

PLATINUM-GROUP ELEMENT-BEARING COPPER-NICKEL-COBALT MINERALIZATION IN THE HABACH GROUP, TAUERN WINDOW, SALZBURG

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The Habach Group, forming part of the Subpennine nappe system exposed in the Tauern Window, comprises a complex metamorphosed sequence of Pre-Permian magmatic and sedimentary rocks. From an economic point of view, it is host to the famous Felbertal scheelite deposit, in addition to emerald and base metals. A small Cu-Ni orebody hosted by chlorite schist, amphibolite and metasediments has been intermittently explored until 1939 in the Haidbach valley south of Mittersill. Anomalous concentrations of platinum-group elements (PGE) reported previously initiated a detailed microscopical and geochemical investigation of the underground mine.

Sulfide mineralization occurs as layers, up to 50 cm thick, oriented parallel to the foliation, and as disseminations in epidote-chlorite-rich schist. Major ore minerals comprise pyrite, pyrrhotite, chalcopyrite and pentlandite. Massive ore carries between 0.2 and 5.5 wt.% Cu, 0.2-1.5 wt.% Ni and 500 – 3000 ppm Co. Precious metal concentrations reach up to 1 ppm Pt, 2.5 ppm Pd, 23 ppm Ag, 0.3 ppm Re and 0.4 ppm Au. In addition some of the minor metals reveal elevated concentrations, most notably As, Se and Te. Elevated concentrations of Cr are noteworthy, reflected by the chemistry of chlorite and the occasional presence of chromian spinel included in sulfides.

Reflected light and electron microscopy confirm the presence of a large number of rare-metal-bearing minerals that usually occur included in the major sulphides. They comprise Ni-Fe-Co sulfarsenides (gersdorffite, cobaltite, arsenopyrite), sphalerite, molybdenite, hessite Ag_2Te , empressite AgTe , Pd-melonite $(\text{Ni,Pd})(\text{Te,Bi})_2$, kotulskite PdTe , merenskyite $\text{Pd}(\text{Te,Bi})_2$, sudburyite $\text{Pd}(\text{Sb,Te})$, testibiopalladite $\text{PdSb}(\text{Sb,Te})$, hexastibiopanickeite $(\text{Pd,Ni})(\text{Sb,Te})$, Pd-Ag telluride, sperrylite PtAs_2 , irarsite IrAsS , rheniite ReS_2 , Re-Pb-sulfide, and gold. Most of these minerals form euhedral or subhedral inclusions, reaching up to 100 μm in size (Ni-Co-Fe sulfarsenides). Platinum-group minerals reach up to 30 μm in their longest dimension. The abundance of discrete euhedral small grains of Re sulfides included in Fe-Cu sulfides is highly unusual. These minerals are not associated with any of the PGE-bearing phases. The Haidbach mineralization is interpreted as a stratiform sulphide accumulation in basic metavolcanic rocks having affinities to MORB-type basalt. Most primary textures are obscured by strong hydrothermal and metamorphic overprint, as well as polyphase deformation.