

Poster code:

E3

Coal Bottom Ash for Palm Oil Mill Effluent (POME) Decolourization

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Abstract. The utilization of coal bottom ash (CBA) from thermal power plant for palm oil mill effluent (POME) decolourization was studied. CBA is prepared using chemical activation with hydrochloric acid (HCl) to increase adsorption performance. Physico-chemical characterizations of CBA-HCl was analysed using BET for surface area, FTIR for its surface chemistry, SEM for morphology and EDX for elemental analysis. The effectiveness of CBA-HCl for colour adsorption of POME was investigated as a function of pH, initial concentration, adsorbent dosage and contact time by batch experiments. Adsorption increased with increasing contact time and the equilibrium states could be achieved in range of 18 to 24 hr. Results showed that CBA-HCl perform with maximum colour removal of 93% at pH 6 with 10% (w/v) adsorbent dosage in 24 hr. It was shown that the isotherm for adsorption of colour from POME on CBA-HCl was well fitted by Freundlich equation (correlation coefficient, $R^2 = 0.9636$). Based on the results, CBA showed potential adsorbent candidate for POME decolourization.

Keywords: POME, Decolourization, Colour, Removal, Adsorption, Bottom ash.