



A preliminary magnetic study of Sawa lake sediments, Southern Iraq

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ABSTRACT

A preliminary magnetic study combined with chemical analyses was carried out in Sawa Lake in Al-Muthanna province, southern Iraq, about 22 km south west of Samawa city (31°18'48.80"N, 45°0'25.25"E). The lake is about 4.74 km length, 1.75 km width and 5.5 m height, it is surrounded by a salt rim which is higher than the lake water by about 2.8 m and sea water by about 18.5 m (Naqash et al., 1977 in Hassan, 2007). The lake is an elongated closed basin with no surface water available to it, it may be fed by groundwater of the Euphrates and Dammam aquifers through system of joints and cracks.

This study aims to investigate the concentrations of selected heavy metals as pollutants and magnetic susceptibility (MS) and other magnetic properties of sediment samples from fifty sites collected from the bottom of the lake, the study area lies in an industrial area.

The results show spatial variations of MS with mean value of about $4.58 \times 10^{-8} \text{ m}^3 \text{ kg}^{-1}$. Scanning electron microscopy and magnetic mineralogy parameters indicate the dominance of soft magnetic phase like magnetite and presence of hard magnetic phase like hematite.

Spatial variations of MS combined with the concentrations of heavy metals suggests the efficiency of magnetic methods as effective, inexpensive and non-time consuming method to outlining the heavy metal pollution.

References: Hassan W.F., 2007. The Physio-chemical characteristic of Sawa lake water in Samawa city-Iraq. *Marine Mesopotamica*, 22(2), 167-179.