

Feasibility of Agro Waste-Derived Adsorbent for Colour Removal

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Abstract : Feasibility of utilizing Empty Bunch (EB) fibre, a solid waste of palm oil extraction process, as an adsorbent is analysed in this study. Empty bunch fibre is generated after the extraction of retained oil in the sterilized and threshed empty fruit bunches. Besides the numerous characteristics of EB fibre, which enable its utilization as a fuel, a bio-composite material, or mulch, EB fibre also shows exceptional characteristics of a good adsorbent. Fixed bed adsorption method is used to study the adsorptivity of EB fibre using a continuous adsorption column with Methyl-blue (1.13ppm) as the feed. Adsorptivity is assumed to be solely dependent on the bed porosity keeping other parameters (feed flow rate, bed height, bed diameter, and operating temperature) constant. Bed porosity is changed by means of compact ratio and the variation of the feed concentration is analysed using a photometric method. Break through curves are plotted at different porosity levels and optimum bed porosity is identified for a given feed stream. Feasibility of using the EB fibre as an inexpensive and an abundant adsorbent in wastewater treatment facilities, where the effluent colour reduction is adamant, is also discussed.

Keywords : adsorption, fixed bed, break through time, methylene blue, oil palm fibre

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