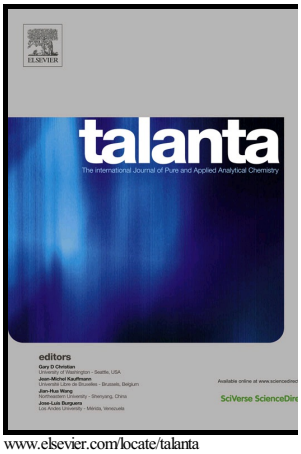

www.elsevier.com/locate/talanta

Magnetic solid phase extraction coupled with inductively coupled plasma mass spectrometry for the speciation of Mercury in environmental water and Human hair samples

Shishuai Ma, Man He, Beibei Chen, Wenchao Deng, Qi Zheng, Bin Hu

PII: S0039-9140(15)30258-7
DOI: http://dx.doi.org/10.1016/j.talanta.2015.08.036
Reference: TAL15896

To appear in: *Talanta*

Received date: 25 June 2015
Revised date: 12 August 2015
Accepted date: 16 August 2015

Cite this article as: Shishuai Ma, Man He, Beibei Chen, Wenchao Deng, Q Zheng and Bin Hu, Magnetic solid phase extraction coupled with inductivel coupled plasma mass spectrometry for the speciation of Mercury i environmental water and Human hair samples, *Talanta* http://dx.doi.org/10.1016/j.talanta.2015.08.036

Magnetic solid phase extraction coupled with inductively coupled plasma mass spectrometry for the speciation of mercury in environmental water and human hair samples

Shishuai Ma[1,2], Man He[2], Beibei Chen[2], Wenchao Deng[1], Qi Zheng[1]*, Bin Hu[2*]

[1]School of Chemical and Environmental Engineering, Jianghan University, Wuhan 430056, China

[2]Key Laboratory of Analytical Chemistry for Biology and Medicine (Ministry of Education), Department of Chemistry, Wuhan University, Wuhan 430072, China

* Corresponding author. Tel: 0086-27-68752162; Fax: 0086-27-68754067; Email: binhu@whu.edu.cn

Abstract

In this work, γ-mercaptopropyltrimethoxysilane (γ-MPTS) modified Fe_3O_4@SiO_2 magnetic nanoparticles (MNPs) was successfully prepared, and characterized by Fourier transform infrared spectrometer (FT-IR), Transmission electron microscope (TEM) and Vibrating sample magnetometer (VSM). The sorption performance of the prepared Fe_3O_4@SiO_2@γ-MPTS MNPs towards methylmercury (CH_3Hg^+) and inorganic mercury (Hg^{2+}) was investigated. It was found that CH_3Hg^+ and Hg^{2+} could be simultaneously retained on the prepared Fe_3O_4@SiO_2@γ-MPTS MNPs, and the quantitative elution of CH_3Hg^+ and total mercury (THg) was achieved by using 1.5 mol L^{-1} HCl containing 0.01% and 3% thiourea (m/v), respectively. And the levels of Hg^{2+} were obtained by subtracting CH_3Hg^+ from THg. Based on the above facts, a method of magnetic solid phase extraction (MSPE) combined with inductively coupled plasma mass spectrometry (ICP-MS) was developed for the speciation of CH_3Hg^+ and Hg^{2+}. Various experimental parameters affecting MSPE of CH_3Hg^+ and Hg^{2+} such as pH, eluent, sample volume, and co-existing ions have been