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Indirect ultra-trace determination of nitrate and nitrite in food samples by in-syringe liquid microextraction and electrothermal atomic absorption spectrometry

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Abstract

A simple and rapid method for simultaneous separation and preconcentration of ultra-trace amounts of nitrate and nitrite using in-syringe liquid microextraction is developed. The extraction procedure is based on the selective ion-pairing complex formation of nitrate and nitrite with Cu(I)-neocuproine in 100 μ L of 1-butyl-3-methylimidazolium hexafluorophosphate as an extracting phase within a syringe. The atomic-absorption signal of copper in the ionic liquid layer is proportional to the nitrate and nitrite concentrations. When barbituric acid is used, nitrite is converted into violuric acid and thus it is removed from the environment. In this case, the selectivity of the modified-ligand is limited to nitrate. Under optimum experimental conditions, the calibration graph was in the range from 0.1 to 25 μ g

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