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Isotope Geochemistry of Neogene Lacustrine Sediments from South of Elazığ Basin, Eastern Turkey

D. Bal Akkoca
Firat University, Faculty of Engineering, Department of Geology Engineering, Elazig, Turkey (dbal@firat.edu.tr)

The stable isotopic composition of lacustrine deposits has the ability to record paleoenvironmental factors. Investigation study area covers Neogene shallow-ramp type lacustrine sediments from the south of Elazığ Basin, Karabakır Formation, Eastern Turkey. The basement rocks of the area consist of Permo-Triassic metamorphics, upper Cretaceous magmatics and middle Eocene-upper Oligocene marine Formation. Lake sediments consist of calcareous-sandy claystone, clayey limestone and limestone intercalated with paleosol levels. X-ray diffraction on 40 samples, whole rock stable isotope measurements (δ^{18}O and δ^{13}C) were performed on 12 carbonated mud samples taken from Rızvanhill 1-2 and Bozhill 1-2 stratigraphic sections. Clay and calcite with equal contents are the most abundant minerals which are accompanied by dolomite, quartz, feldspar and opal. Clay minerals are chiefly composed of smectite, palygorskite and sepiolite and lesser amounts of detrital chlorite, illite, mixed layer clays (S-I, S-C) and kaolinite. The isotopic values of carbonated sediments from -8.11 to - 9.11 for δ^{18}O ‰ and -3.17 to 0.12 for δ^{13}C, ‰. This values are similar to those of smectite-, sepiolite- and palygorskite-bearing lake carbonates in Sivrihisar, Western Turkey. Statistically, δ^{18}O values have low standard deviation (0.32), variation deviation (3.7) and skewness deviation (0.02), and this show that this values have narrow range. The narrow range of δ^{18}O in our samples is characteristic of hydrologically open lake which is fed by meteoric waters during deposition and vulnerable to detrital component. Previous sedimentological studies showed detrital materials transported from the source area to the deposition area. Higher standart deviation (1.18), coefficient of variation (67.04) and skewness (-0.38) of δ^{13}C show variations of values. Variations in δ^{13}C are most intimately associated with biological processes operating in the basin. Some bioclastic materials such as plant fossils and ostracode shells floating within the micritic material in samples. Diagenetic alteration has the potential to significantly affect the oxygen isotopic composition. The δ^{18}O composition of samples suggest that investigation lacustrine rocks have not undergone significant diagenetic alteration.