

Metallogenic potential of Li-rich micas in Li-Sn-greisen of the Schenkenshöhe-Hegelshöhe ore field, Erzgebirge, Germany

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The two Sn-Li-W greisen domes of Schenkenshöhe and Hegelshöhe are located approx. 5 km north of the town of Altenberg on the eastern rim of the Altenberg-Teplice Caldera (ATC) [1] [3]. The Sn-Li-greisen mineralization belongs to multistage late magmatic phases which are associated with A-type granite intrusions (Fig. 1), [2]. The two granite domes consist of five granite intrusions which became increasingly specialized and greisenized. This results in the formation of several meter-thick bodies of Sn-Li-greisen in the apical area of the granite cupolas. There are two main generations of Li-bearing bright mica in both of the greisen domes, which allow conclusions about the genetic development of the granite intrusions and the subsequent Sn-Li-greisenization phases and hydrothermal overprinting.

Figure 1: Geological profile of the greisen deposits Schenkenshöhe and Hegelshöhe. Data basis according to [1] [3].

The 1st generation of Li-bearing mica (zinnwaldite) was formed by the intrusion of the albite granite (granite type V) responsible for the main alteration phase. This generation is primarily magmatic in origin and is characterised by its large grain size, idiomorphic formation and numerous inclusions of FeO phases and tabular albites (Fig. 2).

The 2nd generation of Li-bearing mica (zinnwaldite) was formed by the greisenization process itself. In comparison, the 2nd generation is significantly smaller and often tufted. This mica generation often shows inclusions of ferrocolumbite and monazite.

The 3rd generation is even finer grained and has a very low Fe content. This muscovite is formed during hydrothermal alteration and replaces the first two generations.

Figure 2: BSE-Image of a quartz-mica greisen with 1st and 2nd gen and 3rd gen. (sericitization) at the grain boundaries.

References

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