ON-LINE PRECONCENTRATION AND DETERMINATION OF TRACE ELEMENTS BY FLOW INJECTION/FAAS USING NEWLY SYNTHESIZED 8-HYDROXY-2-QUINOLINE CARBOXYLALDEHYDE FUNCTIONALIZED AMBERLITE XAD-4

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Recently, pollution of water and food samples by appreciable amount of heavy metals has been considered as a result of human activities. Due to positive and negative effects and the toxicity of trace heavy metals on human health and the environment, many researchers interest by the analysis of trace metal contents of the environmental and food samples [1-3].

In this work, a new chelating resin has been synthesized using Amberlite XAD-4 resin anchored with 8-hydroxy-2-quinoline carboxaldehyde through \(-\text{C}=\text{N}^{-}\) group. The synthesized resin, characterized by infrared spectroscopy, was used as packing for the minicolumn in an on-line preconcentration system for cadmium, cobalt, copper, lead, manganese and nickel determination. Metal ions retained on the modified resin were eluted using 1.0 mol L\(^{-1}\) HNO\(_3\) solution and aspirated directly to the nebulizer–burner system of a FAAS instrument using a flow injection system. Optimum hydrodynamic and chemical conditions for metal sorption were investigated. Detection limits (3\(\sigma\)) were determined to be 0.14 µg L\(^{-1}\) for Cd, 0.35 µg L\(^{-1}\) for Cu, 0.26 µg L\(^{-1}\) for Mn, 0.70 µg L\(^{-1}\) for Co, 0.72 µg L\(^{-1}\) for Ni and 2.92 µg L\(^{-1}\) for Pb using a 10 mL sample loading. Enrichment factors for Cu(II), Mn(II), Co(II), Pb(II), Ni(II) and Cd(II) were found out to be 22.3, 24.7, 23.2, 24.1, 20.2 and 27.6 respectively. The proposed method was successfully applied to determination of the analytes in water samples and food samples such as some cereal certified reference materials.

KEYWORDS: Amberlite XAD-4, flame atomic absorption spectrometry (FAAS), on-line preconcentration, 8-hydroxy-2-quinoline carboxaldehyde, trace elements, cereals analyses, water analyses

REFERENCES: