

## **Studium pevných inkluzí vybraných minerálů eklogitů, peridotitů a granulitů Kutnohorské oblasti**

### English abstract

Felsic granulites with lenses and boudins of garnet peridotites and eclogites, for which UHP conditions have been obtained, commonly occur in the Moldanubian Zone of the Bohemian Massif. However, it is not clear when and how the HP-UHPM rocks were emplaced into the host granulites. The most important question that remains is, whether the felsic granulites also experienced UHP metamorphism. By studying solid phase inclusions and compositional zoning in resistant phases as garnet, we provide evidence of prograde metamorphism of felsic rocks prior to their granulite facies overprint. Finding mono-mineral inclusion of Ti-rich phengite point to prograde evolution of the rocks. Polyphase inclusions of phengite and biotite indicate that it was previously Ti-poor phengite. Another important inclusion is graphite, which could be remnant of micro-diamond inclusion.

Well-preserved prograde zoning of major elements in garnet from the felsic granulites is supported by zoning patterns of trace elements, such as titanium, chromium and yttrium and rare earth elements. Both these groups of elements remain heterogeneous at a micro-scale. The garnet profiles reveal that the rocks preserved signs of multiple stages of metamorphism. P-T conditions for different stages are constrained using pseudosection method with application of compositional isopleths in garnet. Increase of calcium from core towards the garnet mantle indicates a rapid burial to coesite/diamond stability field. This process relates to the early subduction event. Subsequent decrease of calcium content towards the rim is a result of pressure decrease during exhumation of rocks to mid-crustal levels. The granulite facies conditions are constrained by mineral assemblages as well as by high Mg and low Ca content in garnet rim. As peak temperatures, estimated for felsic granulite in the Kutná Hora Complex, range between 900-1000 °C, the preservation of prograde compositional zoning in garnet suggest that the granulite facies metamorphism was a short-term process. A polymetamorphic or multistage evolution of rocks with the first HP-UHP metamorphism and subsequent granulite facies overprint is confirmed also by solid phase inclusions in garnet.