

The Bekirli Metamorphic Rocks-Hosted Stratiform Cu-Zn Mineralization in the Kömürlükdere Area, Eastern Pontides, Turkey

Cihan Yalcin, Demet Kiran Yildirim*, Mustafa Kumral, Zeynep Doner, Mustafa Selman Aydogan, and Murat Budakoglu

Geological Engineering Department, Istanbul University, Istanbul, Turkey, *e-mail, kirand@itu.edu.tr

This study deals with the mineralogy and geochemistry of stratiform Cu-Zn mineralization in the Kömürlükdere area in the Kargı (Çorum) district, eastern Pontide, north Turkey. The study area comprises Mesozoic and Late Pliocene lithostratigraphic units. The autochthonous Triassic-Early Jurassic Bekirli metamorphic rocks are tectonically overlain by rocks of the allochthonous Kargı ophiolitic melange and the Saraycık Formation, products of the closing Neotethyan Ocean. They are overlain by rocks of the Upper Pliocene Ilgaz Formation and Pliocene-Quaternary sediments.

The Bekirli metamorphic rocks consist of metabasite with quartz schist, quartzite, amphibolite, metabasalt, mica schist, and phyllite that were formed in an extensional tectonic setting showing affinities to ocean ridge basalts. The Kömürlükdere metamorphic rocks (or the Bekirli metabasite and quartzite) host stratiform Cu-Zn mineralization that occurs parallel to the schistosity and is syngenetic in origin. It occurs along a western part of the NE-striking fault zone. The banded (1- to 5-cm-thick) and disseminated ore mineral assemblages in the wall rock include chalcopyrite, magnetite, hematite, sphalerite, covellite, and pyrite, with quartz and calcite as gangue. Sphalerite occurs as inclusions in pyrite, while magnetite has a brecciated texture because of faulting. The concentrations of Cu and Zn are 7,285 ppm and 6,275 ppm in the main mineralized area, respectively. The $\delta^{34}\text{S}$ values of the sulfides that range from +3.85 to +3.96 ‰ may reflect a magmatic fluid, in which the sulfur is either sourced directly from magma or remobilized from preexisting crustal rocks during the metamorphic event.