



Removal of malachite green from aqueous solutions using molecularly imprinted polymer

Khalil Farhadi^{a*}, Amir Abbas Matin^{a,b}, Paria Hashemi^{a,b}

^aDepartment of Chemistry, Faculty of Science, Urmia University, Urmia, Iran

Tel. +984412972050; Fax +984413443442; email: khalil.farhadi@yahoo.com, kh.farhadi@mail.urmia.ac.ir

^bResearch Department of Chromatography, Iranian Academic Center for Education, Culture and Research (ACECR), Urmia, Iran
email: matinchem@gmail.com; email: parya_hashemei@yahoo.com

Received 9 December 2008; accepted 11 June 2010

ABSTRACT

Efficiency of malachite green molecularly imprinted polymer (MGIP) as a selective adsorbent in removal of malachite green (MG) from aqueous solutions was evaluated by using the batch adsorption experiments. Adsorption kinetics and effects of various parameters such as solution pH, adsorbent dose and initial MG concentration were investigated. Under optimized conditions (adsorbent dose 20 mg, solution pH 7, contact time 5 min), equilibrium experimental data at 293, 303, and 313 K were represented by Freundlich and Langmuir isotherms and the thermodynamic parameters such as ΔG° , ΔH° , and ΔS° were also calculated. Results briefly show that adsorption of MG by MGIP obeys pseudo-second order Lagergren kinetic model and Langmuir-1 isotherm. The capacity of proposed sorbent was determined as 303.03, 285.71 and 416.66 mg g⁻¹ at 293, 303 and 313 K, respectively.

Keywords: Malachite green; Molecularly imprinted polymer; Adsorption; Kinetics; Equilibrium

*Corresponding author