

Bureau of Standards

Certificate of Analyses

OF

STANDARD SAMPLE No. 73

STAINLESS STEEL

ANALYST*	C	Mn		P		S		Si		Ni	Cr			
	CARBON Direct combustion	MANGANESE 1. Bicarbonate (FeSO ₄ -KMnO ₄)	2. Other methods	PHOSPHORUS 1. Alkali-Molybdate ^a	2. Gravimetric (Weighed as Mg ₂ P ₂ O ₇ after removal of arsenic)	1. SULPHUR Gravimetric (Direct oxidation and final precipitation in re- duced solution)	2. SULPHUR Evolution with HCl (1:1 ZnS-Iodine (theoretical sulphur titre))	SILICON Sulphuric acid dehydra- tion	COPPER H ₂ S-CuS-CuO	NICKEL Weighed as nickel dimethyl- glyoxime	CHROMIUM FeSO ₄ -KMnO ₄ titration	Vanadium	MOLYBDENUM	ARSENIC
1.....	0.315	0.275 ^c	0.272 ^d	0.022 ^e	0.021	{ 0.031 ^f .030 ^g }	0.031	0.363	0.034	0.078	13.91 ^h	0.032 ⁱ	0.004 ^j	-----
2.....	-----	.274 ^c	-----	-----	-----	-----	-----	-----	-----	-----	13.89	-----	-----	-----
3.....	.314	.266	-----	.024 ^k	-----	{ .032 .030 ^g }	.032	.354 ^l	.035 ^m	.069	13.86	-----	-----	-----
4.....	.31	.27 ^c	-----	.025 ⁿ	-----	-----	.029	.364 ^l	.027	-----	13.88	-----	.002 ^j	-----
5.....	.318	.286	-----	.025 ⁿ	-----	.030 ⁿ	.029	.362 ^o	.035 ^p	.072 ^q	13.93 ^r 13.95	-----	-----	-----
-----	.32	.28	-----	.022	-----	-----	.034	.35	.026	.069	13.97	-----	-----	-----
-----	.313	.273 ^c	-----	.025 ⁿ	-----	.033	-----	.361 ^l	-----	.067	13.88	.04	-----	-----
8.....	.327	-----	.269 ^s	.024	-----	.028 ^u	.027	.366	.027 ^p	.078	13.98 ^b	-----	-----	-----
9.....	.310	-----	.289 ^s	.021 ^t	-----	.032	.032	.358	.041	-----	13.87	-----	.006 ^j	-----
10.....	.303	-----	.277 ^s	.022 ⁿ	.021	.030	.030 ^u	.359	.040	.073	13.97	.029 ^v	.006 ^j	0.011
11.....	.307	-----	-----	-----	-----	-----	-----	-----	-----	-----	13.96 ^w	-----	-----	-----
AVERAGES	.314	.275	.277	.023	.021	.031	.031	.360	.033	.072	13.93	.034	.005	.011
General	.314	0.276	-----	.023	-----	.031	.031	.360	.033	.072	13.93	.034	.005	.011
Averages..	.314	0.276	-----	.023	-----	.031	.031	.360	.033	.072	13.93	.034	.005	.011

^a Precipitated at 40° C., washed with a 1 per cent solution of KNO₃ and titrated with alkali standardized by means of B. S. benzoic acid and the 23:1 ratio.
^b Value obtained by standardization of titrating solution against sodium oxalate through KMnO₄ and Na₂S₂O₄.
^c Chromium removed by the use of bicarbonate before bismuthate oxidation.
^d Bismuthate oxidation in sulphuric acid solution and electrometric titration with mercurous nitrate in the presence of chromium.
^e Sample dissolved in nitric and hydrofluoric acids.
^f Sample dissolved by covering with nitric acid and then adding 3 cm³ of hydrofluoric acid.
^g Meineke's method.
^h Persulphate oxidation—electrometric titration.
ⁱ Nitric acid oxidation—electrometric titration.
^j Determined colorimetrically by development of color with KSCN and SnCl₂.
^k Dissolved sample in nitric and hydrofluoric acids, precipitated phosphorus as molybdate, reduced with zinc and titrated with KMnO₄.

^l Hydrochloric acid dehydration.
^m Ni₂S₂O₈-CuS-CuO.
ⁿ Dissolved in aqua regia.
^o Perchloric acid dehydration.
^p Finished by electrolysis.
^q Precipitated as nickel dimethylglyoxime, dissolved the precipitate and titrated with KCN.
^r Perchloric acid oxidation.
^s Chromium separated by the use of ZnO.
^t Fused the sample with sodium peroxide. Obtained same result by dissolving the sample in aqua regia.
^u Used 3:1 hydrochloric acid.
^v Cain and Hostetter's method.
^w Used both the permanganate oxidation and chlorate oxidation methods and obtained the same result.

* LIST OF ANALYSTS

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This standard is not recommended for colorimetric carbon determinations, because of uncertainty as to the condition of the carbon.

Washington, D. C.
July 14, 1927

George K. Burgess
Director.