Electronic Supplementary Material (ESI) for RSC Advances.

Liquid-liquid extraction of rare earths elements from nitrate media in DMDOHEMA/ionic liquid system: performance and mechanism studies.

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Supplementary Materials

Table S1

Distribution coefficients and selectivity values for [HNO_3] = 3.0 M

Organic solvent	[DMDOHEMA]	Distribution coefficient (D)			Selectivity (S)	
	(mol/L)	La^{3+}	Eu^{3+}	Fe^{3+}	$S_{La/Fe}$	$S_{Eu/Fe}$
[$EOPip^+$] [NTf_2^-]	0	<0.01	<0.01	<0.01	-	-
	0.05	0.03	0.07	0.04	0.7	1.6
	0.1	0.28	0.75	0.25	1.1	3.0
	0.2	2.7	6.5	0.43	6.4	15
	0.4	18	34	0.74	24	46
[$EBPip^+$] [NTf_2^-]	0	<0.01	<0.01	<0.01	-	-
	0.05	<0.01	0.04	<0.01	-	-
	0.1	0.32	1.69	0.01	62	327
	0.2	7.6	33	0.03	262	1138
	0.4	152	283	0.26	587	1092
Dodecane	0	<0.01	<0.01	<0.01	-	-
	0.05	<0.01	<0.01	<0.01	-	-
	0.1	0.11	0.07	0.04	3.1	1.9
	0.2	0.77	0.50	0.48	1.6	1.1
	0.4	3.17	2.01	1.84	1.7	1.1

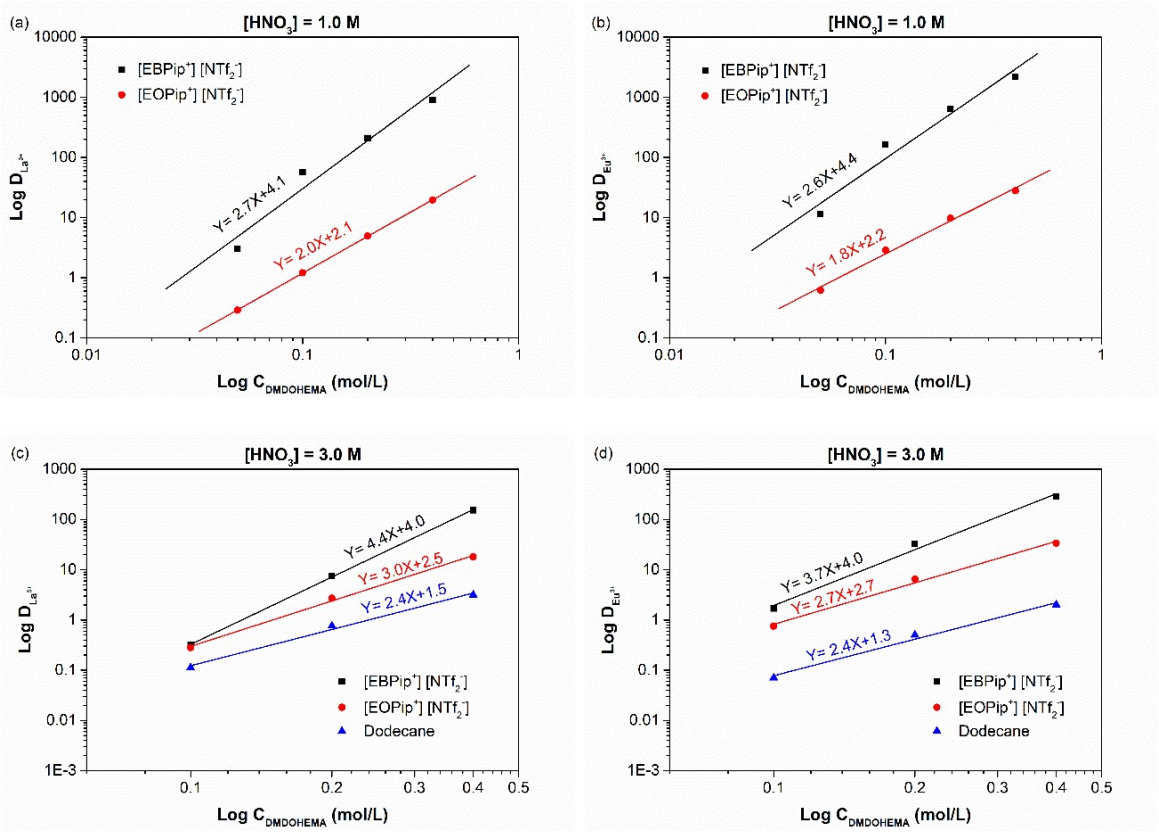

Fig. S1 Slope analysis in ILs and dodecane for: (a and c) La^{3+} and (b and d) Eu^{3+}. Nitric acid concentration 1 M (top) and 3 M (bottom).

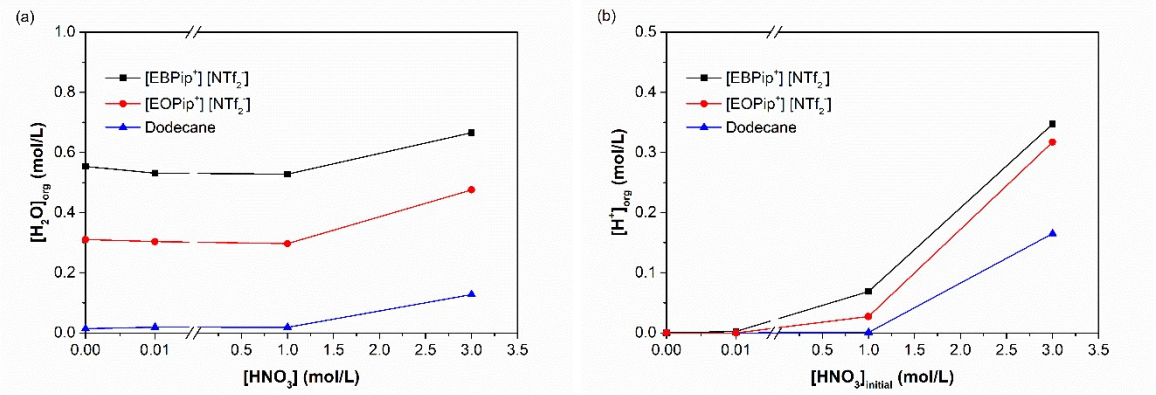

Fig. S2 (a) Water and (b) H^+ concentrations in the organic phase, after metal extraction, as a function of the nitric acid concentration for [DMDOHEMA] = 0.2 M.

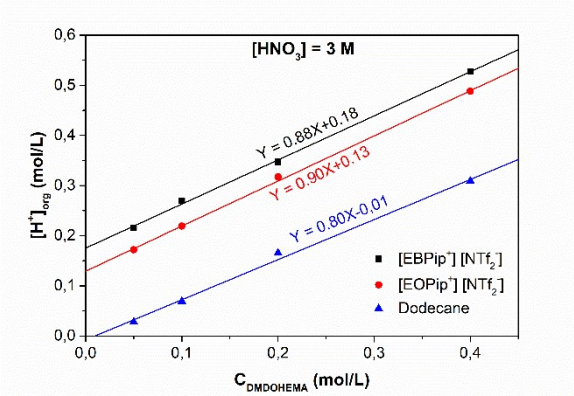

Fig. S3 H^+ concentration in the organic phase, after metal extraction, in function of the DMDOHEMA concentration for $[HNO_3]$ 3 M.

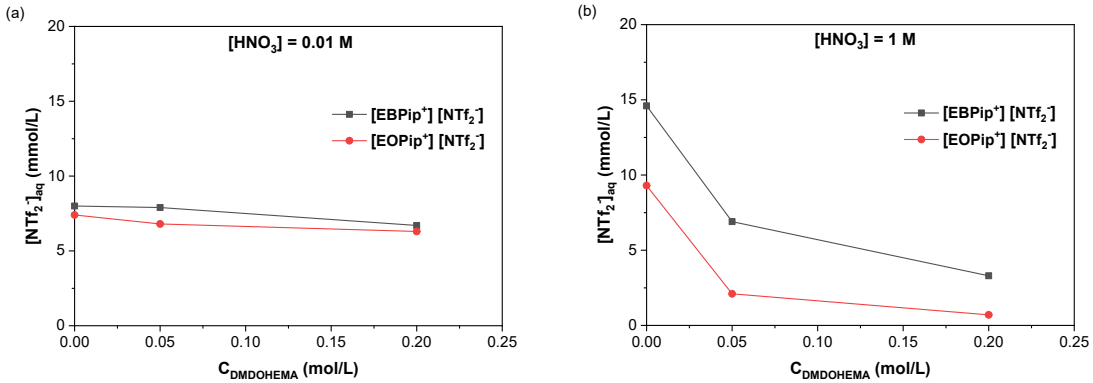

Fig. S4 Bistriflimide anion concentration in the aqueous phase as a function of the [DMDOHEMA] when $[EBPip^+]$ $[NTf_2^-]$ or $[EOPip^+]$ $[NTf_2^-]$ are used as organic solvent, for an initial nitric acid concentration of: (a) 0.01 M and (b) 1.0 M.

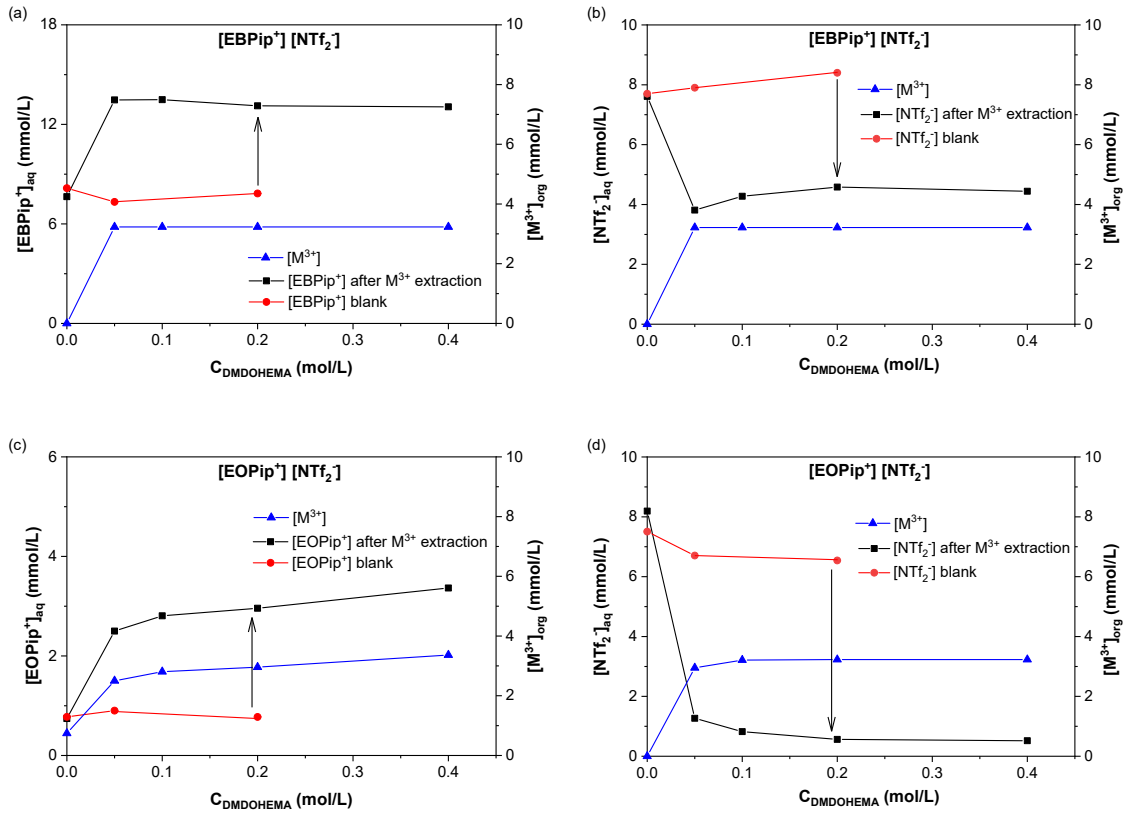

Fig. S5 a) Pip^+ and b) NTf_2^- concentrations in the aqueous phase for [$EBPip^+$] [NTf_2^-]; c) Pip^+ and d) NTf_2^- concentrations in the aqueous phase for [$EOPip^+$] [NTf_2^-], as a function of the DMDOHEMA concentration and for an initial nitric acid concentration of 0 M in the aqueous phase.

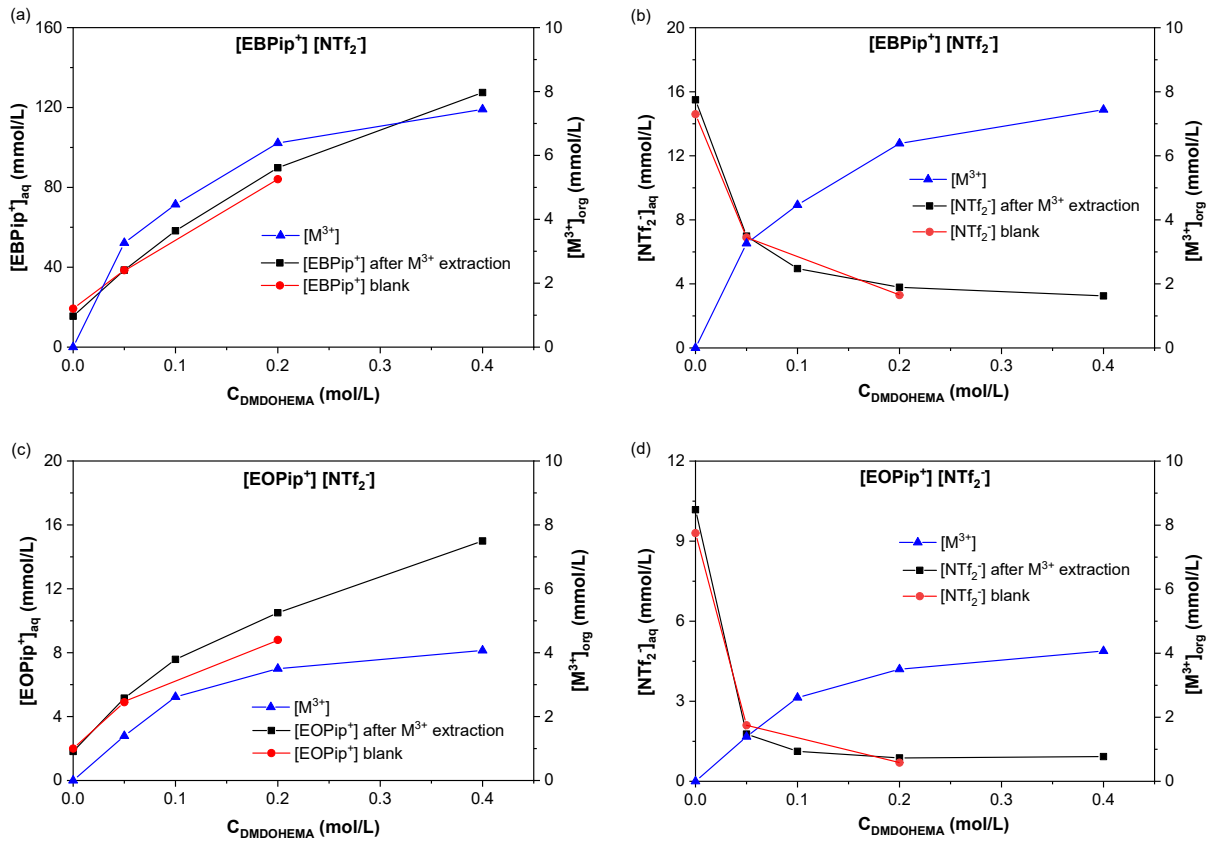

Fig. S6 a) Pip^+ and b) NTf_2^- concentrations in the aqueous phase for [$EBPip^+$] [NTf_2^-]; c) Pip^+ and d) NTf_2^- concentrations in the aqueous phase for [$EOPip^+$] [NTf_2^-], as a function of the DMDOHEMA concentration and for an initial nitric acid concentration of 1 M in the aqueous phase.