

U. S. DEPARTMENT OF COMMERCE

National Bureau of Standards

Certificate of Analyses OF STANDARD SAMPLE 61A FERROVANADIUM

ANALYST*	V		C	Mn	P		S	Si	CHROMIUM FeSO ₄ -KMnO ₄ titration	ALUMINUM (total)
	HNO ₃ oxidation, potentiometric titration	Other methods	Direct combustion	Persulfate-Arsenic	Gravimetric (weighed as Mg ₂ P ₂ O ₇ after removal of arsenic)	Alkali-Molybdate ^a	Gravimetric (direct oxidation and final precipitation in reduced solution)	Nitric-sulfuric acid dehydration		
1	50.16	^b 50.20	^c 1.05	^d 1.78	^e 0.120	^f 0.119	0.005	^g 5.14	^h 0.68	0.02
2		ⁱ 50.15	1.08	^j 1.77	^k .124	^l .118	.006	^m 5.08	.69	.02
	50.22		1.05	ⁿ 1.77	^o .127	.125	.003	^p 5.14	.67	.02
		^q 50.18	^r 1.04	^s 1.81		.118	^t .005	^u 5.09	.69	< .01
5		^v 50.15	^w 1.05	^x 1.78			.004	^y 5.12		< .01
6		^z 50.27	1.07	^{aa} 1.78		.113		^{ab} 5.10	.67	.01
7		^{ac} 50.29	1.04	^{ad} 1.75		.108	.005	^{ae} 5.10		.03
8		^{af} 50.13	1.07	^{ag} 1.79	.122		.006	^{ah} 5.18	.70	.02
Averages.....	50.19	50.20	1.06	1.78	0.123	0.117	0.005	5.12	0.68	0.02
General averages.....	50.19		1.06	1.78		0.119	0.005	5.12	0.68	0.02

^a Titrated with alkali standardized by the use of acid potassium phthalate and the ratio 23NaOH:1P.
^b Mercury cathode-SO₂ reduction-KMnO₄ titration method.
^c Burned with ingot iron.
^d Manganese separated from chromium and vanadium by precipitation with NaOH-Na₂O₂.
^e Ammonium phosphomolybdate precipitated from hot, reduced solution in the absence of nitrates.

^f Molybdenum-blue photometric method. See J. Research NBS 26, 405 (1941) RP1386.
^g Double dehydration.
^h Potentiometric titration.
ⁱ FeSO₄-(NH₄)₂S₂O₈-KMnO₄ titration method.
^j Bismuthate-FeSO₄-KMnO₄ titration method.
^k Vanadium separated with cupferron.
^l Peroxide fusion, H₂SO₄ dehydration method.
^m Bismuthate-arsenite method.

ⁿ Combustion method. Sulfur gases absorbed in acidified starch iodine solution and titrated with KIO₃ solution.
^o Potentiometric titration with Fe(NH₄)₂(SO₄)₂ followed by titration with 0.1 N KMnO₄ to pink end point.
^p ZnO separation.
^q HCl reduction, KMnO₄ titration.
^r HClO₄ dehydration.

*LIST OF ANALYSTS

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The metal for the preparation of this standard was furnished by the Electro Metallurgical Co.

WASHINGTON, April 15, 1946.

E. U. CONDON, *Director.*