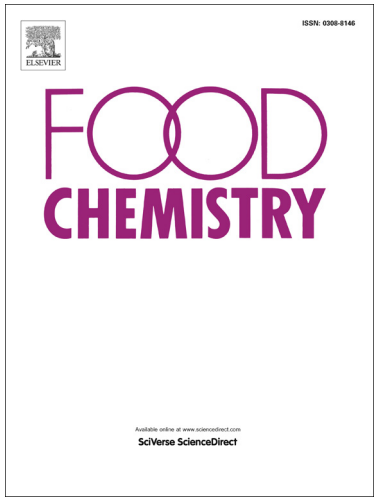

SPE coupled to AAS trace determination of Cd(II) and Zn(II) in food samples using amine functionalized GMA-MMA-EGDMA terpolymer: isotherm and kinetic studies

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PII: S0308-8146(16)31055-X
DOI: http://dx.doi.org/10.1016/j.foodchem.2016.07.033
Reference: FOCH 19494

To appear in: *Food Chemistry*

Received Date: 11 December 2015
Revised Date: 24 May 2016
Accepted Date: 5 July 2016

Please cite this article as: Islam, A., Kumar, S., Zaidi, N., Ahmad, H., SPE coupled to AAS trace determination of Cd(II) and Zn(II) in food samples using amine functionalized GMA-MMA-EGDMA terpolymer: isotherm and kinetic studies, *Food Chemistry* (2016), doi: http://dx.doi.org/10.1016/j.foodchem.2016.07.033

SPE coupled to AAS trace determination of Cd(II) and Zn(II) in food samples using amine functionalized GMA-MMA-EGDMA terpolymer: isotherm and kinetic studies

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Abstract

An ethylenediamine functionalized glycidyl methacrylate (GMA) based terpolymeric chelating resin was synthesized for the separation and preconcentration of Cd(II) and Zn(II) by SPE from bread, rice and fruit juice prior to FAAS determination. The resin was characterized by FT-IR, TGA/DTA, SEM, BET analysis and EDS. Synthesized resin shows a good capacity of 53.96 mg g^{-1} for Cd(II) and 24.19 mg g^{-1} for Zn(II) at pH 8.0. Five isotherm equilibrium models were studied to explain the sorption phenomenon out of which Langmuir, Dubinin–Radushkevich, Scatchard and Temkin models were found to be the best fitted. The limit of detection (LOD) and limit of quantification (LOQ) were observed to be 1.5 and 5.1 µg L^{-1} for Cd and 1.2 and 4.1 µg L^{-1} for Zn. The reliability of the method was investigated by the analysis of SRM and the recovery of analytes from various spiked food samples.

Keywords: Terpolymer; solid phase extraction; food analysis; FAAS.

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