SHORT COMMUNICATIONS

MINERALOGICAL MAGAZINE, MARCH 1969, VOL. 37, NO. 285

Oldhamite from the Hvittis meteorite

A SMALL concentrate of the rare sulphide mineral *oldhamite*, contaminated by a little plagioclase, has been prepared as an incidental by-product of an investigation of major constituents in the Hvittis enstatite chondrite (BM 86754). A microanalysis by A. J. Easton, obtained by dissolving 12 mg of the concentrate in slightly acidified boiling water, gave Ca 50·4, Fe 1·1, Mn 1·0, Mg 0·9, insol. 4·3, S (calc.) 42·7, total 100·4. Ca was measured by flame photometer, Mg by atomic absorption, and Mn, Fe, and Ni by spectrophotometer. Sulphur was calculated assuming the composition (Ca,Mg,Fe,Mn)S. Ca: Fe: Mn: Mg = 0·943: 0·015: 0·014: 0·028.

The results indicate general similarity to the type oldhamite from the Bustee enstatite achondrite (Story-Maskelyne, 1870). Compared with recent electron probe data for Hvittis oldhamite (Keil, 1968), however, Fe and Mg are significantly higher. No other constituent that might explain these differences was observed in the concentrate.

An X-ray powder photograph of the concentrate has a very weak superimposed high-albite pattern, but is otherwise similar to those of Bustee oldhamite and synthetic CaS. The cell dimension, kindly measured by Dr. R. J. Davis from high angle lines (Cu radiation) using standard graphical extrapolation methods, is 5·6821±0·0006 Å. This value compares favourably with those for Bustee oldhamite (a = 5·675 Å; Dana, 7th edn, 1944) and for synthetic CaS (a = 5·6948 Å, ASTM card 8-464; a = 5·6905± 0·0002 Å, Güntert and Faessler, 1956).

The oldhamite was separated from a finely ground sample of Hvittis by repeated centrifuging in a mixture of acetone and tetra-bromo-ethane (acetylene tetrabromide). Its density was found to overlap with that of the feldspar, hence the refractive index (β = 1·545±0·001) of plagioclase grains forming the main contaminant in the analysed concentrate allows a comparatively accurate estimate of the density of Hvittis oldhamite. A slightly less dense plagioclase fraction with the composition $Or_{3\cdot5}Ab_{85\cdot8}An_{10\cdot7}$(mol %), from which oldhamite was removed with dilute hydrochloric acid before analysis, has β = 1·544±0·001. The plagioclase in a fraction that was slightly more dense than the oldhamite concentrate has β = 1·545–1·546. The refractive index of the analysed plagioclase appears slightly anomalous, nevertheless the known relationships between composition, refractive index, and density in the plagioclase series (cf. Deer, Howie, and Zussman, 1963, fig. 54) indicate the density of Hvittis oldhamite to be 2·63±0·01. Its calculated density based on the formula and cell dimension is 2·61. Dana (1944) quotes 2·58 and 2·71 as the density of natural (Bustee?) and synthetic oldhamite respectively.

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Sinhalite and serendibite from Tanzania

EVER since Claringbull and Hey (1952) first described the mineral sinhalite, which had previously been identified as gem peridot, other discoveries have been reported (Meixner, 1953; Zwaan, 1955; Payne, 1958; Gübelin, 1962). Essentially sinhalite is found in skarn assemblages from contact zones of metamorphosed carbonate rocks with, for example, Archean gneiss (Aldan massif, U.S.S.R., Shabynin, 1956) or granite (Warren County, New York, U.S.A., Schaller and Hildebrand, 1955). It is mineralogically similar to forsteritic olivine but can be distinguished by its higher refractive indices, specific gravity, and a much smaller optic axial angle. Chemically, boron substitutes for silicon and part of the magnesium is replaced by aluminium in the olivine structure. Optical absorption spectra have also shown that minor but significant amounts of iron are present as Fe^{2+} giving a chemical composition of $AlMg_{0.95}Fe_{0.05}BO_4$ (Fang and Newnham, 1965).

This paper discusses a further occurrence of sinhalite in a skarn assemblage from the Handeni district, north-east Tanzania. The mineral was provisionally identified by the writers during 1964 in a sample of calcitic marble from the Kwakonje area. A brief note on this occurrence has already been published by one of us (von Knorring, 1967); additional information on the locality and the associated minerals including serendibite and warwickite is given in this communication. It is worth noting that this is the first recorded *in situ* locality of sinhalite in the African continent.

The locality in Tanzania is known for its production of gem quality tourmaline, blue and red spinels, and the occasional ruby. More recently kornerupine was identified by Dr. R. A. Howie (personal communication) in a marble collected from the