MINERALOGICAL MAGAZINE

JOURNAL OF THE MINERALOGICAL SOCIETY

Vol. 32 March 1961 No. 252

Occurrence of stokesite in Czechoslovakia.

By F. ČECH

Dept. of Mineralogy, Charles University, Prague, Czechoslovakia.

[Communicated by the Editor; read 26 January 1961.]

Summary. Stokesite was found in a lithium-bearing pegmatite at Ctidružice near Moravské Budějovice in Western Moravia (Czechoslovakia) in a close association with cryptocrystalline cassiterite. The type of its occurrence is described and its X-ray powder diffraction data given. This represents only the second occurrence of this very rare hydrous silicate of tin and calcium.

THE very rare tin-bearing silicate stokesite, of the formula $CaSnSi_3O_{11}H_4$, was described by Hutchinson (1899, 1900) from Roscommon Cliff, St. Just, Cornwall. At this locality it had been found in the form of a single 1-cm. colourless crystal together with crystals of axinite, in the cavity of a sample. A second occurrence has now been discovered by the present author in Czechoslovakia. It was found as a product of the hydrothermal phase in lithium-bearing pegmatite near Ctidružice in the vicinity of Moravské Budějovice in Western Moravia.

The lithium-bearing pegmatite from Ctidružice forms a body in which, progressing to the centre, the following types of pegmatite may be found: pegmatite of granitoid texture with frequent biotite; pegmatite with black tourmaline and pegmatite of graphic texture; coarser-grained pegmatite composed of larger grains (up to 7 cm.) of potassium feldspar and quartz. Each of the above-named pegmatite types forms an independent zone, the zones passing one into the other gradually. These zones were formed by fractional crystallization of a pegmatite magma. The second stage in the development of the pegmatite represents a sodium replacement unit, which is characterized by abundant occurrence of albite, developed in the form of cleavelandite. Of less frequent occurrence is a lithium replacement unit represented mainly by lepidolite. In addition to common minerals, such as quartz and feldspars, the pegmatite contains the following mineral association: amblygonite (?), apatite,

bertrandite, beryl, biotite, cassiterite, chlorite (alteration product of biotite), columbite-tantalite, hambergite, lepidolite, tourmaline (varieties elbaite and schorl), and zircon (cyrtolite). Pseudomorphs of bertrandite after hambergite described by the present author at an earlier date (1957) are of great interest.

Cassiterite occurs in the pegmatite body in two varieties. Dark brown to brown-black small grains or imperfectly developed crystals of cassiterite of the first variety are usually intergrown in the coarser-grained pegmatite. A similar cassiterite may be encountered quite commonly in lithium-bearing pegmatites in Western Moravia. Toward the end of the entire pegmatite process a new import of SnO_2 material took place

TABLE I. X-ray powder data for stokesite from Ctidružice, Western Moravia, Czechoslovakia. Cu/Ni radiation, 114·59 mm.-diameter camera.

I.	*d.*	*I.*	*d.*	*I.*	*d.*
*8	7·25 Å.	*3	2·23 Å.	*5	1·556 Å.
*6	5·81	*3	2·16	1	1·542
<1	4·95	3	2·13	*3	1·513
1	4·78	*5	2·04	2	1·491
*3	4·54	1	1·992	2b	1·451
*9	3·98	2	1·943	1b	1·427
2	3·76	2	1·910	*2	1·388
*3	3·55	<1	1·879	1	1·373
*2	3·44	*4	1·834	3	1·324
*3	3·04	1	1·812	<1	1·311
*10b	2·88	*3	1·779	<1	1·304
*3	2·70	1	1·755	<1	1·290
2b	2·63	1	1·731	1	1·253
1	2·53	*2	1·714	1	1·234
1	2·47	<1	1·695	*2	1·197
*4	2·39	2b	1·674	2	1·180
<1	2·36	1	1·595		
*3	2·27	<1	1·580		

during the hydrothermal phase. A second variety of cassiterite was formed, which by its appearance and properties strongly reminds one of 'wood-tin'. It is predominantly cryptocrystalline, soft, sometimes finely powdered and resembling a clay mineral. Its colour varies from a pink-grey through light grey to greyish-white. It often forms characteristic pseudomorphs after lepidolite (Čech, 1955).

In spectral analyses of the last-named variety of cassiterite greater amounts of silicon and calcium were found repeatedly (of the order of 0·1% to 1% or more). The silicon content could be ascribed to impurities of quartz, which cassiterite occasionally contains. The increased calcium content was difficult to explain as no calcium-bearing mineral

could be detected either macroscopically or microscopically to accompany cassiterite. X-ray powder diffraction patterns revealed, beside lines of cassiterite, a number of other, mostly very weak reflections (intensities 2 to <1). In table I these reflections are marked with an asterisk. These interferences pointed to the presence of a small admixture of another component, which could not be identified. Only when the paper by Gay and Rickson (1960) appeared recently, containing the X-ray data of stokesite from the original locality in Cornwall, could it be established that all lines of this unidentified component coincided with the principal intense lines of stokesite. On detailed observation of the samples of cryptocrystalline cassiterite pure stokesite could also be discovered, its minute amount, however, being only sufficient for a powder-pattern analysis.

The sample with stokesite represents a heavily albitized pegmatite with relicts of potassium feldspar. There is an abundant admixture of quartz and an accessorial occurrence of green tourmaline (verdelite). In its appearance the stokesite from Ctidružice differs markedly from the sample from Roscommon Cliff. Whereas stokesite from the British locality possessed the habit of a gypsum-like transparent crystal, the Czechoslovak specimen is chalk-white and forms a layer about 1 mm. thick, filling a short fine fissure in cryptocrystalline cassiterite. The cassiterite is very light brown, of earthy appearance and crumbles easily. The stokesite layer was composed of a number of radial-fibrous fine individuals.

The X-ray powder diffraction data of stokesite from Ctidružice are given in table I and compare well with those for the original stokesite, as published by Gay and Rickson (1960).

Samples with cryptocrystalline cassiterite containing a small admixture of stokesite are deposited in the Collection of the Department of Mineralogy, Charles University, Prague, and in the Collection of the Moravian Museum in Brno.

References.

ČECH (F.), 1955. Čas. Morav. musea v Brně, vol. 40, p. 81.
—— 1957. Univ. Carolina-Geol., vol. 3, No. 2, p. 129.
GAY (P.) and RICKSON (K. O.), 1960. Min. Mag., vol. 32, p. 433.
HUTCHINSON (A.), 1899. Phil. Mag., ser. 5, vol. 48, p. 480.
—— 1900. Min. Mag., vol. 12, p. 274.