Department of Commerce

Bureau of Standards

Certificate of Analyses

(SECOND EDITION, REVISED)

OF

STANDARD SAMPLE No. 26

CRESCENT IRON ORE (DRIED AT 100°)

CHEMIST	LOCATION	METHOD FOR Al_2O_3	APPARENT Al_2O_3	TRUE[1] Al_2O_3	CaO	MgO
William Blum	Bureau of Standards					
a		Phosphate	1. 10	1. 03	2. 57	3. 26
b		Phenylhydrazine	1. 17	1. 01		
c		Ether	1. 19	1. 03		
d		Electrolytic	1. 17	1. 01		
W. F. Hillebrand	Bureau of Standards				2. 55	3. 28
Average, Bureau of Standards				1. 02	2. 56	3. 27
F. L. Crobaugh	Cleveland, Ohio	Phosphate	(1. 13)	1. 06	2. 83	3. 27
Crowell & Murray	Cleveland, Ohio	Phosphate	1. 09	(1. 02)	2. 76	3. 70
Dickman & Mackenzie	Chicago, Ill	Phosphate	(1. 11)	1. 04	2. 70	3. 47
A. Emmerton	Cleveland, Ohio	Phosphate	1. 09	(1. 02)	2. 59	3. 54
J. Rattle & Sons	Cleveland, Ohio	Phosphate	1. 08	(1. 01)	2. 45	3. 58
Oscar Textor	Cleveland, Ohio	Phosphate	1. 07	(1. 00)	2. 71	3. 45
Average, commercial chemists				1. 00	2. 67	3. 50
J. M. Camp	Carnegie Steel Co., Duquesne, Pa	Ether	(1. 16)	1. 00	2. 54	3. 43
R. F. Clanfield	Illinois Steel Co., South Chicago, Ill	Phosphate			2. 75	3. 50
W. B. N. Hawk	National Tube Co., Lorain, Ohio	Phosphate	(1. 09)	1. 02	2. 54	3. 48
C. H. Rich	Carnegie Steel Co., Clairton, Pa	Phosphate	1. 06	(. 99)	2. 52	3. 40
Average, Steel Corporation chemists				1. 00	2. 59	3. 45
G. L. Fitzwilliam	Ely, Minn		(1. 07)	1. 00	2. 60	3. 35
A. T. Gordon	Mt. Iron, Minn		(1. 13)	1. 06	2. 53	3. 41
E. T. Griese	Hibbing, Minn		(1. 15)	1. 08	2. 56	3. 45
G. A. Hellberg	Norway, Mich		(1. 10)	1. 03	2. 58	3. 58
J. H. Hitchens	Iron Mountain, Mich		(1. 09)	1. 02	2. 90	3. 76
A. L. Johnson	Ishpeming, Mich		(1. 06)	. 99	2. 78	3. 20
E. C. Jones	Eveleth, Minn		(1. 11)	1. 04	2. 55	3. 42
C. J. Mott	Coleraine, Minn		(1. 16)	1. 09	2. 62	3. 40
W. J. Phillips	Iron River, Wis		(1. 07)	1. 00	2. 63	3. 47
H. S. Sherman	Eveleth, Minn		(1. 10)	1. 03	2. 55	3. 44
F. W. Ulrich	Chisholm, Minn		(1. 14)	1. 07	2. 69	3. 32
Norman Winn	Bessemer, Mich		(1. 09)	1. 02	2. 69	3. 47
A. Winn	Ironwood, Mich		(1. 09)	1. 02	2. 75	3. 42
Average, Oliver Mining Co. chemists				1. 03	2. 65	3. 44
GENERAL AVERAGE				1. 02	2. 64	3. 44

[1] Values in parentheses have been calculated from those submitted.

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(OVER)

NOTES

1. *Alumina.*—Analyses at the Bureau of Standards showed 0.07 per cent TiO_2 and 0.09 per cent P_2O_5 in this ore. Assuming 1.02 per cent as the correct value for true alumina, the apparent alumina if weighed as phosphate, as in Peter's method, would be 1.09 per cent. In other methods, in which the sum of Al_2O_3, TiO_2, and P_2O_5 is determined, the apparent alumina should be 1.18 per cent. The values given for the mine chemists, and for Messrs. Crobaugh, Dickman & Mackenzie, and Emmerton, represent the results obtained in redeterminations, using special precautions to avoid loss or contamination.

2. *Lime.*—We recommend the value 2.56 per cent rather than the general mean 2.64 per cent, which is derived from results showing wide variations. High results are probably due to the attack of the glass vessels used in the analyses, or to impurities in reagents, or to the use of unwashed filters. On the other hand, low results will be obtained if the lime carried into the filtrates and precipitated with the magnesia is not determined. Frequently, no doubt, these errors approximately balance each other, though failure to make such corrections will cause high results for magnesia.

3. *Magnesia.*—The average value 3.27 per cent is believed to be very much nearer the true value than the general average 3.44 per cent. Results on this and other ores have shown that unless extreme precautions are observed, high values for magnesia will be obtained, due to impurities in the reagents, or contamination from the containing vessels, or to incomplete precipitation of lime. By using the true value of such a standard as this for comparative analyses, the commercial chemist can readily learn approximate magnitude of such errors in the methods used by him.

4. *Iron.*—The mean of twelve determinations at the Bureau of Standards indicates 58.62 per cent total iron. While this ore is not primarily intended as an iron standard, this value may be employed, provided the ore is dried at 100° immediately before using.

5. *Silica.*—The mean of five determinations at the Bureau of Standards was 5.03 per cent SiO_2.

6. For description of the methods employed consult Circular No. 26, fourth edition, on "Analyzed Iron and Manganese Ores—Methods of Analysis."

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Director.

WASHINGTON, D. C.,
September 20, 1930