

## INTISARI

### **PENGARUH SUHU DAN WAKTU PADA SINTESIS ADSORBEN EPOXIDIZED NATURAL RUBBER- $\beta$ -CYCLODEXTRIN TERHADAP ADSORPSI BETALAIN DARI KULIT BIT (*Beta vulgaris L.*)**

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*Epoxidized natural rubber- $\beta$ -cyclodextrin* (ENR- $\beta$ -CD) digunakan sebagai adsorben untuk mengadsorp betalain dari kulit bit (*Beta vulgaris L.*). Penelitian ini bertujuan untuk memperoleh kondisi suhu dan waktu sintesis adsorben optimal serta mengevaluasi *reusability* adsorben dan model isoterm adsorpsi. Adsorpsi betalain dianalisis dengan menguji pengaruh suhu (suhu ruang, 40°C, 60°C) dan waktu (4, 6, 8, 10, 12 jam) sintesis ENR- $\beta$ -CD. Perlakuan terbaik diperoleh pada suhu ruang selama 10 jam dengan tingkat adsorpsi sebesar 91%. Data adsorpsi dianalisis dengan model isotermal Langmuir dan Freundlich. Kapasitas adsorpsi ( $q_m$ ) dan intensitas adsorpsi ( $b$ ) yang diperoleh dari model isotermal Langmuir masing-masing sebesar 0,535 mg/g dan 1,869. Kapasitas adsorpsi ( $K_f$ ) dan intensitas adsorpsi ( $n$ ) yang diperoleh dari model isotermal Freundlich masing-masing sebesar 0,758 dan 1,439. Uji *reusability* menunjukkan bahwa adsorben ENR- $\beta$ -CD hanya dapat digunakan sekali.

Kata kunci: Betalain, Adsorpsi, Isoterm, Bit,  $\beta$ -siklodekstrin, *Epoxidized Natural Rubber*

## ABSTRACT

### **EFFECT OF TEMPERATURE AND TIME OF ADSORBENT EPOXIDIZED NATURAL RUBBER- $\beta$ -CYCLODEXTRIN SYNTHESIS ON BETALAINS ADSORPTION FROM BEET (*Beta vulgaris L.*) PEEL**

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Epoxidized natural rubber- $\beta$ -cyclodextrin (ENR- $\beta$ -CD) cross-linked polymer was prepared as adsorbent to adsorb betalains from beet (*Beta vulgaris L.*) peel juice. The objectives of this study were to obtain the optimum temperature and time of adsorbent synthesis, and to evaluate the reusability of adsorbent and isotherm model of adsorption. Adsorption of betalains was analyzed by studying the effects of temperature (room temperature, 40°C, 60°C) and time (4, 6, 8, 10, 12 hours) of ENR- $\beta$ -CD synthesis. The optimum condition for ENR- $\beta$ -CD synthesis was at room temperature within 10 h. The amount of betalains adsorbed were 91%. The adsorption data were analyzed by Langmuir and Freundlich adsorption isotherm models. The adsorption capacity ( $q_m$ ) and adsorption intensity ( $b$ ) of Langmuir model were 0.535 mg/g dan 1.869, respectively. The adsorption capacity ( $K_f$ ) and adsorption intensity ( $n$ ) of Freundlich model were 0.758 dan 1.439, respectively. However, it was seen that ENR- $\beta$ -CD is not reusable.

Keywords: Betalains, Adsorption, Isotherm, Beet peel,  $\beta$ -cyclodextrin, Epoxidized Natural Rubber