

Electrothermal atomization of a substance with fractional condensation of the element being determined on a probe

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Abstract

This paper describes a method of electrothermal atomization with a fractional condensation of the elements being determined on a refractory probe with the aim of decreasing the matrix influences on the atomic-absorption signal. In the course of primary atomization of the sample, the probe is placed over the dosing port of a tubular atomizer. The internal argon flow directs the vapor to the probe for the condensation of the elements being determined. The matrix vapors volatilize. Then the probe is inserted into the atomizer for evaporation of the elements and analytical signal recording. It has been shown that this technique makes it possible to decrease the influence of sodium chloride and potassium sulfate on the absorption of Ag, Cd, Pb, and Au by a factor of 50-20,000 as compared to the atomization from the atomizer wall. In the case of Au, this decrease is comparable to the level attained under the conventional conditions of a stabilized temperature furnace with a platform, a modifier, and a background corrector based on the Zeeman effect, while for the other elements its efficiency is 1.5-40 times higher. ©2005 Springer Science+Business Media, Inc.

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Keywords

Electrostatic atomic-absorption spectrometry, Fractional condensation, Matrix interference, Refractory probe