

Evaporite mineralogy of Quaternary sequence and geochemical evolution of the Meyghan Playa, Arak province

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Abstract: In this study, brine and sediment samples from the Meighan basin located about 15 km northeast of Arak city were considered. Sediments samples were collected from boreholes and surface sediments of playa bed were studied for their mineralogical content by X-ray diffraction (XRD) technique and sedimentology. The results showed that the Playa sediments were consist of chemical (evaporate) and detrital (quartz, muscovite and clays) minerals. Evaporate minerals including calcite, gypsum, halite, glauberite, thernadite, polyhalite, natron and very small amounts of dolomite, magnesite, bassanite and sylvite are present. The study of surface sediments indicate that carbonate and sulfate minerals were precipitated along the margins of the playa whereas the minerals with higher solubility like halite appear in the central parts. In other words, a kind of mineralogical zonation which obeys the Bull's-eye pattern occurs in the Meighan playa. Study of geochemical evolution associate with minerals precipitation suggest that high concentration of Meyghan playa brines to formation of chloride and bitter salts and Na-Cl-SO₄ brines.

Keywords: *evaporate minerals; X-ray diffraction analysis (XRD); sodium sulfate; Meighan playa; Arak.*

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