

Adsorption Characteristics of Benzene on Activated Carbon Nanostructured Fibers

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The adsorption properties for activated carbon nano fibers (ACNF) which was fabricated by using electrospinning route were investigated for the assessment of its possibility as a novel alternative adsorbent. Commercial fibers, A-10, was chosen for comparison purpose. Nitrogen adsorption-desorption isotherms and gravimetric techniques were used to understand the pore structure, adsorption equilibrium, kinetics, and the energetic heterogeneity of the prepared sorbent. The nitrogen adsorption and desorption isotherms showed that ACNF was highly microporous and had small mesoporous region. The equilibrium data of benzene were obtained at three different temperatures and correlated successfully with Toth isotherm equation. Also, by using this isotherm model, the adsorption affinity and isosteric enthalpy of adsorption were determined. According to the results of isosteric enthalpy of adsorption and adsorption energy distribution, ACNF had heterogeneous surface and seemed to be more homogeneous than A-10. Moreover, it was found from the mass transfer and thermal desorption that ACNF having shallow pores could be a good candidate adsorbent for removing the toxic compounds.