

Author's Accepted Manuscript

Solid phase extraction and trace monitoring of cadmium ions in environmental water and food samples based on modified magnetic nanoporous silica

Fariborz Omid, Mohammad Behbahani, Majid Kalate Bojdi, Seyed Jamaledin Shahtaheri



PII: S0304-8853(15)30403-0
DOI: <http://dx.doi.org/10.1016/j.jmmm.2015.07.093>
Reference: MAGMA60458

To appear in: *Journal of Magnetism and Magnetic Materials*

Received date: 18 June 2015
Revised date: 14 July 2015
Accepted date: 25 July 2015

Cite this article as: Fariborz Omid, Mohammad Behbahani, Majid Kalate Bojdi and Seyed Jamaledin Shahtaheri, Solid phase extraction and trace monitoring of cadmium ions in environmental water and food samples based on modified magnetic nanoporous silica, *Journal of Magnetism and Magnetic Materials* <http://dx.doi.org/10.1016/j.jmmm.2015.07.093>

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 galley proof before it is published in its final citable 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

Solid phase extraction and trace monitoring of cadmium ions in environmental water and food samples based on modified magnetic nanoporous silica

Fariborz Omidi¹, Mohammad Behbahani^{2,*}, Majid Kalate Bojdi³, Seyed Jamaledin Shahtaheri⁴

¹*Department of Occupational Health Engineering, School of Public Health, Shahroud University of Medical Sciences, Shahroud, Iran*

²*Department of Chemistry, Shahid Beheshti University, Evin, Tehran, Iran*

³*Faculty of Chemistry, Kharazmi (Tarbiat Moallem) University, Tehran, Iran*

⁴*Department of Occupational Health Engineering, School of Public Health and Institute for Environmental Research, Tehran University of Medical Sciences, Tehran, Iran*

Corresponding author Tel.: +98 21 22431661; fax: +98 21 22431683

E-mail address: mohammadbehbahai89@yahoo.com

Abstract

A new method has been developed for trace separation/preconcentration of cadmium ions using pyridine-functionalized magnetic nanoporous silica material (called Py-Fe₃O₄@MCM-41) as a new magnetic sorbent and their determination by flame atomic absorption spectrometry (FAAS). The Py-Fe₃O₄@MCM-41 sorbent was characterized by thermogravimetric analysis, differential thermal analysis, transmission electron microscopy, Fourier transform infrared spectrometry and X-ray diffraction. The modified Fe₃O₄@MCM-41 can be easily separated from an aqueous solution by applying an external magnetic field. Effects of pH, amount of functionalized Fe₃O₄@MCM-41, extraction time, type and quantity of eluent, desorption time, and interfering ions on the extraction efficiency were evaluated and optimized. Under the optimized conditions, the detection limit and relative standard deviation was 0.04 µg L⁻¹ and 2.9 %, respectively and the maximum adsorption capacity of the synthesized sorbent for cadmium ions was 154 mg g⁻¹.

Download English Version:

<https://daneshyari.com/en/article/8155671>

Download Persian Version:

<https://daneshyari.com/article/8155671>

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