



Mineralizing fluids related to barite-fluorite fissure mineralizations at the southern edge of the Thuringian Basin, Germany

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The Thuringian sedimentary basin contains a series of Upper Permian and Triassic strata (Rotliegendes and Zechstein, followed by Buntsandstein, Muschelkalk, and Keuper). The Tertiary tectonic activity uplifted the marginal portions of the today's basin where the pre-Permian rock complexes are exposed [1].

In our work, we concentrate on the mineralization of fissures in and around the Thuringian Basin as an archive of ancient fluid systems. For this purpose, samples were taken in Kamsdorf, situated at the SE-Zechstein fringe at the interface between the basin and the uplifted horst (Thüringer Schiefergebirge) and in Gehren, Friedrichsroda and Trusetal, situated at the SW-Zechstein fringe at the interface between the basin and the uplifted horst (Thüringer Wald). Hydrothermal veins and lenses pervade the Rotliegendes up to the Zechstein [2] (Lower to Upper Permian) and are either stratiform or crosscutting the sedimentary rocks. The mineralization consists mostly of barite, calcite, dolomite and locally quartz for Kamsdorf and mostly of barite and fluorite in Trusetal and Gehren. The primary fluid inclusions in barite from Kamsdorf show a wide range of salinity between 8 to 22 eq. wt% CaCl₂. The primary fluid inclusions in the fluorite samples from Gehren and Trusetal show similar results. The salinity in those primary inclusions is about 24 to 27 eq. wt% CaCl₂. The measurements range between 85°C to 160°C in barite and range between 80°C to 130°C in fluorite. Because of the low melting temperatures and low eutectic temperatures, one can assume a CaCl₂ -dominated system.

The paragenesis of the primary minerals and the fluid inclusions are used here as indicators of the chemical composition and the physical properties of the hydraulic fluid system that circulated in the Thuringian Basin during the formation of the studied veins, most likely during the late Mesozoic.

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References:

- [1] Ziegler, P.A. (1990): Geological atlas of Western and Central Europe, Shell Internationale Petroleum Maatschappij B. V. and Geological Society of London, 39 S. (2. Auflage). [2] Rüger, F. et al (1992): Bergbaugeschichte, Geologie und Mineralien des Saalfeld- Kamsdorfer Bergreviers, Bd. 19 Naturwissenschaftliche Reihe, Museum für Naturkunde, Gera, Germany