



## **Chemical, mineralogical, and mass-change examinations across a gold bearing vein zone in the Akoluk area, Ordu, NE Turkey**

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Chemical changes associated with gold mineralization in the Akoluk field in the western part of the eastern Pontides are investigated. The eastern Black Sea region hosts several Kuroko-type, massive sulfide deposits and, therefore, has drawn the attention of numerous workers. Acidic intrusions play an important role and structurally controlled zones of alteration are widespread thus leading to a great potential for epithermal gold deposits in this region. Rocks in the study area are part a volcano-sedimentary sequence. Vein-type mineralization occurs along fault systems in dacitic tuffs of upper Cretaceous age. These rocks are cut by a N45-50°E trending fault system, which is partly truncated by another N55-60°W extending fault system. Mineralization is observed in areas where these fault systems intersect.

Native gold, zinckenite, stibnite, orpiment, realgar, cinnabar, pyrite, marcasite, sphalerite, and galena are the main ore minerals. Gangue minerals are quartz, barite and dolomite. Mineralization occurs as a replacement type in the wall rock, and filling type in fracture zones where voids are filled mostly by realgar, orpiment, zinckenite, stibnite, quartz, barite, and sericite. The presence of framboidal and colloidal ore minerals and textures indicate that mineralization occur at low temperatures in an epithermal system.

Zonal alteration is observed along the fault systems. Outward from the fault alteration types change from silicification through illitization, smectization to carbonatization. As a result of alteration, wall rock has undergone a total mass loss of 2.19%. Almost all the major oxide contents decreased to certain levels. Due to alteration of feldspar and hornblende, the concentrations of Na, Ca and Fe significantly decreased while silica and ore-forming elements were added to the host rocks. Development of carbonate minerals at the fringe of the fracture zone in the host rock indicates relatively alkaline conditions for the hydrothermal fluids in the beginning. However, absence of these carbonate minerals, sericitization of plagioclases and increase in pyrite content towards the quartz-barite with time, became slightly acidic and were enriched in silica.