

A RAPID QUALITATIVE TEST FOR TELLURIUM

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During the investigation of mineralization aureoles in Goldfield, Nevada, a rapid qualitative test for tellurium was desired. The method most commonly used in western mining districts is the addition of a powdered telluride to hot concentrated sulphuric acid, or vice versa. This is quite satisfactory for native tellurium, gold and silver tellurides, but the color reaction is obscured or fails when dealing with goldfieldite ($\text{Cu}_6\text{Sb}_2(\text{S}, \text{Te})_9$), tellurite, durdenite, and emmonsite. I have not had the opportunity of trying its efficacy on the copper tellurides, rickardite and weissite.

The mineral in question in Goldfield was chiefly goldfieldite. Occasional durdenite, tellurite, and native tellurium were encountered megascopically. The textbook method of fusion to sodium telluride was too long when many samples were to be handled. A method involving the solution of the sample and precipitation by sodium thiosulphate was interesting for the apparent differential precipitation of tellurium and selenium but had no practical value for the work at hand and was also too long.

The method finally adopted was very largely suggested by Mr. Roger Downer of Goldfield. A small fragment of the mineral is placed inside and near the rim of a No. 00 porcelain crucible (high form), reclined in a preformed cavity of proper angle in a charcoal block (too often the fragment is lost when the crucible is held in bent tip forceps). The fragment is then gently reduced with a blowpipe flame. Tellurium, if present, forms a lustrous black sublimate round the inside of the crucible. After removing the fragment, the addition of a drop of concentrated sulphuric acid to the now hot crucible confirms the tellurium with the familiar reddish-violet coloration.

Where a number of samples are to be tested at one time, this method is more rapid than the usual one with sulphuric acid, as grinding of the fragment and heating of the solution are eliminated. Also it can be used on any type of tellurium mineral. The test can be made roughly quantitative with practice in judging the relation of the size of the sublimate to the size of the fragment. In a well equipped laboratory refinements in apparatus may be attained but the simple materials described here are the most dependably available at the mine.