

Accepted Manuscript

Equilibrium, kinetic and mechanism studies of Cu(II) and Cd(II) ions adsorption by modified chitosan beads

Zetty Azalea Sutirman, Mohd Marsin Sanagi, Khairil Juhanni Abd Karim, Wan Aini Wan Ibrahim, Binta Hadi Jume



PII: S0141-8130(18)30241-1
DOI: doi:[10.1016/j.ijbiomac.2018.05.031](https://doi.org/10.1016/j.ijbiomac.2018.05.031)
Reference: BIOMAC 9632

To appear in:

Received date: 15 January 2018
Revised date: 2 April 2018
Accepted date: 6 May 2018

Please cite this article as: Zetty Azalea Sutirman, Mohd Marsin Sanagi, Khairil Juhanni Abd Karim, Wan Aini Wan Ibrahim, Binta Hadi Jume , Equilibrium, kinetic and mechanism studies of Cu(II) and Cd(II) ions adsorption by modified chitosan beads. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Biomac(2017), doi:[10.1016/j.ijbiomac.2018.05.031](https://doi.org/10.1016/j.ijbiomac.2018.05.031)

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.

Equilibrium, Kinetic and Mechanism Studies of Cu(II) and Cd(II) Ions Adsorption by Modified Chitosan Beads

Zetty Azalea Sutirman^a, Mohd Marsin Sanagi^{ab*}, Khairil Juhanni Abd Karim^a and Wan Aini Wan Ibrahim^{ab}, Binta Hadi Jume^{ac}

^a*Department of Chemistry, Faculty of Science, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia*

^b*Centre for Sustainable Nanomaterials, Ibnu Sina Institute for Scientific and Industrial Research, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia*

^c*Chemistry Department, Aljouf University, Sakaka, 72388, KSA*

*Corresponding author. Tel.: +6075534517

E-mail address: marsin@kimia.fs.utm.my

Abstract

In this study, the Cu(II) and Cd(II) ions removal behavior of crosslinked chitosan beads grafted poly(methacrylamide) (abbreviated as crosslinked chitosan-*g*-PMAM) from single metal ion solutions was investigated. The modified chitosan beads presented a remarkable improvement in acid resistance. The batch experiments demonstrated that pH of solution played a significant role in adsorption. It was found that the adsorption of Cu(II) and Cd(II) were optimum at pH 4 and pH 5, respectively. The maximum adsorption capacities for Cu(II) and Cd(II) based on Langmuir equation were 140.9 mg g⁻¹ and 178.6 mg g⁻¹, respectively. Pseudo-second order gave a better fit for adsorption data with respect to linearity coefficients than pseudo-first order suggesting that chemisorption or electron transfer is the dominant mechanism of the metal ions onto crosslinked chitosan-*g*-PMAM. In addition, X-ray photoelectron spectroscopy (XPS) investigations revealed that adsorption of both metal ions took place on the surfaces of crosslinked chitosan-*g*-PMAM by chelation through C-NH₂, C-O and C=O groups. Overall, the modified chitosan has proved a promising adsorbent for removal of metal ions.

Keywords: Modified chitosan, adsorption, kinetic, mechanism

1. Introduction

Download English Version:

<https://daneshyari.com/en/article/8327063>

Download Persian Version:

<https://daneshyari.com/article/8327063>

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