عنوان مقاله:

Selective Separation and Preconcentration of trace Amounts of Gallium in Water and Rice Samples using Cloud Point Extraction and Determination by Inductively Coupled Plasma-Atomic Emission Spectrometry

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خلاصه مقاله:

In the present study a cloud-point extraction process using non-ionic surfactant Triton X-114 for selective extraction of gallium from aqueous solutions was developed. The method is based on the complex formation of Ga (III) with N, N′ - bis (salycilidene)-1, 2-phenylenediamine (salophen) as a chelating agent in buffer media of pH 5. After phase separation and dilution of the surfactant-rich phase with 0.2 mL of a (80-20) propanol-water mixture containing 0.02 mL HNO3, the enriched analyte was determined by inductively coupled plasma-atomic emission spectrometry (ICP-AES). The variables affecting the complexation and extraction steps were optimized. Under the optimum conditions (i.e. 7.5×10-5 mol L-1 salophen, 0.5% (v/v) Triton X-114, 45ºC equilibrium temperature, incubation time 15 min) the calibration graph was linear in the range of 20–120 ng mL-1 with detection limit of 1.5 ng mL-1. The precision (R.S.D. %) for five replicate determinations at 60 ng mL-1 of Ga (III) was better than 4%. In this manner, the preconcentration factor was 22.2. Under the presence of foreign ions, no significant interference was observed. Finally, the proposed .method was utilized successfully for the determination of gallium in water and rice samples

کلمات کلیدی:

Keywords: Cloud point extraction, Gallium, Inductively coupled plasma atomic emission spectrometry, Salophen, Rice