A highly sensitive liquid chromatography-tandem mass spectrometry method for the analysis of a toxic water disinfection by-product, N-nitrosomethylethylamine

Yassine Kadmi,Lidia Favier,Mouni Lotfi,Noureddine Nasrallah and Dominique Wolberta

Recently, among the emerging contaminants, N-nitrosomethylethylamine has become of special concern because it is a potent human mutagenic and carcinogenic contaminant detected in chlorinated or chloraminated drinking waters and wastewaters. In this work a sensitive and robust method, which was based on solid-phase extraction followed by ultra-high-pressure liquid chromatography coupled with tandem mass spectrometry, was developed for the determination of N-nitrosomethylethylamine in water at ultra-trace levels. Chromatographic separation was performed on a C18 column. Quantification of N-nitrosomethylethylamine was achieved by using a triple quadrupole mass spectrometer that was equipped with an electrospray interface and was operated in positive ionization mode.
Under optimized conditions, the calibration curve was linear from 0.1 to 100 mg L_1 (r2 $ 0.999). The precision of the intra- and inter-day values was found to be less than 2.5%, and the accuracy of the method was within _3%. Moreover, an extraction efficiency greater than 86% was obtained at different concentration levels with relative standard deviation, RSD < 4.2%. Therefore, the experimental results showed that the proposed analytical method can be used successfully to determine N-nitrosomethylethylamine at ultra-trace levels (ng L_1) in aqueous samples.