EFFECT OF OPERATING PARAMETERS ON OIL SPILL REMOVAL FROM SEAWATER BY PKFAD-COATED MAGNETIC BIOCHAR

SITI NUR IRAWAN BINTI ARIFFIN

BACHELOR OF CHEMICAL ENGINEERING (ENVIRONMENT) WITH HONOURS

UNIVERSITI TEKNOLOGI MARA

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By

SITI NUR IRAWAN BINTI ARIFFIN

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ABSTRACT

Oil spill at sea are one of the most common forms of water contamination, and as a result, they cause a significant amount of harm to both the environment and the economy. The ecological system of the ocean is severely harmed when it is polluted, which lead to a considerable decline in the number of aquatic species. The application of adsorption technology has the potential to remove oil contamination. In this study PKFAD-coated magnetic biochar were prepared as adsorbent to remove oil spill from seawater. PKFAD-coated magnetic biochar was successfully synthesized by using biochar from duckweed a species of aquatic plant. Ferrous chloride and ferric chloride used as magnetic medium and mix with the raw biochar and palm kernel fatty acid distillate (PKFAD) by co-precipitation method. Characteristics of these adsorbent were analyzed the functional group with Fourier Transform Infrared (FTIR) and specific surface area by BET analysis. Biochar, PKFAD, magnetic adsorbent and PKFAD-coated magnetic biochar were compared to evaluate the preserved of the functional group and the effectiveness of oil removal. It is found that PKFAD-coated magnetic biochar shows that the functional group is presented on the surface of the adsorbent which indicated its effectiveness. Next, the effect operating parameters such as pH, contact time, adsorbent dosage on oil removal from seawater was studied. The results show that the operating parameters does affecting the oil removal efficiency. The optimum parameters are at pH 8, 90 minutes of contact time and 150 mg/l of adsorbent dosage where the oil removal efficiency are 50.25%, 62.60%, and 26.50%, respectively. Lastly, the adsorbent can be regenerated and reusable for up to 2 cycles.