

## **Alteration geochemistry of the volcanic-hosted Dedeninyurdu, Yergen and Fındıklıyar Fe-Cu mineralization at Gökçedoğan, Çorum-Kargı region, Turkey**

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This study is to determine the mass/volume gain and loss of the major and trace elements during the alteration processes on Dedeninyurdu, Yergen and Fındıklıyar Fe-Cu mineralizations of the area. Fe-Cu mineralization occurred in the spilitic volcanic a rock of Saraycık Formation is associated with the different types of alteration zones which are pyritization, silicification and sericitization. The study area comprises Bekirli Formation, Saraycık Formation, Beşpınar Formation, and Ilgaz Formation. Saraycık formation consists of spilitic volcanic rocks with pelagic limestone, siltstone and chert. The ore mineralogical data show that the pyrite, chalcopyrite, covellite, hematite, malachite and goethite formed during three phases of mineralization. As well as the geologic and petrographic studies reveal three alteration zones with definite mineral assemblages; phyllic alteration (quartz + sericite + pyrite) that represents the main alteration and mineralized zone; propylitic alteration; and carbonatized sericitic alteration zone. The boundaries between these zones are gradual. Mass balance calculations suggested that the phyllic alteration zone represented by gain in Si, Fe, K, S, and LOI and loss in Mg, Ca, and Na refers to silicification, sericitization and pyritization as well as replacement of Fe-Mg silicate and plagioclase. While, in the propylitic alteration zone, enrichment of Si, Fe, Mg, LOI and S occurred with depletions of Ca, Na, and K reflecting chloritization alteration type. On the other hand, carbonatized sericitic alteration zone shows local gain in Si, CaO and K reflects the occurrence of calc-silicate alteration. All alteration zones contain a large proportion of sulfide minerals (gain in S) with increase in loss on ignition (LOI).

**Keywords:** Alteration geochemistry; Mass balance calculation, Fe-Cu mineralization; phyllic alteration, propylitic alteration.