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PŮVODNÍ PRÁCE/ORIGINAL PAPER

Komplexní magmaticko-hydrotermální vývoj columbitu, mikrolitu a fersmitu z beryl-columbitového pegmatitu D6e u Maršíkova, Česká republika

Complex magmatic to hydrothermal evolution of columbite, microlite and fersmite from beryl-columbite D6e pegmatite near Maršíkov, Czech Republic

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Abstract

The recently rediscovered small D6e granitic pegmatite body, enclosed in amphibole gneiss of the Sobotín amphibolite massif (Jeseníky Mountains, Czech Republic), is characterized by numerous accessory minerals, including common columbite group minerals (CGM) and minor microlite and fersmite related to blocky K-feldspar unit. The CGM show complex internal zoning. Primary magmatic columbite-(Mn) occurs as corroded domains of prevailing homogeneous pattern, followed by less evolved oscillatory zonation. Primary CGM were overprinted by extensive recrystallization controlled by late-magmatic to post-magmatic fluids and leading to a formation of complex patchy and convolute oscillatory domains of secondary (hydrothermal) CGM. Primary columbite-(Mn) shows significantly limited Ta/(Ta+Nb) and Mn/(Mn+Fe) ratios, whereas secondary columbite-(Fe) to -(Mn) show slightly wider Fe-Mn and Nb-Ta compositional variations. Complex textures and the element fluctuations indicate a partial dissolution-precipitation of primary CGM caused by late- to post-magmatic fluids. Moreover, late calciomicrolite I, II and fersmite precipitated on the cracks of columbite crystals. Rare U-rich calciomicrolite I was extensively replaced by fersmite and oscillatory zoned U-poor calciomicrolite II, slightly enriched in F. Their formation sequestered part of hydrothermally released Na, Ca, U and represents the final subsolidus fluid-driven stage of the pegmatite evolution. Textural and compositional variations of Nb-Ta mineralization point to a complex magmatic to hydrothermal evolution of the D6e beryl-columbite pegmatite similar to other pegmatites in this region.

Key words: *columbite, microlite, fersmite, granitic pegmatite, magmatic fractionation, subsolidus alteration, dissolution-precipitation*

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