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THE SEPARATION OF MANGANESE FROM TUNGSTIC ACID.

BY WALTER T. TAGGART AND EDGAR F. SMITH.

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THE necessity of obtaining pure tungstic acid from time to time, using wolframite as the starting out material, has frequently suggested the inquiry as to what course would probably prove the best in the quantitative separation of this acid from oxides, such as those of iron and manganese.

In the experiments recorded in this communication only the results obtained from a study of mixtures of a manganous salt and a soluble alkali tungstate will be given. The directions taken in the experimentation were, 1st, to effect the separation by the use of yellow ammonium sulphide in the presence of ammonium chloride; 2nd, to eliminate the acid oxide by the use of an alkaline carbonate.

Following the first course, mixtures of definite amounts of ammonium tungstate and manganous chloride were made. To these was added water and a considerable excess of yellow ammonium sulphide, together with ammonium chloride. The mixtures were digested on a water-bath at 70° C., for several hours, and the vessels containing them were then closed and allowed to stand during the night. The manganese sulphide was filtered out, and, after solution, was changed into sulphate and weighed as such, or it was finally obtained as protosesquioxide in the customary way.

RESULTS.

Manganous oxide present.	Manganous oxide found.
Gram.	Gram.
0.1950	0.2121
0.1949	0.2255
0.1290	0.1708
0.1287	0.1720
0.1291	0.1760

In every trial tungstic acid adhered to the metallic oxide.

In trying the second suggestion the soluble tungstate and the

soluble manganous salt were digested for some hours in a platinum dish, upon a water-bath, with an excess of a ten per cent. potassium carbonate solution, after which the whole was evaporated to dryness, the residue boiled up with water, the manganous carbonate filtered out, washed, and finally converted into protosesquioxide.

RESULTS.

Manganous oxide present.	Manganous oxide found.
Gram.	Gram.
0.1949	0.1516
0.1949	0.1534

Several trial were made using a fifty per cent. solution of potassium carbonate.

RESULTS.

Manganous oxide present.	Manganous oxide found.
Gram.	Gram.
0.1951	0.1745
0.1950	0.1528

The experimental evidence given in the preceding paragraphs leaves no doubt as to the insufficiency of the two methods, which were tried, in effecting the desired separation. It is probable that fusion with an alkaline carbonate will alone answer for this purpose. How complete that course would be can only be ascertained by careful experimentation.

In the course of analysis molybdenum is quite often obtained as sulphide. Its conversion into a weighable form is attended with more or less difficulty. Trials made in connection with its estimation show that if the sulphide, as generally obtained, be dried, then intimately mixed with anhydrous oxalic acid, its careful ignition to trioxide can be made quite rapidly.

RESULTS.

Molybdenum trioxide taken.	Molybdenum trioxide found.
Gram.	Gram.
0.3000	0.3009
0.3000	0.2990
0.1007	0.1011