

National Bureau of Standards

Certificate of Analyses

Standard Sample 54C

Tin-Base Bearing Metal

ANALYST	Sn	Sb	Cu	Pb	ARSENIC	IRON	BISMUTH	SILVER	NICKEL Colorimetric
	SnCl ₂ -KIO ₃		Electrolytic						
1.....	^a 86.32	^b 7.26	^c 4.29	^d 1.98	^e 0.050	^f 0.033	^g 0.026	^h 0.023	0.014
2.....	86.37	ⁱ 7.27	4.31	^j 1.97	^k .048	^l .034	^m .029	ⁿ .021	
3.....		ⁱ 7.26	4.26	ⁿ 1.99	^o .049	^p .029	^q .029	^r .020	.014
4.....	86.27	ⁱ 7.28	^r 4.31 ^s 4.29	^j 2.00	^t .049	^v .032	^w .026	^u .018	.010
5.....	86.28	ⁱ 7.28	^r 4.31 ^v 4.29	ⁿ 2.00	^k .049	^w .033	^x .028	^y .020	.013
	86.27	ⁱ 7.27	^r 4.30	ⁿ 2.00	^k .048	^w .038	^z .030	^{aa} .018	.010
7.....	^{aa} 86.26	^{aa} 7.33	4.33	^{aa} 2.01	^t .051	^p .03	^g .029		
Average.....	86.29	7.28	4.30	1.99	0.049	0.033	0.028	0.020	0.012

^a Tin separated by distillation from a 0.2-g sample (aliquot portion of 2 g), precipitated with cupferron, and ignited to SnO₂. (See J. Research NBS **33**, 307 (1944) RP1610).

^b Antimony separated by distillation from a 1-g sample as described in J. Research NBS **21**, 95 (1938) RP1116. Distillate treated with H₂S. Antimonous sulfide dissolved and titrated with KMnO₄.

^c Copper deposited electrolytically after removal of tin, antimony, arsenic, bismuth, and silver.

^d 5-g sample dissolved in aqua regia, and double KOH-Na₂S separation made. Sulfides dissolved in HNO₃, and solution evaporated to fumes of H₂SO₄. Solution treated with HF in a platinum dish and evaporated twice to fumes of H₂SO₄, diluted to 100 ml, digested overnight, filtered, and lead weighed as PbSO₄.

^e Sodium hypophosphite-ammonium molybdate-photometric method.

^f 10-g sample treated with HBr-HClO₄. Copper removed with H₂S. Iron precipitated with NH₄OH and determined by the SnCl₂-K₂Cr₂O₇ method.

^g Thiourea-photometric method.

^h Weighed as AgCl.

ⁱ Antimony reduced with H₂SO₄ and titrated with KBrO₃. See ASTM method E-57.

^j Weighed as PbCrO₄.

^k Arsenic separated by distillation and titrated with KBrO₃.

^l Iron reduced in a silver reductor and titrated with Ce(SO₄)₂.

^m Weighed as AgI.

ⁿ Lead deposited electrolytically as PbO₂.

^o Distillation-As₂S₃-photometric method.

^p KCNS-photometric method.

^q Dithizone method. Same value obtained by the fire assay method.

^r Copper deposited in a HNO₃-HF solution.

^s Copper separated as CuCNS and deposited electrolytically.

^t Distillation-As₂S₃-gravimetric method.

^u Fire assay method.

^v Electrolytic deposition and titration by the iodide-thiosulfate method.

^w Ferric chloride-photometric method.

^x Iodide-photometric method.

^y Internal electrolysis. See ASTM method E-37.

^z Bismuth separated by internal electrolysis and determined photometrically.

^{aa} Titration with thiocyanate.

^{ab} Tin reduced with iron and titrated with iodine.

^{ac} Titration with KMnO₄.

^{ad} Weighed as PbSO₄.

List of Analysts

1. R. K. Bell and B. B. Bendigo, National Bureau of Standards, Washington 25, D. C.
2. L. A. Wooten, Bell Telephone Laboratories, New York, N. Y.
3. M. Eisemann, American Smelting and Refining Co., Barber, N. J.
4. W. C. Bowden, Jr., and Silve Kallmann, Ledoux and Co., New York, N. Y.

5. D. R. Evans, I. Moffat, and John Negra, Western Electric Co., Kearny, N. J.
6. J. W. Claypool, Nassau Smelting and Refining Co., Tottenville, N. Y.
7. National Lead Co., Analytical Department, Brooklyn, N. Y.

The metal for the preparation of this standard was furnished by the National Lead Co., and atomized by the Metals Disintegrating Co.

E. U. CONDON, *Director*.

WASHINGTON 25, D. C., July 8, 1949.