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Equilibrium Critical Phenomena In Fluids and Mixtures: A Comprehensive Bibliography With Key-Word Descriptors

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**Equilibrium Critical Phenomena
In Fluids and Mixtures:
A Comprehensive Bibliography With Key-Word Descriptors**

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Equilibrium Critical Phenomena in Fluids and Mixtures:

A Comprehensive Bibliography with Key-Word Descriptors

Stella Michaels*, Melville S. Green*, and Sigurd Y. Larsen*

This bibliography of 1088 citations comprehensively covers relevant research conducted throughout the world between January 1, 1950 through December 31, 1967. Each entry is characterized by specific key word descriptors, of which there are approximately 1500, and is indexed both by subject and by author. In the case of foreign language publications, effort was made to find translations which are also cited.

Key words: Binary liquid mixtures; critical opalescence; critical phenomena; critical point; critical region; equilibrium critical phenomena; gases; liquid-vapor systems; liquids; phase transitions; ternary liquid mixtures; thermodynamics

1. Introduction

This bibliographical project was begun as an experiment in connection with the renewed research interest in the rather old subject of critical phenomena. Ever since its discovery in carbon dioxide by Thomas Andrews (1863)*, the phenomena in the neighborhood of the critical point of liquid-vapor transition and other analogous phenomena have given rise to numerous experimental investigations of greater or lesser permanent value.

The motivation of the project was to search out this vast literature in order that those papers of more than ephemeral interest would be available to the scientific community. Originally, the bibliography was intended to include the general field of second-order phase transitions as well as critical phenomena in the stricter sense and was to be divided into two parts - an historical part covering the period prior to 1950, and a modern part covering 1950 onward. It was quickly decided to defer the historical part and to limit the present bibliography to critical phenomena in a stricter sense.

The bibliography is intended to include all studies of equilibrium properties of the critical point of liquid-vapor systems and of binary and ternary liquid mixtures. Excluded

* At the time of compilation of this material, Mrs. Michaels was a member of the Bibliography and Translation Unit, National Bureau of Standards Library; Dr. Green was Chief, Statistical Physics Section, Heat Division, Institute for Basic Standards; and Dr. Larsen was a member of the Statistical Physics Section, Heat Division. The present address for Mrs. Michaels is the Center for Computer Sciences and Technology, National Bureau of Standards, Washington, D.C. 20234, and for Dr. Green and Dr. Larsen, Temple University, Philadelphia, Pennsylvania 19122.

were general studies which included the critical region but did not make a special study of it, simple measurement of critical constants, and compilations of data. The time period covered is from January 1, 1950 through December 31, 1967. Studies published in all major scientific languages except Chinese, in which adequate sources of information were available to us, were surveyed.

Each paper was analyzed and was associated with a number of key word descriptors with a primary division as to type of research, i.e., experimental, theoretical, or analytical being made first. Another primary categorization was made according to the type of system, namely, liquid-vapor and binary or ternary liquid mixtures. Other descriptors included property measured, theoretical method used, and the chemical name of the substance measured. Approximately 1500 distinct descriptors were used to describe the papers. Each paper is characterized by roughly seven to ten descriptors. A subject index is also included through which all papers described by a given key word can be identified.

All entries are cited in English. In the case of foreign language papers, the original language is noted in brackets. Whenever possible, translations of foreign language documents are also cited.

Authors' names appear in the citations as they were published in the original paper - initials in one case - full name in the next. But, all authors' names have been standardized in the author index.

In order to assure comprehensive coverage, not only were the major abstracting services used, but also systematic searches of selected publications were made. Listings of both appear elsewhere in this manuscript. The standard for abbreviations was that of the American Chemical Society and a list of these abbreviations is provided.

Here we take the opportunity to thank those individuals who were so helpful to us during the compilation of this bibliography. Miss Sarah Anne Jones, retired Chief of the Bureau Library in which large portions of our studies were made; Mr. William Sartain, Chief, Stack and Reader Division, Library of Congress, who made that vast and valuable collection accessible to us; Dr. Raymond Mountain, Chief, Statistical Physics Section, NBS, for his generous assistance; Mrs. Patricia Jacobs and Miss Nancye E. McBryde who typed the manuscript; and Miss Stella Gross who willingly handled the difficult task of putting the subject index together.

*For details on Andrews' experiments see Miller's Chemical Physics, 1863, third edition and also Philosophical Transactions of the Royal Society, Vol. 159, Part II, (1869) pp. 575-590. For claims that the phenomena were discovered by D.I. Mendeléeff prior to 1863, see Annalen der Physik, 217, (1870) 618-626.

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Experimental; liquid-vapor; argon; methane;
carbon tetrafluoride; Clausius-Mossotti
relation; Lorentz-Lorenz function; index of
refraction; critical point; critical temperature
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Treatment of liquid-liquid phase equilibria. Hydrocarbon-perfluorocarbon mixtures.
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Experimental; hexane-perfluorohexane; n-heptane-
perfluoro-n-heptane; methylcyclohexane-perfluoro-
methylcyclohexane; binary liquid mixtures; critical
solution temperature, upper; methane-carbon
tetrafluoride
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Theoretical; statistical mechanics; phase
transition; liquid-gas; critical point;
logarithmic singularity
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Singularity of specific heat in the second order phase transition.
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Theoretical; statistical mechanics; phase
transition; logarithmic singularity; canonical
partition function; Yang-Lee theory; heat
capacity, C_v ; critical point
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vaporization; entropy; critical point
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J. Chem. Phys. 38, 2740-2 (1963).

Analytical; critical constants; gaseous mixtures;
ethane-nitrogen; methane-ethane; methane-heptane;
propane-benzene; ethane-propane; methane-decane;
carbon dioxide-sulfur dioxide; equation of state

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Efficiency of equations of state for gaseous mixtures at the critical locus.
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Analytical; equation of state; critical region
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Observations of time-dependent density fluctuations in carbon dioxide near the critical point using an He-Ne laser.
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Time-dependent concentration fluctuations near the critical temperature.
Critical Phenomena. Proc. Conf., Washington, D. C., April 1965. Natl. Bur. Std. Misc. Publ. 273, 157-60 (1966).
Experimental; binary liquid mixtures; aniline-cyclohexane; critical temperature; concentration fluctuations; light scattering; lasers

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Analytical; critical temperature; liquid-vapor; corresponding states

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The critical temperatures of forty organic compounds.

Trans. Faraday Soc. 56, 1452-9 (1960).

Experimental; critical temperature; n-pentane; 2-methylbutane; n-hexane; 2-methylpentane; 2,2-dimethylbutane; 2,3-dimethylbutane; n-heptane; 2-methylhexane; n-octane; 2-methylheptane; 2,2,4-trimethylpentane; n-nonane; n-decane; cis-butene-2 trans-butene-2; pentene-1; hexene-1; methylcyclopentane; methylcyclohexene; benzene; toluene; ethylbenzene; n-propylbenzene; 1,2,3-trimethylbenzene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; isobutylbenzene; fluorobenzene; naphthalene; 2,5-lutidine; 3,5-lutidine; n-undecane; n-dodecane; heptene-1; octene-1; cyclohexene; n-butylbenzene; 1-methylnaphthalene; 2,3-lutidine, 3,4-lutidine

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Phase transitions of the second kind and critical phenomena. V. Maximum specific heat on the critical layer formation of two-component liquid systems. [Russian]. Zh. Fiz. Khim. 30, 1158-61 (1956).

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Experimental; liquid-vapor; ethanol; critical point; heat capacity, C_v ; van der Waals equation of state

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Experimental; liquid-vapor; water; heat capacity, C_v ; critical isobar; critical point
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Experimental; binary liquid mixtures; cyclohexane-aniline; "flat top" coexistence curve; critical concentration; critical opalescence; critical region

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Theoretical; liquid-vapor; argon; oxygen; logarithmic singularity; heat capacity, C_v free energy; critical point

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Analytical; REVIEW; thermodynamics; critical
phenomena; liquid-vapor; benzene; carbon dioxide;
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coexistence curve; REVIEW
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of state; REVIEW
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equation of state; vapor pressure; critical
volume
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Analytical; gravity effect; critical phenomenon;
liquid-vapor; compressibility; density; critical
isotherm; coexistence curve
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Planks equation; high pressure; carbon dioxide;
xenon; methane; critical point

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Behavior of the specific heat C_v and of the entropy at the critical point of water.
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Theoretical; phase transition

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temperature

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cyclohexane; ethane-benzene; methane-n-butane;
methane-propane; propane-n-butane; propane-n-
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propane-n-butane; propane-n-pentane; n-butane-n-pentane;
n-butane-n-heptane; n-butane-n-decane; n-pentane-n-
hexane; n-pentane-n-heptane; methane-isobutane; methane-
isopentane; propane-isopentane; n-pentane-neopentane; n-
hexane-neopentane; methane-ethylene; ethane-propylene;
propane-butene-1; n-butane-ethylene; n-heptane-ethylene;
propane-acetylene; methane-cyclohexane; ethane-cyclo-
hexane; n-pentane-cyclohexane; n-hexane-cyclohexane

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mixture; azeotropes; critical region; n-heptane-
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heptane; liquid-vapor; ethane-perfluoro-n-
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phenylmethane; sulfur-cis-decaline; sulfur-trans-
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hexane; neopentane-cyclohexane; neopentane-benzene;
neopentane-toluene; n-hexane-cyclohexane; n-hexane-
benzene; n-hexane-toluene; cyclohexane-benzene;
cyclohexane-toluene; benzene-toluene; gas-liquid;
critical point; critical temperature; second-virial
coefficient
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singularity
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theory; equation of state; critical constants
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methane; ethane; propane; critical temperature
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equation of state; liquid-vapor; argon; critical
point

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Theoretical; thermodynamics; phase transition; critical point

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Theoretical; theory of conformal solutions;
Lennard-Jones-Devonshire cell model; critical
solution temperature, upper, lower; binary
liquid mixtures

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mixtures; conformal solution; critical phenomena;
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isobutyric acid-water; phenol-water; phenol-heptane;
methanol-cyclohexane; methanol-hexane;
nitrobenzene-isopentane; aniline-cyclohexane;
triethylamine-water; methanol-carbon disulfide;
critical opalescence; Rayleigh's law

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potential; equation of state; critical constants;
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methane; ethane
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point
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equation; Berthelot equation; Dieterici equation;
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oxygen; carbon monoxide; methane; vapor pressure
heat of vaporization; critical point

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condensation; critical point vs. critical region;
Mayer theory; surface tension; "flat top" coexistence
curve; "derby hat" coexistence curve; critical
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temperature; impurities
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Guldberg ratio

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Analytical; theory of corresponding states;
vapor pressure; critical temperature; helium;
hydrogen; neon; argon
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acetate; quinoline
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critical temperature; corresponding states
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density; vapor pressure; phosphorous trihydride;
sulfur dioxide; methane; propylene
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states

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coexistence curve
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critical solution temperature; miscibility
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sound absorption; heat capacity, C_v
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states; equation of state
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critical region; critical temperature; dielectric
constant; dipole polarization
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dielectric constants; critical point; dipole
polarization; sulfur dioxide; water; hydrochloric acid
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mixtures; ternary liquid mixtures; distribution
function critical point; statistical mechanics
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functions; phase transition; critical temperature
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curves; impurities; critical phenomena

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Theoretical; equation of state; critical constants;
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point; liquid-vapor equilibrium
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n-butylcyclohexane; 1, 1-dimethylcyclohexane;
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diethylamine; light scattering; critical point
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critical point; gravity effect; "flat top"
coexistence curve
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pyridine-chloral hydrate-water;
critical solution temperature, upper; critical point
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solution temperature, upper
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critical solution temperature, lower; critical
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point
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critical solution temperature; methanol-heptane;
methanol-octane; methanol-nonane; azeotropes
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acetonitrile-i-heptane; acetonitrile-i-octane;
acetonitrile-n-nonane; acetonitrile-i-decane;
acetonitrile-i-undecane; critical temperature;
azeotropes
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acetic acid-n-undecane; acetic acid-n-dodecane;
impurities; critical solution temperature

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mixtures; critical solution temperature
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solution temperature, upper; azeotropes;
boiling temperature isobars
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retrograde condensation; miscibility

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hexamethylenimine-water; critical solution temperature,
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impurities; second-order phase transition;
critical point
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coexistence curve; critical region
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compressibility; chemical potential;
statistical mechanics; thermodynamics
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critical point; critical phenomena.
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critical point; fluctuations

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Theoretical; radial distribution function;
Lennard-Jones potential; equation of state;
critical point; critical isotherm; critical
constants; liquid-vapor; isothermal compressibility

3. Bibliographic References

ABSTRACTS

- | | |
|--|---|
| Bulletin Signalétique. Physique I (random issues) | Referativnyi Zhurnal: Fizika, SSSR (April 1960 - 1966) |
| Chemical Abstracts (1950 - 1966) | Referativnyi Zhurnal: Khimiia, SSSR (1960 - 1963) |
| Dissertation Abstracts (1952 - 1964) | Science Abstracts. Section A: Physics Abstracts (1950 - April 1968) |
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SELECTED PUBLICATIONS

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| Annals of Physics (1957 - 1967) | Physics (1966 - 1967) |
| Annual Reports on the Progress of Chemistry (London) (1950 - 1962) | Physics Letters (Amsterdam) (1966 - 1967) |
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| International Journal of Heat and Mass Transfer (1959 - March 1967) | Ukrainskii Fizichnii Zhurnal (1956 - 1967) |
| Journal de Chimie Physique (1950 - 1965) | Zeitschrift für physikalische Chemie (1950 - 1965) |
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| Journal of Mathematical Physics (1966 - 1967) | Zhurnal Eksperimental'noi i Teoreticheskoi, SSSR (1955 - 1963, 1966 - 1967) |
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| Mathematical Reviews (1951 - April 1968) | |
| Molecular Physics (1966 - 1967) | |
| Physica (1963 - 1964) | |

4. Abbreviations

-A-

Acta Chem. Scand.	Acta Chemica Scandinavica
Acustica (Intern.)	Acustica. International Journal on Acoustics
Advan. Chem. Phys.	Advances in Chemical Physics
Advan. Phys.	Advances in Physics
Akad. Wiss. Lit. (Mainz) Abhandl. Math. - Nat. Kl.	Akademie der Wissenschaften und der Literatur (Mainz), Abhandlungen der Mathematisch--Naturwissenschaftlichen Klasse
Allgem. Wärmtech.	Allgemeine Wärmetechnik
Am. Inst. Chem. Engrs. J.	American Institute of Chemical Engineers Journal
Am. J. Phys.	American Journal of Physics
Am. J. Sci.	American Journal of Science
Anal. Chem.	Analytical Chemistry
Anales Real Soc. Españ. Fis. Quím. (Madrid)	Anales de la Real Sociedad Española de Física y Química (Madrid)
Ann. Acad. Sci. Fennicae	Annales Academiae Scientiarum Fennicae
Ann. Phys. (N. Y.)	Annals of Physics (New York)
Ann. Rev. Phys. Chem.	Annual Review of Physical Chemistry
Appl. Sci. Res. Sec. A	Applied Scientific Research, Section A; Mechanics, Heat, Chemical Engineering, Mathematical Methods
Australian J. Chem.	Australian Journal of Chemistry

-B-

Bull. Acad. Polon. Sci.	Bulletin de l'Academie Polonaise des Sciences
Bull. Chem. Soc. Japan	Bulletin of the Chemical Society of Japan
Bull. Classe Sci., Acad. Roy. Belg.	Bulletin de la Classe des Sciences, Academie Royale de Belgique
Bull. Soc. Chem. Belges	Bulletin des Societes Chimiques Belges

-C-

Can. J. Chem.	Canadian Journal of Chemistry
Can. J. Chem. Eng.	Canadian Journal of Chemical Engineering
Can. J. Phys.	Canadian Journal of Physics
Chem. Eng. Progr.	Chemical Engineering Progress
Chem. Eng. Progr. Symp. Ser.	Chemical Engineering Progress, Symposium Series
Chem. Eng. Sci.	Chemical Engineering Science
Chem.-Ingr.-Tech.	Chemie-Ingenieur-Technik
Chem. Rev.	Chemical Reviews
Chem. Tech. (Berlin)	Chemische Technik, Die (Berlin)
Chem. Weekbald	Chemisch Weekbald
Comm.	Commission
Commun. Math. Phys.	Communications in Mathematical Physics (Germany)
Compt. Rend.	Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences
Conf.	Conference
Contemp. Phys.	Contemporary Physics

-D-

Discussions Faraday Soc.	Discussions of the Faraday Society
Dokl. Akad. Nauk Azerb. SSR	Doklady Akademii Nauk Azerbaidzhanskoi SSR
Dokl. Akad. Nauk SSSR	Doklady Akademii Nauk SSSR

-E-

Econ. Geol. and the Bull. Soc. Economic Geologists	Economic Geology and the Bulletin of the Society of Economic Geologists
Exptl.	Experimental

-F-

Forsch. Gebiete Ingenieurw.	Forschung auf dem Gebiete des Ingenieurwesens
Forschungsh. Ver. Deut. Ingr.	Forschungsheft. Verein Deutscher Ingenieure

-H-

Helv. Phys. Acta	Helvetica Physica Acta
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-I-

Ind. Eng. Chem.	Industrial and Engineering Chemistry
Intern.	International
Inzh -Fiz. Zh., Akad. Nauk Belorussk-SSR	Inzhenerno-Fizicheskii Zhurnal, Akademiya Nauk Belorusskoi SSR
Izv. Akad. Nauk Kaz. SSR., Ser. Energ.	Izvestiya Akademii Nauk Kazakhskoi SSR, Seriya Energeticheskaya
Izv. Sektora Fiz-Khim. Analiza, Inst. Obshch. Neorgan. Khim., Akad. Nauk SSSR	Izvestiya Sektora Fiziko-Khimicheskogo Analiza, Institut Obschei i Neorganicheskoi Khimii imeni N. S. Kurnakova, Akademiya Nauk SSSR
Izv. Vysshikh Uchebn. Zavedenii, Fiz.	Izvestiya Vysshikh Uchebnykh Zavedenii Fizika
Izv. Vysshikh Uchebn. Zavedenii, Khim. I Khim. Tekhnol.	Izvestiya Vysshikh Uchebnykh Zavedenii, Khimiya i Khimicheskaya Tekhnologiya
Izv. Vysshikh Uchebn. Zavedenii, Neft i Gaz.	Izvestiya Vysshikh Uchebnykh Zavedenii, Neft i Gaz

-J-

J. Am. Chem. Soc.	Journal of the American Chemical Society, The
J. Appl. Chem. (London)	Journal of Applied Chemistry (London)
J. Appl. Chem. USSR (English Transl.)	Journal of Applied Chemistry of the USSR (English Translation of Zhurnal Prikladnoi Khimii)
J. Chem. Educ.	Journal of Chemical Education
J. Chem. Eng. Data	Journal of Chemical and Engineering Data
J. Chem. Phys.	Journal of Chemical Physics, The
J. Chem. Soc.	Journal of the Chemical Society
J. Chim. Phys.	Journal de Chimie Physique et de Physicochimie Biologique
J. Colloid Sci.	Journal of Colloid Science
J. Franklin Inst.	Journal of the Franklin Institute
J. Gen. Chem. USSR (English Transl.)	Journal of General Chemistry of the USSR (English Translation of Zhurnal Obshchei Khimii)
J. Heat Transfer	Journal of Heat Transfer
J. Imp. Coll. Chem. Eng. Soc.	Journal of the Imperial College Chemical Engineering Society

-J-

J. Math. Phys.	Journal of Mathematical Physics
J. Nat. Sci. Math.	Journal of Natural Sciences and Mathematics, The
J. Phys. Chem.	Journal of Physical Chemistry, The
J. Phys. Colloid Chem.	Journal of Physics and Colloid Chemistry
J. Phys. Radium	Journal de Physique et le Radium, Le
J. Phys. Soc. Japan	Journal of the Physical Society of Japan
J. Polymer Sci.	Journal of Polymer Science
J. Res. Natl. Bur. Std.	Journal of Research of the National Bureau of Standards
J. Tech. Phys. (USSR)	Journal of Technical Physics (USSR)
J. Wash. Acad. Sci.	Journal of the Washington Academy of Sciences
Jena Rev.	Jena Review

-K-

Kriticheskie Yavleniya i Flyuktuatsii v Rastvorakh, Mosk. Gos. Univ., Tr. Soveshch.	Kriticheskie Yavleniya i Flyuktuatsii v Rastvorakh, Moskovskii Gosudarstvennyi Universitet im. M. V. Lomonosova, Trudy Soveshchaniya
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-L-

Lab.	Laboratory
LC	Library of Congress

-M-

Mat. Sb.	Mathematicheskii Sbornik
Materialy Ural'sk. Soveshch. po Spektroskopii, Ural'sk. Akad. Nauk SSSR	Materialy Ural'skogo Soveshchaniya po Spektroskopii, Ural'skii Filial Akademii Nauk SSSR, Sverdlovsk, 1958
Mekhanizm i Kinetika Kristallizatsii, Nauchn. Sov. Akad. Nauk Belorussk. SSR po Fiz. Tverd. Tela	Mekhanizm i Kinetika Kristallizatsii, Nauchnyi Sovet Akademii Nauk Belorusskoi SSR po Fizike Tverdogo Tela
Mem. Defense Acad. Math., Phys. Chem. Eng. (Yokosuka) Japan	Memoirs of the Defense Academy, Mathematics, Physics, Chemistry and Engineering (Yokosuka, Japan)
Mem. Fac. Eng., Kyushu Univ.	Memoirs of the Faculty of Engineering, Kyushu Imperial University
Mol. Phys.	Molecular Physics

NLL	-N- National Lending Library Boston Spa, England
Natl. Bur. Std. Misc. Publ.	National Bureau of Standards (U. S.) Miscellaneous Publication
Nauchn. Ezhegodnik. Chernovitsk. Univ.	Nauchnyi Ezhegodnik Chernovitskogo Universiteta
Ned. Tijdschr. Natuurk.	Nederlands Tijdschrift voor Natuurkunde
..	-O- ..
Osterr. Chemiker-Ztg.	Österreichische Chemiker-Zeitung
Opt. Spectry. (USSR) (English Transl.)	Optics and Spectroscopy (USSR) (English Translation)
Opt. i Spektroskopiya	Optika i Spektroskopiya
OTS	Office of Technical Sciences, U. S., Department of Commerce
	-P-
Pakistan J. Sci. Res.	Pakistan Journal of Scientific Research
Phil. Mag.	Philosophical Magazine, The
Phil. Trans. Roy. Soc. London, Ser. A	Philosophical Transactions of the Royal Society of London, Series A: Mathematical and Physical Sciences
Phys. Fluids	Physics of Fluids
Phys. Letters	Physics Letters
Phys. Rev.	Physical Review, The
Phys. Rev. Letters	Physical Review Letters
Pribery i Tekhn. Eksperim.	Pribery i Tekhnika Eksperimenta
Primenenie Ul'traakustiki k Issled. Veshchestva.	Primenenie Ul'traakustiki k Issledovaniyu Veshchestva
Proc.	Proceedings
Proc. Acad. Sci. USSR, Phys. Chem. Sec.	Proceedings of the Academy of Sciences of the USSR, Physical Chemistry Section
Proc. Natl. Acad. Sci. U. S.	Proceedings of the National Academy of Sciences of the United States of America
Proc. Phys. Soc. (London)	Proceedings of the Physical Society (London)
Proc. Roy. Soc. Edinburgh, Sec. A	Proceedings of the Royal Society of Edinburgh, Section A: Mathematics and Physical Sciences

[continued]

-P-

Proc. Roy. Soc. (London) Ser. A

Proceedings of the Royal Society (London)
Series A: Mathematical and Physical
Sciences

Progr. Theor. Phys. (Kyoto)

Progress of Theoretical Physics (Kyoto)

Pure Appl. Chem.

Pure and Applied Chemistry

-R-

Rec. Trav. Chim.

Recueil des Travaux Chimiques

Rend. Scuola Intern. Fis. "Enrico Fermi"

Rendiconti della Scuola Internazionale de
Fisica "Enrico Fermi"

Rept.

Report, reports

Rept. Progr. Phys.

Reports on Progress in Physics

Rev. Mod. Phys.

Reviews of Modern Physics

Rev. Phys. (Bucharest)

Revue de Physique, Academie de la Republique
Populaire Romaine

Ric. Sci.

La Ricerca Scientifica

Roczniki Chem.

Roczniki Chemii

Russ. J. Phys. Chem.

Russian Journal of Physical Chemistry

-S-

SLA

Special Libraries Association

Sov. Phys. - Dokl.

Soviet Physics-Doklady

Soviet Phys. - JETP

Soviet Physics - JETP

Stroenie i Fiz. Svoistva Veshchestva v
Zhdkom Sostoyan'ii, Min. Vysshego i
Srednego Spets. Obrazov. Ukr. SSR,
Kievsk. Gos. Univ., Materialy 4-
go Soveshch.

Stroenie i Fizicheskie Svoistva Veshchestva v
Zhdkom Sostoyanii, Ministerstvo
Vysshego i Srednego Spetsial'nogo
Obrazovaniya Ukrainskoi SSR, Kievskii
Gosudarstvennyi Universitet im T. G.
Shevchenko, Materialy 4-go Soveshchaniya

Symp.

Symposium

-T-

Teploenerg.	Teploenergetika
Teplofiz. Vysokikh Temperatur, Akad. Nauk SSSR	Teplofizika Vysokikh Temperatur, Akademiya Nauk SSSR
Termodinam. i Stroenie Rastvorov. Akad. Nauk SSSR. Otd. Khim. Nauk i Khim. Fak., Mosk. Gos. Univ., Tr. Soveshch.	Termodinamika i Stroenie Rastvorov, Akademiya Nauk SSSR, Otdelenie Khimicheskikh Nauk i Khimicheskii Fakul'tet, Moskovskii Gosudarstvennii Universitet, Trudy Soveshchaniya
Theor.	Theoretical
Tr. Gos. Inst. Prikl. Khim.	Trudy, Gosudarstvennyi Institut Prikladnoi Khim
Tr. Moskov. Energet. Inst.	Trudy, Moskovskogo Energeticheskogo Instituta
Tr., Vses. Nauchno-Issled. Inst. Kislородn. Mashinostr.	Trudy, Vsesoyuznyi Nauchno-Issledovatel'skii Institut Kislородnogo Mashinostroeniya
Trans. Faraday Soc.	Transactions of the Faraday Society

-U-

Uch. Zap. Kabardino-Balkarsk. Univ.	Uchenye Zapiski Kabardinskogo-Balkarskogo Universiteta
Uch. Zap. Karbardinsk. Gos. Ped. Inst.	Uchenye Zapiski Karbardinskogo Gosudarstvennogo Pedagogicheskogo Instituta
Uch. Zap., Mosk. Obl. Ped. Inst.	Uchenye Zapiski, Moskovskogo Oblastnogo Pedagogicheskogo Instituta
Uch. Zap., Permsk. Gos. Univ.	Uchenye Zapiski, Permskii Gosudarstvennyi Universitet Imeni A. M. Gorkogo
Ch. Zap., Yakutskogo Gos. Univ. Ser. Estestven. Nauk	Uchenye Zapiski Yakutskogo Gosudarstvennogo Universiteta
Ukr. Fiz. Zh.	Ukrainskii Fizichnii Zhurnal
Ukr. Khim. Zh.	Ukrainskii Khimicheskii Zhurnal
Univ.	University
US At. Energy Comm.	United States Atomic Energy Commission
Usp. Khim.	Uspekhi Khimii
Usp. Fiz. Nauk	Uspekhi Fizicheskikh Nauk

-V-

Vestn. Leningr. Univ. Ser. Fiz. i Khim.	Vestnik Leningradskogo Universiteta Seriya Fiziki i Khimii
Vestn. Mosk. Univ. Ser. Fiz. Astron.	Vestnik Moskovskogo Universiteta, Seriya. Fizika, Astronomiya
Vestn. Mosk. Univ. Ser. Khim.	Vestnik Moskovskogo Universiteta, Seriya II: Khimiya
Visn. Kiivsk Univ. Ser. Astron., Fiz. ta Khim.	Visnik Kiivskogo Universitetu. Seriya Astronomii, Fiziki ta Khimii
Vopr. Sovrem. Fiz. i Mat., Akad. Nauk Uz. SSR	Voprosy Sovremennoi Fiziki i Matematiki, Akademiya Nauk Uzbekskoi SSR
Vses. Konf. Kolloidnoi Khim., Akad. Nauk SSR Otd. Khim. Nauk, Minsk.	Vsesoyuznoi Konferentsii po Kolloidnoi Khimii Akademiya Nauk, SSSR, Otdelenie Khimicheskikh Nauk, Minsk
Vysokomolekul. Soedin.	Vysokomolekulyarnye Soedineniya

-W-

Wiss. Z. Tech. Hochsh. Chem. Leuna-Merseburg	Wissenschaftliche Zeitschrift der Technischen Hochschule für Chemie Leuna-Merseburg
--	---

-Z-

Z. angew. Math. Phys.	Zeitschrift für angewandte Mathematik und Physik
Z. Elektrochem.	Zeitschrift für Elektrochemie
Z. Naturforsch.	Zeitschrift für Naturforschung
Z. Physik.	Zeitschrift für Physik
Z. physik. Chem. (Frankfurt)	Zeitschrift für physikalische Chemie (Frankfurt)
Z. physik. Chem. (Leipzig)	Zeitschrift für physikalische Chemie (Leipzig)
Zh. Eksp. i Teor. Fiz.	Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki
Zh. Fiz. Khim.	Zhurnal Fizicheskoi Khimii
Zh. Obshch. Khim.	Zhurnal Obshchei Khimii
Zh. Prikl. Khim.	Zhurnal Prikladnoi Khimii
Zh. Tekh. Fiz.	Zhurnal Tekhnicheskoi Fiziki

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