Analytical methods

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PII: S0308-8146(16)30718-X
DOI: http://dx.doi.org/10.1016/j.foodchem.2016.05.037
Reference: FOCH 19186

To appear in: *Food Chemistry*

Received Date: 7 August 2015
Revised Date: 16 February 2016
Accepted Date: 3 May 2016

Please cite this article as: Daşbaş ı, T., Saçmacı, S., Çankaya, N., Soykan, C., Synthesis, characterization and application of a new chelating resin for solid phase extraction, preconcentration and determination of trace metals in some dairy samples by flame atomic absorption spectrometry, *Food Chemistry* (2016), doi: http://dx.doi.org/10.1016/j.foodchem.2016.05.037

Synthesis, characterization and application of a new chelating resin for solid phase extraction, preconcentration and determination of trace metals in some dairy samples by flame atomic absorption spectrometry

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ABSTRACT

In this study, a simple and rapid solid phase extraction/preconcentration procedure was developed for determination of Cd(II), Co(II), Cr(III), Cu(II), Fe(III), Mn(II), Pb(II), and Zn(II) trace metals by flame atomic absorption spectrometry (FAAS). A new chelating resin, poly(N-cyclohexylacrylamide-co-divinylbenzene-co-2-acrylamido-2-methyl-1-propanesulfonic acid) (NCA-co-DVB-co-AMPS) (hereafter CDAP) was synthesized and characterized. The influences of the analytical parameters such as pH of the sample solution, type and concentration of eluent, flow rates of the sample and eluent, volume of the sample and eluent, amount of chelating resin, and interference of ions were examined. The limit of detection (LOD) of analytes were found (3s) to be in the range of 0.65 to 1.90 µg L^{-1} . Preconcentration factor (PF) of 200 and the relative standard deviation (RSD) of ≤ 2% were achieved (n = 11). The developed method was applied for determination of analytes in some dairy samples and certified reference materials.

Keywords: Solid phase extraction, Trace Metals, Chelating resin, FAAS, Dairy Samples