

ADSORPSI IBUPROFEN OLEH SENG OKSIDA MESOPORI DENGAN CETAKAN GELATIN

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INTISARI

Telah dilakukan uji adsorpsi ibuprofen oleh seng oksida mesopori dengan cetakan gelatin. Tujuan penelitian ini adalah melakukan sintesis seng oksida mesopori menggunakan gelatin sebagai cetakan dan mengkaji waktu kontak, kinetika adsorpsi, dan isoterm adsorpsi seng oksida mesopori dalam mengadsorp ibuprofen.

Sintesis seng oksida mesopori dilakukan dengan mencampurkan gelatin, pluronik F127, dan etanol. Campuran tersebut ditambahkan dengan seng sulfat heptahidrat dan diaduk menggunakan *stirrer*, kemudian dilakukan proses hidrotermal pada suhu 100 °C dan hasil disaring. Hasil penyaringan dikeringkan, lalu di kalsinasi dengan suhu 550 °C dan dilakukan karakterisasi menggunakan TEM, BET, XRD, dan FTIR. Selanjutnya dilakukan uji waktu kontak dan kinetika adsorpsi ibuprofen dengan pelarut n-heksana dan adsorben ZnO mesopori. Waktu kontak diuji selama 60 menit pada menit ke- 3, 12, 15, 18, 39, 57, dan 60 menit diukur dengan spektrofotometer UV-Visibel. Uji isoterm adsorpsi menggunakan variasi konsentrasi ibuprofen 20, 40, 60, 80, dan 100 ppm diukur dengan spektrofotometer UV-Visibel.

Dari penelitian yang dilakukan didapatkan seng oksida (ZnO) mesopori dengan ukuran pori 3,15 nm. Waktu kontak optimum yang digunakan dalam proses adsorpsi adalah 60 menit, dari data waktu kontak tersebut didapatkan kinetika kimia adsorpsi ibuprofen dengan adsorben ZnO mesopori mengikuti orde dua semu (Ho & McKay) dan dari variasi konsentrasi didapatkan adsorpsi ibuprofen mengikuti model isoterm adsorpsi Langmuir.

Kata kunci : adsorpsi, ibuprofen, isoterm, kinetika, seng oksida mesopori

ADSORPTION OF IBUPROFEN BY MESOPOROUS ZINC OXIDE WITH GELATIN MOLD

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ABSTRACT

The adsorption test for ibuprofen by mesoporous zinc oxide with gelatin mold has been carried out. The purpose of this study was to synthesize mesoporous zinc oxide using gelatin as a template and to assess the contact time, adsorption kinetics, and adsorption isotherm of mesoporous zinc oxide to adsorb ibuprofen.

Mesoporous zinc oxide synthesis was carried out by mixing gelatin, F127 pluronics, and ethanol. The mixture is added with zinc sulfate heptahydrate and mixing with stirrer. Then hydrothermal process in 100 °C and filtered were conducted. The results were dried, then calcined in 550 °C and characterization using TEM, BET, XRD, and FTIR. Then the contact time was tested and the adsorption kinetics of ibuprofen were carried out with n-hexane solvent and mesoporous ZnO adsorbent. Contact time was tested for 60 min at 3, 12, 15, 18, 39, 57, and 60 min measured by a UV-Visible spectrophotometer. Furthermore, the adsorption isotherm test was carried out using variations in the concentration of ibuprofen 20, 40, 60, 80, and 100 ppm, measured by a UV-Visible spectrophotometer.

From the research, it was found that mesoporous zinc oxide (ZnO) with a pore size of 3,15 nm. The optimum contact time used in the adsorption process was 60 min, from the contact time data it was found that ibuprofen's adsorption kinetics with ZnO adsorbent followed pseudo-second order (Ho & McKay) and from variation in concentration it was obtained that adsorption of ibuprofen followed the Langmuir adsorption isotherm model.

Keyword: adsorption, ibuprofen, isotherm, kinetics, mesoporous zinc oxide