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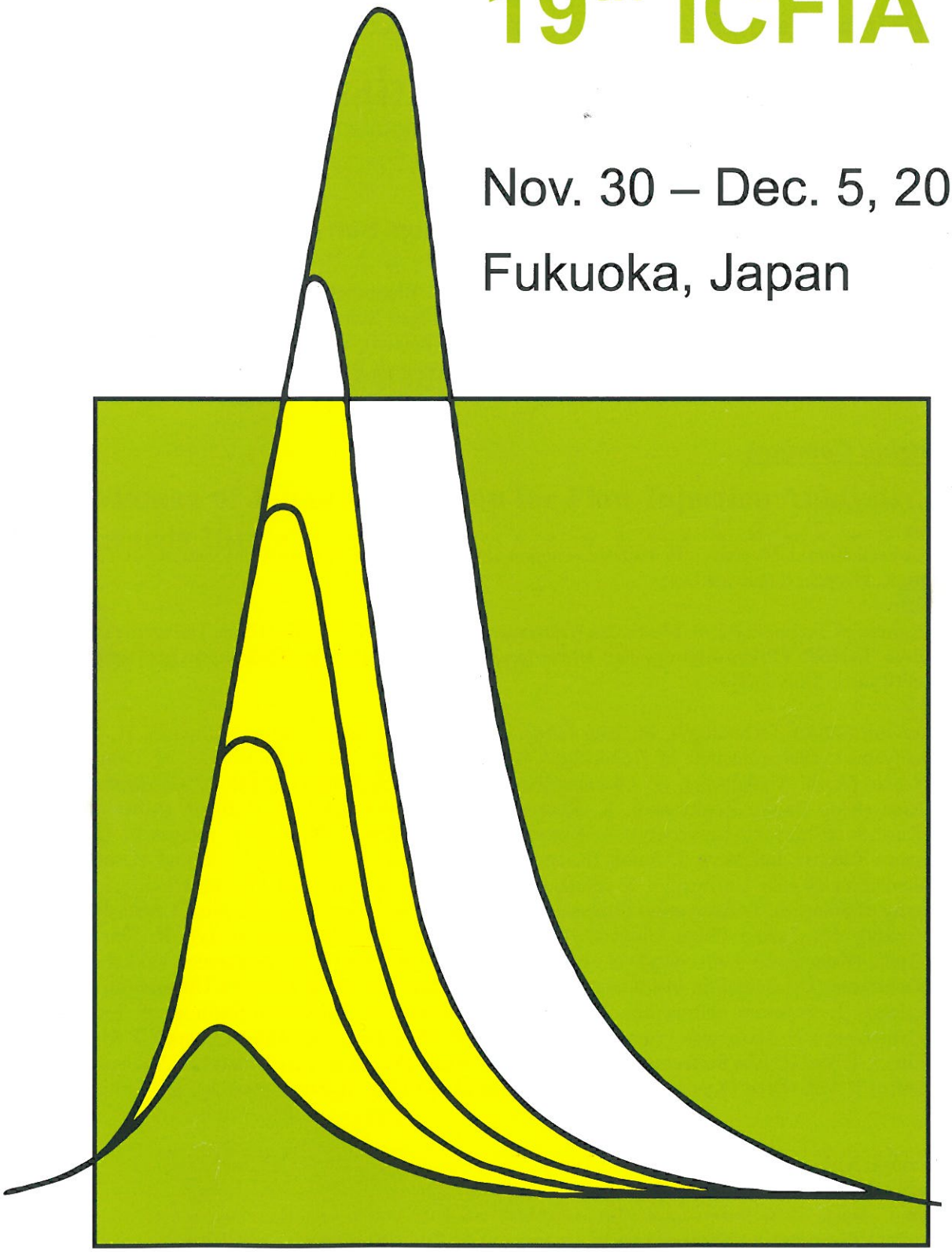

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Solid phase spectrometry for copper, zinc and cadmium determination in natural waters using a SI-LOV system

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Sequential injection-lab on valve (SI-LOV), considered the third generation of flow injection analysis, brought important advantages when compared to the other flow injection analysis techniques [1]. Its configuration allows the manipulation of solid particles, beads, enabling to perform solid phase extraction (SPE). When the beads are placed in the detector path at the flow cell of the multiposition valve, solid phase spectrometry (SPS) is attained. This technique consists in detecting the retained analyte at the beads surface with the reaction between analyte and reagent taking place at the surface of the beads and consequent monitoring of the color product. SPS enables the preconcentration of analyte together with minimization of sample matrix interferences.

The determination of metal ions in natural waters is still pertinent since they continue to be discarded to the environment due to anthropogenic activities. The expected analyte low levels and the matrix complexity pose an intricate challenge. In this context, SPS with SI-LOV is an interesting approach to target metals determination in natural waters.

The aim of this work was to develop a SPS-SI-LOV method for copper, zinc and cadmium determination in natural waters using beads of Nitrilotriacetic Acid (NTA) resin. The beads were packed in the flow cell and subsequently perfused with the sample for analyte retention. Afterwards, the reaction with dithizone (at different pH) was carried out by propelling the reagent towards the column and the color product was measured (550 nm) at the beads surface. Detection limits of 0.11, 2.39 and 0.23 $\mu g\ L^{-1}$ were obtained for copper, zinc and cadmium, respectively.

References:

[1] J. Ruzicka, Analyst 125 (2000) 1053.

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