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PEGMATITES OF THE SZKLARSKA PORĘBA HUTA GRANITE QUARRY: PRELIMINARY DATA ON *REE* MINERALIZATION

Pegmatite bodies in the Polish part of the Karkonosze granite massif are generally associated with the Janowice Wielkie and Szklarska Poręba areas (Zbójeckie Skały, Biała Dolina, Skalna Brama, Ptasie Gniazda, Czerwona Jama, the Kobyła stream, Michałowice and Szklarska Poręba Huta granite quarries, *etc.*). Long time ago some of them were locally exploited for feldspathic raw material. In Polish mineralogical literature there are only few papers on the Karkonosze granite pegmatites, mainly concerning those from the vicinity of Szklarska Poręba (Gajda 1960a,b; Karwowski et al., 1973; Kozłowski et al., 1975; Olszyński et al., 1976; Karwowski et al., 1983; Włodyka et al., 1983; Sachanbiński 1970). The minerals listed include: quartz, K-feldspars (orthoclase, microcline), plagioclase (albite, oligoclase), biotite, muscovite, Li-rich mica, aegirine, hornblende, garnet, magnetite, ilmenite, haematite, titanite, wolframite, cassiterite, scheelite, molibdenite, fergusonite, uraninite, thorite, niobite, tourmaline, beryl, topaz, spodumene, dumortierite, gadolinite, arsenopyrite, pyrite, chalcopyrite, pyrrothite, tetrahedrite, sphalerite, emplectite, nuffieldite, bismuthite, marcasite, native bismuth and silver, Bi- and Mo-ochres, chalcocite, limonite, Mn-hydroxyoxides, apatite, zircon, monacite, xenotime, autunite, epidote, prehnite, bavenite, zeolites, fluorite, apophyllite, goethite, malachite, siderite, calcite and chlorites. Some of them were identified in the past by simple methods of phase analysis (optical microscopy and [1]X-ray diffraction), but their compositions have not been completely characterized so far. Increasing availability of various analytical microtechniques (*e.g.* EMPA) justifies reinvestigations of mineral composition of the Karkonosze pegmatites.

Szklarska Poręba Huta, after completion of exploitation in the Michałowice quarry some fifteen to twenty years ago, is currently the only place where granite is excavated in the Polish part of the massif. Located within the municipality of Szklarska Poręba, close to the contact between the granite intrusion and the Góry Izerskie metamorphic cover, it quarries fine-crystalline aplogranite and medium- and coarse-crystalline monzogranite, often with porphyritic texture. In some places the granite is cut by narrow aplite veins linked to the granite tectonics. Small pegmatite bodies developed as short veins, lenses and nests, up to few tens of centimetres, are usually associated with the coarse-crystalline parts of the granite.

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However, smaller nests, only few centimetres in size, are common within the whole granite mass, including aplogranite. The pegmatite bodies are mostly massive, *i.e.* they are completely or almost completely filled in, rarely form druses. Pneumatolytic mineralization (quartz, cleavelandite, wolframite, cassiterite) in quartz veins and small voids in aplogranite, and also rich hydrothermal polymetalic assemblage (magnetite, haematite, molybdenite, pyrite, scheelite, native Bi, pyrrothite, chalcopyrite, sphalerite, emplectite, nuffieldite, bismuthite, melnikovite, marcasite, Bi- and Mo-ochres, chalcocite, limonite, Mn-hydroxyoxides) were well documented by Karwowski et al. (1973), Kozłowski et al. (1975) and Olszyński et al. (1976). The present authors additionaly observed secondary covellite and malachite. Many of those minerals can be commonly found during careful observation of the pegmatite veins and nests in the quarry. For example, iron-black subhedral grains of Ti-rich magnetite are relatively frequent in the medium-crystalline quartzo-feldspathic veins; pyrite and chalcopyrite in small voids of the aplogranite; black crystals of wolframite reaching 2-3 centimetres, sometimes accompanied by small, up to 5 mm, euhedral crystals of white scheelite in the medium-crystalline quartzo-feldspathic veins. Kozłowski et al. (1975) described from the quarry wolframites with 25-30 mol.% of the hübnerite member, and with above 2 wt.% CaO from intergrowths with scheelite. The wolframites analysed by the present authors are richer in Mn (sometimes Mn contents exceed those of Fe), they have no significant amounts of Ca, and only traces of Ta, Nb and Mo occur. Besides the phases mentioned, the hydrothermal activity in the Szklarska Poręba Huta pegmatites is marked by the presence of low-temperature Ca-, Mg- and Fe-silicates occurring in small nests. Their border plagioclasic zone is usually impregnated with flakes of green-brownish clinochlore, abundant epidote overgrows the plagioclases, and within the epidote accumulations can be found fine, pale-greenish, tabular grains or white-grey needles of pumpellyite and small pink-brownish crystals of titanite. Central parts of the nests are usually filled with white laumontite occurring very often in the form of radial aggregates of platy crystals. Intensively coloured, grass-green pumpellyite (XRD identification) was also found as small, accicular crystals in voids within the medium-crystalline quartzo-feldspathic veins in biotitic monzogranite. Pyrite cubes, occurring inside small aplogranite voids, very often overgrow dark grey chamosite. Single needles of epidote and small, tabular crystals of stilbite occur sporadically in this assemblage, while yellowish-orange chabasite grains, even up to 1 cm, are rather common.

Thorium and Be-*REE* mineralization (thorite and gadolinite) from the Szklarska Poręba Huta quarry was earlier mentioned only by Gajda (1960a). Aggregates of fine grains or isolated, intensively red thorite crystals even 2 cm in size are rather common within the coarse-crystalline parts of the pegmatites composed of pinkish and white feldspars, grey and also smoky quartz, very often overgrown by haematite flakes. The authors noticed also uranium mineralization, developed as lemon-yellowish encrustations and radial aggregates of acicular crystals of β-uranophane, 1-2 mm long (probably secondary after dispersed uraninite) in the

same pegmatites, but sometimes it can also be observed in microfissures of aplogranite.

Gadolinite, $(Y,REE)_2Fe[BeSiO_4|O]_2$, was found by the authors some years ago also within the coarse-crystalline parts of the pegmatites. It forms rather large, few milimetres in size, dark greenish crystal, irregularly intergrown with an intensively red mineral, probably hingganite-Y $(Y,REE)_2[BeSiO_4|OH]_2$. The latter mineral has also been recognized in outer parts of an unidentified, hetergenous, zoned, lemon-yellowish to olive-orange to grey-greenish crystal up to 1 cm large. Within both of them small inclusions of the hingganite-Ce and a Nd-carbonate close to hydroxylbastnaesite $Nd[CO_3|OH]$ have been observed in EMPA. The presence of several *REE*-bearing phases indicates that the composition of the Karkonosze pegmatites probably is even more complicated than it was supposed to be; at least some of those minerals are exceptionally rare. Conditions of the pegmatite crystallization in the Karkonosze granite were well determined by Kozłowski et al. (1975) and Kozłowski (1978). According to them, the Karkonosze pegmatites (especially those from the Szklarska Poręba Huta quarry) formed by recrystallization of aplites due to the action of high-temperature pneumatolytic solutions containing large amounts of volatiles, at the temparatures dropping from around 450^{o}C to less than 110^{o}C, almost neutral pH, decreasing pressure (from 725 to 680 atm beetwen 300 and 200^{o}C), and slightly increasing Eh.

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REFERENCES

GAJDA E., 1960a: Żyły pegmatytowe okolic Szklarskiej Poręby (Karkonosze). Kwart. Geol. 4 (3).

GAJDA E., 1960b: Minerały żył pegmatytowych okolic Szklarskiej Poręby (Karkonosze). Kwart. Geol. 4 (3).

KARWOWSKI Ł., OLSZYŃSKI W., KOZŁOWSKI A., 1973: Mineralizacja wolframitowa z okolic Szklarskiej Poręby Huty. Prz. Geol. 14.

KARWOWSKI Ł., WŁODYKA R., KURDZIEL M., 1983: Warunki powstawania minerałów druzowych w Michałowicach (Karkonosze). Arch. Mineral. 39 (1).

KOZŁOWSKI A., 1978: Pneumatolytic and hydrothermal activity in the Karkonosze-Izera block. Acta Geol. Polon. 28 (2).

KOZŁOWSKI A., KARWOWSKI Ł., OLSZYŃSKI W., 1975: Tungsten-tin-molybdenum mineralization in the Karkonosze massif. Acta. Geol. Polon. 25 (3).

OLSZYŃSKI W., KOZŁOWSKI A., KARWOWSKI Ł., 1976: Bismuth minerals from the Karkonosze massif. Acta. Geol. Polon. 26 (3).

SACHANBIŃSKI M., 1970: Beryl i akwamaryn z Karkonoszy. Przegl. Geol. 11.

WŁODYKA R., KARWOWSKI Ł., BZOWSKI Z., 1983: Pegmatyt berylonośny z okolic Jakuszyc. Arch. Mineral. 39 (1).