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PŮVODNÍ PRÁCE/ORIGINAL PAPER

Minerály skupiny columbitu a mikrolitu v granitovom pegmatite pri Liešťanoch: prvý výskyt vzácnoprvkovej Nb-Ta mineralizácie v Strážovských vrchoch (Slovenská republika)

Minerals of columbite and microlite groups in granitic pegmatite near Liešťany: the first occurrence of rare-element Nb-Ta mineralization in the Strážovské vrchy Mts. (Slovak Republic)

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Abstract

Accessory minerals of columbite and microlite groups were identified in granitic pegmatite dike intruded into parental Carboniferous (~350 Ma) leucogranites of the crystalline basement of the Tatric Unit, Central Western Carpathians. The pegmatite is situated on E slope of Bystrý Hill near Liešťany village, the Strážovské vrchy Mts., Slovakia. Primary columbite-(Fe) forms euhedral crystal (~3 mm across) with diffuse internal zoning reflecting a relatively small compositional variations: $Mn/(Mn + Fe) = 0.40 - 0.45$ and $Ta/(Ta + Nb) = 0.21 - 0.24$. Secondary anhedral domains of Ta-rich columbite-(Fe) to tantalite-(Fe) ($\leq 200 \mu m$) with $Mn/(Mn + Fe) = 0.45 - 0.47$ and $Ta/(Ta + Nb) = 0.45 - 0.62$ partly replace primary columbite-(Fe) along crystal rims. Moreover, secondary subhedral crystals of microlite-group minerals ($\leq 25 \mu m$) form fracture fillings in columbite-(Fe). The microlites show uniform high $Ta/(Ta + Nb)$ ratio (0.77 - 0.80) and U content (7.7 - 10.2 wt.% UO_2 ; 0.18 - 0.21 U *apfu*) but different contents of F, Ca, Na and Pb: central parts locally show fluorcalciomicrolite composition (~2 wt.% F, ~9.5 wt.% CaO, 2.2 - 2.7 wt.% Na_2O), whereas main microlite mass forms zero-valent-dominant microlite with inclusions ($\leq 8 \mu m$) of Pb-rich zero-valent-dominant microlite (16.8 - 19.7 wt.% PbO ; 0.46 - 0.56 Pb *apfu*). Textural relationships and chemical compositions of Nb-Ta minerals indicate primary magmatic origin of columbite-(Fe) and post-magmatic (early subsolidus to late hydrothermal) formation of secondary Ta-rich columbite-(Fe) to tantalite-(Fe) and microlite-group minerals.

Key words: columbite-(Fe), Pb-U rich microlite, Nb-Ta oxide minerals, granitic pegmatite, Liešťany, Strážovské vrchy Mts., Western Carpathians, Slovak Republic

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