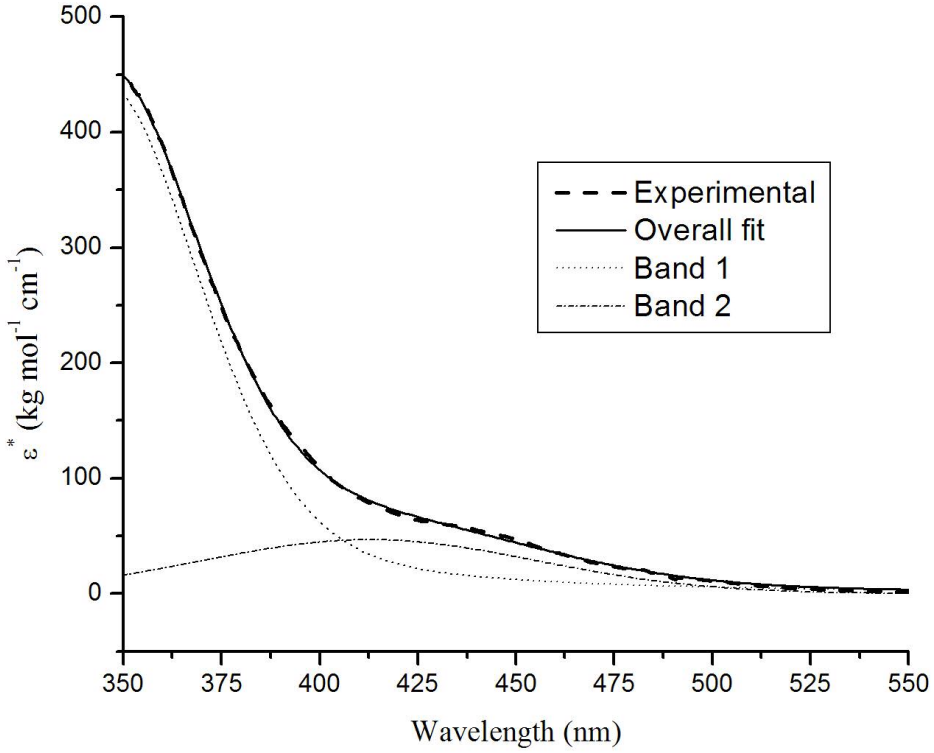
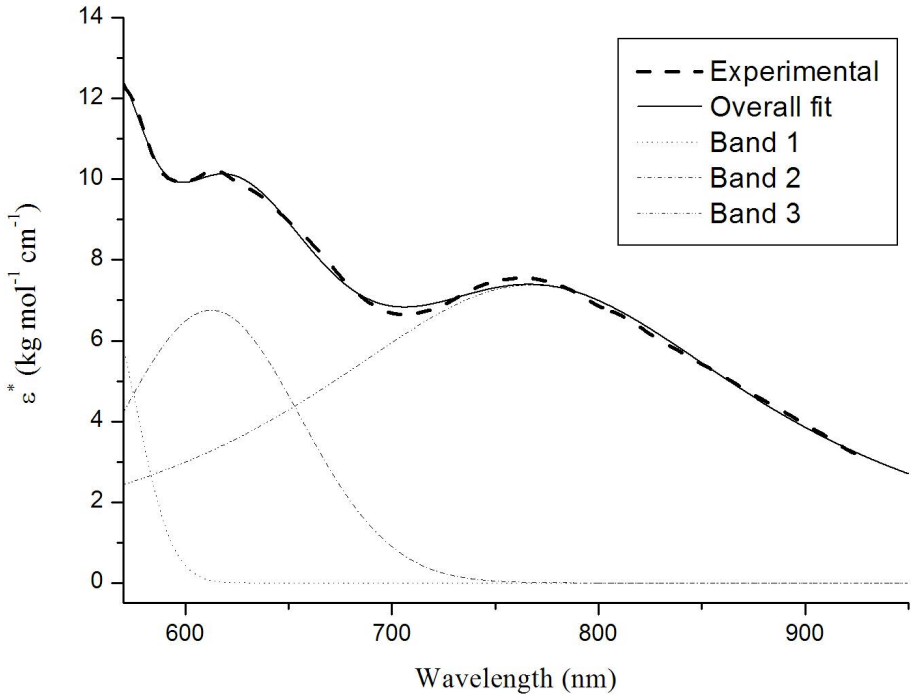
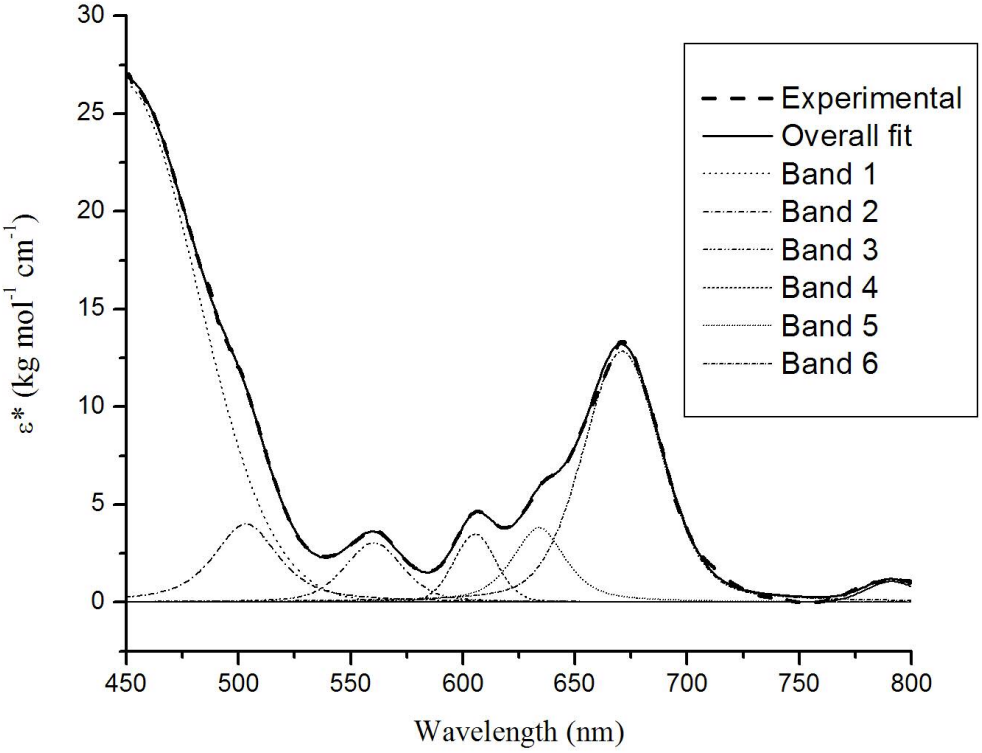
Supporting Information



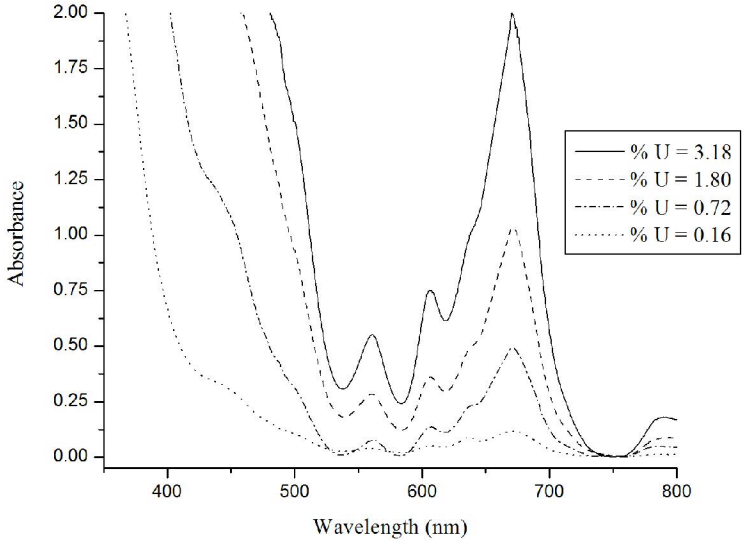
SI 1. Electronic absorption spectrum of UO_3 exposed to HCl in LiCl-KCl at 450 °C – *i.e.* $\{UO_2\}^{2+}$ - with fitted peaks.



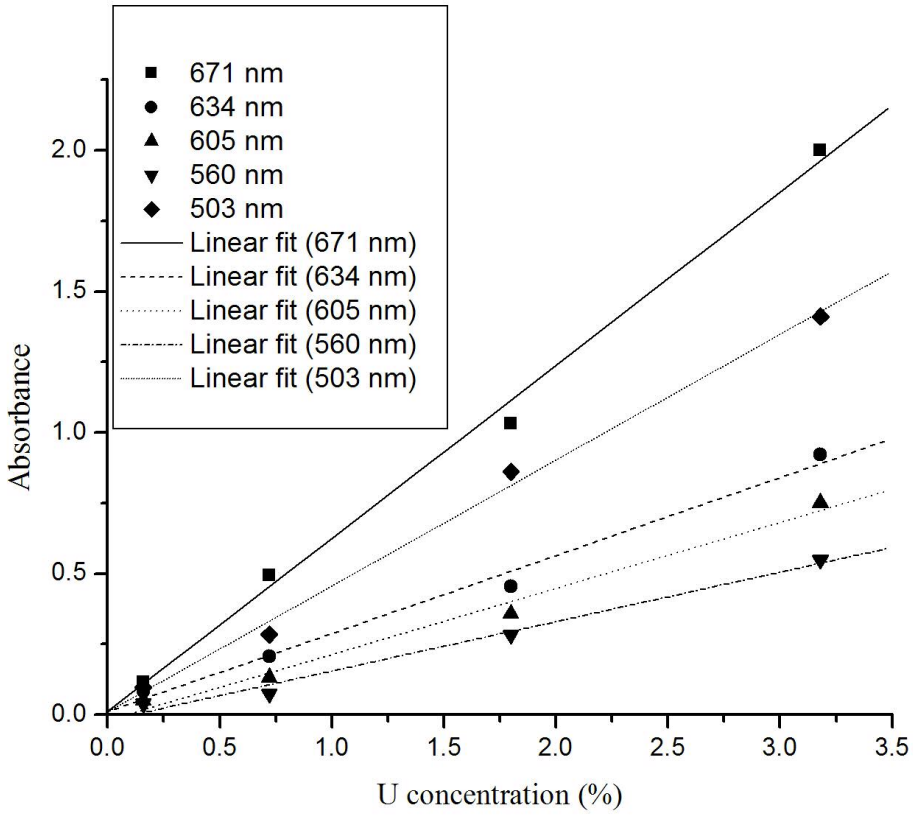
SI 2. Electronic absorption spectrum of UO_2 exposed to HCl in LiCl at 750 °C - *i.e.* $\{UO_2\}^+$ - with fitted peaks.



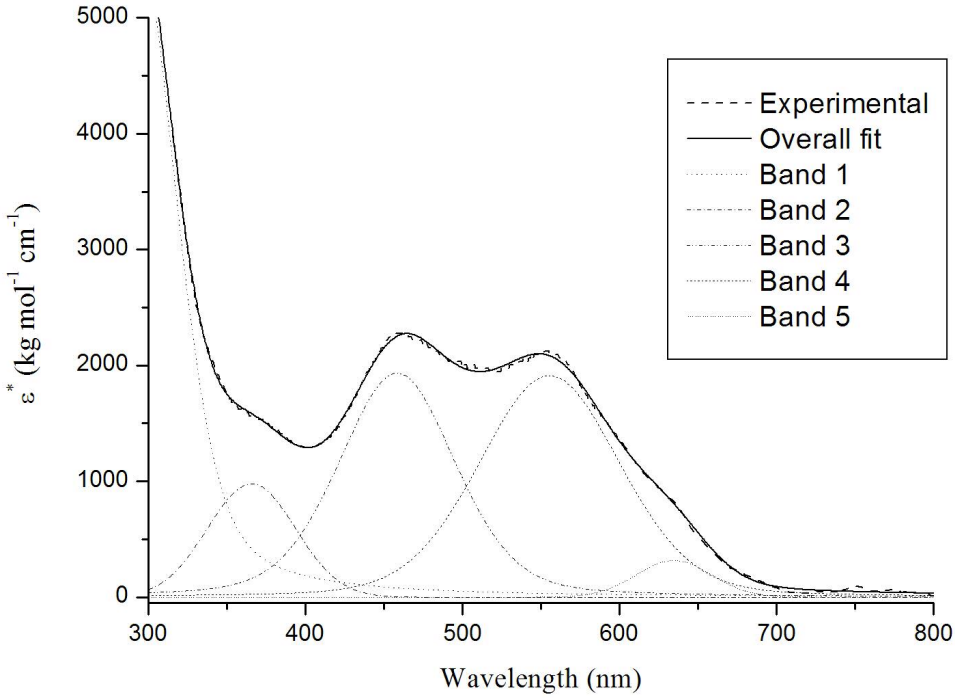
SI 3 Electronic absorption spectrum of UO_2 exposed to HCl in LiCl-KCl at 450 °C - *i.e.* U(IV) - with fitted peaks.



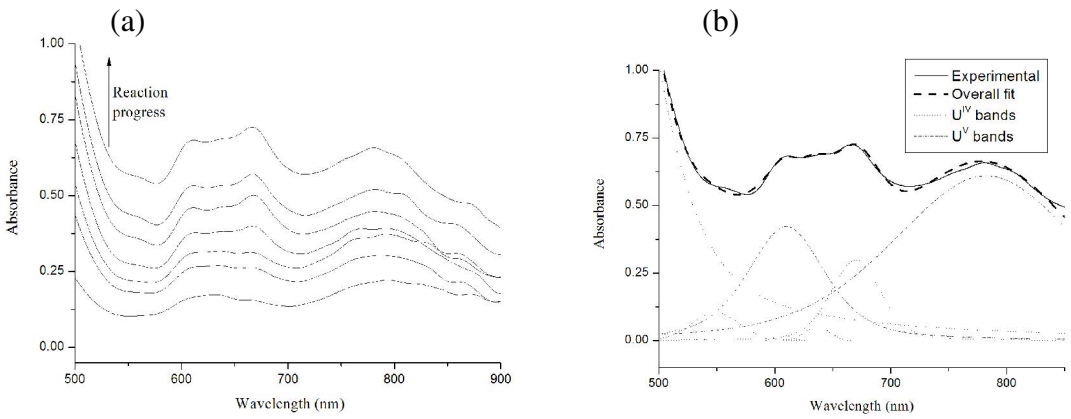
SI 4. Electronic absorption spectra of UO_2 exposed to HCl in LiCl-KCl at 450 °C - *i.e.* U(IV) - at various uranium concentrations.



SI 5. Plot of intensities of absorption maxima from the electronic absorption spectra of the reaction of UO_2 with HCl in LiCl-KCl at 450 °C with respect to uranium concentration



SI 6 Electronic absorption spectrum from the reaction of U metal with UCl_4 in LiCl-KCl eutectic at 450 °C – *i.e.* U(III) - with fitted peaks.



SI 7. Electronic absorption spectra monitoring the reaction progress of UO_2 with HCl in LiCl-KCl eutectic at 750 °C (a), and the final spectrum with fitted peaks (b).