Accepted Manuscript

Application of hollow mesoporous carbon nanospheres as an high effective adsorbent for the fast removal of acid dyes from aqueous solutions

Wojciech Konicki, Krzysztof Cendrowski, Xuecheng Chen, Ewa Mijowska

PII: S1385-8947(13)00687-6
DOI: http://dx.doi.org/10.1016/j.cej.2013.05.067
Reference: CEJ 10801

To appear in: *Chemical Engineering Journal*

Received Date: 4 April 2013
Revised Date: 15 May 2013
Accepted Date: 17 May 2013

Please cite this article as: W. Konicki, K. Cendrowski, X. Chen, E. Mijowska, Application of hollow mesoporous carbon nanospheres as an high effective adsorbent for the fast removal of acid dyes from aqueous solutions, *Chemical Engineering Journal* (2013), doi: http://dx.doi.org/10.1016/j.cej.2013.05.067

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.

ACCEPTED MANUSCRIPT

Application of hollow mesoporous carbon nanospheres as an high effective adsorbent for the fast removal of acid dyes from aqueous solutions

Wojciech Konicki[a,*], Krzysztof Cendrowski[b], Xuecheng Chen[b], Ewa Mijowska[b]

[a]Department of Integrated Transport Technology and Environmental Protection, Maritime University of Szczecin, H. Pobożnego St. 11, 70-507 Szczecin, Poland.

[b]Institute of Chemical and Environment Engineering, West Pomeranian University of Technology, Pułaskiego St. 10, 70-322 Szczecin, Poland.

*Corresponding author

E-mail address: w.konicki@am.szczecin.pl

Fax: +48 91 48 09 643

Keywords: Carbon nanospheres, Acid dyes, Kinetics, Adsorption.

Abstract

In this study, hollow mesoporous carbon nanospheres (HMCN) prepared from core-shell structured mesoporous silica sphere using chemical vapor deposition were used as a novel adsorbent for the investigation of the adsorption of two acid dyes: Acid Orange 8 (AO8) and Acid Red 88 (AR88) from aqueous solutions. The adsorbent was characterized by X-ray diffraction XRD, high-resolution transmission electron microscopy HRTEM, Raman spectroscopy, Fourier infrared spectroscopy FTIR, N_2 adsorption/desorption isotherms and zeta potential measurements. The effects of initial dye concentration, pH and temperature on adsorption capacity were studied. The experimental data were analyzed by the Langmuir and Freundlich models of adsorption. Equilibrium data fitted well with the Langmuir model. The

Download English Version:

https://daneshyari.com/en/article/6587524

Download Persian Version:

https://daneshyari.com/article/6587524

Daneshyari.com