

out with water, and the solution filtered upon ashless paper; and when the residue was large the process of fusing and extracting was repeated. If the operation was successful, the solution now contained as sodium sulpho-salts all the tin, antimony, and arsenic of the insoluble residue. The residue and filtrate were treated separately.

III. TREATMENT OF THE RESIDUE AFTER THE SULPHUR FUSION AND EXTRACTION.

(a) If the original material was pure metal, the material upon the filter, containing possibly sulphides of lead, copper, and iron, was ignited, and the residue was treated with aqua regia and a little sulphuric acid. The mixture was heated to the fuming point of sulphuric acid, cooled, and treated with a little water. Any precipitate of lead sulphate at this point was filtered off on asbestos and weighed.

The solution, filtered if necessary from precipitated lead sulphate, was treated with ammonium hydroxide and any precipitated ferric hydroxide was filtered off and weighed as ferric oxide.

The solution containing no ferric salt, or filtered from the precipitated ferric hydroxide, was treated with hydrogen sulphide and any precipitated copper sulphide was filtered off, ignited, and weighed as copper oxide.

(b) In case the original material was corroded material contaminated with siliceous and earthy substance, the procedure in treating the residue after the sulphur fusion and extraction was varied. In this event, the material remaining upon the filter might consist of siliceous and earthy substance as well as small amounts of copper, lead, and iron sulphides. This residue was ignited with the filter, in platinum, and treated with hydrofluoric acid and a few drops of sulphuric acid. The mixture was heated until the free acid had been removed and was then ignited and weighed. The loss of weight under the treatment with hydrofluoric acid should be silica, in the absence of material capable of yielding undecomposable sulphates. If the material contained bases, like lime or soda, which formed with sulphuric acid refractory sulphates, this measure of the silica was only approximate.

The residue after the volatilization of silica was fused with sodium carbonate, the mass after fusion was treated with hydrochloric acid, and hydrogen sulphide was passed into the solution. Any precipitate of sulphides thus obtained was filtered off, ignited, and treated for the formation of lead sulphate, ferric oxide, and copper oxide, according to method described in the preceding paragraph (a).

IV. TREATMENT OF THE SOLUTION OBTAINED AFTER THE SULPHUR FUSION AND EXTRACTION.

The solution obtained by extracting with water the mass remaining after the fusion with sodium carbonate and sulphur was acidified with hydrochloric acid. The precipitate containing sulphur, and possibly sulphides of antimony, arsenic, and tin, was collected upon a small filter, the filtrate being rejected. The precipitate upon the filter was dissolved in the least possible amount of a warm solution of sodium sulphide. The solution was concentrated, cooled, and treated gradually with sodium dioxide until the liquid became colorless and oxygen was liber-