

AN ATTEMPT AT DIRECT DATING OF THE SADISDORF Sn–W MINERALIZATION, EASTERN ERZGEBIRGE (GERMANY)

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The Sadisdorf Sn–W mineralization, Eastern Erzgebirge (Germany) is localized on top of a Li–F granitic stock. Greisenization of the granite, aplites and wall rocks (brecciated gneisses and a porphyry dike) led to the formation of a cone-like metasomatic ore body.

Variations in trace element content in wolframites from different wall rocks give strong evidence for mixing processes during fluid–rock interaction (Fig. 1). The evolution of the Bi, Mg, Nb, Sc and Ti concentrations from endo- to exocontact is similar to the behaviour observed in wolframites from the Ehrenfriedersdorf Sn deposit (Belyatsky & Kempe, 1994). Our inference is supported by REE data for fluorites (Goldstein et al., 1995).

The Sm–Nd system of wolframites and fluorites from Sn–W deposits may yield information regarding the age of ore formation (Belyatsky et al., 1992, Kempe & Belyatsky, 1994). Nevertheless, in the case of mixing processes, no isotope homogenisation occurs through the ore body. Therefore, we selected for isotope analysis wolframite samples with similar trace element characteristics from the silica cap at the top of the granite. The data points (including two fluorite samples from the silica cap and a greisenised aplite) plot on a well-defined line in the Sm–Nd isochron diagram (Fig. 1).

The obtained apparent age of 326 ± 8 Ma corresponds well with the Sm–Nd age of 321 ± 22 Ma published by Höhendorf et al. (1994) for fluorites from Cínovec and the Sachsenhöhe (Eastern Erzgebirge).

As we stated elsewhere (Seifert & Kempe, 1994), Sn(–W) mineralization in the Erzgebirge seems to be not older than 290 Ma according to geological and isotope data. Although there is no direct indication that the mineral isochron is a mixing line, we assume some input of wall rock isotope compounds possibly influencing the isochron age. Our inference is supported by relatively high ϵ_{Nd} of -3.8 . Another possible explanation is that Sn–W mineralization in the Eastern Erzgebirge is older than in the Central and Western Erzgebirge.

The reported results call for additional isotope investigations on the Sn deposits in the Eastern Erzgebirge.

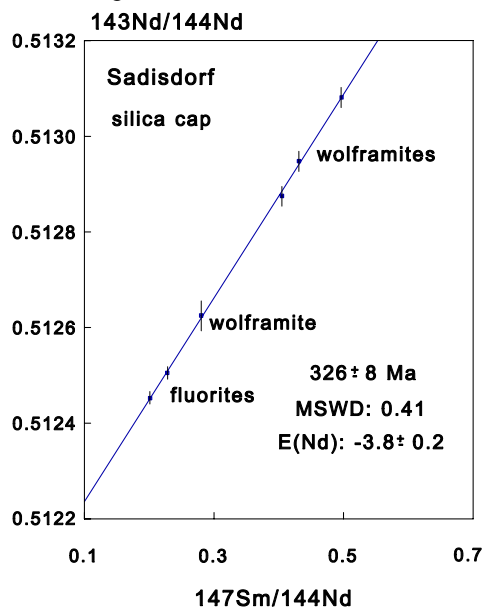


Fig. 1: Sm–Nd isochron diagram for wolframites and fluorites from Sadisdorf (left). Trace-element characteristics for wolframites of different geological position (right). REE data for fluorites according to Goldstein et al. (1995).

