

SOURCE, TEMPERATURE AND MECHANISM OF FORMATION OF BARITE-FLUORITE ORE DEPOSITS IN THE CENTRAL IRAN; A FLUID INCLUSION APPROACH

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Barite-fluorite ore deposits in the central tectonic zone of Iran are hosted by carbonate units of Devonian to Permian. These are epigenetic fracture and void filling deposits with some Jasperoid alteration. Fluid inclusion technique along with field and petrographic studies (SEM, thin and polished sections) were employed to ascertain the source, temperature and mechanisms of ore mineralization. Because of intergrowth of barite and fluorite and other evidences that indicate their contemporaneous formation, and exceptional inclusions in fluorite, it was used for fluid inclusion studies. Two types of fluid inclusions were distinguished, one is liquid-rich and the other is gas-rich inclusion. The former converted to a homogenous liquid phase during heating stage but the latter changed to a homogeneous vapor by heating. Boiling of hydrothermal fluids in some open space structures caused formation of these two types of inclusions and some mineralization. Salinity of hydrothermal fluids, calculated from freezing temperatures, are low (3.7 ± 1.4 Wt.% NaCl eq.) and their temperature of homogenization are $167 \pm 11^{\circ}\text{C}$. Granitoids of early Kimmerian orogeny in the vicinity of area emitted Ba, F and reduced sulfur. Mixing of ore-bearing magmatic hydrothermal fluids with low salinity oxygen-rich meteoric waters is the main mechanism of mineralization. Granitoids the main source of ions, were also operated as heat engine for convection of hydrothermal fluids and ore deposition. Low salinity of final mineralizing fluids, calculated from fluid inclusions, denotes that meteoric waters were the main source of hydrothermal fluids.