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Adsorbent Removal of Oil Spills Using Bentonite Clay

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Abstract : The adsorption method is one of the best modern techniques used in removing pollutants, especially organic hydrocarbon compounds, from polluted water. Through this research, bentonite clay can be used to remove organic hydrocarbon compounds, such as heptane and octane, resulting from oil spills in seawater. Bentonite clay can be obtained from the Kholayaz area, located north of Jeddah, at a distance of 80 km. Chemical analysis shows that bentonite clay consists of a mixture of silica, alumina and oxides of some elements. Bentonite clay can be activated in order to raise its adsorption efficiency and to make it suitable for removing pollutants using an ionic organic solvent. It is necessary to study some of the factors that could be in the efficiency of bentonite clay in removing oily organic compounds, such as the time of contact of the clay with heptane and octane solutions, pH and temperature, in order to reach the highest adsorption capacity of bentonite clay. The temperature can be a few degrees Celsius higher. The adsorption capacity of the clay decreases when the temperature is raised more than 4°C to reach its lowest value at the temperature of 50°C. The results show that the friction time of 30 minutes and the pH of 6.8 is the best conditions to obtain the highest adsorption capacity of the clay, 467 mg in the case of heptane and 385 mg in the case of octane compound. Experiments conducted on bentonite clay were encouraging to select it to remove heavy molecular weight pollutants such as petroleum compounds under study.

Keywords : adsorbent, bentonite clay, oil spills, removal
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