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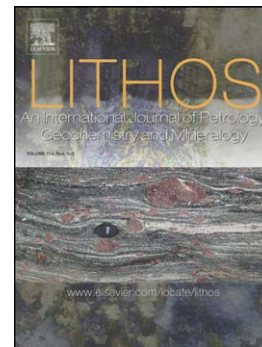
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# Variscan metagranitoids in the central Tauern Window (Eastern Alps, Austria) and their role in the formation of the Felbertal scheelite deposit

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**Abstract.** The W mineralised Early Carboniferous orthogneisses (K1-K3 orthogneiss) in the Felbertal scheelite deposit represent a chemically evolved metagranitoid series. Some of its characteristics are high concentrations of F (<4438 ppm), Nb (<86 ppm), Ta (<13 ppm), and U (<74 ppm) and REE patterns with distinct negative Eu-anomalies ( $\text{Eu}/\text{Eu}^* = 0.24\text{-}0.48$ ) and increasing HREE concentrations ( $\text{Lu}_N/\text{Ho}_N = 1.93\text{-}2.81$ ). The systematic chemical trends documented for a multitude of elements (e.g.,  $\text{SiO}_2$ ,  $\text{TiO}_2$ ,  $\text{P}_2\text{O}_5$ , Ba, Nb, Ta) and their respective ratios (e.g.,  $1/\text{TiO}_2$ , Nb/Ta, Zr/Hf) indicate that crystal-melt fractionation controlled the evolution of the granitic melts. The higher differentiated, peraluminous light-coloured K1-K3 variety ( $\text{ASI} = 0.99\text{-}1.08$ , Nb/Ta = 5-7, Zr/Hf = 13-18) evolved from the less differentiated, metaluminous dark-coloured variety ( $\text{ASI} = 0.93\text{-}1.03$ ; Nb/Ta = 6-10, Zr/Hf = 18-24). Peraluminous holo-leucocratic aplite gneiss represents the most evolved member of the series ( $\text{ASI} = 1.11\text{-}1.12$ , Nb/Ta = 4, Zr/Hf = 9-10). Modelling of magmatic differentiation assuming Rayleigh fractionation shows that c. 70-90 % of the residual granitic magma had crystallised at the time of the emplacement of the aplites. When compared to barren metagranitoids in the central Tauern Window ("Zentralgneis"), the metaluminous dark-coloured K1-K3 orthogneiss shows some geochemical similarities with the peraluminous Felbertauern augengneiss, one of the regional orthogneisses exposed near the W deposit. Elevated concentrations of Nb (<36 ppm), Ta (<5.3 ppm) and U (<30 ppm) distinguish it from other regional Zentralgneis types and illustrate its genetic relation with the K1-K3 orthogneiss.

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