

Effect of ionizing radiation on Pu(IV)-monoamides complexes in solution

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Supporting Information

Table SI.1. Composition analysis of organic solutions contacted with a 5 mol.L⁻¹ HNO₃ aqueous phase after gamma irradiation determined by GC-FID for DEHBA and DEHiBA. (EHiBA/EHBA: compound A)

Integrated dose (MGy)	DEHiBA solutions		DEHBA solutions	
	[EHiBA] (mol.L ⁻¹)	[DEHiBA] (mol.L ⁻¹)	[EHBA] (mol.L ⁻¹)	[DEHBA] (mol.L ⁻¹)
0	0	1.34	0	1.36
0.75	0.13	0.97	0.14	1.05

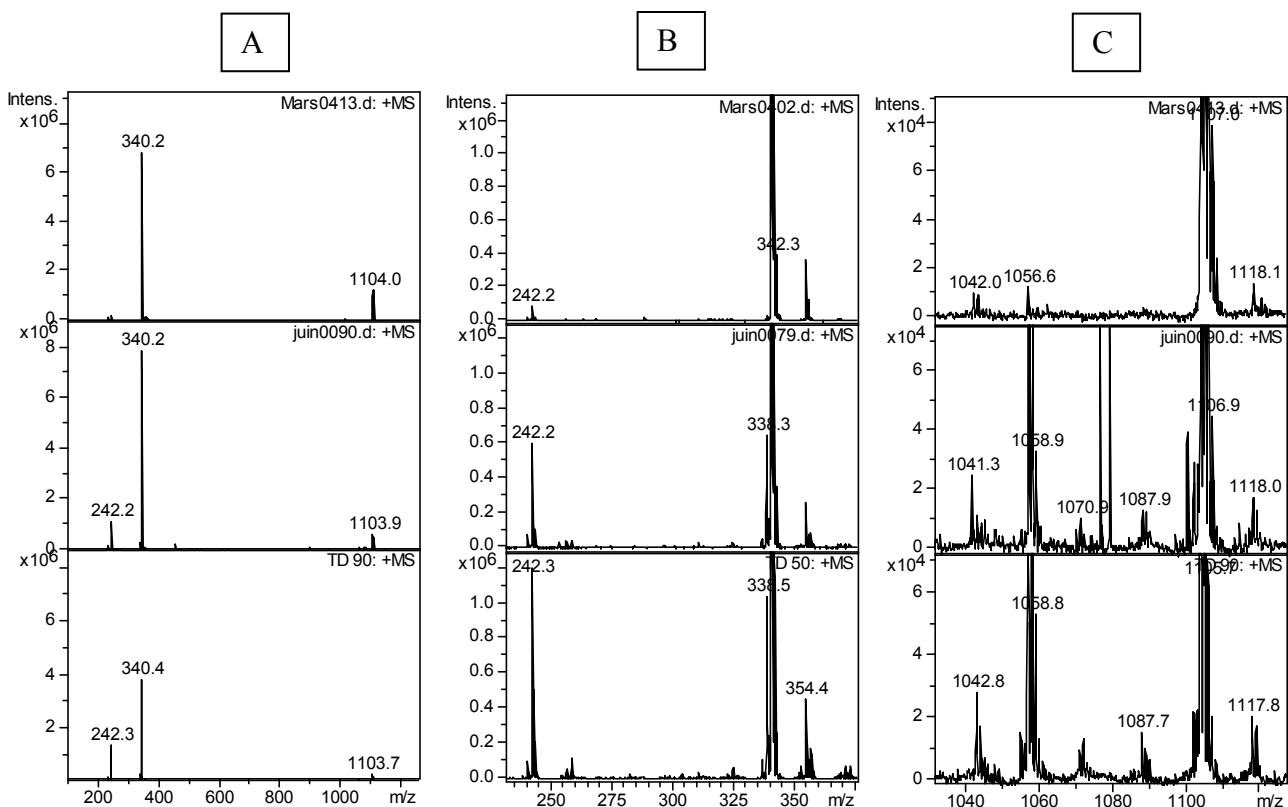
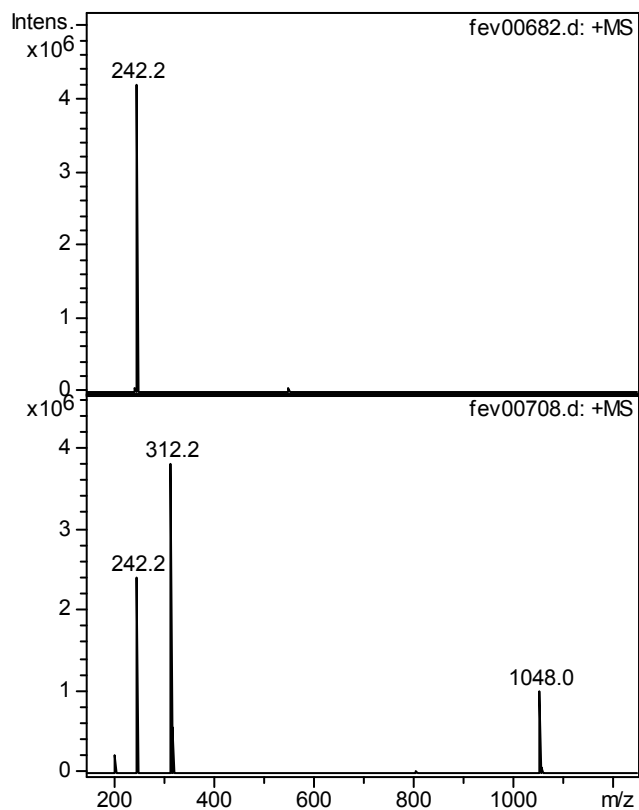


Figure SI.1 ESI-MS spectra of the Pu-DEHDMBA (extraction) organic phase solution at different dose measurements. Top: day 1, 0 kGy; middle: day 88, 554 kGy; bottom: day 130, 819 kGy. Group A: full 200-1200 m/z mass range; trap drive 90, skimmer voltage 50 V, positive ionization mode. Group B: 240-370 m/z mass range, trap drive 50, skimmer voltage 30 V, positive ionization mode. Group C: 1040-1120 m/z mass range, trap drive 90, skimmer voltage 50 V, positive ionization mode. Dilution 1/30 in acetonitrile.



Species	m/z
B2EHA (Compound C)	242.2
DEHBA	312.2
Pu(DEHBA) ₂ (NO ₃) ₃ ⁺	1048.0

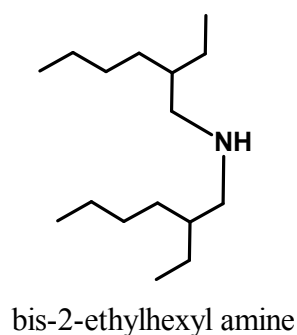
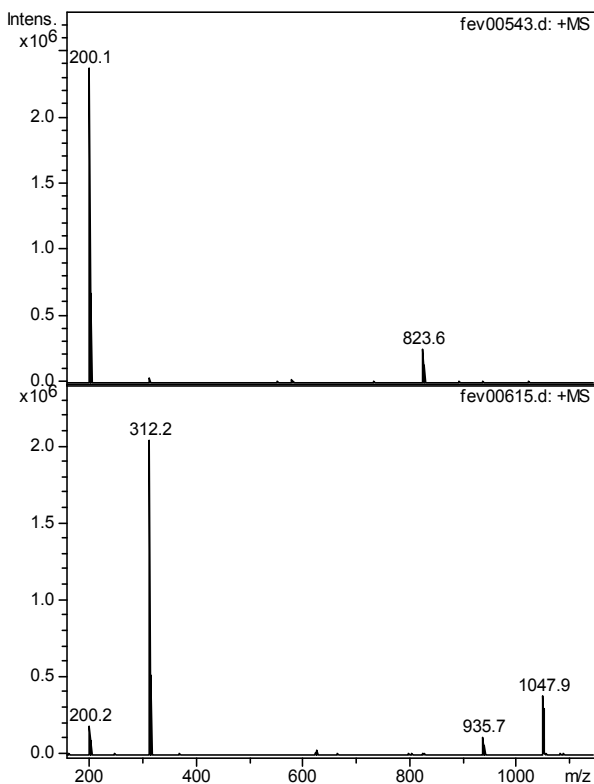
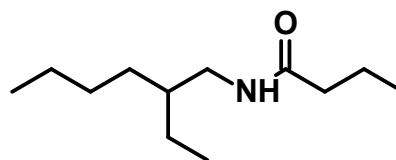


Figure SI.2. ESI-MS spectra of Pu-B2EHA (top) and Pu with a mixture of B2EHA (shown in the figure) and DEHBA. Initial conditions: (top) 5.0 mmol.L⁻¹ Pu, 5.0 mmol.L⁻¹ B2EHA, 0.4 mol.L⁻¹ HNO₃, acetonitrile media; (bottom) 5.0 mmol.L⁻¹ Pu, 2.5 mmol.L⁻¹ B2EHA, 2.5 mmol.L⁻¹ DEHBA, 0.4 mol.L⁻¹ HNO₃, acetonitrile media. ESI-MS instrument settings: trap drive 90, skimmer voltage 40 V, positive ionization mode, 1/10 dilution in acetonitrile.



EHBA(compound A)	200.1
DEHBA	312.2
$\text{Pu}(\text{EHBA})_2(\text{NO}_3)_3^+$	823.6
$\text{Pu}(\text{EHBA})(\text{DEHBA})(\text{NO}_3)_3^+$	935.7
$\text{Pu}(\text{DEHBA})_2(\text{NO}_3)_3^+$	1047.9



N-2-ethylhexylbutyramide

Figure SI.3. ESI-MS spectra of Pu-EHBA (top) and Pu with a mixture of EHBA (shown in the figure) and DEHBA. Initial conditions: (top) 5.0 mM Pu, 5.0 mM EHBA, 0.4 M HNO_3 , acetonitrile media; (bottom) 5.0 mM Pu, 2.5 mM EHBA, 2.5 mM DEHBA, 0.4 M HNO_3 , acetonitrile media. ESI-MS instrument settings: trap drive 90, skimmer voltage 30 V, positive ionization mode, 1/10 dilution in acetonitrile. Table with species and associated m/z values included.