

Application of Oil Palm Empty Fruit Bunch as Adsorbent: A Review

ABSTRACT

The abundance of oil palm wastes specifically oil palm empty fruit bunch (EFB) has possessed disposal issues that need to be tackled. Consequently, the utilisation of EFB as adsorbent for adsorbing pollutants from wastewater is a way forward. The unmodified EFB can be applied naturally but showed low adsorption capacity. The adsorption performance of EFB can be significantly improved upon modifications. This review covers the modification methods adopted to transform EFB into value-added adsorbent. Physical modifications discussed are heat pyrolysis, microwave irradiation and hydrothermal carbonisation. The output of heat pyrolysis followed by activation through oxidising gaseous and chemicals produced EFB activated carbon with high BET surface area and microporous which promotes high adsorption capacity. Besides, chemical modifications utilising acid, alkali, polymer grafting, organic and inorganic solvents provide high specificity on designing EFB adsorbent in the removal of targeted pollutants. Generally, this review serves as a guidance for researchers to move forward in searching for a simple, economic and environmental friendly technique to produce EFB based adsorbent with excellent properties and adsorption performance.