



## **Microextraction techniques for the non-chromatographic speciation of ultratraces of elements in waters: some significant cases**

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The speciation of very low concentrations of some elements in waters is of interest due to the different behaviour and toxicity the species can have. This task can be carried out by using liquid chromatographic techniques (LC) for separation together with inductively coupled plasma mass spectrometry (ICP-MS) for detection. However, this combination is not easily available in all laboratories mainly due to the relative high cost of acquisition and maintenance of the ICP-MS spectrometer, and so other alternatives are of practical interest. Present knowledge of microextraction techniques involving minimal (or none) amounts of organic solvents allows, in some cases, speciation to be carried out without the need of such an expensive instrument, and even avoiding the use of a chromatographic stage. The selectivity of the separation (fractionation or speciation) can be achieved by modifying the experimental conditions used for microextraction, and a sensitive final measurement be obtained by means of electrothermal atomic absorption spectrometry (ETAAS). In this way, since an ETAAS instrument is common (and sometimes underused) in all laboratories, the speciation procedures are made available to most laboratories worldwide. The high preconcentration factor achieved by means of the microextraction stage together with the high sensitivity inherent in ETAAS measurements result in extremely sensitive methods that permit the speciation at ultratrace levels. The advantages of this methodology are presented by discussing speciation of chromium and arsenic as representative examples.