Supplementary Materials for

Routine high-precision Nd isotope analyses: An optimized chromatographic purification scheme

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Supplementary text

Tests conducted with different acid molarities (2.0 M vs 2.5 M HCl/3.6 M vs 4.0 M HCl) for the REE-preconcentration step revealed that small changes in acid molarity led to relatively large changes in elution volumes.

For the elution of matrix elements, our optimal method uses 3 ml of 1.5 M HCl followed by 55 ml of 2.0 M HCl (Fig S1a). A test conducted with 2.5M HCl (instead of 2.0 M) decreased the amount of acid needed to elute the matrix elements to 45 mL but also resulted in an early release of the heavy REEs (Fig S1c). As the isotopic composition of all REEs are becoming of interests in geo/cosmochemical investigations, we prefer the use of 2.0 M HCl to ensure both matrix element removal (>99%) and elution of the REEs in a single cut.

For the second part of the elution, we tested two acid molarities: 3.6 and 4.0 M HCl. Using 3.6 M HCl for the elution of REE instead of 4.0 M required an extra 15 mL (50% increase) to fully elute Nd (Figure S1b). We therefore prefer the use of 4.0 M HCl, which allows release of the REEs in ~30 ml and minimizes the molarity of acid needed, and thus the blanks.

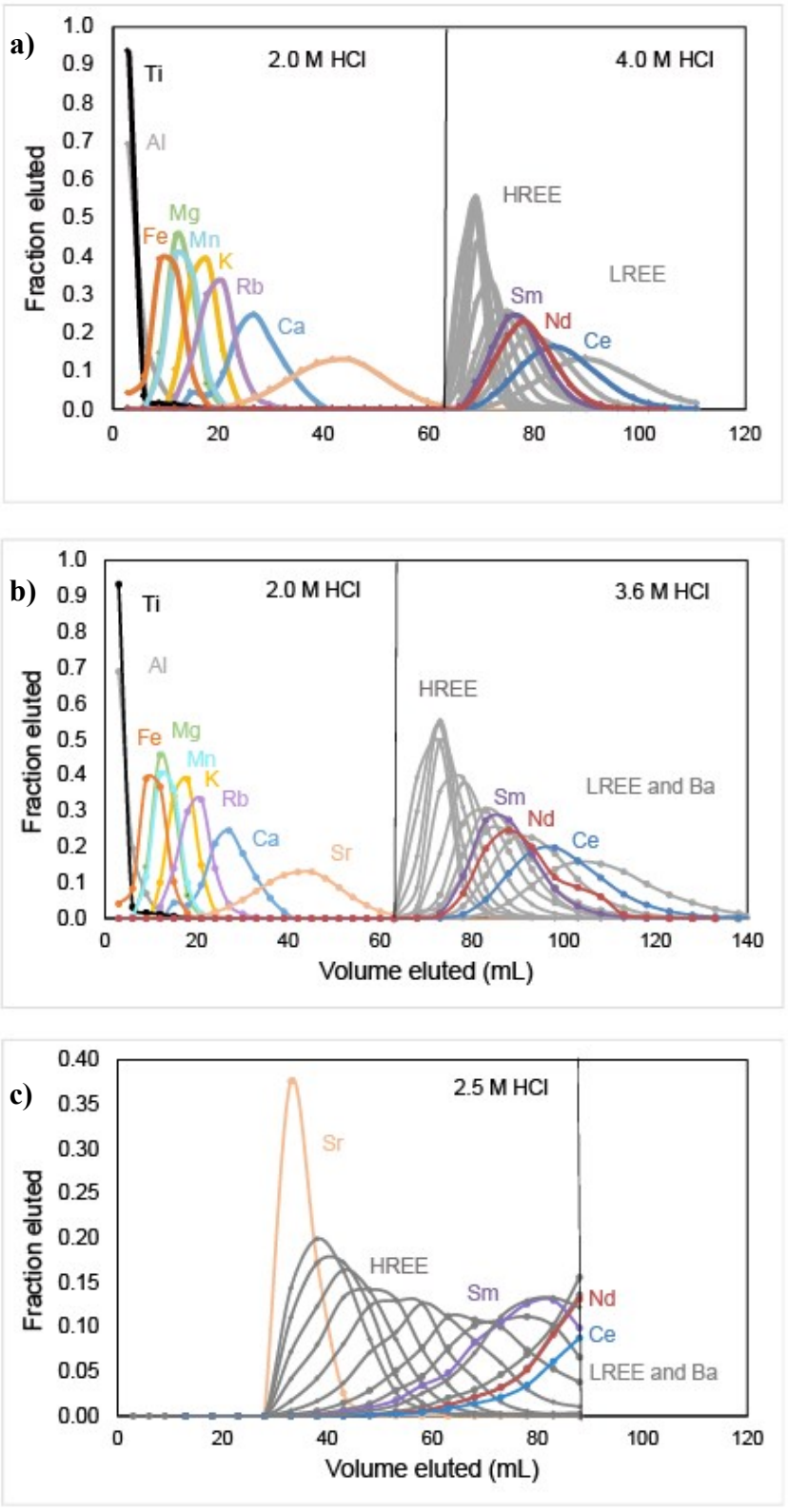

Figure S1. Comparison of the REE pre-concentration elutions.