Minerals and geochemistry of the Bratislava - Jezuitské Lesy granitic pegmatite (Slovakia)

Pavel Uher 1) * and Peter Chudik 2)

1) Katedra mineralögie a petrologie, Prirovedecká fakulta, Univerzita Komenského, Mlynská dolina G, 842 15 Bratislava, Slovensko; *e-mail: puher@fns.uniba.sk
2) Hurbanova 13, 909 01 Skalica, Slovensko


Abstract

The Bratislava - Jezuitské Lesy granitic pegmatite forms a relatively narrow dike (up to 1 - 2 m thick) in parental Hercynian (~350 Ma) S-type granodiorite to granite. The pegmatite internal zoning consists of a coarse-grained quartz-feldspar-muscovite zone, locally with transition into a graphic pegmatite, blocky K-feldspar and massive quartz. An aplitic saccharoidal albite (albite >> quartz + muscovite + garnet) and cleavelandite extensively replace the older pegmatite zones. Beryl, garnet (almandine > spessartine), zircon (≤ 12 wt.% HfO₂), monazite to cheralite, Nb-Ta-(Sn) oxide minerals (all columbite-tantalite members, ferrotapiolite, ferrowodginite), and gahnite occur in coarse-grained zone as well as saccharoidal albite. The pegmatite is enriched in Rb, Cs, Be, Nb, Ta, Sn and W and depleted in Li, Sr, Ba, Zr and REE’s. These geochemical features and mineral composition show a relatively highly fractionated pegmatite melt and beryl-columbite subtype of the rare-element class and LCT tendency of the pegmatite. Moreover, anomalously high Y/Ho value (60) and presence of the lanthanide tetrad effect (T_{1,3} = 1.17), together with presence of fluorapatite (≤ 10 wt.% MnO) and fluorcalcioomicrolite, indicate an influence of fluorine-rich fluids during late magmatic to early hydrothermal (high-temperature) evolution stage of the pegmatite. On the contrary, phenakite, bertrandite, quartz II, and muscovite II originated during late hydrothermal (low-temperature) overprint of the pegmatite as a result of post-magmatic Hercynian uplift or Alpine tectono-thermal overprint of the Bratislava granitic massif.

Key words: granitic pegmatite, rock-forming minerals, accessory minerals, secondary minerals, Bratislava - Jezuitské Lesy, Slovakia