

National Bureau of Standards

Certificate of Analyses

OF

STANDARD SAMPLE 10E

BESSEMER STEEL, 0.4% CARBON

ANALYST*	C	Mn		P		S		Si	COPPER H ₂ S-CuS-CuO	NICKEL Weighed as nickel dimethylglyoxime	CHROMIUM FeSO ₄ -KMnO ₄ titration	VANADIUM	MOLYBDENUM Colorimetric	ARSENIC	NITROGEN
	Direct combustion	Bismuthate (FeSO ₄ -KMnO ₄)	Persulfate-Arsenite	Gravimetric (weighed as Mg ₂ P ₂ O ₇ after removal of arsenic) ^c	Alkali-Molybdate ^a	Gravimetric (direct oxidation and final precipitation after reduction of iron)	Evolution with HCl (1:1) ZnS-Iodine (theoretical sulfur titer) ^b	Combustion							
1	0.406	0.632	0.635	0.081	0.082	0.046	0.045	0.068	0.035	0.020	0.024	0.004	0.009	0.004	0.009
2	.403		i. 635	.082	.081	.046	i. 045	.067	.034	.021	.023	j. 005	.011	k. 006	
3	.404		i. 631	.085	e. 084		.047	l. 065	m. 030	.020	n. 025	f. 004	.009		
	.407		.636	.083	.085	.048	o. 049	p. d. 066	q. 034	.021	r. 023	i. 004	.009	s. 004	t. 010
5	.410	.635			.085		u. i. 050	v. d. 065	m. 032	.020	r. 023	x. 003	.012		
6	.406		i. 631		.081	.046		v. d. 073	.029	.018	y. 022	z. 002	.010	aa. 003	
Averages	0.406	0.634	0.634	0.083	0.083	0.047	0.047	0.067	0.032	0.020	0.023	0.004	0.010	0.004	0.010
General average	0.406	0.634		0.083		0.047		0.067	0.032	0.020	0.023	0.004	0.010	0.004	0.010

^a Precipitated at 40° C washed with a 1-percent solution of KNO₃ and titrated with alkali standardized by the use of National Bureau of Standards acid potassium phthalate and the ratio 23NaOH:1P.
^b Value obtained by standardizing the titrating solution by means of sodium oxalate through KMnO₄ and Na₂S₂O₃ and the use of the ratio 2I:1S.
^c Molybdenum-blue photometric method. See J. Research NBS 26, 405 (1941) RP1386.
^d Double dehydration.
^e Persulfate oxidation, potentiometric titration with ferrous ammonium sulfate solution.
^f Nitric acid oxidation, potentiometric titration with ferrous ammonium sulfate solution.

^g Determination made by K. D. Fleischer by the distillation-molybdenum-blue photometric method. See J. Research NBS 24, 7 (1940) RP1267.
^h Determination made by M. Marie Cron, by the vacuum-fusion method. See BS J. Research 7, 375 (1931) RP346.
ⁱ Solution standardized by use of a standard steel.
^j Ferrous sulfate-persulfate method.
^k Distillation-bromate titration method.
^l Perchloric acid dehydration.
^m Finished by electrolysis.
ⁿ Perchloric acid-photometric method.
^o Absorbed in cadmium chloride solution.
^p Nitric-sulfuric acid dehydration.
^q Finished by Na₂S₂O₃ titration.
^r Perchloric acid oxidation.

^s Distillation-As₂S₃ method.
^t Solution in HCl (1:1). Distillation-titration method.
^u 5-g sample wrapped in filter paper and annealed for 1 hour at 700° C.
^v Sulfur gases absorbed in NaOH-H₂O₂ and excess NaOH titrated with H₂SO₄.
^w Solution in HCl-HNO₃. Perchloric acid dehydration.
^x Cupferron-phosphotungstovanadate-photometric method.
^y Preliminary separation of chromium in a 10-g sample by precipitation with NaHCO₃.
^z Vanadium separated from a 10-g sample as in footnote y, and determined by the H₂O₂-colorimetric method.
^{aa} Distillation-As₂S₃-Ag₂AsO₄-KCNS titration method.

* LIST OF ANALYSTS

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2. R. H. Rouse, Bethlehem Steel Corporation, Steelton, Pa.
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The steel for the preparation of this standard was furnished by the Bethlehem Steel Co.