

Screening of some transition metal ions and quantitative determination of copper, cadmium and zinc by solid phase derivative spectrophotometry

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A simple solid phase spectrophotometric method for both screening of eight transition metal ions plus lead and quantitative determination of copper, cadmium and zinc is described. The method is based on the preparation of a sensitive analytical zone by immobilization of the organic reagent 1-(2-pyridylazo)-2-naphthol (PAN) in a Dowex 50WX2-100 resin, in which Cd, Cu, Zn, Co, Fe, Ni, Ag, Pb and Hg react at pH 10, to form colored complexes on the surface of the resin. Absorbance can be measured directly on the solid phase at 550 nm, to detect the presence or absence of these cations in a solution sample. Physical-chemical variables of the method were optimized in order to find suitable analytical conditions for the simultaneous determination of Cu, Cd and Zn by solid phase derivative spectrophotometry. Under the selected conditions the three analytes can be accurately determined between 1 and 100 ng·mL⁻¹, with a detection limit (3 σ criterion) of 0.9, 0.5, and 0.4 ng·mL⁻¹, for Cu, Cd and