

Labile iron associated trace metals and REEs in estuarine surface sediments

Z. Zhou, J. Guo, X. Xu, N. Su, S. Yang

Supplementary Information

The Supplementary Information includes:

- Supplementary Tables S-1 to S-4
- Supplementary Figures S-1 to S-3
- Supplementary Information References

Supplementary Tables

Table S-1 Characterizations of sieved sediments from different stations.

Station	Location	Salinity (PSU)	Water depth (m)	Mean (μm)	Median (μm)	SSA (cm ² /g)	TOC (%)	Fe _{tot} (%)
1	30°53'57" N 122°19'25" E	25.6	12.6	31.96	24.70	7402.04	1.21	4.11
2	30°53'59" N 122°23'10"E	26.4	13.8	29.68	24.33	7321.17	1.15	4.44
3	30°54'00"N 122°29'08"E	27.1	17.4	31.85	24.48	7423.02	1.05	4.21
4	30°51'22"N 122°38'22"E	28.7	26.1	69.38	58.62	4575.33	0.52	2.89
5	30°52'49" N 122°44'76" E	31.6	24.8	31.63	25.92	7231.41	0.73	3.91
6	30°51'43"N 123°17'06"E	34.8	58.4	25.57	19.95	8637.62	1.45	4.01

Table S-2 The total amount of elements (units: mg/g for Al, Ca, Mg, Mn, Fe; $\mu\text{g/g}$ for ΣREE , Co, Ni, Cr, Li) released in the batch leaching and FT-TRA.

Treatment	Al	Ca	Mg	Mn	Fe
Digestion	67.8 ± 6.51	–	–	0.6 ± 0.17	35.1 ± 5.2
Batch Leaching	1.7 ± 0.26	22.2 ± 1.35	4.8 ± 10.6	0.4 ± 0.10	4.3 ± 0.68
FT-TRA	1.4 ± 0.38	17 ± 8.6	4.1 ± 1.5	0.3 ± 0.15	3.5 ± 1.05
Treatment	ΣREE	Co	Ni	Cr	Li
Digestion	169.5 ± 18.38	19.43 ± 3.49	26.8 ± 0.73	63.5 ± 10.73	36.3 ± 9.17
Batch Leaching	49.6 ± 1.42	3.6 ± 0.64	4.0 ± 0.45	3.4 ± 0.37	2.7 ± 0.36
FT-TRA	54.0 ± 9.6	2.5 ± 0.61	5.35 ± 0.69	2.36 ± 0.45	0.9 ± 0.36

Table S-3 The Pearson correlation analysis of key elements during their releases in the batch leaching of 0.5 M HNO_3 .

Element		REE	Cr	Co	Ni	Li
Fe	Coefficiency	0.794	0.89	0.995	0.963	0.691
	Sig.	0.01	0.01	0.01	0.01	0.01
	Cases	36	36	36	36	36
Mn	Coefficiency	0.884	0.358	0.718	0.841	0.029
	Sig.	0.01	0.01	0.01	0.01	0.01
	Cases	36	36	36	36	36

Table S-4 The Pearson correlation analysis of key elements in FT-TRA.

Element		0.1 M HNO_3					0.5 M HNO_3				
		REE	Co	Ni	Cr	Li	REE	Co	Ni	Cr	Li
Fe	Coefficiency	0.942	0.970	0.833	0.971	0.977	0.926	0.499	0.538	0.978	−0.013
	Sig.	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Cases	91	91	91	91	91	85	85	85	85	85
Mn	Coefficiency	0.556	0.886	0.990	0.614	0.842	–	–	–	–	–
	Sig.	0.01	0.01	0.01	0.01	0.01	–	–	–	–	–
	Cases	91	91	91	91	91	–	–	–	–	–

Supplementary Figures

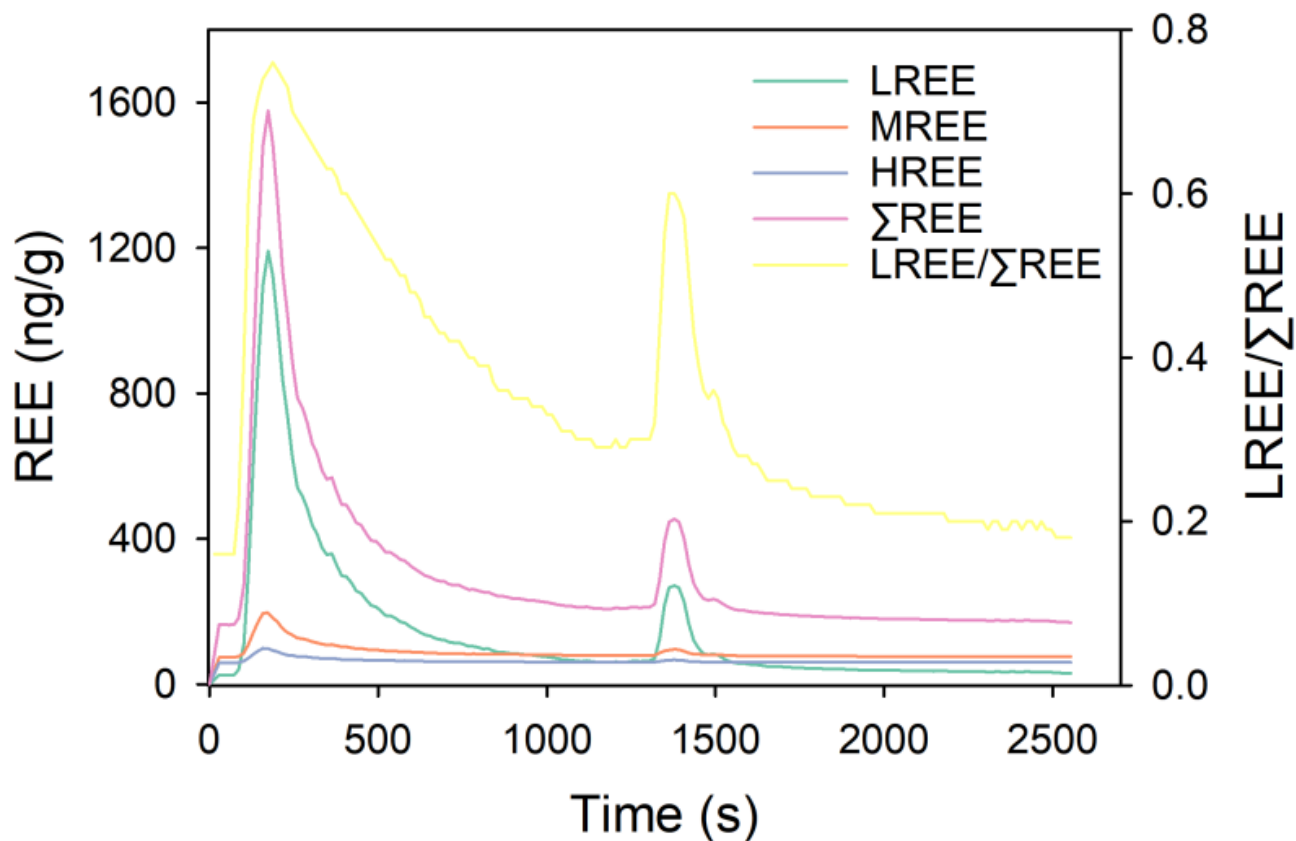


Figure S-1 The dynamics of REE during which 0.1 M and 0.5 M HNO₃ sequentially flowed through the sediments. The data points represent average values measured in six stations.

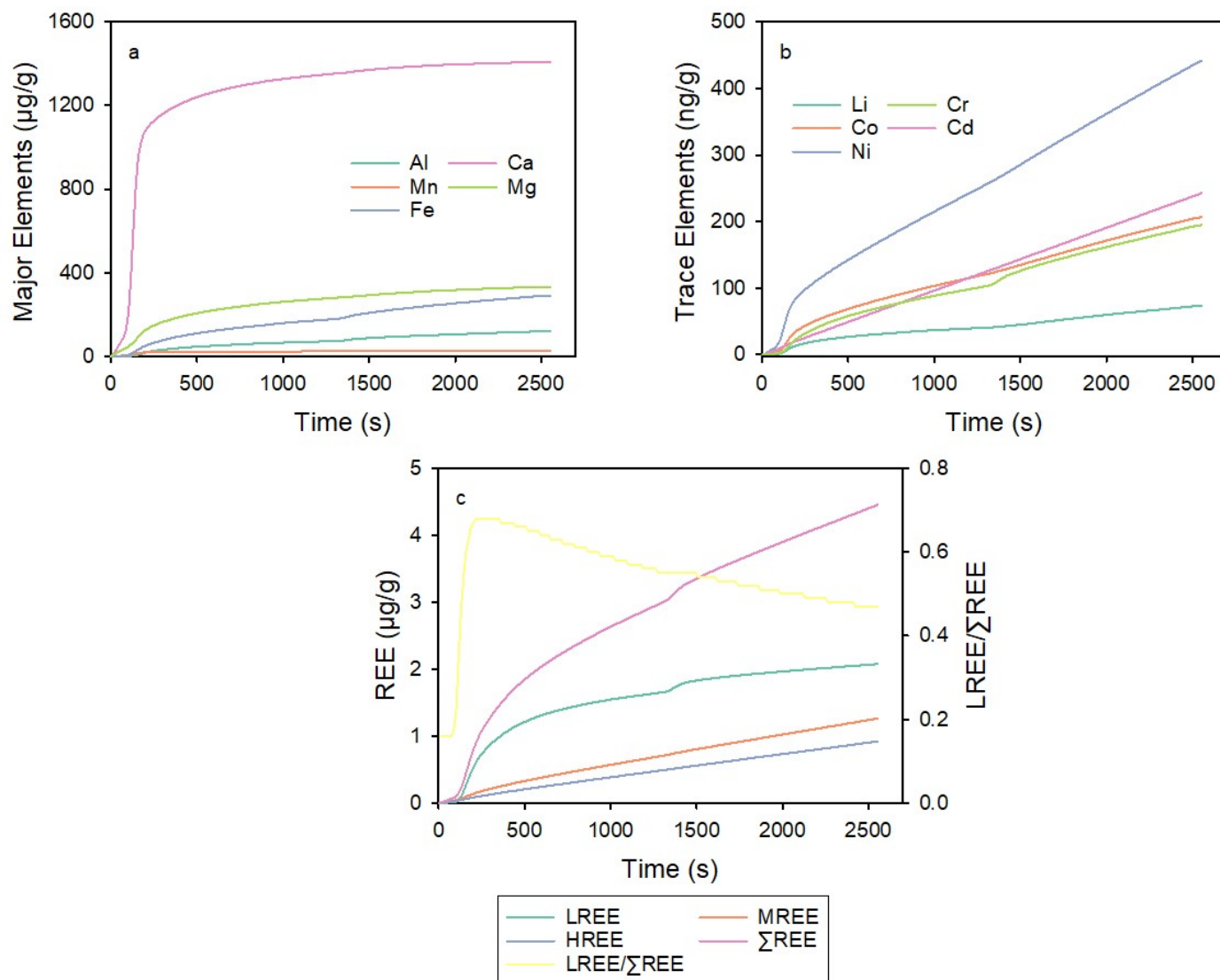


Figure S-2 The dynamics of **(a)** Al, Ca, Mg, Fe, Mn, **(b)** Co, Ni, Cr, Cd and Li, and **(c)** REE in the FT-TRA, during which 0.1 M and 0.5 M HNO₃ sequentially flowed through the sediments. The data points represent average values measured in six stations.

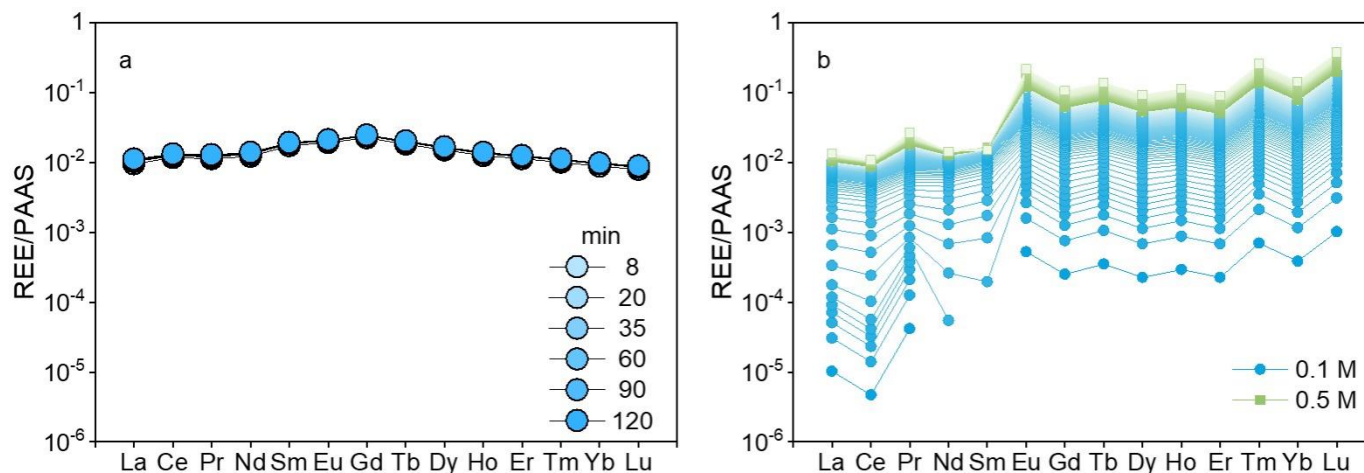


Figure S-3 The PAAS normalized patterns of cumulated REE contents in **(a)** batch leaching and **(b)** FT-TRA. PAAS values are from McLennan (1989).

Supplementary Information References

McLennan, S.M. (1989) Rare Earth Elements in Sedimentary Rocks: Influence of Provenance and Sedimentary Processes. In: Lipin, B.R., McKay, G.A. (Eds.) *Geochemistry and Mineralogy of Rare Earth Elements*. De Gruyter, Berlin, *Reviews in Mineralogy and Geochemistry* 21, 169–200.
<https://doi.org/10.1515/9781501509032-010>