



Synthesis of Mesoporous Carbon using Gelatin as A Carbon Source and SBA-15 as A Template for Dibenzothiophene Adsorption

Maria Ulfa, Wega Trisunaryanti*, Iplzul Falah, Sutarno, Indriana Kartini

Department of Chemistry, Faculty of Mathematics and Natural Sciences
Universitas Gadjah Mada, Sekip Utara, Yogyakarta, Indonesia 55281

Abstract : Synthesis of mesoporous carbon using bovine bone gelatin as the carbon precursor and SBA-15 as a template for dibenzothiophene adsorption had been investigated. The Gelatin was infiltrated onto the SBA-15 template by carbonization step at 110 and 160 °C for 7 h followed by pyrolysis at 900 °C for 3 h under argon atmosphere. The carbon had a specific surface area of 760 m²/g, total pore volume of 0.999 cm³/g, average pore diameter of 5.2 nm, a meso-pores quantity of 74 % and a narrow pore size distribution that was dominant at 4.5 nm. Dibenzothiophene (DBT) was used as a model of fuels fraction for adsorption study using the mesoporous carbon as an adsorbent. This paper investigated the equilibrium, kinetics and thermodynamics of the adsorption of the DBT. Kinetic studies were investigated by Lagergren, HoMcKay and Pandey equation. The equilibrium obtained within 70 min. It was found that the adsorption kinetic followed a pseudo-second-order rate equations. While, the adsorption equilibrium followed the Langmuir isotherm model, with the maximum adsorption capacity of 66.6 mg/g-carbon.

Keywords: mesoporous carbon, gelatin, dibenzothiophene, adsorption.

Wega Trisunaryanti *et al* / International Journal of ChemTech Research, 2016,9(9),pp 588-597.
