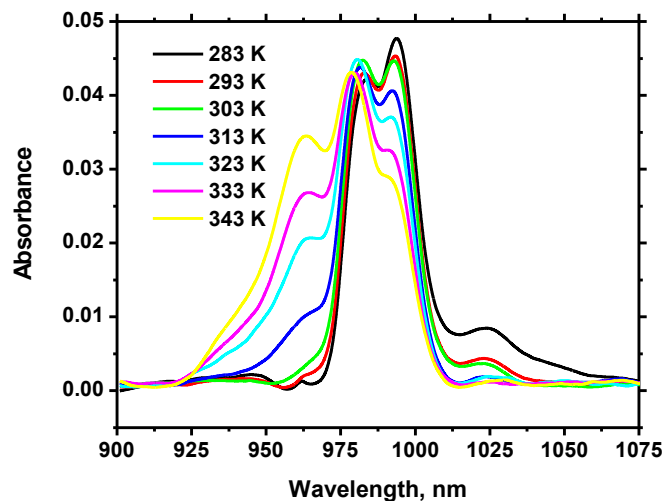


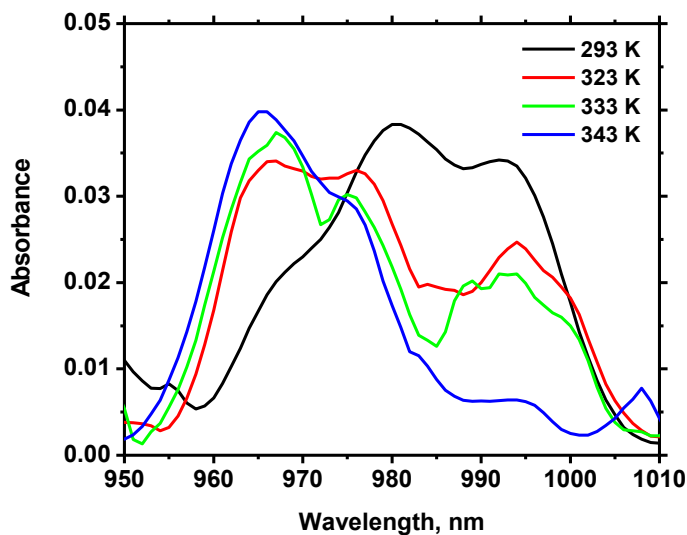
## Electronic Supporting Information (ESI)

Manuscript ID: DT-ART-04-2013-050985

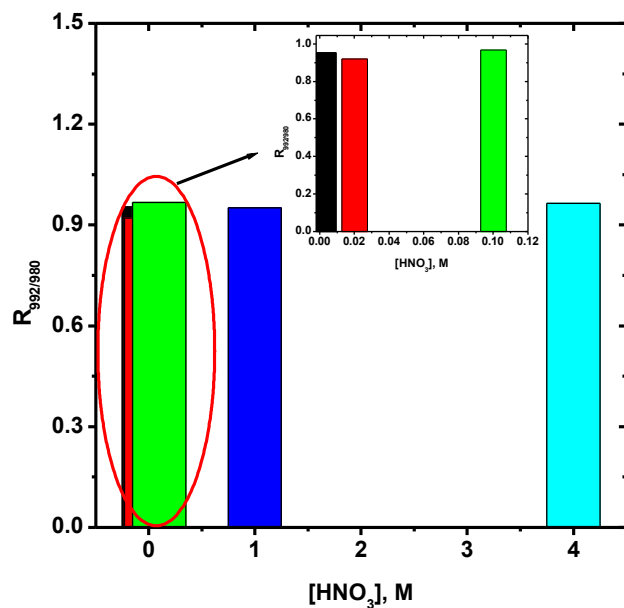
**Title:** A revisit of the cation–cation interactions between  $\text{NpO}_2^+$  and  $\text{UO}_2^{2+}$  in nitric acid medium and their impact on separation processes: spectrophotometric and solvent extraction studies



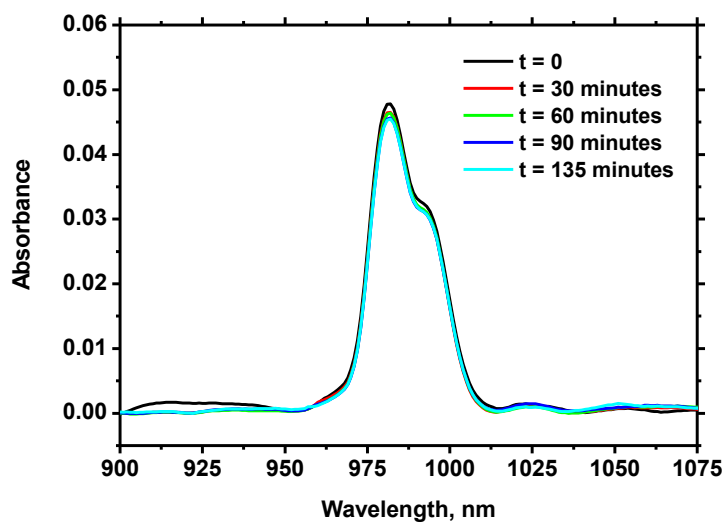
ESI 1: Absorption spectra of Np-U mixture as a function of temperature;  
[Np]:  $2 \times 10^{-4}$  M; [U]: 0.85 M; [HNO<sub>3</sub>]: 4 M



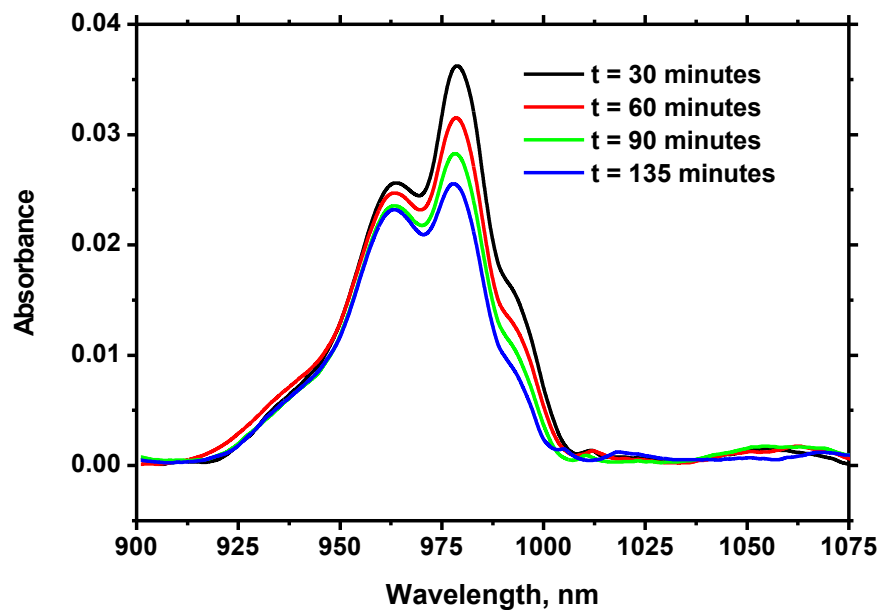
ESI 2: Absorption spectra of  $2 \times 10^{-4}$  M Np(V) - 1.2 U(VI) solutions in  
 $2 \times 10^{-3}$  M HNO<sub>3</sub> as a function of temperature



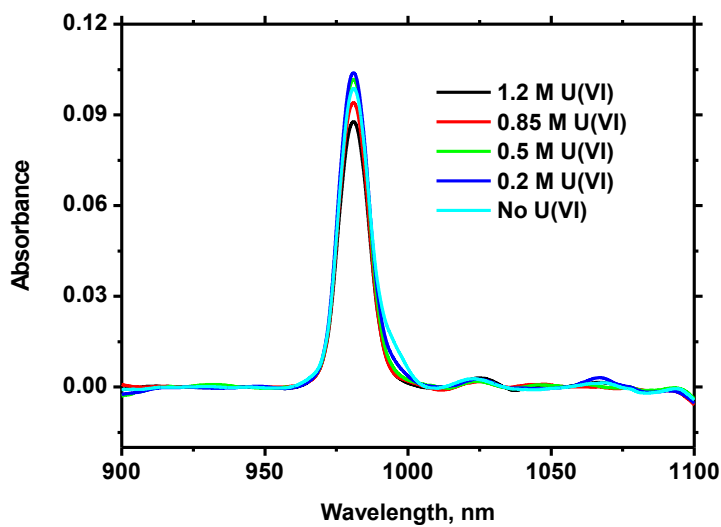
ESI 3: Variation of absorbance ratios of  $\text{NpO}_2^+ \text{-UO}_2^{2+}$  CCl species (992 nm) and  $\text{NpO}_2^+$  (980 nm) peaks ( $R_{992/980}$ ) with nitric acid concentrations; [Np]:  $2 \times 10^{-4}$  M; [U(VI)]: 1.2 M; T: 298 K



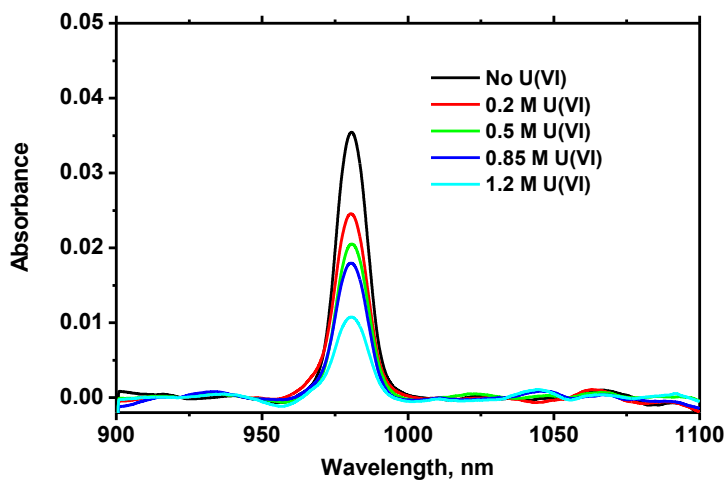
ESI 4: Effect of time on Np(V) spectra in the presence of 0.5 M U(VI) at 4 M  $\text{HNO}_3$ ; [Np]:  $2 \times 10^{-4}$  M; T: 298 K



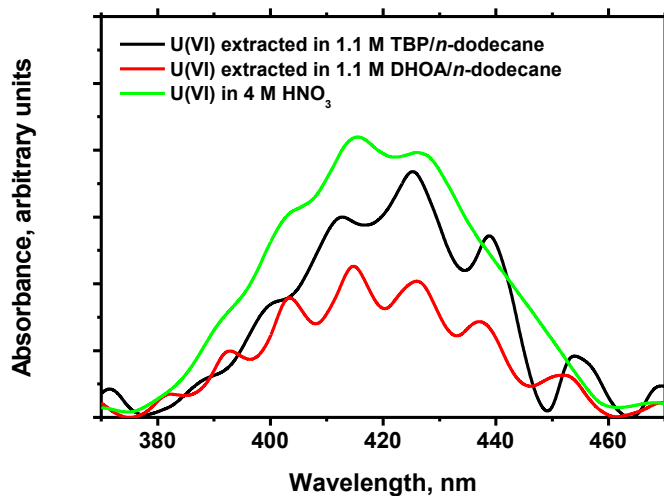
ESI 5: Effect of time on Np(V) spectra in the presence of 0.5 M U(VI) at 4 M HNO<sub>3</sub>; [Np]: 2x10<sup>-4</sup> M; T: 333 K



ESI 6: Absorption spectra of the raffinate(s) obtained after extraction with 1.1 M TBP/*n*-dodecane solutions; Aqueous phase(s): 2x10<sup>-4</sup> M Np(V) + 0-1.2 M U(VI) solutions in 4 M HNO<sub>3</sub>; O/A: 2; T: 298 K



ESI 7: Absorption spectra of the raffinate(s) obtained after extraction with 1.1 M DHOA/*n*-dodecane solutions; Aqueous phase(s):  $2 \times 10^{-4}$  M Np(V) + 0-1.2 M U(VI) solutions in 4 M HNO<sub>3</sub>; O/A: 2; T: 298 K



ESI 8: Comparison of absorption spectra of U(VI) in aqueous phase and extracted in the organic phases; Solvents: 1.1 M TBP or 1.1 M DHOA solutions in *n*-dodecane; Aqueous phase: 4 M HNO<sub>3</sub>; O/A: 2; T: 298 K