Geophysical Research Abstracts
Vol. 17, EGU2015-646, 2015
EGU General Assembly 2015

Distinct metasomatic events and their relation to a crustal-scale deformation zone (Gemer-Vepor Contact Zone, Central Western Carpathians)

Nikol Novotná (1,2), Pavel Pitra (2), and Petr Jeřábek (1)

(1) Institute of Petrology and Structural Geology, Charles University, Albertov 6,128 43 Praha 2, Czech Republic (novotna@natur.cuni.cz), (2) Géosciences Rennes, Université Rennes 1, 35042 Rennes, France (nnovotna@univ-rennes1.fr)

Numerous talc, magnesite and siderite ore deposits occur in the Central Western Carpathians (Slovakia) along the so-called Gemer-Vepor Contact Zone, which marks the contact between two major blocks of Variscan basement, the Vepor and Gemer units. During the polyphase deformation of Cretaceous age, the Gemer Unit was first thrust over the Vepor Unit. This is well documented by the development of subhorizontal and prograde metamorphic foliation reaching up to amphibolite facies conditions in the Vepor and by the development of subvertical greenschist facies cleavages in the Gemer Unit. The subsequent exhumation of the Vepor Unit along large-scale detachment zone is documented by the development of subhorizontal lower grade cleavage in the Vepor Unit. Finally, the ongoing northward propagating convergence with the Gemer Unit led to the development of the sinistral transpressional Trans-Gemer Shear zone. Two types of shear zones with contrasting metasomatic record have been recognized in the Vepor Unit. Mg-enriched shear zones heterogeneously develop within the Carboniferous granitoids resulting in formation of Mg-chlorite–muscovite–quartz phyllonites as well as Mg-chlorite–kyanite-bearing schists. Compared to the composition of granitoids, these mylonites-phyllonites are depleted in alkalies and enriched in magnesium, iron and manganese, which is most likely related to the influx of fluids along the shear zones. The equilibrium mineral assemblage chlorite, kyanite, muscovite, rutile and quartz corresponds to $\sim 420^{\circ}$C at 4 kbar. In contrast, the second type of shear zones developed within chloritoid-kyanite schists of the Veporic Permian cover. These shear zones display metasomatic alteration characterized by a strong Fe-enrichment resulting in formation of Fe-chlorite-muscovite-quartz phyllonite. The unusual enrichment in either Mg or Fe suggests either heterogenous fluid composition or two separate metasomatic events in the studied area. Indeed, the two types of shear zones are associated with two distinct deformation events. The Mg-enriched first type shear zones are associated with prograde metamorphic evolution related to burial of the Vepor Unit whereas the Fe-enriched second type shear zones are related to the Vepor exhumation. Therefore, the formation of these metasomatic rocks reflects different stages of the polyphase Cretaceous evolution, rather than heterogenous composition of fluids. The sources of metasomatic fluids are discussed in relation to the nearby ore deposits.