

TRACE ELEMENTS OF SULPHIDE ORE HOSTED IN THE EAST CARPATHIAN (ROMANIA) EPIMETAMORPHIC ROCKS

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The subject of this study is the distribution of the trace elements from ores hosted by epimetamorphic rocks belonging to the Tulgheş series (East Carpathians). The ores are located in Burloaia, Bălan, Fundul Moldovei and Leşu Ursului. We analyzed the common sulphides: pyrite, chalcopyrite, sphalerite and galena, which are present in great amounts. The trace elements permanently present in the analysed sulphides are the following: As, Co, Ni, Mn, Ti in pyrite; Co, Ni, Mn, In, Bi, Sn in chalcopyrite; Cd, Mn, Ga, Ge, Sn, In in sphalerite; Ag, Bi, Sb in galena.

From the trace element data the following observations have been made. The sulphide ores associated with epimetamorphic rocks of the Tulgheş series contain a large number of trace elements in high concentration: Co in pyrite, chalcopyrite and sphalerite, Ni in pyrite and chalcopyrite, In in sphalerite, As in pyrite.

Tin has been recorded as a permanent element in chalcopyrite and sphalerite. In CuFeS_2 it is present in concentrations up to 4000 ppm; in ZnS the maximum value is 450 ppm. The appearance of cassiterite and some Sn bearing sulphosalts prove a strong stanniferous character of fluid solutions that generated the analyzed ores.

The concentration of different trace elements varies from one location to another. In the same deposit there is variation both on the surface as well as in depth. This is the case of the Bălan ore body, where a heterogeneous repartition of different trace elements with depth was found. Thus, on the level + 50 a clear depletion in In, Ag, Ni, Mn content can be observed and a strong enrichment of Sn; In reaches the highest contents on the - 85 and Wetter levels. The analyses of trace element variations lead to an interesting observation concerning their repartition depending on ore type: massive ore and disseminated ore. This statement could be supported by the data from the Leşu Ursului mineralization. Thus, Mn in massive ore pyrite can reach values as high as 5000 ppm while the highest Mn values in pyrite from disseminated ores are only 500 ppm. The amount of Sn in massive ore is in between 10 and 50 ppm while in the disseminated ore the values are between 50 and 5000 ppm. In 70 % of the samples from massive ore, Sb content varies from 100 to 5000 ppm while in the disseminated ore only 30 % of samples reach values between 100 and 500 ppm. Co and Ni were found only in pyrite from massive ore and they are absent from the disseminated ore. The same observation is valid also for the Fundu Moldovei mineralization.

It is interesting to point out the behaviour of Mn from the Crucea–V. Bistriței–P. Sarpelui sulphide mineralization, hosted also in the Tulgheş series. The content of Mn in pyrite, chalcopyrite and sphalerite clearly increases with depth as follows: level 790 – py 0.7 %, cpy 0.03 %, sph 0.2% ; level 690 – py 2 %, cpy 1.5 %, sph 3.5 %.

The sulphides hosted in epimetamorphic rocks of the Tulgheş series contain the typical trace elements for this mineral category. The correlation between trace element contents and the concentration of the major elements such as Cu, Pb or Zn do not substantially increase the economic value of the mineralization.