

U. S. DEPARTMENT OF COMMERCE

DANIEL C. ROPER, Secretary

NATIONAL BUREAU OF STANDARDS

LYMAN J. BRIGGS, Director

SUPPLEMENT TO NATIONAL BUREAU OF STANDARDS CIRCULAR C398

STANDARD SAMPLES
ISSUED OR IN PREPARATION BY
THE NATIONAL BUREAU OF STANDARDS

[Issued June 3, 1937]



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1937

STANDARD SAMPLES ISSUED OR IN PREPARATION BY THE NATIONAL BUREAU OF STANDARDS

CONTENTS

	Page		Page
I. Purchase procedure.....	1	III. Summary of analyses—Con.	
1. Identification of samples.....	1	1. Averaged analyses—Con.	
2. Ordering.....	1	Feldspars.....	7
3. Terms and shipping.....	1	Fluorspar.....	7
(a) Domestic.....	1	Clays.....	7
(b) Foreign.....	1	Bauxite and alumina	
(c) Money orders, etc.....	1	refractories.....	8
II. Standard samples, with sched- ule of weights and fees.....	2	Chrome refractory.....	8
1. Descriptive list.....	2	Silicon carbide.....	8
Steels.....	2	Glass sand.....	8
Irons.....	2	Soda-lime glass.....	8
Steel-making alloys.....	2	Lead-barium glass.....	8
Nonferrous alloys.....	2	Opal glass.....	8
Ores.....	3	Boron glasses.....	9
Ceramic materials.....	3	Iron ores.....	9
Fineness standards.....	3	Magnetite iron ore.....	9
Melting-point stand- ards.....	3	Phosphate rocks.....	9
Chemicals.....	3	Manganese ore.....	9
Thermoelectric stand- ards.....	3	Zinc ores.....	9
III. Summary of analyses.....	3	2. Chemicals.....	10
1. Averaged analyses.....	4	Acid potassium phthal- ate.....	10
Irons and steels.....	4, 5	Benzoic acid.....	10
Ferroalloys.....	6	Sodium oxalate.....	10
Sheet brass and bronzes	6	Arsenic trioxide.....	10
Bearing metals.....	6	Napthalene.....	10
Aluminum-base cast- ing alloy.....	6	Sugars.....	10
Zinc-base die-casting alloys.....	7	IV. General information.....	11
Limestone, dolomite, silica brick, and burned magnesite....	7	1. Bottling.....	11
		2. Literature.....	11
		3. Samples out of stock.....	11
		4. New samples.....	11
		5. Mixing.....	11

I. PURCHASE PROCEDURE

1. IDENTIFICATION OF SAMPLES

The samples are listed by groups; the sample numbers represent the order of issuance of the first representative of each kind. Renewals of an analyzed sample are indicated by the original number, with an added letter to denote its intended relation. Thus, 10a is the first, 10b the second, and 10c the third renewal of no. 10 Bessemer 0.4 C steel. In this way a given number will always represent a material of fixed or approximately fixed composition. Numbers missing from the series in the following table represent samples of which the supply has become exhausted and which it is not the present intention to replace.

2. ORDERING

Orders should give both the number and name of the sample wanted. Example: No. 9c, steel, Bessemer, 0.2 C. The list of standard samples, their numbers, prices, and analyses are to be found in the succeeding pages. No samples of smaller size than those listed are distributed.

3. TERMS AND SHIPPING

(a) DOMESTIC

Samples must be paid for in advance with order. The former practice of sending samples c. o. d. has been discontinued. No discounts are allowed on any orders.

(b) FOREIGN

Shipments intended for Mexico and Canada will be sent under Government frank. For all other foreign shipments, 30 cents postage must be added for every 300 grams of sample or fraction thereof and, in addition, 15 cents for insurance or registration.

(c) MONEY ORDERS, ETC.

Money orders, etc., should be payable to the National Bureau of Standards. Payment for foreign orders should be by an international money order or by a check payable through the New York Clearing House or a bank in the United States.

II. STANDARD SAMPLES, WITH SCHEDULE OF WEIGHTS AND FEES

1. DESCRIPTIVE LIST

STEELS

Sample number	Name	Constituents determined or intended use	Approximate weight of sample, in grams	Price per sample
8e	Bessemer, 0.1 C	C, Mn, P, S, Si, (Cu, Ni, Cr, V)	150	\$2.00
9c	Bessemer, 0.2 C	C, Mn, P, S, Si, (Cu, Ni, Cr, V, Sn)	150	2.00
10d	Bessemer, 0.4 C	C, Mn, P, S, Si, (Cu, Ni, Cr, V, N)	150	2.00
22b	Bessemer, 0.6 C	C, Mn, P, S, Si, (Cu, Ni, Cr, V, Sn)	150	2.00
15b	B. O. H., 0.1 C	C, Mn, P, S, Si, (Cu, Ni, Cr, V, As)	150	2.00
11d	B. O. H., 0.2 C	C, Mn, P, S, Si, (Cu, Ni, Cr, V, As)	150	2.00
12d	B. O. H., 0.4 C	C, Mn, P, S, Si, (Cu, Ni, Cr, V, As)	150	2.00
13c	B. O. H., 0.6 C	C, Mn, P, S, Si, (Cu, Ni, Cr, Al, Sn)	150	2.00
14c	B. O. H., 0.8 C	C, Mn, P, S, Si, (Cu, Ni, Cr, V, Al, Al ₂ O ₃)	150	2.00
16c	B. O. H., 1.0 C	C, Mn, P, S, Si, (Cu, Ni, Cr, V)	150	2.00
19c	A. O. H., 0.2 C	C, Mn, P, S, Si, (Cu, Ni, Cr, V)	150	2.00
20c	A. O. H., 0.4 C	C, Mn, P, S, Si, (Cu, Ni, Cr, V)	150	2.00
21c	A. O. H., 0.6 C	C, Mn, P, S, Si, (Cu, Ni, Cr, V)	150	2.00
34a	A. O. H., 0.8 C	C, Mn, P, S, Si, (Cu, Cr, Mo)	150	2.00
35a	A. O. H., 1.0 C	C, Mn, P, S, Si, (Cu, Cr, Al)	150	2.00
51a	Electric furnace, 1.2 C	C, Mn, P, S, Si, (Cu, Ni, Cr, V, Sn)	150	2.00
65a	Acid electric	C, Mn, P, S, Si, (Cu, Ni, Cr, V, Sn)	150	2.00
100	Medium manganese	C, Mn, P, S, Si, (Cu, Ni, Cr, V)	150	2.00
105	High sulphur	C	150	1.00
30c	Chrome-vanadium	C, Mn, P, S, Si, Cr, V, (Cu, Ni)	150	3.00
32b	Chrome-nickel	C, Mn, P, S, Si, Cr, Ni, (Cu)	150	3.00
33b	Nickel	C, Mn, P, S, Si, Ni, (Cu, Cr, V)	150	3.00
50a	Chrome-tungsten-vanadium	C, Mn, P, S, Si, W, Cr, V, (Cu, Mo, Sn)	150	3.50
72a	Chrome-molybdenum	C, Mn, P, S, Si, Cr, Mo, (Cu, V)	150	3.00
106	Cr-Mo-Al (Nitalloy "G")	C, Mn, P, S, Si, Cr, Mo, Al, (Cu, Ni, V, As, N)	150	3.00
111	Ni-Mo-Cr (SAE 4615)	C, Mn, P, S, Si, Cr, Ni, Mo, (Cu, V, As)	150	2.50
73	Stainless	C, Mn, P, S, Si, Cr, (Cu, V, Mo)	150	3.00
101	18 Cr, 8 Ni	C, Mn, P, S, Si, Cr, Ni, (Cu, V, N, Mo)	150	3.00
121	18 Cr, 9 Ni (Ti bearing)	C, Mn, P, S, Si, Cr, Ni, Ti, (Cu, V)	150	3.00
123	18 Cr, 11 Ni (Cb bearing)	C, Mn, P, S, Si, Cr, Ni, Cb, (Cu, V)	150	3.00

IRONS

4e	Cast iron	C, Mn, P, S, Si, Ti, (Cu, Ni, Cr, V)	150	\$2.50
5g	Cast iron	C, Mn, P, S, Si, Ti, (Cu, Ni, Cr, V)	150	2.50
6d	Cast iron	C, Mn, P, S, Si, Ti, (Cu, Ni, Cr, V, Sn)	150	2.50
7c	Cast iron	C, Mn, P, S, Si, Ti, (Cu, Ni, Cr, V)	150	2.50
55a	Ingot iron	C, Mn, P, S, Si, Cu, (Ni, Cr, N, Al, Al ₂ O ₃ , Co, Sn)	150	2.00
74	Cast iron	C, Mn, P, S, Si, Ti, (Cu, Ni, Cr, V)	150	2.50
82	Nickel-chromium cast iron	C, Mn, P, S, Si, Cr, Ni, (Ti, Cu, V)	150	2.50
107	Nickel-molybdenum cast iron	C, Mn, P, S, Si, Ni, Mo, Cr, (V, Cu, Ti)	150	2.50
115	Nickel-chromium-copper cast iron	C, Mn, P, S, Si, Ni, Cr, Cu, (V, Mo)	150	2.50
122	Cast iron (car wheel)	C, Mn, P, S, Si, Ni, Cr, Cu, (V, Mo)	150	2.50

STEEL-MAKING ALLOYS

57	Refined silicon	Complete analysis	60	\$2.00
58	Ferrosilicon (75% silicon)	do	75	2.00
59	Ferrosilicon (50% silicon)	do	75	2.00
61	Ferrovandium (high carbon)	do	100	3.00
64	Ferrochromium (high carbon)	do	100	3.00
66	Spiegeleisen	do	100	2.00
67	Manganese metal	do	100	2.50
68	Ferromanganese	do	100	2.50
75	Ferrotungsten	do	150	4.00
90	Ferrophosphorus	Phosphorus	75	2.50
71	Calcium molybdate	Mo, Fe, Ti	60	2.50
116	Ferrotitanium (low carbon)	Ti, C, Si, V, Cr, Al	100	2.50
117	Ferrotitanium (high carbon)	Ti, C, Si, V, Cr, Al	100	2.50

NONFERROUS ALLOYS

88	Aluminum-base casting alloy	Complete analysis	60	\$2.00
53a	Bearing metal, lead base	do	200	3.00
54a	Bearing metal, tin base	do	200	3.00
63	Bearing metal, phosphor-bronze	do	150	3.00
37b	Brass, sheet	do	150	3.00
52	Bronze, cast	do	150	3.00
124	Ounce metal	do	150	3.00
62	Bronze, manganese	do	150	3.00
94	Zinc-base, die-casting alloy	do	100	2.00
95	Do	do	100	2.00
96	Do	do	100	2.00

1. DESCRIPTIVE LIST—Continued

ORES

Sample number	Name	Constituents determined or intended use	Approximate weight of sample, in grams	Price per sample
69	Bauxite.....	Complete analysis.....	60	\$2.00
26	Iron ore, Crescent.....	Al ₂ O ₃ , CaO, MgO.....	100	2.00
29	Iron ore, Magnetite.....	Complete analysis.....	50	1.00
28	Iron ore, Norrie.....	Mn (low).....	50	1.00
27b	Iron ore, Sibley.....	SiO ₂ , P, Fe.....	125	2.00
25b	Manganese ore.....	Manganese, available oxygen.....	100	2.00
56	Phosphate rock (Tennessee).....	P ₂ O ₅ , Fe ₂ O ₃ , Al ₂ O ₃ , etc.....	60	2.00
120	Phosphate rock (Florida).....	P ₂ O ₅ , Fe ₂ O ₃ , Al ₂ O ₃ , etc.....	60	2.00
2a	Zinc ore.....	Zinc.....	50	1.00
113	Zinc ore (Tri-State Concentrate).....	Zinc.....	50	1.00

CERAMIC MATERIALS

104	Burned magnesite.....	Complete analysis.....	60	\$2.00
76	Burned refractory (40% Al ₂ O ₃).....	do.....	60	2.00
77	Burned refractory (60% Al ₂ O ₃).....	do.....	60	2.00
78	Burned refractory (70% Al ₂ O ₃).....	do.....	60	2.00
103	Chrome refractory.....	Cr ₂ O ₃ , SiO ₂ , Al ₂ O ₃ , FeO, CaO, MgO.....	60	2.00
97	Clay, flint.....	Complete analysis.....	60	2.00
98	Clay, plastic.....	do.....	60	2.00
70	Feldspar, potash.....	do.....	40	2.00
99	Feldspar, soda.....	do.....	40	2.00
79	Fluorspar.....	do.....	60	2.50
1a	Limestone, argillaceous.....	do.....	50	2.00
88	Limestone, dolomitic.....	do.....	50	2.00
92	Glass, low boron.....	B ₂ O ₃	45	2.00
93	Glass, high boron.....	Complete analysis.....	45	2.00
89	Glass, lead-barium.....	do.....	45	2.00
91	Glass, opal.....	do.....	45	2.00
80	Glass, soda-lime.....	do.....	45	2.00
81	Glass sand.....	Fe ₂ O ₃ , Al ₂ O ₃ , TiO ₂ , ZrO ₂ , CaO, MgO.....	60	2.00
102	Silica brick.....	Complete analysis.....	60	2.00
112	Silicon carbide.....	do.....	85	2.00

FINENESS STANDARDS

46r	Cement (normal).....		160	\$1.00
47q	Cement (extra fine).....		160	1.00
114b	Cement (turbidimetric standard).....		12	2.00

MELTING-POINT STANDARDS

44c	Aluminum.....	660.15° C.....	200	\$2.00
45a	Copper.....	1,083° C.....	450	2.00
49a	Lead.....	327.35° C.....	1,400	2.00
42c	Tin.....	231.87° C.....	350	2.00
43d	Zinc.....	419.52° C.....	350	2.00

CHEMICALS

84	Acid potassium phthalate.....	Acidimetric value.....	60	\$3.00
39e	Benzoic acid.....	Acidimetric and calorimetric values.....	30	2.00
40c	Sodium oxalate.....	Oxidimetric value.....	60	2.00
83	Arsenic trioxide.....	do.....	75	2.00
38b	Naphthalene.....	Calorimetric value.....	50	2.00
17	Sucrose (cane-sugar).....	Calorimetric and saccharimetric values.....	60	2.00
41	Dextrose (glucose).....	Reducing value.....	70	2.00

THERMOELECTRIC STANDARDS

118	Alumel wire no. 8 gage.....	emf vs. NBS Pt no. 27, 0 to 1,300° C.....	3 ft.....	\$2.00
119	Chromel wire no. 8 gage.....	emf vs. NBS Pt no. 27, 0 to 1,300° C.....	3 ft.....	2.00

III. SUMMARY OF ANALYSES

The values given in the following sections are listed primarily as a guide for purchasers. In some cases provisional values are given which may differ slightly from those given on the certificates. For this reason *the certificates issued with the standards should always be consulted to obtain the proper values.*

1. AVERAGED ANALYSES—Continued

FERROALLOYS

Number	Kind	Carbon	Manganese	Phosphorus	Sulphur	Silicon	Vanadium	Titanium	Aluminum	Calcium	Iron
57	Refined silicon	0.087	0.034	0.008	0.005	96.8	-----	0.10	0.67	0.73	0.65
58	Ferrosilicon (75%Si)	.033	.165	.016	.01	75.6	0.004	.085	.77	.45	22.5
59	Ferrosilicon (50%Si)	.015	.310	.035	.008	50.0	.004	.105	.93	.04	48.4
116	Ferrotitanium	.097	-----	-----	-----	1.26	.31	25.5	5.5	-----	-----
117	Ferrotitanium	5.45	-----	-----	-----	2.57	.07	14.6	.96	-----	-----

Number	Kind	Carbon	Manganese	Phosphorus	Sulphur	Silicon	Nickel	Chromium	Vanadium	Aluminum	Iron
61	Ferrovandium	1.15	3.57	0.243	0.003	7.78	1.33	0.52	31.15	0.02	52.8
64	Ferrochromium	5.10	2.25	.016	.070	2.05	.33	67.9	.11	.02	24.05
66	Spiegeleisen	4.05	19.93	.070	.016	2.22	.015	.009	.012	-----	73.45
67	Manganese metal	.06	97.25	.235	<.001	.407	.045	.18	.19	-----	1.50
68	Ferromanganese	6.87	80.67	.30	.014	.235	.10	.025	.075	-----	11.47

Number	Kind	Carbon	Manganese	Phosphorus	Sulphur	Silicon	Tungsten	Copper	Tin	Arsenic	Antimony
75	Ferrotungsten	0.54	1.16	0.015	0.039	0.67	75.2	0.039	0.18	0.035	<0.002
90	Ferrophosphorus	-----	-----	26.2	-----	-----	-----	-----	-----	-----	-----

71	Calcium molybdate.	Molybdenum=35.30; iron=1.92; titanium=0.06.									
----	--------------------	---	--	--	--	--	--	--	--	--	--

SHEET BRASS AND BRONZES

Number	Kind	Copper	Zinc	Tin	Lead	Iron	Nickel	Antimony	Manganese	Aluminum
37b	Sheet brass	70.36	27.09	0.99	0.90	0.21	0.45	-----	-----	-----
52	Cast bronze	88.33	1.89	7.90	1.52	.12	.13	0.16	-----	-----
62	Manganese bronze	59.07	35.06	.82	.56	1.13	.64	-----	1.59	1.13
124	Ounce metal	-----	-----	-----	-----	-----	-----	-----	-----	-----

BEARING METALS

Number	Kind	Lead	Tin	Antimony	Bismuth	Copper	Iron	Arsenic	Phosphorus	Zinc
53a	Lead-base	79.35	10.22	10.28	0.05	0.002	0.005	0.07	-----	-----
54a	Tin-base	.21	88.61	7.32	.019	3.75	.041	.039	-----	-----
63	Phosphor-bronze	9.74	9.91	.55	-----	78.05	.27	.19	0.62	0.48

ALUMINUM-BASE CASTING ALLOY

Number	Si	Cu	Fe	Zn	Mn	Mg	Ti	Zr
86	0.35	7.66	1.52	1.50	0.01	<0.001	0.017	0.007

1. AVERAGED ANALYSES—Continued

ZINC-BASE DIE-CASTING ALLOYS

Number	Cu	Pb	Cd	Al	Mg	Fe	Sn
94	2.83	0.03	0.003	3.92	0.11	0.048	0.0001
95	2.87	.32	.28	3.92	.10	.061	.0003
96	2.97	.58	.10	.56	.002	.029	5.98

LIMESTONE, DOLOMITE, SILICA BRICK, AND BURNED MAGNESITE

Number	Kind	SiO ₂	Fe ₂ O ₃	Al ₂ O ₃	TiO ₂	MnO	CaO	SrO	MgO	Na ₂ O
1a	Limestone	14.11	1.63	4.16	0.16	0.038	41.32	0.12	2.19	0.39
88	Dolomite	.31	.084	.067	.005	.006	30.49	<.01	21.48	.08
102	Silica brick	93.94	.66	1.96	.16	.005	2.29	-----	.21	.06
104	Burned magnesite	2.54	7.06	.84	.03	.43	3.35	-----	85.67	.04

Number	Kind	K ₂ O	SO ₃	S	P ₂ O ₅	CO ₂	C	H ₂	Ignition loss
1a	Limestone	0.71	0.04	0.25	0.15	33.53	0.61	-----	34.55
88	Dolomite	.03	.035	.013	.003	47.25	.08	0.008	47.52
102	Silica brick	.29	-----	-----	.025	-----	-----	-----	.38
104	Burned magnesite	<.01	-----	-----	.057	-----	-----	-----	-----

FELDSPARS

Number	Kind	K ₂ O	Na ₂ O	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MgO	TiO ₂	Ignition loss
70	Potash	12.58	2.38	66.66	18.03	0.03	0.07	0.013	0.002	0.22
99	Soda	.41	10.73	68.66	19.06	.067	.36	0.053	.017	.52

FLUORSPAR

Number	CaF ₂	CO ₂	SiO ₂	Zn	Pb	S	Fe ₂ O ₃	Al ₂ O ₃	P ₂ O ₅	TiO ₂	K ₂ O	Na ₂ O	MgO	BaO	MnO
79	94.83	0.99	1.88	0.35	0.23	0.13	0.15	0.02	0.005	0.003	0.01	0.06	0.13	0.07	0.003

CLAYS

Number	Kind	SiO ₂	Al ₂ O ₃	TiO ₂	ZrO ₂	Fe ₂ O ₃	P ₂ O ₅	V ₂ O ₅	Cr ₂ O ₃	K ₂ O
97	Flint clay	42.87	38.77	2.38	0.25	0.98	0.08	0.04	0.079	0.54
98	Plastic clay	59.11	25.54	1.43	.04	2.05	.08	.025	.021	3.17

Number	Kind	Na ₂ O	CaO	MgO	BaO	SO ₃	MnO	CuO	MoO ₃	Loss on ignition
97	Flint clay	0.33	0.10	0.26	0.015	0.042	0.002	0.003	0.0002	13.35
98	Plastic clay	.28	.21	.72	.06	.07	.005	.009	.0001	7.23

1. AVERAGED ANALYSES—Continued

BAUXITE AND ALUMINA REFRACTORIES

Number	Total Al ₂ O ₃	Total Fe ₂ O ₃	Loss on ignition	SiO ₂	TiO ₂	ZrO ₂	MnO
69.....	55.06	5.66	28.77	6.3	3.07	0.08	0.55
76.....	37.7	2.4	.22	54.7	2.2	.07	-----
77.....	59.4	.90	.21	32.4	2.9	.09	-----
78.....	70.0	.79	.26	20.7	3.4	.12	-----

CHROME REFRACTORY

Number	Cr ₂ O ₃	SiO ₂	FeO	Al ₂ O ₃	CaO	MgO	TiO ₂
103.....	36.97	8.24	14.39	20.83	0.79	16.27	0.93

SILICON CARBIDE

Number	Total Si	Total carbon	Free carbon	SiC	Fe	Al	Ti	Zr	Ca	Mg
112.....	69.1	29.10	0.1	96.85	0.45	0.24	0.024	0.025	0.03	0.02

GLASS SAND

Number	Fe ₂ O ₃	Al ₂ O ₃	TiO ₂	ZrO ₂	CaO	MgO
81.....	0.073	0.265	0.095	0.031	0.029	0.016

SODA-LIME GLASS

Number	SiO ₂	TiO ₂	Al ₂ O ₃	Fe ₂ O ₃	ZrO ₂	MnO	As ₂ O ₃	As ₂ O ₅	CaO	MgO	K ₂ O	Na ₂ O	SO ₃	Cl	Ignition loss
80.....	74.1	0.02	0.33	0.07	0.003	0.003	0.07	0.03	4.65	3.23	0.04	16.65	0.41	0.047	0.30

LEAD-BARIUM GLASS

Number	SiO ₂	PbO	Al ₂ O ₃	Fe ₂ O ₃	TiO ₂	CaO	BaO	MgO	MnO	Na ₂ O	K ₂ O	P ₂ O ₅	SO ₃	As ₂ O ₃	As ₂ O ₅	Cl	Ignition loss
89.....	65.4	17.50	0.18	0.049	0.01	0.21	1.40	0.03	0.09	5.70	8.40	0.23	0.03	0.36	0.03	0.05	0.32

OPAL GLASS

Number	SiO ₂	CaO	Na ₂ O	K ₂ O	Al ₂ O ₃	F	As ₂ O ₃	As ₂ O ₅	Fe ₂ O ₃	PbO	ZnO	P ₂ O ₅	TiO ₂	ZrO ₂	Cl	MnO	MgO
91.....	67.53	10.48	8.48	3.25	6.01	5.72	0.091	0.102	0.081	0.10	0.08	0.022	0.019	0.01	0.014	0.008	0.008

1. AVERAGED ANALYSES—Continued

BORON GLASSES

Number	SiO ₂	B ₂ O ₃	Al ₂ O ₃	Fe ₂ O ₃	TiO ₂	ZrO ₂	Na ₂ O	MgO	K ₂ O	P ₂ O ₅	SO ₃	Cl	As ₂ O ₃	As ₂ O ₅	CaO	
92.....		0.70														
93.....	80.60	12.76	1.94	0.076	0.027	0.013	4.16	0.026	0.16	(¹)	0.009	0.036	0.085	0.14	(¹)	

IRON ORES

Number	Name	SiO ₂	TiO ₂	P	Al ₂ O ₃	Fe	Mn	CaO	MgO
26.....	Crescent.....	² 5.03	² 0.07	0.040	² 1.02	² 58.62		2.56	3.27
27b.....	Sibley.....	1.31		.036		68.23			
28.....	Norrie.....						0.465		

MAGNETITE IRON ORE

Number	SiO ₂	TiO ₂	Al ₂ O ₃	V ₂ O ₃	FeO	Fe ₂ O ₃	Fe	MnO
29.....	12.02	0.99	1.91	0.08	24.78	52.20	[55.75]	0.09
	CaO	MgO	K ₂ O	Na ₂ O	H ₂ O+	CO ₂	P ₂ O ₅	S
29 (con.).....	2.90	2.01	0.51	0.45	0.47	0.68	1.01	0.025

PHOSPHATE ROCKS

Number	Name	Total P ₂ O ₅	Total Fe ₂ O ₃	Total Al ₂ O ₃	CaO	MgO
56.....	Tennessee.....	31.33	3.30	3.07	44.8	0.40
120.....	Florida land pebble.....	35.2	0.85	0.85		

MANGANESE ORE

Number	Total manganese	Available oxygen	Calculated MnO ₂
25b.....	58.35	16.67	90.59

ZINC ORES

Number	Name	Zinc
2a.....		30.53
113.....	Tri-State Concentrates.....	61.10

¹ Not detected.² Values derived from a small number of determinations at the National Bureau of Standards and not so well established as the other values.

2. CHEMICALS

ACID POTASSIUM PHTHALATE

Number	Purity on basis of titration	Chlorides	Sulphates	Heavy metals	Iron	Specific gravity
84.....	99.97	<0.001	None found.....	None found.....	<0.001	1.636

BENZOIC ACID

Number	Purity on basis of titration	Nonvolatile matter at 600° C	Heavy metals	Cl	S	Heat of combustion
39e.....	99.99	0.002%	<0.0005%	<0.001%	0.001%	26.419 International kilojoules per gram mass (wt in vacuo).

SODIUM OXALATE

Number	Water, 105°	Loss, 105 to 240°	NaHC ₂ O ₄	Na ₂ SO ₄	K	Fe	Cl	Specific gravity
40c.....	0.01	0.05	0.04	0.005	None found.....	None.....	<0.001	2.347

ARSENIC TRIOXIDE

Number	Purity on basis of titration	Non-volatile matter	Sulphides	Chlorides	Anti-mony	Iron	Other foreign metals	Specific gravity
83.....	99.97	0.014	<0.001	<0.002	<0.005	<0.003	None found...	3.71

NAPHTHALENE

Number	Heat of combustion, per gram weight (in air).
38b.....	9,614 calories 20° C.

SUGARS

Number	Name	Moisture	Reducing substances	Ash	Heat of combustion
17.....	Sucrose.....	<0.003	<0.002	<0.003	16.476 International kilojoules per gram mass (wt in vacuo).
41.....	Dextrose.....	<0.01	-----	<0.003	

IV. GENERAL INFORMATION

1. BOTTLING

Iron, steel, ceramic, and ore samples are sent in screw-capped glass bottles and organic samples in glass-stoppered bottles under seal.

2. LITERATURE

Detailed certificates of analysis are sent under separate cover to the same destination as the samples. Gummed labels with the summary of analysis are also furnished with most samples. In the case of new or renewed samples provisional typewritten certificates will be supplied until they can be replaced by the printed certificates and labels when ready.

3. SAMPLES OUT OF STOCK

The preparation of "Renewal" samples is intended to be complete at the time each kind of sample becomes exhausted, but owing to delays encountered in obtaining a proper grade of material and for other reasons this is not always possible. If orders are received for samples that are out of stock, notice will be mailed to that effect. The "Renewal" of an analyzed sample will have a composition more or less different from that of its predecessor, but, as regards the characteristic constituent or constituents, will pattern after it closely.

4. NEW SAMPLES

When new samples or renewals of old ones are issued, announcement will be made in scientific and trade journals.

5. MIXING

In order to overcome the effect of any segregation of granular samples in shipment, the contents of each bottle (except the organic samples) *should be thoroughly mixed before any is used for analysis.*

NOTE.—This supplement replaces that issued February 18, 1935. It supersedes all previous supplements and is effective on the date of issue hereof.

LYMAN J. BRIGGS,
Director, National Bureau of Standards.

Approved:

DANIEL C. ROPER,
Secretary of Commerce.



