

STUDI ADSORPSI ZAT WARNA SAFRANIN O PADA SELULOSA- ALGINAT TERTAUT SILANG EPIKLOROHIDRIN

Fida Salma Khamidah

19/445663/PA/19487

INTISARI

Adsorpsi zat warna safranin O menggunakan adsorben selulosa-alginat tertaut silang epiklorohidrin (Sel-Epi-Alg) telah dilakukan. Tujuan dari penelitian ini adalah melakukan sintesis Sel-Epi-Alg dan menentukan kondisi optimum, isoterm adsorpsi, serta kinetika adsorpsi safranin O pada Sel-Epi-Alg. Karakterisasi adsorben Sel-Epi-Alg dilakukan dengan FTIR, XRD, dan SEM-EDX.

Tahap pembuatan Sel-Epi-Alg terdiri dari isolasi selulosa dari ampas tebu dan sintesis adsorben. Uji kestabilan Sel-Epi-Alg menunjukkan Sel-Epi-Alg bersifat stabil dalam variasi pH 2-10. Adsorpsi safranin O menggunakan Sel-Epi-Alg berlangsung optimum pada pH 5. Model isoterm adsorpsi mengikuti model isoterm adsorpsi Freundlich dengan nilai $1/n$ dan K_F sebesar 1,7764 dan 0,2845 L/mol. Model kinetika adsorpsi safranin O mengikuti model kinetika adsorpsi Ho dan McKay dengan nilai konstanta laju adsorpsi sebesar $0,003 \text{ g mg}^{-1}\text{menit}^{-1}$. Desorpsi safranin O dilakukan menggunakan pelarut NaCl, NaOH, HCl, dan etanol. Persen desorpsi paling tinggi terjadi pada desorpsi dengan pelarut NaCl. Hasil yang dilaporkan mengungkapkan bahwa Sel-Epi-Alg dapat digunakan sebagai adsorben untuk menurunkan kadar safranin O.

Kata kunci: adsorpsi, selulosa, alginat, epiklorohidrin, safranin

***ADSORPTION STUDY OF SAFRANIN O DYE ON CELLULOSE-
ALGINATE CROSSLINKED WITH EPICHLOROHYDRIN***

Fida Salma Khamidah

19/445663/PA/19487

ABSTRACT

The adsorption of Safranin O dye on epichlorohydrin crosslinked cellulose-alginate (Sel-Epi-Alg) adsorbent has been conducted in this research. The aims of this study were to synthesize Sel-Epi-Alg adsorbent and to determine the optimum conditions, adsorption isotherms, and adsorption kinetics of safranin O adsorption on Sel-Epi-Alg. The characteristics of Sel-Epi-Alg adsorbent were investigated by FTIR, XRD, and SEM.

The preparation of Sel-Epi-Alg adsorbent consists of cellulose isolation from sugarcane bagasse and synthesis of the adsorbent. The stability test of Sel-Epi-Alg indicated that the adsorbent was stable at pH 2-10. The optimum pH for Safranin O adsorption using Sel-Epi-Alg was found to be at pH 5. The adsorption isotherm model followed the Freundlich adsorption isotherm model with $1/n = 1.7764$ and $K_F = 0.2845 \text{ L/mol}$. The adsorption kinetics followed the Ho and McKay adsorption model with $0.003 \text{ g mg}^{-1} \text{ min}^{-1}$ as the rate constant. Desorption of Safranin O was performed using NaCl, NaOH, HCl, and ethanol. NaCl was selected as the best solvent for the desorption. The reported results revealed that Sel-Epi-Alg could be used as an adsorbent for the removal of safranin O.

Keywords: adsorption, cellulose, alginate, epichlorohydrin, safranin