

# National Bureau of Standards

## Certificate of Analyses

OF

STANDARD SAMPLE 7D

### CAST IRON

(HIGH-PHOSPHORUS)

*500) 52.00 (.07 cents)*  
*350 lbs*  
*200) 900 samples*  
*4 Yrs*  
*cont Sep 1948*

*See half 9c*

ANALYST*	C		Mn		P		S		Si	COPPER H <sub>2</sub> S CuS-CuO	NICKEL Weighed as nickel dimethylglyoxime	CHROMIUM FeSO <sub>4</sub> -KMnO <sub>4</sub> titration	VANADIUM	MOLYBDENUM Colorimetric	TITANIUM Colorimetric
	Total	Graphitic	Bismuthate (FeSO <sub>4</sub> -KMnO <sub>4</sub> )	Persulfate-Arsenite	Gravimetric (weighed as Mn <sub>2</sub> P <sub>2</sub> O <sub>7</sub> after removal of arsenic)	Alkali-Molybdate <sup>a</sup>	Gravimetric (direct oxidation and final precipitation in reduced solution)	Evolution with HCl (sp gr 1.18) ZnS-Iodine (theoretical sulfur titre) <sup>o</sup>	Sulfuric acid dehydration						
1	2.39	1.92	0.564	0.559	0.76	<sup>d</sup> 0.78	0.065	0.066	<sup>e</sup> 1.82	0.042	0.009	<sup>f</sup> 0.020	<sup>g</sup> 0.039	0.002	<sup>h</sup> 0.07
2	2.40	1.94	<sup>i,j</sup> 0.567			.78			<sup>k,e</sup> 1.81	<sup>l</sup> 0.042	<sup>m</sup> 0.009	.022		.004	
3	2.45	1.97	.56		.78	.78	.069	.066	1.81	<sup>l</sup> 0.048	.012	.024	.038		
	2.41	1.93		<sup>i</sup> 0.560	.78	.79	.067		<sup>k</sup> 1.81	.040	.010	.015	.042		
	2.42	1.94	.563	.558	<sup>n</sup> 0.76	.77	.067	.064	<sup>e</sup> 1.82	<sup>m</sup> 0.037	<sup>n</sup> 0.009	<sup>f</sup> 0.019	<sup>g</sup> 0.037	.003	.06
6	2.40	1.93		.564	.78	.77	.064	.062	<sup>e</sup> 1.81	.040	.010	.020	.038		
7	2.44			.567	.77	.75	.066					<sup>f</sup> 0.020			
8	2.38	1.94		<sup>i</sup> 0.566		.77		.067	<sup>o</sup> 1.79	<sup>p</sup> 0.042	.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

<sup>a</sup> Precipitated at 40° C., washed with a 1-percent solution of KNO<sub>3</sub> and titrated with alkali standardized by the use of acid potassium phthalate and the ratio 23NaOH:1P.

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

<sup>c</sup> Value obtained by standardizing the titrating solution by means of sodium oxalate through KMnO<sub>4</sub> and Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> and use of the ratio 21:18.

<sup>d</sup> Molybdenum-blue photometric method. See J. Research NBS 26, 405 (1941) RP1386.

<sup>e</sup> Double dehydration.

<sup>f</sup> Persulfate oxidation and potentiometric titration with ferrous ammonium sulfate.

<sup>g</sup> Nitric acid oxidation and potentiometric titration with ferrous ammonium sulfate.

<sup>h</sup> 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 Na<sub>2</sub>CO<sub>3</sub>.

<sup>i</sup> Bismuthate-arsenite method.

<sup>j</sup> Titrating solution standardized by use of a standard steel.

<sup>k</sup> Perchloric acid dehydration.

<sup>l</sup> Finished by electrolysis.

<sup>m</sup> Dimethylglyoxime colorimetric method.

<sup>n</sup> Weighed as ammonium phosphomolybdate.

<sup>o</sup> Nitric-sulfuric acid dehydration.

<sup>p</sup> KI-Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> titration.

### \* LIST OF ANALYSTS

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 WASHINGTON, July 10, 1945.

LYMAN J. BRIGGS, Director.