

PREPARATION AND CHARACTERIZATION OF ACTIVE CARBON USING PALM KERNEL SHELLS FOR INDUSTRIAL EFFLUENT PURIFICATION

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Abstract

Activated carbons were prepared from Palm kernel shells. Carbonization temperature was 600⁰C, at a residence time of 5 min for each process. Chemical activation was done by heating a mixture of carbonized material and the activating agents at a temperature of 70⁰C to form a paste, followed by subsequent cooling and using the active carbon to purify effluents from a Bottling Company. NaCl, KOH, H₂SO₄ and H₃PO₄ were used as the activating agents at 1M and 2M and 710 μm particle size. The activated carbon samples produced were found to posses properties within the limits of commercial activated carbons. Bottling company effluent was purified and the results showed that carbonized materials activated with 2M H₂SO₄ had the best adsorption characteristics. These properties include 1.12% moisture content, 2.50 % ash content, 57.00 % yield of activated carbon, 93.65 % fixed carbon, 2.73 % volatile content, 0.97 g/cm³ bulk density and 0.69 cm³ pore volume.

Keywords: Active carbon, Palm kernel shell, Effluent, Purification

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