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Speciation analysis of organotin compounds in human urine by headspace solid-phase micro-extraction and gas chromatography with pulsed flame photometric detection

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Abstract

A new headspace solid-phase micro-extraction (HS-SPME) method followed by gas chromatography with pulsed flame photometric detection (GC-PFPD) analysis has been developed for the simultaneous determination of 11 organotin compounds, including methyl-, butyl-, phenyl- and octyltin derivatives, in human urine. The methodology has been validated by the analysis of urine samples fortified with all analytes at different concentration levels, and recovery rates above 87% and relative precisions between 2 and 7% were obtained. Additionally, an experimental-design approach has been used to model the storage stability of organotin compounds in human urine, demonstrating that organotins are highly degraded in this medium, although their stability is satisfactory during the first 4 days of storage at 4°C and pH = 4. Finally, this methodology was applied to urine samples collected from harbor workers

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