

# **Determination of the Adsorption of Solids and Some Selected Elements into Different Types of Clay Minerals for Hospital Wastewater**

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The hospital wastewater is a greater concern because of the hazardous and toxic nature and its direct discharge will contaminate water bodies. The main objective of this study was to remove total suspended solids and some selected elements from hospital wastewater since the previous studies show that Total Suspended Solids (TSS) of the hospital wastewater is high and the existing treatment plants are not efficient enough to remove them to meet environmental standards. This study showed that the TSS was 1534 mg l<sup>-1</sup> and Total Dissolved Solids was 580 mg l<sup>-1</sup>. Adsorption series were prepared by adding equal weight of five different clay samples which mainly contain Montmorillonite, Kaolinite and Illite clay compositions to an equal volume (100 ml) of hospital wastewater. The clay samples were then analyzed using X Ray Diffraction pattern and for the filtrate Fourier Transform Infrared Spectroscopy was done to determine the absorption after 2, 4, and 6 weeks by filtering out 100 ml of the sample from each clay type. Total Suspended Solids were measured for the untreated sample and for the samples treated with each clay by filtering using a 45µm filter paper and taking the dry weight. Removal percentages for the sample using Illite clay for TSS and Total Dissolved Solids were 96.02% and 43.27% respectively which were reached within two weeks. As for the results the optimum clay to absorb and reduce the TSS and Total Dissolved Solids in hospital wastewater is Illite which was reached within two weeks.

**Keywords:** Hospital wastewater, Total suspended solids, Adsorption, Illite, Total dissolved solids