

Banana Leaves as Biosorbent for Oil Spill Sorption: Sorption Efficiency and Characterization

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Structured Abstract

Background: Oil spill is widely happened around the world as it is discharge into the sea and wastewater can cause environmental pollution. The use of biomass as an adsorbent for the removal of oil is a promising solution to this problem.

Methods: In this study, the surface of biomass as adsorbent, which is banana leaves, was modified chemically by acetylation using 1 M acetic acid and used as an adsorbent for the removal of oil from aqueous solutions. The raw and modified banana leaves were characterized by FT-IR, SEM, degree of hydrophobicity and bulk density. The oil retention and sorption and oil to water selectivity was analysed by contacting the adsorbent and the oil and water.

Results: The result showed that modified banana leaves have high oil retention and oil to water selectivity. This is due to the increasing of the properties of the banana leaves in the acetylation process. Modified banana leaves show high oil retention and sorption making it hold the oil longer and more than raw banana leaves. Modified banana leaves also shows high oil to water selectivity making it absorb more oil than water.

Conclusion: The modified banana leaves were found to be an effective adsorbent for the removal of oil from wastewater, and the findings of this study can be useful for developing eco-friendly and cost-effective methods for the treatment of wastewater.

Keywords: Acetylated modified adsorbent, oil spill sorption, Biomass, wastewater

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