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Solid phase spectrometry in a μSI-LOV system for cadmium and lead determination

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Cadmium and lead determination in natural waters is still a major concern due to their high toxicity. Furthermore, both metal ions continue to be discharged to the environment by anthropogenic activities. Flow analysis is an appropriate choice for the monitoring of pollutants in the environment since it allows a real-time determination of the analyte together with miniaturization and automation of the analysis. When compared to other flow techniques, micro sequential injection lab-on-valve (μSI-LOV) presents advantages such as the miniaturization with further decrease in sample and reagents consumption. Additionally, the possibility to manipulate beads allows the performance of on-line solid phase extraction. In fact, since the flow cell of the μSI-LOV equipment is incorporated in the selection valve, packing the solid material in the optical path is feasible. This feature enables the spectrophotometric measurement to be performed on the beads surface (solid phase spectrometry).

The objective of this work was to develop a μSI-LOV method with solid phase spectrometry using NTA (Nitrilotriacetic Acid) resin for cadmium and lead determination in natural waters. The NTA resin is packed in the flow cell and subsequently perfused with the sample/standard for Cd^{2+} and Pb^{2+} retention. Afterwards, the reaction with dithizone is carried out by propelling the reagent towards the column and the color product is measured at 550 nm.

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