

Alteration geochemistry and sulfur isotope insights into metasediment-hosted Cu-Pb (-Zn) mineralization at Halılar area, NW Turkey

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This contribution reports on new stable isotope data of sulfides and REE geochemical behavior of the alteration types within the metasediment-hosted Cu-Pb (-Zn) mineralization at Halılar area, NW Turkey. This vein-type mineralization occurred with intense greenschist facies alteration along NE-SW fault zone at the lower contact Bağcağız Formation with the Düztarla granitic intrusion. Mineralized quartz veining traversed this granite locally transgressing into the surrounding metasediments. Two alteration zones bounded the mineralized brecciated zone and mineralized quartz veins having chalcopyrite, galena, and some sphalerite with covellite; mainly phyllic alteration (quartz, sericite, and pyrite), and particular propylitic alteration (albite, calcite, epidote, sericite and/or chlorite). Phyllic alteration is the main mineralized zone characterized by enrichments of Cu, Pb, and Zn with Si, Fe, K, Ba, and LOI reflecting silicification and sericitization. While, propylitic zone has Ca-, Na-, K-, Ti-, P-, Ba-, and Cu-enriched referring to albite, calcite, epidote, and sericite with chlorite alterations.

$\delta^{34}\text{S}$ values of pyrite, chalcopyrite, and galena in quartz vein range from -1.1 to 0.4 ‰_{VCDT}, -2.7 to -0.5 ‰_{VCDT}, and -3.5 to -2.1 ‰_{VCDT}, respectively. It refers to the $\delta^{34}\text{S}$ values of the sulfide minerals are around 0 ‰_{VCDT} suggesting their magmatic signature and their ore fluids have magmatic-hydrothermal sources in which the S is either sourced directly from the remobilization from the igneous intrusion in the study area that represented by Düztarla granitic intrusion.