

DEPARTMENT OF COMMERCE

Bureau of Standards

Certificate of Analyses

OF

STANDARD SAMPLE No. 55

INGOT IRON

FURNISHED BY THE AMERICAN ROLLING MILL CO., MIDDLETOWN, OHIO.

ANALYSTS.*	C		Mn		P		S		Si	COPPER. H ₂ S-CuS-CuO.	NICKEL. Weighed as nickel dimethylglyoxime.	CHROMIUM. FeSO ₄ -KMnO ₄ titration.	MOLYBDENUM.	COBALT.	ARSENIC.	ALUMINUM.
	1. Direc: Combustion.	2. Solution and combustion. ^a	1. Bismuthate (FeSO ₄ -KMnO ₄).	2. Other methods.	1. Alkali-Molybdate. ^b	2. Gravimetric (Weighed as MgP ₂ O ₇ after removal of arsenic).	1. SULPHUR. Gravimetric (Direct oxidation and final precipitation in reduced solution).	2. SULPHUR. Evolution with HCl (1:1; theoretical sulphur titre %).	SILICON. Sulphuric acid dehydration.							
1.....	0.014	0.014	0.021		0.003	0.002	0.016	0.016 ^d	0.001	0.043	0.018	0.002	0.002	0.004	0.010	0.001
2.....	.011	.011 ^e	.020		.003		.016	0.017	<.001	.043	.019	.002	.002		.011	.002
3.....	.012			0.018 ^f	.006				.001 ^g	.038 ^h						
4.....	.015		.020		.004	.003	.018	.019	.002	.037	.018					
5.....	.012 ^e			.018 ^f	.005		.018	.017	<.001	{.042 ⁱ .044					.014	
6.....	.015		.021		.003		.018 ^j		.001	.042 ⁱ						
7.....	.012 ^k	.011	.019		.004	.004	.014	.014 ^l	{None found	.040	.023			.007		
8.....	.013 ^m		.017		.002		.015		<.001	.041	.024					
9.....	.015 ⁿ	.013	.018		.003	.003	.018	.019	.001	.038	.019					
Averages.....	.013	.012	.019	.018	.004	.003	.017	.017	<.001	.041	.020	.002	.002	.006	.012	.002
General Averages.....	.013		.019		.003		.017	.017	<.001	.041	.020	.002	.002	.006	.012	.002

NOTE.—By the use of methods employing empirical titres for evolution sulphur an average of 0.020 per cent was obtained by three analysts.

^a Dissolved in a hydrochloric acid solution of copper-potassium chloride, filtered on ignited asbestos and burned in the usual way.

^b Precipitated at 40° C., washed with 1 per cent KNO₃ solution and titrated with alkali standardized by the use of B. S. benzoic acid and the 23:1 ratio.

^c Value obtained by standardization of titrating solution against sodium oxalate through KMnO₄ and Na₂S₂O₃.

^d Owing to the difficulty with which this ma-

terial dissolves in HCl (1:1), it is advisable to add 10 cc. of strong ammonium hydroxide to the absorbing solution to prevent neutralization by the HCl which passes over during the evolution.

^e Weighed as BaCO₃.

^f Bismuthate-Arsenite.

^g Solution in HNO₃ and H₂SO₄.

^h Colorimetric.

ⁱ Finished by electrolysis.

^j Precipitated in FeCl₃ solution.

^k CO₂ absorbed in Ba(OH)₂, BaCO₃ filtered and titrated with standard HCl.

^l Evolved gases absorbed in bromine water and the sulphur determined as BaSO₄.

^m Mixed with red lead.

ⁿ Mixed with Fe₂O₃.

*LIST OF ANALYSTS

- James I. Hoffman, Bureau of Standards.
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- J. A. Aupperle, The American Rolling Mill Co., Middletown, Ohio.
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- G. H. Corey and Wm. H. Buckhout, Ledoux & Co., New York, N. Y.

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