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Determination of Trace Copper by FAAS after Solid Phase Extraction and Preconcentration onto Amberlite XAD-2 Loaded with Nitroso-R Salt

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Abstract: A procedure for the separation and preconcentration of trace amounts of copper is proposed. It is based on the adsorption of copper(II) ions solution onto a column of Amberlite XAD-2 resin loaded with disodium 1-nitroso-2-naphthol-3, 6-disulfonate (nitroso-R salt). Copper is quantitatively retained on the column in the pH range 5.5-7.8 at a flow rate of 2 mL min⁻¹. The copper complex eluted with 5 mL of dimethylformamide (DMF) and copper was measured by flame atomic absorption spectrometry (FAAS) at 324.8 nm. In this case, 0.10 µg of copper can be concentrated in the column from 800 mL of aqueous sample, where its concentration is as low as 0.125 ng mL⁻¹. Eight replicate determinations of 1.0 µg mL⁻¹ of copper in the final DMF solution gave a relative standard deviation of 1.8%. The sensitivity for 1% absorption was 27.5 ng mL⁻¹. The interference of a large number of anions and cations was studied and the optimized conditions developed were utilized for the trace determination of copper in various environmental and standard samples.

Key Words: Amberlite XAD-2, flame atomic absorption spectrometry, solid phase extraction of copper, standard alloys and biological samples

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