U. S. DEPARTMENT OF COMMERCE

National Bureau of Standards

Certificate of Analyses

OF

STANDARD SAMPLE 8G

BESSEMER STEEL, 0.1% CARBON

ANALYST*	C	Mn		P		S			Si	Cu	Ni	Cr	V	Mo	Sn	N	
	Direct combustion	Bismuthate ($FeSO_4$-$KMnO_4$)	Persulfate-Arsenite	Gravimetric (weighed as $Mg_2P_2O_7$ after removal of arsenic)	Alkali-Molybdate[a]	Gravimetric (direct oxidation and final precipitation after reduction of iron)	Evolution with HCl (1:1) ZnS-Iodine (theoretical sulfur titer)[s]	Combustion	Sulfuric acid dehydration	H_2S-CuS-CuO	Weighed as nickel dimethylglyoxime	$FeSO_4$-$KMnO_4$ titration					
1	0. 067	0. 423	0. 429	0. 092	[c]0. 093	0. 024	0. 026		[d]0. 014	[e]0. 020	0. 010	[f]0. 009	[g]0. 002	0. 003	[h]0. 002	[i]0. 020	
2	. 068	. 425	. 425	. 093	[c]. 093	. 027	. 027		[j,d]. 013	. 021	. 010	[k]. 009				[l]. 021	
3	. 071		. 425	. 089	. 089	. 025	. 024		. 012	. 016	. 010	. 008					
4	. 070		[m]. 425	. 092	. 094	. 025	. 025		. 011	. 018	[n]. 008	[k]. 008				[o]. 021	
5	. 066		[m]. 427		[m]. 093		[p]. 028	0. 027	. 010	[q]. 019	. 010	. 009				. 021	
6	. 071	[m,r]. 431		[s]. 095	[m]. 095	. 025	[m]. 027	[t]. 026	. 013	. 021	. 012	[m]. 009					
7	. 070	[m,r]. 428			. 091				[j,d]. 016	[q]. 020	[n]. 013	. 008		. 003			
8	. 070	. 428	. 423		. 093	. 025	. 026		[d]. 014	. 019	[n]. 011	[f]. 008				[o]. 023	
9	. 070		. 431	. 094	. 093	. 025	. 026		[d]. 014	. 020	[n]. 012	[u]. 009				[o]. 022	
Averages	0. 069	0. 427	0. 426	0. 093	0. 093	0. 025	0. 026	0. 026	0. 013	0. 019	0. 011	0. 009	0. 002	0. 003	0. 002	0. 021	
General average	0. 069	0. 427		0. 093		0. 026			0. 013	0. 019	0. 011	0. 009	0. 002	0. 003	0. 002	0. 021	

[a] Precipitated at 40° C, washed with a 1-percent solution of KNO_3, 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 $KMnO_4$ and $Na_2S_2O_3$, and use of the ratio 2I:1S.

[c] Colorimetric method. See J. Research NBS **26,** 405 (1941) RP1386.

[d] Double dehydration.

[e] Copper-ammonia-complex colorimetric method.

[f] Persulfate oxidation and potentiometric titration with ferrous ammonium sulfate.

[g] Nitric acid oxidation and potentiometric titration with ferrous ammonium sulfate.

[h] Determination made by R. K. Bell by the sulfide separation, iodine titration method. See BS J. Research 8, 309 (1932) RP415.

[i] Determination made by M. Marie Cron, by the vacuum-fusion method. See BS J. Research **7,** 375 (1931) RP346.

[j] Perchloric acid dehydration.

[k] Perchloric acid oxidation.

[l] Solution-distillation method.

[m] Titrating solution standardized by use of a standard steel.

[n] Dimethylglyoxime colorimetric method.

[o] Determined colorimetrically following semimicro distillation.

[p] Solution in diluted HCl(2:1).

[q] Finished by electrolysis.

[r] Bismuthate-arsenite method.

[s] Weighed as ammonium phosphomolybdate.

[t] Sulfur gases absorbed in starch-iodide solution and titrated with KIO_3 solution standardized with standard steels.

[u] Diphenylcarbazide colorimetric method.

*LIST OF ANALYSTS

1. Ferrous laboratory, National Bureau of Standards, John L. Hague in charge. Analysis by John P. Hewlett, Jr., and J. I. Shultz.
2. M. Herzog and J. P. Fite, St. Louis-San Francisco Railway Co., Springfield, Mo.
3. S. J. Modzikowski, F. P. Mueller, and H. J. Latham, Peoples Gas Light & Coke Co., Chicago, Ill.
4. E. T. Saxer, Jones & Laughlin Steel Corporation, Otis Works, Cleveland, Ohio.
5. W. E. Steiner, Bethlehem Steel Co., Johnstown, Pa.
6. Stephen Hisch, The Andrews Steel Co., Newport, Ky.
7. J. A. Sample, Weirton Steel Co., Weirton, W. Va.
8. Jones & Laughlin Steel Corporation, H. E. Slocum, director of chemical laboratories. Analysis by Pittsburgh Works, J. D. Ritz, chief chemist.
9. Jones & Laughlin Steel Corporation, H. E. Slocum, director of chemical laboratories. Analysis by Aliquippa Works, D. J. Hallisey, chief chemist.

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

ASHINGTON, May 3, 1944.

LYMAN J. BRIGGS, *Director.*

U. S. GOVERNMENT PRINTING OFFICE 588609