

## **Minor Element Chemistry of the Cu-Deposit of the Kelchalm near Kitzbühel (N-Tyrol, Austria)**

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The Cu-deposit from the Kelchalm lies in the western Greywacke Zone. The western Greywacke Zone is important for the investigation in the framework of the special research project HiMAT (history of mining activities in Tyrol and adjacent regions) and it's between northern Kalkalps and Central-alps. It can be subdivided in four nappes: Alpbach Unit, Hohe Salve Unit, Jochberg Unit and Langeck Unit. The investigation area lies in the Jochberg Unit (= Glemmtal Unit), which is characterized by a mighty siliciclastic progression. This progression is named as "Wildschönauer Schiefer" and they are the main rocks in the Kitzbühl Alps and can be subdivided because of the age into two groups (the lower Wildschönau Schists and the higher Wildschönau Schists). We can distinguish between three types of rocks: sedimentary rocks, acid and alkaline volcanites and tuffs.

The Jochberg-unit is characterised by numerous syngenetic Cu-deposits of the Lahn-Dill Typ. These deposits are connected with the mafic volcanism in the Wildschönau Schists. The gangue consists of quartz, ankerite and dolomite. The primary ore assemblage mostly consists of chalcopyrite and pyrite. The secondary assemblage mostly consists of goethite replacing pyrite and chalcopyrite, and subordinately covellite, markasite and azurite. In order to characterize the ore assemblage chemically for further provenance studies, 21 elements were analysed and counted for 50 seconds by WDS EMPA analyses on ca. 200 spots on pyrite and chalcopyrite, as well as NAA was performed on selected hand specimen. The data show significant differences to the ores from the largest Cu-deposits in the Eastern Alps namely the Mitterberg-Mühlbachl-Larzenbach district "in the eastern continuation of the Jochberg Unit, hosted in the Pinzgau Phyllites. In the Kelchalm, Co (5,5-155 ppm) and Ni (48-749 ppm) are lower than in Mitterberg (Co: 241-1088 ppm, Ni: 838-1479 ppm). As on the other hand is much higher in Mitterberg (839-3039 ppm) than in the Kelchalm (4-240 ppm). Se (40-145 ppm) and Ag (4-25 ppm) are higher in Kelchalm than in Mitterberg (Se: 20-40 ppm, Ag: 5-10 ppm). It is the aim of this SFB project to create a large minor and trace element database for different Cu-ore deposits from North- and South-Tyrol, as well as from Vorarlberg and Salzburg for provenance studies concerning historical trade routes of pre-historic artefacts.

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