Ningsih, O.W., 2016, Adsorpsi Isopropil Alkohol (IPA) Dalam Air Menggunakan Karbon Aktif dan Bentonit Teraktivasi Asam, Skripsi di bawah bimbingan Dr. rer. nat. Ganden Supriyanto, M.Sc dan Dr. Abdulloh, M.Si, Departemen Kimia, Fakultas Sains dan Teknologi, Universitas Airlangga, Surabaya

ABSTRAK

Metode sederhana untuk memisahkan isopropil alkohol (IPA) telah dikembangkan menggunakan karbon aktif dan bentonit teraktivasi asam sebagai adsorben. Karbon aktif diaktivasi menggunakan asam fosfat dan bentonit di aktivasi menggunakan asam sulfat. Karbon aktif dan bentonit teraktivasi asam dikarakterisasi menggunakan *Brunauer-Emmet-Teller* (BET). Adsorpsi dilakukan dalam sistem *batch* menggunakan variasi waktu, massa adsorben, pH dan suhu. Analit yang teradsorpsi ditentukan menggunakan piknometer. Parameter adsorpsi yang ditentukan antara lain kinetika adsorpsi, isoterm adsorpsi dan termodinamika adsorpsi. Jenis adsorpsi isotherm IPA pada karbon aktif adalah mengikuti kinetika orde dua dengan koefisien korelasi (R^2) sebesar 0,8141. Model isoterm mengikuti model Langmuir dengan q_m = -0,0886 mg/g, K_L = -597,3716 L/mg, R^2 = 0,9254. Nilai ΔG°, ΔH°, dan ΔS° berturut-turut adalah -32169,79 kJ/mol, 44,5139 kJ/mol dan 99,7347 J/mol.K, Bentonit teraktivasi asam mengikuti kinetika orde dua dengan koefisien korelasi (R^2) sebesar 0,6336. Model isoterm mengikuti model Langmuir dengan q_m = -0,1001 mg/g, K_L = -561,7977 L/mg, R^2 = 0,923. Nilai ΔG°, ΔH°, dan ΔS° berturut-turut adalah -7143,01 kJ/mol, 7,0026 kJ/mol, dan -22,8435 J/mol.K. Campuran karobon aktif dan bentonit teraktivasi asam mengikuti orde dua dengan koefisien korelasi (R^2) sebesar 0,6923. Model isoterm mengikuti model Langmuir dengan q_m = -0,0831 mg/g, K_L = -641,0256 L/mg, R^2 = 0,9212. Nilai ΔG°, ΔH°, dan ΔS° berturut-turut adalah -11073,92 kJ/mol, 2,6749 kJ/mol, -35,3885 J/mol.K.

Kata kunci : *adsorpsi, isopropil alkohol (IPA), karbon aktif, bentonit teraktivasi asam*

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ABSTRACT

The use of activated carbon and acid activated bentonite as asorbent has been developed as simple method to separate IPA. The activated carbon was activated by phosphoric acid and bentonite was activated by sulfuric acid. The activated carbon and acid activated bentonite were characterized by using *Brunauer-Emmet-Teller* (BET). The adsorpstion was done in batch system using variations of time, mass of adsorbent, pH and temperature. The adsorbed analyte was measured by pycnometer. Adsorption parameter used in their study were adsorption kinetic, isotherm adsorption and thermodynamic. Arsorption of IPA using activated carbon is following two order kinetics with correlation coefisiens 0,8141. Isotherm model is following Langmuir model with q_m = -0,0886 mg/g, K_L = -597,3716 L/mg, R^2 = 0,9254. ΔG^o, ΔH^o, and ΔS^o are -32169,79 kJ/mol, 44,5139 kJ/mol and 99,7347 J/mol.K respectively. Adsorption IPA using Acid activated bentonit is following two order kinetics with correlation coefisiens 0,6336. Isotherm model is following Langmuir model with q_m = -0,1001 mg/g, K_L = -561,7977 L/mg, R^2 = 0,923. ΔG^o, ΔH^o, and ΔS^o are -7143,01 kJ/mol, 7,0026 kJ/mol, and -22,8435 J/mol.K respectively. Adsorption of IPA using mixture activated carbon and acid activated bentonit is following two order kinetics with correlation coefisiens 0,6923. Isotherm model is following Langmuir model with q_m = -0,0831 mg/g, K_L = -641,0256 L/mg, R^2 = 0,9212. ΔG^o, ΔH^o, and ΔS^o are -11073,92 kJ/mol, 2,6749 kJ/mol, -35,3885 J/mol.K respectively.

Keyword : adsorption, isoprophyl alcohol (IPA), activated carbon, acid activated bentonite