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Mineralization styles related to a hidden late-Variscan granite intrusion: the district of Oelsnitz (Vogtland Synclinorium, Germany)

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The mining district of Oelsnitz covers an area of approx. 100 km² (Fig 1). Mining has taken place from the middle ages until 1991 [2]. Historic activities were directed towards Sn, Fe, Cu and Ag, whereas the last and most intense period comprised the exploitation of fluorspar.

Since the first comprehensive geological studies of the area (e.g. [3]), mineralization in the area has been considered to be spatially and genetically related to a granite, which is not exposed at the surface. The existence of the granite was indicated by a ca. 5 km² large area of contact-metamorphosed shales, was additionally supported by geophysical surveys, and was eventually proved by several exploration drillholes that intersected the body at depths of about 500 m. During the 1980s, the granite was dated by Rb/Sr (whole rock) yielding an age of 297±3 Ma as well as by U/Pb (zircon) yielding an age of 300-310 Ma assigning the intrusion age to the late Variscan orogeny (cf. [2]). Furthermore, the geochemical Sn-F-specialization of this granite was established.

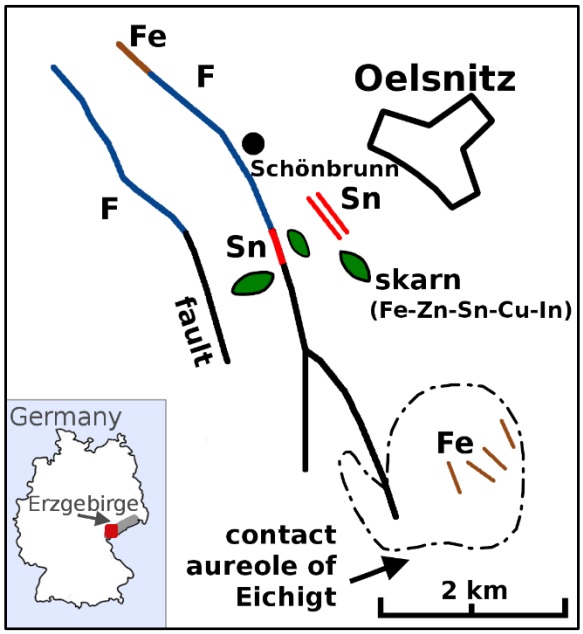

Figure 1: sketch map of the Schönbrunn district showing the distribution of main mineralization types and their relation to major faults.

Most types of mineralization are linked to NW-trending fault systems that are traceable for up to several kilometers. The mineralization chiefly comprises quartz ± cassiterite ± sulfide veins up to several decimeters in thickness and fluorite-quartz-adularia veins up to 10 m or more in thickness [2]. Apart from mineralized veins, the studied area shows occurrences of skarn-type sulfidic mineralization and metasomatites related to metamorphosed limestones and basalts of Devonian age and Ordovician shales, respectively. Investigations of sulfide ores of one particular occurrence revealed contents of indium in sphalerite up to 0.7 at% and the presence of discrete In-minerals [1]. The examination of two additional metasomatite bodies confirmed considerable indium enrichments in bulk ores up to 140 ppm. However, the In-carrier minerals have not yet been identified [4].

While a metallogenetic relation between vein-style mineralization and the hidden pluton is probable, the role of the intrusion in the formation of the skarns has not yet been established. The objective of ongoing studies is to further constrain the genetic and age relations of the different types of mineralization by the latest geochemical and geochronological methods.

References:

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