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Removal Oil from Produced Water by Using Adsorption Method with Adsorbent a Papyrus Reeds

Abstract- A papyrus reed, as a type of unusable farming waste, was used as kind of low-cost biosorbent for elimination a crude oil from the produced water that was produced in an Al-Ahdab field, Iraq, in a batch stirred operation mode. Fourier transform infrared spectroscopy (FTIR) and scanning electron microscope (SEM) were used to characterize the biosorbent before and after adsorption. Batch tests were employed as a function of the contact time, adsorbent dose, and the pH of the solution. The experimental results show that increases the amount adsorbent dosage, pH and contact times, the removal efficiencies were increases and optimum condition was obtained at pH value equal to 9, 5000 ppm adsorbent dose and 45 minutes contact time for removal about 94.5% of crude oil, for test sample initial crude oil concentration 257.06 ppm. Therefore, it can be disposed of without environmental damage. The better fitting for equilibrium sorption process data were satisfactorily by the Freundlich isotherm model with ($R^2 = 0.9665$) and the adsorption kinetics best described by a pseudo-second-order kinetic model.

Keywords- Produced water, Papyrus reeds, crude oil removal, kinetic model, biosorption.

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