English abstract

Hydrothermal systems related to highly evolved granitic magmas host diverse mineralization styles and provide an important source of economic metals. This master thesis concentrates on description and interpretation of geological structure, petrographic and textural variability, alteration zoning and calculation of time-integrated fluid fluxes recorded in highly evolved granites and tin-mineralized greisens of the Horní Blatná massif in the Western Krušné hory pluton. The massif is a composite intrusion, which consists of a large number of intrusive units emplaced during two stages. The first stage is represented by sparsely porphyritic fine-grained low-lithian annite granites that can be correlated with marginal granites (G2) of the Fichtelgebirge (Smrčiny) batholith or with intermediate granites (Walfischkopf type) of the Western Krušné hory (Erzgebirge) pluton. Intrusive batches of the second stage progressively evolve from medium- to coarse-grained serial high-lithian annite and zinnwaldite granites with topaz and rare tourmaline towards aphyric fine-grained zinnwaldite (or trilithionite) granites. This suite corresponds to the EIB2 and EIB3 facies of the younger intrusive complex in the Western Krušné hory (Erzgebirge) pluton and it can be compared to the G3 Waldstein and G4 units in the Fichtegebirge (Smrčiny) batholith. Greisen veins and swarms are irregularly distributed but predominantly hosted in the medium- to coarse-grained granites and generally lacking in the less or more evolved fine-grained varieties. Greisenization occured in several stages: (i) incipient alkali exchange between K-feldspar and albite; (ii) breakdown of feldspars to quartz and muscovite, with concomitant replacement of dark micas by muscovite. Silicification with sericite formation *vs*. muscovite formation are spatially decoupled and represent dissolution-precipitation process, which requires local transport of Al; (iii) breakdown of muscovite to topaz and quartz, which is a replacement reaction under Al-conserved conditions but porosity formation that is counterbalanced by quartz precipitation; (iv) hydraulic fracturing and open-space filling by quartz greisens and monomineralic veins. Thermodynamic simulation of fluid-mineral interaction during disequilibrium infiltration in a pressure-temperature gradient reveals that the formation of mica-quartz and topaz-quartz greisens requires time-integrated fluid fluxes 10^2 to 10^3 m^3 fluid per m^2 rock. The formation of a single greisen vein with a typical volume of 10^3–$5{\cdot}10^4$ m^3 would thus require 10^5–$3{\cdot}10^7$ m^3 aqueous fluid that must have exsolved from an intrusion measuring 80-700 m in each dimension.