

# Rb-Sr dating of sphalerite from polymetallic sulfide veins of the Freiberg ore district, Erzgebirge (Germany)

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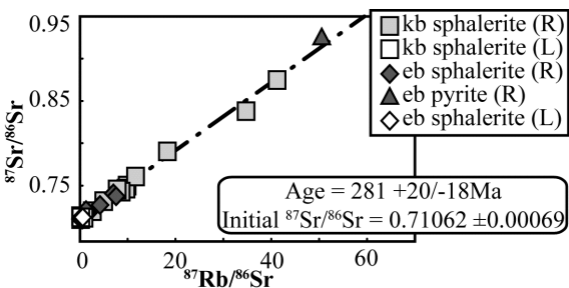
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Two styles of late- to post-Variscan polymetallic vein-type mineralization have been recognized in the Freiberg ore district: (1) the quartz-bearing kb-type, and (2) the carbonate-bearing eb-type. So far, no precise ages are available for these mineralization stages, but from field relationships it has been established that the eb-type is younger than the kb-type (e.g. [1]). We investigated the Rb-Sr isotopic composition of sphalerite and pyrite (one sample) from both stages using the crush-leach method [e.g. 2].  $^{87}\text{Rb}/^{86}\text{Sr}$  and  $^{87}\text{Sr}/^{86}\text{Sr}$  of all samples (sulfide residues, fluid leachates) are linearly well correlated and robust regression yields an age of c. 280 Ma (Fig. 1). Hence, we conclude that both ore types formed from the same fluid system within a geologically short time interval during the waning stages of the Variscan orogeny and the onset of Permian rifting. The close genetic relation between kb and eb ore-type is well supported by virtually identical Pb isotopic ratios of sulfides (galena, sphalerite) of both mineralization styles.



**Figure 1:** Rb-Sr isochron diagram for sphalerite and pyrite from kb and eb ore-type (R = residue; L = fluid leachate).

[1]Seifert (2008), *Metallogeny and Petrogenesis of Lamprophyres in the Mid-European Variscides*, 303 pp.

[2]Nakai, Halliday, Kesler, Jones, Kyle & Lane (1993), *Geochim Cosmochim Acta* **75**, 417-427