

## **Mineralogy, Mineral Chemistry, and Fluid Inclusion Investigation of Köstere Hydrothermal Vein-Type Deposit (Gumushane, NE-Turkey)**

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Vein type Köstere ores were deposited along cracks formed as a result of NE-SW fault system in the 78-my aged felsic volcanic rocks in the northeastern Black Sea Region of Turkey. Total silver content of the Köstere ore is controlled by total silver content of the hydrothermal solution, homogenization temperature of the ore minerals and modal abundances of the tetrahedrite-tennantite serie minerals. The Zn/Cd ratios of sphalerites from the Köstere deposit are close to those of granite-related classical vein-type hydrothermal deposits. Furthermore Co/Ni ratio in pyrite separates, higher than unit, suggests an acidic source for the ore forming fluids. Homogenization temperatures of 200-370°C and salinity of 0-9.85 eq. wt% NaCl were obtained on the basis of fluid inclusions studies measured in quartz minerals. These data indicate that ore formation conditions for the Köstere ore are similar with the vein-type epithermal-mesothermal deposits, related to the magmatic fluids. The overall low salinities of fluids (on average: 5.4 eq. wt% NaCl) suggest that meteoric waters were involved in mineralization. The possibility of interactions between ascending hydrothermal fluids and dilute meteoric waters is supported by geological features and mineralogical data which indicate a shallow depth of mineralization. Torul Pluton, which is the younger acidic unit (72 my) in the area, is suggested to be related to the formation of Köstere deposit.

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