GENESIS OF VEIN-STOCKWORK CRYPTOCRYSTALLINE MAGNESITE FROM THE DINARIDE OPHIOLITES

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Vein and stockwork depositions of cryptocrystalline magnesite, known also as Kraubath type, gelmagnesite, and Khalilovo type, are widespread phenomena in the Tethyan ophiolites from Alps to Zagros, including those in Dinarides, but also in other ophiolite suits like California, Bushveld, etc. Thirteen samples from the magnesite deposits: Čajetina, Kose, Krive Strane, Ćave, Mokra gora (Zlatibor Mt.), Trnava and Bela Stena (Raška, Kopaonik Mt.), Miličevci (Čačak), Goleš and Kamenica (Kosovo), and Banovići (Konjuh Mt.) in the Dinaridic and Vardar ophiolite belts were analyzed on C- and O isotopes, REE and trace elements, to shade more light on genesis of this specific genetic type, widespread along the whole Tethyan ophiolite belt.

From two controversial hypotheses on genesis, applying direction of flow of ore forming fluids – *per ascendum* and *per descendum* – the authors favour the latter. Pro and contra arguments for either models track the following reasoning:

1) Stable isotopic data on C- and O-isotopes in magnesite show significant regression line in all cryptocrystalline vein-stockwork deposits. It requires uniform conditions on a regional scale. Supply of light CO_2, needed for gaining low C-isotope values of the vein magnesite proposed by *per ascendum* model, can hardly derived by decarboxylation of organic rich sediments, in 2–3 km beneath the ophiolite, as a regional phenomenon. The *per descendum* model offers evolution of C-isotopes from heavy to light by gradual precipitation of heavier isotopes in magnesite in comparison to those of $(CO_3)^{2-}$ in the descending fluid. A closed, or semi-closed system regarding CO_2 supply in the fluid from lateritic weathering crusts downward is controlled by the Rayleigh equation. It does not require exceptionally light $\delta^{13}C_{CO2}$ and can satisfy the model with those of atmospheric origin with initial value of -7‰.

2) Extremely low values of REE and trace elements, as well as a simple monomineralic paragenesis, are results of precipitation from "clean descending fluid" already purified by weathering processes in the thick lateritic crust. *Per ascendum* hydrothermal fluids, mobilizing all elements accompanied in the ophiolitic precursor by the lateral-secretion model, would produce complex ferroan carbonate paragenesis, which appropriates to listvenites.

3) Degassing as a result of magnesite precipitation in the veins reaching 300 m depth requires a high partial pressure of the free CO_2 phase, and extremely unreal, high concentration of $\Sigma(CO_2)_{tot}$ under high pH conditions.

4) Mg-HCO_3 waters leaving the lateritic crust gradually precipitate magnesite on the way down, controlled by increasing pH. The final results are magnesium-poor waters of Ca-OH type. Magnesitization is a phenomenon similar to karstification in many respects.

REE chondrite-normalized patterns in magnesites reflect processes in the weathering lateritic crust. Mobilization of REE in saprolite by carbonate complexing, fixation and fractionation of LREE and HREE in the lateritic zone by adsorption on colloids and clays, and remobilization of REE in the ferruginous crust, shape the final patterns of the magnesite vein-stockwork system beneath.