

## Genetické aspekty vzniku křišťálů v sileziku, severní Morava

### Genetic aspects of the origin of rock crystals in the Silesicum, northern Moravia

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#### Abstract

Rock crystals occur at many sites in the Silesicum in various geological environments. An investigation of their genetic aspects has been carried out using fluid inclusion petrography, microthermometry and oxygen isotope investigations.

Results from fluid inclusions and stable oxygen isotopes suggested that some quartz veins are associated with pegmatite (Velká Kraš) or with metamorphic type of fluids („alpine-type paragenesis”: Krásné near Hraběšice, Vernířovice). These fluids are most likely a product of the Variscan magmatic or metamorphic events. They had higher temperatures indicated by  $T_h$  between 110 and 311 °C, aqueous fluids shown a lower salinity and CO<sub>2</sub> was a common component. The type of these parent fluids can be expressed as H<sub>2</sub>O-NaCl-CO<sub>2</sub>. The fluid isotopic composition of oxygen is rather positive between values of  $\delta^{18}\text{O}$  from +1.9 to +3.6 ‰ V-SMOW.

The second group of samples comes from localities within metamorphic environment however their fluid inclusions provided data pointing to low temperature parent fluids. Rock crystals precipitated from solutions of H<sub>2</sub>O - NaCl ± CaCl<sub>2</sub> ± KCl ± MgCl<sub>2</sub> ± FeCl<sub>2</sub> type under lower temperatures within a range of 107 - 194 °C. One of the younger aqueous hydrothermal systems contains also higher liquid hydrocarbons suggested by the light blue fluorescence. Isotopic composition of oxygen of that type of parent fluids was about values of  $\delta^{18}\text{O}$  from -2.2 to 7.1 ‰ V-SMOW. The fluids are, with respect to microthermometric parameters and composition, interpreted as transformed sedimentary brines. Salinity of those fluids is largely between 10 and 25 wt. % of NaCl eq. In spite of a distinct rock environment in which the second type of fluids percolated they show a very similar nature at all sites. The differences are explained by fluid-rock interactions which resulted into alteration of rocks (albitization, kaolinization). Origin of these rock crystals is discussed in terms of deeply circulating sedimentary brines that were active possibly during Mesozoic.

**Key words:** rock crystal, fluid inclusions, oxygen isotope, genesis, Silesicum