Distribution of trace elements in molybdenite from different types of mineralization: Results from LA-ICP-MS study

J. PAŠAVA[1]*, M. SVOJTKA[2], F. VESELOVSKÝ[1], J. ĎURIŠOVÁ[2], L. ACKERMAN[2], O. POUR[1], M. DRÁBEK[1], K. ŽÁK[2], P. HALODOVÁ[1] AND E. HALUZOVÁ[2]

[1]Czech Geological Survey, Geologická 6, CZ-152 00, Prague 5, Czech Republic (*correspondence: jan.pasava@geology.cz)

[2]Institute of Geology of the Czech Academy of Sciences, Rozvojová 269, CZ-165 00 Prague 6, Czech Republic

On the example of four different types of associations from the Bohemian Massif (greisien-, gold-, base metal-, and „barren granite"-related) and the Kalmakyr porphyry-Cu-Mo(Au) deposit from Uzbekistan, we show that molybdenite from specific type of mineralization possess a distinct trace element chemical composition which is often overprinted by the presence of relevant mineral phases occurring in the form of nano- to micro-scale impurities [1]. Distribution of Re indicates crustal sources for group of greisen-, base-metal-, and part of granite-related molybdenite, and mixed mantle/crustal sources for Au-related and majority of granite-related molybdenite. Greisen-related molybdenite shows the highest average values of As (40 ppm), Cu (58 ppm) and Zn (45 ppm) but the lowest average Re value (0.5 ppm). They often contain inclusions of wolframite, scheelite, native Bi, bismuthinite, Bi(Se), Bi(Pb), Pb(Bi), Pb-Bi(Cu), and other phases. Gold-related molybdenite is characteristic by its highest average values of Bi (1150 ppm), Te (112 ppm), Sb (38 ppm), Au (24 ppm) and Ag (434 ppm). These concentrations are reflected by the presence of numerous micro-inclusions of native Bi, Au-Ag alloy and different tellurides and selenides. Base metal-related molybdenite is characterized by the highest average Pb (3223 ppm) and the highest median Ag (15 ppm), documented by the occurrence of abundant galena and/or anglesite micro-phases. Native Bi was also identified. „Barren granite"-related molybdenites (dispersed in the rock matrix, small quarz veinlets, pegmatite veins and/or located in fissures) show the highest median Ni value (16 ppm). These molybdenites are either inclusion free or contain micro-inclusions of native Bi, galena and/or anglesite. Molybdenite from the Kalmakyr porphyry-Cu-Mo(Au) deposit is characteristic by the highest average Re value (236 ppm) with identified micro-inclusions of base metal sulfides.

[1] Pašava *et al*. (in prep.), *Ore Geology Reviews*.