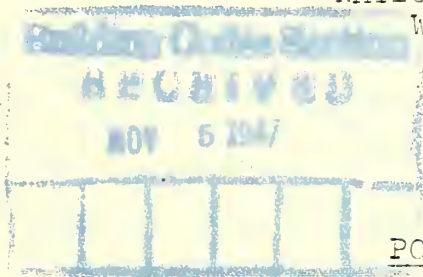


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U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
Washington 25, D.C.

Letter Circular
LC 880
(Supersedes
LC 762)



October 27, 1947

PORCELAIN & POTTERY

Publications by members of the staff of the National Bureau of Standards, with a list of Federal Specifications and Standard Samples.

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GENERAL INFORMATION

Some of the publications in this list have appeared in the regular series of publications of the Bureau and others in various scientific and technical journals. Unless specifically stated, papers are not obtainable from the National Bureau of Standards.

When the price is stated, the publication can be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. The prices quoted are for delivery to addresses in the United States and its territories and possessions and in certain countries which extend the franking privilege. In the case of all other countries, one-third the cost of the publication should be added to cover postage. Remittances should be made either by coupons (obtainable from the Superintendent of Documents in sets of 20 for \$1.00 and good until used), or by check or money order payable to the "Superintendent of Documents, Government Printing Office" and sent to him with order. Letter Circulars are obtainable without charge, from the Bureau. Publications marked "OP" are out of print, but, in general, may be consulted at technical libraries.

For papers in other scientific or technical journals, the name of the journal or of the organization publishing the article is given in abbreviated form with the volume number (underscored), page, and year of publication, in the order named. In general, the Bureau cannot supply copies of these journals, or reprints from them, and it is unable to furnish information as to the availability or price. However, in a few cases (publications preceded by a single asterisk (*)) a very limited supply of reprints is available for distribution, and copies will be sent free upon request to the Bureau. They, too, can usually be consulted at technical libraries.

Serial letters are used to designate the several series of Bureau publications:

- T = "Technologic Paper." T1 to T370. This series was superseded by the "Bureau of Standards Journal of Research" in 1928.
- RP = "Research Paper." These are reprints of articles appearing in the "Bureau of Standards Journal of Research" and the "Journal of Research of the National Bureau of Standards," the latter being the title of the periodical since July 1934 (volume 15, number 1).
- C = "Circular."
- CS = "Commercial Standard."
- R = "Simplified Practice Recommendations."

Circular C24, 7th edition, and supplements, the complete list of the Bureau's publications (1901-1944), is sold by the Superintendent of Documents for \$1.50. Announcement of new publications is made each month in the Technical News Bulletin which is obtainable by subscription at \$1.00 a year in the United States, Canada, Cuba, Mexico, Newfoundland, and Republic of Panama; other countries at \$1.35.

PART 1 - TECHNOLOGIC PAPERS

	<u>Series</u>	<u>Price</u>
Viscosity of porcelain bodies. A.V. Bleininger and Paul Teetor. Tech. Pap. BS, T30(1913).	T30	OP
Some leadless boro-silicate glazes maturing at about 1,100°C. E.T. Montgomery. Tech. Pap. BS, T31(1913).	T31	OP
A study of the Atterberg plasticity method. C.S. Kinnison. Tech. Pap. BS, T46(1915).	T46	OP

PART 1 - TECHNOLOGIC PAPERS (Continued)

	<u>Series</u>	<u>Price</u>
The viscosity of porcelain bodies high in feldspar. A.V. Bleininger and C.S. Kinnison. Tech. Pap. BS, T50(1915).	T50	OP
Use of sodium salts in the purification of clays and in the casting process. A. V. Bleininger. Tech. Pap. BS, T51 (1915).	T51	OP
Constitution and microstructure of porcelain. A.A. Klein. Tech. Pap. BS, T80(1916).	T80	OP
High-fire porcelain glazes. H.H. Sortwell. Tech. Pap. BS, T196(1921).	T196	OP
American and English ball clays. H.H. Sortwell. Tech. Pap. BS, T227(1923).	T227	OP
Properties of potter's flints and their effects in whiteware bodies. E.E. Pressler and W.L. Shearer. Tech. Pap. BS, T310(1926).	T310	OP

PART 2 - RESEARCH PAPERS

The passage of gas through the walls of pyrometer protection tubes at high temperatures. William F. Roeser, BS J. Research <u>7</u> , 485(1931).	RP354	OP
Gases obtained from commercial feldspars heated in vacuo. G.R. Shelton and H.H. Holscher. BS J. Research <u>8</u> , 347(1932).	RP420	OP
The thermal expansion of some silicates of elements in Group II of the periodic system. R.F. Geller and H. Insley. BS J. Research <u>9</u> , 36(1932).	RP456	OP
"Moisture expansion" of ceramic whiteware. R.F. Geller and A.S. Creamer. BS J. Research <u>9</u> , 291(1932).	RP472	OP
A study of some ceramic bodies of low absorption maturing at temperatures below 1000°C. R.F. Geller and D.N. Evans. BS J. Research <u>9</u> , 473(1932); also Ceramic Industry (59 East Van Buren Street, Chicago, Ill.) <u>20</u> (1933).	RP483	OP

PART 2 - RESEARCH PAPERS (Continued)

	<u>Series</u>	<u>Price</u>
The interference method of measuring thermal expansion. George E. Merritt. BS J. Research <u>10</u> , 59(1933).	RP515	OP
Effects of particle size of a potter's "flint" and a feldspar in whiteware. R.F. Geller, D.N. Evans and A.S. Creamer. BS J. Research <u>11</u> , 327 (1933).	RP594	OP
The system: PbO-SiO ₂ . R.F. Geller, A.S. Creamer and E.N. Bunting. J. Research NBS <u>13</u> , 237(1934).	RP705	OP
Thermal behavior of the kaolin minerals. H. Insley and R.H. Ewell. J. Research NBS <u>14</u> , 615(1935).	RP792	OP
Hydrothermal synthesis of kaolinite, dickite, beidellite and nontronite. H. Insley and R.H. Ewell. J. Research NBS <u>15</u> , 173(1935).	RP819	OP
Thermal decomposition of talc. R.H. Ewell, E.N. Bunting, and R.F. Geller, J. Research NBS <u>15</u> , 551(1935).	RP848	OP
The system K ₂ O-PbO-SiO ₂ . R.F. Geller and E.N. Bunting. J. Research NBS <u>17</u> , 277(1936).	RP911	.05
The system PbO-B ₂ O ₃ . R.F. Geller and E.N. Bunting. J. Research NBS <u>18</u> , 585(1937).	RP995	.05
Substitution of domestic for imported clays in whiteware bodies. W.W. Meyer and T.A. Klinefelter. J. Research NBS <u>19</u> , 65(1937).	RP1011	.05
Some "soft" glazes of low thermal expansion. R.F. Geller, E.N. Bunting, and A.S. Creamer. J. Research NBS <u>20</u> , 57(1938).	RP1064	OP
Solubility of colored glazes in organic acids. R.F. Geller and A.S. Creamer. J. Research NBS <u>22</u> , 441(1939).	RP1196	.05
Improved interferometric procedure with application to expansion measurements. James B. Saunders. J. Research NBS <u>23</u> , 179(1939).	RP1227	.10
The system PbO-B ₂ O ₃ -SiO ₂ . R.F. Geller and E.N. Bunting. J. Research NBS <u>23</u> , 275(1939).	RP1231	.05

PART 2 - RESEARCH PAPERS (Continued)

	<u>Series</u>	<u>Price</u>
X-ray studies of compounds in the system PbO-SiO ₂ . H.F. McMurdie and E.N. Bunting. J. Research NBS <u>23</u> , 543(1939).	RP1251	.05
Length changes of whiteware clays and bodies during initial heating, with supplementary data on mica. R.F. Geller and E.N. Bunting. J. Research NBS <u>25</u> , 15(1940).	RP1311	.10
Some factors affecting the properties of ceramic talcose whiteware. R.F. Geller and A.S. Creamer. J. Research NBS <u>26</u> , 213(1941).	RP1371	.10
X-ray studies of compounds in the systems PbO-B ₂ O ₃ and K ₂ O-PbO-SiO ₂ . H.F. McMurdie. J. Research NBS <u>26</u> , 489(1941).	RP1392	.05
A resistor furnace, with some preliminary results up to 2,000°C. R.F. Geller. J. Research NBS <u>27</u> , 555(1941).	RP1443	OP
Progress report on the systems PbO-Al ₂ O ₃ and PbO-Al ₂ O ₃ -SiO ₂ . R.F. Geller and E.N. Bunting. J. Research NBS <u>31</u> , 255(1943).	RP1564	.10
Melting point of alpha-alumina. R.F. Geller and P.J. Yavorsky. J. Research NBS <u>34</u> , 395(1945).	RP1649	.05
Effects of some oxide additions on the thermal length changes of zirconia. R.F. Geller and P.J. Yavorsky. J. Research NBS <u>35</u> , 87(1945).	RP1662	.10
An apparatus for photographing interference phenomena. James B. Saunders. J. Research NBS <u>35</u> , 157(1945).	RP1668	.10
Studies of binary and ternary combinations of magnesia, calcia, baria, beryllia, alumina, thoria, and zirconia in relation to their use as porcelains. R.F. Geller, P.J. Yavorsky, B.L. Steierman, and A.S. Creamer. J. Research NBS <u>36</u> , 277(1946).	RP1703	.15
Properties of barium-strontium titanate dielectrics. E.N. Bunting. G.R. Shelton, and A.S. Creamer. J. Research NBS <u>38</u> , 337(1947).	RP1776	.10

PART 3 - CIRCULARS

	<u>Series</u>	<u>Price</u>
Recommended specification for ceramic whitening. Cir. BS, C152(1923).	C152	.05
Ceramic properties of some white-burning clays of the eastern United States. Cir. BS, C325 (1927).	C325	OP

PART 4 - COMMERCIAL STANDARDS

Feldspar	CS23-30	OP
Colors for sanitary ware.	CS30-31	OP
Staple vitreous china plumbing fixtures.	CS20-47	.10
Earthenware (vitreous glazed) plumbing fixtures.	CS111-43	.05

PART 5 - SIMPLIFIED PRACTICE RECOMMENDATIONS

Hotel chinaware	R5	.05
Cafeteria and restaurant chinaware	R33	.05
Dining-car chinaware	R39	.05
Hospital chinaware	R40	.05
Clay tiles for floors and walls	R61-44	.10
Hospital plumbing fixtures	R106-41	.05

PART 6 - FEDERAL SPECIFICATIONS

(Issued by the Federal Specifications Board, Washington, D.C., and obtainable from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at the prices stated.)

Vitrified chinaware	M-C-301a	.10
Plumbing fixtures	WW-P-541	.10

PART 7 - OUTSIDE PUBLICATIONS

(List of papers which have appeared in the Transactions or the Journal of the American Ceramic Society, 2525 N. High Street, Columbus 2, Ohio.)

A study of the vitrification range and di-electric behavior of some porcelains. A.V. Bleininger and R.T. Stull. Trans. Am. Ceramic Soc., 12, 628(1910).

The measurement of color of whiteware and whiteware materials. H.E. Ashley. Trans. Am. Ceramic Soc. 13, 111(1911).

Cutlery marks on glaze. H.E. Ashley. Trans. Am. Ceramic Soc., 13, 226(1911).

High voltage insulators and high potential testing. E.T. Montgomery. Trans. Am. Ceramic Soc., 14, 267(1912).

Viscosity of porcelain bodies. A.V. Bleininger and Paul Teetor. Trans. Am. Ceramic Soc., 15, 328(1913).

Note on the electrical separation of clay. A.V. Bleininger. Trans. Am. Ceramic Soc., 15, 338(1913).

The Clark viscosimeter. W.E. Emley. Trans. Am. Ceramic Soc., 15, 401(1913).

A study of the Atterberg plasticity method. C.S. Kinnison. Trans. Am. Ceramic Soc., 16, 472(1914).

The veritas firing rings. A.V. Bleininger and G.H. Brown. Trans. Am. Ceramic Soc., 16, 222(1914).

The viscosity of porcelain bodies high in feldspar. A.V. Bleininger and C.S. Kinnison. Trans. Am. Ceramic Soc., 17, 130 (1915).

The Bureau of Standards contrast method for measuring transparency. I.G. Priest. Trans. Am. Ceramic Soc., 17, 150(1915).

Electrical conductivity of a porcelain mixture and a shale upon heating. C.S. Kinnison. Trans. Am. Ceramic Soc., 17, 422(1915).

The use of deflocculating agents in the washing of clays and the effect of the process upon the color. G.H. Brown and W.L. Howat. Trans. Am. Ceramic Soc., 17, 81(1915).

Constitution and microstructure of porcelain. A.A. Klein. Trans. Am. Ceramic Soc., 18, 377(1916).

PART 7 - OUTSIDE PUBLICATIONS (Continued)

Notes on the manufacture of porcelain pyrometer tubes. W. I. Howat. Trans. Am. Ceramic Soc., 18, 268(1916).

Notes on the production of special refractories - Marquardt porcelain and magnesium aluminate. F.H. Riddle. Trans. Am. Ceramic Soc., 19, 397(1917).

Note on the temperature-porosity-volume changes of some porcelain bodies. G.A. Loomis. Trans. Am. Ceramic Soc., 19, 636(1917).

Some types of porcelain. F.H. Riddle and W.W. McDanel. J. Am. Ceramic Soc., 1, 606(1918).

Note on certain characteristics of porcelain. A.V. Bleining. J. Am. Ceramic Soc., 1, 697(1918).

Effect of time and temperature on the microstructure of porcelain. A.B. Peck. J. Am. Ceramic Soc., 2, 175(1919).

Impact tests and porosity determinations on some American hotel china and semi-porcelain plates. H.F. Staley and J.S. Hromatko. J. Am. Ceramic Soc., 2, 227(1919).

Some physical properties of American commercial porcelain bodies. J.W. Wright and S.I. Sewell. J. Am. Ceramic Soc., 2, 282(1919).

Special spark plug porcelains. A.V. Bleining and F.H. Riddle. J. Am. Ceramic Soc., 2, 564(1919).

Relation between the composition and the thermal expansivity of porcelain. F.H. Riddle. J. Am. Ceramic Soc., 2, 804(1919).

Further studies on porcelain. F.H. Riddle. J. Am. Ceramic Soc., 2, 812(1919).

The use of American raw materials in the manufacture of white-ware pottery. A.V. Bleining and W.W. McDanel. J. Am. Ceramic Soc., 3, 134(1920); J. Am. Ceramic Soc., 3, 997(1920).

The solubility of boric acid frits. G. Blumenthal. J. Am. Ceramic Soc., 3, 152(1920).

The rate of vitrification of porcelain molded under different conditions. R.F. Sherwood. J. Am. Ceramic Soc., 3, 837(1920).

High-fire porcelain glazes. H.H. Sortwell. J. Am. Ceramic Soc., 4, 718(1921).

Solubility and fusibility of some feldspar frits. H.H. Sortwell. J. Am. Ceramic Soc., 4, 446(1921).

PART 7 - OUTSIDE PUBLICATIONS (Continued)

Absorption of sodium hydroxide by kaolins. R.F. Geller and D.R. Caldwell. J. Am. Ceramic Soc., 4, 468(1921).

Use of special oxides in porcelain bodies. R.F. Geller and B.J. Woods. J. Am. Ceramic Soc., 4, 842(1921).

Note on the hardness of glazes. G. Blumenthal. J. Am. Ceramic Soc., 4, 896(1921).

Earthenware bodies and glazes. H.H. Sortwell. J. Am. Ceramic Soc., 4, 990(1921).

Comparative tests of American and foreign tableware. H. H. Sortwell. J. Am. Ceramic Soc., 5, 276(1922).

Comparative tests of English and domestic whitings. A.E. Williams and B.J. Woods. J. Am. Ceramic Soc., 5, 901(1922).

Impact tests on tableware. H.H. Sortwell. J. Am. Ceramic Soc., 6, 349(1923).

The effect of variation in firing on the physical properties of vitreous china bodies. H.H. Sortwell. J. Am. Ceramic Soc., 6, 915(1923).

*The bonding effect of ball clays in fired bodies. H.H. Sortwell. J. Am. Ceramic Soc., 7, 75(1924).

*An apparatus for measuring the abrasive hardness of glazes. W.J. Scott. J. Am. Ceramic Soc., 7, 342(1924).

Interferometer measurements of the thermal dilatation of glazed ware. G.E. Merritt and C.G. Peters. J. Am. Ceramic Soc., 9, 327(1926).

*A comparison of the softening points of some foreign and American pyrometric cones. R.F. Geller and E.E. Pressler. J. Am. Ceramic Soc., 9, 744(1926).

Characteristics of pyrometric cones. C.O. Fairchild and M.F. Peters. J. Am. Ceramic Soc., 9, 700(1926).

*The effect of calcined cyanite in porcelain bodies. S.J. McDowell and E.J. Vachuska. J. Am. Ceramic Soc., 10, 64(1927).

*A preliminary study of the resistance to abrasion of ceramic glazes, its control and methods of determination. A.O. Harrison. J. Am. Ceramic Soc., 10, 77(1927).

PART 7 - OUTSIDE PUBLICATIONS (Continued)

- *The microstructure of earthenware. H. Insley. J. Am. Ceramic Soc., 10, 317(1927).
- Bureau of Standards investigation of feldspar - second progress report. R.F. Geller. J. Am. Ceramic Soc., 10, 411(1927).
- *The quantitative microscopic analysis of commercial feldspar. H. Insley. J. Am. Ceramic Soc., 10, 651(1927).
- *The effect of various sodium silicates and other electrolytes on clay slips. S.J. McDowell. J. Am. Ceramic Soc., 10, 225(1927).
- Methods for testing crazing of glazes caused by increases in size of ceramic bodies. H.G. Schurecht. J. Am. Ceramic Soc., 11, 271(1928).
- *Comparative tests of chinaware using two forms of testing machines. G.W. Wray and C.M. Brand. J. Am. Ceramic Soc., 12, 716(1929).
- The influence of chemical composition on the physical properties of glazes. F.P. Hall. J. Am. Ceramic Soc., 13, 182(1930).
- The casting of clayware - a resume. F.P. Hall. J. Am. Ceramic Soc., 13, 751(1930).
- Investigation of feldspar and its effect in pottery bodies. R.F. Geller and A.S. Creamer. J. Am. Ceramic Soc., 14, 30(1931).
- Metal marking of whiteware glazes as influenced by sulphur and carbon in kiln atmospheres. R.F. Geller and A.S. Creamer. J. Am. Ceramic Soc., 14, 624(1931).
- Some synthetic fluxes in whiteware bodies. Paul F. Collins. J. Am. Ceramic Soc., 15, 17(1932).
- Some properties of English china clays. T.A. Klinefelter, W.W. Meyer and E.J. Vachuska. J. Am. Ceramic Soc., 16, 269(1933).
- Effect of repeated heatings on the mechanical strength of high-tension insulator porcelains. R.F. Geller. Bul. Am. Ceramic Soc., 12, 18(1933).
- Properties of some American kaolins and comparisons with English china clay. T.A. Klinefelter and W.W. Meyer. J. Am. Ceramic Soc., 18, 163(1935).
- Talc in whiteware of the wall-tile type. R.F. Geller and A.S. Creamer, J. Am. Soc., 18, 259(1935).
- The analysis of feldspar. H.B. Knowles and J.C. Redmond. J. Am. Ceramic Soc., 18, 206(March 1935).

PART 7 - OUTSIDE PUBLICATIONS (Continued)

The nature of the glass phase in heated clay materials. I. Common clays. G.R. Shelton. J. Am. Ceramic Soc., 18, 289(Oct.1935).

Talc in whiteware. R.F. Geller and A.S. Creamer. J. Am. Ceramic Soc., 20, 137(May 1937).

Computation of heat treatments for whiteware bodies. W.W. Meyer, J. Am. Ceramic Soc., 21, 75(March 1938).

Nature of the glass phase in heated clay materials. II. The effect of the rate of heating on the glass phase and physical properties of whiteware bodies. G.R. Shelton and W.W. Meyer. J. Am. Ceramic Soc., 21, 371(November 1938).

Solubility of colored glazes in organic acids. R.F. Geller and A.S. Creamer. J. Am. Ceramic Soc., 22, 133(April 1939).

Note on moisture expansion of ceramic whiteware in storage and in service. R.F. Geller and A.S. Creamer. J. Am. Ceramic Soc., 24, 77(March 1941).

Effect of exchangeable bases on some properties of ball clays. M.D. Burdick, W.W. Meyer and T.A. Klinefelter. J. Am. Ceramic Soc., 12, 327(August 1942).

Effect of hardness of hammers on resistance of vitrified china-ware to chipping and to impact. R.F. Geller and A.S. Creamer. Bul. of Am. Ceramic Soc., 23, 146(April 1944).

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Measurement of moisture expansion. R.F. Geller and A.S. Creamer. Ceramic Age (The Ceramics Publishing Co., 34 North Crystal St., E. Stroudsburg, Pa.).

Nature of china clays. W.W. Meyer. (Technical Association Papers, Technical Association Paper and Pulp Industry, 122 East 42nd St., New York City). Series 20, 373(June 1937).

A rose by any other name (A discussion of whiteware terminology). R.F. Geller. Ceramic Age (The Ceramics Publishing Co., E. Stroudsburg, Pa.) 13, 35(February 1938).

Complacence. R.F. Geller. Ceramic Age 41, 6, 186(1943).

Progress report on strength and creep of special ceramic bodies in tension at elevated temperatures. R.F. Geller and M.D. Burdick. National Advisory Committee for Aeronautics. ARR No. 6D24 (June 1946).

S T A N D A R D S A M P L E S

Standard samples of certain materials which are recommended for control work may be obtained from the National Bureau of Standards by prepayment of the indicated price. Such samples were prepared for checking the accuracy of methods of analysis, and those of particular interest to the ceramic industry are listed below. The Supplement to Circular C398, which can be obtained from this Bureau without charge, contains a complete list of our standard samples.

Standard Sample Number	N a m e	Constituents determined or intended use	Weight of sample in grams	Price
1a	Limestone, argillaceous	Complete analysis	50	\$2.00
39f	Benzoic acid	Acidimetric and calorimetric values	30	2.00
40e	Sodium oxalate	Oxidimetric value	60	2.00
69	Bauxite	Complete analysis	60	2.00
70	Feldspar, potash	" "	40	2.00
76	Burned refractory (40% Al ₂ O ₃)	" "	60	2.00
77	Burned refractory (60% Al ₂ O ₃)	" "	60	2.00
78	Burned refractory (70% Al ₂ O ₃)	" "	60	2.00
79	Fluorspar	" "	60	2.00
80	Glass, soda-lime	" "	45	2.00
81	Glass sand	Fe ₂ O ₃ , Al ₂ O ₃ , TiO ₂ , ZrO ₂ , CaO, MgO	60	2.00
83a	Arsenic trioxide	Oxidimetric value	75	2.00
84c	Acid potassium phthalate	Acidimetric value	60	3.00
88	Limestone, dolomitic	Complete analysis	50	2.00
89	Glass, lead-barium	" "	45	2.00
91	Glass, opal	" "	45	2.00
92	Glass, low boron	B ₂ O ₃ only	45	2.00
93	Glass, high boron	Complete analysis	45	2.00
97	Clay, flint	" "	60	2.00
98	Clay, plastic	" "	60	2.00
99	Feldspar, soda	" "	40	2.00
102	Silica brick	" "	60	2.00
103	Chrome refractory	" "	60	2.00
104	Burned magnesite	" "	60	2.00
112	Silicon carbide	" "	85	2.00
154	Titanium dioxide	TiO ₂	40	2.00