

Base Metal Zoning in the Pyhäsalmi Volcanogenic Massive Sulfide Deposit

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VMS deposits commonly show internal metal zonation where Cu is usually most abundant in the stringer zone and in the base of the deposit, while Zn and Pb are most common at the margins of the deposits (Large 1977). This Cu-Zn zoning is so common that it has been used as an indicator of stratigraphic facing direction (Sangster 1972).

Cu-Zn zonation is also present in the Pyhäsalmi deposit, being very clear in the deep parts of the ore body. There massive pyritic core is surrounded by the pyrite-chalcopyrite-calcite ore which in turn is capped by the sphalerite-pyrite-barite-calcite ore (Imaña 2003).

At the ongoing study the spatial distribution and relationships between Cu and Zn concentrations are studied by using all available assay data from the whole ore body. Leapfrog Geo 3D modelling software is used to model zones with distinct $\text{Cu}/(\text{Cu}+\text{Zn}) \cdot 100$ ratios. Also the 3D model of the Pyhäsalmi ore body is being refined by using historical and modern data sets.

This study hopefully gives better insight from the Cu-Zn zoning, internal structure and structural evolution of the whole Pyhäsalmi deposit. Majority of the observed Cu-Zn zonation is probably primary in origin. However, 1.93-1.90 Ga old Pyhäsalmi deposit has experienced amphibolite facies metamorphism and multiple stages deformation. As a result, sulphide remobilization has occurred and to some extent that can obscure the primary Cu-Zn zoning.

References:

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