A new Czechoslovak occurrence of stokesite

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Summary. The third occurrence of stokesite was discovered in a desilicated pegmatite at Věžná, Western Moravia. In this locality, stokesite accompanies columbite, cassiterite, and stibian pyrochlore-microlite, in a miarolitic cavity of albite. The X-ray data and the optical properties of the Věžná stokesite agree well with those observed by previous authors.

STOKESITE—hydrous silicate of calcium and tin—is a well-known mineral species at present. Its chemical composition, physical properties, and X-ray data were determined by Hutchinson (1899, 1900) and Gay and Rickson (1960); the structure, displaying a new chain type of silicate framework, was resolved by Vorma (1963 *a*, *b*). All this knowledge is based, however, on the examination of the single crystal found at Roscommon Cliff, St. Just, Cornwall; the other occurrence at Ctidružice, Western Moravia, yielded a minute amount of material suitable only for an X-ray powder photograph (Čech, 1961). Now stokesite has been found at Věžná, Western Moravia, in the quartz–oligoclase type of desilicated pegmatite that has already attracted attention by its unusual mineral paragenesis. Only one stokesite specimen has been collected at this locality up to the present. The amount of material available for the study was very small and contaminated by a cerolite-like mineral, but the author feels that even the incomplete data, obtained on stokesite from its third locality, are worthy of publication.

Stokesite forms fine-grained aggregates on albite in a miarolitic cavity of the pegmatite. Individual crystals reach 0·5 mm, usually being much smaller. They are very similar to the type stokesite from Cornwall, showing tabular combinations of {100} and {211}.

An X-ray diffraction powder photograph was obtained with a minute amount of material glued on the glass fibre mount. Seventeen intense lines and unresolved doublets of the stokesite pattern were observed; their *d*-spacings are in good accordance with the data published by Gay and Rickson (1960) and Čech (1961). The X-ray identification was verified by single crystal photographs kindly supplied by ing. Vl. Kupčík. They yielded the dimensions a 14·48±0·02 Å, [011] 12·83±0·03 Å, and d_{011} 4·73±0·02 Å, which compare well with those calculated from the unit-cell dimensions measured by Gay and Rickson (1960) and Vorma (1963 *a*, *b*). On the other hand, rotation photographs taken around the *b*-axis gave a period ~23 Å, which is double the *b* parameter found by the above authors. The lack of perfect single crystals did not permit an investigation of the structure characteristics of the Věžná stokesite in more detail.

The crystals are white with a pale bluish tint, their colour resembling that of bluish cleavelandite. Microscopic study revealed a slightly undulating extinction; zones with faintly varying birefringence, parallel to the crystal surface, were observed in some instances. The optical properties were measured in sodium light: α 1·610, β 1·613, γ 1·620, $\gamma-\alpha$ 0·010, $2V_{\gamma}$ medium (est.), 68° (calc.); $\alpha = c$, $\beta = a$, $\gamma = b$. These data are in almost perfect accordance with the values measured and calculated by Hutchinson (1900), all deviations lying within the limits of experimental error.

All stokesite crystals are more or less penetrated by thin contorted fibres of a cerolite-like mineral that fills the cavity of the stokesite specimen. This contamination prevented a determination of the specific gravity of the mineral and affected the result of the qualitative spectro-chemical analysis: $X0$ %—Ca,Si; X %—Sn,Mg; 0·X %—Ti; 0·0X %—Na, Fe, Mn, Nb, Zr, Be; < 0·0X %—Ba, Al, Sc, Ta, Y, Yb; uncertain—Ag, As, Cu, Pb. The first three elements correspond to the most important components of stokesite; concerning the minor and trace elements, it is not possible, however, to decide whether they belong to the stokesite proper or to the replacing magnesium hydrosilicate.

The paragenesis of stokesite at Věžná differs from both the Cornish and Ctidružice localities. The parent rock is a desilicated pegmatite, formed by albite and minor quartz in the central parts and by albite-oligoclase with tremolite in the margins. A reaction rim of actinolite, biotite, chlorite, and anthophyllite is developed along contacts with the surrounding serpentinite. Metasomatic accumulations and fracture-filling veinlets belong to a later association; they contain apatite, monazite, xenotime, beryl, tourmaline, columbite, tantalian rutile (Černý and Čech, 1962), cassiterite, zircon-type minerals, and stibian pyrochlore-microlite. These minerals were occasionally deposited also on albite in miarolitic cavities. In one of them, stokesite occurs as the latest mineral accompanying earlier columbite, cassiterite, and stibian pyrochlore-microlite. Etched grains of cassiterite, found in contact with or in the immediate vicinity of stokesite, indicate that this mineral was at least a partial source of tin for the crystallization of stokesite. Late low-temperature products of the hydrothermal decomposition of feldspar and other minerals are distinctly separated from the association described above; among them wellsite, thomsonite, epididymite, milarite, and hydrotalcite are noteworthy (Černý, 1960; 1963 *a*, *b*; 1965). The magnesium hydrosilicate that penetrates stokesite is one of the latest minerals of the pegmatite; this mineral is the object of present investigation as is the stibian pyrochlore-microlite.

Stokesite is regarded as a rare species; the inconspicuous appearance of this mineral at Ctidružice (Čech, 1961) and at Věžná indicates that it may easily escape attention when finely dispersed and not looked for. So it is possible that stokesite might be much more widespread in tin-bearing pegmatites and perhaps greisens than is supposed at present.

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