

PARTIAL MELTING OF THE BROKEN HILL GALENA-SPHALERITE ORE:
EXPERIMENTAL STUDIES IN THE SYSTEM PbS - FeS - ZnS - (Ag_2S)

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Abstract

For many years the genesis of the Broken Hill Pb-Zn-Ag deposit has been, and continues to be, hotly debated, mostly because many of the original characteristics of the deposit have been obscured by high-grade metamorphism and deformation. Metamorphism not only overprinted the deposit but fundamentally modified the sulfides through metamorphic remobilization. Based on experimental studies it had also been speculated that partial melting of the sulfides may have occurred. The lack of experimental data at elevated pressures in the PbS-FeS-ZnS system has limited this suggestion to mere speculation. We present the results of an experimental study of the melting behavior of sulfides, which show that Broken Hill ores must have been partially molten under peak metamorphic conditions.