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A Compilation and Evaluation of Mechanical, Thermal, and Electrical Properties of Selected Polymers

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LAST PAGE OF BOOK

A Compilation and Evaluation of Mechanical, Thermal, and Electrical Properties of Selected Polymers

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A Compilation and Evaluation of Mechanical, Thermal, and Electrical Properties of Selected Polymers

R. E. Schramm, A. F. Clark, and R. P. Reed

This compilation abstracts original experimental data on the mechanical, thermal, and electrical properties of six commercially available polymers. After an extensive review of the open literature, all available data were collected together in graphical and tabular form along with material characterization, experimental method, and reference to the original publication. The data are also summarized and a brief description of each polymer is included.

Key words: Compilation; electrical properties; mechanical properties; plastics; polymers; thermal properties.

1. Introduction

Polymers are widely used in virtually all aspects of the modern world. In both scientific and nonscientific fields, reliable property data are needed by designers, manufacturers, and research personnel, but they are widespread and scattered throughout the technical literature (many are only published in final reports to sponsoring agencies and do not appear in the open literature). There is a strong need to correlate and critically evaluate these data and compile them into a ready reference. To fill this need and to be able to identify data gaps in the technical literature, we have undertaken this compilation and critical evaluation of the mechanical, thermal, and electrical properties of a selected group of the more common types of polymers.

A. The Polymers

Natural and artificial polymers were studied as early as the 1860's but it wasn't until Staudinger in 1920 proposed the chain model that we began to understand them. This model wasn't widely accepted until the late 1930's and it took about twenty more years to develop the technical expertise that has led to the burgeoning use of polymers in the last decade.

There are many good texts to aid in understanding the polymer physical properties and their behavior (which we have compiled here) and we shall make no attempt to generate another. These texts and several good review articles are listed as references to this introduction. Perhaps two of the texts should be mentioned: Flory 1953, seems to be the source of most of the commonly accepted definitions, and the other, Billmeyer 1962, is a good, general first reference for someone with little understanding of polymers.

The polymers whose data are compiled are (with their abbreviations):

1. Polytetrafluoroethylene (TFE)
   and its copolymer with
   —Hexafluoropropylene (FEP)
2. Polychlorotrifluoroethylene (CTFE)
3. Polyethylene terephthalate (PET)
4. Polypyromellitimide (PPMI)
5. Polyparaxylylene (PPX)
6. Polycarbonate (PC)

These were chosen as representative of the most commonly used structural and film polymers at low temperatures and are by no means complete. Generally, copolymers were avoided because the properties depend strongly on the proportions of the two polymers. An exception was made for the widely used FEP.

B. The Properties

We have compiled the physical properties that are necessary for good applications design, including virtually all of the bulk mechanical, thermal and electrical properties. We have neglected some properties, such as the surface electrical resistivity, which are not inherent properties of the bulk material but dependent on the surface state and environment of a particular application. We have also ignored viscosity and other liquid properties since these are not applicable to structural use.

Temperature was chosen as the primary variable but other parameters have been plotted where useful and available, such as the dielectric loss tangent versus frequency. Most of the polymers are frequently used in radiation fields and consequently, a considerable amount of data have been accumulated on radiation effects. These have been included. Other special environmental conditions have usually been ignored. Test temperatures were noted when stated in the original paper; when not specified, it was assumed that the test was conducted at room temperature.

The *mechanical* properties which have been included in this compilation are:

Stress-Strain Relation
Elongation
Tensile and Yield Strength
Compressive Strength
Shear Strength
Flexural Strength
Impact Energy
Young's Modulus
Compressive Modulus
Shear Modulus
Bulk Modulus
Flexural Modulus
Secant Modulus
Toughness
Internal Friction
Fatigue
Creep
Stress Relaxation
Hardness
Poisson's Ratio

The *thermal* properties included are:

Expansion
Diffusivity
Specific Heat
Conductivity

The *electrical* properties included are:

Dielectric Loss Tangent
Dielectric Constant
Volume Resistivity
Dielectric Strength

The diffusivity is directly related to the specific heat, conductivity, and density but these properties are so commonly used independently that they have all been included. The expansion was plotted rather than the expansivity or expansion coefficient because it represents the actual measurement and is most sought for design considerations. The two fundamental ac and two dc properties have been included. The other properties can be derived from these or are not bulk properties.

The units used are those in widespread use in the U.S., such as psi or volts mil^{-1}. Where no universal acceptance is manifest, we have converted to SI (Système Internationale) units to encourage international uniformity. On all stress graphs an auxiliary scale in dynes cm^{-2} is included where 1 dyne $cm^{-2} = 0.1$ N/m^{-2} (pascal). Section 4 lists other conversion facts between units.

C. Structure of the Compilation

The data are arranged in units according to polymer in the following order:

Polytetrafluoroethylene	TFE
and its copolymer with	
—hexafluoropropylene	FEP
Polychlorotrifluoroethylene	CTFE
Polyethylene terephthalate	PET
Polypyromellitimide	PPMI
Polyparaxylylene	PPX
Polycarbonate	PC

Each unit is introduced by a brief section describing its structure and general properties, its common applications, and a list of the trade names that occur in the articles abstracted for this compilation.

The data are presented graphically with each reference indicated on the graph. Common coordinate scales are used where possible for easy comparison between graphs. Beneath each graph is a table listing the references, any material identification given, and a brief summary of the specimen description and the experimental conditions given in the reference. If test or material information is not presented in these tables, it should be assumed that the information was not provided by the investigators in their report. Single point data that are not best presented on a graph are summarized in tables at the end of each mechanical, thermal, or electrical properties section. The references are listed alphabetically by first author at the end of these sections.

There are many variables in the preparation of these polymers that significantly affect their physical properties. The average molecular weight and the molecular weight distribution, the degree of crystallinity, the degree and direction of orientation are all affected by a specimen's thermal and mechanical history and may significantly alter its physical properties. Because of this and the fact that there are no industry-wide standards for chemical purity or uniformity of preparation techniques, a "best value" for each of the properties is sometimes difficult. In many cases, the data from different sources closely overlap and for these we have generated average value plots. These curves have been collected together in section 5, and are intended for quick reference and comparison of polymers. If accuracy is of interest to the user, he is advised to choose the data from those experimental conditions and specimen history closest to his own application.

In any compilation of this size there are undoubtedly valuable references which have been overlooked. For this the authors apologize. We have, however, collected, reviewed, or abstracted over 2000 references and have, to the best of our knowledge, covered all of the open literature up to and including the year 1971.

Included in the summary presented for each polymer is a list of the trade names which appeared in the papers compiled. These lists relate the common trade names to the less common generic identification used for each polymer. Trade names also appear in the tables describing material and experimental techniques. These are included to characterize accurately these conditions. The use of these trade names in no way implies endorsement or approval by NBS. It is to be further understood that there is no judgment made on the relative merits of the commercial products listed herein.

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2. Definitions

A. Mechanical Properties

1. *Stress-strain*

Definition: The stress-strain diagram is a plot of applied strain (ϵ) versus the resulting stress (σ); 2 typical examples are shown in figure 1. Stress or engineering stress (σ) is the applied force (F) divided by the original area (A) of the sample; true stress (σ_T) is the applied load divided by the instantaneous area (A_ϵ). Strain or engineering strain (ϵ) is the change in sample length (ΔL) divided by the original length (L); true strain (ϵ_T) is $\int dL/L$. Unless otherwise specified, the reported data were obtained on specimens under tension; measurements made under compression or torsion are so identified.

In all the diagrams presented here, an X terminating a stress-strain curve signifies fracture, while a O terminating a stress-strain curve indicates either no fracture or uncertainty as to whether fracture did occur prior to the completion of measurement.

Formulae:

$$\sigma = F/A \qquad \sigma_T = F/A\epsilon$$
$$\epsilon = \Delta L/L \qquad \epsilon_T = \int dL/L$$

Units:

σ has units of psi; ϵ is dimensionless.

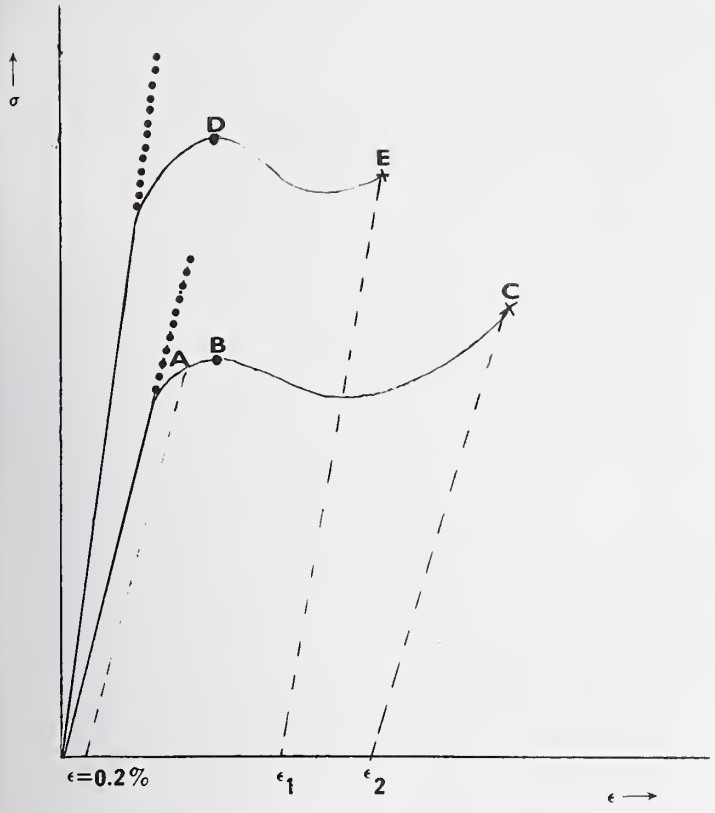


FIGURE 1

2. *Elongation*

Definition: Elongation is the plastic deformation, $\Delta L/L$, which a sample exhibits in the process of being broken in tension (ϵ_1 and ϵ_2 in fig. 1).
Formula: Elongation $=\Delta L$(plastic)$/L$, where ΔL is the change of specimen length within a gage length, L.
Unit: Elongation is dimensionless.

3. *Strength*

Definitions:

Tensile strength (TS) is the maximum engineering stress endured by a specimen in tension (C and D in fig. 1). To compute it, the maximum load is divided by the original cross-sectional area.

Yield strength (YS) is the engineering stress at which a sample has undergone some small plastic deformation (e.g., 0.2%, A in fig. 1); this plastic strain is the yield offset (yd. off) and is noted when specified in the original report. Some authors identify the point at which the stress first starts to decrease as the yield strength (B and D in fig. 1), while as many fail to define their yield strength at all.

Breaking strength is the engineering stress at the time of fracture (C and E in fig. 1).

Compressive strength is the maximum engineering stress endured by a specimen in compression.

Shear strength is the maximum engineering stress endured by a specimen in shear or torsion.

Flexural strength is the maximum engineering stress endured by a specimen flexing due to a perpendicular force.
Formula: Strength $=F/A$
Unit: psi

4. *Impact strength*

Definition: Impact strength is a measure of the relative susceptibility to fracture by shock loading. There are two standard types of test: In the Izod type of test, the notched sample is broken by a single hammer blow delivered at a fixed distance from the edge of the speciman clamp. In the Charpy type test, the sample (notched or plain) is broken by a single hammer blow delivered midway between two specimen supports. The results of impact tests have only relative value, and the two types cannot be directly compared.
Formula: Impact strength $=$ Energy absorbed/distance from bottom of notch to back of sample.
Units ft.-lb. in^{-1} of notch

5. *Impact energy*

Definition: Impact energy is the energy absorbed in fracturing a sample by an impact blow.
Unit: ft.-lb.

6. *Modulus*

Definitions:

Young's modulus (also called elastic modulus or modulus of elasticity) is the slope of the initial straight line portion of the stress-strain curve measured in tension (dotted lines in fig. 1).

Compressive modulus is Young's modulus measured in compression.

Sonic modulus is Young's modulus determined by measuring the velocity of sound through the specimen.
Formula: Sonic Modulus $=$ (velocity of sound)$^2 \times$ density

Shear modulus (also called the modulus of rigidity) is the slope of the initial straight line portion of the shear stress-shear strain curve.

Bulk modulus (reciprocal of the compressibility) is the proportionality constant between the change in pressure (ΔP) applied to a sample and its change in volume (ΔV).
Formula: Bulk modulus $=-\Delta P/\Delta V/V$

Flexural modulus is Young's modulus determined while flexing the sample with a perpendicular force.

Secant modulus is the stress required to produce a given strain (e.g., 1%) divided by that strain.

Formula: In general: Modulus $=\dfrac{\Delta\sigma}{\Delta_\epsilon}$

Unit: psi

7. *Toughness*

Definition: Toughness is a measure of the energy required to strain a sample to fracture; in tension or compression, it is the area under the stress-strain curve, in impact it is the energy absorbed.
Unit: ft.-lb. in^{-3}

8. *Internal friction*

Definition: Internal friction is a measure of the mechanical losses which occur in the test sample. The logarithmic decrement (δ) measures the wave damping of a free oscillator, and the damping factor (Q^{-1}) is calculated for a forced oscillator. Internal friction is the mechanical analog of the dielectric loss tangent.

Formula: $\delta=\ln\dfrac{u_1}{u_2}$ where u_1 and u_2 are the amplitudes of successive oscillations.

$$Q^{-1}=\frac{\omega_2-\omega_1}{\omega_0}$$ where ω_1 and ω_2 are frequencies above and below the resonant frequency, ω_0, at which the amplitude is reduced by a factor of $\dfrac{1}{\sqrt{2}}$

When $\delta \ll 1$, $\delta=\pi Q^{-1}$ but this condition does not hold when the losses are large, as in these polymers [see Cottrell, A. H., The Mechanical Properties of Matter, (John Wiley & Sons, Inc., New York, 1964) pp. 172–178].
Units: δ and Q^{-1} are dimensionless.

9. *Fatigue*

Definition: Fatigue is the gradual failure of a sample under cyclical application of a constant stress or strain.

10. *Creep*

Definition: Creep is the increase of strain with time in a sample subjected to a constant stress.

11. *Stress relaxation*

Definition: Stress relaxation is the decrease of stress with time in a sample subjected to a constant strain.

12. *Hardness*

Definition: Hardness is a measure of the relative difficulty with which a permanent indentation is made in the surface of a sample. Several systems, often with various scales, are in use, e.g., Rockwell, Brinnel, and Shore.

13. *Poisson's ratio*

Definition: Poisson's ratio (μ) is the ratio of the transverse contraction to longitudinal extension of a sample under uniaxial stress.

Formula: $\mu = -\epsilon_{\perp}/\epsilon_{||}$

Unit: Poisson's ratio is dimensionless.

B. Thermal Properties

1. *Expansion*

Definition: The thermal expansion, $\Delta L/L$, is the total length change from a reference temperature to a given temperature divided by the length at the reference temperature. Room temperature, 295 K (22 C or 72 F), is commonly used as the reference temperature. The expansivity or expansion coefficient, α, is the temperature derivative of the thermal expansion.

Formulae:

$$\frac{\Delta L}{L} = \frac{L_T - L_{295}}{L_{295}}$$

$$\alpha = \frac{d}{dT}\left(\frac{\Delta L}{L}\right) = \frac{1}{L_{295}}\frac{dL}{dT}$$

Units: $\frac{\Delta L}{L}$ is dimensionless; α has units of K^{-1}

2. *Diffusivity*

Definition: The diffusivity, α, is a measure of the rapidity with which a sample reaches thermal equilibrium after a temperature disturbance. It is defined as the ratio of the thermal conductivity, λ, to the density, ρ, and specific heat, C_p.

Formula:

$$\alpha = \frac{\lambda}{\rho C_p}$$

Unit: $cm^2\ s^{-1}$

3. *Specific Heat*

Definition: The specific heat, C_p, is the amount of energy required to raise a unit mass of the material one unit of temperature at constant pressure. The integral of the specific heat over a temperature range T_1 to T_2 is the enthalpy, H, a measure of the heat energy required to raise a unit mass from T_1 to T_2.

Formula

$$H = \int_{T_2}^{T_1} C_p dT$$

Unit: $J\ g^{-1}\ K^{-1}$

4. *Thermal Conductivity*

Definition: The thermal conductivity, λ, is a measure of ease with which heat energy can be transmitted through a material. It is the coefficient that relates the heat flow, dQ/dt, to the driving temperature gradient, dT/dx, and the area, A.

Formula:

$$\frac{dQ}{dt} = -\lambda A \frac{dT}{dx}$$

Unit: $W\ m^{-1}\ K^{-1}$

C. Electrical Properties

1. *Dielectric Loss Tangent and*

2. *Dielectric Constant*

Definition: The dielectric constant, ϵ, of a material can be defined as the ratio of the capacitance of a capacitor filled with the material to one containing a vacuum, and is always greater than one. ϵ is also referred to as the relative dielectric constant, dielectric coefficient, specific inductive capacity, and relative permittivity. All polymers are dielectric materials in that they are good insulators. In addition, most polymers are polar due to their asymmetric molecular charge distributions and these polar molecules tend to line up when an electric field is applied. If the applied electric field is alternating the dielectric constant is broken up into an immediately responding part, ϵ_1, due to the small realignment of the electrons and a lagging part, ϵ_2, due to the viscous resistance to the small rotation of the polar molecules. The ratio of these two, ϵ_2/ϵ_1, represents the tangent of the phase angle by which the net polarization lags the applied a.c. field and is indicative of a power loss. This angle, δ, is called the loss angle. The tangent of the angle, tan δ, is the dielectric loss tangent or dissipation factor. ϵ is frequently displayed in complex notation with $\epsilon = \epsilon_1 - i\epsilon_2$.

Formulae: $\epsilon = C_{diel}/C_{vac.}$

$\tan \delta = \epsilon_2/\epsilon_1$

Units: Both ϵ and tan δ are dimensionless.

3. *Volume Resistivity*

Definition: The volume resistivity, ρ, represents the resistance of a material, R, to the passage of electrical current, I, when subject to an applied electric potential, V. The resistance of a specimen is normalized by its area, A, and length, L, to make the resistivity independent of specimen size.

Formula:

$$V = IR$$

$$\rho = R\,A/L$$

Unit: Ωcm

4. *Dielectric Strength*

Definition: The dielectric strength, *D.S.*, is the maximum voltage attainable before a material breaks down permitting an ionized path for conduction directly through it.

Unit: $V\ mil^{-1}$

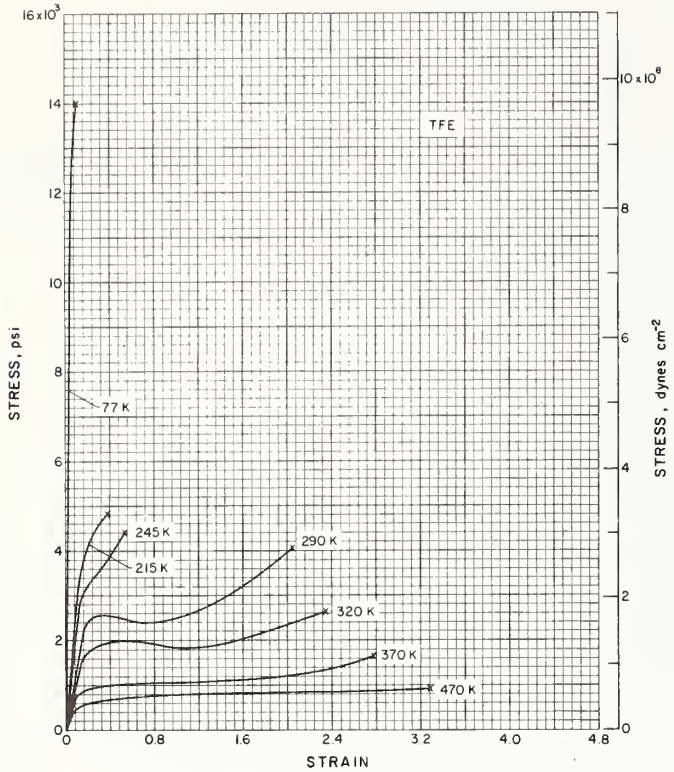
3. Abbreviations and Symbols

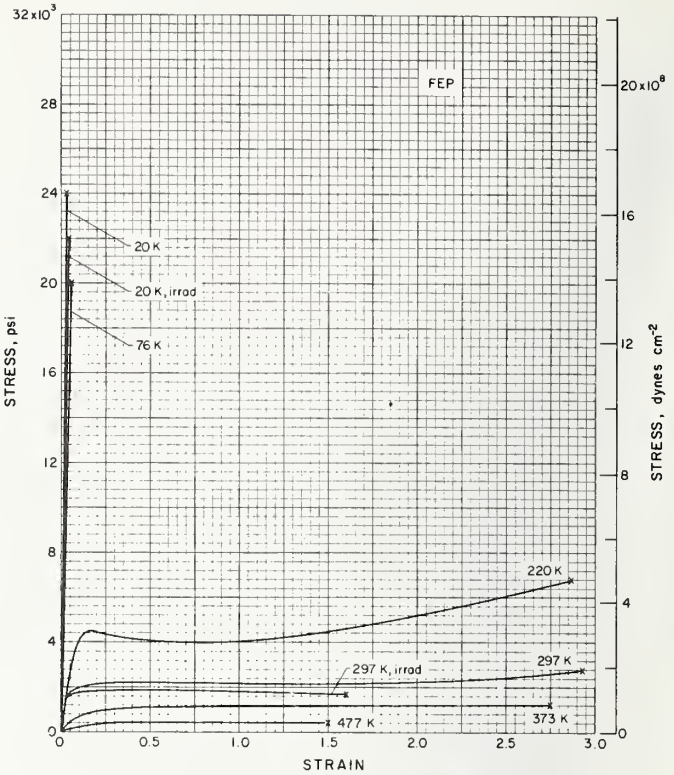
Å = angstrom
ac = alternating current
approx = approximately
ASTM = American Society for Testing Materials
atm = atmosphere
av = average
BTU = British thermal unit
C = Centigrade
cal = calorie
cm = centimeter
C_p = specific heat
crys = crystallinity
dc = direct current
diam = diameter
D.S. = dielectric strength
E = Young's modulus
F = Fahrenheit
ft = foot
g = gram
GL = gage length
h = hour
Hz = hertz
in = inch
irrad = irradiated
J = joule
K = Kelvin
kg = kilogram
kcal = kilocalorie
l = length
lb = pound
ln = natural logarithm (base e)
log = common logarithm (base 10)
long. = longitudinal
m = meter
max = maximum
min = minimum or minute
mm = millimeter
N = newton
nvt = total number of thermal neutrons striking an area of 1 cm^2 oriented in any direction in t seconds
ppm = parts per million
psi = pounds per square inch
Q^{-1} = damping factor
Red Sec = reduced section
rel hum = relative humidity
s = second
spd = speed
sp gr = specific gravity
t = thickness
tan δ = dielectric loss tangent
temp = temperature
T_g = glass transition temperature
trans = transverse
TS = tensil strength
unirrad = unirradiated
V = volt
W = watt
w = width
xhd = cross head
xsec area = cross sectional area
yd off = yield offset
YS = yield strength
α = diffusivity
$\Delta L/L$ = thermal expansion, change in length divided by the original length
ϵ = strain or dielectric constant
$\dot{\epsilon}$ = strain rate
λ = thermal conductivity
ρ = volume resistivity
σ = standard deviation or stress
Ω = ohm
$\|$ = parallel
$\perp$ = perpendicular

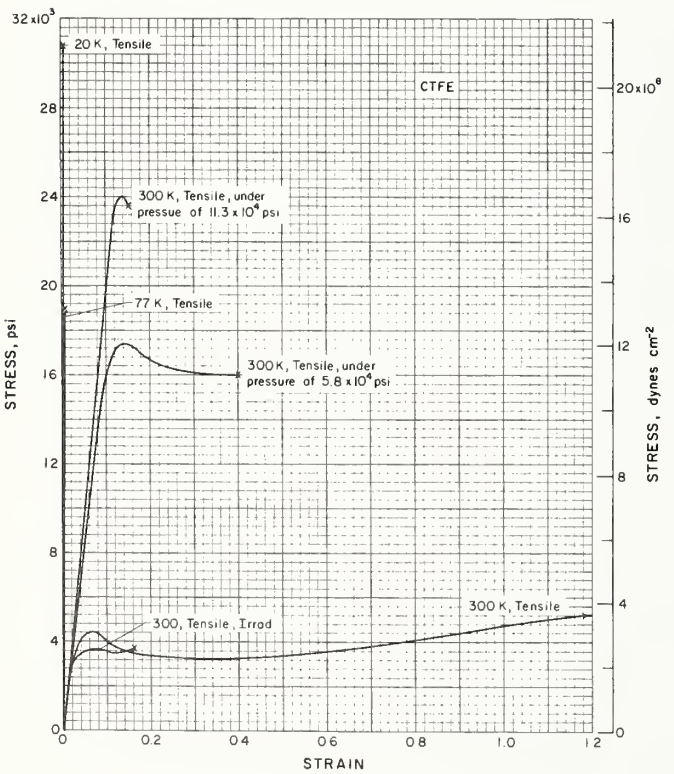
4. Unit Conversions

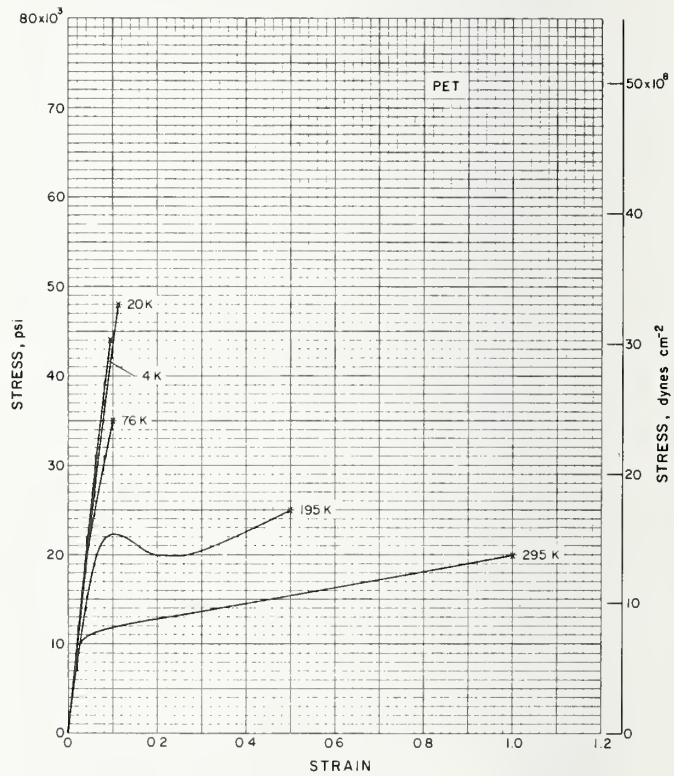
1 psi = 6.89×10^3 Nm^{-2}
6.89×10^4 dyne cm^{-2}
7.03×10^{-4} kg mm^{-2}
5.66×10^{-5} g $denier^{-1}$ (Dacron)
1 mil = 0.001 in
1 J g^{-1} = 0.239 BTU (lb °F)$^{-1}$
0.239 cal g^{-1} K^{-1}
1 W m^{-1} K^{-1} = 2.39×10^{-3} cal cm^{-1} s^{-1} K^{-1}
0.577 BTU ft^{-1} h^{-1} °F^{-1}
6.93 BTU in ft^{-2} h^{-1} °F^{-1}
0.862 kcal m^{-1} °C^{-1}
1 Ω cm = 6.02×10^6 Ω ml ft
1 V mil^{-1} = 394 V cm^{-1}
39.4 V mm^{-1}
1 cm^2 s^{-1} = 0.155 in^2 s^{-1}
1 rad = 100 erg g^{-1}

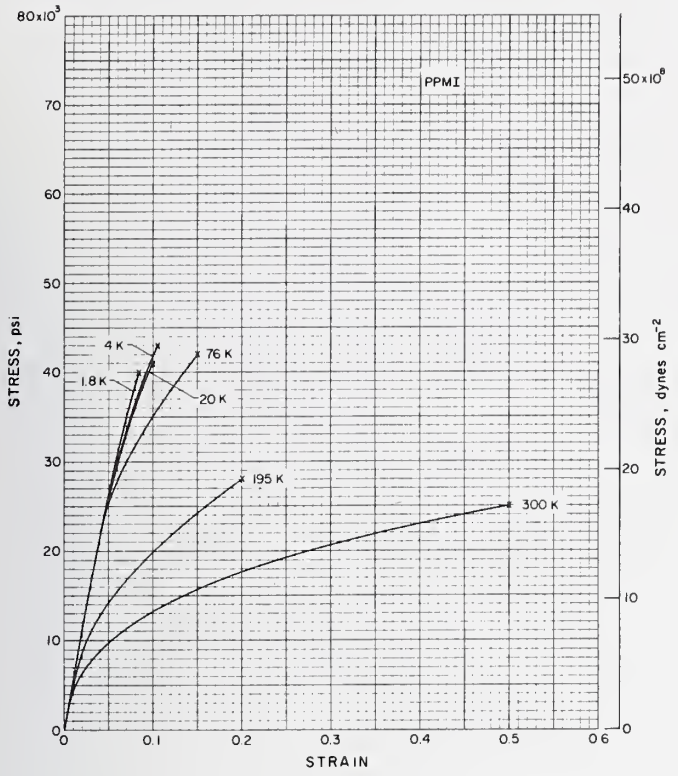
5. Summary of Property Data Compiled for Each Polymer

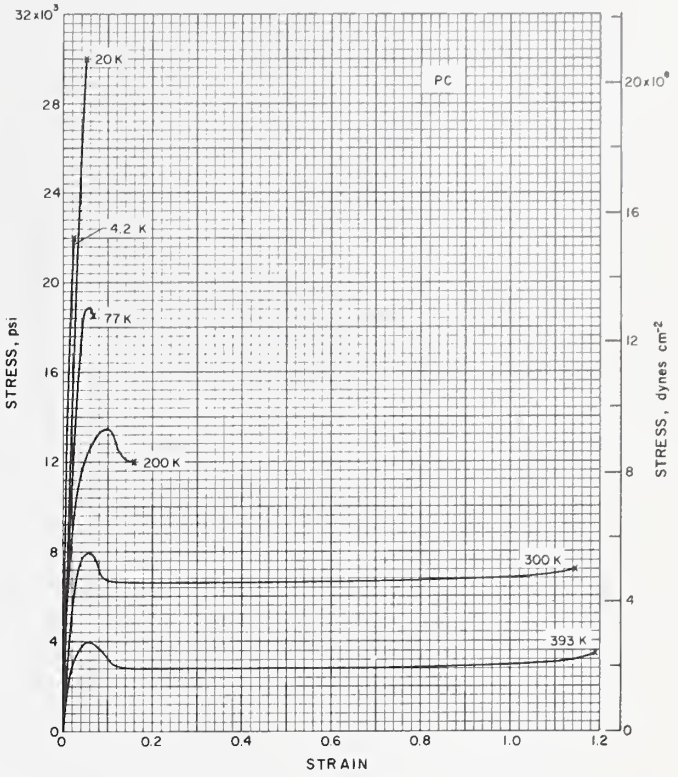

TFE
STRESS, psi
STRESS, dynes cm⁻²
STRAIN
77 K
215 K
245 K
290 K
320 K
370 K
470 K

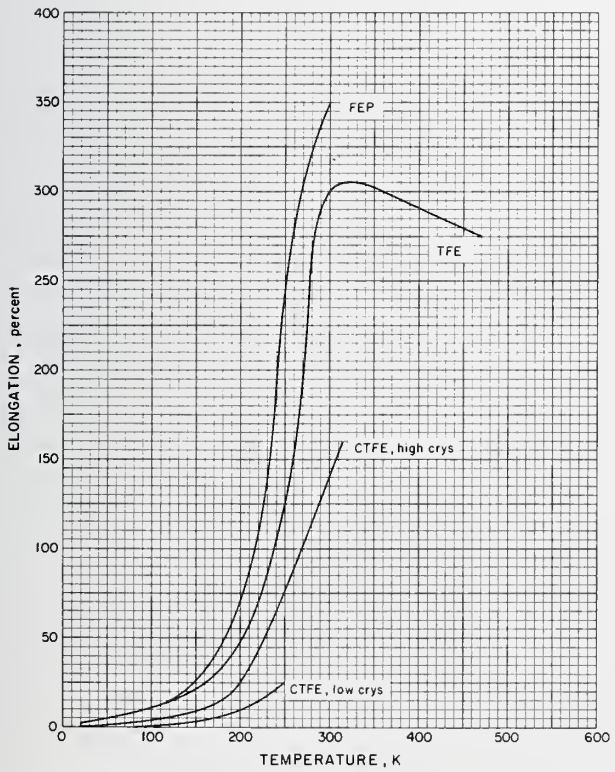

FEP
STRESS, psi
STRESS, dynes cm⁻²
STRAIN
20 K
20 K, irrad
76 K
220 K
297 K, irrad
297 K
373 K
477 K

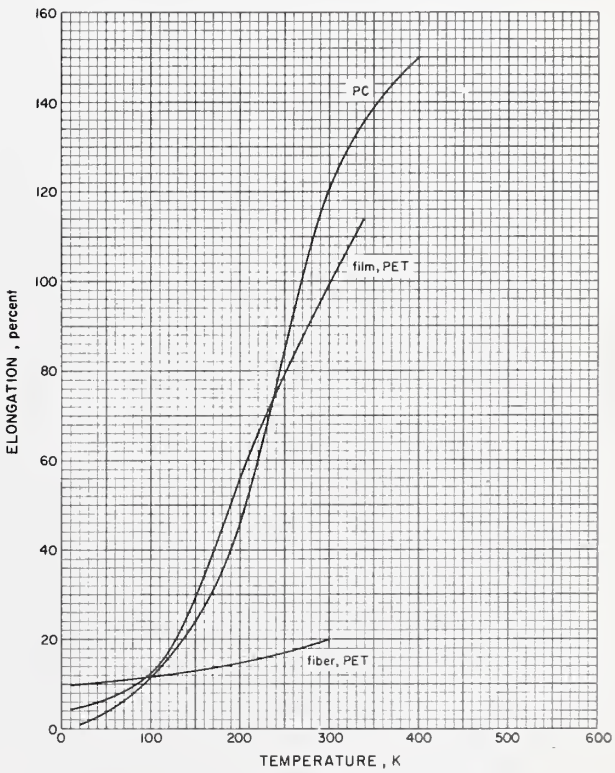

CTFE
STRESS, psi
STRESS, dynes cm⁻²
STRAIN
20 K, Tensile
300 K, Tensile, under pressue of 11.3 x 10⁴ psi
77 K, Tensile
300 K, Tensile, under pressure of 5.8 x 10⁴ psi
300, Tensile, Irrad
300 K, Tensile

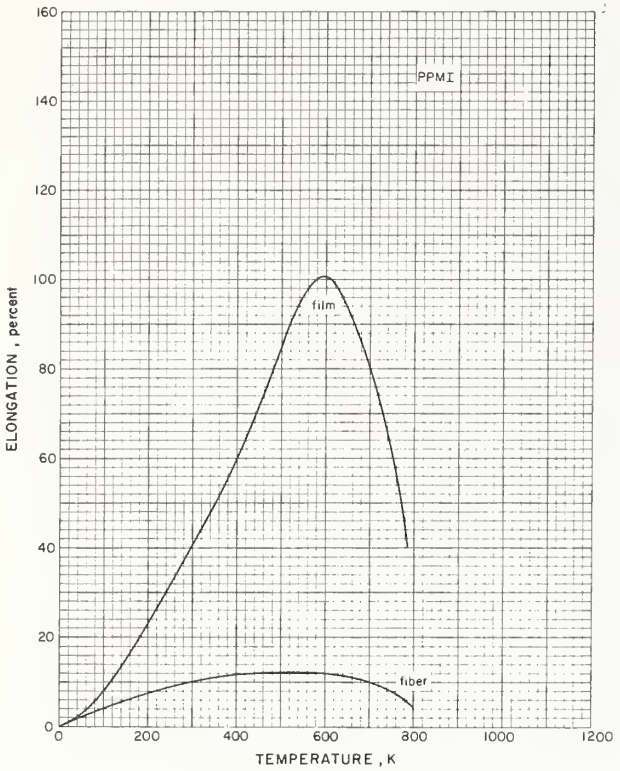

PET
STRESS, psi
STRESS, dynes cm⁻²
STRAIN
20 K
4 K
76 K
195 K
295 K

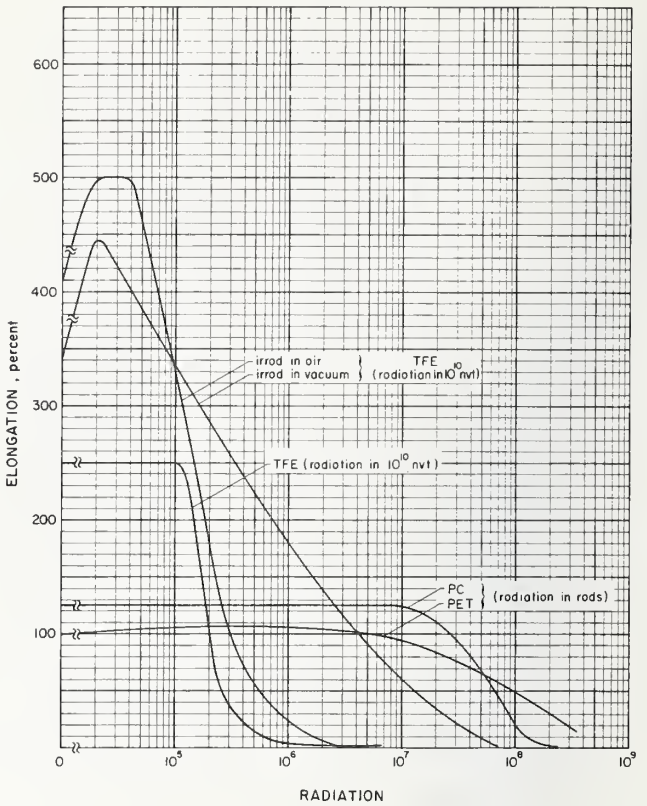

PPMI
STRESS, psi
STRESS, dynes cm⁻²
STRAIN
4 K
1.8 K
76 K
20 K
195 K
300 K

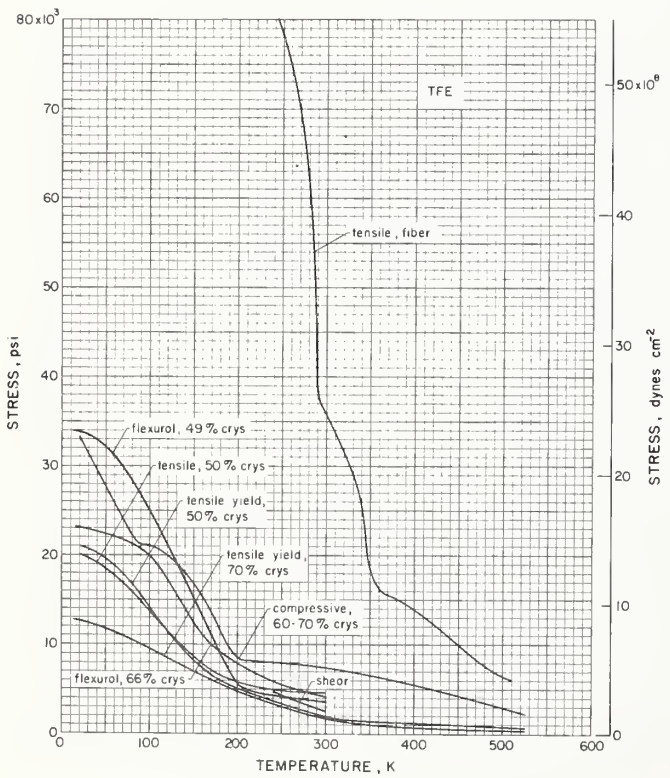

PC
STRESS, psi
STRESS, dynes cm⁻²
STRAIN
20 K
4.2 K
77 K
200 K
300 K
393 K

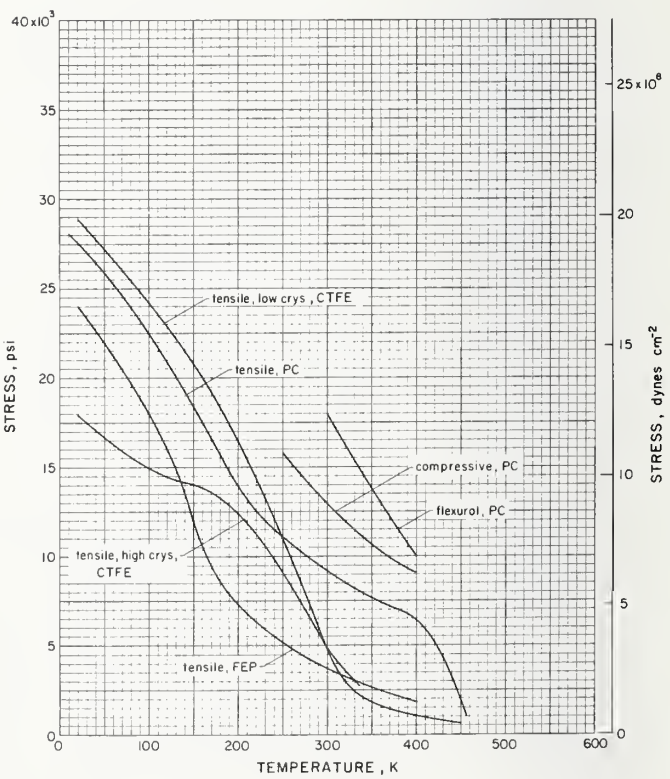

ELONGATION, percent
TEMPERATURE, K
FEP
TFE
CTFE, high crys
CTFE, low crys

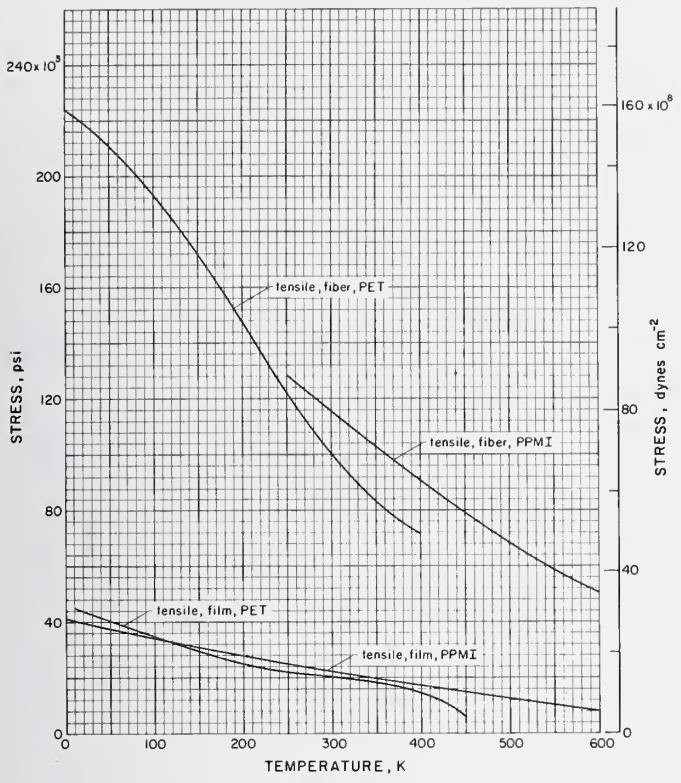

ELONGATION, percent
TEMPERATURE, K
PC
film, PET
fiber, PET

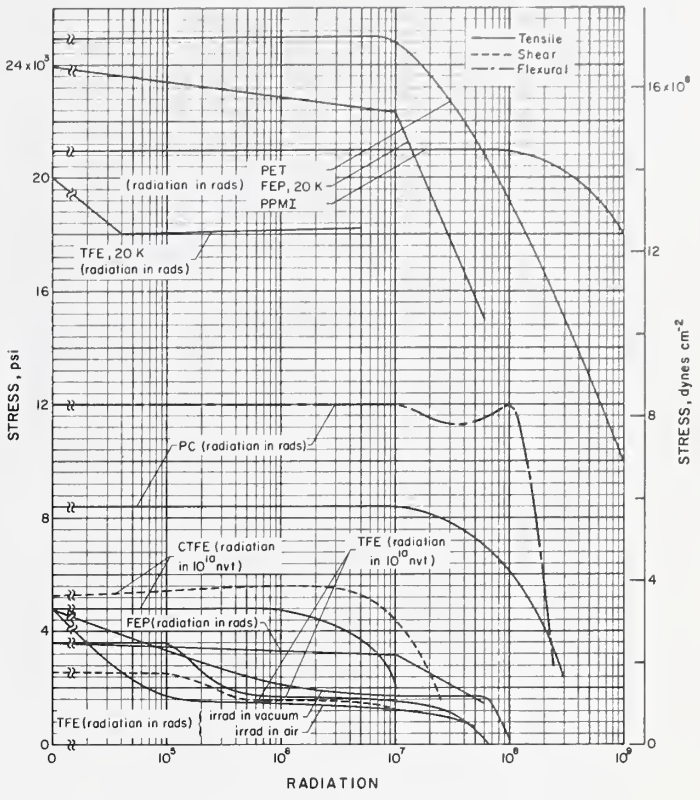

PPMI
film
fiber
ELONGATION , percent
TEMPERATURE , K

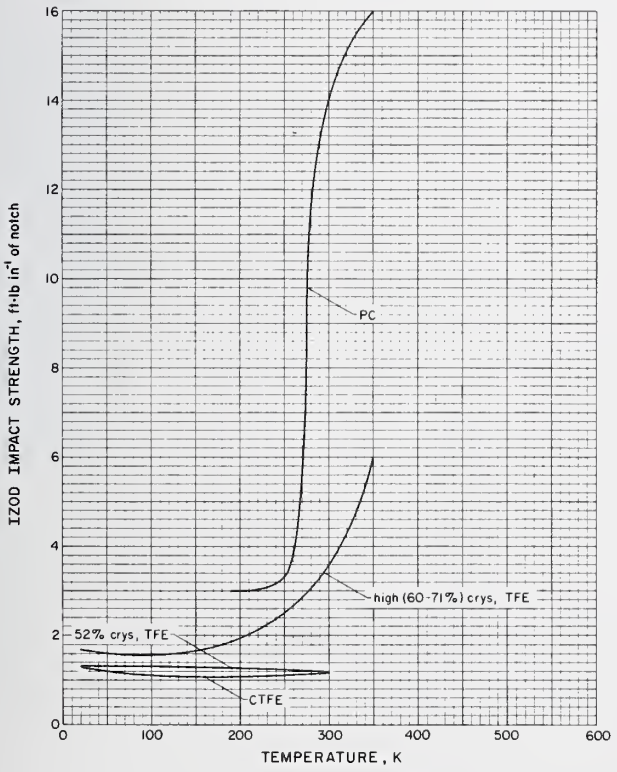

irrad in air
irrad in vacuum
TFE (radiation in 10^10 nvt)
TFE (radiation in 10^10 nvt)
PC
PET
(radiation in rads)
ELONGATION , percent
RADIATION

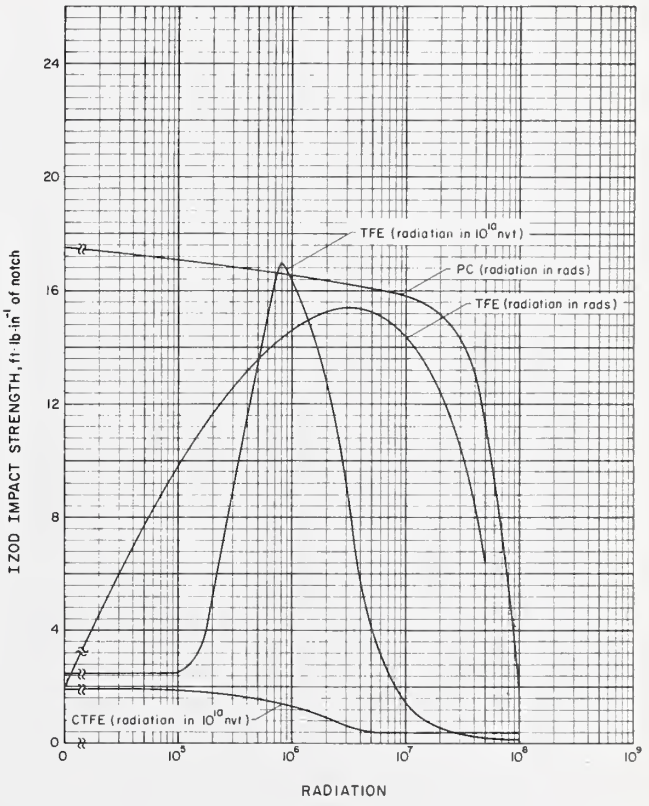

TFE
tensile , fiber
flexurol, 49% crys
tensile, 50% crys
tensile yield, 50% crys
tensile yield, 70% crys
compressive, 60-70% crys
flexurol, 66% crys
shear
STRESS , psi
STRESS , dynes cm^-2
TEMPERATURE , K

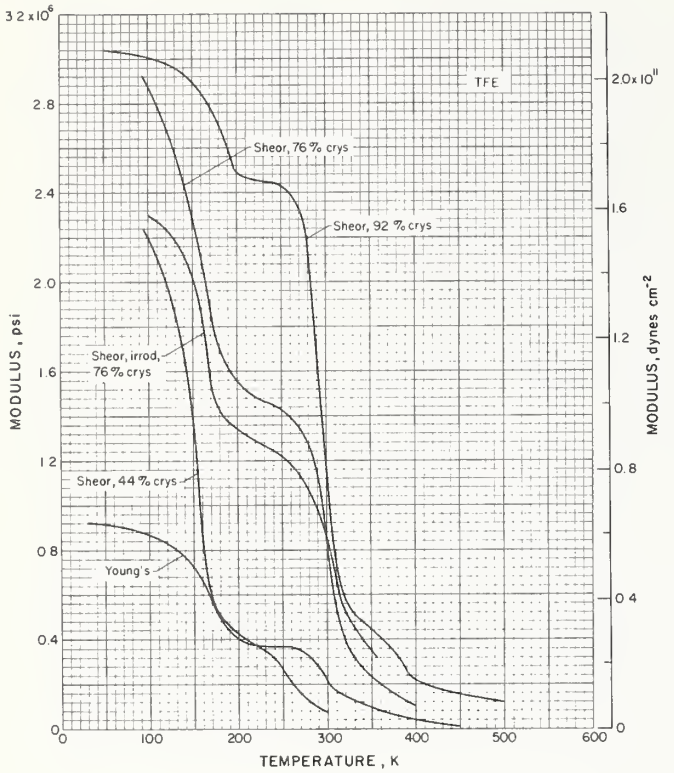

tensile, low crys , CTFE
tensile, PC
compressive, PC
flexurol, PC
tensile, high crys, CTFE
tensile, FEP
STRESS , psi
STRESS , dynes cm^-2
TEMPERATURE , K

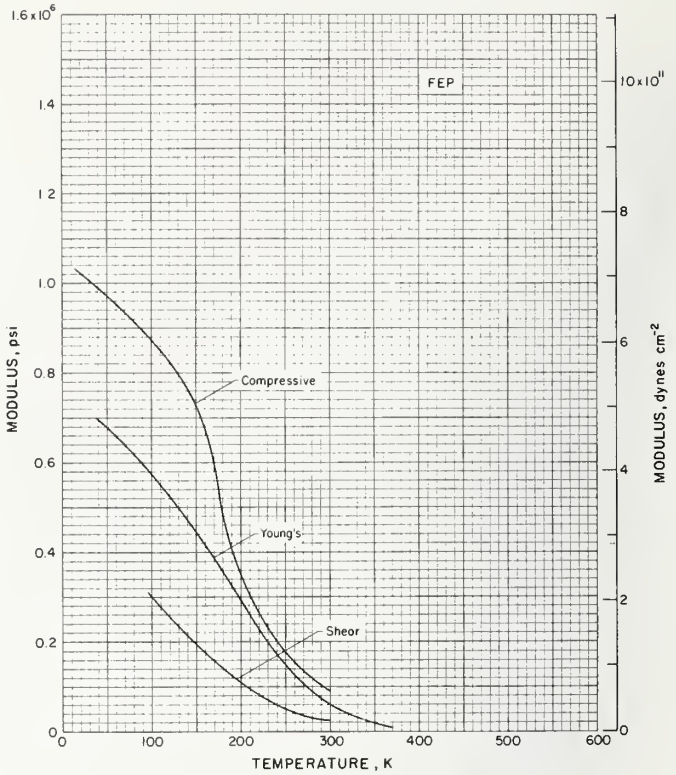

STRESS, psi
STRESS, dynes cm^{-2}
TEMPERATURE, K
tensile, fiber, PET
tensile, fiber, PPMI
tensile, film, PET
tensile, film, PPMI

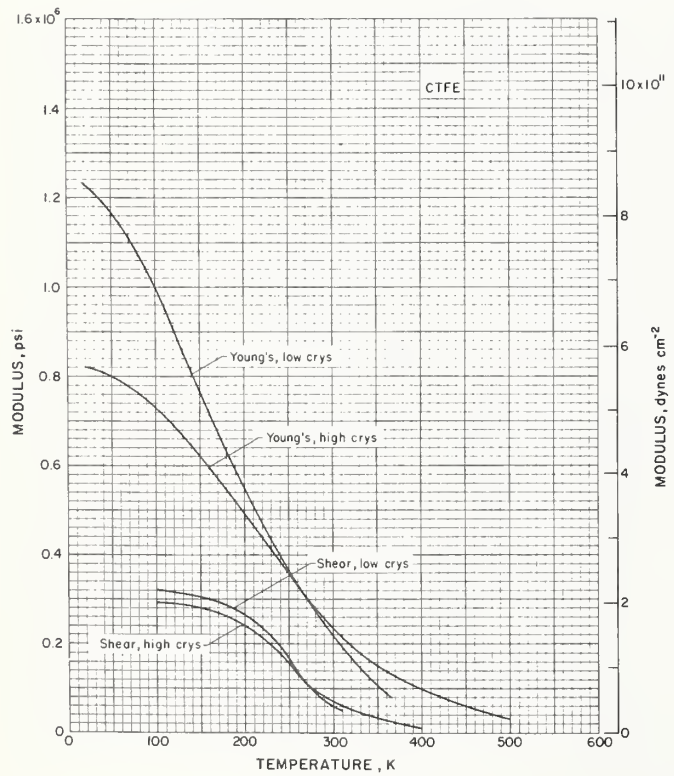

STRESS, psi
STRESS, dynes cm^{-2}
RADIATION
Tensile
Shear
Flexural
PET
FEP, 20 K
PPMI
(radiation in rads)
TFE, 20 K
(radiation in rads)
PC (radiation in rads)
CTFE (radiation in 10^{10} nvt)
TFE (radiation in 10^{10} nvt)
FEP(radiation in rads)
TFE(radiation in rads)
irrad in vacuum
irrad in air

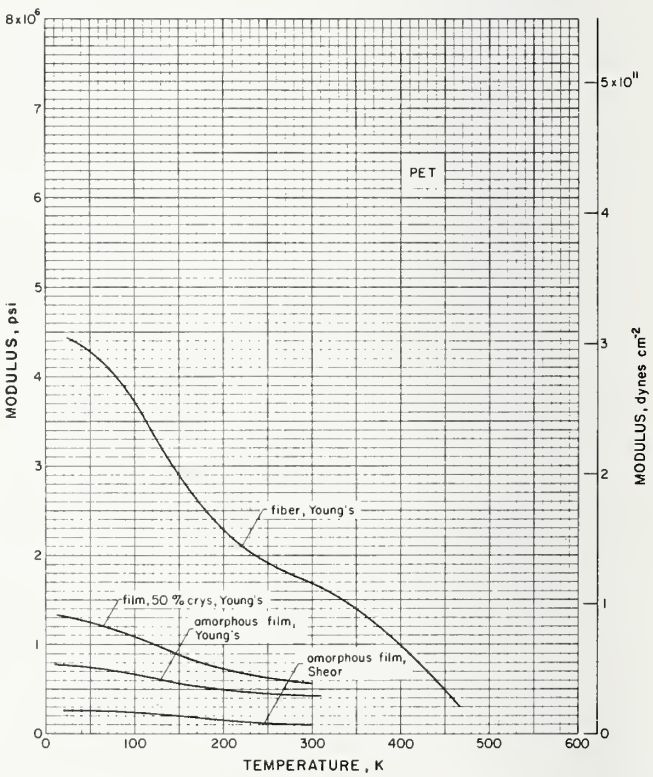

IZOD IMPACT STRENGTH, ft·lb in^{-1} of notch
TEMPERATURE, K
PC
high (60-71%) crys, TFE
52% crys, TFE
CTFE

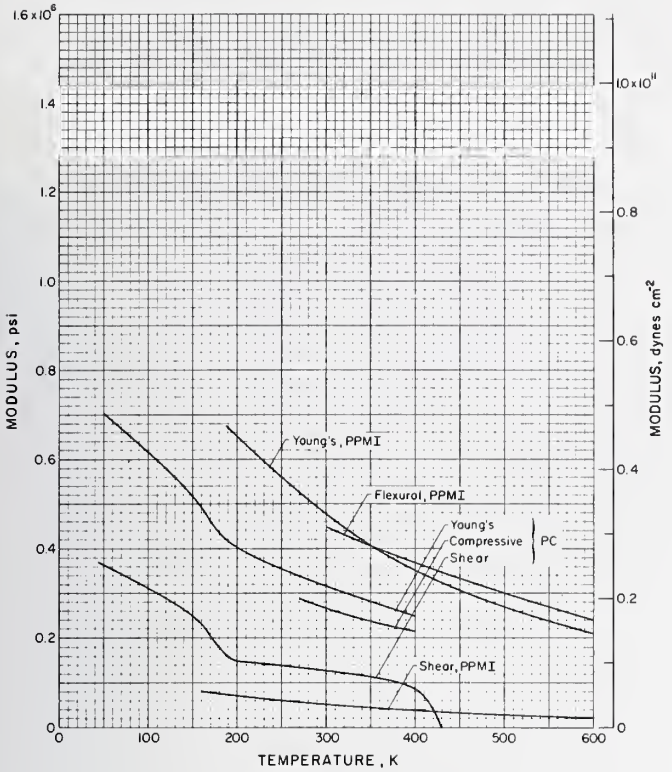

IZOD IMPACT STRENGTH, ft·lb·in^{-1}
RADIATION
TFE (radiation in 10^{10} nvt)
PC (radiation in rads)
TFE (radiation in rads)
CTFE (radiation in 10^{10} nvt)

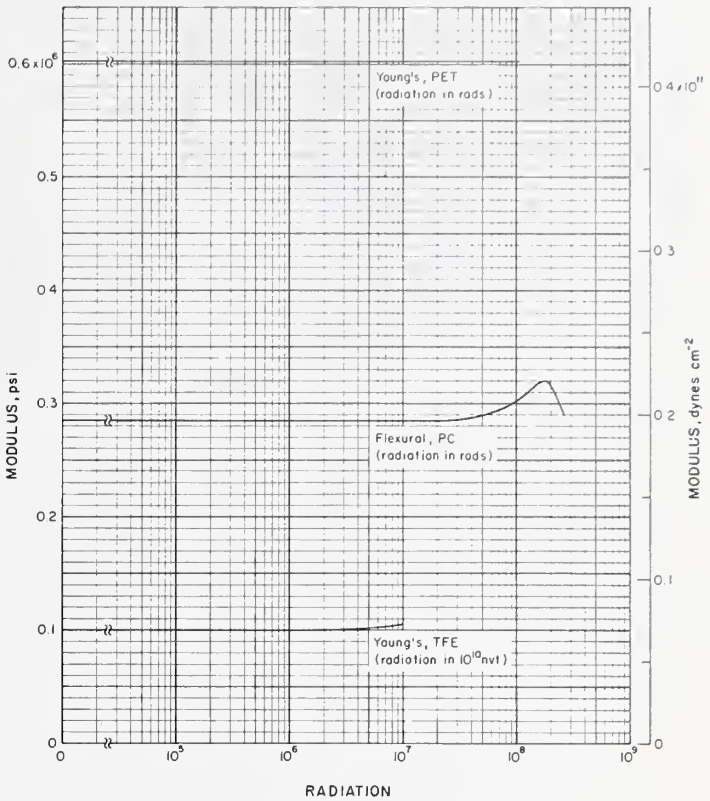

TFE
Shear, 76 % crys
Shear, 92 % crys
Shear, irrad, 76 % crys
Shear, 44 % crys
Young's
MODULUS, psi
MODULUS, dynes cm⁻²
TEMPERATURE, K

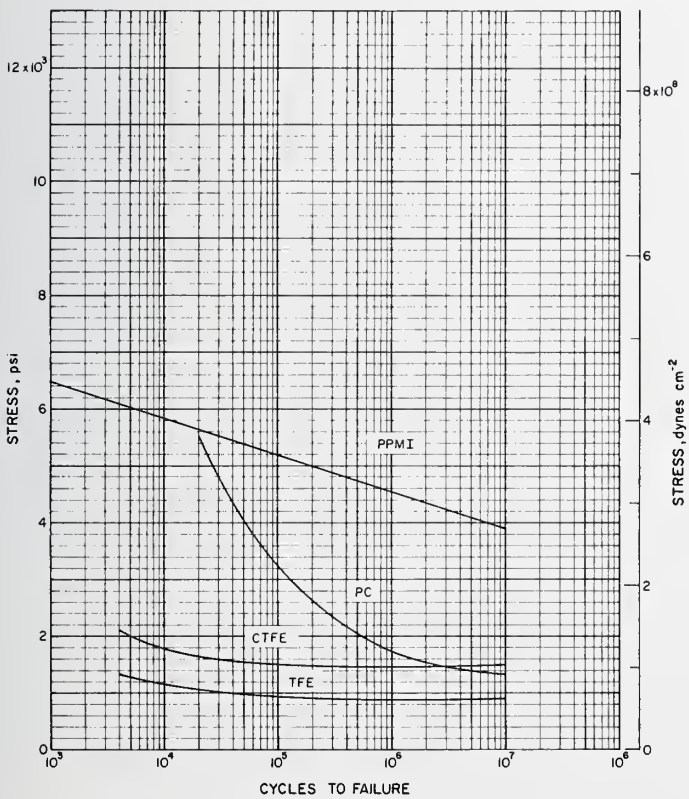

FEP
Compressive
Young's
Shear
MODULUS, psi
MODULUS, dynes cm⁻²
TEMPERATURE, K

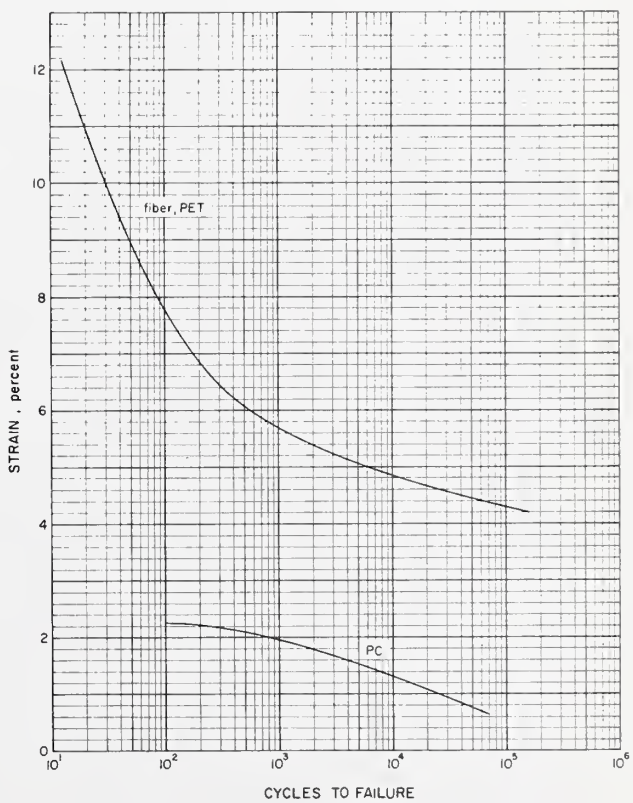

CTFE
Young's, low crys
Young's, high crys
Shear, low crys
Shear, high crys
MODULUS, psi
MODULUS, dynes cm⁻²
TEMPERATURE, K

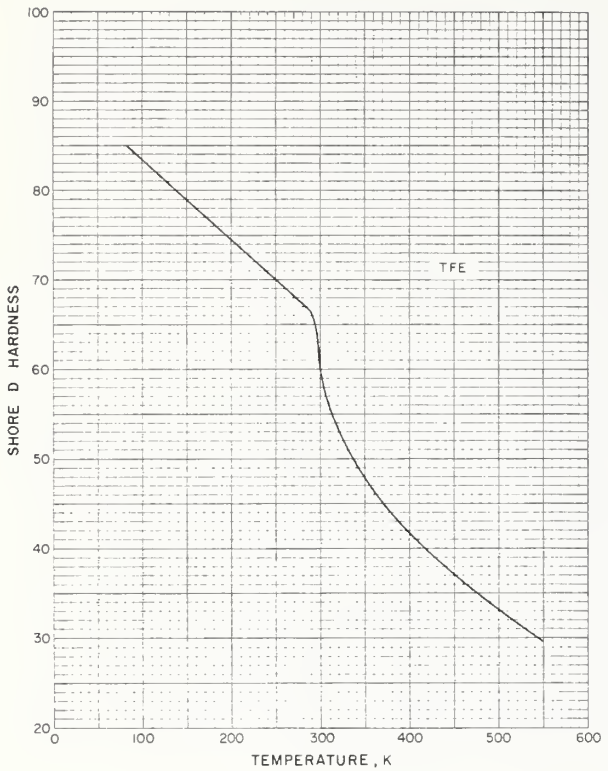

PET
fiber, Young's
film, 50 % crys, Young's
amorphous film, Young's
amorphous film, Shear
MODULUS, psi
MODULUS, dynes cm⁻²
TEMPERATURE, K

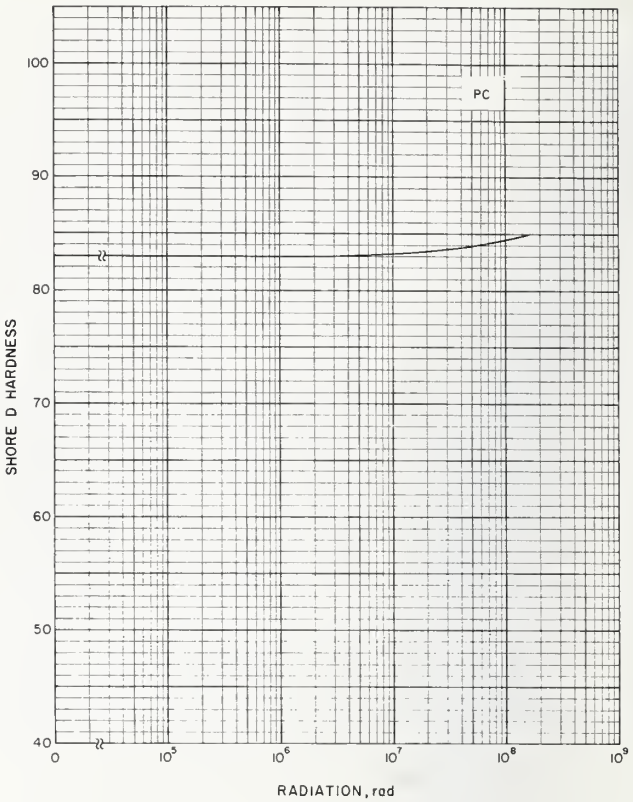

MODULUS, psi
MODULUS, dynes cm⁻²
TEMPERATURE, K
Young's, PPMI
Flexural, PPMI
Young's
Compressive
Shear
PC
Shear, PPMI

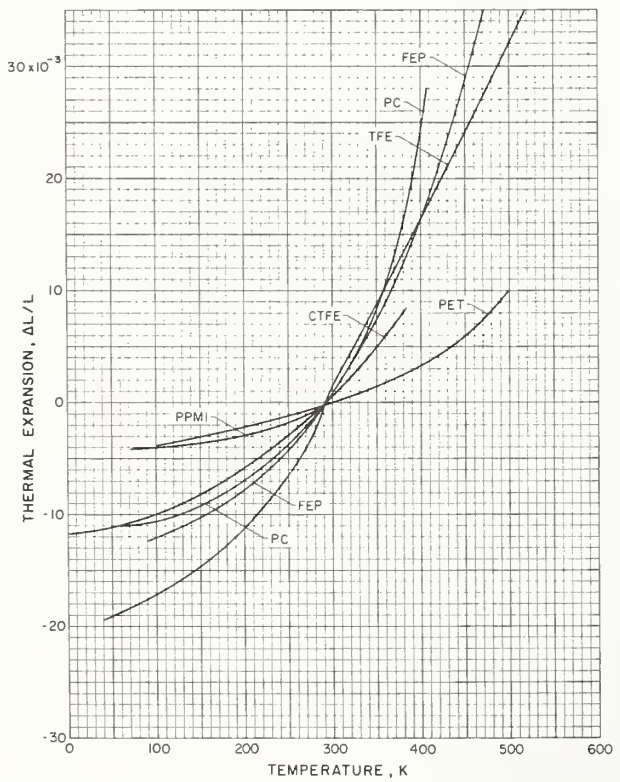

MODULUS, psi
MODULUS, dynes cm⁻²
RADIATION
Young's, PET
(radiation in rads)
Flexural, PC
(radiation in rads)
Young's, TFE
(radiation in 10¹⁰nvt)

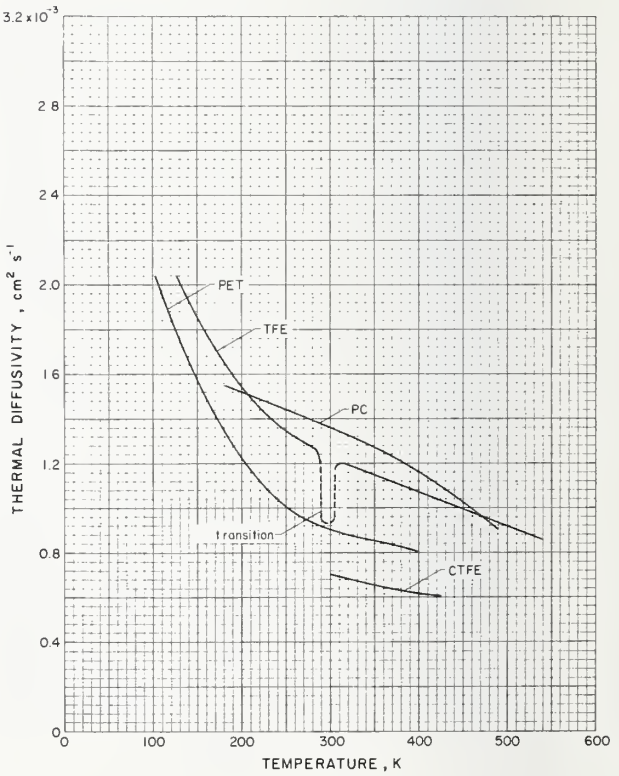

STRESS, psi
STRESS, dynes cm⁻²
CYCLES TO FAILURE
PPMI
PC
CTFE
TFE

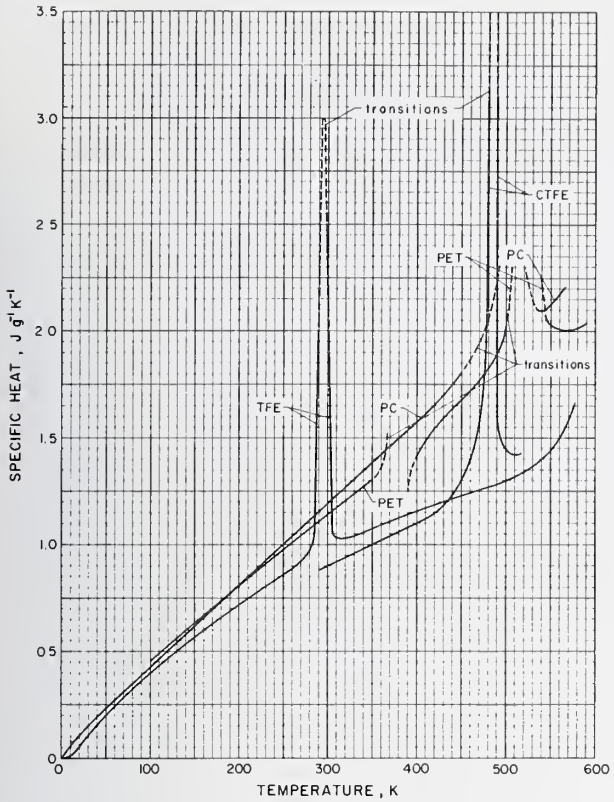

STRAIN, percent
CYCLES TO FAILURE
fiber, PET
PC

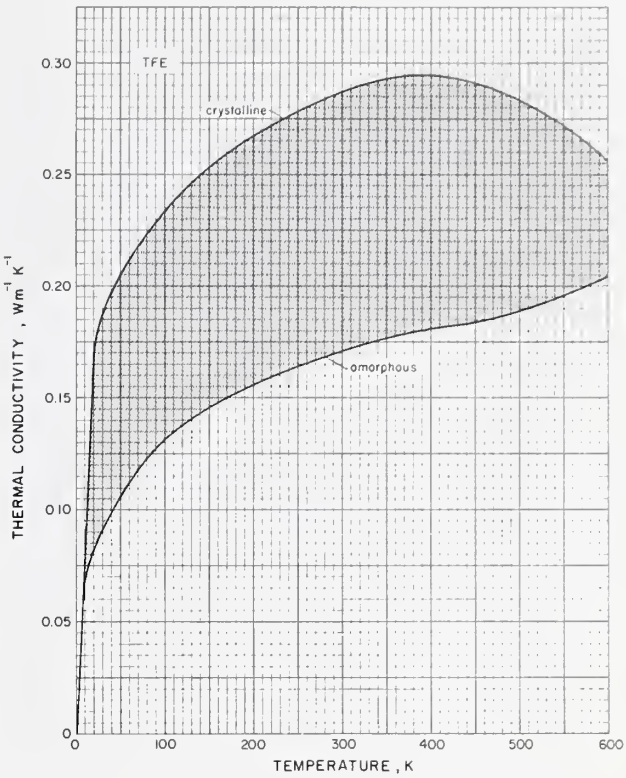

SHORE D HARDNESS
TFE
TEMPERATURE , K

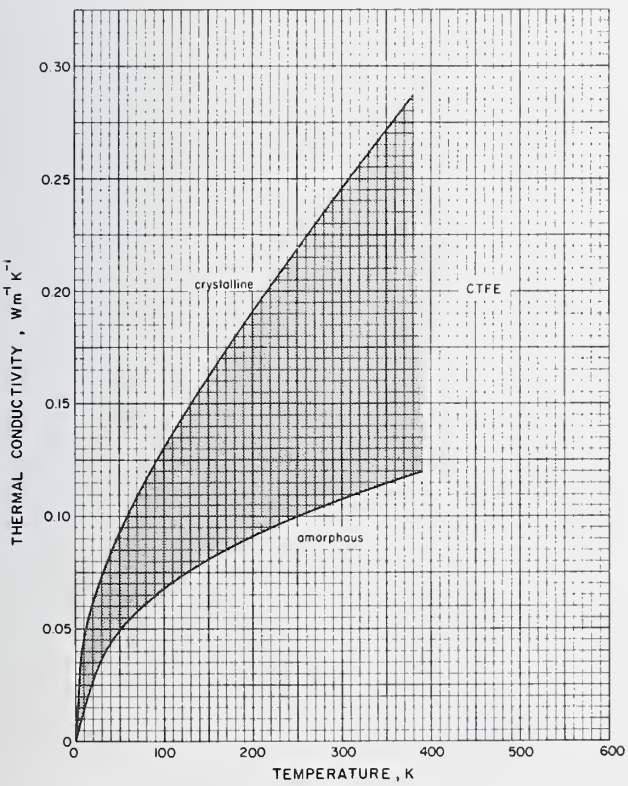

SHORE D HARDNESS
PC
RADIATION, rad

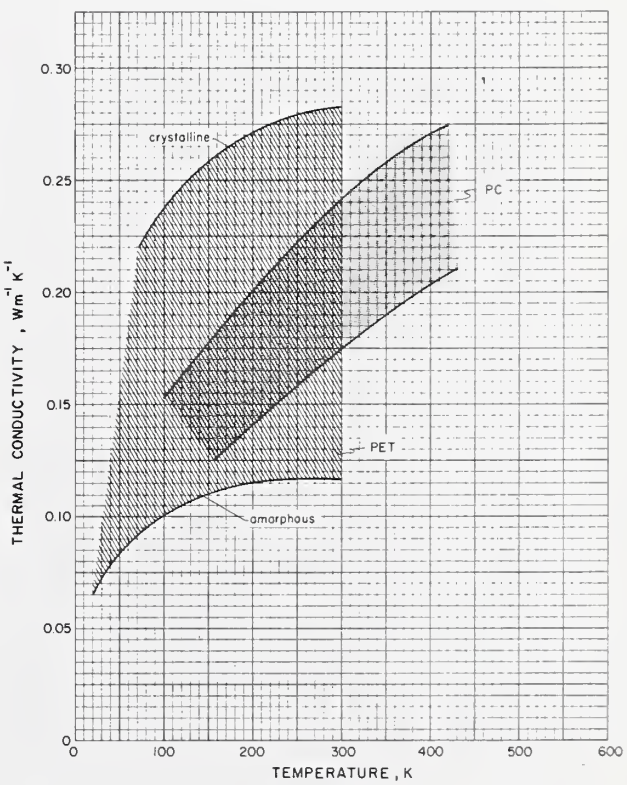

THERMAL EXPANSION, ΔL/L
FEP
PC
TFE
CTFE
PET
PPMI
FEP
PC
TEMPERATURE , K

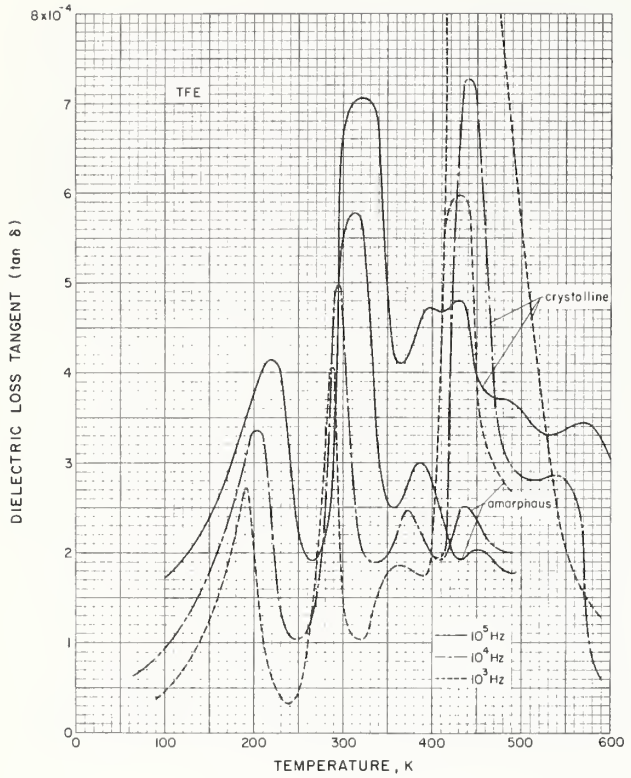

THERMAL DIFFUSIVITY , cm² s⁻¹
PET
TFE
PC
transition
CTFE
TEMPERATURE , K

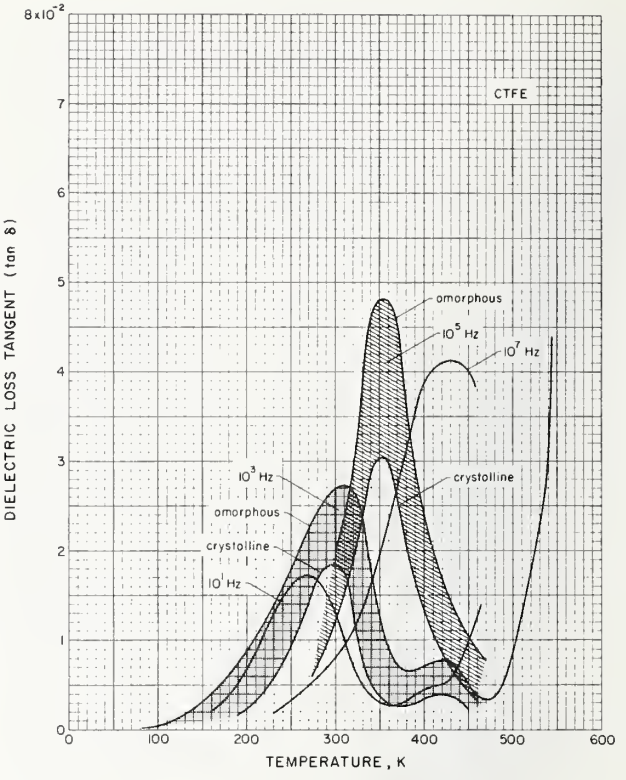

SPECIFIC HEAT , J g⁻¹ K⁻¹
TEMPERATURE , K
transitions
CTFE
PET
PC
transitions
TFE
PC
PET

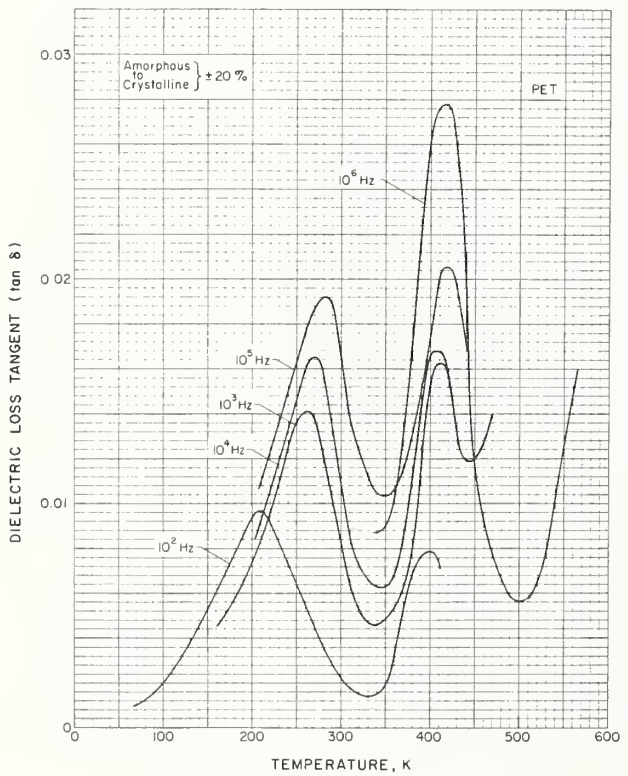

THERMAL CONDUCTIVITY , Wm⁻¹ K⁻¹
TEMPERATURE , K
TFE
crystalline
amorphous

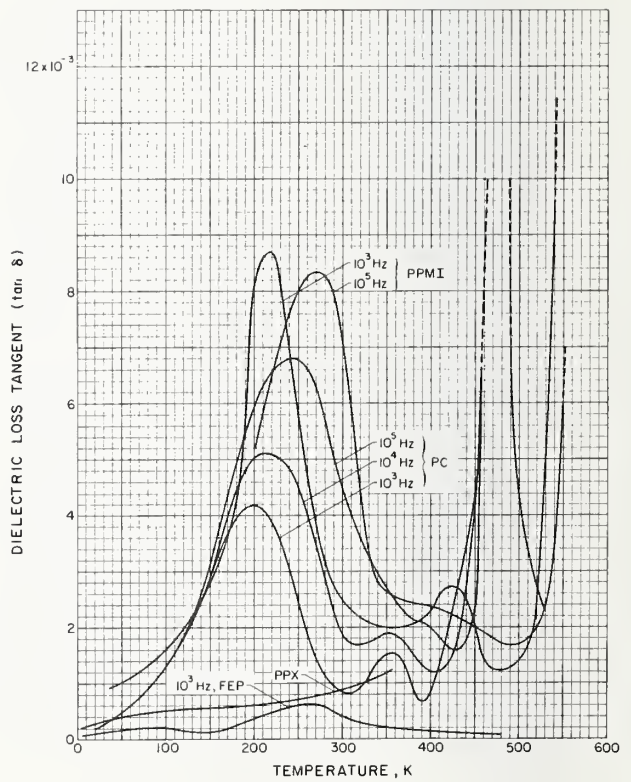

THERMAL CONDUCTIVITY , Wm⁻¹ K⁻¹
TEMPERATURE , K
crystalline
CTFE
amorphous

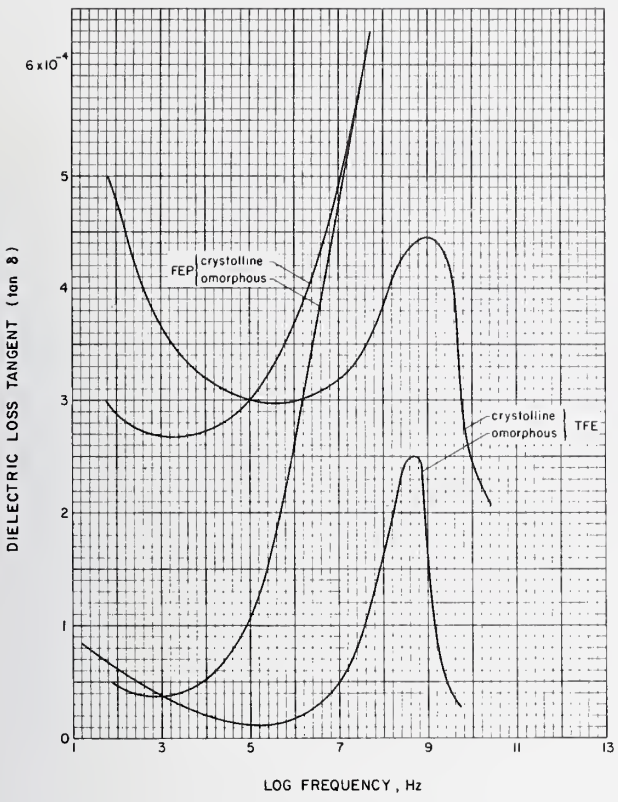

THERMAL CONDUCTIVITY , Wm⁻¹ K⁻¹
TEMPERATURE , K
crystalline
PC
PET
amorphous

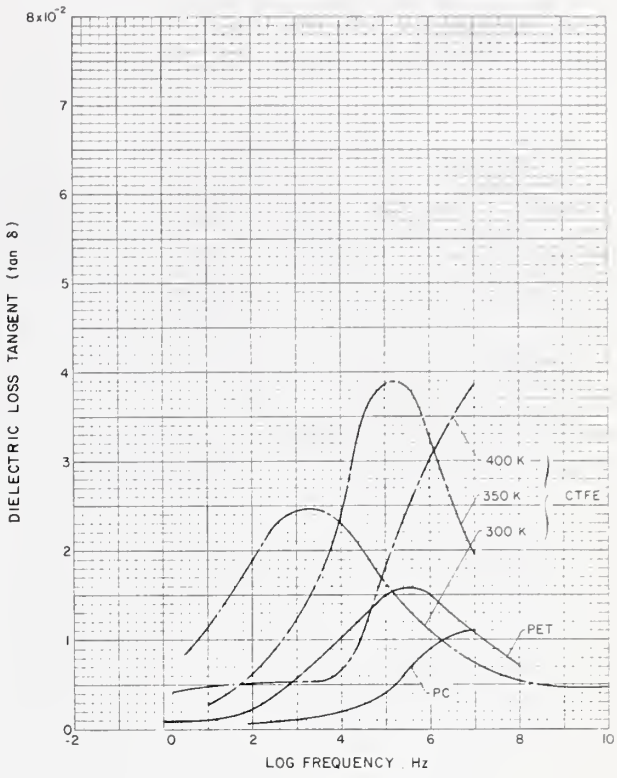

TFE
crystalline
amorphous
10^5 Hz
10^4 Hz
10^3 Hz
DIELECTRIC LOSS TANGENT (tan δ)
TEMPERATURE, K

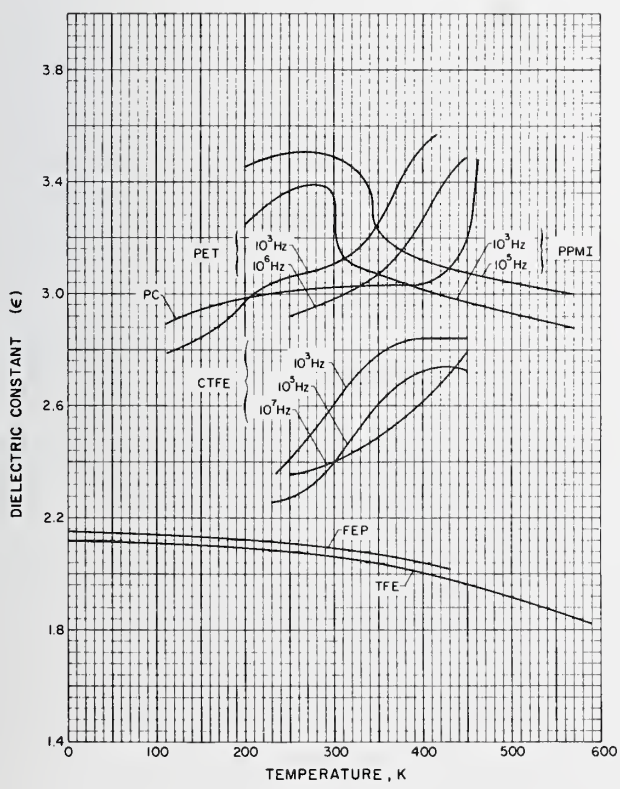

CTFE
amorphous
10^5 Hz
10^7 Hz
10^3 Hz
crystalline
amorphous
crystalline
10^1 Hz
DIELECTRIC LOSS TANGENT (tan δ)
TEMPERATURE, K

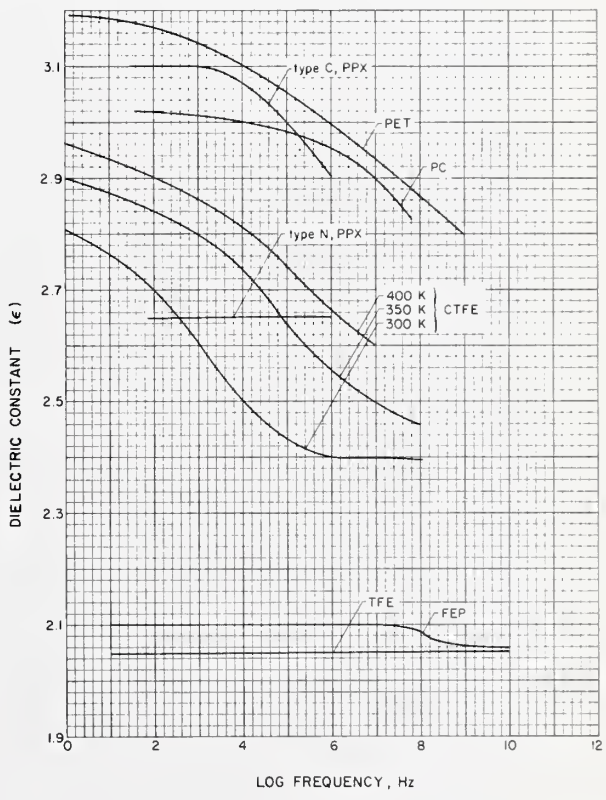

Amorphous to Crystalline ± 20 %
PET
10^6 Hz
10^5 Hz
10^3 Hz
10^4 Hz
10^2 Hz
DIELECTRIC LOSS TANGENT (tan δ)
TEMPERATURE, K

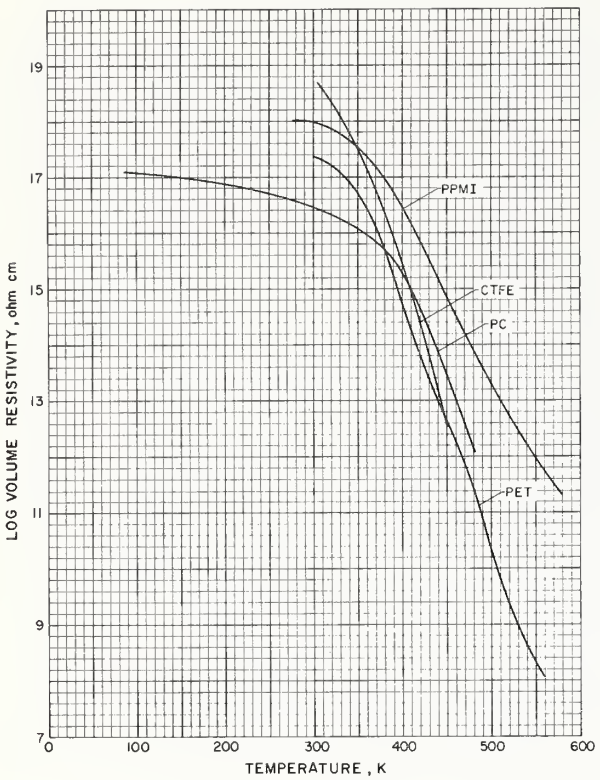

10^3 Hz
10^5 Hz
PPMI
10^5 Hz
10^4 Hz
10^3 Hz
PC
10^3 Hz, FEP
PPX
DIELECTRIC LOSS TANGENT (tan δ)
TEMPERATURE, K

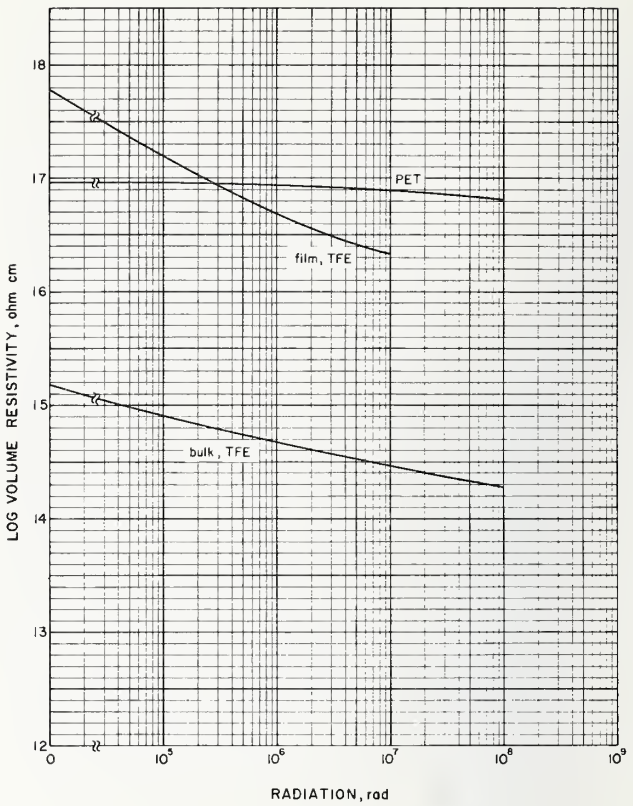

DIELECTRIC LOSS TANGENT (tan δ)
6x10⁻⁴
FEP crystolline omorphous
crystolline omorphous TFE
LOG FREQUENCY, Hz

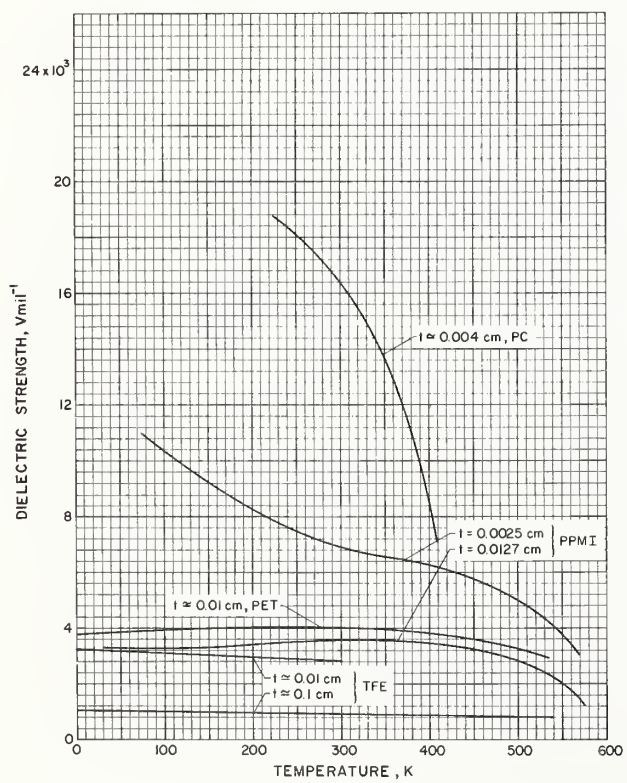

DIELECTRIC LOSS TANGENT (tan δ)
8x10⁻²
400 K
350 K
300 K
CTFE
PET
PC
LOG FREQUENCY Hz

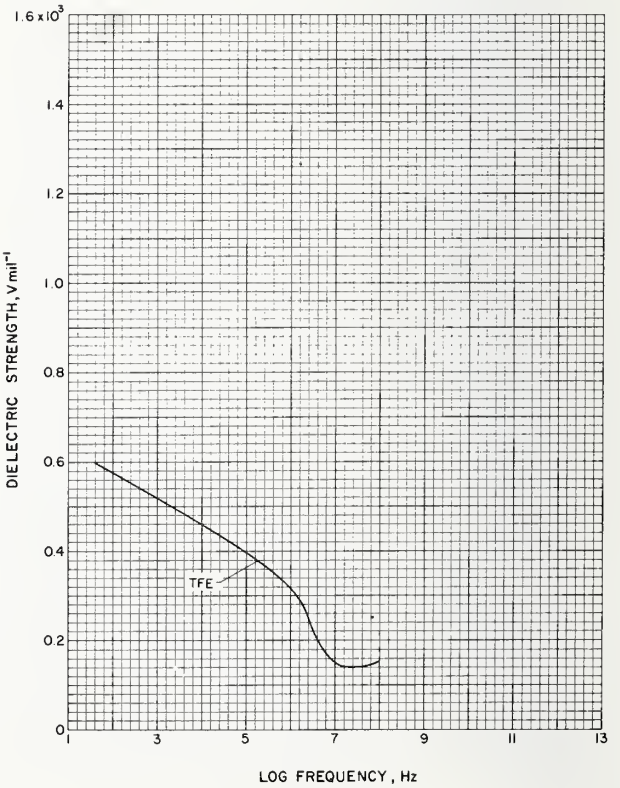

DIELECTRIC CONSTANT (ε)
PET 10³Hz 10⁶Hz
10³Hz 10⁵Hz PPMI
PC
CTFE 10³Hz 10⁵Hz 10⁷Hz
FEP
TFE
TEMPERATURE, K


DIELECTRIC CONSTANT (ε)
type C, PPX
PET
PC
type N, PPX
400 K
350 K
300 K
CTFE
TFE
FEP
LOG FREQUENCY, Hz


LOG VOLUME RESISTIVITY, ohm cm
TEMPERATURE, K
PPMI
CTFE
PC
PET


LOG VOLUME RESISTIVITY, ohm cm
RADIATION, rad
PET
film, TFE
bulk, TFE


DIELECTRIC STRENGTH, Vmil⁻¹
TEMPERATURE, K
t ≃ 0.004 cm, PC
t = 0.0025 cm
t = 0.0127 cm
PPMI
t ≃ 0.01 cm, PET
t ≃ 0.01 cm
t ≃ 0.1 cm
TFE

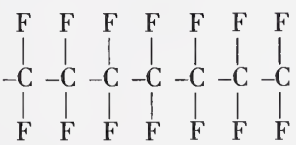

DIELECTRIC STRENGTH, Vmil⁻¹
LOG FREQUENCY, Hz
TFE

6. Polytetrafluoroethylene (TFE) and its Copolymer with Hexafluoropropylene (FEP)

A. Summary

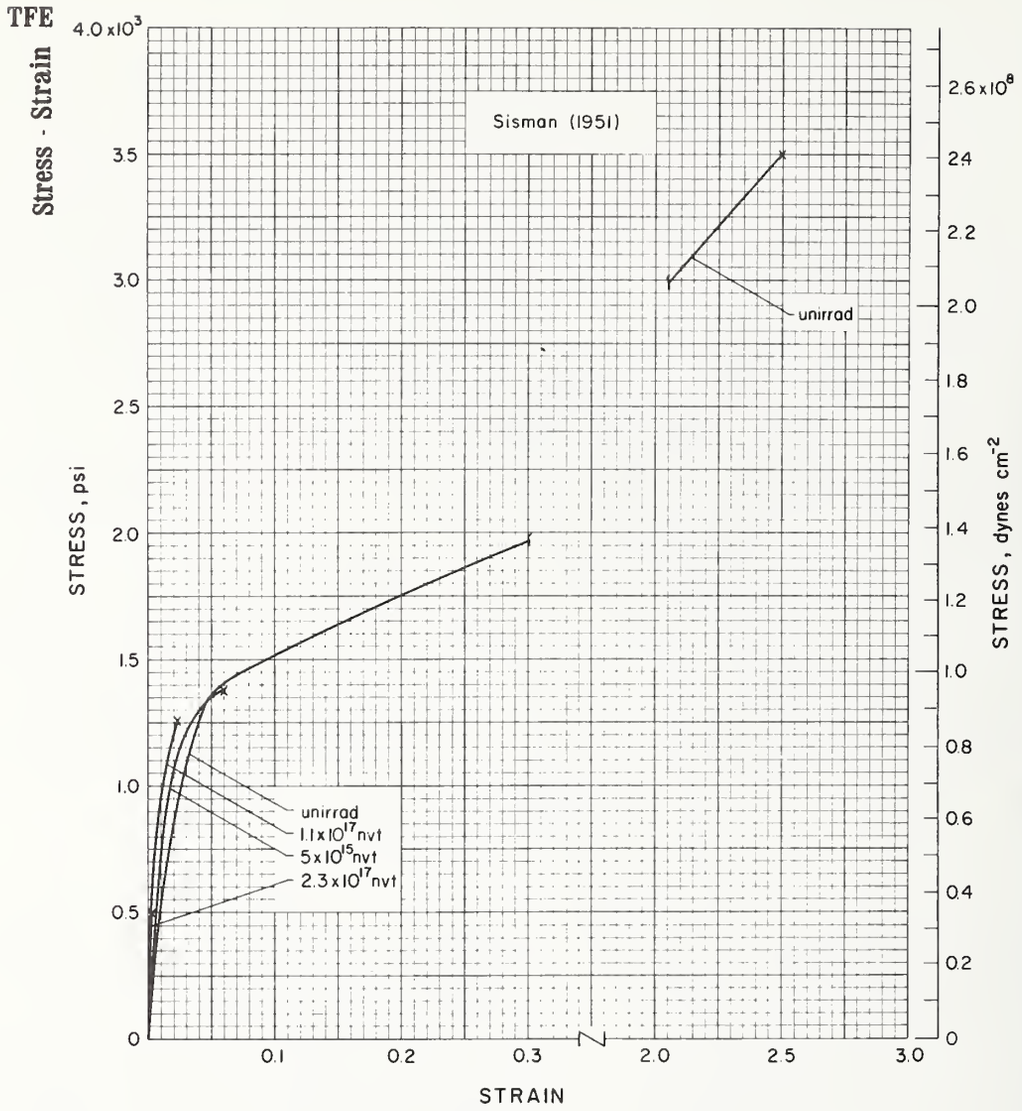
Polytetrafluoroethylene is a highly crystalline and orientable polymer consisting of $-CF_2-CF_2-$ chains involving the very strong C–F bonds. Because of this, it has little or no crosslinking or branching resulting in a stiff and slippery material which is inert to almost all chemical attack, is insoluble, and has a high melting point. Because of its high symmetry and tight bonding it has excellent electrical properties and has one of the lowest dielectric loss tangents known. Powder and sinter techniques are primarily used for its fabrication for applications utilizing its excellent toughness, electrical properties, heat resistance and low frictional coefficient. The low frictional coefficient enhances its use in gasket and bearing applications. Other applications are for piping, sealing, electrical and thermal insulation, and as a liner and coating.

To aid in processing by the more conventional extrusion or injection modeling techniques, polytetrafluoroethylene is frequently combined with hexafluoropropylene as a copolymer. This lowers the crystalline melting point to permit processing, but has little effect on the rest of its properties.

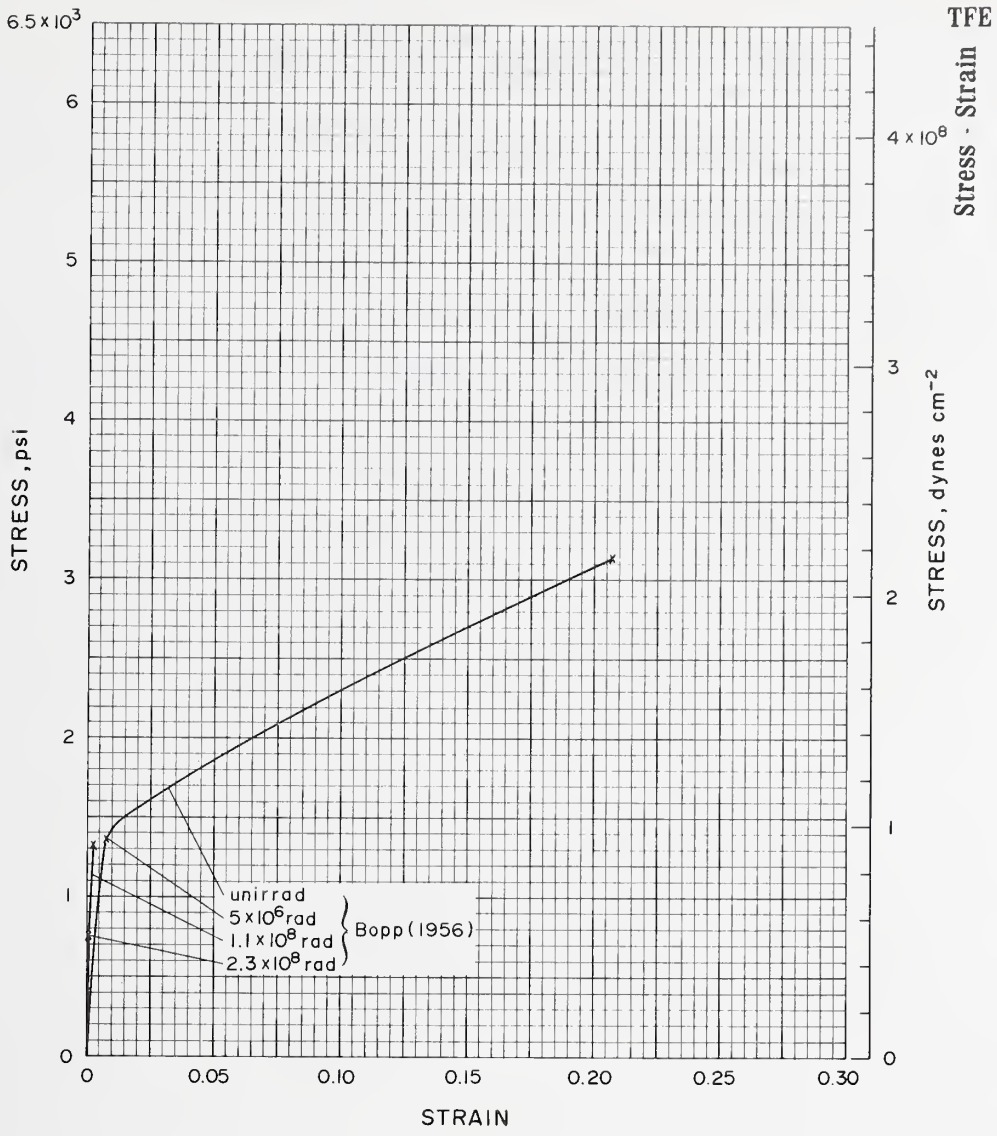
	TFE-FEP	
	TFE	FEP
Chemical Formula	$-(CF_2)_n-$	- - - -
Chemical Structure		- - - -
Significant Properties:		
Density (295 K)	2.1–2.3 gm cm^{-3}	2.3–2.17 gm cm^{-3}
Crystalline melting point	600 K	563 K
Molecular weight	$\sim 10^5$–10^6	- - - -
Crystallinity	45–98 percent	30–60 percent
Approximate transition regions	170–210 K, 290–320 K, 360–440 K	180–260 K, 345–380 K
Chemical resistance	Highly inert	Highly inert
Flammability	Very low	- - - -
Tensile strength (295 K)	4,500 psi	4,000 psi
Thermal expansion coefficient (295 K)	1.5×10^{-4} K^{-1}	1.2×10^{-4} K^{-1}
Dielectric constant (10^5 Hz), (295 K)	2.0	2.1
Dielectric loss tangent (10^5 Hz), (295 K)	$\sim 10^{-4}$	$\sim 4 \times 10^{-4}$

Trade names occurring in the references compiled:
Fluon, Fluoroplast-4, Halon, Heydeflon, Hostaflon, Polyflon, Teflon, Valflon, Zitex.

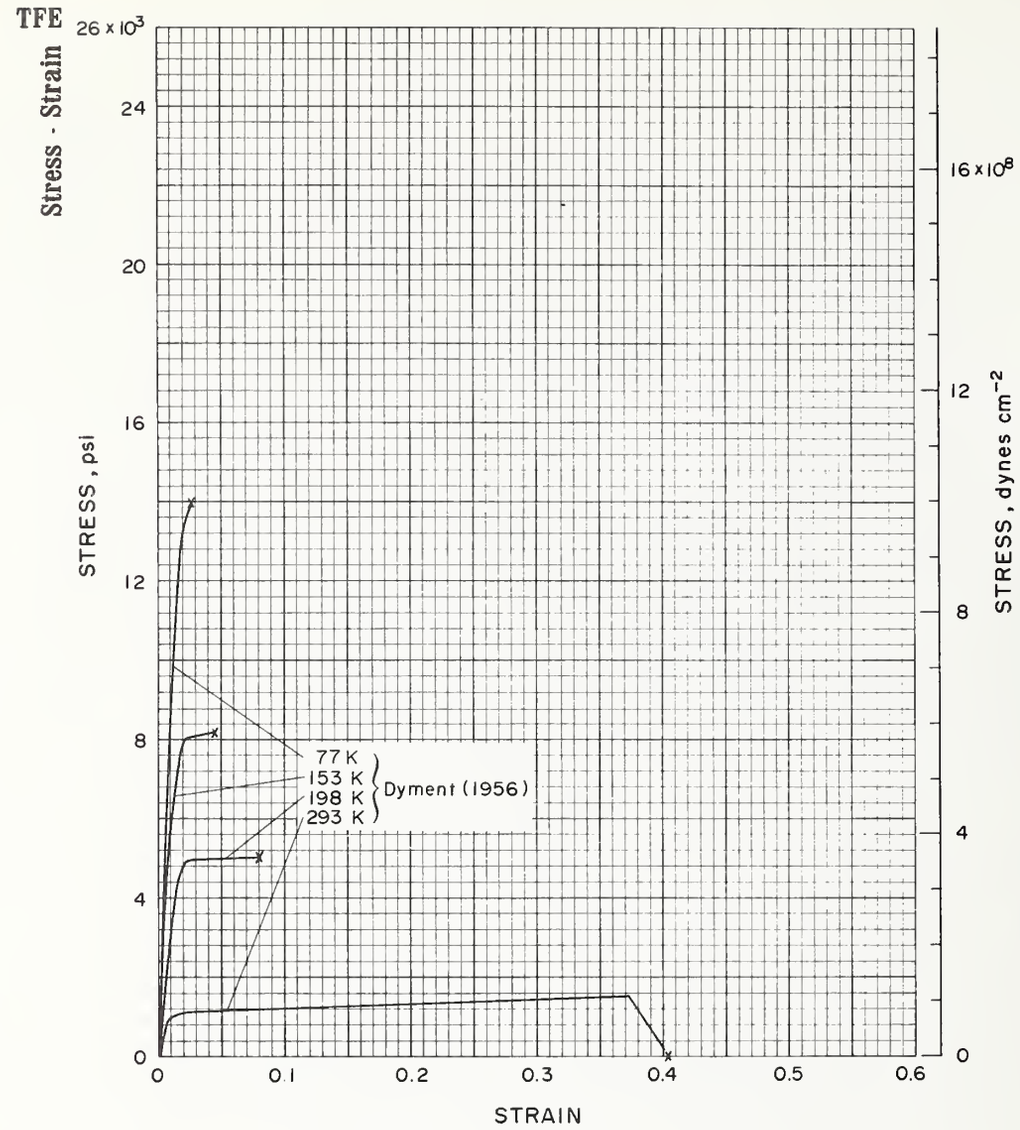
B. Mechanical Properties (TFE)



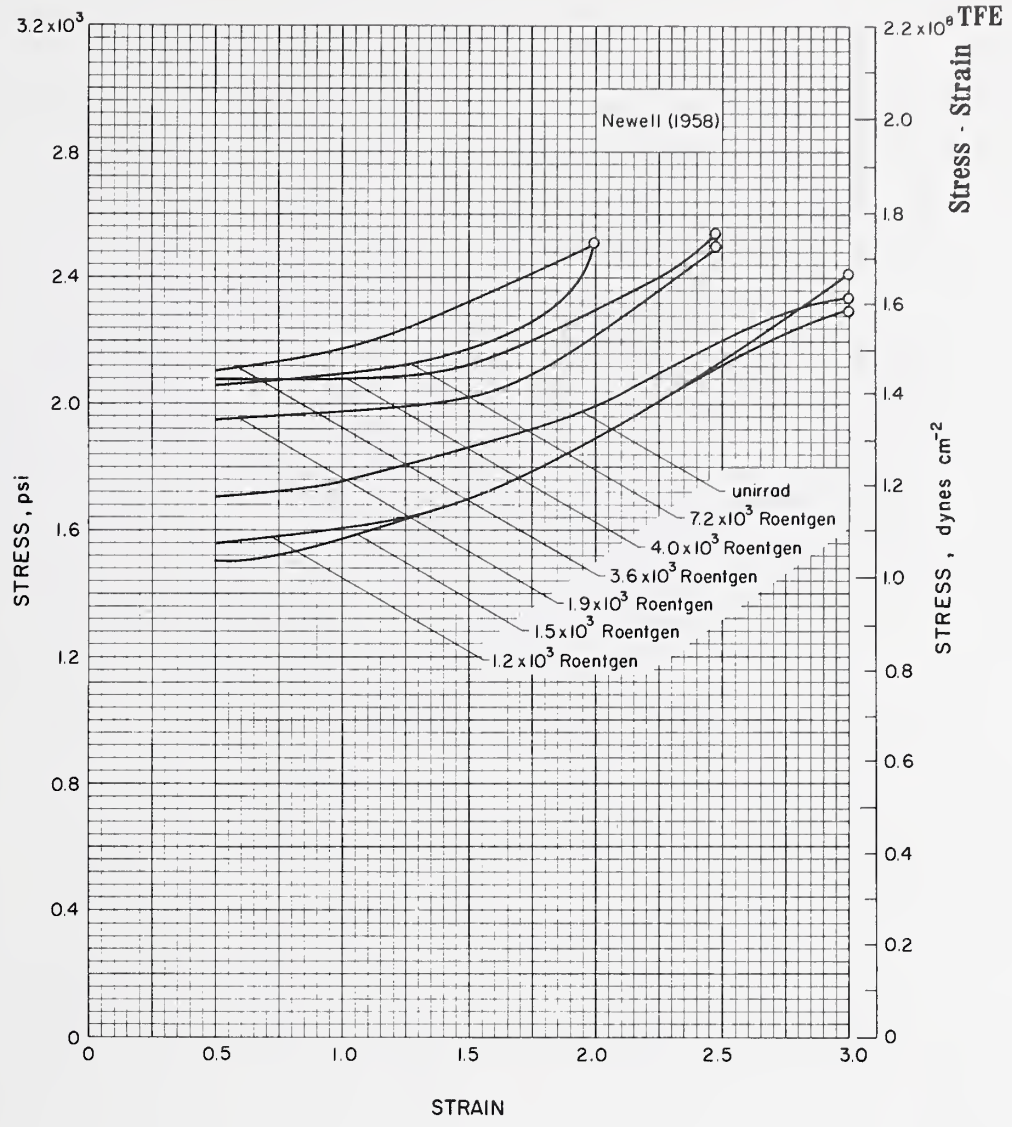
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sisman, Bopp (1951)	Teflon	Red Sec ℓ = 5.72 cm, w = 1.27 cm; modified ASTM D 638-49T test procedure, Baldwin Southwark testing machine, xhd spd = 0.0021 cm s^{-1} to a strain of 0.02 and then xhd spd = 0.0085 cm s^{-1}; irrad in Hole 19 of ORNL reactor at 298-313 K, and in air, aged 7 days at 298 ± 1 K and 50 ± 2% rel hum before testing.



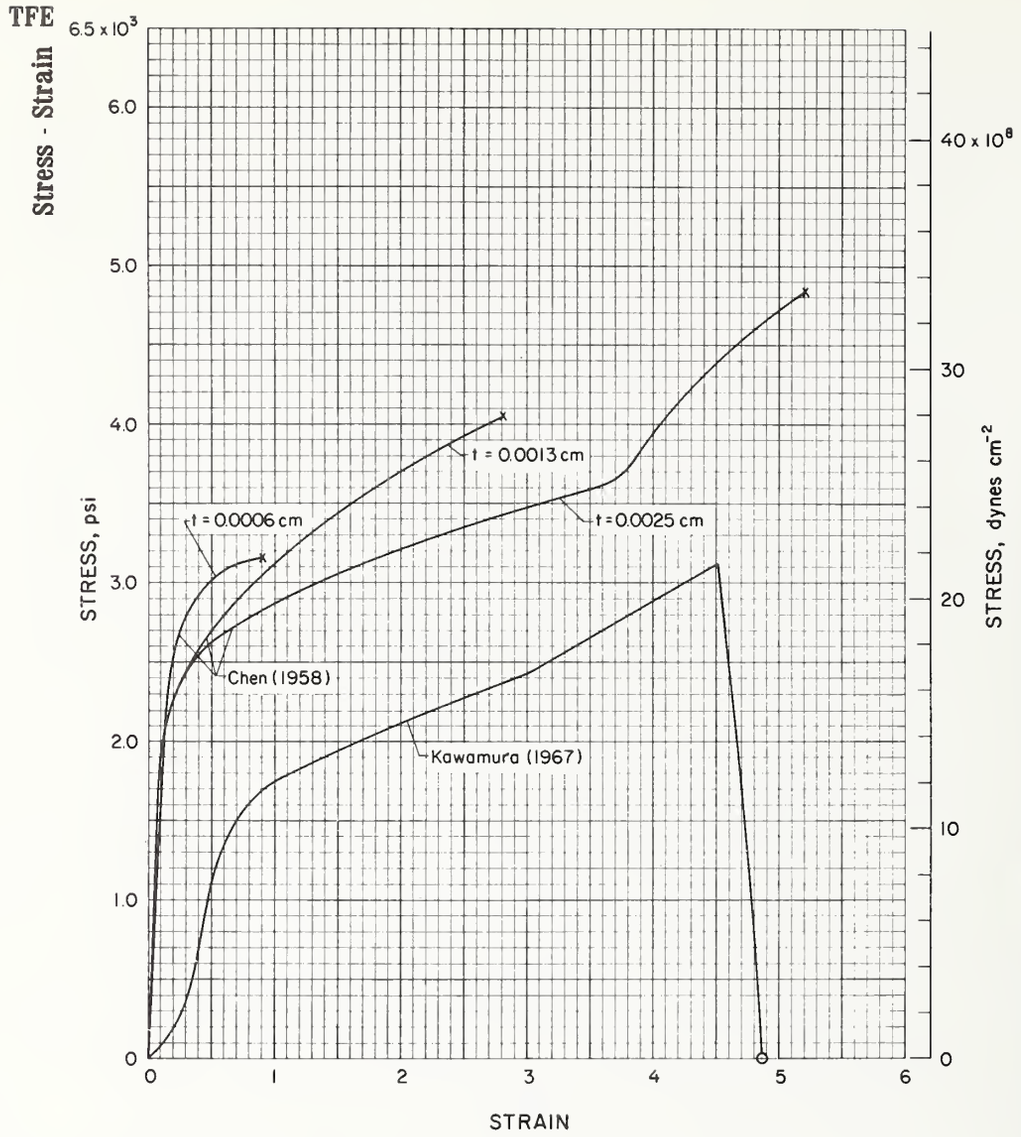
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bopp, Sisman (1956)	Teflon, conditioned to 298 K and 50% rel hum	GL = 5.08 cm, w = 1.27 cm, t = 0.16-0.64 cm; Baldwin universal testing machine with recording extensometer, ASTM D 638-49T test procedure, xhd spd = 0.0021 cm s^{-1} to ϵ = 0.02 and 0.0085 cm s^{-1} after that; irrad by Oak Ridge National Laboratory Graphite Reactor.



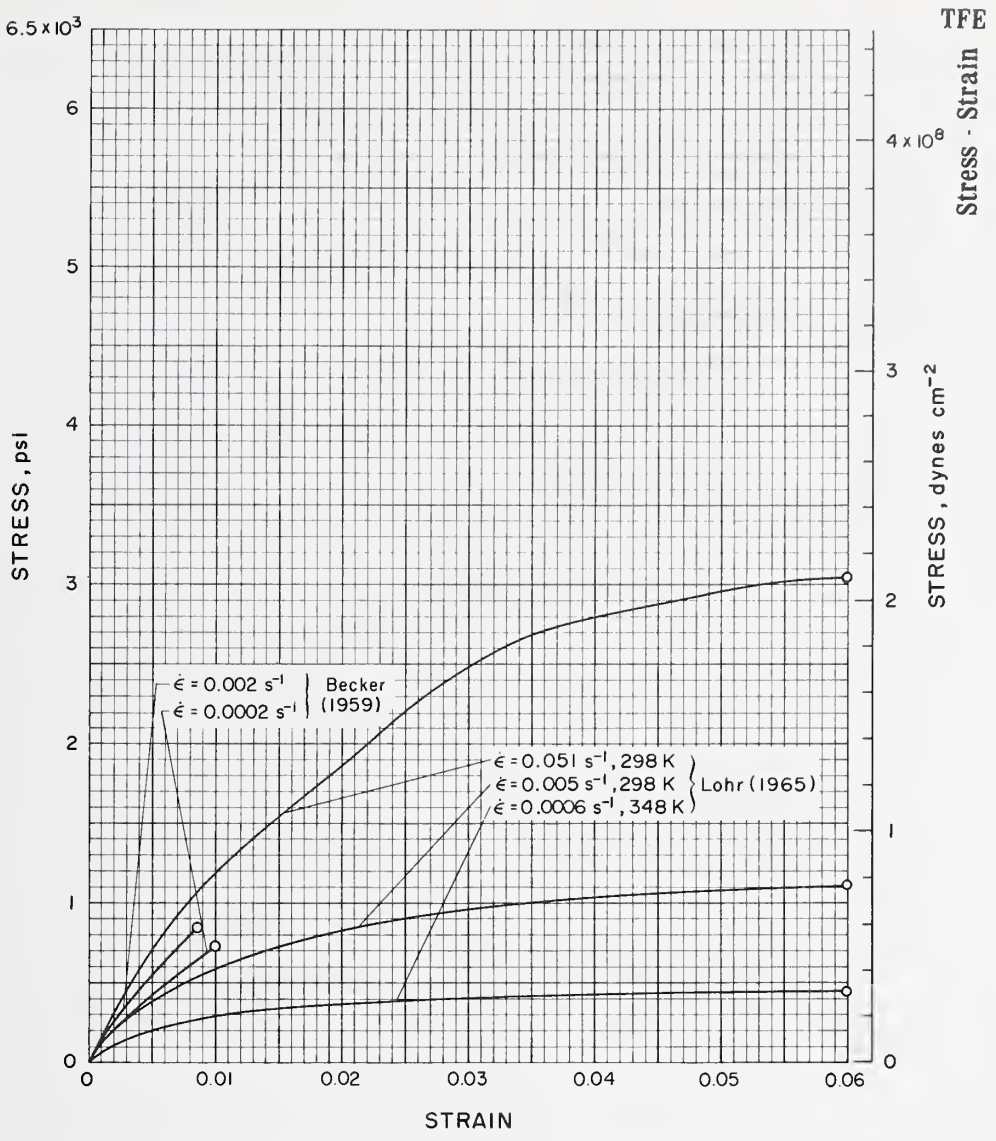
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Dyment, Ziebland (1956)	Fluon, 0.73 cm diam rod	Red Sec ℓ = 1.14 cm, diam = 0.32 cm; K-type Hounsfield tensometer, xhd spd = 0.003 cm s^{-1}.



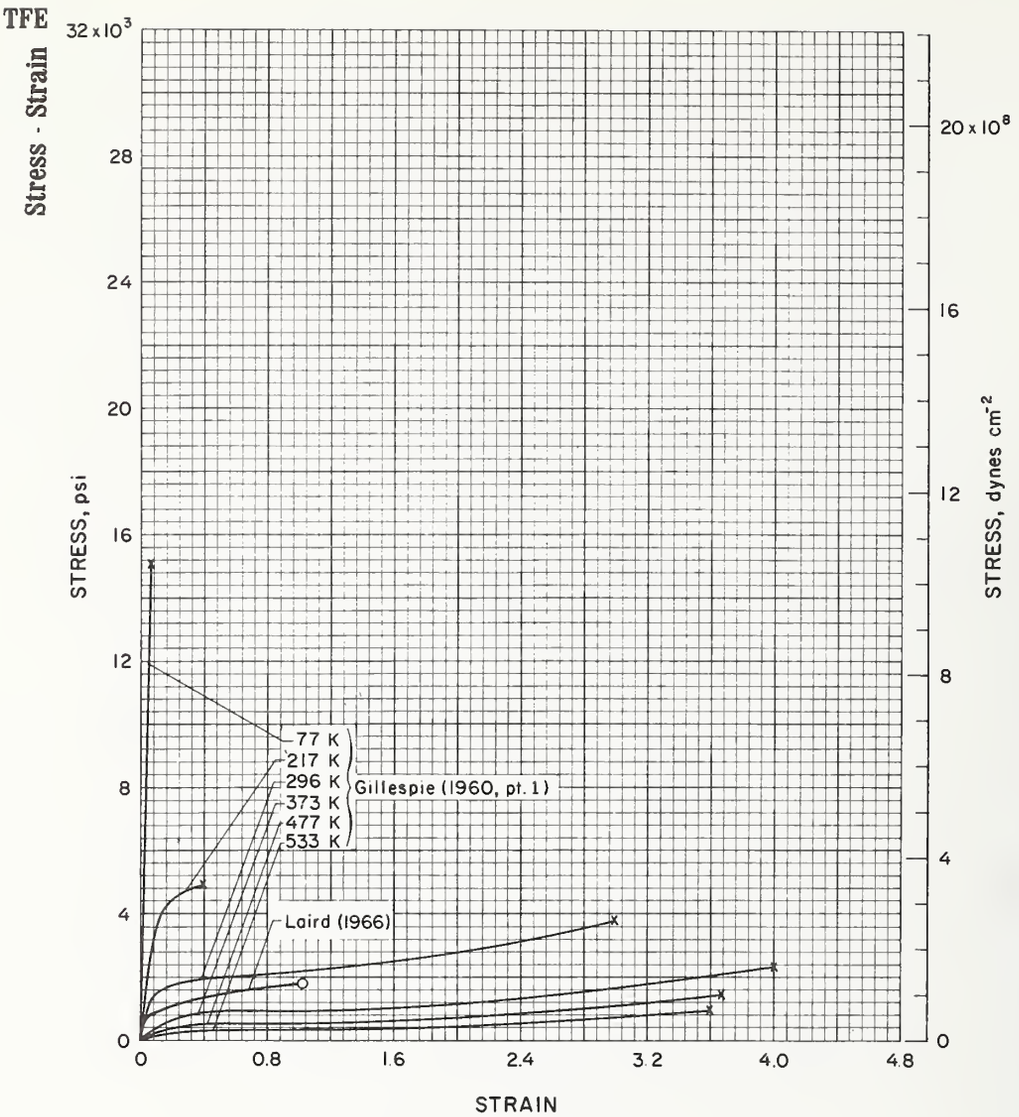
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Newell (1958)	Teflon, 0.32 cm sheet stock.	ASTM D-638-42T test procedure; irrad by 1-10 bursts from Godiva assembly at Los Alamos.



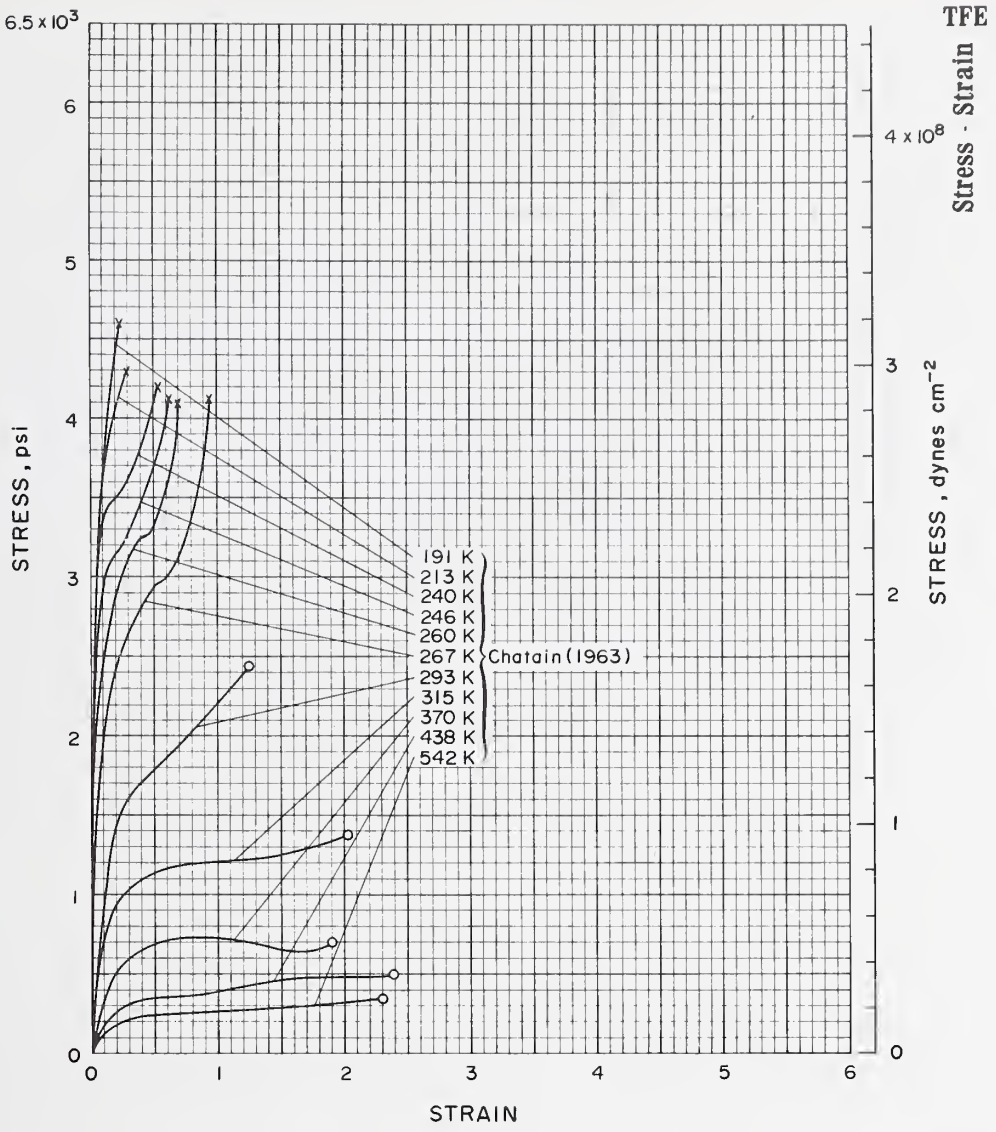
INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Chen, Estey (1958)	Teflon	ℓ = 2.54 cm, w = 0.64 cm.
Kawamura, Wada (1967)	Valflon	t = 0.05 - 0.10 cm; $\dot{\varepsilon} \approx 0.25\ s^{-1}$, 293K.



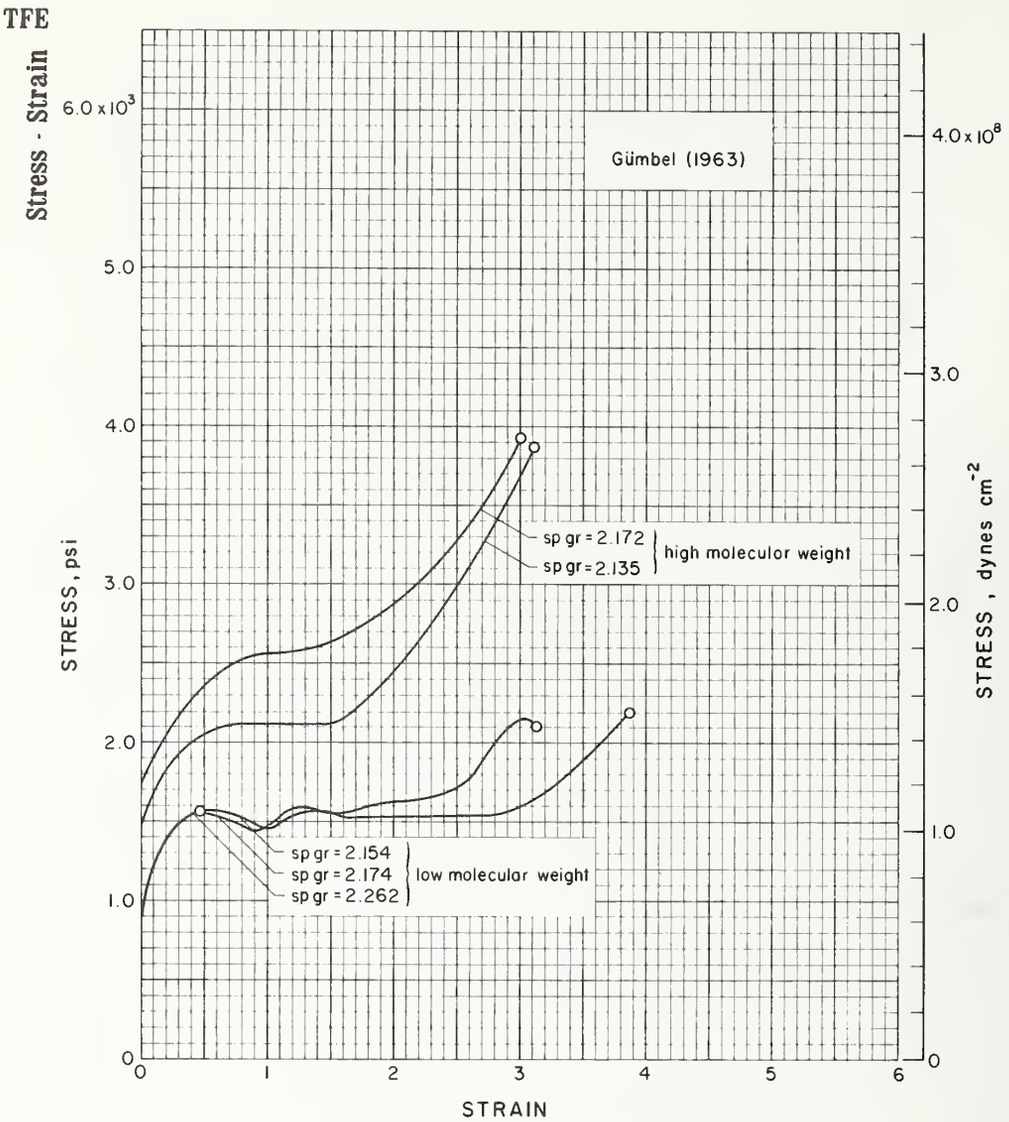
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Lohr (1965)	Teflon sheet, t = 0.08 cm	ASTM D 638 specimens; Plas-Tech model 591 tensile test machine.
Becker (1959)	Hostaflon TF, sp gr = 2.14±0.02, 46 ±2% crys	295 K.



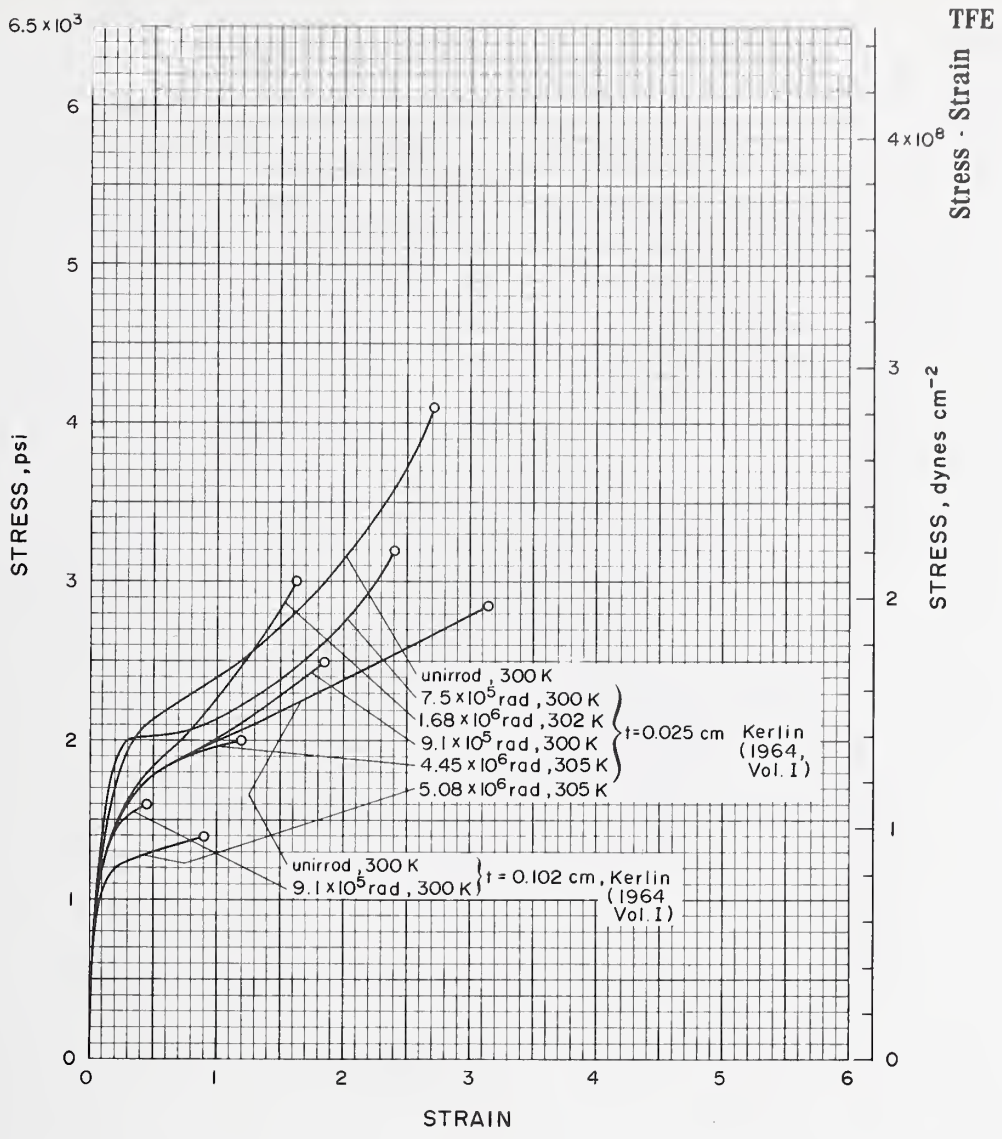
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 1, ram extruded, av sp gr = 2.17, 60±2% crys, void content < 0.3%, preform pressure = 2500 psi	35.6x35.6x0.318 cm, ASTM D-1457-56T test procedure.
Laird, Cimprich, Kappler, Mason, Jr. (1966)	Teflon, sp gr = 2.18	Red Sec ℓ = 5.08 cm, w = 1.27 cm, t = 0.64 cm as per ASTM D 638-61T, Tinius Olsen HL-400-2 tensile test machine, $\dot{\epsilon}$ = 0.0029 s^{-1}; typical curve.



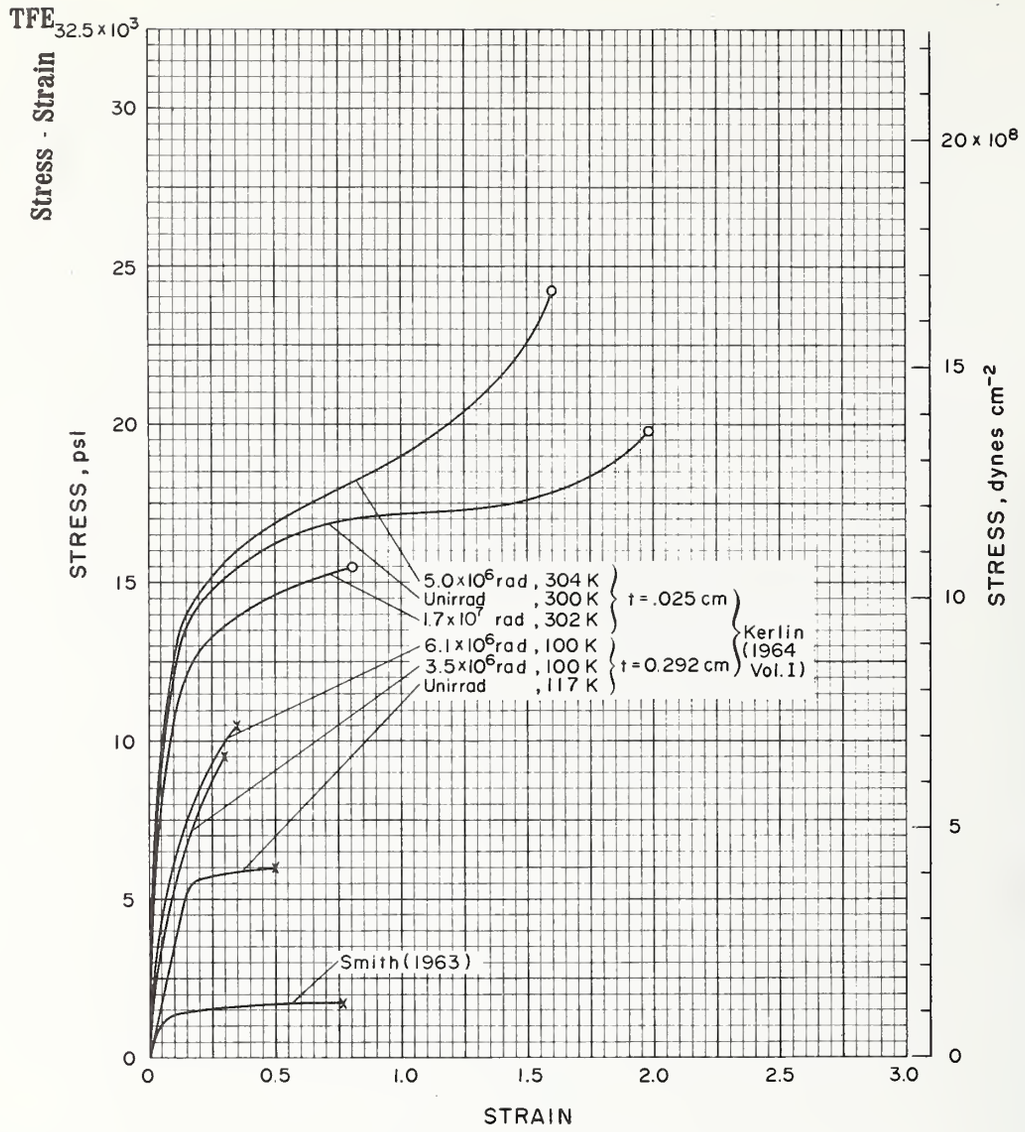
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Chatain (1963)	Teflon	



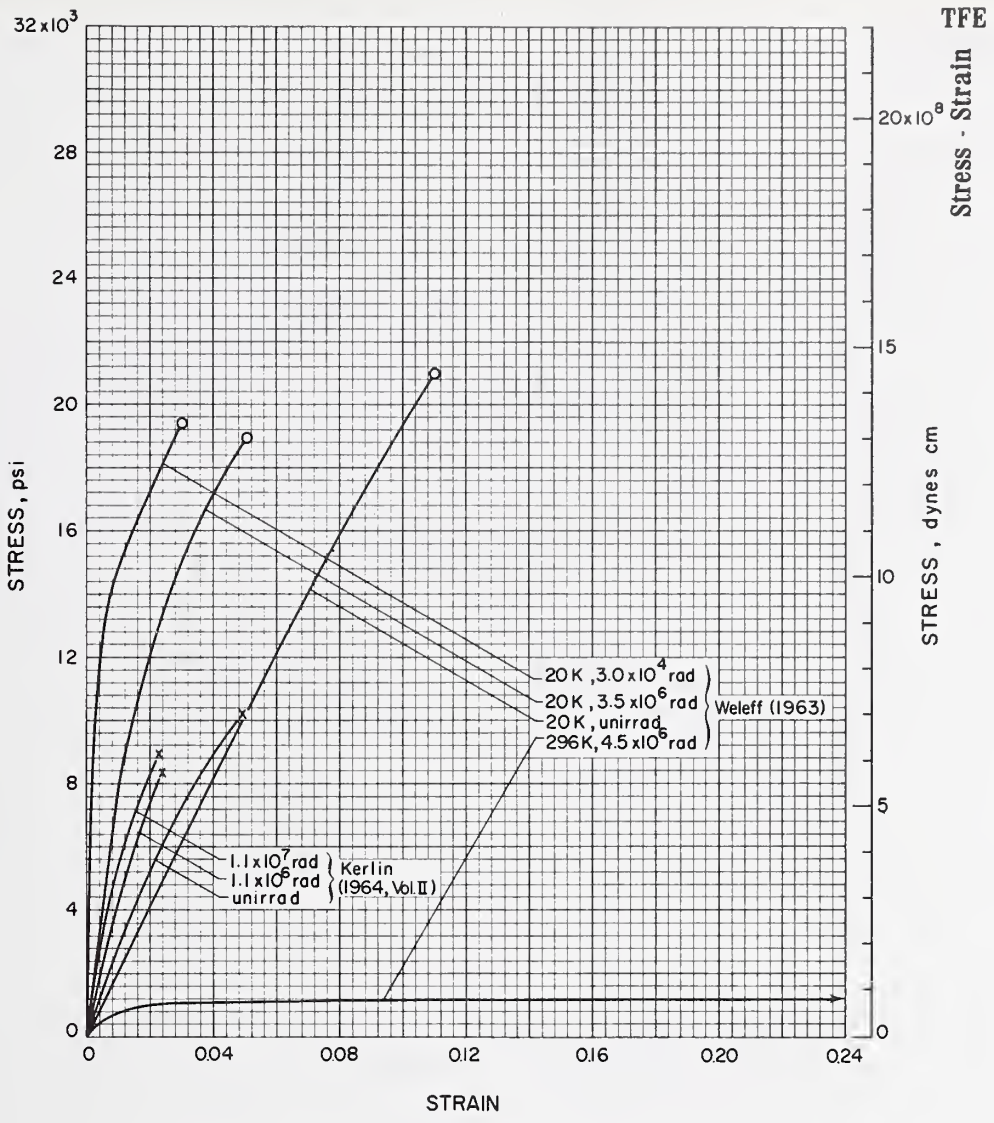
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Gümbel (1963)	Powdered Heydeflon and Ftoroplast-4, sintered at 653 K for 0.5 h; low molecular weight: slow cooled, sp gr = 2.262; quenched annealed 1 h at 543 K; cooled at 1.6 K min^{-1}, sp gr = 2.172; quenched in water, sp gr = 2.135	ℓ = 7.5 cm, t = 0.16 cm, GL = 2.2 cm, samples per ASTM D 1457-56T test procedure; xhd spd = 0.083 cm s^{-1}.



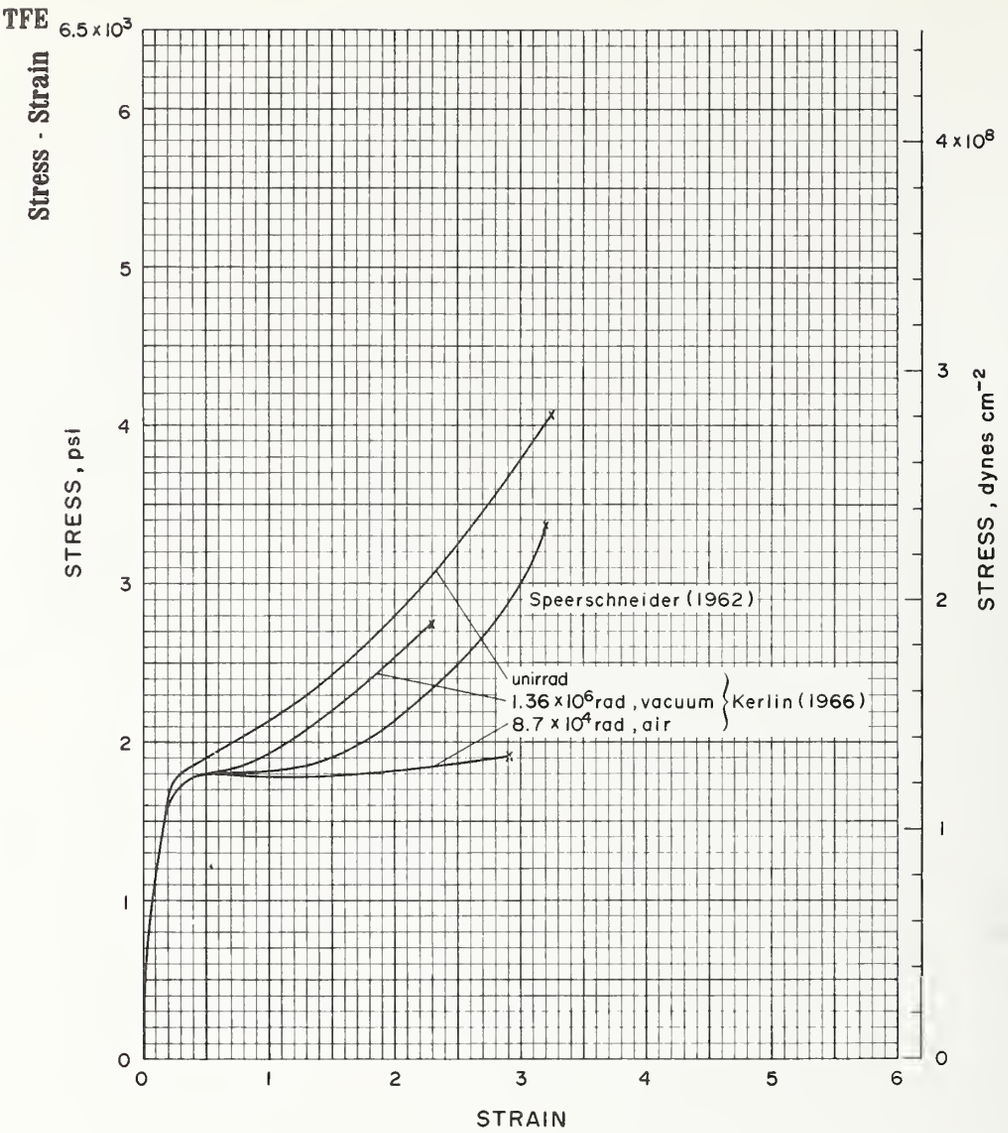
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1964, Vol. I)	Teflon 7	Red Sec = 15.2 x 2.54 cm; Instron, xhd spd = 0.85 cm s^{-1}, ASTM D 882-56T test procedure for specimens with t = 0.025 cm, ASTM D 412-51T test procedure for specimens with t = 0.102 cm; irrad by reactor in vacuum; av of 4 or 5 tests.



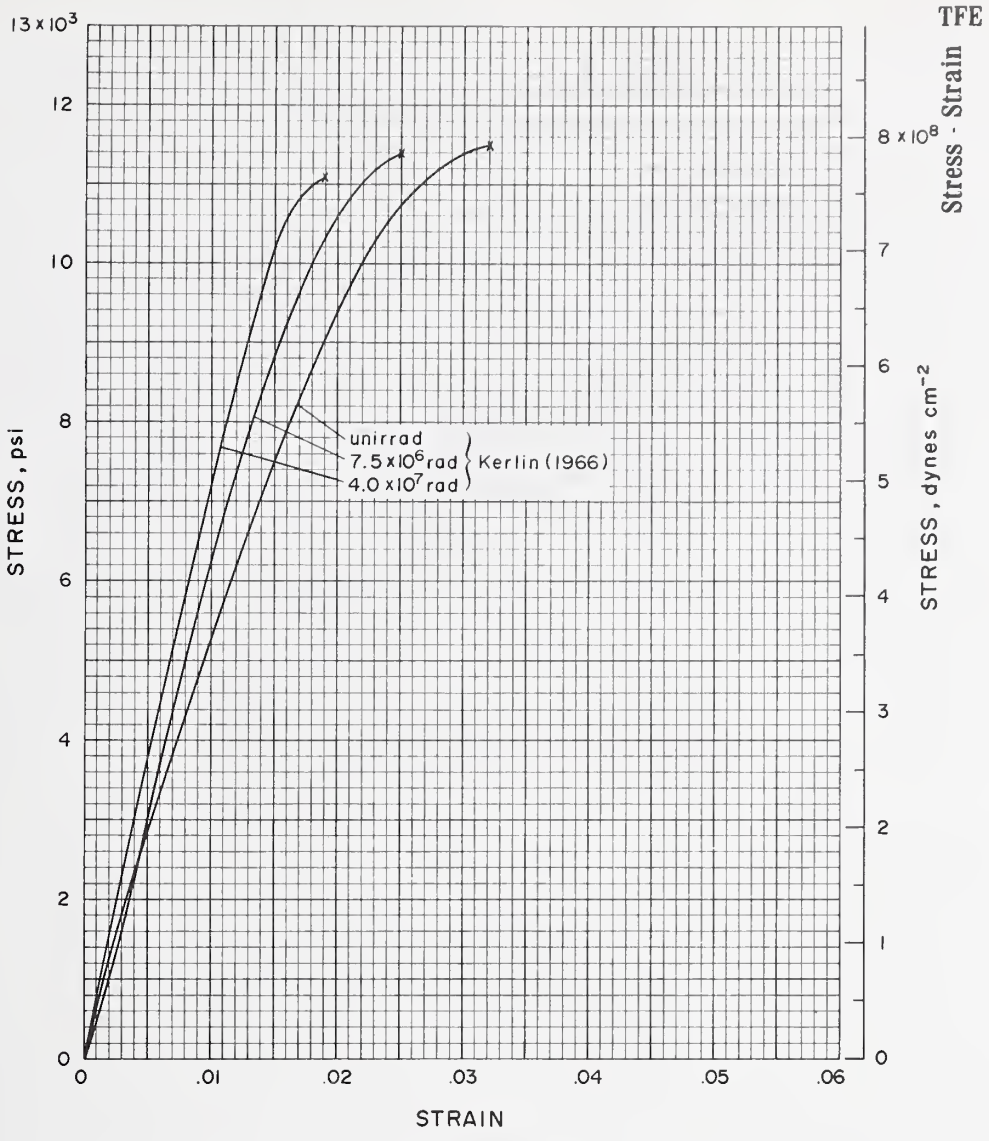
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1964, Vol I)	Teflon 7	Red Sec = 15.2 x 2.54 cm; low force tensile tester used at room temp with ASTM D 882-56T test procedure, cryomethanical tester used at low temp with ASTM D-638-61T modified test procedure; irrad by reactor in vacuum; av of 2 or 3 tests.
Smith (1963)	Teflon	t = 0.025 cm; modified ASTM D 882-61T test procedure, av temp = 335K.



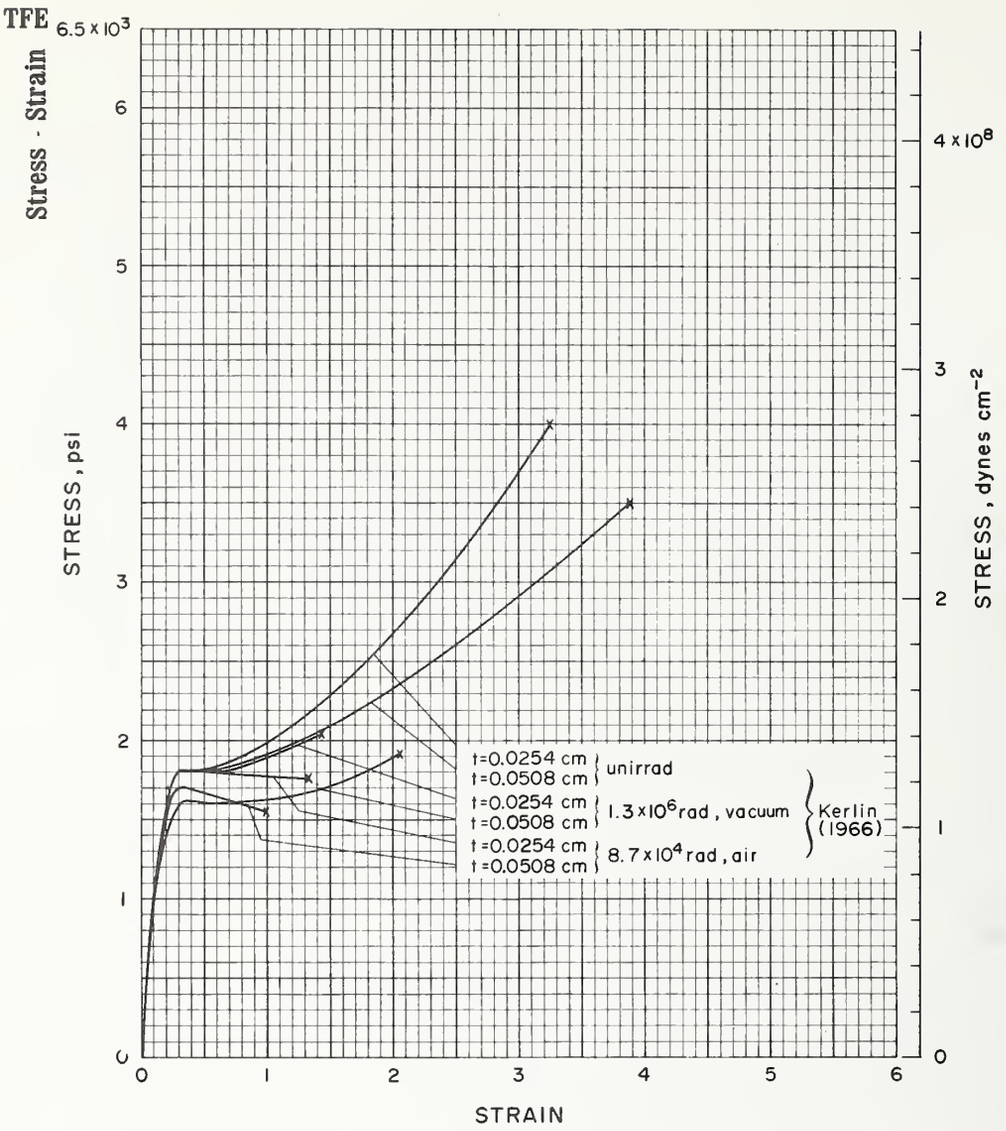
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Weleff, Emmons (1963)	Teflon	Instron, xhd spd = 0.0021 cm s^{-1}; exposed to gamma radiation and fast neutrons at 20K.
Kerlin, Smith (1964, Vol. II)	Teflon-7	Red Sec 5.72x1.27x0.317 cm; Instron, xhd spd = 0.021 cm s^{-1}, ASTM D-638-61T test procedure, tested in liquid nitrogen; exposed to gamma radiation and fast neutrons.



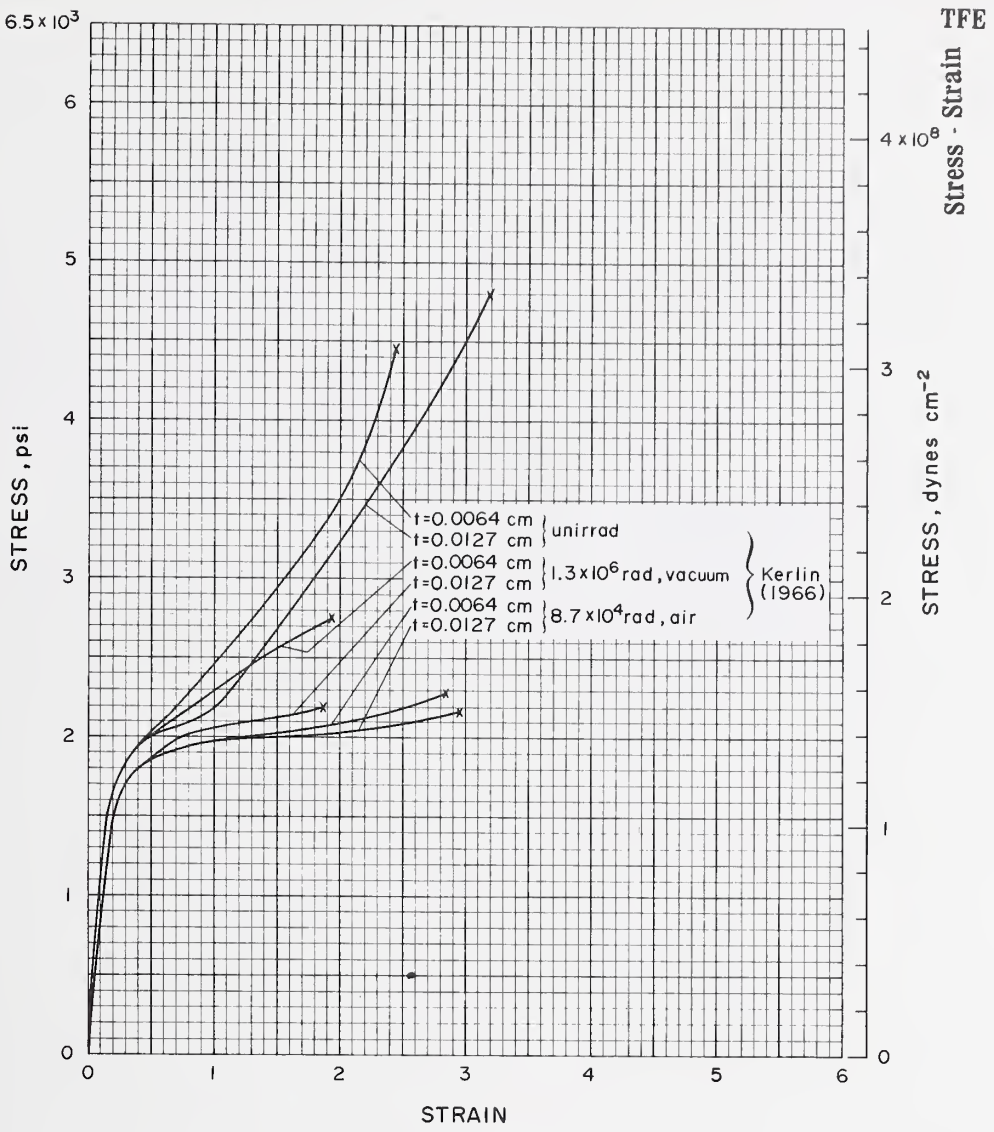
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Teflon 7	t = 0.101 cm; Instron, ASTM D 412-62T test procedure, Die A, xhd spd = 0.85 cm s^{-1}, tested in air at 297 K; av of 4 or 5 specimens; irrad in vacuum and air by Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics at Fort Worth.
Speerschneider, Li (1962)	Produced from aqueous dispersion of Teflon 41-BX	Red Sec 4 = 1.9 cm, w = 0.5 cm, t = 0.2 cm; Instron, xhd spd = 0.0042 cm s^{-1}.



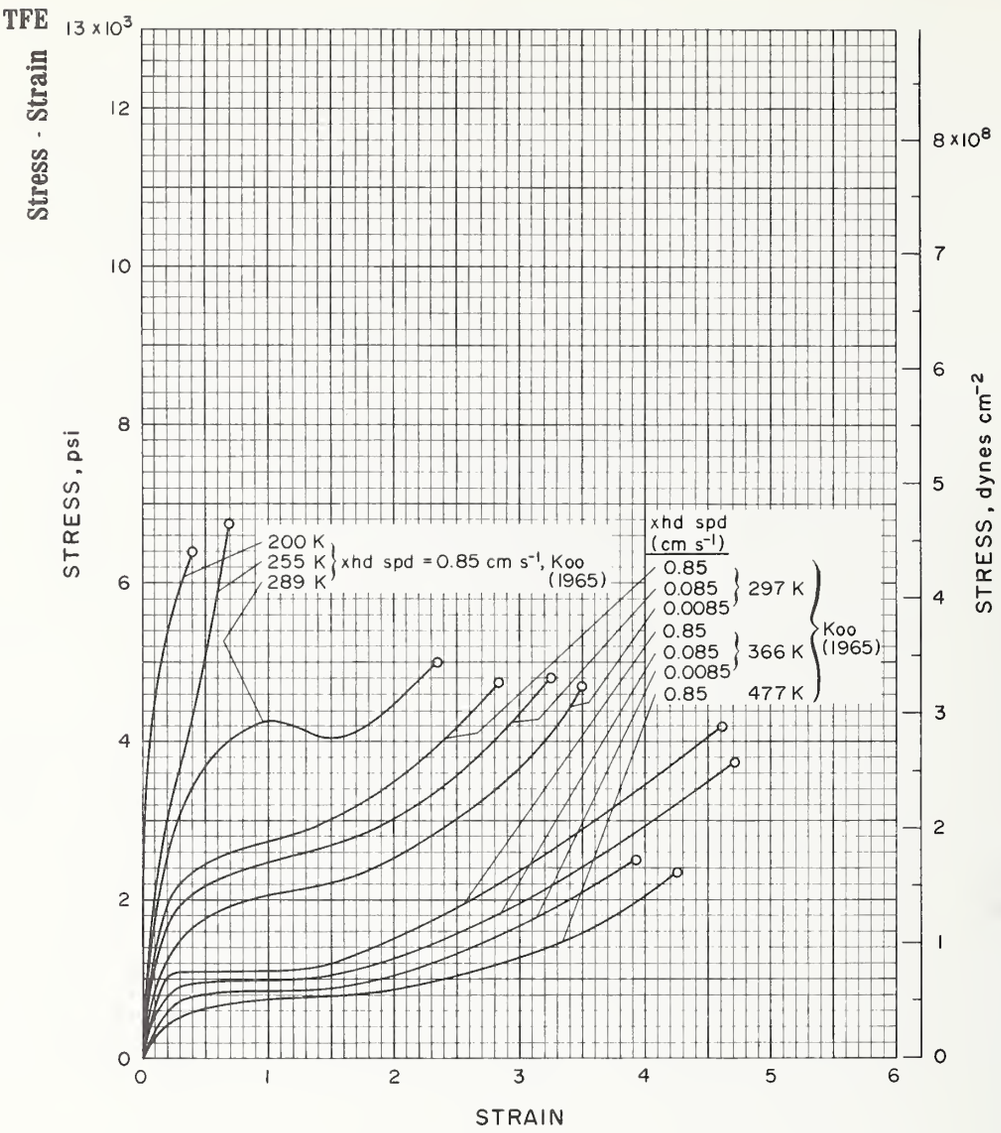
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Teflon 7	Red Sec ℓ = 5.72 cm, w = 1.27 cm, t = 0.292 cm; xhd spd = 0.0021 cm s^{-1}, irrad and tested in liquid hydrogen at 20K; av of 4 or 5 specimens; irrad by Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics at Fort Worth.



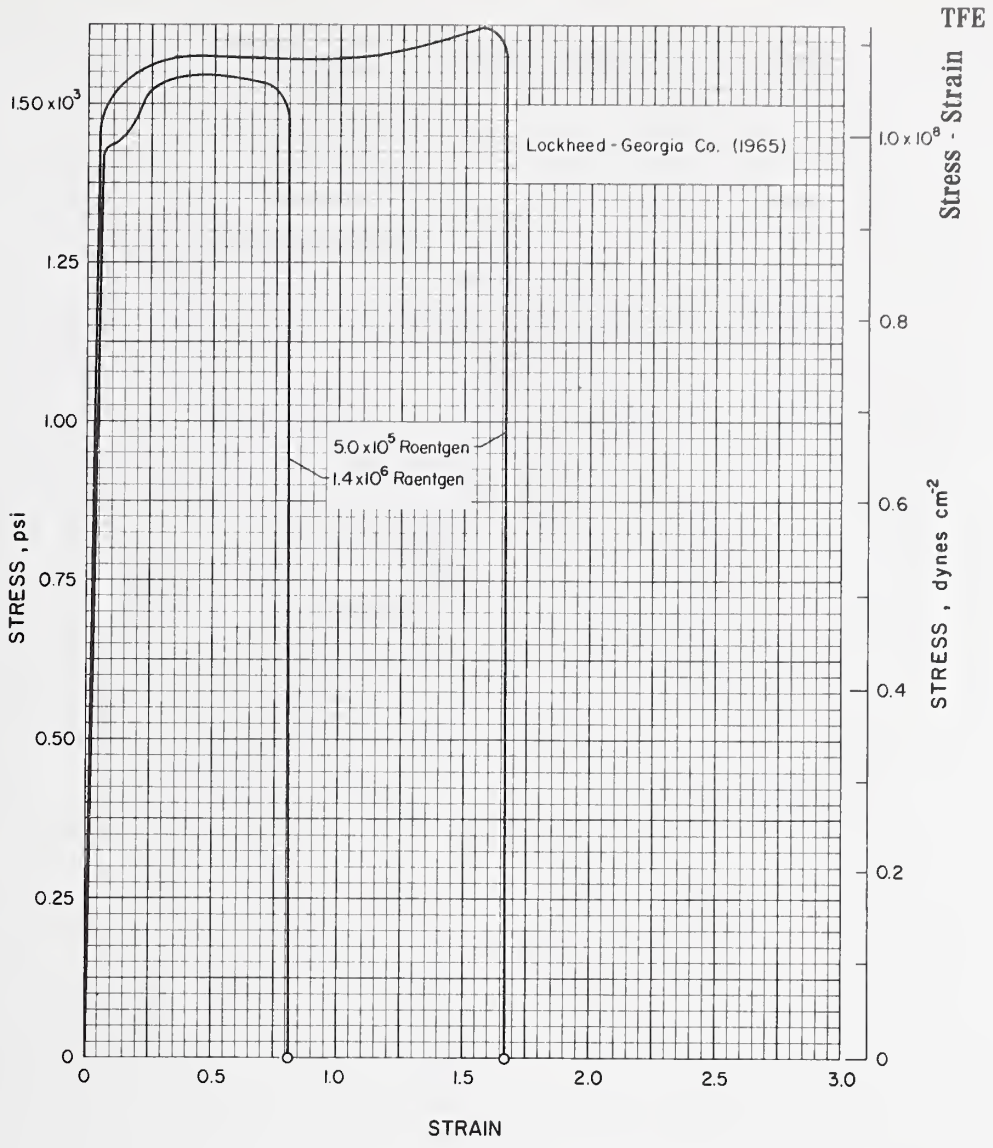
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Teflon 7	Red Sec = 15.2 x 2.54 cm; Instron, ASTM D 882-61T test procedure, xhd spd = 0.85 cm s^{-1}, tested in air at 297 K; av of 4 or 5 specimens; irrad in vacuum and air by Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics at Fort Worth.



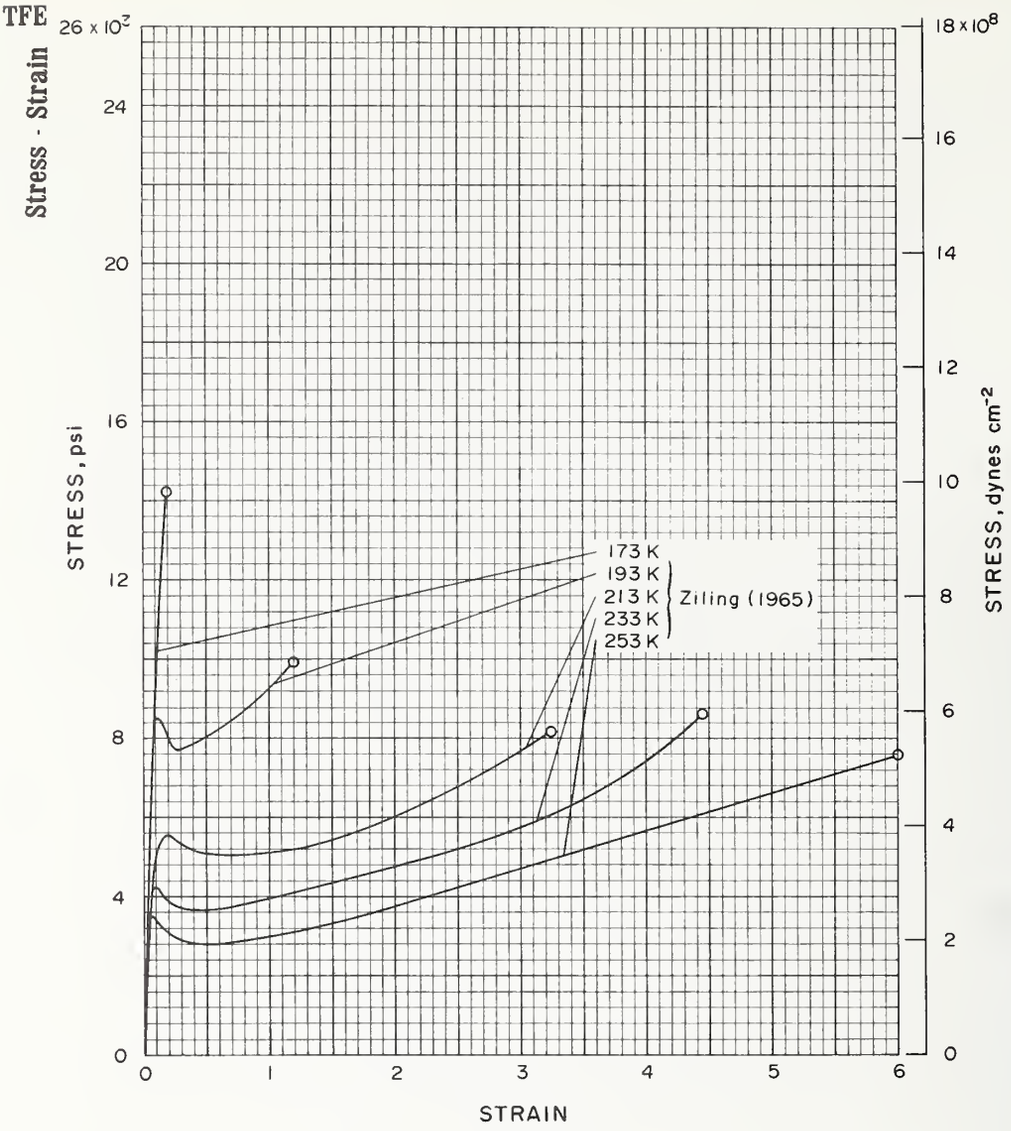
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Teflon 7	Red Sec = 15.2 x 2.54 cm; Instron, ASTM D 882-61T test procedure, xhd spd = 0.85 cm s^{-1}, tested in air at 297 K; av of 4 or 5 specimens; irrad in vacuum and air by Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics at Fort Worth.



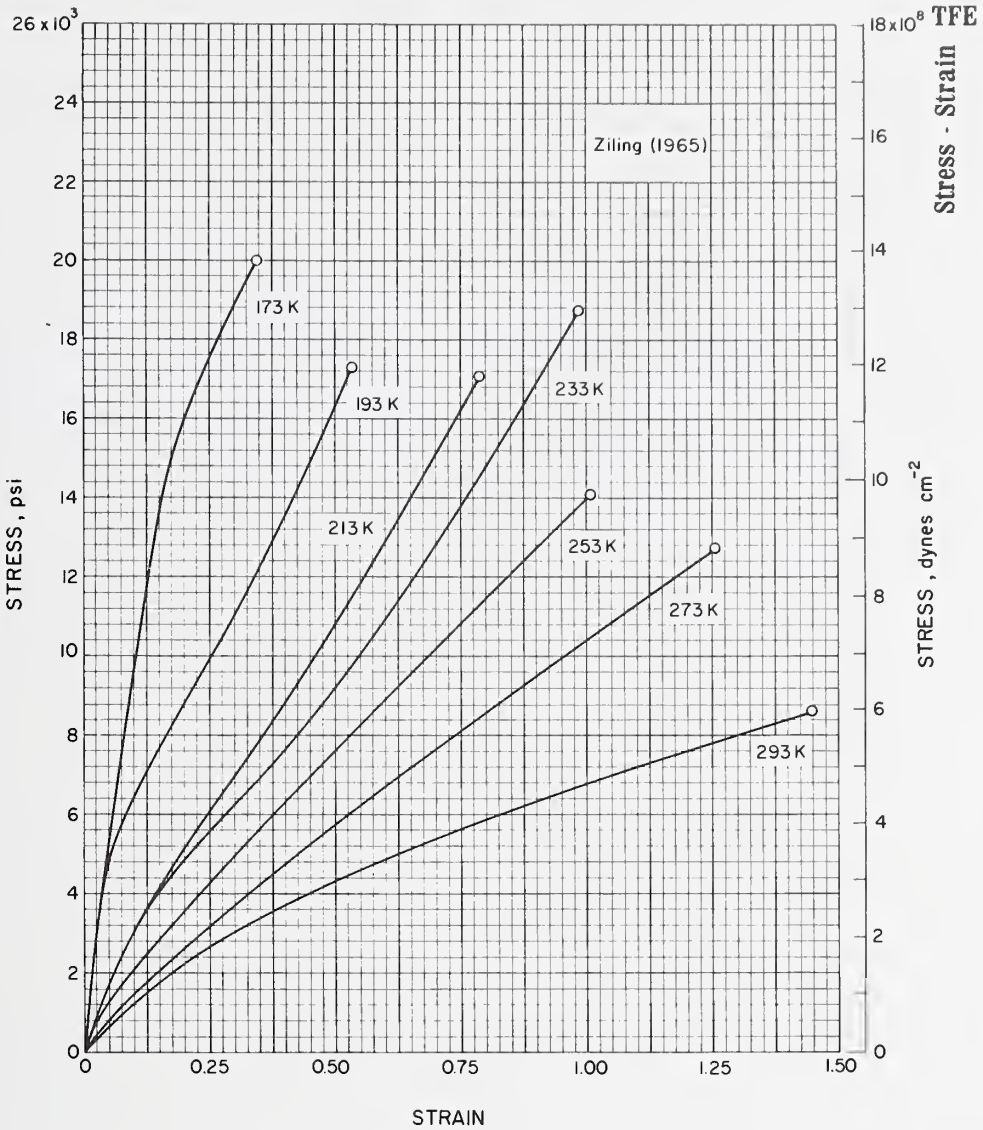
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Koo, Jones, Riddell, O'Toole (1965)	Halon G-80	Results for intermediate temp and xhd spd also given.



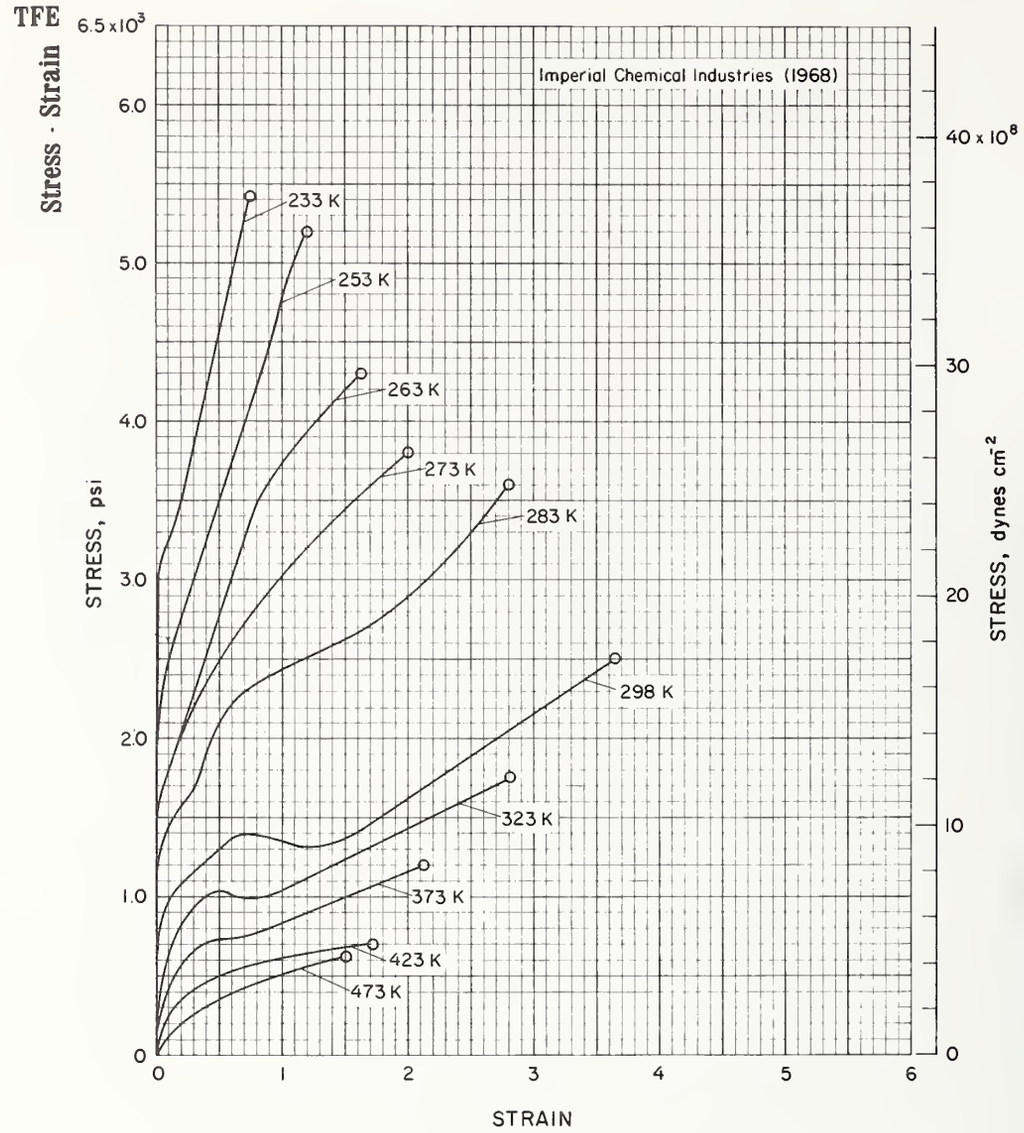
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Lockheed-Georgia Co. (1965)	Teflon	ASTM D 638-61T test procedure, xhd spd = 0.0106 cm s^{-1}, irrad in vacuum.



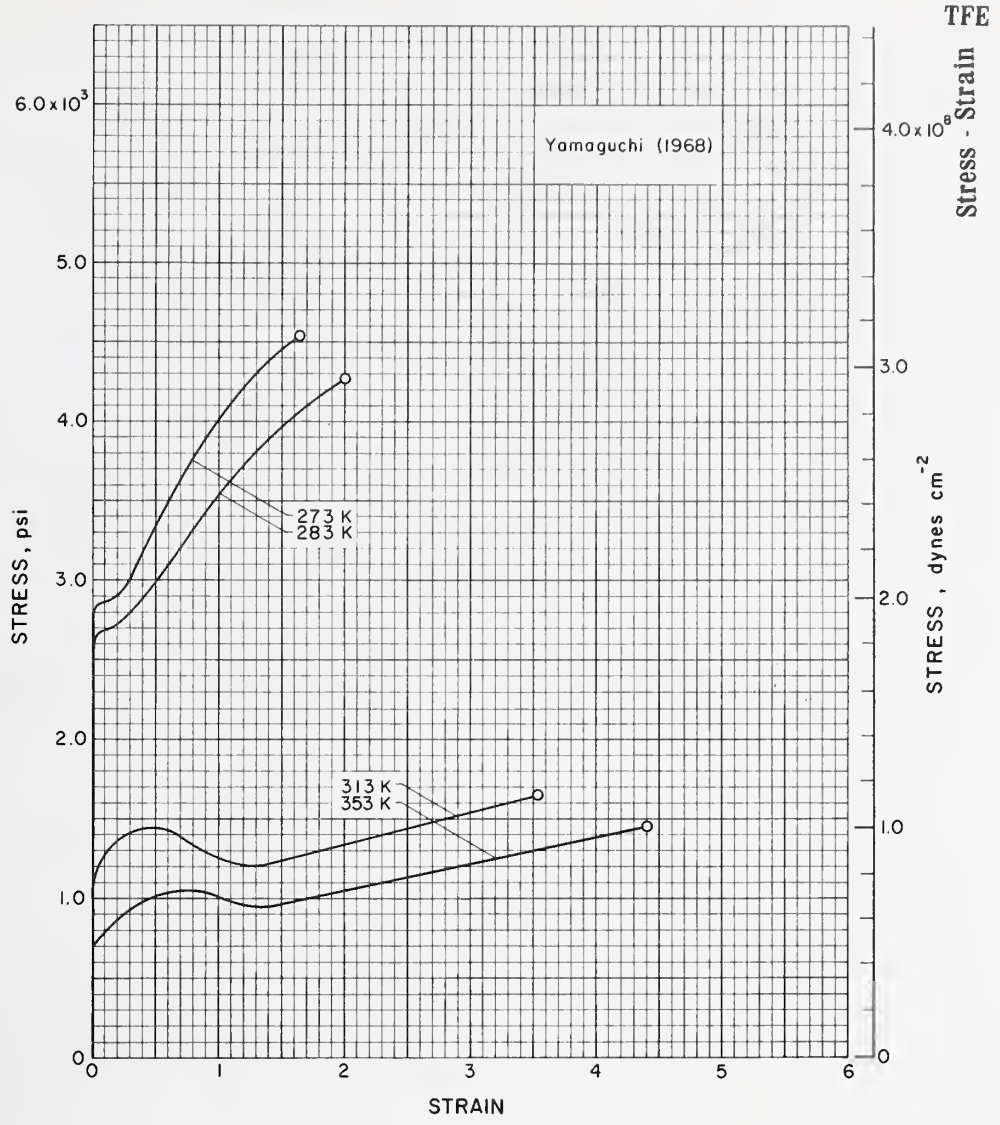
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Ziling, Malinin (1965)	Fluoroplast-4, annealed, sp gr = 2.12.	t = 0.01 cm, specimens cut ⊥ to length of film sheet.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ziling, Malinin (1965)	Fluoroplast-4, annealed, sp gr = 2.12.	t = 0.01 cm, specimens cut ‖ to length of film sheet.

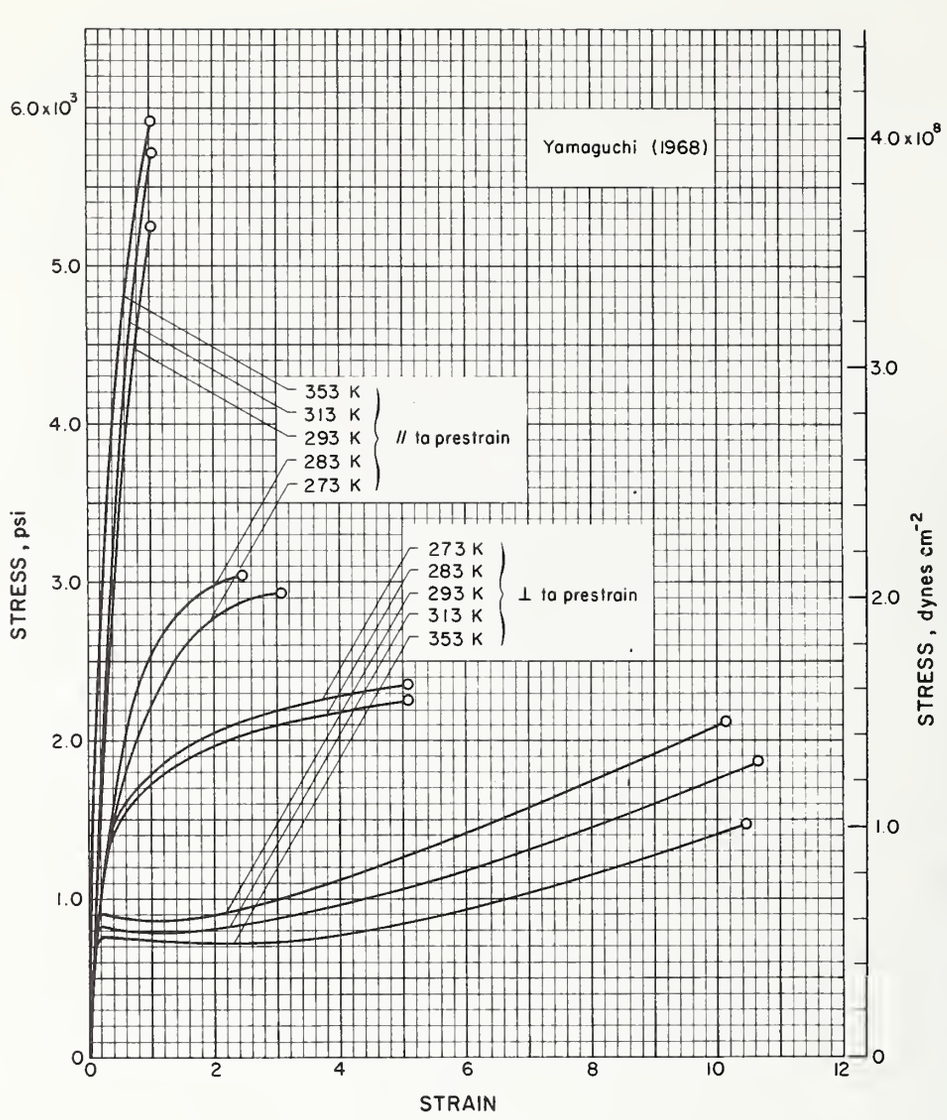


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Imperial Chemical Industries (1968)	Fluon	

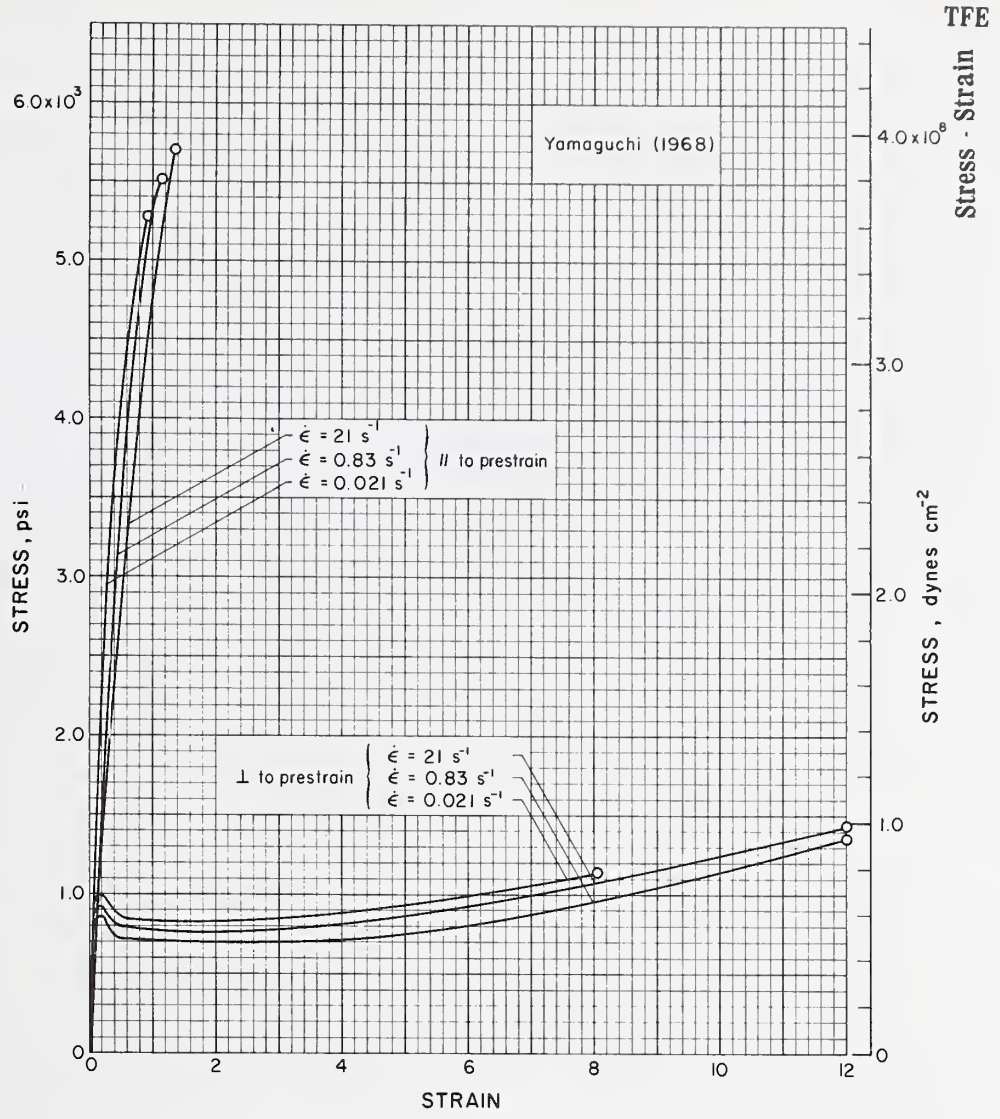


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Yamaguchi, Ota (1968)		$\dot{\varepsilon} = 0.83\ s^{-1}$

TFE

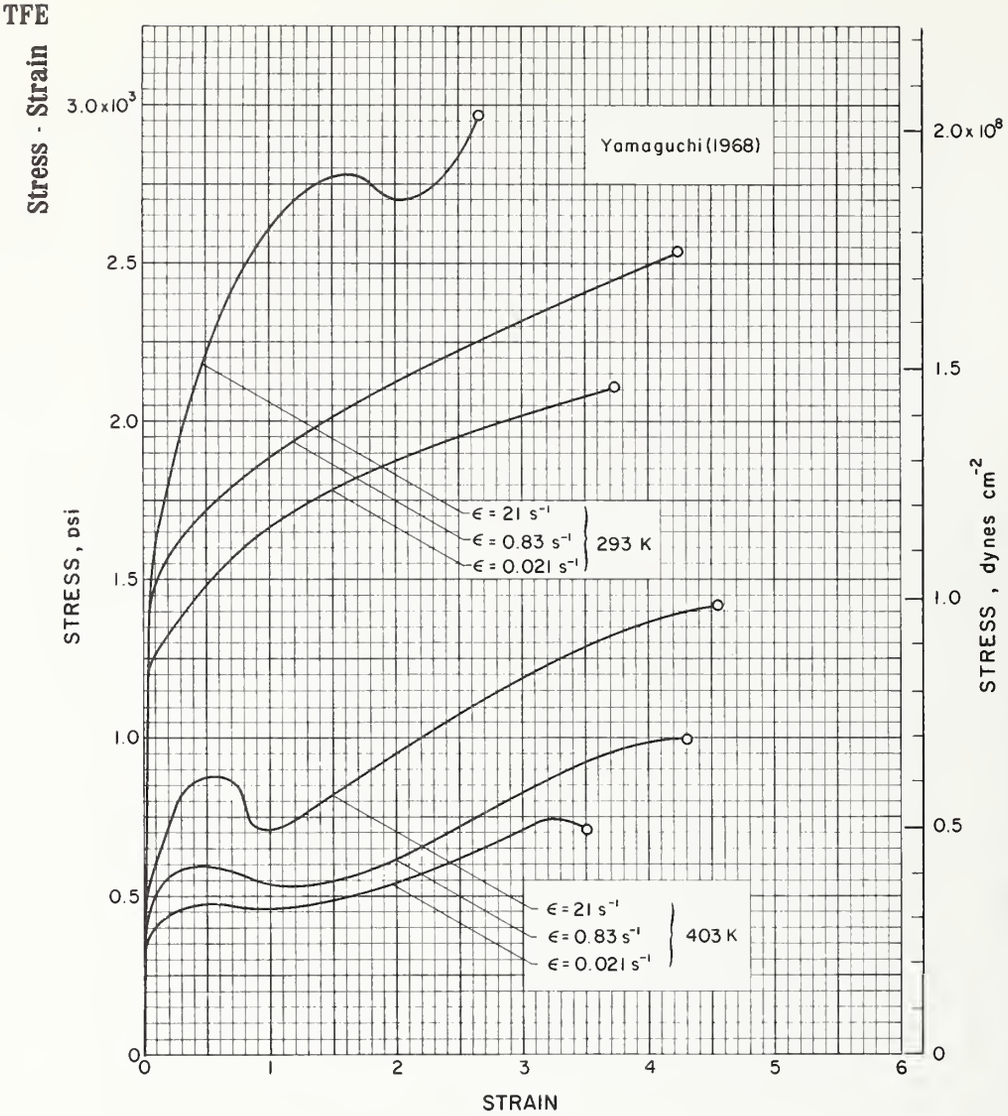


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Yamaguchi, Ota (1968)	Plate, strained prior to test	$\dot{\epsilon}$ = 0.83 s^{-1}, tested at 293 K, 60% rel hum, tested ∥ and ⊥ to direction of prestrain.

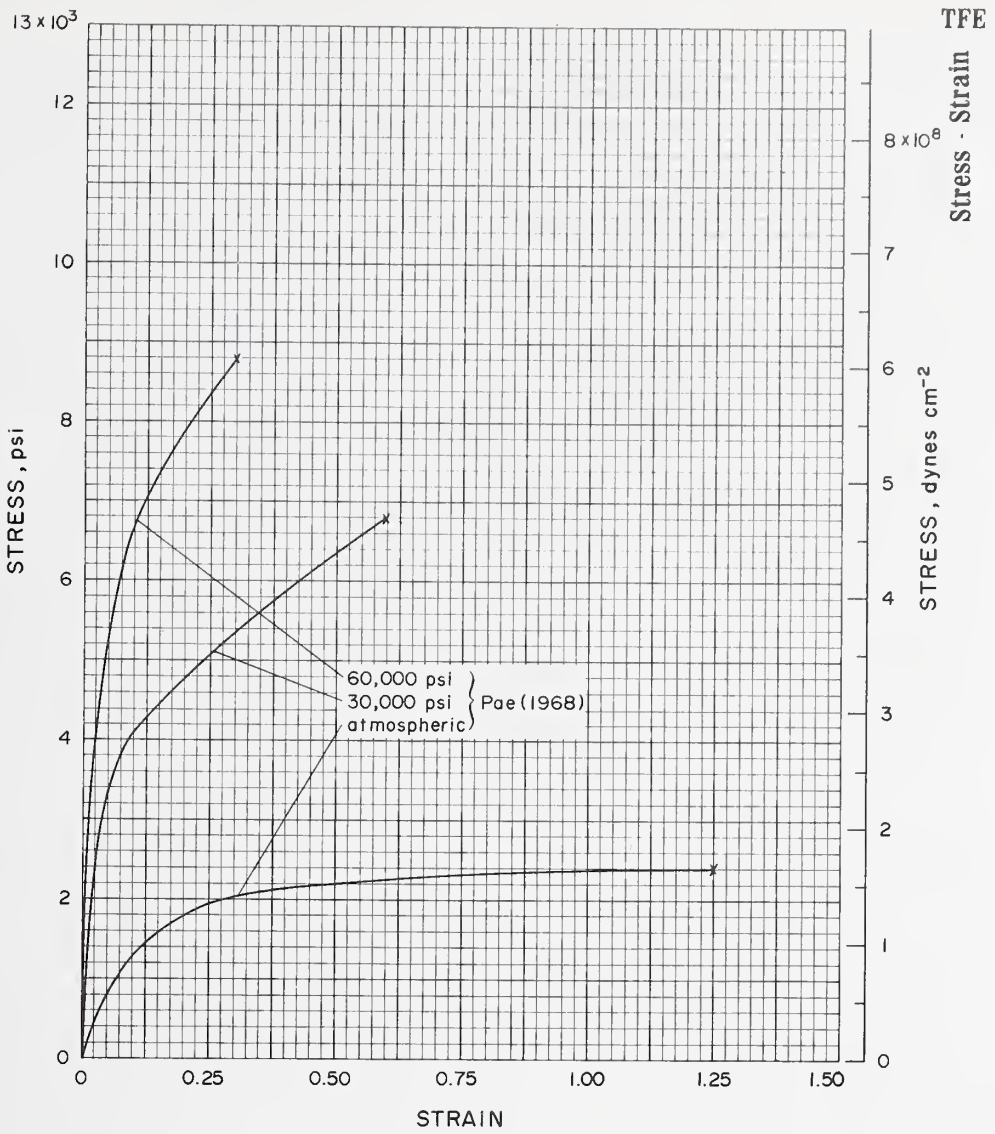


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Yamaguchi, Ota (1968)	Plate, strained at 403 K prior to test	Tested at 293 K, ⊥ and ∥ to direction of prestrain.

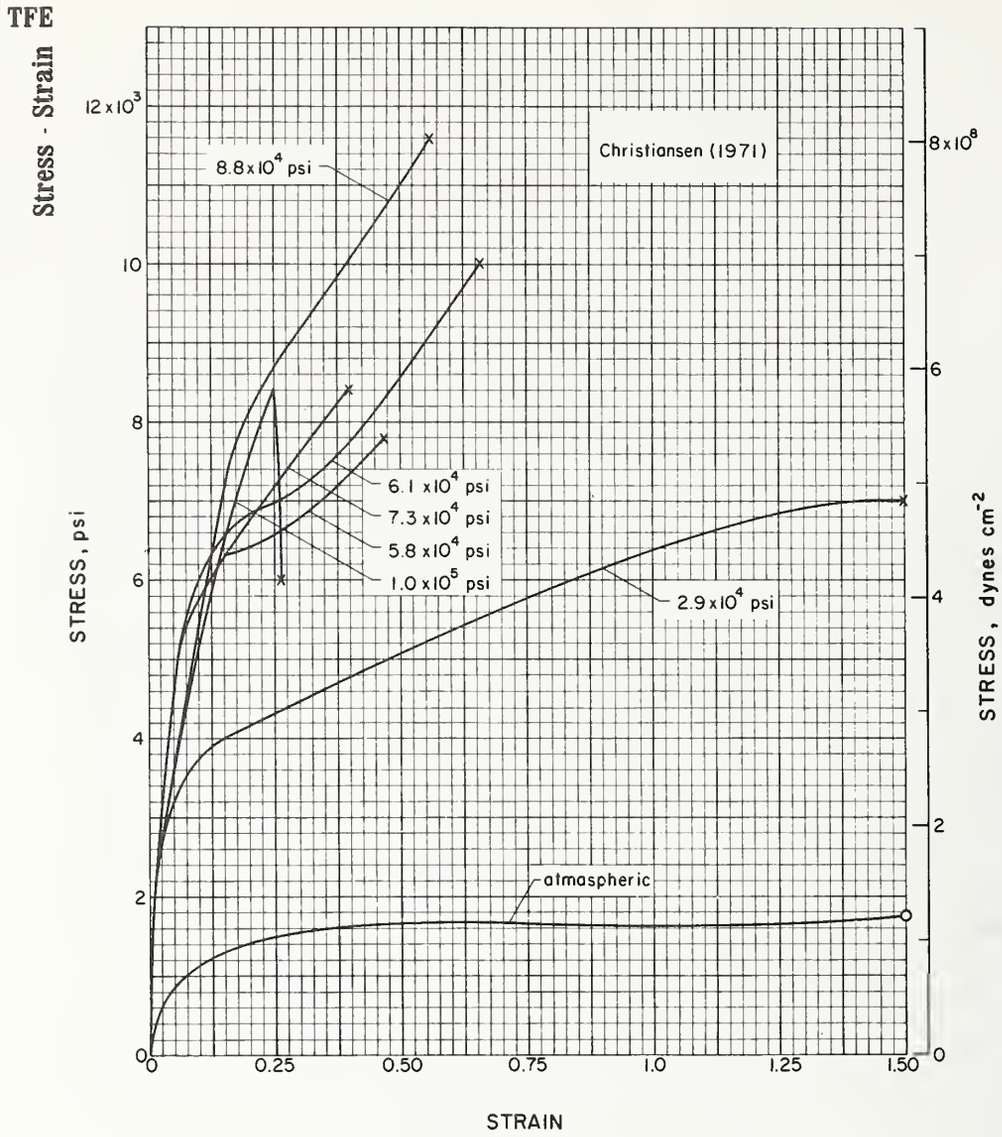
TFE



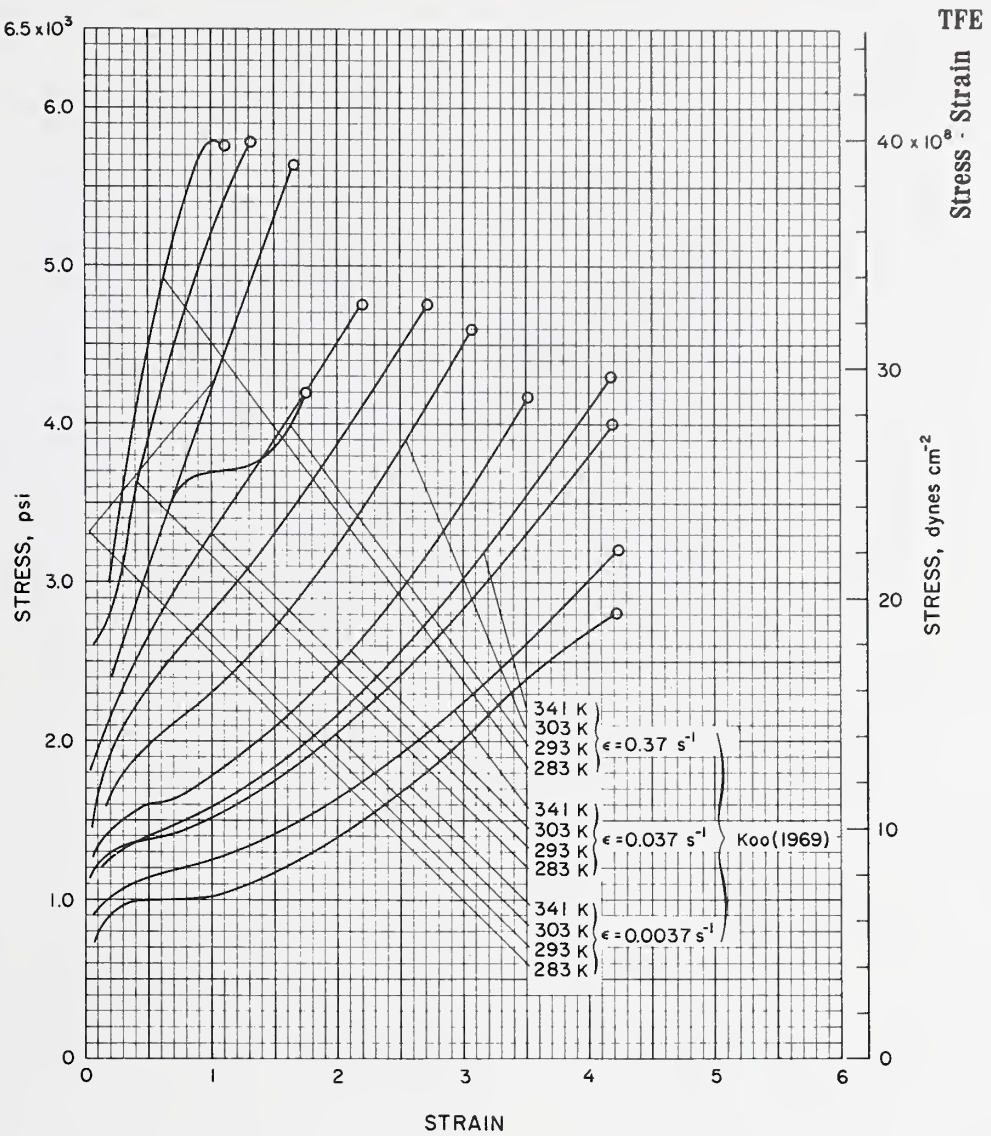
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Yamaguchi, Ota (1968)		



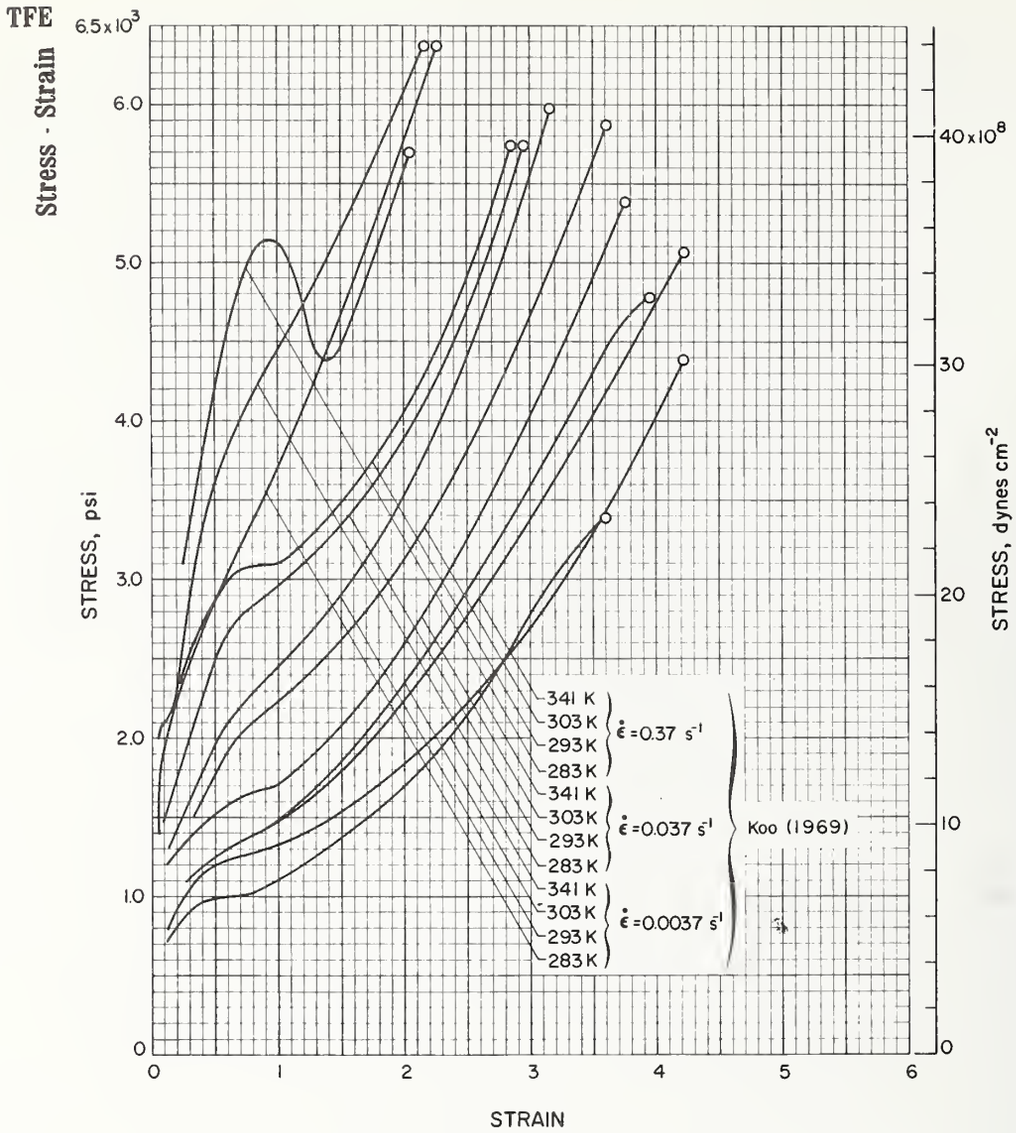
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Pae, Mears (1968)	Teflon, extruded rod, diam = 1.27 cm	ℓ = 1.27 cm, diam = 0.76; xhd spd = 0.0042 cm s^{-1}, measurements made in a high pressure apparatus exerting a constant hydrostatic pressure on the sample through a kerosene medium, pressure noted.



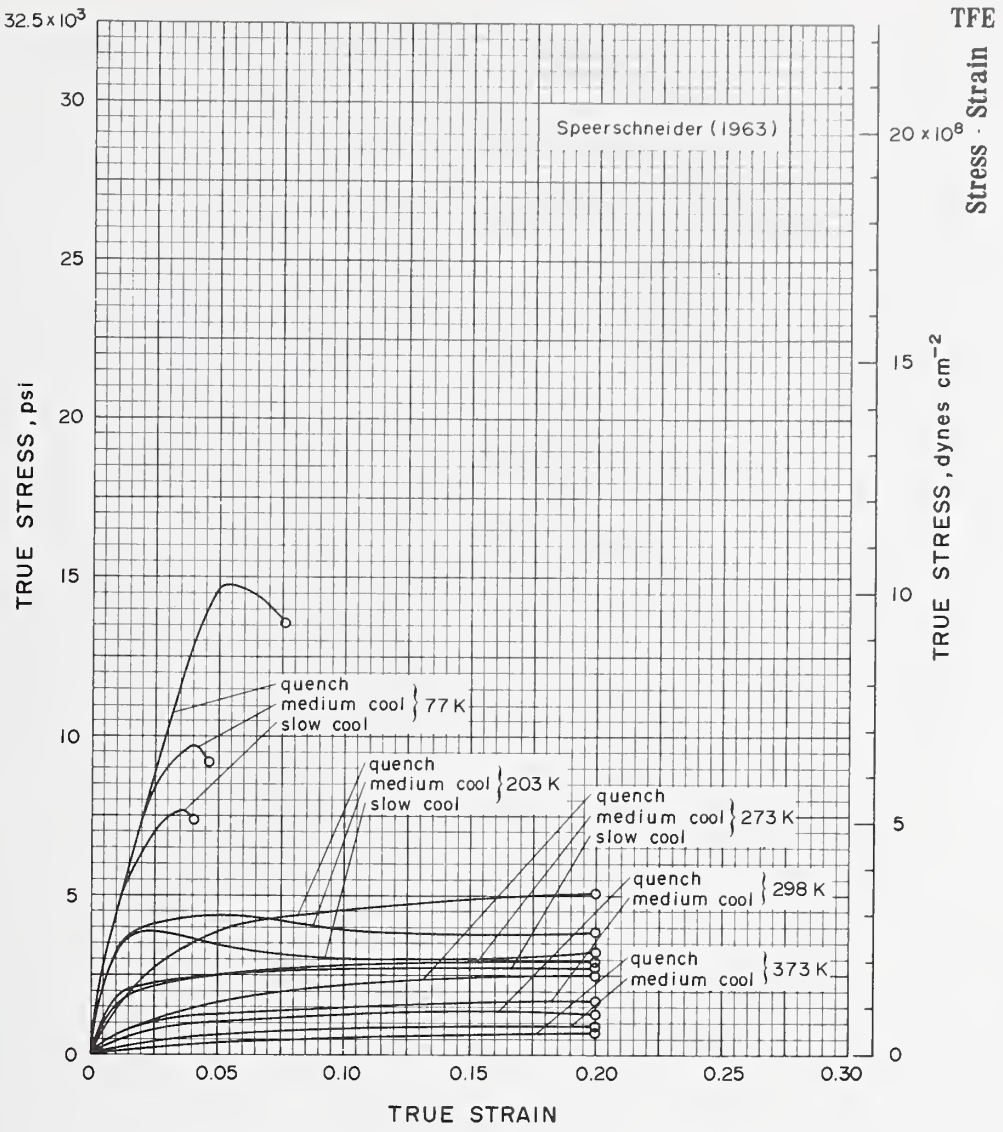
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Christiansen, Baer, Radcliffe (1971)	Teflon 6121, ram extruded rod, diam = 1.27 cm, partially crystalline	Machined to diam = 0.38 cm, ℓ = 1.52 cm; measurements made while the samples were under a hydrostatic pressure transmitted through castor oil, xhd spd = 0.00025 cm s^{-1}, 300 K, pressure noted.



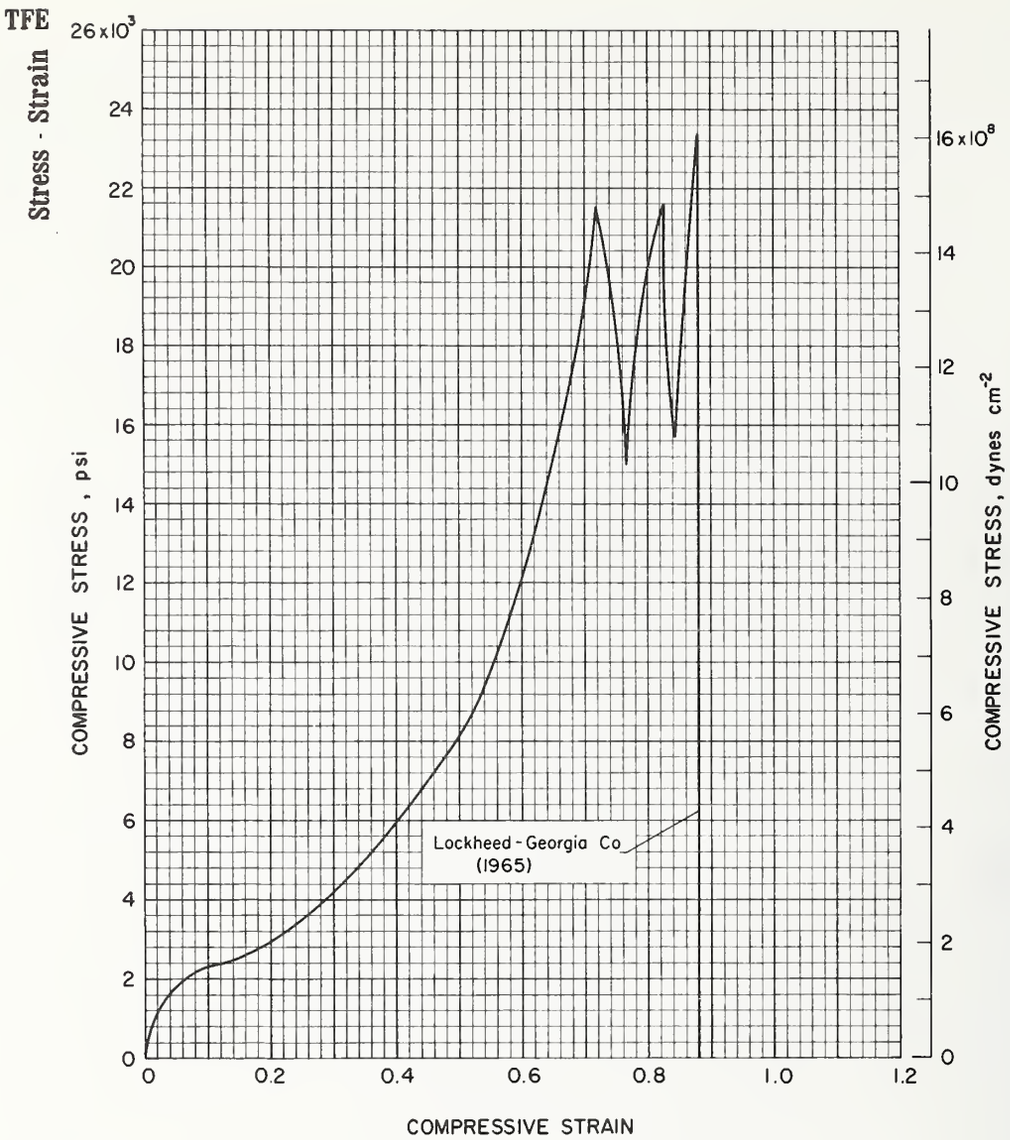
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Koo, Andrews (1969)	Halon G-80, preformed at room temp and 4000 psi, heated to 653K in 4 h, held for 2 h, cooled through melting point (600K) to 558K in 60 h, then cooled to room temp at rate of 60K h^{-1}, sp gr = 2.169±0.001, 60% crys (63% crys by X-rays)	Microtensile specimens per ASTM D-1708-66, GL = 2.3 cm; Instron, temp uniformity to ±0.5K, xhd spd = 0.0085, 0.085, and 0.85 cm s^{-1}; curves are av of 4 tests.



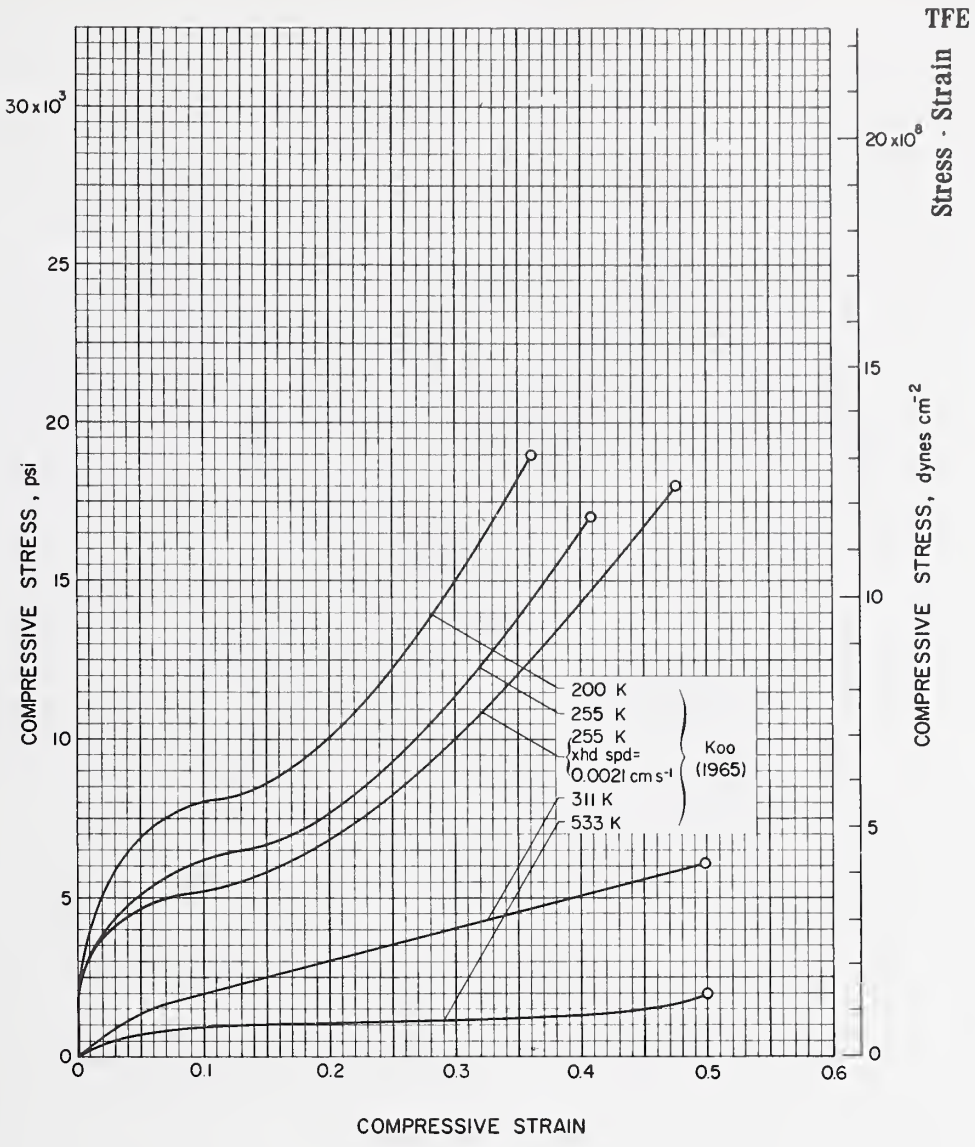
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Koo, Andrews (1969)	Halon G-80, preformed at room temp and 4000 psi, heated to 653K in 3 h, held for 2 h, then rapidly cooled in air, sp gr = 2.136±0.001, 49% crys (54% crys by X-rays)	Microtensile specimens per ASTM D-1708-66, GL = 2.3 cm; Instron, temp uniformity to ±0.5K, xhd spd = 0.0085, 0.085, and 0.85 cm s^{-1}; curves are av of 4 tests.



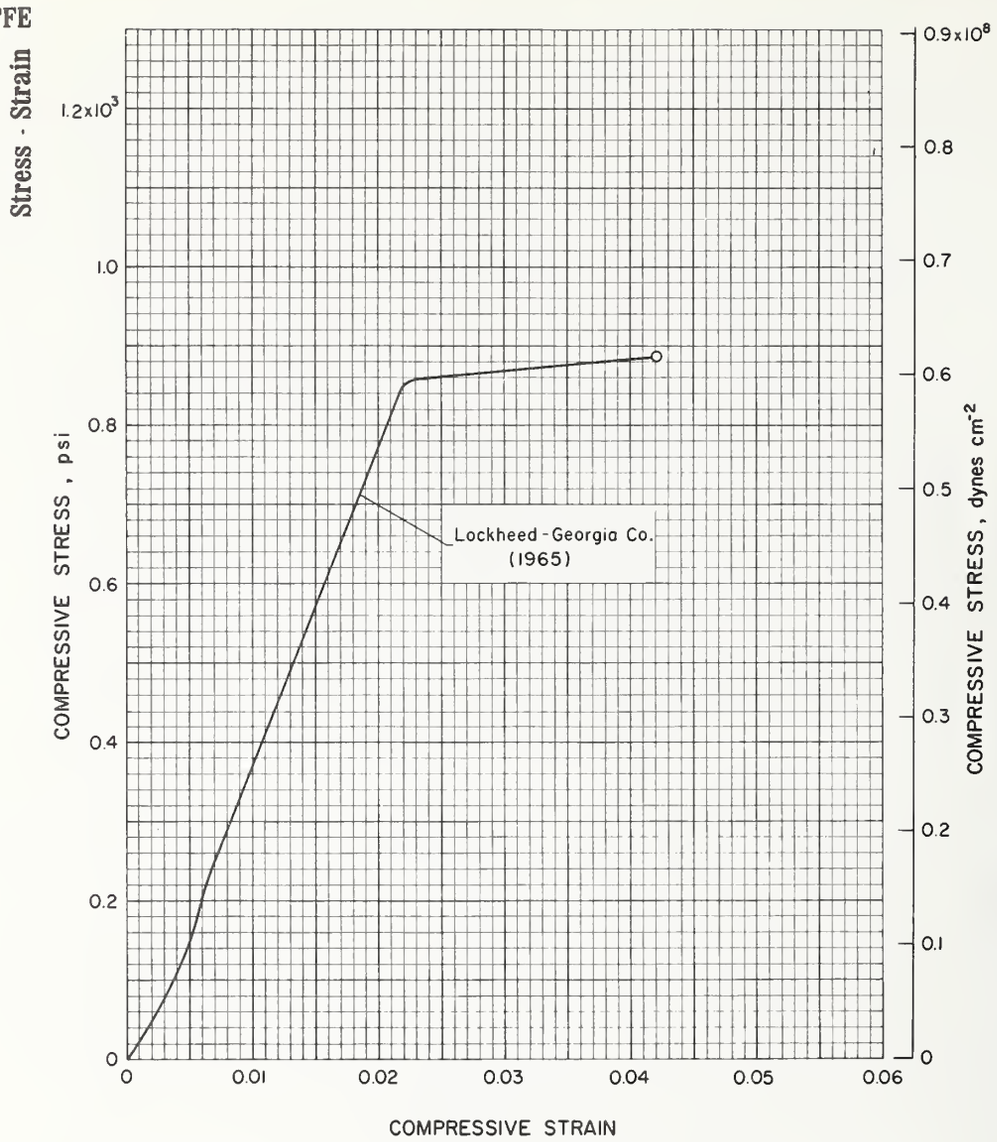
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Speerschneider, Li (1963)	Teflon 41-BX, cut with long narrow bands containing fine strations _band length, samples with 0.2 x 10_ bands quenched in ice water, samples with 0.4 x 50_ bands cooled at 180K h^{-1}, samples with 1 x 100_ bands cooled at 15K-h^{-1}	Red Sec 1.90 x 0.50 x 0.20 cm; Instron, $\dot{\varepsilon}$ = 0.00085 s^{-1}, results at 298 and 373 K were the same for medium and slow cooling.



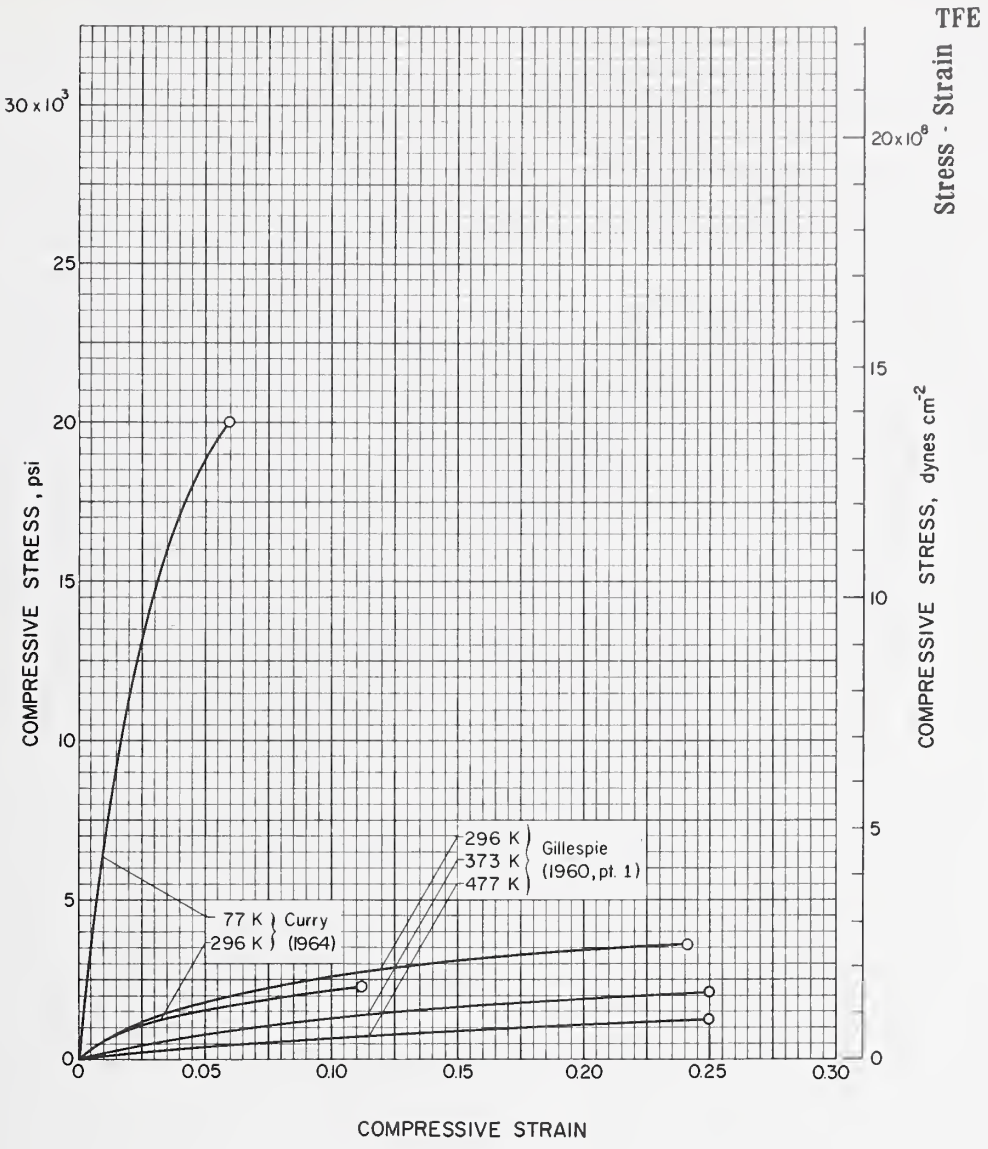
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Lockheed-Georgia Co. (1965)	Teflon	ASTM D 638-61T test procedure, xhd spd = 0.0021 cm s^{-1}.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Koo, Jones, Riddell, O'Toole (1965)	Halon G-80	Xhd spd = 0.021 cm s^{-1} except as noted.



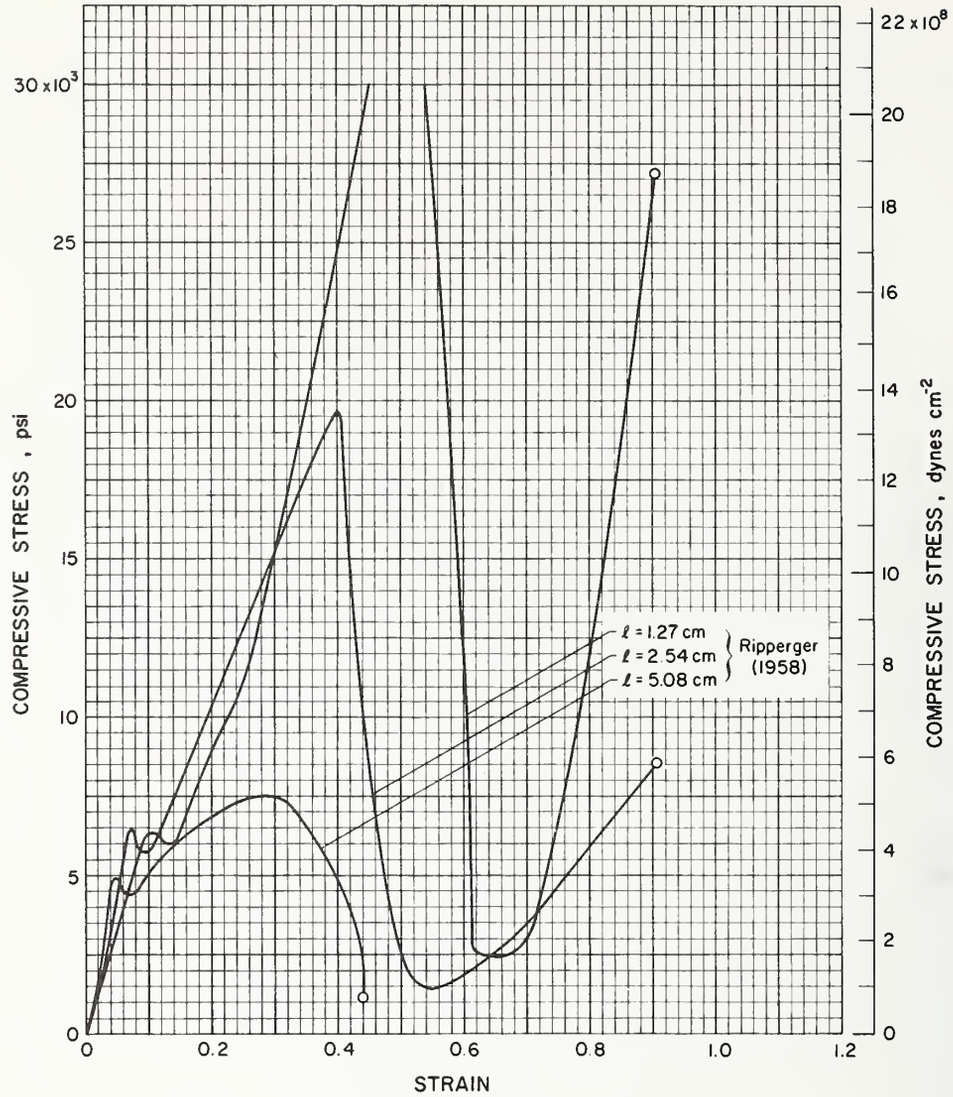
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Lockheed-Georgia Co. (1965)	Teflon	ASTM D 638-61T test procedure, xhd spd = 0.0021 cm s^{-1}, irrad in vacuum, results nearly identical after 5.0×10^6 and 1.4×10^6 Roentgen.



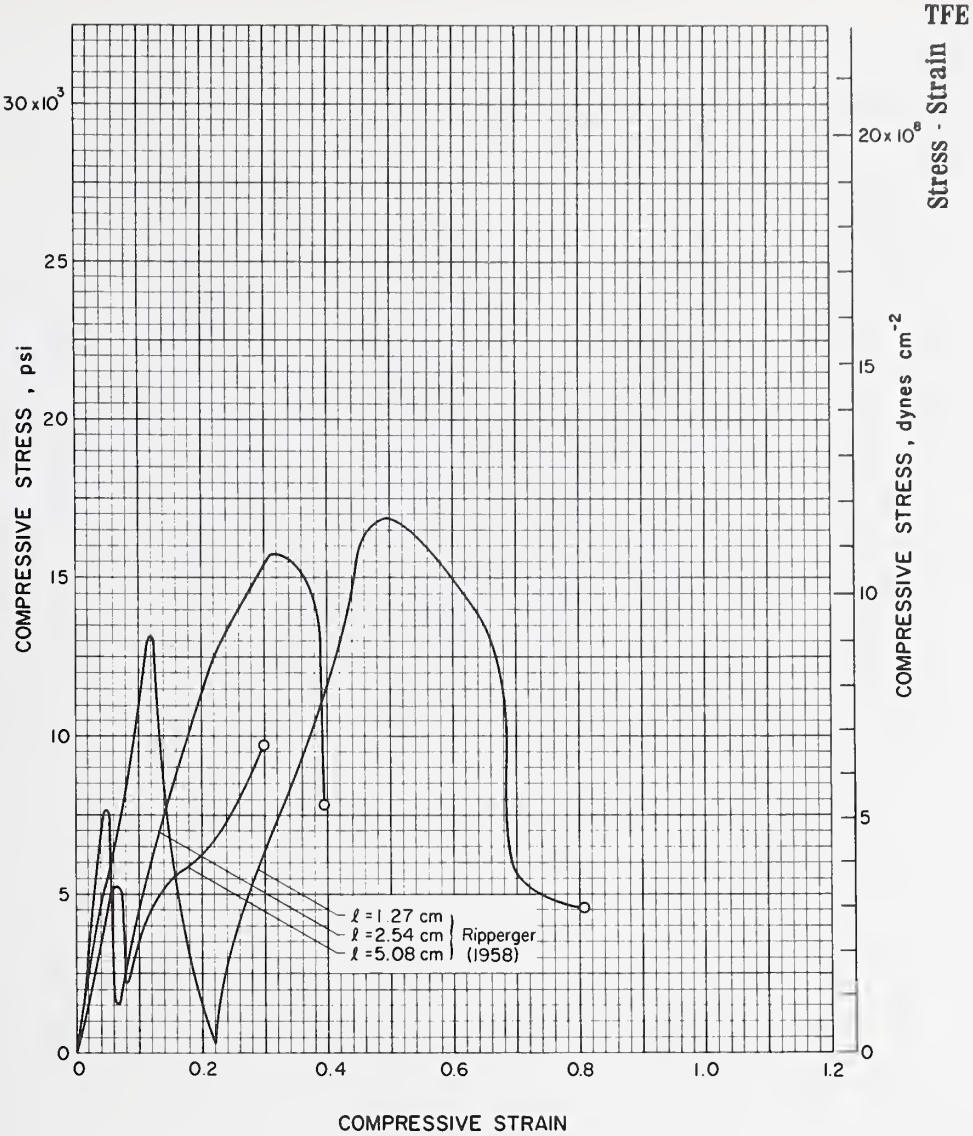
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Curry (1964)	Teflon	Stacked specimens 1.27 x 1.27 x 0.16 cm; conventional metallurgical test equipment
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 1, ram extruded, av sp gr = 2.17, 60 ± 2 % crys, void content < 0.3%, preform pressure = 2500 psi.	ℓ = 15.2 cm, diam = 1.52 cm; ASTM D-695-54 test procedure.

TFE

Stress - Strain

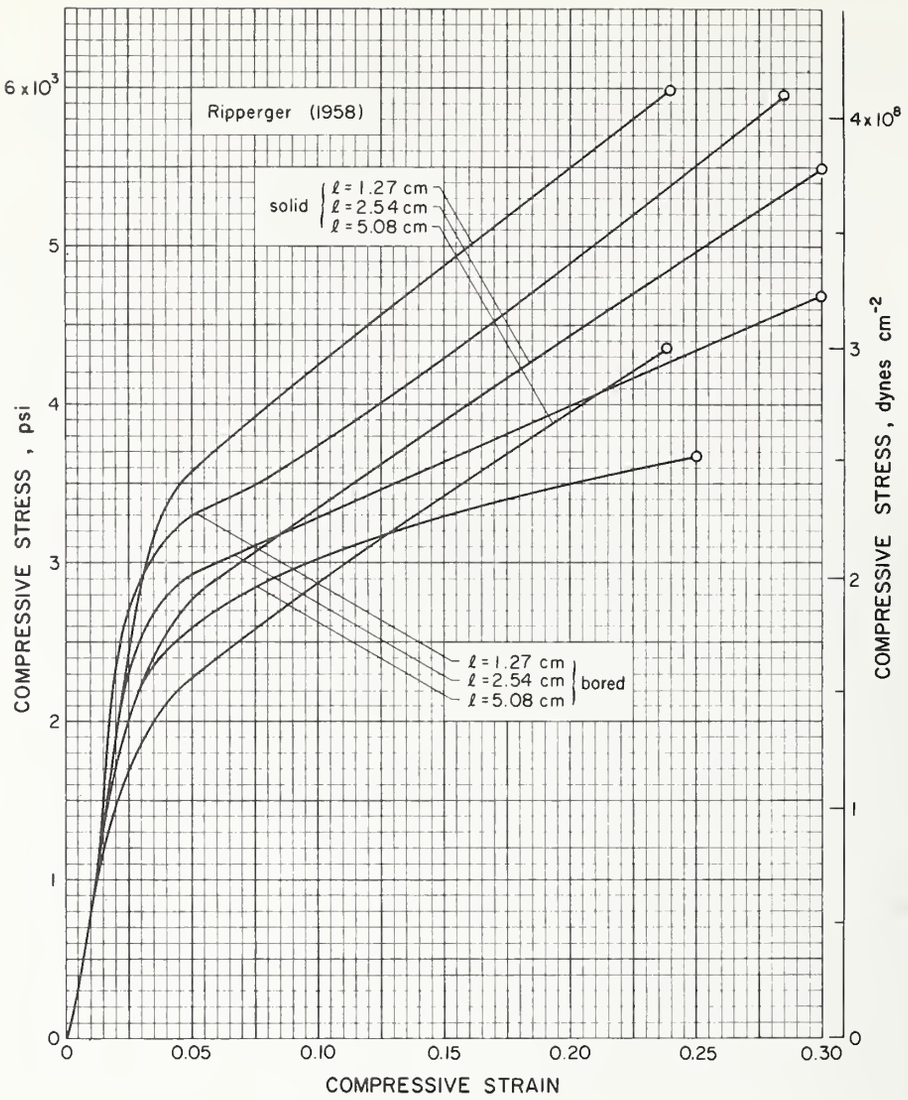


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ripperger (1958)	Teflon, sp gr = 2.2	Diam = 5.08 cm, ℓ as noted, 3.56 cm diam hole bored along the axis; impact loaded by a 0.83 kg Al projectile with a nominal speed of 57.8 m s^{-1}, 300 K.

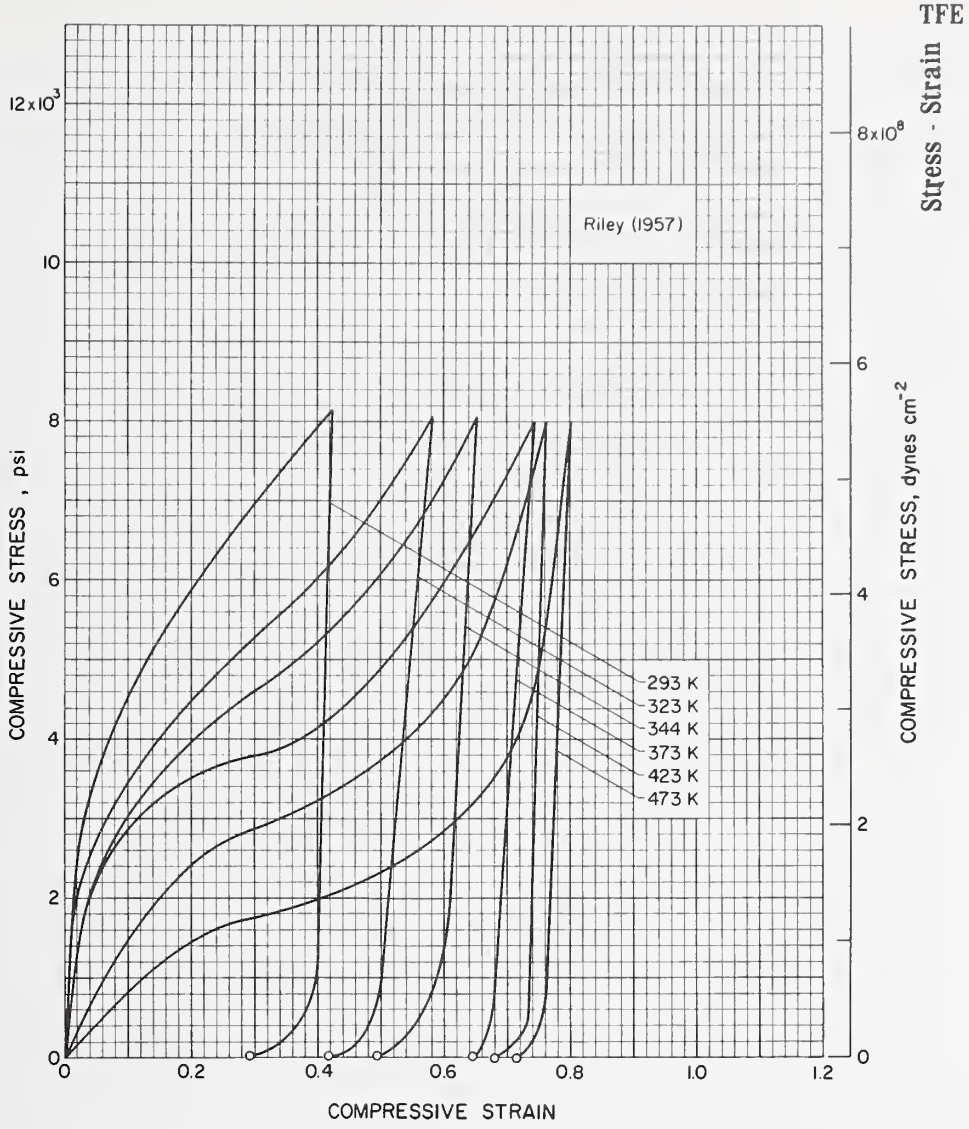


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ripperger (1958)	Teflon, sp gr = 2.2	Diam = 5.08 cm, ℓ as noted, solid cylinders; impact loaded by a 0.83 kg Al projectile with a nominal speed of 57.8 m s^{-1}, 300 K.

Stress - Strain



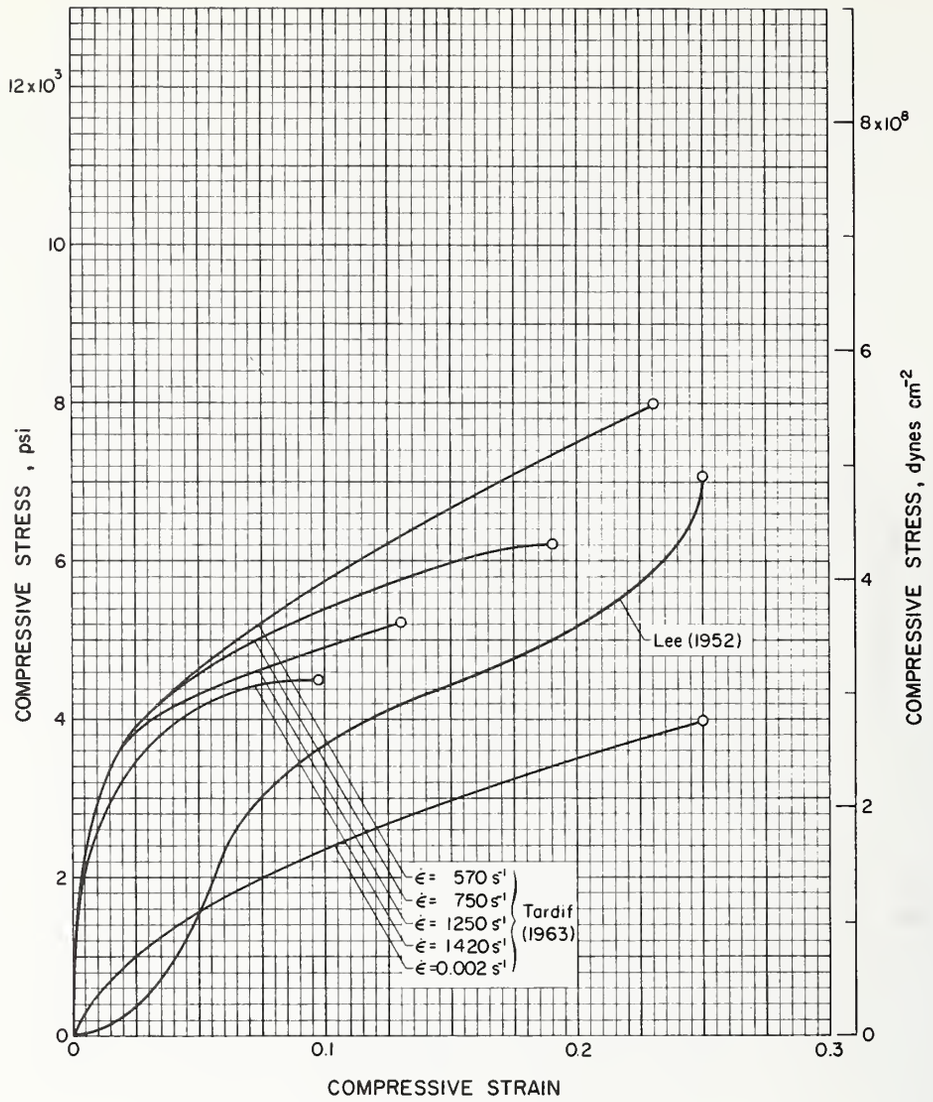
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ripperger (1958)	Teflon, sp gr = 2.2	Diam = 5.08 cm, ℓ as noted, both solid cylinders and samples with a 3.56 cm diam hole bored along the axis; xhd spd = 0.0025 cm s^{-1}, 300 K.



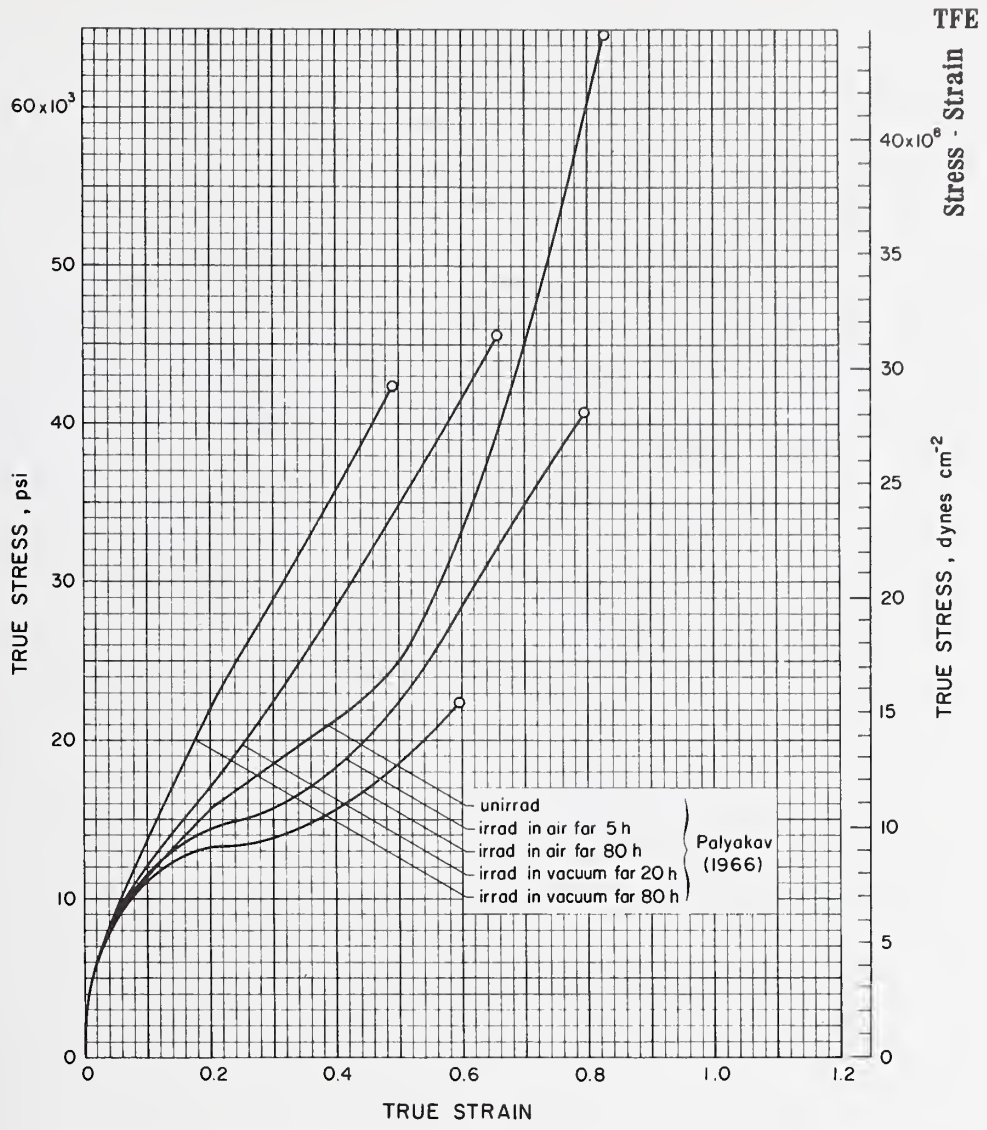
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Riley (1957)		Deformation and recovery.

TFE

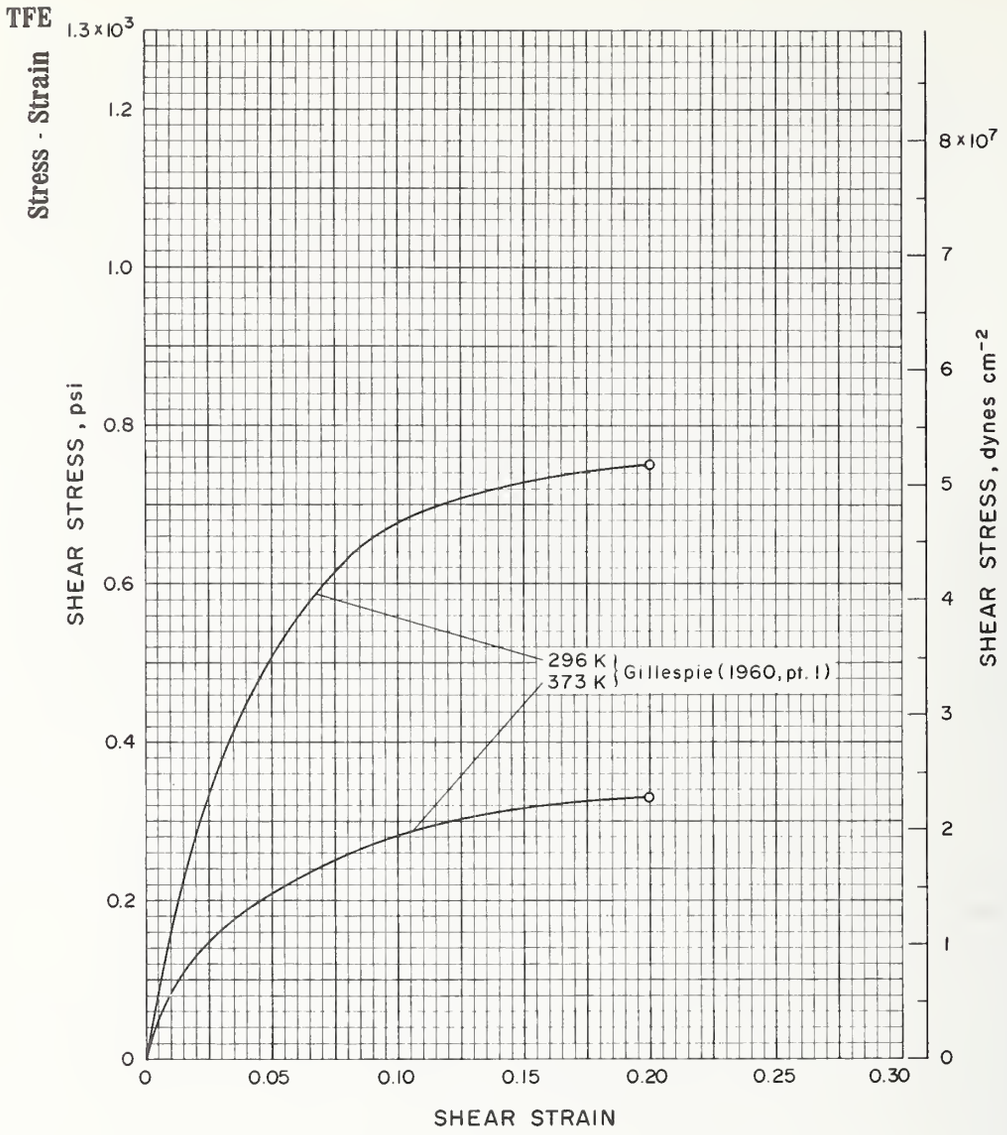
Stress - Strain



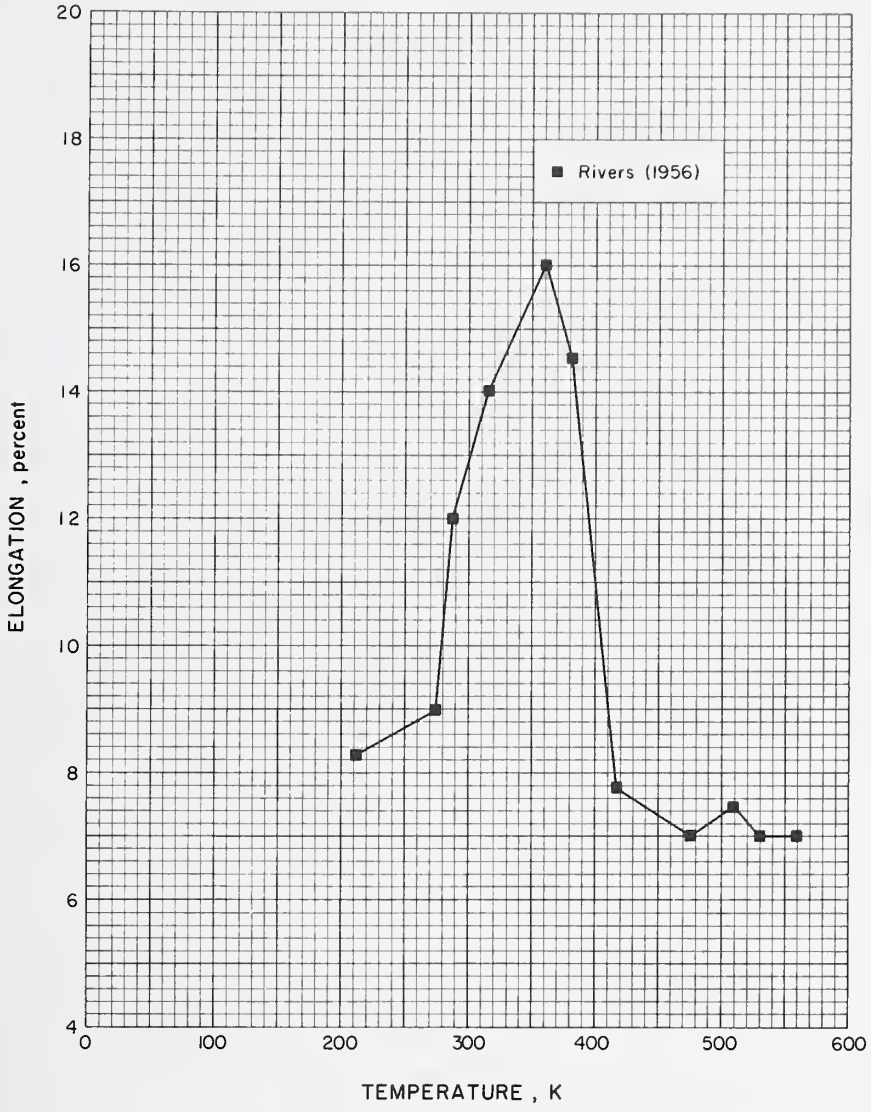
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Tardif, Marquis (1963) Lee (1952)	Teflon	Daim = 1.9 cm; drop tester, mean value $\dot{\epsilon}$ given.



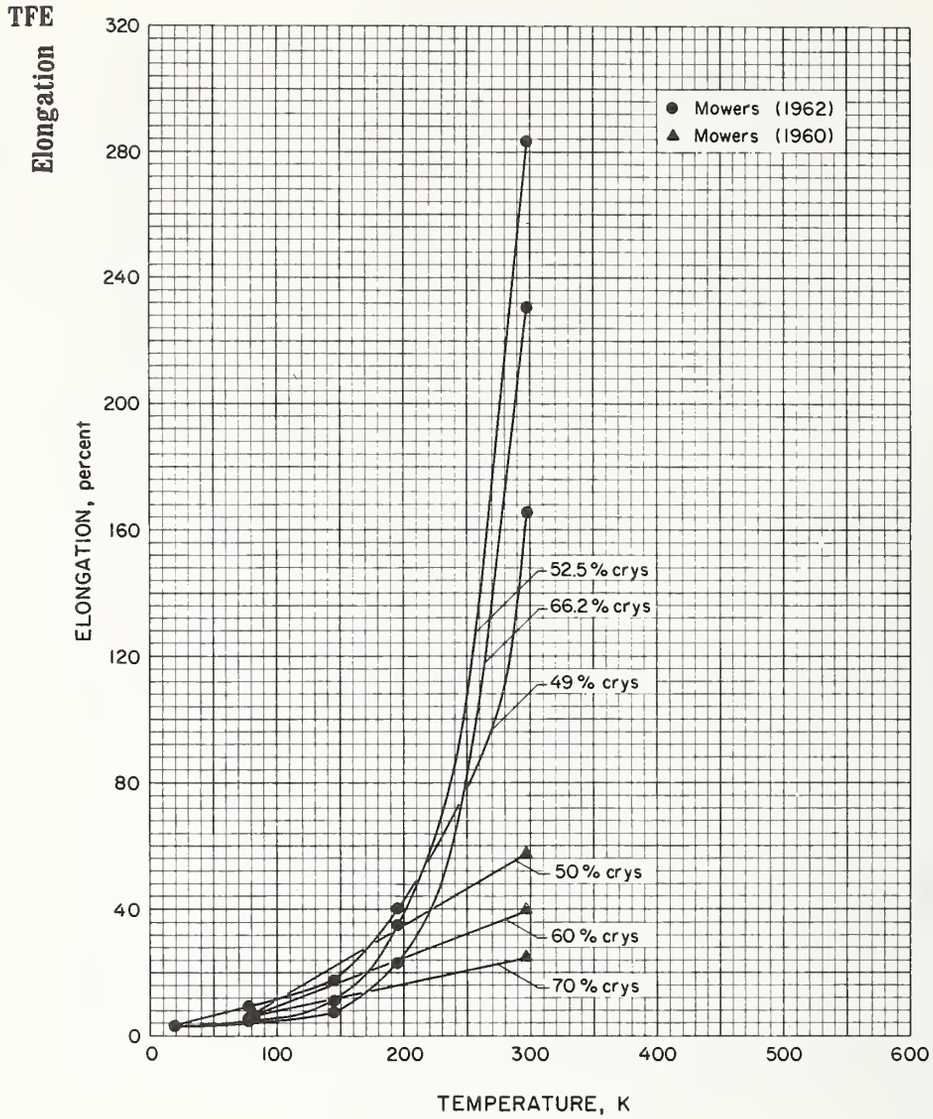
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Polyakov (1966)		ℓ = 2.0 cm, w = 0.6 cm, t = 0.001 cm; loaded on a microscope stage, xhd spd 0.0048 cm s^{-1}; sealed in quartz tube for irradiation by a PRK-2 quartz-mecury UV lamp with a line spectrum in the 2400-3700 Å region, intensity = 2.8 x 10^{-3} W cm^{-2}, samples 40 cm from lamp to maintain temp at 293-296K.



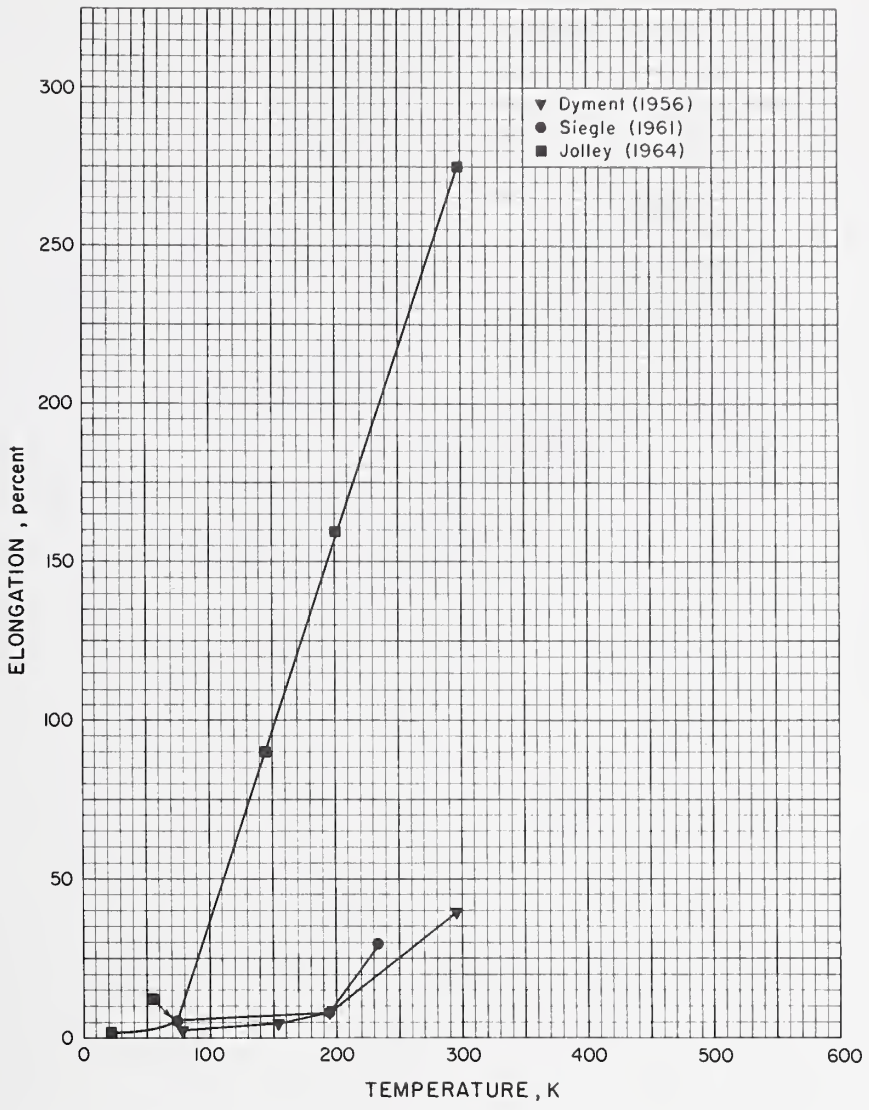
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 1, ram extruded, av ps gr = 2.17, 60± 2% crys, void content < 0.3%, preform pressure = 2500 psi	L = 15.2 cm, diam = 1.52 cm.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Rivers, Franklin (1956)	Teflon oriented fiber, sp gr = 2.2	Test at room temp and below conducted in hexane, all others conducted in air.



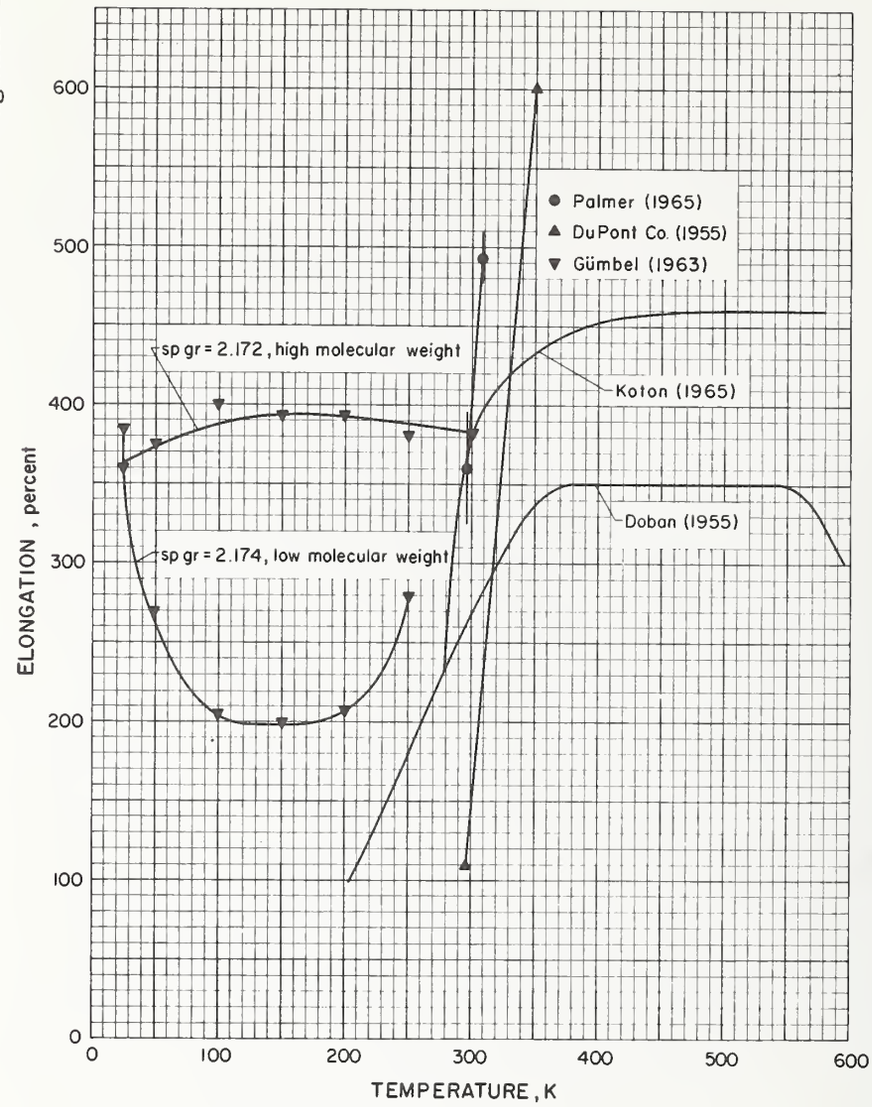
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 49-50% crys, sp gr = 2.148-2.152, molded at 655 K, 30 min, quick quenched; 52.5-56% crys, sp gr = 2.159-2.171, molded at 655 K, 30 min, quick quenched then held at 580 K for 5 h; 66.2-71% crys, sp gr = 2.199-2.226, molded at 655 K, 30 min, slow cooled then held at 599 K for 20 h.	3 dies used to give Red Sec of 2.54 x 0.635 cm, 2.54 x 0.318 cm, and 0.51 x 0.254 cm; Instron, xhd spd = 0.042 cm s^{-1} at 298 K and 0.0042 cm s^{-1} otherwise.
Mowers (1960)	Teflon, 50, 60, and 70% crys	Instron.



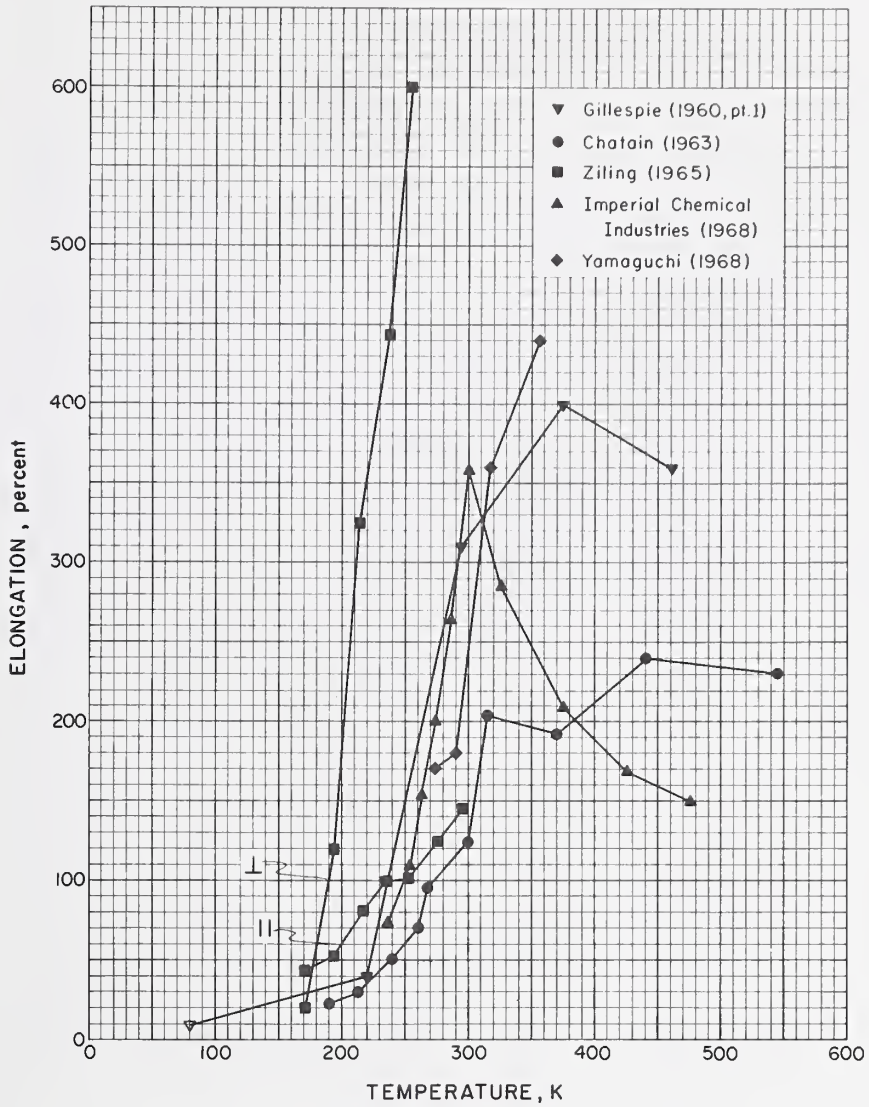
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Siegle (1961)	Teflon, 60% crys	ASTM D 638-52T test procedure.
Jolley, Homsy, Reed (1964)	Teflon	ASTM D 638 test procedure.
Dyment, Ziebland (1956)	Fluon in form of 0.73 cm diam rod	Red Sec ℓ = 1.14 cm, diam = 0.32 cm; K-type Hounsfield tensometer, xhd spd = 0.003 cm s^{-1}.

TFE

Elongation



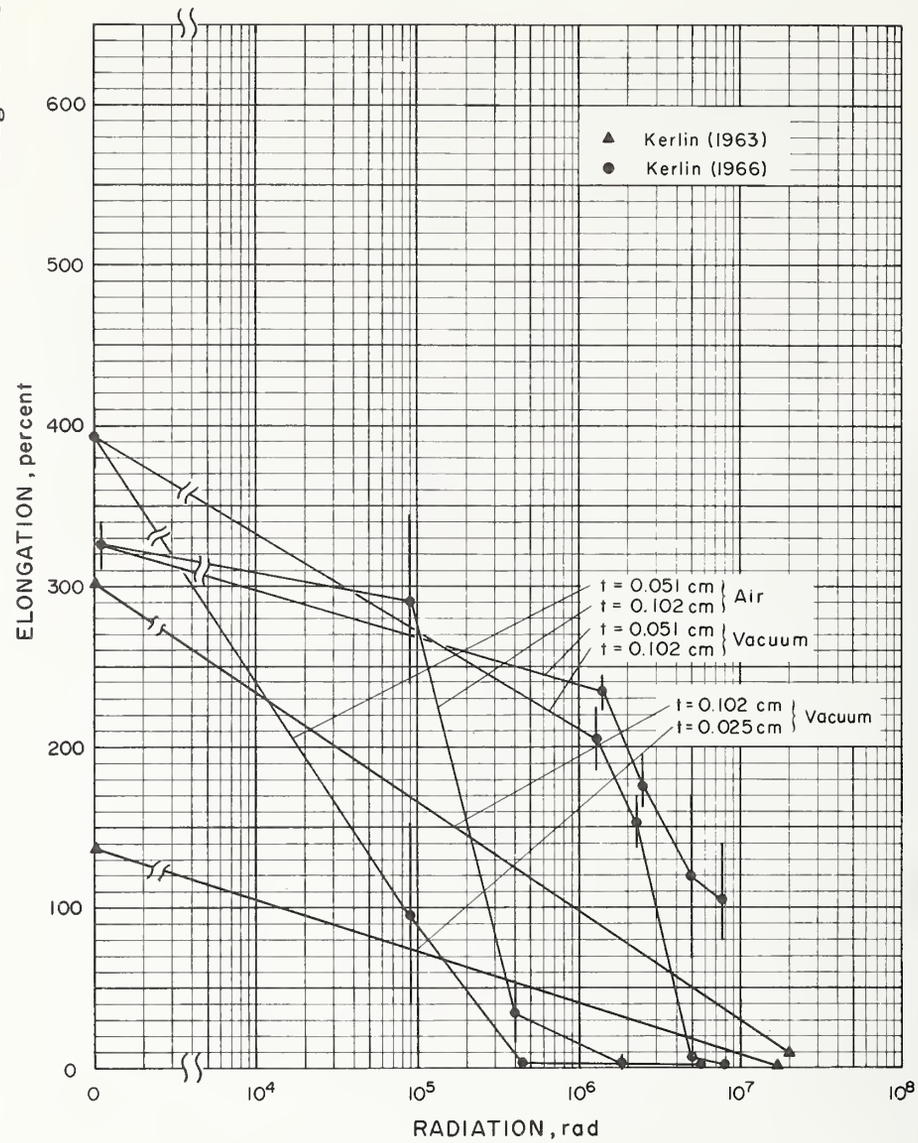
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Palmer (1965)	Sheet made from granular polymer by skiving from a molded block, warmed to 313 K for punching specimens.	t = 0.25 cm, B.S. 903 specification, type E die with w = 0.41 cm pulled at xhd spd of 0.42 cm s^{-1}, type D die with w = 0.63 cm pulled at xhd spd of 0.84 cm s^{-1}; tested at 296± 2 K and 308 ± 1K; the 2 specimen sizes yield almost identical results and the data points are an av, error bars indicate standard deviation in 12 specimens of each type.
DuPont Co. (1955)	Teflon	ASTM D 638-49T test procedure.
Doban, Sperati, Sandt (1955)	Teflon, sp gr = 2.1-2.3	ASTM D 638-52T test procedure
Gümble (1963)	Powdered Heydeflon and Floroplast-4, sintered at 653 K for 0.5 h, cooled at 1.6 K min^{-1}; low molecular weight, sp gr = 2.174; high molecular weight, sp gr = 2.174	ℓ = 7.5 cm, t = 0.16 cm, GL = 2.2 cm, samples per ASTM D 1457-56T test procedure; xhd spd = 0.083 cm s^{-1}.
Koton, Yakovlev, Rudakov, Knyazeva, Florinskii, Bessonov, Kuleva, Tolparova, Laius (1965)	Teflon	



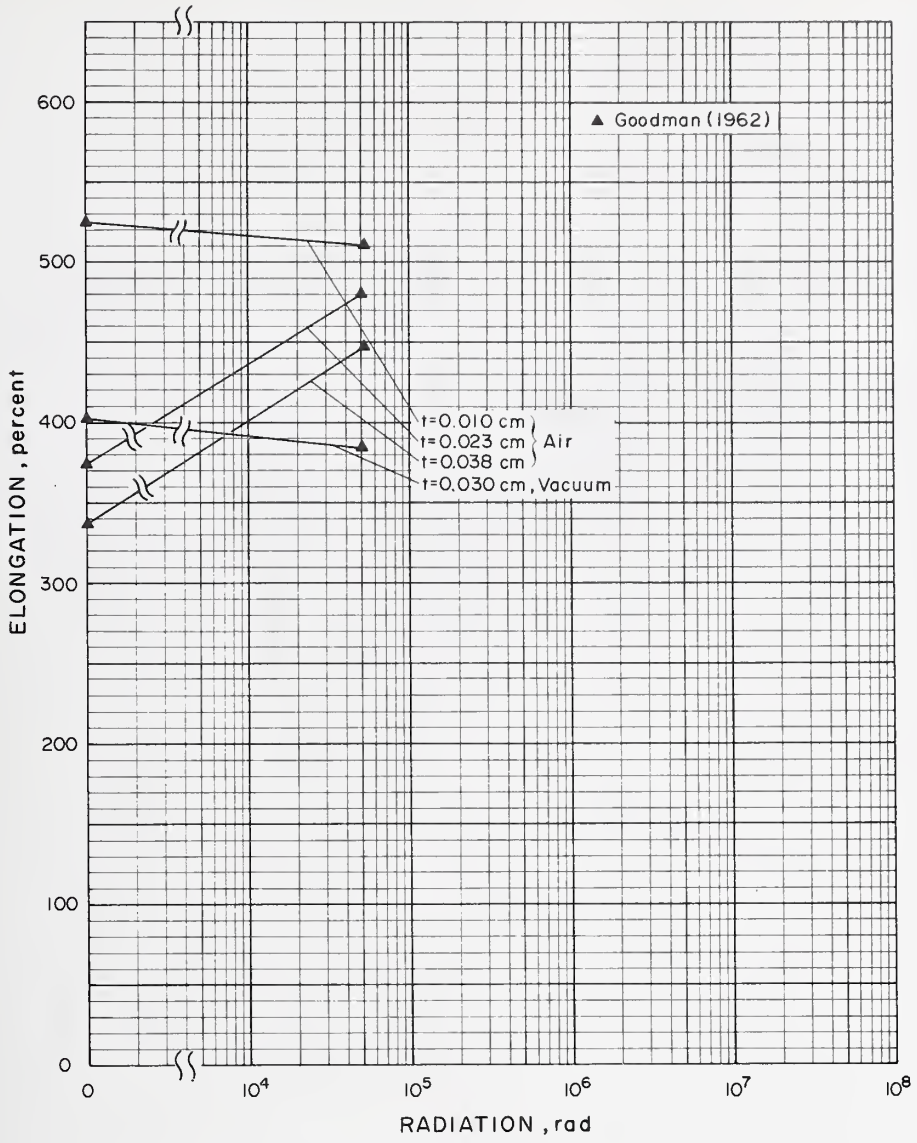
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 1, ram extruded sp gr = 2.17, 60 ± 2 %, void content < 0.3 %, preform pressure = 2500 psi	35.6 × 35.6 × 0.318 cm; ASTM D - 1456 - 56 T test precedure; extracted from σ-ϵ diagrams.
Chatain (1963)	Teflon	Extracted from σ-ϵ diagrams.
Ziling, Malinin (1965)	Fluoroplast-4, annealed, sp gr = 2.12	t = 0.01 cm, specimens cut ∥ and ⊥ to length of film sheet; extracted from σ-ϵ diagrams.
Imperial Chemical Industries (1968)	Fluon	Extracted from σ-ϵ diagrams.
Yamaguchi (1968)		$\dot{\epsilon}$ = 0.83 s^{-1}; extracted from σ-ϵ diagrams.

TFE

Elongation



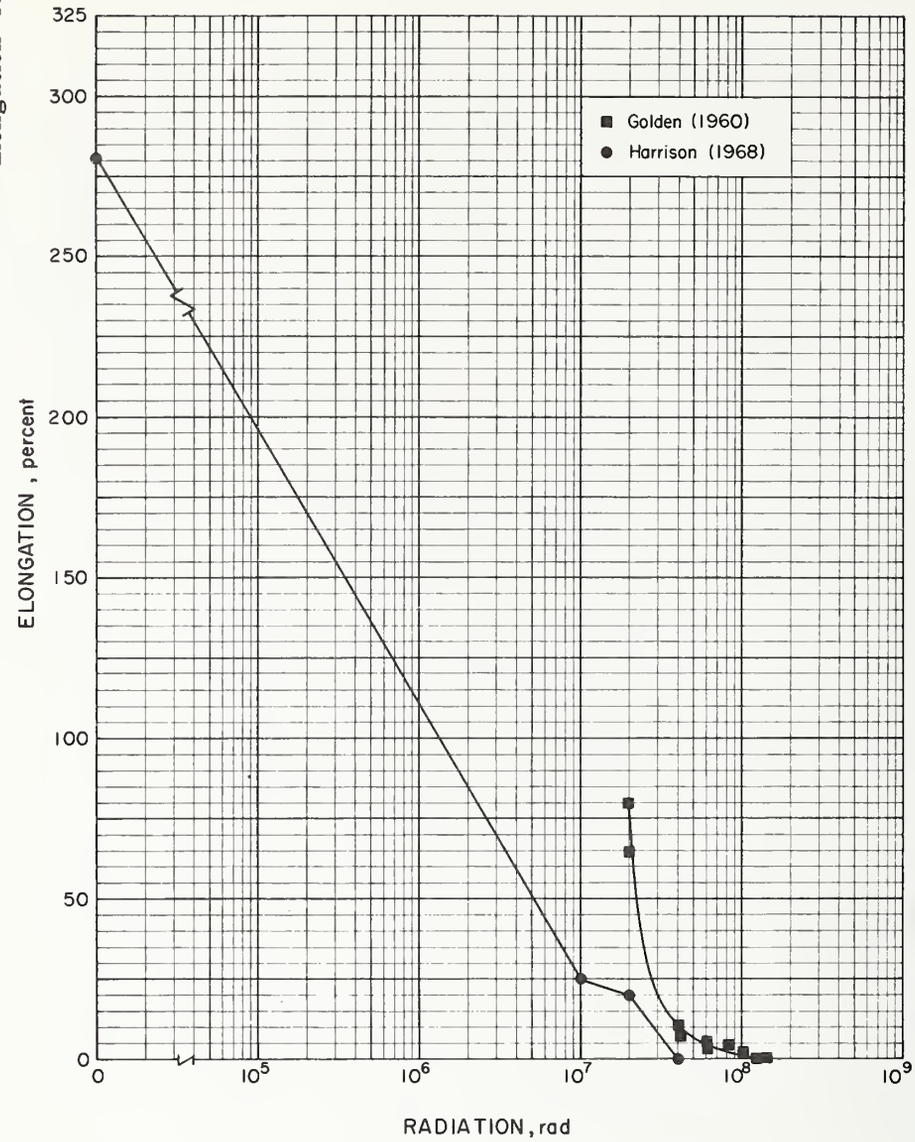
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Teflon 7	For t = 0.051 cm specimens: Red Sec ℓ = 15.2 cm, w = 2.54 cm; Instron, ASTM D 882-61T testing procedure; for t = 0.102 cm specimens Die A used with ASTM D 412-62T testing procedure on an Instron; all tests conducted in air with xhd spd = 0.85 cm s^{-1}; irrad in air and vacuum at 297K by Ground Test Reactor at Nuclear Aerospace Research Facility, General Dynamics, Fort Worth; error bars indicate standard deviation of 4 or 5 tests.
Kerlin (1963)	Teflon	w = 2.54 cm, ℓ = 15.24 cm; ASTM D-882 test procedure, Instron Model TT; irrad in vacuum at 300 K by Ground Test Reactor at Nuclear Aerospace Research Facility, General Dynamics, Fort Worth; error bars indicate standard deviation of 2 to 4 tests.



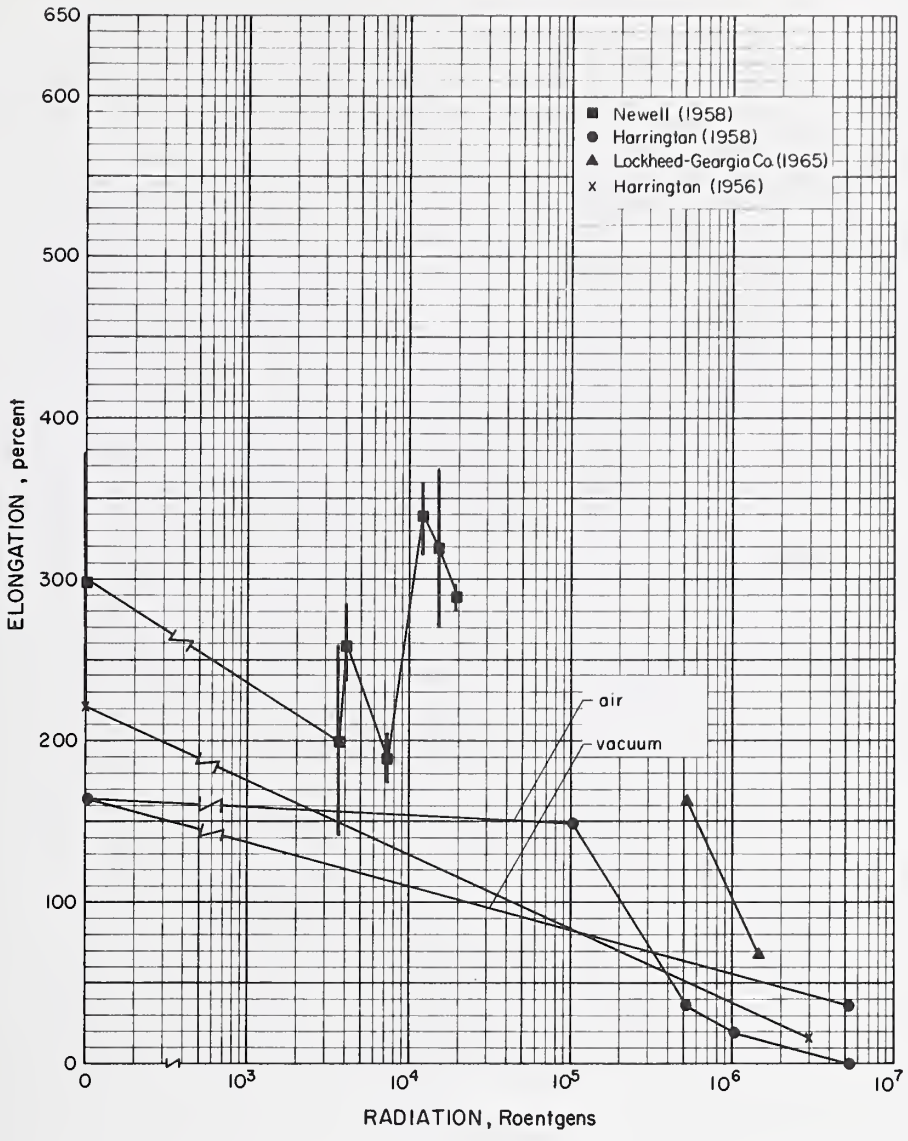
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Goodman (1962)	Teflon TFE T-30	ASTM 882-56T, Method A test procedure, tested in air at 297 K; irrad in air and vacuum by spent reactor fuel elements.

TFE

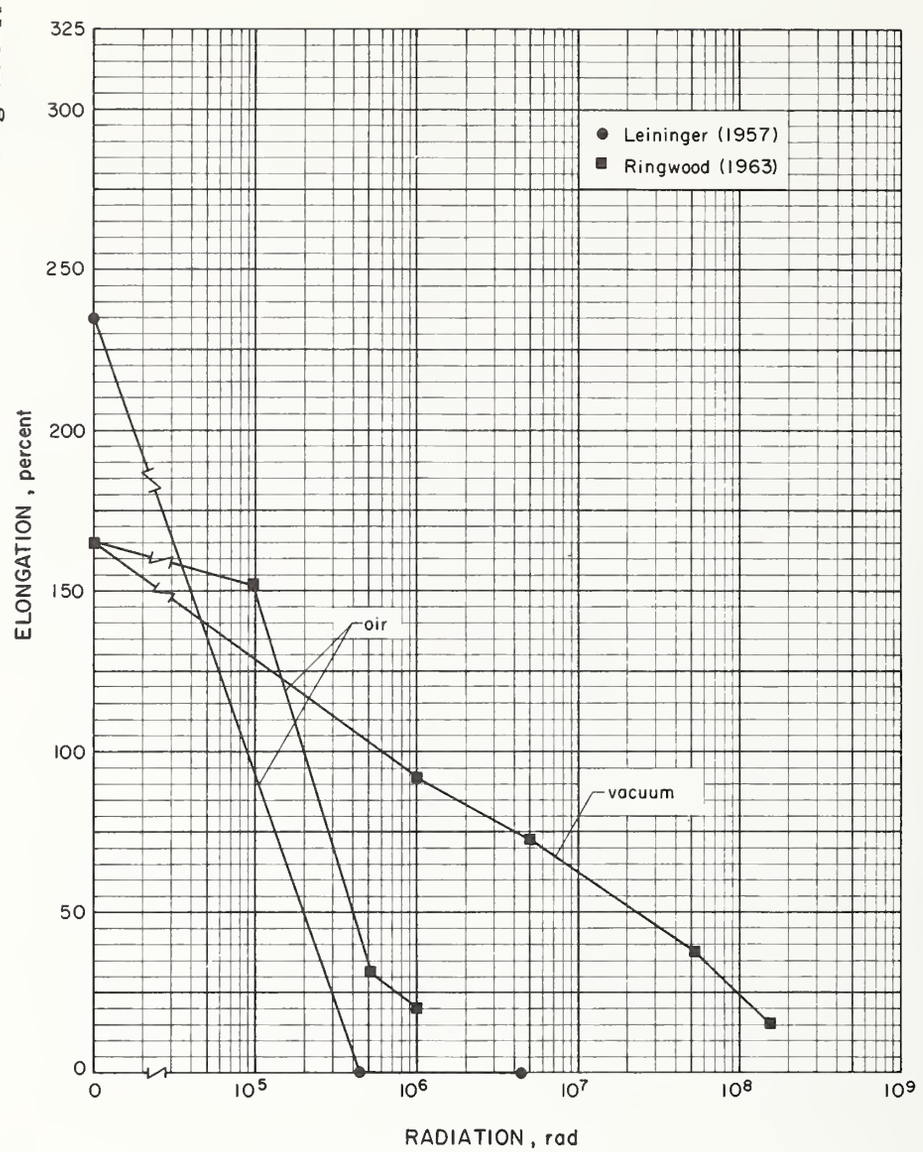
Elongation



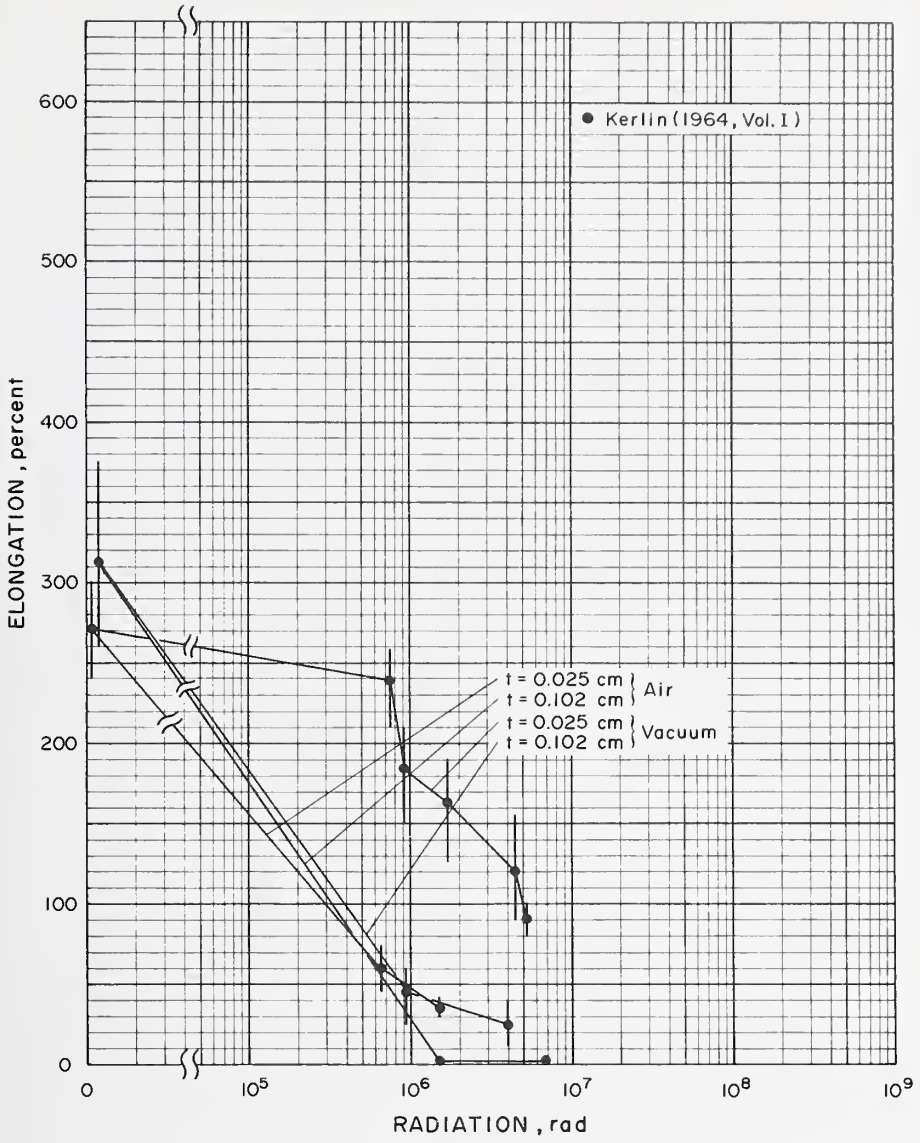
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Golden, Hazell (1960)		w = 1.27 cm, t = 0.0132 cm; xhd spd = 0.042 cm s^{-1}, 294 K; irrad in vacuum by 4 Mev electron beam.
Harrison (1968)	Held at 373 K and 10^{-8} Torr for 24h, then sealed in separate thin-walled glass tubes.	Small dumb-bell shaped samples; xhd spd = 0.021 $cm^{-}s^{-1}$, 308 K; irrad by 4 Mev electron electron beam, stored at 308 K for 24 h before test.



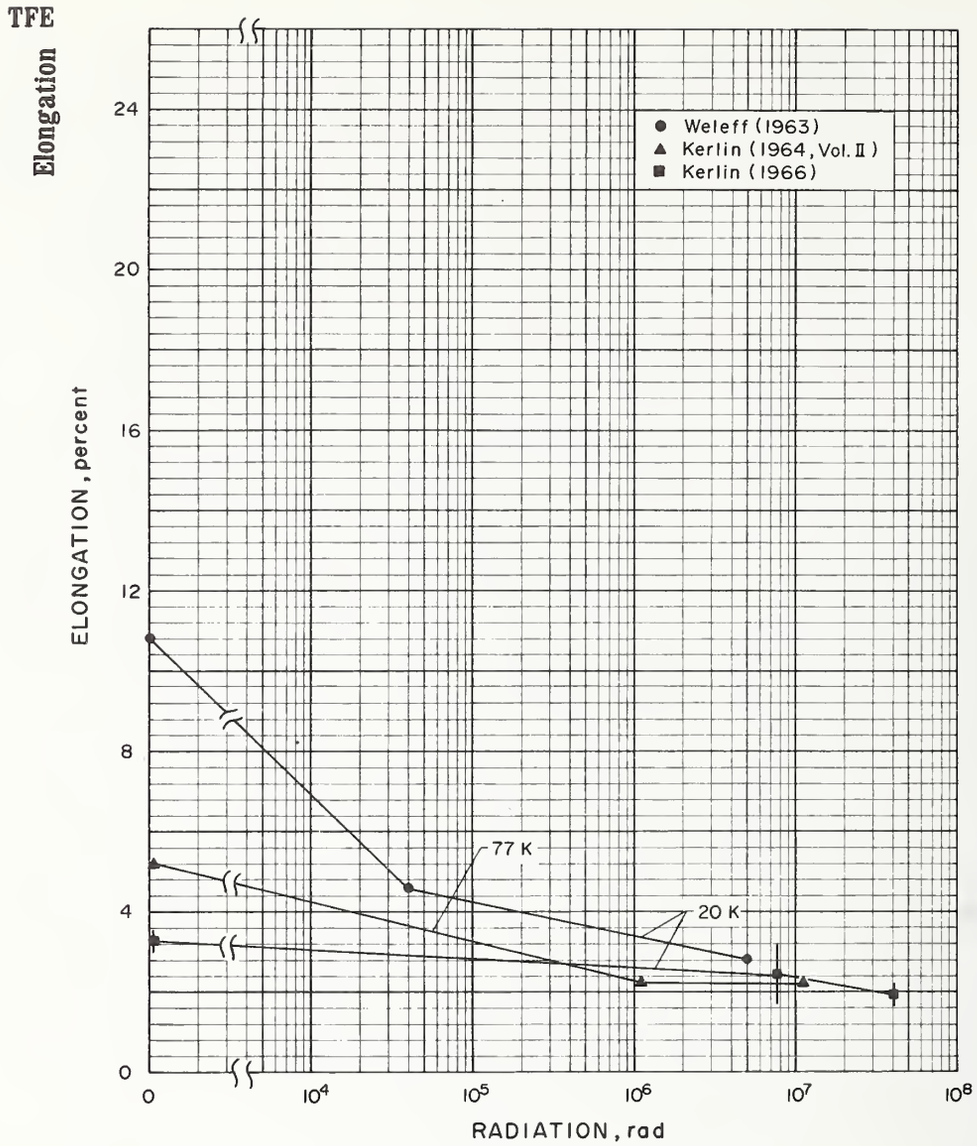
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Newell (1958)	Teflon, 0.32 cm sheet stock	ASTM D-638-42T test procedure; irrad by 1-10 bursts from Godiva assembly at Los Alamos; error bars indicate 95% confidence limits.
Harrington, Giberson (1958)	Teflon 1, sp gr = 2.160	Scott tensile tester, ASTM D 412-51T test procedure using Die C type dumbbell specimens, 298K, 50% rel hum; 95% confidence limits are about ± 10%; irrad by 1.24 Mev gammas from Co^{60}, 3×10^4 Curies at 1.3×10^6 Roentgen h^{-1}, irrad at 298K in air and vacuum.
Lockheed-Georgia Co. (1965)	Teflon	ASTM D 638-61T test procedure, xhd spd = 0.0106 cm s^{-1}, irrad in vacuum.
Harrington (1956)	Teflon	Die C type dumbbell test specimens; ASTM D 412-51T test procedure, Scott tensile tester; irrad in air at 288 K by spent fuel elements from the Hanford reactors, 6×10^4 Roentgen h^{-1}.



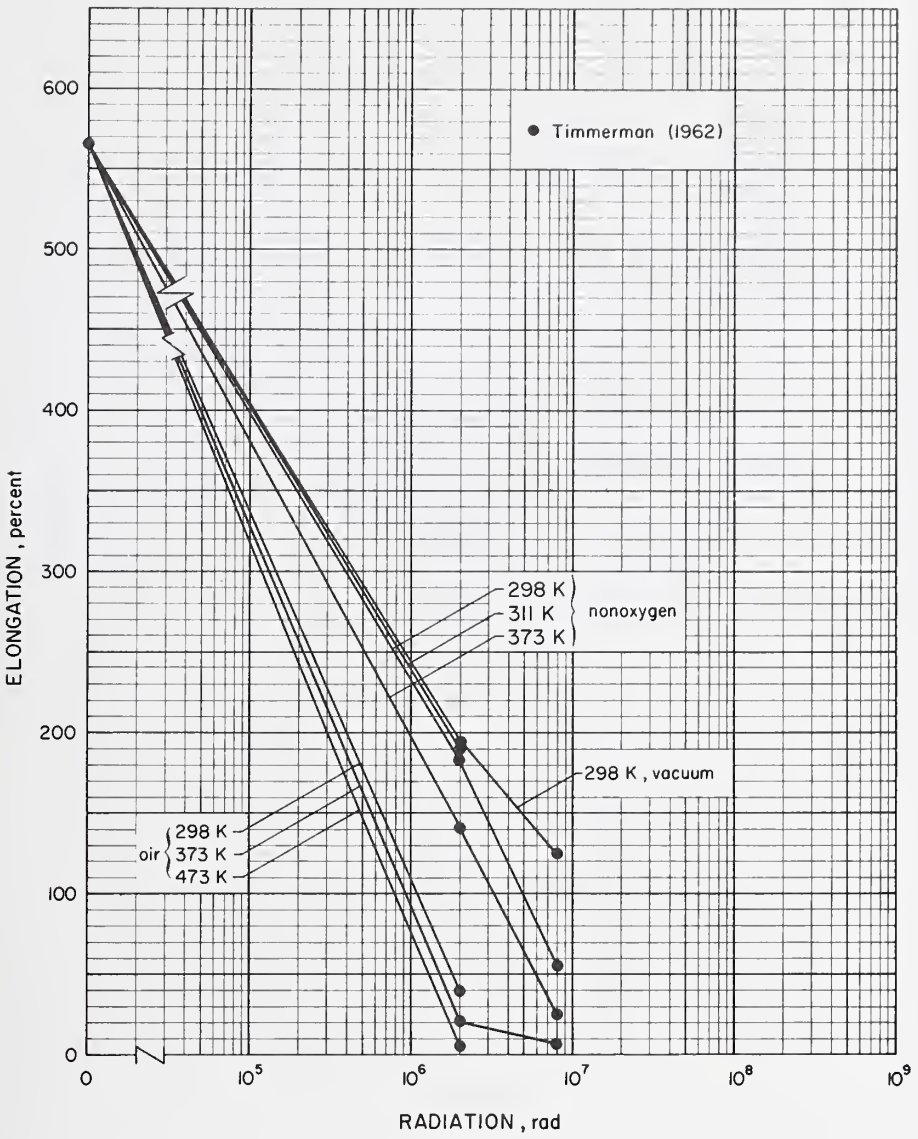
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Lerninger (1957)	Teflon	Irrad in air by Co^{60}.
Ringwood (1963)	Teflon	Irrad in vacuum and air.



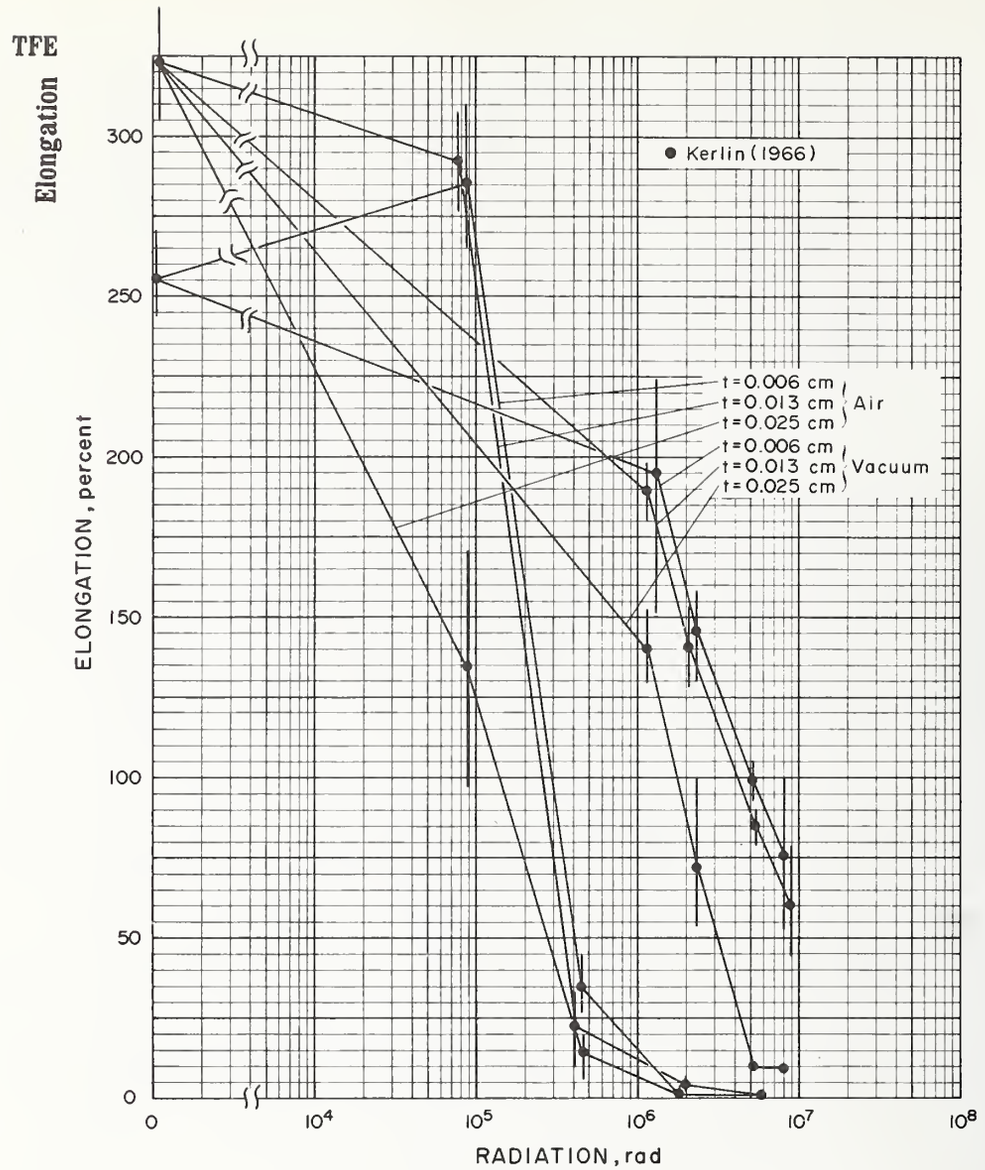
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin Smith, (1964, Vol. I)	Teflon 7	t = 0.025 cm specimens: Red Sec ℓ = 15.2 cm, w = 2.54 cm, Instron, ASTM D 882-56T testing procedure; for t = 0.102 cm specimens Die A used with D 412-51T testing procedure on an Instron; all tests conducted in air with xhd spd = 0.85 cm s^{-1}; irrad in air and vacuum at 297 K by Ground Test Reactor at Nuclear Aerospace Research Facility, General Dynamics, Fort Worth; error bars indicate standard deviations.



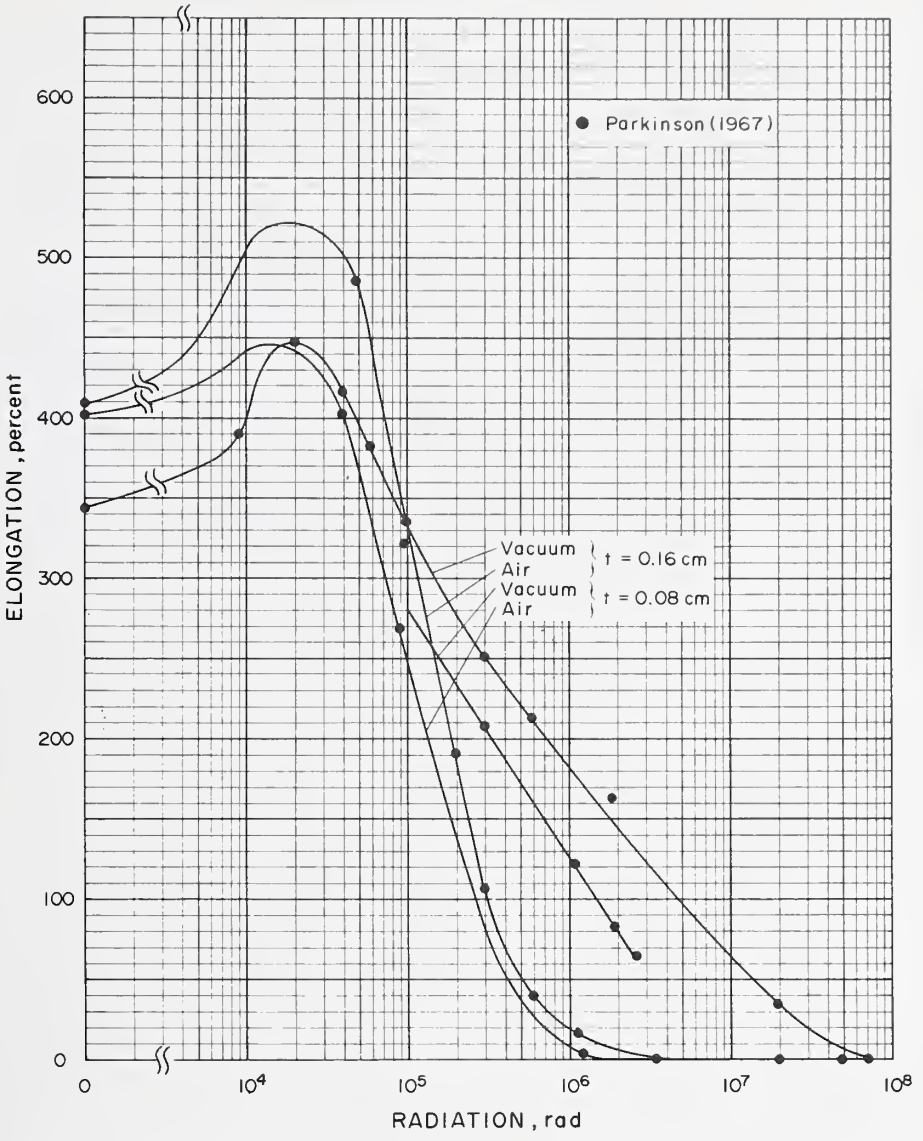
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Weleff (1963)	Teflon	Red Sec ℓ = 5.08 cm, w = 1.27 cm, t = 0.32 cm; Instron, xhd spd = 0.0021 cm s^{-1}, tested in liquid hydrogen at 20 K; reactor irrad while in liquid hydrogen; av value of 3-5 tests.
Kerlin, Smith(1964 Vol. II)	Teflon 7	Red Sec ℓ = 5.72, w = 1.27 cm, t = 0.317 cm; Instron, ASTM D 638-61T testing procedure, xhd spd = 0.021 cm s^{-1}, tested in liquid nitrogen at 77 K; irrad in liquid nitrogen by Ground Test Reactor at Nuclear Aerospace Research Facility, General Dynamics, Fort Worth.
Kerlin, Smith (1966)	Teflon 7	Red Sec ℓ = 15.2 cm, w = 2.54 cm; Instron, ASTM D 882-61T testing procedure, xhd spd = 0.85 cm s^{-1}, tested in liquid hydrogen at 20 K; irrad in liquid hydrogen by Ground Test Reactor at Nuclear Aerospace Research Facility, General Dynamics, Fort Worth; error bars indicate standard deviation of 3 or 4 tests.



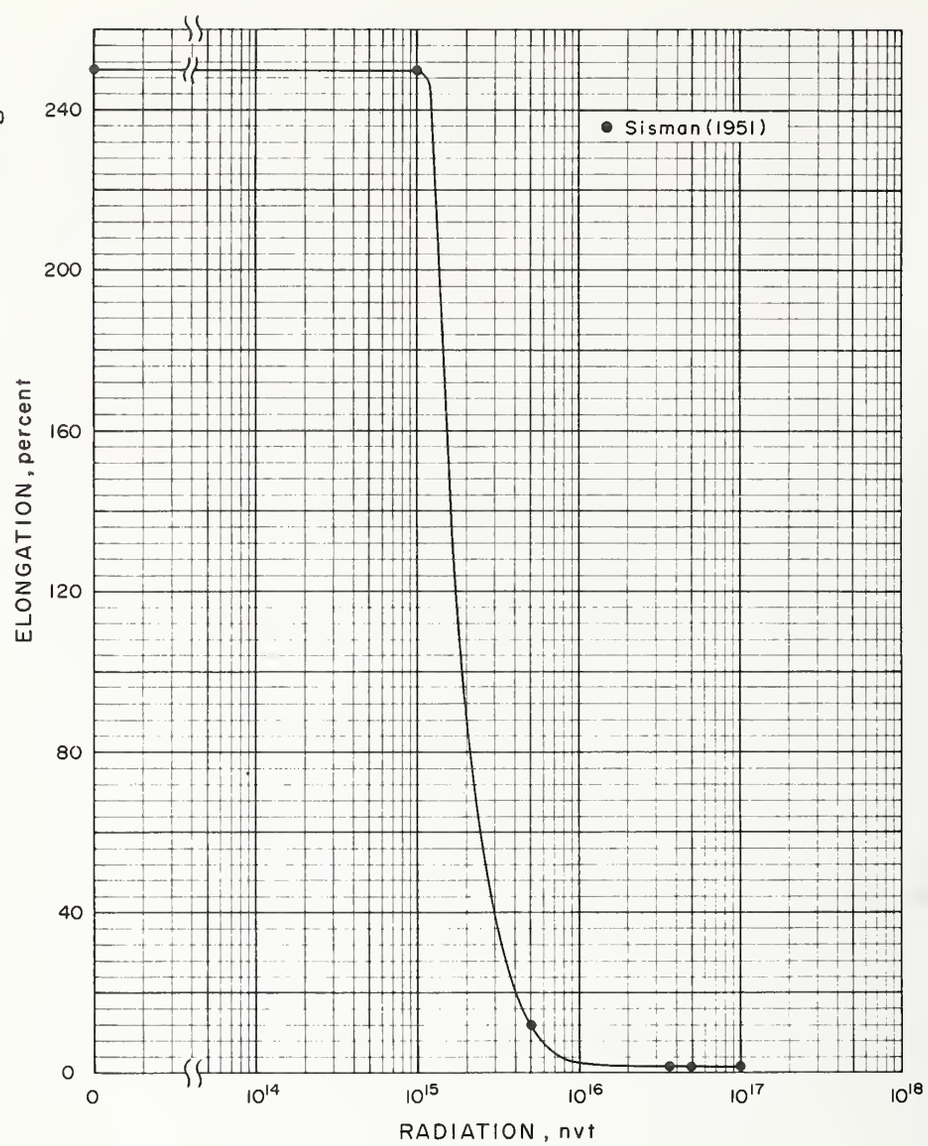
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Timmerman, Greyson (1962)	Teflon	t = 0.025 cm; tested at 298 K at least 24 h after being irrad at various temps and in various atmospheres; irrad by Radiation Dynamics, Inc. Model EA-1.0 Dynamitron Electron Accelerator.



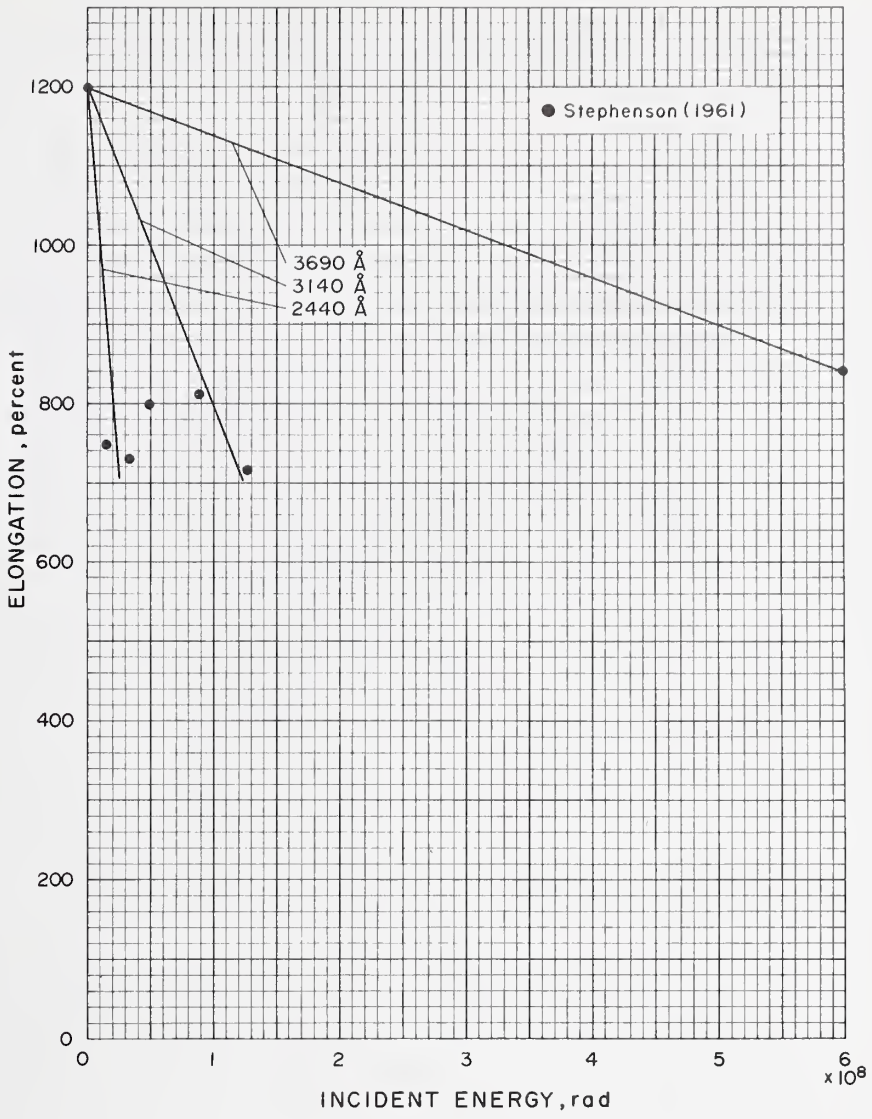
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Teflon 7	Red Sec ℓ = 15.2 cm, w = 2.54 cm; Instron, ASTM D 882-61T testing procedure, xhd spd = 0.85 cm s^{-1}, tested in air; irrad in air and vacuum at 297K by Ground Test Reactor at Nuclear Aerospace Research Facility, General Dynamics Fort Worth; error bars indicate standard deviation of 4 or 5 tests.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Parkinson, Kirkland (1967)	Teflon sheet, t = 0.08 and 0.16 cm	CL = 1.27 cm, w = 0.64 cm; 298 K; irrad by Co^{60} in air and vacuum.



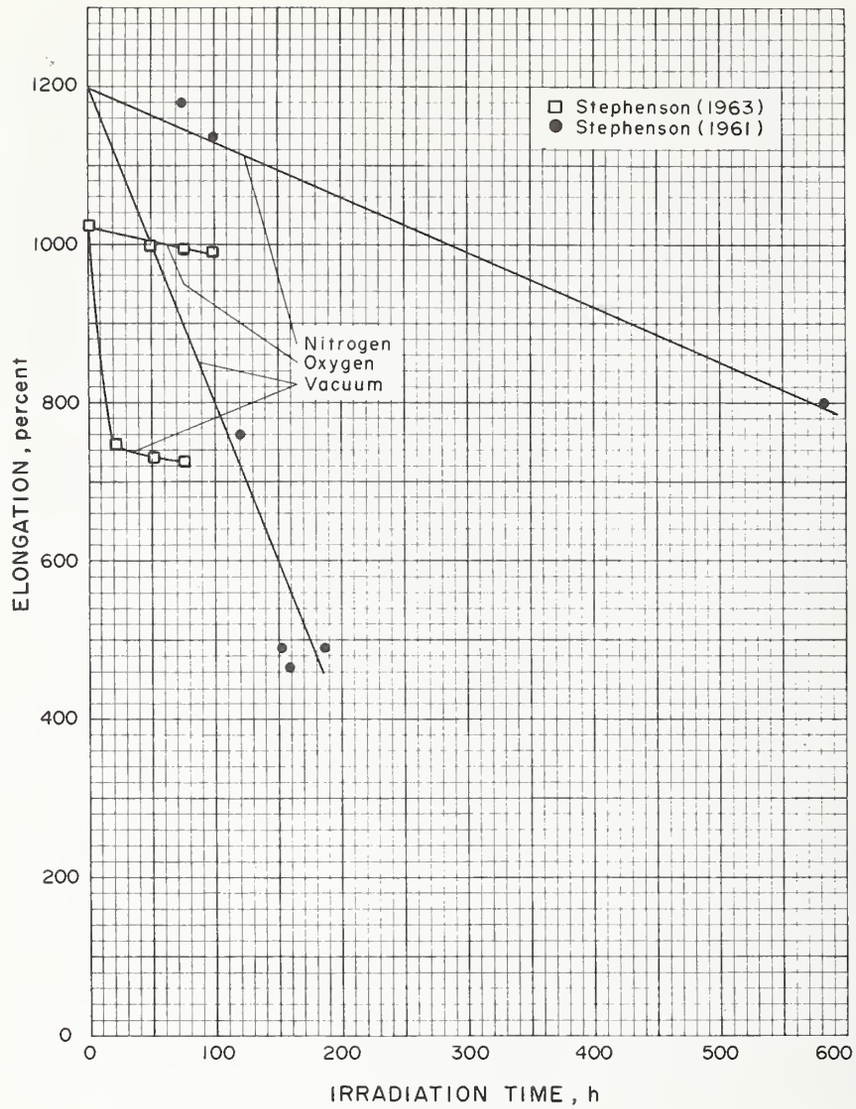
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Sisman, Bopp (1951)	Teflon	Red Sec ℓ = 5.72 cm, w = 1.27 cm; modified ASTM D 638-49T test procedure, Baldwin Southwark testing machine, xhd spd = 0.0021 cm s^{-1} to a strain of 0.02 and then xhd spd = 0.0085 cm s^{-1}; irrad in Hole 19 of ORNL reactor at 298-313 K and in air, aged 7 days at 298 ± 1K and 50 ± 2% rel hum before testing.



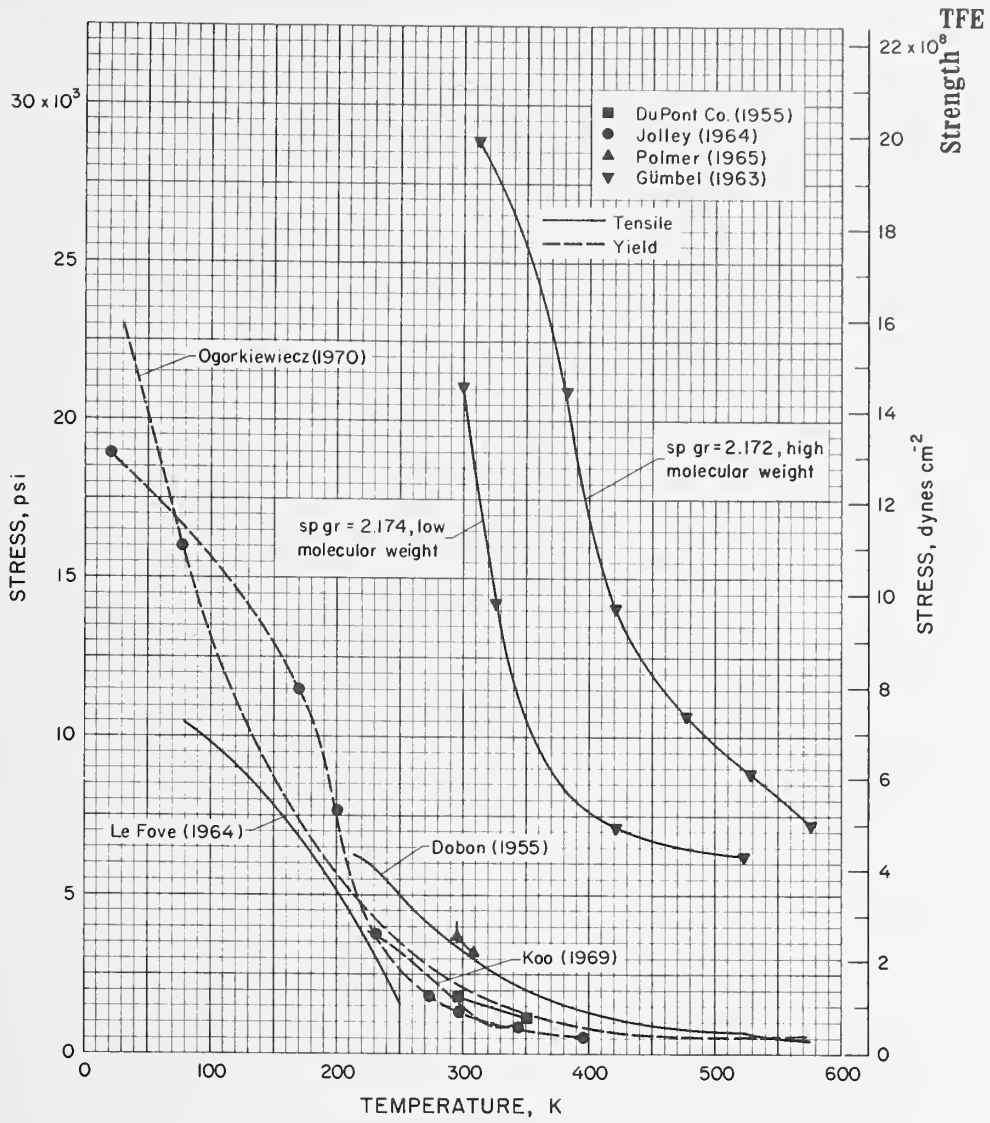
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Stephensen, Moses, Wilcox (1961)	Teflon	t = 0.0025 cm, ASTM D 882-49T test procedure, Instron; ultraviolet radiation source: General Electric G 30 T8 lamp emitting 90% of radiation at 2537 Å; General Electric A-H6 vapor lamp, high P, 1000 watts, broad spectrum of radiation with intensity peaks at 2440, 3140, and 3690 Å, monochromator (Bausch and Lomb) slits (132 Å wide) used to select radiation, irrad in nitrogen.

TFE

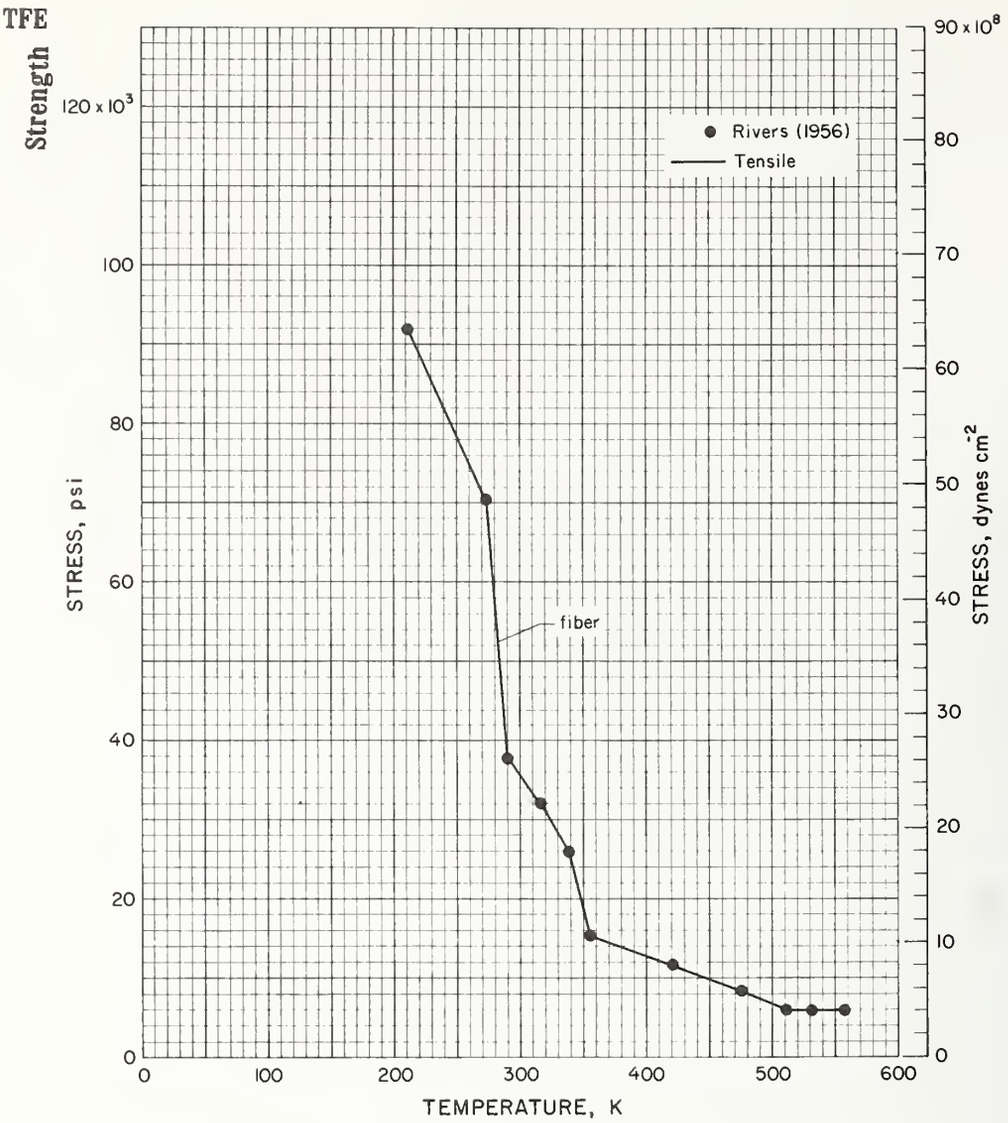
Elongation



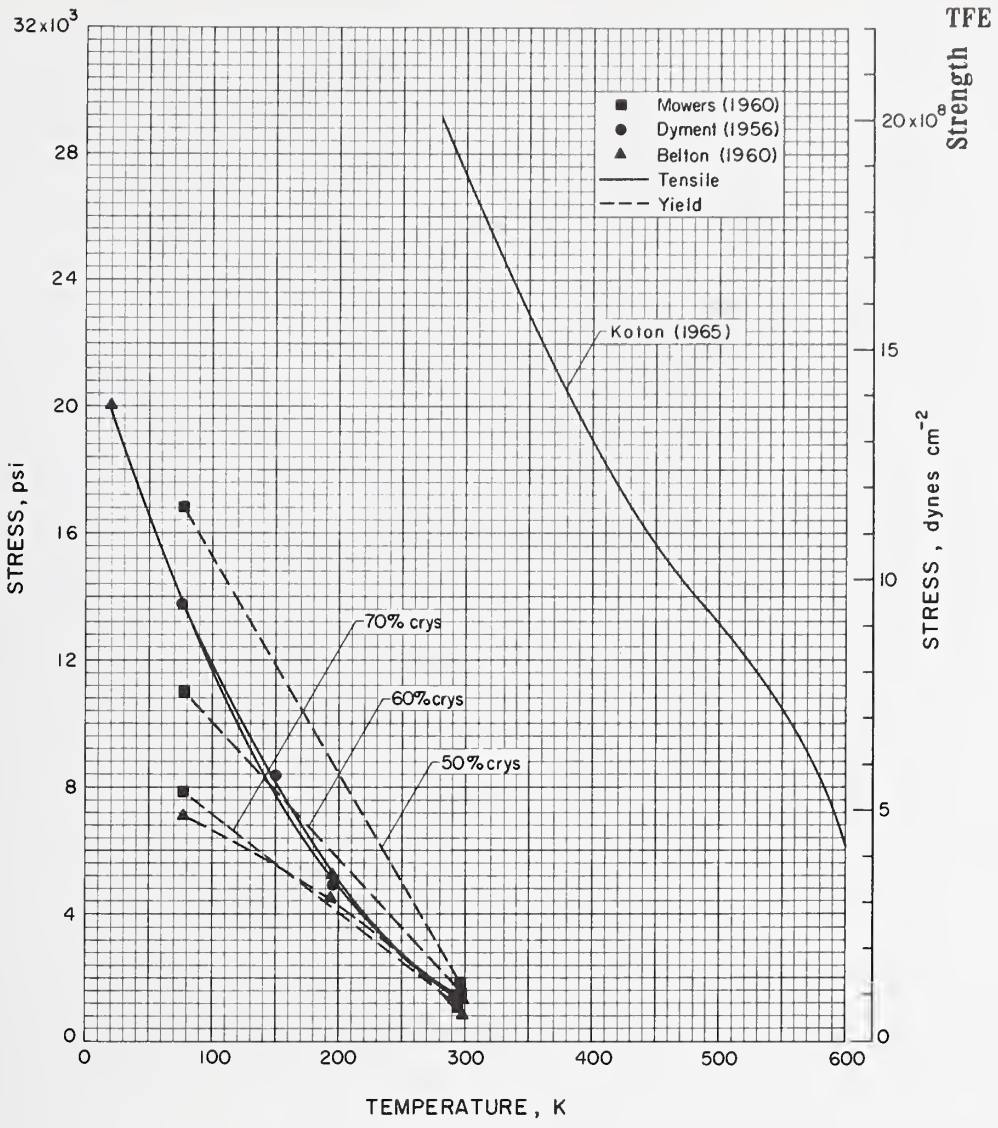
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Stephenson, Moses, Wilcox (1961)	Teflon	t = 0.0025 cm; ASTM D 882-49T test procedures, Instron; ultraviolet radiation source: General Electric G30T8 lamp emitting about 90% of radiation at 2537 Å, samples placed in quartz tubes and evacuated or flushed with nitrogen.
Stephenson, Wilcox (1963)	Teflon, film	ASTM D 882-49T test procedures, Instron; ultraviolet radiation source: General Electric G 30T8 lamp emitting 90% of radiation at 2537 Å, irrad in vacuum or oxygen.



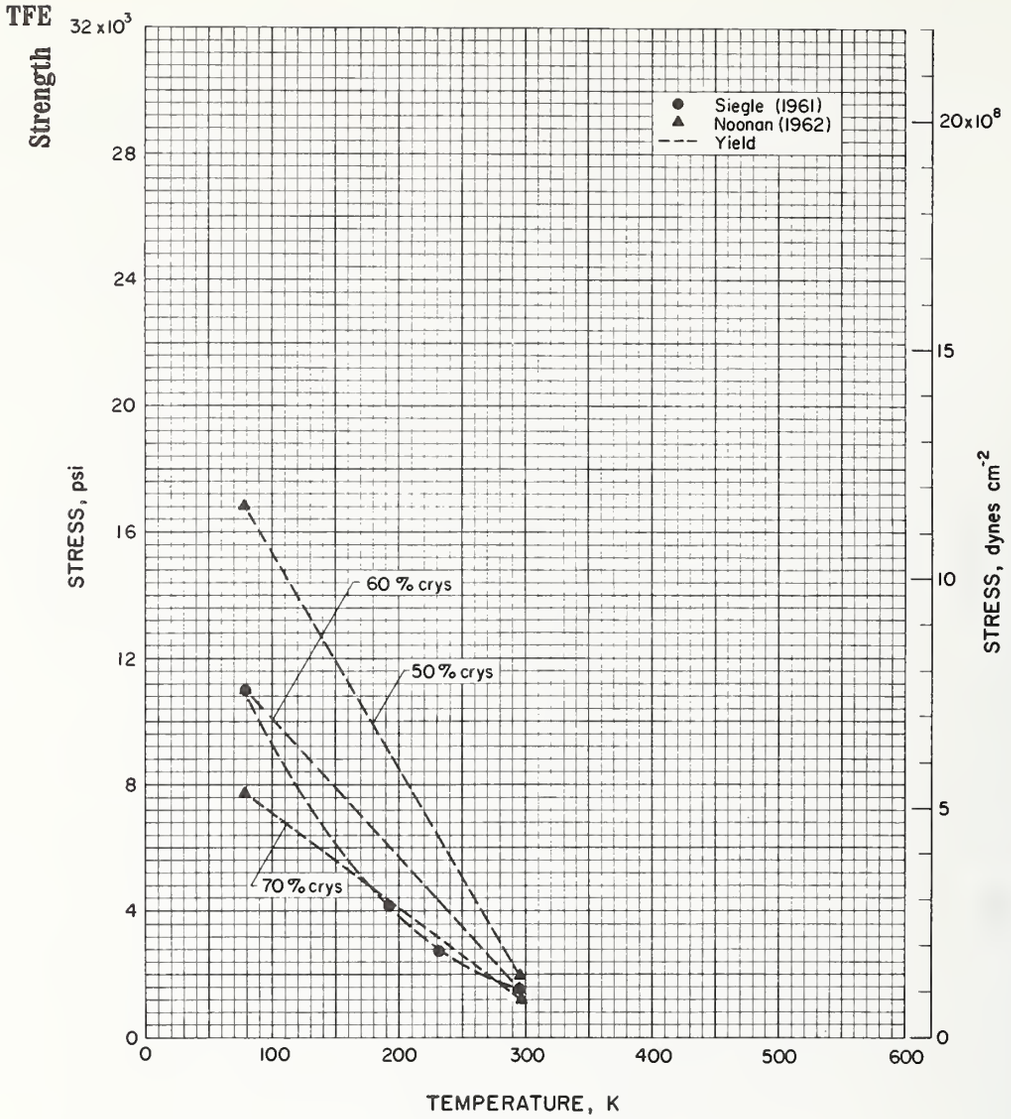
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Jolley, Homsy, Reed (1964)	Teflon	ASTM D 638 test procedure.
Koo, Andrews (1969)	Halon G-80, preformed at 297 K and 4000 psi; some annealed at 653 K for 2 h and air quenched, sp gr =2.136±0.001, 49% crys; some annealed at 653 K for 2 h then cooled at 60 K min^{-1} to 297 K, sp gr = 2.169±0.001, 60% crys	Microtensile specimens per ASTM D 1708-66, GL = 2.3 cm; Instron, temp uniform to ± 0.5 K xhd spd = 0.085 and 0.85 cm s^{-1}; graph is av of data presented for both degrees of crys and for $\dot{\epsilon}$ = 0.0037 s^{-1} and 0.037 s^{-1}, data spread from this curve is <± 300 psi.
Ogorkiewicz (1970)	Fluon G4	$\dot{\epsilon}$ = 0.083 s^{-1}.
Palmer (1965)	Sheet made from granular polymer by skiving from a molded block, warmed to 313 K for punching specimens	t = 0.25 cm, B.S. 903 specifications, type E die with w = 0.41 cm pulled at xhd spd of 0.42 cm s^{-1}, type D die with w = 0.63 cm pulled at xhd spd of 0.84 cm s^{-1}; tested at 296 ± 2K and 308 ± 1 K; the 2 specimen sizes yield almost identical results and the data points are an av, error bars indicate standard deviation in 12 specimens of each type.
DuPont Co. (1955)	Teflon	ASTM D 638-49T test procedure.
Doban, Sperati, Sandt (1955)	Teflon, sp gr = 2.1-2.3	ASTM D 638-52T test procedure.
Le Fave, Gamero, Moore (1964)	Teflon	
Gümbel (1963)	Powdered Heydeflon and Ftoroplast-4 sintered at 653 K for 0.5 h, cooled at 1.6 k min^{-1}; low molecular weight, sp gr = 2.174; high molecular weight, sp gr = 2.172	ℓ = 7.5 cm, t = 0.16 cm, GL = 2.2 cm, samples per ASTM D 1457-56T; xhd spd = 0.083 cm s^{-1}.



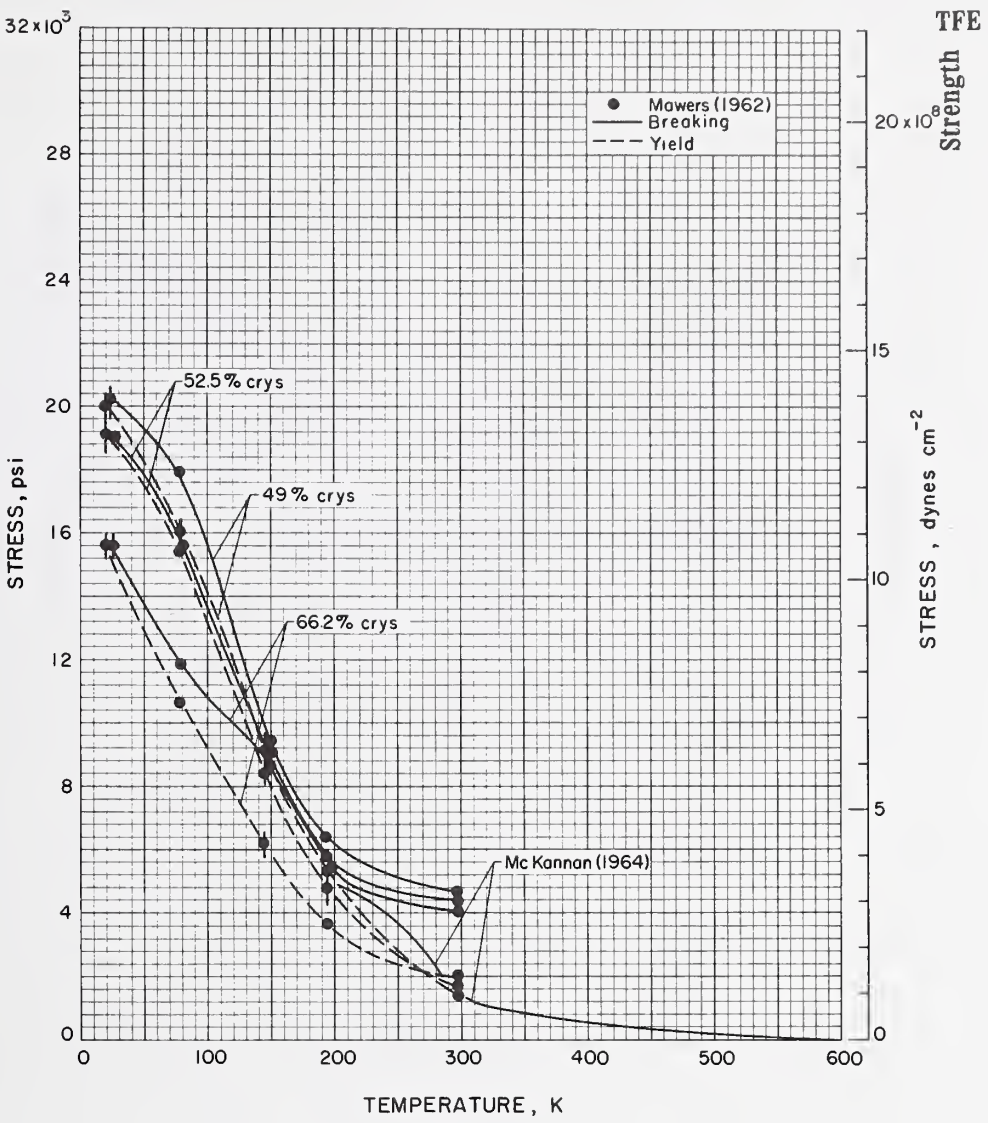
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Rivers, Franklin (1956)	Teflon oriented fiber, sp gr = 2.2	Tests at room temp and below conducted in hexane, all others conducted in air.



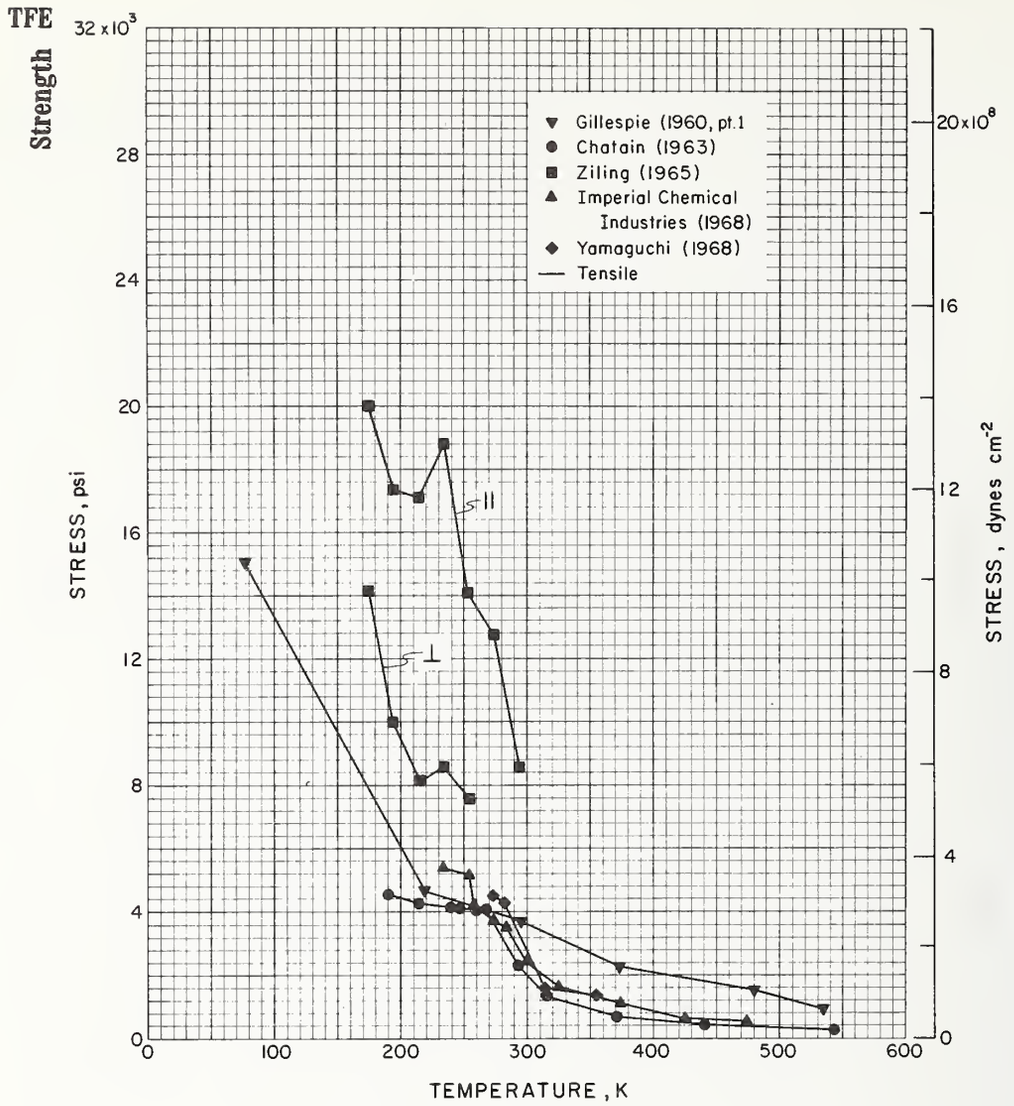
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Dyment, Ziebland (1956)	Fluon in form of 0.730 cm diam rod	Red Sec ℓ = 1.14 cm, diam = 0.32 cm; K-type Hounsfield tensometer, xhd spd = 0.003 cm s^{-1}.
Belton, Godby, Taft (1960)	Teflon	ℓ = 2.72, diam = 0.64 cm; used Tinius-Olsen tester at 20 K and Young Universal tester at all other temp, xhd spd = 0.0021 cm s^{-1} before initial yield and 0.0042 cm s^{-1} after yield, 0.2% yd off.
Mowers (1960)	Teflon, 50, 60, and 70% crys.	Instron.
Koton, Yakovlev, Rudakov, Knyazeva, Florinskii, Bessonov, Kuleva, Tolparova, Laius (1965)	Teflon	



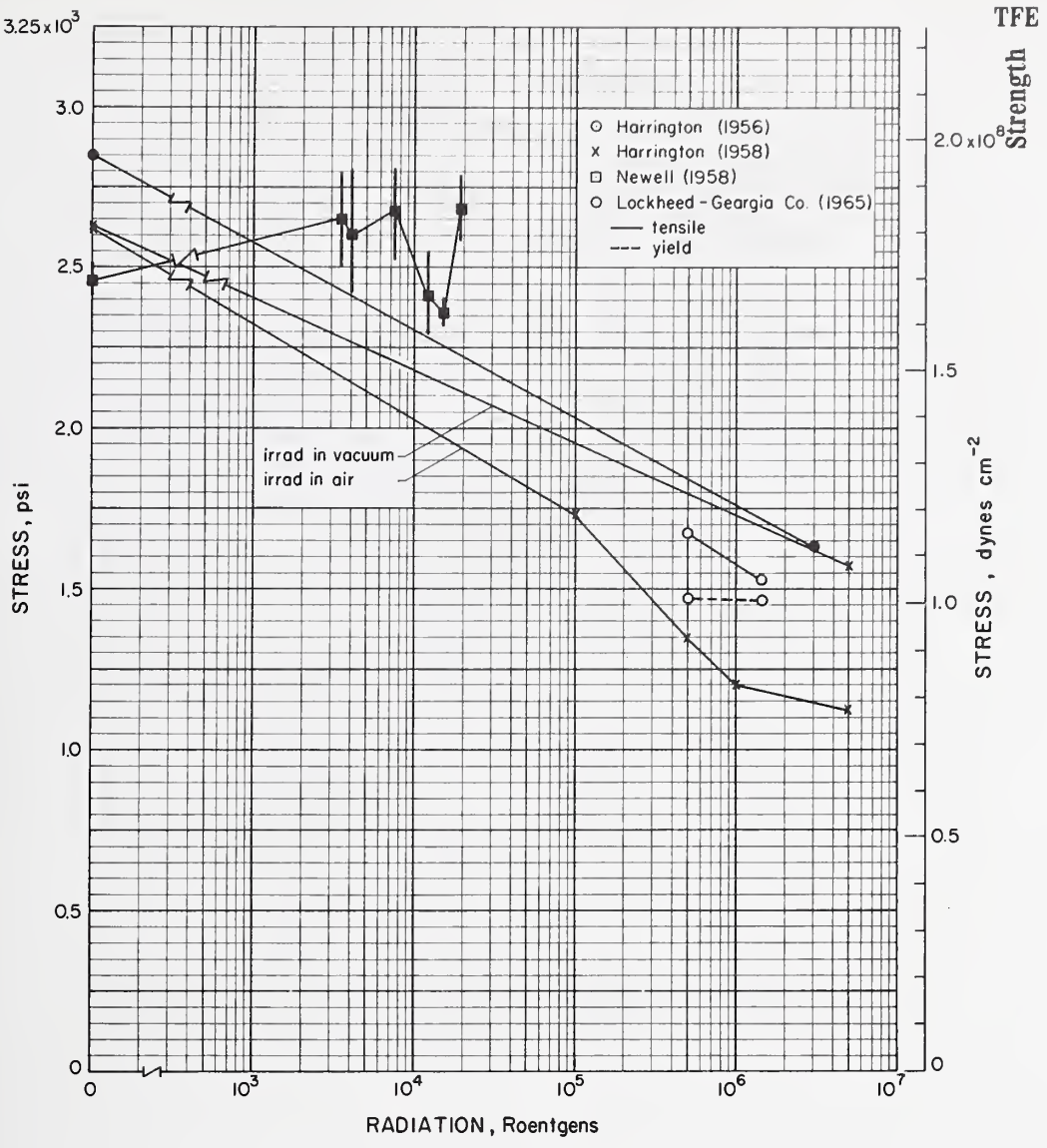
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Siegle (1961)	Teflon, 60% crys	ASTM D 638-52T test procedure.
Noonan (1962)	Teflon	



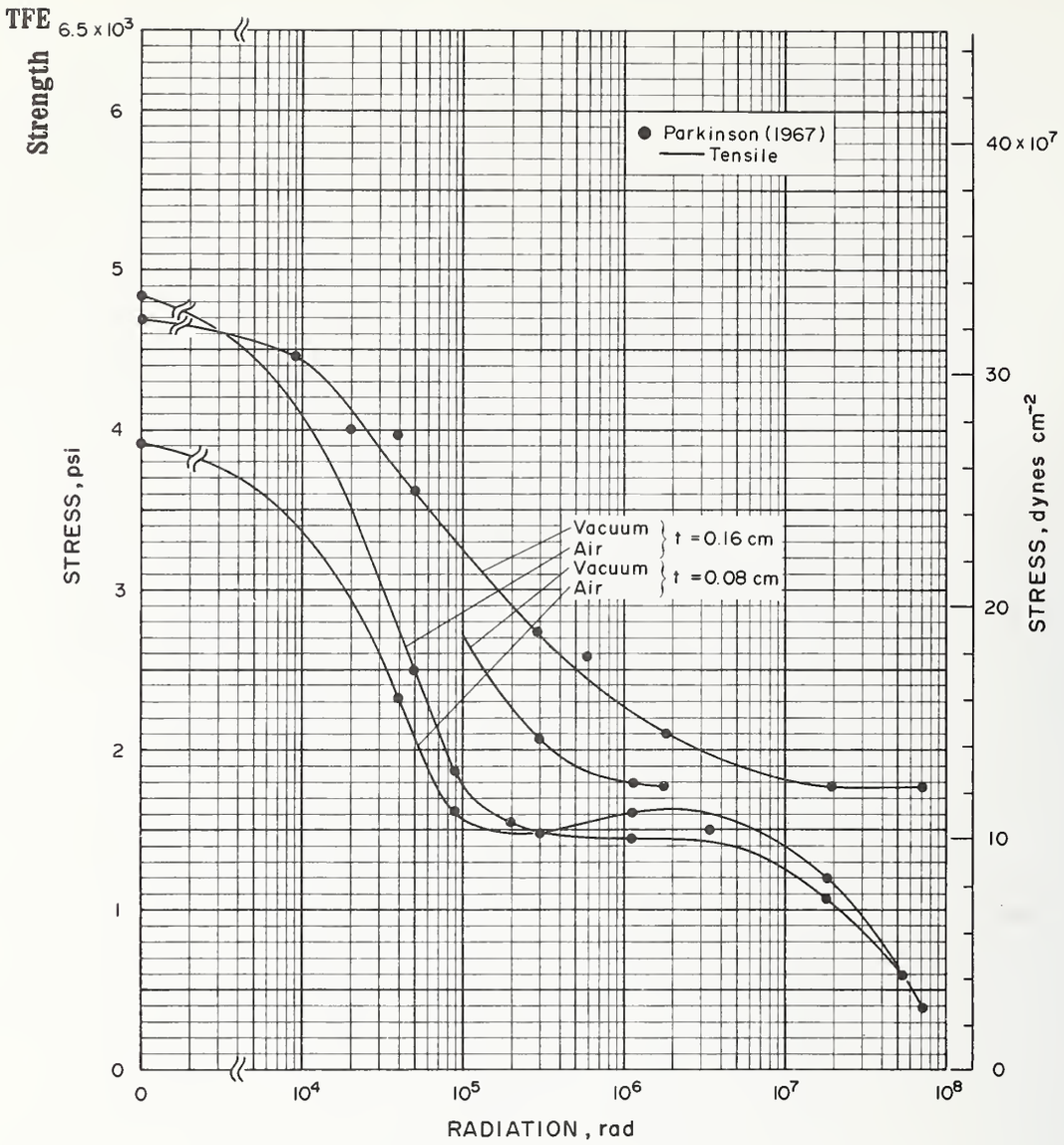
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 49-50% crys, sp gr = 2.148-2.152, molded at 655 K, 30 min, quick quenched; 52.5-56% crys, sp gr = 2.159-2.171, molded at 655 K, 30 min, quick quenched then held at 580 K for 5 h; 66.2-71% crys, sp gr = 2.199-2.226, molded at 655 K, 30 min, slow cooled then held at 599 K for 20 h.	3 dies used to give Red Sec of 2.54 x 0.635 cm, 2.54 x 0.318 cm, and 0.51 x 0.254 cm; Instron, xhd spd = 0.042 cm s^{-1} at 298 K and 0.0042 cm s^{-1} otherwise; yd off unknown, error bars indicate data spread.
McKannan, Gause (1964)	Teflon	Instron.



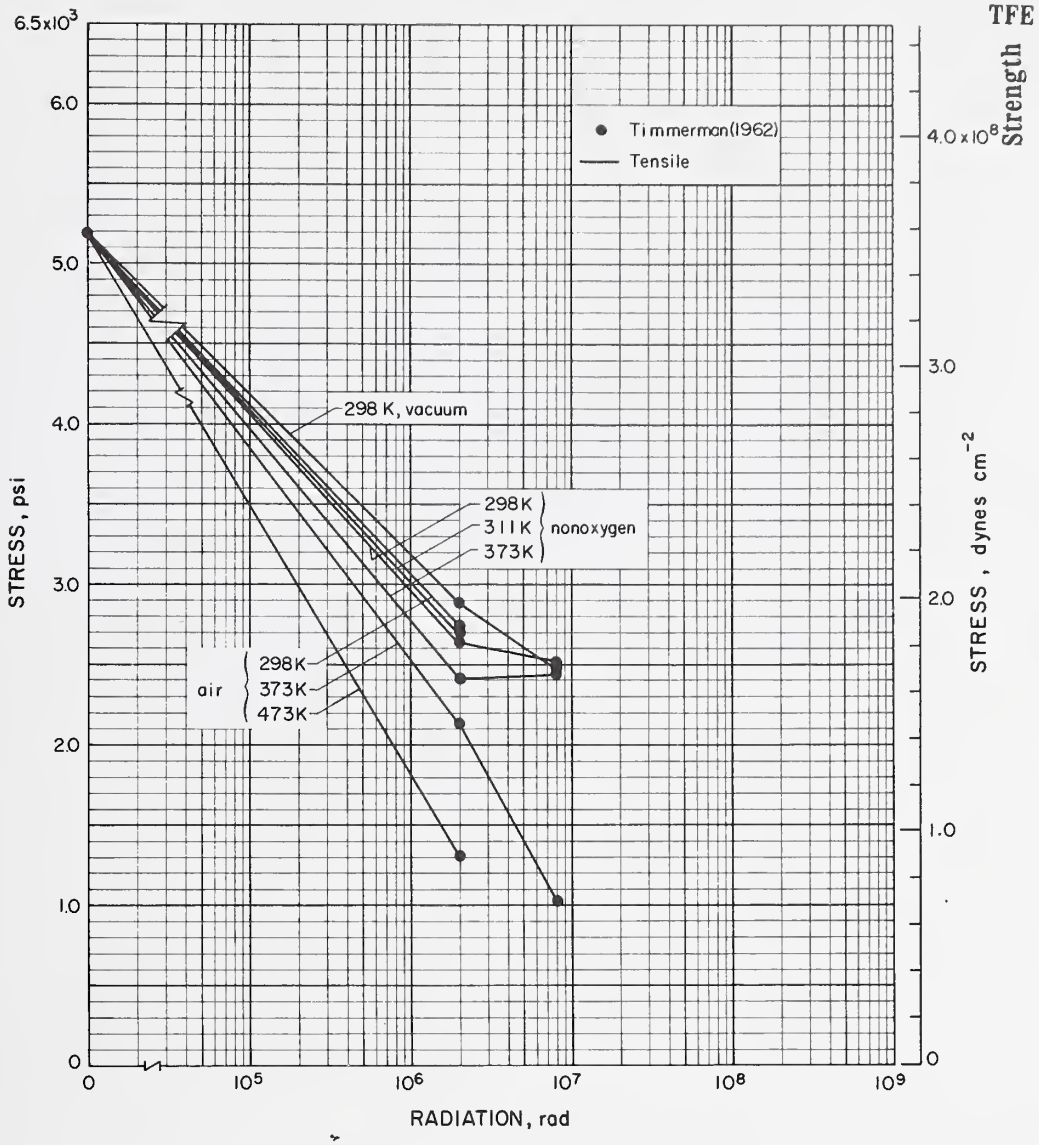
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 1, ram extruded, sp gr = 2.17, 60 ± 2 %, void content < 0.3%, preform pressure = 2500 psi	35.6 × 35.6 × 0.318 cm; ASTM D - 1456 - 56 T test procedure; extracted from $\sigma - \epsilon$ diagrams.
Chatain (1963)	Teflon	Extracted from $\sigma - \epsilon$ diagrams.
Ziling, Malinin (1965)	Fluoroplast-4, annealed, sp gr = 2.12	t = 0.01 cm, specimens cut ∥ and ⊥ to length of film sheet; extraxted from $\sigma - \epsilon$ diagrams.
Imperial Chemical Industries (1968)	Fluon	Extracted from $\sigma - \epsilon$ diagrams.
Yamaguchi (1968)		$\dot{\epsilon} = 0.83\ s^{-1}$; extracted from $\sigma - \epsilon$ diagrams.



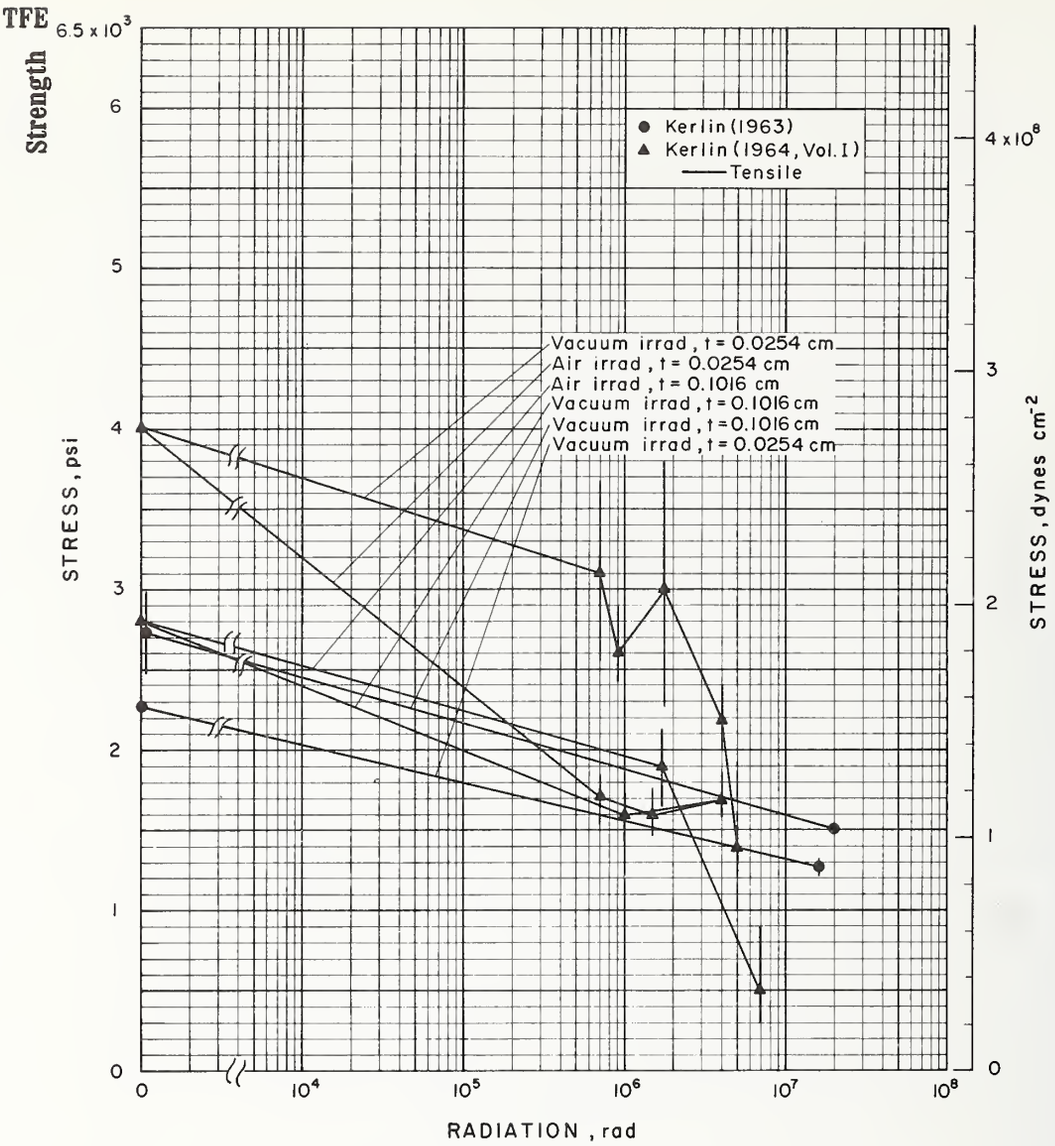
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Harrington (1956)	Teflon	Die C type dumbbell test specimens; ASTM D 412-51T test procedure, Scott tensile tester; irrad in air at 288 K by spent fuel elements from the Hanford reactors, 6×10^5 Roentgen h^{-1}.
Harrington, Giberson (1958)	Teflon 1, sp gr = 2.160	Die C type dumbbell specimens; ASTM D 412-51T test procedure, Scott tensile tester, 298 K, 50% rel hum; irrad by 1.24 Mev gammas from Co^{60}, 3×10^4 Curies, at 1.3×10^5 Roentgen h^{-1}, irrad at 298K in air and vacuum; 95% confidence limits are about ± 8%.
Newell (1958)	Teflon, 0.32 cm sheet stock	ASTM D 638-42 T test procedure; irrad by 1-10 bursts from Godiva assembly at Los Alamos; error bars indicate 95% conficerce limits.
Lockheed-Georgia Co. (1965)	Teflon	ASTM D 638-61T test procedure, xhd spd = 0.0106 cm s^{-1}; irrad in vacuum.



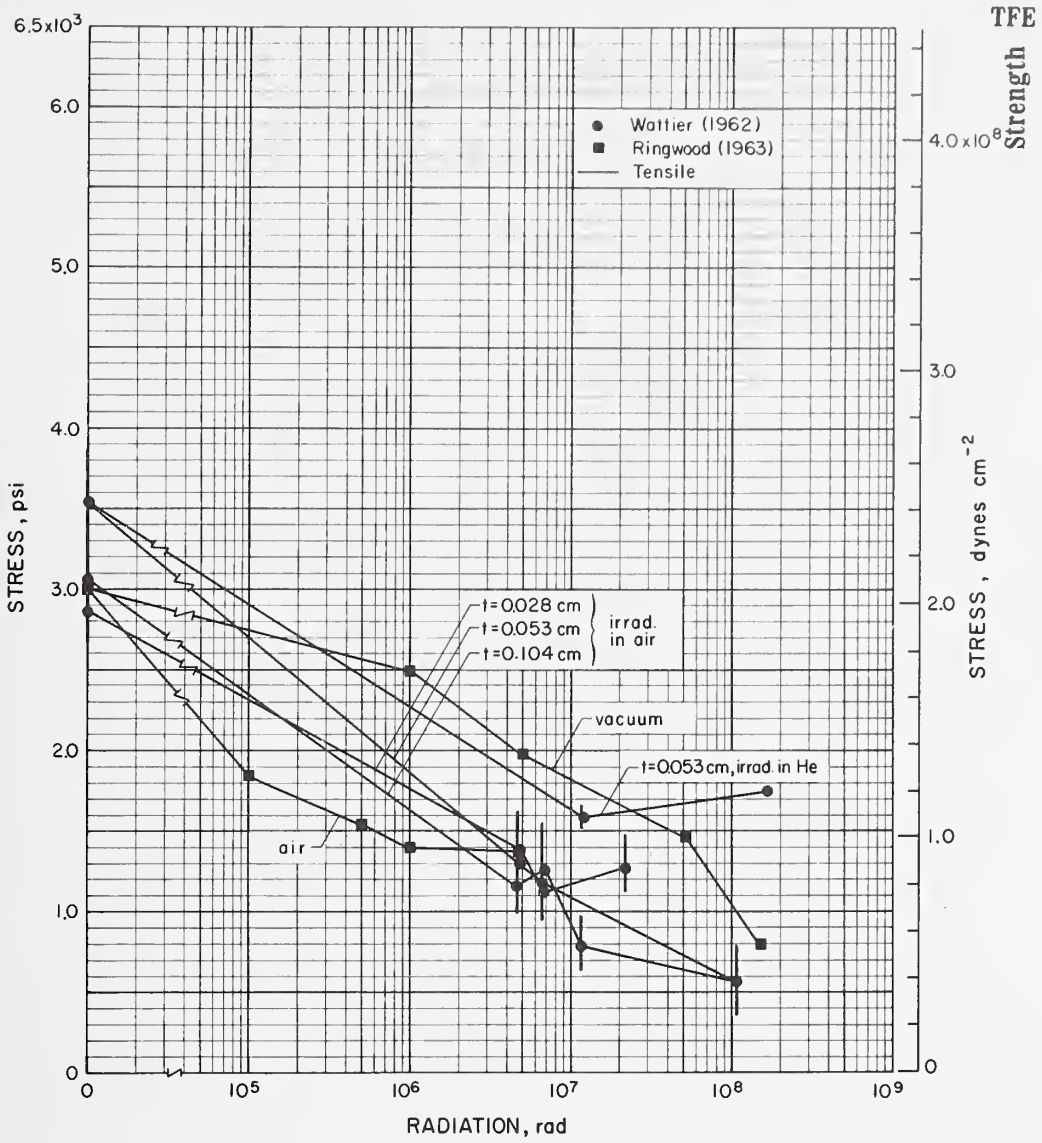
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Parkinson, Kirkland (1967)	Teflon sheet, t = 0.08 and 0.16 cm	GL = 1.27 cm, w 0.64 cm; 298 K; irrad by Co^{60} in air and vacuum.



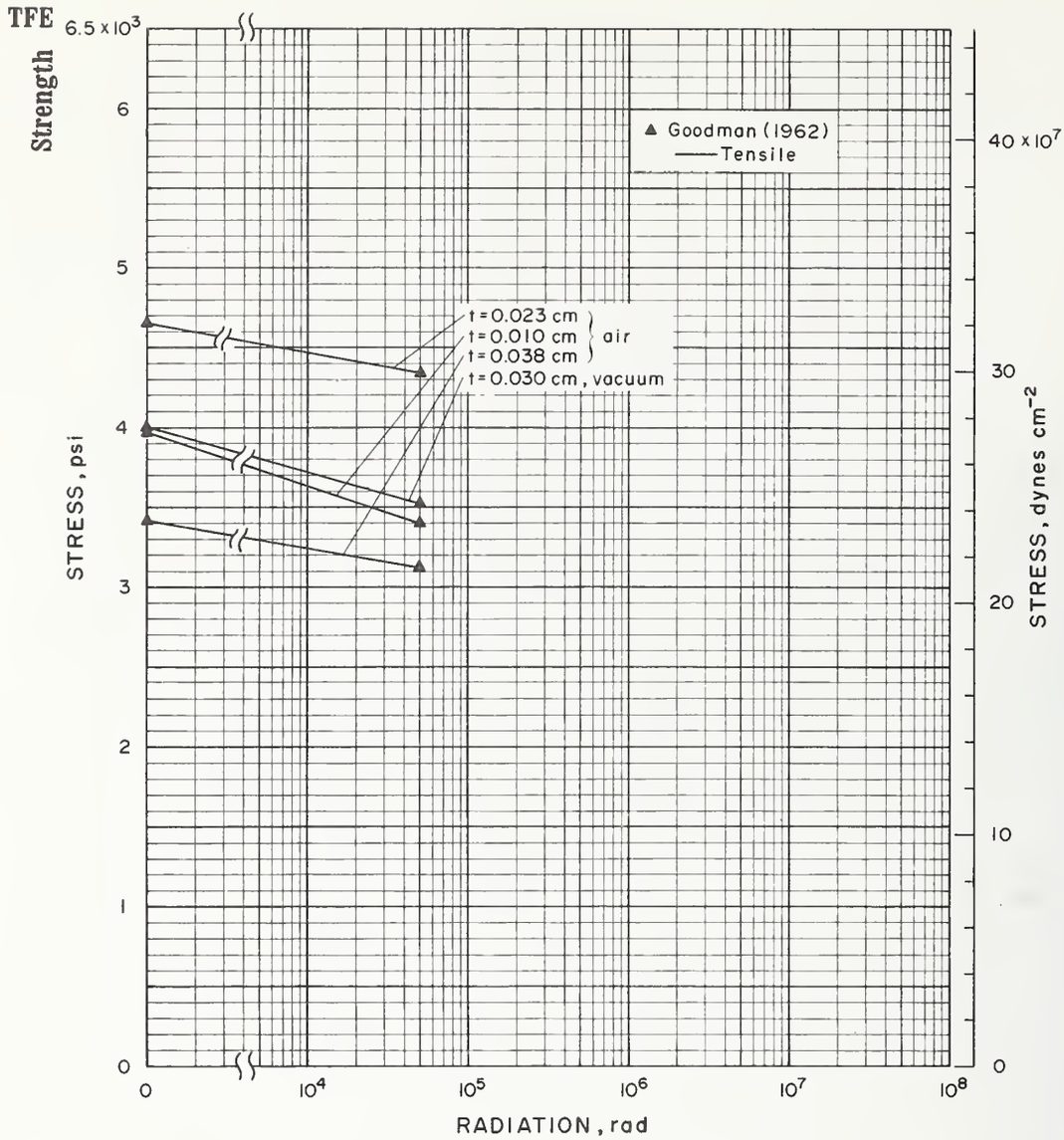
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Timmerman, Greyson (1962)	Teflon	t = 0.025 cm; tested at 298K at least 24 h after being irrad at various temps and in various atmospheres; irrad by Radiation Dynamics, Inc. Model EA-1.0 Dynamitron Electron Accelerator.



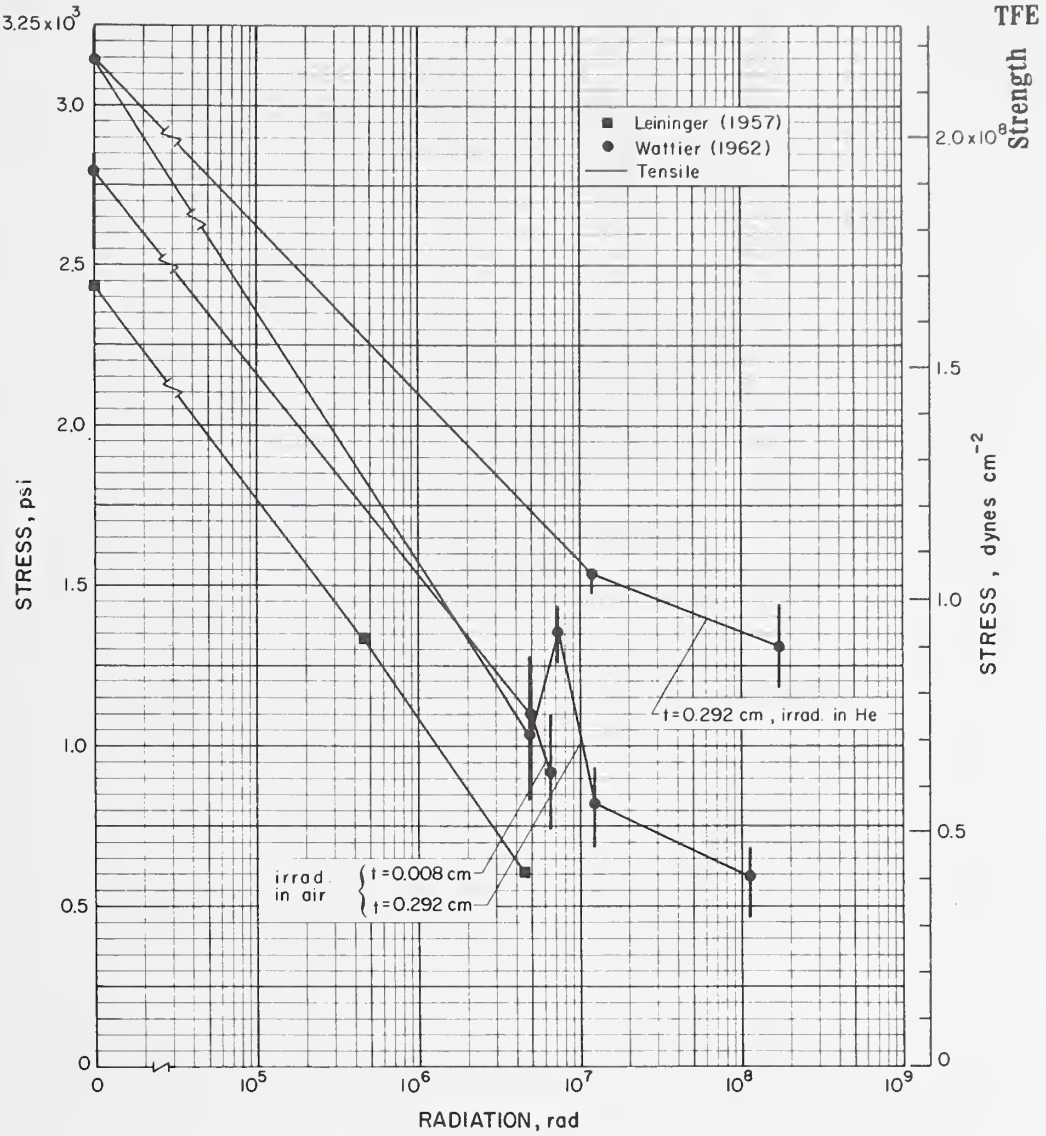
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1964, Vol I)	Teflon 7	Samples with t = 0.0254 cm: w = 2.54 cm, ℓ = 15.24 cm; Instron, ASTM D-882-56T test procedure; samples with t = 0.1016 cm: cut with Die A described in ASTM D-412-51T; Instron, xhd spd = 0.85 cm s^{-1}; irrad in air and vacuum and tested in air, irrad in Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth; error bars indicate standard deviation.
Kerlin (1963)	Teflon	w = 2.54 cm, ℓ = 15.24 cm; ASTM D 882 test procedure; irrad in Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth; error bars indicate standard deviation of 2 to 4 tests.



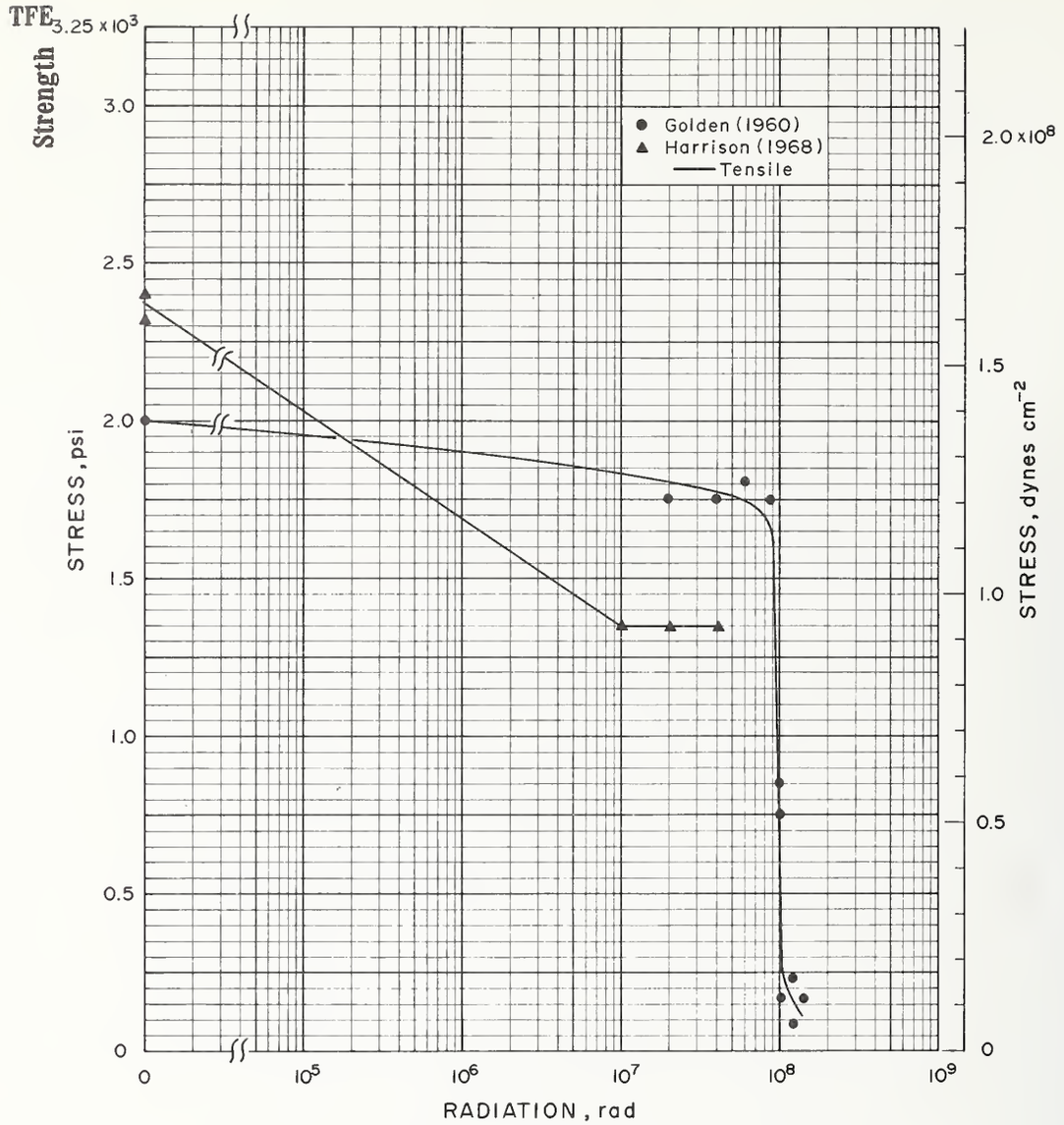
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Wattier, Newell, Morgan (1962)	Teflon	Irrad and tested at 300 K, irrad in air and He.
Ringwood (1963)	Teflon	Irrad in vacuum and air.



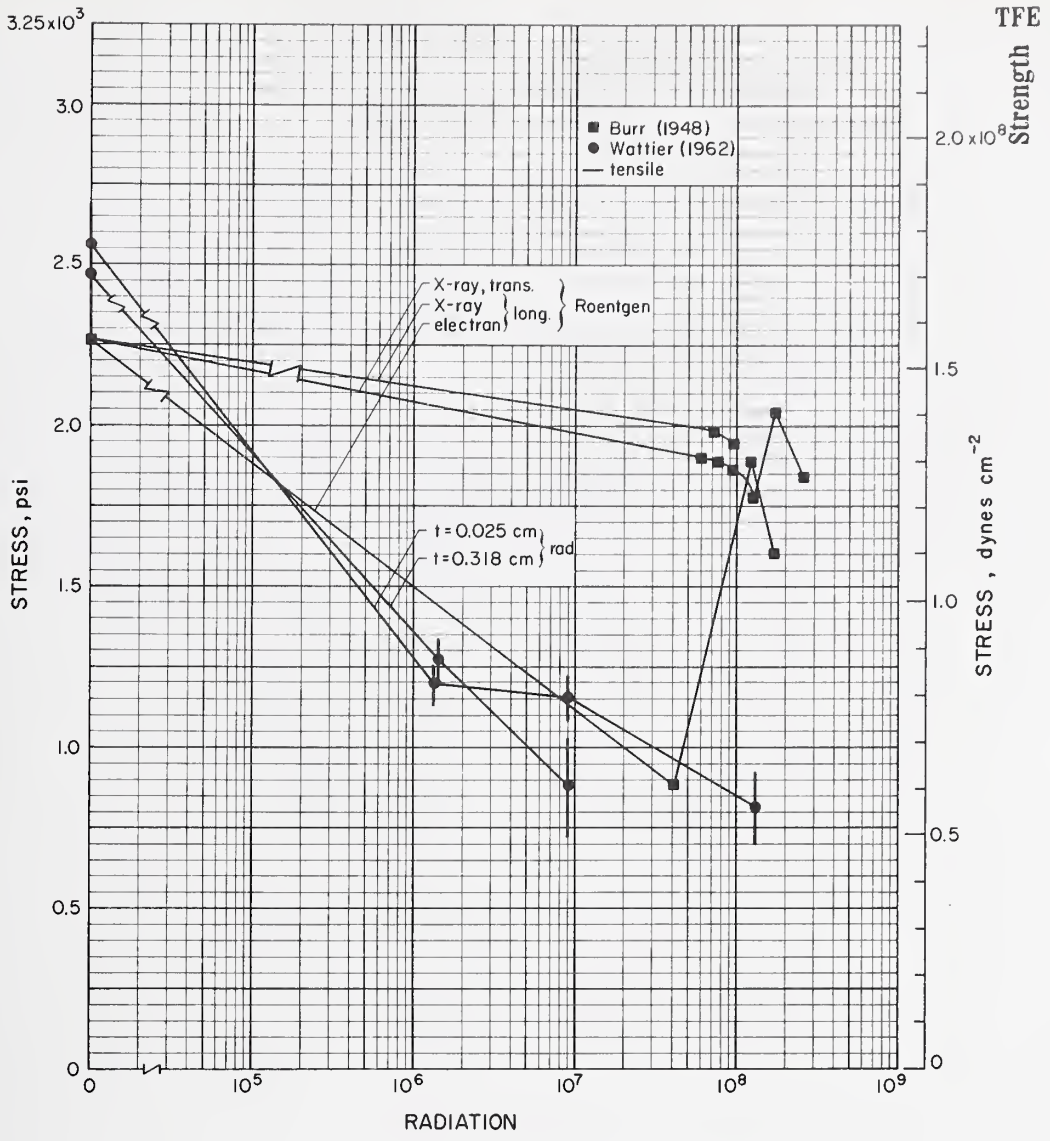
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Goodman (1962)	Teflon TFE T-30	ASTM 882-56T, Method A .est procedure, tested in air at 297 K; irrad in air and vacuum by spent reactor fuel elements.



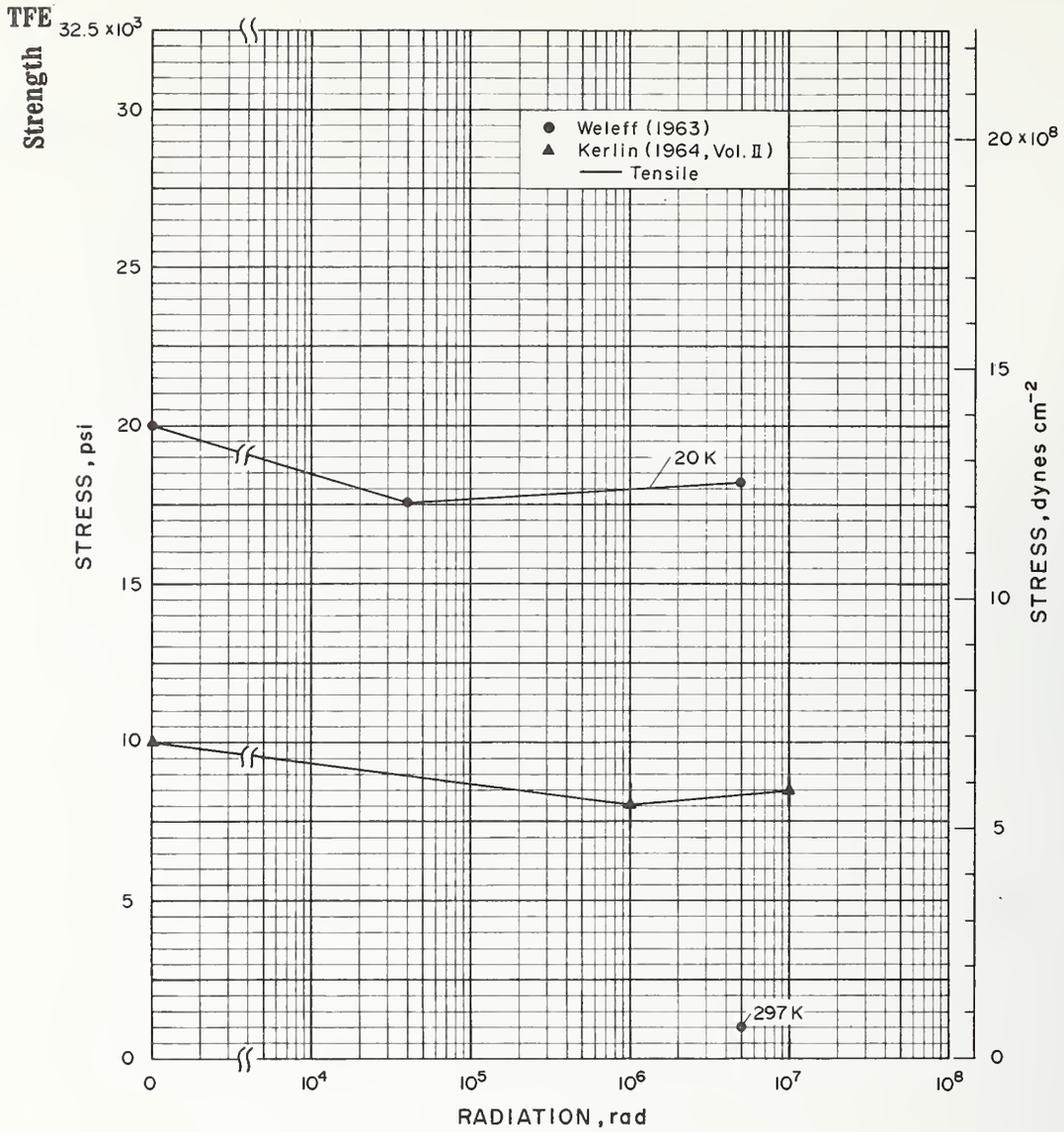
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Wattier, Newell, Morgan (1962)	Teflon	Irrad and tested at 300 K, irrad in air and He.
Leininger (1957)	Teflon	Irrad in air by Co^{60}.



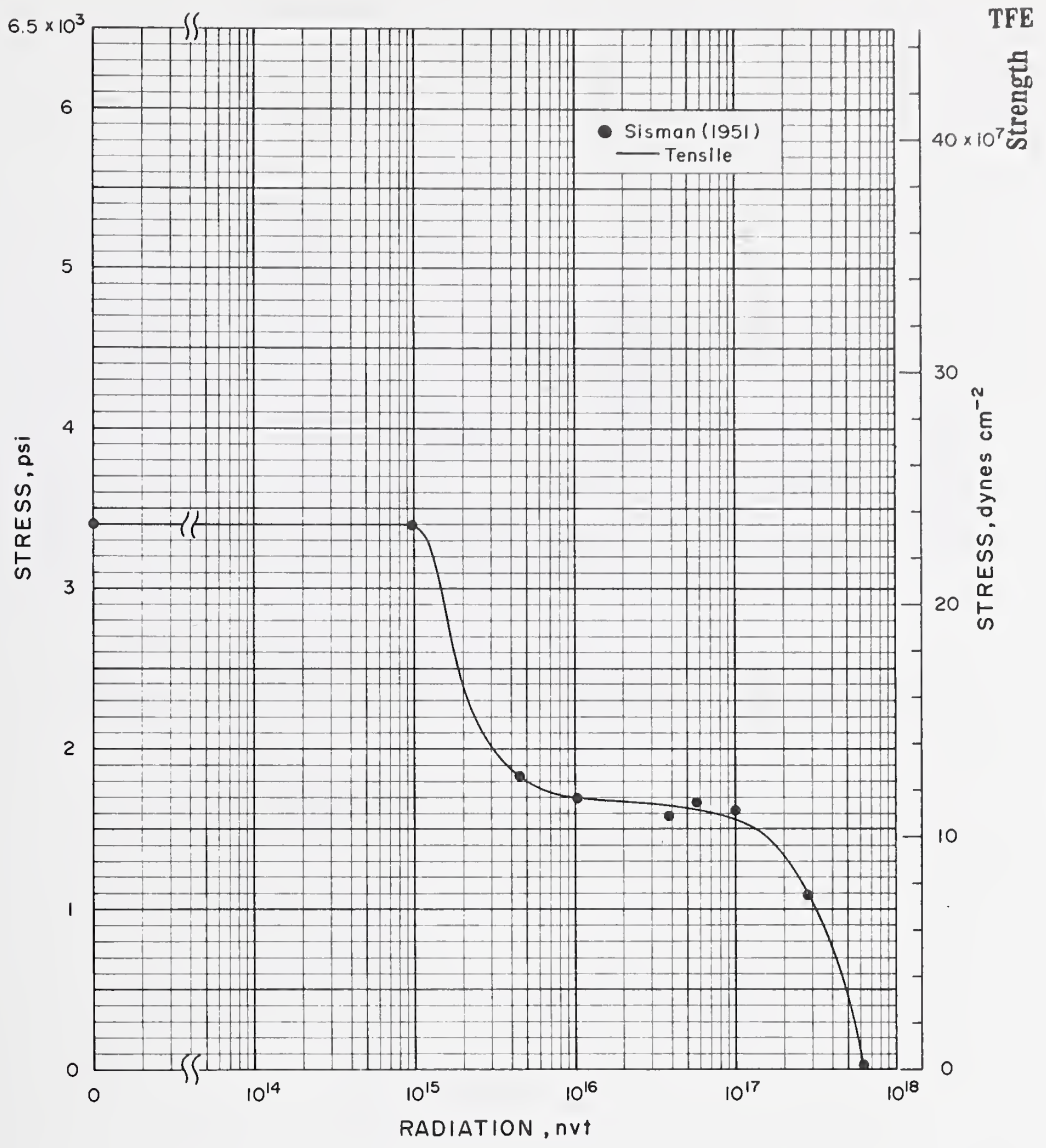
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Golden, Hazell (1960)		Thin film strips, t = 0.0132 cm, w = 1.27 cm; standard tensile machine, xhd spd = 0.042 cm s^{-1}, tested at 294 K, irrad by 4 Mev electron beam, sealed in Al Chamber and evacuated during irradiation.
Harrison (1968)	Held at 373 K and 10^{-5} Torr for 24 h then sealed in separate thin-walled glass ampoules.	Small dumb-bell shaped samples; xhd spd = 0.021 cm s^{-1}, 308 K; irrad by 4 Mev electron beam, stored at 308 K for 24 h before test.



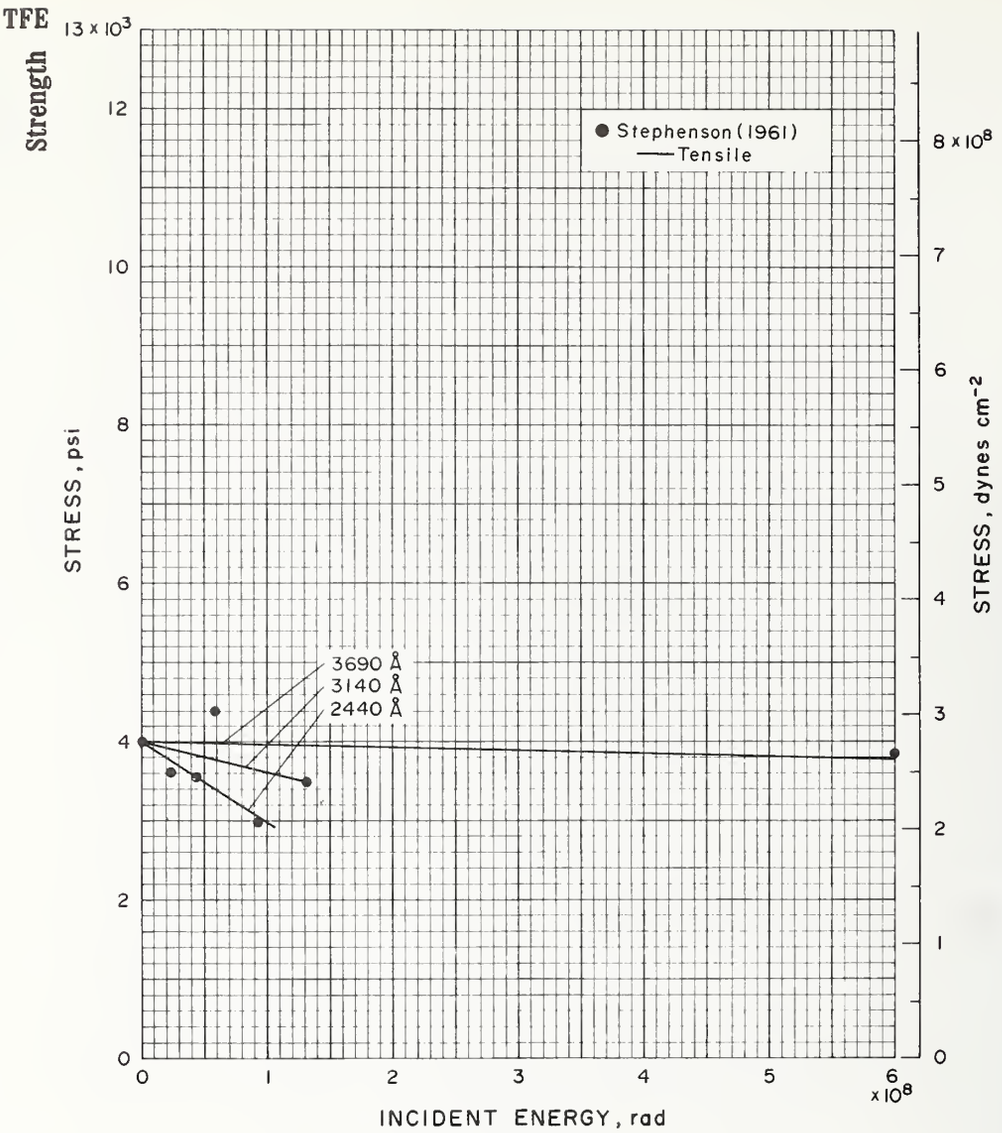
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Burr, Garrison, Haeckl, Hochandel, McClinton, Penneman, Scott, Miller, Steel (1948)		ℓ = 7.62-12.70 cm, w = 0.64 cm; Scott tensile tester; 2 Mev electrons from Van de Graaff generator bombarded 1.27 cm long spot in the middle of the specimen; x-ray irradiation received by whole length of specimen but was most intense in the middle: dosage in Roentgens.
Wattier, Newell, Morgan (1962)	Teflon	Irrad and tested at 300 K, irrad in air; dosage in rads.



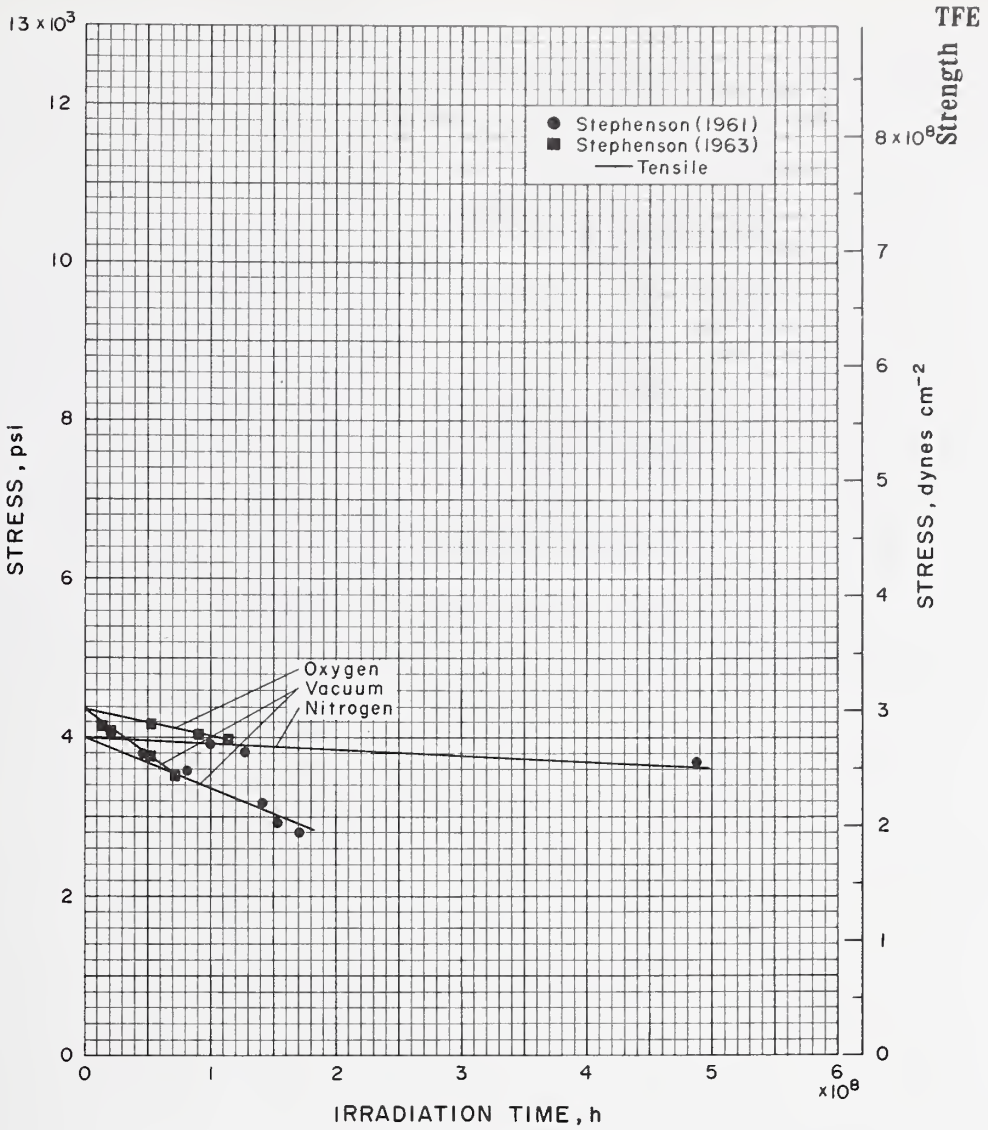
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Weleff, Emmons (1963)	Teflon	Instron, xhd spd = 0.0021 cm s^{-1}, irrad and tested at 20K except for one point as noted, irrad by both fast neutrons and gammas; av values of 4 or 5 specimens.
Kerlin, Smith (1964, Vol II)	Teflon 7	Red Sec 5.72 x 1.27 x 0.317 cm; Instron, xhd spd = 0.021 cm s^{-1}, ASTM D-638-61T test procedure, tested in liquid N_2 at 77K; total radiation includes fast neutrons and gammas.



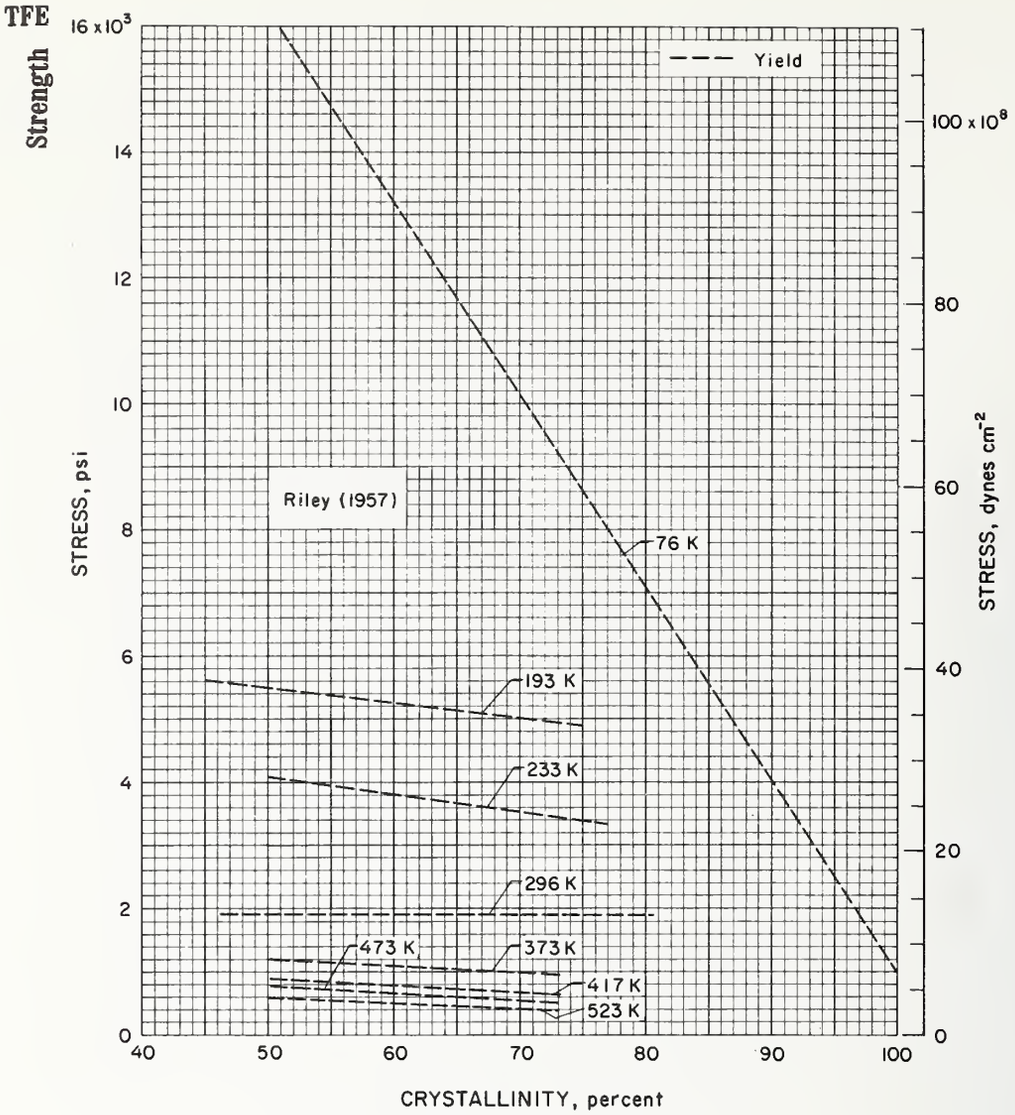
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Sisman, Bopp (1951)	Teflon	Red Sec ℓ = 5.72 cm, w = 1.27 cm; modified ASTM D 638-49T test procedure, Baldwin Southwark testing machine, xhd spd = 0.0021 cm s^{-1} to a strain of 0.02 and then xhd spd = 0.0085 cm s^{-1}; irrad in Hole 19 of ORNL reactor at 298-313K and in air, aged 7 days at 298 ± 1K and 50 ± 2% rel hum before testing.



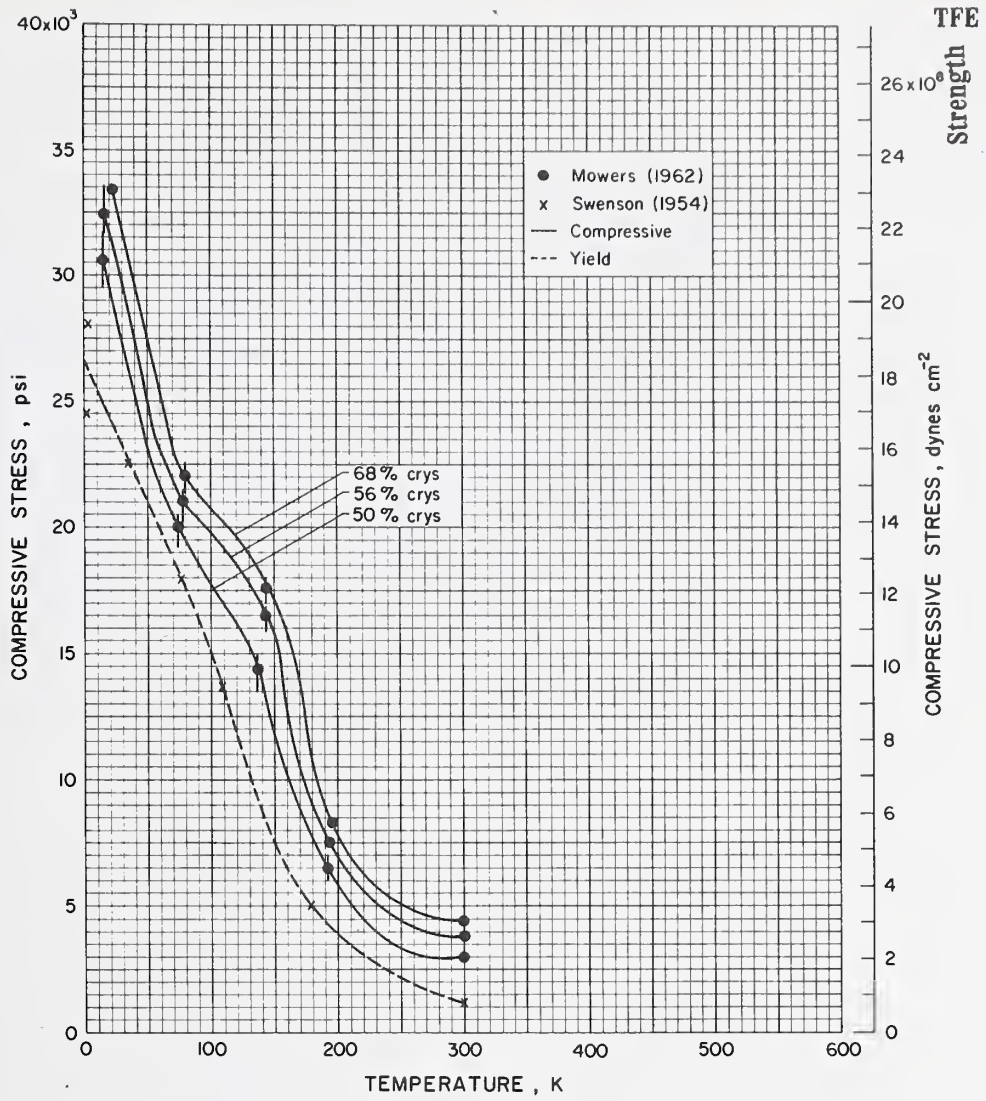
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Stephenson, Moses, Wilcox (1961)	Teflon	t = 0.0025 cm, ASTM D 882-49T test procedure, Instron; ultraviolet radiation source: General Electric G 30 T8 lamp emitting 90% of radiation at 2537 ; General Electric A-H6 vapor lamp, high P, 1000 watts, broad spectrum of radiation with intensity peaks at 2440, 3140, and 3690 Å, monochromator (Bausch and Lomb) slits (132 Å wide) used to select radiation, irrad in nitrogen.



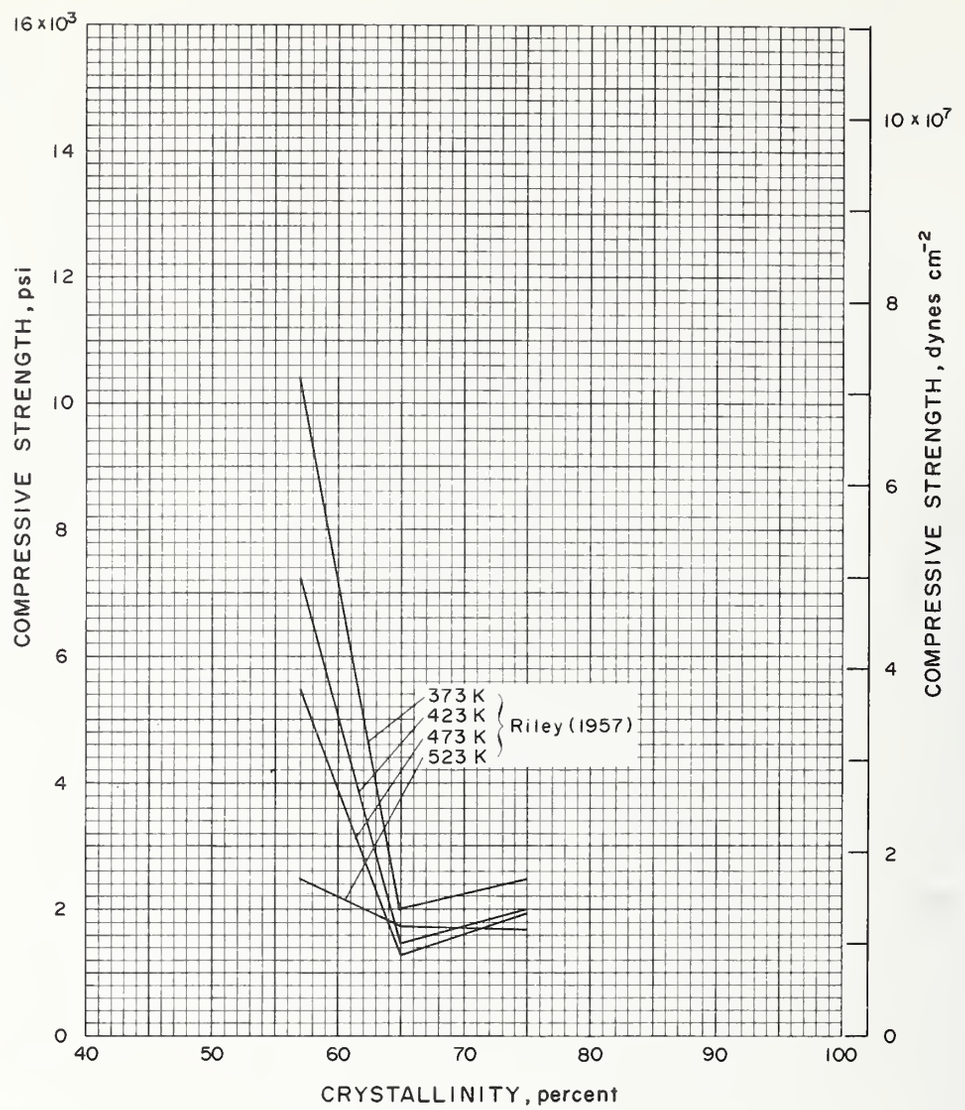
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Stephenson, Moses, Wilcox (1961)	Teflon	t = 0.0025 cm; ASTM D882-49T test procedures, Instron; ultraviolet radiation source: General Electric G30T8 lamp emitting about 90% of radiation at 2537 Å, samples placed in quartz tubes and evacuated or flushed with nitrogen.
Stephenson, Wilcox (1963)	Teflon, film	ASTM D882-49T test procedures, Instron; ultraviolet radiation source: General Electric G 30T8 lamp emitting 90% of radiation at 2537 Å, irrad in vacuum or oxygen.



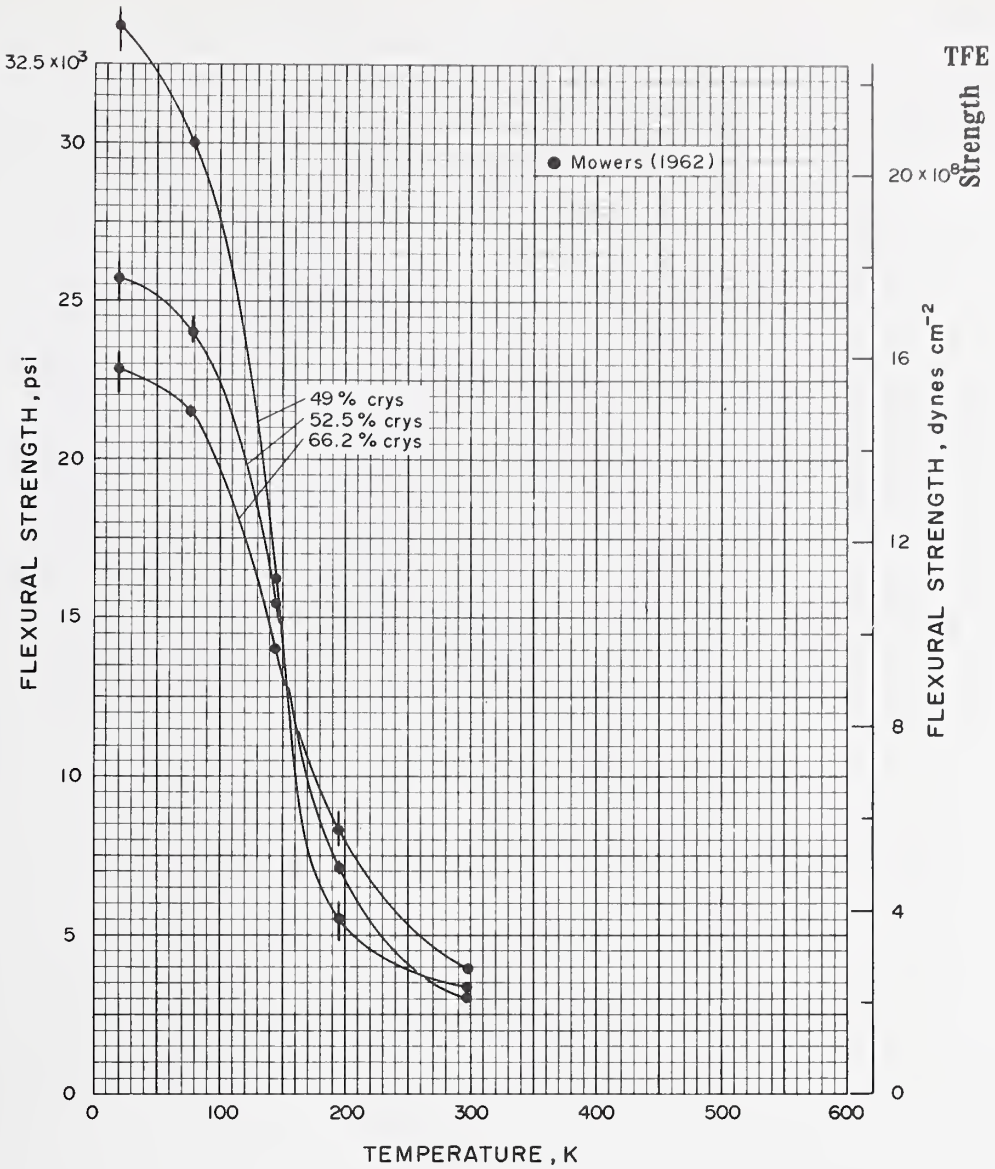
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Riley (1957)	Teflon	



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 49-50% crys, sp gr = 2.148-2.152, molded at 655 K, 30 min, quick quenched; 52.5-56% crys, sp gr = 2.159-2.171, molded at 655 K, 30 min, quick quenched then held at 580 K for 5 h; 66.2-71% crys, sp gr = 2.199-2.226, molded at 655 K, 30 min, slow cooled then held at 599 K for 20 h.	ℓ = 2.54 cm, diam = 1.27 cm; Instron, ASTM D 695-54 test procedure, xhd spd = 0.0021 cm s^{-1}.
Swenson (1954)	Teflon, sp gr = 2.17	ℓ = 1.58 cm, diam = 1.27 cm; yd off = 0.2%.



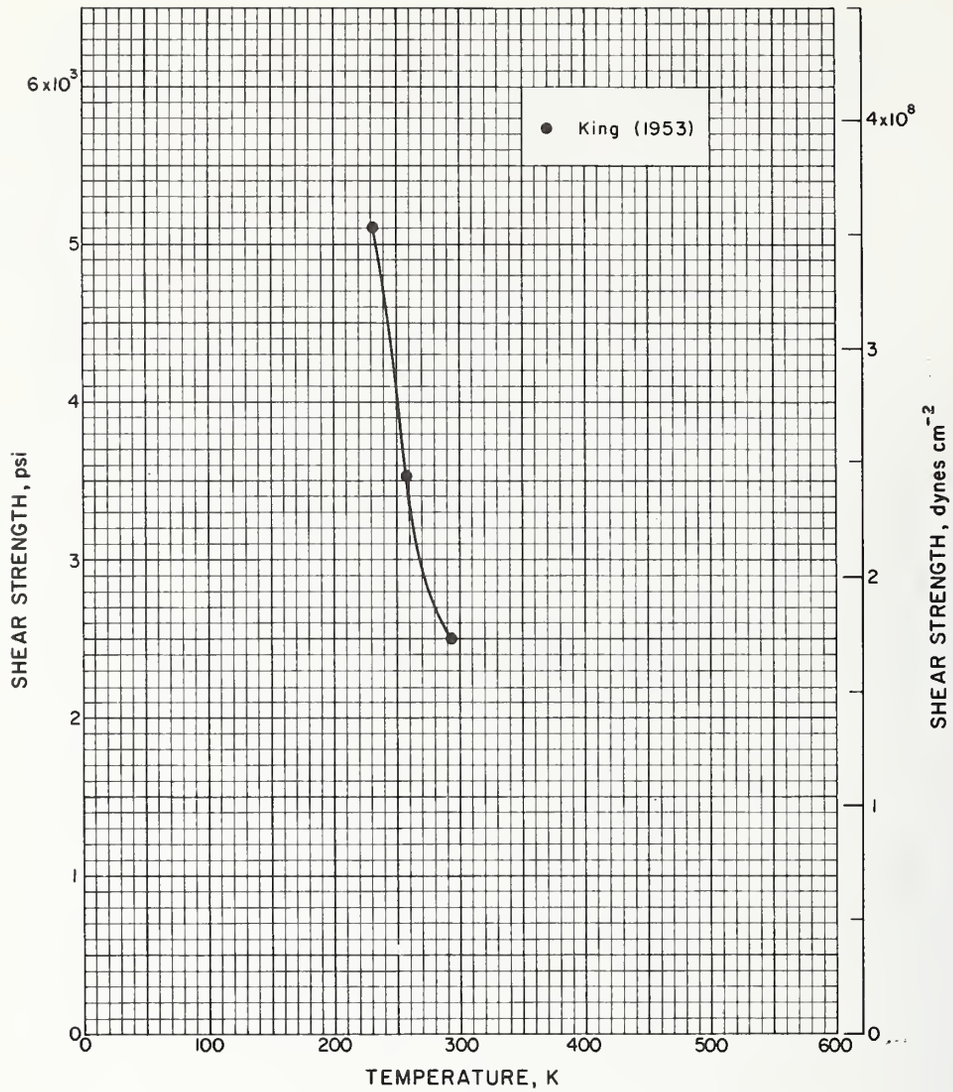
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Riley (1957)	Teflon	



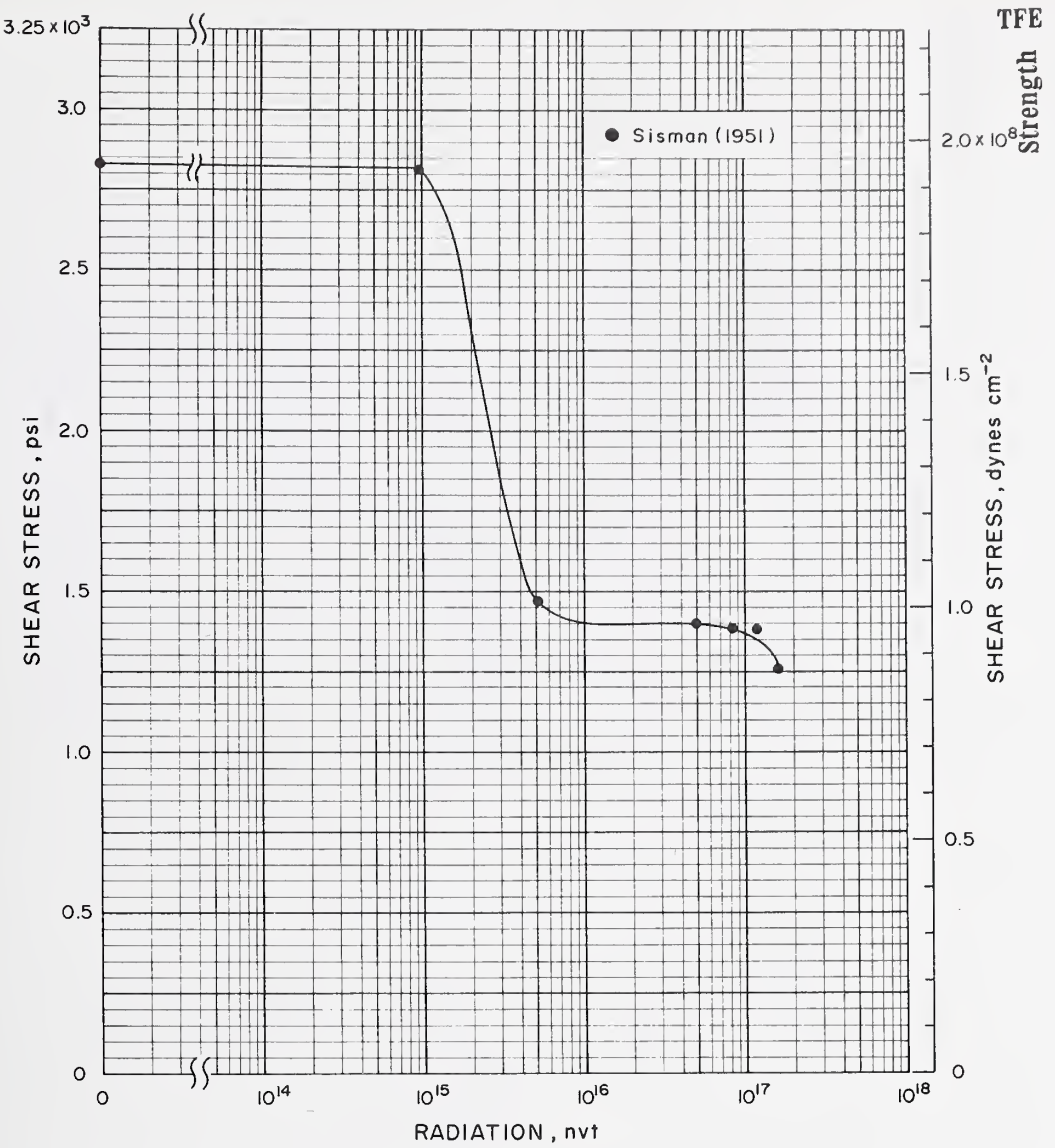
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 49-50% crys, sp gr = 2.148-2.152, molded at 655 K, 30 min, quick quenched; 52.5-56% crys, sp gr = 2.159-2.171, molded at 655 K, 30 min, quick quenched then held at 580 K for 5 h; 66.2-71% crys, sp gr = 2.199-2.226, molded at 655 K, 30 min, slow cooled then held at 599 K for 20 h.	5.07 x 0.446 cm, t varied but rates of ℓ/t maintained at 16; Instron, xhd spd 0.0021 cm s^{-1}, ASTM D 790-495 test procedure, miniature size dies used; error bars indicate data spread.

TFE

Strength



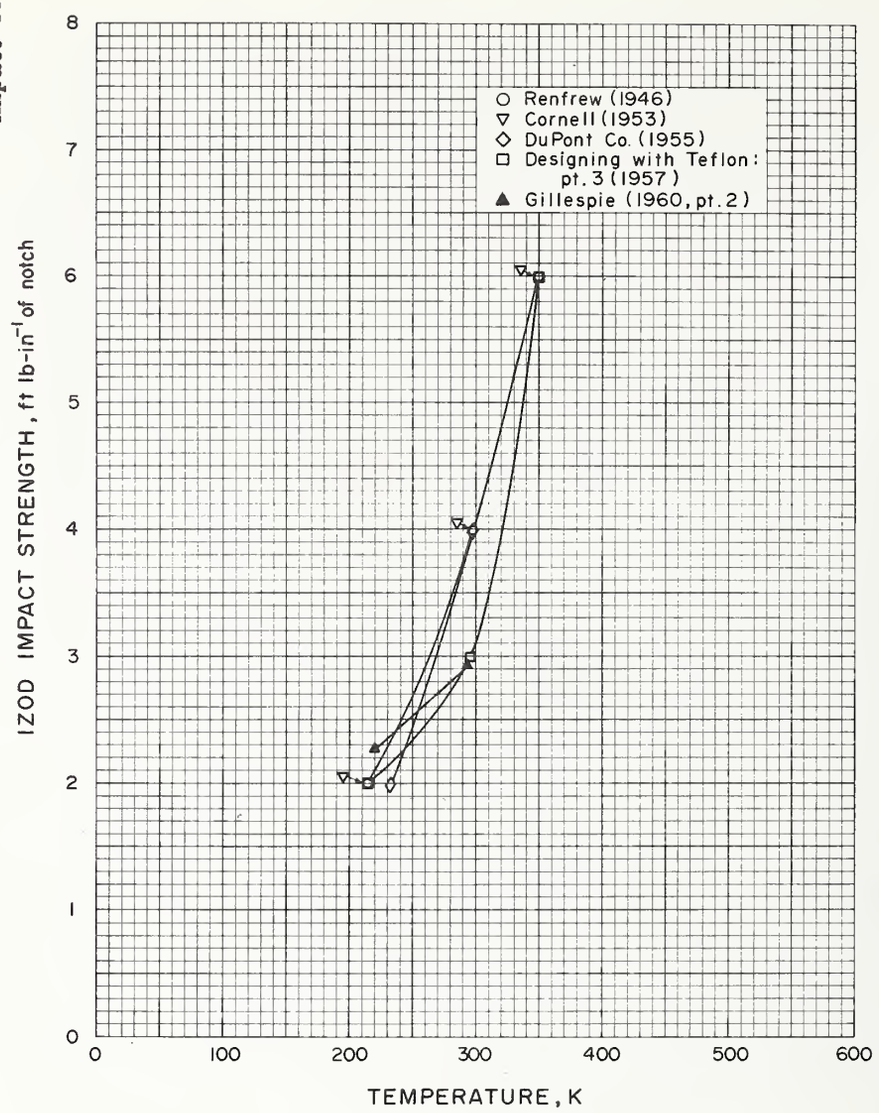
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
King, Tabor (1953)	Powder sintered above softening temp of 600 K and rapidly quenched	Cylindrical specimen sheared between 2 metal blocks, force read on a spring balance: 7 - 10^{7} error.



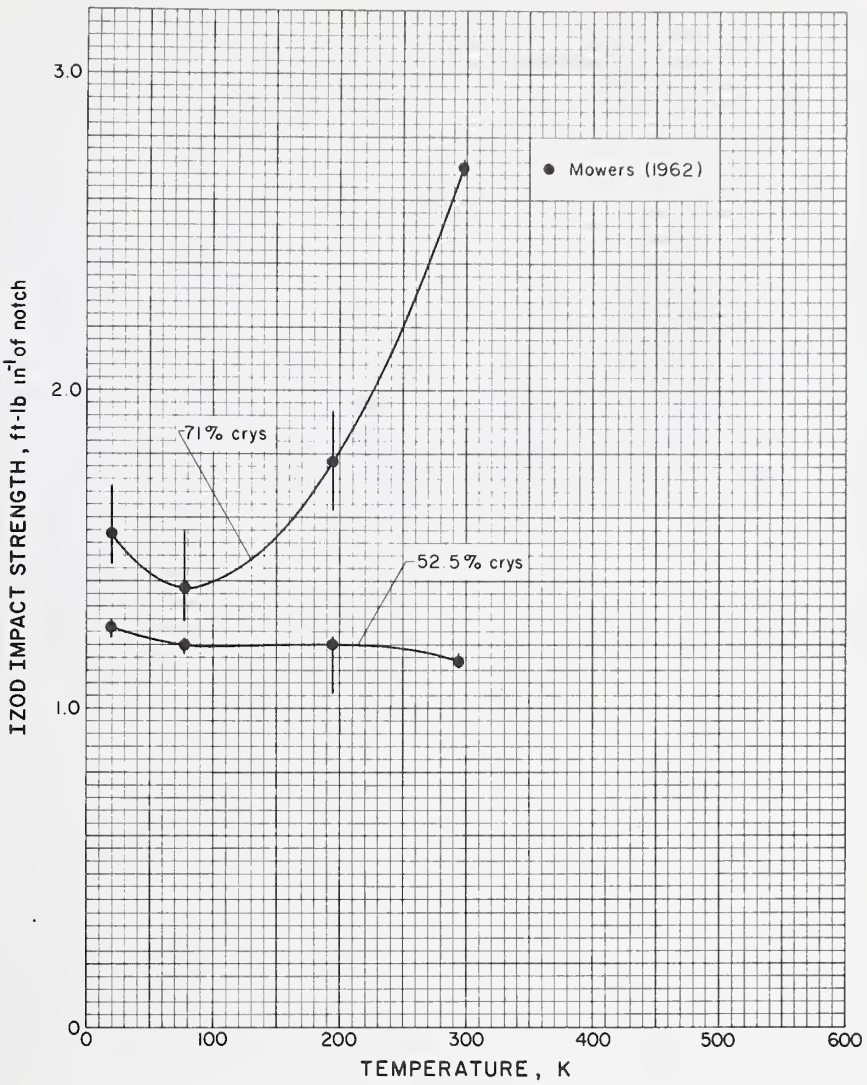
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Sisman, Bopp (1951)	Teflon	ℓ = 7.62, w = 2.54 cm, t = 0.16-0.64 cm; test procedure was a modification of Federal Specification 1041, L-P-406a, p. 12, Johnson type shear tool with self-aligning compression plate, xhd spd = 0.0008 cm s^{-1}; irrad in Hole 19 of ORNL reactor at 298-313 K and in air, aged 7 days at 298 ± 1K and 50 ± 2% rel hum before testing.

TFE

Impact



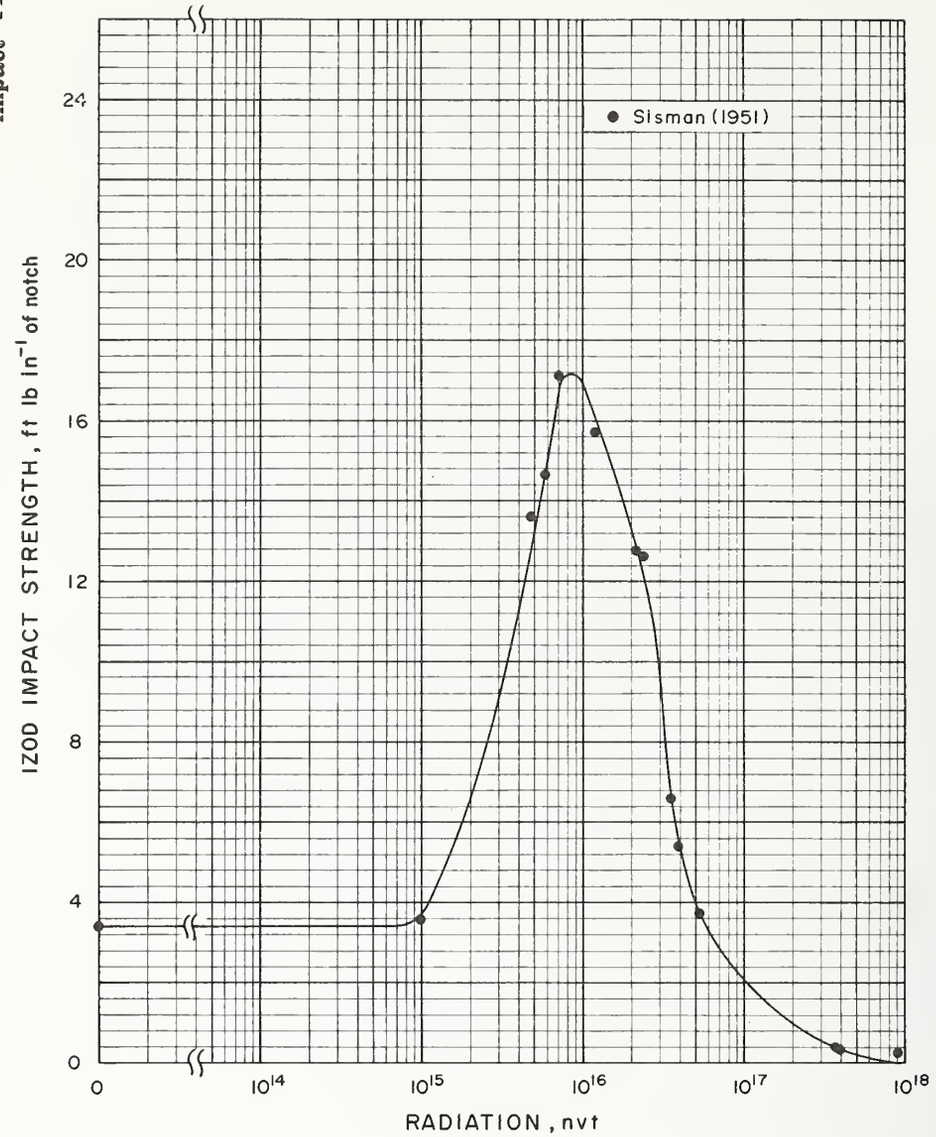
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Renfrew, Lewis (1946)		ASTM D 256-41T test procedure.
Gillespie, Saxton, Chapman (1960, pt 2)	Teflon 1, ram extruded av sp gr = 2.17, 60±2% crys, void content < 0.3%, pre-form pressure = 2500 psi	ASTM D 256-56 test procedure.
Designing with Teflon: Pt. 3 (1957)	Teflon	ASTM D 256-47T test procedure.
DuPont Co. (1955)	Teflon	ASTM D-256-47T test procedure
Cornell (1953)	Teflon	ASTM D 256-47T test procedure



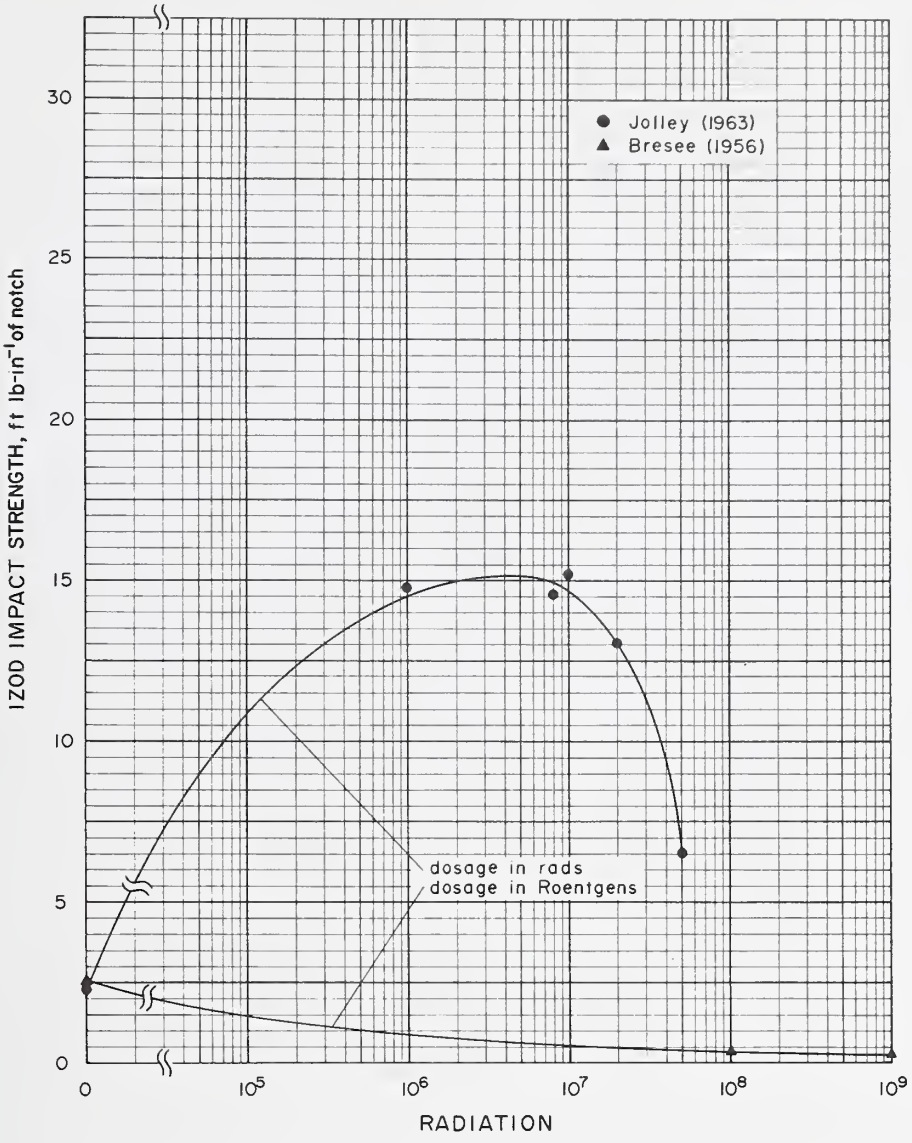
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 52.5-56% crys, sp gr = 2.159-2.171, molded at 655 K, 30 min, quick quenched then held at 580 K for 5 h; 66.2-71% crys, sp gr = 2.199-2.226, molded at 655 K, 30 min, slow cooled then held at 599 K for 20 h.	0.635 x 1.27 x 6.35 cm Izod samples with standard notch machined into 0.635 cm face; Tinius-Olsen tester, ASTM D 256-56 test procedure, impact vel = 335 cm s^{-1}; error bars indicate data spread of 5 tests.

TFE

Impact



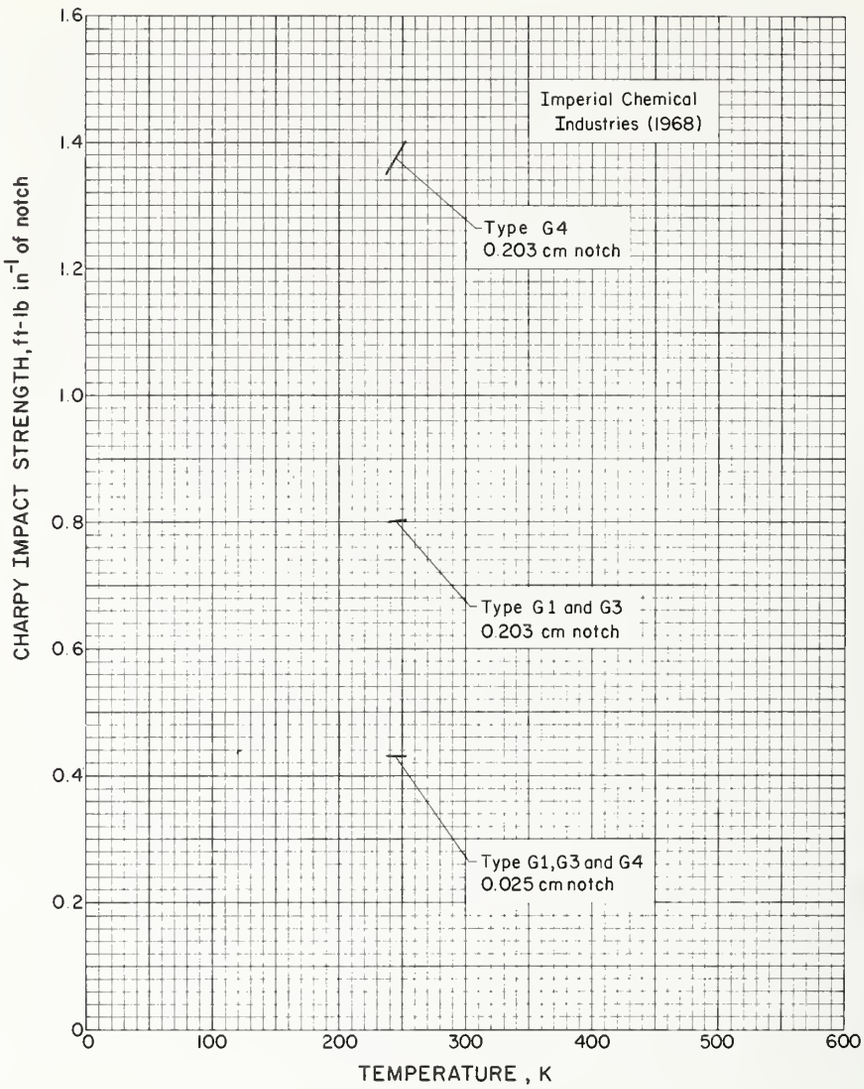
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Sisman, Bopp (1951)	Teflon	Izod impact specimen; modified ASTM D 256-47T test procedure, Baldwin pendulum cantilever beam impact testing machine; irrad in Hole 19 of ORNL reactor at 298-313 K and in air, aged 7 days at 298 ± 1K and 50 ± 2% rel hum before testing.



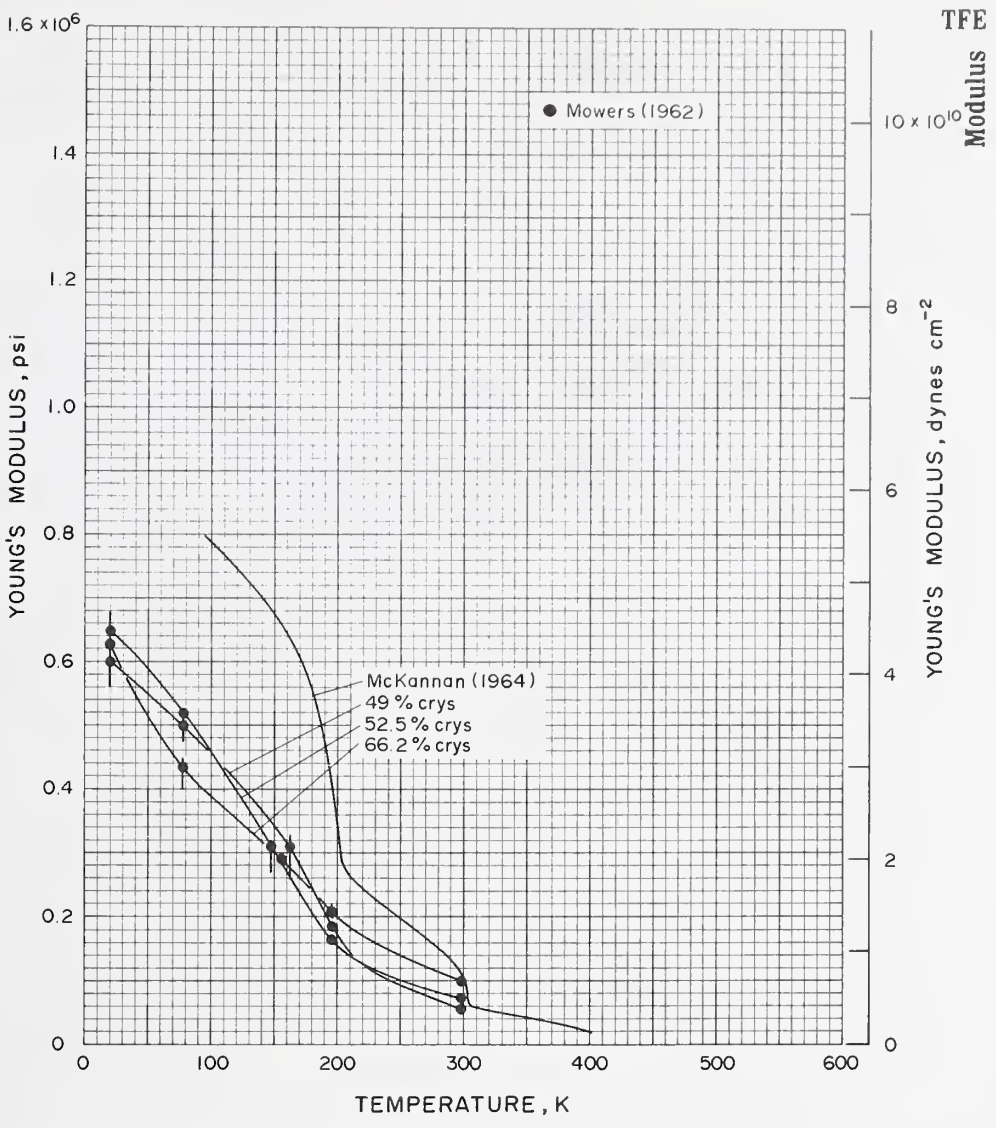
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bresee, Flanary, Goode, Watson, Watson (1956)	Teflon, sp gr = 2.14 before irradiation	Irrad by Co^{60}.
Jolley, Reed (1963)	Teflon cut from AWG #22 commercially available wire	Notched Izod specimens, 1.27 x 6.35 x 0.635 cm; 122 cm pendulum, 293 K; irrad in air with 2 Mev electrons from a Van de Graaf accelerator; av of 5 tests.

TFE

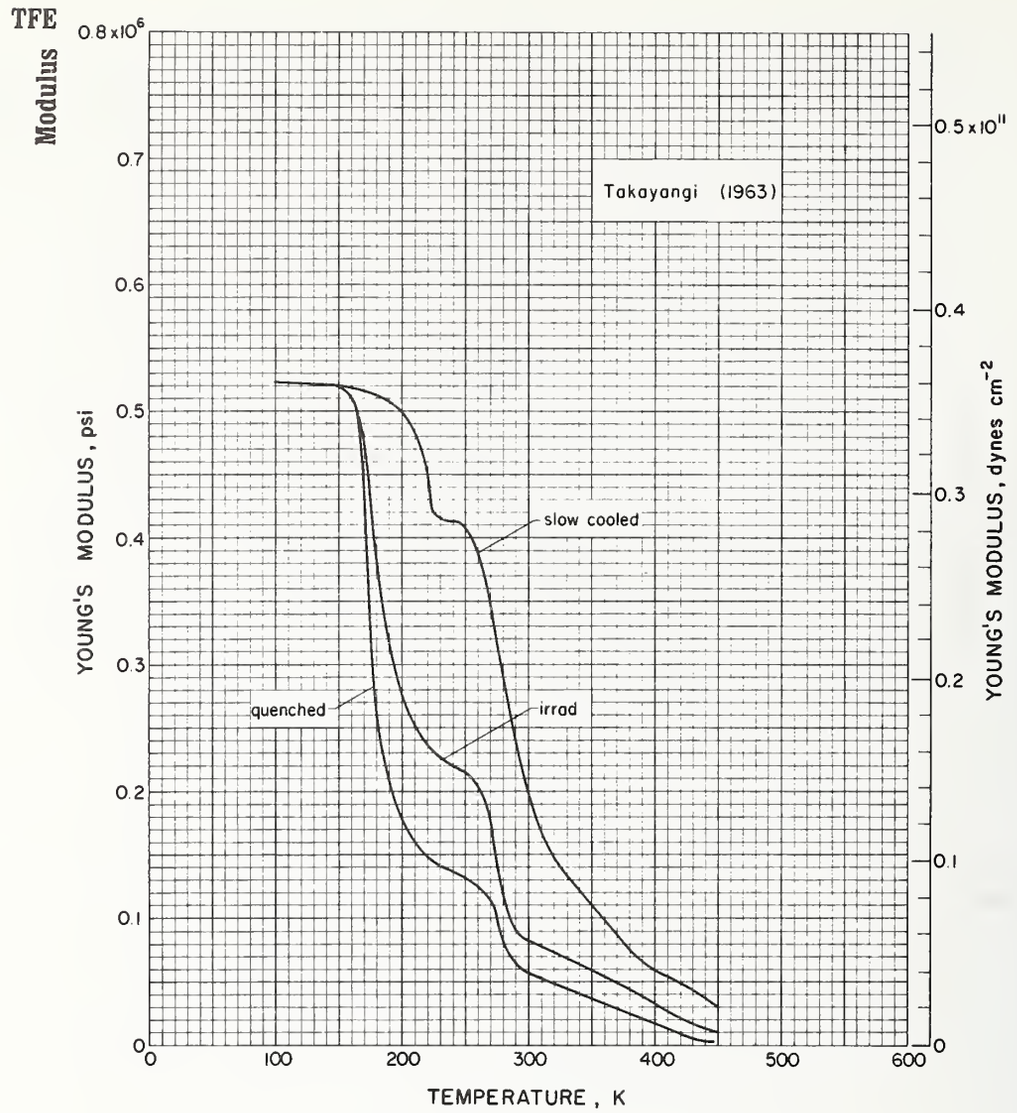
Impact



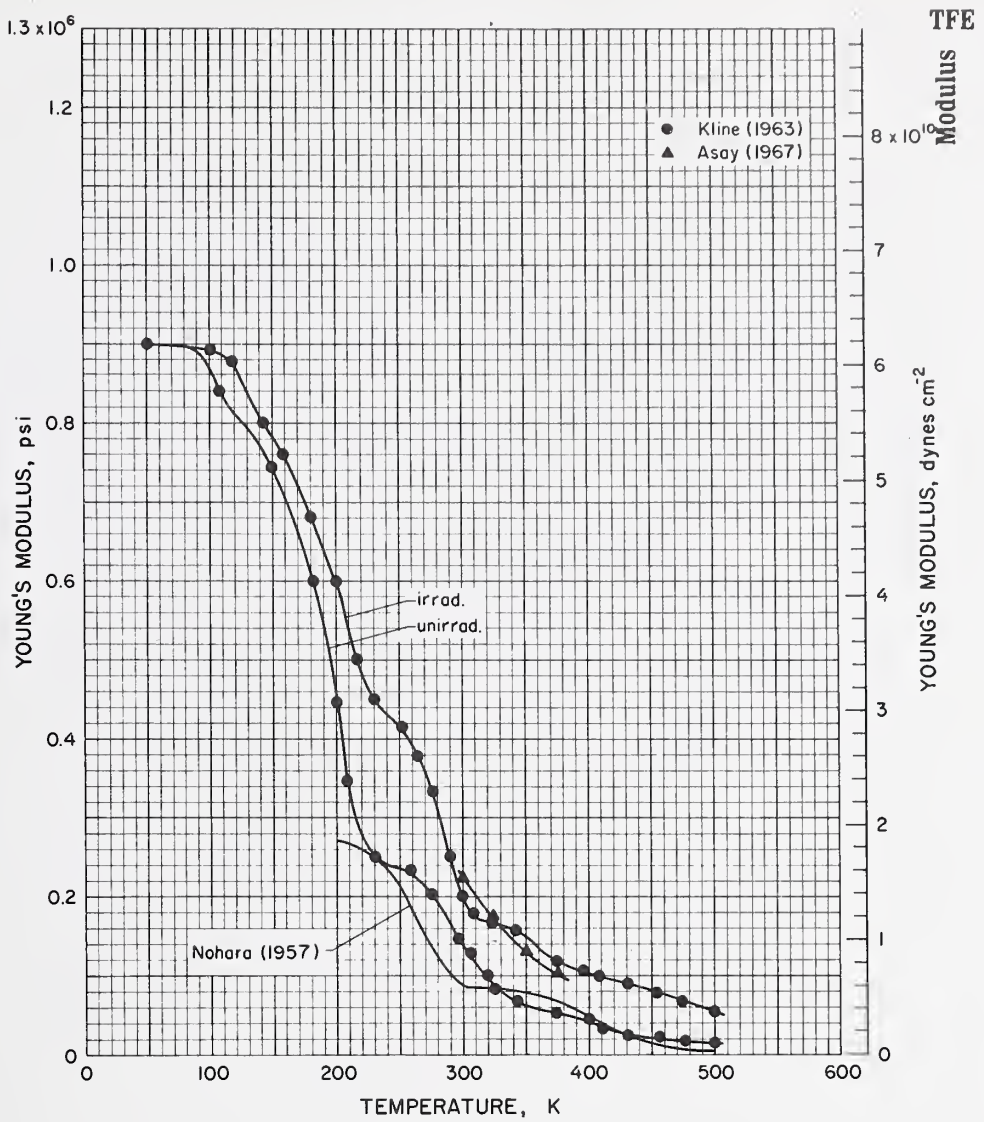
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Imperial Chemical Industries (1968)	Fluon, G1 and G3 preformed at 2000 psi, G4 preformed at 2500 psi, one sample of each cooled at 25K h^{-1}; another cooled from 653 K to 293 K in 2 h.	ℓ = 2.54 or 3.81 cm, notch depth = 0.2819 cm, notch radius noted; Charpy 3 point loading, impact velocity = 244 cm s^{-1}; no difference in results from the 2 cooling rates; considerable scatter in results above 253 K.



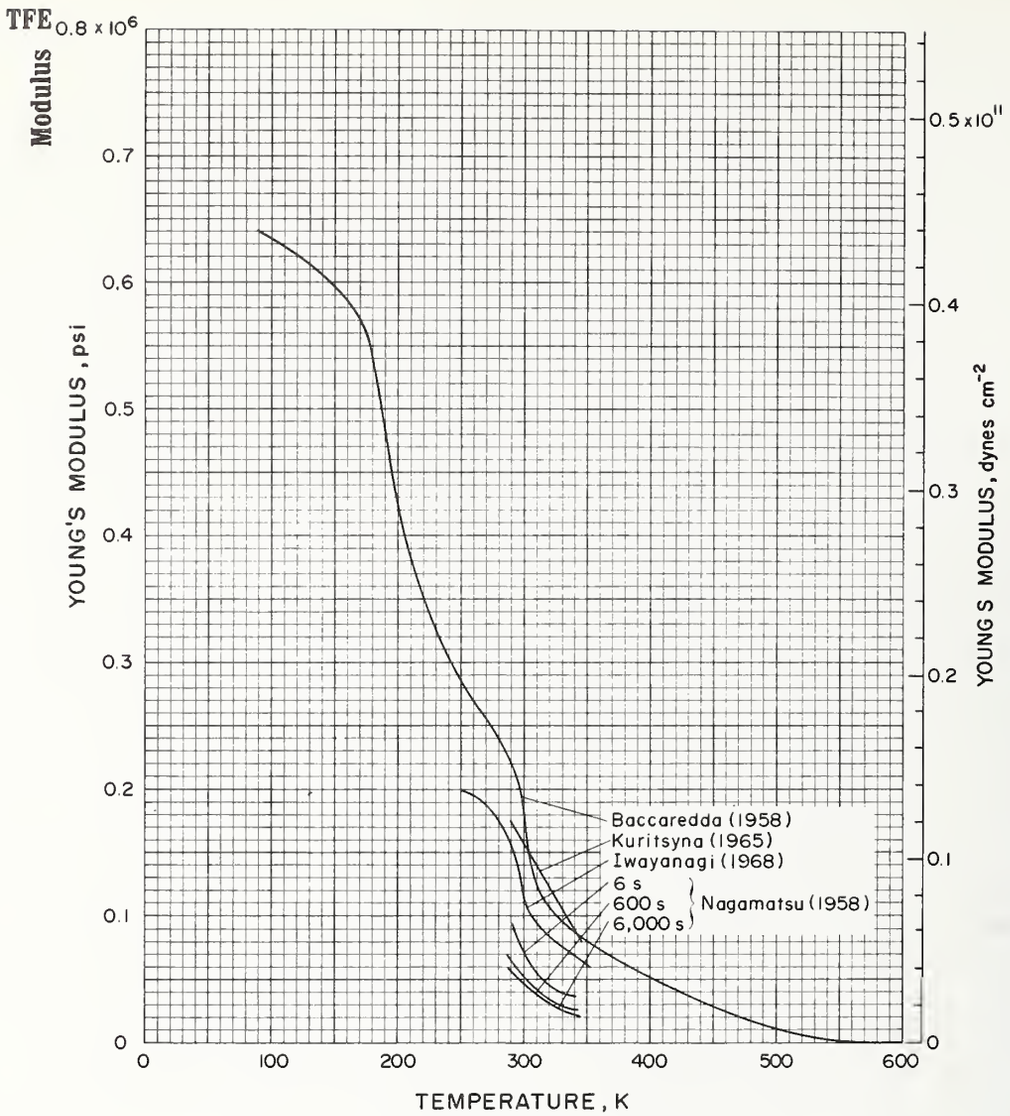
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 49-50% crys, sp gr = 2.148 - 2.152, molded at 655 K, 30 min, quick quenched; 52.5-56% crys, sp gr = 2.159-2.171, molded at 655 K, 30 min, quick quenched then held at 580 K for 5 h; 66.2-71% crys, sp gr = 2.199-2.226, molded at 655 K, 30 min, slow cooled then held at 599 K for 20 h.	3 dies used to give Red Sec of 2.54 x 0.635 cm, 2.54 x 0.318 cm, and 0.51 x 0.254 cm; Instron, xhd spd = 0.042 cm s^{-1} at 298 K and 0.0012 cm s^{-1} otherwise; errors bars indicate data spread.
McKannan, Gause (1964)	Teflon	Instron.



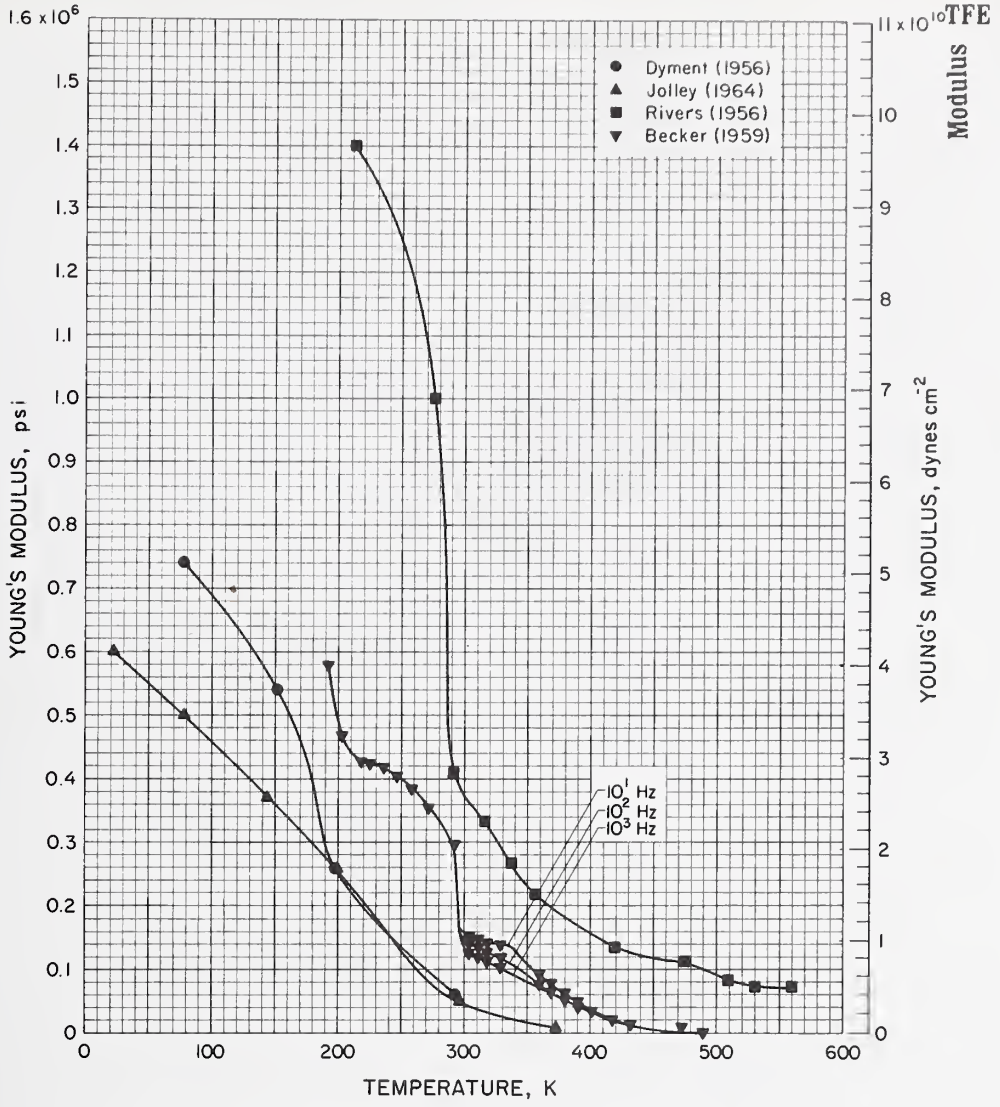
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Takayanagi (1963)	Teflon 5; quenched from 633 K into liquid nitrogen; gradually cooled to room temp after 1 h at 633 K; 10^8 rep irrad by Co^{60} for 2 h, annealed at 623 K for 3 h and cooled gradually	ℓ = 2-6 cm, w = 0.2-0.3 cm, t = 0.02-0.03 cm; sinusoidal tensile strain applied at one end and stress/strain ratio measured at other end, 138 Hz.



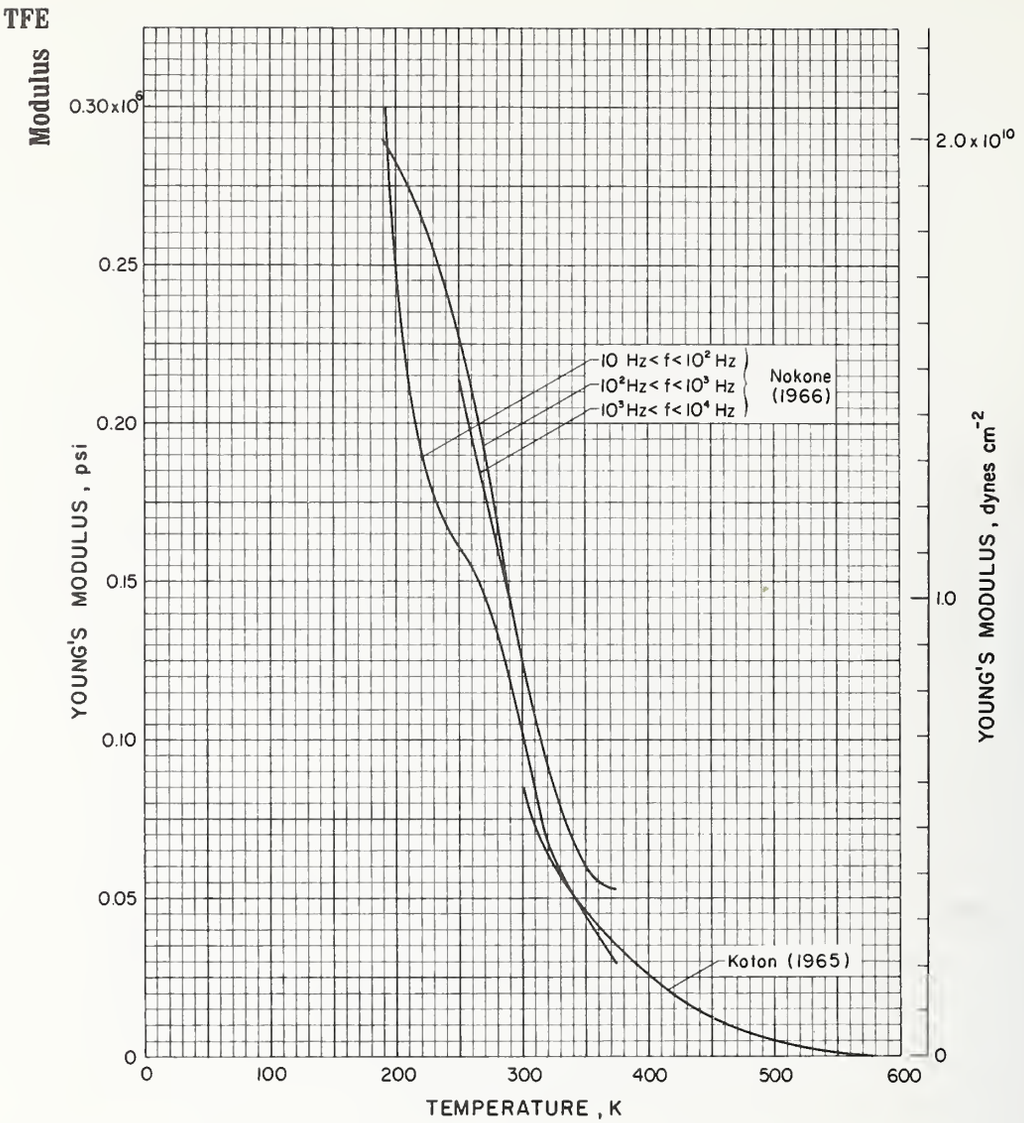
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kline, Sauer (1963)	TFE, unirrad sp gr = 2.17, crys = 59%; irrad sp gr = 2.54, crys = 83%.	Diam = 0.64 cm, ℓ= 10.2 cm; frequencies used ranged from 100 to 2100 Hz; room temp density value used in obtaining moduli so their values are nominal and may be a few percent in error, especially at high temp; irrad in nuclear reactor for 18h, received about 10^8 rads, energy is 1/6 from fast neutron collisions and 5/6 from gamma ray interactions.
Asay, Guenther (1967)	Teflon, sp gr = 2.19	Ceramic tranducer operated at 1-10x10^6 Hz, long. signal received by 2nd transducer held together by clamp; not all points plotted.
Nohara (1957)	Teflon	Dynamic measurements.



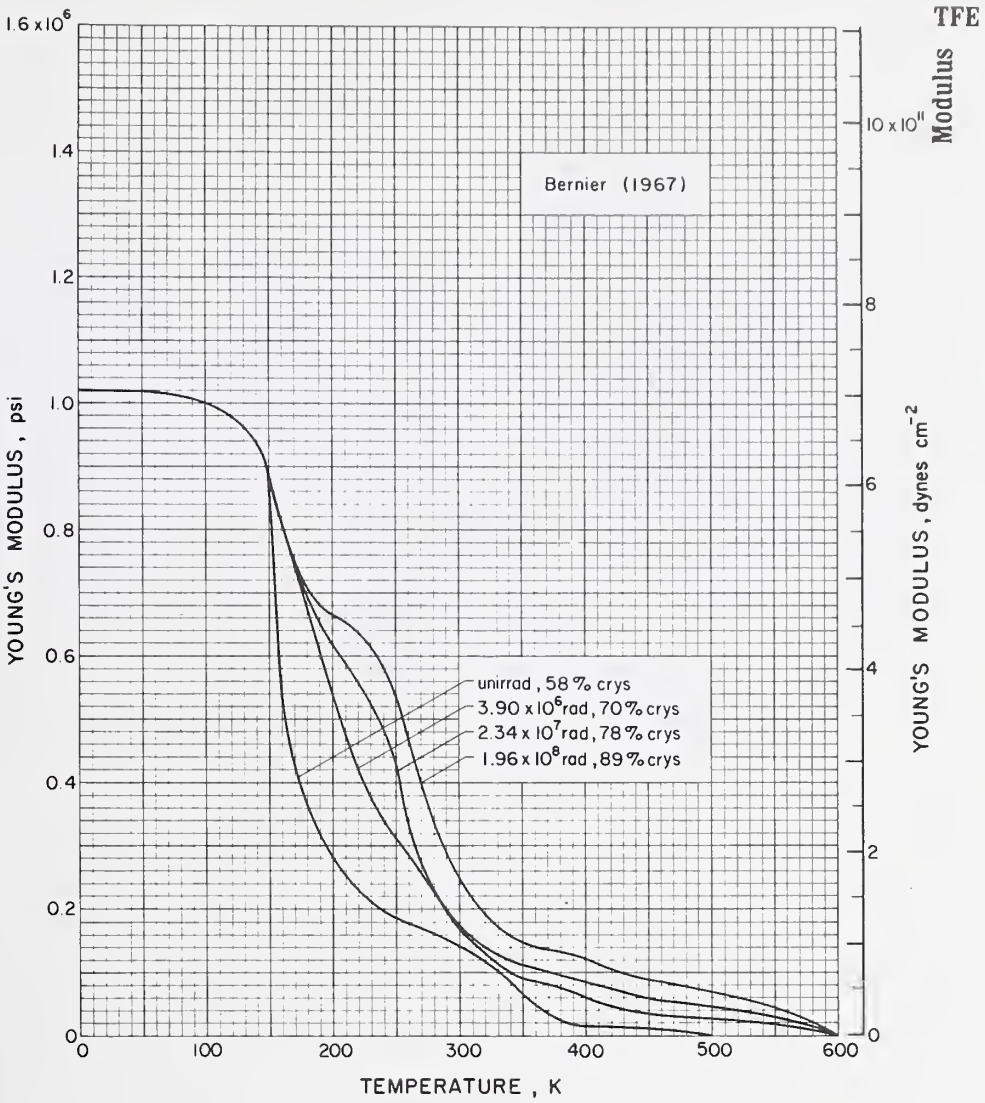
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Baccaredda, Butta (1958)	TFE	Frequency of 2-25 x 10^3 Hz; curve represents a series of experimental points.
Iwayanagi, Nakane (1968)		Long. vibration of a rod; curve represents a series of experimental points.
Kuritsyna, Meinstev (1965)	Fluoroplast-4	
Nagamatsu, Yoshitomi, Takemoto (1958)	Teflon	ℓ = 13.0 cm, w = 0.61 cm, t = 0.006 cm; max strain < 0.007; temp fluctuation < 0.1 K, time noted is the interval between loading and measurement.



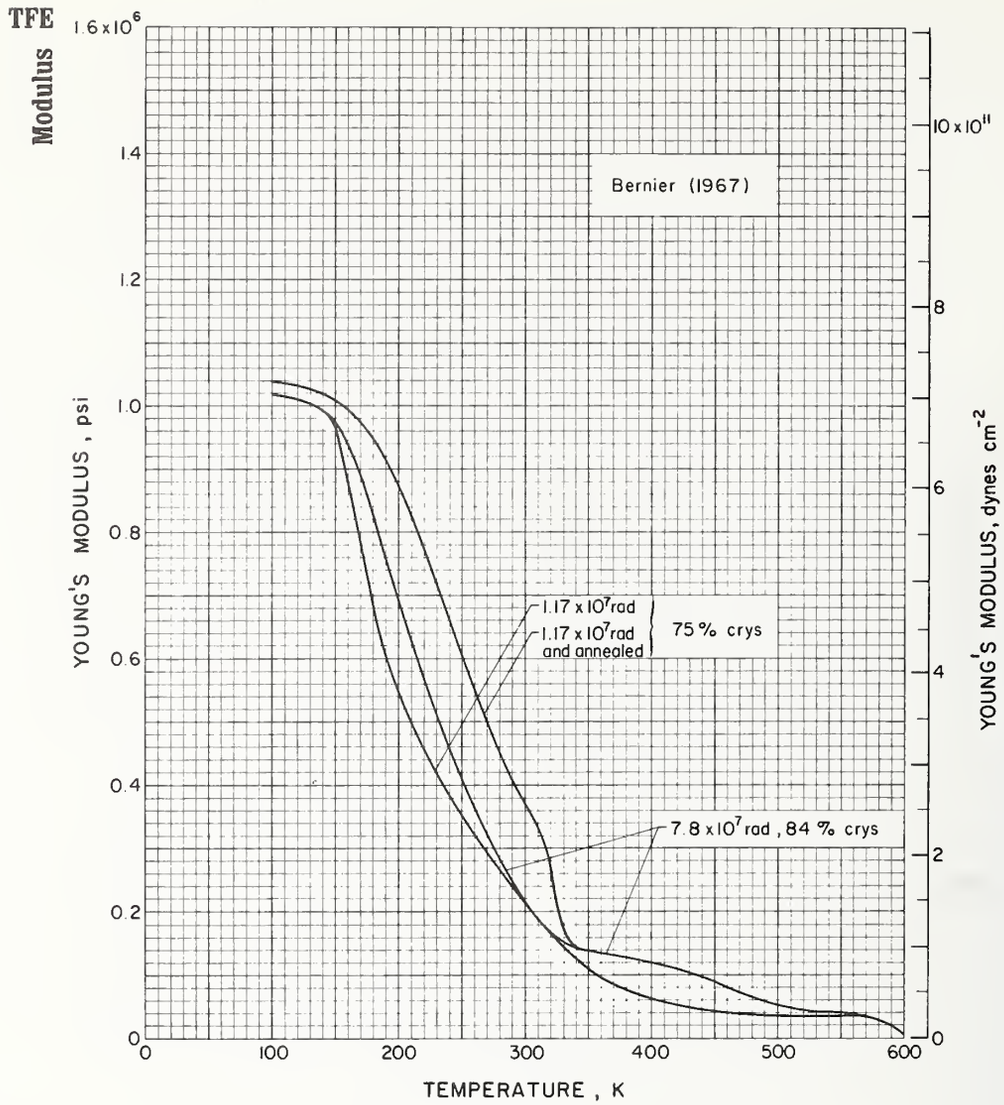
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Dyment, Ziebland (1956)	Fluon in form of 0.730 cm diam rod	Red Sec ℓ = 1.14 cm, diam = 0.32 cm; K-type Hounsfield tensometer, xhd spd 0.003 cm s^{-1}.
Rivers, Franklin (1956)	Teflon oriented fiber, sp gr = 2.2	Tests at room temp and below conducted in hexane, all others conducted in air.
Jolley, Homsy, Reed (1964)	Teflon	
Becker (1959)	Hostaflon TF, sp gr = 2.14 ± 0.02, 46 ± 2% crys	



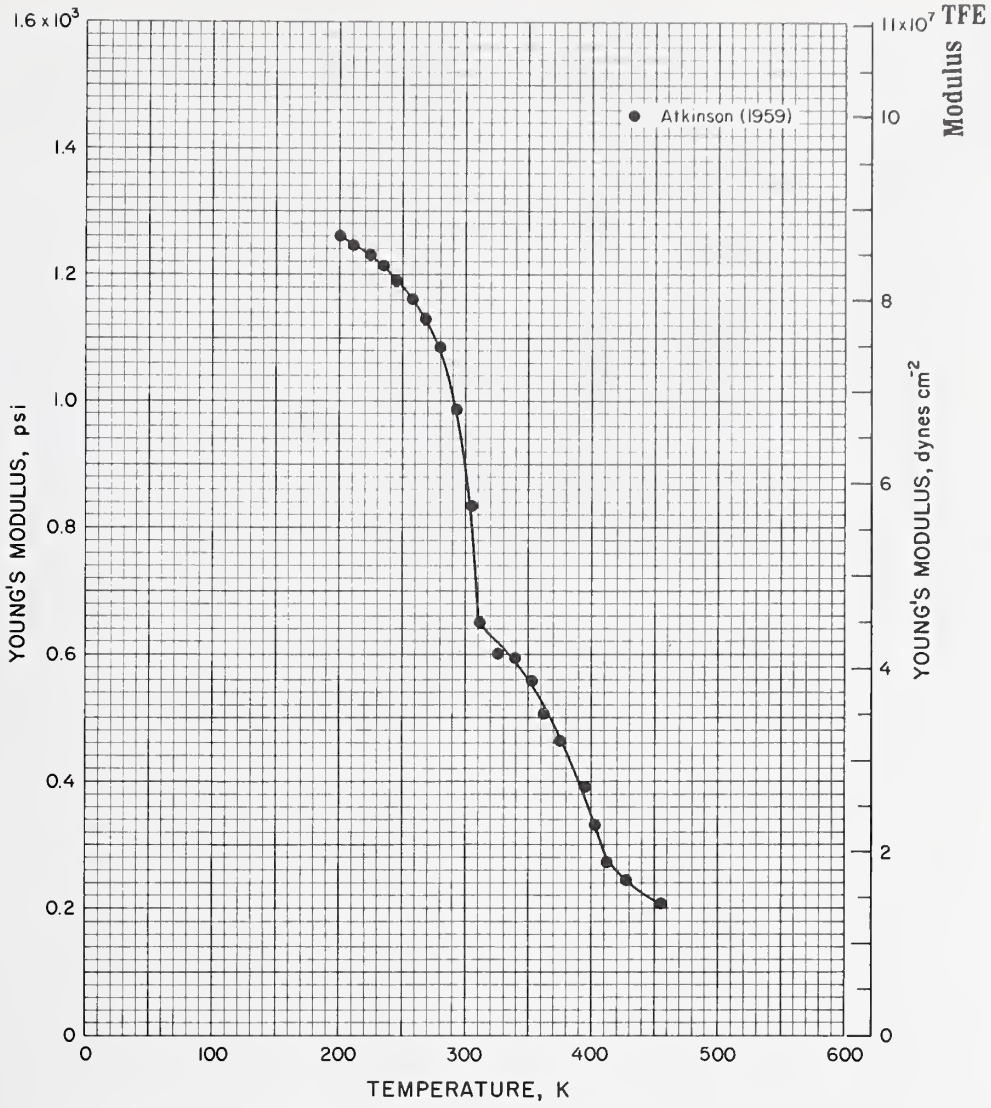
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Nakane, Takahashi, Iwayanagi (1966)	Sp gr = 2.163 at 292 K	Frequency of measurement noted.
Koton, Yakovlev, Rudakov, Knyazeva, Florinskii, Bessonov, Kuleva, Tolparova, Laius (1965)	Teflon	



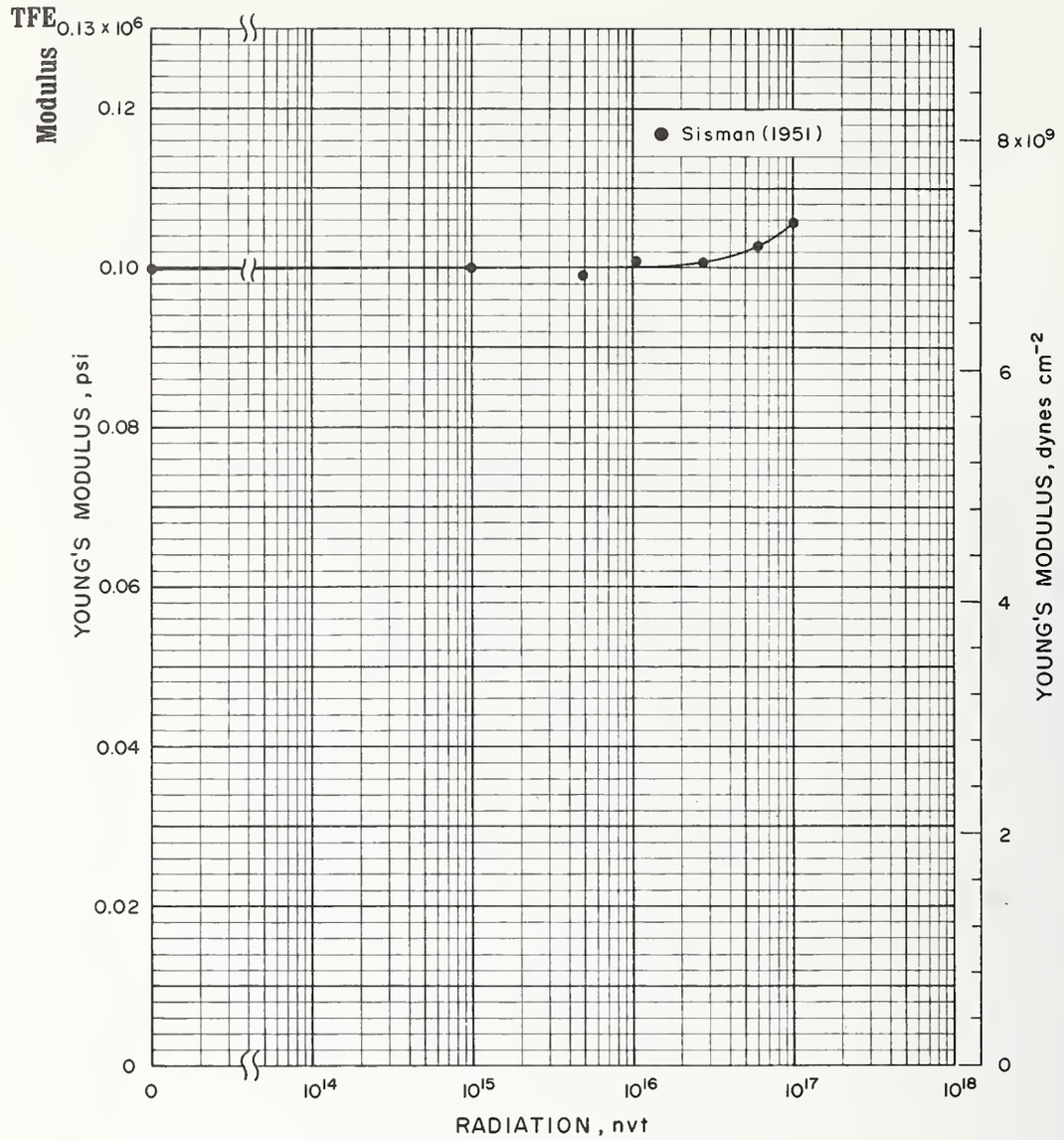
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Bernier, Kline, Sauer (1967)	TFE 7, number av molecular weight $\simeq 1.6 \times 10^{17}$; after irradiation and initial testing, some samples were annealed at 423 K for 100 h and then re-tested	l = 11.2 cm, diam = 0.64 cm; sample supported as a free bar and excited in the fundamental mode of flexural vibration, room temp density and dimensions used in all calculations; irrad in NBS 50 k Ci Co^{60} γ-ray facility at 10^7 Roentgens h^{-1}; the annealing treatment produced almost no change in the test results on the unirrad sample and the sample irrad to 1.96×10^8 rad.



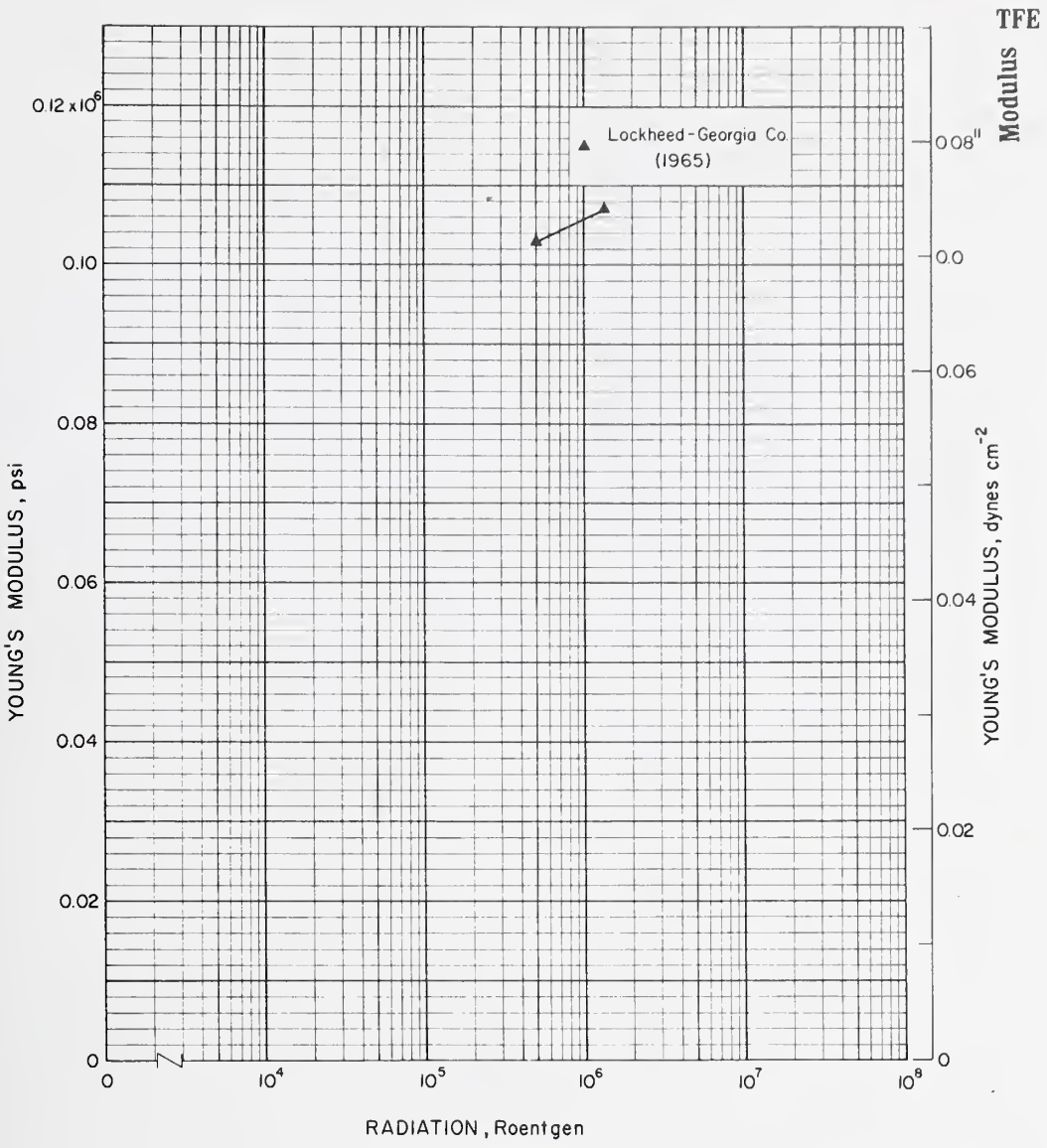
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Bernier, Kline, Sauer (1967)	TFE 7, number av molecular weight ~ 1.6×10^{17}; after irradiation and initial testing, some samples were annealed at 423 K for 100 h and then re-tested	ℓ = 11.2 cm, diam = 0.64 cm; sample supported as a free bar and excited in the fundamental mode of flexural vibration, room temp density and dimensions used in all calculations; all samples but one irrad in NBS 50 k Ci Co^{60} γ-ray facility at 10^7 Roentgens h^{-1}, one sample irrad to 7.8×10^7 rad in Pennsylvania State University nuclear reactor; the results on the samples irrad to 7.8×10^7 rad by Co^{60} and the nuclear reactor were nearly identical.



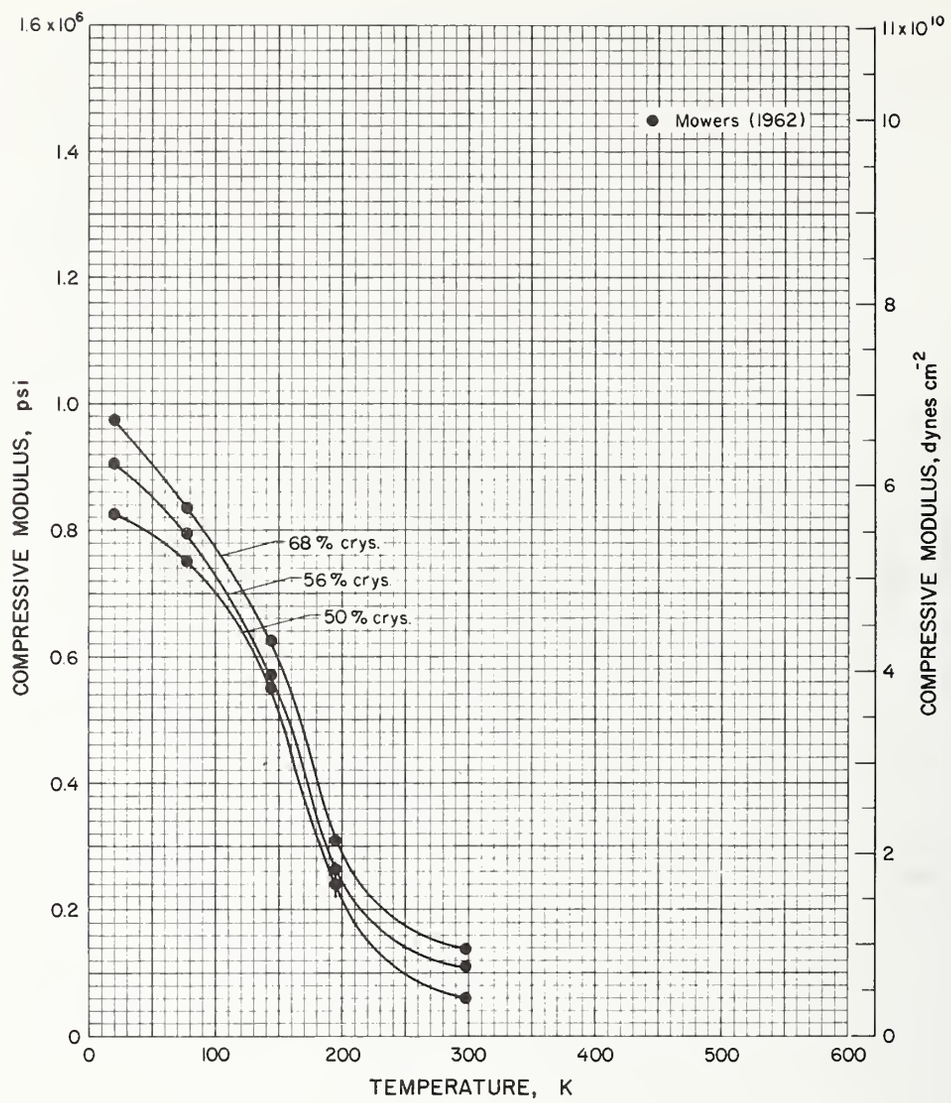
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Atkinson, Eagling (1959)	Teflon	$\ell \approx 5.08$ cm, w = 0.64 cm, t = 0.15 cm; vibrating reed apparatus.



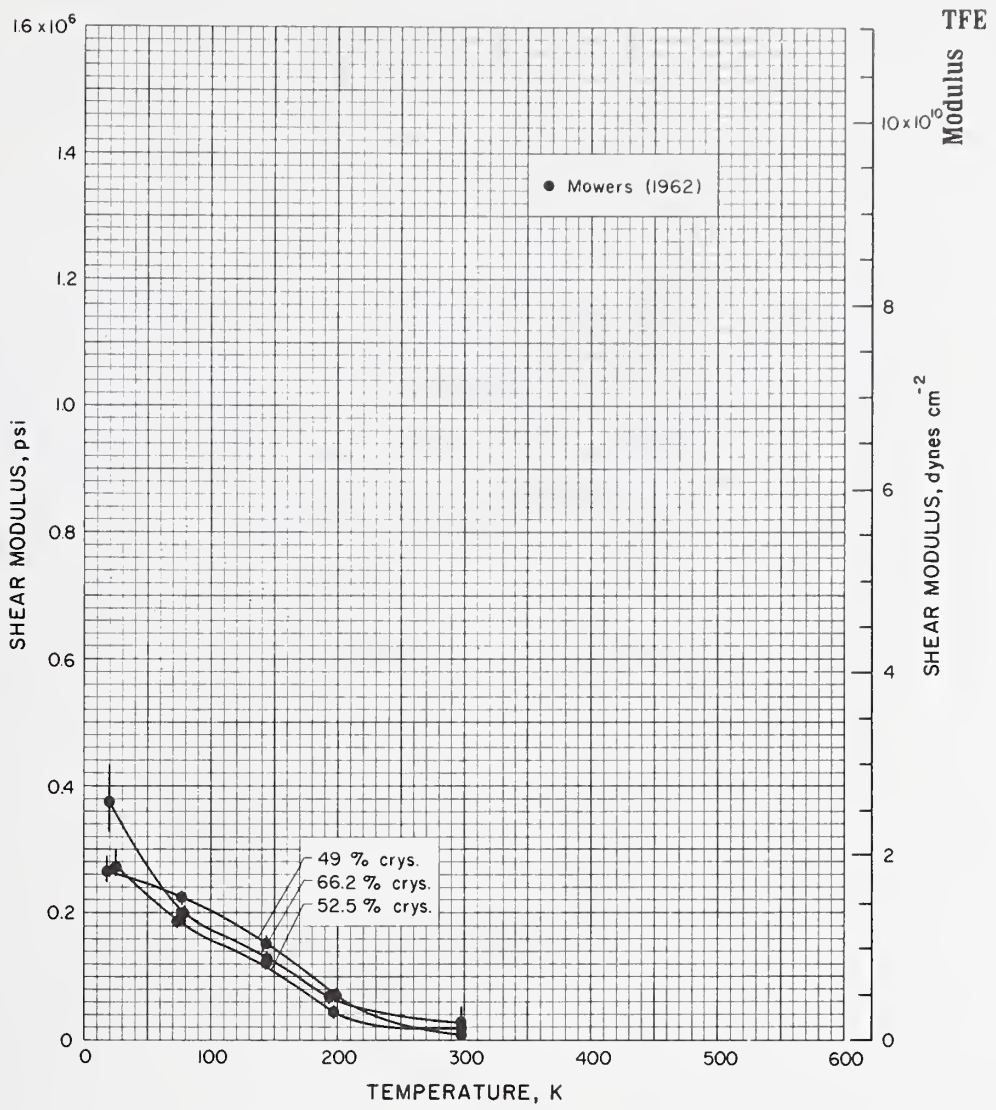
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Sisman, Bopp (1951)	Teflon	Red Sec ℓ = 5.72 cm, w = 1.27 cm; modified ASTM D 638-49T test procedure, Baldwin Southwark testing machine, xhd spd = 0.0021 cm s^{-1} to a strain of 0.02 and then xhd spd = 0.0085 cm s^{-1}; irrad in Hold 19 of ORNL reactor at 298-313 K and in air, aged 7 days at 298 ± 1 K and 50 ± 2% rel hum before testing.



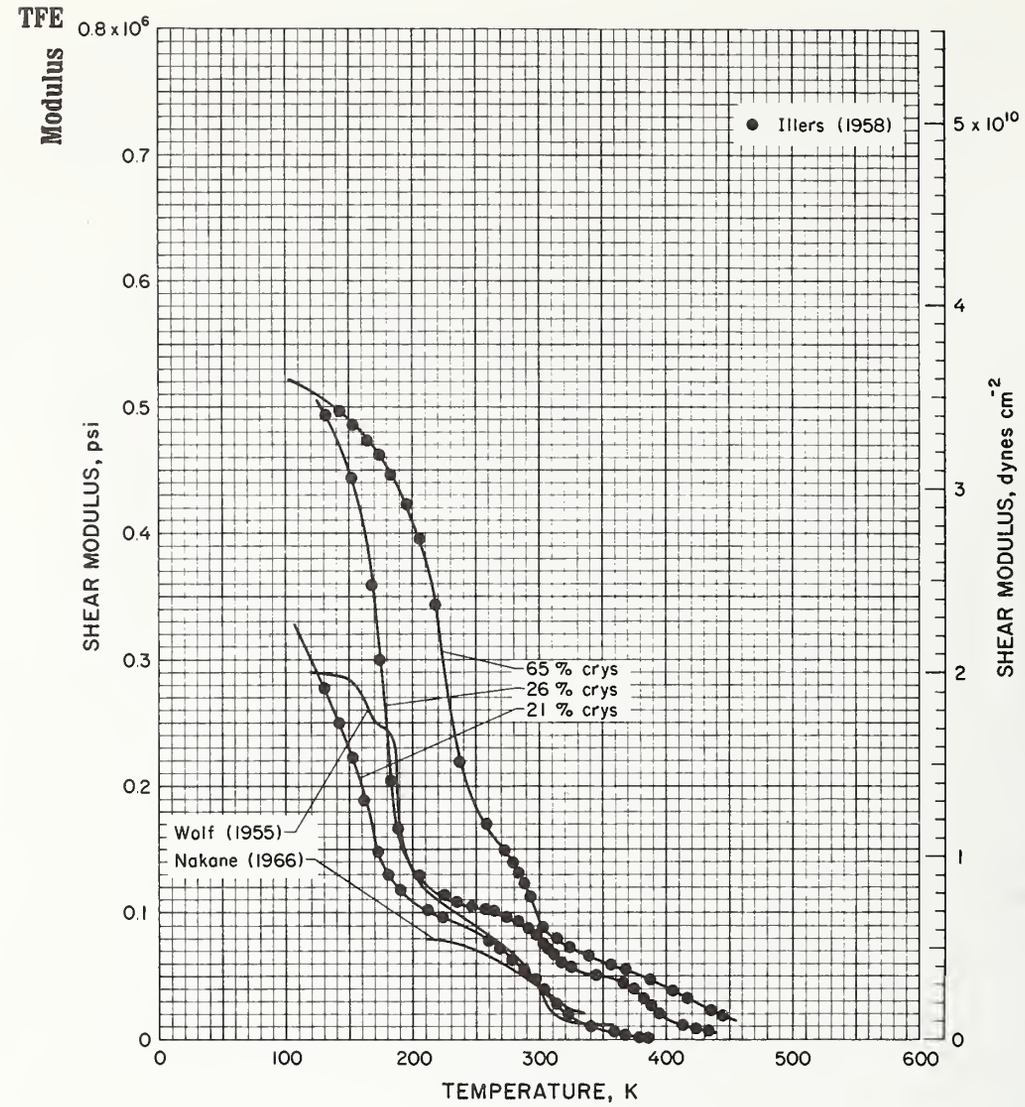
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Lockheed-Georgia Co. (1965)		ASTM D 638-61T test procedure, xhd spd - 0.010 cm s^{-1}, irrad in vacuum.



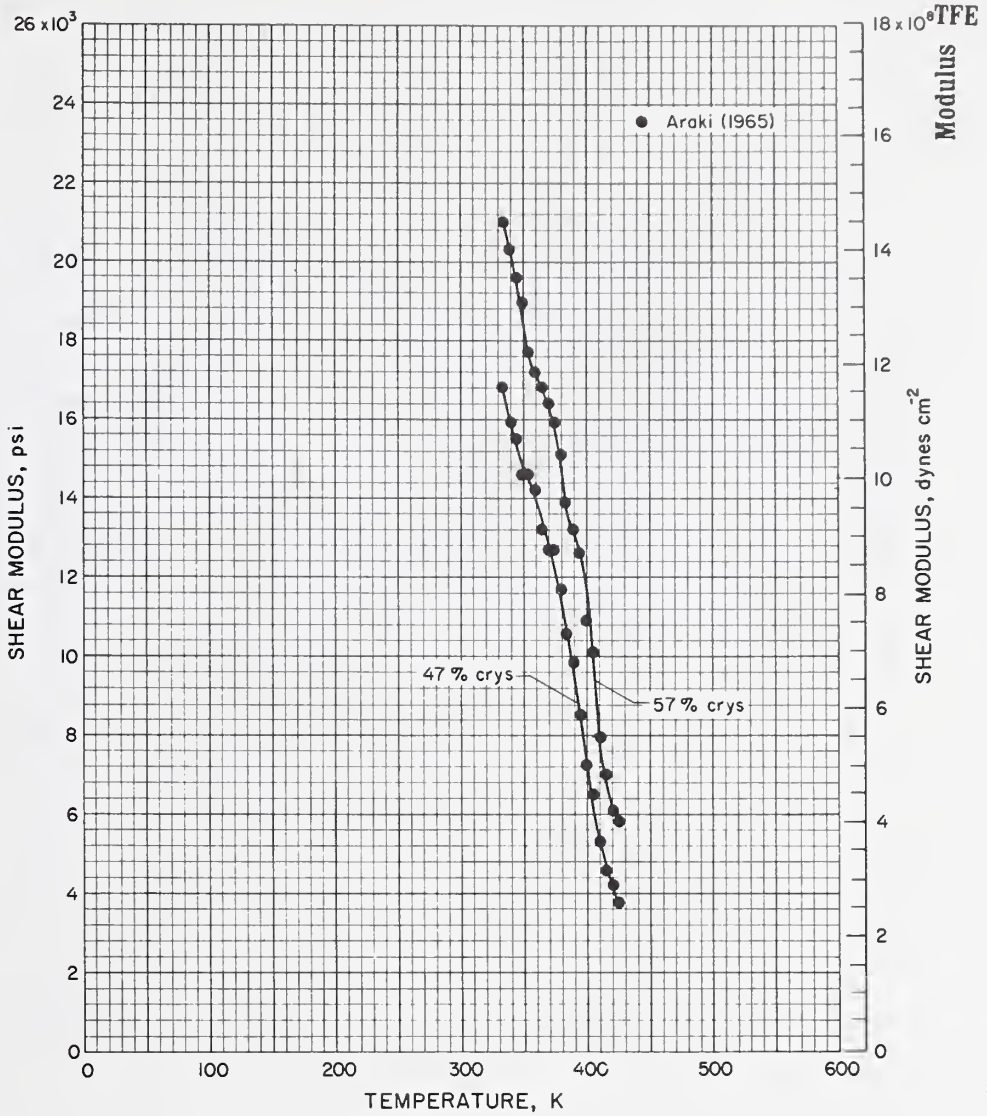
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 49-50% crys, sp gr = 2.148-2.152, molded at 655 K, 30 min, quick quenched; 52.5-56% crys, sp gr = 2.159-2.171, molded at 655 K, 30 min, quick quenched then held at 580 K for 5 h; 66.2-71% crys, sp gr = 2.199-2.226, molded at 655 K, 30 min, slow cooled then held at 599 K for 20 h.	ℓ = 2.54 cm, diam = 1.27 cm; Instron, ASTM D 695-54 test procedure, xhd spd = 0.0021 cm s^{-1}; av of at least 3 samples, error bar indicates data spread.



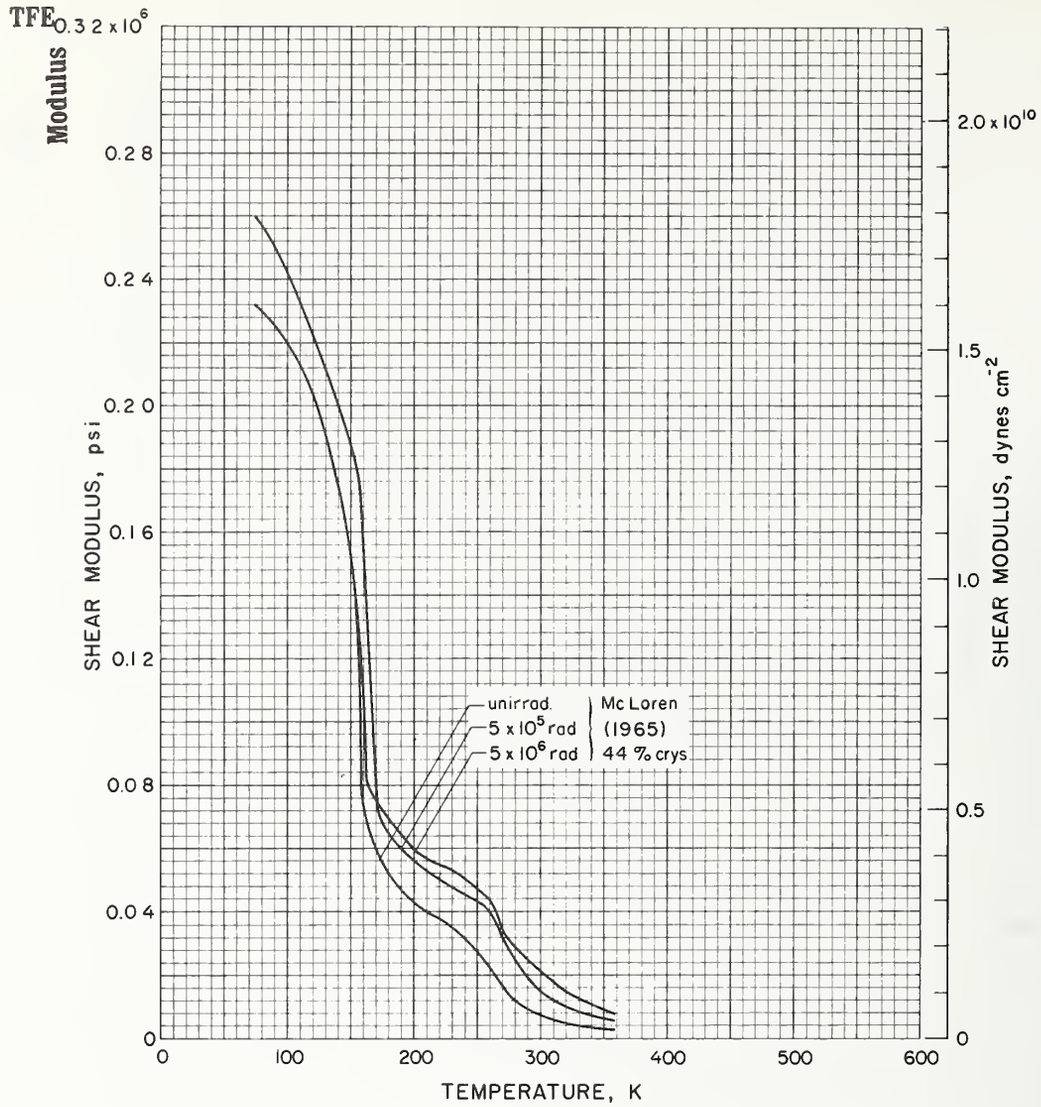
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 49-50% crys, sp gr = 2.148-2.152, molded at 655 K, 30 min, quick quenched; 52.5-56% crys, sp gr = 2.159-2.171, molded at 655 K, 30 min, quick quenched then held at 580 K for 5 h; 66.2-71% crys, sp gr = 2.199-2.226, molded at 655 K, 30 min, slow cooled then held at 599 K for 20 h.	Tinius-Olsen tester, ASTM DI 043-51 test procedure; av of at least 3 samples, error bar indicates data spread.



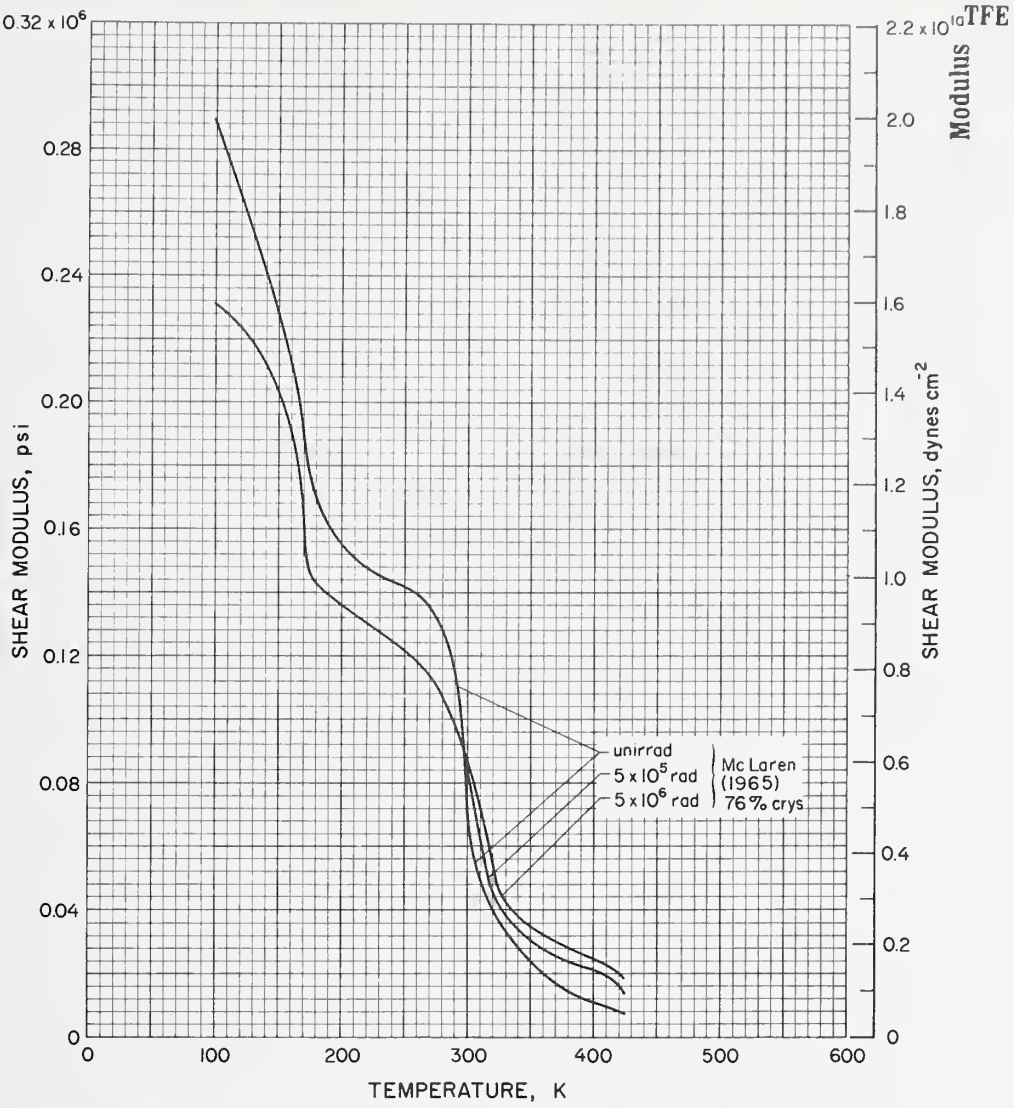
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Wolf, Schmeider (1955)		
Illers, Jenckel (1958)		t 0.05 - 0.25 cm, w = 1 cm; frequency = 1 Hz.
Nakane, Takahashi, Iwayanagi (1966)	Sp gr 2.163 at 292 K	Frequency < 1 Hz.



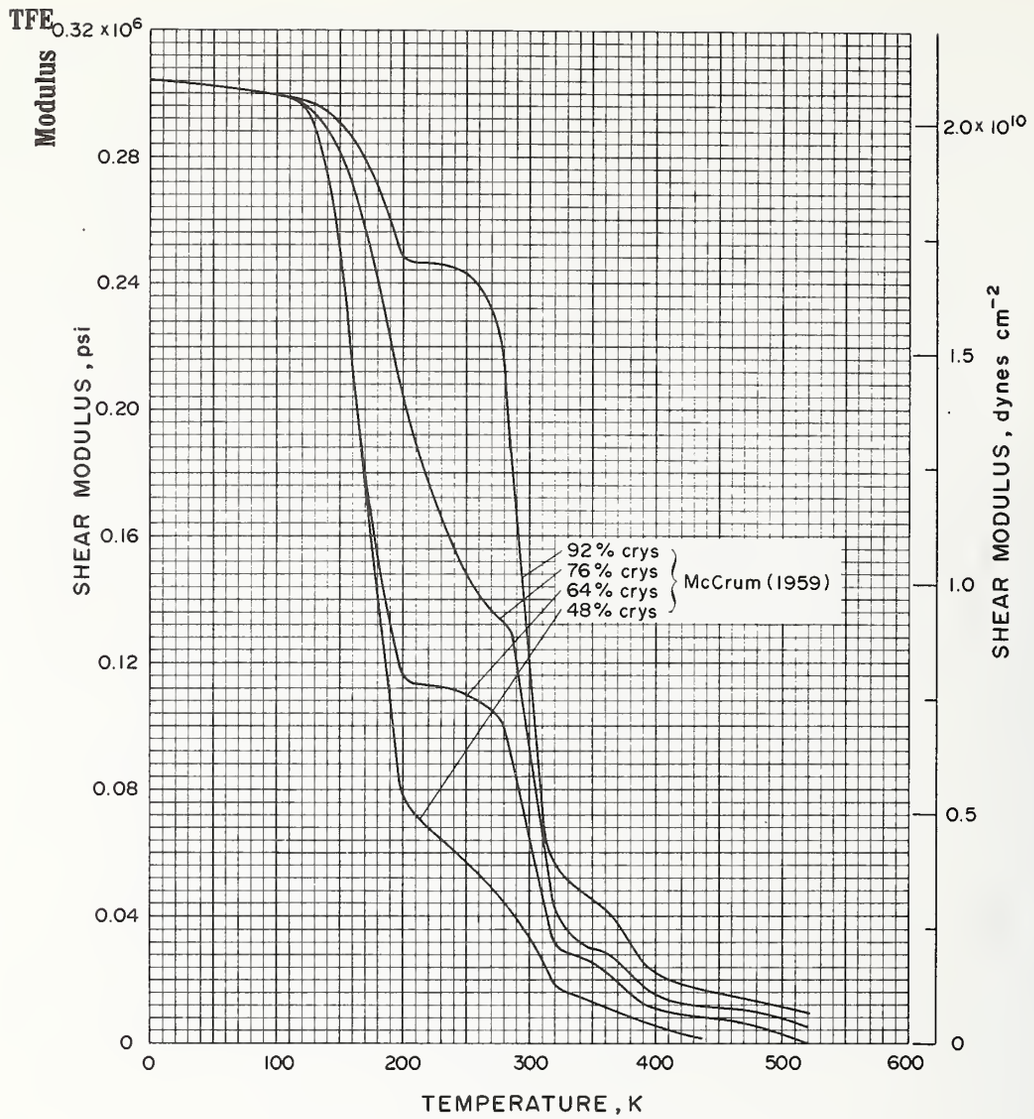
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Araki (1965)	Teflon 5	ℓ = 8 cm, w = 1 cm, t = 0.1 cm; torsion pendulum method. Voight model assumed, temp regulated to ± 0.1 K.



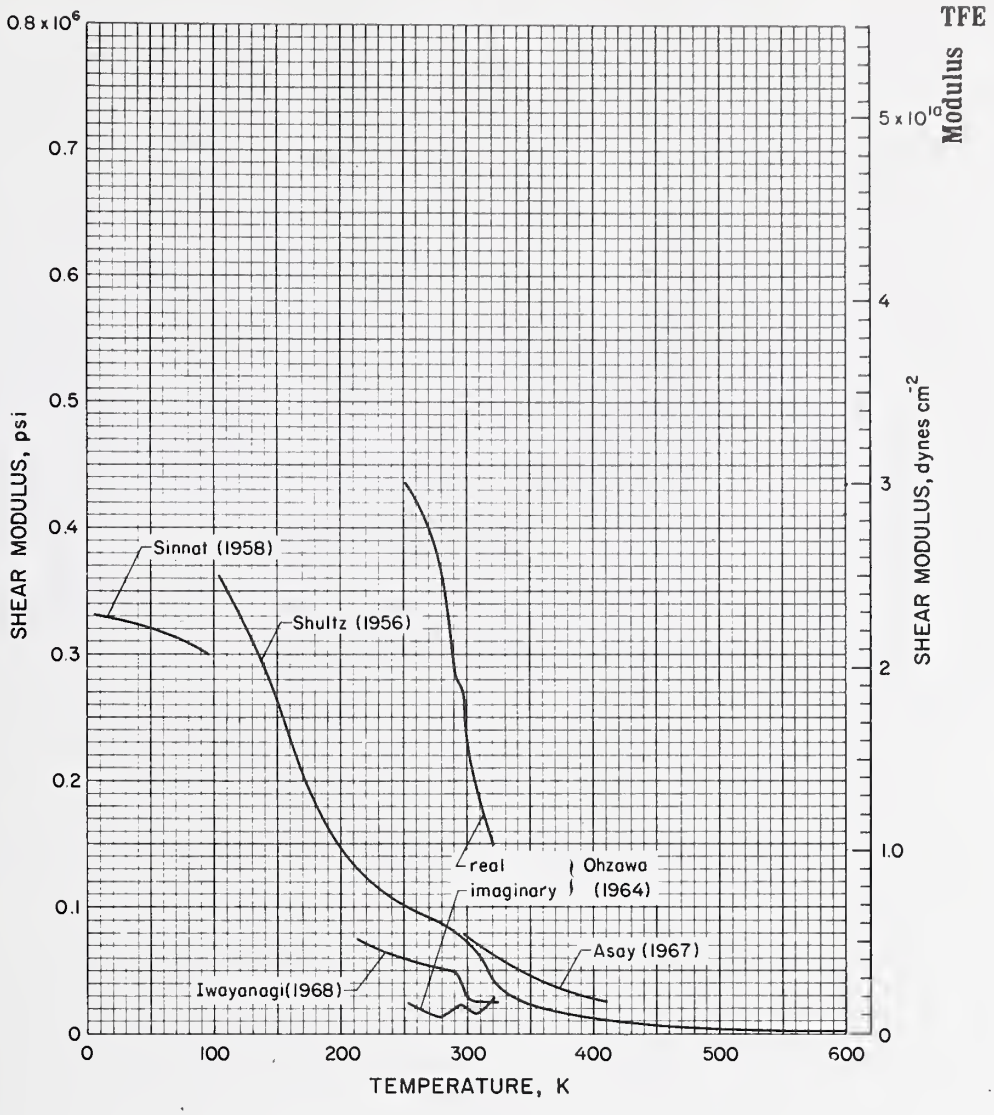
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
McLaren (1965)	Quenched from 643 K into ice water, approx 44% crys	ℓ = 5.0 cm, w = 0.635 cm, t = 0.038 cm; torsion pendulum apparatus, specimens cooled to 103 K and then warmed at 0.008 K s^{-1}, frequency varied from 0.5-1.0 Hz at 103 K to 0.08-0.2 Hz at 393 K; sealed in evacuated glass tubes for 3 days, irrad by Co^{60} at 296 K, opened to air for 1 week before measurements; experimental points not included here.



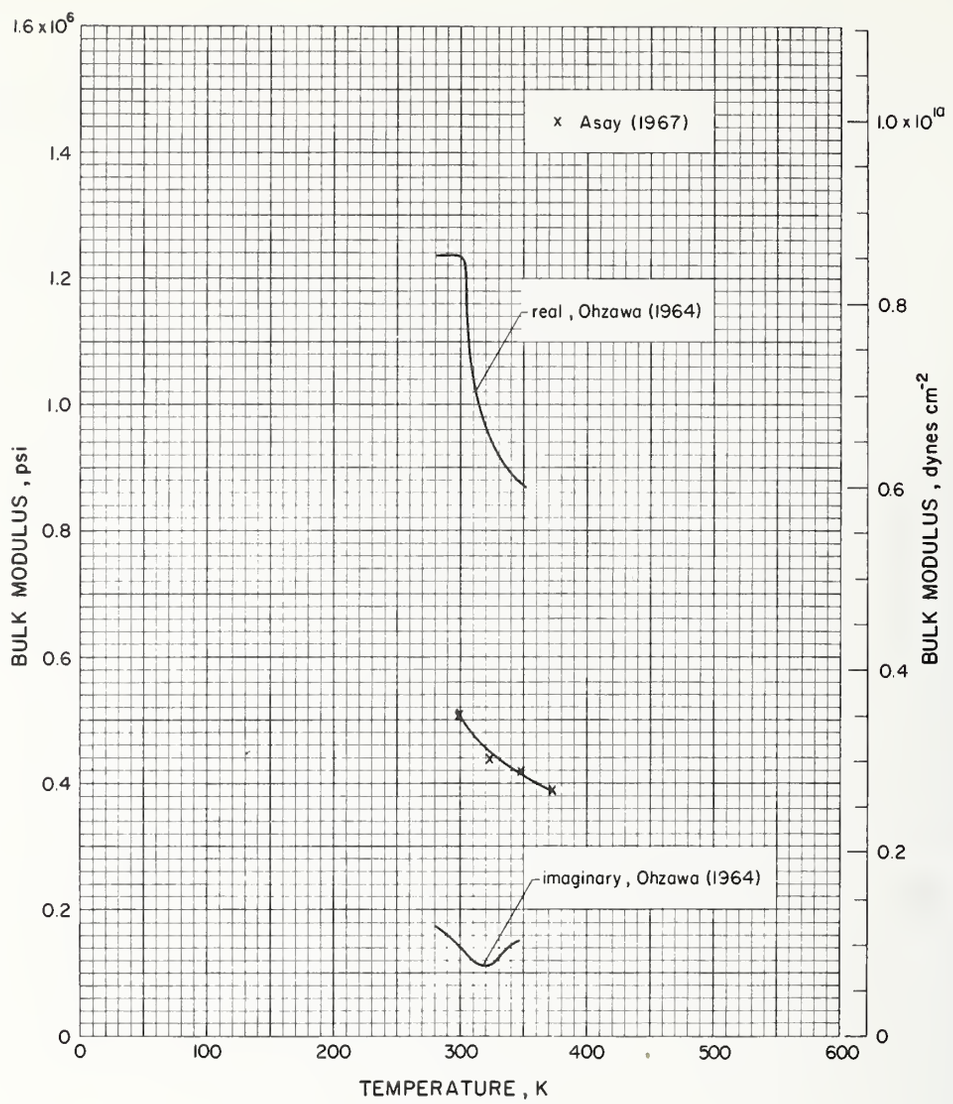
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
McLaren (1965)	Heated to 653K then cooled to 533K at 2-3K h^{-1}, approx 76% crys	ℓ = 5.0 cm, w = 0.635 cm, t = 0.038 cm, torsion pendulum apparatus, specimens cooled to 103K and then warmed at 0.008 K s^{-2}, frequency varied from 0.5-1.0 Hz at 103K to 0.08-0.2 Hz at 393K; sealed in evacuated glass tubes for 3 days; irrad by Co^{60} at 296K, opened to air for 1 week before measurements; experimental points not included here.



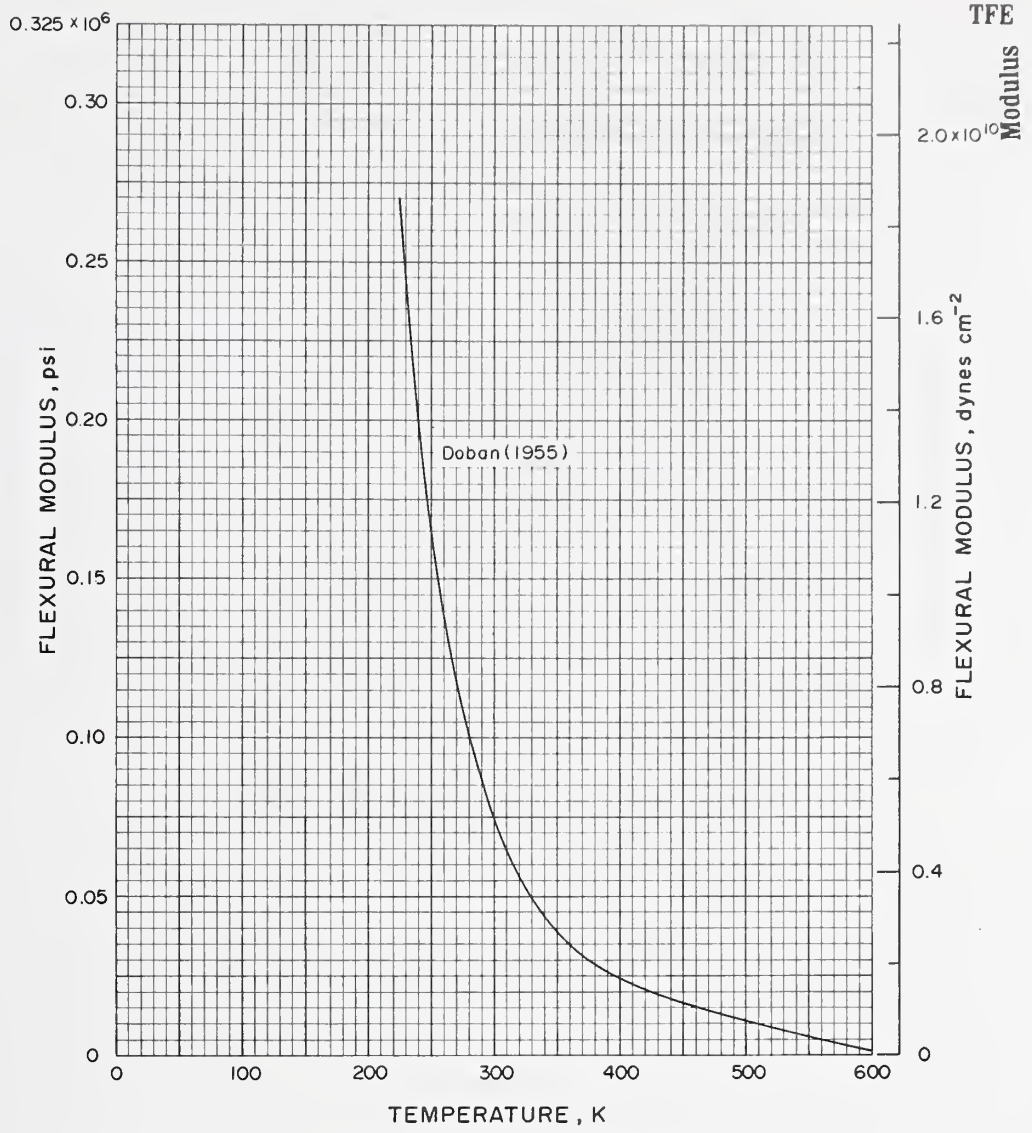
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
McCrum (1959)		l = 7.62 cm, w 1.27 cm, t = 0.152 cm, crys determined by infrared method; measurements by torsion pendulum.



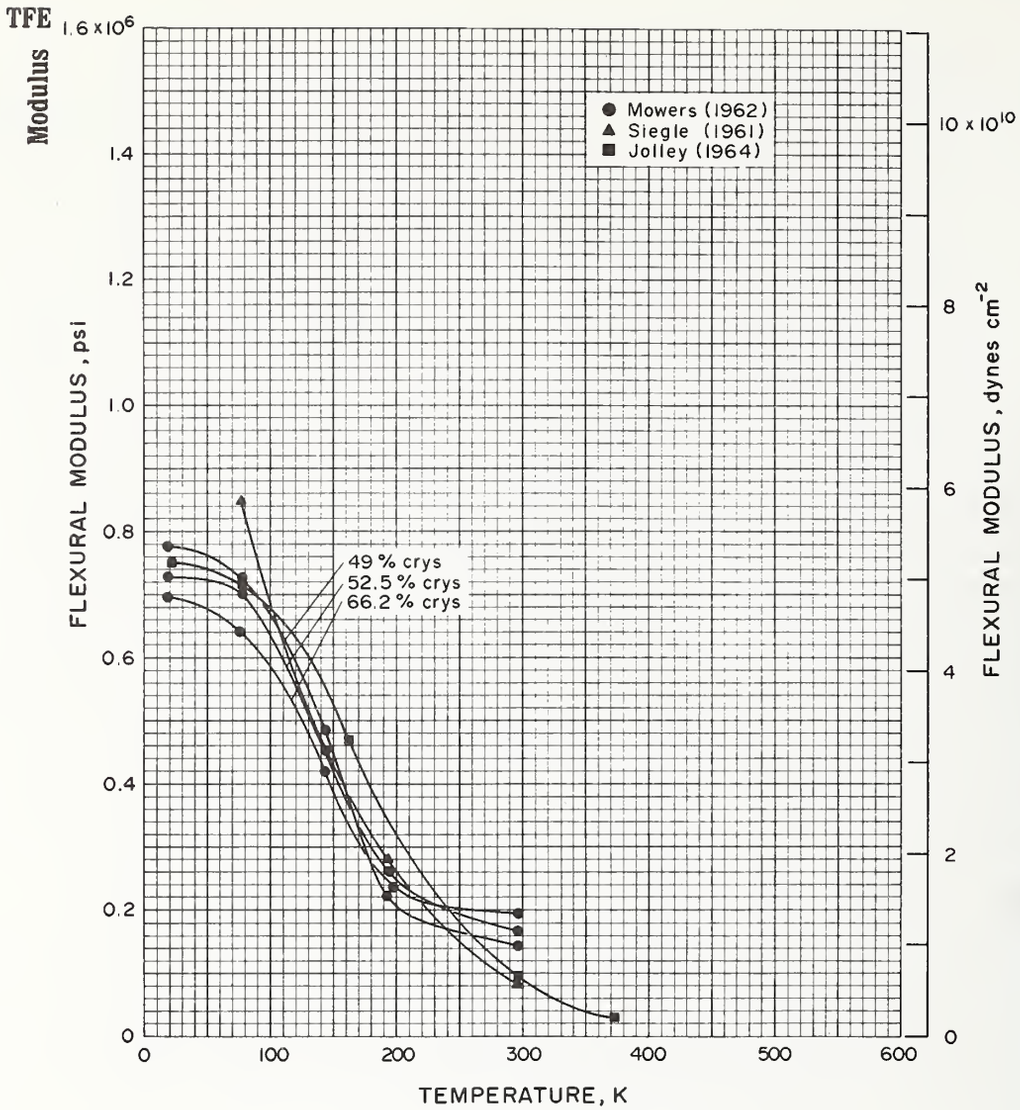
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Asay, Guenther (1967)	Teflon, sp gr = 2.19	Samples machined flat and to within a few microns; quartz transducer operated at fundamental frequency of 1 x 10^8 Hz or at 3rd harmonic, trans signal received by 2nd transducer crystals bonded with epoxy resin; 1-2% uncertainty; data points not shown.
Ohzawa, Wada (1964)	68% crys	t = 0.6 cm; composite oscillator technique, 3.3 x 10^5 Hz; data points not shown.
Iwayanagi, Nakane (1968)		Free torsional vibration below 1 Hz; data points not shown.
Schulz (1956)		0.2-1Hz
Sinnott (1958)	55% crys	l = 7.62 cm, w = 1.27 cm, t = 0.152 cm; small torsion pendulum, usual frequency 6 Hz; estimated accuracy = ± 5%.



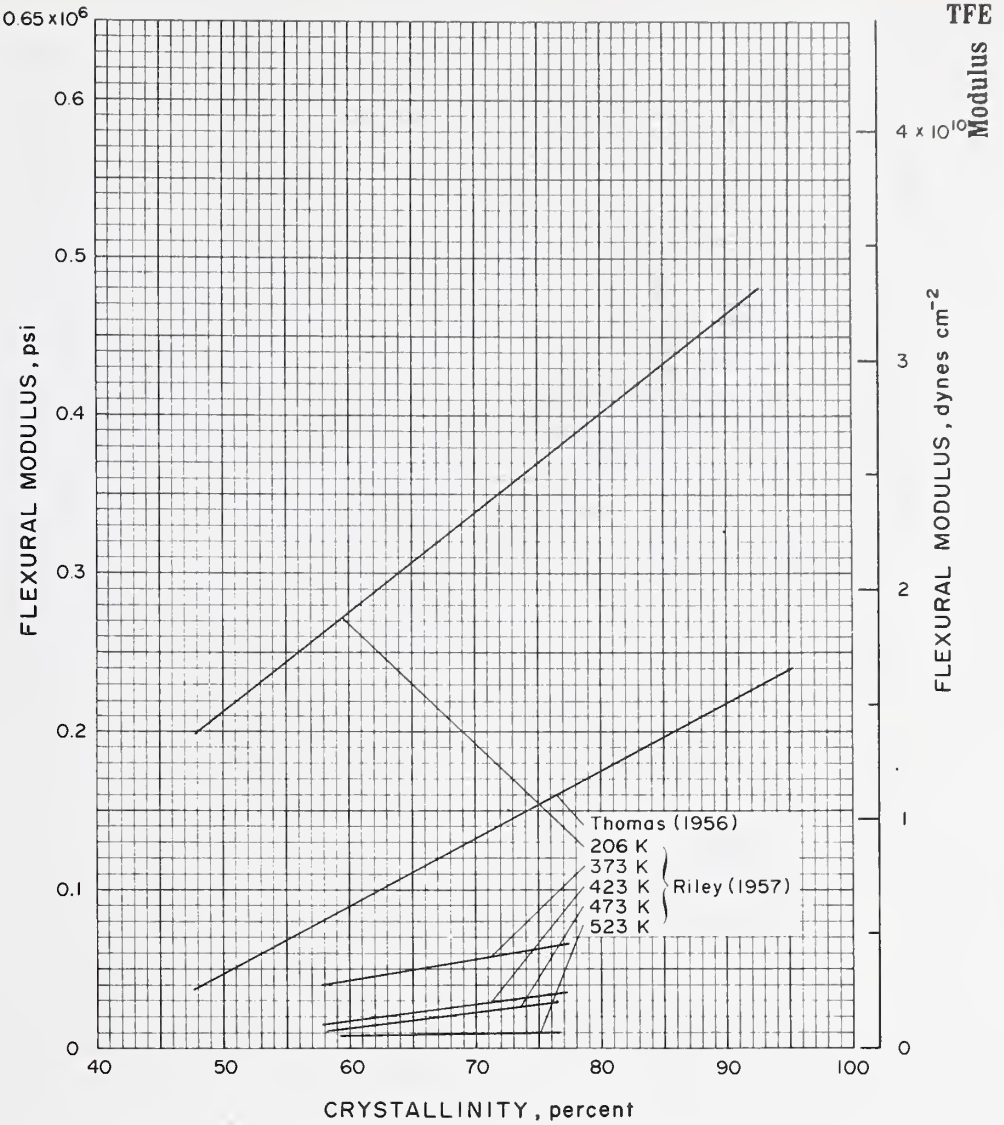
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Asay, Guenther (1967)	Teflon, sp gr = 2.19	Ceramic transducer operated at 1-10 x 10^6 Hz, signal received by 2nd transducer; not all points plotted.
Ohzawa, Wada (1964)	Aqueous suspension of as-polymerized powder in 10% volume concentration, av particle radius = 0.2 μ, particle sp gr = 2.295, almost perfect crys.	Ultrasonic measurements at 1 x 10^6 Hz, data points not shown.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Doban, Sperati, Sandt (1955)	Teflon, sp gr - 2.1-2.3	

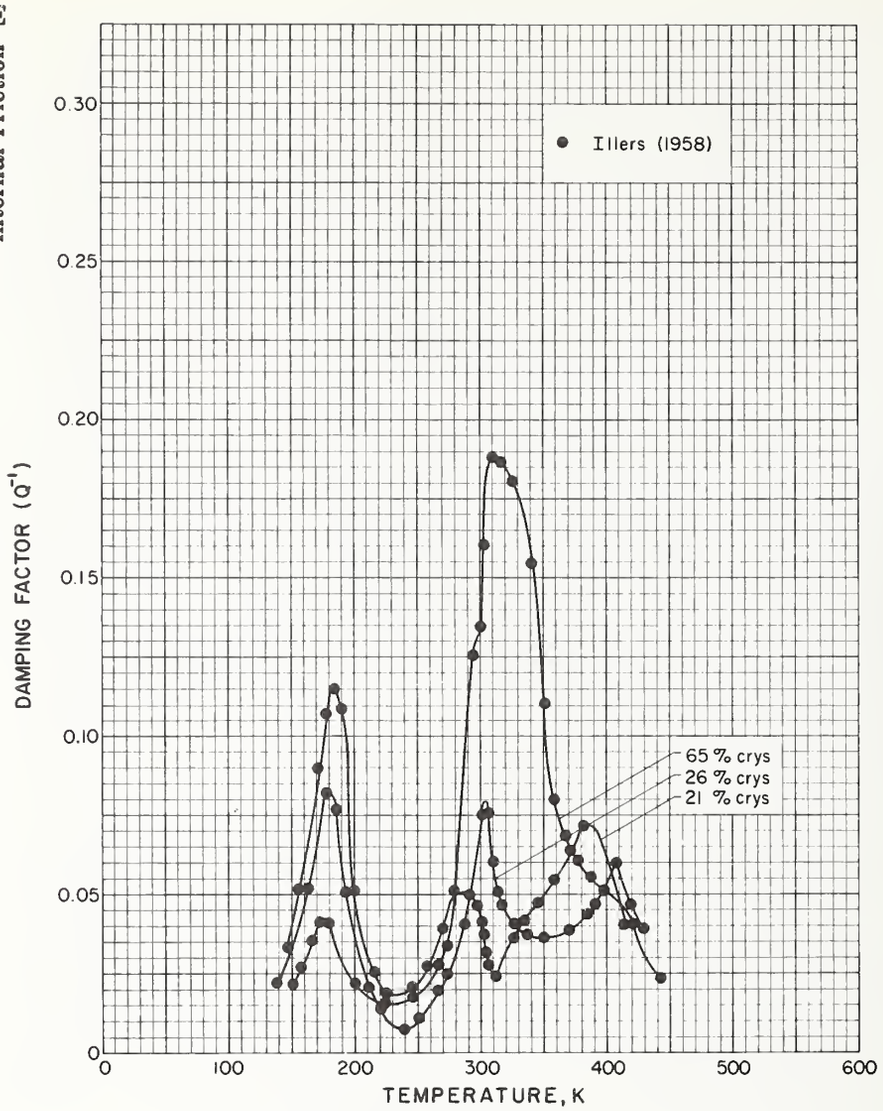


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 49-50% crys, sp gr = 2.148-2.152, molded at 655 K, 30 min, quick quenched; 52.5-56% crys, sp gr = 2.159-2.171, molded at 655 K, 30 min, quick quenched then held at 580K for 5 h; 66.2-71% crys, sp gr = 2.199-2.226, molded at 655 K, 30 min, slow cooled then held 599 K for 20 h.	5.07 x 0.446 cm, t varied but ratio of ℓ/t maintained at 16; Instron, xhd spd = 0.0021 cm s^{-1} ASTM D 790-495 test procedure, miniature size dies used.
Siegle (1961)	Teflon, 66% crys	ASTM D 790 test procedure.
Jolley, Homsy, Reed (1964)	Teflon	ASTM D 747 test procedure.

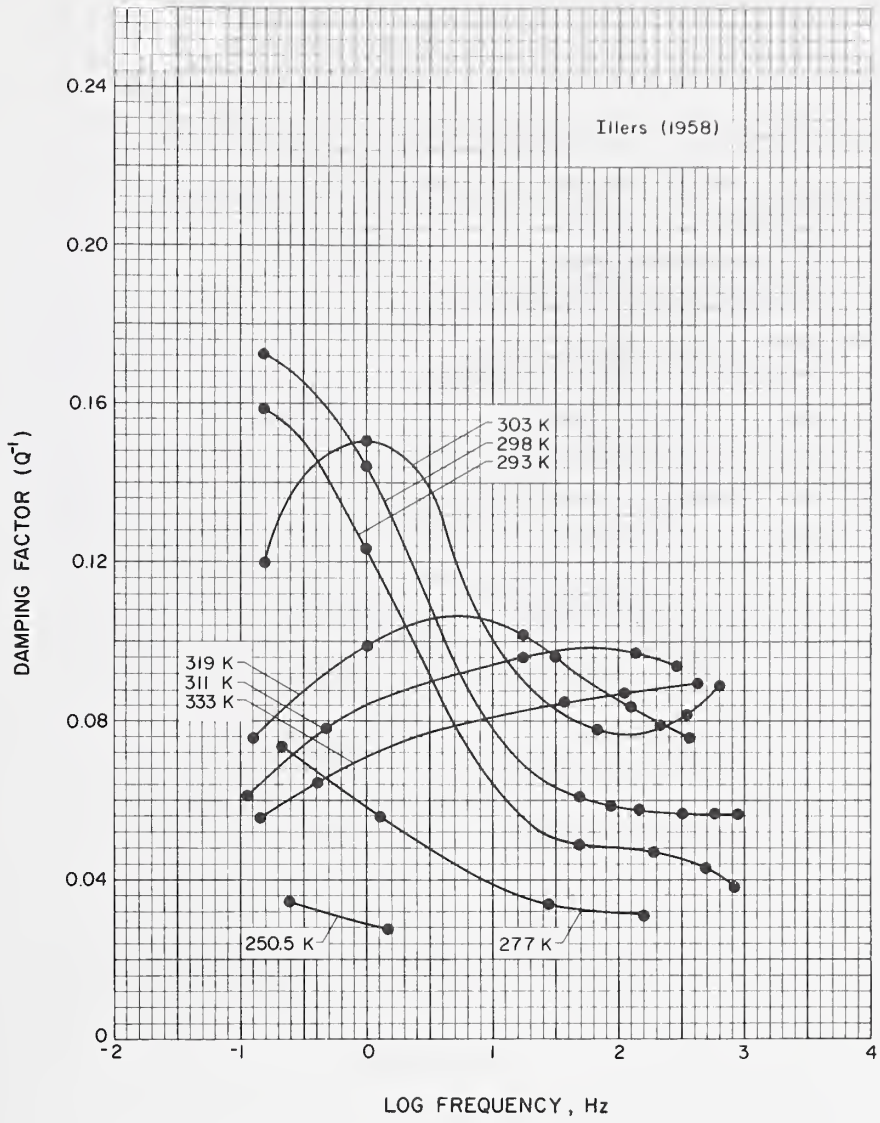


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Thomas, Lontz, Sperati, McPherson (1956)	Teflon, void content = 0% and 2%	ASTM D-790 test procedure, 296 K, data points not shown.
Riley (1957)	Teflon	

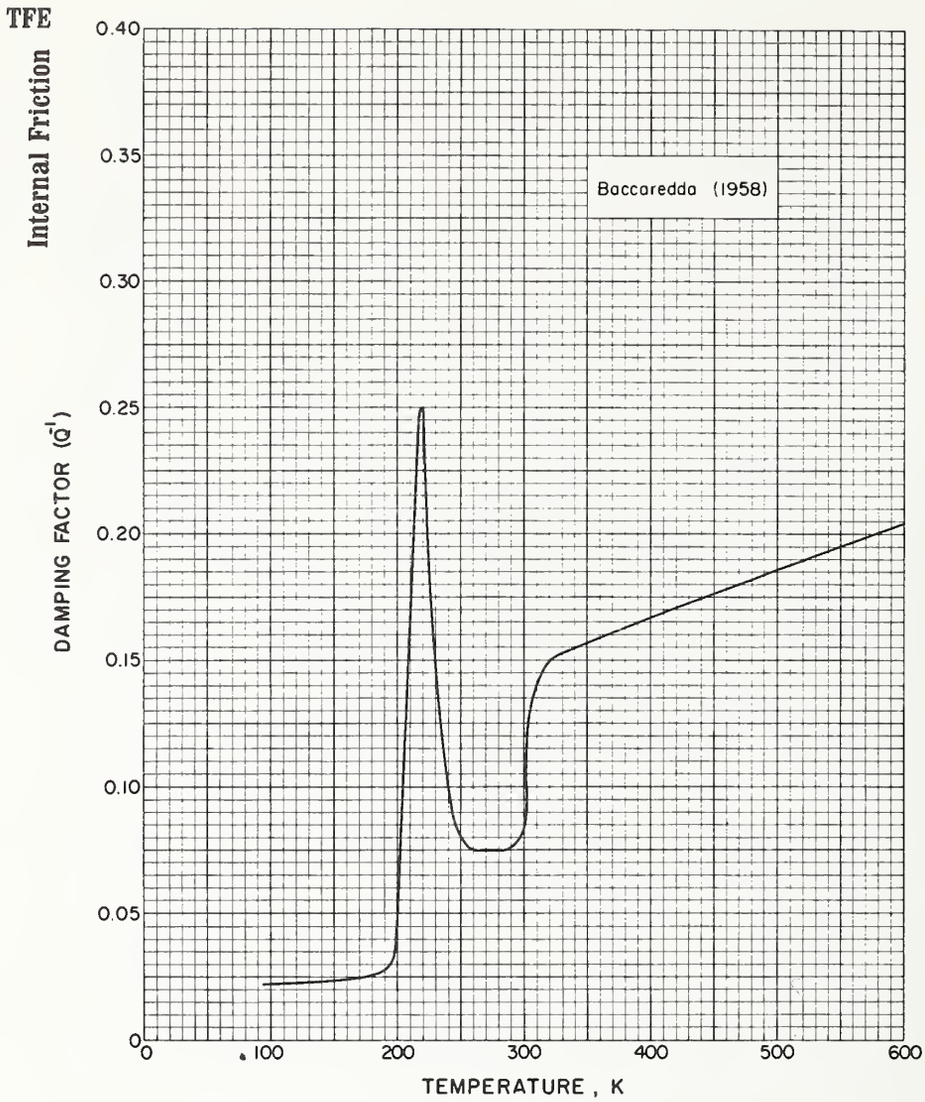
TFE



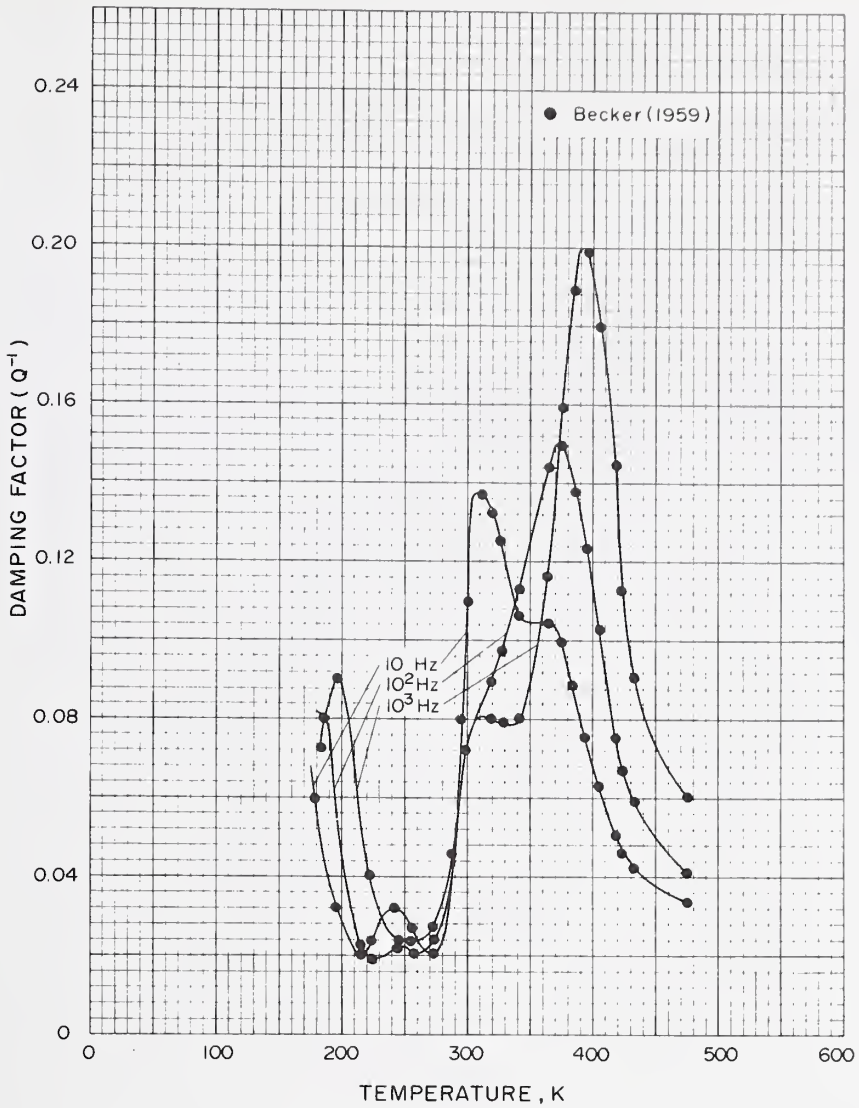
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Illers, Jenckel (1958)	Teflon	w = 1 cm, t = 0.05-0.25 cm; 1 Hz.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Illers, Jenckel (1958)	Teflon, 26% crys	w = 1 cm, t = 0.05-0.25 cm.



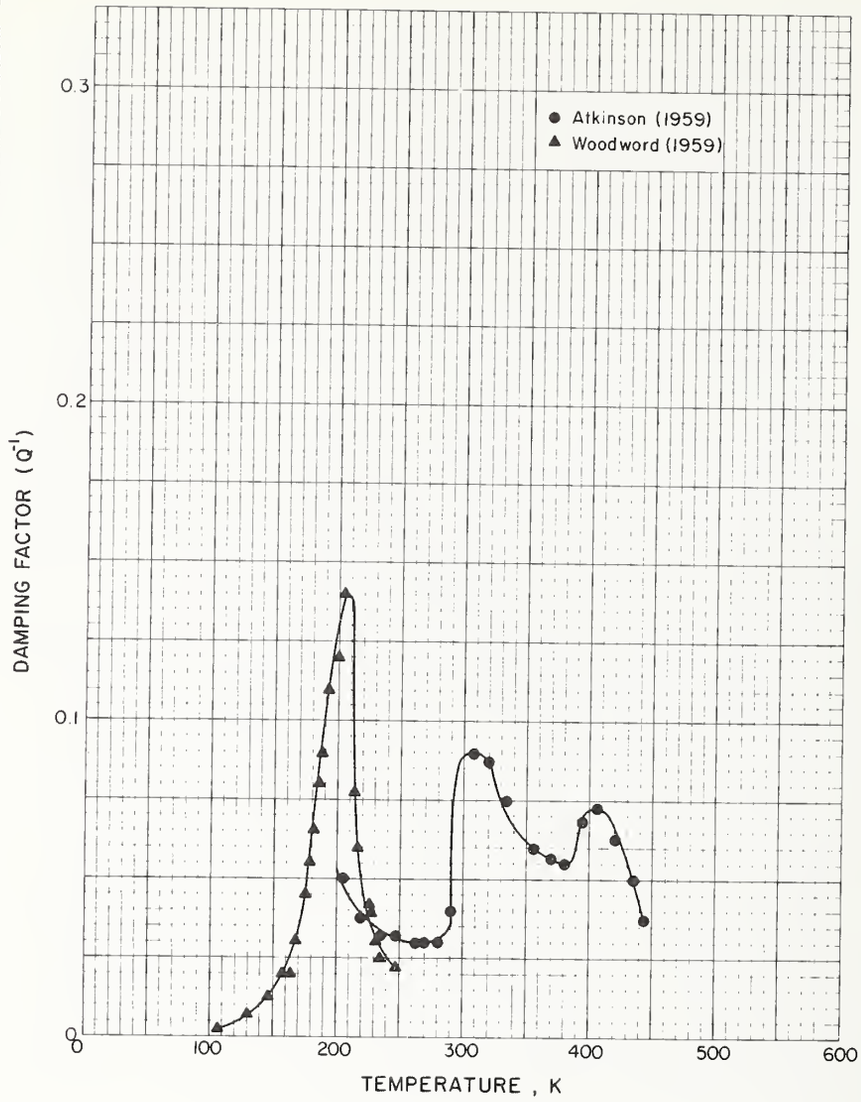
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Baccaredda, Butta (1958)	TFE	Frequency of 2-25 x 10^3 Hz; curve represents a series of experimental points.



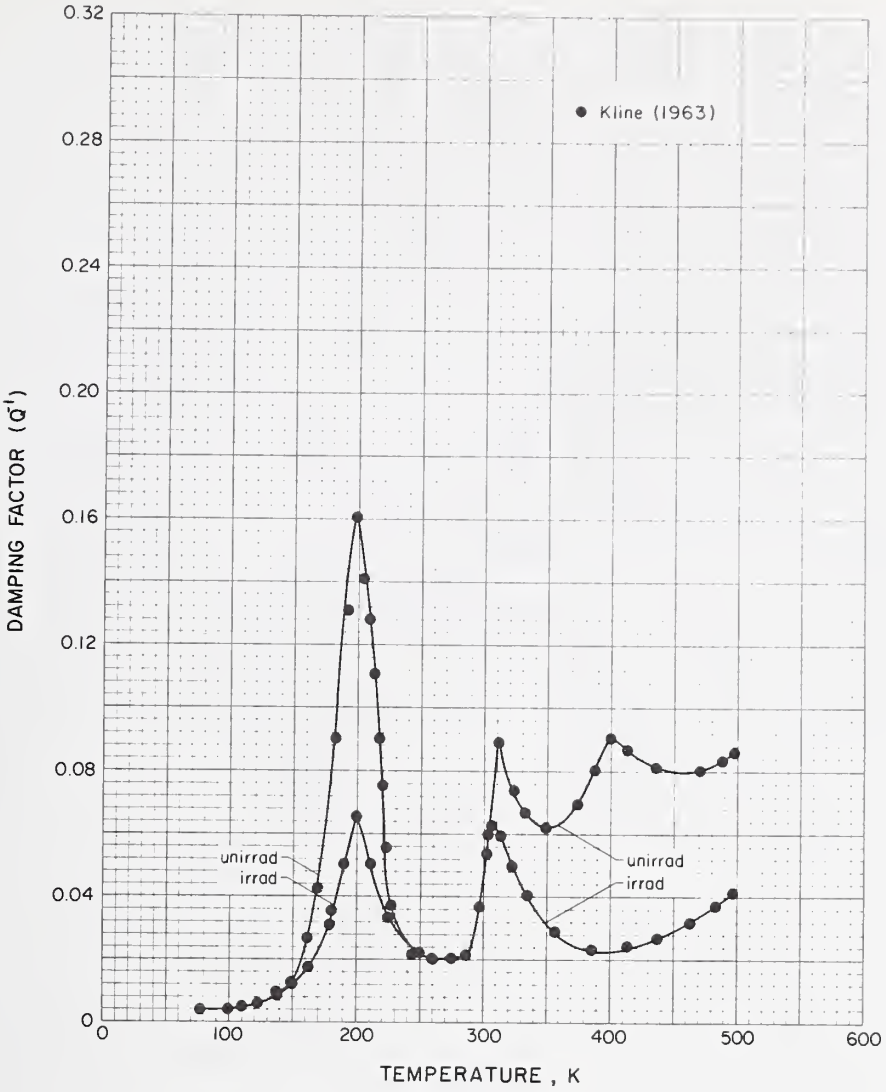
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Becker (1959)	Hostaflon TF, sp gr = 2.14 ± 0.02, 46 ± 2% crys	

TFE

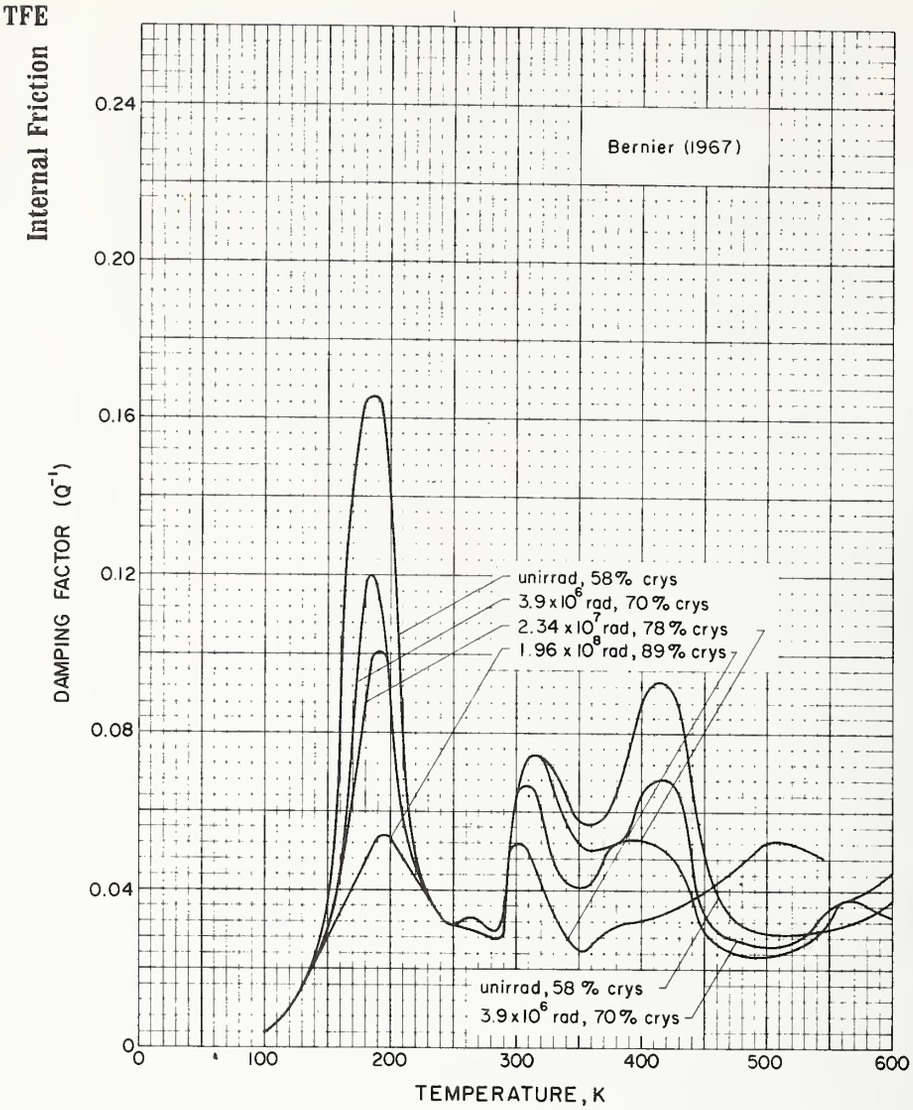
Internal Friction



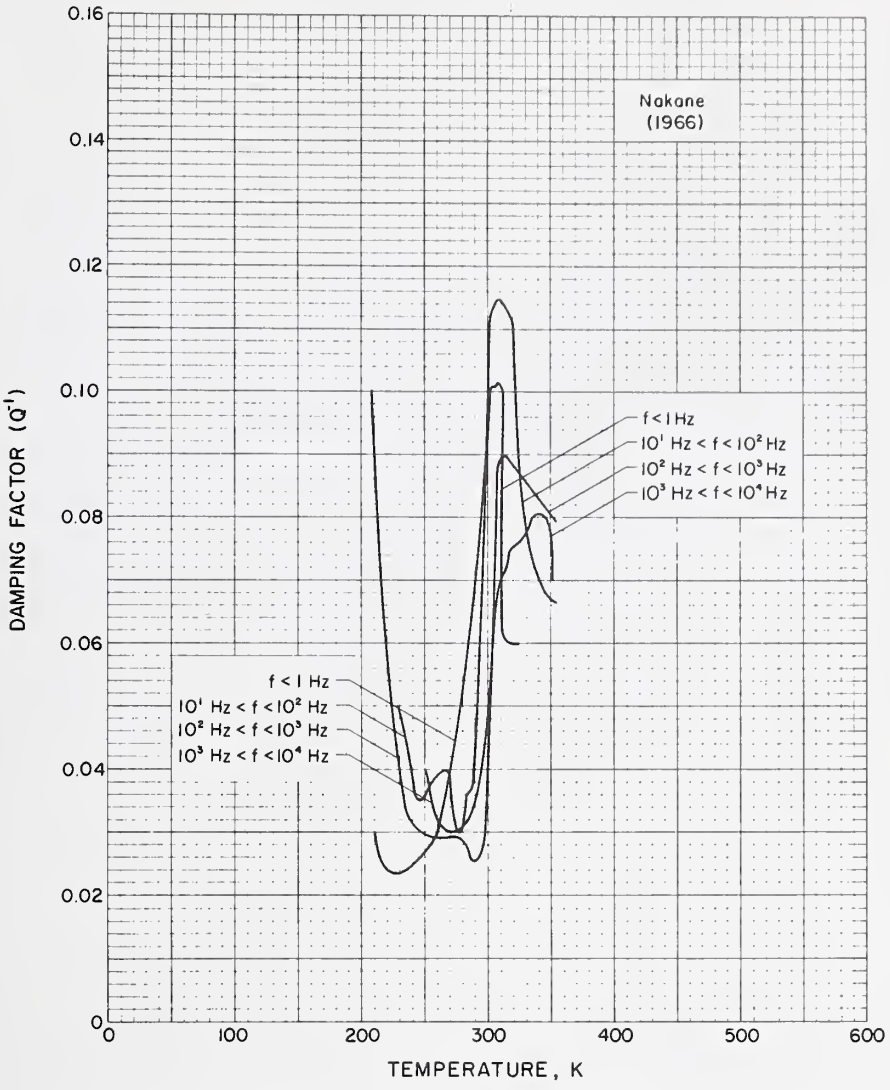
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Atkinson, Eagling (1959)	Teflon	5.1 x 0.64 x 0.15 cm; vibrating reed apparatus.
Woodward, Sauer (1959)	Sp gr = 2.160 at 298 K, 64% crys	



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kline, Sauer (1963)	TFE, unirrad sp gr = 2.17, crys = 59%; irrad sp gr = 2.54, crys = 83%	Diam = 0.64 cm, ℓ = 10.2 cm; frequencies used ranged from 100 to 2100 Hz, measurements consist of driving a horizontal specimen supported on vertical cotton threads through its natural trans vibration frequency and observing the deformational response; irrad in nuclear reactor for 18 h, received about 10^5 rads, energy is 1/6 from fast neutron collisions and 5/6 from gamma ray interactions.

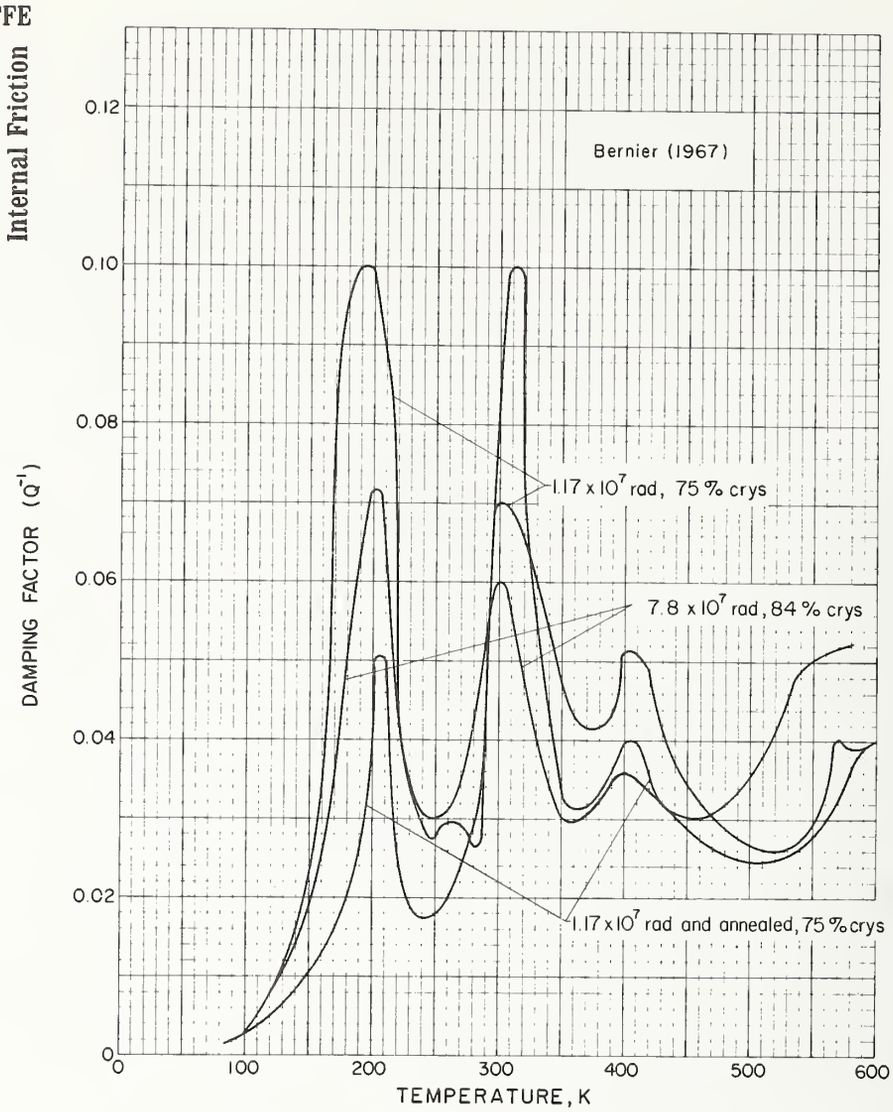


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bernier, Kline, Sauer (1967)	TFE 7, number av molecular weight $\sim 1.6 \times 10^{17}$; after irradiation and initial testing, some samples were annealed at 423 K for 100 h and then re-tested.	$\ell = 11.2$ cm, diam = 0.64 cm; sample supported as a free bar and excited in the fundamental mode of flexural vibration, room temp density and dimensions used in all calculations; irrad in NBS 50k Ci Co^{60} γ-ray facility at 10^7 Roentgens h^{-1}; the annealing treatment produced almost no change in the test results on the unirrad sample and the sample irrad to 1.96×10^8 rad.

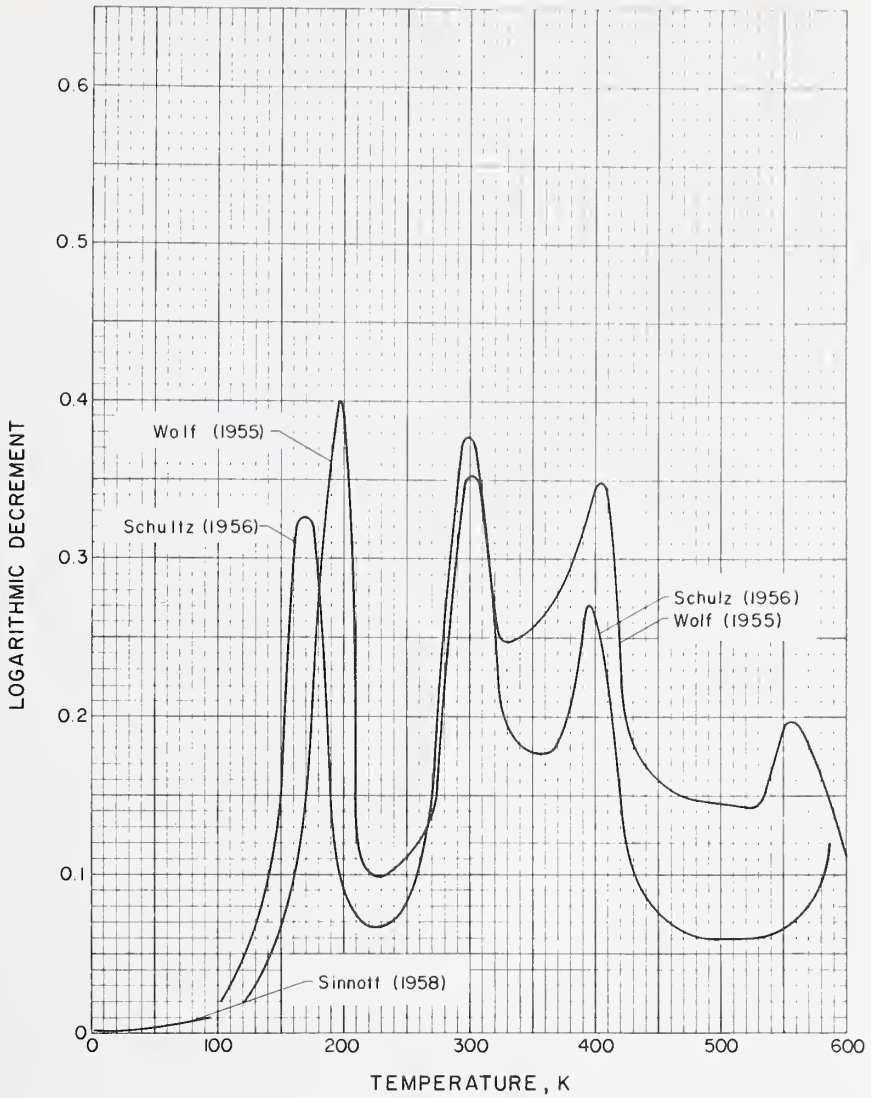


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Nakane, Takahashi, Iwayanagi (1966)	Sp gr = 2.163 at 292 K	Frequency of measurement noted.

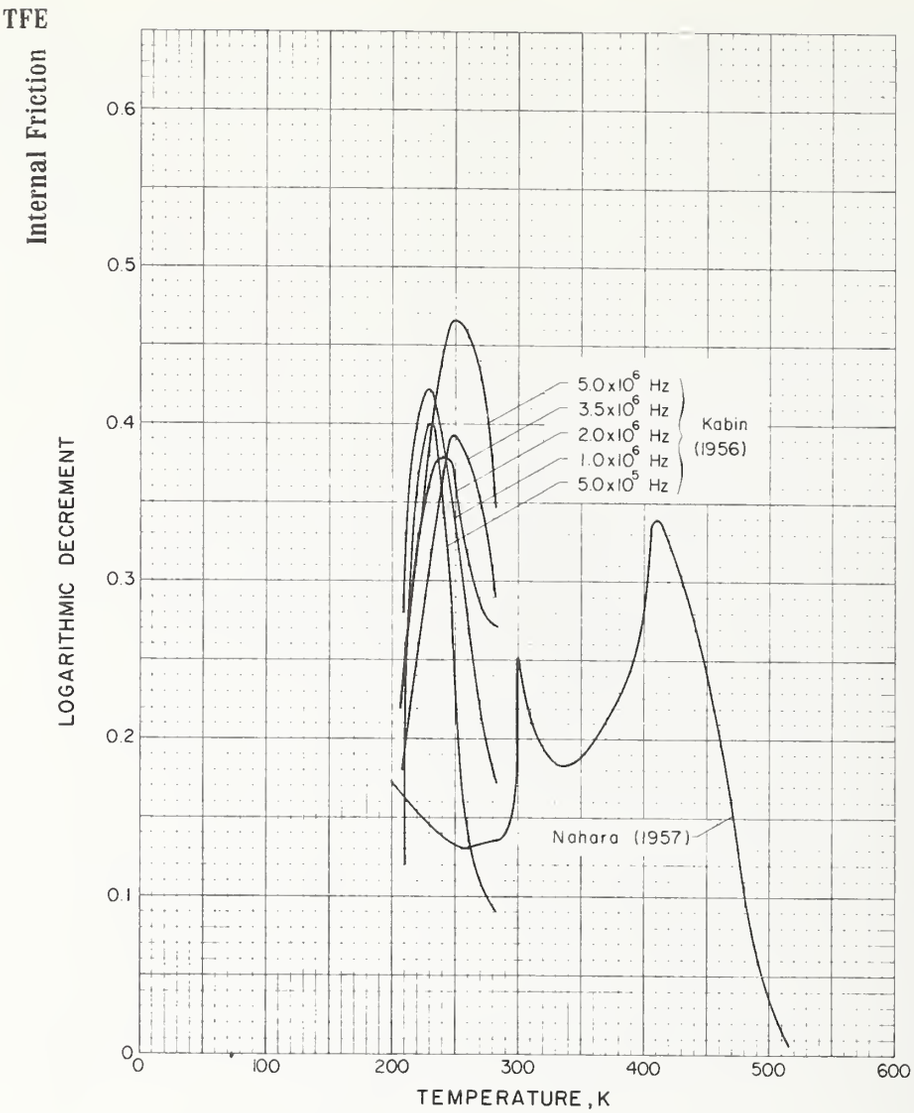
TFE



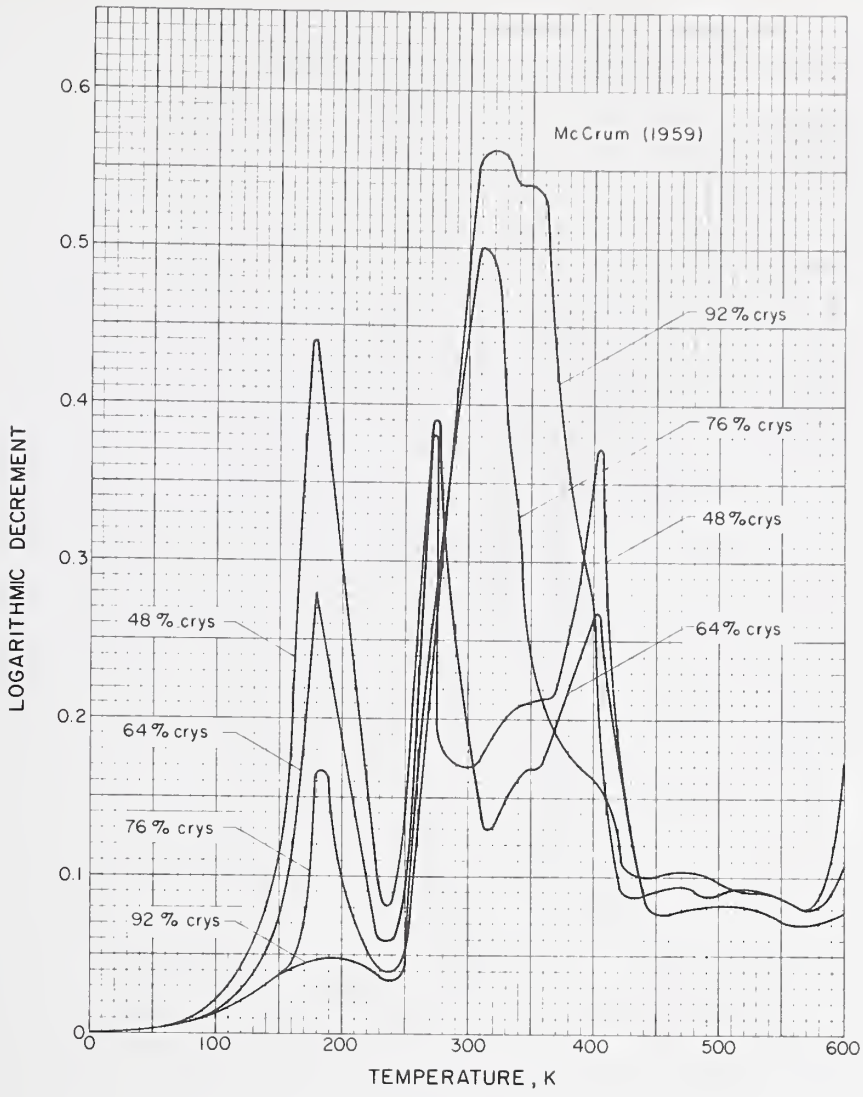
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bernier, Kline, Sauer (1967)	TFE 7, number av molecular weight $\simeq 1.6 \times 10^{17}$; after irradiation and initial testing, some samples were annealed at 423 K for 100 h and then re-tested	ℓ = 11.2 cm, diam = 0.64 cm; sample supported as a free bar and excited in the fundamental mode of flexural vibration, room temp density and dimensions used in all calculations; all samples but one irrad in NBS 50 k Ci Co^{60} γ-ray facility at 10^7 Roetgens h^{-1}, one sample irrad to 7.8×10^7 rad in the Pennsylvania State University nuclear reactor; the results on the samples irrad to 7.8×10^7 rad by Co^{60} and the nuclear reactor were nearly identical.



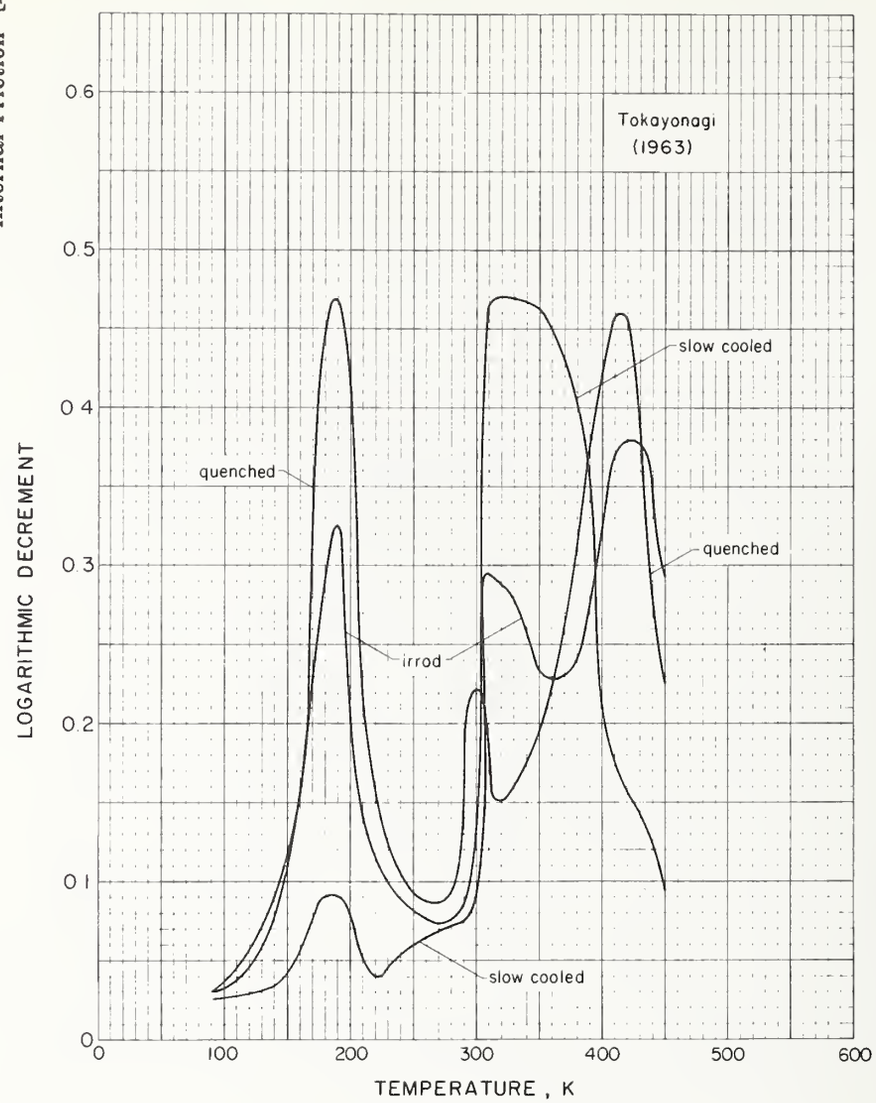
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Wolf, Schmeider (1955)		
Schulz (1956)		0.2 - 1 Hz.
Sinnott (1958)	55% crys	ℓ = 7.62 cm, w = 1.27 cm, t = 0.152 cm; small torsion pendulum, usual frequency ≈ 6 Hz; estimated accuracy = ± 5%.



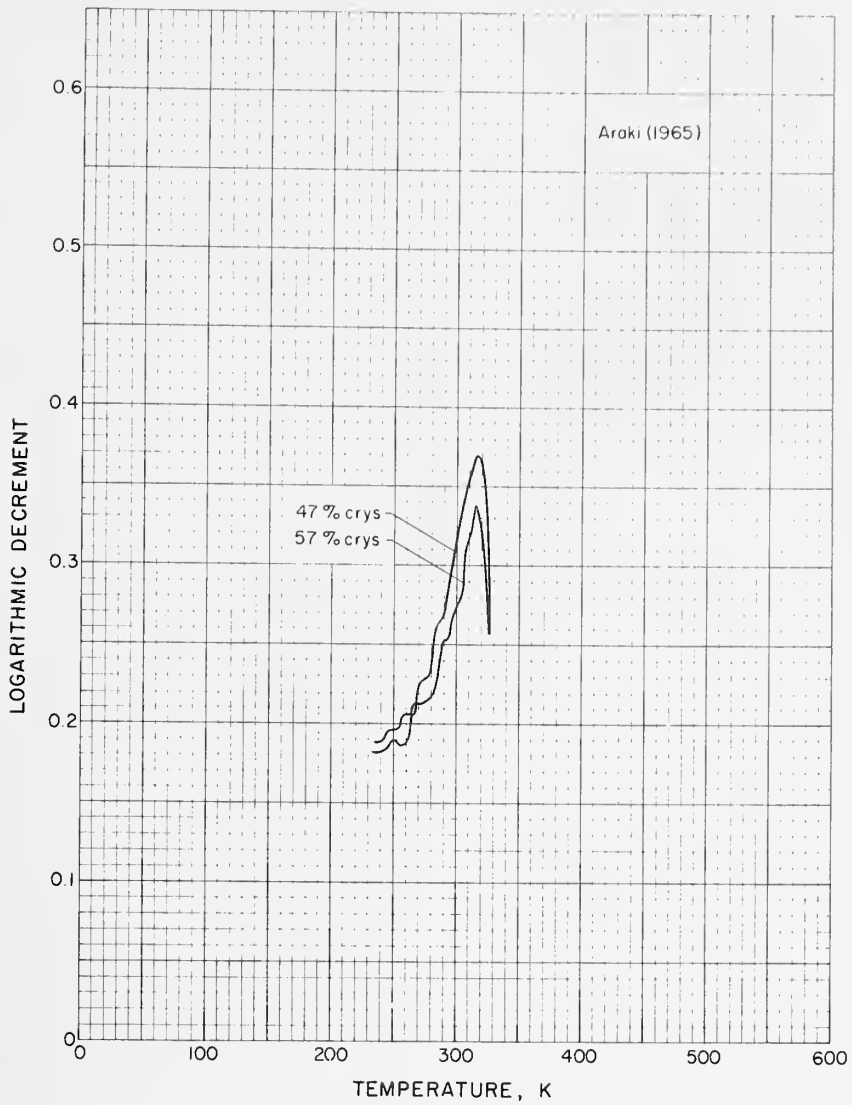
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kabin (1956)		Longitudinal ultrasonics, measurements below 273 K were made in an alcohol bath, those above in a water bath, frequency of measurement noted.
Nohara (1957)	Teflon	



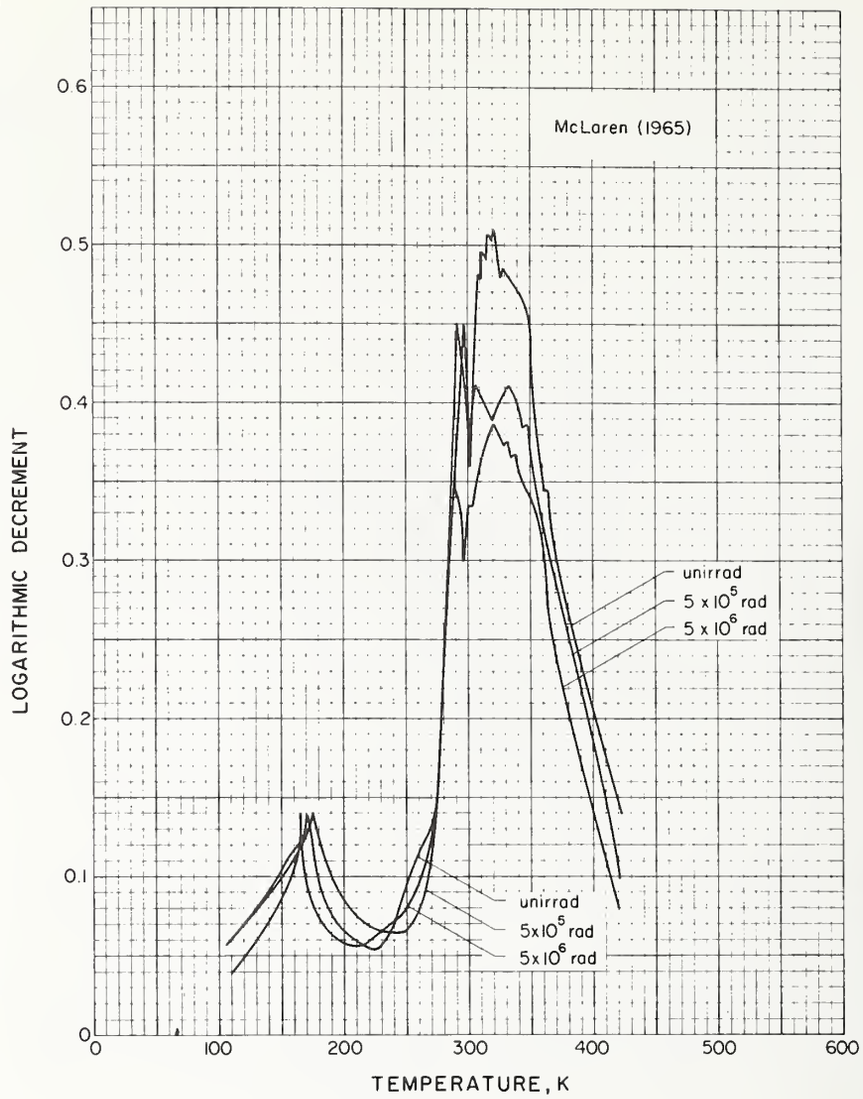
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
McCrum (1959)		ℓ = 7.62 cm, w = 1.27 cm, t = 0.152 cm, crys determined by infrared method; measurements by torsion pendulum.



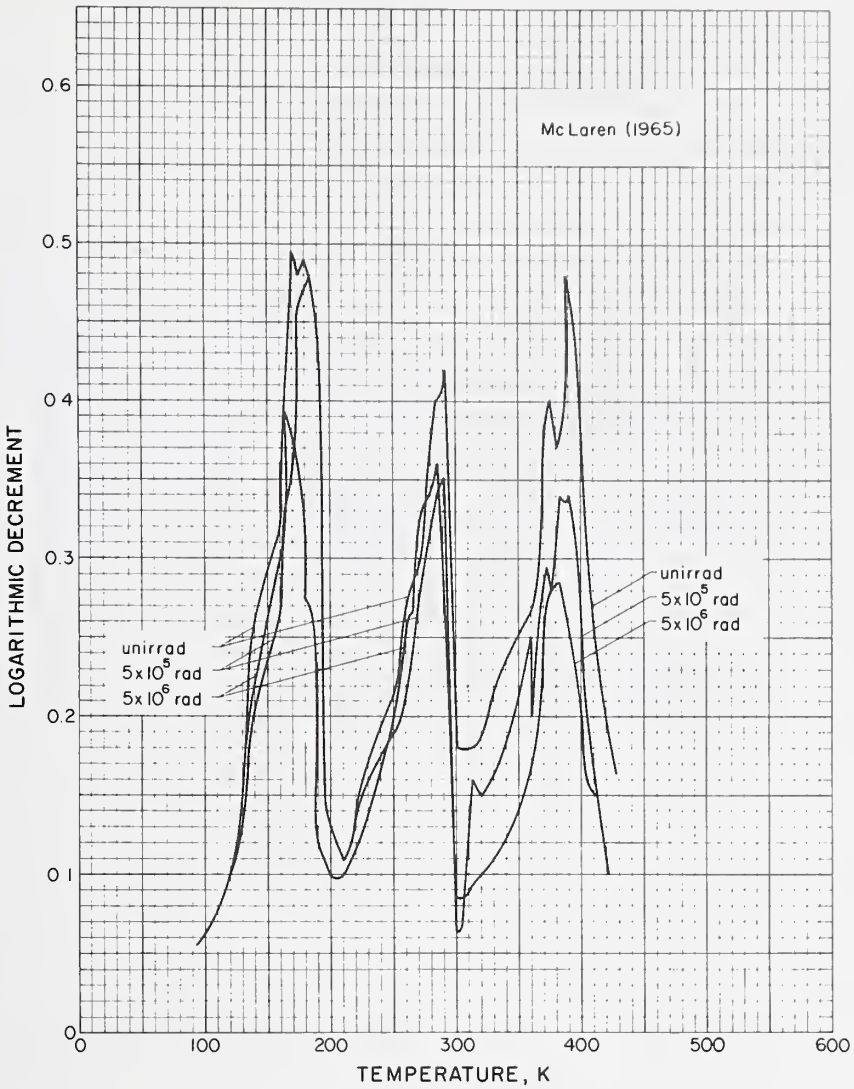
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Takayanagi, (1963)	Teflon 5; quenched from 633 K into liquid nitrogen: gradually cooled to room temp after 1 h at 633 K: 10^{7} rep irrad by Co^{60} for 2 h, annealed at 623 K for 3 h and cooled gradually	ℓ = 2-6 cm, w = 0.2-0.3 cm, t = 0.02-0.03 cm; sinusoidal tensile strain applied at one end and phase angle between stress and strain measured at other end, 138 Hz.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Araki (1965)	Teflon 5	ℓ = 8 cm, w = 1 cm, t = 0.1 cm; torsion pendulum method, Voight model assumed, temp regulated to ± 0.1 K.

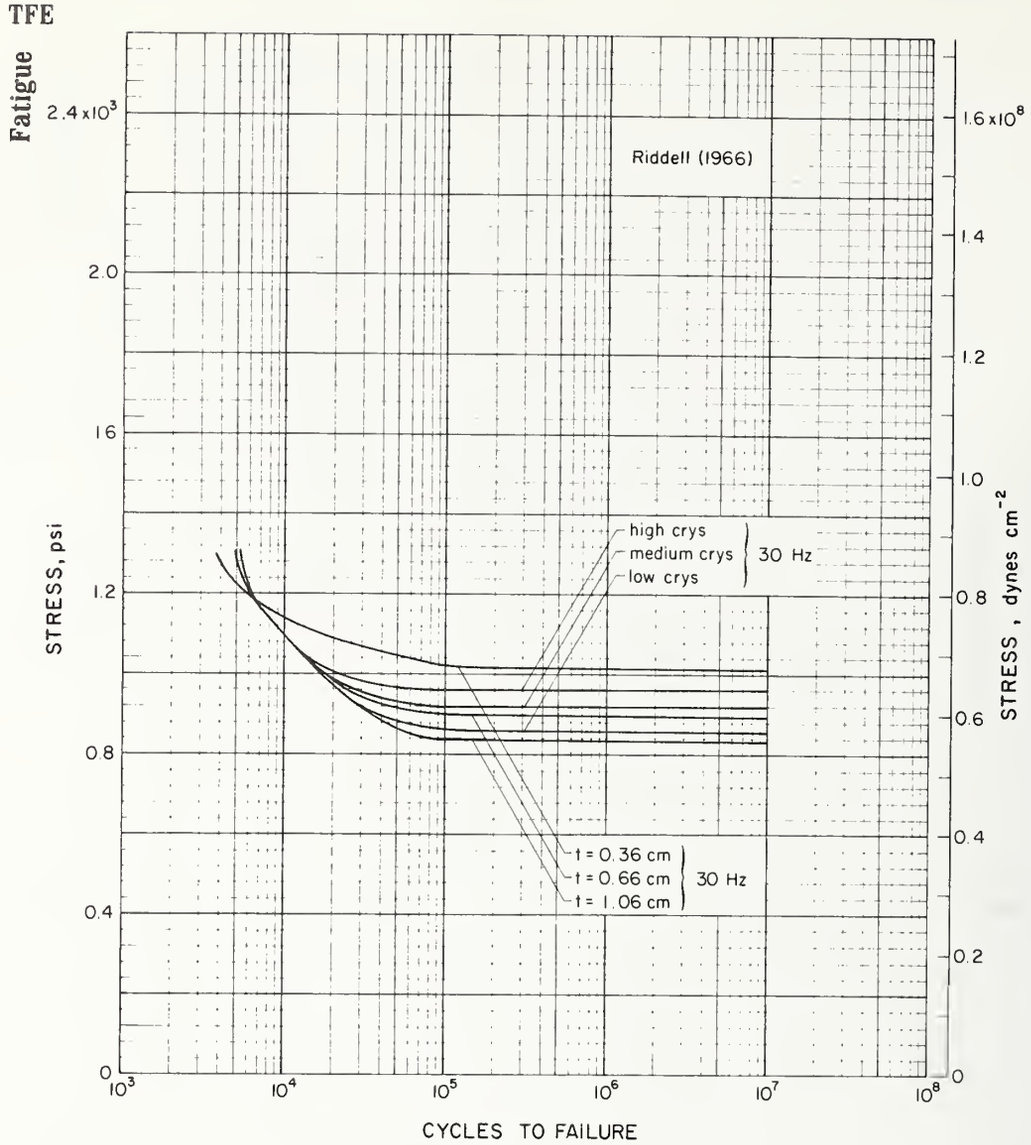


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
McLaren (1965)	Heated to 653 K then cooled to 533 K at 2-3 K h^{-1}, approx 76% crys	ℓ = 5.0 cm, w = 0.635 cm, t = 0.038 cm ; torsion pendulum apparatus, specimens cooled to 103 K and then warmed at 0.008 K s^{-1}, frequency varied from 0.5 -1.0 Hz at 103 K to 0.08-0.2 Hz at 393 K; sealed in evacuated glass tubes for 3 days, irrad by Co^{60} at 296 K, opened to air 1 week before measurements; experimental points not included here.

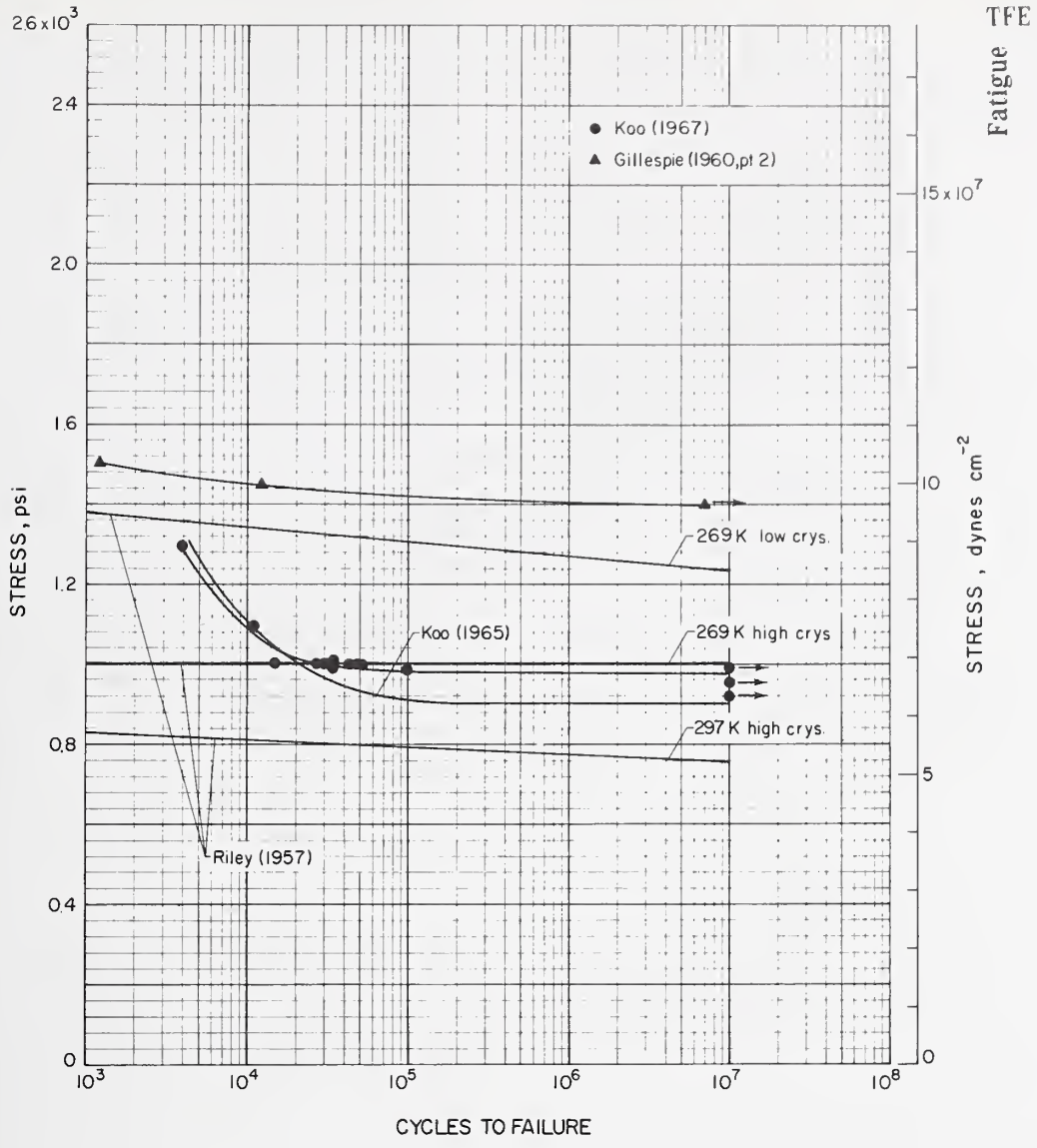


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
McLaren (1965)	Quenched from 643 K into ice water, approx 44% crys	ℓ = 5.0 cm, w = 0.635 cm, t = 0.038 cm; torsion pendulum apparatus, specimens cooled to 103 K and then warmed at 0.008 K s^{-1}, frequency varied from 0.5-1.0 Hz at 103 K to 0.08-0.2 Hz at 393 K; sealed in evacuated glass tubes for 3 days, irrad by Co^{60} at 296 K, opened to air 1 week before measurements; experimental points not included here.

TFE



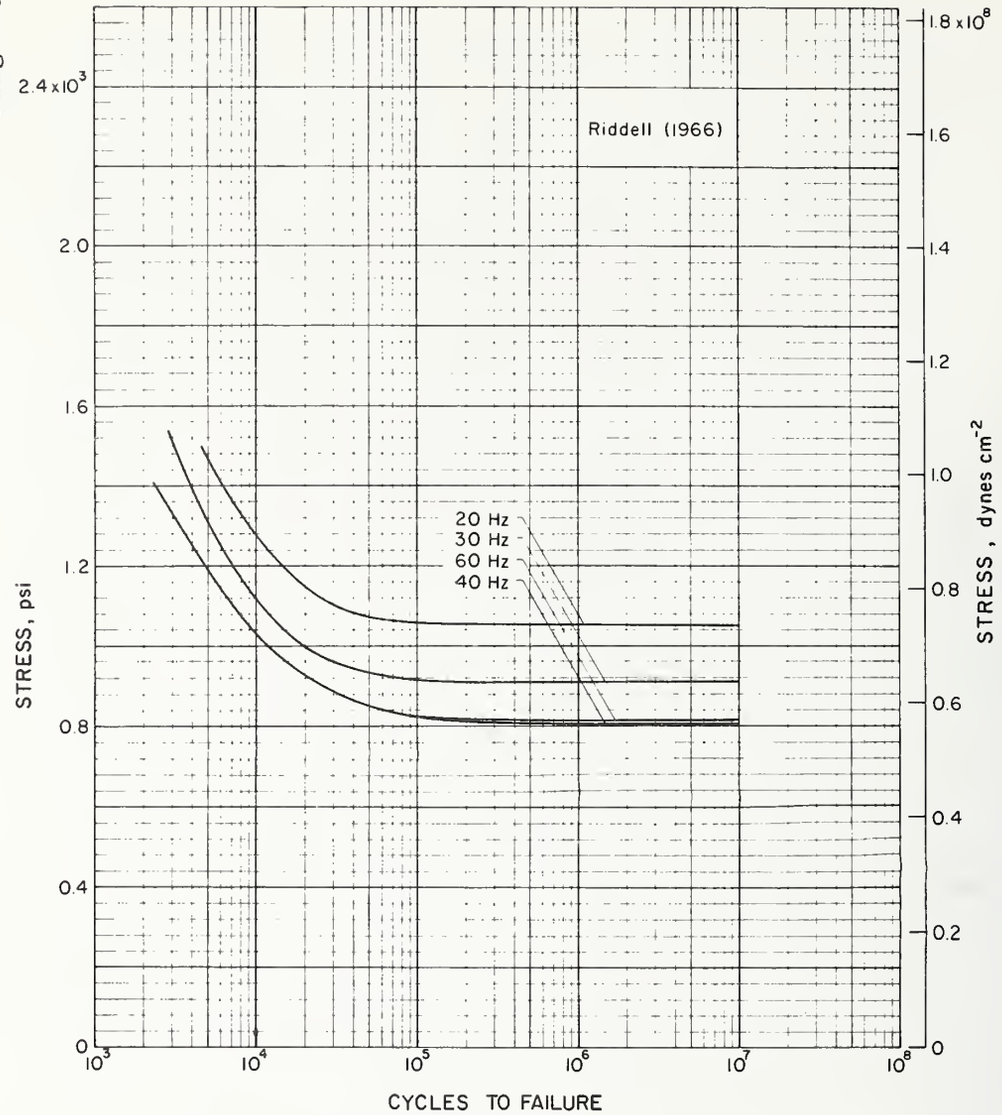
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Riddell, Koo, O'Toole (1966)	Halon; high crys after cooling at 6 K h^{-1}, medium crys after cooling at 33 K h^{-1}, low crys after air quenching	ASTM D 671-63 T test procedure Method B with Type I specimens, Sonntag Model SF-2u constant forces cantilever-flexural fatigue machine, failure defined as ± 1.27 cm deflection of cantilevered specimen, tested at 30 Hz.



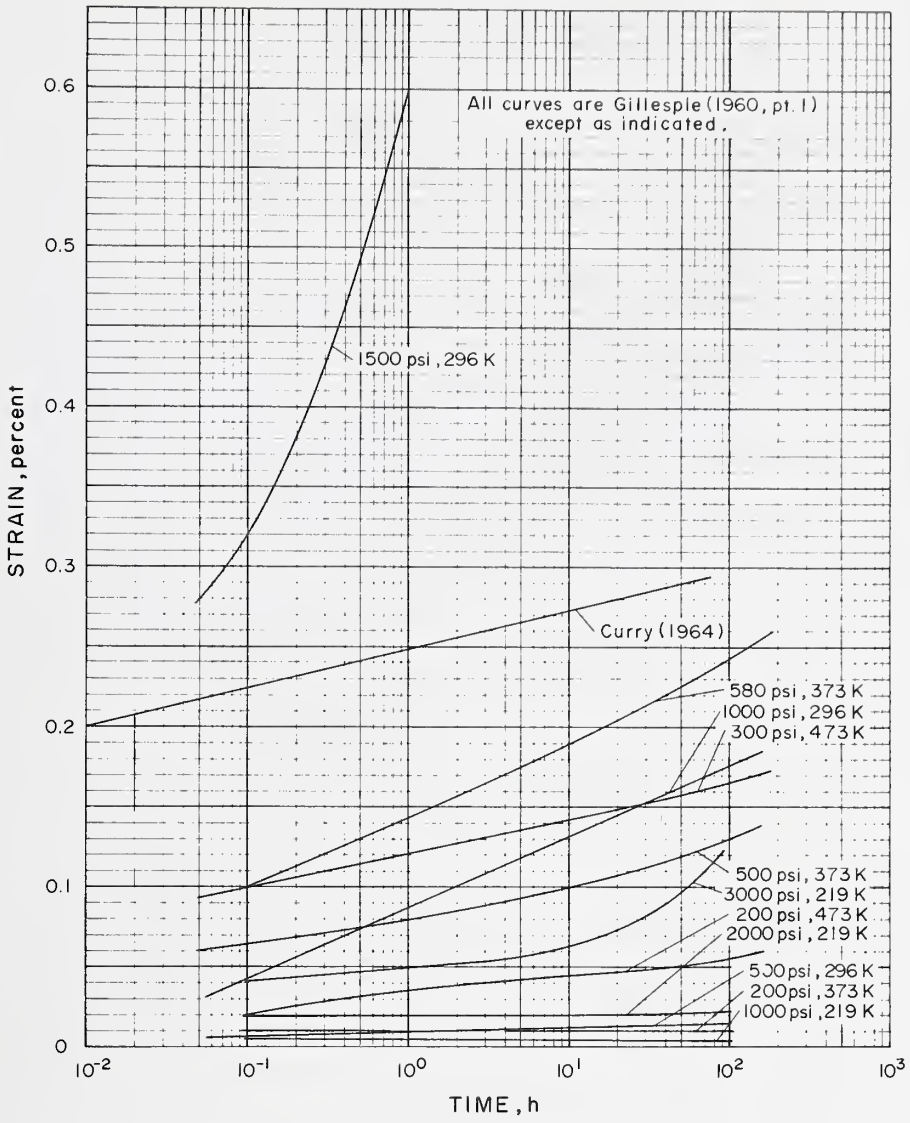
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Koo, Riddell, O'Toole (1967)		Sonntag Model SF 2U test machine, 30 Hz, ASTM D-671-63T, Method B test procedure.
Gillespie, Saxton, Chapman (1960, pt. 2)	Teflon 1, ram extruded, av sp gr = 2.17, 60±2% crys, void content < 0.3%, preform pressure = 2500 psi	
Koo, Jones, Riddell, O'Toole (1965)	Halon G-80	t = 0.635, ASTM D-671-63T Method B test procedure using type 1 specimens, 30 Hz.
Riley (1957)	Teflon 1	Tensile - compressive stresses completely reversed.

TFE

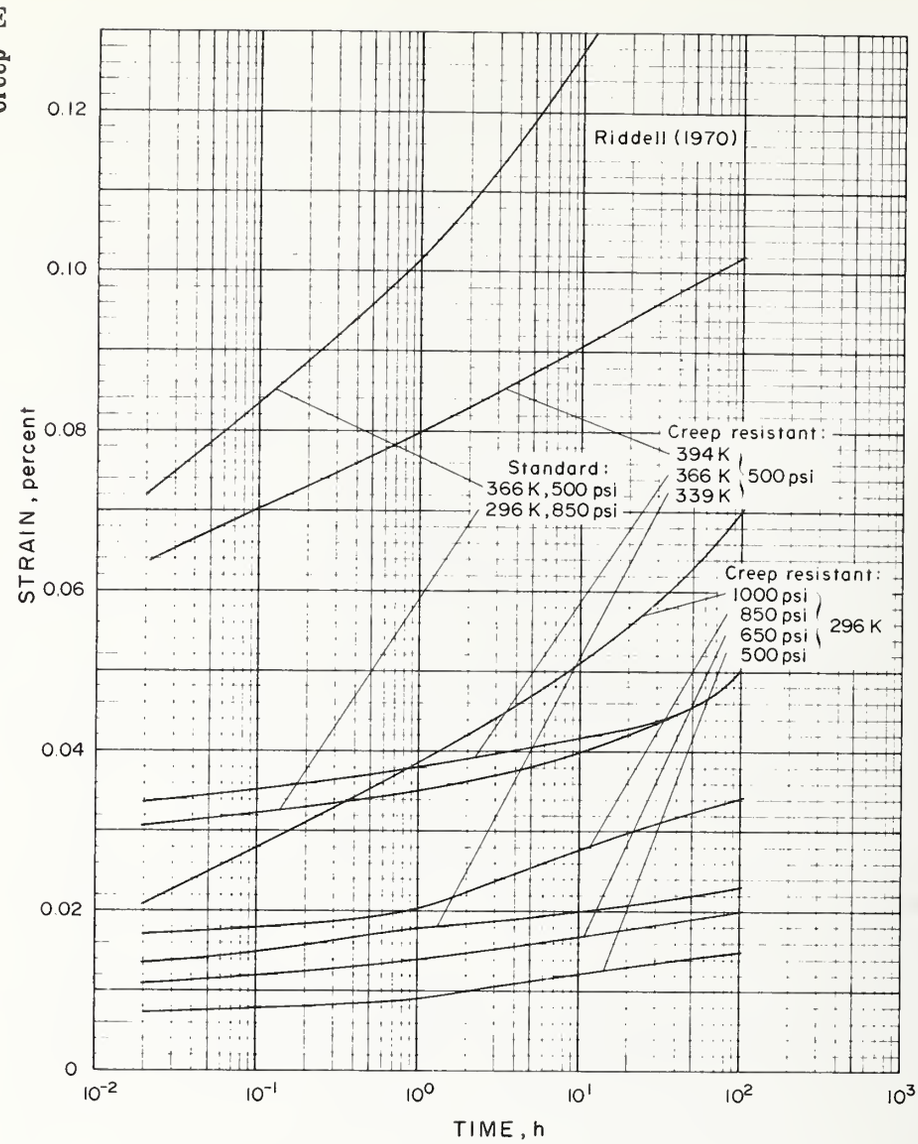
Fatigue



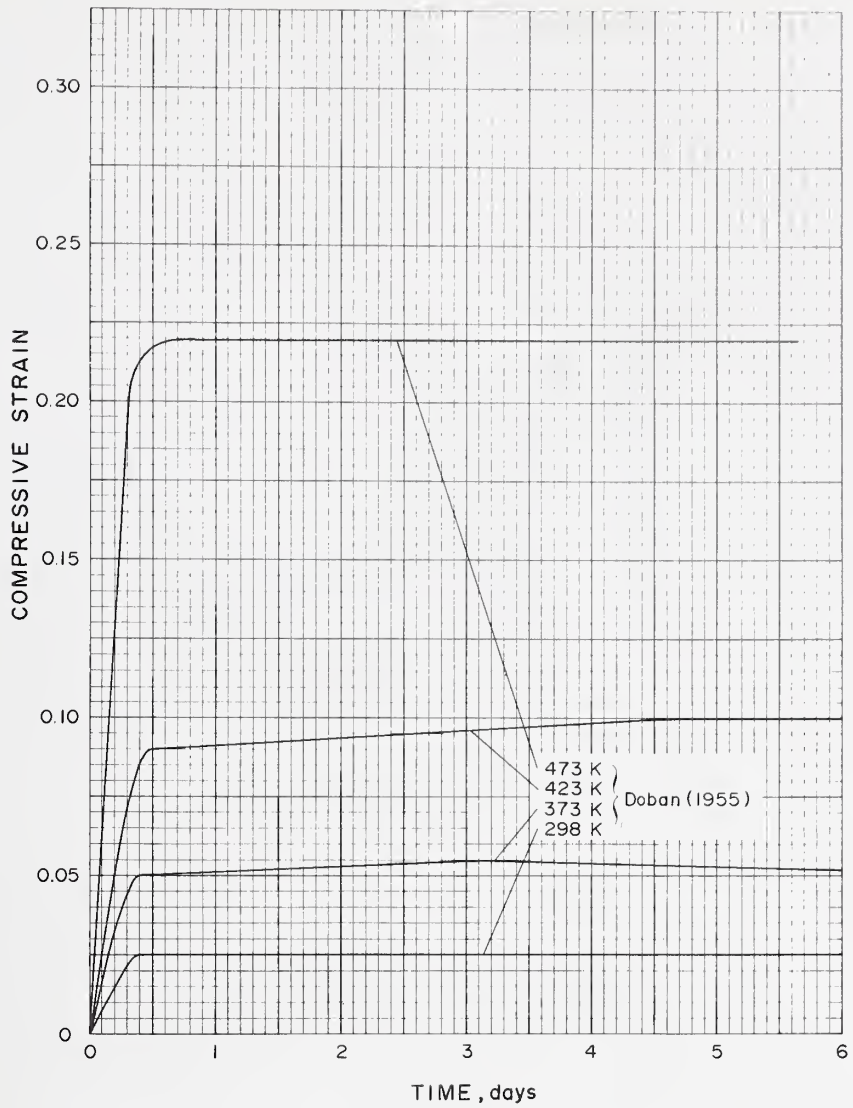
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Riddell, Koo, O'Toole (1966)	Halon	ASTM D 671-63T test procedure Method B with Type I specimens, Sonntag Model SF-2u constant force cantilever-flexural fatigue machine, failure defined as ± 1.27 cm deflection of cantilevered specimen, test speed noted.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 1, ram extruded, av sp gr = 2.17, 60 ± 2% crys, void content < 0.3%, preform pressure = 2500 psi.	ℓ = 15.2 cm, diam = 1.52 cm; tested at constant σ.
Curry (1964)	Teflon	296K, σ = 3,000 psi.



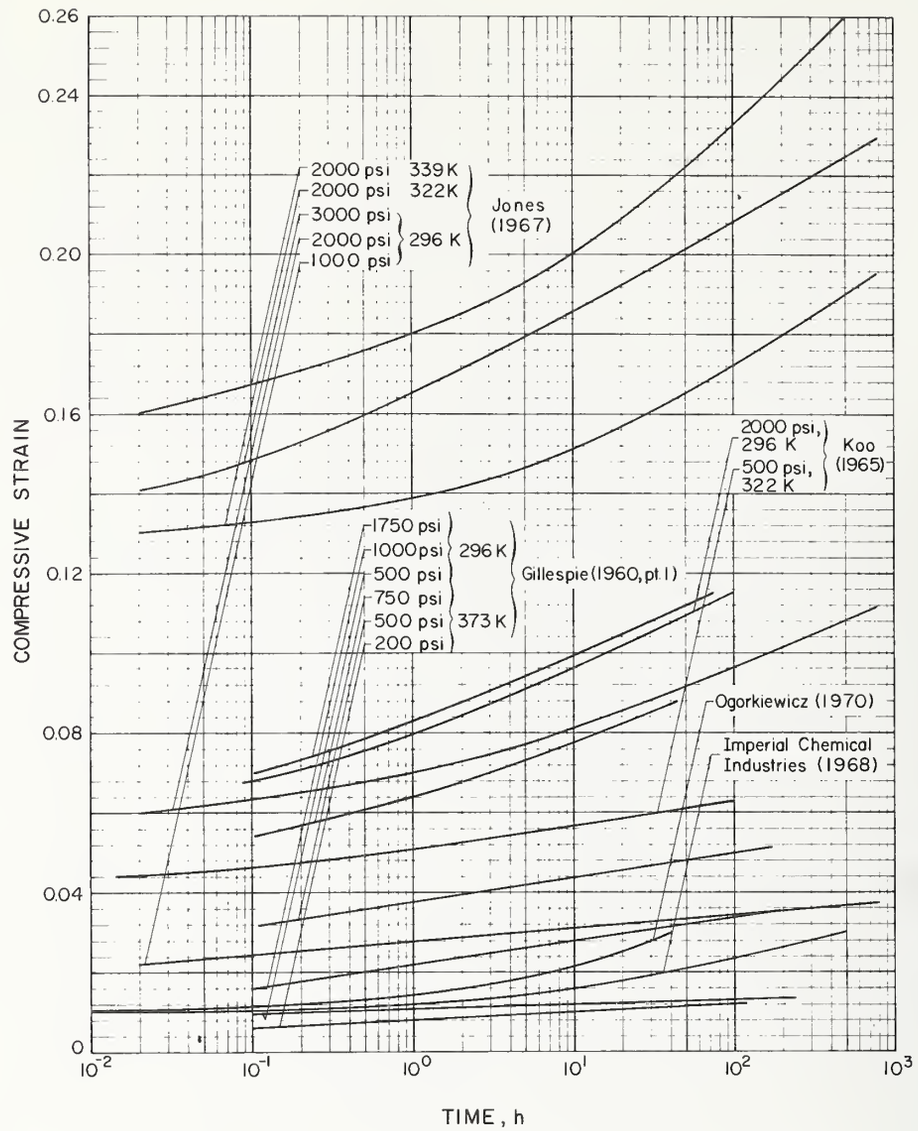
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Riddell, Toelcke, O'Toole (1970)	"Standard" is high strength grade covered in ASTM D-1457, Type IV; "creep resistant" is Halon C-700.	ASTM D-638 Type IV tensile specimen with Red Sec increased in length to 8.64 cm; specimens manually loaded with weights.



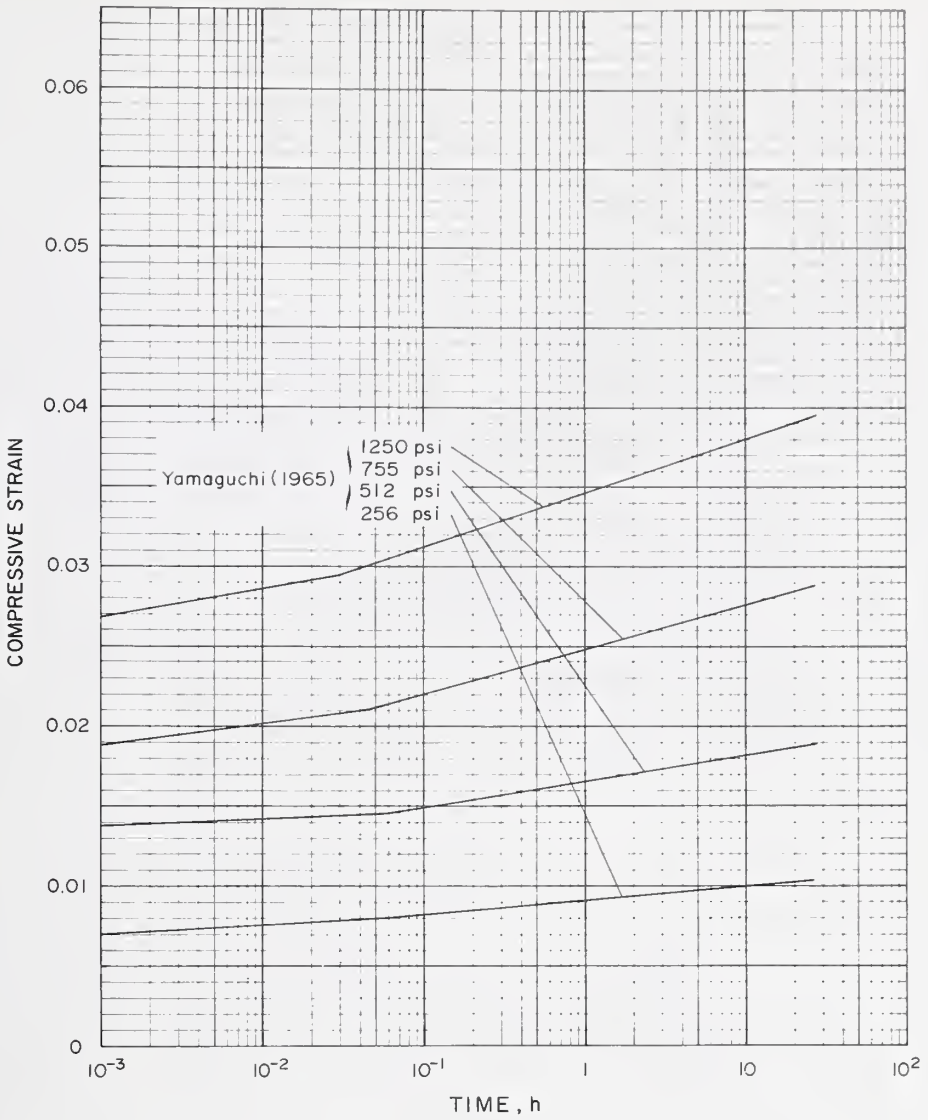
INVESTIGATOR(S), (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Doban, Sperati, Sandt (1955); also Riley (1957)	Teflon 1	Compressed at 1000 psi.

TFE

Creep



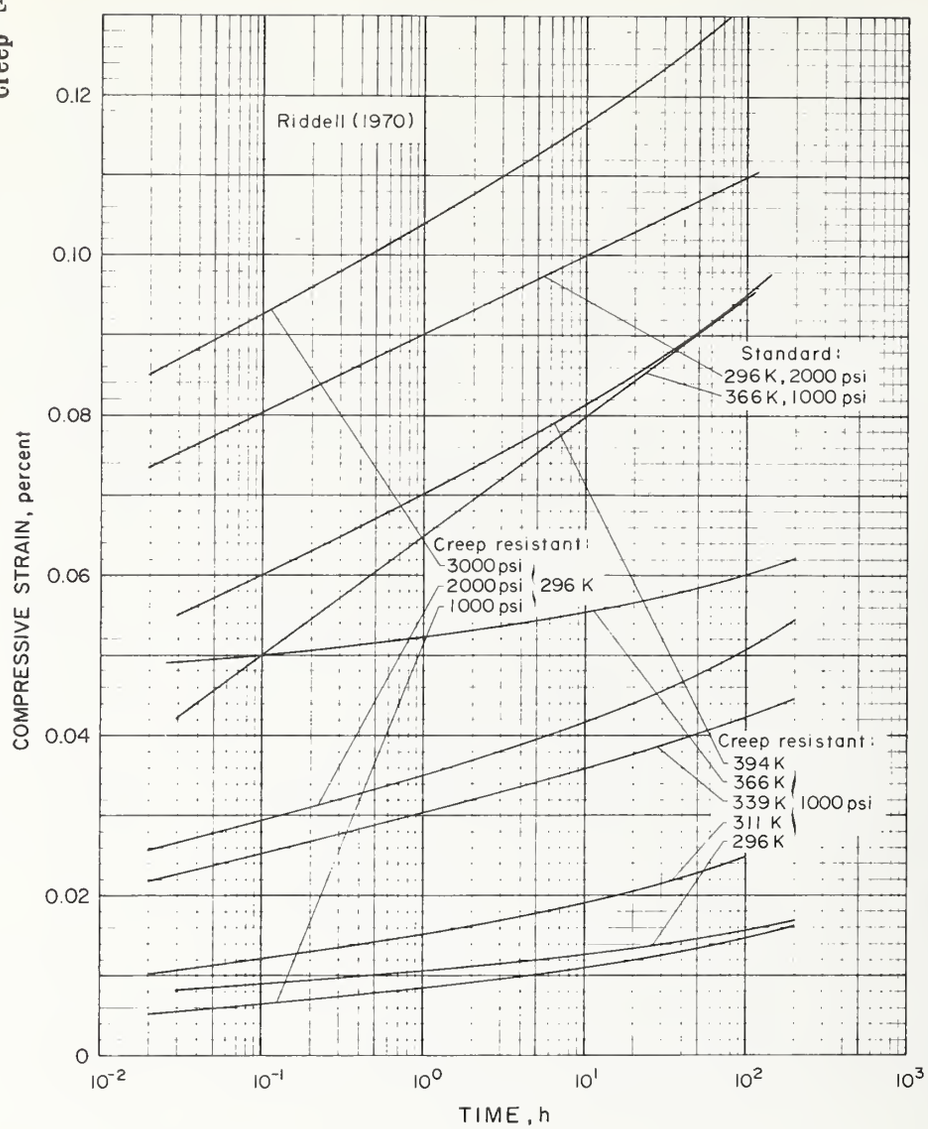
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 1, ram extruded, av sp gr = 2.17, 60±2% crys, void content <0.3%, preform pressure = 2500, psi	ℓ = 15.2 cm, diam = 1.52 cm.
Koo, Jones, O'Toole (1965)	Halon G-80	Gasket relaxometer described in ASTM F 38-62T(5).
Jones, Koo, O'Toole (1967)	Halon G-80	Gasket relaxometer.
Imperial Chemical Industries (1968)	Fluon G4, preformed at 2000 psi, molding was freely sintered at 653K and slowly cooled	Diam = 2.86 cm, ℓ = 1.14 cm; 1000 psi, 298K.
Ogorkiewicz (1970)	Fluon G4	1000 psi, 293K.



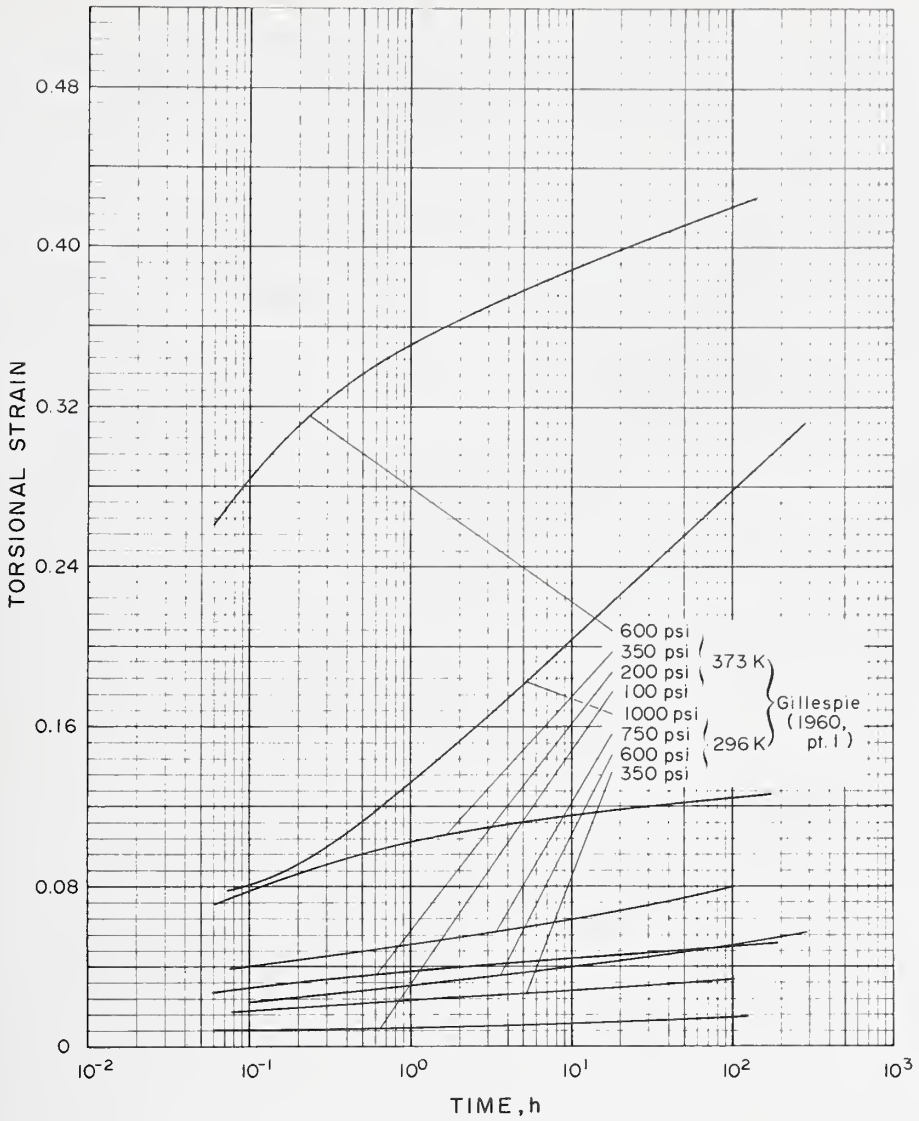
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Yamaguchi, Oyanagi, Ishida, Tanaka (1965)		298 K, applied compressive stress noted.

TFE

Creep



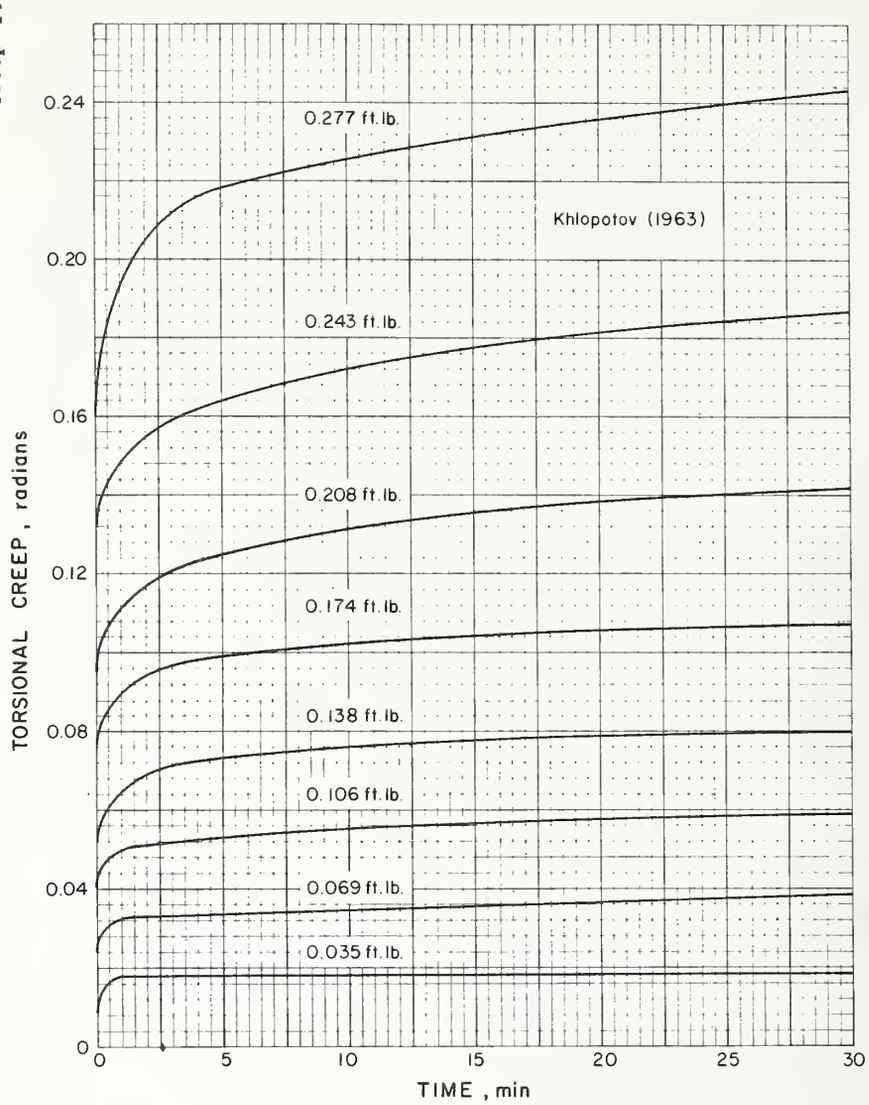
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION . EXPERIMENTAL CONDITIONS
Riddell, Toelcke, O'Toole (1970)	"Standard" is high strength grade covered in ASTM D-1457 Type IV; "Creep resistant" is Halon G-700.	Annular gasket having a rectangular cross-section compressively loaded to a predetermined stress level.



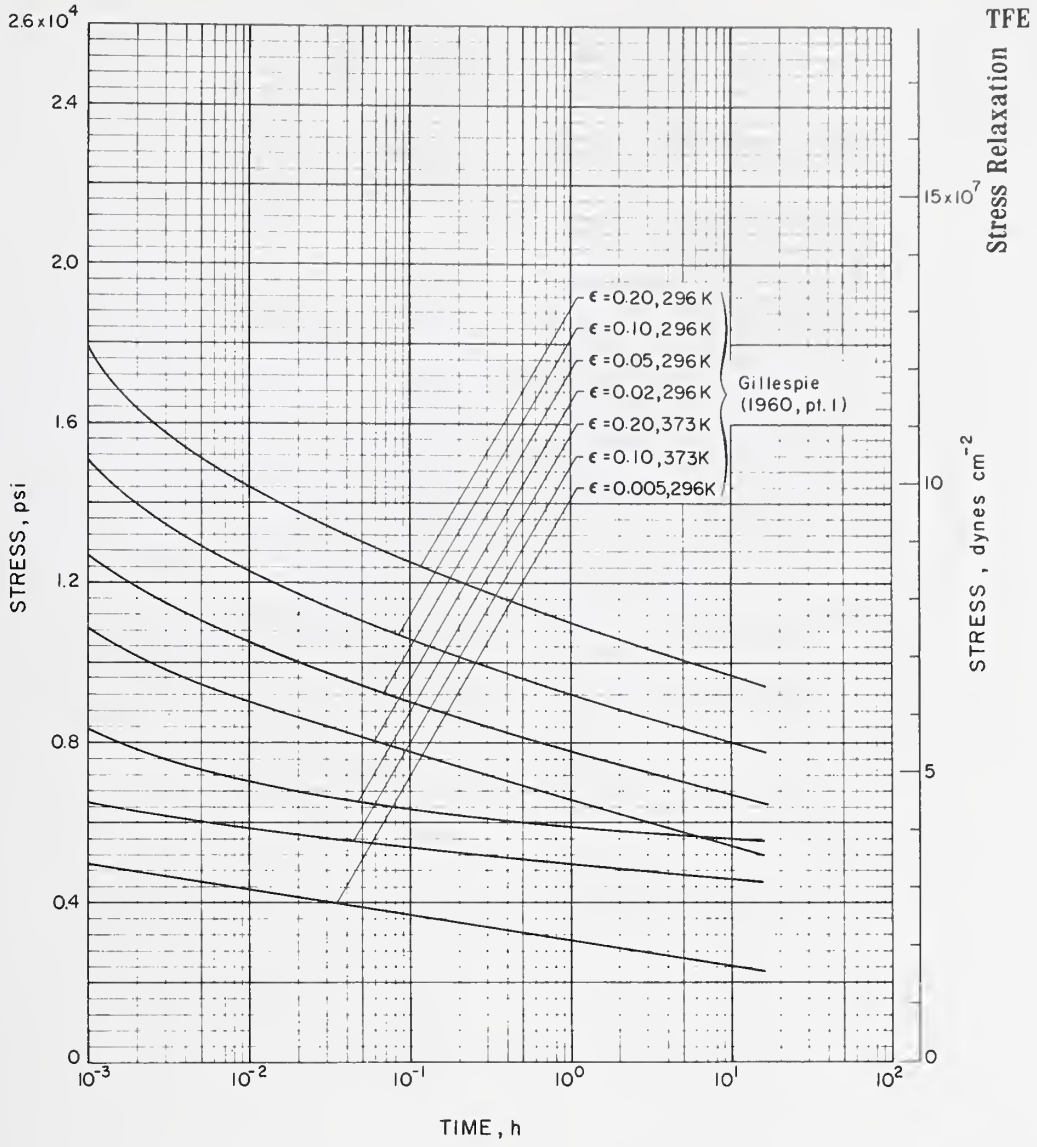
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 1, ram extruded, av sp gr = 2.17, 60 ± 2% crys, void content < 0.3%, preform pressure = 2500 psi.	ℓ = 15.2 cm, diam = 1.52 cm.

TFE

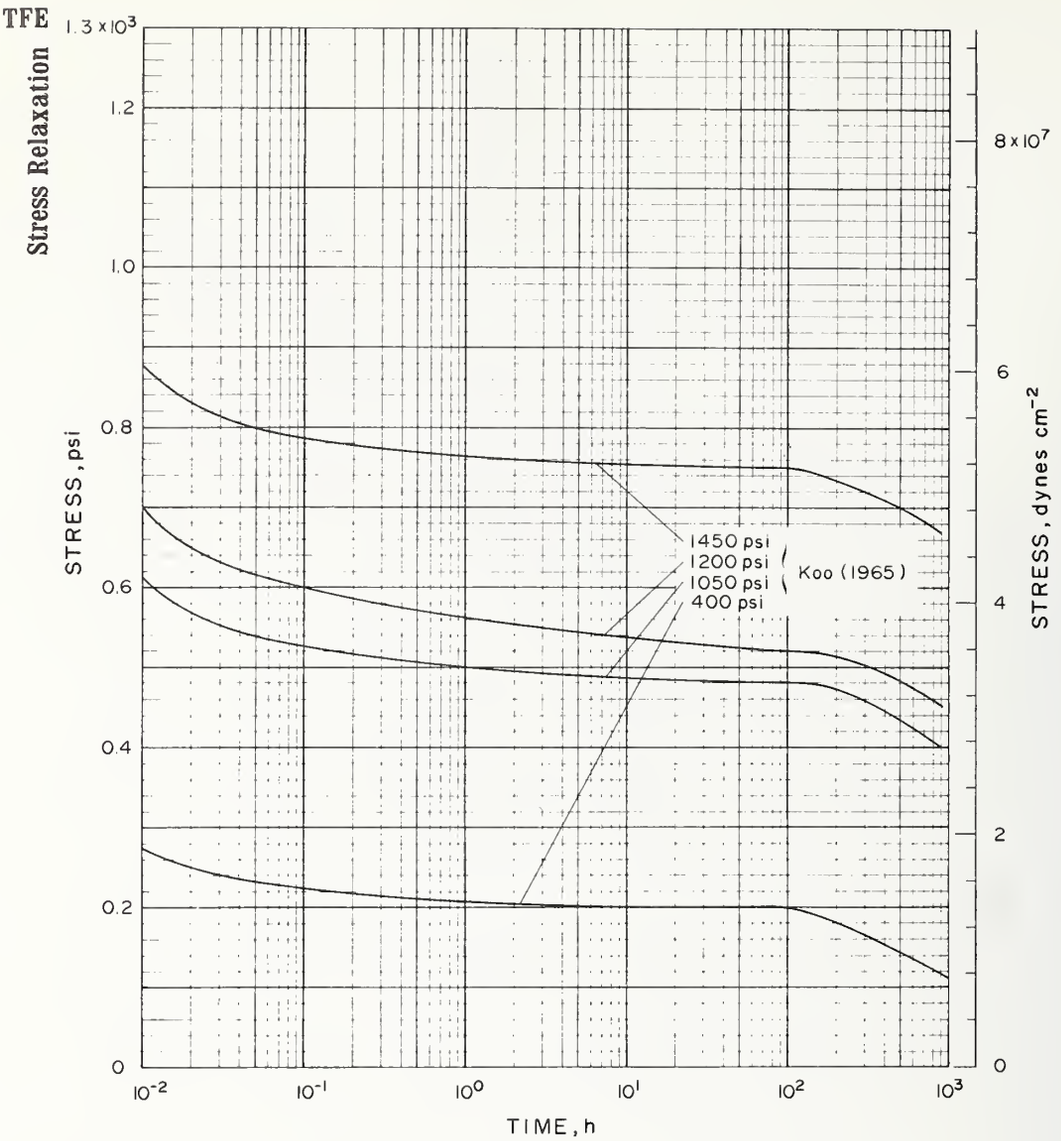
Creep



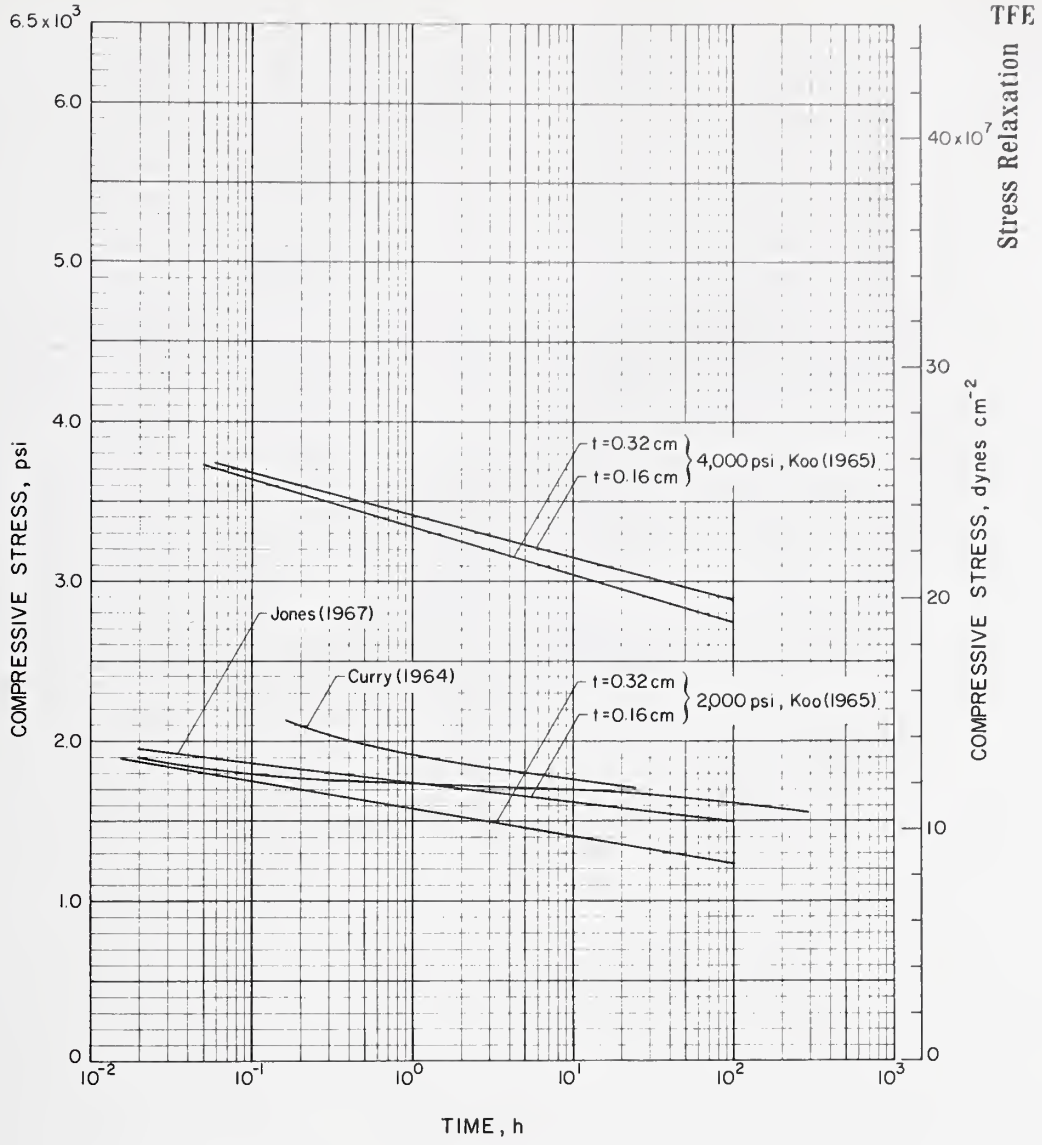
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Khlopotov (1963)		ℓ = 3 cm, diam = 0.8 cm; 297 K, applied torque noted.



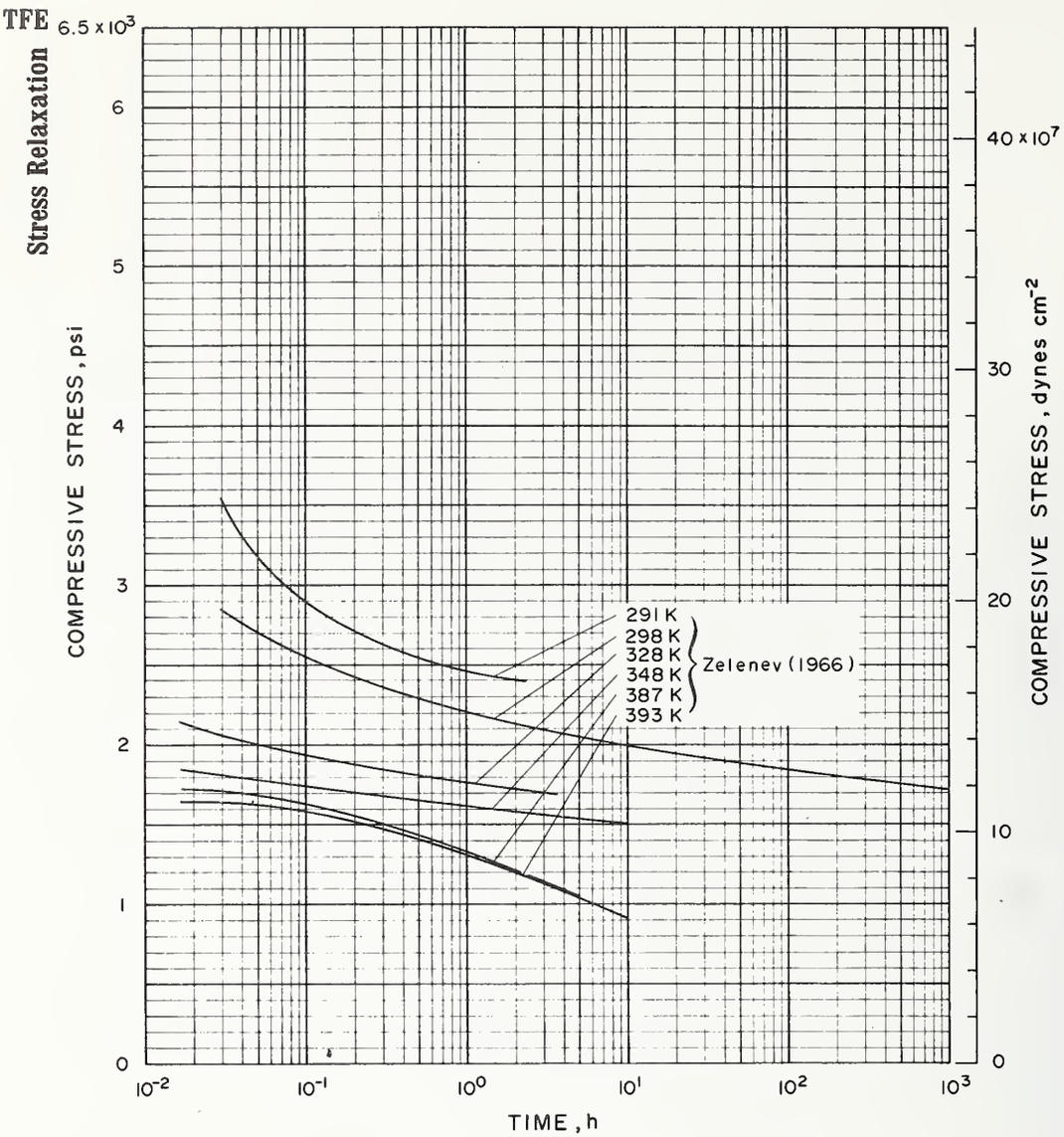
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 1, ram extruded, av sp gr = 2.17, 60 ± 2% crys, void content < 0.3%, preform pressure = 2500 psi.	ℓ = 15.2 cm, diam = 1.52 cm; tested at constant ε.



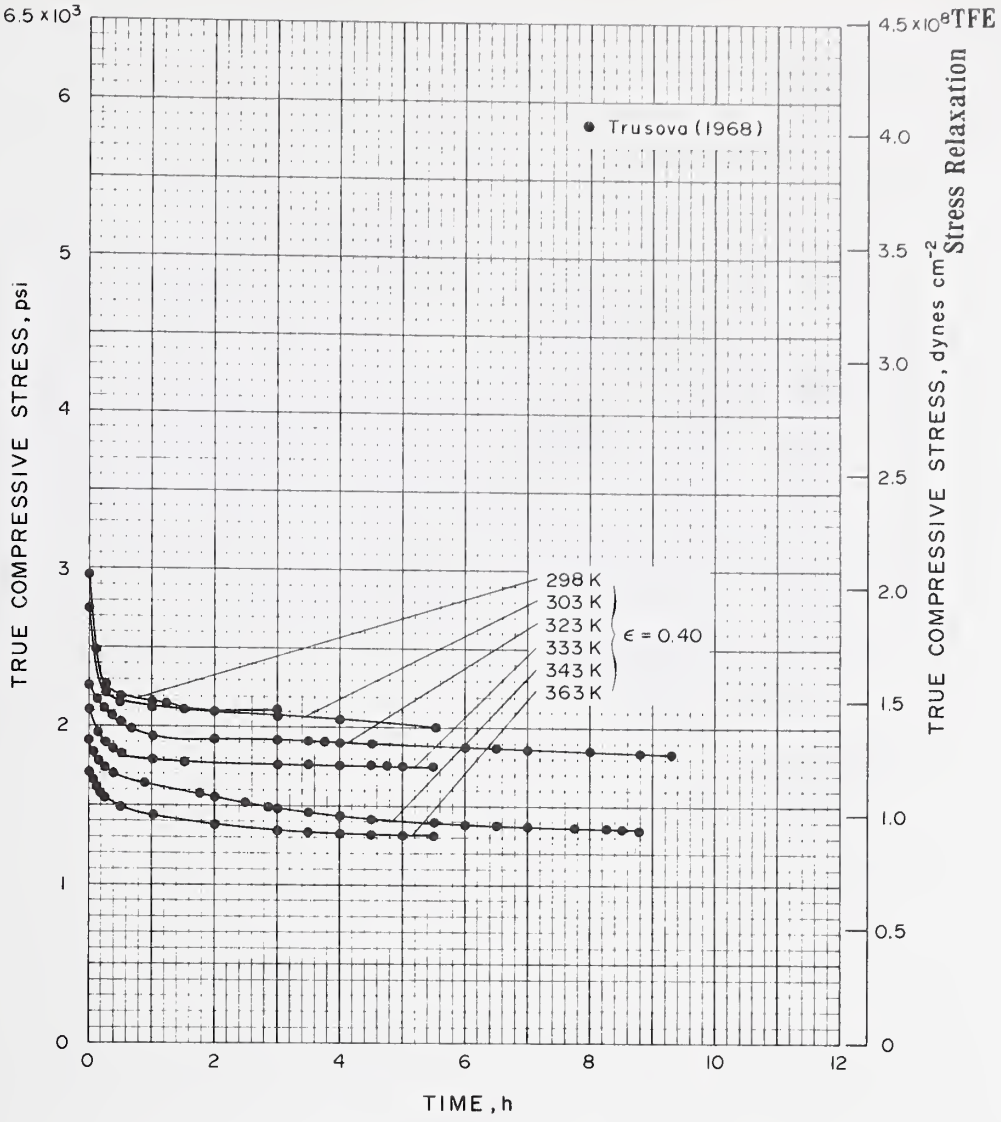
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Koo, Jones, Riddell, O'Toole (1965)	Halon G-80	296K, initial stress noted.



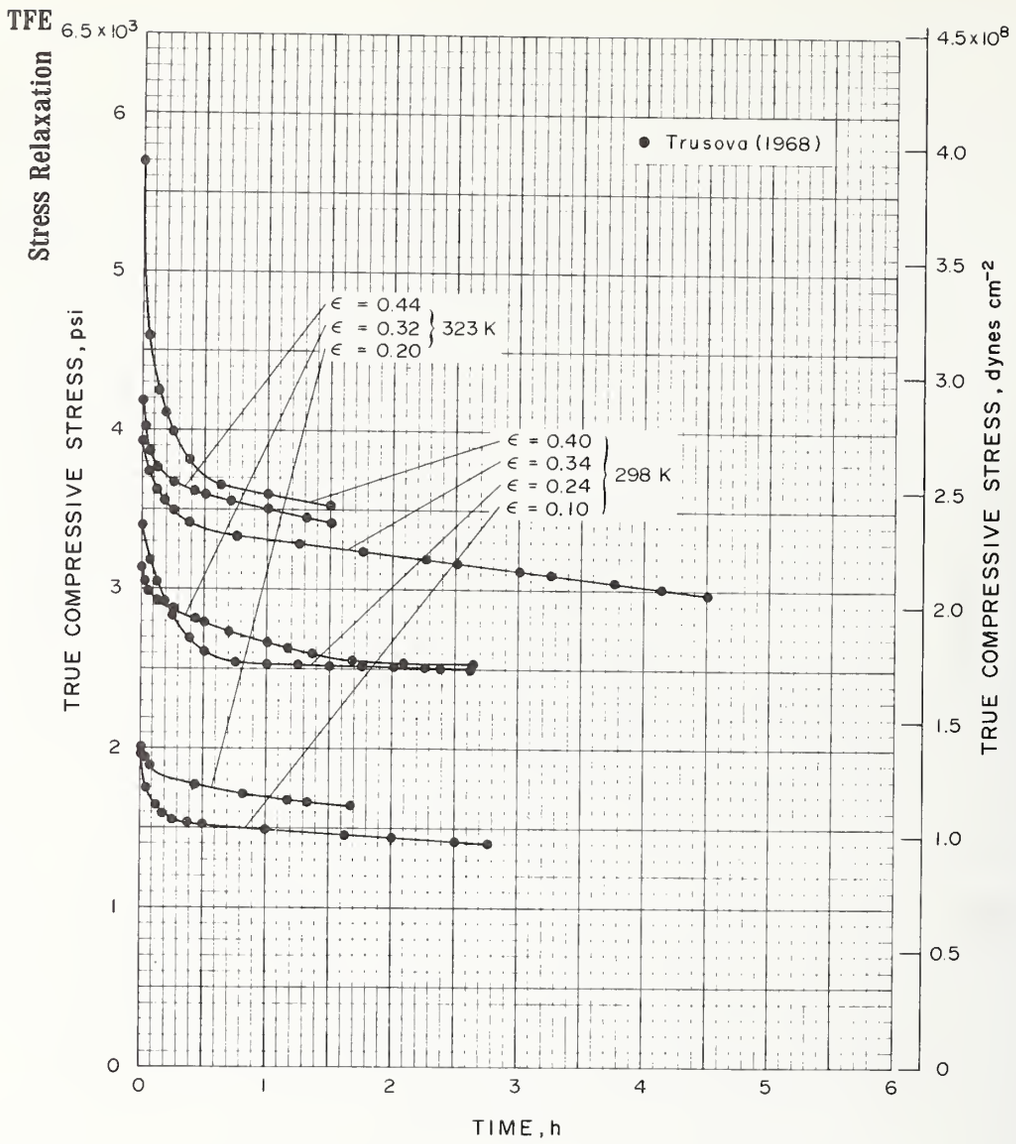
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Curry (1964)	Teflon	Compressed to predetermined initial stress level, 296K.
Koo, Jones, O'Toole (1965)	Halon G-80	Gasket relaxometer described in ASTM F-38-62T(5), 296K, initial stress noted.
Jones, Koo, O'Toole (1967)	Halon G-80	t = 0.16 cm; gasket relaxometer, 339K, initial stress = 2000 psi; curves for 322, 311, and 296K also presented, the latter is the same as that of Koo, Jones, O'Toole (1965).



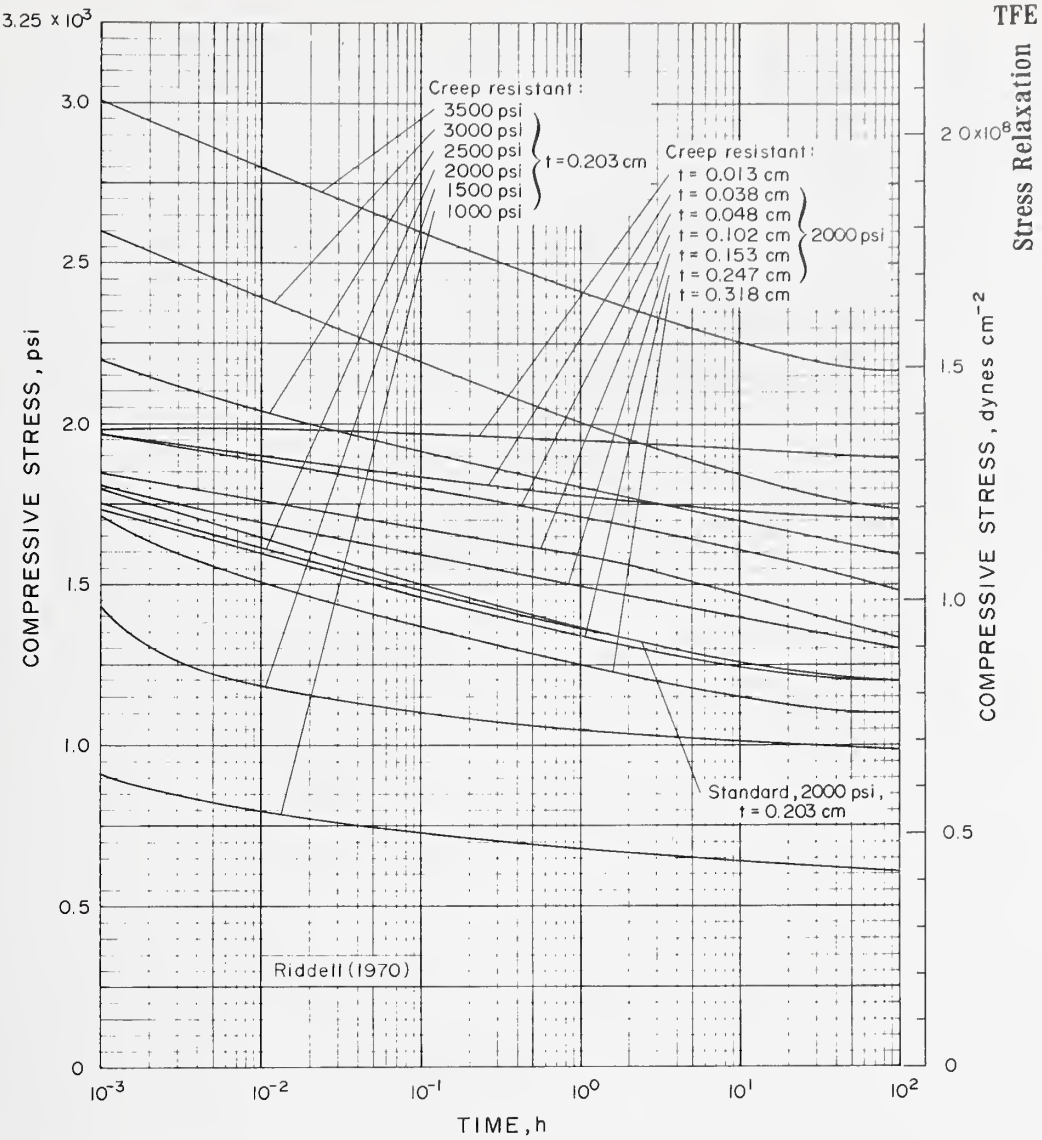
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Zelenev, Novikov (1966)	TFE	50% compressive strain, stress based on the doubled specimen area.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Trusova, Abakumova, Mikheev (1968)	65% crys.	Diam 0.25 - 0.35 cm, ℓ 0.5 cm, machined; stress measured with photoelectrooptical dynamometer, during loading xhd spd 0.0017 - 0.0033 cm s^{-1}, temp and compressive strain noted.



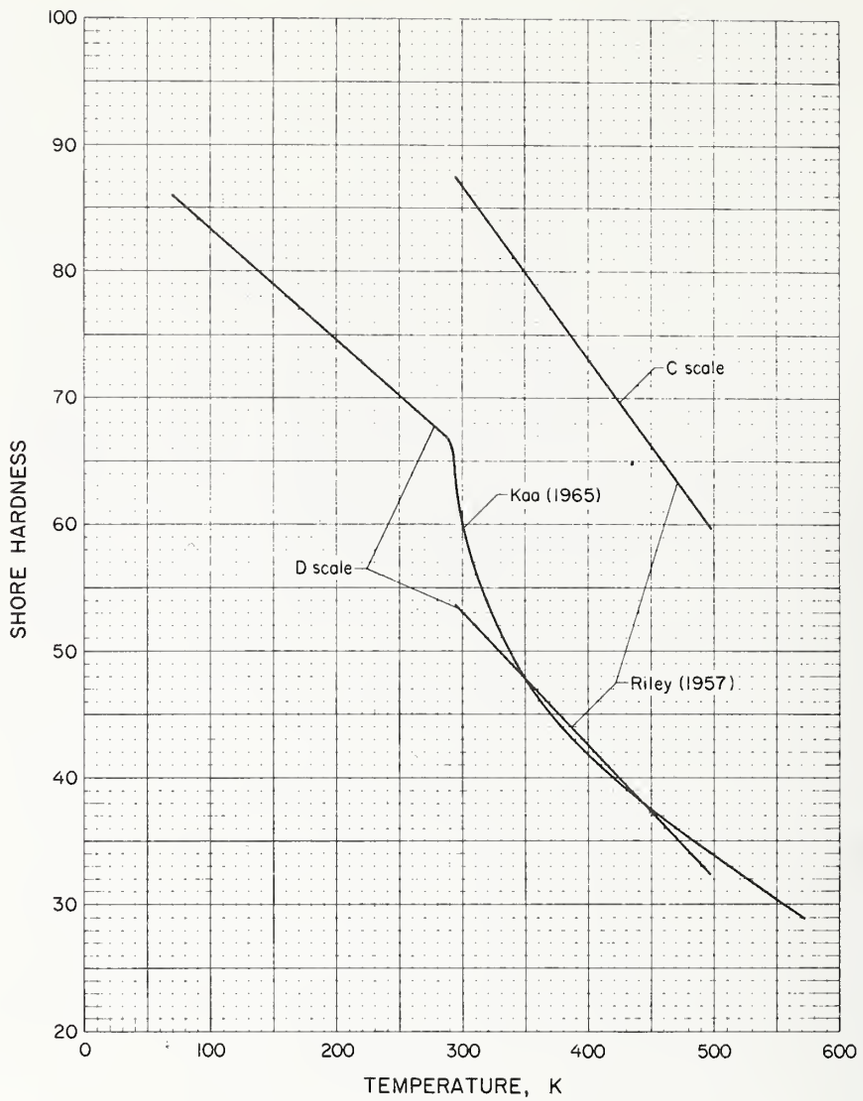
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Trusova, Abakumova, Mikheev (1968)	65% crys.	Diam = 0.25 - 0.35 cm, ℓ = 0.5 cm, machined; stress measured with photoelectrooptical dynamometer, during loading xhd spd = 0.0017 - 0.0033 cm s^{-1}, temp and compressive strain noted.



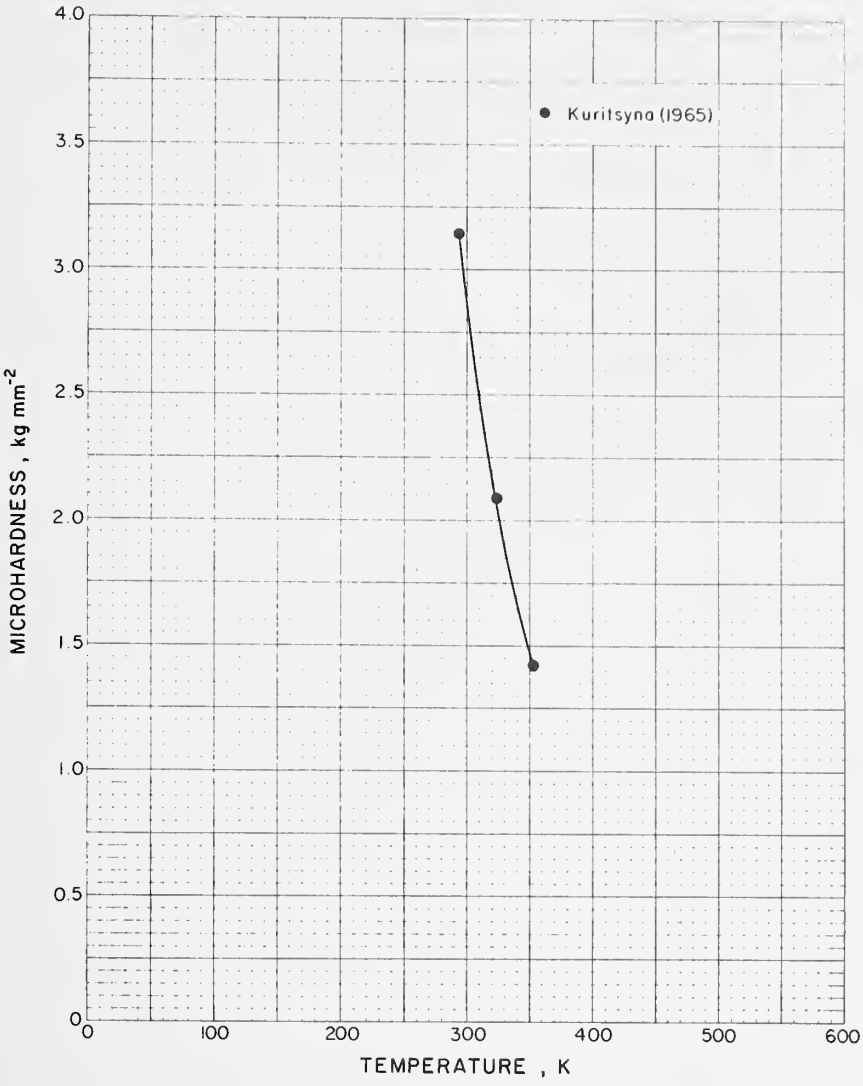
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Riddell, Toelcke, O'Toole (1970)	"Standard" is high strength grade covered in ASTM D-1457, Type IV, "creep resistant" is Halon G-700.	ℓ = 5.08 cm, w = 0.48 cm, t = 0.48 cm; fitted inside round tube to prevent buckling.

TFE

Hardness



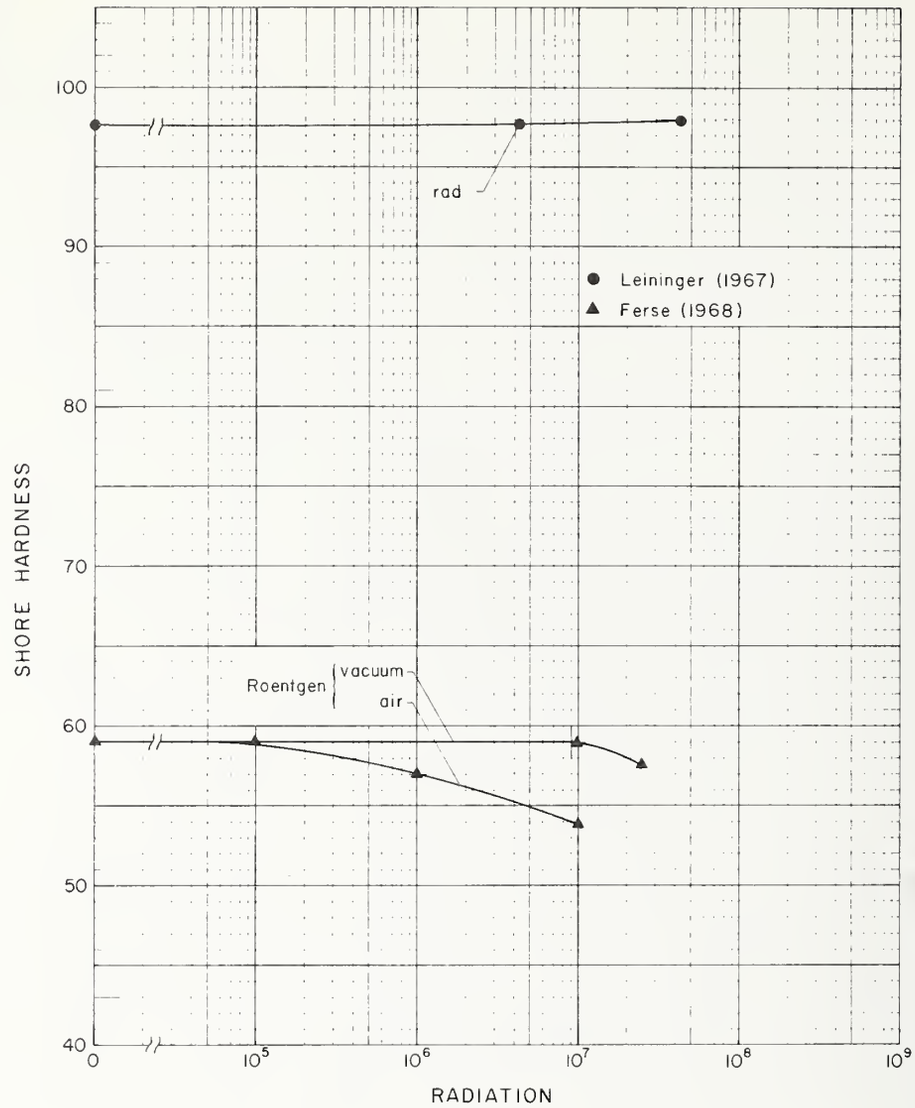
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Koo, Jones, Riddell, O'Toole (1965)	Halon G-80	Measured by durometer, ASTM D-1706-61 test procedure.
Riley (1957)	Teflon	



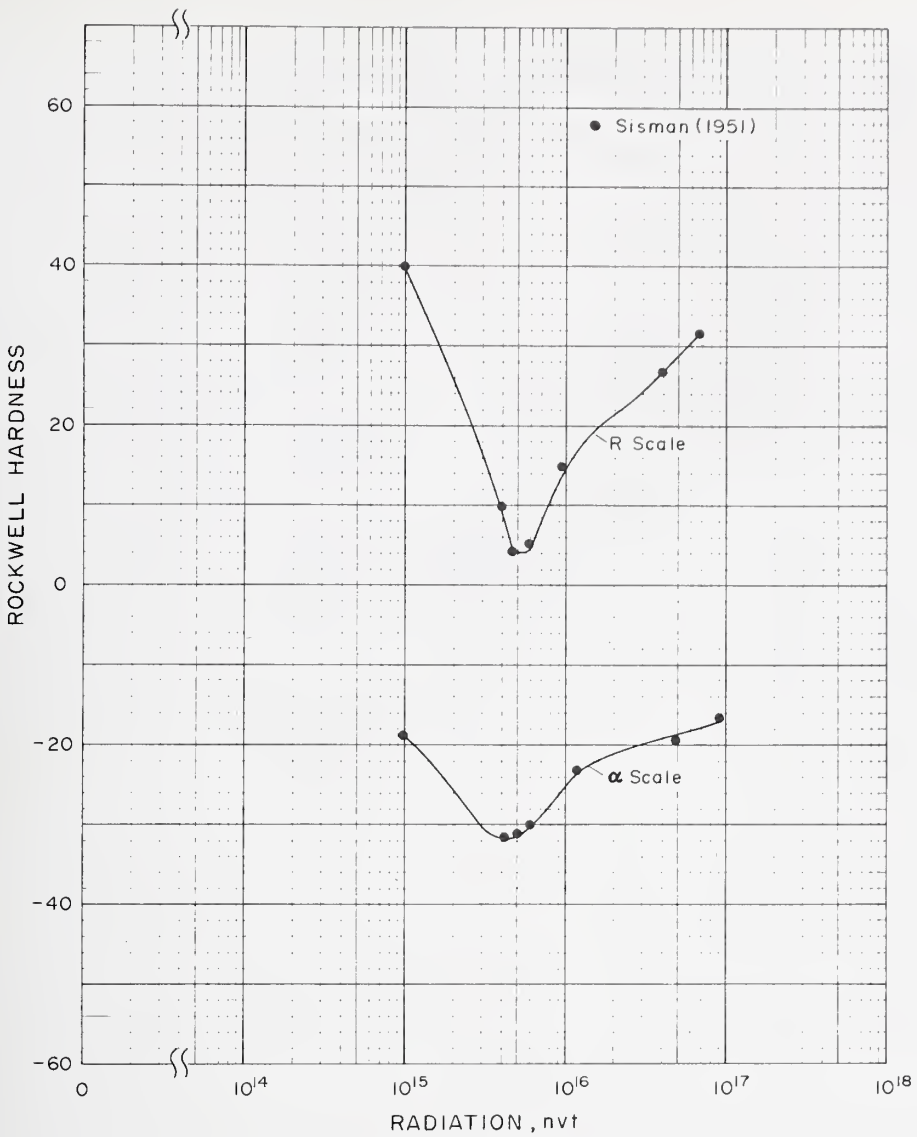
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL ...ON
Kuritsyna, Meinstev (1965)	Fluoroplast-4	

TFE

Hardness

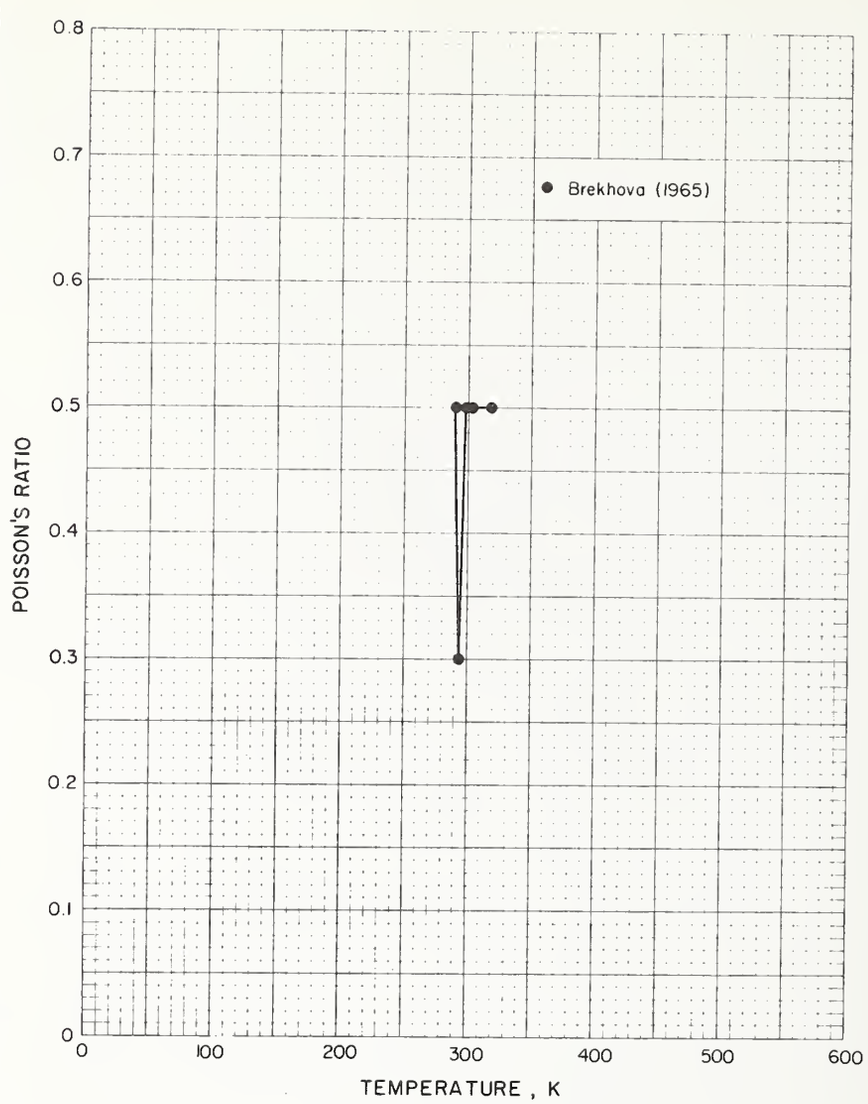


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Leininger (1957)	Teflon	Irrad in air by Co^{60}, dosage given in rads; scale not given.
Ferse (1968)	Sp gr = 2.155 at 296 K	TGL 20139 test procedure; irrad by 1300 Curie Co^{60} source at 6.5×10^5 Roentgens h^{-1}, irrad in vacuum and air dosage given in Roentgens.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sisman, Bopp (1951)	Teflon	Modified ASTM D 785-48T test procedure, Rockwell long stroke machine; irrad in Hole 19 of ORNL reactor at 298-313K and in air, aged 7 days at 298 ± 1K and 50 ± 2% rel hum before testing.

TFE



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Brekhova (1965)	Teflon	Diam = 1.2 cm, ℓ = 2.0 cm; measured in compression, 6250 psi.

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Young's Modulus (10^5 psi)
Renfrew (1946)		298	2.0-4.5			
Cornell (1953)	Extruded transparent Teflon film, t = 0.013 cm	298				
	long.		7.0			
	trans		2.5			
	Self-fusing Teflon film, t = 0.013 cm, sp gr = 1.4-1.5					
	long.		1.3		175	
	trans		0.16		500	
	Teflon, sp gr = 2.1-2.3		1.5-2.5		100-200	
Rudner (1954)	Teflon TF1 sp gr = 2.14		2.8		342	
Bopp (1955)						0.10
DuPont Co. (1955)	Teflon	298				0.58
Bresee (1956)	Teflon, sp gr = 2.14		3.76		175	
Kast (1956)	Teflon, sp gr = 2.14		1.4-2.5			
Thomas (1956)	Teflon 1	297				
	sp gr = 2.13, 50% crys		2.8	1.8	250	
	sp gr = 2.15, 56% crys		2.3	2.0	180	
	Teflon 6					
	sp gr = 2.15, 50% crys		4.2	1.6	380	
	sp gr = 2.22, 72% crys		3.1	1.8	450	
	sp gr = 2.25, 82% crys		2.0	1.8	800	
Mallouk (1958)	Teflon 6	298	3.0		360	

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Renfrew, Lewis (1946)		ASTM D 412-41T test procedure.
Cornell (1953)	Teflon	ASTM D 638-46T test procedure.
Rudner, Graeff, Bertolet, Jr. (1954)	Teflon TF1, sp gr = 2.14, molded under 4,000 psi, cured at 639 K and cooled at 56 K h^{-1}	
Bopp, Sisman (1955)	Teflon	
DuPont Co. (1955)	Teflon	ASTM D 638-49 T test procedure.
Bresee, Flanary, Goode, Watson, Watson (1956)	Teflon, sp gr = 2.14	
Kast, Meskat, Rosenberg, van der Vegt (1956)	Teflon, sp gr = 2.2	
Thomas, Lontz, Sperati, McPherson (1956)	Teflon 1 and 6	Red Sec = 0.48 x 0.16 x 2.24 cm; rhd spd = 0.21 cm s^{-1}, ASTM D 792 test procedure for sp gr.
Mallouk, Thompson (1958)	Teflon 6, extrusion grade, 50-82% crys, sp gr = 2.2	

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3psi)	Yield Strength (10^3psi)	Elongation (percent)	Young's Modulus (10^6 psi)
Thomas (1961)	Teflon, 65-68% crys	298	3.6		390	
Vincent (1962)	Fluon G1	293	1.7			
Green (1964)	Teflon	297	2.550			
Bernatskii (1965)	Fluoroplast-4	297				0.312
Denis (1966)	Fluoroplast-4	297				
	pressure = 2845 psi					
	rectangular, lab					0.353
	round, lab					0.346
	rectangular, commercial					0.381
	round, commercial					0.361
	pressure = 9956 psi					
	rectangular, lab					0.410
	round, lab					0.374
	rectangular, commercial					0.388
	round, commercial					0.325
Ihling (1966)	Teflon, sp gr = 2.185	297				
	Miniature					
	long.		3.25		251.8	
	trans		3.93		303.0	
	Standard					
	long.		2.84		286.5	
Laird (1966)	Teflon, sp gr = 2.18	297	>1.6		>100	0.567
Sakurada (1966)	Determined from (0015) lattice plane					22.2
Muraca (1967)	Sintered 633K, 20 min	294				
	t = 0.012 cm, 79% crys		3.55		512	
	t = 0.009 cm, 78.3% crys		3.48		440	
	t = 0.011 cm, 61.8% crys		4.31		415	
	Sintered 673K, 20 min					
	t = 0.017 cm, 61.9% crys		3.10		346	
	Sintered 633 K, 12 min					
	t = 0.012 cm, 51.8% crys		4.34		422	
Nerren (1968)	Unnotched	295	2.67			
	Notched	77	7.36			
Warfield (1969)	Teflon	298				0.07
ICI America (F-13)	Fluon, sp gr = 2.17	298				
	molded		3.0-5.0		250-400	
	extruded		2.0-2.5		250-400	

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thomas (1961)	Teflon, negligible microporosity, 65-68% crys	t = 0.16 cm; ASTM D 1457-56T test procedure.
Vincent (1962)	Fluon G1	
Green, Levine (1964)	Teflon	
Bernatskii (1965	Fluoroplast-4	
Denis, Balodis, Lipovskii (1966)	Fluoroplast-4, commercially prepared and laboratory prepared.	Rectangular specimens: ℓ = 10.0 cm, w = 1.5 cm, t = 1.0 cm; round specimens: diam = 3.0 cm; measurements made at high pressures.
Ihling (1966)	Teflon tube, 7.24 cm O.D, 4.45 cm I.D., ℓ = 15.24 cm, sp gr = 2.185	"Standard" and "miniature" tensile specimens cut from tube in trans and long. directions; av of 3-5 tests.
Laird, Cimprich, Kappler, Mason, Jr. (1966)	Teflon, sp gr = 2.18	Red Sec ℓ = 5.08 cm, w = 1.27 cm, t = 0.64 cm as per ASTM D 638-61T; Tinius Olsen HL-400-2 tensile test machine, $\dot{\varepsilon} = 0.0029\ s^{-1}$; av of 2 tests.
Sakurada, Ito, Nakamae (1966)		Fiber; to calculate stress, the specimen cross-section was reduced to a reference state (dried); strain measured by determining lattice extension of (0015) plane by a Geiger counter x-ray diffractometer, stress assumed homogeneous throughout specimen.
Muraca (1967)	Teflon TFE-30, films prepared from aqueous dispersion, cooling rates after sintering varied to obtain values of crys	GL = 2.54 cm, w = 0.32 cm; Instron model TT CLM-6, xhd spd = 0.021 cm s^{-1}; av of 6 tests, 3 specimens cut $\perp$ and $\parallel$ to mandrel axis.
Nerren (1968)		ℓ = 15.24 cm, w = 1.91 cm, unnotched samples had a Red Sec with w = 0.64 cm, distance between notches on notched samples = 0.64 cm; tests conducted in air or liquid N_2.
Warfield, Cuevas, Barnet (1969)	Teflon	ℓ = 7.62 cm, diam = 0.630 cm; modified Matsuoka-Maxwell apparatus; estimated accuracy = ± 5%.
ICI America (F-13)	Fluon, unfilled, sp gr = 2.17	

Investigator(s) (year)	Description	Temperature (K)	Strength (10^3 psi)	Modulus (10^6 psi)	Hardness	Other
Renfrew (1946)		298				60[a]
Cornell (1953)	Teflon, sp gr = 2.1-2.3	298			D55-D70 (Durometer)	60[a]
DuPont Co. (1955)	Teflon	298	3.8[b]		D55 (Rockwell)	
		296				60[a]
Bresee (1956)	Teflon, sp gr = 2.14		3.01[b]			2.65[c]
Thomas (1956)	Teflon 1					
	sp gr = 2.13, 50% crys			0.062[d]	92	200[e]
	sp gr = 2.15, 56% crys			0.074	90	100
	Teflon 6					
	sp gr = 2.15, 50% crys			0.054	90	>400
	sp gr = 2.22, 72% crys			0.150	85	300
	sp gr = 2.25, 82% crys			0.170	80 (Rockwell J)	150
Mallouk (1958)	Teflon 6	298		0.078[d]	D65 (Durometer)	
Heydeman (1959)	Teflon	293		0.306[f]		
Gillespie (1960, part 2)	Teflon 1	296			58 (Rockwell R)	
Kuritsyna (1961)	Fluoroplast-4	297			3.3 kg mm^{-2} (Brinell)	
Vincent (1962)	Fluon G 1	293	1.6[b] 2.1[g]			
Curry (1964)		296			56 (Shore D)	
Bragaw (1956)	Teflon 1	296				905 ± 176[e]

(a) Stiffness (10^3 psi)
(b) Shear strength
(c) Izod impact strength (ft-lb per in. of notch)
(d) Flexural modulus
(e) Tensile impact strength (ft-lb in^{-3})
(f) Bulk modulus
(g) Compressive strength

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Renfrew, Lewis (1946)		ASTM D 747-43T test procedure.
Cornell (1953)	Teflon	Stiffness measured by ASTM D 790-45T test procedure, hardness measured by ASTM D 676-47 T test procedure.
DuPont Co. (1955)	Teflon	Stiffness measured by ASTM D 747-48T test procedure, shear strength measured by ASTM D 732-46 test procedure.
Bresee, Flanary, Goode, Watson, Watson (1956)	Teflon, sp gr = 2.14	
Thomas, Lontz, Sperati, McPherson (1956)	Teflon 1 and 6	ASTM D 790 test procedure for flexural modulus, ASTM D 785 test procedure for hardness, ASTM D 792 test procedure for sp gr.
Mallouk, Thompson (1958)	Teflon 6, extrusion grade, 50-82% crys, sp gr = 2.2	
Heydemann (1959)	Teflon	In the frequency range of 0.1 Hz to 6×10^4 Hz the bulk modulus remaining constant.
Gillespie, Saxton, Chapman (1960, part 2)	Teflon 1, ram extruded av sp gr = 2.17, 60 ± 2% crys, void content < 0.3%, preform pressure = 2,500 psi	ASTM D 785-51T test procedure.
Kuritsyna, Meinstev (1961)	Fluoroplast-4	Measured by unrecovered indentations.
Vincent (1962)	Fluon G 1	
Curry (1964)	Teflon	Penetration type hardness measurement.
Bragaw (1956)	Teflon 1	50% rel hum; error is standard deviation of 4 tests.

Investigator(s) (year)	Description	Temperature (K)	Strength (10^3 psi)	Modulus (10^6 psi)	Hardness	Other
Jolley (1964)	sp gr = 2.13-2.20	296			58 (Rockwell R)	3.0[c]
						320[e]
Koo (1965)	Halon G-80	296				205[e]
Ainbinder (1966)	Teflon	297			3.84 kg mm^{-2} (Brinell)	
Denise (1966)	Fluoroplast-4	297				
	pressure = 2845 psi					
	rectangular, lab			0.123[h]	0.384[i]	0.105[j]
	round, lab			0.120	0.384	
	rectangular, commercial				0.380	0.110
	round commercial				0.398	
	pressure = 9956 psi					
	rectangular, lab			0.142	0.368	0.126
	round, lab			0.134	0.397	
	rectangular commercial				0.381	0.118
	round commercial				0.400	
Kelleher (1968)		297				55[a]
Nerren (1968)	notched					
	827.5±22.5 psi, 3 Hz	295				96,959[k]
	365 ± 20 psi, 5.5 Hz	77				297,120
	unnotched					
	210±22.5 psi, 3 Hz	295				3,218
Warfield (1969)	Teflon	298		0.30[f]		0.46[i]
Wisander (1969)		293		0.08[ℓ]		
		77	20[b]			
ICI America (F-13)	Fluon, sp gr = 2.17 molded	298			50-55 (Shore D)	

(a) Stiffness (10^3 psi)
(b) Shear strength
(c) I zod impact strength (ft-lb per in of notch)
(e) Tensile impact strength (ft-lb in^{-3})
(f) Bulk modulus
(h) Shear Modulus
(i) Poisson ratio
(j) Damping factor (Q^{-1})
(k) Fatigue life in cycles
(ℓ) Compressive modulus

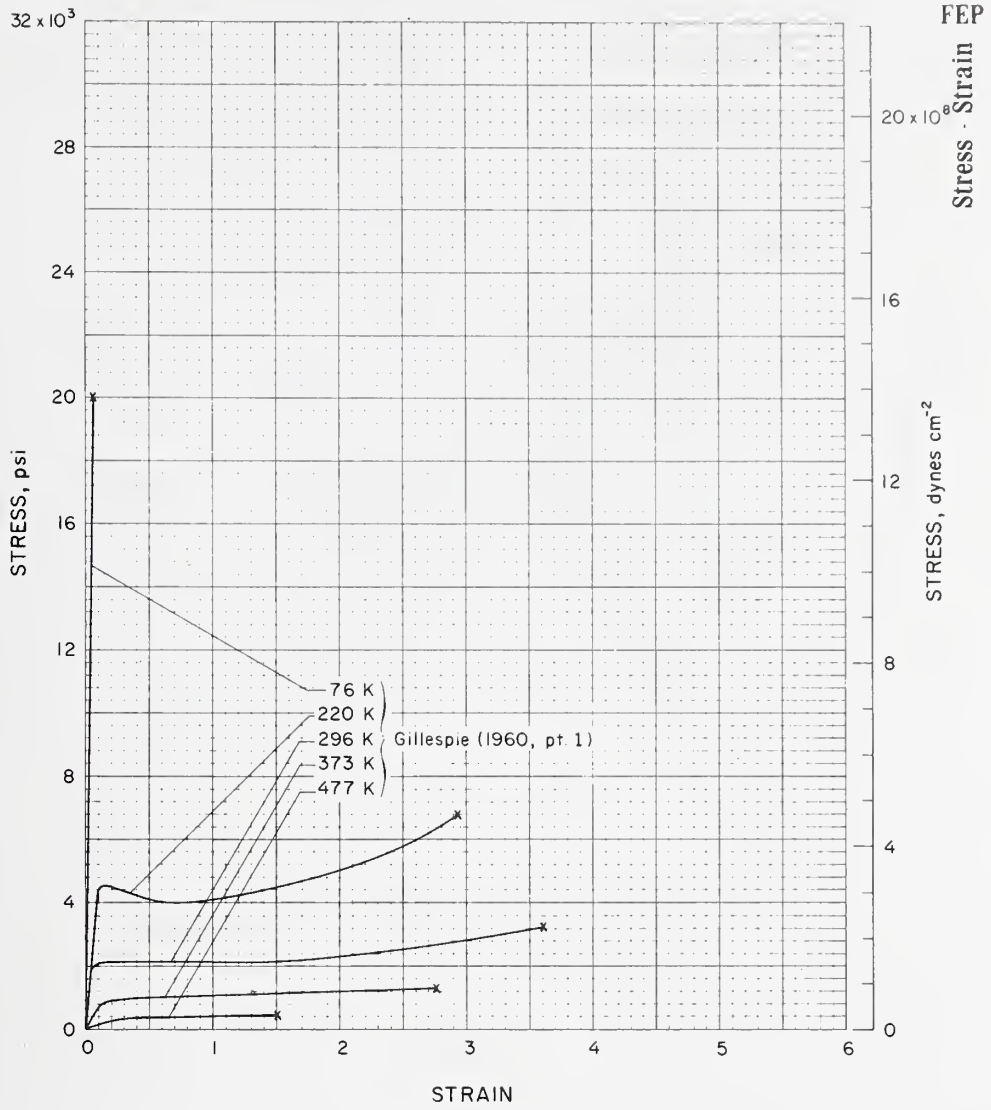
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Jolley, Homsy, Reed (1964)	sp gr = 2.13-2.20	ASTM D 785 test procedure for hardness, ASTM D 256 test procedure for Izod impact strength, ASTM D 792 test procedure for sp gr.
Koo, Jones, Riddell, O'Toole (1965)	Halon G-80	Type S specimens; ASTM D 1822-61T test procedure.
Ainbinder, Laka (1965)	Teflon, "as received"	Rockwell type instrument modified to measure the depth of the unrecovered indentation.
Denis, Balodis, Lipovskii (1966)	Fluoroplast-4, commercially prepared and laboratory prepared	Rectangular specimens: ℓ = 10.0 cm, w = 1.5 cm, t = 1.0 cm; round specimens: diam = 3.0 cm; measurements made at high pressures.
Kelleher, Miner, Boyle (1968)	Unpigmented, molded to t = 0.157 cm	w = 0.64 cm; modified Tinius Olsen stiffness tester, ASTM D 747 test procedure.
Nerren (1968)		ℓ = 15.24 cm, w = 1.91 cm, unnotched samples had a Red Sec with w = 0.64 cm, distance between notches on notched samples = 0.64 cm; tests conducted in air or liquid N_2.
Warfield, Cuevas, Barnet (1969)	Teflon	ℓ = 7.62 cm, diam = 0.630 cm; modified Matsuoka-Maxwell apparatus; estimated accuracy = ± 5%.
Wisander, Johnson (1969)		Compression: ℓ = 1.905 ± 0.003 cm, diam = 0.635 ± 0.003 cm; max load = 200 lb, xhd spd = 0.0021 cm s^{-1}.
		Shear: ℓ = 2.54 cm, diam = 0.318 ± 0.003 cm; xhd spd = 0.021 cm s^{-1}.
ICI America (F-13)	Fluon, unfilled, sp gr = 2.17	

Investigator(s) (year)	Description	Temperature (K)	Strength (10^3 psi)	Modulus (10^6 psi)	Hardness	Other
Lane (1949)	Teflon unirrad irrad 12 h irrad 1 week	298				3.3[c] 5.7 0.3

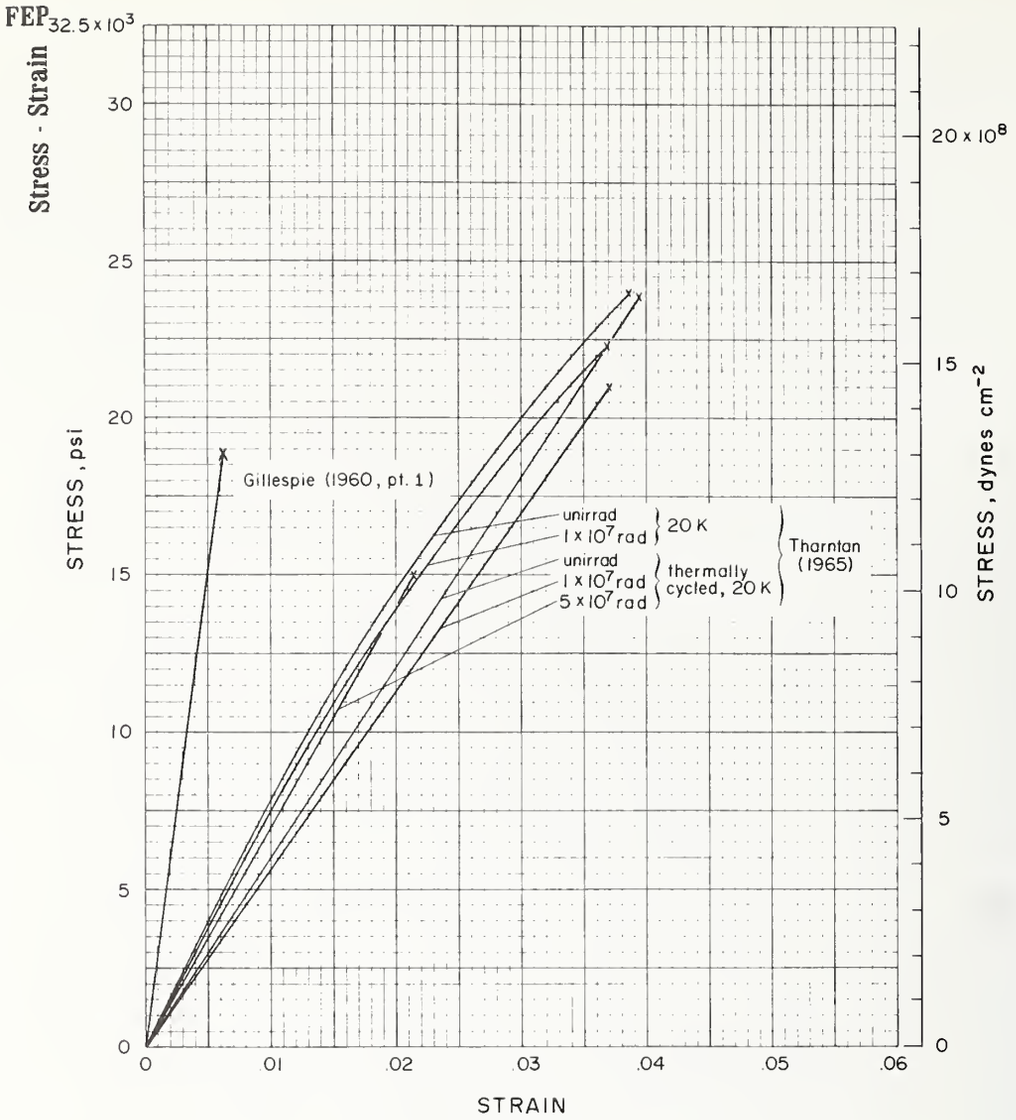
(c) Izod impact strength (ft-lb per in of notch)

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Lane, Winters (1949)	Teflon	Standard ASTM test specimens; irrad in reactor at 313 K.

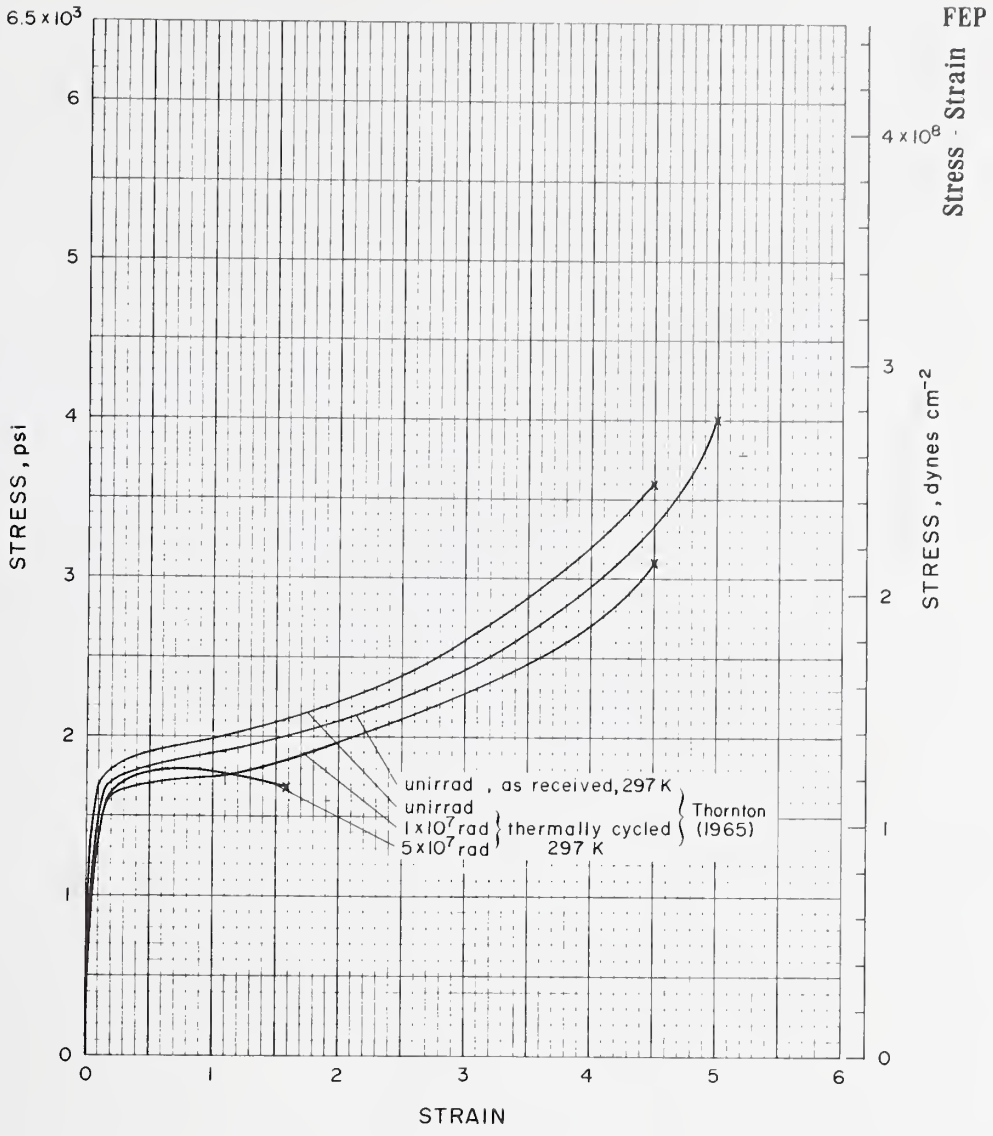
Mechanical Properties (FEP)



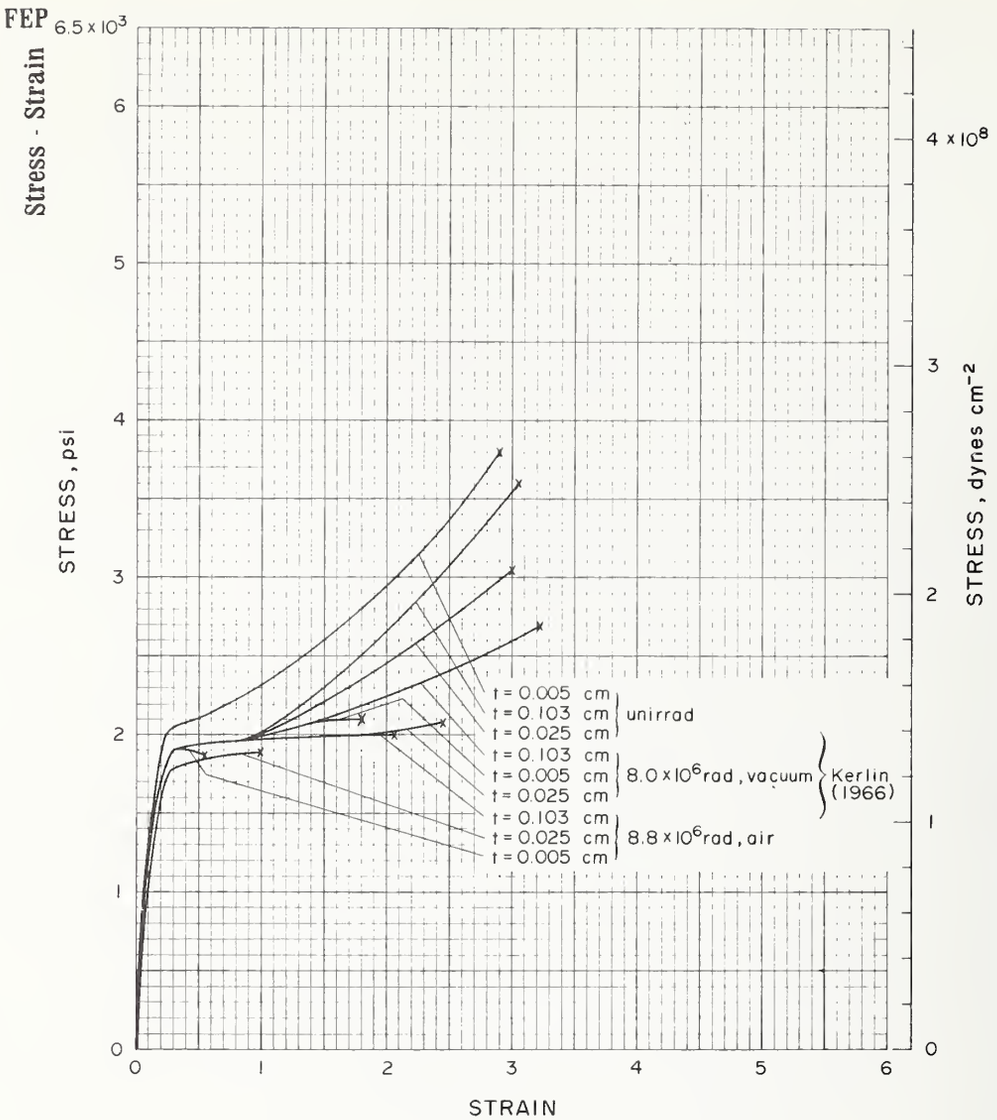
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 100X, melt extruded, av sp gr = 2.14	ℓ = 2.54 cm, diam = 2.54 cm, ASTM D-1457-56T test procedure.



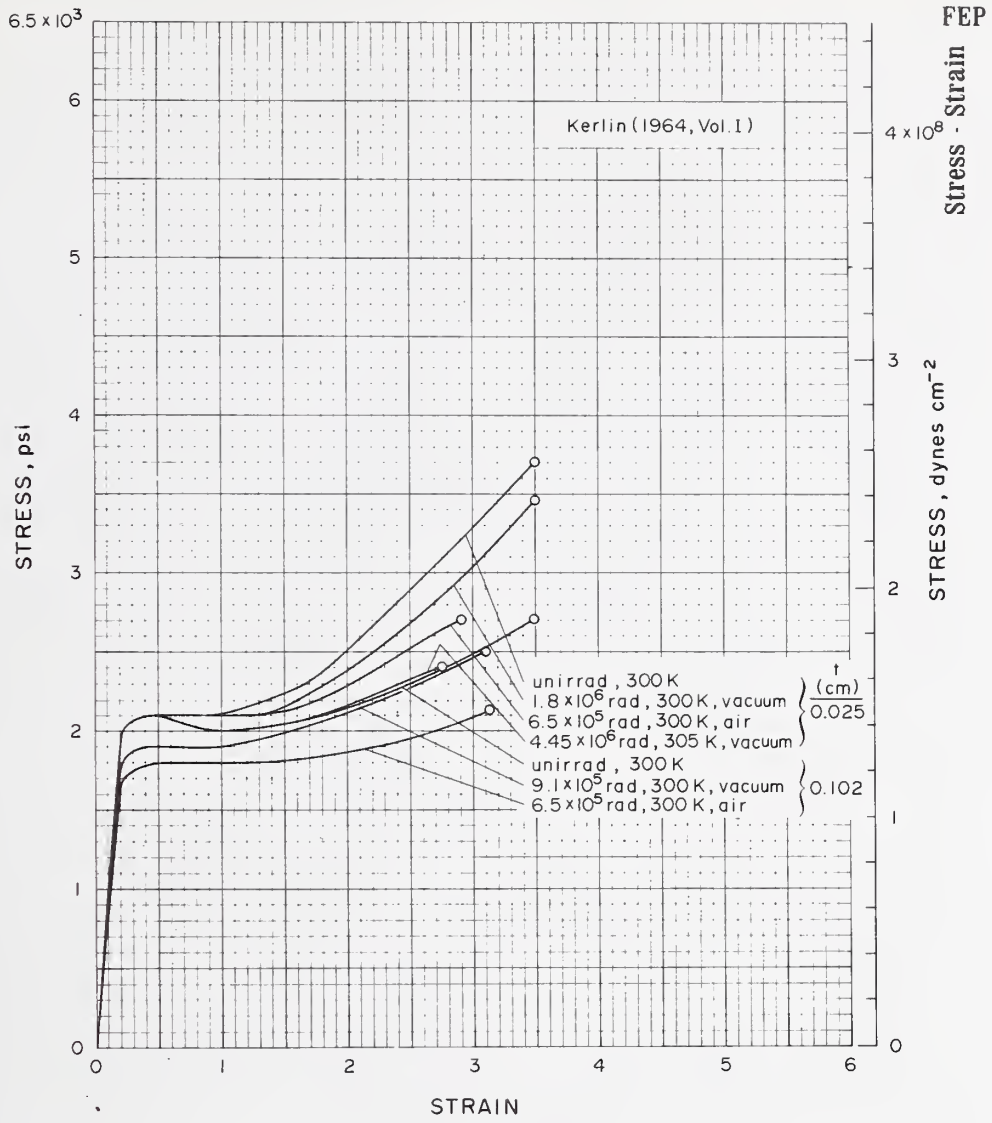
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 100 X, melt extruded, av sp gr = 2.15, molding pressure = 10^4 psi	ℓ = 35.6 cm, w = 35.6 cm, t = 0.32 cm; ASTM D 1457-56T test procedure, 77 K.
Thornton (1965)	Teflon FEP	Instron, xhd spd = 0.0021 cm s^{-1}; all irradiation done in liquid H_2, thermally cycled specimens were held at 297 K in gaseous He for 4 days and then returned to liquid H_2, irrad by Ground Test Reactor of the Nuclear Aerospace Research Facility of General Dynamics at Fort Worth; av curve.



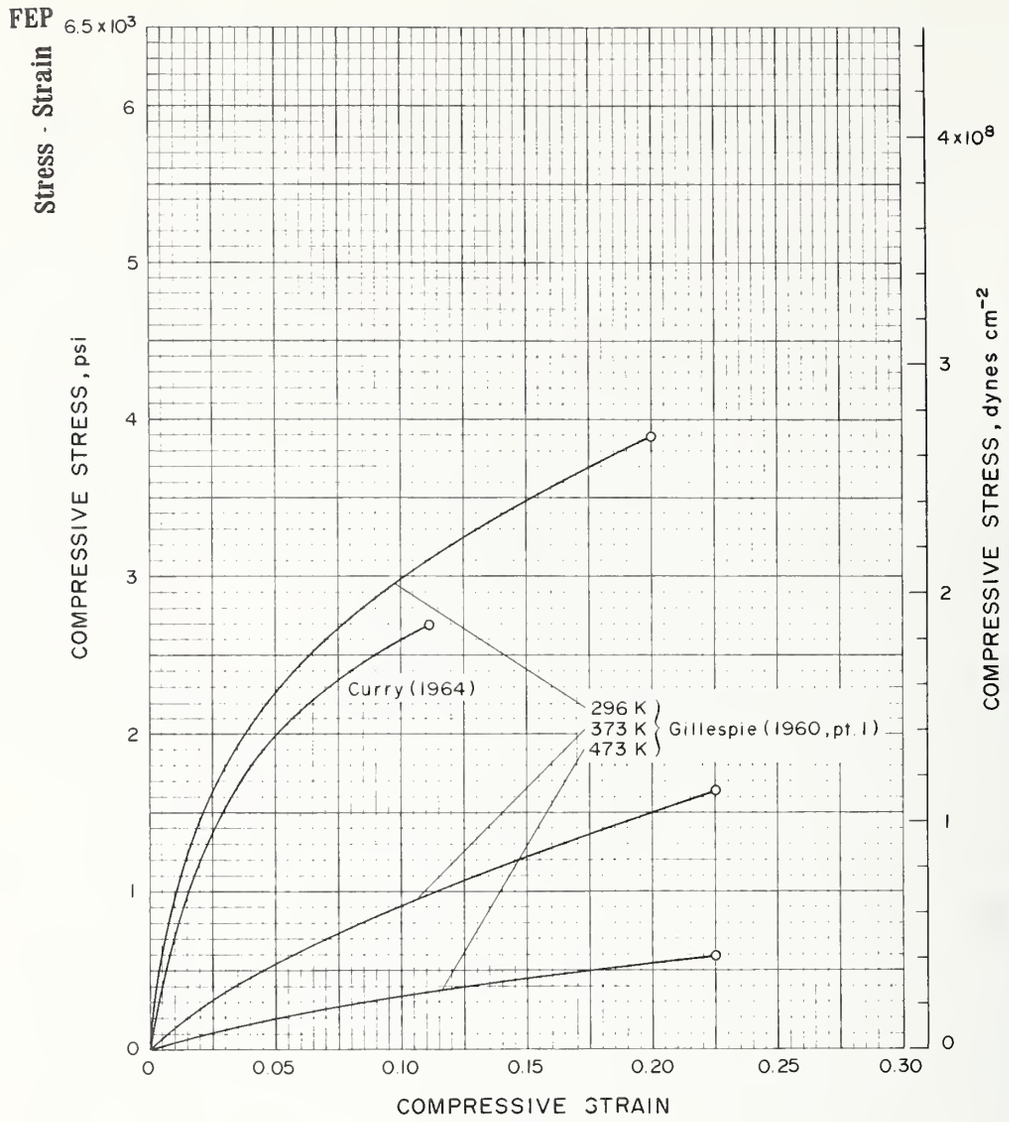
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thornton (1965)	Teflon FEP	Instron, xhd spd = 0.0021 cm s^{-1}; all irradiation done in liquid H_2, thermally cycled specimens were held at 297 K in gaseous He for 4 days, returned to liquid H_2, and then held at 297 K in air for 4 days before testing, irrad by Ground Test Reactor of the Nuclear Aerospace Research Facility of General Dynamics at Fort Worth; av curve.



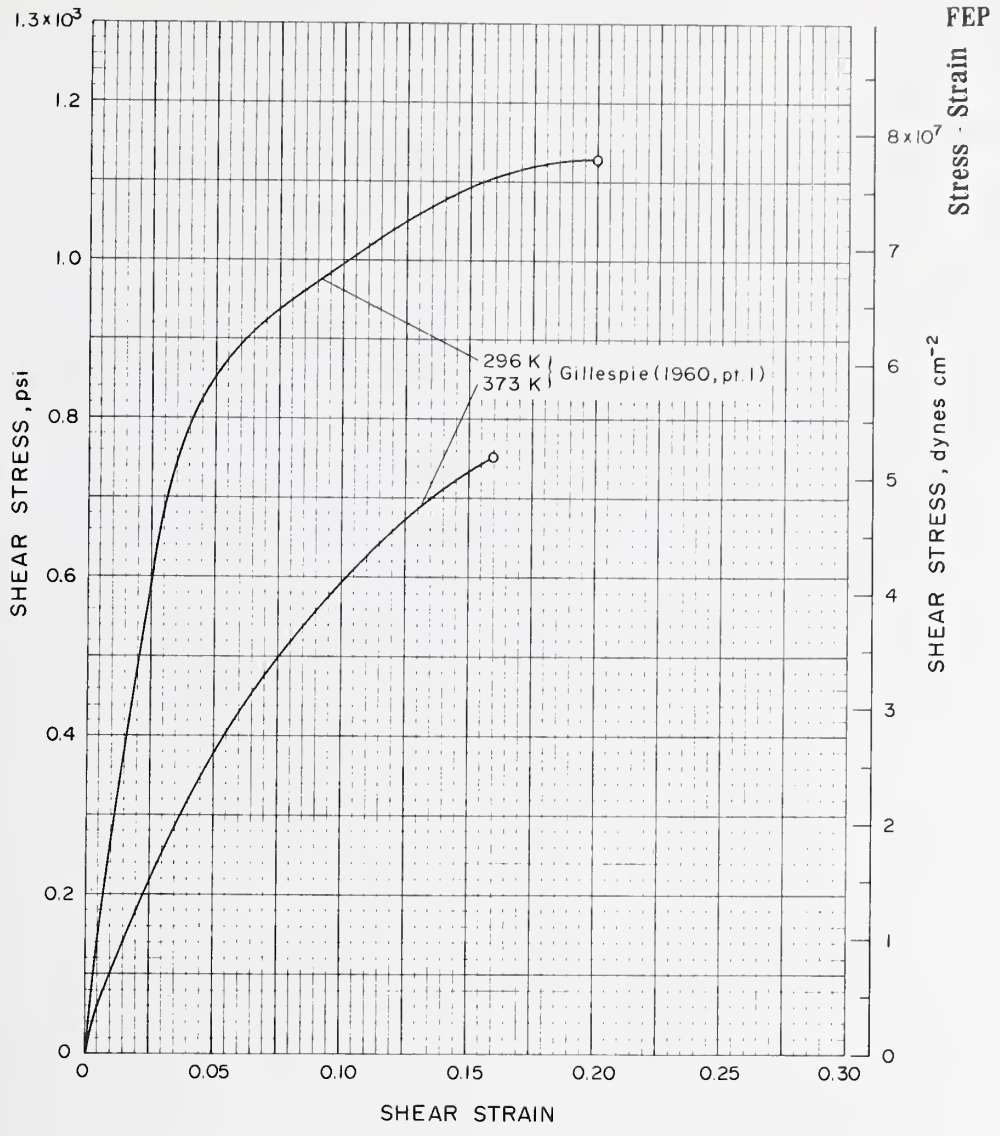
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Teflon	For t = 0.005 and 0.025 cm specimens: Red Sec = 15.24 x 2.54 cm; Instron, xhd spd = 0.85 cm s^{-1}, ASTM D 882 - 61T test procedure; for t = 0.103 cm specimens: xhd spd = 0.85 cm s^{-1}, ASTM D 412-62T test procedure, Die A; unirrad and air irrad specimens tested at 297 K, vacuum irrad specimens tested at 322K, in air; av of 4 or 5 specimens, irrad by the Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics at Fort Worth.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1964, Vol. I)	Teflon	t = 0.025 cm specimens have Red Sec of 15.2 x 2.54 cm; Instron, ASTM D 882-56T test procedure: t = 0.102 specimens tested according to ASTM D412-51T procedure on an Instron, Die A used, xhd spd = 0.85 cm s^{-1}; av of 4 or 5 specimens tested; irrad in vacuum or air by the Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics at Fort Worth.



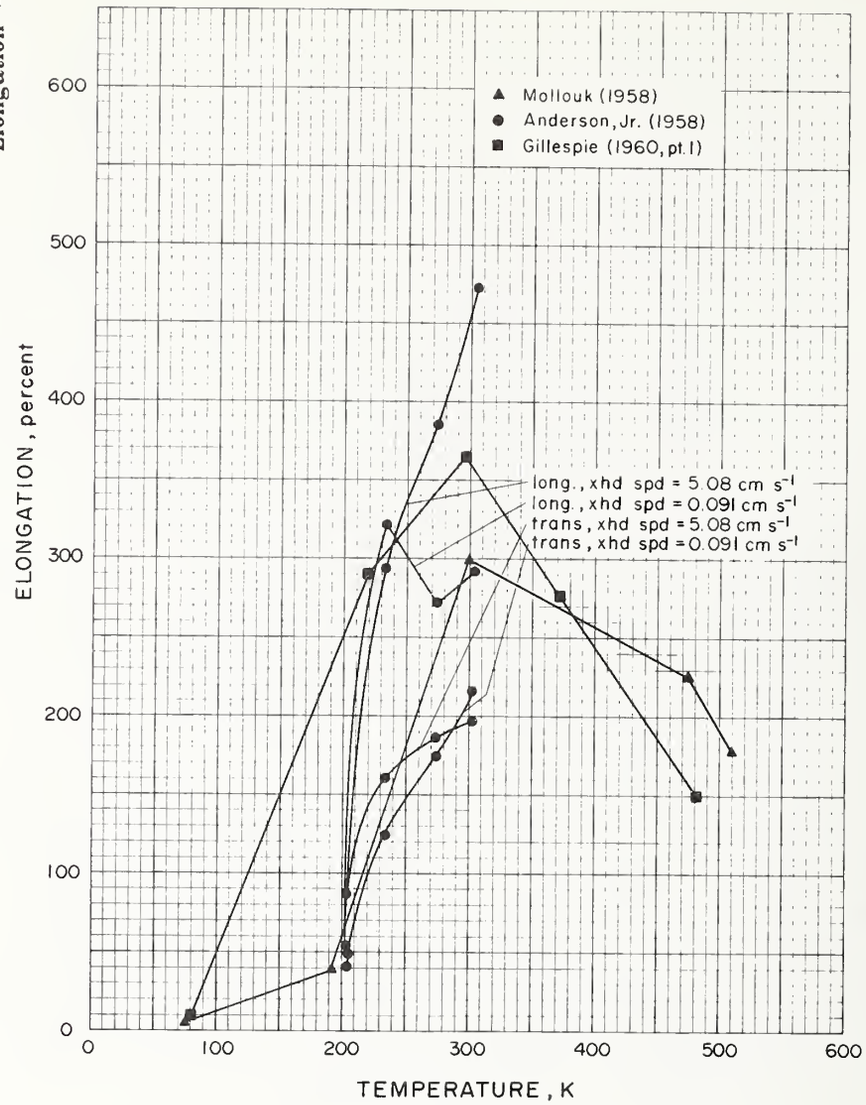
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Curry (1964)	Teflon	Stacked specimens 1.27 x 1.27 x 0.16 cm; conventional metallurgical test equipment, 296 K.
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 100X, melt extruded, av sp gr = 2.14, molding pressure = 10,000 psi	∿ = 2.54 cm, diam = 2.54 cm; ASTM D-695-54 test procedure.



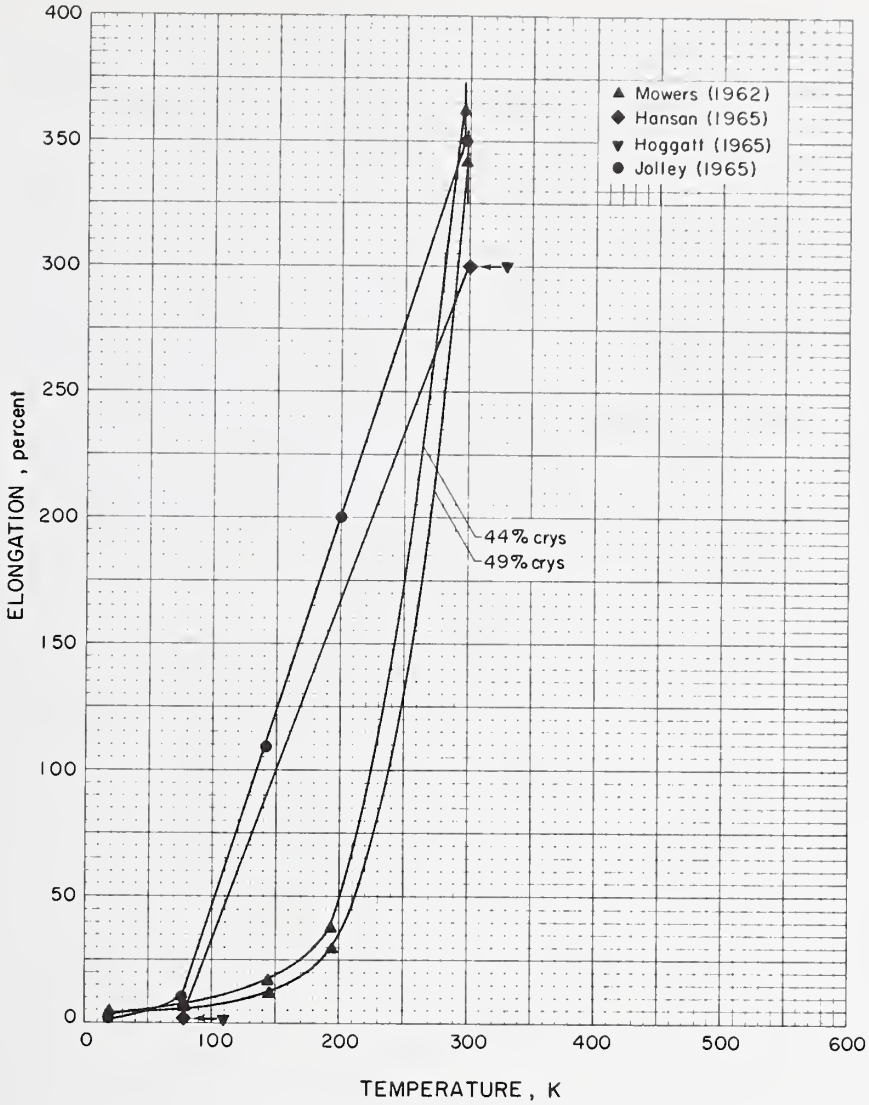
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 100 X, melt extruded, av sp gr = 2.14	λ = 2.54 cm, diam = 2.54 cm.

FEP

Elongation



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mallouk, Thompson (1958)	Teflon 100X	
Anderson, Jr., Morfitt (1958)	Teflon 100X	t = 0.002 cm; direction of pull noted; av of 5 tests.
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 100X, melt extruded, av sp gr = 2.14	ℓ = 2.54 cm, diam = 2.54 cm; ASTM D-1457-56T test procedure; extracted from $\sigma - \epsilon$ diagrams.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 44-49% crys, sp gr = 2.135-2.149, molded at 589K, 5 min, quick quenched; 49-55% crys, sp gr = 2.149-2.155, molded at 589K, 5 min, quick quenched then held at 519K for 12 h	3 dies used to give Red Sec of 2.54x0.635 cm, 2.54x0.318, and 0.51x0.254 cm; Instron, xhd spd = 0.042 cm s^{-1} at 298K and 0.0042 cm s^{-1} otherwise.
Hanson, Richards, Hickel (1965)	Teflon	Red Sec 20.2x1.27 cm, t = 0.0254-0.0762 cm; universal tester, self-locking film grips, xhd spd = 0.0021 cm s^{-1}.
Hoggatt (1965)	Teflon	t = 0.0051; ASTM D-1708-597 test procedure.
Jolley, Homsy, Reed (1964)	Teflon	ASTM D-638 test procedure.

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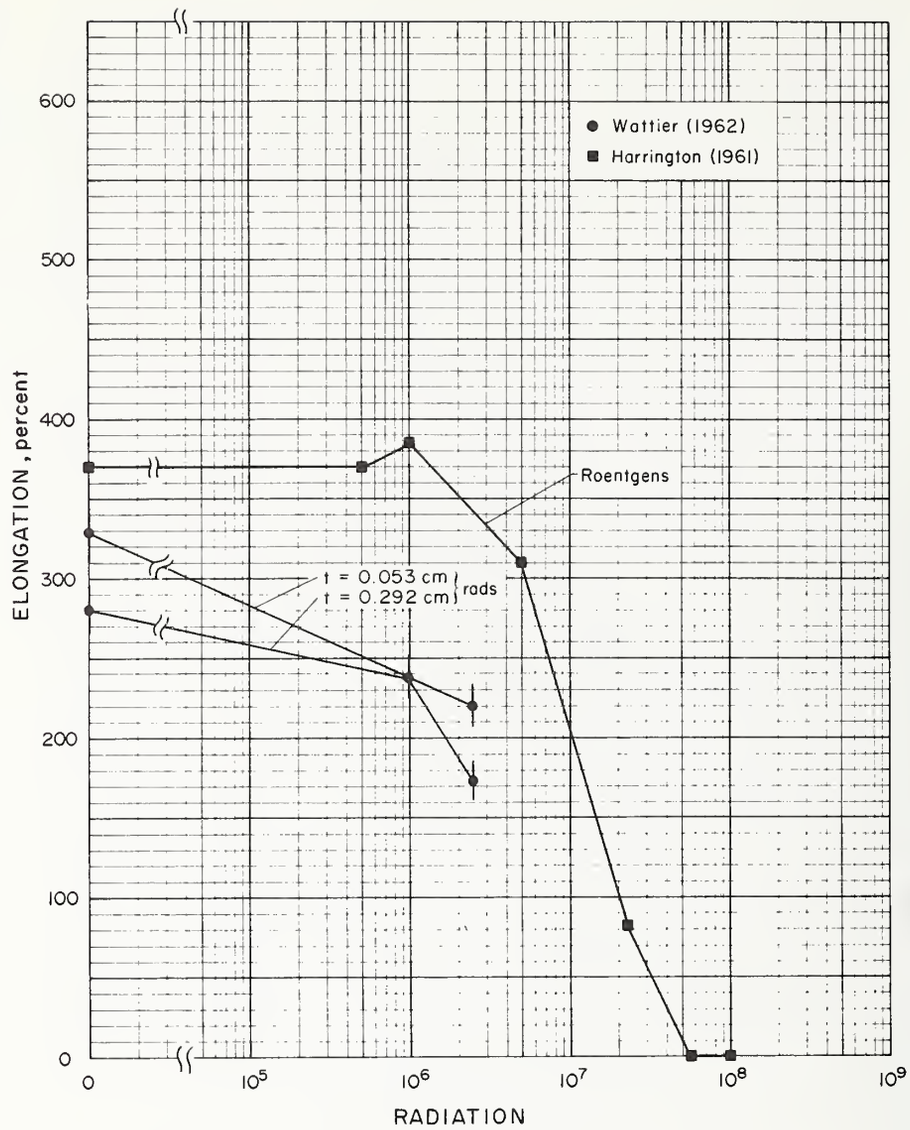
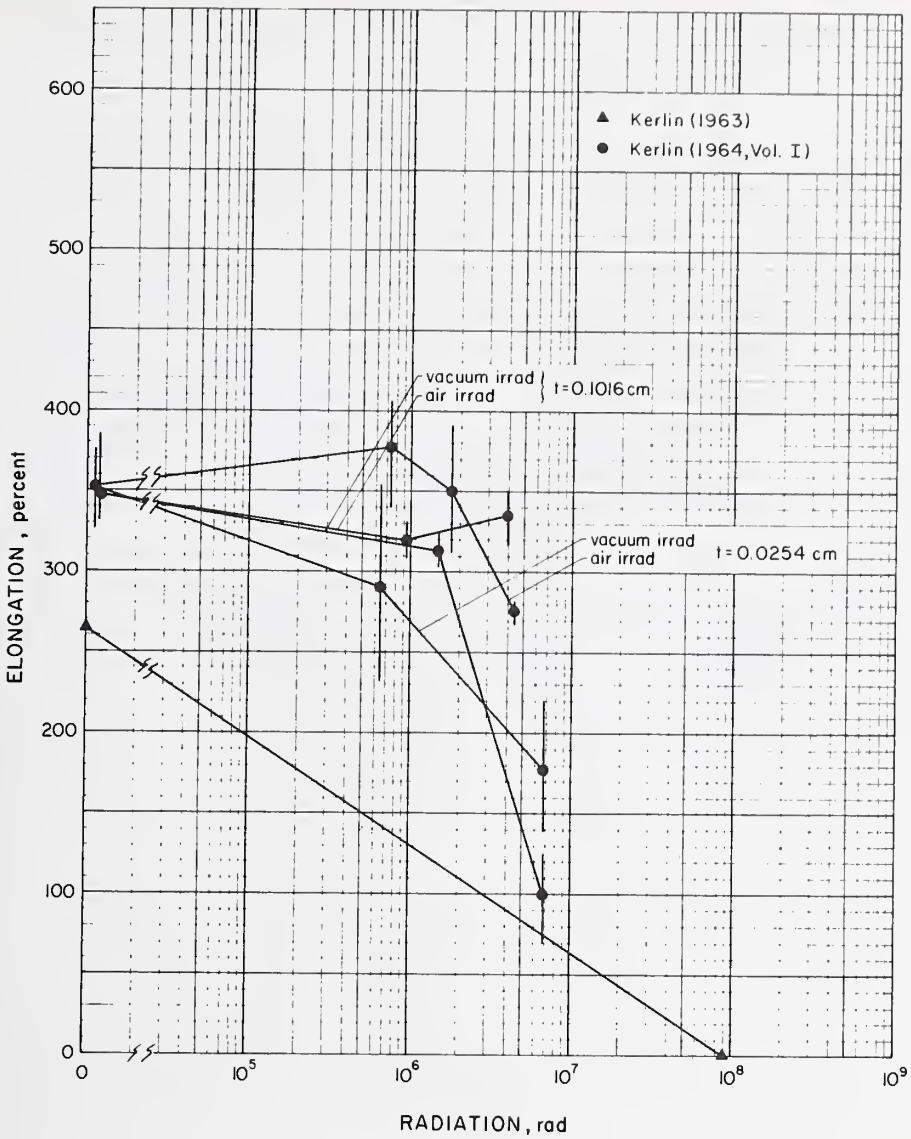
Elongation



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Wattier, Newell, Morgan (1962)	Teflon 100	Irrad and tested at 300 K, irrad in air; error bars indicate standard deviation.
Harrington (1961)	Teflon 100X	t = 0.020 cm, Die C dumbbell test specimen; ASTM D 412-51T test procedure, Scott tensile tester; irrad by 1.3×10^3 Roentgens h^{-1} Co^{60} source in air at 298 K.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1964, Vol. I)	Teflon	Samples with t = 0.0254 cm: w = 2.54 cm, ℓ = 15.24 cm; Instron, ASTM D-882-56T test procedure; samples with t = 0.1016 cm: cut with Die A described in ASTM D-412-51T; Instron, xhd spd = 0.85 cm s^{-1}; irrad in air and vacuum and tested in air, irrad in Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics, Fort Worth; error bars indicate standard deviation.
Kerlin (1963)	Teflon 100	w = 2.54 cm, ℓ = 15.24 cm, t = 0.102 cm; ASTM D-882 test procedure. Instron Model TT; irrad in vacuum at 298 - 316 K in Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics, Fort Worth; error bars indicate standard deviation of 2 or 3 tests.

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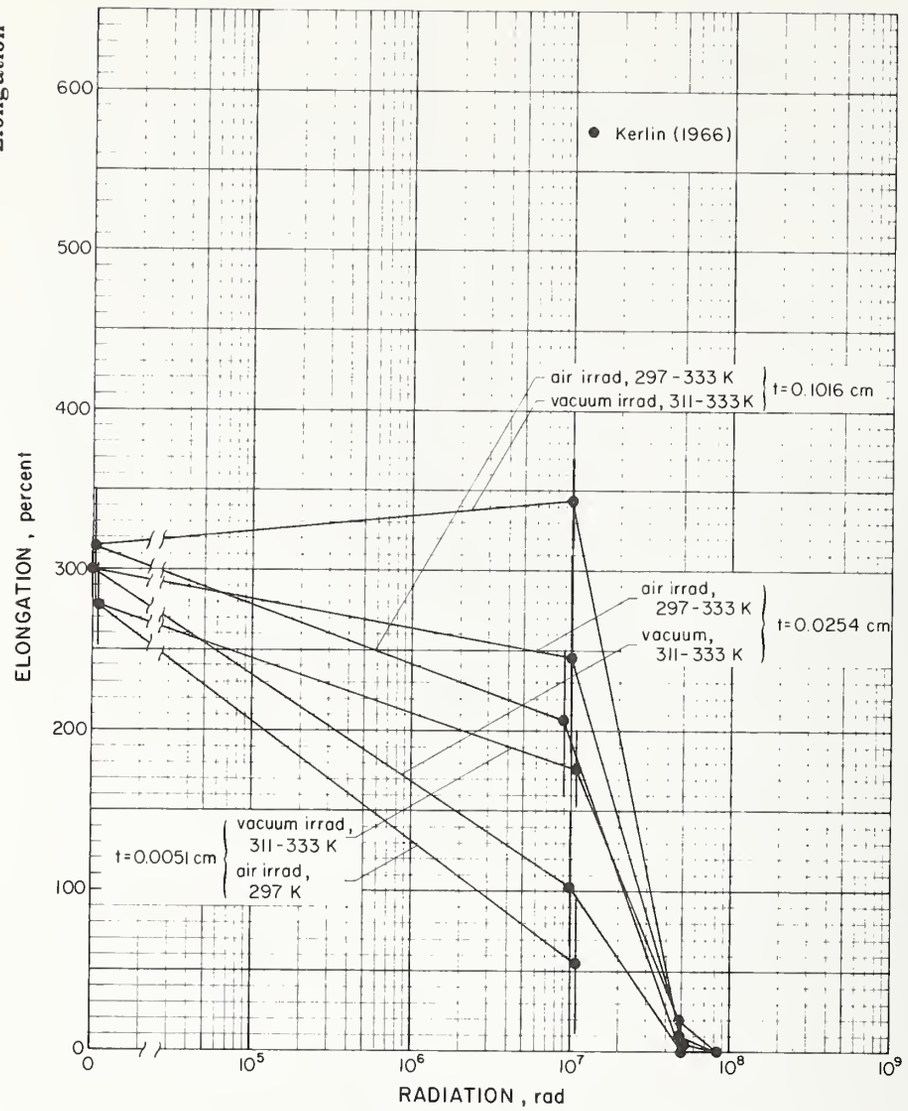
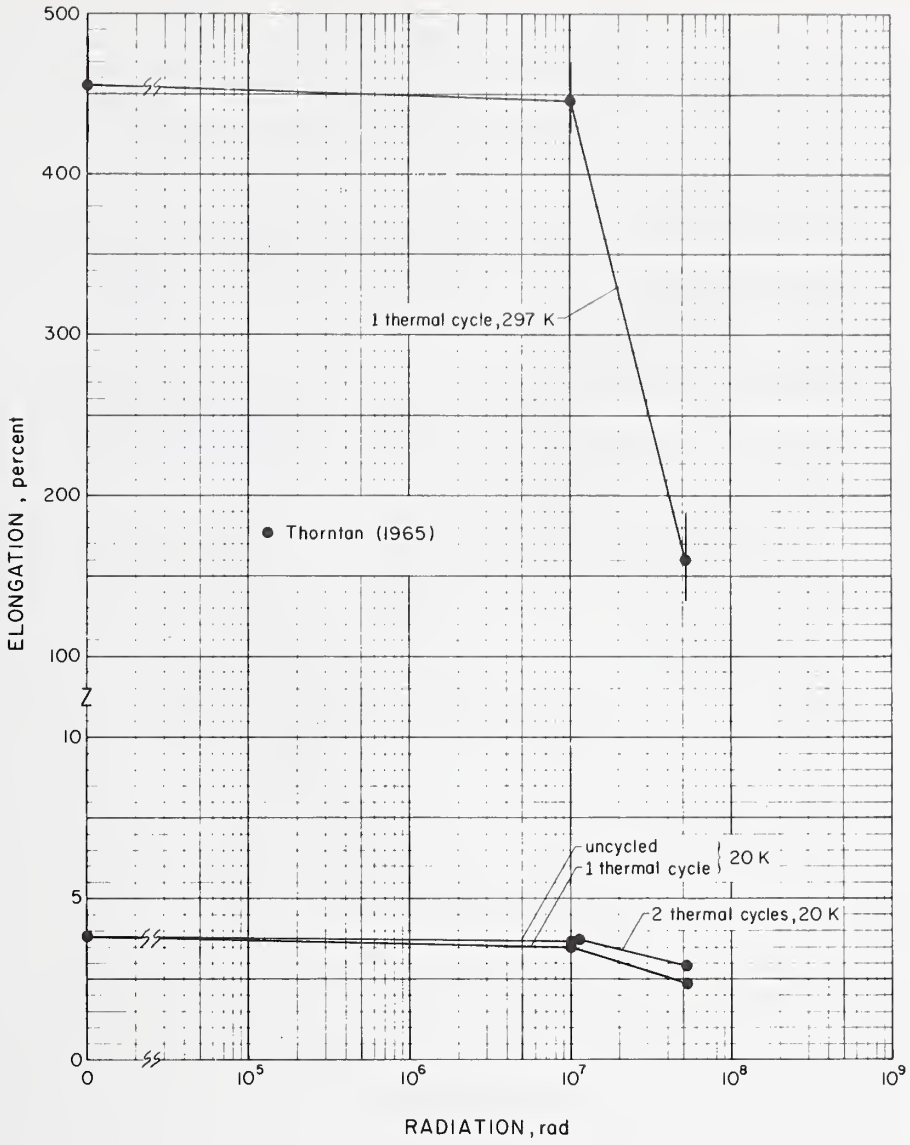
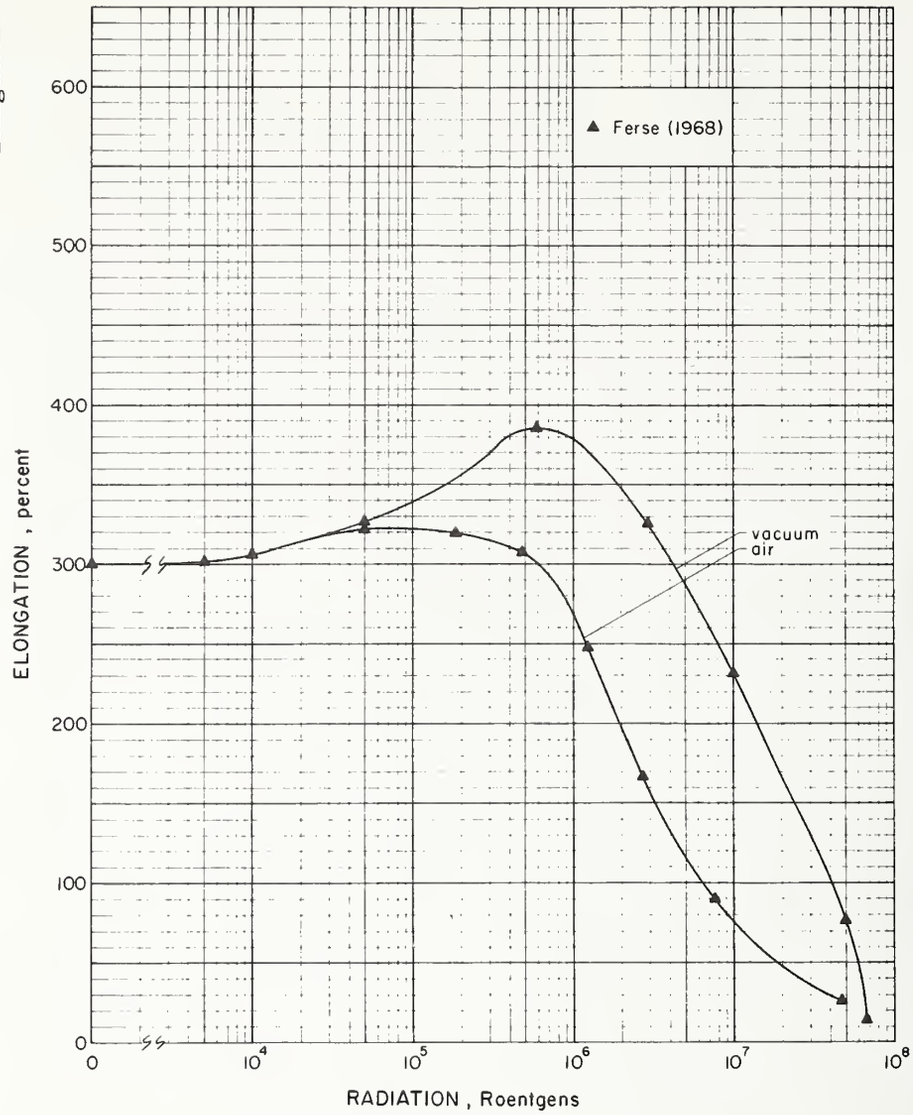
Elongation



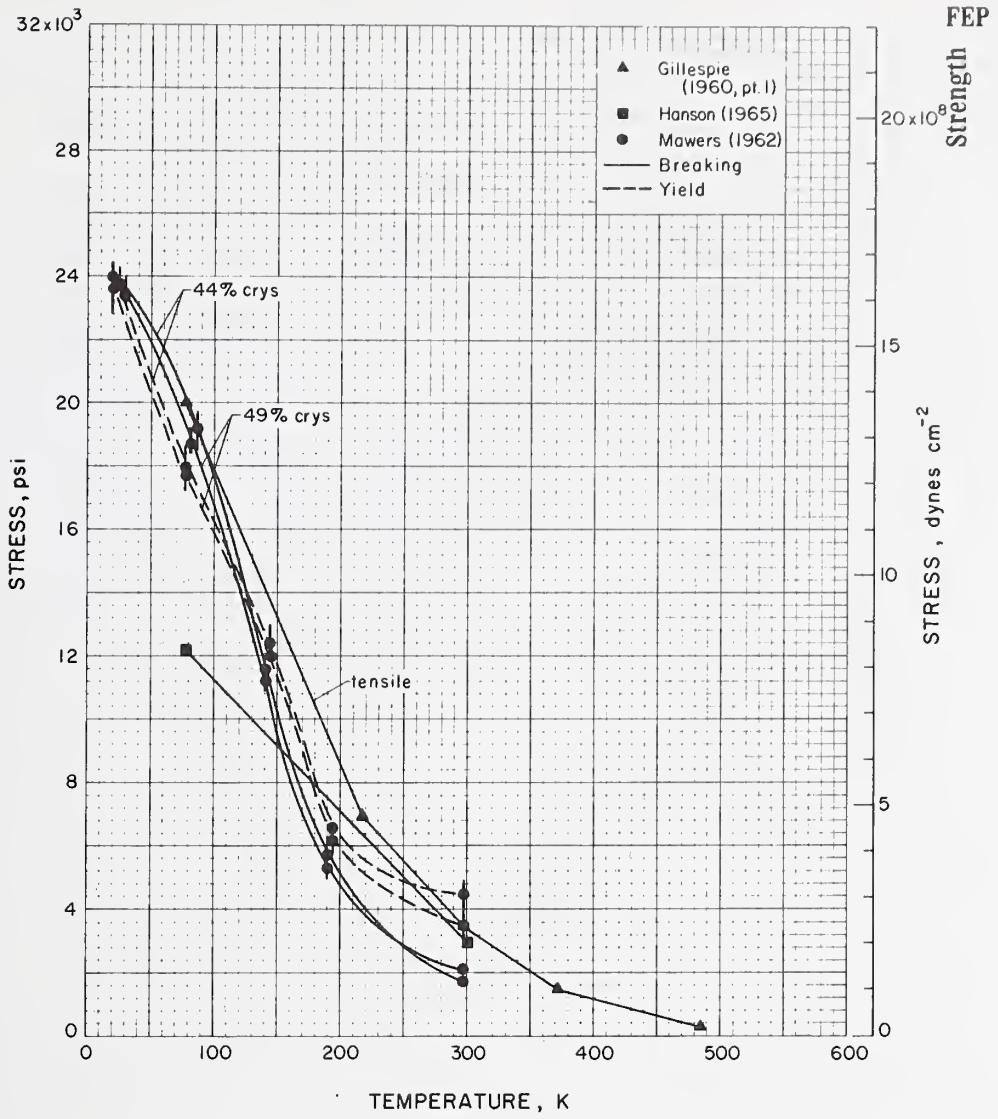
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Teflon	Samples with t = 0.0051 cm and t = 0.0254 cm: w = 2.54 cm, ℓ = 15.24 cm; Instron, ASTM D-882-61T test procedure, xhd spd = 0.85 cm s^{-1}; samples with t = 0.1016 cm: cut with Die A described in ASTM D-412-62T; Instron, xhd spd = 0.85 cm s^{-1}; irrad in air and vacuum and tested in air, irrad in Ground Test reactor at the Nuclear Aerospace Research Facility of General Dynamics, Fort Worth; error bars indicate standard deviation.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thornton (1965)	Teflon FEP	Instron, xhd spd = 0.0021 cm s^{-1}; all samples irrad in liquid H_2, most of the irrad specimens were thermally cycled once or twice to 297 K and then tested at 20 K or 297 K, the first cycle was 4 days in gaseous He and the second was 4 days in air, irrad by Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics at Forth Wroth; av of 4 tests is plotted, error bars indicate standard deviation.



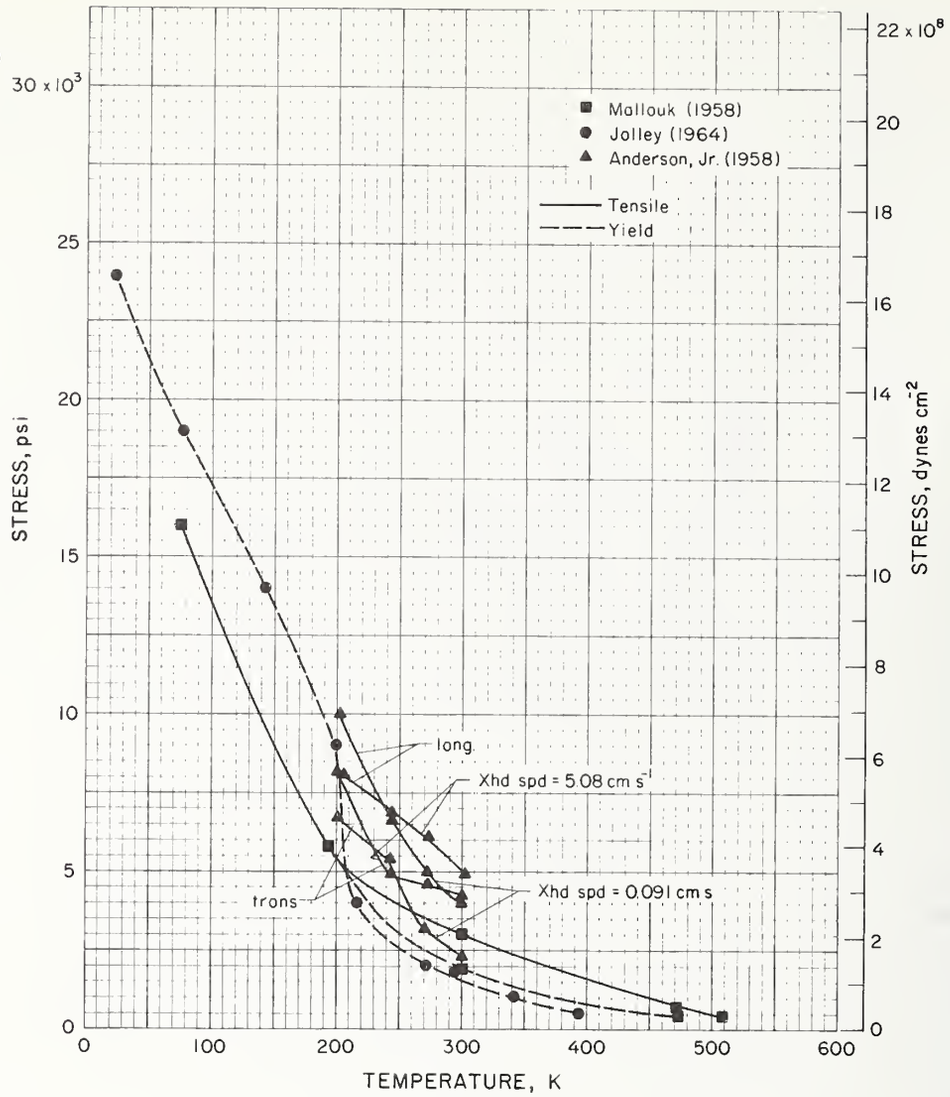
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ferse (1968)	12 mole % hexafluoropropylene	t = 0.15-0.20 cm; ASTM D1457-62T test procedure, xhd spd = 0.083 cm s^{-1}; irrad by 1300 Curie Co^{60} source at 6.5 x 10^5 Roentgen h^{-1}, irrad in vacuum and air.



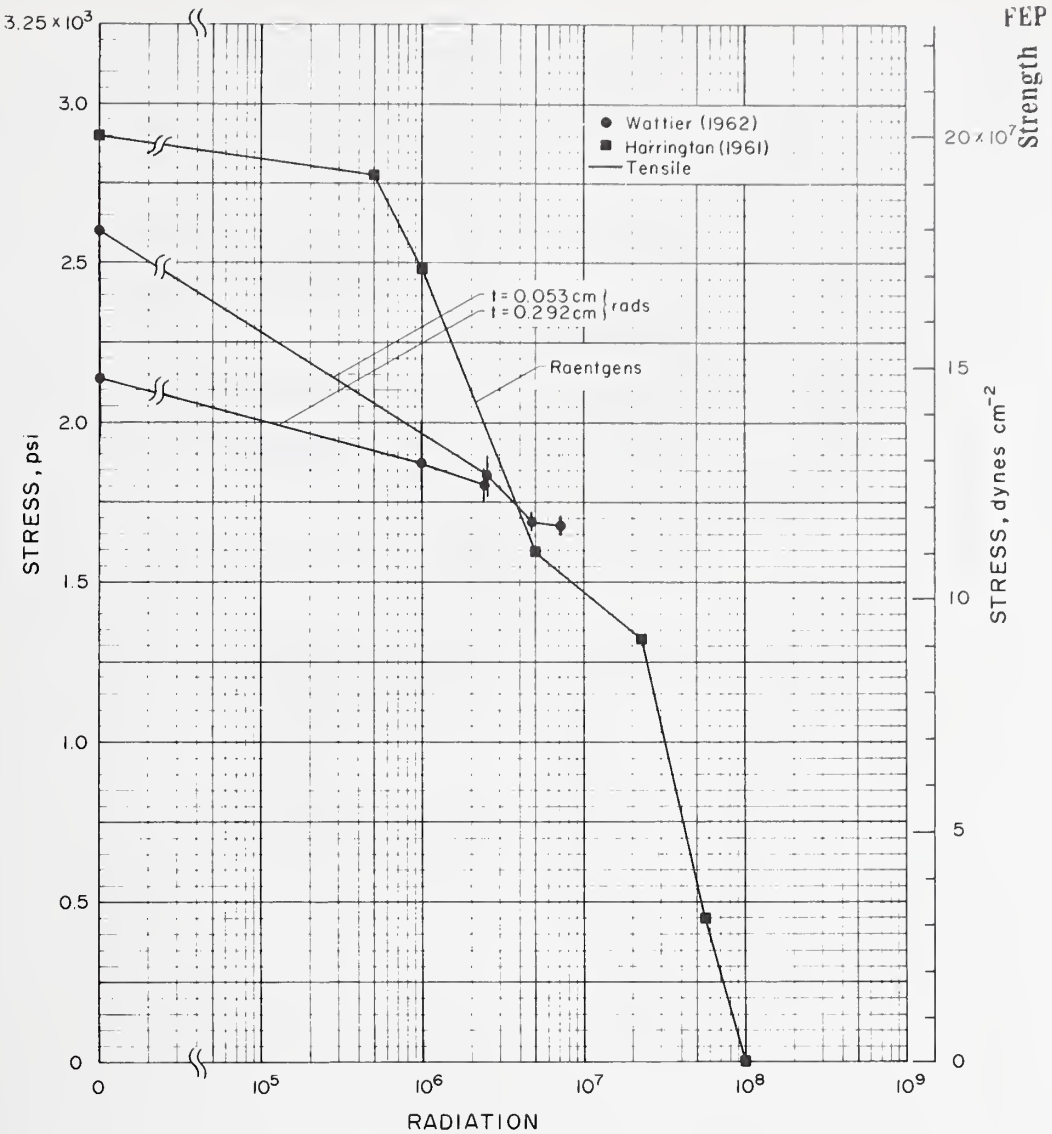
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 44-49% crys, sp gr = 2.135-2.149, molded at 589 K, 5 min, quick quenched; 49-55% crys, sp gr = 2.149-2.155, molded at 589 K, 5 min, quick quenched then held at 519 K for 12 h.	3 dies used to give Red Sec of 2.54 x 6.35 cm, 2.54 x 0.318 cm, and 0.51 x 0.254 cm; Instron xhd spd = 0.042 cm s^{-1} at 298 K and 0.0042 cm s^{-1} otherwise.
Hanson, Richards, Hickel (1965)	Teflon	Red Sec 20.2 x 1.27 cm, t = 0.0254-0.0762 cm; universal tester, self-locking film grips, xhd spd = 0.0021 cm s^{-1}.
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 100X, melt extruded, av sp gr = 2.14	ℓ = 2.54 cm, diam = 2.54 cm; ASTM D-1457-56T test procedure; extracted from σ-ϵ diagrams.

FEP

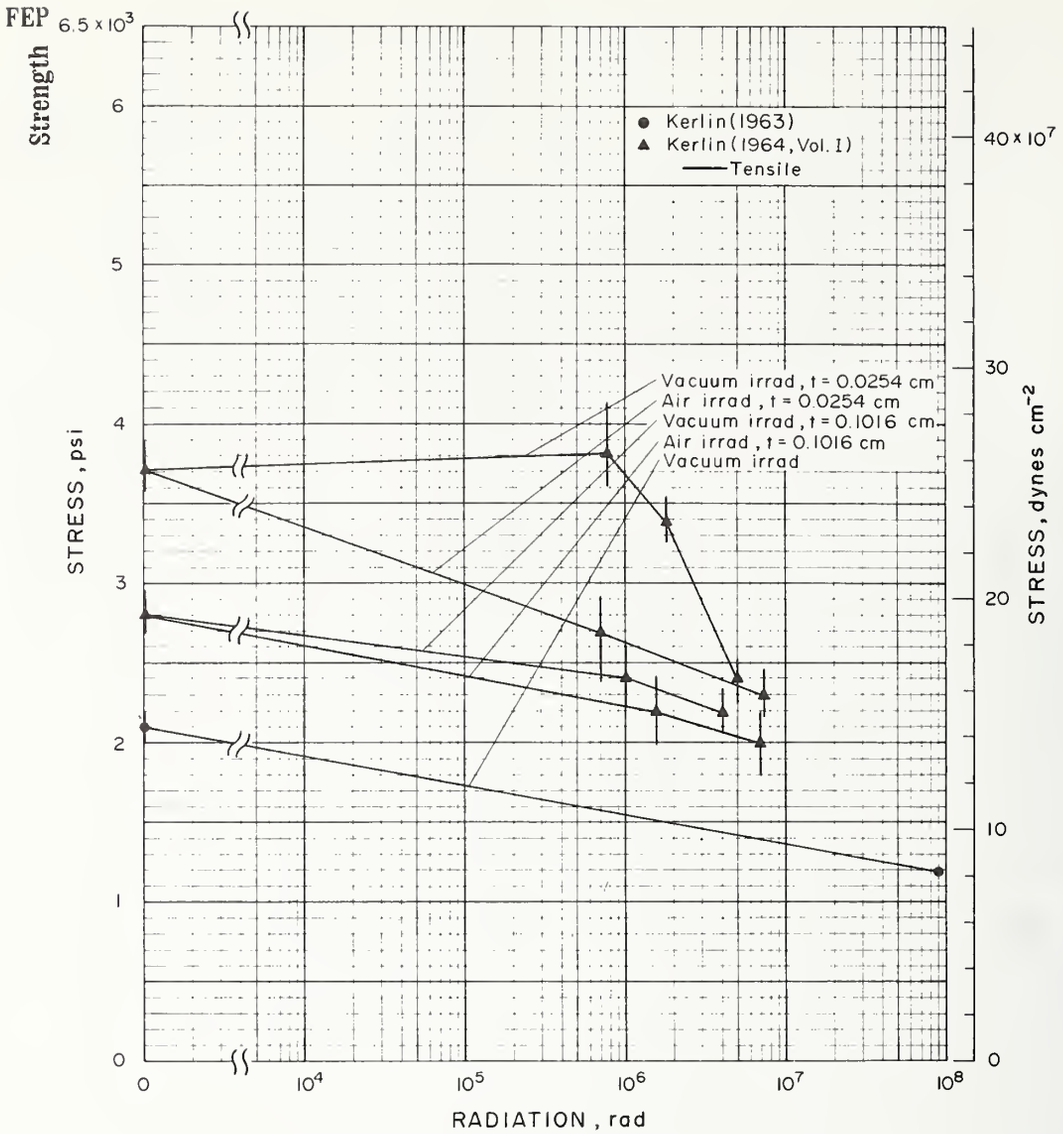
Strength



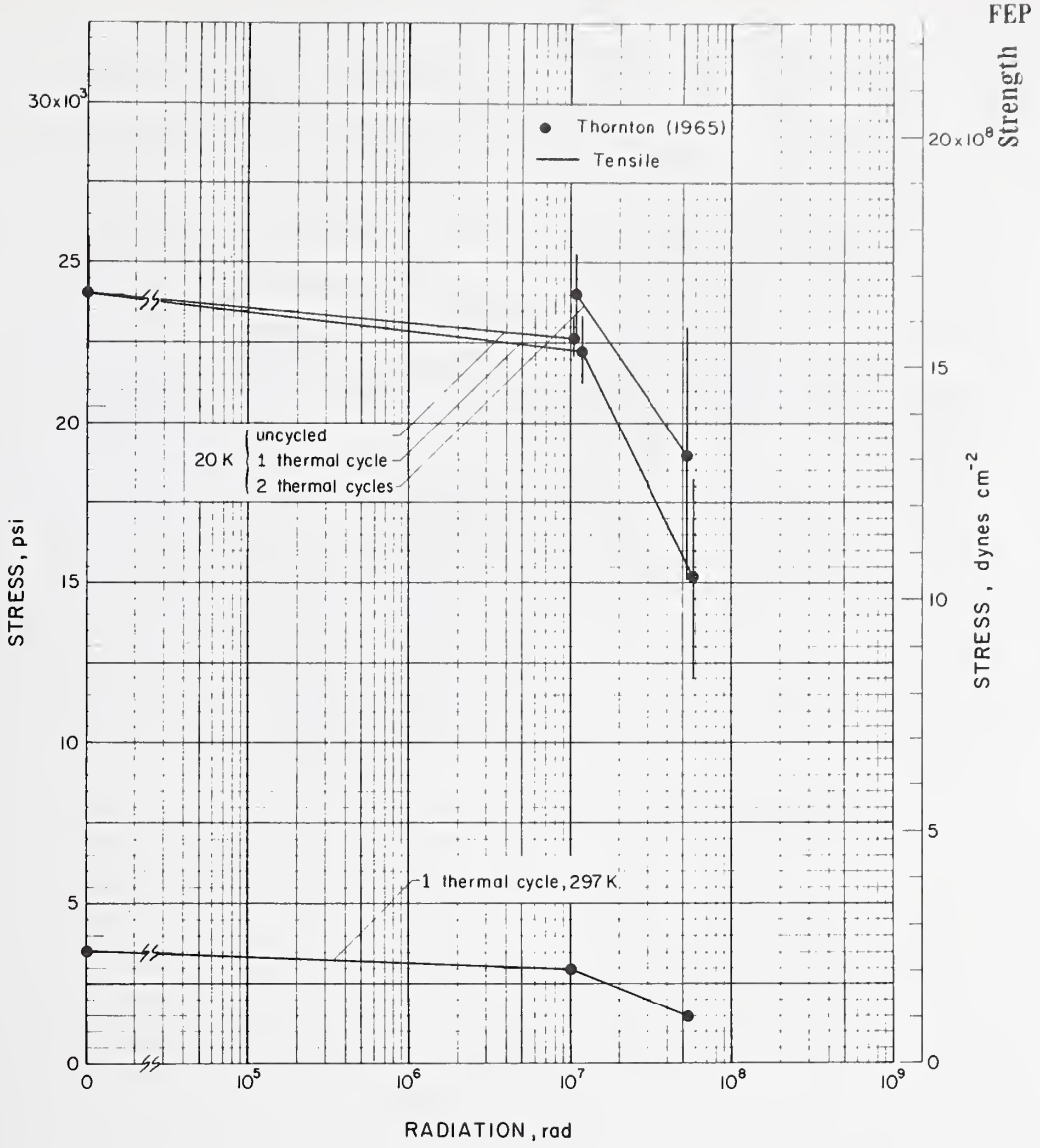
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Jolley, Homsy, Reed (1964)	Teflon	ASTM D 638 test procedure.
Mallouk, Thompson (1958)	Teflon 100 ×	
Anderson, Jr., Morfitt (1958)	Teflon 100 ×	t = 0.002 cm; directions of pull noted; av of 5 tests.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Wattier, Newell, Morgan (1962)	Teflon 100	Irrad and tested at 300 K, irrad in air; error bars indicate standard deviation.
Harrington (1961)	Teflon 100X	t 0.020 cm, Die C dumbbell test specimen; ASTM D 412-51T test procedure. Scott tensile tester; irrad by 1.3×10^{5} Roentgens h^{-1} Co^{60} source.



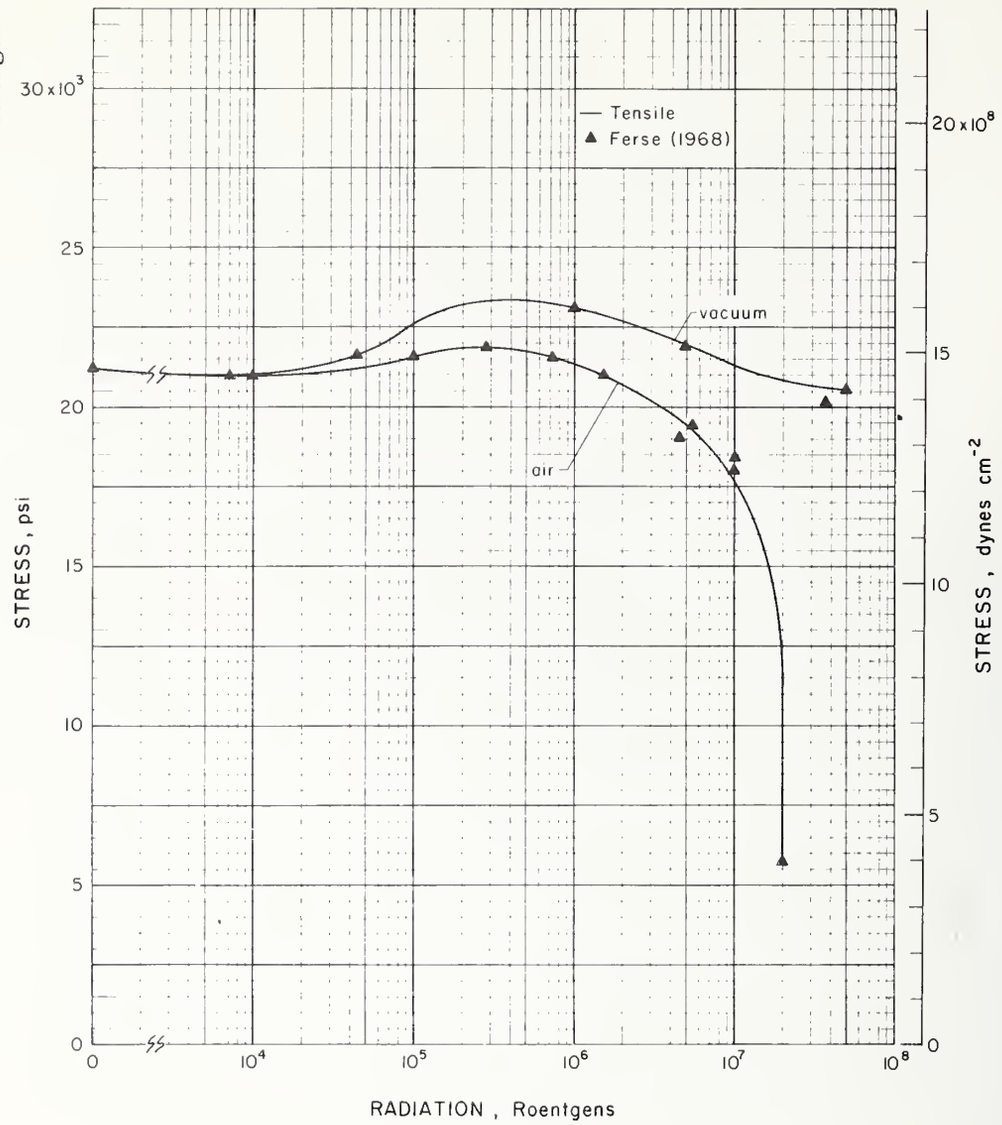
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1964, Vol. I)	Teflon	Samples with t = 0.0254 cm; w = 2.54 cm, ℓ = 15.24 cm; Instron, ASTM D-882-56T test procedure; samples with t = 0.1016 cm; cut with Die A described in ASTM D-412-51T; Instron xhd spd = 0.85 cm s^{-1}; irrad in vacuum and tested in air, irrad in Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth.
Kerlin (1963)	Teflon FEP 100	w = 2.54 cm, ℓ = 15.24 cm, t = 0.1016 cm; ASTM D 882 test procedure; irrad in Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth, damage was so severe after 1.7 x 10^7 rad that data could not be obtained.



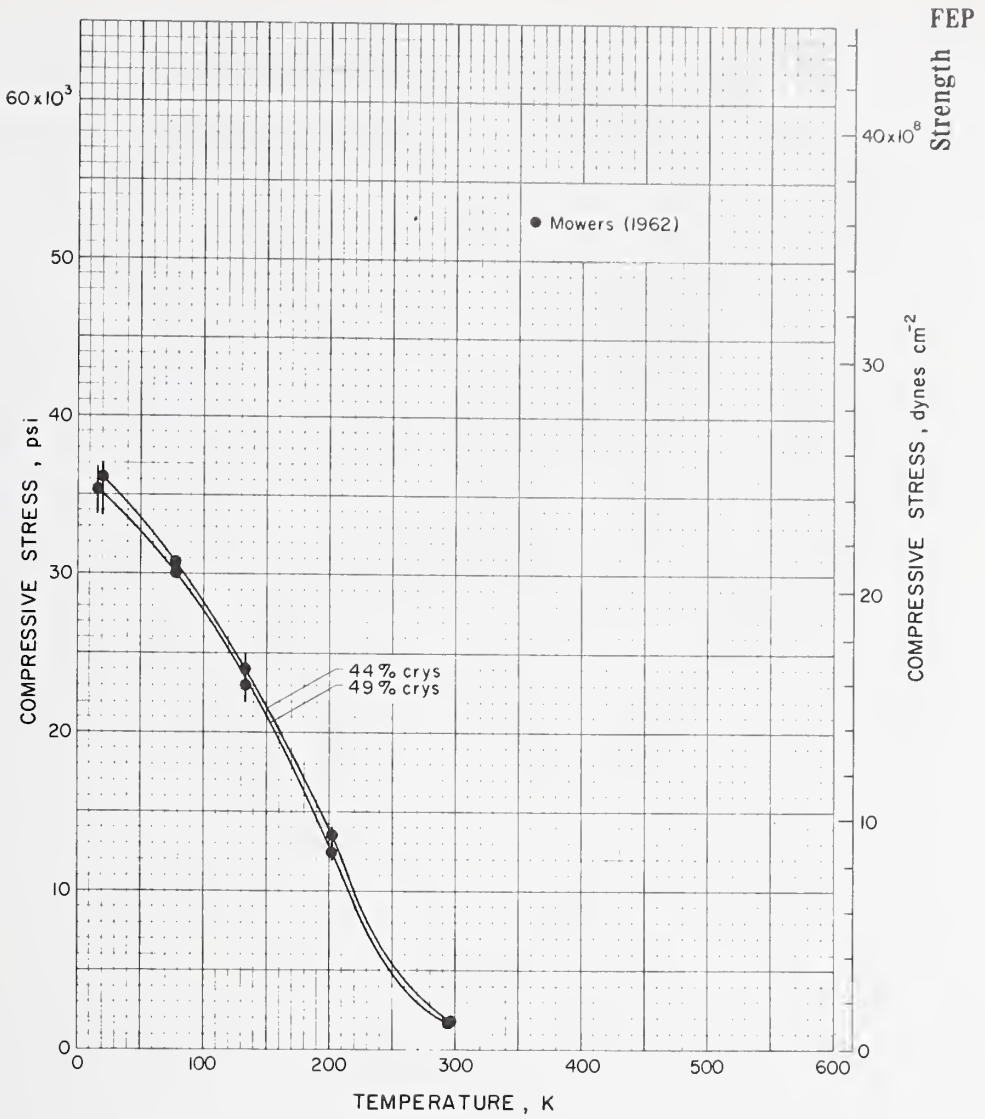
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Thornton (1965)	Teflon FEP	Instron, xhd spd = 0.0021 cm s^{-1}; all samples irrad in liquid H_2, most of the irrad specimens were thermally cycled once or twice to 297 K and then tested at 20 K or 297 K, the first cycle was 4 days in gaseous He and the second was 4 days in air, irrad by Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics at Fort Worth; av of 4 tests is plotted, error bars indicate standard deviation.

FEP

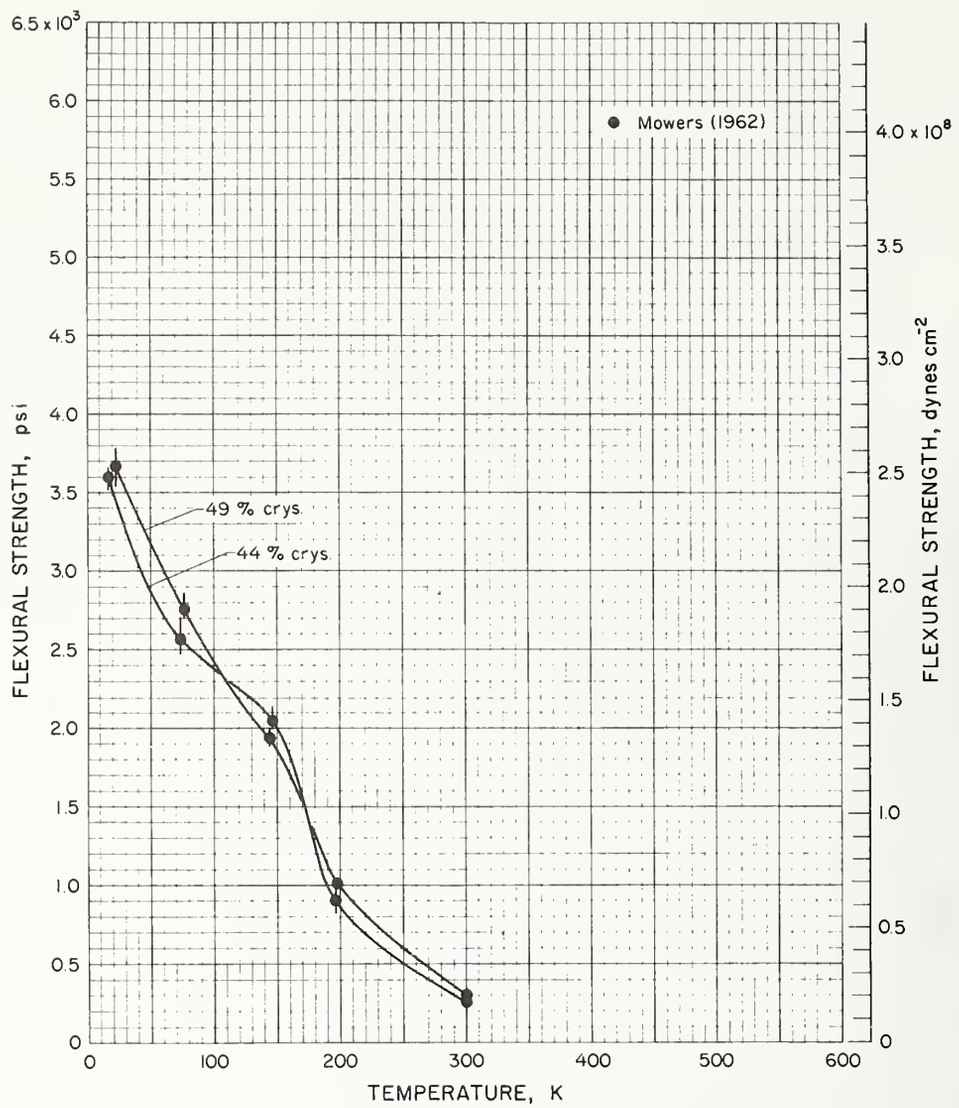
Strength



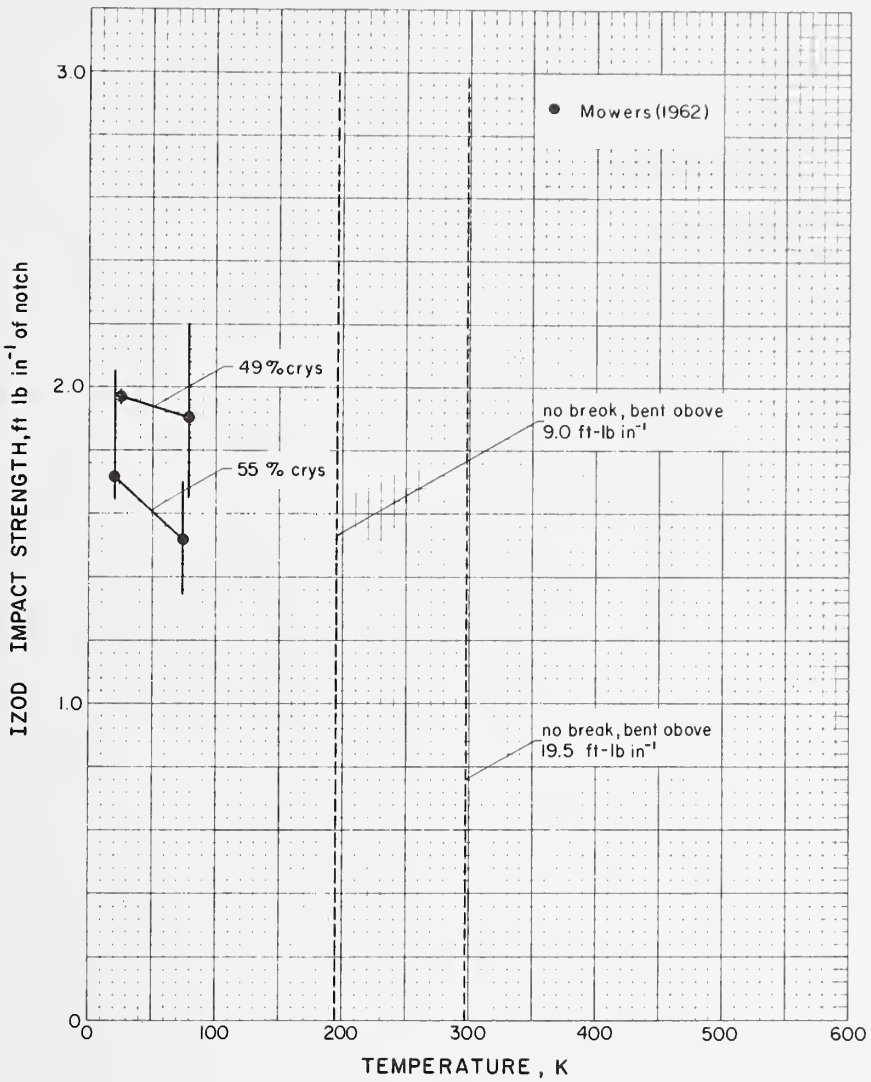
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Ferse (1968)	12 mole % hexafluoropropylene	t = 0.15-0.20 cm; ASTM D 1457-62T test procedure, xhd spd = 0.083 cm s^{-1}; irrad by 1300 Curie Co^{60} source at 6.5 x 10^5 Roentgen h^{-1}, irrad in vacuum and air.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 44-49% crys, sp gr = 2.135-2.149, molded at 589 K, 5 min, quick quenched; 49-55% crys, sp gr = 2.149-2.155, molded at 589 K, 5 min, quick quenched then held at 519 K for 12 h.	ℓ = 2.54 cm, diam = 1.27 cm; Instron, ASTM D695-54 test procedure, xhd spd = 0.0021 cm s^{-1}; av of at least 3 samples, error bars indicate data spread.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 44-49% crys, sp gr = 2.135-2.149, molded at 589 K, 5 min, quick quenched; 49-55% crys, sp gr = 2.149-2.155, molded at 589 K, 5 min, quick quenched then held at 519K for 12 h.	5.07 x 0.446 cm, t varied but ratio of ℓ/t maintained at 16; Instron, xhd spd 0.0021 cm s^{-1}. ASTM D 790-495 test procedure, miniature size dies used; av of at least 3 samples, error bar indicates data spread.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 44-49% crys sp gr = 2.135-2.149, molded at 589K, 5 min, quick quenched; 49-55% crys, sp gr = 2.149-2.155, molded at 589 K, 5 min, quick quenched then held at 519 K for 12 h.	0.635 x 1.27 x 6.35 cm Izod samples with standard notch machined into 0.635 cm face; Tinius-Olsen tester, ASTM D 256-56 test procedure, impact vel = 335 cm s^{-1}; error bars indicate data spread of 5 tests.

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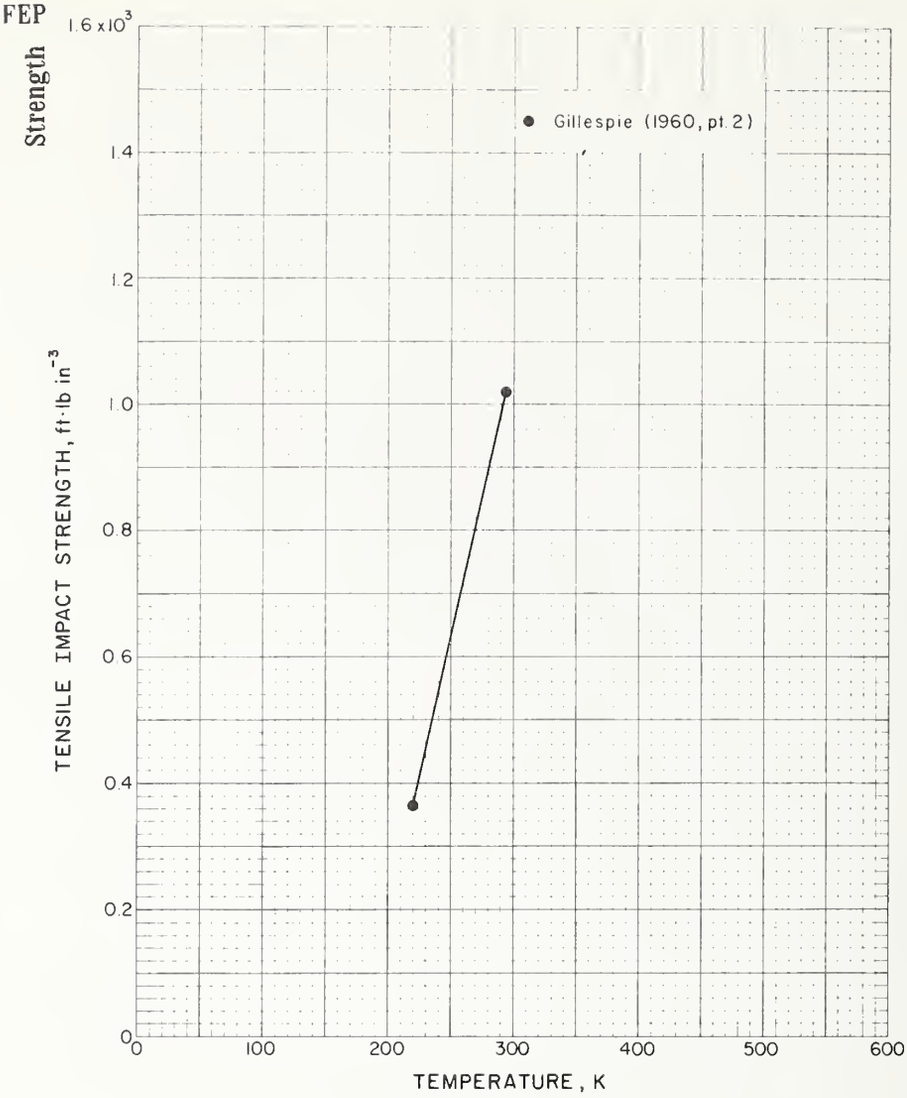
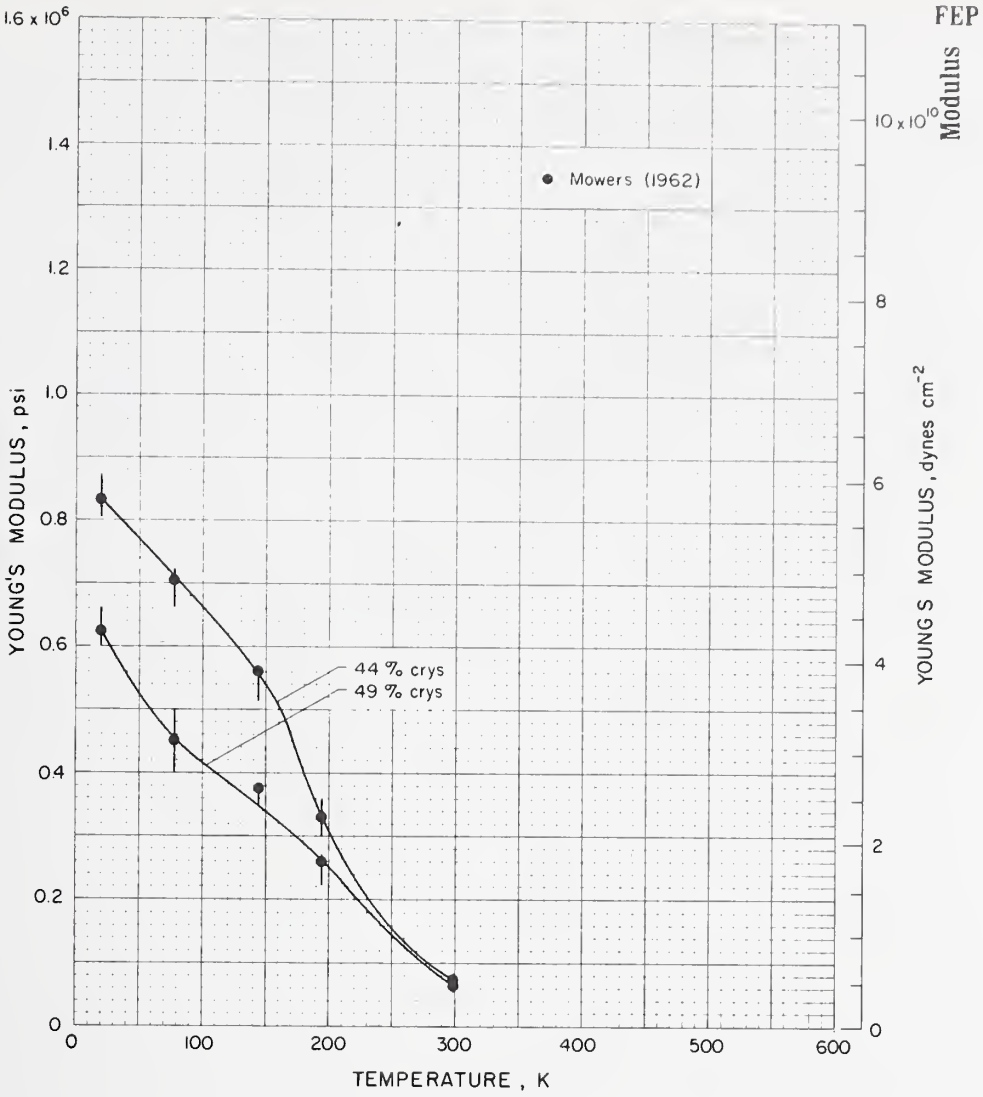


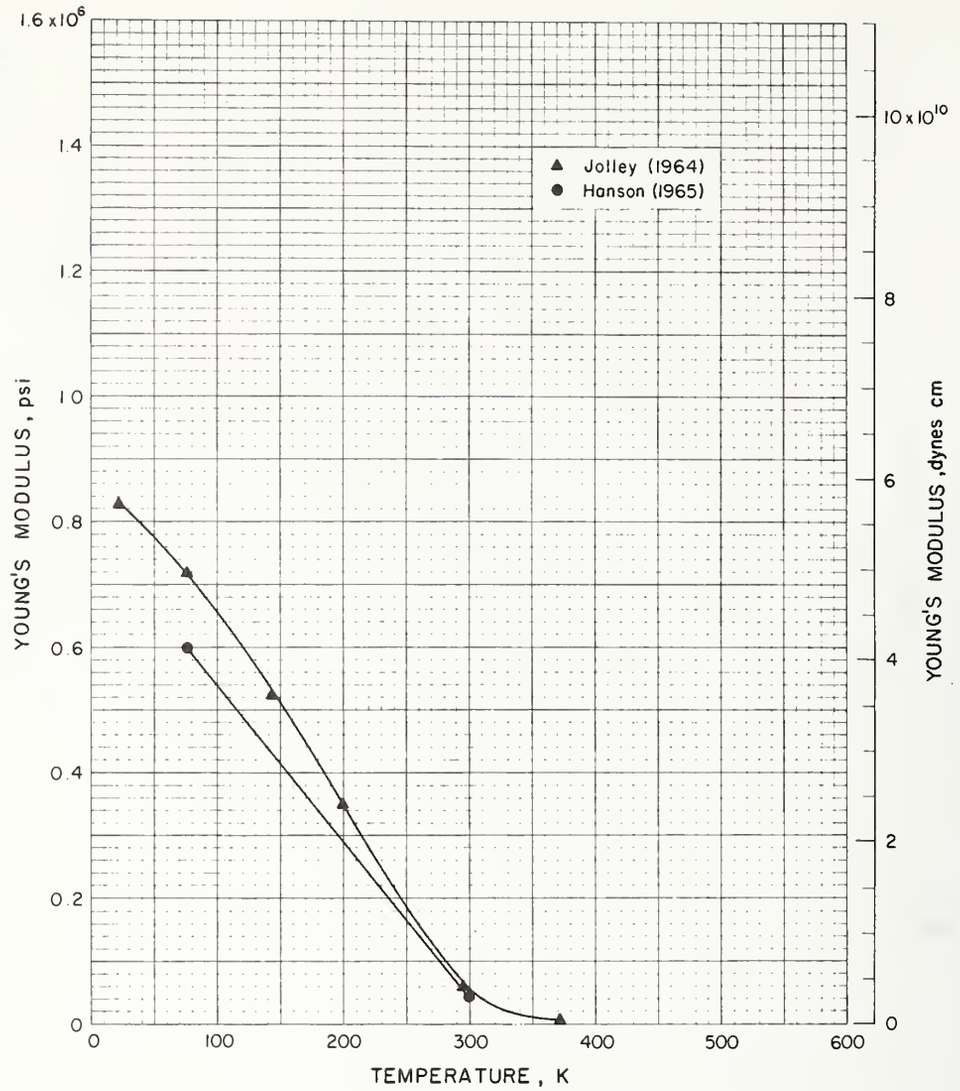
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, part 2)	Teflon 100 x, melt extruded, av sp gr = 2.14	



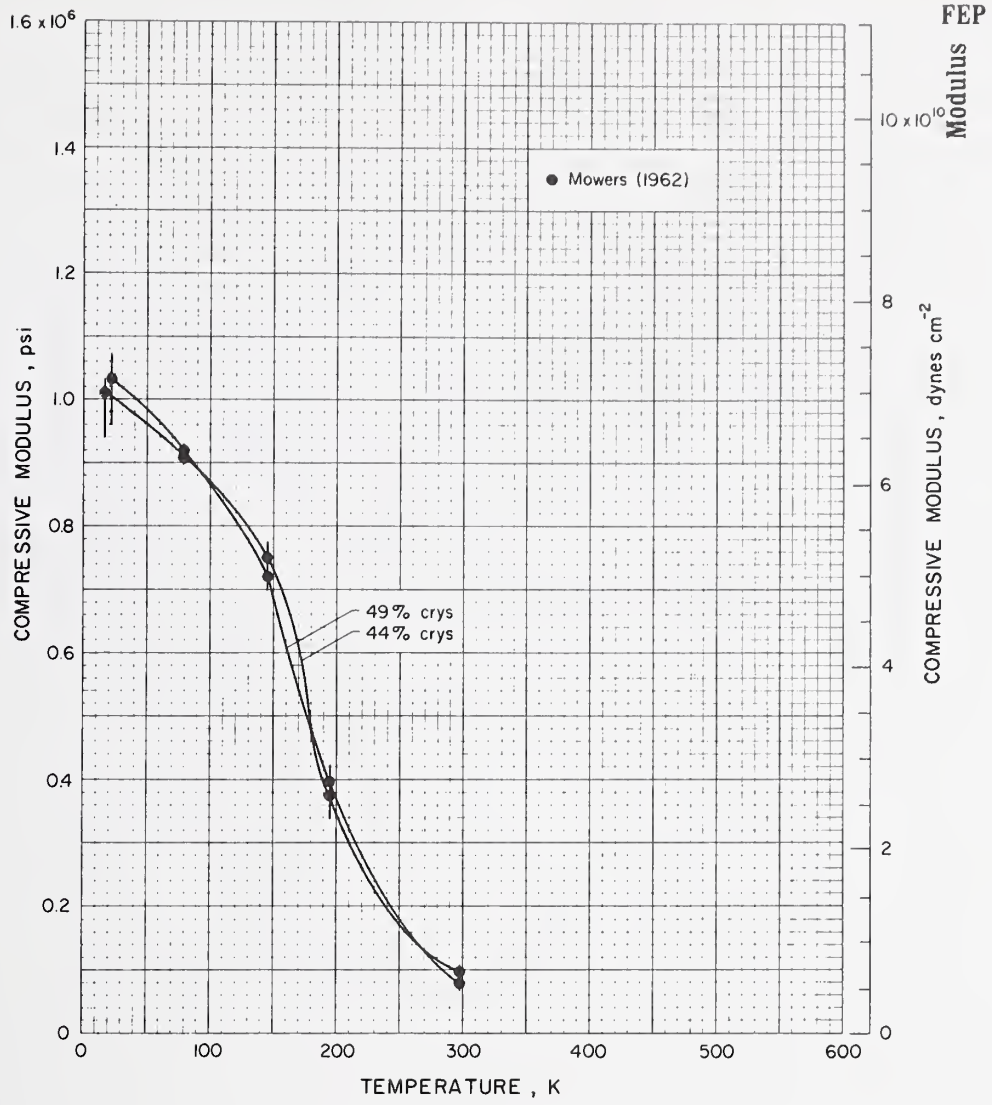
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 44-49% crys, sp gr = 2.135-2.149, molded at 589 K, 5 min, quick quenched; 49-55% crys, sp gr = 2.149-2.155, molded at 589 K, 5 min, quick quenched then held at 519 K for 12 h.	3 dies used to give Red Sec of 2.54 x 0.635 cm, 2.54 x 0.318 cm, and 0.51 x 0.254 cm; Instron, xhd spd = 0.042 cm s^{-1} at 298 K and 0.0042 cm s^{-1} otherwise; av of at least 3 samples, error bar indicates data spread.

FEP

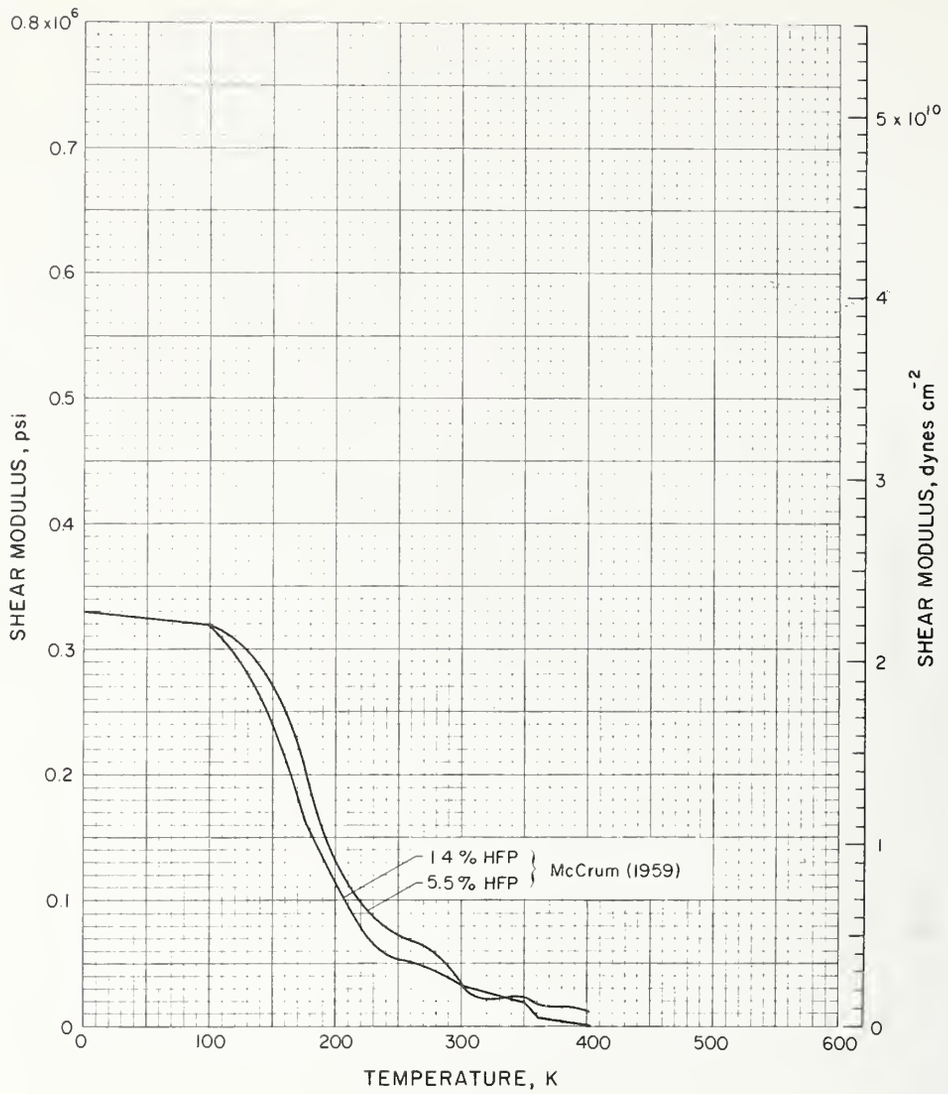
Modulus



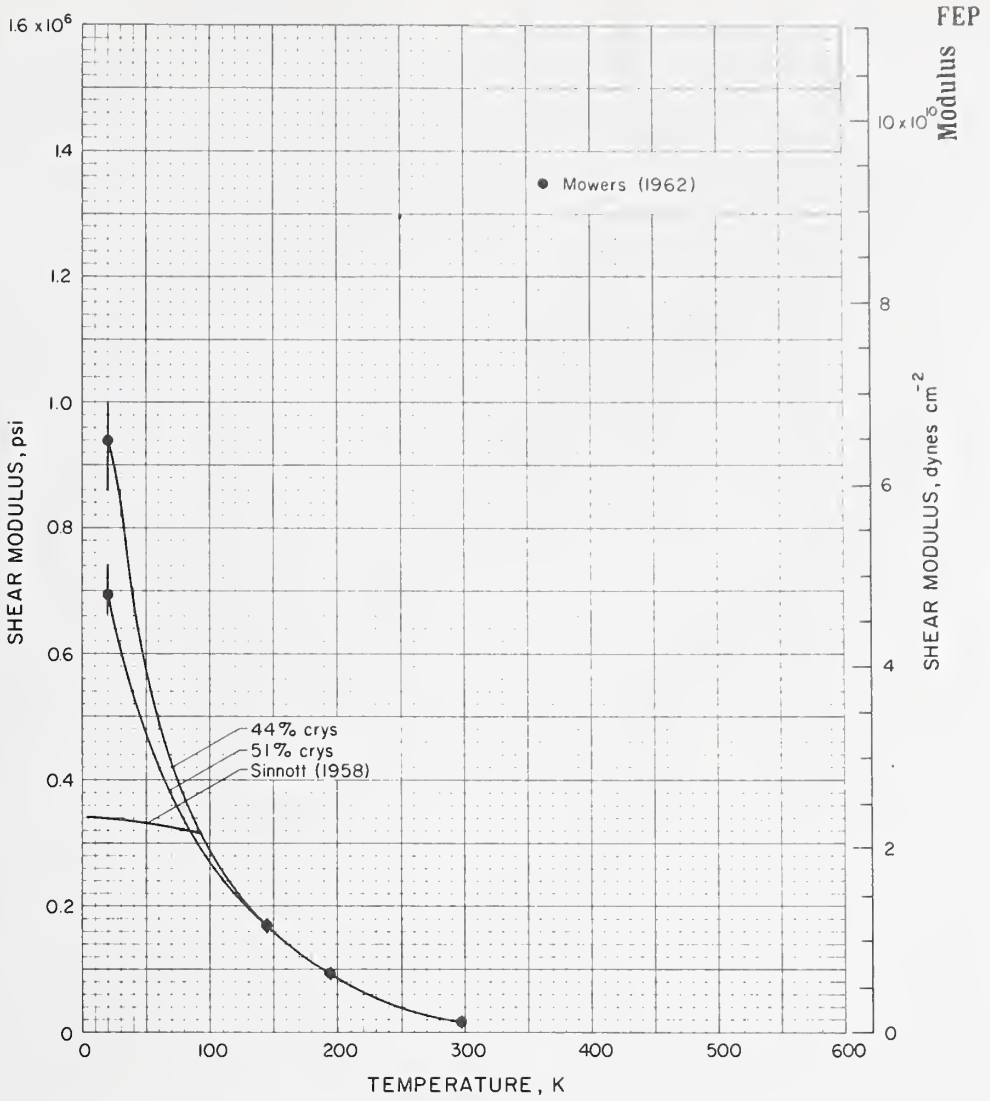
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Jolley, Homsy, Reed, (1964)	Teflon	
Hanson, Richards, Hickel (1965)	Teflon	Red Sec = 20.2 x 1.27 cm, t = 0.0254-0.0762 cm, overall ℓ = 45.6 cm; self-locking film grips, uniaxial test.



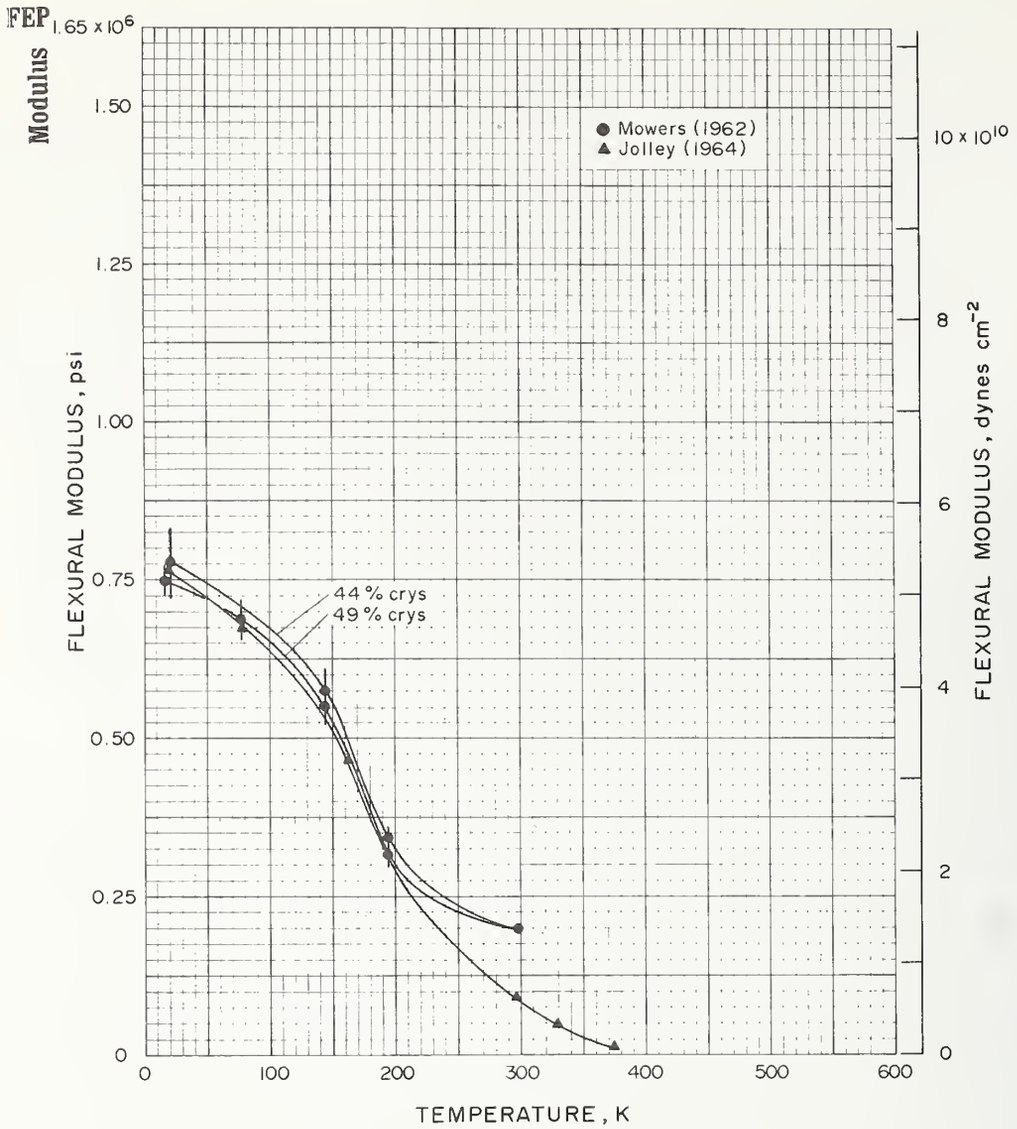
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 44-49% crys, sp gr = 2.135-2.149, molded at 589K, 5 min, quick quenched; 49-55% crys, sp gr = 2.149-2.155, molded at 589 K, 5 min, quick quenched then held at 519 K for 12 h	ℓ = 2.54 cm, diam = 1.27 cm; Instron, ASTM D 695-54 test procedure, xhd spd = 0.0021 cm s^{-1}; av of at least 3 samples, error bar indicates data spread.



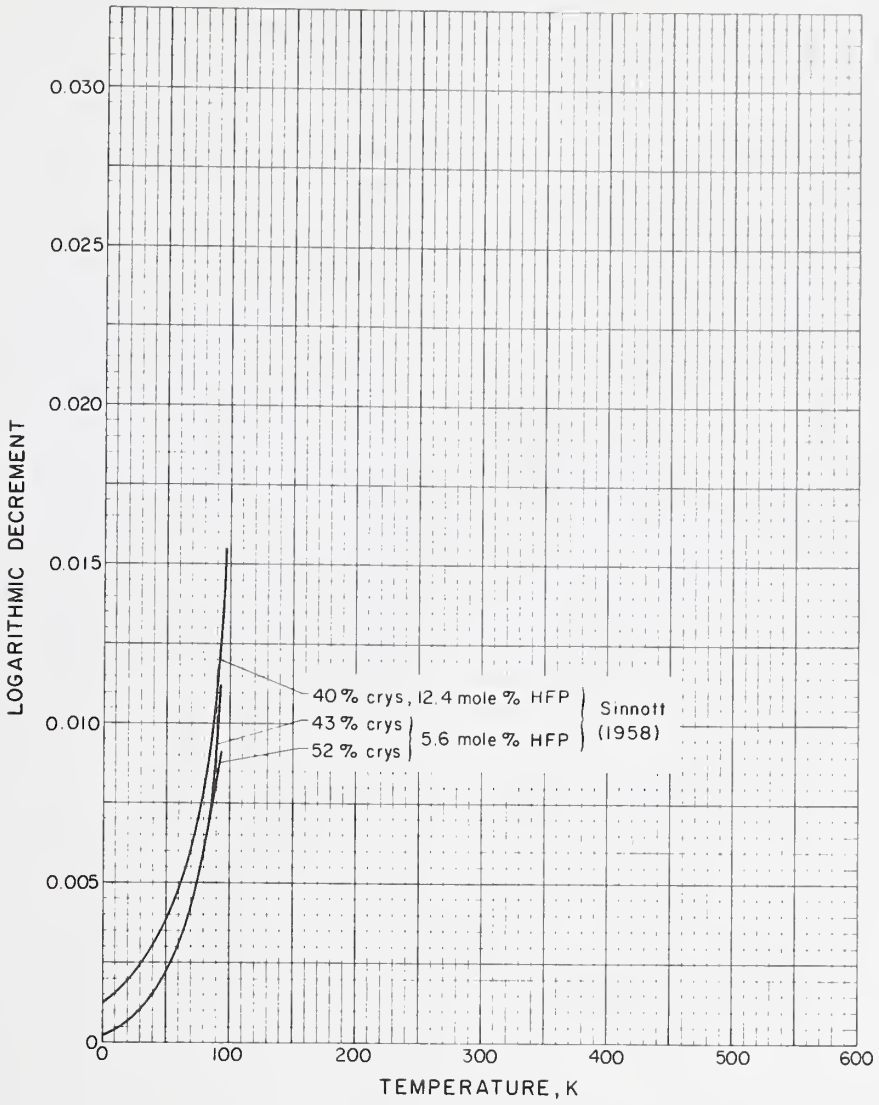
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
McCrum (1959, Makromol. Chemie)	5.5 mole% hexafluoropropylene, 52% crys; 14 mole % hexafluoropropylene. 33% crys.	ℓ = 10.16 cm, w = 1.27 cm, t = 0.152 cm; measurements by torsion pendulum.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 44-49% crys, sp gr = 2.135 - 2.149, molded at 589K, 5 min, quick quenched; 49-55% crys, sp gr = 2.149 -2.155 molded at 589K, 5 min, quick quenched then held at 519K for 12 h.	Tinius-Olsen tester, ASTM D1 043-51 test procedure; av of at least 3 samples, error bar indicates data spread.
Sinnott (1958)	5.6 mole% hexafluoropropylene, 43% crys	ℓ = 7.62 cm, w = 1.27 cm, t = 0.152 cm; small torsion pendulum, usual frequency = 1 Hz; estimated accuracy = + 5%.

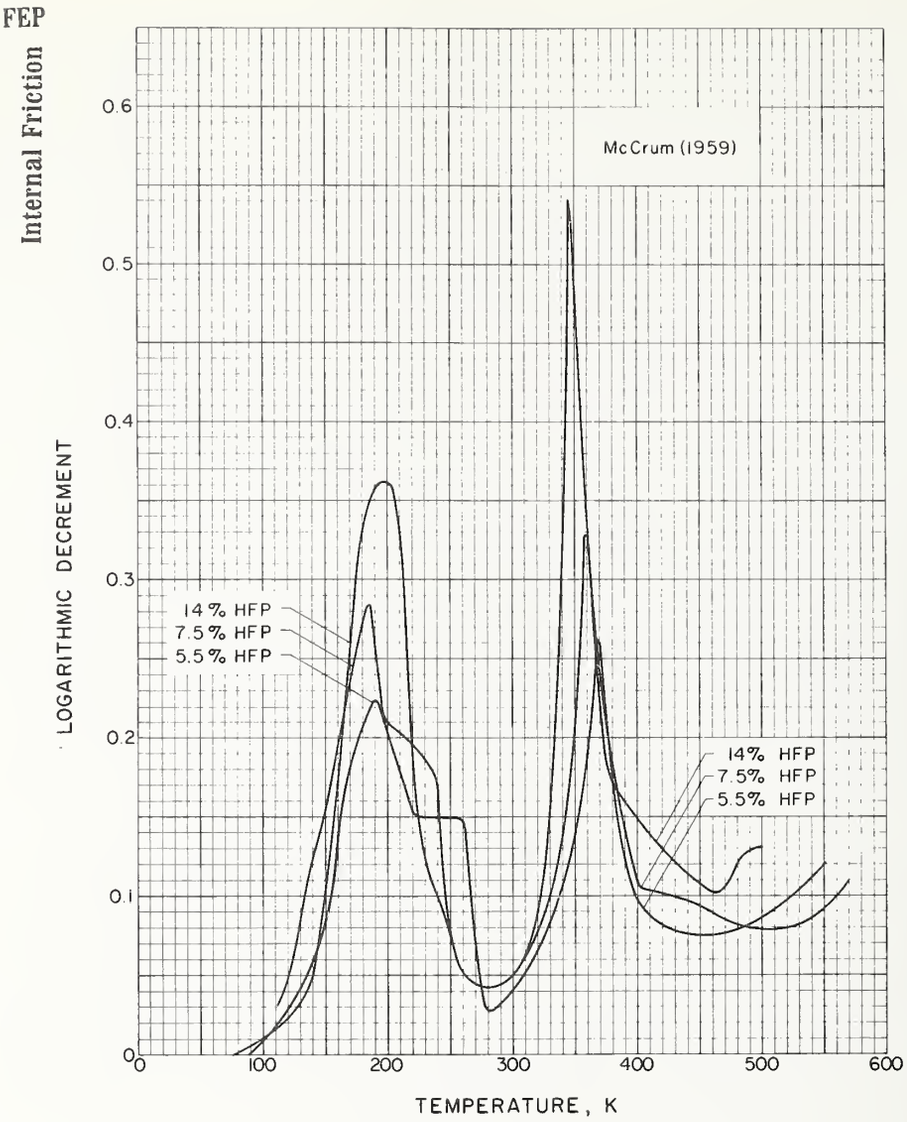


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mowers (1962)	Teflon; 44-49% crys, sp gr = 2.135-2.149, molded at 589 K, 5 min, quick quenched; 49-55% crys, sp gr = 2.149-2.155, molded at 589 K, 5 min, quick quenched then held at 519 K for 12 h.	5.07 x 0.446 cm, t varied but ratio of ℓ/t maintained at 16; Instron, xhd spd 0.0021 cm s^{-1}, ASTM D 790-495 test procedure, miniature size dies used.
Jolley, Homsy, Reed, (1964)	Teflon	ASTM D 747 test procedure.

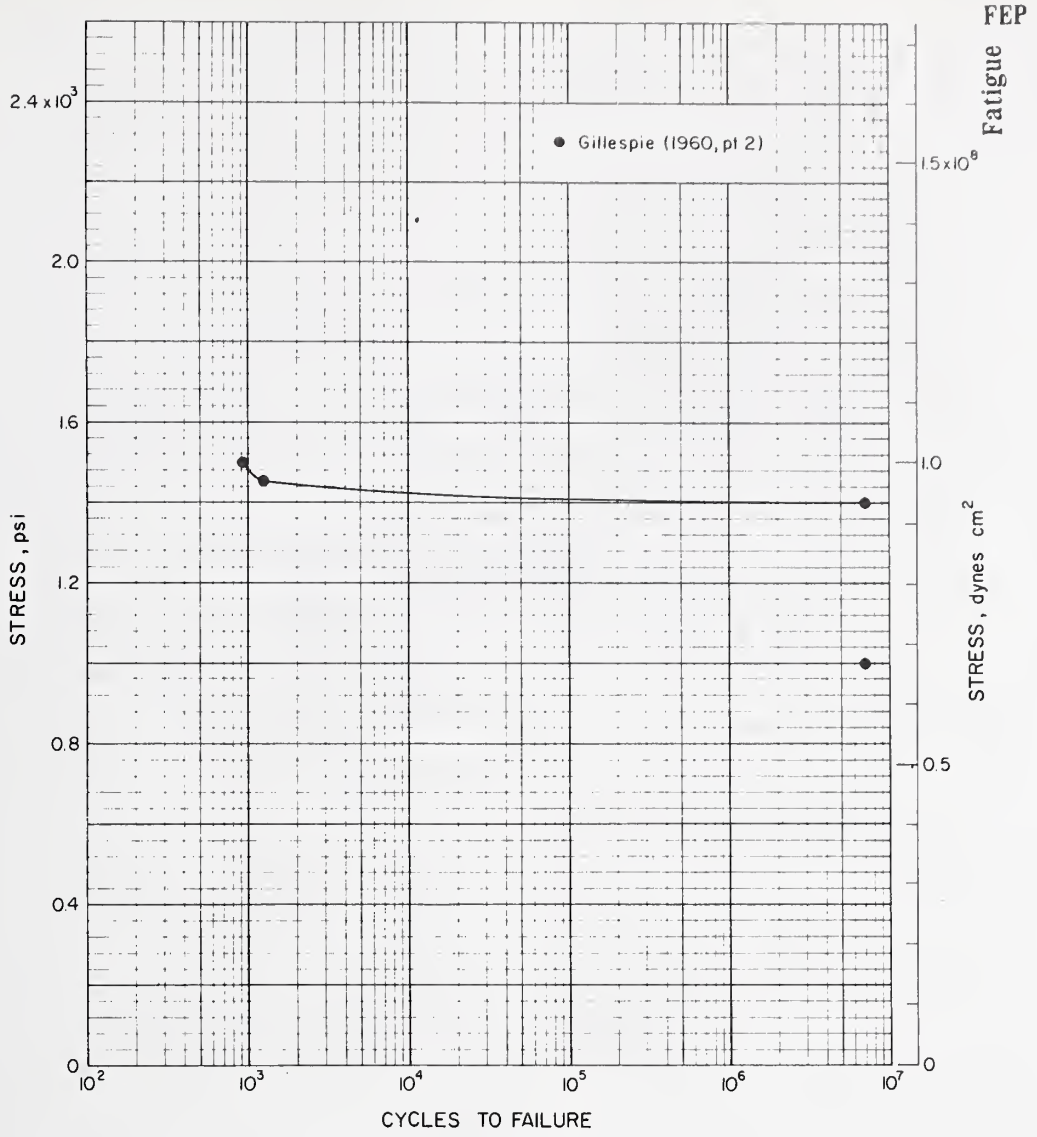


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sinnott (1958)	Mole % of hexafluoropropylene noted	ℓ = 7.62 cm, w = 1.27 cm, t = 0.152 cm; small torsion pendulum, usual frequency = 6 Hz; estimated accuracy = ± 5%.

FEP



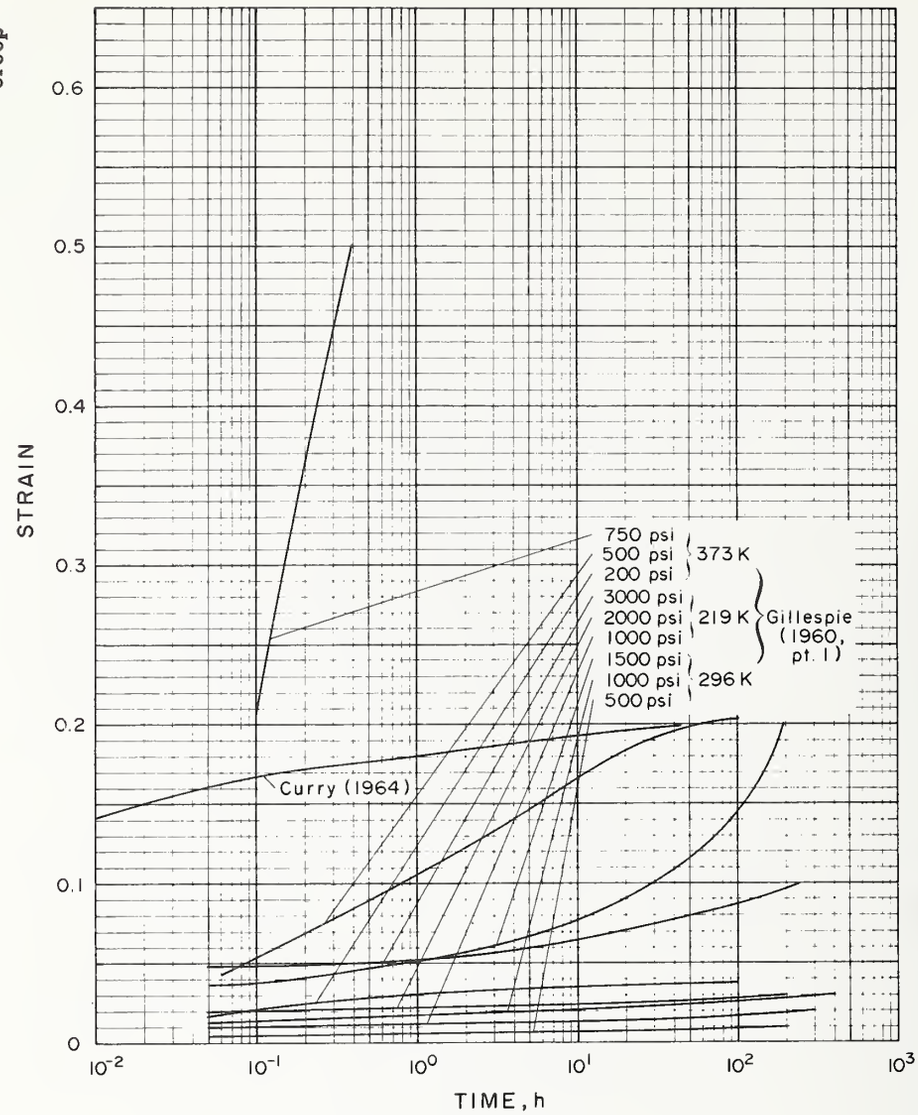
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
McCrum (1959, Makromol. Chemie)	5.5 mole% HFP, 52% crys; 7.5 mole % HFP, 50% crys; 14 mole % HFP, 33% crys.	ℓ = 10.16 cm, w = 1.27 cm, t = 0.152 cm; measurements by torsion pendulum.



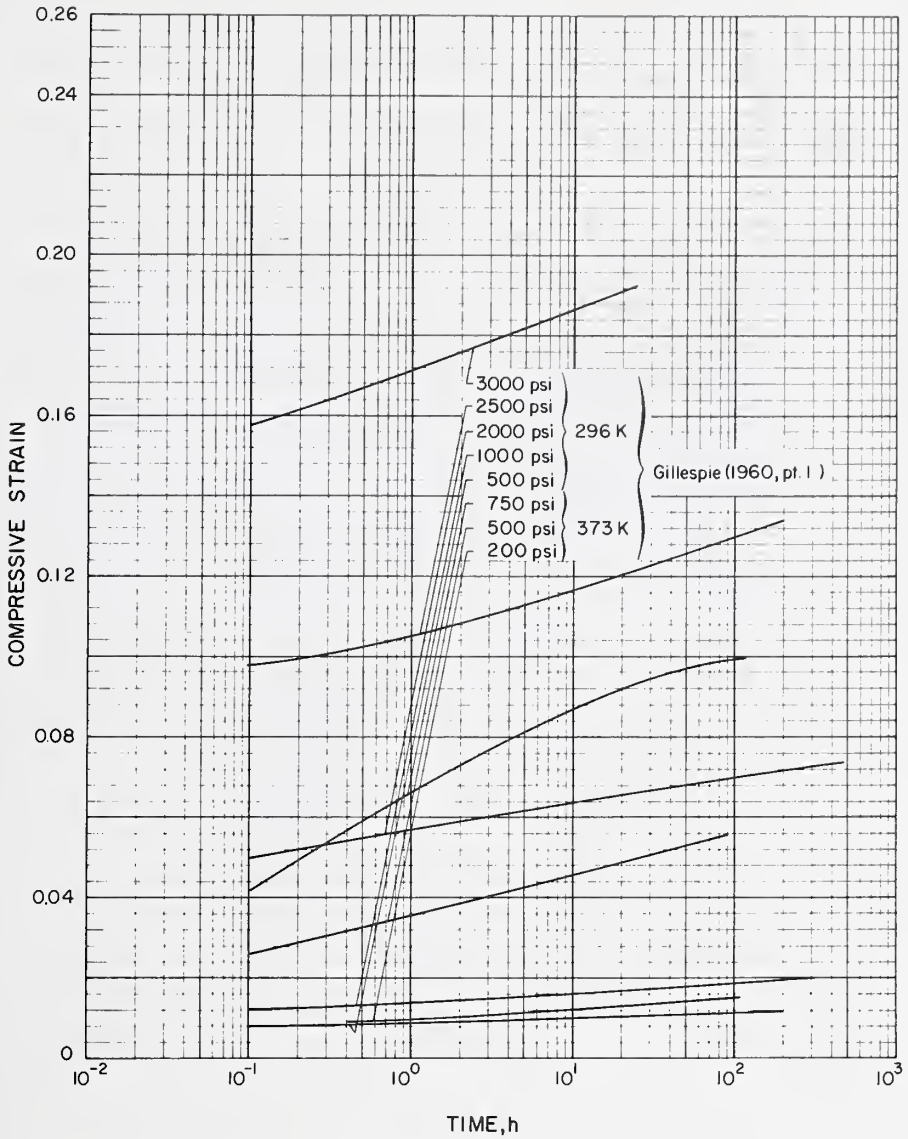
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960 pt. 2)	Teflon 100 X, melt extruded, av sp gr = 2.14.	296K.

FEP

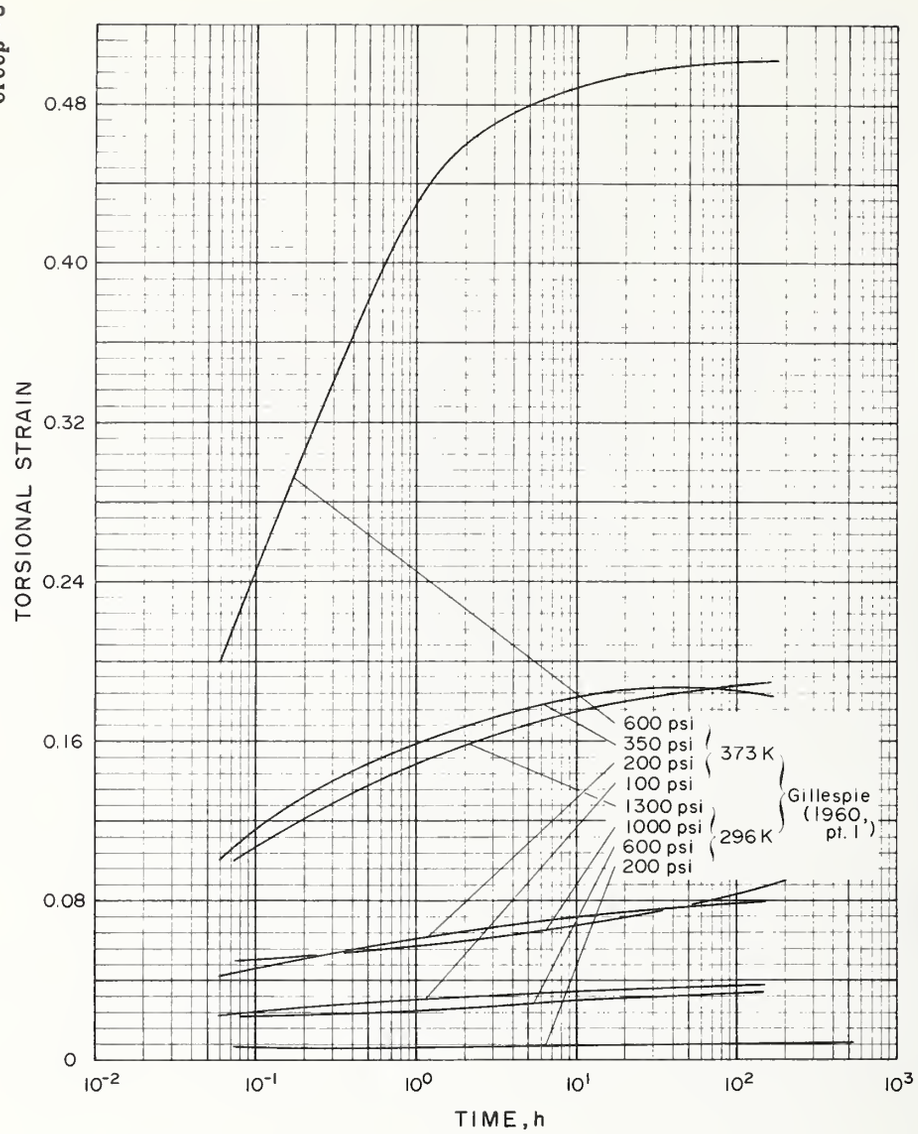
Creep



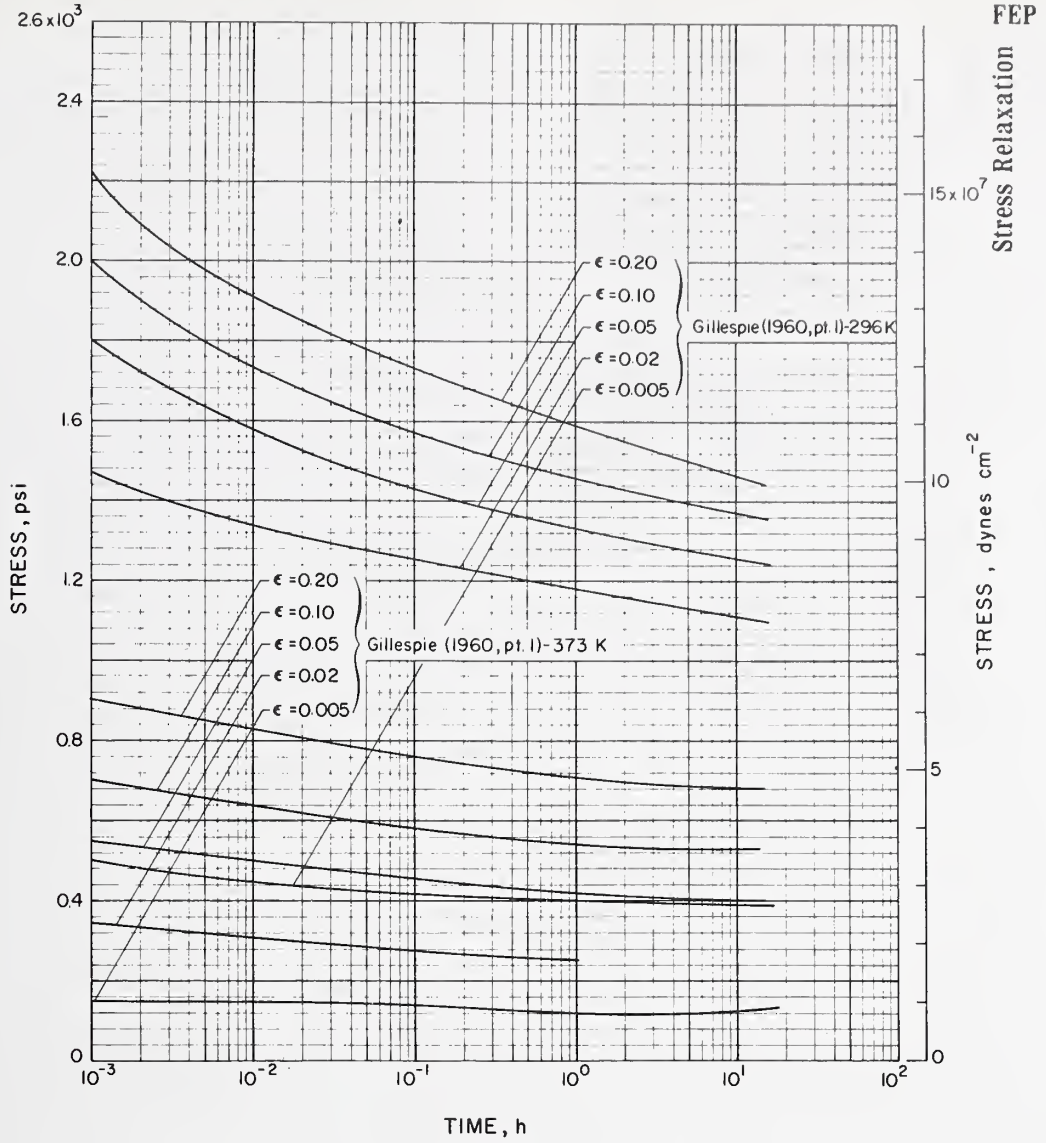
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Curry (1964)	Teflon	296 K, σ = 3,000 psi.
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 100 X, melt extruded, av sp gr 2.14	ℓ = 2.54 cm, diam 2.54 cm.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 100X, melt extruded, av sp gr = 2.14	ℓ = 2.54 cm, diam = 2.54 cm.



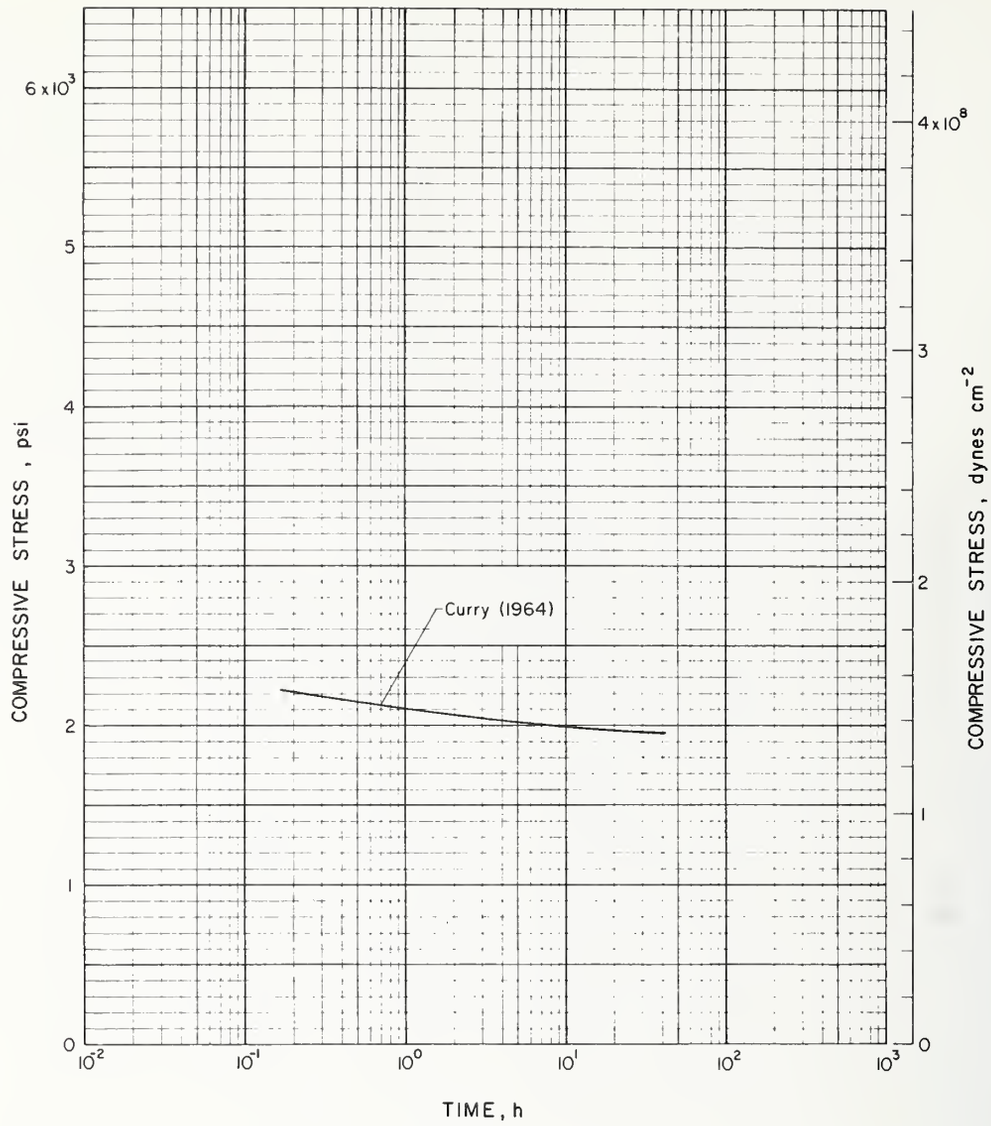
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 100 X, melt extruded av sp gr - 2.14.	ℓ 2.54 cm, diam - 2.54 cm.



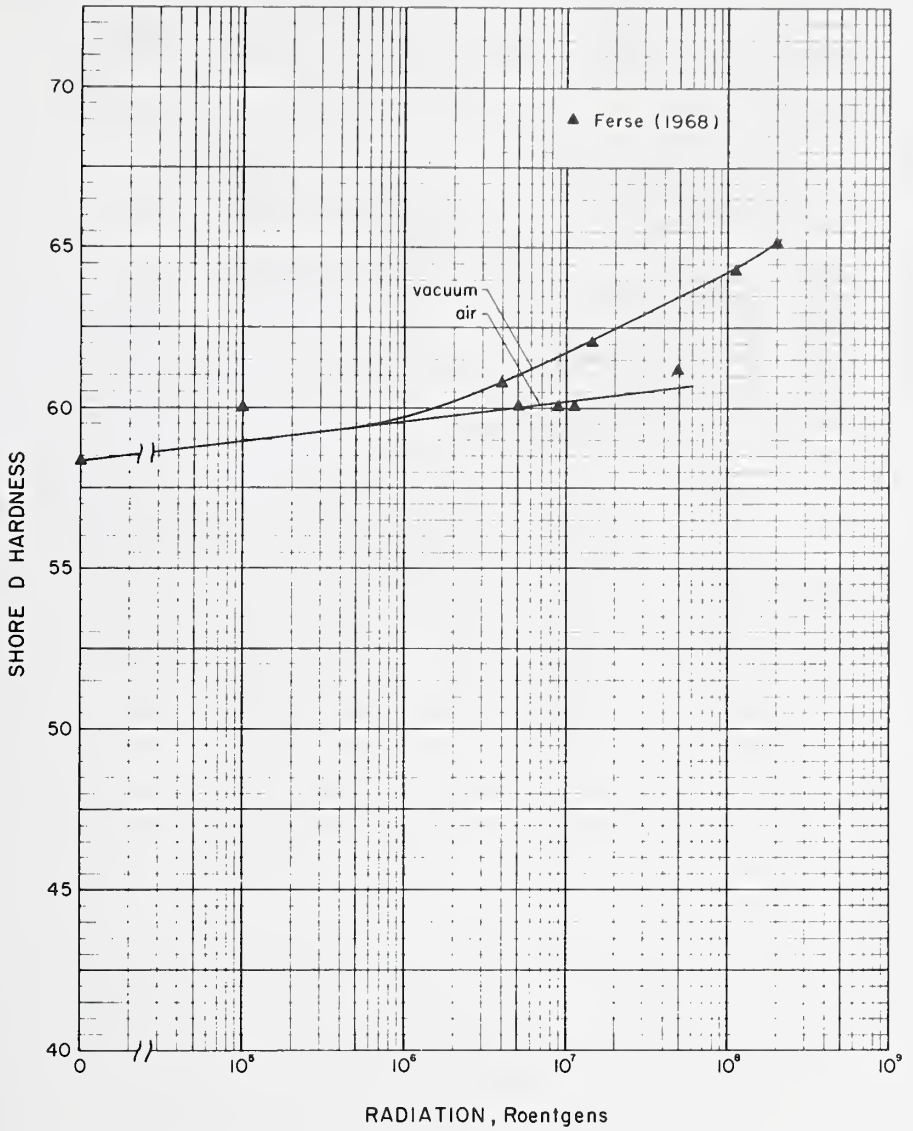
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, pt. 1)	Teflon 100X, melt extruded, av sp gr = 2.14	ℓ = 2.54 cm, diam = 2.54 cm; tested at constant ϵ.

FEP

Stress Relaxation



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Curry (1964)	Teflon	Compressed to predetermined initial stress level, 296K.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Ferse (1968)	12 mole % hexafluoropropylene	TGL 20139 test procedure; irrad by 1300 Curie Co ^{60} source at 6.5×10^{5} Roentgens h^{-1}, irrad in vacuum and air.

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3psi)	Yield Strength (10^3psi)	Elongation (percent)	Young's Modulus (10^6 psi)
Mallouk (1958)	Teflon 100X	298	3.0		370	
Larsen (1959)	Teflon 100X	297				
	slow ram					
	652K stock, 484K mold		2.14		198	
	677K stock, 484K mold		2.11		155	
	652K stock, 497K mold		2.25		179	
	677K stock, 497K mold		2.29		266	
	fast ram					
	677K stock, 484K mold		2.12		157	
	677K stock, 497K mold		2.37		336	
Green (1964)	Teflon	297	2.875			
Lare (1965)	Teflon Type A	297				
	trans		2.833	1.850	403	0.056
	long.		3.678	1.975	481	0.053
	45°		3.265	1.917	453	0.058

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mallouk, Thompson (1958)	Teflon 100X, sp gr = 2.1	
Larsen, DeHoff, Todd (1959)	Teflon 100X, molded from stock at 652 K and 677 K in molds at 484 K and 497 K using slow and fast ram speeds	
Green, Levine (1964)	Teflon	
Lare, DeBoskey, Divecha, Hahn (1965)	Teflon Type A, "as received"	t = 0.013 cm, specimens per ASTM D412 Die C; Instron, $\dot{\ }$ = 0.0083 s^{-1}, yd off = 2%; av of 3 tests.

Investigator(s) (year)	Description	Temperature (K)	Strength (10^3 psi)	Modulus (10^6 psi)	Hardness	Other
Mallouk (1958)	Teflon 100 X	298		0.082[d]	D55 (Durometer)	
Larsen (1959)	Teflon 100 X slow ram	297				
	652K stock, 484K mold			0.0845[d]		
	677K stock, 484K mold			0.0833		
	652K stock, 497K mold			0.0798		
	677K stock, 497K mold			0.0835		
	fast ram					
	677K stock, 484K mold			0.0872		
	677K stock, 497K mold			0.0815		
Gillespie (1960, part 2)	Teflon 100 X	296			25 (Rockwell R)	sample bends[c]
		219				2.9
Curry (1964)		296			58 (Shore D)	
Jolley (1964)	sp gr = 2.14-2.17	296				no break[c]
Wisander (1969)		293		0.08[f]		1020[h]
		77	8[b]			

(b) Shear strength
(c) Izod impact strength (ft-lb per in. of notch)
(d) Flexural modulus
(h) Impact strength (ft-lb in^{-3})
(f) Compressive modulus

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mallouk, Thompson (1958)	Teflon 100 X, sp gr = 2.1	
Larsen, DeHoff, Todd (1959)	Teflon 100 X, molded from stock at 652 K and 677 K in molds at 484 K and 497 K using slow and fast ram speeds	
Gillespie, Saxton, Chapman (1960, part 2)	Teflon 100 X, melt extruded, av sp gr = 2.14	ASTM D 785-51 test procedure for hardness, ASTM D 256-56 test procedure for Izod impact strength.
Curry (1964)	Teflon	Penetration type hardness measurement.
Jolley, Homsy, Reed (1964)	Sp gr = 2.14-2.17	ASTM D 256 test procedure.
Wisander, Johnson (1969)		Compression: ℓ = 1.905 ± 0.003 cm, diam = 0.635 ± 0.003 cm; max load = 200 lb, xhd spd = 0.0021 cm s^{-1}. Shear: ℓ = 2.54 cm, diam = 0.318 ± 0.003 cm; xhd spd = 0.021 cm s^{-1}.

Polytetrafluoroethylene (TFE) and Tetrafluoroethylene-Hexafluoropropylene (FEP) Mechanical Properties References

1. *Ainbinder, S. B., Laka, M. B.*, Hardness of polymers, Mekhanika Polimerov, **2 No. 3,** 337 (1966); English translation in Polymer Mechanics **2 No. 3,** 211 (1966).
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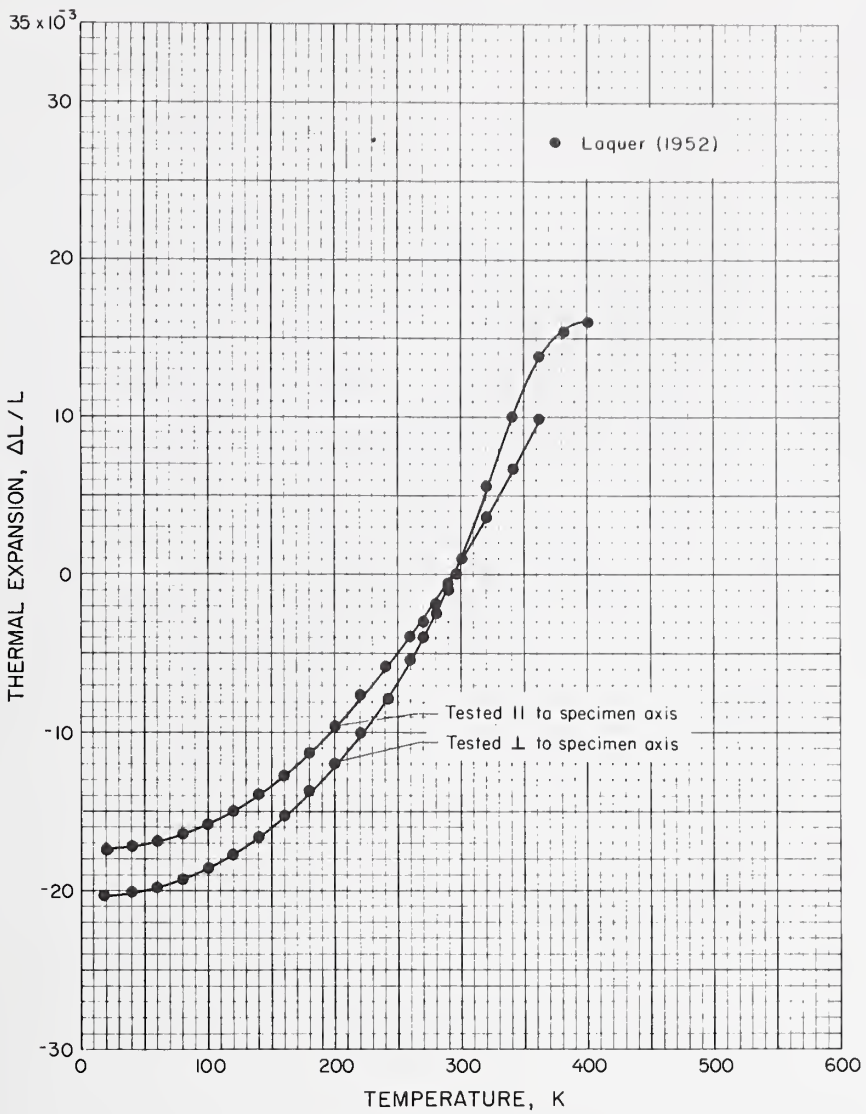
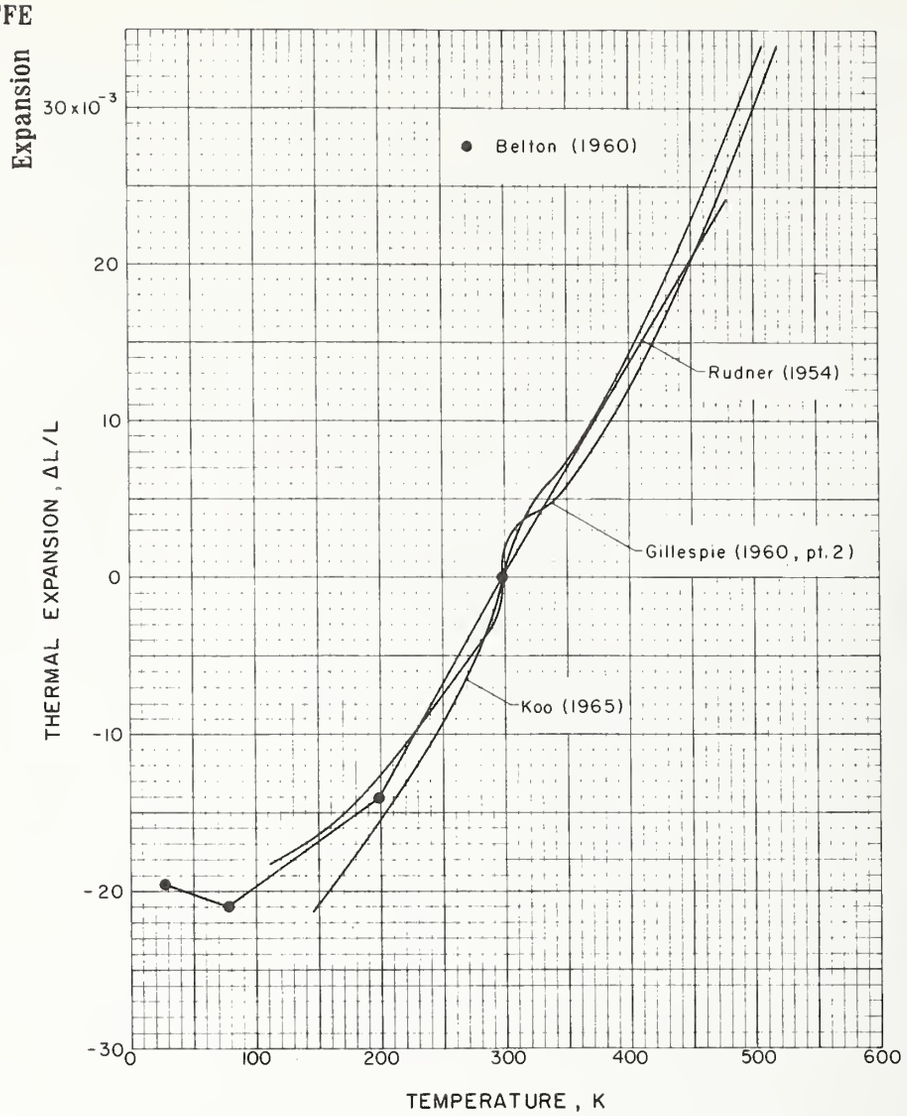


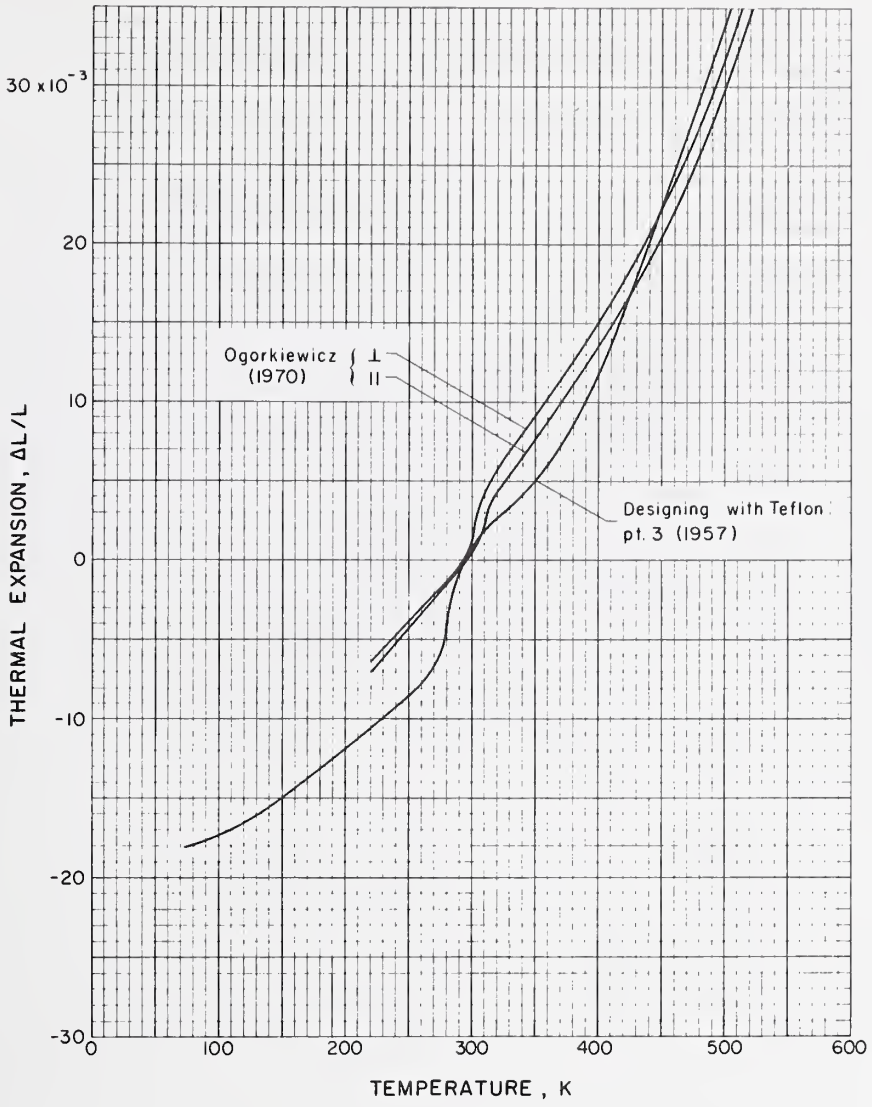
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Laquer, Head (1952)	Teflon	Rods, 0.508 cm diam and ℓ = 2.54 cm; quartz tube - dilatometer method used. temperature measured to ± 0.1 K with copper - constantan thermocouple; quoted probable accuracy ± 7.0 x 10^{-5}.

TFE

Expansion

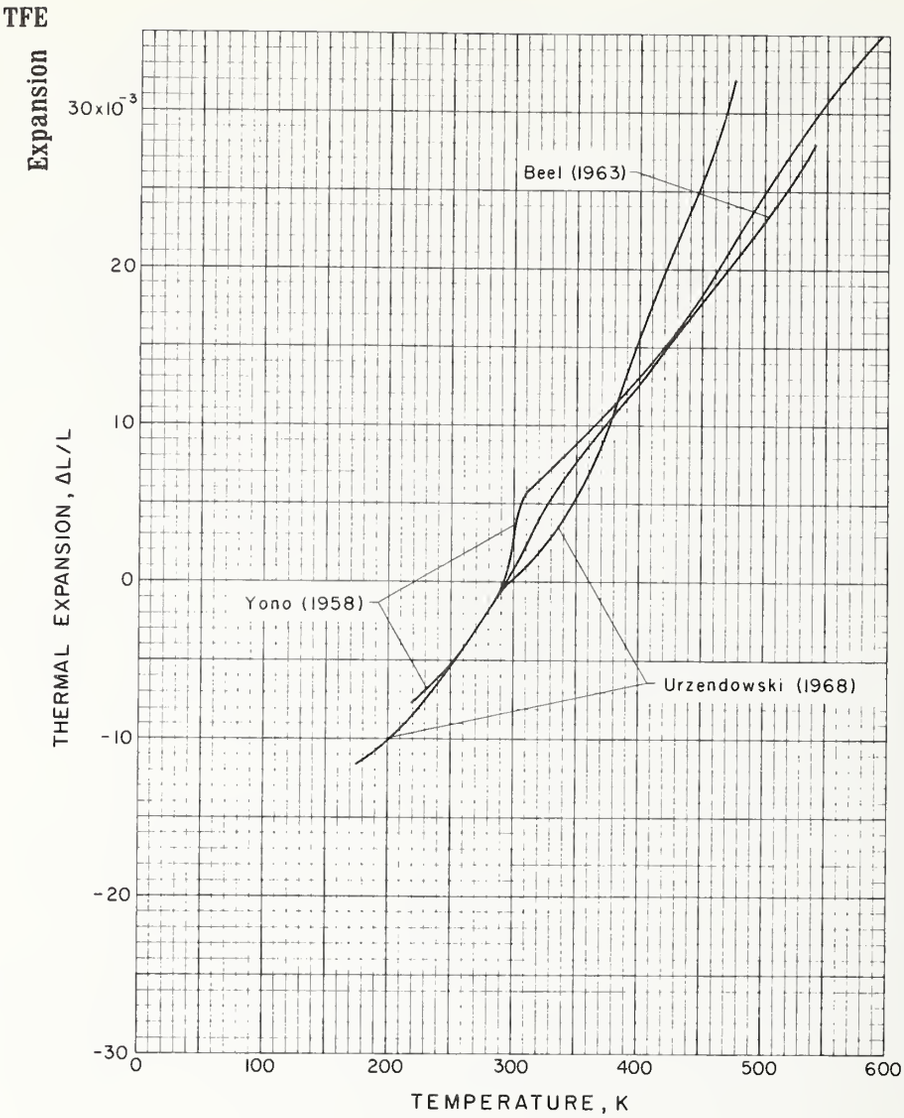


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, part 2)	Teflon 1	
Koo, Jones, Riddell, O'Toole (1965)	Halon G-80	
Rudner, Graeff, Bertolet, Jr. (1964)	Teflon TF1, sp gr = 2.14, molded under 4,000 psi, cured at 639 K and cooled at 56 K h^{-1}	Diam = 0.64 cm, ℓ = 5.08 cm; dilatometer; calculated from the coefficient of thermal expansion for 293-478 K.
Belton, Godby, Taft (1960)	Teflon	ℓ = 10.7 cm; fused quartz dilatometer.

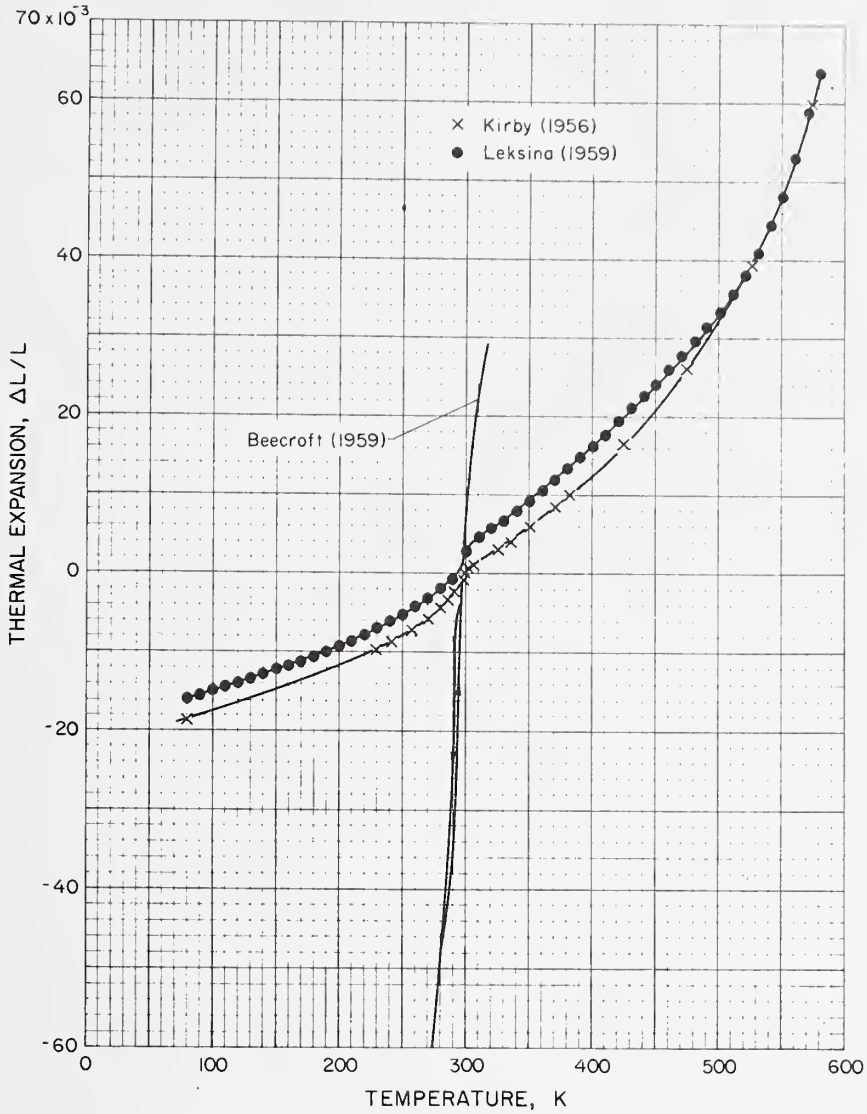


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Designing with Teflon: Part 3 (1957)	Teflon, annealed, 54% crys	
Ogorkiewicz (1970)	Fluon	Measured ⊥ and || to direction of molding pressure.

TFE



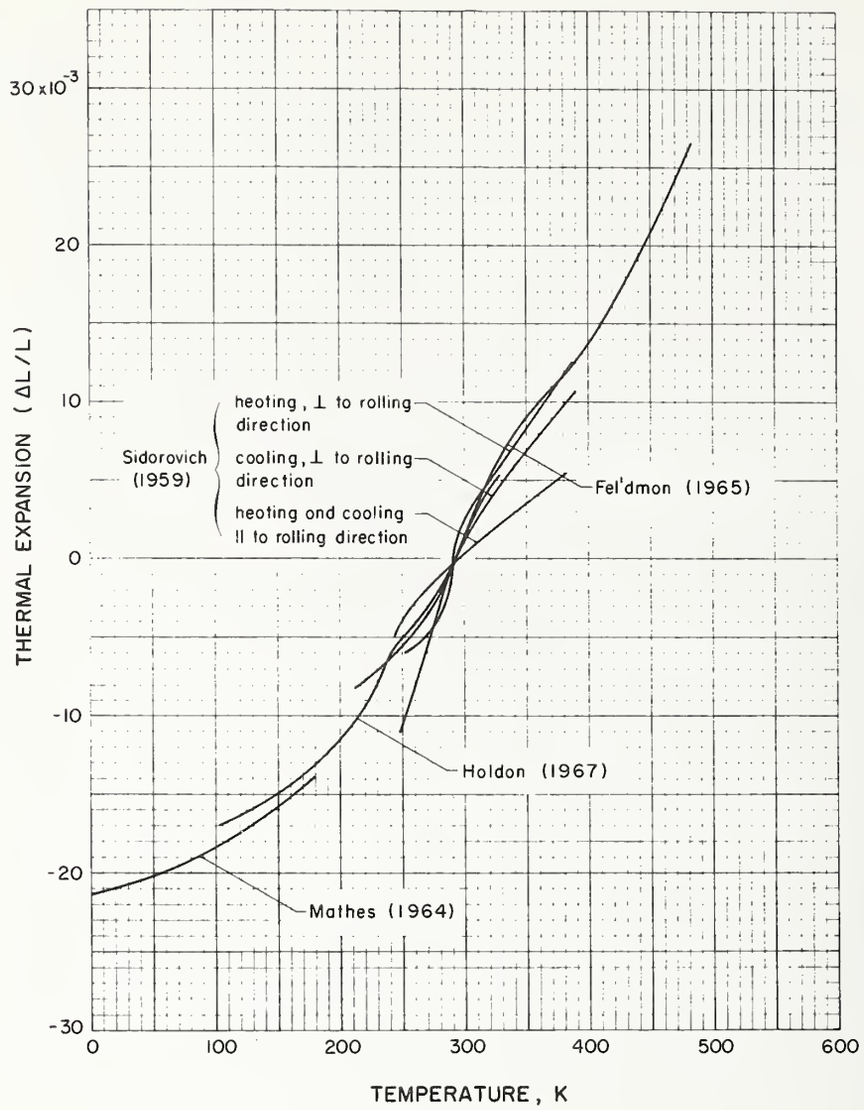
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Beel, Markovich (1963)	Fluoroplast-4	Diam ≃ 1.0 cm, ℓ = 2.5-5.0 cm; samples heated at 1, 5, and 10 K min^{-1} with very little difference.
Yano (1958)	Teflon film	
Urgendowski, Guenther, Asay (1968)	Teflon	0.64 cm x 0.64 cm; Du Pont 940 amp Thermo mechanical analyzer; total probable error = ± 2.5%.



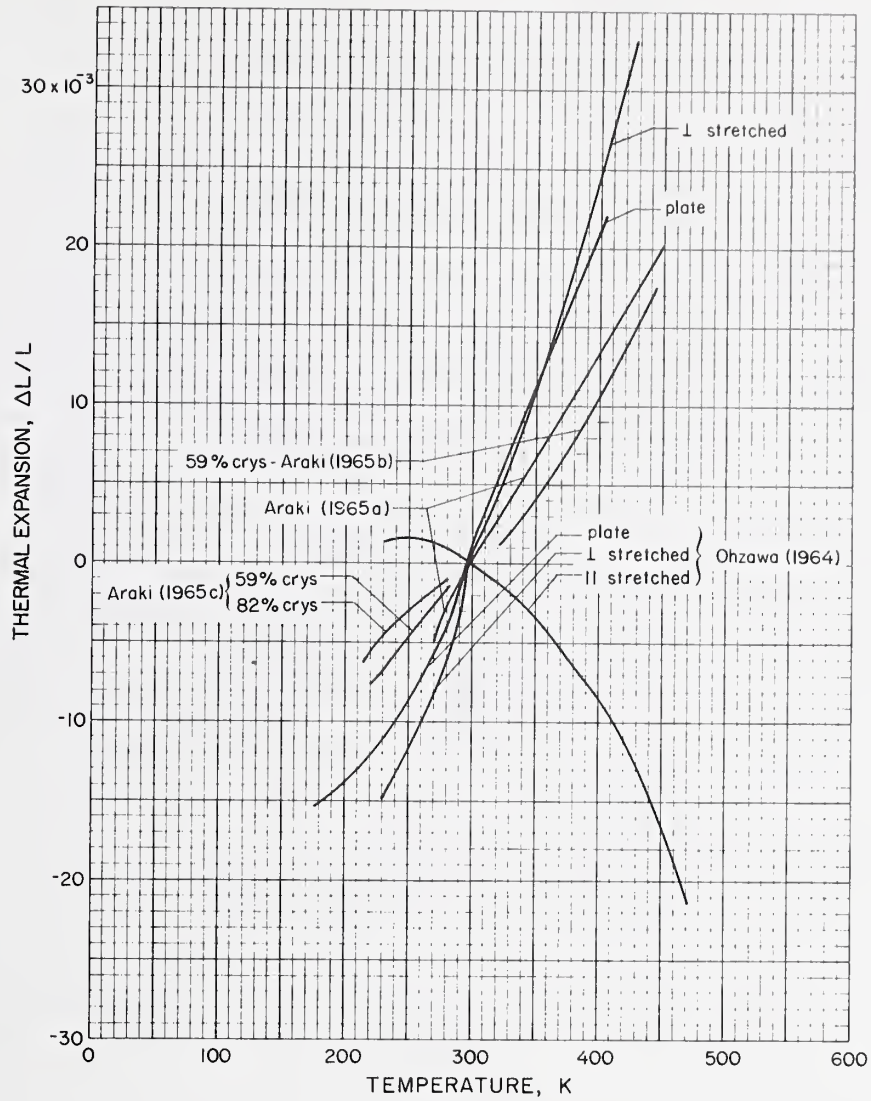
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kirby (1956)	Teflon, extruded, annealed sp gr 2.162 at 298 K	l 7.6 cm, 1.27 cm diam; fused-quartz tube and dial-indicator method used, 0.00025 cm graduations on indicator, temp of sample measured by thermocouple in hole near center of sample.
Beecroft, Swenson (1959)	Teflon, 68% crys, sp gr 2.25	Rod, l = 2.43 cm; fused-quartz tube and dial-indicator method, av heating and cool rate 0.2 K h^{-1} with a max of 0.6 K h^{-1}; arrows indicate direction of temp change.
Leksina, Novikova (1959)	Photoplast IV	

TFE

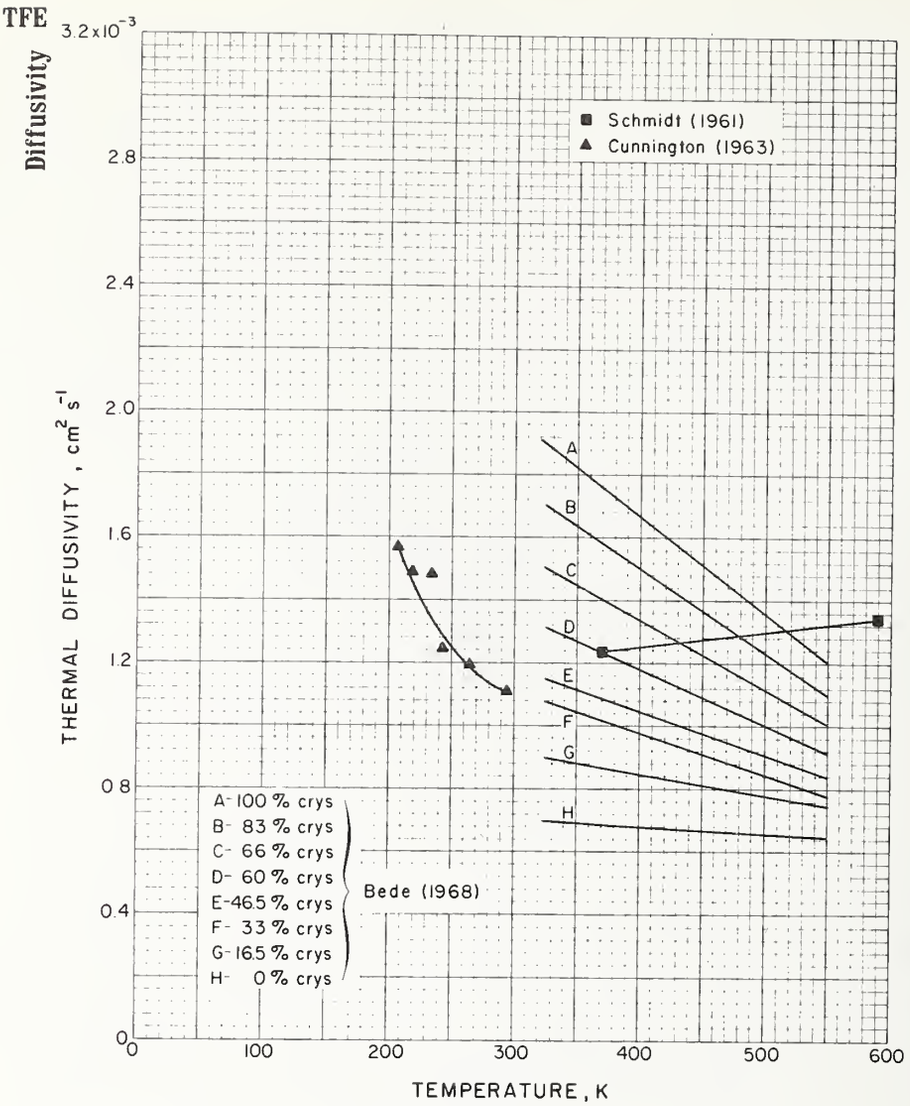
Expansion



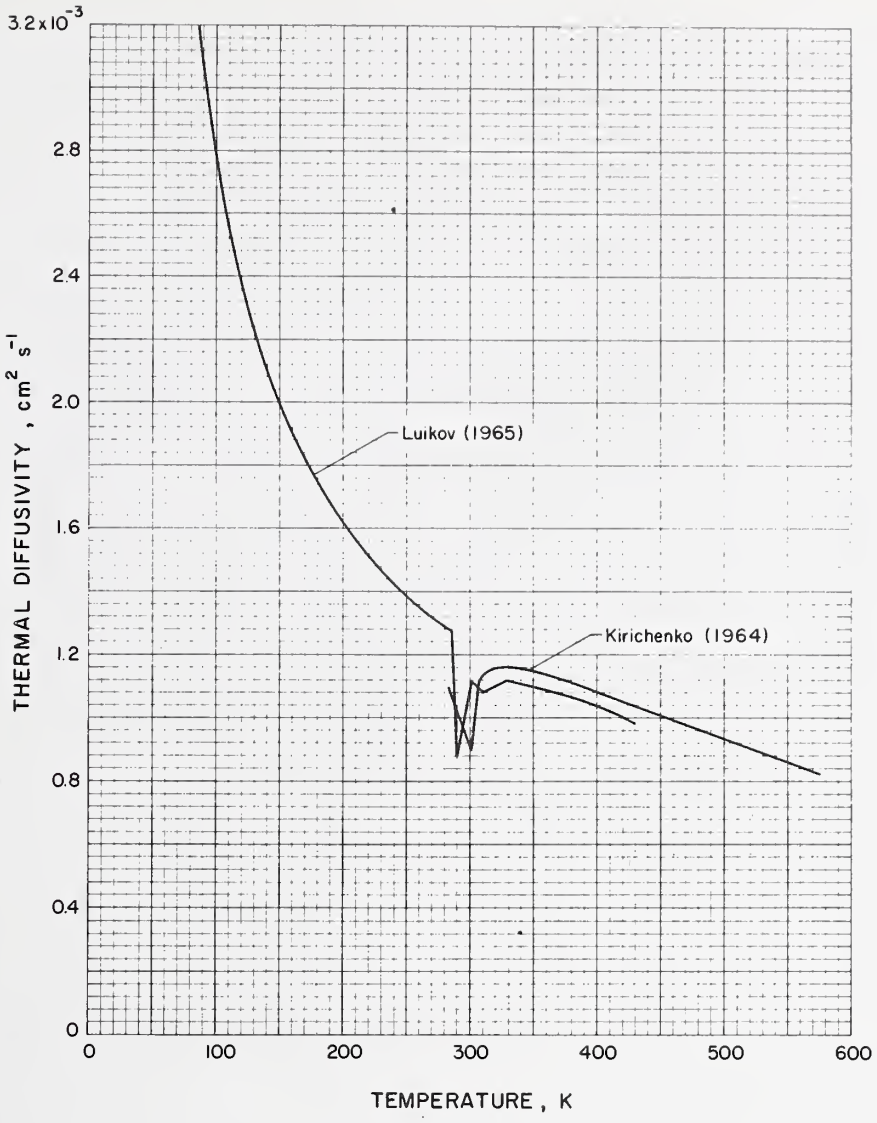
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Haldon, Schell, Simha (1967)	Teflon, 52% crys	Quartz tube dilatometer; quoted probable accuracy ±5%.
Fel'dman, Sokolov (1965)	Fluoroplast IV, nonoriented and unquenched	Strips, ℓ = 10 cm, w = 1 cm, t = 0.2 cm; strips placed vertically in dynamometer operated as a dilatometer, length of specimen measured within 1 μ, rate of temperature change 1 K per 3-5 min.
Mathes (1964)	Teflon	Thin film; vapor deposited gold electrodes.
Sidorovich, Kuvskinskii (1959)	Teflon	



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ohzawa, Wada (1964)	Plate, t = 0.6 cm, 68% crys, sp gr = 2.161 at 298 K; film, t = 0.05 cm, sp gr = 2.167 at 298K, stretched 200% at 298 K and annealed at 453 K for several h, then sp gr = 2.003 at 298 K	Differential transformer.
Araki (1965a)	Polyflon M-11, molding pressure = 2,850 psi, annealed at 633K for 2 h and cooled slowly, sp gr = 2.1530, 52% crys	Diam = 1.0 cm, ℓ = 2.0 cm; dial gauge
Araki (1965 b)	Teflon 5, sp gr = 2.1758, 59% crys	Diam = 1.5 cm, ℓ = 4.0 cm; unbonded type strain gauge.
Araki (1965c)	Teflon 6, sp gr = 2.2088, 59% crys, and sp gr = 2.2470, 82% crys	Same as above

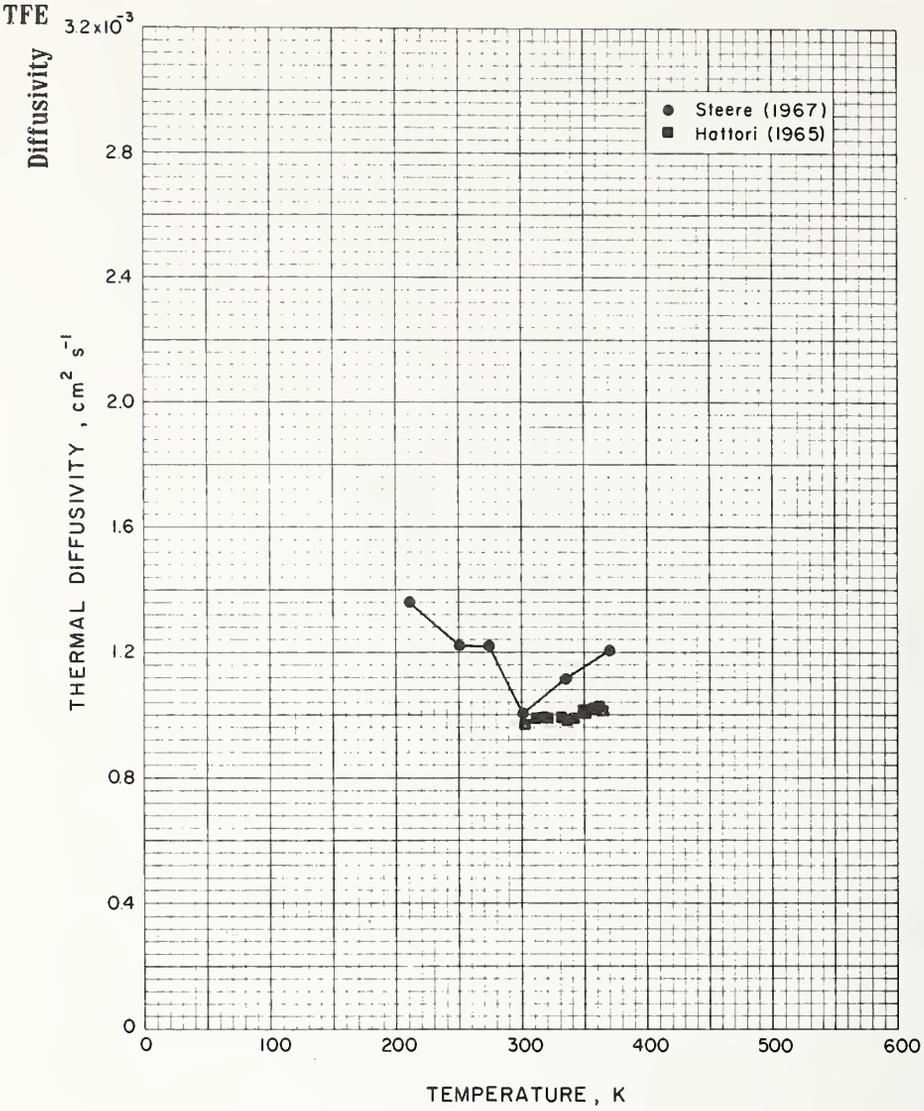


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Schmidt (1961)		
Cunnington, Mon (1963)	Teflon, extruded for stock, sp gr = 2.17	Diam = 1.91 cm, t = 0.15-0.64 cm; front face coated with 0.003-0.005 cm thick optically black paint, flash method; total maximum uncertainty = 12%.
Bede, Samardzkov, Gasteva, Schchonoba (1968)	Fluoroplast 4 : sp gr = 2.30, 100% crys; sp gr = 2.25, 83% crys; sp gr = 2.20, 66% crys, sp gr = 2.18, 60% crys; sp gr = 2.14, 46.5 % crys; sp gr = 2.10, 33% crys; sp gr = 2.05, 16.5% crys; sp gr = 2.00, 0% crys	

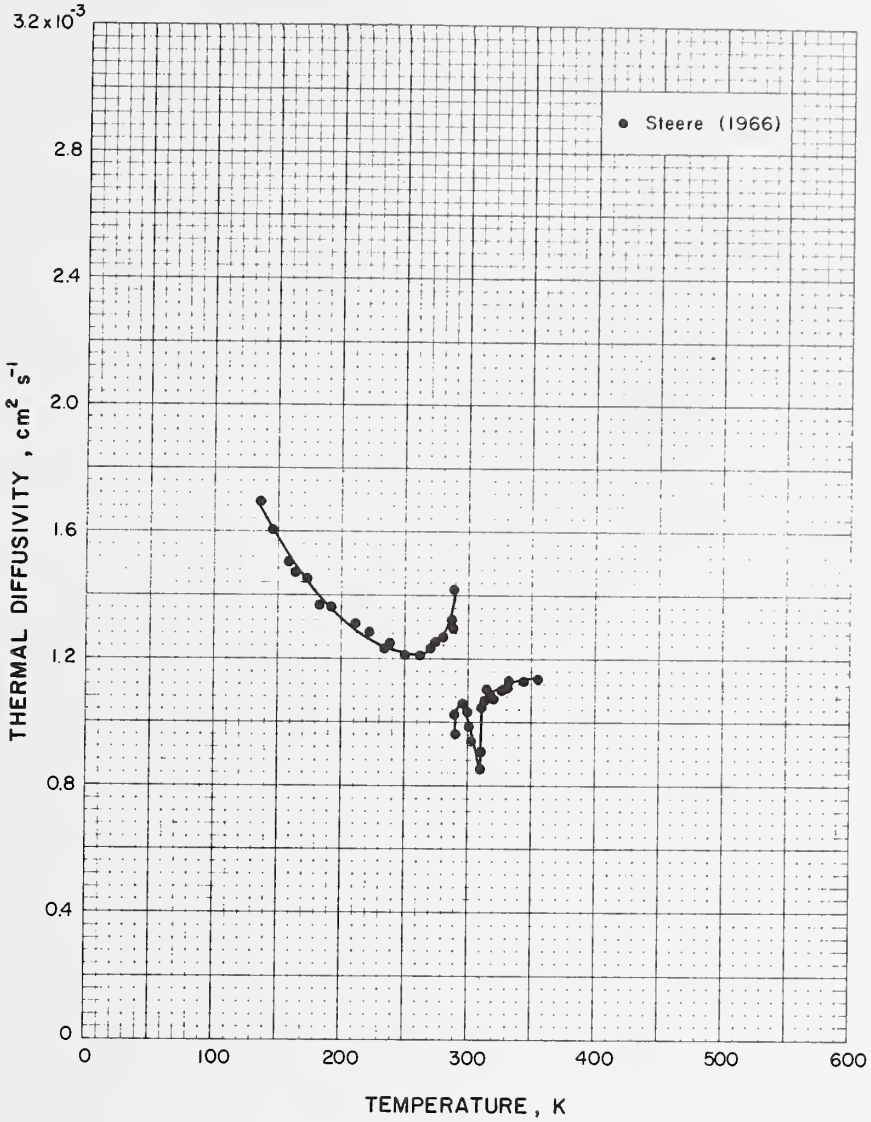


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kirchenko, Oleinik, Chabovich (1964)	Fluoroplast	Temp wave method used.
Luikov, Vasiliev, Shashkov (1965)	Teflon	Temp measured with copper - constantan thermocouples, measurement and control of temp within 0.01 K; heating rate of 1-4 K min^{-1}.

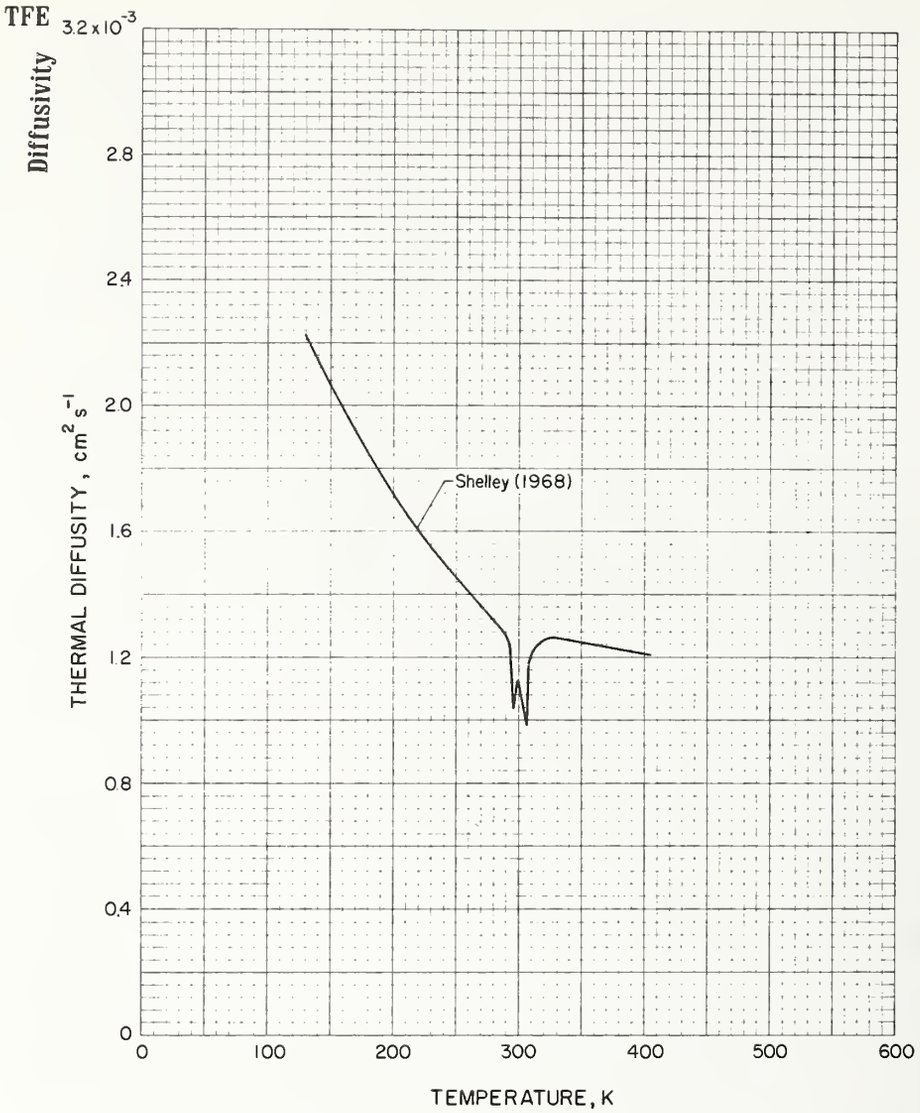
TFE



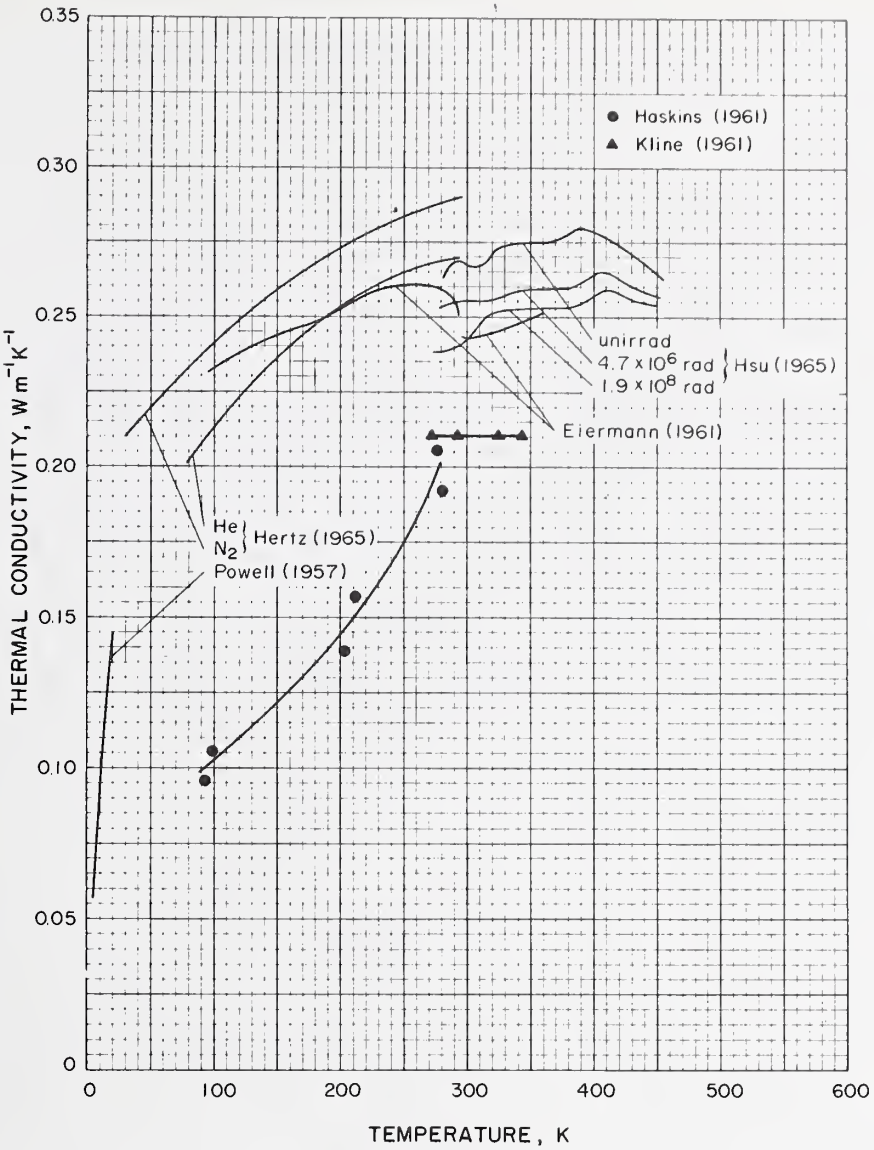
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Hattori (1965)	Teflon	Solid cylinder, 1.0 cm diam and ℓ = 4.0 cm, copper - constantan thermocouple 0.02 cm diam.
Steere (1967)	Teflon	Transient and location-of-max methods used; quoted probable accuracy ±3% using location-of-max method.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Steere (1966)	Teflon	Modified transient heating method.



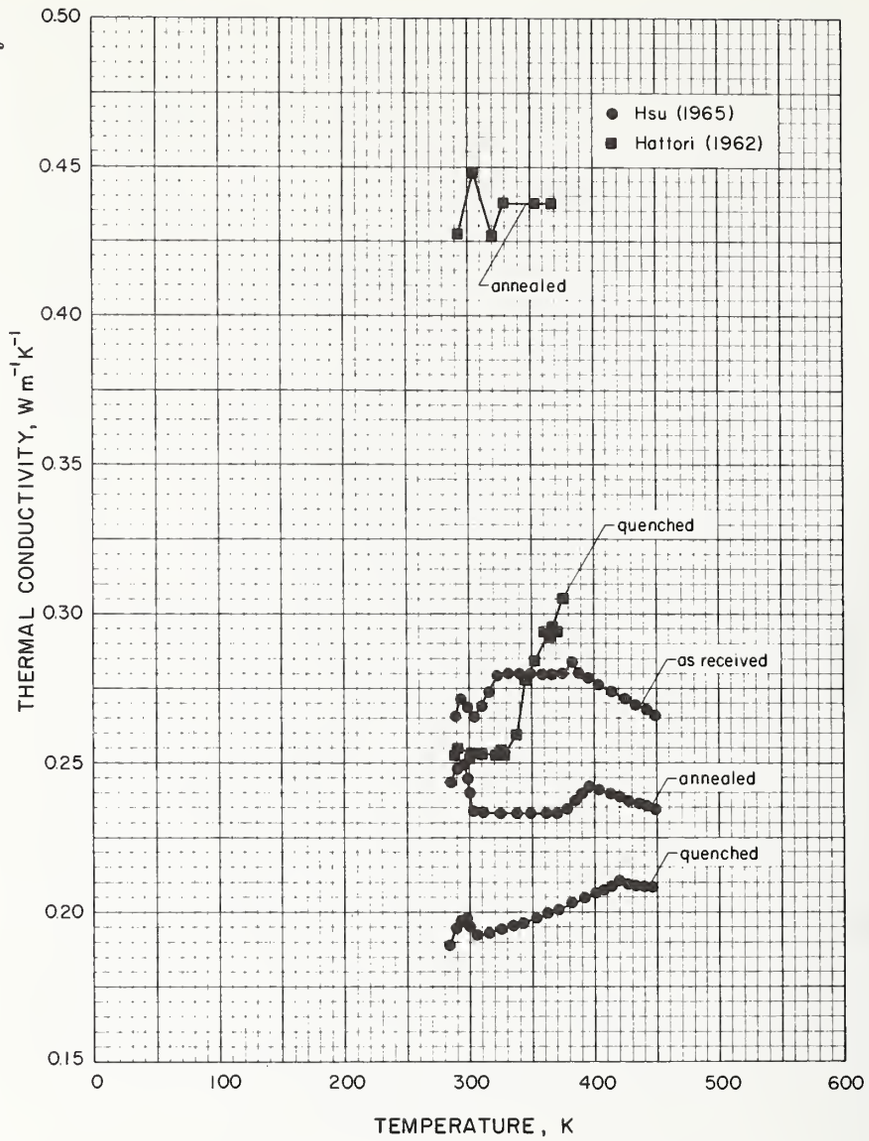
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Shelley, Huber (1968)	Teflon, 75% crys	ι = 0.103 cm; periodic heat wave and constant heat flux methods used, temp held to within 0.1 K. quoted probable accuracy 2%.



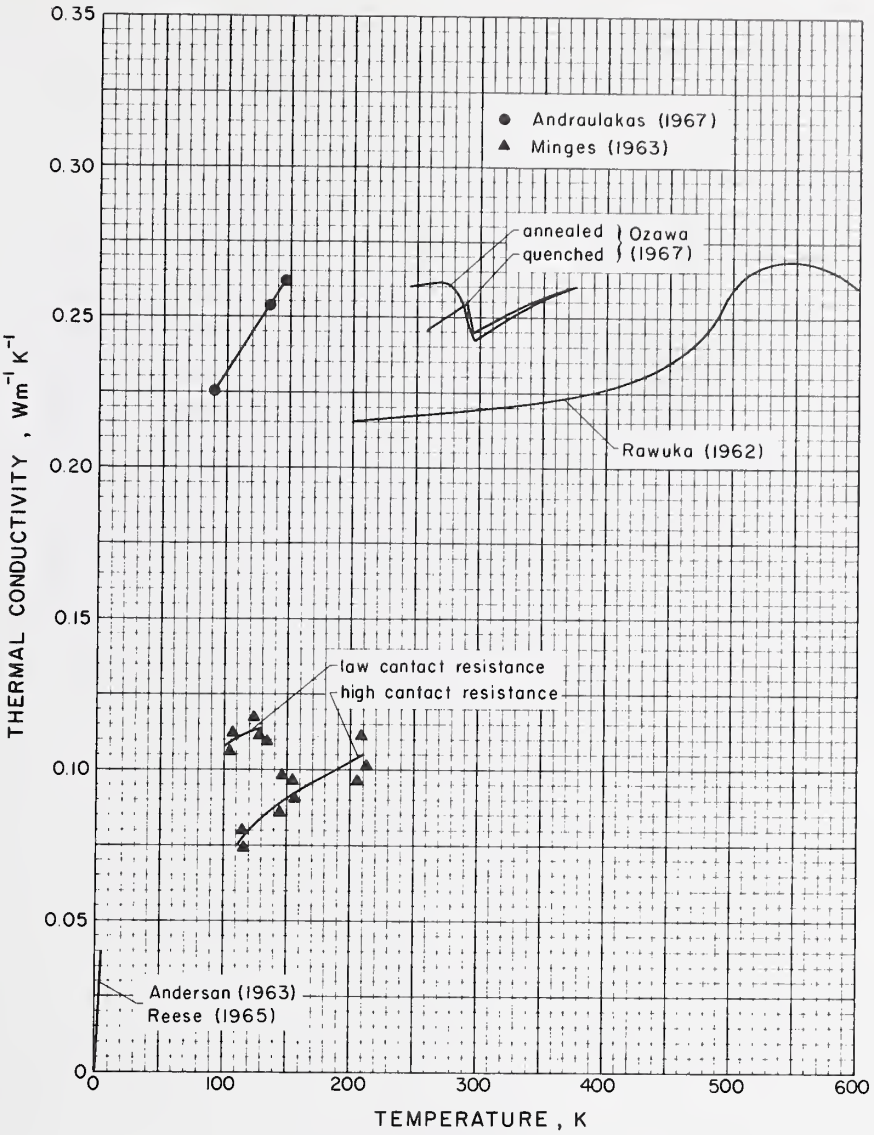
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Powell, Rogers, Coffin (1957)	Teflon, extruded, sp gr 2.218	Diam 2.5 cm, ℓ 20.5 cm; axial heat flow through a long cylindrical sample; probable accuracy ≈ 10%.
Haskins, Hertz (1961)	Teflon	Samples 20.3 x 20.3 x 1.3 cm and 17.8 x 17.8 x 1.3 cm; guarded plate principle used.
Kline (1961)	Teflon, sp gr 2.19, crys 65%.	Diam 1.27 cm, ℓ 30.5 cm; steady-state method utilizing a concentric cylinder; accuracy of voltage and current at heater ends ± 2%.
Eiermann, Hellwege, Knappe (1961)	Teflon	
Hertz, Haskins (1965)	Teflon	19.1 x 17.8 x 1.3 cm; guarded hot-plate technique; measurements conducted in He and N_2.
Hsu, Kline, Tomlinson (1965)	Number av molecular weight ≈ 10^7; unirrad sp gr = 2.154, 54% crys; after 4.7 x 10^6 rad sp gr = 2.198, 67% crys; after 1.9 x 10^8 rad sp gr = 2.222, 74% crys	Heater concentric with sample; irrad by Co^{60} at 8.4 x 10^5 rads h^{-1}.

TFE

Conductivity



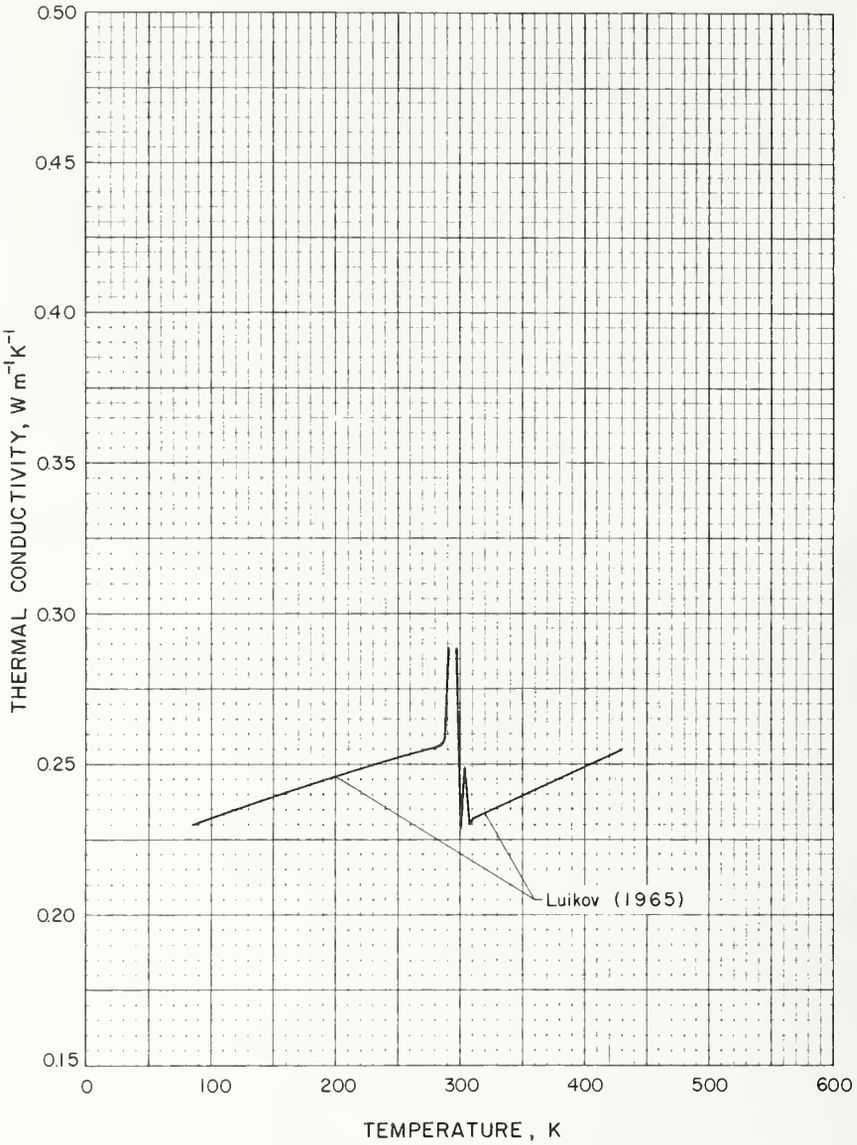
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Hattori (1962)	Teflon, annealed specimen held at 473 K for 0.5 h and slowly cooled, quenched specimen held at 623 K for 4 h and rapidly cooled in ice water	
Hsu, Kline, Tomlinson (1965)	Number av molecular weight $\approx 10^7$; as received sp gr = 2.154, 54% crys; annealed sample held at 613 K for 2 weeks then very slowly cooled, sp gr = 2.235, 78% crys; quenched sample held at 623 K for 18 h then quenched in liquid N_2, sp gr = 2.132, 45% crys	Tubes 0.508 cm inside diam, 1.09 cm outside diam; heater concentric with sample.



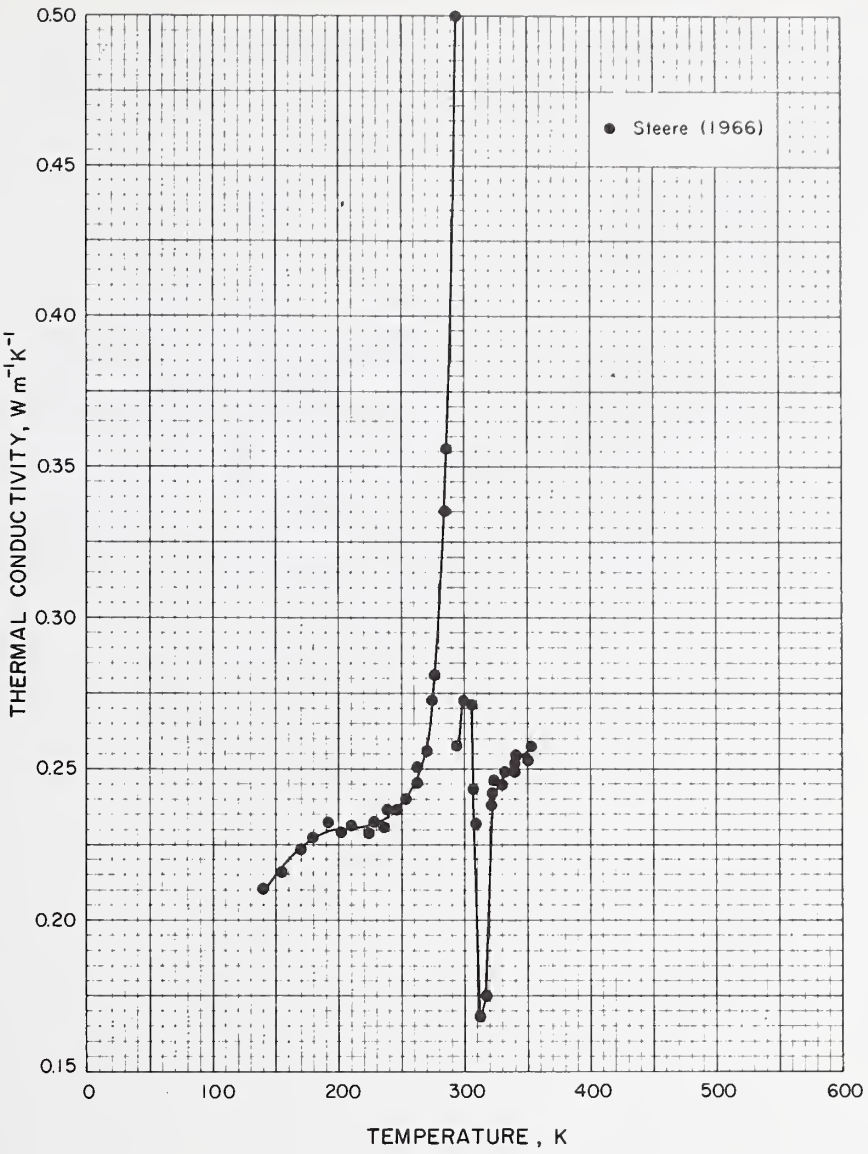
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Rawuka (1962)	Teflon	
Minges, Meiselman, Broadus (1963)	Teflon	Variation of ASTM Wilkes Calorimeter Test Method, in higher temp test the copper constantan couples were brought into contact with the sample by a pad of HT-1 cloth giving an average precision of 4.5%, in lower temp test the thermocouples were soft-soldered to small discs of high conductivity silver alloy foil which were cement bonded to the specimen, this gave an average precision of 3.0%.
Anderson, Reese, Wheatley (1963)	Teflon, 2 samples of sp gr = 2.160 ± 0.005 and sp gr = 2.155 ± 0.005	Diam = 1.00 cm, ℓ = 3.05 cm; resistance thermometer, measurements made from 0.1-0.8 K.
Reese, Tucker (1965)	Teflon, sp gr ± 2.160 ± 0.005	Diam = 1.27 cm, ℓ = 10.8 and 4.1 cm; carbon resistance thermometer; systematic errors ≃ 4-10%, reproducibility = 1.5%; measurements made from 1-4.5 K.
Androulakis , Kosson (1967)	Teflon	ℓ = 7.6 cm; copper-constantan thermocouples, Leeds and Northrup type K-3 potentiometer, temp measured at 2 or 3 points in vacuum; total error estimate = 5-8%
Ozawa, Kanari (1967)	Sintered plates: one specimen quenched from 663 K to 263 K and then skived flat, sp gr = 2.142, 48.1% crys; another specimen annealed at 649K for 4 h, cooled to 592 K at 30 K h^{-1}, cooled to 500 K at 6 K h^{-1}, then cooled in air, sp gr = 2.185, 61.8% crys	Quantitative differential thermal analysis, measurements from 288-313 K made at a constant temp other measurements made at a constant rate of heating.

TFE

Conductivity



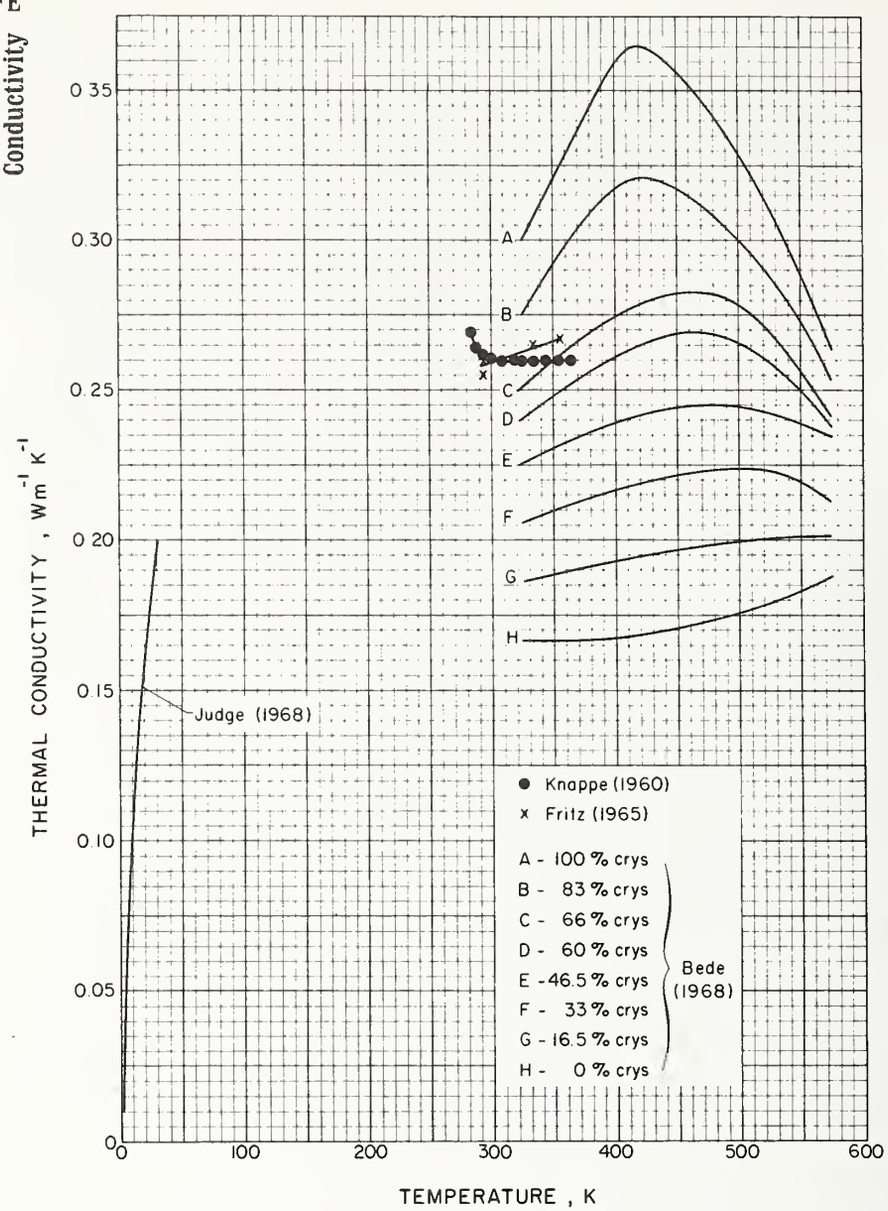
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Luikov, Vasiliev, Shashkov (1965)	Teflon	Rods; temp measured with copper-constantan thermocouples, measurement and control of temp within 0.01 K; heating rate of 1-4 K min^{-1}.



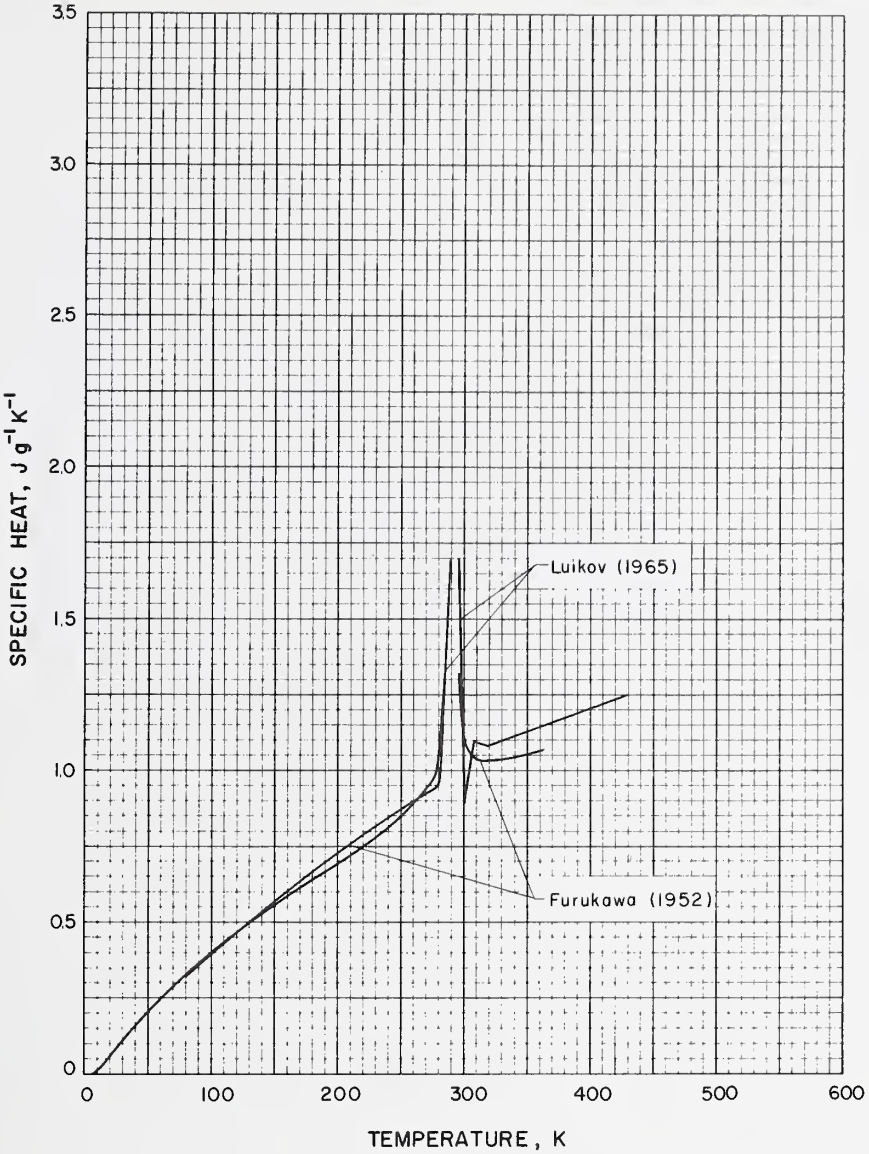
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Steere (1966)	Teflon	Modified transient heating method.

TFE

Conductivity



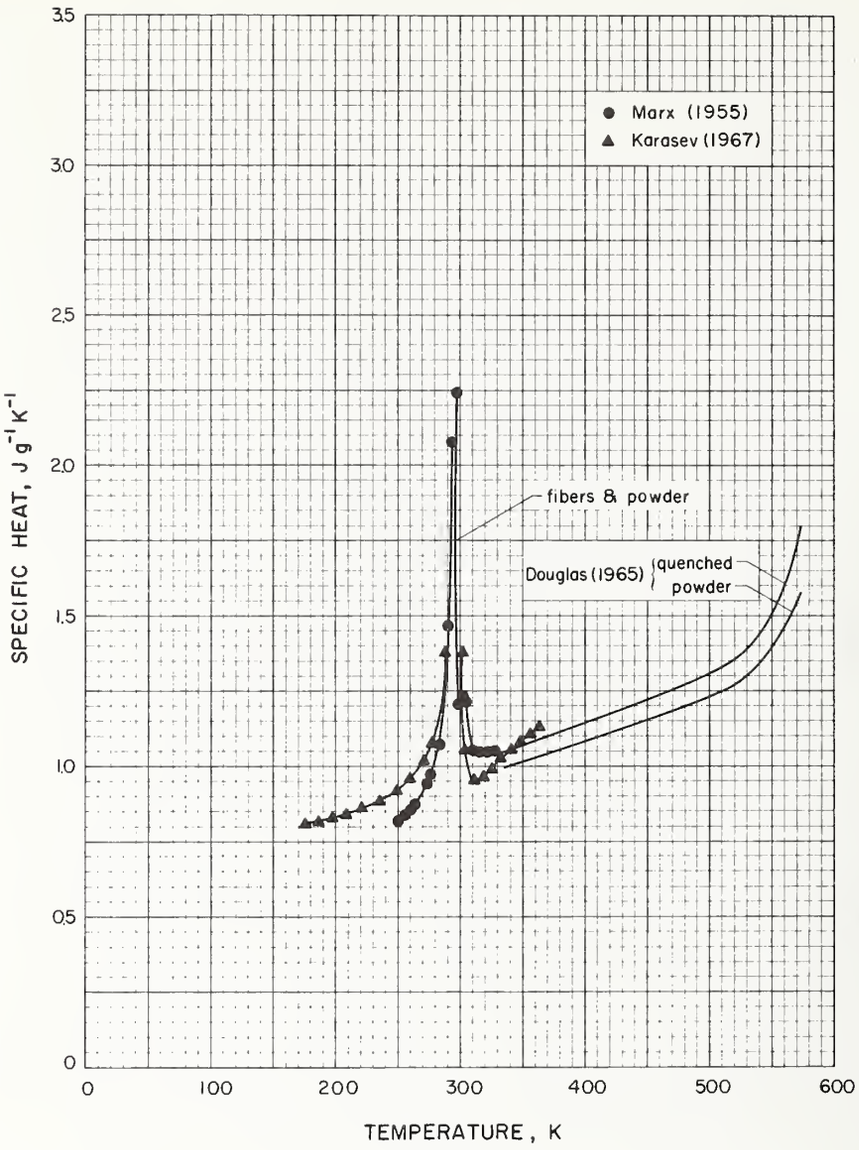
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Knappe (1960)	Teflon	2 plate method with guard ring, stationary temp.
Fritz, Bode (1965)	Teflon, sp gr = 2.17	t = 1.26 cm; one-plate apparatus with guard ring.
Bede, Samardukov, Gasteva, Schchonoba (1968)	Fluoroplast 4: sp gr = 2.30, 100% crys; sp gr = 2.25, 83% crys; sp gr = 2.20, 66% crys; sp gr = 2.18, 60% crys; sp gr = 2.14, 46.5% crys; sp gr = 2.10, 33% crys; sp gr = 2.05, 16.5% crys; sp gr = 2.00, 0% crys	
Judge (1968)	Teflon	Measured by superconducting bolometer.



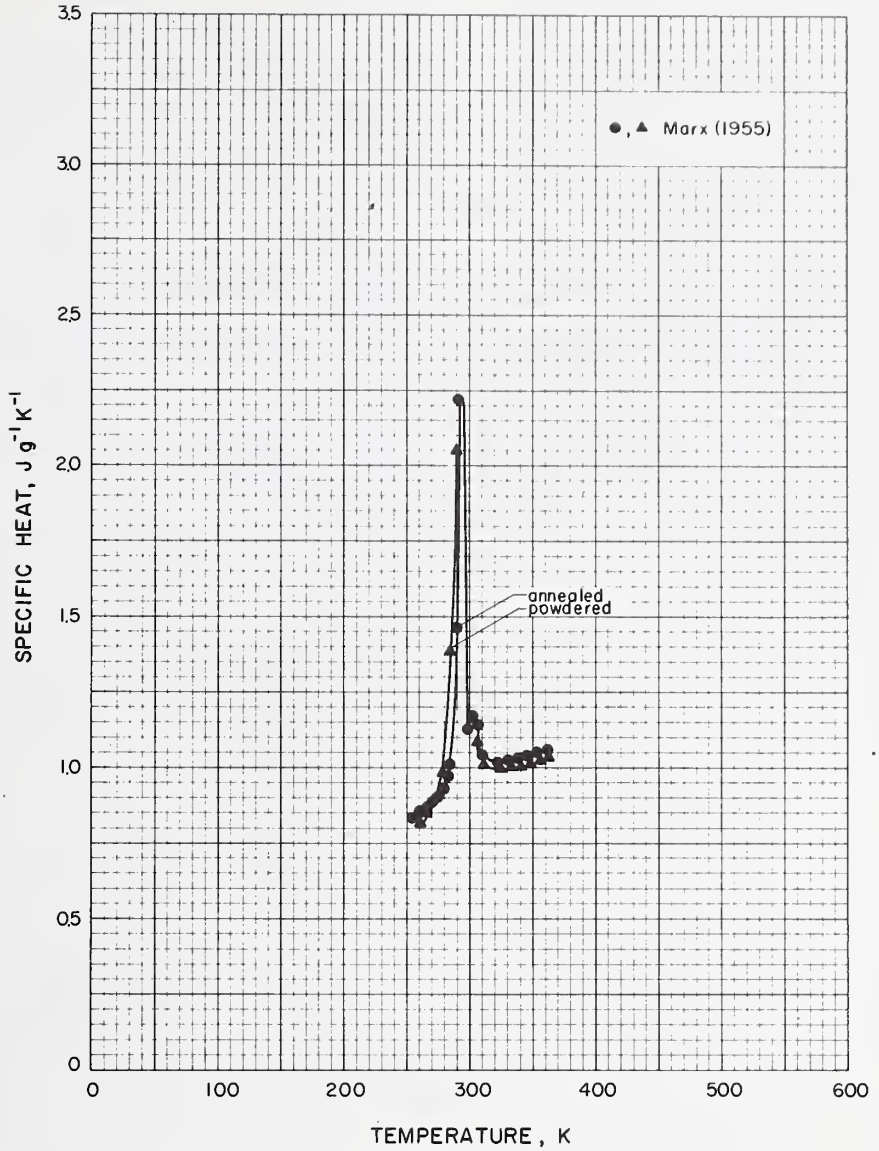
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Luikov, Vasiliev, Shashkov (1965)	Teflon	Rods; temp measured with copper - constantan thermocouples, measurement and control of temp within 0.01 K; heating rate of 1-4 K min^{-1}.
Furukawa, McCoskey, King (1952)	Teflon, powder, powder molded into 0.1 to cm sheet, then annealed at 623 K for 4 h in vacuum and cooled slowly to room temp., sheet heated to 623 K until clear and quenched in liquid N_2.	Sheet cut into 0.1 to cm cubes; platinum resistance thermometer and heater assembly, electrical power input to calorimeter heater measured by Wenner potentiometer with standard resistor and volt box, Mueller-type bridge used to measure resistance thermometer; curve represents av data from powdered, molded, annealed and quenched material, continuous series of test points taken at 5 K intervals, max data spread ±0.075 $Jg^{-1} K^{-1}$, quoted probably accuracy 0.2%.

TFE

Specific Heat



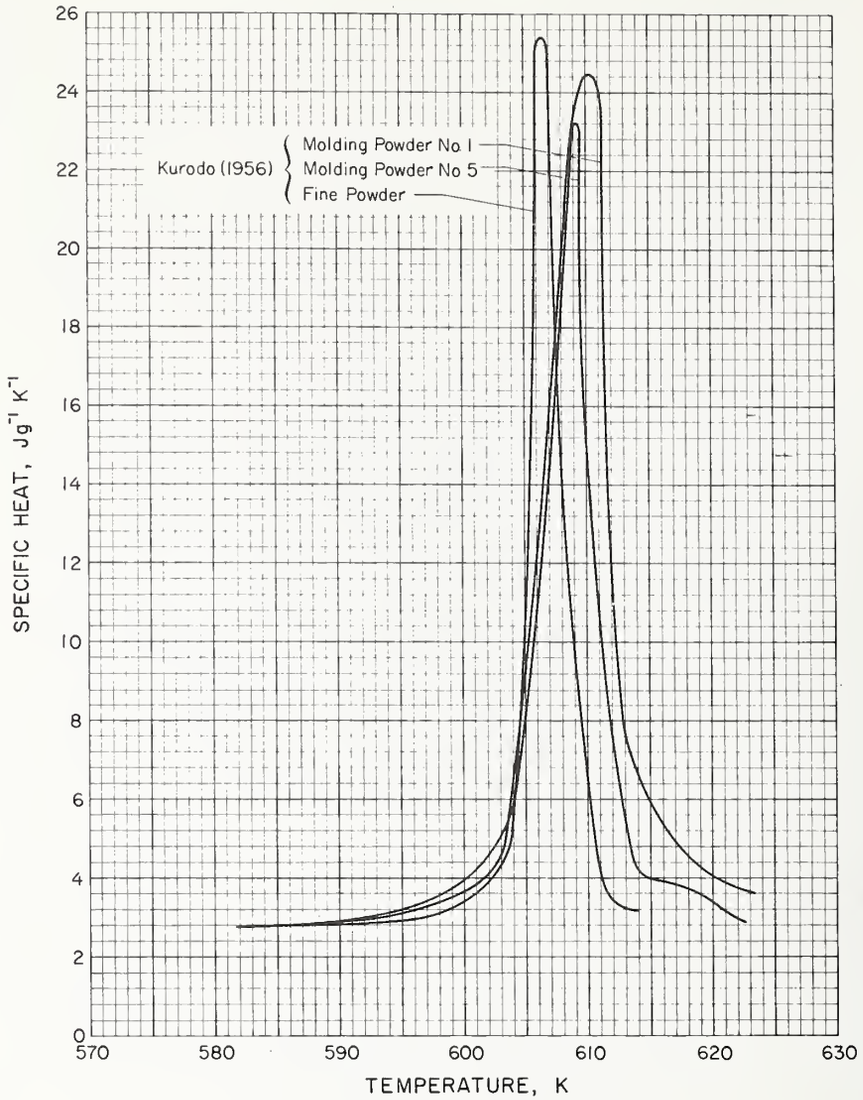
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Douglas, Harman (1965)	Teflon TF-1, 94.8 crys, 2.166 sp gr	Bunsen ice calorimeter, specimen evacuated to remove traces of moisture, furnace temp held to ±0.01 K, temp measured by strain-free platinum resistance thermometer and Mueller bridge.
Marx, Dole, (1955)	Teflon	
Karasev (1967)	Teflon	



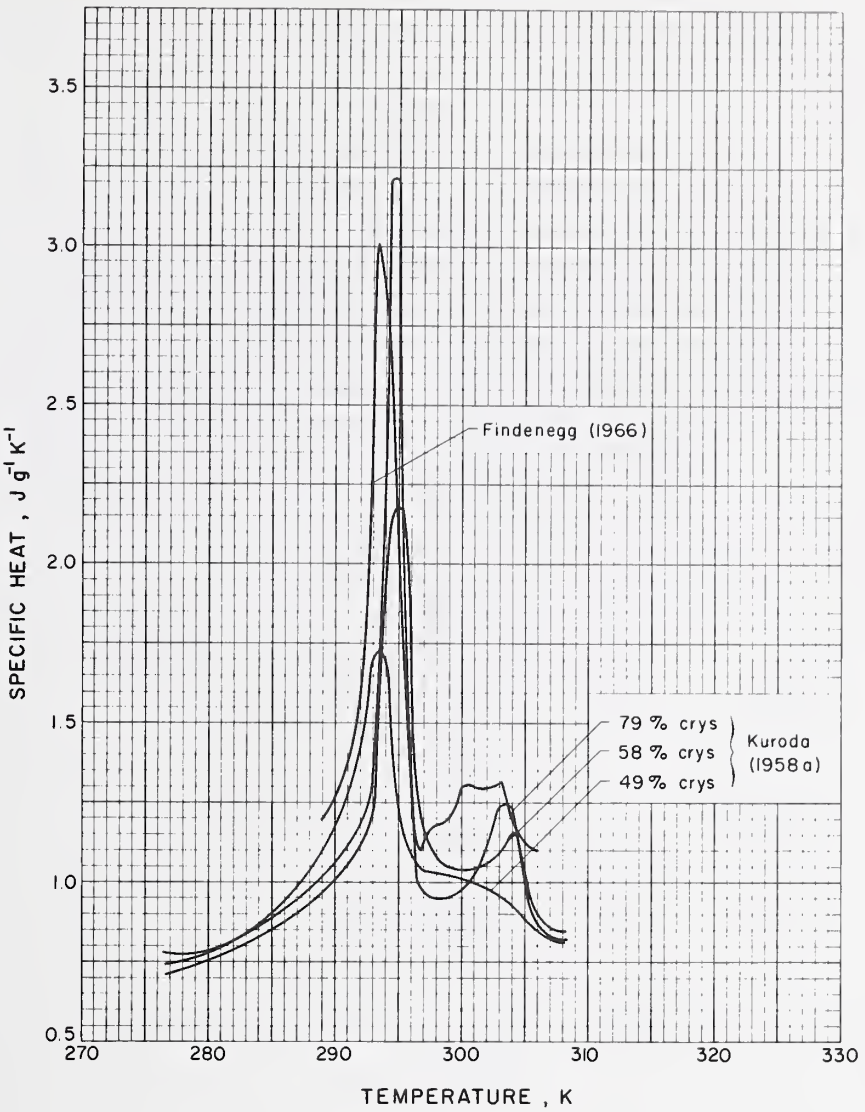
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Marx (1955)	Teflon, powdered and annealed	Vacuum adiabatic calorimeter, automatic system for heating and cooling, automatic recording of temp difference between jacket and calorimeter, Watt-hour meter used for measuring electrical energy input.

TFE

Specific Heat



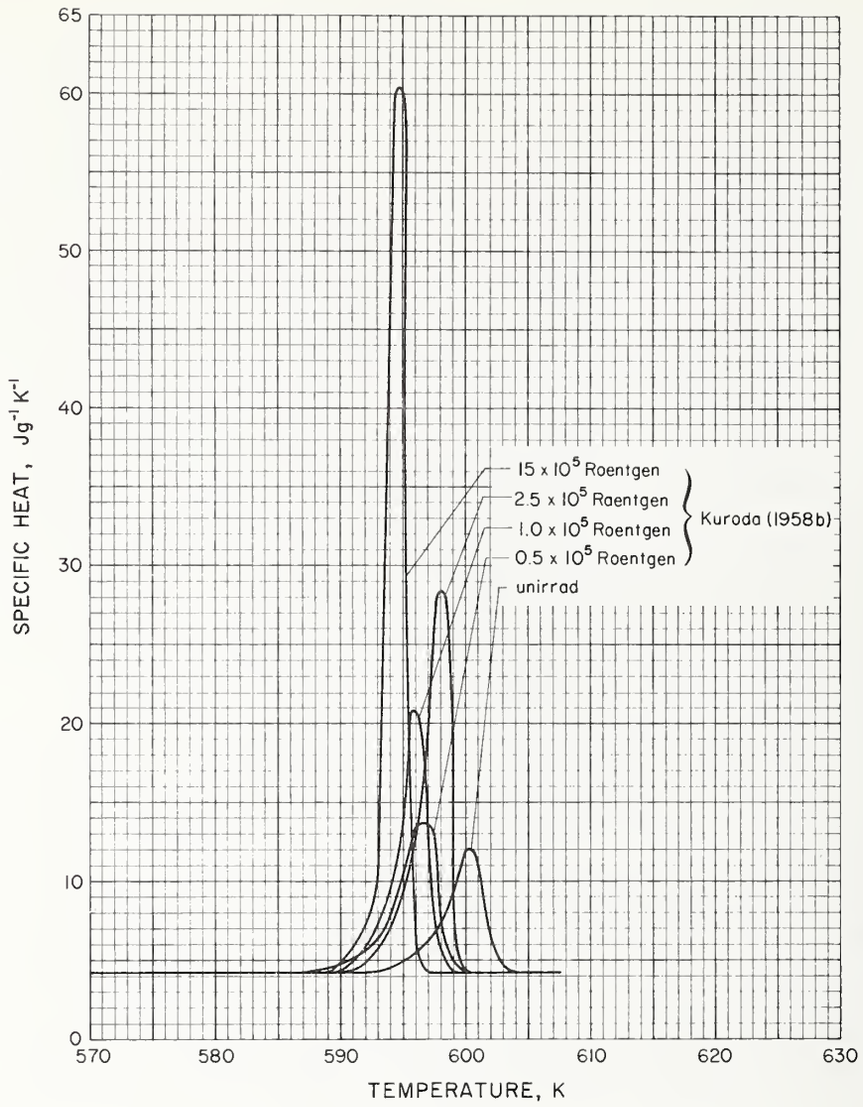
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kuroda (1956)	Teflon: molding powder no. 1, ~30 mesh; molding powder no. 5, ~ 60 mesh; still finer powder	



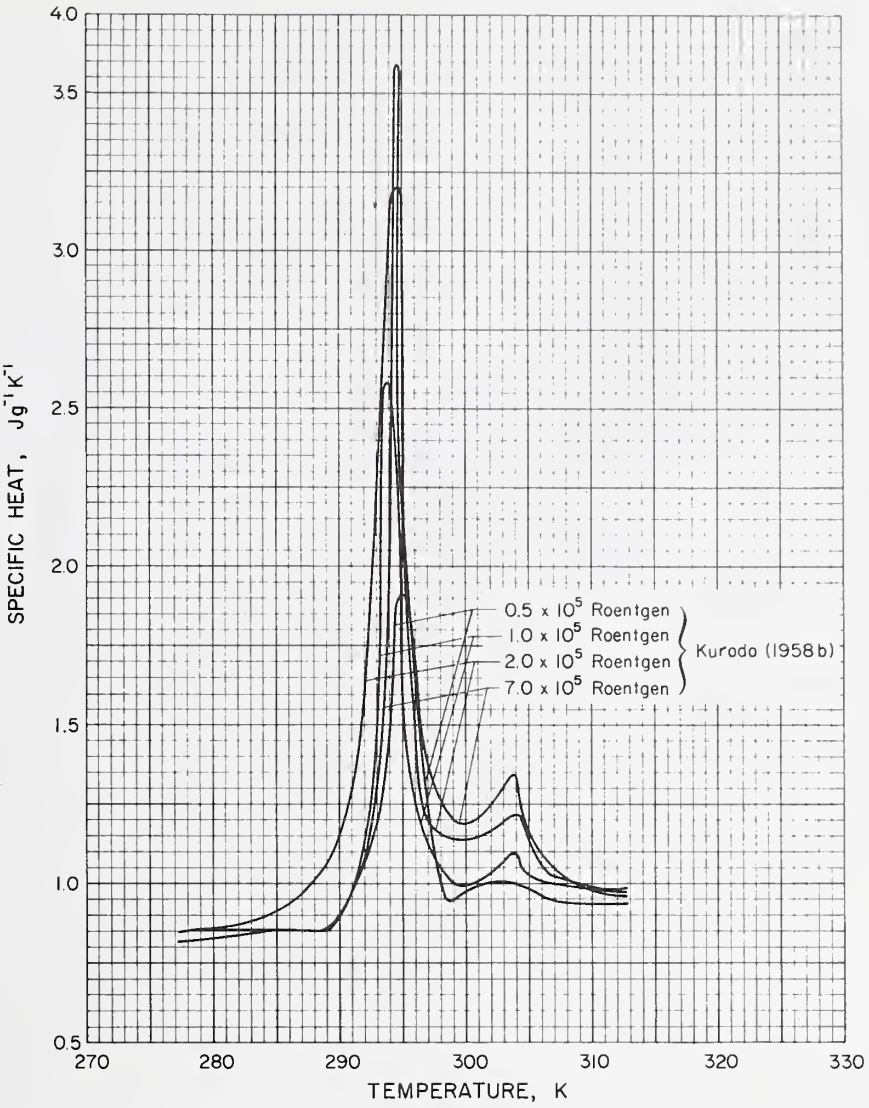
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kuroda, Sakami (1958a)	Teflon 6: sp gr = 2.145, 49% crys; sp gr = 2.170, 58% crys; sp gr = 2.245, 79% crys; sp gr = 2.258, 83% crys	The curve for the 83% crys sample has a peak at 3.5 $Jg^{-1} K^{-1}$ but is otherwise identical to the curve for the 79% crys sample.
Findenegg, Wilhelm, Kohler (1966)	Teflon, sp gr = 2.207	Adiabatic calorimeter.

TFE

Specific Heat



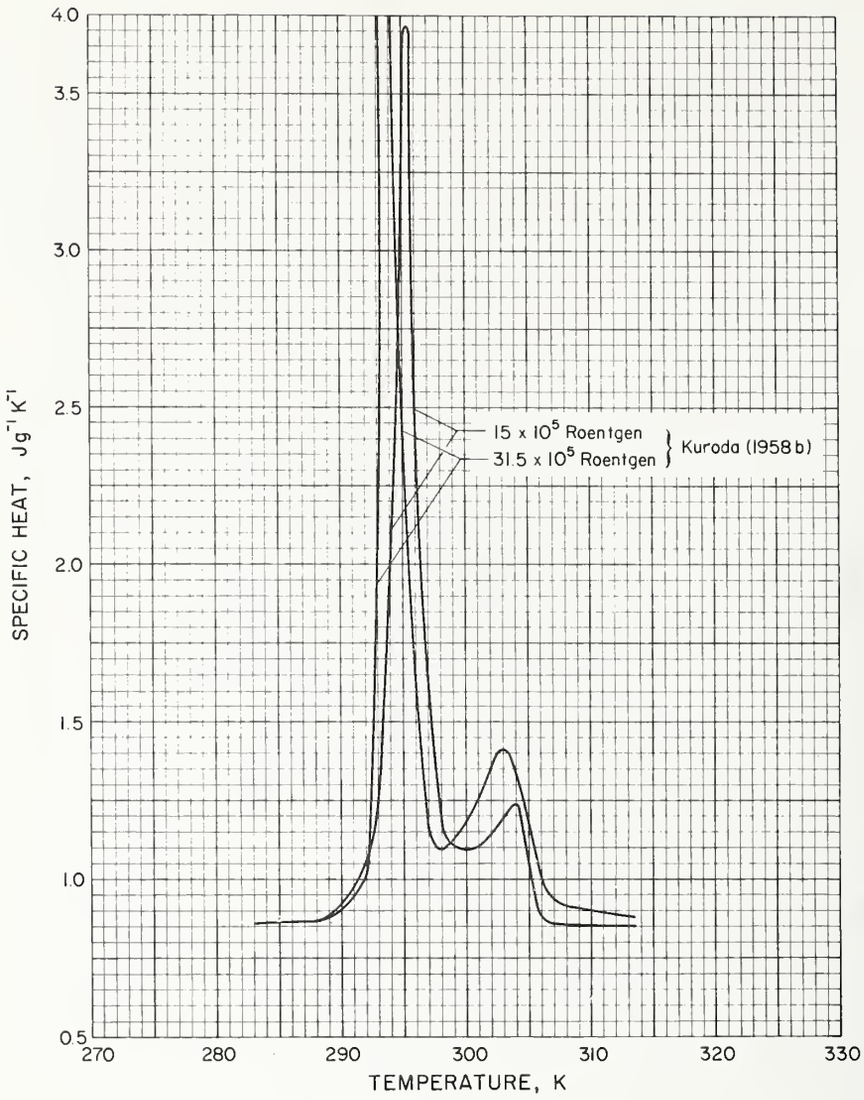
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kuroda, Sakami (1958b)	Teflon 1	Irrad by Co^{60}



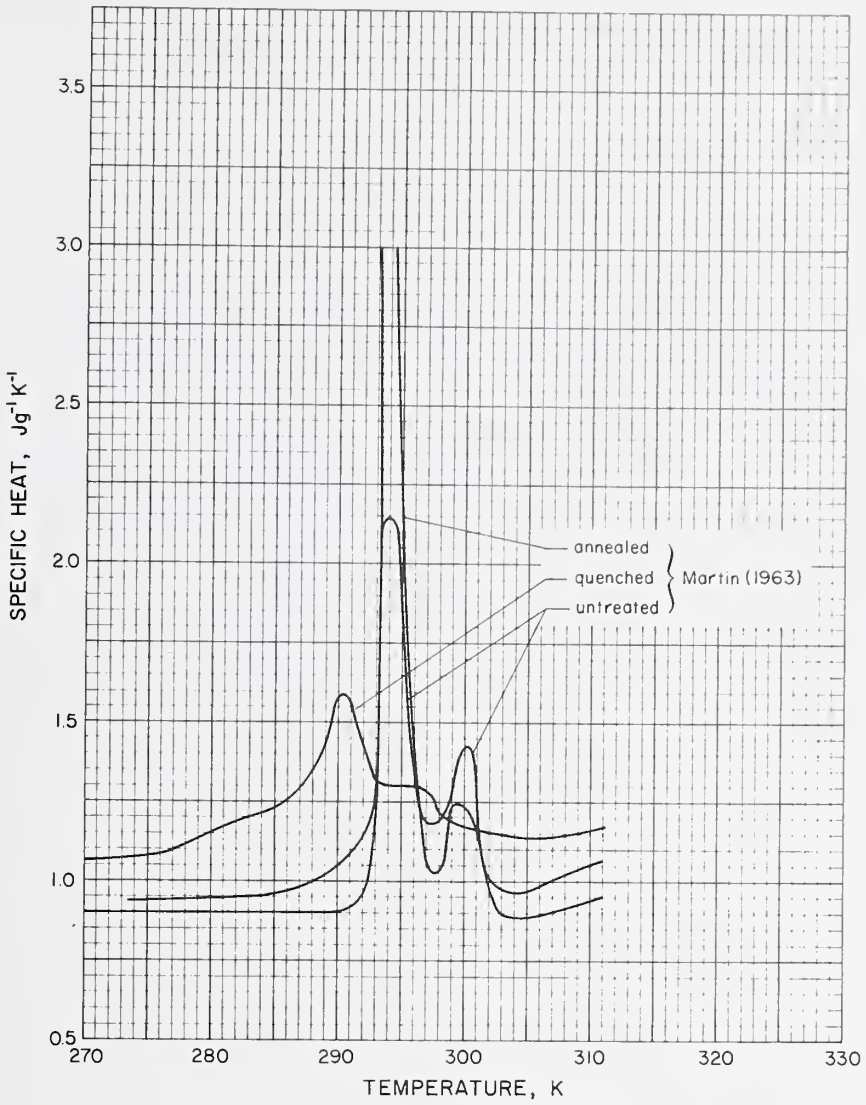
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kuroda, Sakami (1958b)	Teflon 1	Irrad by Co^{60}.

TFE

Specific Heat

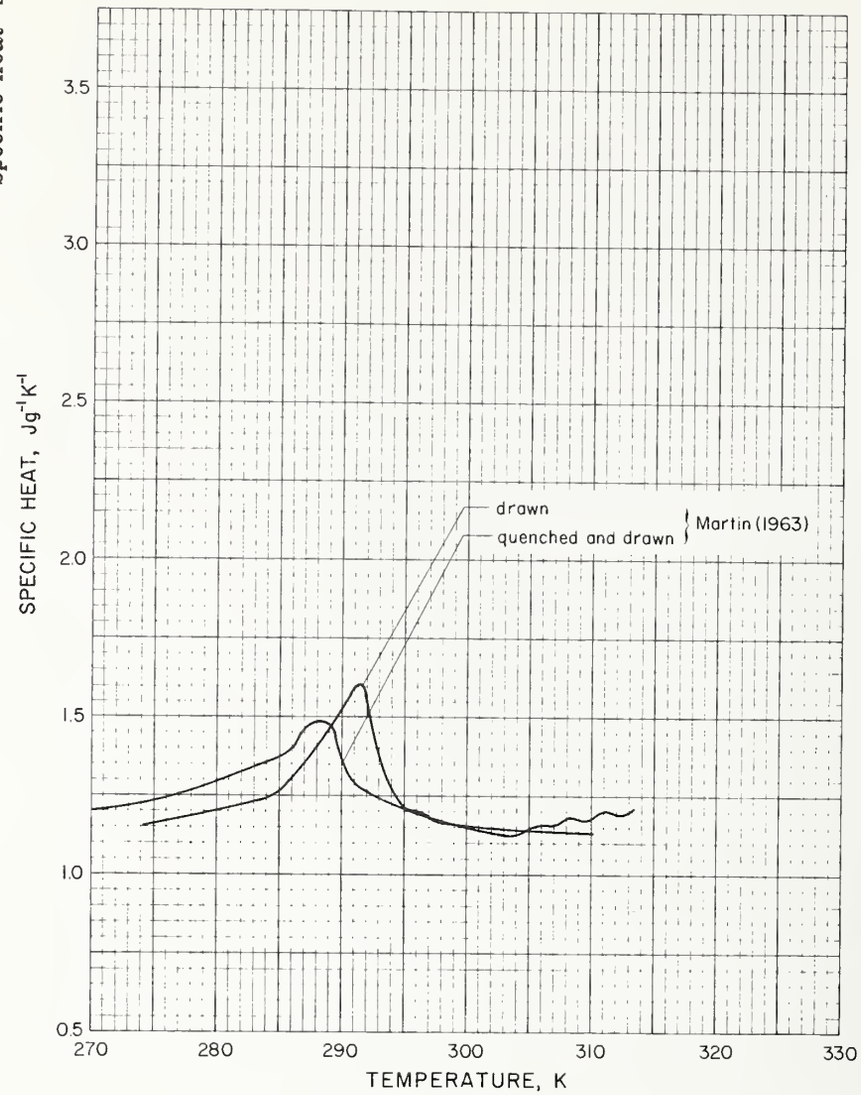


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kuroda, Sakami (1958b)	Teflon 1	Irrad by Co^{60}.

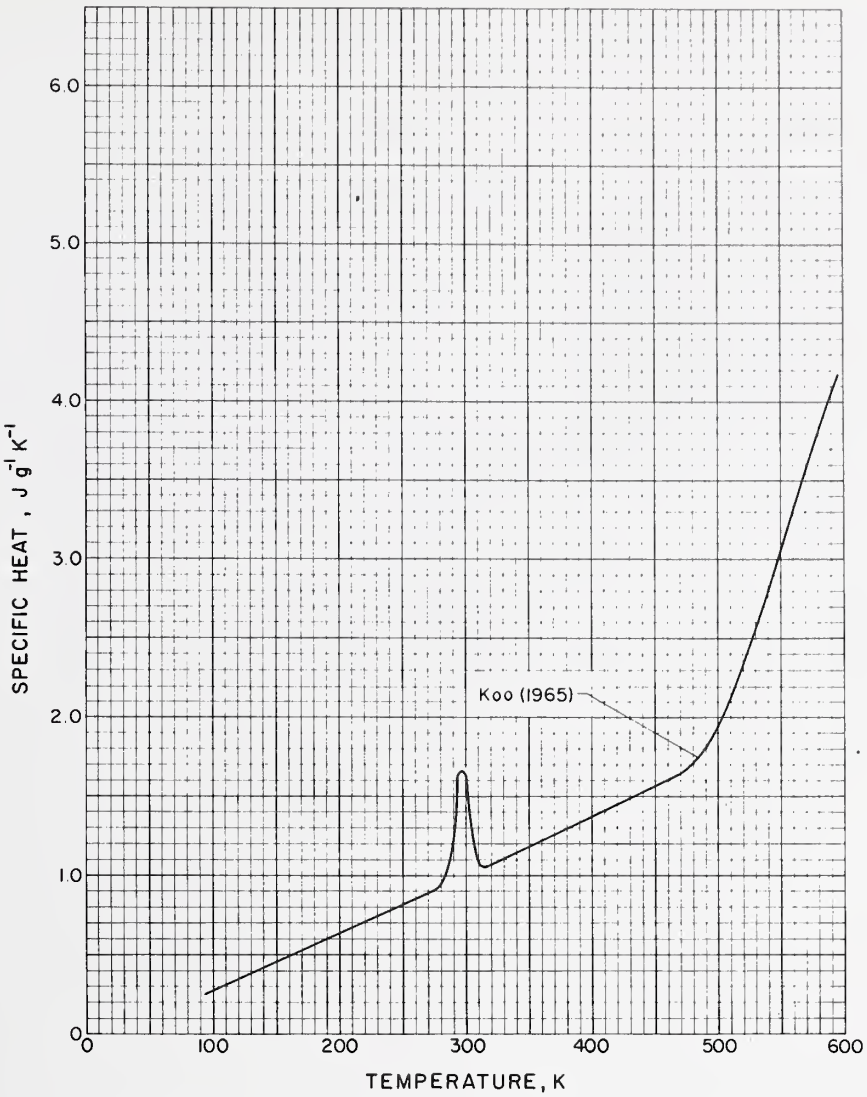


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Martin, Müller, (1963)	Teflon film; untreated; quenched from 623K into water at 293K; annealed	t = 0.01 cm; max absolute error = ± 5%.

Specific Heat



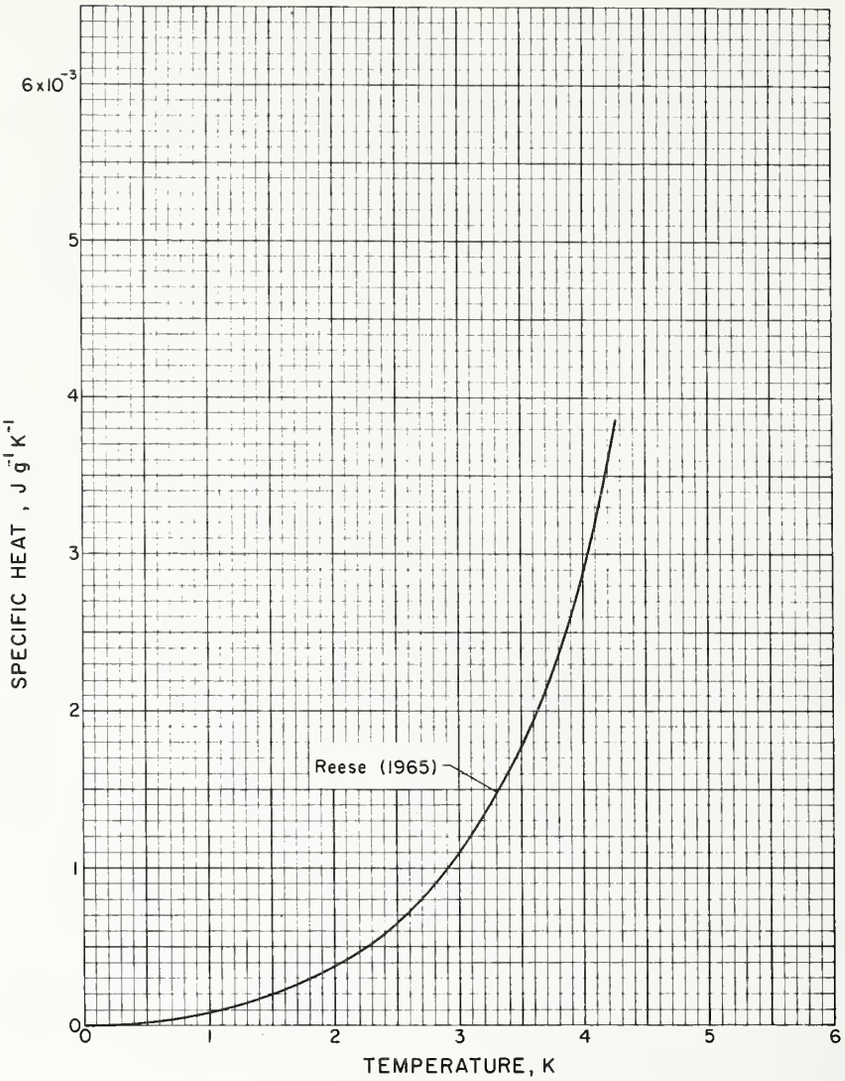
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Martin, Müller (1963)	Teflon film, drawn at 297K and 0.0083 cm s^{-1}; quenched from 623 K into water at 293 K and then drawn	t = 0.01 cm; max absolute error = ± 5%



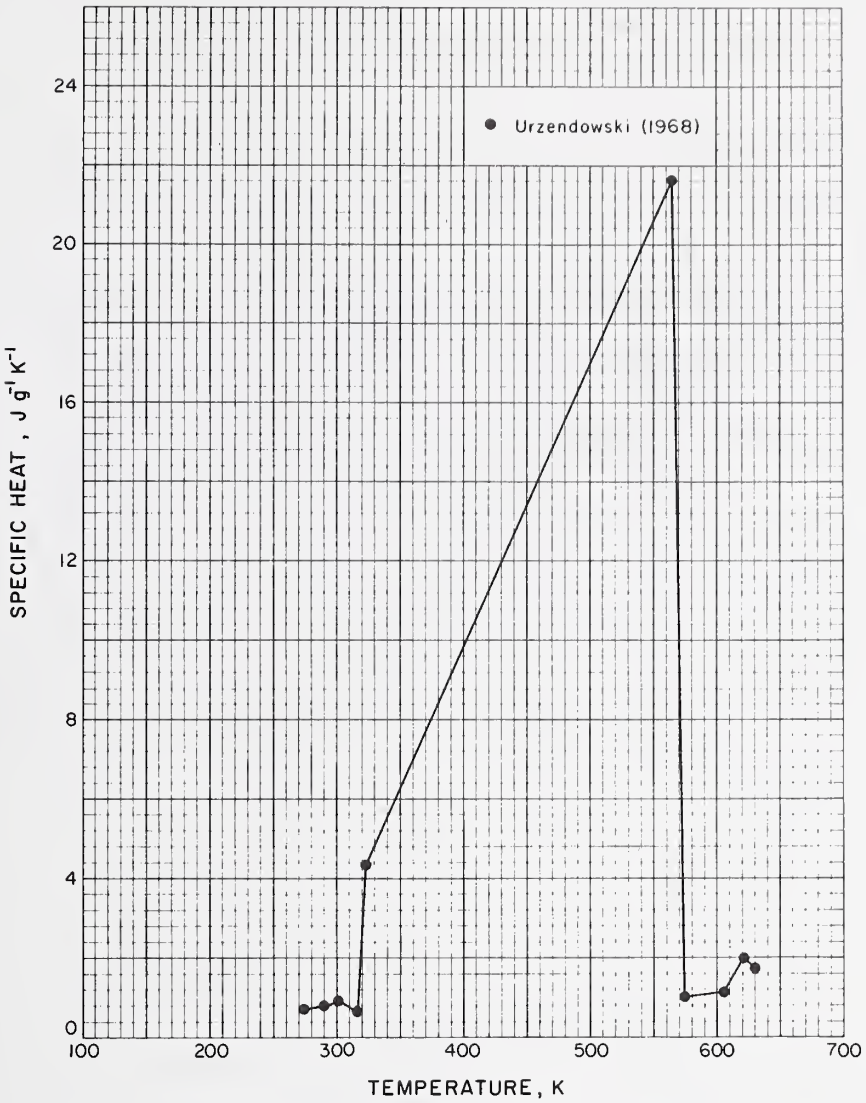
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Koo, Jones, Riddel, O'Toole (1965)	Halon G-80	

TFE

Specific Heat



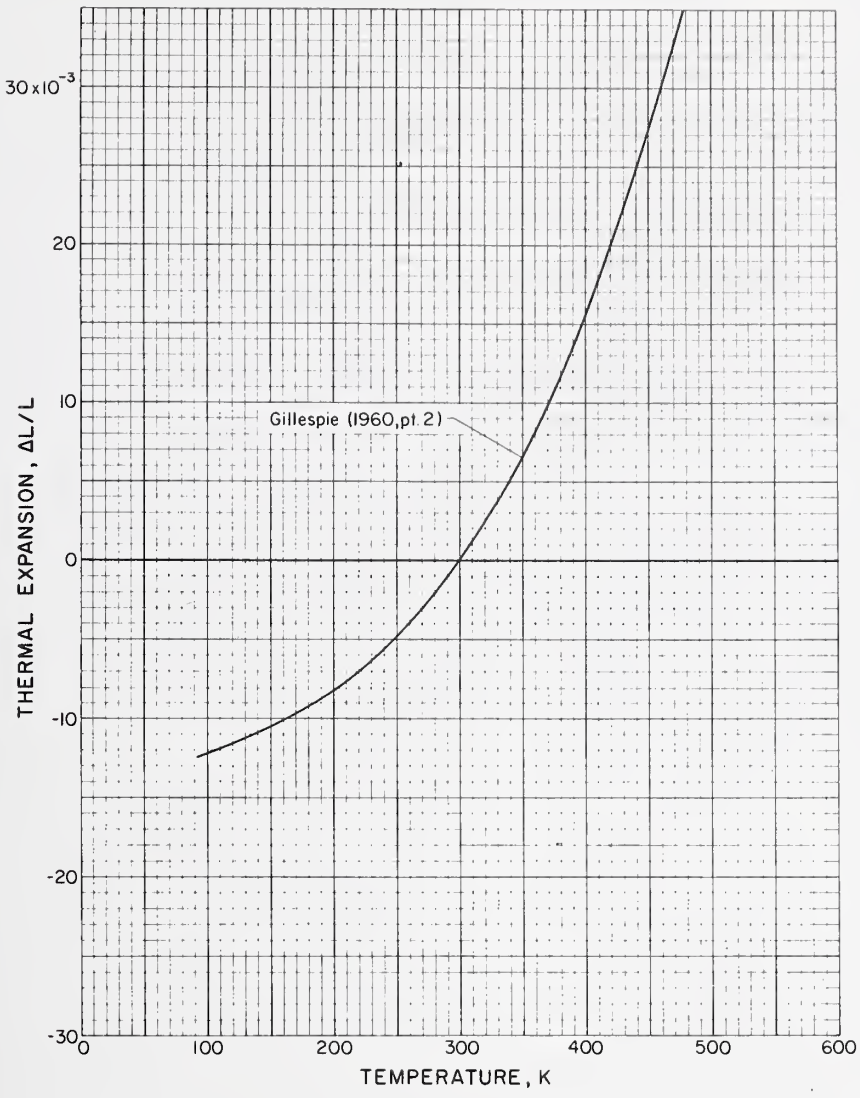
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Reese, Tucker (1965)	Teflon, sp gr = 2.160±0.005	Diam = 1.27 cm, ℓ = 4.1 or 10.8 cm; carbon resistance thermometer.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Urzendowski, Guenther, Assay (1968)	Teflon	Plug weighing 0.03 - 0.04 g; Du Pont 900 Differential Thermal Analyzer with calorimetric plug-in attachment; accuracy ≃± 2%, points calculated from authors' curve fitting parameters, points at 173, 628, and 698 K gave negative values.

Investigator(s) (Year)	Material Identification	Temperature (K)	ΔL/L Thermal Expansion	Thermal Conductivity ($Wm^{-1}\ K^{-1}$)	α Thermal Diffusivity ($cm^2\ s^{-1}$)	C_p Specific Heat ($Jg^{-1}\ K^{-1}$)
Renfrew (1946)	Teflon, sp gr = 2.1-2.3	298		0.245		1.05
Gillespie (1960, part 2)	Teflon 1	297		0.24±0.04		1.05
Fritz (1965)	Teflon t = 1.41 cm, sp gr = 2.16 t = 0.19 cm, sp gr = 2.14	293		 0.265 0.250		
Ogorkiewicz (1970)	Sp gr = 2.15-2.24	297		0.26		
Wisander (1969)		77	-1.5×10^{-2}			
Salinger (1961)	Teflon	77	$-1.51 \pm 0.04 \times 10^{-2}$			

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Renfrew, Lewis (1946)	Teflon, sp gr = 2.2-2.3	
Gillespie, Saxton, Chapman (1960, part 2)	Teflon 1	
Fritz, Bode (1965)	Teflon, sp gr = 2.14 and 2.16	t = 0.19 and 1.41 cm; one-plate apparatus with guard ring.
Ogorkiewicz (1970)	Sp gr = 2.15 - 2.24	
Wisander, Johnson (1969)		ℓ = 2.54 cm, diam = 0.95 cm; submerged in liquid N_2 and then measured with a micrometer, measurement repeated 6-8 times until no further contraction is noted.
Salinger, Wheatley (1961)	Teflon	Diam = 2.5 cm, ℓ = 2.5 cm.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, part 2)	Teflon 100 X	

Investigator (s) (year)	Material Identification	Temperature (K)	$\Delta L/L$ Thermal Expansion	λ Thermal Conductivity ($Wm^{-1}K^{-1}$)	α Thermal Diffusivity ($cm^2 s^{-1}$)	C_p Specific Heat ($Jg^{-1} K^{-1}$)
Gillespie (1960, part 2)	Teflon 100X	297		0.20±0.04		1.17
Wisander (1969)		77	-0.93×10^{-2}			

INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONOITIONS
Gillespie, Saxton, Chapman (1960, part 2)	Teflon 100 X	
Wisander, Johnson (1969)		ℓ = 2.54 cm, diam = 0.95 cm; submerged in liquid N_2 and then measured with a micrometer, measurement repeated 6-8 times until no further contraction is noted.

Polytetrafluoroethylene (TFE) and Tetrafluoroethylene-Hexafluoropropylene (FEP) Thermal Properties References

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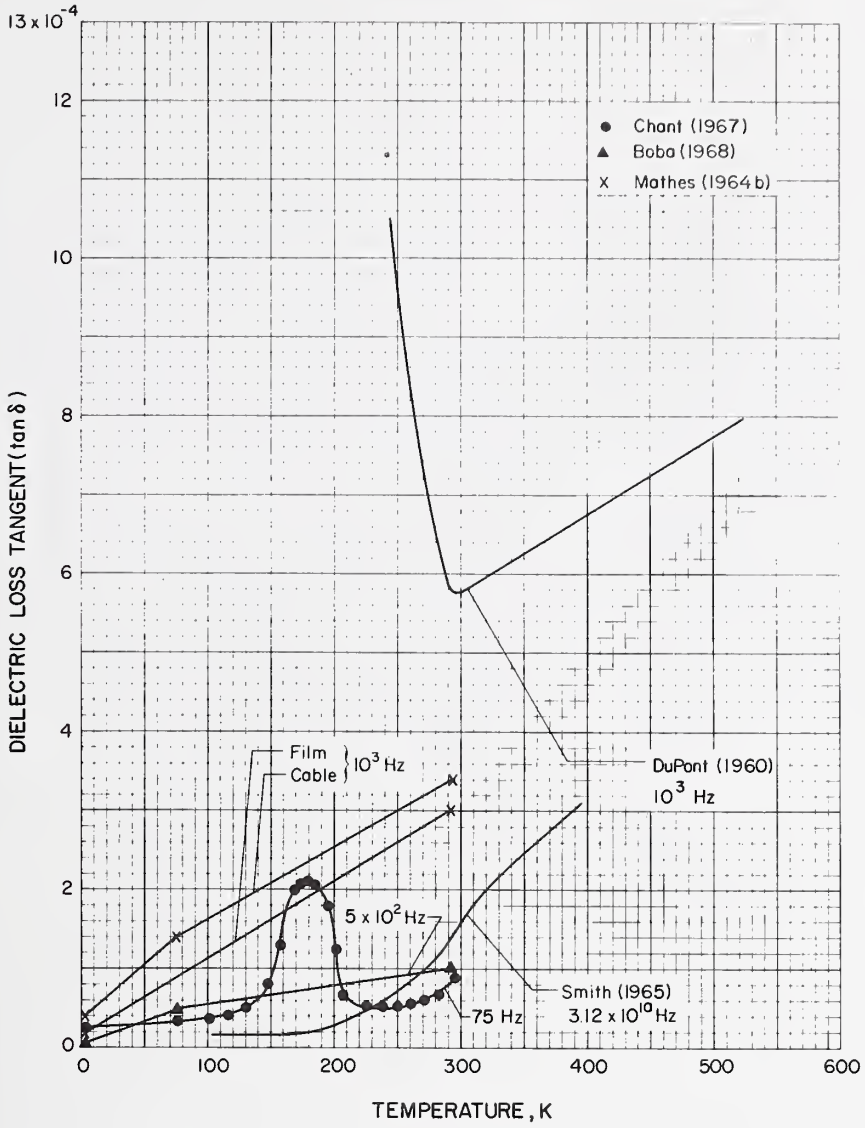
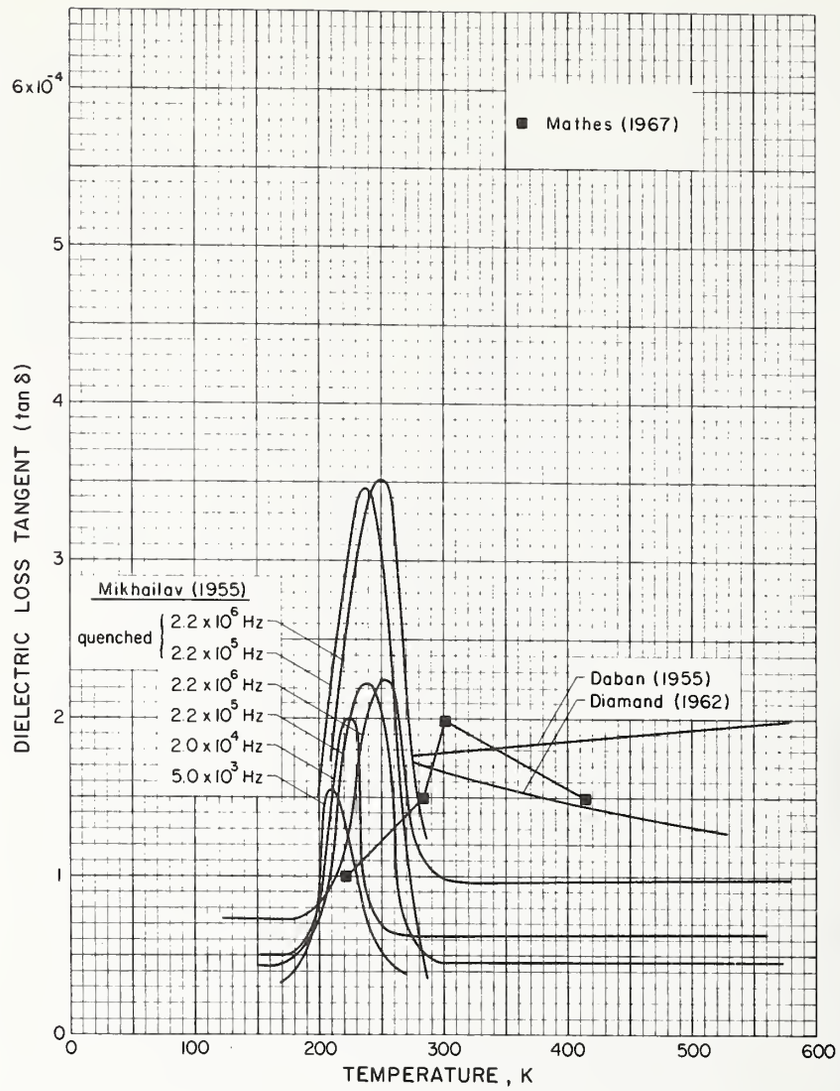
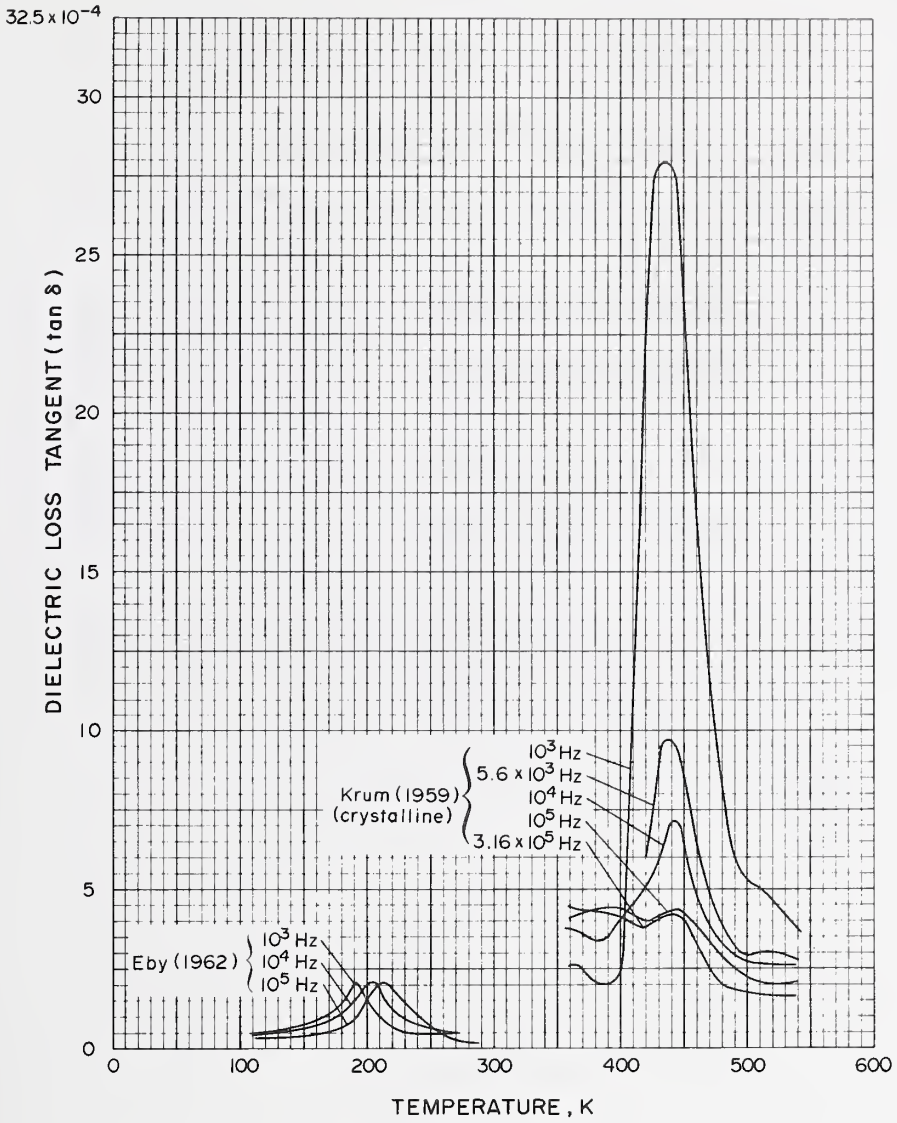


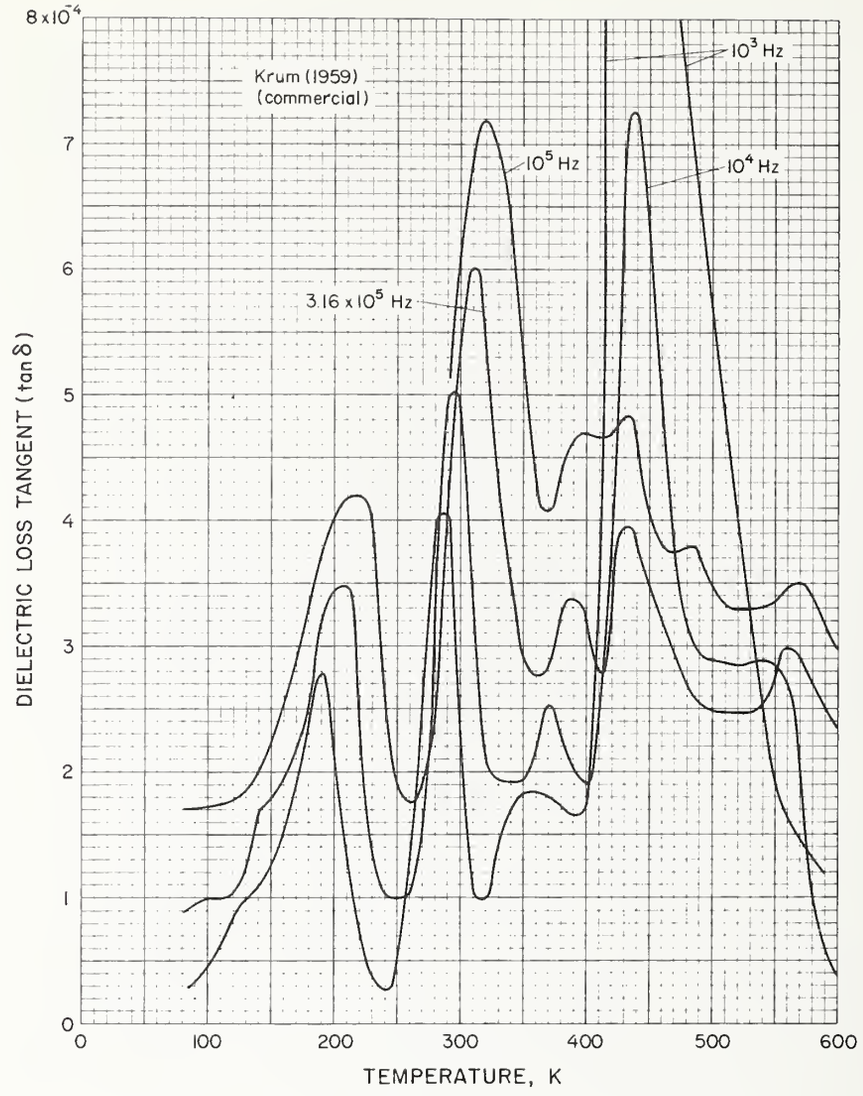
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Chant (1967)	Teflon	Discs 9.5 cm diam and t = 0.019 cm; sample clamped between two brass plates, edge effects allowed for in calculations, contraction of specimens not taken into account.
DuPont (1960)	Teflon,	
Smith, Müller (1965)		
Bobo, Perrier (1968)		t 0.0025 - 0.0200 cm; 2.5 - 3.5 × 10⁵ V, 5 × 10³ Hz.
Mathes (1964b)		Vapor deposited Au electrodes used on film, 10³ Hz; values measured at 4 K were at the lower limit of the measuring equipment.



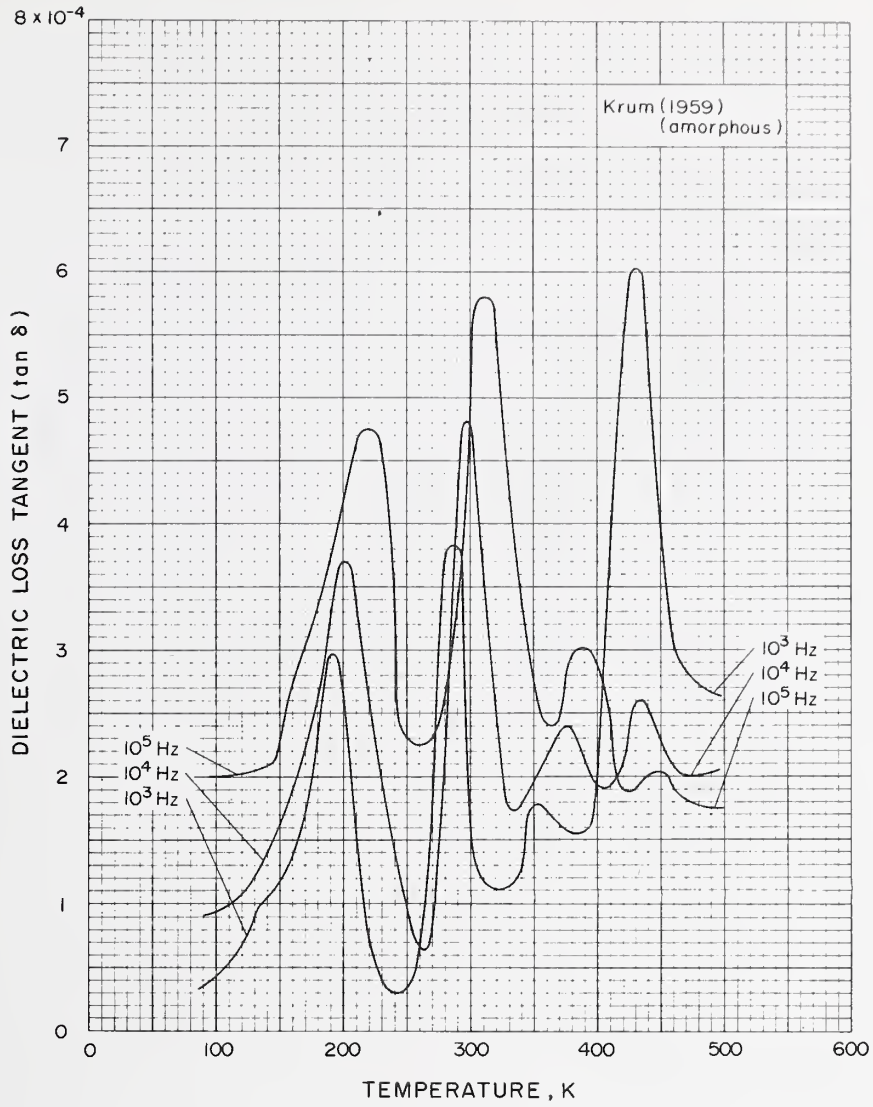
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mathes (1967)		10^3 Hz.
Doban, Sperati, Sandt (1955)	Teflon	10^3 Hz.
Diamond (1962)	Teflon	10^3 and 10^5 Hz.
Mikhailov, Kabin, Smolyanski (1955)	Some material quenched from 673 K into water at 293 K	t = 0.03 cm; tested in vacuum.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Krum, Müller (1959)	Teflon, crystalline	Measurements made over P_2O_5; max absolute error for tan $\delta > 5 \times 10^{-5}$ is 0.3%, max absolute error for tan $\delta < 10^{-5}$ is 5%; see Eby, Sinnott (1961) for discussion of possible polar impurities in the samples used.
Eby, Wilson (1962)		General Radio 1605-A impedance comparator; estimated error limits = $\pm 1 \times 10^{-5}$.

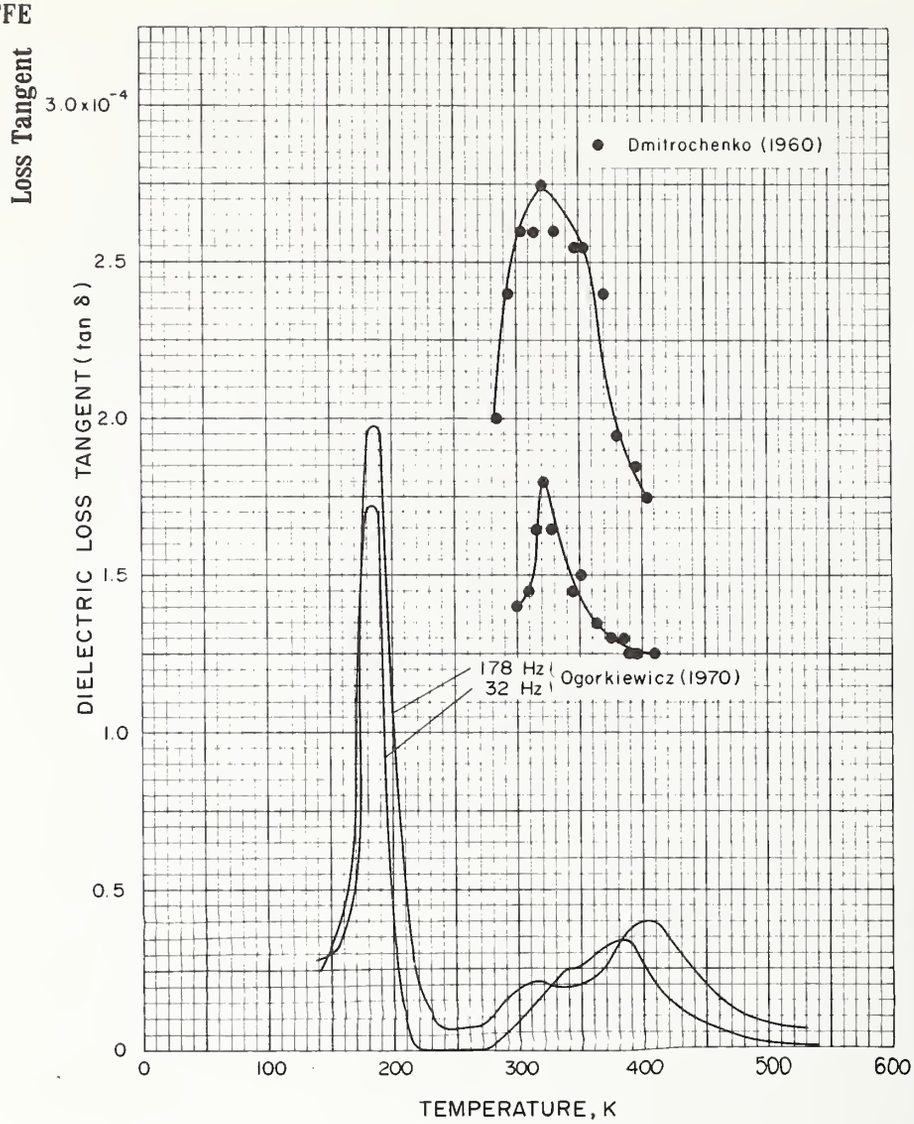


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Krum, Müller (1959)	Teflon, commercial	Measurements made over P_2O_5; max absolute error is 5%; see Eby, Sinnott (1961) for discussion of possible polar impurities in the samples used.

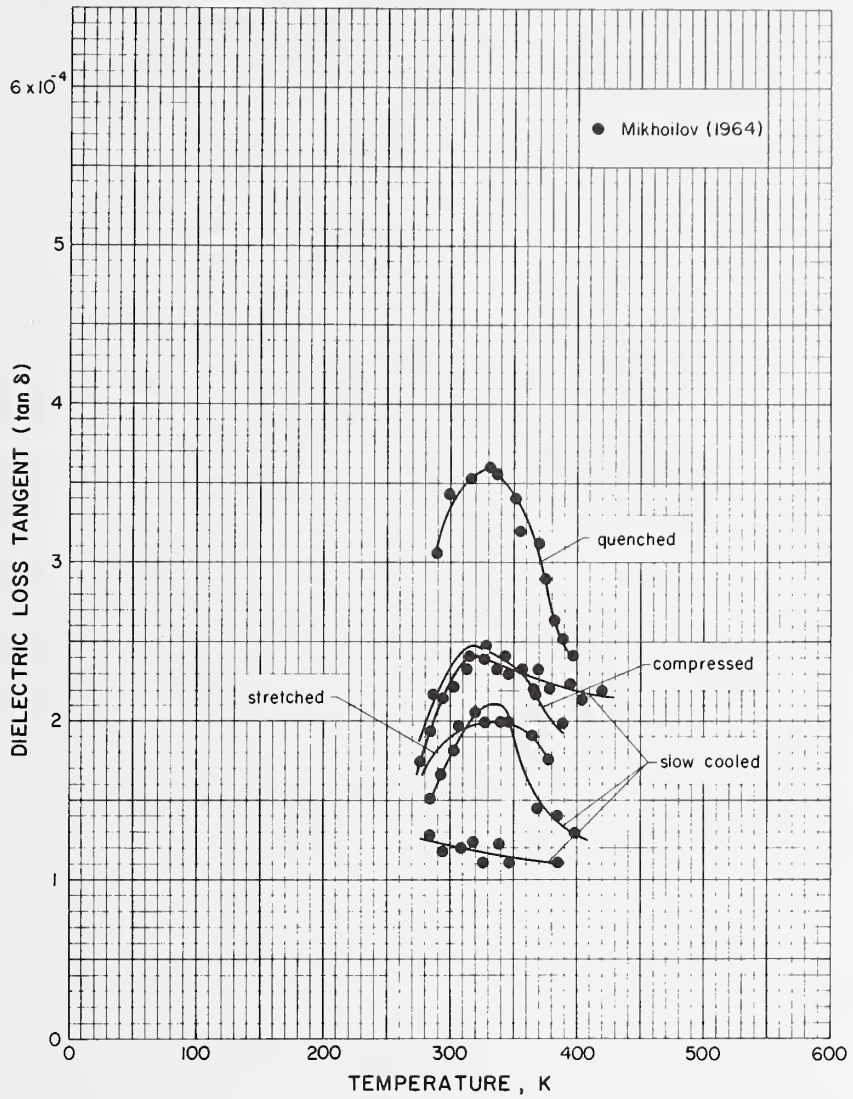


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Krum, Müller (1959)	Teflon, amorphous	Measurements made over P_2O_5; max absolute error is 5%; see Eby, Sinnott (1961) for discussion of possible polar impurities in the samples used.

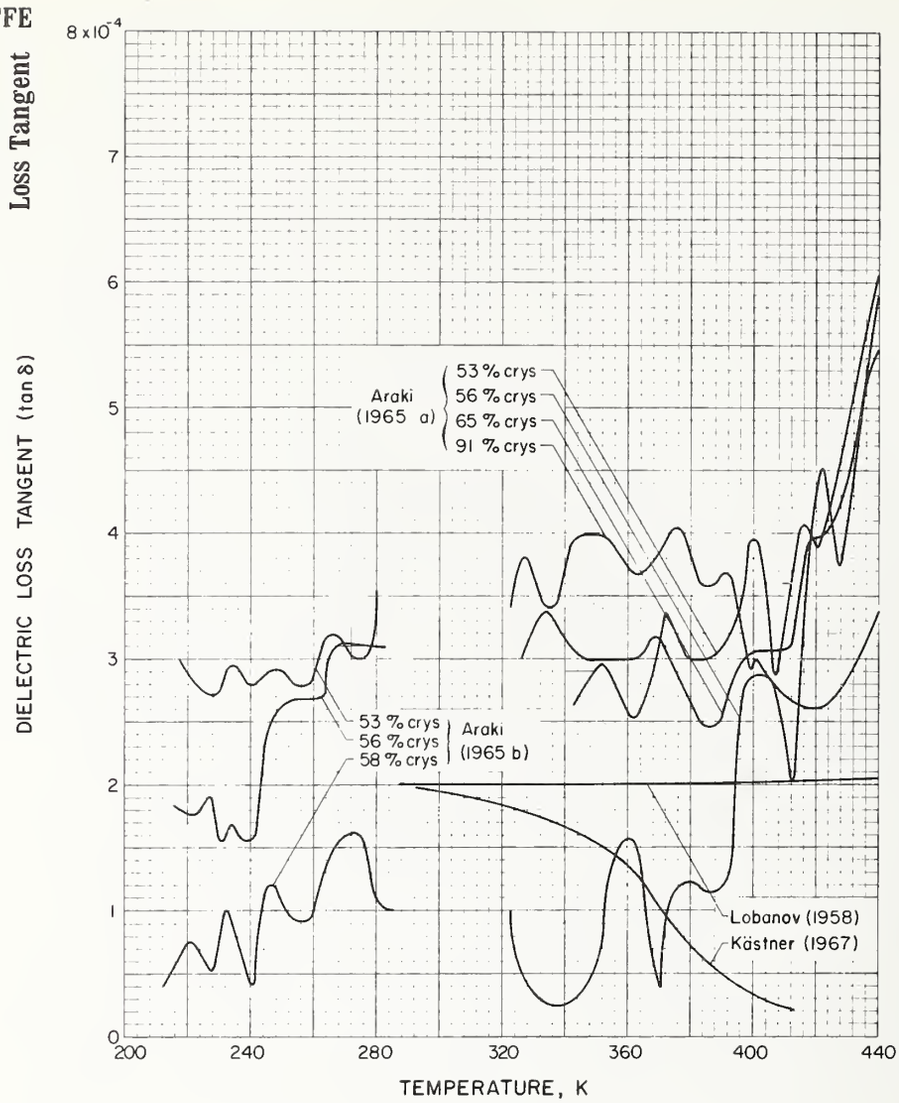
TFE



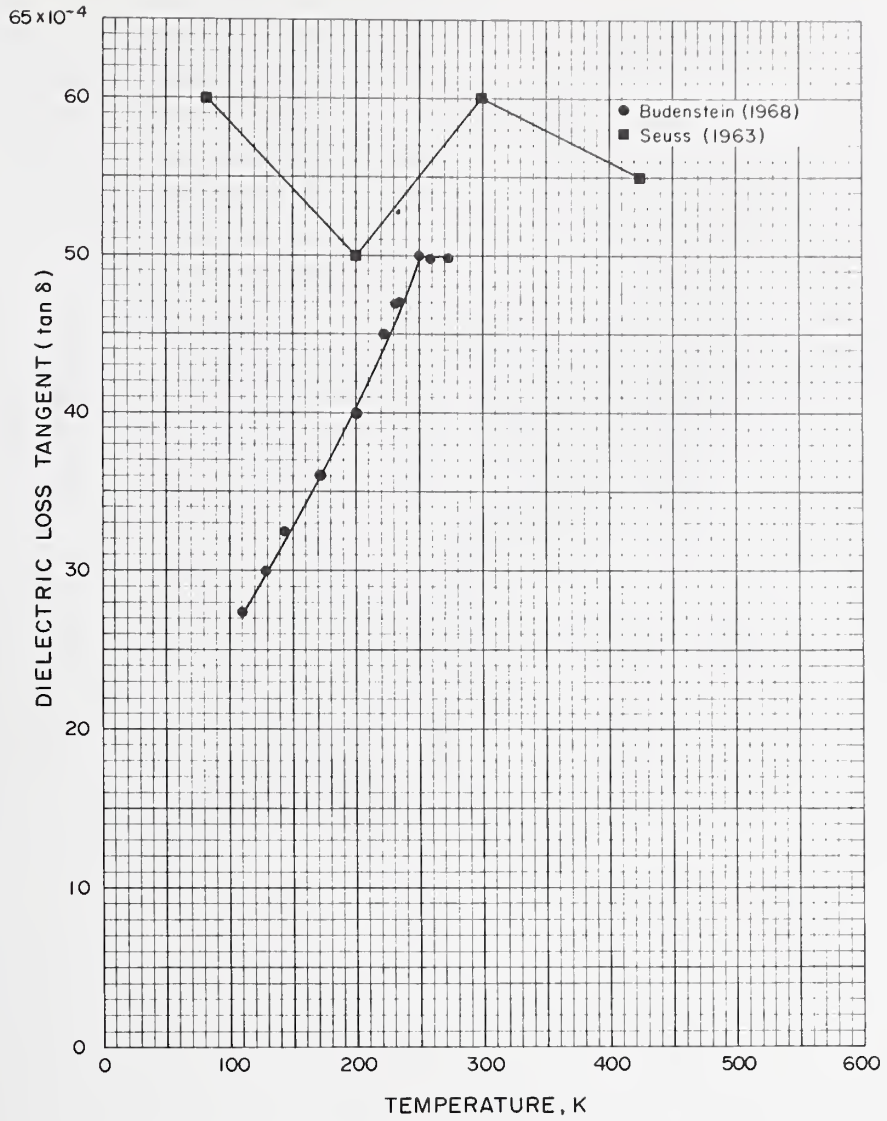
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ogorkiewicz (1970)	Fluon, G1	
Dmitrochenko, Shevelev (1960)	Commercial samples from 2 manufacturers	Coaxial resonator method.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mikhailov, Lobanov, Shevelev, Orlova (1964)	Samples slow cooled, quenched, compressed, and cut from the necked area formed in stretching at room temp.	Measured at 4.7 x 10^9 Hz.



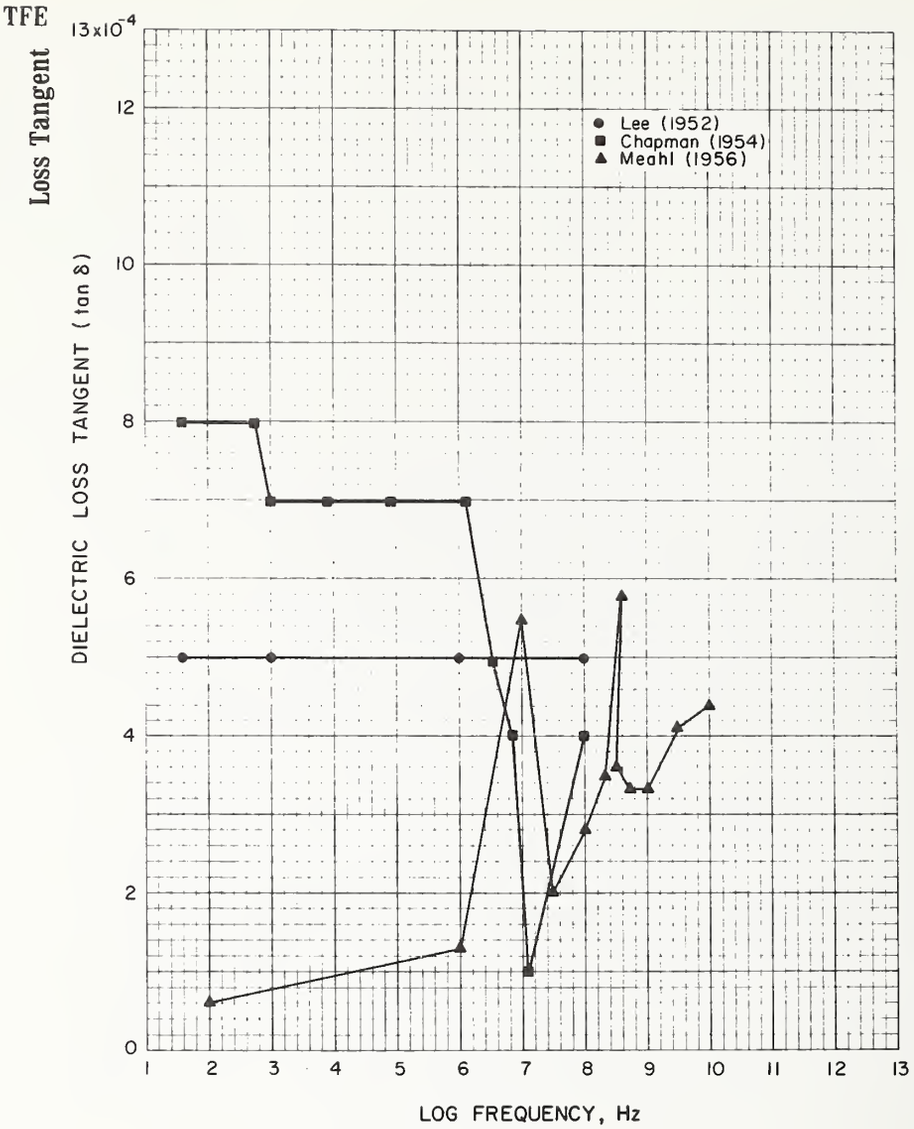
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Lobanov (1958)		3×10^3 Hz.
Araki (1965 a)	Teflon 5, 53% and 56% crys; irrad Teflon 5, 91% crys; Polyflon F-102, 65% crys.	Diam = 8 cm, t = 0.02 cm; diam guarded electrodes = 5.6 cm, diam unguarded electrodes = 7.0 cm, guard ring inside diam = 6.0 cm, outside diam = 7.0 cm, electrodes formed by conductive paint, measurement by Schering bridge, 50 Hz.
Araki (1965 b)	Teflon 5, 53% and 56% crys; Teflon 7, 58% crys	Diam = 8 cm, t = 0.02 cm; diam guarded electrodes = 5.6 cm, diam unguarded electrodes = 7.0 cm, guard ring inside diam = 6.0 cm, outside diam = 7.0 cm, electrodes formed by conductive paint, measurement by Schering bridge, 50 Hz.
Kästner, Dittmer (1967)		Coaxial resonator, 4.8×10^7.



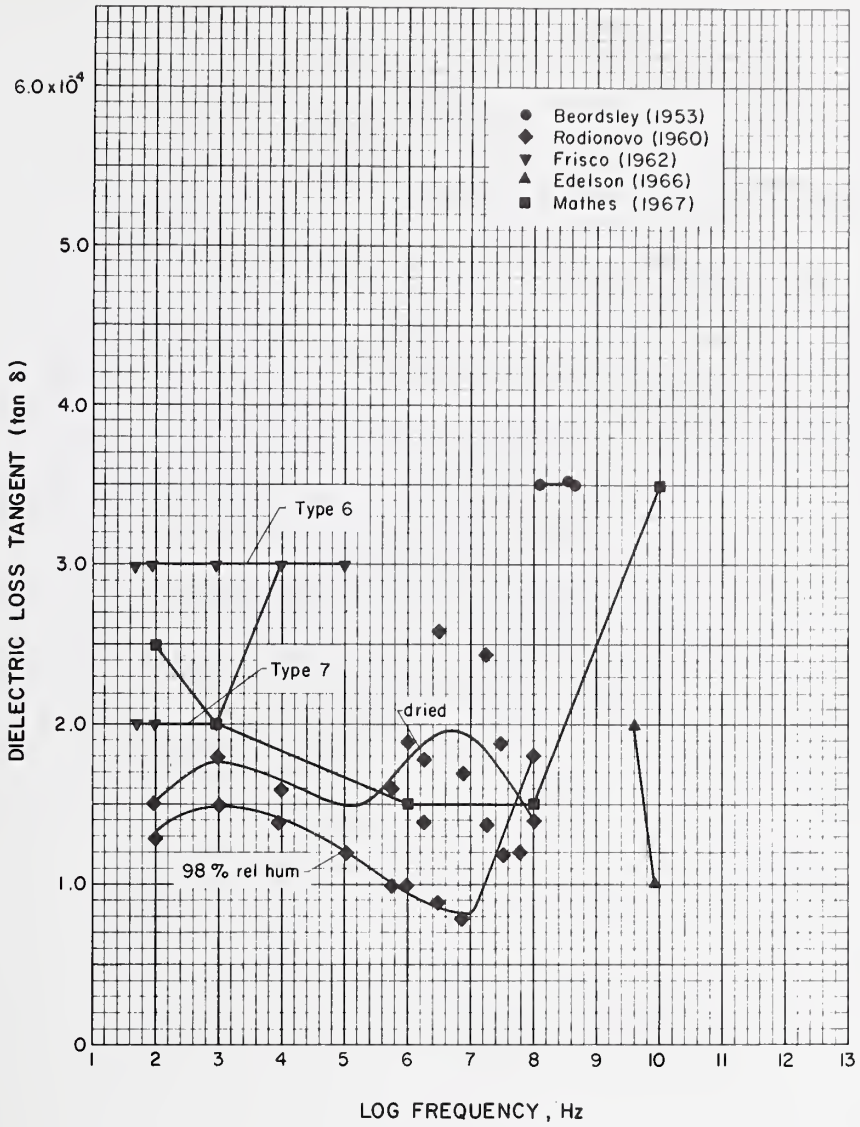
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Budenstein (1968)	Teflon film formed by RF sputtering	t = 900 Å; 10^3 Hz, ESI Model 250 DA impedance bridge.
Seuss, Neff (1963)	Insulated wire, Tensolite Wire Co. "UT" Ultra-thin emulsion dipped TFE	′ = 152.4 cm wound on coil form; measured in vacuum while submerged in Hg which served as one electrode, central wire served as other electrode, impedance bridge, 10^7 Hz, tested according to MIL STD-202B, Method 305.

TFE

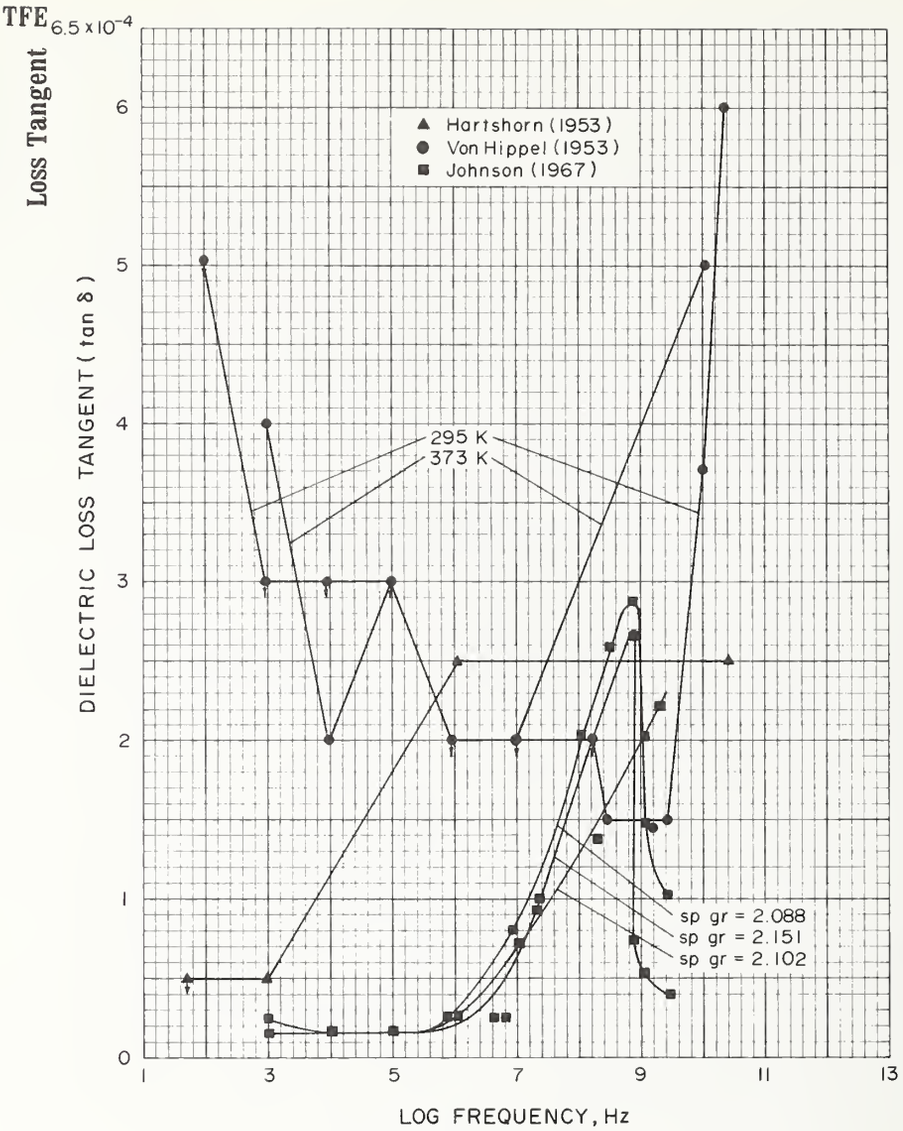
Loss Tangent



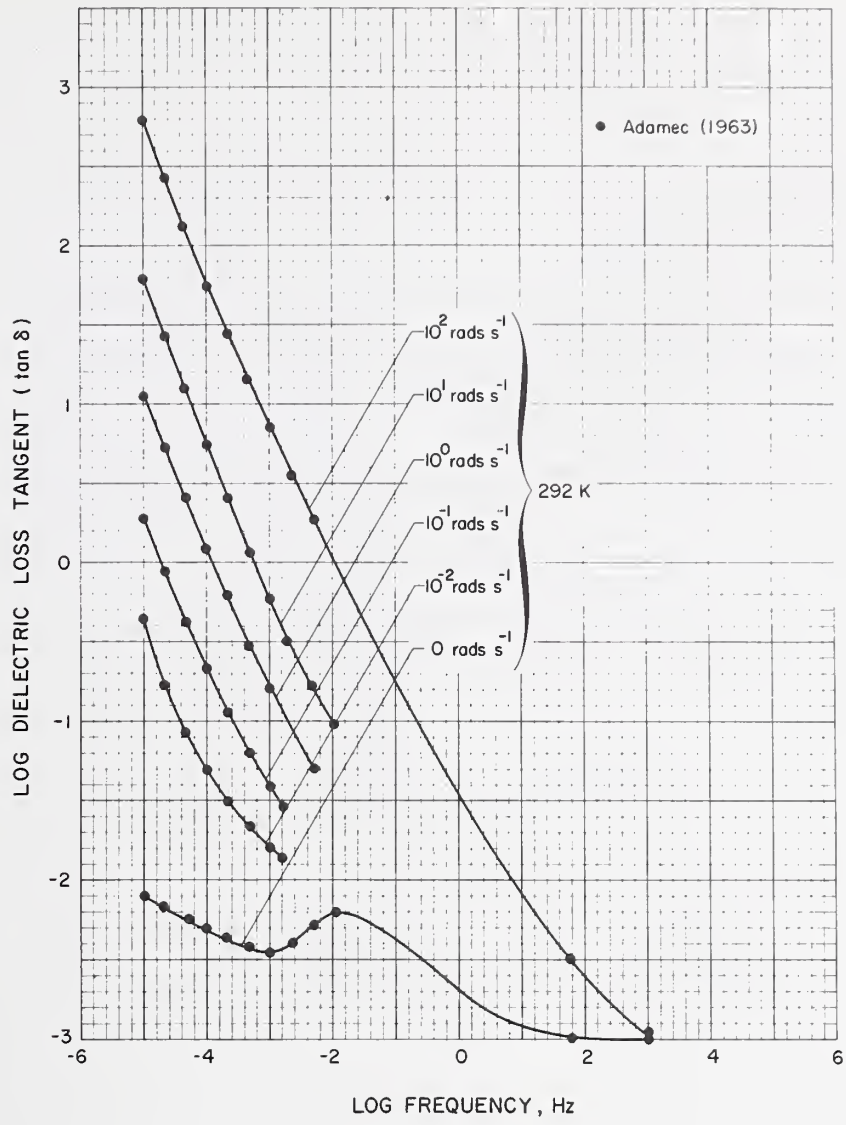
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Lee (1952)	Teflon	295 K, ASTM D150-47T test procedure.
Chapman, Frisco (1954)	Teflon	t = 0.159 cm; brass electrodes, coated with highly conducting silver paint.
Meahl (1956)	Teflon	Av data from measurements by several laboratories.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Beardsley (1953)	Teflon	Variable length re-entrant cavity.
Rodionova (1960)		One sample dried to a constant weight, the other saturated in 98% rel hum at 293 K.
Frisco (1962)	Teflon, TFE-6 and TFE-7	Stored under room conditions for at least 2 weeks before measurement.
Edelson, Jaeger, Williams (1966)	Teflon	Measurements made in S and X microwave bands with TM-010 and TE-101 cavities respectively.
Mathes (1967)		298 K

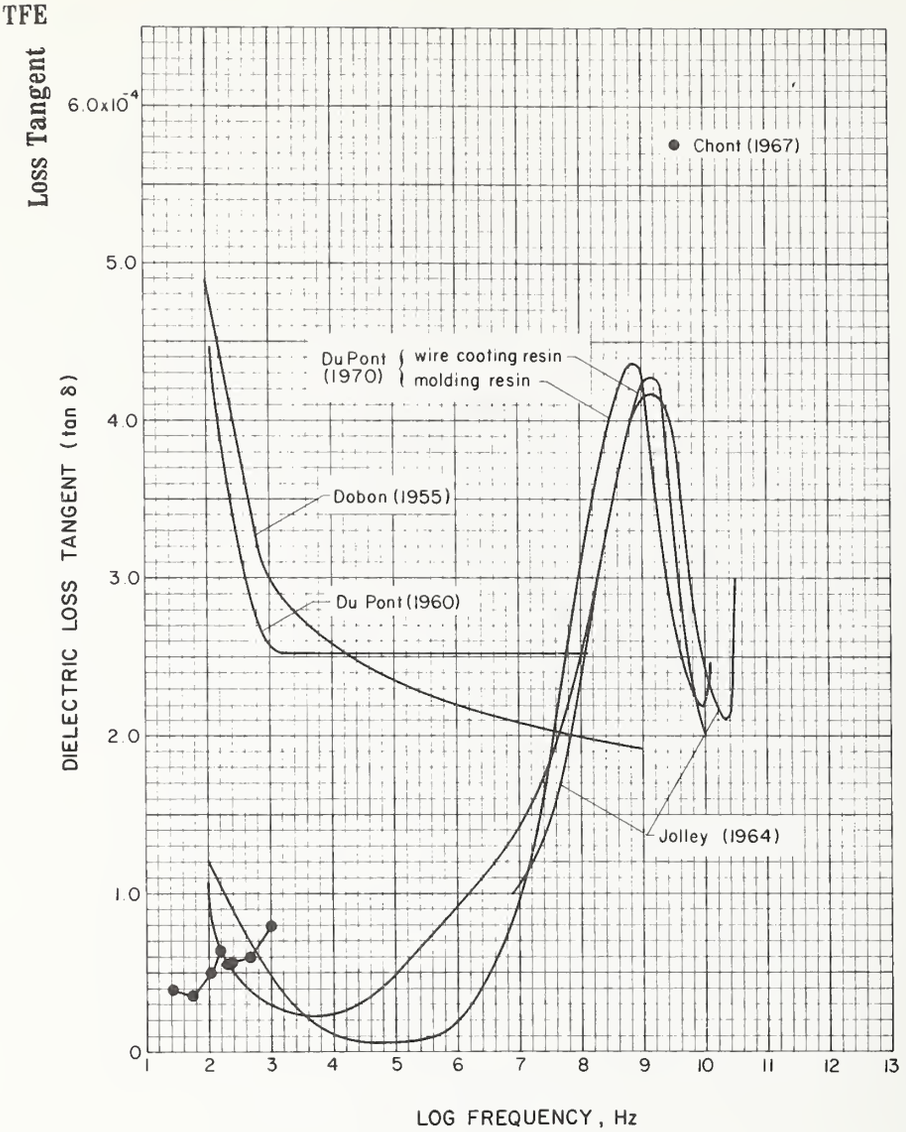


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Hartshorn, Parry, Rushton (1953)	Powder molded at 297 K and 2,000 psi, baked at 633 K for 1.5 h and slow cooled	2.0-2.5 cm diam; Schering-bridge method for frequencies to 10^4 Hz, circuit-resonance method for 10^4-10^8 Hz, cavity-resonance for 5×10^8, 9×10^9, and 24×10^9 Hz bands, transmission-line method also used in 3×10^9 Hz region, electrodes at lower frequencies were platinum-plated, silver-plated with rhodium flash, or solid invar; arrow indicates "less than".
von Hippel (1953)	Teflon, dried over phosphorous pentoxide	Field strength ~ 50 V cm^{-1}; nominal accuracy ± 1%; arrows indicate "less than".
Johnson (1967)	Teflon molding pure, electrical grade, sp gr = 2.088; Halon, G-80, lots 270 and 285, sp gr = 2.151; Polyflon, R.C.F. modified TFE, sp gr = 1.102	General Radio type 1615 A bridge, Boonton Radio type 260A and 190A Q meters, Central Research Dielectrometer, Hewlett-Packard type 612A or 608C signal generators, Hewlett-Packard type 5245L frequency counter, Hewlett-Packard type 415B standing-wave indicator, ASTM D 150 test procedure.

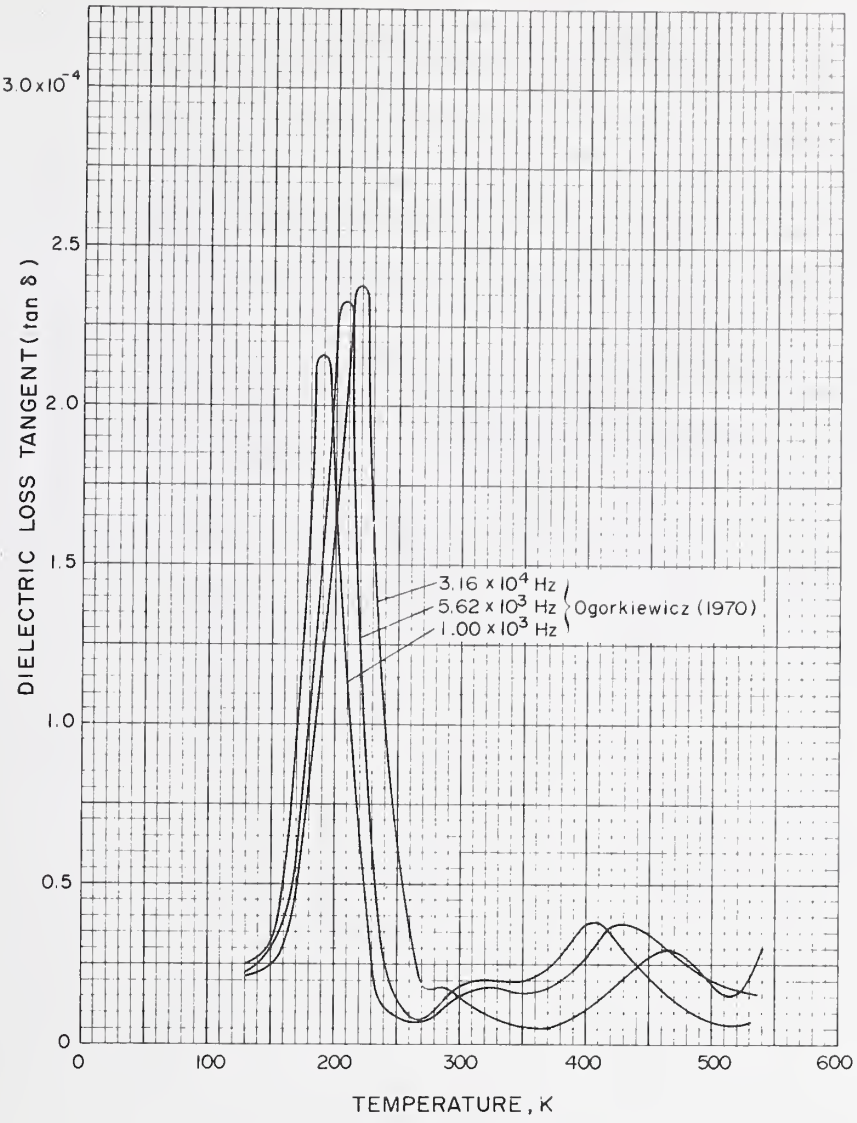


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Adamec (1963)	Teflon	Circular, t = 0.40 cm, aluminum electrodes evaporated on both sides; Wien's bridge provided with a Wagner's ground; X-ray irradiation.

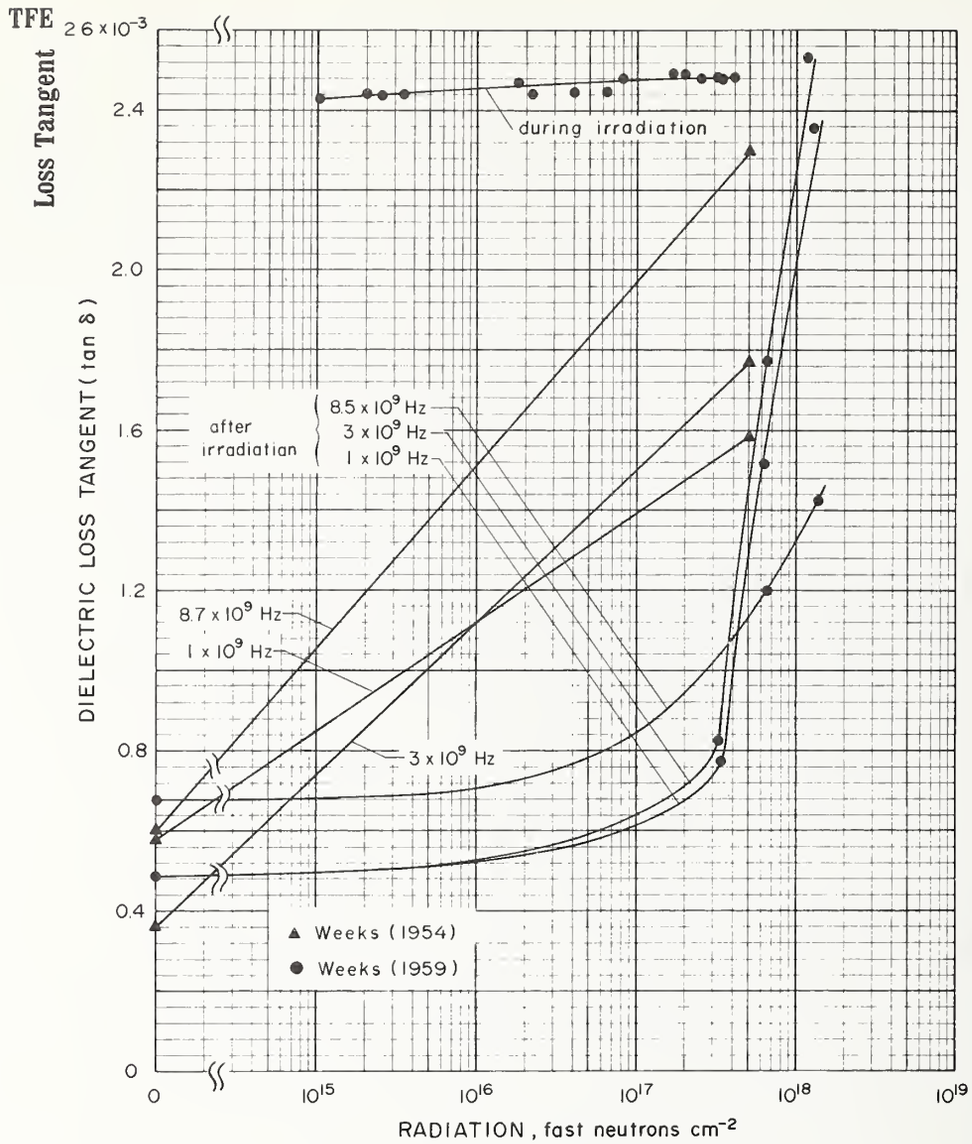
TFE



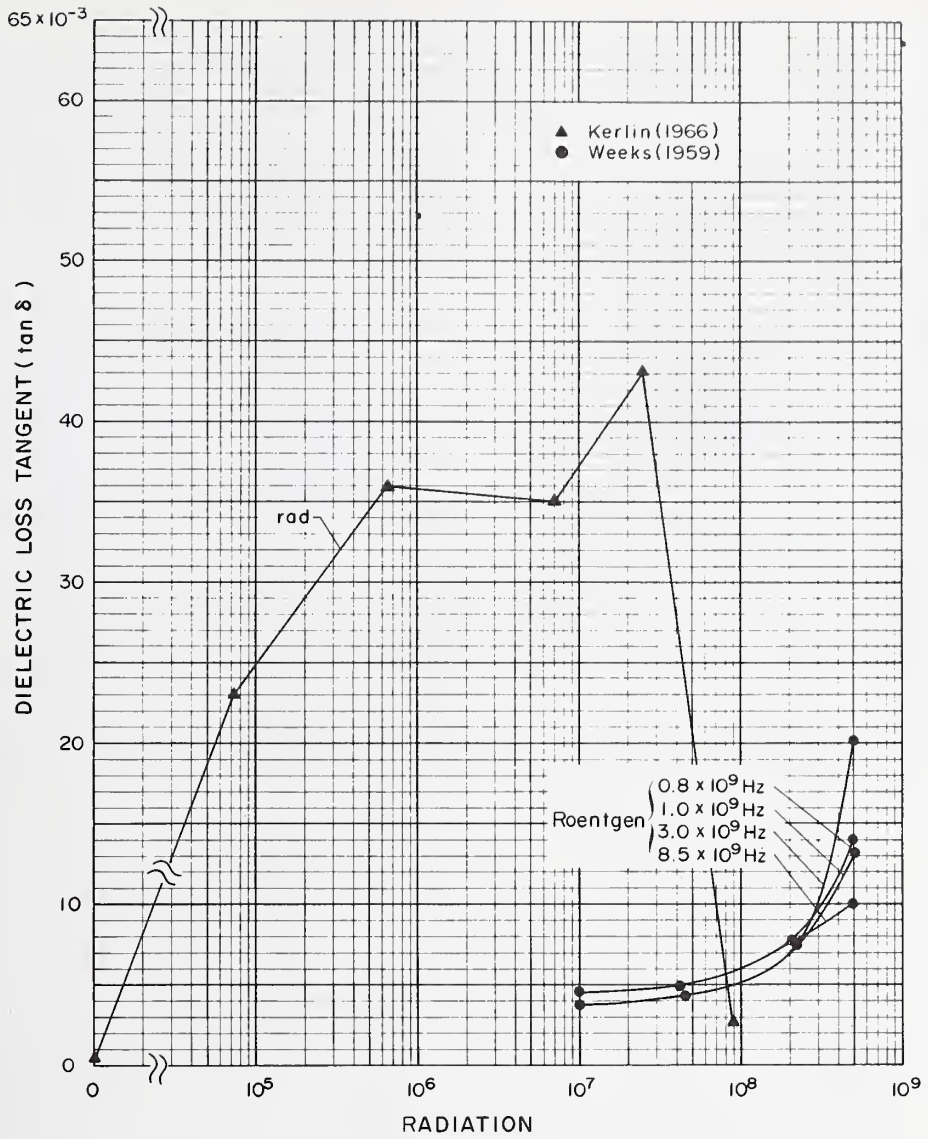
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Doban, Sperati, Sandt (1955)	Teflon	296 K
Jolley, Homsy, Reed (1964)	Teflon	296 K
Du Pont Co. (1970)	Teflon	298 K
Du Pont Co. (1960)	Teflon	296K.
Chant (1967)	Teflon	Discs 9.5 cm diam and t - 0.019 cm; sample clamped between two brass plates. edge effects allowed for in calculations, contraction of specimens not taken into account.



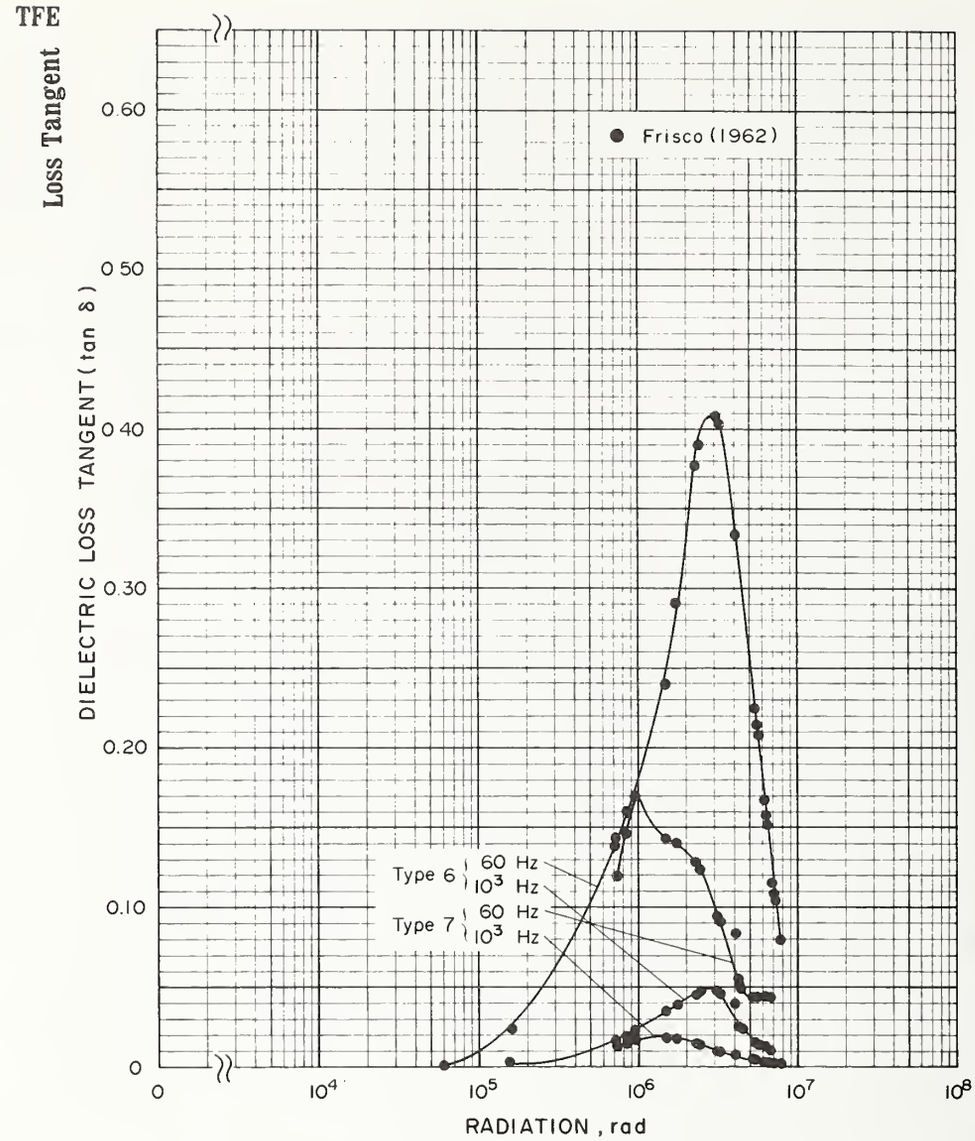
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ogorkiewicz (1970)	Fluon, G1	



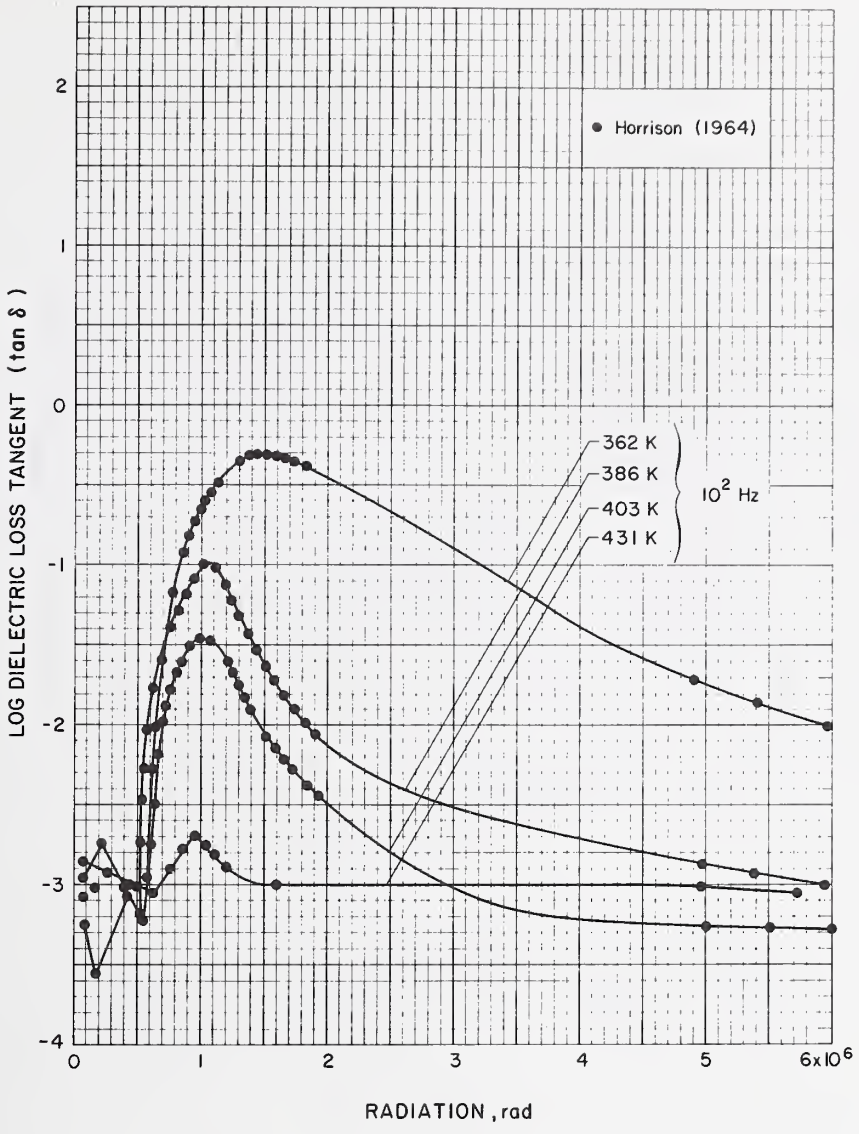
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Weeks, Binder (1959)	Teflon insulation	During irradiation: Teflon insulated cable, ℓ = 11.92 ± 0.05 m; 1/4 wave-length cable extended through the active lattice of the reactor, ~ 60% of cable irrad, ~ 4 x 10^{8} Hz, measurements made on open ended cable during irradiation, temp varied from 318K at 10^{15} fast neutrons cm^{-2} to 338 K at 5 x 10^{17} fast neutrons cm^{-2}. After irradiation: Teflon insulated cable, ℓ = 1/4 wave-length at 1 x 10^{9} Hz and 3/4 wave-length at 3 x 10^{9} Hz; measurements made with microwave dielectrometer, coaxial resonant cavity used at 1 and 3 x 10^{9} Hz, circular resonant cavity used at 8.5 x 10^{9} Hz, specimens placed in sealed Al containers and irrad by reactor, different specimen used for each dose; irrad in Oak Ridge National Laboratory graphite reactor; estimated error = ± 0.1 x 10^{-3}.
Weeks (1954)	Teflon	299 ± 3 K, measurements at 1 and 3 x 10^{9} Hz made in the coaxial TEM mode, measurements at 8.7 x 10^{9} Hz made in the TE_{11} mode; irrad by ORNL Graphite Reactor while sealed in an Al capsule.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Weeks, Binder (1959)	Teflon insulation	Teflon insulated cable, ℓ = 1/4 wave-length at 1 x 10^9 Hz and 3/4 wave-length at 3 x 10^9 Hz; measurements made with microwave dielectrometer, coaxial resonant cavity used at 0.8 - 3 x 10^9 Hz, circular resonant cavity used at 8.5 x 10^9 Hz; single specimen irrad by Co^{60}; estimated error = ± 0.1 x 10^{-3}.
Kerlin, Smith (1966)	Teflon 7	Test cells fabricated according to ASTM D 160-59T, unguarded electrode and guard ring diam = 11.4 cm, guarded electrode diam = 10.1 cm, gap between guarded electrode and guard ring was 0.051 cm, spring loaded Al plunger in contact with guarded electrode secured specimens between electrodes, General Radio Co. Type 1610-A capacitance-measuring assembly, tested at 60-127 K in vacuum; irrad in Ground Test Reactor at Nuclear Aerospace Research Facility, Fort Worth.



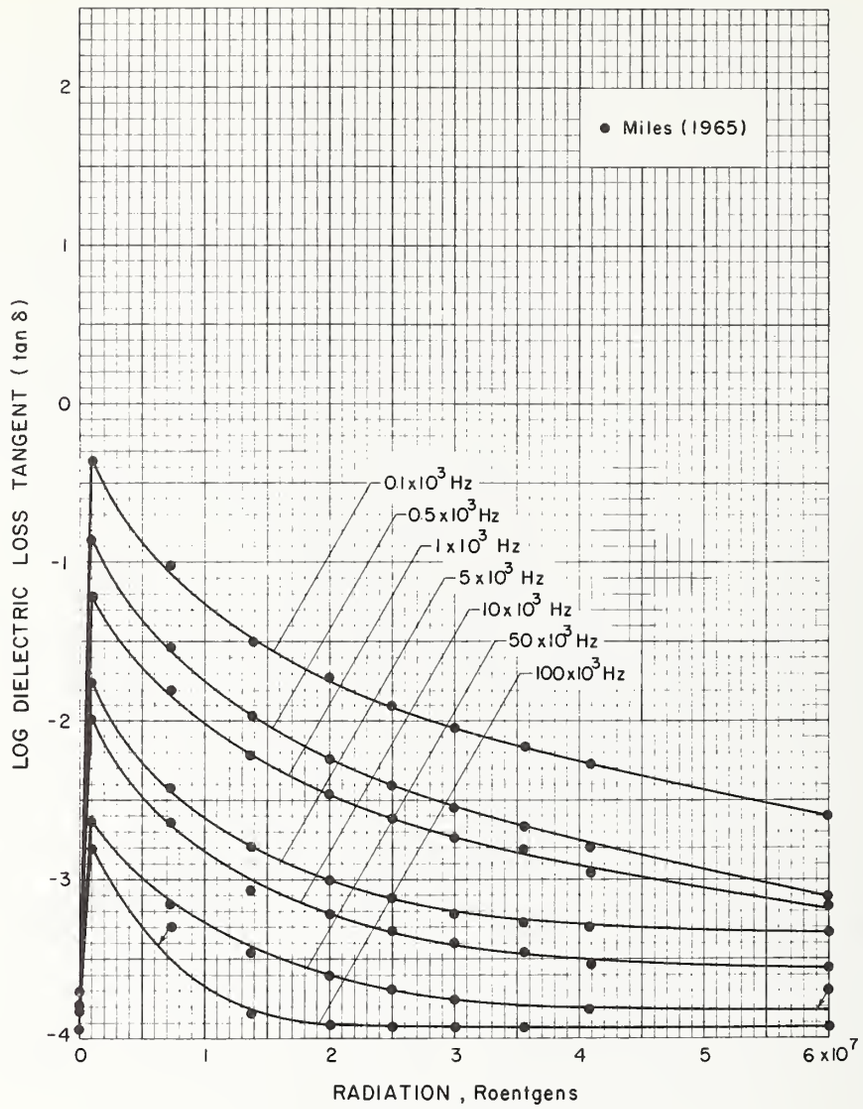
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Frisco (1962)	Teflon, TFE -6 and TFE-7	Circular area = 1.0 cm^2, t = 0.05 cm; irrad by Ag x-rays in vacuum.



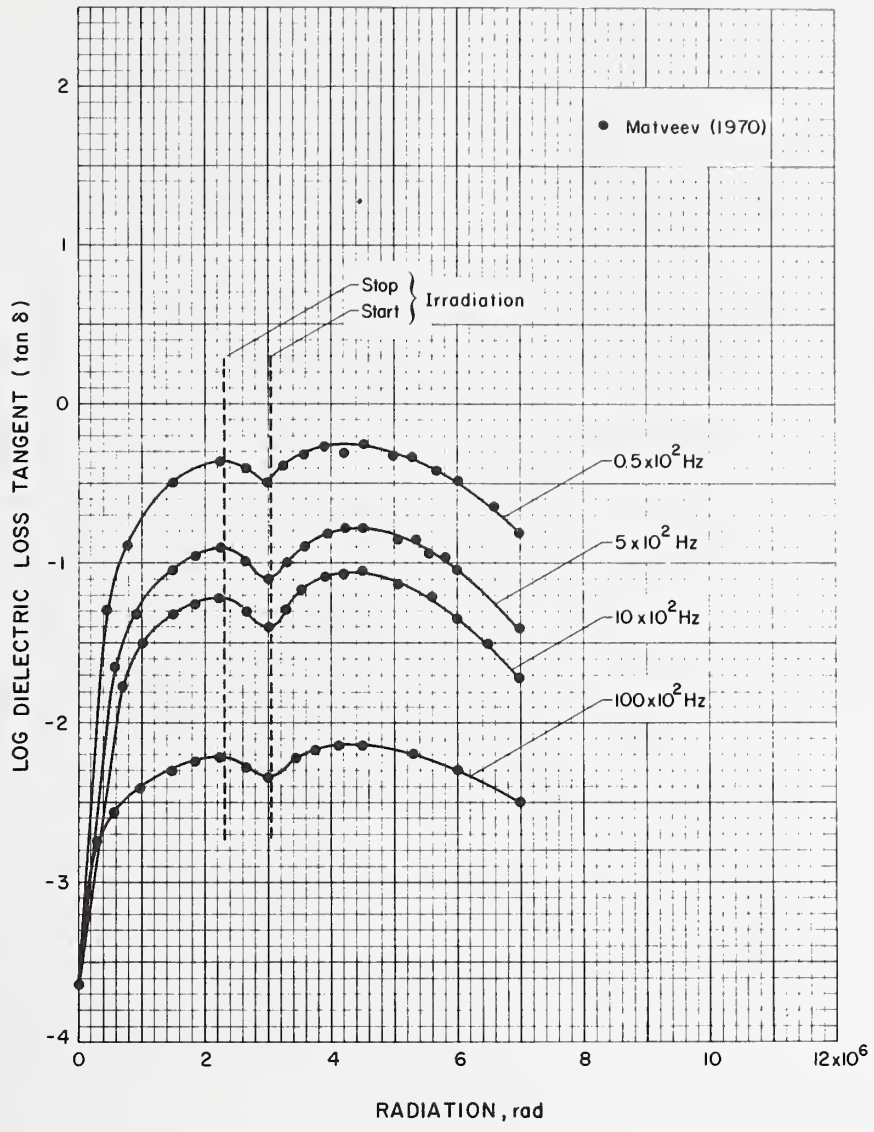
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Harrison (1964)	Teflon, TFE-7	Irradiated by 50 kVp continuous duty X-ray machine, dose rate 2×10^{5} rads h^{-1}, environmental pressure 5×10^{-5} torr.

TFE

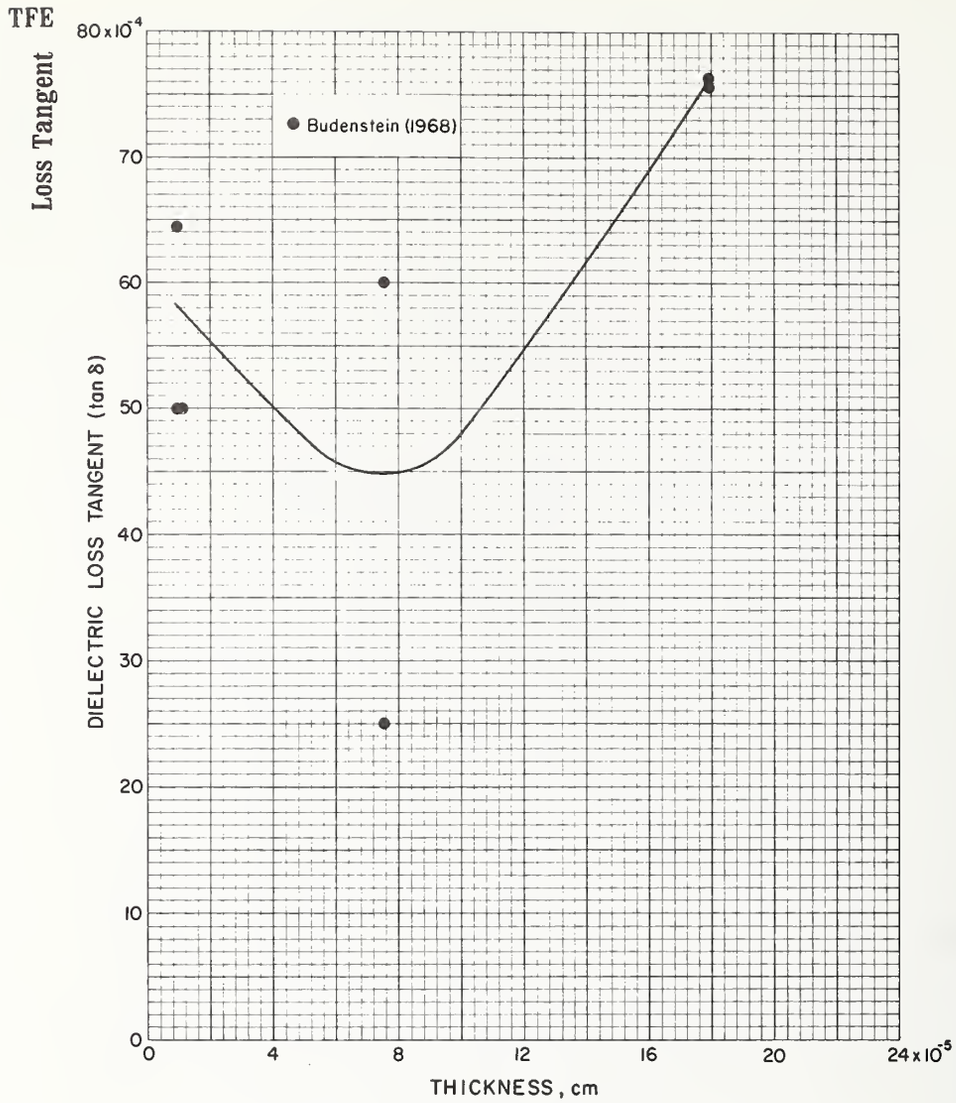
Loss Tangent



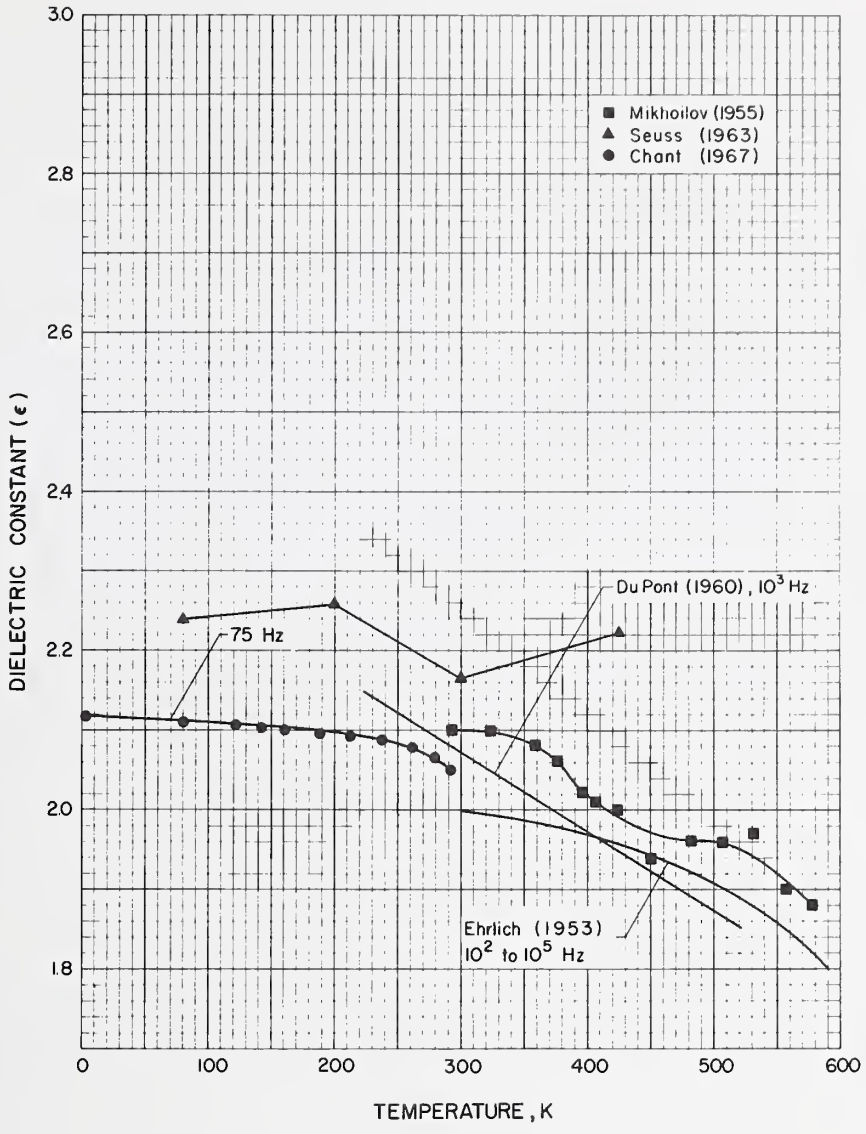
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Miles, Newell (1965)	Teflon, TFE	Discs 7.62 cm diam, t = 0.305 cm; electrodes coated with silver paint, diam of guarded electrode 6.35 cm, General Radio Model 716 Schering bridge and associated guard circuit, three electrode technique, quoted accuracy of bridge ± 0.1 pF for capacitance readings and ± 0.0003 or 2% whichever is greater for loss factor readings, pressure during tests ranged from 5×10^{-7} to 2×10^{-3} torr; irradiated with Co^{60} source.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Matveev, Viceberg, Karnov (1970)	Fluoroplast IV	Irradiated with Co^{60} source at rate of 2.5×10^2 rads s^{-1}.



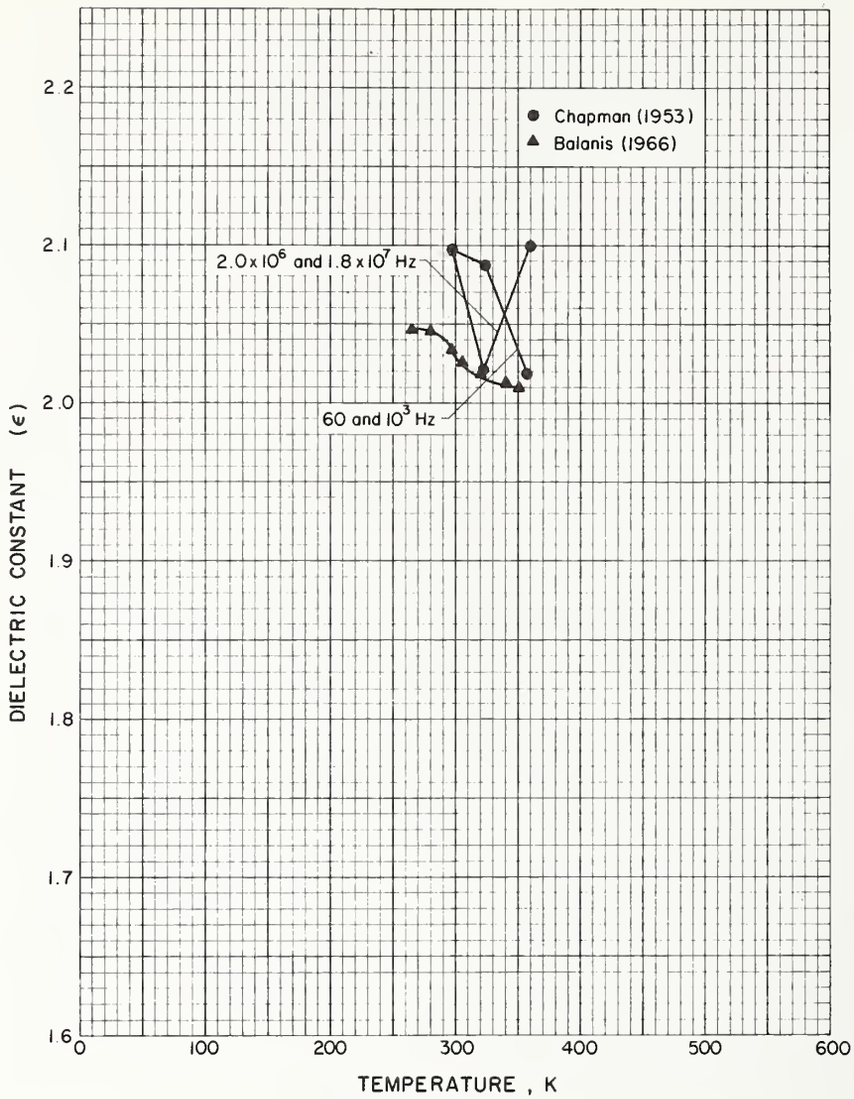
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Budenstein (1968)	Teflon film formed by RF sputtering	10^3 Hz, ESI Model 250 DA impedance bridge.



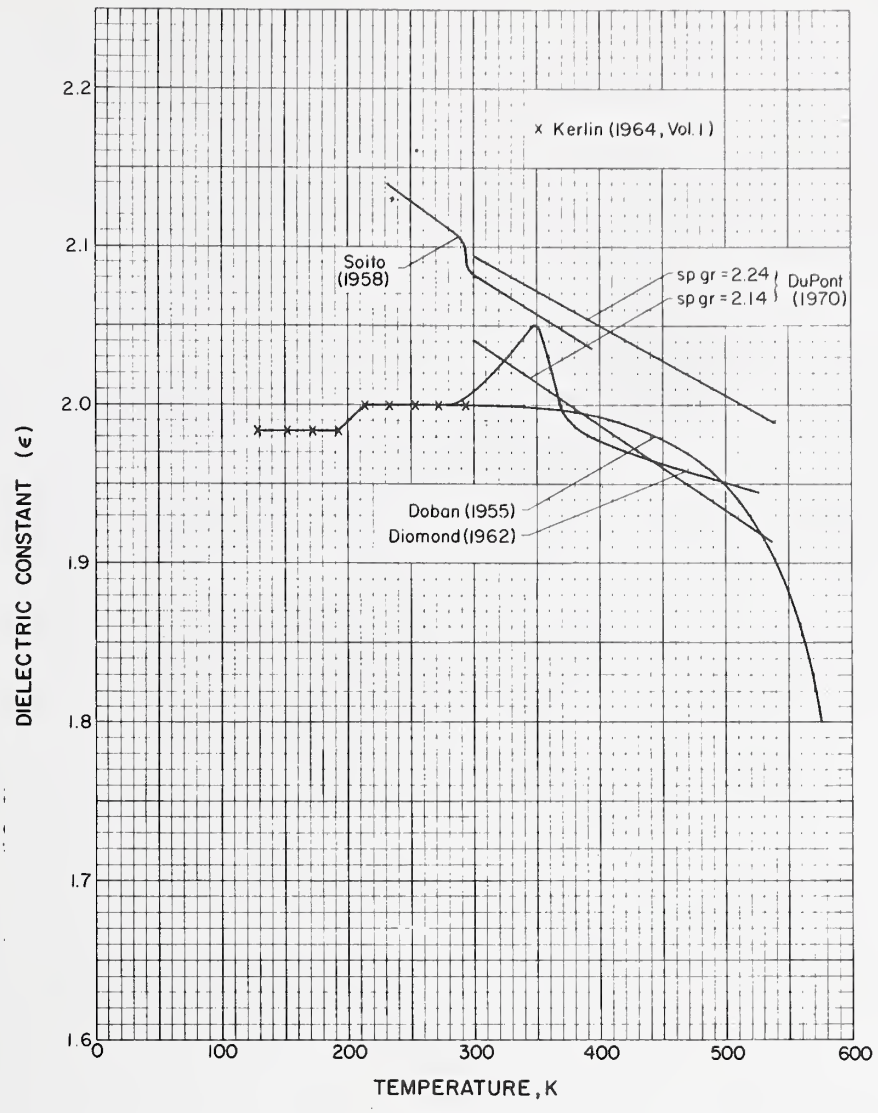
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Miklailov, Kabin, Smolyanski (1955)		t = 0.03 cm; tested in vacuum.
DuPont (1960)	Teflon	
Ehrlich (1953)	Teflon	Discs 3.81 cm diam and t = 0.318 cm, faces parallel to ± 0.0003 cm and diam constant to ± 0.005 cm; evaporated gold used for electrodes, frequency range 10^2 to 10^5 Hz; curve represents an average of 26 tests from 298 K to 593 K, max data spread approx ± 0.03.
Chant (1967)	Teflon	Discs 9.5 cm diam and t = 0.019 cm; sample clamped between two brass plates, edge effects allowed for in calculations, contraction of specimens not taken into account.
Seuss, Neff (1963)	Insulated Wire, Tensolite Wire Co. "UT" Ultra-thin emulsion dipped TFE	ℓ = 152.4 cm wound on coil form; measured in vacuum while submerged in Hg which served as one electrode, central wire served as other electrode, impedance bridge, 10^2 Hz, tested according to MIL STD-202B, Method 305, computed as in Specification MIL-W-16878D.

TFE

Dielectric Constant



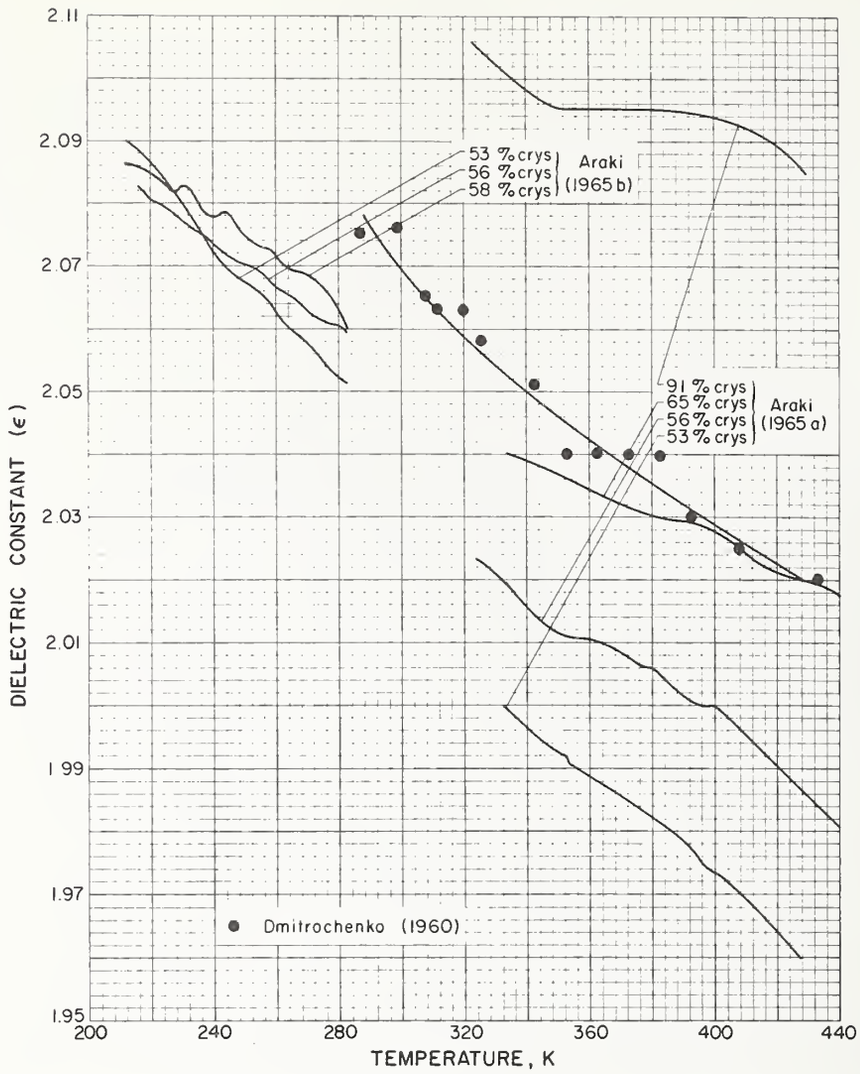
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Chapman, Frisco (1953)		Modified Beechnut circuit
Balanis (1966)	Teflon	t = 2.7742 cm; Fabry - Perot interferometer, 61.24×10^9 Hz.



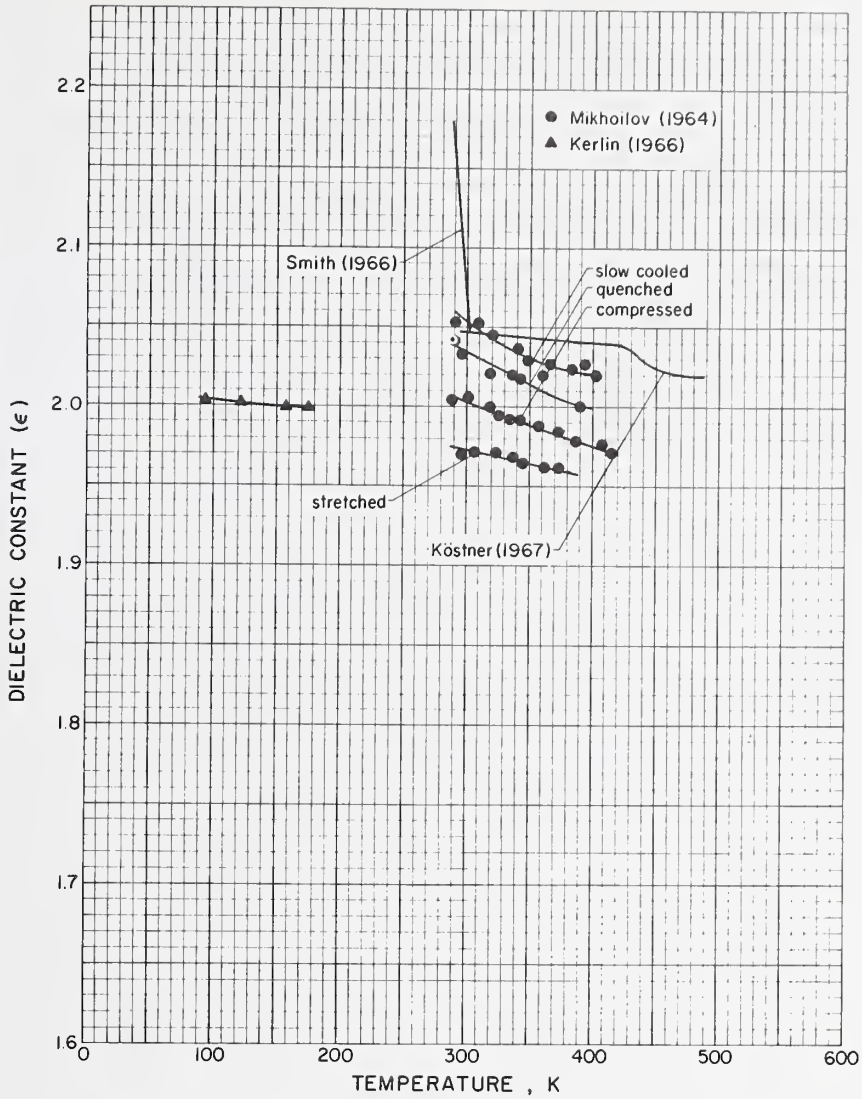
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Doban, Sperati, Sandt (1955)	Teflon	10^3 Hz.
Du Pont Co. (1970)	Teflon	Molded disc.
Diamond (1962)	Teflon	10^3 and 10^5 Hz.
Saito, Tanno, Nakajima, Kashimura (1958)	Teflon	Curve represents a series of closely spaced points.
Kerlin, Smith (1964, Vol. I)	Teflon	Test cell fabricated according to ASTM D 150-58T, guard electrode at floating potential, General Radio Model 716-C capacitance bridge, 10^3 Hz, ASTM D 150-58T test procedure, tested in vacuum.

TFE

Dielectric Constant



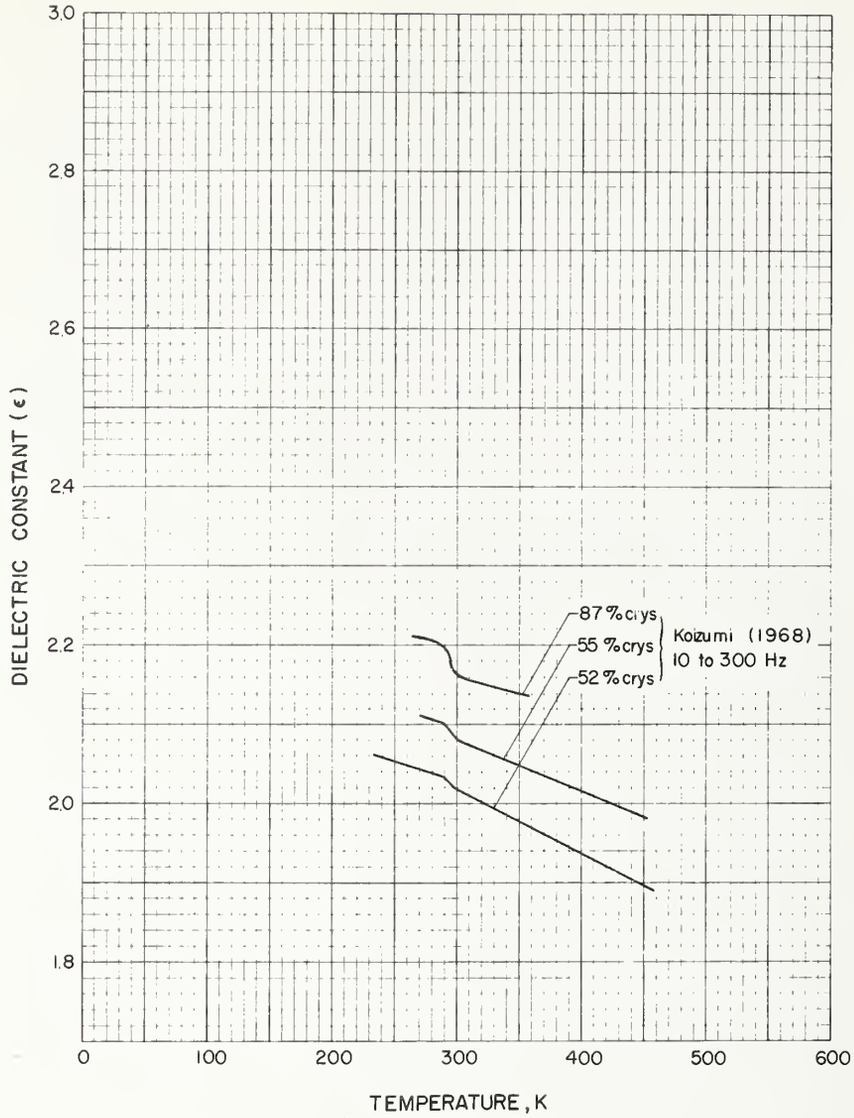
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Araki (1965a)	Teflon 5, 53% and 56% crys; irrad Teflon 5, 91% crys; Polyflon F-102, 65% crys.	Diam = 8 cm, t = 0.02 cm; diam guarded electrodes = 5.6 cm, diam unguarded electrodes = 7.0 cm, electrodes formed by conductive paint, measurement by Schering bridge, 50 Hz.
Araki (1965b)	Teflon 5, 53% and 56% crys; Teflon 7, 58% crys.	Diam = 8 cm, t = 0.02 cm; diam guarded electrodes = 5.6 cm, diam unguarded electrodes = 7.0 cm, electrodes formed by conductive paint, measurement by Schering bridge, 50 Hz.
Dmitrochenko, Shevelev (1960)	Commercial samples from 2 manufacturers	Coaxial reasonator method.



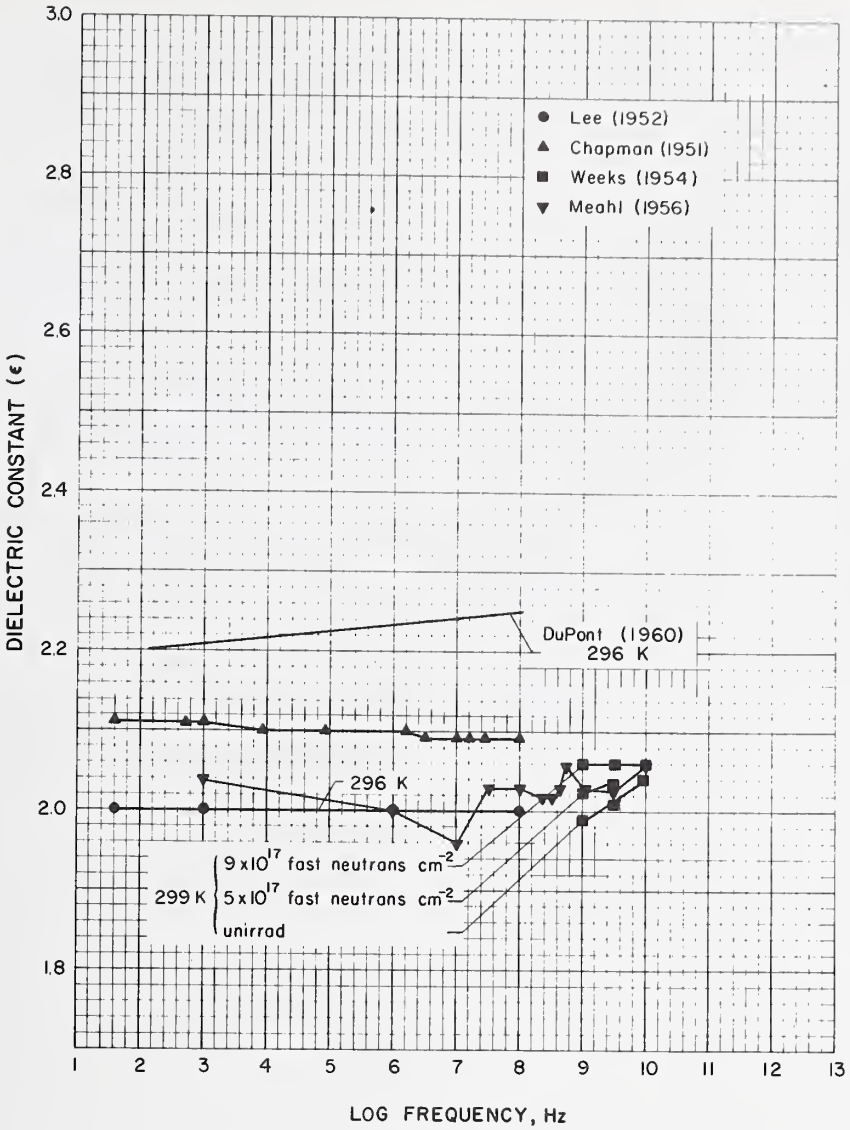
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mikhailov, Lobanov, Shevelev, Orlova (1964)	Samples slow cooled, quenched compressed, and cut from necked area formed in stretching at room temp.	Measured at 4.7×10^9 Hz
Smith, Müller (1965)	Teflon	
Kerlin, Smith (1966)	Teflon 7	Test cells fabricated according to ASTM D 160-59T, unguarded electrode and guard ring diam = 11.4 cm, guarded electrode diam = 10.1 cm, gap width between guarded electrode and guard ring was 0.051 cm, spring loaded Al plunger in contact with the guarded electrode secured specimens between electrodes, General Radio Co. Type 1610-A capacitance-measuring assembly, tested in vacuum.
Kästner, Dittmer (1967)		Coaxial resonator, 4.8×10^8 Hz.

TFE

Dielectric Constant

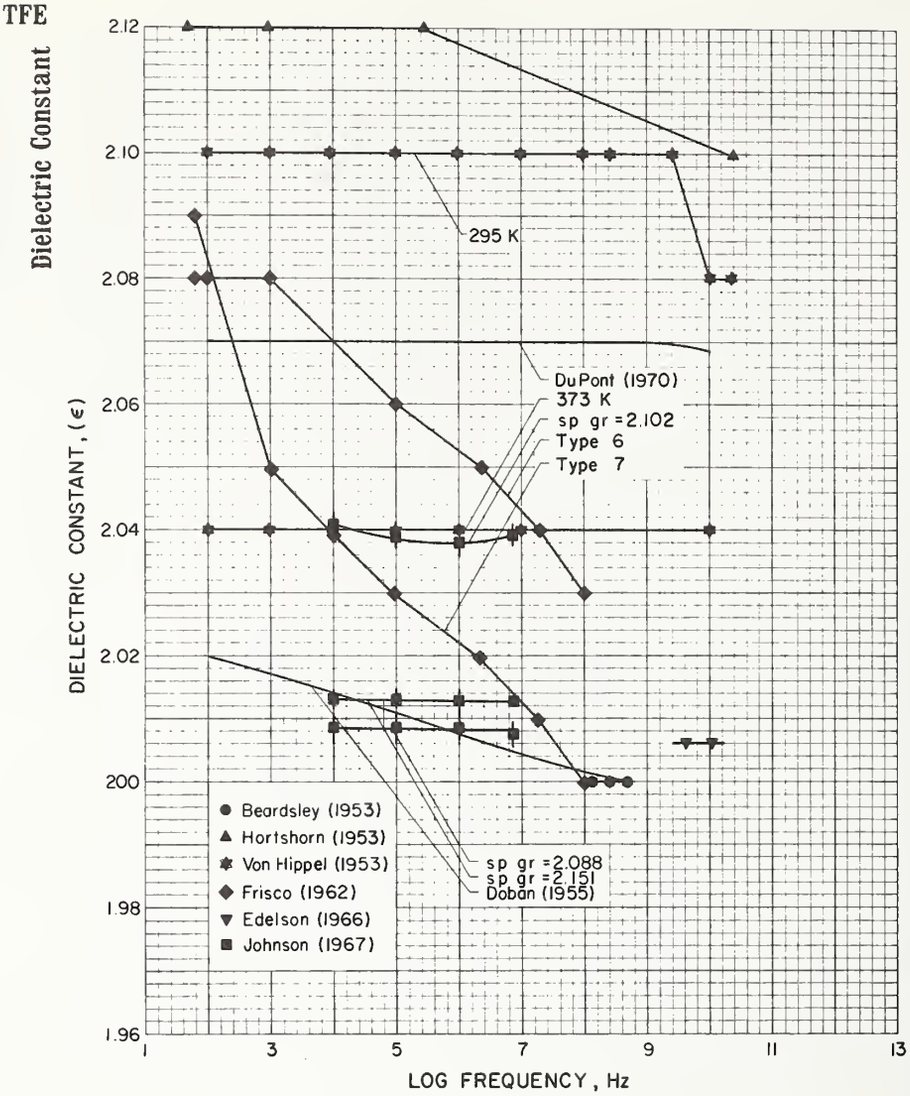


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Koizumi, Yano, Tsuji (1968)	Teflon 5, sp gr = 2.161, 55% crys; Teflon 5, irrad with 3 x 10^5 Roentgens, sp gr = 2.261, 87% crys; Polyflon M-12, sp gr = 2.156, 52% crys	t = 0.015 - 0.020 cm; 3 electrode system, guard electrode diam = 3.7 cm, Al electrodes evaporated onto specimen, Ando Electric Co. Type TR 10 Bridge with a guard circuit of the Wagner Type, 10 Hz to 3 x 10^5 Hz; accuracy better than ± 3%, curves represent a closely spaced series of test points.

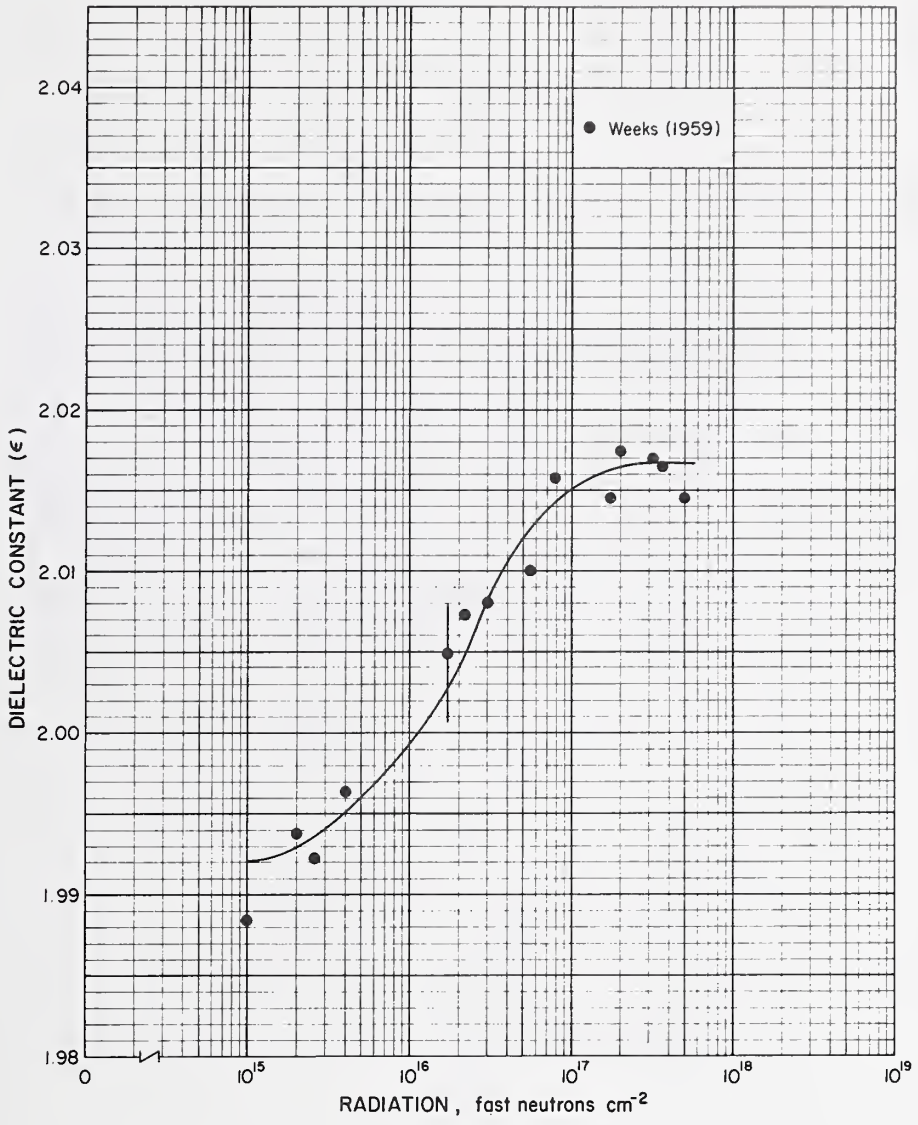


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Lee (1952)	Teflon	295 K, ASTM D150-47T test procedure.
Chapman, Frisco (1954)	Teflon	t = 0.159 cm; brass electrodes coated with highly conducting silver paint.
DuPont (1960)	Teflon	296 K.
Weeks (1954)	Teflon	299 ± 3 K, measurements at 1 and 3 x 10^9 Hz made in the coaxial TEM mode, measurements at 8.7 x 10^9 Hz made in the TE_{11} mode; irrad by ORNL Graphite Reactor while sealed in an Al capsule.
Meahl (1956)	Teflon	Av data from measurements by several laboratories.

TFE

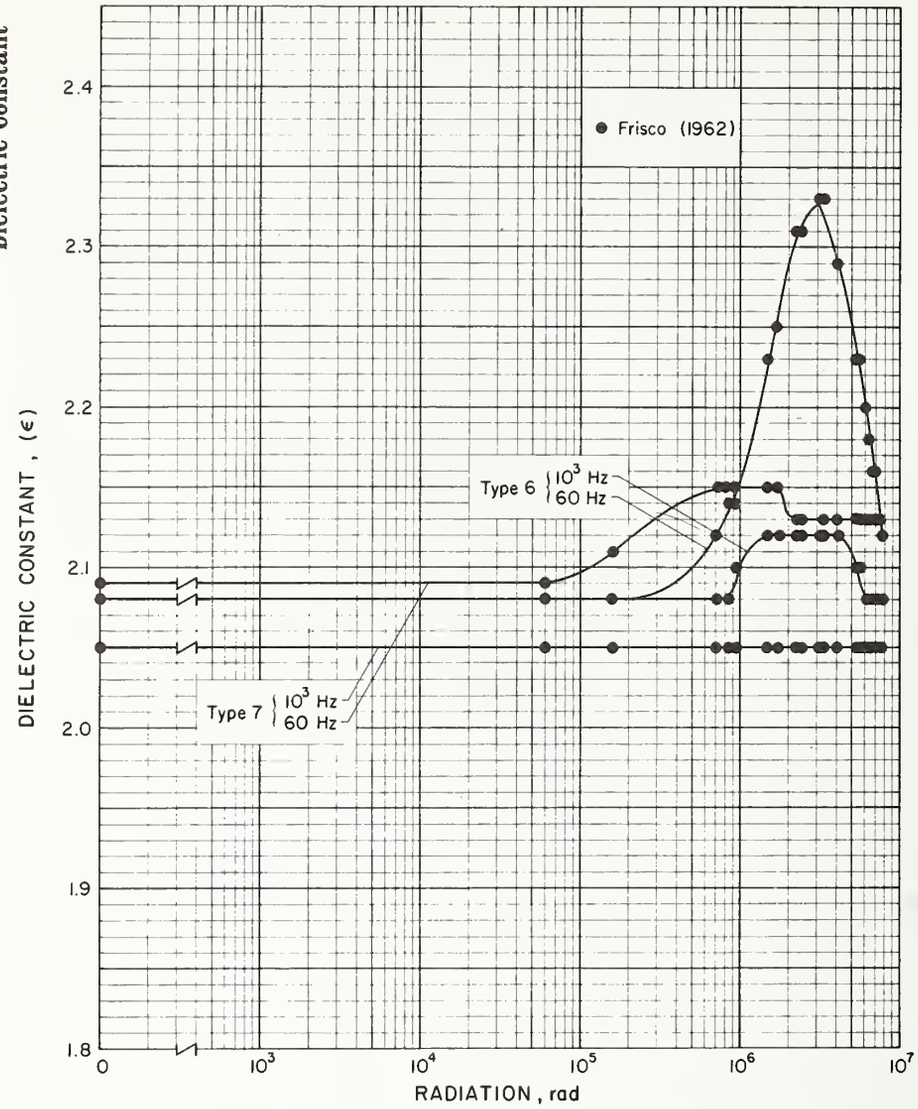


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Beardsley (1953)	Teflon	Variable length re-entrant cavity.
Hartshorn, Parry Rushton (1953)	Powder molded at 297K and 2,000 psi at 633K for 1.5 h and slow cooled	2.0 - 2.5 cm diam; Schering-Bridge method for frequencies to 10^7 Hz, circuit resonance method for 10^4 - 10^8 Hz, cavity-resonance method for 5×10^8, 9×10^9, and 24×10^9 Hz bands, transmission-line method also used in 3×10^9 Hz region, electrodes at low frequencies were platinum-plated, silver-plated with rhodium flash, or solid invar.
von Hippel (1953)	Teflon, dried over phosphorus pentoxide	Field strength ~ 50 V cm^{-1}; nominal accuracy = ± 2%.
Doban, Sperati, Sandt (1955)	Teflon	296 K.
Frisco (1962)	Teflon, TFE-6 and TFE-7	Stored under room conditions for at least 2 weeks before measurement.
Edelson, Jaeger, Williams (1966)	Teflon	Measurements made in S and X microwave bands with TM-010 and TE-101 cavities respectively.
Johnson (1967)	Teflon, molding pure electrical grade, sp gr = 2.088; Halon, G-80, lots 270 and 285, sp gr = 2.151; Polyflon, R.C.F. modified TFE, sp gr = 2.102.	General Radio type 1615A bridge, Boonton Radio type 260A and 190A Q meters, Central Research Dielectrometer, Hewlett - Packard type 612A or 608C signal generators, Hewlett-Packard type 5245L frequency counter, Hewlett-Packard type 415B standing-wave indicator, measured in cyclohexane, $\epsilon = 2.0181 \pm 0.0004$.
Du Pont Co. (1970)	Teflon, sp gr = 2.20	Molded disc, 296 K.

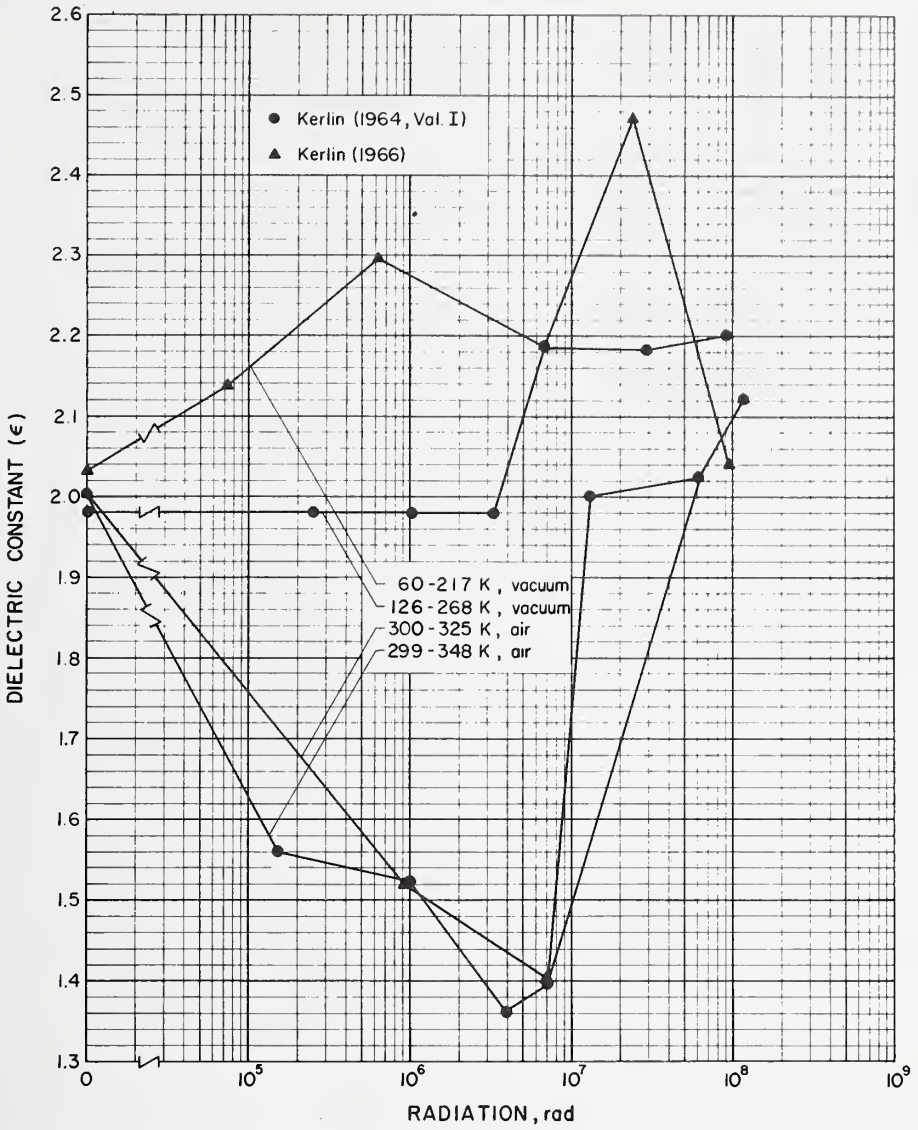


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Weeks, Binder (1959)	Teflon insulation	Teflon insulated cable, ℓ = 11.92 ± 0.05 m; 1/4 wave-length cable extended through the active lattice of the Oak Ridge National Laboratory graphite reactor, ~ 60% of cable irrad, ~ 4 x 10^8 Hz, measurements made on open ended cable during irradiation, temp varied from 318 K at 10^{15} fast neutrons cm^{-2} to 338K at 5 x 10^{17} fast neutrons cm^{-2}.

TFE

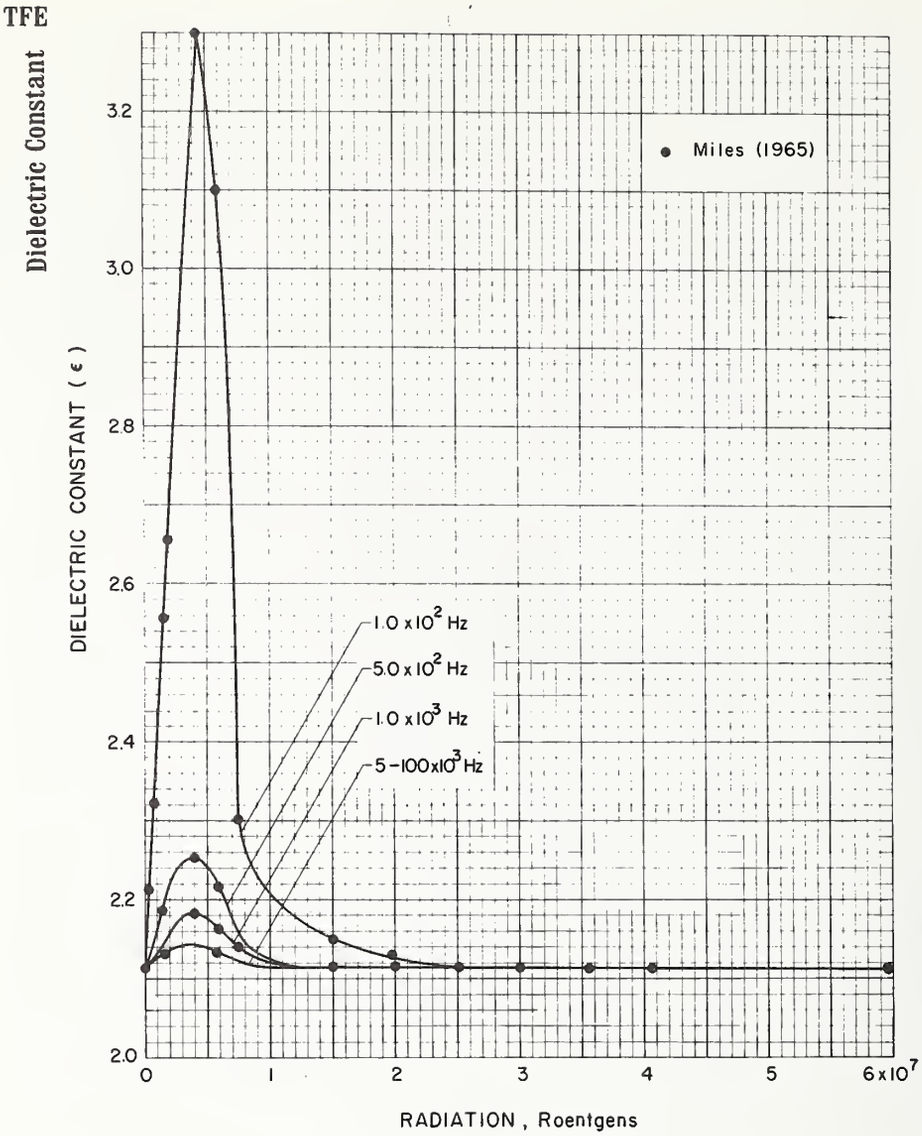


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Frisco (1962)	Teflon, TFE-6 and TFE-7	Circular area = 1.0 cm^2, t = 0.05 cm; irrad by Ag x-rays in vacuum.

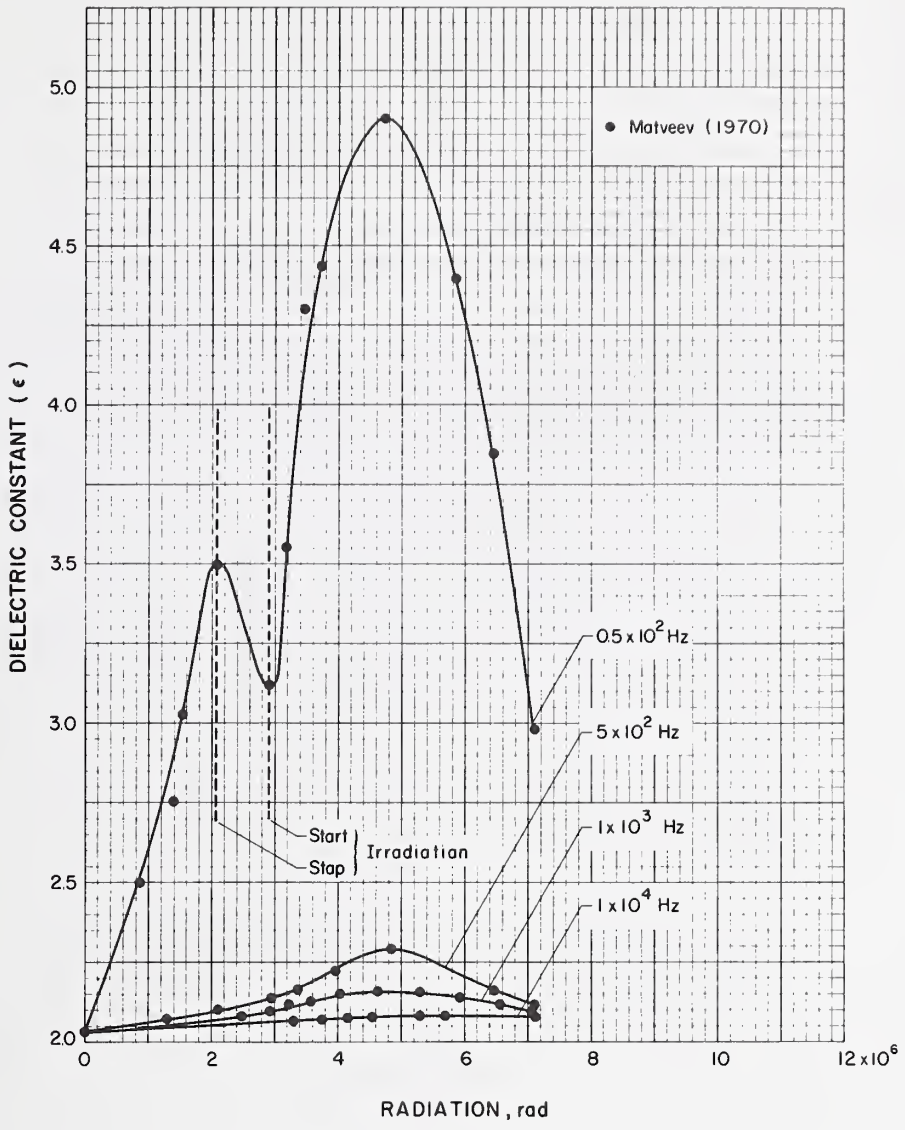


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1964, Vol. I)	Teflon	Test cell fabricated according to ASTM D 150-58T, guard electrode at floating potential, General Radio Model 716-C capacitance bridge, 10^3 Hz, ASTM D 150-58 T test procedure, irrad and tested in vacuum and air; irrad in Ground Test Reactor at Nuclear Aerospace Research Facility, Fort Worth.
Kerlin, Smith (1966)	Teflon 7	Test cells fabricated according to ASTM D 160-59T, unguarded electrode and guard ring diam = 11.4 cm, guarded electrode diam = 10.1 cm, gap width between guarded electrode and guard ring was 0.051 cm, spring loaded Al plunger in contact with guarded electrodes, secured specimens between electrodes, General Radio Co. Type 1610-A capacitance-measuring assembly, tested in vacuum and air; irrad in Ground Test Reactor at Nuclear Aerospace Research Facility, Fort Worth.

TFE



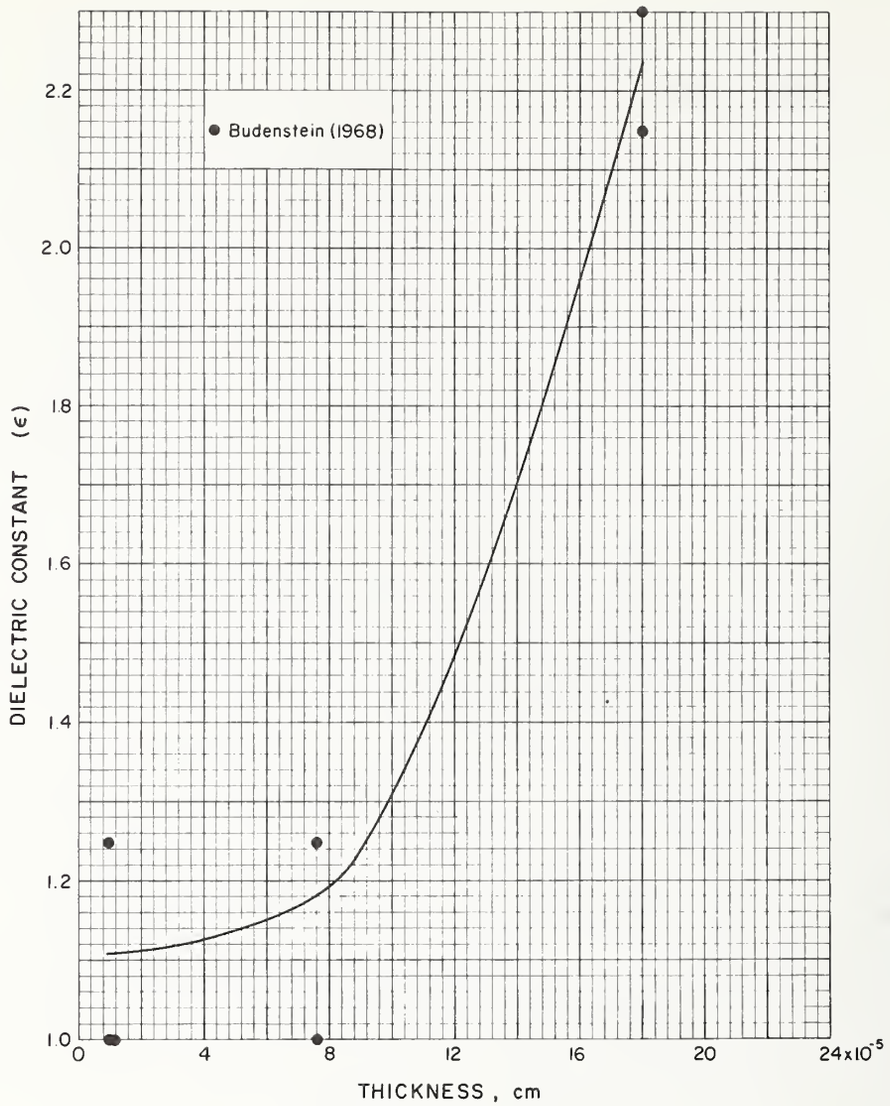
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Miles, Newell (1965)	Teflon	Diam = 7.62 cm, t = 0.305 cm; electrodes coated with silver paint, diam of guarded electrode = 6.35 cm, General Radio Model 716 Schering bridge and associated guard circuit, 3 electrode technique, tested in vacuum, measurements at 5, 10, 50, and 100 x 10^3 Hz gave same result; irrad by Co^{60}.



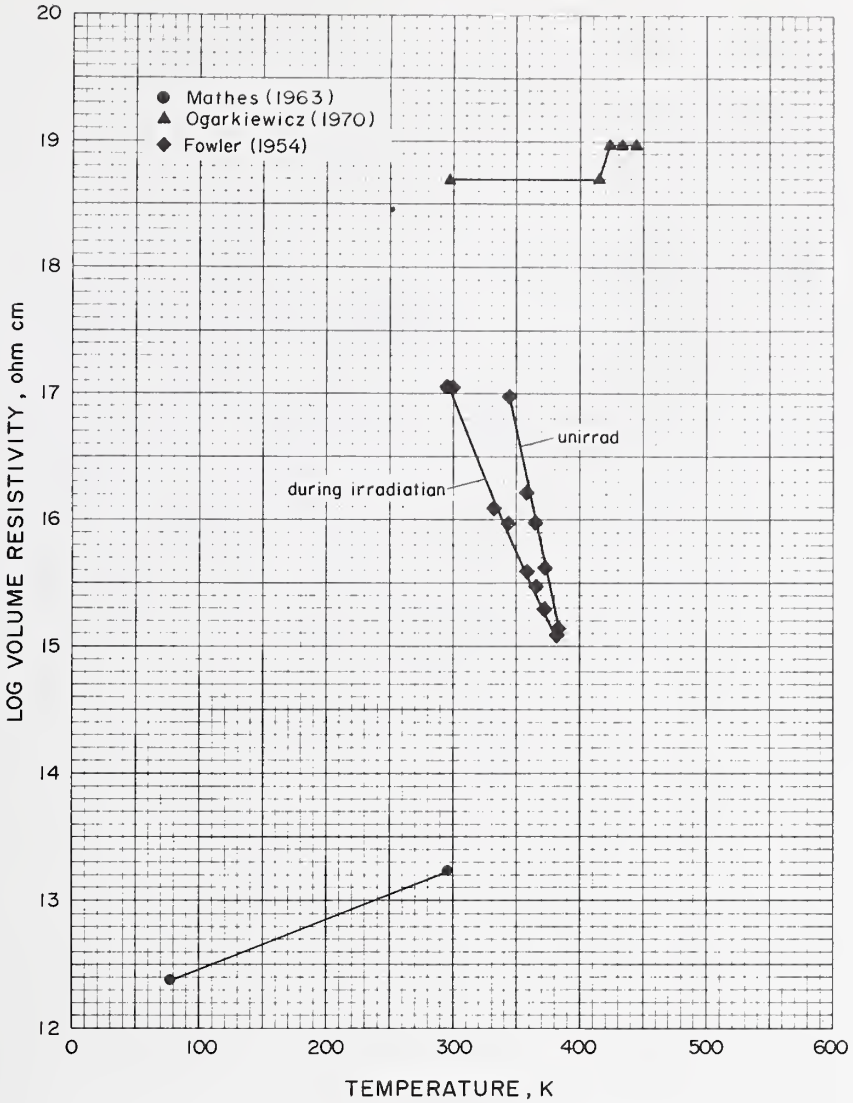
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Matveev, Viceberg, Karnov (1970)	Fluoroplast IV	Irradiated with Co^{60} source at rate of 2.5×10^2 rads s^{-1}.

TFE

Dielectric Constant

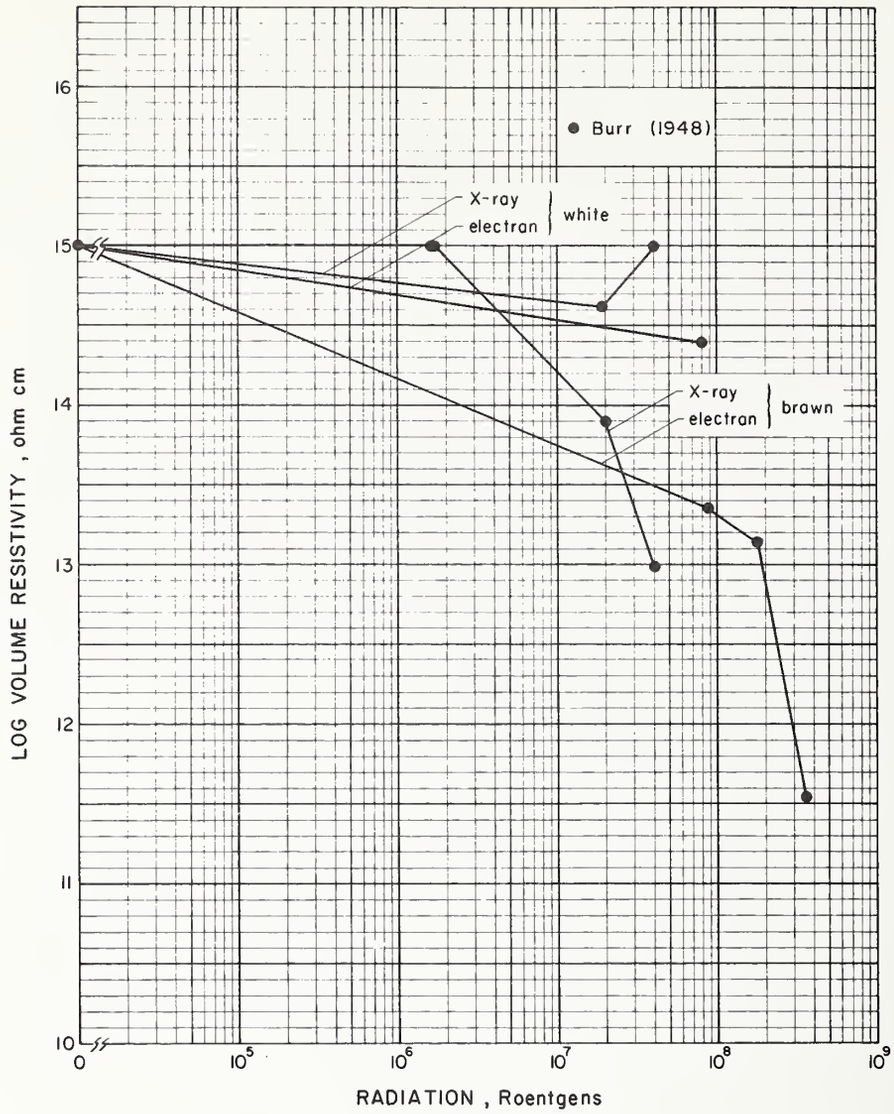


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Budenstein (1968)	Teflon film formed by RF	10^3 Hz, ESI Model 250 DA impedance bridge.

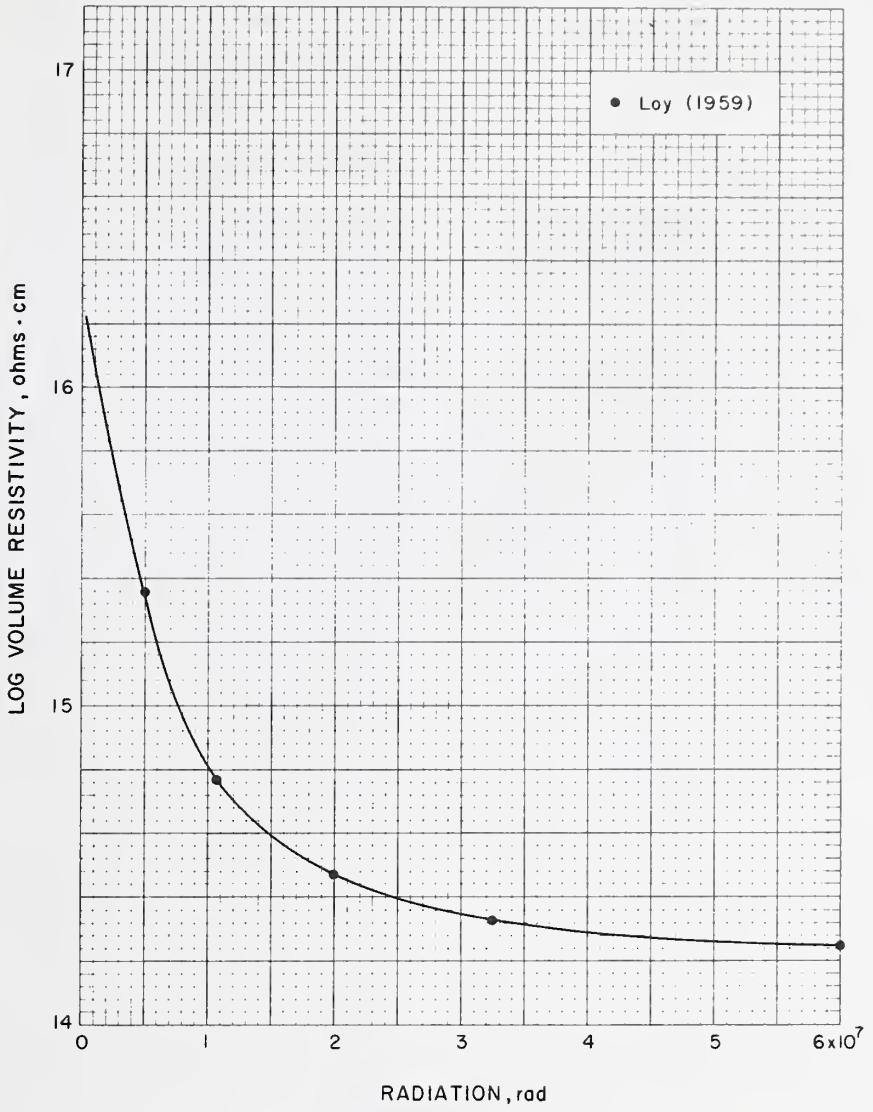


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mathes (1963)	Teflon, extruded, aged 15 days at 296 K and 95% rel hum	Insulated single conductor round Cu wire, nominal wire diam = 0.0643 cm, insulation t = 0.02883 cm; 2 thin Pb foil electrodes wound on insulated wire, w = 0.96 cm, separation = 0.32 cm, Pb electrodes connected together and measured against center conductor, no guarding techniques.
Ogorkiewicz (1970)	Fluon G1	Measured after 10 s.
Fowler, Farmer (1954)		Cylinder, ℓ = 2.5 cm; current measured with Baldwin Ionex Mk3 dc amplifier; irrad by 220 KVp x-rays.

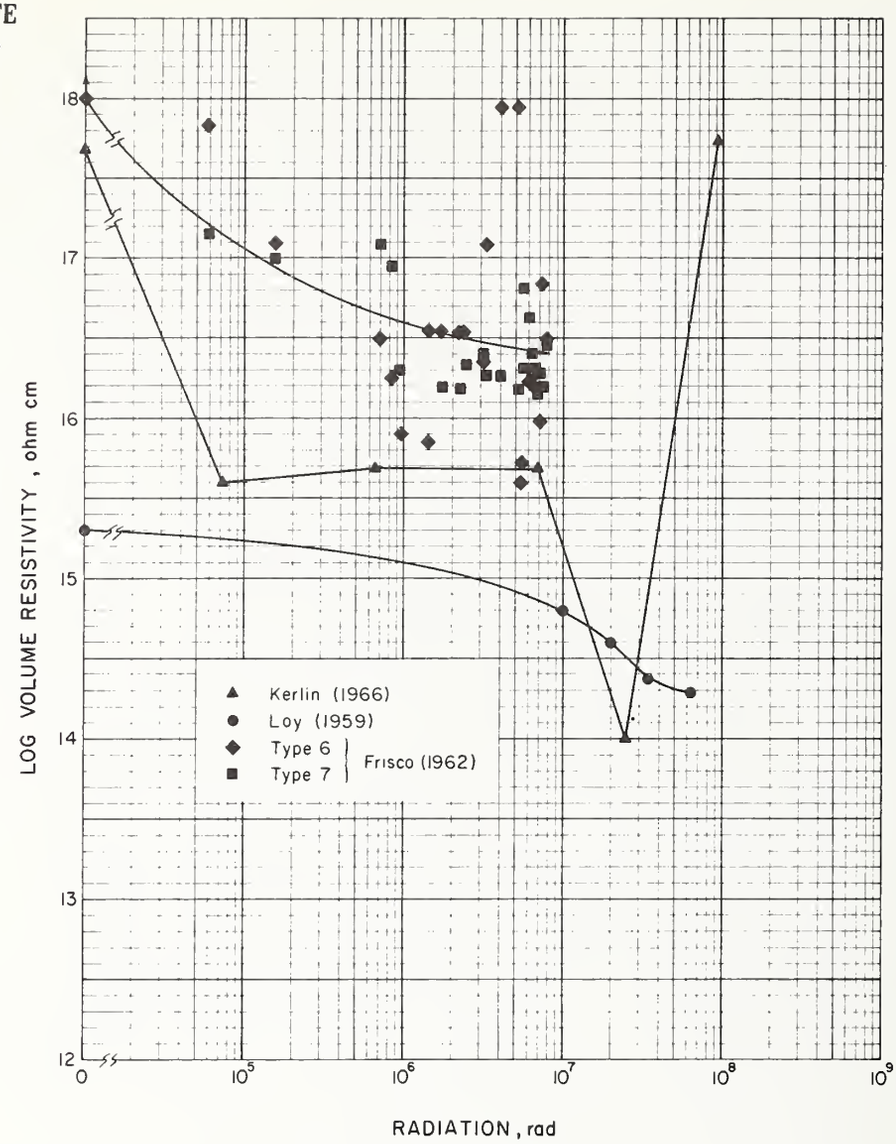
Resistivity



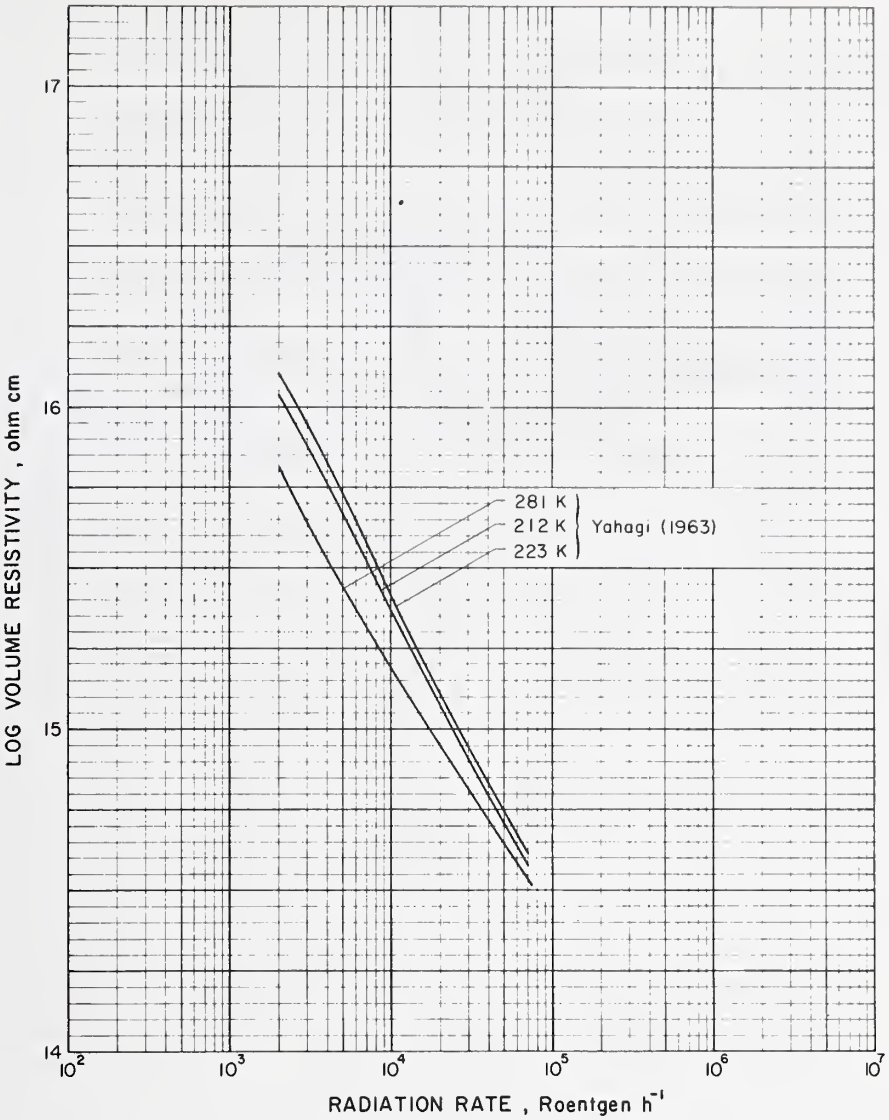
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Burr, Garrison, Haeckl, Hochandel, McClinton, Penneman, Scott, Miller, Steel (1948)	White and brown, stored over $CaCl_2$ for 48 h	Diam = 1.3 cm, t = 0.3 cm; Edelman electrometer, 298 K, rel hum $\leq$ 1%; 2 Mev electrons from Van de Graaff generator and x-ray irradiation.



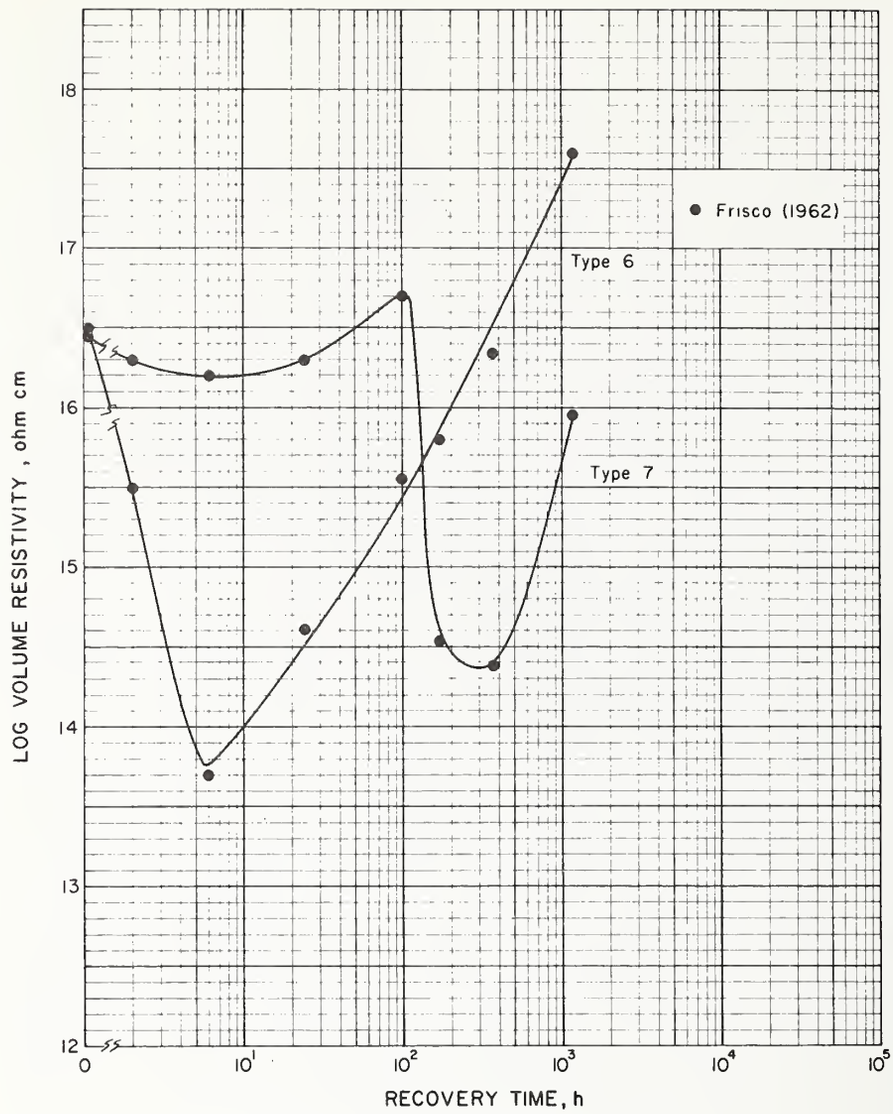
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Loy (1959)	Teflon, TFE	t = 0.635 cm, area of guarded electrode 45.6 cm^2, area to thickness ratio 71.7 to 4.47 x 10^3; between 90 and 500 v dc applied across specimen for 1 min, irradiated with cobalt - 60 source at dosage rate of 3.0 x 10^5 rads h^{-1}, resistivity values measured immediately after removal from irradiation source.



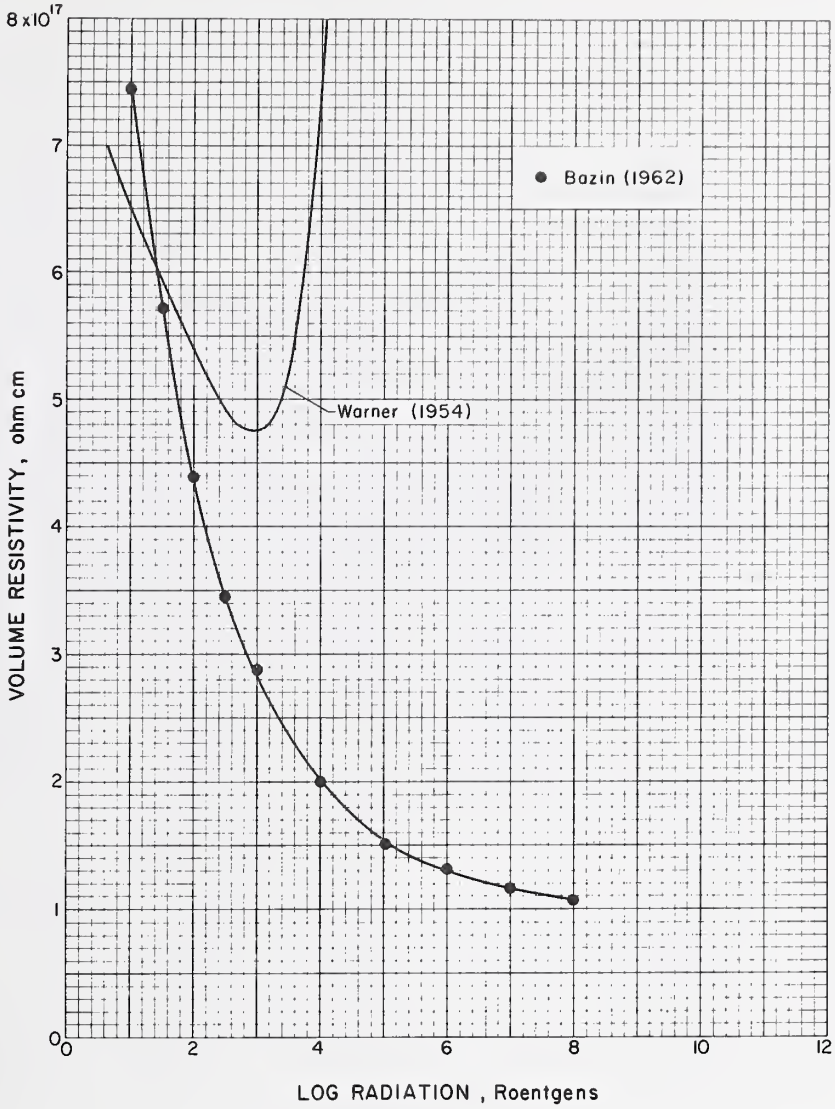
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Teflon 7	Test cells fabricated according to ASTM D 160-59T, unguarded electrodes and guard ring diam = 11.4 cm, guarded electrode diam = 10.1 cm, gap between guarded electrode and guard ring was 0.051 cm, spring loaded Al plunger in contact with guarded electrode secured specimens between electrodes, Federal Telephone and Radio Co. Model FT-H4 Tera-Ohmmeter, tested at 60-127 K in vacuum; irrad in Ground Test Reactor at Nuclear Aerospace Research Facility Fort Worth.
Loy (1959)	Teflon	t = 0.635 cm; area of guarded electrode = 45.6 cm^2, area/t ratio = 71.7 - 4.47 x 10^3, 90-500 V dc applied across specimen for 1 min irrad with Co^{60} at 3.0 x 10^5 rad h^{-1}, measured immediately after irradiation.
Frisco (1962)	Teflon, TFE-6 and TFE-7	Circular area = 1.0 cm^2, t = 0.05 cm; irrad by Ag x-rays in vacuum; a second sample of TFE-6 was simulataneously tested and showed a general ρ that was lower by a factor of 10, also tested was a second sample of TFE-7 which indicated a somewhat higher ρ; arrow indicates "greater than."



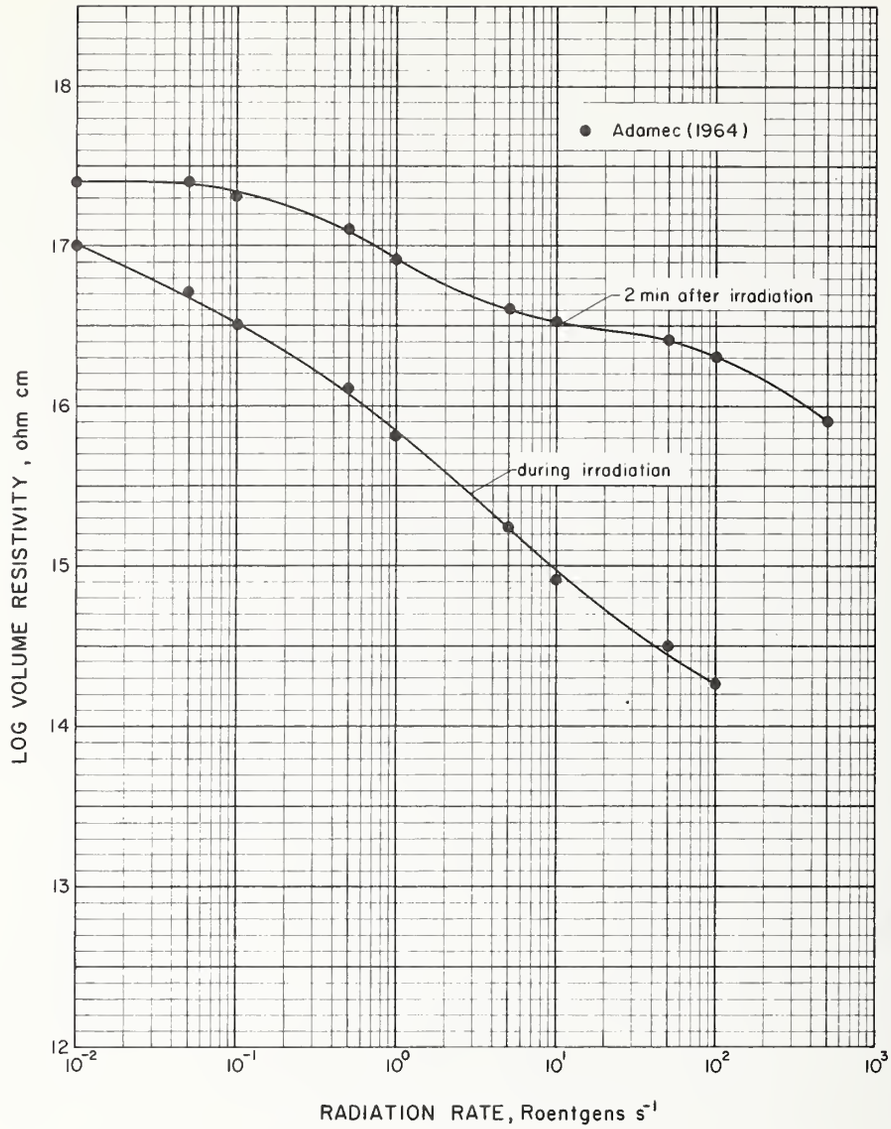
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Yahagi (1963)	Teflon, ~ 36% crys	Diam = 9 cm, t = 0.05 cm; specimen coated with Ag paste, Cu electrode diam = 3 cm with Cu guard ring with internal and external diam = 4 cm and 8 cm, respectively, current measured by a vibrating reed electrometer with a response time < 2 s, current measured in steady state after about 10 min, applied voltage = 285 v, ρ calculated from induced currents reported by author; irrad by Co^{60}.



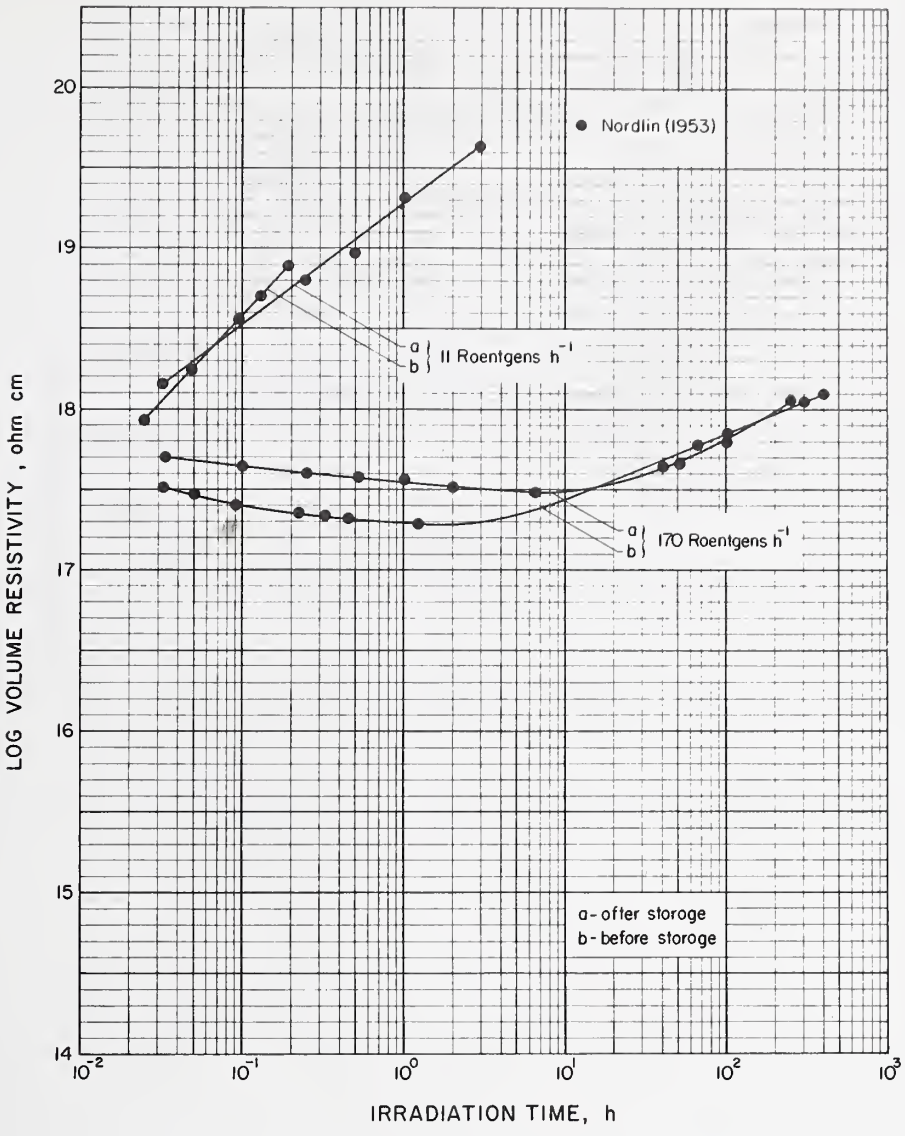
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Frisco (1962)	Teflon, TFE-6 and TFE-7	Circular area = 1.0 cm^2, t = 0.05 cm; ρ measured after a vacuum irradiation of 7.72 x 10^5 rad using Ag x-rays, samples removed from vacuum after 96 h; a second sample of each type was simultaneously tested and followed essentially the same recovery.



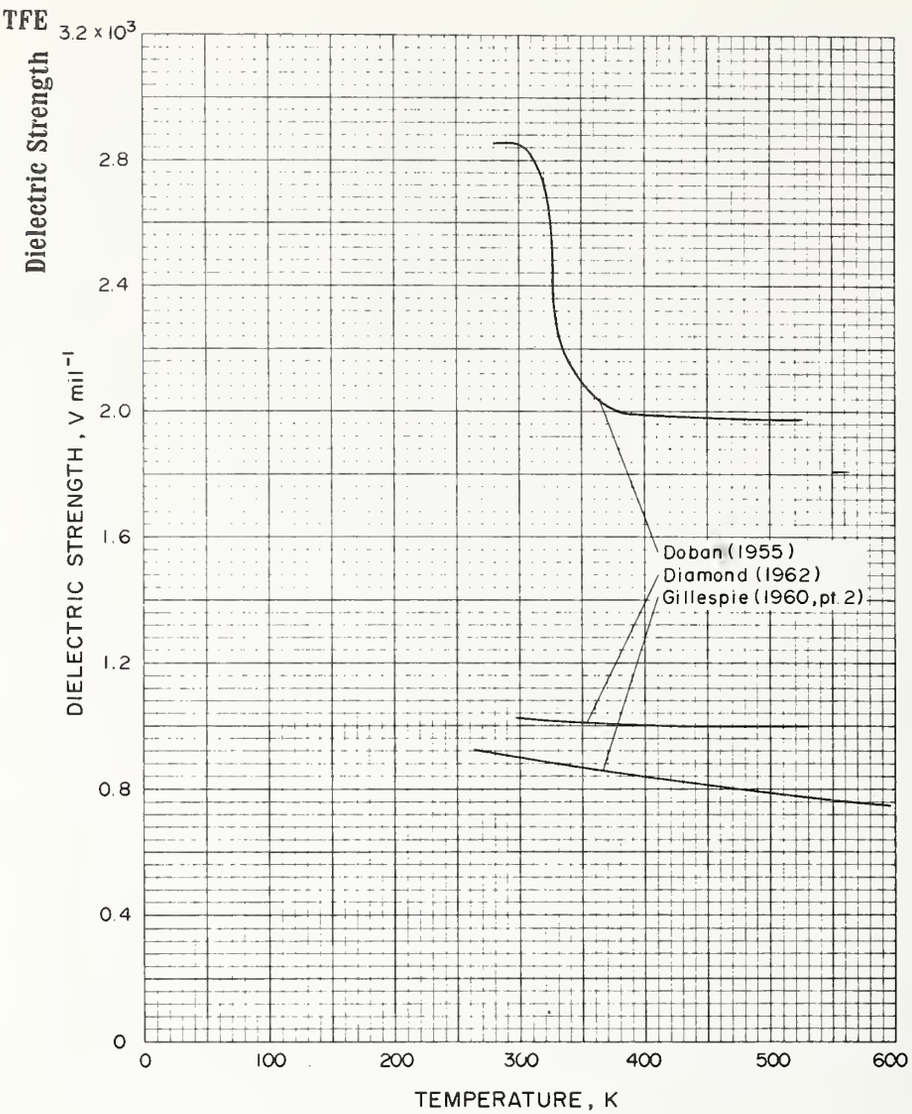
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bazin (1962)	Fluorofilm - 4	293 K, thin Ag electrodes; bremsstrahlung radiation from 25 Mev betatron.
Warner, Muller, Nordlin (1954)	Tefon	Disc with electrode area to thickness ratio ~10^4 cm; guard electrodes on sample and leads to sample, measuring voltage applied before the start of radiation and maintained all through the test; irrad in an evacuated dessicator by 1 Curie of Co^{60} at 100 Roentgens h^{-1}.



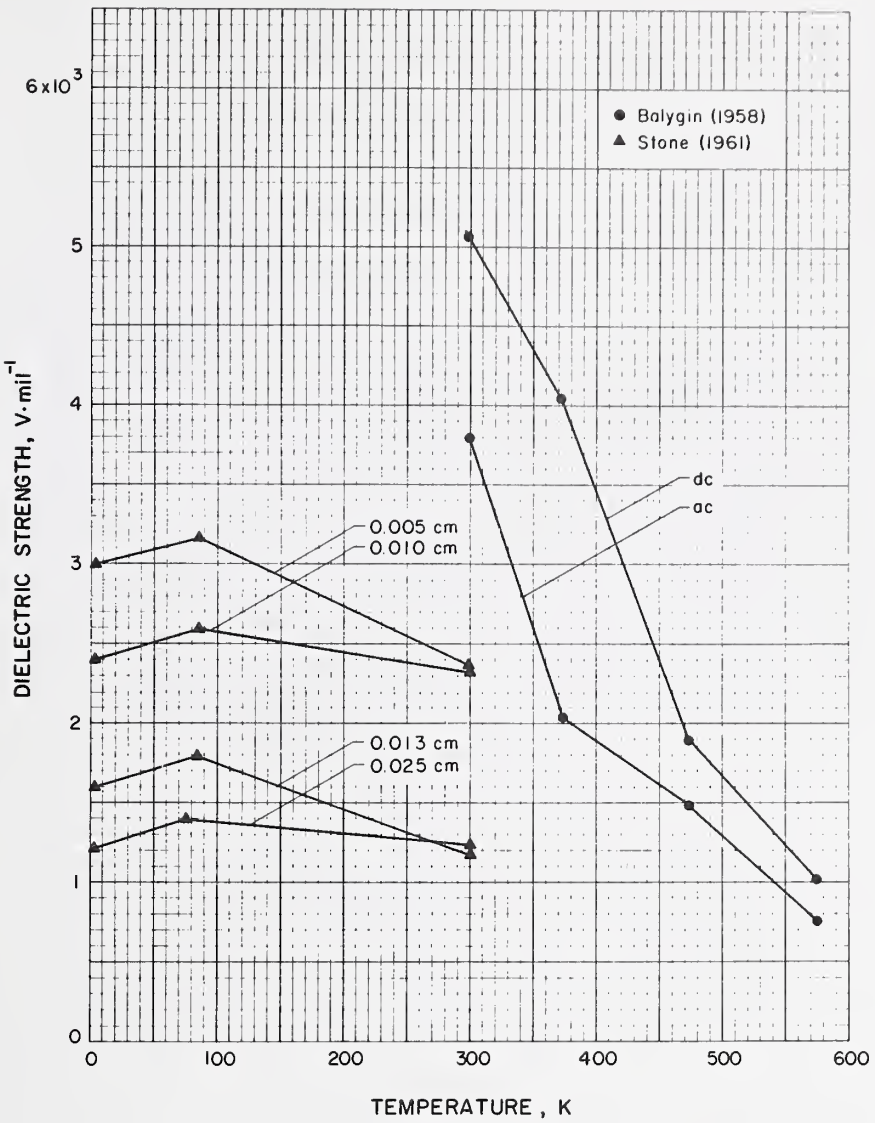
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Adamec (1964)	Commercial sheet	t = 4 - 6 x 10^{-3} cm, diam = 5.0 cm; 2.0 cm diam Al electrodes vacuum-deposited on specimens, 120 V battery used as a voltage source, current measured with a vibrating reed electrometer, 294 K, 50 ± 5% rel hum; irrad with 15 - 38 KeV x-rays.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Nordlin, Keel, Mayhew (1953)	Teflon	t = 0.015 cm; same specimen tested in vacuum at 570 V before and then after 3 weeks of storage over silica gel; irrad by Co^{60}, irrad at 170 Roentgens h^{-1} at first and then at 11 Roentgens h^{-1}.

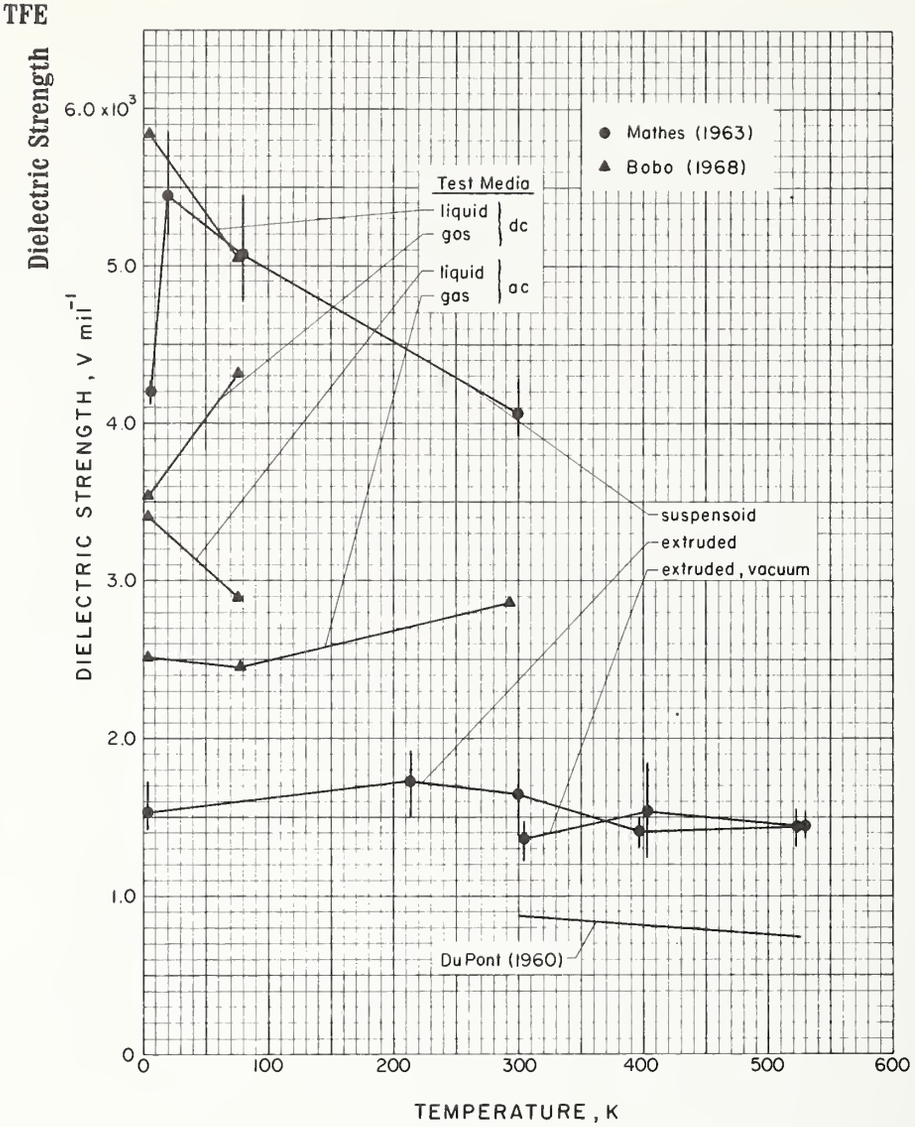


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Doban, Sperati, Sandt (1955)	Teflon	t = 0.013 cm; electrode diam = 0.42 cm.
Gillespie, Saxton, Chapman (1960, part 2)	Teflon	Short-time test, ASTM D-149-55 T test procedure.
Diamond (1962)	Teflon	Short-time, ASTM D-149-55 T test procedure.

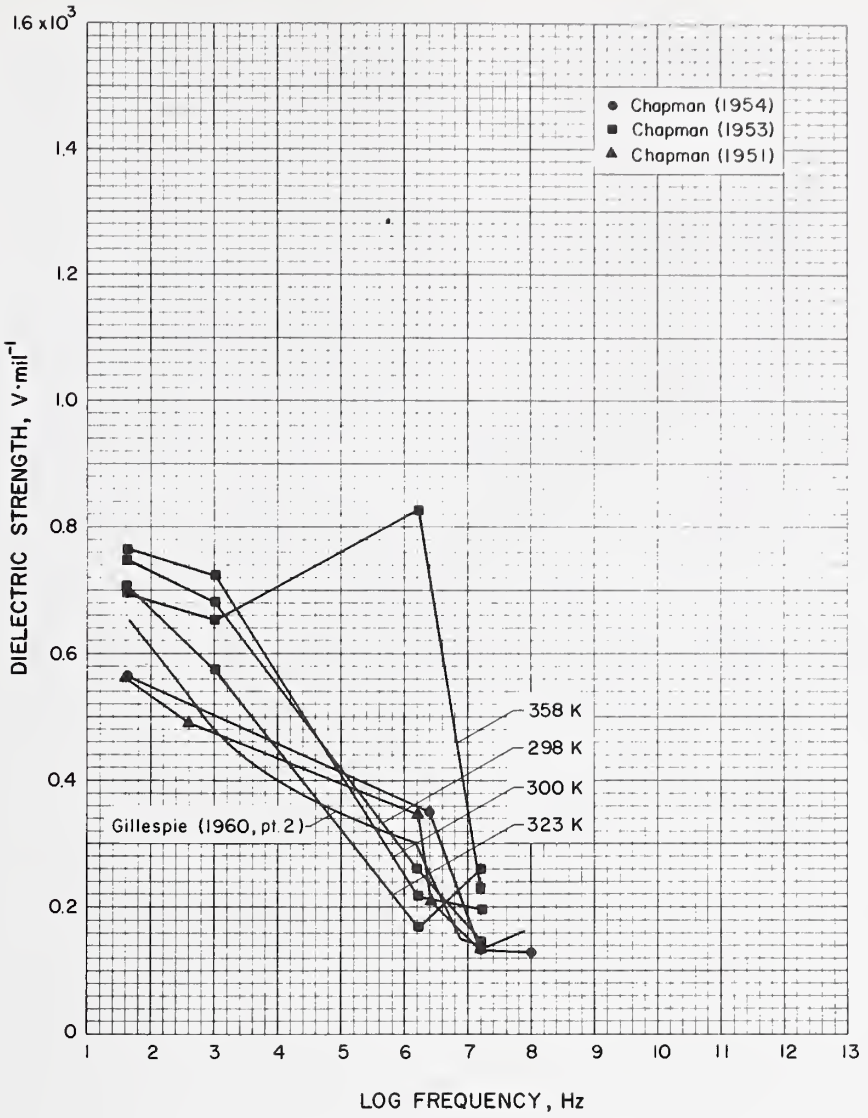


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Balygin, Porovskii (1958)	Teflon	Chrome-plated disc electrodes 2.5 cm diam, voltage supplied from full wave rectifier, 25 μf capacitor used to smooth voltage pulsations, small ohmic resistance connected in series with sample to protect surface of electrodes from rapid deterioration.
Stone, McFee (1961)	Teflon	Sample sandwiched between two brass electrodes, each 0.63 cm diam and rounded to 0.08 cm radius at edges, 60 Hz impressed voltage, short term tests, impressed voltage increased at rate of approx one thousand volts every 5 s, thickness noted.

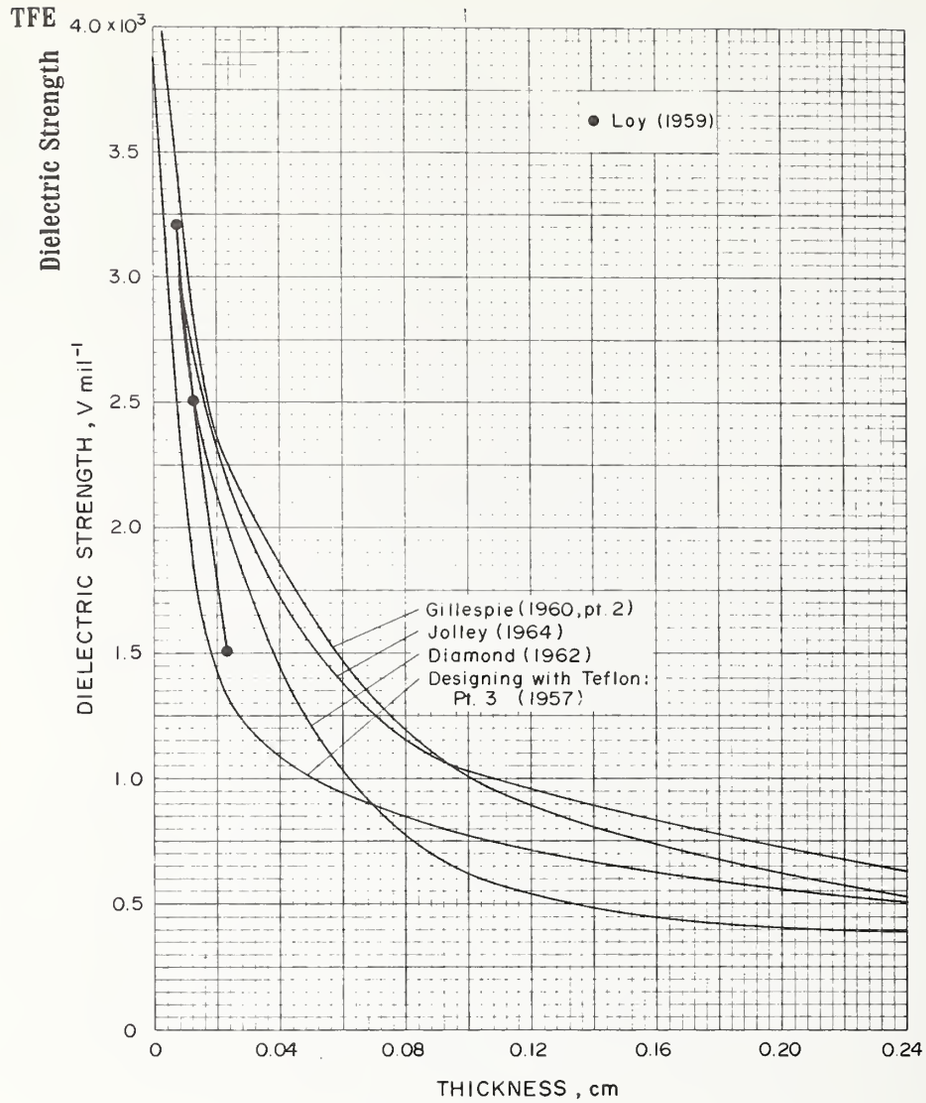
TFE



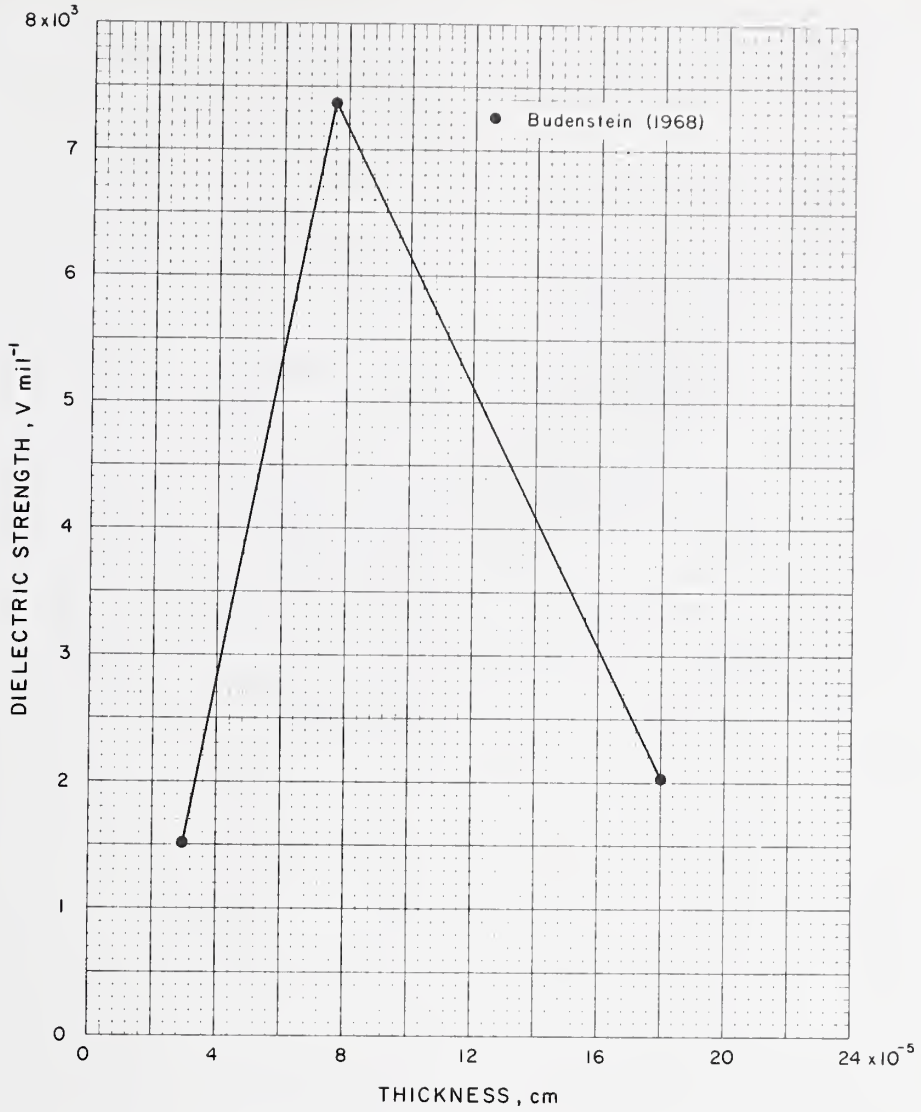
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mathes (1963)	Teflon, fused suspensoid and extruded	Insulated single conductor round Cu wire, nominal wire diam = 0.0643 cm, suspensoid t = 0.0038 cm, extruded t = 0.02883 cm; short-time test, ASTM D 149 test procedure with NEMA twisted pair test specimens, tests conducted in cryogenic liquids or air except for vacuum tests as noted; error bars indicate data spread in 2 or 3 tests.
DuPont (1960)	Teflon	t = 0.11 cm; tested in silicone oil, 2.54 cm electrode with 0.32 cm radius.
Bobo, Perrier (1968)	Teflon	t = 0.01 cm; electrodes were 3.0 cm diam spheres, voltage increased at 5 x 10^2 V s^{-1}, ac and dc tests made in air and helium in gas and liquid form.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Chapman, Dzimianski, Miller, Witt (1951)	Teflon	Discs, diam = 10.2 cm, t = 0.16 cm; bottom electrode had 5.1 cm diam with 0.63 cm radius on edge, upper electrode had 1.9 cm diam and 0.32 cm radius on edge, specimen immersed in dibutyl sebacate, RCA 25 kv rf voltmeter and Sylvania Type 134 rf voltmeter; av value of 4 tests at each frequency plotted, av deviation from mean = ± 8%, max error in measurement of rf voltage = ± 5%.
Chapman, Frisco (1953)	Teflon	
Chapman, Frisco (1954)	Teflon	t = 0.159 cm; brass electrodes coated with highly conducting silver paint, values are RMS, 100% rel hum.
Gillespie, Saxton, Chapman (1960, pt. 2)	Teflon	40 s test, 0.16 cm breakdown path, 1.91 cm diam electrode with 0.32 cm edge radius, tested in oil.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, part 2)	Teflon	Short-time test at 60 Hz.
Designing with Teflon: Part 3 (1957)	Teflon, skived tape	Short-time test, 2.54 cm electrode, oil immersion, 0.16 cm round on electrode.
Diamond (1962)	Teflon	Short-time, ASTM D 149-55T test procedure.
Jolley, Homsy, Reed (1964)	Teflon	Short-time
Loy (1959)	Teflon	ASTM D-249-59T test procedure, General Electric high voltage testing machine with max output of 5×10^4 VAC.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Budenstein (1968)	Teflon film formed by RF sputtering	Applied voltage increased at 1 V s^{-1}.

Investigator (s) (year)	Material Identification	Temperature (K)	ρ Volume Resistivity (ohm-cm)	Tan δ Dielectric Loss Tangent	ε Dielectric Constant	D.S. Dielectric Strength (V mil^{-1})
DuPont Co. (1955)	Teflon	297	$>10^{16}$	< 0.0005	2.0	480 (short-time)
						430 (step by step)
Cornell (1953)	Teflon, sp gr = 2.1-2.3	298	10^{16}	0.0005	2.0	400-500
	Extruded transparent Teflon Film, t = 0.013 cm					2,500
	Self-fusing Teflon Film, sp gr = 1.4-1.5, t = 0.013 cm			0.005	1.7	750
Thomas (1961)	Teflon, no visible voids at 100X magnification	298				760
Gillespie (1960, pt. 2)	Teflon, t = 0.18 cm	298	1.89×10^{19}	0.0002	2.1	400
Blasi (1959)	Teflon unirrad	298		0.00026	2.03	
	irrad			< 0.00010	2.03	
Mallouk (1958)	Teflon 6, sp gr = 2.2	298	$> 10^{16}$	<0.0003	2.0	500-2000
Linden (1963)	Teflon	298				
	60 Hz, 10^6 Hz		$>2.3 \times 10^{15}$	< 0.001	2.10	
	3 c 10^7 Hz		$>2.3 \times 10^{15}$	< 0.001	2.09	

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
DuPont Co. (1955)	Teflon	D. S. Measured by ASTM D 149-44 test procedure, ρ measured by ASTM D 257-49T test procedure, ε and tan δ measured by ASTM D 150-47T test procedure from 60 Hz to 10^6 Hz.
Cornell (1953)	Teflon	Short time D.S. measured by ASTM D 149-44 test procedure, ρ measured by ASTM D 257-46 test procedure, ε and tan δ measured by ASTM D 150-47T test procedure at 60 Hz and 10^6 Hz.
Thomas (1961)	Teflon, no visible voids at 100X magnification	t = 0.16 cm; ASTM D 149-55T test procedure, immersed in A-80 transformer oil.
Gillespie, Saxton, Chapman (1960, pt.2)	Teflon	Tests for ρ, ε, and D.S. conducted according to ASTM D 257-57T, D 150-54T, and D 149-55T test procedures respectively.
Blasi, Elam (1959)	Teflon	Disc-shaped samples; re-entrant type cavity, approx 3.14×10^8 Hz; irrad by 100 curie Co^{60} source, tan δ became constant after 20 h, source removed after 32 h.
Mallouk, Thompson (1958)	Teflon 6, extrusion grade, 50-82% crys, sp gr = 2.2	
Linden, Lascaro (1963)	Teflon	Measurements made 1 month before and after separate samples were exposed to 2.0×10^{12} nvt from the Godiva Critical Assembly at Los Alamos and to 5.88×10^5 Roentgens from Co^{60}, the results were identical.

Investigator(s) (year)	Material Identification	Temperature (K)	ρ Volume Resistivity (ohm-cm)	Tan δ Dielectric Loss Tangent	ε Dielectric Constant	D.S. Dielectric Strength (V mil^{-1})
Designing with Teflon: Part 1 (1957)	Teflon 1 Molding	298				400
	Teflon 6 Molding					620
Designing with Teflon: Part 3 (1957)	Teflon	298	10^{13}	0.0003	2.0 - 2.5	
Doban (1955)	Teflon	296	10^{19} (dry) $> 10^{16}$ (100 % rel hum)			400-500 (t=0.20 cm) 1000-2000 (t=0.013-0.030 cm)
Renfrew (1946)	Teflon, sp gr = 2.2-2.3	298	10^{16}	< 0.0002	2.0	500 (t=0.20 cm) 1500 (t=0.013 cm)
Sisman (1951)	Teflon t = 0.343 cm unirrad		$> 10^{14}$			
	after 2.3×10^{17} nvt		10^{14}			
	t = 0.058 cm unirrad					1100
	after 5.3×10^{17} nvt					800

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Designing with Teflon: Part 1 (1957)	Teflon 1, t = 0.16 cm, preformed at 5,000 psi for 1 $\frac{1}{2}$ h at 633K, low and moderate crys formed by quenching in air and cooling at 2K min^{-1}; Teflon 6, t = 0.16 -0.32 cm, preformed at 5,000 psi for 50 min at 653K, formed low, moderately high, and very high crys by quenching in ice water, cooling at 1K min^{-1}, and cooling at 1K min^{-1} then annealing at 586K for 35 days.	ASTM D 149 test procedure, 2.54 cm rounded electrode, Primol, D immersion oil, short time method.
Designing with Teflon: Part 3 (1957)	Teflon	Tan δ and ε remain constant from 60 to 10^{10} Hz, no change in values after exposure to 523K for 6 months.
Doban, Sperati, Sandt (1955)	Teflon	ρ at 100% rel hum measured by ASTM D 257-52T test procedure, D.S. measured by ASTM D 149-44 test procedure.
Renfrew, Lewis (1946)	Teflon, sp gr = 2.2 - 2.3	ASTM test procedures used were; for ρ, D 257-38; for tan δ and ε from 60 - 3×10^5 Hz, D 150-42T; for D.S where t = 0.20 cm, D 149-40T; for D.S. where t = 0.013 cm, D 295-38T.
Sisman, Bopp (1951)	Teflon	ρ: modified ASTM D 257-49T test procedure, reading made 1 min after applying 20 V potential; D.S. 2.54 cm square; modified ASTM D 149-44 test procedure, max 30,000 V, 60 Hz, tested under insulating oil; irrad in Hole 19 of ORNL reactor at 298-313 K, aged 7 days at 298 ± 1 K and 50 ± 2% rel hum before testing.

Investigator (s) (year)	Material Identification	Temperature (K)	ρ Volume Resistivity (ohm-cm)	Tan δ Dielectric Loss Tangent	ε Dielectric Constant	D.S. Dielectric Strength (V mil^{-1})
Mathes (1963)	Teflon, as received	296		0.00075		
Storti (1968)	Teflon	298			2.0	5000
Dryagin (1969)	Teflon	298		0.00028 ±0.00002	2.04 ± 0.04	
Fowler (1956)	Teflon, irrad at 0.13 Roentgen S^{-1}	293	1.25×10^{16}			
Lee (1952)		297		0.0005	2.0	
Fittipaldi (1966)	Teflon	293	2.77×10^{14}			
Amborski (1954)	Teflon	298	$> 1.0 \times 10^{16}$			
Mathes (1964 b)		296		0.0003	2.0	
Bragin (1958)	Teflon	297				3600
Chapman (1953)		298-358		< 0.001		

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mathes (1963)	Teflon, extruded, as received	Insulated single conductor round Cu wire, nominal wire diam = 0.0643 cm, insulation t = 0.02883 cm; 50% rel hum; av of 3 tests.
Storti (1968)	Teflon, sp gr = 2.14 - 2.17	t = 0.0051 cm; ε measured at 10^3 Hz.
Dryagin, Chukhvichev (1969)	Teflon	t = 0.835 cm; Fabry Perot interferometer, 1.7×10^{11} Hz.
Fowler (1956)	Teflon	2 specimen shapes: hollow cylinder, ℓ = 2.5 cm, internal diam = 0.6 cm, external diam = 0.7 cm; pairs of discs, diam = 6 cm, t = 0.01 - 0.05 cm, collecting electrode of very thin sheet Al with diam = 5 cm sandwiched between discs; electrodes were colloidal graphite painted on surface and placed in contact with Al, electric field ≤ 1.3×10^4 V cm^{-1}; irrad in vacuum by 220-250 kV x-rays; probable accuracy of current readings = ±1-5%.
Lee (1952)		ASTM D 150-47T test procedure, 60 Hz - 10^8 Hz.
Fittipaldi, Pauciulo (1966)	Teflon, dried over phosphorous pent - oxide	Measured by rotation in an electric field.
Amborski, Burton (1954)	Teflon	Film, 6.35 × 6.35 cm; 5.08 cm diam Ag electrodes painted on both sides, General Radio megohm bridge type 544B, tested at 125 V dc after 6 min.
Mathes (1964 b)		10^3 Hz.
Bragin (1958)	Teflon	t = 0.18 cm; 2.0 cm long needle and 2.0 cm diam. disc. electrodes, $3\text{-}10 \times 10^7$ Hz.
Chapman (1953)		Modified Beechnut circuit, $60\text{-}1.8 \times 10^7$ Hz.

Investigator (s) (year)	Material Identification	Temperature (K)	ρ Volume Resistivity (ohm-cm)	Tan δ Dielectric Loss Tangent	ε Dielectric Constant	D.S. Dielectric Strength (V mil^{-1})
Jolley (1964)	Teflon	296	$>10^{18}$		2.1	500-600
Heyne (1965, pt. 1)	unirrad during irrad	298			2.06 7.25	
Hyene (1965, pt. 11)	after irrad	298			7000.00 (sic)	
Frisco (1962)	TFE-6 TFE-7	297				1600 2400
Westphal (1970)	Zitex, sp gr = 0.463	298		0.00010	1.194	
Balanis (1966)	Teflon	298		0.00024 ± 0.00006	2.053 ± 0.004	

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Jolley, Homsy, Reed (1964)	Teflon	ρ measured at 50% rel hum using ASTM D 257 test procedure; ε measured at 60 and 10^6 Hz using ASTM D 150 test procedure; D.S. measured in short term by ASTM D 149 test procedure.
Heyne, Hauser (1965, pt. I)		Measurement made 10^4 after application of 6×10^3 V cm^{-1} electric field, 800 Hz; reactor irrad by 1.15 Roentgen s^{-1} of γ's, 2.3×10^6 fast neutrons cm^{-2} s^{-1}, and 2.2×10^6 thermal neutrons cm^{-2} s^{-1}.
Heyne, Hauser (1965, pt. II)		See above; measurement made after 5×10^7 rad.
Frisco (1962)	TFE-6 and TFE-7	t = 0.030 cm; vacuum tested 60 Hz; av of 5-7 tests.
Westphal, Iglesias (1970)	Zitex, sp gr = 0.463, fibrous, porous	8.52×10^9 Hz.
Balanis (1966)	Teflon	Values here are an av for several samples and several tests, t = 2.5961-5.3027 cm, surface finishes had an rms height of irregularities of 41-81 x 10^{-6} cm; Fabry-Perot interferometer, 60.32-61.45 x 10^9 Hz, plate separation = 12.2-16.5 cm; errors indicate range of measurements.

Investigator (s) (year)	Material Identification	Temperature (K)	ρ Volume Resistivity (ohm-cm)	Tan δ Dielectric Loss Tangent	ε Dielectric Constant	D.S. Dielectric Strength (V mil^{-1})
Kerlin (1966)	Teflon 7	86-170	$> 5 \times 10^{17}$	< 0.0002		
Saito (1958)	Teflon, 0.3 Hz-10^6 Hz	293		0.0002	2.10	
McKeown (1965)	Extruded film	298				> 16,000 (rms)

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Teflon 7	Test cells fabricated according to ASTM D 160-59T, unguarded electrode and guard ring diam = 11.4 cm, guarded electrode diam = 10.1 cm, gap width between guarded electrode and guard ring was 0.051 cm, spring loaded Al plunger in contact with the guarded electrode secured specimens between electrodes, General Radio Co. Type 1610-A capacitance - measuring assembly and Federal Telephone and Radio Co. Model FT-H4 Tera-Ohmmeter, tested in vacuum.
Saito, Tanno, Nakajima, Kashimura (1958)	Teflon	0.3 Hz - 10^6 Hz.
McKeown (1965)	Extruded film	t = 0.0048; spherical electrodes embedded in thermoset resin with sample, 60 Hz, surface treated by immersion in liquid-ammonia solution of Na; 9 samples.

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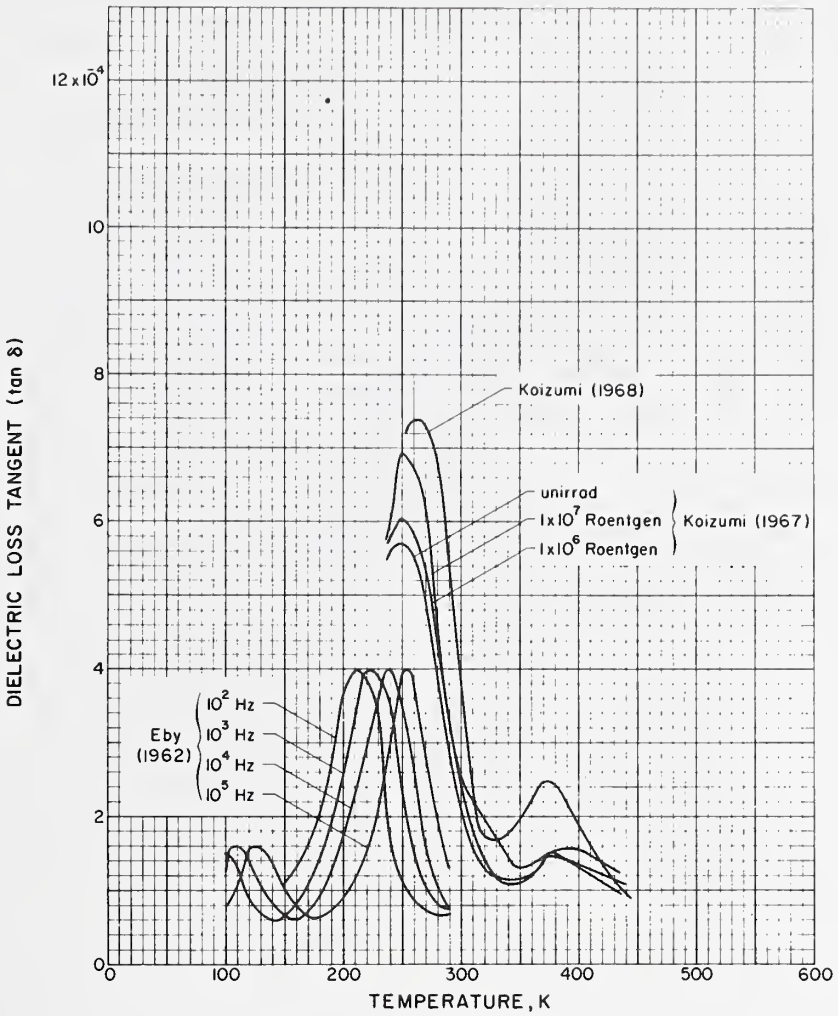
Loss Tangent



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Koizumi, Yano, Tsuji, Nakamura, Kobayashi (1967)	Teflon 100, 11.9 mole % hexafluoropropylene: unirrad, unannealed, sp gr = 2.132, 35% crys; after 1 x 10^6 Roentgen, annealed for 16 h at 473 K, sp gr = 2.151, 45% crys; after 1 x 10^7 Roentgen, unannealed sp gr = 2.136, 40% crys.	Diam = 7.0 cm, t = 0.015 cm; Ando Electric Co. Type TR 10 Transformer Bridge equipped with a Wagner type guard circuit. 1 x 10^5 Hz, temp controlled to ±0.5 K; irrad by Co^{60}; accuracy better than 3%.
Koizumi, Yano, Tsuji (1968)	Neoflon, 15.5 mole % hexafluoroprophylene, sp gr = 2.154, 42% crys	t = 0.015 - 0.020 cm; Al evaporated on specimen surface in high vacuum, Ando Electric Co. Type TR 10 Transformer Bridge equipped with a Wagner type guard circuit, 10 Hz to 3 x 10^5 Hz; accuracy better than 3%.
Eby, Wilson (1962)	10.7 mole % hexafluoropropylene	General Radio 1605-A impedance comparator; estimated error limits = ± 1 x 10^{-4}.

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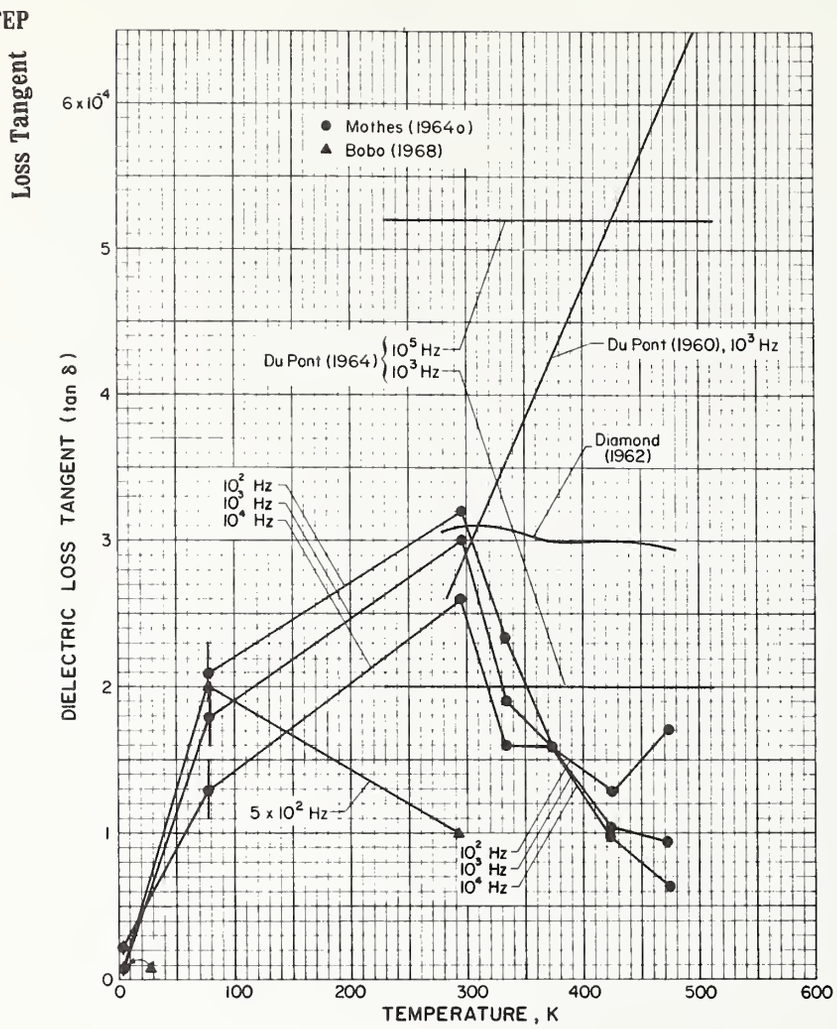
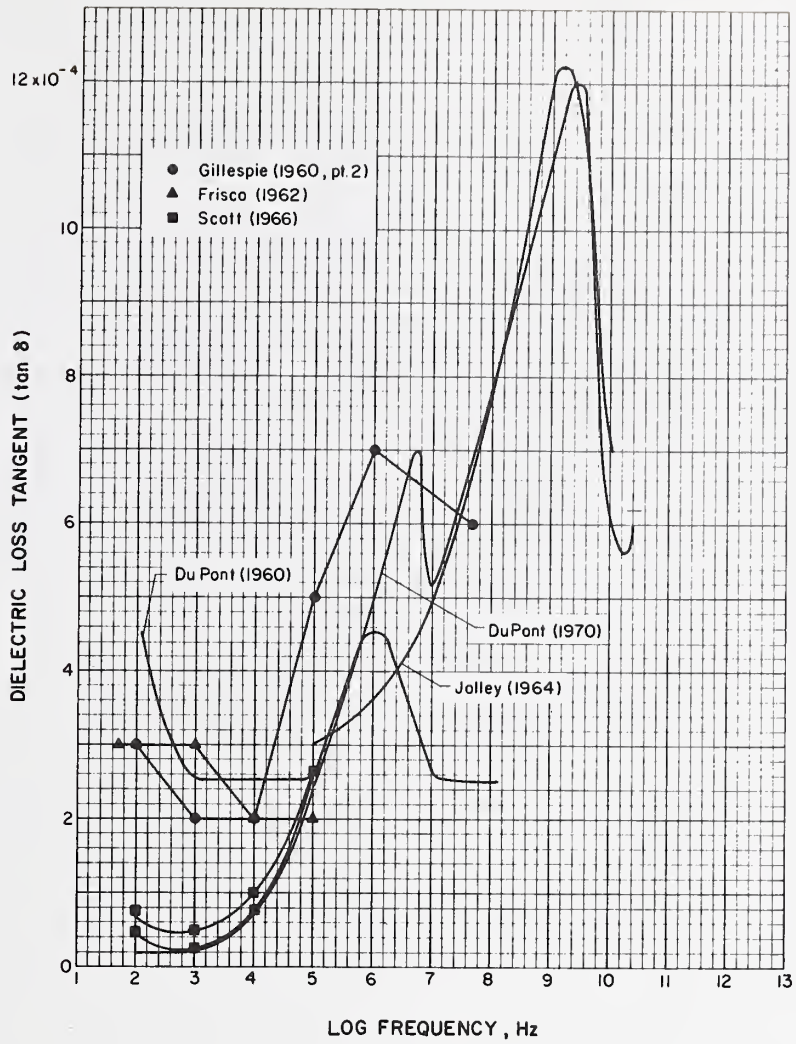


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Diamond (1962)	Teflon	10^3 and 10^5 Hz.
Mathes (1964a)	Teflon	Nominal t = 0.013 cm; electrodes were evaporated Au backed up by a coating of #4132 Du Pont Ag paint, opposite electrodes with a diam of 2.54 cm and 3.18 cm; error bars indicate data spread, no corrections for edge effects or changes in specimen dimensions with temp change, data also given for intermediate frequencies of 2×10^2, 5×10^2, 2×10^3 and 5×10^3 Hz.
DuPont (1960	Teflon	
DuPont (1964)	Teflon, type A and C films	ASTM D 150-59T test procedure.
Bobo, Perrier (1968)	Teflon	t = 0.0025 - 0.0200; 2.5 - 3.5 × 10^3 V, 5 × 10^2 Hz.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Gillespie, Saxton, Chapman (1960, part 2)	Teflon 100 X	ASTM D 150-54 T test procedure, 296 K.
Frisco (1962)	Teflon, FEP-100	Stored under room conditions for at least 2 weeks before measurement.
Jolley, Homsy, Reed (1964)	Teflon	296 K.
Scott, Kinard, Jr. (1967)	Laboratory grade stock, compression molded	Measurements made without contact electrodes using air-gap technique, used discs with diam = 8.5 cm and t = 0.2-0.5 cm, some discs with diam = 3.8 cm prepared with 1500 Å thick evaporated Au electrodes; low-voltage Schering bridge used with guard-ring micrometer-electrode cell; estimated error = ± 1-3%.
Du Pont Co. (1970)	Teflon	298 K.
DuPont Co. (1960)	Teflon	296 K.

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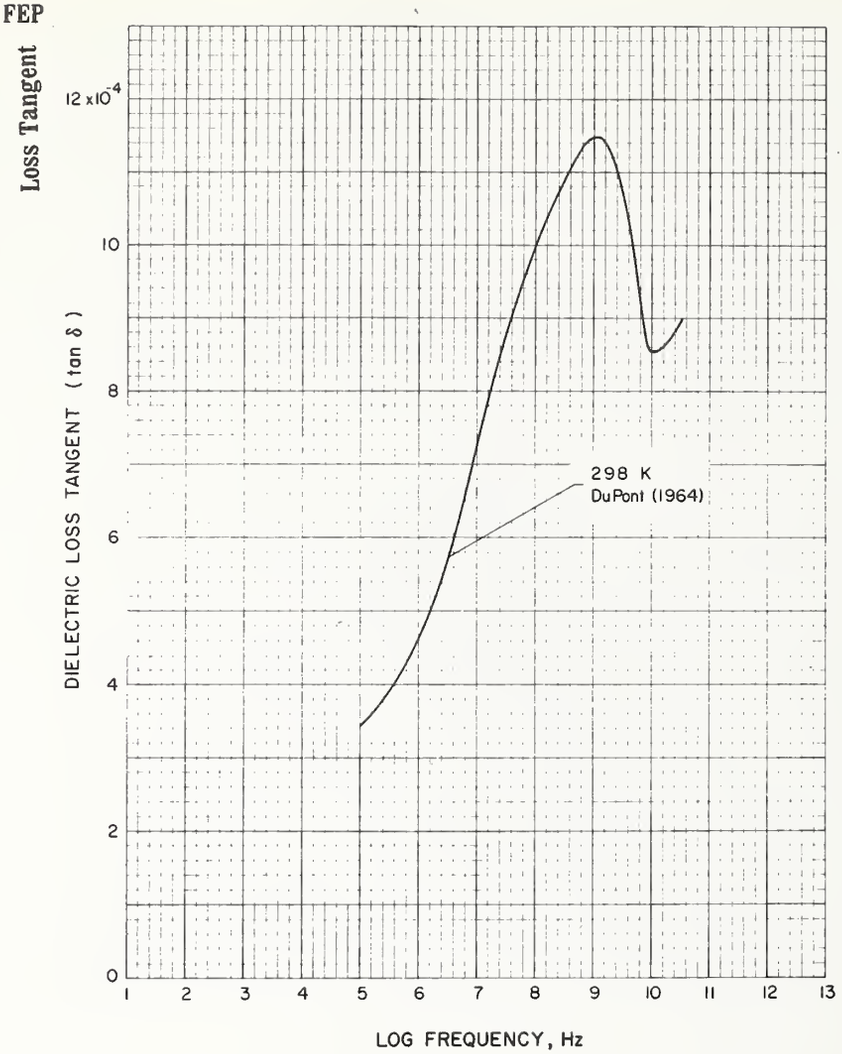
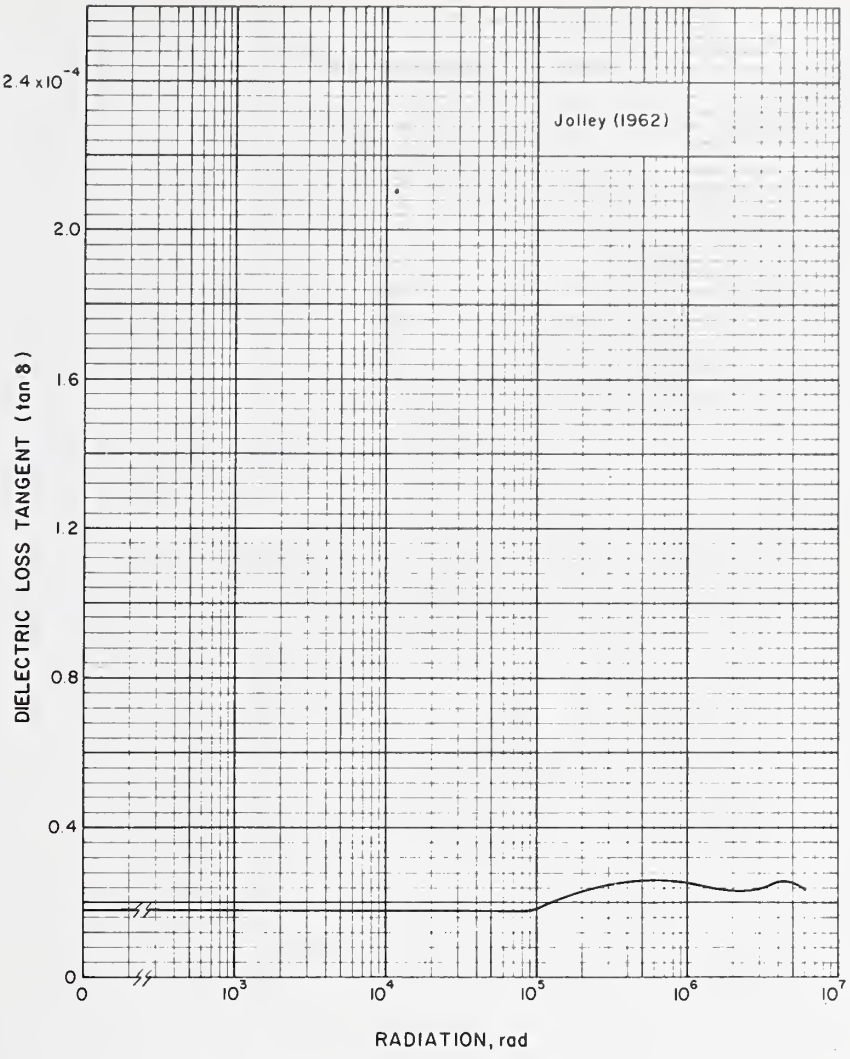


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
DuPont (1964)	Teflon, Type A and C film	ASTM-D-150-59T test procedure, 298K; measurements at 10^2, 10^3, and 10^4 Hz were were below 0.0001.



INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Jolley, Reed (1962)	Teflon 100	10^2 - 10^5 Hz, vacuum irrad, 298 K; from private conversation with John Hopkins University, Dielectrics Lab.

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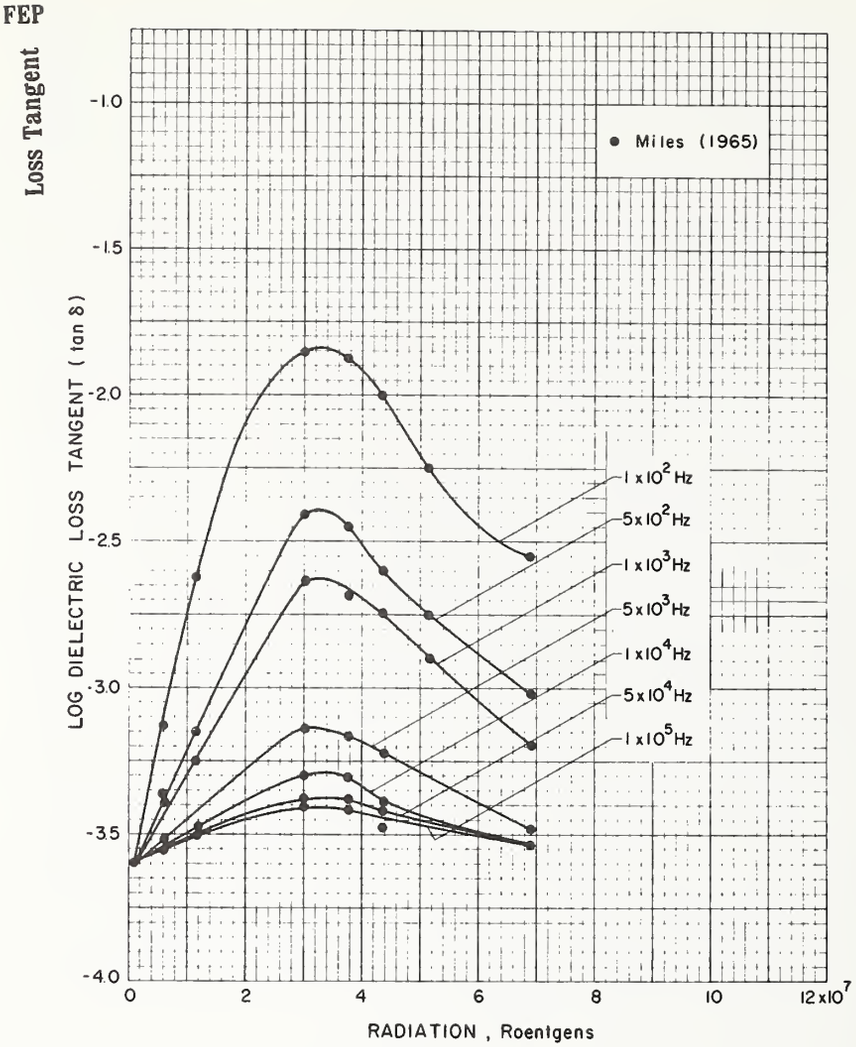
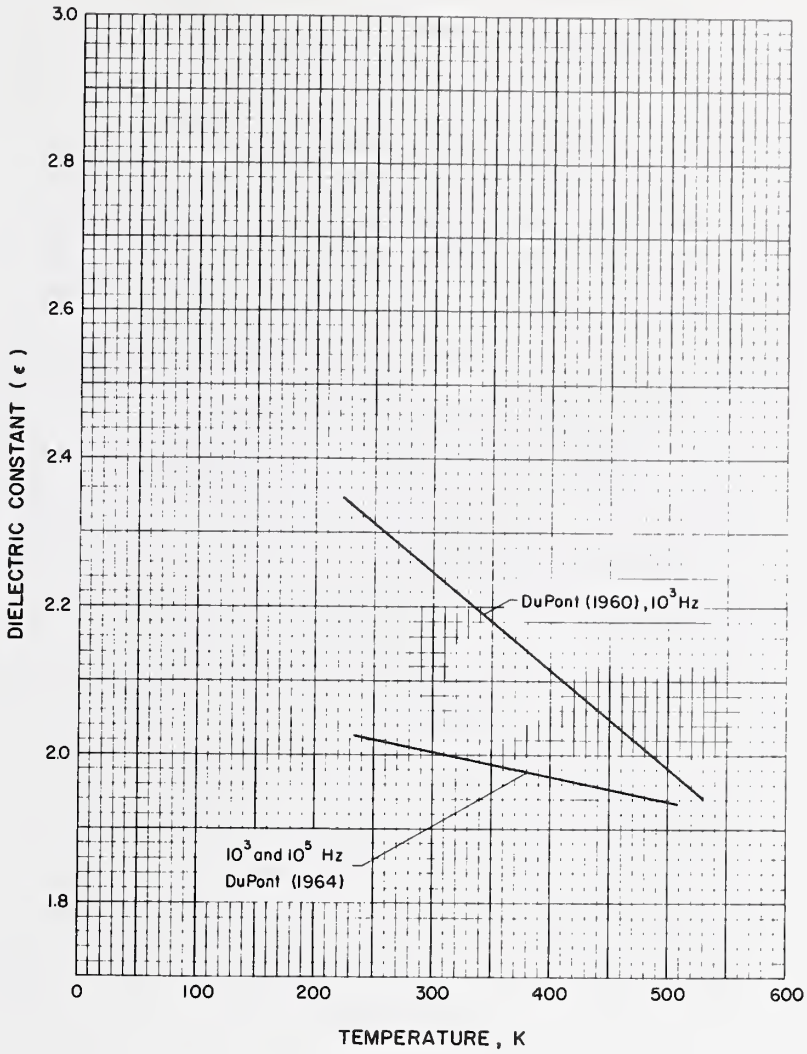


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Miles, Newell (1965)	Teflon, FEP	Discs 7.62 cm diam, t = 0.305 cm; electrodes coated with silver paint, diam of guarded electrode 6.35 cm; General Radio Model 716 Schering bridge and associated guard circuit, three electrode technique, quoted accuracy of bridge ± 0.1 pF for capacitance readings, pressure during tests ranged from 5×10^{-7} to 2×10^{-6} torr; irradiated with Co^{60} source.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
DuPont (1960)	Teflon	
DuPont (1964)	Teflon, type A and C films	ASTM D 150-59T test procedure .

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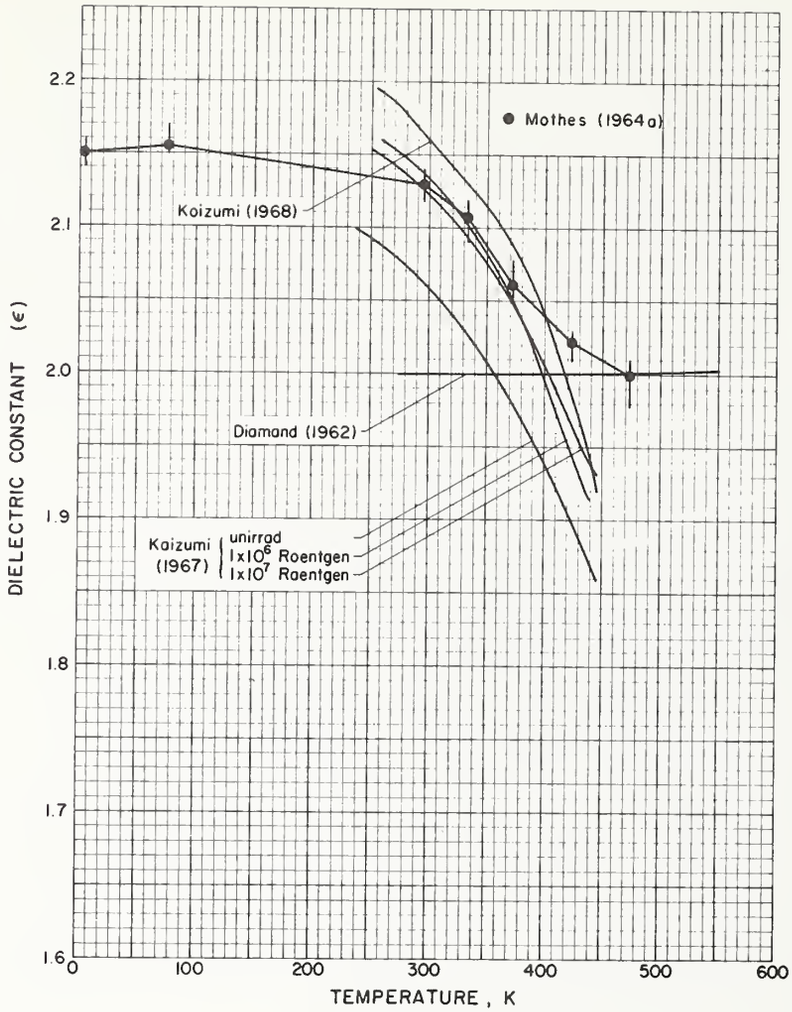
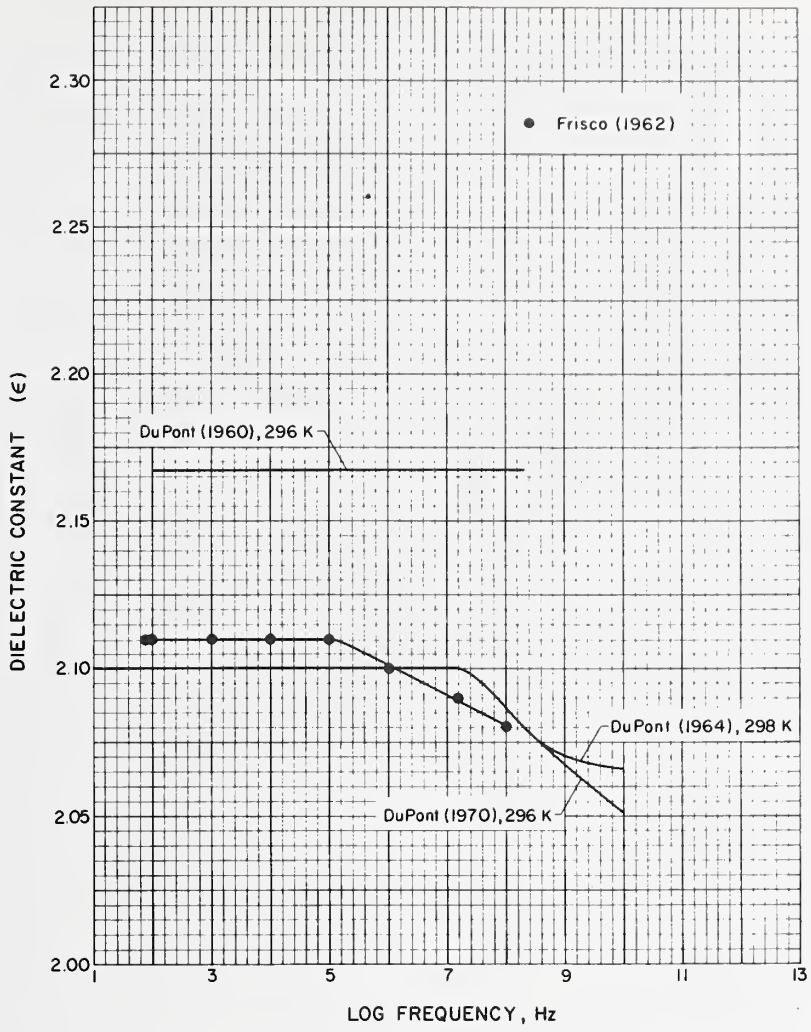
Dielectric Constant



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Koizumi, Yano, Tsuji, Nakamura, Kobayashi (1967)	Teflon 100, 11.9 mole % hexafluoropropylene unirrad, unannealed, sp gr = 2.132 35% crys; after 1×10^6 Roentgen, annealed for 16 h at 473 K, sp gr = 2.151 45% crys; after 1×10^7 Roentgen, unannealed, sp gr = 2.136, 40% crys.	Diam = 7.0 cm, t = 0.015 cm; Ando Electric Co. Type TR 10 Transformer Bridge equipped with a Wagner-type guard circuit, 1×10^5 Hz, temp controlled to ± 0.5 K; accuracy better than 3%.
Koizumi, Yano, Tsuji (1968)	Neoflon, 15.5 mole % hexafluoropropylene, sp gr = 2.154, 42% crys.	t = 0.015 - 0.020 cm; Al evaporated on specimen surface in high vacuum, Ando Electric Co. Type TR 10 Transformer Bridge equipped with a Wagner-type guard circuit, 10 Hz to 3×10^5 Hz; accuracy better than 3%.
Diamond (1962)	Teflon	10^3 and 10^5 Hz.
Mathes (1964a)	Teflon	Nominal t = 0.013 cm; electrodes were evaporated Au backed up by a coating of #4132 DuPont Ag paint, opposite electrodes with a diam of 2.54 cm and 3.18 cm; av of 3 specimens, error bars indicate data spread, no corrections for edge effects or changes in specimen dimensions with temp change, nearly identical results were obtained at 10^2, 10^3, and 10^4 Hz.

Dielectric Constant



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Frisco (1962)	Teflon, FEP-100	Stored under room conditions for at least 2 weeks before measurement.
DuPont Co. (1970)	Teflon	Molded disc; 296K.
DuPont (1960)	Teflon	
DuPont (1964)	Teflon, type A and C films	ASTM D150-59T test procedure, 298 K.

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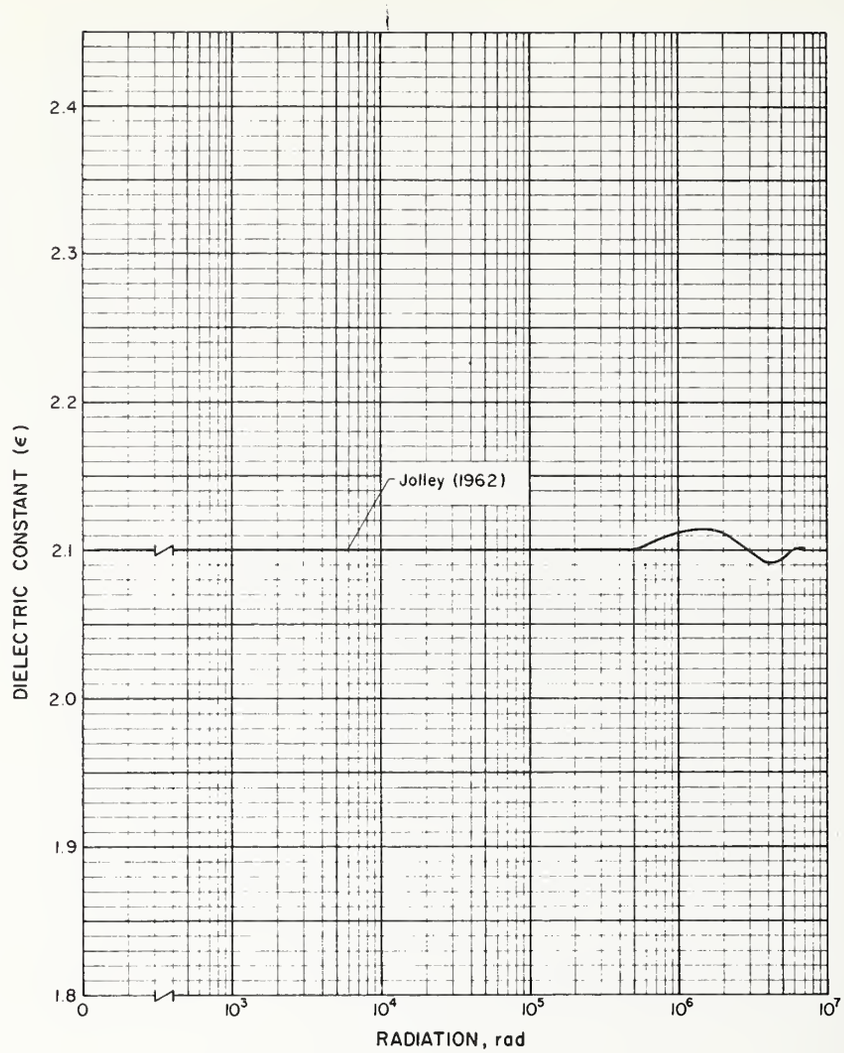
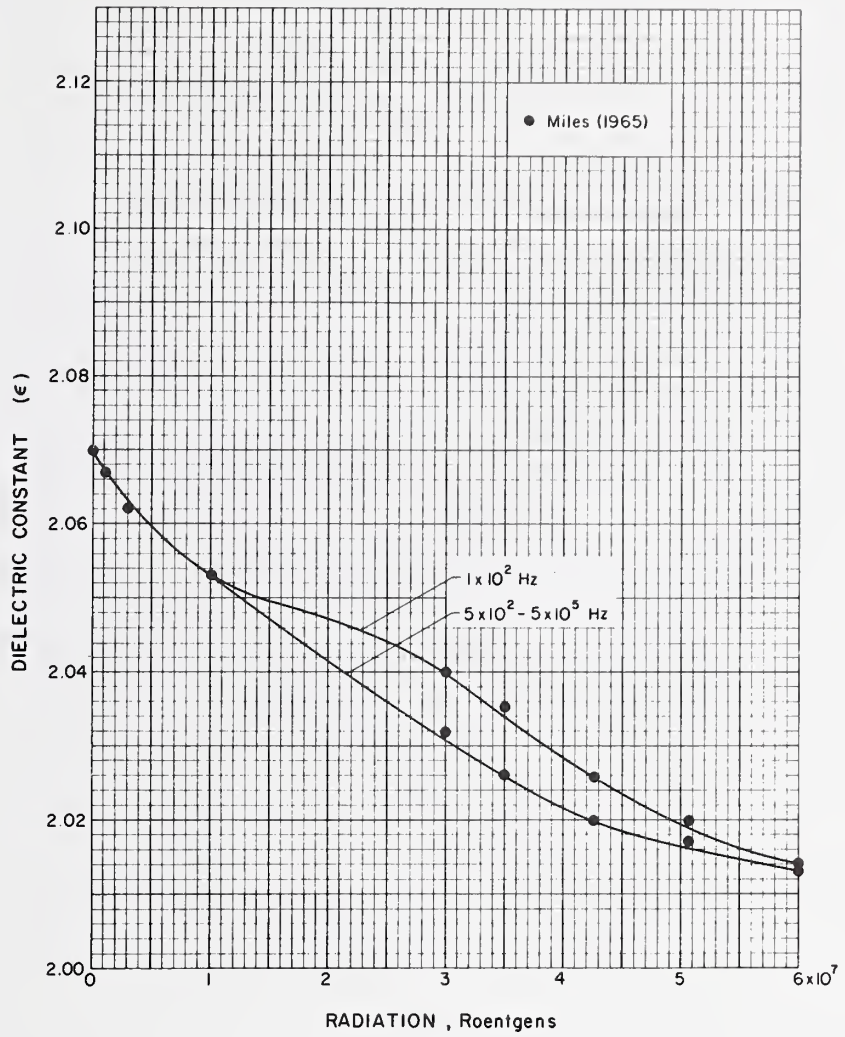
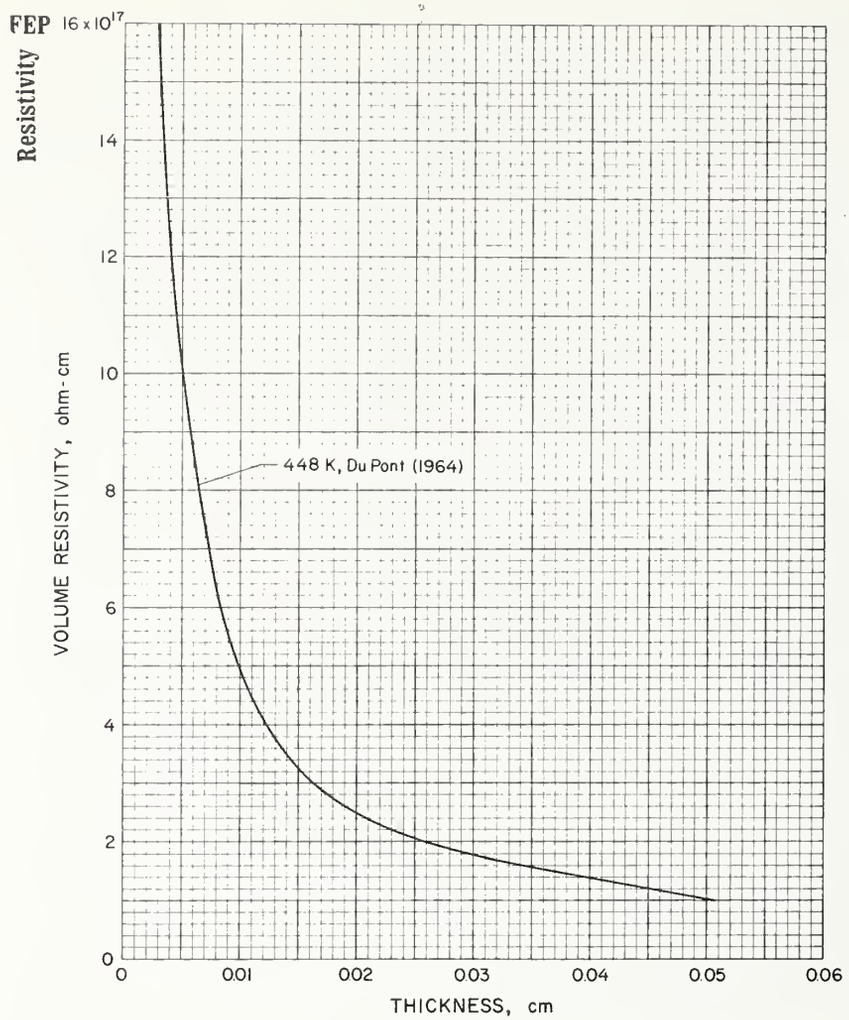
Dielectric Constant



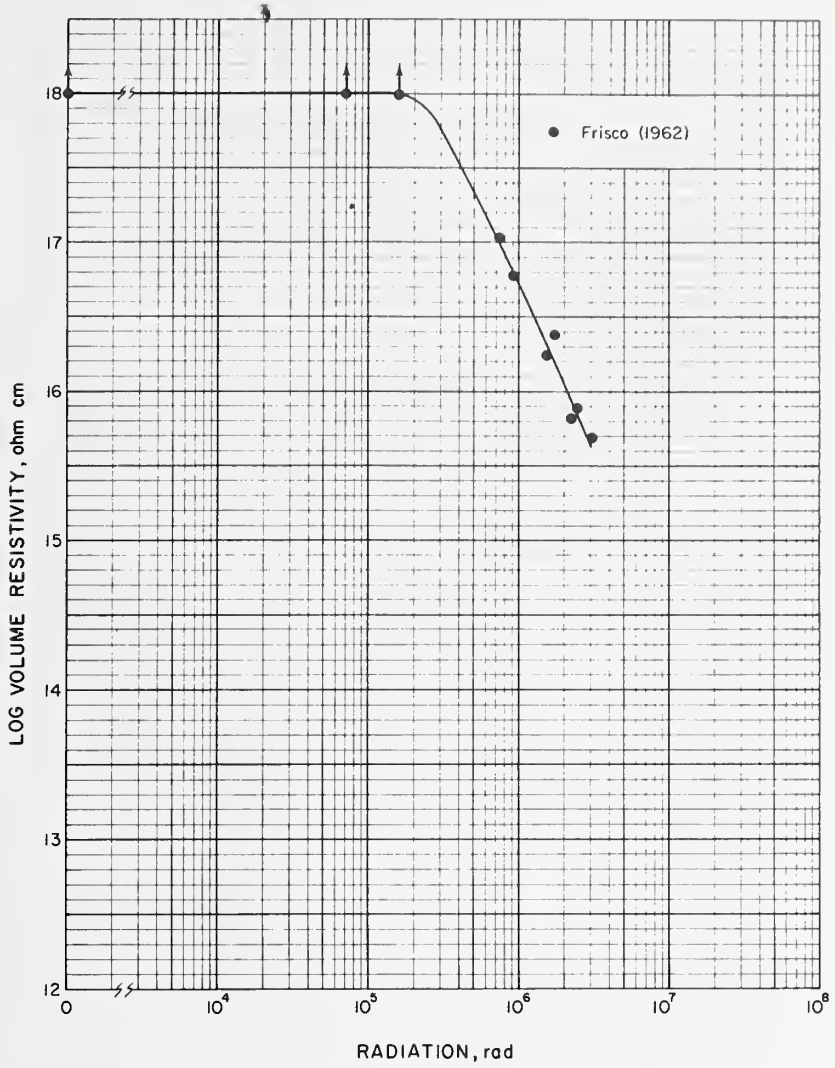
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Jolley, Reed (1962)	Teflon 100	10^2 - 10^5 Hz, vacuum irrad, 298 K; from private conversation with John Hopkins University, Dielectrics Lab.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Miles, Newell (1965)	Teflon	Diam = 7.62 cm, t = 0.305 cm; electrodes coated with silver paint, diam of guarded electrode = 6.35 cm, General Radio Model 716 Schering bridge and associated guard circuit, 3 electrode technique, tested in vacuum, measurements at 0.5, 1, 5, 10, 50, and 500 x 10^3 Hz gave same result; irrad by Co^{60}.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
DuPont (1964)	Teflon, FEP, type A and C films	ASTM D 150-59T; measurements at 10^2, 10^3 and 10^4 Hz were below 1.0×10^{-4}.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Frisco (1962)	Teflon, FEP-100	Circular area = 1.0 cm^2, t = 0.05 cm; irrad by Ag x-rays in vacuum; arrow indicates "greater than".

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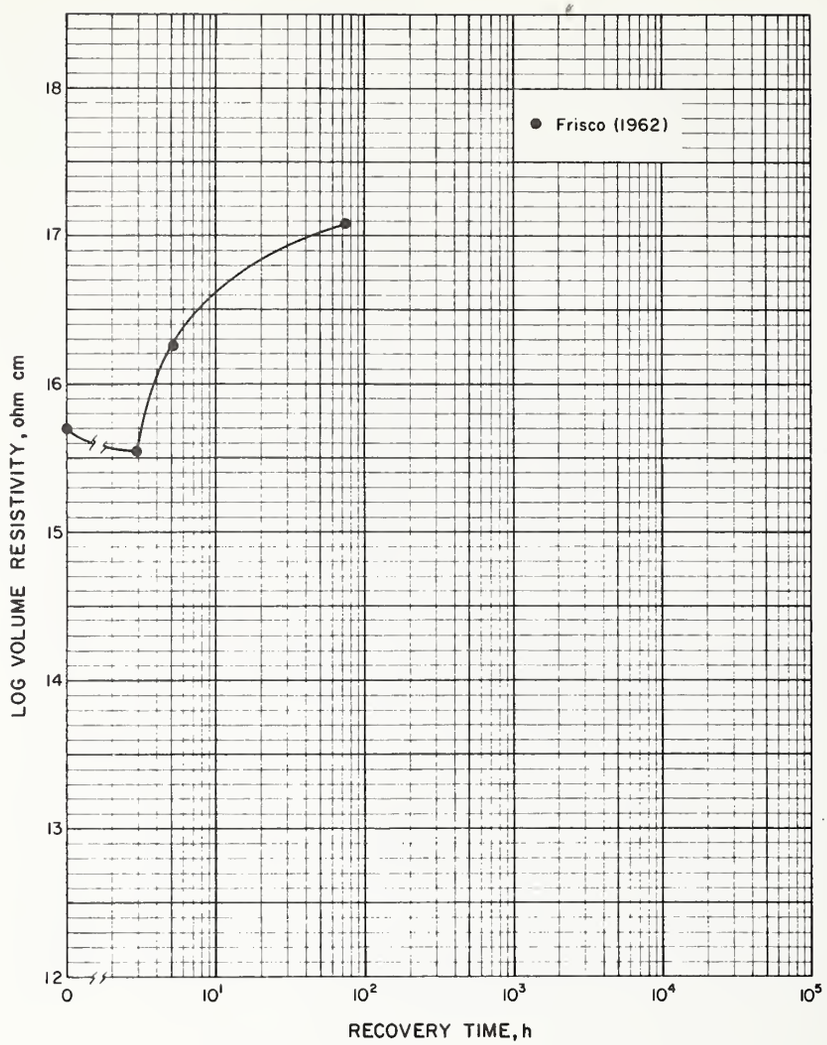
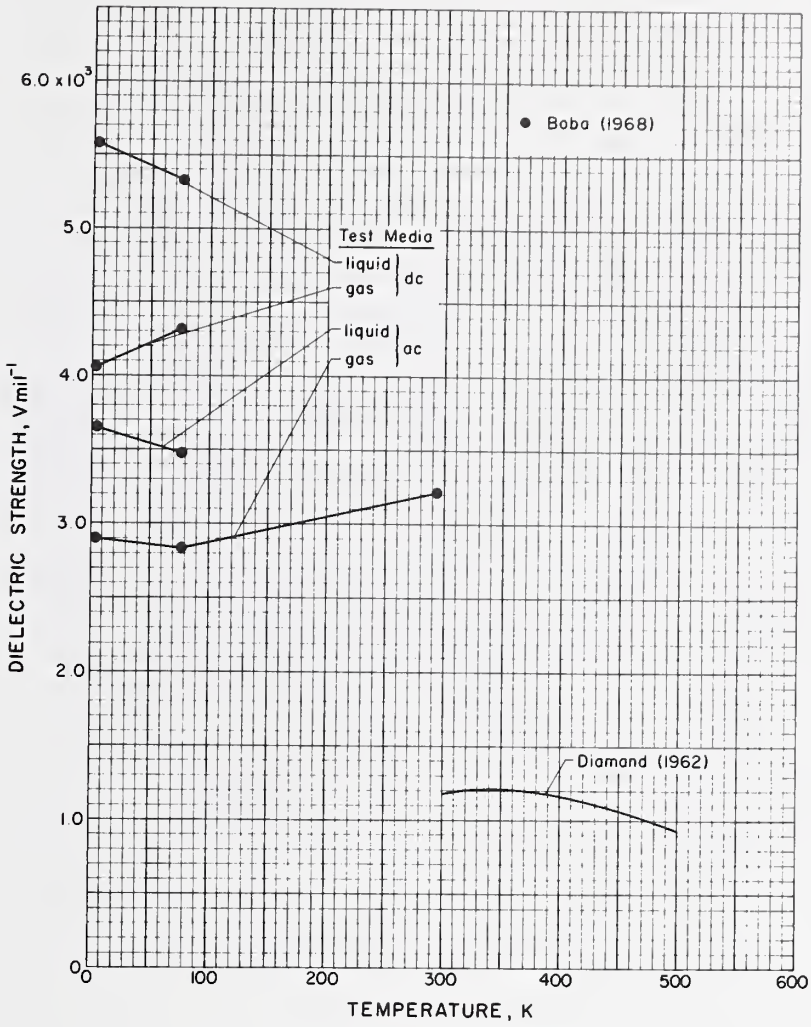
Resistivity



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Frisco (1962)	Teflon, FEP-100	Circular area = 1.0 cm^2, t = 0.05 cm; ρ measured after a vacuum irradiation of 3.08×10^6 rad using Ag x-rays, sample remained in vacuum.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Diamond (1962)	Teflon	Short-time, ASTM D 149-55T test procedure
Bobo, Perrier (1968)	Teflon	t = 0.01 cm; electrodes were 3.0 cm diam spheres, voltage increased at 5 x 10^6 V s^{-1}, ac and dc tests made in air and helium in gas and liquid form.

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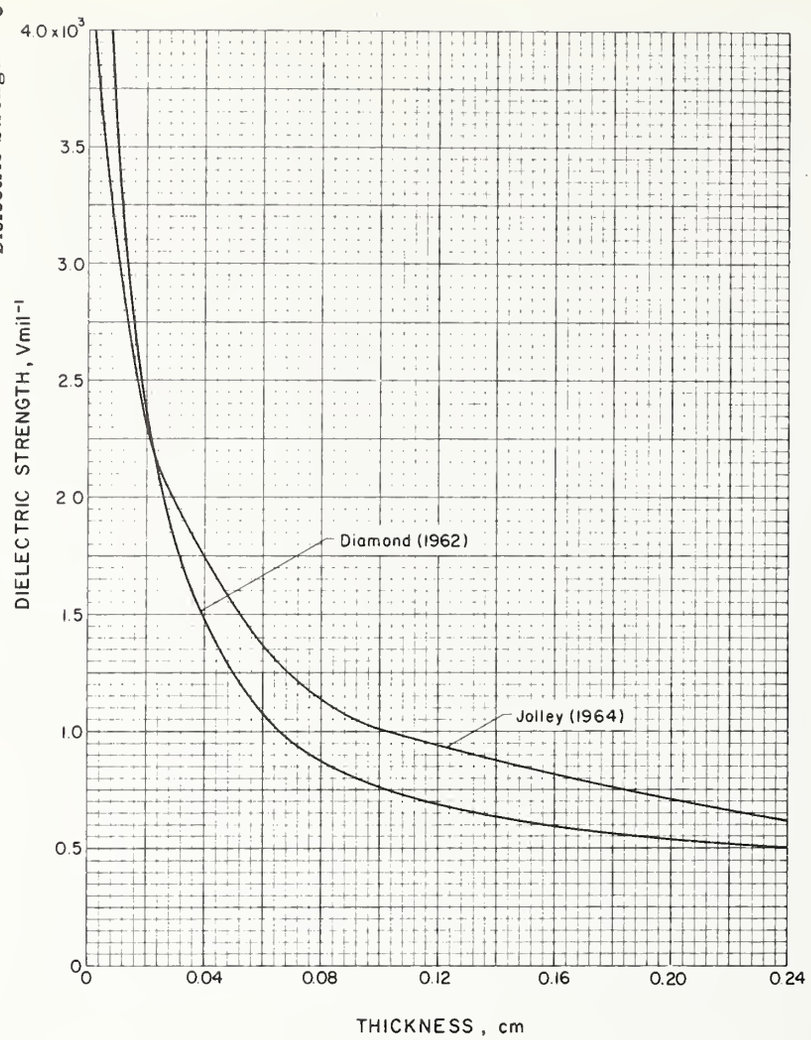
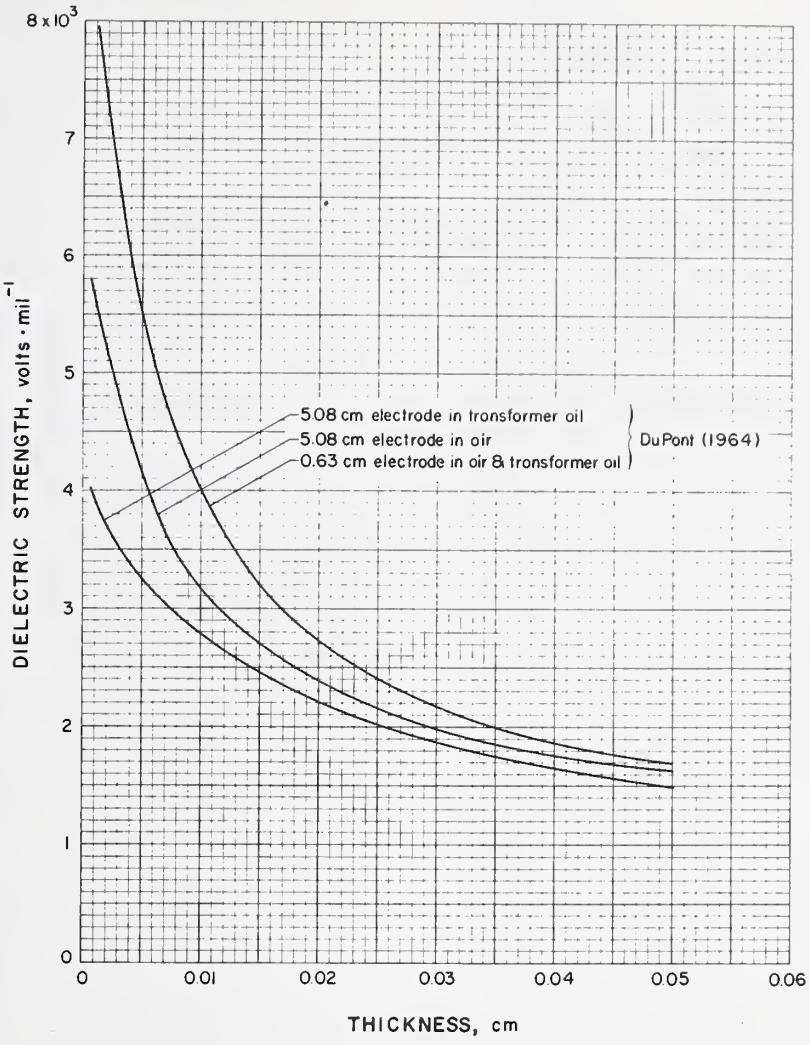


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Diamond (1962)	Teflon	Short-time, ASTM D 149-55 T test procedure.
Jolley, Homsy, Reed (1964)	Teflon	Short-time.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
DuPont (1964)	Teflon, FEP	ASTM-D-149-61 test procedure.

Investigator(s) (year)	Material Identification	Temperature (K)	ρ Volume Resistivity (ohm-cm)	Tan δ Dielectric Loss Tangent	ε Dielectric Constant	D.S. Dielectric Strength (V mil^{-1})
Mallouk (1958)	Teflon 100X	298	$> 10^{18}$	< 0.0003	2.1	2000-4000
Gillespie (1960, pt. 2)	Teflon 100X	298	$> 10^{19}$		2.1	
Jolley (1964)	Teflon	296	$> 10^{18}$		2.1	500-600
Frisco (1962)	FEP-100	297				2200

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mallouk, Thompson (1958)	Teflon 100X, sp gr = 2.1	
Gillespie, Saxton, Chapman (1960, pt.2)	Teflon 100X	ε measured at 60 - 6×10^7 Hz and 3×10^9 Hz.
Jolley, Homsy, Reed (1964)	Teflon	ρ measured at 50% rel hum using ASTM D 257 test procedure; ε measured at 60 and 10^6 Hz using ASTM D150 test procedure; D.S. measured in short term by ASTM D149 test procedure.
Frisco (1962)	FEP-100	t = 0.030 cm; vacuum tested, 60 Hz; 1 test.

Polytetrafluoroethylene (TFE) and Tetrafluoroethylene-Hexafluoropropylene (FEP) Electrical Properties References

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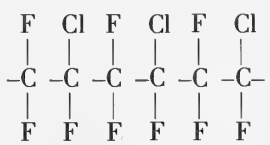
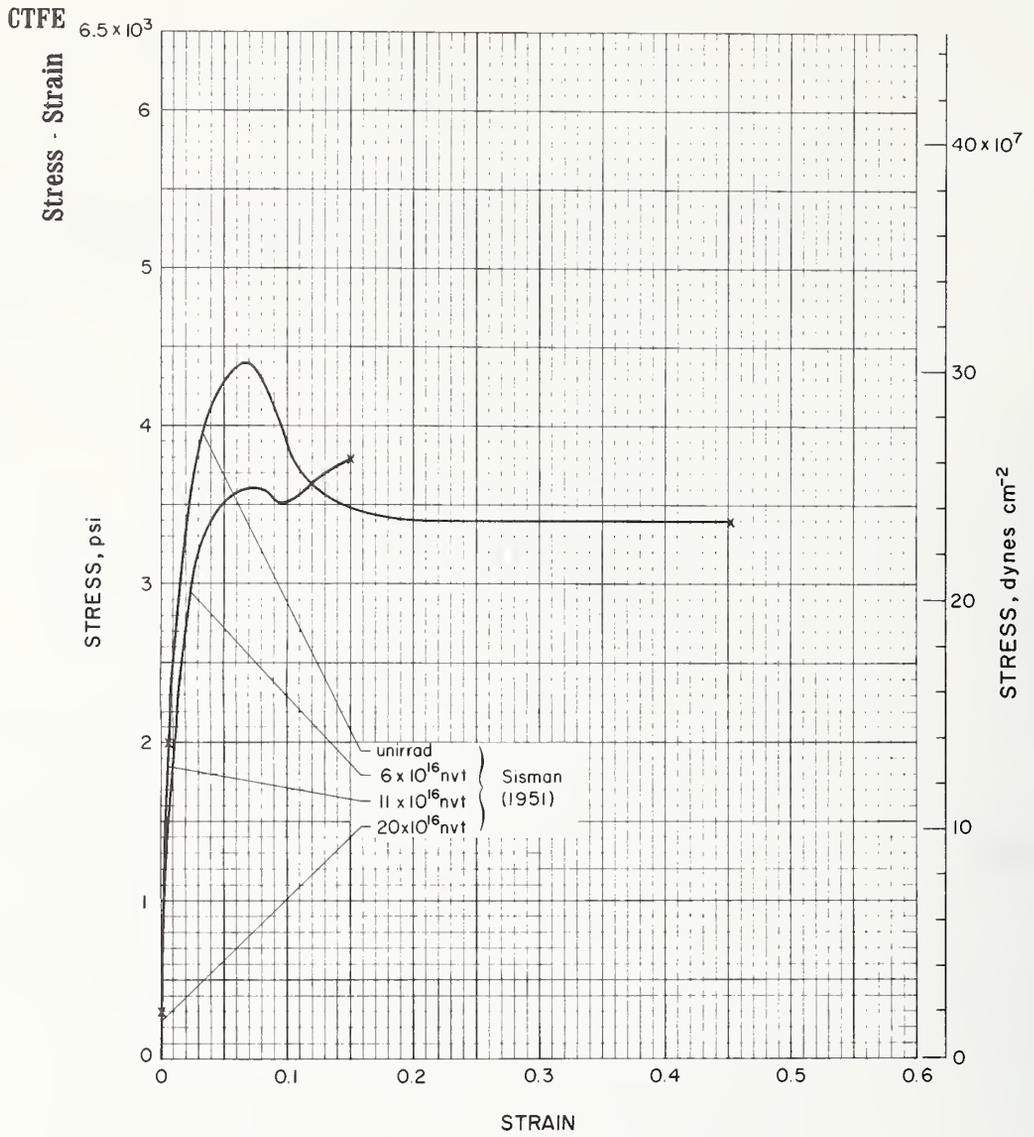
7. Polychlorotrifluoroethylene (CTFE)

A. Summary

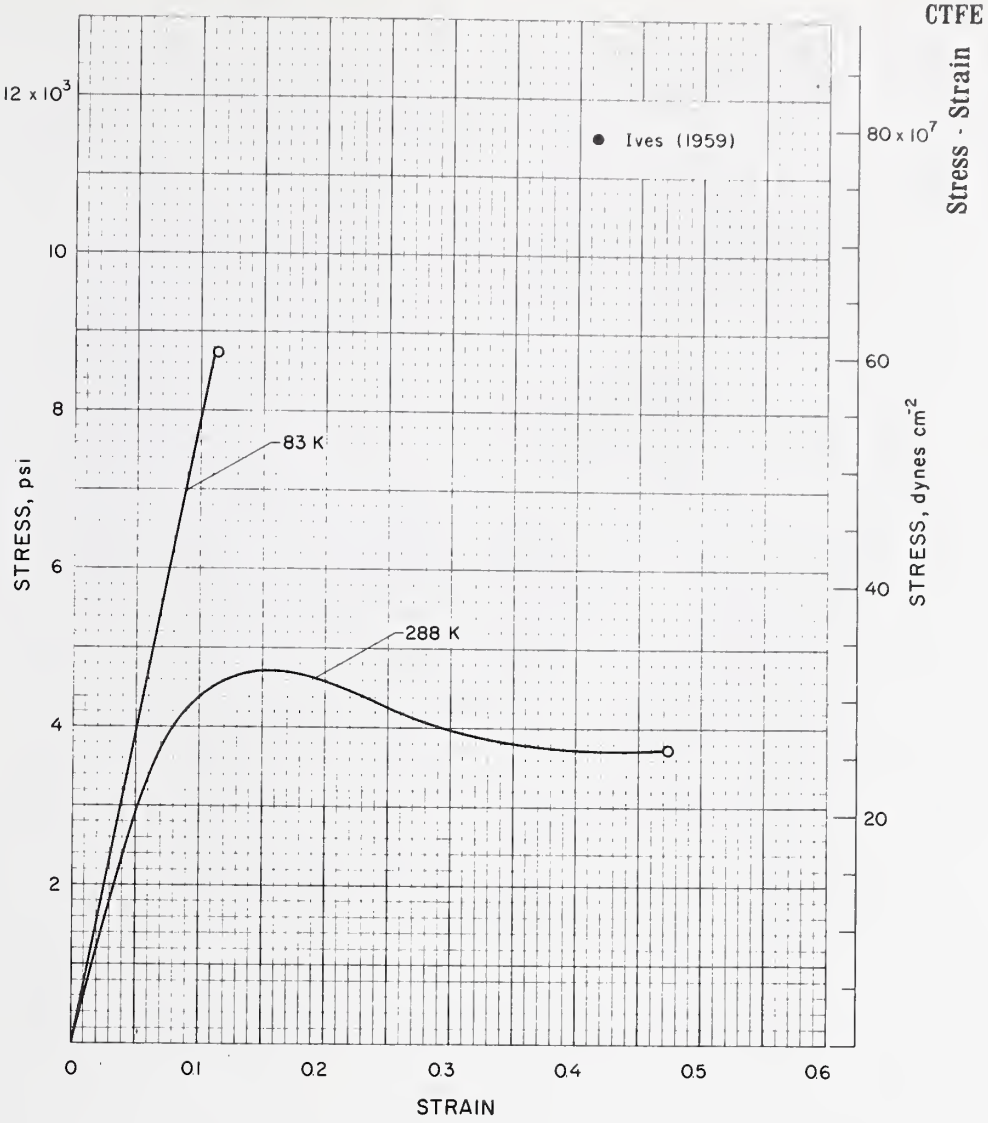
Polychlorotrifluoroethylene is second only to TFE and FEP for its high temperature strength, chemical inertness, inability to absorb moisture, and low coefficient of friction. The addition of the one chlorine bond is sufficient to lower its melt viscosity to permit extrusion and molding. Other than slight degradation of the mechanical properties, this one bond makes the molecule significantly more polar and the high frequency electrical properties are degraded. Quenching or slow cooling allows a large variation in crystallinity and a wide range of mechanical and optical properties. Common uses of CTFE are for insulation, tubing, gaskets, seals, coatings, and laminates.

	CTFE
Chemical Formula	$(CF_2\,CFCl)_n$
Chemical Structure	
Significant Properties:	
Density (295 K)	2.1 gm cm^{-3}
Crystalline melting point	491 K
Molecular weight	$1–4 \times 10^6$
Crystallinity	Variable
Approximate transition regions	230–280 K, 315–400 K, 400–485 K
Chemical resistance	Highly resistant
Tensile strength (295 K)	5,000 psi
Thermal expansion coefficient (295 K)	10^{-4} K^{-1}
Dielectric constant (10^5 Hz), (295 K)	2.5
Dielectric loss tangent (10^5 Hz), (295 K)	0.02

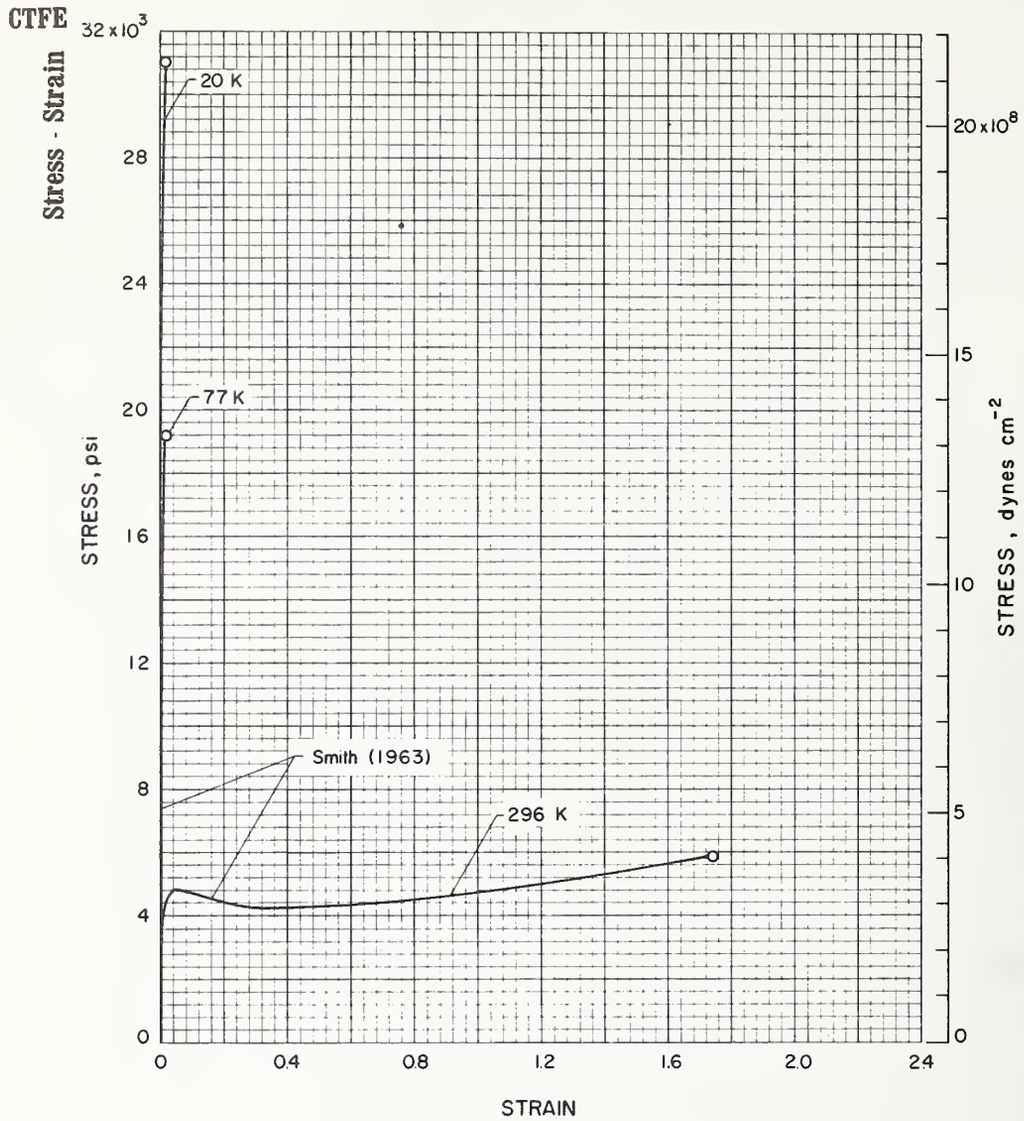
Trade names occurring in the references compiled:
Fluorofilm-3, Fluorolube, Fluoroplast-3, Fluorothene, Hastaflon, Kel-F, and Trithene.



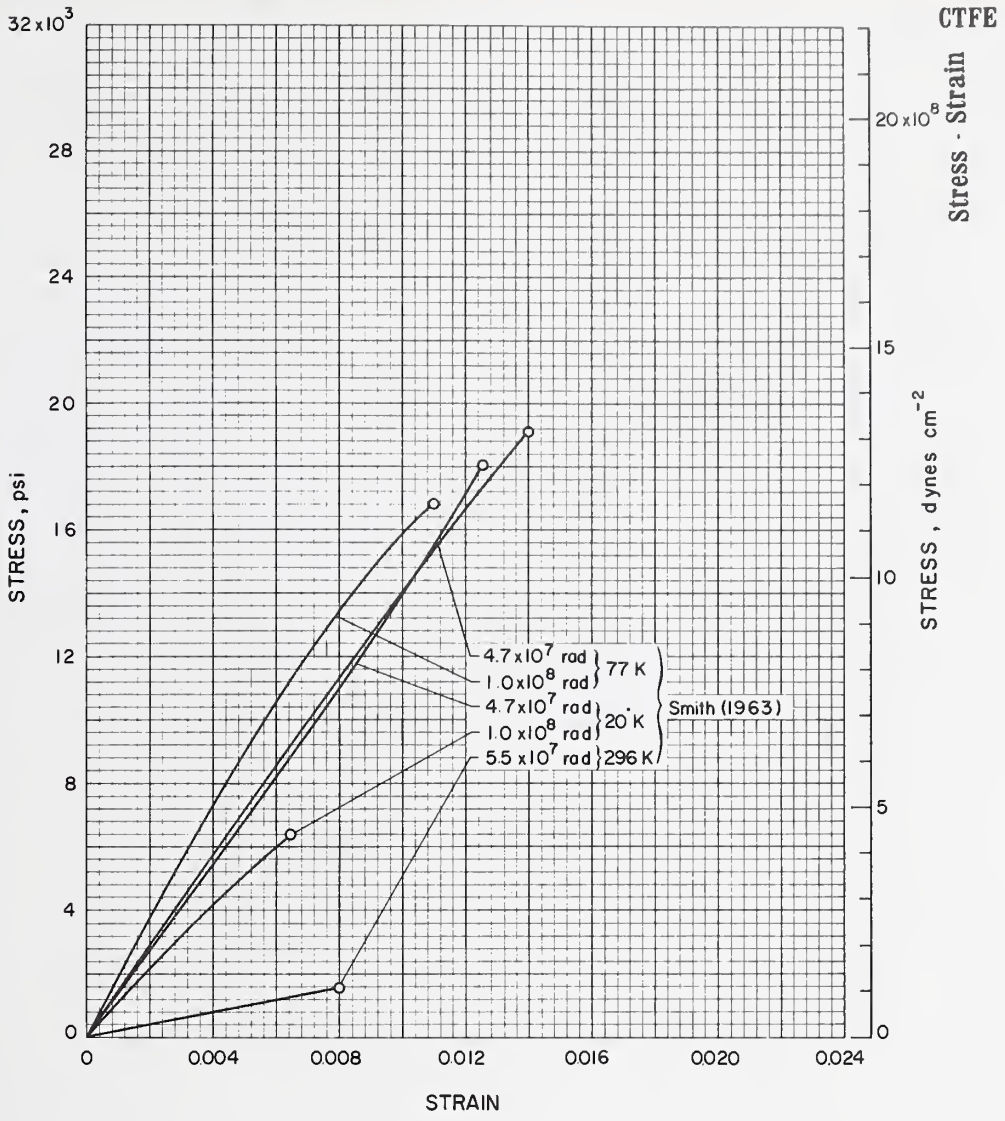
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sisman, Bopp (1951)	Fluorothene	Red Sec ℓ = 5.72 cm, w = 1.27 cm; modified ASTM D 638-49T test procedure, Baldwin Southwark testing machine, xhd spd = 0.0021 cm s^{-1} to a strain of 0.02 and then xhd spd = 0.0085 cm s^{-1}; irrad in Hole 19 of ORNL reactor at 298-313 K, and in air, aged 7 days at 298 ± 1 K and 50 ± 2% rel hum before testing.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ives, Mead (1959)		Dumbbell specimens; ±1 K with time and over length of sample at low temp.



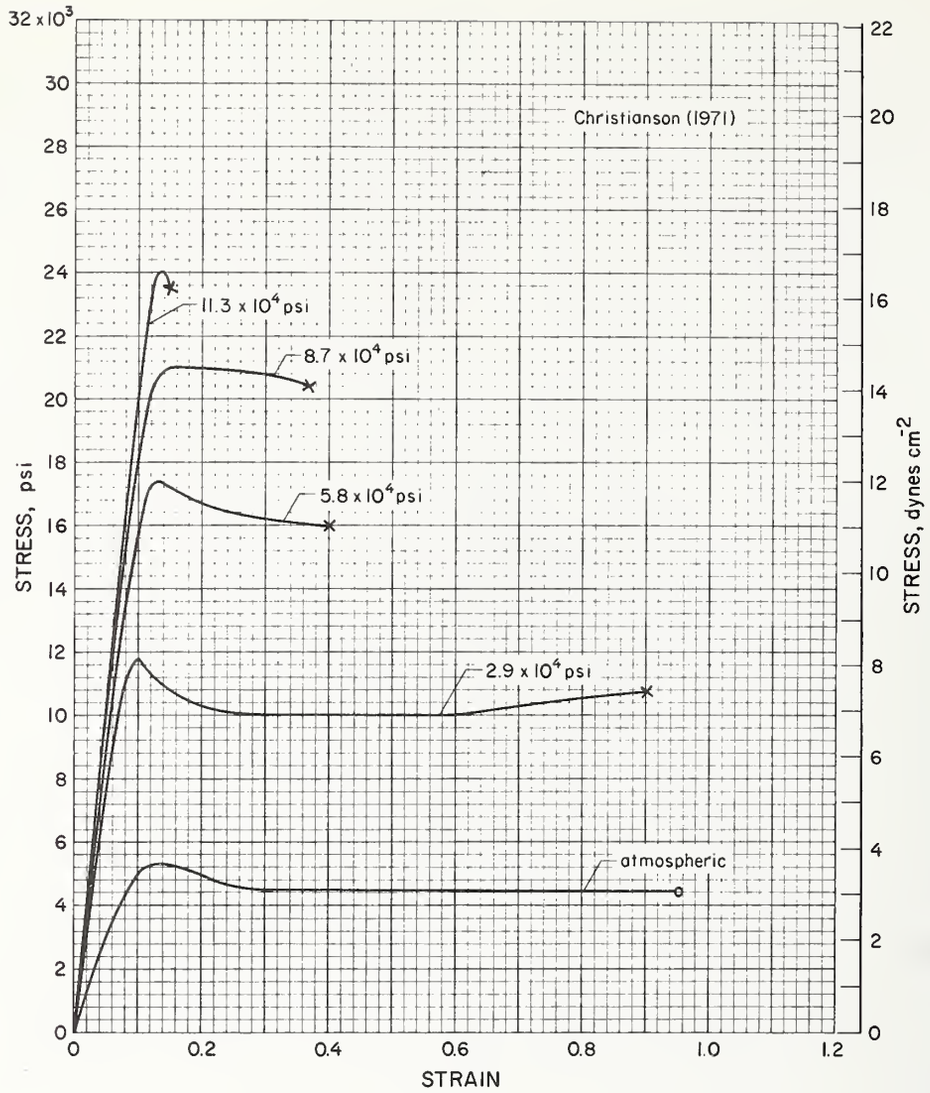
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Smith (1963)	Kel-F-81	GL = 5.08 cm; extensometer used at room temp, calculated extensometer values used at cryogenic temp, testing performed in liquid nitrogen or hydrogen.



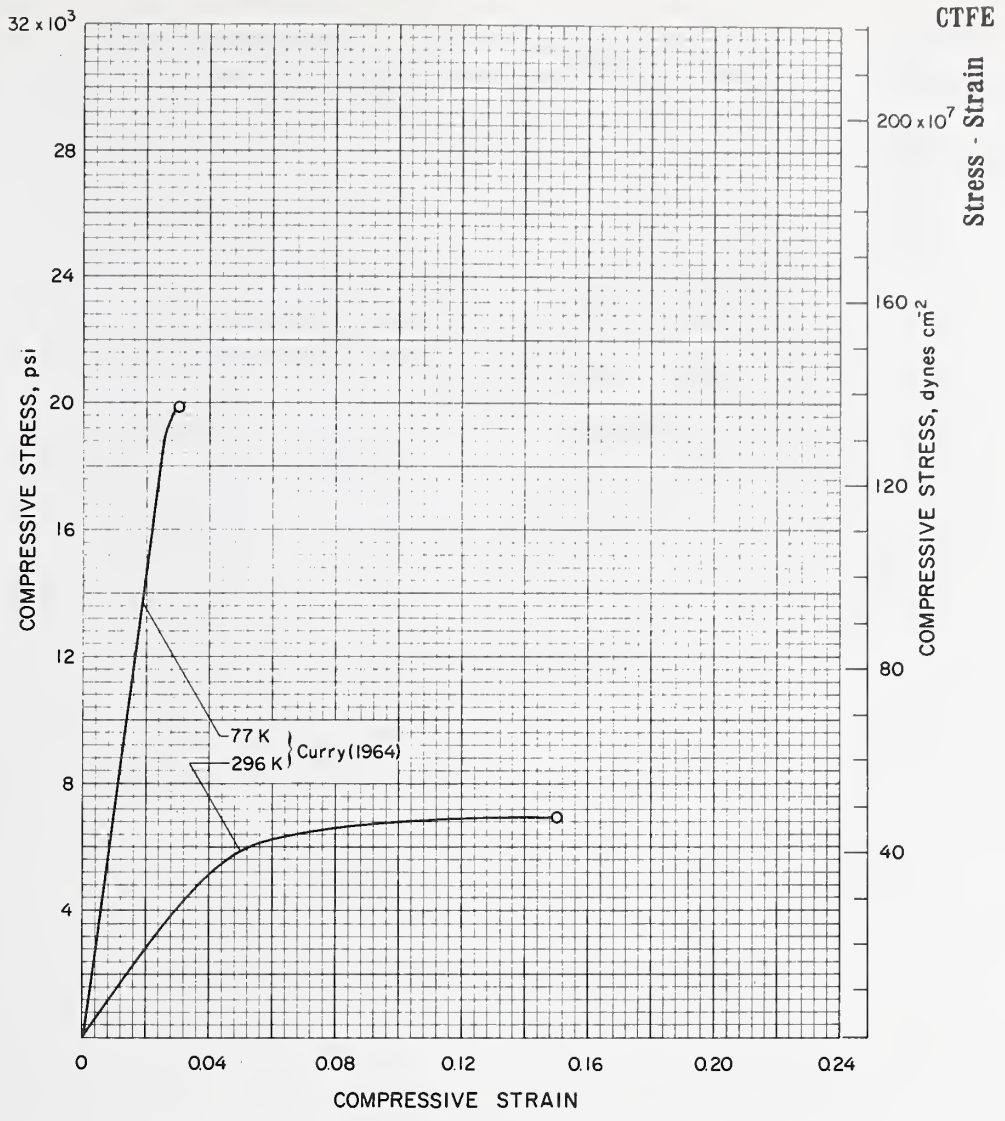
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Smith (1963)	Kel-F-81	GL = 5.08 cm; extensometer used at room temp, calculated extensometer values used at cryogenic temp, cryogenic irradiation and testing performed in liquid nitrogen or hydrogen; irrad by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth.

CTFE

Stress - Strain



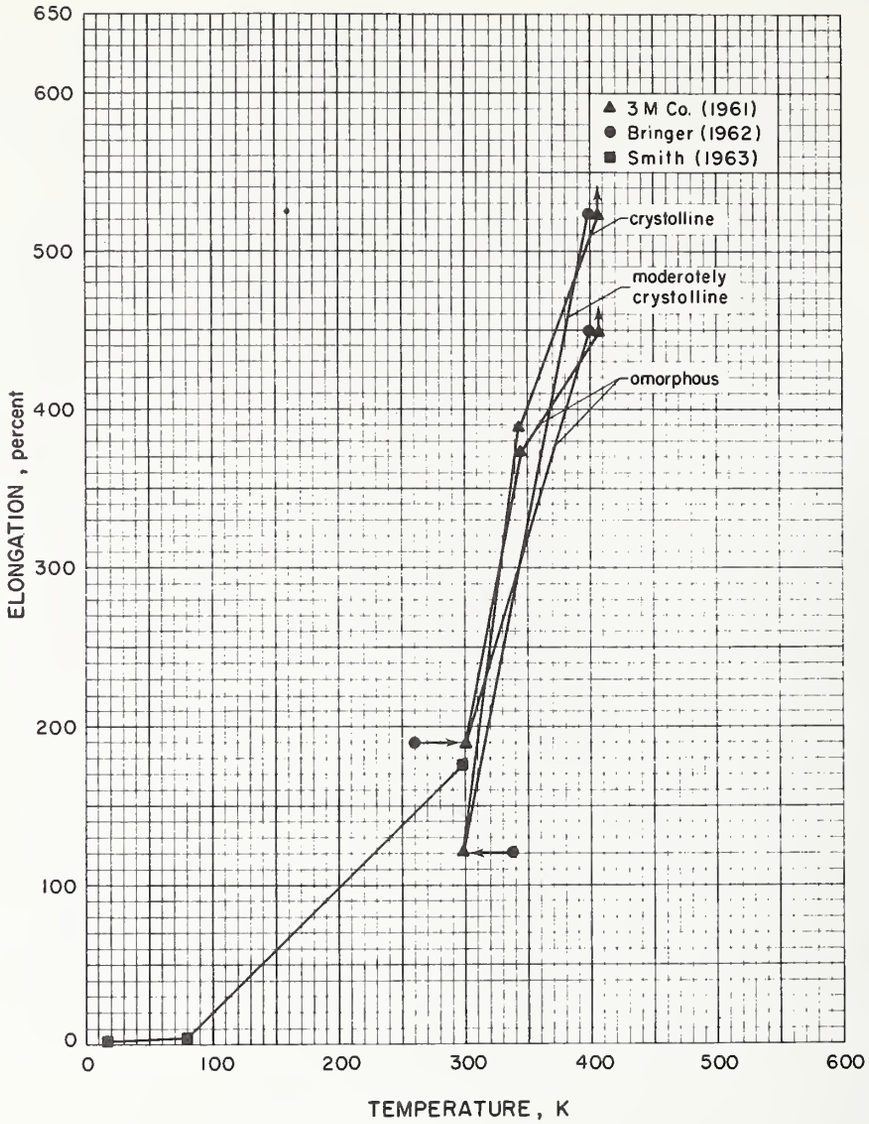
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Christiansen, Baer, Radcliffe (1971)	Kel-F-81, Grade III, semi-crystalline, 1.3 cm diam rod	Machined to diam = 0.38 cm, ℓ = 1.52 cm; measurements made while the samples were under a hydrostatic pressure transmitted through castor oil, xhd spd = 0.00025 cm s^{-1}, 300 K, pressure noted.



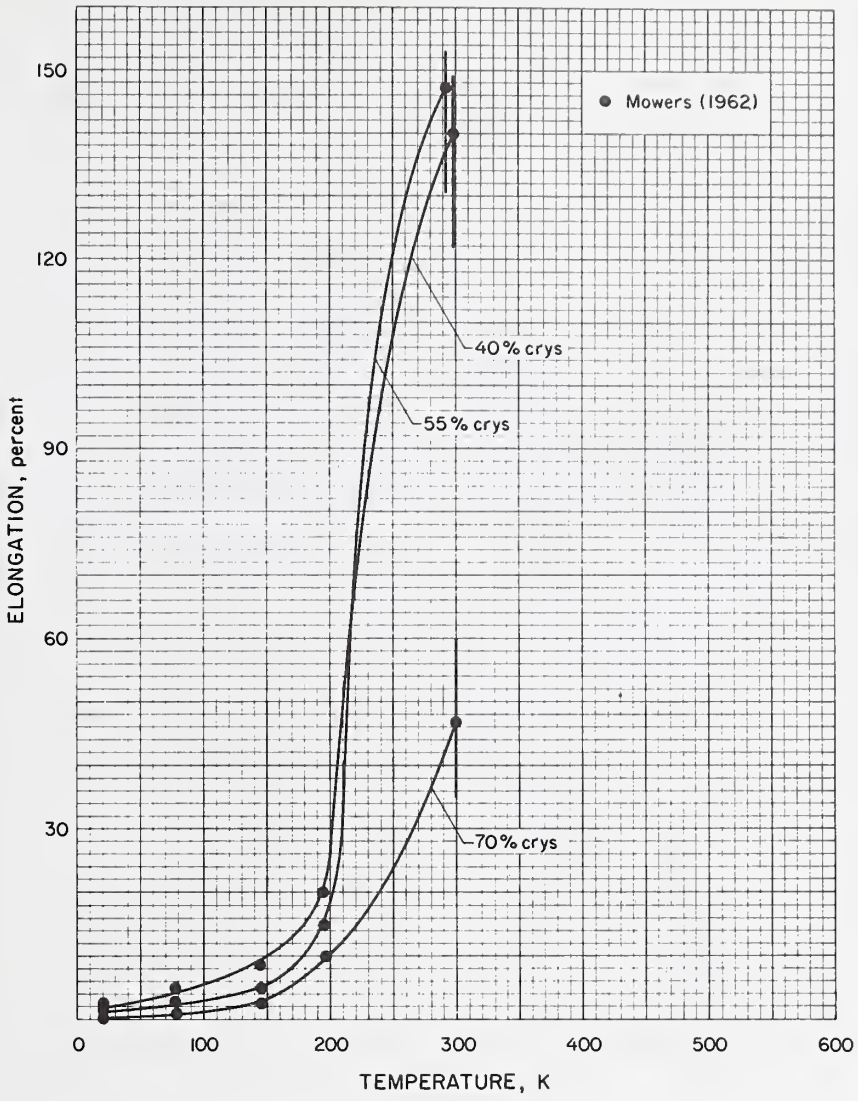
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Curry (1964)	Kel-F, "Lox Grade"	Stacked specimens 1.27 x 1.27 x 0.16 cm; conventional metallurgical test equipment.

CTFE

Elongation



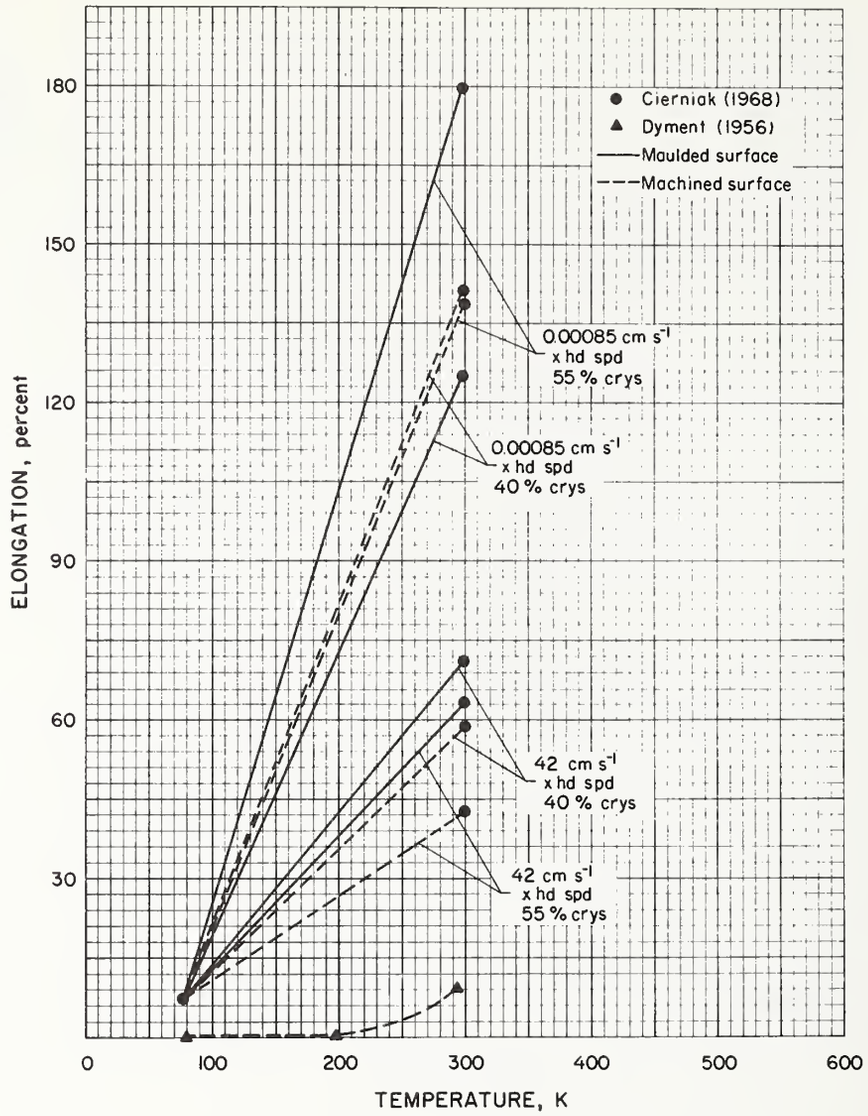
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bringer (1962)	Kel-F moderately crystalline (sp gr = 2.13) and amorphous (sp gr = 2.11)	
3 M Co. (1961)	Kel-F 81, KF-6050, Grade 2, crystalline sp gr = 2.1312, amorphous sp gr= 2.1047	ASTM D638-56T test procedure; arrows indicate "greater than".
Smith (1963)	Kel-F-81	GL = 5.08 cm; extensometer used at room temp, calculated extensometer values used at cryogenic temp, testing performed in liquid nitrogen or hydrogen; extracted from σ-ϵ



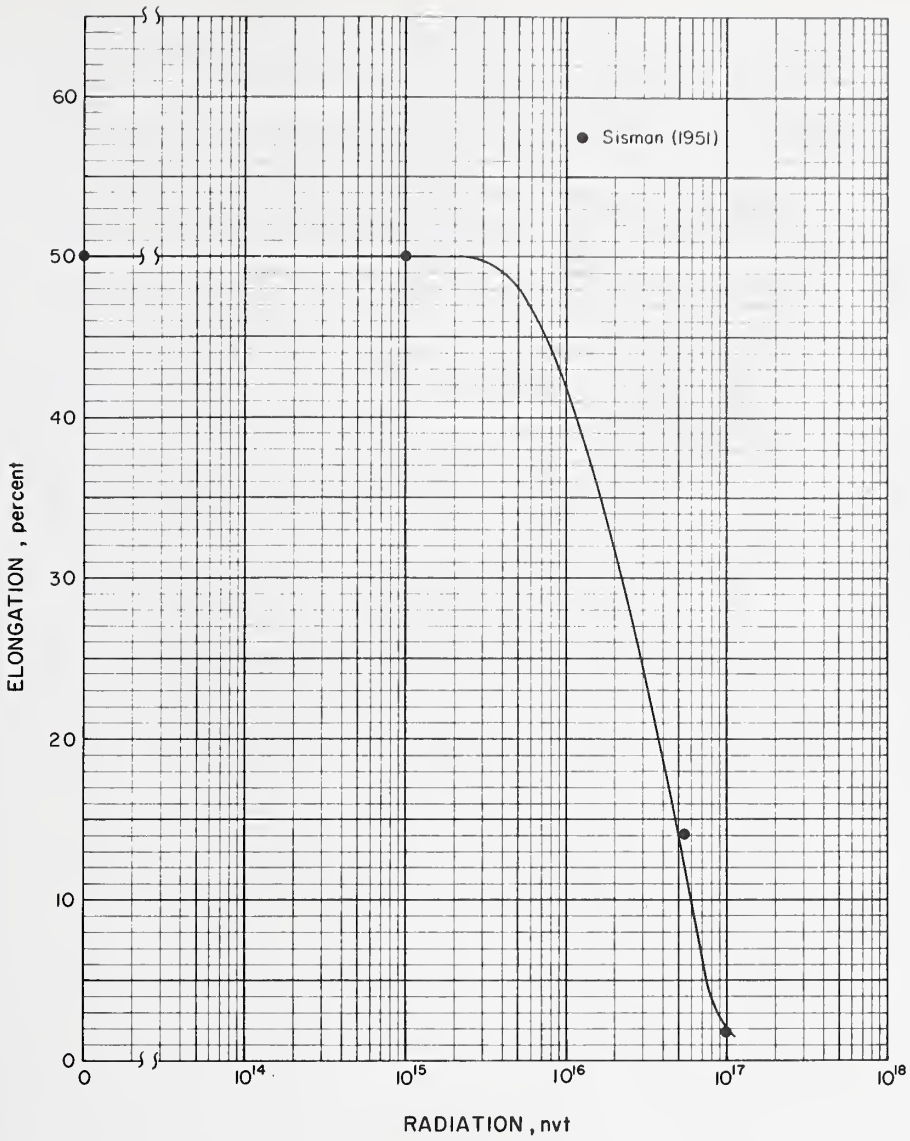
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mowers (1962)	Kel-F unfilled; 40% crys: sp gr = 2.10, molded at 547 K for 5 min then quick-quenched; 55% crys: sp gr = 2.12, as received + 4 h at 422 K, slow cool; 70% crys: sp gr = 2.14, as received + 24 h at 475 K, slow cool.	GL = 0.508 cm, w = 0.254 cm; Instron, 0.042 cm s^{-1} xhd spd at 298 K, 0.0042 cm s^{-1} xhd spd at 194 K, 144 K, 77 K, and 20 K; error bars indicate spread of data for several tests.

CTFE

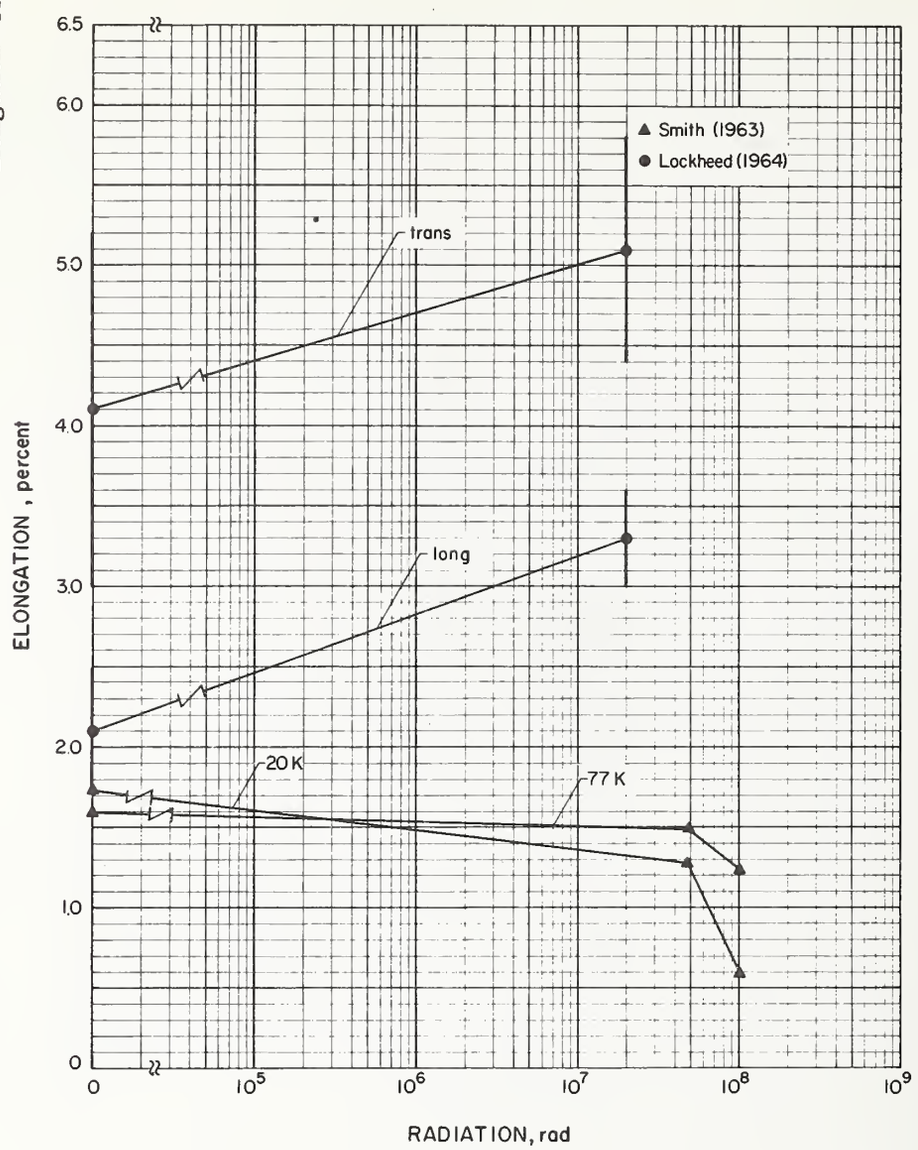
Elongation



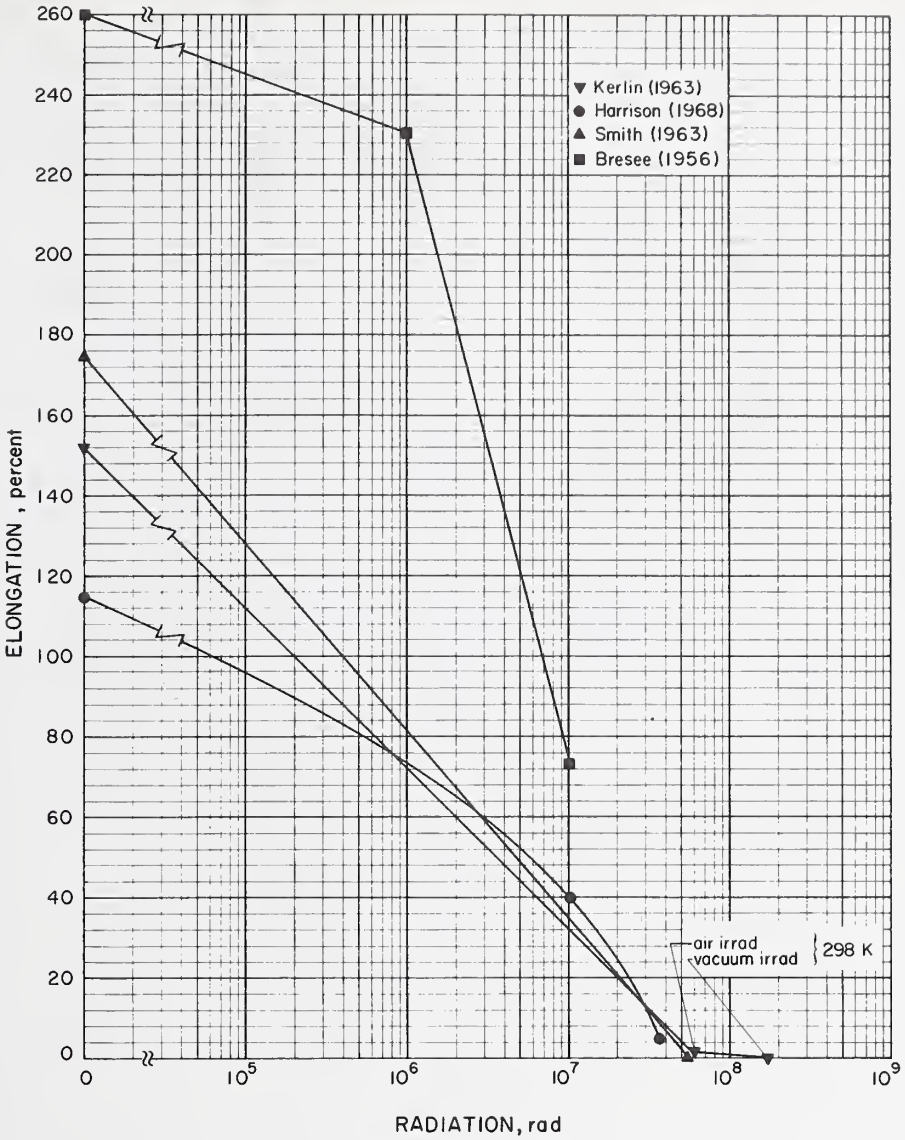
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Cierniak, Lieb, Mowers (1968)	PCTFE, grade 6067, initially 40% crys, heat-treated at 450 K for 4 h and slow-cooled to produce 55% crys.	t = 0. 152 cm, high speed router used to fabricate ASTM 1708 microtensile specimens; low speed tests on Instron, high speed tests on Plastechon Model 581 High-Speed Universal Test Machine with an oscilloscope recording system equipped with a Polaroid camera; analysis of variance presented, data also presented for xhd spd of 0. 0085, 0. 085, 0. 85, and 423 cm s^{-1}.
Dyment, Ziebland (1956)	Hastaflon cut from 1. 27 cm thick sheet	Red Sec ℓ = 1. 14 cm, diam = 0. 32 cm; K-type Hounsfield tensometer, xhd spd = 0. 003 cm s^{-1}.



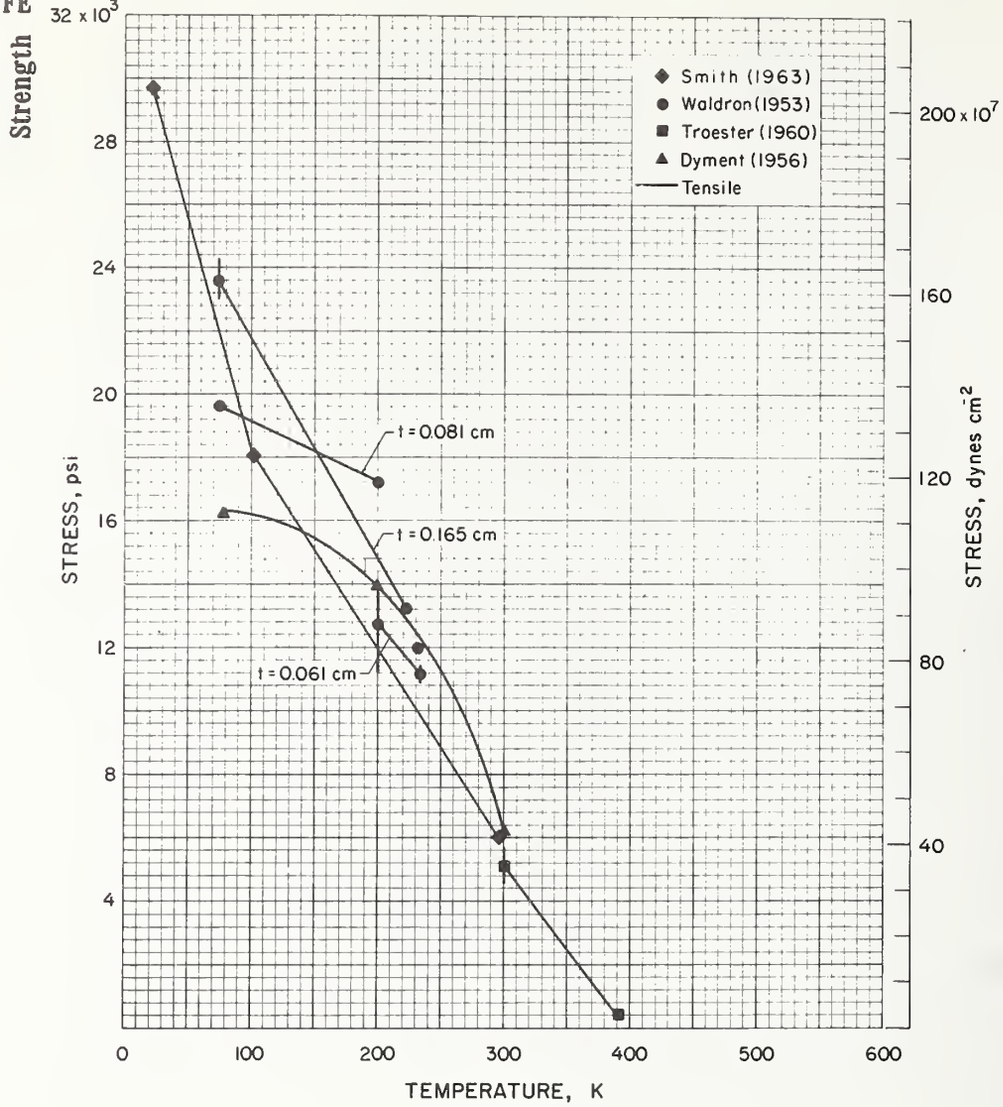
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sisman, Bopp (1951)	Fluorothene	Red Sec ℓ = 5.72 cm, w = 1.27 cm; modified ASTM D 638-49T test procedure, Baldwin Southwark testing machine, xhd spd = 0.0021 cm s^{-1} to a strain of 0.02 and then xhd spd = 0.0085 cm s^{-1}; irrad in Hole 19 of ORNL reactor at 298-313 K and in air, aged 7 days at 298 ± 1K and 50 ± 2% rel hum before testing.



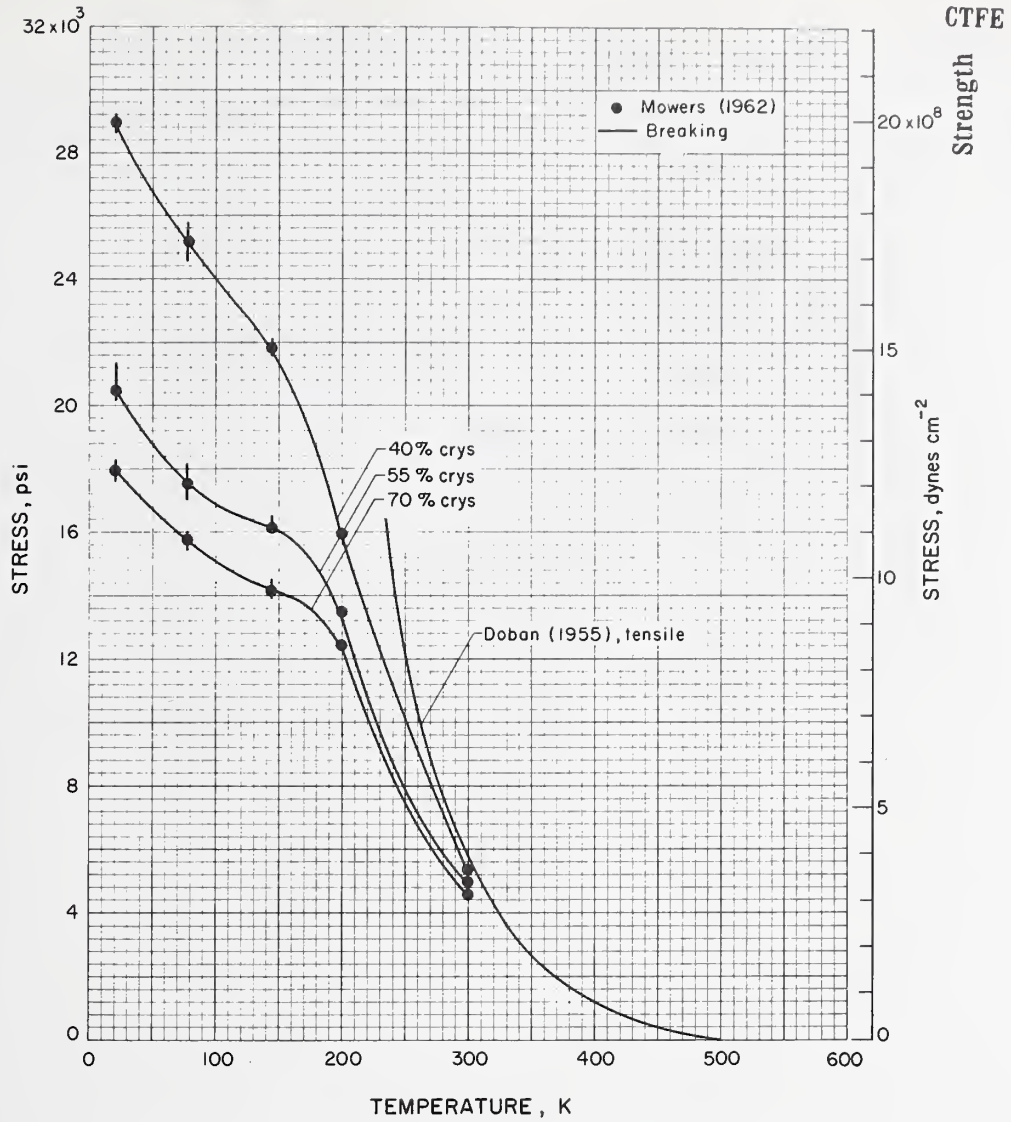
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Smith (1963)	Kel-F-81	GL = 5.08 cm; calculated extensometer values used at cryogenic temp, cryogenic irradiation and testing performed in liquid nitrogen or hydrogen; irrad by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth.
Lockheed Missles and Space Co. (1964)	Kel-F	t = 0.0051 cm, ASTM D-412-51T Type C die; Tinius Olsen Universal Test Machine, Model RM-2, xhd spd = 0.0042 cm s^{-1}, 77K; exposed to $2x10^7$ rad gammas and $1x10^{15}$ nvt neutrons from Radiation Effects Reactor at Dawsonville, Georgia operated at 10^6 watts; errors are standard deviation of 4-6 tests.



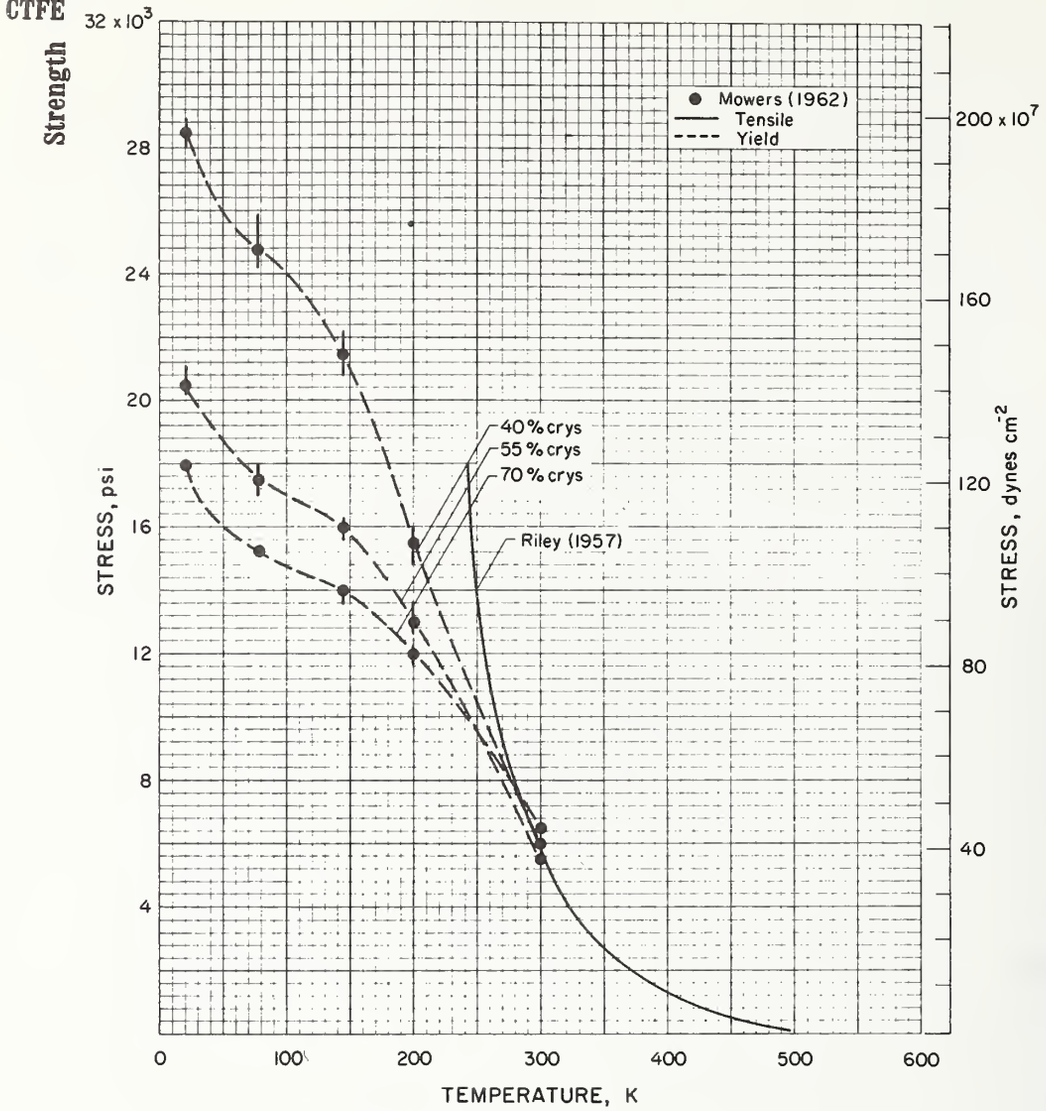
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Harrison (1968)	Held at 373 K and 10^{-5} Torr for 24 h then sealed in separate thin-walled glass ampoules.	Small dumbbell shaped samples; xhd spd = 0.021 cm s^{-1}, 308 K; irrad by 4 Mev electron beam accelerator, stored at 308 K for 24 h before test.
Smith (1963)	Kel-F-81	GL = 5.08 cm; extensometer used at room temp: irrad by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth.
Bresee, Flanary, Goode, Watson, Watson (1956)	Kel-F	Irrad by $Co.^{60}$
Kerlin (1963)	Kel-F-81	ASTM D 638-57T test procedure, Instron Model TT; irrad by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth.



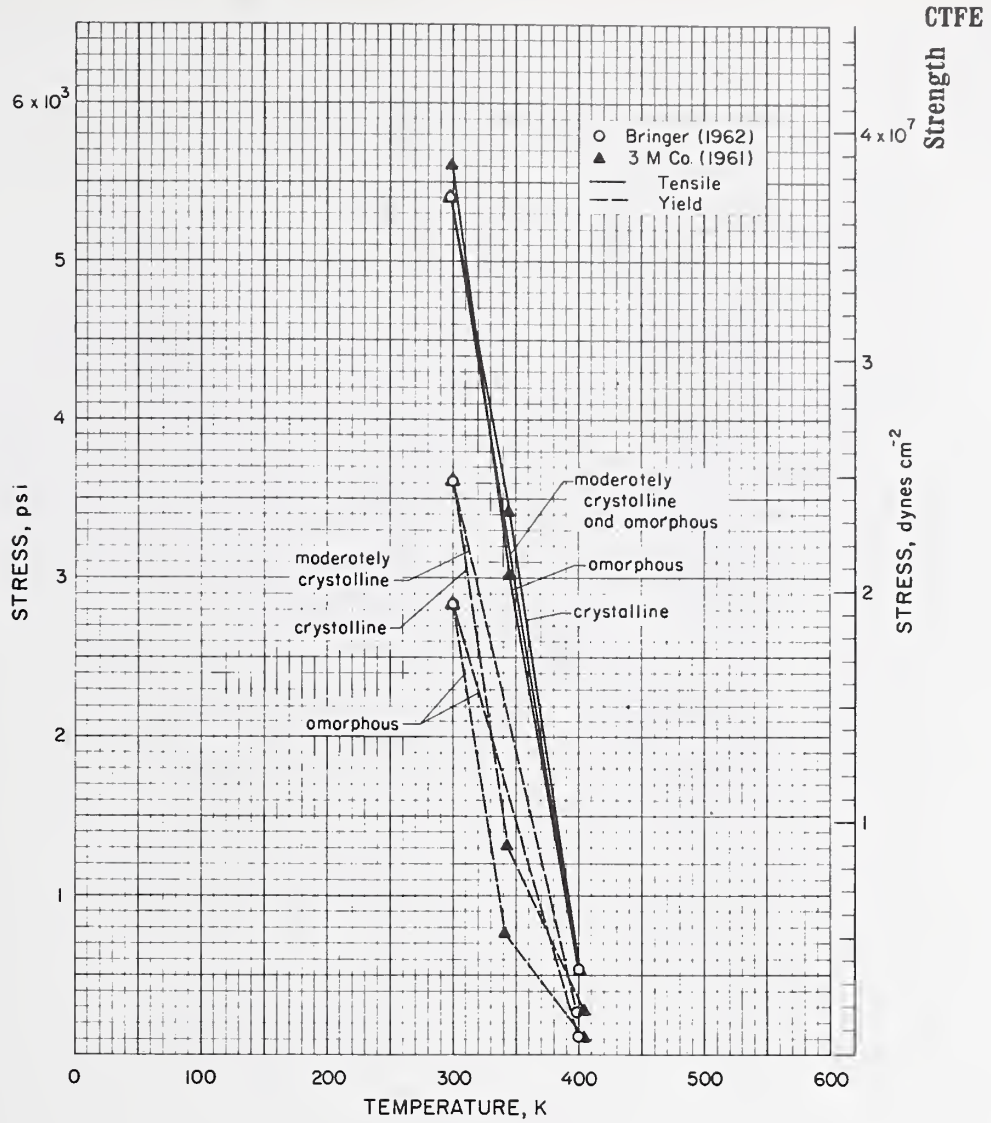
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Waldron, Molander (1953)	Kel-F, Grade 300, Unplasticized, Type A	w = 1.27 cm; "bolted plate" type fixture used to grip specimens, dial indicator used between upper and lower xhd; error bars indicate spread of data from 2 or 3 tests; data for several other film thicknesses presented.
Troester (1960)	Kel-F grades 270-300, unplasticized	ASTM D638-46T test procedures.
Dyment, Ziebland (1956)	Hastaflon cut from 1.27 cm thick sheet	Red Sec ℓ = 1.14 cm, diam = 0.32 cm; K-type Hounsfield tensometer, xhd spd = 0.003 cm s^{-1}.
Smith (1963)	Kel-F-81	GL = 5.08 cm; extensometer used at room temp, calculated extensometer values used at cryogenic temp, testing performed in liquid nitrogen or hydrogen; extracted from σ-ϵ diagrams.



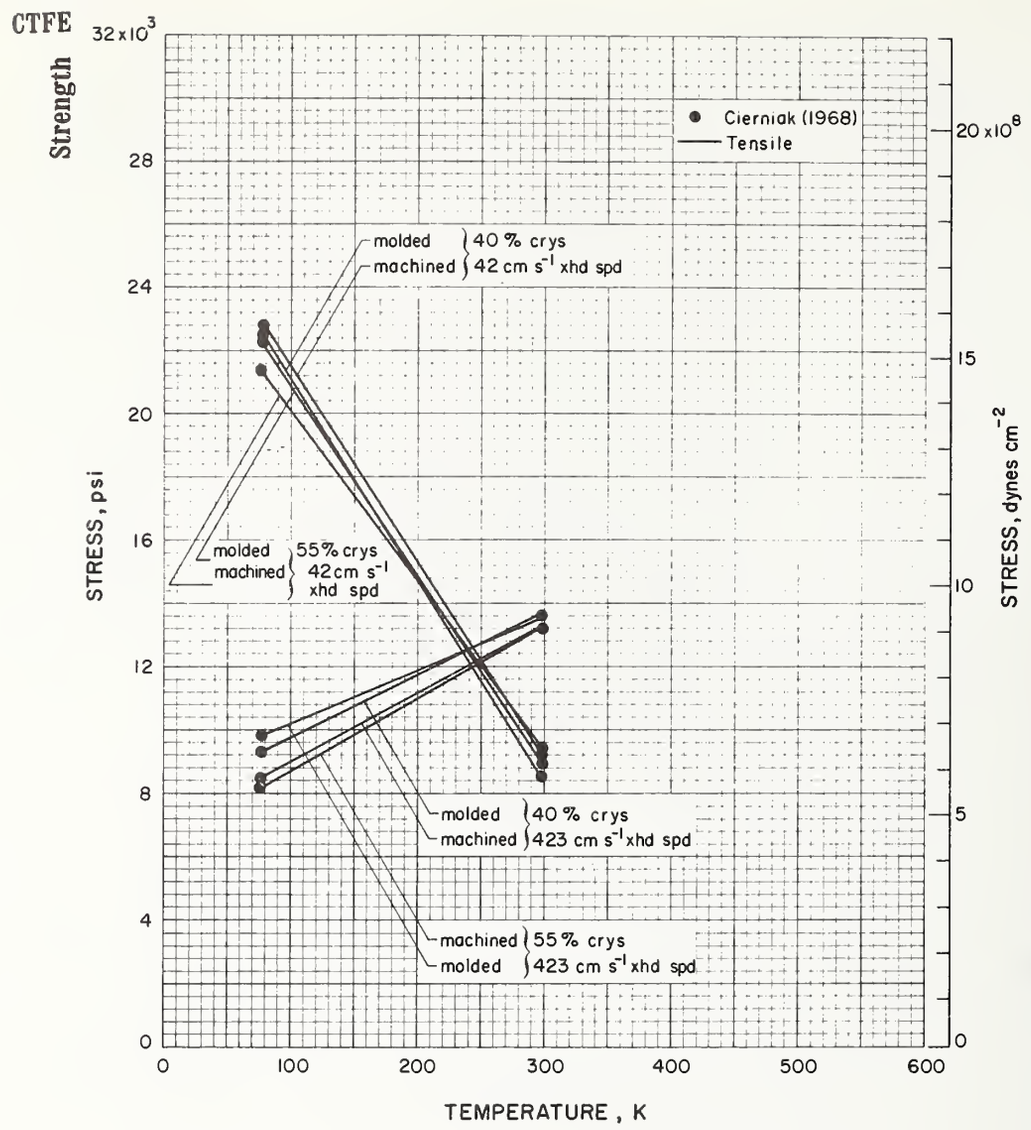
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mowers (1962) Doban, Sperati, Sandt (1955)	Kel-F unfilled; 40% crys: sp gr = 2.10, molded at 547K for 5 min then quick-quenched; 55% crys: sp gr = 2.12, as received + 4h at 422K, slow cool; 70% crys: sp gr = 2.14, as received + 24h at 475K, slow cool.	GL = 0.508 cm, w = 0.254 cm; Instron, 0.042 cm s^{-1} xhd spd at 298K, 0.0042 cm s^{-1} xhd spd at 194K, 144K, 77K, and 20 K; error bars indicate spread of data for several tests.



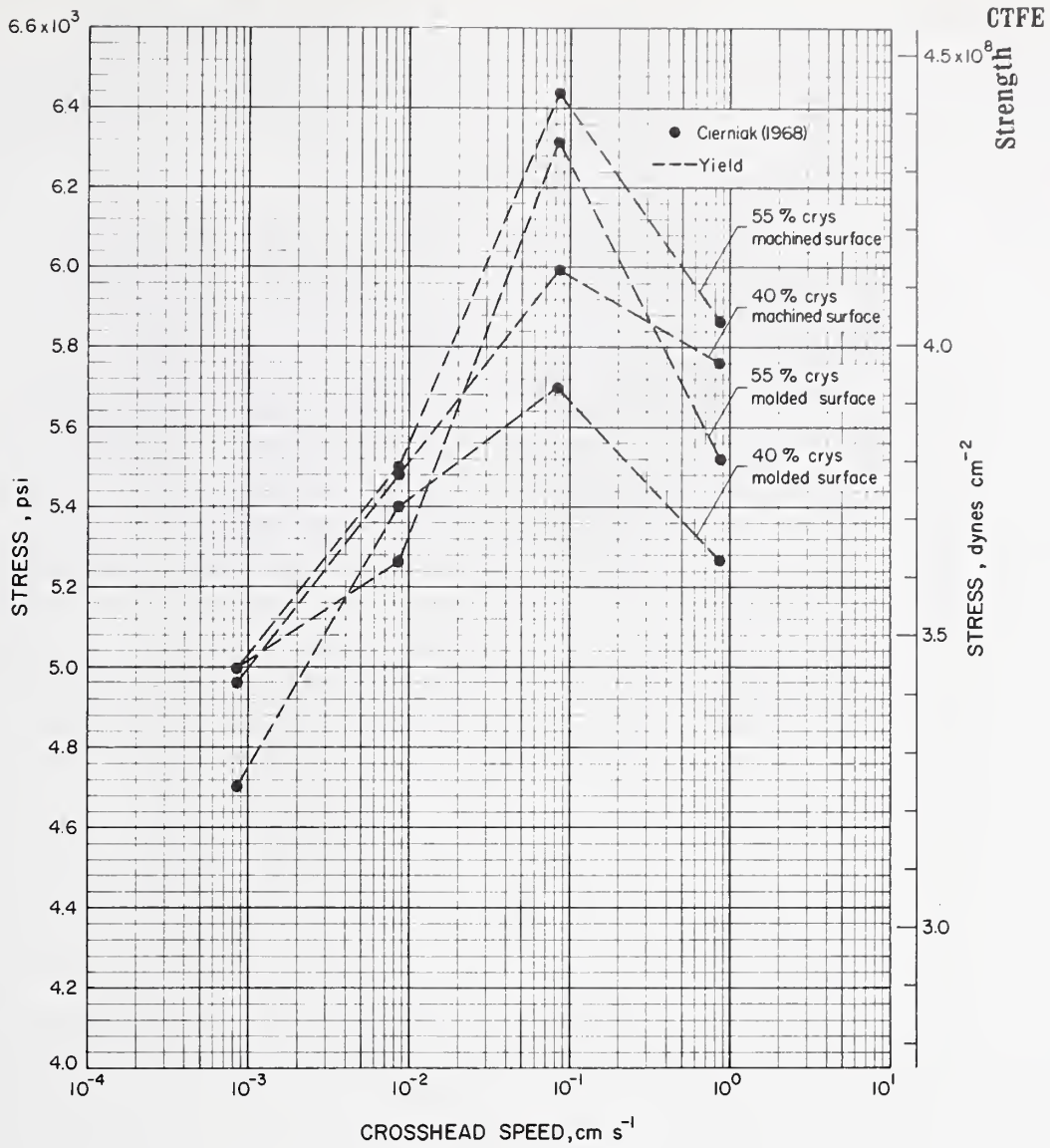
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mowers (1962) Riley (1957)	Kel-F unfilled; 40% crys: sp gr = 2.10, molded at 547K for 5 min then quick-quenched; 55% crys: sp gr = 2.12, as received + 4 h at 422K, slow cool; 70% crys: sp gr = 2.14, as received + 24 h at 475K, slow cool.	GL = 0.508 cm, w = 0.254 cm; Instron, 0.042 cm s^{-1} xhd spd at 298K, 0.0042 cm s^{-1} xhd spd at 194K, 144K, 77 K, and 20K; error bars indicate spread of data for several tests.



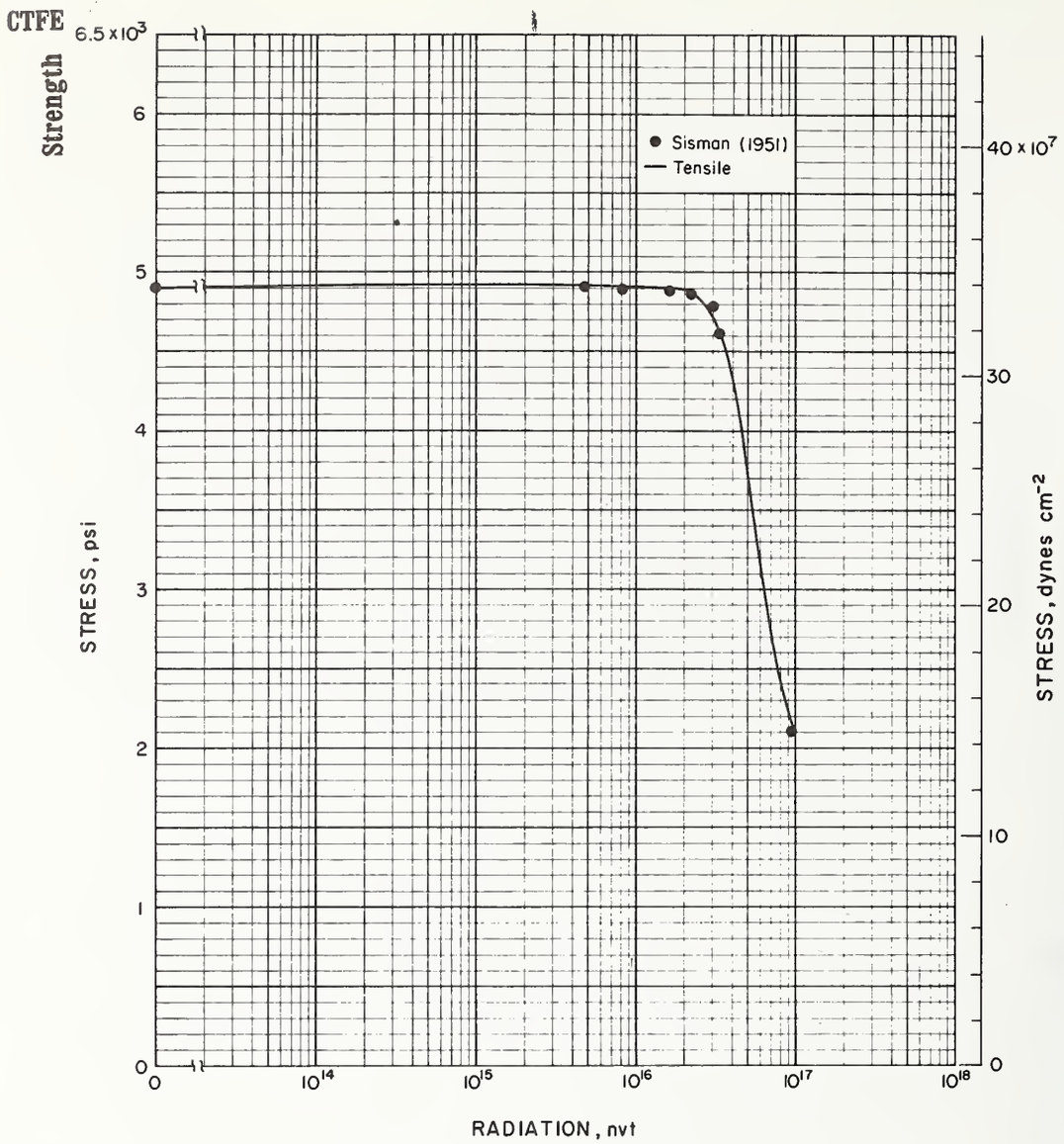
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bringer (1962)	Kel-F, moderately crystalline (sp gr = 2.13) and amorphous (sp gr = 2.11)	
3 M Co. (1961)	Kel-F 81, KF-6050, Grade 2, crystalline sp gr = 2.1312, amorphous sp gr = 2.1047	ASTM D638-56T test procedure, 0.2% yd off.



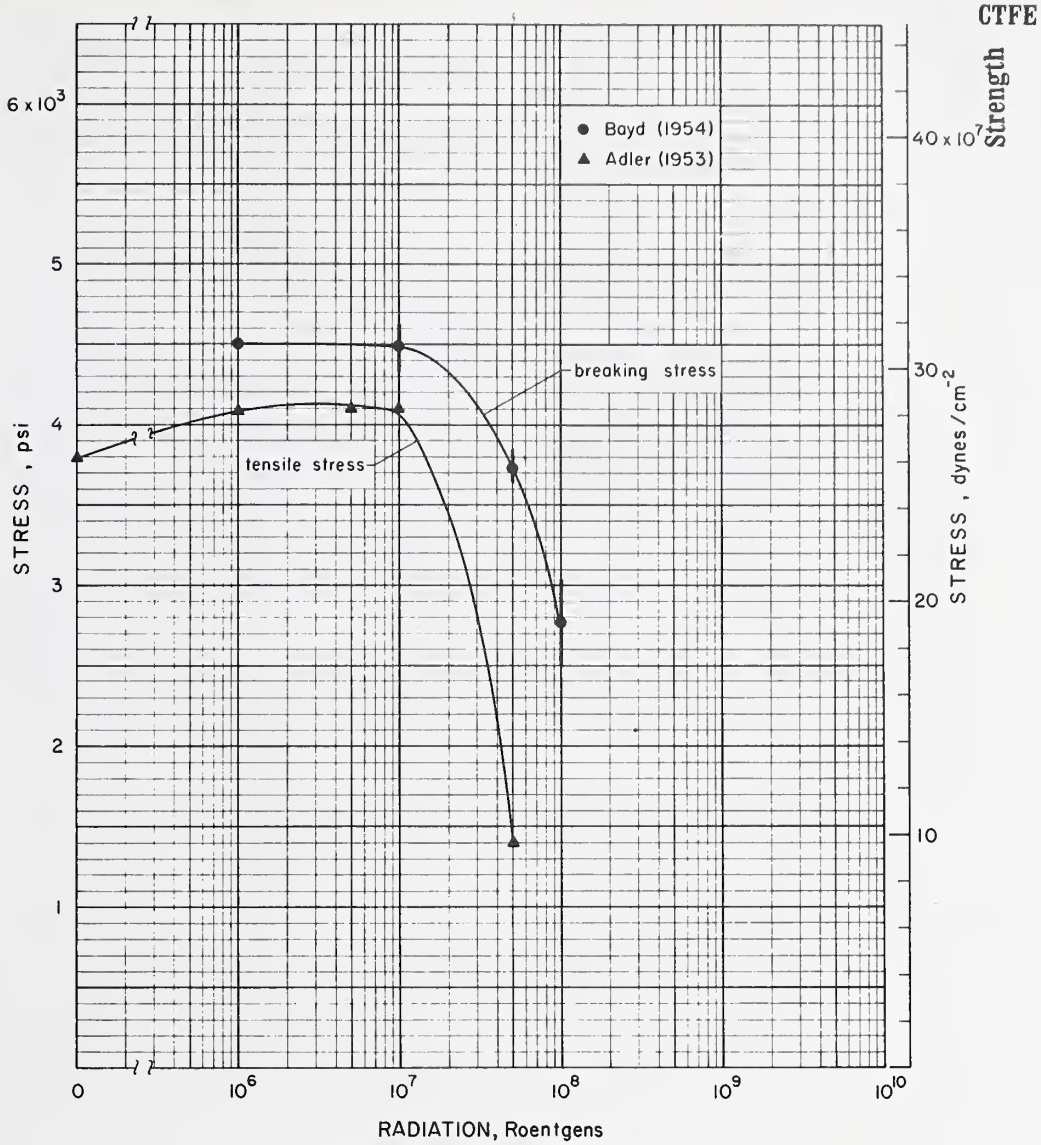
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Cierniak, Lieb, Mowers (1968)	PCTFE, grade 6067, initially 40% crys, heat-treated at 450K for 4 h and slow-cooled to produce 55% crys.	t = 0.152 cm, high speed router used to fabricate ASTM 1708 microtensile specimens; Plastechon Model 581 High-Speed Universal Test Machine with an oscilloscope recording system equipped with a Polaroid camera; analysis of variance presented.



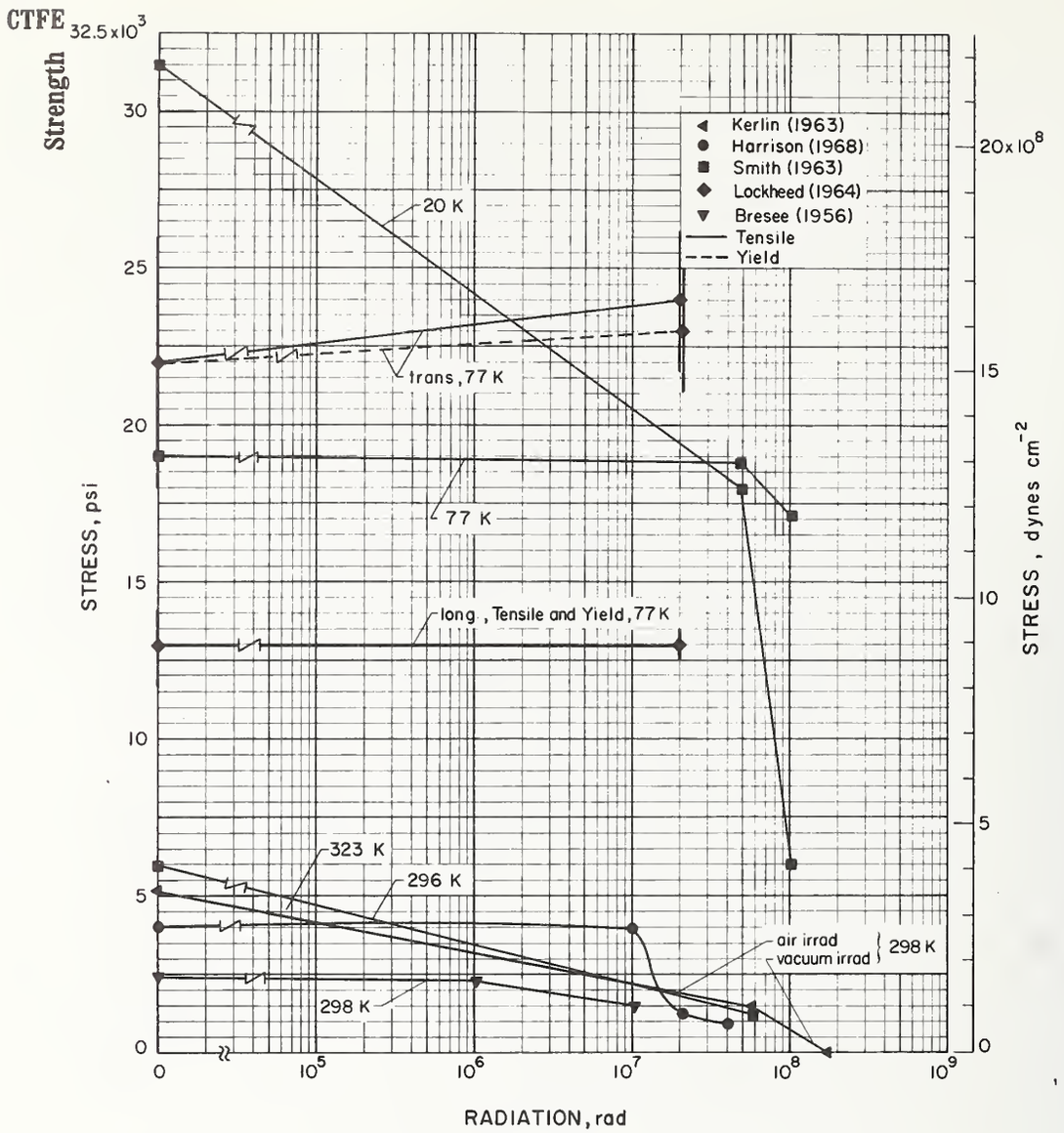
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Cierniak, Lieb, Mowers (1968)	PCTFE, grade 6067, initially 40% crys, heat treated at 450 K for 4 h and slow-cooled to produce 55% crys.	t = 0.152 cm, high speed router used to fabricate ASTM 1708 microtensile specimens; Instron, temp = 297 K; analysis of variance presented.



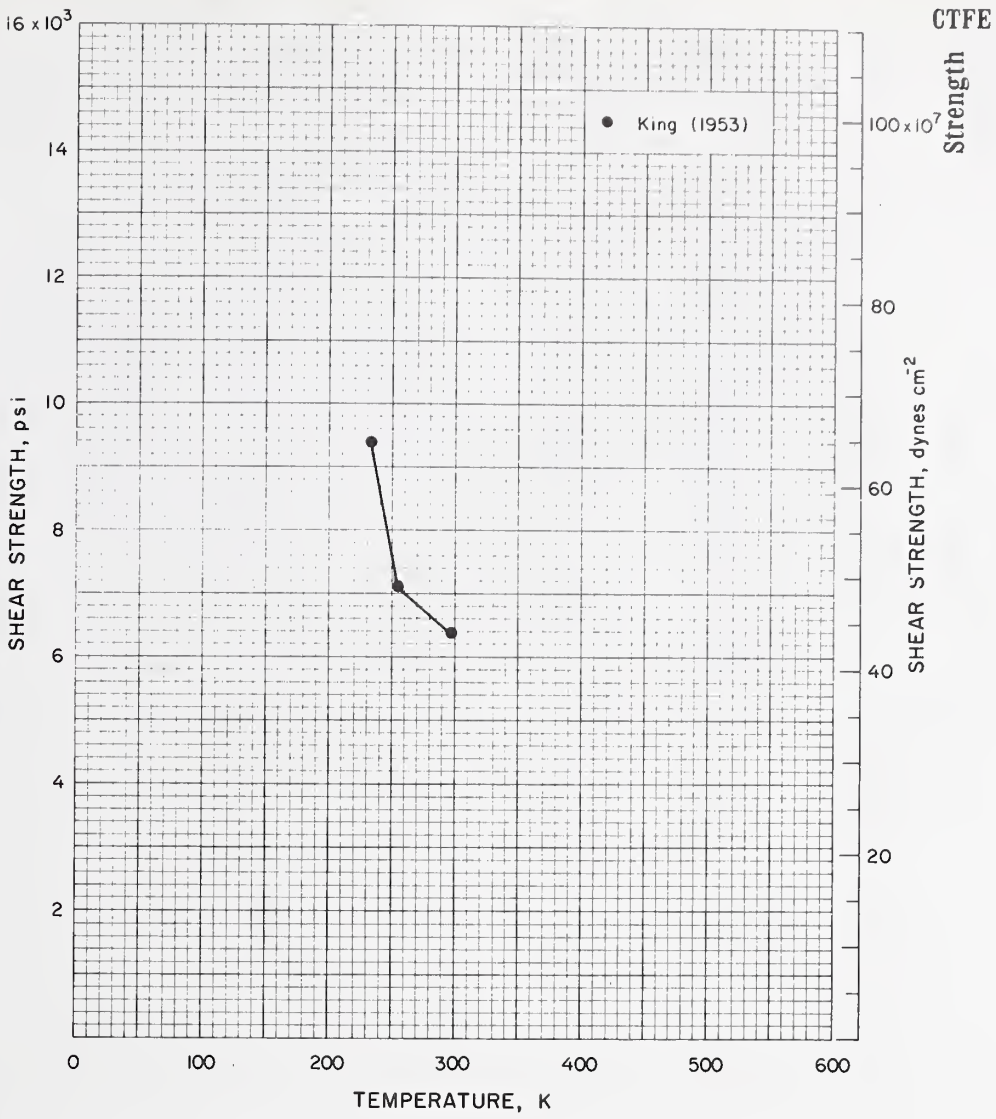
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Sisman, Bopp (1951)	Fluorothene	Red Sec ℓ = 5.72 cm, w = 1.27 cm; modified ASTM D 638-49T test procedure, Baldwin Southwark testing machine, xhd spd = 0.0021 cm s^{-1}; to a strain of 0.02 and then xhd spd = 0.0085 cm s^{-1}; irrad in Hole 19 of ORNL reactor at 298-313K and in air, aged 7 days at 298 ± 1K and 50 ± 2% rel hum before testing.



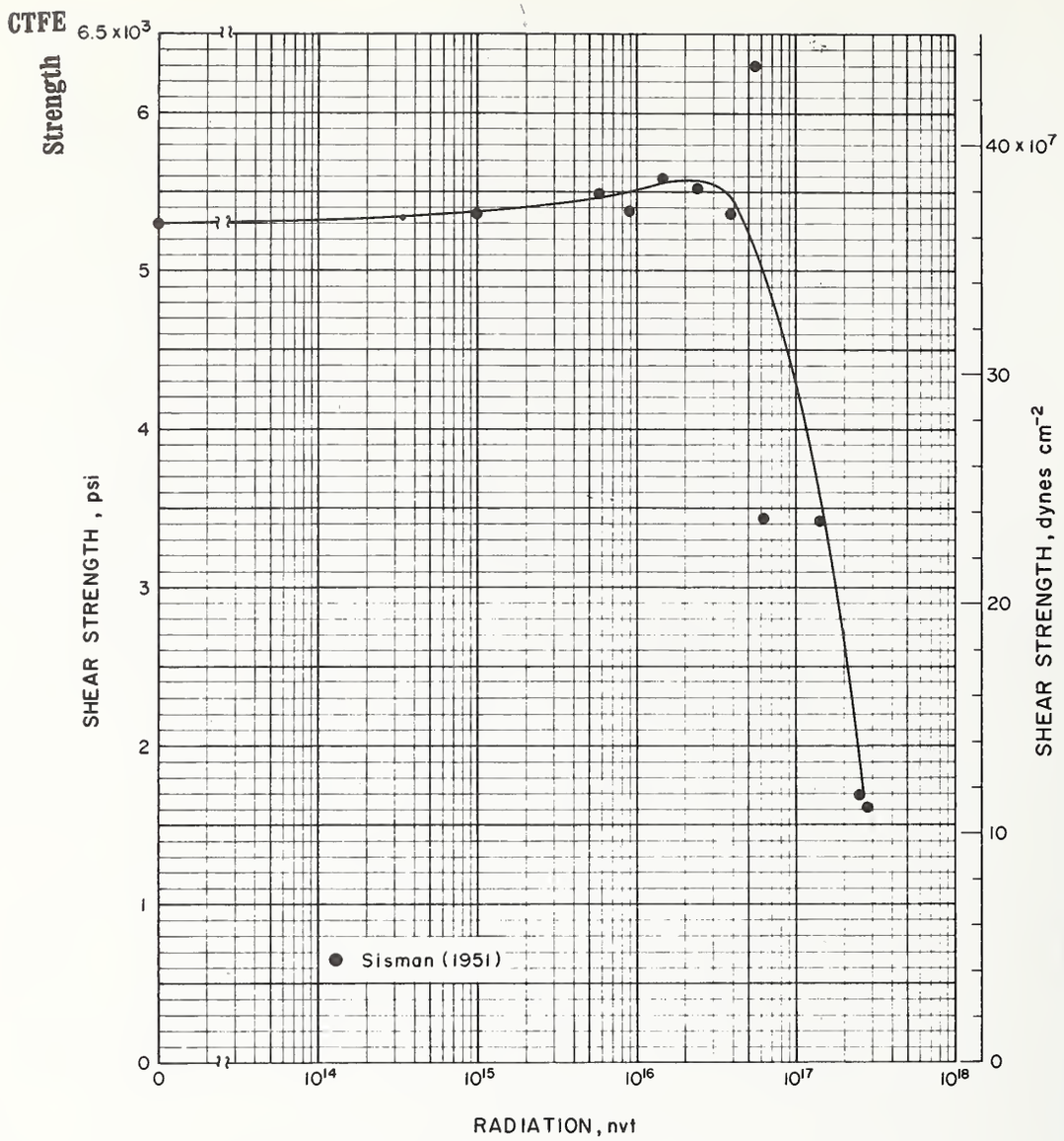
INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Boyd (1954)	Kel-F	t = 0.08 cm, w = 1.91 cm; Tinius Olsen Universal testing machine with a 200 lb Baldwin Tate-Emery load cell, 0.009 cm s^{-1} xhd spd; load readings accurate to ±0.5 lb, error bars indicate spread of 2 measurements, not all samples oriented the same with respect to the rolling direction.
Adler (1953)	Fluorothene	ℓ = 3.81 cm, w = 1.91 cm, 0.64 cm center hole, xsec area = 0.04 cm^2; Baldwin 600,000 pound testing machine, xhd spd = 0.0008 cm s^{-1}; irrad by Ta^{182}.



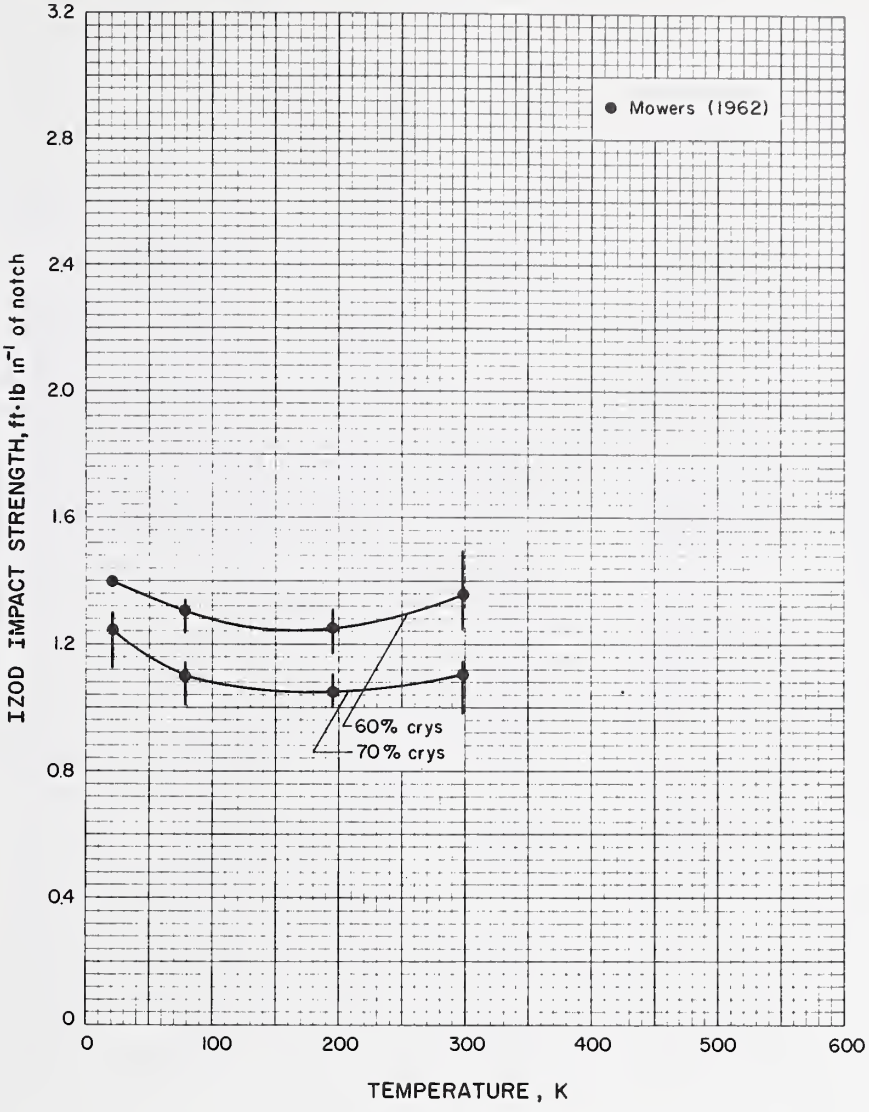
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Harrison (1968)	Held at 373K and 10^{-8} Torr for 24 h then sealed in separate thin-walled glass ampoules.	Small dumbbell shaped samples; xhd spd = 0.021 cm s^{-1}, 308 K; irrad by 4 Mev electron beam accelerator, stored at 308 K for 24 h before test.
Lockheed Missles and Space Co. (1964)	Kel-F	t = 0.0051 cm, ASTM D-412-51T Type C die; Tinius Olsen Universal Test Machine, Model RM-2, xhd spd = 0.0042 cm s^{-1}, 77K; exposed to $2x10^7$ rad gammas and $1x10^{18}$ nvt neutrons from Radiation Effects Reactor at Dawsonville, Georgia operated at 10^6 watts; errors are standard deviation of 4-6 tests.
Smith (1963)	Kel-F-81	GL = 5.08 cm; cryogenic irradiation and testing performed in liquid nitrogen or hydrogen; irrad by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth.
Bresee, Flanary, Goode, Watson, Watson (1956)	Kel-F	Irrad by $Co.^{60}$
Kerlin (1963)	Kel-F-81	ASTM D 638-57T test procedure, Instron Model TT; irrad by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
King, Tabor (1953)	Kel-F, "as received"	Cylindrical specimen sheared between 2 metal blocks, force read on a spring balance; error 7-10%.



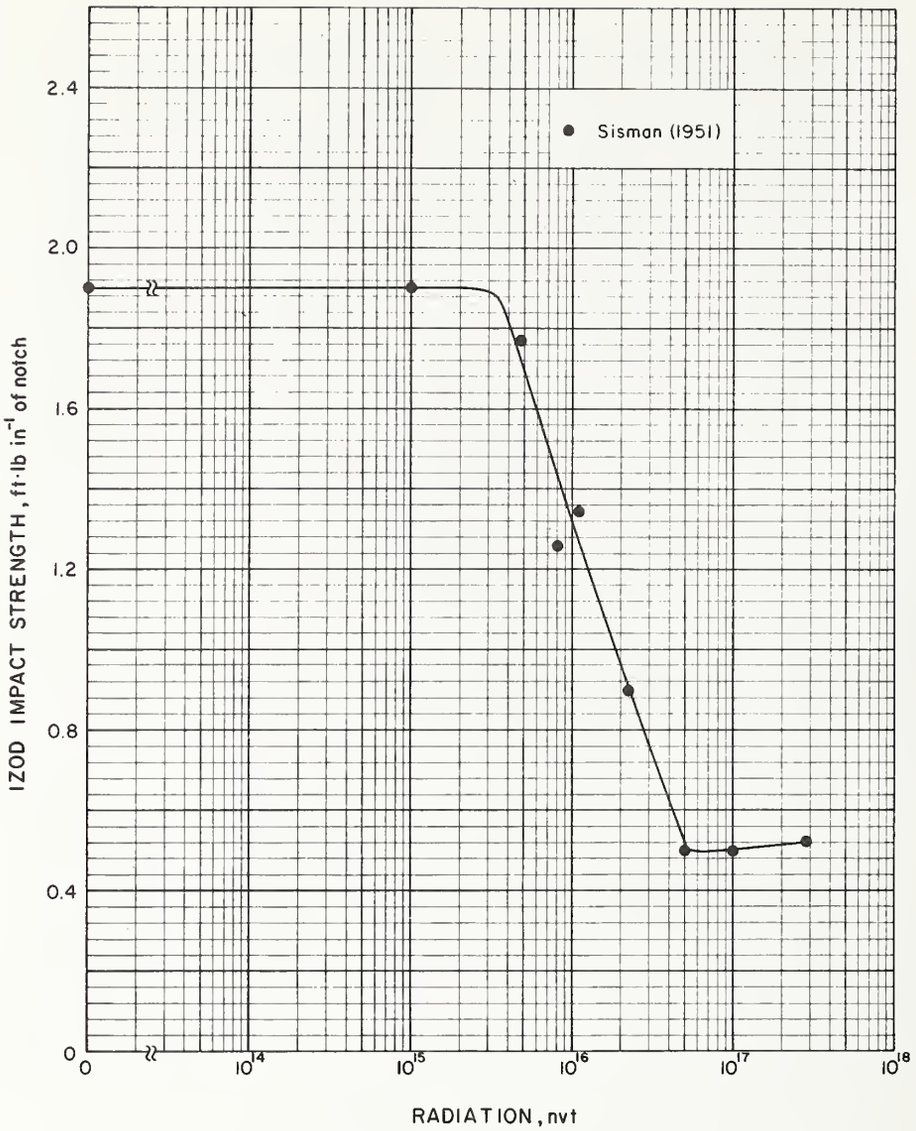
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sisman, Bopp (1951)	Fluorothene	ℓ = 7.62, w = 2.54 cm, t = 0.16-0.64 cm; test procedure was a modification of Federal Specification 1041, L-P-406a, p. 12, Johnson type shear tool with self-aligning compression plate, xhd spd = 0.0008 cm s^{-1}; irrad in Hole 19 of ORNL reactor at 298-313 K and in air, aged 7 days at 298 ± 1K and 50 ± 2% rel hum before testing.



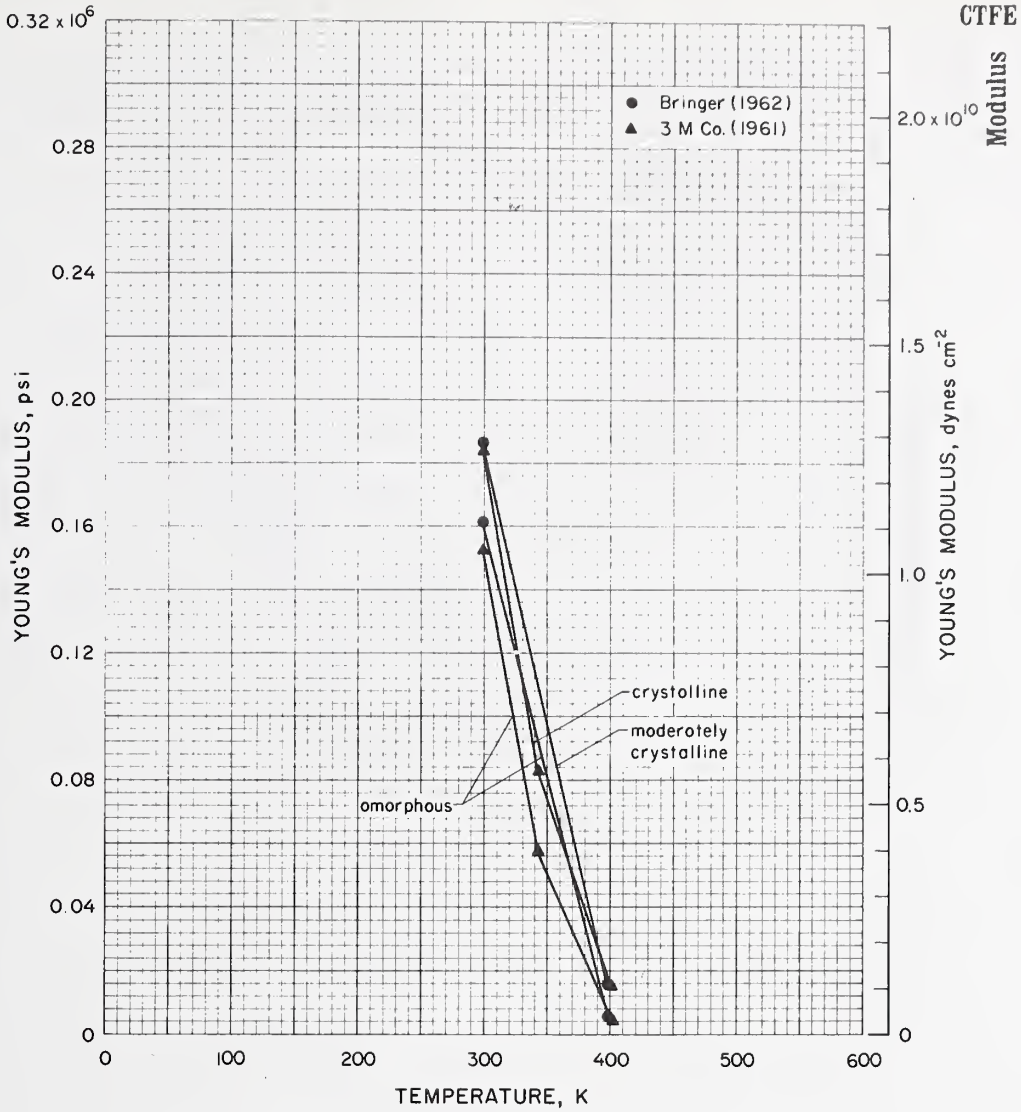
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mowers (1962)	Kel-F unfilled	ASTM D256-56 notched Izod sample except t = 0.635 cm instead of 1.27 cm; ASTM D256-56 test procedures, modified Tinius-Olsen Change-O-Matic Impact tester; error bars indicate spread of data for several tests.

CTFE

Impact



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Sisman, Bopp (1951)	Fluorothene	Izod impact specimen; modified ASTM D 256-47T test procedure, Baldwin pendulum cantilever beam impact testing machine; irrad in Hole 19 of ORNL reactor at 298-313 K and in air, aged 7 days at 298 ± 1K and 50 ± 2% rel hum before testing.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bringer (1962)	Kel-F, moderately crystalline (sp gr = 2.13) and amorphous (sp gr = 2.11)	
3 M Co. (1961)	Kel-F 81, KF-6050, Grade 2, crystalline sp gr = 2.1312, amorphous sp gr = 2.1047.	ASTM D638-56T test procedure.

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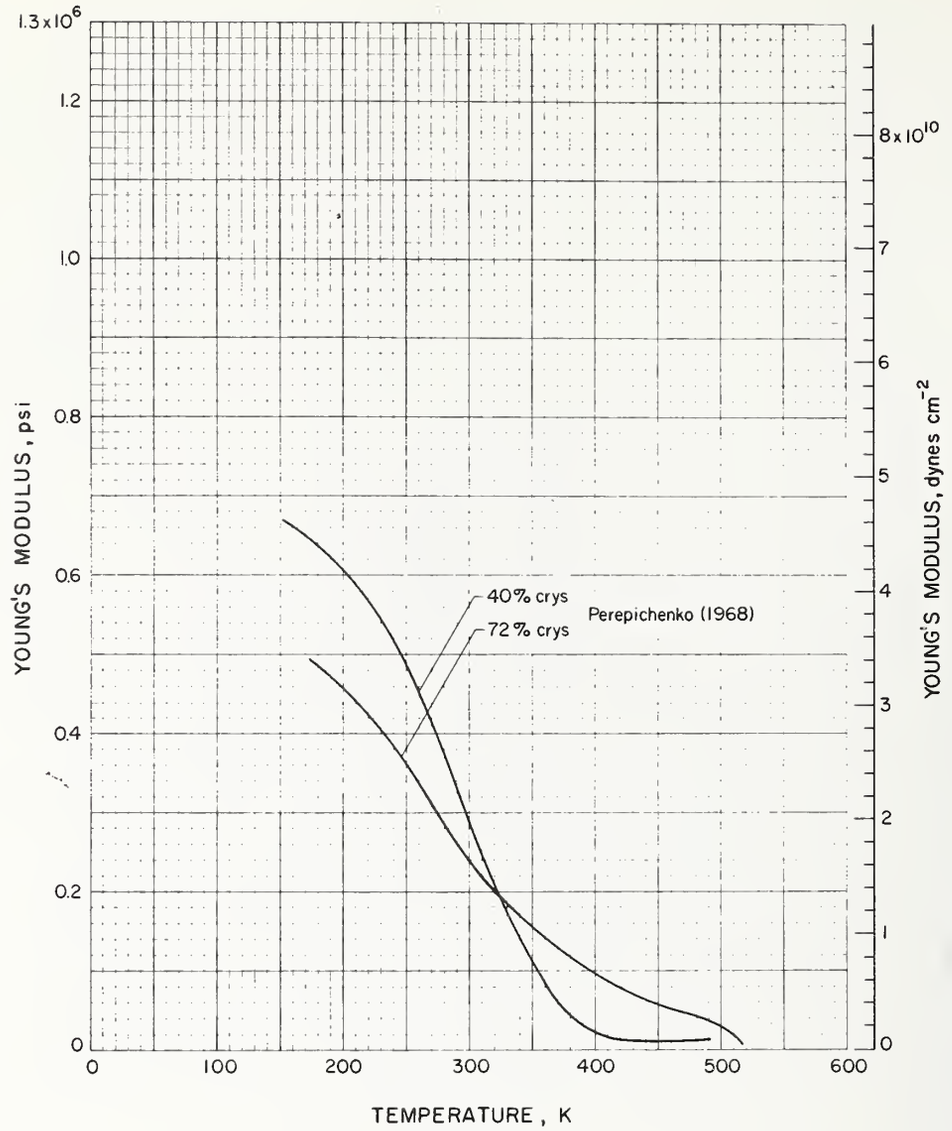
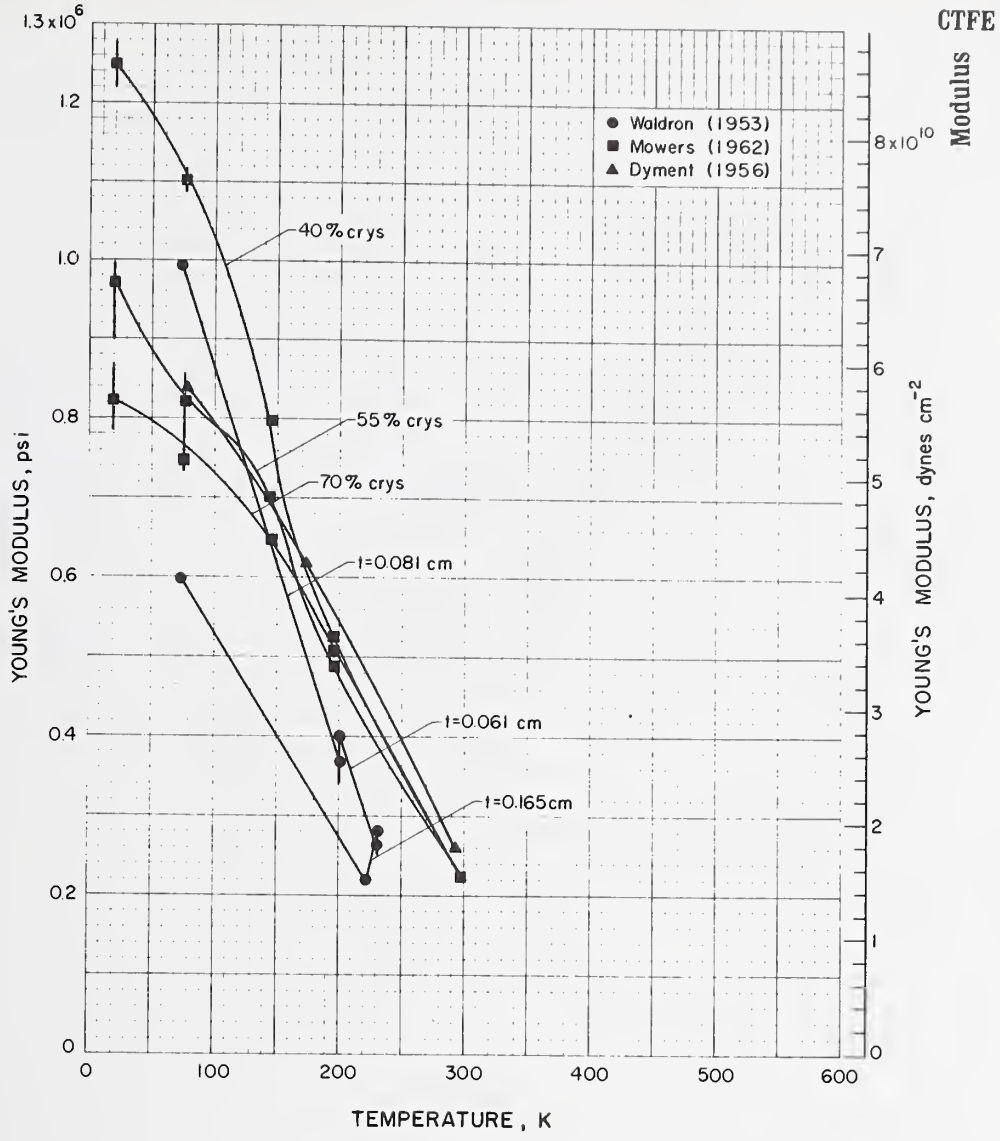
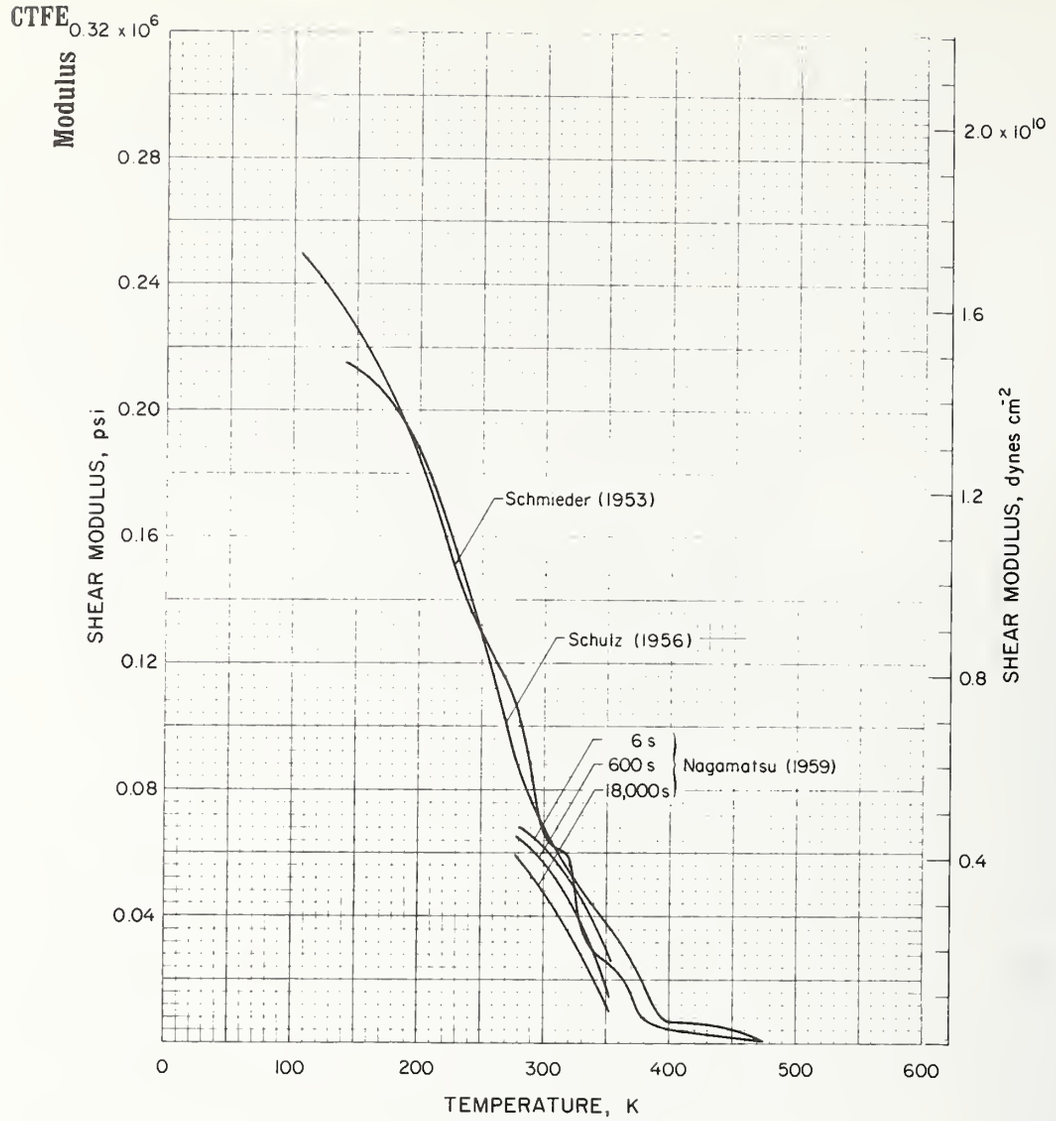
Modulus



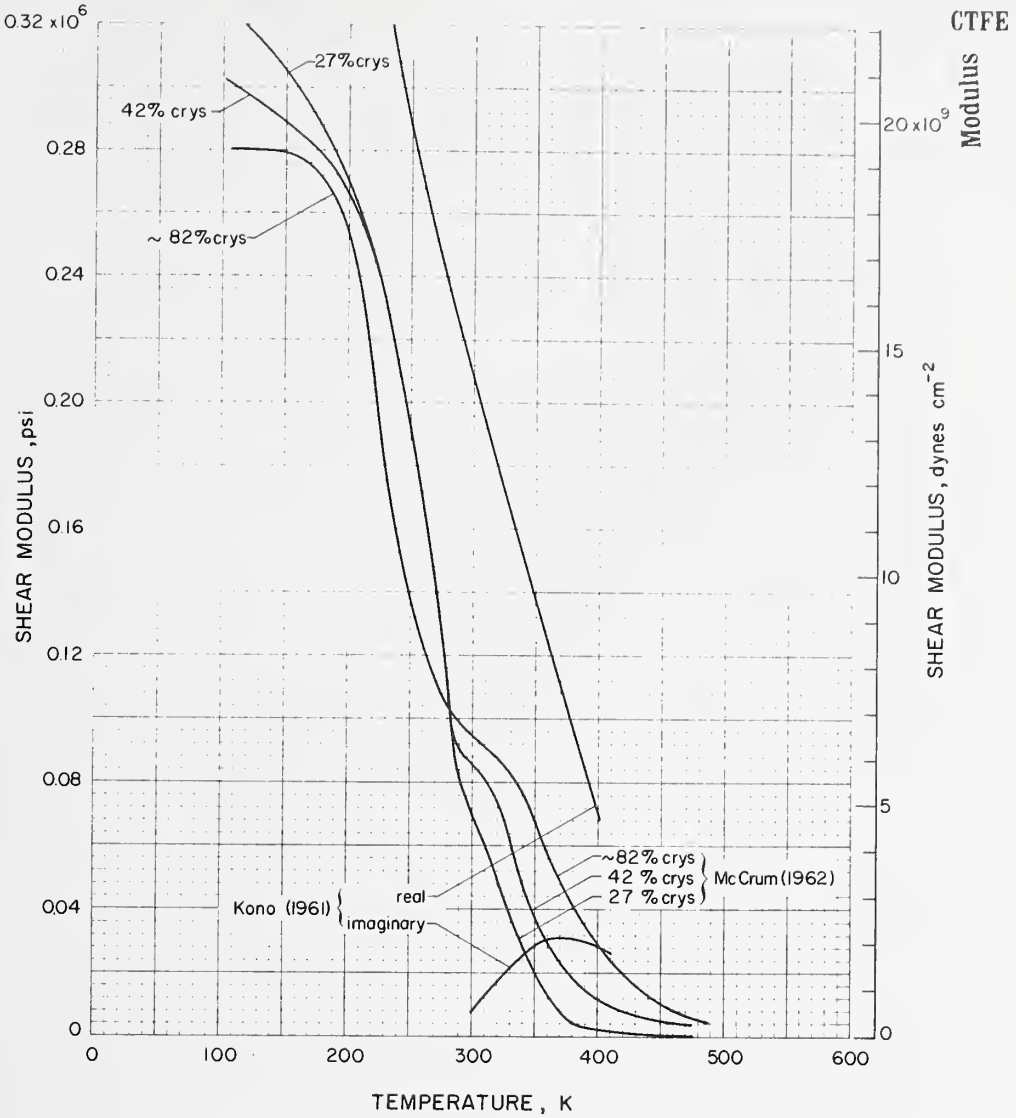
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Perepichenko, Bodrova (1968)		Acoustical method, 20-300 Hz



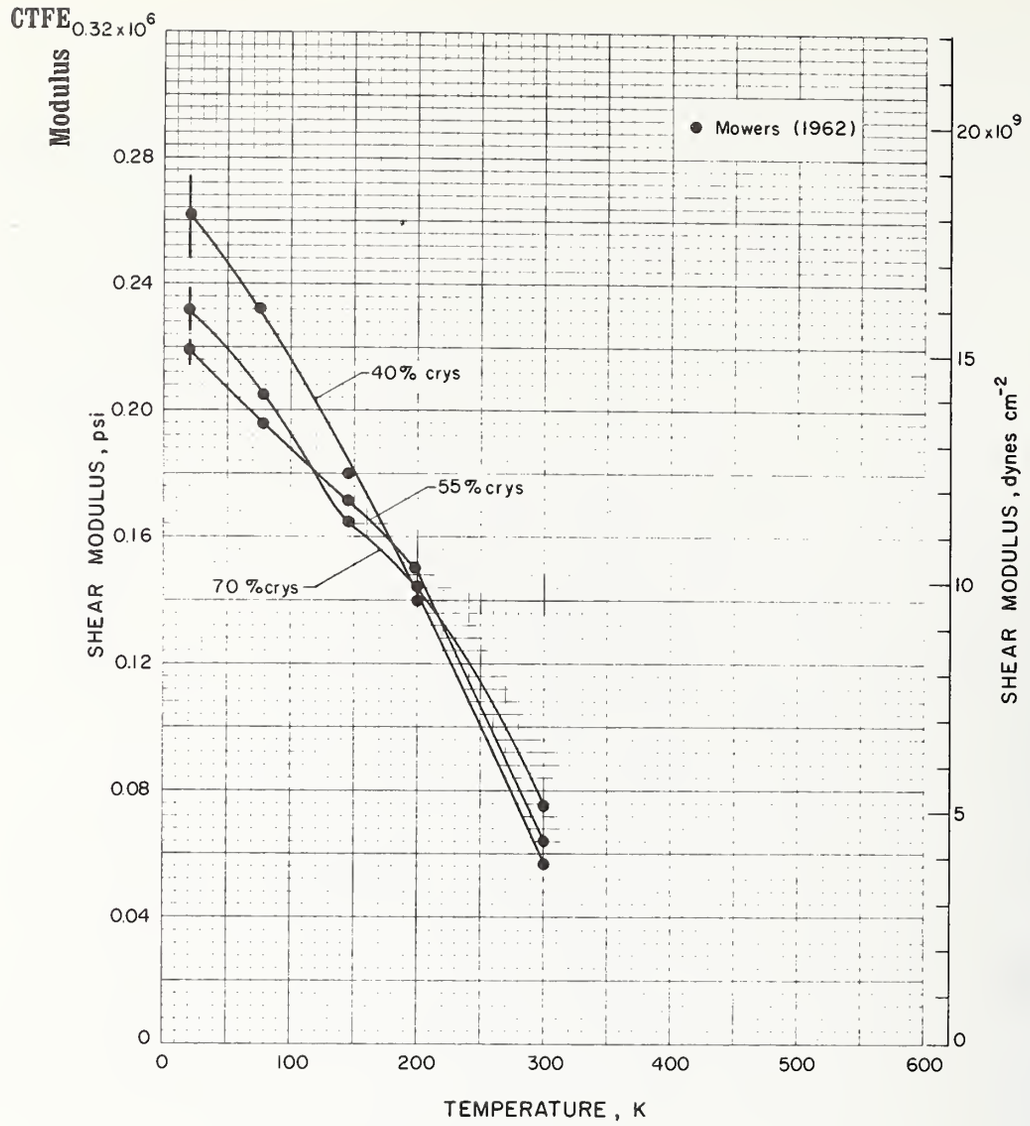
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Waldron, Molander (1953)	Kel-F, Grade 300, Unplasticized, Type A	w = 1.27 cm; "bolted plate" type fixture used to grip specimens, dial indicator used between upper and lower xhd; error bars indicate spread of data from 2 or 3 tests; data for several other film thicknesses presented.
Mowers (1962)	Kel-F unfilled; 40% crys: sp gr = 2.10, molded at 547K for 5 min then quick-quenched; 55% crys: sp gr = 2.12, as received + 4h at 422K, slow cool; 70% crys: sp gr = 2.14 as received + 24 h at 475K, slow cool.	GL = 0.508 cm, w = 0.254 cm; Instron, 0.042 cm s^{-1} xhd spd at 298K, 0.0042 cm s^{-1} xhd spd at 194K, 144K, 77K, and 20 K; error bars indicate spread of data for several tests.
Dyment, Ziebland (1956)	Hastaflon cut from 1.27 cm thick sheet	Red Sec ℓ = 1.14 cm, diam = 0.32 cm; K-type Hounsfield tensometer, xhd spd = 0.003 cm s^{-1}.



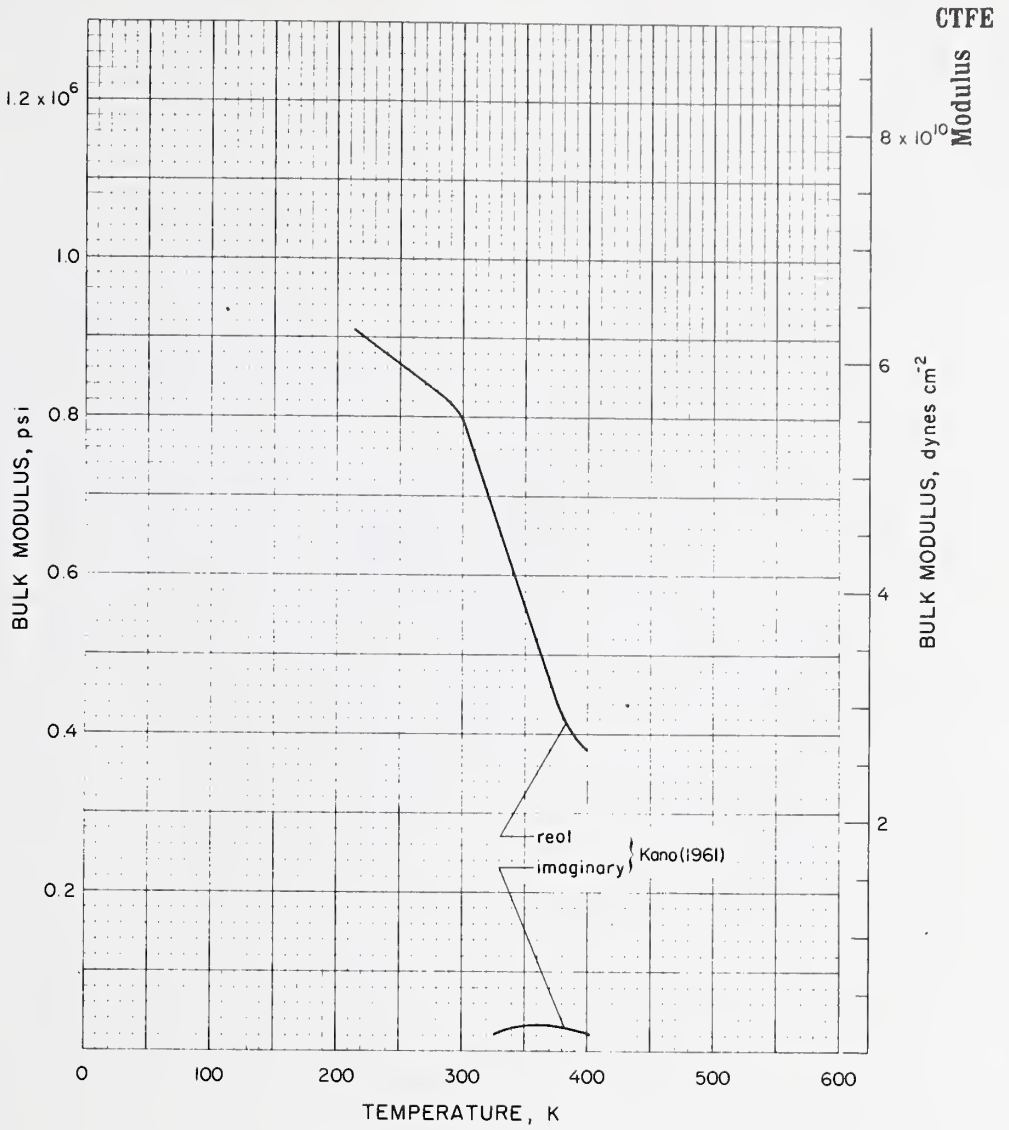
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Nagamatsu, Yoshitomi (1959)	Kel-F	ℓ = 6 cm, t = w = 0.14 cm; max strain <0.005, before each measurement the specimen was kept at constant temp >18 h in an unstrained state; temp fluctuation <0.1 K, time noted is the interval between loading and measurement.
Schmieder, Wolf (1953)		Torsion pendulum, damping.
Schulz (1956)		0.2-1 Hz



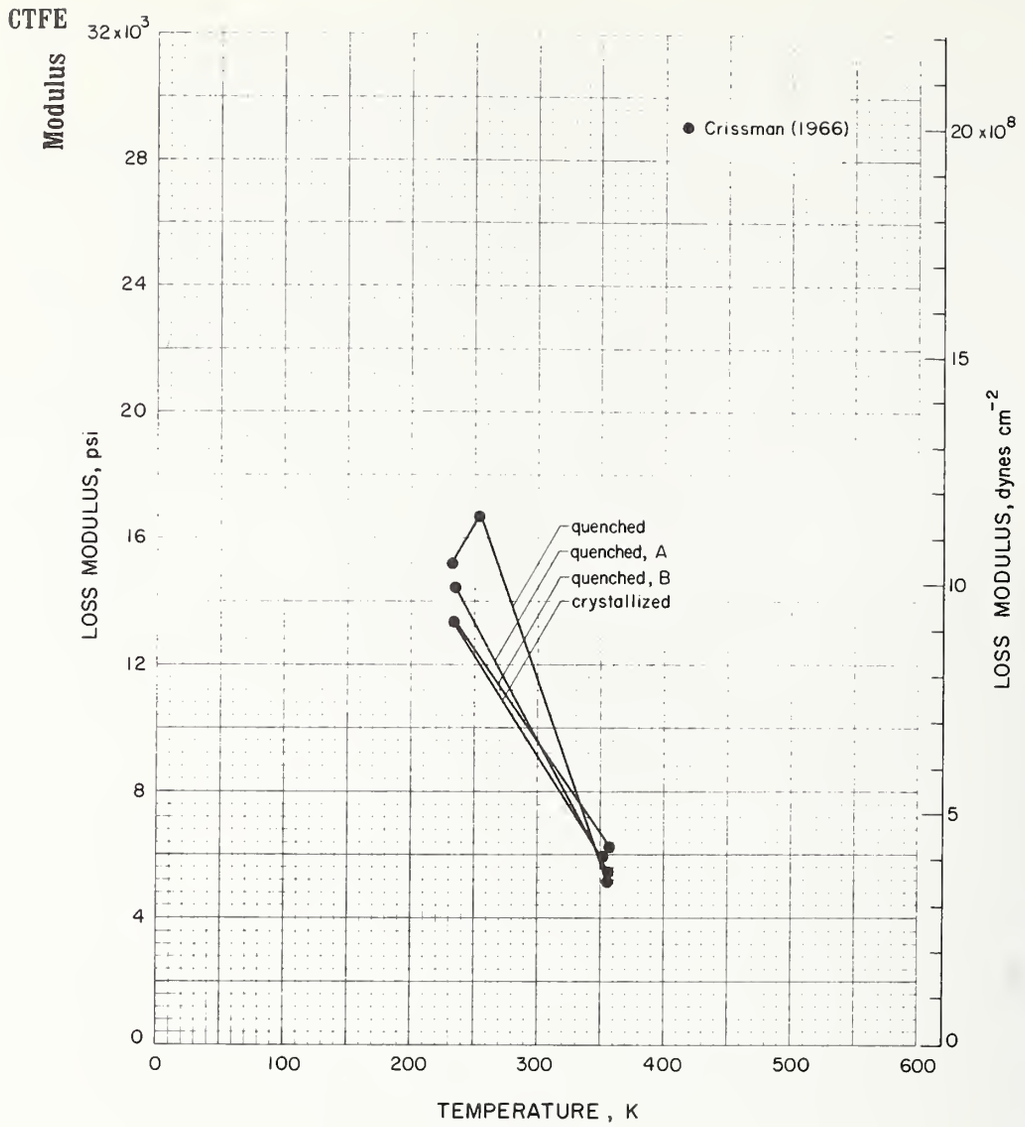
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kono (1961)	Kel-F, annealed at 373K for 1 h.	t = 0.05-0.5 cm; modulus calculated from density, long. and trans wave velocity, and long. and trans wave attenuation, 2.5×10^6 Hz.
McCrum (1962	Fluorothene; one sample quenched from melt, sp gr = 2.102, 27% crys; one sample cooled from melt at intermediate rate, sp gr = 2.119, 42% crys; one sample slow cooled and then annealed close to melting point, sp gr >2.136, > 57% crys, probable sp gr ~2.16, ~ 82% crys.	Torsion pendulum.



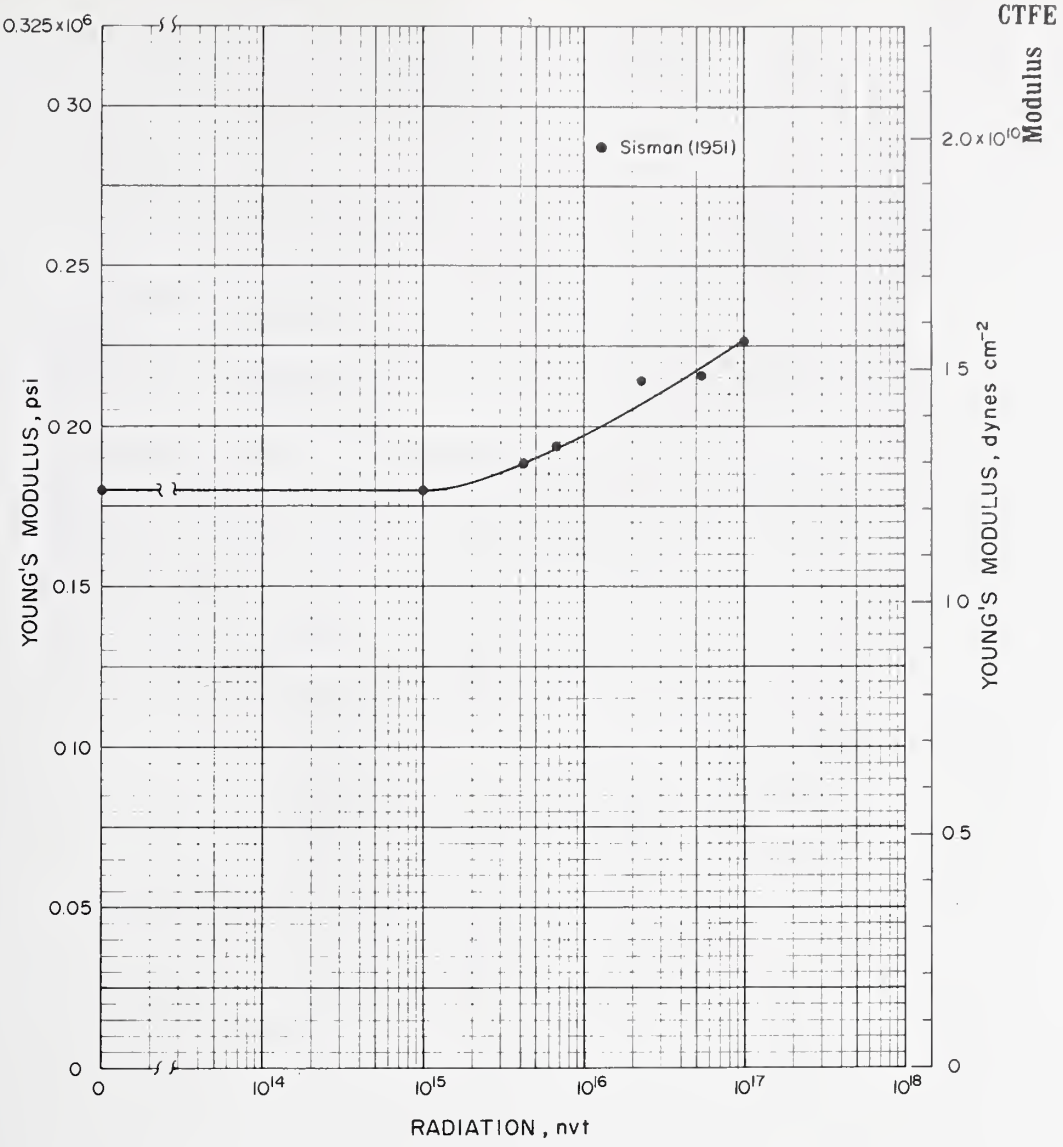
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mowers (1962)	Kel-F unfilled; 40% crys: spgr = 2.10 molded at 547 K for 5 min then quick-quenched; 55% crys: spgr = 2.12, as received + 4 h at 422 K, slow cool; 70% crys: spgr = 2.14, as received + 24 h at 475 K, slow cool	ASTM DIO 43-51 test procedures, Tinius-Olsen torsional stiffness tester slightly modified; error bars indicate spread of data for several tests.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kono (1961)	Kel-F, annealed at 373 K for 1 h	t = 0. 05 - 0. 5 cm; modulus calculated from density, long. and trans wave velocity, and long. and trans wave attenuation, 2. 5 x 10^{8} Hz.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Crissman, Passaglia (1966)	Molecular weight ≃ 150,000, one sample formed by quenching in dry ice and acetone, sp gr = 2.1176, 39.6% crys; after high temp tests sp gr increased to 2.1314, 53.3% crys, then designated A and re-tested; during re-run sp gr increased to 2.1346, 62.9% crys, then designated B and again re-tested; one sample crystallized at 463 K for 4 days, sp gr = 2.1496, 69.1% crys.	Torsion pendulum, nominal frequency of 1 Hz.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Sisman, Bopp (1951)	Fluorothene	Red Sec ℓ = 5.72 cm, w = 1.27 cm; modified ASTM D 638-49T test procedure, Baldwin Southwark testing machine, xhd spd = 0.0021 cm s^{-1} to a strain of 0.02 and then xhd spd = 0.0085 cm s^{-1}; irrad in Hole 19 of ORNL reactor at 298-313 K and in air, aged 7 days at 298 ± 1 K and 50 ± 2% rel hum before testing.

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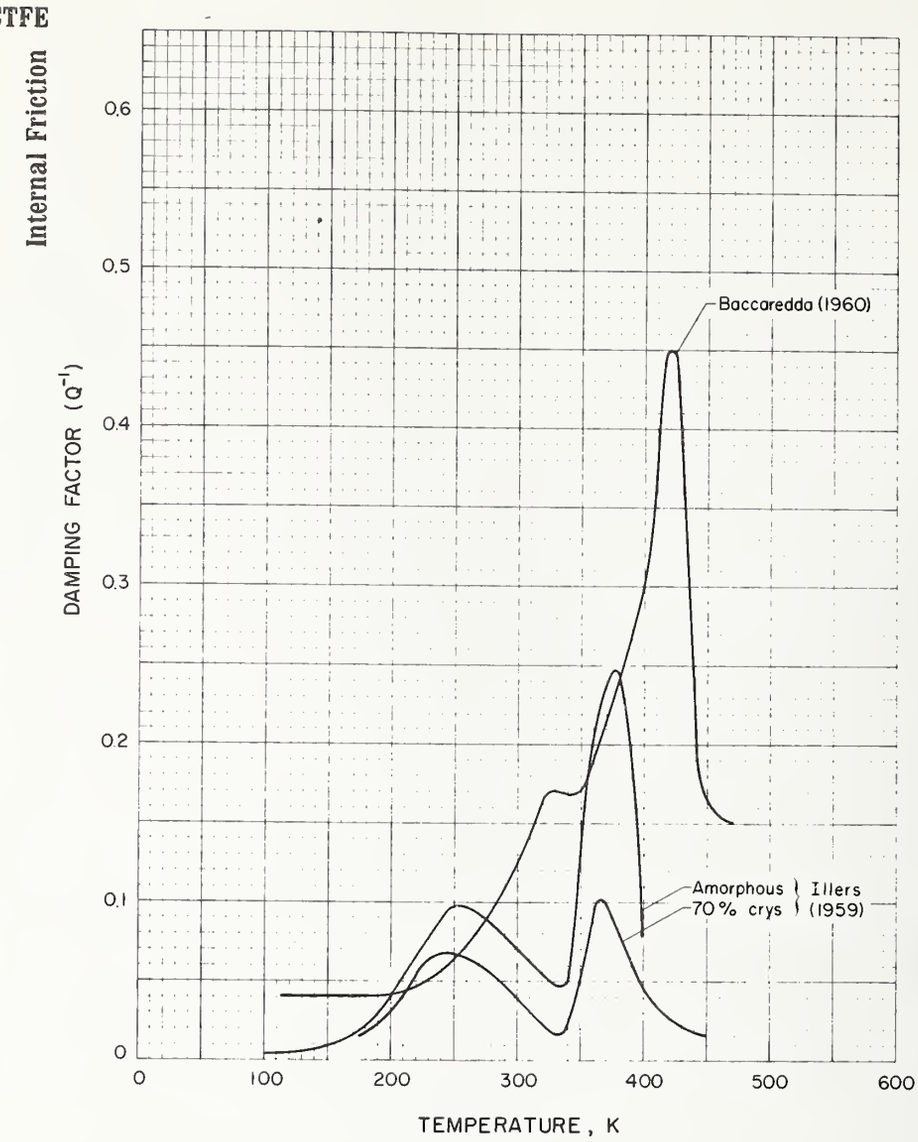
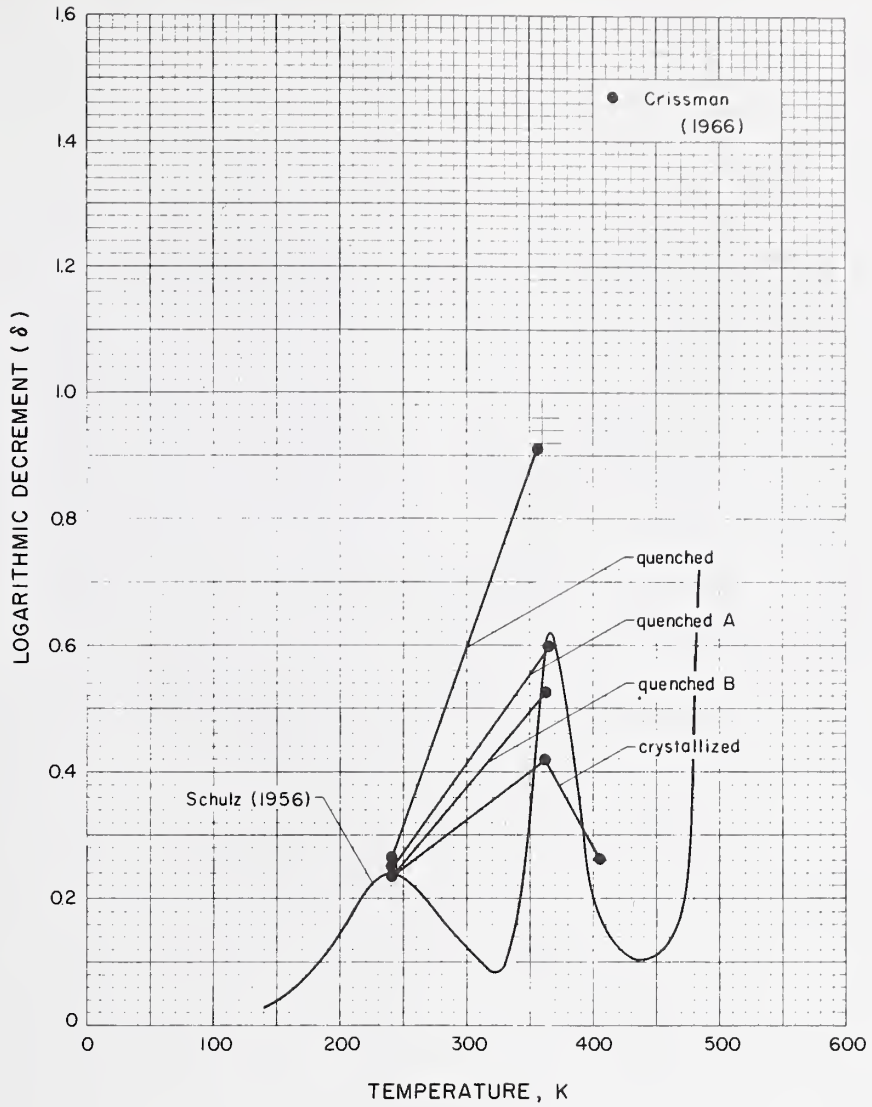


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Baccaredda, Butta (1960)	Sp gr = 2.13, 51% crys	Rod diam = 0.8 cm, ℓ = 4.5 cm; dynamic electrostatic method, 4-16 x 10^3 Hz.
Illers, Jenckel (1959)	Hostaflon	Torsional pendulum, 1 Hz.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Crissman, Passaglia (1966)	Molecular weight ~150,000, one sample formed by quenching in dry ice and acetone, sp gr = 2.1176, 39.6% crys; after high temp tests sp gr increased to 2.1314, 53.3% crys, then designated A and re-tested; during re-run sp gr increased to 2.1346, 62.9% crys, then designated B and again re-tested; one sample crystallized at 463 K for 4 days, sp gr = 2.1496, 69.1% crys.	Torsion pendulum, nominal frequency of 1 Hz.
Schulz (1956)		0.2-1 Hz

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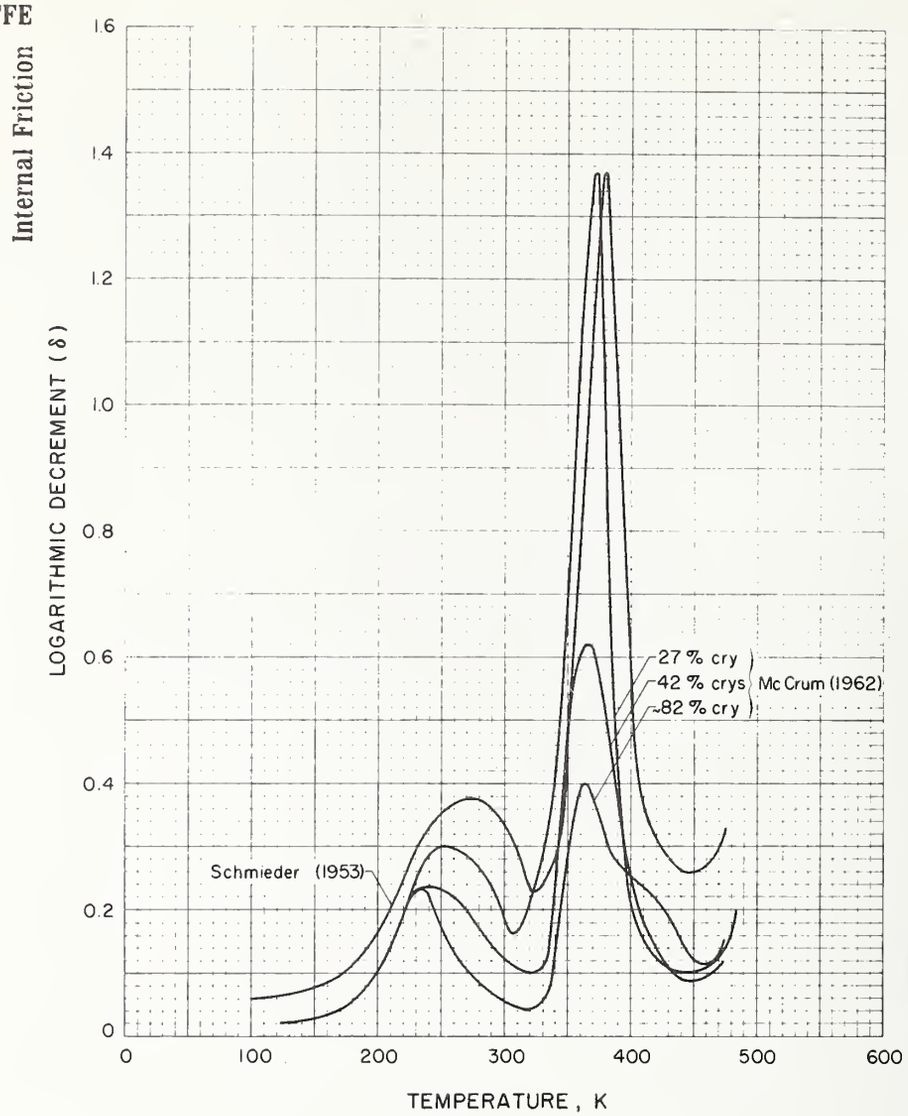
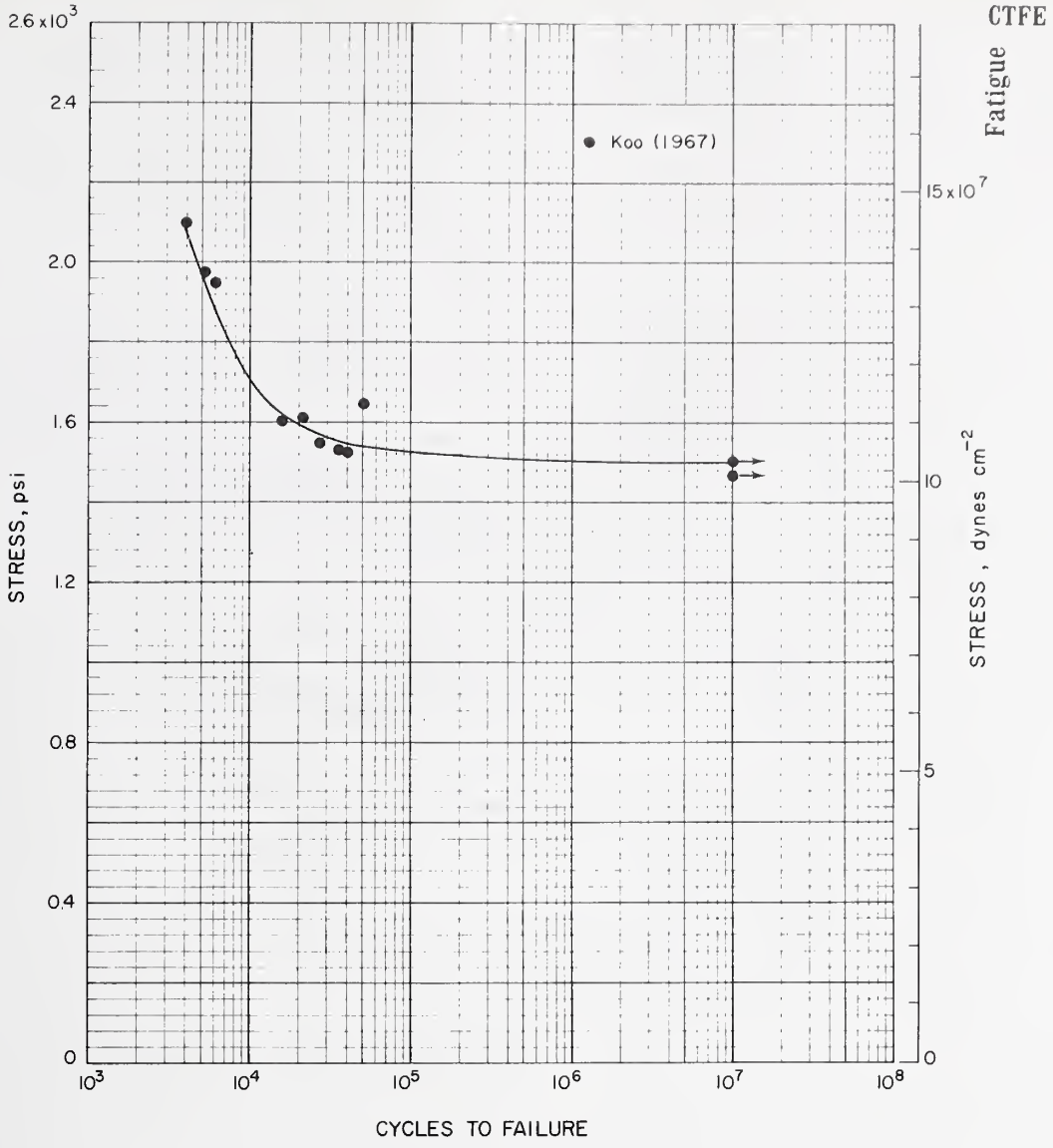


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
McCrum (1962)	Fluorothene; one sample quenched from melt, sp gr = 2.102, 27% crys; one sample cooled from melt at intermediate rate, sp gr = 2.119, 42% crys; one sample slow cooled and then annealed close to melting point, sp gr > 2.136, >57% crys, probable sp gr ~2.16, ~82% crys.	Torsion pendulum.
Schmieder, Wolf (1953)		Torsion pendulum, damping.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Koo, Riddell, O'Toole (1967)		Sonntag Model SF 2U test machine, 30 Hz, ASTM D 671-63T, Method B test procedure.

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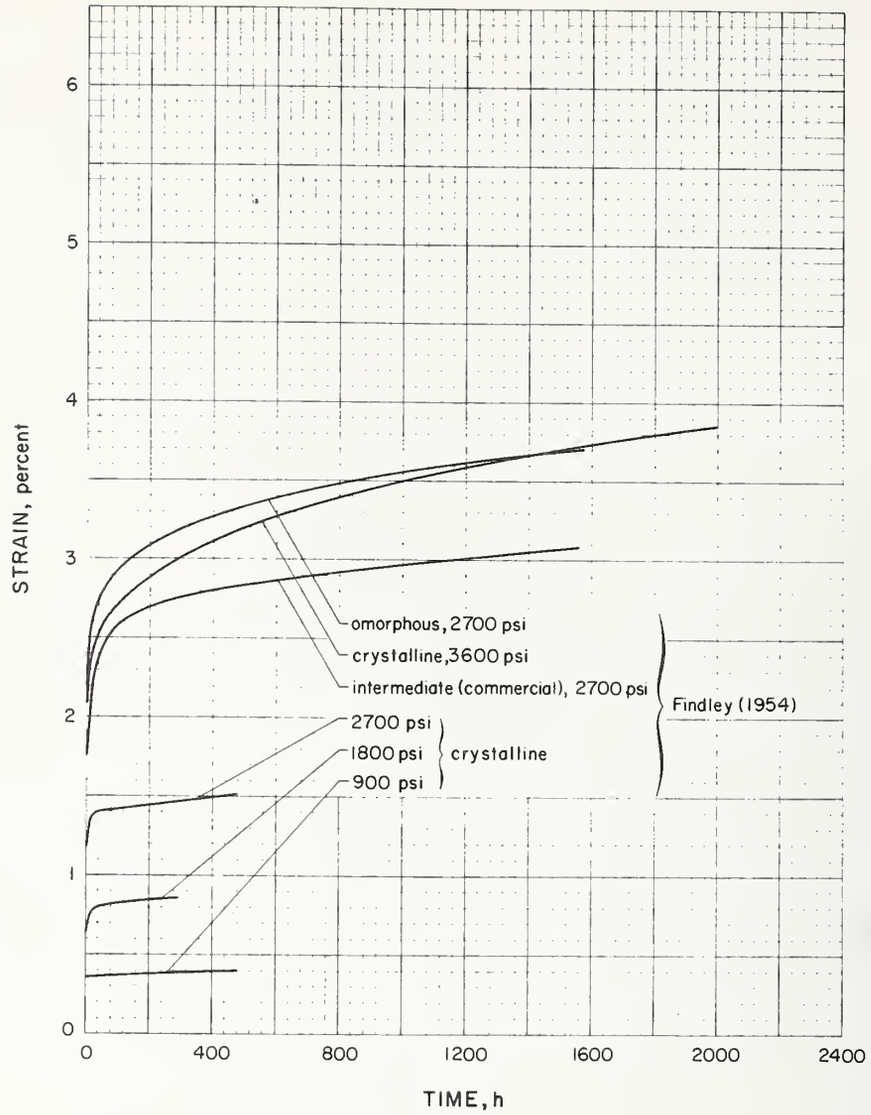
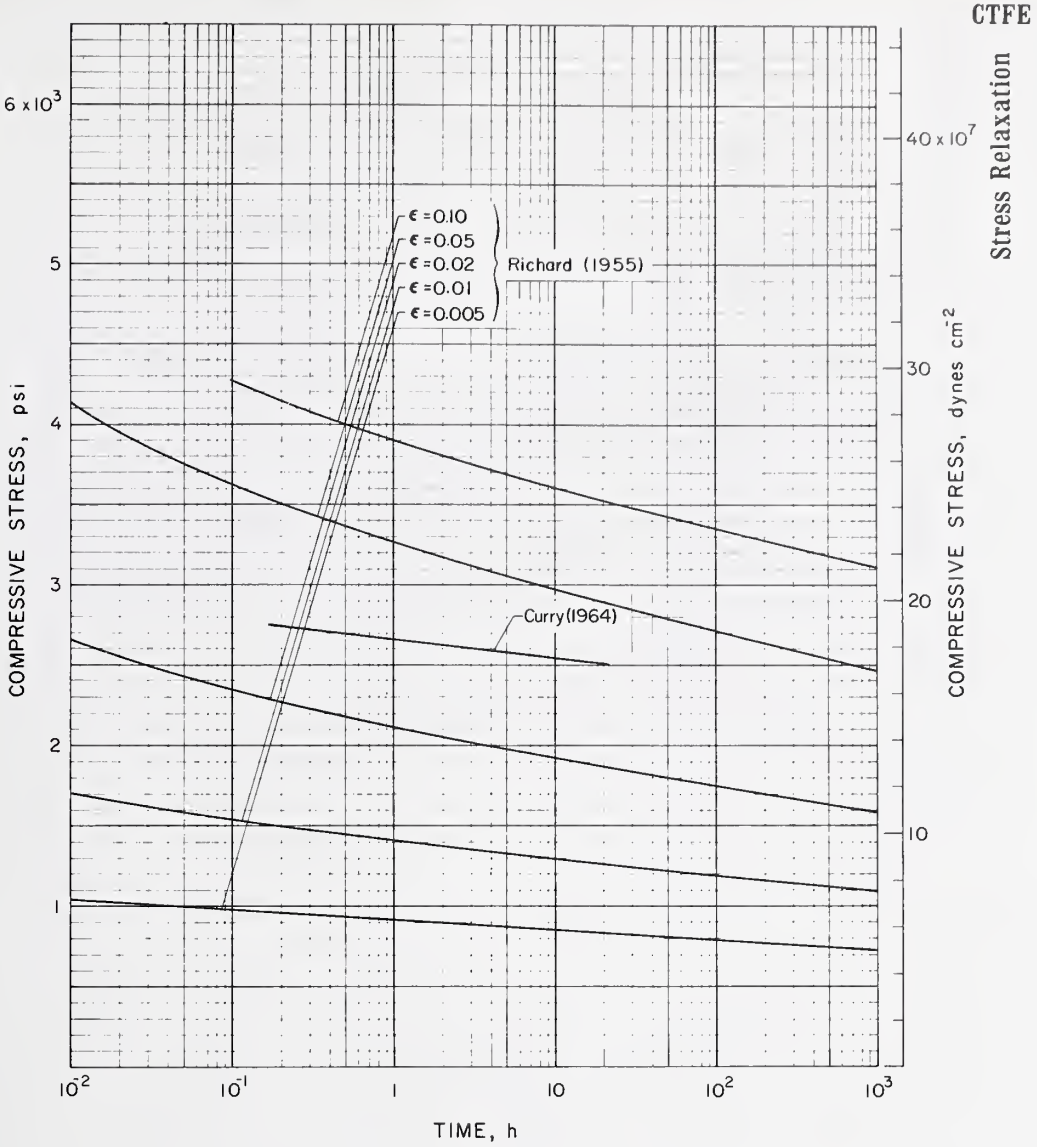
Creep



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Findley (1954)	Kel-F, grade 300, unplasticized, molded under 250 - 300 psi at 522 - 533 K, water quenched to produce amorphous sample, mold platens water-cooled to produce intermediate crys, for crystalline form mold cooled to 505 K with steam and then cooled to room temp in 6 - 8 h.	t = 0.3175 cm.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Curry (1964) Richard, Diedrich (1955)	Kel-F, "Lox Grade"	Compressed to predetermined initial stress level, 296 K. Tested in air at 293 K.

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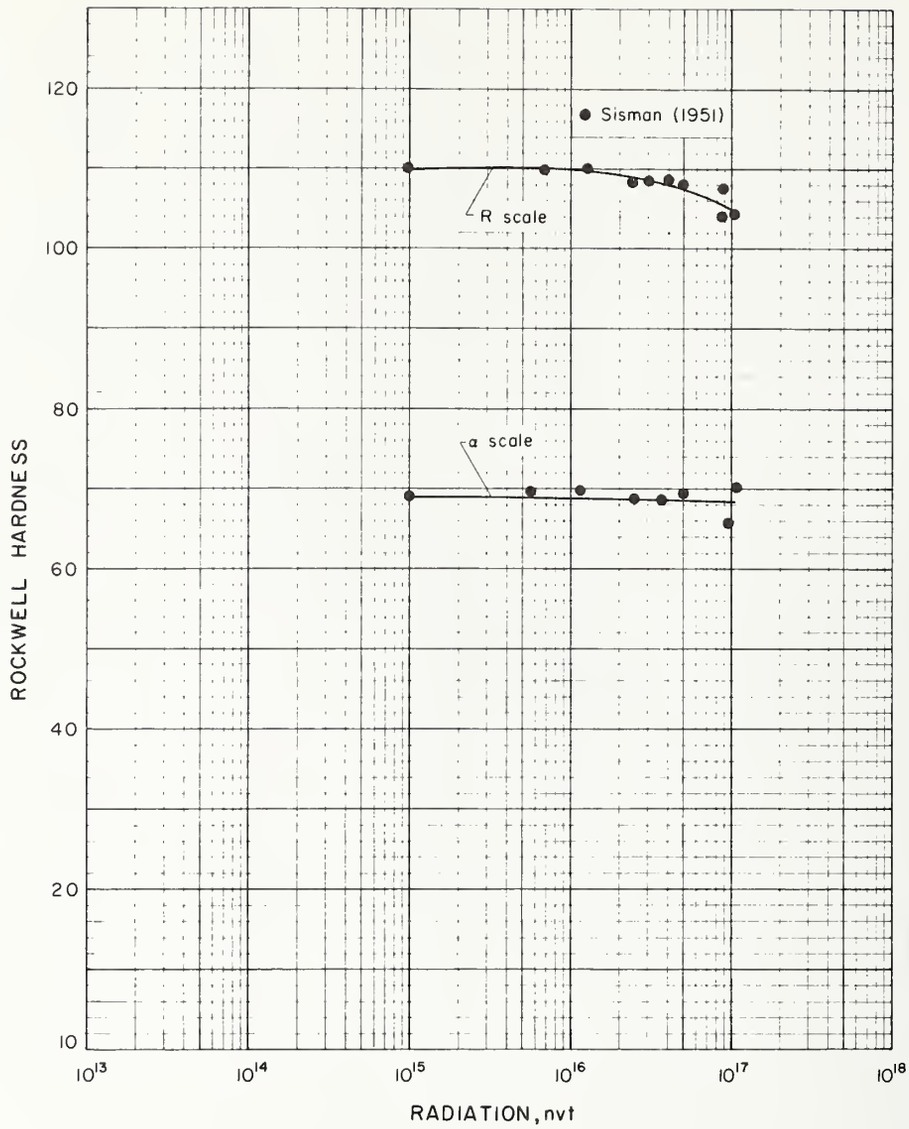
Hardness



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sisman, Bopp (1951)	Fluorothene	Modified ASTM D 785-48T test procedure, Rockwell long stroke machine; irrad in Hole 19 of ORNL reactor at 298-313K and in air, aged 7 days at 298 ± 1K and 50 ± 2% rel hum before testing.

Investigator(s) (Year)	Description	Tensile Strength (10^3 psi)	Elongation (percent)	Impact Strength, Izod (ft-lb in^{-1})	Hardness	Other
Bickel (1967)	Kel-F 5500 Kel-F 3700	1.415 2.105	475 350			
Bringer (1962)	amorphous moderately crystalline			7.3 3.1	S80 S85 (Rockwell)	
Conroy (1955)	unfilled	1.7	300		55 (Shore A)	
Postelnek (1957)	raw gum peroxide cured	0.530 2.405	800 405		49 55 (Shore A)	
Troester (1960)	oriented film and fiber	30-50	125-175	3.62	111-115 (Rockwell R)	3.64[a] 0.192[b] 0.226[b]
Johnson (1958)	unirrad irrad	5.662 5.266	45.6 67.2	1.78 1.49		
Warfield (1969)						0.28[b] 0.75[c] 0.44[d]
Curry (1964)					76 (Shore D)	
Lieb (1961)	xhd spd = 0.085 cm s^{-1}					
	Die C	5.38	68			
	Die D	5.53	68			
	Micro Die	5.52	45			
	xhd spd = 0.042 cm s^{-1}					
	Die C	5.40	97			
	Die D	5.53	96			
	Micro Die	5.50	97			
Lockheed (1964)	long.	3.7±0.6	160±22			2.6±0.3[a] 0.099 ± 0.01[b]
	trans	5.7±0.7	82±27			2.9±0.2[a] 0.011± 0.016 [b]

Footnotes:
[a] Yield Strength, 0.2% offset (10^3 psi)
[b] Young's Modulus (10^6 psi)
[c] Bulk Modulus (10^8 psi)
[d] Poisson's Ratio

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Bickel, Stotz (1967)	Kel-F 5500 and 2700	Federal Test Method Standard 601, methods 4111 and 4121.
Bringer (1962)	Kel-F moderately crystalline (sp gr = 2.13) and amorphous (sp gr = 2.11)	
Conroy, Honn, Robb, Wolf (1955)	Kel-F, unfilled, Stock No. Q-28	
Postelnek (1957)	Kel-F elastomer 214, raw gum and peroxide cured No. av molecular weight 590,000	
Troester (1960)	Kel-F grade 270-300, unplasticized	ASTM test procedures: D638-46T for Y S and E, D638-52T for elongation, D256-47T for impact strength, and D785-48T for Rockwell hardness; tensile strength is for oriented film and fiber.
Johnson, Sicilio (1958)	Kel-F, unplasticized, sp gr = 2.12 before irradiation, sp gr = 2.11 after irradiation	Flat, dumbbell shaped specimens for strength and elongation, for impact strength a 45° notch was milled 0.025 cm deep in specimens, ℓ = 6.35 cm, t = w = 1.27 cm; irrad in Ground Test Reactor at Convair-Fort Worth, av integrated fast neutron flux of 6×10^{14} nvt, thermal-neutron flux of 6×10^{13} nvt, and gamma flux of 5×10^{16} gammas-cm^{-2}.
Warfield, Cuevas, Barnet (1969)	Kel-F, sp gr = 2.148, crys ≈ 90%	ℓ = 7.62 cm, diam = 0.630 cm; modified Matsuoka-Maxwell apparatus; estimated accuracy ± 5%.
Curry (1964)	Kel-F, "Lox Grade"	Penetration type hardness measurement, 296K
Lieb, Mowers (1961)	Kel-F, quick quenched from 561K	t = 0.157 cm, dies C and D as in ASTM D442, Red Sec = 2.54 x 0.64 cm and 2.54 x 0.32 cm respectively, micro die Red Sec 0.508 x 0.254 cm.
Lockheed Missles and Space Co. (1964)	Kel-F	t = 0.0051 cm, ASTM D-412-51T Type C die; Tinius Olsen Universal Test Machine, Model RM-2, xhd spd = 0.0042 cm s^{-1}; errors are standard deviation of 4-6 tests.

Investigator(s) (Year)	Description	Tensile Strength (10^3 psi)	Elongation (percent)	Impact Strength Izod (ft-lb in^{-1})	Hardness	Other
Green (1964)	Kel-F 81	5.775				
Riley (1957)	Unplasticized, sp gr = 2.1	4.5 - 6.0	125 - 175	3.6-4.0	77-80 (Shore D)	4.2[a]
Kelleher (1968)						0.118[b]
Wisander (1969)	293 K 77 K					0.24[c] 24[d]
Anagnostou (1965)	Trithene A unirrad irrad	 7 3	 550 2			

(a) Yield Strength (10^3 psi)
(b) Stiffness (10^6 psi)
(c) Compressive Modulus (10^6 psi)
(d) Shear Strength (10^3 psi)

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Green, Levine (1964)	Kel-F 81	
Riley (1957)	Unplasticized, sp gr = 2.1	Tensile tested according to ASTM D638-52T method, xhd spd = 0.042 cm s^{-1}.
Kelleher, Miner, Boyle (1968)	Unpigmented, molded to t = 0.157 cm	w = 0.64 cm; modified Tinius Olsen stiffness tester, ASTM D 747 test procedure.
Wisander, Johnson (1969)		Compression: ℓ = 1.905 ± 0.003 cm, diam = 0.635 ± 0.003 cm; max load = 200 lb, xhd spd = 0.0021 cm s^{-1}.
Anagnostou (1965)	Trithene A	t = 0.003 cm, w = 0.6 - 1.3 cm, ℓ = 2.5 - 5.1 cm, GL = 1.3 cm; Instron Model TT-C, rubber faced jaws, xhd spd = 0.004 - 0.021 cm s^{-1}, specimens randomly cut from film; irrad in vacuum at 321 K by ultraviolet from Hanovia 100 watt, type SH, high pressure quartz Hg vapor lamp located 24.4 cm from specimen for 1003 h, also irrad by 2 Mev electrons for a dose of 5×10^{16} electrons cm^{-2}.

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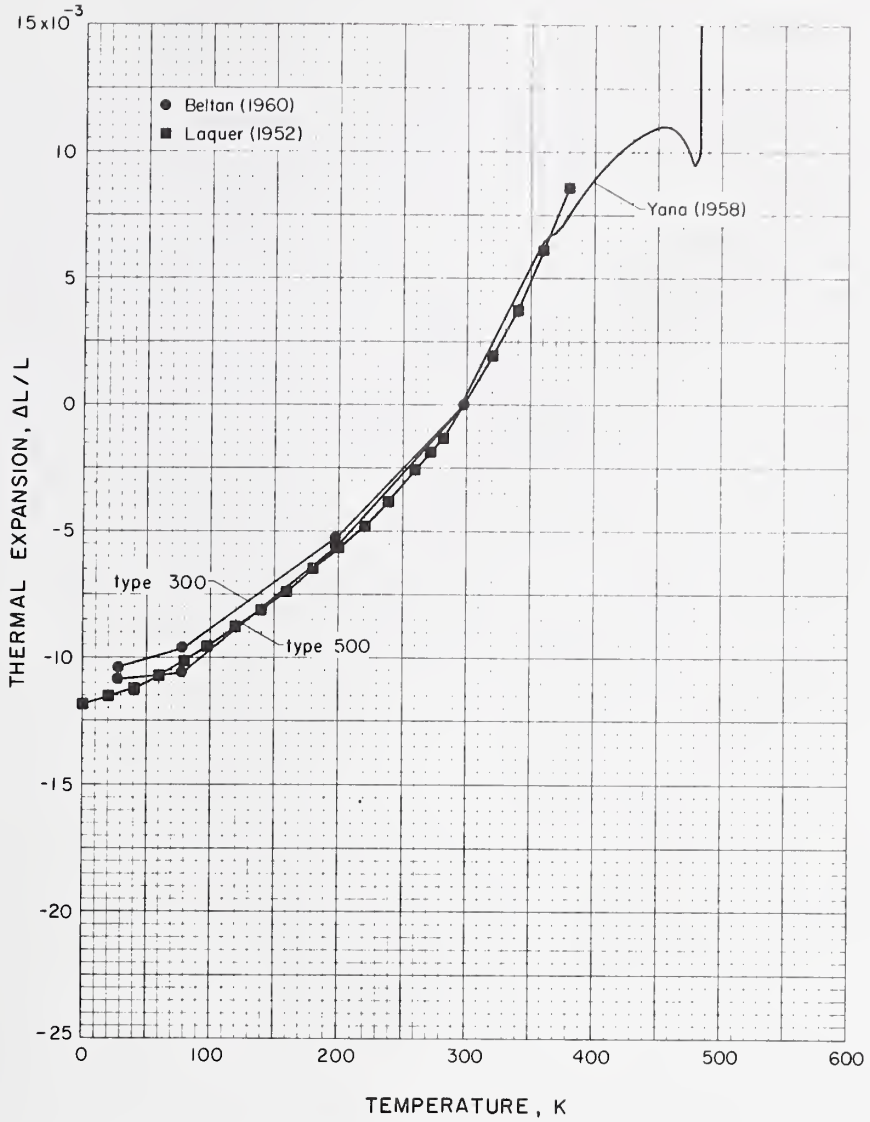

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Belton, Godby, Taft (1960)	Kel-F 300 and 500	ℓ = 10.7 cm; fused quartz dilatometer.
Laquer, Head (1952)	Fluorothene rod, 12.7 cm diam, probably annealed or slowly cooled, milky appearance; Kel-F sheet, t = 0.16 cm, probably quenched, transparent	ℓ = 2.54 cm, rod specimen of 0.508 cm diam cut ⊥ to original rod, rectangular cross-section specimen cut from sheet; quartz tube-dilatometer method used, temperature measured to ± 0.1 K with copper-constantan thermocouple; quoted probable accuracy = ± 7.0×10⁻⁶, only avg of 2 samples reported since they gave very similar expansions.
Yano (1958)	Daiflon film	

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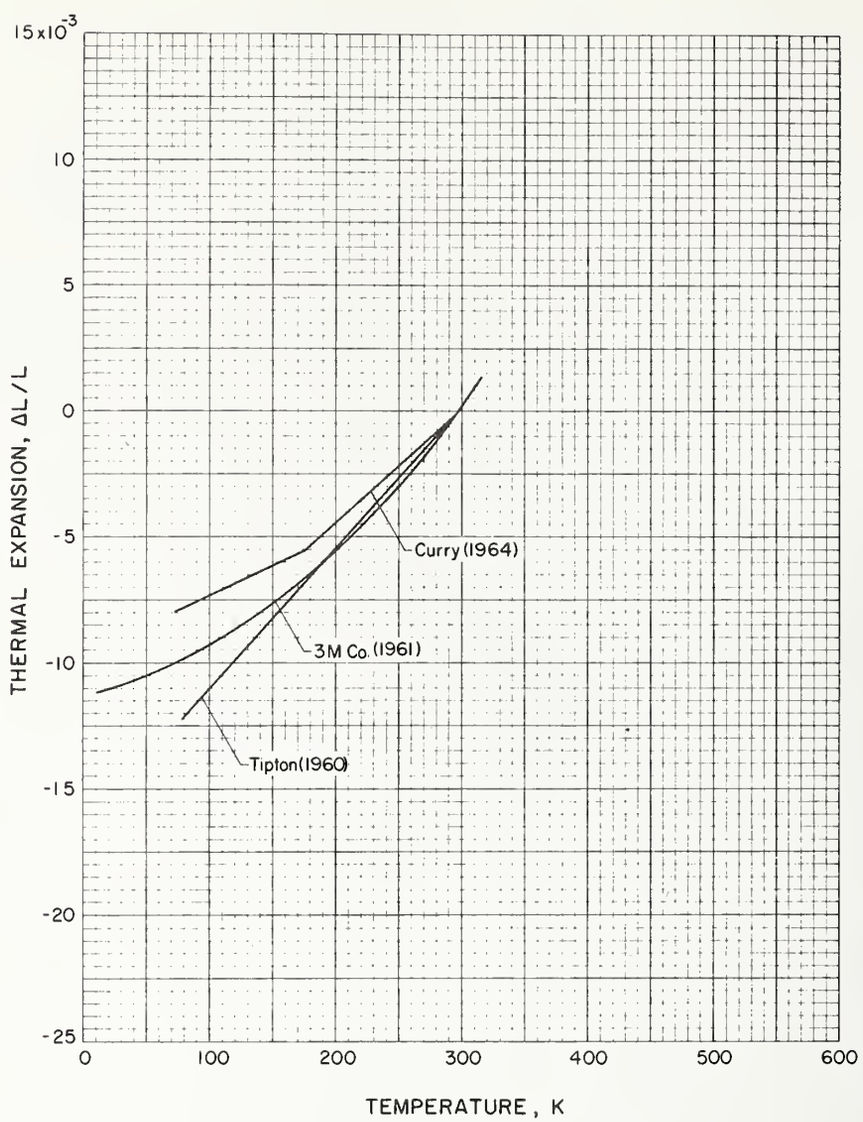
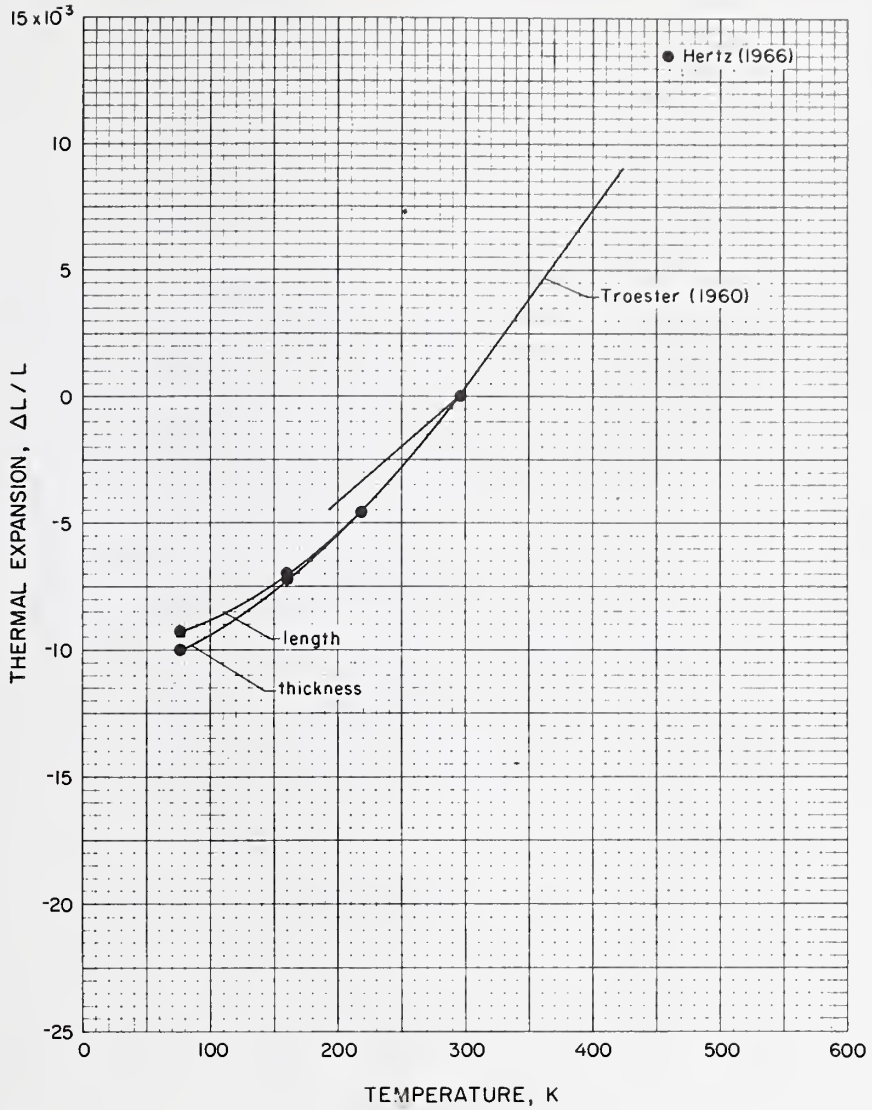
Expansion



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
3M Co. (1961)	Kel-F 81	
Curry (1964)	Lox Grade Kel-F	Calculated from av coefficients of contraction over the temp ranges 77-173K and 173-296K.
Tipton, Trepus, Roper, Weitzel, Robbins (1960)	Kel-F Elastomer	Cylinder. ℓ = 5.08 cm, diam = 1.27 cm; dilatometer, measurements at room temp and 76K.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Troester (1960)	Unplasticized grades 270-300, sp gr = 2.1	ASTM D696-44 test procedure; calculated from av coefficients of contraction over the temp ranges 193-293K and 293-423K.
Hertz (1966)	Kel-F (270/300 NST), as received	t = 1.27 cm; tested ∥ to length and thickness, ⊥ to thickness specimens prepared by slicing initial specimens into 1.27 cm wide strips which were rotated 90° and bonded with an epoxy-polyamide adhesive, the surfaces were then ground flat and ∥.

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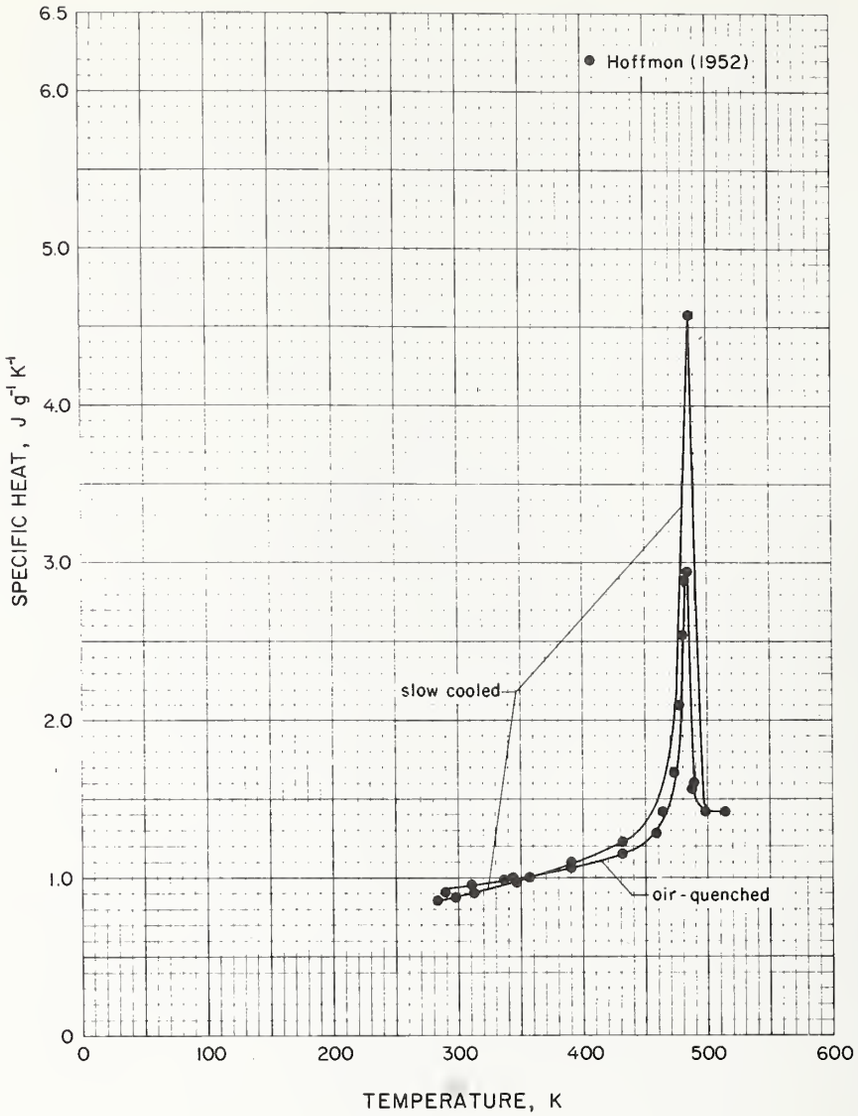
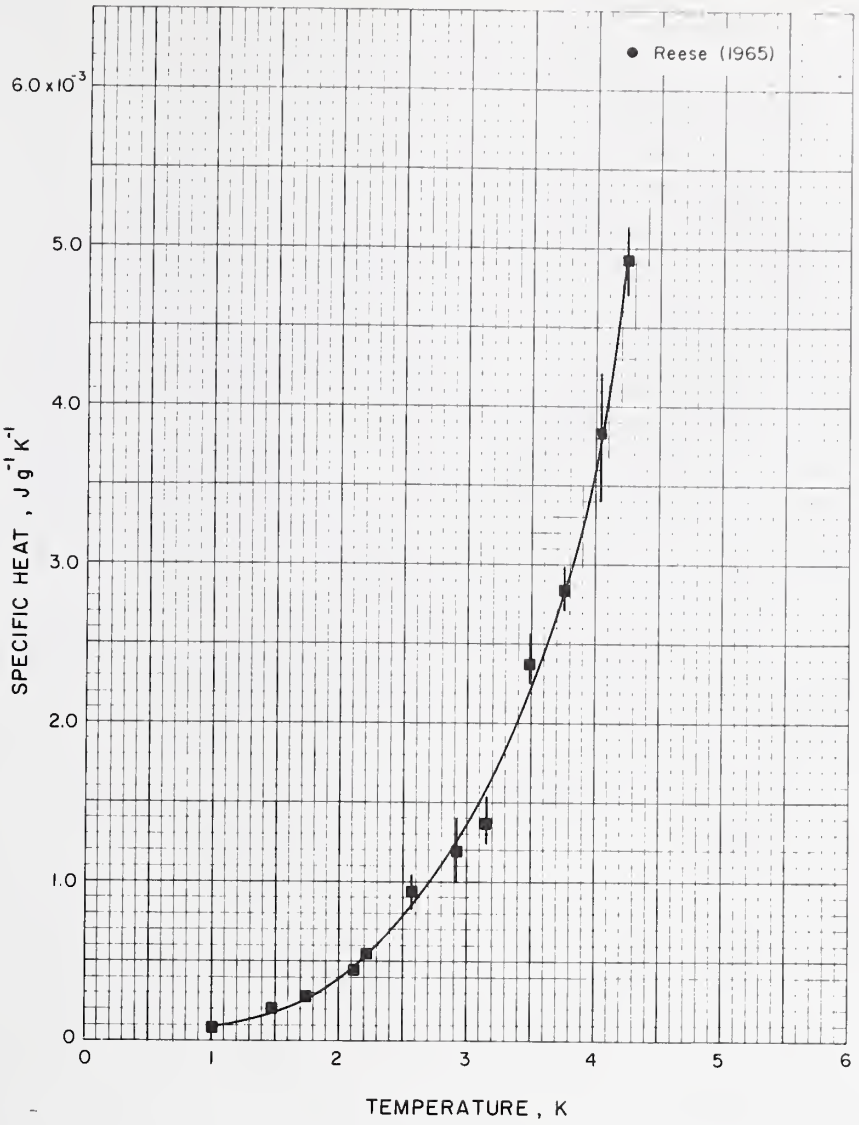
Specific Heat



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Hoffman (1952)	Kel-F, melting point = 483-485K, pressed at 523K into 0.1 cm thick sheets and quenched by cooling in air at room temp , after experimental runs to 373K with air-quenching and then to 523K the material was cooled to room temp at 9K min^{-1}, after another run to 523K the material was cooled at 5K min^{-1}, 35% crys after air-quenching, 82% crys after slow cooling.	Differential calorimeter calibrated between 273K and 523K with diphenyl ether and sapphire; results of first 2 runs very similar and listed as "air-quenched", last 2 runs almost identical and listed as "slow cooled".



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Reese, Tucker (1965)	Kel-F, sp gr = 2.114 ± 0.005	Diam = 1.27 cm, ℓ = 8.2cm; carbon resistance thermometer; error bars indicate statistical errors

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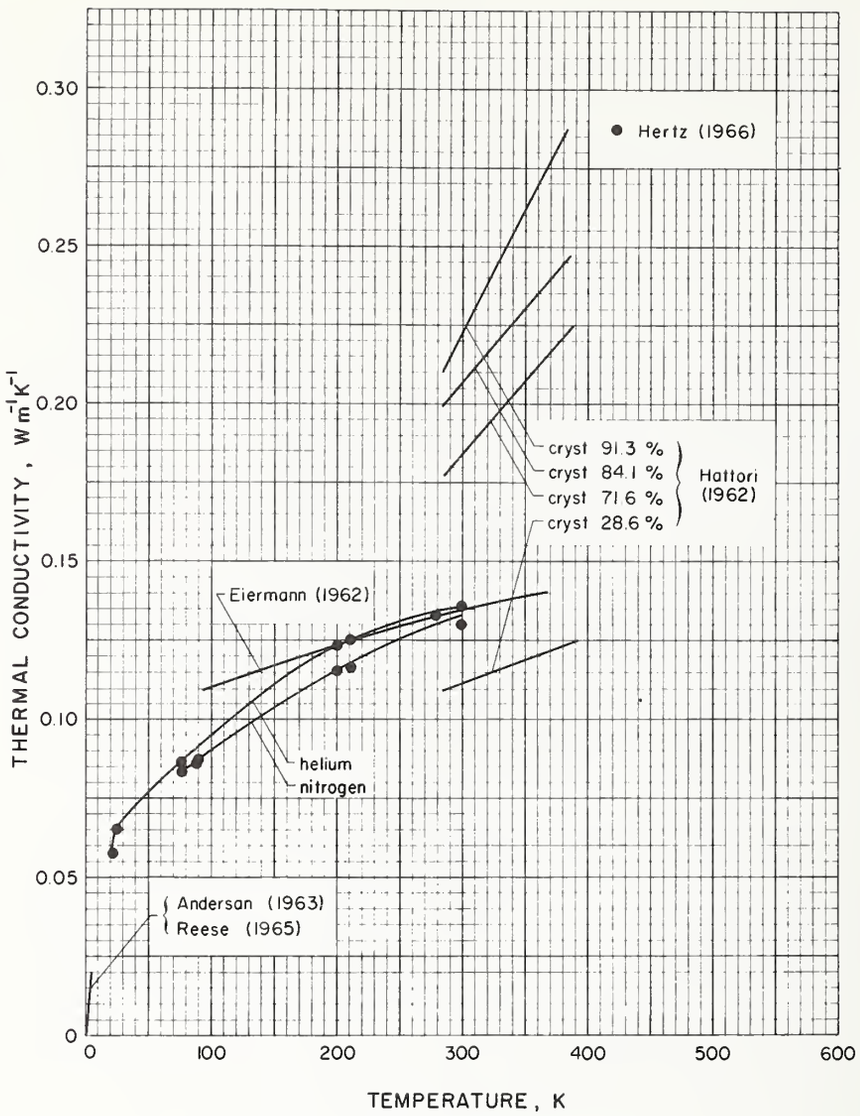
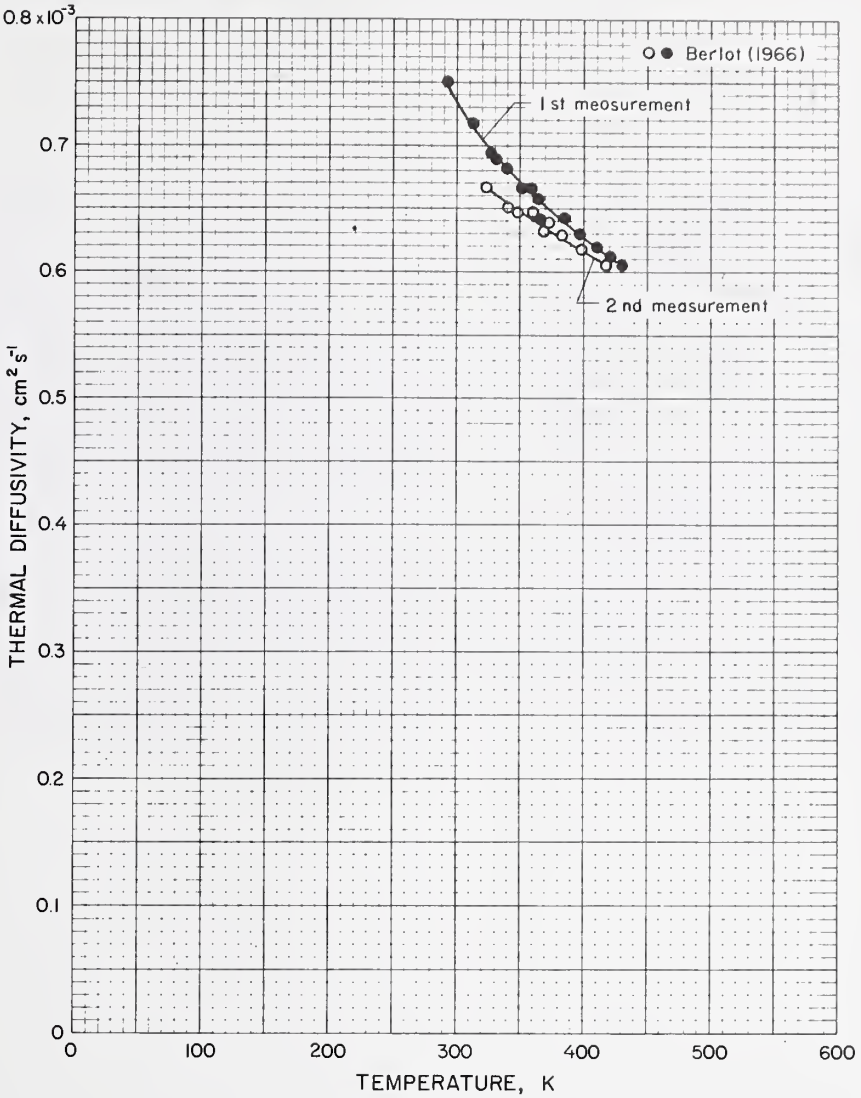
Conductivity



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Hertz (1966)	Kel-F (270/300 NST), as received.	t = 1.27 cm; modified guarded hot-plate technique, tested in helium and nitrogen gas at 1 atmosphere pressure.
Anderson, Reese, Wheatley (1963)	Kel-F, sp gr = 2.134 ± 0.005	Diam = 1.00 cm, ℓ = 3.05 cm; resistance thermometer; measurements made from 0.2-0.8 K.
Reese, Tucker (1965)	Kel-F, sp gr = 2.114 ± 0.005	Diam = 1.27, ℓ = 8.2 cm; carbon resistance thermometer; systematic errors ≃ 4 - 10%, reproducibility = 1.5%; measurements made from 1 - 4.5 K.
Eiermann, Hellwege (1962)		Maximum absolute error ≃ 4%, relative error < 1%.
Hattori (1962)	Original sample held at 473K for one half h and quenched in ice water giving sp gr = 2.116, 28.6% crys; sample then heated at 463K for one half h and quenched in ice water giving sp gr = 2.140, 71.6% crys; sample then heated at 463K for 4 h and slowly cooled to room temp giving sp gr = 2.147, 84.1% crys; finally sample heated at 493K for one half h and at 443K for 4 h cooling slowly to room temp after each heat giving sp gr = 2.151, 91.3% crys.	Measured under steady heat flow by absolute method.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Berlot (1966)		t = 0.5 cm, diam = 10 cm; thermocouple measurements made in 6 directions, specimen re-tested.

Investigator(s) (Year)	Material Identification	Temperature (K)	$\Delta L/L$ Thermal Expansion	λ Thermal Conductivity ($Wm^{-1}K^{-1}$)	α Thermal Diffusivity ($cm^2 s^{-1}$)	C_p Specific Heat ($Jg^{-1} K^{-1}$)
Troester (1960)	Unplasticized grades 270-300, sp gr = 2.1	298		0.258		0.902
Wisander (1969)		77	-0.53×10^{-3}			

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Troester (1960)	Unplasticized grades 270-300, sp gr = 2.1	
Wisander, Johnson (1969)		ℓ = 2.54 cm, diam = 0.95 cm; submerged in liquid N_2 and then measured with a micrometer, measurement repeated 6-8 times until no further contraction is noted.

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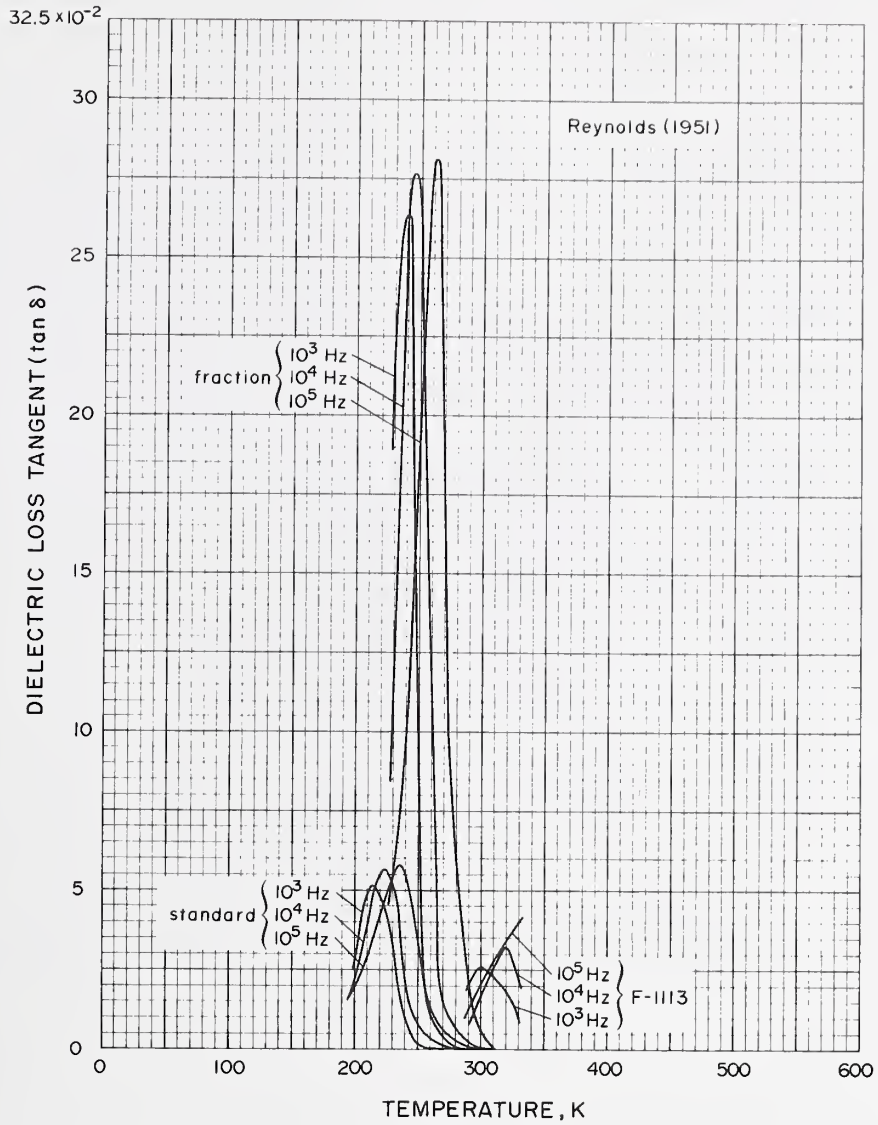

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Loss Tangent

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Reynolds, Thomas, Sharbaugh, Fuoss (1951)	Fluorolube standard collected over the range 373-473 K at 0.1 cm, refractive index at 293 K = 1.394, sp gr = 1.93 at 298 K; Fluorolube fraction obtained from standard by redistillation, collected over the range of 463 K at 1 cm to 503 K at 0.2 cm, crystallites appear sharply at 295 K, number av molecular weight = 980, F-113, sheet of unknown but high molecular weight, same formula as other material.	F-113 specimen diam = 5 cm, t ≈ 0.2 cm; Fluorolube measured in a guarded platinum cell, F-113 measured in a guarded copper cell with platinum electrode faces, General Electric Schering bridge modified to accomodate a guard circuit temp regulated to 0.2 K.

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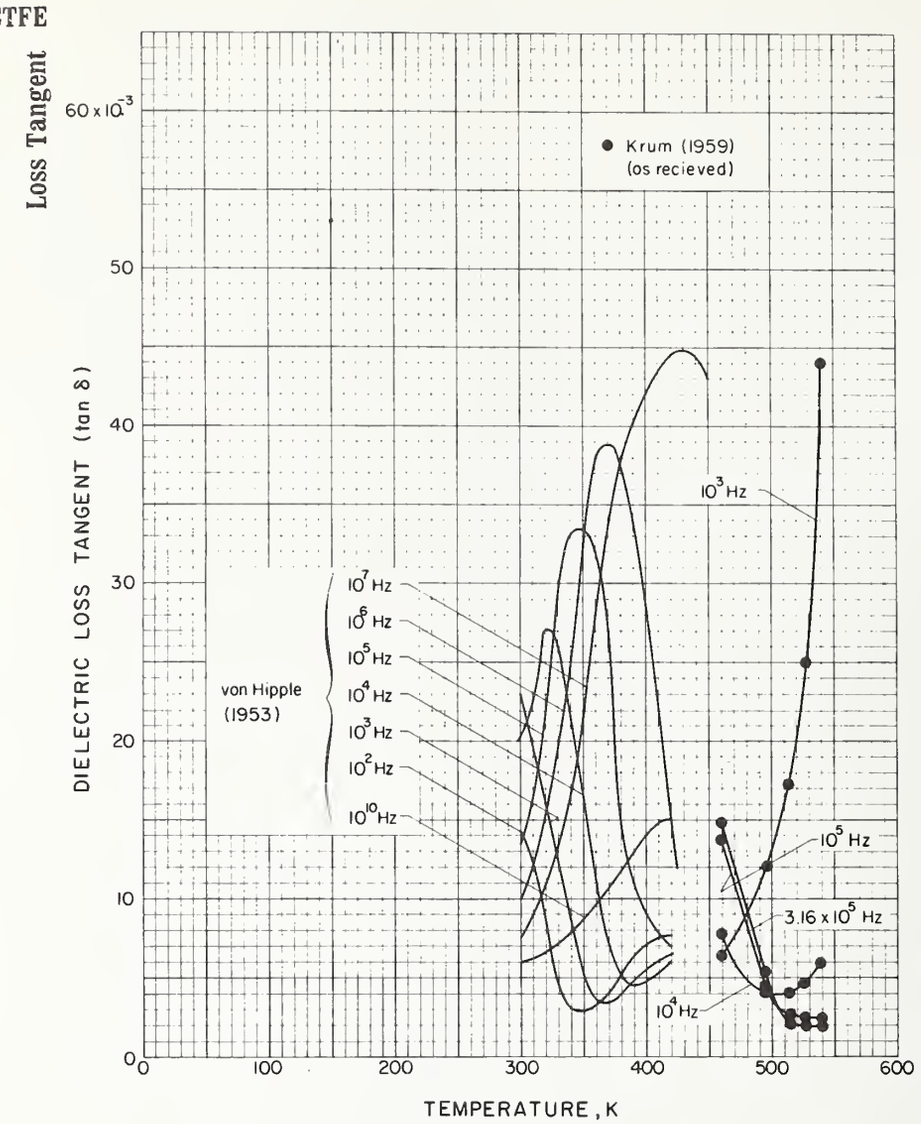
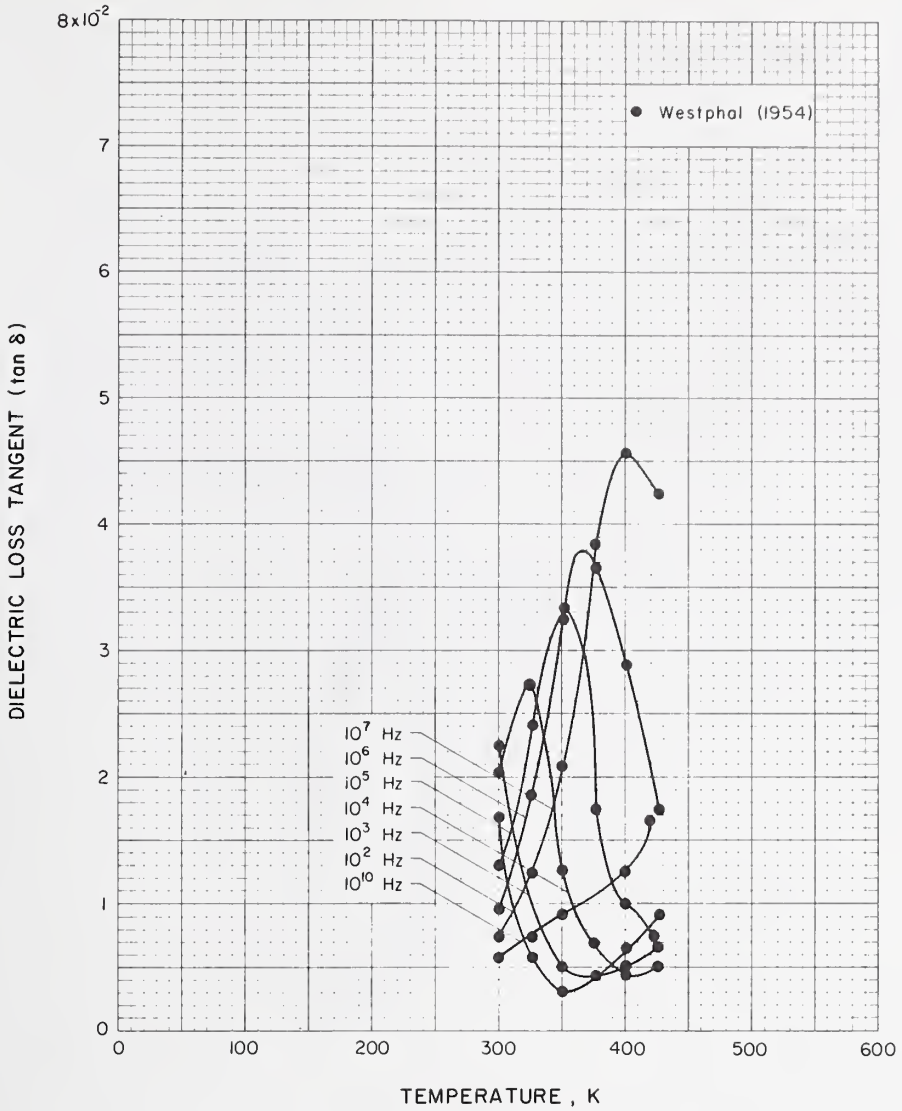


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
von Hippel (1953)	Kel-F Grade 300	Field strength ~ 50 V cm^{-1}; nominal accuracy ± 1%.
Krum, Müller (1959)	Hostaflon, as received, heated from 306 K to 462 K in 1 h	Measurements made over P_2O_5; max absolute error for tan $\delta > 5 \times 10^{-3}$ is 0.3%, max absolute error for tan $\delta < 10^{-3}$ is 5%.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Westphal, Dunn, Fergus, McCarty (1954)	Kel-F, grade 300 samples dried over phosphorus pentoxide	Quoted probable accuracy ± 2%.

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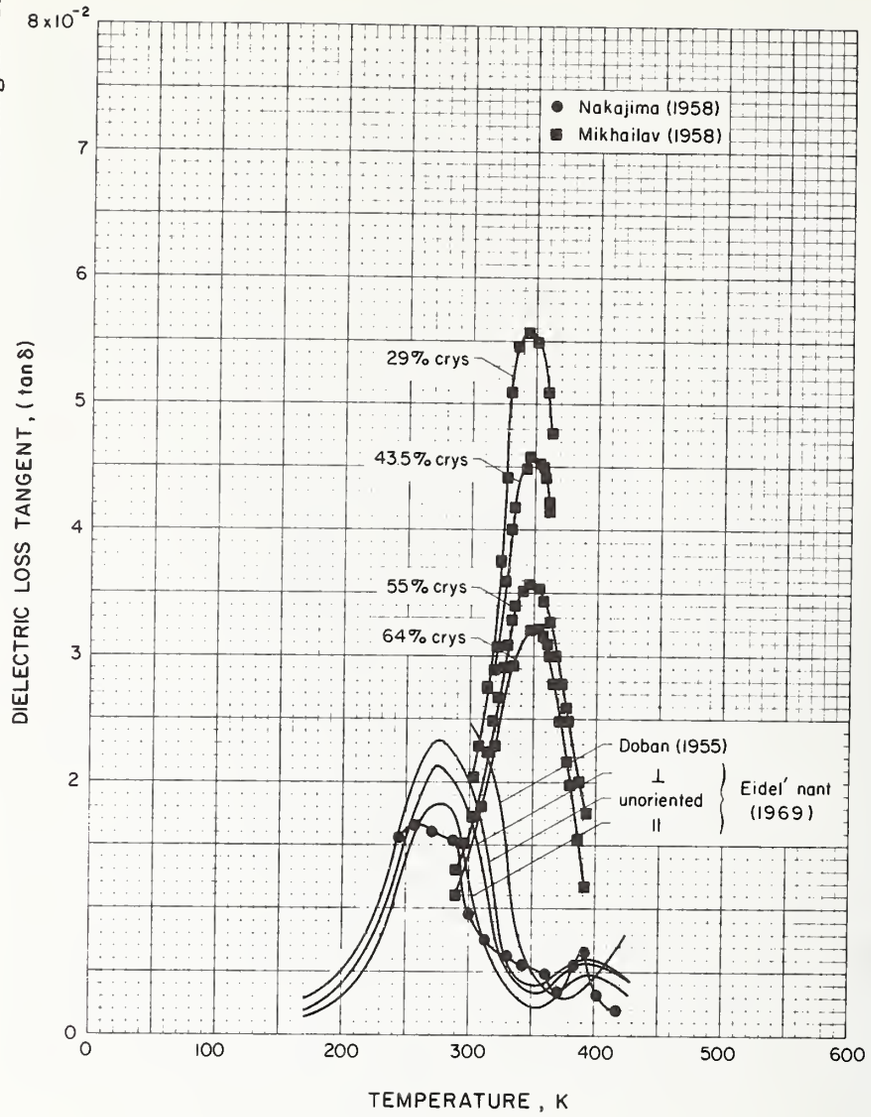
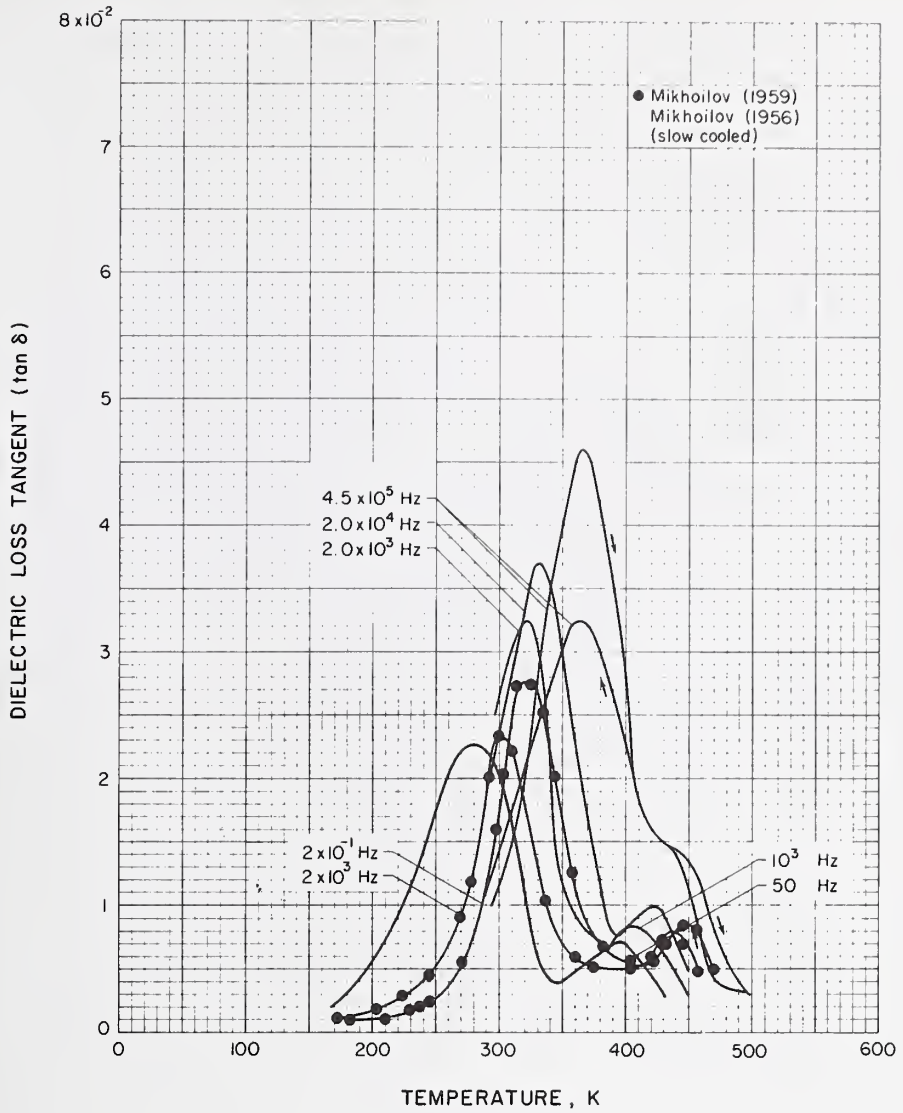


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Nakajima, Saito (1958)	Kel-F, 110,000 molecular weight cooled slowly from melting temp, 48.9% crys	t = 0.2 cm, 8.0 cm diam; three electrode arrangement, guarded electrode 4.0 cm diam, silver conductive paint, 10 Hz.
Eidel'nant, Kreitser, Sazhin (1969)	Bars prepared by extrusion from the melt at 573K and quenched in water at 288K, sp gr = 2.085	10^3 Hz, R-570 bridge, relation between electric field and orientation axis noted; data points not plotted here, 3% measurement error.
Doban, Sperati, Sandt (1955)		10^3 Hz
Mikhailov, Sazhin, Presniakova (1958)	F-3 heat treated to obtain: sp gr = 2.0886, 29% crys; sp gr = 2.1200, 43.5% crys; sp gr = 2.1465, 55% crys; sp gr = 2.1645, 64% crys	t = 1.8×10^{-3} or 10.0×10^{-3} cm; 8×10^4 Hz.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mikhailov, Sazhin (1956) Mikhailov, Sazhin (1959)	Fluoroplast-3, slowly cooled from the melt Fluoroplast-3	Arrows indicate direction of temp change.

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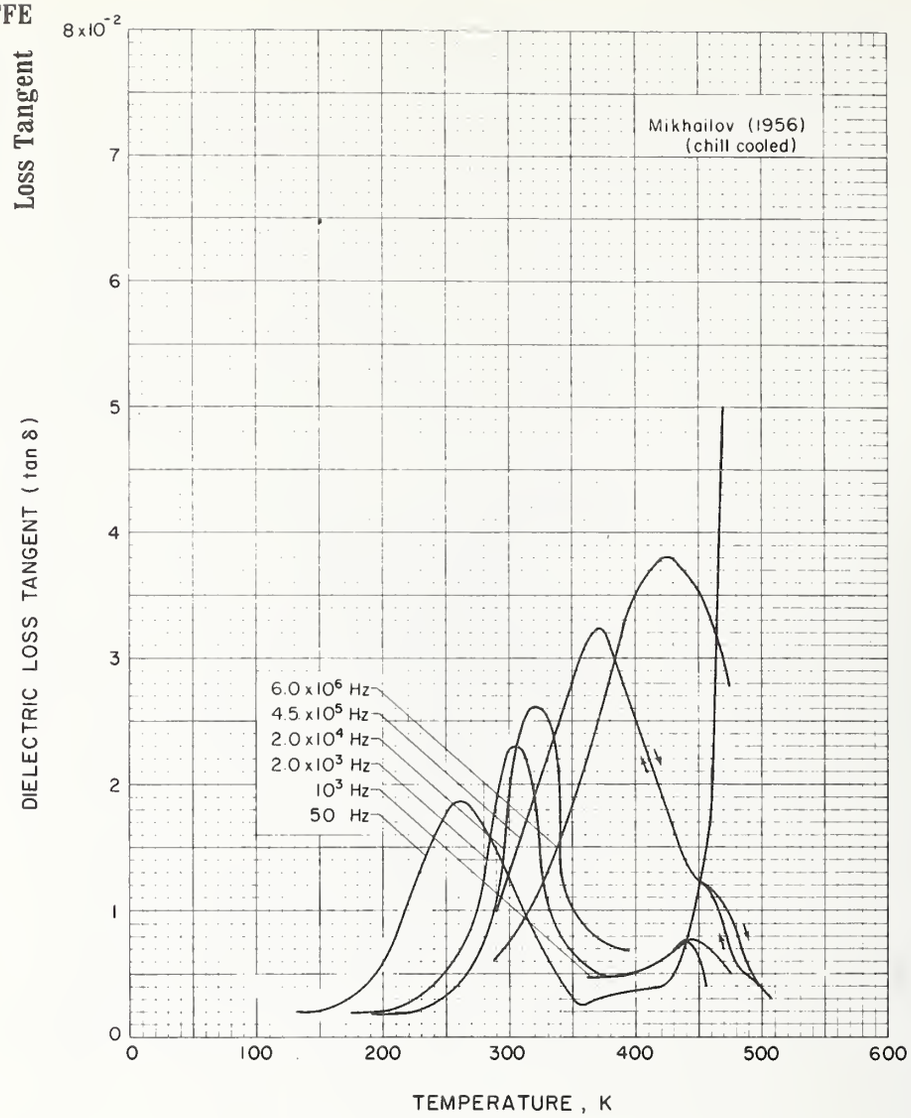
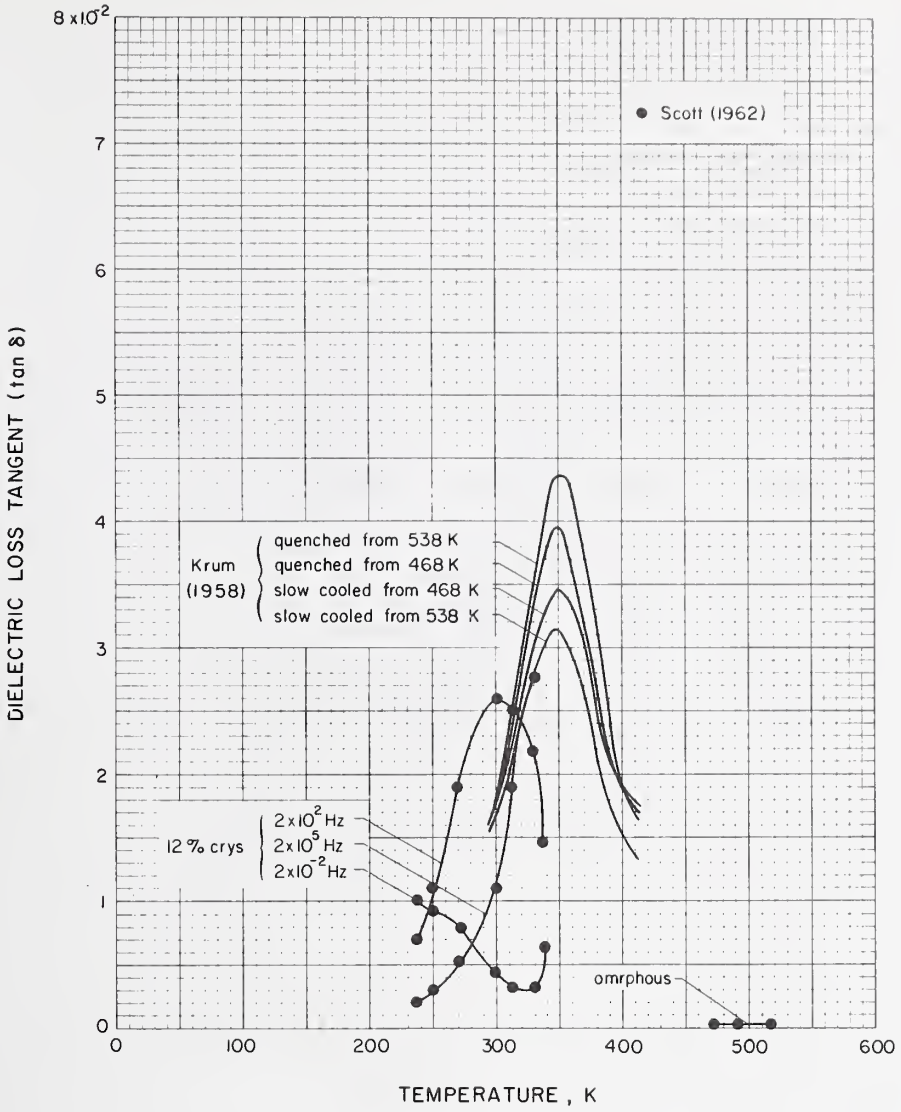


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mikhailov, Sazhin (1956)	Fluoroplast-3, chill cooled from the melt	Arrows indicate direction of temp change.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Krum (1958) Scott, Scheiber, Curtis, Lauritzen, Jr., Hoffman (1962)	Softening temp = 483 Kel-F grade 300, av molecular weight = 415,000, melting point = 497 ± 1 K, 12% crys at start of measurement and amorphous	10^5 Hz. t = 0.015 cm, diam = 5.08 cm for 12% crys specimen, t = 0.2 cm, diam = 5.4 cm for amorphous specimen; evaporated gold electrodes applied in vacuum to 12% specimen, for amorphous specimen no surface electrodes were used and a guard ring prevented flow, modified General Radio type 716-C Schering bridge and modified Boonton Radio Corp. type 160-A Q-meter; uncertainty = ± 0.5%, measurements also made at several other frequencies.

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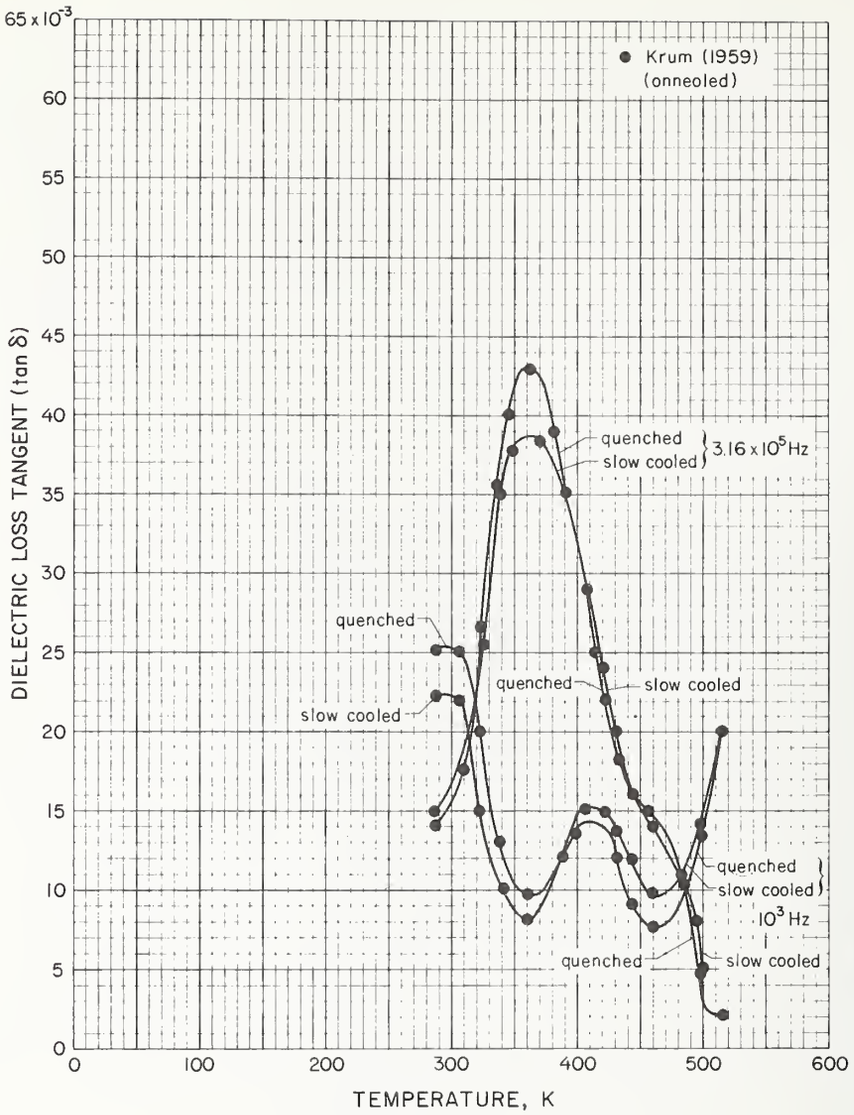
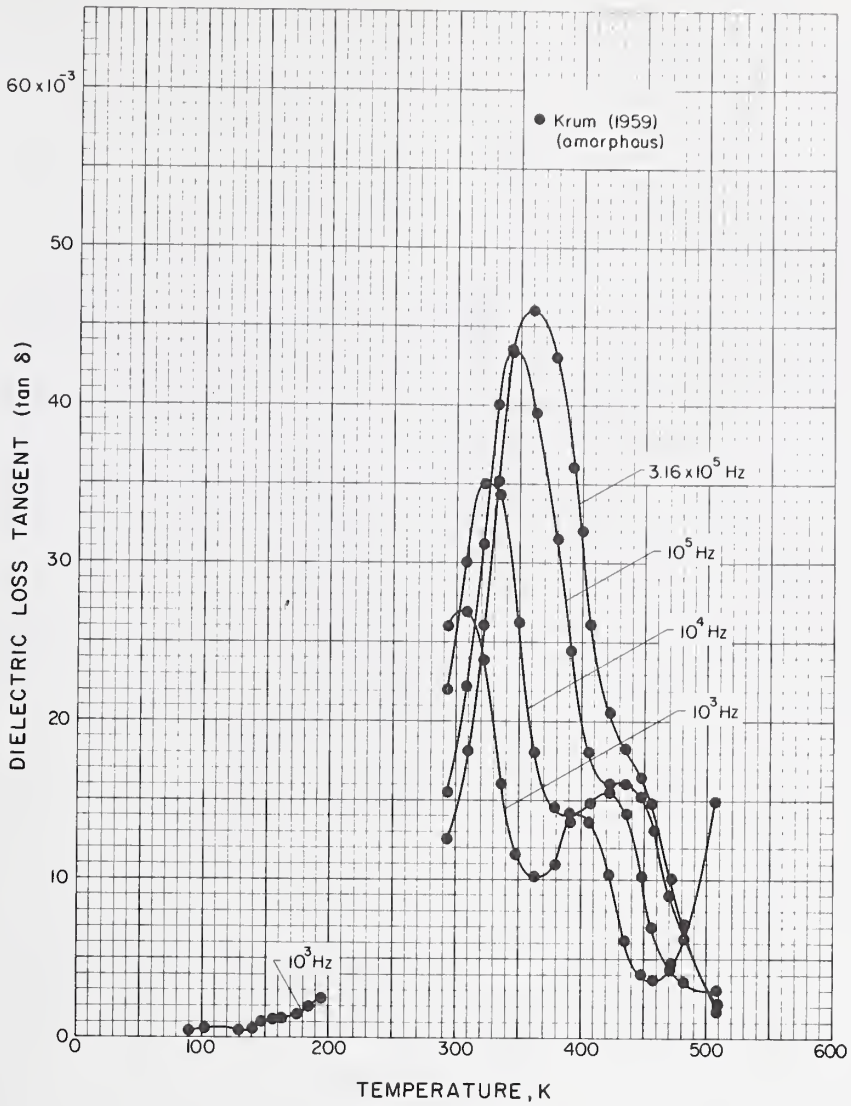
Loss Tangent



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Krum, Müller (1959)	Hostaflon; annealed at 465 K for 20 min and cooled at 0.5 K min^{-1} ; annealed at 468 K for 20 min and quenched to room temp within 3 s	Measurements made over P_2O_5 ; max absolute error for tan $\delta > 5\times10^{-3}$ is 0.3%, max absolute error for tan $\delta < 10^{-3}$ is 5%.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Krum, Müller (1959)	Hostaflon, melted at 538 K for 10 min, quenched to room temp within 3 s, transparent, fully amorphous	Measurements made over P_2O_5; max absolute error for tan $\delta > 5\times10^{-3}$ is 0.3%, max absolute error for tan $\delta < 10^{-3}$ is 5%.

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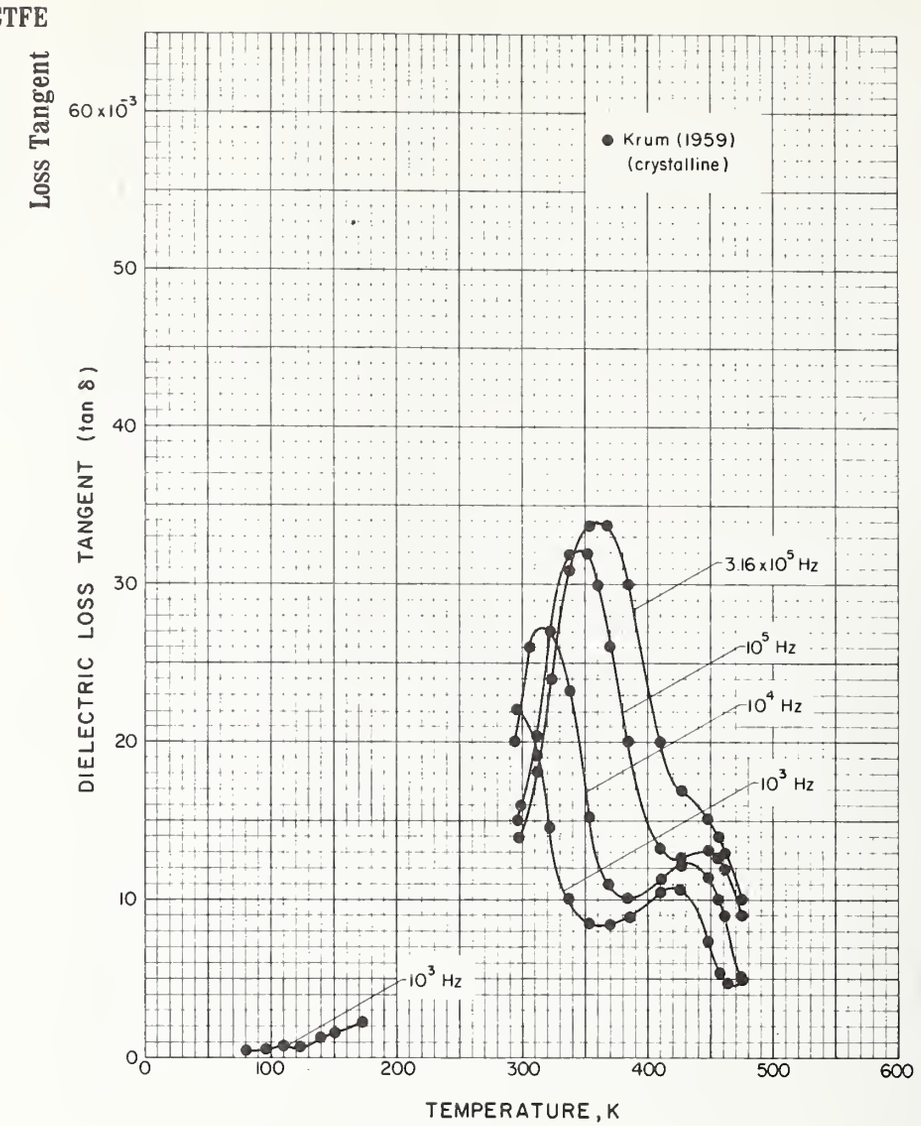
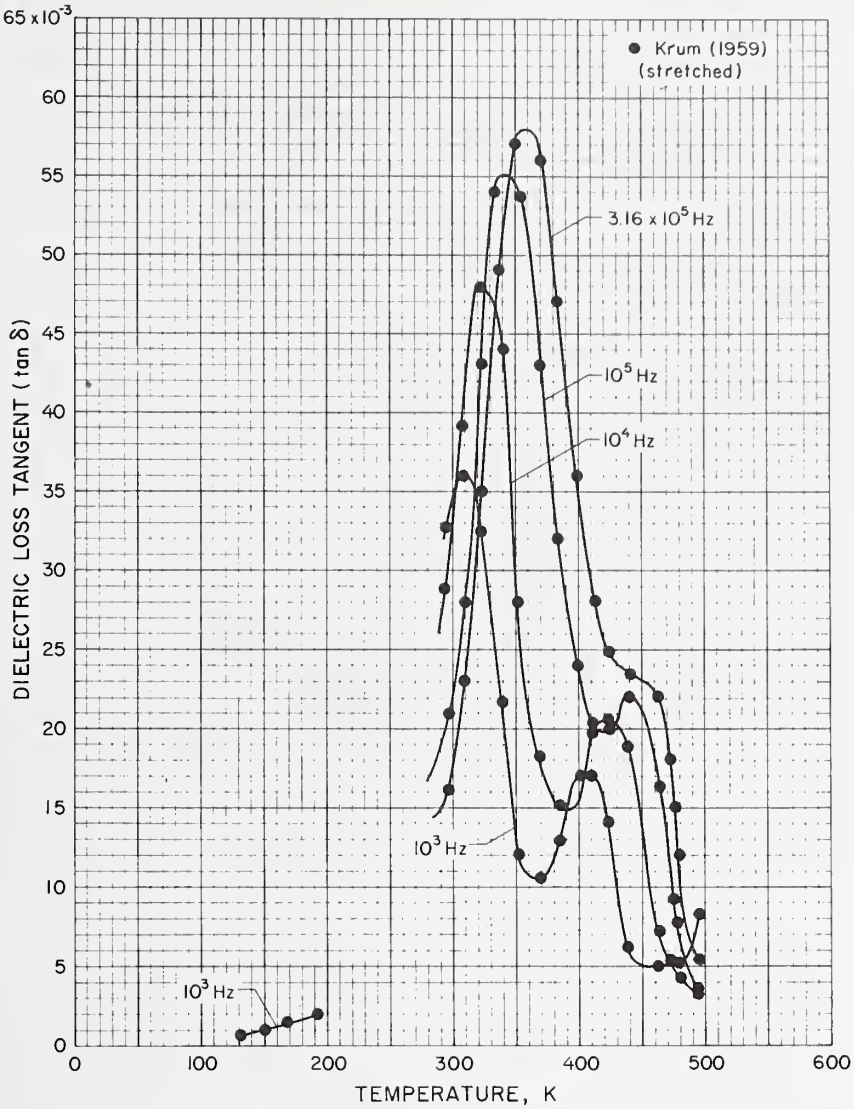


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Krum, Müller (1959)	Hostaflon, melted at 538 K for 10 min, cooled at 0.67 K min^{-1}, dull-white, fully crystalline	Measurements made over P_2O_5; max absolute error for tan $\delta > 5\times10^{-3}$ is 0.3%, max absolute error for tan $\delta < 10^{-3}$ is 5%.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Krum, Müller (1959)	Hostaflon, stretched 100% and then left unrestrained	Measurements made over P_2O_5; max absolute error for tan $\delta > 5\times10^{-3}$ is 0.3%, max absolute error for tan $\delta < 10^{-3}$ is 5%.

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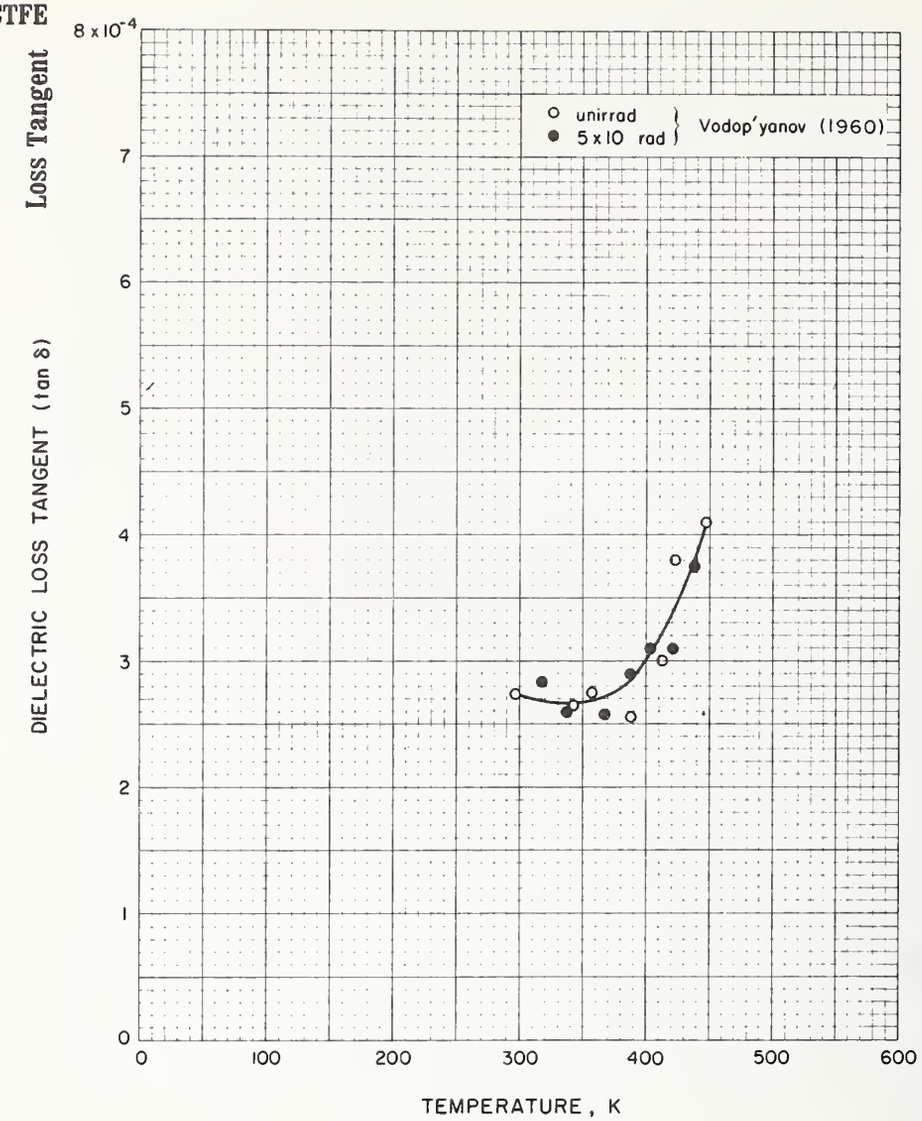
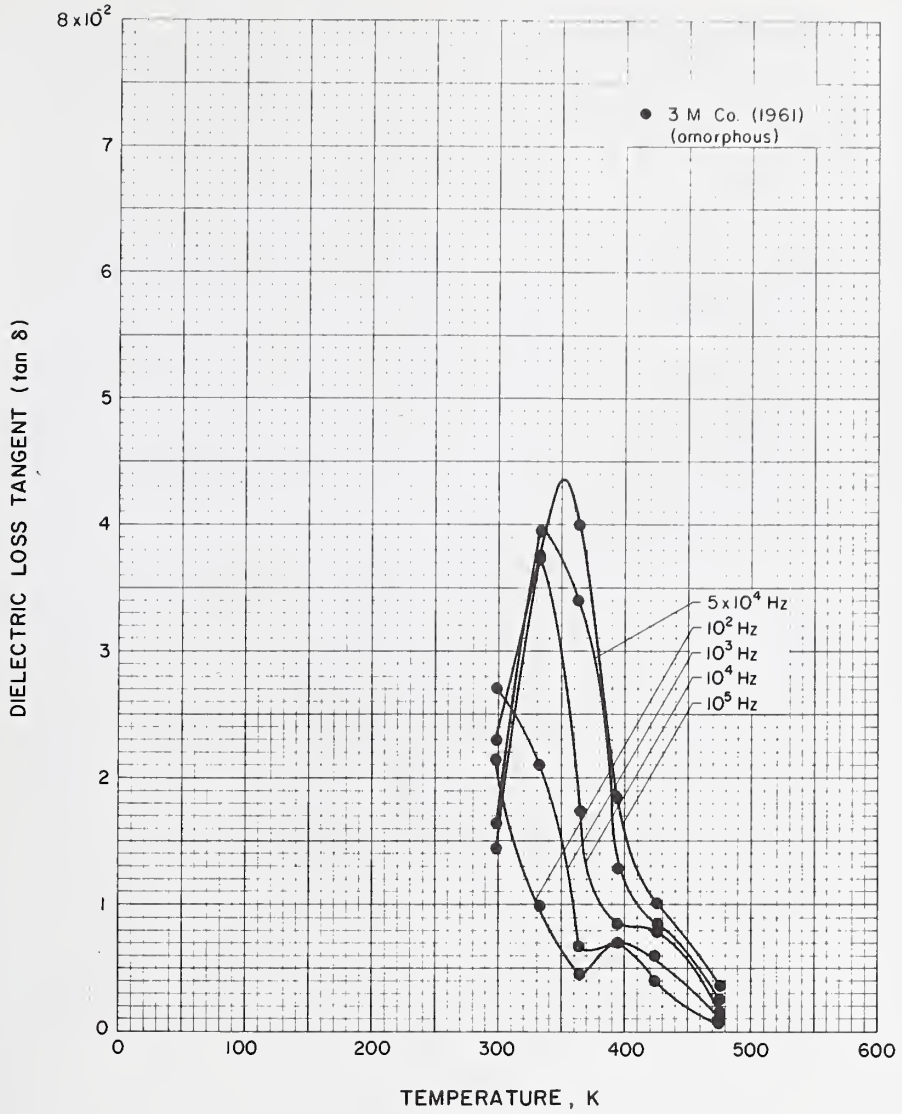


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Vodop'yanov, Borozhtoov, Lavrov, Nesmelova, Potakhova (1960)	Kel-F	Discs, t = 0.1-0.2 cm; 10 Hz; irrad by gamma rays from a betatron with 15 Mev particles.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
3M Co. (1961)	Kel-F 81, amorphous	

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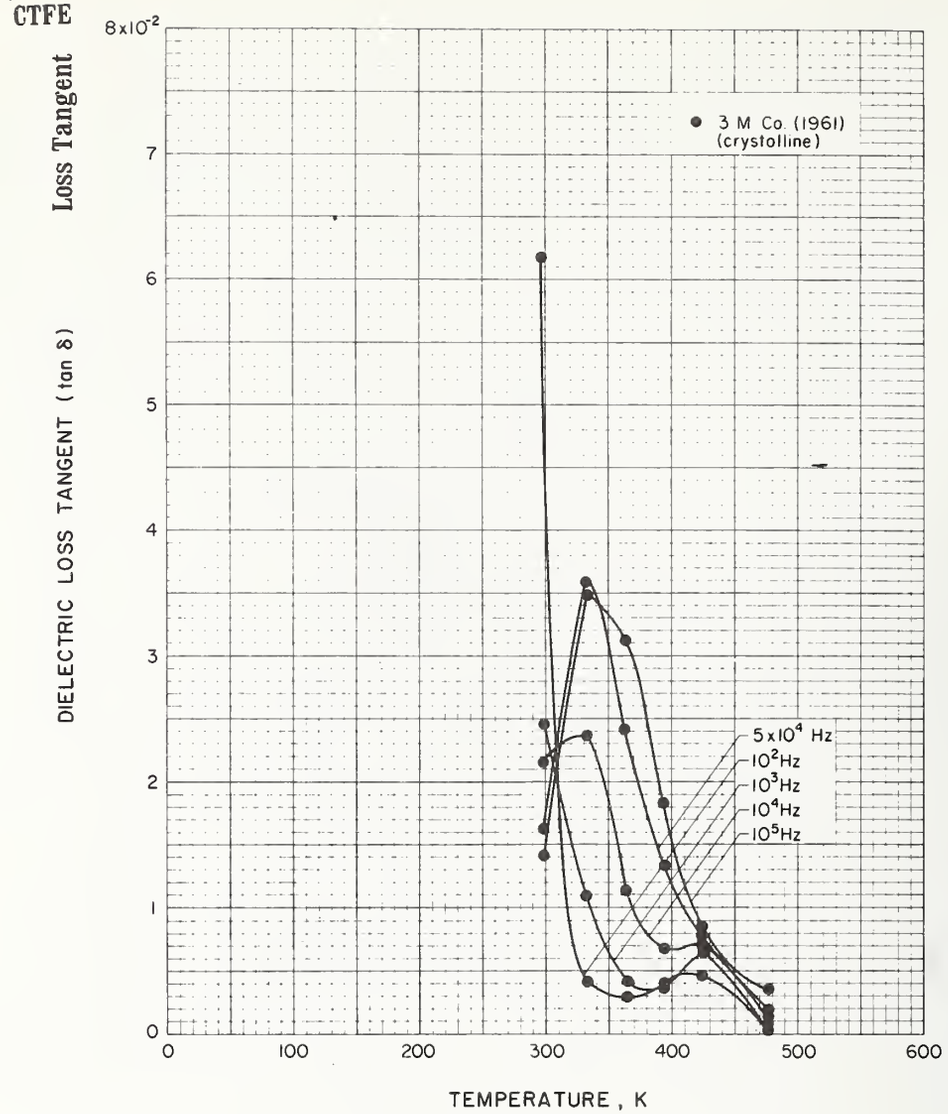
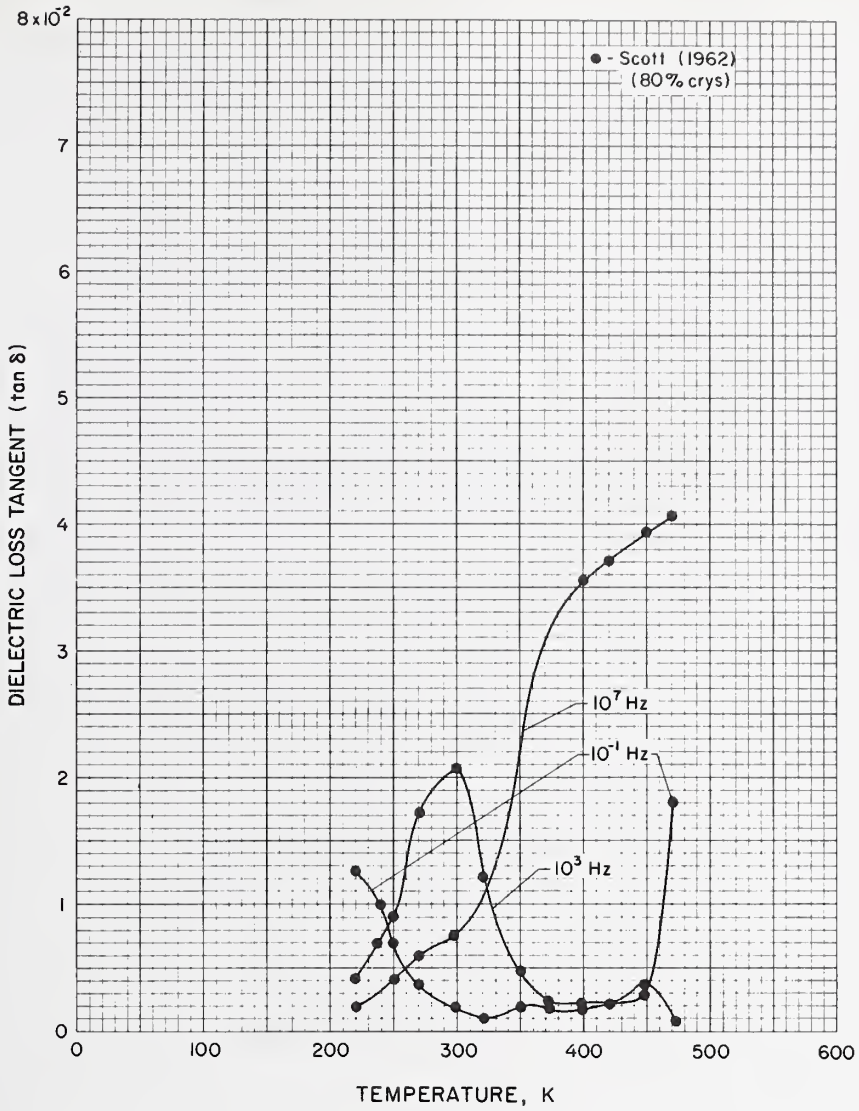


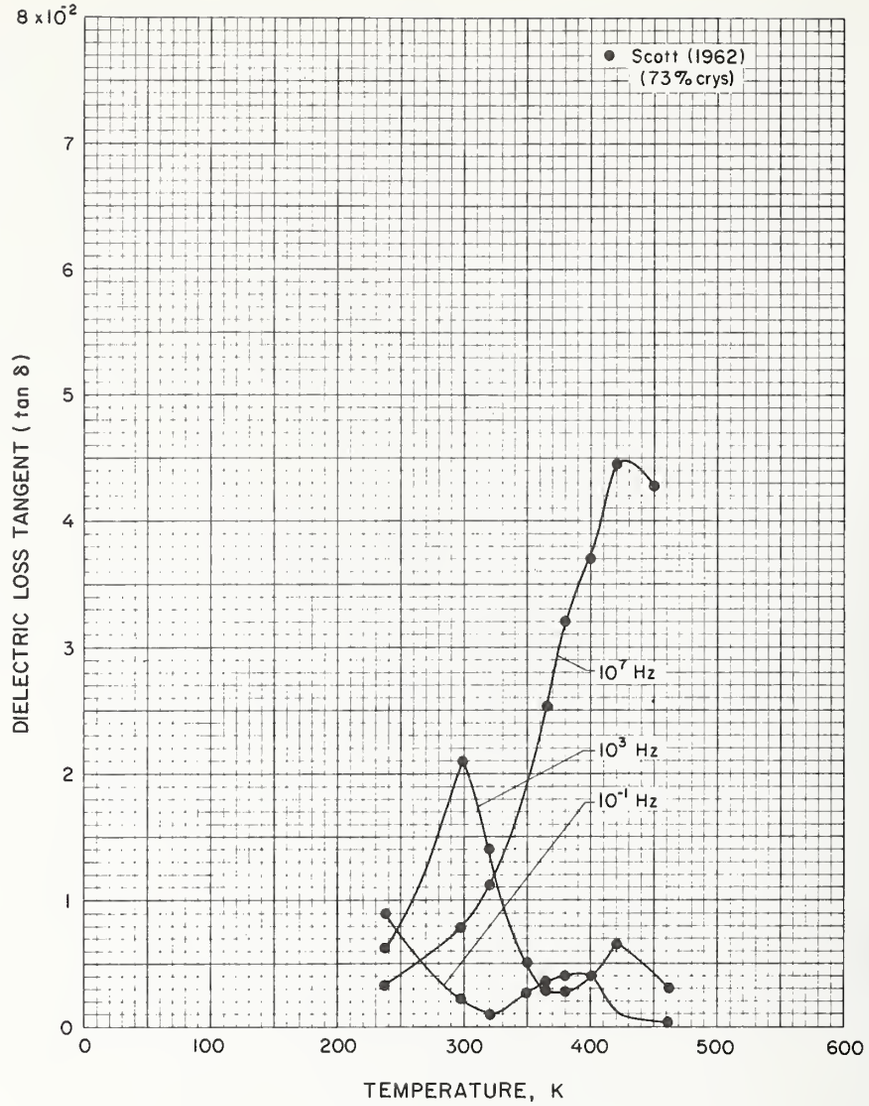
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
3M Co. (1961)	Kel-F 81, crystalline	



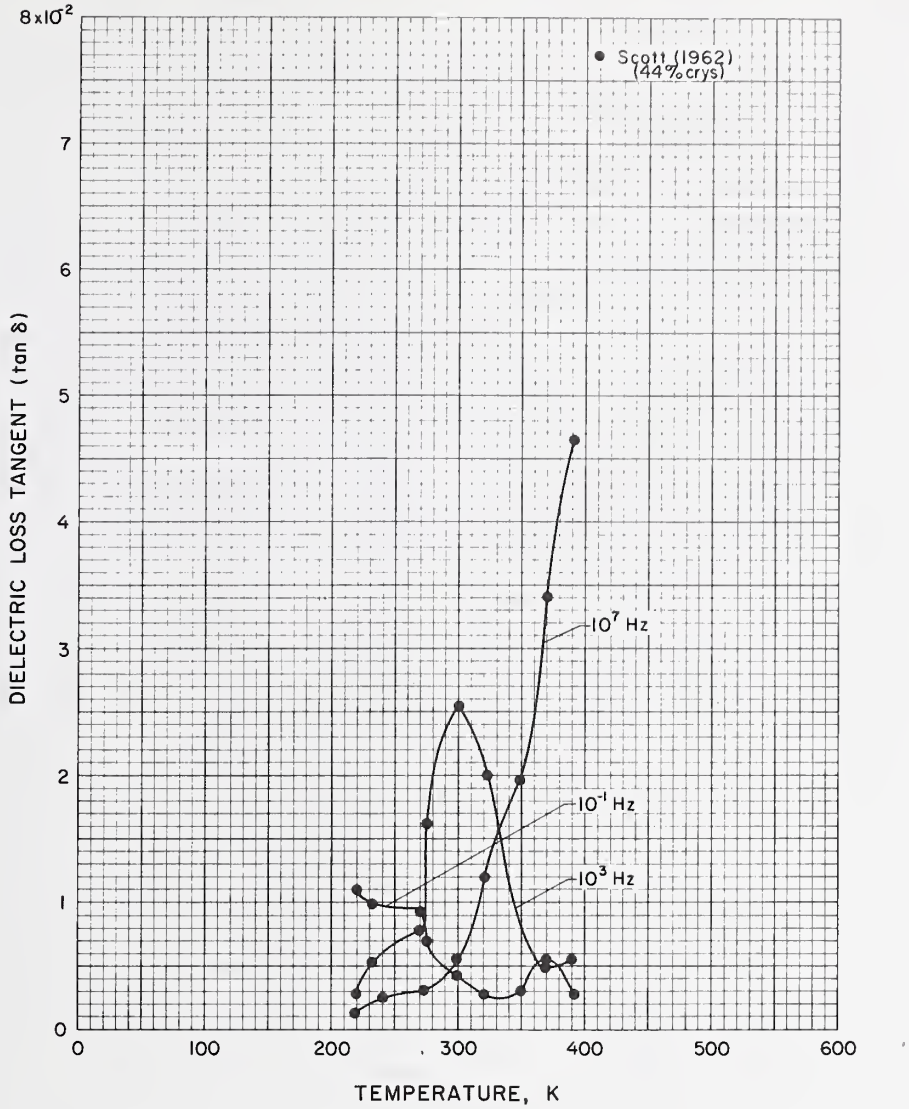
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Scott, Scheiber, Curtis, Lauritzen, Jr., Hoffman (1962)	Kel-F grade 300, av molecular weight ≈415,000, melting point = 497± 1K, 80% crys at start of measurement	t = 0.23 cm, diam = 4.24 cm, then machined to diam = 2.54 cm; evaporated gold electrodes applied in vacuum, modified General Radio type 716-C Schering bridge and modified Boonton Radio Corp. type 160-A Q-meter; uncertainty = ± 0.5%, measurements also made at several other frequencies.

CTFE

Loss Tangent



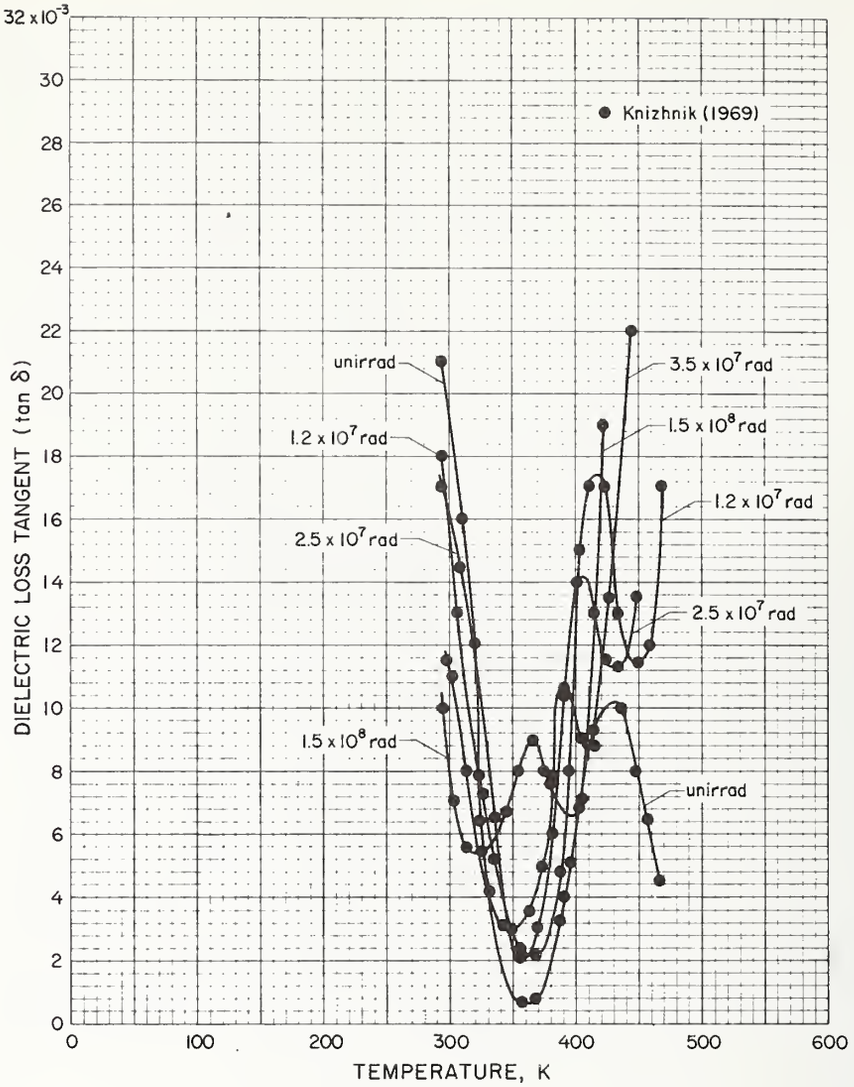
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Scott, Scheiber, Curtis Lauritzen, Jr., Hoffman (1962)	Kel-F grade 300, av molecular weight = 415,000, melting point = 497 ± 1K, 73% crys at start of measurement	t = 0.18 cm, diam = 2.54 cm; evaporated gold electrodes applied in vacuum, modified General Radio type 716-C Schering bridge and modified Boonton Radio Corp. type 160-A Q-meter; uncertainty = ± 0.5%, measurements also made at several other frequencies.



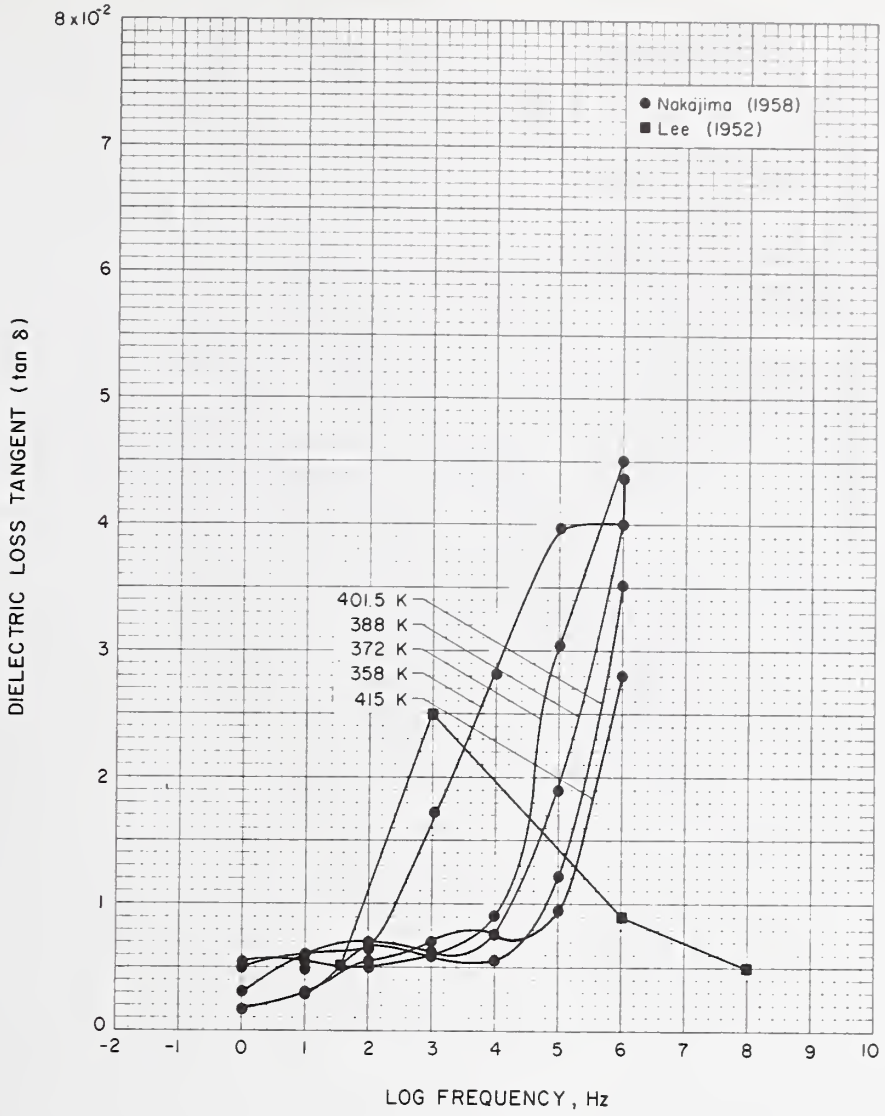
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Scott, Scheiber, Curtis, Lauritzen, Jr., Hoffman (1962)	Kel-F grade 300, av molecular weight ≃ 415,000, melting point = 497 ± 1K, 44% crys at start of measurement	t = 0.18 cm, diam = 4.40 cm, then machined to diam = 2.54 cm; evaporated gold electrodes applied in vacuum, modified General Radio type 716-C Schering bridge and modified Boonton Radio Corp. type 160-A Q-meter; uncertainty = ± 0.5%, measurements also made at several other frequencies.

CTFE

Loss Tangent



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Knizhnik, Mamchich (1969)	Commercial sheet, 50-58% crys	Diam = 3.8 cm, t ≃ 0.2 cm; measured at 400 Hz, 3-electrode cell, TR-9701 bridge, GZ-33 generator, and F510 indicator; irrad in cooled air in a VVR-M reactor, temp did not exceed 323 K; error = 7%.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Nakajima, Saito (1958)	Kel-F, 110,000 molecular weight, cooled slowly from melting temp, 48.9% crys	t = 0.2 cm, 8.0 cm diam; three electrode arrangement, guarded electrode 4.0 cm diam, silver conductive paint, inductive-ratio-arm bridge used above 30 Hz and resistive-ratio-arm bridge for below 10 Hz, both with conductance shifter.
Lee (1952)		ASTM D 150-47T test procedure, 298 K.

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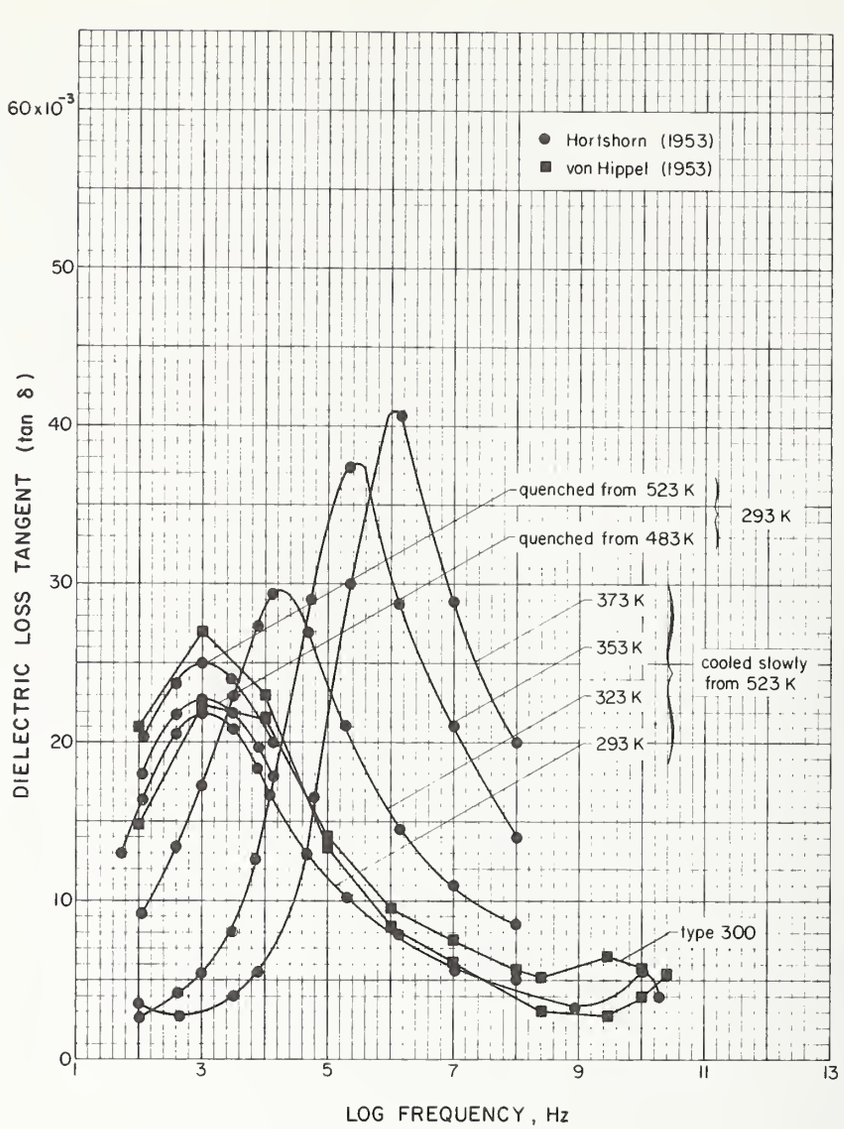
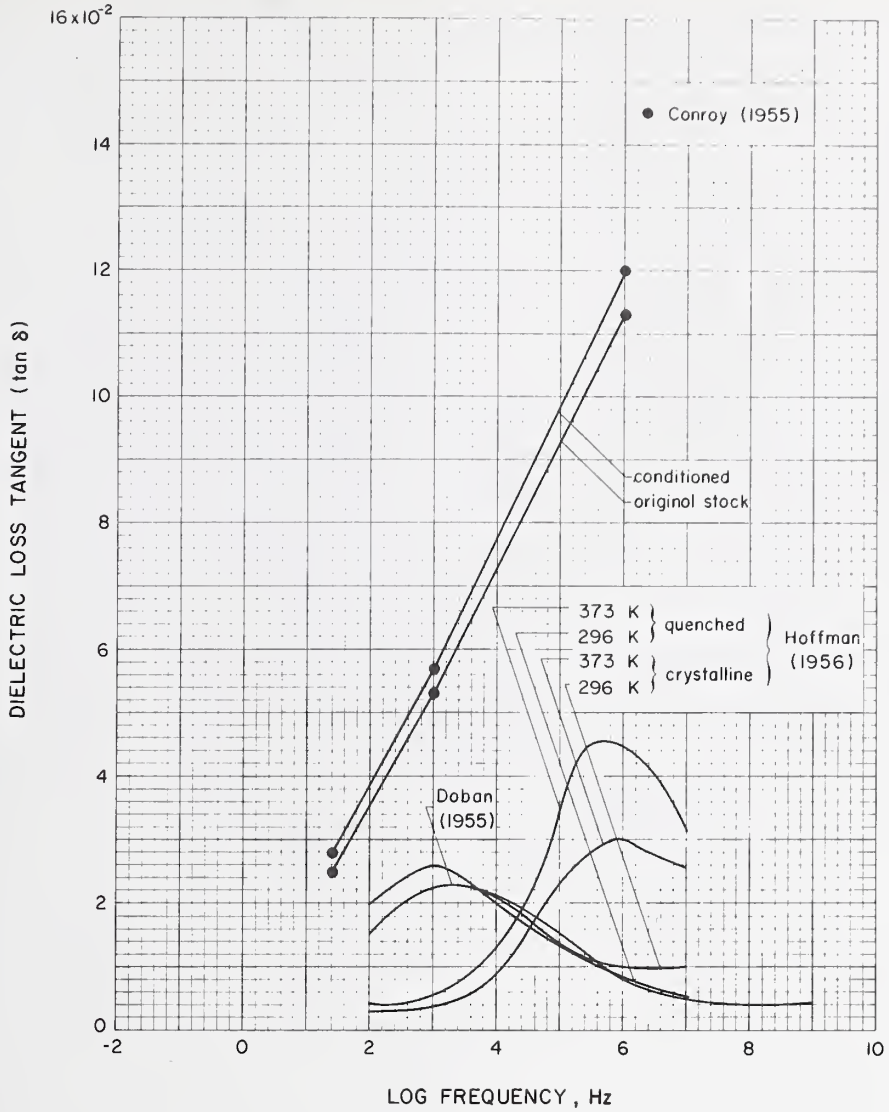


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Hartshorn, Parry, Rushton (1953)	Kel-F, molded from powder at 523 K and 750 psi pressure	Diam ≤ 5. 3 cm; Schering-bridge method for frequencies to 10^4 Hz, circuit-resonance method for 10^4-10^8 Hz, cavity-resonance for 5×10^8, 9×10^9, and 24×10^9 Hz bands, transmission-line method also used in 3×10^9 Hz region, electrodes at lower frequencies were platinum-plated, silver-plated with rhodium flash, or solid invar.
von Hippel (1953)	Kel-F and Kel-F Grade 300	Field strength ~ 50 V cm^{-1}, 298 K; nominal accuracy ± 1%.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Conroy, Honn, Robb, Wolf (1955)	Kel-F, peroxide cured, stock number 122, original stock and conditioned for 1 week at 95% rel hum and 298 K	298 K
Doban, Sperati, Sandt (1955)		296 K
Hoffman, Scott (1956)	Quenched material melted and dropped directly into an ice bath; crystalline material cooled from 503 K to 423 K in 5 days, crys ≥ 95%.	

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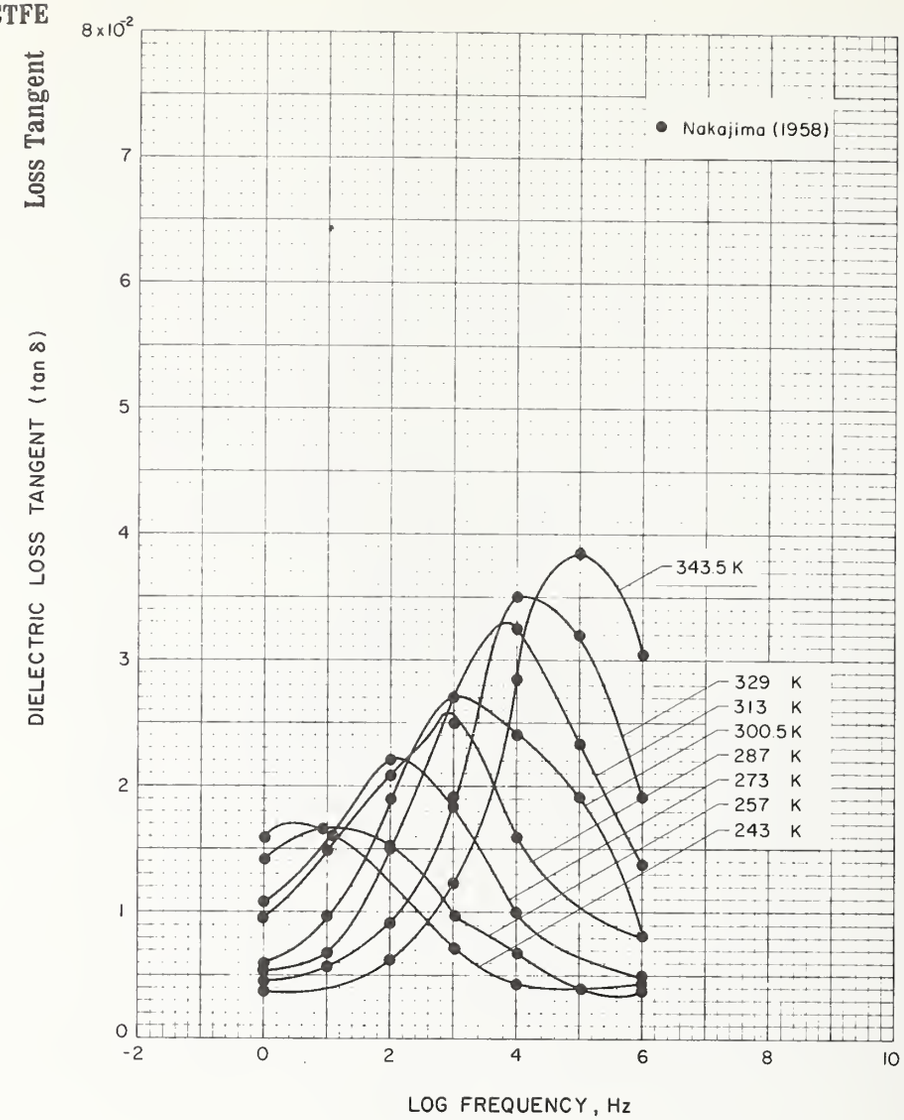
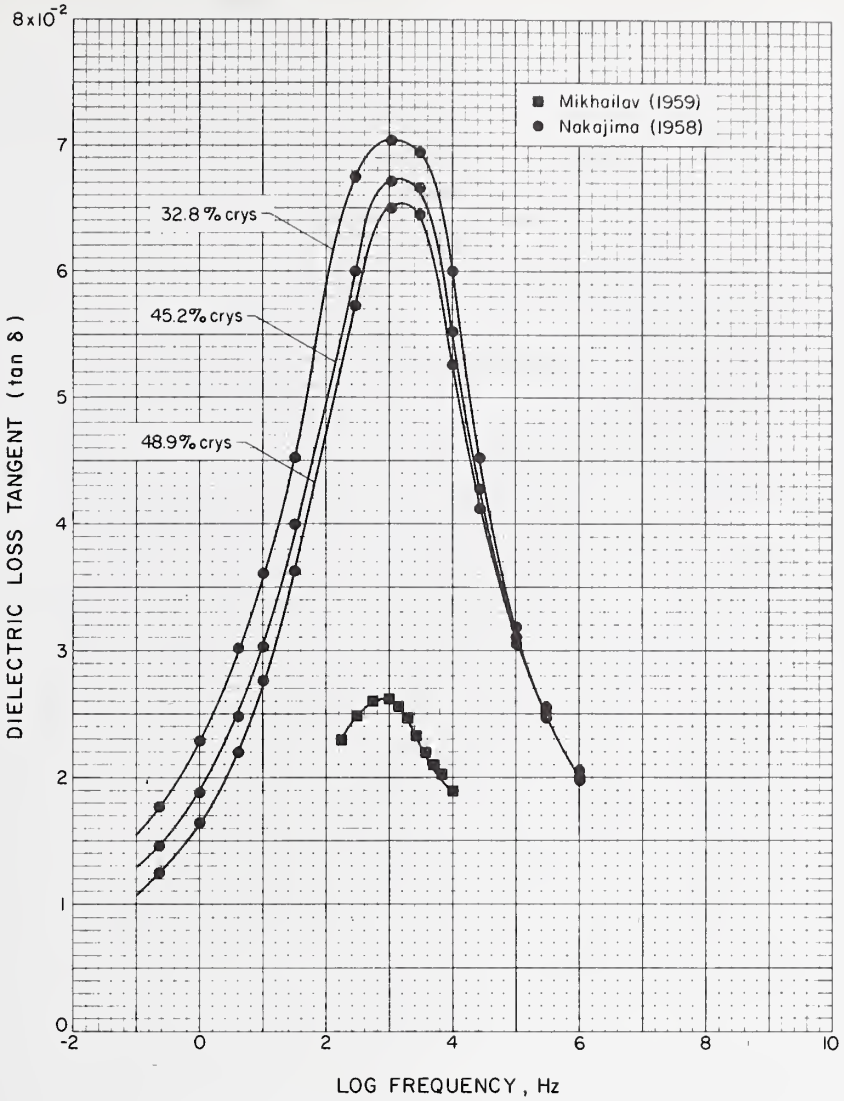
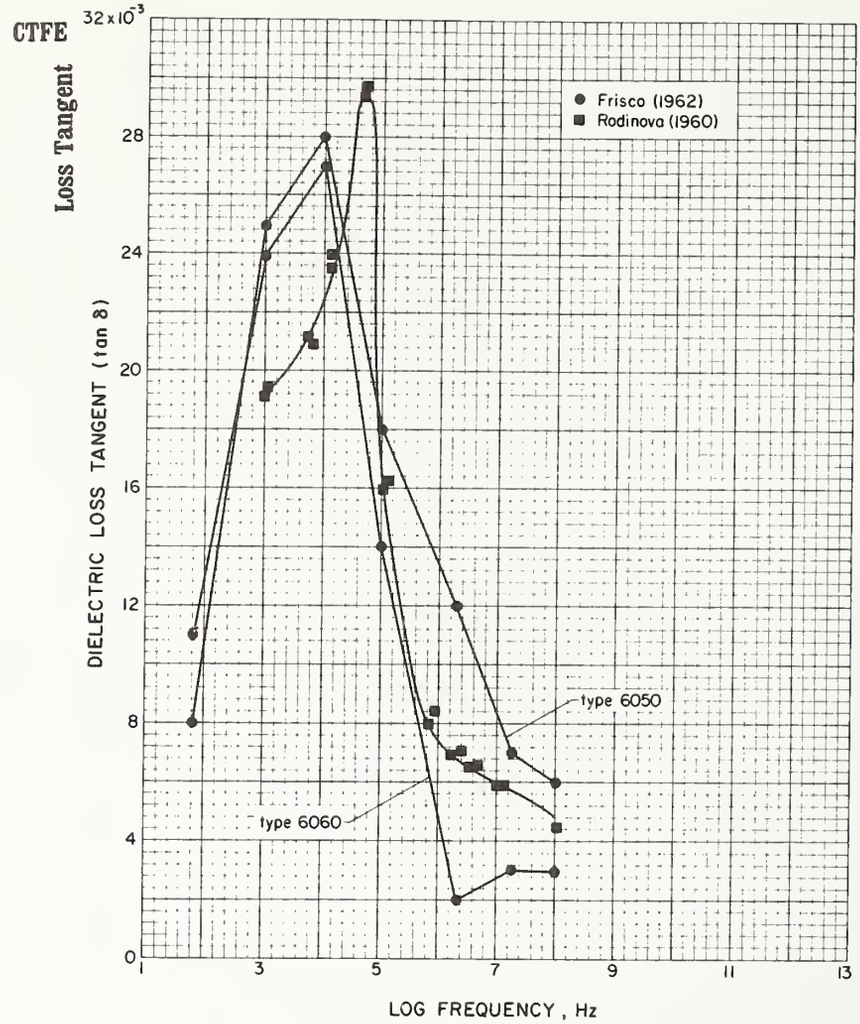


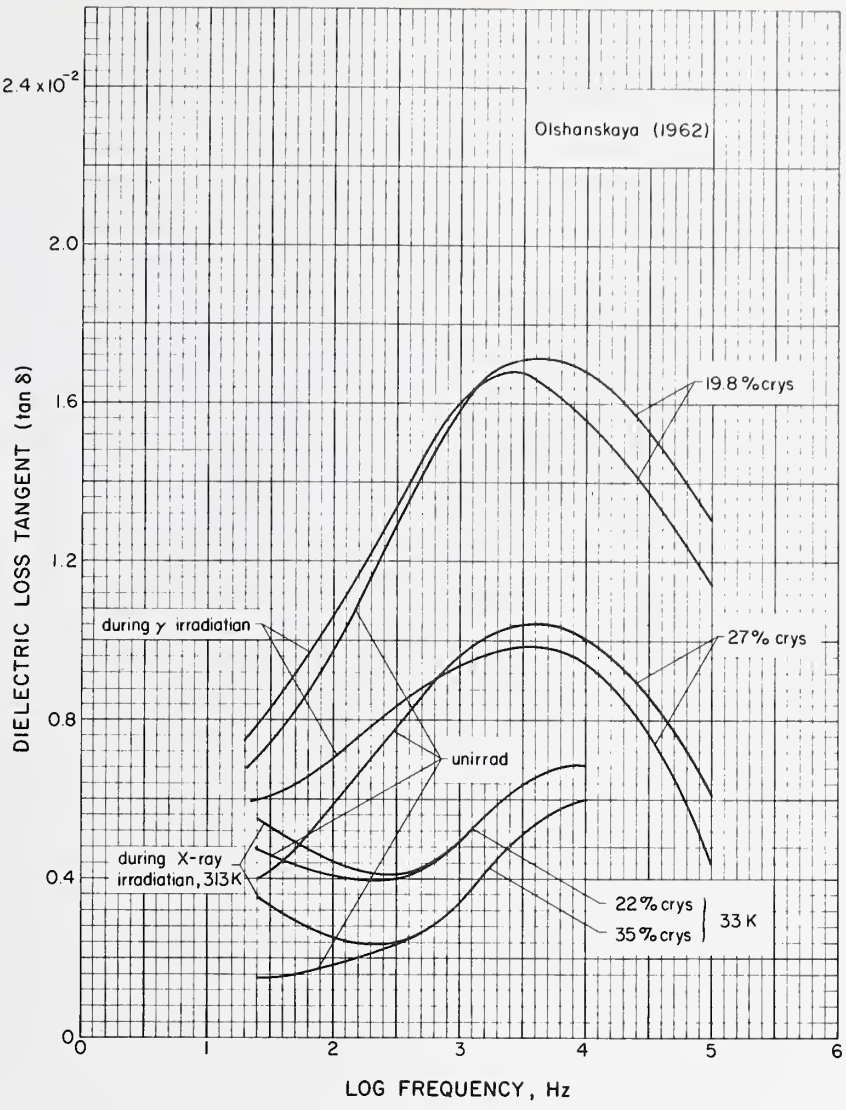
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Nakajima, Saito (1958)	Kel-F, 110,000 molecular weight, cooled slowly from melting temp, 48.9% crys	t = 0.2 cm, 8.0 cm diam; three electrode arrangement, guarded electrode 4.0 cm diam, silver conductive paint, inductive-ratio-arm bridge used above 30 Hz and resistive-ratio-arm bridge for below 10 Hz, both with conductance shifter.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Nakajima, Saito (1958)	Kel-F, 110,000 molecular weight, quenched to 243 K (32.8% crys), quenched to room temp (45.2% crys), cooled slowly from melting temp (48.9 % crys).	t = 0.2 cm, 8.0 cm diam; three electrode arrangement, guarded electrode 4.0 cm diam, silver conductive paint; inductive-ratio-arm bridge used above 30 Hz and resistive-ratio-arm bridge for below 19 Hz, both with conductive shifter.
Mikhailov, Sazhin (1959)	Fluoroplast-3	291 K.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Rodionova (1960)		Results virtually identical for specimen dried and saturated in 98% rel hum at 293 K.
Frisco (1962)	Commercial KF-6050, ASTM 1430-58T Grade II, pelletized, injection molding and extrusion resin; commercial KF-6060, ASTM 1430-58T Grade III, unpelletized, compression molding resin	Stored under room conditions for at least 2 weeks before measurement.



INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONOITIONS
Olshanskaya, Vososchev (1962)	Fluoroplast-3	Irrad by x-rays at 5.8×10^{-6} rad min^{-1}, γ irradiation by Co^{60} at $1-2 \times 10^{3}$ rad min^{-1} in vacuum.

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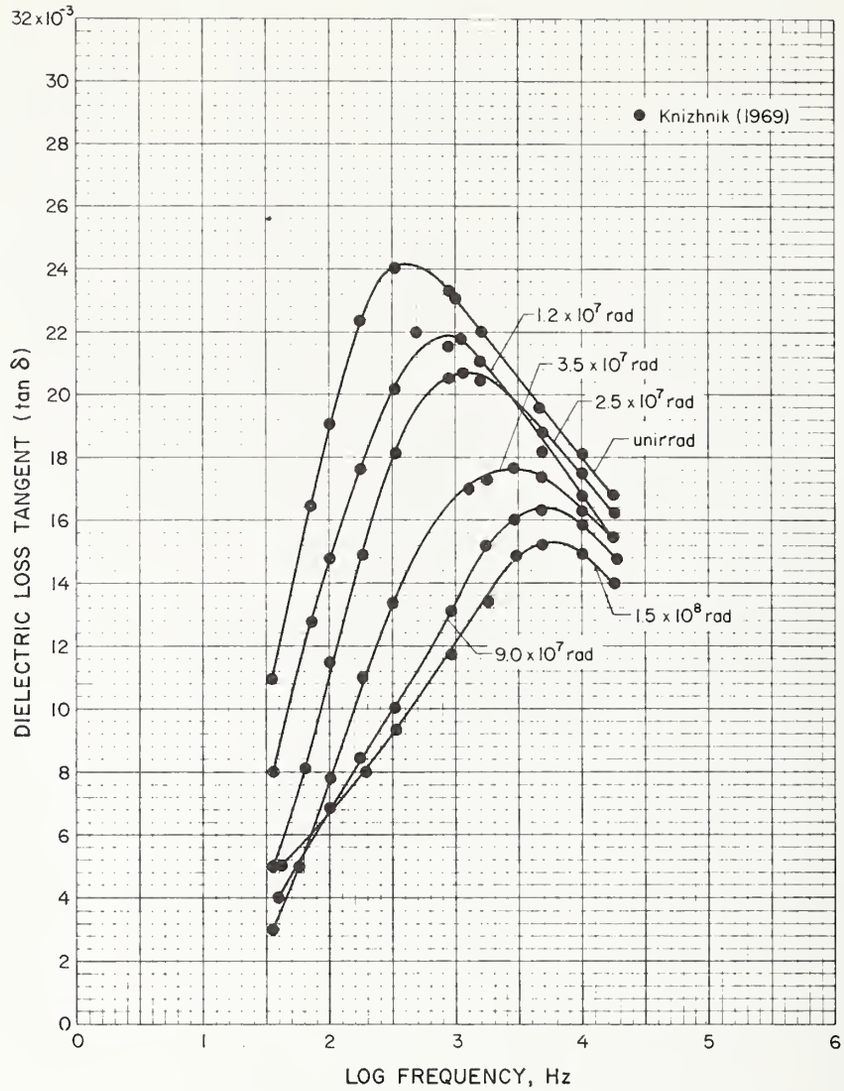
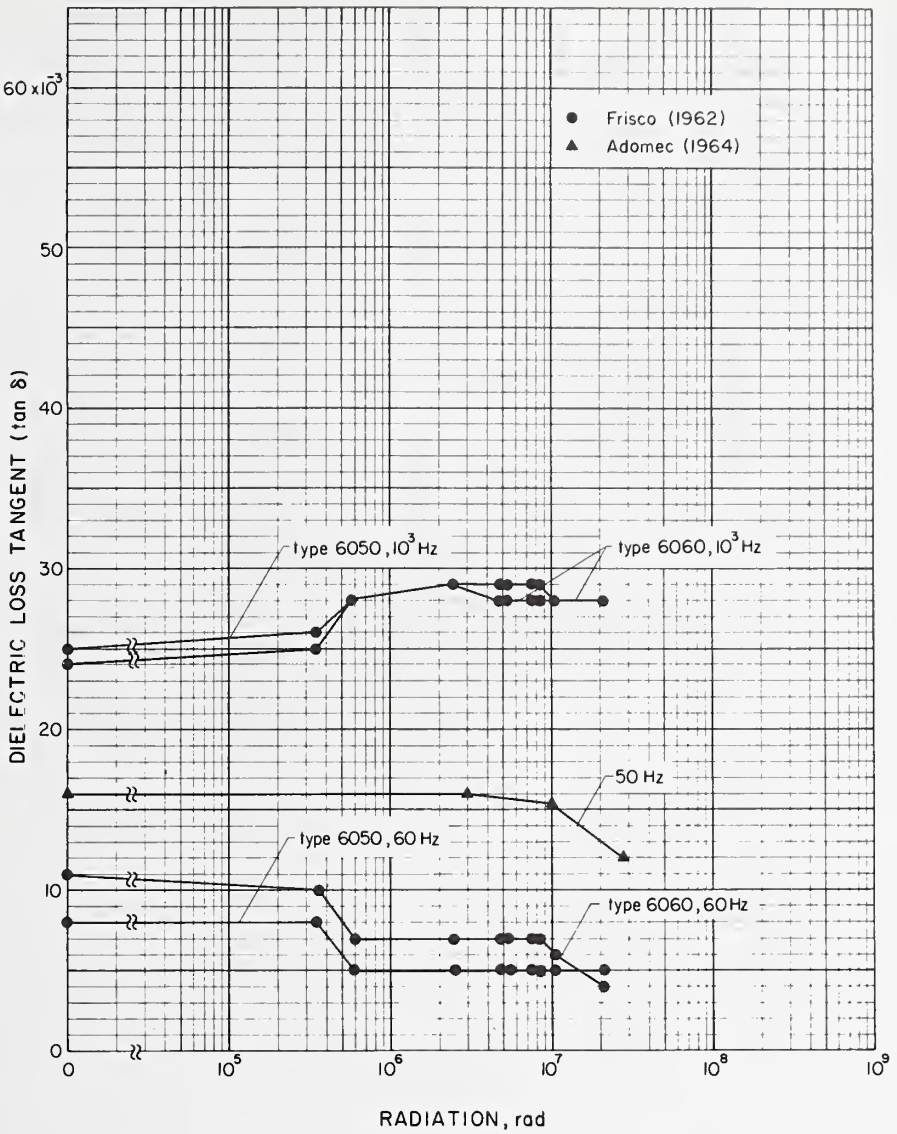
Loss Tangent



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Knizhnik, Mamchich (1969)	Commercial sheet, 50-58% crys	Diam = 3.8 cm, t ≃ 0.2 cm; measured at 296 K, 3-electrode cell, TR-9701 bridge, GZ-33 generator, and F510 indicator; irrad in cooled air in a VVR-M reactor, temp did not exceed 323 K; error = 7%.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Frisco (1962)	Commercial KF-6050, ASTM 1430-58T Grade II, pelletized, injection molding and extrusion resin; commercial KF-6060, ASTM 1430-58T Grade III, unpelletized, compression molding resin	Circular area = 1.0 cm^2, t = 0.05 cm; irrad by Ag x-rays in vacuum.
Adamec (1964)		50 Hz, 296 K; reactor irrad.

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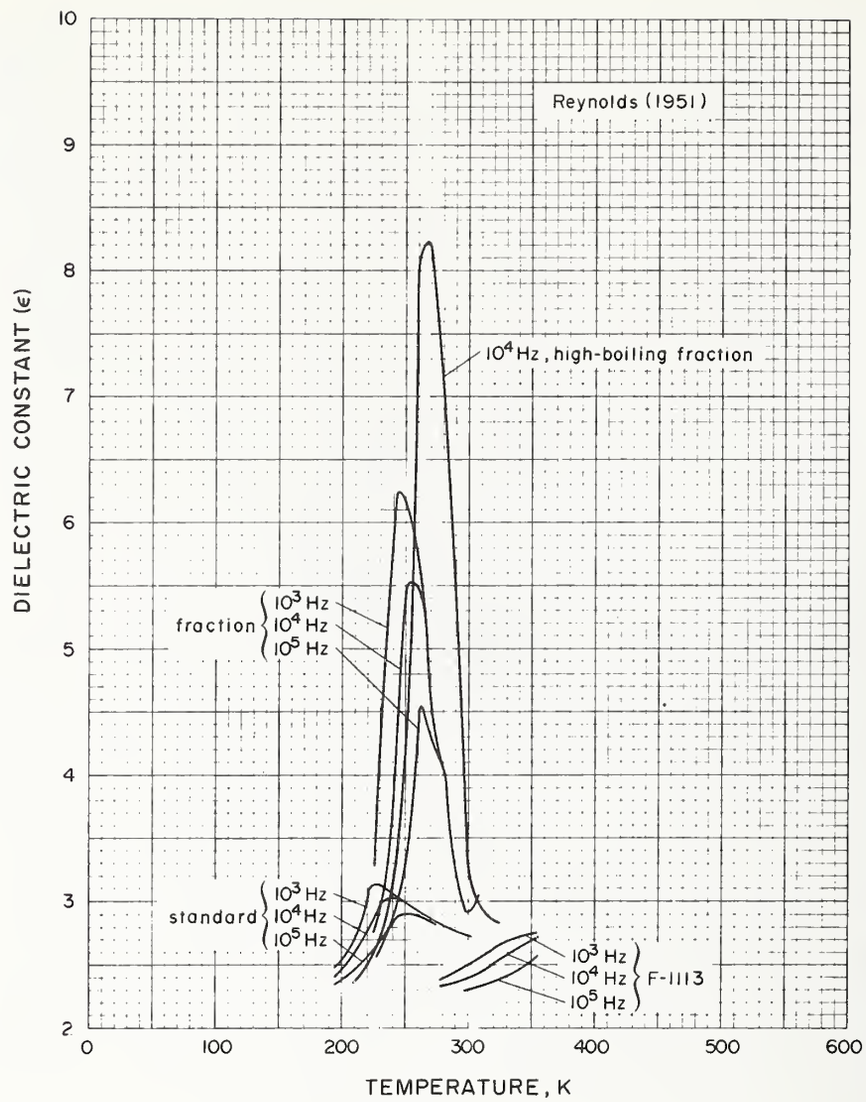
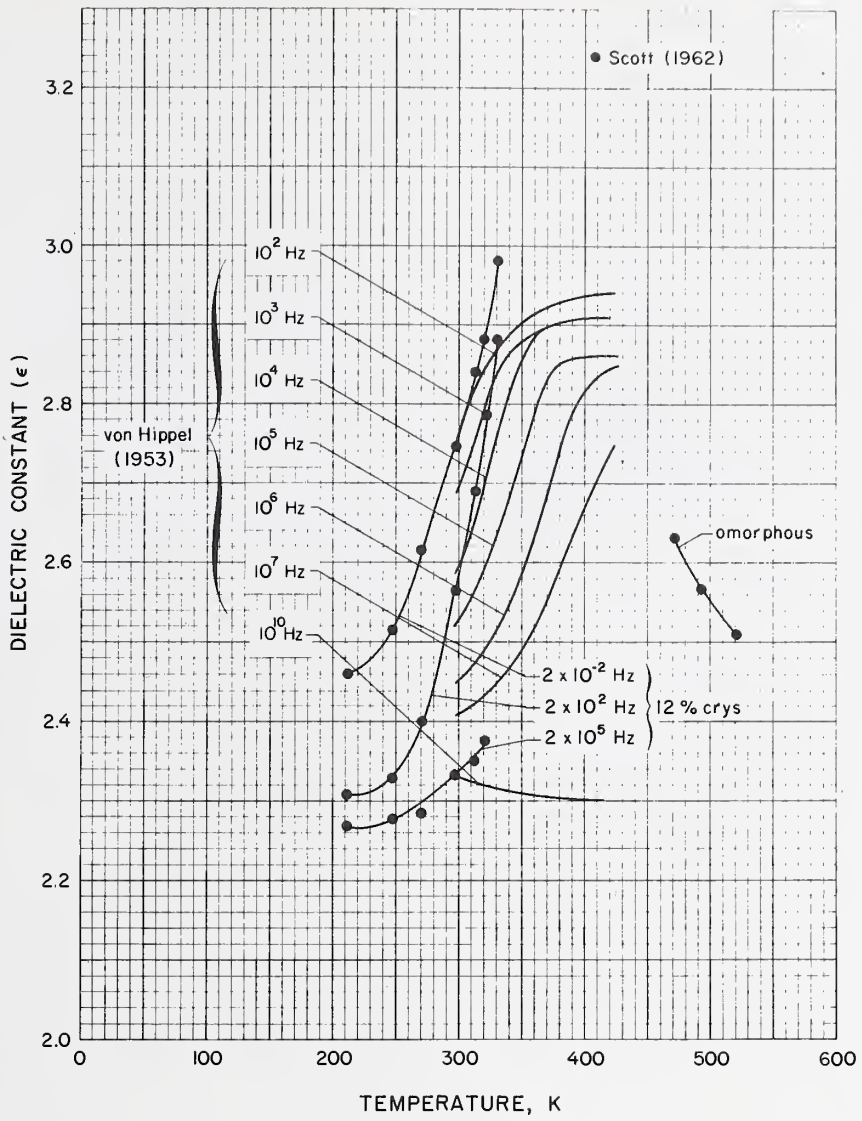
Dielectric Constant



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Reynolds, Thomas, Sharbaugh, Fuoss (1951)	Fluorolube standard collected over the range 373-473 K at 0.1 cm, refractive index at 293K = 1.394, sp gr = 1.93 at 298K; Flourolube fraction obtained from standard by redistillation, collected over the range of 463K at 1 cm to 503K at 0.2 cm, crystallites appear sharply at 295K, number av molecular weight = 980; high-boiling Fluorolube fraction collected between 478K at 0.5 cm and 503 K at 0.2 cm obtained from previous fraction; F-1113, sheet of unknown but high molecular weight, same formula as other material.	F-1113 specimen diam = 5 cm, t ≃ 0.2 cm; Fluorolube measured in a guarded platinum cell, F-1113 measured in a guarded copper cell with platinum electrode faces, General Electric Schering bridge modified to accomodate a guard circuit, temp regulated to 0.2 K.

Dielectric Constant



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Scott, Scheiber, Curtis, Lauritzen, Jr., Hoffman (1962)	Kel-F grade 300, av molecular weight ≈415,000, melting point = 497 ± 1K, 12% crys at start of measurement and amorphous	t = 0.015 cm, diam = 5.08 cm for 12% crys specimen, t = 0.2 cm, diam = 5.4 cm for amorphous specimen; evaporated gold electrodes applied in vacuum to 12% specimen, for amorphous specimen no surface electrodes were used and a guard ring prevented flow, modified General Radio type 716-C Schering bridge and modified Boonton Radio Corp. type 160-A Q-meter; uncertainty = ± 0.5%, measurements also made at several other frequencies.
von Hippel (1953)	Kel-F Grade 300	Field strength ~ 50 V cm^{-1}; nominal accuracy ± 2%.

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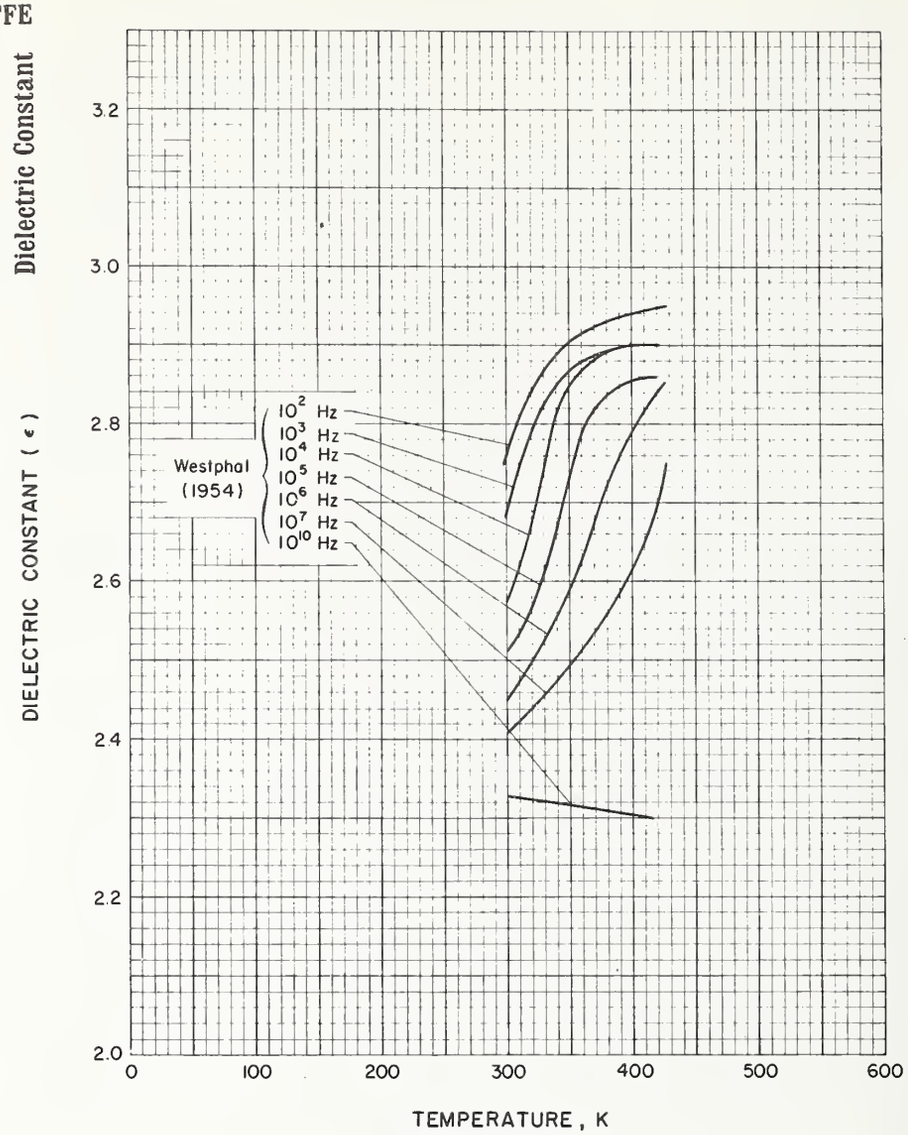
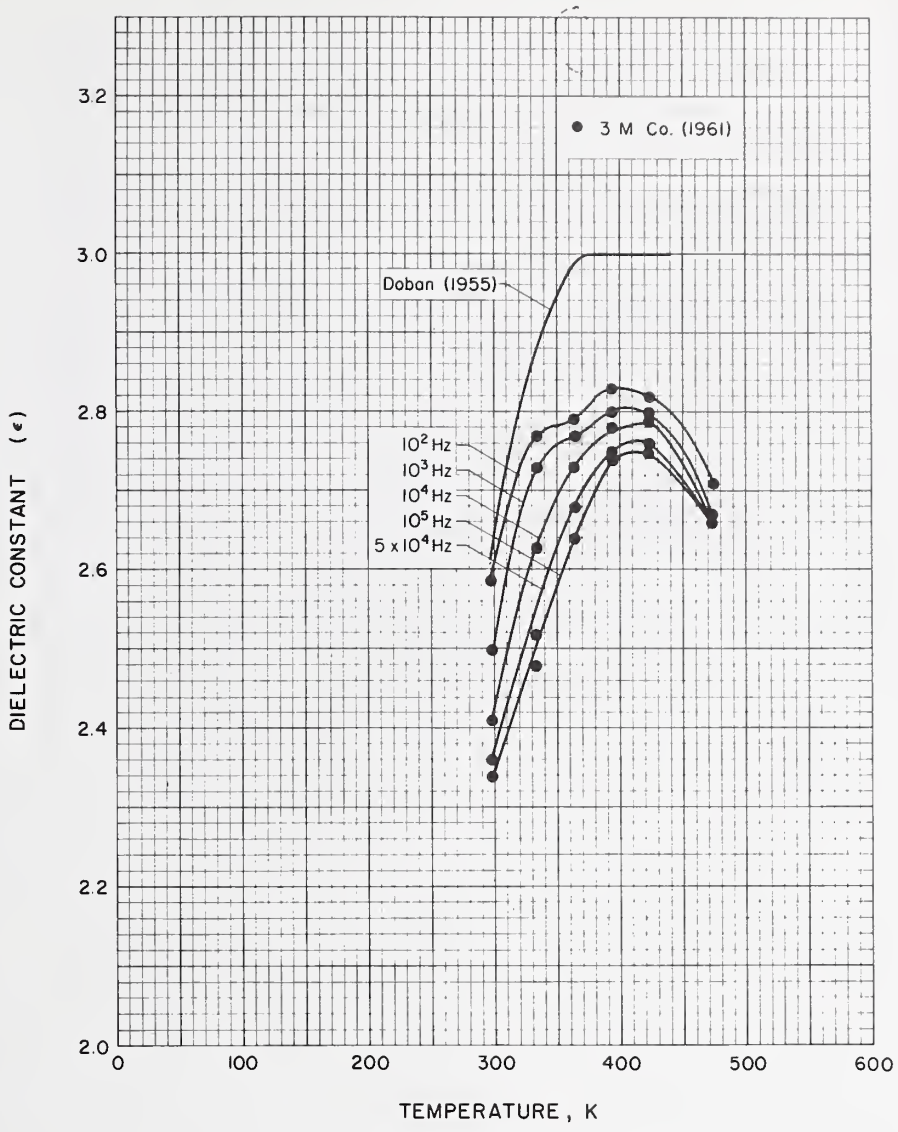


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Westphal, Dunn, Fergus, McCarty, (1954)	Kel-F, grade 300, samples dried over phosphorous pentoxide	Quoted probable accuracy ± 2%



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
3M Co. (1961)	KeF-F 81, amorphous	
Doban, Sperati Sandt (1955)		10^3 Hz

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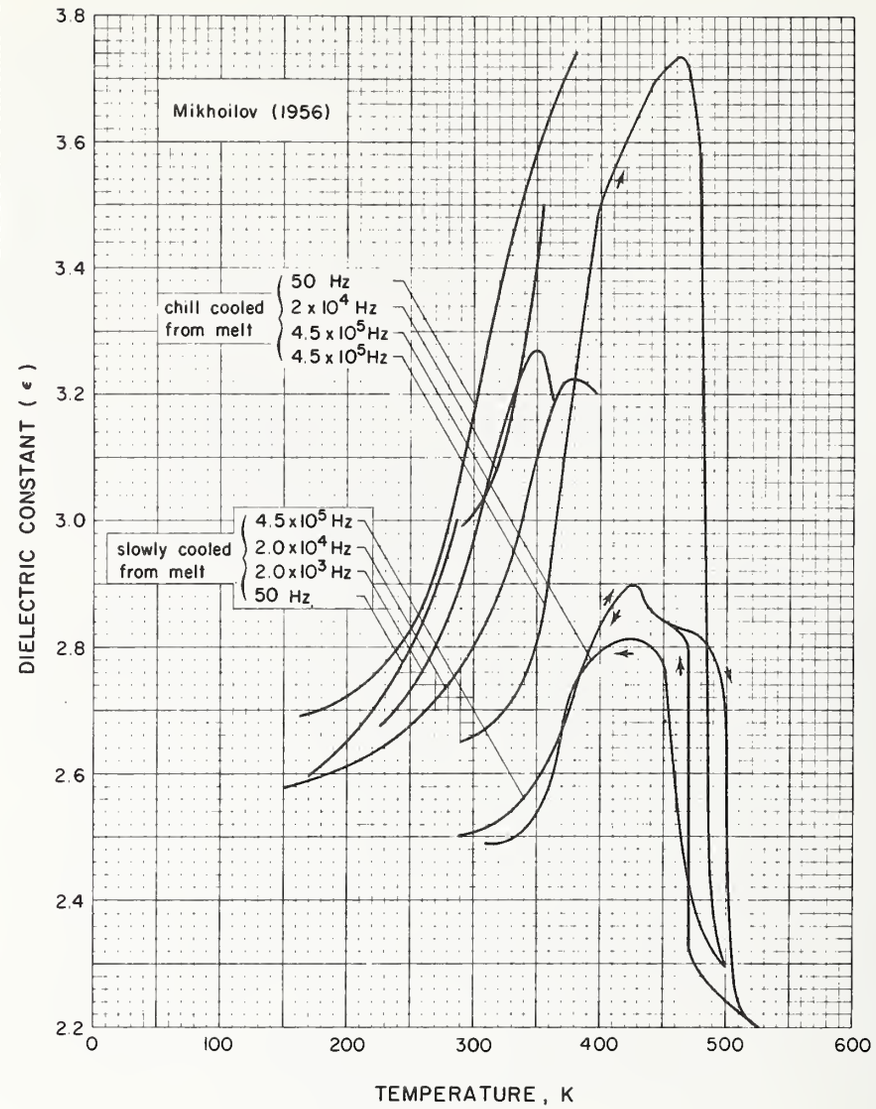
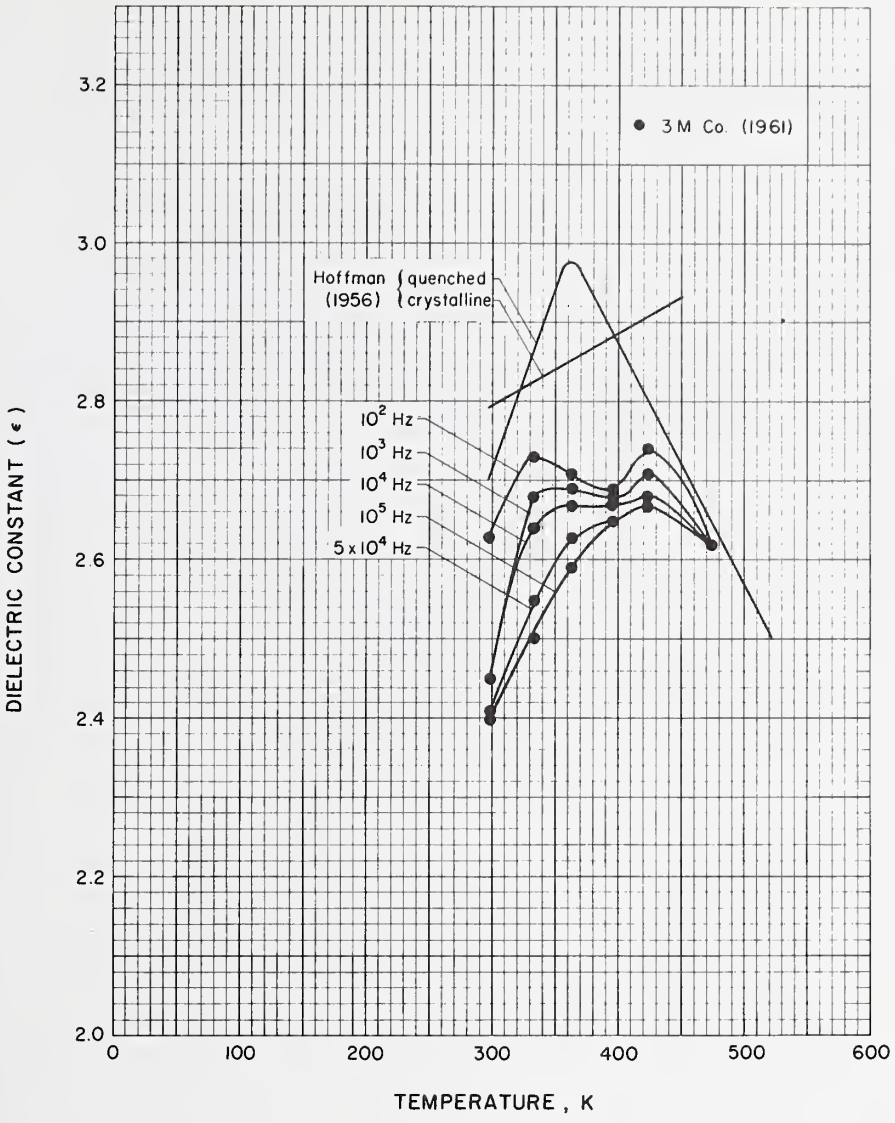
Dielectric Constant



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mikhailov, Sazhin (1956)	Fluoroplast-3, slowly cooled and chill cooled from melt	Arrows indicate direction of temp change.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
3M Co. (1961)	Kel-F 81, crystalline	
Hoffman, Scott (1956)	Quenched material melted and dropped directly into an ice bath; crystalline material cooled from 503K to 423K in 5 days, crys ≥ 95%.	Static dielectric constant.

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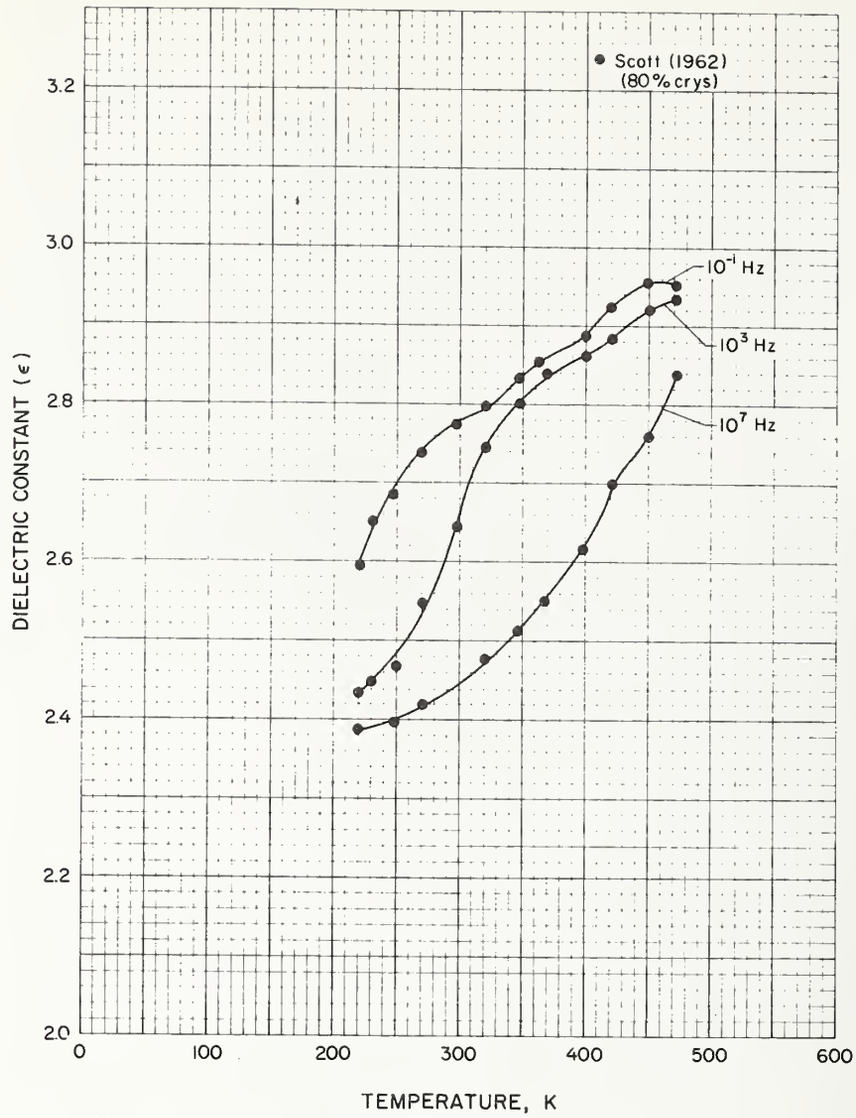
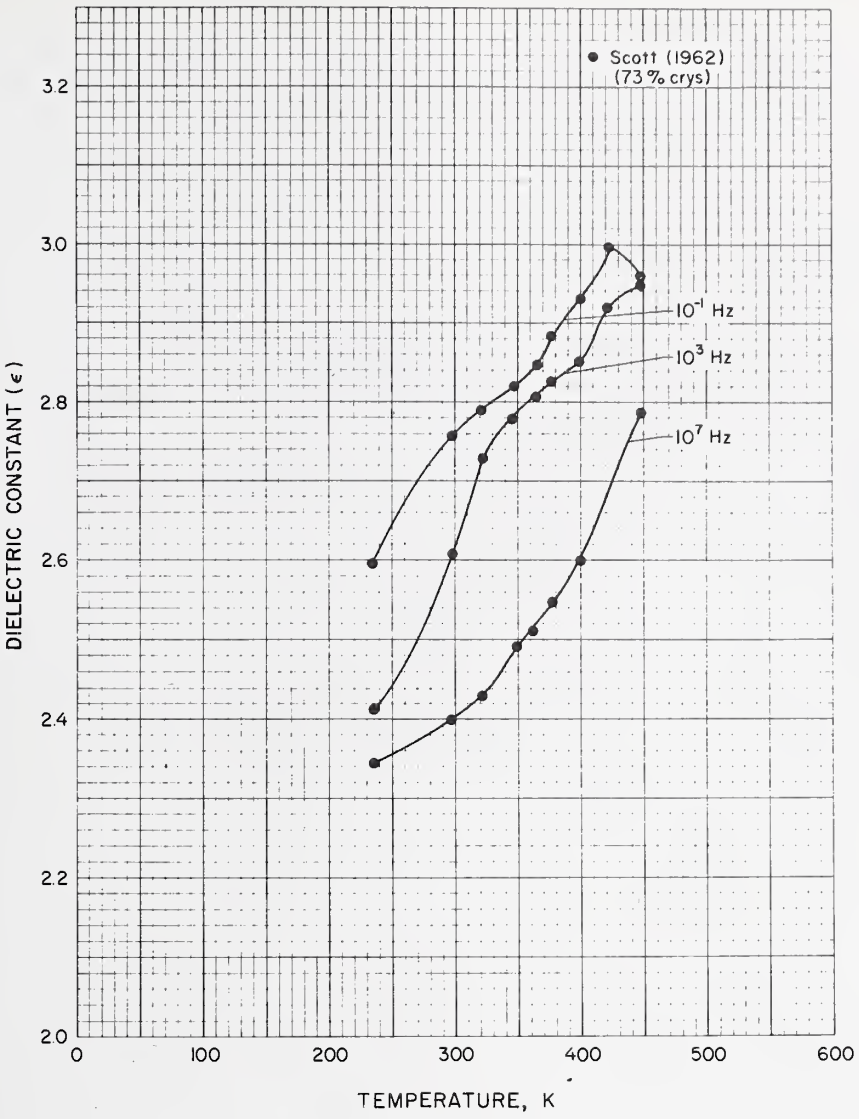
Dielectric Constant



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Scott, Scheiber, Curtis, Lauritzen, Jr., Hoffman (1962)	Kel-F grade 300, av molecular weight ≃ 415,000, melting point = 497 ± 1 K, 80% crys at start of measurement	t = 0.23 cm, diam = 4.24 cm, then machined to diam = 2.54 cm; evaporated gold electrodes applied in vacuum, modified General Radio type 716-C Schering bridge and modified Boonton Radio Corp. type 160-A Q-meter; uncertainty = ± 0.5%, measurements also made at several other frequencies.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Scott, Scheiber, Curtis, Lauritzen, Jr., Hoffman (1962)	Kel-F grade 300, av molecular weight ≃ 415,000, melting point = 497 ± 1 K, 73% crys at start of measurement	t = 0.18 cm, diam = 2.54 cm; evaporated gold electrodes applied in vacuum, modified General Radio type 716-C Schering bridge and modified Boonton Radio Corp. type 160-A Q-meter; uncertainty = ± 0.5%, measurements also made at several other frequencies.

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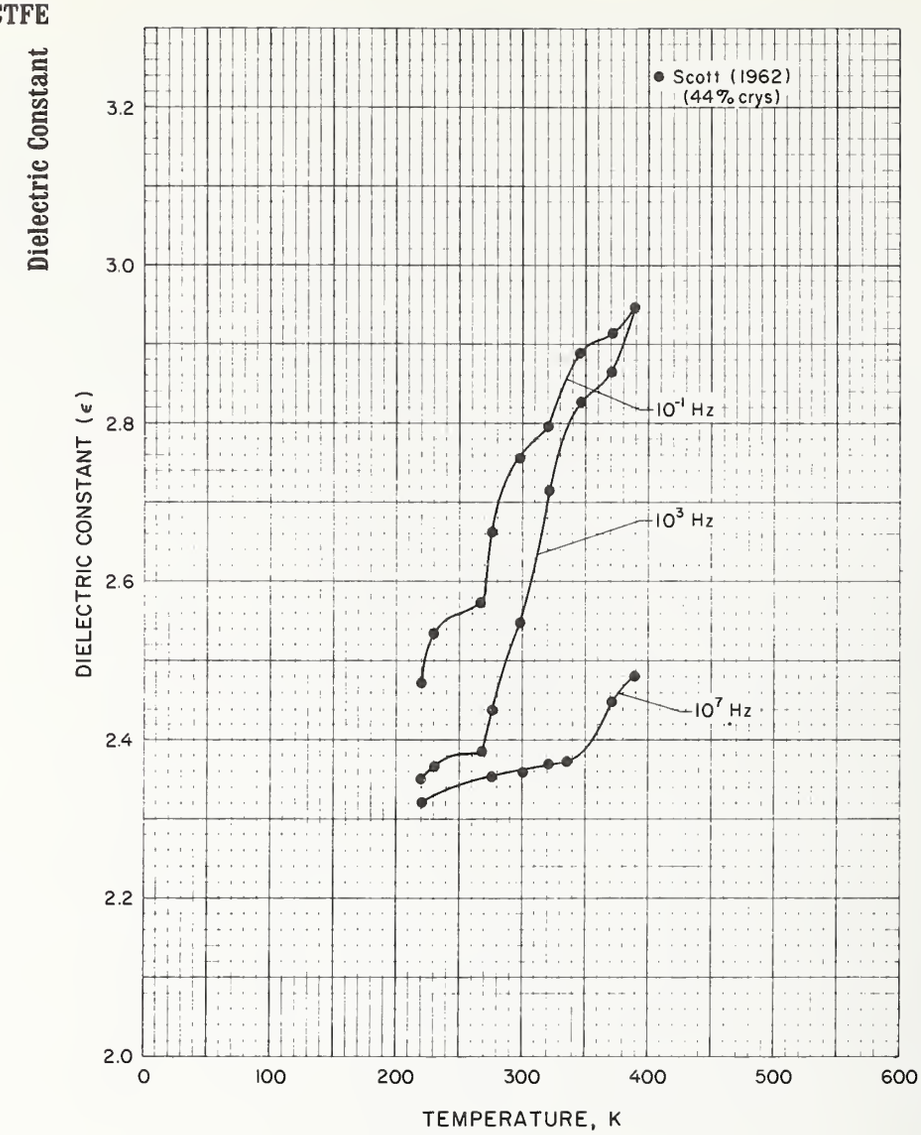
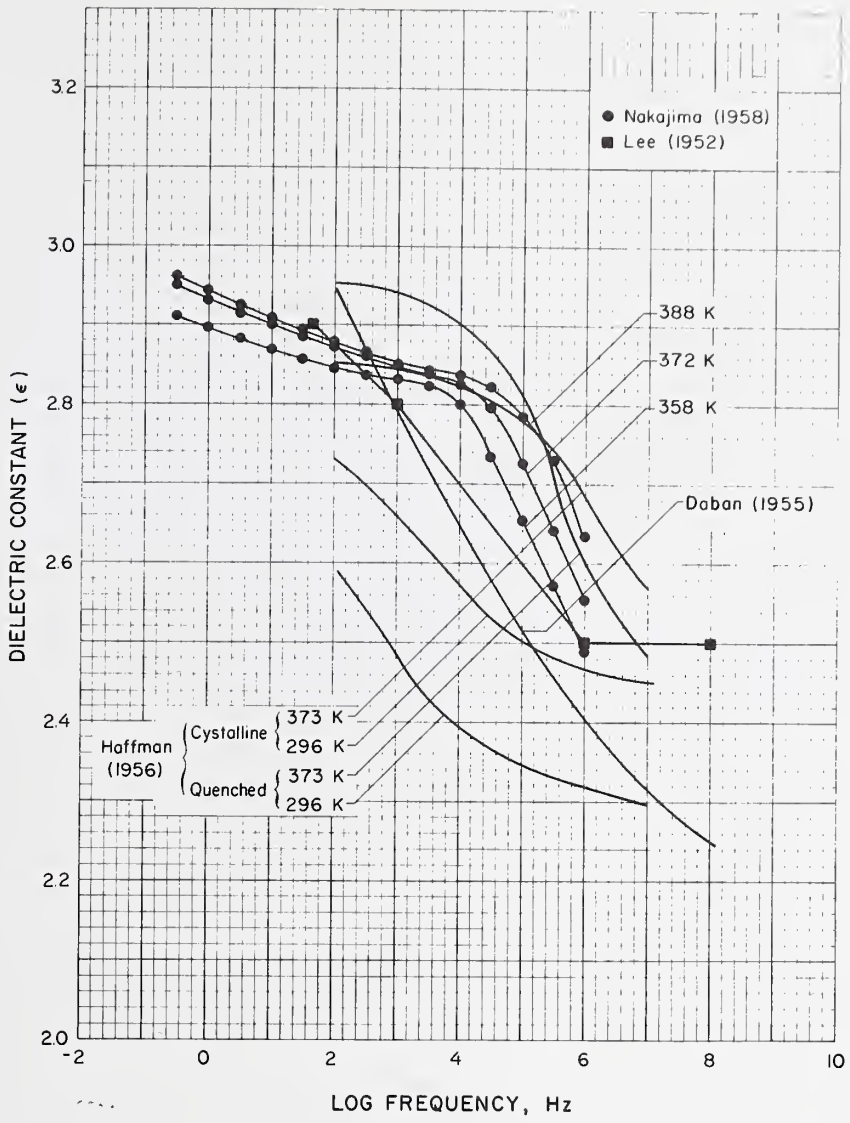


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Scott, Scheiber, Curtis, Lauritzen, Jr., Hoffman (1962)	Kel-F grade 300, av molecular weight ≃ 415,000, melting point = 497 ± 1 K, 44% crys at start of measurement	t = 0.18 cm, diam = 4.40 cm, then machined to diam = 2.54 cm; evaporated gold electrodes applied in vacuum, modified General Radio type 716-C Schering bridge and modified Boonton Radio Corp. type 160-A Q-meter; uncertainty = ± 0.5%, measurements also made at several other frequencies.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Nakajima, Saito (1958)	Kel-F, 110,000 molecular weight, cooled slowly from melting temp, 48.9% crys	t = 0.2 cm, 8.0 cm diam; three electrode arrangement, guarded electrode 4.0 cm diam, silver conductive paint, inductive-ratio-arm bridge used above 30 Hz and resistive-ratio-arm bridge for below 10 Hz, both with conductance shifter.
Doban, Sperati, Sandt (1955)		296 K
Hoffman, Scott (1956)	Quenched material melted and dropped directly into an ice bath; crystalline material cooled from 503 K to 423 K in 5 days, crys ≥ 95%	
Lee (1952)		ASTM D 150-47T test procedure, 298 K.

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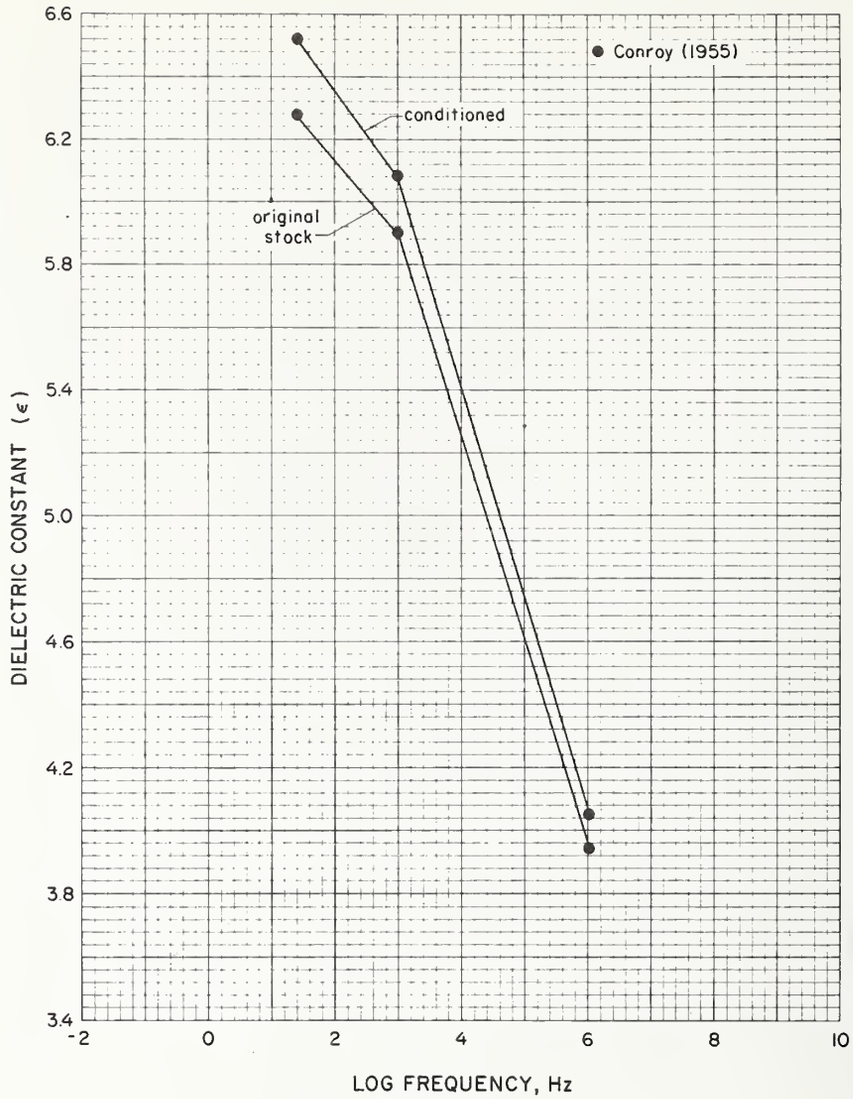
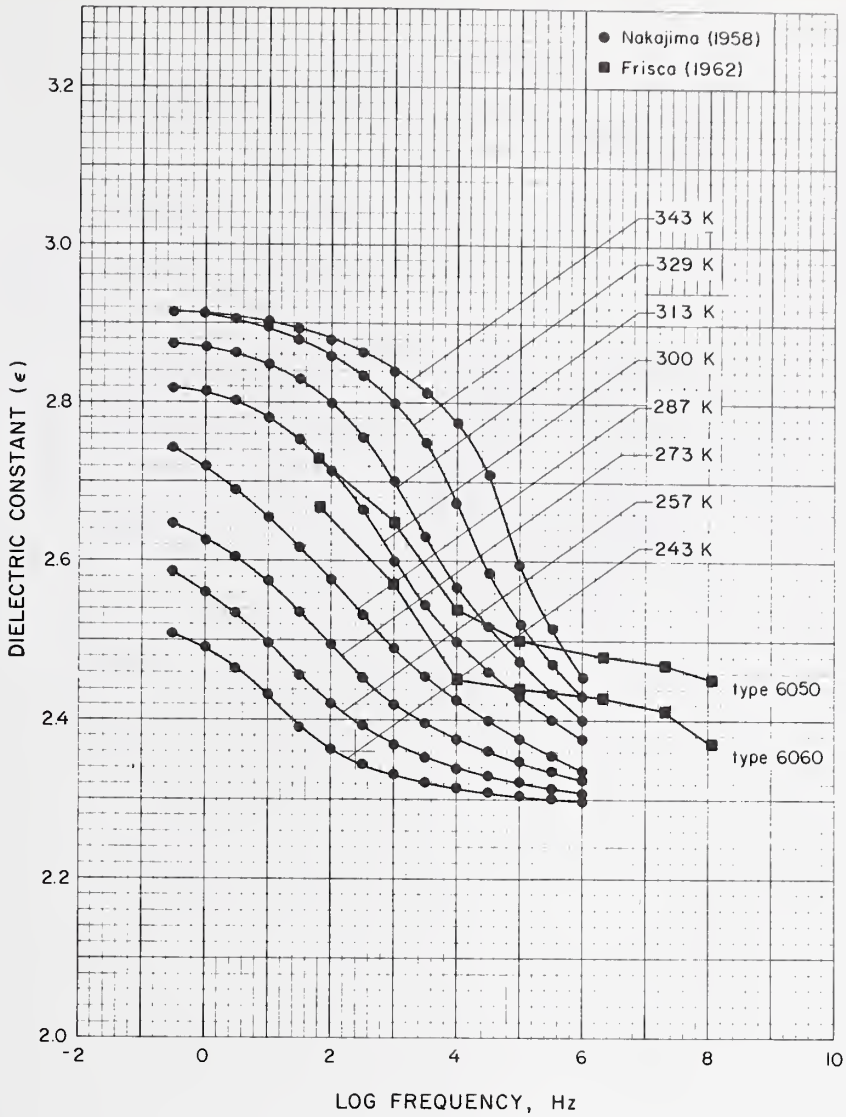
Dielectric Constant



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Conroy, Honn, Robb, Wolf (1955)	Kel-F, peroxide cured, stock number 122, original stock and conditioned for 1 week at 95% rel hum and 298 K	298 K



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Nakajima, Saito (1958)	Kel-F, 110,000 molecular weight, cooled slowly from melting temp, 48.9% crys	t = 0.2 cm, 8.0 cm diam; three electrode arrangement, guarded electrode 4.0 cm diam, silver conductive paint, inductive-ratio-arm bridge used above 30 Hz and resistive-ratio-arm bridge for below 10 Hz, both with conductance shifter.
Frisco (1962)	Commercial KF-6050, ASTM 1430-58T Grade II, pelatized, injection molding and extrusion resin; commercial KF-6060, ASTM 1430-58T Grade IV, unpelletized, compression molding resin	Stored under room conditions for at least 2 weeks before measurement.

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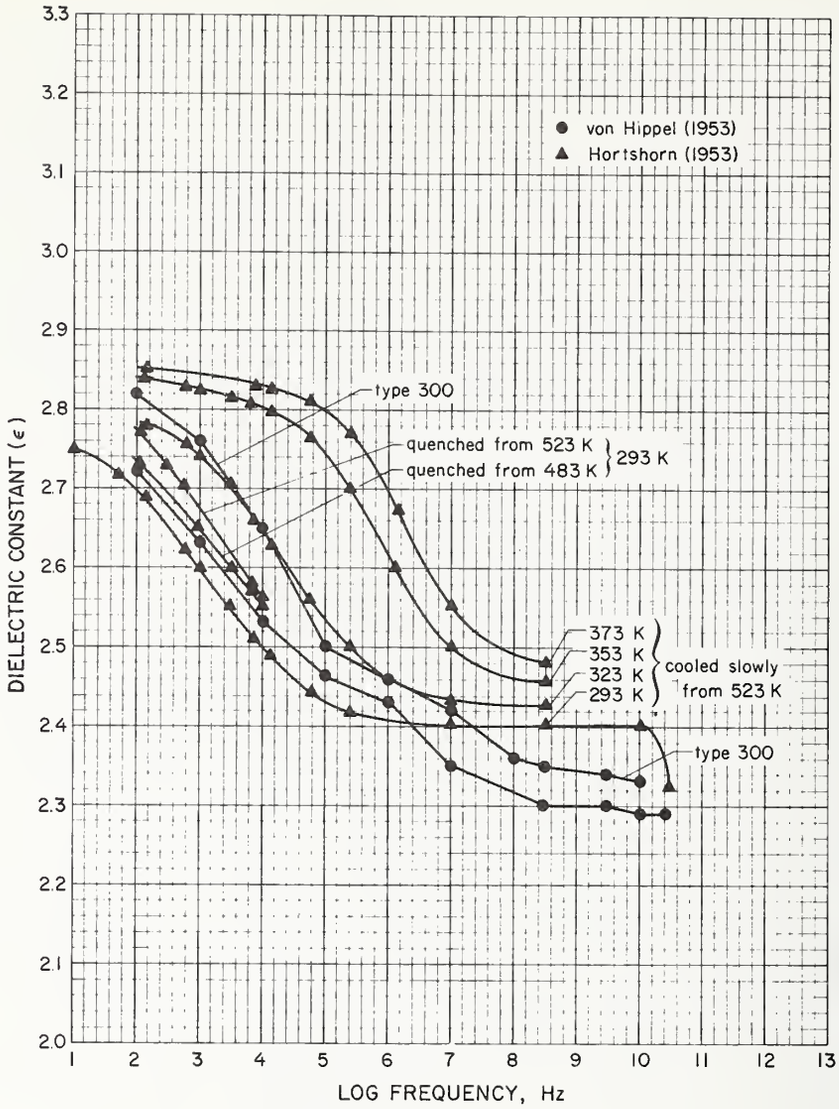
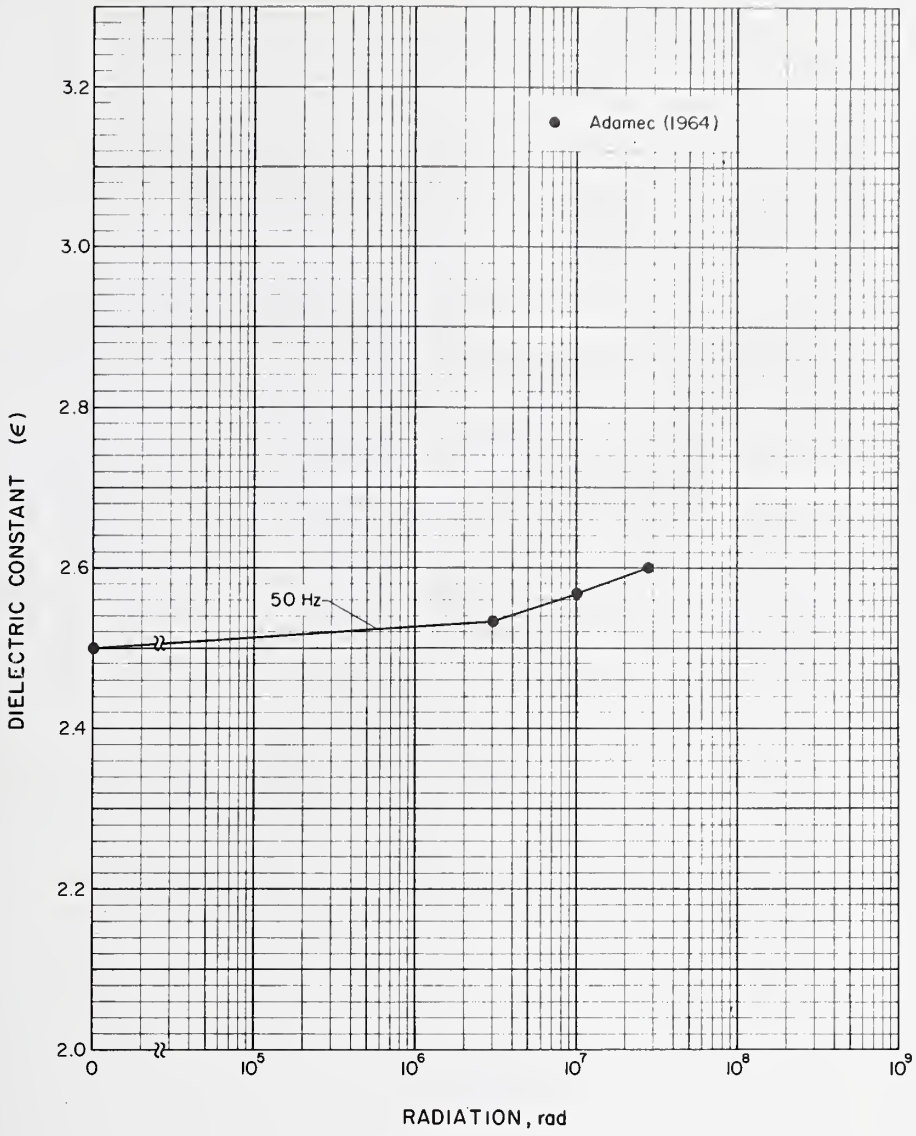
Dielectric Constant



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Hartshorn, Parry, Rushton (1953)	Kel-F, molded from powder at 523 K and 750 psi pressure	Diam ≤ 5. 3 cm; Schering-bridge method for frequencies to 10^4 Hz, circuit-resonance method for 10^4-10^5 Hz, cavity-resonance for 5×10^8, 9×10^9, and 24×10^9 Hz bands transmission-line method also used in 3×10^9 Hz region, electrodes at lower frequencies were platinum-plated, silver-plated with rhodium flash, or solid invar.
von Hippel (1953)	Kel-F and Kel-F Grade 300	Field strength ~ 50 V cm^{-1}, 298 K; nominal accuracy ± 2%.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Adamec (1964)		50 Hz, 296 K; reactor irrad.

A

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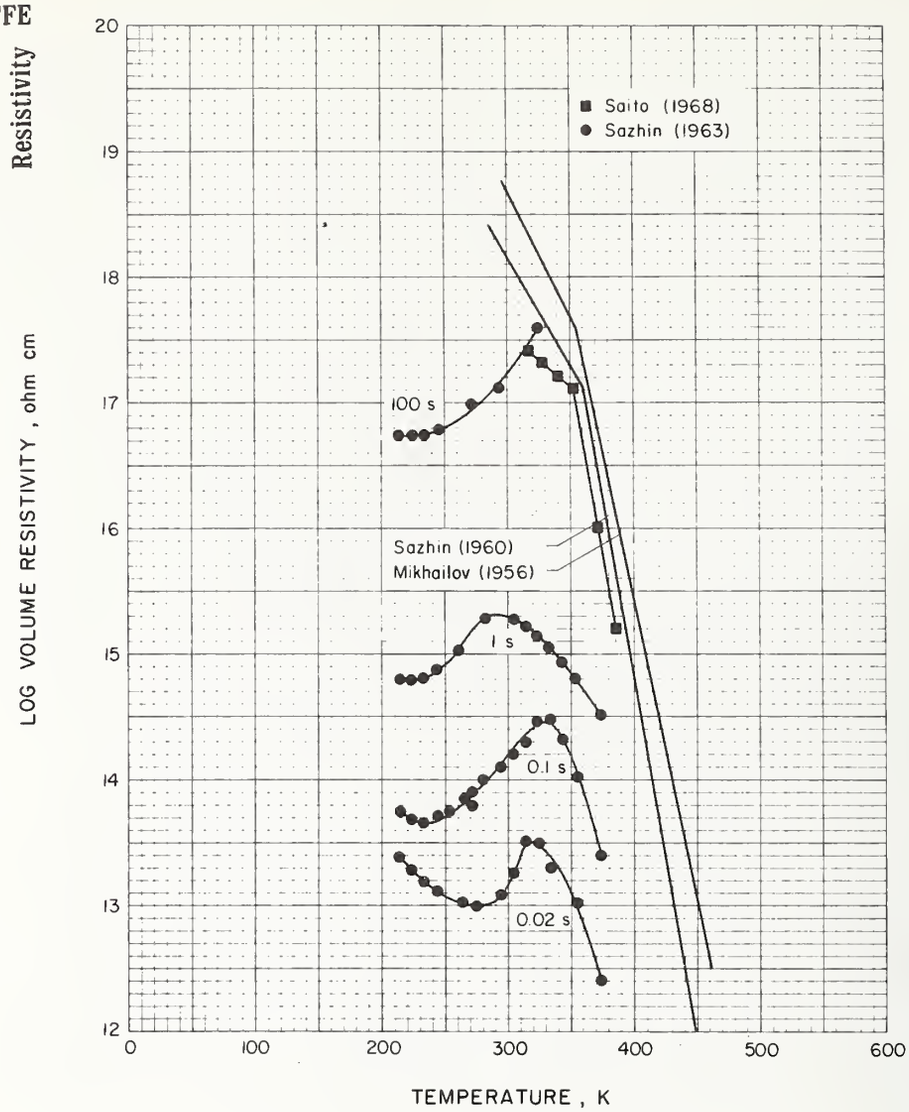
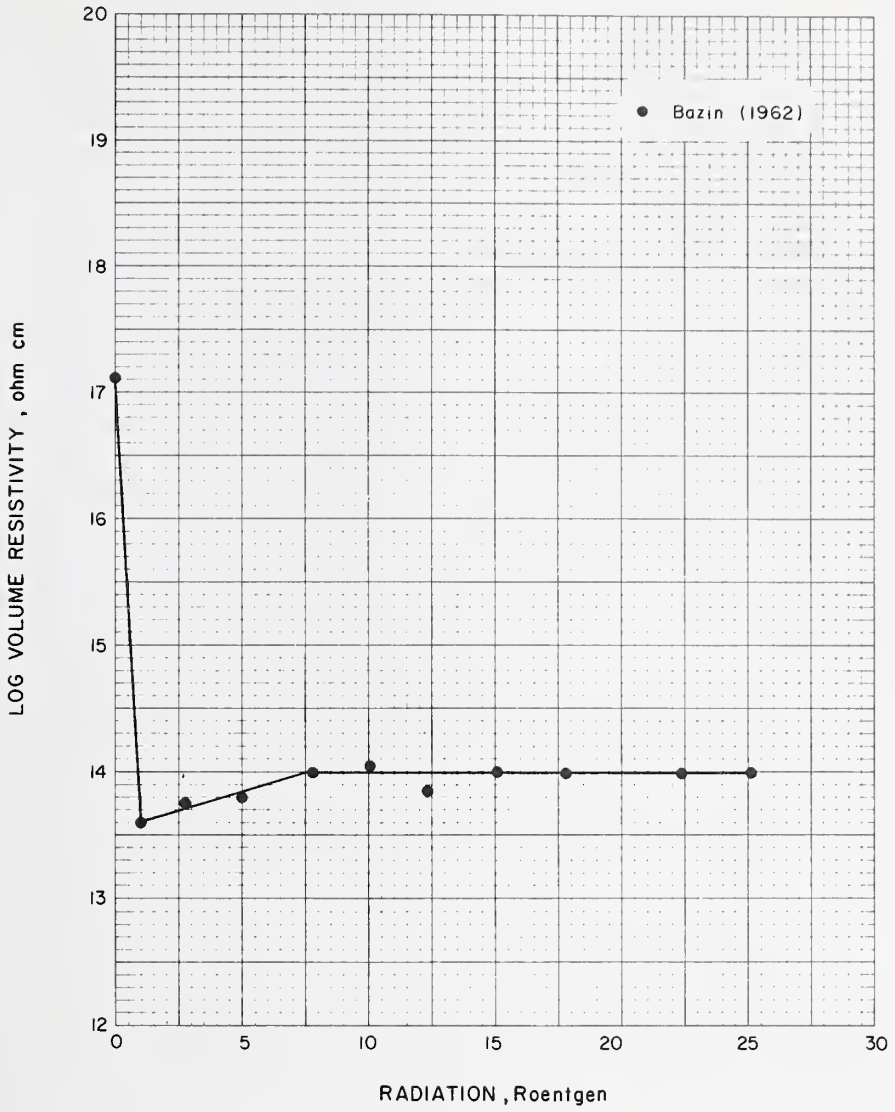
Resistivity



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sazhin, Stafeeva (1960)	Fluoroplast-3, pressed at 2100 psi and 523 K for 5 min, slowly cooled to room temp	Disc, t = 0.1 cm, diam = 5.0 cm; silver electrodes vapor deposited in vacuum, diam = 3.0 cm, 650 V potential, current measured after 100 s.
Mikhailov, Sazhin (1956)	Fluoroplast-3, slowly cooled from the melt	
Sazhin, Filippovich (1963)	Fluoroplast-3	Time between application of voltage and measurement indicated.
Saito, Sasabe, Nakajima, Yada (1968)	Compression molded, desiccated	Max t = 0.5 cm and 7.0 cm diam; dc applied, pressure = 1 atm, guarded electrode method.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bazin (1962)	Fluorofilm-3	293 K; thin silver electrodes; bremsstrahlung radiation from 25 meV betatron, irrad in vacuum.

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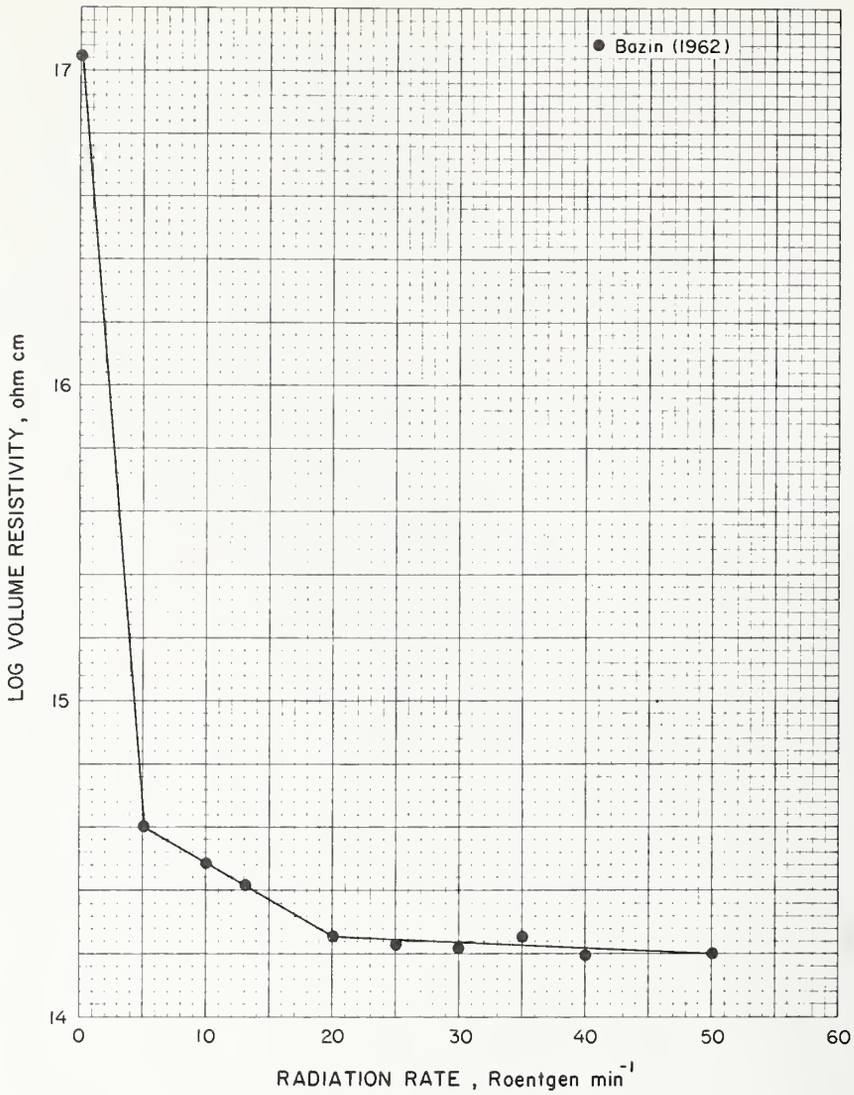
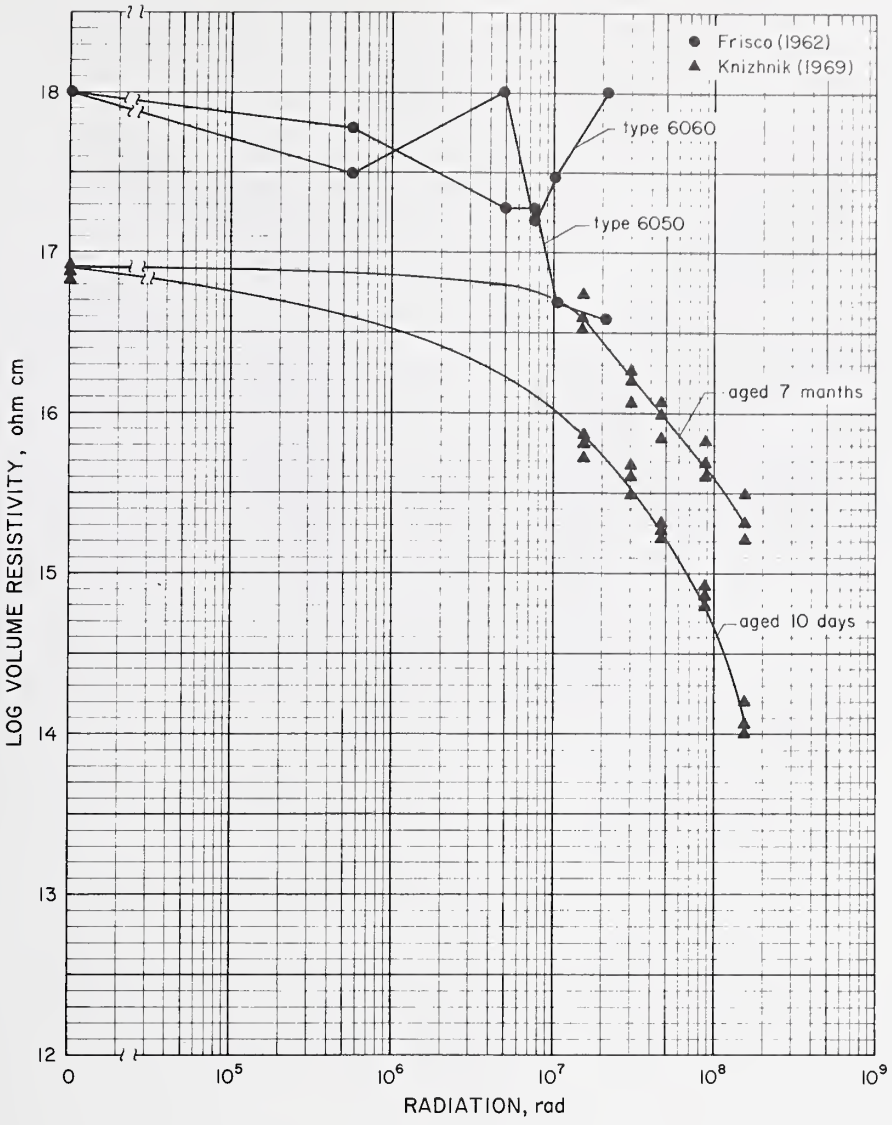
Resistivity



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Bazin (1962)	Fluorofilm-3	293K, thin silver electrodes; bremsstrahlung radiation from betatron (25 meV).



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Frisco (1962)	Commercial KF-6050, ASTM 1430-58T Grade II, pelletized, injection molding and extrusion resin; commercial KF-6060, ASTM 1430-58T Grade III, unpelletized, compression molding resin	Circular area = 1.0 cm^2, t = 0.05 cm; irrad by Ag x-rays in vacuum; a second sample of each type was tested and both showed a somewhat lower ρ; arrow indicates "greater than".
Knizhnik, Mamchich (1969)	Commercial sheet, 50-58% crys	Diam = 3.8 cm, t ≃ 0.2 cm; measured at 296 K and after voltage had been applied for 10^3 s, 3-electrode cell, UI-2 electromagnetic amplifier; irrad in cooled air in a VVR-M reactor, temp did not exceed 323 K, aged as noted before measurements; error = 8%.

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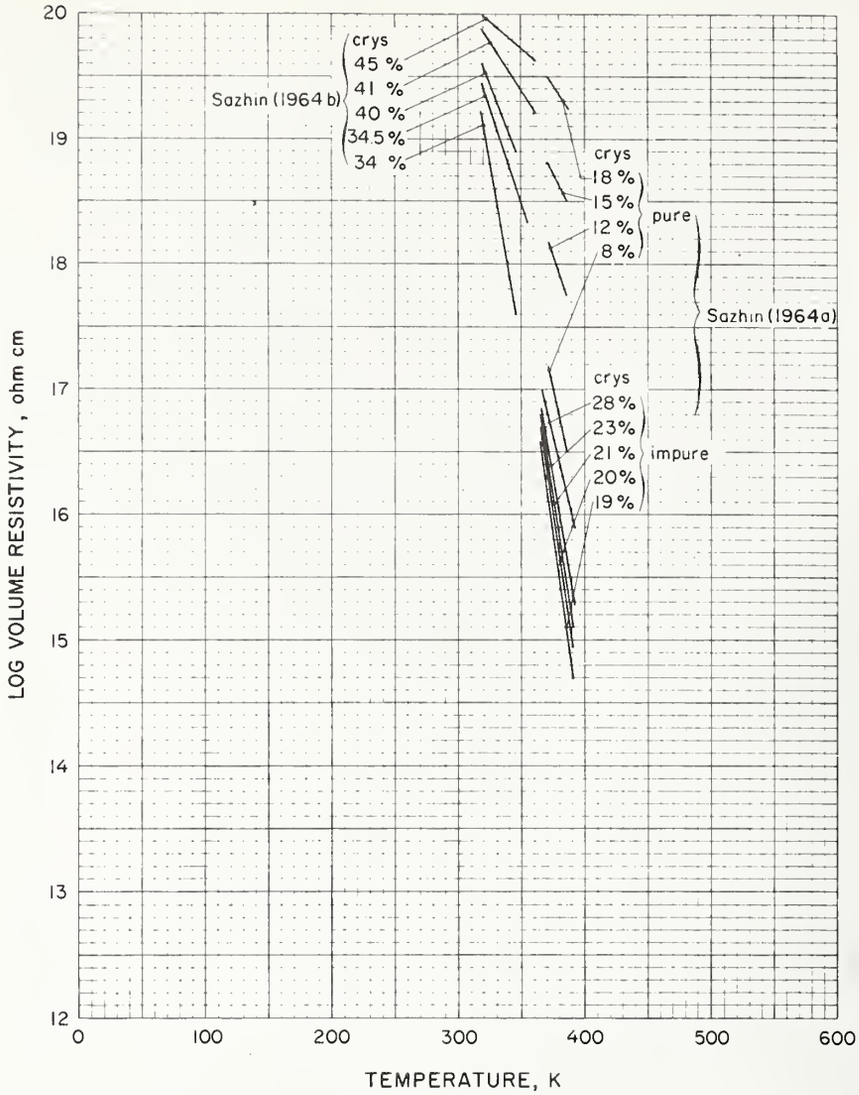
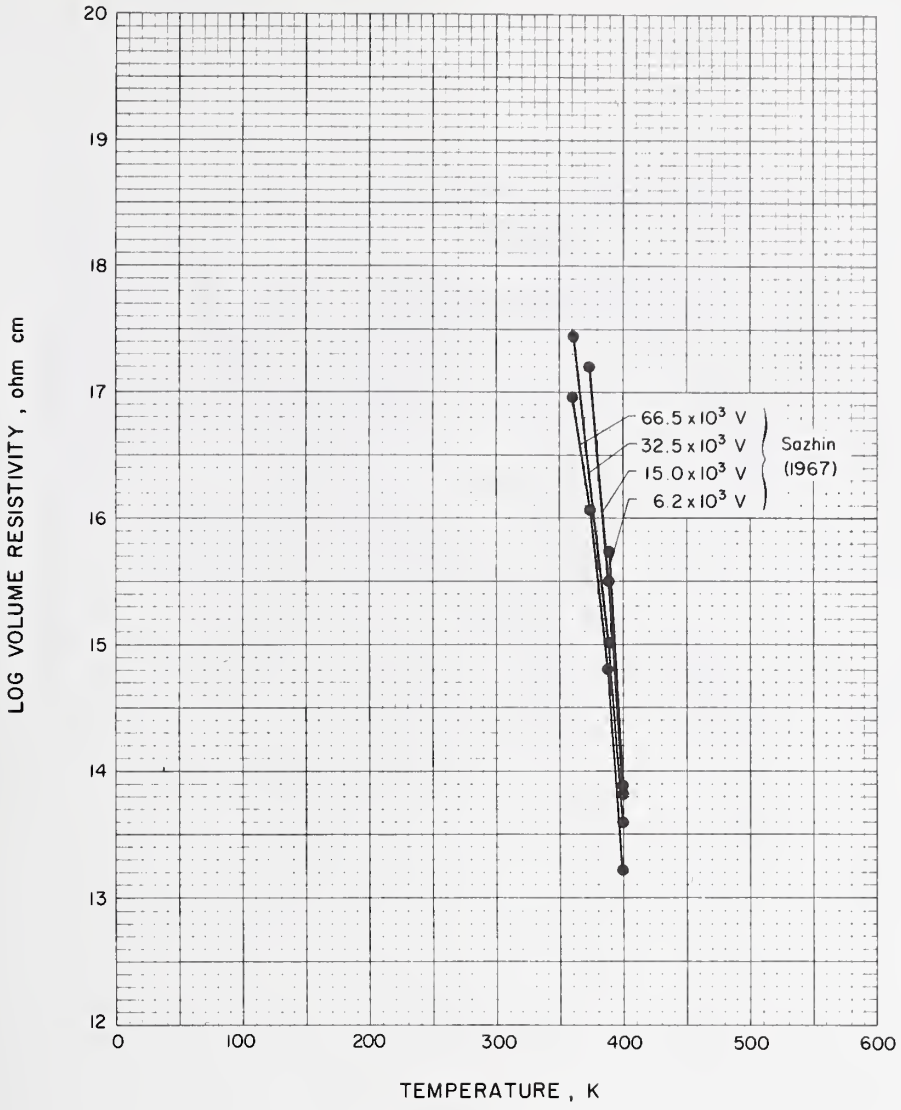
Resistivity



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sazhin, Podosenova (1964a)	Fluoroplast-3, 2 purities industrial grade, prepared by compression-molding: sp gr measured at 303 K; sp gr = 2.106, 8% crys; sp gr = 2.116, 12% crys; sp gr = 2.122, 15% crys; sp gr = 2.128, 18% crys; sp gr = 2.129, 19% crys; sp gr = 2.131, 20% crys; sp gr = 2.135, 21% crys; sp gr = 2.138, 23% crys; sp gr = 2.148, 28% crys	Disc, t = 0.1 cm, diam = 1.5 cm; aluminum foil electrodes, t = 0.0055 cm, pressed onto impure specimens, electrodes deposited on pure specimens by hot vacuum spraying; error in determining resistivity not more than 15%, data spread not more than 5%.
Sazhin, Podosenova (1964b)	Fluoroplast-3: sp gr = 2.142, 34% crys; sp gr = 2.144, 34.5% crys; sp gr = 2.151 40% crys; sp gr = 2.156, 41% crys; sp gr = 2.159, 45% crys	



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sazhin, Shurikhina (1967)	Prepared from powder or pellets by molding in the form of films, sp gr = 2.13	t = 0.005-0.01 cm; electrodes formed by sputtering with aluminum in vacuum, dried in vacuum and stored over $CaCl_2$, electrically purified just prior to measurement by applying 3-4 x 10^5 V at 393-403K for 3-6h, measurements made on EK6-7 tetraohmmeter 1-2 h after voltage applied, electic field strength noted; error in measurement was 10-20%.

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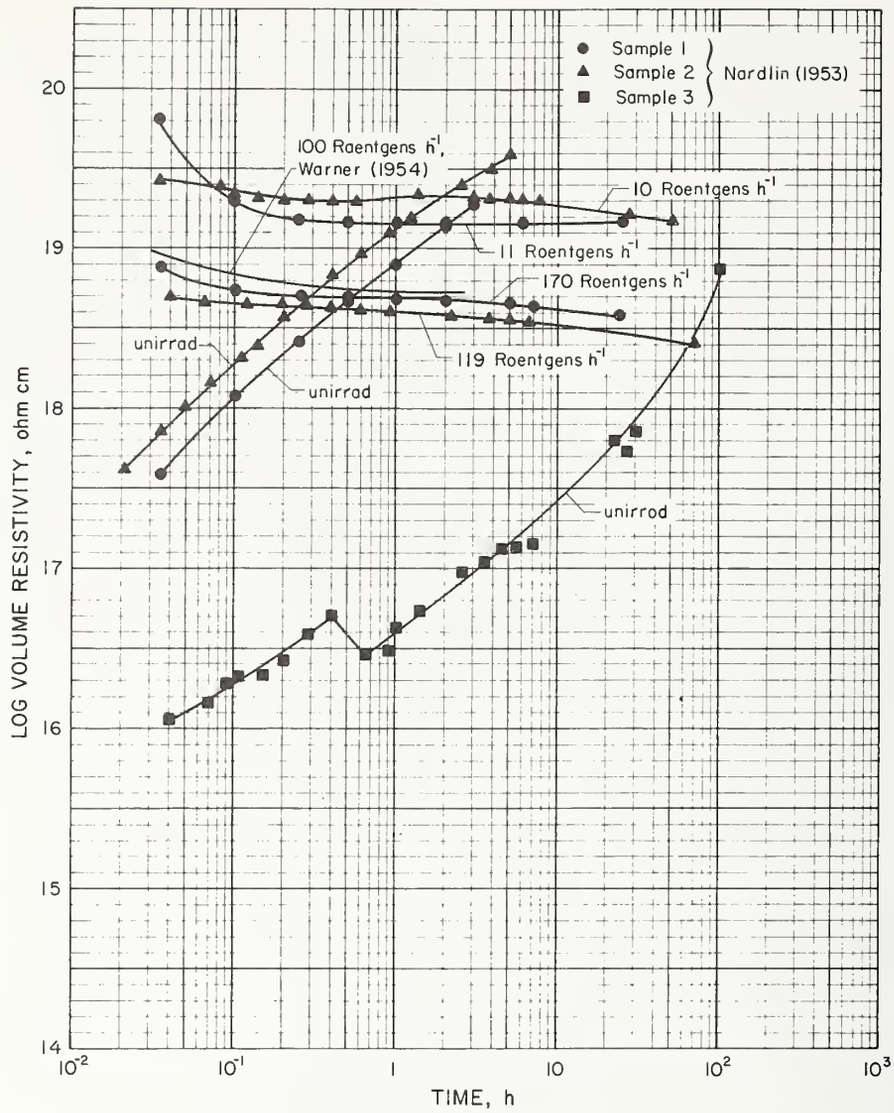
Resistivity



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Nordlin, Keel. Mayhew (1953)	Sample 1 is Trithene A made of Kel-F resin, large flattened tubing with 0.013 cm wall; sample 2 is the same as sample 1 but heated between sheets of glass at 491 K for 2 h, cooled to 466 K in 4.5 h, cooled to 425 K in 24 h, then cooled to room temp, highly crys; sample 3 is laboratory molded film from granulated Fluorothene CF-3-15	Same specimen of each sample material tested in vacuum at 570 V, tested without radiation, then at low radiation rate, then at high radiation rate; irrad ly Co^{60}.
Warner, Muller, Nordlin (1954)	Kel-F	Disc with electrode area to thickness ratio ~10^4 cm; guard electrode on sample and leads to sample, measuring voltage applied before the start of radiation and maintained all through the test; irrad in an evacuated desiccator by 1 Curie of Co^{60} at 100 Roentgens h^{-1}.

Investigator(s) (year)	Description	Temperature (K)	ρ Volume Resistivity (Ω cm)	Tan δ Dielectric Loss Tangent	ε Dielectric Constant	D.S. Dielectric Strength (V mil^{-1})
Kallweit (1963)	Hostaflon	298	3.1×10^{16}			
Conroy (1955)	Kel-F, original stock conditioned	298	1.13×10^{14} 1.21×10^{14}			613 642
3M Co. (1961)	Kel-F 81 crystalline amorphous	298	2.5×10^{16} 4×10^{10}			495 502
Coleman (1953)	β irrad for 30 min	295	5×10^{16}			
Olshanskaya (1962)	unirrad crys = 19.8% crys = 27% during γ irradiation crys = 19.8% crys = 27%	293	3.27×10^{13} 4.00×10^{14} 2.78×10^{12} 1.61×10^{13}			
Sisman (1951)	Fluorothene unirrad and after 3×10^{17} nvt, t = 0.32 cm	298	$>10^{14}$			
	unirrad and after 5×10^{17} nvt, t = 0.076 cm					900
Heyne (1965, pt. I)	unirrad during irrad	298			2.38 3.50	
Heyne (1965, pt. II)	after irrad	298			3.80	

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kallweit (1963)	Hostaflon	t = 0.5 cm; resistivity constant from 120 - 800 V.
Conroy, Honn, Robb, Wold (1955)	Kel-F, peroxide cured stock number 122, original stock and conditioned for 1 week at 95% rel hum and 298 K.	
3M Co. (1961)	Kel-F, moderately crystalline and amorphous	D.S. measured with 5.08 cm electrodes.
Coleman, Bohm (1953)		Irrad with 25 mc Sr^{90} β-source deposited on one electrode, other electrode collected the β-particles that penetrated insulator, 1500V battery and electrometer connected between electrodes, value noted is minimum induced resistivity.
Olshanskaya, Vosochev (1962)	Fluoroplast-3	Irrad by Co^{60} at $1\text{-}2\times10^{3}$ rad min^{-1} in vacuum.
Sisman, Bopp (1951)	Fluorothene	ρ: modified ASTM D 257-49T test procedure, reading made 1 min after applying 20 V potential; D.S.: 2.54 cm square; modified ASTM D 149-44 test procedure, max 30,000 V, 60 Hz, tested under insulating oil; irrad in Hole 19 of ORNL reactor at 298-313 K, aged 7 days at 298 ± 1 K and 50 ± 2% rel hum before testing.
Heyne, Hauser (1965, pt. I)		Measurement made 10^{4} s after application of 6×10^{3} V cm^{-1} electric field, 800 Hz; reactor irrad by 1.15 Roentgen s^{-1} of γ's, 2.3×10^{8} fast neutrons cm^{-2} s^{-1}, and 2.2×10^{8} thermal neutrons cm^{-2} s^{-1}.
Heyne, Hauser (1965, pt. II)		See above; measurement made after 5×10^{7} rad.

Investigator(s) (year)	Description	Temperature (K)	ρ Volume Resistivity (Ω cm)	Tan δ Dielectric Loss Tangent	ε Dielectric Constant	D.S. Dielectric Strength (V mil^{-1})
Sazhin (1963)	As received, sp gr = 2.106	373	2.5×10^{18}			
	Annealed at 403 K for 25 h, sp gr = 2.116		1.0×10^{18}			
	Annealed at 423 K for 25 h, sp gr = 2.122		1.0×10^{19}			
	Annealed at 443 K for 20 h, sp gr = 2.128		2.0×10^{19}			
	Quenched from melt into ice water, sp gr = 2.129		2.0×10^{15}			
	Annealed at 403 K for 24 h, sp gr = 2.131		2.5×10^{15}			
	Annealed at 423 K for 20 h, sp gr = 2.135		4.0×10^{15}			
	Annealed at 443 K for 24 h, sp gr = 2.138		5.0×10^{15}			
	Annealed at 473 K for 24 h, sp gr = 2.148		2.0×10^{16}			
McKeown (1965)	Extruded film	298				10,600 (rms)

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Sazhin, Podosenova (1963)		Each thermal treatment indicates a sequential step performed on a single specimen.
McKeown (1965)	Extruded film	t = 0.0051 cm; spherical electrodes embedded in thermoset resin with samples, 60 Hz, surface treated by immersion in liquid-ammonia solution of Na; standard deviation of 8 samples = 22%.

Investigator(s) (year)	Description	Temperature (K)	ρ Volume Resistivity (Ω cm)	Tan δ Dielectric Loss Tangent	ε Dielectric Constant	D.S. Dielectric Strength (V mil^{-1})
Sazhin (1965)	As received, sp gr = 2.106	298	2.5×10^{16}			
	Annealed at 403 K for 25 h, sp gr = 2.116		1.0×10^{16}			
	Annealed at 423 K for 25 h, sp gr = 2.122		1.0×10^{19}			
	Annealed at 443 K for 20 h, sp gr = 2.128		2.0×10^{19}			
	Quenched from melt ice water, sp gr = 2.129		2.0×10^{15}			
	Annealed at 403 K for 24 h, sp gr = 2.131		2.5×10^{16}			
	Annealed at 423 K for 20 h, sp gr = 2.135		4.0×10^{16}			
	Annealed at 443 K for 24 h, sp gr = 2.138		5.0×10^{16}			
	Annealed at 473 K for 24 h, sp gr = 2.148		2.0×10^{16}			

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sazhin (1965)		Each thermal treatment indicates a sequential step performed on a single specimen.

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E. Related References

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8. Polyethylene terephthalate (PET)

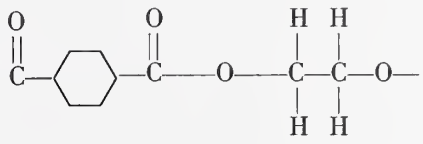
A. Summary

Polyethylene terephthalate is a high molecular weight polyester with relatively high melting point and glass transition temperatures for the retention of good mechanical properties up to 425 K–450 K. The polymer chain is stiff with a high modulus and the interchain bonds are unaffected by moisture resulting in excellent fiber and film properties. PET is melt spun or drawn into fiber or film, quenching the molten polymer to below its glass transition. The fibers are frequently stretched to obtain varying degrees of crystallinity and preferred orientation which give a considerable range in the mechanical properties. The fibers are commonly used for clothing and the films, the toughest known, are frequently used for insulation and magnetic tapes.

PET

Chemical Formula $(C_{10}H_8O_4)_n$

Chemical Structure

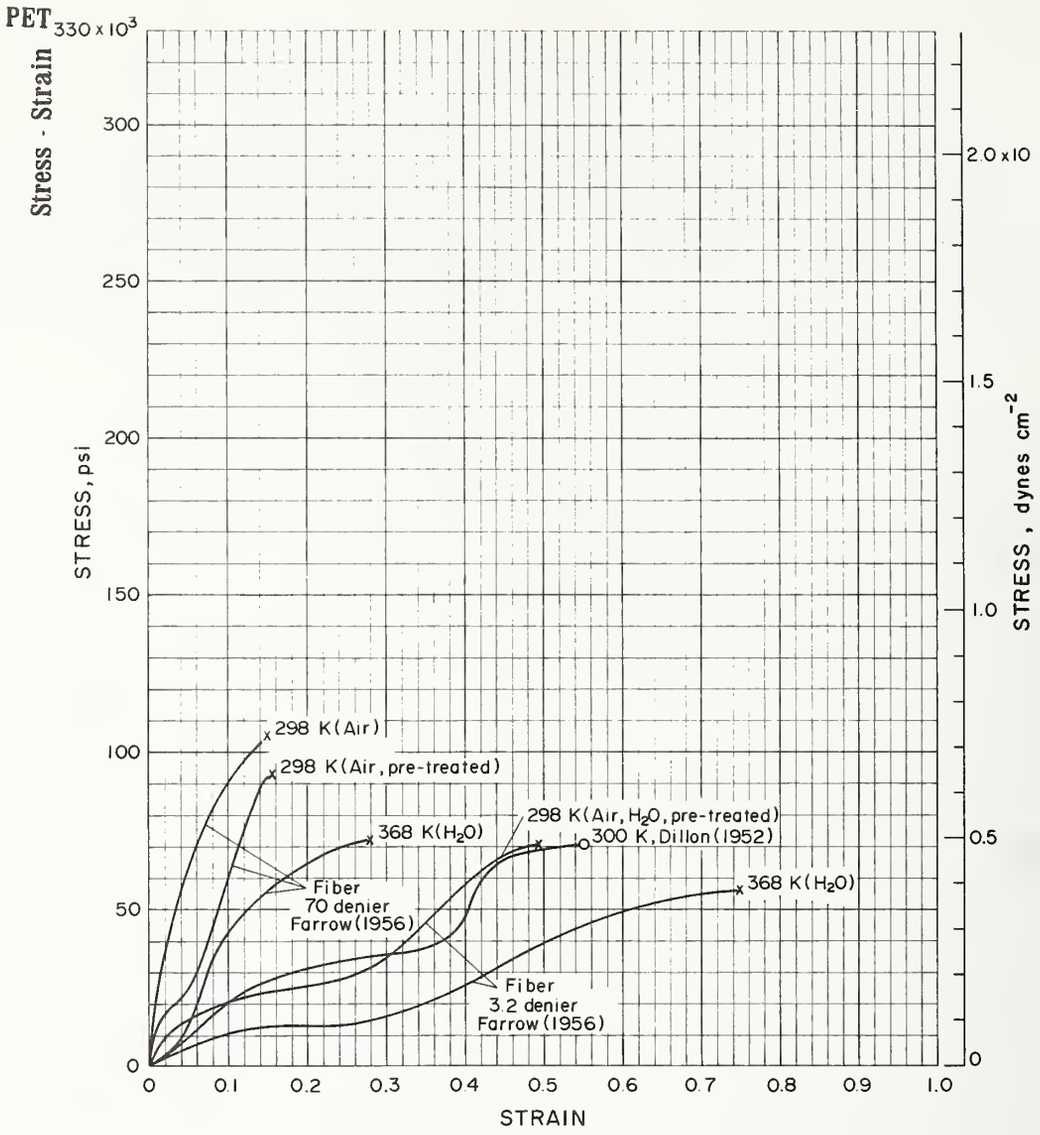


Significant Properties:

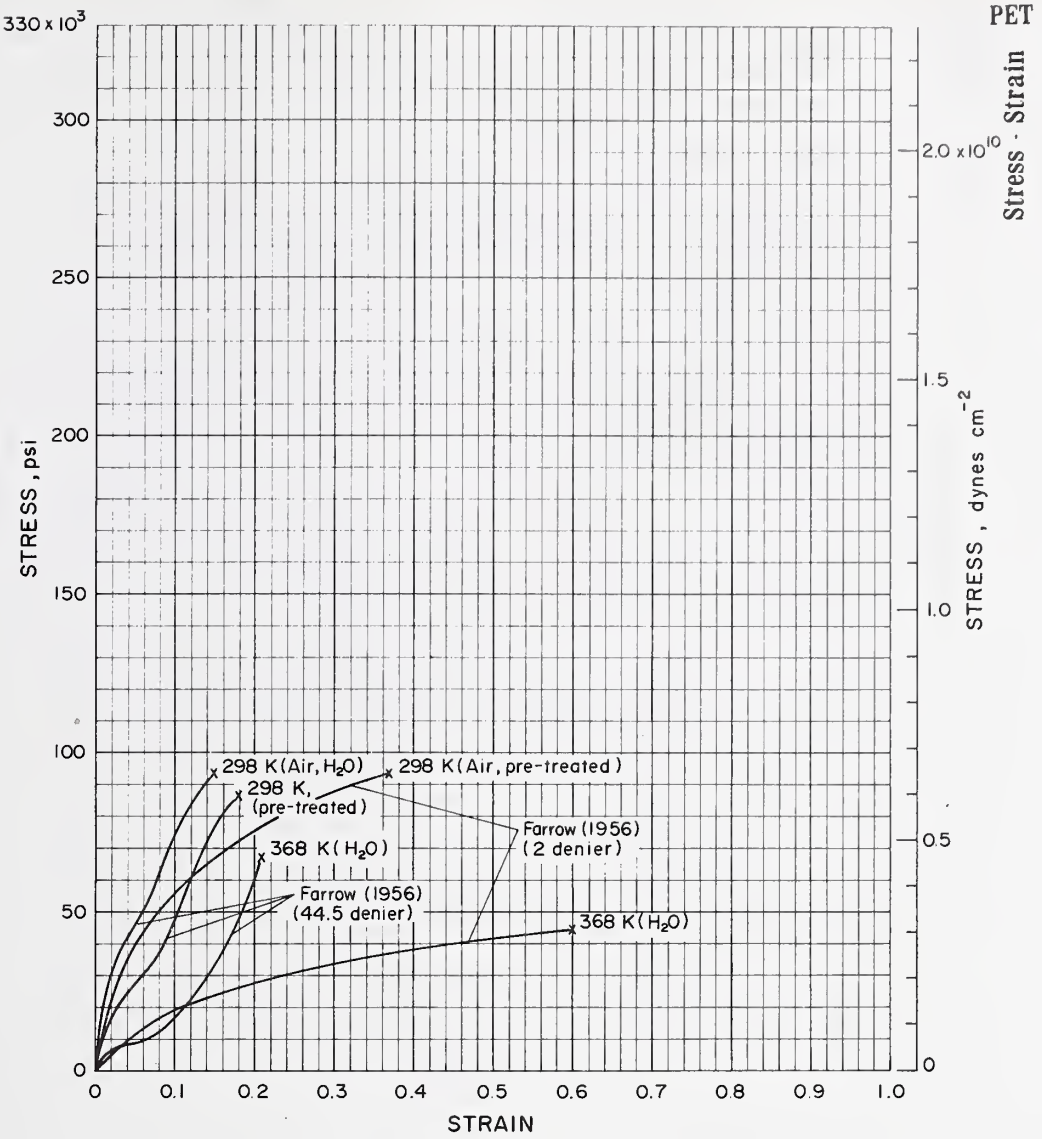
Density (295 K)	1.38 gm cm^{-3}
Crystalline melting point	538 K
Molecular weight	1300–1600
Crystallinity	Amorphous
Approximate transition regions	200–290 K, 340–430 K, 515–540 K
Chemical resistance	Good
Tensile strength (295 K)	20,000 psi (film) 100,000 psi (fiber)
Thermal expansion coefficient (295 K)	5×10^{-5} K^{-1}
Dielectric constant (10^5 Hz), 295 K)	3.05
Dielectric Loss Tangent (10^5 Hz), (295 K)	0.01

Trade names occurring in the references compiled:
Dacron, Hostaphan, Lavsan, Melinex, Mylar, and Terylene

B. Mechanical Properties and References (PET)



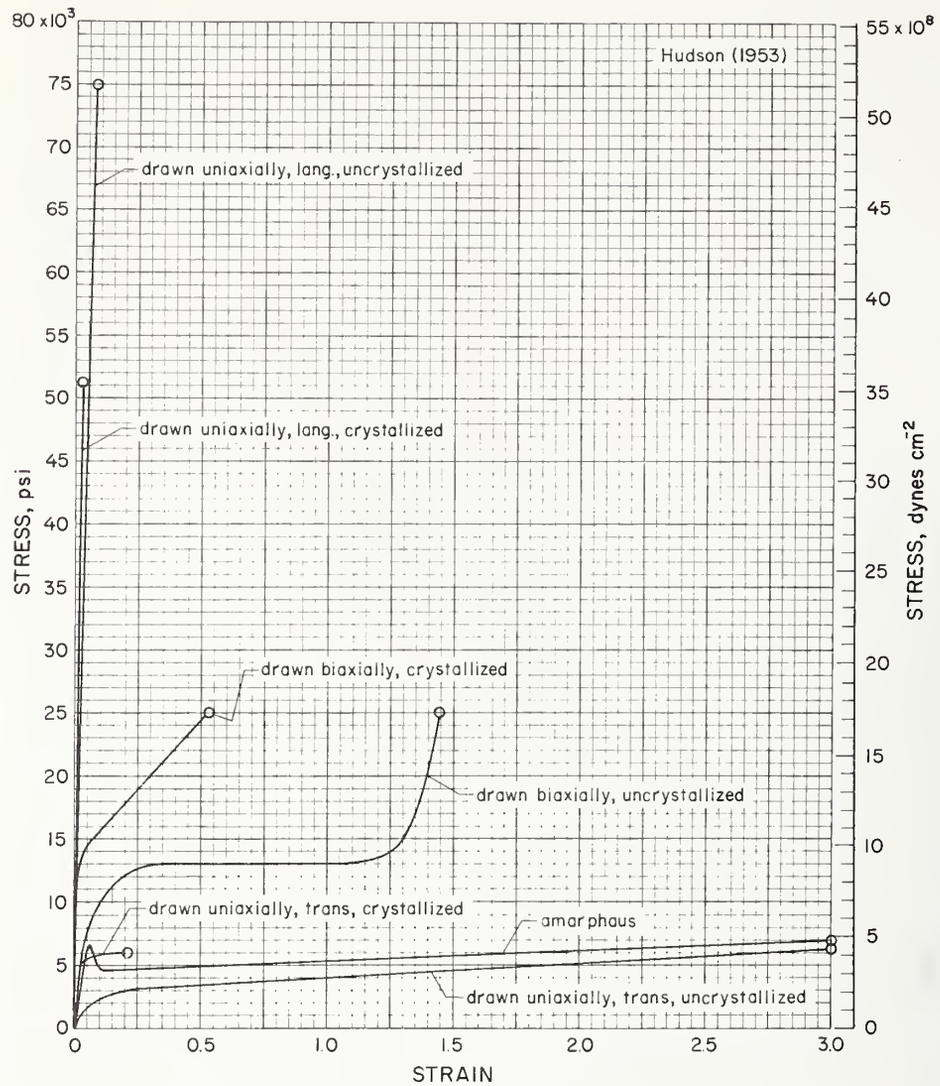
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Dillon (1952)	Dacron, 3 denier	GL = 2.54 cm; Instron, 0.021 cm s^{-1} xhd spd; 10 samples and averaged.
Farrow (1956)	Dacron, 3.2 and 70 denier; Terylene, 2.0 and medium tenacity 44.5 denier	Cambridge Textile Extensometer used, varied both specimen length and rate of loading; test media in parentheses; pretreated specimens immersed in water (368 K) for 1 min, dried at room temp.



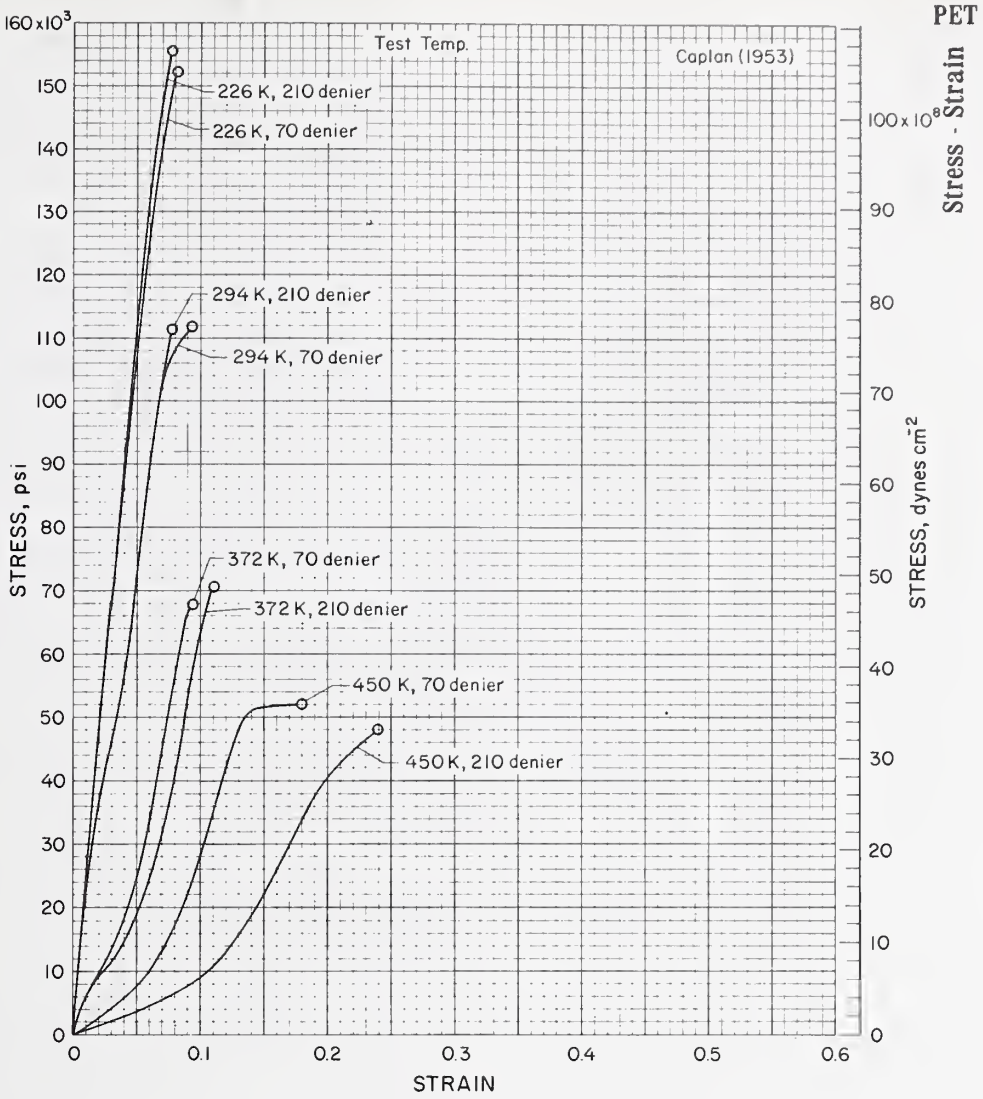
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Farrow (1956)	Dacron, 3.2 and 70 denier; Terylene, 2.0 and medium tenacity 44.5 denier	Cambridge Textile Extensometer used, varied both specimen length and rate of loading; test media in parentheses; pre-treated specimens immersed in water (368 K) for 1 min, dried at room temp.

PET

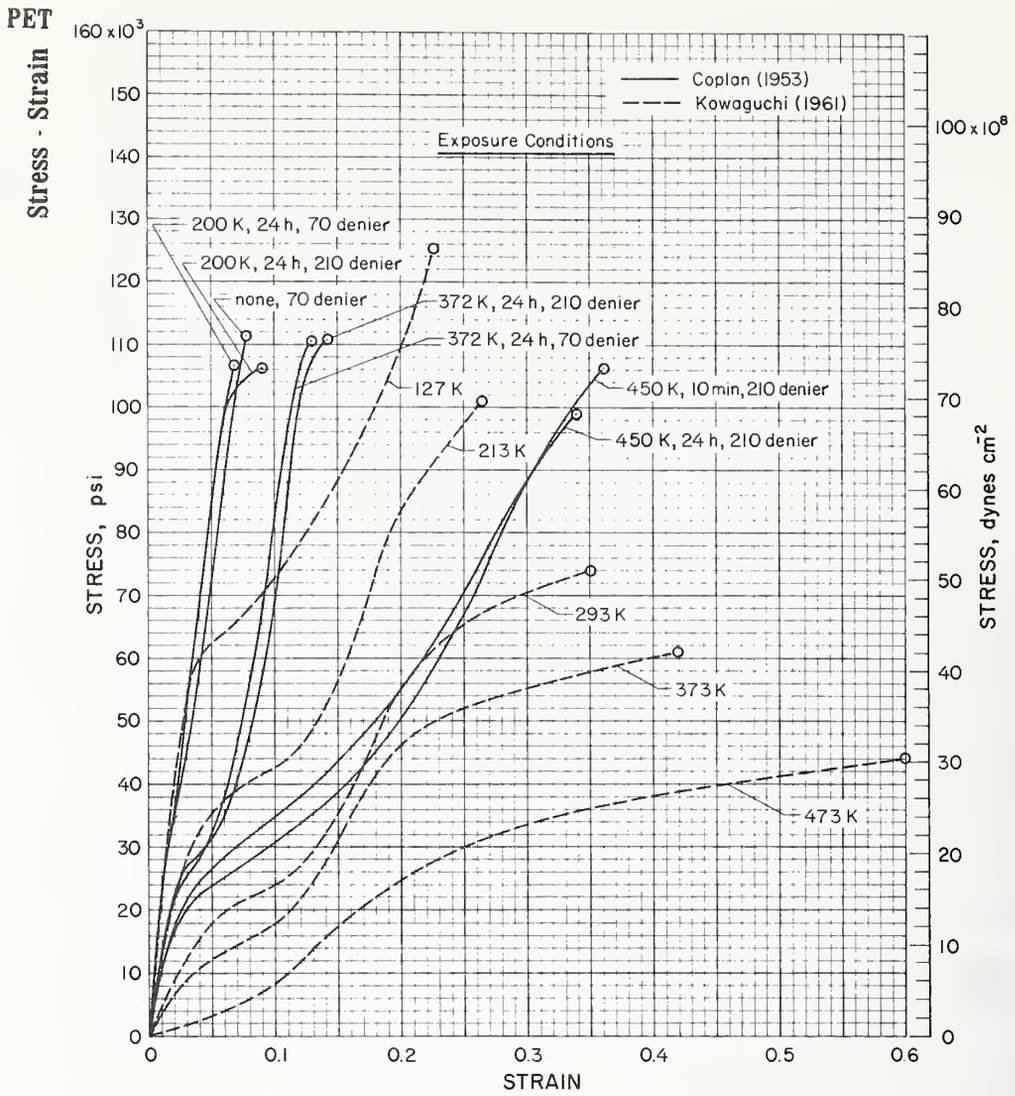
Stress - Strain



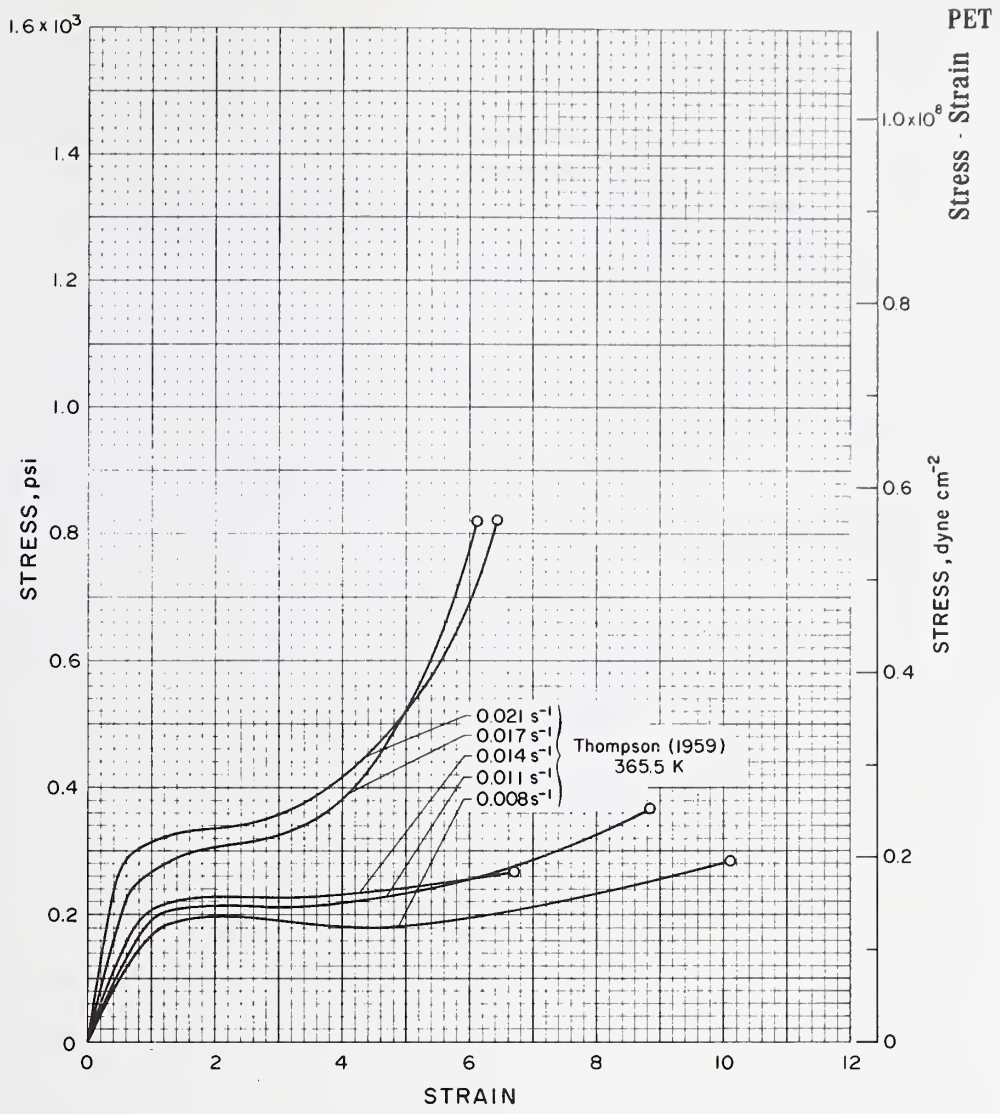
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Hudson (1953)	Terylene film	293 K



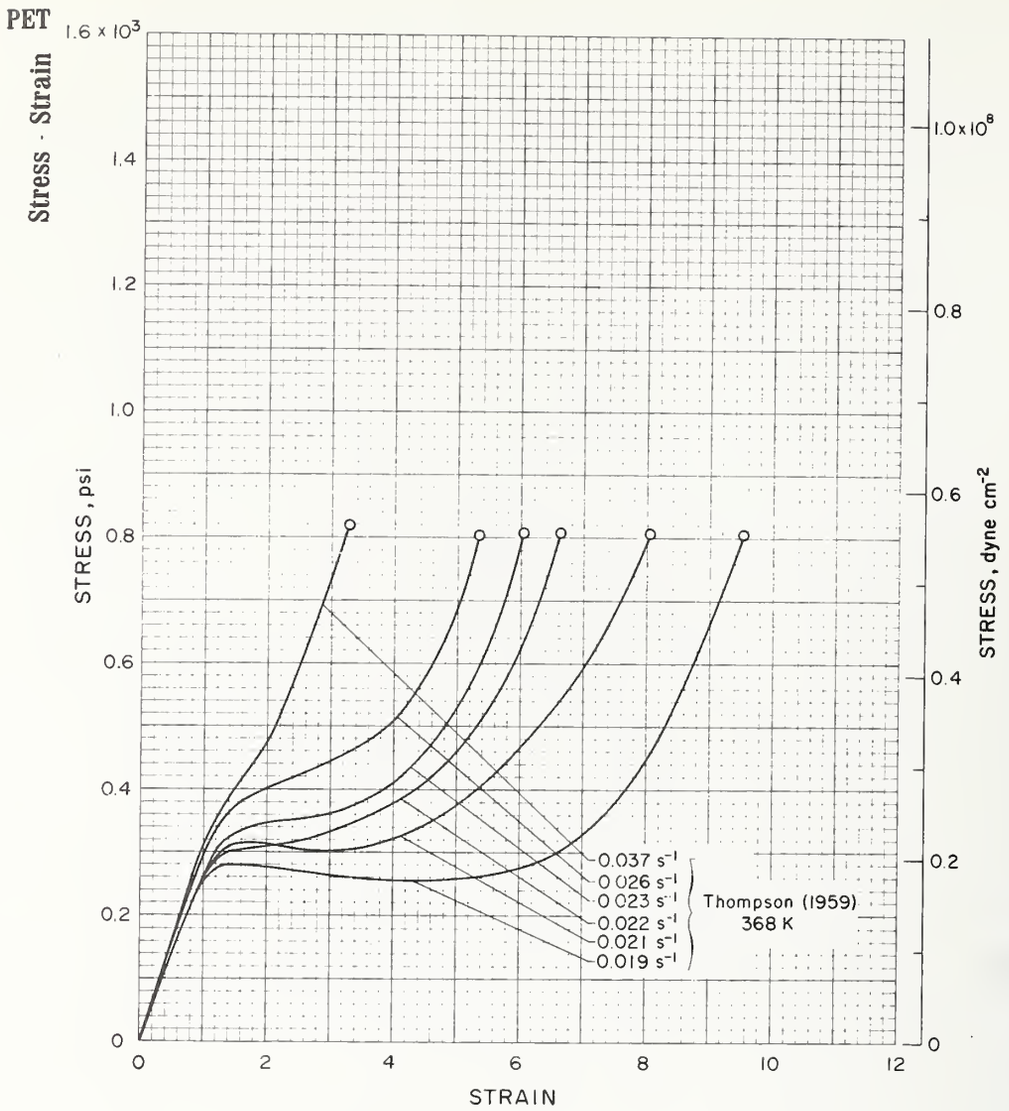
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Coplan (1953)	Dacron 5100; 70 denier, 34 filament, 3/4 Z	GL = 25.4 cm; Instron or F.R.L. Tester, xhd spd = 0.127 cm s^{-1}, 294 K test was at 65% rel hum; max load error = 2%, max elongation error = 5%, 12 specimens tested.



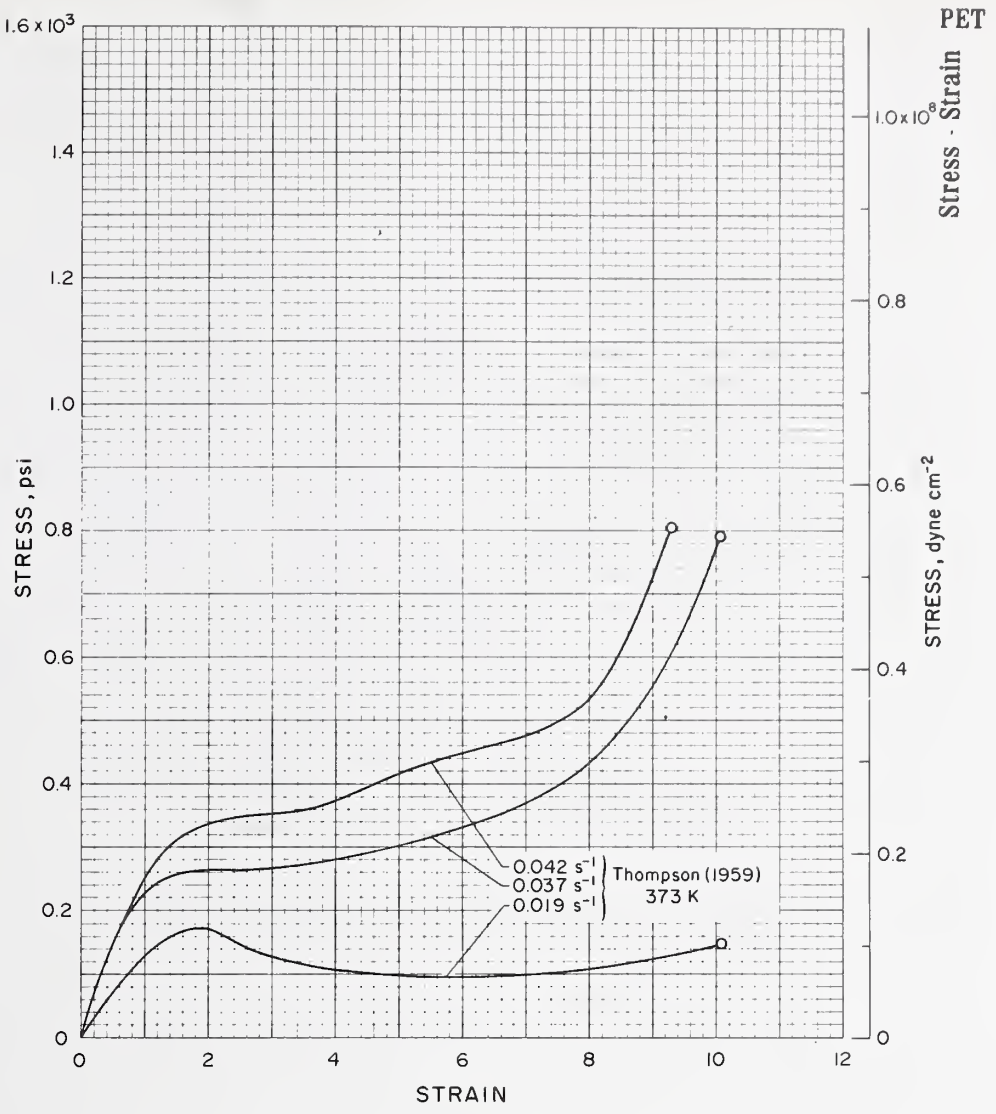
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Coplan (1953)	Dacron 5100; filament yarns: 70 denier, 34 filament, 3/4 Z; 210 denier, 34 filament, 1 Z	GL = 25.4 cm; Instron or F. R. L. Tester, xhd spd = 0.127 cm s^{-1}, exposed to conditions noted and then tested at 294 K and 65% rel hum; exposure at 372 K was at both 2% and 95% rel hum with practically no difference in results, max load error = 2%, max elongation error = 5%, 12 specimens tested.
Kawaguchi (1961)		Filament; data for intermediate temps also presented.



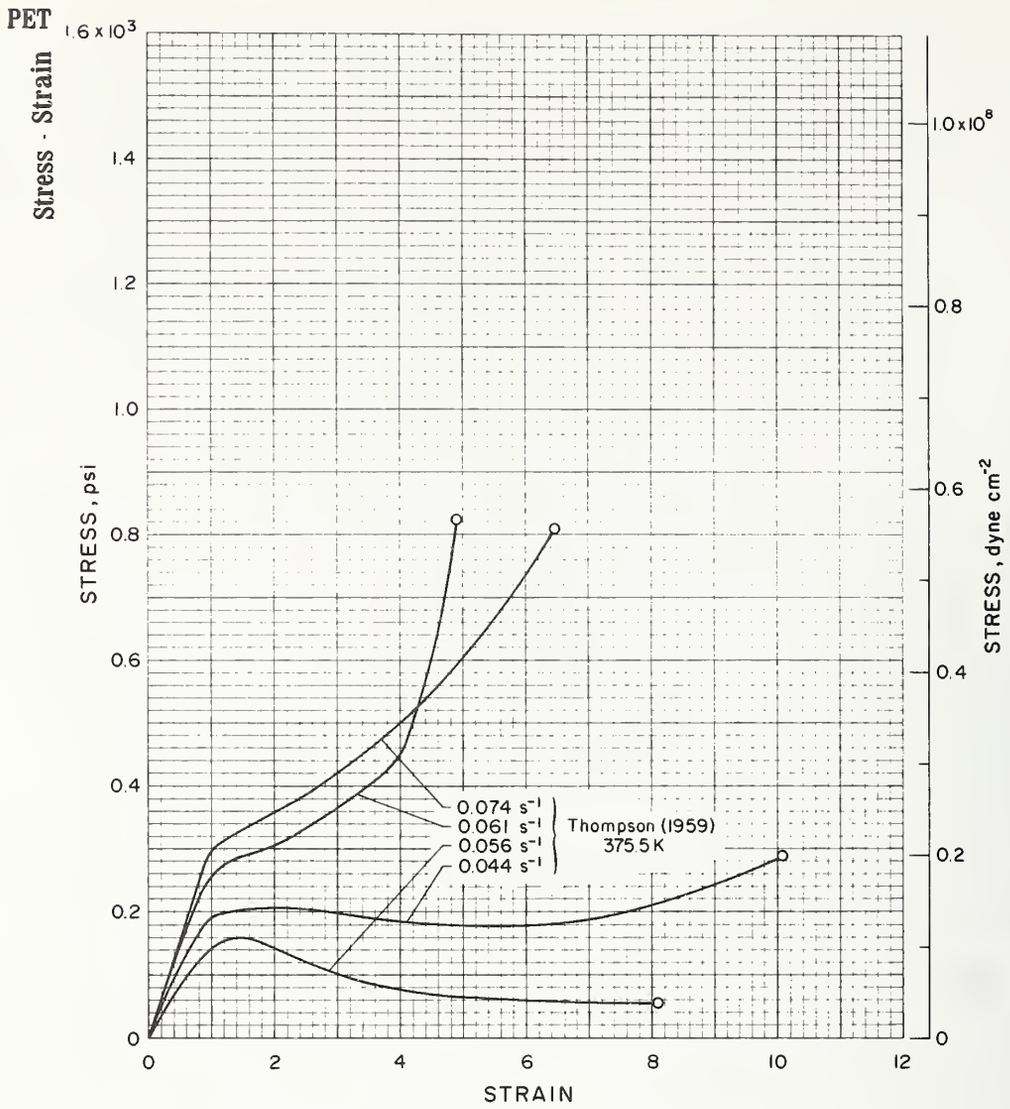
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thompson (1959)	melt spun, amorphous, molecular weight = 15,000	Fiber, diam ≃ .01 cm; immersed in silicone oil, tests at several strain rates.



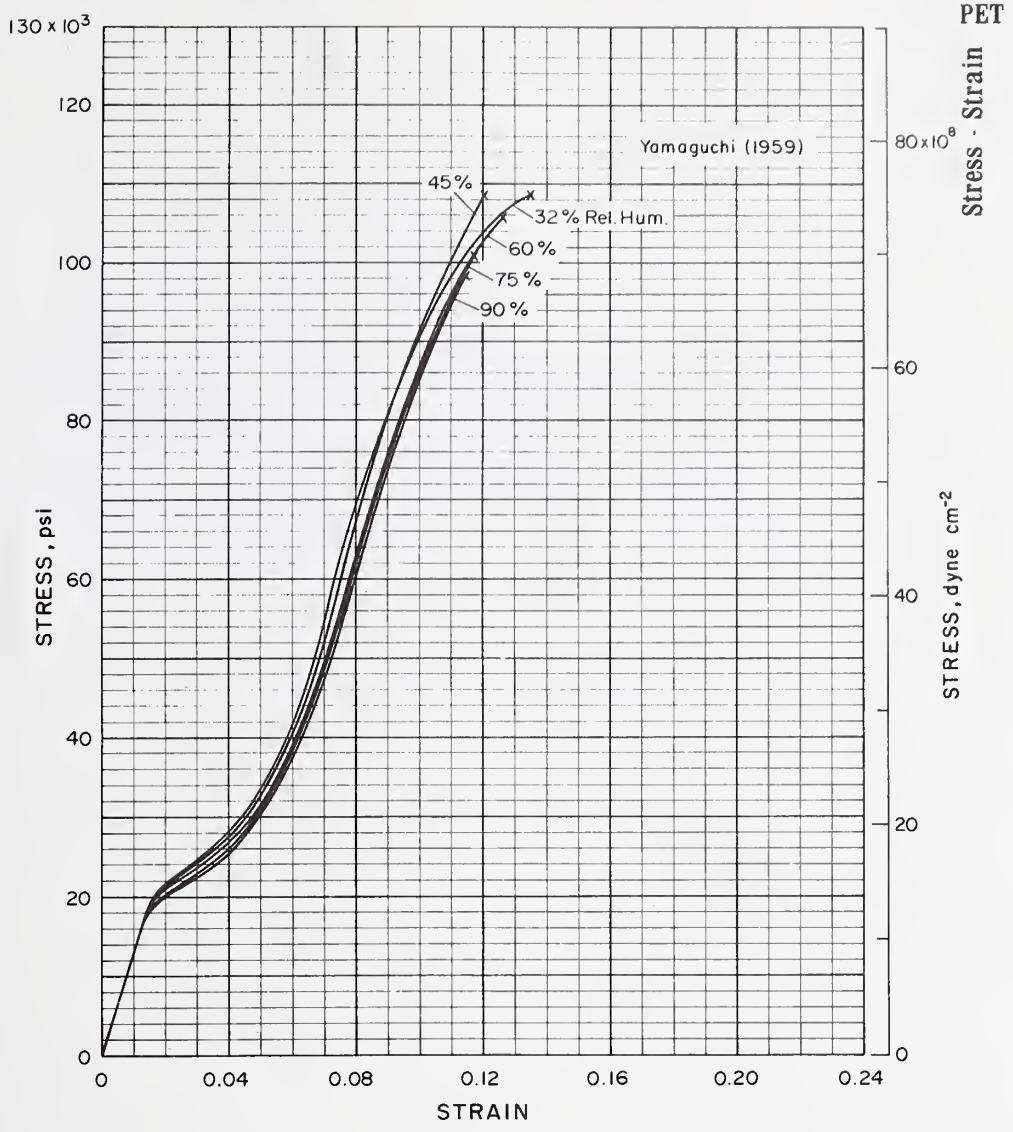
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thompson (1959)	melt spun, amorphous, molecular weight = 15,000	Fiber, diam ≃ .01 cm; immersed in silicone oil, tests at several strain rates.



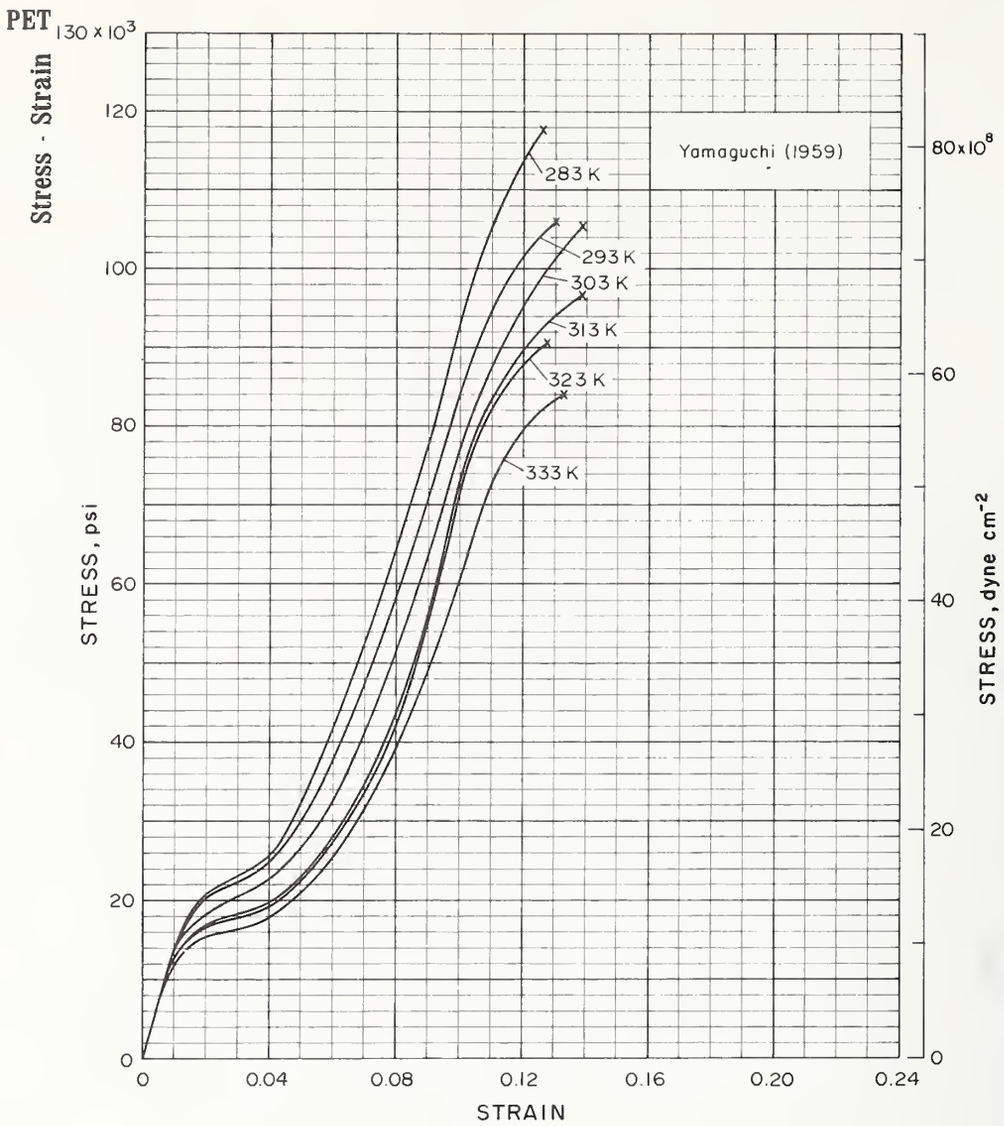
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thompson (1959)	melt spun, amorphous, molecular weight = 15, 000	Fiber, diam ≃. 01 cm; immersed in silicone oil, tests at several strain rates.



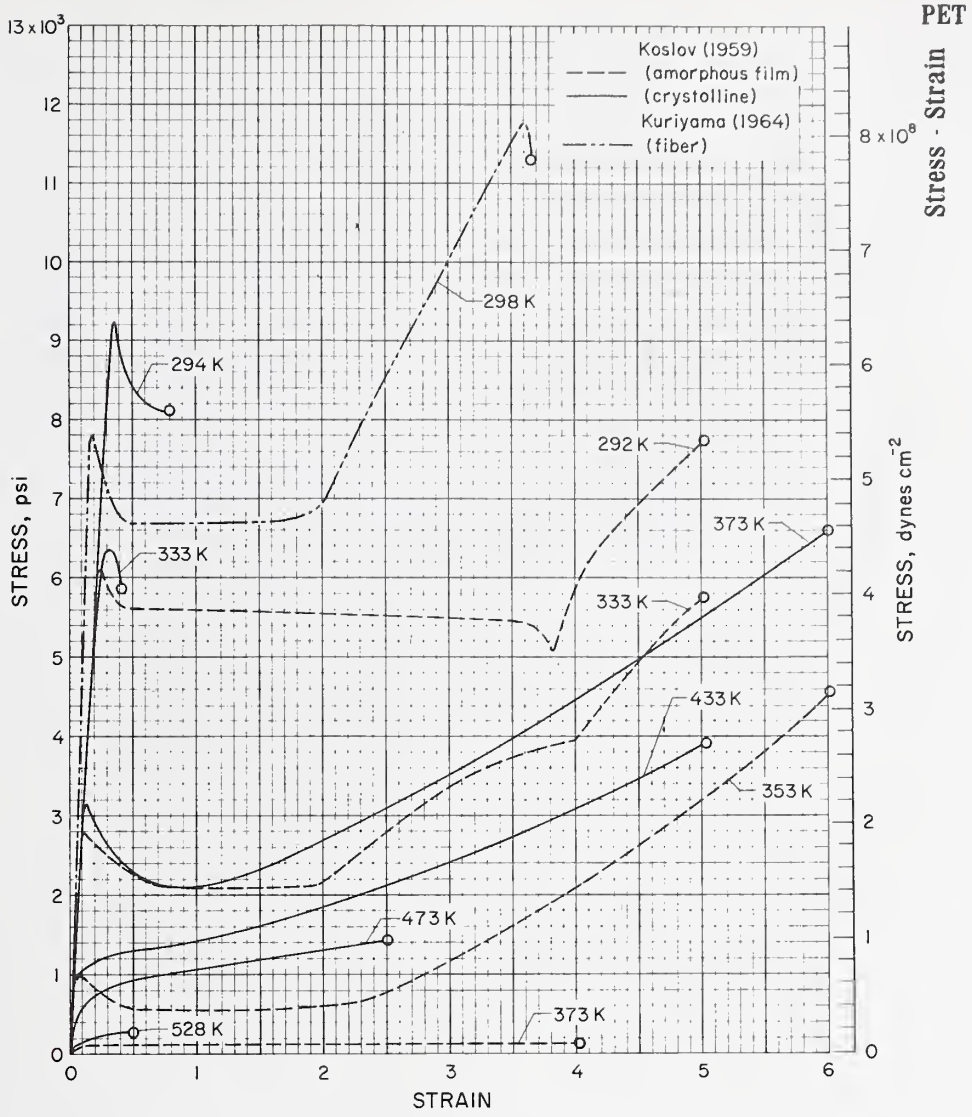
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thompson (1959)	melt spun, amorphous, molecular weight = 15,000	Fiber, diam ≃ .01 cm; immersed in silicone oil, tests at several strain rates.



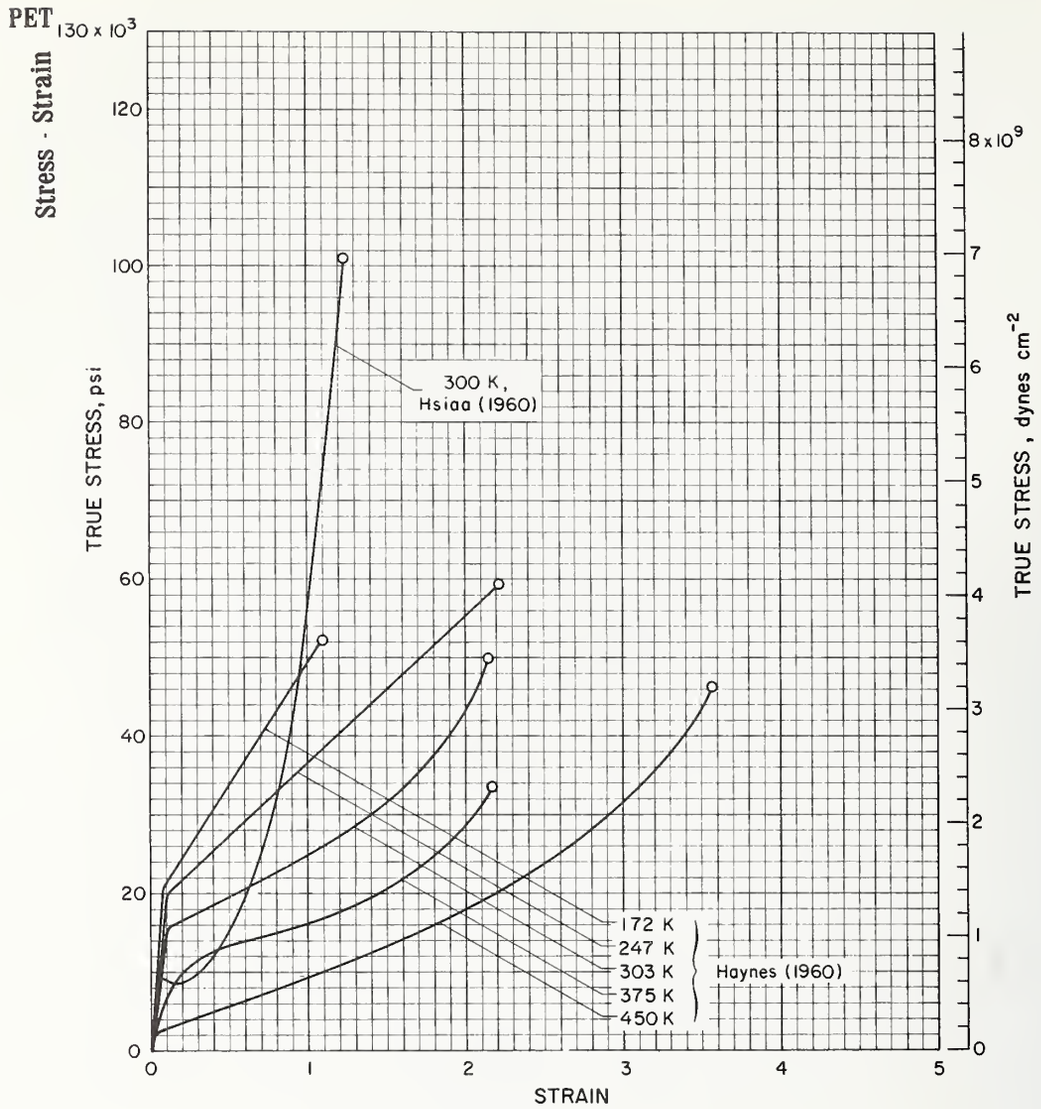
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Yamaguchi (1959)	Terylene F	5 denier, single filament; 6 cm between holding points, $\dot{\epsilon} = 0.0005\ s^{-1}$, 293K.



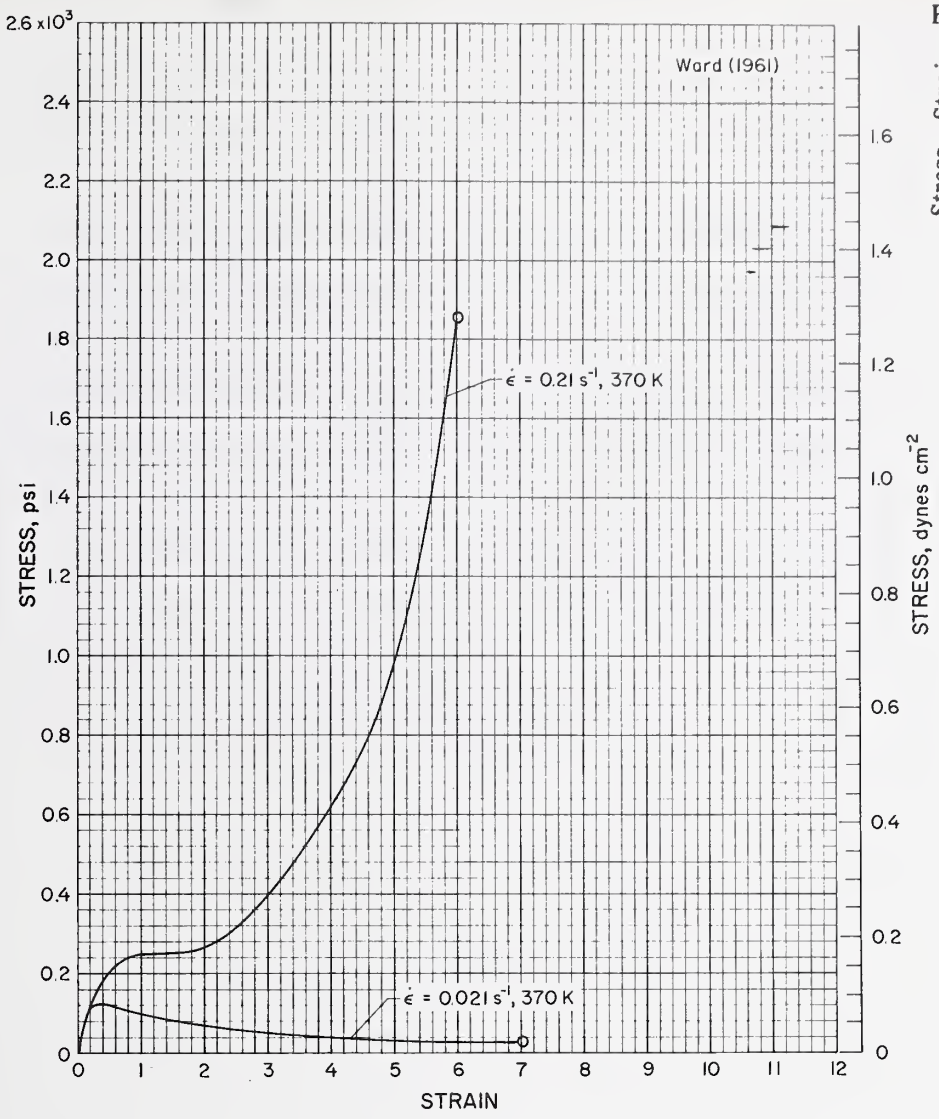
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Yamaguchi (1959)	Terylene F	5 denier, single filament; 6 cm between holding points, $\dot{\epsilon} = 0.0005\ s^{-1}$, rel hum = 65%.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kozlov, Kabanov, Frolova (1959)	Amorphous film, crystallized by annealing at 388 K for 30 min	Xhd spd = 0.0017 cm s^{-1} ; data at intermediate temps also presented.
Kuriyama, Shirakashi (1964)	Undrawn	Fiber, ℓ = 2.0 cm; $\dot{e}$ = 0.0042 s^{-1}, tested in air; data also given for samples in hot water.



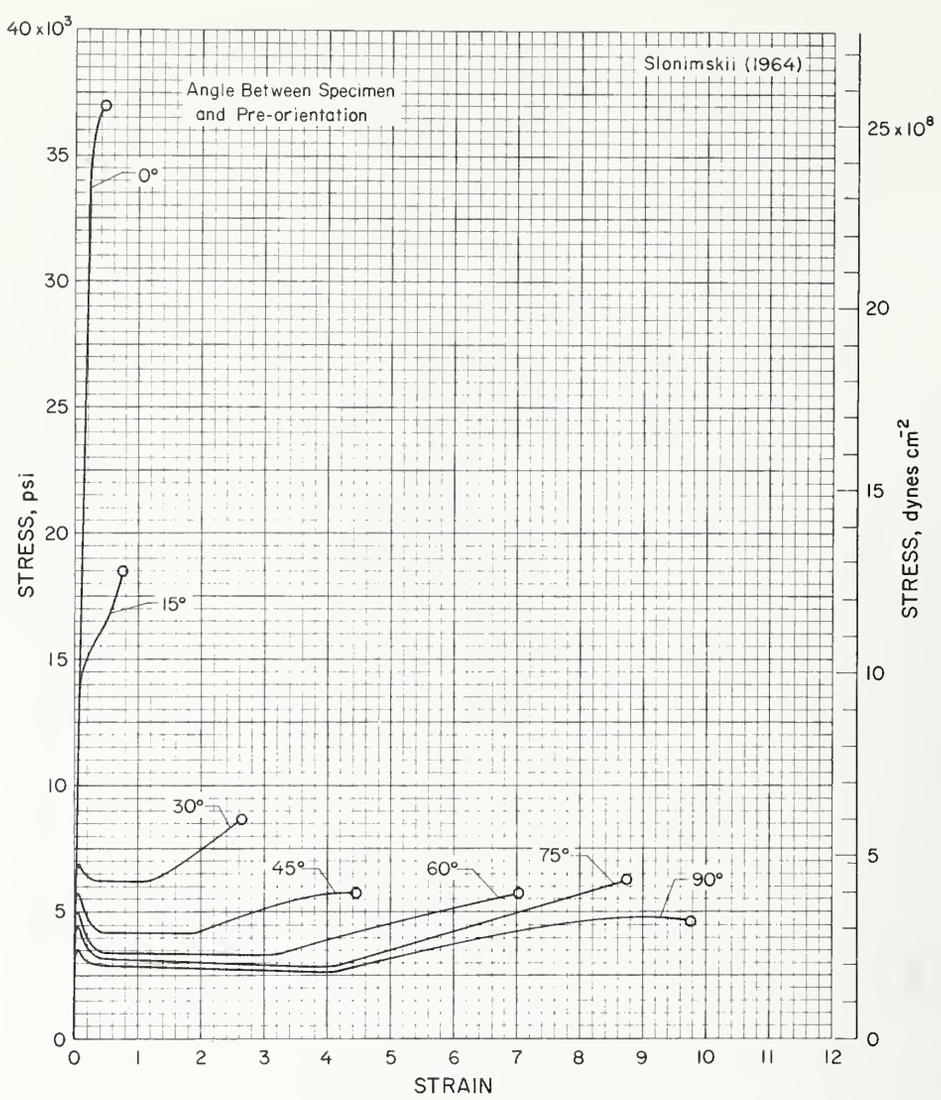
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Haynes, Hsiao (1960)	Mylar, biaxially oriented	Specimens cut ‖ to a biaxial direction, ℓ = 10.1 cm, Red Sec 1.3 x 0.65 x .0270 cm; 0.0033 s^{-1} nominal $\dot{\varepsilon}$.
Hsiao, Chow (1960)	Dacron	34 fibers, 0.0029 cm fiber diam; 0.033 s^{-1} nominal $\dot{\varepsilon}$.



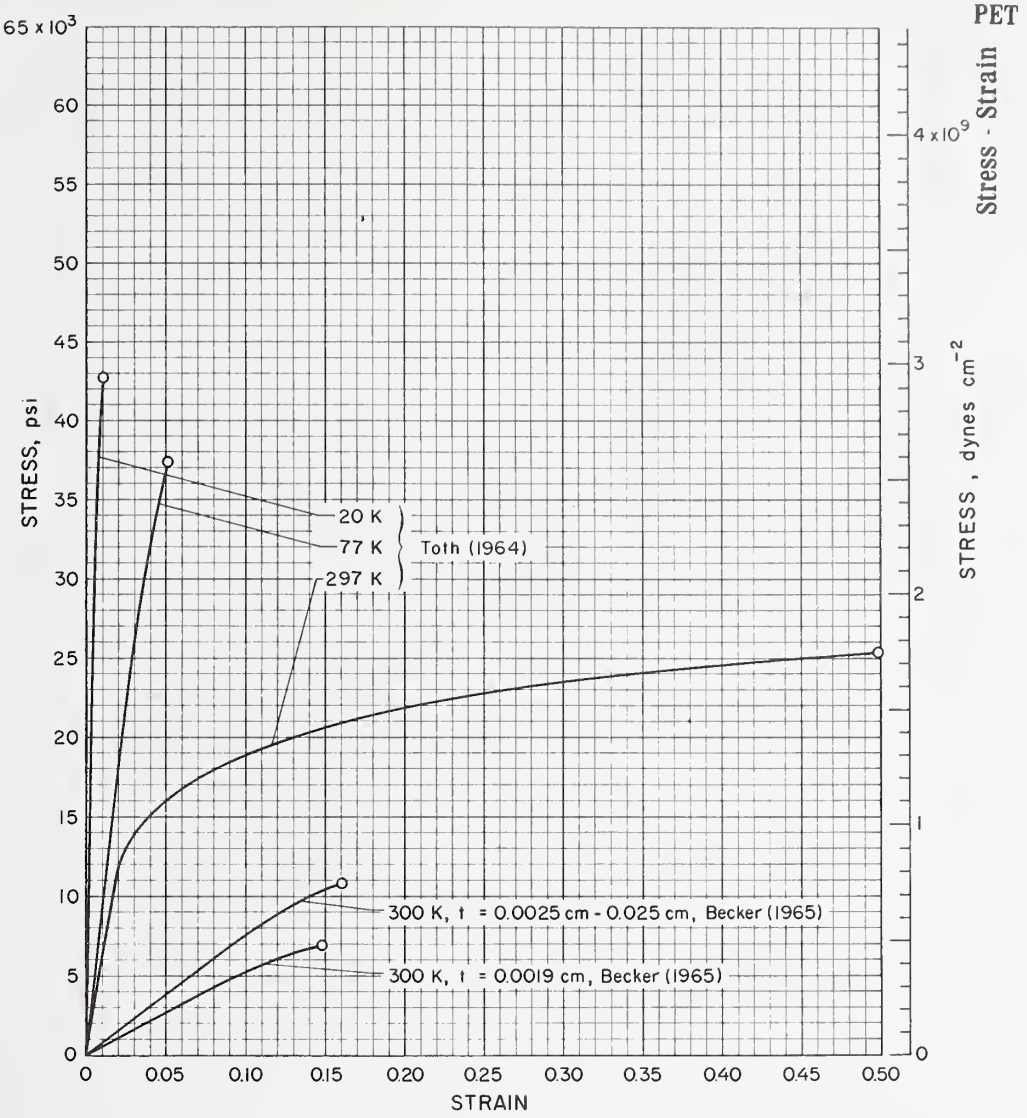
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ward (1961)	Amorphous fiber	370 K.

PET

Stress - Strain



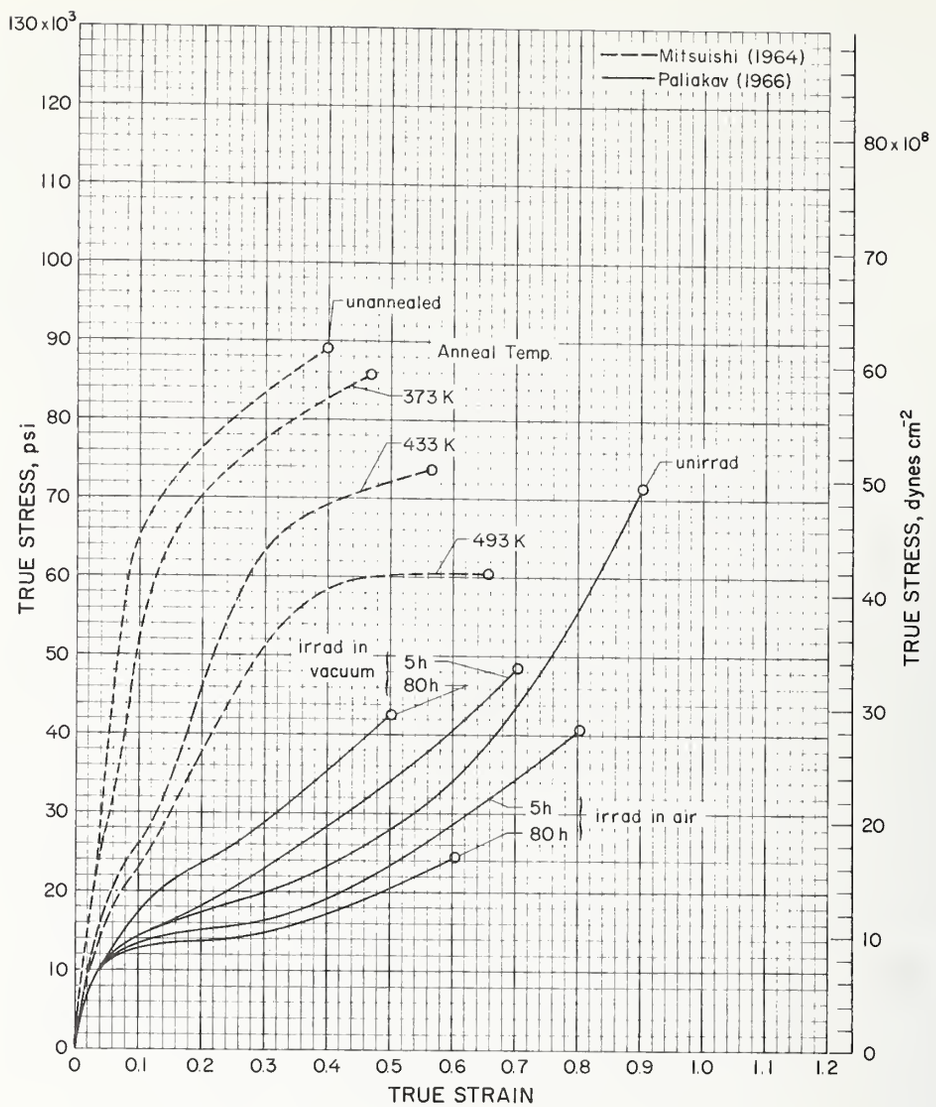
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Slonimskii, Dikareva (1964)	Anisotropic film	Specimens cut with various angles between the primary orientation and the stretch, 293 K.



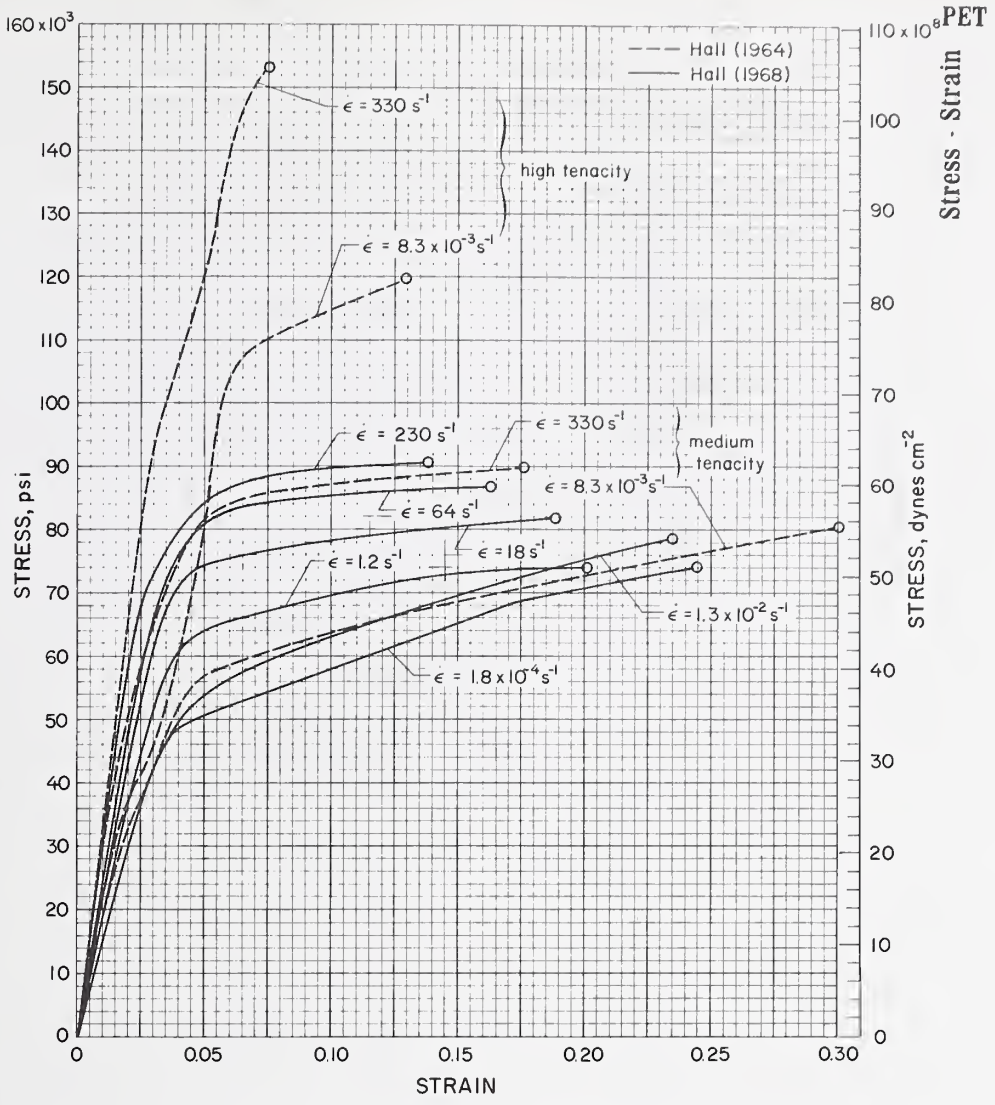
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Toth, Barber (1964)	Mylar A	t = 0.00125-0.00180 cm.
Becker (1965)	Mylar A sheet	Overall dimension 2.5 x 15.0 cm, t = 0.0019, 0.0025, 0.0075, 0.013, 0.020, 0.025 cm, GL = 6.63 cm; pneumatic machine; strain measured using micrometer microscope.

PET

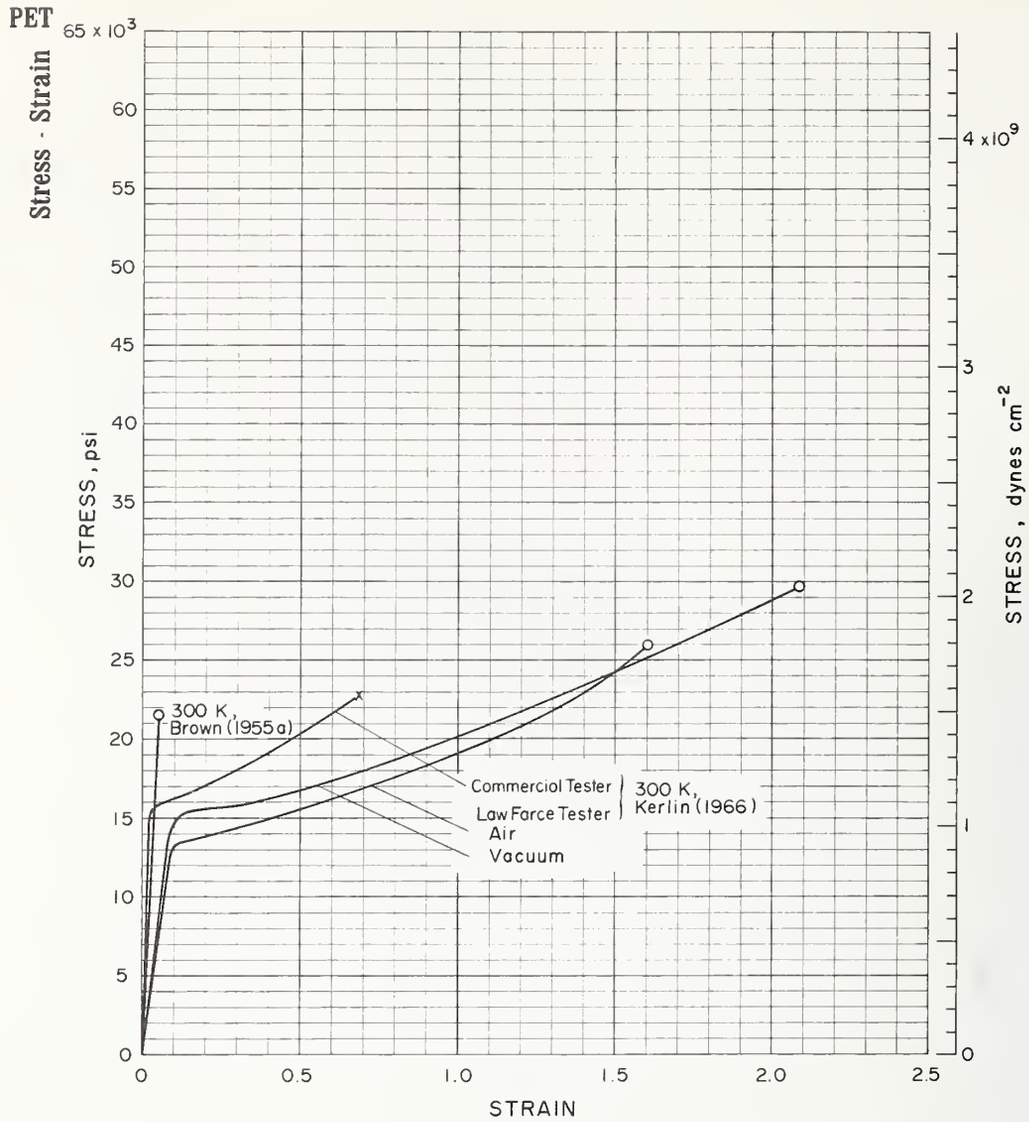
Stress - Strain



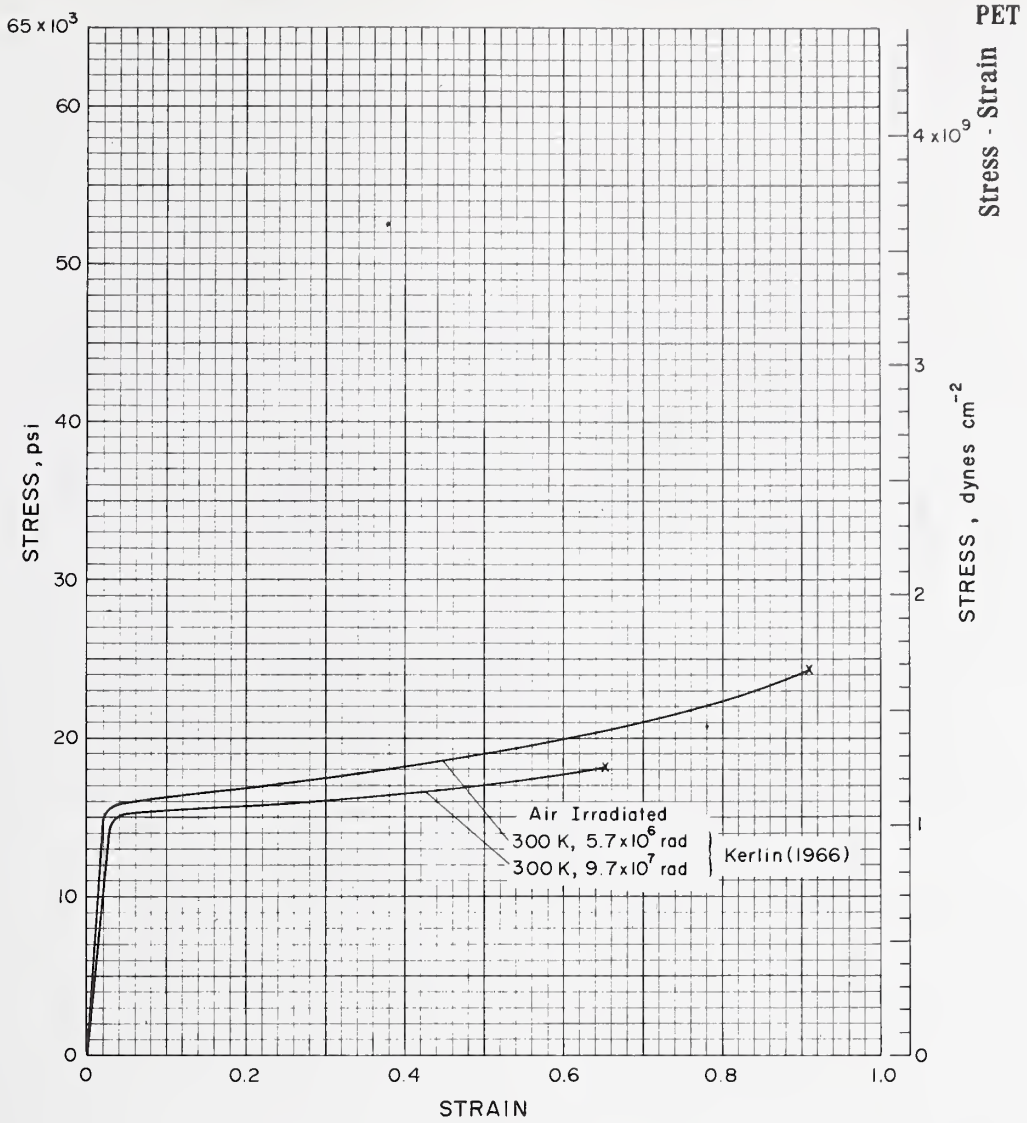
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mitsuishi, Tonami (1964)	Annealed for 1 h without tension	Fiber, 2.1-2.6 denier, ℓ = 2.0 cm; $\dot{\epsilon}$ = 0.017 s^{-1}; results also presented for intermediate temps, results also presented for samples held at fixed length during anneal, the Young's modulus was somewhat higher and the elongation lower.
Poliakov (1966)		ℓ = 2.0 cm, w = 0.6 cm, t = 0.001 cm; 293 K; irrad in air and vacuum by ultraviolet light from a mercury-quartz lamp, 2400-3700 Å, intensity ≈ 28 W m^{-2}, lamp to specimen distance ≈ 40 cm.



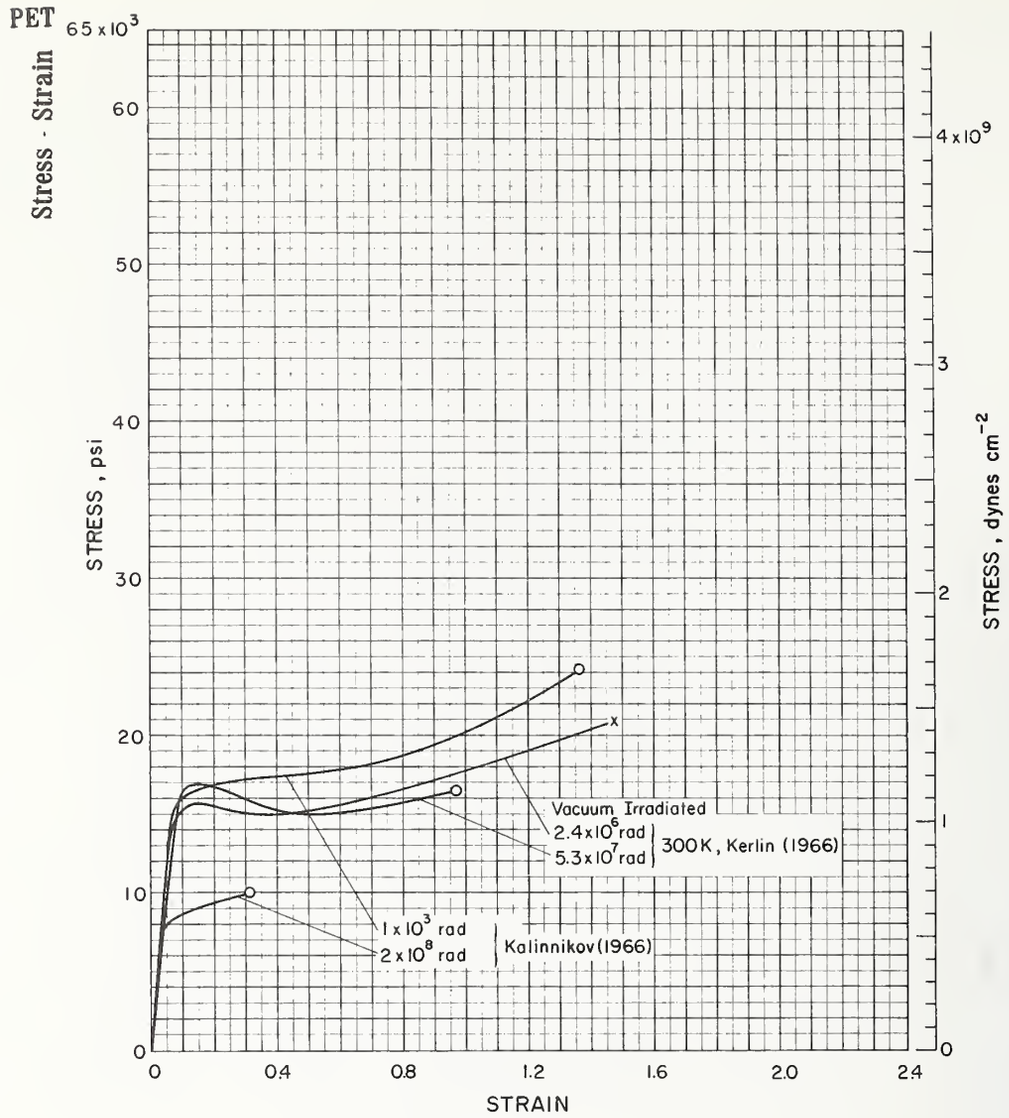
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Hall (1964)	Terylene microdull high tenacity, 24 filaments; Terylene dull medium tenacity, 48 filaments	GL = 5 cm; 295 K, 65 ± 4% rel hum; end correction used at high $\dot{\epsilon}$.
Hall (1968)	Terylene dull medium tenacity, 48 filaments	GL = 2. 5-10 cm; 294 ± 1 K, 65 ± 4% rel hum; av of several tests, correction for slip applied to GL.



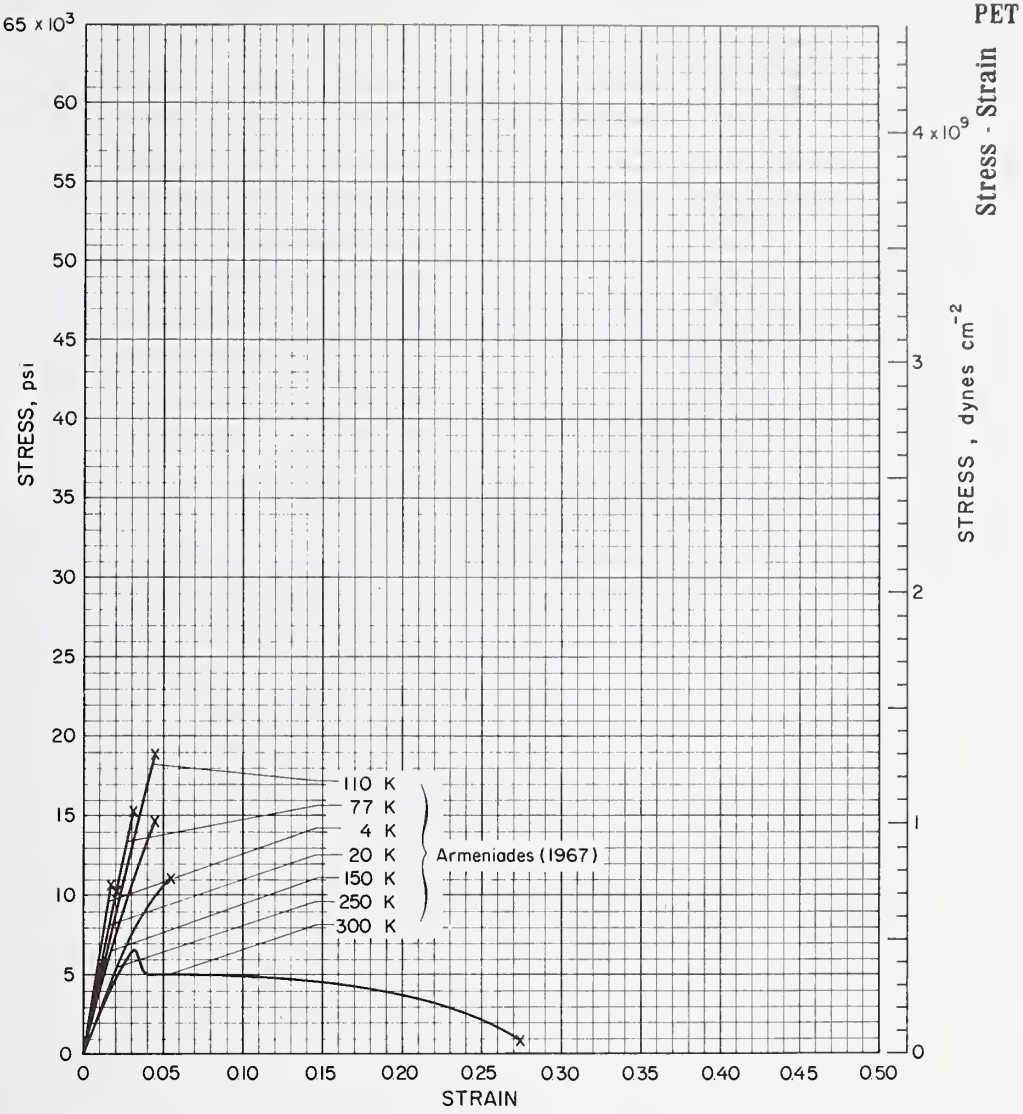
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Mylar C	Overall dimension 15.24 x 2.54 x 0.0025 cm; low-force tester, 1.27 cm min^{-1} xhd spd; curve represents av of 3 specimens, samples did not fracture.
Kerlin, Smith (1966)	Mylar C	Overall dimension 15.24 x 2.54 x 0.0025 cm; ASTM D882-61T test procedure, Instron, 50.8 cm min^{-1} xhd spd.
Brown (1955a)	Dacron	



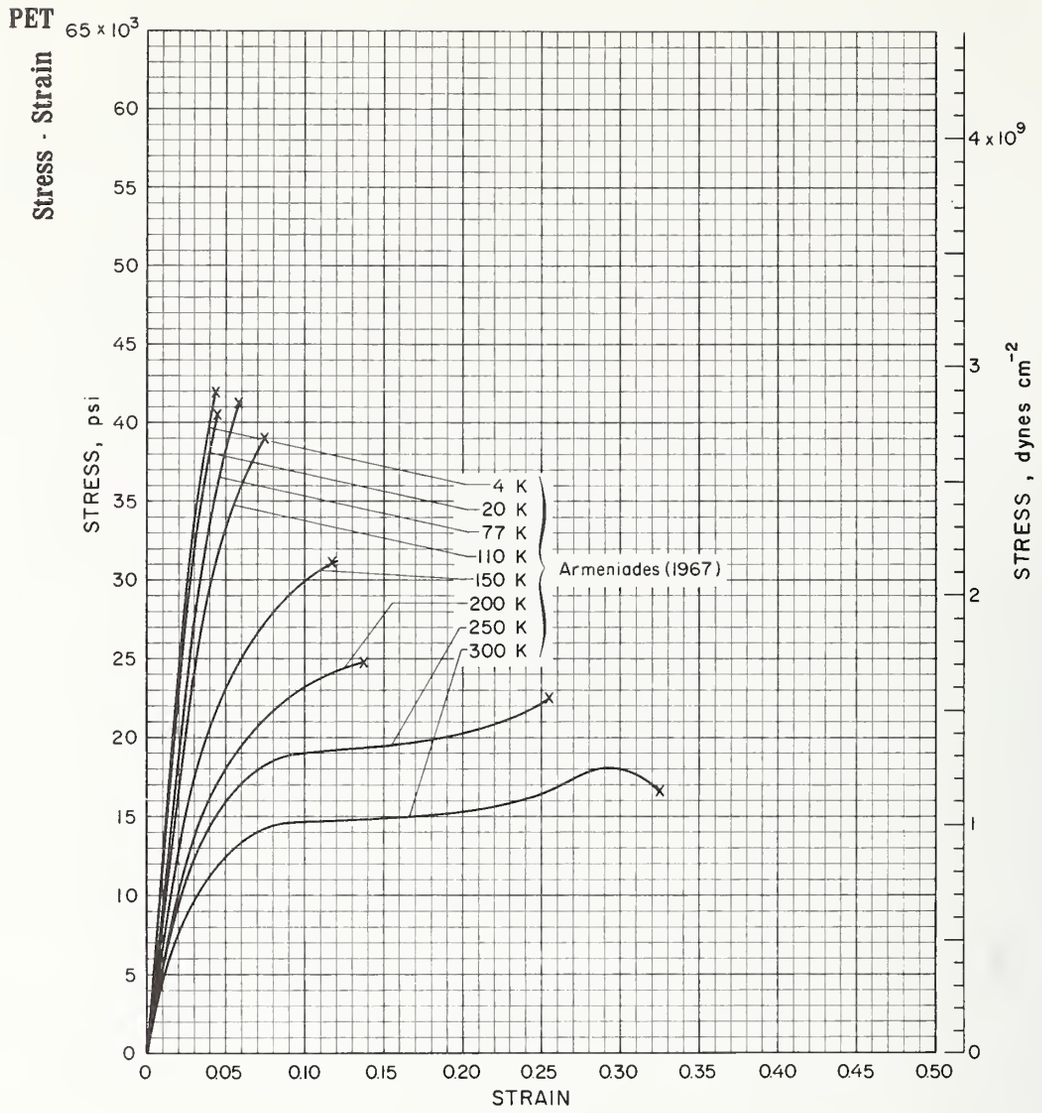
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Mylar 100 C	Overall dimension 15.24 x 2.54 x 0.0025 cm; ASTM D-882-61T test procedure, Instron, 50.8 cm min^{-1} xhd spd; curve represents av of 9 specimens.



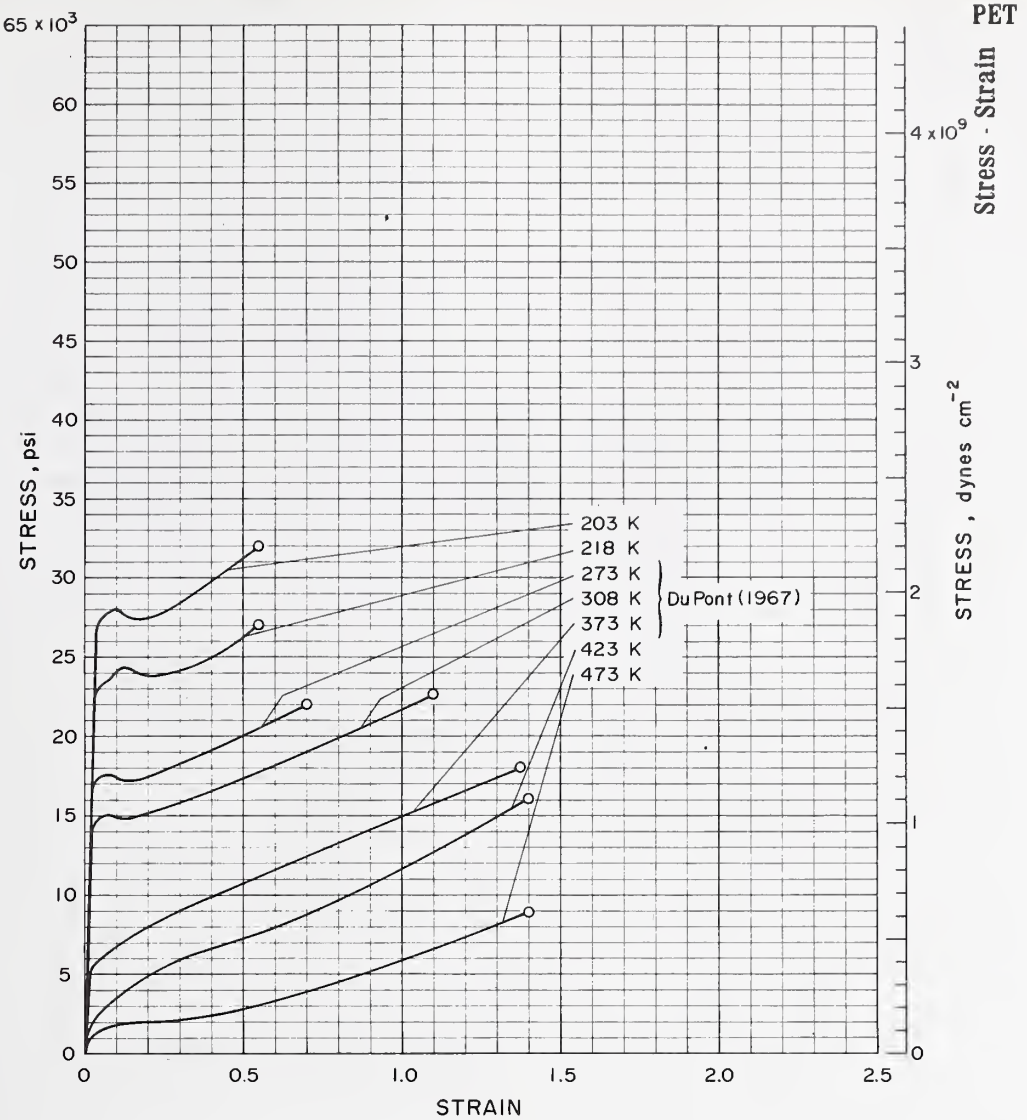
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966) Kalinnikov (1966)	Mylar 100 C	Overall dimension 15.24 x 2.54 x 0.0025 cm; low-force tester, 1.27 cm min^{-1} xhd spd; curve represents av of 3 specimens, sample (5.3×10^7 rad) did not fracture; irrad by Ground Test Reactor at the Nuclear Aerospace Research Facility of the Fort Worth Division of General Dynamics. Irrad with Co^{60}.



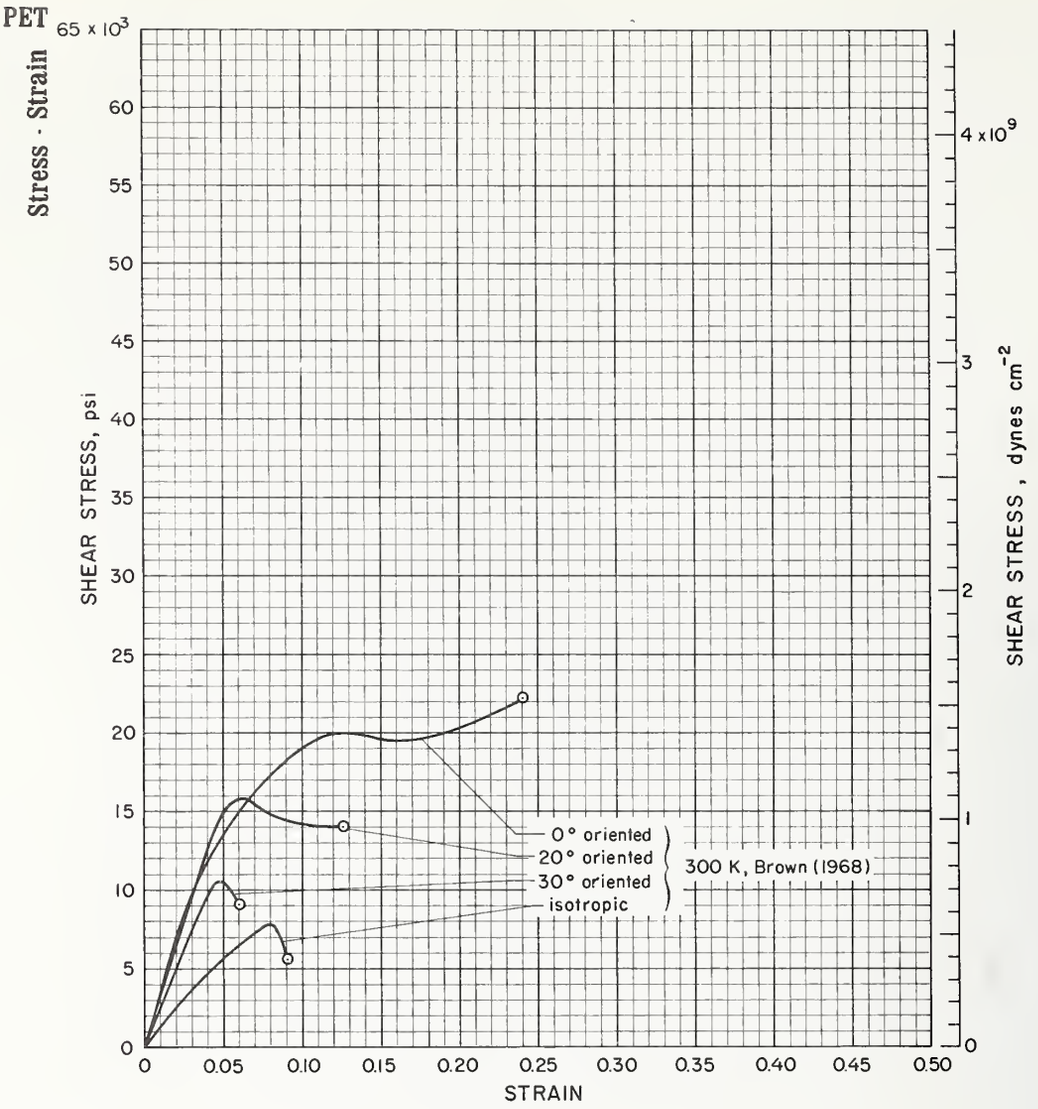
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Armeniades, Kuriyama, Roe, Baer (1967)	Mylar, amorphous	Red Sec 6.35 x 1.27 x 0.013 cm; Instron, 3.06 cm s^{-1} xhd spd.



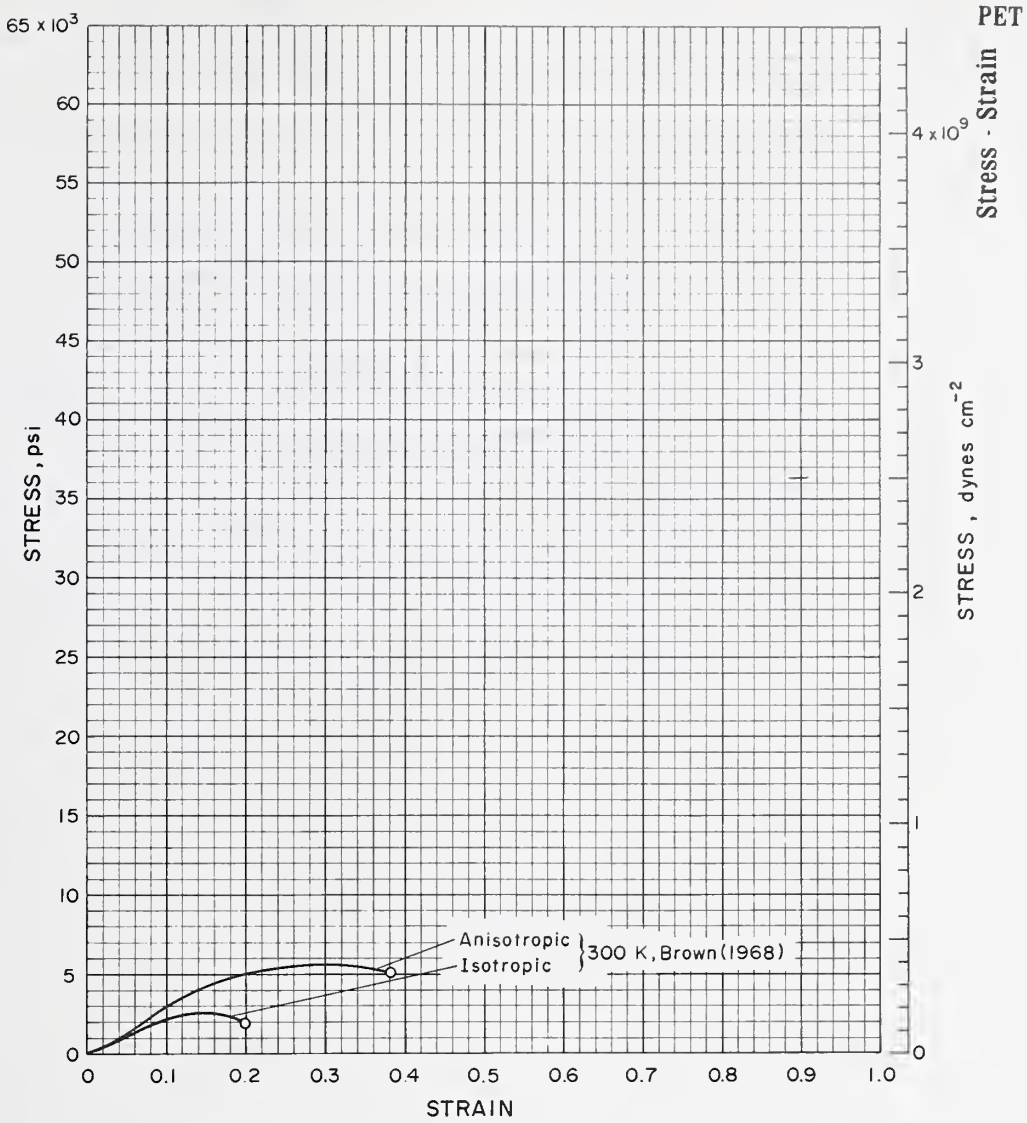
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Armeniades, Kuriyama, Roe, Baer (1967)	Mylar A, biaxially oriented	Red Sec 6.35 x 1.27 x 0.013 cm; Instron, 3.06 cm s^{-1} xhd spd.



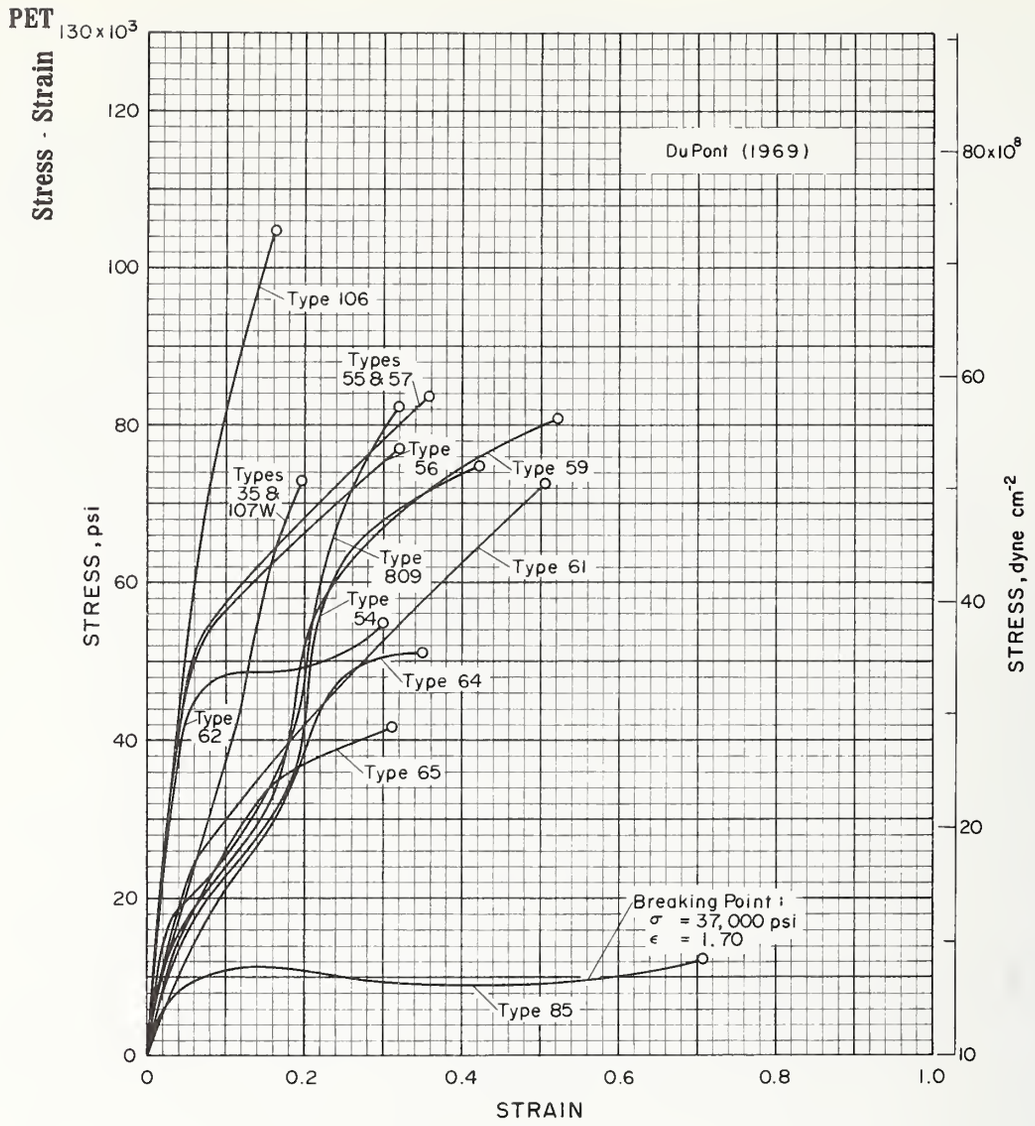
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
DuPont (1967)	Mylar	



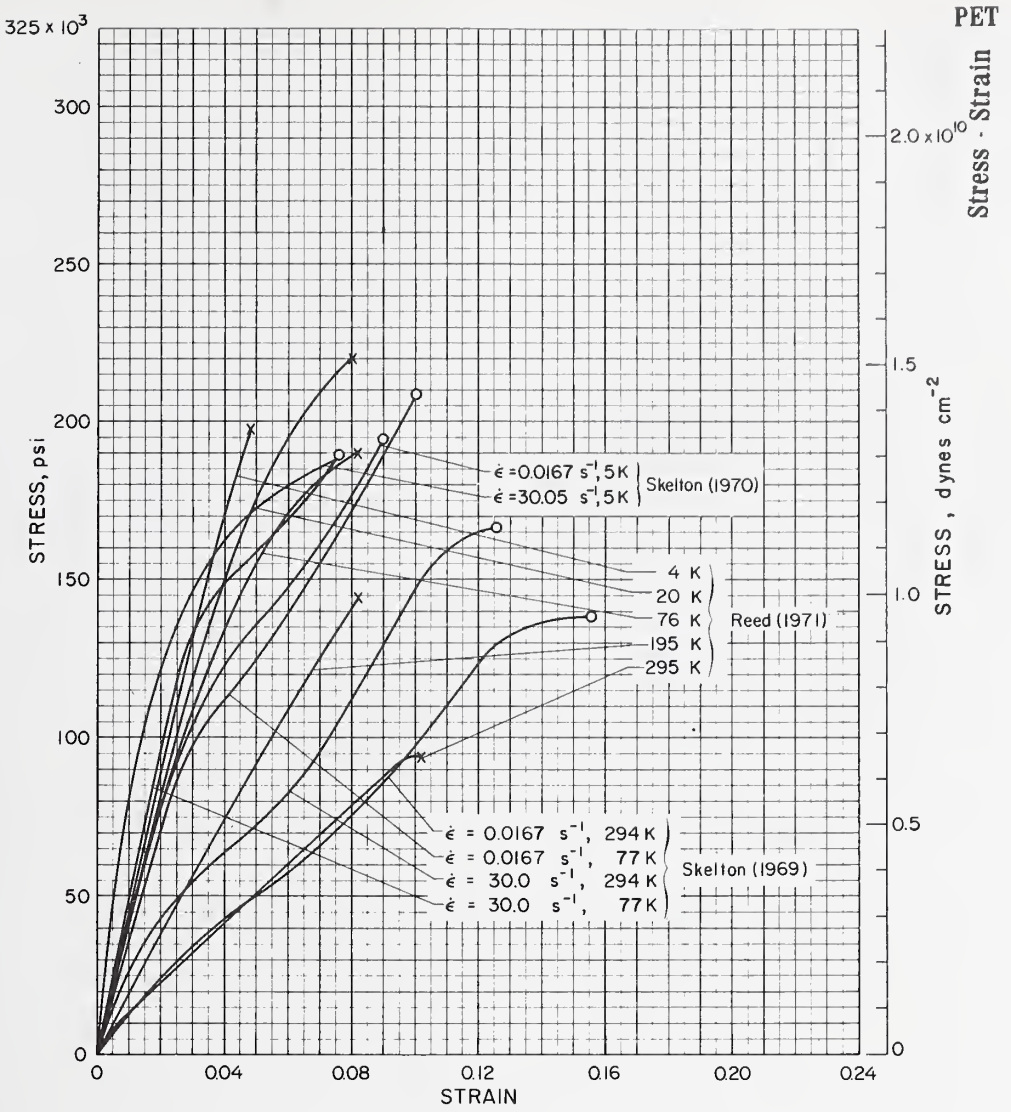
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Brown, Ward (1968)	Mylar, isotropic and anistropic	Overall dimension 0.15 x 0.15 x 0.20 cm block; direction of shear parallel to direction of draw.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Brown, Ward (1968)	Mylar, oriented and isotropic	Isotropic specimen - Red Sec 2.5 x 0.4 x 0.1 cm; oriented specimen - Red Sec 2.5 x 0.4 x 0.02 cm; type E tensometer, $\dot{\epsilon} << 10^{-1}$ min^{-1}.



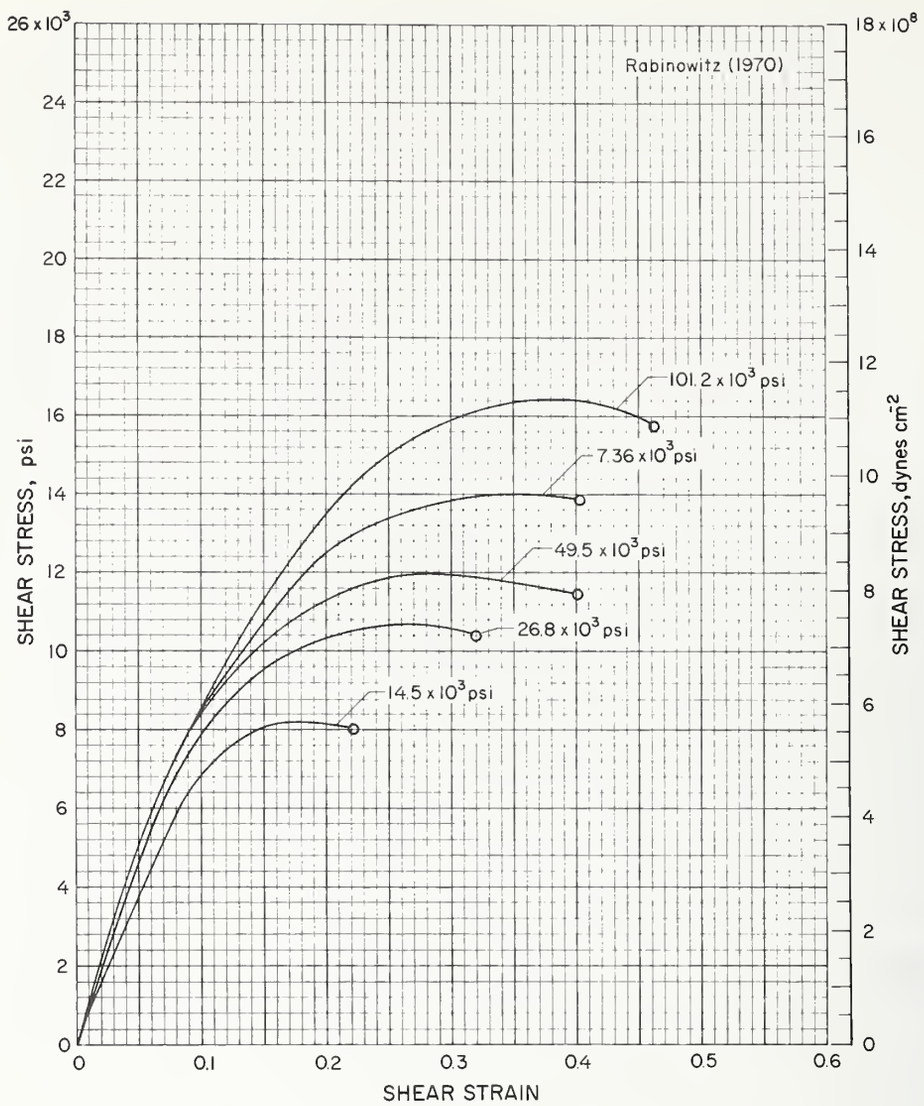
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Du Pont (1969)	Dacron	Types 55, 56, 57, 62 are filament yarn taken directly from shipping package, all others are staple and tow obtained by using 100 den bundles of dried and crimped samples, all samples twisted to 0.8 turns cm^{-1}; conditioned at 294K, 65% rel hum, Instron, GL = 25.4 cm, $\dot{\epsilon} = 0.01\ s^{-1}$.



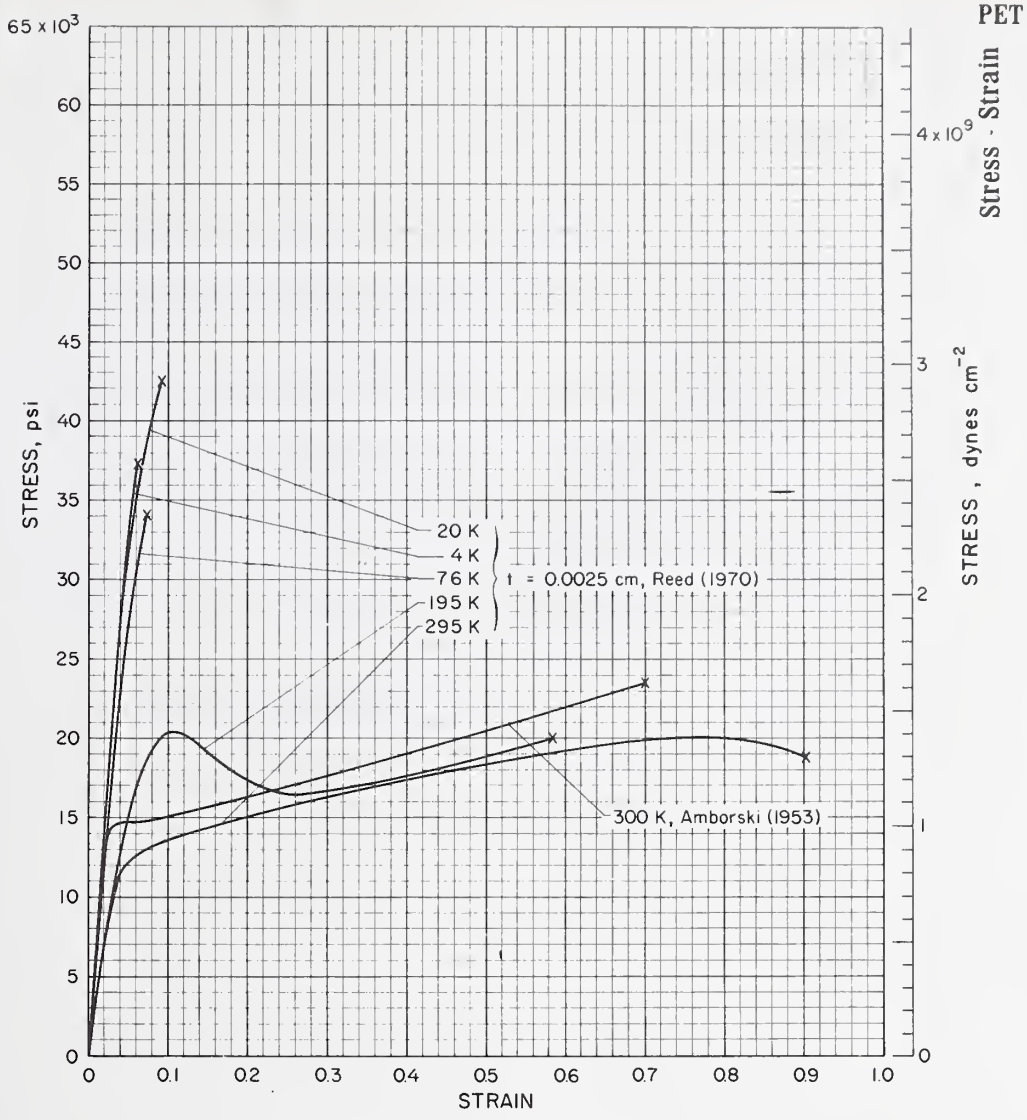
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Skelton, Freeston Jr., Ford (1969)	Dacron 1100-250-0, Type 52, 1060 denier	GL = 5.1 - 61.0 cm; Instron used $\dot{\epsilon} = 0.0167\ s^{-1}$, FRL high-speed piston tester used for $\dot{\epsilon} = 30.0\ s^{-1}$, specimens conditioned at 294 K and 65% rel hum for 24 hr before test; 5 specimens tested for each configuration.
Reed, Durcholz, Arvidson (1971)	Dacron, type 52, 220 denier	0.000178 cm^2 xsec area, 44 continuous fibers, GL = 10.16 cm; Instron, 0.0061 to 0.00085 cm s^{-1} xhd spd.
Skelton, Freeston Jr., Schoppe (1970)	Dacron 1100-250-0, Type 52, 1060 denier	For $\dot{\epsilon} = 0.0167\ s^{-1}$; GL = 12.7 cm; Instron. For $\dot{\epsilon} = 30.0\ s^{-1}$; GL = 55.9 cm; FRL high-speed piston tester.

PET

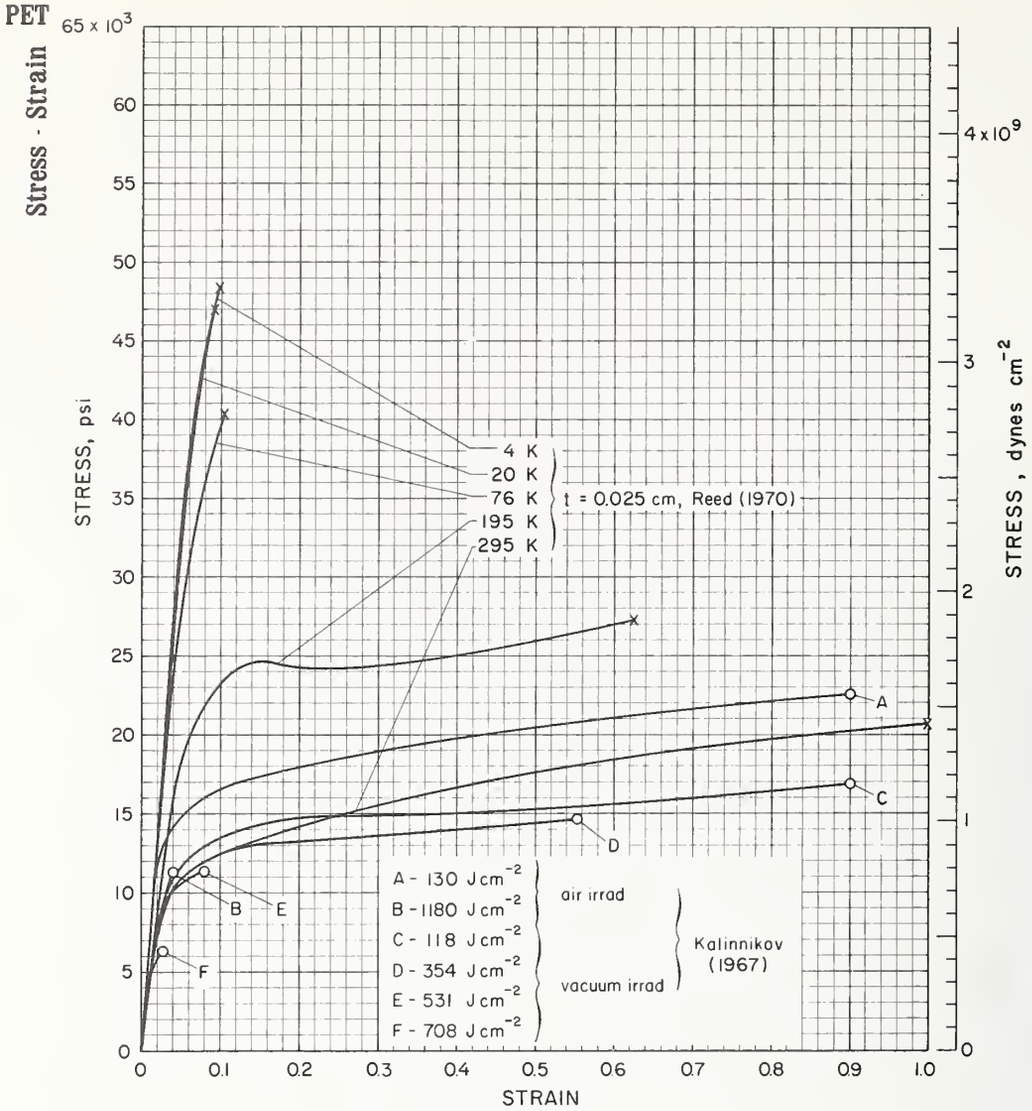
Stress - Strain



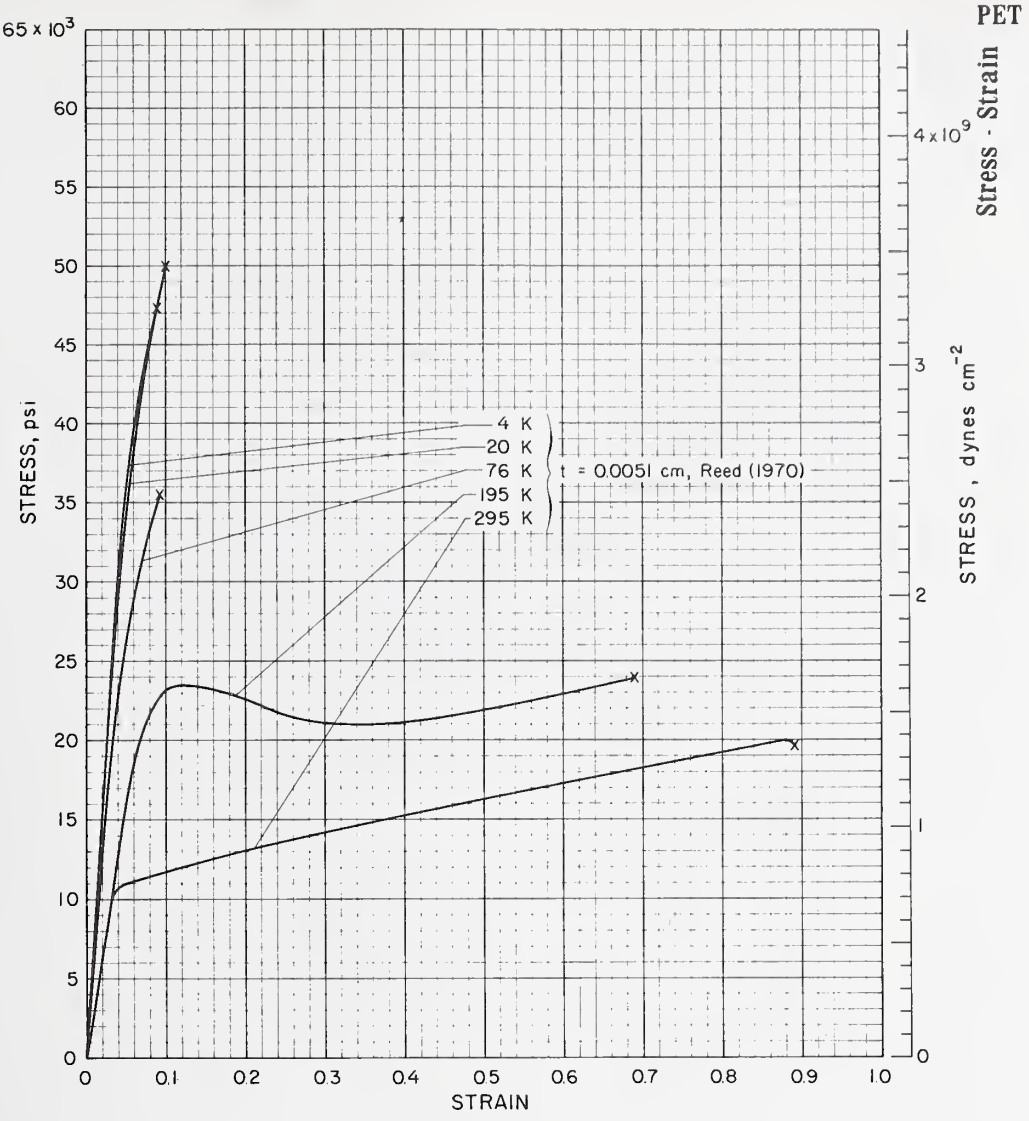
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Rabinowitz, Ward, Parry (1970)	Arnite type A 150, crystalline	Hollow specimen; $\dot{\epsilon} = 0.0004\ s^{-1}$, measurements made while samples were under a hydrostatic pressure transmitted through a mixture of equal parts of castor oil and hydraulic brake fluid, pressure noted.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Reed, Durcholz, Arvidson (1970)	Mylar A	Red Sec 2.54 x 0.51 x 0.0025 cm; Instron, 0.00021 cm s^{-1} xhd spd.
Amborski, Flierl (1953)	Mylar	t = 0.0025 cm; Instron, 0.042 cm s^{-1} xhd spd.



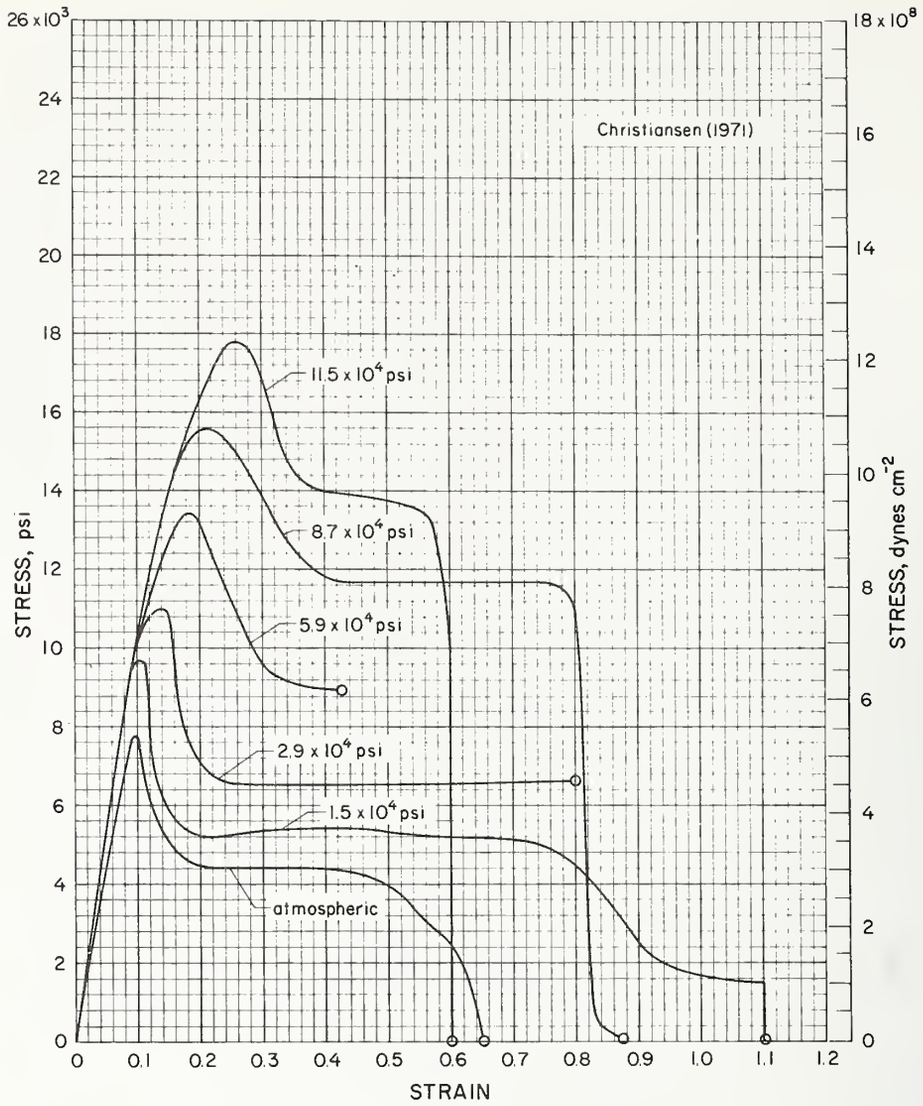
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Reed, Durcholz, Arvidson (1970) Kalinnikov (1967)	Mylar A	Red Sec 2.54 x 0.51 x 0.025 cm; Instron, 0.0127 cm min^{-1} xhd spd. Film; irrad by 2500-5800 Å light in air and vacuum.



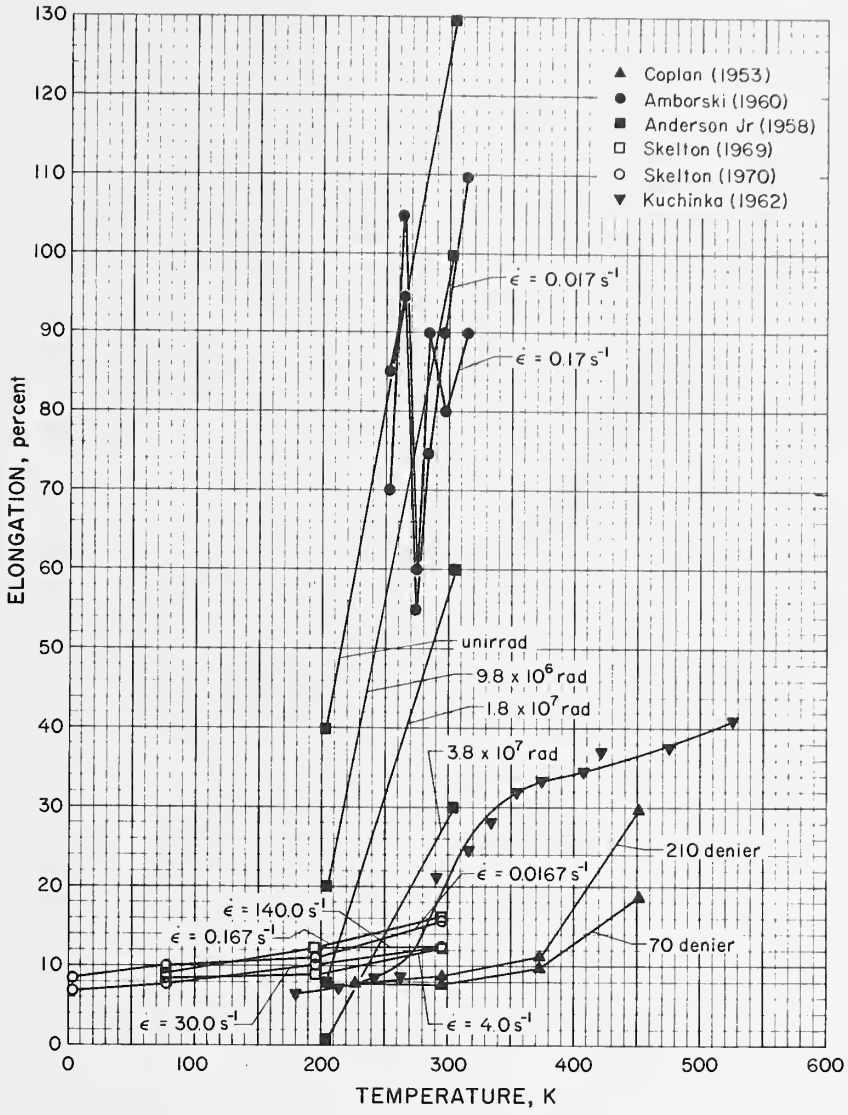
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Reed, Durcholz, Arvidson (1970)	Mylar A	Red Sec 2.54 x 0.51 x 0.0051 cm; Instron, 0.0127 cm min^{-1} xhd spd.

PET

Stress - Strain



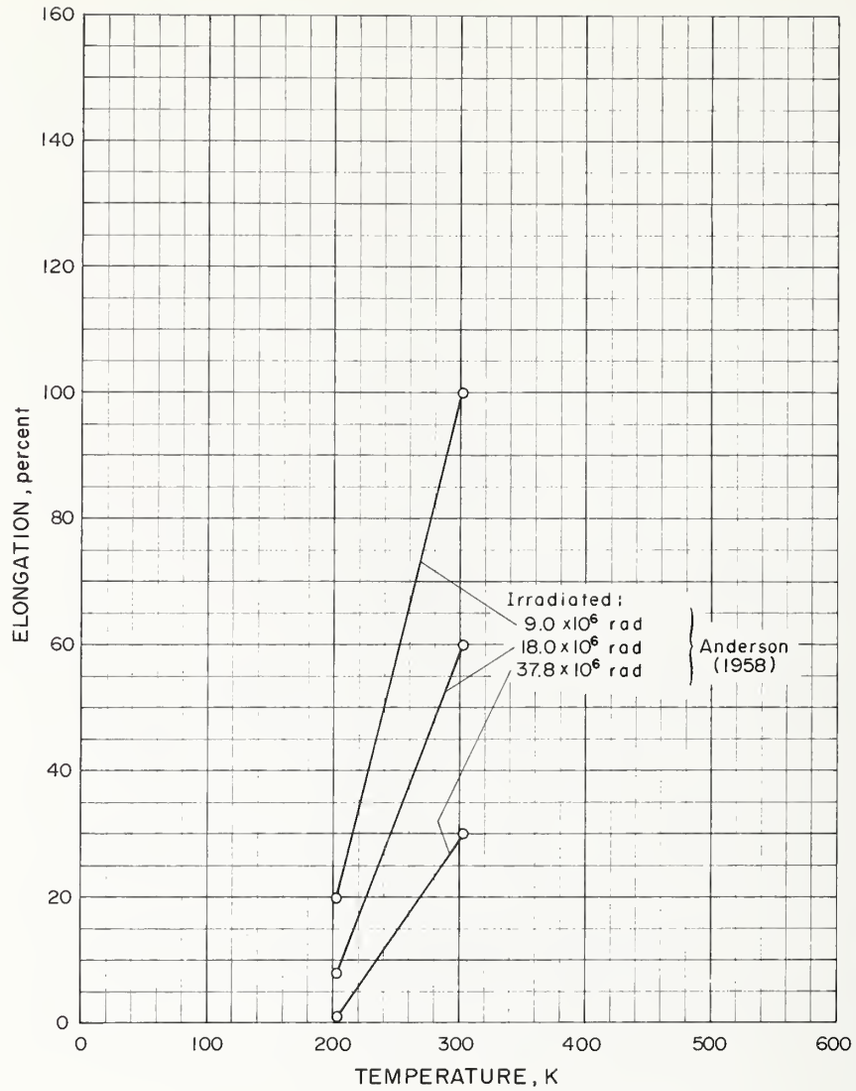
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Christiansen, Baer, Radcliffe (1971)	Commercial sheet	t = 0.24 cm; measurements made while the samples were under a hydrostatic pressure transmitted through castor oil, xhd spd = 0.00025 cm s^{-1}, 300 K, pressure noted.



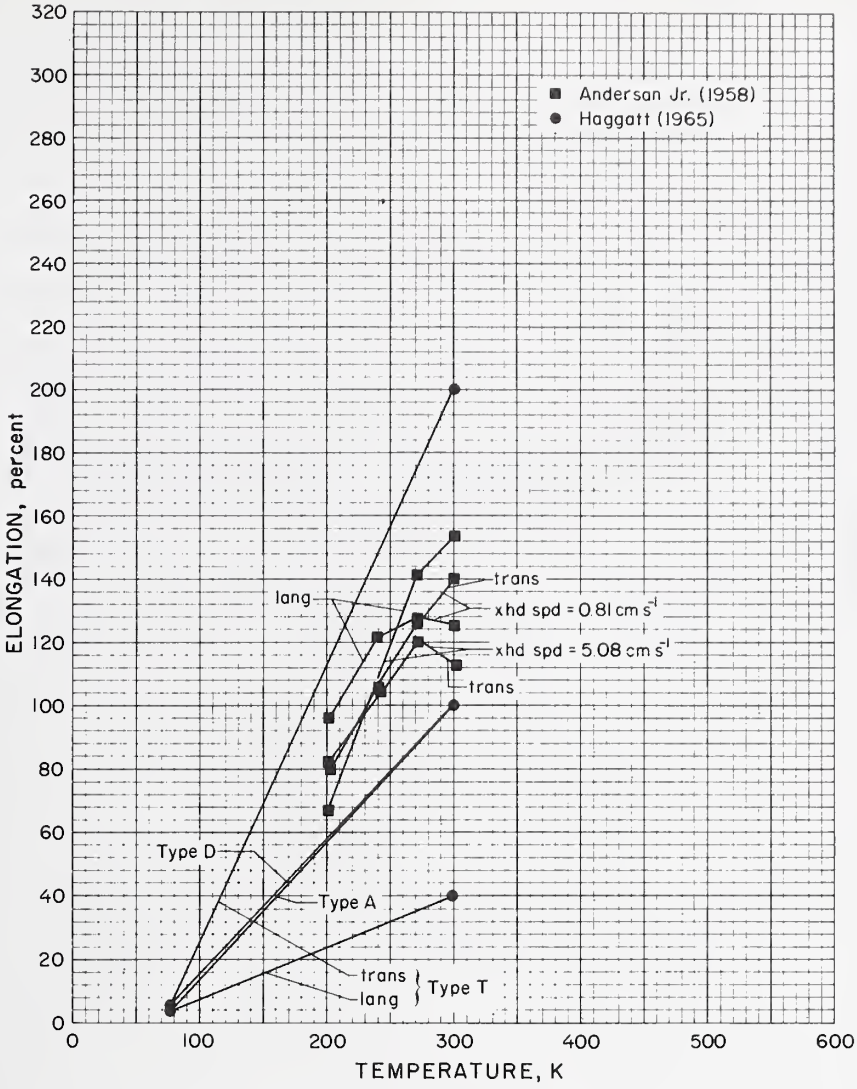
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Coplan (1953)	Dacron 5100; filament yarn: 70 denier, 34 filament, 3/4 Z; 210 denier, 34 filament, 1 Z	GL = 25.4 cm, Instron or F.R.L. Tester, xhd spd = 0.127 cm s^{-1}; max error = 5%, 12 specimens tested.
Anderson, Jr., Morfitt (1958)	Mylar	t = 0.0013 cm, cut in long. direction; xhd spd = 0.84 cm s^{-1}; irrad by ultraviolet at 298 K and 305 K; av of 5 tests.
Amborski, Mecca (1960)	Mylar C	Long. specimens; Instron.
Kuchinka (1962)		Fiber.
Skelton, Freeston, Jr., Ford (1969)	Dacron 1100-250-0, Type 52, 1060 denier	GL = 5.1-61.0 cm; Instron used for $\dot{\epsilon}$ = 0.167 s^{-1}, FRL high-speed piston tester used for higher $\dot{\epsilon}$, specimens conditioned at 294 K and 65% rel hum for 24 h before test; 5 specimens tested for each configuration.
Skelton, Freeston, Jr., Schoppe (1970)	Dacron 1100-250-0, Type 52, 1060 denier	For $\dot{\epsilon}$ = 0.0167 s^{-1}: GL = 12.7 cm; Instron. For $\dot{\epsilon}$ = 30.0 s^{-1}: GL = 55.9 cm; FRL high-speed piston tester.

PET

Elongation



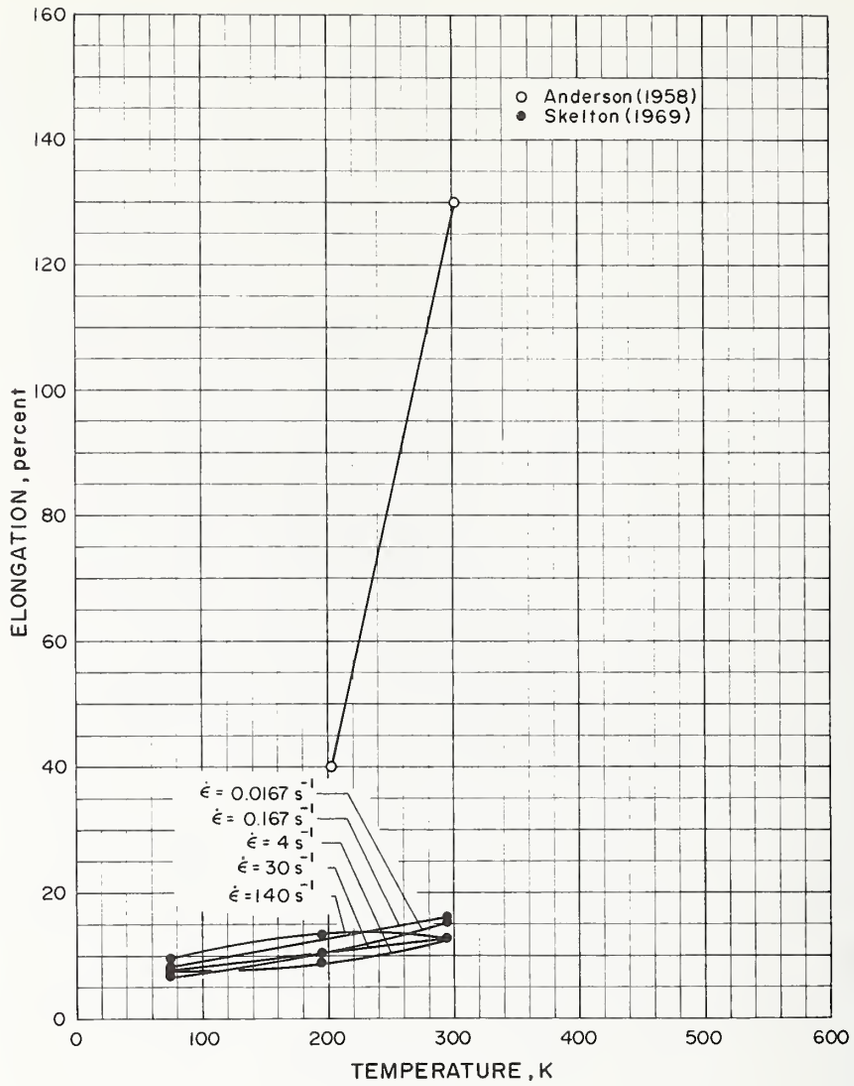
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Anderson, Morfitt (1958)	Mylar	t = 0.00127 cm; tested in long direction, 0.84 cm s^{-1}.



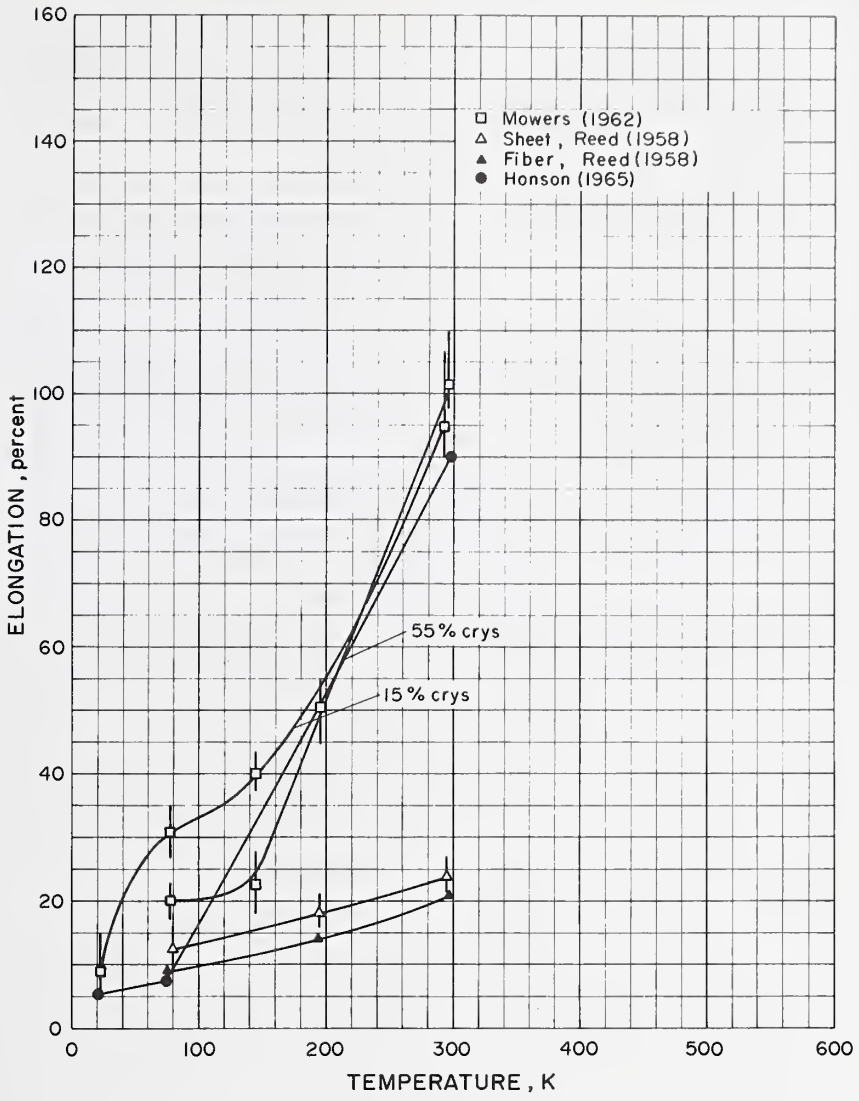
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Anderson, Jr., Morfitt (1958)	Weatherable Mylar	Av of 5 tests
Hoggatt (1965)	Mylar A, D, and T	Mylar A: t = 0.0025, 0.0051, and 0.0191 cm, Mylar D and T: t = 0.0076 cm; ASTM D1708-597 test procedure.

PET

Elongation



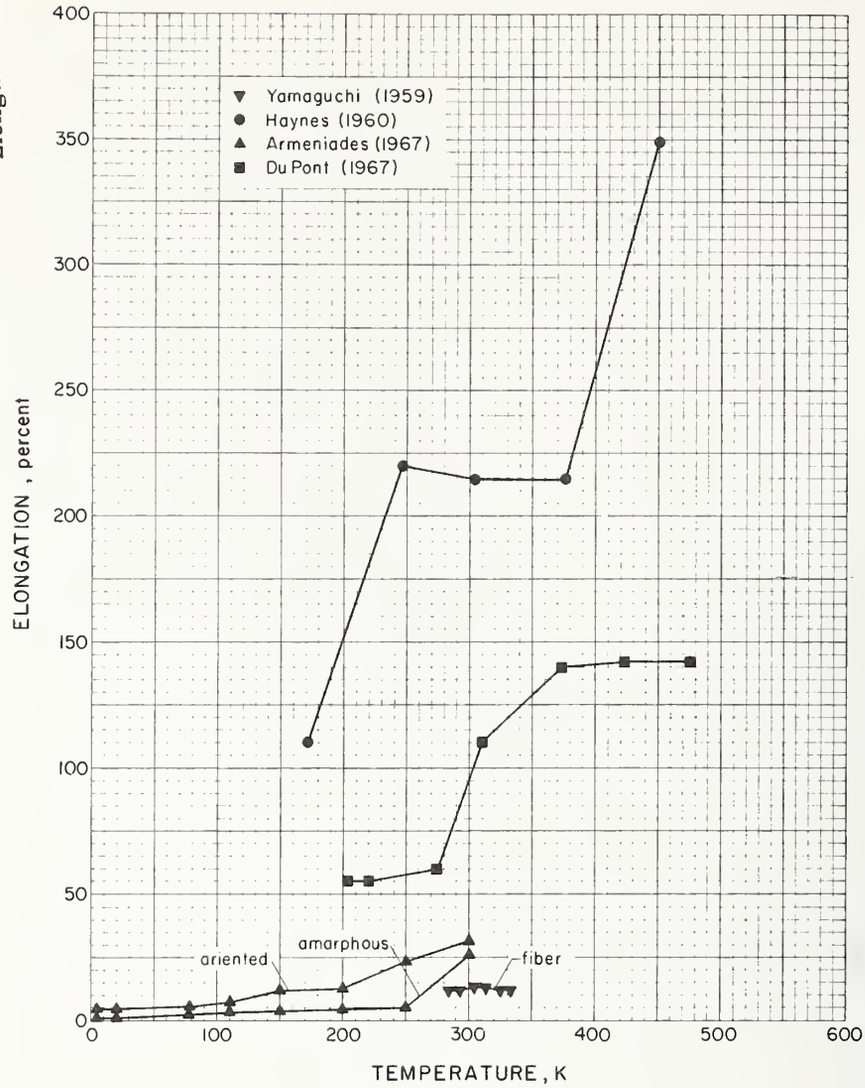
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Skelton, Freeston, Jr., Ford (1969)	Dacron, type 52	GL = 5.08 cm, 1060 denier; Instron, $\dot{\epsilon}$ = 0.0167 to 0.167 s^{-1}, GL = 17.7 to 61.0 cm; high-speed piston tester, $\dot{\epsilon}$ = 4.0 to 14.0 s^{-1}.
Anderson, Morfitt (1958)	Mylar	t = 0.00127 cm; tested in long direction, 0.84 cm s^{-1} xhd spd.



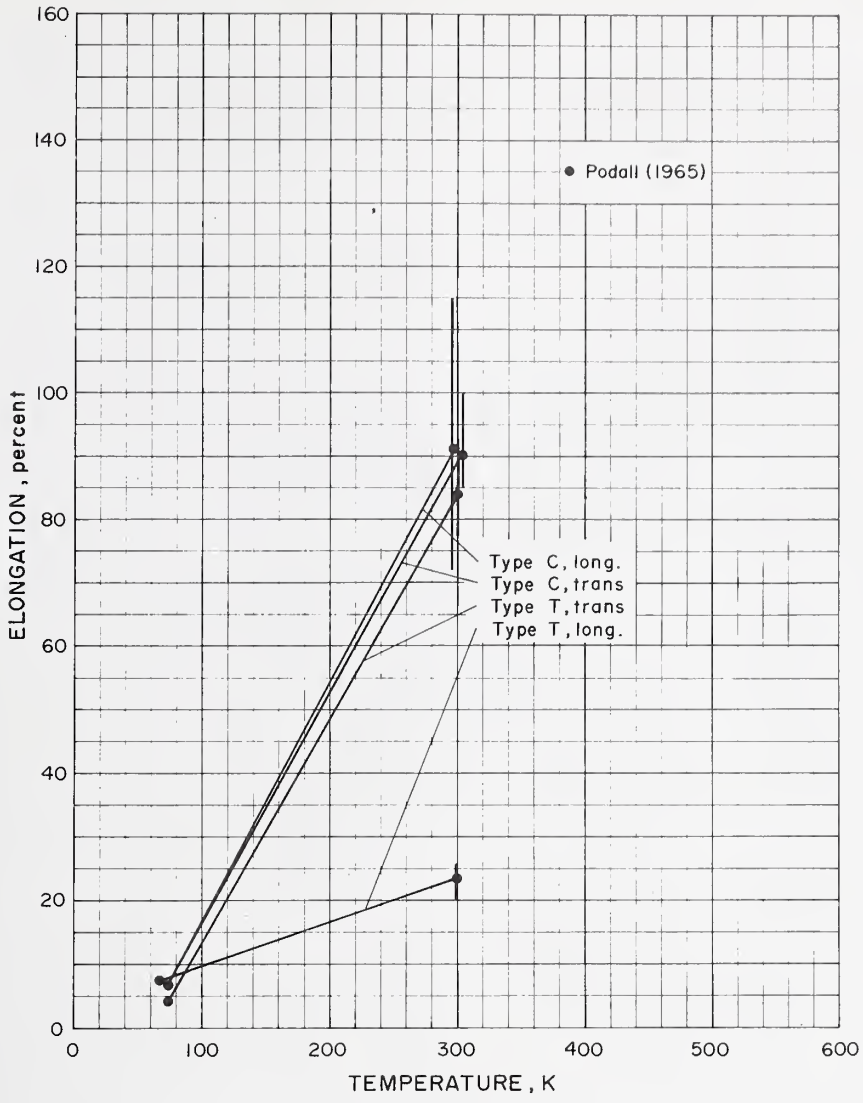
INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONOITIONS
Mowers (1962)	Mylar D, 15 and 55% crys	Red Sec 2.54 x 0.63 x 0.051 cm, 2.54 x 3.2 x 0.051 cm and 0.025 x 0.51 x 0.051 cm; Instron, 0.0042 cm s^{-1} xhd spd used at cryogenic temperatures; GL unknown.
Reed, Mikesell (1958)	Mylar	Six twisted sheets woven into one strand, GL = 10.6 cm, xsec area = 0.122 cm^2; $\dot{\epsilon}$ = 0.00017 s^{-1}, elongation taken during test.
Reed, Mikesell (1958)	Dacron	Braided continuous filaments, xsec area = 0.00615 cm^2, ℓ = 11.7 cm; Instron, $\dot{\epsilon}$ = 0.00017 s^{-1}; GL unknown.
Hanson, Richards, Hickel (1965)	Mylar A	Red Sec 5.08 x 1.27 x 0.32 cm; $\dot{\epsilon}$ = 0.0002 - 0.0005 s^{-1}.

PET

Elongation



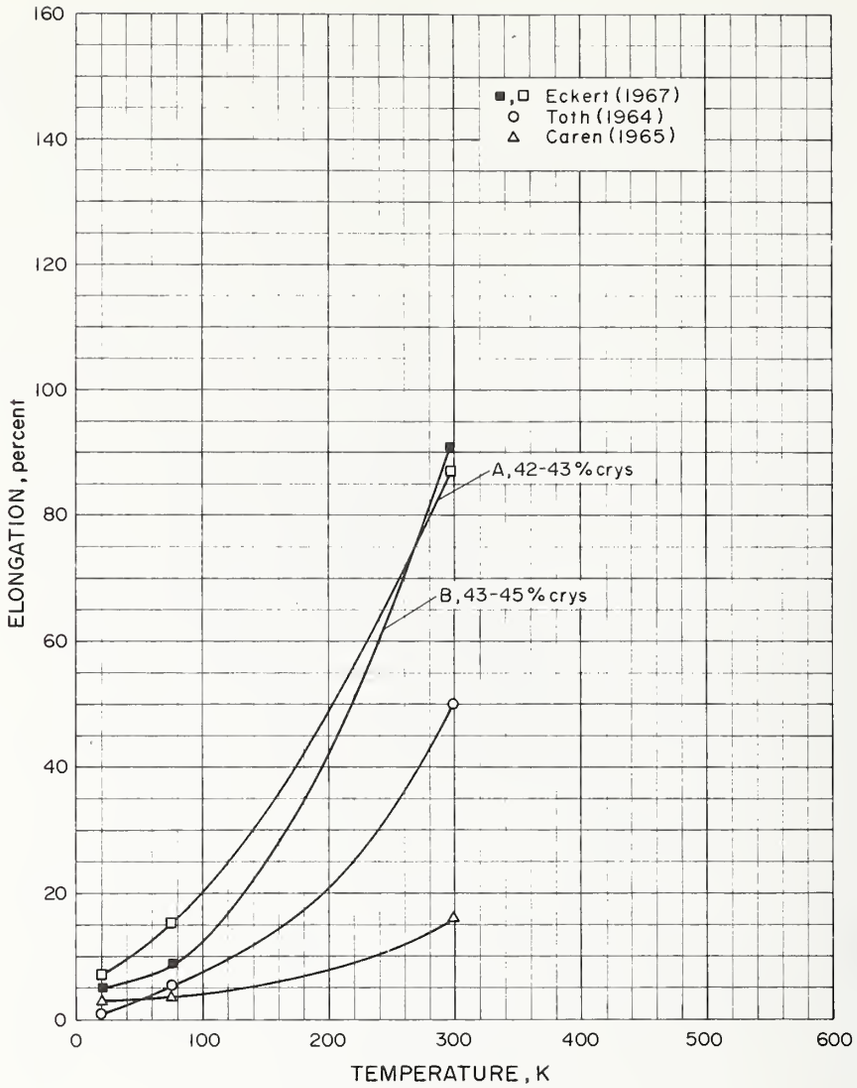
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Yamaguchi (1959)	Terylene F	5 denier, single filament, 6 cm between holding points; $\dot{\epsilon}$ = 0.0005 s^{-1}, rel hum = 65%; extracted from σ - ϵ diagrams.
Haynes, Hsiao (1960)	Mylar, biaxially oriented	Specimens cut ∥ to a biaxial direction, ℓ = 10.1 cm, Red Sec = 1.3 × 0.65 × 0.0270 cm; $\dot{\epsilon}$ = 0.0033 s^{-1} nominal; extracted from σ - ϵ diagrams.
Armeniades, Kuriyama, Roe, Baer (1967)	Mylar, amorphous and biaxially oriented	Red Sec = 6.35 × 1.27 × 0.013 cm; Instron, 3.06 cm s^{-1} xhd spd; extracted from σ - ϵ diagrams.
Du Pont (1967)	Mylar	Extracted from σ - ϵ diagrams.



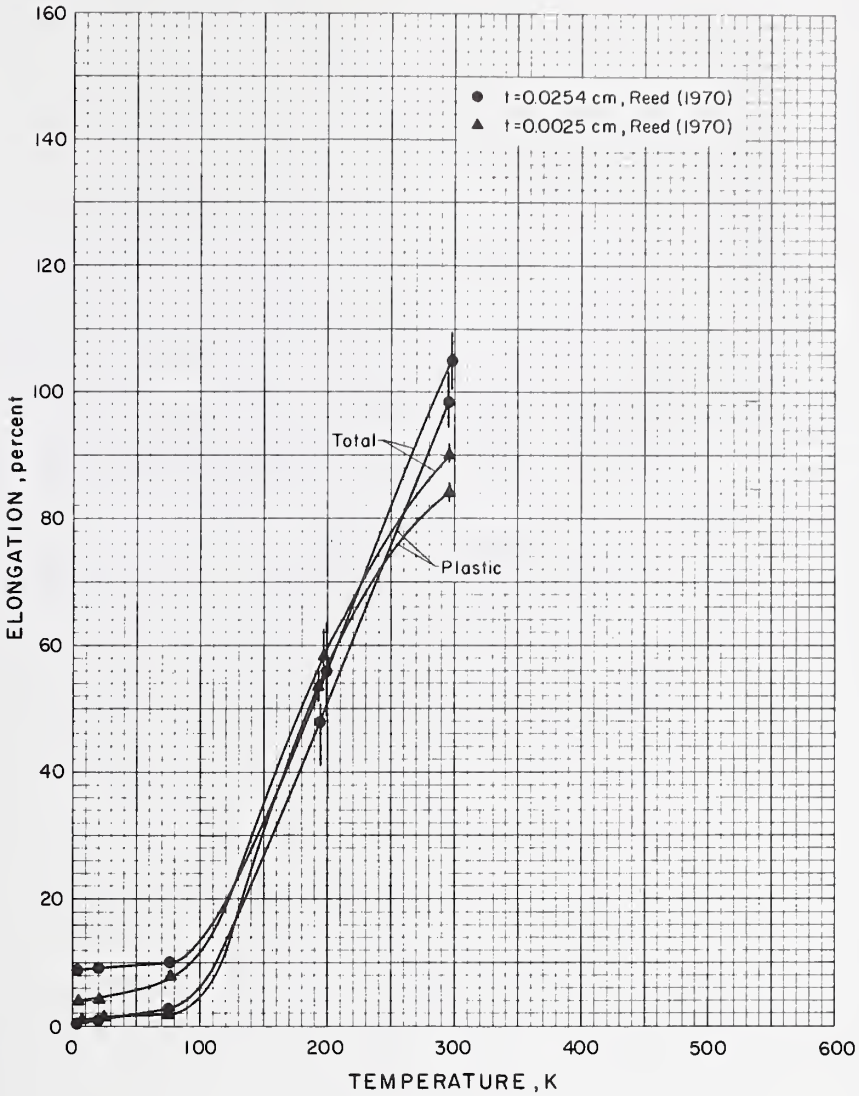
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Podall, Oser, Elisson, Augl (1965)	Mylar, type C and T	

PET

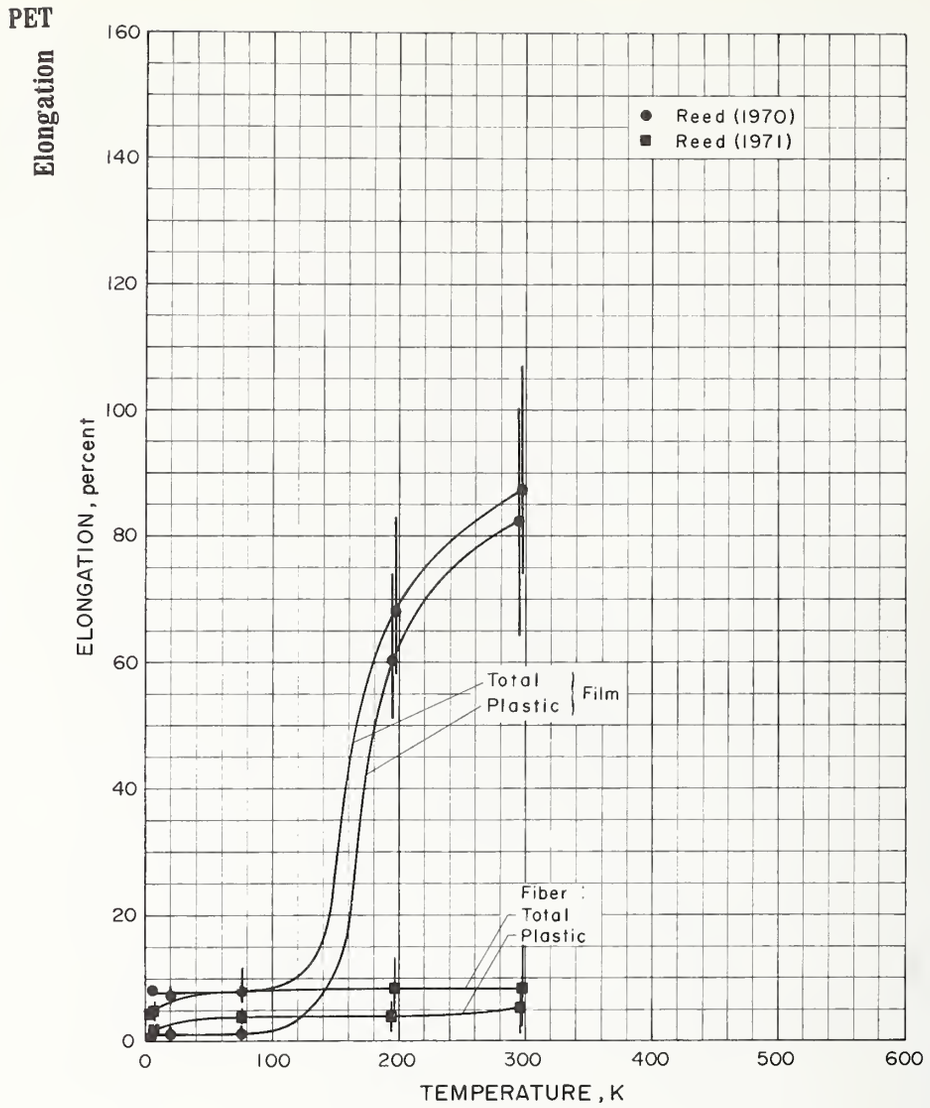
Elongation



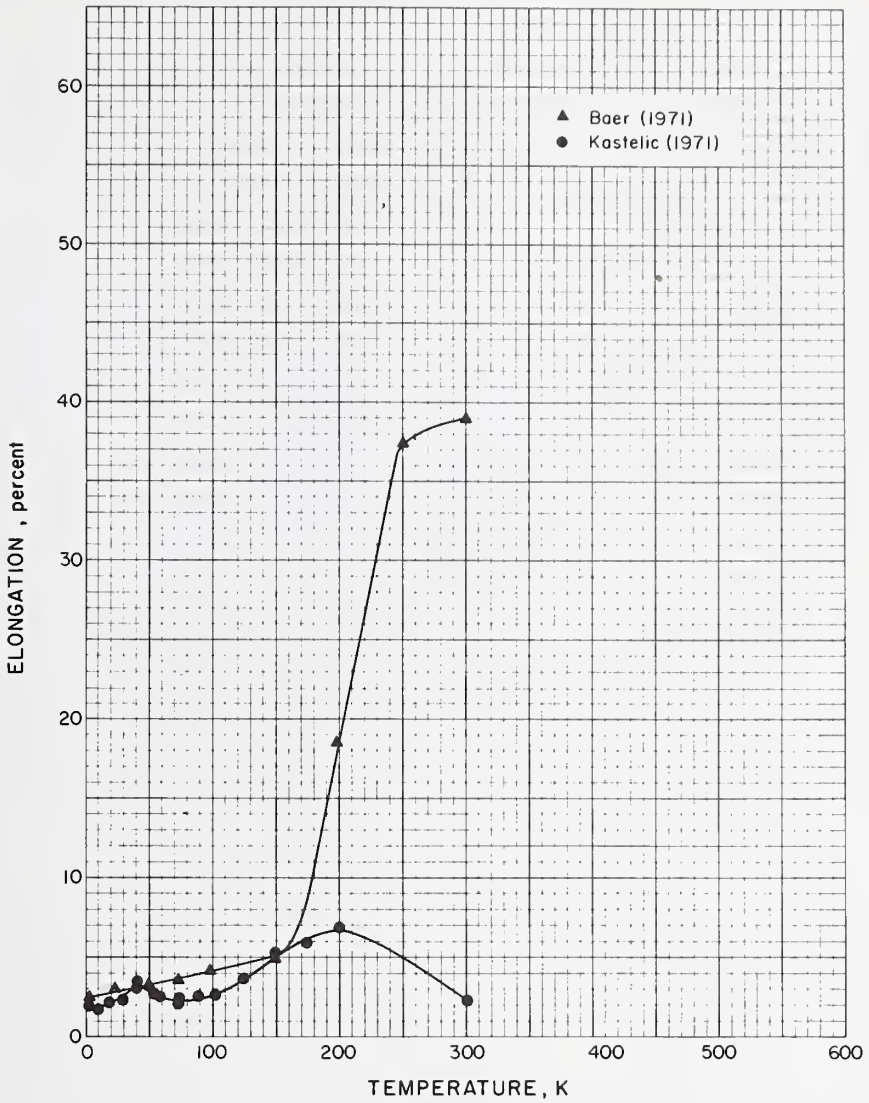
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Caren, Coston, Holmes, Dubus (1965)	"plain" Mylar film	t = 0.0254 cm, Red Sec 7.62 cm long, 1.27 cm wide; strain gage extensometer.
Toth, Barber (1964)	Mylar A film	t = 0.0508 cm, 5 specimens per temp, GL determined by time-lapse photography.
Eckert, Serafini (1967)	Mylar, extruded amorphous sheet; av molecular weight = 19,500, t = 0.015 cm, processed (A) by stretching at 358 K, heat setting at 463 K for 15,120 sec (42-43% crystallinity); or (B) stretching at 368 K, heat setting at 463 K for 15,120 sec (43-45% crystallinity), biaxial stretch at 1000% per min to 3X.	2.54 cm wide specimens, cut trans to film extrusion direction, GL = 10.16 cm; $\dot{\varepsilon}$ = 0.0083 s^{-1}.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Reed, Durcholz, Arvidson (1970)	Mylar A	Red Sec = 2.54 x 0.51 cm; Instron, xhd spd = 0.00021 cm s^{-1}; error bars indicate range of value from several tests.



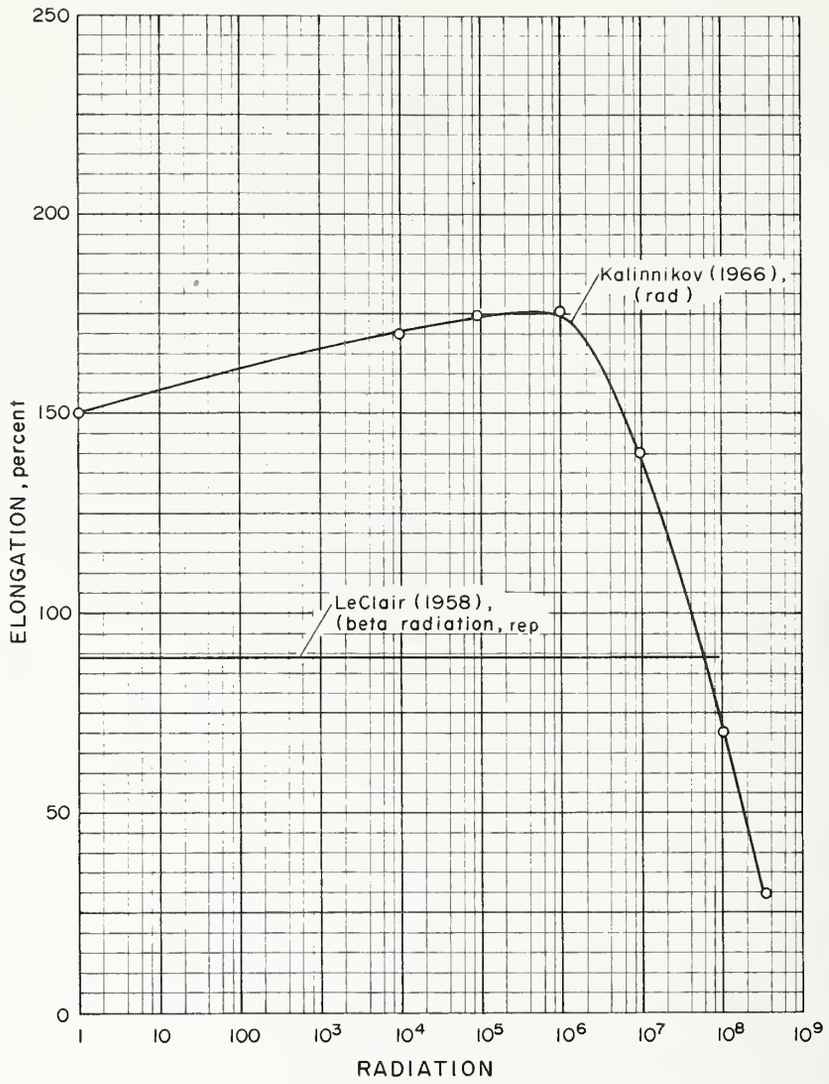
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Reed, Durcholz, Arvidson (1970)	Mylar A	Red Sec 2.54 x 0.51 x 0.0051 cm, GL = 2.54 cm, Instron; 0.00021 cm s^{-1} xhd spd; error bars indicate range of values from several tests.
Reed, Durcholz, Arvidson (1971)	Dacron, type 52, 220 denier, 44 fibers	$\ell \simeq$ 20 cm; Instron, 0.00085 and 0.00021 cm s^{-1} xhd spd; error bars indicate range of values from several tests.



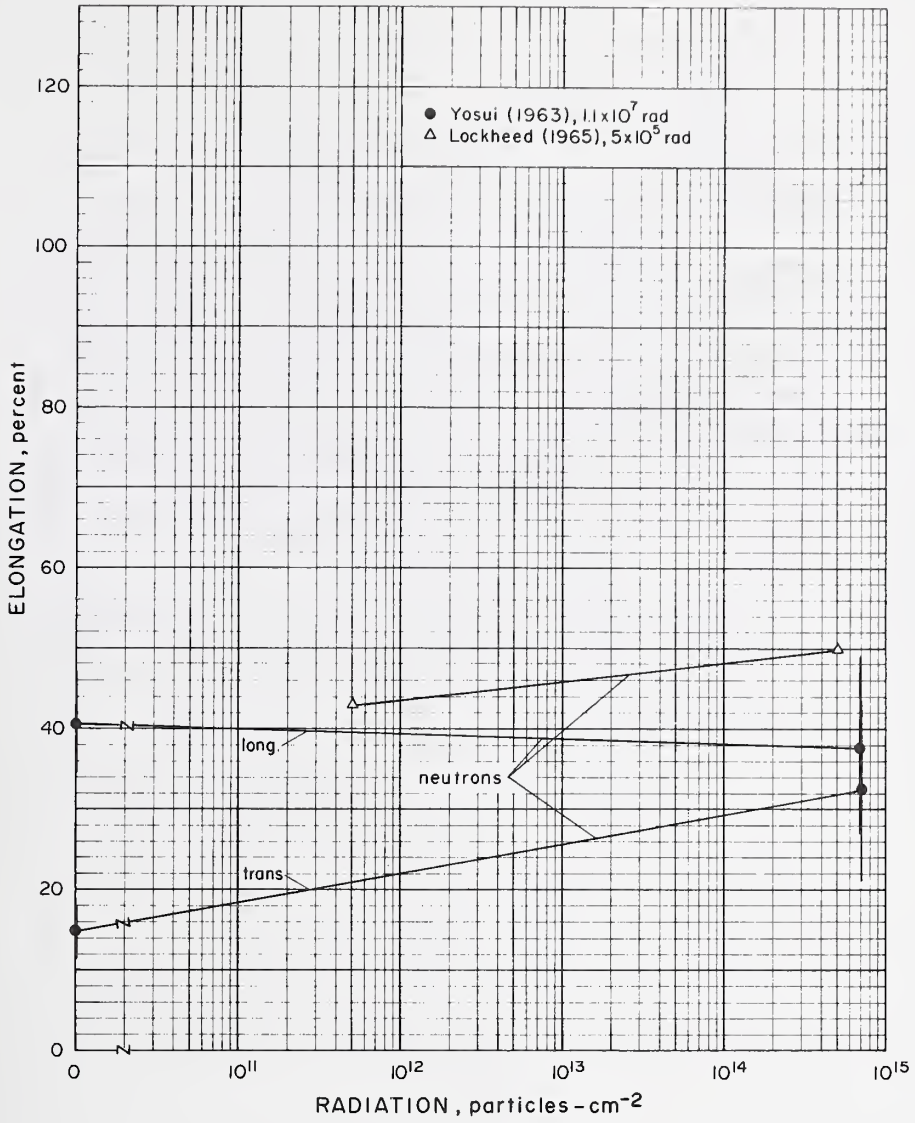
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Baer, Hiltner, Kastelic (1971)	Mylar 100A, biaxially oriented	t = 0.0025 cm; $\dot{\epsilon}$ = 0.00017 s^{-1}.
Kastelic, Baer (1971)	Amorphous	t = 0.013 cm, ASTM Die C modified by narrowing grip ends to 1.57 cm; Instron, xhd spd = 0.0083 cm s^{-1}, $\dot{\epsilon}$ = 0.00017 s^{-1}.

PET

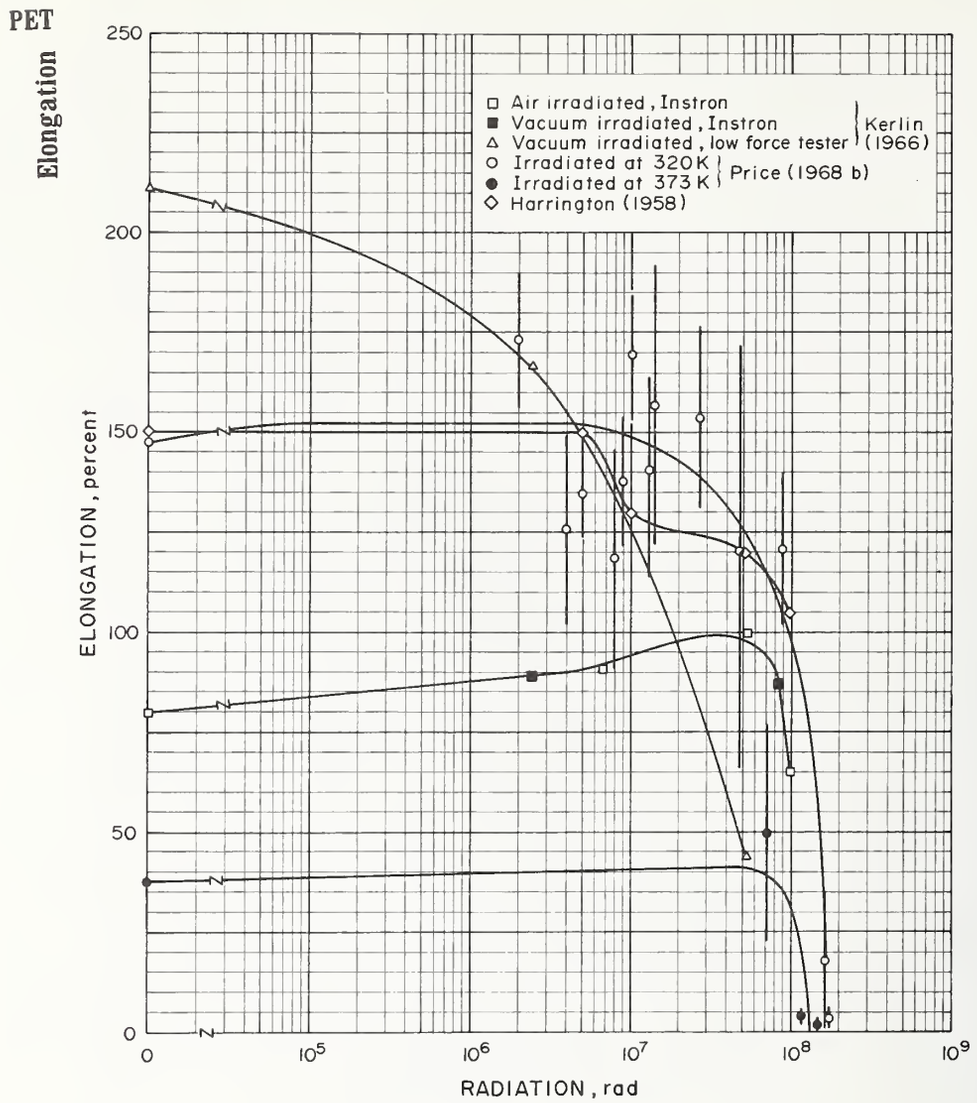
Elongation



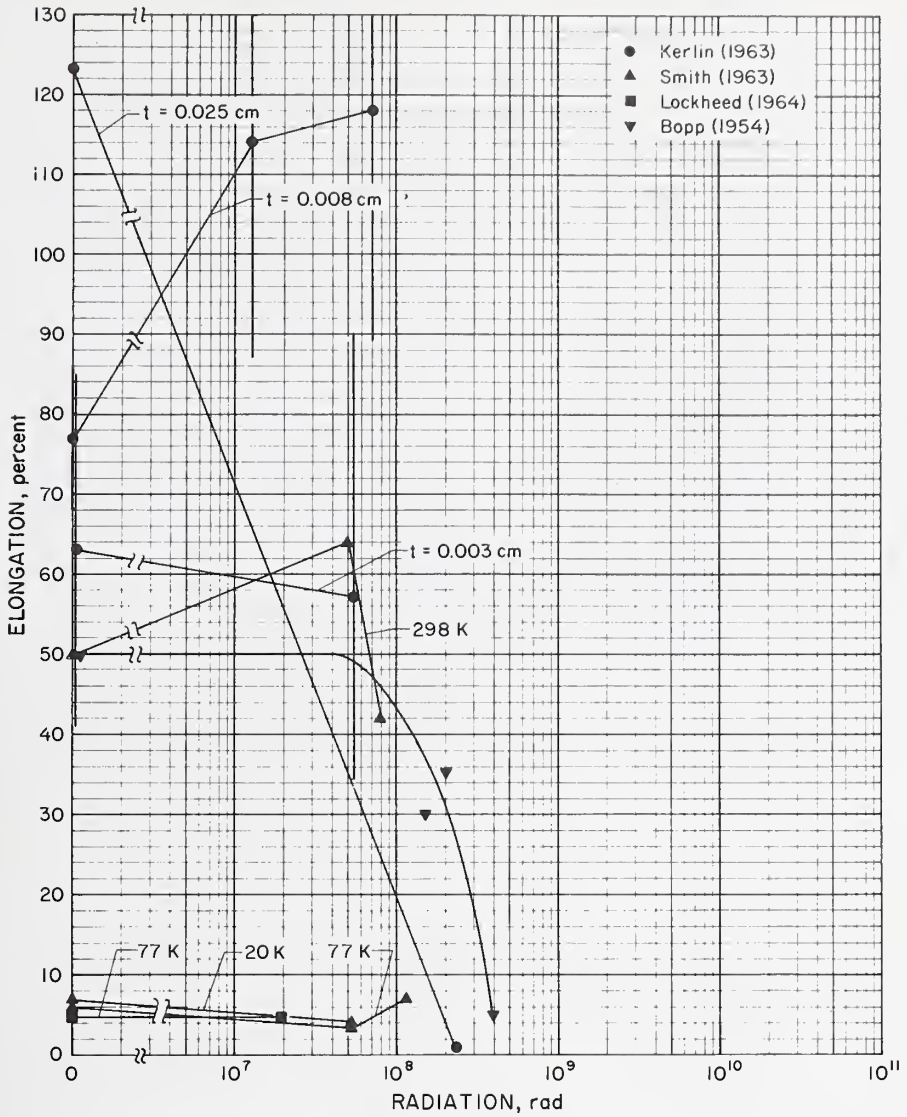
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
LeClair, Cobbs Jr. (1958)	Mylar film, type A and C	$\dot{\epsilon} = 0.0167\ s^{-1}$, Instron tensile machine; electron irradiation from a 2 Mev Van de Graaff accelerator; 5 samples tested, 95% confidence limits = ± 25%.
Kalinnikov (1966)	Film	γ irrad by Co^{60}.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Yasui (1963)	Mylar	t = 0.00254, GL = 5.08 cm, 0.635 cm wide; 0.021 cm s^{-1} xhd spd, ASTM-D412-51T procedures, Type C die, Tinius-Olsen; radiation source: Radiation Effects Reactor, Lockheed, Dawsonville, Ga., at ambient temp.
Lockheed (1965)	Mylar	ASTM D638-61T procedures, 9-13 specimens per irrad group; irradiation source: Radiation Effects Reactor, Lockheed, Dawsonville, Ga., temp rise in specimens during irradiation <10K, in vacuum.



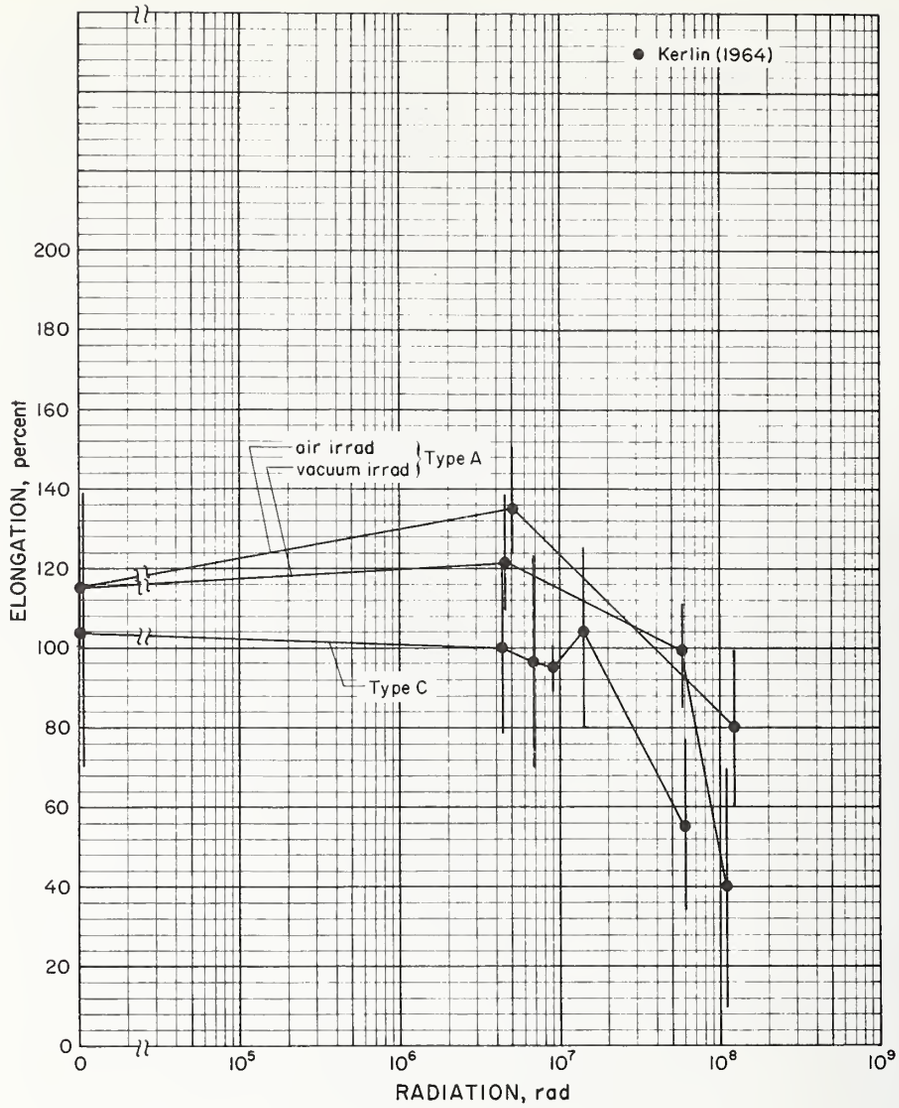
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Harrington, Giberson (1958)	Mylar A, sp gr = 1.39	t = 0.008 cm, Die C dumbbell specimen; ASTM-D-412-51T test procedure. Scott tensile; irrad in air at 298 K by a 3×10^4 curie Co^{60} source at 1.3×10^6 Roentgen h^{-1}; 95% confidence limits are approx = 10%.
Kerlin, Smith (1966)	Mylar 100C film	t = 0.00254 cm, Red Sec 2.54 x 15.24 cm; ASTM-D-882-61T procedures, except for testing of some specimens in "Low-Force Tester" at xhd spd of 10.021 cm s^{-1}, other specimens tested in Instron at xhd spd 0.845 cm s^{-1}; irrad at Ground Test Reactor, NARF, G.D., Ft. Worth, Texas.
Price (1968b)	Mylar, sp gr = 1.395	7.6 x 1.27 x 0.0025 cm, GL = 7.6 cm, degassed 3 days in pyrex tubes at 320 K and 10^{-6} Torr, 0.085 cm s^{-1} xhd spd, $\dot{\epsilon} = 0.011$ s^{-1}, irrad with Co^{60} at rate of 1.6×10^{12} rad h^{-1} at 320 K.



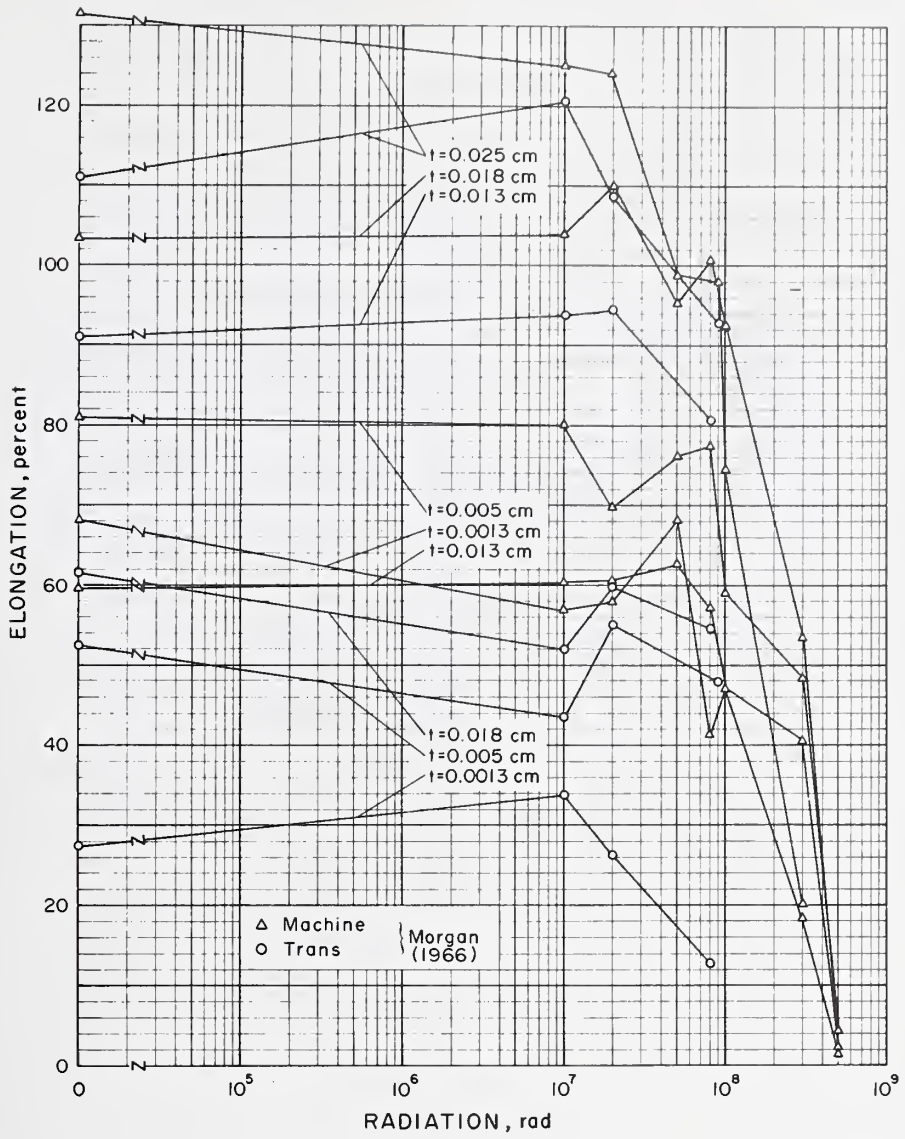
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bopp, Sisman (1954)	Mylar film	Irrad in ORNL Graphite Reactor.
Kerlin (1963)	Mylar, t = 0.025 cm; Mylar A, t = 0.008 cm; Mylar C, t = 0.003 cm	ℓ = 15.2 cm, w = 2.5 cm; ASTM D882-56T test procedure, Instron Model TT, 298-321 K; vacuum irrad by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth; av of 2-4 tests, error bars indicate standard deviation.
Smith (1963)	Mylar C	GL = 10.2 cm, w = 2.5 cm, t = 0.003 cm; Instron used at room temp, xhd spd = 0.021 cm s^{-1}; irrad in air and liquid H_2 and N_2 by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth; av of several tests.
Lockheed Missles and Space Co. (1964)	Mylar	t = 0.005 cm, ASTM D412-51T Type C die; Tinius Olsen Universal Test Machine Model RM-2, xhd spd = 0.0042 cm s^{-1}, 77 K; irrad in Radiation Effects Reactor at Dawsonville, Georgia operated at 10^8 watts; results nearly identical for trans and long. specimens, av of 4-6 tests.

PET

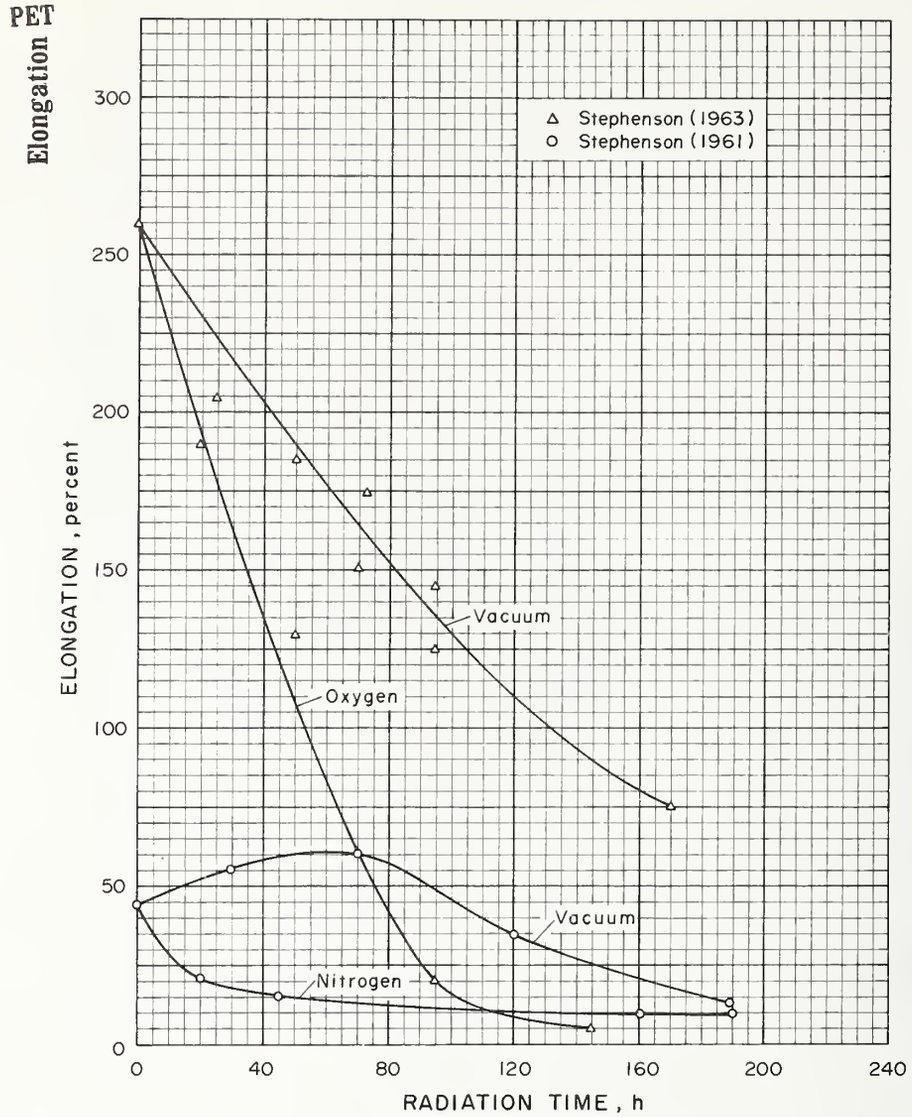
Elongation



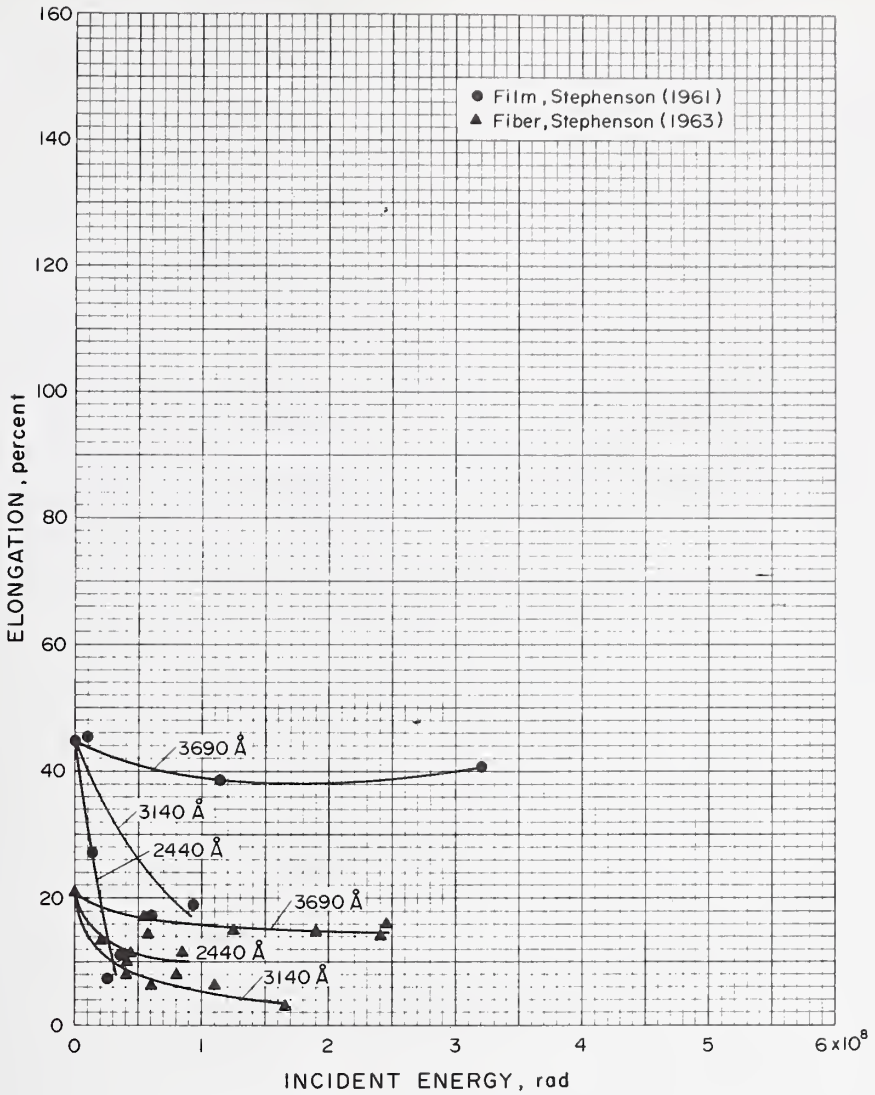
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kerlin, Smith (1964)	Mylar A and C	w = 2.54 cm, ℓ = 15.24 cm; ASTM D882-56T test procedure, xhd spd = 0.85 cm s^{-1}; irrad in vacuum and air by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth, temp of irradiation noted.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Morgan, Sheldon, Stapleton (1966)		Specimens 10.2 cm x 1.3 cm cut from both machine and trans directions of roll, film as supplied approximately 40% crys; irrad at 303K with spend fuel element assembly at A.E.R.E. Harwell, tested at 296K with an Instron.



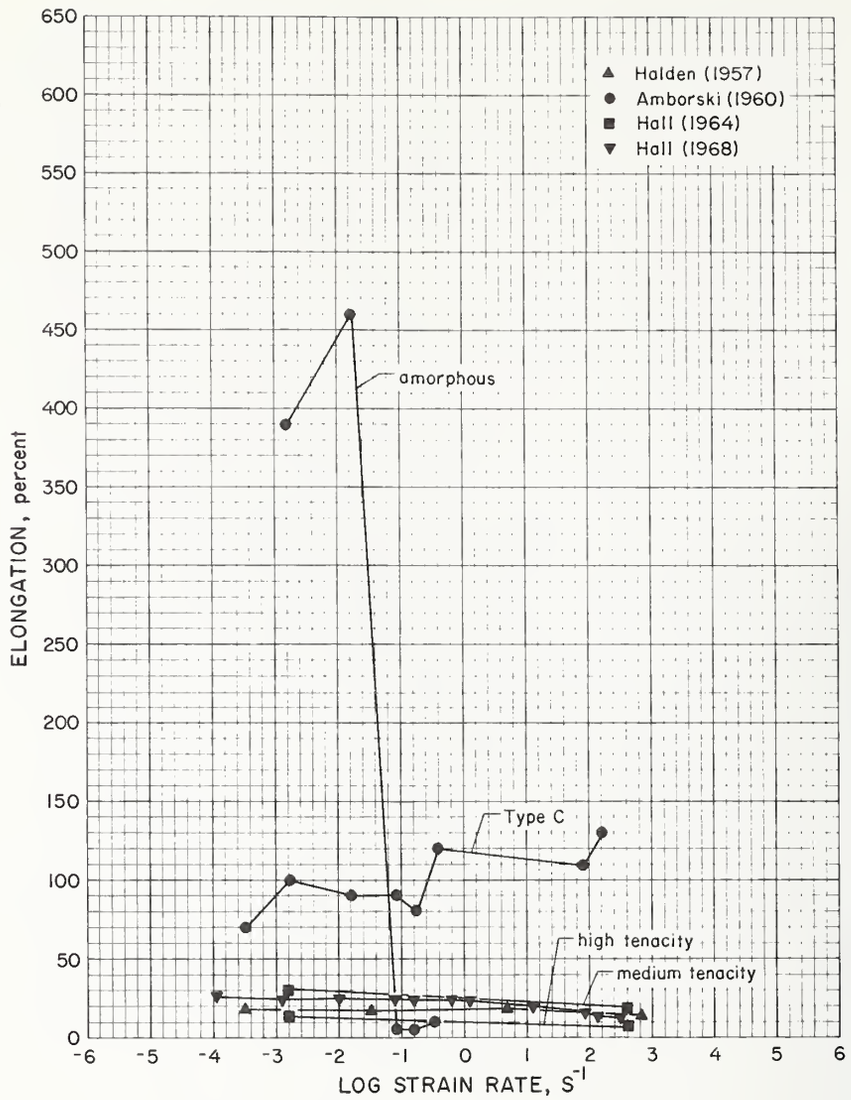
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Stephenson, Moses Wilcox (1961)	Mylar C	t = 0.000635 cm; ASTM-D-882-49T procedures, Instron; ultraviolet radiation sources: General Electric G30T8 H6 vapor lamp, emitting 90% of radiation at 2537Å; General Electric A-H6 Hg vapor lamp, high P, 1000 Watts, broad spectrum of radiation with intensity peaks at 2440, 3140, and 3690Å, monochromator (Bausch and Lomb) slits (132Å wide) used to select radiation, irrad in vacuum.
Stephenson, Wilcox (1963)	Mylar film, Dacron fibers (4.4 denier)	Diam (Dacron) = 0.00254 cm; ASTM-D-882-49T procedures, Instron; ultraviolet radiation sources: General Electric G30T8 Hg vapor lamp, emitting 90% of radiation at 2537Å; General Electric A-H6 Hg vapor lamp, high P, 1000 watts, broad spectrum of radiation with intensity pulse at 2440, 3140, and 3690Å, monochromator (Bausch and Lomb) slits (132Å wide) used to select radiation, irrad at 10^{-6} Torr.



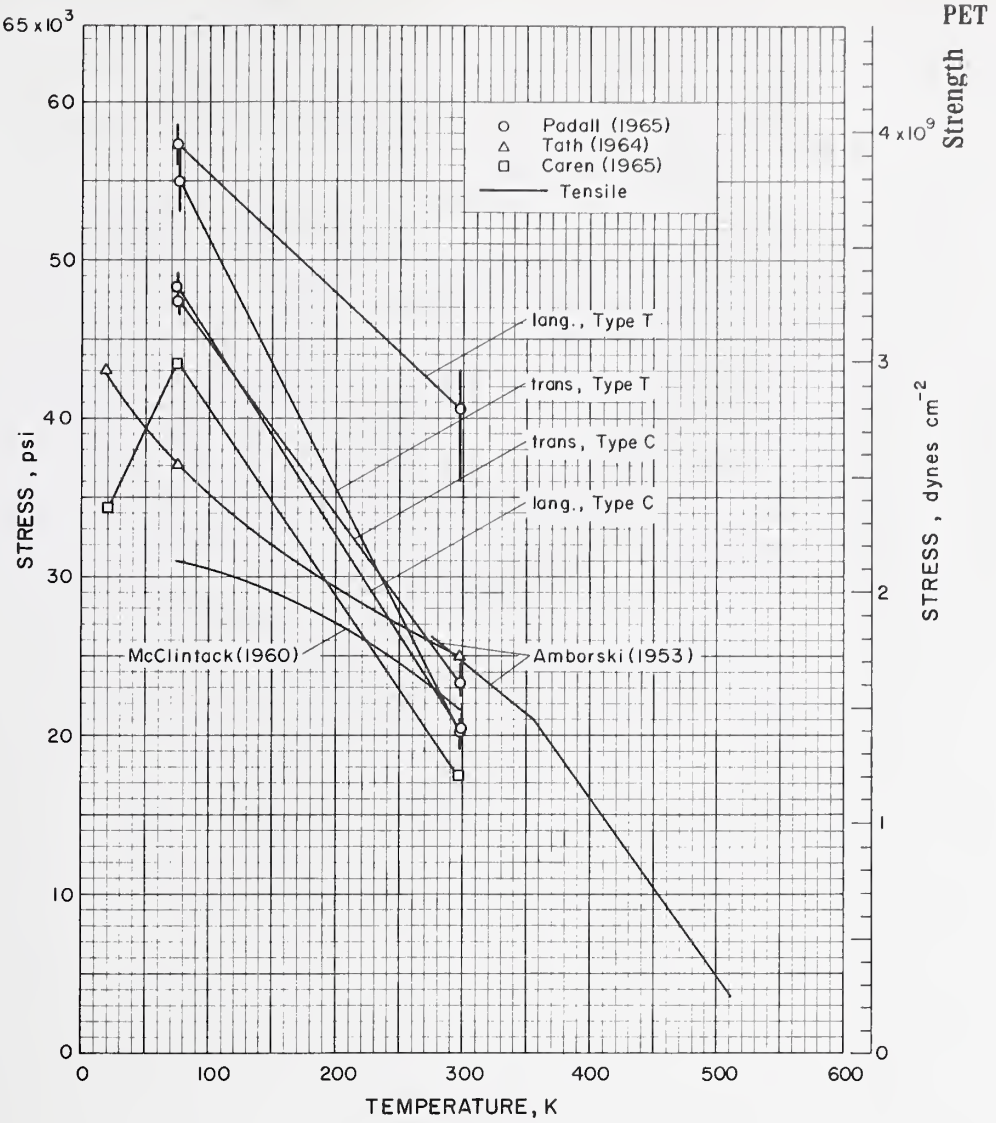
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Stephenson, Moses Wilcox (1961)	Mylar C	t = 0.000635 cm; ASTM D882-49T procedures, Instron; ultraviolet radiation source: General Electric G30T8 lamp emitting 90% of radiation at 2537Å, samples placed in quartz tubes and evacuated or flushed with nitrogen.
Stephenson, Wilcox (1963)	Mylar film	t = 0.000635 cm; ASTM D882-49T procedures, Instron; ultraviolet radiation source: General Electric G30T8 lamp emitting 90% of radiation at 2537Å, irrad under both vacuum and oxygen, vacuums of 5×10^{-2} Torr and 1×10^{-6} Torr used.

PET

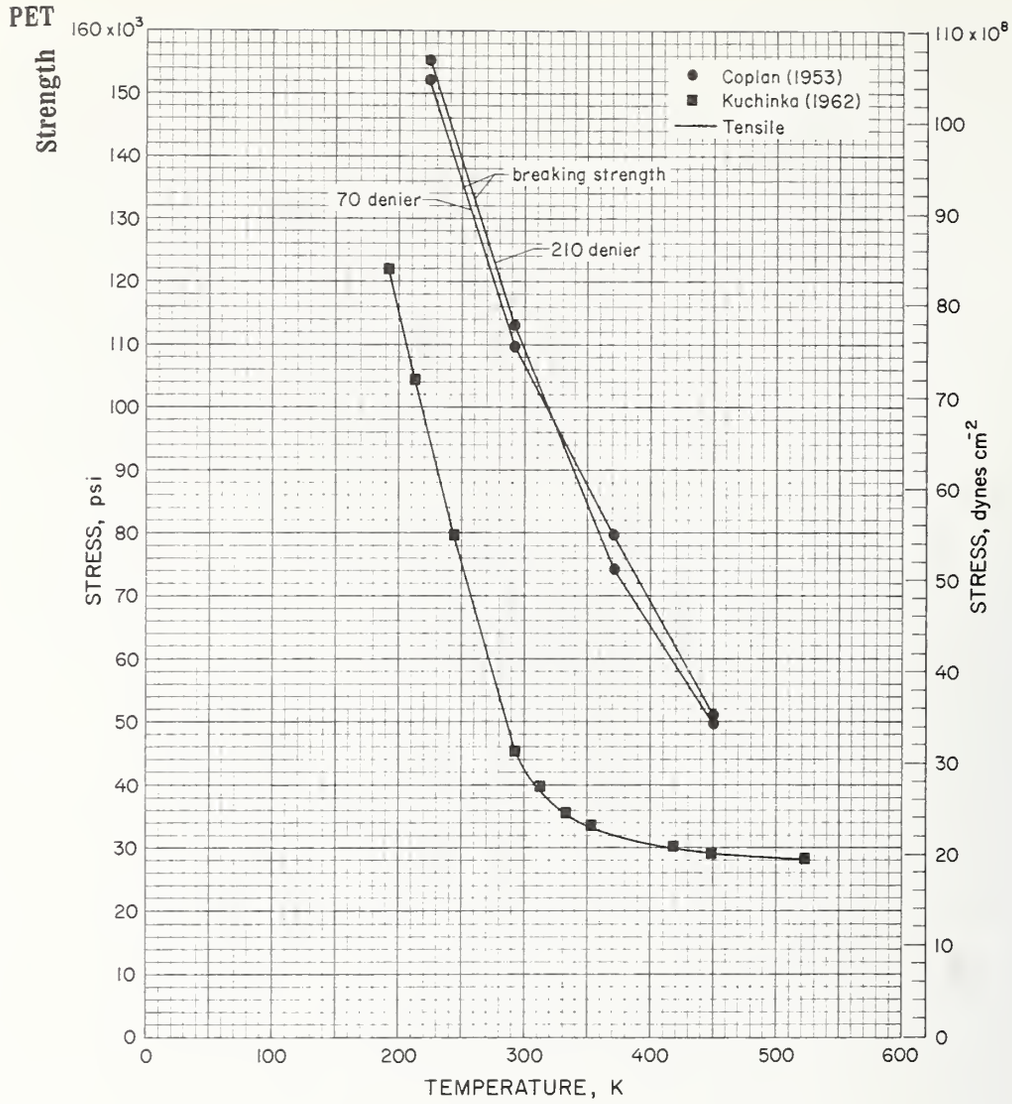
Elongation



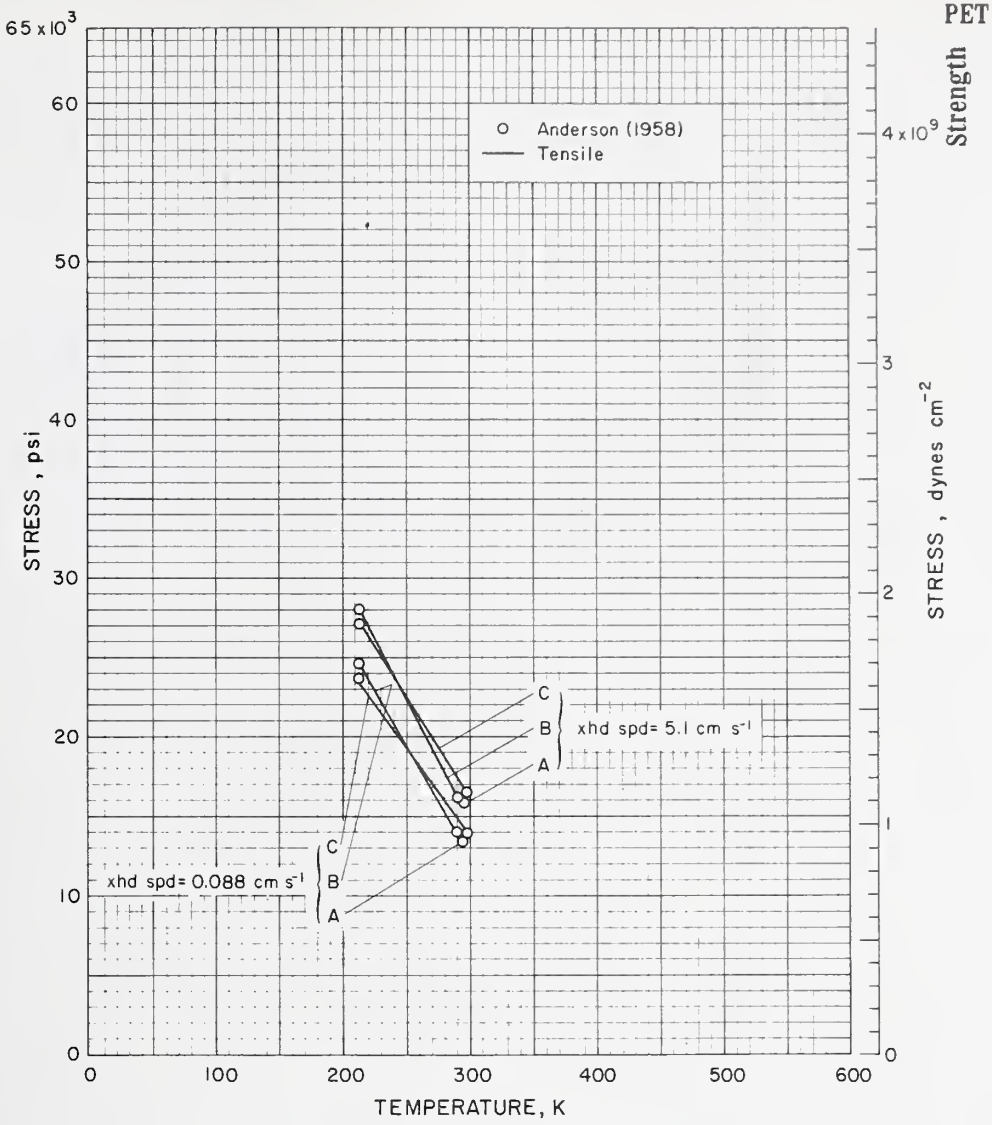
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Holden (1959)	Terylene, 3 filament yarn	Dried over silica gel at 293 K for 24 h then allowed to reach equilibrium at 293 K and 65% rel hum; low $\dot{\varepsilon}$ on Instron, 10 tests; high $\dot{\varepsilon}$ on impact device, 16 tests.
Amborski, Mecca (1960)	Amorphous film and Mylar C	Long. specimens; 296. 5 K, 50% rel hum.
Hall (1964)	Terylene microdull high tenacity, 24 filaments; Terylene dull medium tenacity, 48 filaments	GL = 5 cm; 295 K, 65 ± 4% rel hum; end correction used at high $\dot{\varepsilon}$.
Hall (1968)	Terylene dull medium tenacity, 48 filaments	GL = 2. 5-10 cm; 294 ± 1 K, 65 ± 4% rel hum; av of several tests, correction for slip applied to GL.



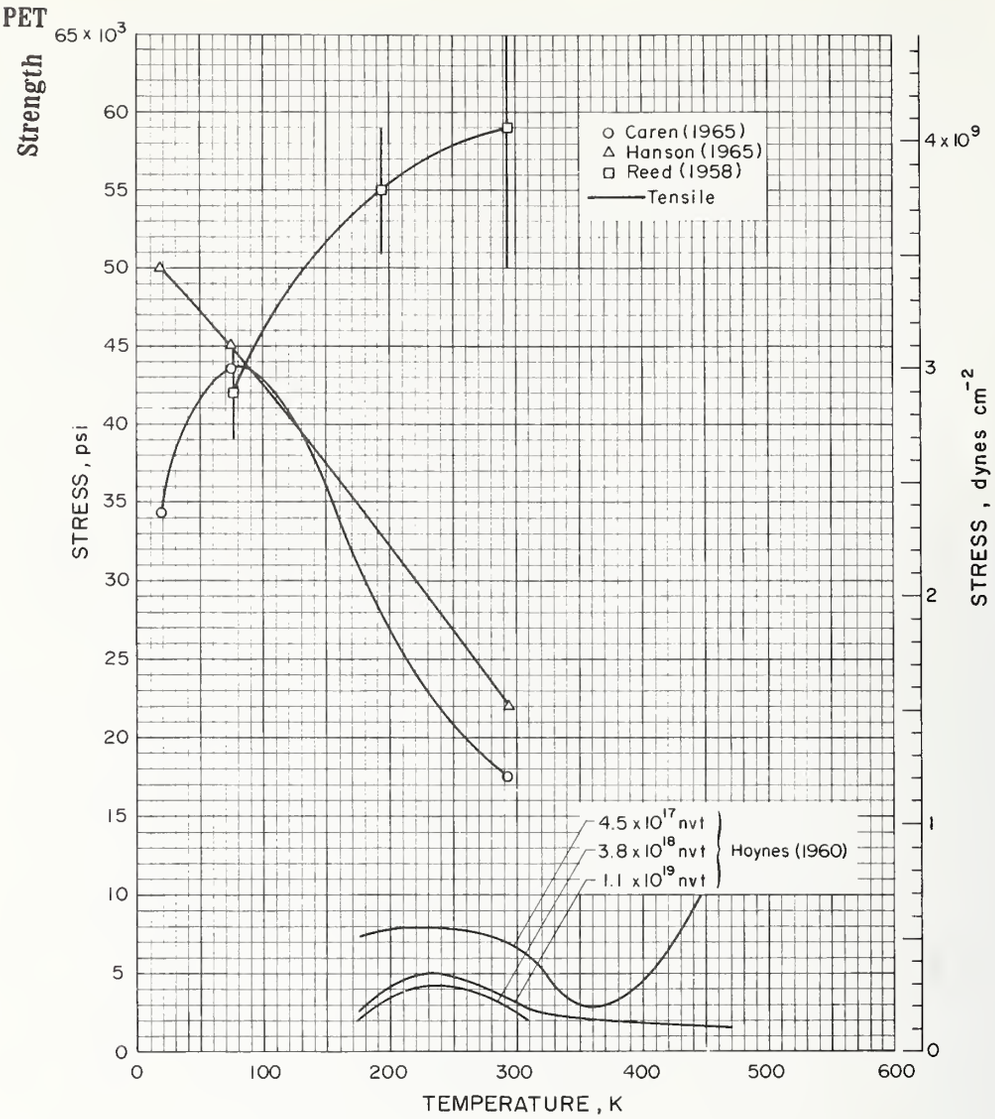
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Caren, Coston, Holmes, Dubus (1965)	"plain" Mylar film	t = 0.0254 cm, Red Sec 7.62 x 1.27 cm; strain gage extensometer.
Toth, Barber (1964)	Mylar A	t = 0.0508 cm, 5 specimens tested per temp, GL determined by time-lapse photography.
McClintock, Gibbons (1960)	Mylar	"NBS unpublished data."
Podall, Oser, Elisson, Augl (1965)	Mylar, type C and T	
Amborski, Flierl (1953)	Mylar	t = 0.00254 cm; constant rate of elongation (100% min^{-1}), Instron.



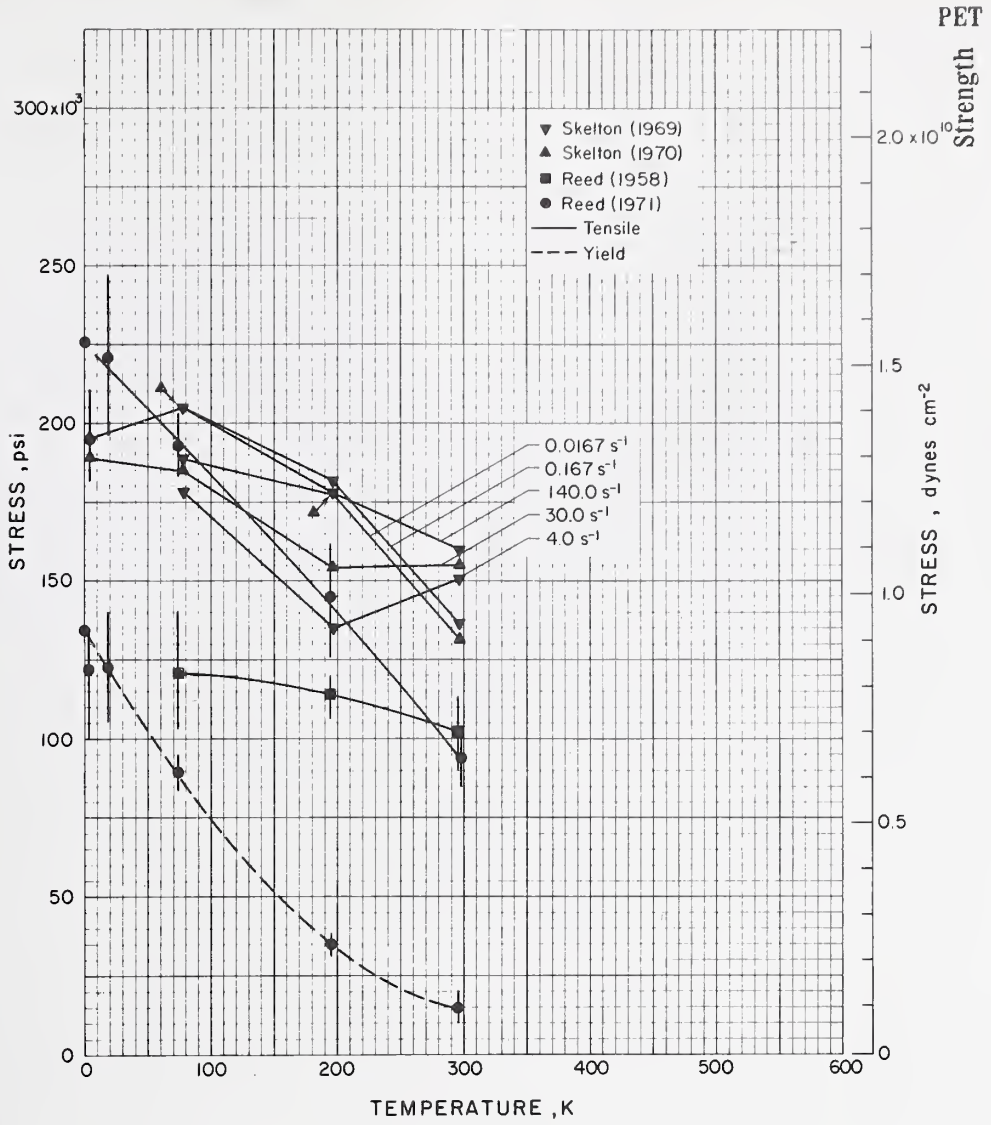
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Coplan (1953)	Dacron 5100; filament yarn: 70 denier, 34 filament, 3/4 Z; 210 denier, 34 filament, 1 Z	GL = 25.4 cm, Instron or F. R. L. Tester, xhd spd = 0.127 cm s^{-1}; max load error = 2%, 12 specimens tested.
Kuchinka (1962)		Fiber.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Anderson, Morfitt (1958)	Mylar	t = 0.00127 cm; A: Mylar tested along long direction, B: creased Mylar, crease 180° with respect to test direction, C: 45° creased Mylar, samples creased for 6 months under 5 psi, 0.088 cm s^{-1} and 5.1 cm s^{-1} xhd spd; yd off unknown.



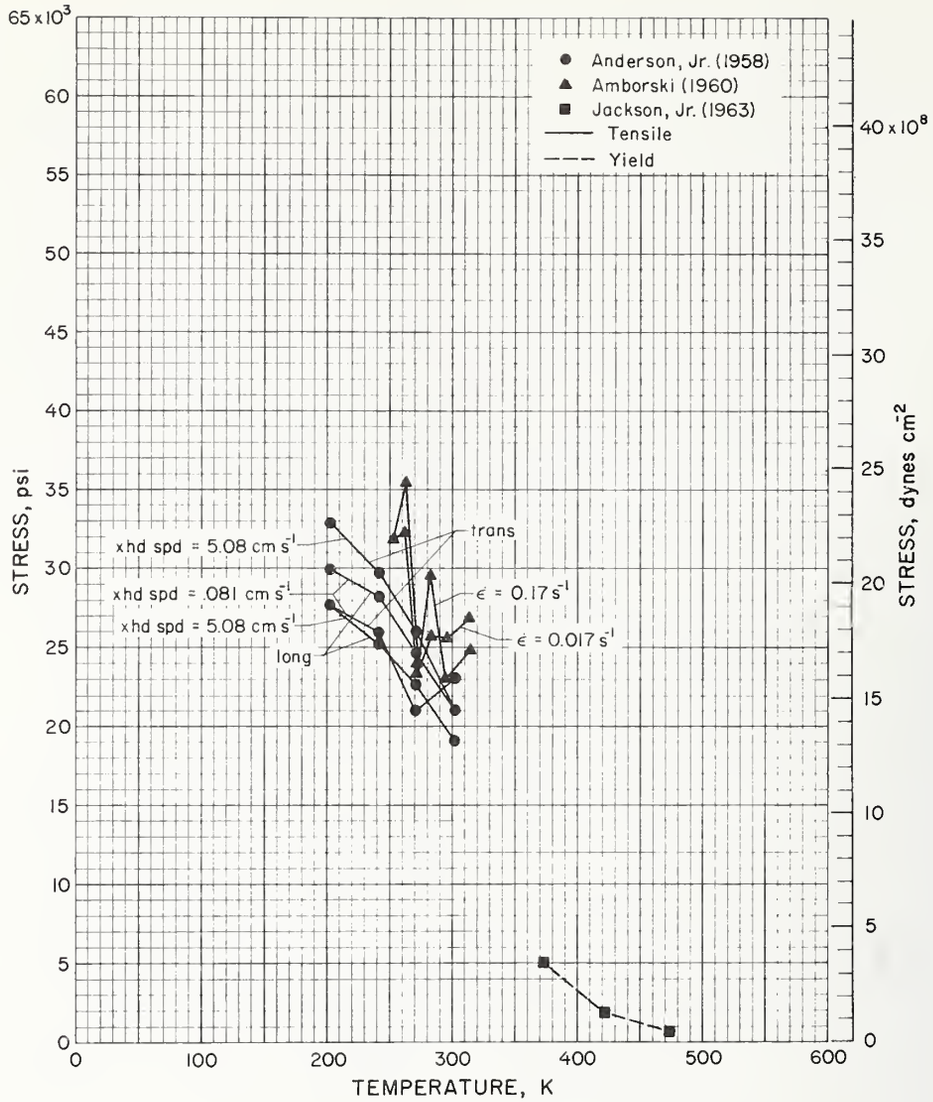
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Caren, Coston, Holmes, Dubus (1965)	Mylar A	Overall dimension 7.62 x 1.27 cm and t = 1.27 to 1.78 cm; hydraulic tester; max deviation from av, 21% (295 K), 8% (76 K), 6.7% (20 K), 3 tests at each temp.
Hanson, Richards, Hickel (1965)	Mylar A	t = 5.08 to 7.62 x 10^{-3} cm, cylindrical specimens with lapped seam, pressure in vessel loaded and unloaded cyclically until failure, $\dot{\epsilon}$ = 12.7 x 10^{-3} cm min^{-1}.
Reed, Mikesell (1958)	Mylar	Specimens composed of 6 twisted sheets woven into 1 strand, GL = 10.6 cm, xsec area = 0.00122 cm^2; hydraulic test machine, spools of 1.27 cm diam for gripping strands, $\dot{\epsilon}$ = 0.0017 s^{-1}.
Haynes, Hsiao (1960)	Mylar, biaxially oriented	ℓ = 10.1 cm, Red Sec 1.3 x 0.65 x 0.27 cm, specimens cut ∥ to biaxial directions; 12.0 s^{-1} nominal $\dot{\epsilon}$.



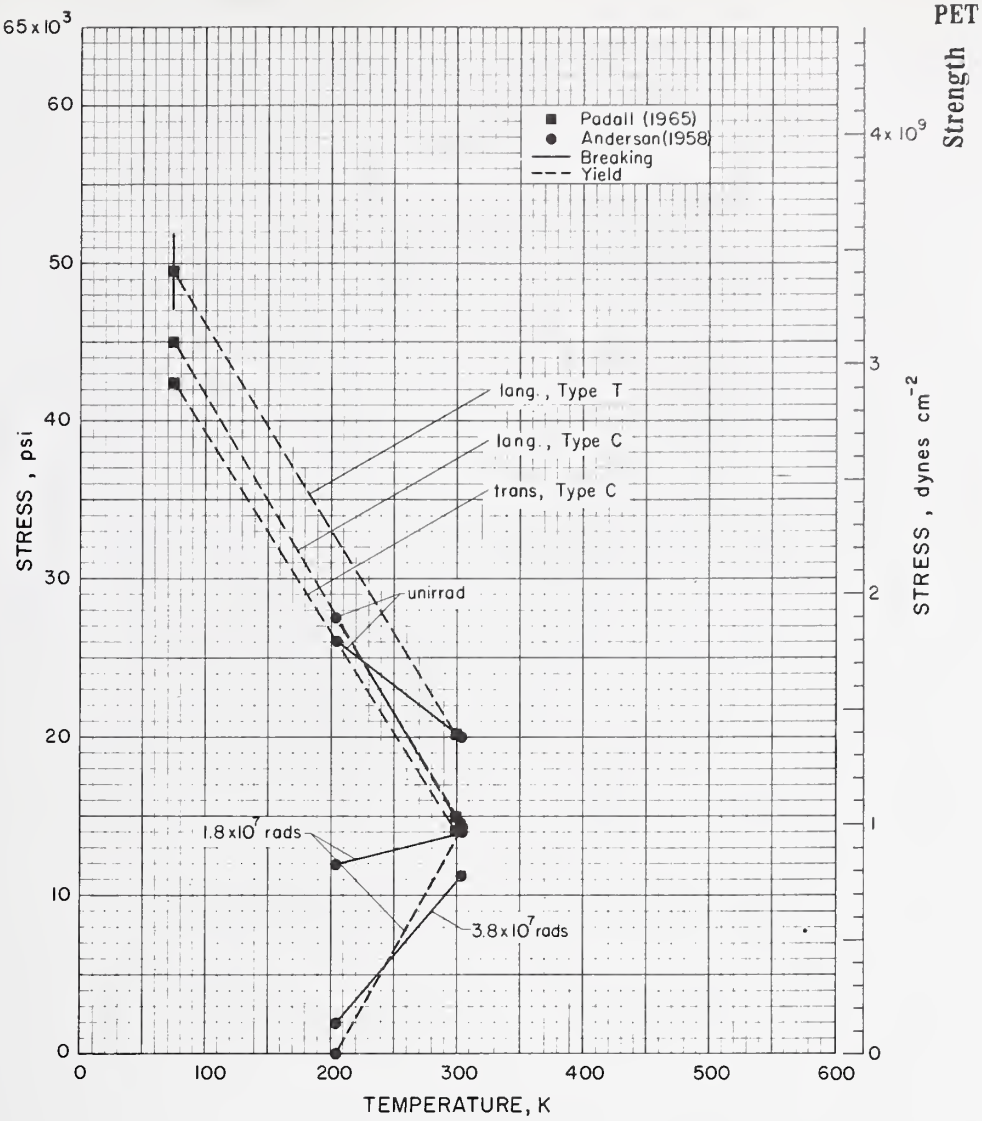
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Reed, Mikesell (1958)	Dacron	Braided continuous filaments, xsec area = 6.15×10^{-3} cm^2, 11.7 cm long; Instron, $\dot{\epsilon} = 0.00017$ sec^{-1}; 0.2% yd off.
Reed, Durcholz, Arvidson (1971)	Dacron, type 52	44 continuous fibers, xsec area = 17.56×10^{-5} cm^2, GL = 10.16 cm; Instron, 0.00021-0.00085 cm s^{-1} xhd spd; 0.2% yd off; error bars indicate spread of several tests.
Skelton, Freeston, Jr., Ford (1969)	Dacron 1100-250-0, Type 52, 1060 denier	GL = 5.1-61.0 cm; Instron used for $\dot{\epsilon} = 0.167$ s^{-1}, FRL high-speed piston tester used for higher $\dot{\epsilon}$, specimens conditioned at 294 K and 65% rel hum for 24 h before test; 5 specimens tested for each configuration.
Skelton, Freeston, Jr., Schoppe (1970)	Dacron 1100-250-0, Type 52, 1060 denier	For $\dot{\epsilon} = 0.0167$ s^{-1}: GL = 12.7 cm; Instron. For $\dot{\epsilon} = 30.0$ s^{-1}: GL = 55.9 cm; FRL high-speed piston tester.

PET

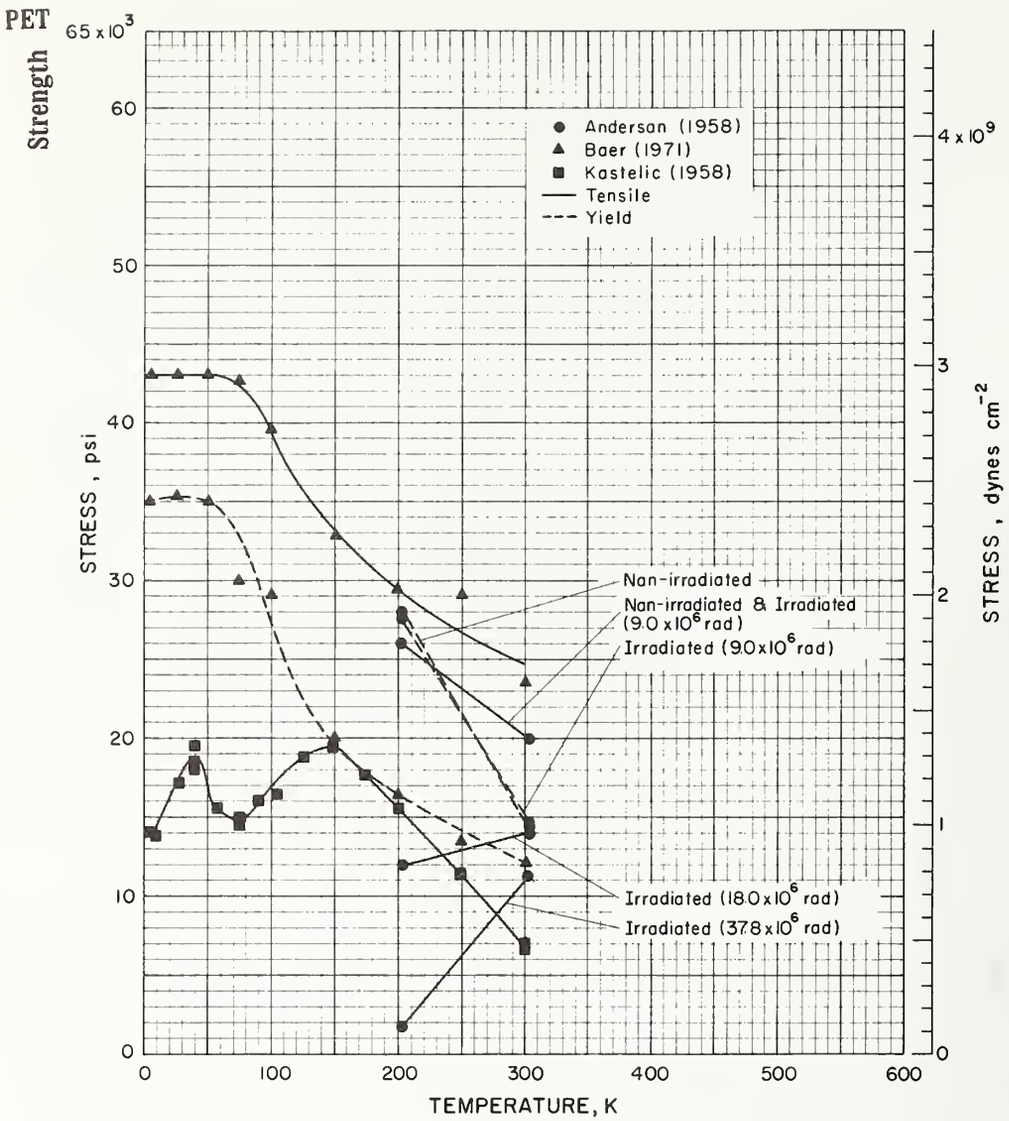
Strength



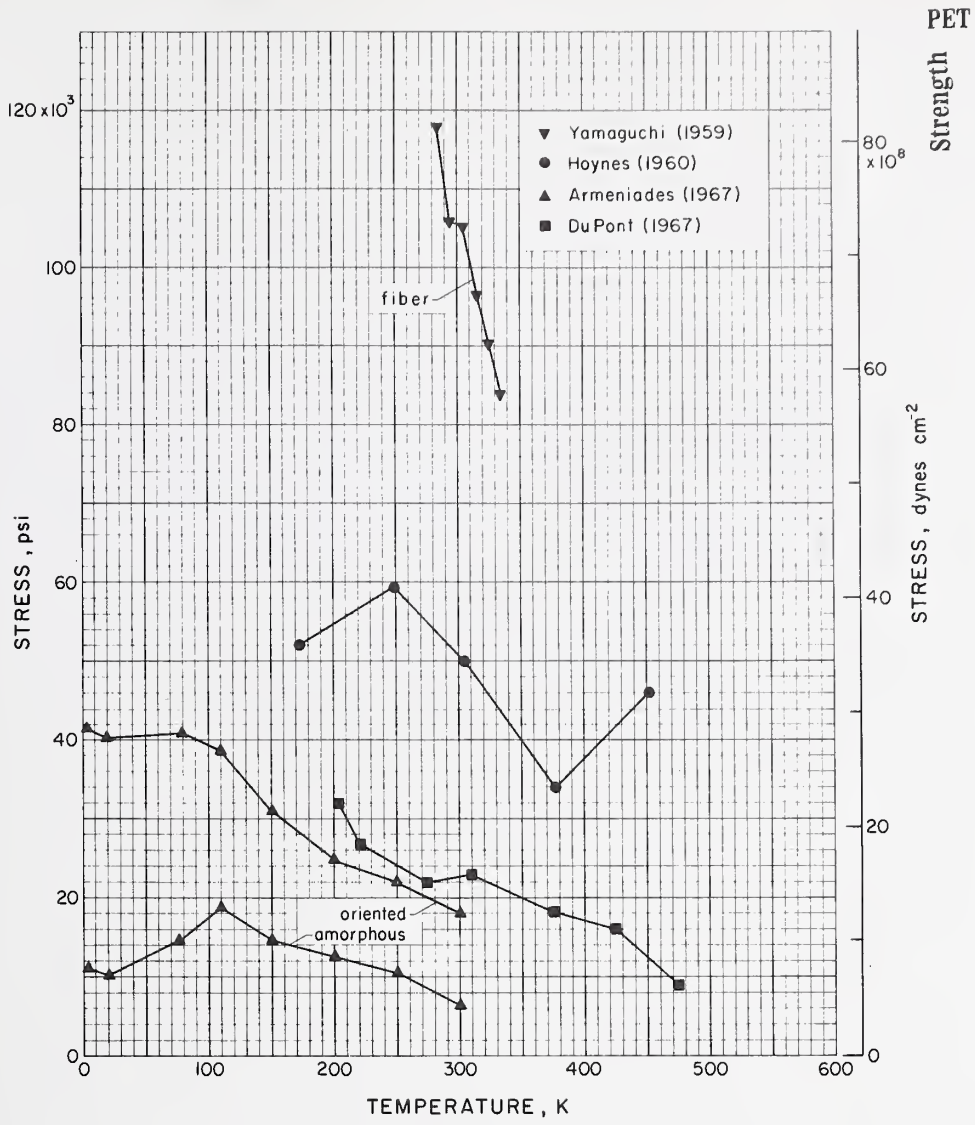
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Anderson, Jr., Morfitt (1958)	Weatherable Mylar	t = 0.0025 cm.
Amborski, Mecca (1960)	Mylar C	Long. Specimens; Instron.
Jackson, Jr., Caldwell (1963)		Film; Instron, ASTM D882-61T, Method A test procedure.



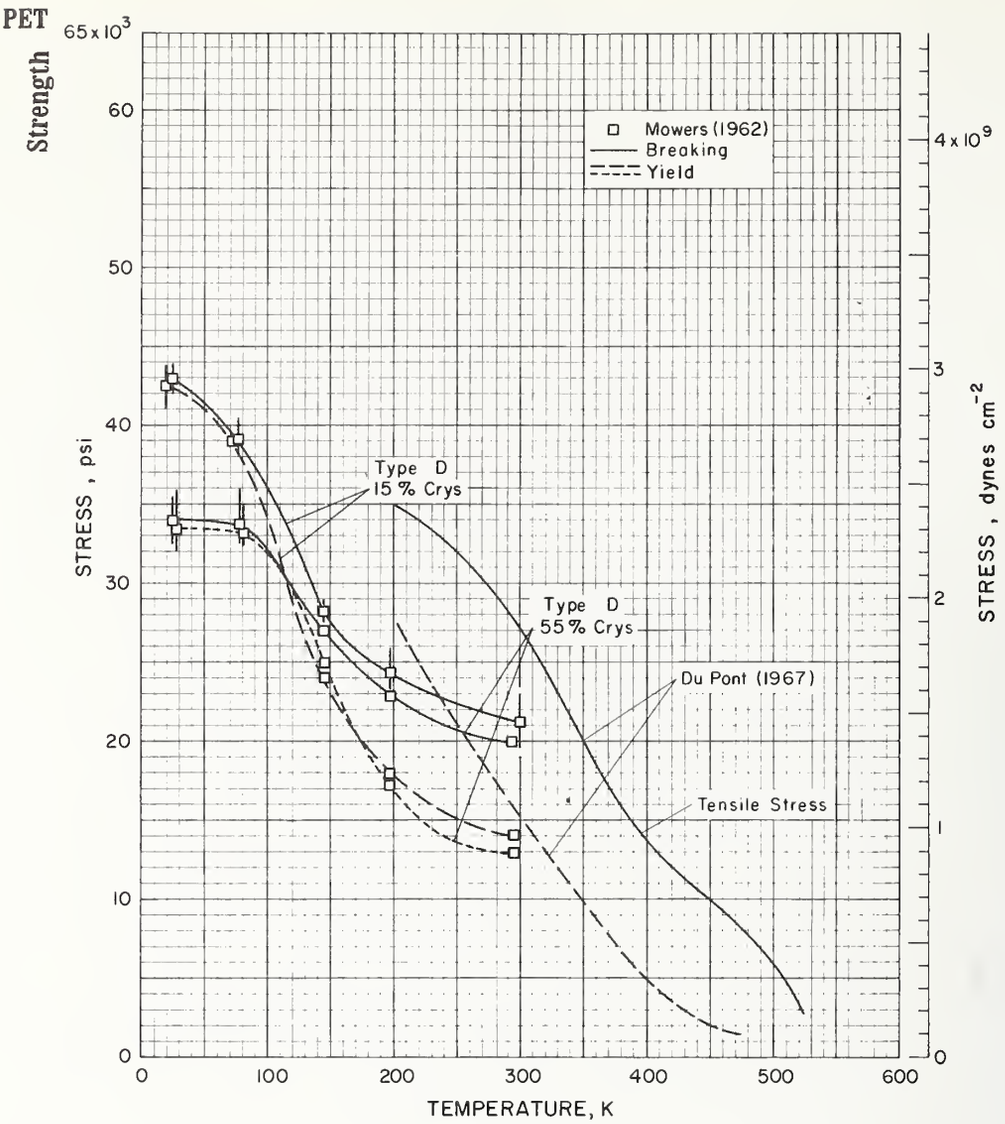
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Podall, Oser, Elisson, Augl (1965)	Mylar, type C and T	0.2% yd off.
Anderson Jr., Morfitt (1958)	Mylar	t = 0.013 cm, cut in long. direction; xhd spd = 0.84 cm s^{-1}; irrad by ultraviolet at 298 K and 305 K; av of 5 tests, results almost identical after no irradiation and 9 x 10^6 rads.



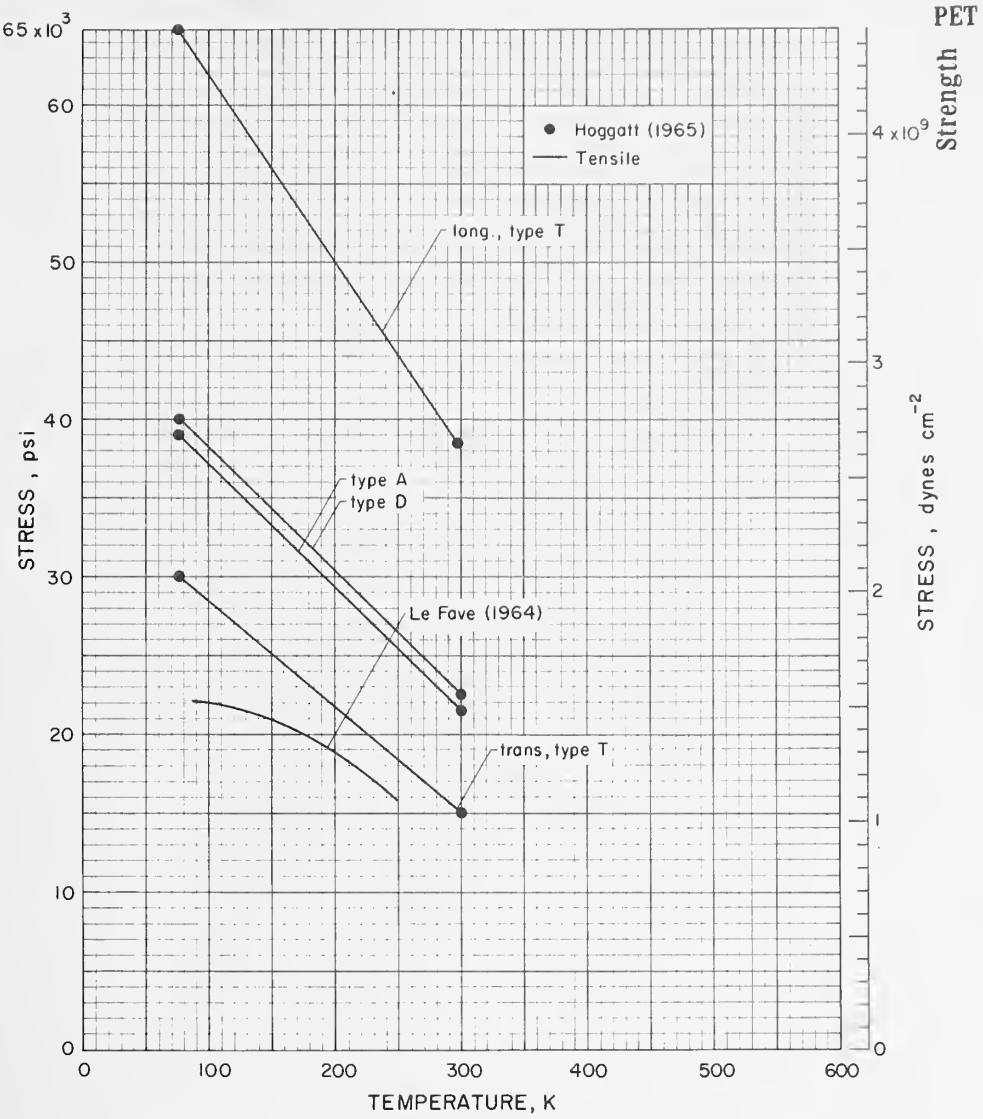
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Anderson, Jr., Morfitt (1958)	Mylar	t = 0.00127 cm; tested along long direction, 0.838 cm sec^{-1} xhd spd, utraviolet irradiated, yd off unknown.
Baer, Hiltner, Kastelic (1971)	Mylar 100A, biaxially oriented	t = 0.0025 cm; $\dot{\varepsilon}$ = 0.00017 s^{-1}, 2% yd off.
Kastelic, Baer (1971)	Amorphous	t = 0.013 cm, ASTM Die C modified by narrowing grip ends to 1.57 cm; Instron, xhd spd = 0.00083 cm s^{-1}, $\dot{\varepsilon}$ = 0.00017 s^{-1}.



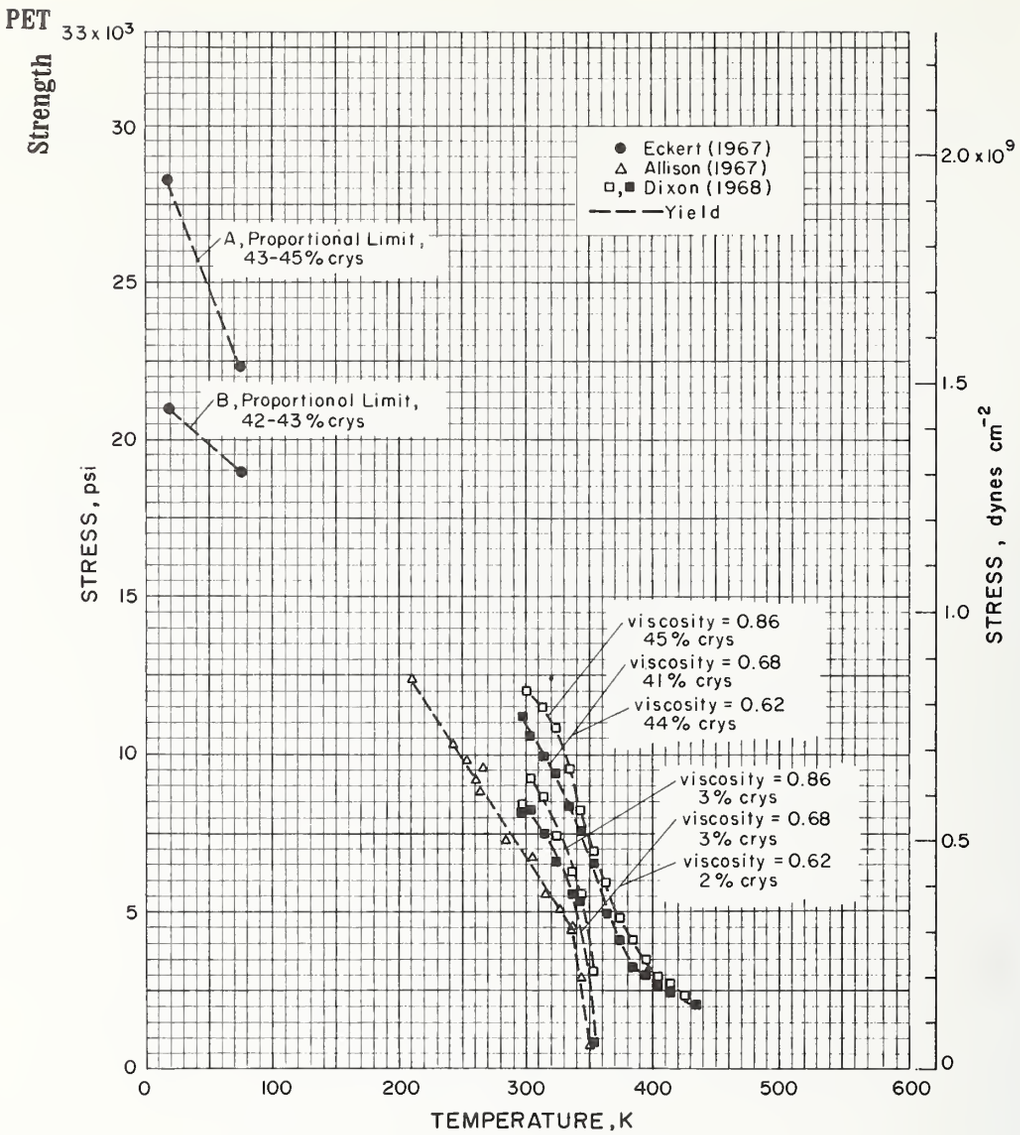
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Yamaguchi (1959)	Terylene F	5 denier, single filament, 6 cm between holding points; $\dot{\epsilon} = 0.0005\ s^{-1}$, rel hum = 65%; extracted from $\sigma - \epsilon$ diagrams.
Haynes, Hsiao (1960)	Mylar, biaxially oriented	Specimens cut ∥ to a biaxial direction, $\ell = 10.1$ cm, Red Sec = $1.3 \times 0.65 \times 0.0270$ cm; $\dot{\epsilon} = 0.0033\ s^{-1}$ nominal; extracted from $\sigma - \epsilon$ diagrams.
Armeniades, Kuriyama, Roe, Baer (1967)	Mylar, amorphous and biaxially oriented	Red Sec = $6.35 \times 1.27 \times 0.013$ cm; Instron, 3.06 cm s^{-1} xhd spd; extracted from $\sigma - \epsilon$ diagrams.
Du Pont (1967)	Mylar	Extracted from $\sigma - \epsilon$ diagrams.



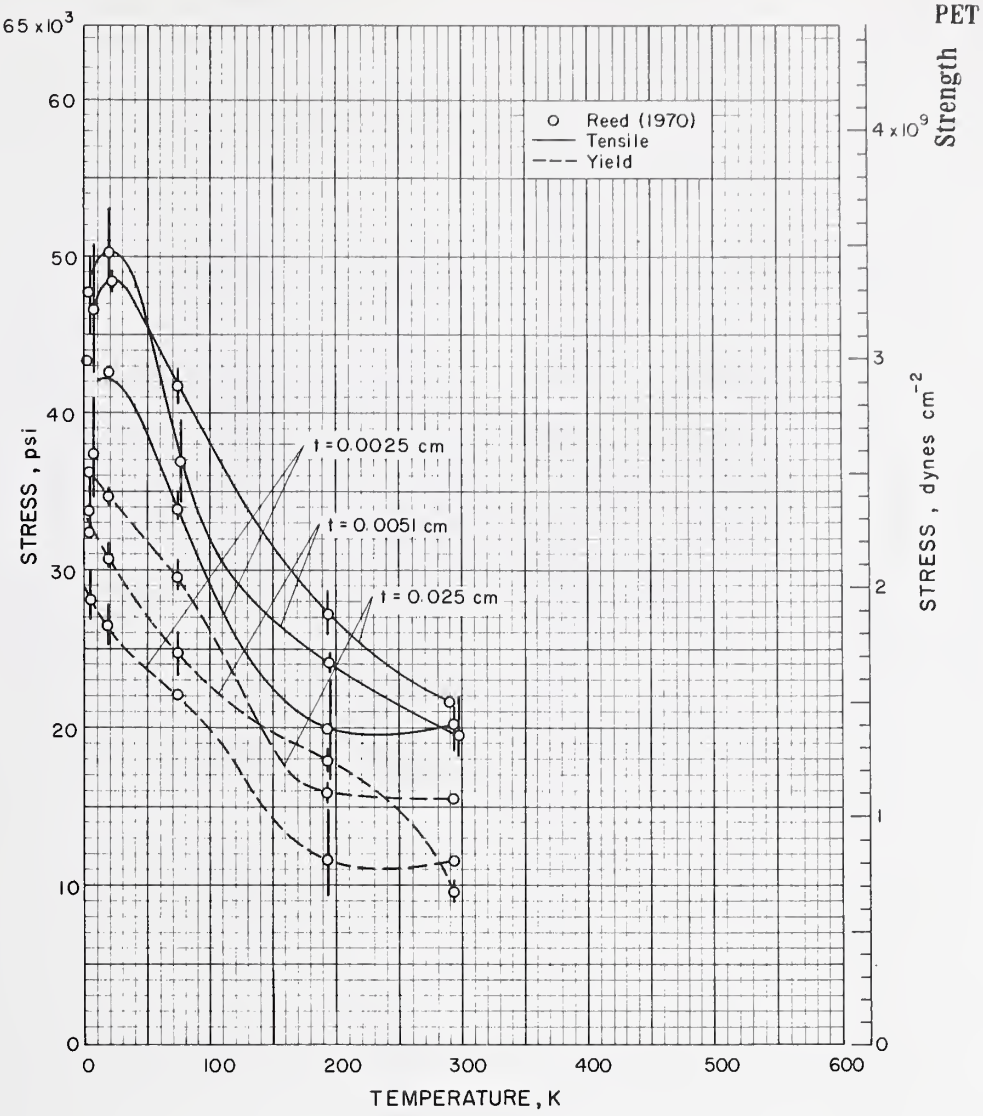
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
DuPont (1967)	Mylar	Continuous curve, yd off unknown.
Mowers (1962)	Mylar D, two crystallinities 15% (1.35 sp gr) and 55% (1.39 sp gr)	Red Sec 2.54 x 0.63 x 0.051 cm, 2.54 x 3.2 x 0.051 cm and 0.25 x 0.51 x 0.051 cm; Instron, 0.042 cm s^{-1} xhd spd at 76 and 295 K, 0.0042 cm s^{-1} at 20 K.



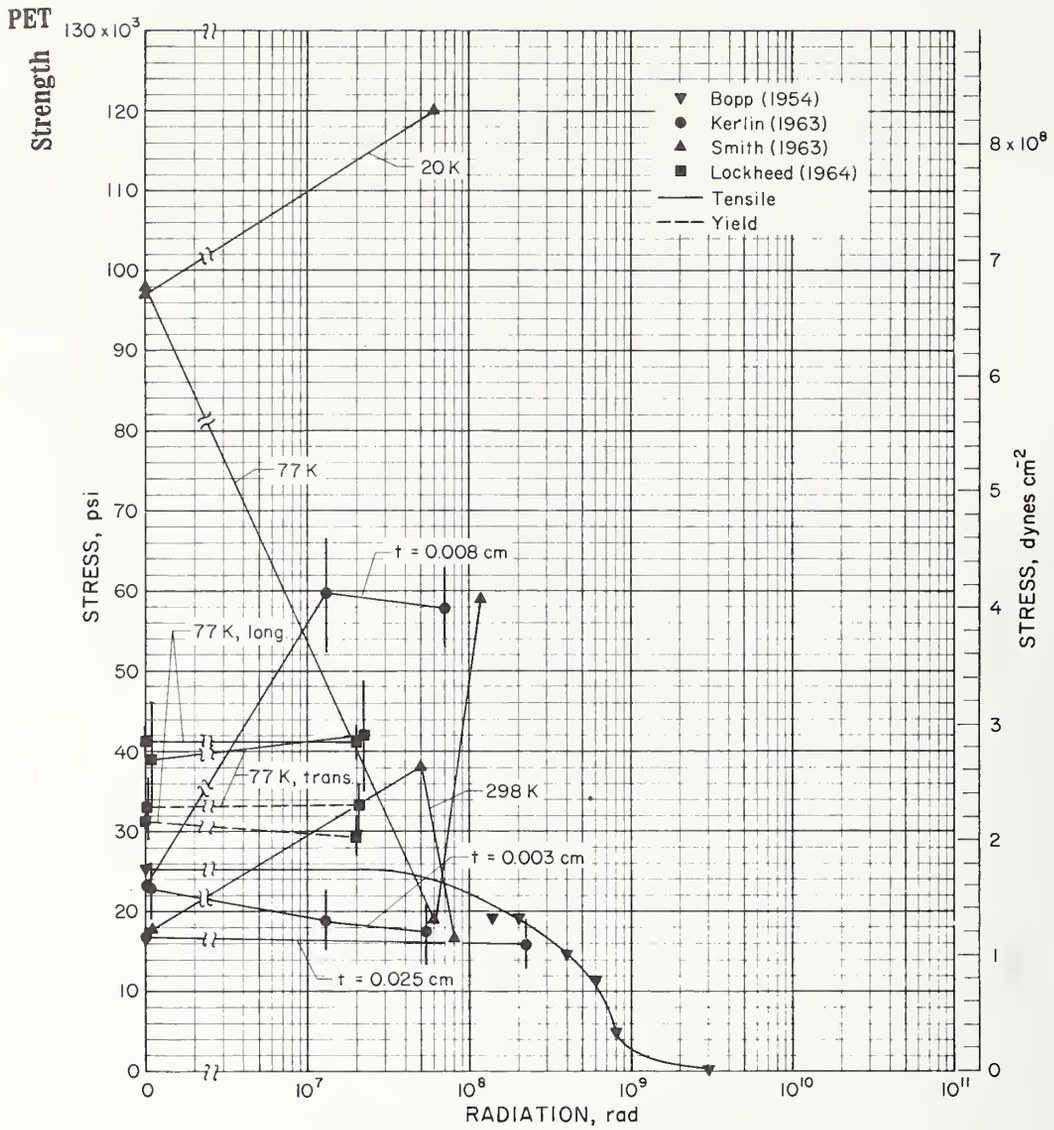
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Le Fave, Gamero, Moore (1964)	Mylar	
Hoggatt (1965)	Mylar A, D, and T	Mylar A: t = 0.0025, 0.0051, and 0.0191 cm, Mylar D and T: t = 0.0076 cm; ASTM D 1708-597 test procedure.



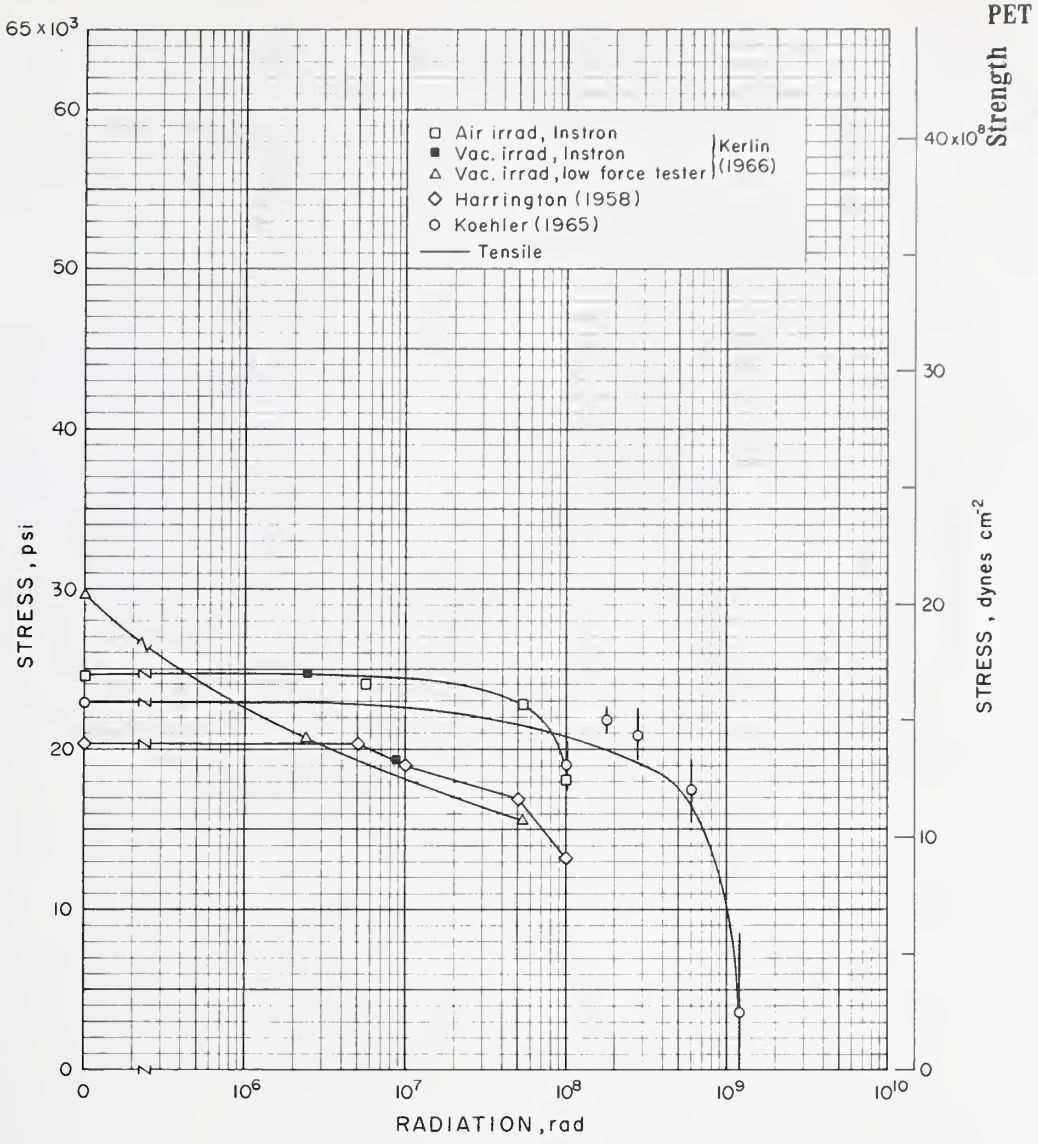
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Dixon, Jackson (1968)	Mylar sheet, cold injection molding (1500 kg/cm^2 injection pressure, 150 kg/cm^2 clamping pressure, 15 sec injection time) producing molecular weights of 29,000, 22,000 and 19,500. Molecular weights correspond to intrinsic viscosities of 0.86, 0.68 and 0.62 respectively. Sometimes 0.5 wt % talc added. Crystallinities of 40-44% produced by annealing 456 K 26 min.	1/2 size "BS 2782" specimens, GL = 2.5 cm; test method "301E", Hounsfield type E tensometer, $\dot{\epsilon}$ = 160% min^{-1}, higher temperatures controlled to ±1 K, strain extensometer.
Allison, Ward (1967)	Unoriented fiber	ℓ = 10 cm; Instron.
Eckert, Serafini (1967)	Mylar, extruded amorphous sheet, av molecular weight = 19,500, t = 0.015 cm; processed (A) by stretching at 358 K, heat setting at 463 K for 15, 120 sec (42-43% crystallinity); or (B) stretching at 368 K, heat setting at 463 K for 15 and 20 sec (43-45% crystallinity), biaxial stretch at 1000% per min to 3X.	2.54 cm wide specimens, cut transverse to film extrusion direction, GL = 10.16 cm; xhd spd = 5.08 cm min^{-1}; proportional limit.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Reed, Durcholz, Arvidson (1970)	Mylar A	Red Sec 2.54 x 0.51 cm, t = 0.0025, 0.0051 and 0.025 cm, Instron, 0.0127 cm min^{-1} xhd spd; 0.2% yd off; error bars indicate spread of data from 2-4 samples.



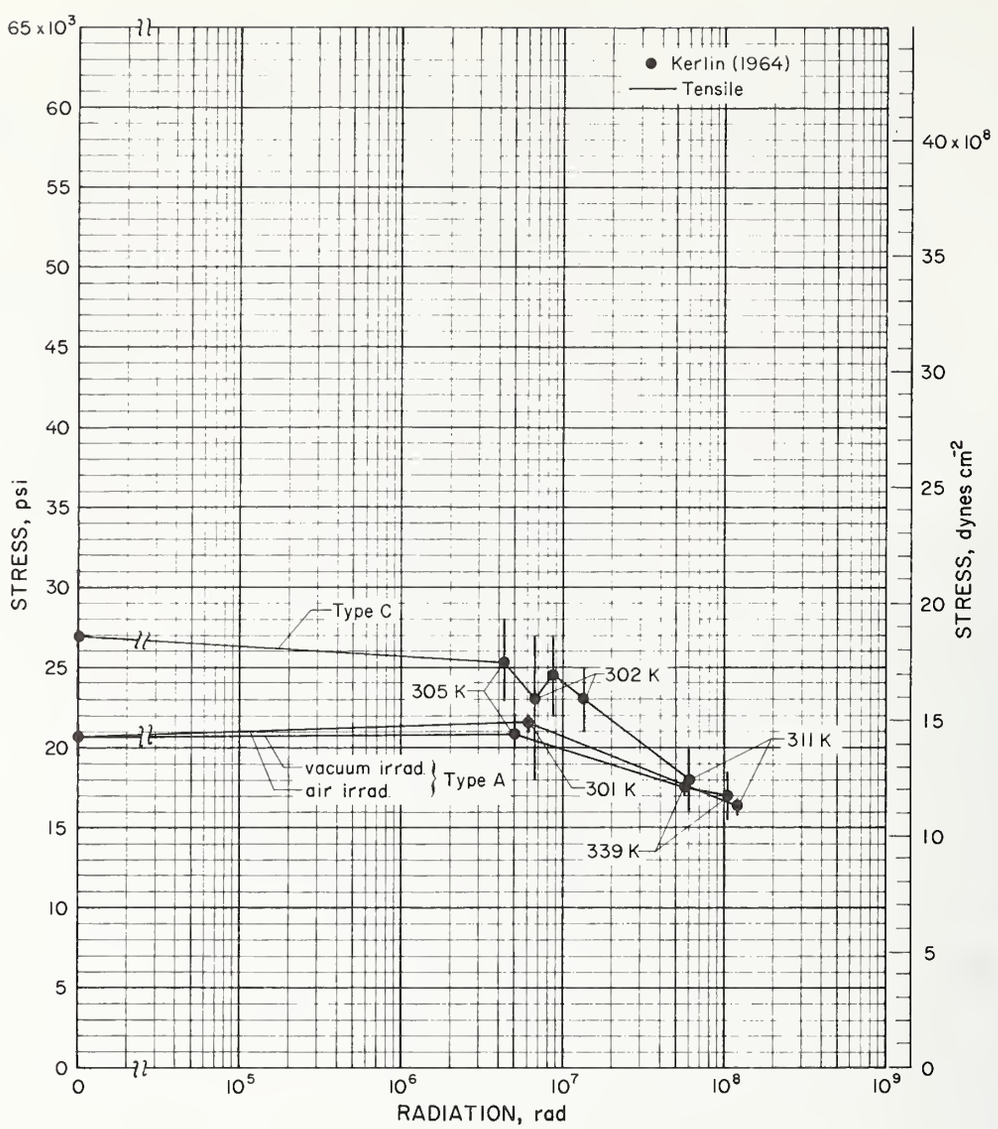
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bopp, Sisman (1954)	Mylar film	Irrad in ORNL Graphite Reactor.
Kerlin (1963)	Mylar, t = 0.025 cm; Mylar A, t = 0.008 cm; Mylar C, t = 0.003 cm	ℓ = 15.2 cm, w = 2.5 cm; ASTM D882-56T test procedure, Instron Model TT, 298-321 K; vacuum irrad by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth; av of 2-4 tests, error bars indicate standard deviation.
Smith (1963)	Mylar C	GL = 10.2 cm, w = 2.5 cm, t = 0.003 cm; Instron used at room temp, xhd spd = 0.021 cm s^{-1}; irrad in air and liquid H_2 and N_2 by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth; av of several tests.
Lockheed Missles and Space Co. (1964)	Mylar	t = 0.005 cm, ASTM D412-51T Type C die; Tinius Olsen Universal Test Machine Model RM-2, xhd spd = 0.0042 cm s^{-1}, 77 K; irrad in Radiation Effects Reactor at Dawsonville, Georgia operated at 10^6 watts; errors are standard deviation of 3-6 tests.



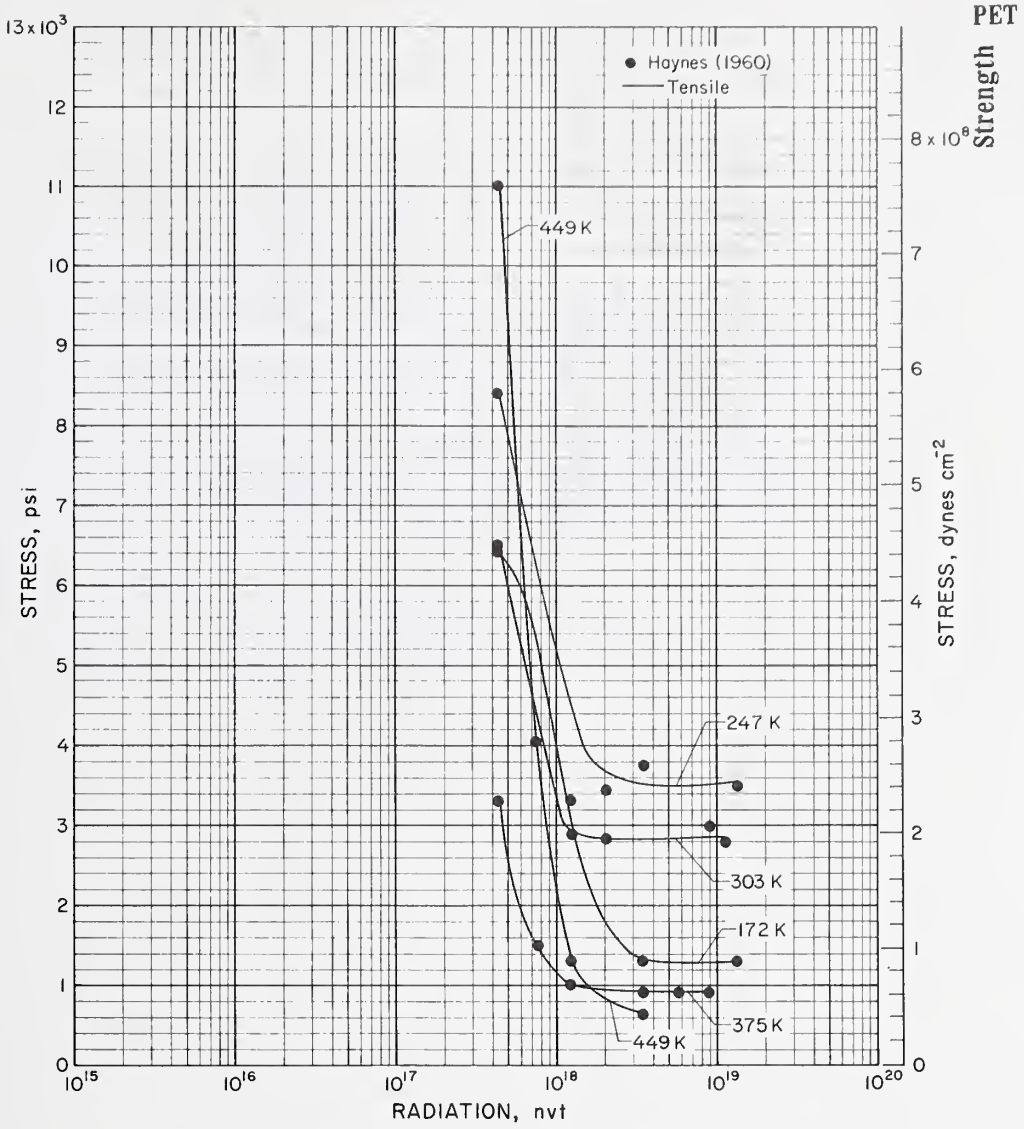
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Harrington, Giberson (1958)	Mylar A, 1.39 sp. gr.	t = 0.00762 cm; ASTM-D-412-51T procedures, Die C type dumbbell specimens, Scott tensile machine; irradiation in air at 298K, Co^{60} source, dose rate of 1.3×10^6 rad-h^{-1}.
Kerlin, Smith (1966)	Mylar 100C film	t = 0.00254 cm, Red Sec 2.54 x 15.24 cm; ASTM-D-882-61T procedures except for testing some specimens in "Low Force Tester" at xhd spd of 0.021 cm s^{-1}, other specimens tested in Instron at xhd spd 0.845 cm s^{-1}; irrad at Ground Test Reactor, NARF, G.D., Ft. Worth, Texas.
Koehler, Measday , Morrill (1965)	Mylar	t = 0.00254 cm, GL = 0.635 cm; Instron, $\dot{\epsilon}$ = 0.00423 s^{-1}; radiation source: proton beam of Harvard (Cambridge, Mass.) synchrocyclotron , max-dose quoted, considerable variation of dose along specimen length (factor of 3), central 0.3175 cm uniform dose.

PET

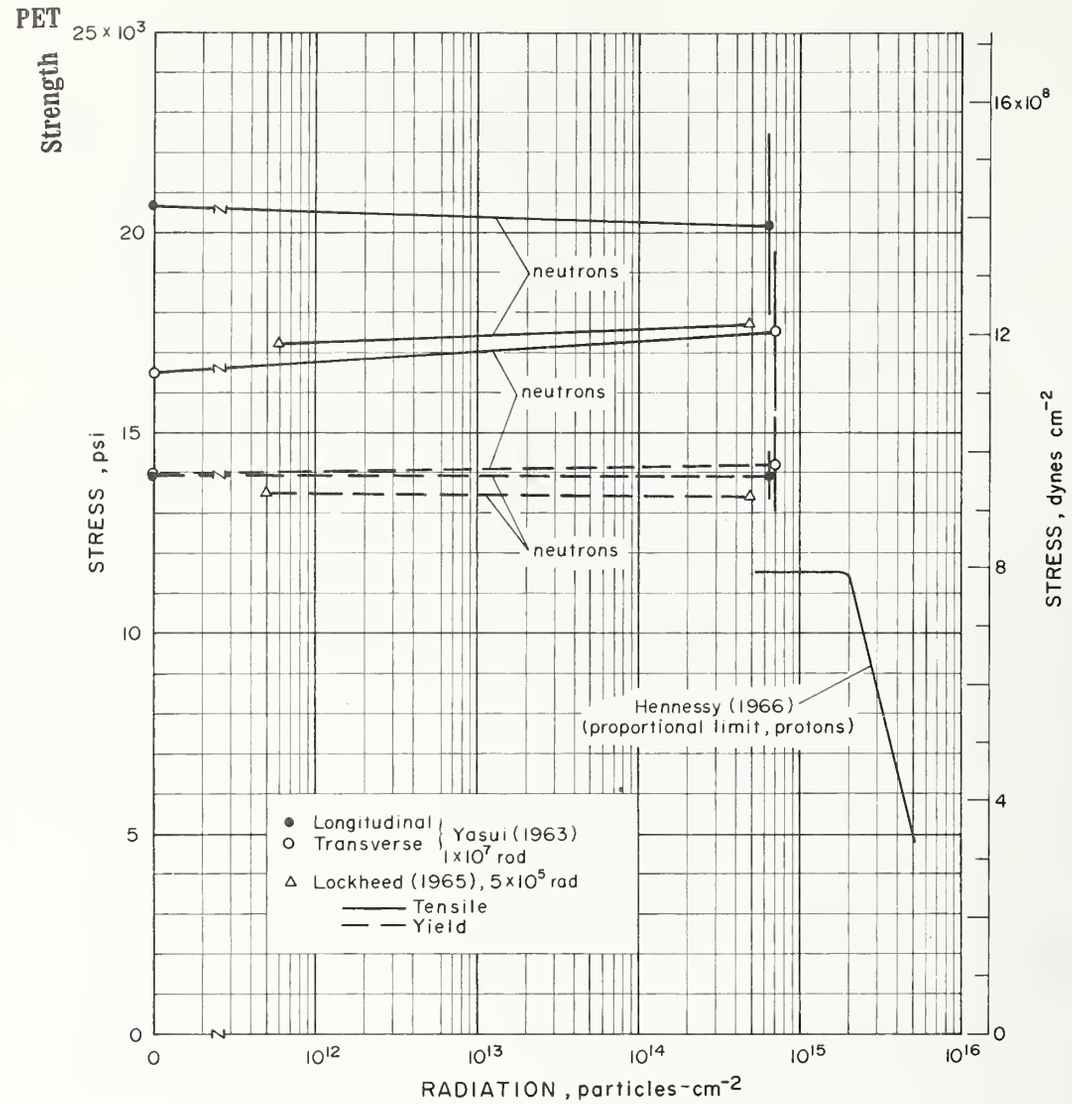
Strength



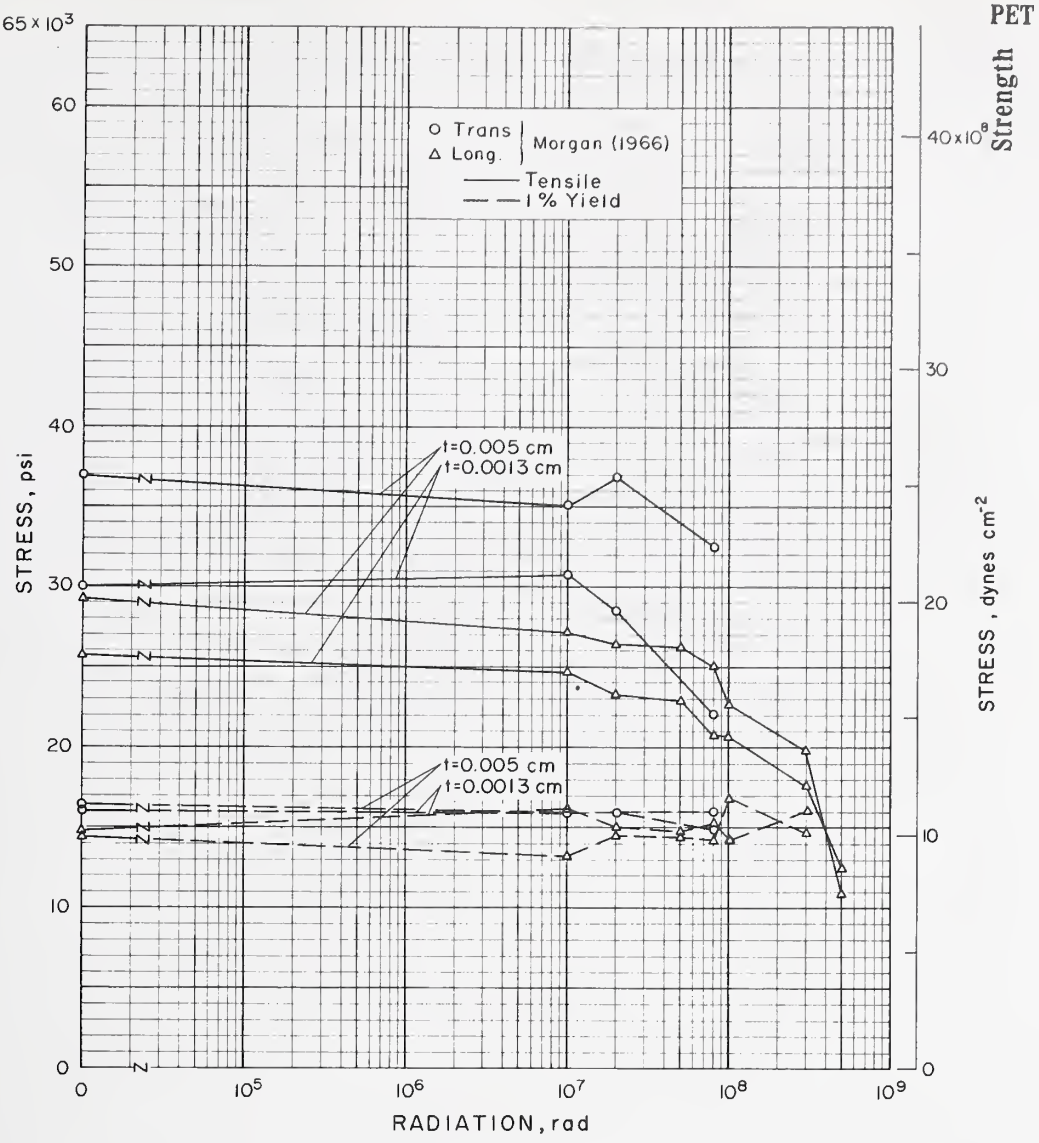
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kerlin, Smith (1964)	Mylar A and C	w = 2.54 cm, t = 15.24 cm; ASTM D882-56T test procedure, xhd spd = 0.85 cm s^{-1}; irrad in vacuum and air by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth, temp of irradiation noted.



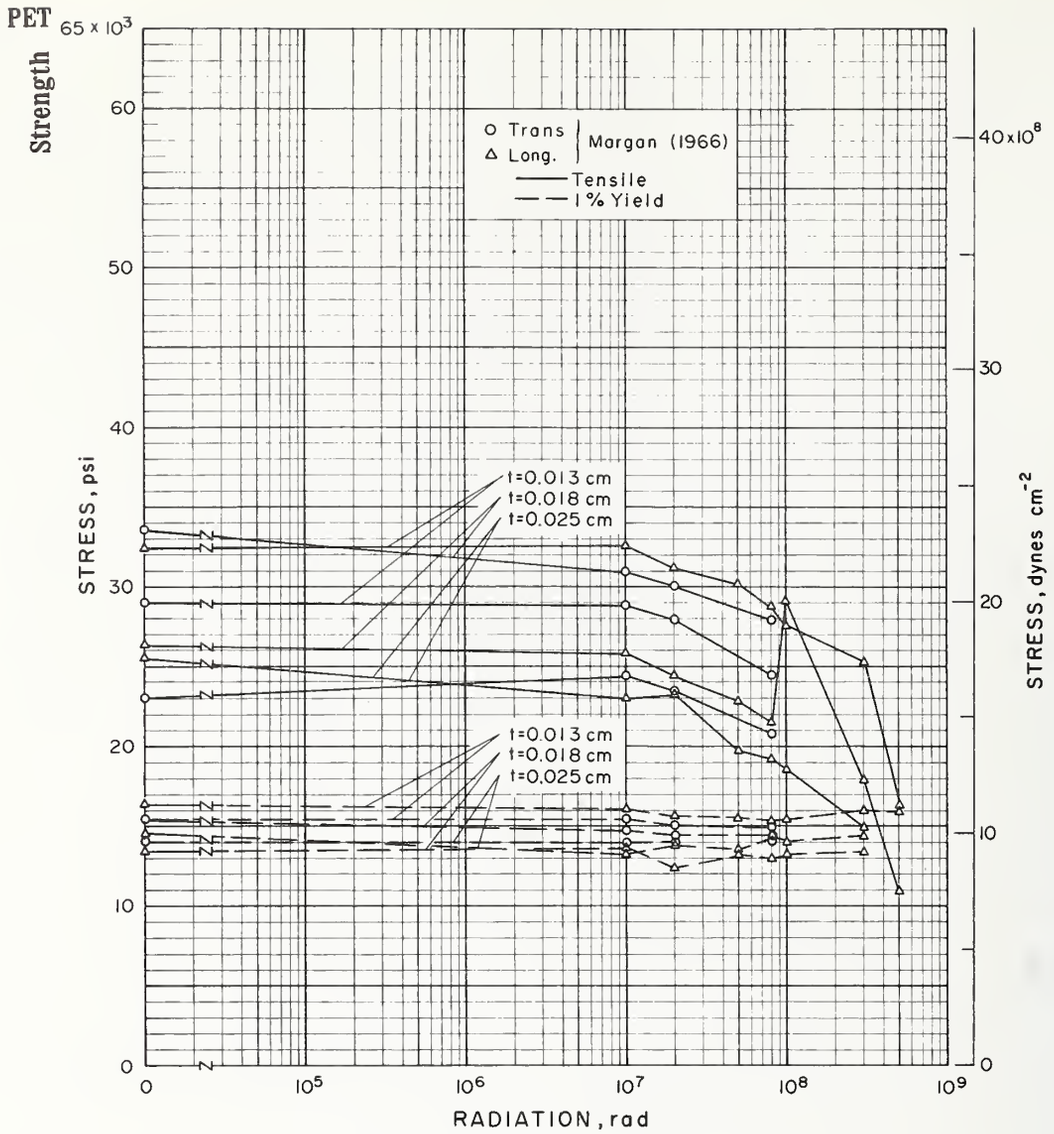
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Haynes, Hsiao (1960)	Mylar, biaxially oriented	Specimens cut ∥ to a biaxial direction, ℓ = 10.1 cm, Red Sec = 1.3 x 0.65 x0.027 cm; $\dot{\epsilon}$ = 0.0033 s^{-1}; sealed in Al containers and irrad in the Material Testing Reactor.



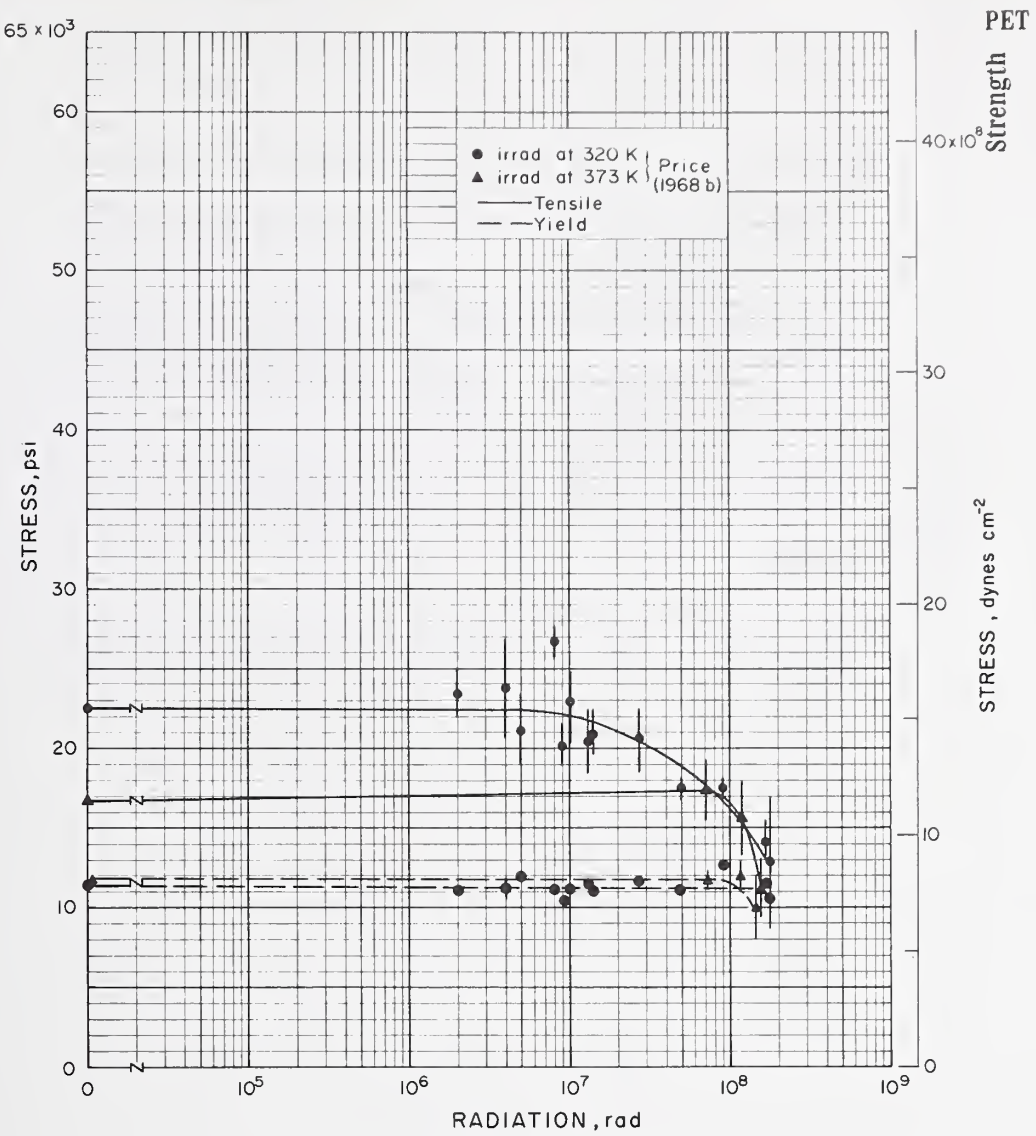
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Hennessy, More (1966)	Mylar D	t = 0.025 cm; 0.0085 cm s^{-1} xhd spd
Yasui (1963)	Mylar	t = 0.00254, GL = 5.08 cm, w = 0.635 cm; 0.021 cm s^{-1} xhd spd, ASTM-D412-51T procedures, Type C die, Tinius-Olsen; radiation source: Radiation Effects Reactor, Lockheed, Dawsonville, Ga., at ambiant temp.
Lockheed (1965)	Mylar	ASTM D638-61T procedures, 9-13 specimens per irradgroup; irradiation source: Radiation Effects Reactor, Lockheed, Dawsonville, Ga., temp rise in specimens < 10K during irradiation, in vacuum.



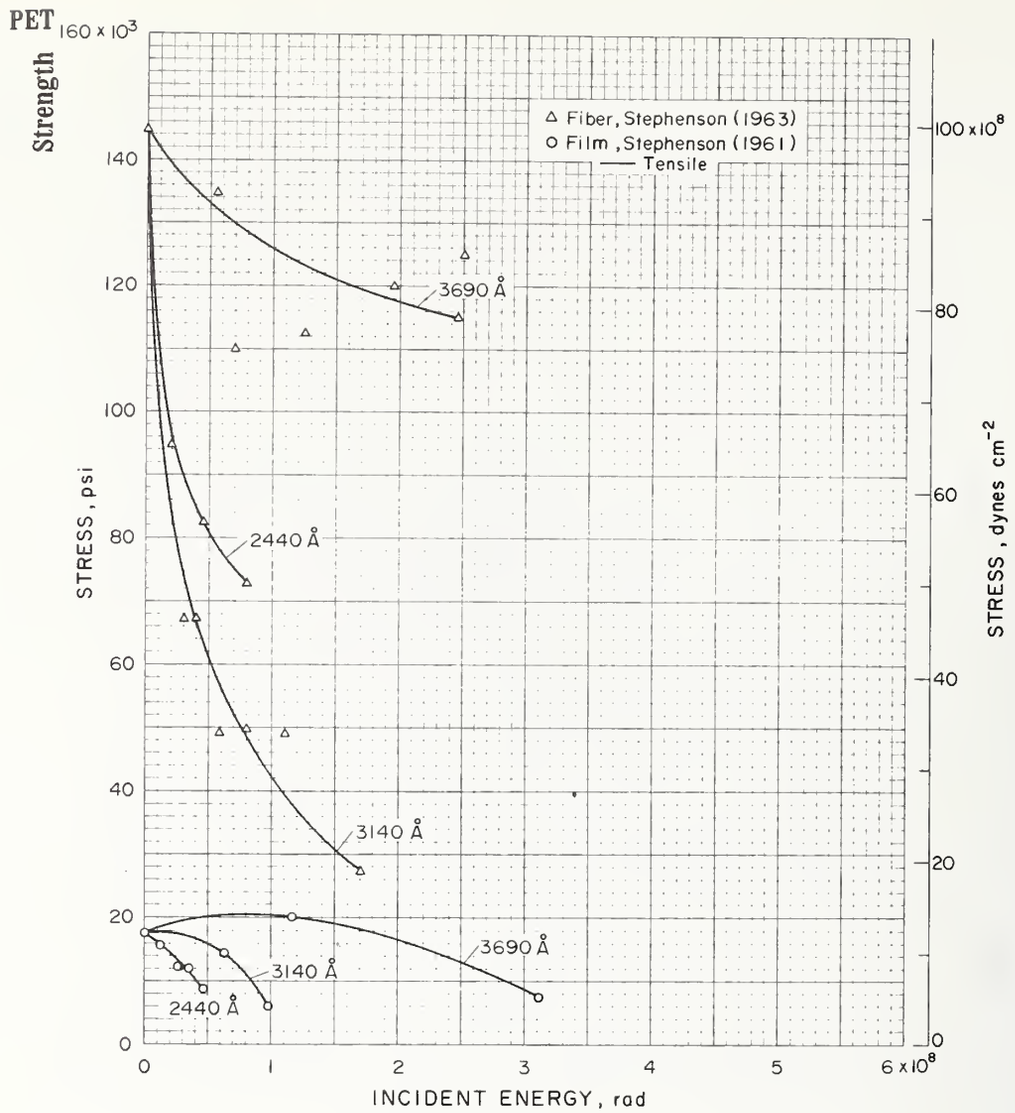
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Morgan, Sheldon, Stapleton (1966)		Specimens 10.2 x 1.3 cm cut from both machine and trans directions of roll, film as supplied, approximately 40% crys; irrad at 303K in air with spent fuel element assembly at A.E.R.E. Harwell, tested at 296K with an Instron.



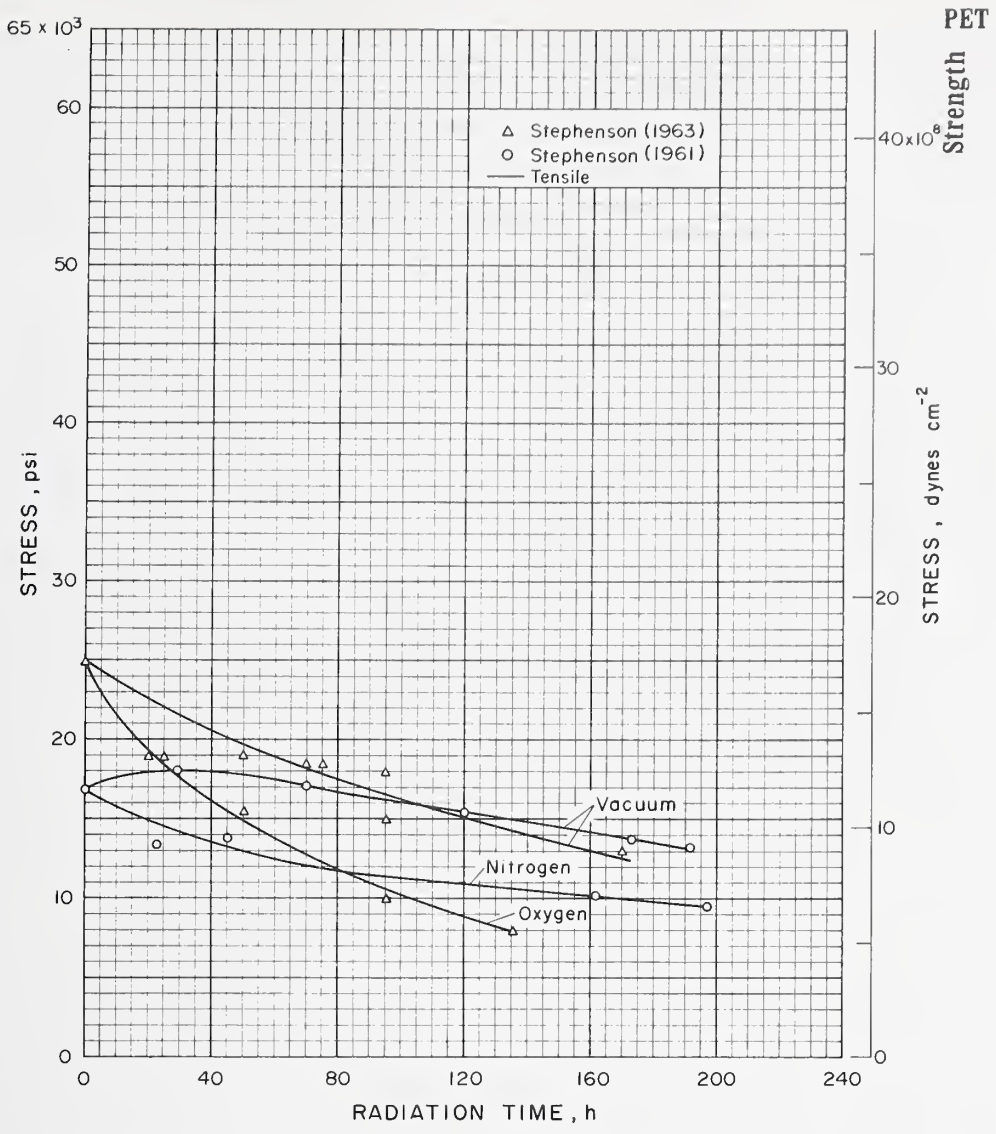
INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONOITIONS
Morgan, Sheldon, Stapleton (1966)		Specimens 10.2 cm x 1.3 cm cut from both machine and trans directions of roll, film as supplied approximately 40% crys; irrad at 303K with spend fuel element assembly at A.E.R.E. Harwell, tested at 296K with an Instron.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Price (1968b)	Mylar, sp gr = 1.395	7.6 x 1.27 x 0.0025 cm Red Sec, GL = 7.6 cm; degassed 3 days in pyrex tubes at 320 K and 10^{-6} Torr; 0.0085 cm s^{-1} xhd spd, $\dot{\epsilon}$ = 0.011 s^{-1}, 0.2% yd off; irrad with Co^{60} at rate of 1.6 x 10^{6} rad h^{-1} and 320K.



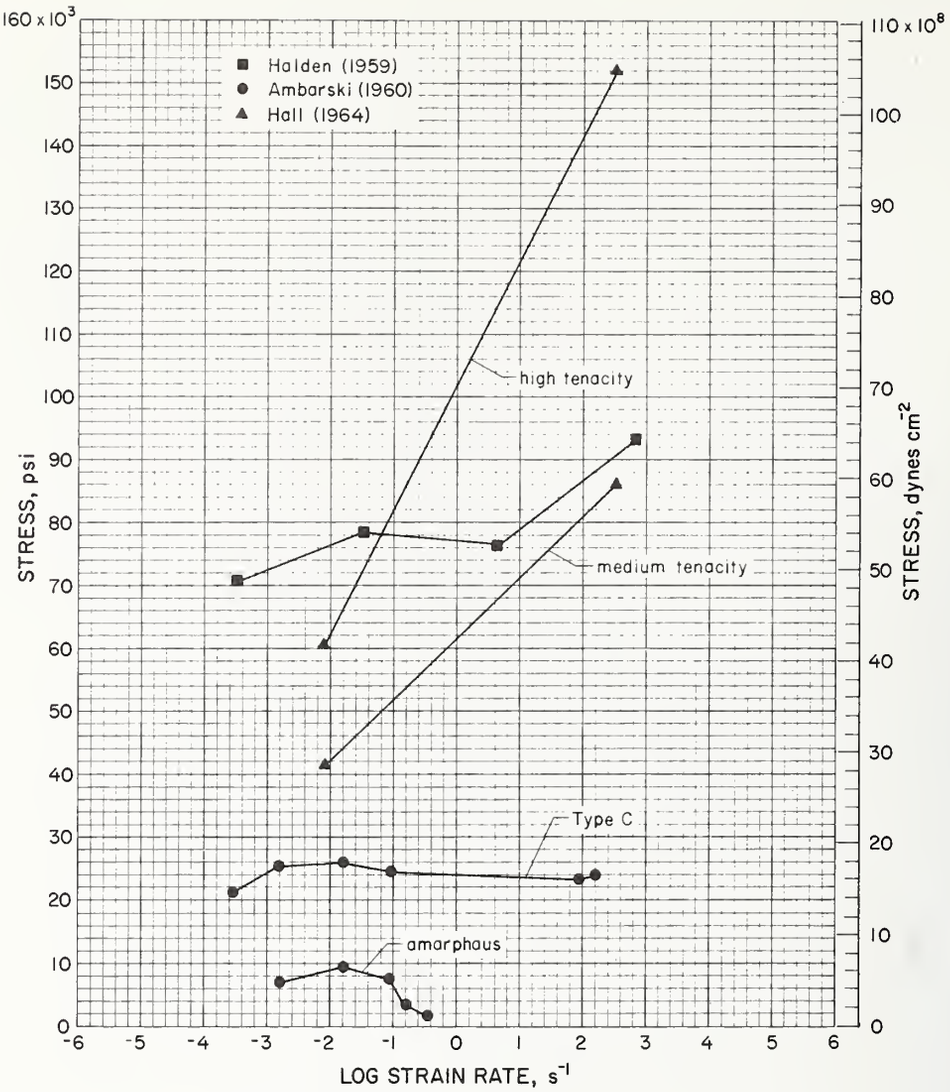
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Stephenson, Moses Wilcox (1961)	Mylar C	t = 0.000635 cm; ASTM D882-49T procedures, Instron; ultraviolet radiation sources: General Electric G30T8 lamp emitting 90% of radiation at 2537Å, samples placed in quartz tubes and flushed with nitrogen.
Stephenson, Wilcox (1963)	Dacron fiber (44 denier)	ASTM D882-491 procedures. Instron: ultraviolet ratiation source: General Electric G30T8 lamp emitting 90% of radiation at 2537Å; General Electric A-H6 Hg vapor lamp, high P, 1000 watts, broad spectrum of radiation with intensity pulse at 2440, 3140, and 3690Å, monochromator (Bausch and Lomb) slits (132Å wide) used to select radiation, irrad in nitrogen.



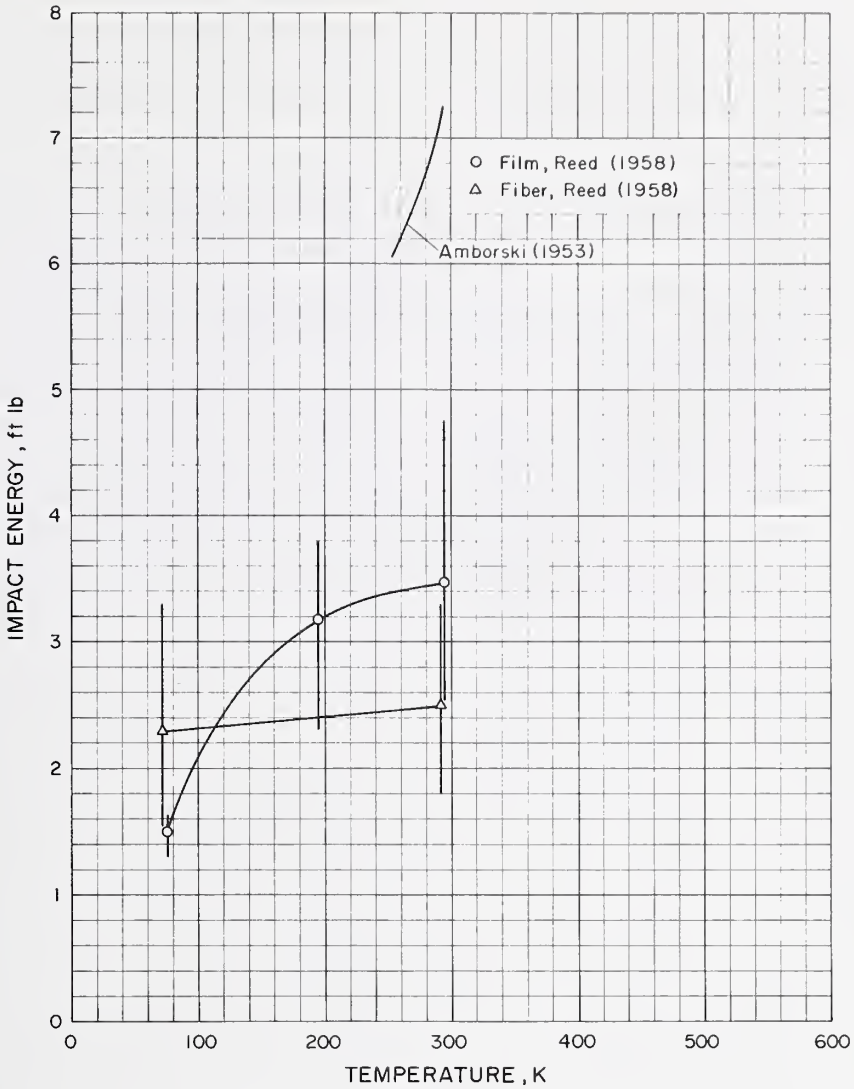
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Stephenson, Moses, Wilcox (1961)	Mylar C	t = 0.00635 cm; ASTM-D-882-49T procedures, Instron.; ultraviolet radiation sources = General Electric C30T8 Hg vapor lamp emitting 90% of radiation at 2537Å, General Electric A-H6 Hg vapor lamp, high P, 1000 watts, broad spectrum of radiation with intensity peaks at 2440, 3140, and 3690Å, monochromator (Bausch and Lomb) slits (132 Å wide) used to select radiation, irrad in vacuum.
Stephenson, Wilcox (1963)	Mylar film, Dacron fibers (4.4 denier)	t (Mylar) = 0.000635 cm, diam (Dacron) = 0.00254 cm; ASTM-D-882-49T procedures, Instron ; ultraviolet radiation sources: General Electric G30T8 Hg vapor lamp, emitting 90% of radiation at 2537Å, General Electric A-H6 Hg vapor lamp, high P, 1000 watts, broad spectrum of radiation with intensity peaks at 2440, 3140, and 3690Å, monochromator (Bausch and Lomb) slits (132Å wide) used to select radiation, irrad at 10^{-6} Torr.

PET

Strength



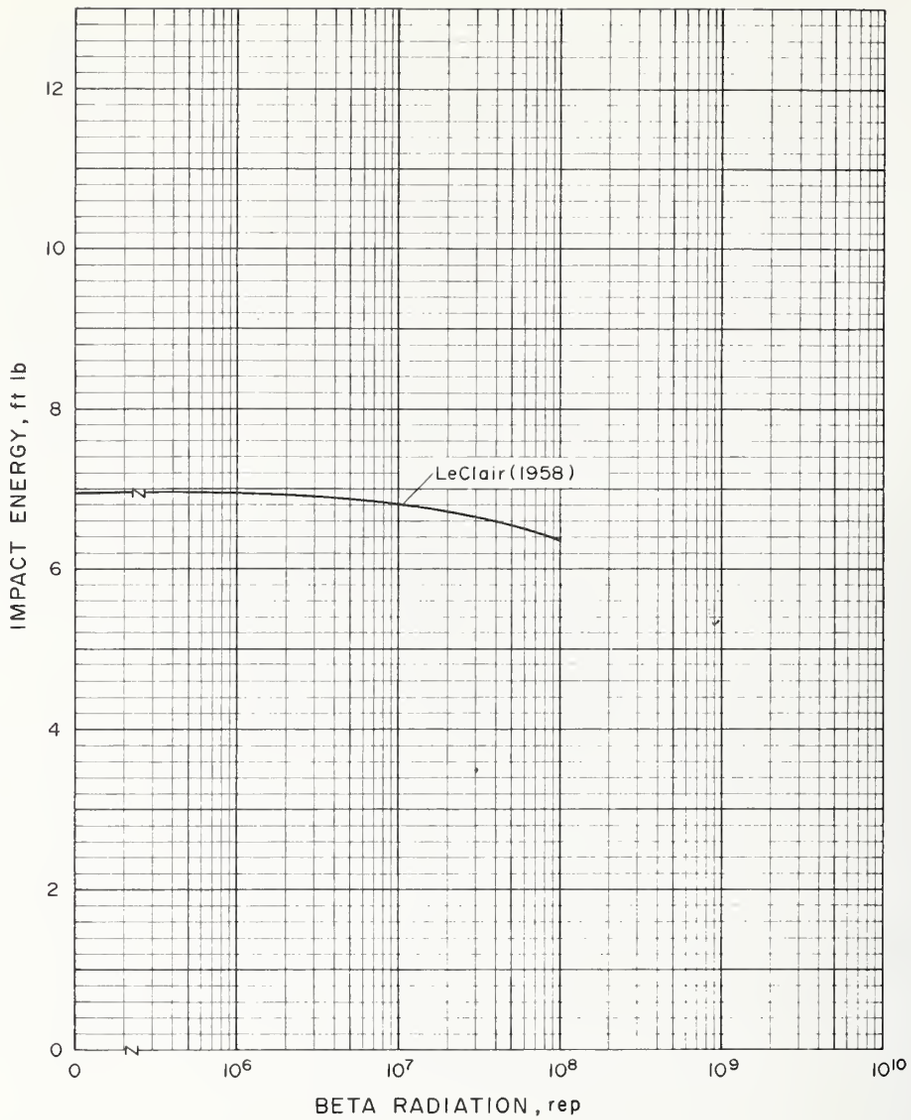
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Holden (1959)	Terylene, 3 filament yarn	Dried over silica gel at 293 K for 24 h then allowed to reach equilibrium at 293 K and 65% rel hum; low $\dot{\varepsilon}$ on Instron, 10 tests; high $\dot{\varepsilon}$ on impact device, 16 tests.
Amborski, Mecca (1960)	Amorphous film and Mylar C	Long. specimens; 296. 5 K, 50% rel hum.
Hall (1964)	Terylene microdull high tenacity, 24 filaments; Terylene dull medium tenacity, 48 filaments	GL = 5 cm; 295 K, 65 ± 4% rel hum; end correction used at high $\dot{\varepsilon}$.



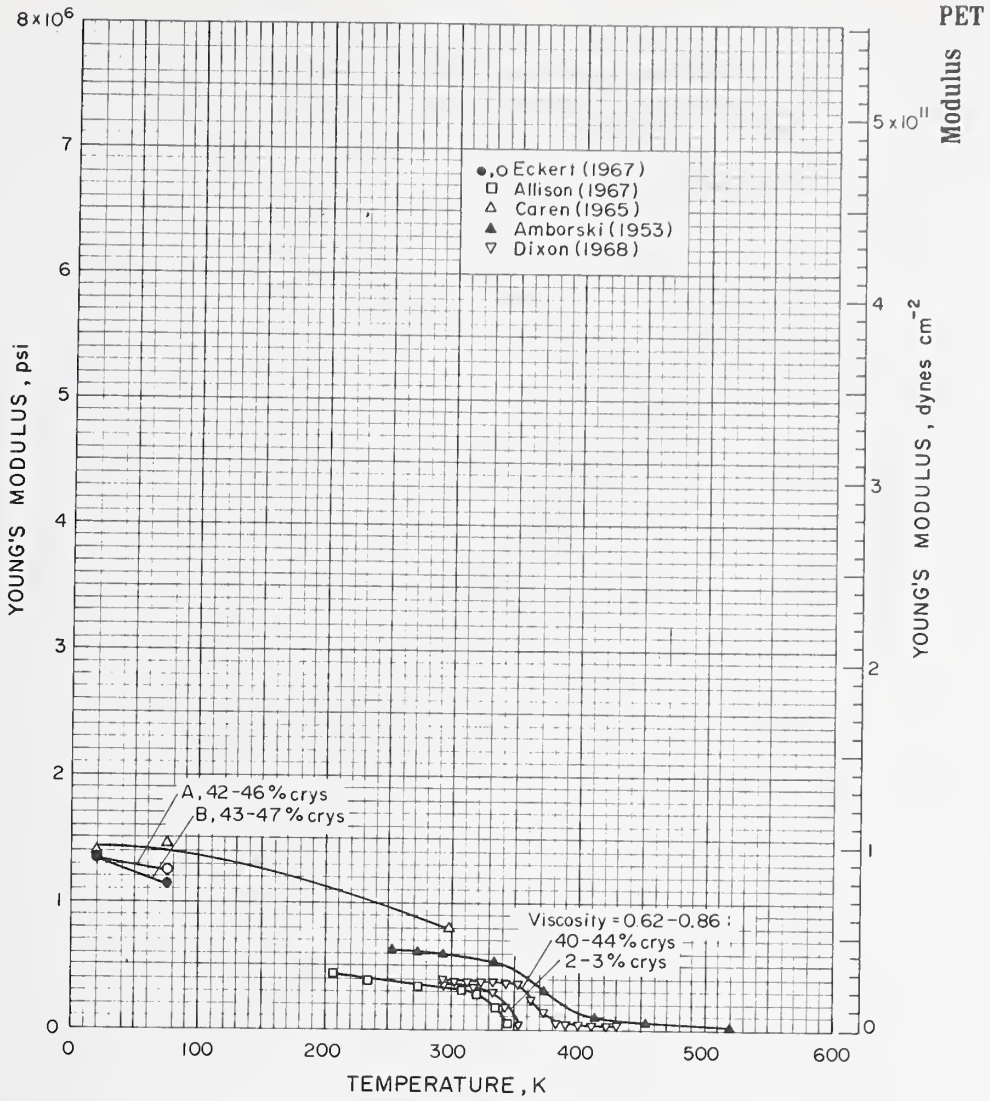
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Reed, Mikesell (1958)	Mylar	xsec area = 0.0122 cm^2, ℓ = 10.7 cm; standard pendulum test, stress rates of 6.8 kg used, hammer dropped from 1.2 m with velocity of 4.9 m s^{-1}.
Reed, Mikesell (1958)	Dacron, braided continuous filaments	xsec area = 0.00585 cm^2, ℓ = 11.8 cm; standard pendulum test, stress rates of 6.8 kg used, hammer dropped from 1.2 m with velocity of 4.9 m s^{-1}.
Amborski, Flierl (1953)	Mylar	

PET

Impact

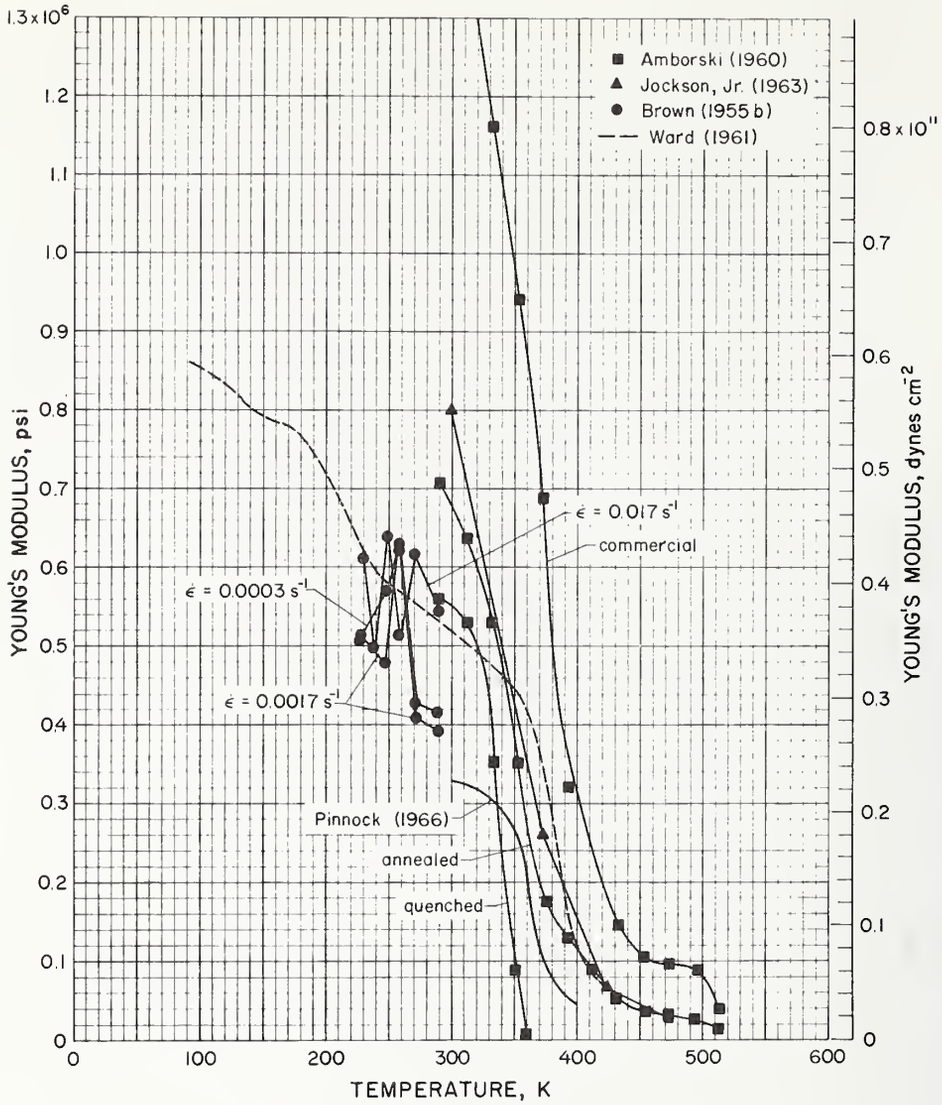


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
LeClair, Cobbs (1958)	Mylar film, type A and C	Test conducted using falling ball, dropped through film, charge in kinetic energy of ball assumed = to energy absorbed during impact; electron irradiation from 2 Mev Van de Graaff accelerator.

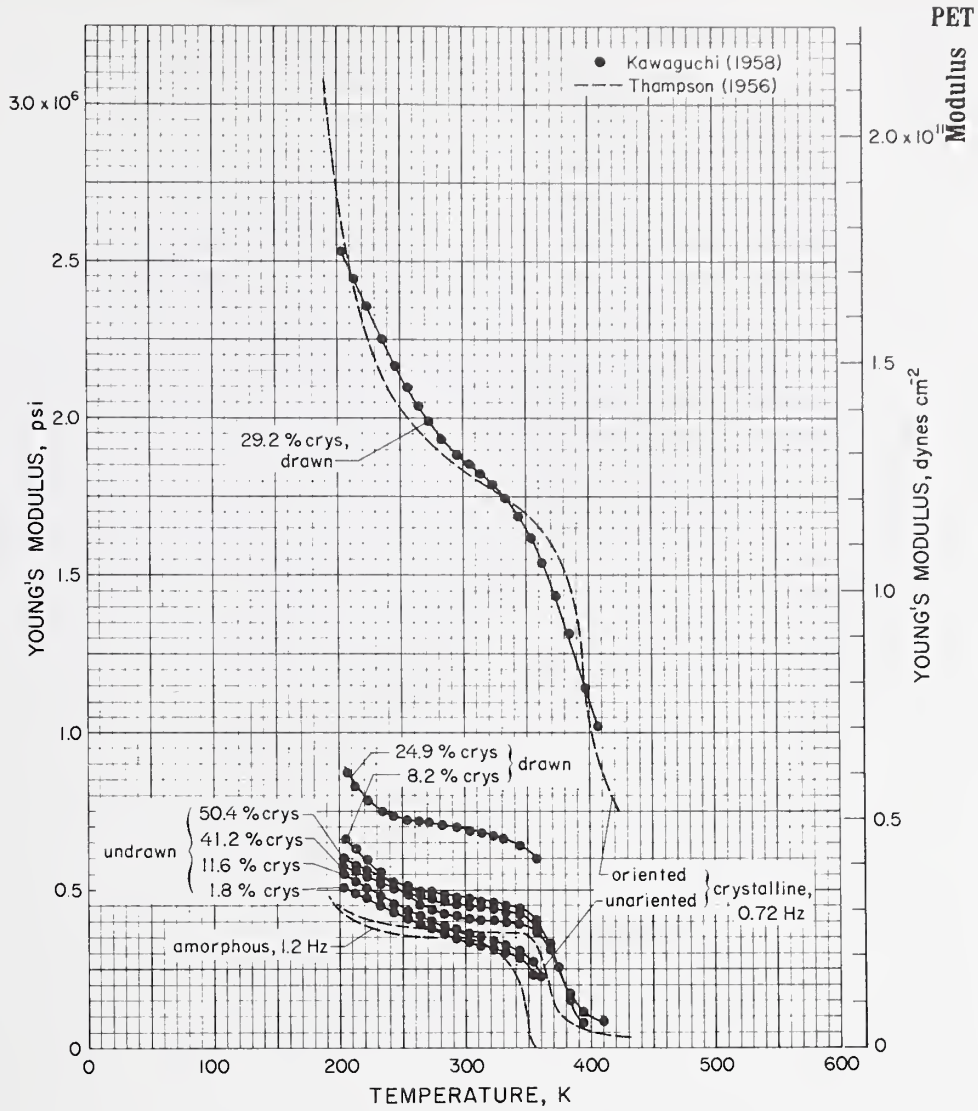


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Caren, Coston, Holmes, Dubus (1965)	"plain" Mylar film	0.0254 cm thick, Red Sec 7.62 cm long x 1.27 cm wide; strain gage extensometer. Assume data presented is in error by a factor of 10 (too high).
Dixon, Jackson (1968)	Mylar sheet, cold injection molding (1500 kg/cm^2 injection pressure, 150 kg/cm^2 damping pressure, 15 sec injection time) producing molecular weights of 29,000, 22,000 and 19,500. Sometimes 0.5 wt % talc added. Crystallinities of 40-44% produced by annealing 456 K, 26 min.	1/2 size "BS 2782" specimens, GL = 2.5 cm, test method "301E", Hounsfield type E tensometer, $\dot{\epsilon}$ = 160% min^{-1}, higher temperatures controlled to ±1 K, strain extensometer.
Allison, Ward (1967)	Unoriented fiber	ℓ = 10 cm; Instron.
Amborski, Flierl (1953)	Mylar	0.00254 cm thick, constant rate of elongation (100% min^{-1}), Instron.
Eckert, Serafini (1967)	Extruded amorphous sheet, av molecular weight = 19,500; 0.015 cm thick; processed by (A) stretching at 358 K, heat setting at 463 K or 483 K for 15 sec (42-46% crystallinity); (B) stretching at 358 K, heat setting at 463 K or 483 K for 120 sec (43-47% crystallinity). Biaxial stretch at 1000% min^{-1} to 3X.	

PET



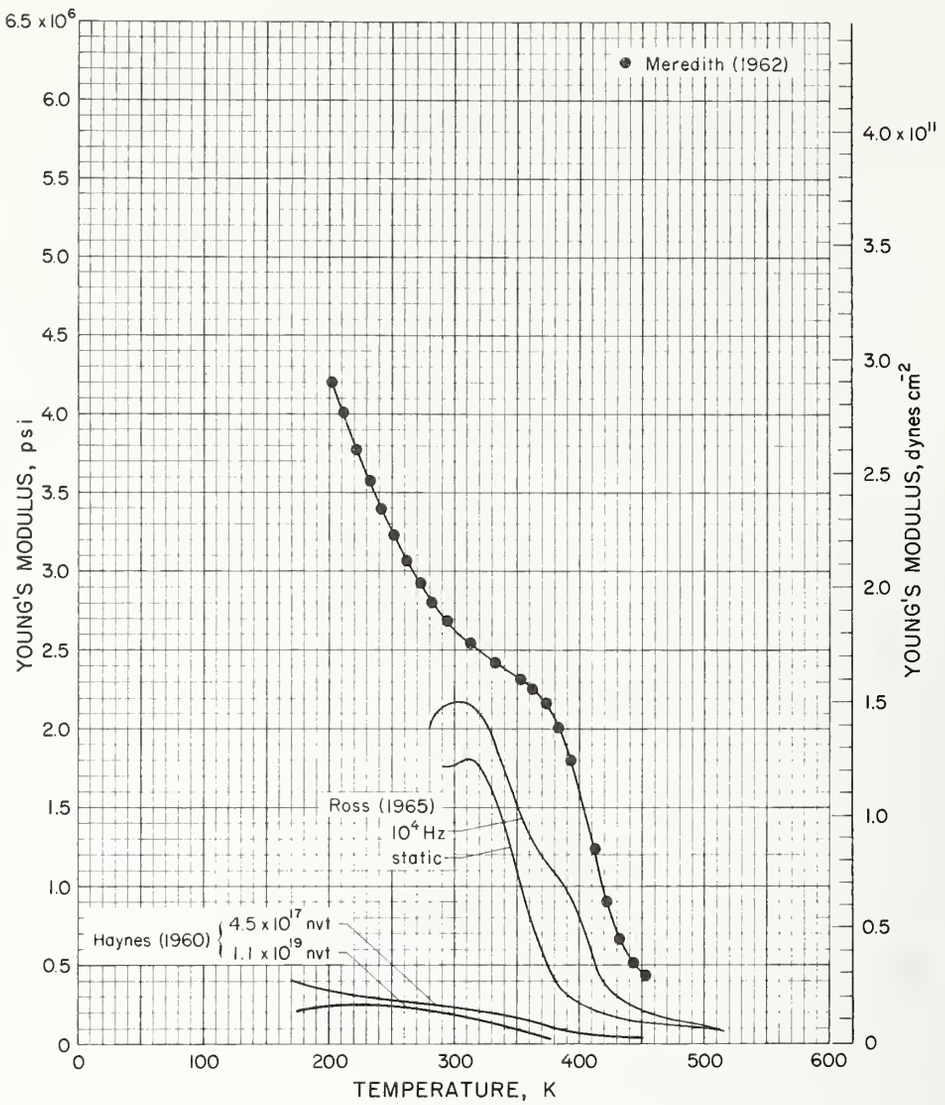
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Brown (1955b)	Dacron as received; fiber annealed to complete crystallization; fiber quenched from melt	GL = 5.1 cm; Instron, xhd spd = 0.0085 cm s^{-1}, extended 1.2-1.3%.
Amborski, Mecca (1960)	Mylar C	Long. specimens; Instron.
Ward (1961)	Heat-crystallized, isotropic	Rod-shaped specimens in cantilever, frequency range = 10^3 Hz.
Jackson, Jr., Caldwell (1963)		Film; Instron, ASTM D882-61T, Method A test procedure.
Pinnock, Ward (1966)	Melt-spun fibers, heat-crystallized to 33%	ℓ = 10 cm; sinusoidal stain of $\pm$ 0.25% at 0.1 Hz.



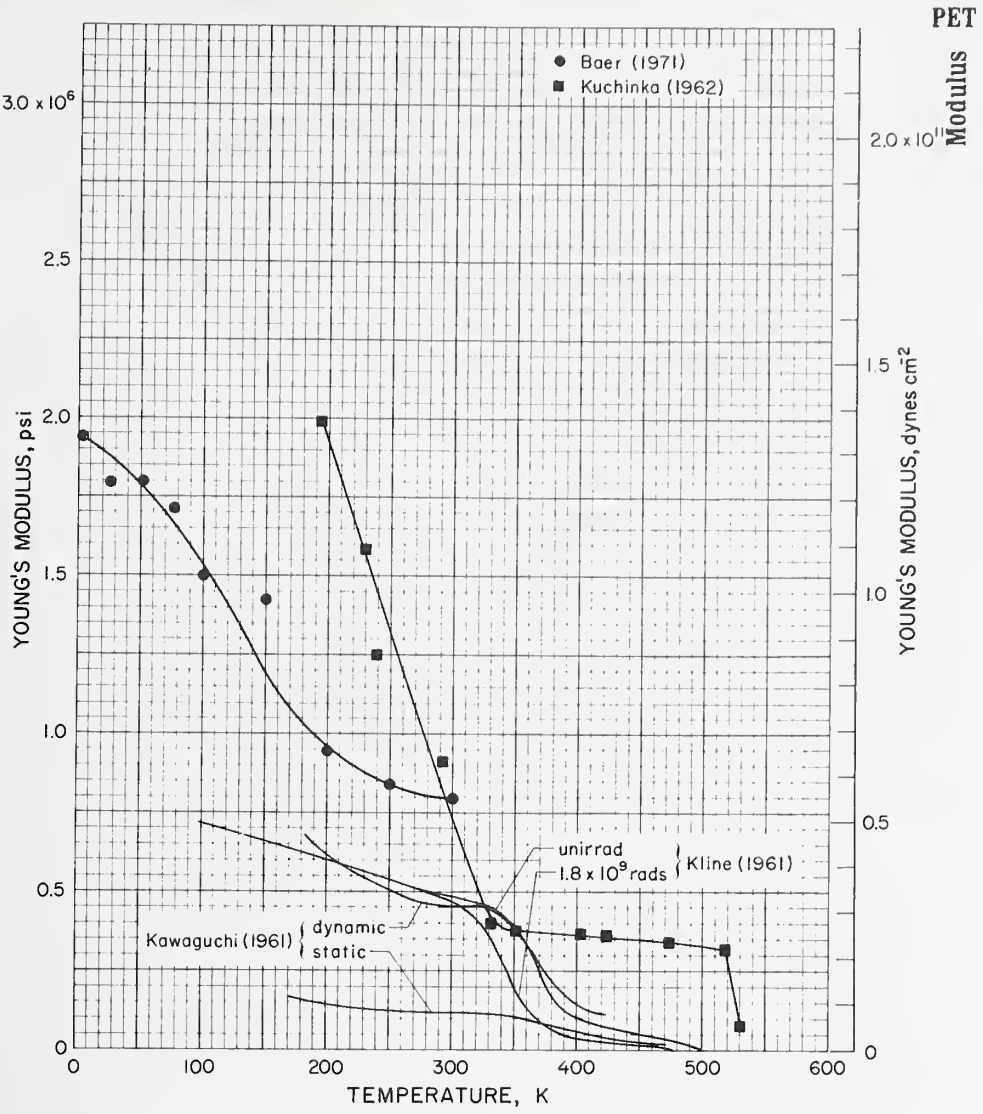
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thompson, Woods (1956)	Chips with molecular weight = 15,000, melted at 558 K, fibers extruded	ℓ = 50 cm; results also presented for frequencies from 10^{-3} - 10^{4} Hz.
Kawaguchi (1958)	Untreated, birefringence = 0.005, 1.8% crys; annealed in N_2 for 30 min at 373 K, 11.6% crys; annealed in N_2 for 30 min at 423 K, 41.2% crys; annealed in N_2 for 30 min at 473 K, 50.4% crys; draw ratio = 3, birefringence = 0.023, 8.2% crys; draw ratio = 5, birefringence = 0.105, 24.9% crys; draw ratio = 7, 29.2% crys; all specimens dried in vacuum over P_2O_5 at 298 K for 1 week	Monofilament, diam ≃ 0.04 cm; cantilever vibration method, 100-200 Hz.

PET

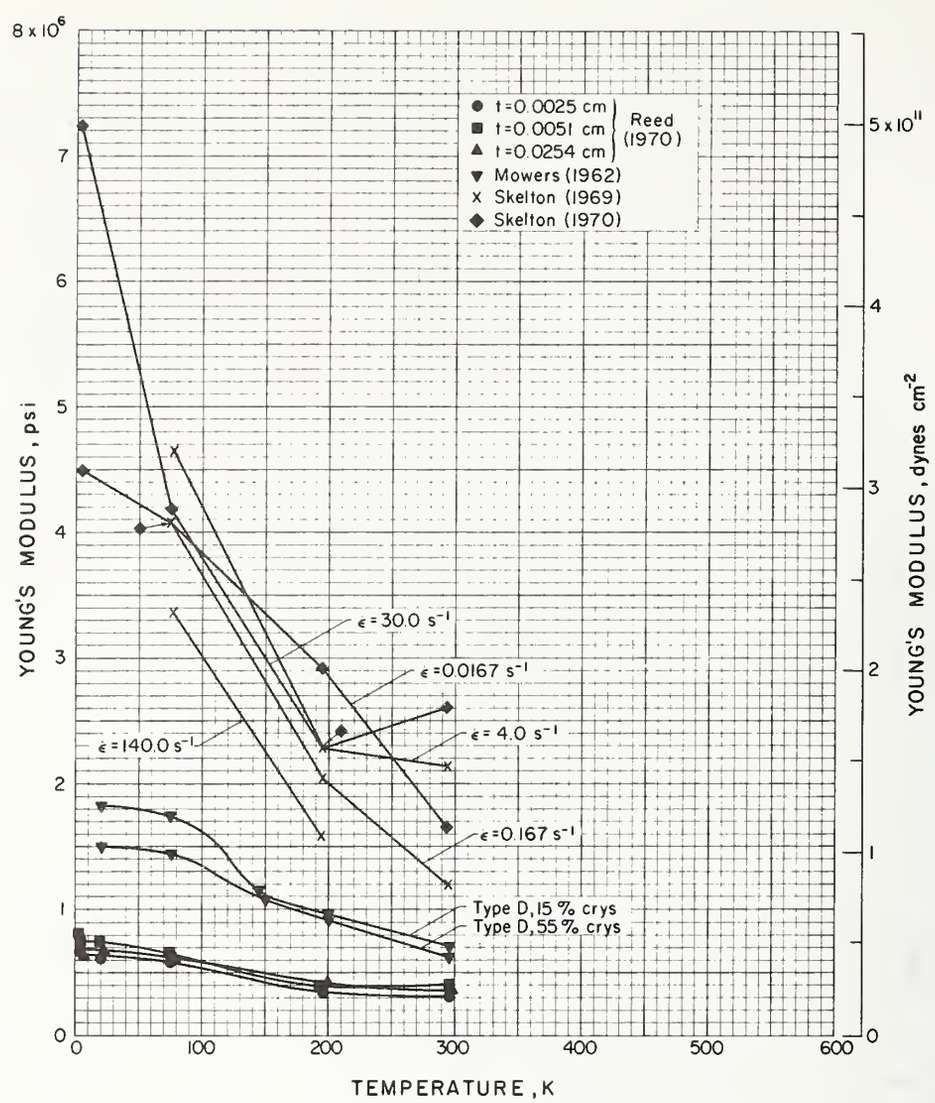
Modulus



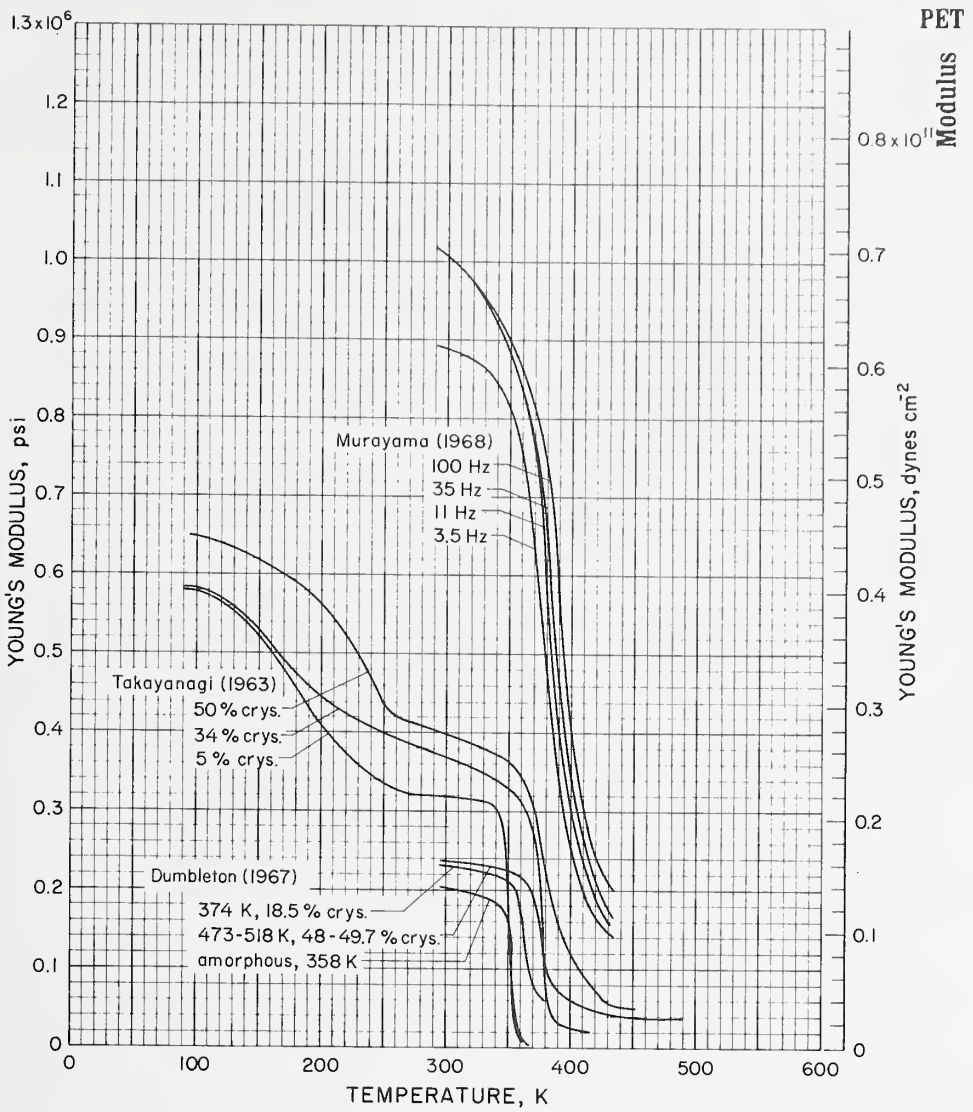
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Meredith, Hsu (1962)	Terylene, sp gr = 1.38, heated at 443 K for 10 min under 0.04 psi tension	Single fiber, denier 150 (72); electrostatic method of exciting lateral vibrations.
Ross (1965)	Dacron, 140-68-0 type 55	Static tests performed at ϵ = 1% and $\dot{\epsilon}$ = 0.002 s^{-1} on an Instron, dynamic tests performed using sonic techniques with the Pulse Propagation Meter.
Haynes, Hsiao (1960)	Mylar, biaxially oriented	ℓ = 10.1 cm, Red Sec 1.3 x 0.65 x 0.27 cm, specimens cut ‖ to biaxial directions; 12.0 s^{-1} nominal $\dot{\epsilon}$.



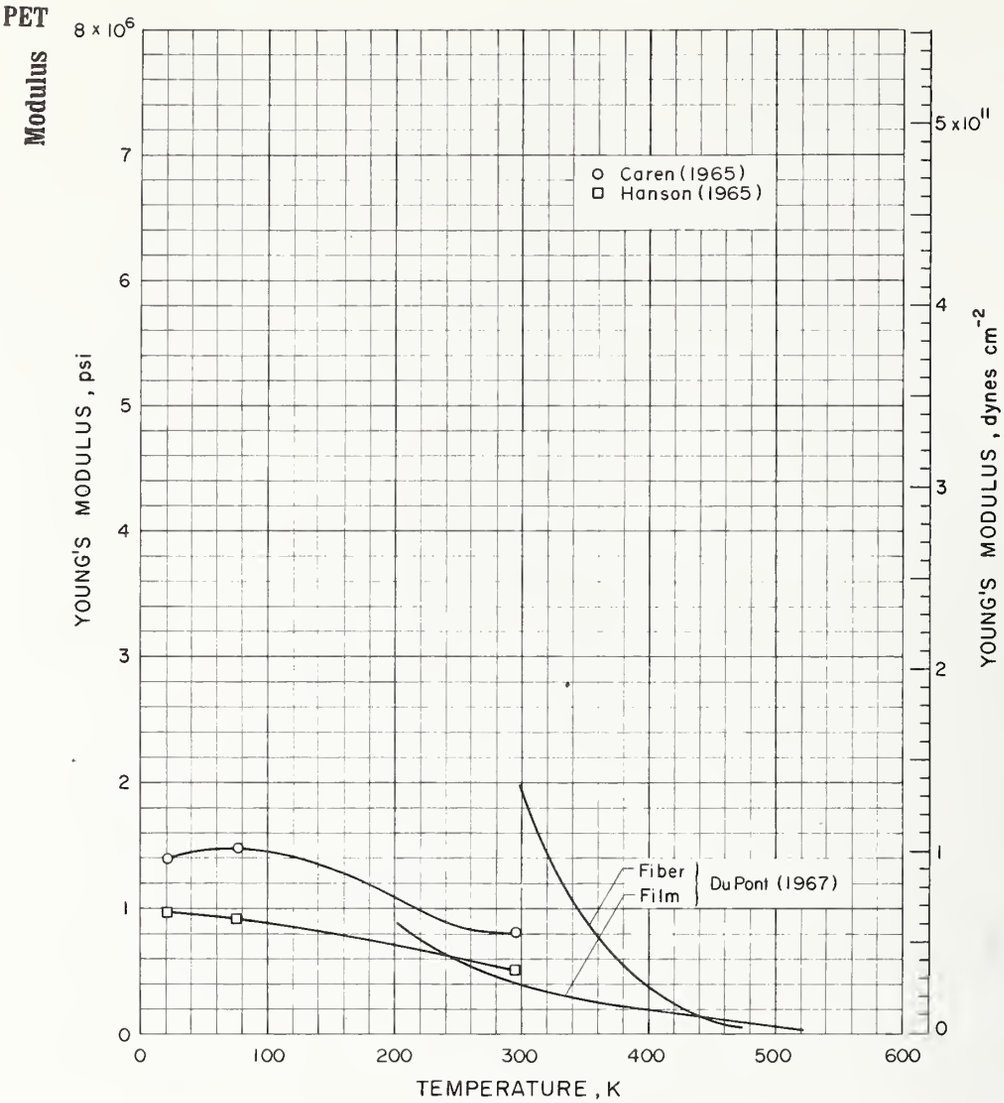
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kawaguchi (1961)		Filament.
Kline, Sauer (1961)	Injection molded rod, sp gr = 1.386, 52% crys, molecular weight = 25,000	Turned to ℓ = 11.18 cm, diam = 0.864 cm; dynamic measurements; irrad in nuclear reactor, results also presented for intermediate doses.
Kuchinka (1962)		Fiber.
Baer, Hiltner, Kastelic (1971)	Mylar 100A, biaxially oriented	t = 0.0025 cm; $\dot{\epsilon}$ = 0.00017 s^{-1}.



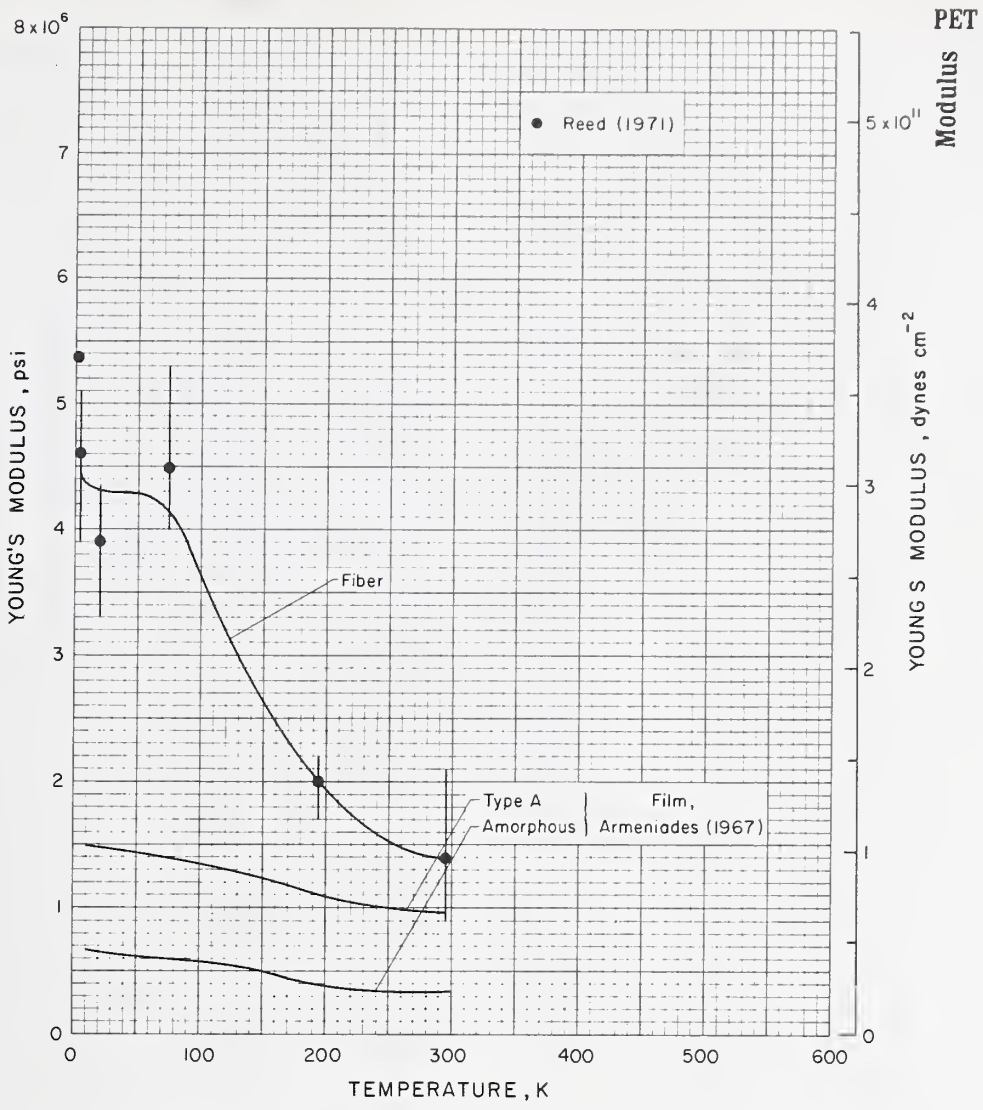
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Reed, Durcholz, Arvidson (1970)	Mylar A	Red Sec 2.54 x 0.508 cm, t = 0.00254 to 0.0254 cm; Instron, 6.1×10^4 cm s^{-1} xhd spd.
Mowers (1962)	Mylar D, 15 and 55% crys	Red Sec 2.54 x 0.63 x 0.051 cm, 3.2 x 2.54 x 0.051 cm and 0.25 x 0.51 x 0.051 cm; Instron, 0.0042 cm s^{-1} xhd spd used at cryogenic temp.
Skelton, Freeston, Jr., Ford (1969)	Dacron 1100-250-0, Type 52, 1060 denier	GL = 5.1 - 61.0 cm; Instron used for $\dot{\epsilon} = 0.167\ s^{-1}$, FRL high-speed piston tester used for higher $\dot{\epsilon}$ specimens conditioned at 294K and 65% rel hum for 24h before test; 5 specimens tested for each configuration.
Skelton, Freeston, Jr., Schoppe (1970)	Dacron 1100-250-0, Type 52, 1060 denier	For $\dot{\epsilon} = 0.0167\ s^{-1}$: GL = 12.7 cm; Instron. For $\dot{\epsilon} = 30.0\ s^{-1}$: GL = 59.9 cm; FRL high-speed piston tester.



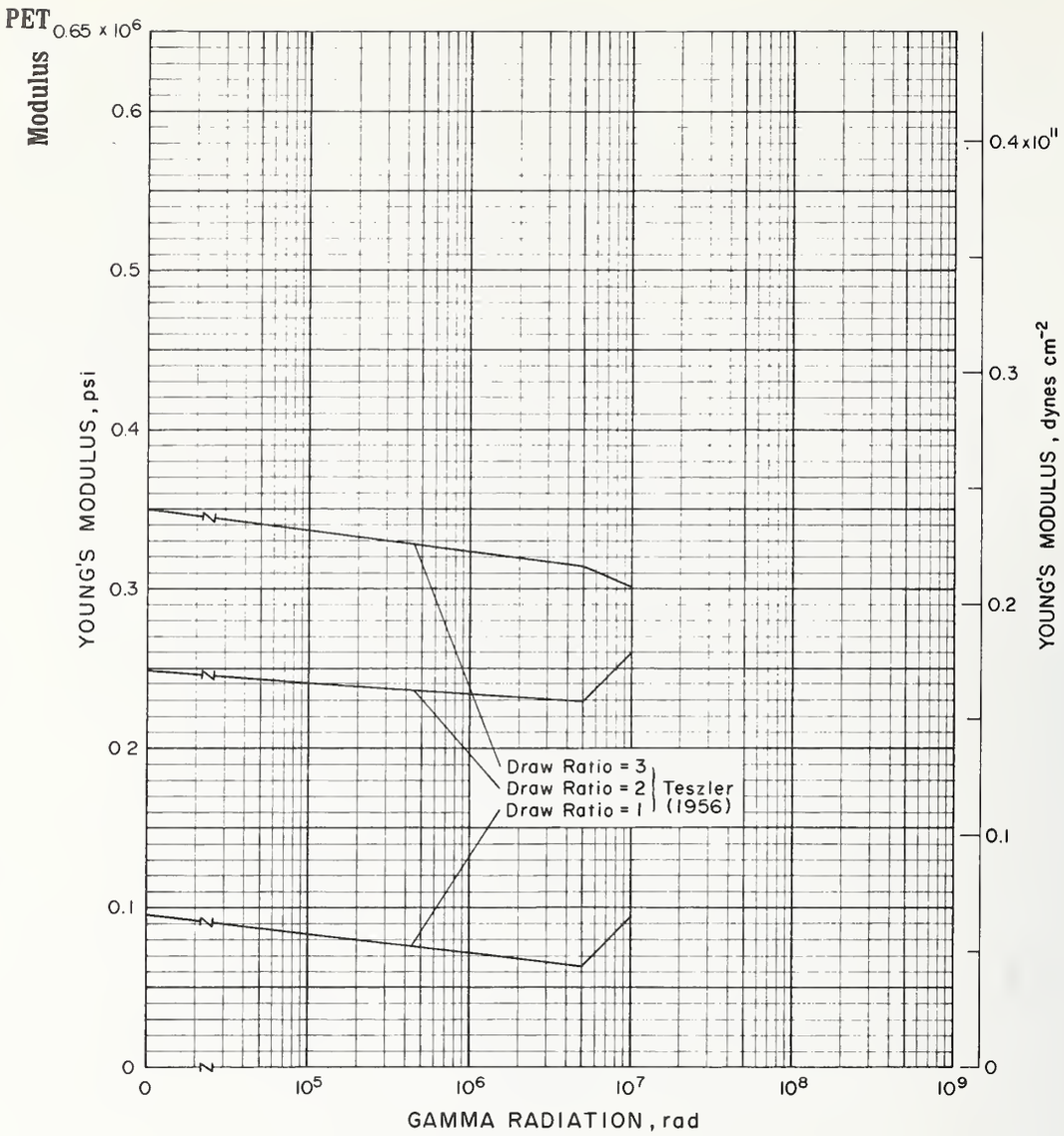
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Takayanagi (1963)	Commercial sample from Teijin Co., Ltd., formed by hot-press into film and quenched to 273 K: annealed at 353 K for 10 h, sp gr = 1.341, 5% crys; annealed at 373 K for 24 h, sp gr = 1.379, 38% crys; annealed at 403 K for 24 h, sp gr = 1.386, 45% crys	ℓ = 2-6 cm, w = 0.2-0.3 cm, t = 0.02-0.03 cm; sinusoidal tensile strain applied at one end and stress/strain ratio measured at other end, 138 Hz.
Dumbleton, Murayama (1967)	Unoriented spun fibers of 2-3% crys, annealed in N_2 for 6 h	Vibron, 11 Hz, heated at 1 K min^{-1} in N_2; results also presented for intermediate annealing temp and crys.
Murayama, Dumbleton, Williams (1968)	Yarn, 560 denier, 110 filaments, drawn over a hot pin at 363 K with a draw ratio of 5, annealed at 473 K for 6 h under no tension, 48% crys, birefringence = 0.193	$\ell \simeq$ 5 cm; Vibron, 0% rel hum, frequency of measurement indicated.



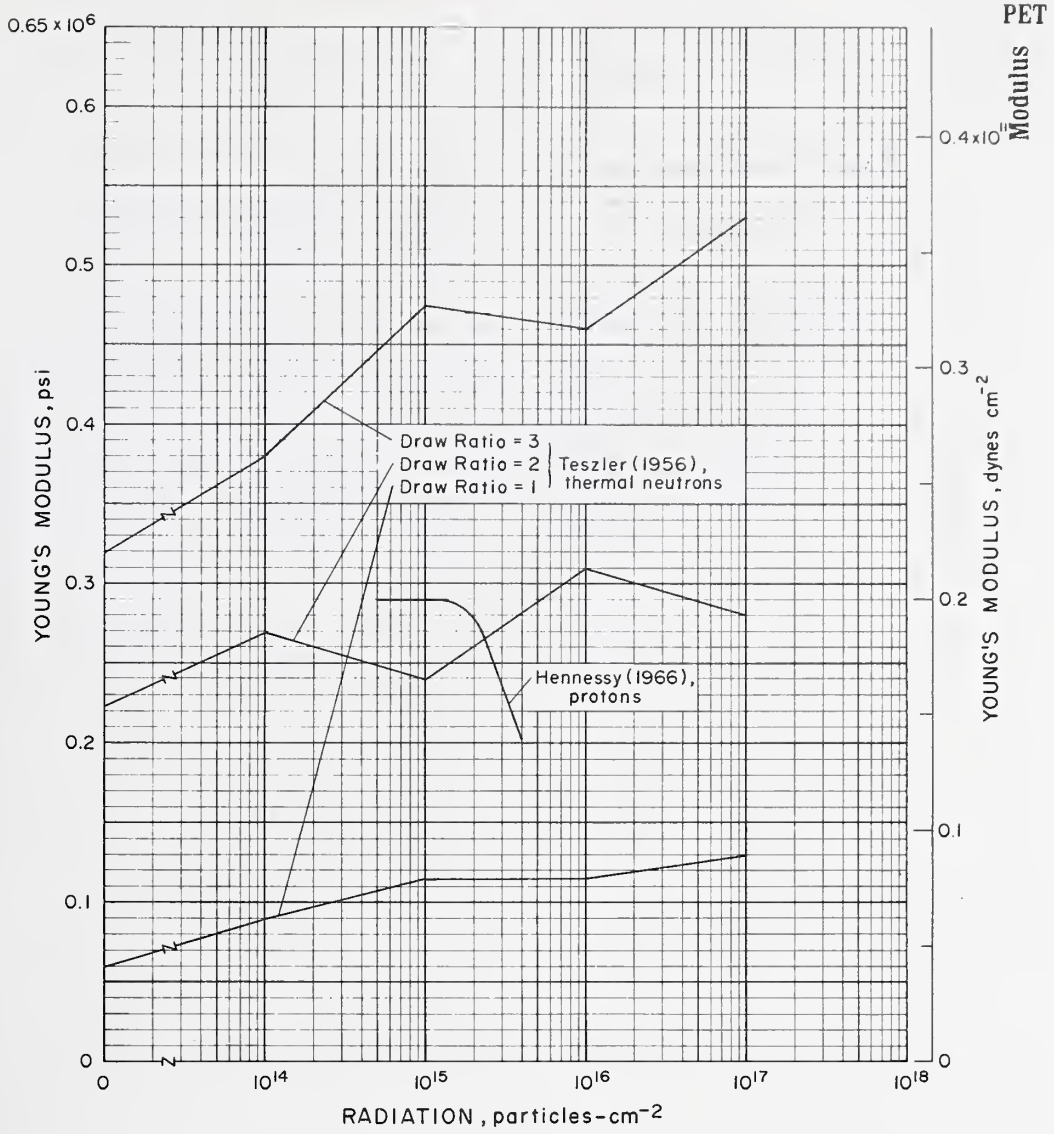
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Caren, Coston, Holmes, Dubus (1965)	Mylar A	Overall dimension 7.62 x 1.27 cm, t = 0.0254 cm, hydraulic tester, max deviation from av for 3 temperatures tested: 3.8% (295 K), 4.1% (76 K), and 12% (20 K).
Hanson, Richards, Hickel (1965)	Mylar A	t = 0.0051 to 0.00762 cm, cylindrical specimens with lapped seam; pressure in vessel loaded and unloaded cyclically until failure, $\dot{\epsilon} = 2.1 \times 10^{-4}$ cm s^{-1}.
DuPont (1967)	Mylar	Continuous curve given.
DuPont (1967)	Dacron	Instron, $\dot{\epsilon} = 0.01\ s^{-1}$.



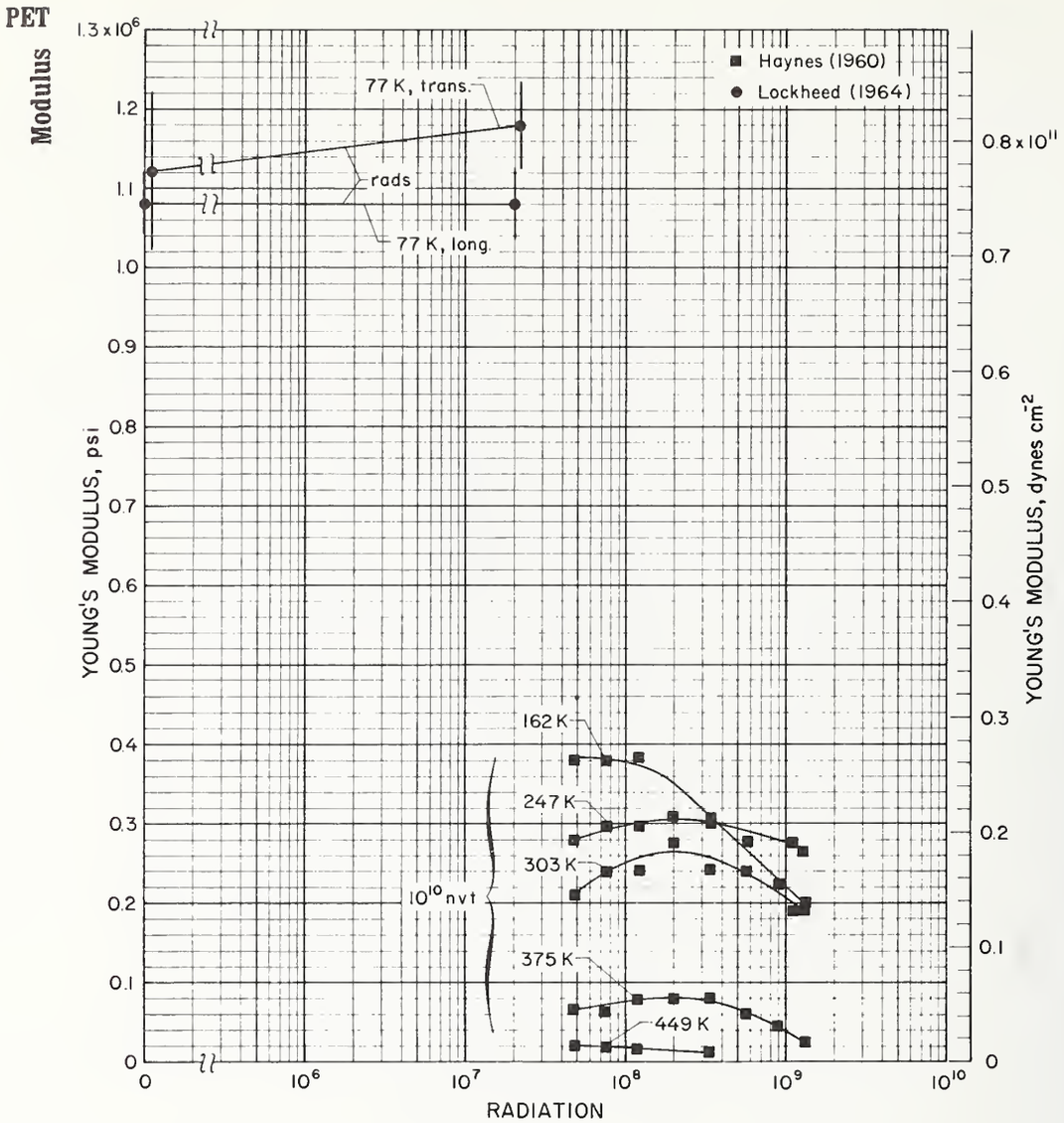
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Armeniades, Kuriyama, Roe, Baer (1967)	Amorphous Mylar and Mylar A film	Red Sec 1.25 x 7.6 x 0.0127 cm; 0.051 cm min^{-1} xhd spd, values measured from stress-strain curve.
Reed, Durcholz, Arvidson (1971)	Dacron, type 52	44 continuous fibers, 17.56 x 10^{-5} cm xsec area, GL = 10.16 cm; Instron, 0.00021-0.00085 cm s^{-1} xhd spd; error bars indicate spread of several tests.



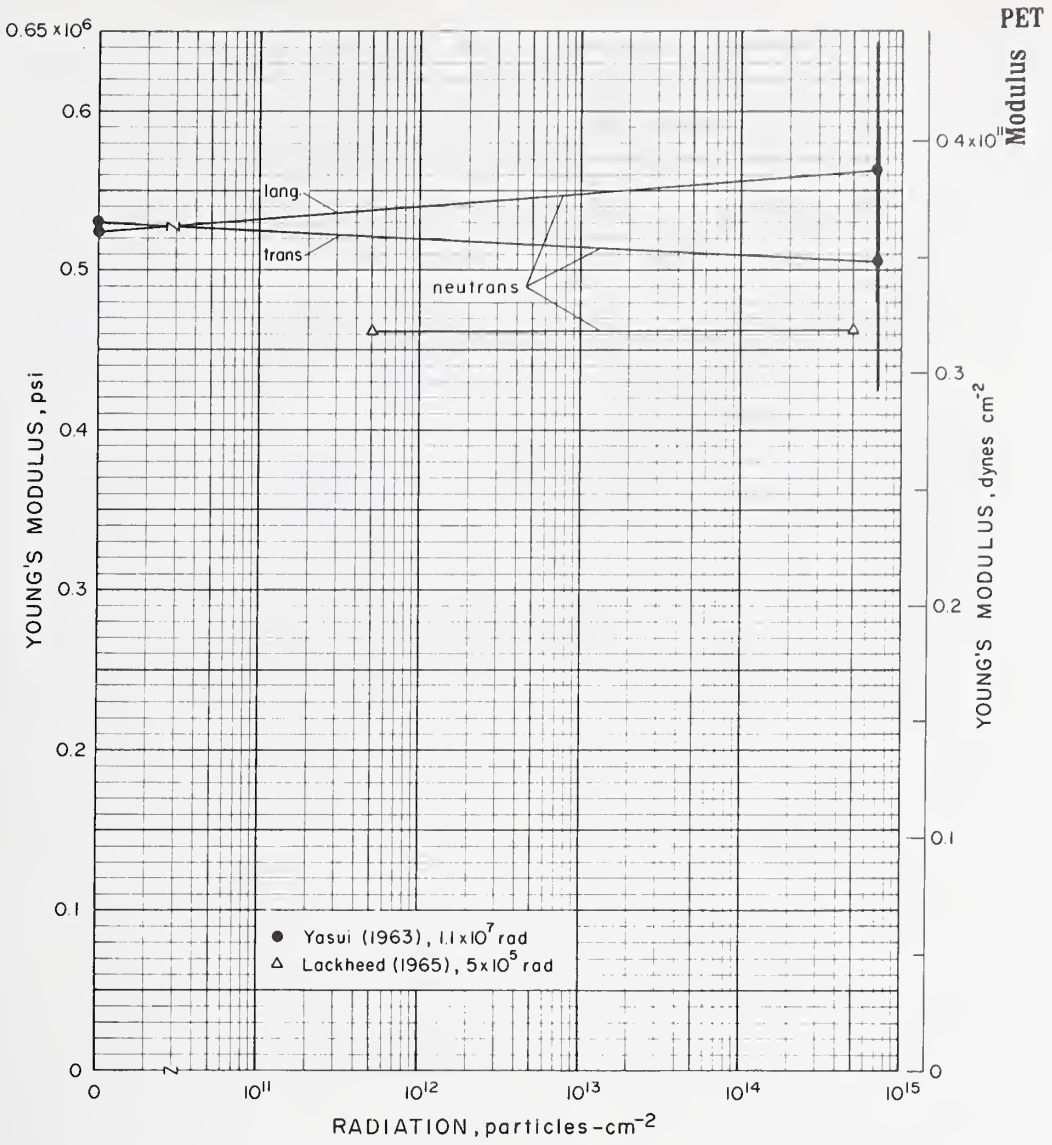
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Teszler, Rutherford (1956)	Dacron, specially prepared by Du Pont, melting point = 528K.	Continuous filament; exposed to mostly thermal neutrons in a reactor water-cooled exposure port (facility W-52 at Brookhaven National Laboratory) where prevailing temperature was approx. 313 K, samples exposed for 1, 10, 100, and 1000 min to obtain doses of 10^{14}, 10^{15}, 10^{16}, and 10^{17} n.v.t.; gamma irradiated by Co^{60} source (facility 21-N).



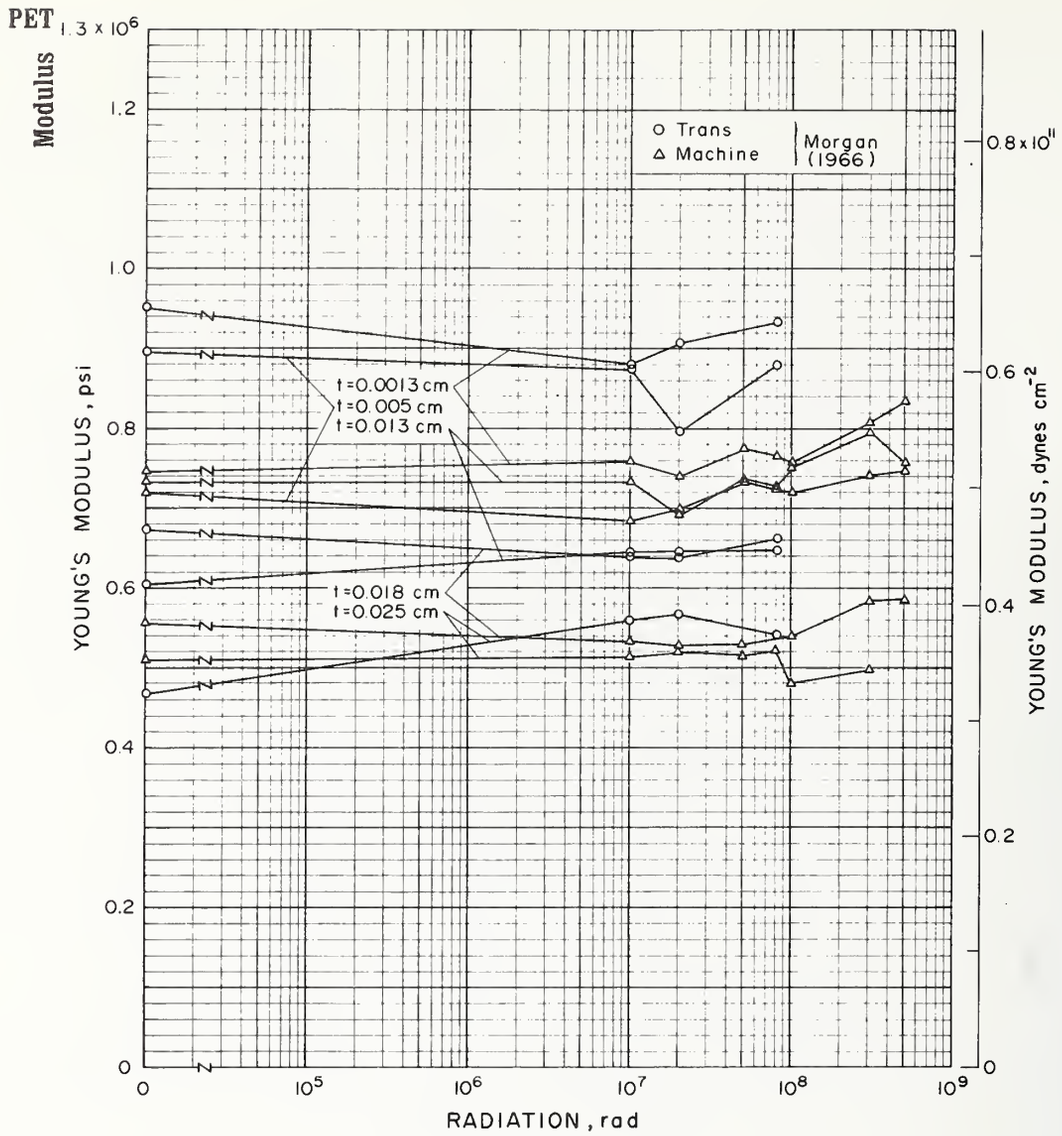
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Teszler, Rutherford (1956)	Dacron, specially prepared by Du Pont, melting point = 528K.	Continuous filament; exposed to mostly thermal neutrons in a reactor water-cooled exposure port (facility W-52 at Brookhaven National Laboratory) where prevailing temperature was approx. 313K, samples exposed for 1, 10, 100, and 1000min to obtain doses of 10^{14}, 10^{15}, 10^{16}, and 10^{17} n.v.t.; gamma irrad by Co^{60} source (facility 21-N).
Hennessy, Moore (1966)	Mylar D	t = 0.025 cm; 0.0085 cm s^{-1} xhd spd; Instron; Brookhaven Cosmotron, 10^{16} protons for 16.3 h, vacuum chamber.



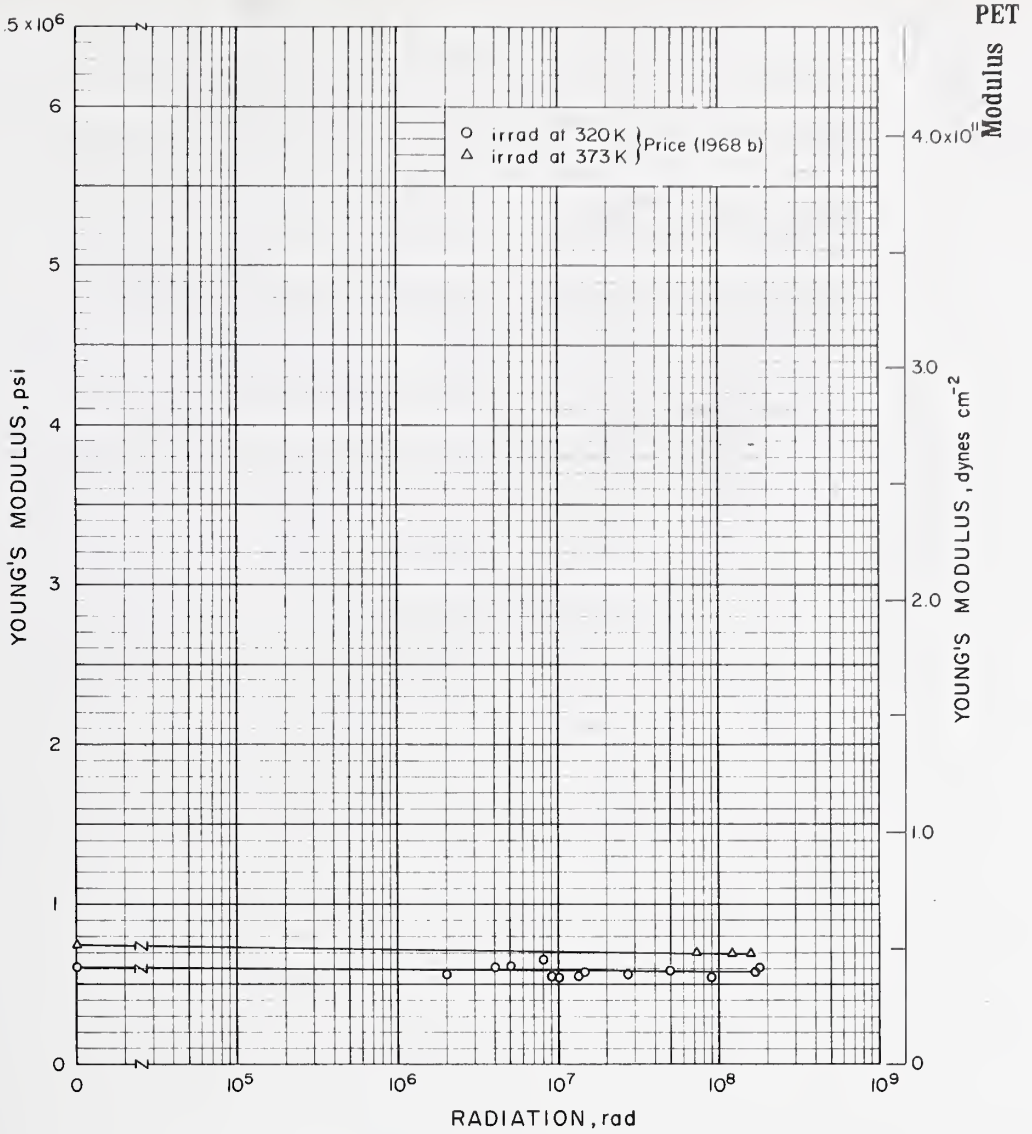
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Haynes, Hsiao (1960)	Mylar, biaxially oriented	Specimens cut ∥ to a biaxial direction, ℓ = 10.1 cm, Red Sec = 1.3 x 0.65 x 0.027 cm; $\dot{\epsilon}$ = 0.0033 s^{-1} ; sealed in Aℓ containers and irrad in the Material Testing Reactor.
Lockheed Missles and Space Co. (1964)	Mylar	t = 0.005 cm, ASTM D412-51T Type C die; Tinius Olsen Universal Test Machine Model RM-2, xhd spd = 0.0042 cm s^{-1}, 77 K; irrad in Radiation Effects Reactor at Dawsonville, Georgia operated at 10^6 watts; errors are standard deviation of 4-6 tests.



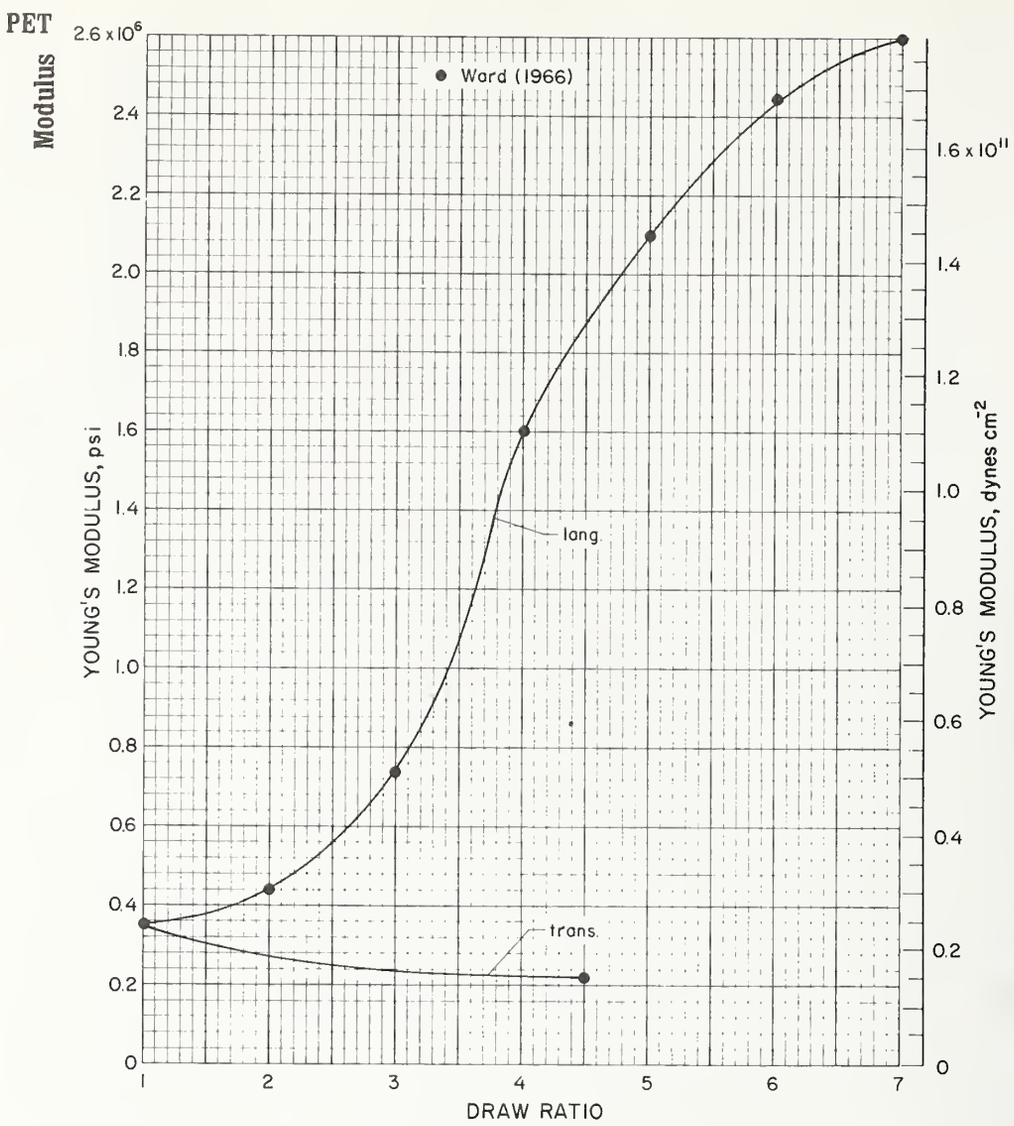
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Yasui (1963)	Mylar	t = 0.00254 cm, GL = 5.08 cm, 0.635 cm wide; 0.021 cm s^{-1} xhd spd, ASTM-D412-51T procedures, Type C die, Tinius-Olsen; radiation source: Radiation Effects Reactor, Lockheed, Dawsonville, Ga. at ambient temp.
Lockheed (1965)	Mylar	ASTM D638-61T procedures, 9-13 specimens per irrad group; irradiation source: Radiation Effects Reactor, Lockheed, Dawsonville, Ga., temp rise in specimens <10 K during irradiation, in vacuum.



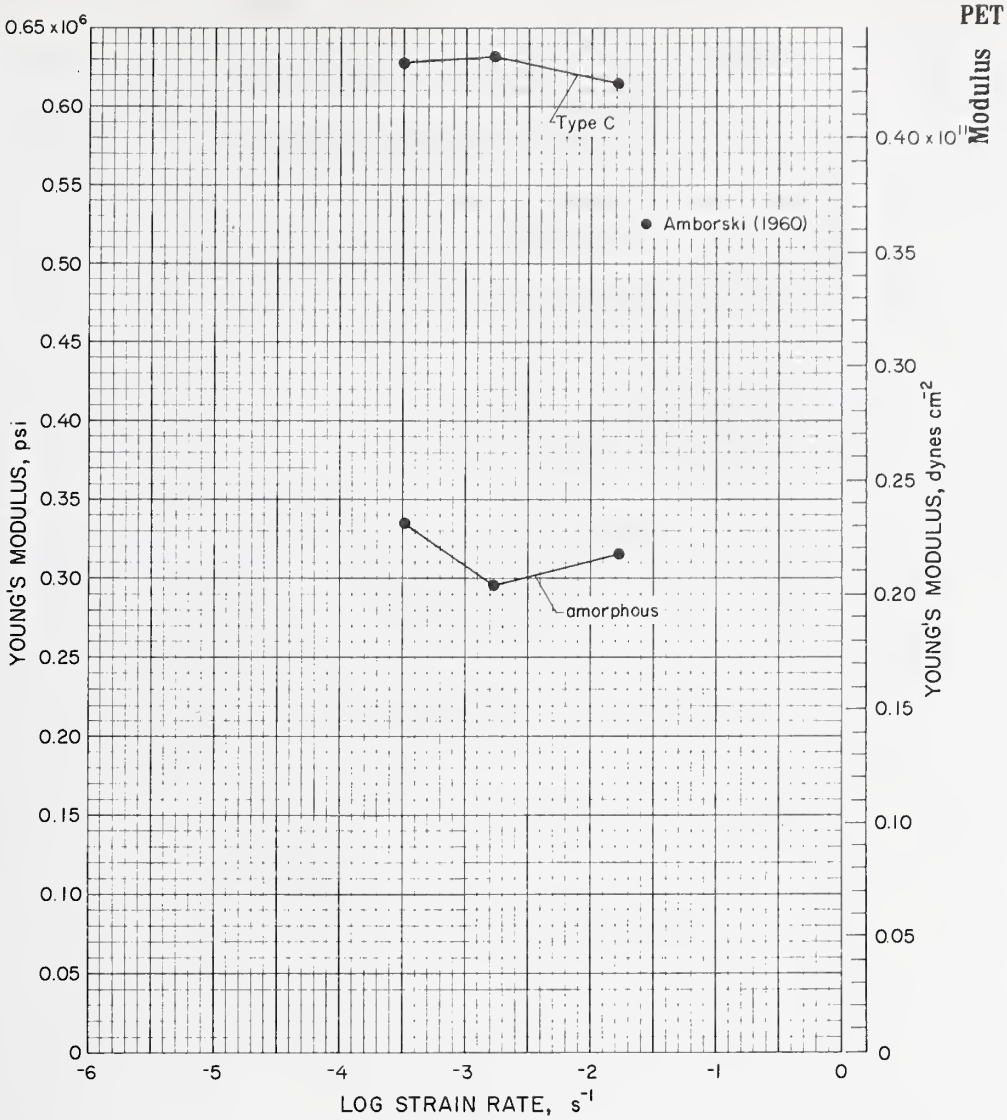
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Morgan, Sheldon, Stapleton (1966)		Specimens 10.2 cm x 1.3 cm, cut from both machine and trans directions of roll, film as supplied, approx. 40% crys; irrad at 303°K in air with spent fuel element assembly at A.E.R.E. Harwell, tested at 296K with an Instron.



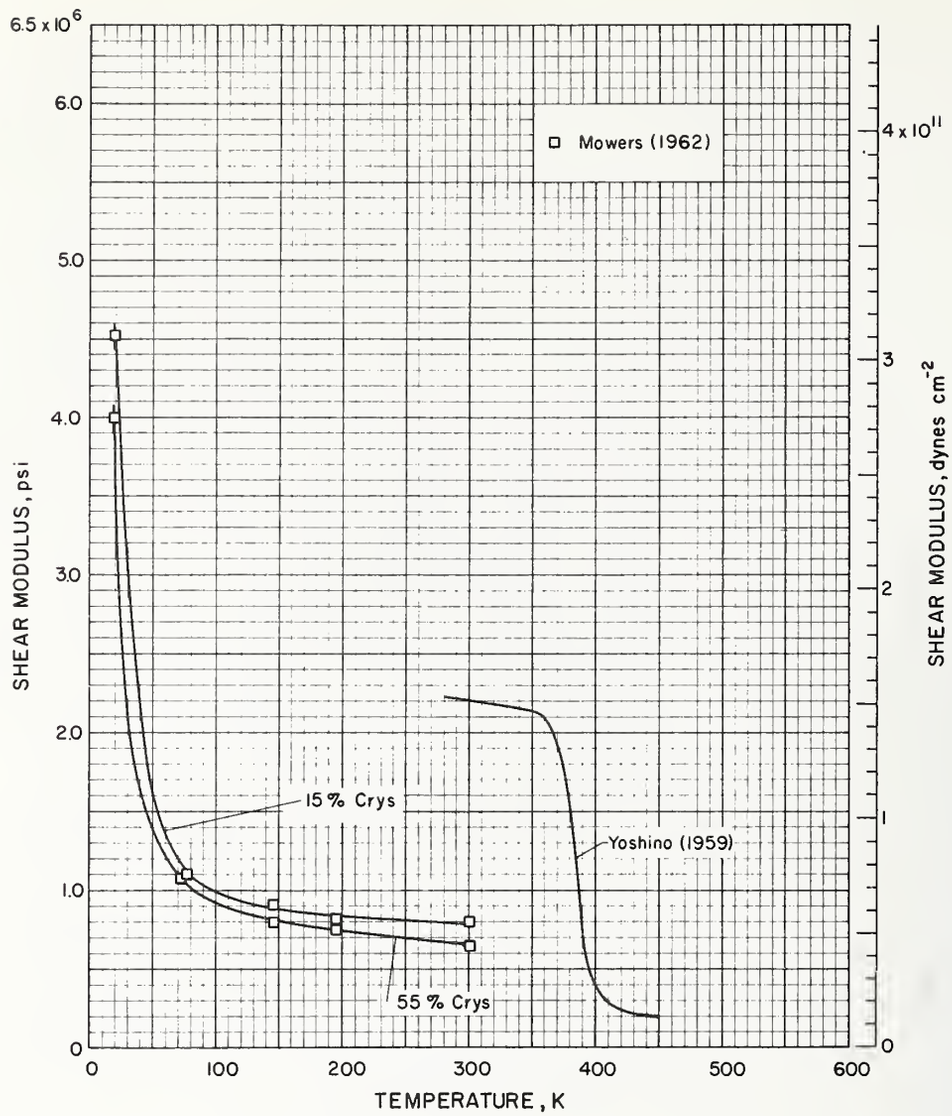
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Price (1968b)	Mylar, sp gr = 1.395	7.6 x 1.3 x 0.0025 cm Red Sec; degassed 3 days at 320 K and 10^{-6} Torr, xhd spd = 0.085 cm s^{-1}, $\dot{\epsilon}$ = 0.011 s^{-1}, tested at 298 K; irrad by Co^{60} at 1.6 x 10^6 rad h^{-1}, samples irrad at 320 K and at 373 K.



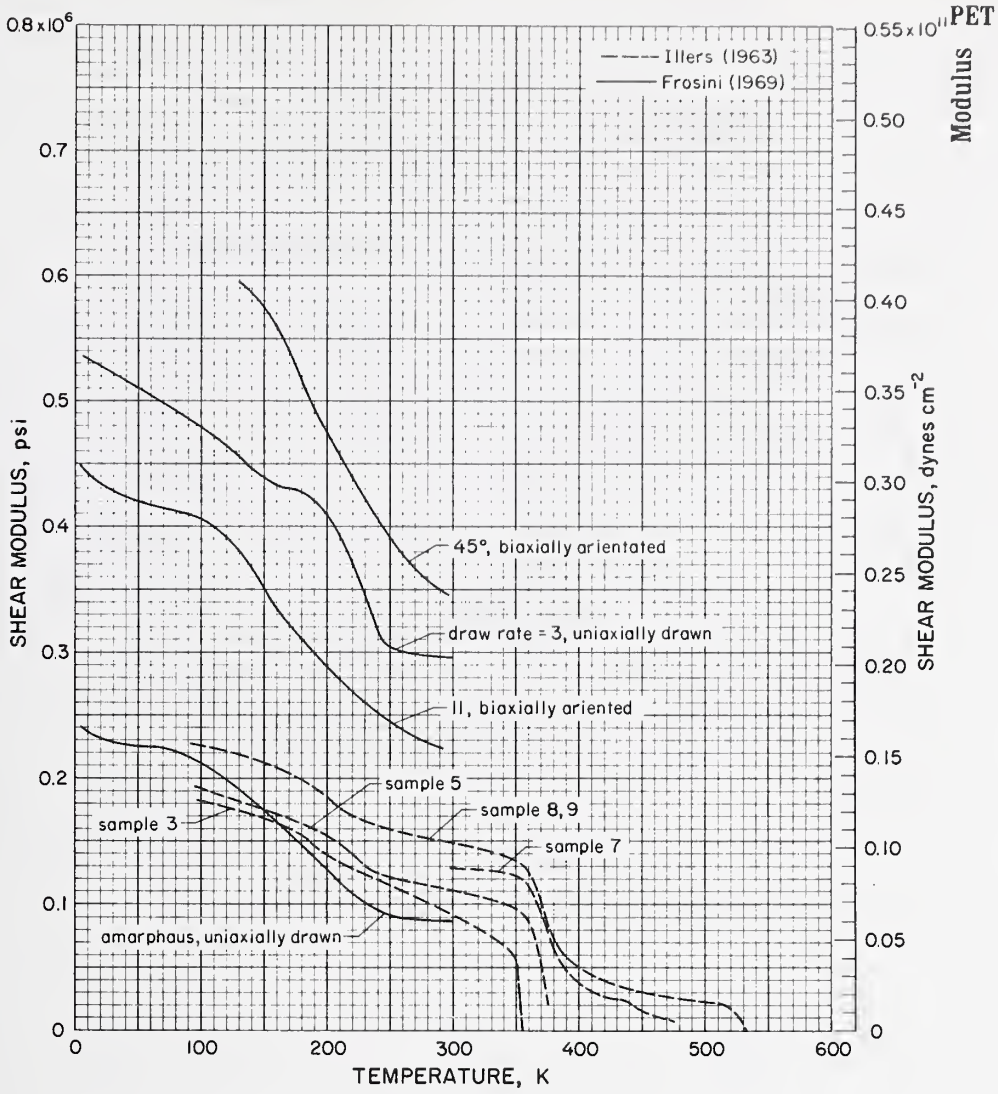
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ward (1966)	Terylene fiber	



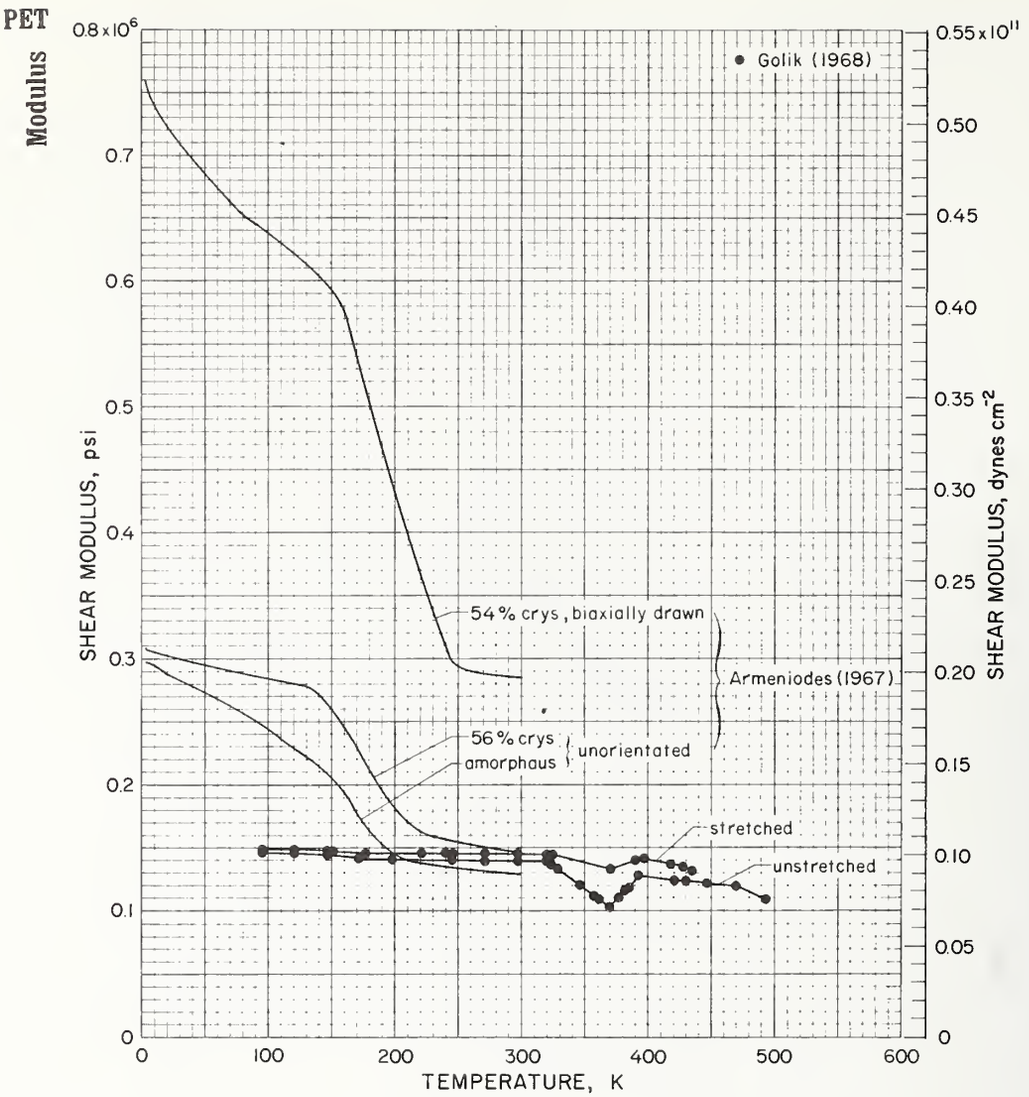
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Amborski, Mecca (1960)	Amorphous film and Mylar C	Long. specimens; 296.5 K, 50% rel hum.



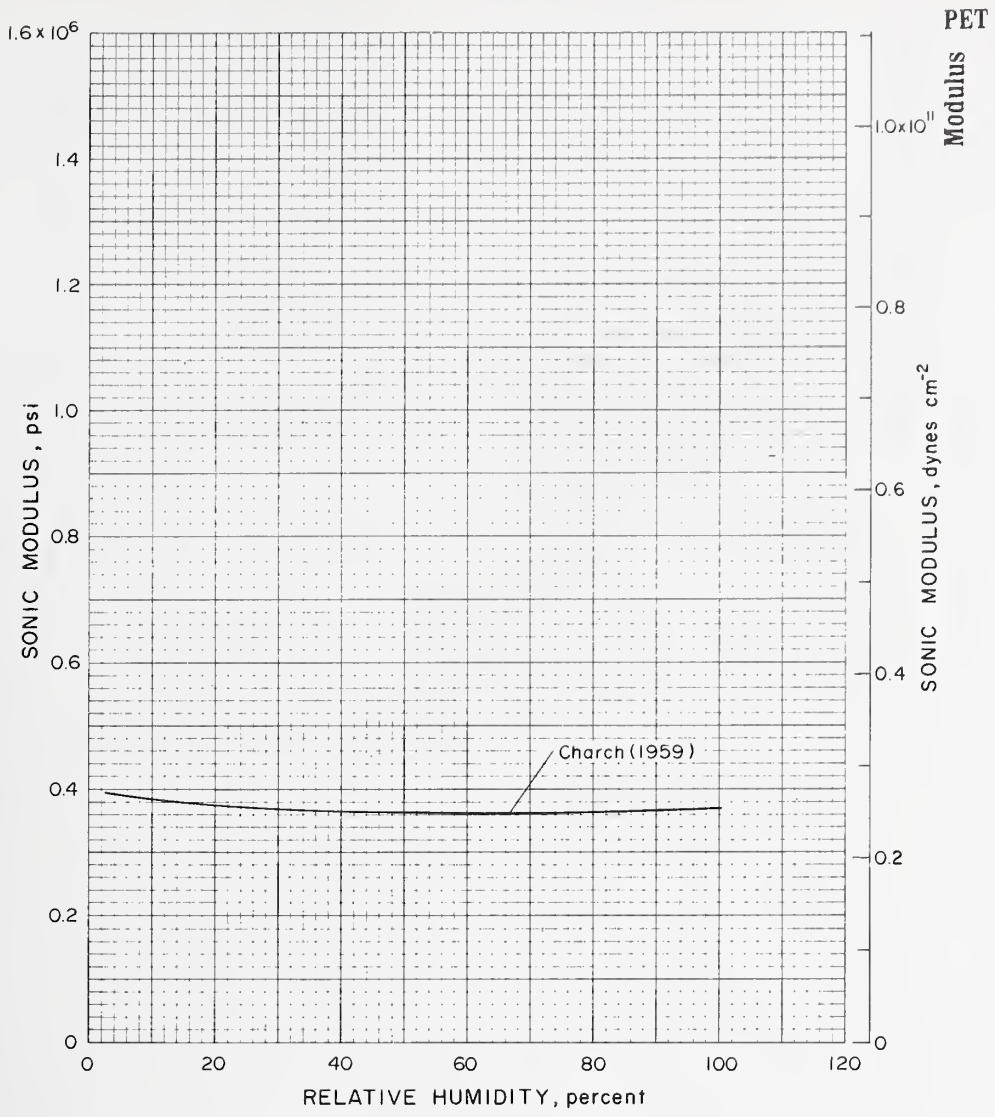
INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN OESCRIPTION , EXPERIMENTAL CONDITIONS
Mowers (1962)	Mylar D, 15 and 55% crys	Red Sec 2.54 x 0.63 x 0.051 cm, 2.54 x 3.2 x 0.051 cm and 0.025 x 0.51 x 0.051 cm; Instron, 0.0042 cm s^{-1} xhd spd at cryogenic temp.
Yoshino, Takayanagi (1959)	Oriented fiber annealed at 453 K for 0.5 h	Mechanical tan δ meter of direct reading type, 100 Hz, heating rate = 1 K min^{-1}.



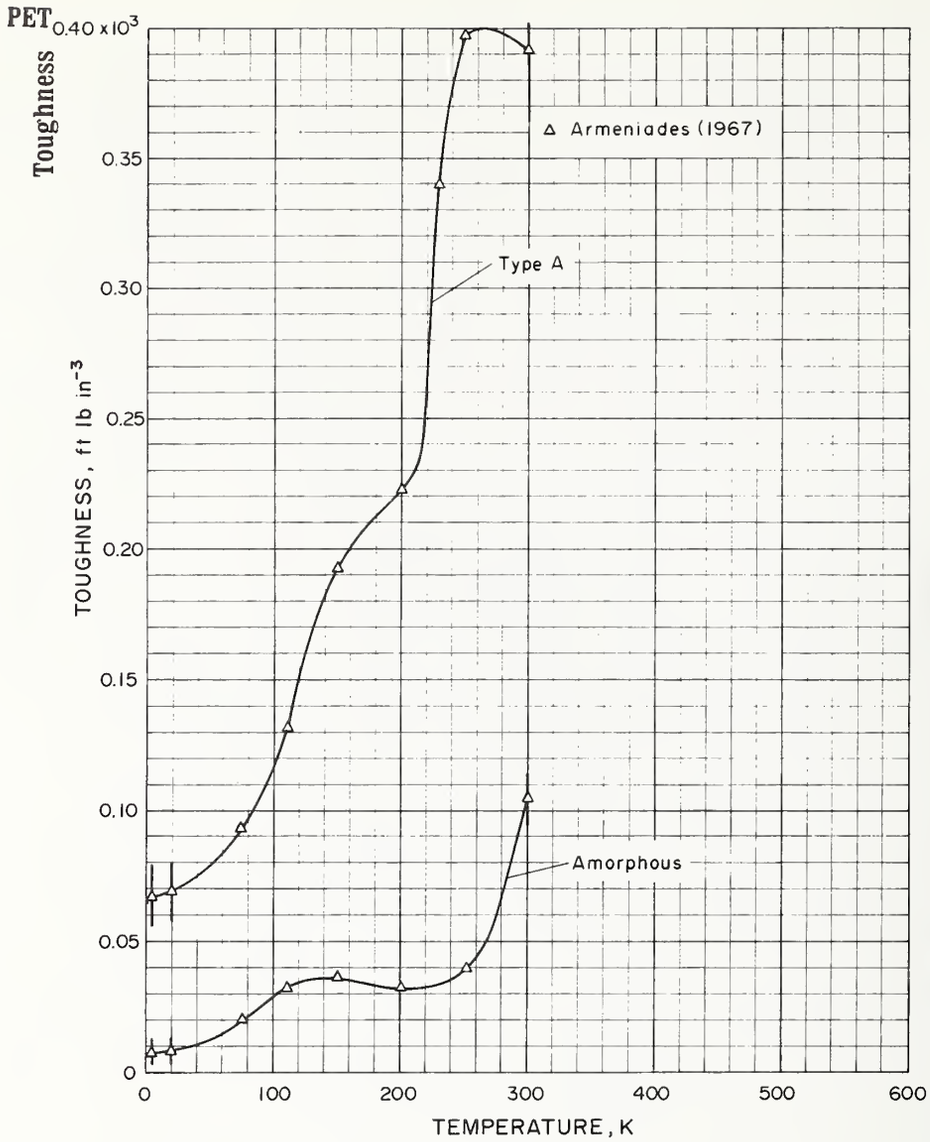
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Illers (1963)	Commercial plate, annealed and dried at 343 K for 7 days in vacuum, specimens isothermally crystallized in vacuum until there was no increase of crystallinity with time: sample 3: 353 K for 7 days, 0% crys; sample 5: 363 K for 5 days, 16% crys; sample 7: 447 K for 1 day, 33% crys; sample 8: 503 K for 1 day, 40% crys; sample 9: 518 K for 2 days, 46% crys	ℓ = 5.0 cm, w = 0.8 cm, t = 0.1 cm; torsion pendulum, 1 Hz; data also presented for sample with intermediate heat treatments and crystallinities.
Frosini, Woodward (1969)	Undried film; number-av molecular weight = 23,000 for amorphous specimen and specimen uniaxially oriented by stretching to a draw ratio of 3 at 348 K; number-av molecular weight = 16,000 for specimens biaxially oriented 3-fold above Tg and then heat set at 493-498 K	Biaxially oriented specimens tested ‖ to an orientation direction and at 45° to the orientation directions; torsion pendulum, 0.4-2 Hz.



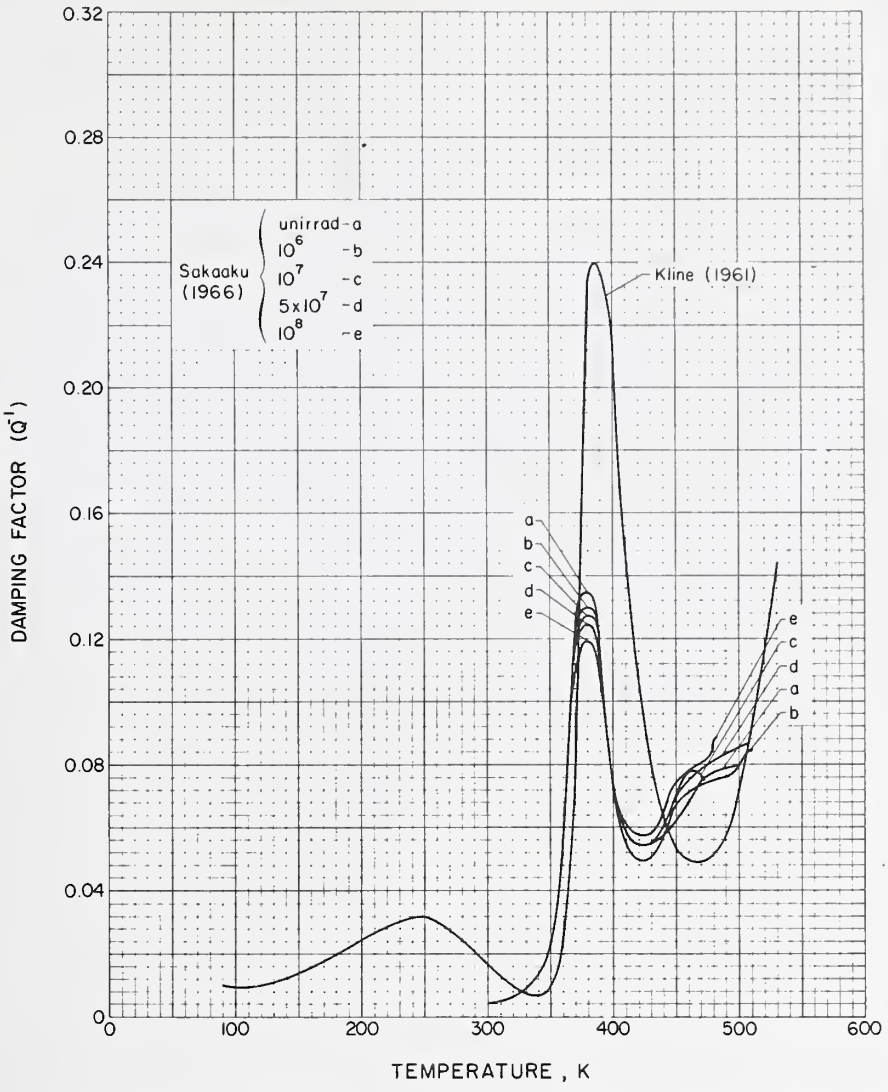
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Armeniades, Kuriyama, Roe, Baer (1967)	Number-av molecular weight = 15,000 with 1% low molecular weight (xylene extractable) species: amorphous mylar film, as received; compression molded from mylar, crystallized from melt by slow cooling, 56% crys; biaxially drawn and heat-set mylar A, 54% crys, as received	ℓ = 6.0 cm, w = 0.5 cm, t = 0.02 cm; free oscillating torsion pendulum at a frequency range of 1 Hz; intermediate results given for other crystallinities and drawing conditions.
Golik, Lopan, Genina (1968)	Monofiber, formed in water from melt at 553 K: unstretched, sp gr = 1.337 at 301.5 K, 2.17% crys, birefringence = 0.0002, heated at 360 K for 15 min; stretched at 360 K to 0.202 of the original cross-sectional area, sp gr = 1.348 at 301.5 K, 10.8% crys, birefringence = 0.129	ℓ = 2.0 cm, original diam = 0.097 cm; inverted torsion pendulum, frequency = 0.06-0.23 Hz.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Charch, Moseley, Jr. (1959)	Dacron (2GT), unoriented	Fiber



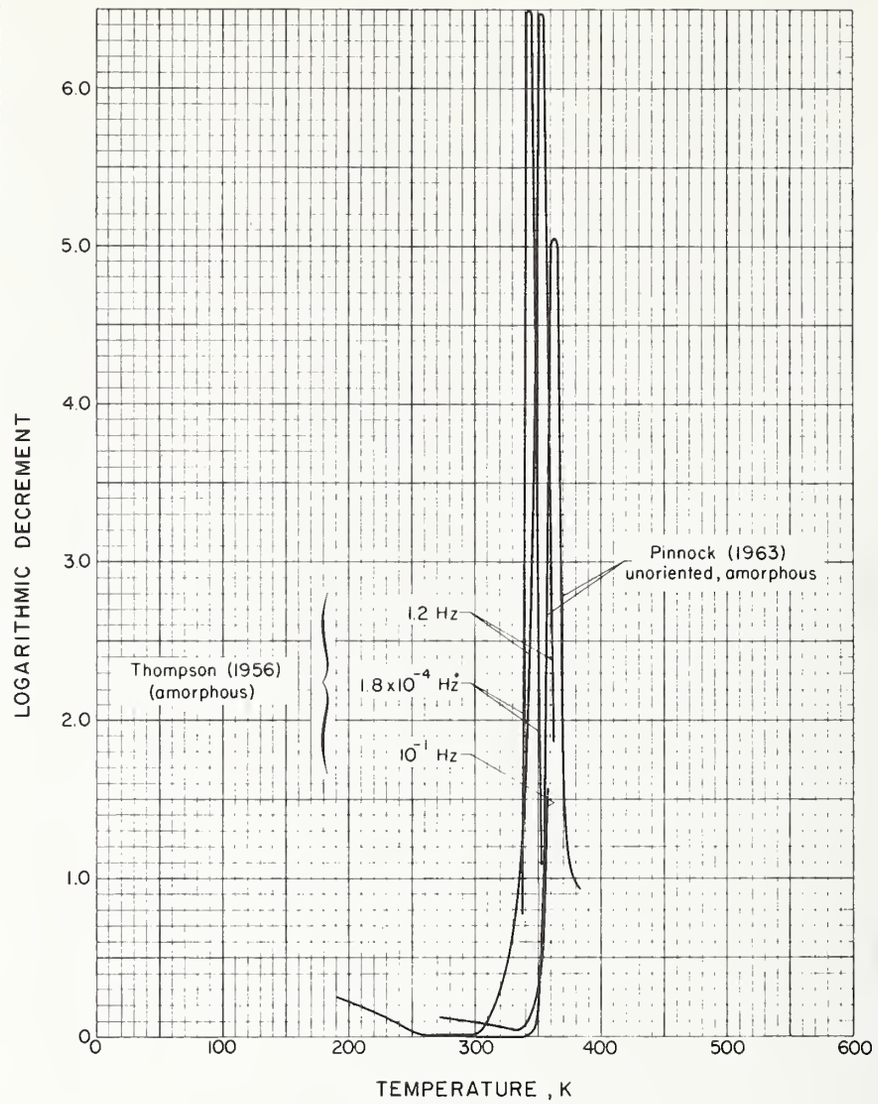
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Armeniades, Kuriyama, Roe, Baer (1967)	Amorphous Mylar and Mylar A	Toughness calculated using area under stress-strain curve.



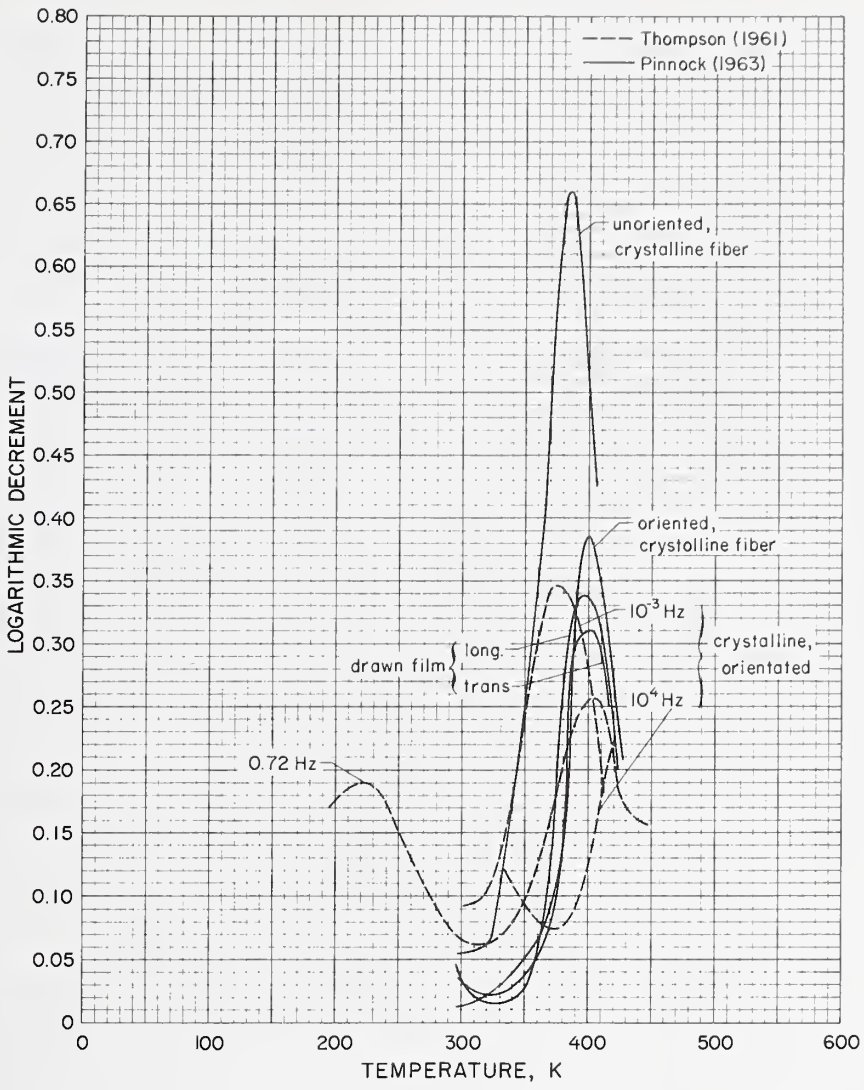
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sakaoku (1961)	Crystalline Mylar	Torsion free vibration; irrad by Co^{60}.
Kline, Sauer (1961)	Injection molded rod, sp gr = 1. 386, 52% crys, molecular weight = 25,000	Turned to ℓ = 11. 18 cm, diam = 0. 864 cm; results also presented for samples irrad to 3. 7 x 10^9 rads in a nuclear reactor but the results were very similar.

PET

Internal Friction

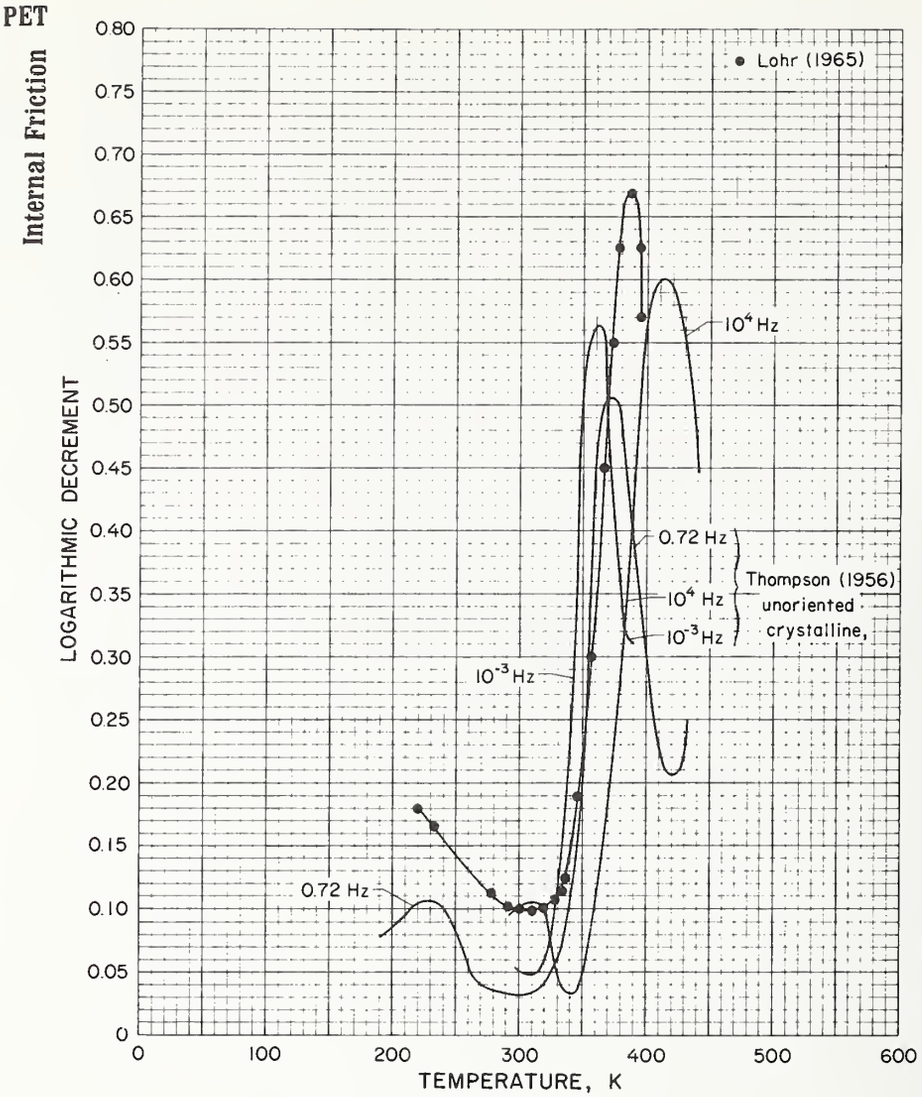


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thompson, Woods (1956)	Chips with molecular weight = 15,000 melted at 558 K, fibers extruded, amorphous	ℓ = 50 cm; frequency of measurement noted.
Pinnock, Ward (1963)	Melt-spun fiber	ℓ = 10 cm; 1-100 Hz.

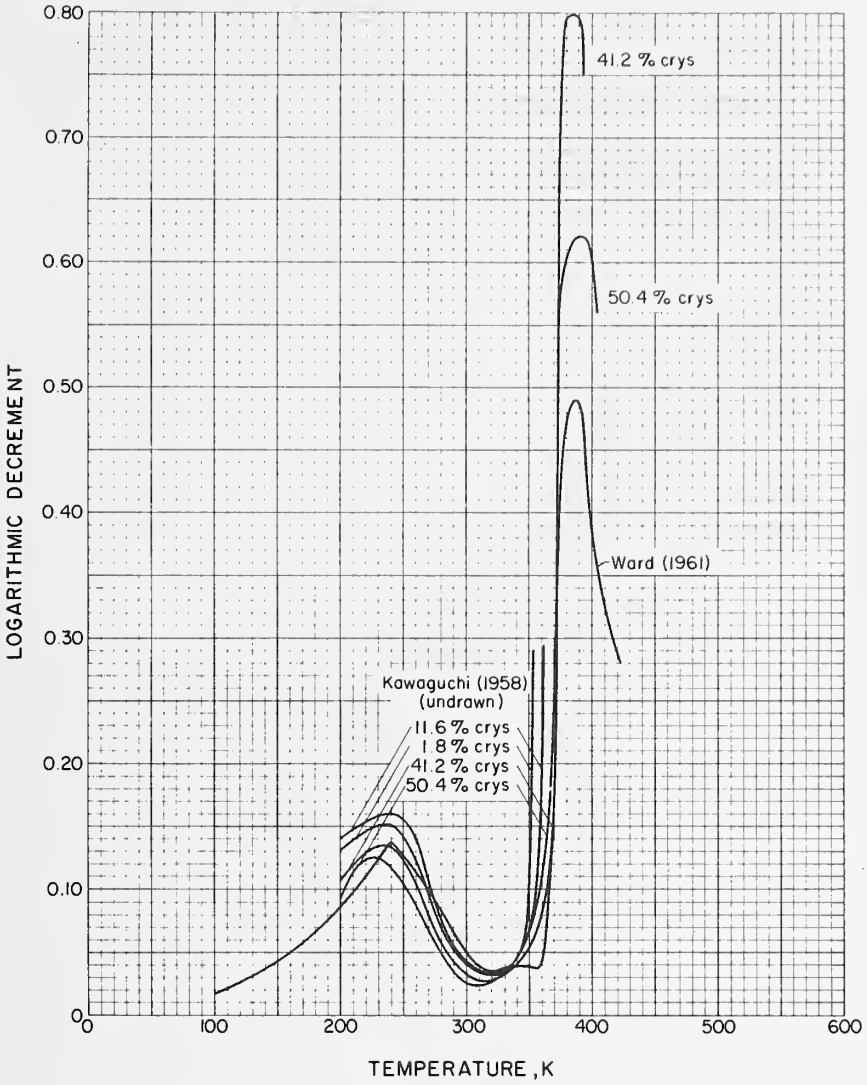


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thompson, Woods (1956)	Chips with molecular weight = 15,000, melted at 558 K, fibers extruded, partially crystalline, oriented	ℓ = 50 cm; frequency of measurement noted.
Pinnock, Ward (1963)	Fiber: melt-spun, oriented and crystallized by stretching over a hot point, crystallized only by heat treatment without tension; film: uniaxially stretched to a draw ratio of 5	Fiber: ℓ = 10 cm; 1-100 Hz.

PET

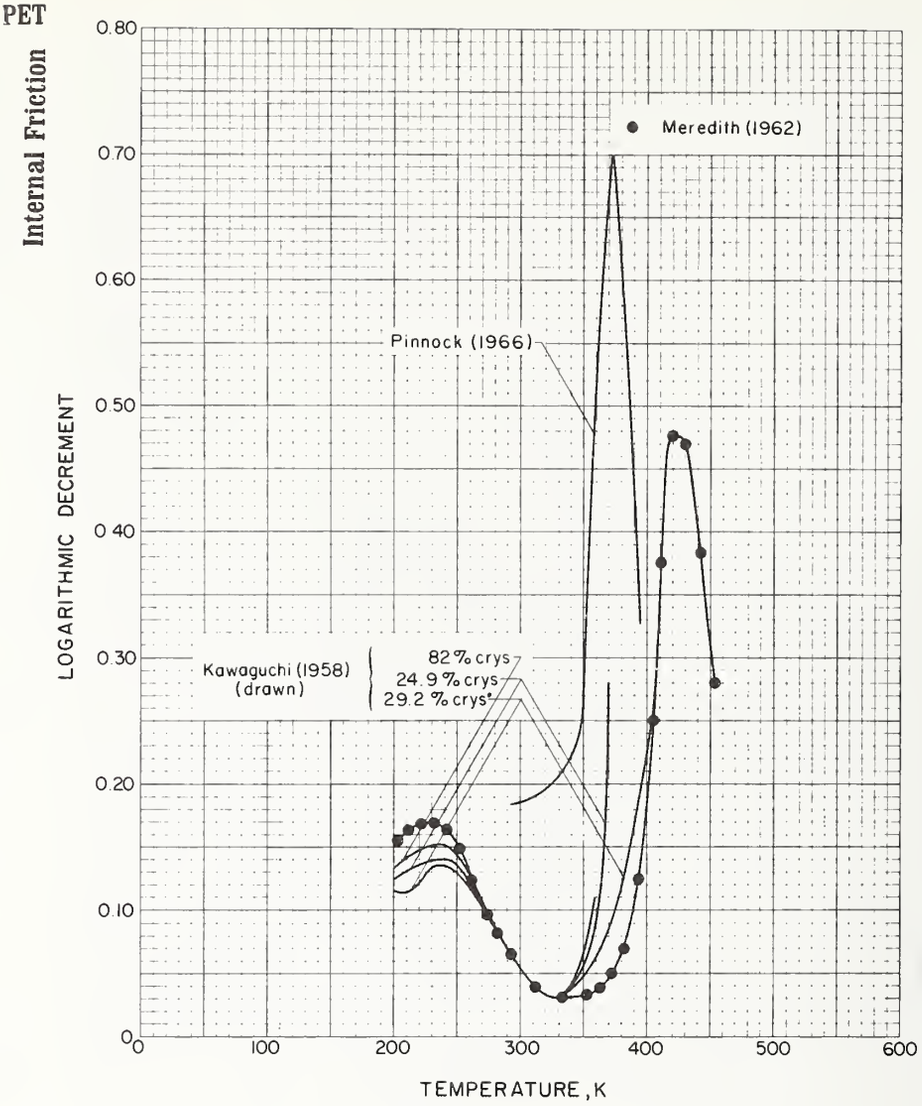


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thompson, Woods (1956)	Chips with molecular weight = 15,000 melted at 558 K, fibers extruded, partially crystalline, unoriented	ℓ = 50 cm; frequency of measurement noted.
Lohr (1965)	Mylar sheet, partially crystalline	t = 0.025 cm; torsion pendulum.

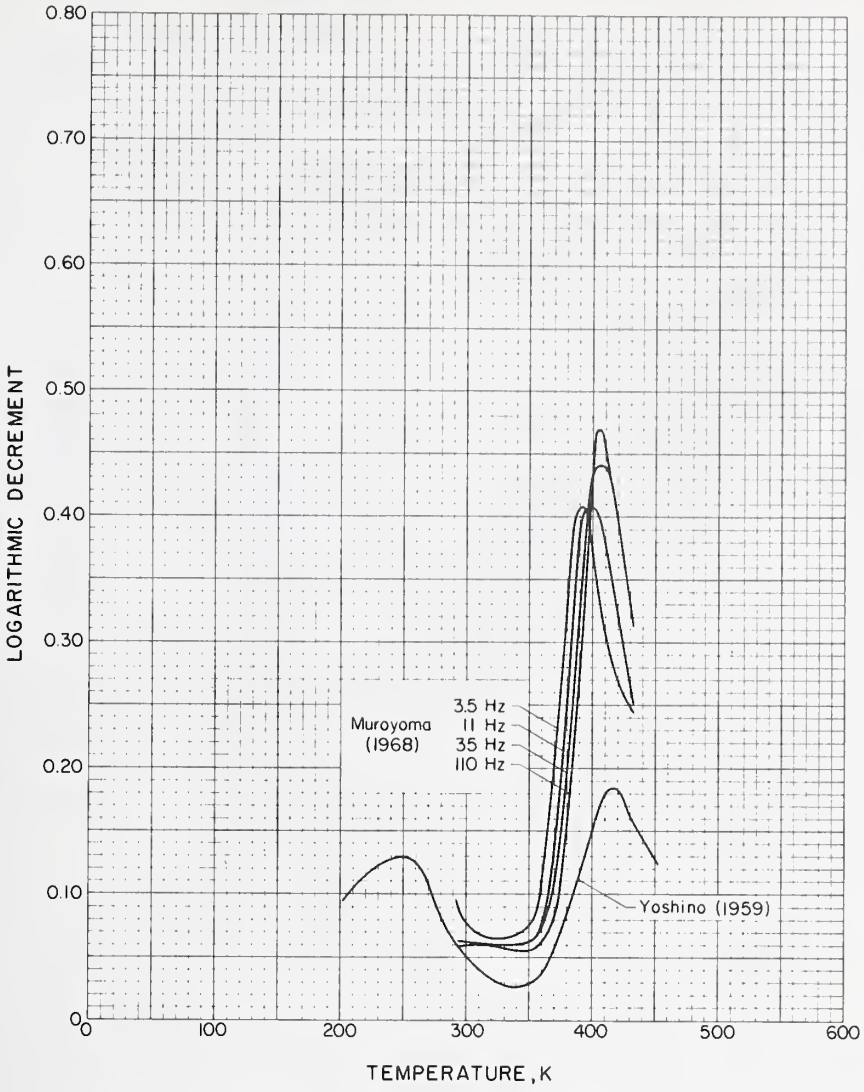


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kawaguchi (1958)	Untreated, birefringence = 0.005, 1.8% crys; annealed in N_2 for 30 min at 373 K, 11.6% crys; annealed in N_2 for 30 min at 423 K, 41.2% crys; annealed in N_2 for 30 min at 473 K, 50.4% crys; all specimens dried over P_2O_5 at 298 K for 1 week	Monofilament, diam ≃ 0.04 cm; cantilever vibration method, 100-200 Hz.
Ward (1961)	Heat-crystallized, isotropic	Rod-shaped specimens in cantilever, frequency range = 10^3 Hz.

PET



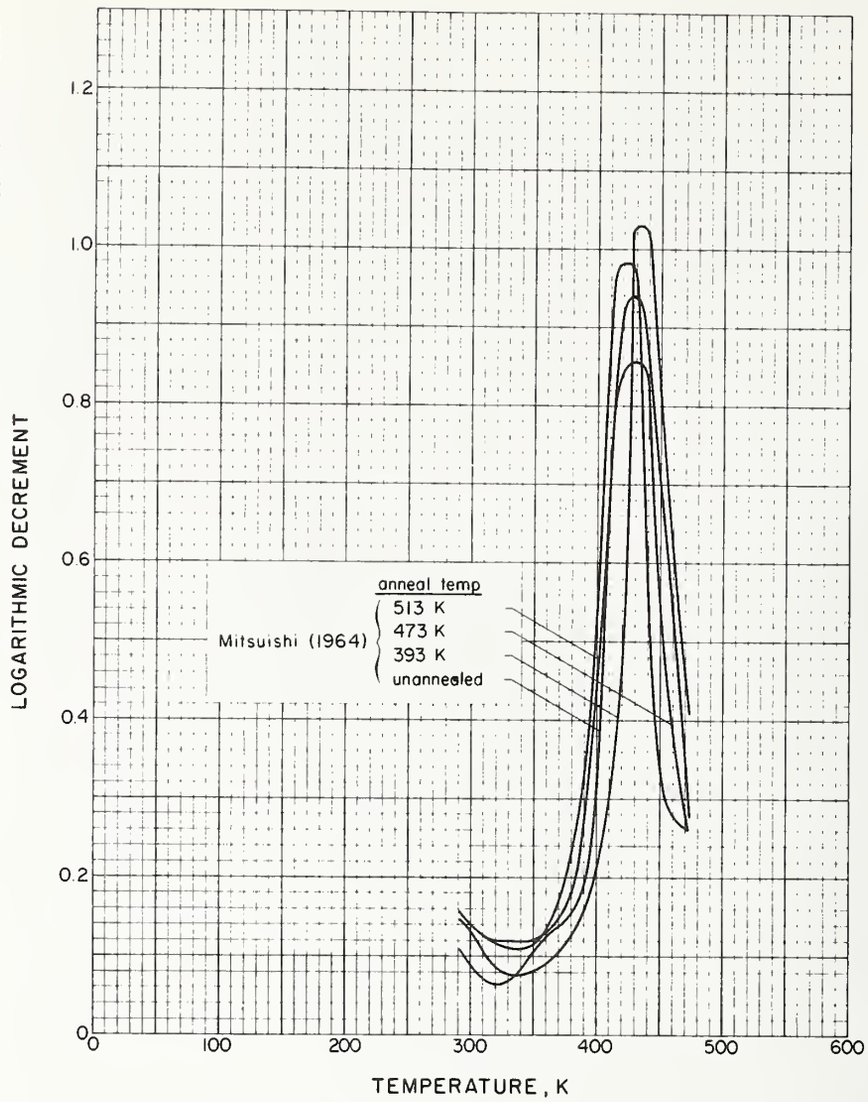
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kawaguchi (1958)	Draw ratio = 3, birefringence = 0.023, 8.2% crys; draw ratio = 5, birefringence = 0.105, 24.9% crys; draw ratio = 7, 29.2% crys; all specimens dried in vacuum over P_2O_5 at 298 K for 1 week	Monofilament, diam ≃ 0.04 cm; cantilever vibration method, 100-200 Hz.
Meredith, Hsu (1962)	Terylene, sp gr = 1.38, heated at 443 K for 10 min under 0.04 psi tension	Single fiber, denier 150 (72); electrostatic method of exciting lateral vibrations.
Pinnock, Ward (1966)	Melt-spun fibers, heat-crystallized to 33%	ℓ = 10 cm; sinusoidal strain of ± 0.25% at 0.1 Hz.



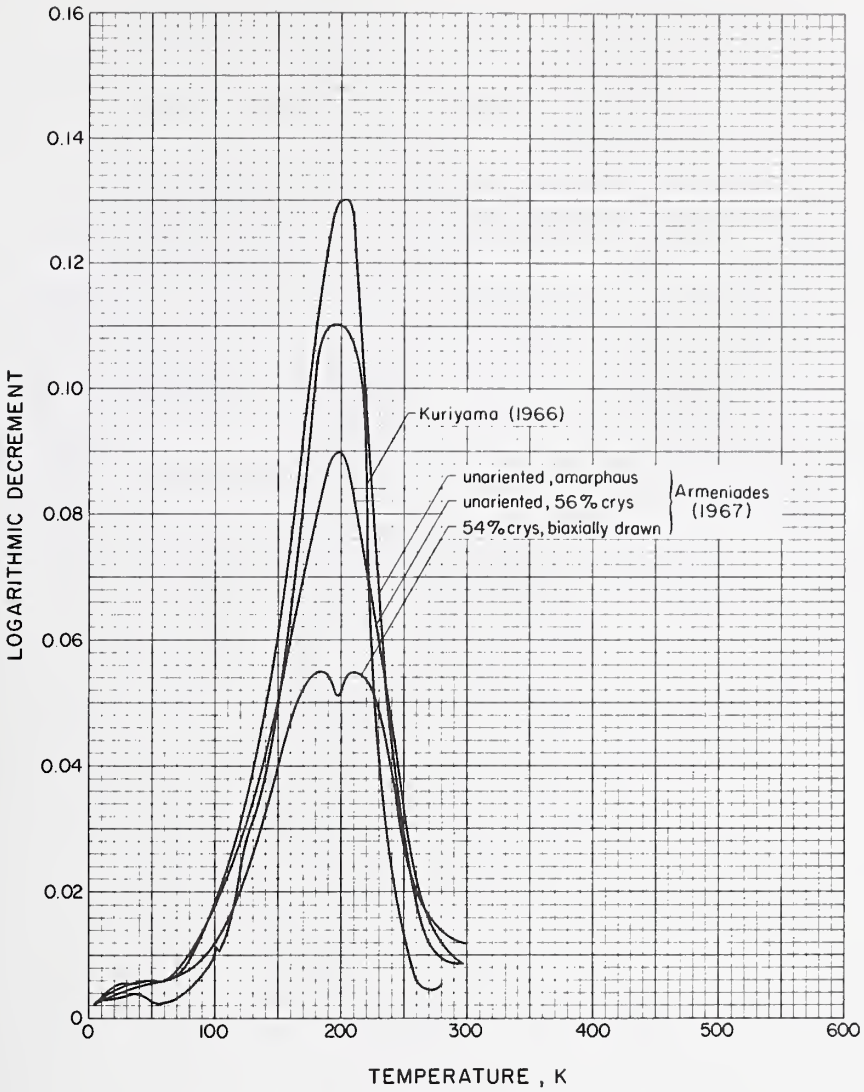
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Yoshino, Takayanagi (1959)	Oriented fiber, annealed at 373 K for 30 h, also annealed at 453 K for 0.5 h	Mechanical tan δ meter of direct reading type, 100 Hz, heating rate = 1 K min^{-1}; specimen annealed at 273 K tested between 210 K and 340 K, specimen annealed at 453 K tested between 295 K and 440 K.
Murayama, Dumbleton, Williams (1968)	Yarn, 560 denier, 110 filaments, drawn over a hot pin at 363 K with a draw ratio of 5, annealed at 473 K for 6 h under no tension, 48% crys, birefringence = 0.193	$\ell \simeq 5$ cm; Vibron, 0% rel hum, frequency of measurement indicated.

PET

Internal Friction

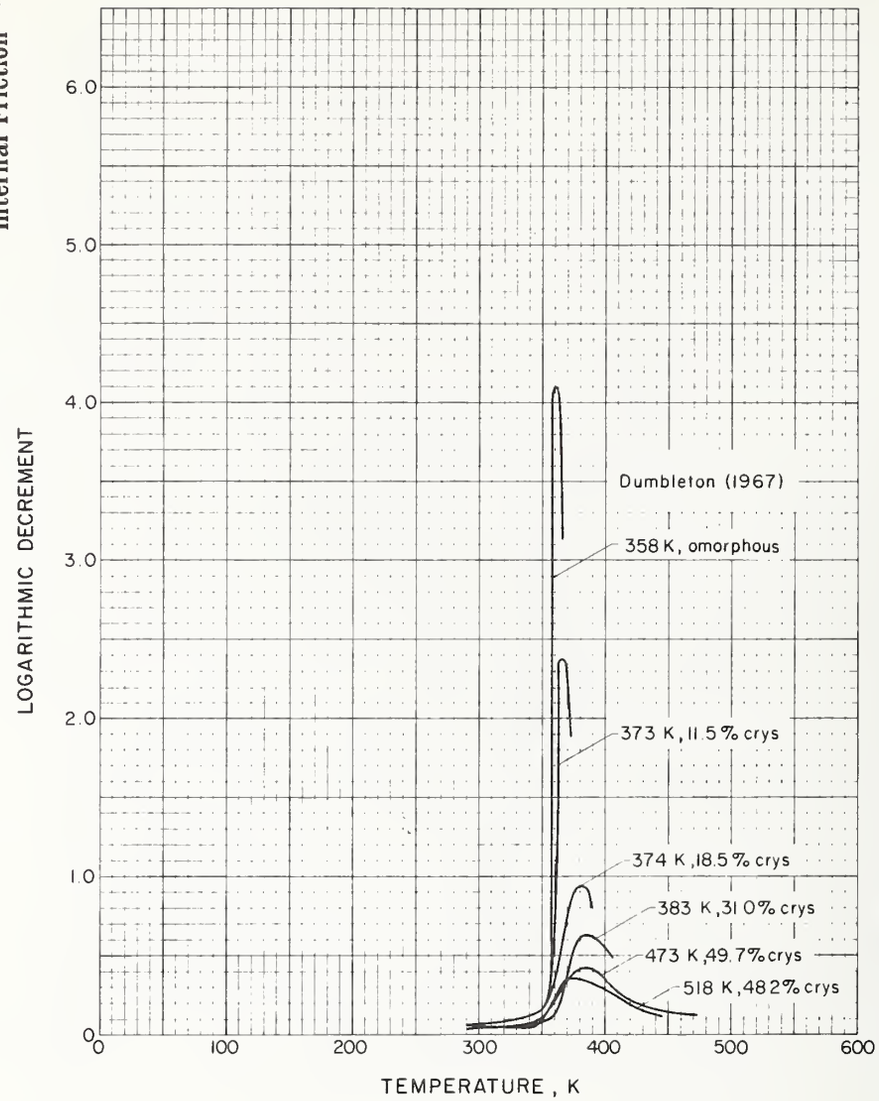


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mitsuishi, Tonami (1964)	Annealed for 1 h without tension	Fiber, 2.1-2.6 denier; results also presented for 453 K anneal and for samples held at fixed length during anneal, the peak values generally occurred a few degrees lower in temp.

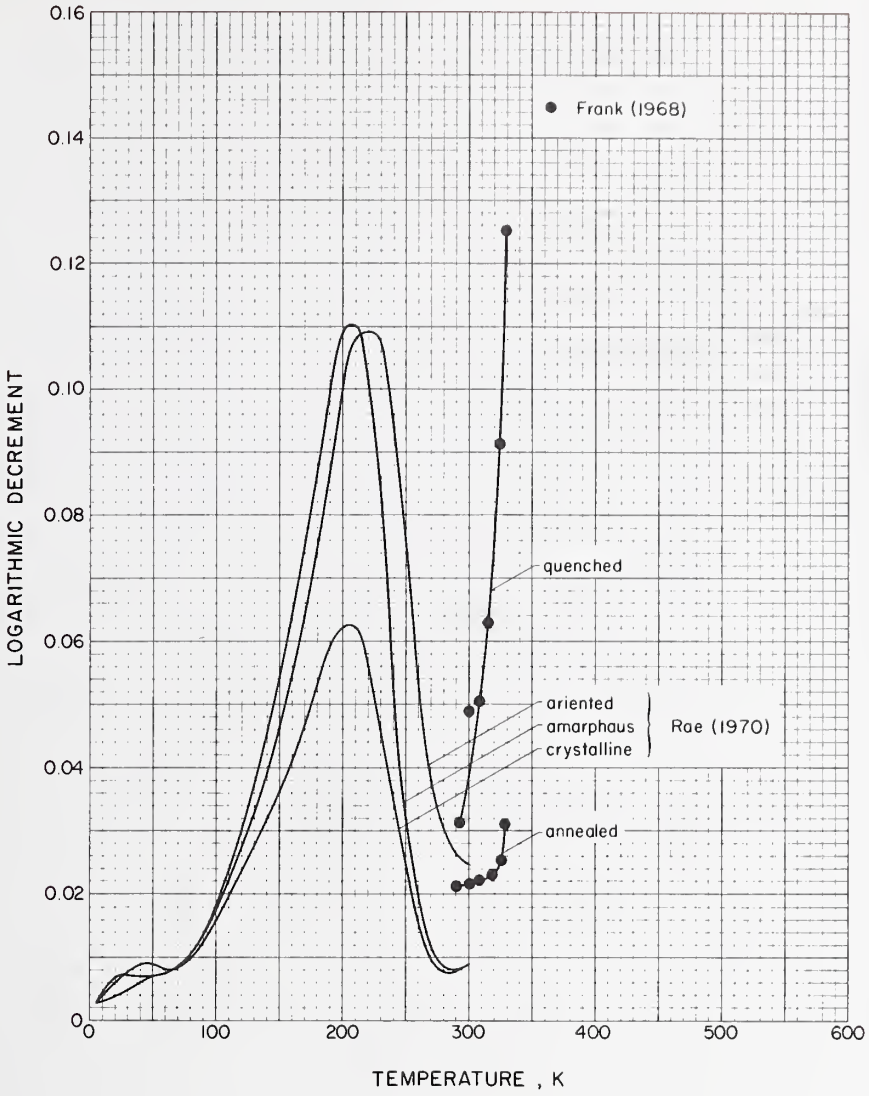


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kuriyama, Baer (1966)	Amorphous, unoriented film	Torsion pendulum, 1. 32 Hz.
Armeniades, Kuriyama, Roe, Baer (1967)	Number-av molecular weight = 15, 000 with 1% low molecular weight (xylene extractable) species: amorphous Mylar film, as received; compression molded from Mylar, crystallized from melt by slow cooling, 56% crys; biaxially drawn and heat-set mylar A, 54% crys, as received	ℓ = 6. 0 cm, w = 0. 5 cm, t = 0. 02 cm; free oscillating torsion pendulum at a frequency range of 1 Hz; intermediate results given for other crystallinities and drawing conditions.

PET

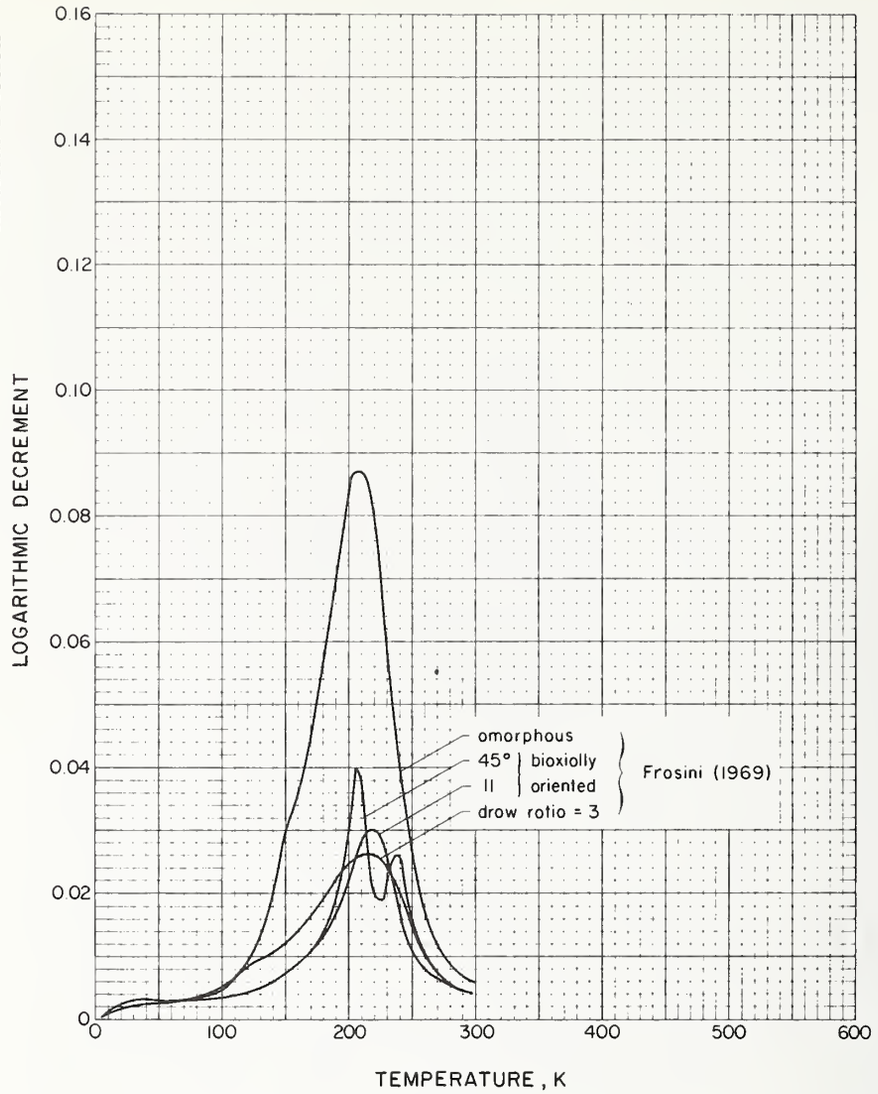


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Dumbleton, Myrayama (1967)	Unoriented spun fibers of 2-3% crys, annealed in N_2 for 6 h	Vibron, 11 Hz, heated at 1 K min^{-1} in N_2.

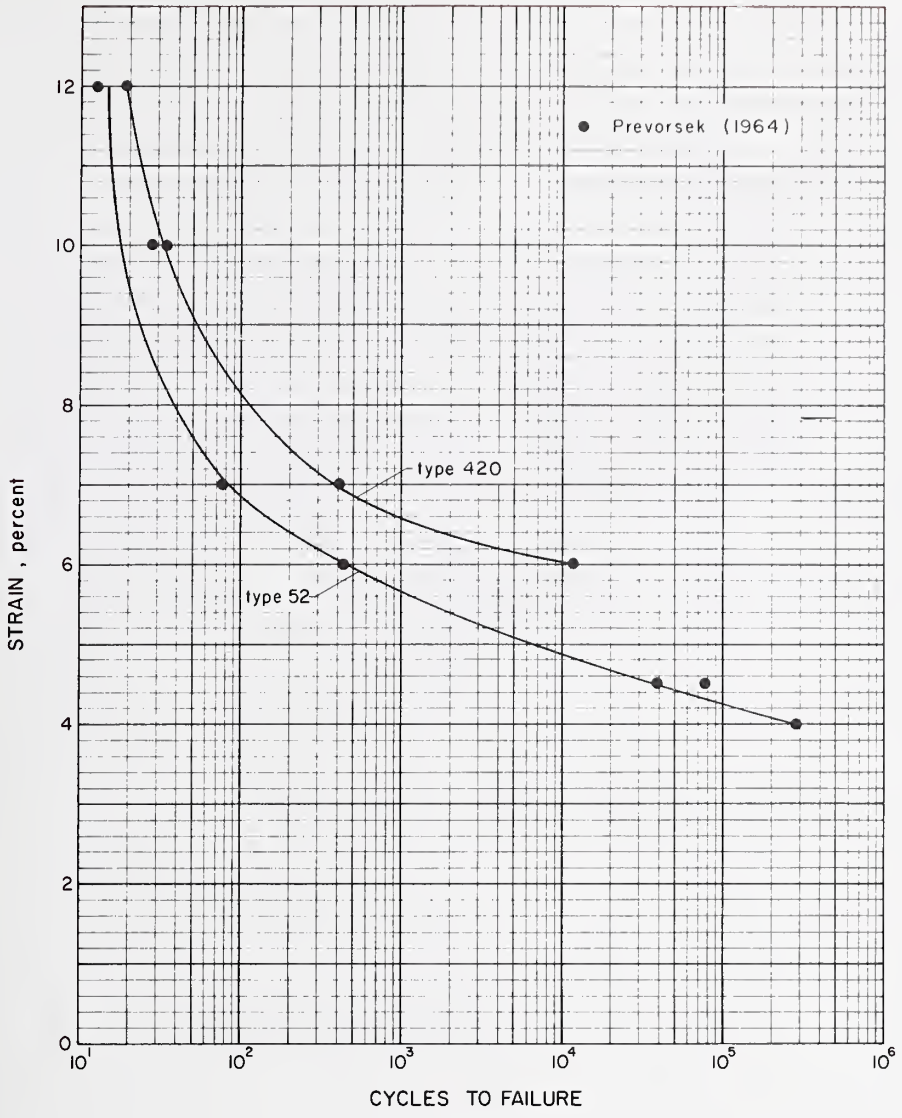


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Frank, Stuart (1968)	Commercial sheet	ℓ = 6.0 cm, w = 1.0 cm, t = 0.02 cm; torsion pendulum.
Roe (1970)	Av molecular weight = 15,000 with 1% low molecular weight (xylene extractable) species; amorphous melt cast and rapidly cooled; oriented Mylar A biaxially drawn and heat set	ℓ = 6.0 cm, w = 0.6 cm, t = 0.03 cm; inverted torsion pendulum, pendulum system evacuated to 10^{-2} Torr for 24 h, oscillation measured at 1-4 K intervals as temp increased at 15-20 K h^{-1}.

PET



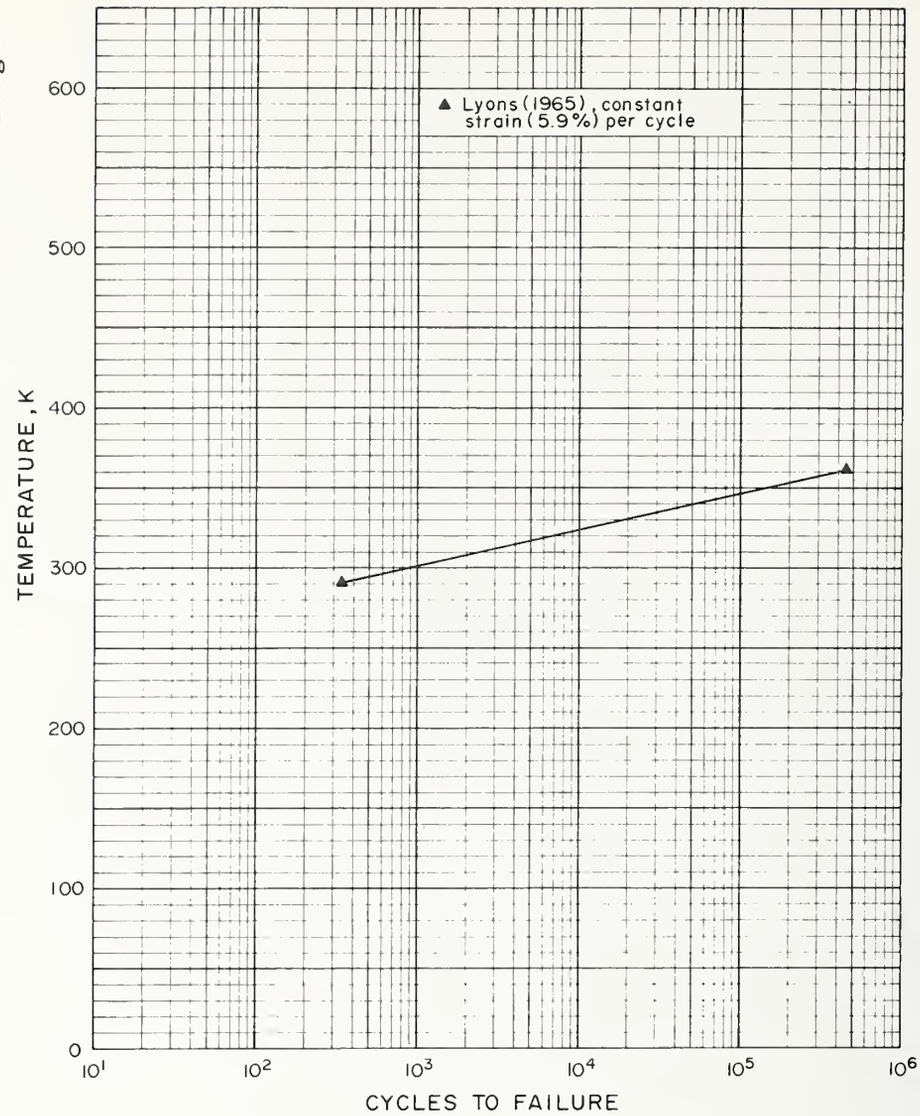
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Frosini, Woodward (1969)	Undried film; number-av molecular weight = 23,000 for amorphous specimen and specimen uniaxially oriented by stretching to a draw ratio of 3 at 348 K; number-av molecular weight = 16,000 for specimens biaxially oriented 3-fold above Tg and then heat set at 493-498 K	Biaxially oriented specimens tested ‖ to an orientation direction and at 45° to the orientation directions; torsion pendulum, 0.4-2 Hz.



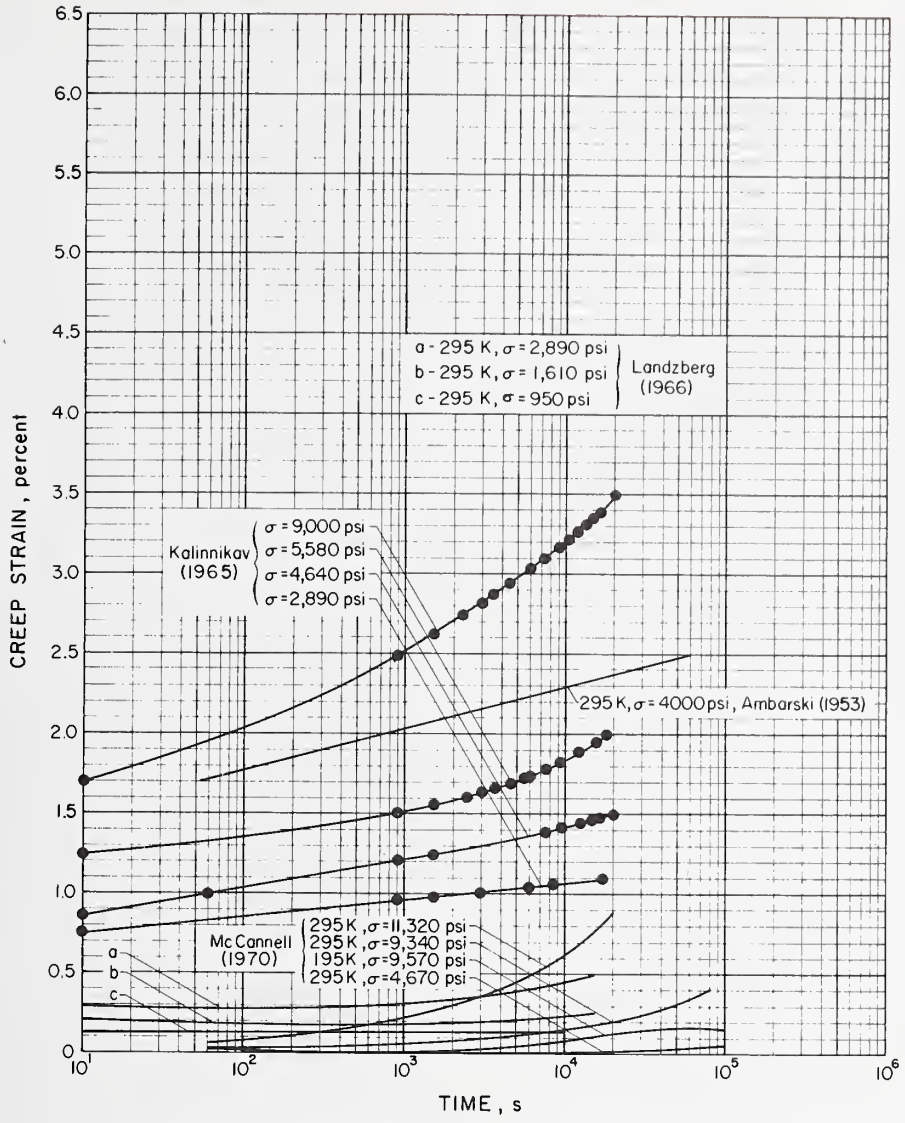
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Prevorsek, Lyons (1964)	Dacron, types 52 and 420	$\ell \simeq 12.7$ cm; constant displacement fatigue, 294 K, 4.17 Hz.

PET

Fatigue



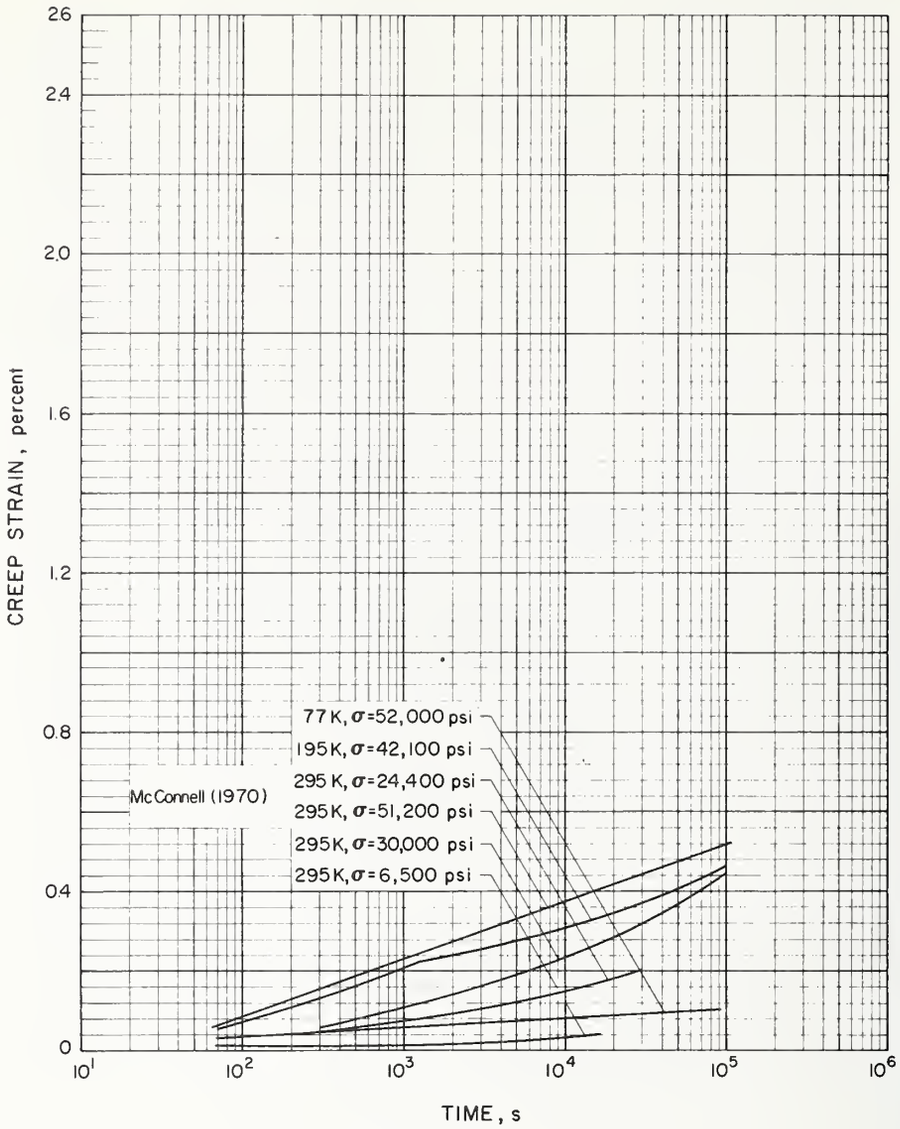
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Lyons, Ribnick, Way (1965)	Dacron, type 52	Single fibers, 4 denier; 4.17 Hz, 5.9% elongation per cycle, 21-37 specimens per temp, within dry oven.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
McConnell, Daney, Kirgis (1970)	Mylar A film	ℓ = 17.7 cm, 0.00254, 0.0051, 0.0254 cm widths; ends epoxied to Cu top and nylon bottom disc, "slight" prestrain, measurements within quartz tube dilatometer with dial gauge sensitivity of 5×10^{-3} cm, est error of ±3%, constant load applied after cool-down.
Amborski, Flierl (1953)	Mylar	Constant load.
Landzberg (1966)	Mylar, type A, film	t = 0.00381 cm, specimens 1.27 x 15.24 cm, GL = 12.7 cm; sensitivity of 0.000254 cm through optical lever, slight preload.
Kalinnikov (1965)		ℓ = 4.0 cm, w = 0.5 cm, t = 0.0025 cm; 293 K, 50% rel hum.

PET

Creep



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
McConnell, Daney, Kirgis (1970)	Dacron, type 52, multi-fiber yarn, 220 denier	ℓ = 17.7 cm, av yarn x sec area = 0.0001777 cm^2, 44 continuous fibers; ends epoxied to Cu top and nylon bottom disc, "slight" prestrain, measurements with quartz tube dilatometer with dial gauge sensitivity of 5 x 10^{-3} cm, est error of ±3% content load applied after cool-down.

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Young's Modulus (10^5 psi)
Beste (1950)	Yarn	297			57	
Hamburger (1952)	Dacron type 5100, 210 denier	297	109.5		8.9	
Amborski (1953)	Mylar	297	23.5		70	0.5
Coplan (1953)	Dacron Yarn Exposure Conditions	294				
	226 K		107		8.1	
	294 K		111	30.0	8.5	2.12
	372 K, 24 h		111	21.2	14.5	1.41
	450 K, 24 h		97	21.2	34.1	1.06
Hudson (1953)	Terylene Film sp gr = 1.39	295	25 (breaking strength)	14	50	
Guthrie (1954)	Dacron continuous filament	297				1.81
	Terylene continuous filament staple					1.95
						1.05
Wakelin (1955)	Draw Ratio = 1	297				0.31
	2					0.41
	3					1.15
	4					1.78
	5					1.85
	6					1.99
Farrow (1956)	Terylene 45/24, medium tenacity, loading rate = 1233 psi s^{-1}	297			15	2.12
	Terylene 45/24, dull, loading rate = 1233 psi s^{-1}				16	1.77
	Terylene 125/72, high tenacity, loading rate = 1233 psi s^{-1}				7	2.65
	Terylene, staple, 2 denier, loading rate = 2090 psi s^{-1}				37	1.77
	Dacron 70/34, loading rate = 392 psi s^{-1}				15	3.53
	Dacron, staple, 3.2 denier, loading rate = 500 psi s^{-1}				50	0.49
Kast (1956)	Continuous filament Yarn	297	70.5-122.0 53.0-83.0		8-30 25-60	

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Beste, Hoffman (1950)	Yarn	$\dot{\epsilon} = 0.0017\ s^{-1}$.
Hamburger, Platt, Morgan (1952)	Dacron type 5100, 210 denier, 34 filaments	2.54 twists cm^{-1}.
Amborski, Flierl (1953)	Mylar	t = 0.025 cm; Instron, rel hum = 35%.
Coplan (1953)	Dacron 5100; filament yarns: 70 denier, 34 filament, 3/4 Z; 210 denier, 34 filament, 1Z	GL = 25.4 cm; Instron or F.R.L. Tester, xhd spd = 0.127 cm s^{-1}, exposed to conditions noted, tested at 65% rel hum; values here are an av of the 2 yarns which gave almost the same results, max load error = 2%, max elongation error = 5%, 12 specimens tested.
Hudson (1953)	Terylene film, sp gr = 1.39	
Guthrie, Morton, Oliver (1954)	Dacron and Terylene, continuous filament of 2.2 denier or staple	Cliff tester, loading rate = 0.74 x 10^3 psi s^{-1}, rel hum = 65 ± 2%.
Wakelin, Voong, Montgomery, Dusenbury (1955)	Dacron	ℓ = 2.5 cm; Instron, $\dot{\epsilon} = 0.0083\ s^{-1}$; av of 4 measurements.
Farrow (1956)	Terylene and Dacron	ℓ varied; Cambridge Textile Extensometer operated at constant loading rate; several tests made to obtain reliable load-extension curve.
Kast, Meskat, Rosenberg, van der Vegt (1956)	Dacron, sp gr = 1.38; continuous filament: 1.2-5.0 denier; yarn: 1.5-6.0 denier	

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Young's Modulus (10^6 psi)
Charch (1959)	Dacron 2GT	298				0.37
McMahon (1959)	Film	296				
	t = 0.025 cm		25.8		158	
	t = 0.0013 cm		21.2		99.4	
	Yarn		121		11.6	
Haskins (1962)	long.	297	17.6		171	0.71
	trans		20.1		133	0.82
Miller (1962)	long.	76	44.0		5.1	
	trans		45.6		5.4	
Sakurada (1962)		297				10.8
Alexandrov (1963)	Before aging	293				
	Hostaphan					
	t = 0.004 cm					
	long.		33.4		26.9	
	trans		21.6		43	
	t = 0.005 cm					
	long.		29.8		109	
	Melinex					
	t = 0.0035 cm					
	long.		23.8		62	
	trans		27.0		49	
	t = 0.005 cm					
	long.		28.7		89	
	trans		30.4		56.6	
	t = 0.012 cm					
	long.		20.2		110	
	Melinex C					
	t = 0.004 cm					
	long.		24.7		78	
	trans		27.1		68	
	After aging 20 days at 423 K					
	Hostaphan					
	t = 0.004 cm					
	long.		25.1		26.4	
	trans		15.3		11.6	
	t = 0.005 cm					
	long.		19.2		35	
	Melinex					
	t = 0.0035 cm					
	long.		17.7		65	
	trans		21.9		52.8	
	t = 0.005 cm					
	long.		17.0		67.6	
	trans		24.6		45.6	
	t = 0.012 cm					
	long.		14.9		50	

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Charch, Moseley, Jr. (1959)	Dacron 2GT	Constant from 3-100% rel hum, calculated from velocity of sound measurements.
McMahon, Birdsall, Johnson, Camilli (1959)	Mylar film, Dacron yarn	Instron Model TT-C, 50% rel hum.
Haskins, Hertz, Campbell (1962)	Mylar sheet	ℓ = 22.9 cm, w = 1.27 cm, t = 0.0035 cm; Instron, xhd spd = 0.085 cm s^{-1}.
Miller, Bailey, Freeman, Beall, Coxe (1962)	Mylar A	ℓ = 6.25 cm, w = 0.63 cm, t = 0.0076 cm; Instron.
Sakurada (1962)		Fiber, specimen cross section reduced to a reference state (dried) for stress calculation; strain measured by determining lattice extension of ($\bar{1}05$) plane by a Geiger counter x-ray diffractometer, stress assumed homogeneous throughout specimen.
Alexandrov, Trubashev (1963)	Hostaphan, Melinex, Melinex C	

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Young's Modulus (10^5 psi)
Pinnock (1963)	Unstabilized fiber (crys/birefringence)	297				
	0%/0					0.29
	31%/0.142					1.42
	30%/0.159					1.65
	29%/0.190					2.27
	Heat stabilized fiber (crys/birefringence)					
	33%/0					0.32
	40%/0.161					0.97
	43%/0.166					1.13
	41%/0.177					1.33
	Uniaxially drawn fiber (birefringence)					
	0.104					1.15
	0.142					1.50
	0.159					1.81
	Uniaxially drawn film birefringence = 0.104					
	long.					1.14
	trans					0.25
	45°					0.29
	birefringence = 0.122					
	long.					1.50
	trans					0.22
	45°					0.28
	birefringence = 0.152					
	long.					1.59
	trans					0.21
	45°					0.24
Green (1964)	Mylar	297	17.0			
Hall (1964)	Terylene	295				
	high tenacity					
	$\dot{\epsilon} = 8.3 \times 10^{-3}\ s^{-1}$					2.54
	$\dot{\epsilon} = 330\ s^{-1}$					3.83
	medium tenacity					
	$\dot{\epsilon} = 8.3 \times 10^{-3}\ s^{-1}$					1.77
	$\dot{\epsilon} = 330\ s^{-1}$					3.73
Lockheed (1964)	Film	295				
	long.		19.0±0.8	14.0±1.7	19.5±2.1	0.980±0.380
	trans		22.5±2.3	14.2±0.8	50.0±4.0	0.590±0.025
Mitsuishi (1964)	Fiber	298				
	unannealed		93.9		36.3	1.465
	annealing temp					
	353		91.6		33.1	1.310
	373		90.5		39.1	1.510
	393		96.2		37.9	1.181
	413		91.3		43.4	1.152
	433		92.2		45.8	1.125
	453		87.0		48.8	1.129
	473		82.0		44.9	1.125
	493		64.3		56.8	1.024
	513		41.5		25.0	1.053

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Pinnock, Ward (1963)	Fibers from conventional 2 stage process, stabilized by heat at least 40 K above transition temp; film initially extended to draw ratio of 5	Fixed alternating strain of 0.005 at 0.01-100 Hz for fibers, film tested on Instron.
Green, Levine (1964)	Mylar	
Hall (1964)	Terylene microdull high tenacity, 24 filaments; Terylene dull medium tenacity, 48 filaments	GL = 5 cm; 295 K, 64 ± 4% rel hum; end correction used at high $\dot{\epsilon}$.
Lockheed Missles and Space Co. (1964)	Mylar	t = 0.005 cm, ASTM D 412-51T Type C die; Tinius Olsen Universal Test Machine Model RM-2, xhd spd = 0.0042 cm s^{-1}; errors are standard deviation of 2-6 tests.
Mitsuishi, Tonami (1964)	Annealed for 1 h without tension	Fiber, 2.1-2.6 denier, ℓ = 2.0 cm; $\dot{\epsilon} = 0.017\ s^{-1}$; results also presented for samples held at fixed length during anneal, the tensile strength and Young's modulus were somewhat higher while the elongation was lower.

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (Percent)	Young's Modulus (10^6 psi)
Pope (1964)	long. trans	297	24.7 25.7	15.5 15.5	53 148	
Anagnostou (1965)	unirrad irrad	321	13 10		69 3	
Becker (1965)	t = 0.0015 cm 0.0025 cm 0.0038 cm 0.0076 cm 0.0132 cm 0.0215 cm 0.254 cm	297				0.57 0.75 0.80 0.79 0.79 0.74 0.67
Cumberbirch (1965)	200 denier (birefringence/ draw ratio) 0/1 0.007/1.22 0.013/1.54 0.029/2.03 0.086/2.90 0.105/3.37 0.157/3.93 0.178/4.25	297				 0.35 0.35 0.38 0.50 0.84 0.98 1.7 2.0
Hadley (1965)	Monofilament long. trans Film long. trans	297				 1.31 0.165 1.60 0.218

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Pope, Isakson (1964)	Mylar C sheet	t = 0.0025 cm; Instron, xhd spd = 0.085 cm s^{-1}, ASTM D 882-56T test procedure; 3 specimens tested in each orientation.
Anagnostou (1965)	Mylar film	ℓ = 2.5-5.1 cm, w = 0.6-1.3 cm, t = 0.003 cm, GL = 1.3 cm; Instron Model TT-C, rubber faced jaws, xhd spd = 0.004-0.021 cm s^{-1}, specimens randomly cut from film; irrad in vacuum at 321 K by ultraviolet from Hanovia 100 watt type SH high pressure quartz Hg vapor lamp located 24.4 cm from specimen for 1003 h, also irrad by 2 MeV electrons for a dose of 5 x 10^{16} electrons cm^{-2}.
Becker (1965)	Mylar A sheet, 22 x 28 cm	ℓ = 15.2 cm, w = 2.54 cm, GL = 6.63 cm long,dimension cut ‖ to 22 cm sheet dimension; strain readings taken at constant load; 2 specimens of each thickness tested.
Cumberbirch, Owen (1965)	Terylene, initially undrawn, 200 denier, drawn over 343-348 K hot plate	Instron, 65% rel hum.
Hadley, Ward, Ward (1965)	Film and melt-spun monofilament	Filament ℓ = 4.0 cm; long. values at 0.5% strain.

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (Percent)	Young's Modulus (10^6 psi)
Heffelfinger (1965)	Uniaxially stretched	297				
	draw ratio = 2.0					
	long.		16.9		214	0.46
	trans		6.5		497	0.53
	draw ratio = 3.0					
	long.		26.0		92	0.88
	trans		6.5		490	0.30
	draw ratio = 3.5					
	long.		31.8		68	1.02
	trans		7.1		400	0.26
	draw ratio = 4.0					
	long.		40.8		48	1.28
	trans		6.5		474	0.25
	draw ratio = 4.5					
	long.		47.3			1.55
	trans		7.4			0.30
	draw ratio = 5.0					
	long.		57.7		19	1.77
	trans		7.3		492	0.33
	Biaxially stretched					
	draw ratio = 2.5x2.5					
	long.		19.5		128	0.62
	trans		23.2		140	0.70
	draw ratio = 3.0x3.0					
	long.		26.5		114	0.65
	trans		22.4		135	0.64
	draw ratio = 3.5x3.5					
	long.		30.5		78	0.76
	trans		24.3		100	0.67
	Post-stretched					
	draw ratio = 1.3					
	long.		37.0		40	0.92
	trans		21.0		150	0.56
	draw ratio = 1.45					
	long.		38.2		52	0.99
	trans		17.0		250	0.46
	draw ratio = 1.68					
	long.		42.1		27	1.05
	trans		18.3		133	0.53
Lare (1965)	Mylar A	297				
	t = 0.013 cm					
	trans		22.8-23.5	12.4-12.8	85-100	0.36-0.40
	long.		22.5-24.0	11.6-12.4	105-122	0.35-0.40
	45°		25.8-26.9	12.2-12.4	90-100	0.35-0.39
	t = 0.005 cm					
	trans		22.1-25.3	12.2-12.6	60-80	0.38-0.45
	long.		22.1-22.6	12.8-13.2	80-100	0.35-0.38
	45°		16.0-16.5	14.3-14.5	145-150	0.35-0.38
	t = 0.001 cm					
	trans		19.0-19.5	11.2-12.0	60-70	0.37-0.39
	long.		17.5-19.8	12.0-12.8	50-65	0.34-0.40
	45°		14.4-15.2	13.1-13.5	40-50	0.31-0.37

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Heffelfinger, Schmidt (1965)	Mylar, uniaxially stretched specimens extended in long. direction, biaxially stretched specimens extended in long. then in trans directions, post-stretched specimens extended in long. then trans then long. directions	t = 0.0025 cm; Instron, xhd spd = 0.042 cm s^{-1}.
Lare, DeBoskey, Divecha, Hahn (1965)	Mylar A, as received	ASTM D-412 Type C die; Instron, $\dot{\epsilon}$ = 0.008 s^{-1}; 3 samples in each orientation measured, 0.2% yd off.

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Young's Modulus (10^5 psi)
Podall (1965)	Mylar A	297				
	long.		23.5	14.5	96	0.43
	trans		22.2	14.2	112	0.41
	Mylar C					
	long.		20.3	15.0	92	0.40
	trans		23.3	14.3	90	0.45
	Mylar T					
	long.		40.0	20.0	24	0.62
	trans		20.2	12.7	84	0.31
Prevorsek (1965)	Dacron 52	294				
	fatigue cycles					
	1					1.17
	375					2.24
	2500					2.40
	Dacron 420					
	fatigue cycles					
	1					1.46
	375					2.35
	2500					2.40
Weingarten (1965)	Mylar	297				0.74
Elder (1966)	Terylene, single filament	297				1.85±0.23
Ishai (1966)	t = 0.035 cm	297	17.8±2.5	13.6±0.7		0.62±0.10
	t = 0.026 cm		26.7±4.7	14.5±0.9		0.73±0.11
	t = 0.013 cm		31.3±6.7	14.6±0.5		0.78±0.08
Levantovskaya (1966)	Aged in air at 426 K	297				
	0 h		16.5			
	10 h		11.4			
	20 h		10.8			
	30 h		1.42			
Morbitzer (1966)	Draw ratio = 1.1	297				0.30
	1.15					0.31
	1.2					0.36
	1.3					0.91
	1.4					1.49
	1.5					2.02
	1.6					2.02
	After heating to 448 K for 10 min					
	Draw ratio = 1.3					1.10
	1.4					1.42
	1.5					1.69
	1.6					1.83
Pinnock (1966)	trans	297				
	birefringence = 0.001					0.33±0.02
	long.					
	birefringence = 0.153					1.32±0.13
	0.187					2.10±0.12

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Podall, Oser, Eliason, Augl (1965)	Mylar A, C, and T sheet	0.2% yd off.
Prevorsek, Lyons (1965)	Dacron 52 and 420	$\ell \simeq 12.7$ cm; constant displacement fatigue, 4.17 Hz.
Weingarten, Seide (1965)	Mylar	Cones and cylinders, t = 0.0075-0.025 cm; data spread = 0.66-0.80 x 10^6 psi.
Elder (1966)	Terylene, monofilament	ℓ = 0.25 -40 cm; Instron, rel hum = 65%.
Ishai, Weller, Singer (1966)	Mylar A	GL = 4-10 cm; Instron, $\dot{\epsilon} = 1.67 \times 10^{-4}$ s^{-1}; 5-6 specimens taken from each of 4 different directions, errors indicate av material direction variations.
Levantovskaya, Kovarskaya, Novoselova, Berlin, Bass, Klapovskaya, Grecheva, Andrianova (1966)	Unstabilized film	
Morbitzer, Hentze, Bonart (1966)	Fiber	$\dot{\epsilon} = 0.09$ s^{-1}, dynamic measurement.
Pinnock, Ward, Wolfe (1966)	Monofilaments from melt-spinning and drawing	Axial extension measured by microscope; stated errors are 95% confidence limits on the mean.

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Young's Modulus (10^6 psi)
Sagalaev (1966)	Film	298				0.40
Ward (1966a)	Terylene A oriented	297				
	long.					1.3
	trans					0.16
	Terylene B oriented					
	long.					2.3
	trans					0.09
	Terylene unoriented					0.33
Eckert (1967)	Formed at 358 K					
	heat-set time = 15 s					1.25
	120 s					1.15
	15 and 120 s					1.35
	Formed at 368 K					
	heat-set time = 15 s					1.21
	120 s					0.87
	15 and 120 s					1.00
Sagalaev (1967)	Formed at 353 K	297				
	$\dot{\epsilon}$ = 13.3 s^{-1}					
	draw ratio = 2.25		13.5	13.2[a]		0.51
	2.6		19.2	13.7		0.62
	$\dot{\epsilon}$ = 100 s^{-1}					
	draw ratio = 3.2		29.2	16.4		0.82
	3.0		25.6	16.1		0.74
	2.7		20.9	12.1		0.65
	Formed at 363 K					
	$\dot{\epsilon}$ = 53.3 s^{-1}					
	draw ratio = 2.2		10.7	11.1		0.51
	2.8		19.9	11.7		0.64
	3.25		27.0	14.9		0.81
	3.25		28.4	15.6		0.85
	$\dot{\epsilon}$ = 26.7 s^{-1}					
	draw ratio = 3.5		23.6	16.5		0.92
	$\dot{\epsilon}$ = 13.3 s^{-1}					
	draw ratio = 2.5		14.2	13.7		0.84
	3.2		23.6	14.2		0.91
	Formed at 373 K					
	$\dot{\epsilon}$ = 26.7 s^{-1}					
	draw ratio = 2.5		11.4	11.4		0.47
	3.0		18.5	14.2		0.60
	3.5		23.5	15.1		0.80
	$\dot{\epsilon}$ = 53.3 s^{-1}					
	draw ratio = 4.2		32.7	18.5		1.14
	$\dot{\epsilon}$ = 31.7 s^{-1}					
	draw ratio = 3.5		29.0	17.1		0.80
	Amorphous, unoriented		8.5	6.4		0.28
Zolg (1967)	long.	297	33.0	15.7	50	0.42
	trans		19.0	13.4	100	0.28
	45°		23.0	14.2	71	0.35
	After heating at 510 K for 30 min					
	long.		21.6		40	
	trans		11.5		1	

(a) Referred to as proportional limit by authors.

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sagalaev, Andrianova, Vlasov, Gracheva (1966)		Film; data also presented for film biaxially drawn at several temperatures and rates.
Ward (1966a)	Terylene fiber	Diam = 0.025 cm.
Eckert, Serafini (1967)	Unoriented film, number av molecular weight = 19,000, simultaneous 3x stretch	t = 0.002 cm, w = 2.54 cm, GL = 10 cm, $\ell_{\perp}$ to extrusion direction; xhd spd = 0.085 cm s^{-1}.
Sagalaev, Andrianova, Gracheva, Livin (1967)	Films simultaneously oriented in 2 directions, thermally fixed.	
Zolg (1967)	Mylar	t = 0.013 cm; 50% rel hum.

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Young's Modulus (10^6 psi)
Zuerev (1967)	Fiber	293				
	Stretched at 318 K as stretched					
	Draw ratio = 4.0		54.9		44.20	0.284
	4.5		61.9		30.90	0.316
	4.8		66.9		29.10	0.344
	Annealed 3 h at 383 K					
	Draw ratio = 4.0		60.1		37.66	0.307
	4.5		65.7		32.20	0.320
	4.8		68.9		23.50	0.362
	Annealed 30 min at 413 K					
	Draw ratio = 4.8		68.0		29.70	0.404
	Annealed 20 min at 443 K					
	Draw ratio = 4.8		69.3		27.30	0.413
	Stretched at 383 K to draw ratio = 4.8					
	as stretched		76.8		22.2	0.386
	Annealed 3 h at 383 K		79.7		22.9	0.420
	Annealed 30 min at 413 K		78.2		25.0	0.441
Bridle (1968)	Draw ratio = 2.5	297				
	long.			14.0		0.68
	trans			8.0		0.33
	45°			9.4		0.34
	Draw ratio = 3.5					
	long.			22.0		1.21
	trans			6.8		0.28
	Draw ratio = 4.25					
	long.			34.0		1.59
	trans			8.2		0.26
	45°			10.0		
	Draw ratio = 5.0					
	long.			51.0		2.04
	trans			8.4		0.33
	45°			10.7		

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Zuerev, Polovikina (1967)	Fiber, stretched at 318 K and 383 K	
Bridle, Buckley, Scanlan (1968)	Mylar, initially amorphous, drawn by passing the extruded film through 2 sets of rollers going at different speeds	ℓ = 2.54 cm, w = 0.5 cm; Instron with CTM load cell, nominal $\dot{\epsilon}$ = 0.0066 s^{-1} used for draw ratio of 4.25, all other tests were dead weight measurements.

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Young's Modulus (10^5 psi)
DuPont (1968)	Filament yarns (den.-fil.-twist-type)	296				
	40-8-RO2-55		74		31	
	40-26-RO2-62 dull		48		29	
	40-27-RO2-56		83		34	
	40-27-RO2-57		76		31	
	40-27-RO2-62 semi dull		51		32	
	40-27-RO2-92		58		30	
	70-14-RO2-55		76		28	
	70-34-RO2-26 semi dull		74		29	
	70-34-RO2-56		88		31	
	70-34-RO2-57		76		31	
	70-34-RO2-62 semi dull		53		34	
	70-34-RI0-56		99		24	
	70-34-RI0-92		71		30	
	70-44-RO2-26 dull		76		31	
	70-44-RO2-62 dull		48		29	
	100-34-RO2-56		85		29	
	150-34-RO2-56		83		33	
	150-34-RI0-56		87		33	
	150-34-RI0-62 semi dull		60		33	
	200-54-RI0-56		88		32	
	250-50-RO2-55		95		19	
	Staple and tow (den. - filament type)					
	1.5-34 (staple only)		69		21	
	1.5-89 (staple only)		57		12	
	1.5-106 (staple only)		106		19	
	2.25-59 (staple only)		79		48	
	3.0-54		74		41	
	3.0-64		53		34	
	3.0-65		41		30	
	3.0-809		78		32	
	12.0-114 (staple only)		64		35	
	12.0-115 (staple only)		39		28	
Kazakevich (1968)	Commercial, crystalline	298	28			
Price (1968a)	Specimen orientation within film:	297				
	long.		24.6	10.6	138	0.54
	22.5°		24.6	11.0	150	0.55
	45°		24.6	10.8	157	0.52
	67.5°		32.6	11.0	112	0.63
	trans		34.0	11.6	92	0.69

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Du Pont (1968)	Dacron	GL = 25.4 cm; conditioned at 296 K and 65% rel hum, Instron, $\dot{\epsilon} = 0.01\ s^{-1}$; data are av values from current production.
Kazakevich, Kozlov, Pisarenko (1968)	Commercial, crystalline	$\ell = 10.0$ cm, w = 3.0 cm, t = 0.008 cm; dynamometer.
Price (1968a)	Biaxially oriented film, sp gr = 1.395	GL = 7.62 cm, w = 1.27 cm, t = 0.0025 cm; xhd spd = 0.085 cm s^{-1}; av of 25 measurements, max data spread: TS = ± 3 x 10^3 psi, YS = ± 1 x 10^3 psi, elongation = ± 64%, E = ± 0.06 x 10^5 psi.

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Young's Modulus (10^6 psi)
Dumbleton (1969)	Draw ratio = 3	293				
	Annealing temp =					
	373 K					0.61
	423 K					0.48
	448 K					0.46
	473 K					0.30
	498 K					0.19
	Draw ratio = 5					
	Annealing temp =					
	373 K					1.17
	423 K					0.85
	448 K					0.62
	473 K					0.48
	498 K					0.21
	513 K					0.25
Hadley (1969)	(orientation/birefringence/draw ratio)	294				
	long./0/1.0					0.29
	long./0.020/1.5					0.36
	long./0.040/2.0					0.44
	long./0.055/2.5					0.44
	long./0.080/3.0					0.73
	long./0.105/3.5					1.16
	long./0.125/4.0					1.60
	trans/ /4.25					0.15
	long./0.145/4.5					1.74
	long./0.180/5.0					2.10
	trans/ /5.25					0.07
	long./0.190/5.5					2.25
	long./0.195/6.0					2.39
	long./0.200/6.5					2.47
	long./0.205/7.0					2.61
	long./0.210/7.5					2.68

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Dumbleton (1969)	Monofilaments, < 2% crys, birefringence = 0.002, drawn at 353 K then annealed in silicone oil at 493 K, quenched to 295 K in CCl_4 with no crystallization	Instron, 65% rel hum.
Hadley, Pinnock, Ward (1969)	Terylene, monofilaments from conventional 2 stage melt spinning and drawing process, very low degree of orientation, subsequently stretched in a heated zone between 2 sets of rollers moving at different speeds	Diam = 0.01 - 0.03 cm; cycled to max load several times before measurement.

Investigators(s) (year)	Description	Temperature (K)	Bulk Modulus (10^9 psi)	Shear Modulus (10^9 psi)	Compressive Modulus (10^9 psi)	Other
Amborski (1953)	Mylar	297 K				0.65[a]
Wakelin (1955)	Draw Ratio = 1	297		0.13		
	2			0.09		
	3			0.10		
	4			0.12		
	5			0.10		
	6			0.12		
Helwege (1962)	Pressure = 14.2 psi	293				
	sp gr = 1.34		0.71			
	1.37		0.77			
	1.42		0.83			
	Pressure = 7,100 psi					
	sp gr = 1.34		0.77			
	1.37		0.91			
	1.42		1.00			
	Pressure = 14,200 psi					
	sp gr = 1.34		0.83			
	1.37		0.91			
	1.42		1.11			
	Pressure = 28,400 psi					
	sp gr = 1.34		0.91			
	1.37		1.11			
	1.42		1.25			
Pascale (1963)		296				81[b]
Pinnock (1963)	Unstabilized fiber (crys/birefringence)	297				
	0%/0			0.11		
	31%/0.142			0.12		
	30%/0.159			0.09		
	29%/0.190			0.11		
	Heat stabilized fiber (crys/birefringence)					
	33%/0			0.13		
	40%/0.161			0.09		
	43%/0.166			0.06		
	41%/0.177			0.09		

(a) Impact Energy (ft-lb)
(b) Shore D Hardness

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Amborski, Flierl (1953)	Mylar	t = 0.025 cm; rel hum = 35%.
Wakelin, Voong, Montgomery, Dusenbury (1955)	Dacron	ℓ = 7-10 cm; vibrascope; av of 4 measurements.
Hellwege, Knappe, Lang (1962)		Piezometer, measured while under pressure in a Hg medium.
Pascale, Hermann, Miner (1963)	Weather stabilized	t = 0.013 cm; rel hum = 50 ± 5%.
Pinnock, Ward (1963)	Fibers from conventional 2 stage process, stabilized by heat at least 40 K above transition temp	Electrostatic vibroscope, 1-100 Hz.

Investigators(s) (year)	Description	Temperature (K)	Bulk Modulus (10^6 psi)	Shear Modulus (10^6 psi)	Compressive Modulus (10^6 psi)	Other
Cumberbirch (1965)	200 denier (birefringence/draw ratio	297				
	0/1			0.13		
	0.007/1.22			0.10		
	0.013/1.54			0.11		
	0.029/2.03			0.13		
	0.086/2.90			0.12		
	0.105/3.37			0.11		
	0.157/3.93			0.12		
	0.178/4.25			0.09		
Hadley (1965)	Monofilament	297				
	1% extensional strain					0.60±0.05
	2% extensional strain					0.55±0.03
Elder (1966)	Terylene, single filament	297			1.84±0.27	
Ishai (1966)		297				15.8±0.5[d]
Pinnock (1966)	birefringence=0.001	297				
	trans		0.61	0.134±0.002		0.38±0.12[c]
	birefringence=0.153					
	long.		0.16	0.107±0.004		0.43±0.06
	trans					0.44±0.09
	birefringence=0.187					
	long.		0.07	0.107±0.002		0.44±0.07
	trans					0.37±0.06
Ward (1966)	Terylene A oriented	297				
	long.			0.10		0.43[c]
	trans					0.44
	Terylene B oriented					
	long.			0.10		0.44
	trans					0.37
	Terylene unoriented			0.13		
Hadley (1969)	(birefringence/draw ratio)	294				
	0/1.0			0.13		
	0.040/2.0			0.14		
	0.080/3.0			0.12		
	0.125/4.0			0.10		
	0.180/5.0			0.12		
	0.195/6.0			0.12		
	0.205/7.0			0.11		

(c) Poisson's Ratio
(d) Shear Strength (10^3 psi)

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Cumberbirch, Owen (1965)	Terylene, initially undrawn, 200 denier, drawn over 343-348 K hot plate	ℓ = 1.535 cm; scaled down Searle's double and single pendulum with an oscillation period of 0.5 - 10 s, 65% rel hum.
Hadley, Ward, Ward (1965)	Melt-spun monofilament	Av of 35 measurements with standard errors on the mean.
Elder (1966)	Terylene, monofilament	ℓ = 0.2 - 0.5 cm; Instron, rel hum = 65%.
Ishai, Weller, Singer (1966)	Mylar A	t = 0.035 cm, circular specimen; shear pin puncture, Instron; 5-6 specimens taken from each of 4 different directions, errors indicate av material direction variations.
Pinnock, Ward, Wolfe (1966)	Monofilaments from melt-spinning and drawing	Axial extension measured by microscope, torsion pendulum for shear modulus, compressed between glass plates to measure bulk modulus; stated errors are 95% confidence limits on the mean.
Ward (1966)	Terylene fiber	Diam = 0.025 cm.
Hadley, Pinnock, Ward (1969)	Terylene, monofilaments from conventional 2 stage melt spinning and drawing process, very low degree of orientation, subsequently stretched in a heated zone between 2 sets of rollers moving at different speeds	Diam = 0.01 - 0.03 cm; free vibration torsion pendulum.

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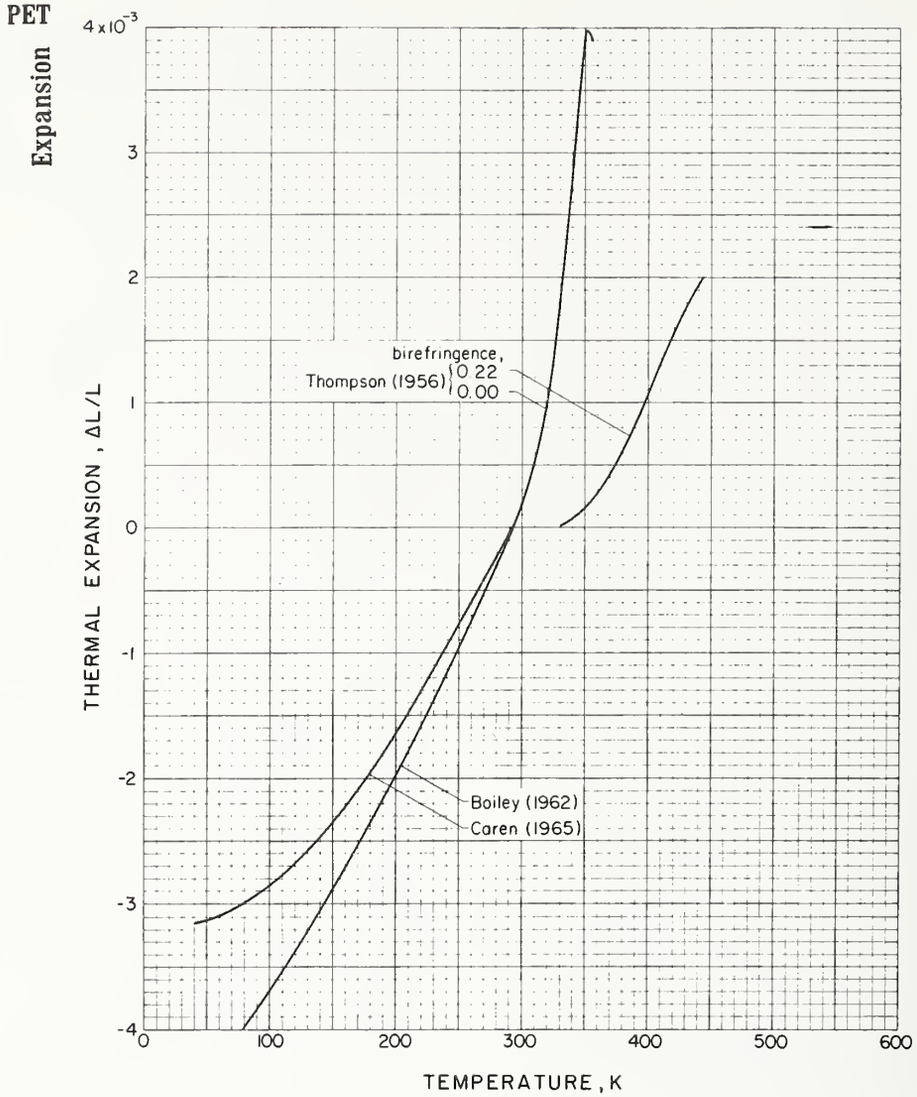
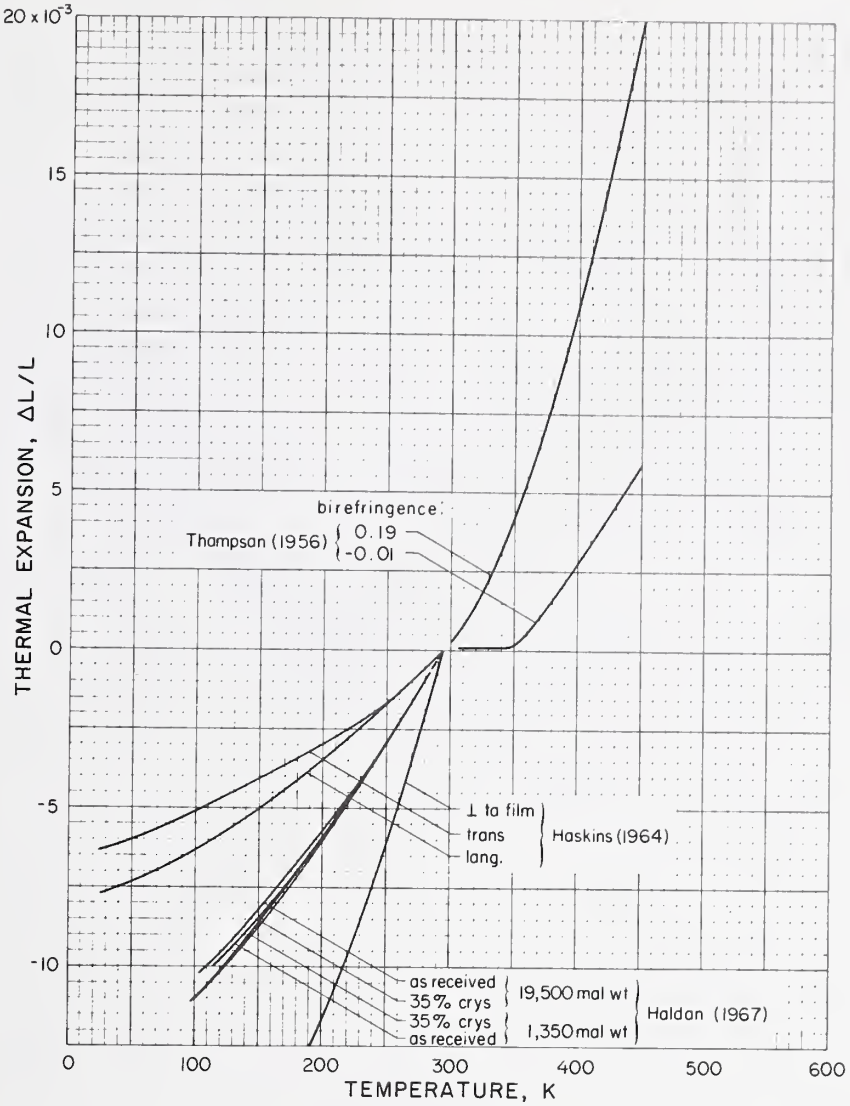
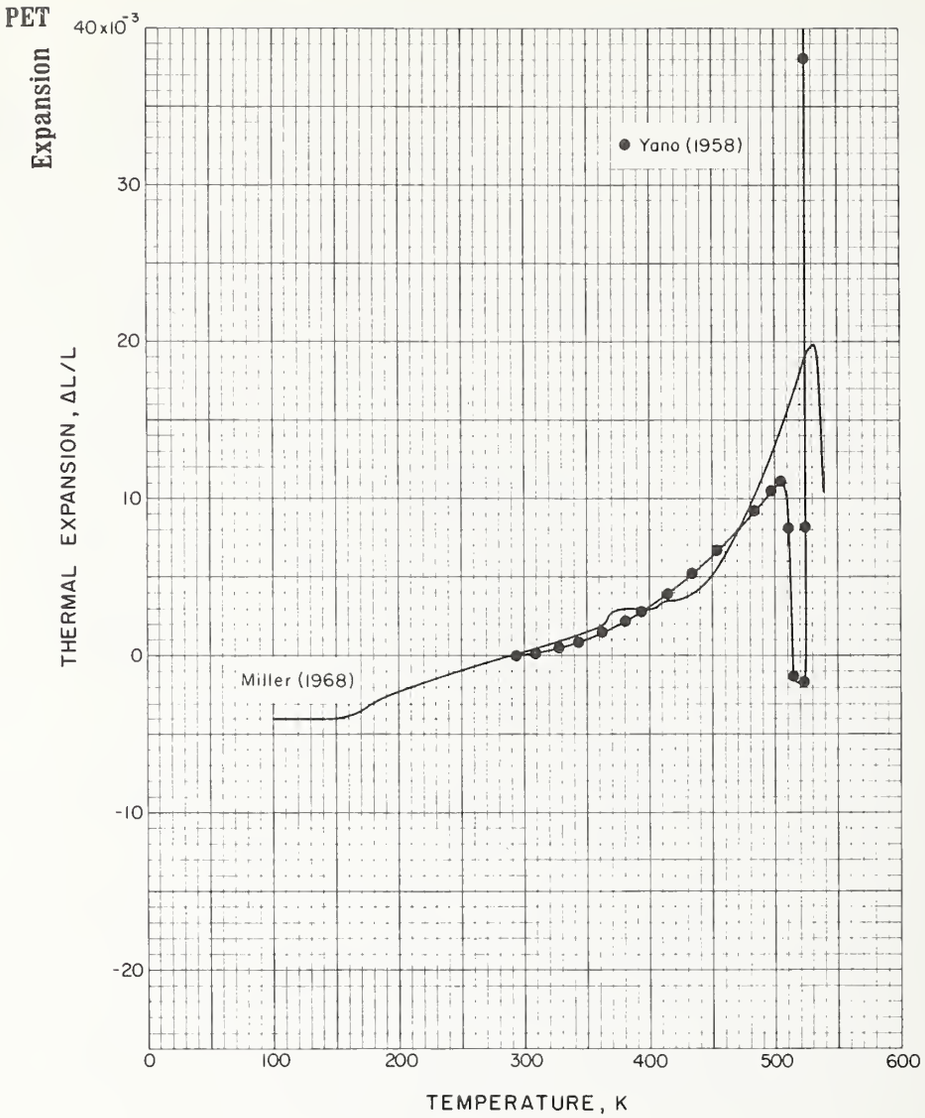


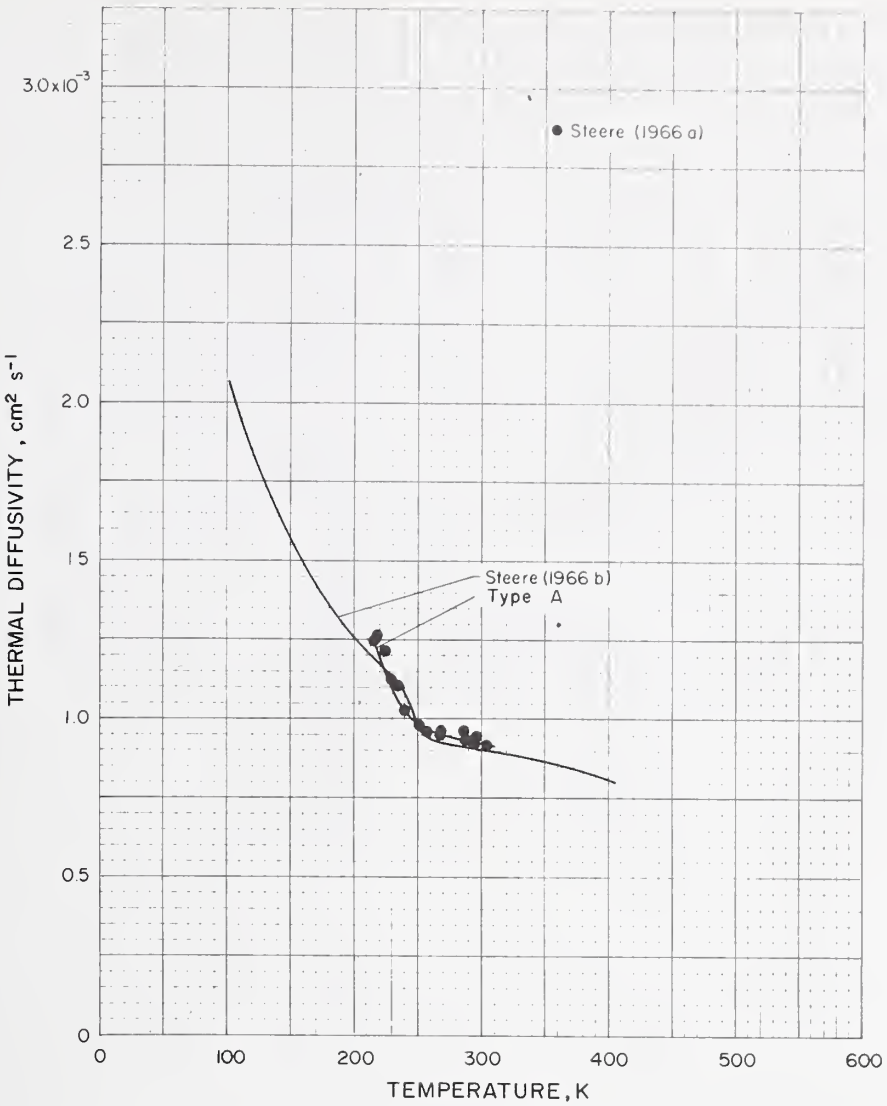
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bailey (1962)	Mylar	Diam = 0.95 cm, ℓ = 10.16 cm; quartz tube dilatiometer; total error ≤ 5%.
Caren, Coston, Holmes, Dubus (1965)	Mylar	t = 0.003 cm, rolled into tight cylinders approx 0.63 in diam and 5.08 cm long; thermocouples attached by drilling small hole near center; fused-quartz tube and dial-indicator used, data taken on warm-up; three samples tested, 5% max data scatter.
Thompson, Woods (1956)	Terylene filament yarn	Thermal expansion measurements made by observing change of length of specimen suspended by its own weight inside insulated metal jacket, birefringence decay observed using hot-stage microscope fitted with Babinet compensator.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Haldon, Schell, Simha (1967)	Mylar	Quartz tube dilatometer; quoted accuracy ± 5%.
Thompson, Woods (1956)	Terylene filament yarn	Thermal expansion measurements made by observing change of length of specimen suspended by its own weight inside insulated metal jacket, birefringence decay observed using hot-stage microscope fitted with Babinet compensator.
Haskins, Campbell, Hertz, Percy (1964)	Mylar	Leitz dilatometer.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Yano (1958)	Mylar, film was heat-stretched and then heated from 293 K to 498 K	
Miller (1968)	Mylar	t = 0.32 cm; flat-tipped quartz probe on a DuPont 940 Thermomechanical Analyzer, monitored by thermocouple, heating rate = 5 K min^{-1} starting at 77 K.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Steere (1966b)	Mylar	Transient heating method used; curve represents closely spaced series of points.
Steere (1966a)	Mylar A	Typical dimensions: ℓ = 6.25 cm, w = 3.5 cm, film stacked to 1.25 cm; transient heating method used, temp differential measured by Sanborn 350-1500 preamplifier and 299 recorder system; accuracy ≃ 2%.

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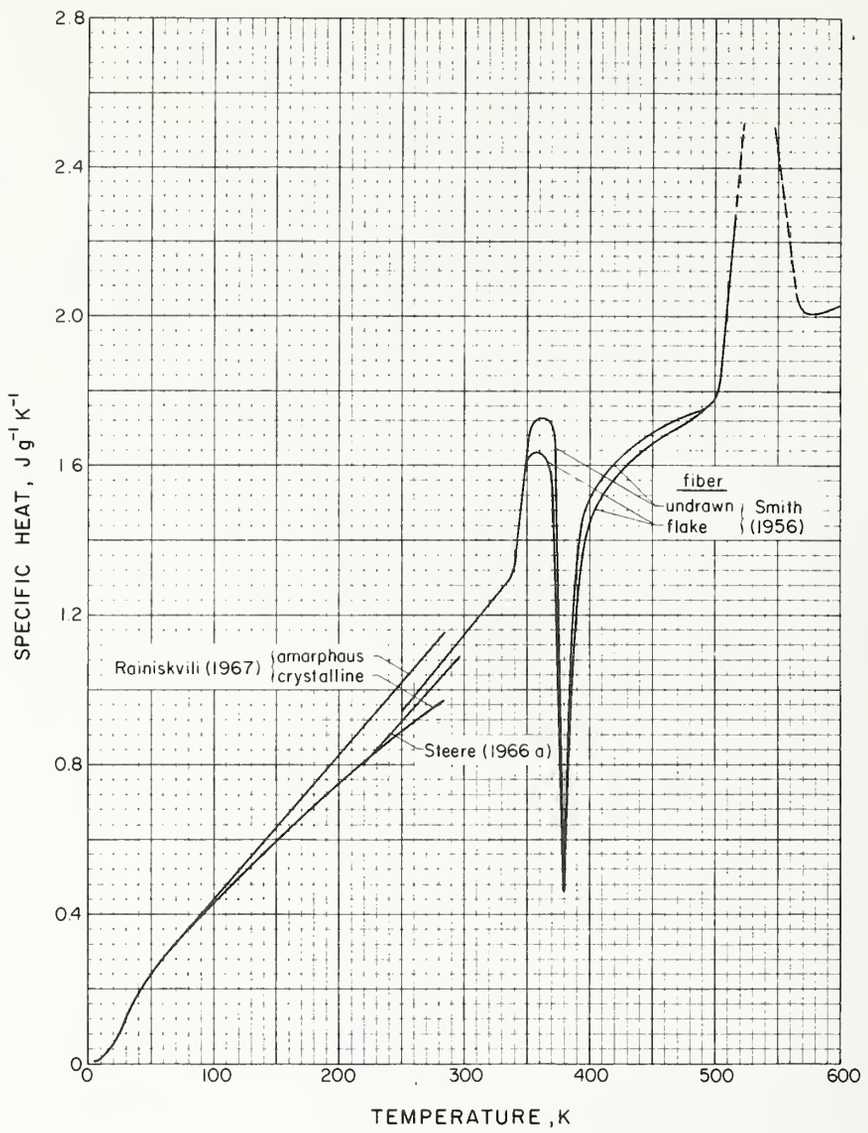
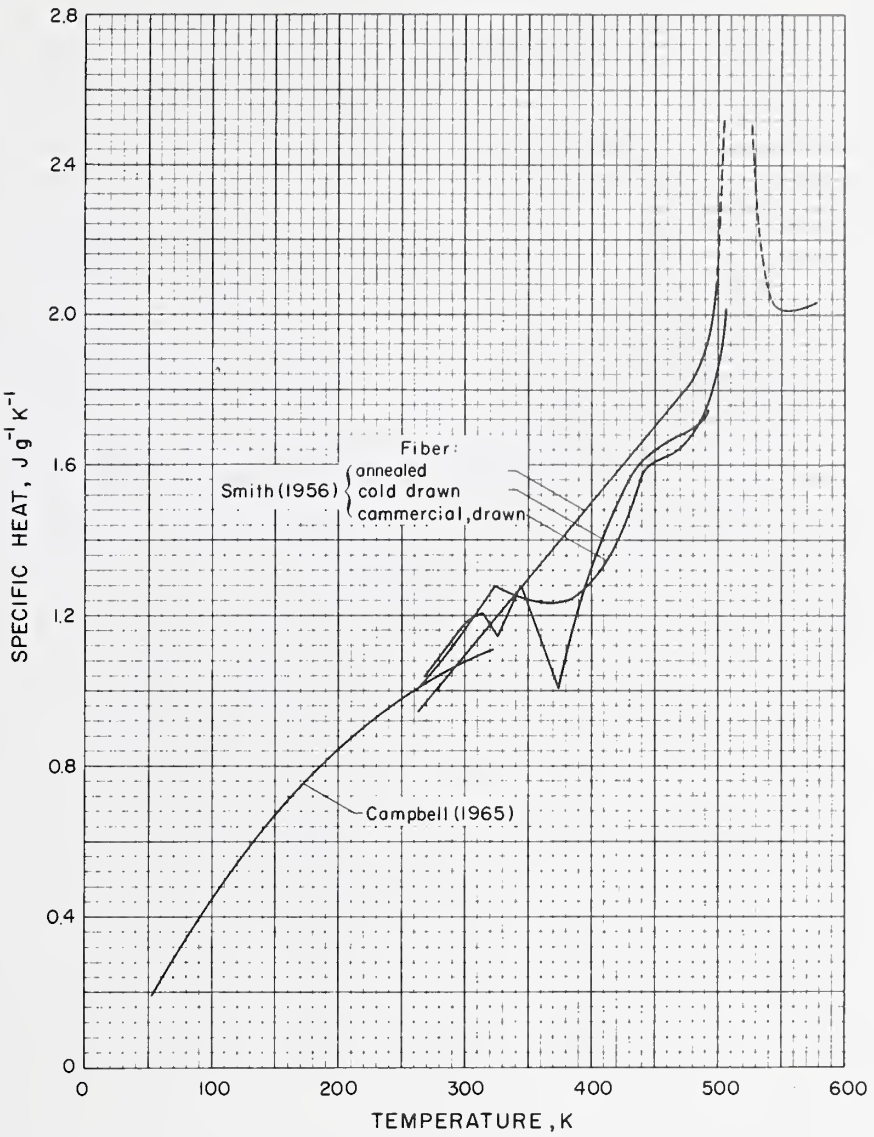
Specific Heat



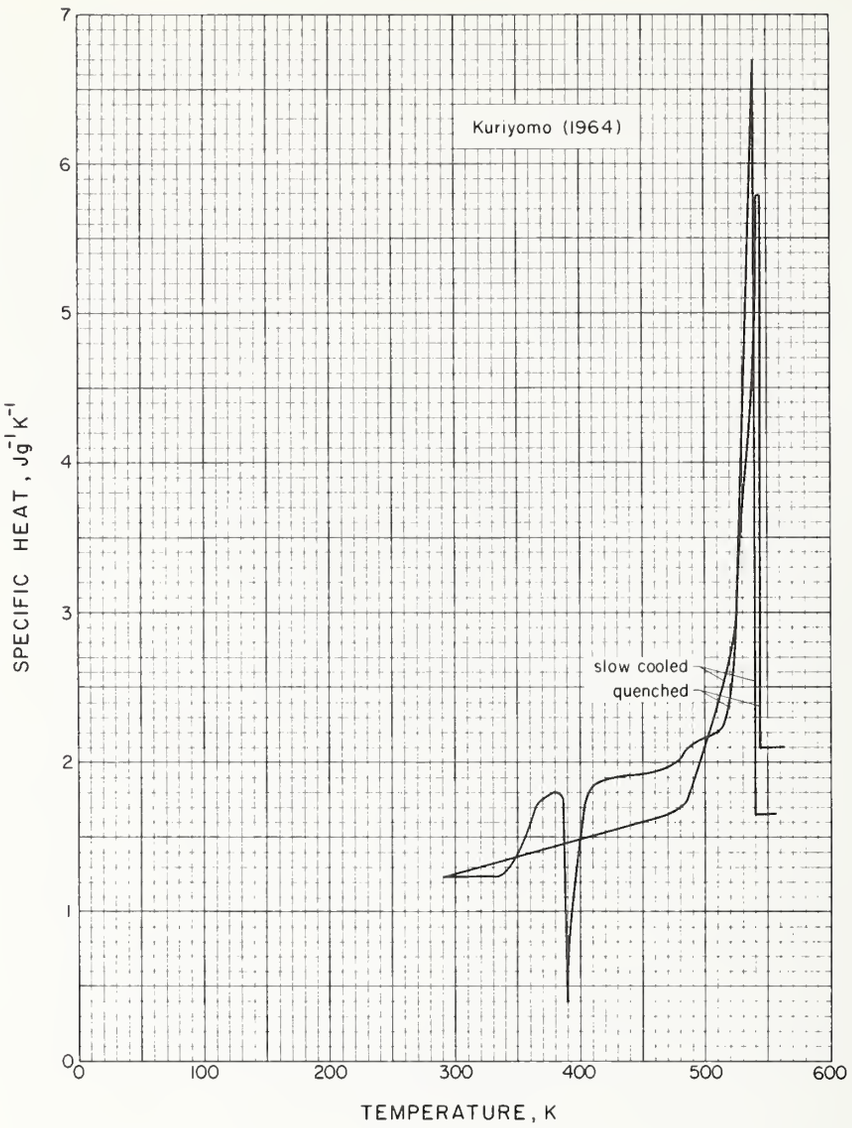
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Steere (1966a)	Mylar A	Typical dimensions: ℓ = 6.25 cm, w = 3.5 cm, film stacked to 1.25 cm; transient heating method used, temp differential measured by Sanborn 350-1500 preamplifier and 299 recorder system; accuracy ≃ 3%, curve represents closely spaced series of points.
Smith, Dole (1956)	Dacron	Dashed lines indicate trend only (no data points beyond solid line).
Roinishvili, Tavkeledze, Akropyan (1967)		



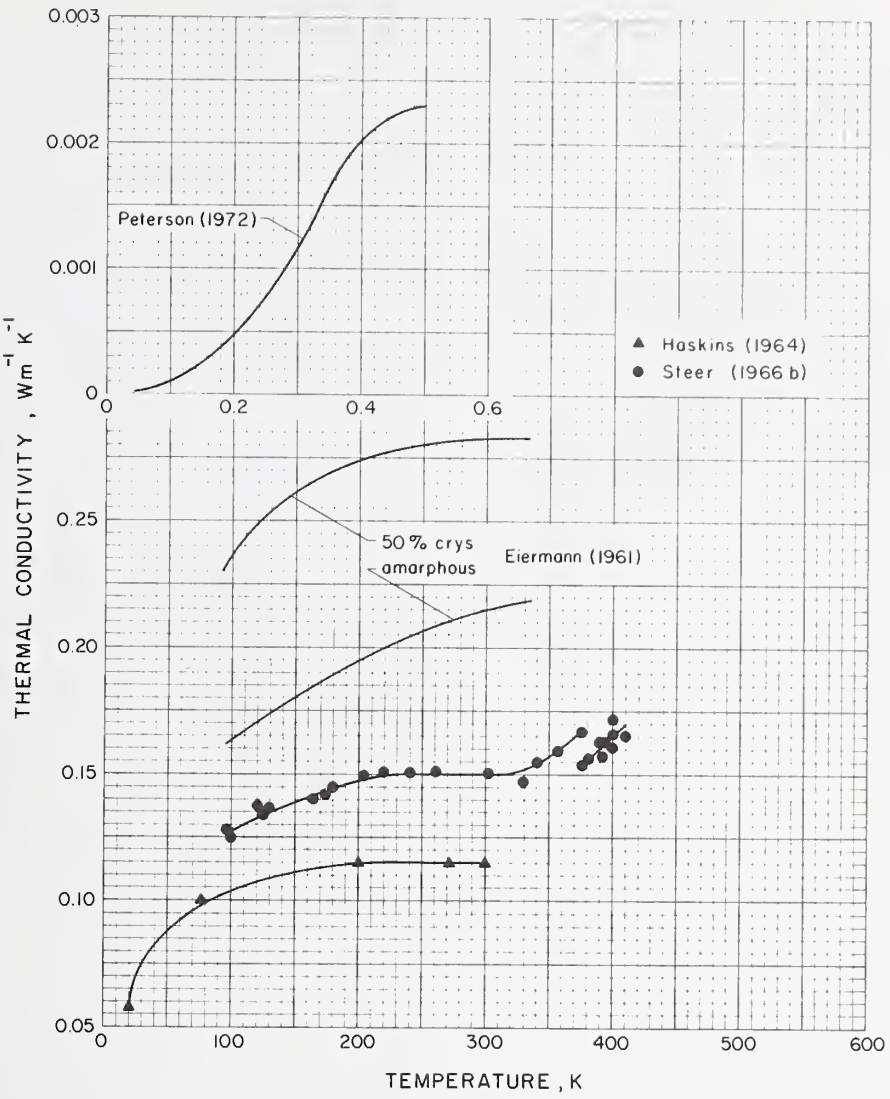
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Smith, Dole (1956)	Dacron: annealed by cooling molten sample from 559 K to room temp in 3 days, also by cooling commercially drawn fibers from 483 K in 2 days; commercially drawn by pulling over a hot point slightly above the glass transition temp to a draw ratio of 3.5; cold drawn by pulling slowly near the glass transition temp, this method produced less crys than commercial procedure	Results for the 2 annealing methods were nearly identical; dashed lines indicate trend only (no data points beyond solid line).
Campbell, Hertz, O'Barr, Haskins (1965)	Mylar	2.54 x 2.54 x 0.035 cm; measurements made using cooling curve method.

PET

Specific Heat



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kuriyama, Tomiita, Shirakashi (1964)	Melted in vacuum, slow cooled and quenched in ice water	Curves also given for an unheated and undrawn filament and for a sample quenched in a dry ice-methanol mixture, these data were similar to that for the sample quenched in ice water.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Eiermann (1961)	Mylar: sp gr = 1.409, 50% crys; sp gr = 1.337, amorphous	Curve represents closely spaced series of test points.
Haskins, Campbell, Hertz, Percy (1964)	Mylar	t = 0.036 cm; thermocouples bonded directly to each side by a 0.001 cm layer of adhesive.
Steere (1966b)	Mylar	Modified transient heating method used.
Peterson, Anderson (1972)	Mylar	t = 0.0206 and 0.00254 cm; measured difference in thermal impedances of 2 thicknesses ⊥ to plane of sheet; accuracy ≃ 5 %.

Investigator(s) (year)	Description	Temperature (K)	ΔL/L Thermal Expansion	λ Thermal Conductivity ($W\ m^{-1}\ K^{-1}$)	α Thermal Diffusivity ($cm^2\ s^{-1}$)	C_p Specific Heat ($J\ g^{-1} K^{-1}$)
McMaster (1964)	Dacron, sp gr = 1.39	298		0.16		
Podall (1965)	Mylar T	298-78				
	long.		-5.23×10^{-3}			
	trans		-4.24×10^{-4}			
	Mylar C					
	long.		-4.27×10^{-3}			
	trans		-4.47×10^{-3}			
	Mylar A					
	long.		-4.02×10^{-3}			
	trans		-4.17×10^{-3}			
Engel'ne (1966)	Lavsan	298		0.109	0.076	
Du Pont (1968)	Mylar A	300				1.17

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
McMaster (1964)	Dacron, sp gr = 1.39	Diam = 23μ, av ℓ = 0.204 cm in a fiber bed; circular guarded hot plate apparatus.
Podall, Oser, Eliason, Augl (1965)	Mylar A, C, and T sheet	Quartz dilatometer.
Engel'ne, Krasha (1966)	Lavsan, granular, fibrous	
Du Pont (1968)	Mylar A	t = 0.025 cm; modified ASTM D 696-44 test procedure.

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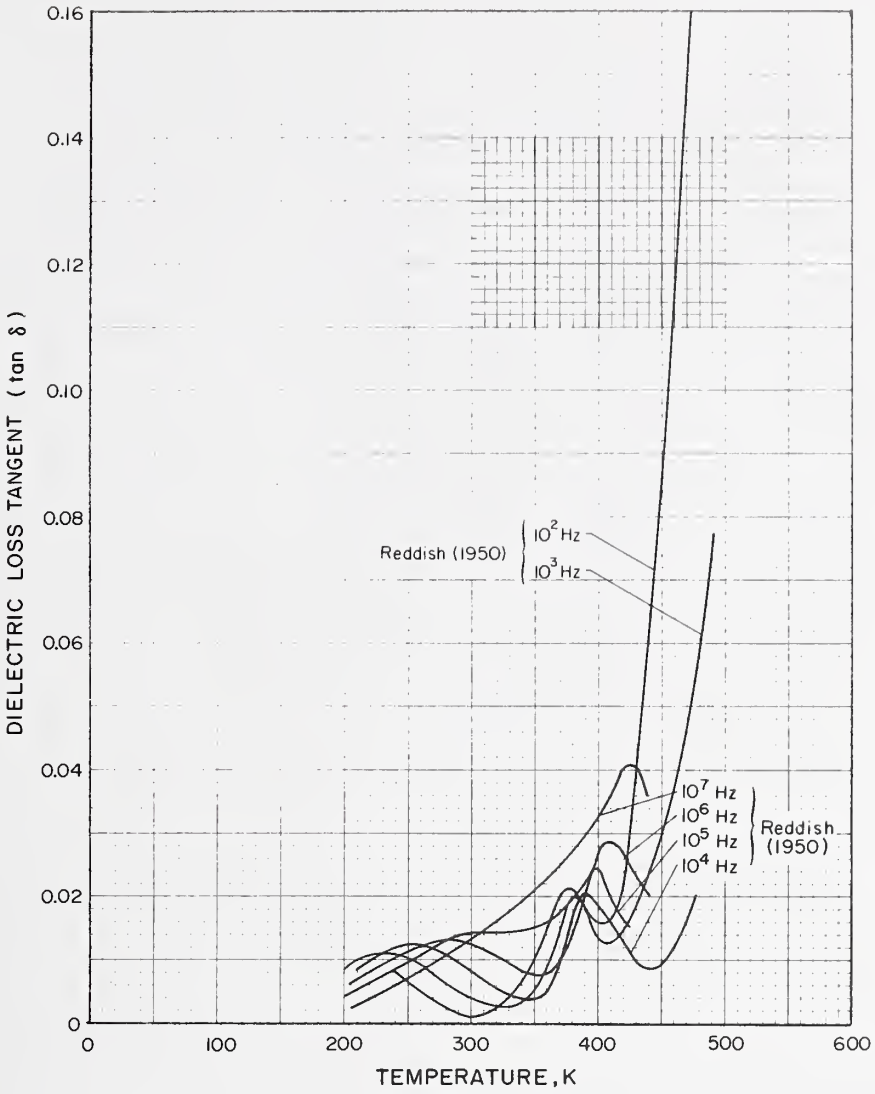
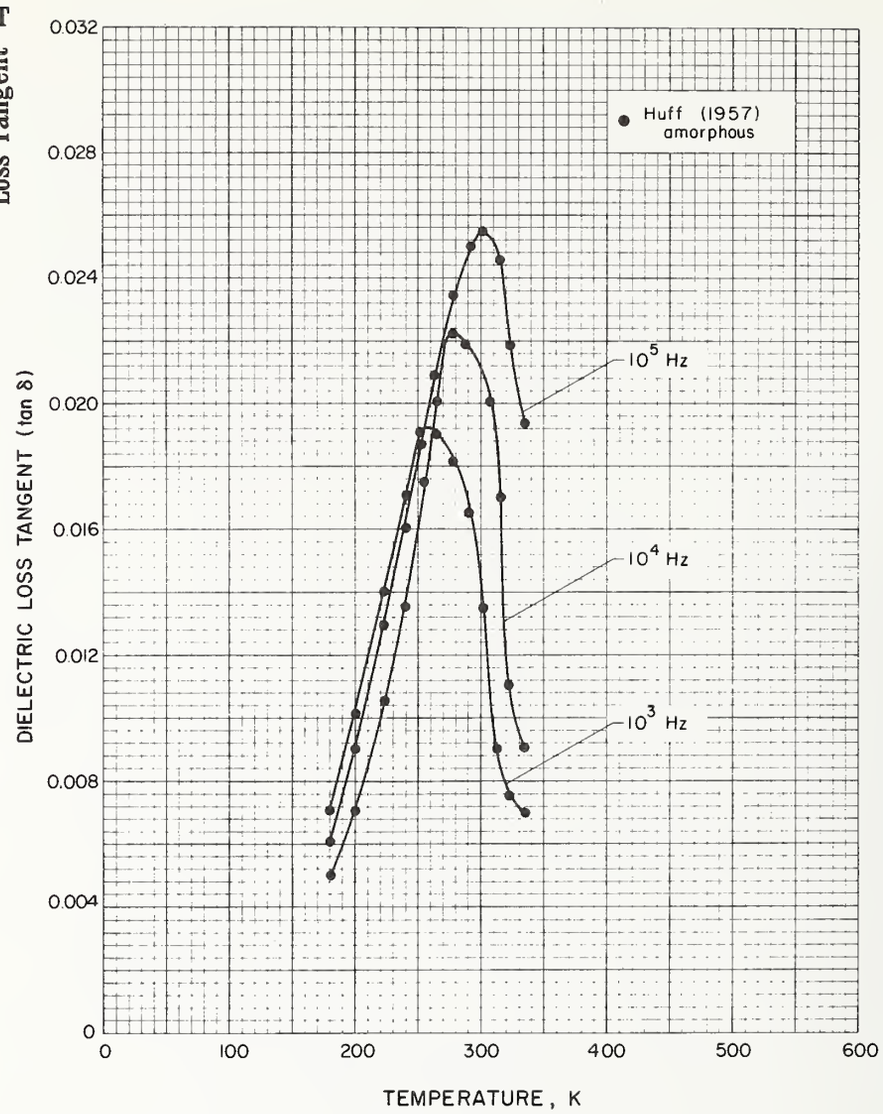
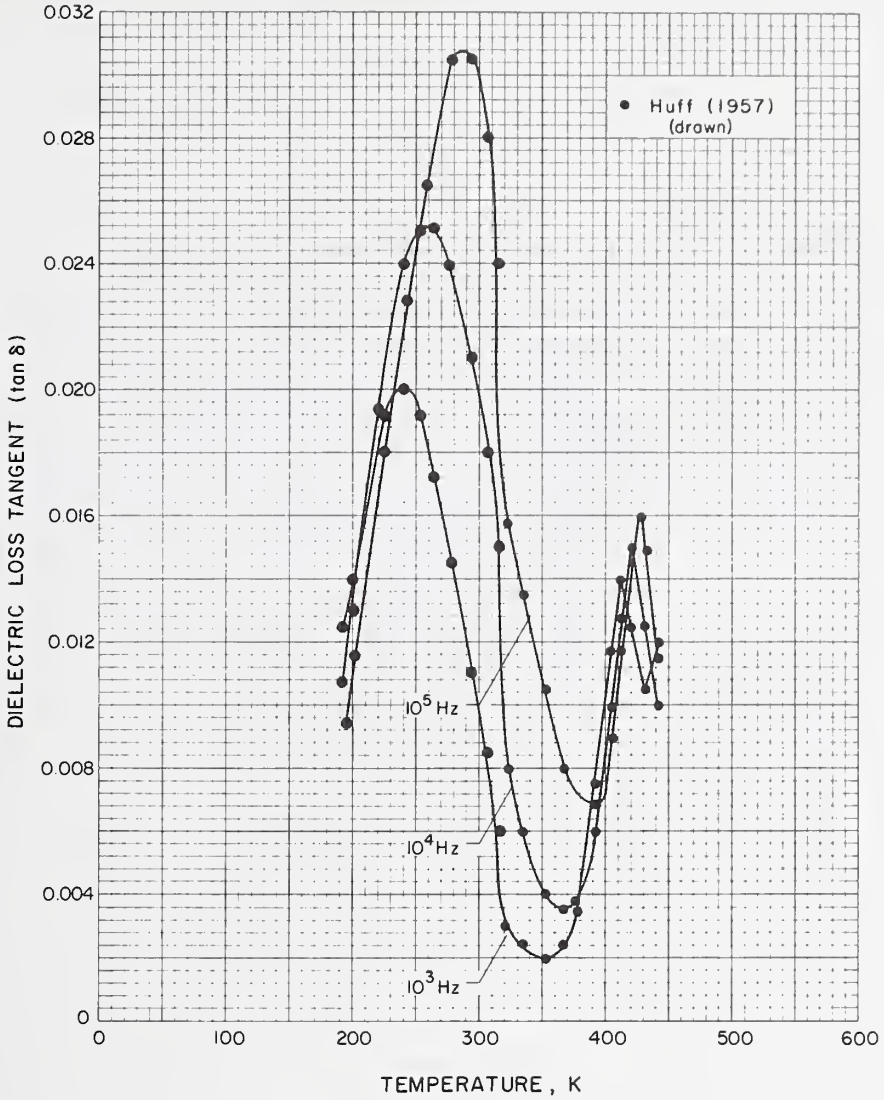


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Reddish (1950)	Terylene, molded, crystalline	5.3 cm diam, t = 0.05 cm; tin foil electrodes stuck to discs with trace of vaseline, measured in audio frequency range of 10^2 to 3.0×10^4 Hz by Schering type audio frequency bridge, radio frequency range 10^6 to 10^7 Hz was covered by use of resonance substitution method; these curves derived from a loss tangent contour map.

PET

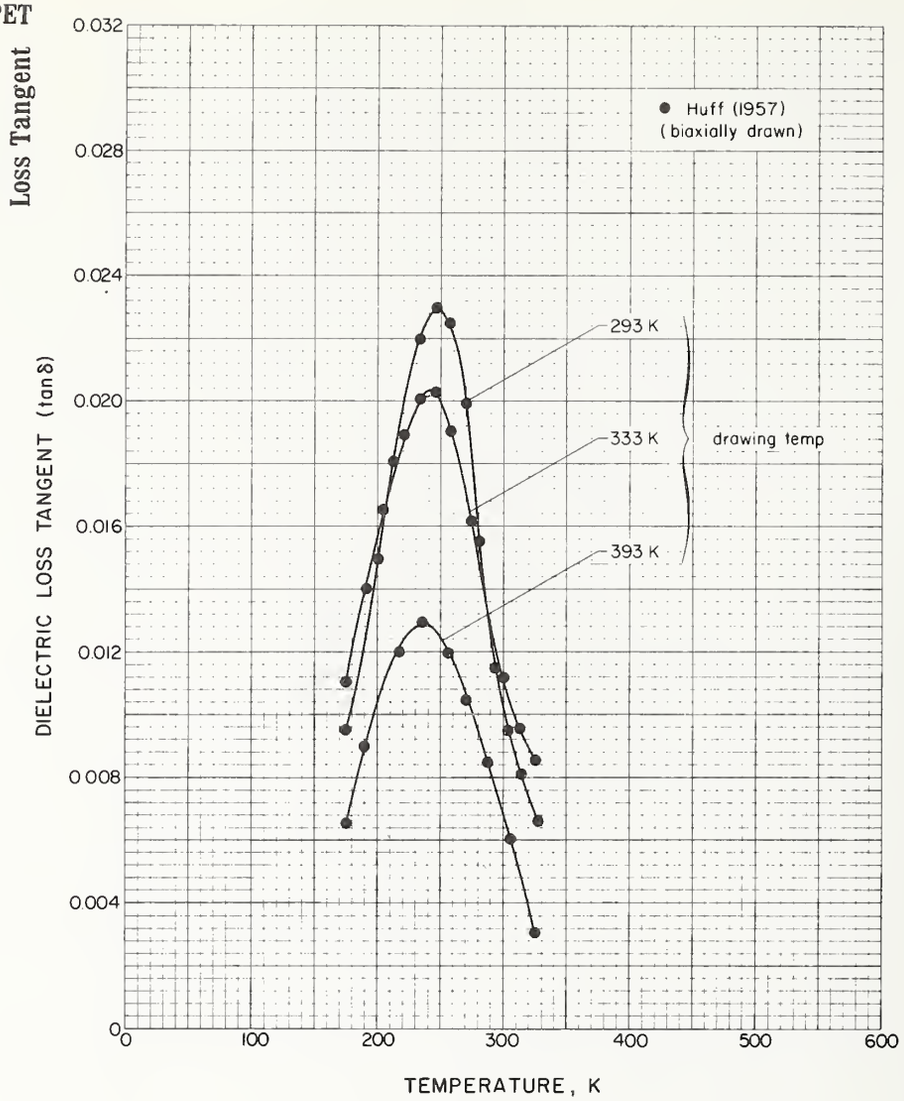


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Huff, Müller (1957)	Terylene, amorphous, quenched to 293 K from the melt, colorless with good flexibility	Capacitance bridge technique, max of 5×10^4 V, 0.0008 cm foil electrodes.

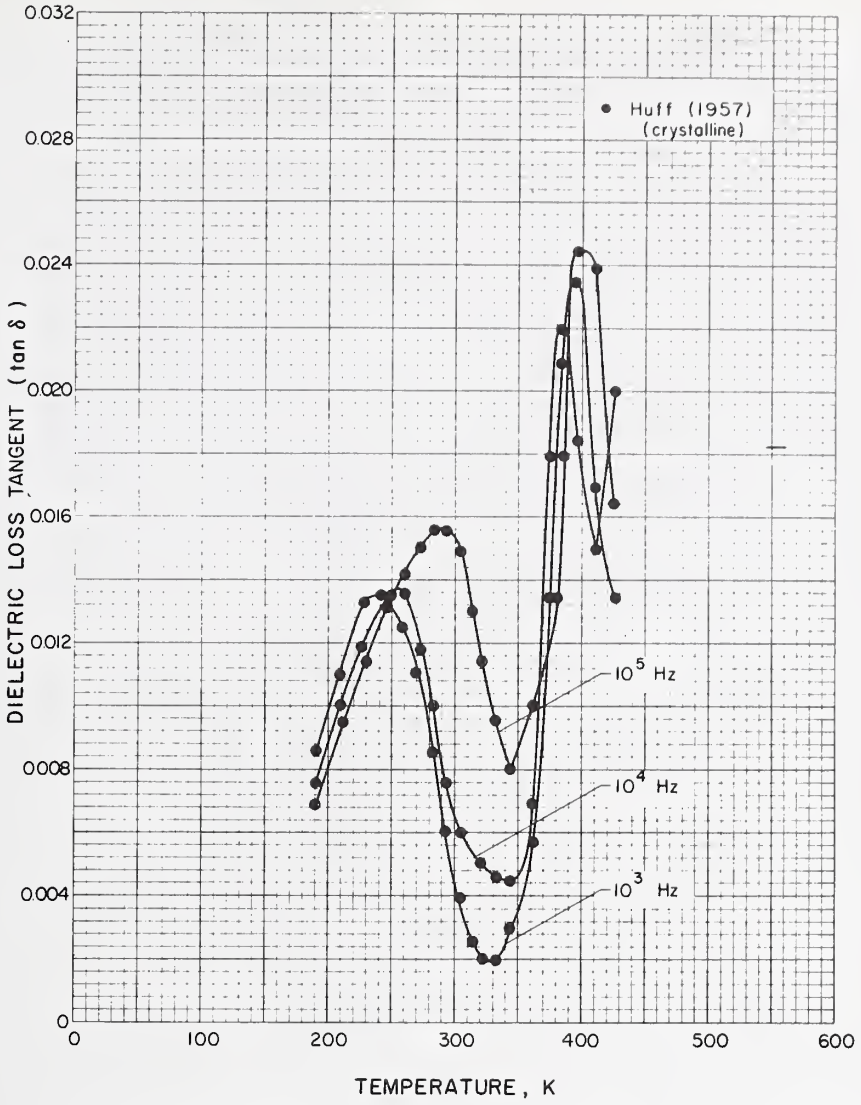


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Huff, Müller (1957)	Terylene, uniaxially drawn	Capacitance bridge technique, mas of 5×10^4 V, 0.0008 cm foil electrodes.

PET

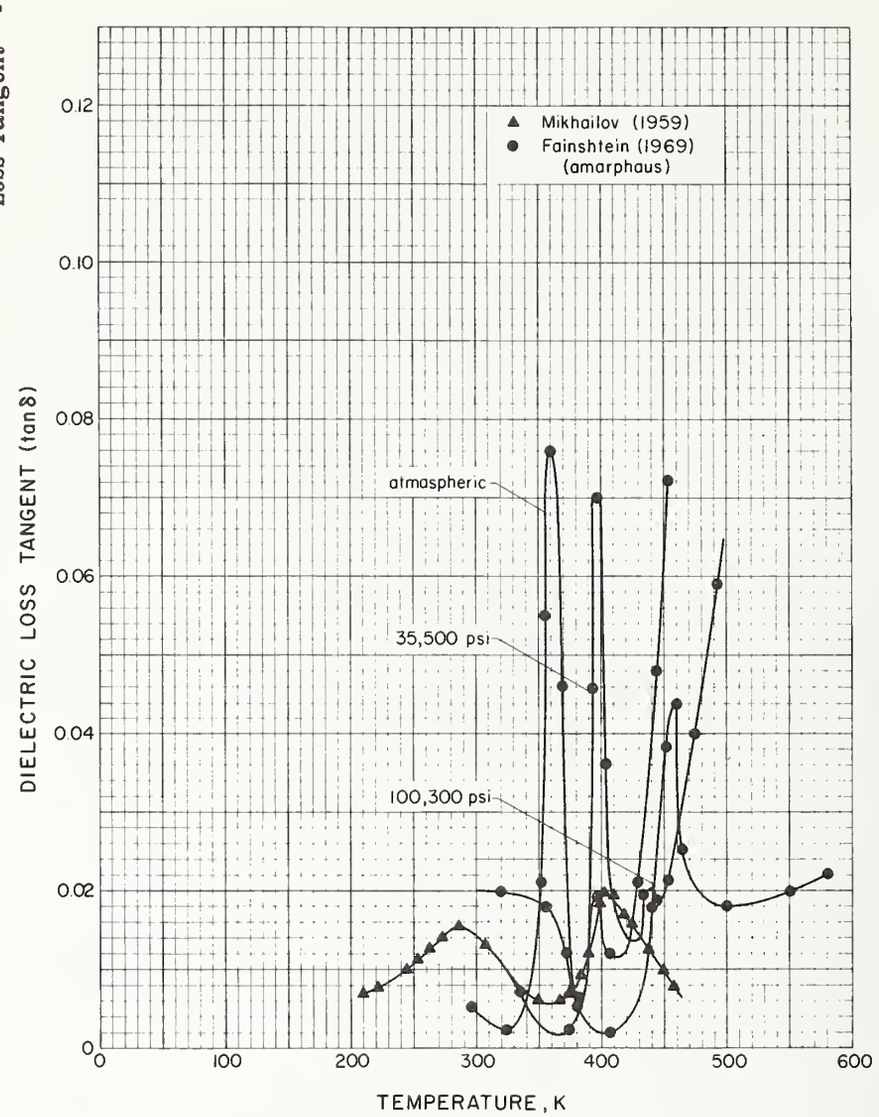


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Huff, Müller (1957)	Terylene, biaxially drawn	Capacitance bridge technique, max of 5×10^4 V, 10^3 Hz, 0.0008 cm foil electrodes.

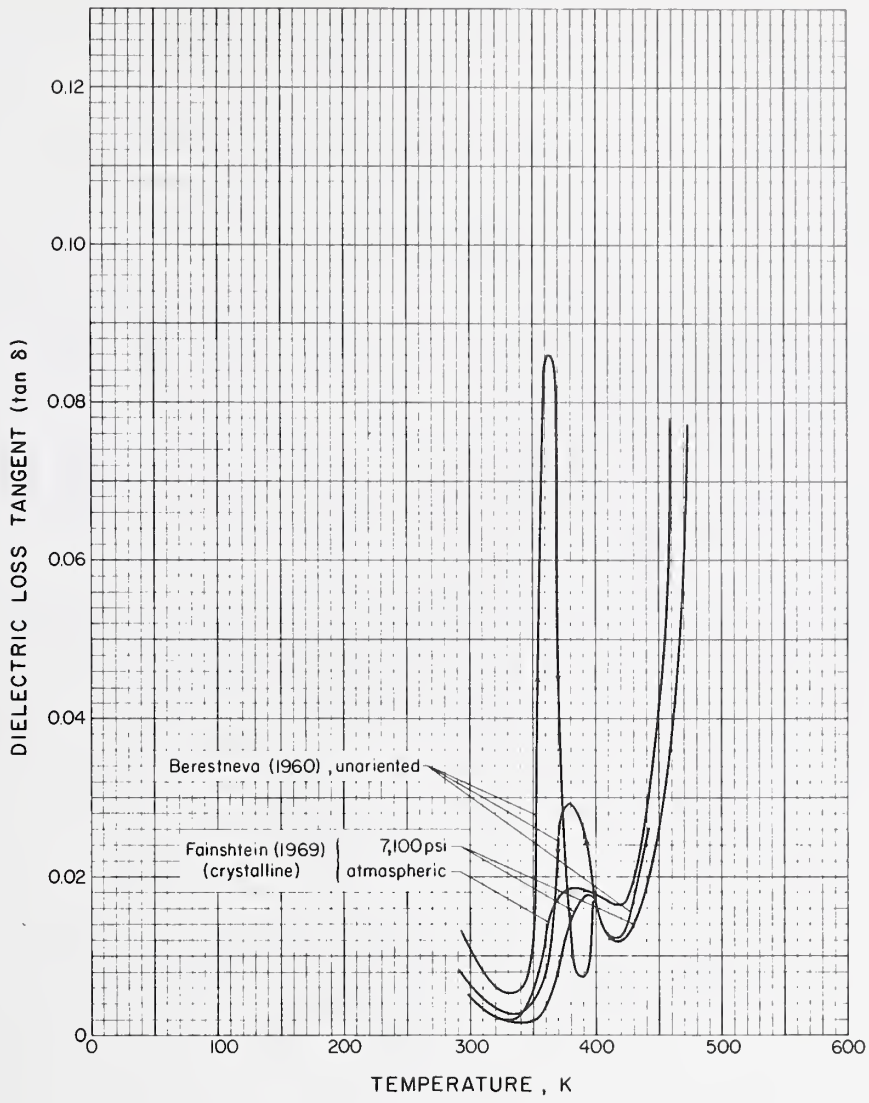


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Huff, Müller (1957)	Terylene, crystalline, cooled from melt at 0.5 K min^{-1} opaque white, very brittle	Capacitance bridge technique, max of 5 x 10^4 V, 0.0008 cm foil electrodes.

PET



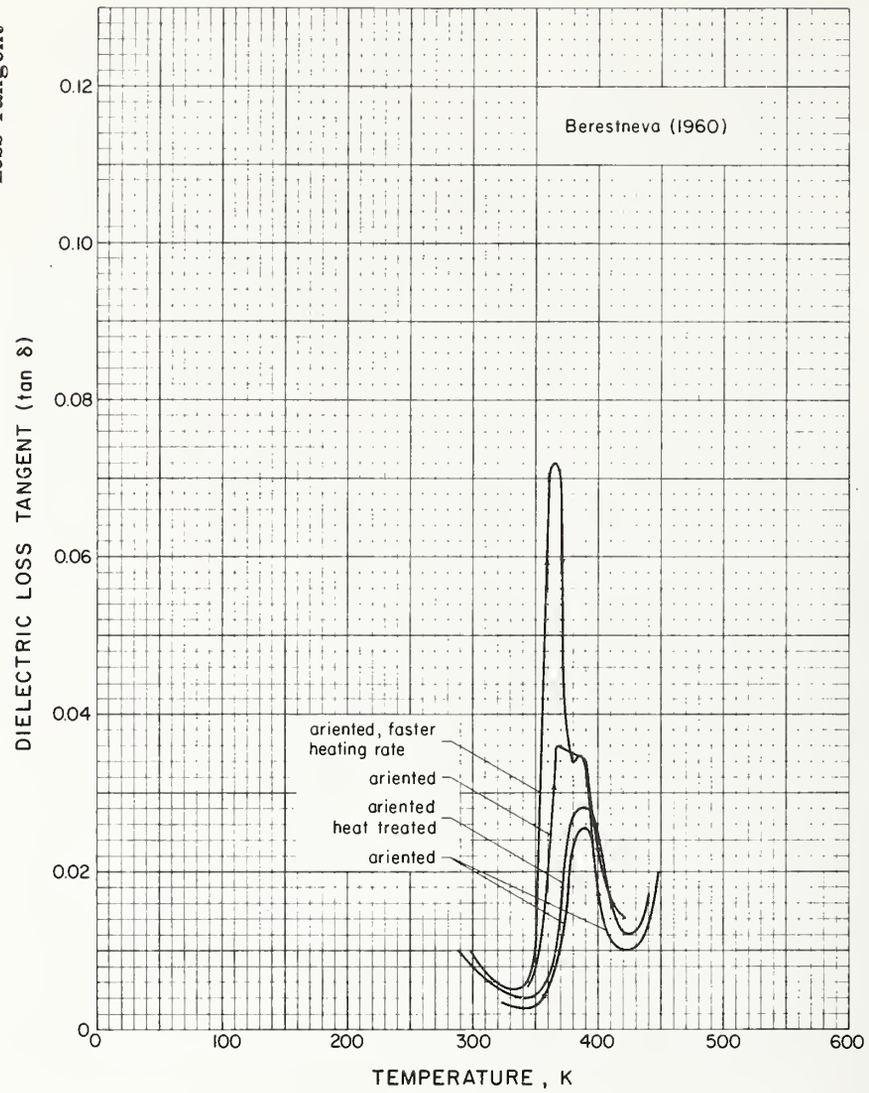
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Michailov, Sazhin (1959)		6×10^4 Hz.
Fainshtein, Igonin (1969)	Extruded amorphous	t = 0.02 - 0.04 cm, diam = 3.6 cm; MLE - 1 dielectric loss bridge, 10^3 Hz, temp increased at 1 K min^{-1}, pressure applied to sample during measurement as noted; error = 2%, curves for intermediate pressures also presented.



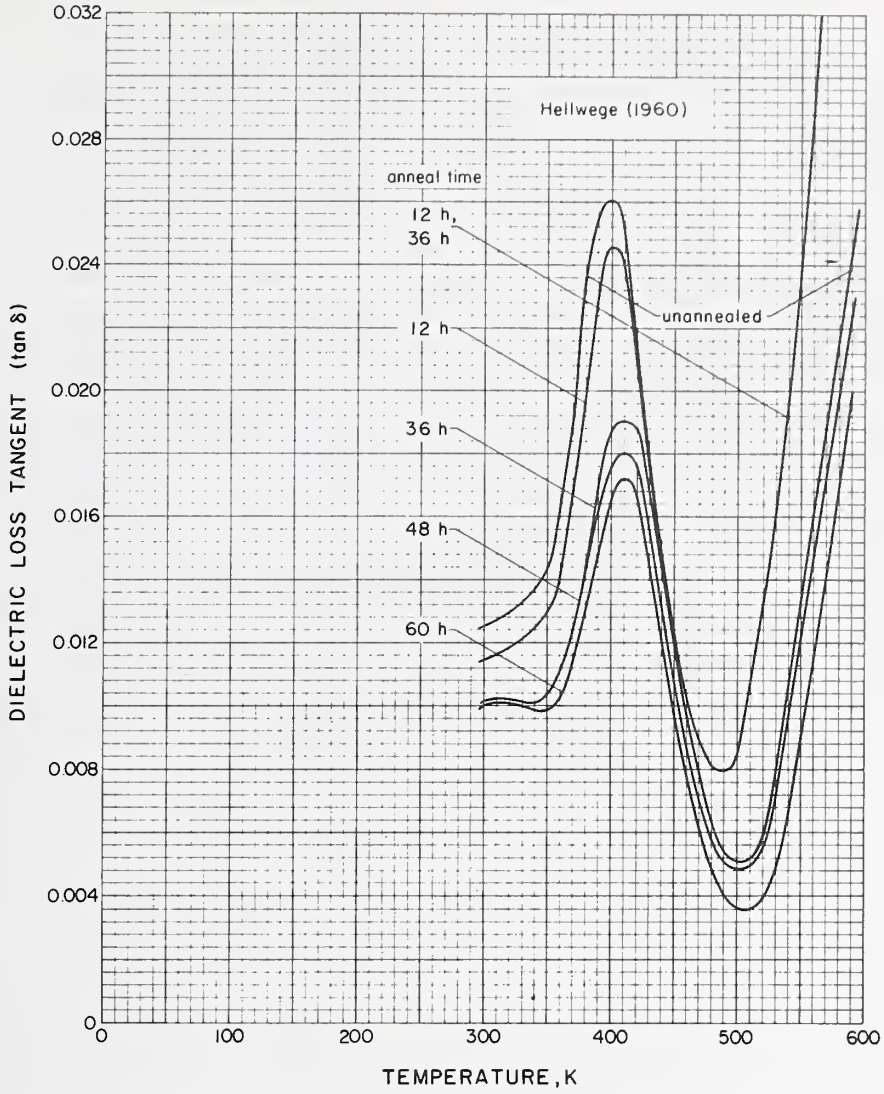
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Berestneva, Burshtein, Kozlov (1960)	Amorphous, unoriented film	10^3 Hz, vapor-deposited Ag electrodes, arrow indicates direction of temp change.
Fainshtein, Igonin (1969)	Crystalline sample produced by annealing amorphous material at 453K for 2 h.	t = 0.02 - 0.04 cm, diam = 3.6 cm; MLE - 1 dielectric loss bridge, 10^3 Hz, temp increased at 1K min^{-1}, pressure applied to sample during measurement as noted; error = 2%.

PET

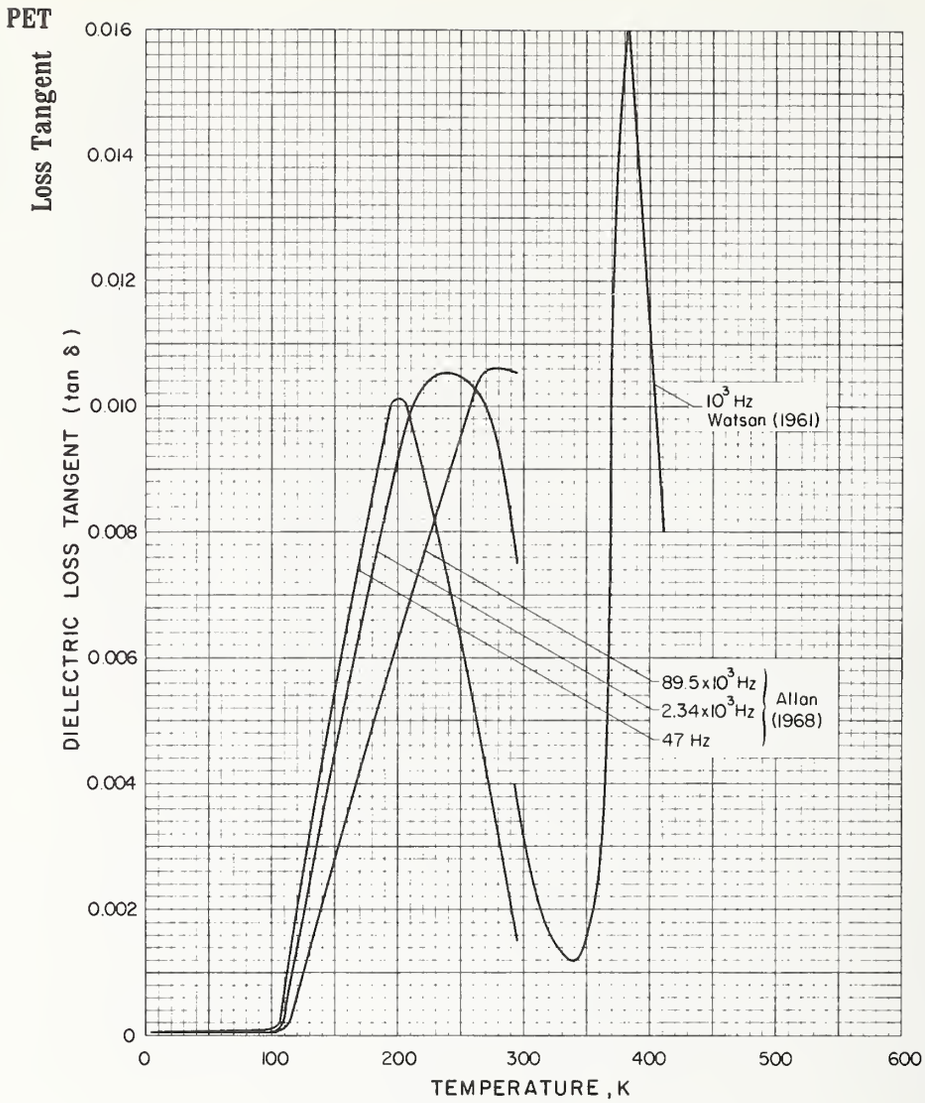
Loss Tangent



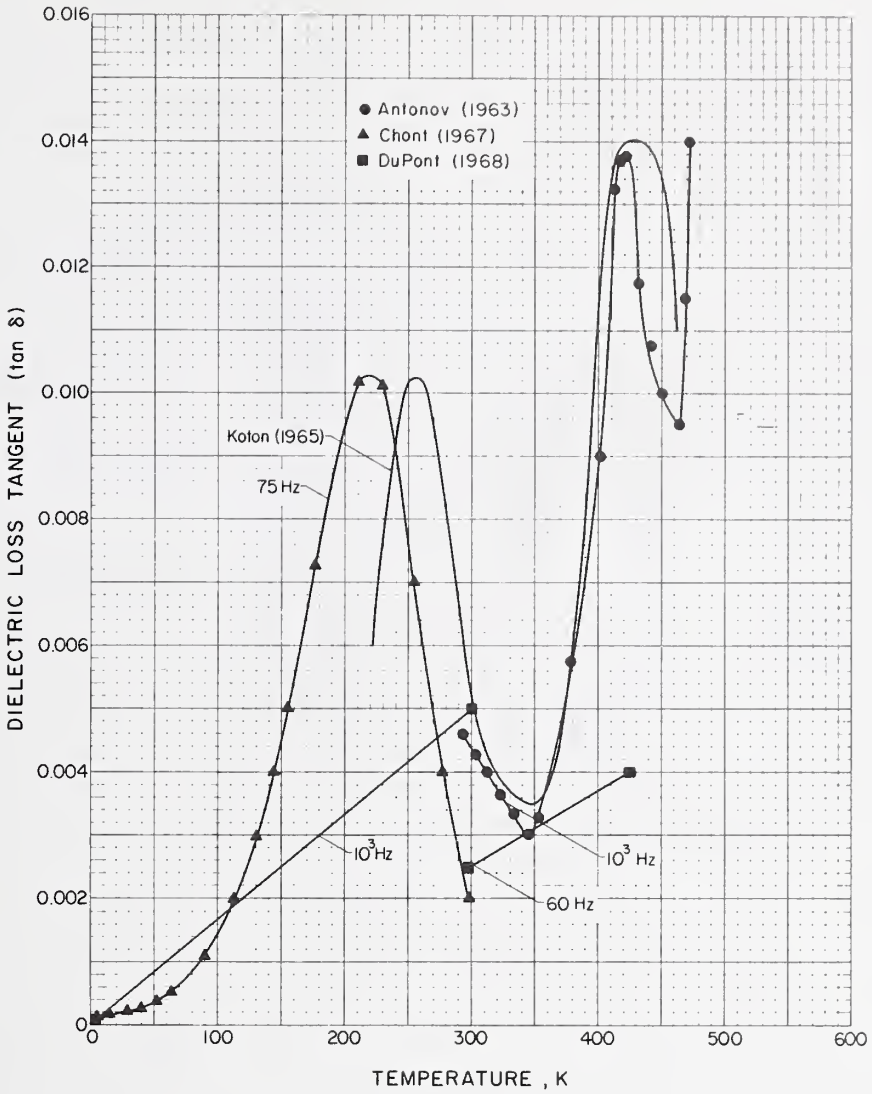
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Berestneva, Burshtein, Kozlov (1960)	Film oriented by stretching at 353 K; film oriented and then heated to 443 K for 10 min.	10^3 Hz, vapor-deposited Ag electrodes, arrow indicates direction of temp change, one specimen heated at a faster rate than the others.



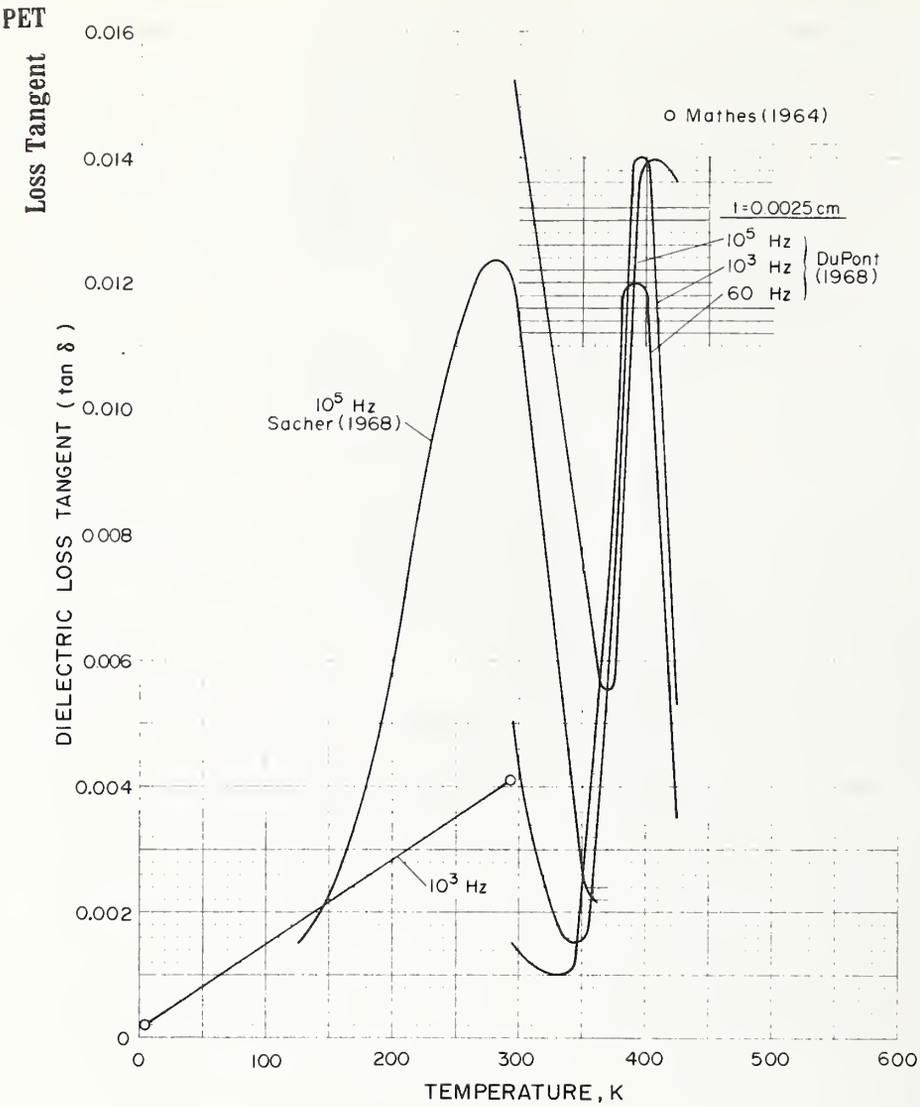
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Hellwege, Langbein (1960)	Hostaphan	Film; 10^6 Hz, length of anneal noted.



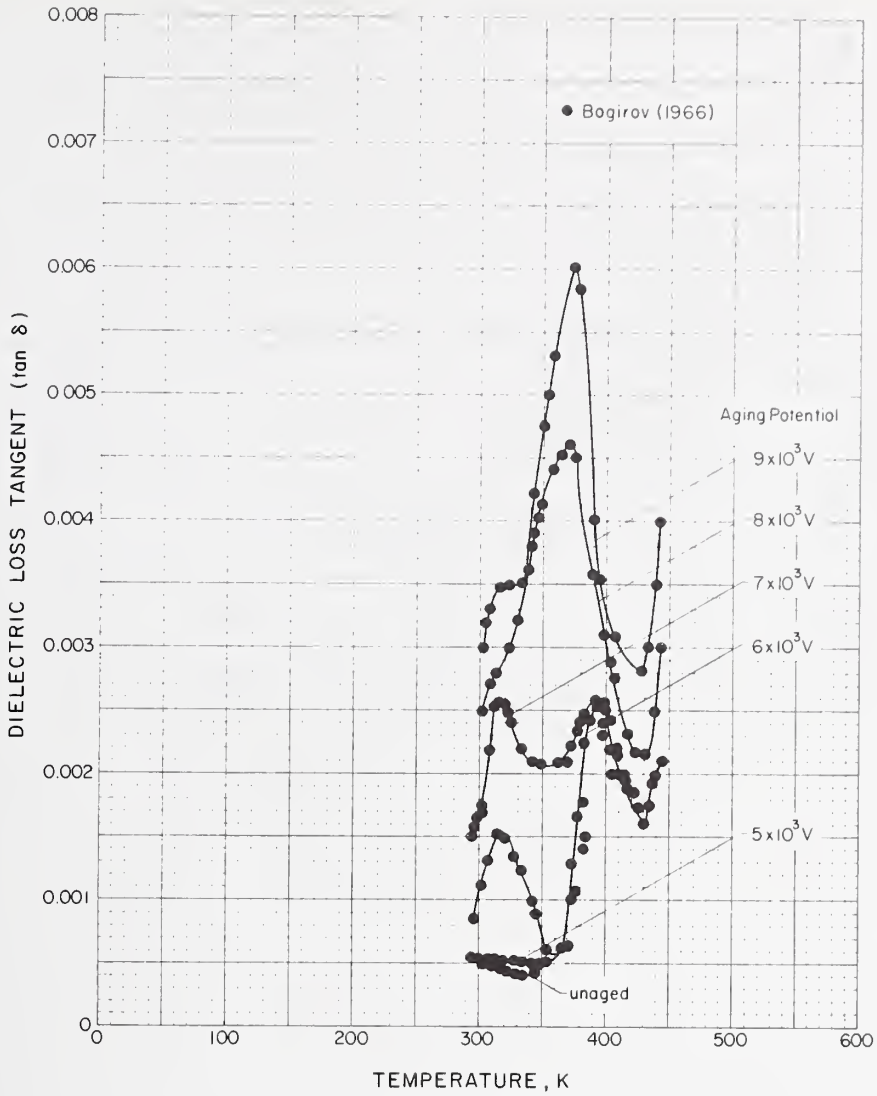
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Watson (1961)	Commercial, electrical-grade	ASTM D150-54T test procedure.
Allan, Kuffel (1968)	Plane-oriented and crystallized	t = 0.013 cm; capacitance bridge accurate to ± 0.01%, applied voltage = 20-50 Vrms; data for intermediate frequencies also presented.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Chant (1967)	Mylar, t = 0.025 cm; Melinex, t = 0.013 cm	Diam = 9.5 cm; vacuum evaporated 2000 Å Al electrodes; accuracy ≃ ± 0.2%, same results reported for both samples.
DuPont (1968)	Mylar	t = 0.0025 cm; ASTM D150-65T test procedure.
Antonov, Feinstein, Andrianova (1963)	Film	10^3 Hz.
Koton, Yakovlev, Rudakov, Knyazeva, Florinskii, Bessonov, Kuleva, Tolparova, Laius (1965)		MLE bridge at 10^3 Hz, electrodes applied by vacuum deposition of Ag.



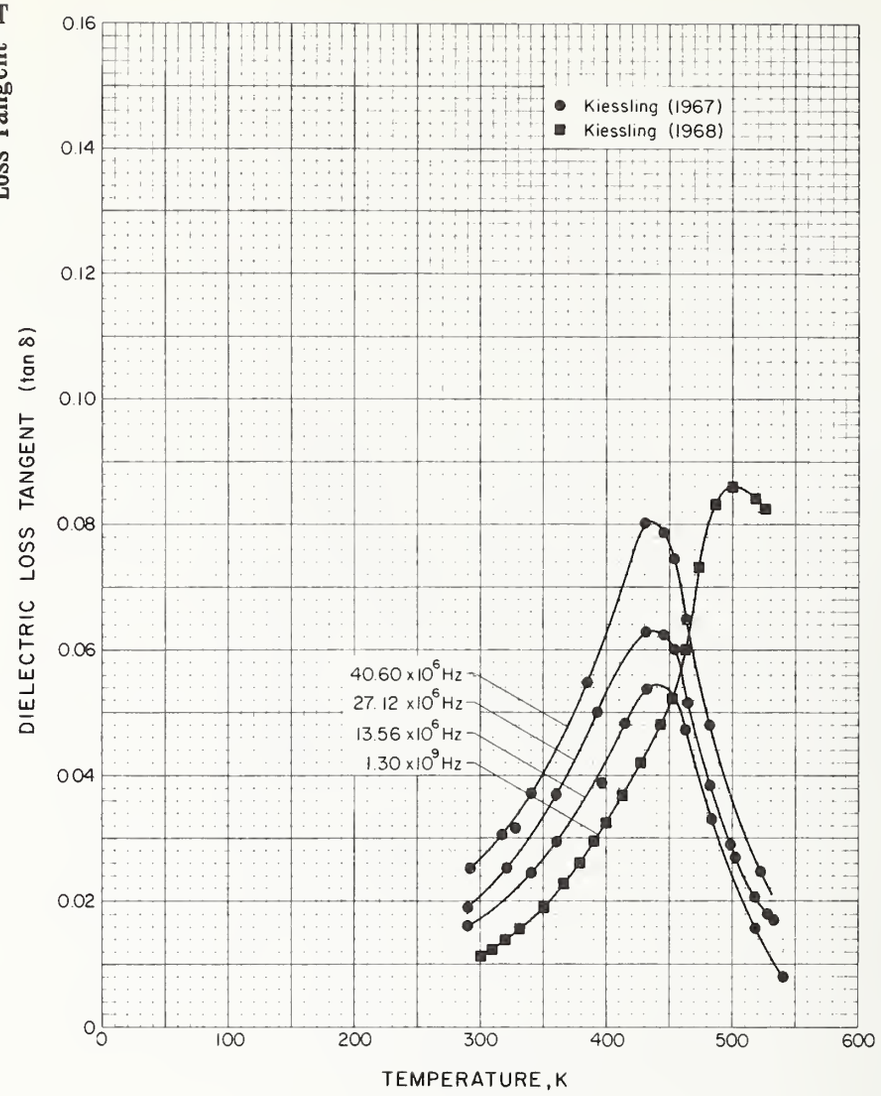
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mathes (1964)		
Sacher (1968)	Mylar S	Biaxially oriented, heat set with density-determined crys of 48%; frequency of measurement: 10^5 Hz.
Du Pont (1968)	Mylar C	t = 0.0025 cm, ASTM D150-65T test procedure.



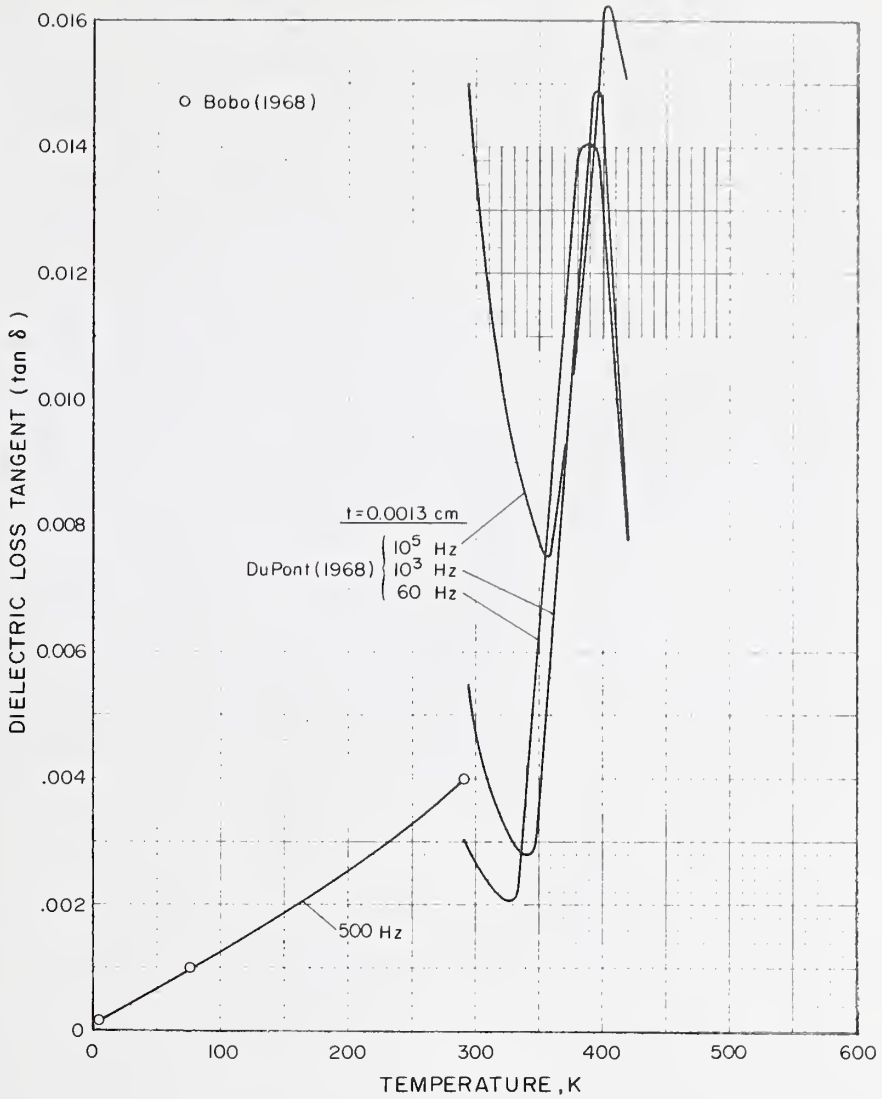
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Bagirov, Klimova, Malin (1966)	Film	t = 0.002 cm; 400 Hz, aged at 303K with potential applied for 5 h.

PET

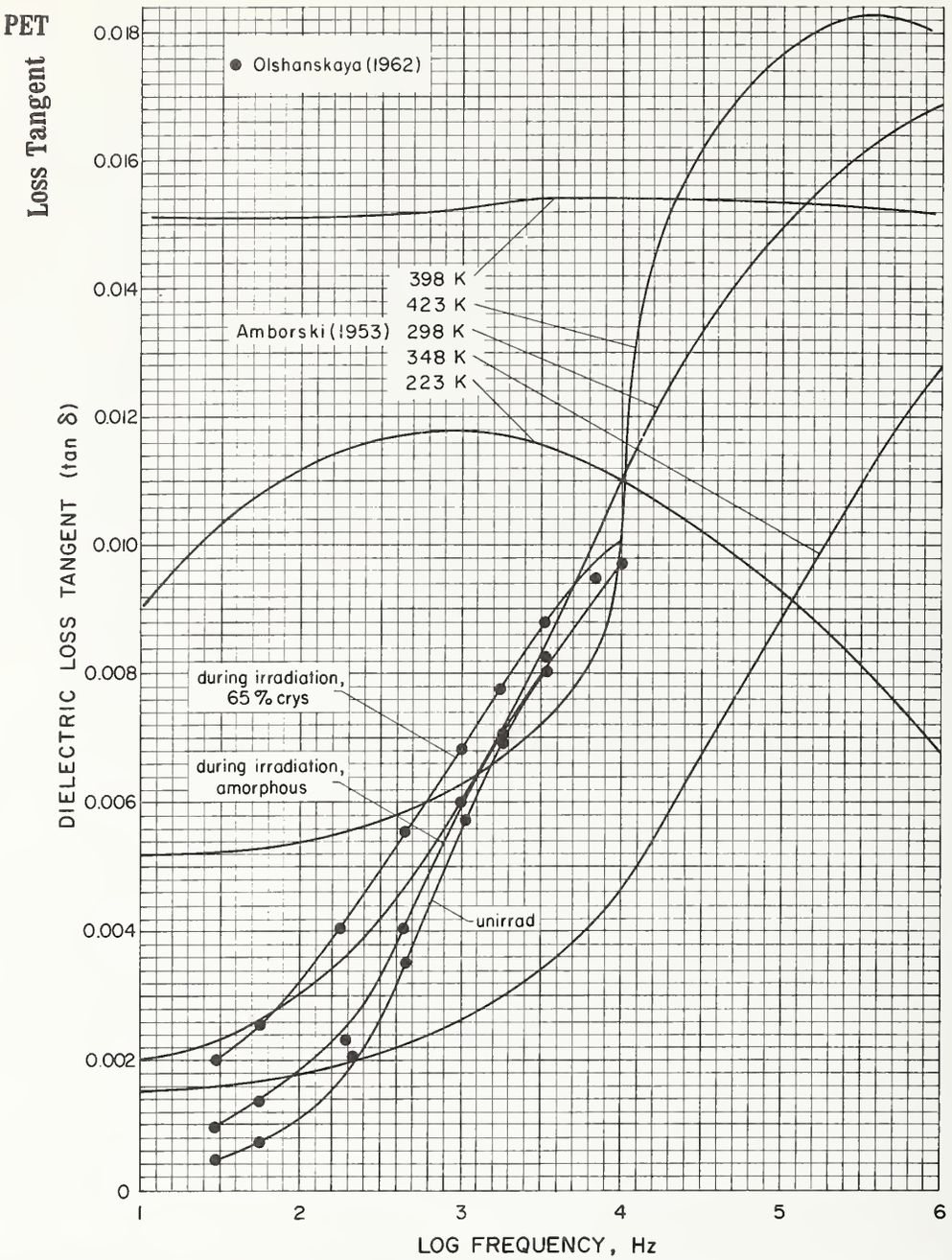
Loss Tangent



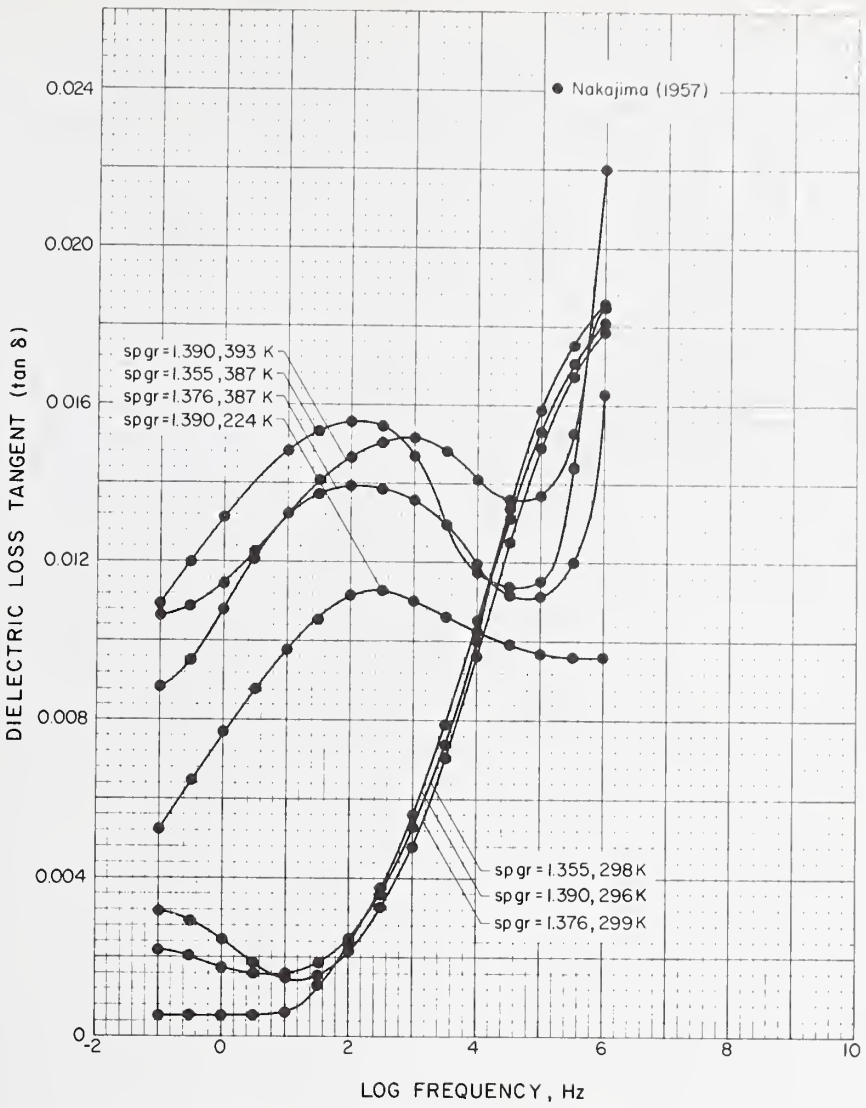
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kiessling, Rehwagen (1967) Kiessling, Mündörfer, Joppich (1968)		t = 0.1 - 2.5 cm; capacitance technique. Coaxial condensor method.



INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONOITIONS
Bobo, Perrier (1968)	Mylar	t = 0.0025 to 0.020 cm; 2.5 - 3.5 x 10^3 V.
Du Pont (1968)	Mylar C	t = 0.0013 av; ASTM D150-65T test procedure.

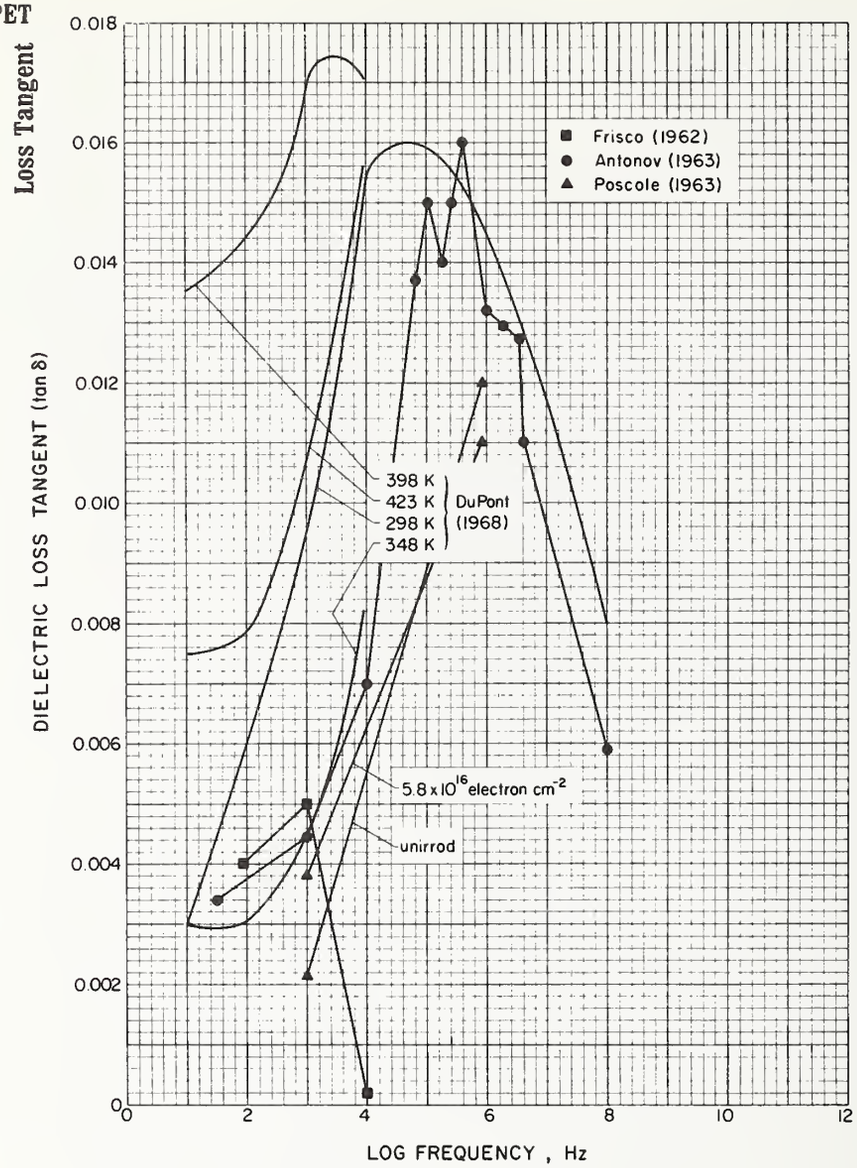


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Amborski, Flierl (1953)	Mylar	ASTM Method D150 test procedure.
Olshanskaya, Vososchev 1962)	Lavsan	Irrad by Co^{60} at $1\text{-}2 \times 10^{3}$ rad min^{-1} in vacuum.

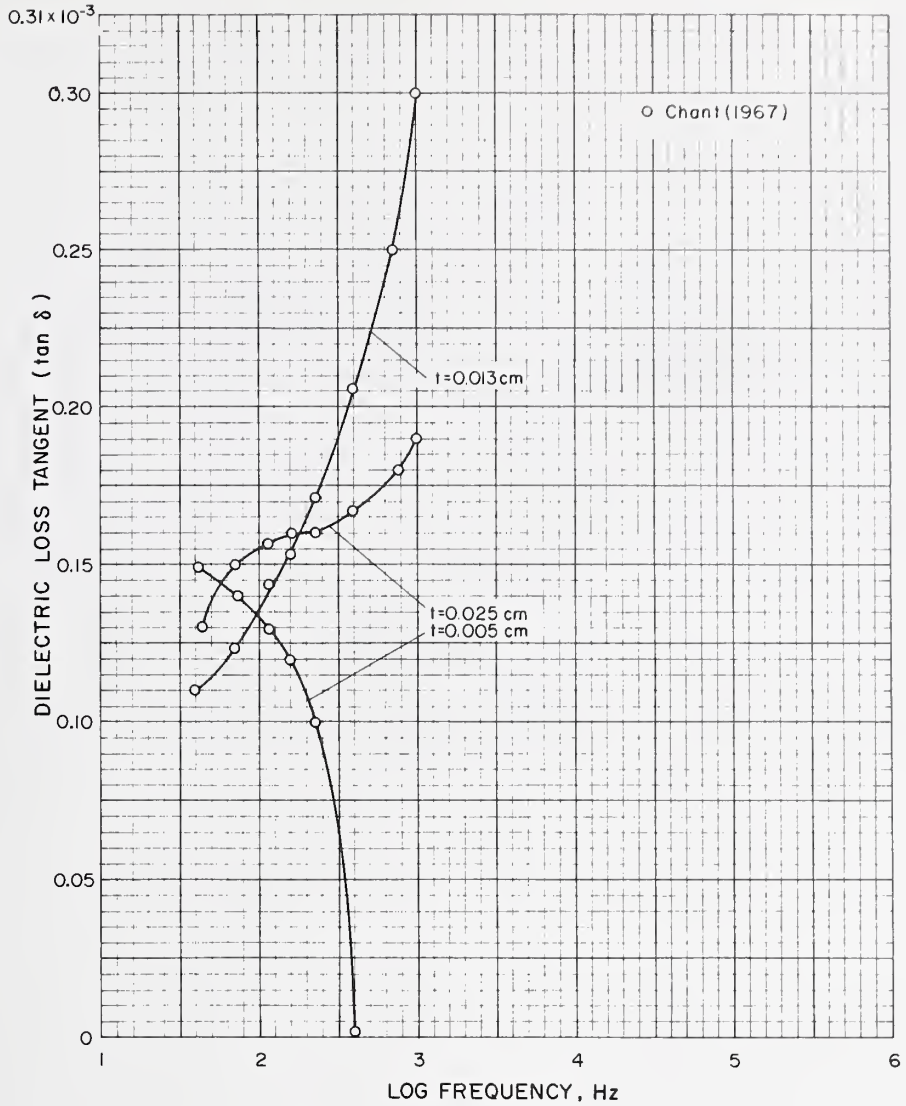


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Nakajima, Saito (1957)	Mylar	Data also presented for several intermediate temperatures.

PET

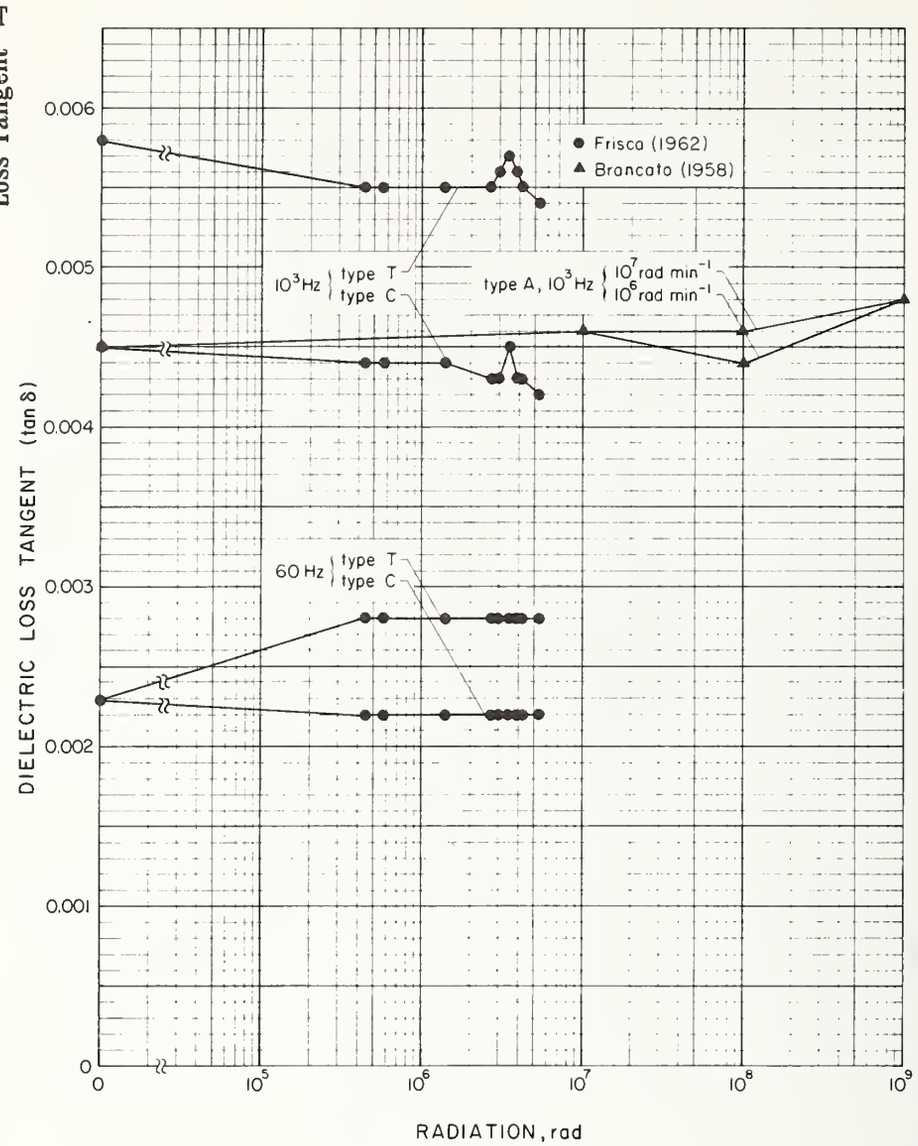


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Frisco (1962)	Mylar 130-100 C and Mylar 130-100 T highly oriented and tensilized	t = 0.003; tested in air.
Antonov, Feinstein, Andrianova (1963)	Film	293 K.
Pascale, Herrmann, Miner (1963)	Weather stabilized	t = 0.013 cm; rel hum = 50 ± 5%, 298 K; irrad by Van de Graaf accelerator.
Du Pont (1968)	Mylar	t = 0.0025 cm; ASTM D 150-65 T test procedure.

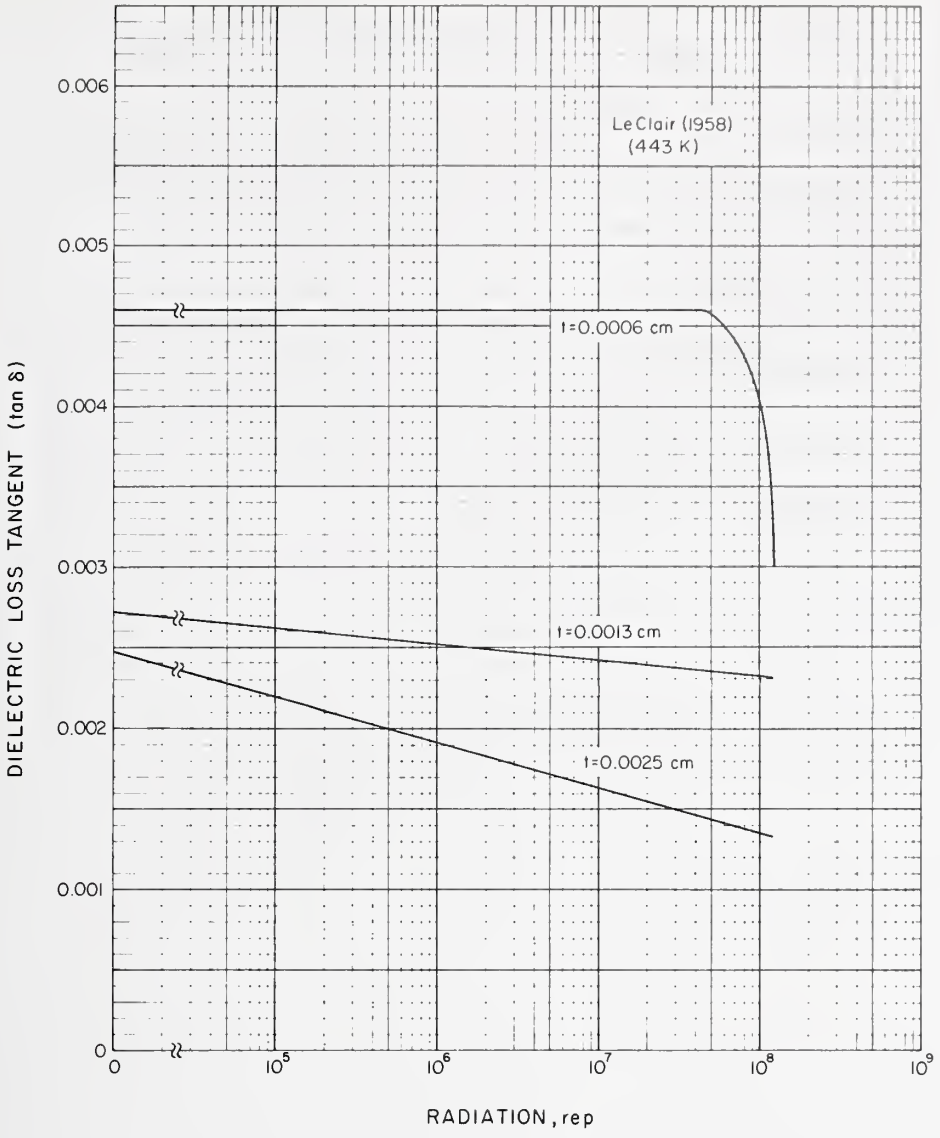


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Chant (1967)	Mylar, t = 0.025 cm and t = 0.005 cm; Melinex, t = 0.013 cm	Diam = 9.5 cm; vacuum evaporated 2000 Å Al electrodes; accuracy ≃ ± 0.2%.

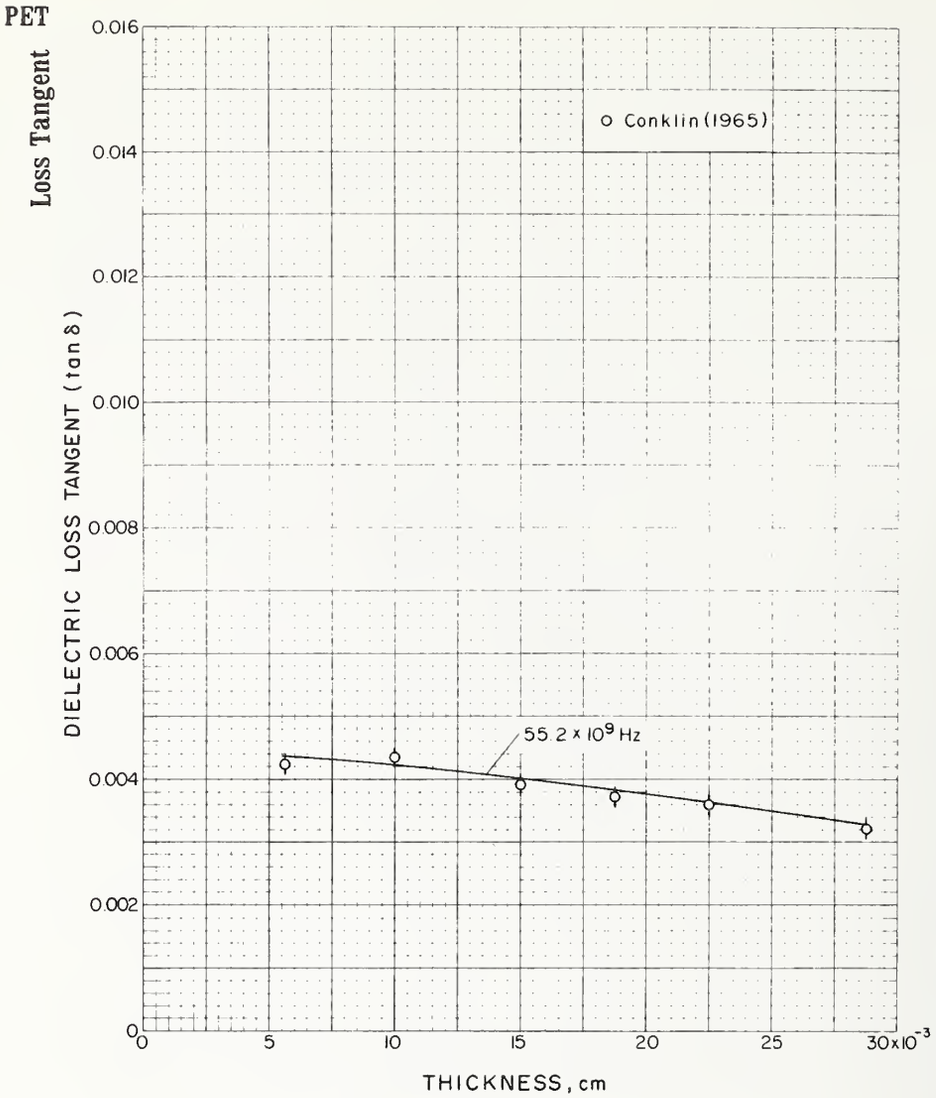
PET



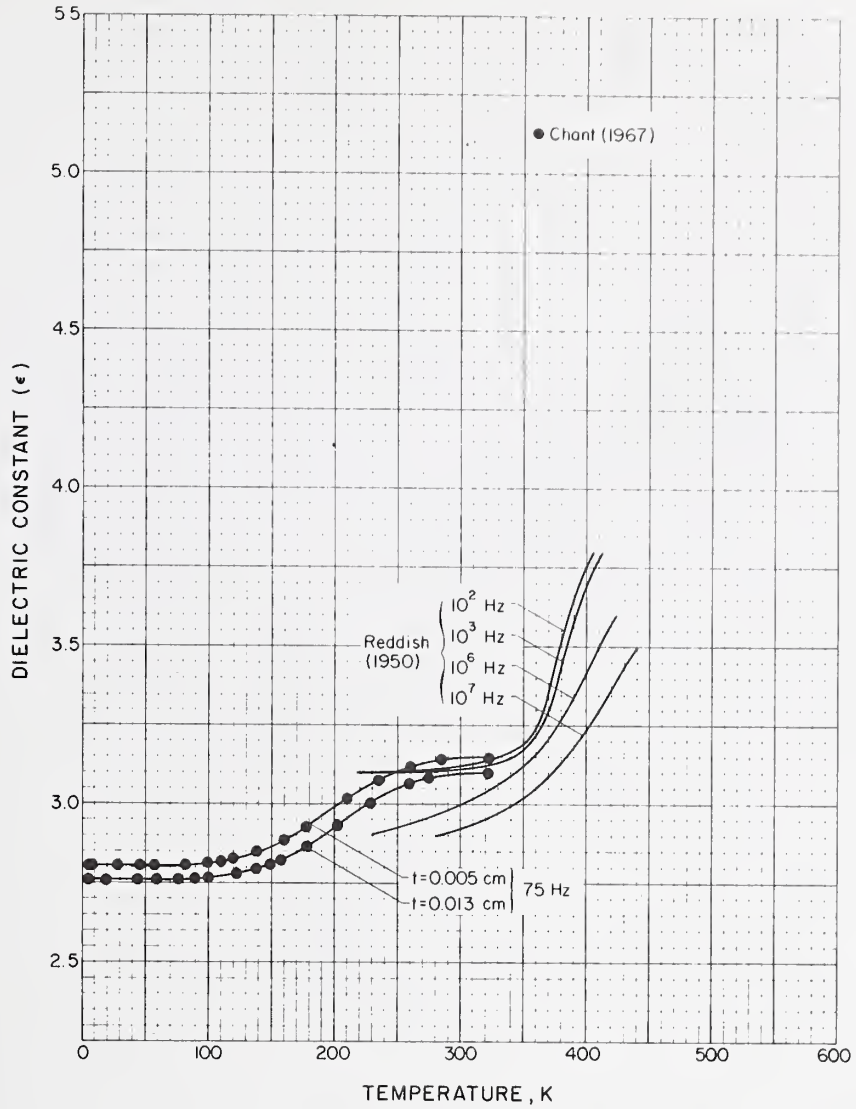
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Brancato, Allard (1958)	Mylar A	ℓ = 15.2 cm, w = 10.2 cm, t = 0.005 cm; General Radio Capacitance Bridge Type 716-C, 2.5 and 3.5 cm diam electrodes of Pb foil with t = 0.0009 cm, 299 ± 1 K, 50% rel hum, measurements taken after 24 h; irrad with 2 Mev electrons from Van de Graaf accelerator; av of 10 specimens.
Frisco (1962)	Mylar 130 - 100C and Mylar 130 - 100 T highly oriented and tensilized.	t = 0.003 cm; tested and irrad by Ag x-rays in vacuum.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
LeClair, Cobbs, Jr. (1958)	Mylar A	Capacitance bridge, 10^3 Hz, 443K; electron radiation from 2 Mev Van de Graff accelerator; 2 samples tested, 95% confidence limits = ± 3%.



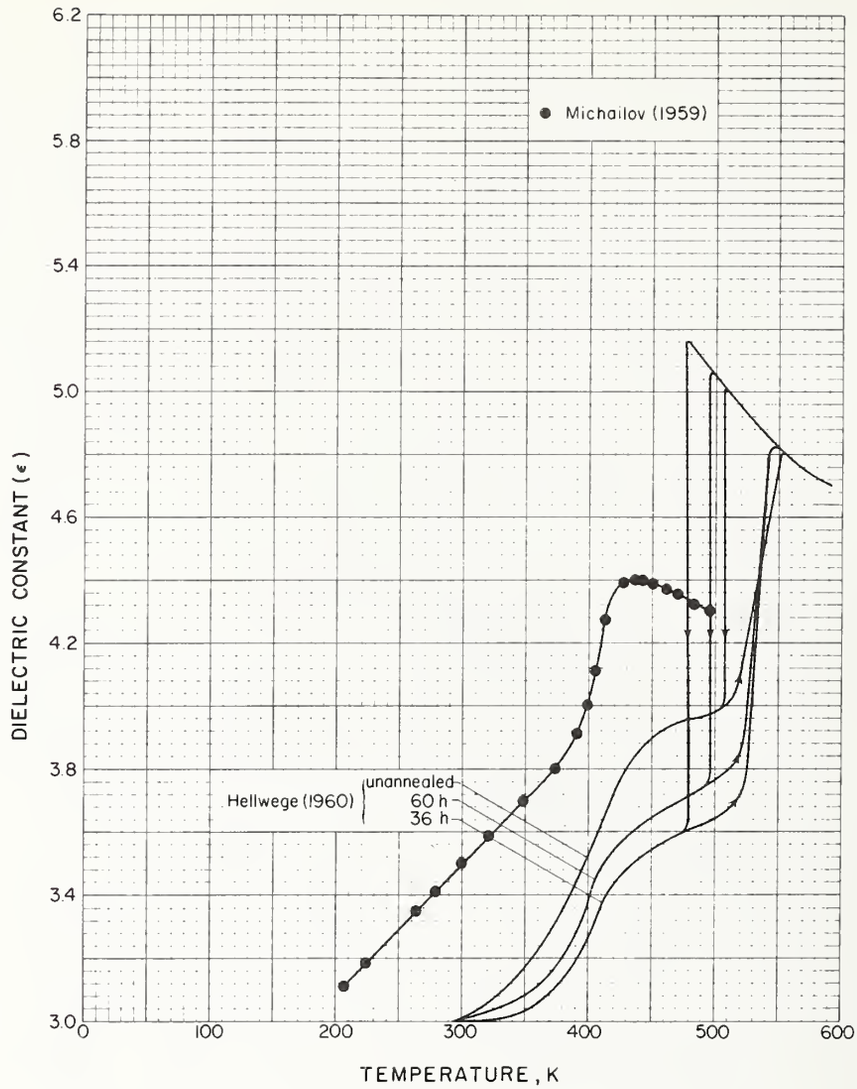
INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONOITIONS
Conklin (1965)	Mylar	TE^{o}_{01} mode waveguide method, 296 K.



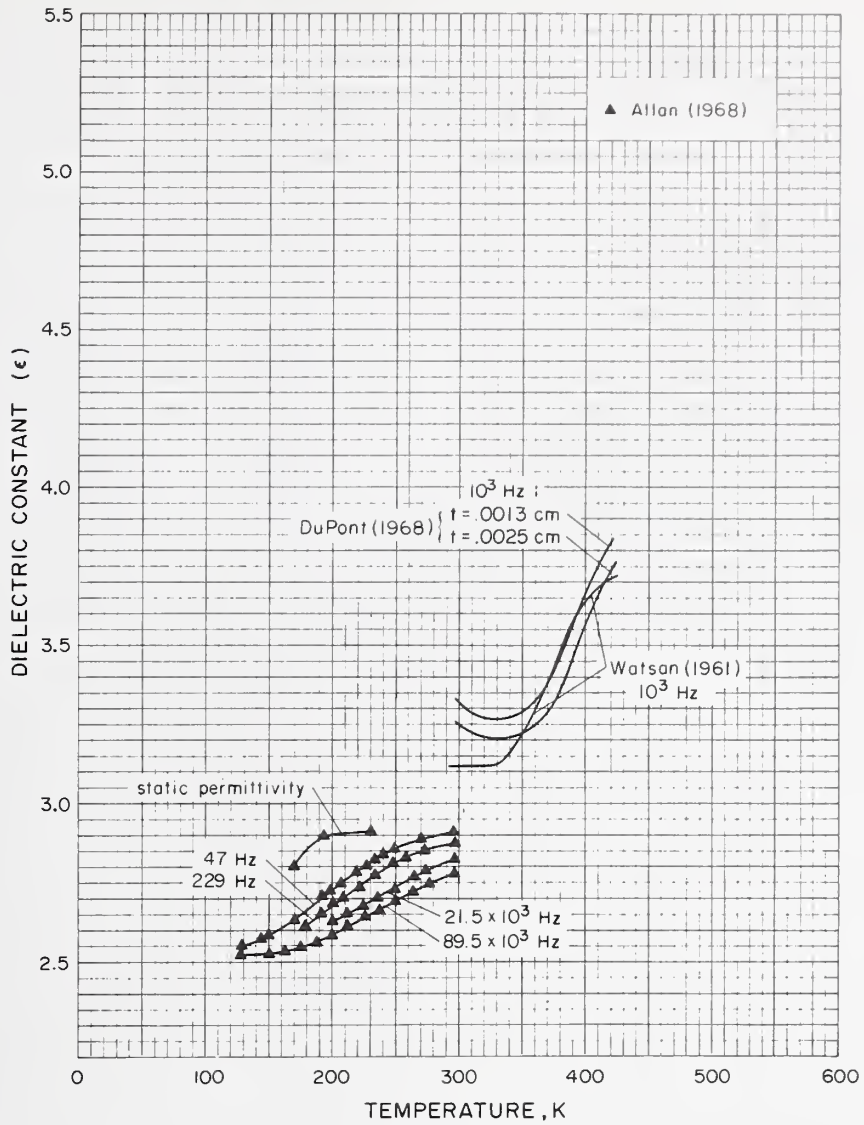
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Reddish (1950)	Terylene, molded, crystalline	5.3 cm diam, t = 0.05 cm; tin foil electrodes adhered to discs with trace of vaseline, measured in audio frequency range 10^2 to 3.0×10^4 Hz by Schering type audio frequency bridge, radio frequency range 10^5 to 10^7 Hz covered by use of resonance substitution method; these curves derived from a dielectric constant contour map.
Chant (1967)	Mylar, t = 0.005 cm; Melinex, t = 0.013 cm	Diam = 9.5 cm; vacuum evaporated 2000 Å Al electrodes; accuracy ≃ ± 5%.

PET

Dielectric Constant



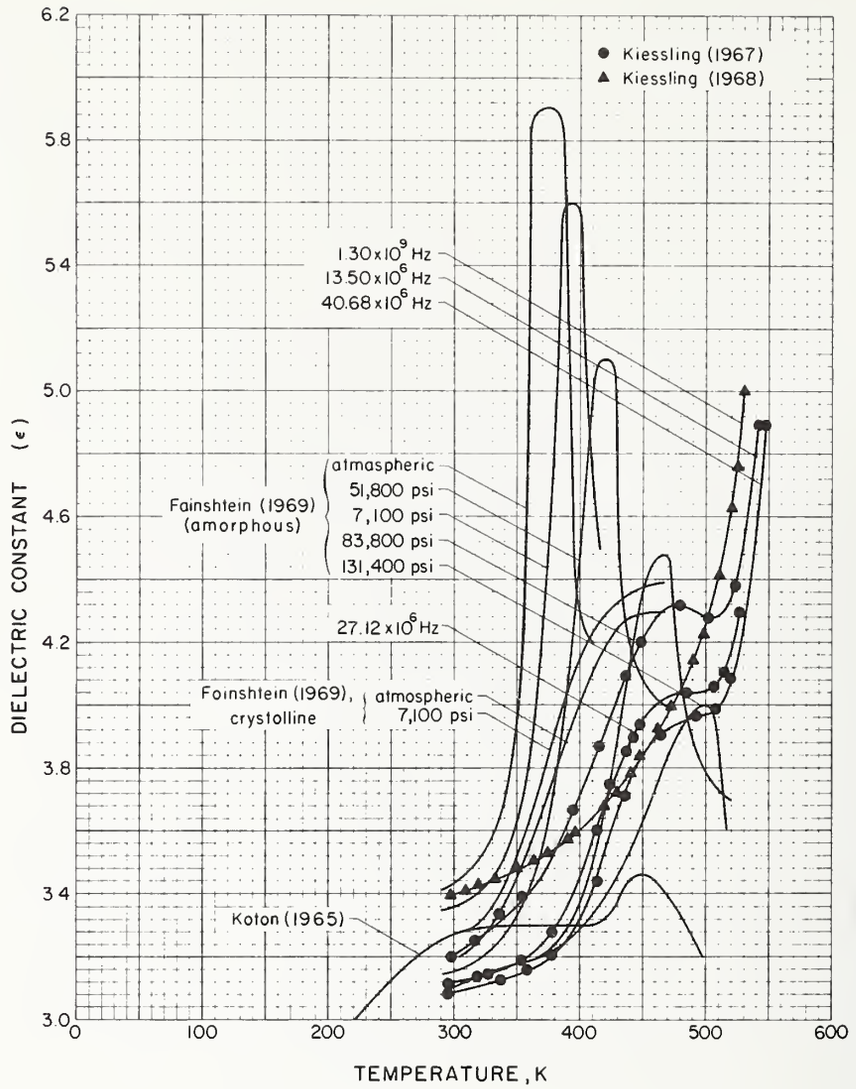
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Michailov, Sazhin (1959)		6×10^4 Hz.
Hellwege, Langbein (1960)	Hostaphan	Film; 10^6 Hz, length of anneal noted, arrows indicate direction of temp change.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Watson (1961)	Commercial, electrical-grade	ASTM D150-54T test procedure.
Allan, Kuffel (1968)	Plane-oriented and crystallized	t = 0.013 cm; capacitance bridge accurate to ± 0.01%, applied voltage = 20-50 V rms; data for intermediate frequencies also presented.
DuPont (1968)	Mylar C	ASTM D150-65T test procedure.

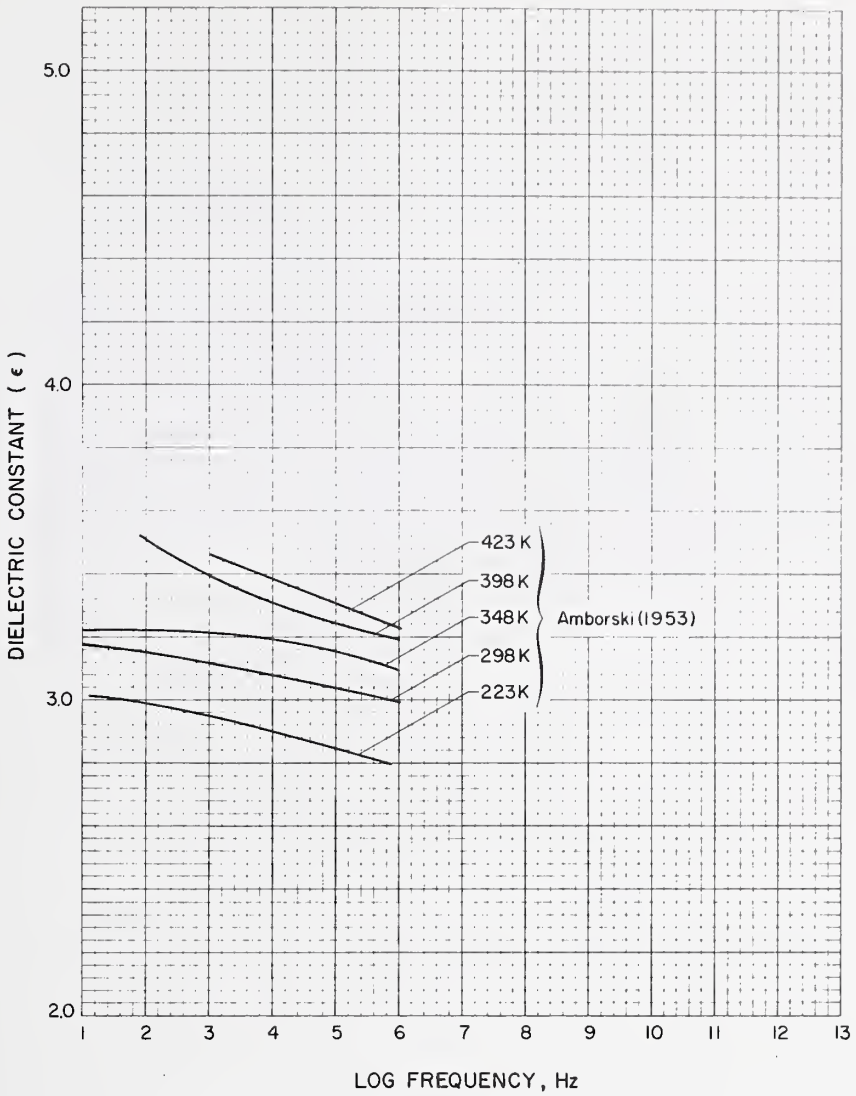
PET

Dielectric Constant



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kiessling, Rehwagen (1967)		t = 0.1 - 2.5 cm; capacitance technique.
Kiessling, Mündörfer, Joppich (1968)		Coaxial condensor method.
Koton, Yakovlev, Rudakov, Knyazeva, Florinskii, Bessonov, Kuleva, Tolparova, Laius (1965)		MLE bridge at 10^3 Hz, electrodes applied by vacuum deposition of Ag.
Fainshtein, Igonin (1969)	Crystalline sample produced by annealing amorphous material at 453K for 2 h.	t = 0.02 - 0.04 cm, diam = 3.6 cm; MLE - 1 dielectric loss bridge, 10^3 Hz, temp increased at 1 K min^{-1}, pressure applied to sample during measurement as noted.

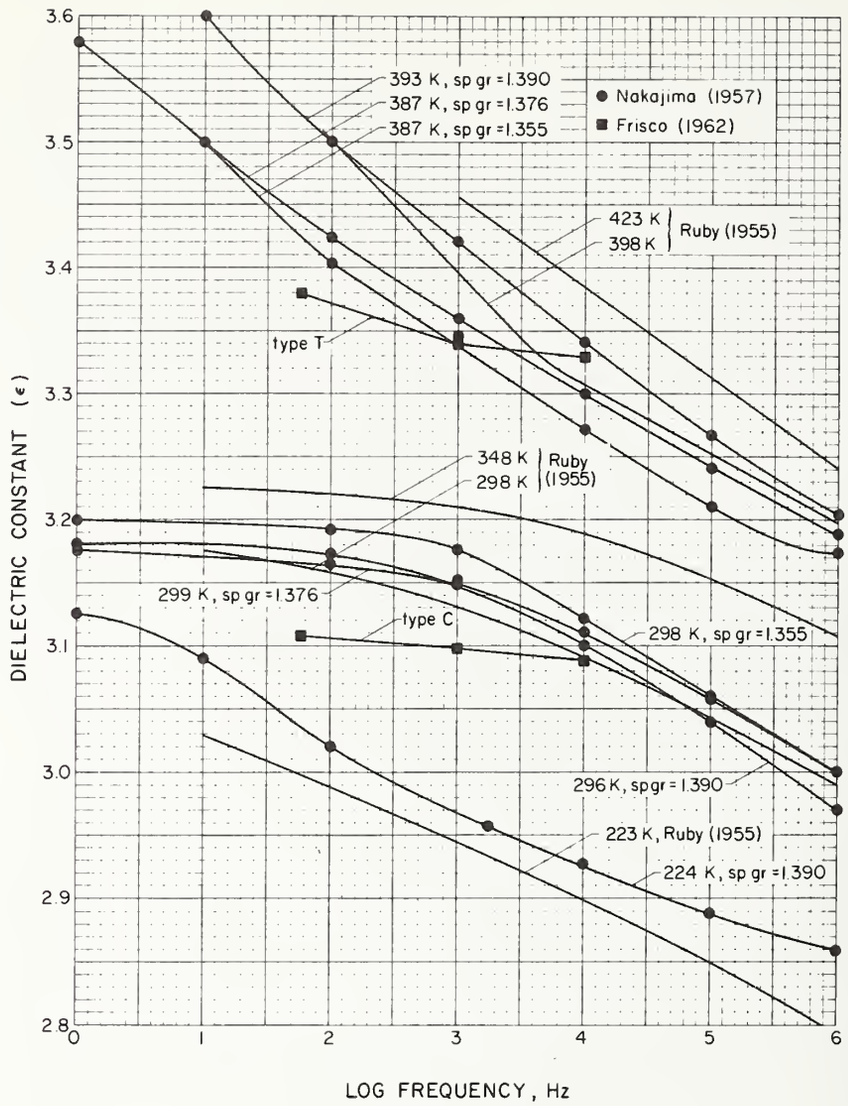
Dielectric Constant



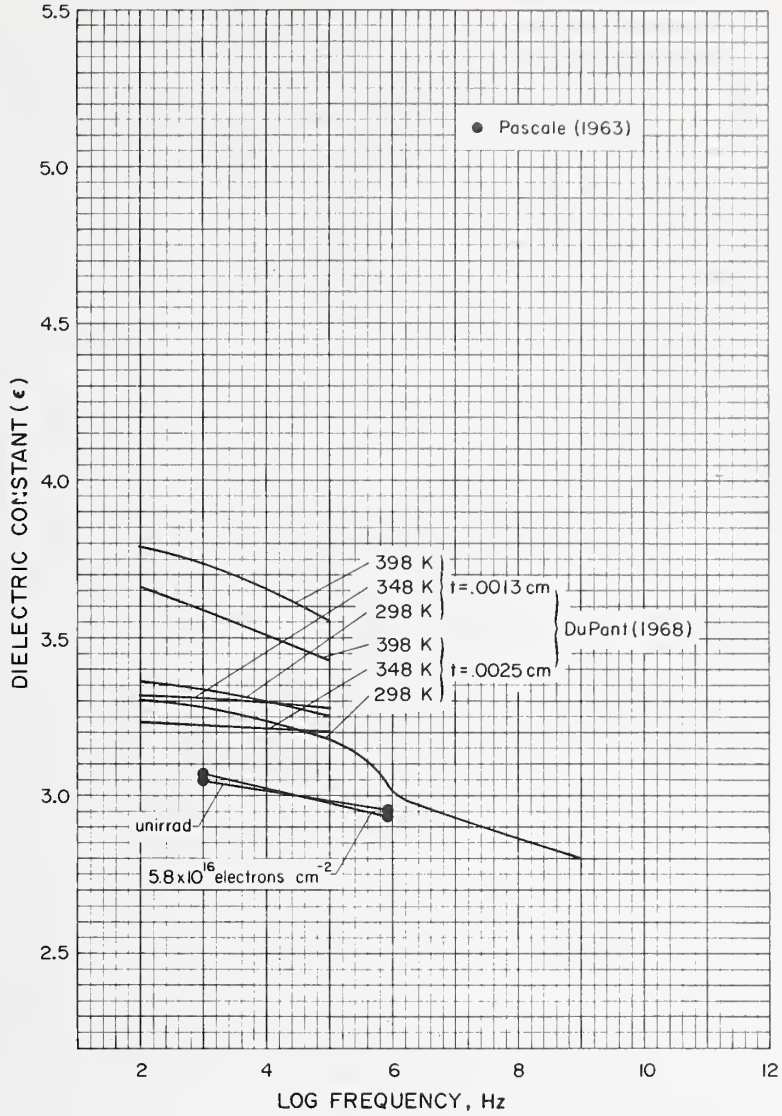
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Amborski, Flierl (1953)	Mylar	ASTM Method D150 test procedure.

PET

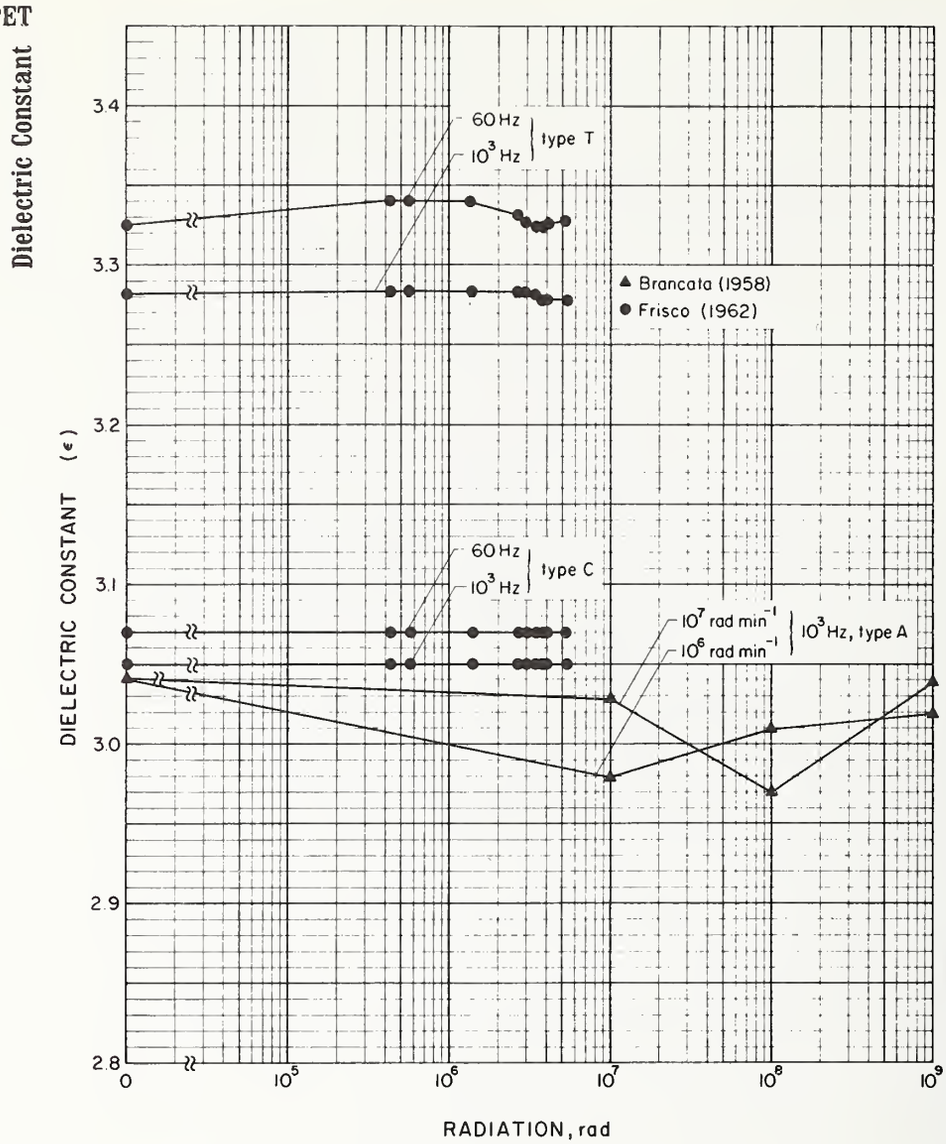
Dielectric Constant



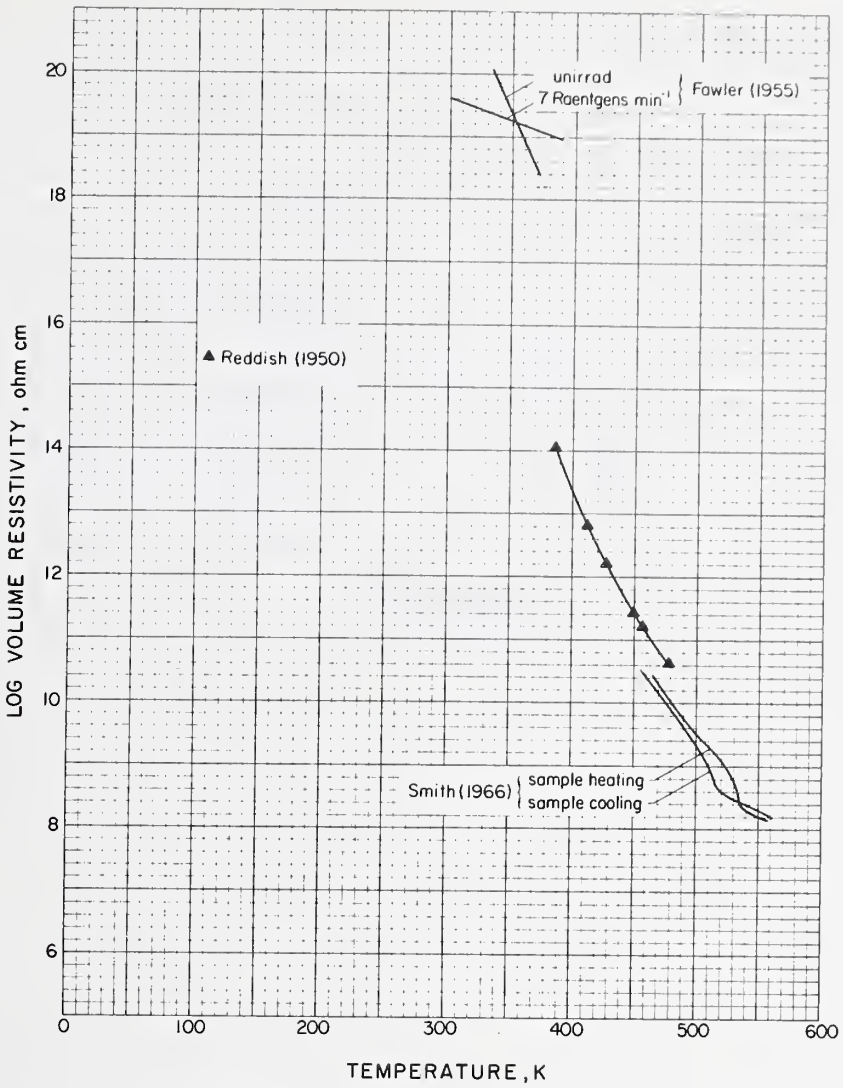
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Ruby (1955)	Mylar C	2.5 cm diam painted Ag electrodes, ASTM D150 test procedure.
Nakajima, Saito (1957)	Mylar	Data also presented for several intermediate temperatures.
Frisco (1962)	Mylar 130-100C and Mylar 130-100T highly oriented and tensilized.	t = 0.003 cm; tested in air.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Pascale, Herrmann, Miner (1963)	Weather Stabilized	t = 0.013 cm; rel hum = 50 ± 5%, 298 K; irrad by Van de Graaf accelerator.
Du Pont (1968)	Mylar C	ASTM D150-65T test procedure.



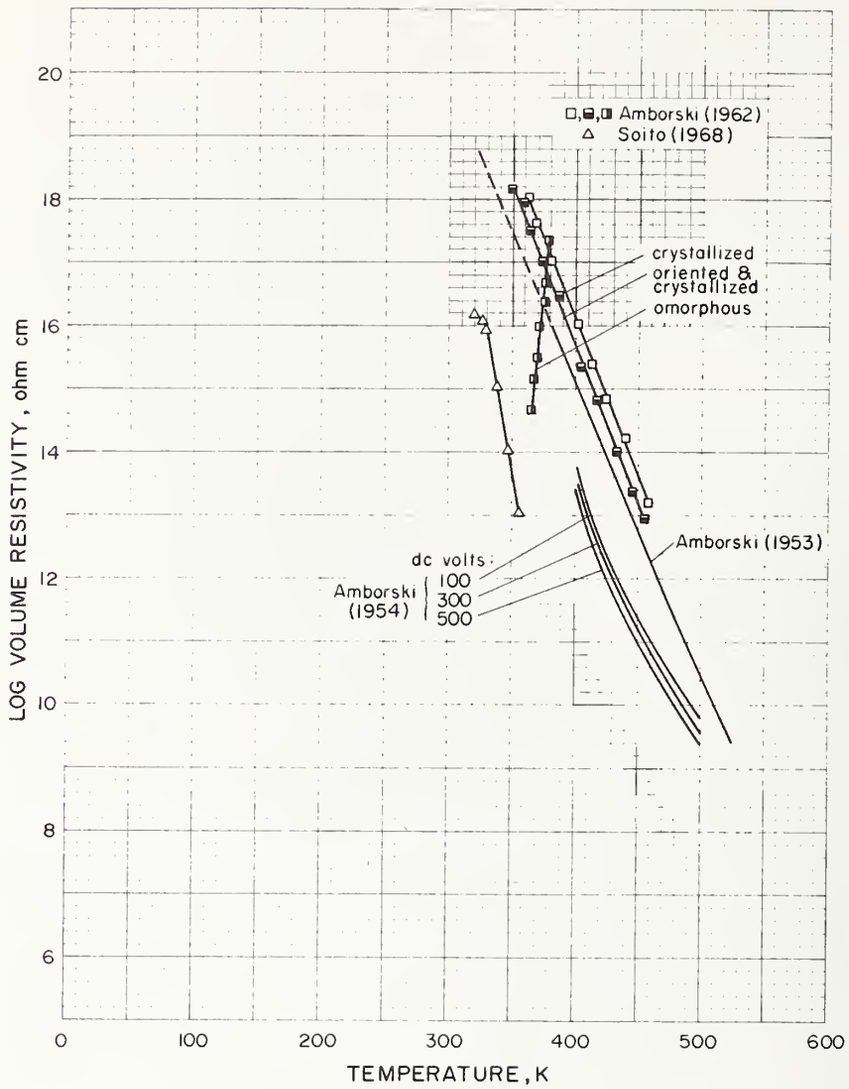
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Brancato, Allard (1958)	Mylar A	ℓ = 15.2 cm, w = 10.2 cm, t = 0.005 cm, General Radio Capacitance Bridge Type 716-C, 2.5 and 3.5 cm diam electrodes of Pb foil with t = 0.0009 cm, 299 ± 1 K, 50% rel hum, measurements taken after 24 h; irrad with 2 Mev electrons from Van de Graaf accelerator; av of 10 specimens.
Frisco (1962)	Mylar 130-100C and Mylar 130-100T highly oriented and tensilized.	t = 0.003 cm; tested and irrad by Ag x-rays in vacuum.



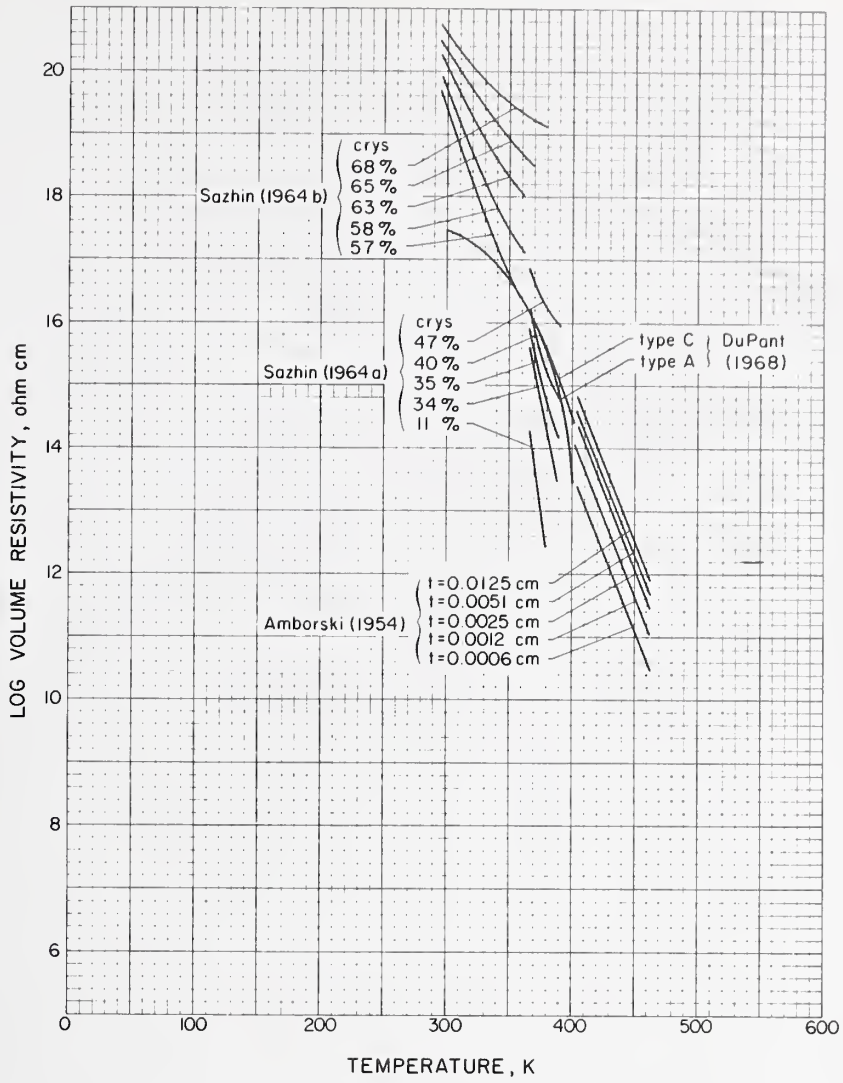
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Reddish (1950)	Terylene, molded, partially crystalline	5.3 cm diam, t = 0.05 cm.
Fowler, Farmer (1955)	Melinex	t = 0.003 cm, measurements made using dc amplifier technique; irrad by x-rays.
Smith, Scott (1966)	Granular form dried at 453 K for several h in vacuum, melted and forced into preheated cell at 563 K which was then cooled at about 0.5 K min^{-1}, highly crystalline, av molecular weight ≃ 15,000	Stainless steel and duralumin electrodes used, measurements made using Wayne Kerr bridge type B521, 50 Hz; curves represent a closely spaced series of experimental points.

PET

Resistivity



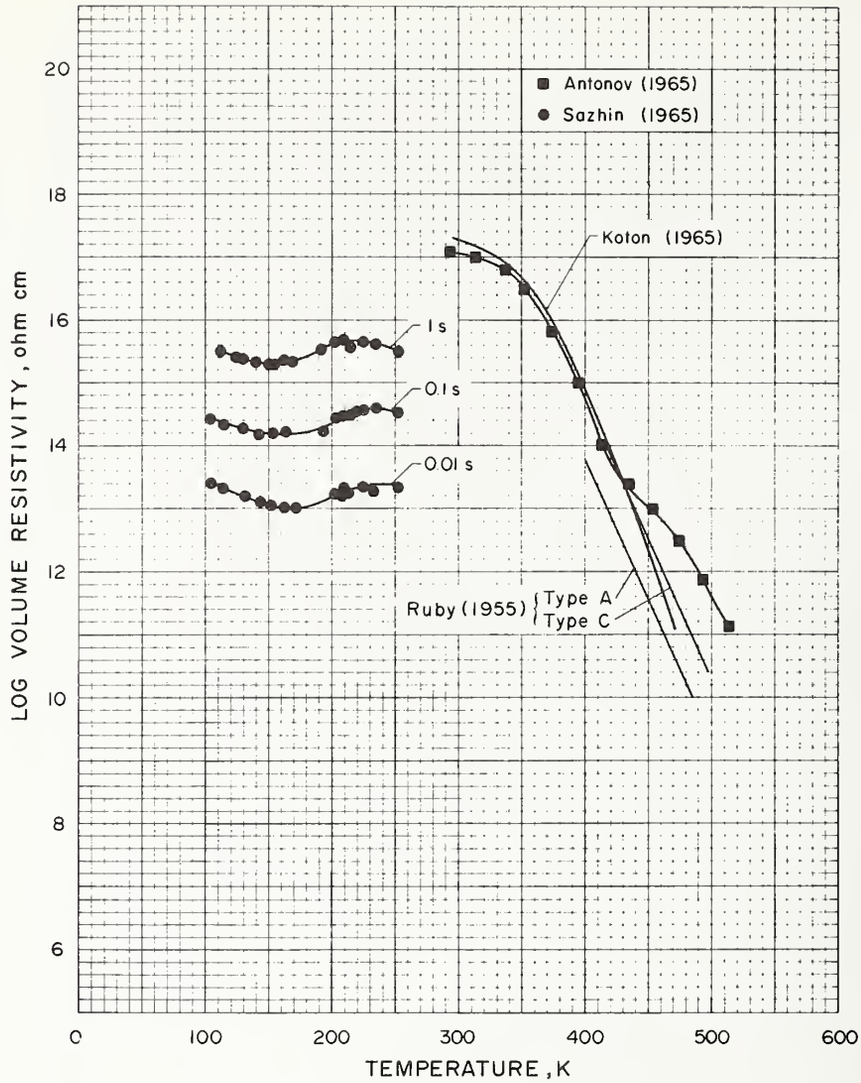
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Amborski, Flierl (1953)	Mylar C	ASTM Method D257-49T test procedure using General Radio Type 544-B megohm bridge, applied potential = 100 V, painted Ag electrodes; dashed part of curve shows authors' extrapolation.
Amborski, Burton (1954)	Mylar A	t = 0.0025 cm, single sheets 6.35 x 6.35 cm; 5.08 cm diam Ag electrodes painted on both sides, resistance measured with General Radio megohm bridge (type 544B), samples controlled to ± 1/2 K, readings taken after 6 min charge.
Amborski (1962)	Mylar, amorphic, crystallized, also oriented and crystallized.	8.9 x 8.9 cm sheet, t = 0.0025 to 0.0076 cm, Ames gage used to measure film thickness; silver electrodes sprayed on both sides of test film, ASTM D257-49T test procedure, resistance measured with General Radio megohm bridge type 544B, 125V dc.
Saito, Sasabe, Nakajima, Yada (1968)	Compression molded, desiccated, amorphous	Max of 0.5 cm thick and 7.0 cm diam; dc current applied, pressure = 1 atm, guarded electrode method.



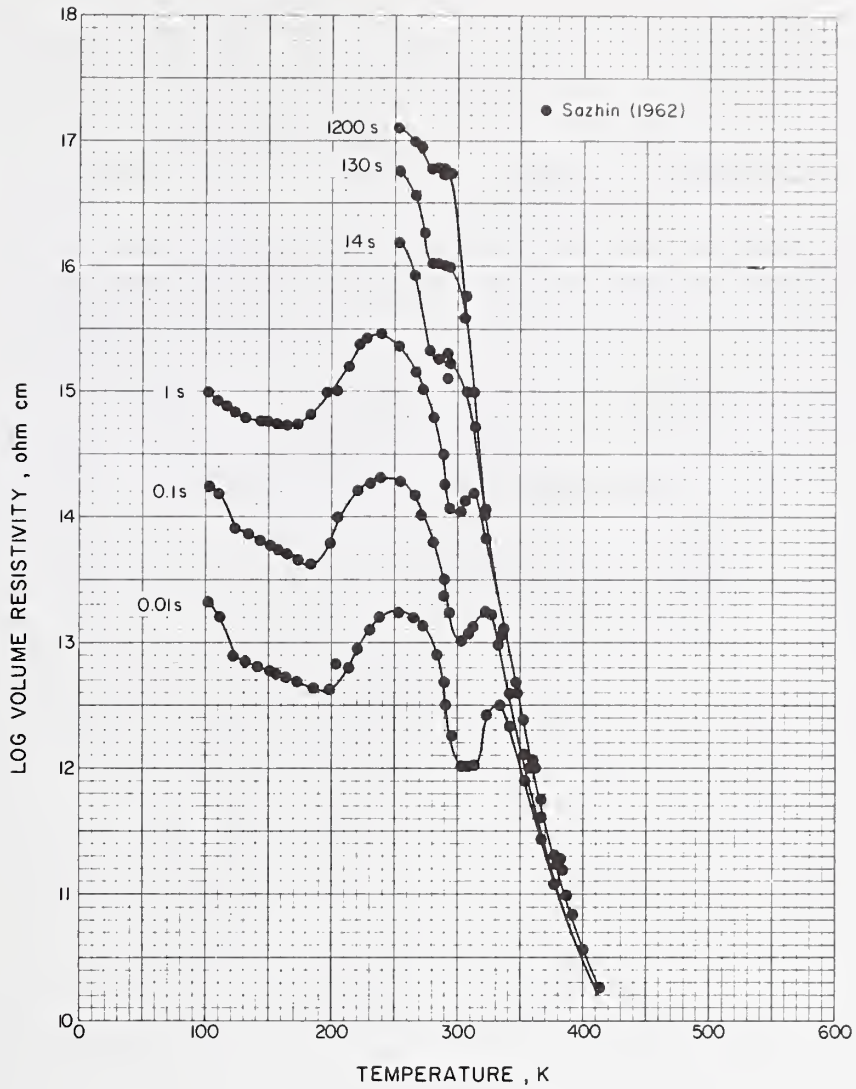
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Amborski, Burton (1954)	Mylar A	t = 0.0006 to 0.0125 cm, single sheets 6.35 x 6.35 cm; 5.08 cm diam, silver electrodes painted on both sides, resistance measured with General Radio megohm bridge (type 544B), samples controlled to ± 1/2 K, 125V dc, readings taken after 6 min charge.
Sazhin, Podosenova (1964a)	Industrial grade: sp gr measured at 303 K; sp gr = 1.345, 11% crys; sp gr = 1.375, 34% crys; sp gr = 1.377, 35% crys; sp gr = 1.383, 40% crys; sp gr = 1.393, 47% crys	t = 0.1 cm, diam = 1.5 cm; aluminum foil electrodes, 0.0055 cm thick pressed onto specimen; error in determining resistivity not more than 15%, data spread not more than 5%.
Sazhin, Podosenova (1964b)	Sp gr = 1.407, 57% crys; sp gr = 1.409, 58% crys; sp gr = 1.416, 63% crys; sp gr = 1.419, 65% crys; sp gr = 1.423, 68% crys	Voltage applied 2-10 h.
Du Pont (1968)	Mylar A, C	t = 0.0025 cm; tested ASTM D257-61 test procedure using 90 to 100 volts dc, 3 min electrification time, sprayed Ag electrodes of 2.5 cm diam.

PET

Resistivity



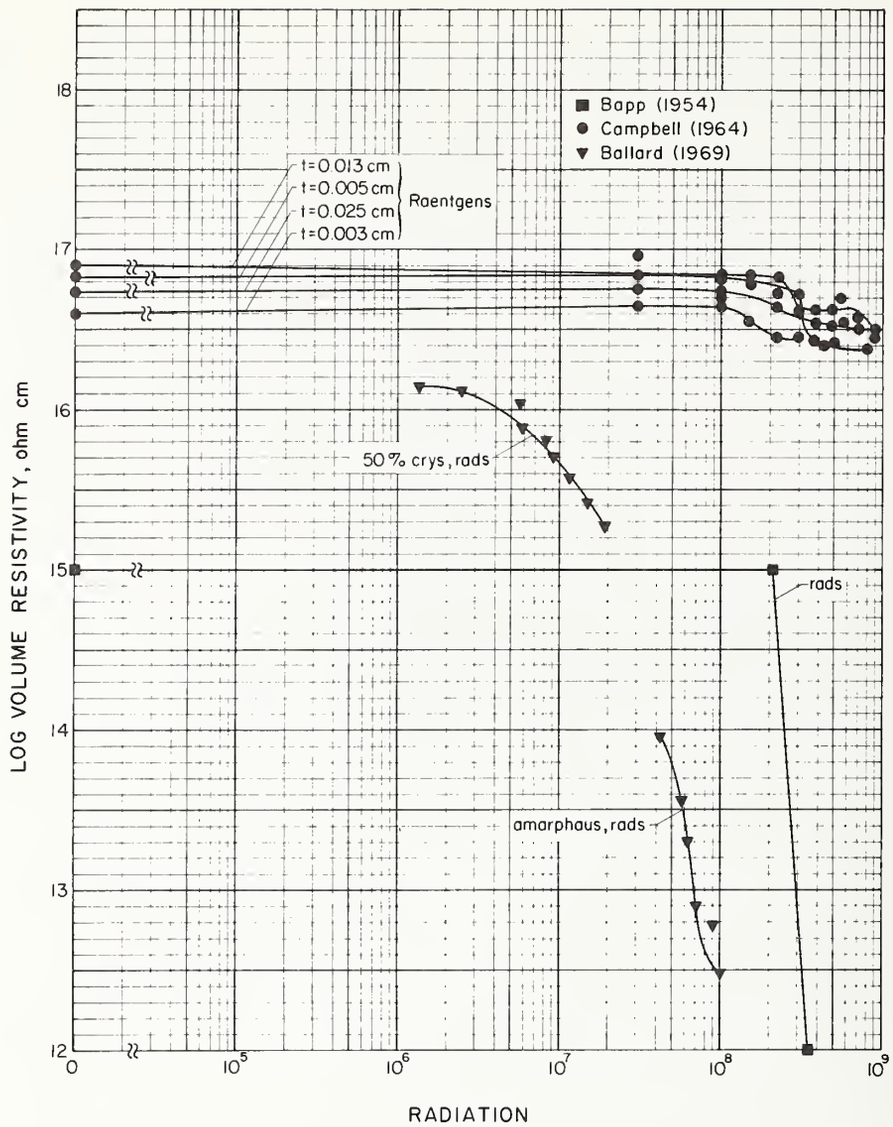
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Ruby (1955)	Mylar	5.1 cm diam painted Ag electrodes, 125 V dc.
Antonov, Feinstein, Andrianova (1963)	Film	
Sazhin, Filippovich (1963)		Time between application of voltage and measurement indicated.
Koton, Yakovlev, Rudakov, Knyazeva, Florinskii, Bessonov, Kuleva, Tolparova, Laius (1965)		String electrometer, electrodes applied by vacuum deposition of Ag.



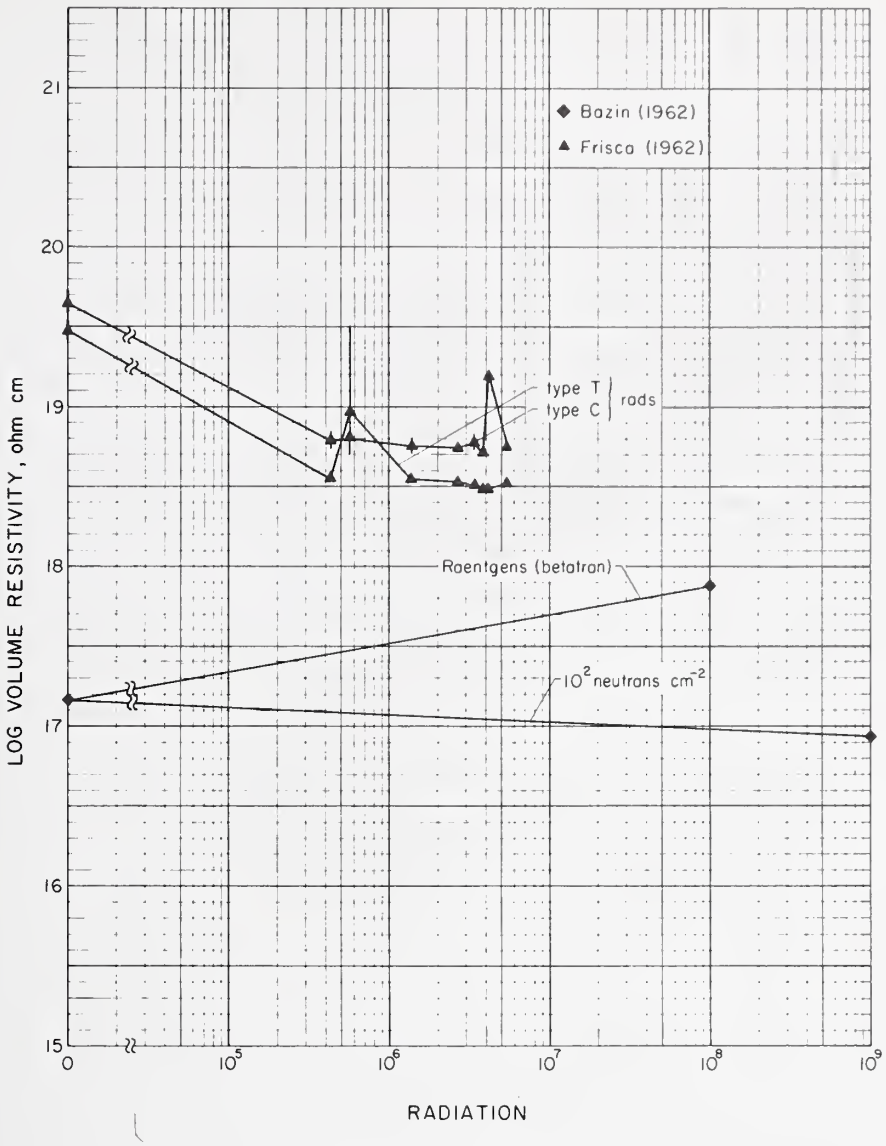
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sazhin, Eidelnant (1962)	Quenched in liquid N_2 from melt, annealed at 473K for 24 h.	0.2 - 2 × 10^3 V cm^{-1}, time between application of electric field and measurement indicated.

PET

Resistivity



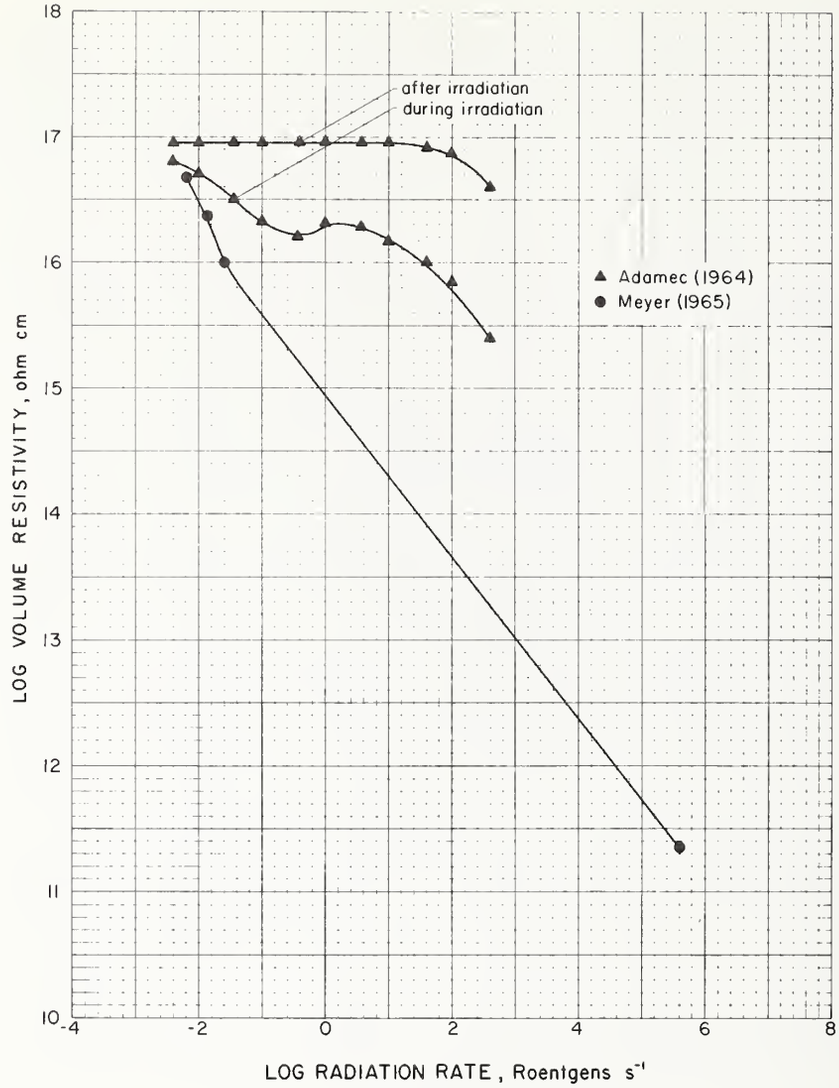
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Bopp, Sisman (1954)	Mylar	Irrad in ORNL Graphite Reactor
Ballard (1969)	Film	Amorphous sample: t = 0.025 cm; Al electrodes with t = 830 Å and area = 3.88 cm^2, 1000 V; irrad at 1.9×10^6 rad h^{-1}. 50% crys sample: t = 0.0025 cm; Ag electrodes with t = 300 Å and area = 3.88 cm^2, 100 V; irrad at 3.8×10^4 rad h^{-1}. Irrad in N_2 by Co^{60}; ρ calculated from the author's measured values of current, no correction for edge effects.
Campbell (1964)	Mylar	Diam = 4.45 cm; electrodes of DuPont No. 4922 conductive Ag paint, diam = 3.81 cm, t ≈ 0.0013 cm, electrodes air dried and then baked on for 1 h at 373K, 3-terminal circuit, direct coupled Keithley Model 410 micromicroammeter, measured at 90 Vdc; irrad in stainless steel containers by a 7000 Curie Co^{60} source at 1.77×10^6 Roentgens h^{-1}.



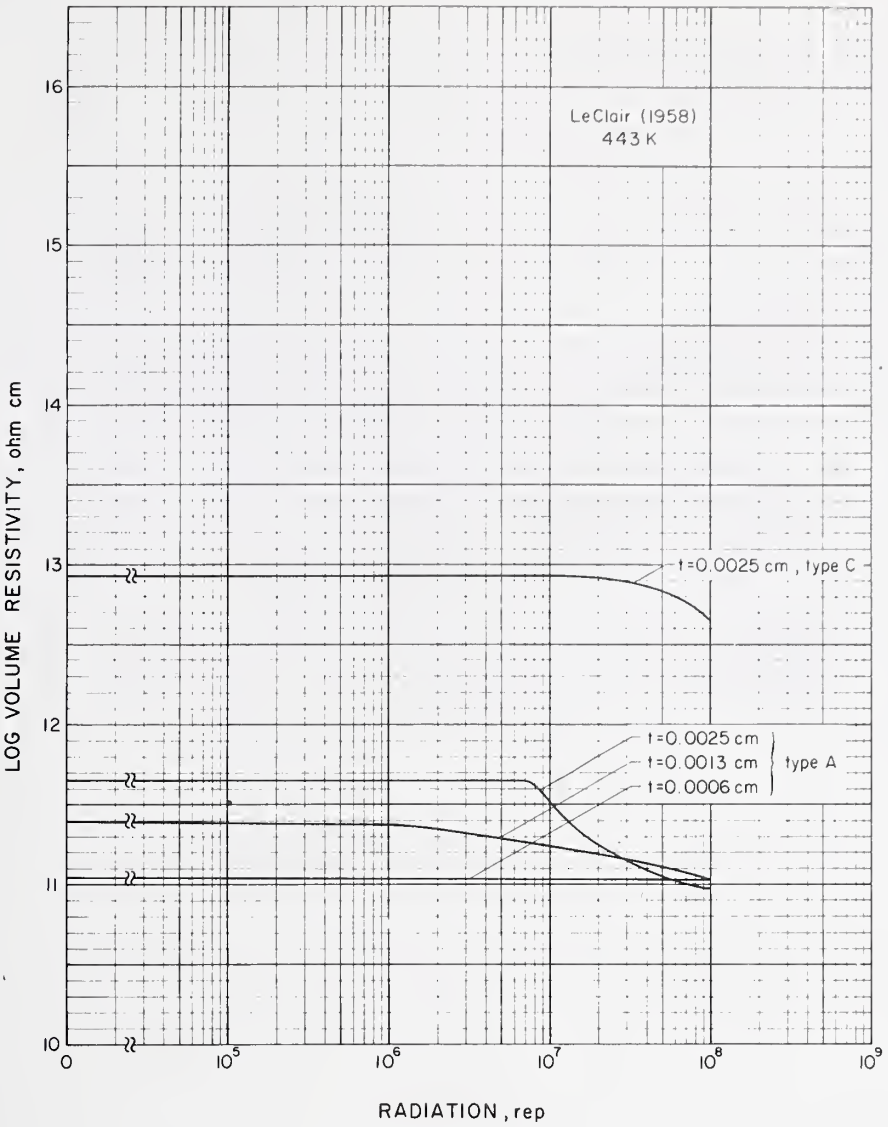
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bazin (1962)	Lavsan	293 K, thin Ag electrodes; irrad in vacuum by bremsstrahlung radiation from 25 Mev betatron and with 14 Mev neutrons from the reaction H^3 (d, n) He^4.
Frisco (1962)	Mylar 130-100C and Mylar 130 - 100 T highly oriented and tensilized.	t = 0.003 cm; dc, tested and irrad by Ag x-rays in vacuum.

PET

Resistivity



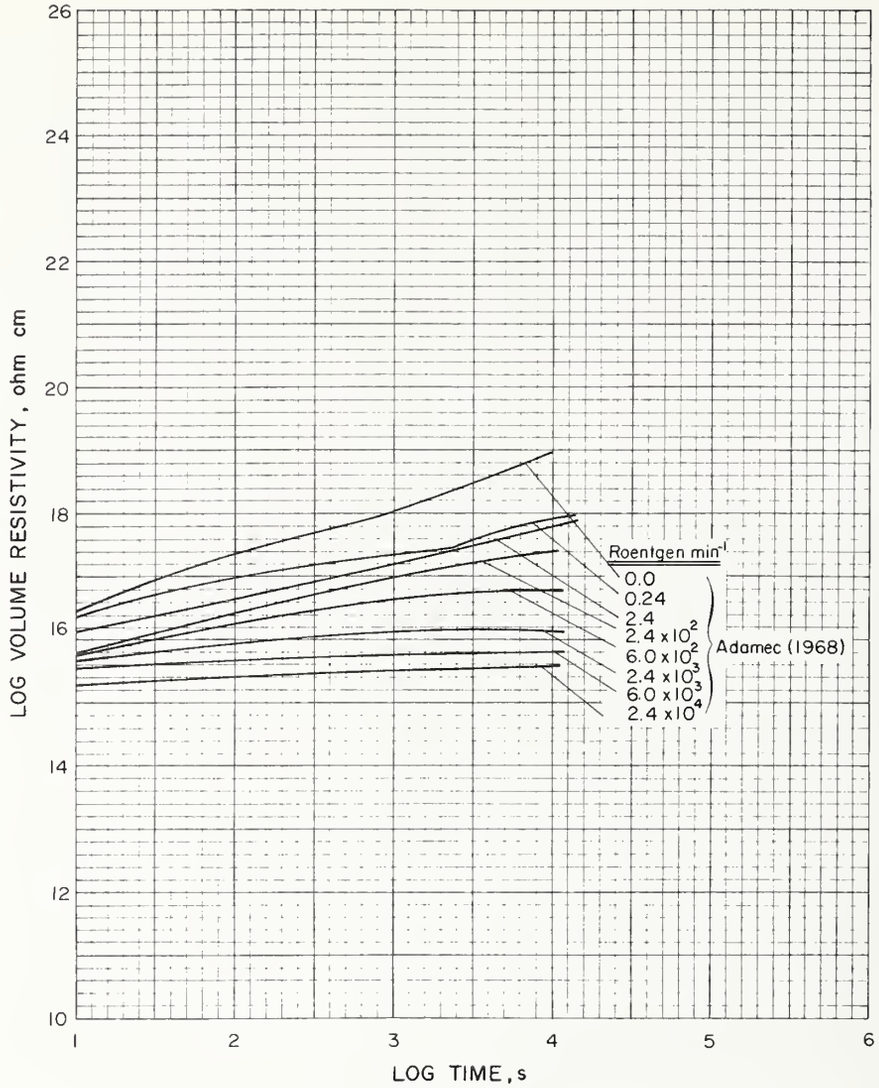
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Adamec (1964)	Commercial sheet	t = 0.004 - 0.006 cm, diam = 5.0 cm; 120 V battery used as voltage source, current measured with a vibrating reed electrometer, measurements made during irradiation and 2 min after switching radiation off; irrad with 15-38 keV x-rays.
Meyer, Grannemann (1965)	Mylar	t = 0.020 cm, area = 150 cm^2; parallel plate capacitor, electrodes were evaporated indium or painted silver; irrad by Ce^{137} or 250 kV, 15 ma dc x-ray machine.



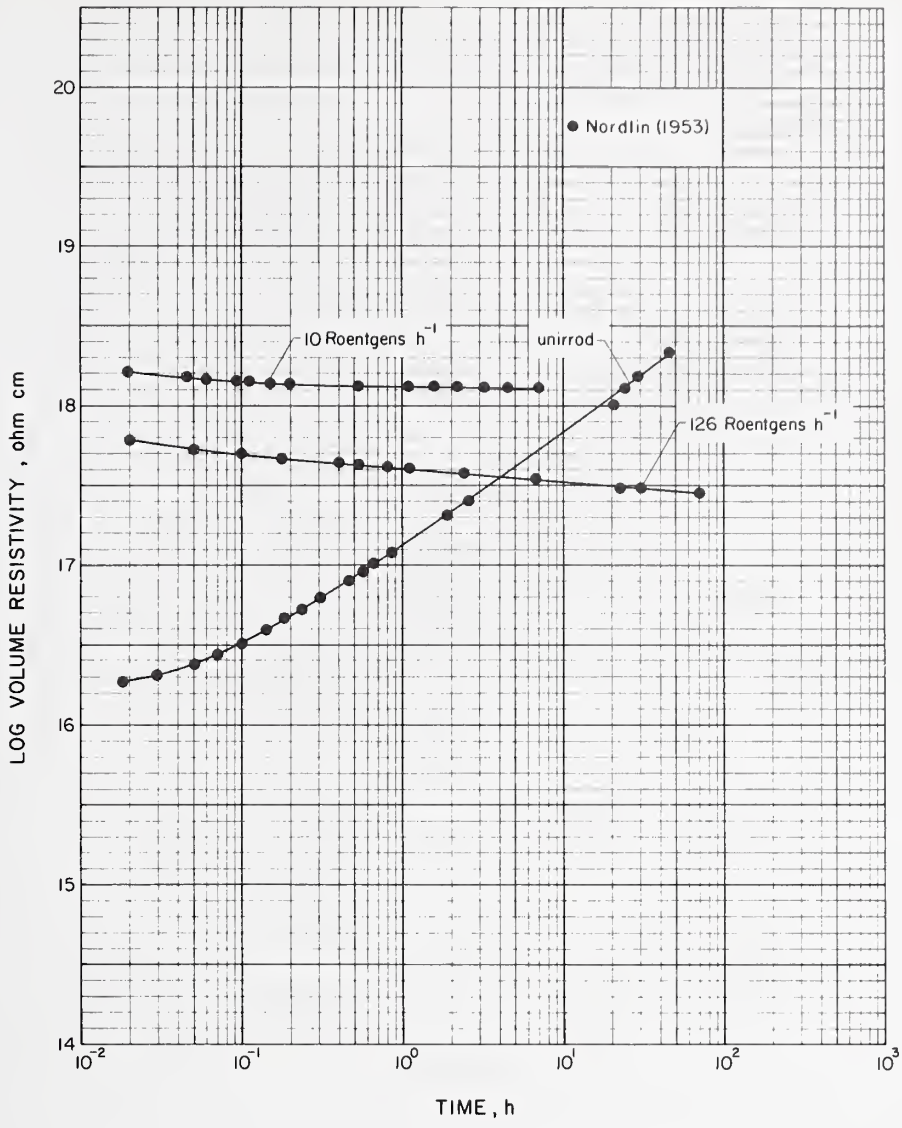
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
LeClair, Cobbs, Jr. (1958)	Mylar A and C	d c , standard megohm bridge, 443 K; electron radiation from 2 Mev Van de Graff accelerator; 3 samples tested, 95% confidence limits = ± 10%.

PET

Resistivity



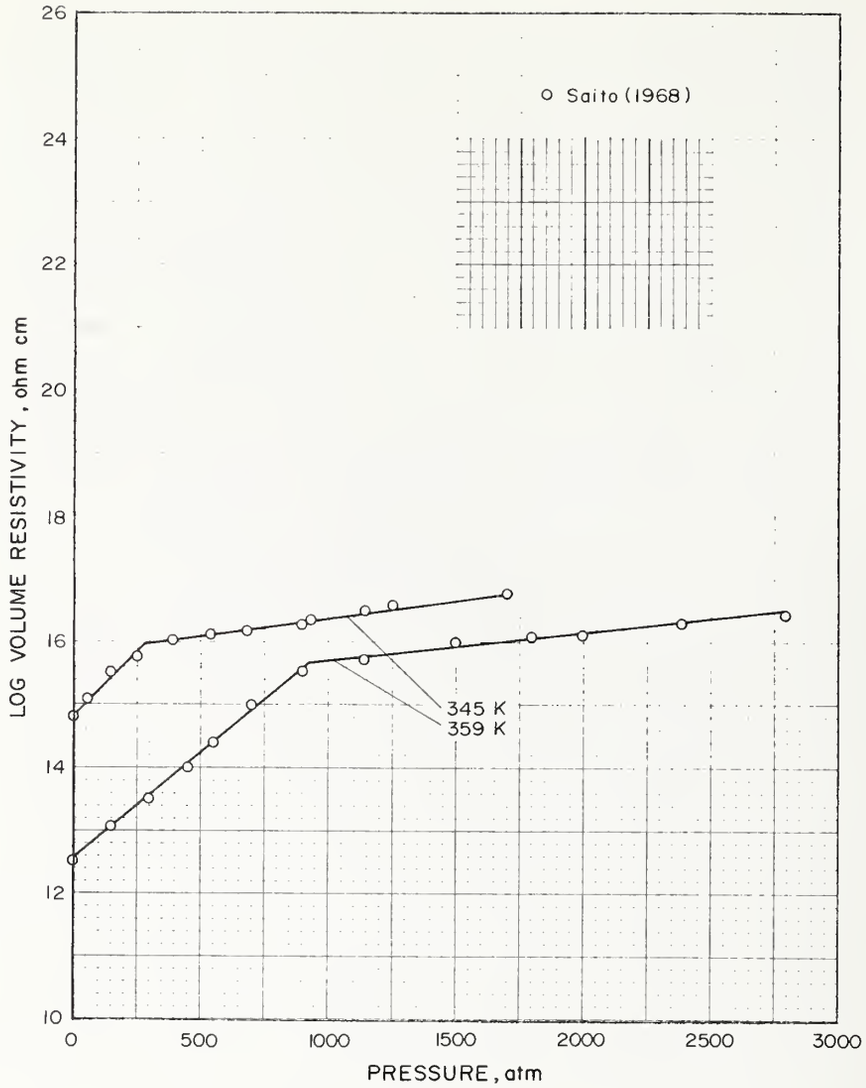
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Adamec (1968)	Mylar	t = 0.005 cm; 100 V battery used as voltage source, Vibron (E. I. L.) electrometer, readings taken after 10 s; irrad with W x-rays.



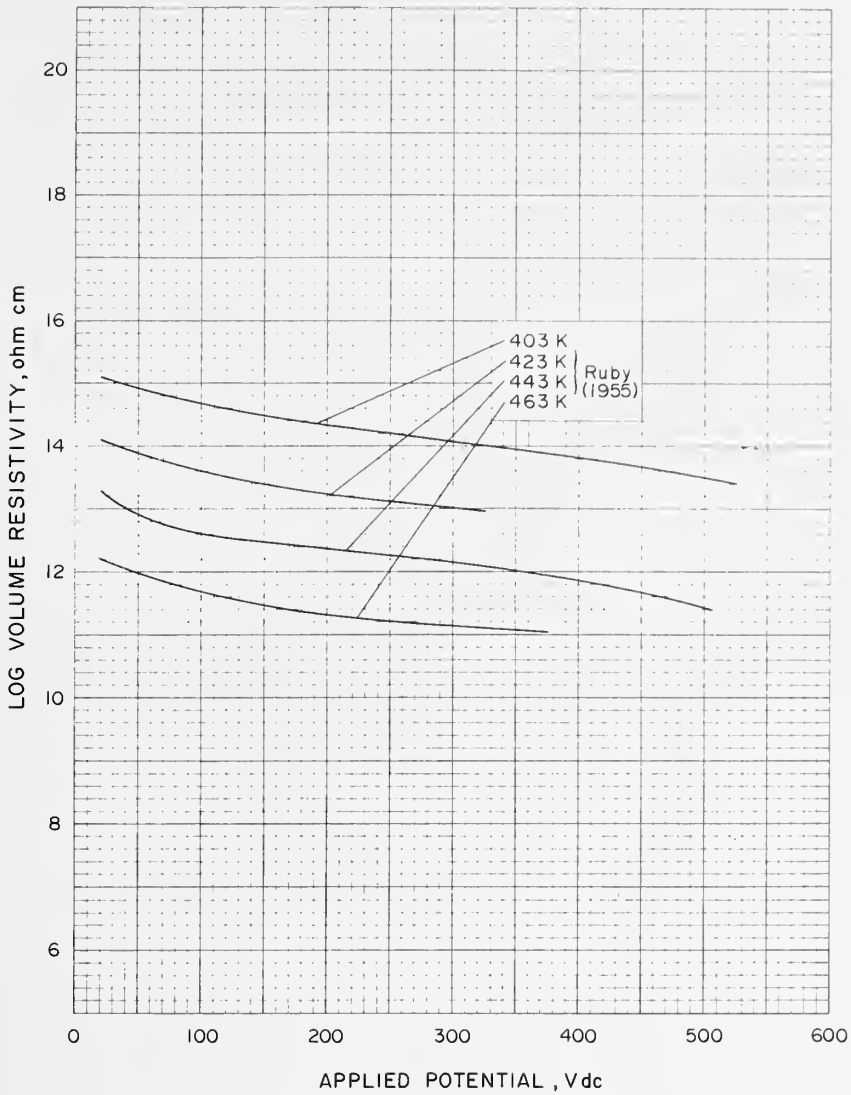
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Nordlin, Keel, Mayhew (1953)	Mylar film, t = 0.0013 cm	Specimen formed by 5 square pieces of film; Al electrodes, same specimen tested in vacuum at 570 V, tested without radiation, then at high radiation rate, after 48 h recovery tested at low radiation rate; irrad by Co^{60}.

PET

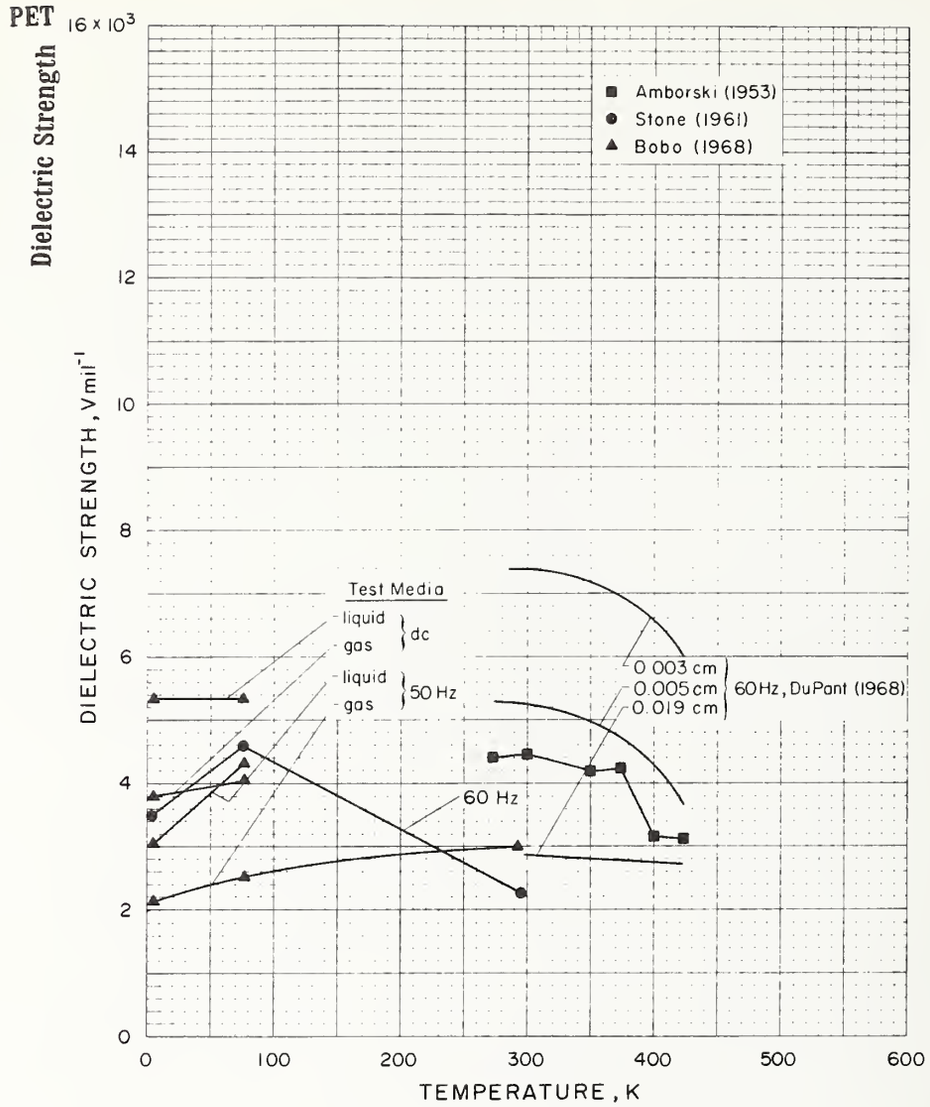
Resistivity



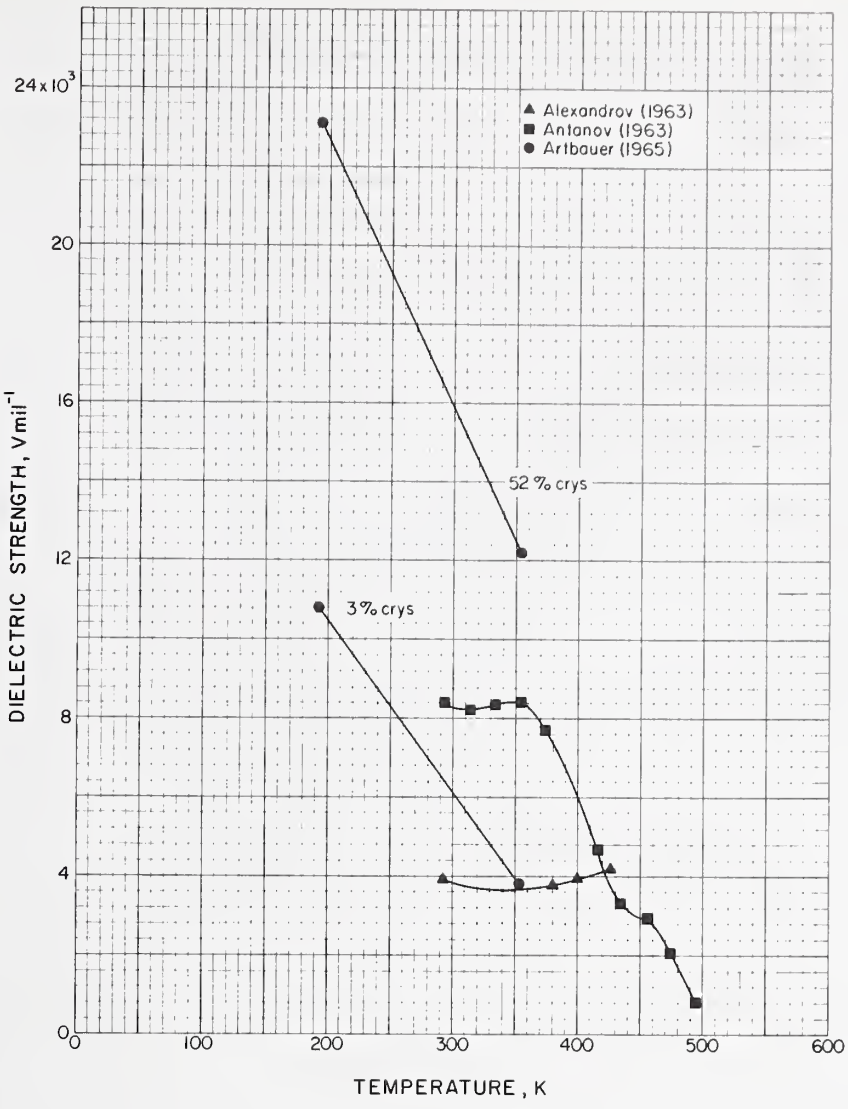
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Saito, Sasabe, Nakajima, Yada (1968)	Compression molded, desiccated, amorphous	Max of t = 0.5 cm and 7.0 cm diam; dc current applied, guarded electrode method.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Ruby (1955)	Mylar C	5.1 cm diam painted Ag electrodes.

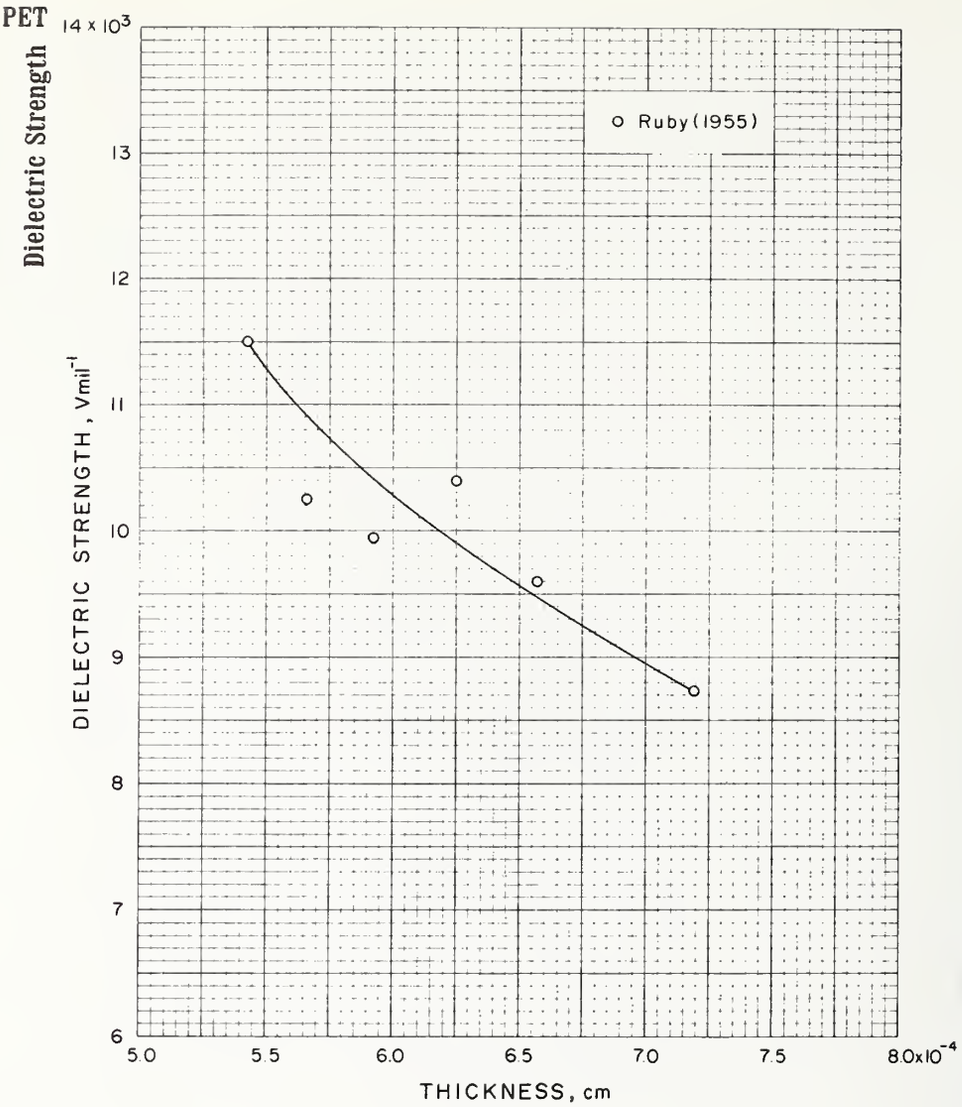


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Amborski, Flierl (1953)	Mylar	t = 0.005 cm; 5.1 cm diam electrodes, ASTM D149-44 short time test procedure.
Stone, McFee (1961)	Mylar	t = 0.0025 cm; 60 Hz, 0.62 cm diam brass electrodes, voltage rise $\simeq$ 200 V s^{-1}.
Bobo, Perrier (1968)	Mylar	t = 0.01 cm; electrodes were 3.0 cm diam spheres, voltage increased at 5 x 10^3 V s^{-1}, ac and dc tests made in air and helium in gas and liquid form, 50 Hz.
DuPont (1968)	Mylar	D2305-67 test procedure, brass electrodes, 60 Hz, voltage increased at rate of 500 V s^{-1}.

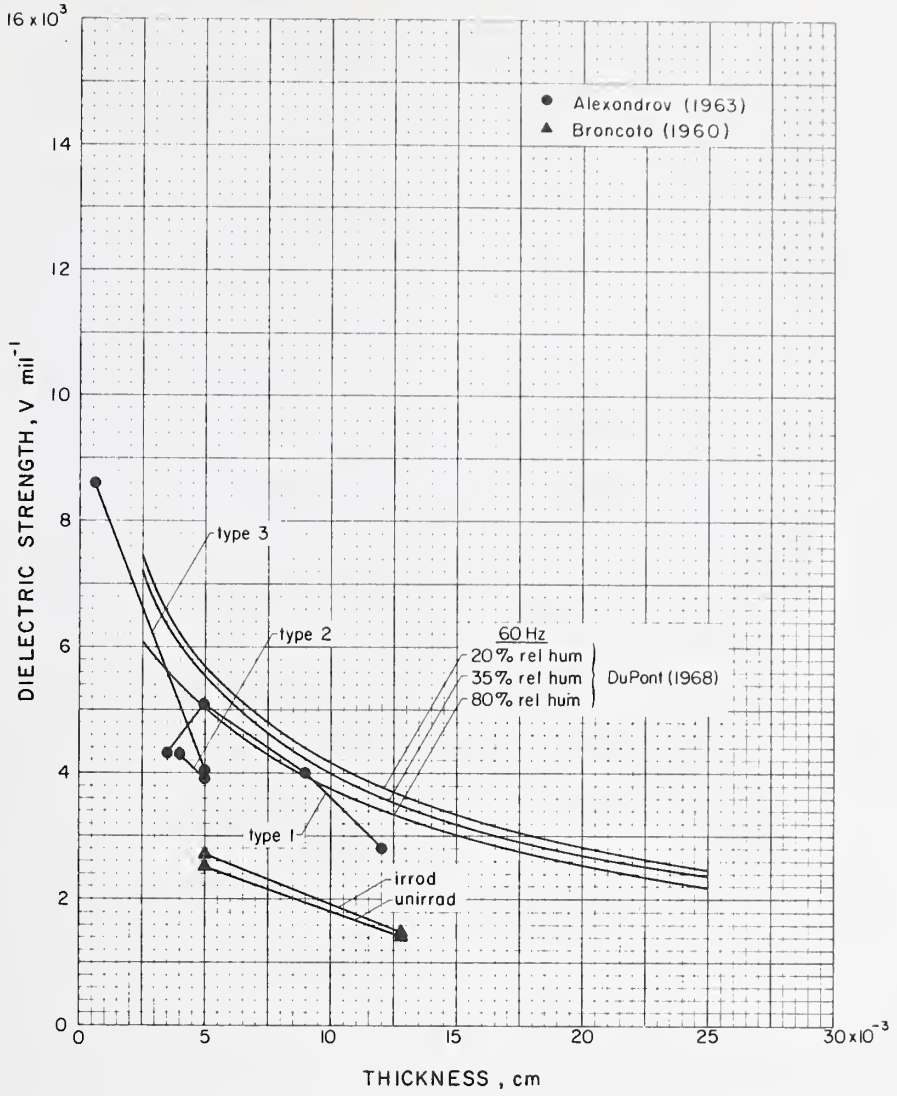


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Alexandrov, Trubashev (1963)	Hostaphan	
Antonov, Feinstein, Andrianova (1963)	Film	
Artbauer, Griav (1965)	Sp gr = 1.339, 3% crys and sp gr = 1.397, 52% crys	Av t = 0.0075-0.0177 cm; Ag paint electrodes; values given are medians of 6-13 tests.

PET

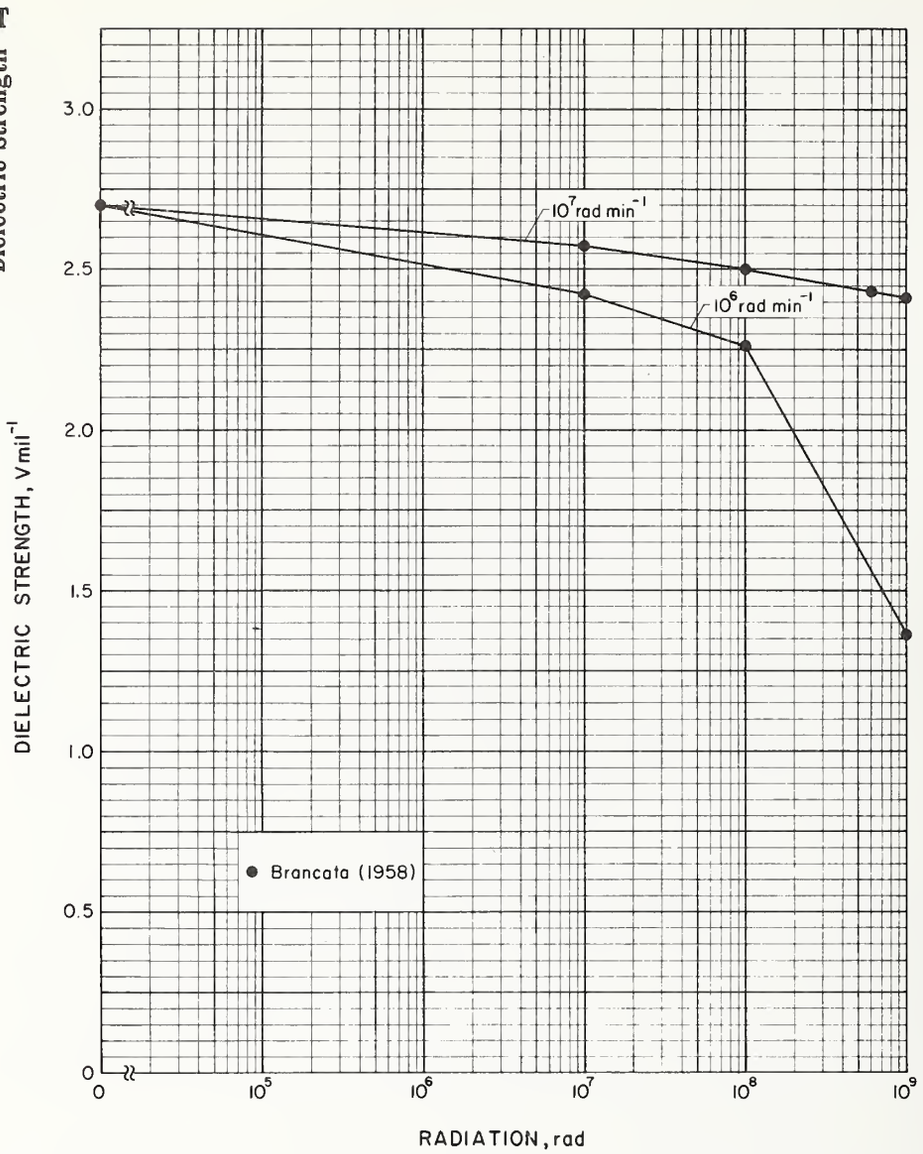


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Ruby (1955)	Mylar C	2.5 cm diam painted Ag electrodes, 298 K.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Alexandrov, Trubashev (1963)	Type 1 is Melinex, type 2 is Hostaphan, type 3 is Mylar	
DuPont (1968)	Mylar	D2305-67 test procedure, brass electrodes, 60 Hz, voltage increased at rate of 500 V s^{-1}.
Brancato, Kallander (1960)		2 types of electrodes: Pb foil attached with silicone grease and evaporated Al films; irrad by 1800 Curie Co^{60} source at 6 x 10^5 Roentgens h^{-1}; av of 10 measurements.

PET



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Brancato, Allard (1958)	Mylar A	ℓ = 15.2 cm, w = 10.2 cm, t = 0.005 cm; ASTM D 149-44 test procedure, 300 V s^{-1} applied, brass electrodes with 2.5 cm diam, electrodes were epoxy potted; irrad with 2 Mev electrons from Van de Graaf accelerator; av of 10-20 specimens.

Investigator(s) (year)	Description	Temperature (K)	ρ Volume Resistivity (Ω cm)	Tan δ Dielectric Loss Tangent	ε Dielectric Constant	D. S. Dielectric Strength (V mil^{-1})
Amborski (1953)	Mylar C	298	1.0×10^{1}	0.003	3.2	4,500
Coleman (1953)	Mylar, β irrad for 30 min	295	1.0×10^{1}			
Amborski (1954)	Mylar	298	10^{1}-10^{1}			
Fowler (1956)	Mylar, irrad at 8 rads min^{-1}	293	1.7×10^{1}			
Inuishi (1957)	Mylar	298				15,200
Brancato (1958)		299		0.0045	3.04	5,410
Reynolds (1958)	Mylar	298		0.0043	3.5	

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Amborski, Flierl (1953)	Mylar C	60 Hz.
Coleman, Bohm (1953)	Mylar	1500 V battery and electrometer; irrad with 25 mc of Sr^{90} deposited on one electrode; value noted is minimum induced ρ.
Amborski, Burton (1954)	Mylar	t = 0.0006-0.0125 cm, single sheets 6.35 x 6.35 cm; 5.1 cm diam electrodes on both sides, General Radio meg-ohm Bridge (type 544B), 125 Vdc, measurement made after 6 min charge.
Fowler (1956)	Mylar	Diam = 0.06-0.07 cm, ℓ = 2.5 cm and 0.01-0.05 cm; thin sheet Al used as electrodes between discs, dc amplifier and Baldwin Ionex mk3, tested in vacuum; irrad by x-rays at 8 rads min^{-1}.
Inuishi, Powers (1957)	Mylar	t = 0.0006-0.0051 cm; dc, no edge effects, evaporated Au electrodes, t ≤ 100Å.
Brancato, Allard (1958)	Mylar A	ℓ = 15.24 cm, w = 10.16 cm, t = 0.0051 cm; 50% rel hum, D.S. as per ASTM D 149-44 test procedure with brass cylinder electrodes of 2.54 cm diam at 300 V s^{-1}, ε and tan δ measured with General Radio Capacitance Bridge type 716-C on Pb foil electrodes.
Reynolds, Kollath (1958)	Mylar	10^{3} Hz, General Radio type 716-C guarded bridge.

Investigator(s) (year)	Description	Temperature (K)	ρ Volume Resistivity (Ω cm)	Tan δ Dielectric Loss Tangent	ε Dielectric Constant	D. S. Dielectric Strength (V mil^{-1})
McMahon (1959)	Mylar Exposure conditions: 40-50% rel hum	298		0.00422	3.35	11,500
	75% rel hum at 372 K for 7 days					12,800
	95% rel hum at 363 K for 21 days					11,500
	dry at 373 K for 49 days			0.00489	3.29	
	75% rel hum at 373 K for 49 days			0.00313	3.30	
	dry at 363 K for 91 days			0.00575	3.20	
	75% rel hum at 363 K for 50 days			0.00398	3.30	
Olshanskaya (1962)	Lavsan unirrad	293				
	amorphous		3.3×10^{15}			
	65% crys		6.2×10^{12}			
	during irradiation					
	amorphous		2.0×10^{14}			
	65% crys		1.7×10^{12}			
Sazhin (1963)	Quenched from melt into ice water, sp gr = 1.345	373	3.3×10^{12}			
	annealed at 378 K for 10 h, sp gr = 1.375		3.3×10^{14}			
	annealed at 393 K for 15 h, sp gr = 1.378		5×10^{14}			
	annealed at 423 K for 20 h, sp gr = 1.383		1.0×10^{15}			
	annealed at 443 K for 24 h, sp gr = 1.393		3.3×10^{15}			
	annealed at 473 K for 28 h, sp gr = 1.408		1.0×10^{16}			
Killiam (1964)		298	8.7×10^{17}		3.7	
Mathes (1964)	Mylar	296		0.0041	3.15	

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
McMahon, Birdsall, Johnson, Camilli (1959)	Mylar	tan δ and ε: t = 0.025; 10^3 Hz; accuracy = ± 5% for tan δ and ± 1% for ε. D.S.: t = 0.0013 cm, diam = 1.27 cm; dc voltage increased at 8000 V min^{-1}; multiple measurements reported, other exposure conditions tested.
Olshanskaya, Vososchev (1962)	Lavsan	Irrad by Co^{60} at 1-2 x 10^3 rad min^{-1} in vacuum.
Sazhin, Podosenova (1963)		Each thermal treatment indicates a sequential step performed on a single specimen.
Killiam (1964)		90% rel hum, ε measured at 60 Hz.
Mathes (1964)	Mylar	10^3 Hz.

Investigator(s) (year)	Description	Temperature (K)	ρ Volume Resistivity (Ω cm)	Tan δ Dielectric Loss Tangent	ε Dielectric Constant	D. S. Dielectric Strength (V mil^{-1})
Sazhin (1964a)	Mylar Percent crys 11 34 35 40 47 57	373	 3.0×10^{15} 3.0×10^{14} 4.0×10^{14} 9.0×10^{14} 3.0×10^{15} 8.0×10^{15}			
Conklin (1965)	Mylar	296			3.145	
McKeown (1965)	Extruded film	298				10,200 (rms)
Lengyel (1966)	Mylar	313-393			3.4	
Levantovskaya (1966)	Mylar, bilaterally oriented	300	2.6×10^{16}	0.0043		
Specht (1967)	Fiber, 5-45% crys Draw Ratio = 1 long. and trans	298			2.90-2.95	
	Fiber, 33% crys Draw Radio = 3 long.				3.10	
	Draw Ratio = 6 long.				3.40	
Bobo (1968)	Mylar	300				4,830
Du Pont (1968)	Mylar	298				14,000

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Sazhin, Podosenova (1964a)	Mylar	
Conklin (1965)	Mylar	TE_{01}^{o} mode wave guide method, 55.2×10^{9} Hz.
McKeown (1965)	Extruded film	t = 0.0046 cm; spherical electrodes embedded in thermoset resin with sample, 60 Hz; standard deviation of 22 samples = 9%.
Lengyel (1966)	Mylar	t = 0.0028 cm; 3 terminal guarded electrode system of evaporated Al.
Levantovskaya, Kovarskaya, Klapovskaya, Gracheva, Andrianova (1966)	Mylar, bilaterally oriented, no stabilizer	10^{3} Hz.
Specht, Stockhauser (1967)		Fiber; 9.39×10^{9} Hz; accuracy ≃ 2% for long. and 4% for trans measurements.
Bobo, Perrier, Fallou, Garland (1968)	Mylar	t = 0.005 cm; polished stainless steel sphere electrodes of 3.0 cm diam, 50 Hz at 500 V s^{-1} in transformer oil; other conditions also tested.
Du Pont (1968)	Mylar	t = 0.0025 cm; dc at 500 V s^{-1}.

Electrical References

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2. *Adamec, V.*, Temporary changes in electrical properties of polymer dielectrics due to ionizing radiation, J. Polymer Sci. **6,** 1241 (1968).
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3. *Alexandrov, N. V., Trubashev, S. G.*, Electrical and mechanical properties of polyethylene terephthalate films, Vestnik Elektropromysklennosti No. 8, 41 (1963).
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9. Polypyromellitimide (PPMI)

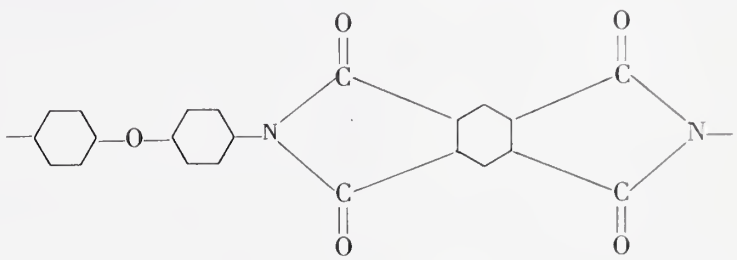
A. Summary

Polypyromellitimide is one of the polyimides that incorporate multiple bonds along the backbone of the chain. This results in exceptional resistance to thermal degradation because several covalent bonds must be broken to break the chain. It has good dimensional stability and mechanical strength to both high and low temperatures and retains ductility to low temperatures. It also has little or no branching or cross linking. PPMI is primarily used as film for insulation.

PPMI

Chemical Formula $(C_{22}H_{10}N_2O_5)_n$

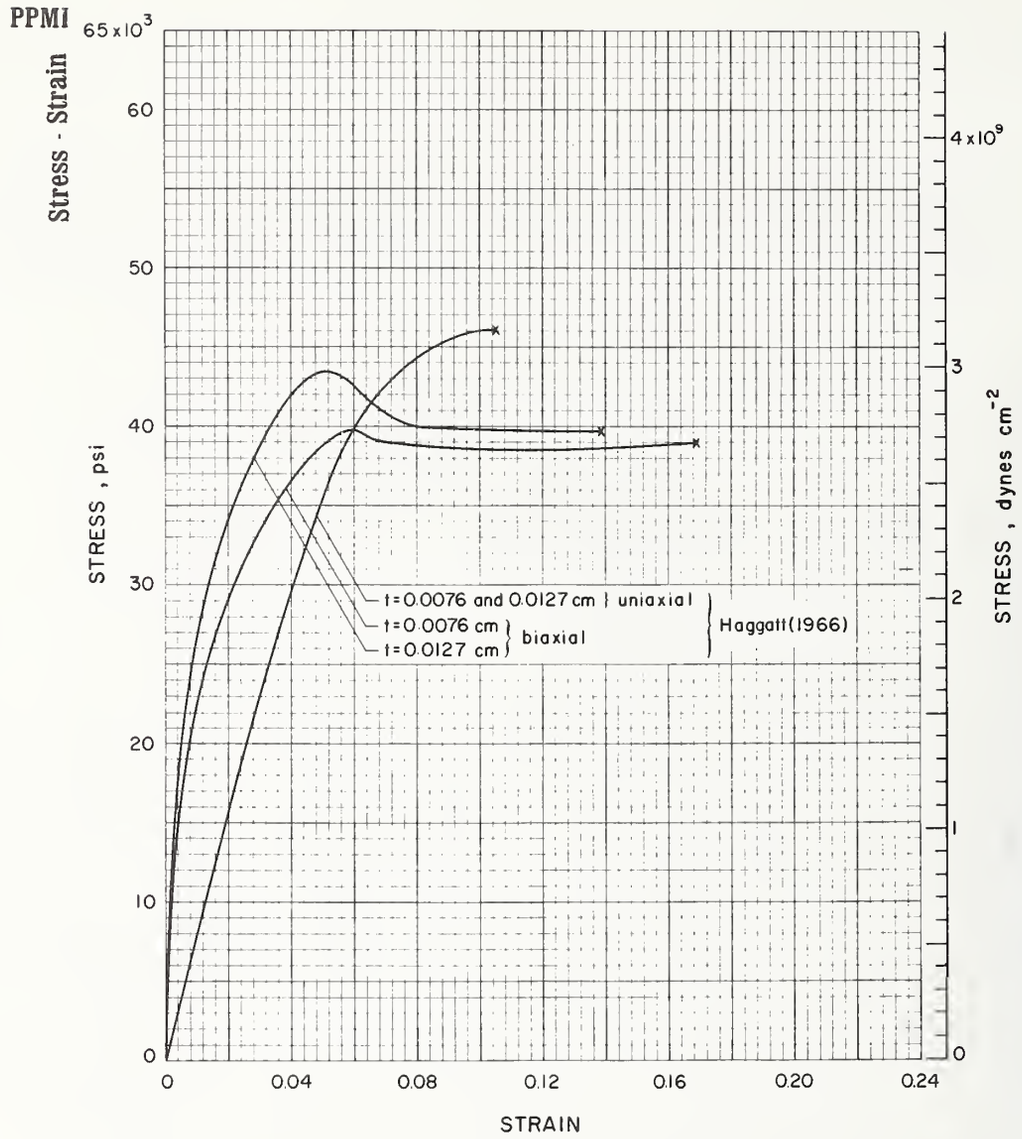
Chemical Structure



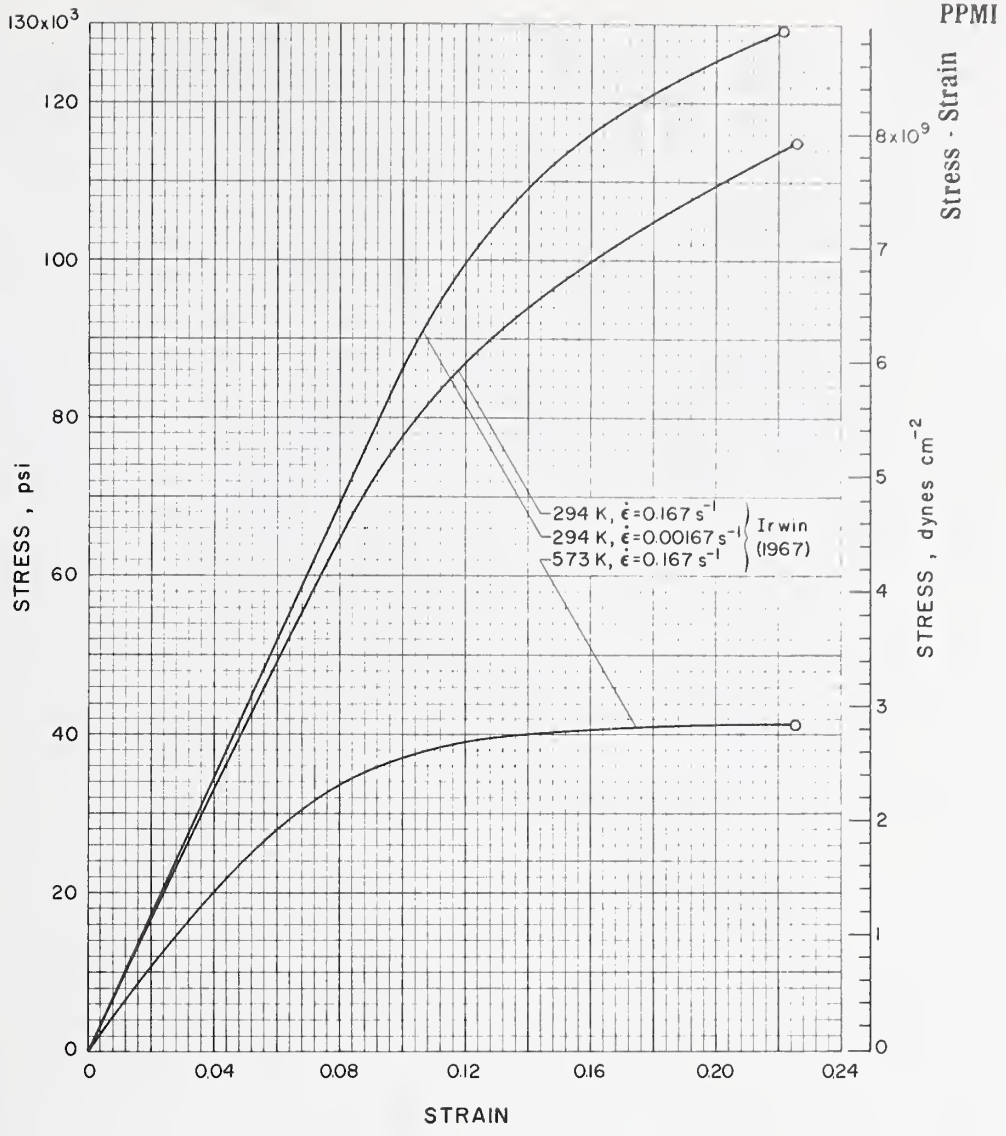
Significant Properties:

Density (295 K)	1.43 gm cm^{-3}
Crystalline melting point	None
Crystallinity	Variable
Approximate transition regions	220–300 K, 400–430 K
Chemical resistance	Highly resistant
Flammability	Self extinguishing Flame resistant
Tensile strength (295 K)	22,000 psi
Thermal expansion coefficient (295 K)	2×10^{-5} K^{-1}
Dielectric constant (10^5 Hz), (295 K)	3.4
Dielectric loss tangent (10^5 Hz), (295 K)	0.005

Trade names occurring in the references compiled:
Kapton H film (F film has a coating of FEP and is not included here), S P Solid, Vespel.



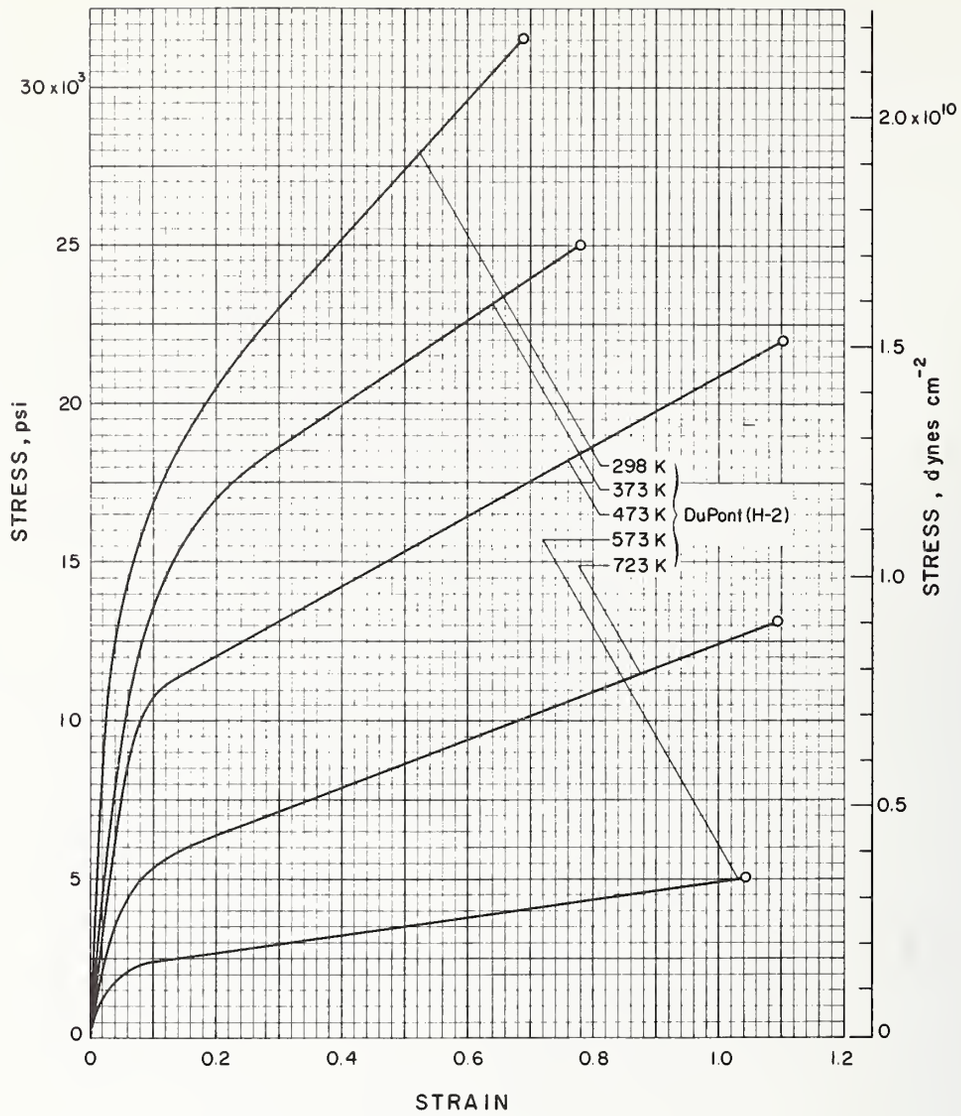
INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONOITIONS
Hoggatt, Workman (1966)	Kapton, film	Uniaxial specimen per ASTM D-412 die C; uniaxial tests on Riehle machine, xhd spd = 0. 0042 cm s^{-1}, biaxial measurements on bursting diaphrams, all tests at 20K.



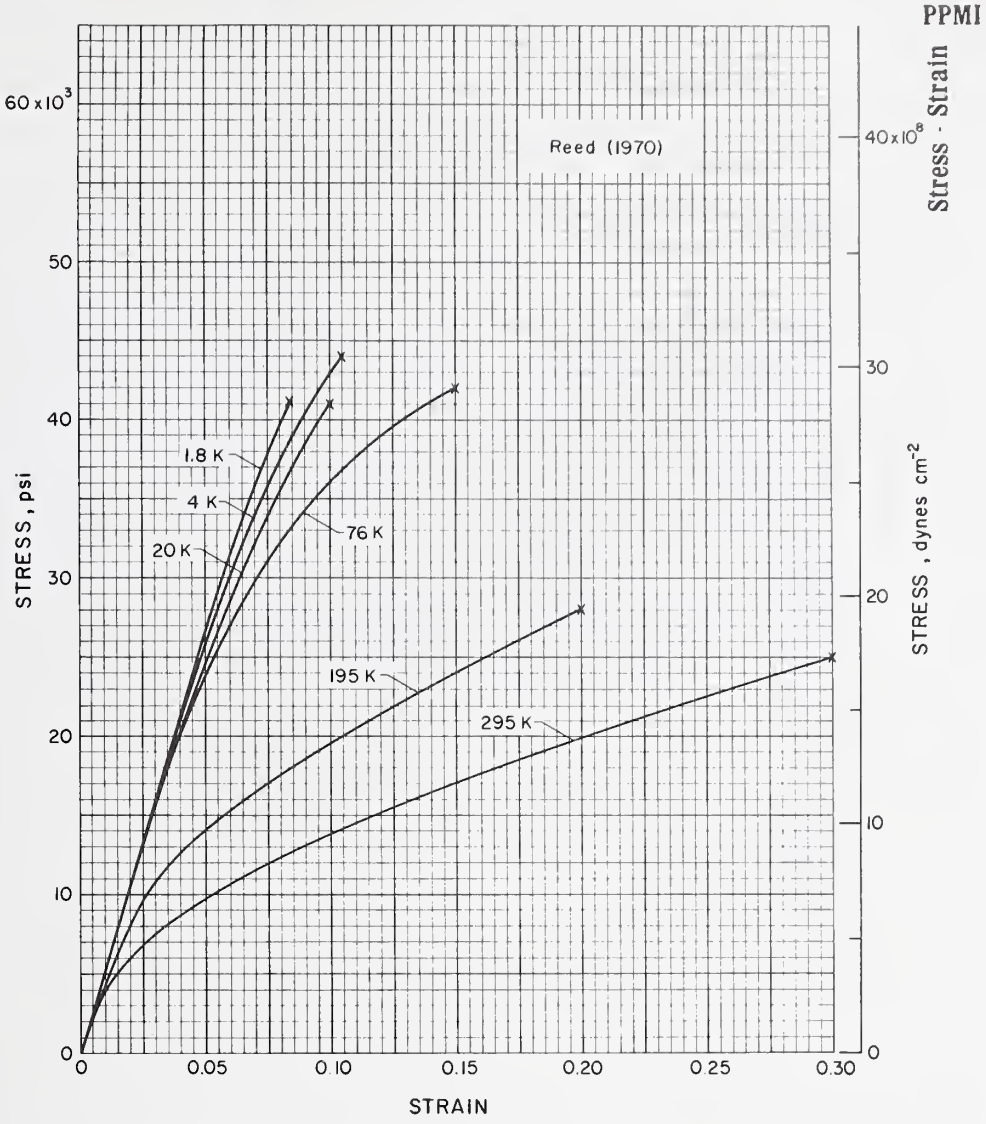
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Irwin, Sweeny (1967)	Fiber spun from solution	ℓ = 25.4 cm, either 200 den/60 filaments or 100 den/30 filaments; 1.18 turns cm^{-1}; Instron.

PPMI

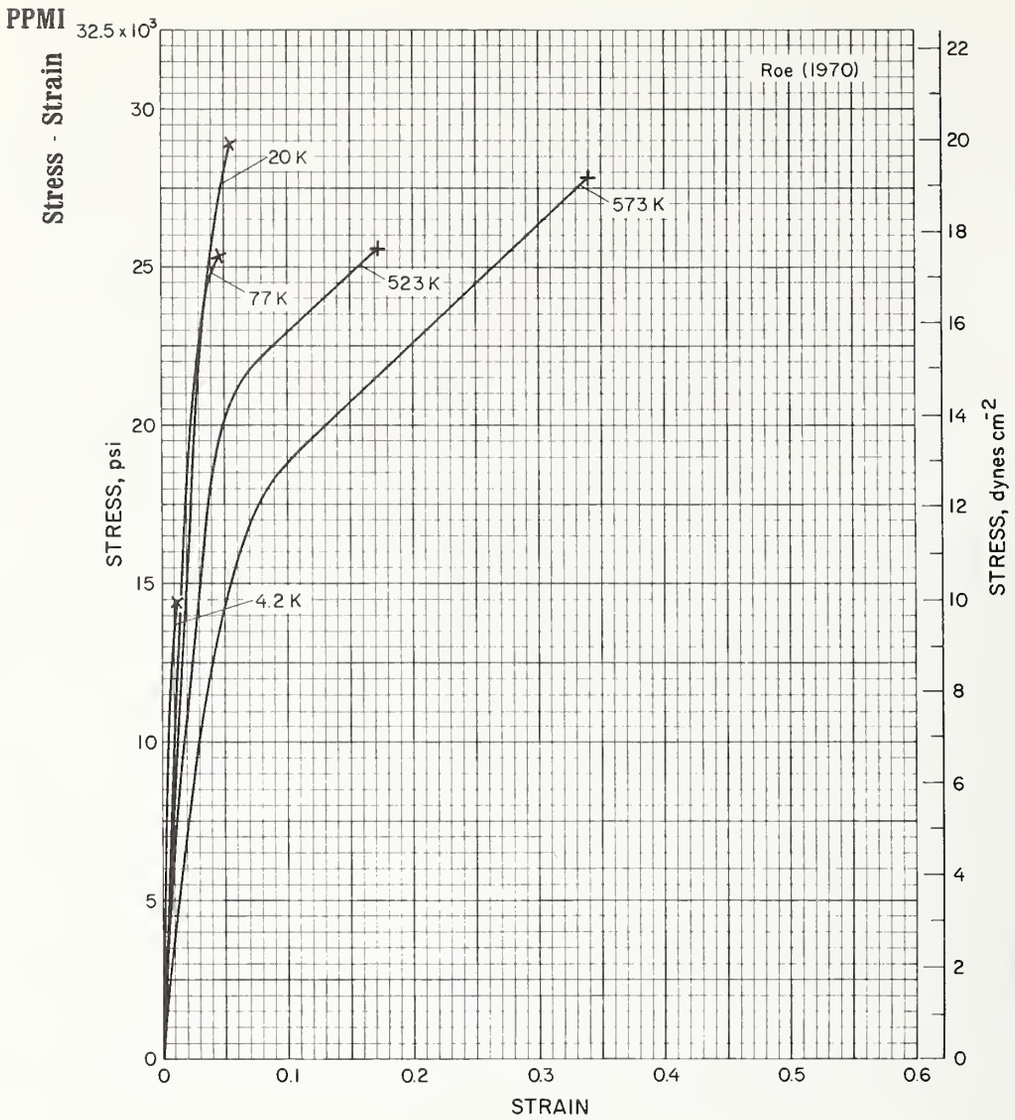
Stress - Strain



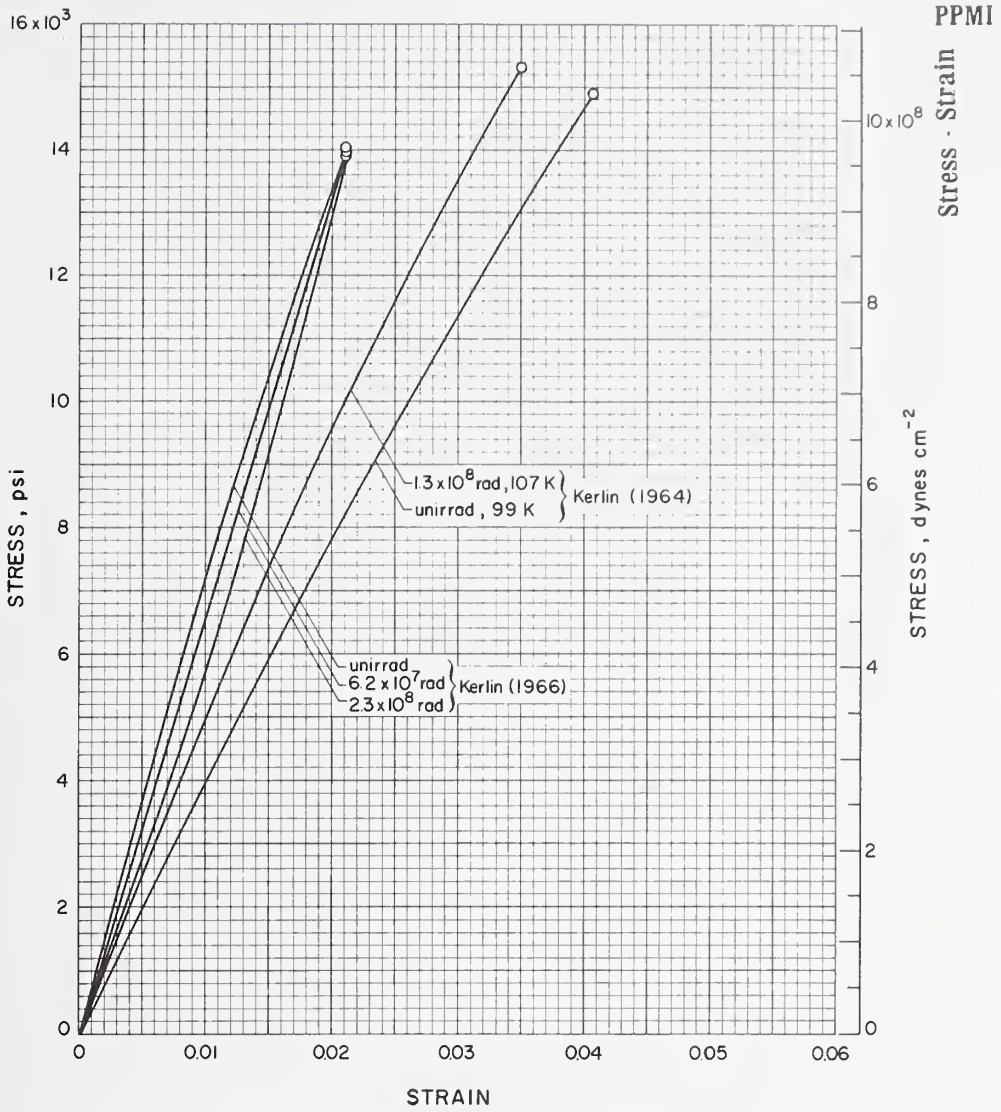
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Du Pont (H-2)	H-film	t = 0.0025 cm



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Reed, Durcholz, Arvidson (1970)	Kapton	Red Sec = 2.54 x 0.51 x 0.0025 cm, long.; Instron, xhd spd = 0.00085 and 0.00021 cm s^{-1}; measurements on long. and trans samples with t = 0.0127 cm gave similar results except that failure occured at slightly lower strain.



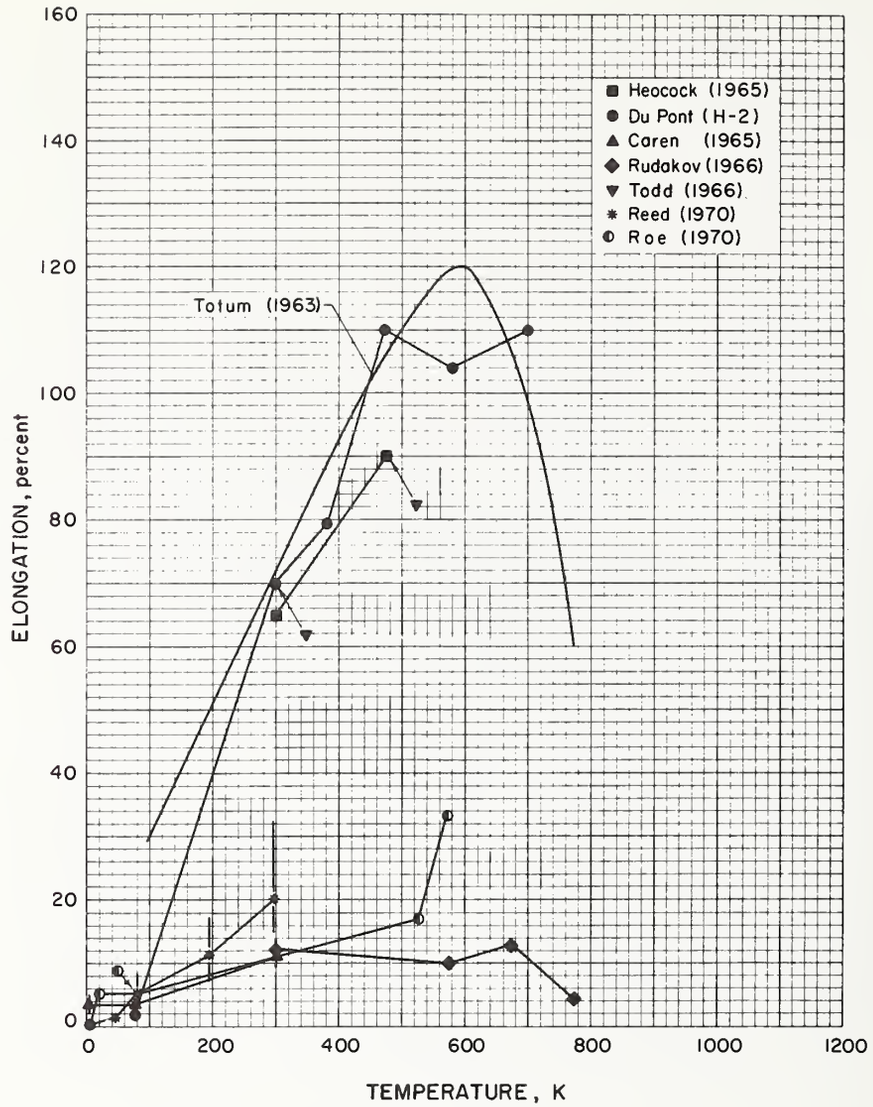
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Roe (1970)	Kapton	



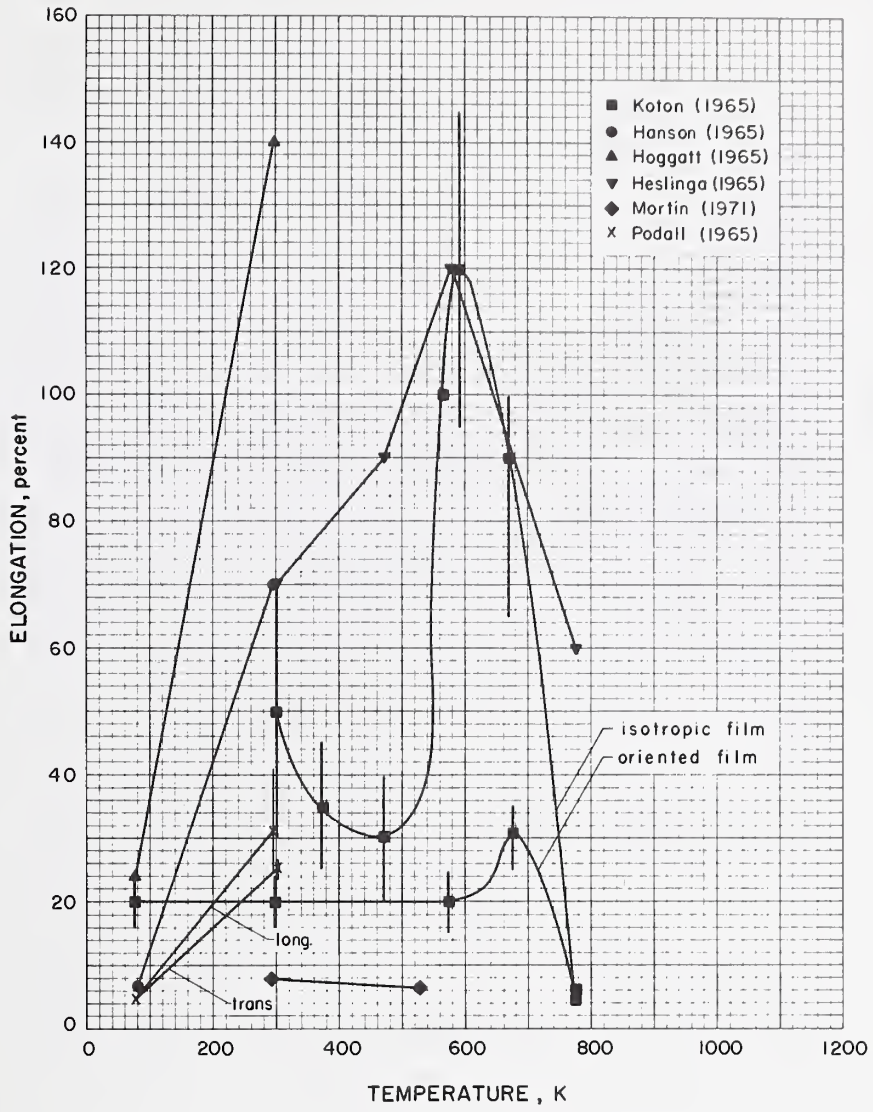
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	SP-1	Irrad and tested at 20 K, Cryomechanical tester; av of 4 specimens; irrad by Ground Test Reactor at the Nuclear Aerospace Research Facility of the Fort Worth Division of General Dynamics.
Kerlin, Smith (1964)	SP-1	w = 0.635 cm; ASTM D-638-61T test procedure, Cryomechanical tester; irrad by Ground Test Reactor at the Nuclear Aerospace Research Facility of the Fort Worth Division of General Dynamics.

PPMI

Elongation

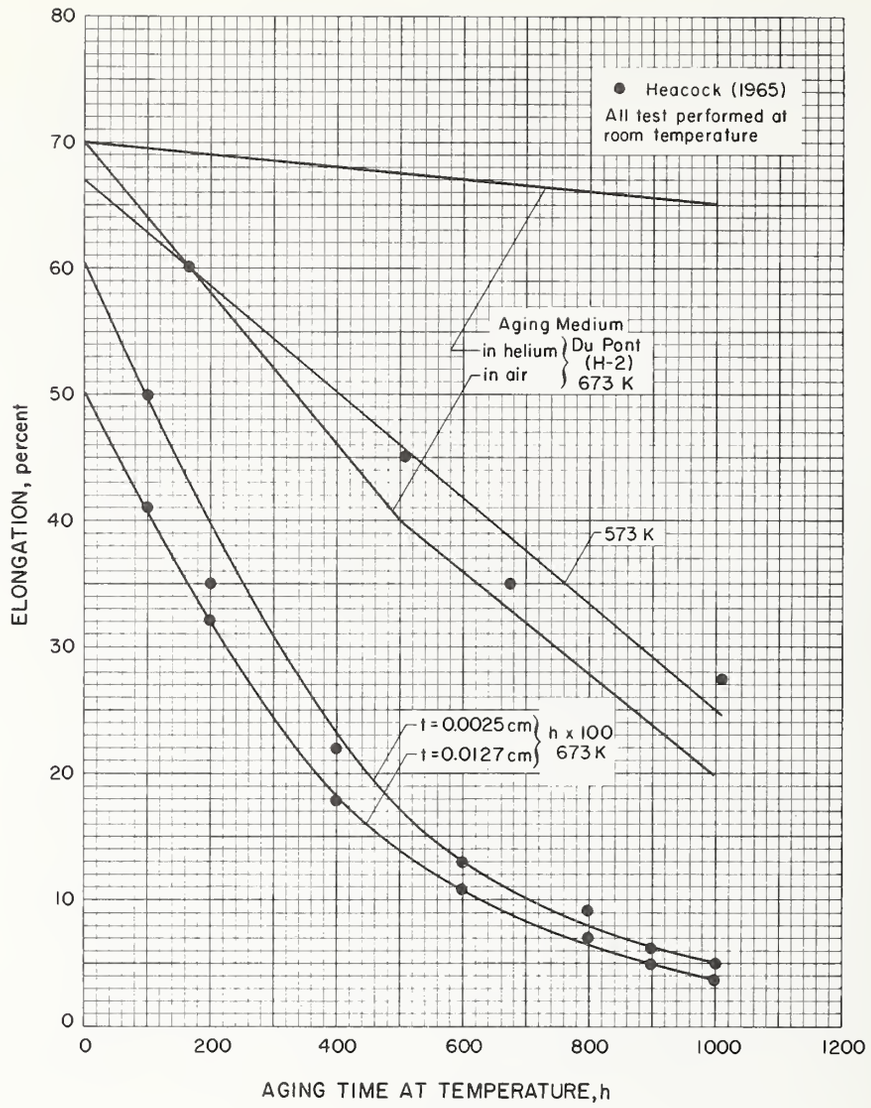


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Todd, Wolfe, Mallouk, Courtright (1966)	Kapton, sp gr = 1.42	ASTM D-882 test procedure
Caren, Coston, Holmes, Dubus (1965)	H-film	Red Sec ℓ = 7.62 cm, w = 1.27 cm, t = 0.0020-0.0023 cm; tension applied by hydralic ram, force measured with 2000 lb capacity Ormond load cell calibrated by dead weights, specimen mounted in clamp blocks attached to flexible pull rods, strain measured by clip strain gauges; error bars indicate max deviation from av of 3 tests.
Du Pont (H-2)	Kapton, sp gr = 1.42	t = 0.0025; ASTM D-882-64T test procedure, machine direction.
Rudakov, Bessonov, Køton, Florinskii (1966)	Fiber, lab produced, sp gr $\simeq$1.4	Tests at 473K and above were made in an Ar atm.
Heacock, Berr (1965)	H-film	t = 0.0025 cm; ASTM D-882-61T test procedure.
Tatum, Amborski, Gerow, Heacock, Mallouk (1963)	H-film	t = 0.0025 cm
Reed, Durcholz, Arvidson (1970)	Kapton	Red Sec = 2.54 x 0.51 cm, t = 0.0025 and 0.0127 cm, trans and long; Instron, xhd spd = 0.00085 and 0.00021 cm s^{-1}; error bars indicate the spread in several measurements, results from both thicknesses and both orientations averaged here.
Roe (1970)	Kapton	Extracted from σ-ϵ diagrams.



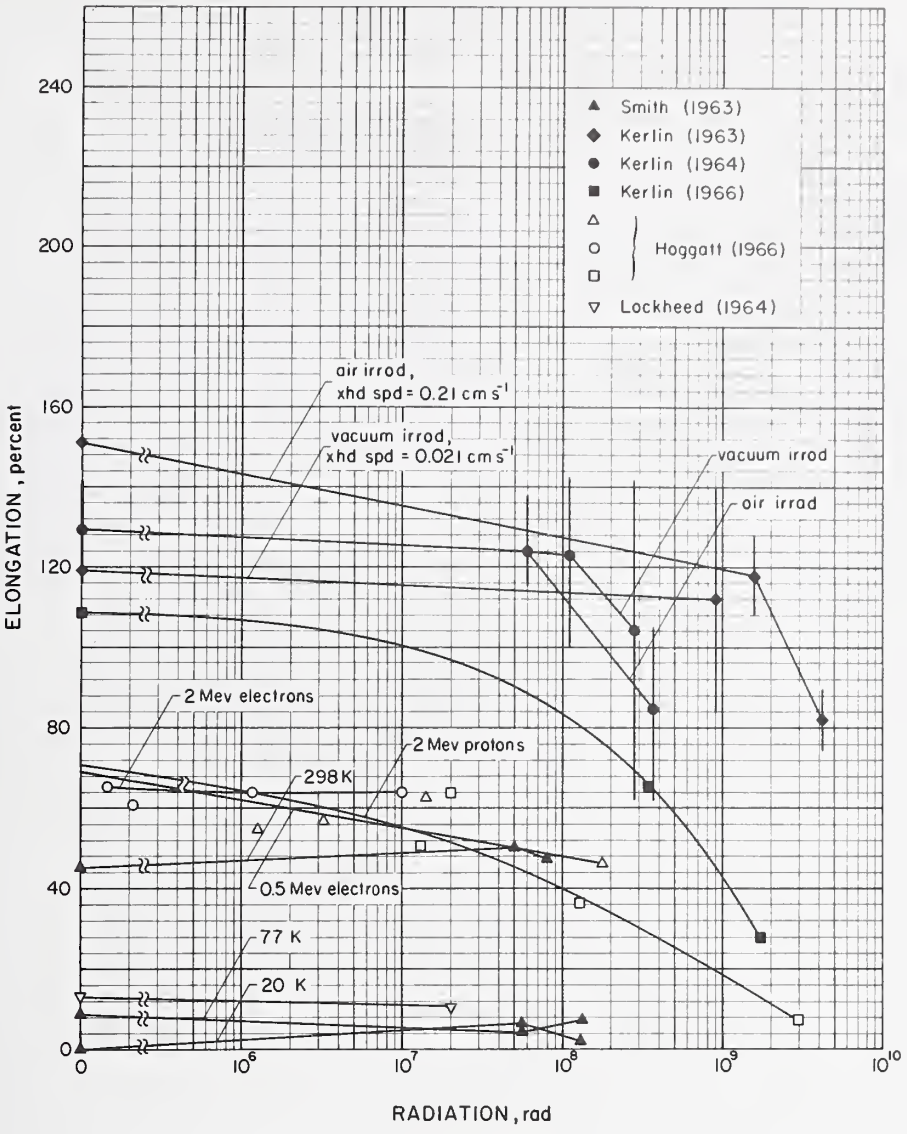
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Koton, Yakovlev, Rudakov, Knyazeva, Florinskii, Bessonov, Kuleva, Tolparova, Laius (1965)	Film, lab produced by stretching 100 - 120% at 613K in hot air current then heat treated at 673K.	Above 473K tests were performed in Ar atm.
Hanson, Richards, Hickel (1965)	H-film	Red Sec ℓ = 5.08 cm, w = 1.27 cm, t = 0.32 cm; $\dot{\epsilon}$ = 0.0002-0.0005 s^{-1}.
Hoggatt (1965)	H-film	t = 0.0051, 0.0076, and 0.0127 cm; ASTM D 1708-597 test procedure.
Heslinga (1965)	Kapton H-film	
Martin, Bartz (1971)	SP-1	
Podall, Oser, Eliason, Augl (1965)	Kapton	Av of 2 or 3 tests, error bars indicate data spread.

PPMI

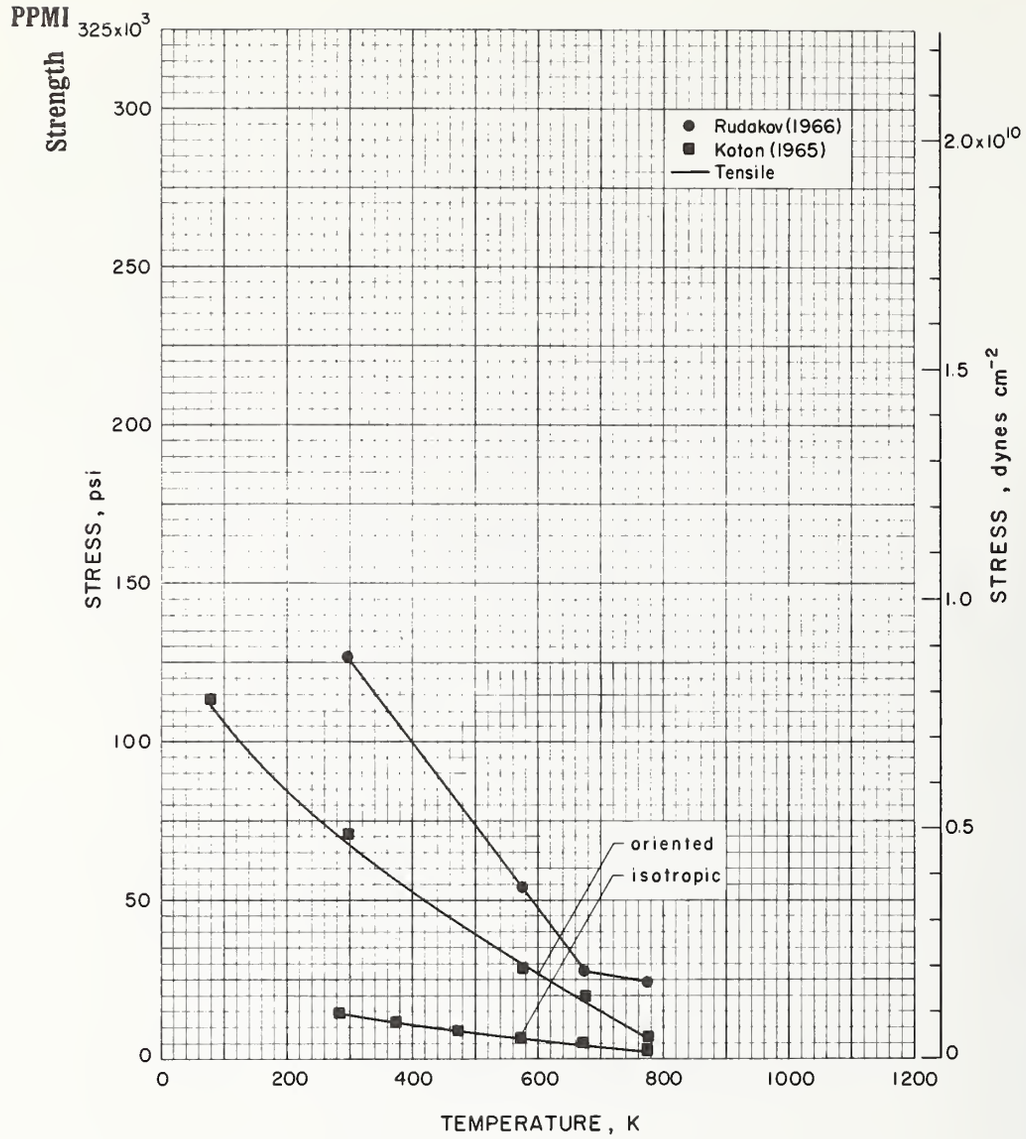


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Du Pont (H-2)	H-film	t = 0.0025
Heacock, Berr (1965)	H-film	Samples interleafed with unsized glass cloth, thermally aged in Model 1443 Hotpack Oven, temp control to 1K, ASTM D-882-61T test procedure (full scale time = 10 h for samples aged at 673 K).

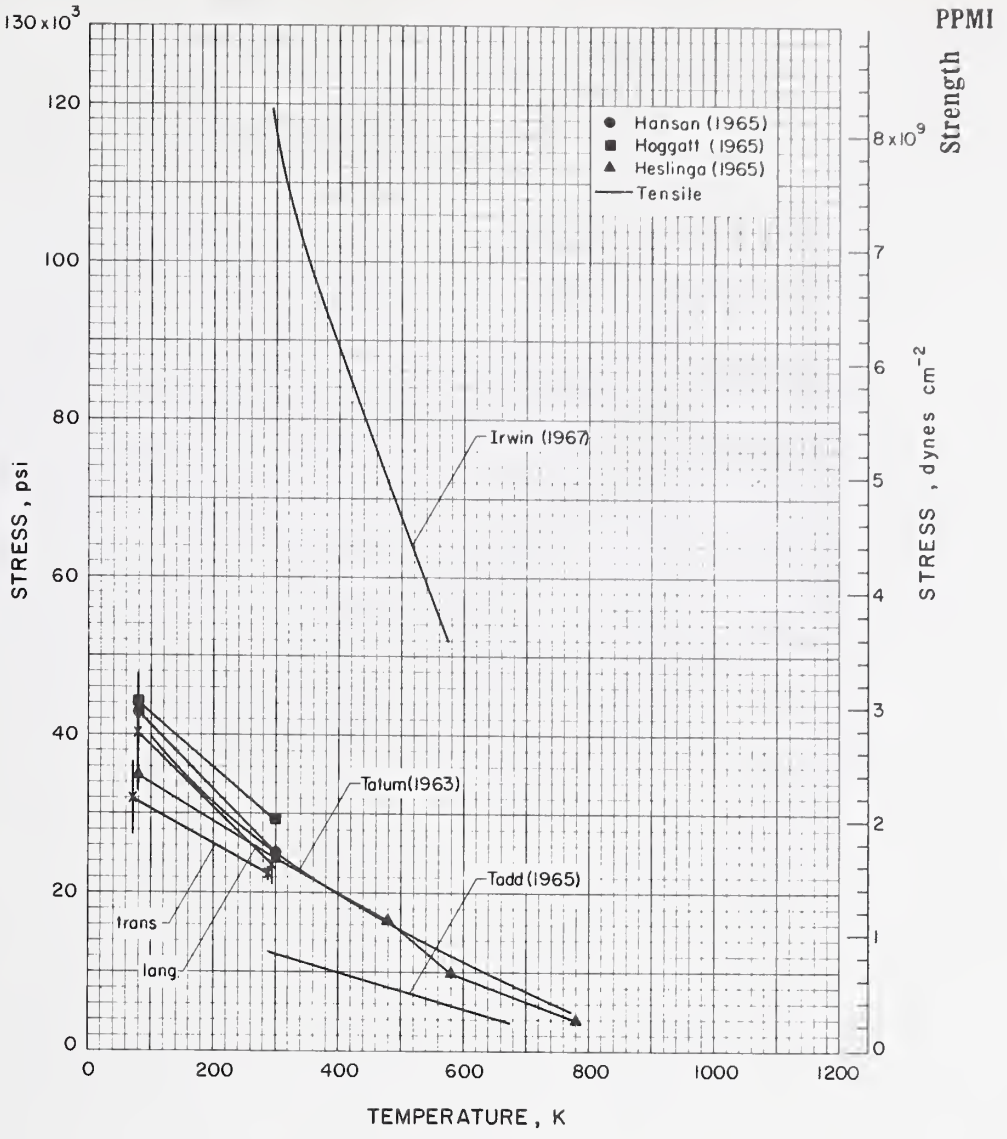
Elongation



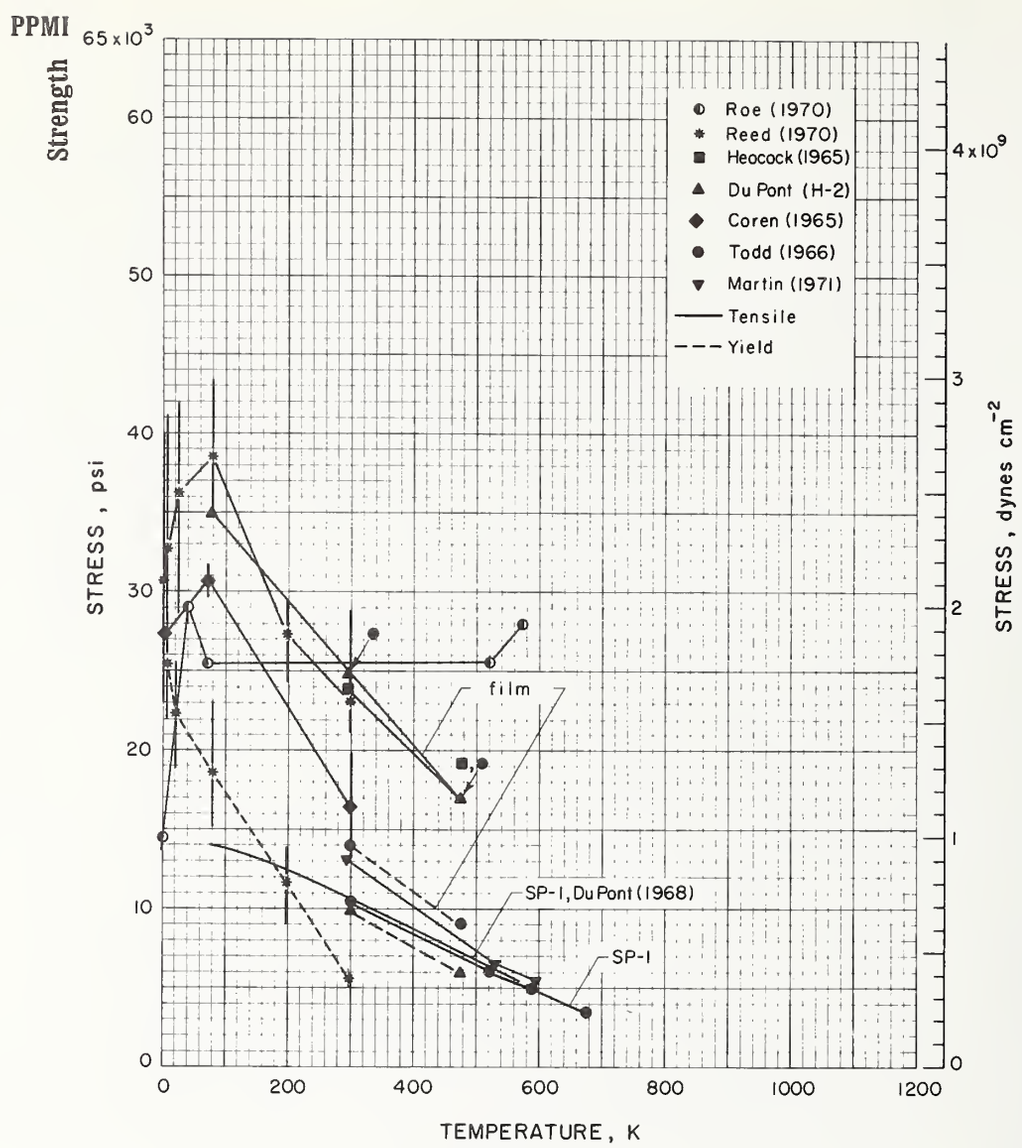
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin (1963)	H-film	ASTM D-882-56T test procedure, Instron Model TT; irrad by Ground Test Reactor at Nuclear Aerospace Research Facility, General Dynamics, Fort Worth; error bars indicate standard deviation of 3 to 8 tests.
Kerlin, Smith (1964)	H-film	w = 1.27 cm, ℓ = 15.24 cm; ASTM D-882-56T test procedure, Instron, xhd spd = 0.85 cm s^{-1}; irrad in vacuum and air by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth, temp of irradiation noted.
Kerlin, Smith (1966)	H-film	t = 0.005 cm; Instron, xhd spd = 0.85 cm s^{-1}; av of several tests; irrad by Ground Test Reactor at the Nuclear Aerospace Research Facility of the Fort Worth Division of General Dynamics.
Smith (1963)	H-film	GL = 10.16 cm, w = 2.54 cm, t = 0.0064 cm; Instron used at 298 K, irrad by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth.
Hoggatt (1966)	Kapton, "as purchased"	t = 0.0127 cm, specimen configuration per ASTM D-412-62T Die C; ASTM D-882-61T test procedure, 302±6 K; irrad by Dynamitron; no significant effect after 10^6 rad of gamma irradiation from Co^{60}.
Lockheed Missles and Space Co. (1964)	H-film	t = 0.0051 cm, ASTM D-412-51T Type C die; Tinius Olsen Universal Test Machine, Model RM-2, xhd spd = 0.0042 cm s^{-1}, 77K; exposed to $2x10^7$ rad gammas and $1x10^{16}$ nvt neutrons from Radiation Effects Reactor at Dawsonville, Georgia operated at 10^6 watts; errors are standard deviation of 5-6 tests.



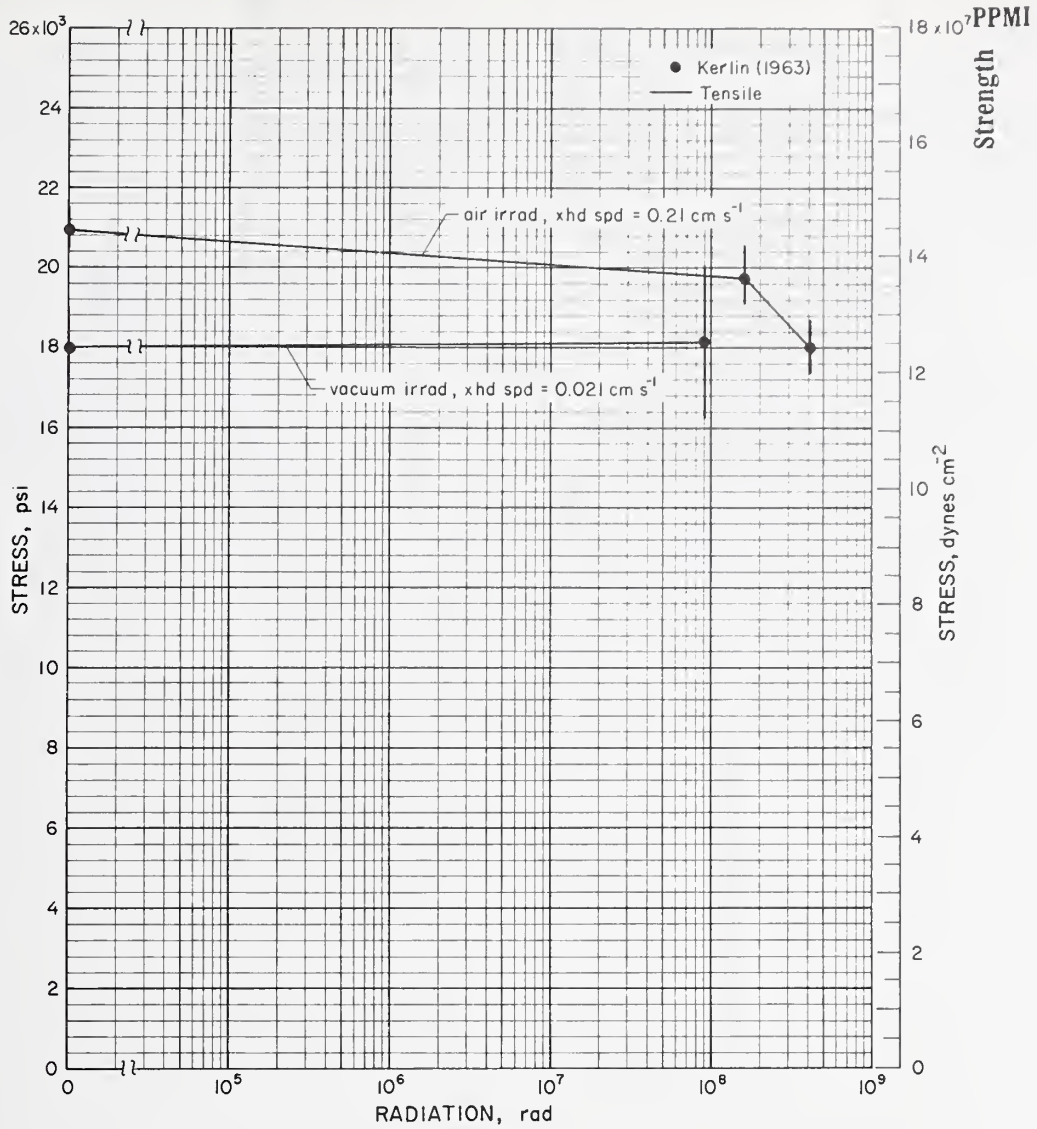
INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Rudakov, Bessonov, Koton, Florenskii (1966)	Fiber lab produced sp gr ≃1.4	Tests at 473K and above were made in an Ar atm.
Koton, Yakovlev, Rudakov, Knyazeva, Florinskii, Bessonov, Kuleva, Tolparova, Laius (1965)	Film, lab produced by stretching 100 - 120% at 613K in hot air current then heat treated at 673K.	Above 473K tests were performed in Ar atm.



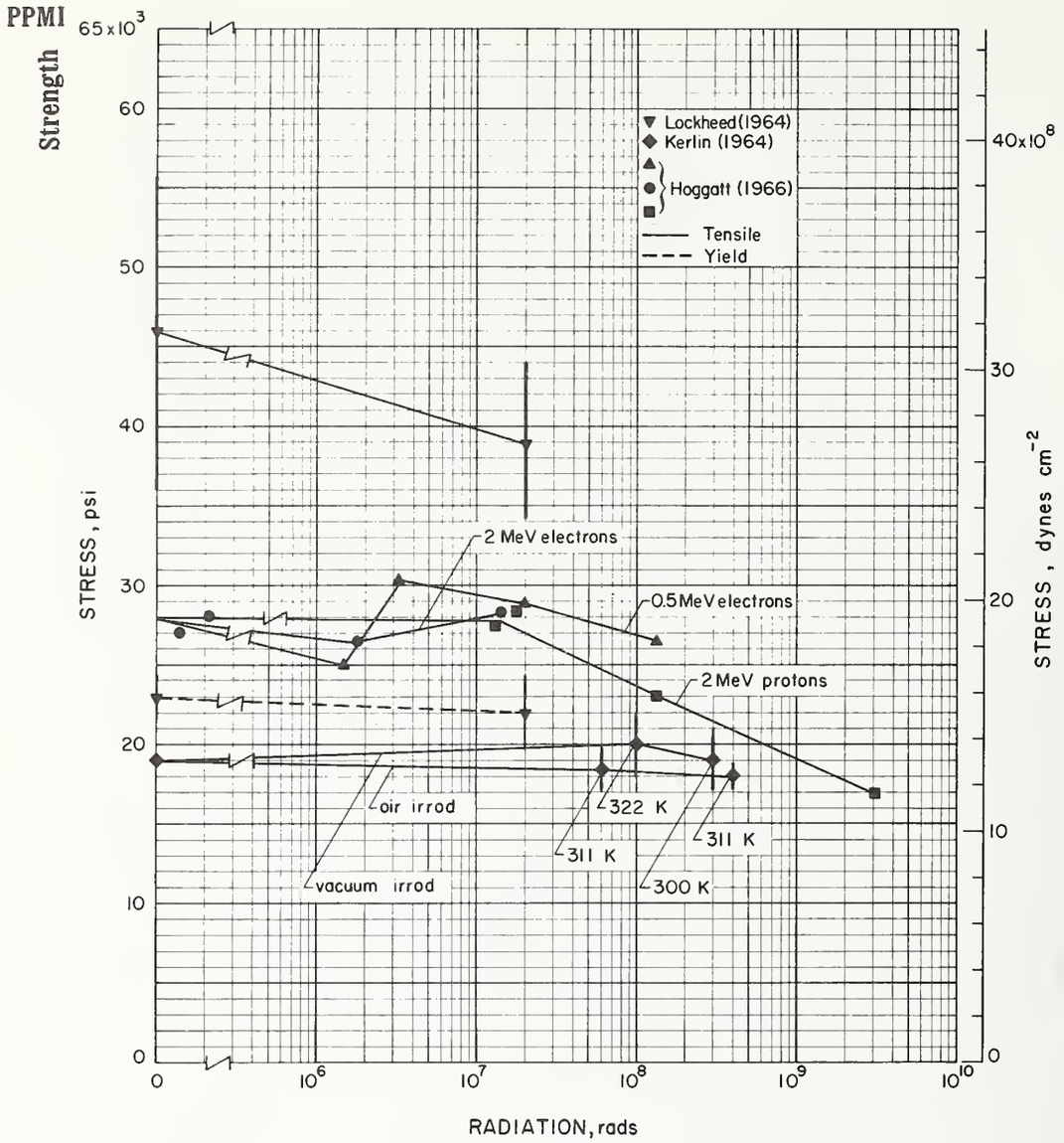
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Tatum, Amborski, Gerow, Heacock, Mallouk (1963)	H-film	t = 0.0025 cm.
Todd (1965)	Vespel, SP	
Irwin, Sweeny (1967)	Fiber spun from solution	ℓ = 25.4 cm, either 200 den/60 filaments or 100 den/30 filaments; 1.18 turns cm^{-1}, Instron, $\dot{\epsilon}$ = 0.0167 s^{-1}, tested in air after 60 s at test temp.
Hanson, Richards, Hickel (1965)	H-film	Red Sec ℓ = 5.08 cm, w = 1.27 cm, t = 0.32 cm; $\dot{\epsilon}$ = 0.0002-0.0005 s^{-1}.
Hoggatt (1965)	H-film	t = 0.0051, 0.0076, and 0.0127 cm; ASTM D 1708-597 test procedure.
Heslinga (1965)	Kapton H-film	
Podall, Oser, Eliason, Augl (1965)	Kapton	Av of 2 or 3 tests, error bars indicate data spread.



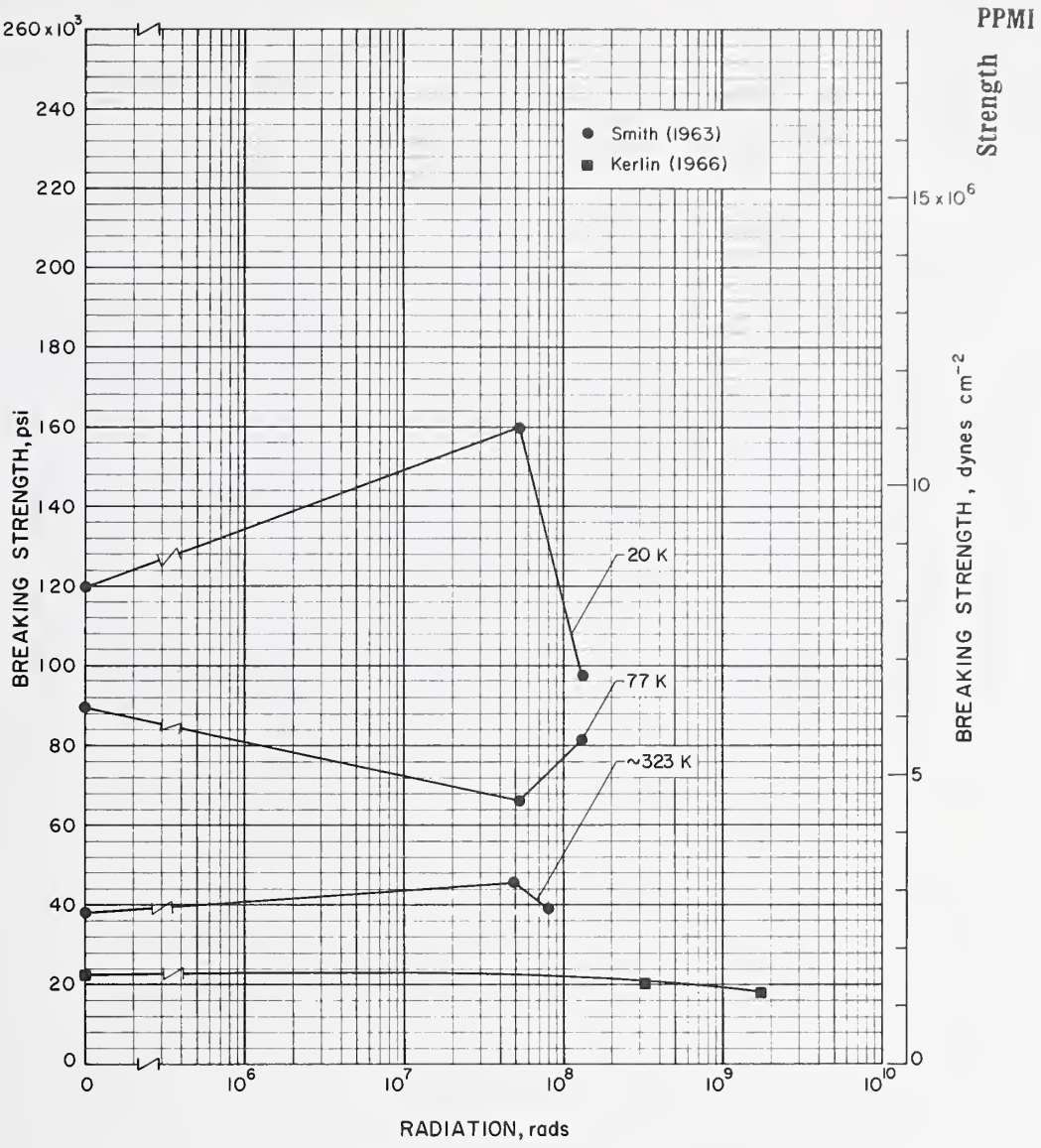
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Todd, Wolfe, Mallouk, Courtright (1966)	Rigid solid SP1, sp gr = 1.43 and Kapton, sp gr = 1.42	ASTM D1708 test procedure for rigid soli and ASTM D882 test procedure for Kapton.
Caren, Coston, Holmes, Dubus (1965)	H-film	Red Sec ℓ = 7.62 cm, w = 1.27 cm, t = 0.0020-0.0023 cm; tension applied by hydralic ram, force measured with 2000 lb capacity Ormond load cell calibrated by dead weights, specimen mounted in clamp blocks attached to flexible pull rods, strain measured by clip strain gauges; error bars indicate max deviation from av of 3 tests.
Du Pont (1968)	SP-1	
Du Pont (H-2)	Kapton, sp gr = 1.42	t = 0.0025 cm; ASTM D-882-64T test procedure, 3% yd off, trans direction.
Heacock, Berr (1965)	H-film	t = 0.0025 cm; ASTM D-882-61T test procedure.
Martin, Bartz (1971)	SP-1	
Reed, Durcholz, Arvidson (1970)	Kapton	Red Sec = 2.54 x 0.51 cm, t = 0.0025 and 0.0127 cm, trans and long; Instron, xhd spd = 0.00085 and 0.00021 cm s^{-1}; error bars indicate the spread in several measurements, results from both thicknesses and both orientations averaged here.
Roe (1970)	Kapton	Extracted from σ-ϵ diagrams.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kerlin (1963)	H-film	ASTM D-882-56T test procedure, Instron Model TT; irrad by Ground Test Reactor at Nuclear Aerospace Research Facility, General Dynamics, Fort Worth; error bars indicate standard deviation of 3 to 8 tests.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kerlin, Smith (1964)	H-film	w = 1.27 cm, ℓ = 15.24 cm; ASTM D-882-56T test procedure, Instron, xhd spd = 0.85 cm s^{-1}; irrad in vacuum and air by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth, temp of irradiation noted.
Hoggatt (1966)	Kapton, "as purchased"	t = 0.0127 cm, specimen configuration per ASTM D-412-62T Die C; ASTM D-882-61T test procedure, 302±6K; irrad by Dynamitron; no significant effect after 10^6 rad of gamma irradiation from Co^{60}.
Lockheed Missles and Space Co. (1964)	H-film	t = 0.0051 cm, ASTM D-412-51T Type C die; Tinius Olsen Universal Test Machine, Model RM-2, xhd spd = 0.0042 cm s^{-1}, 77K; exposed to $2x10^7$ rad gammas and $1x10^{15}$ nvt neutrons from Radiation Effects Reactor at Dawsonville, Georgia operated at 10^6 watts; errors are standard deviation of 5-6 tests.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Smith (1963)	H-film	t = 0.0064 cm; tests at 323 K conducted on an Instron, others on special apparatus, irradiation and testing at cryogenic temp done in liquid hydrogen or nitrogen; irrad by Ground Test Reactor at Nuclear Aerospace Research Facility of General Dynamics, Fort Worth.
Kerlin, Smith (1966)	H-film	t = 0.005 cm; Instron, xhd spd = 0.85 cm s^{-1}; av of several tests; irrad by Ground Test Reactor at the Nuclear Aerospace Research Facility of the Fort Worth Division of General Dynamics.

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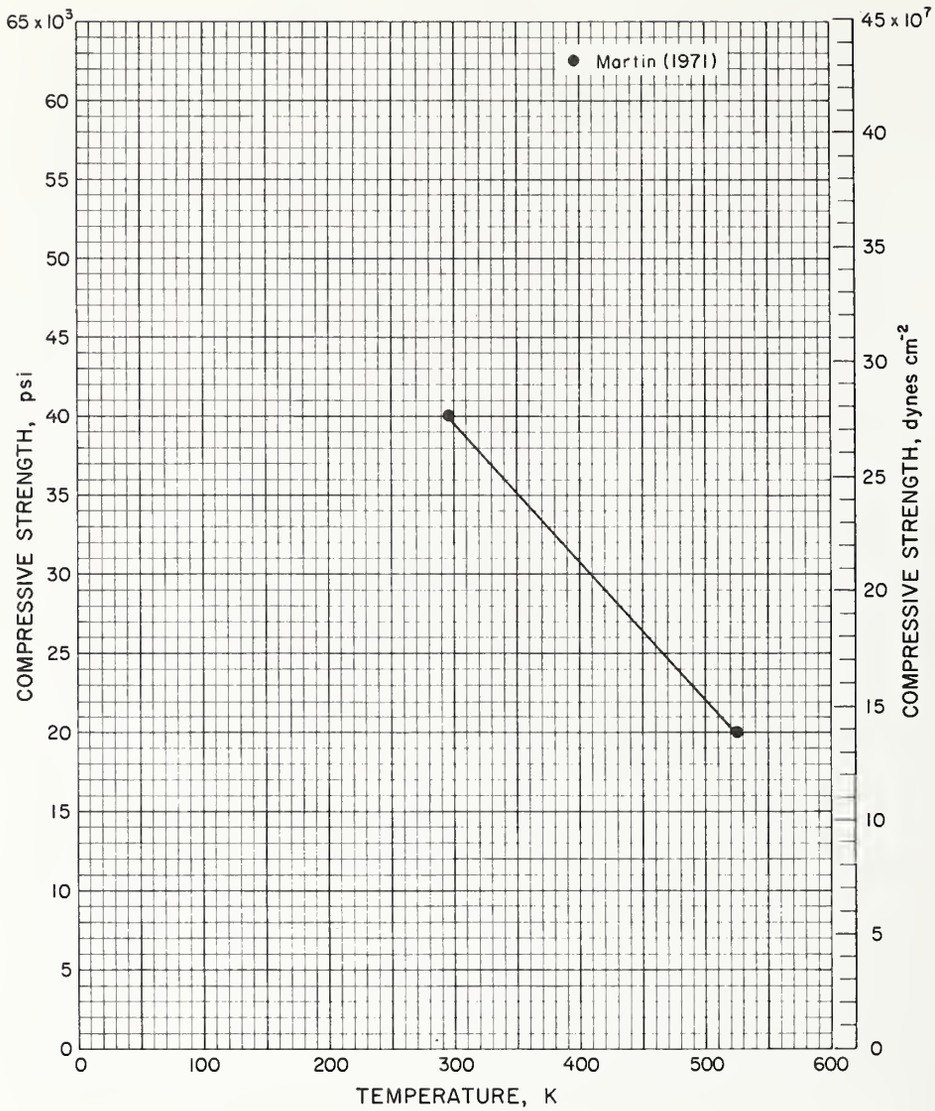
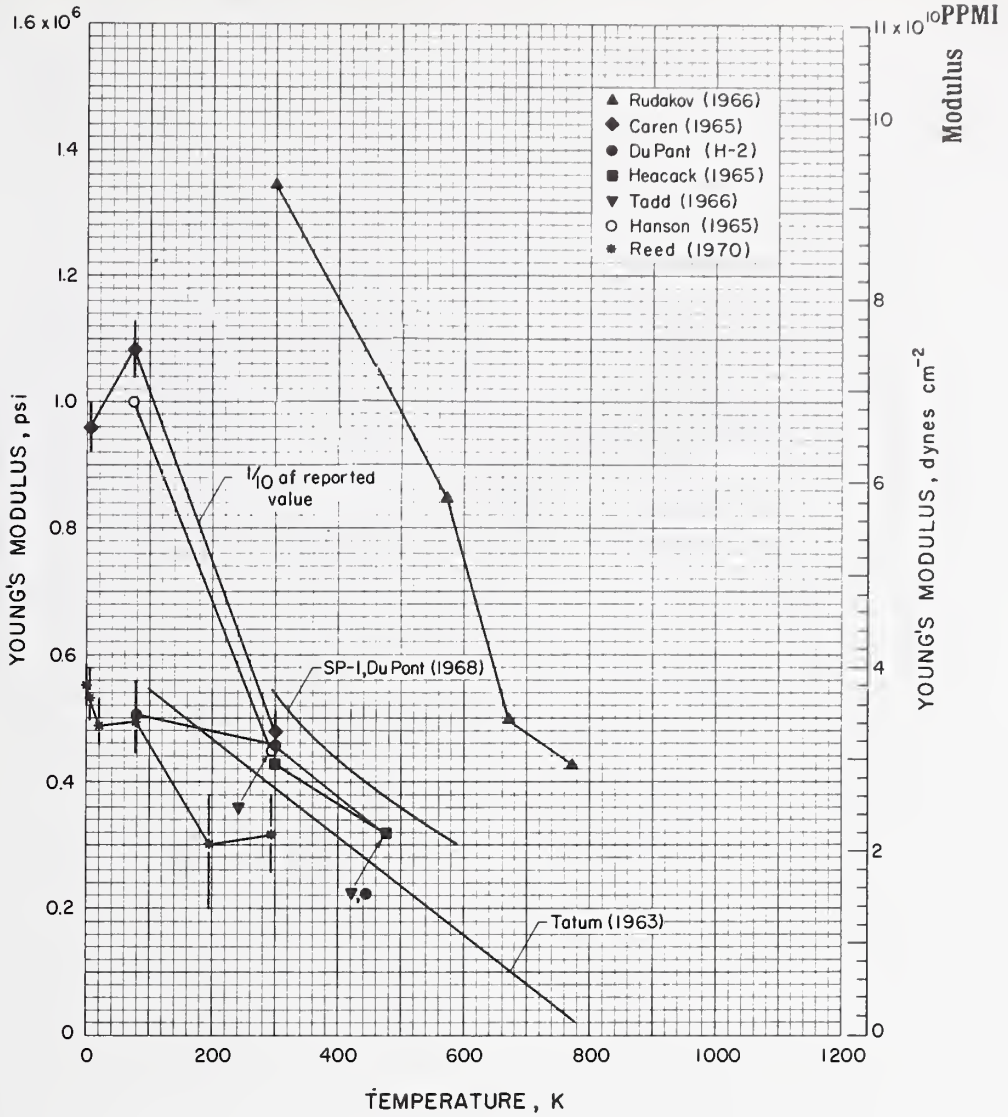
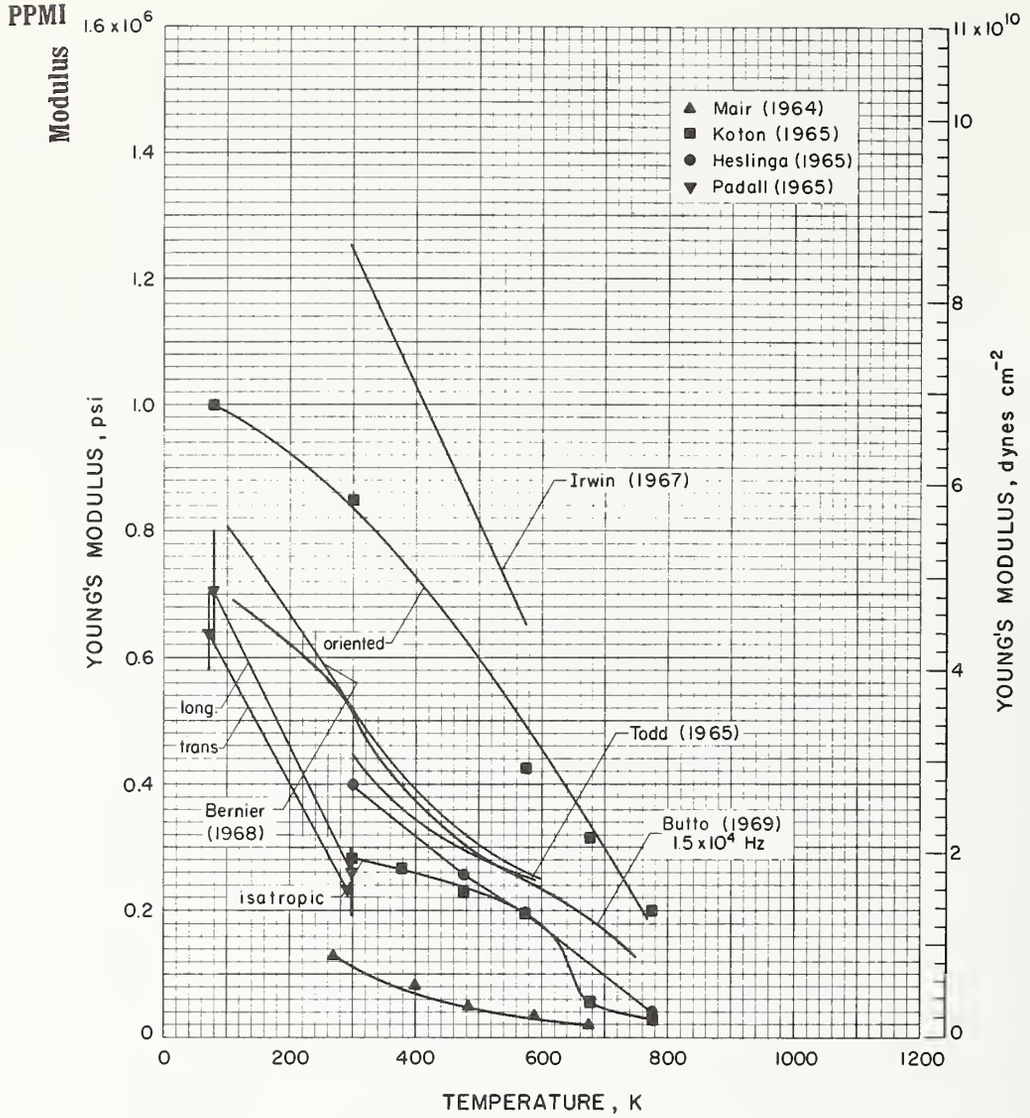
Strength



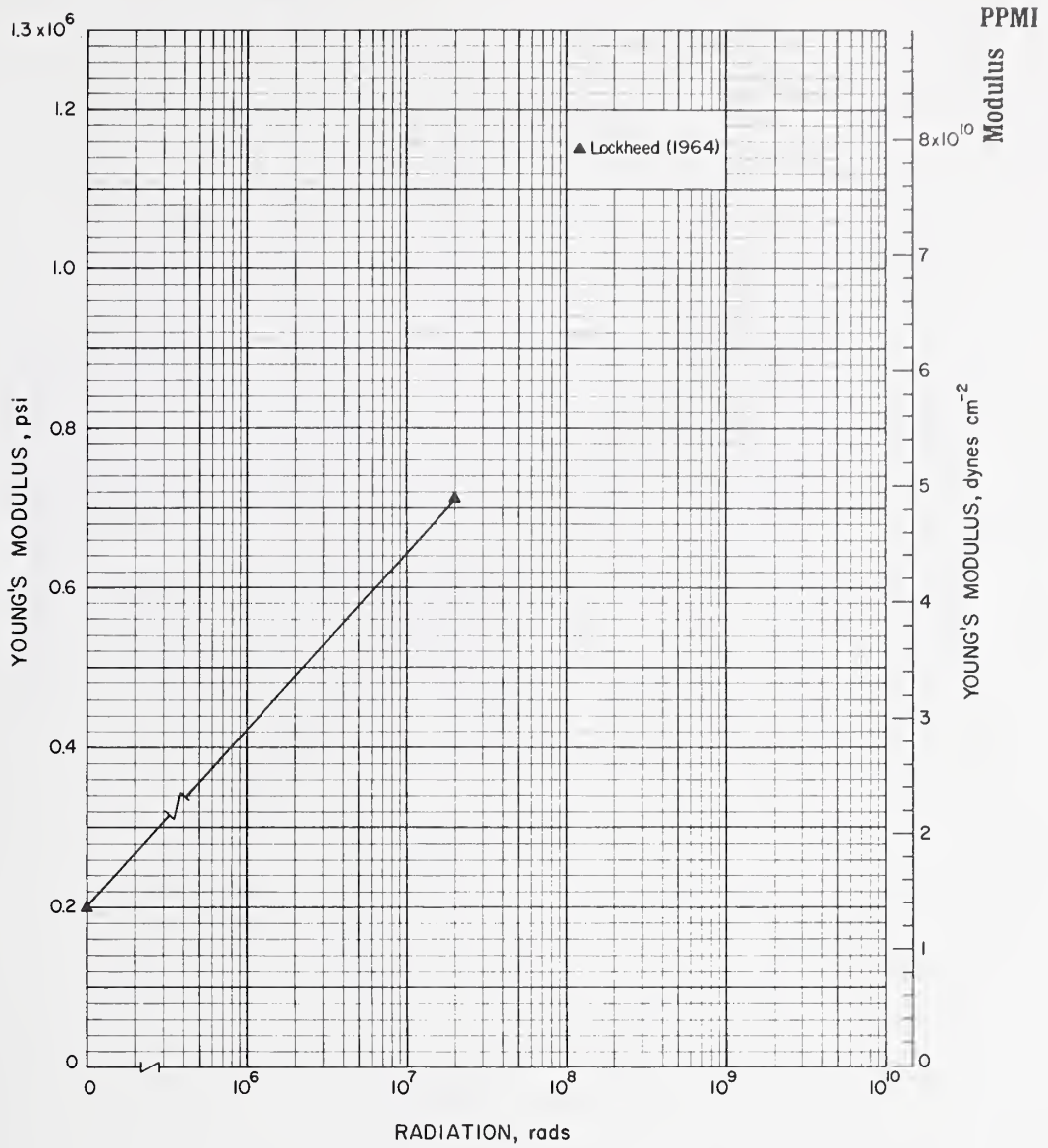
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Martin, Bartz (1971)	SP-1	



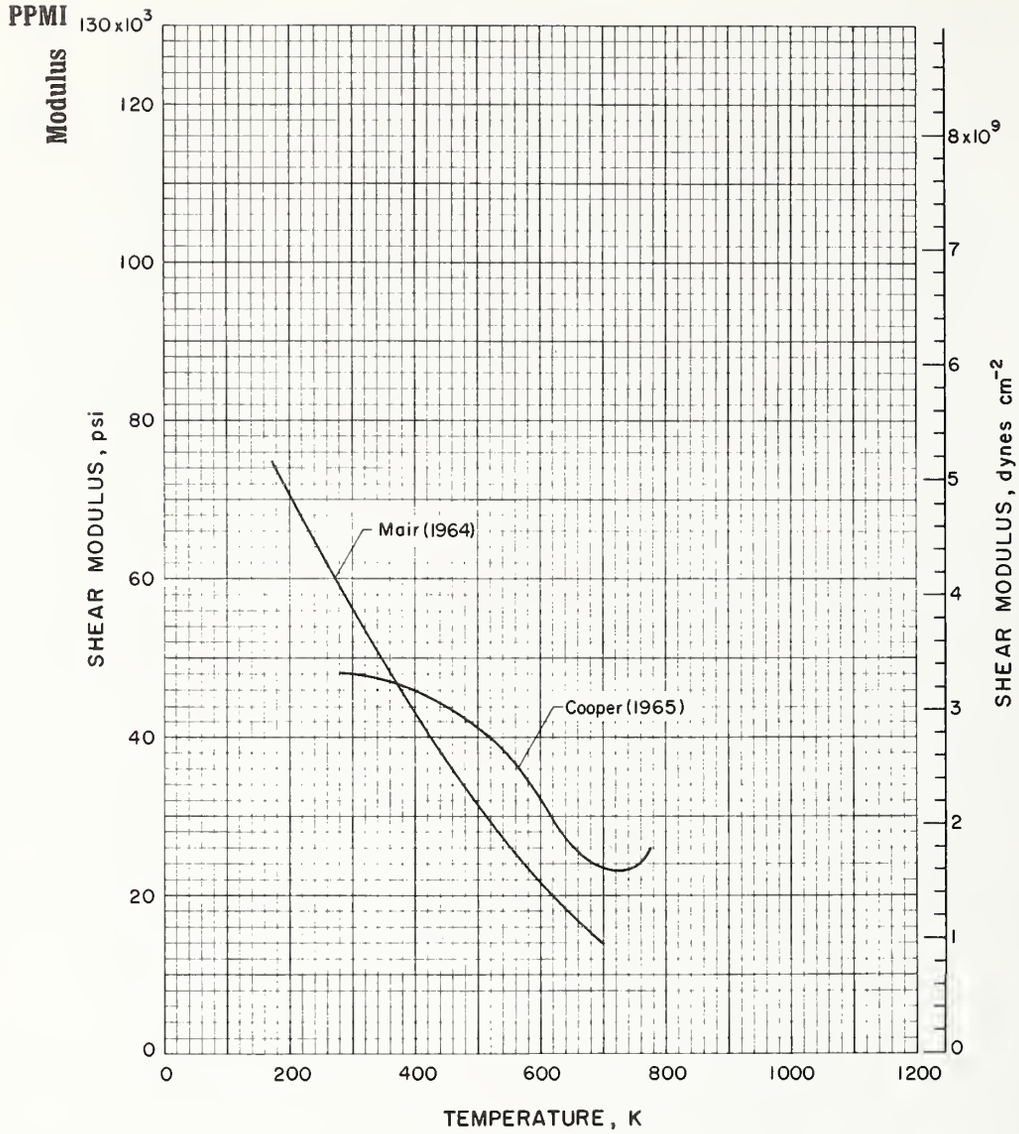
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Todd, Wolfe, Mallouk, Courtright (1966)	Kapton, sp gr = 1.42	ASTM D882 test procedure.
Caren, Coston, Holmes, Dubus (1965)	H-film	Red Sec ℓ = 7.62 cm, w = 1.27 cm, t = 0.0020-0.0023 cm; tension applied by hydralic ram, force measured with 2000lb capacity Ormond load cell calibrated by dead weights, specimen mounted in clamp blocks attached to flexible pull rods, strain measured by clip strain gauges; error bars indicate max deviation from av of 3 tests.
Du Pont (1968)	SP-1	ASTM D790 test procedure
Du Pont (H-2)	Kapton, sp gr = 1.42	t = 0.0025 cm; ASTM D-882-64T test procedure, machine direction.
Rudakov, Bessonov, Katon, Florinskii (1966)	Fiber, lab produced, sp gr ~1.4	Tests at 473K and above were made in an Ar atm.
Heacock, Berr (1965)	H-film	t = 0.0025 cm; ASTM D-882-61T test procedure.
Tatum, Amborski, Gerow, Heacock, Mallouk (1963)	H-film	t = 0.0025 cm
Hanson, Richards, Hickel (1965)	H-film	Red Sec ℓ = 5.08 cm, w = 1.27 cm, t = 0.32 cm; $\dot{\epsilon}$ = 0.0002-0.0005 s^{-1}.
Reed, Durcholz, Arvidson (1970)	Kapton	Red Sec = 2.54 x 0.51 cm, t = 0.0025 and 0.0127 cm, trans and long; Instron, xhd spd = 0.00085 and 0.00021 cm s^{-1}; error bars indicate the spread in several measurements, results from both thicknesses and both orientations averaged here.



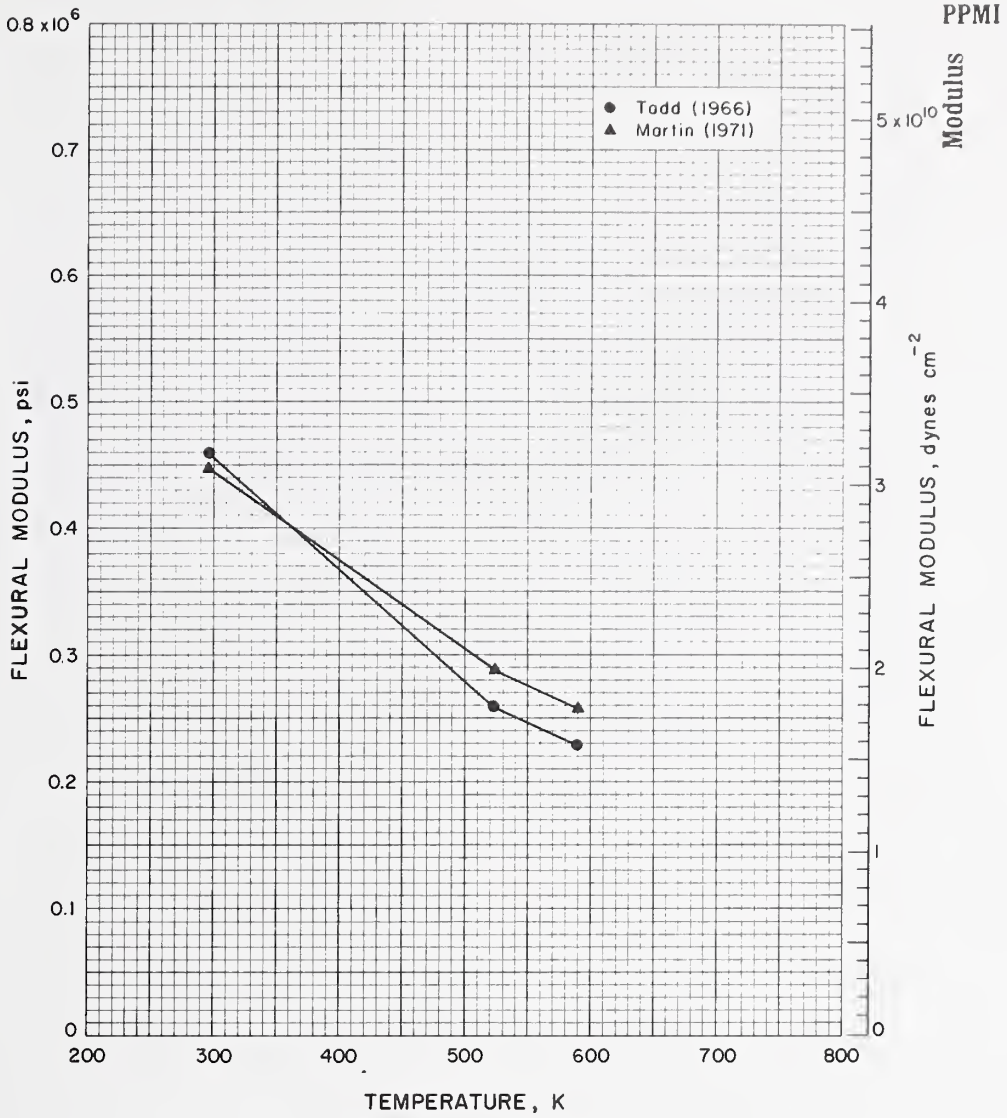
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Todd (1965)	Vespel, SP	ASTM D690, D790 test procedure.
Koton, Yakovlev, Rudakov, Knyazeva, Florinskii, Bessonov, Kuleva, Tolparova, Laius (1965)	Film, lab produced, oriented, 100-120% stretched at 613K in hot air current then heat treated at 673K.	Above 473K tests were performed in Ar atm.
Mair, Shen, Tobolsky (1964)	H-film	Conventional stress-relaxation balance in conjunction with a Tenney Environmental Test Chamber used at 267K, at higher temp a modified balance incorporating a cylindrical electric furnace was used.
Irwin, Sweeny (1967)	Fiber spun from solution	ℓ = 25.4 cm, either 200 den/60 filaments or 100 den/30 filaments; 1.18 turns cm^{-1}, Instron, $\dot{\epsilon}$ = 0.0167 s^{-1}.
Bernier, Kline (1968)	Polymer SP, as received, sp gr = 1.4335	Driven at resonance in the first trans mode, 350-700 Hz; data points not plotted.
Heslinga (1965)	Kapton H-film	
Podall, Oser, Eliason, Augl (1965)	Kapton	Av of 2 or 3 tests, error bars indicate data spread.
Butta, DePetris, Pasquini (1969)	Vespel	t = 0.3 cm, diam = 3.6 cm; resonance electrostatic apparatus, 1.5 x 10^4 Hz, measured in vacuum.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Lockheed Missles and Space Co. (1964)	H-film	t = 0.0051 cm, ASTM D-412-51T Type C die; Tinius Olsen Universal Test Machine, Model RM-2, xhd spd = 0.0042 cm s^{-1}, 77K; exposed to $2x10^7$ rad gammas and $1x10^{15}$ nvt neutrons from Radiation Effects Reactor at Dawsonville, Georgia operated at 10^6 watts; errors are standard deviation of 5-6 tests.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Cooper, Mair, Tobolsky (1965)	H-film (est Tg = 658K)	Modified Gehman torsional apparatus, "10 s modulus," apparatus surrounded by elec furnace, sample w/t ratio of 25, data normalized to room temp value of 450,000 psi (discussion presented of this).
Mair, Shen Tobolsky (1964)	SP	Clash-Berg (ASTM D 1043-61T test procedure) and Gehman (ASTM D 1053-61 test procedure) torsional instruments used, conventional 10 s modulus measured.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Todd, Wolfe, Mallouk, Courtright (1966)	Rigid solid SP-1, sp gr = 1.43	ASTM D790 test procedure.
Martin, Bartz (1971)	SP-1	

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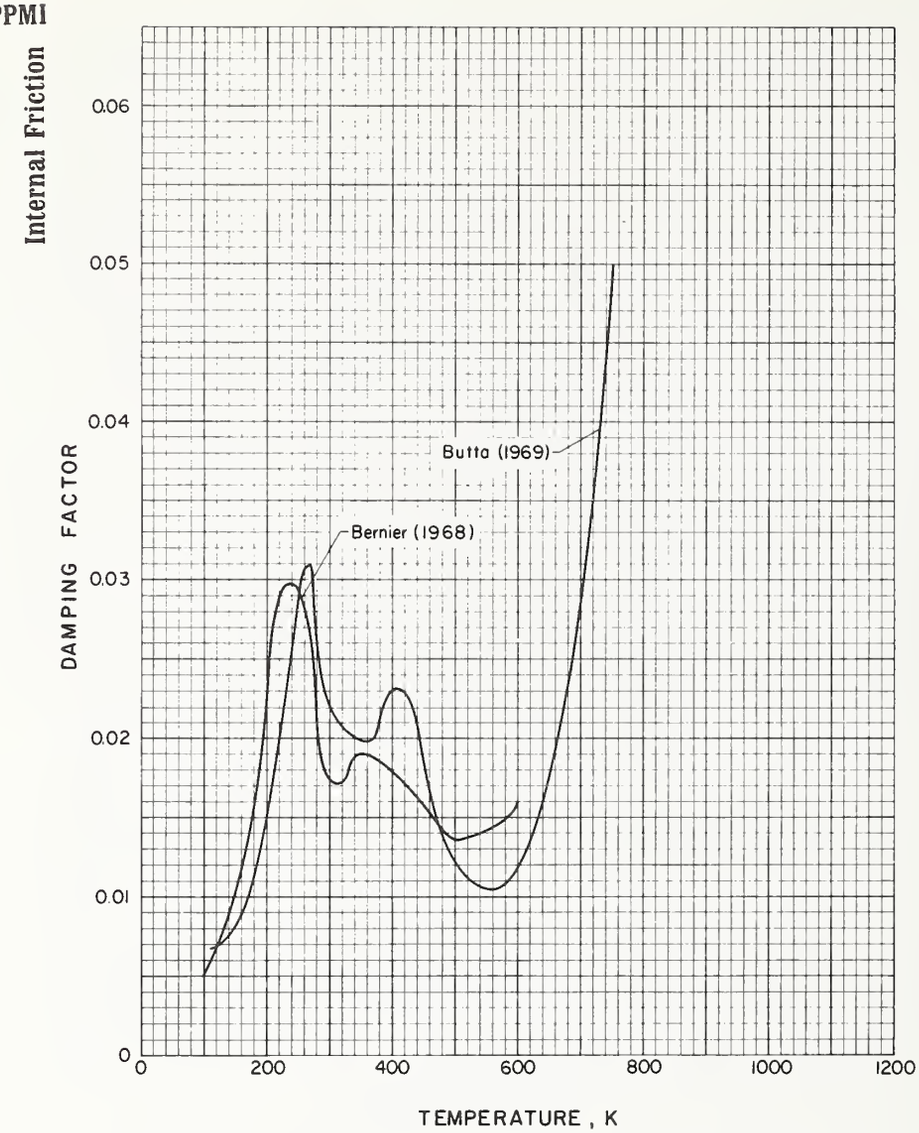
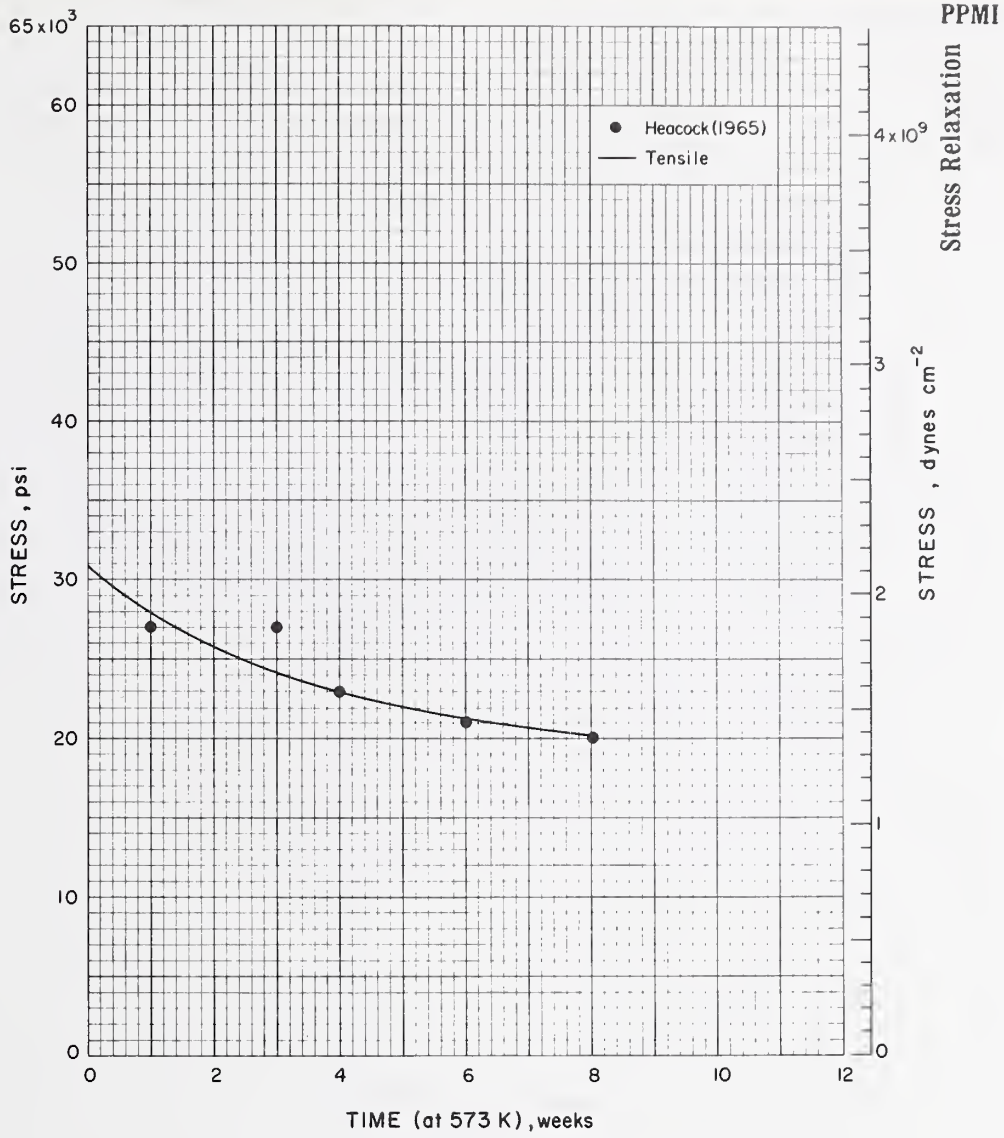
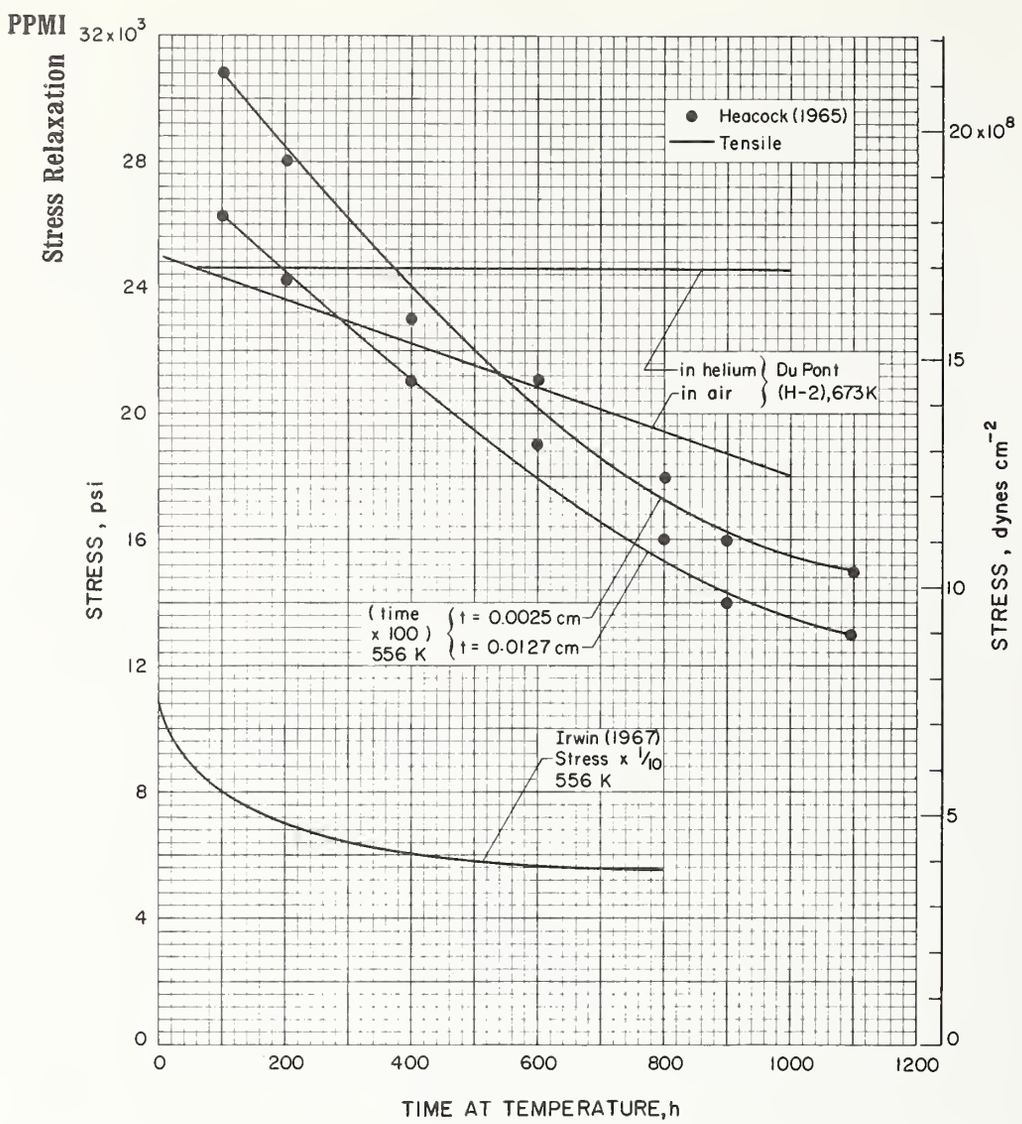


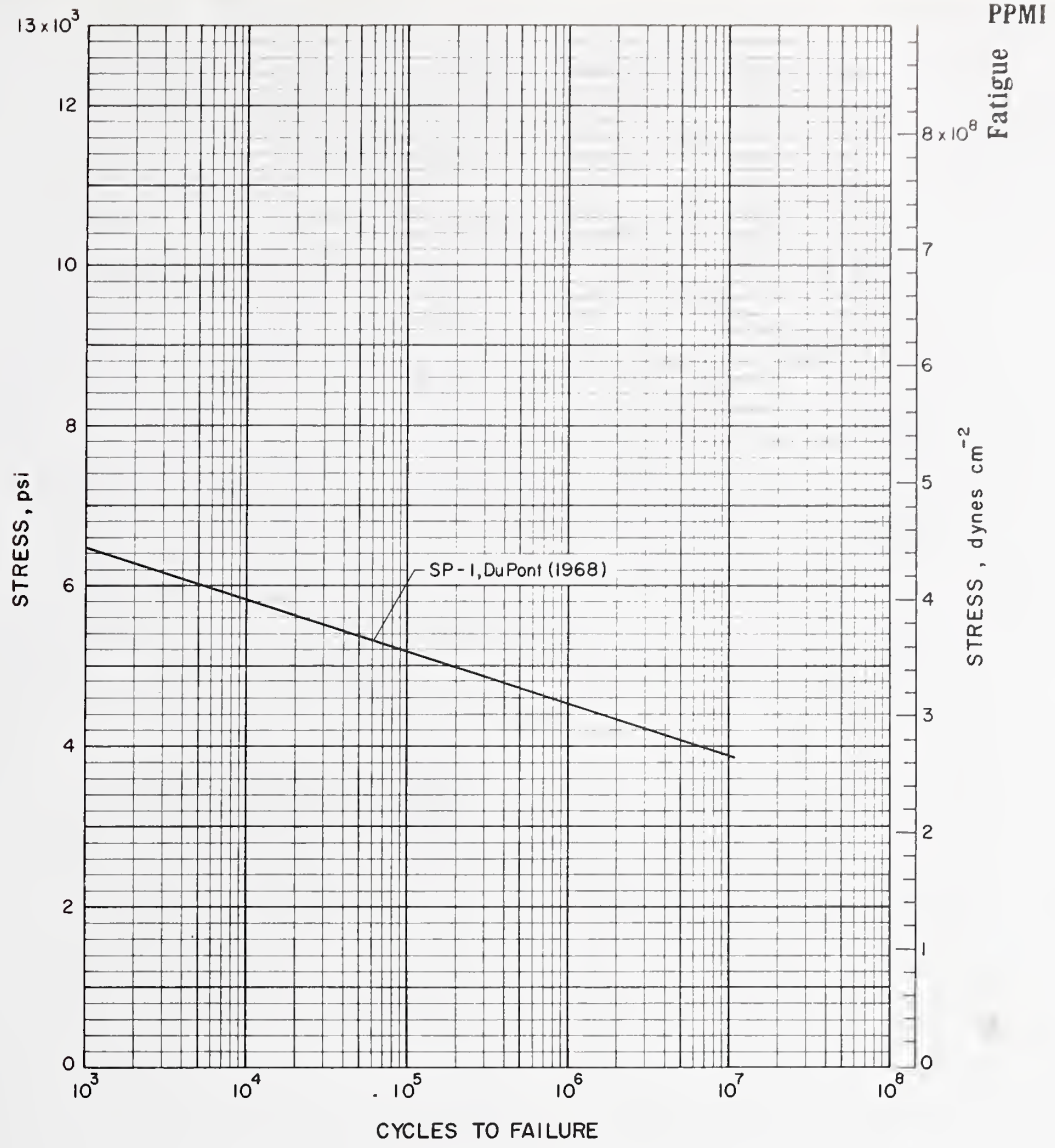
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bernier, Kline (1968)	Polymer SP, as received, sp gr = 1.4335	Driven at resonance in the first trans mode, 350-700 Hz; data points not plotted.
Butta, DePetris, Pasquini (1969)	Vespel	t = 0.3 cm, diam = 3.6 cm; resonance electrostatic apparatus, 1.5×10^4 Hz, measured in vacuum.



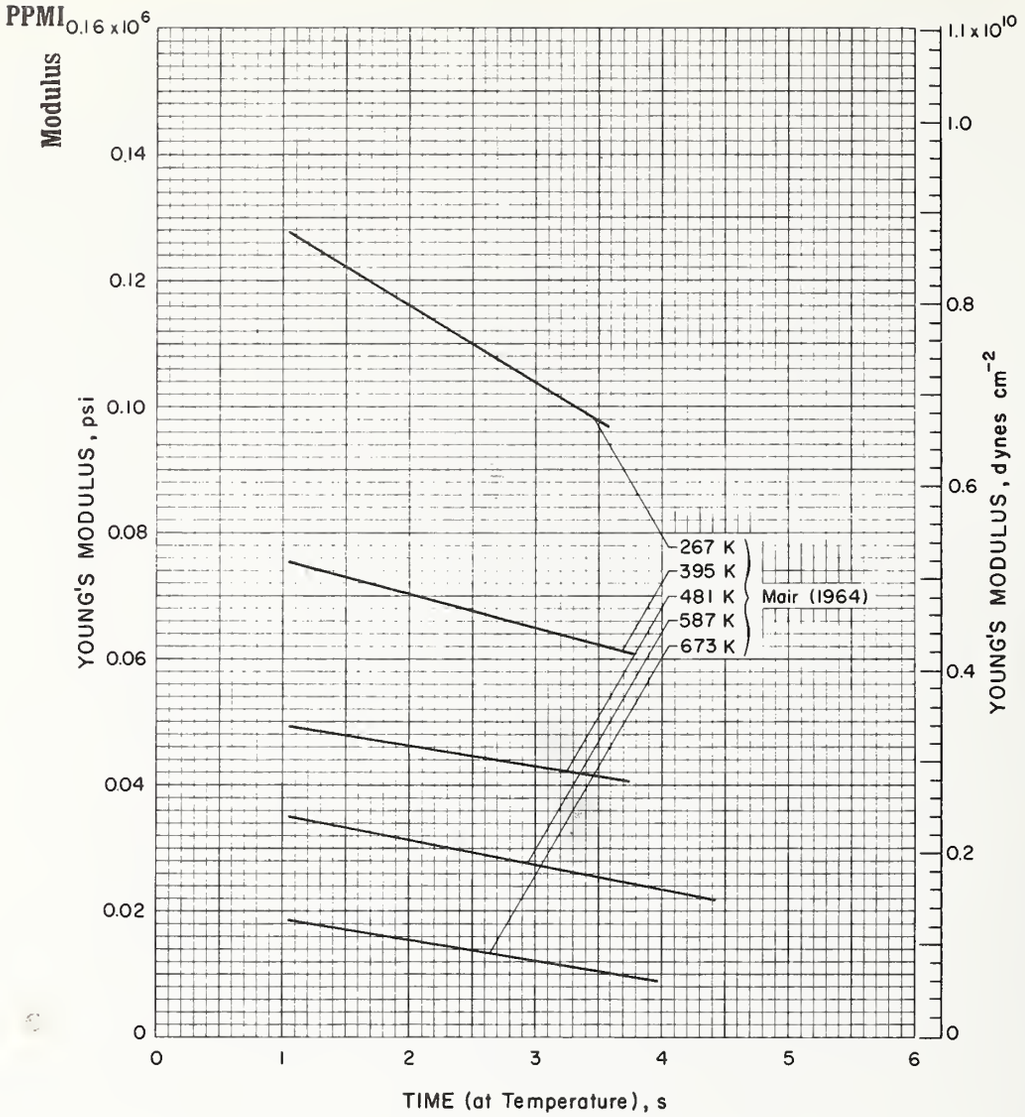
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Heacock, Berr (1965)	H-film	Samples interleafed with unsized glass cloth, thermally aged in Model 1443 Hotpack Oven , temp control to 1K, ASTM D-882-61T test procedure.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Du Pont (H-2)	H-film	t = 0.0025 cm
Heacock, Berr (1965)	H-film	Samples interleafed with unsized glass cloth, thermally aged in Model 1443 Hotpack Oven, temp control to 1K, ASTM test D-882-61T (full scale time = 10 hr).
Irwin, Sweeny (1967)	Fiber spun from solution	ℓ = 25.4 cm either 200 den/60 filaments or 100 den/30 filaments; 1.18 turns cm^{-1}, Instron, $\dot{\epsilon}$ = 0.0167 s^{-1}, exposed in air(full scale strength = 325,000 psi).



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Du Pont (1968)	SP-1	Sonntag test, 296K.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mair, Shen Tobolsky (1964)	H-film	Conventional stress-relaxation balance in conjunction with a Tenney Environmental Test Chamber used at 267K, at higher temp a modified balance incorporating a cylindrical elec furnace was used.

Investigator(s) (Year)	Description	Test Temperature (K)	Tensile Strength (10^3 psi)	Young's Modulus (10^6 psi)	Elongation (per cent)	Other
Todd (1966)	rigid solid, SP-1	298			6-7	
Du Pont(1968)	SP-1					0.45[a]
Du Pont (H-1A)	Kapton	298				0.42[b]
Du Pont (H-97-1)	Kapton, type H at rel hum of 0, 30, 50, 80 and 100%.	296	25			
Du Pont (H-66-1A)	Type H, film gauge = 50	296	14		20	
	100		20		35	
	200		20		40	
	300		20		45	
	500		20		45	
Todd (1965)	unnotched	298				0.010[b]
	notched					0.0007[b]
	fatigue life =10^7 cycles					5000[c]
Cooper (1965)	H-film, 2 tests	294	23.6	0.27	122	
			25.6	0.28	115	
Irwin (1967)		294	119.2	1.25	13	
Hoggatt(1966)	uniaxial, t=0.0076cm	20	46.6		8.7	
	biaxial, t=0.0076cm		37.6		15.0	
	biaxial, t=0.0127cm		39.6		8.6	
Lockheed (1964)		295±3	30±8	0.420± 0.054	44±7	9.0±1[d]

Footnotes:
(a) Poisson's Ratio
(b) Impact strength (ft. lb/mil)
(c) Axial stress (psi)
(d) Yield strength (10^3 psi)

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Todd, Wolfe, Mallouk, Courtright (1966)	rigid solid SP-1, sp gr = 1.43	ASTM D1708 test procedure.
Du Pont (1968)	SP-1	
Du Pont (H-1A)	Kapton, sp gr = 1.42	t = 0.0025 cm; Du Pont pneumatic impact test.
Du Pont (H-97-1)	Kapton, type H	t = 0.0025 cm.
Du Pont (H-66-1A)	Kapton, type H	ℓ = 12.7 cm, w = 2.54 cm; ASTM D-882-64T test procedure, method A, Instron, xhd spd = 0.085 cm s^{-1}, jaw separation = 5.08 cm, based on original thickness; av of 5 specimens.
Todd (1965)	Vespel, SP	Axial fatigue, 30 Hz, Sonntag fatigue machine.
Cooper, Mair, Tobolsky (1965)	H-film (Tg = 658 K)	Instron, xhd spd = 0.017 cm s^{-1}, $\dot{\epsilon}$ = 0.0025 s^{-1}, rel hum = 65%.
Irwin, Sweeny, (1967)	fiber spun from solution	ℓ = 25.4 cm, either 200 den/60 filaments or 100 den/30 filaments; 1.18 turns-cm^{-1}, Instron, $\dot{\epsilon}$ = 0.0167 s^{-1}, av values quoted.
Hoggatt, Workman (1966)	Kapton, film	Uniaxial specimen per ASTM D-412 die C; uniaxial tests on Riehle machine, xhd spd = 0.0042 cm s^{-1}, biaxial measurements on bursting diaphram; av of several tests.
Lockheed Missles and Space Co. (1964)	H-film	t = 0.0051 cm, ASTM D-412-51T Type C die; Tinius-Olsen Universal Test Machine, Model RM-2, xhd spd = 0.0042 cm s^{-1}; errors are standard deviation of 5-6 tests.

Investigator (s) (Year)	Description	Test Temperature (K)	Tensile Strength (10^3 psi)	Young's Modulus (10^6 psi)	Elongation (per cent)	Other
Anagnostou (1965)	H-film, unirrad irrad	321	21 20		110 78	

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Anagnostou (1965)	H-film	l = 2.5 - 5.1 cm, w = 0.6 - 1.3 cm, t= 0.003 cm, GL = 1.3 cm; Instron Model TT-C, rubber faced jaws, xhd spd = 0.004 - 0.021 cm s^{-1}, specimens randomly cut from film; irrad in vacuum at 321 K by ultraviolet from Hanovia 100watt type SH high pressure quartz Hg vapor lamp located 24.4 cm from speciman for 1003 h, also irrad by 2MeV electrons for a dose of $5x10^{16}$ electrons cm^{-2}

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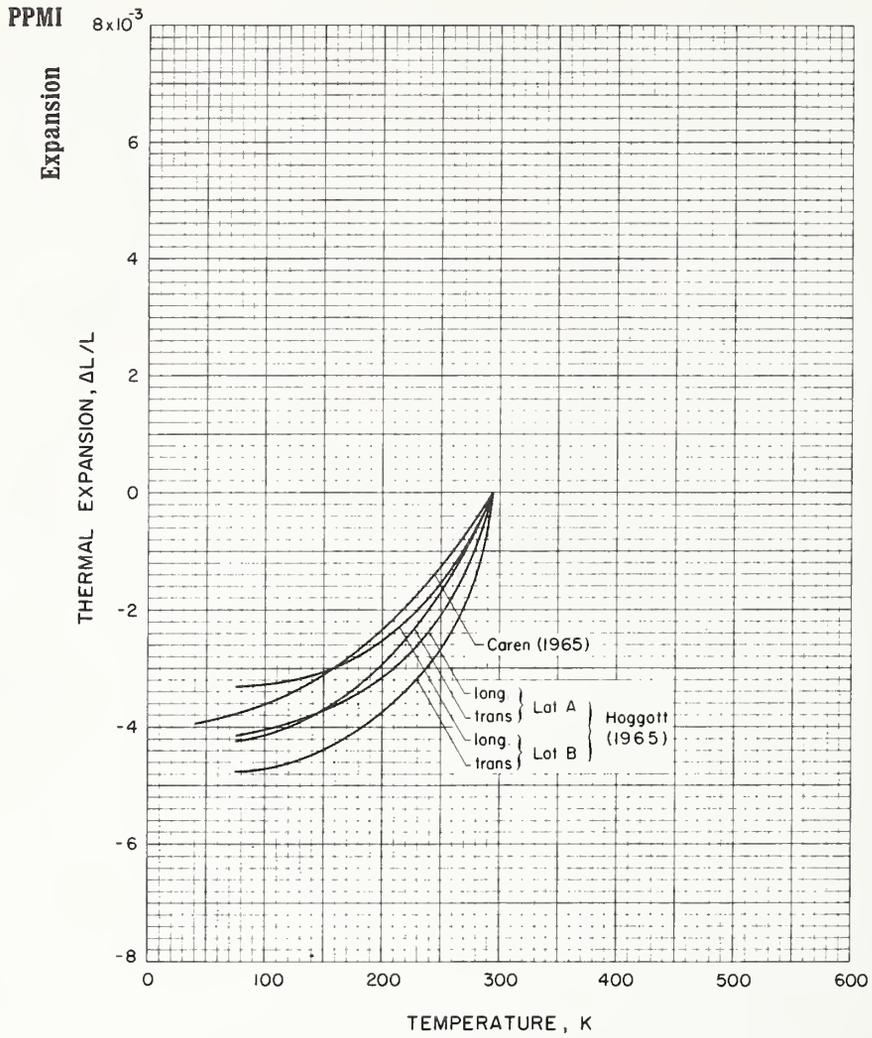
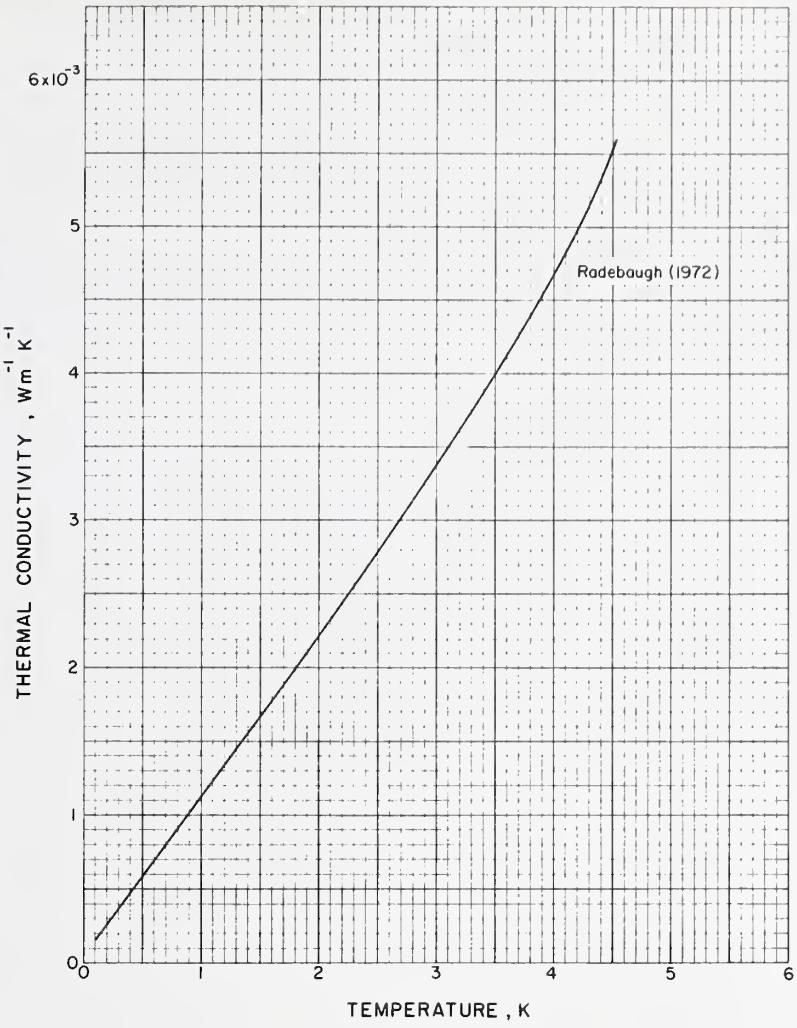


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Caren, Coston, Holmes, Dubus (1965)	H-Film	Rolled into tight cylinders approximately 0.635 cm diam and 5.08 cm long; fused-quartz tube and dial-indicator test procedure used; three samples tested and quoted data scatter within 5%.
Hoggatt (1965)	H-Film, 2 chemically identical lots, lot A assumed to be typical	t = 0.005, 0.007, and 0.013 cm; ASTM D696-44 test procedure, linear differential transformer and an x-y recorder.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Radebaugh, Frederick, Siegwarth (1972)	Kapton, heated to 423 K	t = 0.015 cm; laminated between Cu plates.

Investigator(s)	Description	Temperature (K)	$\Delta L/L$ Thermal Expansion	λ Thermal Conductivity ($Wm^{-1}K^{-1}$)	α Thermal Diffusivity (cm^2s^{-1})	C_p Specific Heat ($Jg^{-1}K^{-1}$)
Todd (1965)	SP Polymer	323 298		 0.38-0.43		3.14
Todd (1966)	SP-1	296 296-400	 21-26 x 10^{-5}	0.37-0.50		1.13
Martin (1971)	SP-1	296		0.33-0.38		
Du Pont (H-2)	Kapton, type H	298				1.09

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Todd (1965)	Polymer SP, sp gr = 1.42	
Todd (1966)	SP-1, sp gr = 1.43	ASTM D 648 test procedure for C_p, ASTM D 696 test procedure for $\Delta L/L$.
Martin, Bartz (1971)	SP-1	
Du Pont (H-2)	Kapton, Type H, sp gr = 1.42	t = 0.0025 cm; differential calorimetry.

Polypyromellitimide

Thermal References

1. *Caren, R. P., Coston, R. M., Holmes, A. M. C., Dubus, F.*, Low-temperature tensile, thermal contraction, and gaseous hydrogen permeability data on hydrogen-vapor barrier materials, *Advances in Cryogenic Engineering* (Ed. K. D. Timmerhaus, Plenum Press, New York, 1965), Vol. 10, p. 171.
2. DuPont, Kapton Physical-Thermal Properties, Bulletin H-2.
3. *Hoggatt, J. T.*, Cryogenic Liner Development for Filament Wound Pressure Vessels, The Boeing Co., Contract No. EWA 69829, Document No. D2-23778-1 (1965).
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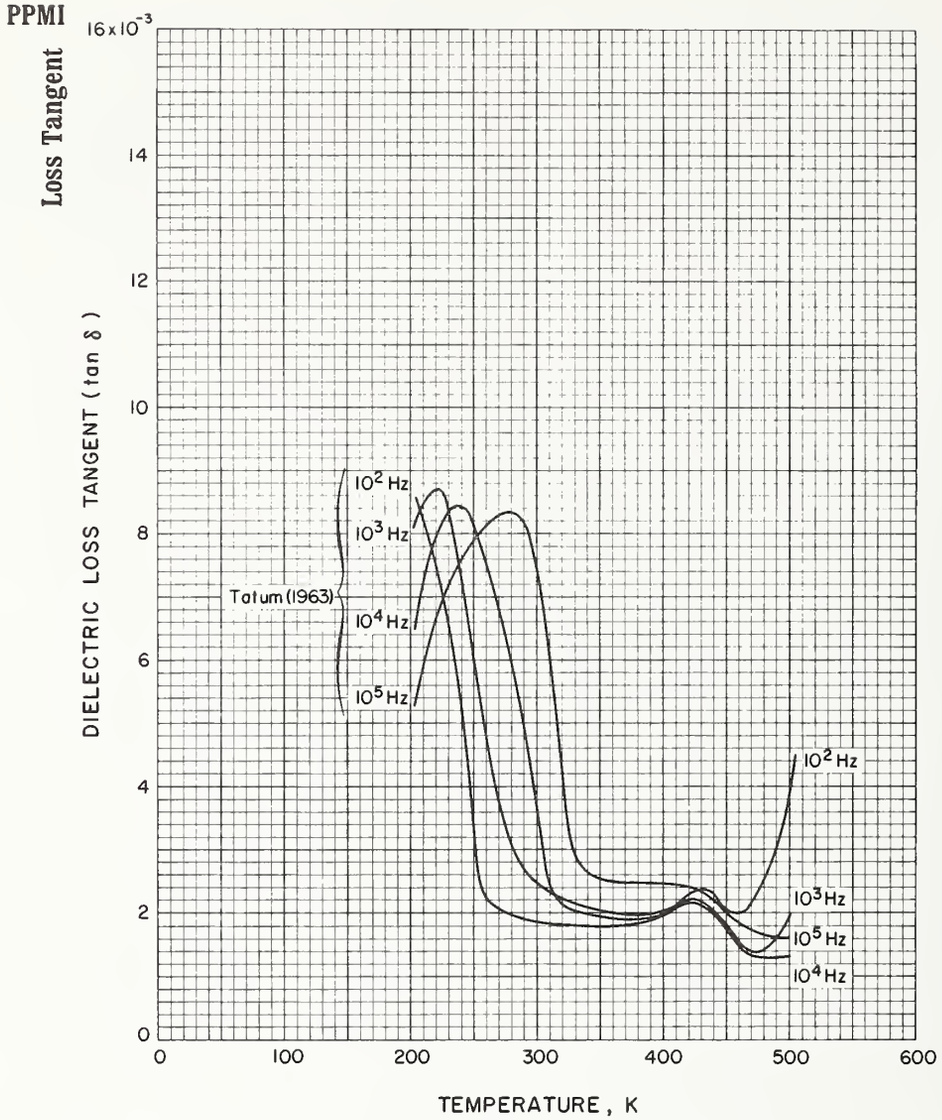
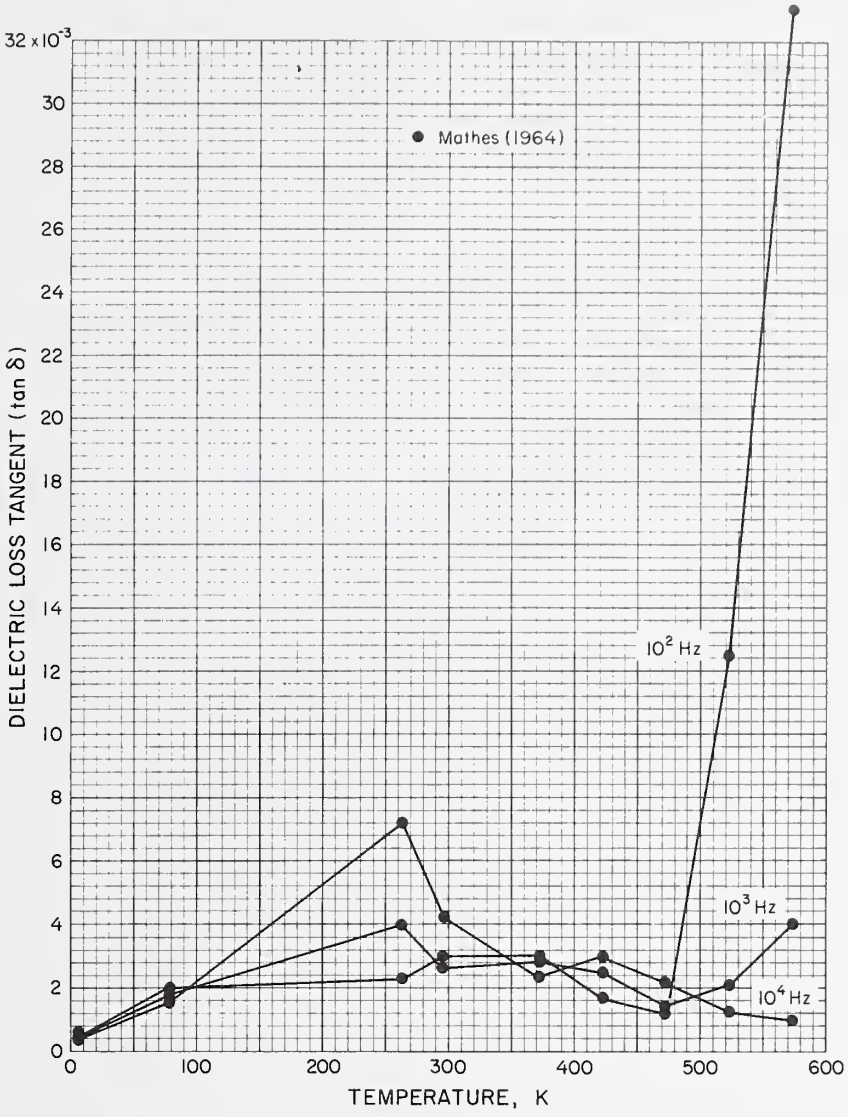
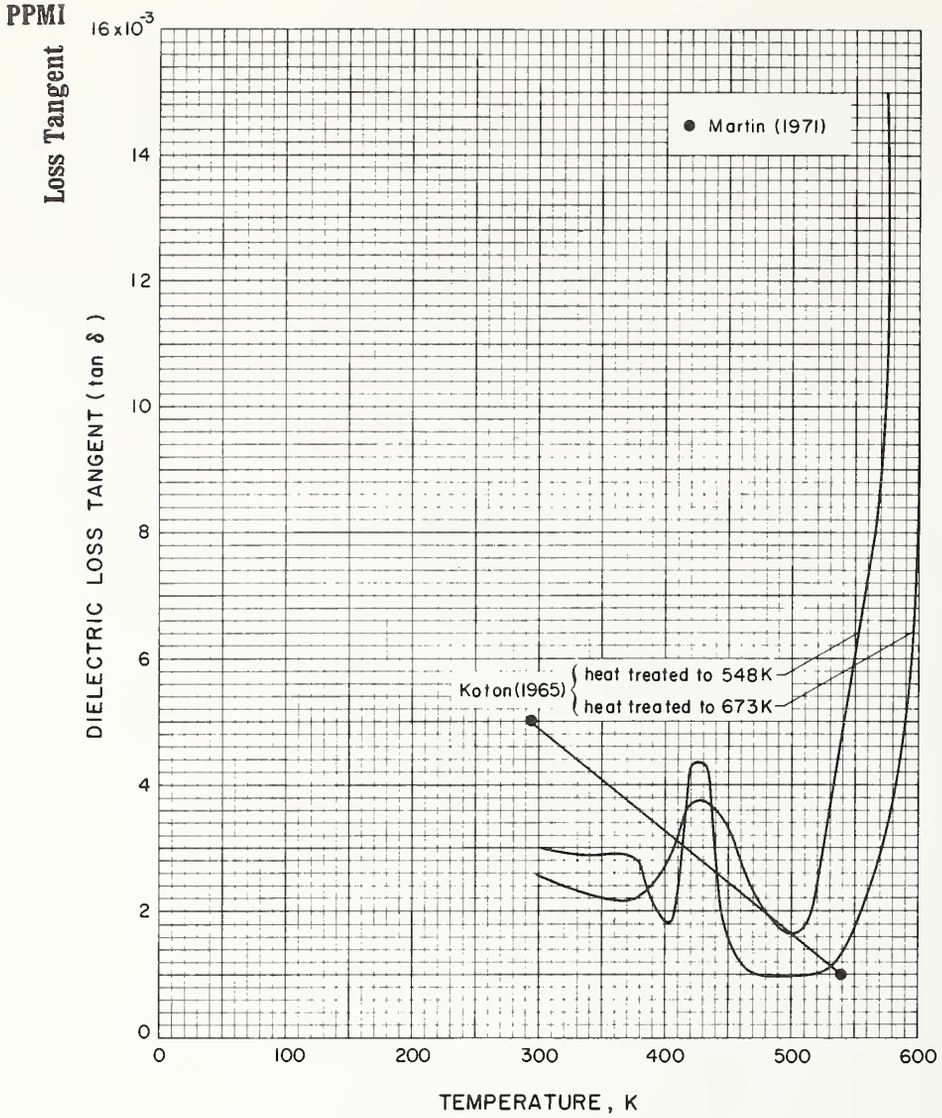


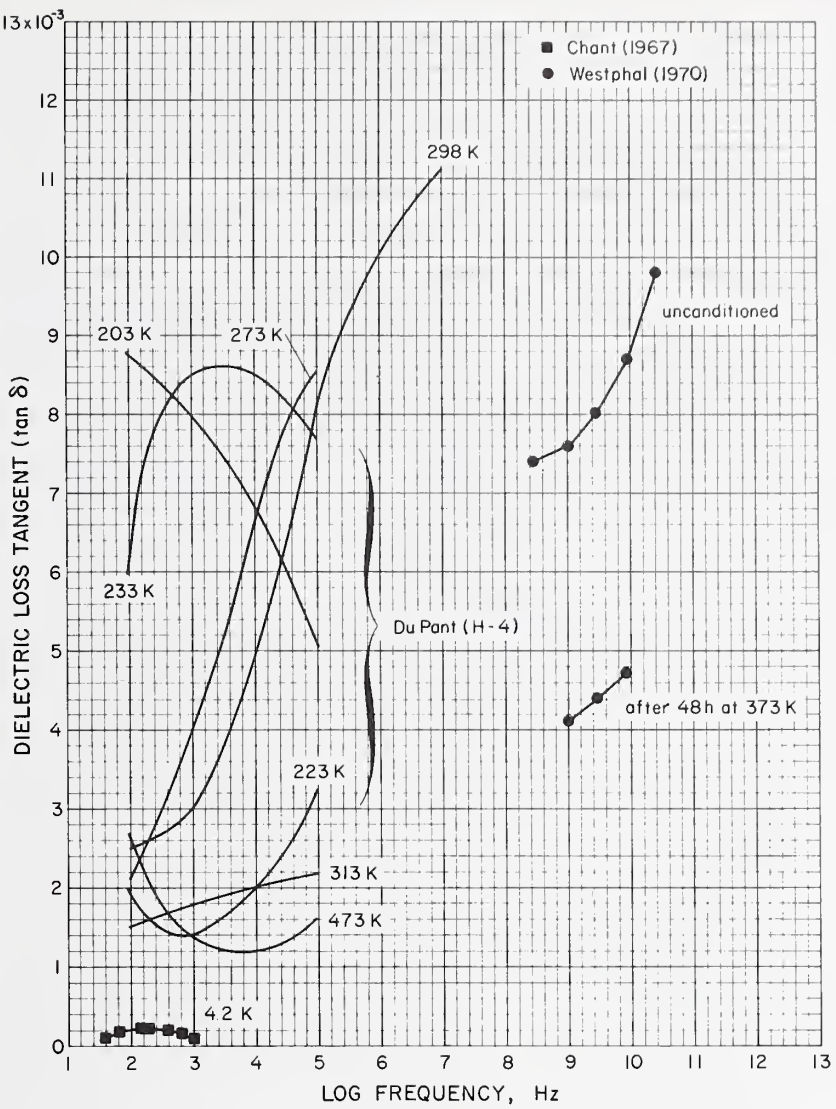
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Tatum, Amborski, Gerow, Heacock, Mallouk (1963)	H-Film	t = 0.0025 cm; ASTM D-150-59 test procedure.



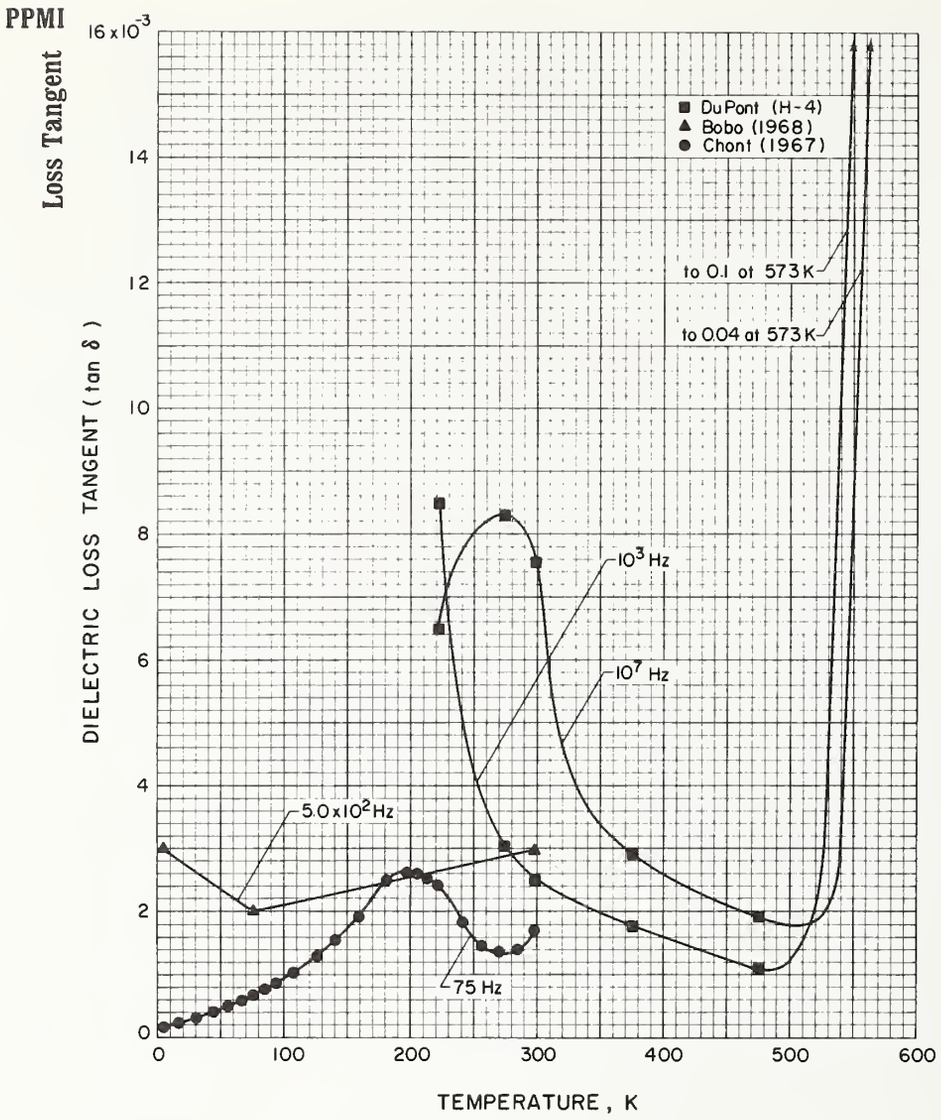
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mathes (1964)	H-film	Nominal t = 0.013 cm; electrodes were evaporated Au backed up by a coating of #4132 Du Pont Ag paint, opposite electrodes with a diam of 2.54 cm and 3.18 cm; no corrections for edge effects or changes in specimen dimensions with temp change, data also given for 60, 2×10^2, 5×10^2, 2×10^3, and 5×10^3 Hz.



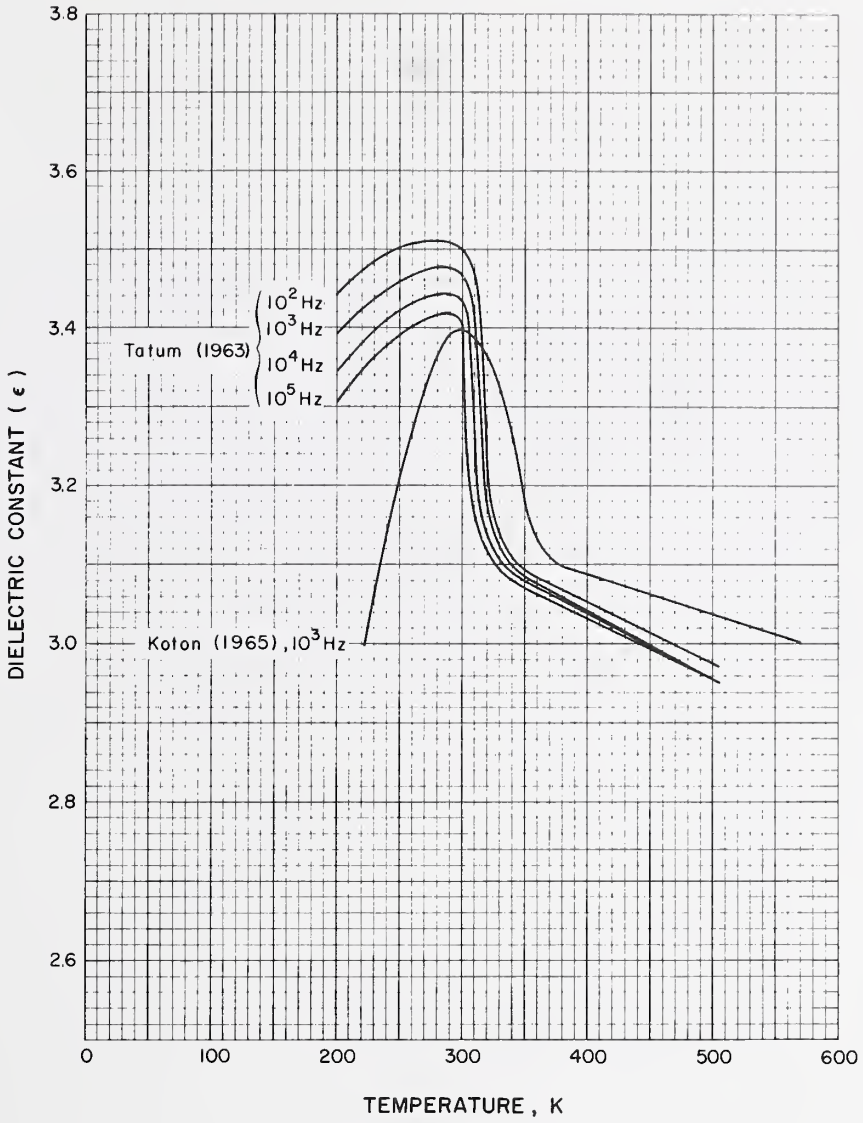
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Koton, Yakovlev, Rudakov, Knyazeva, Florinski, Bessenov, Kuleva, Tolparova, Laius, (1965)	PM polyimide, sp gr = 1.42, solution -cast film	MLE bridge at 10^3 Hz, electrodes applied by vacuum deposition of Ag.
Martin, Bartz (1971)	SP-1	10^5 Hz.



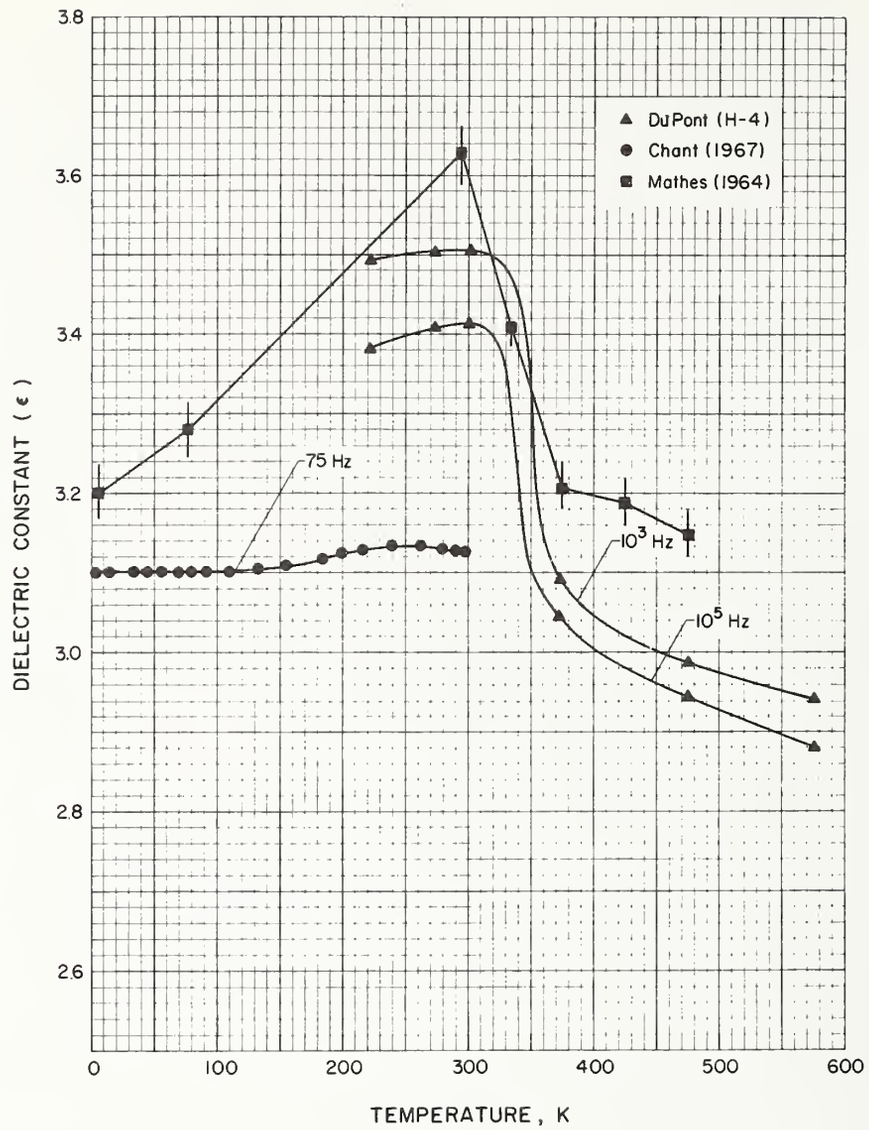
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Du Pont (H-4)	Kapton, Type H	t = 0.0025 cm; ASTM-D150-59T test procedure.
Chant (1967)	Kapton	t = 0.0114 cm, cut into discs 7.0 cm diam, contact with surface made by evaporating aluminum to each face under a vacuum to a thickness of 2000Å, discs clamped between two brass plates, max data accuracy within 5%.
Westphal, Iglesias (1970)	Kapton H-film, type 500	298 K, 45% rel hum; accuracy = $\pm 0.5 \times 10^{-3}$.



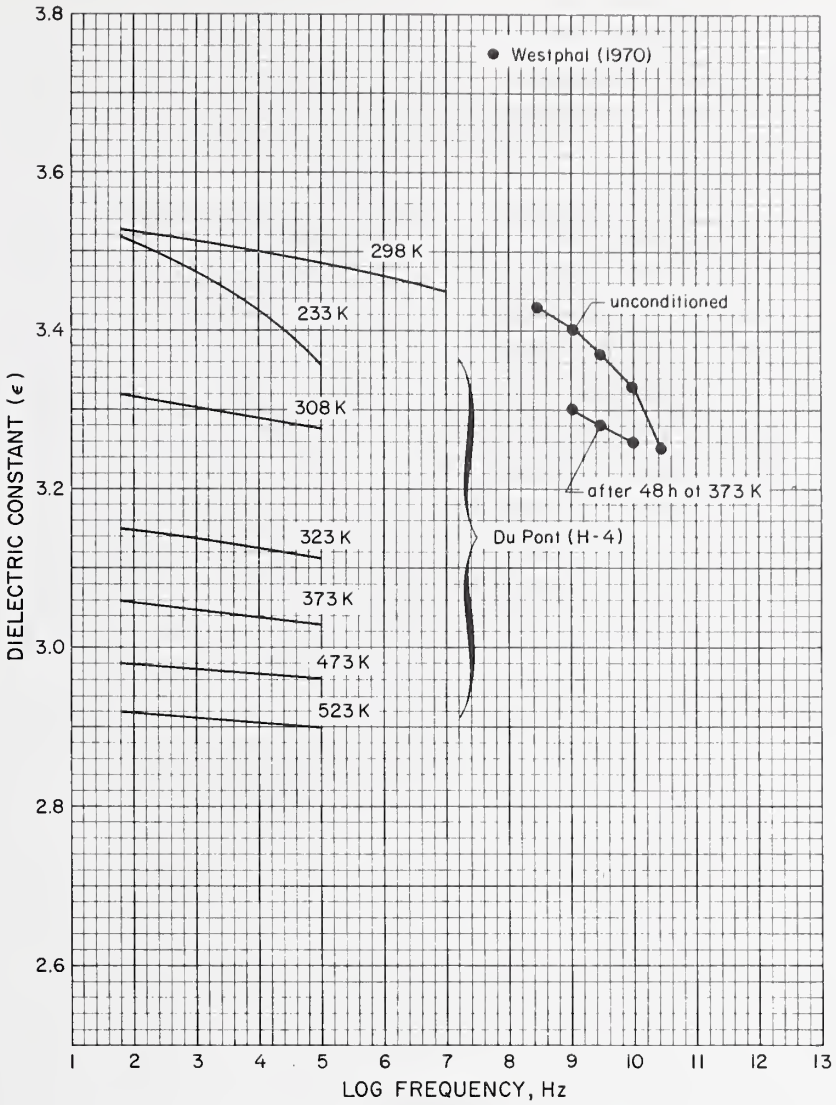
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Du Pont (H-4)	Kapton, type H	t = 0.0025 cm; ASTM D-150-59T test procedure.
Bobo, Perrier (1968)	Kapton	t = 0.0025-0.020 cm; 2.5-3.5 kV ac.
Chant (1967)	Kapton	t = 0.0114 cm, cut into discs 7.0 cm diam, contact with surface made by evaporating aluminum to each face under a vacuum to a thickness of 2000Å, discs clamped between two brass plates, max data accuracy within 5%.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Tatum, Amborski, Gerow, Heacock, Mallouk (1963)	H-Film	t = 0.0025 cm; ASTM D-150-59 test procedure.
Koton, Yakovlev, Rudakov, Knyazeva, Florinskii, Bessonov, Kuleva, Tolparova, Laius (1965)	PM polyimide, solution-cast film, sp gr = 1.42 at 293 K	MLE bridge at 10^3 Hz, electrodes applied by vacuum deposition of Ag.



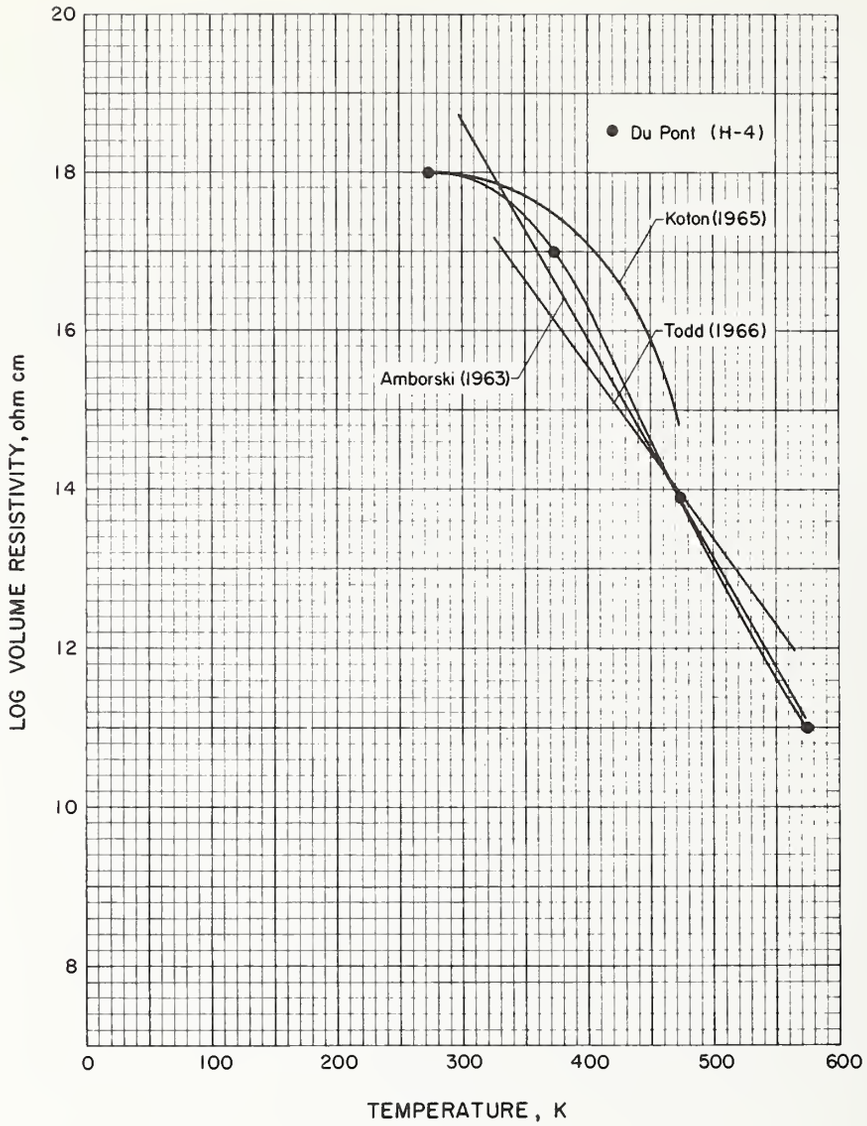
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Du Pont (H-4)	Kapton, type H	t = 0.0025 cm; ASTM Dp150-59T test procedure.
Chant (1967)	Kapton	t = 0.0114 cm, cut into discs 7.0 cm diam, contact with surface made by evaporating aluminum to each face under a vacuum to a thickness of 2000Å, discs clamped between two brass plates, edge effects were allowed for in calculations of dielectric constant; max data accuracy within 5%.
Mathes (1964)	H-film	Nominal t = 0.013 cm; electrodes were evaporated Au backed up by a coating of #4132 DuPont Ag paint, opposite electrodes with a diam of 2.54 cm and 3.18 cm; av of 3 specimens, error bars indicate data spread, no corrections for edge effects or changes in specimen dimensions with temp change, nearly identical results were obtained at 10^2, 10^3, and 10^4 Hz.



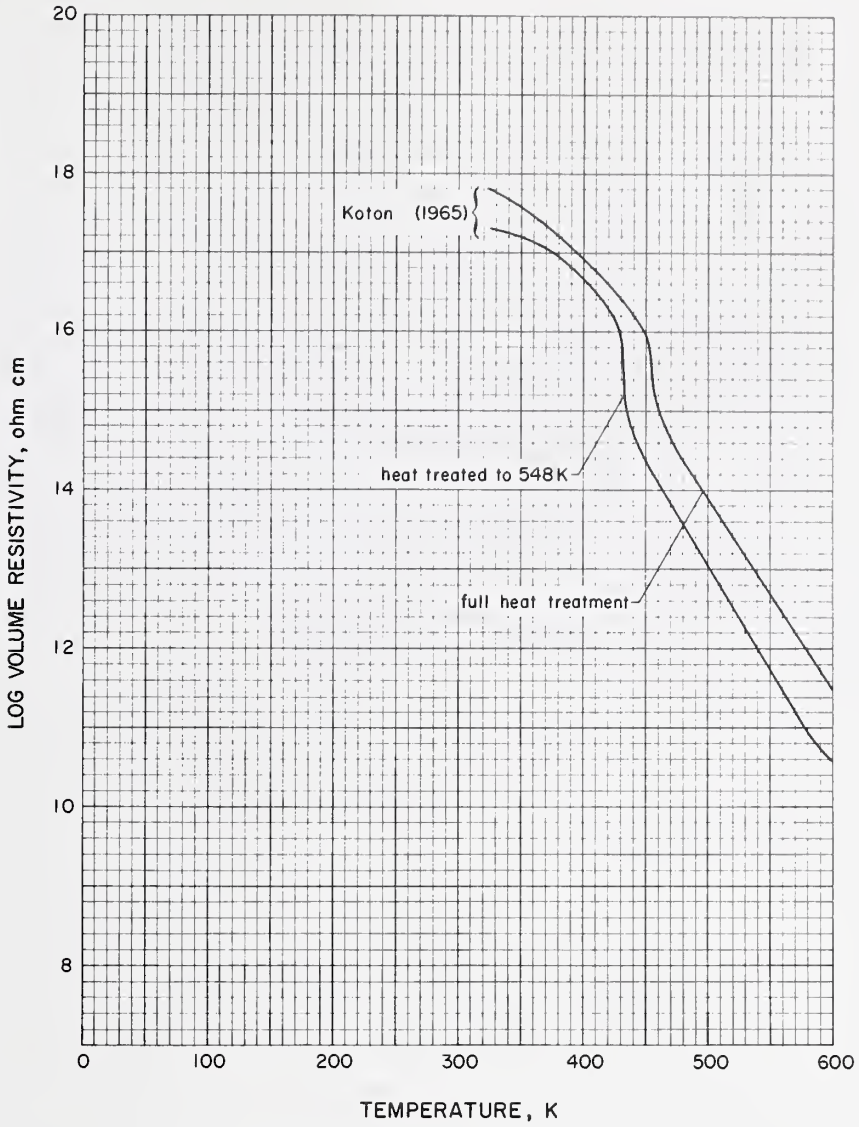
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Du Pont (H-4)	Kapton, type H	t = 0.0025 cm; ASTM D-150-59T test procedure.
Westphal, Iglesias (1970)	Kapton H-film, type 500	298 K, 45% rel hum; accuracy = ± 0.05.

PPMI

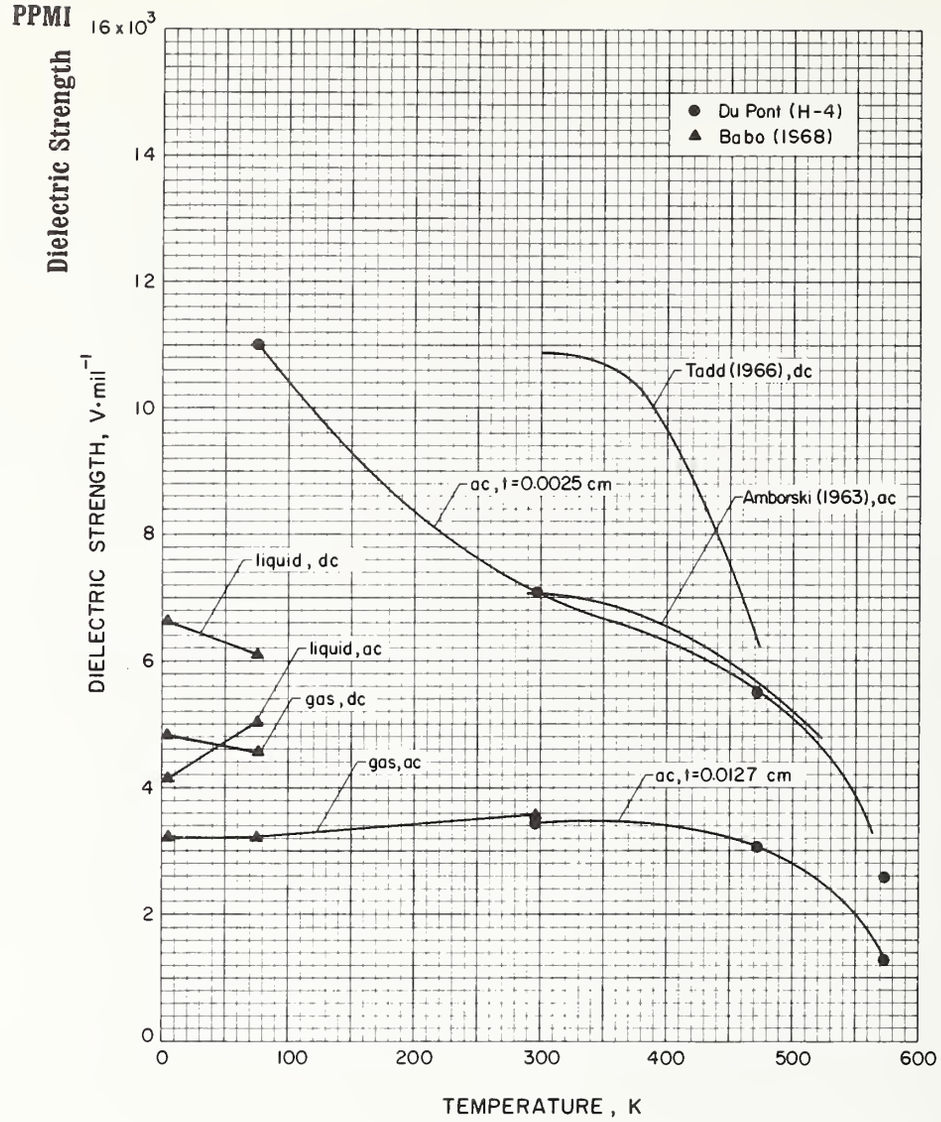
Resistivity



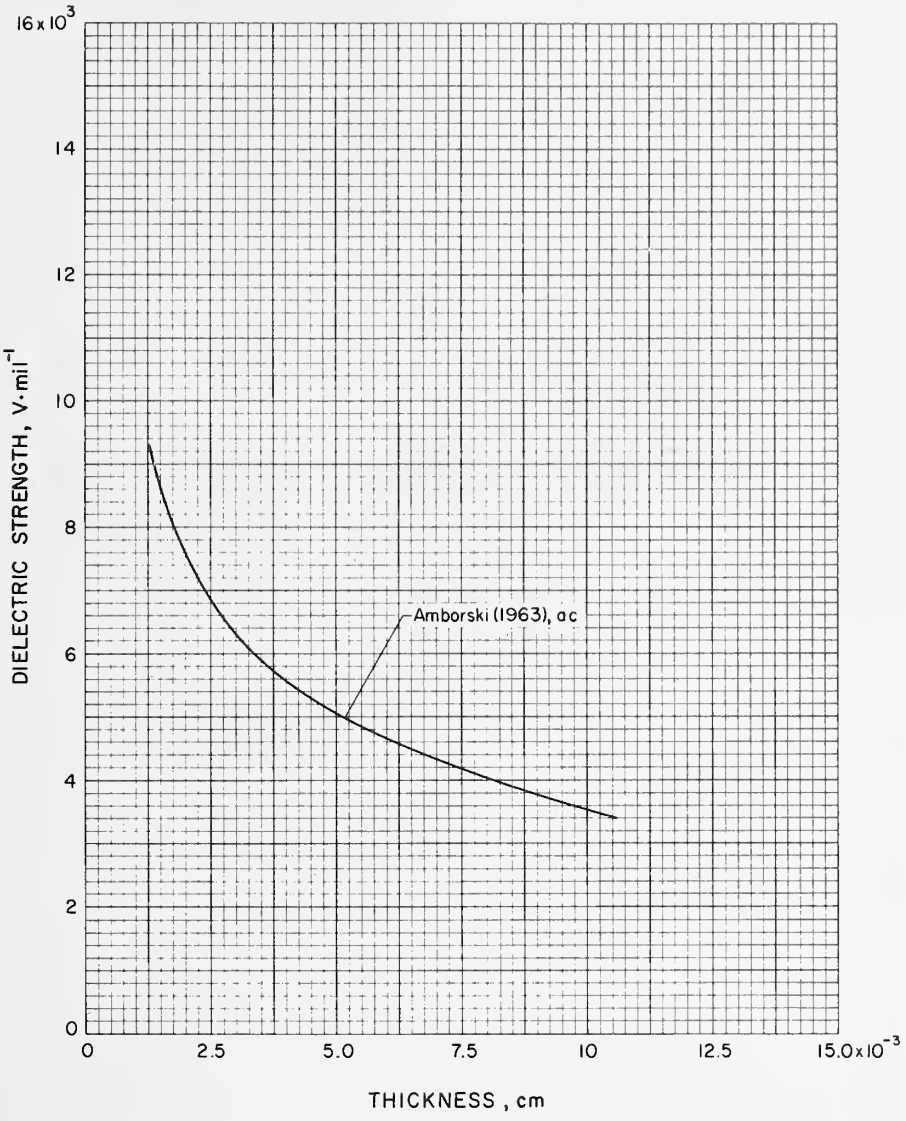
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Du Pont (H-4)	Kapton, Type H	t = 0.0025 cm; ASTM D-257-61 test procedure.
Todd, Wolff, Mallouk, Courtright (1966)	Kapton	t = 0.0025 cm; ASTM D-257 test procedure, 125V dc.
Amborski (1963)	H-Film	t = 0.0025 cm
Koton, Yakovlev, Rudakov, Knyazeva, Florinskii, Bessonov, Kuleva, Toparova, Lains (1965)	PM polyimide, sp gr = 1.42	String electrometer, electrodes applied by vacuum deposition of silver.



INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Koton, Yakovlev, Rudakov, Knyazeva, Florinski, Bessenov, Kuleva, Tolparova, Laius (1965)	PM polyimide, sp gr = 1.42	ρ_v determined with a string electrometer, electrodes applied by vacuum deposition of silver.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Du Pont (H-4)	Kapton, type H	ASTM D-149-61 test procedure
Bobo, Perrier (1968)	Kapton	t = 0.01 cm; 3.0 cm spheres as electrodes; voltage increased at 0.5 kV s^{-1}.
Todd, Wolff, Mallouk, Courtright (1966)	Kapton	t = 0.0025 cm; 0.635 cm diam electrodes; ASTM D-149 test procedure.
Amborski (1963)	H-Film	t = 0.0025 cm; 0.635 cm diam electrodes; rate of voltage rise= 500 V s^{-1}; 60% rel hum and 298 K.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Amborski, (1963)	H-Film	0.635 cm diam electrodes; rate of voltage rise = 500 V s^{-1}; 60% rel hum and 298 K.

Investigator(s)	Description	Temperature (K)	ρ Volume Resistivity (Ωcm)	tan δ Dielectric Loss Factor	ε Dielectric Constant	D.S. Dielectric Strength ($Vmil^{-1}$)
Du Pont (H-4)	Kapton rel hum (%)	298				
	0			0.0018	3.0	7,800
	30			0.0021	3.3	7,300
	50			0.0025	3.5	7,000
	80			0.0037	3.7	6,500
	100			0.0047	3.9	6,200
McKeown (1965)	H-Film, cast	298				9,150 (rms)
Heacock (1965)	H-film	298	1.0×10^{16}	0.002	3.5	7,000
Todd (1965)	Vespel, SP	298	1.0×10^{17}	0.003	3.4	400
Storti (1968)	Kapton	298			3.5	7,000
Heslinga (1965)	Kapton H-film	78	$10^{17}-10^{18}$		3.1-3.7	
		298	$10^{14}-10^{15}$		2.8-3.2	
Martin (1971)	SP-1	296			3.4	560

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Du Pont (Bulletin H-4)	Kapton	t = 0.00254 cm; ASTM D-150-59T test procedure. (Dielectric Constant and Dissipation Factor), ASTM D-149-61 (Dielectric Strength).
McKeown (1965)	H-film, cast	t = 0.0053 cm; spherical electrodes embedded in thermoset resin with sample, 60 Hz; standard deviation of 6 samples = 9%.
Heacock, Berr (1965)	H-film, sp gr = 1.42 (at 275 K)	t = 0.0025 cm; ASTM D-150-59 test procedure of 10^3 Hz (Dielectric Constant and Dielectric Loss Factor), ASTM D-257-61 (Volume Resistivity), ASTM D-149-59 (Dielectric Strength).
Todd (1965)	Vespel, SP	ASTM D-149 short time test procedure with t = 0.318 cm (Dielectric Strength) ASTM D-150 at 10^3 Hz (Dielectric Constant and Dielectric Loss Factor) ASTM D-257 (Volume Resistivity).
Storti (1968)	Kapton, sp gr = 1.42	t = 0.0051 cm, 10^3 Hz.
Heslinga (1965)	Kapton H-film	
Martin, Bartz (1971)	SP-1	Dielectric Constant: 10^6 Hz. Dielectric Strength: t = 0.20 cm; short time.

Polypyromellitimide

Electrical References

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   Martin, R. J., Bartz, J. R., Polyimides, Machine Design **43,** 34 (Feb. 11, 1971).
5. *Heacock, J. F., Berr, C. E.*, Polyimides—new high temperature polymers: H-Film, a polypyromellitimide film, SPE Trans. **5,** No. 2, 345 (1965).
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8. *Martin, R. J., Bartz, J. R.*, Polyimides, Machine Design **43,** 34 (Feb. 11, 1971).
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10. *McKeown, J. I.*, Intrinsic electric strengths of organic polymeric materials, Proc. IEE **112,** 824 (1965).
11. *Storti, G. M.*, Experimental Investigation and Analysis of Dielectric Breakdowns Induced by Electron Irradiation in Polymer Films, NASA TN D–4810, Langley Research Center, Langley Station, Hampton, Va. (1968).
12. *Tatum, W. E., Amborski, L. E., Gerow, C. W., Heacock, J. F., Mallouk, R. S.*, H-Film—DuPont's new polyimide film, Electrical Insulation Conf., Chicago (Sept. 17, 1963).
13. *Todd, N. W.*, Polyimide resins for extreme environments, 8th SAMPE Symposium (1965).
14. *Todd, N. W., Wolff, F. A., Mallouk, R. S., Courtright, J. R.*, Polyimides, Machine Design **38,** 81 (June 16, 1966).
15. *Westphal, W. B., Iglesias, J.*, Dielectric Measurements on High-Temperature Materials, Air Force Materials Laboratory, Wright-Patterson Air Force Base, Ohio, Technical Report AFML–TR–70–138 (1970).

E. Related References

1. *Bobo, J., Perrier, M., Fallou, B., Garland, J.,* Dielectric strength of polymers at cryogenic temperatures under vacuum, Vacuum **18,** 397 (1968).

10. Polyparaxylylene (PPX)

A. Summary

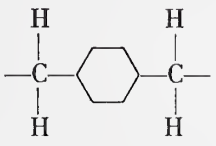
Polyparaxylylene was developed specifically as a more radiation resistant film to be used similarly to PET. It is completely linear and highly crystalline. The larger the number of ethyl groups on each end of the monomer, the more similar its structure and properties are to polyethylene. Normal PPX is frequently labeled N and with the addition of one or two chlorines it is labeled C and D, respectively. These chlorine additions add to its polarizability and cross linking. Because of its symmetry, normal PPX is a good dielectric. PPX generally exhibits good dimensional stability even at cryogenic temperatures.

PPX

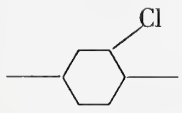
Chemical Formula: $[(CH_2)_x C_6H_4 (CH_2)_x]_n$, $x = 1$–5

Chemical Structure:

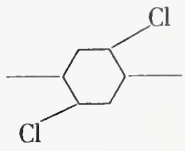
N



C

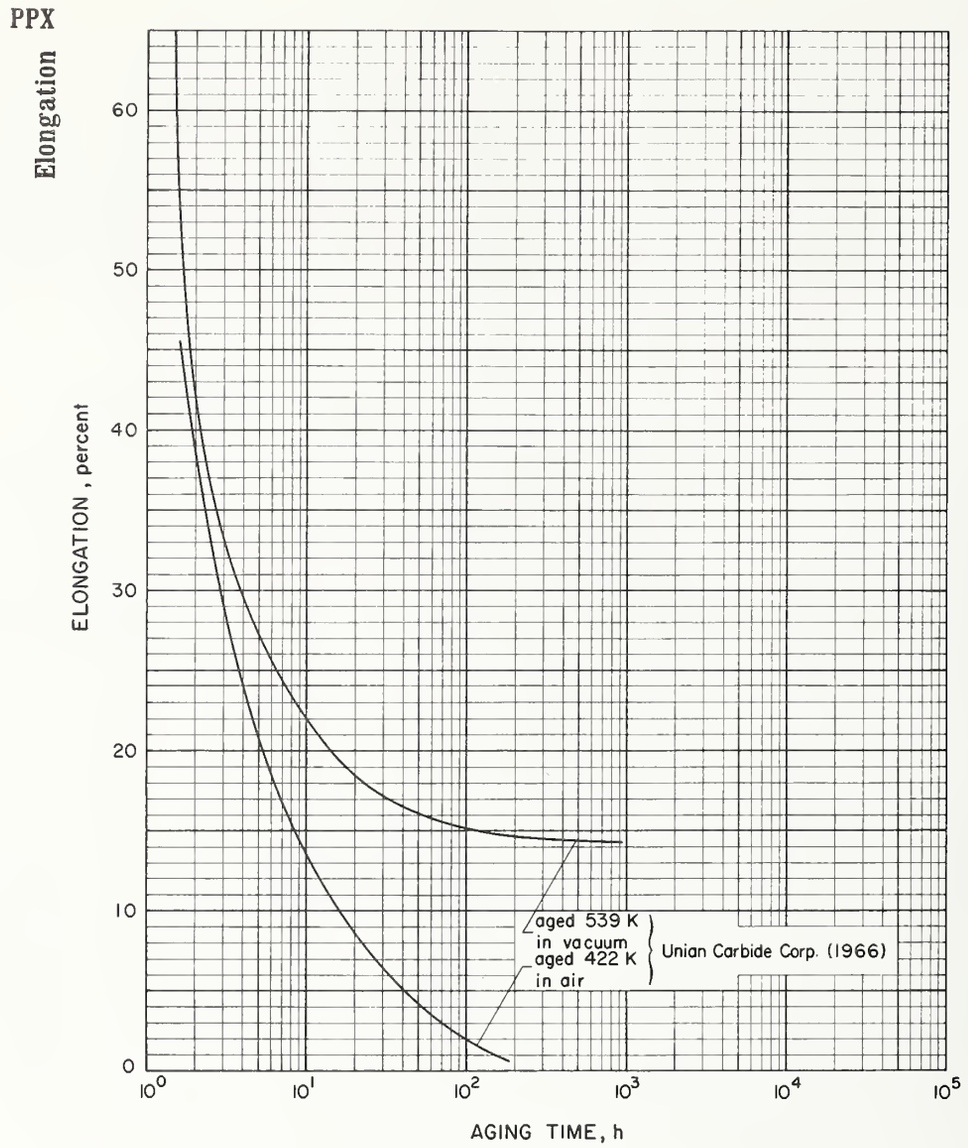


D

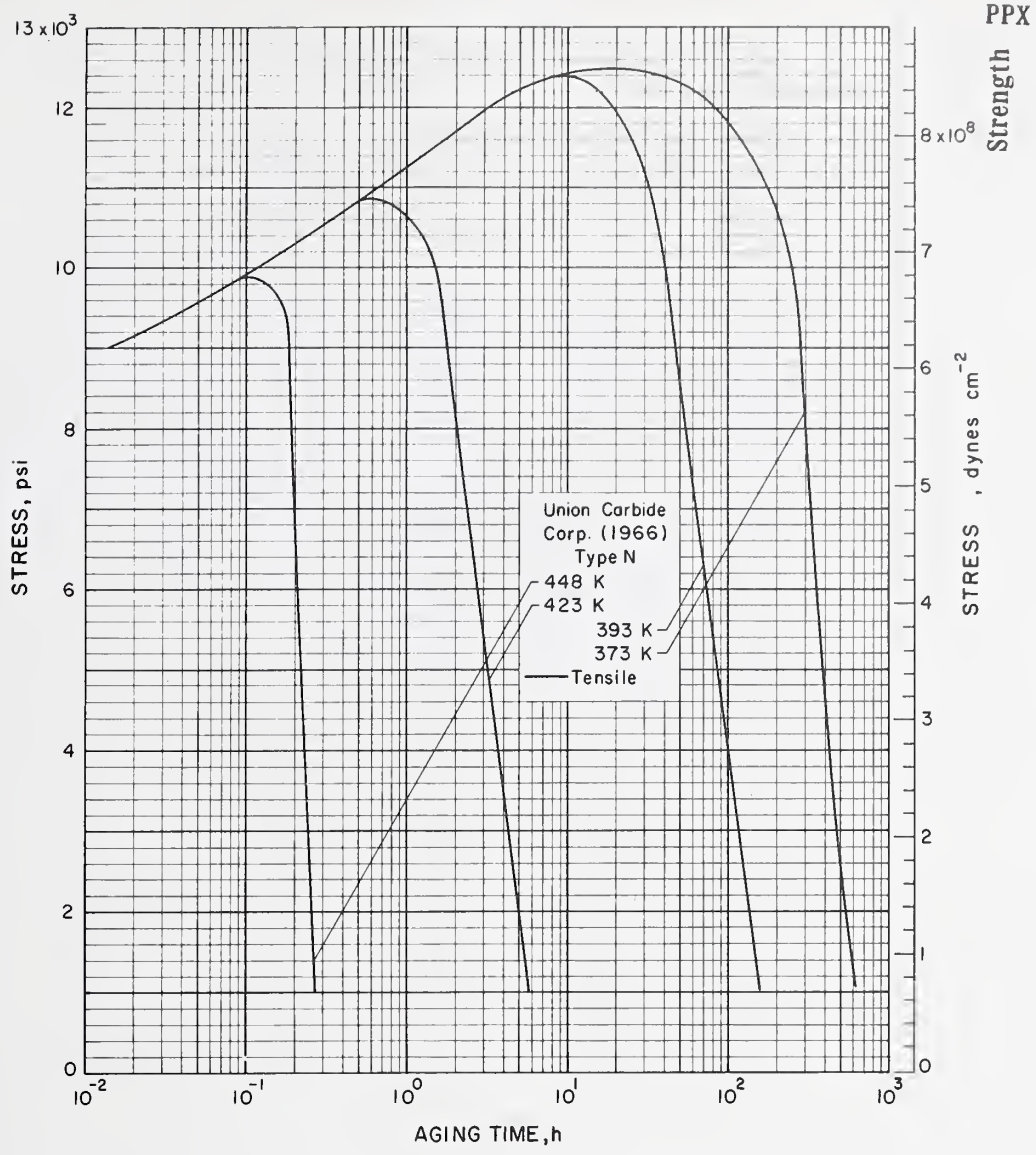


Significant Properties:	*N*	*C*
Density (295 K)	1.10–1.12 gm cm^{-3}	1.3 gm cm^{-3}
Crystalline melting point	673 K	~563 K
Molecular weight	~5000	
Crystallinity	High	Variable
Approximate transition temperature	340 K	360 K
Chemical resistance	Very good	Very good
Dielectric Constant (10^3 Hz) (295 K)	2.60	3.1
Dielectric Loss Tangent (10^3 Hz), (295 K)	0.0002	0.02

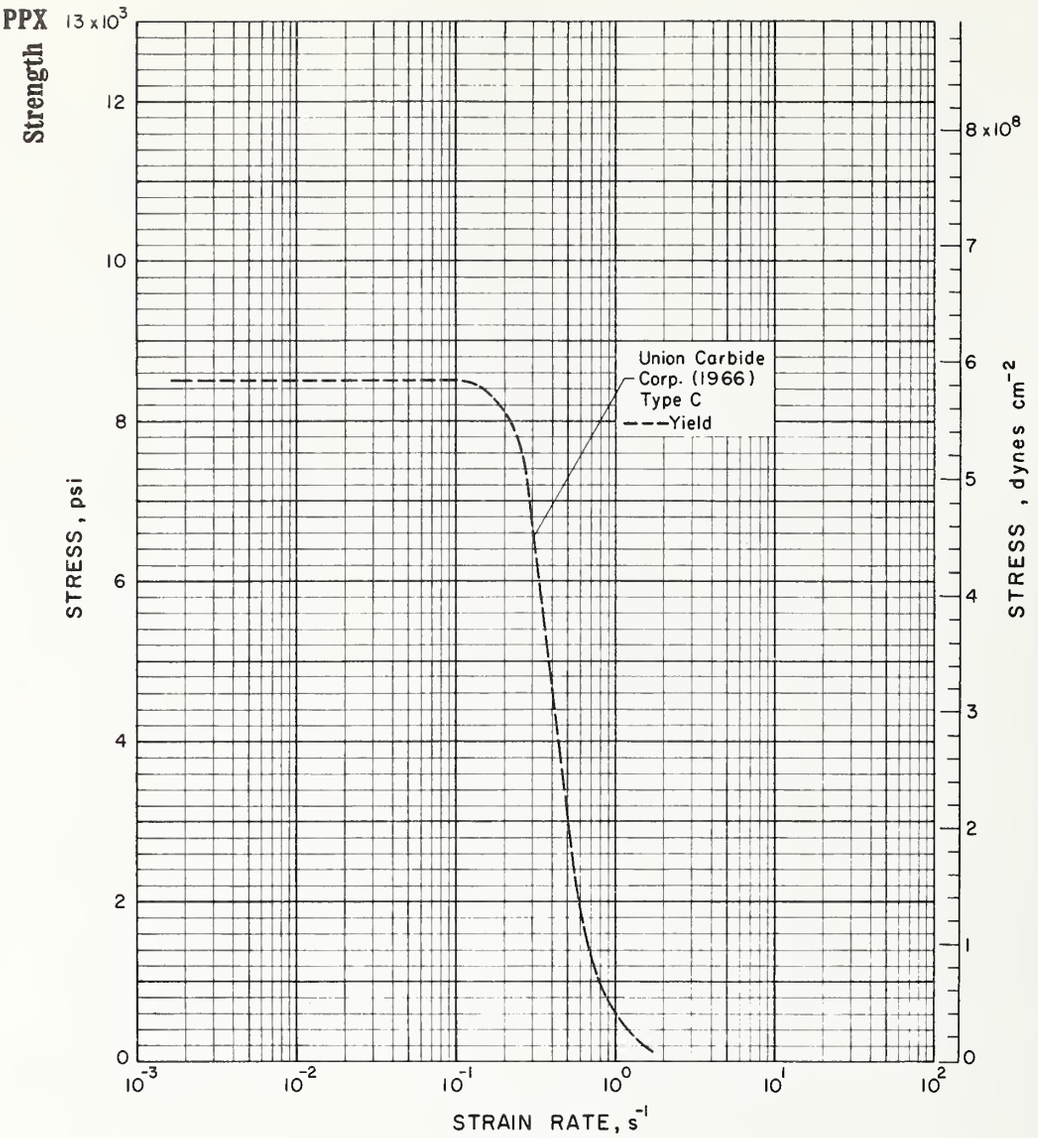
Trade names occurring in the references compiled:
Parylene



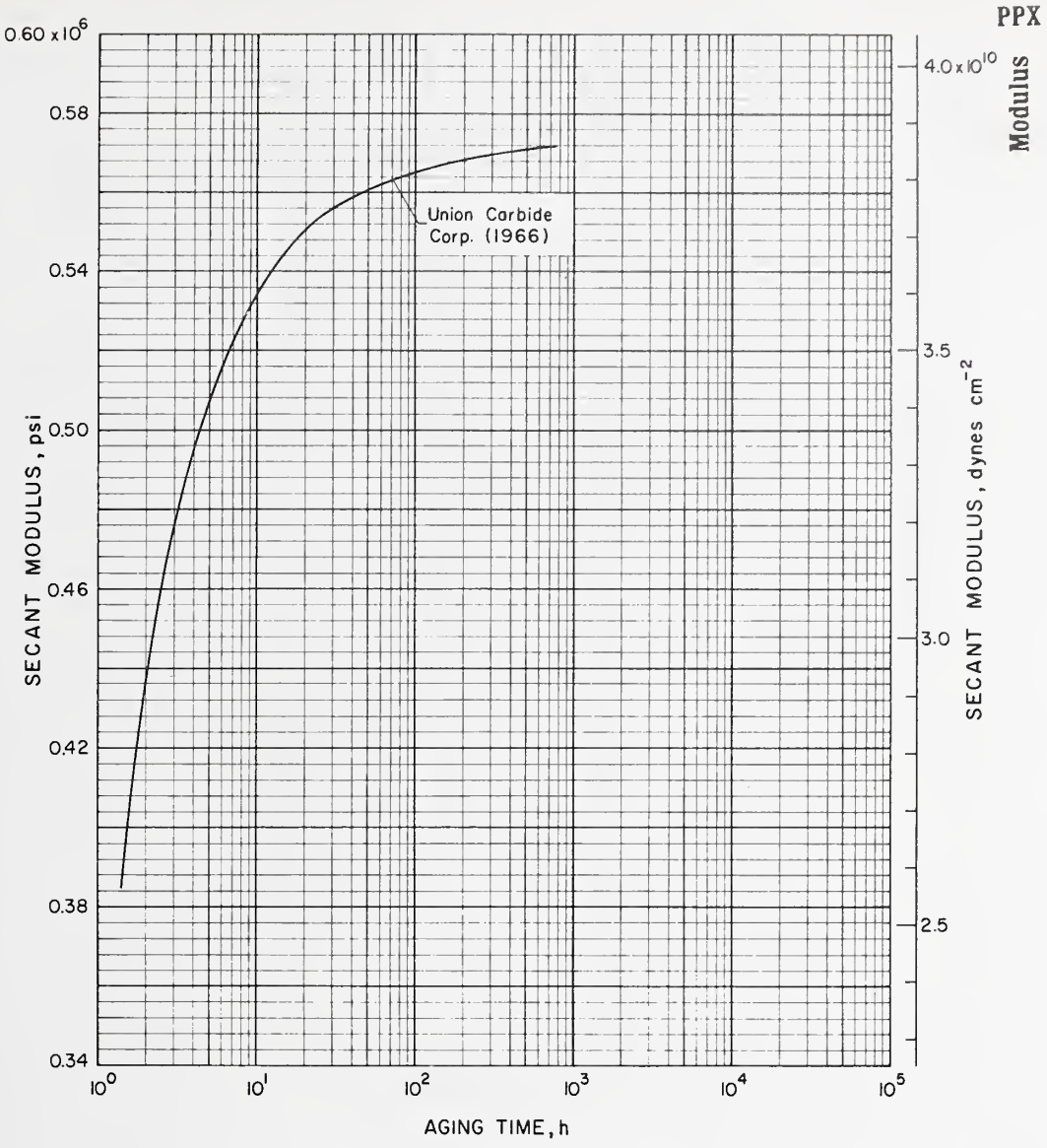
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Union Carbide Corp. (1966)	Parylene, molecular weight ≈ 500, 000	t = 0. 005 cm, film stripped from glass.



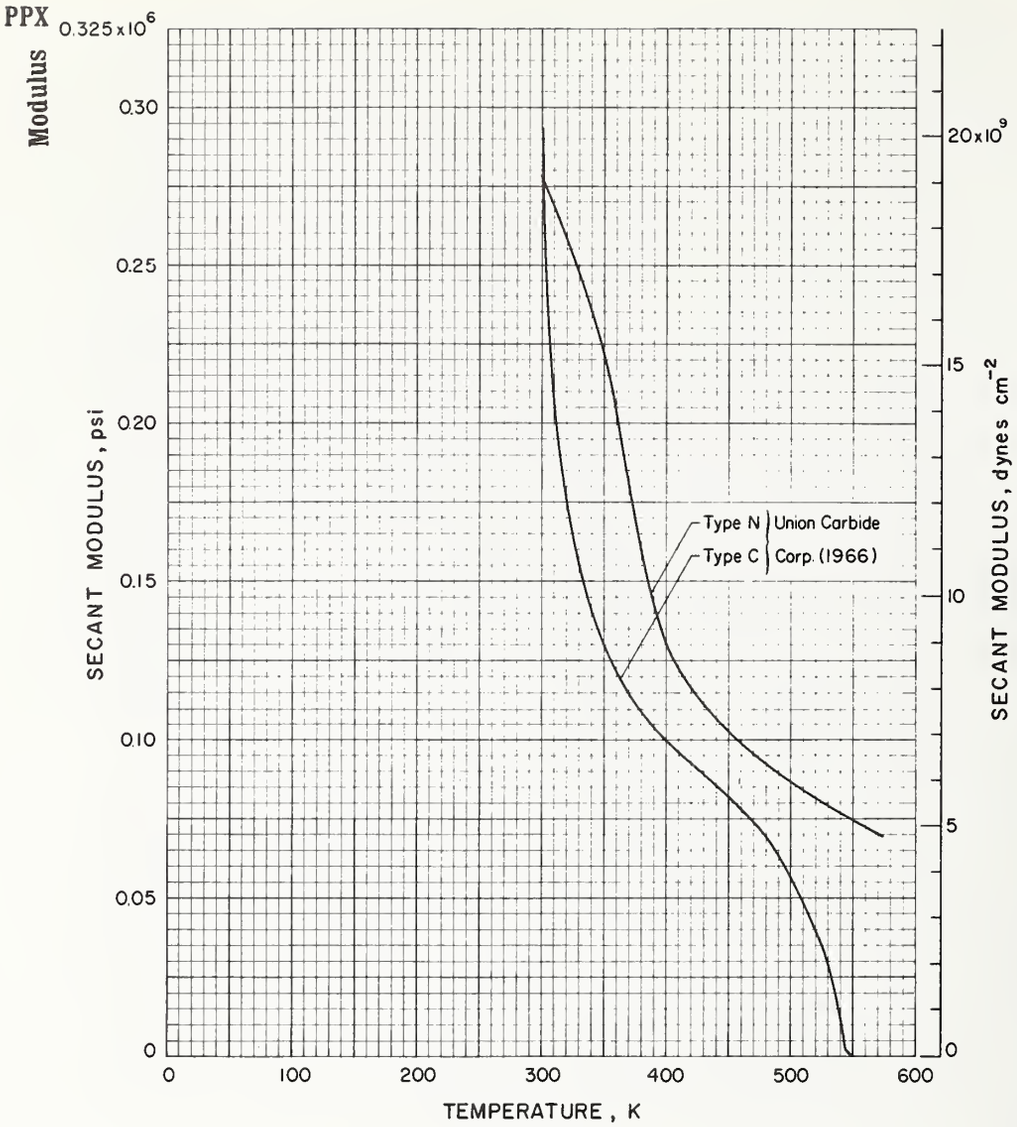
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Union Carbide Corp. (1966)	Parylene N, molecular weight ≈500, 000	t = 0. 005 cm, film stripped from glass.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Union Carbide Corp. (1966)	Parylene C, molecular weight ~ 500,000	t = 0.005 cm, film stripped from glass.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Union Carbide Corp. (1966)	Parylene, aged 539 K in vacuum or 422 K in air, molecular weight ≈ 500,000	t = 0.005 cm, film stripped from glass; 1% strain. similar results for aging at 539 K in vacuum or at 422 K in air.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Union Carbide Corp. (1966)	Parylene C and N, molecular weight ≈ 500,000	t = 0.005 cm, film stripped from glass; 1% strain

Investigator(s) (Year)	Description	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Secant Modulus 1% strain (10^6 psi)	Rockwell Hardness
Loeb (1970)	Parylene C Parylene N	10.0 6.0 - 11.0	8.0 6.1	200 20-250	0.40 0.35	R80 R85
Gorham (1966)	Parylene C, sp gr = 1.289	13.0		200	0.40	
	Parylene N, sp gr = 1.103 - 1.120	9.0		200	0.35	
Cariou (1965)		10.0		150		

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Loeb (1970)	Parylene C and N	Properties of Parylene N depend somewhat on deposition conditions.
Gorham (1966)	Parylene C, sp gr = 1.289 and Parylene N, sp gr = 1.103 - 1.120	
Cariou, Valley, Loeb (1965)	Vacuum deposited	t = 0.0025 - 0.0050 cm.

Mechanical References

1. *Cariou, F. E., Valley, D. J., Loeb, W. E.*, Poly-para-xylylene in thin film applications, IEEE Trans. on Parts, Materials, and Packaging, Vol. PMP–1, p. s–54 (1965).
2. *Gorham, W. F.*, Parylenes, Machine Design **38,** 72 (June 16, 1966).
   Clearwater, W. F., Parylene—A new thin film insulating material, Soc. Plastics Engr., SPE Look at Plastics of Tomorrow, Tech. Paper presented at meeting of Sept. 8, 1966.
   New process, new polymer—Parylene, Plastics Tech. **11,** 22 (March, 1965).
   New polymers and associated vapor deposition process provide high integrity thin insulating films, Insulation **11,** 34 (April, 1965).
   Union Carbide Corp., Bakelite Parylene, Plastics Div., 270 Park Ave., N. Y. (1966).
   Gorham, W. F., Parylenes, Machine Design **40,** 65 (Dec. 12, 1968).
3. *Loeb, W. E.*, Parylene for Electronics, Chemicals and Plastics Div., Union Carbide Corp., River Rd., Bound Brook, N. Y. (1970).
4. Union Carbide Corp., Bakelite Parylene, Plastics Div., 270 Park Ave., N. Y. (1966).

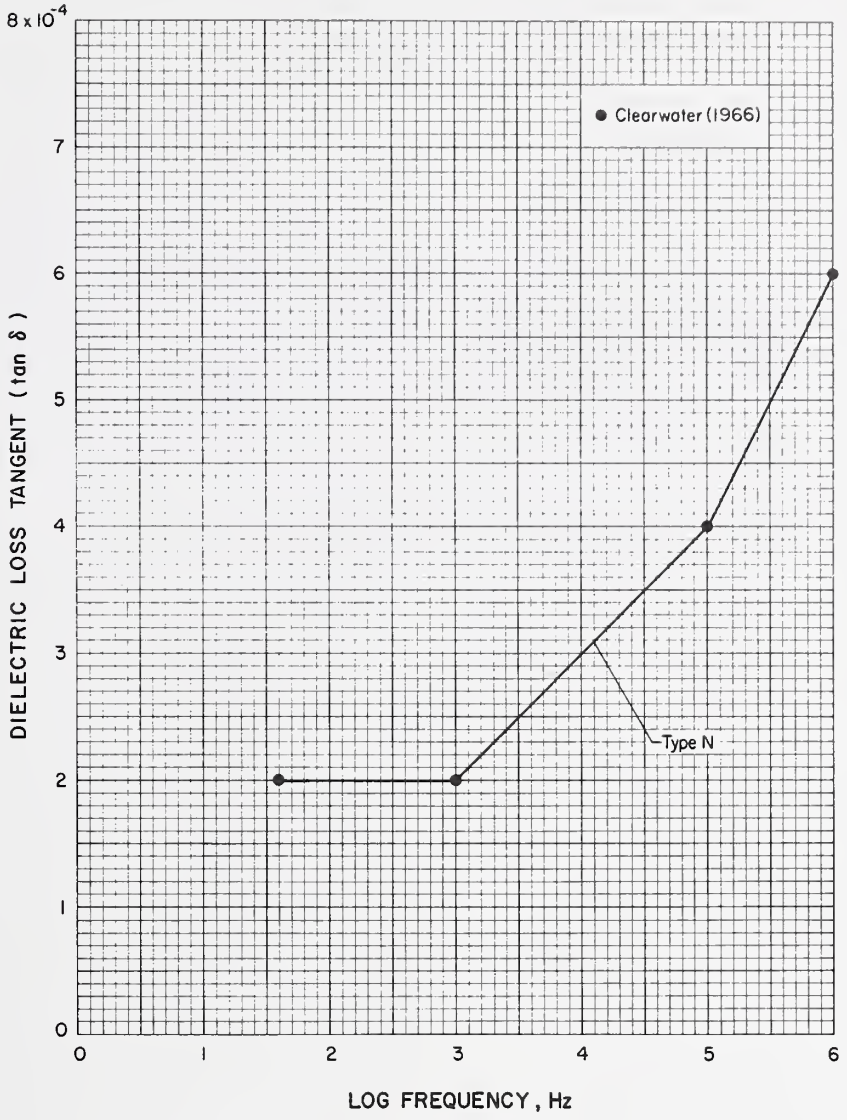
Investigator(s) (Year)	Material Identification	Temperature (K)	$\Delta L/L$ Thermal Expansion	λ Thermal Conductivity ($Wm^{-1}K^{-1}$)	α Thermal Diffusivity (cm^2s^{-1})	C_p Specific Heat ($Jg^{-1}K^{-1}$)
Loeb (1970)	Parylene Type C N	293		12.6×10^{-2}		0.71 0.84

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Loeb (1970)	Parylene type C and N	ASTM C177 test procedure.

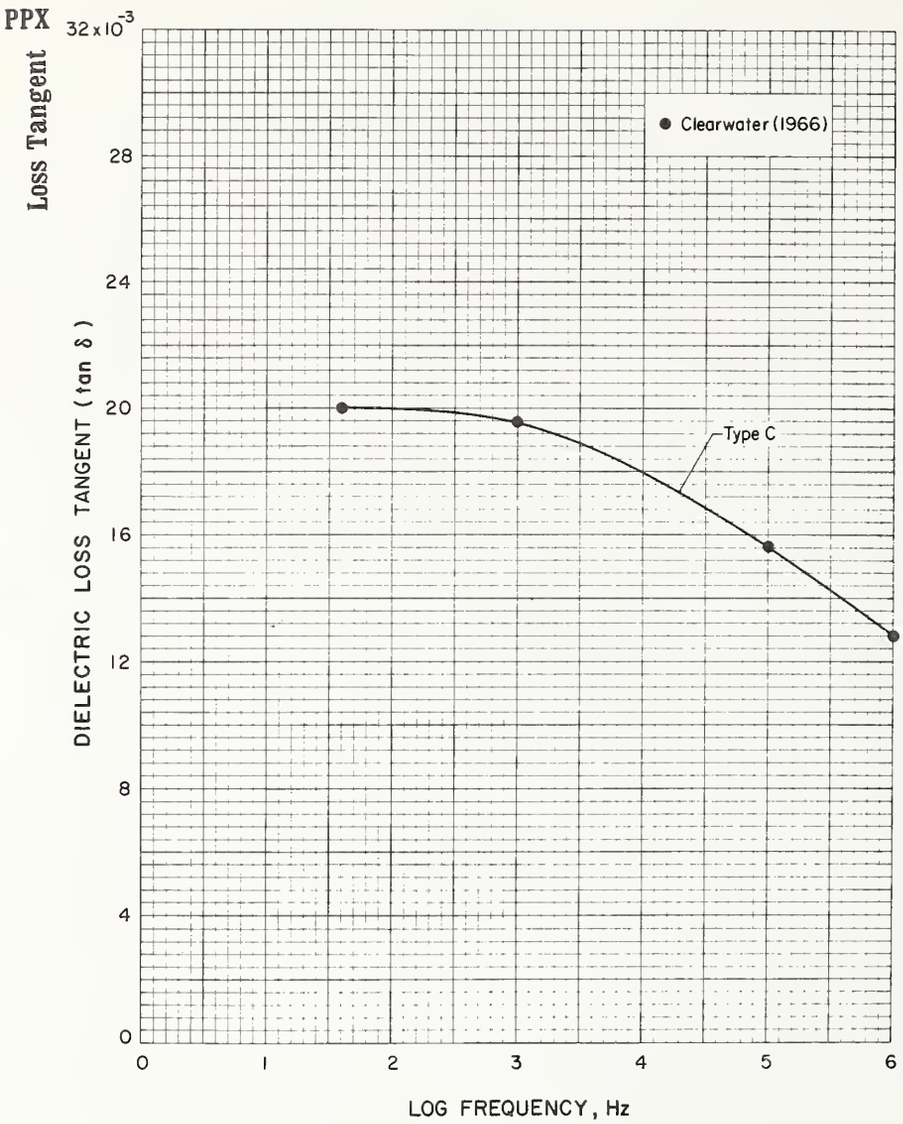
Polyparaxylylene

Thermal Reference

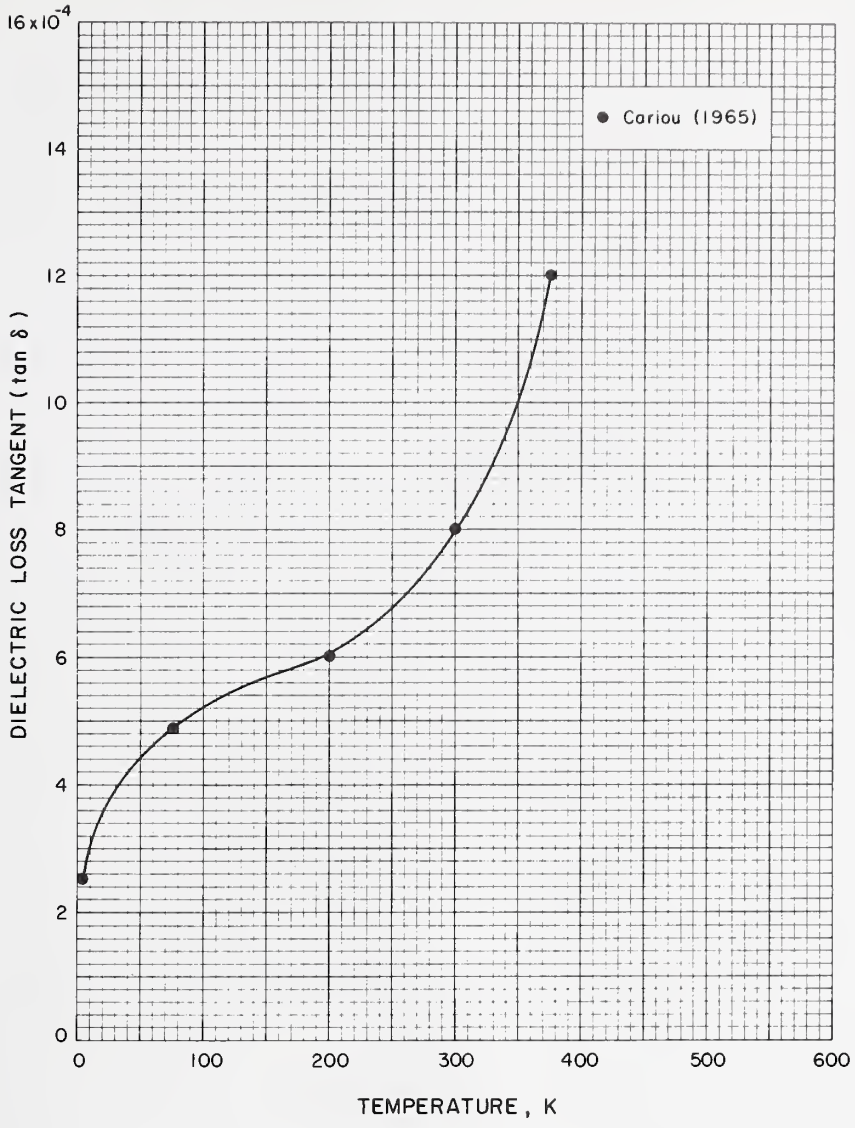
1. *Loeb, W. E.*, Parylene for Electronics, Chemical and Plastics Div., Union Carbide Corp., River Rd., Bound Brook, N. Y. (1970).



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Clearwater (1966)	Parylene type N, high molecular wt (~500, 000)	t = 0.0076 cm

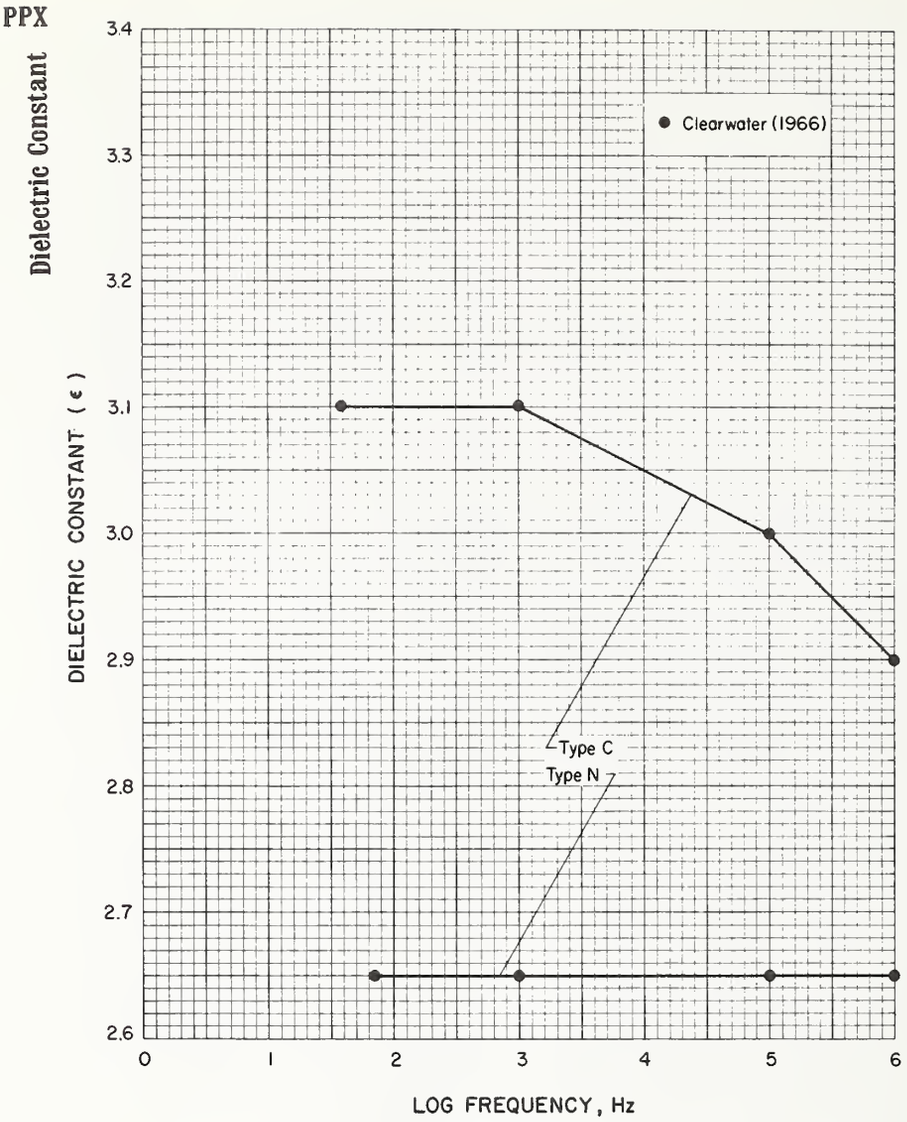


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Clearwater (1966)	Parylene type C, high molecular wt(~500, 000)	t = 0.0076 cm

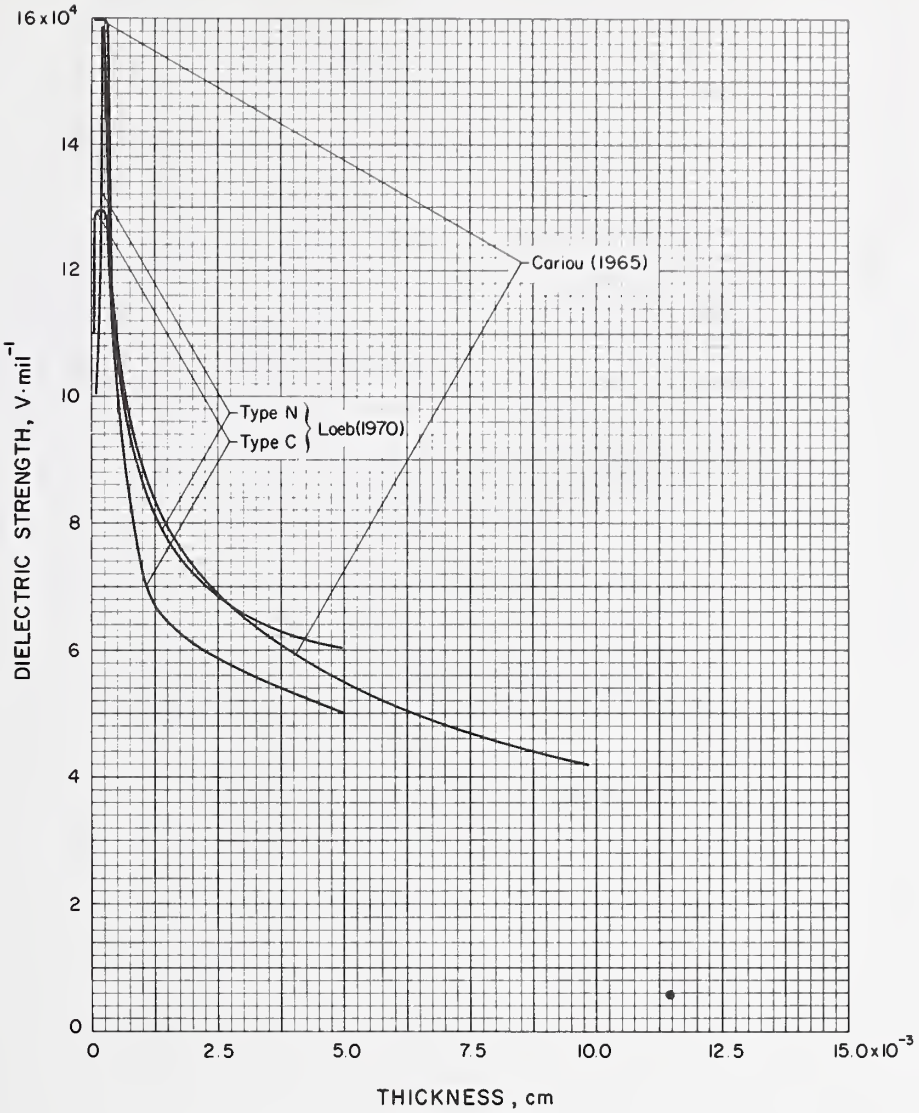


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Cariou, Valley, Loeb (1965)	Parylene, vacuum deposited. The crys solid, di-p-xylylene (dimmer), is sublimed under a vacuum at 373-498 K and pyrolyzed at about 723-1023 K. At temp <393 K this intermediate gas phase polymerizes on any surface. The resulting film is linear and of high molecular weight.	Aluminum electrodes.

PPX



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Clearwater (1966)	Parylene type C and N, high molecular wt (~500, 000)	t = 0. 0076 cm



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Loeb (1970)	Parylene type C and N	2.54 cm^2 Hg electrodes, ASTM D150-65T test procedure.
Cariou, Valley, Loeb (1965)	Parylene, vacuum deposited. The crys solid, di-p-xylylene (dimmer), is sublimed under a vacuum at 373-498 K and pyrolyzed at about 723-1023 K. At temps < 393 K this intermediate gas phase polymerizes on any surface. The resulting film is linear and of high mol wt.	Aluminum electrodes

Investigator(s) (Year)	Description	Temperature (K)	ρ Volume Resistivity (Ω cm)	Tan δ Dielectric Loss Factor x 10^4	ε Dielectric Constant	D.S. Dielectric Strength (V mil^{-1})
Clearwater (1966)	Parylene	298				
	short time } Type C					3,700
	short time } Type N					6,500
	step by step } Type C					1,200
	step by step } Type N					600
	Type C	298	8.8×10^{16}			
	Type N		1.4×10^{17}			
Bush (1965)	Parylene	298	7.0×10^{17}	0.0008-0.0010	1.70-1.77	10,160
Cariou (1965)	Parylene					
	Substrate temp, 248 K					
	Deposition rate, 300,000 Å min^{-1}	298	3.4×10^{16}	0.00019	2.64	3,700
	Thickness, 0.010 cm	398	8.4×10^{16}			
	Substrate temp, 298 K					
	Deposition rate, 4,000 Å min^{-1}	298	3.0×10^{16}	0.00011	2.63	6,000
	Thickness, 0.004 cm	398	4.7×10^{16}			
	Substrate temp, - 248 K					
	Deposition rate, 60,000 Å min^{-1}	298	3.0×10^{16}	0.00010	2.70	10,000
	Thickness, 0.0002 cm	398	5.0×10^{15}			
Storti (1968)	Parylene					
	Type C	298			3.1	3,800
	Type N				2.6	6,300

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Clearwater (1966)	Parylene type C and N, high molecular wt (~ 500,000)	t = 0.0076 cm
Bush (1965)	Parylene, vapor phase deposited.	Resistivity measurement at 500 V, electrification time 3 days, 1.4×10^5 - 2.9×10^7 Hz used in measuring tan δ and ε.
Cariou, Valley, Loeb (1965)	Parylene, vacuum deposited. The crys solid, di-p-xylylene (dimmer), is sublimed under a vacuum at 373-498 K and pyrolyzed at about 723-1023 K. At temps < 393 K this intermediate gas phase polymerizes on any surface. The resulting film is linear and of high molecular weight.	Aluminum electrodes, 10^3 Hz used in measuring tan δ.
Storti (1968)	Parylene, Type C sp gr = 1.29, Type N sp gr = 1.10 - 1.12	t = 0.0051 cm; 10^3 Hz used in measuring ε.

Polyparaxylylene

Electrical References

1. *Bush, E. L.*, The preparation and properties of polyparaxylylene, Institution Electrical Engineers, Conference paper no. 31, Vol. 12 (1965).
2. *Cariou, F. E., Valley, D. J., Loeb, W. E.*, Poly-para-xylylene in thin film applications, IEEE Trans on Parts, Materials, and Packaging, Vol. PMP–1, p. s–54 (1965).
3. *Clearwater, W. R.*, Parylene—A new thin film insulating material, Soc. Plastics Engr., SPE Look at Plastics of Tomorrow, Tech. Paper presented at meeting of Sept. 8, 1966.
   New polymers and associated vapor deposition process provide high integrity thin insulating films, Insulation **11**, 34 (April, 1965).
   New process, new polymer—Parylene, Plastics Tech. **11**, 22 (March, 1965).
   Gorham, W. F., Parylenes, Machine Design **38**, 72 (June 16, 1966).
   Gorham, W. F., Parylenes, Machine Design **40**, 65 (Dec. 12, 1968).
   Union Carbide, Parylene Product Data, Union Carbide Bulletin #J–2660–C 016–6.
4. *Loeb, W. E.*, Parylene for Electronics, Chemicals and Plastics Div., Union Carbide Corp., River Rd., Bound Brook, N. Y. (1970).
5. *Storti, G. M.*, Experimental Investigation and Analysis of Dielectric Breakdowns Induced by Electron Irradiation in Polymer Films, NASA TN D–4810, Langley Research Center, Langley Station, Hampton, Va. (1968).

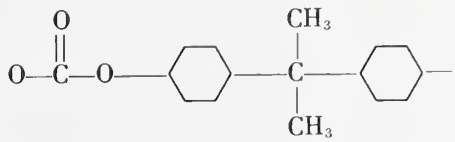
11. Polycarbonate (PC)

A. Summary

Polycarbonates are a group of polyesters formed from carbonic acid which were first developed in Germany in 1953. The most common and basic polycarbonate is poly (*bis*-phenol-A carbonate). PC crystallinity depends on the thermal history but because of high ordering in the amorphorus regions and disorder in the crystalline regions the polycarbonates have unusually high impact strength. Because of the good mechanical properties, dimensional stability, high temperature needed to distort, and ease of molding and extrusion, PC is widely used for structural plastic parts such as machinery housing, gear wheels, valve parts, telephones, and safety equipment. Many of its properties can be modified by slight chemical changes. Adding methyl groups to the two rings, for example, lowers the glass transition and increases ductility. Ading halogens, however, increases T_g and the hardness. Because of this flexibility, the polycarbonates have been growing in use. Other useful properties include its transparency, good electrical properties, and good resistance to creep.

PC

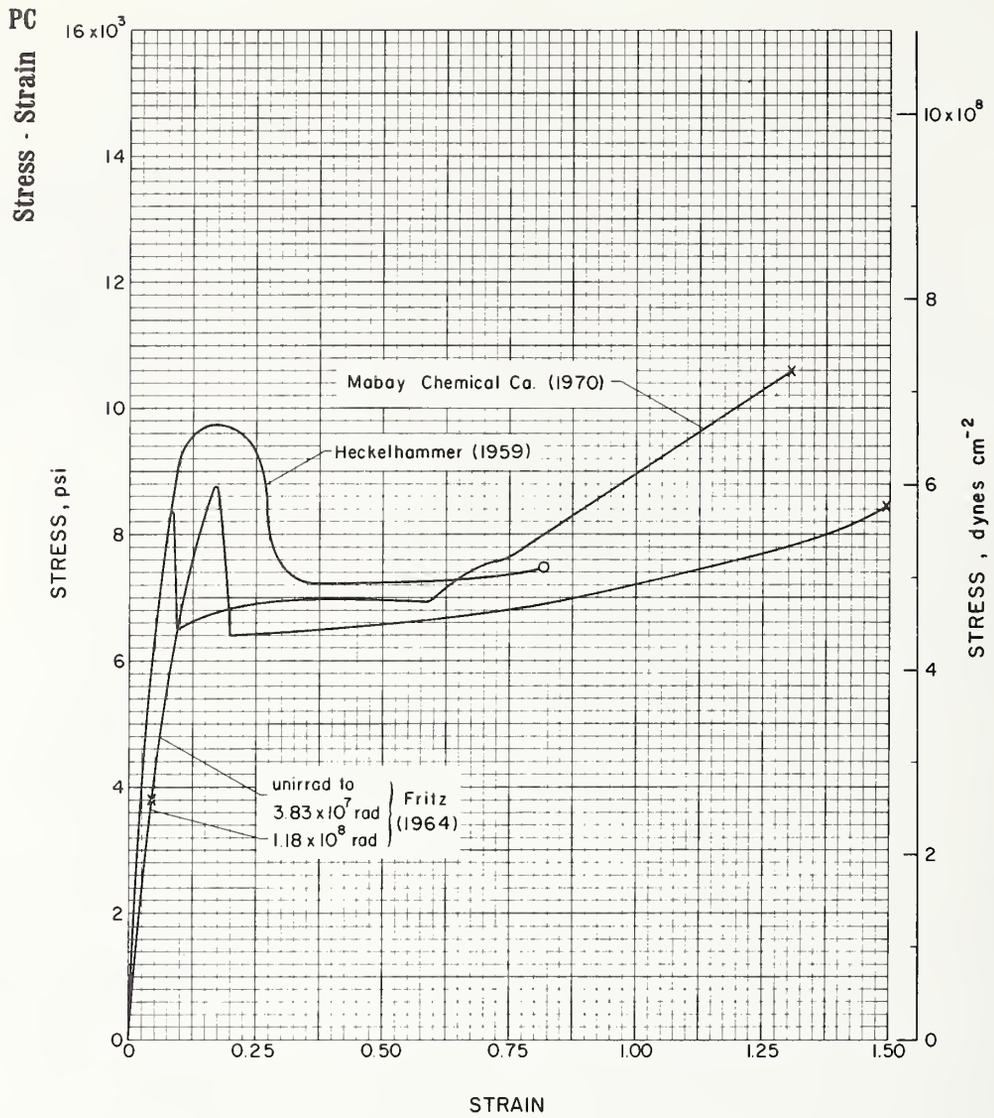
Chemical Structure



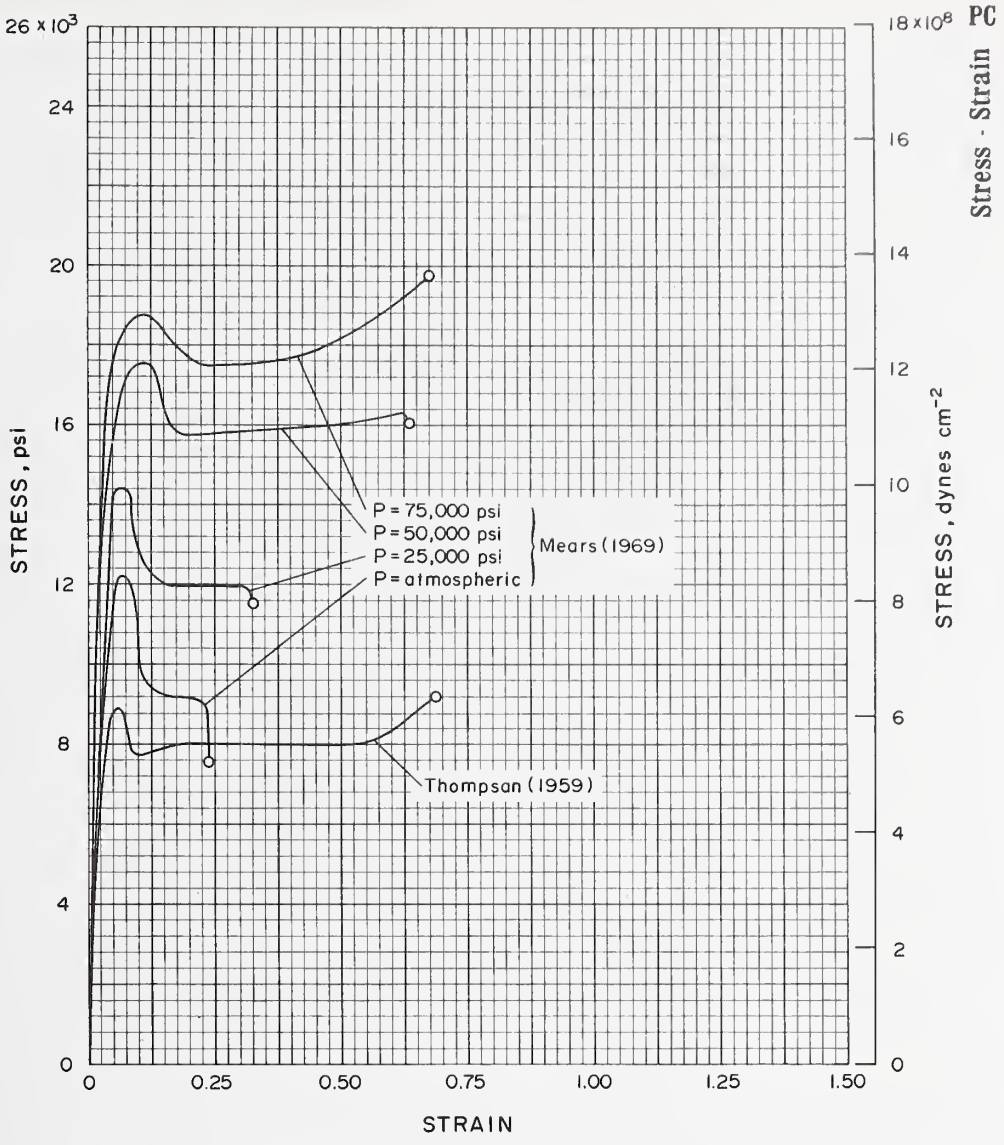
Significant Properties:

Density (295 K)	$\sim$1.2 gm cm^3
Crystalline melting point	535 K
Molecular weight	$\sim$50,000
Crystallinity	Variable
Approximate transition regions	160–250 K, 330–380 K, 430–510 K
Chemical resistance	Good
Flammability	Self extinguishing
Tensile strength (295 K)	8,000 psi
Thermal expansion coefficient (295 K)	6×10^{-5} K^{-1}
Dielectric constant (800 Hz), (295 K)	2.95
Dielectric loss tangent (10^5 Hz), 295 K)	0.003

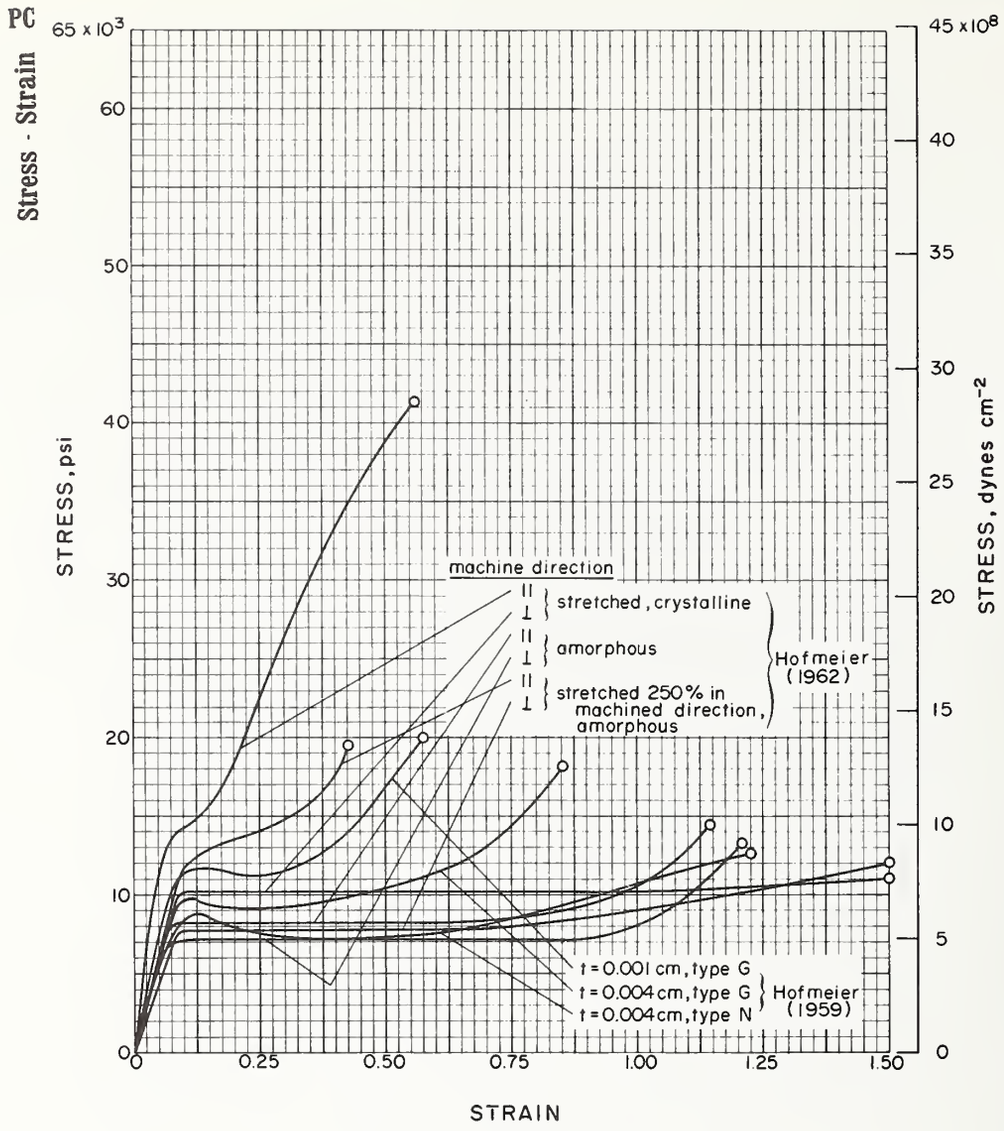
Trade names occurring in the references compiled:
Iupilon, Lexan, Makrofol, Makrolon, Merlon, and Panlite.



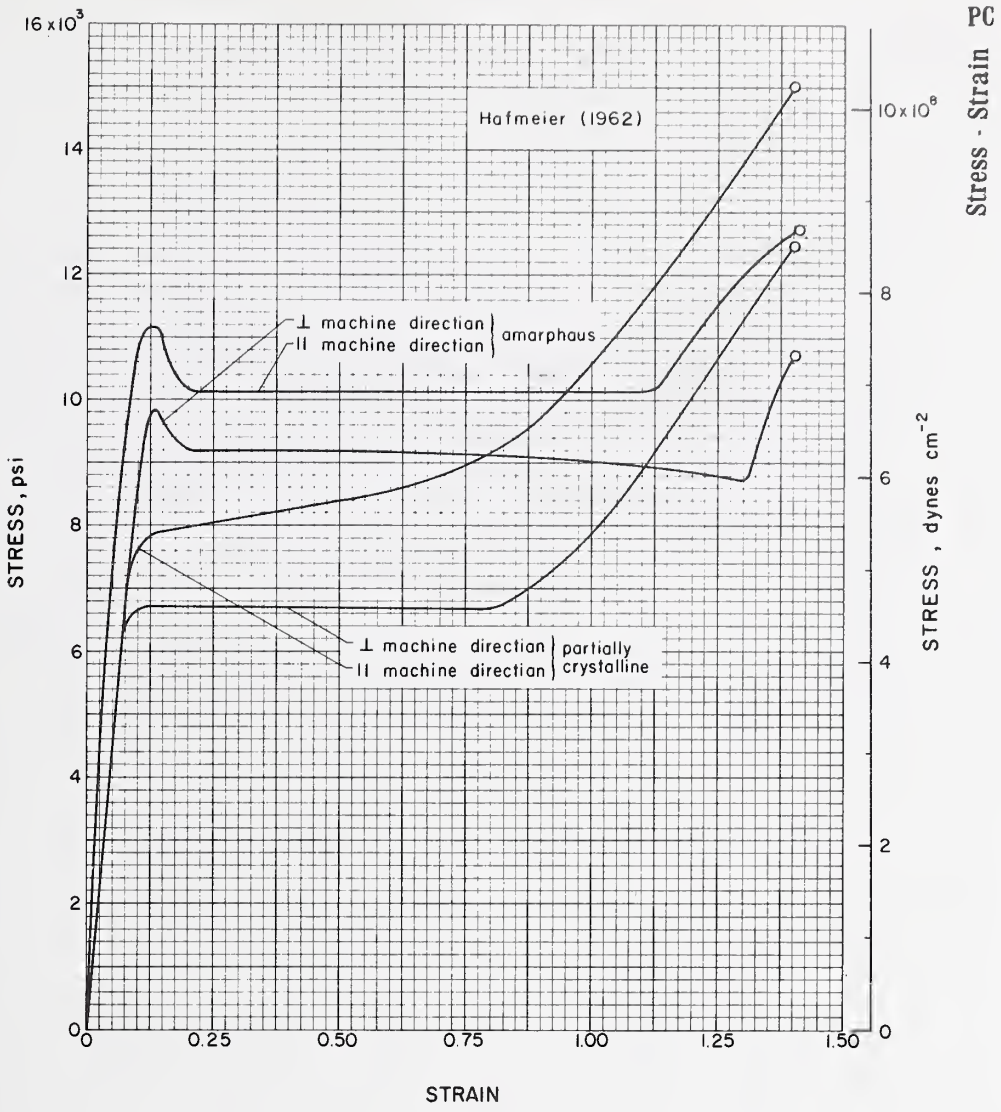
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Hechelhammer, Peilstöcker (1959)	Makrolon, sp gr = 1.20	DIN 53455 test procedure.
Fritz (1964)	Merlon, poly [2, 2-propane-bis-(4-phenyl carbonate)], sp gr = 1.2	Router milled to t = 0.638 ± 0.008 cm, dumbbell specimens as per ASTM D 638-61T, GL = 5.72 cm; Instron, xhd spd = 0.0085 cm s^{-1}, $\dot{\epsilon}$ = 0.00148 s^{-1}; specimens wrapped in Al foil and irrad by the Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics, Fort Worth, specimens stored at 296 ± 3 K for 4 days before testing; curve represents av of 15 tests for each irradiation level, results were nearly identical for unirrad specimens and those which had received 3.07 x 10^8, 6.8 x 10^8, 1.53 x 10^7, and 3.83 x 10^7 rads.
Mobay Chemical Co. (1970)	Merlon	ASTM D 638 test procedure, typical curve.



INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thompson (1959)	Lexan	
Mears, Pae (1969)	Lexan, 1. 27 cm diam extruded rods	Machined to GL = 2. 54 cm, diam = 0. 64 cm; xhd spd = 0. 0042 cm s^{-1}, specimen subjected to pressure noted during test; each curve is the av of 3 tests.



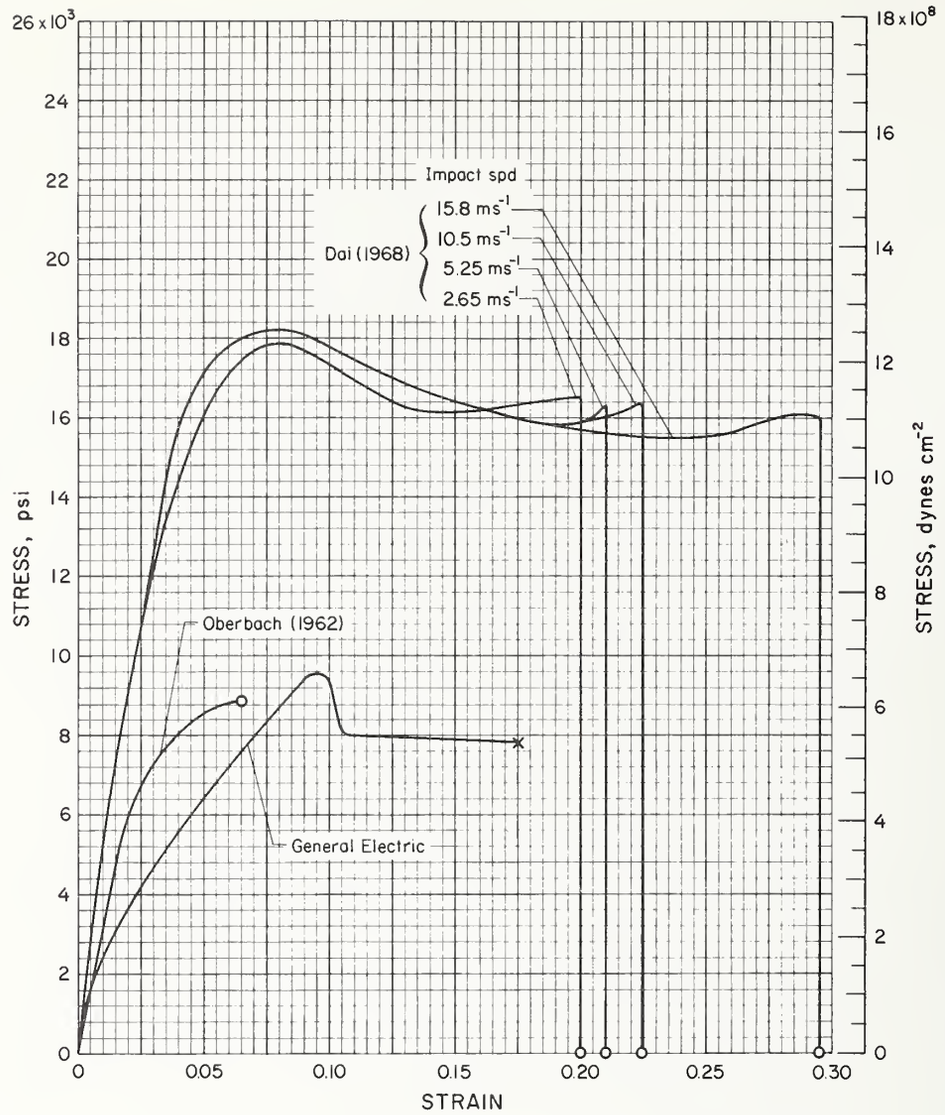
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Hofmeier (1959)	Makrofol G and N	
Hofmeier (1962)	Poly-[2, 2-bis (4-hydroxyphenyl)-propane-carbonate]	t = 0.002 cm.



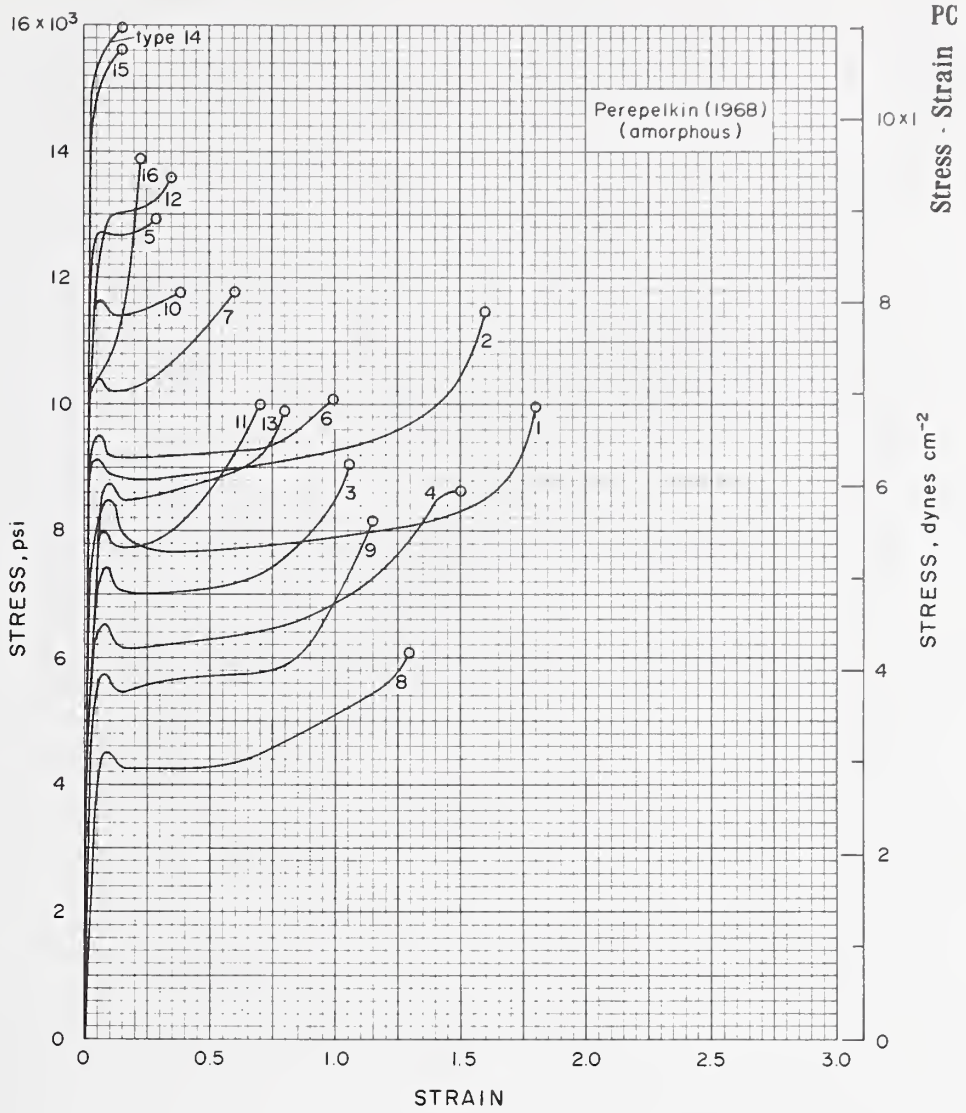
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Hofmeier (1962)	Poly-[2, 2-bis (4-hydroxyphenyl)-propane-carbonate]	t = 0. 007 cm.

PC

Stress - Strain



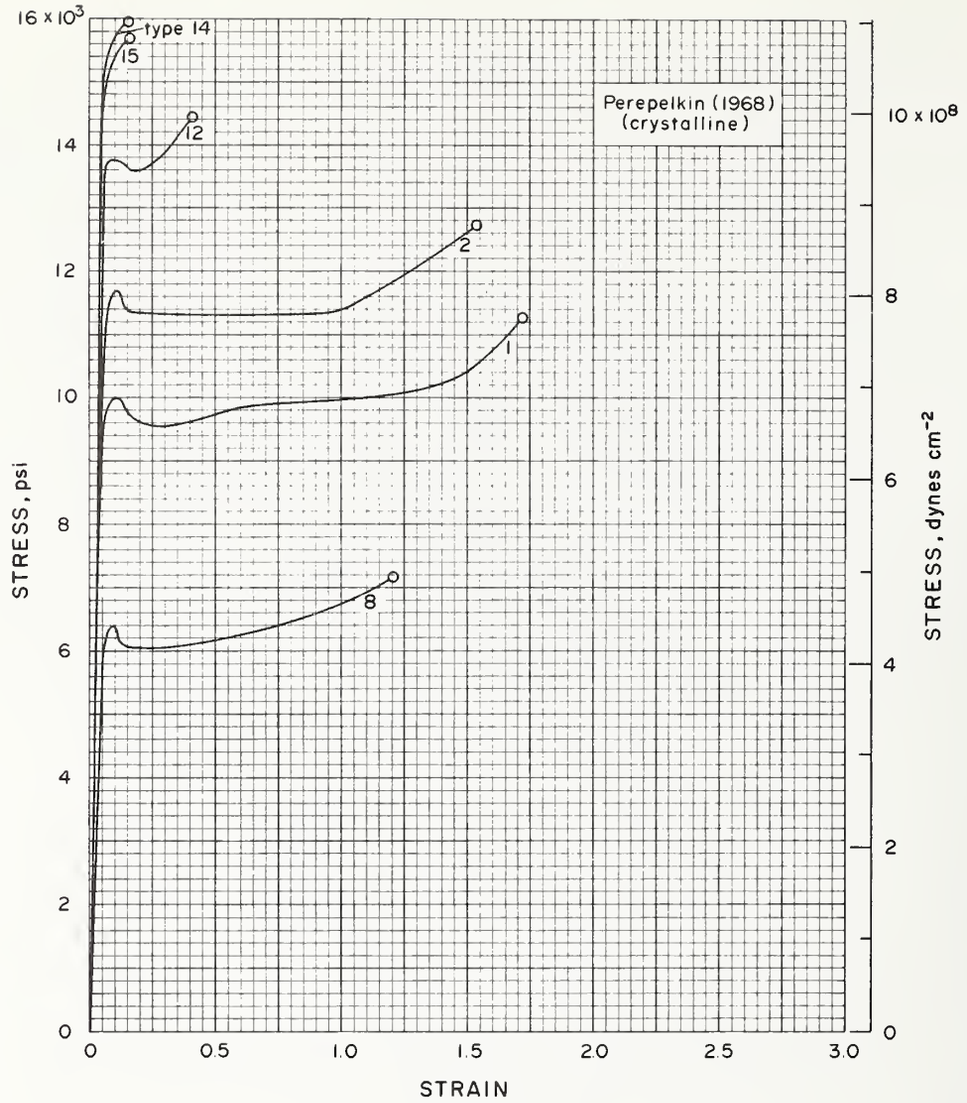
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
General Electric	Lexan 500	
Oberbach, Paffrath (1962)	Makrolon	DIN 53455 test procedure, 295 K, 55% rel hum.
Doi, Sakagami (1968)		Red Sec ℓ = 15.0 cm, w = 1.0 cm; tested under impact.



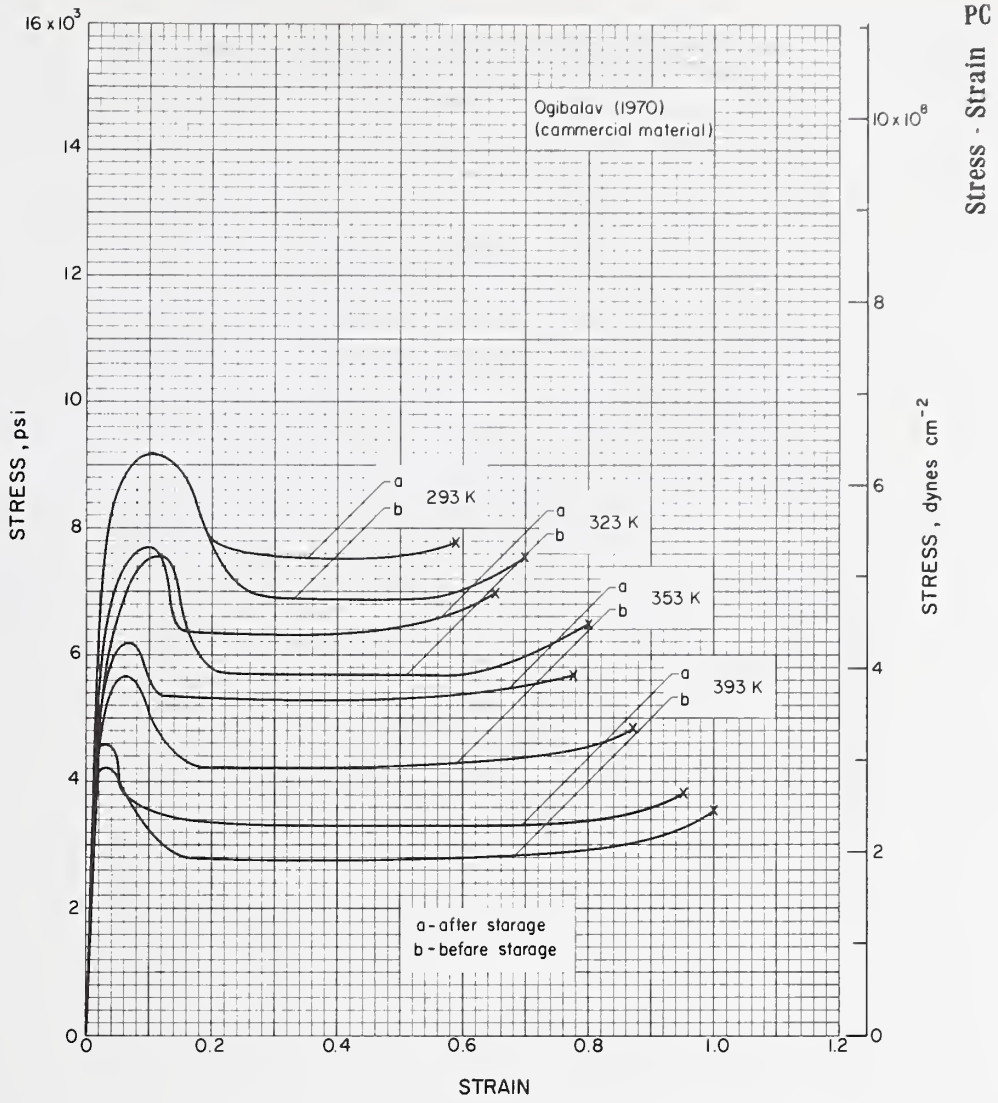
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Perepelkin, Kozlov (1968)	Molecular weight ≃ 60, 000, produced from solution, amorphous: basis for type 1 is 4, 4′-dihydroxydiphenylmethane; type 2 is 4, 4′-dihydroxydiphenyl-2, 2′-propane; type 3 is 4, 4′-dihydroxydiphenyl-2, 2-butane; type 4 is 4, 4′-dihydroxydiphenyl-1, 1-butane; type 5 is 4, 4′-dihydroxytriphenylmethane; type 6 is 4, 4′-dihydroxydiphenyl-1, 1-cyclopentane; type 7 is 4, 4′-dihydroxydiphenyl-1, 1-cyclohexane; type 8 is 4, 4′-dihydroxy-3, 3-dimethydiphenylmethane; type 9 is 4-4′-dihydroxy-3, 3′-dimethyldiphenyl-2, 2′-propane; type 10 is 4-4′-dihydroxy-2, 2-dimethyltriphenylmethane; type 11 is 4, 4′-dihydroxy-3, 3′-dimethyldiphenyl-1, 1′-cyclohexane; type 12 is 4, 4′-dihydroxy-3, 3′-dichlorodiphenyl-2, 2-propane; type 13 is dihydroxy-3, 3′-dichloro-5, 5′-dimethyldiphenyl-2, 2-propane; type 14 is 4, 4′-dihydroxy-3, 3′, 5, 5′-tetrachlorodiphenyl-2, 2-propane; type 15 is 4, 4′-dihydroxy-3, 3′, 5, 5′-tetrabromodiphenyl-2, 2-propane; type 16 is 4, 4′-dihydroxy-3, 3′-dichlorodiphenyl-1, 1-cyclohexane	t = 0. 0075-0. 0085 cm; Polanyi type dynamometer, xhd spd = 0. 0017 cm s^{-1}, 293 K.

PC

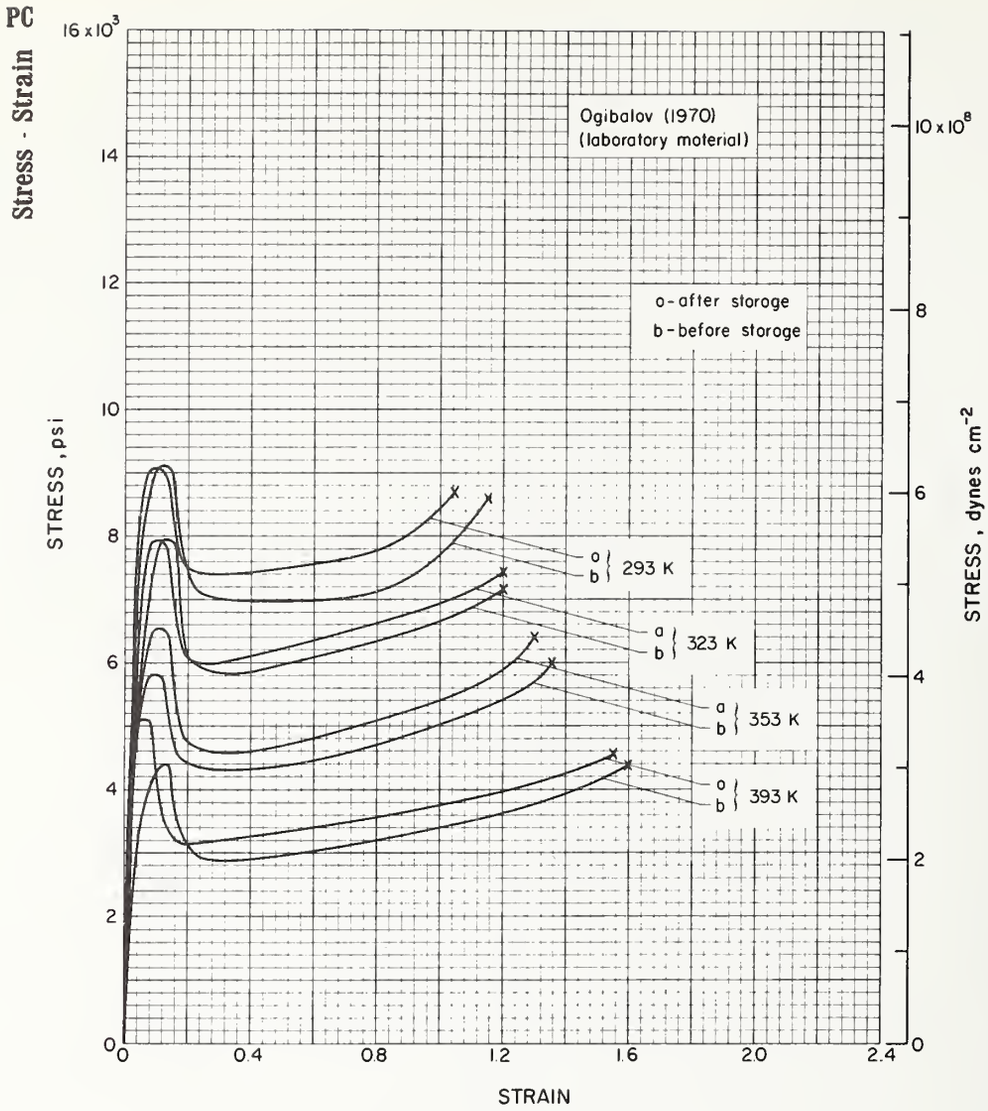
Stress - Strain



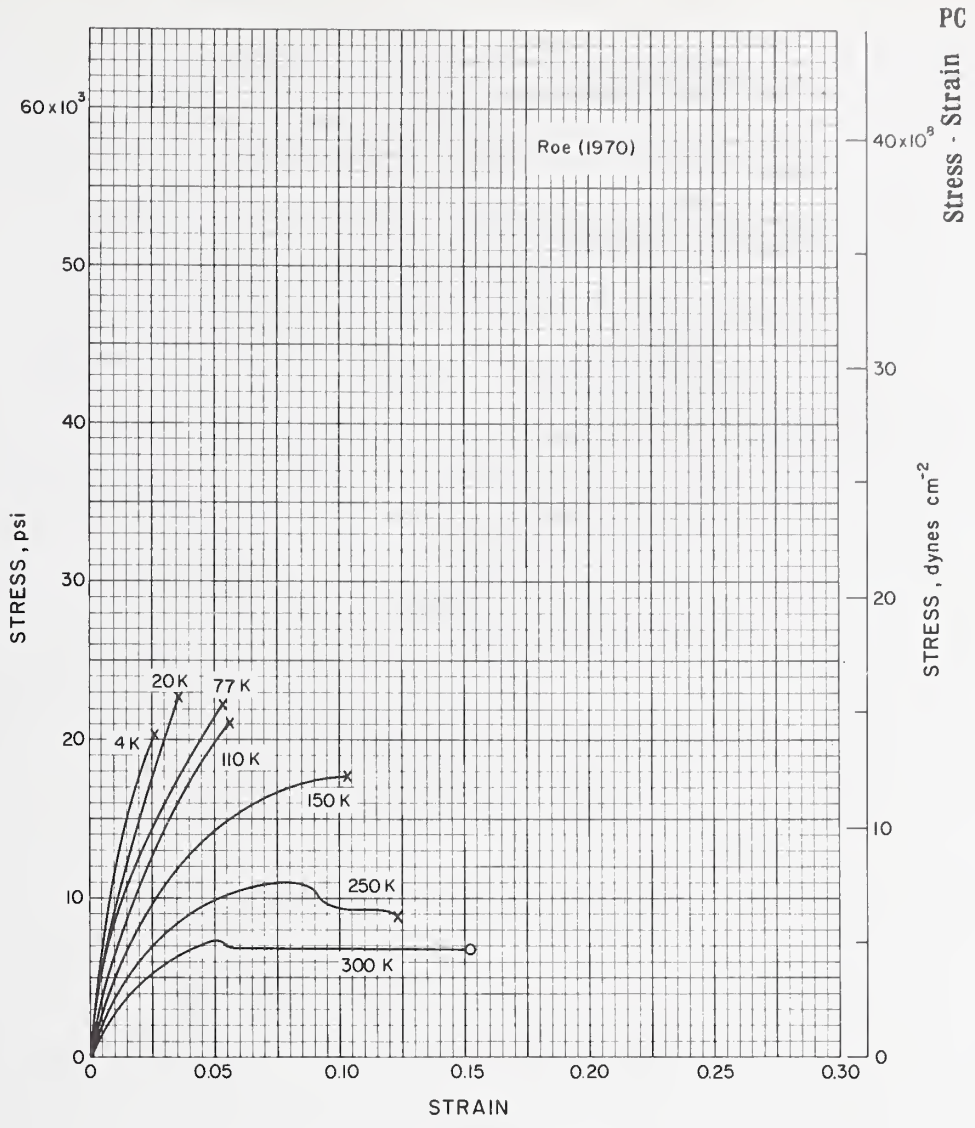
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Perepelkin, Kozlov (1968)	Molecular weight ≃ 60,000, produced by slow evaporation of methylene dichloride or tetrachlorethane at 293 K from solution, crystalline: basis for type 1 is 4, 4′-dihydroxydiphenylmethane; type 2 is 4, 4′-dihydroxydiphenyl-2, 2′-propane; type 8 is 4, 4′-dihydroxy-3, 3-dimethydiphenylmethane; type 12 is 4, 4′-dihydroxy-3, 3′-dichlorodiphenyl-2, 2-propane; type 14 is 4, 4′-dihydroxy-3, 3′, 5, 5′-tetrachlorodiphenyl-2, 2-propane; type 15 is 4, 4′-dihydroxy-3, 3′, 5, 5′-tetrabromodiphenyl-2, 2-propane	t = 0.0075-0.0085 cm; Polanyi type dynamometer, xhd spd = 0.0017 cm s^{-1}, 293 K.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ogibalov, Moroz (1970)	Makrolon	Tested before and after storage for 4 years at 291-293K in a dark dry location.



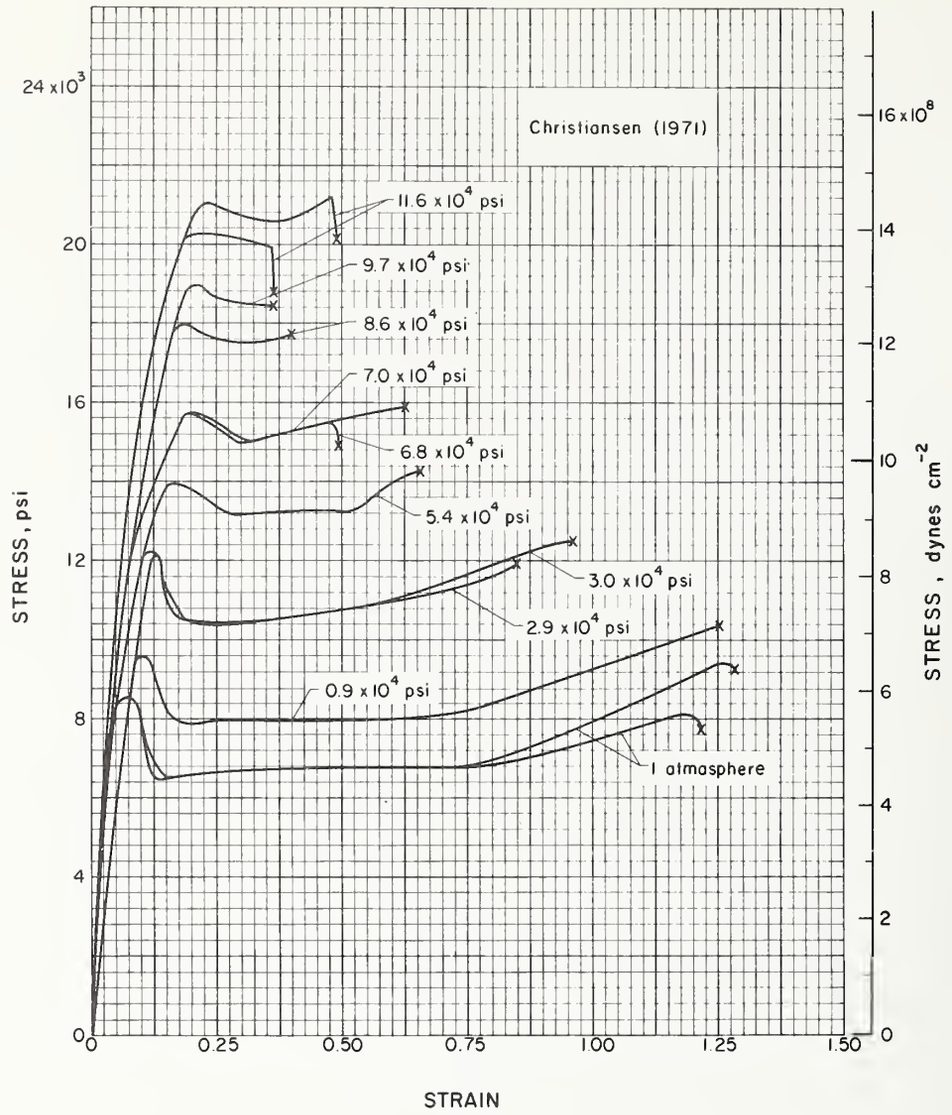
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ogibalov, Moroz (1970)	Laboratory produced polymer	Tested before and after storage for 2 years at 291-293K in a dark, dry location.



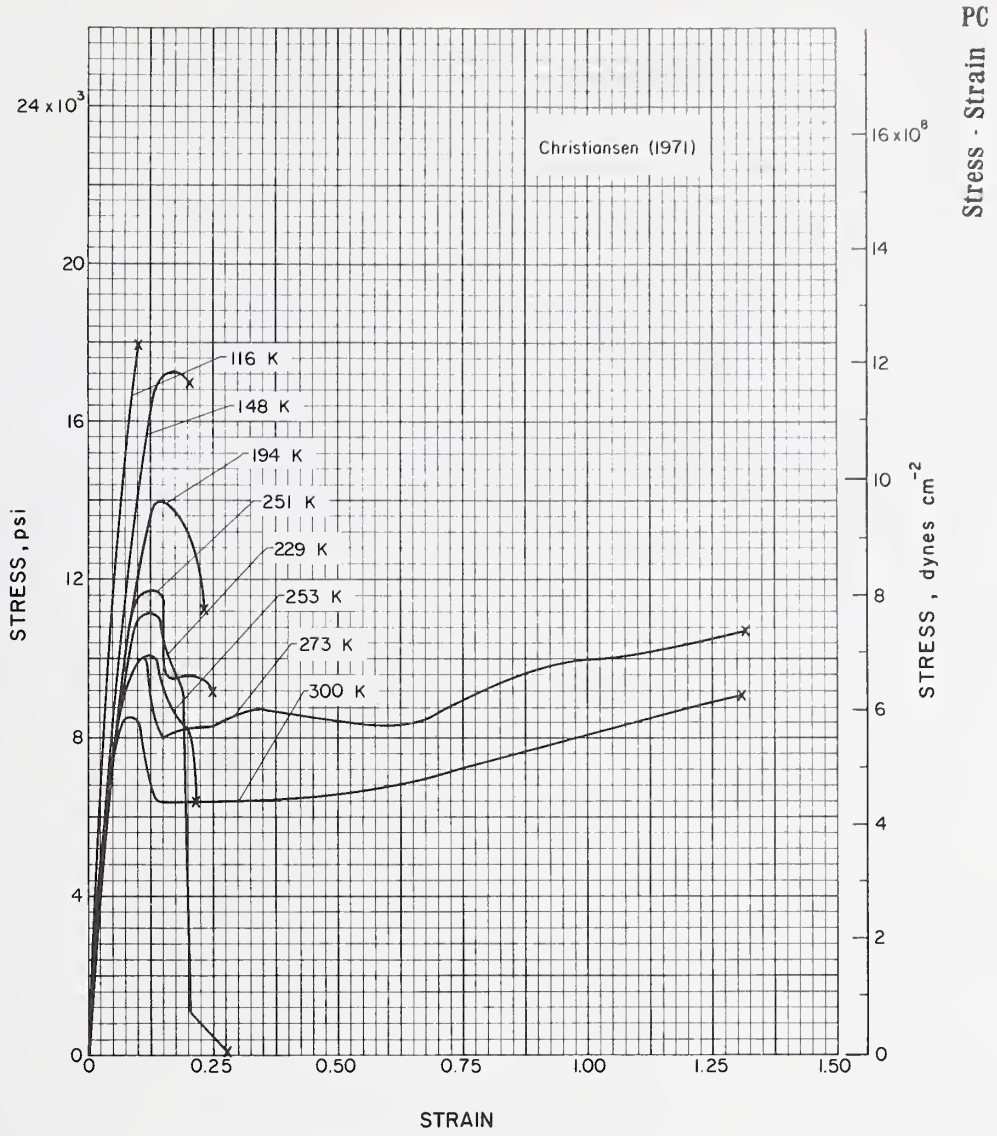
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Roe (1970)	Lexan, amorphous film cast from melt and rapidly quenched	Red Sec 6.0 x 1.27 x 0.013 - 0.025 cm; Instron.

PC

Stress - Strain

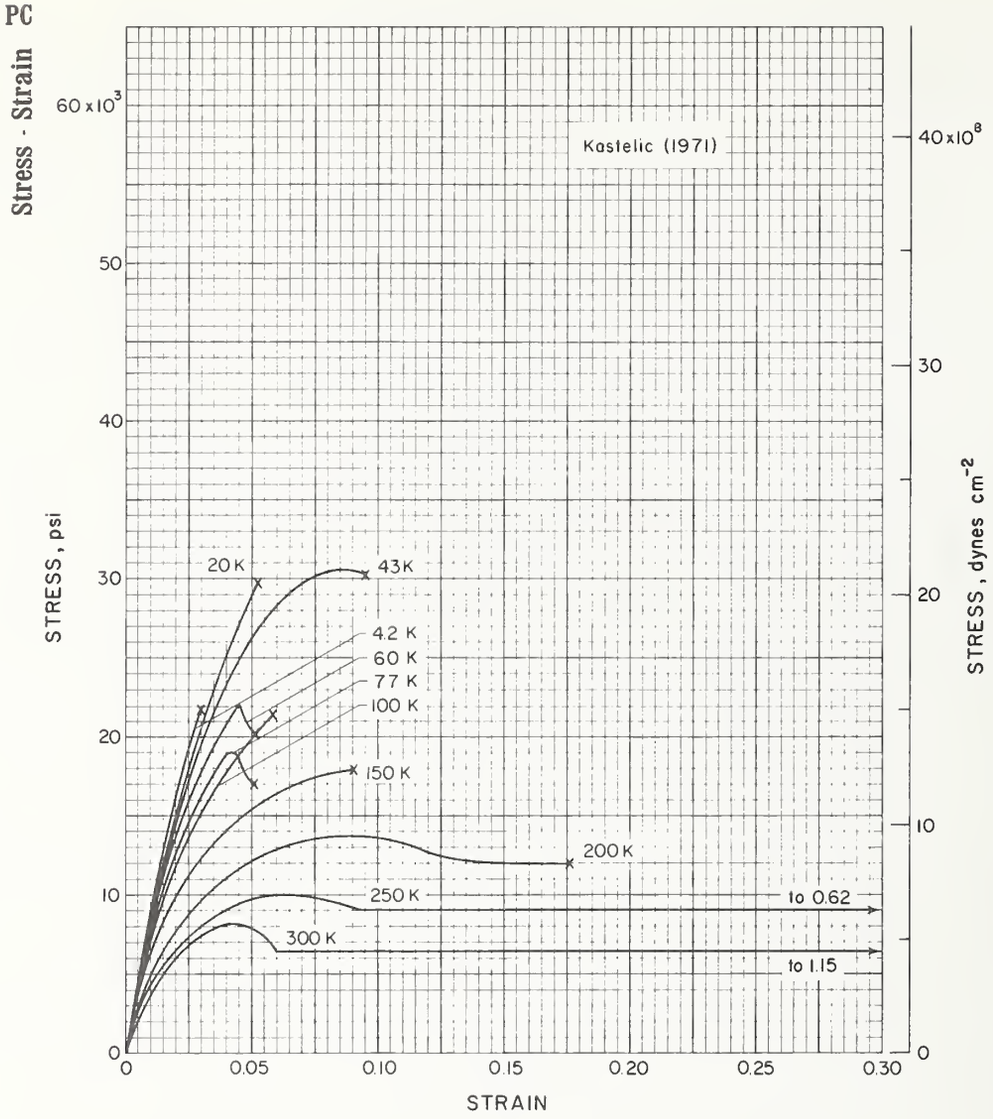


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Christiansen, Baer, Radcliffe (1971)	Merlon, poly (bisphenol A carbonate), molecular weight = 35,000-36,000	Molded bars, 1.27 cm square; measurements made while the samples were under a hydrostatic pressure transmitted through castor oil, xhd spd = 0.00025 cm s^{-1}, 300 K, pressure noted.

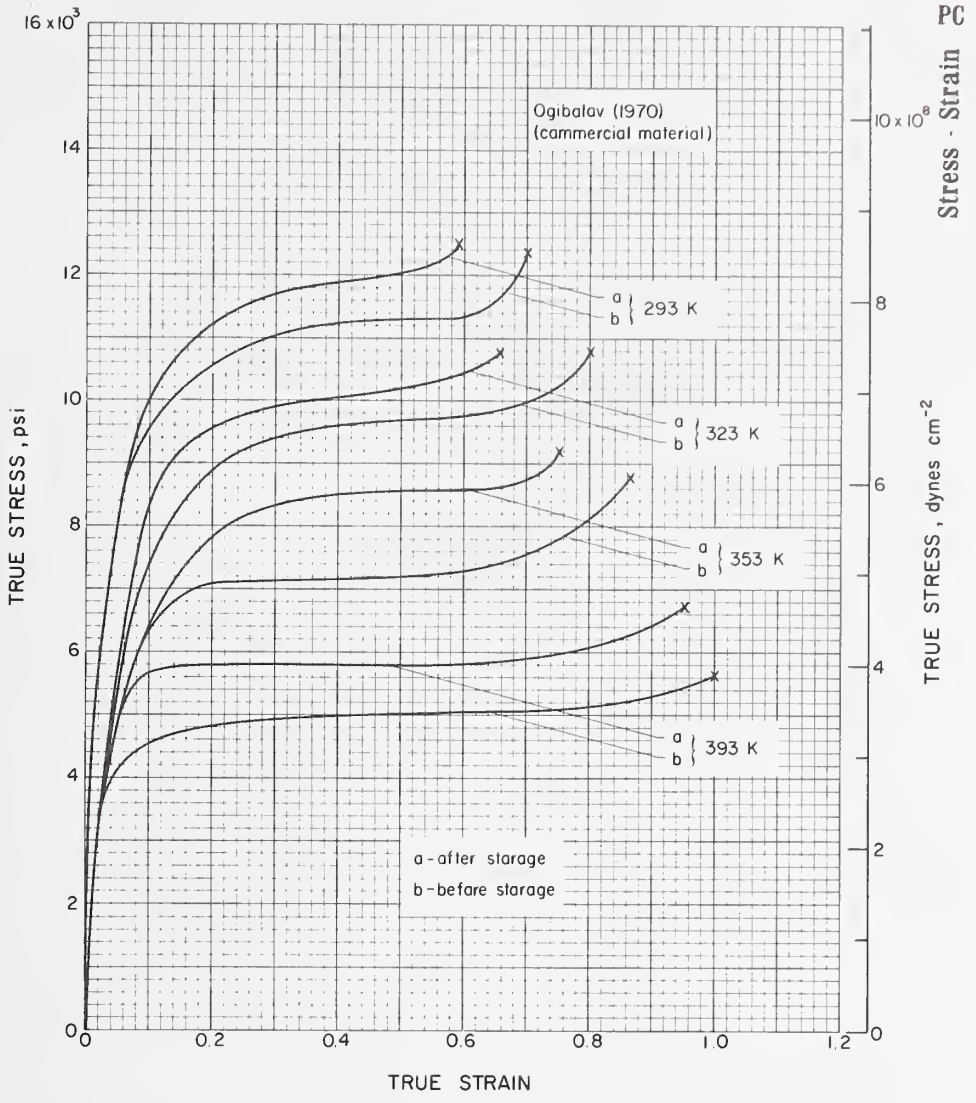


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Christiansen, Baer, Radcliffe (1971)	Merlon, poly (bisphenol A carbonate), molecular weight = 35,000-36,000	Molded bars, 1.27 cm square; xhd spd = 0.00025 cm s^{-1}, atmospheric pressure.

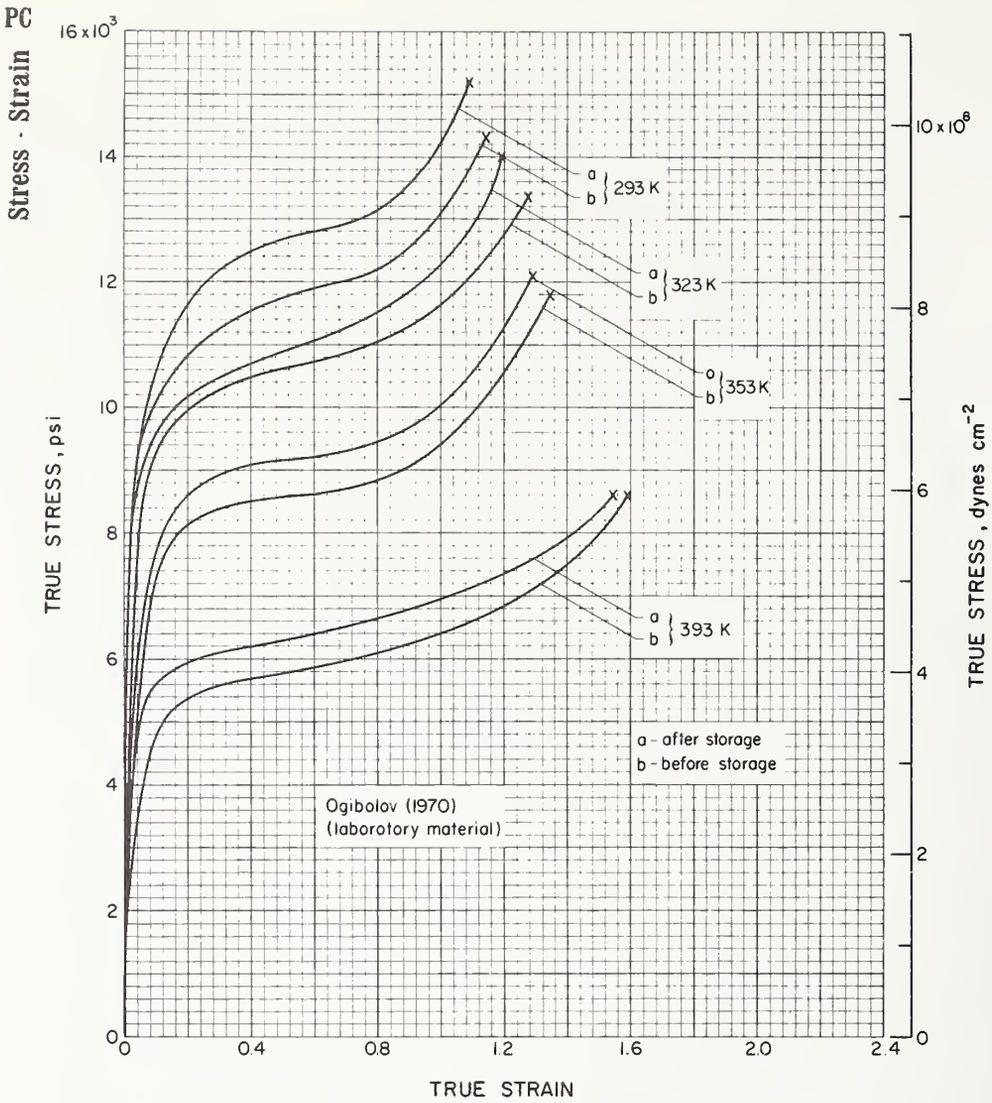
PC



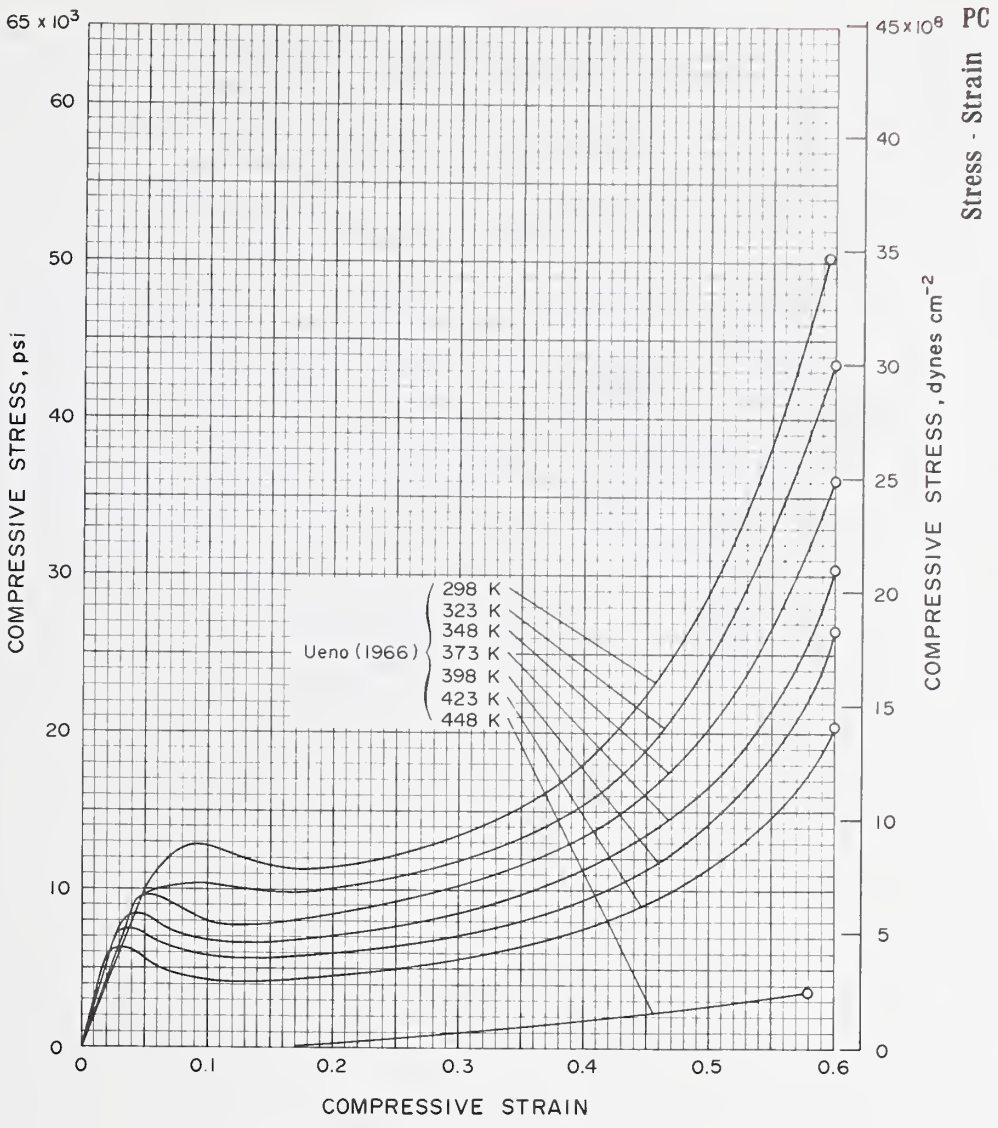
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kastelic, Baer (1971)	Amorphous, unoriented	t = 0.013 cm, ASTM Die C modified by narrowing the grip ends to 1.57 cm; Instron, xhd spd = 0.00083 cm s^{-1}, $\dot{\varepsilon}$ = 0.00017 s^{-1}.



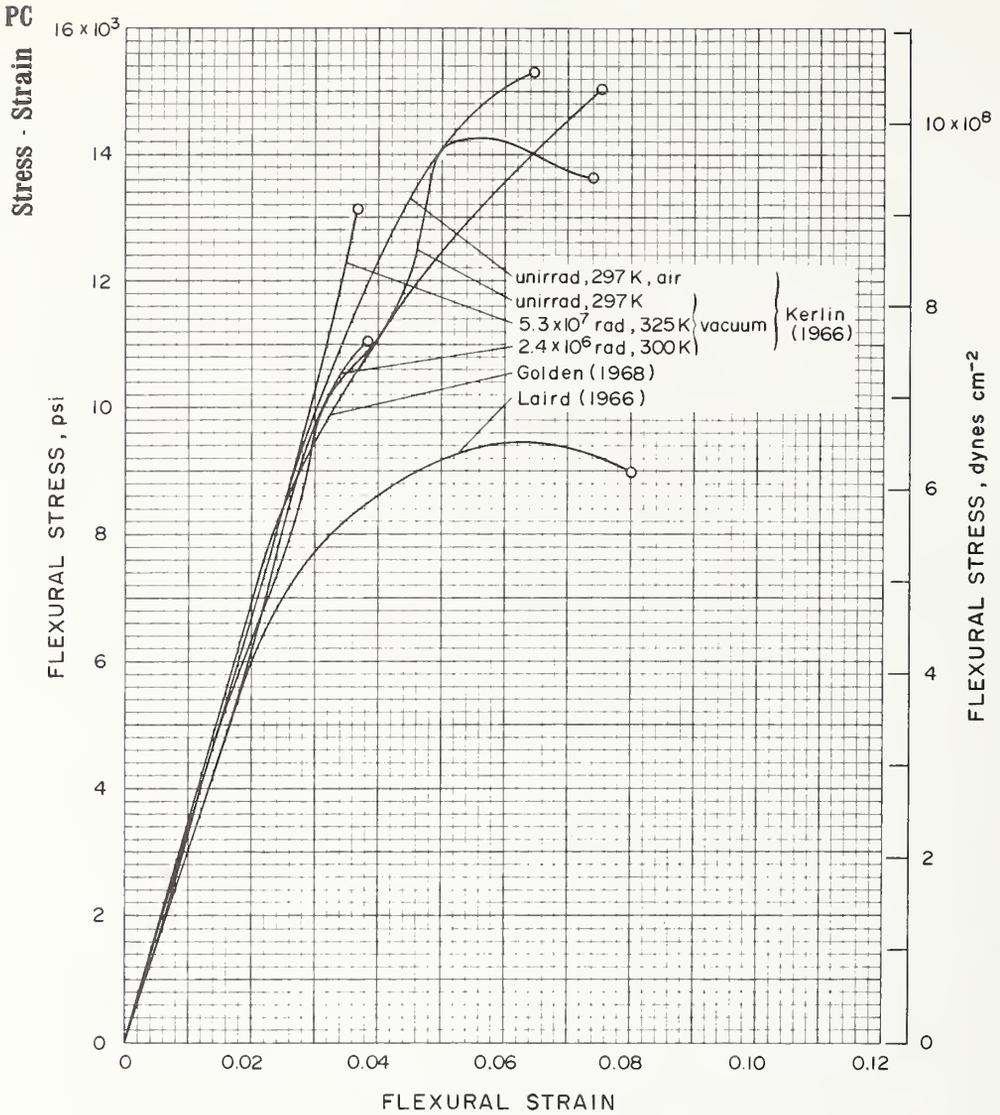
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ogibalov, Moroz (1970)	Makrolon	Tested before and after storage for 4 years at 291-293K in a dark dry location.



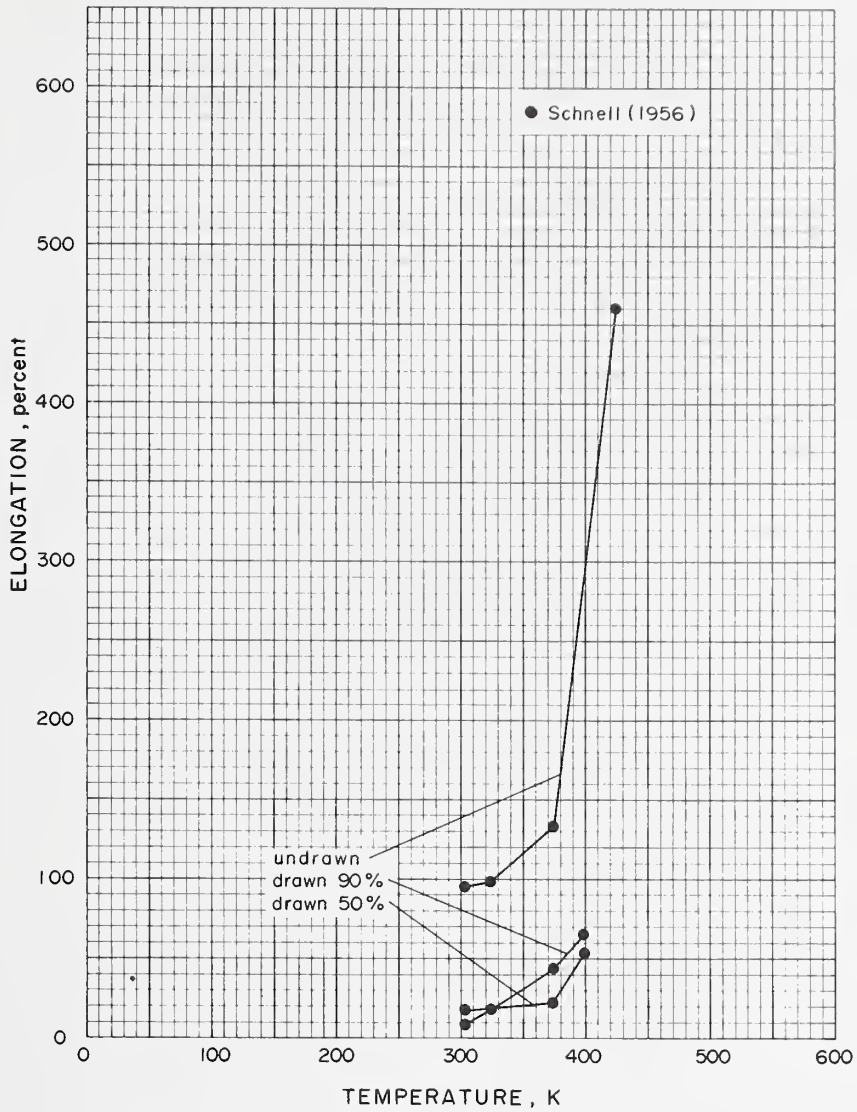
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ogibalov, Moroz (1970)	Laboratory produced polymer	Tested before and after storage for 2 years at 291-293K in a dark, dry location.



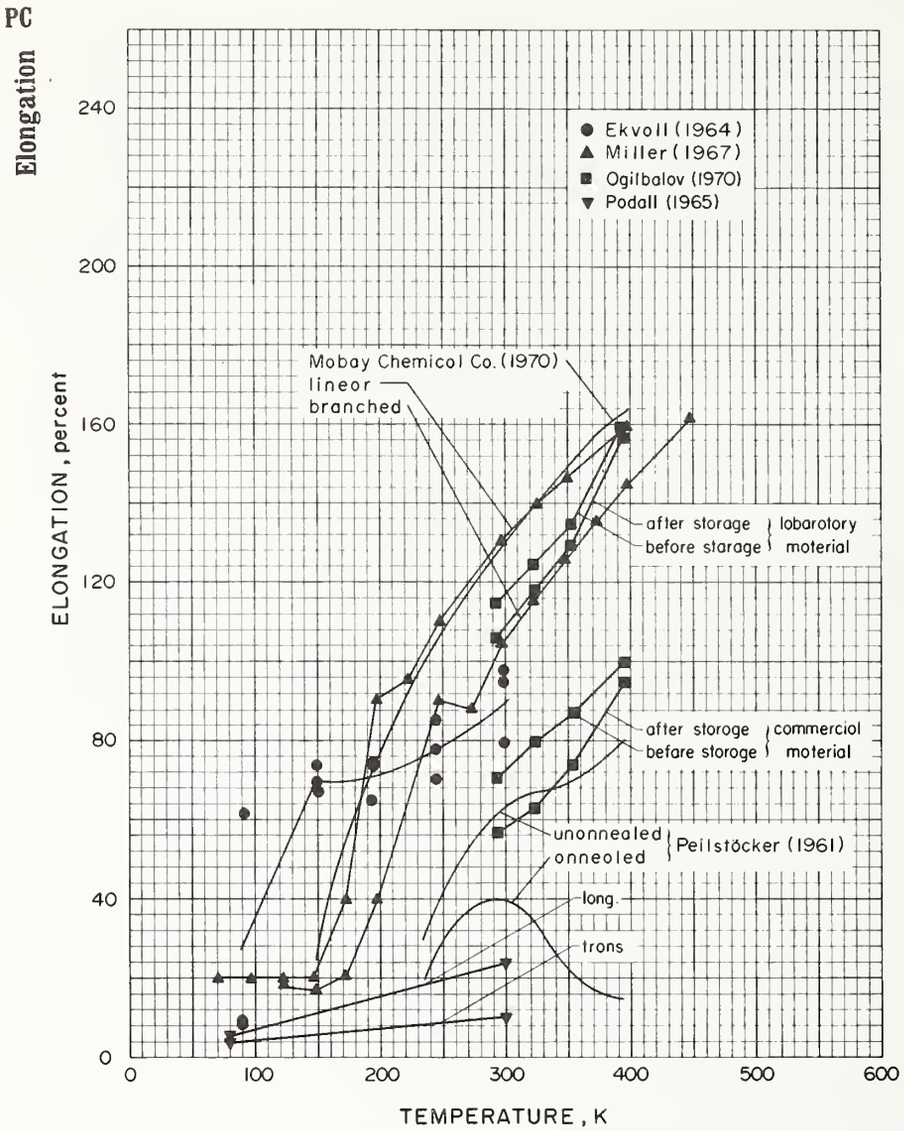
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ueno, Yamazaki, Oue, Ito, Tsutsui (1966)	Iupilon, produced by solvent method, molecular weight = 24,000-25,000, bars made by extrusion molding, dried for more than 10 h at 423 K.	Diam = 1.2 cm, ℓ = 1.2 cm; temp fluctuation maintained within ± 0.5 K.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Lexan	ℓ = 10.2 cm, w = 2.5 cm, t = 0.262 cm; Low Force Tester, ASTM D 790-63 test procedure except that span of flexural test = 5.1 cm; irrad and tested in air and vacuum, irrad by Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics, Fort Worth.
Laird, Cimprich, Kappler, Mason, Jr. (1966)	Lexan, sp gr = 1.20	Red Sec ℓ = 5.08 cm, w = 1.27 cm, t = 0.64 cm as per ASTM D 638-61T; Tinius Olsen HL-400-2 tensile test machine, $\dot{\epsilon}$ = 0.0029 s^{-1}; typical curve.
Golden, Hammant, Hazell (1968)	Makrolon grade S, extruded sheet, initial molecular weight = 21,900	Machined bars, 10.2 x 1.27 x 0.32 cm; 3-point loading jig with a span of 5.08 cm, Hounsfield Tensometer; curve represents an av of measurements made over a strain rate range of 6.7×10^{-2} to 1.7×10^{-3} s^{-1} and a molecular weight range of 7,300 to 21,900, molecular weight calculated from viscosity, different molecular weights obtained by irradiating with 4 Mev electrons at 10^6 rad min^{-1} from a linear accelerator, specimens irrad in an evacuated A' container and then conditioned at 293 ± 1 K and 70 ± 2% rel hum for at least 2 weeks before testing under the same conditions.



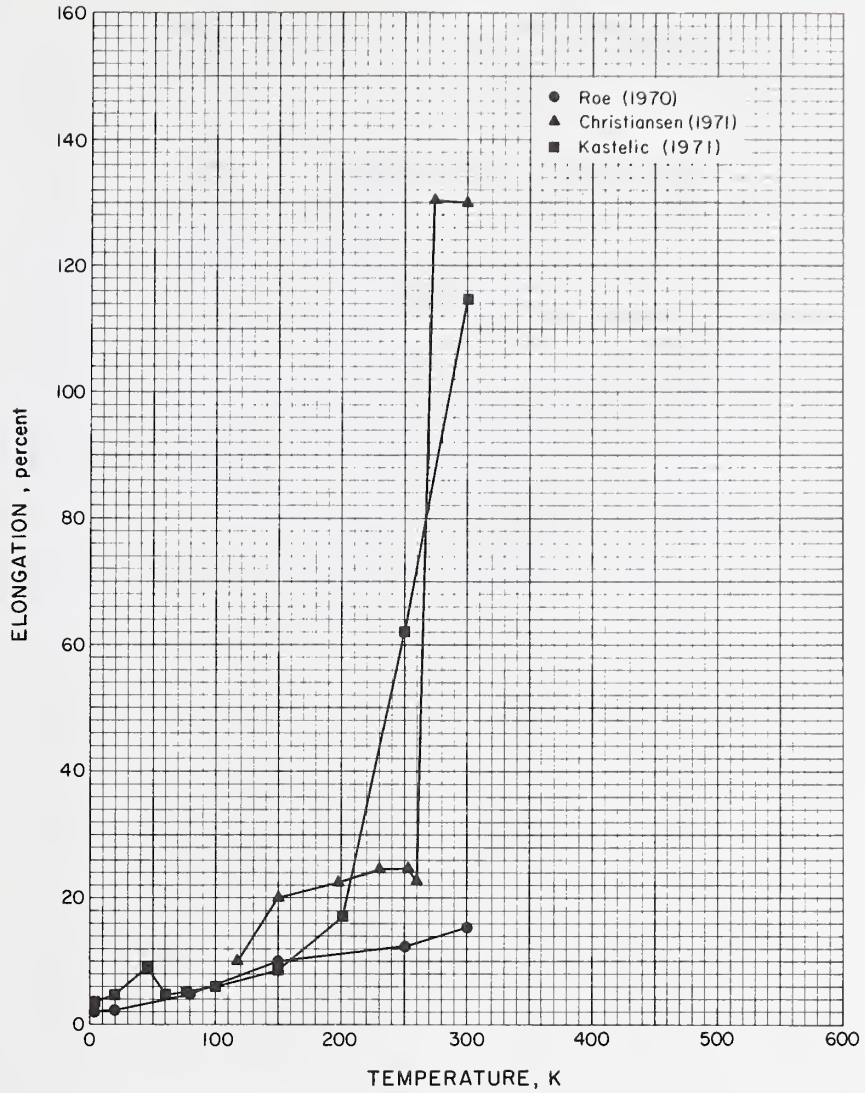
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Schnell (1956)	Film based on 4, 4′-dioxy-diphenyl-2, 2-propane, solution cast	Initial t = 0.011 cm, ℓ = 5 cm, w = 1.5 cm; xhd spd = 0.17 cm s^{-1}, drawn before testing.



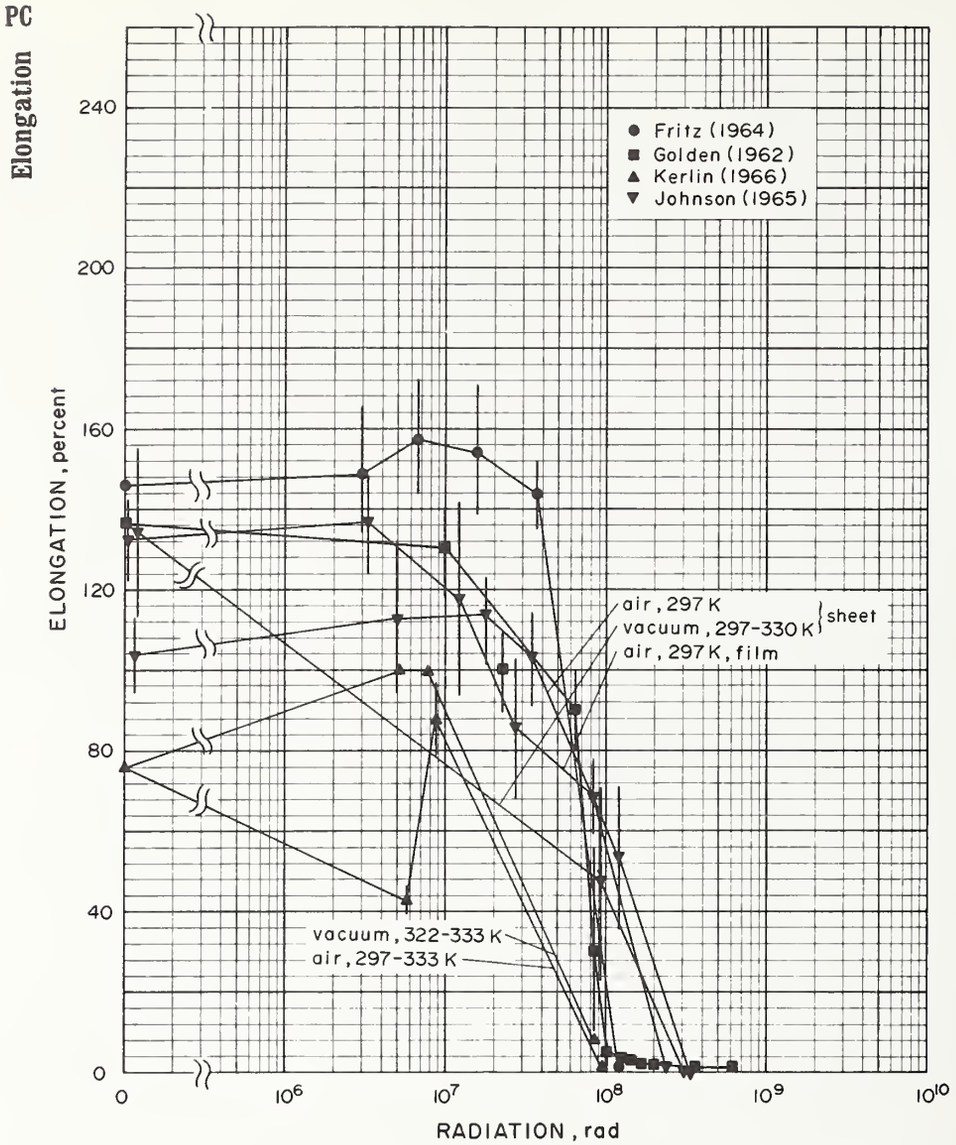
INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Peilstöcker (1961)		
Ekvall, Low, Jr. (1964)	Lexan, bisphenol A polycarbonate, amorphous, solvent-cast film, uniform birefringence of 1.47×10^{-3} indicating 4% molecular orientation	t = 0.010 cm, dumbbell shaped specimen, molecular orientation ∥ tension axis; Instron xhd spd = 0.0085, cooled with cold N_2 gas, photographic strain recording technique using selenium spots vacuum-evaporated onto film; specimen temp uniform to ± 2-3 K.
Miller (1967)	Merlon, M-21100 linear and M-1085 branched	Injection molded ASTM tensile bars; Instron, ASTM D 638-61T test procedure, xhd spd = 0.085 cm s^{-1}.
Mobay Chemical Co. (1970)	Merlon	
Ogibalov, Moroz (1970)	Laboratory produced polymer before and after 2 years storage; Makrolon before and after 4 years storage	Stored at 291-293 K in a dark, dry location.
Podall, Oser, Eliason, Augl (1965)	Lexan	Av of 2 or 3 tests, data spread smaller than point size.

PC

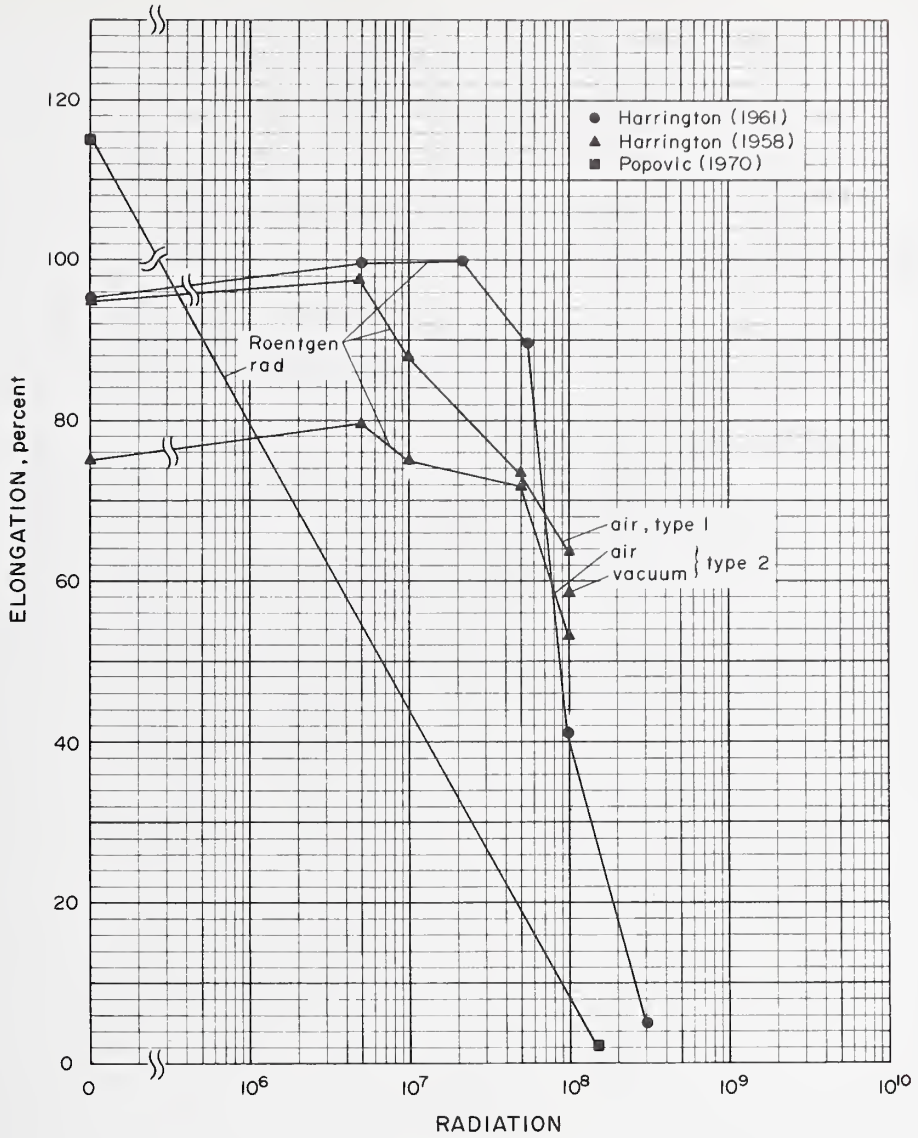
Elongation



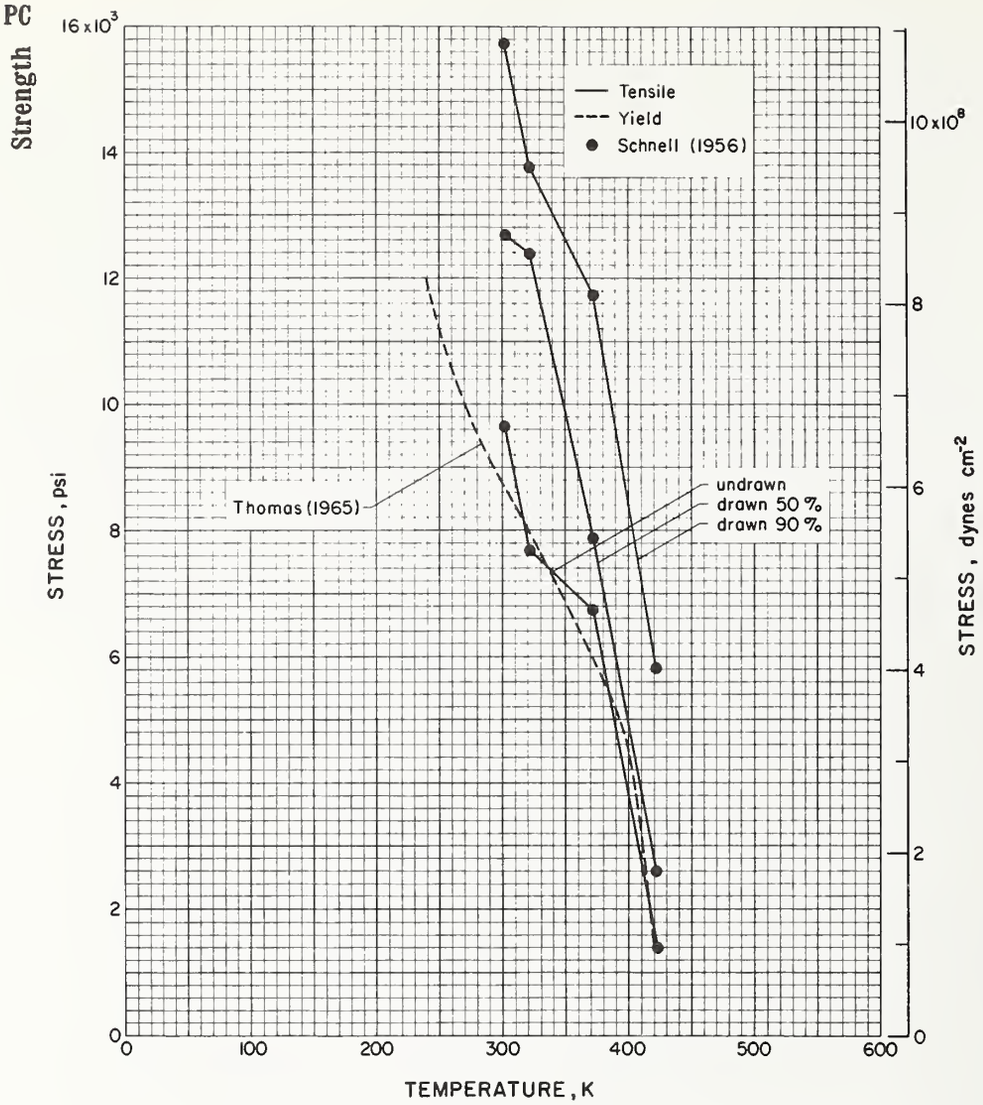
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Roe (1970)	Lexan, amorphous film cast from melt and rapidly quenched	Red Sec 6.0 × 1.27 × 0.013 -0.025 cm; Instron; extracted from σ-ϵ curves.
Christiansen, Baer, Radcliffe (1971)	Merlon, poly(bisphenol A carbonate), molecular weight = 35,000 -36,000	Molded bars, 1.27 cm square; xhd spd = 0.00025 cm s^{-1}, atmospheric pressure; extracted from σ-ϵ curves.
Kastelic, Baer (1971)	Amorphous, unoriented	t = 0.013 cm, ASTM D ie C modified by narrowing the grip ends to 1.57 cm; Instron, xhd spd = 0.00083 cm s^{-1}, $\dot{\epsilon}$ = 0.00017 s^{-1}; extracted from σ-ϵ diagrams.



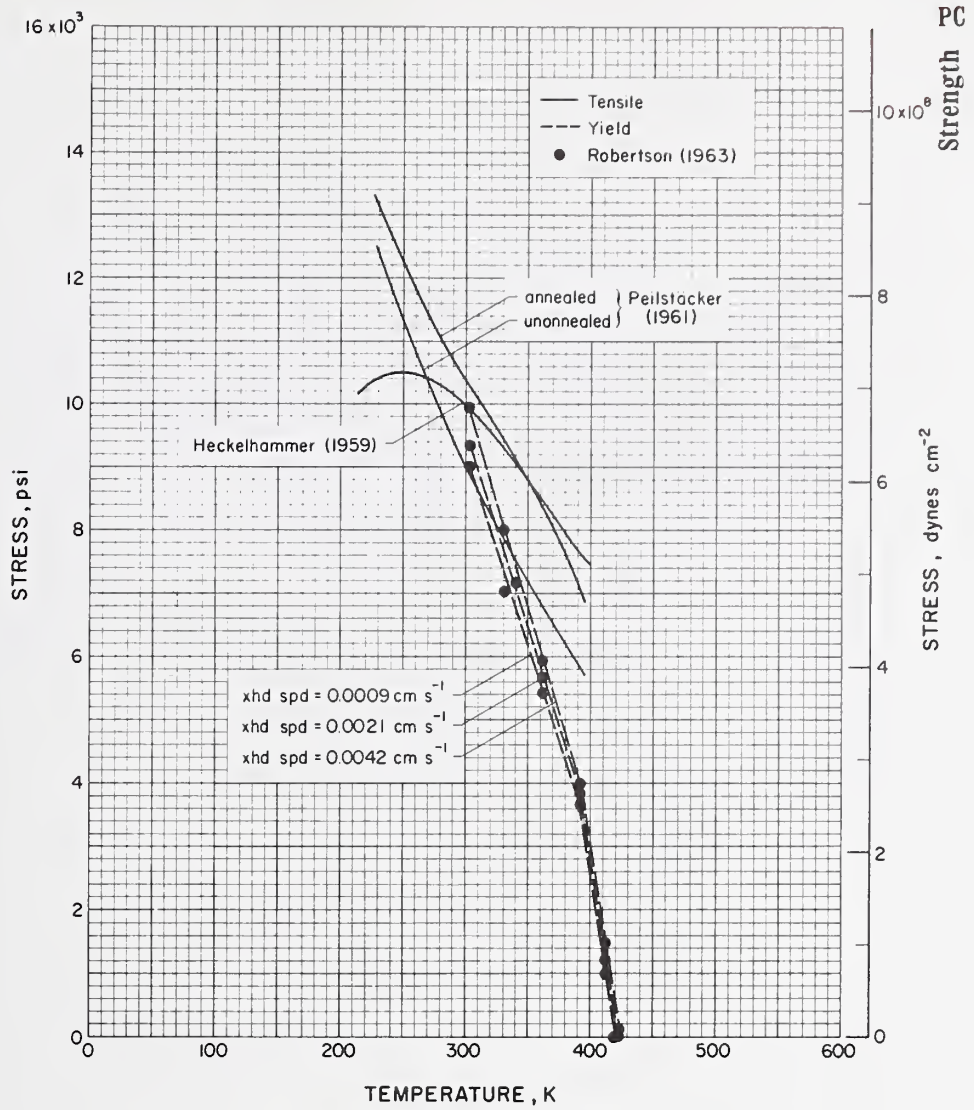
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Golden, Hazell (1962)	Lexan, dried at 333 K and 12 torr pressure for 8 weeks	Injection molded dumbbells, GL ≃ 2.54 cm; Baldwin P. T. E. 60 Machine, xhd spd = 0.0042 cm s^{-1}; irrad by 4 Mev electrons from a linear accelerator at 10^6 rad min^{-1}, held in a water cooled Aℓ tray with a 0.08 cm thick Aℓ window, irrad in vacuum and held in vacuum for at least 2 weeks between irradiation and testing.
Fritz (1964)	Merlon, poly [2, 2-propane-bis-(4-phenyl carbonate)], sp gr = 1.2	Router milled to t = 0.638 ± 0.008 cm, dumbbell specimens as per ASTM D 638-61T, GL = 5.72 cm; Instron, xhd spd = 0.0085 cm s^{-1}, $\dot{\epsilon}$ = 0.00148 s^{-1}; specimens wrapped in A′ foil and irrad by the Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics, Fort Worth, specimens stored at 296 ± 3 K for 4 days before testing; av values of 15 measurements.
Johnson, Lewis, Self (1965)	Sheet is Merlon, sp gr = 1.2; film is Plestar, solvent-cast from a combination of Merlon 90 and Lexan 125	Sheet: router-milled dumbbell specimens, GL = 3.3 cm, w = 0.56 cm, t = 0.152-0.178 cm; ASTM D 638-61T test procedure, xhd spd = 0.0085 cm s^{-1}. Film: ℓ = 18.3 cm, w = 2.5 cm, t = 0.0064 cm; ASTM D 882-61T, Method A test procedure, xhd spd = 0.085 cm s^{-1}. All tests conducted on Instron, model TTC; samples wrapped individually in A′ foil and irrad in air and vacuum at temp noted by the Ground Test Reactor at the Nuclear Aerospace Research Facility, General Dynamics, Fort Worth; error bars indicate standard deviation of 9 to 15 measurements on the sheet and 3 to 10 measurements on the film.
Kerlin, Smith (1966)	Lexan	Red Sec GL = 10.16 cm, w = 1.27 cm; Instron, xhd spd = 0.085 cm s^{-1}, tested in air, ASTM D 638-61T test procedure except for change in tensile specimen; irradiation conditions noted, irrad by Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics, Fort Worth; error bars indicate standard deviation of 4 or 5 measurements.



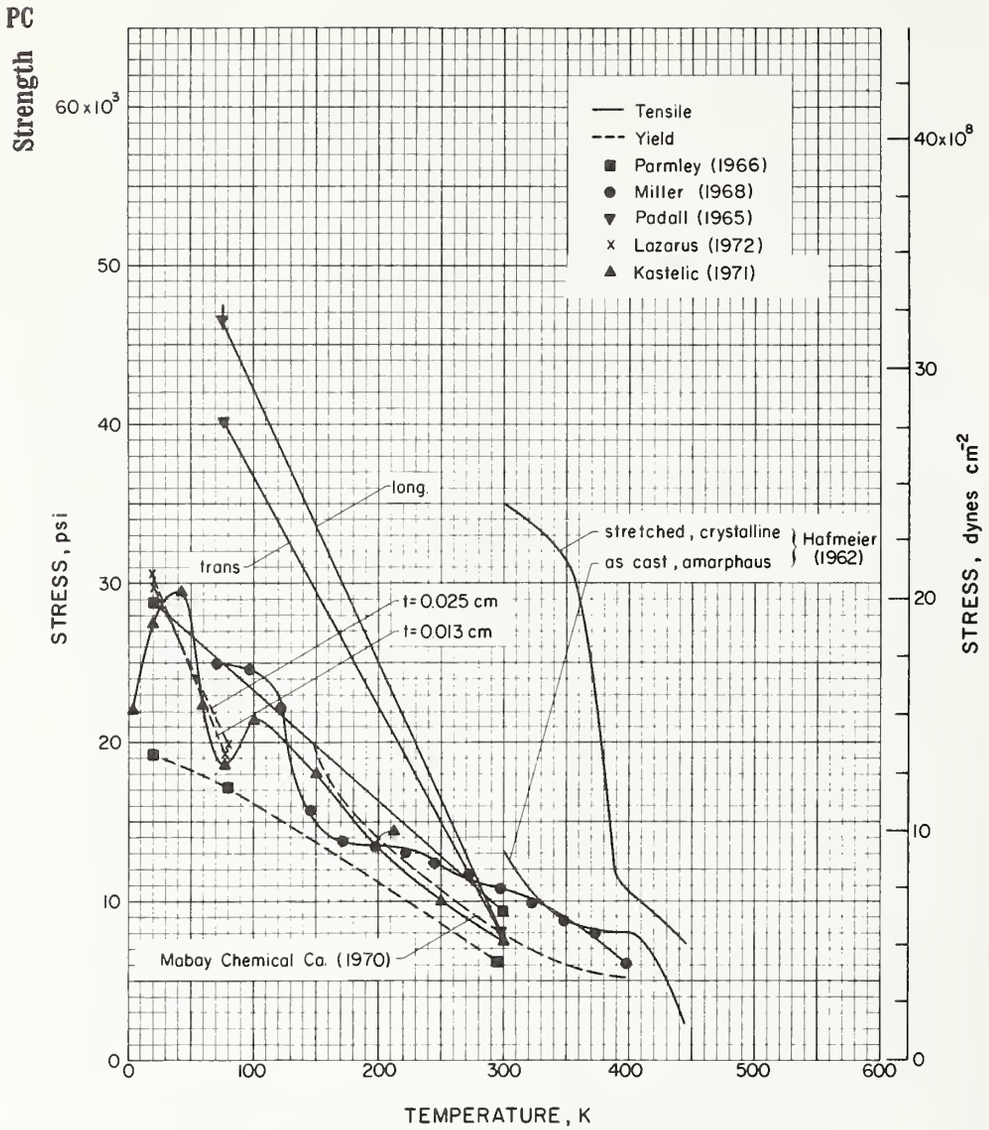
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Harrington, Giberson (1958)	Type 1 is Lexan, type 2 is Macrofol, both with sp gr = 1.20	t = 0.008 cm, Die C dumbbell test specimen; ASTM D 412-51T test procedure, Scott Tensile tester; irrad in air (except for 1 sample, as noted) at 298 K by a 3×10^4 curie, 1.3×10^5 Roentgens h^{-1} Co^{60} source; 95% confidence limits are approx ± 10%.
Harrington (1961)	Lexan	t = 0.013 cm, Die C dumbbell test specimen; ASTM D 412-51T test procedure, Scott tensile tester; irrad in air at 298 K by 1.3×10^6 Roentgens h^{-1} Co^{60} source except for the sample at 3×10^8 Roentgens which was irrad by spent reactor fuel elements.
Popovic (1970)		Injection molded to standard ASTM dimensions; conditioned according to ASTM D 618, Procedure A, floor model Instron, ASTM D 638 test procedure, 296 ± 2 K, 50 ± 5% rel hum; irrad in air at room temp and 0.33×10^5 rads h^{-1} by Co^{60}.



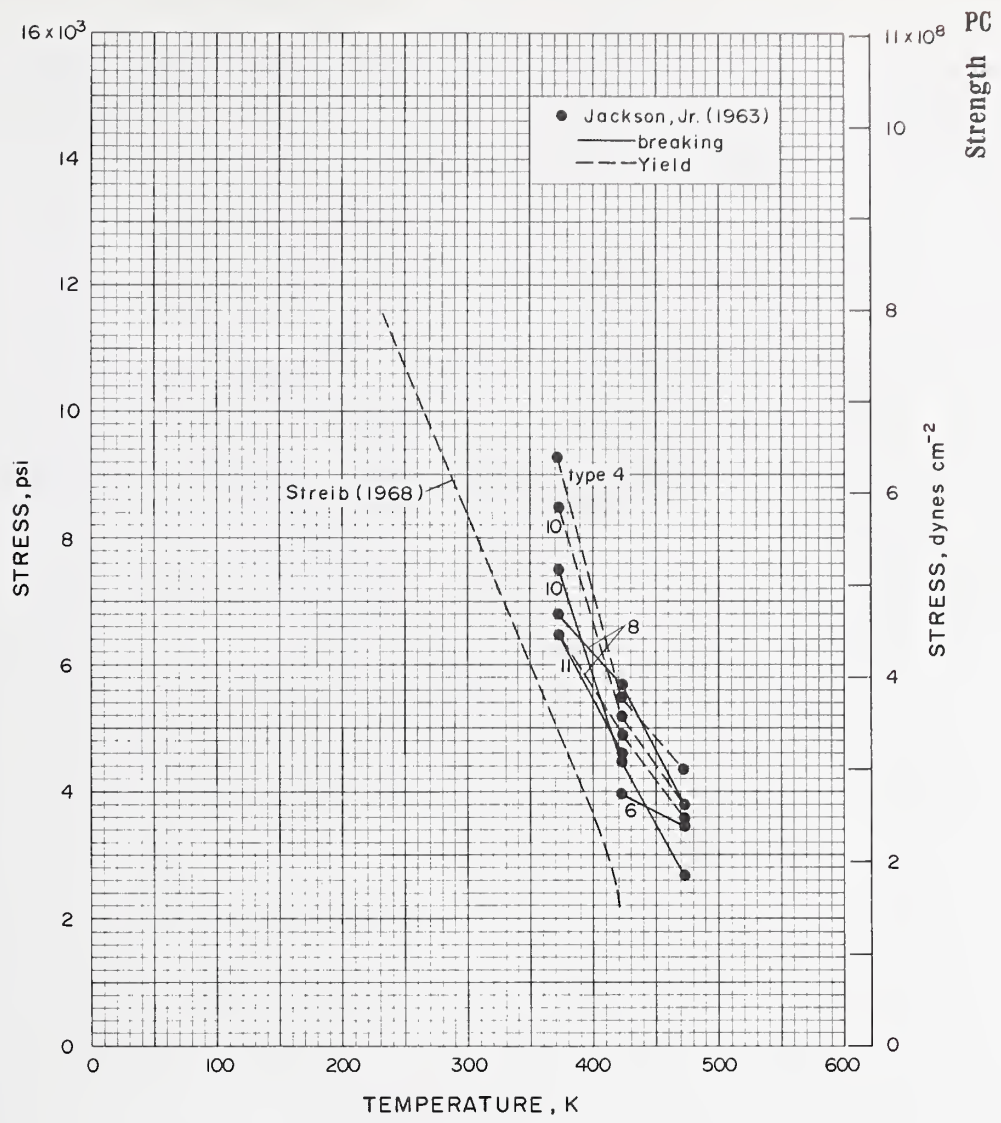
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Schnell (1956)	Film based on 4, 4′-dioxy-diphenyl-2, 2-propane, solution cast	Initial t = 0.011 cm, ℓ = 5 cm, w = 1.5 cm; xhd spd = 0.17 cm s^{-1}, drawn before testing.
Thomas (1965)	Lexan	



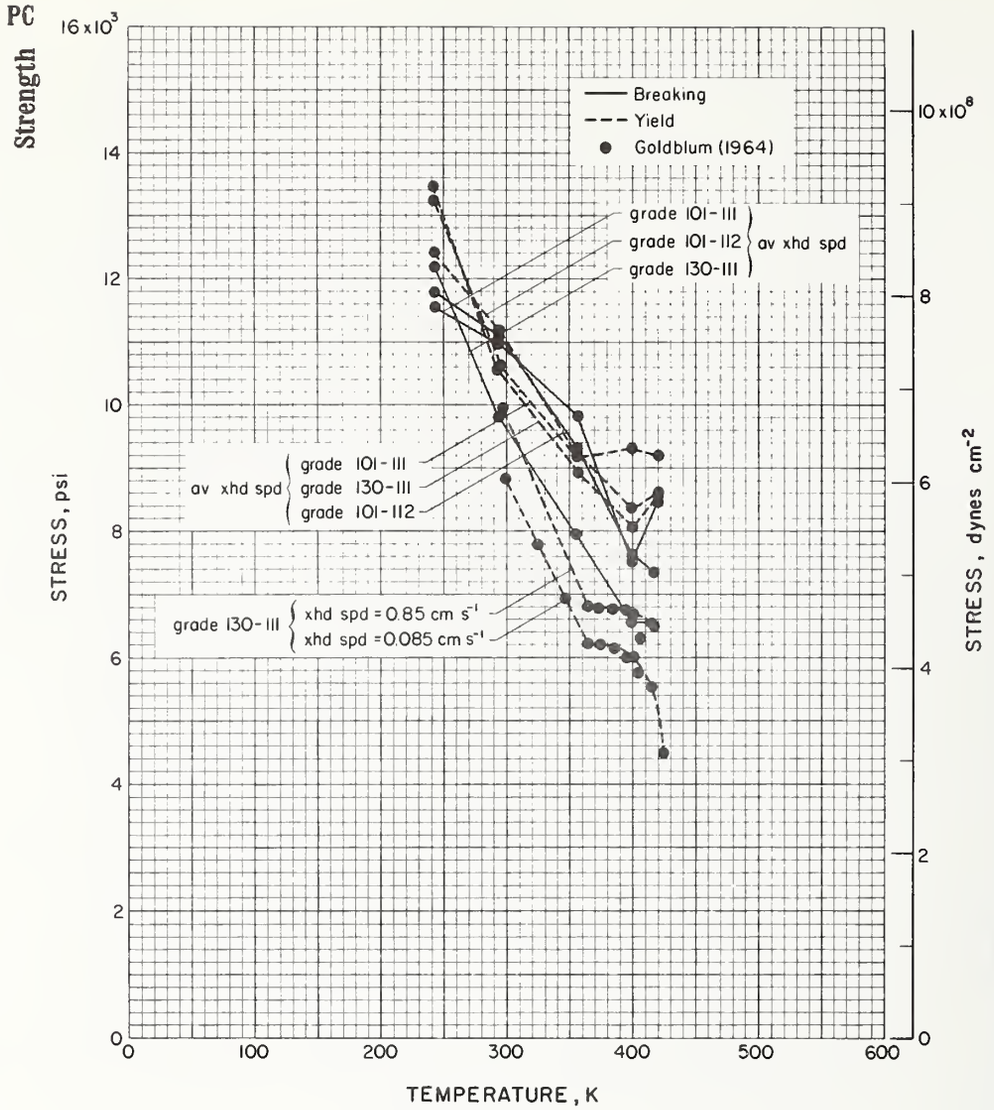
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Hechelhammer, Peilstöcker (1959)	Makrolon, sp gr = 1.20	DIN 53455 test procedure.
Peilstöcker (1961)		
Robertson (1963)	Lexan, cast film	t = 0.010 cm.



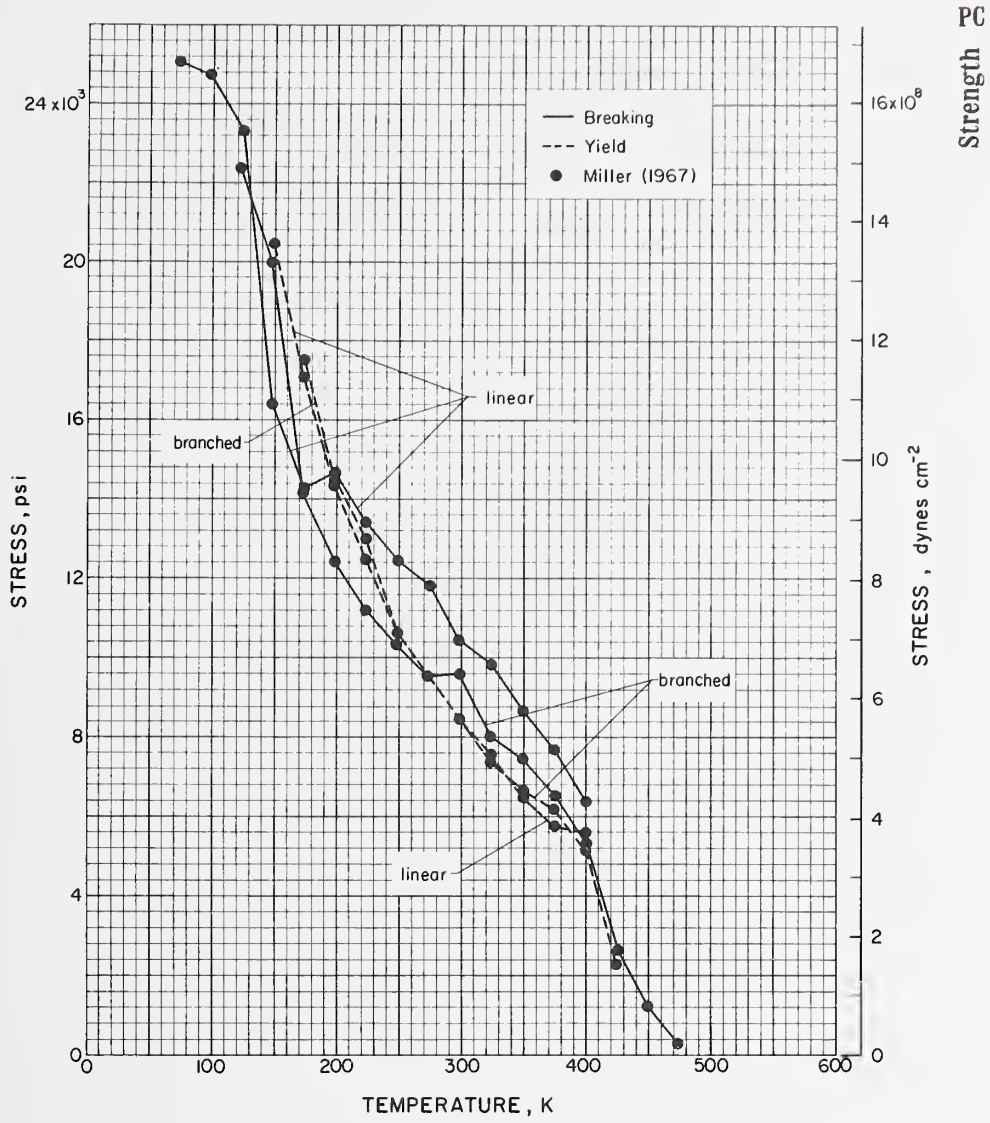
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Hofmeier (1962)	Poly-[2.2-bis (4-hyroxyphenyl)-propane-carbonate], cast film	
Parmley, Wong, Skogh (1966)	Lexan	0.2% yd off.
Miller (1968)	Merlon, injection grade, amorphous, film	Constant stress, heating rate from 77 K was 10 K min^{-1}, DuPont 940 Thermomechanical Analyzer.
Mobay Chemical Co. (1970)	Merlon	
Podall, Oser, Eliason, Augl (1965)	Lexan	Av of 2 or 3 tests, error bars indicate data spread.
Lazarus (1972)	Lexan 8070-112, conditioned at 295-297 K 40-45% rel hum	GL = 3.81 cm, w = 0.635; Instron Model TT-K Universal test machine, xhd spd = 0.0042 cm s^{-1}, clip-on strain gauge; error bars indicate standard deviation of 5 tests.
Kastelic, Baer (1971)	Amorphous, unoriented	t = 0.013 cm, ASTM Die C modified by narrowing the grip ends to 1.57 cm; Instron, xhd spd = 0.00083 cm s^{-1}, $\dot{\varepsilon}$ = 0.00017 s^{-1}.



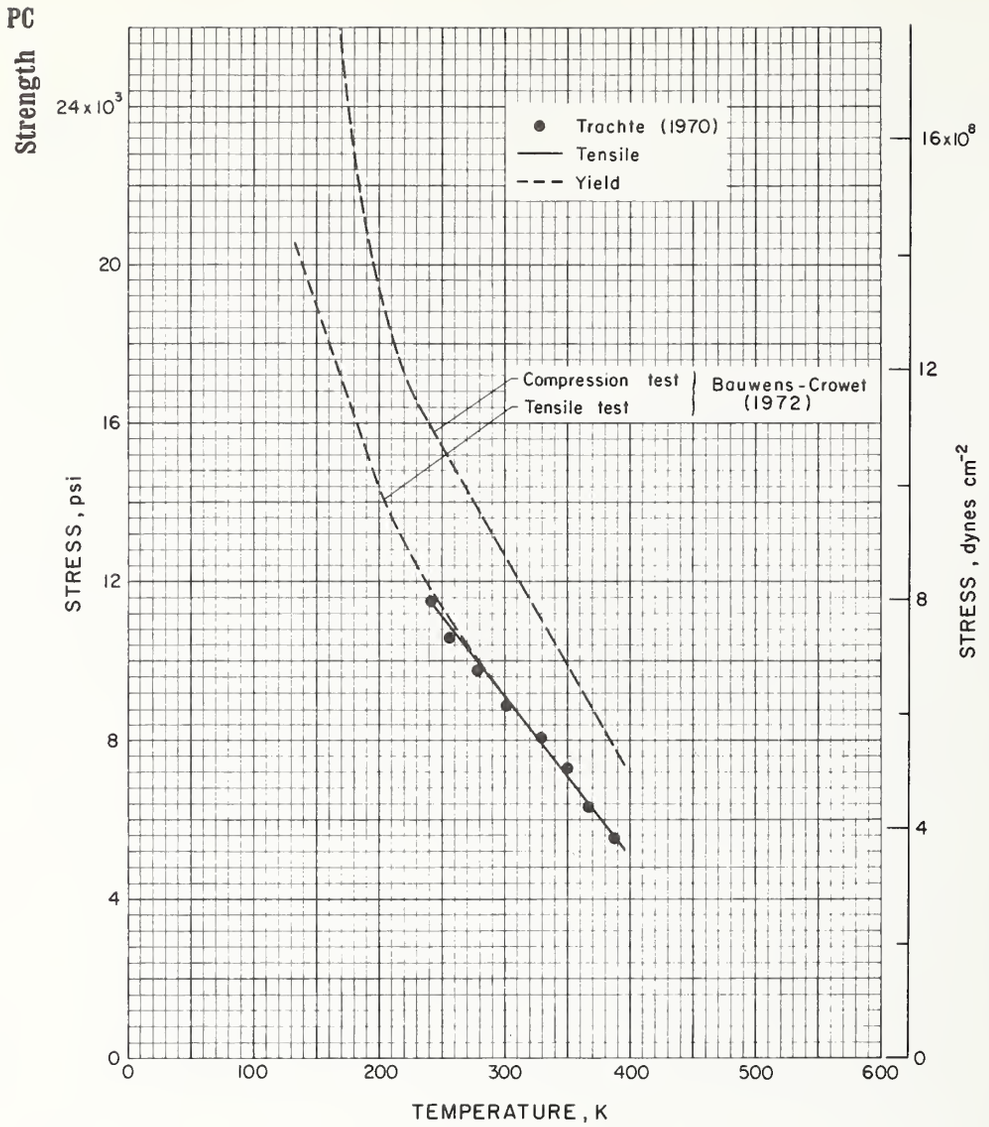
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Jackson, Jr., Caldwell (1963)	Basis for type 4 is 4, 4′-(2-norbornylidene) bis (2, 6-dichlorophenol); type 6 is 4, 4′-(2-norbornylmethylene) diphenol; type 8 is 4, 4′-(3-methyl-2-norbornylmethylene) diphenol; type 10 is 4, 4′-(hexahydro-4, 7-methanoidan-5-ylidene) diphenol; type 11 is 4-4′-(hexahydro-4, 7-methanoidan-5-ylidene) di-o-cresol	Films cast from methylene chloride, t = 0.002-0.008 cm, air dried then heated at 383 K for 1-2 h; tested on an Instron using ASTM D 882-61T test procedure.
Streib (1968)	Makrolon 3000	Tested to DIN proposal 53444 (1966).



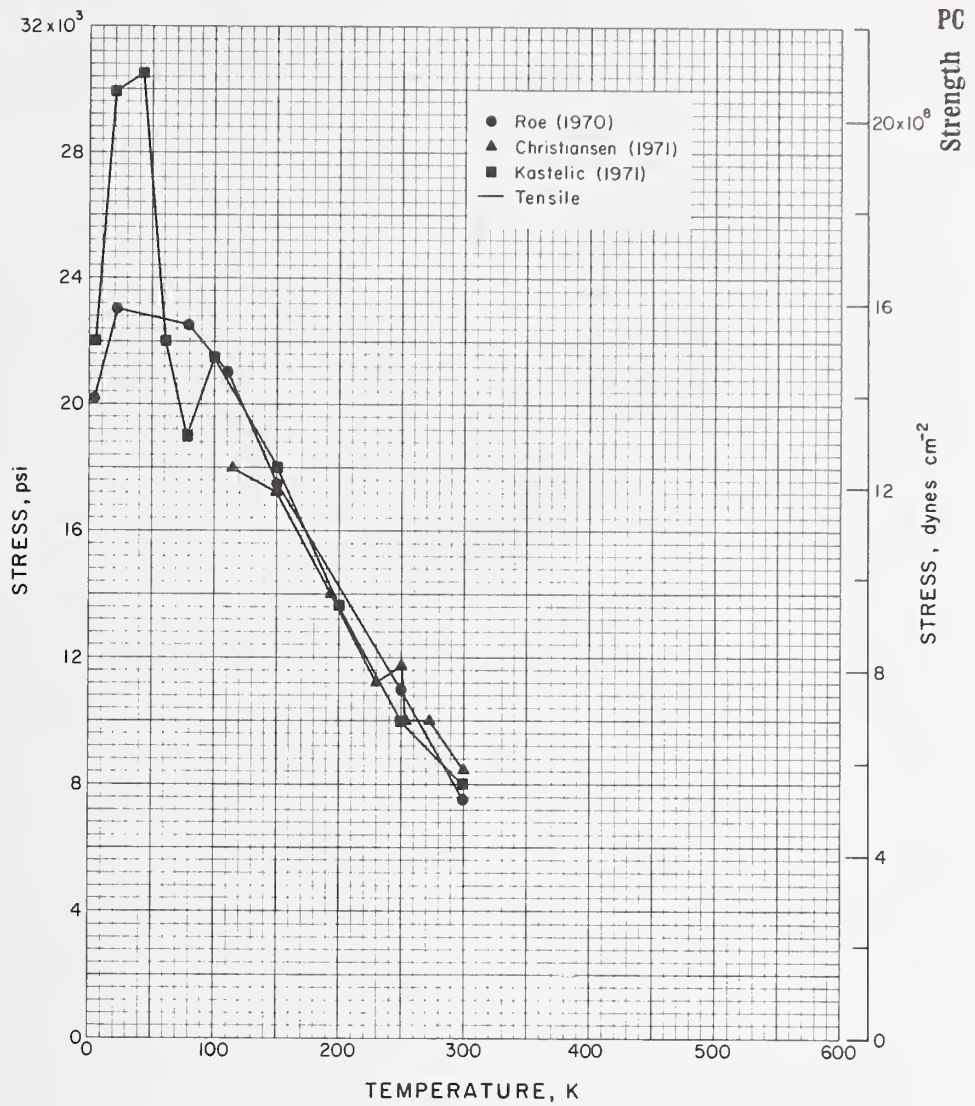
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Goldblum (1964)	Lexan, grades 130-111, 101-112, and 101-111	ASTM Type I injection molded tensile bars; Plastechon 591 machine used for high xhd spds of 8.47, 84.7, 254, and 735 cm s^{-1} and the results at these loading rates were averaged, specimens tested at 353 and 498 K were preconditioned at those temps overnight, specimens tested at 413 K were preconditioned for 5 h, all samples held 45 min at test temperature before loading; the lower loading rate tests were conducted with an Instron, specimens were preconditioned for the 298 to 403 K tests overnight and for the 313 and 323 K tests for 4 h; Instron tests were made on at least 3 samples at each temp.



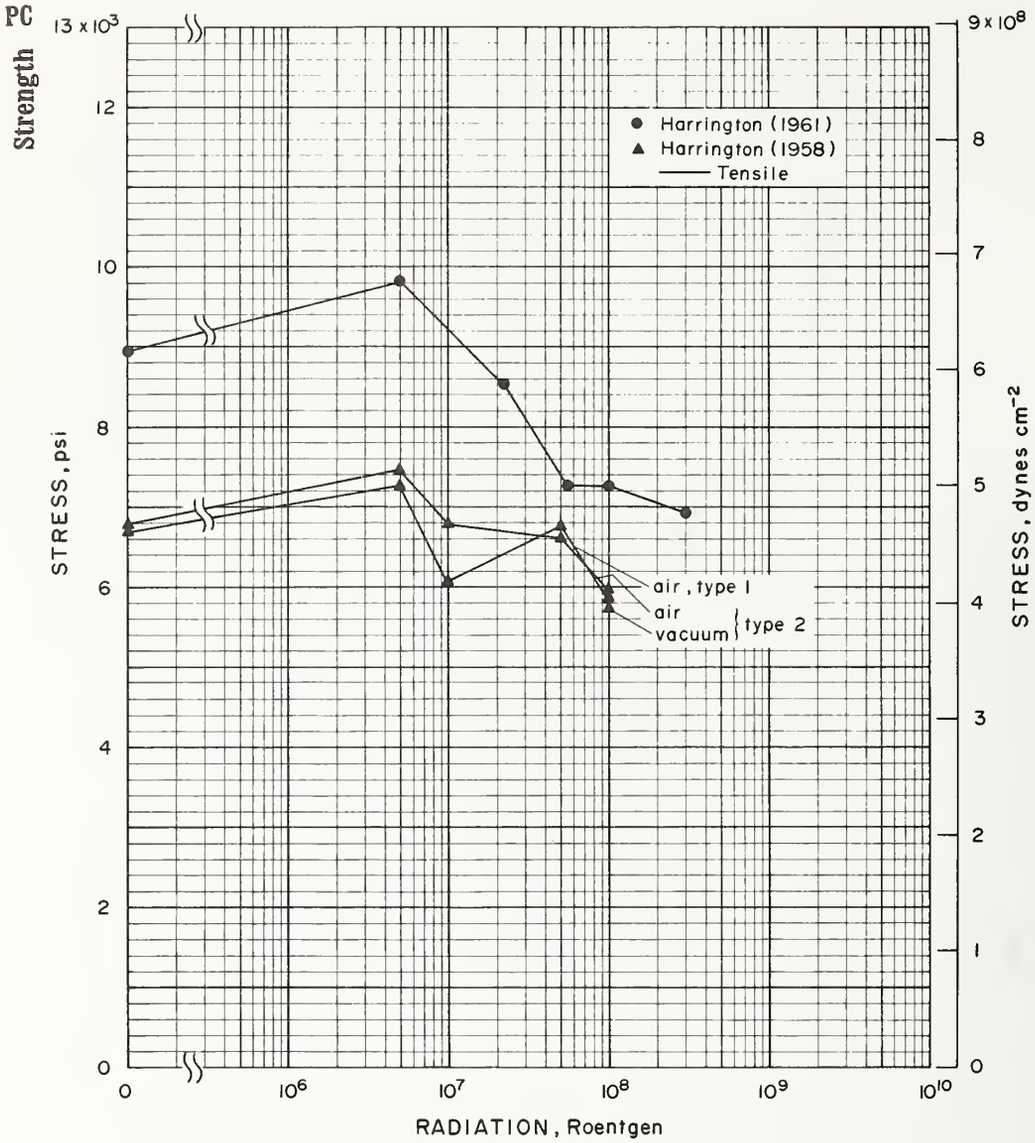
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Miller (1967)	Merlon, M-21100 linear, and M-1085 branched	Injection molded ASTM tensile bars; Instron, ASTM D 638-61T test procedure, xhd spd = 0.085 cm s^{-1}.



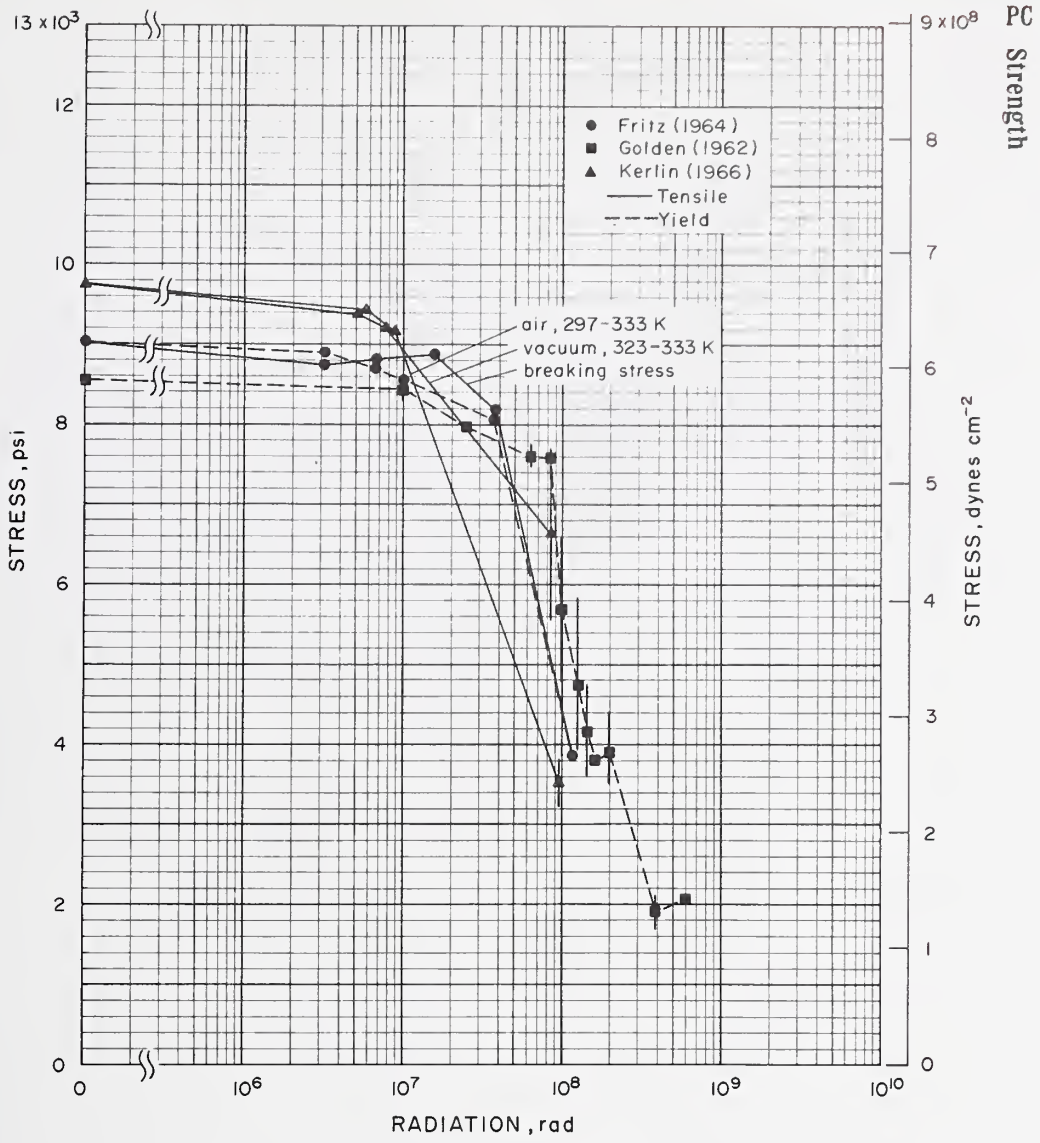
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Bauwens-Crowet, Bauwens, Homès (1972)	Makrolon Bayer	w = 0.8 cm, t = 0.5 cm, GL for tensile = 4.0 cm; Instron, $\dot{\varepsilon} = 4.16 \times 10^{-3}$ s^{-1}; compression tests were conducted on specimens of 3 lengths and results were extrapolated to infinite length.
Trachte (1970)		ℓ = 10.2 cm, w = 1.3 cm, t = 0.32 cm; Instron Model TT-D, $\dot{\varepsilon} = 2\text{-}20 \times 10^{-6}$ s^{-1}.



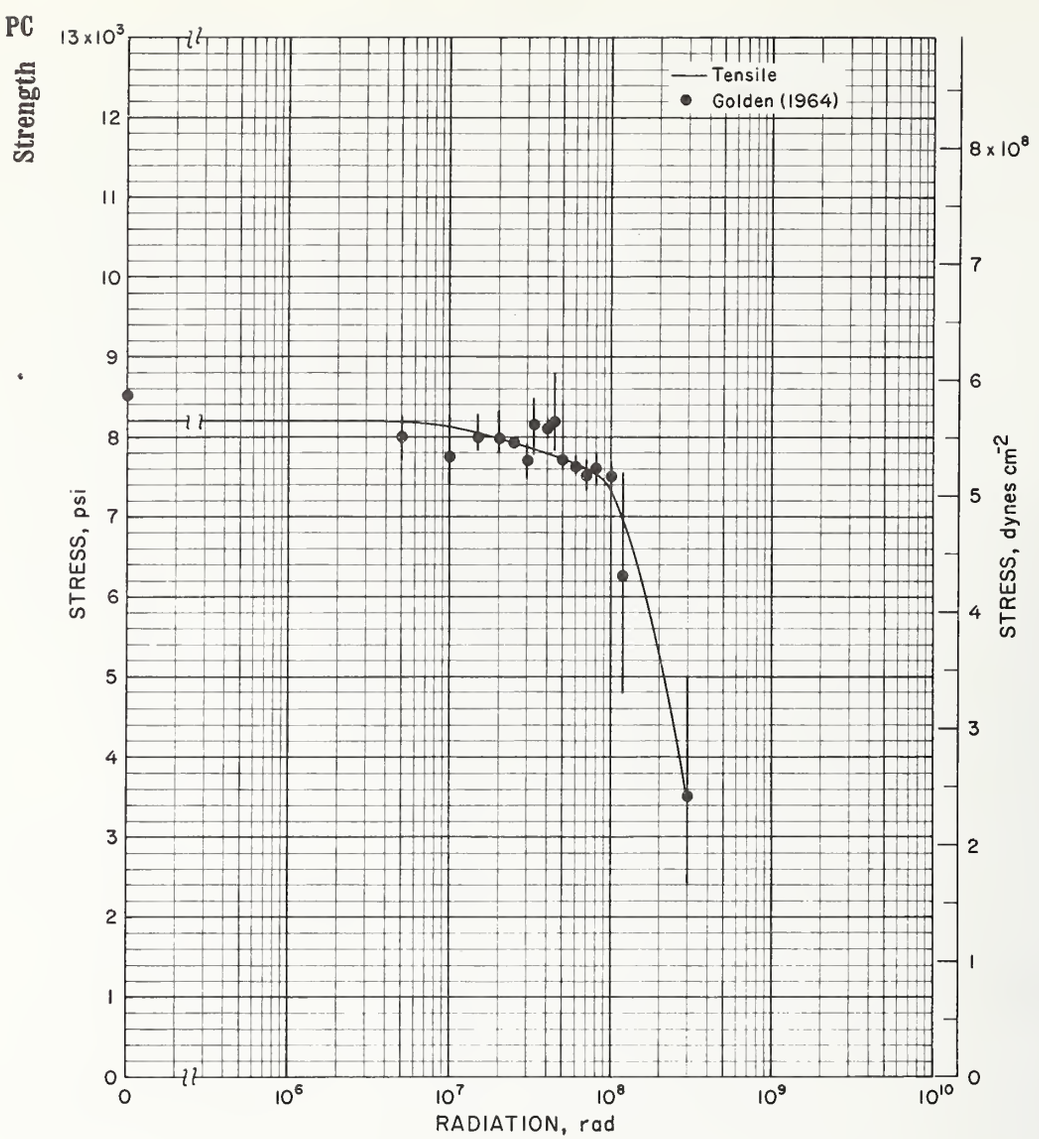
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Roe (1970)	Lexan, amorphous film cast from melt and rapidly quenched	Red Sec 6.0 × 1.27 × 0.013 -0.025 cm; Instron; extracted from σ-ϵ curves.
Christiansen, Baer, Radcliffe (1971)	Merlon, poly(bisphenol A carbonate) molecular weight = 35,000 -36,000	Molded bars, 1.27 cm square; xhd spd = 0.00025 cm s^{-1}, atmospheric pressure; extracted from σ-ϵ curves.
Kastelic, Baer (1971)	Amorphous, unoriented	t = 0.013 cm, ASTM D ie C modified by narrowing the grip ends to 1.57 cm; Instron , xhd spd = 0.00083 cm s^{-1}, $\dot{\epsilon}$ = 0.00017 s^{-1}; extracted from σ-ϵ diagrams.



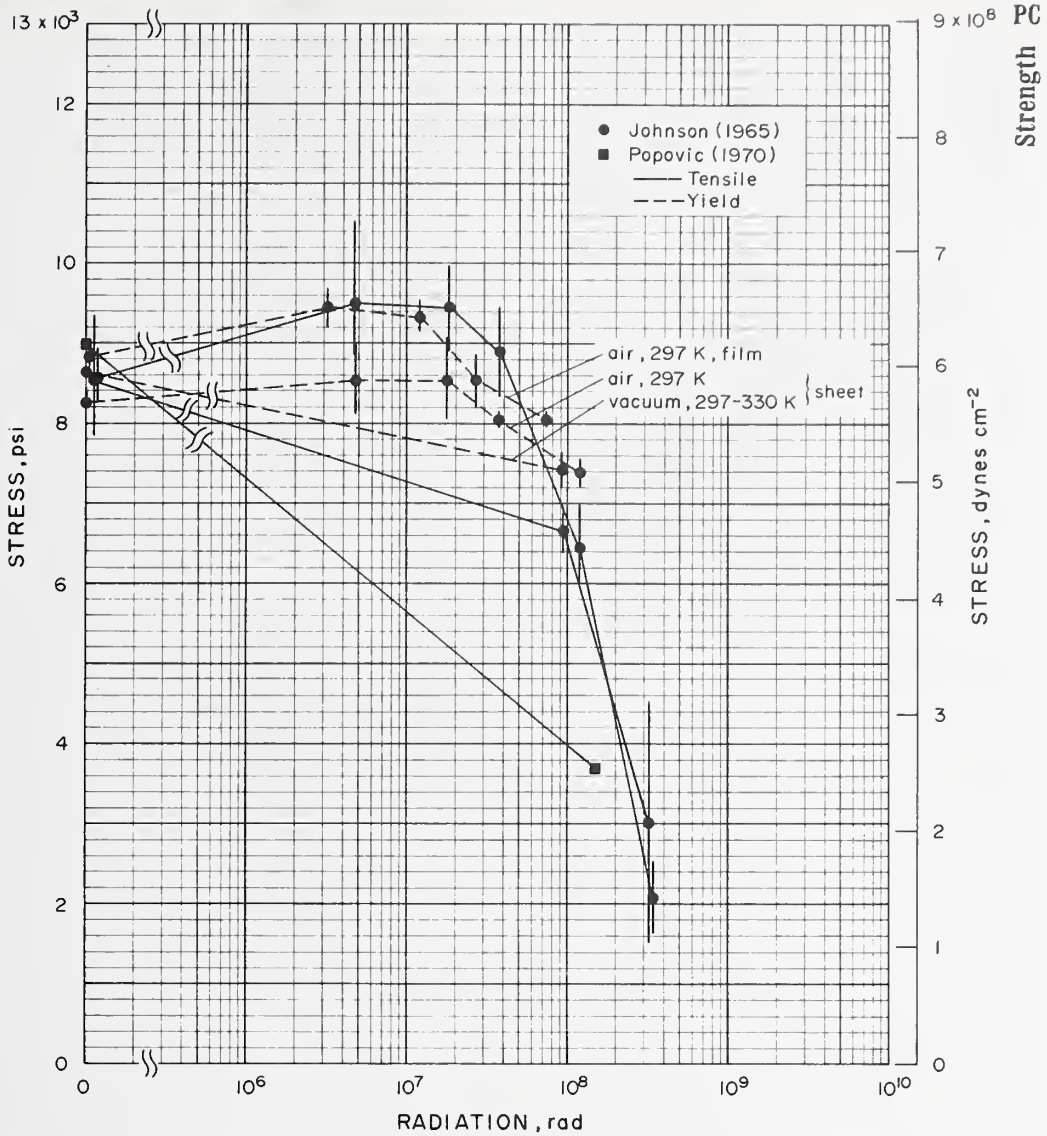
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Harrington, Giberson (1958)	Type 1 is Lexan, type 2 is Macrofol, both with sp gr = 1.20	t = 0.008 cm, Die C dumbbell test specimen; ASTM D 412-51T test procedure, Scott tensile tester; irrad in air (except for 1 sample, as noted) at 298 K by a 3×10^4 curie, 1.3×10^6 Roentgen h^{-1} Co^{60} source; 95% confidence limits are approx ± 8%.
Harrington (1961)	Lexan	t = 0.013 cm, Die C dumbbell test specimen; ASTM D 412-51T test procedure, Scott tensile tester; irrad in air at 298 K by 1.3×10^6 Roentgens h^{-1} Co^{60} source except for the sample at 3×10^8 Roentgens which was irrad by spent reactor fuel elements.



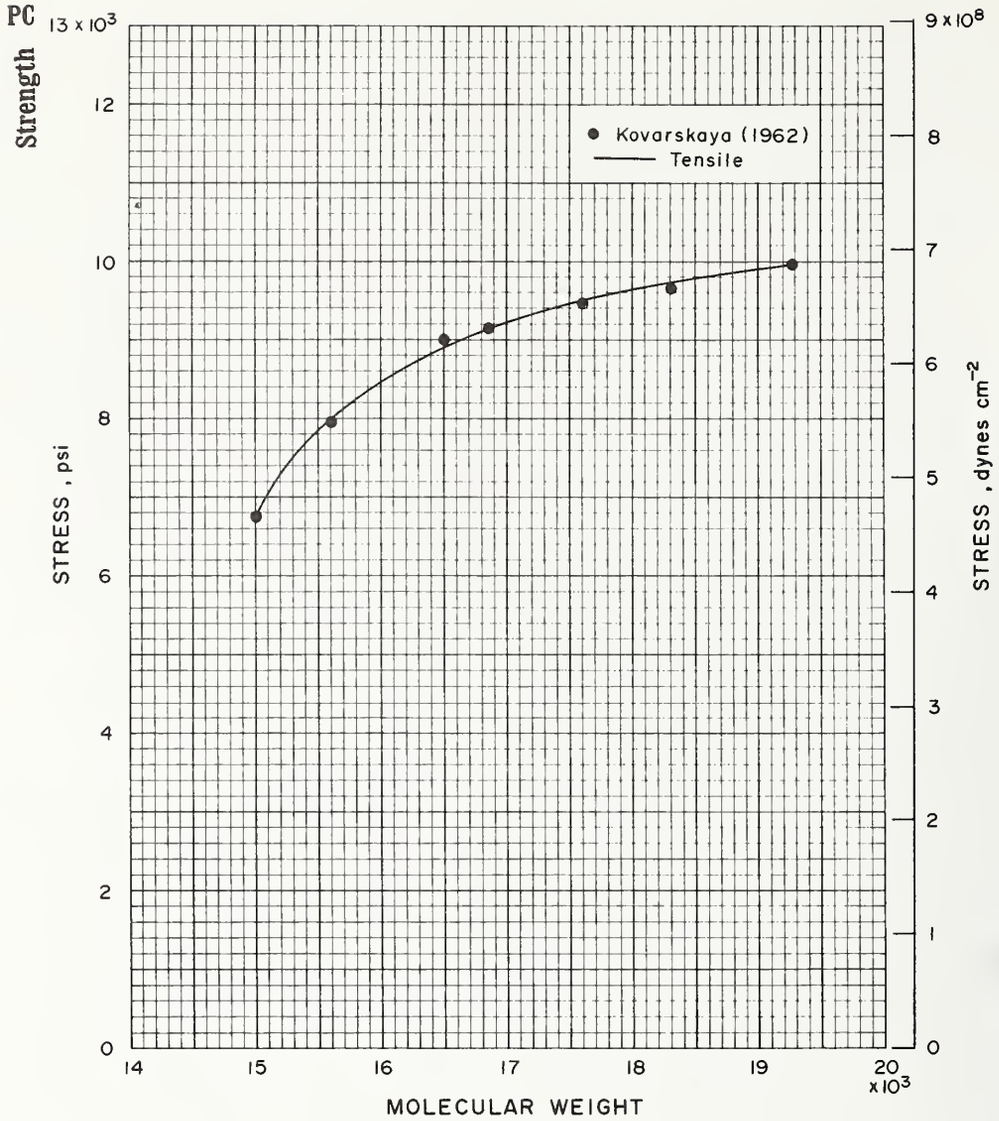
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Golden, Hazell (1962)	Lexan, dried at 333 K and 12 torr for 8 weeks	Injection molded dumbbells, GL ~ 2.54 cm; Baldwin P. T. E. 60 Machine, xhd spd = 0.0042 cm s^{-1}; irrad by 4 Mev electrons from a linear accelerator at 10^6 rad min^{-1}, held in a water cooled Aℓ tray with a 0.08 cm thick Aℓ window, irrad in vacuum and held in vacuum for at least 2 weeks between irradiation and testing.
Fritz (1964)	Merlon, poly [2, 2-propane-bis-(4-phenyl carbonate)], sp gr = 1.2	Router milled to t = 0.638 ± 0.008 cm, dumbbell specimens as per ASTM D 638-61T, GL = 5.72 cm; Instron, xhd spd = 0.0085 cm s^{-1}, $\dot{\epsilon}$ = 0.00148 s^{-1}; specimens wrapped in Aℓ foil and irrad by the Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics, Fort Worth, specimens stored at 296 ± 3 K for 4 days before testing; av values of 15 measurements.
Kerlin, Smith (1966)	Lexan	Red Sec GL = 10.16 cm, w = 1.27 cm; Instron, xhd spd = 0.085 cm s^{-1}, tested in air, ASTM D 638-61T test procedure except for change in tensile specimen; irradiation conditions noted, irrad by Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics, Fort Worth; standard deviation of 4 or 5 measurements is smaller than the data point except where indicated by error bars.



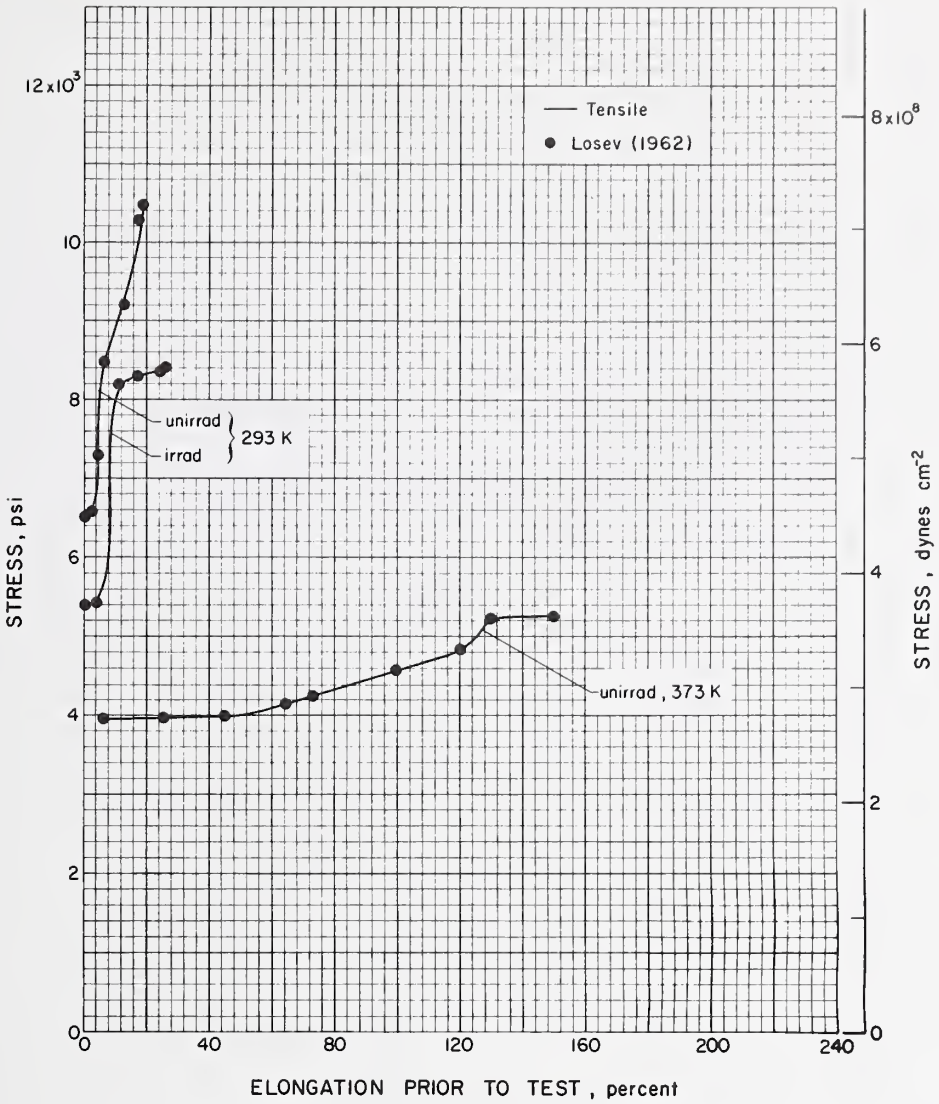
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Golden, Hammant, Hazell (1964)	Makrolon Grade S, machined from extruded sheet, in equilibrium at 293 ± 1 K and 70% rel hum	ℓ = 10.2 cm, w = 1.3 cm, t = 0.318 cm; 293 ± 1 K, 70% rel hum, Hounsfield Tensometer, xhd spd = 0.0042 cm s^{-1} ; tested not less than 2 weeks after 4 Mev electron irradiation at 10^6 rad min^{-1} .



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Johnson, Lewis Self (1965)	Sheet is Merlon, sp gr = 1.2; film is Plestar, solvent-cast from a combination of Merlon 90 and Lexan 125	Sheet: router-milled dumbbell specimens, GL = 3.3 cm, w = 0.56 cm, t = 0.152-0.178 cm; ASTM D 638-61T test procedure, xhd spd = 0.0085 cm s^{-1}. Film: ℓ = 18.3 cm, w = 2.5 cm, t = 0.0064 cm; ASTM D 882-61T, Method A test procedure, xhd spd = 0.085 cm s^{-1}. All tests conducted on Instron, model TTC; samples wrapped individually in Al foil and irrad in air and vacuum at temp noted by the Ground Test Reactor at the Nuclear Aerospace Research Facility, General Dynamics, Fort Worth; error bars indicate standard deviation of 10 to 15 measurements.
Popovic (1970)		Injection molded to standard ASTM dimensions; conditioned according to ASTM D 618, Procedure A, floor model Instron, ASTM D 638 test procedure, 296 ± 2 K, 50 ± 5% rel hum; irrad in air at room temp and 0.33 x 10^6 rads h^{-1} by Co^{60}.



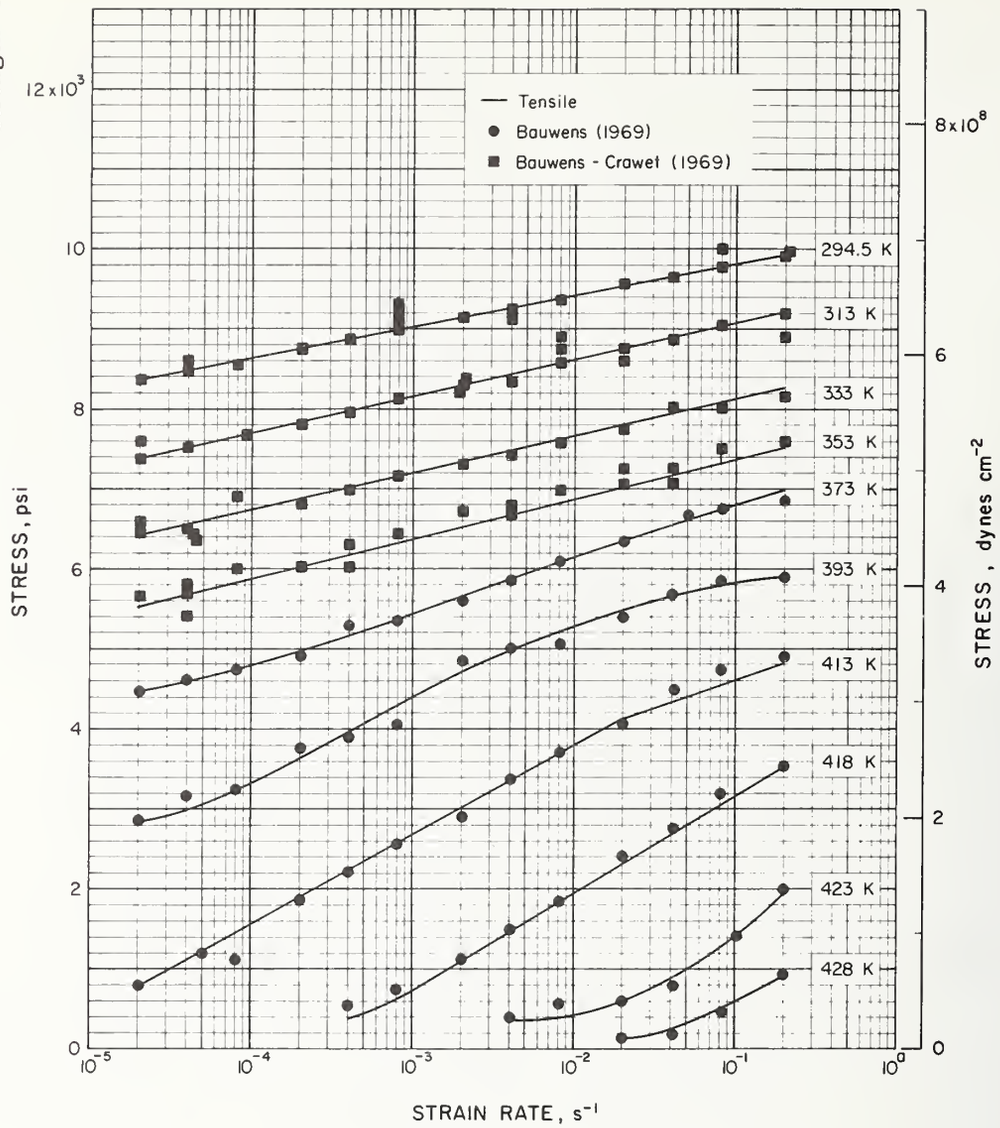
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kovarskaya (1962)		



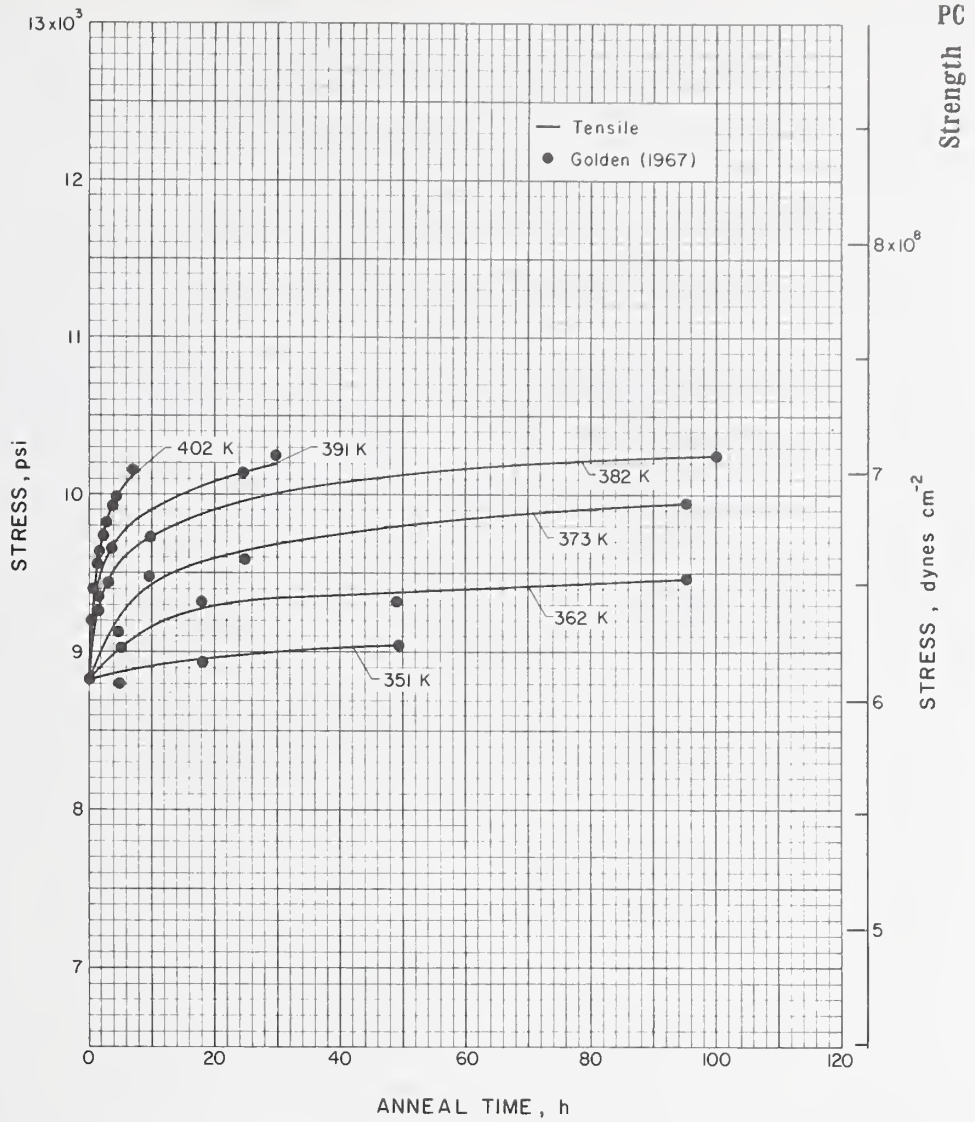
INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Losev, Smirnova, Smyrovz (1962)	Film obtained by evaporation from a 15-20% solution of polycarbonate in methylene chloride, molecular weight = 25,000	Film deformed by elongation prior to test; irrad 1 month by Co^{60} to a dose of 2.33×10^9 rad cm^{-3}, irradiation reduced the molecular weight by a factor of about 2.

PC

Strength



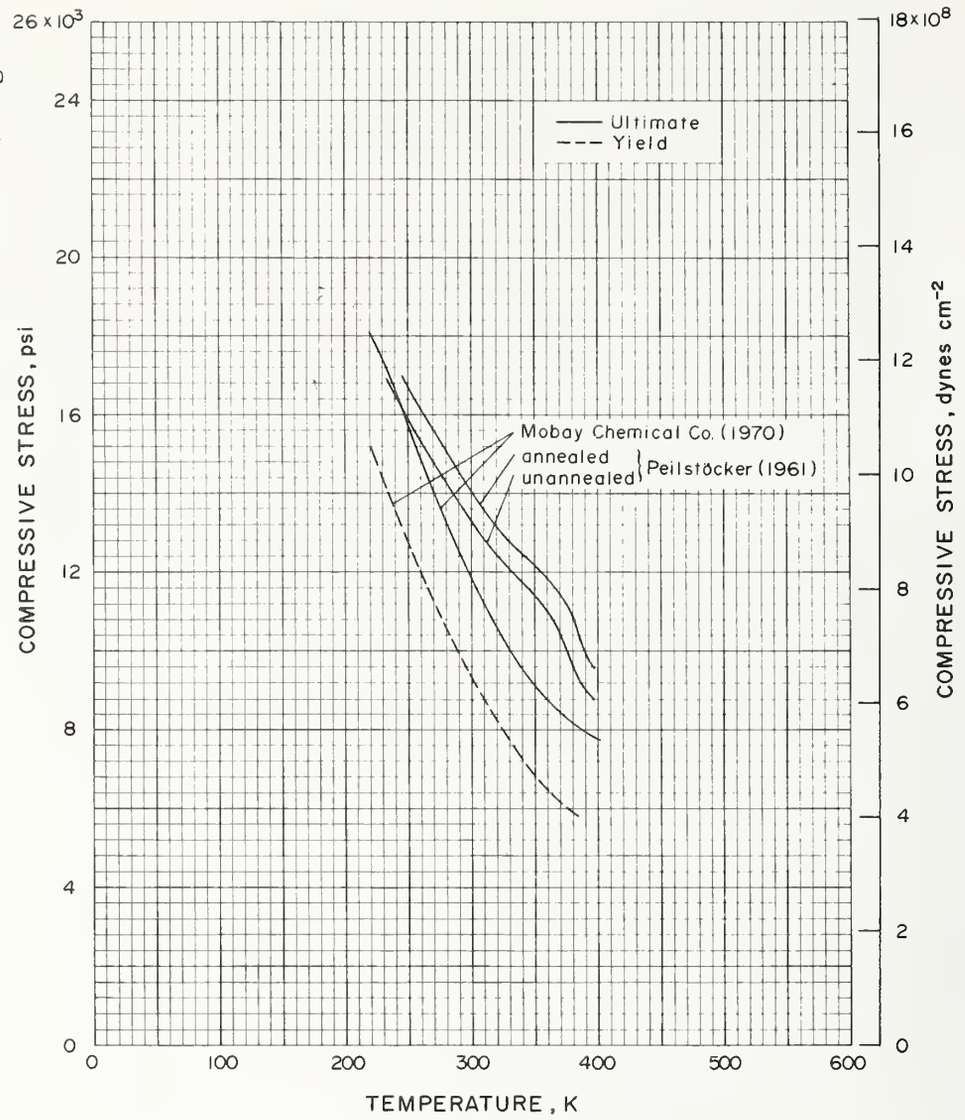
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Bauwens, Bauwens-Crowet, Homès (1969)	Makrolon, sheets, t = 0.2 cm	ℓ = 4 cm, w = 0.8 cm; Instron, specimens held at temp 30 min before test; each point is the mean value of 3 tests.
Bauwens-Crowet, Bauwens, Homès (1969)	Makrolon, sheets, t = 0.2 cm	ℓ = 4 cm, w = 0.8 cm; Instron, specimens held at temp 30 min before test.



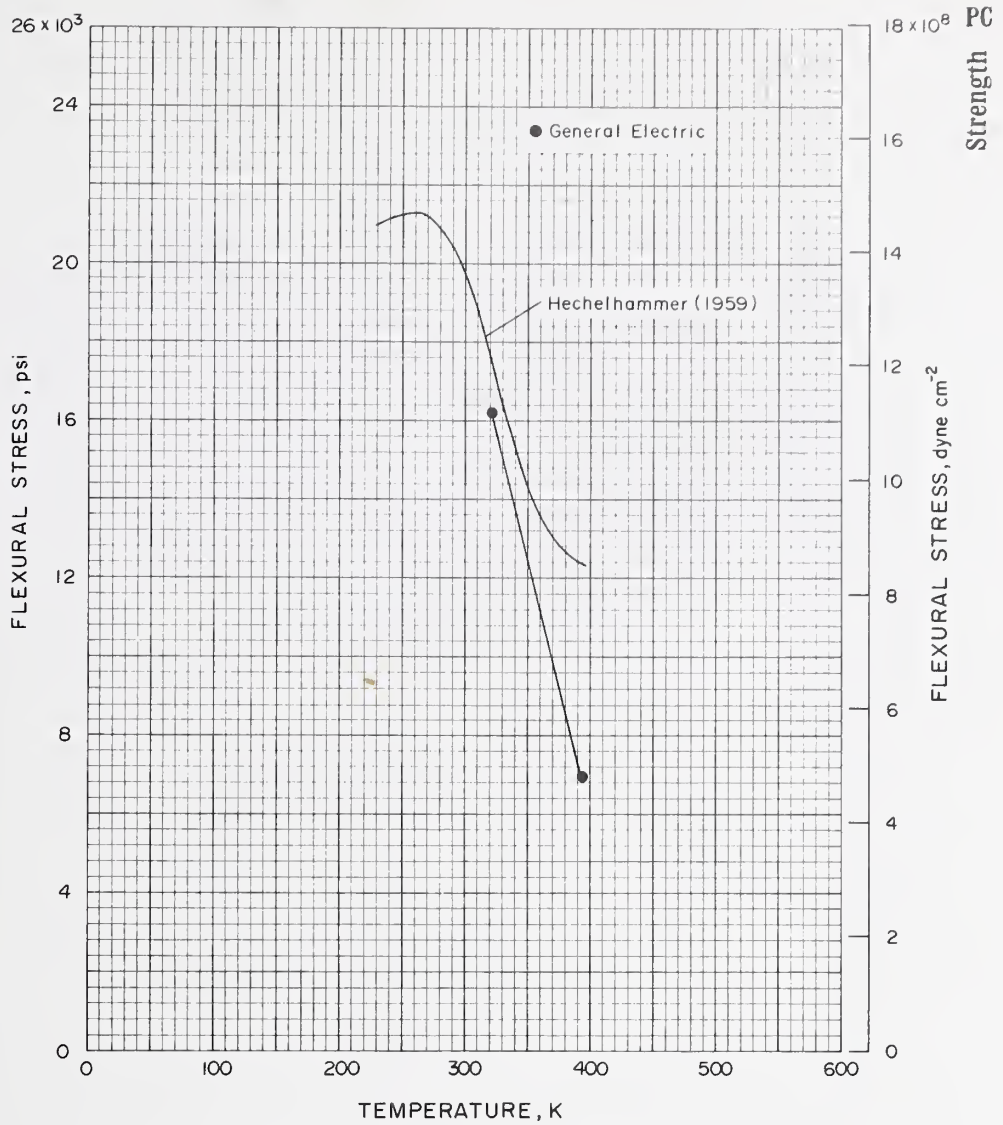
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Golden, Hammant, Hazell (1967)	Makrolon Grade S, extruded sheet	Injection molded dumbbell specimens; Hounsfield Tensometer, xhd spd = 0.0042 cm s^{-1}, annealed at temp noted for various times, specimens then conditioned at 293 ± K and 70% rel hum for 24 h before testing at 293 K.

PC

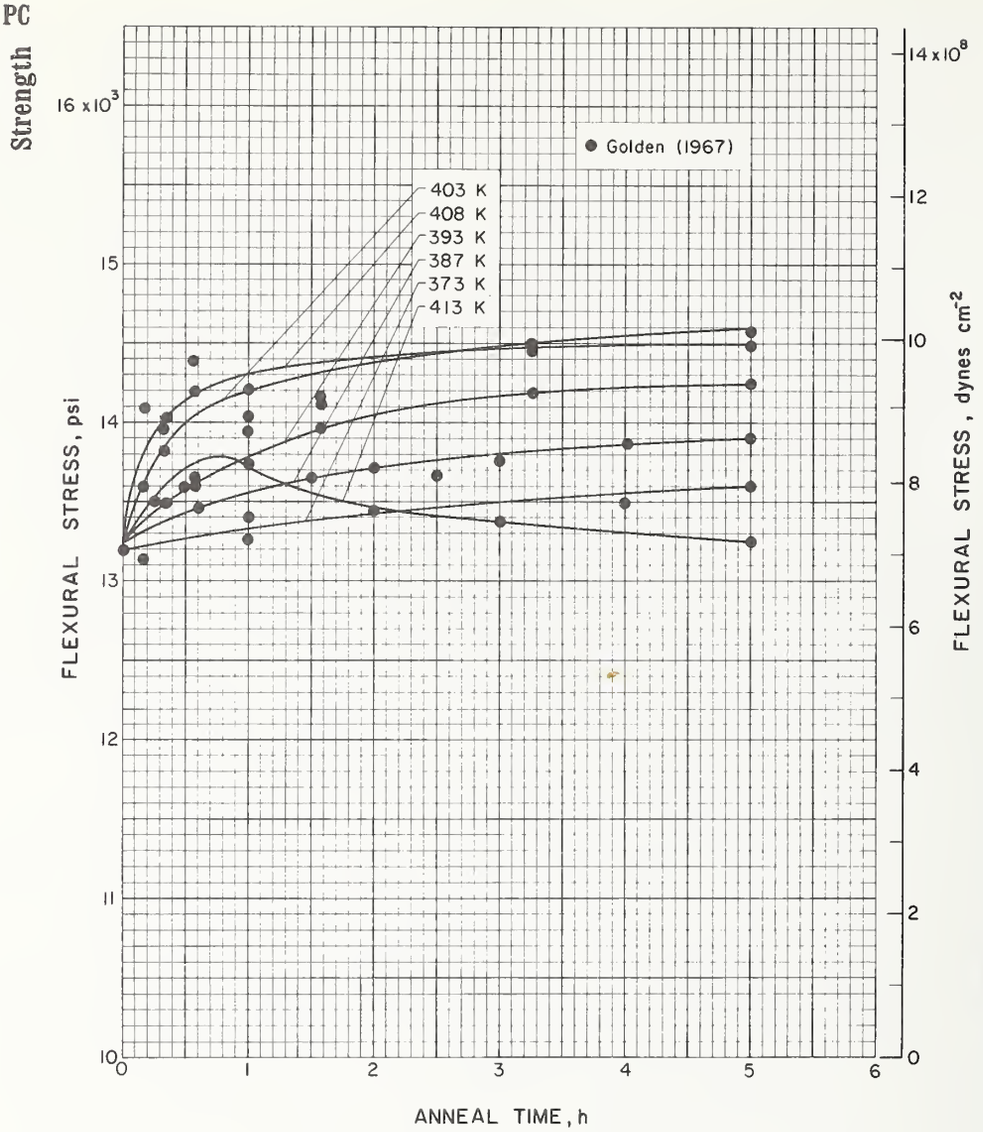
Strength



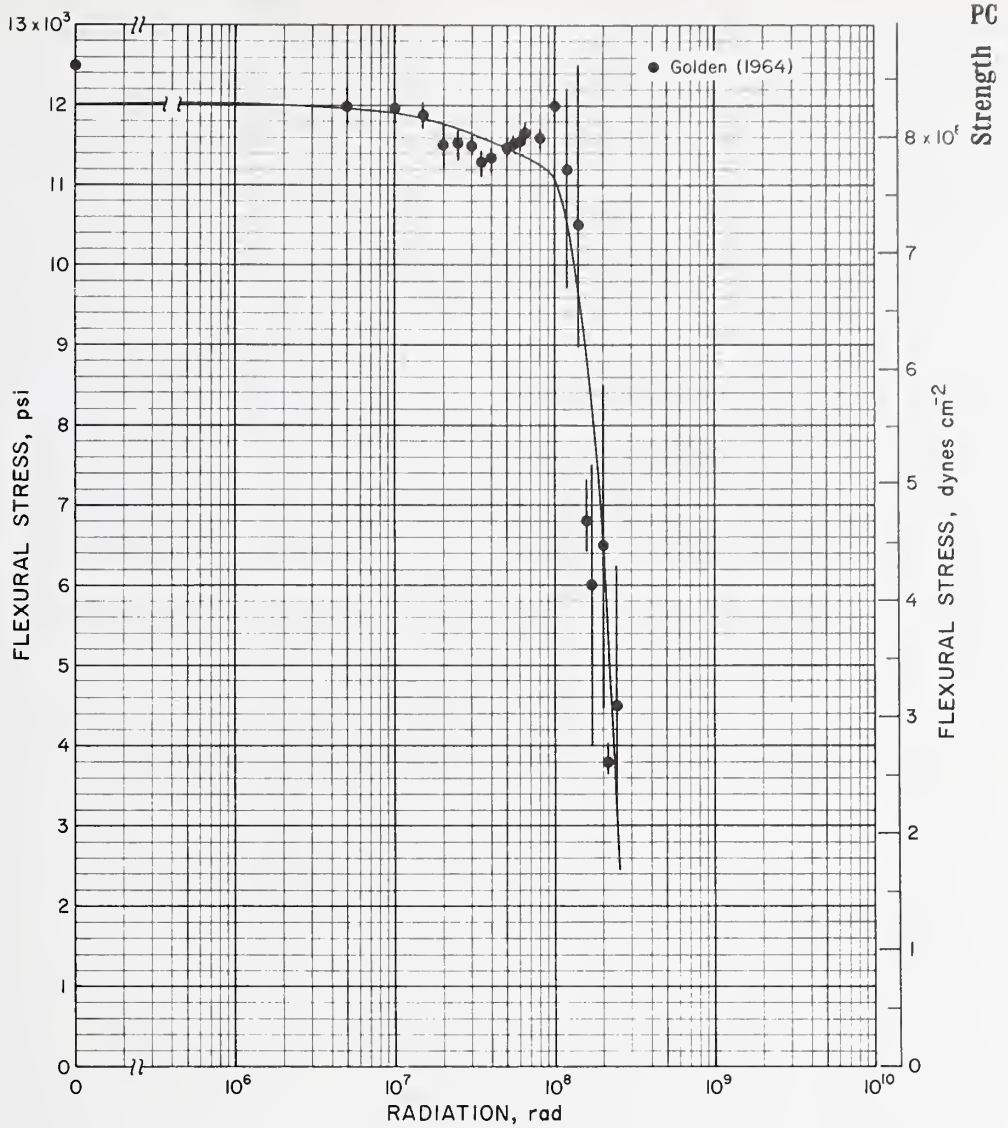
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Peilstöcker (1961) Mobay Chemical Co. (1970)	Merlon	



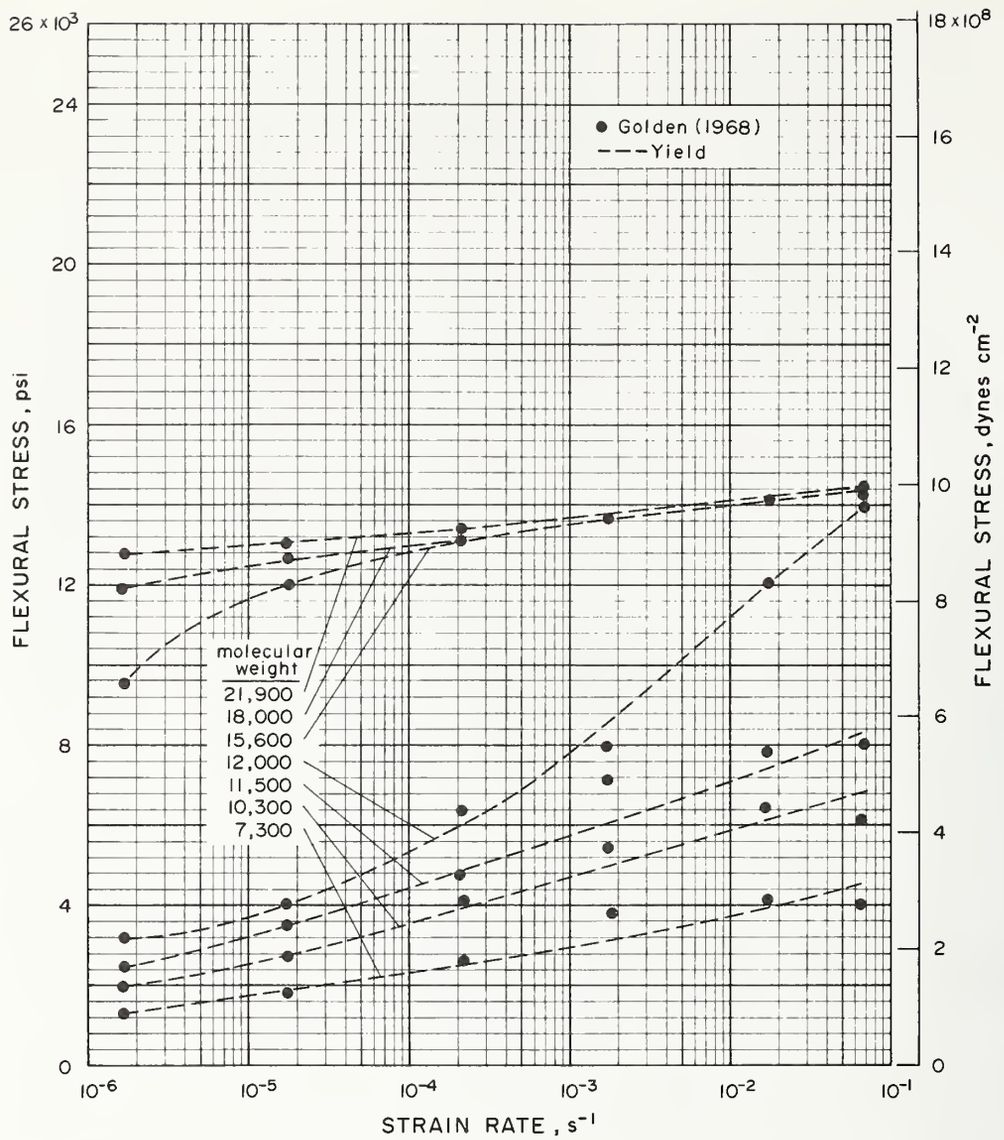
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
General Electric	Lexan 500	
Hechelhammer, Peilstöcker (1959)	Makrolon, sp gr = 1.20	DIN 53452 test procedure.



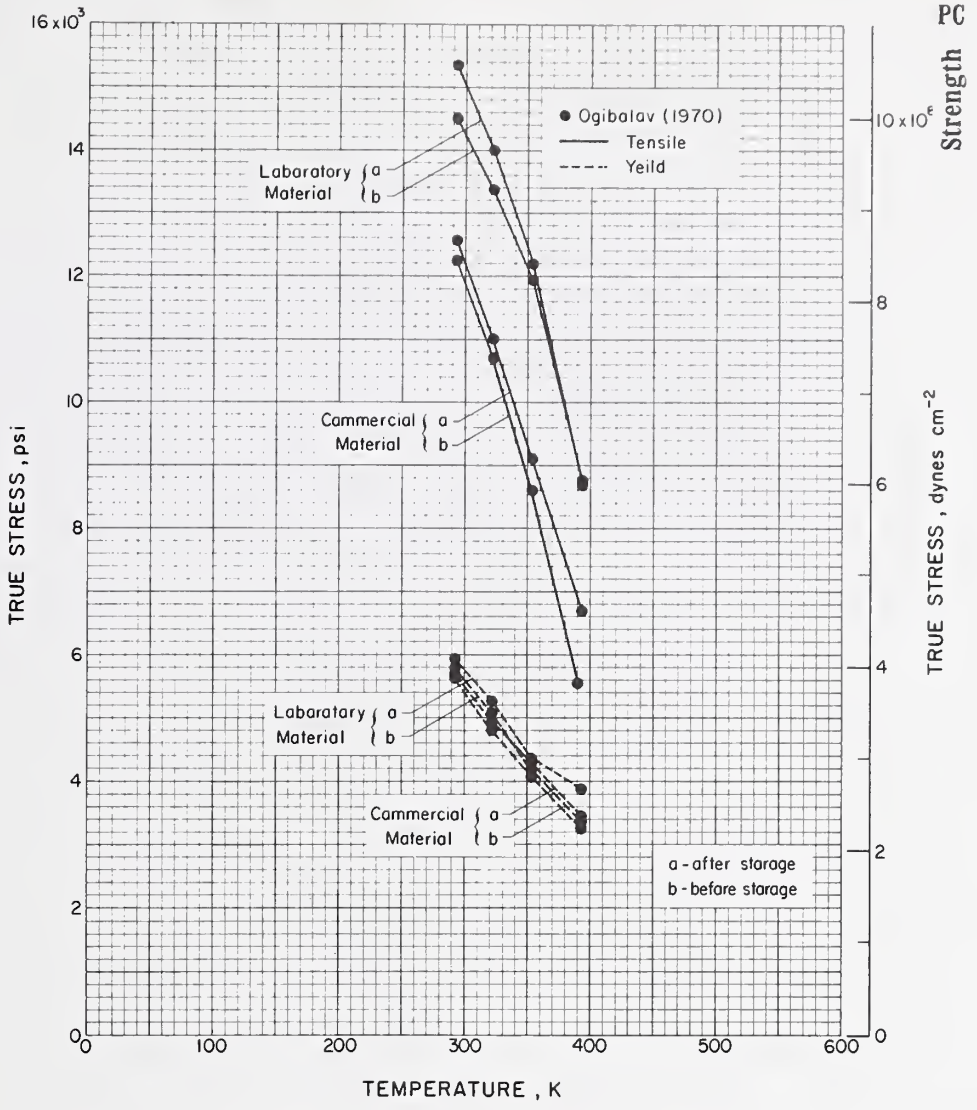
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Golden, Hammant, Hazell (1967)	Makrolon Grade S, extruded sheet	Machined bars, 10.16 x 1.27 x 0.318 cm; annealed at temp noted for various time, 3-point loading, ASTM D 790-58T test procedure B except that samples were conditioned and tested at 293 ± 1 K and 70% rel hum, xhd spd = 0.021 cm s^{-1}.



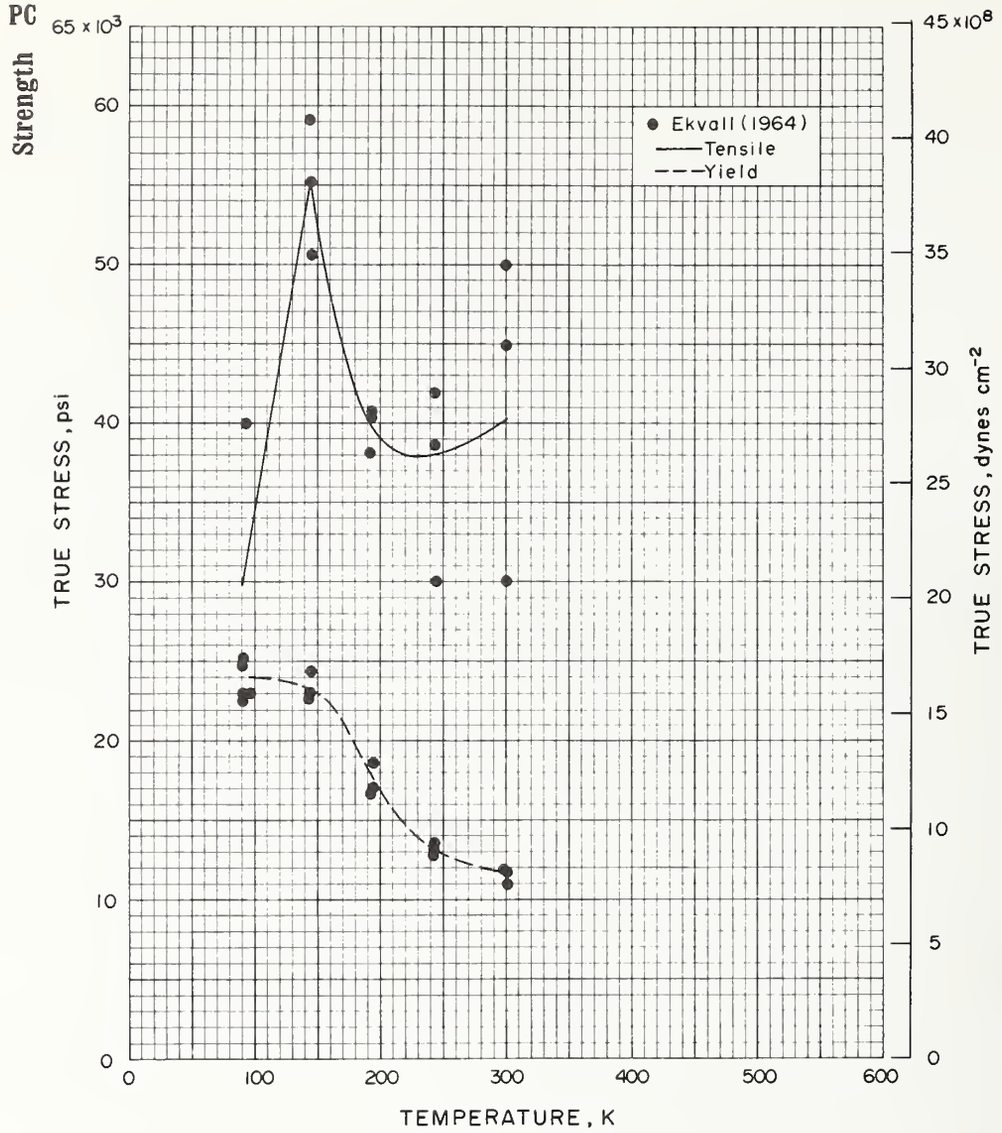
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Golden, Hammant, Hazell (1964)	Makrolon Grade S, machined from extruded sheet, in equilibrium at 293 ± 1 K and 70% rel hum	ℓ = 10.2 cm, w = 1.3 cm, t = 0.318 cm; 293 ± 1 K, 70% rel hum, ASTM D790-58T test procedure B except that xhd spd = 0.021 cm s^{-1}; tested not less than 2 weeks after 4 Mev electron irradiation at 10^5 rad min^{-1}.



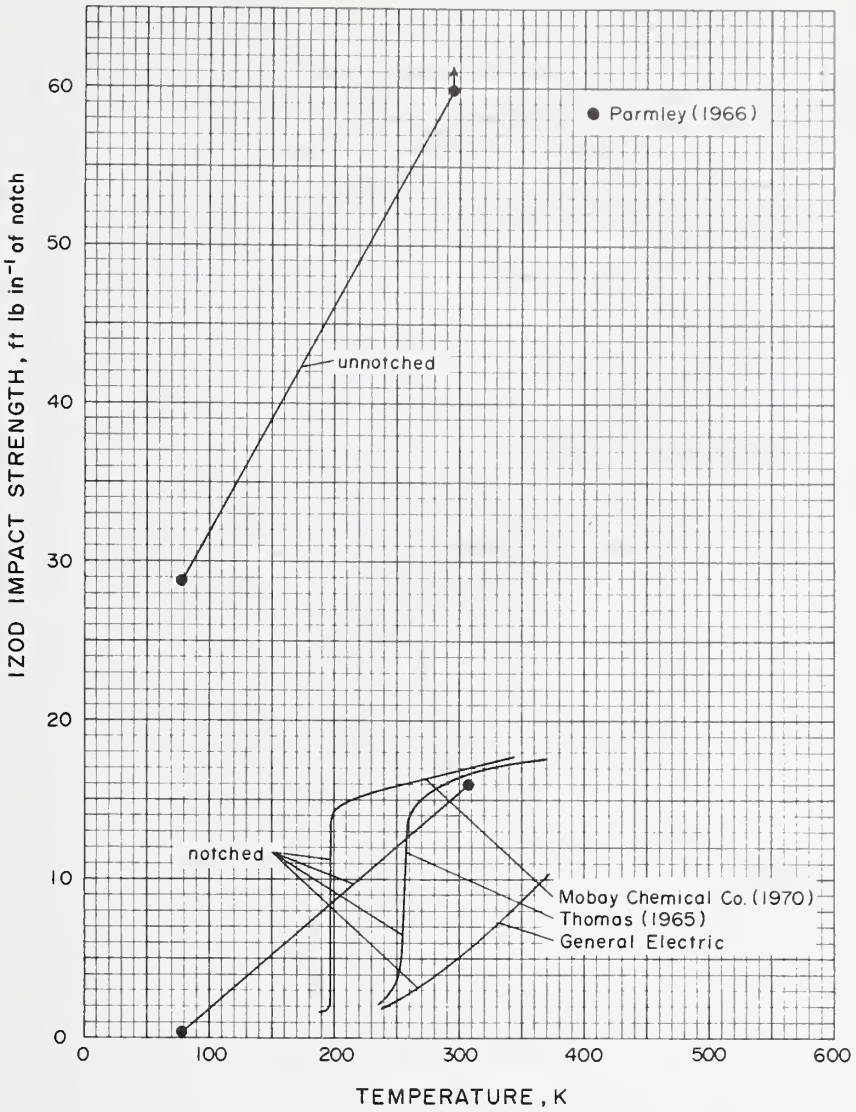
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Golden, Hammant, Hazell (1968)	Makrolon grade S, extruded sheet, initial molecular weight = 21,900	Machined bars, 10.2 x 1.27 x 0.32 cm; 3-point loading jig with a span of 5.08 cm, Hounsfield Tensometer, molecular weight calculated from viscosity, different molecular weights obtained by irradiating with 4 Mev electrons at 10^6 rad min^{-1} from a linear accelerator, specimens irrad in an evacuated Al container and then conditioned at 293 ± 1 K and 70 ± 2% rel hum for at least 2 weeks before testing under the same conditions.



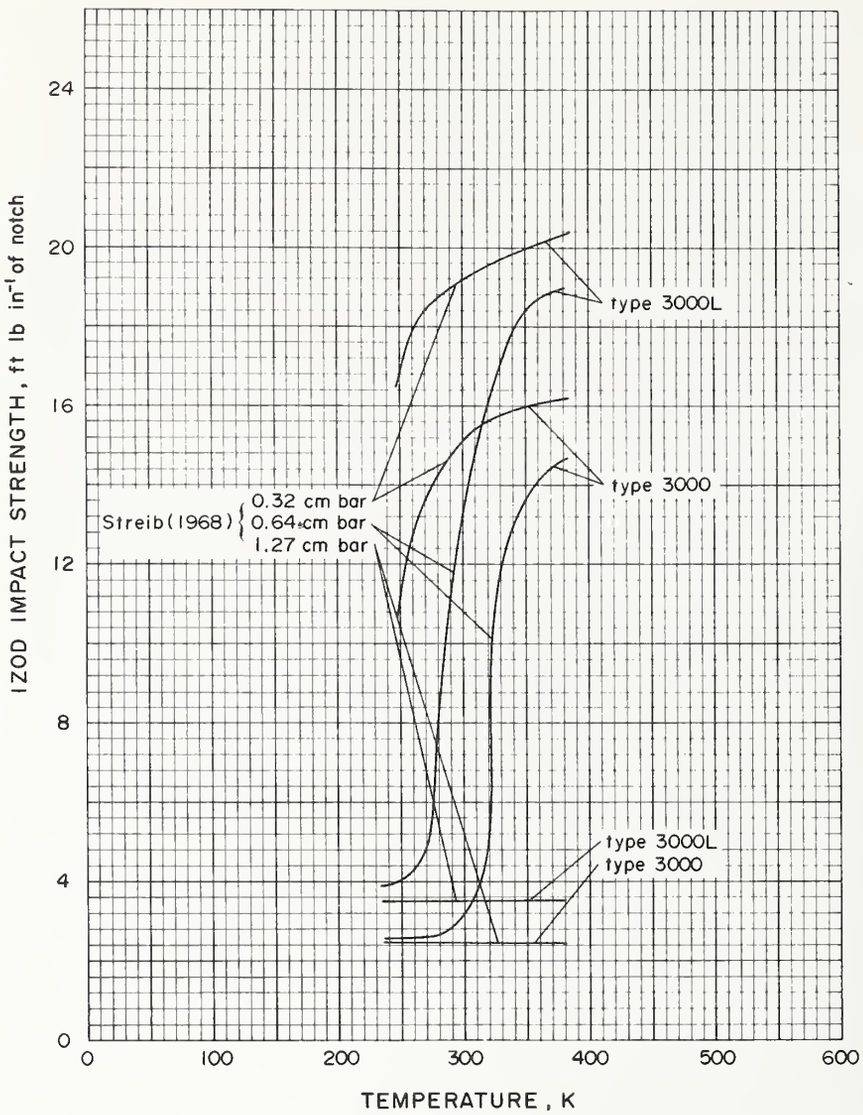
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Ogibalov, Moroz (1970)	Laboratory produced polymer before and after 2 years storage; Makrolon before and after 4 years storage	Stored at 291-293K in a dark dry location.



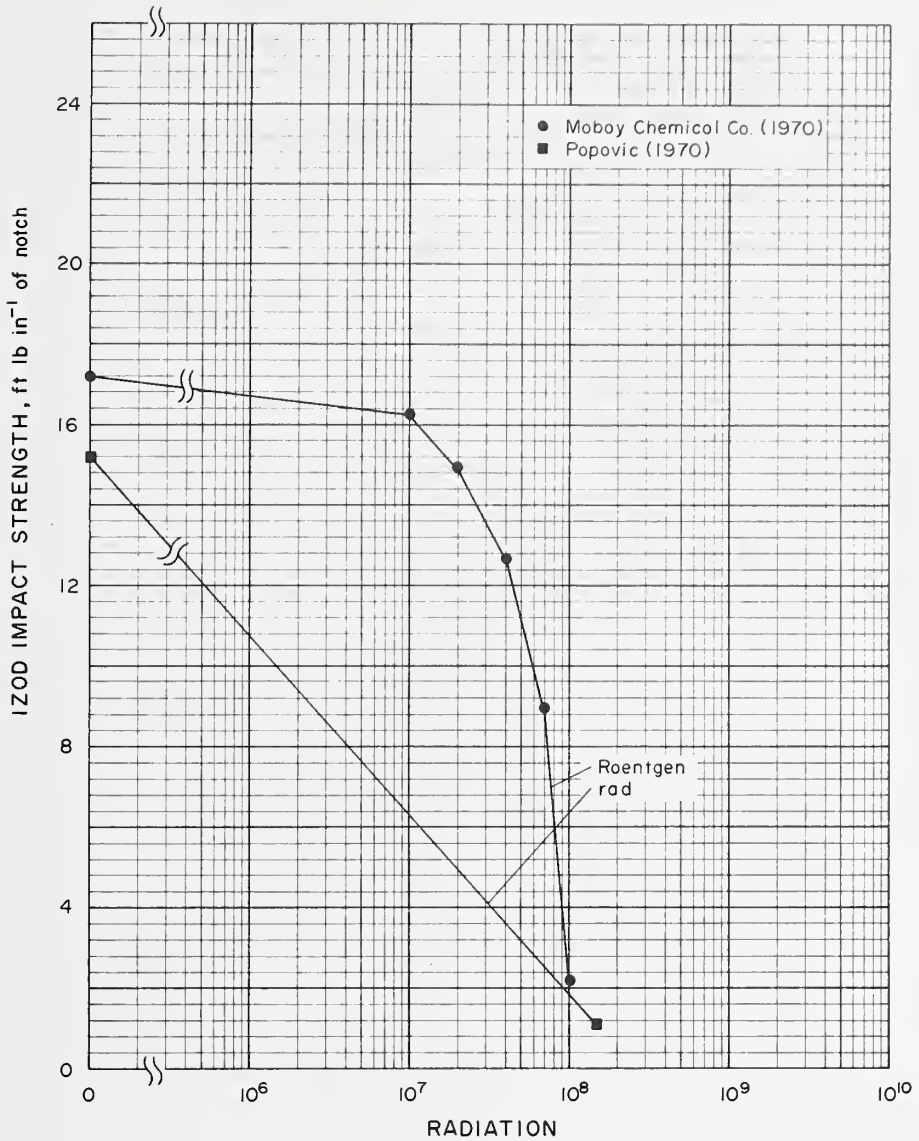
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Ekvall, Low, Jr. (1964)	Lexan, bisphenol A polycarbonate, amorphous, solvent-cast film, uniform birefringence of 1.47×10^{-3} indicating 4% molecular orientation.	t = 0.010 cm, dumbbell shaped specimen, molecular orientation ‖ tension axis; Instron, xhd spd = 0.0085, cooled with cold N_2 gas, photographic strain recording technique using selenium spots vacuum-evaporated onto film; specimen temp uniform to ± 2-3 K.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
General Electric	Lexan 500	0.32 x 1.27 cm notched bars.
Thomas (1965)	Lexan	
Parmley, Wong, Skogh (1966)	Lexan	0.32 cm unnotched and notched specimens; arrow indicates "greater than."
Mobay Chemical Co. (1970)	Merlon	0.32 cm specimen, notched.



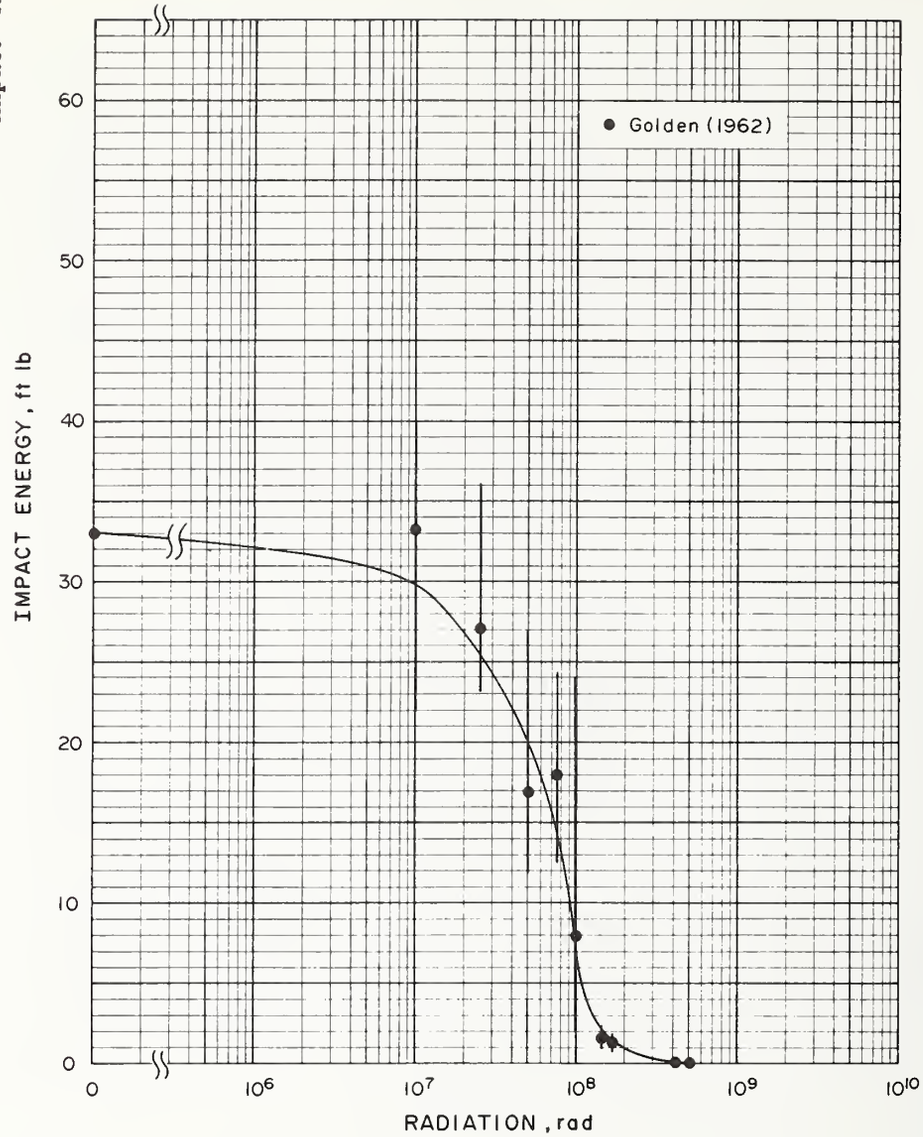
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Streib (1968)	Makrolon 3000, and stabilized Makrolon 300L	Notched bars, size noted; ASTM D 256 test procedure.



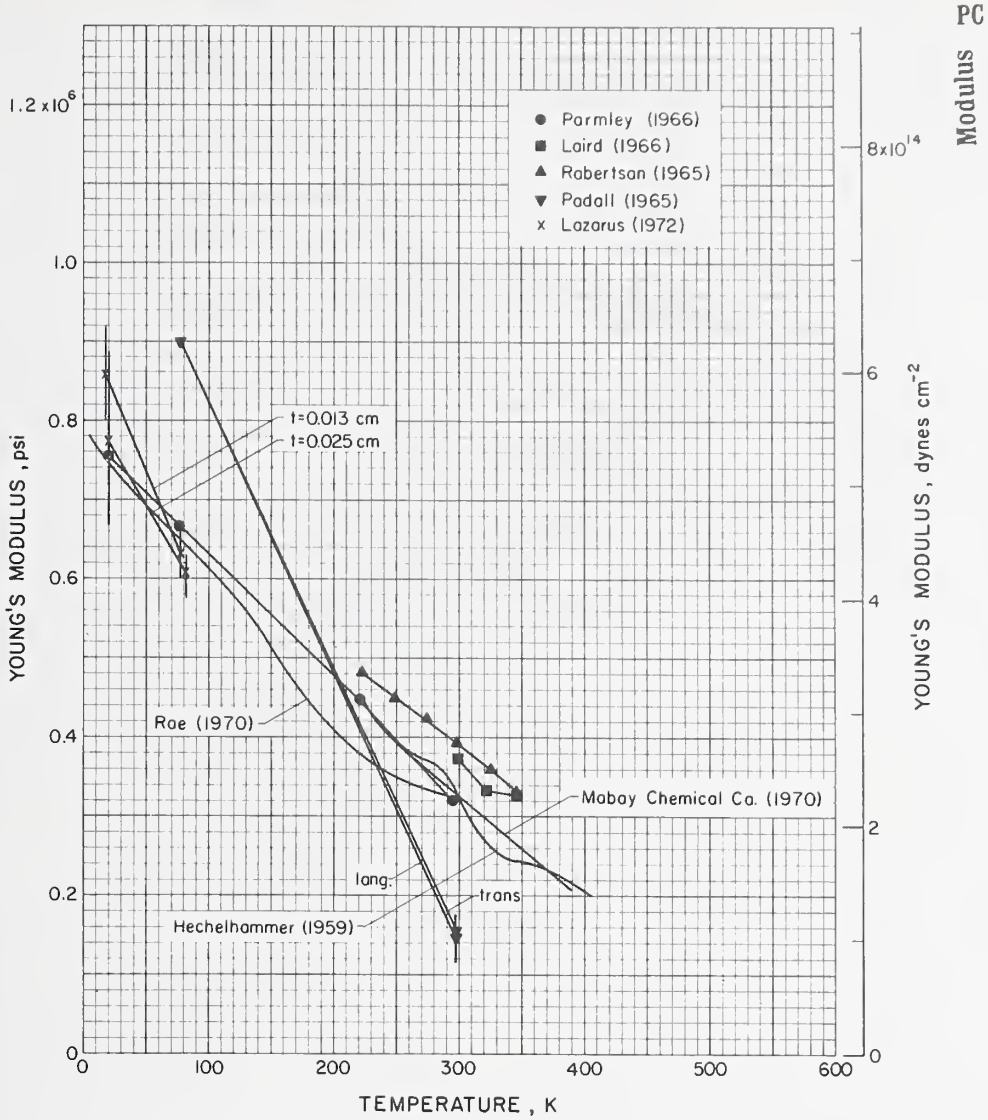
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Popovic (1970)		Injection molded to standard ASTM dimensions; conditioned according to ASTM D 618 Procedure A, ASTM D 256 test procedure, 296 ± 2 K, 50 ± 5% rel hum; irrad in air at room temp and 0.33 x 10^8 rads h^{-1} by Co^{60}.
Mobay Chemical Co. (1970)	Merlon	0.32 cm bars; ASTM D 256; irrad by 2 Mev electrons.

PC

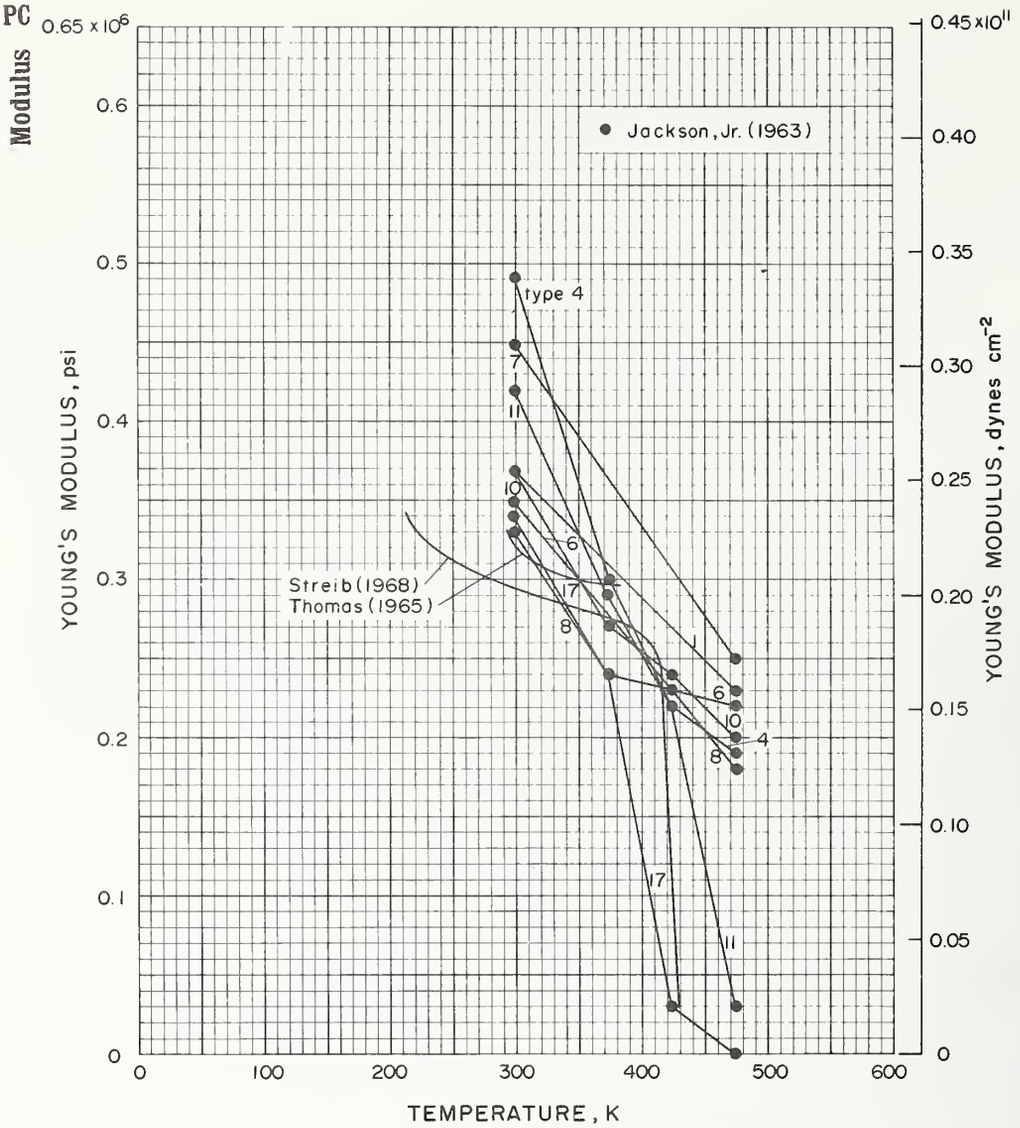
Impact



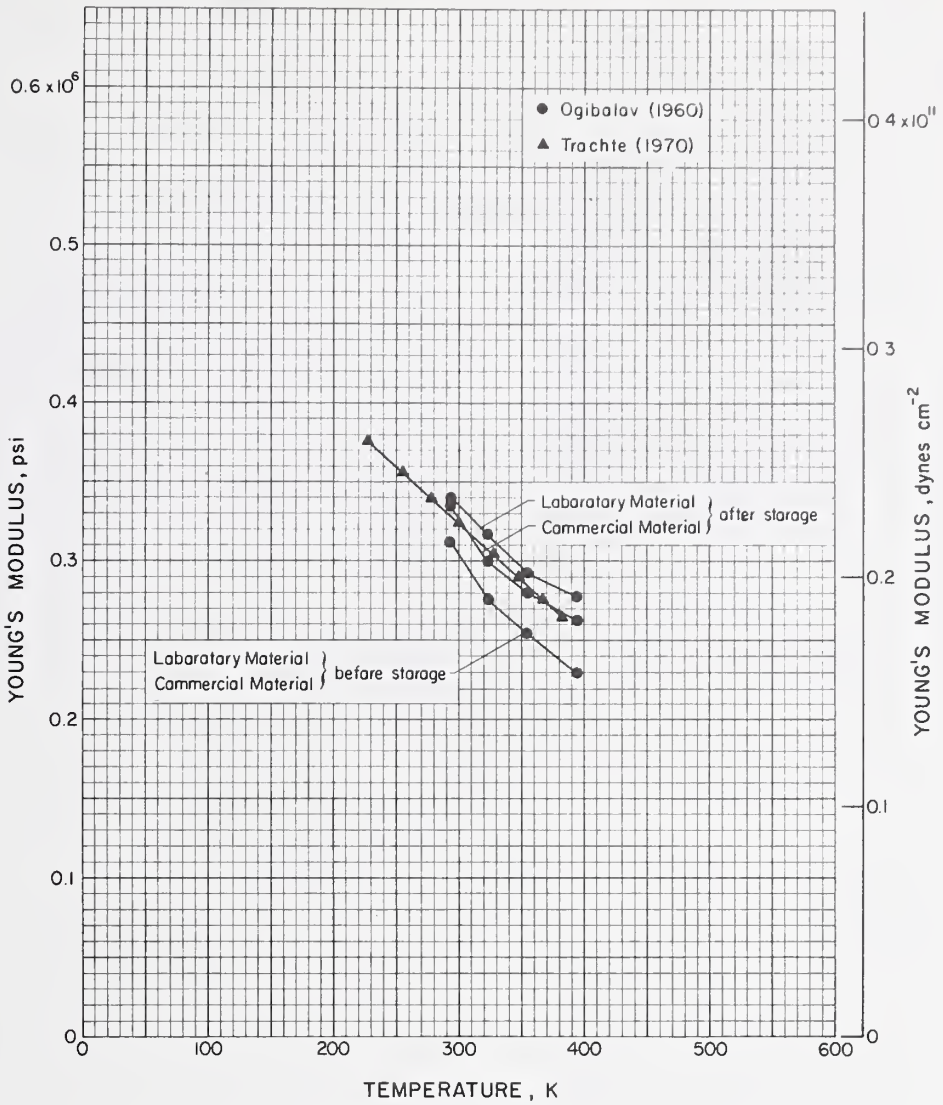
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Golden, Hazell (1962)	Lexan, unconditioned, 0.2% moisture content	Injection molded dumbbells, GL ≃ 2.54 cm; $\dot{\epsilon}$ = 340 s^{-1}; irrad by 4 Mev electrons from a linear accelerator at 10^6 rad min^{-1}, held in a water cooled Al tray with a 0.08 cm thick Aℓ window, irrad in vacuum and held in vacuum for at least 2 weeks between irradiation and testing.



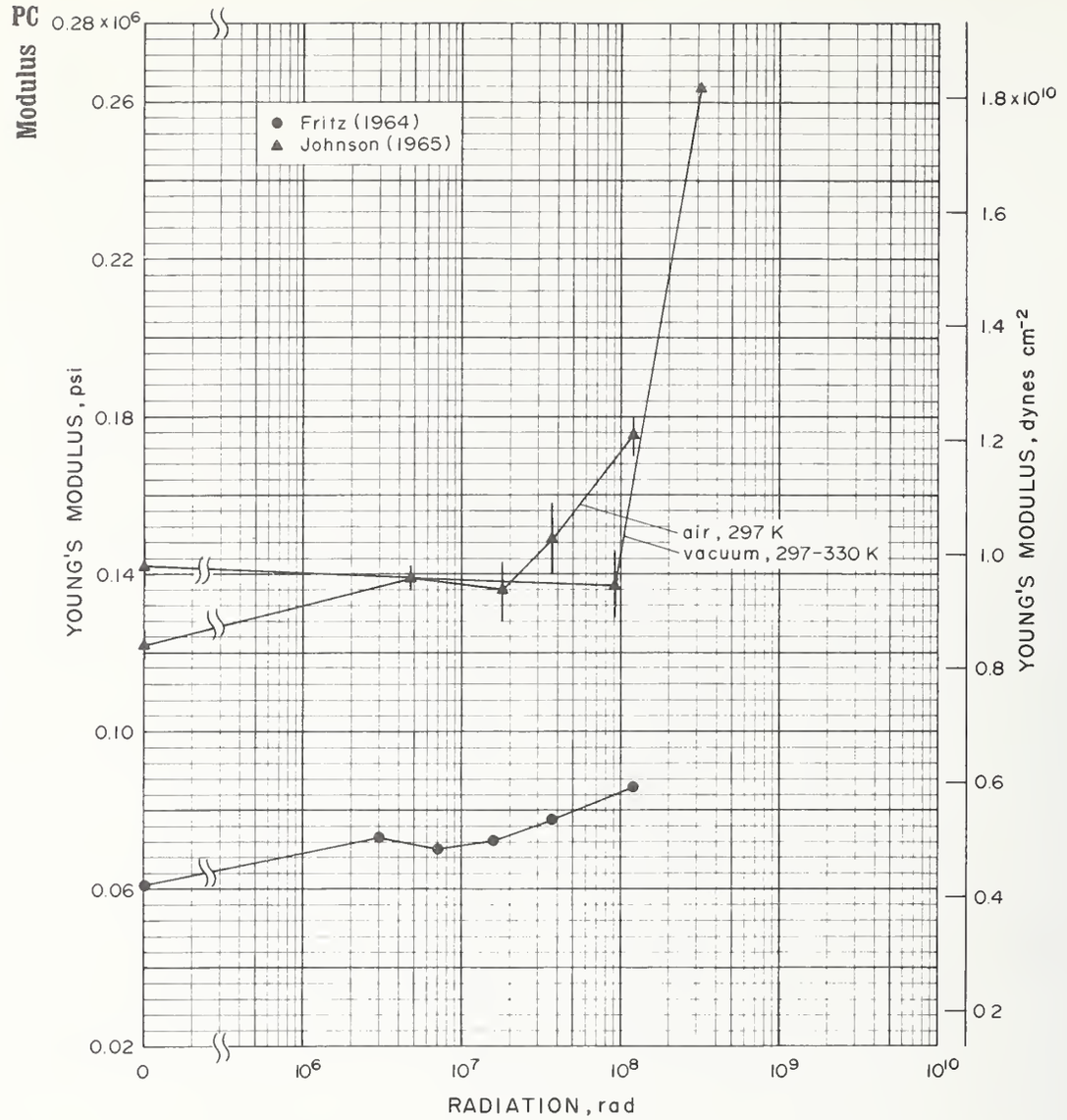
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Hechelhammer, Peilstöcker (1959)	Makrolon, sp gr = 1.20	DIN 53455 test procedure.
Robertson, Wilson (1965)	Lexan, molecular weight = 90,000, unoriented film	t = 0.010 cm; vibrating reed technique, resonant frequency generally in the range of a few hundred Hz.
Parmley, Wong, Skogh (1966)	Lexan	
Laird, Cimprich, Kappler, Mason, Jr. (1966)	Lexan, sp gr = 1.20	Red Sec ℓ = 5.08 cm, w = 1.27 cm, t = 0.64 cm as per ASTM D 638-61T; dynamic tests; error bars show range of values.
Mobay Chemical Co. (1970)	Merlon	
Podall, Oser, Eliason, Augl (1965)	Lexan	Av of 2 or 3 tests; error bars indicate data spread.
Lazarus (1972)	Lexan 8070-112, conditioned at 295-297 K, 40-45% rel hum	GL = 3.81 cm, w = 0.635 cm; Instron Model TT-K, Universal test machine, xhd spd = 0.0042 cm s^{-1}, clip-on strain gauge; error bars indicate standard deviation of 5 tests.
Roe (1970)	Lexan, amorphous film cast from melt and rapidly quenched	Red Sec 6.0 x 1.27 x 0.013 - 0.025 cm; Instron.



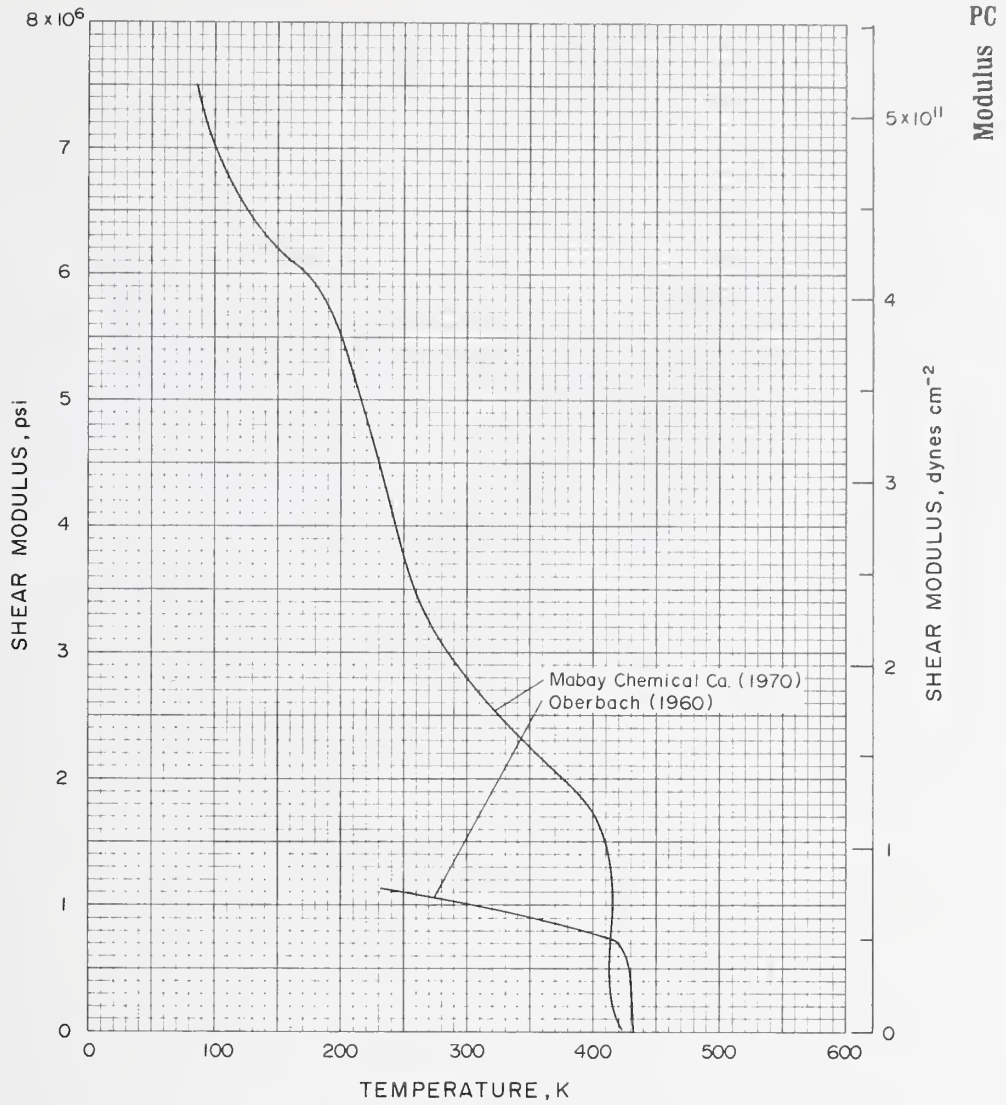
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Jackson, Jr., Caldwell (1963)	Basis for type 1 is 4, 4′-(2-norbornylidene) diphenol; for type 4 is 4, 4′-(2-norbornylidene) bis (2, 6-dichlorophenol); type 6 is 4, 4′-(2-norbornylmethylene) diphenol; type 7 is 4, 4′-(2-norbornylmethylene) bis (2, 6-dichlorophenol); type 8 is 4, 4′-(3-methyl-2-norbornylmethylene) diphenol; type 10 is 4, 4′-(hexahydro-4, 7-methanoidan-5-ylidene) diphenol; type 11 is 4-4′-(hexahydro-4, 7-methanoidan-5-ylidene) di-o-cresol; type 17 is 4, 4′-isopropylidenediphenol	Films cast from methylene chloride, t = 0.002-0.008 cm, air dried then heated at 383 K for 1-2 h; tested on an Instron using ASTM D 882-61T test procedure.
Thomas (1965)	Lexan	
Streib (1968)	Makrolon 3000	Tested to DIN proposal 53444 (1966).



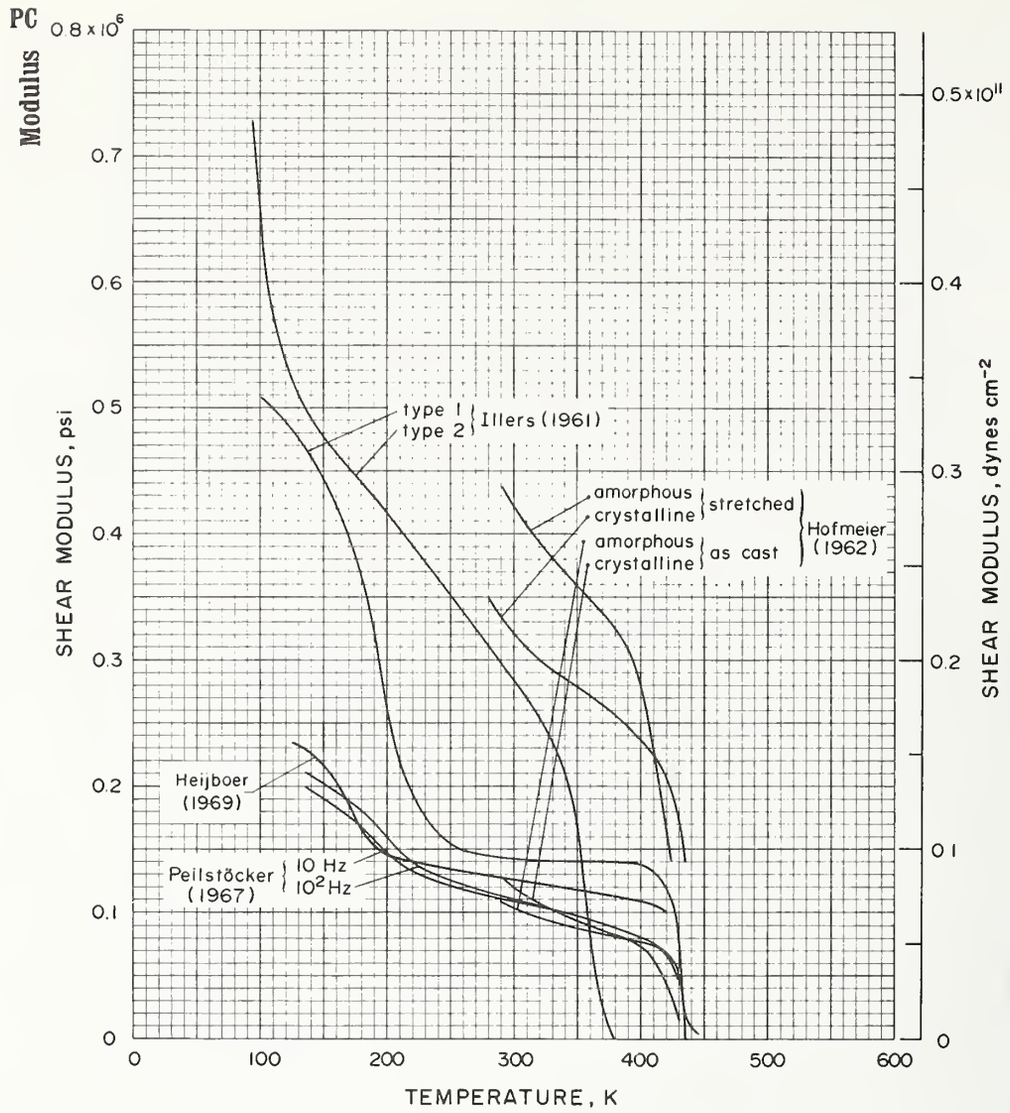
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Ogibalov, Moroz (1970)	Laboratory produced polymer before and after 2 years storage; Makrolon before and after 4 years storage	Stored at 291-293K in a dark dry location.
Trachte (1970)		ℓ = 10.2 cm, w = 1.3 cm, t = 0.32 cm; Instron Model TT-D, $\dot{\epsilon}$ = 2-20 x 10^{-5} s^{-1}.



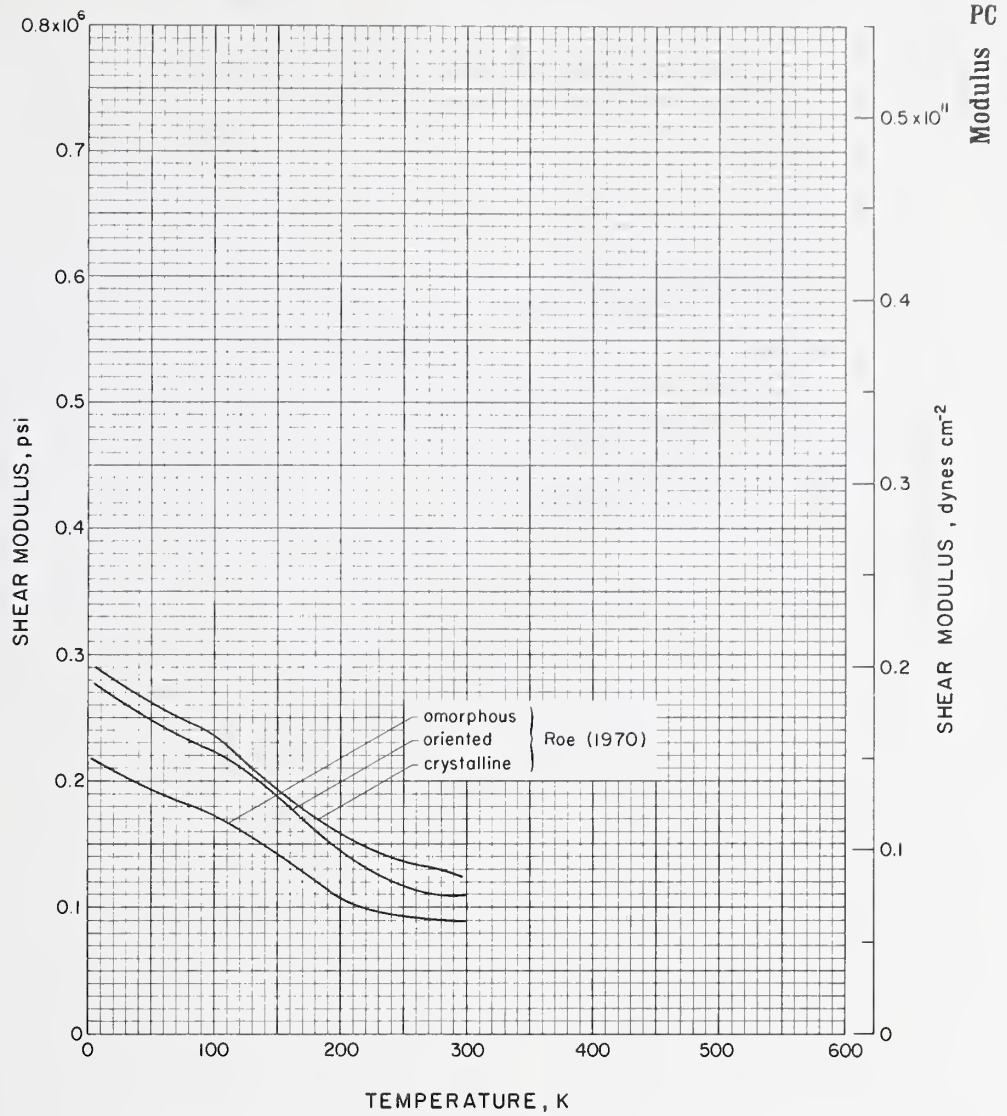
INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONOITIONS
Fritz (1964)	Merlon, poly [2, 2-propane-bis-(4-phenyl carbonate)], sp gr = 1.2	Router milled to t = 0.638 ± 0.008 cm, dumbbell specimens as per ASTM D 638-61T, GL = 5.72 cm; Instron, xhd spd = 0.0085 cm s^{-1}, $\dot{\epsilon}$ = 0.00148 s^{-1}; specimens wrapped in Al foil and irrad by the Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics, Fort Worth, specimens stored at 296 ± 3 K for 4 days before testing; av values of 15 measurements, author presents this data as tangent moduli.
Johnson, Lewis, Self (1965)	Merlon, sp gr = 1.2	Router milled dumbbell specimens, GL = 3.3 cm, w = 0.56 cm, t = 0.152-0.178 cm; Instron model TTC, ASTM D 638-61T test procedure, xhd spd = 0.0085 cm s^{-1}; samples wrapped individually in Al foil and irrad in air and vacuum at temp noted by the Ground Test Reactor at the Nuclear Aerospace Research Facility, General Dynamics, Fort Worth; error bars indicate standard deviation of 7 to 13 measurements.



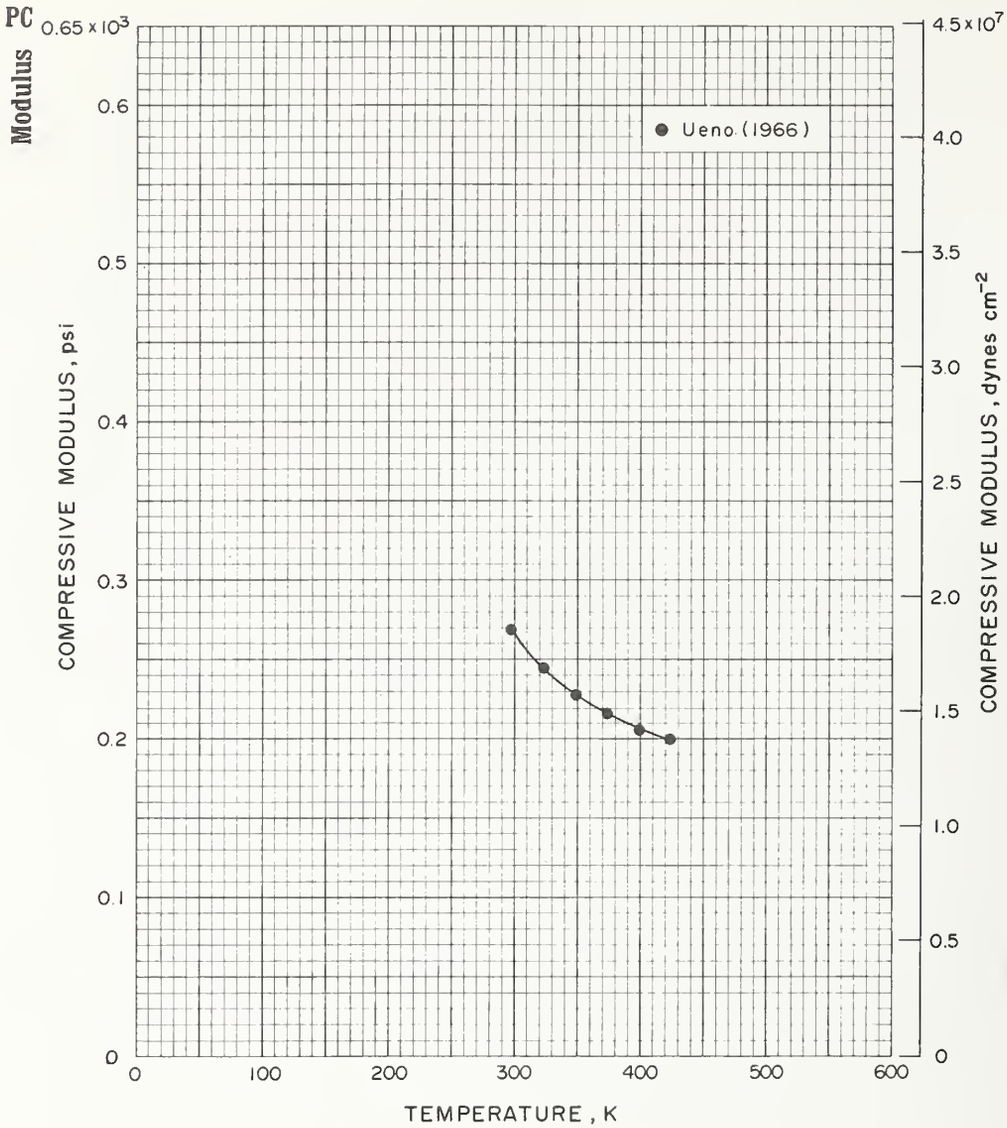
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Oberbach, Paffrath (1960)	Makrolon	
Mobay Chemical Co. (1970)	Merlon	



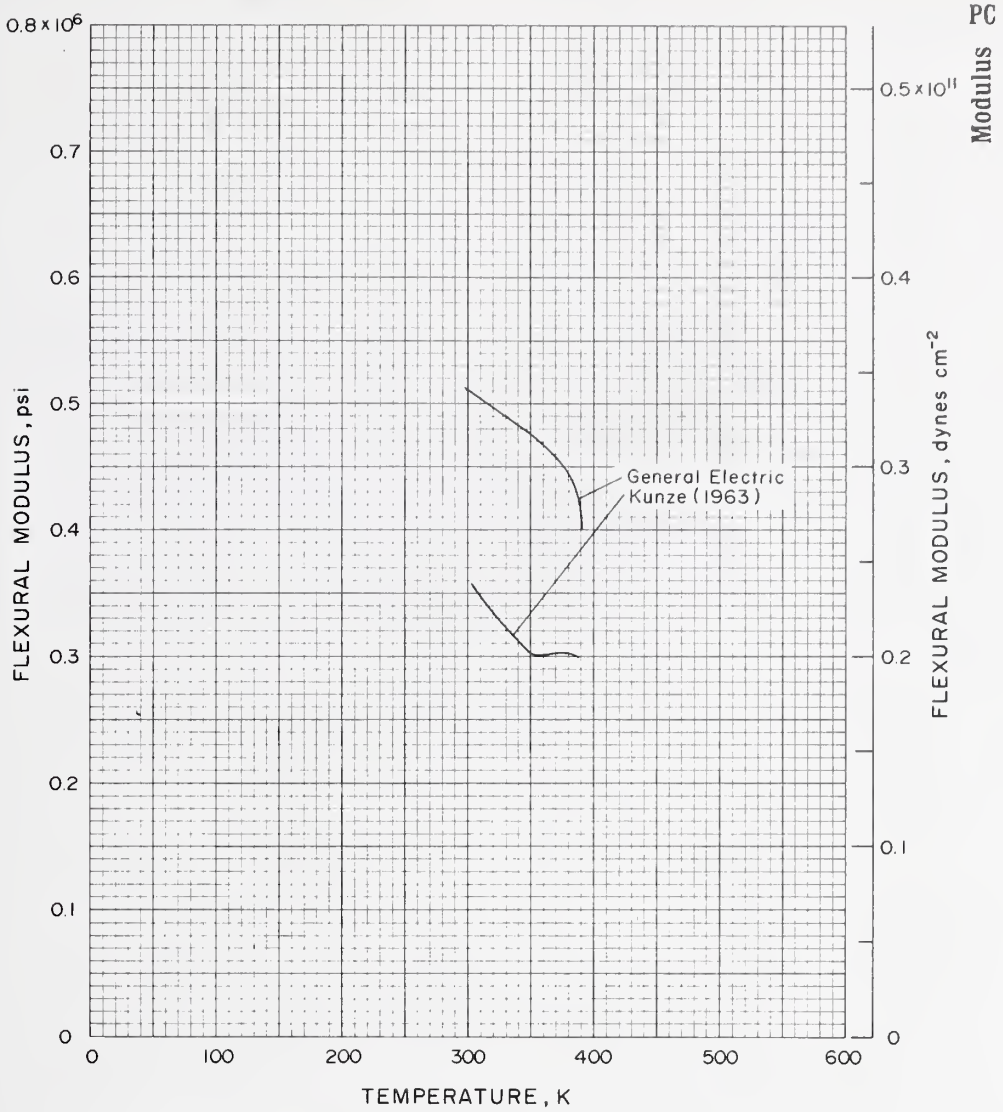
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Illers, Breuer (1961)	Type 1 is Makrolon, based on 4, 4′-dioxydiphenyl-2, 2′-propane; type 2 is based on 1, 5-naphthylene-di-(β-oxy-ethyl-ether)	ℓ = 5.0 cm, w = 0.6 cm, t = 0.1 cm; torsion pendulum, 1 Hz.
Hofmeier (1962)	Poly-[2, 2-bis (4-hydroxyphenyl)-propane-carbonate], cast film	
Peilstöcker (1967)	Makrolon 3000, sp gr = 1.20	
Heijboer (1969)	Makrolon	



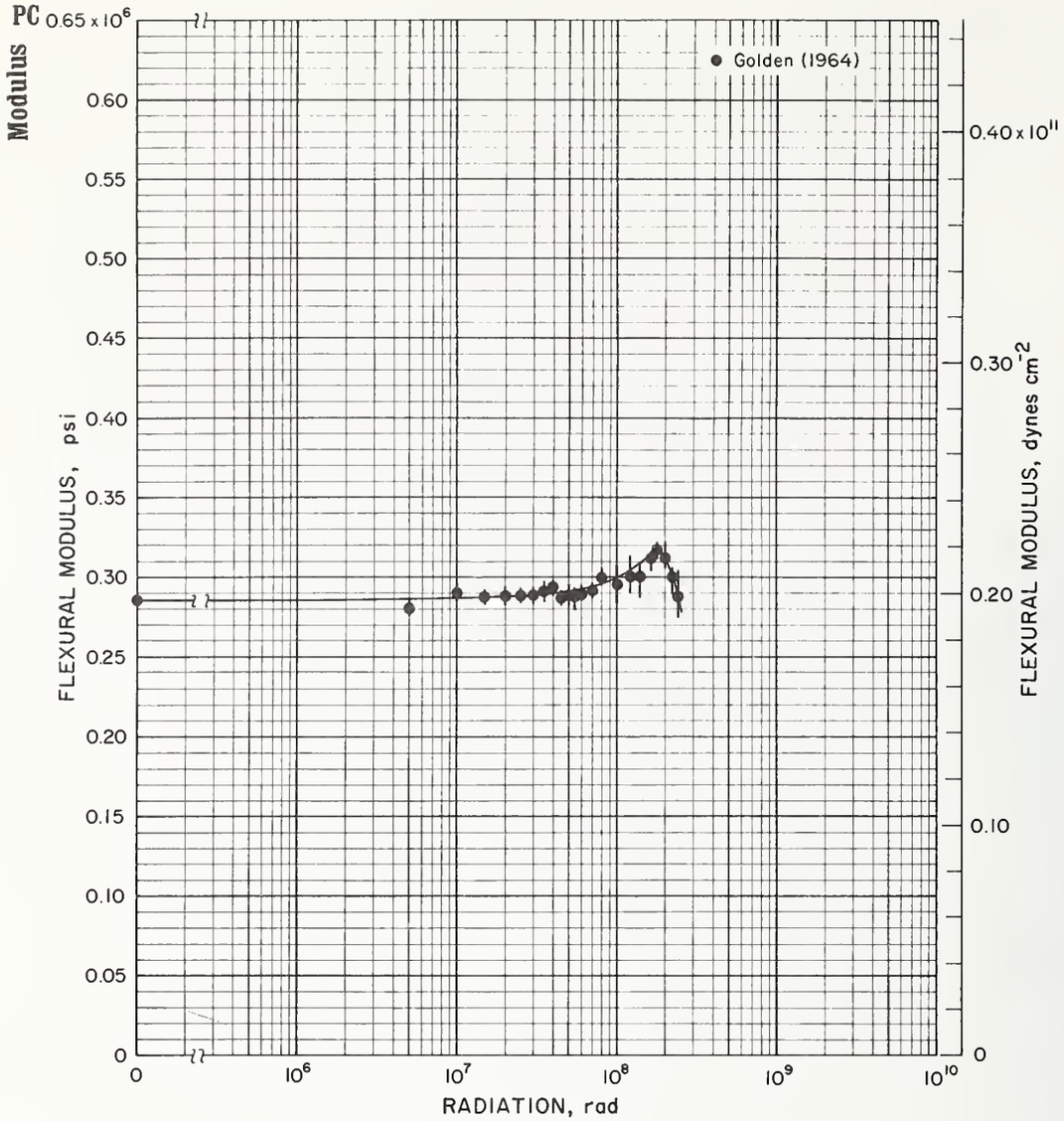
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Roe (1970)	Lexan, amorphous film was cast from melt and rapidly quenched, film crystallized to 28% by exposure to acetone vapors for 24 h, oriented by drawing to 220% elongation at 424 K	6.0 x 0.6 x 0.03 cm; inverted torsion pendulum.



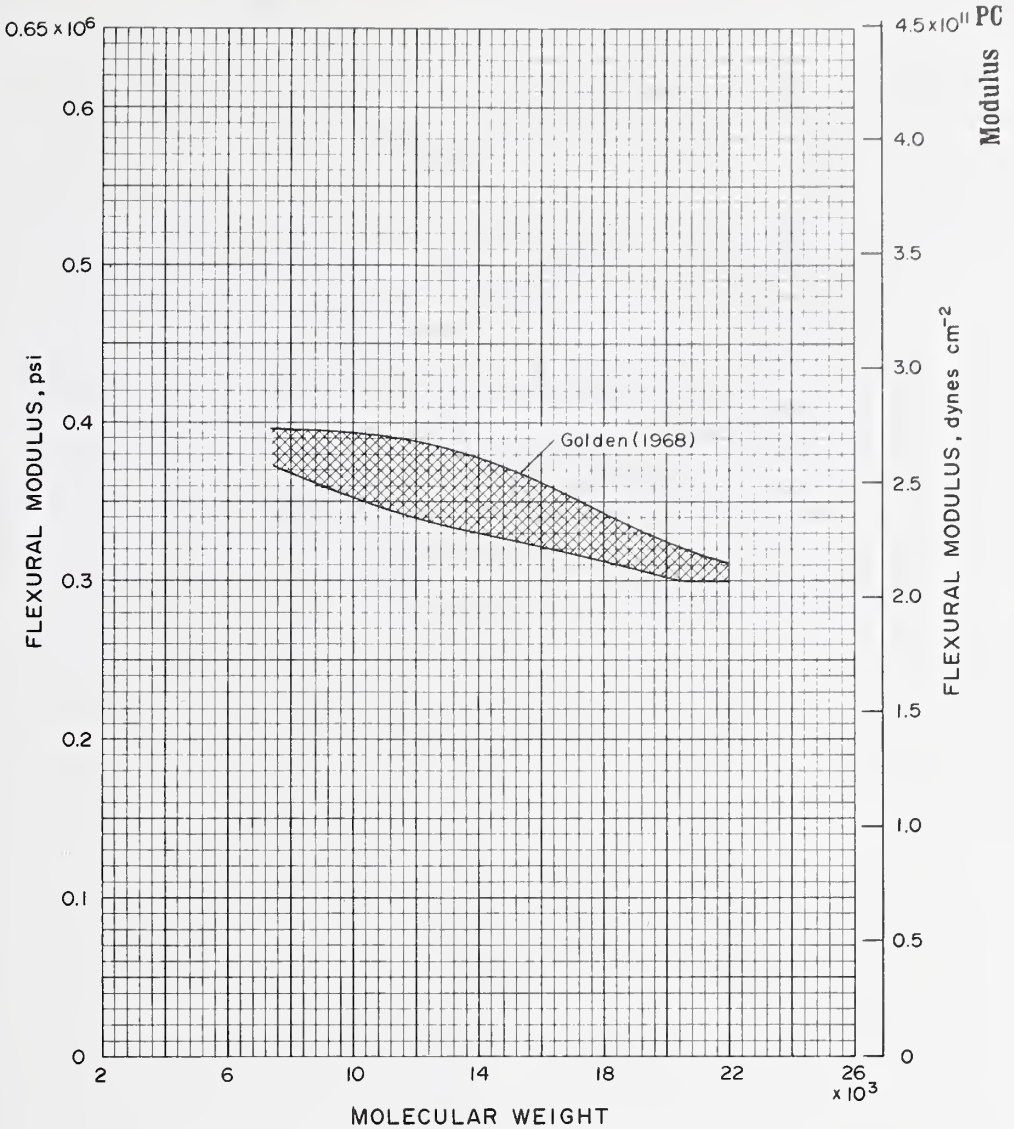
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Ueno, Yamazaki, Oue, Ito, Tsutsui (1966)	Iupilon, produced by solvent method, molecular weight = 24,000-25,000 bars made by extrusion molding, dried for more than 10 h at 423 K	Diam = 1.2 cm, ℓ = 1.2 cm; temp fluctuation maintained within ± 0.5 K.



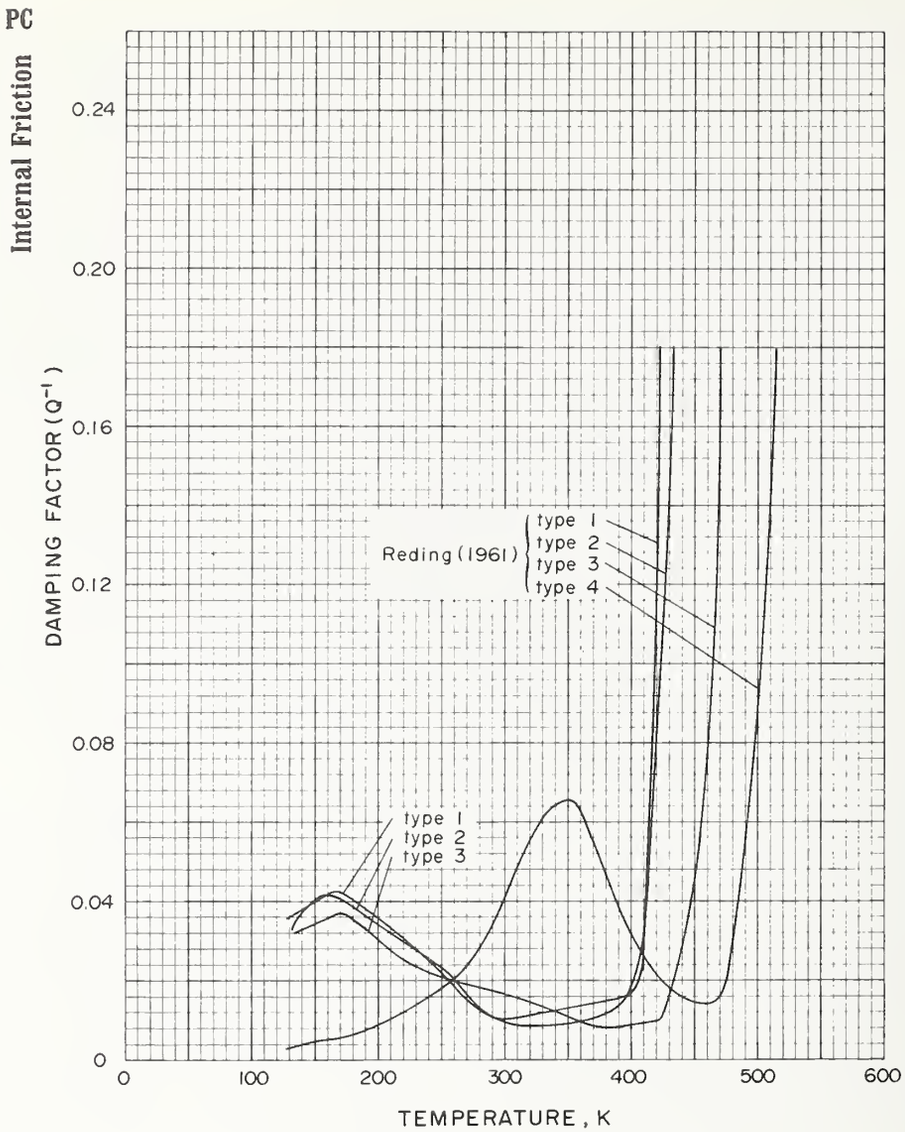
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
General Electric Kunze (1963)	Lexan 500	



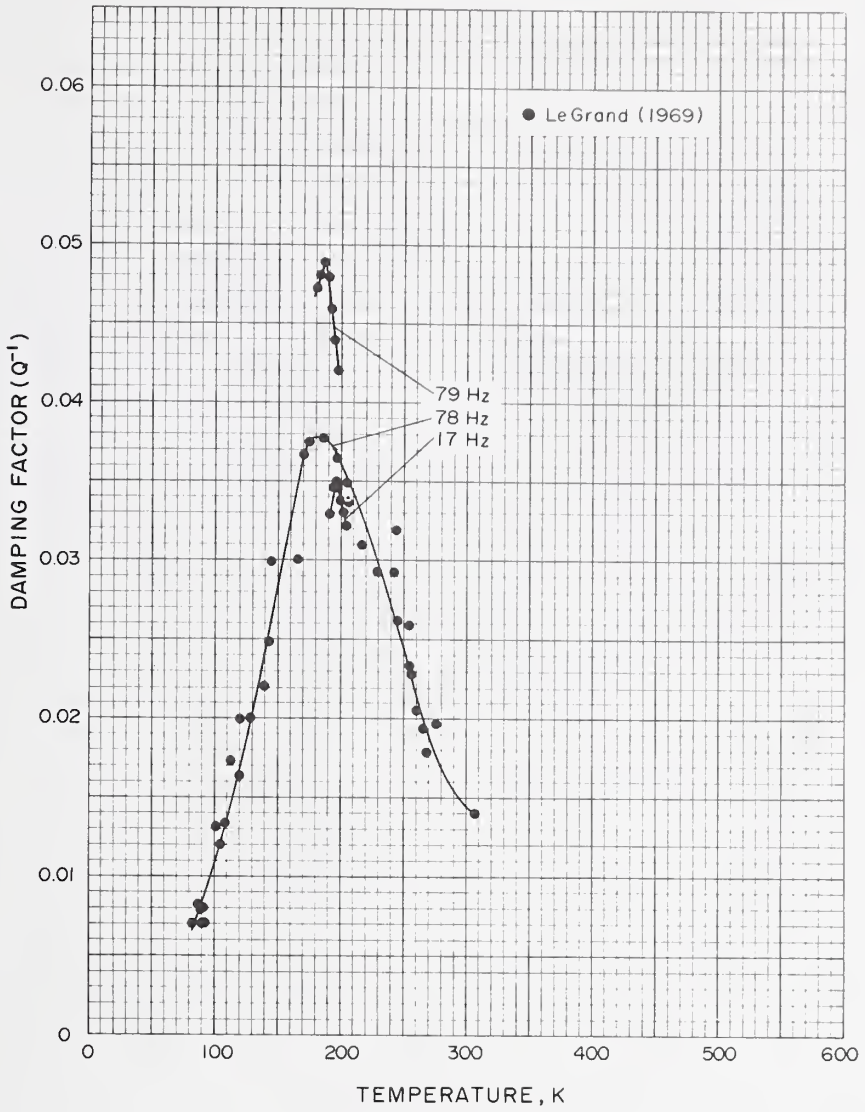
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Golden, Hammant, Hazell (1964)	Makrolon Grade S, machined from extruded sheet, in equilibrium at 293 ± 1 K and 70% rel hum	ℓ = 10.2 cm, w = 1.3 cm, t = 0.318 cm; 293 ± 1 K, 70% rel hum, ASTM D790-58T test procedure B except that xhd spd = 0.021 cm s^{-1} ; tested not less than 2 weeks after 4 Mev electron irradiation at 10^6 rad min^{-1}.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Golden, Hammant, Hazell (1968)	Makrolon grade S, extruded sheet, initial molecular weight = 21,900	Machined bars, 10.2 x 1.27 x 0.32 cm; 3-point loading jig with a span of 5.08 cm, Hounsfield Tensometer, molecular weight calculated from viscosity, different molecular weights obtained by irradiating with 4 Mev electrons at 10^6 rad min^{-1} from a linear accelerator, specimens irrad in an evacuated Al container and then conditioned at 293 ± K and 70 ± 2% rel hum for at least 2 weeks before testing under the same conditions; the band represents measurements made over a strain rate range of 6.7×10^{-2} to 1.7×10^{-6} s^{-1}.

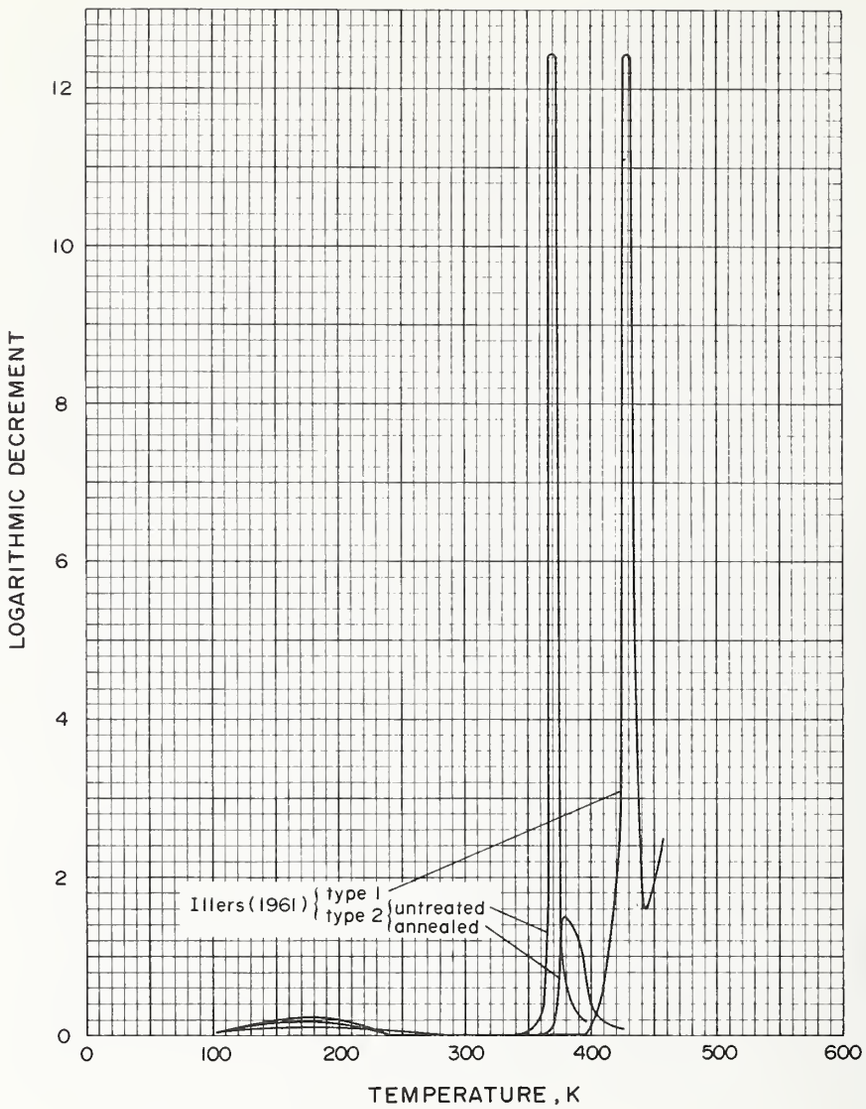


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Reding, Faucher, Whitman (1961)	Type 1 is poly (bisphenol-A carbonate); type 2 is poly (bisorthocresol-A carbonate); type 3 is poly (bisphenol of acetophenone carbonate); type 4 is poly (orthotetrachlorobisphenol-A carbonate)	Recording torsion pendulum, frequency varied from 1.2 Hz to 0.5 Hz.

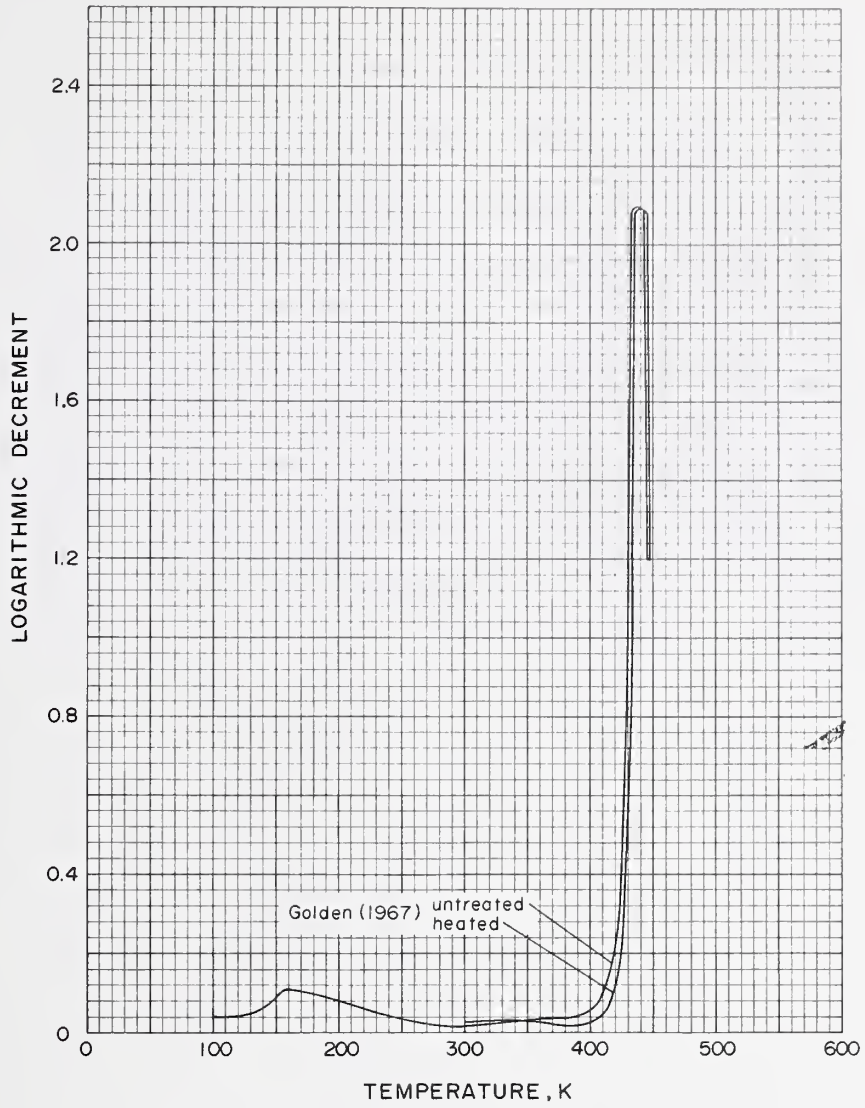


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
LeGrand, Erhardt (1969)	Lexan	Samples formed in the shape of tuning forks by compression molding, ℓ = 15.9 cm, 2.5 cm between inner edges of the prongs which were 12.7 cm long, fork prong was 0.64 cm square; several samples made with nearly identical resonant frequencies, to obtain a lower frequency one fork was shaved to t = 0.32 cm, room temp resonant frequency noted.

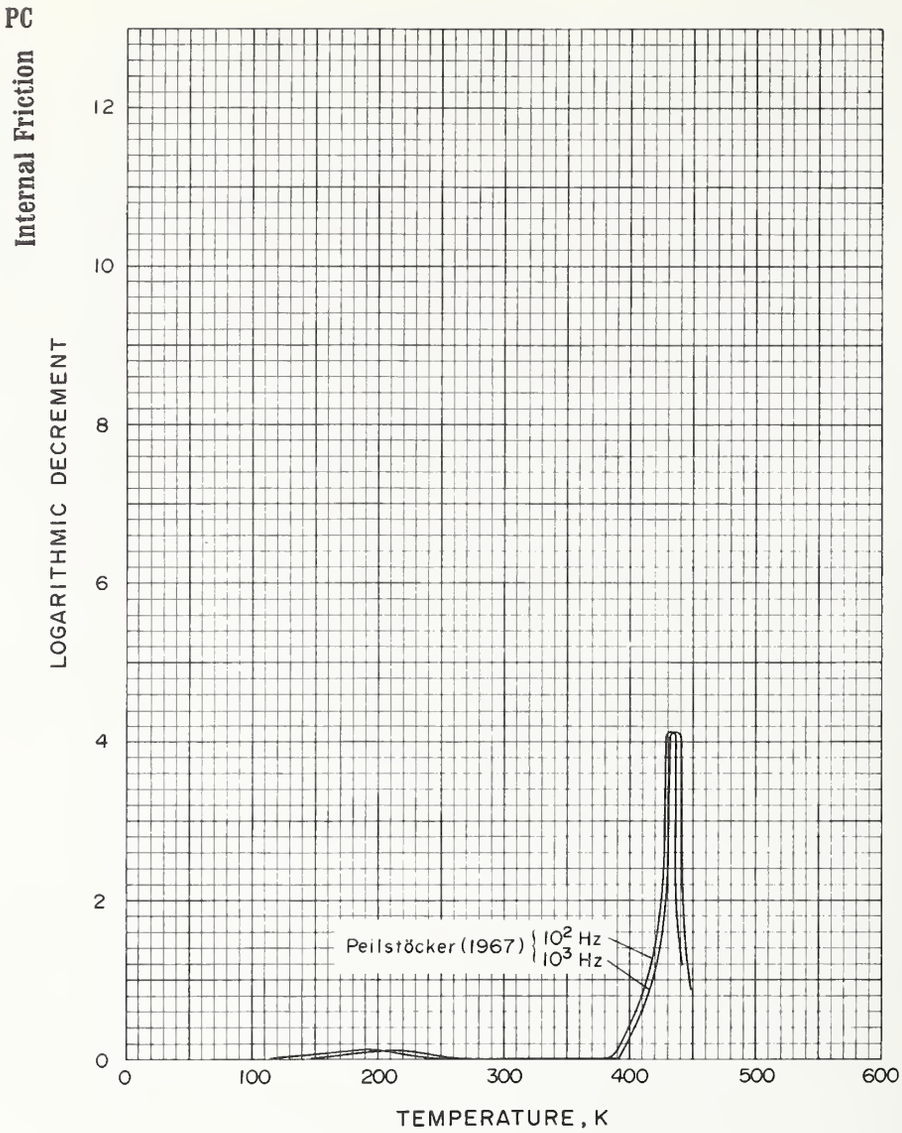
PC



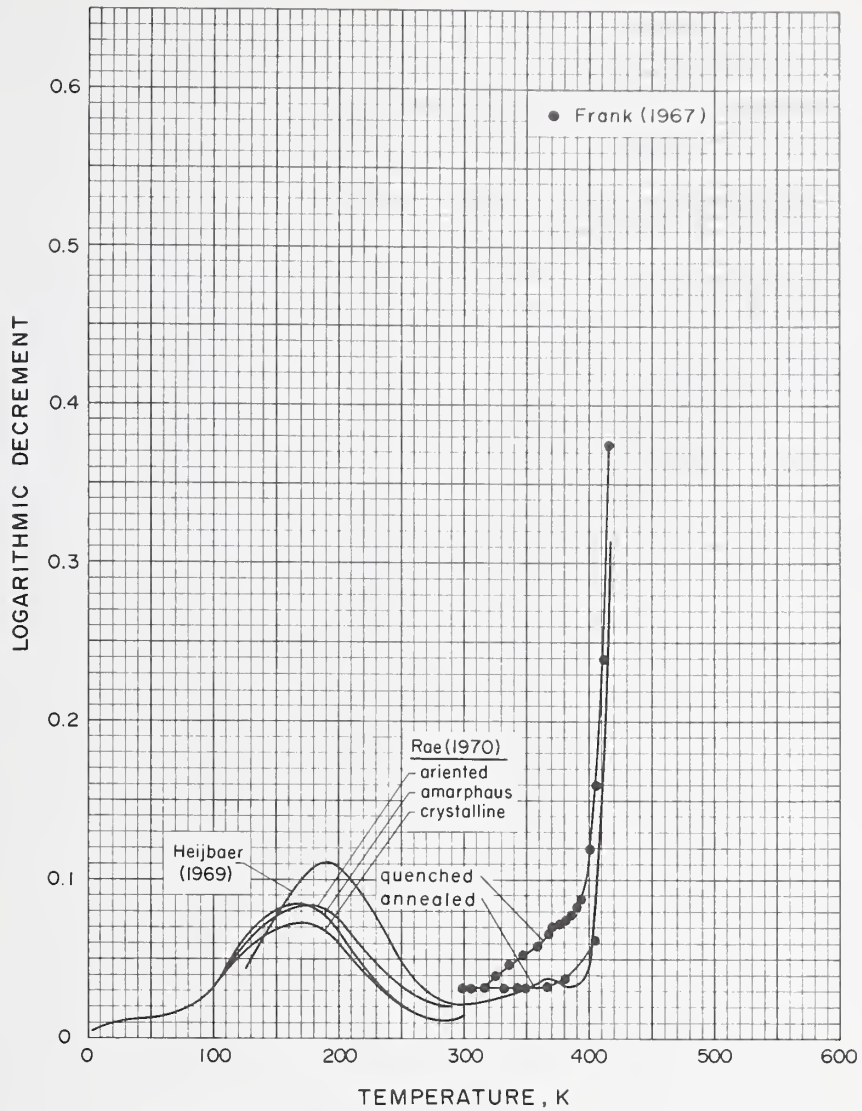
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Illers, Breuer (1961)	Type 1 is Makrolon, based on 4, 4′-dioxydiphenyl-2, 2′-propane; type 2 is based on 1, 5-naphthylene-di-(β-oxy-ethyl-ether), untreated and annealed at 423 K for 24 h	ℓ = 5.0 cm, w = 0.6 cm, t = 0.1 cm; torsion pendulum, 1 Hz.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Golden, Hammant, Hazell (1967)	Makrolon Grade S, extruded sheet, untreated and heated at 405 K for 24 h	Freshly machined surface; torsion pendulum.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Peilstöcker (1967)	Makrolon 3000, sp gr = 1.20	



INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONOITIONS
Frank, Goddar, Stuart (1967)	Bisphenol-A polycarbonate, heated above glass transition temp of 433 K and quenched in ice water, then annealed for 72 h at 383 K	t = 0.02 cm; torsion pendulum.
Heijboer (1969)	Makrolon	
Roe (1970)	Lexan, amorphous film was cast from melt and rapidly quenched, film crystallized to 28% by exposure to acetone vapors for 24 h, oriented by drawing to 220% elongation at 424 K.	6.0 x 0.6 x 0.03 cm; inverted torsion pendulum.

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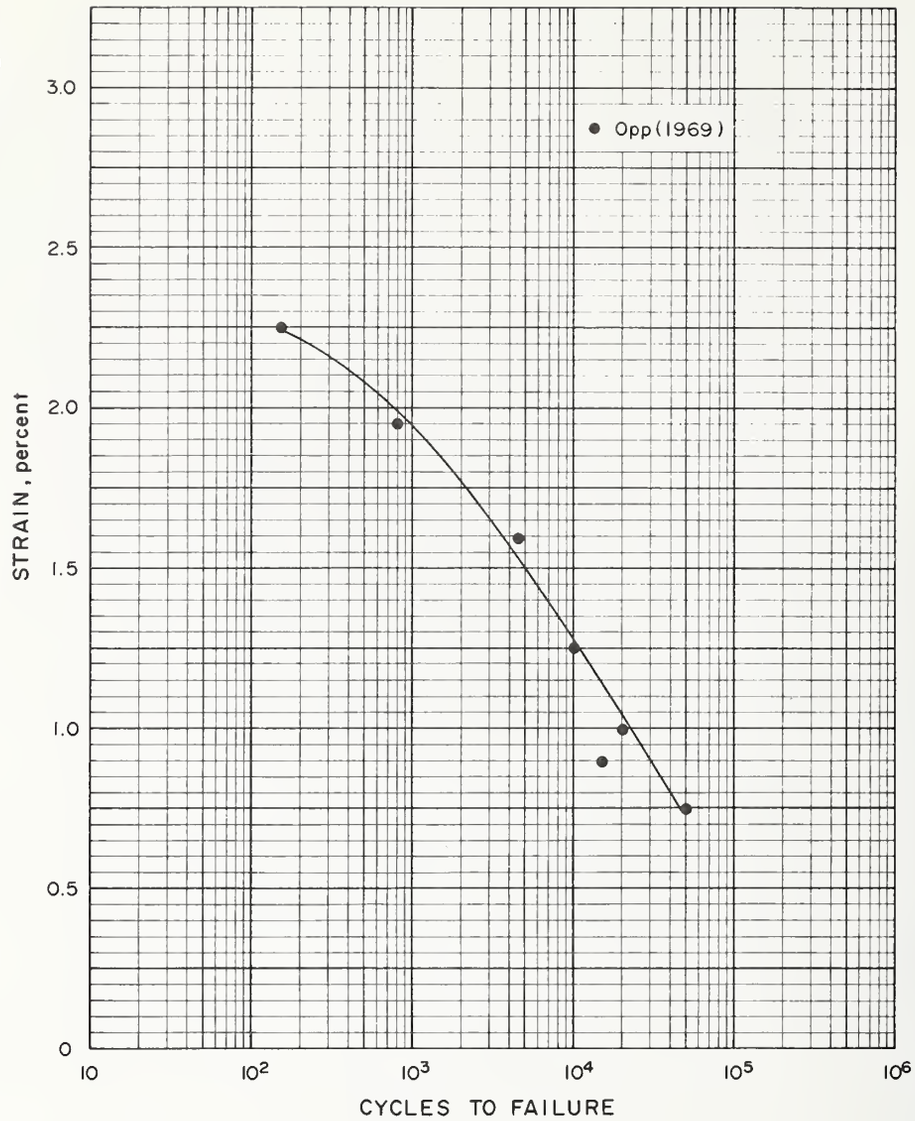
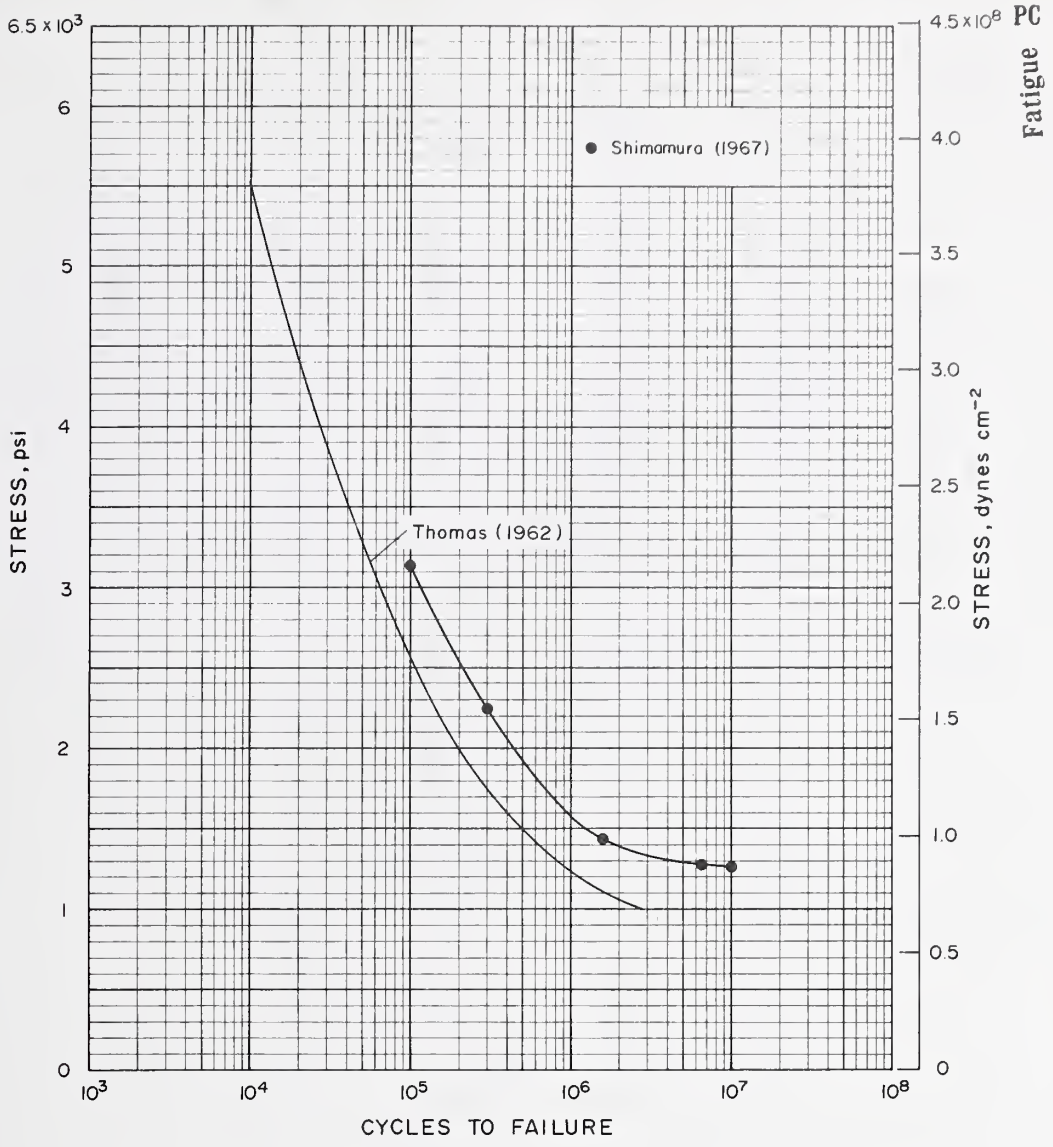
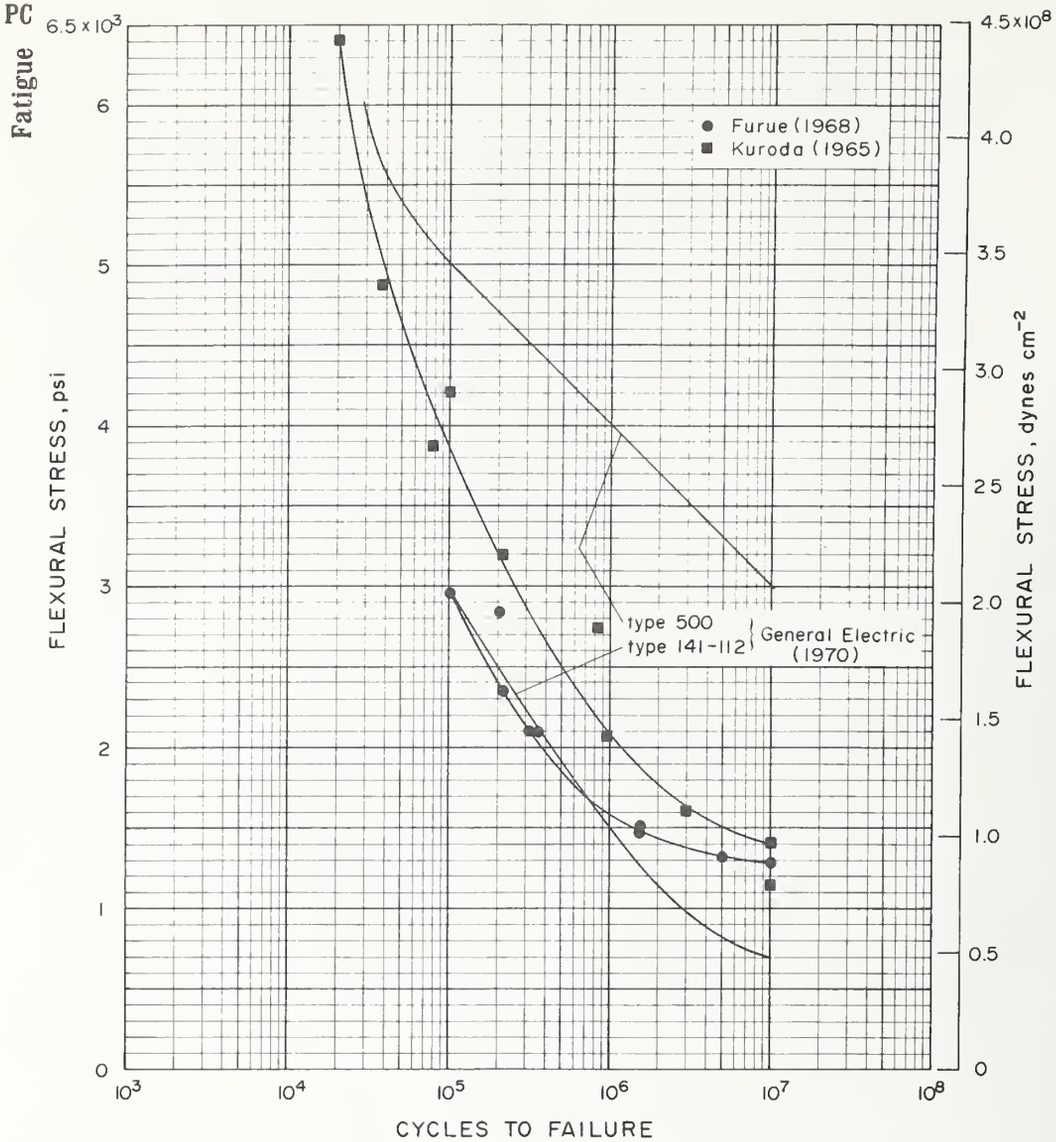
Fatigue



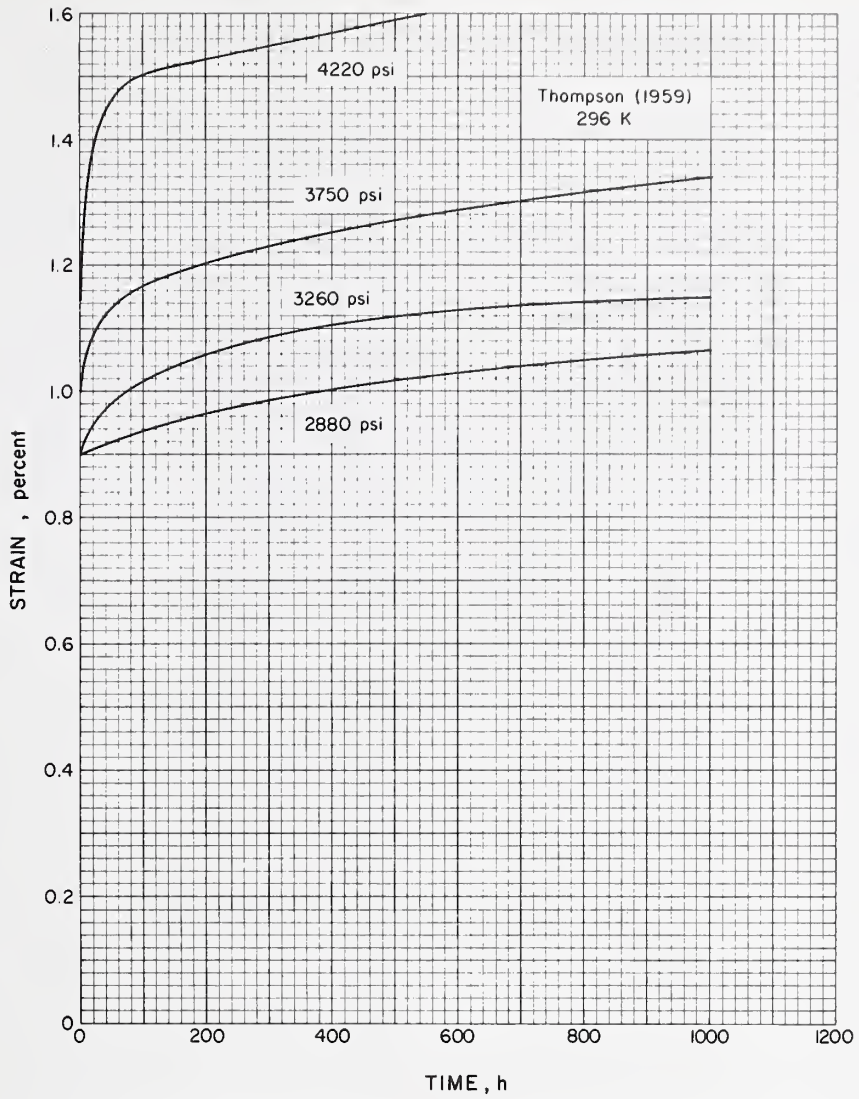
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Opp, Skinner, Wiktorek (1969)		Type S specimen, probably injection molded, MTS low-cycle hydraulic fatigue tester, completely reversed tension-compression cycle, tested in air at 297 ± 3 K and 50 ± 10% rel hum.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thomas, Leuvig (1962) Shimamura (1967)	Lexan Sheet formed by pressure	296 K Machined, t = 0.31 cm, w = 3.8 cm; Baldwin-Sonntag SF-01 universal fatigue tester, 30 Hz.



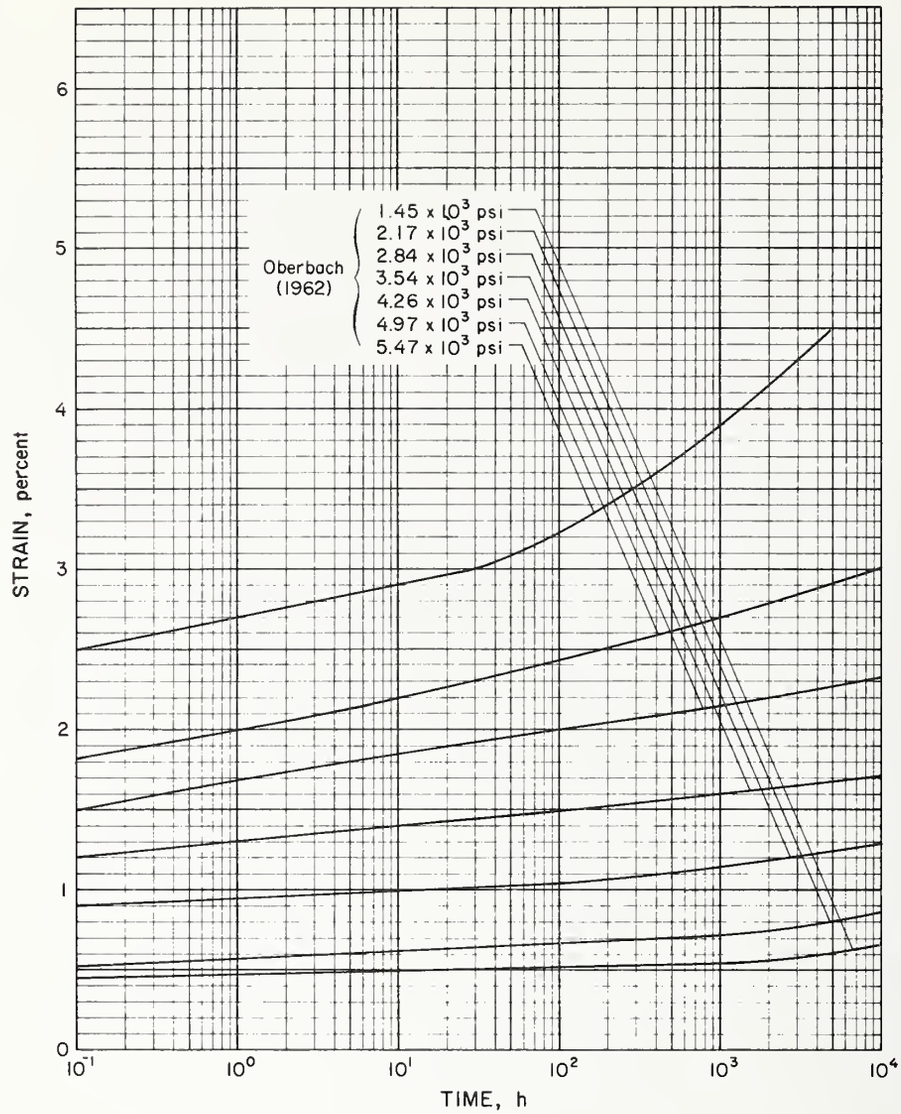
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
General Electric	Lexan 500 and 141-112	
Kuroda, Komaki (1965)	Panlite K	t = 0.24 cm; Wiedmann-Baldwin SF-02-U flexural fatigue machine, 30 Hz, ASTM D 671-63T test procedure, 273 ± 1 K, 65 ± 3% rel hum.
Furue (1968)		Baldwin SF-01 flexural fatigue machine, 30 Hz.



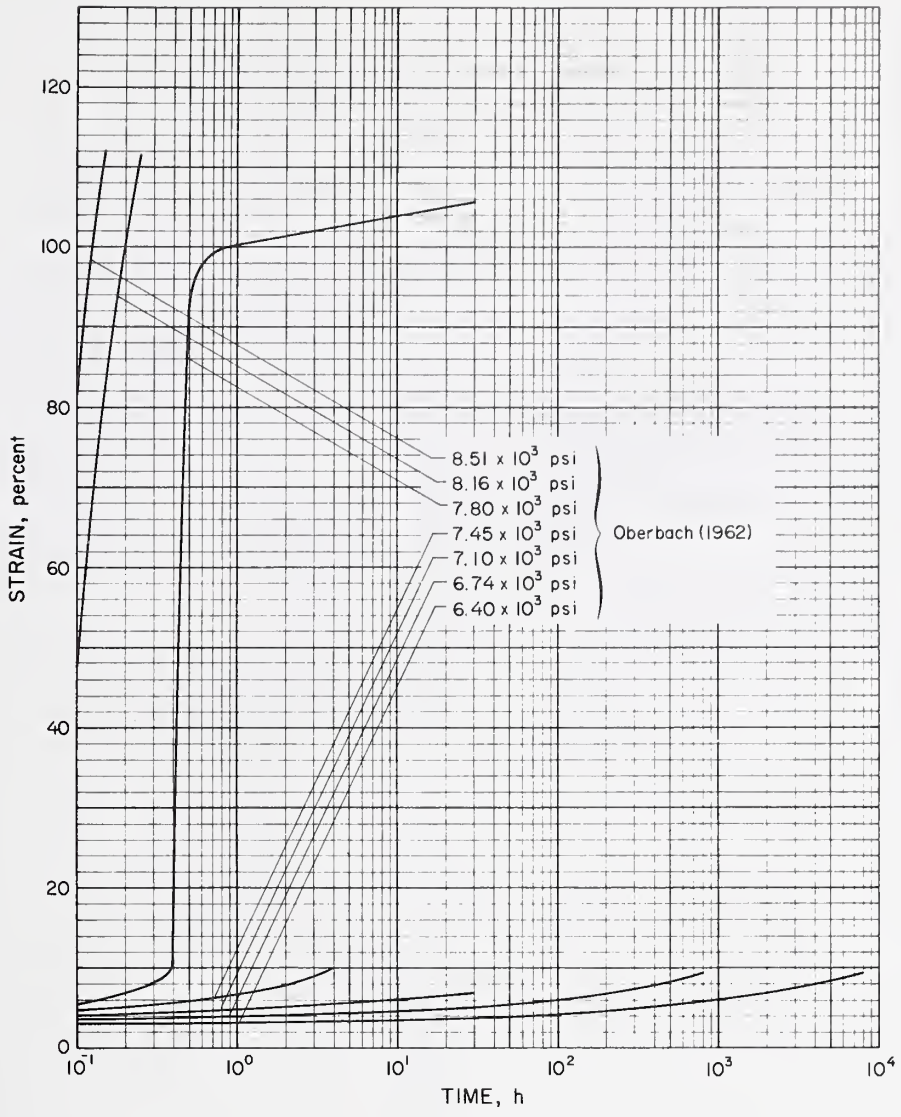
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thompson (1959)	Lexan	Stress noted, 296 K, 50% rel hum.

PC

Creep



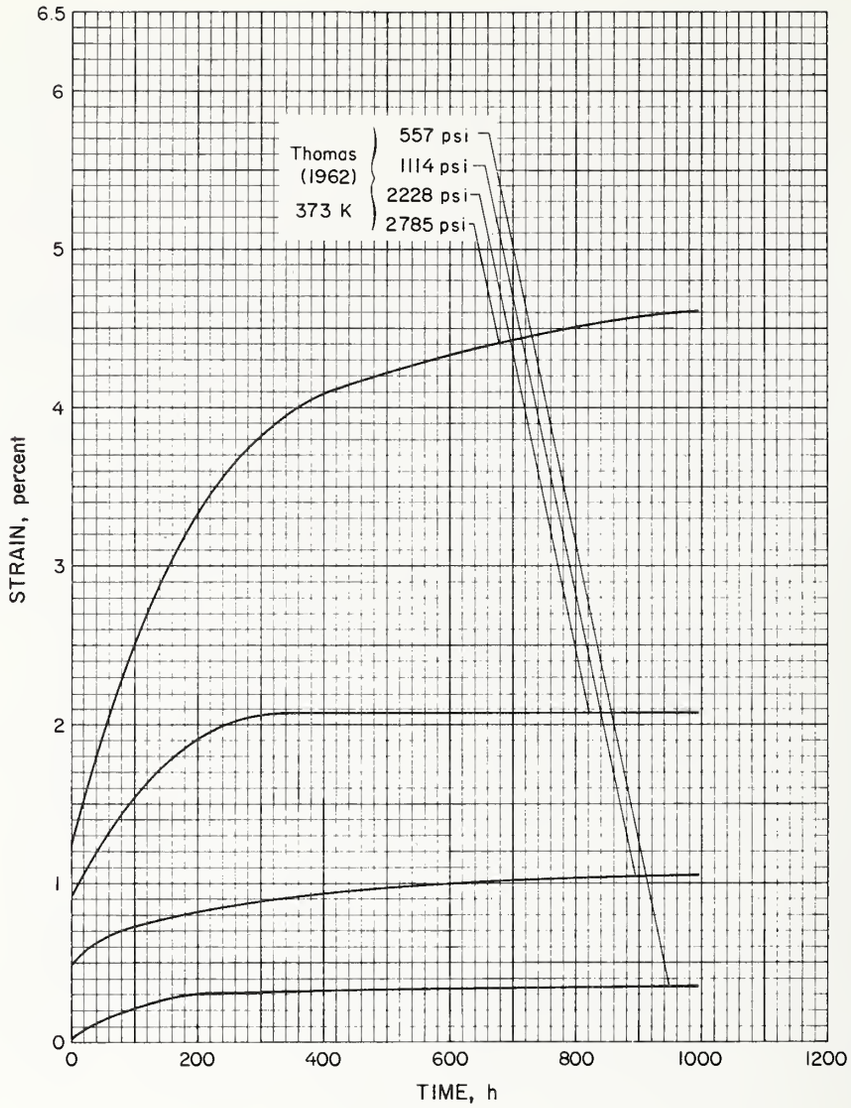
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Oberbach, Paffrath (1962)	Makrolon	Stress noted, 295 K.



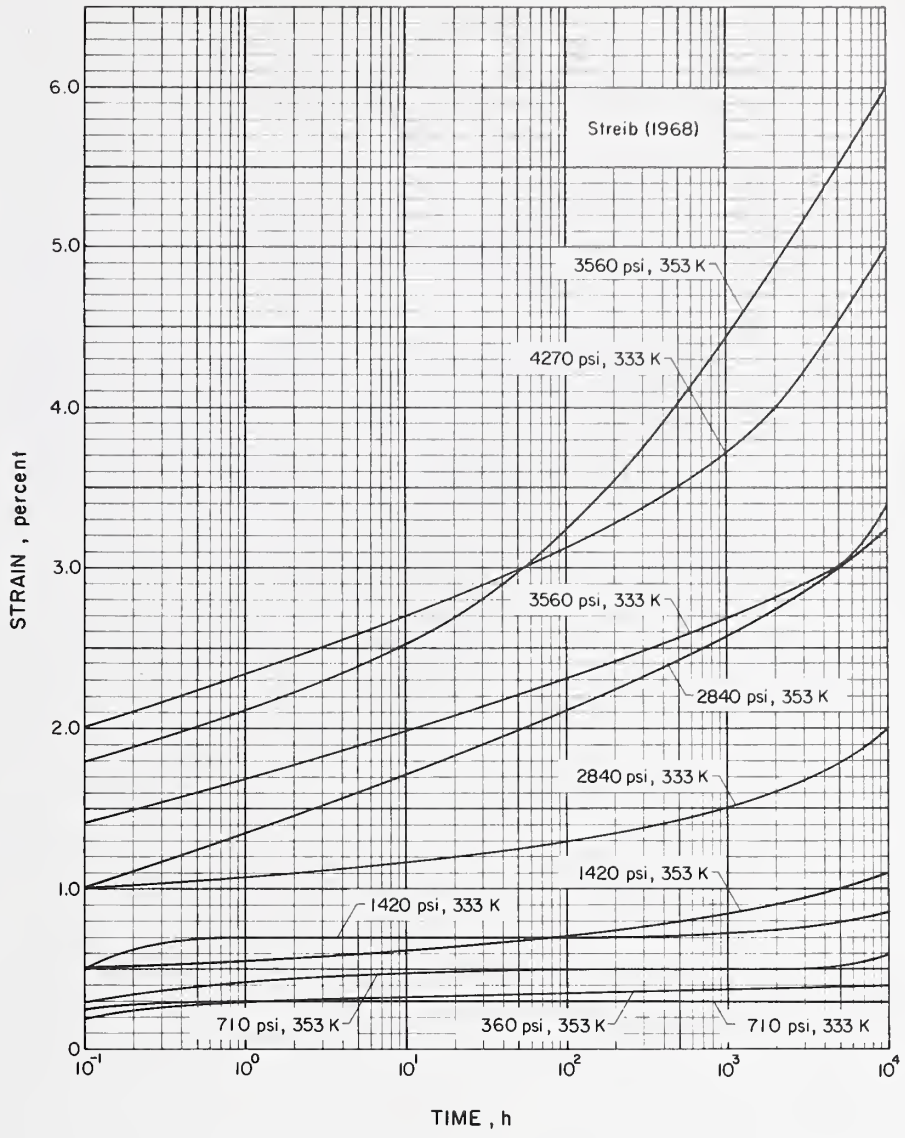
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Oberbach, Paffrath (1962)	Makrolon	Stresses noted, 295 K.

PC

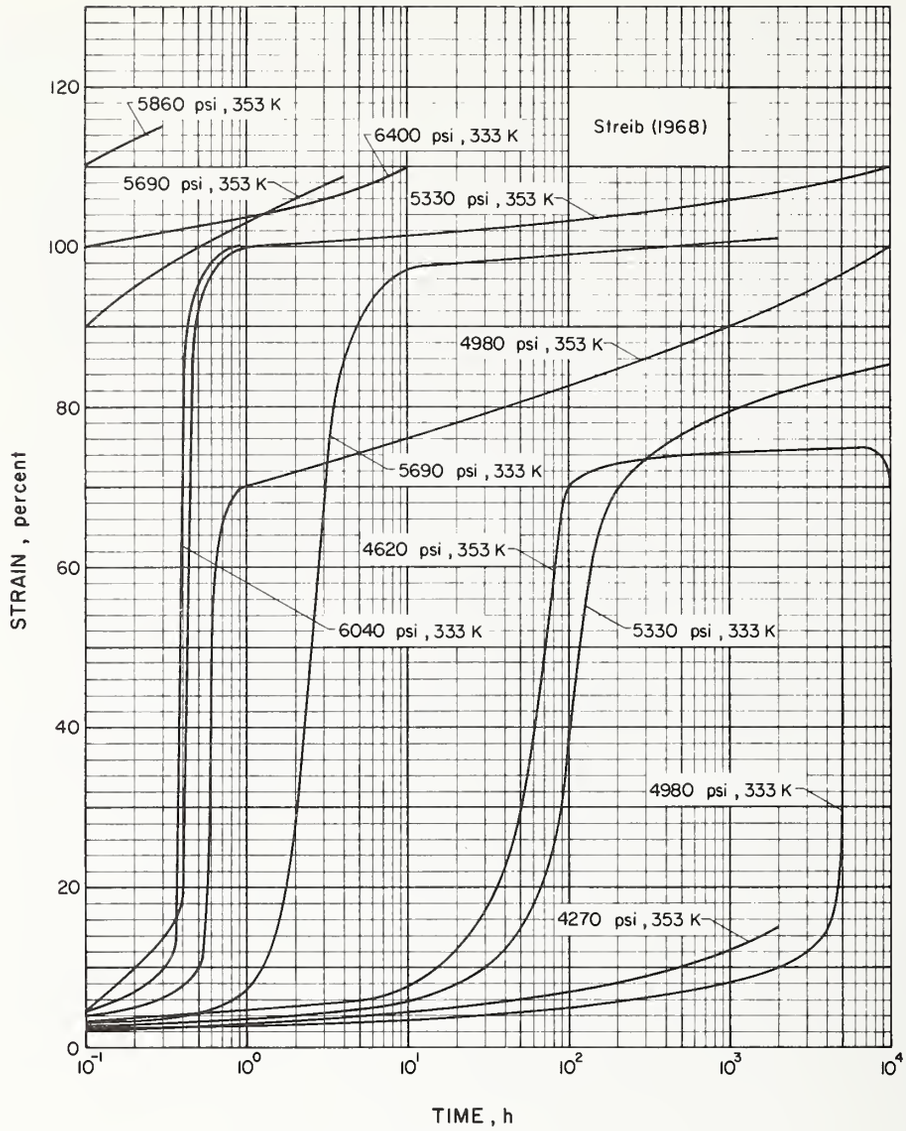
Creep



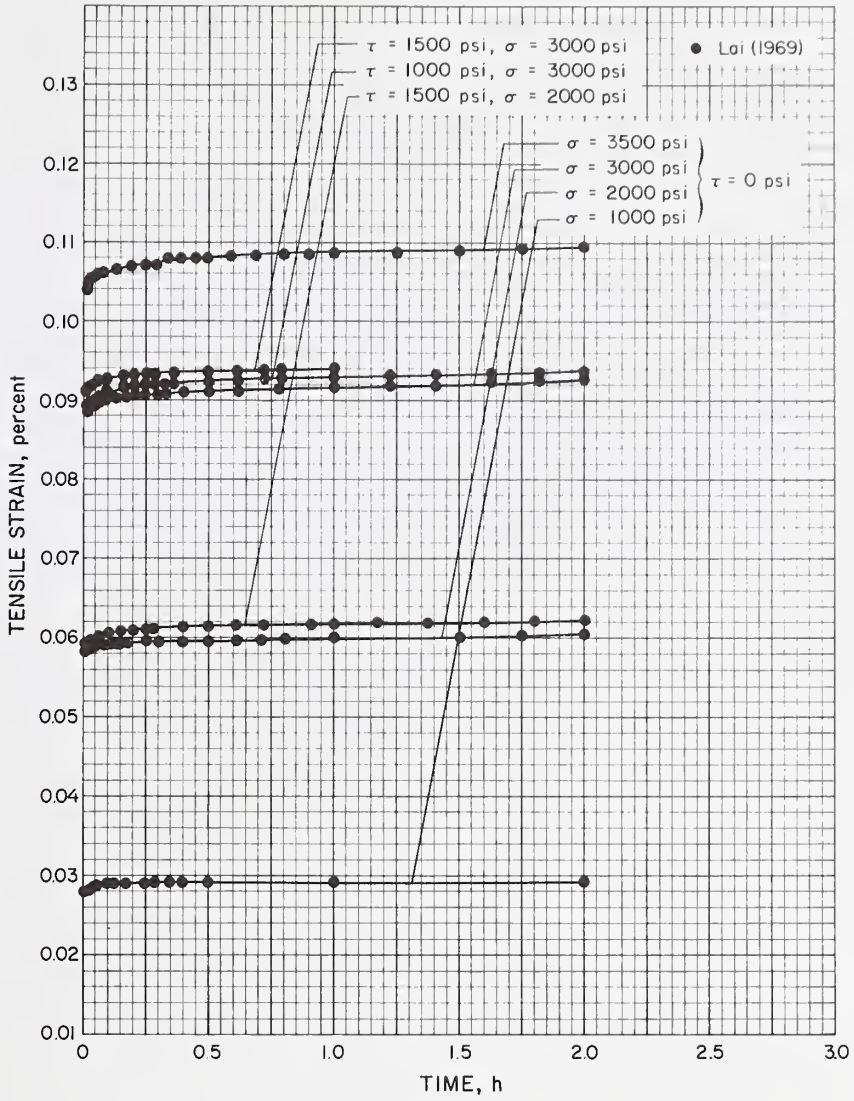
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thomas, Leunig (1962)	Lexan	Stress noted, 373 K.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Streib (1968)	Makrolon 3000	Tested to DIN proposal 53444 (1966), stress and temp noted.



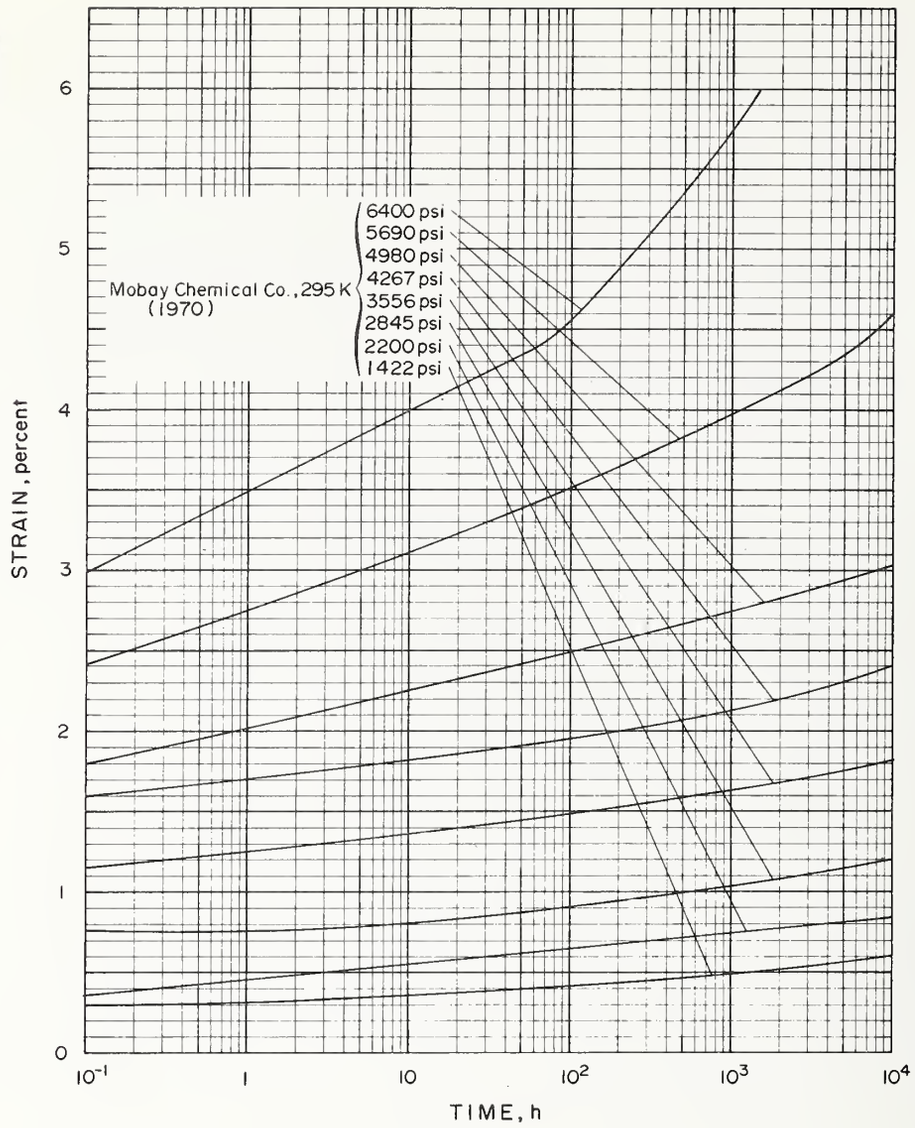
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Streib (1968)	Makrolon 3000	Tested to DIN proposal 53444 (1966), stress and temp noted.



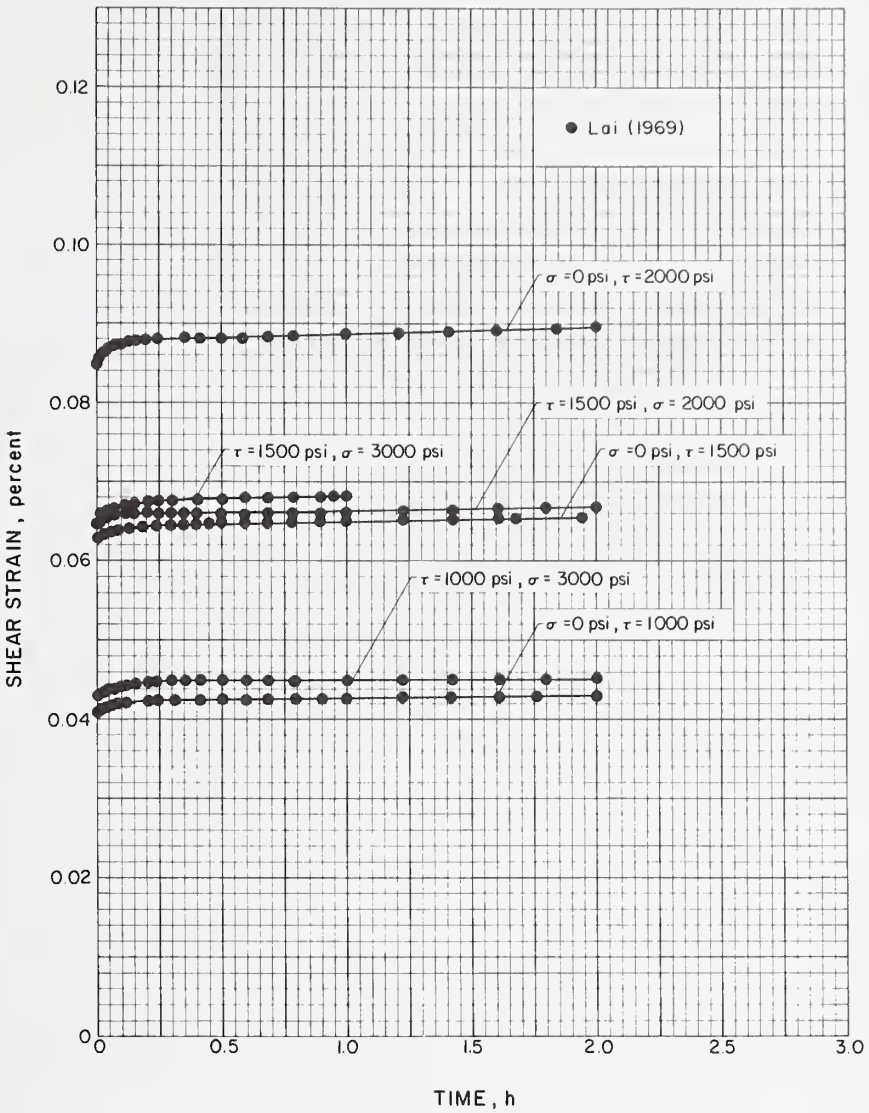
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Lai, Findley (1969)	Zelux, extruded bars 5.1 x 25.4 cm, molecular weight = 25-30 x 10^3, annealed in oil: 9 h from 300 K to 400 K, 5 h at 400 K, 9 h from 400 K to 300 K	Specimen cut ‖ to extrusion direction, annealed in oil before final machining, tubular specimen with enlarged threaded ends, av inside diam = 2.540 cm, av wall thickness = 0.1519 cm, GL = 10.2 cm, 297 ± 0.3 K, 50 ± 0.5% rel hum; tested under pure tensile stress and a combination of tensile stress and torsion; all tests performed on the same specimen after allowing several days for recovery after unloading.

PC

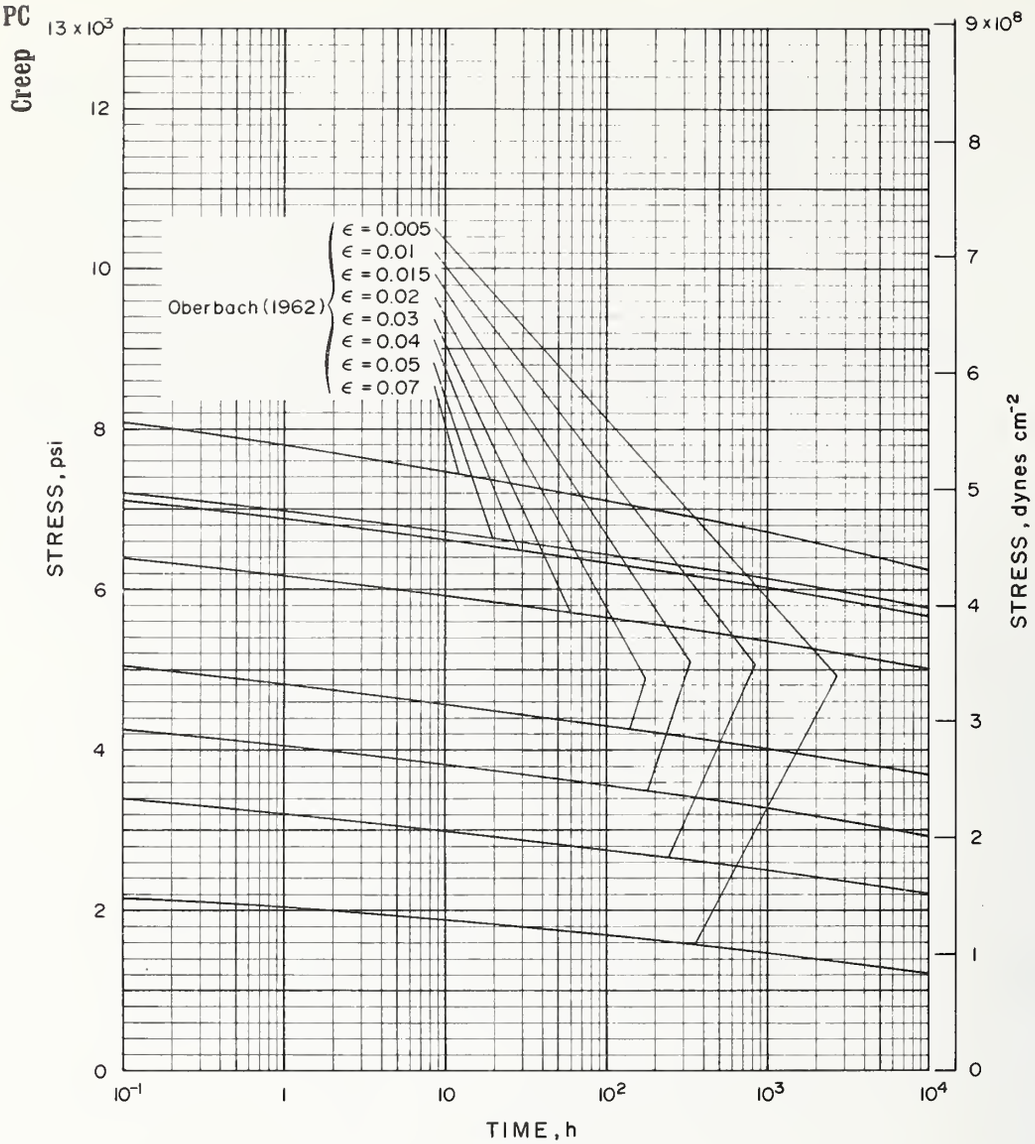
Creep



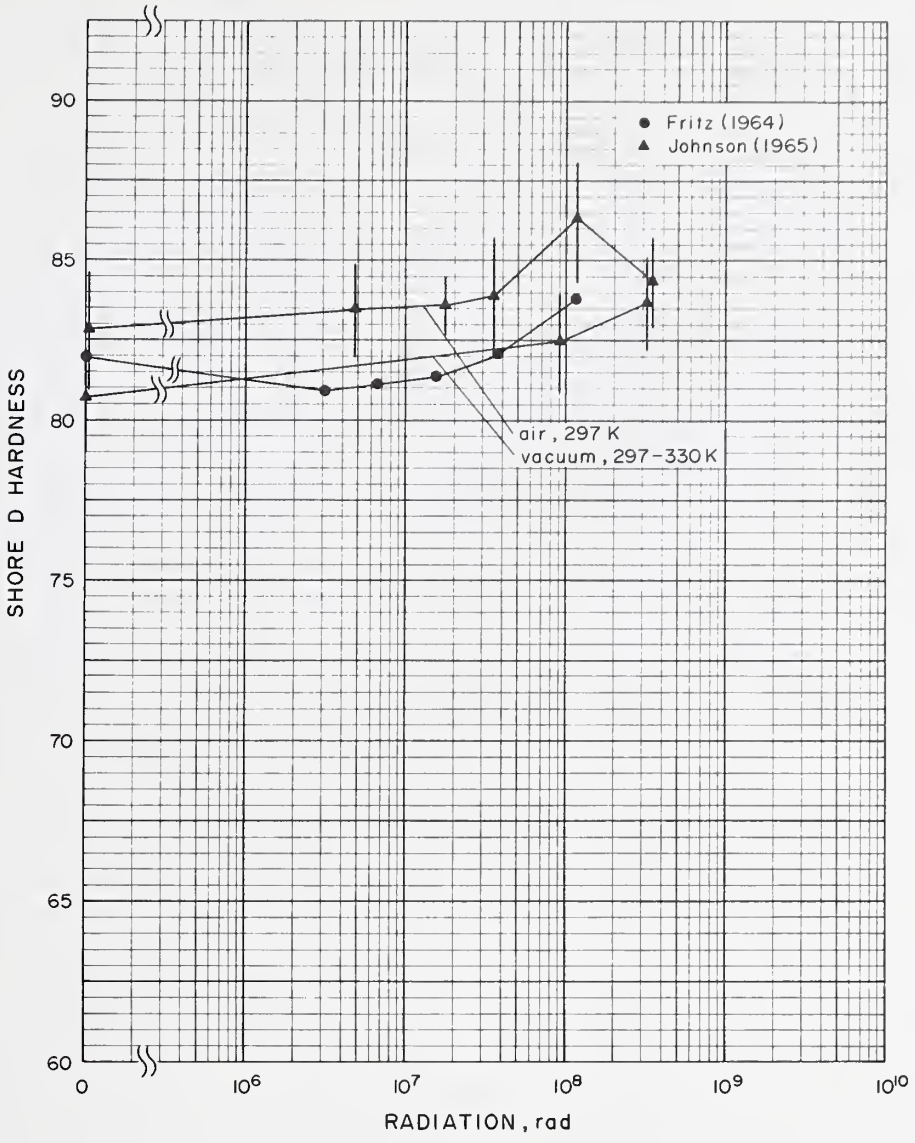
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mobay Chemical Co. (1970)	Merlon	Stress noted, 295 K.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Lai, Findley (1969)	Zelux, extruded bars 5. 1 x 25. 4 cm, molecular weight = 25-30 x 10^3, annealed in oil: 9 h from 300 K to 400 K, 5 h at 400 K, 9 h from 400 K to 300 K	Specimen cut ⊥ to extrusion direction, annealed in oil before final machining, tubular specimen with enlarged threaded ends, av inside diam = 2. 540 cm, av wall thickness = 0. 1519 cm, GL = 10. 2 cm, 297 ± 0. 3 K, 50 ± 0. 5% rel hum; tested under pure torsion and a combination of torsion and tensile stress; all tests performed on the same specimen after allowing several days for recovery after unloading.



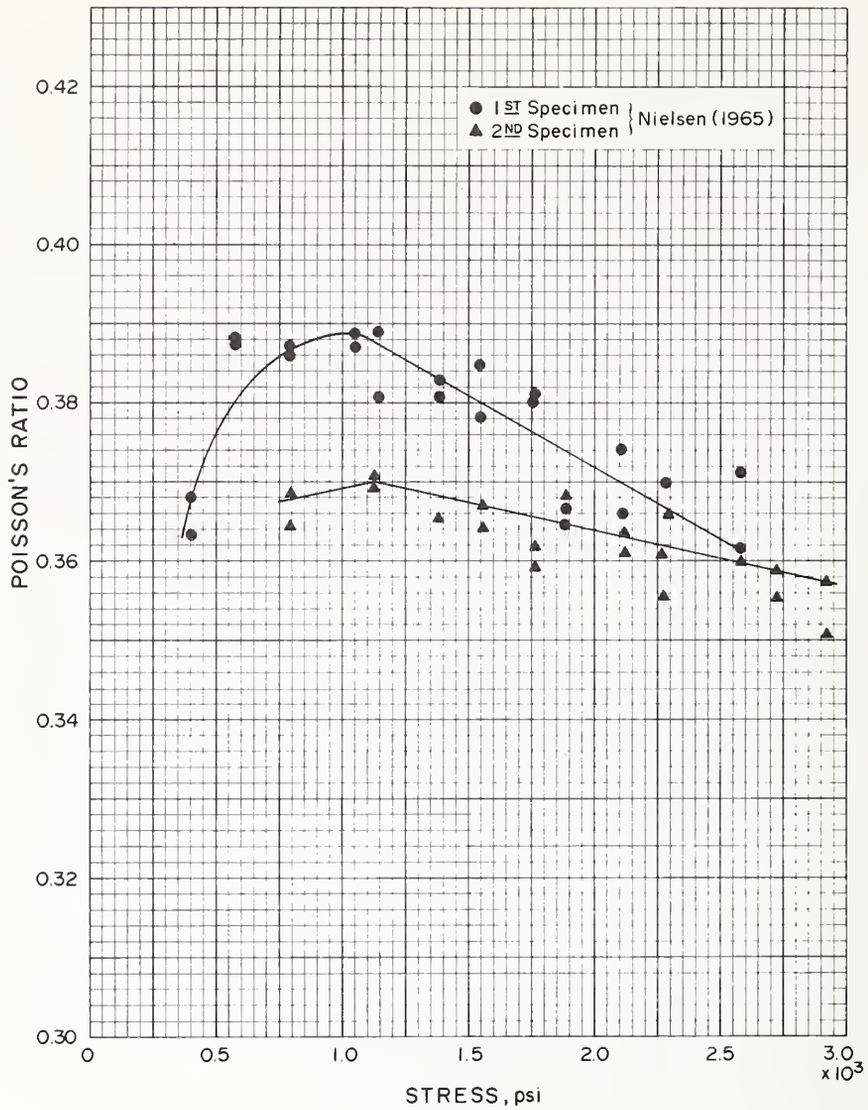
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Oberbach, Paffrath (1962)	Makrolon	295 K, applied strain noted.



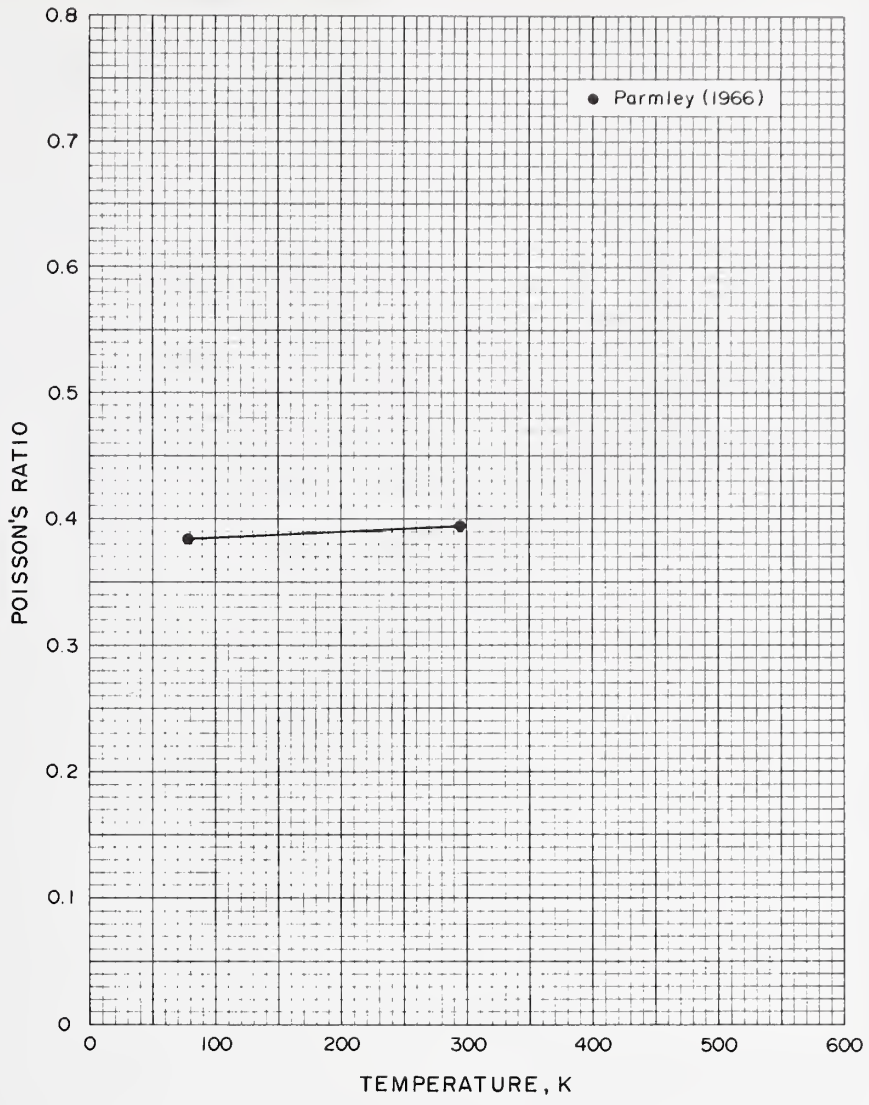
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Fritz (1964)	Merlon, poly [2, 2-propane-bis-(4-phenyl carbonate)], sp gr = 1.2	Router milled to t = 0.638 ± 0.008 cm; specimens wrapped in Aℓ foil and irrad by the Ground Test Reactor at the Nuclear Aerospace Research Facility of General Dynamics, Fort Worth, specimens stored at 296 ± 3 K for 4 days before testing; av value of 30 measurements.
Johnson, Lewis, Self (1965)	Merlon, sp gr = 1.2	ASTM D 1706-61 test procedure, durometer; samples wrapped individually in Aℓ foil and irrad in air and vacuum at temp noted by the Ground Test Reactor at the Nuclear Aerospace Research Facility, General Dynamics, Fort Worth; error bars indicate standard deviation of 15 measurements.

PC

Poisson's Ratio



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Nielsen (1965)	Merlon	Specimens injection molded into ASTM D 638, Type II tensile test bars, w = 1. 3 cm, t = 0. 32 cm; 2 ⊥ foil strain gauges used up to a strain of 1%, square array of dots photographed for strain >1%, 295 K; results for 2 specimens given, reproducibility never better than ± 0. 01.



INVESTIGATOR(S) (year)	MATERIAL IOENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Parmley, Wong, Skogh (1966)	Lexan	

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Young's Modulus (10^6 psi)
Thompson (1958)	Molded Lexan, sp gr = 1.20	297	9.0-10.5	8.0-9.0	60-100	0.320
Hechelhammer(1959)	Makrolon, sp gr = 1.20	298	8.9			0.31-0.36
Greunwald (1960)	t = 0.338 cm	297		8.1		0.342
	t = 0.282 cm			8.5		0.378
	t = 0.231 cm			8.3		0.392
	t = 0.191 cm			8.9		0.380
Oberbach (1960)	Makrolon, sp gr = 1.20	293	8.8-9.5			
Reichherzer (1961)	Makrolon, sp gr = 1.20	296	9.0			
Staub (1961)	∥ to mold flow	298	9.30			
	⊥ to mold flow		9.25			
Oberbach (1962)	Makrolon	295	8.8	5.1		0.30
Hauck (1963)	Molding grade	297	9.5	8.5	75	0.28-0.32
	Film		8.4-8.8		85-105	1.7-1.85
Jackson, Jr., (1963)	Film					
	Type 1	298			16.0	0.34
	1	473		4.5		
	2	298				0.38
	3	298				0.49
	4	298			3.6	0.47
	5	298				0.45
	6	473		3.9		
	7	473		4.8		
	9	298				0.32
	10	298			16.5	0.34

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thompson, Goldblum (1958)	Molded Lexan, sp gr = 1.20	ASTM D 638 test procedure.
Hechelhammer (1959)	Makrolon, sp gr = 1.20	DIN 53455 test procedure.
Greunwald (1960)		ℓ = 5.1 cm, thickness reduced by repeated passes through a pair of cold-mill rolls; ASTM D 638 test procedure, xhd spd = 0.011 cm s^{-1}.
Oberbach, Paffrath(1960)	Makrolon, sp gr = 1.20	DIN 53455 test procedure.
Reichherzer (1961)	Makrolon, sp gr = 1.20	
Staub (1961)	12.7 x 50.8 x 0.32 cm mold formed in 12 oz Lester machine	
Oberbach, Paffrath (1962)	Makrolon	0.05% yd off.
Hauck (1963)	Molding grade and cast film, sp gr = 1.20	ASTM D 638 test procedure.
Jackson, Jr., Caldwell (1963)	Basis for type 1 is 4,4′-(2-norbornylidene) diphenol; for type 2 is 4,4′-(2-norbornylidene) di-o-crsol; for type 3 is 4,4′-(2-norbornylidene)bis (2-chlorophenol); for type 4 is 4,4′-(2-norbornylidene) bis (2,6-dichlorophenol); for type 5 is 4,4′-(2-norbornylidene)bis (2,6-dibromophenol); type 6 is 4,4′-(2-norbornylmethylene) diphenol; type 7 is 4,4′-(2-norbornylmethylene) bis (2,6-dichlorophenol); type 9 is 4,4′-(3-phenyl-2-norbornylmethylene) diphenol; type 10 is 4,4′-(hexahydro-4, 7-methanoidan-5-ylidene) diphenol	Films cast from methylene chloride, t= 0.002-0.008 cm, air dried then heated at 383 K for 1-2 h; injection molded specimens formed on a Watson-Stillman 1 ounce press; fibers were wet-spun from methylene chloride into ethylalcohol; films tested on an Instron using ASTM D 882-61T test procedure; injection molded samples tested by ASTM D 256-56, Method A, D 1708-59T, and D 785-51, Method A test procedures.

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Young's Modulus (10^6 psi)
	Film					
Jackson, Jr. (1963)	Type 11	473		0.0002		
	12	298				0.45
	13	298				0.39
	14	298				0.46
	15	298				0.31
	16	298				0.33
	18	298				0.30
	19	298				0.28
	Injection molded					
	Type 1	298		11.6	54	
	6	298			40	
	8	298		10.8	30	
	17	298		8.8	95	
	Fiber					
	Type 1	298			24	
	4	298			11	1.13
Kudrna (1963)	Bisphenol-A, sp gr = 1.2	298				0.31
Kunze (1963)	Sp gr = 1.20	297	9.5	8.5	75	0.345
Polycarbonates Begin Assault on Market (1964)	Merlon, sp gr = 1.20	298		8-9	90-125	0.28-0.32
Robertson (1964)	Orientation: ∥	297				7.76
	⊥					0.256
Zincz (1964)	Makrolon S	293				
	543 K stock, 293 K mold		9.04		55	
	543 K stock, 393 K mold		9.39		38	
	523 K stock, 293 K mold		9.31		19	
	523 K stock, 393 K mold		9.60		13	
	Makrolon E					
	563 K stock, 293 K mold		9.10		33	
	563 K stock, 393 K mold		9.74		18	
	533 K stock, 293 K mold		9.10		13	
	533 K stock, 393 K mold		9.82		9	

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Jackson, Jr., Caldwell (1963)	Basis for type 11 is 4,4′-(hexahydro-4, 7-methanoidan-5-ylidene) di-o-cresol; type 12 is 4,4′-(hexahydro-4, 7-methanoidan-5-ylidene) bis (2,6-chlorophenol); type 13 is 4,4′-decahydro-1,4-exo-5,8-endo-dimethanonaphth-2-ylidene) diphenol; type 14 is 4,4′-(decahydro-1, 4-exo-5,8-endo-dimethanonaphth-2-ylidene) di-o-cresol; type 15 is 4,4′-(decahydro-1, 4-exo-5,8-exo-dimethanonaphth-2-ylidene) diphenol; type 16 is 4,4′-(decahydro-1,4: 5,8-dimethanonaphth-2-ylmethylene) diphenol; type 18 is 4,4′-cyclohexylidenediphenol; type 19 is 4,4′-(cyclohexylmethylene) diphenol	Films cast from methylene chloride, t = 0.002-0.008 cm, air dried then heated at 383 K for 1-2 h; injection molded specimens formed on a Watson-Stillman 1 ounce press; fibers were wet-spun from methylene chloride into ethyl alcohol; films tested on an Instron using ASTM D 882-61T test procedure; injection molded samples tested by ASTM D 256-56, Method A, D 1708-59T, and D 785-51, Method A test procedures.
Kudrna (1963)	Bisphenol-A polycarbonate, sp gr = 1.2	
Kunze (1963)	Sp gr = 1.20	ASTM D 638 test procedure.
Polycarbonates Begin Assault on Market (1964)	Merlon, sp gr = 1.20	
Robertson, Buenker	Bisphenol-A polycarbonates, oriented by stretching at 438 K	ℓ = 0.75-1.50 cm, w = 0.20-0.40 cm, t = 0.01 cm; vibrating reed technique, resonant frequency ranged from 100-400 Hz.
Zincz (1964)	Makrolon S and E, molded from stock at several temps in molds at 293 and 393 K, type E has a higher molecular weight than type S	

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Young's Modulus (10^6 psi)
Jackson, Jr. (1965)	Bisphenol I	297			6-20	0.35
	Bisphenol II				4-6	0.47
	Bisphenol A				20-90	0.33
Kuroda (1965)	Panlite K	293±1	9.43			0.351
Smirnova (1965)	DOMP	298	7.8		130	0.36
	DOMC		7.8		33	0.38
Laird (1966)	Lexan, sp gr = 1.20	301		9.44	7.8	0.339
Inoue (1967)	Melt temp = 543 K	296				
	∥ to flow direction		9.4			
	⊥ to flow direction		8.8			
	Melt temp = 563 K					
	∥ to flow direction		9.1			
	⊥ to flow direction		8.8			
Maslov (1967)		293	9.95			
Peilstöcker (1967)	Makrolon 3000, sp gr = 1.20	296				0.31
Shimamura (1967)		298	9.2			
Smirnova (1967)	Type 1	298	10.3-11.1		5-8	
	2		10.3-10.8		6	
	3		9.3-10.0		50	
	After irradiation					
	Type 1		10.0-11.1		4-6	

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Jackson, Jr., Caldwell (1965)	Bisphenol I, molecular weight = 20,700, glass temp = 529 K; bisphenol II, molecular weight = 54,000, glass temp = 563 K; bisphenol A, molecular weight = 28,200, glass temp = 423 K; solvent cast films	t = 0.002-0.008 cm; Instron, ASTM D 882-61 T, Method A test procedure.
Kuroda, Komaki (1965)	Panlite K	t = 0.24 cm; 65 ±3% rel hum.
Smirnova, Khasan, Losev, Kolesnikov (1965)	DOMP is based on 2,2-di-(4-hydroxy-3-methylphenyl) propane, molecular weight = 53,000; DOMC is based on 1,1-di-(4-hydroxy-3-methylphenyl) cyclohexane, molecular weight = 50,000	
Laird, Cimprich Kappler, Mason, Jr. (1966)	Lexan, sp gr = 1.20	Red Sec ℓ = 5.08 cm, w = 1.27 cm, t = 0.64 cm as per ASTM D 638-61 T; Tinius Olsen HL-400-2 tensile test machine, $\dot{\epsilon}$ = 0.0029 s^{-1}; av of 2-4 tests.
Inoue, Ito, Fukami, Takagi (1967)	Injection molded from a melt at 543 K under 28 x 10^3 psi pressure and from a melt at 563 K under 21 x 10^3 psi pressure	ℓ = 1.1 cm, w = 0.5 cm; 65 ±5% rel hum, xhd spd = 0.0017 cm s^{-1}.
Maslov (1967)		
Peilstöcker (1967)	Makrolon 3000	50% rel hum.
Shimamura (1967)	Sheet formed by pressure	Machined, t = 0.31 cm.
Smirnova, Erofeeva (1967)	Basis for type 1 is 2,2-bis-(3′-chloro-4′-hydroxyphenyl)-propane; for type 2 is 1,1-bis-(3′-chloro-4′-hydroxyphenyl)-cyclohexane; type 3 is 2,2-bis-(4′-hydroxyphenyl)-propane	Film; some specimens irrad for 48 h by ultraviolet light.

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Young's Modulus (10^6 psi)
Doi (1968)	xhd spd: 0.083 cm s^{-1}	297	9.65			0.158
	0.833 cm s^{-1}		10.32			0.158
	impact spd: 2.65 m s^{-1}				21	0.690
	5.25 m s^{-1}				22	0.690
	10.5 m s^{-1}				23	0.690
	15.8 m s^{-1}				30	0.690
Key (1968)		300		8.5		0.30
Perepelkin (1968)	Amorphous	293				
	Type 1				180	0.26
	2				160	0.30
	3				103	0.23
	4				140	0.21
	5				35	0.38
	6				100	0.34
	7				62	0.34
	8				133	0.16
	9				116	0.17
	10				45	0.28
	11				70	0.23
	12				34	0.38
	13				79	0.26
	14				12	0.46

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Doi, Sakagami (1968)		Red Sec ℓ = 15.0 cm, w = 1.0 cm; static and impact tested.
Key, Katz, Parker (1968)		GL = 5.1 cm, w = 0.635 cm, t = 0.318 cm; Instron, xhd spd = 0.003 cm s^{-1}, conditioned at 296 K and 50% rel hum prior to test.
Perepelkin, Kozlov (1968)	Molecular weight ≃ 60,000, amorphous produced from solution and crystalline produced by slow evaporation of methylene dichloride or tetrachloroethane at 293 K; basis for type 1 is 4,4′-dihydroxydiphenylmethane; type 2 is 4, 4′-dihydroxydiphenyl-2, 2′-propane; type 3 is 4, 4′-dihydroxydiphenyl-2, 2-butane; type 4 is 4, 4′-dihydroxydiphenyl-1, 1-butane; type 5 is 4, 4′-dihydroxytriphenylmethane; type 6 is 4, 4′-dihydroxydiphenyl-1, 1 cyclopentane; type 7 is 4, 4′-dihydroxydiphenyl-1, 1-cyclohexane; type 8 is 4, 4′-dihydroxy-3, 3-dimethydiphenylmethane; type 9 is 4, 4′-dihydroxy-3, 3′-dimethyldiphenyl-2, 2′-propane; type 10 is 4, 4′-dihydroxy-2, 2-dimethyltriphenylmethane; type 11 is 4, 4′-dihydroxy-3, 3′-dimethyldiphenyl-1, 1′-cyclohexane; type 12 is 4, 4′-dihydroxy-3, 3′-dichlorodiphenyl-2, 2-propane; type 13 is dihydroxy-3, 3′-dichloro-5, 5′-dimethyldiphenyl-2, 2-propane; type 14 is 4, 4′-dihydroxy-3, 3′, 5, 5′-tetrachlorodiphenyl-2, 2-propane;	t = 0.0075-0.0085 cm; Polanyi type dynamometer, xhd spd = 0.0017 cm s^{-1}; an error in units has been assumed and the Young's modulus values above have been reduced by a factor of 10^2 from those reported.

Investigator(s) (year)	Description	Temperature (K)	Tensile Strength (10^3 psi)	Yield Strength (10^3 psi)	Elongation (percent)	Young's Modulus (10^6 psi)
Perepelkin (1968) (Continued)	Type 15				10	0.46
	16				22	0.40
	Crystalline					
	Type 1				176	0.28
	2				164	0.34
	8				120	0.21
	12				36	0.40
	14				10	0.47
	15				8	0.47
Powell (1968)	448 K stretch (50%) at 0.17 cm s^{-1}, t = 0.64 cm	298	9.76			0.293
	448 K stretch (50%) at 0.042 cm s^{-1}, t = 1.27 cm		8.470			0.268
	448 K stretch (40%) at 0.042 cm s^{-1}, t = 1.27 cm		11.93			0.353
	448 K stretch (60%) at 0.042 cm s^{-1}, t = 1.27 cm		9.03			0.221
	453 K stretch (40%) at 0.042 cm s^{-1}, t = 2.54 cm		9.21			0.292
Brinson (1969)	Lexan	297				
	∥ to roll direction					0.348
	⊥ to roll direction					0.293
General Electric	Lexan 500	296		9.6	10-20	
	Lexan 1 × 1			9.0	110	
Kazakevich (1968)	Commerical, amorphous	298	8.5			

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Perepelkin, Kozlov (1968) (Continued)	Molecular weight ≃ 60,000, amorphous produced from solution and crystalline produced by slow evaporation of methylene dichloride or tetrachloroethane at 293 K; basis for type 15 is 4, 4′-dihydroxy-3, 3′, 5, 5′-tetra-bromodiphenyl-2, 2-propane; type 16 is 4, 4′-dihydroxy-3, 3′-dichlorodiphenyl-1, 1-cyclohexane	t = 0.0075-0.0085 cm; Polanyi type dynamometer, xhd spd = 0.0017 cm s^{-1}; an error in units has been assumed and the Young's modulus values above have been reduced by a factor of 10^2 from those reported.
Powell, Ehlers, Orroth, Jr. (1968)	Zelux made from Lexan molding powder, Lexan and Mobay resin; dried by heating at 403 K for 2 h	Original t noted; biaxially stretched at temp and to degree noted, tested on Tinius-Olsen machine; values noted are an av of several tests and several batches of material.
Brinson (1969)	Lexan	MTS testing system, strain measured optically, xhd spd = 0.001 cm s^{-1}; av values given, extremes of 3 tests ∥ to roll direction were 0.343 and 0.352 × 10^6 psi, extremes of 4 tests ⊥ to roll direction were 0.277 and 0.309 × 10^6 psi.
General Electric	Lexan 500, 1 × 1	
Kazakevich, Kozlov, Pisarenko (1968)	Commerical, amorphous	ℓ = 10.0, w = 3.0 cm, t = 0.003 cm; dynamometer.

Investigator(s) (year)	Description	Temperature (K)	Strength (10^3 psi)	Modulus (10^6 psi)	Hardness	Other
Thompson (1958)	Molded Lexan, sp gr = 1.20	297	11.0 (a) 11.0-13.0 (b) 9.2 (c)	0.241 (d) 0.375 (e) 0.116 (f)	R118 (Rockwell)	0.6-0.9 (g) 12-16 (h) (notched) >60 (h) (notched)
Hechelhammer (1959)	Makrolon, sp gr = 1.20	298	12.0 (a) 15.6-17.1 (b)		900-1050 (i) (10s) 870-1000 (i) (60s)	
Gruenwald (1960)	t = 1.27 cm t = 1.15 cm t = 1.01 cm t = 0.882 cm t = 0.780 cm t = 0.635 cm t = 0.533 cm t = 0.317 cm	297	 14.3 (b) 13.8 (b)	 0.312 (e) 0.361 (e)	M80 M40 M45 M65 M65 M70 M75 (Rockwell)	
Reichherzer (1961)	Makrolon, sp gr = 1.20	296	11.7 (d)			
Staub (1961)	∥ to mold flow ⊥ to mold flow	298				17 (h) 16 (h) (notched)
Hauck (1963)	Molding grade	297	12.5 (k) 13.5 (b)	0.24 (d) 0.34 (e) 0.116 (f)	M78 (Rockwell)	14 (h) (notched) no break (h) (unnotched) 0.37 (j)
Jackson, Jr. (1963)	Type 1 Type 6 Type 8 Type 17	298			R124 R124 R120 (Rockwell)	0.8 (h) 1.3 (h) 1.3 (h) 16 (h)
Kunze (1963)	Sp gr = 1.20	297	12.5 (a) 13.5 (b) 10.0 (c)	0.345 (d) 0.340 (e) 0.116 (f)	M78 (Rockwell)	14-16 (h) (notched) 60 (h) (unnotched) 0.37 (j)
Heater (1964)		297				0.4 (g)

(a) Compressive Strength
(b) Flexural Strength
(c) Shear Strength
(d) Compressive Modulus
(e) Flexural Modulus
(f) Shear Modulus
(g) Tensile Impact Strength (10^5 ft lb in^{-2})
(h) Izod Impact Strength (ft lb in^{-1})
(i) Brinell Hardness (kg cm^{-2})
(j) Poisson's Ratio
(k) Compressive Yield Strength

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Thompson, Goldblum (1958)	Molded Lexan, sp gr = 1.20	ASTM test procedures used: D 785 for Rockwell hardness; D 256 for Izod impact tests; D 695 for compressive tests; D 790 for flexural tests; D 732 for shear tests.
Hechelhammer (1959)	Makrolon, sp gr = 1.20	Test procedures used: DIN 53454 for compressive tests, DIN 53452 for flexural tests; hardness measured 10 and 60 s after pressure applied.
Greuenwald (1960)		Thickness reduced by repeated passes through a pair of cold mill rolls, flexural test samples were injection molded; hardness tested by ASTM D 785 test procedures.
Reichherzer (1961)	Makrolon, sp gr = 1.20	
Staub (1961)	12.7 x 50.8 x 0.32 cm mold formed in 12 oz Lester machine	
Hauck (1963)	Molding grade, sp gr = 1.20	Impact: ℓ = 1.27 cm, t = 0.32 cm; ASTM D 256 test procedure. Compression: ASTM D 695 test procedure. Hardness: ASTM D 785 test procedure. Flexure: ASTM D 790 test procedure.
Jackson, Jr., Caldwell (1963)	Basis for type 1 is 4,4′-(2-norbornylidene) diphenol; type 6 is 4,4′-(2-norbornylmethylene) diphenol; type 8 is 4,4′-(3-methyl-2-norbornylmethylene) diphenol; type 17 is 4,4′-isopropylidenediphenol.	Injection molded specimens formed on a Watson-Stillman 1 ounce press; ASTM D 256-56, Method A, D 1708-59T, and D 785-51, Method A test procedures.
Kunze (1963)	Sp gr = 1.20	Impact: 0.32 cm specimen; ASTM D 256 test procedure. Compression: ASTM D 695 test procedure. Hardness: ASTM D 785 test procedure. Flexure: ASTM D 790 test procedure. Shear: ASTM D 732 test procedure.
Heater, Lacey (1964)		Cylindrical specimen; impact velocity = 345 cm s^{-1}.

Investigator(s) (year)	Description	Temperature (K)	Strength (10^3 psi)	Modulus (10^6 psi)	Hardness	Other
Polycarbonates Begin . . . (1964)	Merlon, sp gr = 1.20	298	12.0[a] 12.0-13.0[e]		R125 (Rockwell)	
Hennig (1965)	Lexan unoriented oriented ∥ ⊥	295		1.79[l] 4.44[l] 13.80[l]		
Jackson, Jr. (1965)	Bisphenol I Bisphenol II Bisphenol A	297	11.2[m] 14.0[m] 9.0[m]			
Kuroda (1965)	Panlite K	293 ±1	15.4[b] 9.12[m]	0.401[e]		
Kondo (1966)		293		0.35[e]		
Laird (1966)	Lexan, sp gr = 1.20	301	9.12[m]			
Peilstöcker (1967)	Makrolon 3000, sp gr = 1.20	296			M70-75 (Rockwell)	12[h]
Doi (1968)	Unnotched impact spd: 2.65 m s^{-1} 5.25 m s^{-1} 10.5 m s^{-1} 15.8 m s^{-1}					1.51[g] 1.52[g] 1.52[g] 1.54[g]
	Notched impact spd: 2.65 m s^{-1} 5.25 m s^{-1} 10.5 m s^{-1} 15.8 m s^{-1}					0.86[g] 1.02[g] 0.93[g] 1.03[g]
Koda (1968)	Jupilon S before annealing mold temp: 333 K 363 K 393 K after annealing mold temp: 333 K 363 K 393 K				M84.8 M85.6 M86.3 M93.0 M92.9 M93.1 (Rockwell)	
Powell (1968)	448 K stretch (50%) at 0.17 cm s^{-1}, t = 0.65 cm 443 K stretch (50%) at 0.17 cm s^{-1}, t = 0.64 cm 453 K stretch (40%) at 0.042 cm s^{-1}, t = 2.54 cm	298				4.03[h] 2.79[h] 2.87[h]

(a) Compressive Strength
(b) Flexural Strength
(e) Flexural Modulus
(g) Tensile Impact Strength (10^3 ft lb in^{-3})
(h) Izod Impact Strength (ft lb in^{-1})
(l) Bulk Modulus
(m) Breaking Strength

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Polycarbonates Begin Assault on Market (1964)	Merlon, sp gr = 1.20	
Hennig (1965)	Lexan, unoriented and oriented by stretching a 36.0 x 17.0 x 1.5 cm plate 70%	ℓ = 10.0 cm, w = 0.6 cm, t = 0.6 cm.
Jackson, Jr., Caldwell (1965)	Bisphenol I, molecular weight = 20,700, glass temp = 529 K; bisphenol II, molecular weight = 54,000, glass temp = 563 K; bisphenol A, molecular weight = 28,200, glass temp = 423 K; solvent cast films	t = 0.002-0.008 cm; Instron, ASTM D 882-61 T Method A test procedure.
Kuroda, Komaki (1965)	Panlite K	t = 0.24 cm; 65 ±3% rel hum.
Kondo (1966)		Conditioned at 293 ±1 K and 65 ±3% rel hum, Instron, flexure jig conformed to ASTM D 790-63, xhd spd = 0.0008 cm s^{-1}.
Laird, Cimprich, Kappler, Mason, Jr. (1966)	Lexan, sp gr = 1.20	Red Sec ℓ = 5.08 cm, w = 1.27 cm, t = 0.64 cm as per ASTM D 638-61T; Tinius Olsen HL-400-2 tensile test machine, $\dot{\epsilon}$ = 0.0029 s^{-1}; av of 2-4 tests.
Peilstöcker (1967)	Makrolon 3000, sp gr = 1.20	Impact sample 6.35 x 1.27 x 0.32 cm; ASTM D 256 test procedure for impact, ASTM D 785 test procedure for hardness, 50% rel hum.
Doi, Sakagami (1968)		Red Sec ℓ = 15.0 cm, w=1.0 cm notched specimens had a 0.1 cm separation between 45° notches.
Koda (1968)	Jupilon S before and after annealing at 393 K for 2 h	ASTM D 785-60T Procedure A.
Powell, Ehlers, Orrath, Jr. (1968)	Zelux made from Lexan molding powder, Lexan and Mobay resin; dried by heating at 403 K for 2 h	Original t noted; biaxially stretched at temp and to degree noted, tested on Tinius-Olsen machine; values noted are an av of several tests and several batches of material.

Investigator(s) (year)	Description	Temperature (K)	Strength (10^3 psi)	Modulus (10^6 psi)	Hardness	Other
Wisander (1969)		293		0.35[d]		
		77	18.0[c]			
General Electric	Lexan 500	296	14.8[a]		M85 (Rockwell)	20-40[h] (unnotched)
			16.1[b]	0.50[e]		4-6[h] (notched)
			8.76[c]			
	Lexan 1 x 1		12.5[a]		M70 ($R_{ockwell}$)	
			13.5[b]	0.34[e]		
			6.00[c]			
	Lexan 141					>60[h] (unnotched)
						12-16[h] (notched)

(a) Compressive Strength
(b) Flexural Strength
(c) Shear Strength
(d) Compressive Modulus
(e) Flexural Modulus
(h) Izod Impact Strength (ft lb in^{-1})

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Wisander, Johnson (1969)		Compression: ℓ = 1.905 ±0.003cm, diam = 0.635 ±0.003 cm; max load = 200 lb, xhd xpd = 0.0021 cm s^{-1}. Shear: ℓ = 2.54 cm, diam = 0.318 ±0.003 cm; xhd spd = 0.021 cm s^{-1}.
General Electric	Lexan 500, 1 x 1, and 141	Impact specimens: 0.32 x 1.27 cm.

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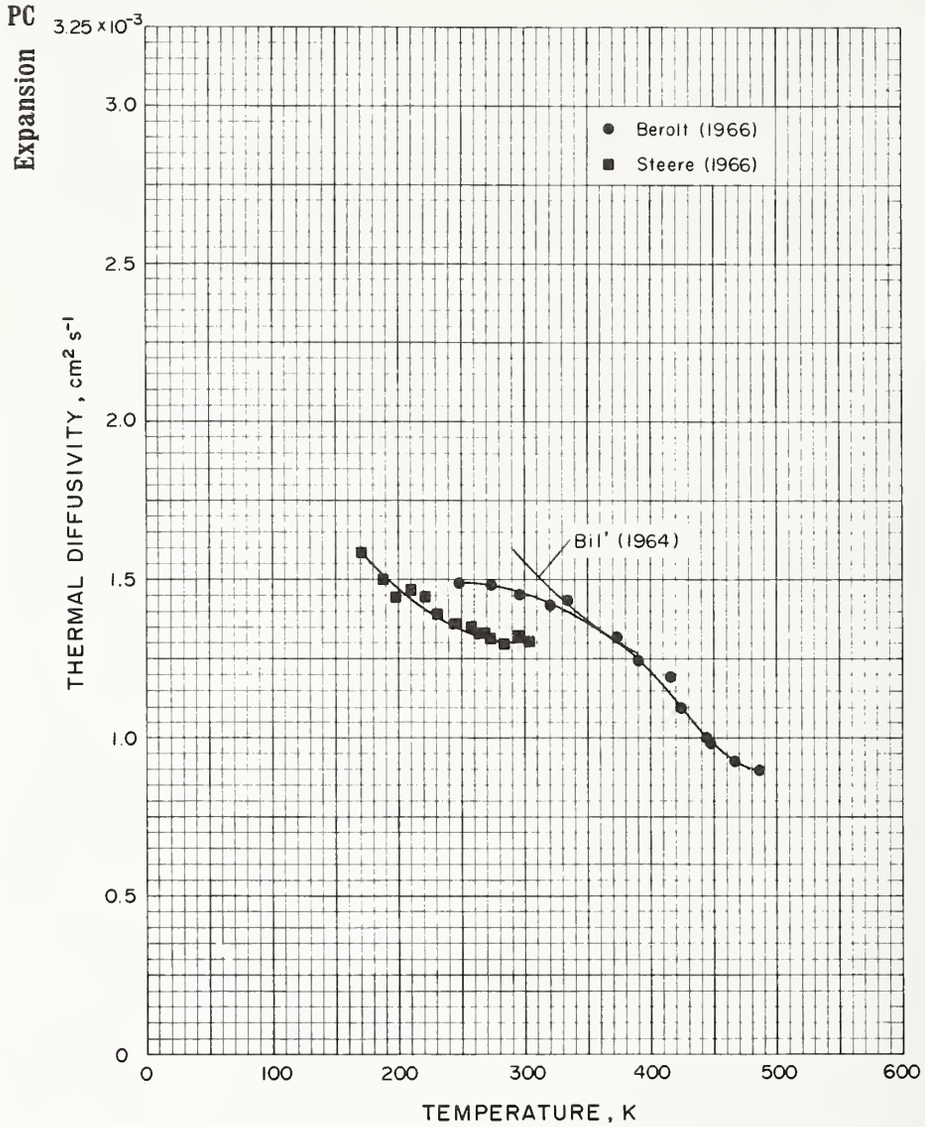
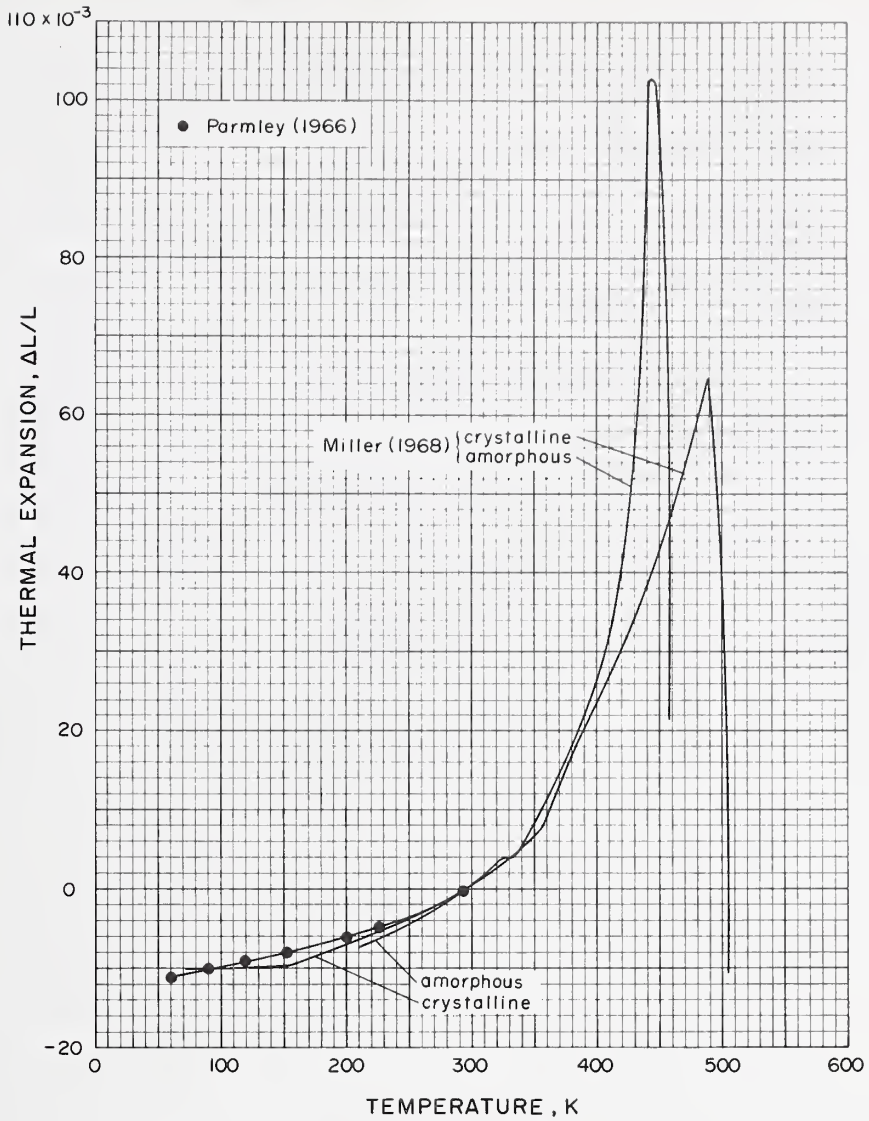
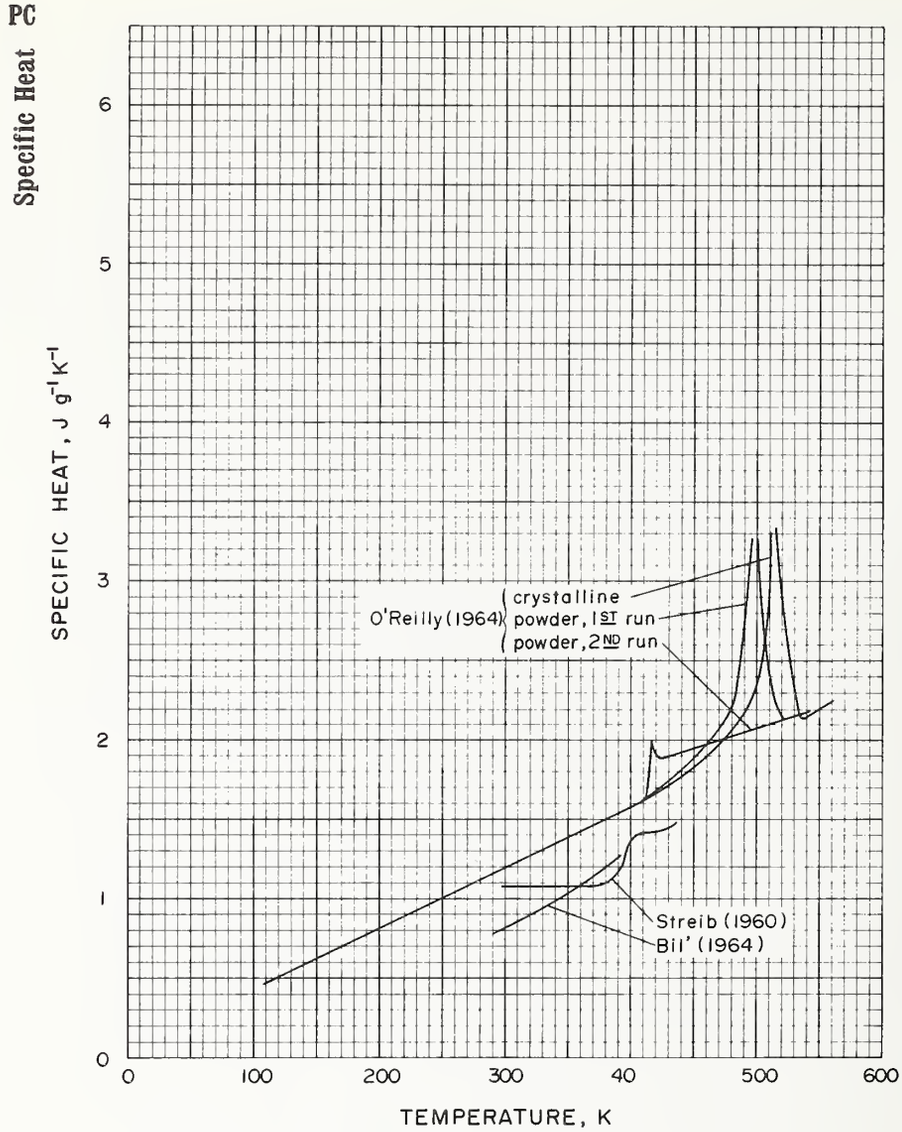


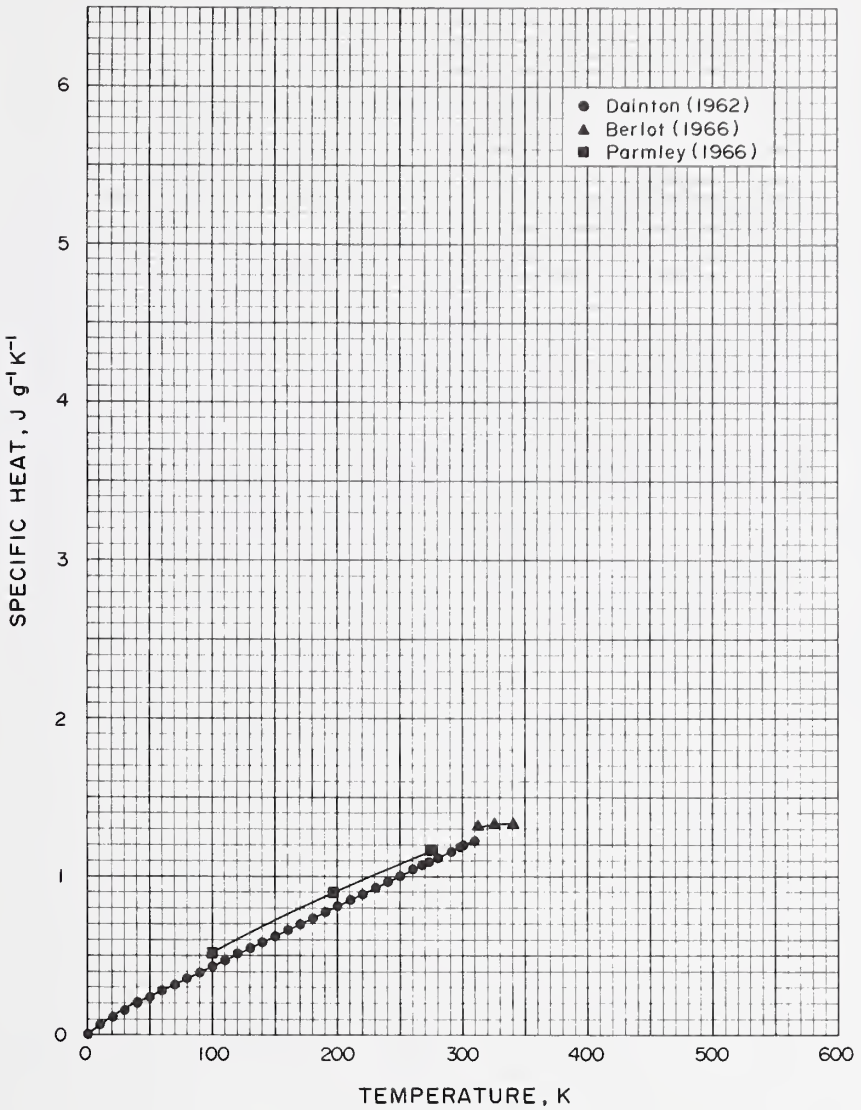
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Bil', Avtokratova (1964)	Molded at 523 K under 142 psi for 30 min for each 0.1 cm of thickness, sp gr = 1.20	Diam = 2.0 - 2.2 cm, t = 0.2 - 0.3 cm; heating rate = 400-900 K h^{-1}; each value is the av of 2 or 3 tests.
Berlot (1966)		t = 0.5 cm, diam = 10 cm; thermocouple measurements made in 6 directions.
Steere (1966)	Prepared from Lexan resin	Modified transient heating method used.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Miller (1968)	Merlon, injection grade, crystallized by immersion in $CC\ell_4$ for several months	t = 0.32 cm; flat-tipped quartz probe on a DuPont 940 Thermomechanical Analyzer, monitored by thermocouple, heating rate = 5 K min^{-1} starting at 77 K.
Parmley, Wong, Skogh (1966)	Lexan	



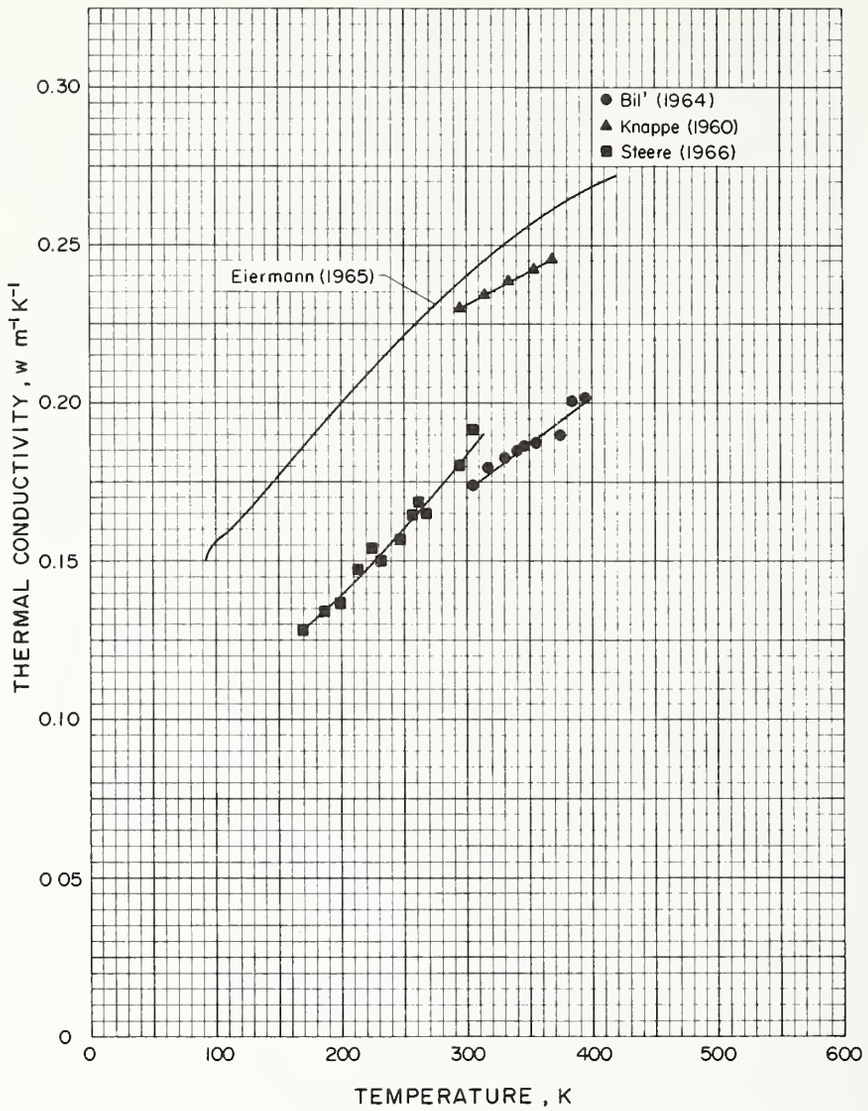
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
O'Reilly, Karasz, Bair (1964)	Lexan, poly (4,4′-dioxy-diphenyl-2,2-propane carbonate); powder precipitated from solution, molecular weight = 4×10^4, dried at 383 K for at least 24 h, 17% crys; crystalline material prepared by slow evaporation of a methylene chloride solution of the powder on a clean Hg surface, could contain as much as 0.1% by weight of methylene chloride, 24% crys	Powder: max particle size = 0.1 cm, volume = 75 cm^3, mass = 21.599 g; crystalline: mass = 25.263 g in irregular large pieces; precision adiabatic calorimeter calibrated with a standard NBS sample of Al_2O_3, measurements at 5-10 K intervals, heating rate = 10-20 K h^{-1}; after the 1st run the powder sample was cooled at 15 K h^{-1} to 320 K and rerun, after being heated to 425 K the crystalline sample was cooled to < 400 K and rerun with no noticeable change; reproducibility better than 0.1% at low temp and 0.4% at the highest temp.
Bil', Avtokratova (1964)	Molded at 523 K under 142 psi for 30 min for each 0.1 cm of thickness, sp gr = 1.20	Diam = 2.0-2.2 cm, t ≤ 0.3 cm; heating rate = 300-900 K h^{-1}; calculated from measurements of the diffusivity and thermal conductivity.
Streib (1960)	Makrolon	



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Parmley, Wong, Skogh (1966)	Lexan	This data is cited as being from the literature but no reference is given.
Dainton, Evans, Hoare, Melia (1962)	Lexan	Degassed for 2 days and then sealed in an adiabatic vacuum type calorimeter with 100 torr of He, Pt resistance thermometer, temp rise = 0.2-2 K min^{-1}, temp recorded 6-7 times after heater turned off; data points are smoothed values.
Berlot (1966)		

PC

Conductivity



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Bil', Avtokratova (1964)	Molded at 523 K under 142 psi for 30 min for each 0.1 cm of thickness, sp gr = 1.20	Diam = 2.0 - 2.2 cm, t ≤ 0.1 cm; heating rate = 300-800 K h^{-1}; each value is the av of 2 or 3 tests.
Knappe (1960)	Lexan	2 plate method without ring guard, stationary temp.
Steere (1966)	Prepared from Lexan resin	Modified transient heating method used.
Eiermann (1965)	Lexan	Curve represents closely spaced series of test points.

Investigator(s) (year)	Description	Temperature (K)	$\Delta L/L$ Thermal Expansion	λ Thermal Conductivity ($Wm^{-1} K^{-1}$)	α Thermal Diffusivity ($cm^2 s^{-1}$)	Specific Heat ($J g^{-1} K^{-1}$)
Thompson (1958)	Lexan, sp gr = 1.20	298		0.19		
Hechehammer (1959)	Makrolon, sp gr = 1.20	298 358	0.36×10^{-2}	0.20		1.17
Hofmeier (1959)	Makrolon, sp gr = 1.2	298 358	0.51×10^{-2}	0.198		
Hauck (1963)	Molding grade, sp gr = 1.20	298		0.193		1.26
Hellwege (1963)	Unoriented oriented, trans	298		0.234 0.184		
Kudrna (1963)	Bisphenol-A, sp gr = 1.2	298 351	0.32×10^{-2}	0.20		1.20
Polycarbonates Begin Assault on Market (1964)	Merlon, sp gr = 1.20	298		0.19		1.17
Parmley (1966)	Lexan	298		0.196		
Peilstöcker (1967)	Makrolon 3000, sp gr = 1.20	298		0.20		1.17
Streib (1968)	Makrolon 3000	296		0.22		
Wisander (1969)		77	-0.8×10^{-2}			
General Electric	Lexan 500 Lexan 1X1 Lexan 3412	298		0.20 0.20 0.21		

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Thompson, Goldblum (1958)	Lexan, sp gr = 1.20	
Hechelhammer, Peilstöcker (1959)	Makrolon, sp gr = 1.20	
Hofmeier (1959)	Makrolon, sp gr = 1.2	
Hauck (1963)	Molding grade, sp gr = 1.20	The author's λ value has been multiplied by 10^{-3} to obtain the value reported here.
Hellwege, Hennig, Knappe (1963)	Unoriented and oriented by stretching 67%	
Kudrna (1963)	Bisphenol-A polycarbonate, sp gr = 1.2	Erk VDE 0304/1 test procedure for $\Delta L/L$ and λ.
Polycarbonates Begin Assault on Market (1964)	Merlon, sp gr = 1.20	
Parmley, Wong, Skogh (1966)	Lexan	This value is cited as being from the literature, but no reference is given.
Peilstöcker (1967)	Makrolon 3000, sp gr = 1.20	Diam = 11.8 cm, t = 0.4 cm; VDE 0304/part 1 test procedure.
Streib (1968)	Makrolon 3000	VDE 0304/T. 1 test procedure.
Wisander, Johnson (1969)		ℓ = 2.54 cm, diam = 0.95 cm; submerged in liquid N_2 and then measured with a micrometer, measurement repeated 6-8 times until no further contraction is noted.
General Electric	Lexan 500, 1 x 1, 3412	

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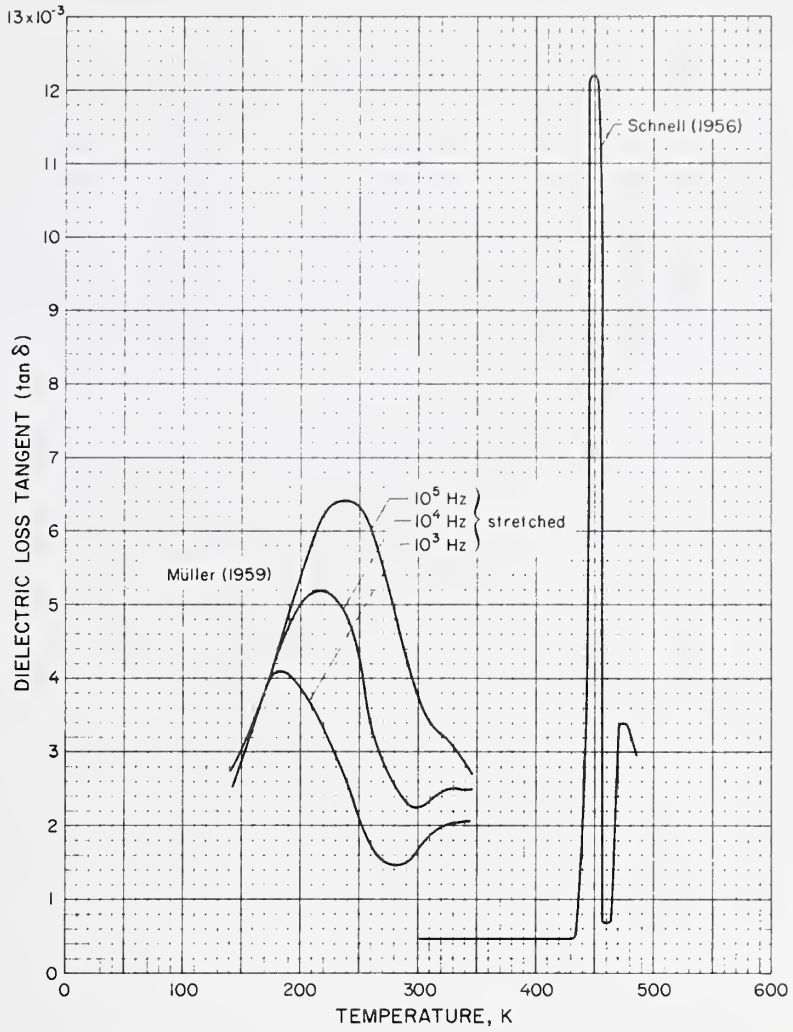
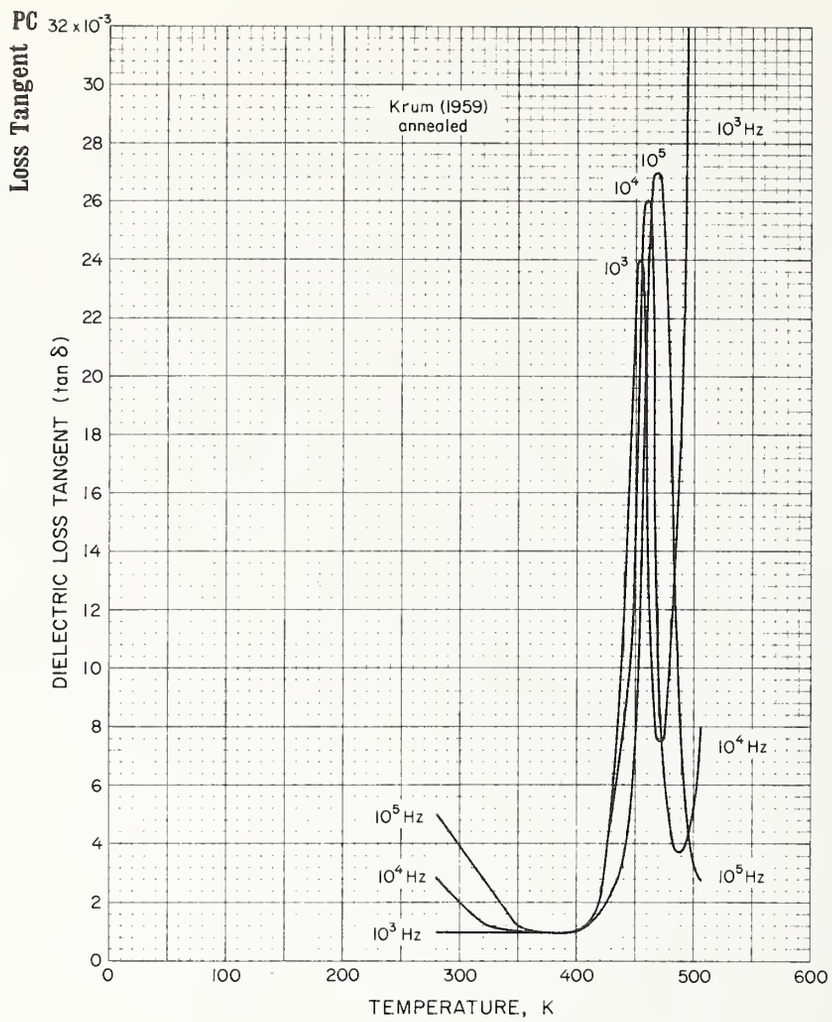
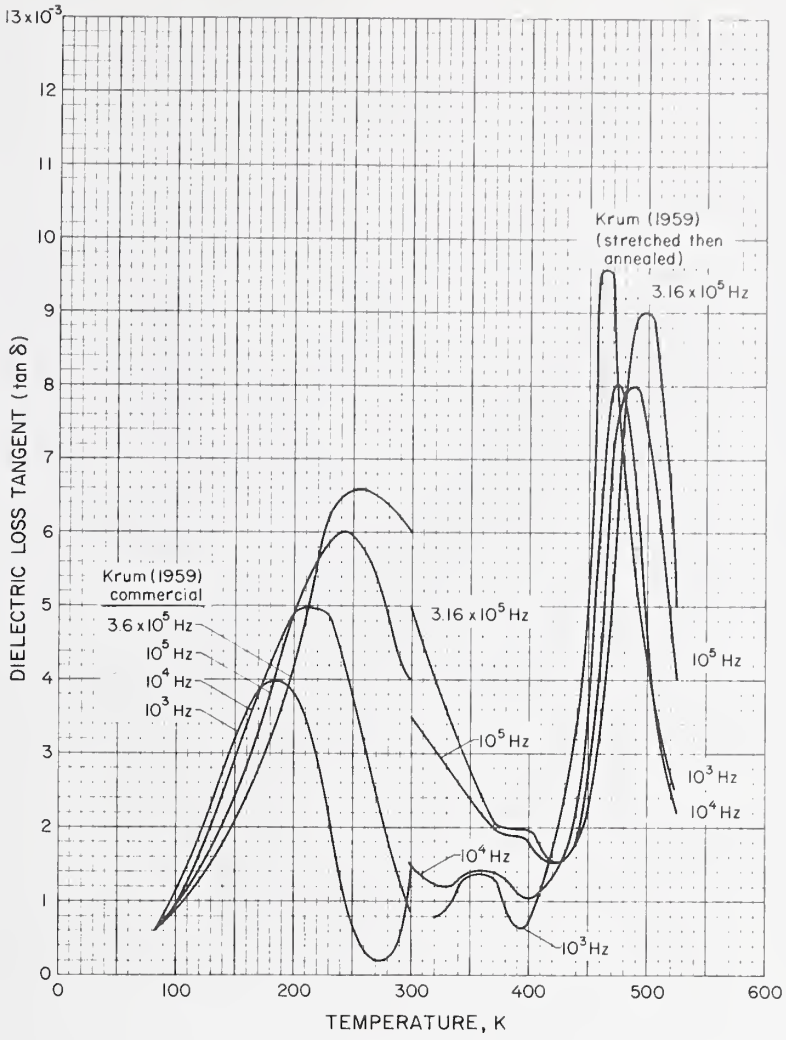


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Müller, Huff (1959)	Makrolon, stretched in one direction at 323 K	Frequency noted.
Schnell (1956)	Film based on 4,4′-dioxy-diphenyl-2,2-propane, solution cast	



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Krum, Müller (1959)	Poly-(4, 4′-dioxy-diphenol-2, 2′ propane carbonate), annealed several h at 493 K then cooled at 0. 5 K min^{-1}	Measurements made over P_2O_5; max absolute error for tan $\delta > 5\times10^{-3}$ is 0. 3%, max absolute error for tan $\delta < 10^{-3}$ is 5%.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Krum, Müller (1959)	Poly-(4, 4′-dioxy-diphenyl-2, 2′ propane carbonate), commercial material with a slight orientation, also material cycled through a stretch and an anneal at 413 K several times	Measurements made over P_2O_5; max absolute error for $\tan \delta > 5 \times 10^{-3}$ is 0.3%, max absolute error for $\tan \delta < 10^{-3}$ is 5%.

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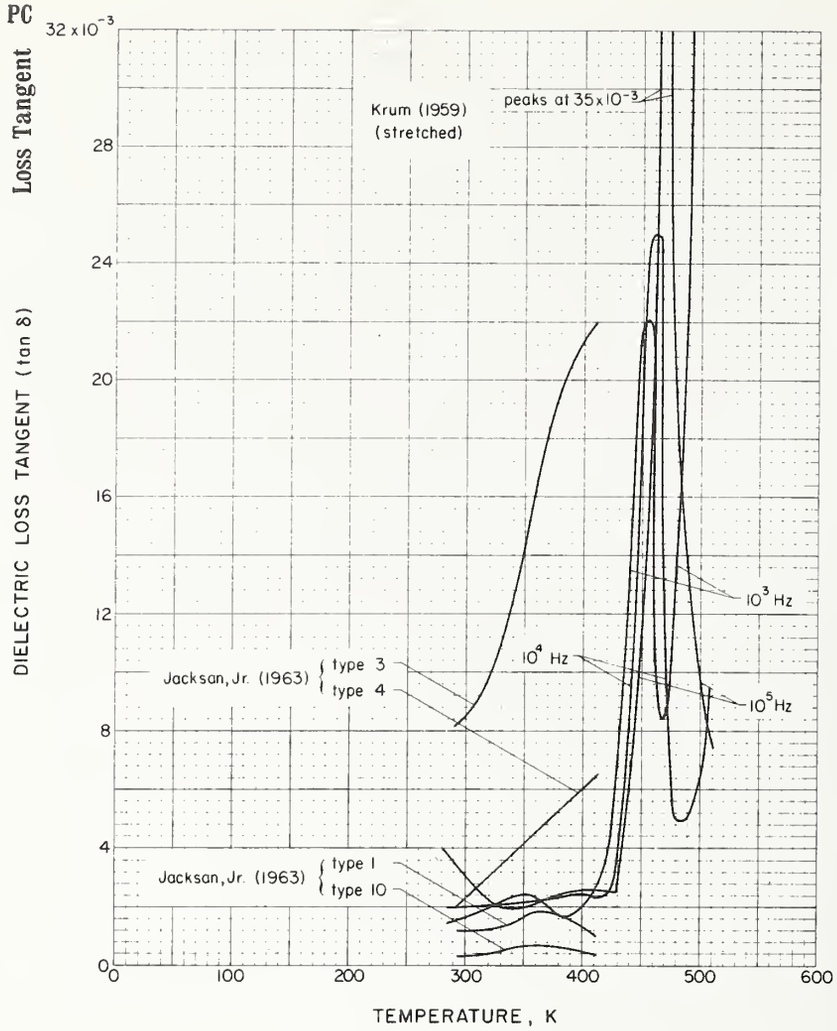
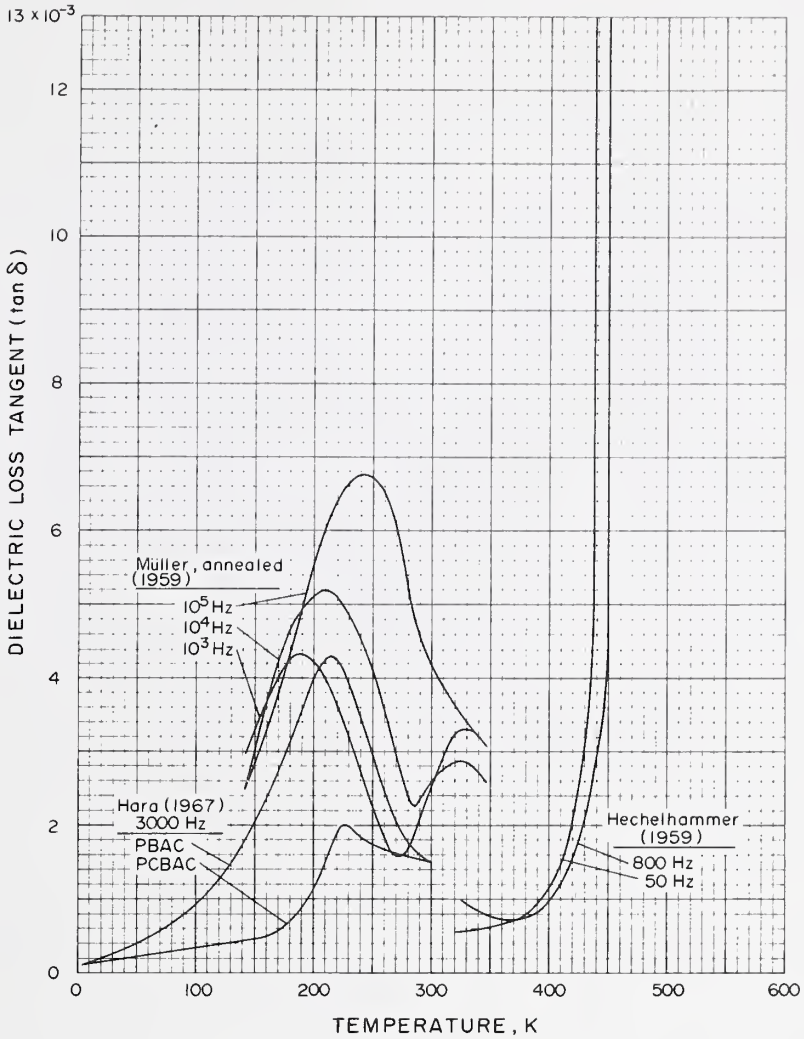
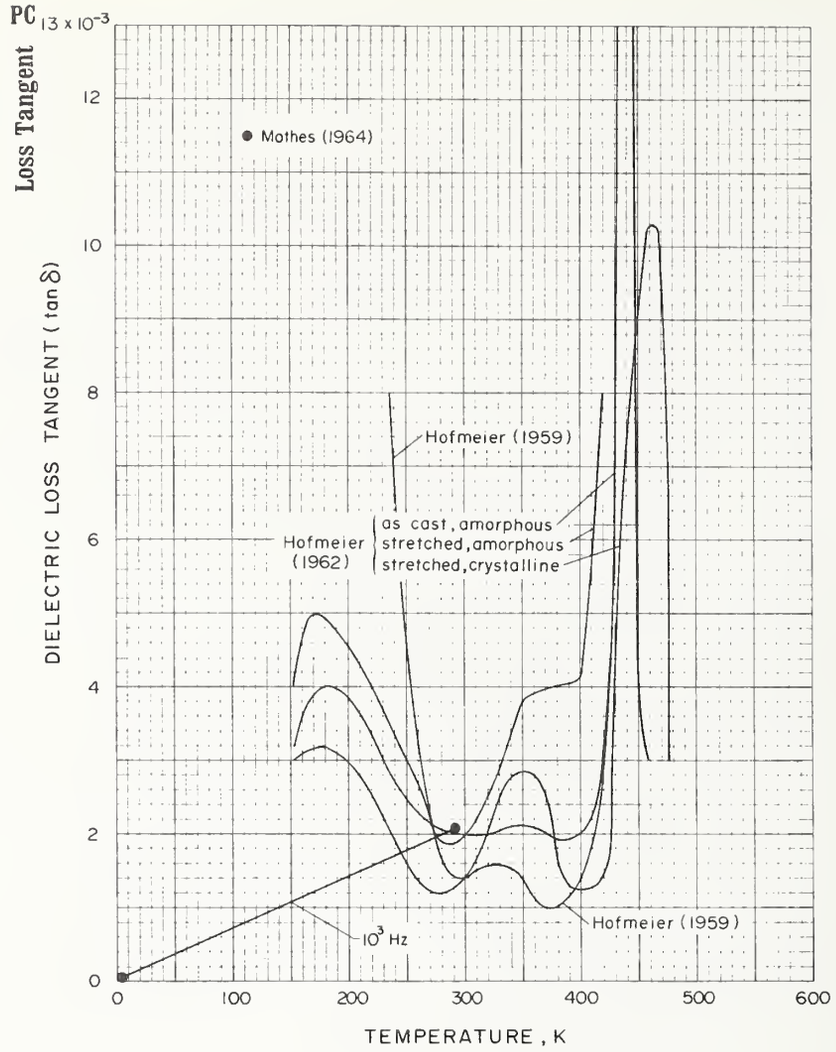


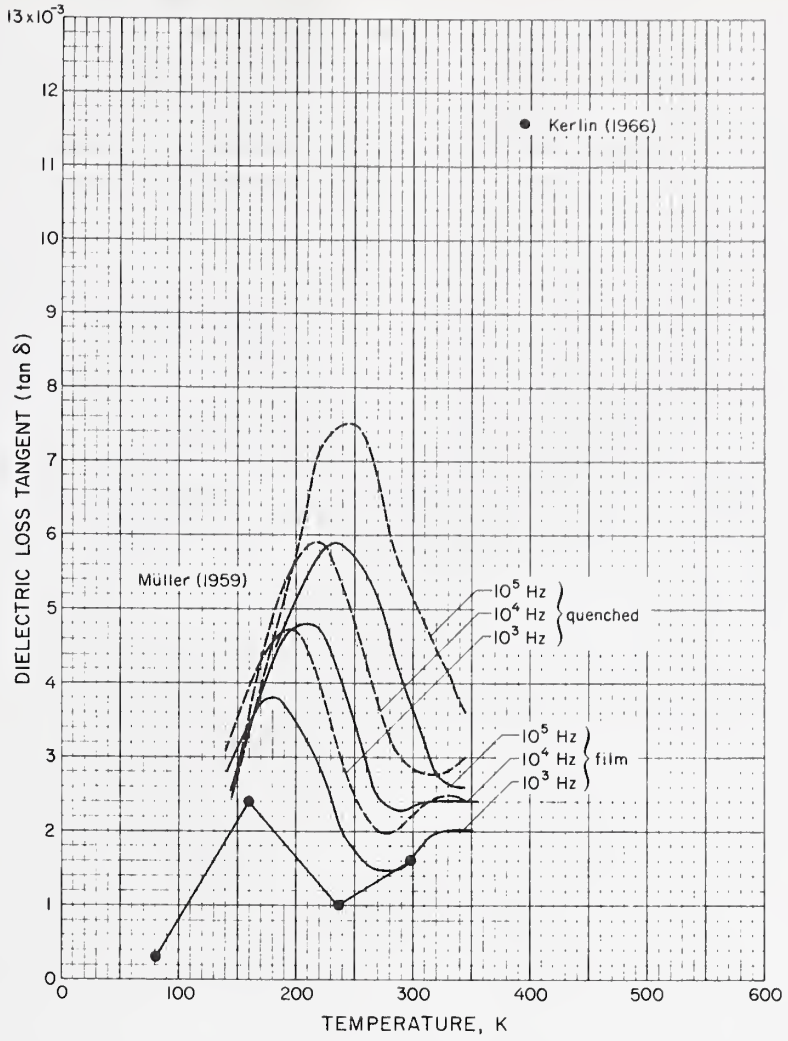
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Krum, Müller (1959)	Poly-(4, 4′-dioxy-diphenyl-2, 2′ propane carbonate), stretched 90% at 298 K	Measurements made over P_2O_5; max absolute error for tan $\delta > 5 \times 10^{-3}$ is 0.3%, max absolute error for tan $\delta < 10^{-3}$ is 5%.
Jackson, Jr., Caldwell (1963)	Basis for type 1 is 4, 4′-(2-norbornylidene) diphenol; for type 3 is 4, 4′-(2-norbornylidene) bis (2-chlorophenol); for type 4 is 4, 4′-(2-norbornylidene) bis (2, 6-dichlorophenol); type 10 is 4, 4′-(hexahydro-4, 7-methanoidan-5-ylidene) diphenol	Films cast from methylene chloride, t = 0.002-0.008 cm, air dried then heated at 383 K for 1-2 h.



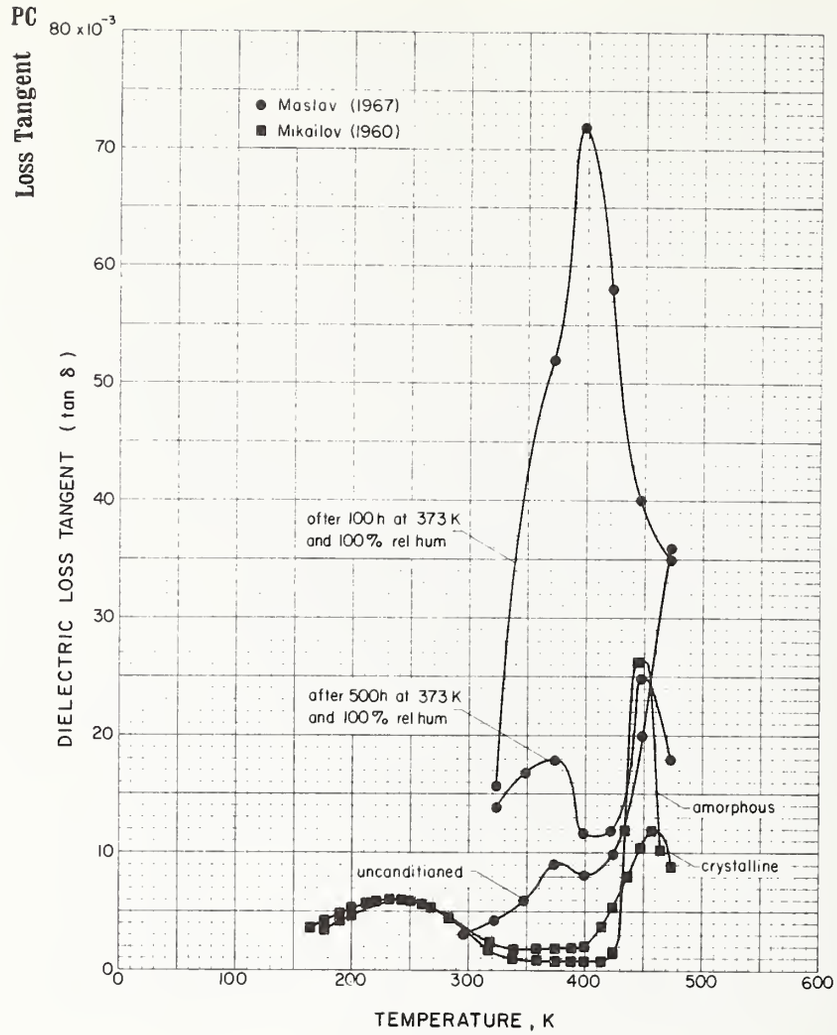
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Hara (1967)	Polybisphenol-A carbonate (PBAC), 20% crys; polytetrachlorobisphenol-A carbonate (PCBAC), 23% crys	Sample mounted inside central tube with 10 torr of He, mutual inductance bridge with a conductance shifter, 3 x 10^3 Hz.
Hechelhammer, Perlstöcker (1959)	Makrolon, sp gr = 1.20	50% rel hum.
Müller, Huff (1959)	Makrolon, annealed at 573 K, cooled to 423 K at 0.5 K min^{-1}	Frequency noted.



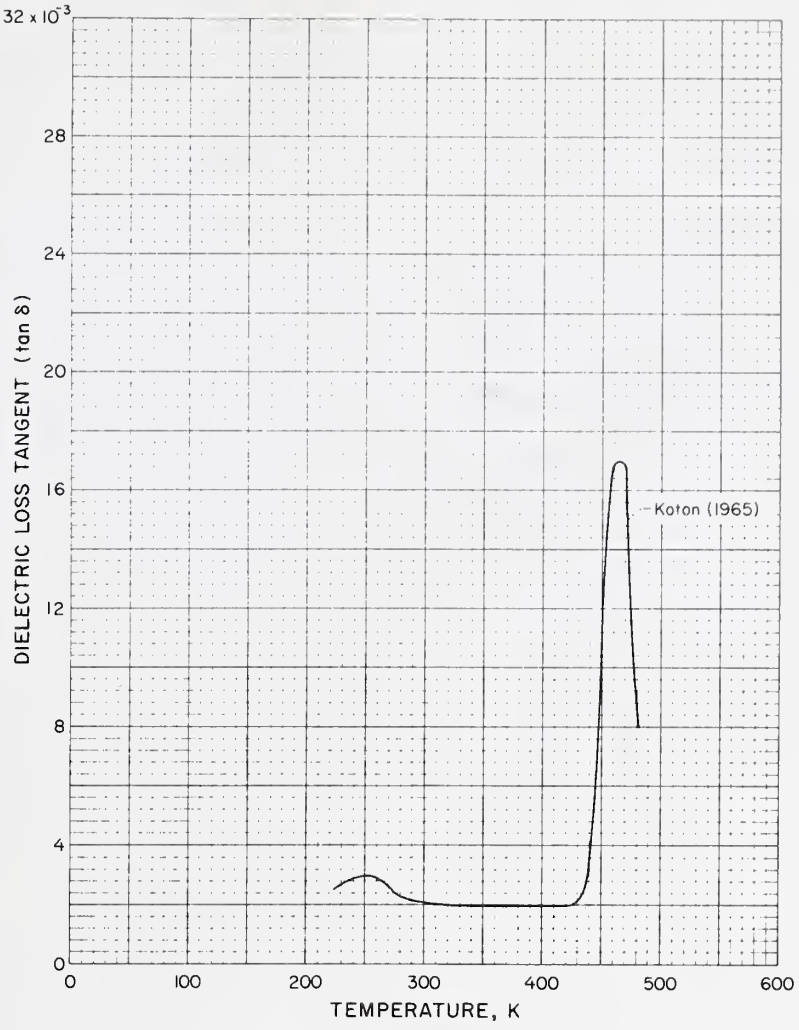
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Hofmeier (1962)	Poly-[2, 2-bis-(4-hydroxyphenyl)-propane-carbonate], amorphous film	10^3 Hz.
Hofmeier (1959)	Makrofol N	8×10^2 Hz.
Mathes (1964)		



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Müller, Huff (1959)	Makrolon, film and quenched	Frequency noted.
Kerlin, Smith (1966)	Lexan	Test cells fabricated according to ASTM D 160 - 59T, unguarded electrodes and guard ring diam = 11.4 cm, guarded electrode diam = 10.1 cm, gap between guarded electrode and guard ring = 0.051 cm, spring loaded Al plunger in contact with guarded electrodes secured specimens between electrodes, General Radio Co. Type 1610-A capacitance-measuring assembly, tested in vacuum except for room temp test in air.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Mikhailov, Eidelnant (1960)	Pressed from powder at 543 K in air, amorphous; produced from solution in dichlorethane, partially crystalline	
Maslov (1967)		Conditioned as noted.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Koton, Yakovlev, Rudakov, Knyazeva, Florinskii, Bessonov, Kuleva, Tolparova, Laius (1965)		MLE bridge at 10^3 Hz, electrodes applied by vacuum deposition of Ag.

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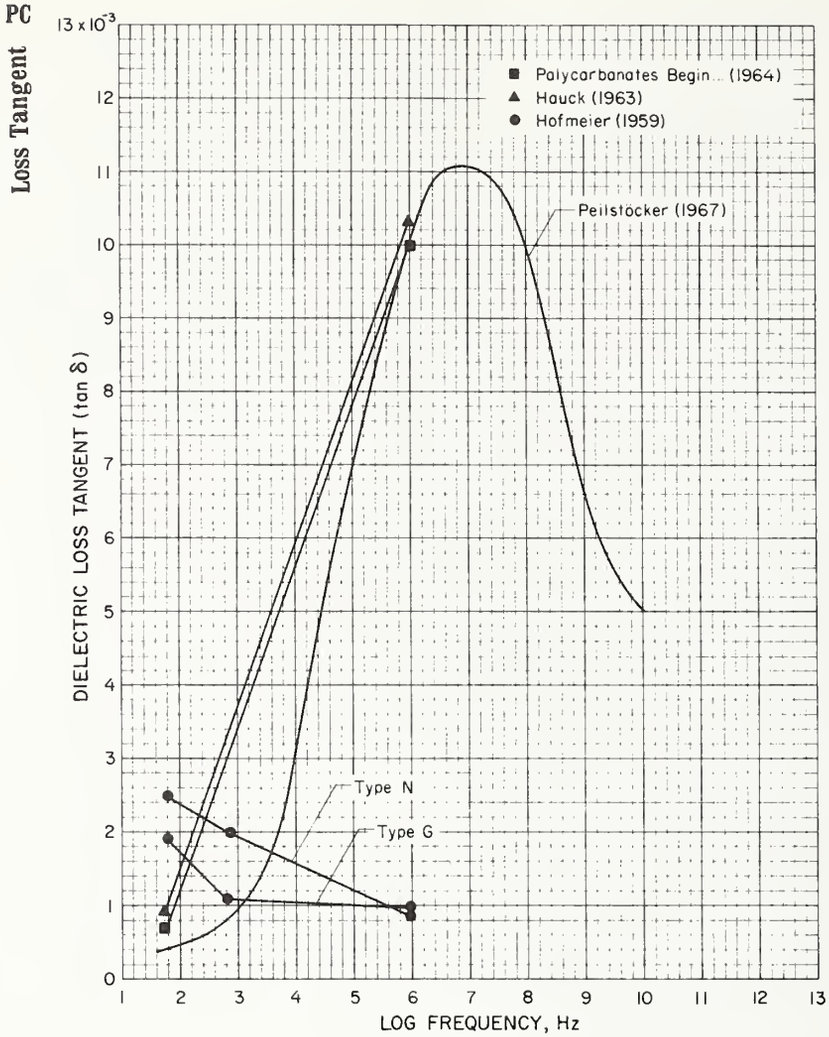
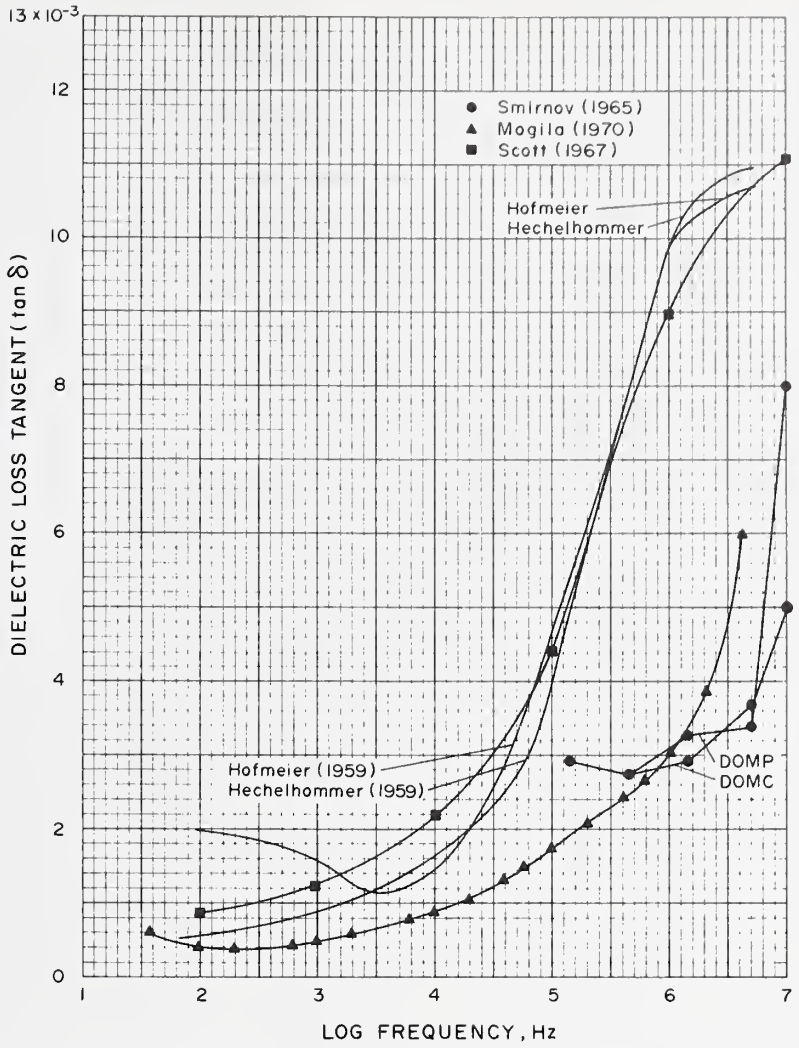
Loss Tangent



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Hofmeier (1959)	Makrofol N and G	
Peilstöcker (1967)	Makrolon	
Hauck (1963)	Sp gr = 1.20, molding grade and cast film	ASTM D 150 test procedure.
Polycarbonates Begin Assault on Market (1964)	Merlon, sp gr = 1.20	



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Hofmeier (1959)		293 K.
Hechelhammer, Peilstöcker (1959)	Makrolon, sp gr = 1.20	295 K, 50% rel hum.
Scott, Kinard (1967)	Molecular weight ≃ 30-35,000	Diam = 3.8 cm; heavy Au electrodes evaporated onto specimen, 10^2 to 10^5 Hz measurements made on a low-voltage conjugate Schering bridge with a 3-terminal guard-ring micrometer-electrode type cell, 10^6 to 10^7 Hz measurements made with a Q-meter with a 2-terminal micrometer-electrode cell, rel hum < 1.5%.
Smirnova, Khasan, Losev, Kolesnikov (1965)	2,2-di-(4-hydroxy-3-methylphenyl) propane base (DOMP), molecular weight = 53,000; 1,1-di-(4-hydroxy-3-methylphenyl) cyclohexane base (DOMC), molecular weight = 50,000	
Magila, LeGrand (1970)	Bisphenol-A	t = 0.025 cm; General Radio 1615 and 716-CS1 bridges.

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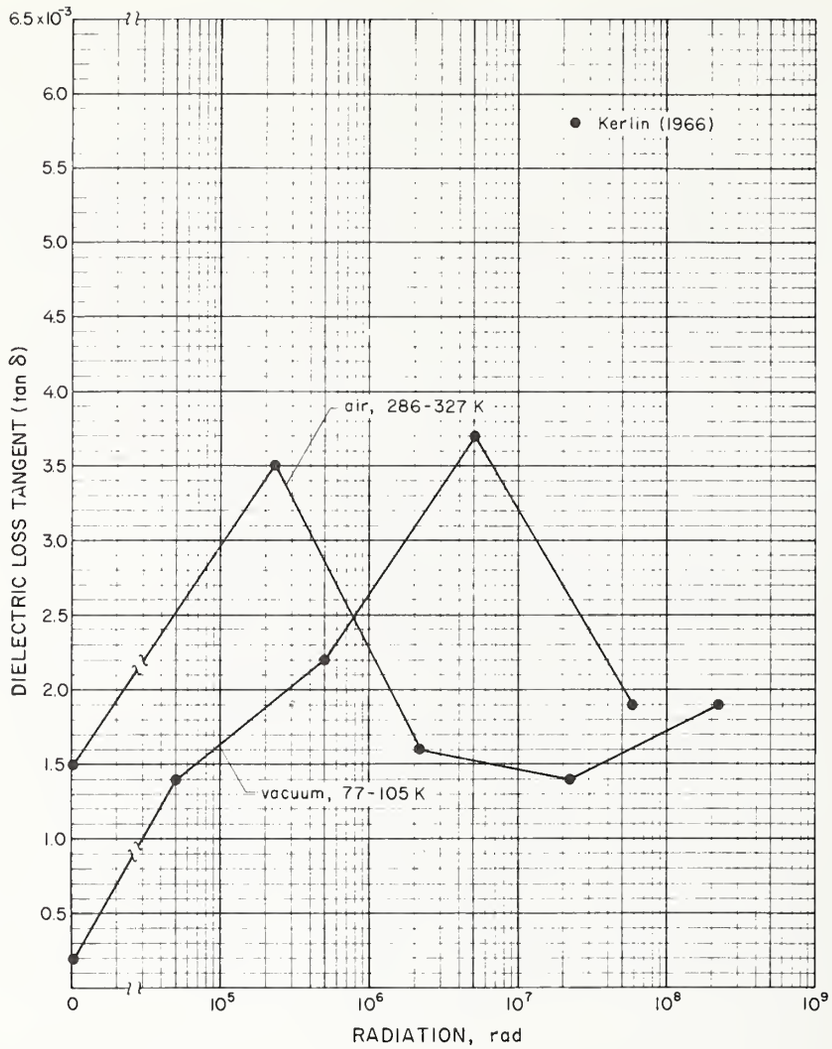
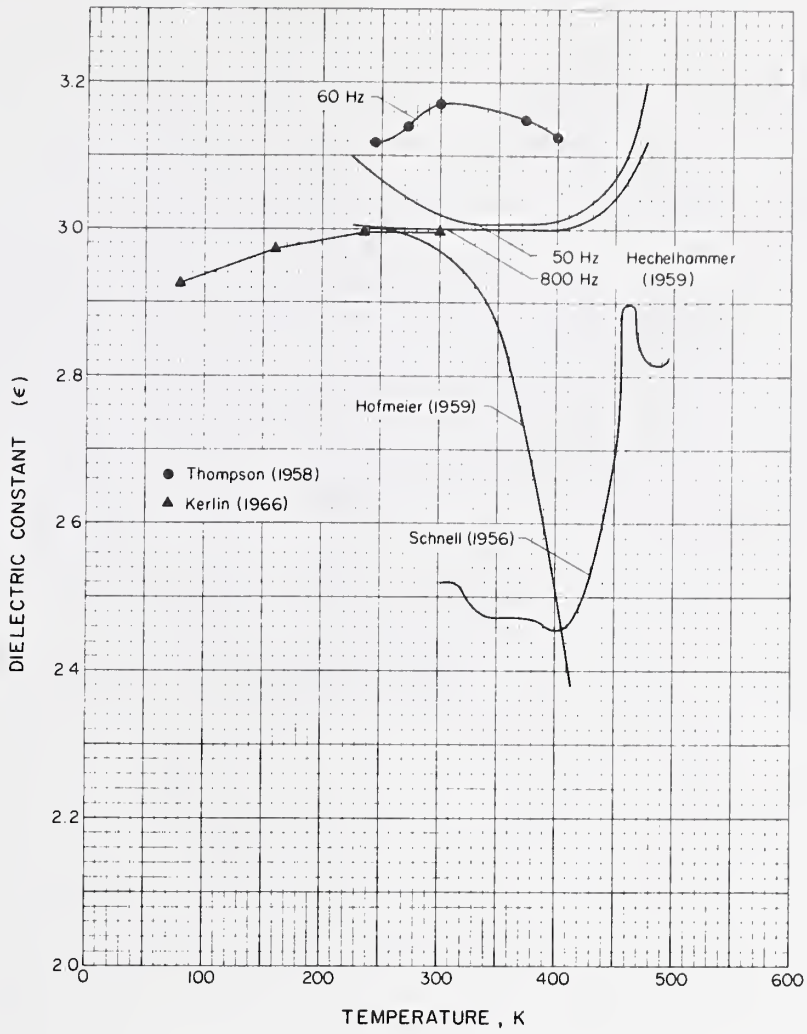
Loss Tangent



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Lexan	Test cells fabricated according to ASTM D 160 - 59T, unguarded electrode and guard ring diam = 11.4 cm, guarded electrode diam = 10.1 cm gap between guarded electrode and guard ring = 0.051 cm, spring loaded Aℓ plunger in contact with guarded electrode secured specimens between electrodes, General Radio Co. Type 1610-A capacitance-measuring assembly, tested in vacuum and air; irrad in Ground Test Reactor at Nuclear Aerospace Research Facility, Fort Worth.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Thompson, Goldblum (1958)	Lexan, sp gr = 1.20	ASTM D 150 test procedure.
Hofmeier (1959)	Makrofol N	
Schnell (1956)	Film based on 4,4′-dioxy-diphenyl-2,2-propane, solution cast	
Hechelhammer, Peilstöcker (1959)	Makrolon, sp gr = 1.20	50% rel hum.
Kerlin, Smith (1966)	Lexan	Test cells fabricated according to ASTM D 160 - 59T, unguarded electrode and guard ring diam = 11.4 cm, guarded electrode diam = 10.1 cm, gap width between guarded electrode and guard ring = 0.051 cm, spring loaded Aℓ plunger in contact with the guarded electrode secured specimens between electrodes, General Radio Co. Type 1610-A capacitance-measuring assembly, tested in vacuum except for room temp test in air.

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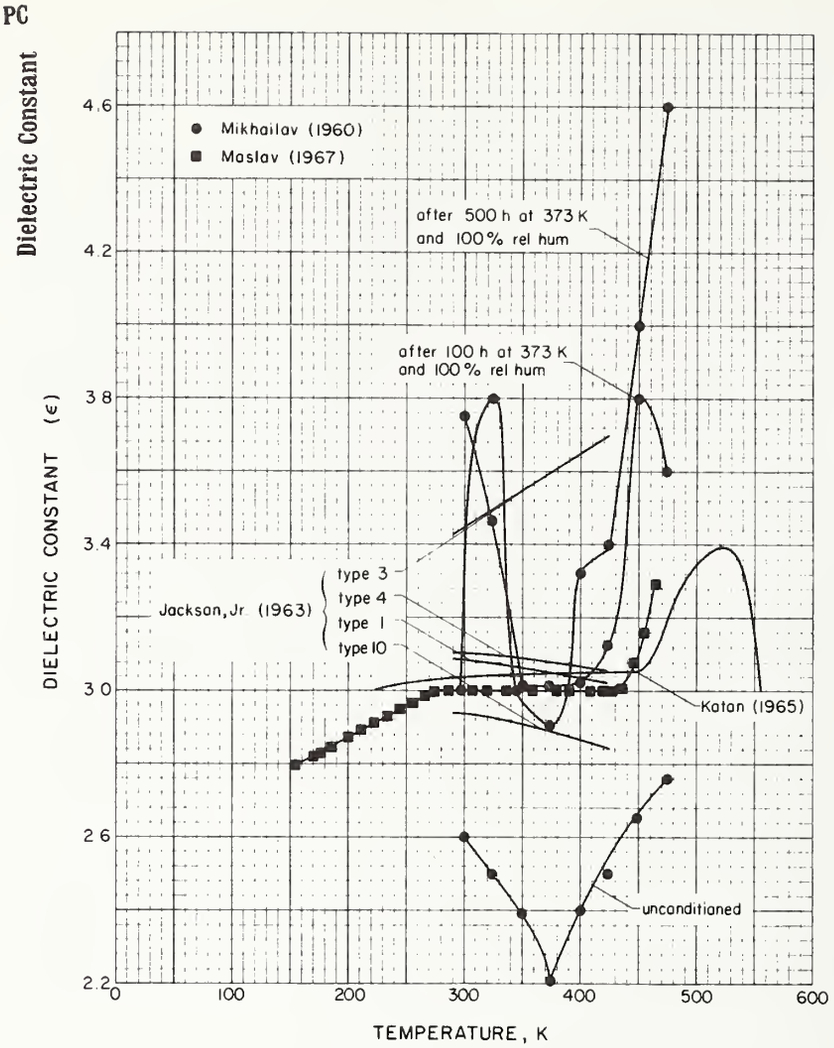
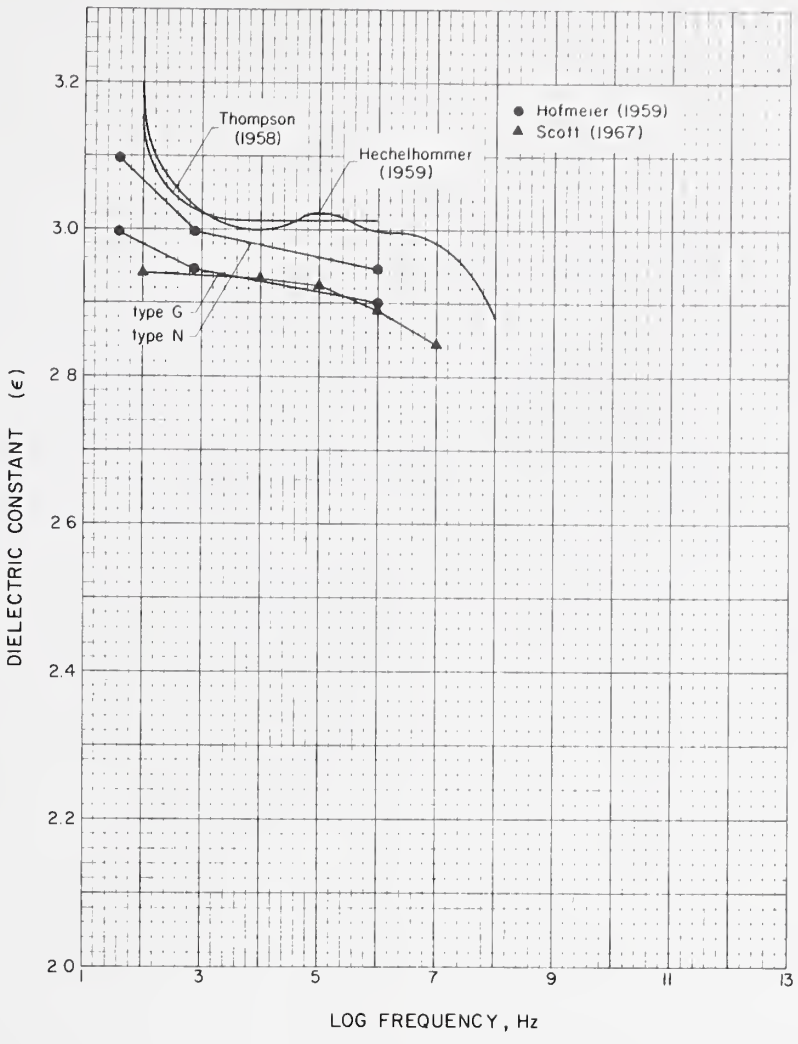


INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mikhailov, Eidelnant (1960)	Pressed from powder at 543 K in air, amorphous	
Maslov (1967)		Conditioned as noted.
Jackson, Jr., Caldwell (1963)	Basis for type 1 is 4, 4′-(2-norbornylidene) diphenol; for type 3 is 4, 4′-(2-norbornylidene) bis (2-chlorophenol); for type 4 is 4, 4′-(2-norbornylidene) bis (2, 6-dichlorophenol); type 10 is 4, 4′-(Hexahydro-4, 7-methanoidan-5-ylidene) diphenol	Films cast from methylene chloride, t = 0.002-0.008 cm, air dried then heated at 383 K for 1-2 h.
Koton, Yakovlev, Rudakov, Knyazeva, Florinskii, Bessonov, Kuleva, Tolparova, Laius (1965)		MLE bridge at 10^3 Hz, electrodes applied by vacuum deposition of Ag.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Scott, Kinard (1967)	Molecular weight ≈ 30-35,000	Diam = 3.8 cm; heavy Au electrodes evaporated onto specimen, 10^2 to 10^5 Hz measurements made on a low-voltage conjugate Schering bridge with a 3-terminal guard-ring micrometer-electrode type cell, 10^6 to 10^7 Hz measurements made with a Q-meter with a 2-terminal micrometer-electrode cell, rel hum < 1.5%.
Hechelhammer, Peilstöcker (1959)	Makrolon, sp gr = 1.20	295 K, 50% rel hum.
Hofmeier (1959)	Makrofol N and G	VDE 0303 test procedure.
Thompson, Goldblum (1958)	Lexan, sp gr = 1.20	ASTM D 150 test procedure, 296 K.

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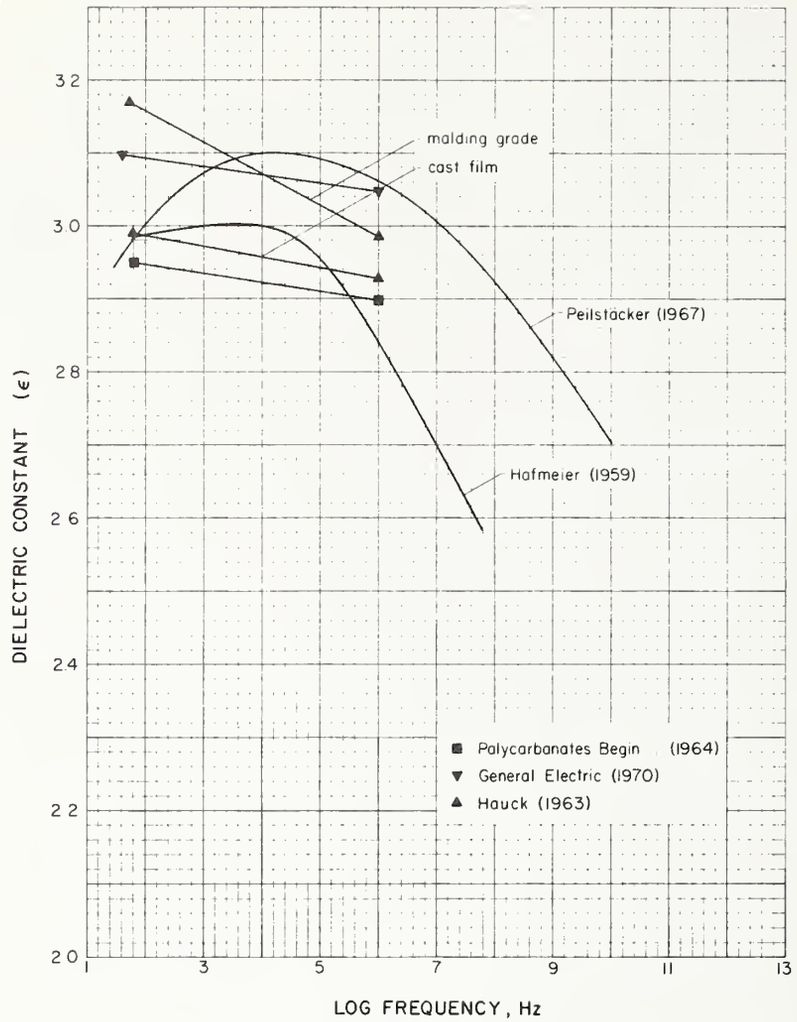
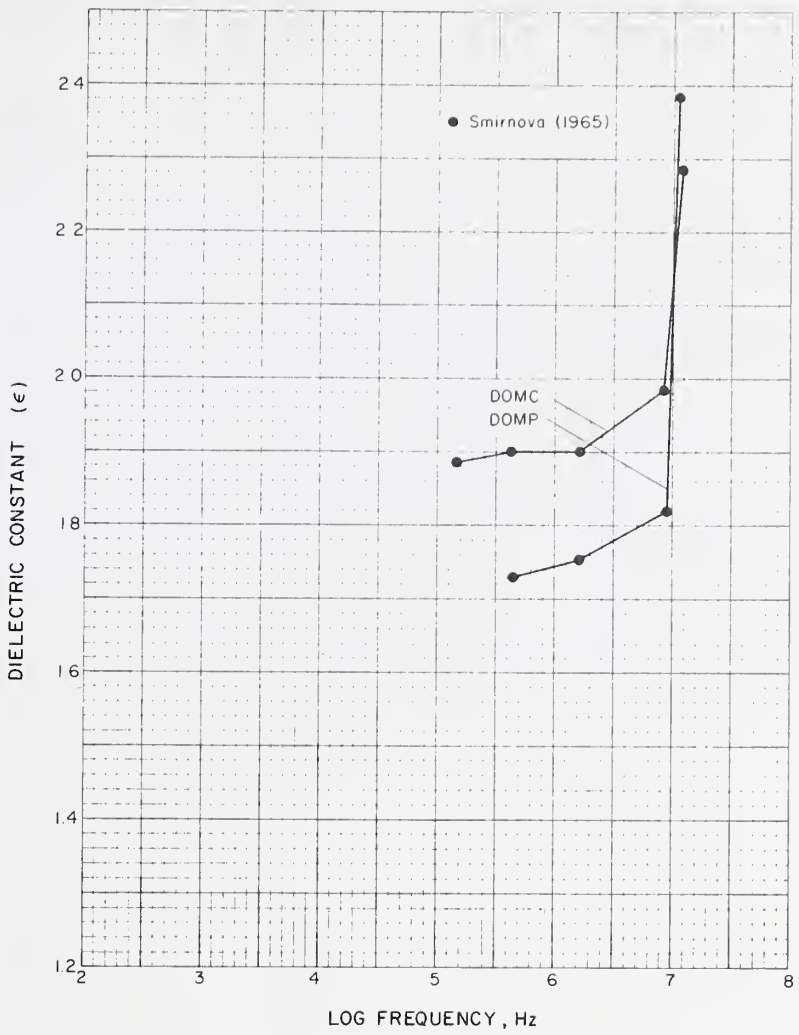
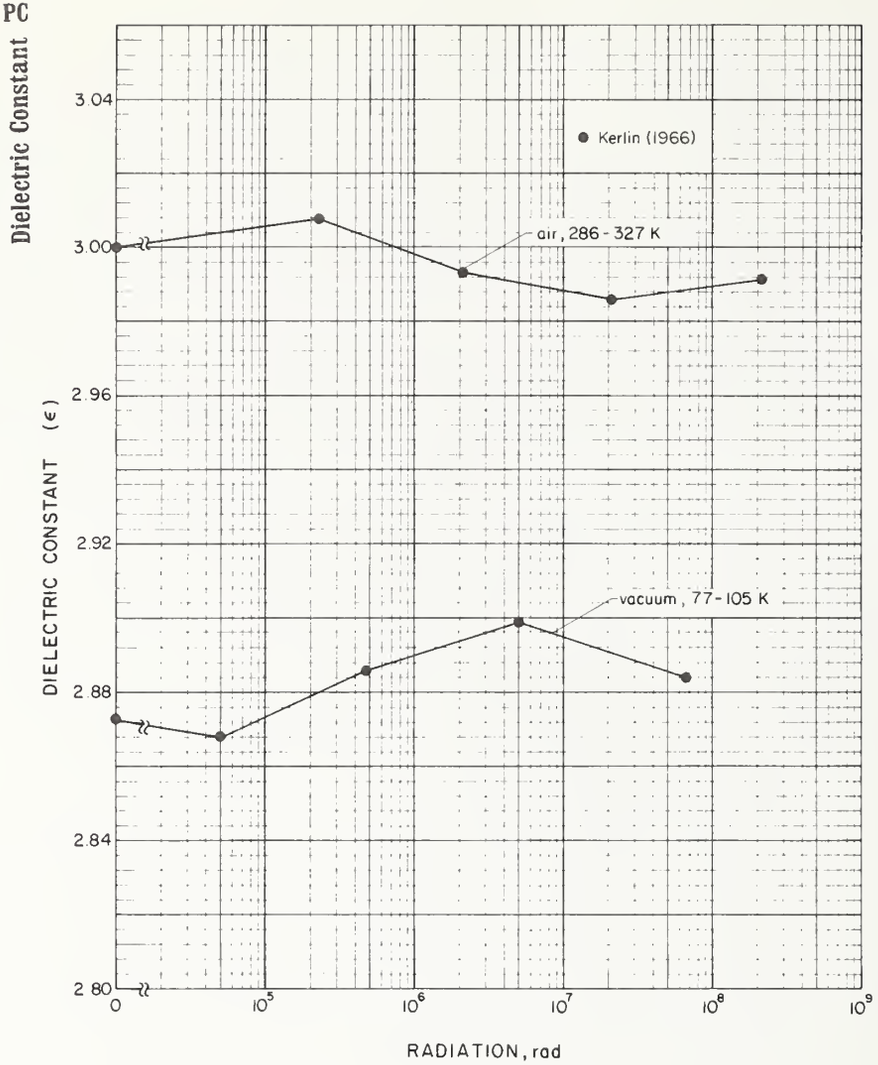
Dielectric Constant



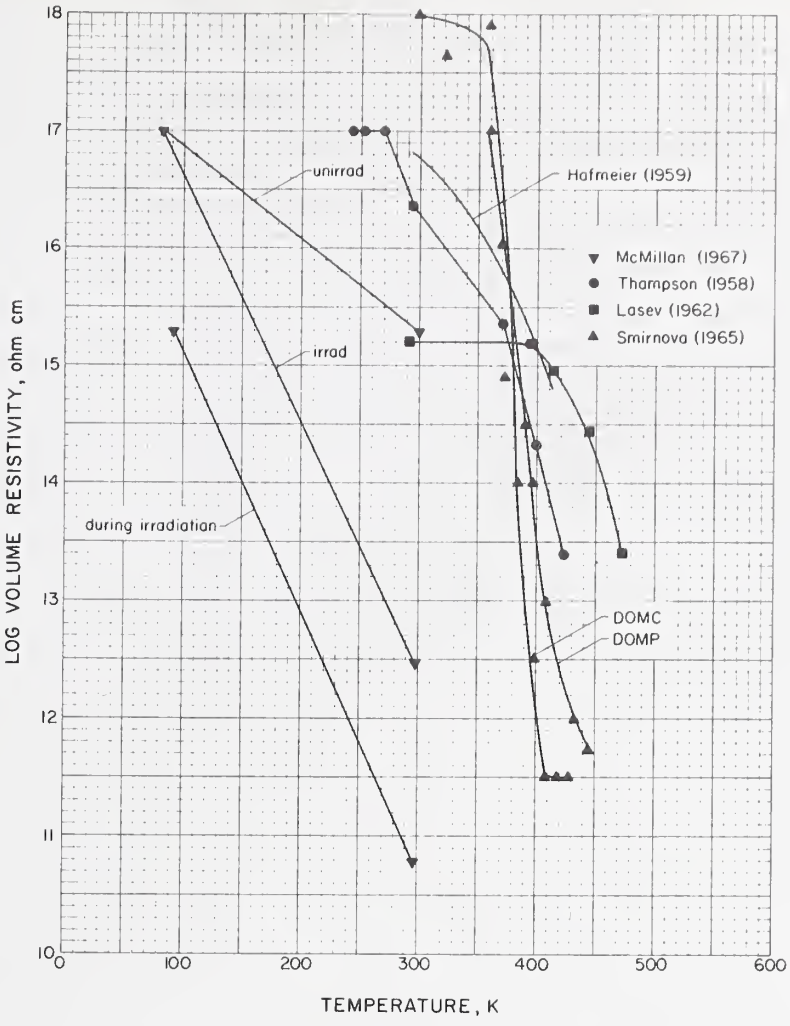
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Hofmeier (1959)		293 K.
Polycarbonates Begin Assault on Market (1964)	Merlon, sp gr = 1.20	
Peilstöcker (1967)	Makrolon 3000	
General Electric (1970)	Lexan 500	ASTM D 150 test procedure, 296 K.
Hauck (1963)	Sp gr = 1.20	ASTM D 150 test procedure.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Smirnova, Khasan, Losev, Kolesnikov (1965)	DOMP is based on 2,2-di-(4-hydroxy-3-methylphenyl) propane, molecular weight = 53,000; DOMC is based on 1,1-di-(4-hydroxy-3-methylphenyl) cyclohexane, molecular weight = 50,000	



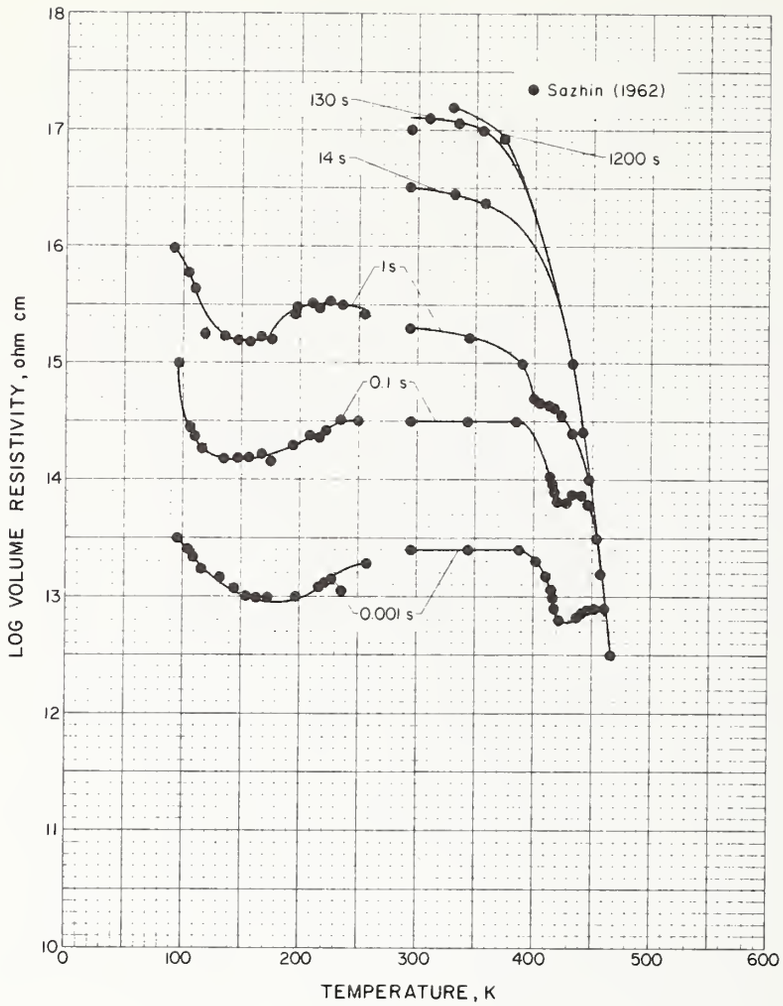
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kerlin, Smith (1966)	Lexan	Test cells fabricated according to ASTM D 160 - 59T, unguarded electrode and guard ring diam = 11.4 cm, guarded electrode diam = 10.1 cm, gap width between guarded electrode and guard ring = 0.051 cm, spring loaded Af plunger in contact with the guarded electrode secured specimens between electrodes, General Radio Co. Type 1610-A capacitance-measuring assembly, tested in vacuum and air; irrad in Ground Test Reactor at Nuclear Aerospace Research Facility, Fort Worth.



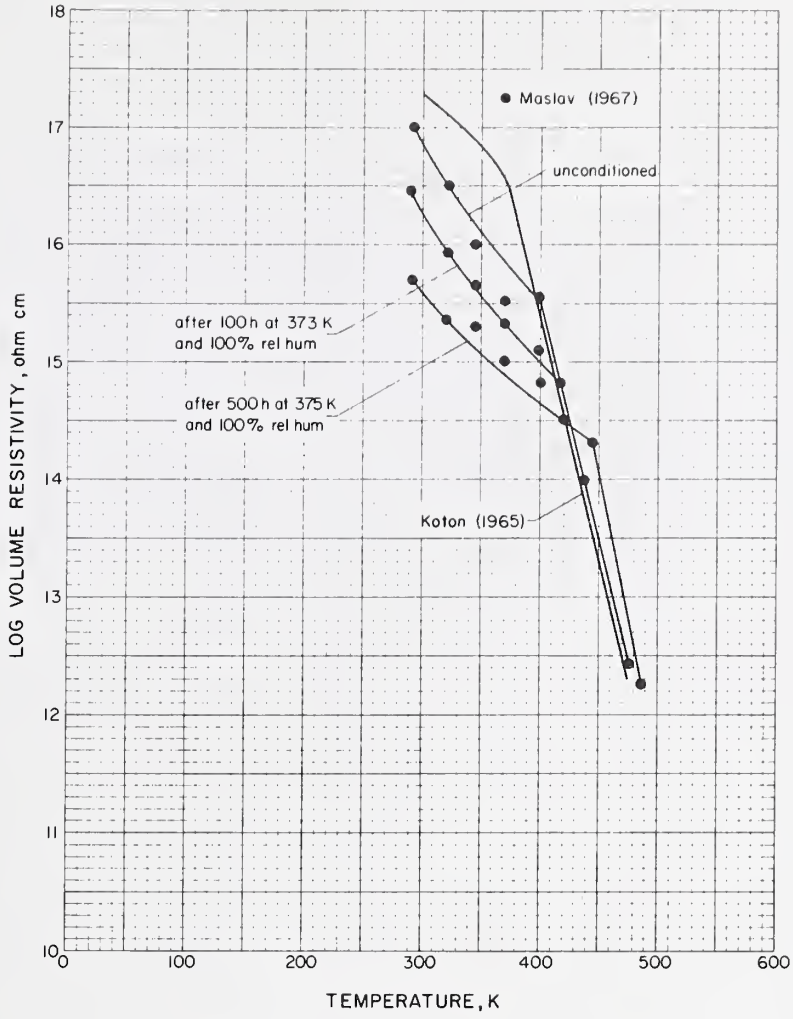
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
McMillan, Gause, Kerlin, Warwick (1967)	Lexan	Diam = 11.4 cm, t = 0.25-0.0.38 cm; ASTM D 257-61 test procedure, unguarded electrode and guard ring diam = 11.4 cm, guarded electrode diam = 10.1 cm, gap width = 0.051 cm, Al electrodes; reactor irrad to about 10^8 rad and 10^{15} fast neutrons cm^{-2}; av of 2 specimens.
Thompson, Goldblum (1958)	Lexan, sp gr = 1.20	
Hofmeier (1959)	Makrofol N	
Losev, Smirnova, Smyrovz (1962)	Film obtained by evaporation from a 15-20% solution of polycarbonate in methylene chloride, molecular weight = 25,000	Av of 3 tests.
Smirnova, Khasan, Losev, Kolesnikov (1965)	DOMP is based on 2,2-di-(4-hydroxy-3-methylphenyl) propane, molecular weight = 53,000; DOMC is based on 1,1-di-(4-hydroxy-3-methylphenyl) cyclohexane, molecular weight = 50,000	

PC

Resistivity



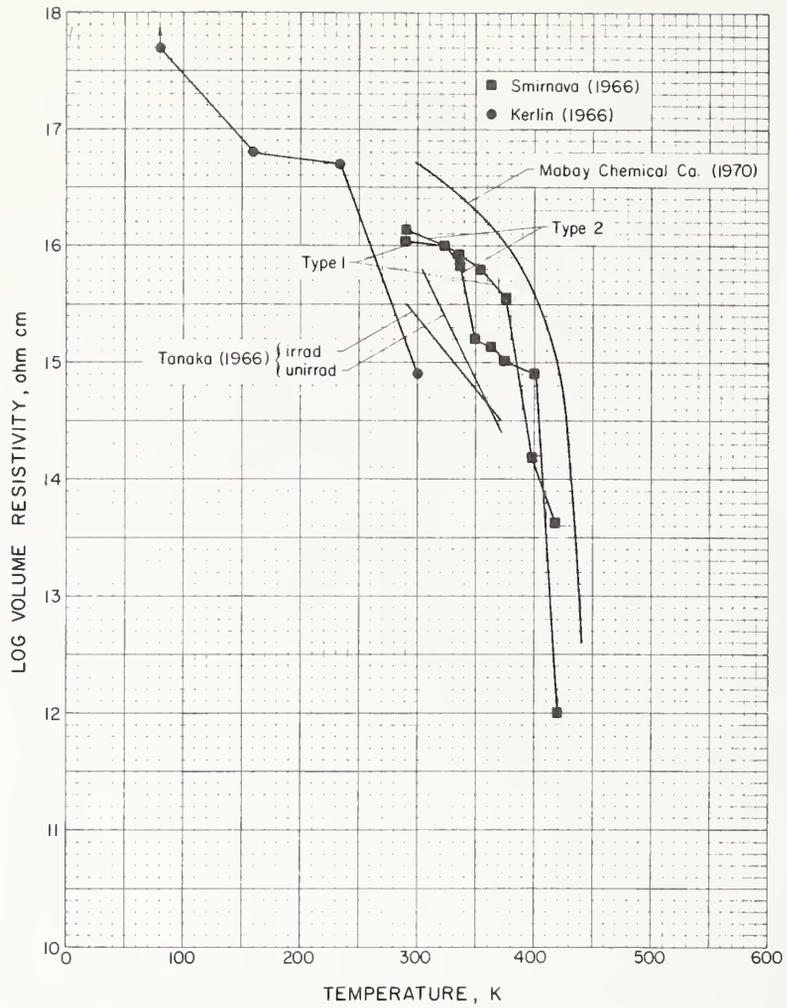
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Sazhin, Eidelnant (1962)	Formed by pressure, low crys, annealed at 483 K for 2 h	0.2 - 2 x 10^3 V cm^{-1}, time between application of electric field and measurement indicated.



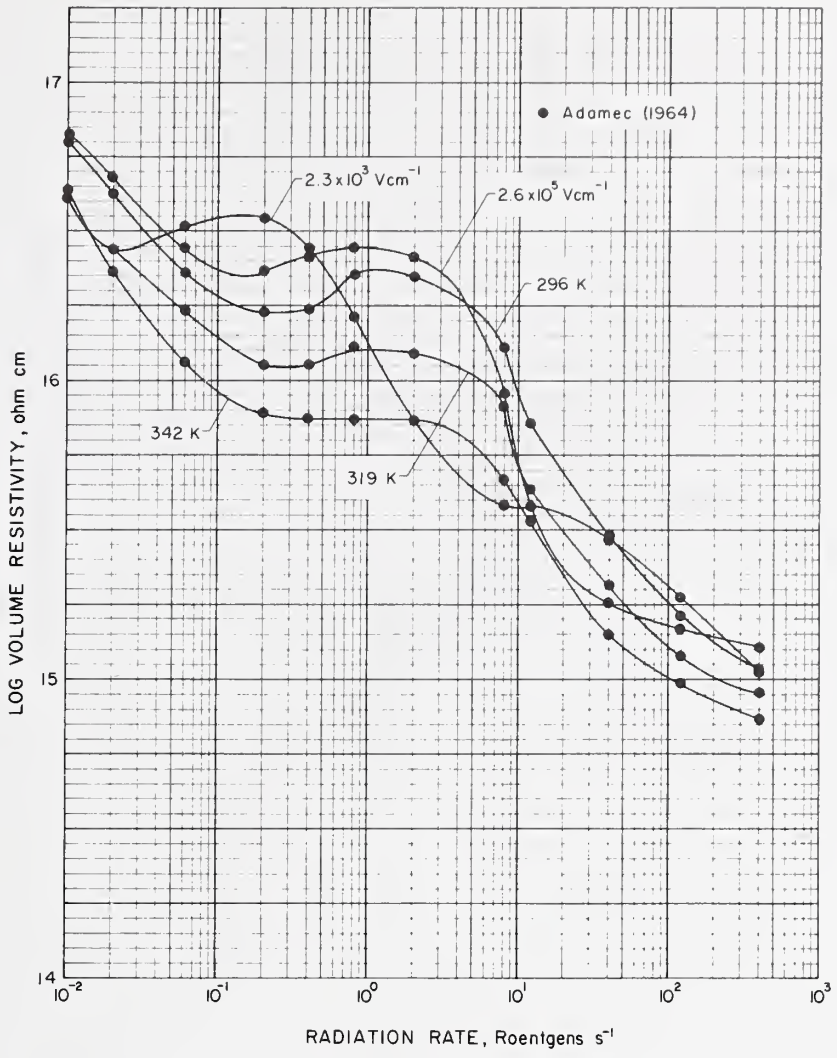
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Maslov (1967)		Conditioned as noted.
Koton, Yakovlev, Rudakov, Knyazeva, Florinskii, Bessonov, Kuleva, Tolparova Laius (1965)		String electrometer, electrodes applied by vacuum deposition of Ag.

PC

Resistivity



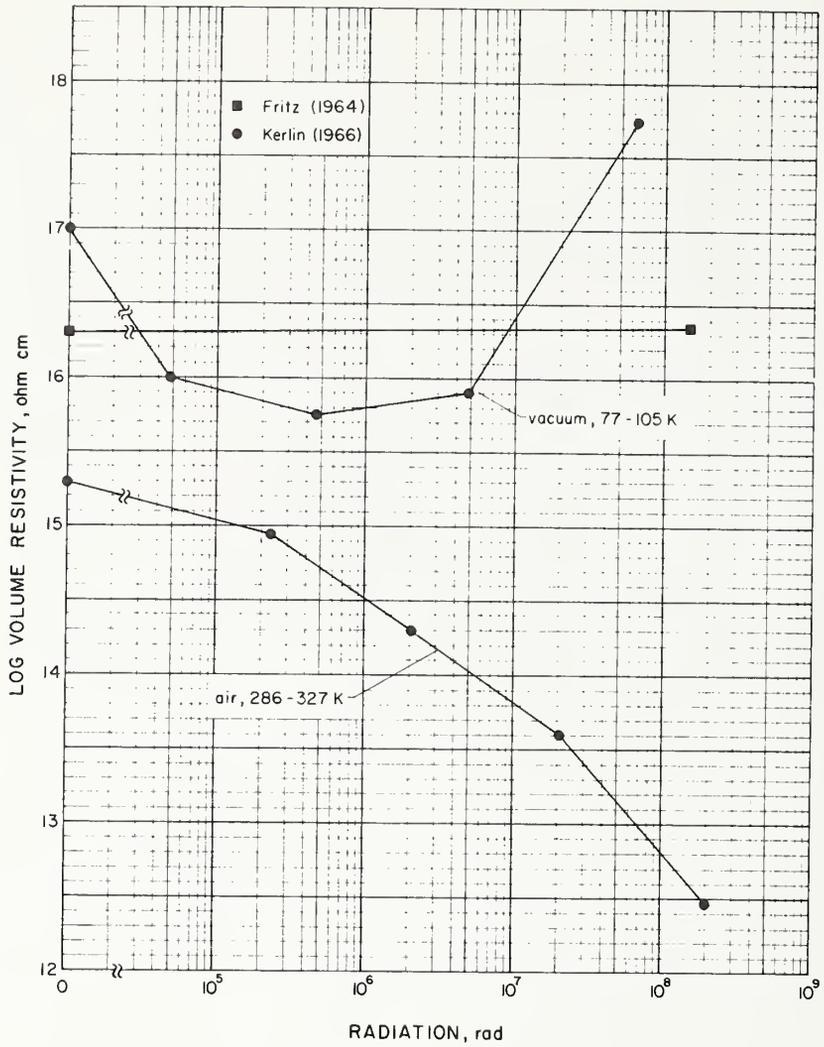
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mobay Chemical Co. (1970)	Merlon	
Tanaka, Inuishi (1966)	Macrohole KG, flux-cast, high crys	t = 0.004 cm; vapor-deposited Au electrodes 0.5 cm in diam, guard ring deposited on 1 side; electron-beam irrad in vacuum at intensities up to 10^7 rad.
Smirnova, Erofeeva (1967)	Type 1 is based on 2,2-bis-(3′-chloro-4′-hydroxy-phenyl)-propane; type 2 is based on 1,1-bis-(3′-chloro-4′-hydroxy-phenyl)-cyclohexane; av molecular weight for both = 25,000	10^6 Hz, rel hum = 84%.
Kerlin, Smith (1966)	Lexan	Test cells fabricated according to ASTM D 160 - 59T, unguarded electrodes and guard ring diam = 11.4 cm, guarded electrode diam = 10.1 cm, gap between guarded electrode and guard ring = 0.051 cm, spring loaded Aℓ plunger in contact with guarded electrode secured specimens between electrodes, Federal Telephone and Radio Co. Model FT-H4 Tera-Ohmmeter, tested in vacuum except for room temp test in air; arrow indicates "greater than".



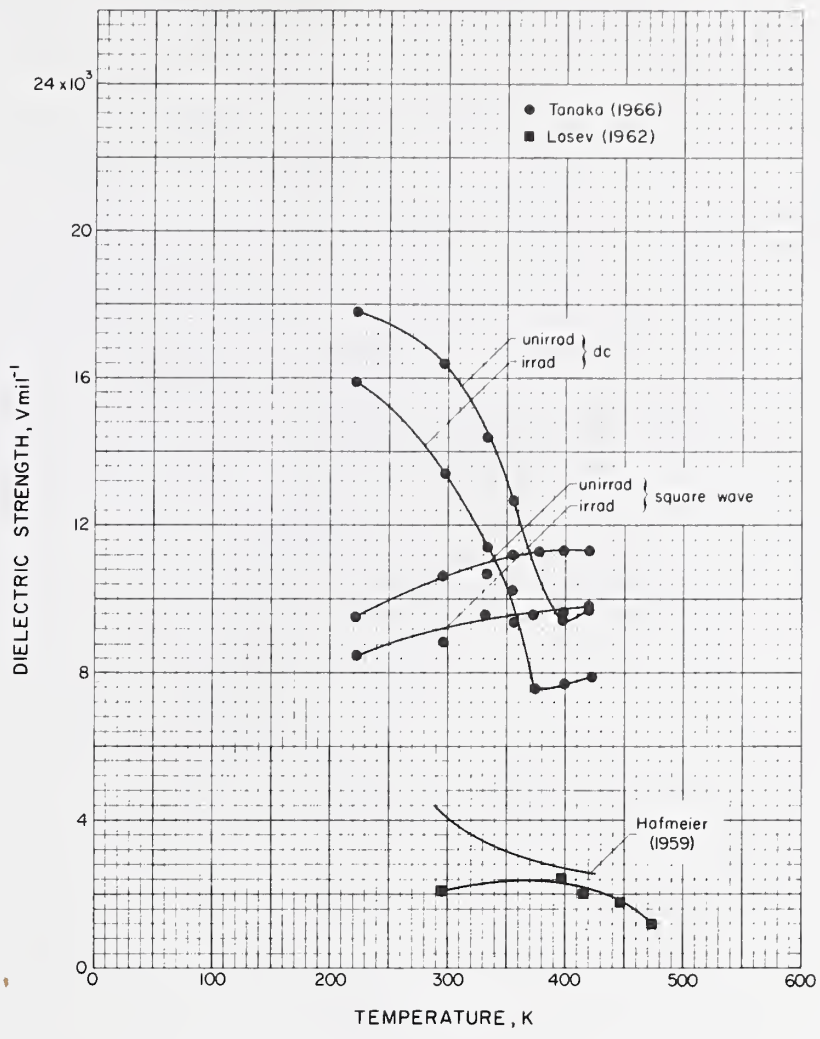
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Adamec (1964)	Commercial sheet	t = 4 - 6 x 10^{-3} cm, diam = 5.0 cm; 2.0 cm diam Al electrodes vacuum-deposited on specimens, 120 V battery used as voltage source, current measured with a vibrating reed electrometer, 294 K, 50 ± 5% rel hum; irrad with 15-38 KeV x-rays; these values were calculated from the induced-volume resistivity reported by the author.

PC

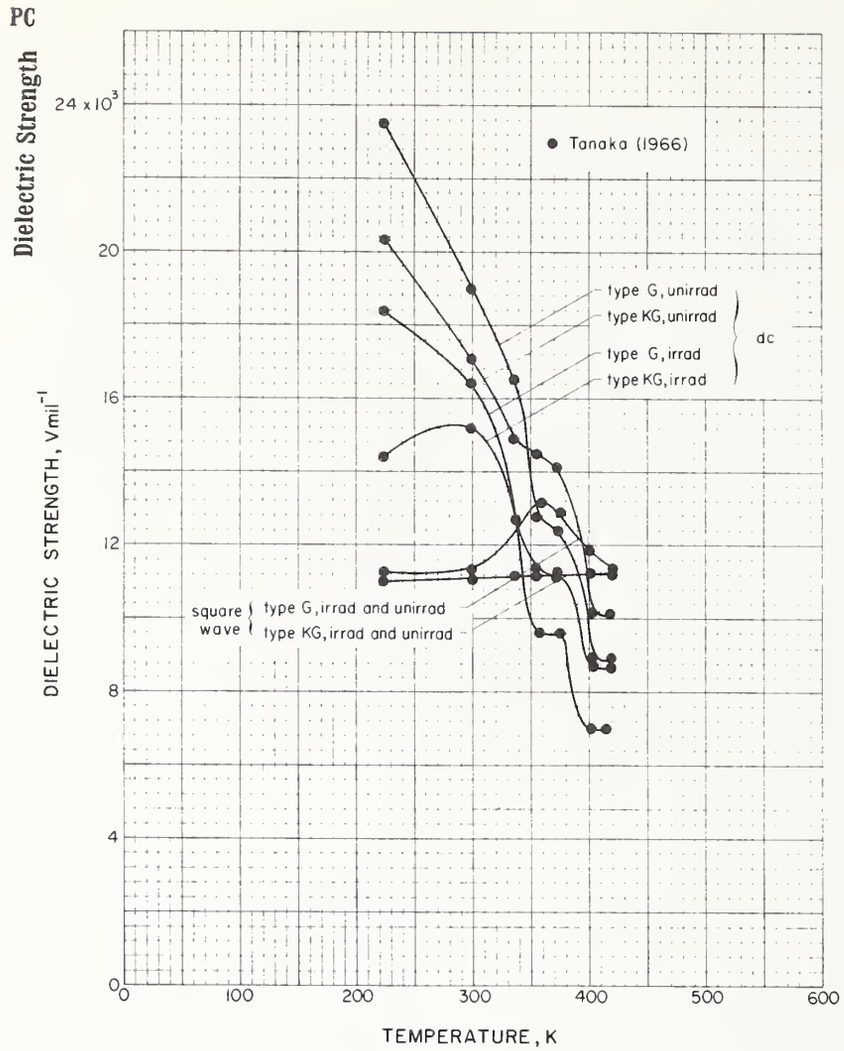
Resistivity



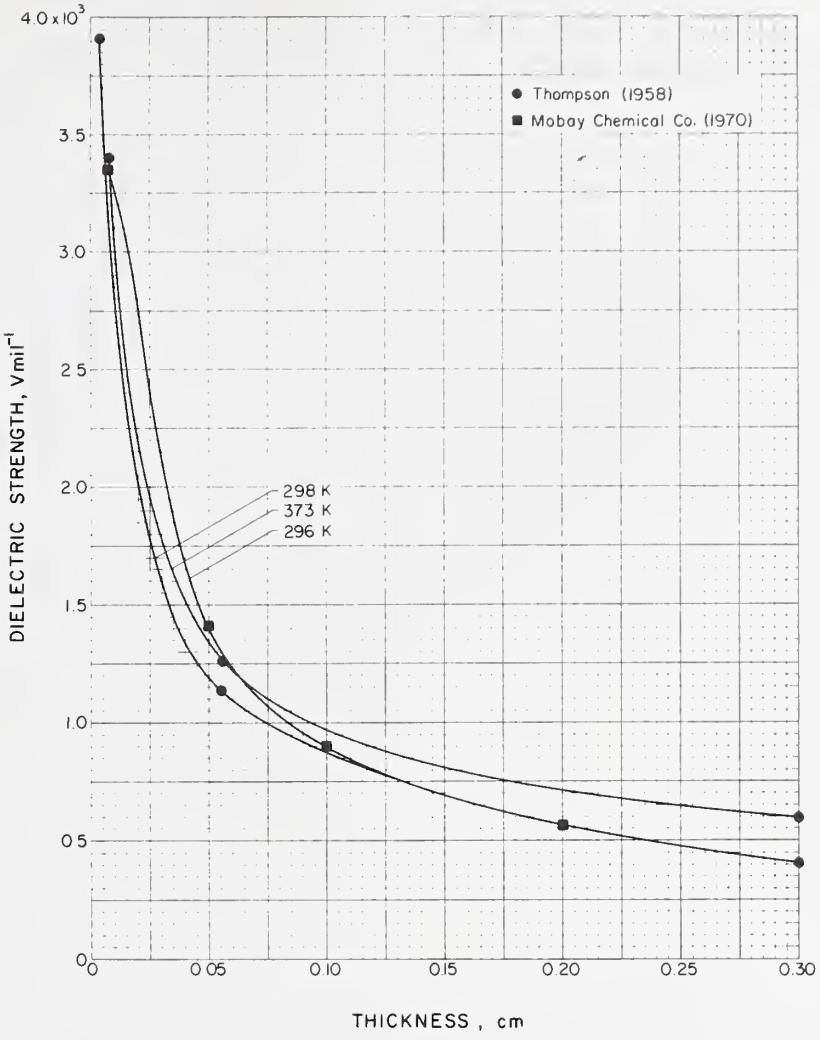
INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Fritz (1964)	Merlon, sp gr = 1.2	ℓ = 5.38 cm, w = 1.9 cm, t = 0.64 cm; Sensitive Research Instrument Corp. Model ESD electrostatic voltmeter, 298 K, 50% rel hum; reactor irrad while wrapped in Al foil.
Kerlin, Smith (1966)	Lexan	Test cells fabricated according to ASTM D 160 - 59T, unguarded electrodes and guard ring diam = 11.4 cm, guarded electrode diam = 10.1 cm, gap between guarded electrode and guard ring = 0.051 cm, spring loaded Al plunger in contact with guarded electrode secured specimens between electrodes, Federal Telephone and Radio Co. Model FT-H4 Tera-Ohmmeter, tested in air and vacuum; irrad in Ground Test Reactor at Nuclear Aerospace Research Facility, Fort Worth; arrow indicates "greater than".



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Tanaka, Inuishi (1966)	Panlite, thermal-case film, low crys	t = 0.004 cm; test conducted in a gap between a 1.5 cm diam ball and a flat plate electrode, measurements made with dc and 2 μs square-wave pulses; electron-beam irrad in vacuum at intensities up to 10^7 rad; av of 10 measurements.
Hofmeier (1959)	Makrofol N	
Losev, Smirnova, Smyrovz (1962)	Film obtained by evaporation from a 15-20% solution of polycarbonate in methylene chloride, molecular weight = 25,000	Av of 3 tests.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Tanaka, Inuishi (1966)	Makrofol, flux-cast film, type G medium crys, type KG high crys	t = 0.004 cm; test conducted in a gap between a 1.5 cm diam ball and a flat plate electrode, measurements made with dc and 2 μs square-wave pulses; electron-beam irrad in vacuum at intensities up to 10^7 rad; av of 10 measurements.



INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Mobay Chemical Co. (1970)	Merlon	ASTM D-149, IEEE Method No. 4, and IEC No. 60 test procedures, 1000 V s^{-1} rate of rise, specimens under transformer oil, 296 K.
Thompson, Goldblum (1958)	Lexan, sp gr = 1.20	ASTM D 149 test procedure.

Investigator(s) (year)	Description	Temperature (K)	ρ Volume Resistivity (Ω-cm)	Tan δ Dielectric Loss Factor	ε Dielectric Constant	D. S. Dielectric Strength (V mil^{-1})
Schnell (1956)	Type 1	298		10×10^{-4}	2.6	
	2			4.5×10^{-4}	3.1	
	3			30×10^{-4}	2.6	
	4			4.9×10^{-4}	2.9	
	5			5.2×10^{-4}	3.3	
	6			5.2×10^{-4}	2.3	
Hechelhammer (1959)	Film	298				> 2540
	Disc					
	dry		4×10^{15}			
	80% rel hum for 4 days		9×10^{14}			
Hauck (1963)	Cast film	298	10^{15}			1500
	Molding grade					400
	dry		1.7×10^{17}			
	80% rel hum for 4 days		9×10^{14}			
Jackson, Jr. (1963)	Type 1	296	10^{18}			4500
	3		2×10^{17}			4000
	4		2×10^{17}			2900
	5		10^{17}			3000
	10		6×10^{18}			2600

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Schnell (1956)	Film, type 1 is based on 4,4′-dioxydiphenyl-2,2-propane, melting temp = 422 K; type 2 is based on 4,4′-dioxydiphenyl-2,2-butane, melting temp = 411 K; type 3 is based on 4,4′-dioxydiphenyl-1,1-cyclohexane, melting temp = 444 K; type 4 is based on 4,4′-dioxydiphenyl-1,1-ethane, melting temp = 403 K; type 5 is based on 4,4′-dioxy-diphenyl-1,1-butane, melting temp = 396 K; type 6 is based on 4,4′-dioxy-diphenyl-1,1-isobutane, melting temp = 422 K	10^3 Hz.
Hechelhammer, Peilstöcker (1959)	Makrolon, sp gr = 1.20	ρ: diam = 8.0 cm, t = 0.2 cm, DIN 53482 test procedure. D. S. : film, t = 0.005 cm; DIN 53481 test procedure.
Hauck (1963)	Cast film and molding grade	ρ: ASTM D 257 test procedure. D. S. : disc, t = 0.32 cm; film, t = 0.01 cm; ASTM D 149 test procedure, step-by-step method for film, step-by-step and short-time methods for molding grade.
Jackson, Jr., Caldwell (1963)	Type 1 is based on 4,4′-(2-norbornylidene) diphenol; type 3 is based on 4,4′-(2-norbornylidene) bis (2-chlorophenol); type 4 is based on 4,4′-(2-norbornylidene) bis (2,6-dichlorophenol); type 5 is based on 4,4′-(2-norbornylidene) bis (2,6-dibromophenol); type 10 is based on 4,4′-(hexahydro-4,7-methanoidan-5-ylidene) diphenol	

Investigator(s) (year)	Description	Temperature (K)	ρ Volume Resistivity (Ω-cm)	Tan δ Dielectric Loss Factor	ε Dielectric Constant	D.S Dielectric Strength (V mil^{-1})
Kudrna (1963)	Bisphenol-A, sp gr = 1.2	298	10^{17}	10^{-4}	3.0	
	dry					3050
	in water 24h					2920
Fritz (1964)	Merlon	298		12×10^{-4}		
Polycarbonates Begin Assault on Market (1964)	Merlon, sp gr = 1.20	298	9×10^{15}			
	step-by-step					370
	short-time					440
Smirnova (1965)	DOMP	298	3.7×10^{16}	39×10^{-4}		
	DOMC		2.2×10^{16}	29×10^{-4}		
Kerlin (1966)	Lexan					
	unirrad	297	6×10^{15}	12×10^{-4}	3.00	
	after 1.7×10^{7} rad					
	in vacuum	154	2×10^{15}	164×10^{-4}	2.92	
	after 1.4×10^{8} rad					
	in air	325	6×10^{10}	930×10^{-4}	3.07	
Maslov (1967)		293	1.6×10^{17}			
Smirnova (1967)	Type 1	293	1.1×10^{16}	34×10^{-4}	2.80	1980
	2		1.5×10^{16}	20×10^{-4}	2.40	2190
	3		1.5×10^{16}	30×10^{-4}	3.00	

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION, EXPERIMENTAL CONDITIONS
Kudrna (1963)	Bisphenol-A polycarbonate, sp gr = 1.2	ρ: DIN 53482 test procedure. Tan δ: DIN 53483 test procedure at 50 Hz. ε: VDE 0303/4 test procedure at 50 Hz. D.S.: DIN 53481 test procedure at 50 Hz and 500 V s^{-1} increase.
Fritz (1964)	Merlon	60 Hz.
Polycarbonates Begin Assault on Market (1964)	Merlon, sp gr = 1.20	
Smirnova, Khasan, Losev, Kolesnikov (1965)	DOMP is based on 2,2-di-(4-hydroxy-3-methylphenyl) propane, molecular weight = 53,000; DOMC is based on 1,1-di-(4-hydroxy-3-methyphenyl) cyclohexane, molecular weight = 50,000	Films cast from methylene chloride, air dried and then heated at 383 K for 1-2 h, D.S. specimens as follows: t = 0.0051 cm for types 1 and 3, t = 0.0061 cm for type 4, t = 0.0046 cm for type 5, and t = 0.0071 cm for type 10.
Kerlin (1966)	Lexan	Test cells fabricated according to ASTM D 160-59T, unguarded electrode and guard ring diam = 11.4 cm, guarded electrode diam = 10.1 cm, gap width between guarded electrode and guard ring = 0.051 cm, spring loaded Al plunger in contact with the guarded electrode secured specimens between electrodes, Federal Telephone and Radio Co. Model FT-H4 Tera-Ohmmeter and General Radio Co. Type 1610-A capacitance-measuring assembly; measurements made during irradiation in Ground Test Reactor at the Nuclear Aerospace Research Facility, Fort Worth.
Maslov (1967)		
Smirnova, Erofeeva (1967)	Type 1 is based on 2,2-bis (3′-chloro-4′-hydroxyphenyl)-propane; type 2 is based on 1,1-bis-(3′-chloro-4′-hydroxyphenyl)-cyclohexane; type 3 is based on 2,2-bis-(4′-hydroxyphenyl)-propane; av molecular weight = 25,000	Rel hum = 84%, 10^{6} Hz.

Investigator(s) (year)	Description	Temperature (K)	ρ Volume Resistivity (Ω-cm)	Tan δ Dielectric Loss Factor	ε Dielectric Constant	D.S. Dielectric Strength (V mil^{-1})
Streib (1968)	Makrolon 3000	296	10^{15}-10^{16}			890
General Electric (1970)	Lexan 500	296	3×10^{16}			450
Mathes (1964)	10^{3} Hz	296			3.04	

INVESTIGATOR(S) (year)	MATERIAL IDENTIFICATION	SPECIMEN DESCRIPTION , EXPERIMENTAL CONDITIONS
Streib (1968)	Makrolon 3000	ρ: 50% rel hum, ASTM D257 test procedure. D.S. : t ≃ 0.1 cm; DIN 53481/3.222 test procedure, value remained the same for dry specimen and specimen immersed in water for 24 h.
General Electric (1970)	Lexan 500	D.S. : t = 0.32 cm; ASTM D 149 test procedure, short-time and step-by-step methods.
Mathes (1964)		

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This compilation abstracts original experimental data on the mechanical, thermal, and electrical properties of six commercially available polymers. After an extensive review of the open literature, all available data were collected together in graphical and tabular form along with material characterization, experimental method, and reference to the original publication. The data are also summarized and a brief description of each polymer is included.

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