

Geochemistry of an actual Fe-sulfides formation from Acisu district, Karsanti, Adana, Turkey

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The aim of this study is to elucidate the geochemical characteristics of the Acisu district actual Fe-sulfides (pyrite/marcasite) formation (Karsanti, Adana, Turkey). Around this mineralization, Upper Cretaceous ophiolite is cropped out and Paleozoic and Mesozoic aged sedimentary rocks are trusted over it. The Fe-sulfide occurrence is approximately 25 m length, 5 m width, and 3 m depth in diameter. The paragenesis comprises marcasite, chalcopyrite, quartz, hematite and calcite/dolomite. Approximately 0.5 l/s hydrothermal water (pH=4-6 and T=40-45°C) is going out to surface as a spring. Total sulfur concentration of the is 200-250 µM. It is known that Tl, Ni, Co, Mn, Zn, Pb, Ge, Cd, and As contents and Co:Ni ratio of the pyrite/marcasite are permit to distinguish them sedimentary, high and low temperature occurrences (Huston et al, 1995; Temur et al, 2006). Fe and Sb contents in the ore showed positive correlation, against strong negative correlation of Fe and SiO₂, Al₂O₃, CaO, MgO, Sr, U. Wide ranges in concentrations of Cd, Cr, and Zn characterize the mineralization. The samples contain low Ag (12 ppm), As (26 ppm), Ni (14 ppm), Sr (1.4 ppm), Y (0.25 ppm), versus high Cu (9600 ppm), Mo (23 ppm), Pb (120 ppm), Se (86 ppm). Based on cluster analysis, four main groups can be clearly distinguished. These are **the main oxides group** (SiO₂, CaO, MgO, Al₂O₃, Sr and U) respecting enrichment of these element against to Fe; **the iron-sulfide group** (Fe, Sb, LOI and TOS) representing of the main marcasite mineralization; **the chalcophile elements group** (Zn, Cd, Hg, Ga, Ag and Cu) reflecting a mineral accumulations by sulfo-salt in solution; and the Co-Cr group (Co, Bi, Se, As, Cr, Y, and Au) representing contamination by ultramafic wall rock. On the triangular diagram of (Sb-Sr-Zn) and (Sr-Co-Zn), three mineralization types can be deviated from each other as (1) pure marcasite; (2) marcasite which contains rich lattice stoichiometric substitutions; (3) marcasite which contains rich other sulfide minerals.

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