

## Trace element behaviour in metamorphosed VMS deposits

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The trace element distribution in samples from eight VMS deposits which have experienced varying metamorphic grades were investigated by LA-ICP-MS spot analyses and mapping. Gold and the PGE in pyrite can be observed in samples from varying metamorphic grades. They do not show any systematic variation depending on metamorphic pressure or temperature and their presence in the samples indicate that no melt migration has occurred.

Samples from deposits at amphibolite metamorphism show a homogeneous distribution of Se, Sb, and Te, while Ag, Rb, Sr, Mo, and Bi are enriched in bornite compared to sphalerite and pyrite.

At greenschist metamorphic grade, Se and Sb are heterogeneously distributed among the different sulfide phases with Se being most enriched in pyrrhotite and Sb in chalcopyrite. Tellurium shows a homogeneous distribution between sulfide phases. Some other elements are as well enriched in chalcopyrite compared to pyrite and pyrrhotite, including V, Cr, Mn, Ni, Ga, Ge, Mo, Ag, Cd, In, Sn, and W. Cadmium, In, and Mn are even more enriched in sphalerite compared to chalcopyrite in weakly metamorphosed VMS. Indium concentrations in sphalerite are up to 0.1 wt%.

Indium, Mn, and Cd in sphalerite, and Bi in galena are homogeneously distributed in trace element maps in two samples from greenschist and epidote-amphibolite facies metamorphosed deposits. Cobalt is observed to occur only at the rim of pyrite grains in the sample from the greenschist facies metamorphosed deposit, while in the sample which experienced higher metamorphic P and T, Co occurs only in the centre of pyrite grains. Germanium and W show a homogeneous distribution in pyrite. Tin is homogeneously distributed in chalcopyrite.