Desalination and Water Treatment
www.deswater.com
22 (2010) 330–339
October
1944-3994 / 1944-3986 © 2010 Desalination Publications. All rights reserved.
doi: 10.5004/dwt.2010.1132

Synthesis and application of 5-amino-2-benzotriazol-2-yl-phenol for preconcentration and determination of zinc (II) in water samples by flame atomic absorption spectrometry

Homayon Ahmad Panahi[a]*, Mohammad Rabbani[b], Nader Zabarjad-Shiraz[a], Shirin Mofavvaz[b], Elham Moniri[c], Sahar Kanghari[a], Mahdieh Entezari[a], Azadeh Hasanzadeh[a]

[a]*Department of Chemistry, Islamic Azad University, Central Tehran Branch, Iran*
Tel. +98 (21) 44164539; Fax +98 (21) 88385778; email: h_ahmadpanahi@iauctb.ac.ir
[b]*Department of Sea Chemistry, Faculty of Marin of Sciences and Technology, Islamic Azad University, North Tehran Branch, Iran*
[c]*Department of Chemistry, Islamic Azad University, Varamin (Pishva) Branch, Iran*

Received 5 January 2009; Accepted in revised form 19 April 2010

ABSTRACT

A novel spherical 5-amino-2-benzotriazol-2-yl-phenol (ABP) chelating sorbent is synthesized simply and rapidly from 2-nitroanilin and 3-nitrophenol characterized (IR, ^{1}H NMR spectra and scanning electron microscopy) and studied for the preconcentration and determination of trace Zn(II) ion from aqueous solution samples. The concentration of metal ion in the solution was determined by flame atomic absorption spectrometry (FAAS). The optimum pH value for sorption of the metal ion was 6.5. The sorption capacity of ABP for Zn(II) was determined. The chelating ABP can be reused for 20 cycles of sorption-desorption without any significant change in sorption capacity. A recovery of 86% was obtained for the metal ion with 0.5 M HNO_3 as eluting agent. The equilibrium adsorption data of Zn(II) on sorbent were analyzed by the Langmuir and Freundlich models. Based on equilibrium adsorption data the Langmuir and Freundlich constants were determined 0.0074 and 1.200 at pH 6.5 and 25°C.

Keywords: Solid phase extraction; 5-amino-2-benzotriazol-2-yl-phenol; Zinc; Immobilization; Isotherm study

* Corresponding author.