

Mineralogy and Geochemistry of Clay Rich Volcano-Sedimentary Units from South of Elazığ Basin (Eastern Turkey)

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The investigated area covers Upper Cretaceous Elazığ Magmatics and Middle Eocene Maden Group in the southern of Elazığ. X-ray powder diffraction (XRD), ICP-AES, ICP-MS were performed on three sections samples belonging to Elazığ Magmatics (Yemişlik and Kavallı sections) and Maden Group (Alıncık section), to investigate the depositional environment of volcano-sediments. The Elazığ magmatic rocks are composed of diorites, monzodiorites, quartz-diorites, and tonalites, basaltic pillow-lavas, andesitic lavas, and andesitic pyroclastic rocks. The Maden Group has a complex lithology consisting of limestones, red-green clayey limestones, sandstone, agglomerate, tuffs, reddish mudstone and basaltic-andesitic pillow lavas. Yemişlik section is composed mainly of altered grey tuffites, Kavallı section is represented by brown altered sediments, intercalated with basaltic, andesitic lava flows. Reddish mudstones constitute the Alıncık section. All samples consist of clay minerals (chlorite, illite), quartz, and feldspar. Yemişlik and Kavallı sections also contain calcite. Chlorite is the dominant clay in three sections. SiO_2 , Al_2O_3 , Fe_2O_3 , K_2O contents show that Kavallı, Yemişlik and Alıncık samples are convenient with Fe shales and shales. The ratios of TiO_2 , Zr, Th/Sc, Zr/Sc, Y/Ni-Cr/V, $\text{Al}/(\text{Al}+\text{Fe}+\text{Mn})$ show dominance of neutral-basic volcanism in the area. REE concentrations of samples are normalized to chondrite values. It is determined that low light rare earth elements (LREEs) are enriched in comparison to high rare earth elements (HREEs), and the absence of Eu anomalies shows that our samples are generally mafic in composition. Rare earth elements (REE) of samples were compared with North American shale composite (NASC), European shale (ES) and Post-Archean Australian shale (PAAS). Elements are not in concurrence with these compositions. Th-Hf/3-Nb/16 tectono-magmatic discrimination diagram for samples in the study area indicate that all samples were derived from an island arc tholeiitic (IAT) source rather than a mid-ocean ridge-type magmatic source. The resemblance of Elazığ Magmatics and Maden Group volcano-sediments show that these two formation were deposited along the southern branch of the Neotethys Ocean margin during Late Maastrichtian—Middle Eocene times.