

## **SINTESIS DAN KARAKTERISASI BEADS Fe<sub>3</sub>O<sub>4</sub>/KITOSAN/POLIAKRILAMIDA SEBAGAI ADSORBEN Cu(II)**

OLAVE HARYA PAMUNGKAS

18/424233/PA/18338

### **INTISARI**

Sintesis *beads* magnetik Fe<sub>3</sub>O<sub>4</sub>/Kitosan/Poliakrilamida (*beads* MFCP) untuk adsorpsi ion logam Cu(II) telah berhasil dilakukan. *Beads* yang terbentuk dilakukan karakterisasi menggunakan FTIR, XRD, SEM-EDX, dan VSM. Kajian adsorpsi dalam penelitian ini dilakukan optimasi pH, waktu kontak, konsentrasi, dan temperatur untuk adsorpsi Cu(II). Data variasi waktu kontak, konsentrasi, dan temperatur secara berturut-turut digunakan untuk menentukan kinetika, isoterm, dan termodinamika adsorpsi Cu(II) oleh *beads* MFCP. Hasil karakterisasi menggunakan XRD, VSM, FTIR, dan SEM-EDX secara berturut-turut menandakan adanya magnetit, kitosan, dan poliakrilamida di dalam *beads* MFCP. Uji adsorpsi menunjukkan adsorpsi optimum terjadi pada pH 6, waktu kontak 330 menit, konsentrasi awal 18 mg L<sup>-1</sup>, dan temperatur 30 °C. Kinetika adsorpsi Cu(II) oleh *beads* MFCP mengikuti model orde satu (Santosa-Muzakky), sementara isoterm adsorpsi mengikuti model isoterm Langmuir, dan termodinamika adsorpsi menunjukkan adsorpsi bersifat spontan dan eksotermik.

**Kata kunci:** adsorpsi, *beads*, ion Cu(II) kitosan, poliakrilamida

## **SYNTHESIS AND CHARACTERIZATION OF $\text{Fe}_3\text{O}_4$ /CHITOSAN/POLYACRYLAMIDE BEADS AS Cu(II) ADSORBENT**

OLAVE HARYA PAMUNGKAS

18/424233/PA/18338

### **ABSTRACT**

The synthesis of  $\text{Fe}_3\text{O}_4$ /Chitosan/Polyacrylamide magnetic beads (MFCP beads) for the adsorption of Cu(II) metal ions has been successfully carried out. The formed beads were characterized by FTIR, XRD, SEM-EDX, and VSM. Adsorption that were optimized included pH, contact time, concentration, and temperature. The data of contact time, concentration, and temperature variations were successively used to determine the kinetics, isotherms, and thermodynamics of Cu(II) adsorption by MFCP beads. Characterization results by XRD, VSM, FTIR, and SEM-EDX successively showed the presence of  $\text{Fe}_3\text{O}_4$ , chitosan, and polyacrylamide. The adsorption test showed optimum adsorption occurred at pH 6, contact time 330 min, initial concentration  $18 \text{ mg L}^{-1}$ , and temperature  $30^\circ\text{C}$ . The kinetics of Cu(II) adsorption by MFCP beads followed the first-order model (Santosa-Muzakky), while the adsorption isotherm followed the Langmuir isotherm model, and the adsorption thermodynamics showed the adsorption was spontaneous and exothermic.

**Keywords:** adsorption, beads, Cu(II) ions, chitosan, polyacrylamide