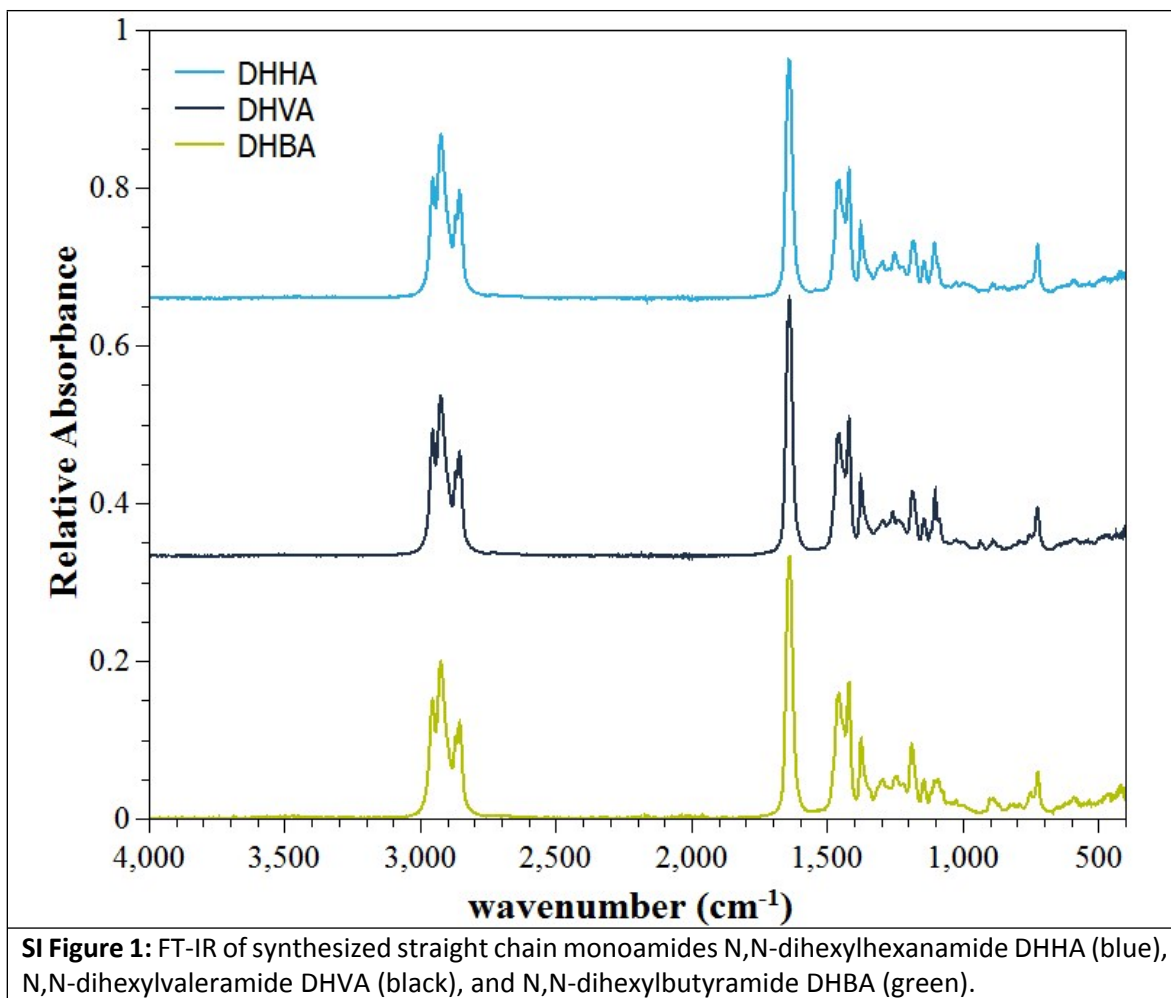
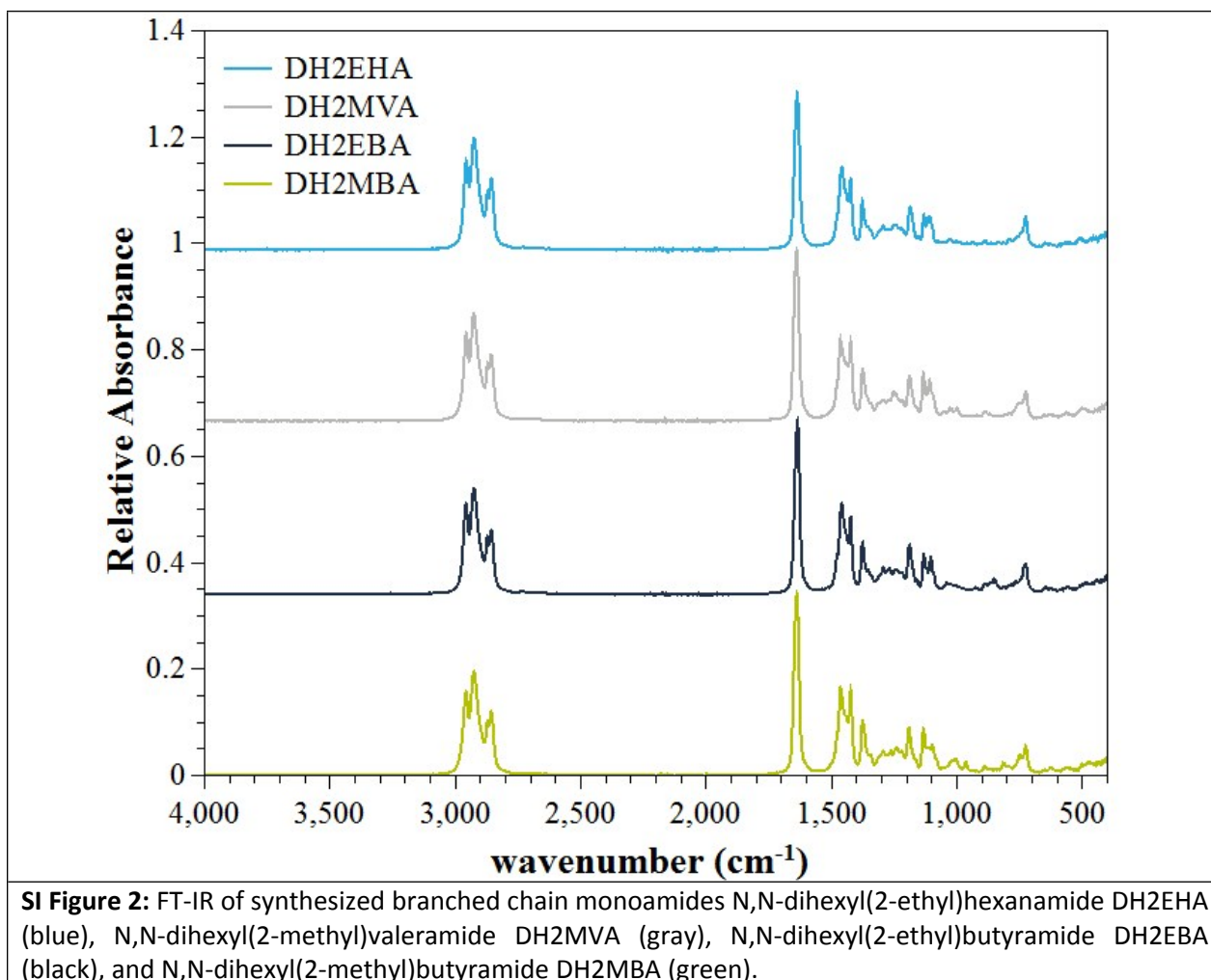
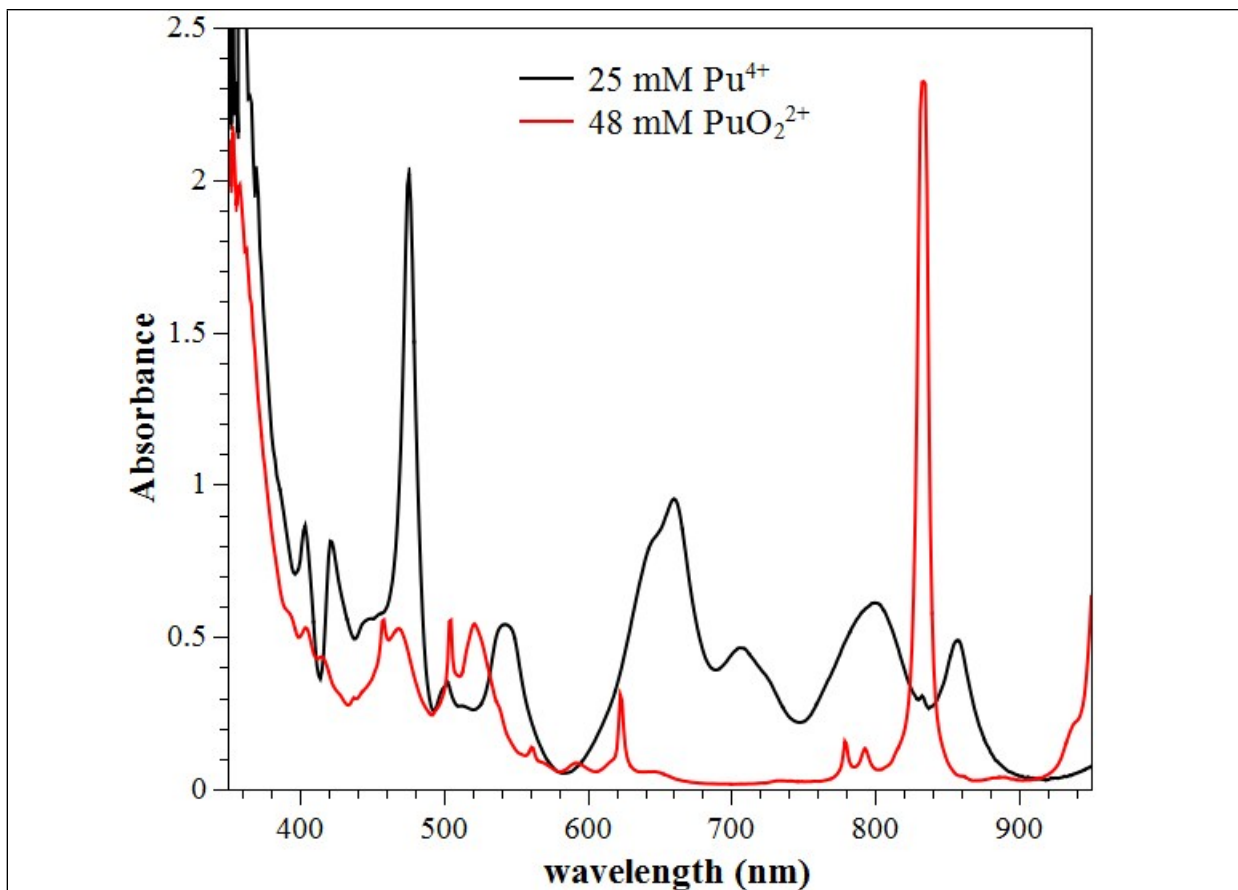


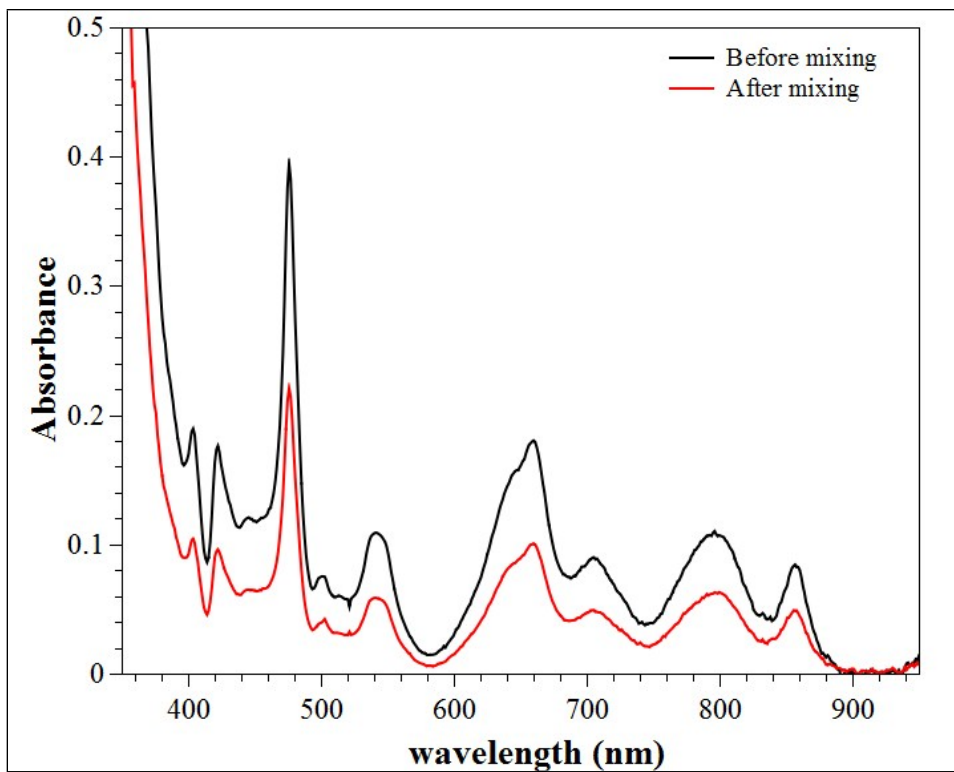
Supporting Information



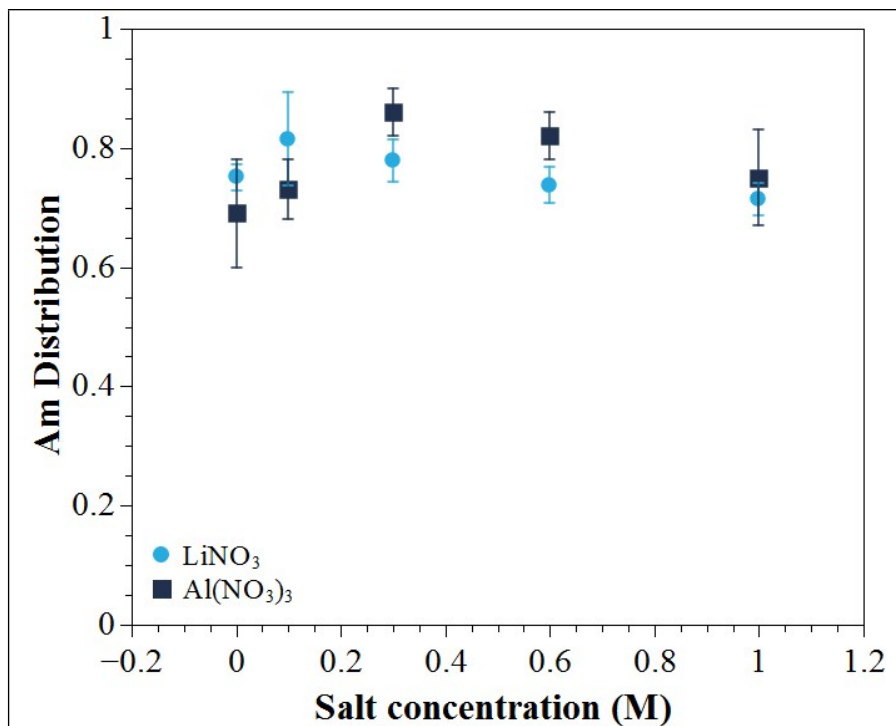




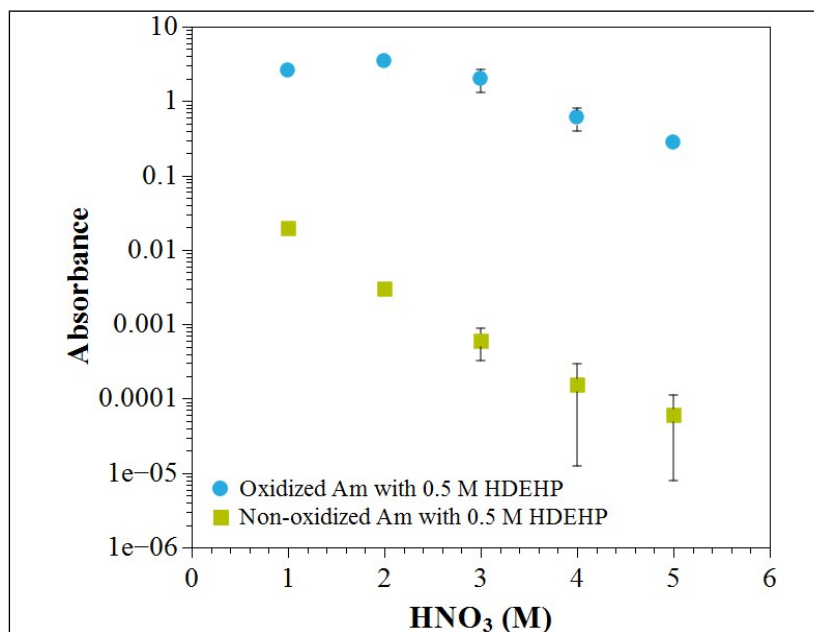
**SI Figure 3:** UV-Vis spectrum of 25 mM Pu<sup>4+</sup> in 2 M HNO<sub>3</sub> (black). The small peak at 832 nm indicates approximately 0.4% PuO<sub>2</sub><sup>2+</sup> was present. A UV-Vis spectrum of 48 mM PuO<sub>2</sub><sup>2+</sup> in 0.5 M HNO<sub>3</sub> (red).



**SI Figure 4:** UV-Vis spectrum of Pu<sup>4+</sup> in 4.5 M HNO<sub>3</sub> before (black) and after (red) vortexing with 1 M N,N-dihexyl(2-ethyl)butyramide. Distribution value was calculated as  $0.79 \pm 0.04$  by calculating the concentration of Pu<sup>4+</sup> before and after contact with the organic phase. Concentrations were calculated using molar absorptivity of  $89.5 \text{ M}^{-1}\text{cm}^{-1}$  at 476 nm. Distribution =  $[\text{Pu}^{4+}]_{\text{org}}/[\text{Pu}^{4+}]_{\text{aq}} = (\text{Pu}^{4+}_{\text{initial}} - \text{Pu}^{4+}_{\text{final}})/\text{Pu}^{4+}_{\text{final}}$



**SI Figure 5:** Distribution values of Cu<sup>3+</sup> periodate oxidized Am with varied concentrations of salting agents LiNO<sub>3</sub> (light blue circle) and Al(NO<sub>3</sub>)<sub>3</sub> (navy blue square).



**SI Figure 6:** Distribution values of non-oxidized Am<sup>3+</sup> extracted by 0.5 M di-(2-ethylhexyl)phosphoric acid, HDEHP, in n-dodecane (green square) and Cu<sup>3+</sup> periodate oxidized Am (blue circles).