

Activated carbon from various agricultural wastes by chemical activation with KOH : preparation and characterization

ABSTRACT

Activated carbons (AC) were prepared by pyrolysis from oil palm empty fruit bunch (EFB), bamboo stem (BS), and coconut shells (CNS) at 800 °C by using potassium hydroxide under nitrogen atmosphere. The influence of temperature and type of agricultural biomass on surface area and morphological properties investigated. Activated carbon produced from BS have a higher specific surface area (1212 m² g⁻¹) and microporosity percentage than those produced from oil palm EFB, and CNS lies in the range of commercial activated carbons. The morphological analysis of the samples was determined by scanning electron microscopy. The external surfaces are full of cavities and quite irregular as a result of activation. X-ray diffraction analysis showed degree of crystallinity 13.25% in case of AC-BS sample while AC-EFB and AC-CNS showed a crystallinity of 1.68% and 8.19%, respectively

Keyword: Activated Carbon; Agricultural Biomass; Scanning Electron Microscopy; Surface Area; X-Ray Diffraction Analysis.