

Trace minerals in Fe-Cu and Fe-zones, Ocna de Fier Fe-(Cu) skarn deposit, Romania. I: Evidence for ore genesis from exotic phases in bornite- and chalcopyrite ores

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Trace ore mineral assemblages in the Ocna de Fier Fe-(Cu) skarn deposit are of considerable mineralogical interest. Species identified, many of them rare or unusual, provide valuable constraints upon conditions and timing of ore deposition during skarnification.

Cu-ores from the central part of the mineralising system at deeper levels occur in a forsterite Mg-skarn matrix - a high-volatile assemblage also containing apatite, phlogopite, valeriite and ludwigite. Bornite and chalcopyrite contain exsolved Co-Bi-Ag-Au-Sn-Se-Te minerals (Co-pentlandite, wittichenite, mawsonite, native Ag, electrum, Bi- and Ag-selenides and -tellurides), as well as galena and sphalerite. Lamellar, symplectitic and marginal exsolution textures reveal a multi-stage expulsion of impurities, as discrete minerals, during prolonged cooling. The assemblage is consistent with initial crystallisation of high-temperature Cu-Fe-sulphides at ~ 600° C.

The Cu-Fe sulphides and exsolution products belong to the final part of prograde mineralisation, characterised by volatile-rich fluids and associated boiling. Formation of this suite, as well as the analagous, Bi-sulphosalt bearing suite in magnetite-hematite ores from the Fe-zone which envelopes the Cu-zone (Ciobanu & Cook, this volume), relates to the coincidence of suitable formational parameters in the skarn environment at Ocna de Fier. The high initial temperatures of crystallisation have been particularly influential in the development of the observed mineral associations. The conspicuous preservation of the assemblages is a function of the refractory character of the enclosing garnet and

MAGNETITE .