

Table S1 Samples for confirming Equation (1)

Samples	$C_{\text{Uranyl}}$ (mol/L)	$C_{\text{nitrate}}$ (mol/L)	$C_{\text{perchlorate}}$ (mol/L)	Predicted $C_{\text{Uranyl}}$ (mol/L)	Relative error(%)
1	0.152	1	0.52	0.154	2
2	0.1	1.5	0.34	0.099	-1
3	0.5	0.5	1.71	0.519	3.8
4	0.1	0.1	0.34	0.097	3
5	0.4	1	1.37	0.414	3.5
6	0.3	0.1	1.03	0.304	1.3
7	0.3	1.5	1.03	0.307	2.3
8	0.2	0.5	0.68	0.2	0

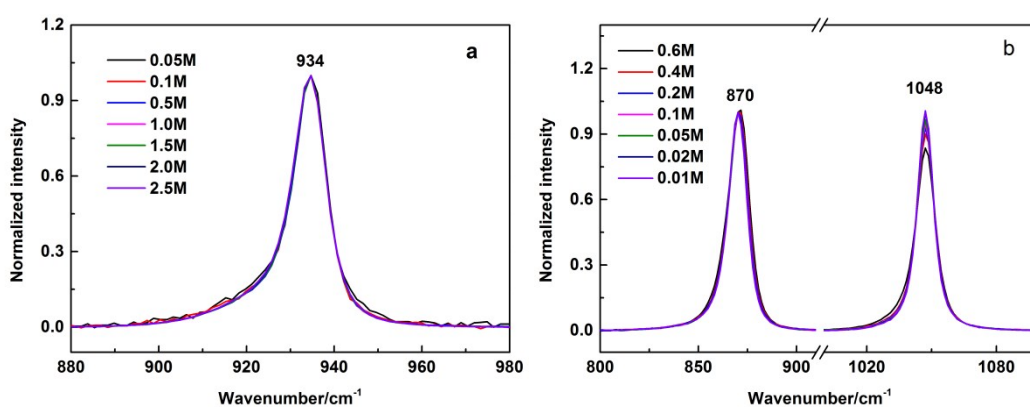


Figure S1 Raman spectra of perchloric acid normalized by intensity(a); Raman spectra of uranyl nitrate normalized by intensity of uranyl(b).

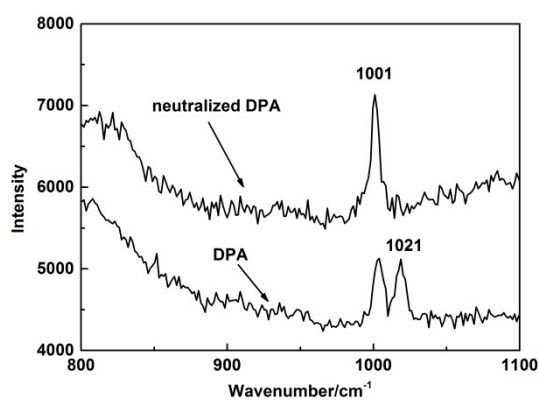


Figure S2. Raman spectra of DPA neutralized completely (upper) and dissolved directly. The concentration of DPA: 28 mM; Laser power: 20mW; Exposure time: 20s; Accumulation: 1 time