

U. S. DEPARTMENT OF COMMERCE

National Bureau of Standards

Certificate of Analyses

OF

STANDARD SAMPLE 122 A

CAST IRON

(CAR-WHEEL)

ANALYST*	C		Mn		P		S		Si						
	Total	Graphitic	Bismuthate (FeSO ₄ -KMnO ₄)	Persulfate-Arsenite	Gravimetric (weighed as Mg ₃ P ₂ O ₇ after removal of arsenic)	Alkali-Molybdate ^a	Gravimetric (direct oxidation and final precipitation in reduced solution)	Evolution with HCl (sp. gr. 1.18) ^b ZnS-Iodine (theoretical sulfur titre) ^c	Sulfuric acid dehydration	COPPER H ₂ S-CaS-CuO	NICKEL Weighed as nickel dimethylglyoxime	CHROMIUM FeSO ₄ -KMnO ₄ titration	VANADIUM	MOLYBDENUM Colorimetric	TITANIUM Colorimetric
1.....	3. 00	2. 32	0. 525	0. 521	0. 303	^d 0. 315	0. 134	0. 126	^e 0. 591	0. 045	0. 022	^f 0. 032	^g 0. 014	0. 002	^h 0. 01
2.....	3. 06	2. 30	ⁱ 0. 520			. 313			^k 0. 599	^l 0. 042	^m 0. 018	. 033		. 004	
	3. 02	2. 34	. 521		. 302	. 307	. 133	. 131	. 584	ⁿ 0. 048	. 024	. 035	. 019		
4.....	3. 05	2. 31		ⁱ 0. 513	. 300	. 295	. 135		^k 0. 584	. 048	. 020	. 030	. 016		
5.....	3. 06	2. 27	. 521	. 517	ⁿ 0. 314	. 315	. 131	. 131	^e 0. 591	. 042	^m 0. 024	^f 0. 027	^g 0. 016	. 002	. 01
6.....	3. 05	2. 31		. 515	. 310	. 309	. 134	. 122	^e 0. 590	. 042	. 020	. 032	. 012		
7.....	3. 03	2. 28		. 527	. 303	. 301						^f 0. 034			
8.....	3. 00	2. 32		ⁱ 0. 522		. 317		. 120	^o 0. 595	^p 0. 045	. 022		. 011		
Averages.....	3. 03	2. 31	0. 522	0. 519	0. 305	0. 309	0. 133	0. 126	0. 591	0. 045	0. 021	0. 032	0. 015	0. 003	0. 01
General average.....	3. 03	2. 31	0. 520		0. 307		0. 133		0. 591	0. 045	0. 021	0. 032	0. 015	0. 003	0. 01

^a Precipitated at 40° C. washed with a 1-percent solution of KNO₃ and titrated with alkali standardized by the use of acid potassium phthalate and the ratio 23NaOH:1P.

^b Sample annealed by covering with a layer of graphite, and heating for 20 minutes at 685° C.

^c Value obtained by standardizing the titrating solution by means of sodium oxalate through KMnO₄ and Na₂S₂O₄ and use of the ratio 21:18.

^d Molybdenum-blue photometric method. See J. Research NBS 26, 405 (1941) RP1386.

^e Double dehydration.

^f Persulfate oxidation and potentiometric titration with ferrous ammonium sulfate.

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

^h Solution in diluted HCl (1:2). A few milliliter of a 6-percent solution of cupferron added. Precipitate ignited, and vanadium separated by fusion with Na₂CO₃.

ⁱ Bismuthate-arsenite method.

^j Titrating solution standardized by use of a standard steel.

^k Perchloric acid dehydration.

^l Finished by electrolysis.

^m Dimethylglyoxime colorimetric method.

ⁿ Weighed as ammonium phosphomolybdate.

^o Nitric-sulfuric acid dehydration.

^p KI-Na₂S₂O₅ titration.

*LIST OF ANALYSTS

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WASHINGTON, July 9, 1945

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