Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary data

Table A. Th electrophoretic mobility variation as function of DTPA, conditions of separation [H^+] = 0.040 M, I = 0.1 M $NaNO_3$, T = 25-26 °C, V = +10 kV. DMF is used as electroosmotic flow marker.

C_{DTPA} (M) + C_{NTA} = 10^{-6} M	μ (×10^4 $cm^2V^{-1}s^{-1}$)	C_{DTPA} (M) + C_{NTA} = 0	μ (×10^4 $cm^2V^{-1}s^{-1}$)
0	+1.105*	0	+2.561*
10^{-8}	+1.103	0	+2.352
10^{-5}	+0.225	10^{-8}	+2.546
5 10^{-5}	–0.416	10^{-7}	+2.444
10^{-4}	–0.662	10^{-6}	–0.808
5 10^{-4}	–0.976	10^{-6}	–1.021
10^{-3}	–0.882	5 10^{-4}	–0.939
5 10^{-3}	–0.975	10^{-4}	–0.834
10^{-2}	–0.965	10^{-3}	–0.936
		8 10^{-3}	–0.948

* Remark: at C_{DTPA} = 0 and C_{NTA} = 10^{-6} M, the main Th species is $ThNTA^+$ (μ = +1.105 10^4 $cm^2V^{-1}s^{-1}$) whereas for C_{DTPA} = C_{NTA} = 0, the main species is Th^{4+} (μ = +2.561 10^4 $cm^2V^{-1}s^{-1}$). The limiting μ value at high DTPA concentration (≈ –0.96 10^4 $cm^2V^{-1}s^{-1}$) corresponds to the complex $ThDTPA^-$.

Table B. Pu relative area variation as function of of DTPA, conditions of separation [H^+] = 0.040 M, I = 0.1 M $NaNO_3$, T = 25-26 °C, V = +10 kV.

pH with C_{DTPA} = 10^{-4} M	Relative area $PuDTPA^-$ (%)	Relative area $Pu(NTA)_2^{2-}$ (%)
10^{-7}	14.42	85.58
5 10^{-7}	17.35	82.65
10^{-6}	26.09	73.91
5 10^{-5}	55.22	44.78
10^{-5}	38.23	61.77
10^{-4}	60.02	39.98
5 10^{-4}	79.13	20.87

Table C. Th electrophoretic mobility variation as function of pH, conditions of separation C_{DTPA} = 10^{-4} and 10^{-2} M, I = 0.1 M TMAX (X = MES or HEPES), T = 25-26 °C, V = +10 kV. DMF is used as electroosmotic flow marker.

pH with C_{DTPA} = 10^{-4} M	μ (×10^4 $cm^2V^{-1}s^{-1}$)	pH with C_{DTPA} = 10^{-2} M	μ (×10^4 $cm^2V^{-1}s^{-1}$)
5.978	–2.365	6.045	–1.559
6.455	–2.452	6.503	–1.581
6.995	–2.387	7.114	–1.514
7.565	–2.477	7.488	–1.514
8.451	–3.169	8.091	–1.568
9.377	–3.452	8.548	–2.1817
		9.612	–2.6952

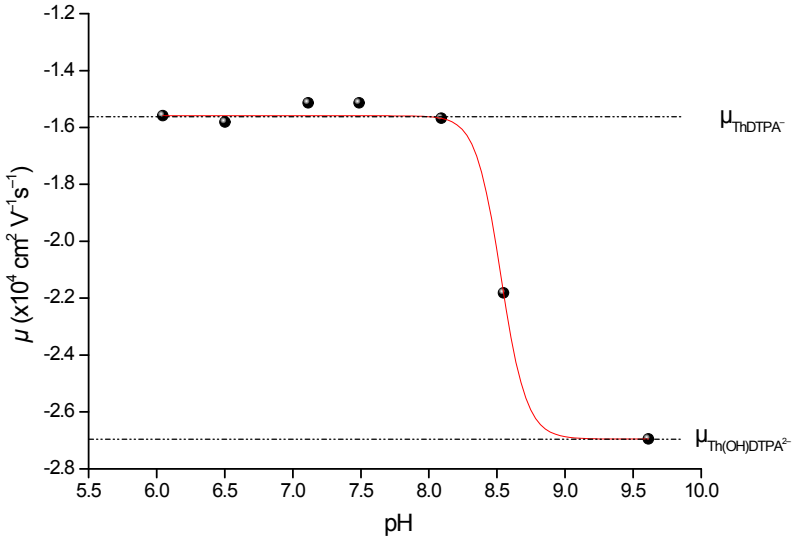

Figure C. example of the variation of the electrophoretic mobility of Th species as function of pH at C_{DTPA} = 10^{-2} M, 0.1 M TMAX (X = MES or HEPES), T = 25 °C.

Table D. Np electrophoretic mobility variation as function of pH, conditions of separation C_{DTPA} = 10^{-4} and 10^{-2} M, I = 0.1 M TMA/(MES or HEPES), T = 25-26 °C, V = +10 kV. DMF is used as electroosmotic flow marker.

pH with C_{DTPA} = 10^{-4} M	μ (×10^4 $cm^2V^{-1}s^{-1}$)	pH with C_{DTPA} = 10^{-2} M	μ (×10^4 $cm^2V^{-1}s^{-1}$)
5.978	–2.459	6.045	–1.383
6.455	–2.529	6.503	–1.477
6.995	–2.477	7.114	–1.577
7.565	–2.545	7.488	–1.711
7.995	–3.046	8.091	–1.862
8.451	–3.221	8.548	–2.051
9.377	–3.327	9.612	–2.167

Table E. Pu relative area variation as function of pH, conditions of separation C_{DTPA} = 10^{-4} and 10^{-2} M, I = 0.1 M TMA/(MES or HEPES), T = 25-26 °C, V = +10 kV. DMF is used as electroosmotic flow marker.

pH with C_{DTPA} = 10^{-4} M	Relative area $Pu(OH)DTPA^{2-}$ (%)	Relative area $PuDTPA^{-}$ (%)	pH with C_{DTPA} = 10^{-2} M	Relative area $Pu(OH)DTPA^{2-}$ (%)	Relative area $PuDTPA^{-}$ (%)
5.047	1.97	98.03	6.045	14.87	85.13
6.070	20.63	79.37	6.503	29.75	70.25
7.466	53.57	46.43	7.114	53.05	46.95
7.806	56.65	43.35	7.488	63.51	36.49
8.021	56.60	43.40	8.091	65.39	34.61
8.261	98.88	98.02	8.548	63.63	36.37
8.674	75.23	24.77	9.612	77.67	22.33

Table F. variations of μ_{Th} and μ_{Pu} as function of the total concentration of nitrilotriacetic acid (NTA) at I = 0.1 M ($NaNO_3$), T = 25 °C, and $[H^+]$ = 0.040 M, V = +10 kV. DMF is used as electroosmotic flow marker.

C_{NTA} (M)	μ_{Th} ($\times 10^4$ $cm^2V^{-1}s^{-1}$)	C_{NTA} (M)	μ_{Pu} ($\times 10^4$ $cm^2V^{-1}s^{-1}$)
10^{-10}	2.565	10^{-8}	2.742
10^{-10}	3.074	10^{-8}	2.754
10^{-10}	3.146	10^{-7}	2.559
10^{-8}	2.742	10^{-7}	2.999
10^{-8}	2.832	$5\ 10^{-7}$	2.618
10^{-8}	2.964	10^{-6}	0.922
10^{-7}	2.756	10^{-6}	0.331
10^{-7}	3.094	$5\ 10^{-6}$	–0.373
$5\ 10^{-7}$	2.442	10^{-5}	–0.426
10^{-6}	2.655	$5\ 10^{-5}$	–1.726
10^{-6}	2.906	10^{-4}	–1.991
10^{-6}	2.404	10^{-4}	–2.345
$5\ 10^{-6}$	2.765	10^{-3}	–2.153
10^{-5}	2.615	10^{-3}	–2.418
10^{-5}	2.391	$5\ 10^{-3}$	–2.417
$5\ 10^{-5}$	1.943	$8\ 10^{-3}$	–2.125
10^{-4}	1.712		
10^{-4}	1.732		
10^{-4}	1.449		
$2\ 10^{-4}$	1.105		
$5\ 10^{-4}$	–0.477		
10^{-3}	–0.898		
10^{-3}	0.048		
10^{-3}	–1.360		
$5\ 10^{-3}$	–2.410		
$8\ 10^{-3}$	–2.371		