

## **GEOCHEMISTRY AND MINERALOGY OF GOLD-BEARING ARSENIC-POLYMETALLIC FORMATION IN THE SUDETES MTS. (POLAND)**

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The Au-bearing arsenic-polymetallic formation occurs in Paleozoic volcanic-sedimentary rock complexes metamorphosed to amphibolite or greenschist facies which have been further intruded by Variscan postorogenic intrusions. Geochemical studies of 40 elements by GF-AAS, ICP-AES, XRF, FAAS and AMA methods in over 200 ore samples were determined. On the ternary diagram of Au-Ag-base metals these ore samples fall in fields of gold deposits of contact-metasomatic, Q-carbonate veins, epithermal, and VMS types. The Au/Ag ratio varies within a wide limits but in ore grade material (3 ppm) is 2:1 (Zloty Stok), 1:1 (Radomice), 1:3-6 (Radzimowice) and 1:6-10 (Czarnow). Gold has high positive correlation with Bi, As, Cu, Fe and S what confirms its microscopic relationship with sulphides. Highest Au contents (135 ppm) was found in pyrite-chalcopyrite-arsenopyrite ore from Radzimowice (Q veins related to final sub-volcanic events). Gold in contact-metasomatic deposits is concentrated mostly in arsenopyrite ores (3-30 % As) in Zloty Stok ( $\pm$ loellingite -40 ppm), Czarnow ( $\pm$ pyrrhotite $\pm$ chalcopyrite -4 ppm) and Bardo (7 ppm). In Radomice richest Au mineralization (20 ppm) was found in volcanic breccia cemented by sulphides. Inclusions of native gold and electrum associated with Bi $\pm$ Te minerals in arsenopyrite, Au microveinlets within fractured sulphides and free grains of Au in voids, Q $\pm$ carbonate veinlets or between sulphides were found. Fineness of gold varies; early deposited Au contains more Ag (650 $\pm$ 30) than deposited later in paragenetic sequence (800-950). Studies by microscope, fluid inclusion, arsenopyrite geothermometer and isotopes indicated different condition and separate stages of Au mineralization.