

U. S. DEPARTMENT OF COMMERCE

National Bureau of Standards

Certificate of Analyses

OF

STANDARD SAMPLE 7D

CAST IRON

(HIGH-PHOSPHORUS)

500) 58.00 (.07 cents)
 350 lbs
 210) 900 samples
 4 1/2 s
 Ant Sep 1948

See half 7c

ANALYST*	C		Mn		P		S		Si							
	Total	Graphitic	Bismuthate (FeSO ₄ -KMnO ₄)	Persulfate-Arsenite	Gravimetric (weighed as Mn ₂ P ₂ O ₇ after removal of arsenic)	Alkali-Molybdate ^a	Gravimetric (direct oxidation and final precipitation in reduced solution)	Evolution with HCl (sp gr 1.18) ZnS-Iodine (theoretical sulfur titre) ^c	Sulfuric acid dehydration	COPPER H ₂ S CuS-CuO	NICKEL Weighed as nickel dimethylglyoxime	CHROMIUM FeSO ₄ -KMnO ₄ titration	VANADIUM	MOLYBDENUM Colorimetric	TITANIUM Colorimetric	
1	2.39	1.92	0.564	0.559	0.76	^d 0.78	0.065	0.066	^e 1.82	0.042	0.009	^f 0.020	^g 0.039	0.002	^h 0.07	
2	2.40	1.94	0.567			.78			^{k, e} 1.81	0.042	^m 0.009	.022		.004		
3	2.45	1.97	.56		.78	.78	.069	.066	1.81	0.048	.012	.024	.038			
	2.41	1.93		ⁱ .560	.78	.79	.067		^k 1.81	.040	.010	.015	.042			
	2.42	1.94	.563	.558	ⁿ .76	.77	.067	.064	^e 1.82	.037	^m .009	^f .019	^g .037	.003	.06	
6	2.40	1.93		.564	.78	.77	.064	.062	^e 1.81	.040	.010	.020	.038			
7	2.44			.567	.77	.75	.066					^f .020				
8	2.38	1.94		ⁱ .566		.77		.067	^{o, e} 1.79	^p .042	.009		.033			
Averages	2.41	1.93	0.564	0.562	0.77	0.77	0.066	0.065	1.81	0.042	0.010	0.020	0.038	0.003	0.07	
General average	2.41	1.93	0.563		0.77		0.066		1.81	0.042	0.010	0.020	0.038	0.003	0.07	

^a Precipitated at 40° C., washed with a 1-percent solution of KNO₃ and titrated with alkali standardized by the use of acid potassium phthalate and the ratio 23NaOH:1P.

^b Sample annealed by covering with a layer of graphite, and heating for 20 minutes at 685° C.

^c Value obtained by standardizing the titrating solution by means of sodium oxalate through KMnO₄ and Na₂S₂O₃ and use of the ratio 21:18.

^d Molybdenum-blue photometric method. See J. Research NBS 26, 405 (1941) RP1386.

^e Double dehydration.

^f Persulfate oxidation and potentiometric titration with ferrous ammonium sulfate.

^g Nitric acid oxidation and potentiometric titration with ferrous ammonium sulfate.

^h Solution in diluted HCl (1:2). A few milliliter of a 6-percent solution of cupferron added. Precipitate ignited, and vanadium separated by fusion with Na₂CO₃.

ⁱ Bismuthate-arsenite method.

^j Titrating solution standardized by use of a standard steel.

^k Perchloric acid dehydration.

^l Finished by electrolysis.

^m Dimethylglyoxime colorimetric method.

ⁿ Weighed as ammonium phosphomolybdate.

^o Nitric-sulfuric acid dehydration.

^p KI-Na₂S₂O₃ titration.

*LIST OF ANALYSTS

Ferrous Laboratory, National Bureau of Standards; analysis by J. P. Hewlett, Jr., J. I. Shultz, Florence Yenchius, and Jewel Doran.

2. J. A. Sample, Weirton Steel Co., Weirton, West Va.

3. J. B. Armstrong, Bethlehem Steel Co., Sparrows Point Plant, Sparrows Point, Md.

4. W. M. Barr, Union Pacific Railroad Co., Omaha, Nebr.

5. Jones & Laughlin Steel Corporation, H. E. Slocum, director of chemical laboratories, analysis by Pittsburgh Works, J. D. Ritz, chief chemist.

6. Jones & Laughlin Steel Corporation, H. E. Slocum, director of chemical laboratories, analysis by Aliquippa Works, D. J. Hallisey, chief chemist.

7. A. C. Miner, Griffin Wheel Co., Chicago, Ill.

8. S. S. Heide and J. W. Lovin, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

WASHINGTON, July 10, 1945.

LYMAN J. BRIGGS, Director.