DEPARTMENT OF COMMERCE

Bureau of Standards

Certificate of Analyses

OF

STANDARD SAMPLE No. 2

ZINC ORE[1]

Analysis by Dr. H. C. P. Weber, Bureau of Standards.	Method (a), see below	31.36% Zn
	Method (b), see below	31.36
	Method (c), see below	31.48
	Method (d), see below	31.41
	Average	31.41
Average of determinations by modified Waring method[2]		31.55
General average of 137 different determinations		31.43

METHODS OF ANALYSIS USED BY THE BUREAU OF STANDARDS.

Method (a).—Waring Method,[2] precipitating zinc sulphide from formic acid solution and titrating with potassium ferrocyanide. Average of five analyses, 31.36% Zn.

Method (b).—Waring Method,[2] but precipitating zinc sulphide from thiocyanate solution after neutralizing the filtrate from the copper, cadmium, etc., with sodium bicarbonate till faintly turbid, adding methyl orange, then double normal hydrochloric acid until a faint pink remained, 2 g. ammonium thiocyanate, and finally heating to 70° and passing hydrogen sulphide. The zinc was weighed as sulphide. Average of two analyses, 31.36% Zn.

Method (c).—0.5 g. was dissolved in hydrochloric and nitric acids and the gangue fused as in (a). The fusion was dissolved in water, hydrogen sulphide passed through the solution, and the metal sulphides filtered off, dissolved in nitric and sulphuric acids and added to the main solution. After fuming with sulphuric acid, copper was reduced by sulphurous acid, ammonium thiocyante was added, and copper, lead, and silica were filtered off. Two g. of thiocyanate was then added and the zinc and cadmium were precipitated by hydrogen sulphide. The sulphides were dissolved in hydrochloric acid, ignited after adding mercuric oxide, and weighed as oxides. The oxides were dissolved in sulphuric acid and cadmium was twice precipitated with H_2S, converted to oxide, and weighed. From the filtrate other metals were precipitated twice by sodium hydroxide and weighed as oxides. The difference was zinc oxide. One analysis, 31.48% Zn.

Method (d).—Same as (c) above, to the precipitation of the sulphides. The mixed sulphides of zinc and cadmium were heated to about 80° C. with 250 cc. water and 2 cc. of concentrated hydrochloric acid and hydrogen sulphide was passed through after all the zinc had dissolved. The filtrate was evaporated and ignited with mercuric oxide, the residue ignited and weighed, dissolved in sulphuric acid, and the remainder of the cadmium separated as in (c). Average of two analyses, 31.41% Zn.

[1] This sample was prepared for the Subcommittee on Zinc Ore Analysis of the Committee on Uniformity in Technical Analysis of the American Chemical Society. A pure blende from Joplin, a mixture of franklinite, willemite, calcite, etc., from Franklin, N. J., and an impure blende from Colorado containing a good deal of iron, copper, and lead, were ground together with enough cadmium sulphide to give about 0.6 per cent cadmium in the sample. It was known as Sample D and was turned over to the Bureau of Standards for distribution, by the Committee of Uniformity in Technical Analysis.

[2] See Jour. Amer. Chem. Soc. 29, 265 (1907).

S. W. STRATTON,
Director.

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