

Mineralogy and Geochemistry of Neogene Terrestrial Sediments from North- East of Malatya (Eastern Turkey)

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This study focuses on the Neogene alluvial fan deposits at the North- East of Malatya (Eastern Turkey). These alluvial fan sediments are largely the products of stream deposition during Upper Miocene – Pliocene. Previous sedimentary studies suggest that most of the alluvial input into the basin was from the the north, northeast, and east. Paleozoic-Mesozoic Metamorphics, the Oligocene - marine sediments, the Miocene Yamadağ Volcanics, and Neogene alluvial and intercalated lacustrine rocks comprise the main lithologic units in the area. Alluvial sediments are occur in successive mudstone, sandstone and conglomerates. Macroscopic determinations show that clastics in the alluviums are derived from Yamadağ Volcanics which are at the north, northeast, and east of the alluviums. Previous petrographic studies show that these volcanics are composed of basaltic andesite to dacite in composition with typical calc-alkaline character. The aim of this study is to interpret the mineralogical and geochemical characteristics of source area of these alluviums. Samples were collected from these alluvial fan alluviums, and X - ray powder diffraction (XRD), ICP-AES, ICP-MS were performed on these samples, Samples consist of clay minerals, calcite, feldspar, quartz and dolomite. Clay minerals were smectite, illite, mixed layer smectite-illite, and palygorskite, with Ca-smectite being the dominant clay phase. Smectite was derived from the transformation of volcanic glass and volcanic rock fragments. These samples are convenient with Fe shales and shales. The ratios of Zr/TiO_2 , Th/Sc , Zr/Sc , $Y/Ni-Cr/V$, $Al/(Al+Fe+Mn)$ show dominance of neutral-basic volcanism in the area. Chondrite-normalized REE diagram show the presence of REE-bearing accessory minerals resulted in a positive LREE anomaly with respect to chondrite. Eu/Eu^* values are between 0.77 and 1.53, (average 1.17). The absence of Eu anomalies shows that our samples are generally neutral-basic in composition.

Key Words: Mineralogy, Geochemistry, Eastern Turkey, Malatya.