

National Bureau of Standards

Certificate of Analyses

OF

STANDARD SAMPLE 9D

BESSEMER STEEL, 0.2% 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	NITROGEN
	Direct combustion	Bismuthate (FeSO ₄ -KMnO ₄)	Persulfate-Arsenite	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)	Evolution with HCl (1-1) ZnS-Iodine (theoretical sulfur titre) ^b	Sulfuric acid dehydration						
1.....	0. 200	0. 618	0. 616	0. 095	^o 0. 097	0. 035	0. 036	^d 0. 033	0. 008	0. 004	^e 0. 004	^f 0. 006	0. 001	^g 0. 018
2.....	. 198	.....	. 62	^h . 100	. 099	. 039	. 038	ⁱ . 029	. 007	. 004	. 003	^j . 005	. 003	.....
3.....	. 200	.....	^k . 623	.....	^k . 097	.....	. 039	. 030	^l . 011	^m . 003	^m . 005	^m . 006	^m . 001	ⁿ . 015
4.....	. 205	.....	^k . 621	.....	^k . 098	. 036	. 034	^o d. 033	^m . 009	.....	.....	.....	.....	.....
5.....	. 206	. 624	. 62	. 096	. 097	. 035	^p . 035	^d . 036	. 012	. 004	^e . 005	^f . 005	. 001	^q . 017
.....	. 204	. 618	. 619	. 095	. 096	. 036	. 036	. 035	. 010	^m . 004	^m . 004	.....	. 001	^q . 018
.....	. 207	.....	^k . 620	.....	^k . 099	.....	^k . 037	ⁱ . 030	^r . 008	. 005	^s . 004	^j . 004	. 002	.....
8.....	. 207	.....	. 620	^h . 095	. 096	. 036	. 036	^o d. 032	. 011	^m . 005	. 007	^k . 01	. 003	^p . 017
9.....	. 205	.....	^k . 620	. 096	^k . 097	. 038	^k . 038	ⁱ d. 033	. 005	. 003	. 004	. 004	. 001	^t . 016
10.....	. 208	.....	. 62	.....	. 098	. 035	. 037	. 031	^m . 007	^m . 004	. 004	^j . 004	.....	.....
Averages.....	0. 204	0. 620	0. 620	0. 096	0. 097	0. 036	0. 037	0. 032	0. 009	0. 004	0. 004	0. 005	0. 002	0. 017
General average.....	0. 204	0. 620		0. 096		0. 036		0. 032		0. 004	0. 004	0. 005	0. 002	0. 017

^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:1 P.
^b Value obtained by standardizing the titrating solution by means of sodium oxalate through KMnO₄ and Na₂S₂O₈, and use of the ratio 2I:1S.
^c Colorimetric method. See J. Research NBS 26, 405 (1941) RP1336.
^d Double dehydration.
^e Persulfate oxidation and potentiometric titration with ferrous ammonium sulfate solution standardized

with recrystallized potassium dichromate.
^f Nitric acid oxidation and potentiometric titration with ferrous ammonium sulfate solution standardized with recrystallized potassium dichromate.
^g Determination made by M. Marie Cron, by the vacuum-fusion method. See NBS J. Research 7, 375 (1931) RP346.
^h Weighed as ammonium phosphomolybdate.
ⁱ Perchloric acid dehydration.
^j Ferrous sulfate-persulfate-KMnO₄ titration.
^k Titrating solution standardized by use of a standard steel.

^l Finished by electrolysis.
^m Colorimetric method.
ⁿ Allen method.
^o Nitric-sulfuric acid dehydration.
^p Titrating solution standardized by use of an empirical factor.
^q Determined colorimetrically following semimicro-distillation.
^r KI-Na₂S₂O₈ titration.
^s Perchloric acid oxidation.
^t Solution in sulfuric-phosphoric acid mixture. Distillation and titration.

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The steel for the preparation of this standard was furnished by the Jones & Laughlin Steel Corporation.

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LYMAN J. BRIGGS, *Director*.