

**Chrisnandari, R.D., 2015, Adsorpsi Kloramfenikol Pada Adsorben Berbasis *Molecularly Imprinted Polymer* (MIP) Menggunakan Sistem *Batch*, Tesis di bawah bimbingan Dr.rer.nat Ganden Supriyanto, M.Sc dan Dr. Ir. Suyanto, M.Si, Departemen Kimia, Fakultas Sains dan Teknologi, Universitas Airlangga, Surabaya**

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### ABSTRAK

Metode yang sederhana dan selektif untuk memisahkan kloramfenikol telah dikembangkan menggunakan *molecularly imprinted polymer* (MIP) sebagai adsorben. MIP disintesis menggunakan kloramfenikol sebagai *template*, asam metakrilat (MAA) sebagai monomer dan kloroform sebagai porogen secara polimerisasi bulk. MIP dikarakterisasi menggunakan *fourier transform infrared spectroscopy* (FT-IR), *scanning electron microscopy* (SEM) dan adsorpsi-desorpsi N<sub>2</sub>. Adsorpsi dilakukan dalam sistem *batch* menggunakan variasi waktu, pH dan suhu. Analit yang teradsorpsi ditentukan secara tidak langsung dengan cara menganalisis analit yang tidak teradsorpsi menggunakan *high performance liquid chromatography* (HPLC) dengan detektor UV-VIS pada panjang gelombang 273 nm. Parameter adsorpsi yang ditentukan antara lain kinetika, isoterm dan termodinamika adsorpsi. Adsorpsi kloramfenikol pada MIP mengikuti kinetika orde satu dengan koefisien korelasi ( $R^2$ ) sebesar 0,9674. Model isoterm mengikuti model Freundlich dengan  $R^2$  0,9356,  $K_F = 1,9810 \text{ mg/g (L/mg)}^{1/n}$  dan  $n = 0,5547$ . Nilai  $\Delta H^\circ$ ,  $\Delta S^\circ$ , dan  $\Delta G^\circ$  berturut-turut adalah -6,1412 kJ/mol, -0,0067 kJ/mol dan -4,0921 kJ/mol. Kapasitas adsorpsi yang diperoleh hingga 4,0828 mg/g dan faktor *imprinting* sebesar 5,1810.

Kata Kunci: Kloramfenikol, *molecularly imprinted polymer*, adsorpsi, kinetika, adsorpsi isoterm, termodinamika

**Chrisnandari, R.D., 2015, Chloramphenicol Adsorption Using Sorbent Based on Molecularly Imprinted Polymer in Batch System, The thesis under the guidance of Dr.rer.nat Ganden Supriyanto, M.Sc and Dr. Ir. Suyanto, M.Si, Departement of Chemistry, Faculty of Science and Technology, Airlangga University, Surabaya**

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### ABSTRACT

A simple dan selective method for extraction of chloramphenicol was successfully developed using molecularly imprinted polymer (MIP) as sorbent. MIP was synthesized using chloramphenicol as template, methacrylic acid (MAA) as monomer and chloroform as porogen by bulking polymerisation. MIP were characterized by fourier transform infrared spectroscopy (FT-IR), scanning electron microscopy (SEM) and N<sub>2</sub> adsorption. Adsorption taken place in batch system with variation in contact time, pH and temperature. The adsorbed analyte was determined indirectly by analysis of analyte which still remain in aqueous solution using high performance liquid chromatography (HPLC) with UV-Vis detector at wavelength 273 nm. Adsorption parameters such as kinetics, isotherm and thermodynamics were determined. Adsorption chloramphenicol on MIP follow kinetics first order with correlation coefficient ( $R^2$ ) 0,9674. The isotherm adsorption was follow Freundlich model with  $R^2$  0,9356,  $K_F = 1,9810 \text{ mg/g (L/mg)}^{1/n}$  and  $n = 0,5547$ . The value of  $\Delta H^\circ$ ,  $\Delta S^\circ$ , dan  $\Delta G^\circ$  are -6,1412 kJ/mol, -0,0067 kJ/mol.K and -4,0921 kJ/mol respectively. Adsorption capacity obtained is up to 4,0828 mg/g and imprinting factor value is 5,1810.

*Key Words: Chloramphenicol, molecularly imprinted polymer, adsorption, kinetics, isotherm adsorption, thermodynamics*