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Vertical and Horizantal Distribution Patterns of Major and Trace Elements: Surface and Subsurface Sediments of Endhorheic Lake Acigol Basin, Denizli Turkey

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Abstract : Lake Acıgöl is located in area with limited influences from urban and industrial pollution sources, there is nevertheless a need to understand all potential lithological and anthropogenic sources of priority contaminants in this closed basin. This study discusses vertical and horizontal distribution pattern of major, trace elements of recent lake sediments to better understand their current geochemical analog with lithological units in the Lake Acıgöl basin. This study also provides reliable background levels for the region by the detailed surfaced lithological units data. The detail results of surface, subsurface and shallow core sediments from these relatively unperturbed ecosystems, highlight its importance as conservation area, despite the high-scale industrial salt production activity. While P2O5/TiO2 versus MgO/CaO classification diagram indicate magmatic and sedimentary origin of lake sediment, Log(SiO2/Al2O3) versus Log(Na2O/K2O) classification diagrams express lithological assemblages of shale, iron-shale, vacke and arkose. The plot between TiO2 vs. SiO2 and P2O5/TiO2 vs. MgO/CaO also supports the origin of the primary magma source. The average compositions of the 20 different lithological units used as a proxy for geochemical background in the study area. As expected from weathered rock materials, there is a large variation in the major element content for all analyzed lake samples. The A-CN-K and A-CNK-FM ternary diagrams were used to deduce weathering trends. Surface and subsurface sediments display an intense weathering history according to these ternary diagrams. The most of the sediments samples plot around UCC and TTG, suggesting a low to moderate weathering history for the provenance. The sediments plot in a region clearly suggesting relative similar contents in Al2O3, CaO, Na2O, and K2O from those of lithological samples.

Keywords : Lake Acıgöl, recent lake sediment, geochemical speciation of major and trace elements, heavy metals, Denizli, Turkey
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