

Accepted Manuscript

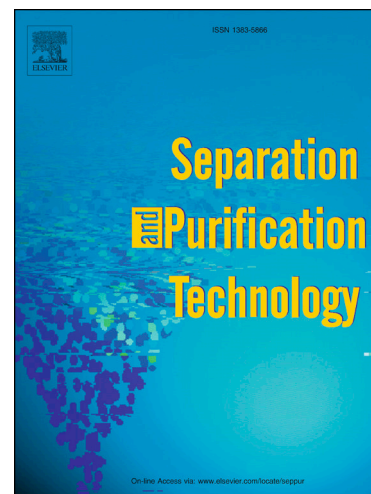
Molecularly imprinted particle embedded composite cryogel for selective tetracycline adsorption

Emel Yeşilova, Bilgen Osman, Ali Kara, Elif Tümay Özer

PII: S1383-5866(17)33287-2
DOI: <https://doi.org/10.1016/j.seppur.2018.02.002>
Reference: SEPPUR 14366

To appear in: *Separation and Purification Technology*

Received Date: 9 October 2017
Revised Date: 30 January 2018
Accepted Date: 4 February 2018



Please cite this article as: E. Yeşilova, B. Osman, A. Kara, E. Tümay Özer, Molecularly imprinted particle embedded composite cryogel for selective tetracycline adsorption, *Separation and Purification Technology* (2018), doi: <https://doi.org/10.1016/j.seppur.2018.02.002>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Molecularly imprinted particle embedded composite cryogel for selective tetracycline adsorption

Emel Yeşilova¹, Bilgen Osman^{1*}, Ali Kara¹, Elif Tümay Özer¹

¹Uludag University, Department of Chemistry, Bursa, Turkey

Abstract

The aim of this study was to prepare a composite cryogel for selective tetracycline (TC) adsorption. The composite cryogel was prepared by embedding TC-imprinted poly(hydroxyethyl methacrylate-N-methacryloyl-L-glutamic acid methyl ester [poly(HEMA-MAGA)] particles into poly(hydroxyethyl methacrylate) [PHEMA] cryogel. Molecular imprinting was used to prepare poly(HEMA-MAGA) particles with selective recognition sites for TC molecule. The TC-imprinted poly(HEMA-MAGA) particles were characterized by Fourier transform infrared spectroscopy (FTIR), X-ray photoelectron spectroscopy (XPS) and zeta size analysis. The morphology of the composite cryogel was investigated by using scanning electron microscope (SEM). Swelling degree, specific surface area, pore volume and pore diameter of TC-imprinted composite cryogel were also determined. TC solutions in different concentrations (5-85 mg/L, pH 5.0) were used to determine TC adsorption capacity of the TC-imprinted composite cryogel for three different temperatures (4 °C, 13 °C and 25 °C). TC adsorption capacity of the TC-imprinted composite cryogel was determined as 680 mg TC/ g at 25 °C (pH 5.0). TC adsorption data were fitted with Freundlich adsorption isotherm model for three different temperatures (4 °C, 13 °C and 25 °C). Both pseudo-second-order and intraparticle diffusion kinetic models explained the adsorption process. The prepared TC-imprinted composite cryogel can be repeatedly used for TC adsorption. The composite cryogel has high adsorption capacity and selectivity, demonstrating the applicability for selective TC adsorption.

Keywords: Tetracycline, molecular imprinting, cryogel, embedding

Correspondence should be addressed to: bilgeno@uludag.edu.tr

Download English Version:

<https://daneshyari.com/en/article/7043810>

Download Persian Version:

<https://daneshyari.com/article/7043810>

[Daneshyari.com](https://daneshyari.com)