

## **Coupling between ionic chromatography and multi collector inductively coupled plasma mass spectrometry for Sm and Nd isotopic measurements**

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Precise determination of Sm and Nd isotopic composition is of major interest in nuclear industry and in geosciences (geochronology ...). The elimination of matrix constituents and isobaric interferences between Sm and Nd is mandatory to obtain accurate isotope ratio measurements. In most cases isotope ratios are determined off-line after Sm/Nd chemical separation steps. The chemical separation steps are now well established but are time and solvent consuming.

In this study the simultaneous on line determination of Sm and Nd isotope ratio measurements are investigated by ionic liquid chromatography and multicollector inductively coupled plasma mass spectrometry coupling. Hence, the preparation time, the sample and solvent volumes are drastically reduced. The separation of Sm and Nd was performed by high performance liquid chromatography using a strong cation exchange (SCX) analytical column in gradient elution mode using the organic acid HMB acid (2-hydroxy-2-methylbutyric acid) in the mobile phase. Sm and Nd chromatographic peak were well separated and isotope ratio were acquired in a single sequence on transient signals. A systematic isotope ratio increase or decrease was observed during the transient signal acquisition, namely isotope ratio drift. The origins of this drift were investigated and discussed (isotope fractionation, time responses of the Faraday amplifier system ...). The blank correction strategy and different methods of data acquisition (point by point, peak area integration, linear regression, multiple linear regression) were evaluated on several experiments involving different Sm and Nd ratios. Reproducibility and accuracy were compared between off line and on line measurements on Nd and Sm isotope ratios. This approach is very attractive for nuclear topics and further applications could be envisaged for geochemical applications.