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On-line Incorporation of Cloud Point Extraction in Flame Atomic Absorption Spectrometric Determination of Silver

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Abstract: A cloud point extraction method was incorporated into a flow injection system, coupled with flame atomic absorption spectrometry, for determination of trace amounts of silver. The analyte in the aqueous solution was acidified with 0.2 mol L⁻¹ sulfuric acid and complexed with dithizone. The cloud point extraction was performed using the non-ionic surfactant Triton X-114. After obtaining the cloud point, the surfactant-rich phase containing the dithizonate complex was collected in a mini-column packed with cotton wool. Then the complex was eluted by passing THF through the column and silver content was determined by flame atomic absorption spectrometry. All the chemical and flow variables were optimized and the enhancement factor was estimated to be 38. The calibration curve was rectilinear in the range of 4-220 μg L⁻¹ and the limit of detection was 0.7 μg L⁻¹. The precision for 6 replicate measurements at a silver concentration of 50 μg L⁻¹ was 2.0% relative standard deviation. The proposed method was applied to the determination of silver in water samples.

Key Words: Cloud point extraction; silver; dithizone; on-line.

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