

Removal of residual oil from palm oil mill effluent by novel adsorbent of alginate & mangrove composite beads coated by chitosan

ABSTRACT

In this study, a novel adsorbent was prepared in bead shape which is Alginate and Mangrove Composite Beads Coated by Chitosan (AMCBCC) and well performed to remove residual oil from Palm Oil Mill Effluent (POME) using batch adsorption studies by different parameters: pH, adsorbent dosage, contact time and initial concentration. It was found that the maximum removal percentage of residual oil was 98.47% occurred at pH 3, 50 g/L of AMCBCC concentration and a contact time of 2.5 hrs. The adsorbent was characterized by Fourier Transform Infrared Spectroscopy (FTIR) to reveal the effective functional groups and to prove the successful coating by Chitosan and was also characterized by Scanning Electron Microscope (SEM) before and after the adsorption to provide an evidence that the residual oil had been adsorbed on the surface of the beads. These results indicated that AMCBCC demonstrate a potential application to remove residual oil from industrial wastewater.

Keyword: Mangrove bark; Alginate; Chitosan; Adsorption; Residual oil; Palm oil mill effluent