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## **Evaluation of calcium alginate beads for Ce, La and Nd preconcentration from groundwater prior to ICP OES analysis**

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### **Abstract**

Analytical methods for the determination of rare earth elements (REE) in natural waters by plasma spectrochemical techniques often require sample preparation procedures for analytes preconcentration as well as for removing matrix constituents, that may interfere on the analytical measurements. In the present work, calcium alginate (CA) beads were used for the first time aiming at Ce, La and Nd preconcentration from groundwater samples for further determination by inductively coupled plasma optical emission spectrometry (ICP OES). Test samples were analyzed in batch mode by transferring a 40 mL test portion ( $\text{pH} = 5 \pm 0.2$ ) into a 50 mL polyethylene flask containing 125 mg CA beads. After 15 min contact, the analytes were quantitatively extracted from the loaded CA beads with 2.0 mL of  $1.0 \text{ mol L}^{-1}$  HCl solution for further determination by ICP OES, using Ce (II) 456.236, La (II) 379.478 and Nd (II) 430.358 nm emission lines. The proposed approach is a reliable alternative for REE single-stage preconcentration from aqueous samples, as it provided accurate results based on the addition and recovery analysis of groundwater. The results

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