

U.S. DEPARTMENT OF COMMERCE
WASHINGTON 25, D.C.

National Bureau of Standards

Certificate of Analyses

Standard Sample 64B

Ferrochromium (High Carbon)

ANALYST	Cr	C	Mn	P	S	Si	V	N
		Direct combustion	Persulfate-arsenite	Molybdenum-blue photometric	Combustion Iodate titration	Perchloric acid dehydration		Distillation-titration
1.....	^a 68.00	4.28	^b 0.214	0.009	^c 0.062	^{b,d} 1.45	^e 0.14	^f 0.033
2.....	^a 67.94	4.28	^g .20	.013	.063	^{b,d} 1.39	ⁱ .16	.032
3.....	^j 68.00	^k 4.34	.21	.011	.059	^b 1.42	^l .14	^m .031
4.....	ⁿ 68.00	^k 4.30	^o .211	.009	.065	^p 1.39	^q .16	.034
5.....	^j 68.12	4.32	^b .201	.012	.061	^{b,d} 1.44	^r .14	.033
6.....	^j 68.15	4.30	^{b,s} .209	^{b,t} .016	.064	^b 1.42	.15	.033
7.....	^j 68.05	4.32	^{b,u} .211	.013	.061	^{b,d} 1.43	.14	.034
Averages.....	68.03	4.30	0.208	0.012	0.062	1.42	0.15	0.033

^a 0.5 g sample fused with 8 g of Na₂O₂. Melt leached with water, solution boiled 15 minutes, acidified with H₂SO₄, treated with AgNO₃-(NH₄)₂S₂O₈ and chromate titrated potentiometrically with FeSO₄ standardized against K₂Cr₂O₇.

^b Na₂O₂ fusion.
^c 0.5 g sample plus 1 g of ingot iron and 0.3 g of copper burned in oxygen at 1,425 °C, and sulfur dioxide absorbed in starch-iodide solution. Iodine liberated from iodide by titration, during the combustion, with standard KIO₃ solution. Titer based on 93 percent of the theoretical factor.
^d Double dehydration with intervening filtration.

^e Na₂O₂ fusion—HNO₃ oxidation, potentiometric titration with FeSO₄.

^f Sulfuric acid digestion for 3 hr of 0.3 g sample. See J. Research NBS 43, 201 (1949) RP2021.

^g Periodate photometric method.

^h Na₂O₂ fusion—H₂SO₄ dehydration.

ⁱ Butyl acetate—cupferron separation. Vanadium determined by H₂O₂ photometric method.

^j Na₂O₂ fusion—FeSO₄-KMnO₄ titration method.

^k Volumetric method.

^l Mercury cathode—cupferron—potentiometric titration.

^m Distillation—photometric method.

ⁿ Na₂O₂, Na₂CO₃ fusion—titration with FeSO₄-K₂Cr₂O₇ using diphenylamine.

^o Potentiometric titration with KMnO₄ in pyrophosphate solution.

^p Silicon precipitated as K₂SiF₆, treated with water, and titrated with standard NaOH solution.

^q Cupferron separation. Vanadium oxidized by the KMnO₄-nitrite-urea method and titrated with FeSO₄.

^r FeSO₄-(NH₄)₂S₂O₈-KMnO₄ method.

^s Bismuthate method.

^t Alkali-molybdate method.

^u Bismuthate-arsenite method.

List of Analysts

1. Ferrous Laboratory, National Bureau of Standards. J. I. Shultz, in charge. Analysis by E. June Maienthal and T. W. Freeman.
2. J. J. Furey, Union Carbide Metals Co., Division of Union Carbide Corp., Niagara Works, Niagara Falls, N.Y.
3. F. Rizak, Vanadium Corporation of America, Research Center, Cambridge, Ohio.
4. E. E. Brown, Interlake Iron Corp., Beverly Plant, Beverly, Ohio.

5. H. A. Mast, R. L. Payne, and L. J. Orndorff, Ohio Ferro-Alloys Corp., Canton, Ohio.
6. P. L. Amschler Allegheny Ludlum Steel Corp., Brackenridge Works, Brackenridge, Pa.
7. A. Thomas, Chief Chemist, Armco Steel Corp., Research Center, Middletown, Ohio. Analysis by L. C. Ikenberry, R. L. LeRoy, and C. C. Borland.

The metal for the preparation of this standard was furnished by Union Carbide Metals Co., Niagara Falls, N.Y.

WASHINGTON, D.C. January 8, 1962

A. V. Astin, Director