# Fluid evolution of the Zinnwald Sn-W-Li deposit, Erzgebirge: insights from fluid inclusions

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The Zinnwald Sn-W-Li deposit in the Erzgebirge (Germany/Czech Republic) is associated with a highly evolved Li-F granite of variscan age. The roof zone of the pluton hosts large greisen bodies and sub-horizontal veins, which are the main host of the economical mineralization of Sn (cassiterite), W (wolframite) and Li (zinnwaldite) [1,2]. To investigate the hydrological and chemical evolution of the ore-forming hydrothermal system, we analysed fluid inclusions in samples from the former underground mine in the German part of the deposit by microthermometry and LA-ICP-MS, with a focus on fluid inclusion assemblages associated with ore formation.

The homogenization temperatures of the most common primary assemblages of fluid inclusions vary between 360°C and 380°C. This type of inclusions can be found throughout the deposit and can in places be petrographically related to the ore minerals. A few samples show brine assemblages containing up to 35 wt% NaCl eq. coexisting vapour-rich inclusions. These brines homogenize at lower temperatures in a range between 300°C and 340°C. Additionally, some rare euhedral quartz crystals show boiling FIAs with higher temperatures of about 470°C and higher salinities of ca. 40 – 45 wt% NaCl eq., similar to those described in [3].

On-going LA-ICP-MS measurements of fluid inclusion assemblages in quartz and ore minerals provide further information about the chemistry of the different fluid types and can help to quantify the nature and composition of the ore-forming fluid. The presentation will show first results from this fluid inclusion study and discuss the hydrothermal ore-forming processes of the Zinnwald deposit.

[1] Dolejs & Stemprok (2001) Bulletin of the Czech Geological Survey, 76, 77-99.

[2]Monecke et al. (2007) Geochemica et Cosmochimica Acta, 71, 335-353.

[3] Heinrich et al. (1999) Geology, 27, 8, 755-758.