

COMPARISON OF SELECTED ORE DEPOSITS OF WESTERN CARPATHIANS AND THE EASTERN ALPS

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The oldest model ages are similar showing high μ_2 -values and age values around more than 600 Ma. They are typical of polymetallic massive sulphide mineralizations with exception of the ore district Stubai-Ötztal. The main difference is the frequency of radiogenic lead (J-type), causing distinct inhomogenities and anomalous negative model ages. The radiogenic leads are the mobilizates of Alpidic metamorphism (30 and 80 Ma) in the Eastern and Western Alps. The Hercynian granite intrusion of the W. Carpathians have not been seized by the "Tauern crystallization." The leads of the ore mineralizations connected with the young volcanism show relevant ages or are slightly radiogenic.

In the Eastern Alps, strata bound Pb-Zn mineralizations have a tendency to model ages which are stratigraphically too old (B-type). Such a isotope composition is also evident for the Devonian Pb-Zn-Ag-Ba mineralization of the Graz Paleozoic (540 - 570 Ma) and for most of the Triassic Pb-Zn- (F-Ba)-deposit there are age differences of 150 to 200 Ma. In the Eastern Alps, the lead isotope data of the carbonate-hosted Pb-Zn-ore mineralizations show model ages 160-400 Ma. In the Western Carpathians, the Pb-isotope data are comparable with the Alpine data or analogous with mineralizations from the Slovak neovolcanics. The μ_2 -values vary from 8 to 10, corresponding to the average crust lead of the Hercynian granite complexes or to the thorogenic upper crust lead inherited from the pre-Cambrian clastic sedimentation.

The comparison is limited to the carbonate-hosted Pb-Zn deposits in respect to the problematic of biogenic and abiogenic sulphate reduction. The sulphide S-isotopes depend on the contemporaneous isotopic composition of the sea water sulphate. Differences in the S-isotope distribution are found between Anisian and Carnian Pb-Zn-mineralizations confirming different temporal origins. Biogenic reduction processes are more typical in the Eastern Alps. In the Western Carpathians, the acceptance of biogenic sulphide formation is conceivable only for the deposits of Poniky and of the vein range Vyšná Slaná. Ore mineralizations influenced by younger endogenic hydrothermal activities would be indicated by Pb-model ages around zero.

The C- and O-isotope study show that the Permian magnesites in W. Carpathians are in an adequate position. The Carboniferous-hosted magnesites are characterized by O-isotopes. In both cases, the sedimentary origin cannot be drawn in doubt considering the other facts too. The present state of the knowledge about the origin of siderites is not sufficient in all. Recent sedimentary siderites are distinguishable clearly from those of deep seated veins or of a higher metamorphic environment. The siderites of the Rudňany deposit show affinity to the siderites of Erzberg. But the thermal history of the Erzberg is more complex. Rožňava and "Penninic" (Tauern gold veins) seem to be genetically analogous. But, the siderites of the "Penninic" are formed at higher temperatures.