UNITED STATES DEPARTMENT OF COMMERCE
WASHINGTON 25, D. C.

National Bureau of Standards

Certificate of Analyses

Standard Sample 3

White Iron

ANALYST	C	Mn	P	S		Si	Cu	Ni	Cr	V	Mo	Ti	B	N
	Direct combustion	Persulfate-Arsenite	Alkali-Molybdate	Gravimetric (direct oxidation and precipitation after reduction of iron),	Combustion Iodate titration	Perchloric acid dehydration		Weighed as nickel dimethylglyoxime	$FeSO_4$–$KMnO_4$ titration		Photometric	H_2O_2 photometric		Distillation-titration
1	2.25	[a]0.349	[b]0.119 [c].120	0.088	[d]0.087	[e]1.00	[f]0.130	0.020	[g]0.052	[h]0.007	0.004	[i]0.010	[j]0.0008	[k]0.010
2	2.27	.346	[e].127			0.97	[l].128		[m].052					
3	2.26	.362	[b].126 .122	.092		[e].99	[n].123	.017	[m].050	[o].008	[p].004 .006	[q].010	[r].0005	
4	2.27	.35	[b].121 .121	.086	[s].086	.99	[t].126		.051					
5	[u]2.24	[v].344	[e].125		.091	[w].98	[x].124		.049					
6	[u]2.26	[v].34	.123		[v].093	.98			[y].050					
7	2.28	.35	.124			[e].99	[n].13		[z].050					
8	[u]2.30	[z1].351	.117	.088		.99			.051					
9	2.29	.354	.126	.090	[z2].090	[w]1.02	[z3].123	[z4].02	[z].051	[z4].01	[z4].005	[z4].01		
Average	2.27	0.350	0.123	0.089	0.090	0.99	0.126	0.019	0.051	0.008	0.005	0.010	0.0007	
General Average	2.27	0.350	0.123	[z5]0.089		0.99	0.126	0.019	0.051	0.008	0.005	0.010	0.0007	

[a] Potentiometric titration.
[b] Molybdate—$Mg_2P_2O_7$.
[c] Molybdenum-blue photometric method. See J. Research NBS **26**, 405 (1941) RP1386.
[d] 1-g sample burned in oxygen at 1,450°C, and sulfur dioxide absorbed in starch-iodide solution. Iodine liberated from iodide by titration, during the combustion, with standard KIO_3 solution. Titer based on 93 percent of the theoretical factor.
[e] Double dehydration with H_2SO_4.
[f] Diethyldithiocarbamate photometric method. See J. Research NBS **47**, 380 (1951) RP2265.
[g] Chromium separated from the bulk of the iron in a 10-g sample by hydrolytic precipitation with $NaHCO_3$, oxidized with persulfate and titrated potentiometrically with ferrous ammonium sulfate.
[h] Vanadium separated as in (g), oxidized with HNO_3, and titrated potentiometrically with ferrous ammonium sulfate.
[i] Cupferron separation after solution of the sample in diluted HCl (1+2). Vanadium separated by treatment with NaOH.
[j] Distillation—turmeric photometric method.
[k] Sulfuric acid digestion for 3 hr of a 1-g sample. See J. Research NBS **43**, 201 (1949) RP2021.
[l] Diethyldithiocarbamate photometric method.
[m] Diphenylcarbazide photometric method.
[n] H_2S—electrolytic method.
[o] $FeSO_4$-$(NH_4)_2S_2O_8$ -$KMnO_4$ method.
[p] Alpha-benzoinoxime—$PbMoO_4$ method.
[q] Vanadium separated by Na_2CO_3 fusion.
[r] Distillation—curcumin photometric method.
[s] Combustion gases absorbed in $AgNO_3$ solution, and liberated HNO_3 titrated with NaOH.
[t] H_2S-KI-$Na_2S_2O_3$ titration.
[u] Gasometric method.
[v] Titrating solution standardized with standard steel or iron.
[w] Double dehydration with intervening filtration.
[x] Copper-ammonia-complex photometric method.
[y] Persulfate oxidation, titration with $FeSO_4$-$Ce(SO_4)_2$.
[z] Perchloric acid oxidation.
[z1] Oxidized with bismuthate.
[z2] Sulfur gases absorbed in NaOH-H_2O_2 solution and excess NaOH titrated with H_2SO_4.
[z3] H_2S-CuS-CuO.
[z4] Spectrographic determination.
[z5] This iron is not recommended for evolution sulfur determinations because of the variation in the values obtained by the evolution-titration method.

List of Analysts

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The iron for the preparation of this standard was furnished by the Chain Belt Company, Milwaukee, Wis., with the cooperation of the Malleable Founders' Society, Cleveland, Ohio.

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