

Geology, mineralogy and fluid inclusion data from the Tumanpınarı volcanic rock-hosted Fe-Mn-Ba deposit, Balıkesir, Turkey

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The Tumanpınarı mineralization is a volcanic rock-hosted hydrothermal deposit located in 35 km west of Dursunbey, Balıkesir. The deposit constitutes one of the most important deposits of the Havran-Dursunbey metallogenic sub-province in which numerous Early Miocene Fe-Mn-Ba deposits are distributed. The geology of the study area consists mainly of andesite that form a part of the West Anatolian calc-alkaline volcanism of Miocene age. The Mn-Fe-Ba deposits in the Dursunbey area associated with andesite. These rocks display a large variation of K₂O from approximately 2 % to 6 %. SiO₂ content ranges between 55 % and 63 %. These chemical results signify a high-K calc-alkaline spectrum. Early hydrothermal activity was responsible for three types of hypogene alteration in decreasing intensity: silicification, hematization and argillic alteration. The ore stage clearly postdates hydrothermal alteration, as indicated by the occurrence of ore minerals in vuggy cavities and fractures in silica bodies. The mineral assemblage includes pyrolusite, psilomelane, barite, hematite, and magnetite as well as minor manganite, poliannite, braunite, bixbyite, pyrite, limonite, and goethite. Mineralogical, it was recognized three ore types as dominant pyrolusite ore, pyrolusite + psilomelane ore, and psilomelane + hematite + barite+ limonite ore with pyrolusite. High As, Pb, Zn contents of the ore seem to be an important geochemical characteristic of the Tumanpınarı deposits. Average $\delta^{34}\text{S}$ values for barite are 2,92 and 6,24 ‰, respectively, suggesting an igneous source for both the sulphur and metals. Fluid inclusions in main-stage quartz and barite homogenize at 134° to 417 °C with salinities ranging from 1.3 to 21,2 eq. wt % NaCl. The deposits formed during the interaction of two aqueous fluids: a higher-salinity fluid (probably magmatic) and a dilute meteoric fluid.