U. S. DEPARTMENT OF COMMERCE

National Bureau of Standards

Certificate of Analyses

OF

STANDARD SAMPLE 124a

OUNCE METAL

ANALYST*	Cu	Zn	Pb	Sn	IRON	NICKEL	ALUMINUM	ARSENIC	
	Electrolytic	ZnS-ZnO	Weighed as $PbSO_4$						
1	[a] 85.05	5.23	[b] 4.87	[c] 4.80	[d] 0.003	[e] 0.001	[f] 0.006	[g] 0.005	
2	[h] 85.03	5.29	[i] {4.87 / 4.83}	[j] 4.84	[k] .006	[e] <.005		[l] 0.007	
3	[m] 85.00	5.25	4.89	[n] 4.83	[o] 006		[p] 0.007		
4	84.94	[q] 5.23	[i] 4.93	[r] 4.87	[s] <.01		[s] 0.005		
Averages	85.01	5.25	4.89	4.84	0.005		0.006	0.006	
Recommended values	85.01	5.25	4.89	4.82	0.004	0.001	0.006	0.006	

[a] Five-gram sample dissolved in 110 ml of HNO_3 (1+4). Solution digested on a steam bath overnight, filtered, and the precipitate washed with hot HNO_3 (1:99). Filtrate diluted to 300 ml, 2 drops of 0.1 *N* HCl added, and solution electrolyzed overnight, by using a current density of 0.5 *amp/dm²*. Metastannic-acid precipitate and paper treated with HNO_3–H_2SO_4. Tin, antimony, and arsenic volatilized by HBr–Br_2, and residual copper determined by electrolysis.

[b] First anode deposit (footnote a) dissolved in HNO_3 and a little alcohol. Lead determined as $PbSO_4$.

[c] Tin separated by distillation from a 3-g sample, precipitated with cupferron, and ignited to SnO_2 as described in J. Research NBS 33, 339 (1944) RP1610.

[d] Metastannic acid separated from a 12.5-g sample. Copper and lead electrodeposited in the filtrate. Electrolyte and residual solution from an HBr–Br_2 treatment of the metastannic-acid precipitate combined. Two such solutions combined (=25-g sample) and iron precipitated with NH_4OH. Precipitate dissolved and iron determined by the $SnCl_2$–$K_2Cr_2O_7$ method.

[e] Weighed as nickel dimethylglyoxime.

[f] Copper deposited from a 5-g sample in HNO_3–HF solution. Sulfuric acid added to the electrolyte and solution evaporated to fumes. Iron and the like removed by a mercury cathode treatment. Aluminum determined by the aurin-colorimetric method. See J. Research NBS 21, 105 (1938) RP1117.

[g] Arsenic distilled from a 25 g sample as described in J. Research NBS 21, 95 (1938) RP1116, and determined as As_2S_3.

[h] Copper deposited in the presence of tin from an HNO_3–HF solution.

[i] Lead deposited electrolytically as PbO_2.

[j] Tin reduced to $SnCl_2$ with iron wire in the presence of added antimony, and titrated with KIO_3.

[k] Iron reduced with H_2S, and $FeSO_4$ titrated with $KMnO_4$.

[l] Arsenic precipitated by H_3PO_2. Solution filtered, arsenic dissolved, and titrated by the bromate-sodium arsenite method.

[m] Metastannic-acid precipitate and paper treated with HNO_3–$HClO_4$. Tin, antimony, and arsenic volatilized by HBr–Br_2, and residual nitric acid solution added to the main solution. Copper electrodeposited after separation of lead as sulfate.

[n] Tin reduced to $SnCl_2$ with aluminum and titrated with iodine.

[o] Zinc removed as ZnS in electrolyte from copper deposition (footnote m). Iron then precipitated as $Fe(OH)_3$, precipitate separated, dissolved, and iron titrated with $TiCl_3$.

[p] Precipitated as $AlPO_4$.

[q] Titration with $K_4Fe(CN)_6$.

[r] Gravimetric-SnO_2 method.

[s] Spectrographic determination.

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