



Sedimentary provenance of Maastrichtian oil shales, Central Eastern Desert, Egypt

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Maastrichtian oil shales are distributed within the Central Eastern Desert in Egypt. In this study elemental geochemical data have been applied to investigate the probable provenance of the sedimentary detrital material of the Maastrichtian oil shale beds within the Duwi and the Dakhla formations. The Maastrichtian oil shales are characterized by the enrichment in Ca, P, Mo, Ni, Zn, U, Cr and Sr versus post-Archean Australian shales (PAAS). The chondrite-normalized patterns of the Maastrichtian oil shale samples are showing LREE enrichment, HREE depletion, slightly negative Eu anomaly, no obvious Ce anomaly and typical shale-like PAAS-normalized patterns. The total REE well correlated with Si, Al, Fe, K and Ti, suggesting that the REE of the Maastrichtian oil shales are derived from terrigenous source. Chemical weathering indices such as Chemical Index of Alteration (CIA), Chemical Proxy of Alteration (CPA) and Plagioclase Index of Alteration (PIA) indicate moderate to strong chemical weathering. We suggest that the Maastrichtian oil shale is mainly derived from first cycle rocks especially intermediate rocks without any significant inputs from recycled or mature sources. The proposed data illustrated the impact of the parent material composition on evolution of oil shale chemistry. Furthermore, the paleo-tectonic setting of the detrital source rocks for the Maastrichtian oil shale is probably related to Proterozoic continental island arcs