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On-line competitive host-guest interactions in a turn-on fluorometric method to amantadine determination in human serum and pharmaceutical formulations

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Abstract

A competitive assay between the antiviral Amantadine and the dye Thionine for the Cucurbit[8]uril cavity was carried out in a flow injection analysis system for the indirect fluorescence detection of Amantadine. Both, Cucurbit[7]uril and Cucurbit[8]uril Thionine complexes were evaluated for the competitive assay. The use of a 12-port injection valve allows the on-line reaction in the flow system. Once optimized all the experimental variables, the methodology developed allows the detection of Amantadine at the 0.16 μM level with excellent accuracy ($E_r \leq 8.2\%$) and reproducibility ($RSD \leq 6.3\%$) for all the concentration range assayed. This one-step turn-on fluorescence methodology allows reaching sampling frequencies of 68 samples per hour. The selectivity of the method was evaluated against different antiviral drugs. Moreover, the performance of the methodology proposed was tested by the Amantadine determination in human serum and pharmaceutical formulations samples. The results demonstrated that the method can be applied to Amantadine determination in real samples of different nature with excellent recoveries, ranging from 83 to 98% depending on the matrix assayed.

Keywords: turn-on fluorescence, competitive supramolecular interaction, cucurbituril, amantadine, flow injection analysis.

Introduction

Flow analysis methods result an excellent option either for environmental, industrial and/or clinical analysis, as they are techniques that permit the automation and miniaturization of the analytical methodologies, resulting in fast and efficient solutions for research and routine determinations. The easy on-line integration of the different steps that analytical procedures usually require, explains the interest and efforts on developing new methodologies based on flow analysis techniques. Among the great

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