Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supplementary Information for Radiation-Induced Effects on the Extraction Properties of Hexa-n-octylnitrilo-triacetamide (HONTA) Complexes of Americium and Europium

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HONTA Degradation Product HPLC-ESI-MS/MS Spectra

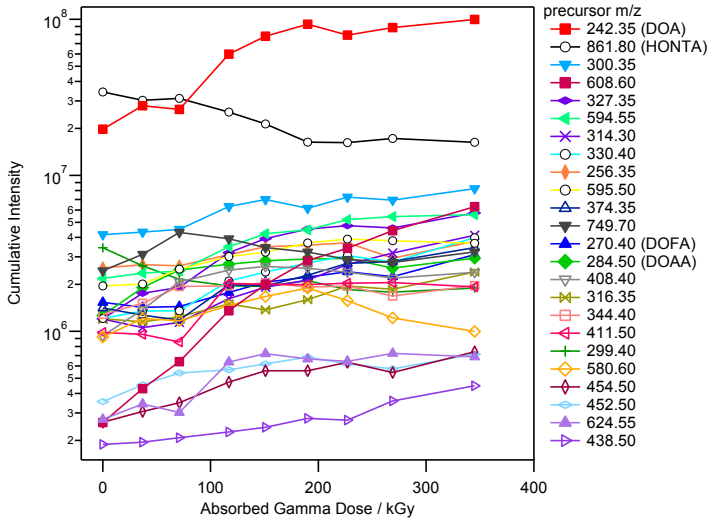

Fig. S1. HPLC-ESI-MS/MS signal amplitude for HONTA and 23 detectable degradation products from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of precursor m/z and absorbed gamma dose (~2.03 kGy h^{-1}).

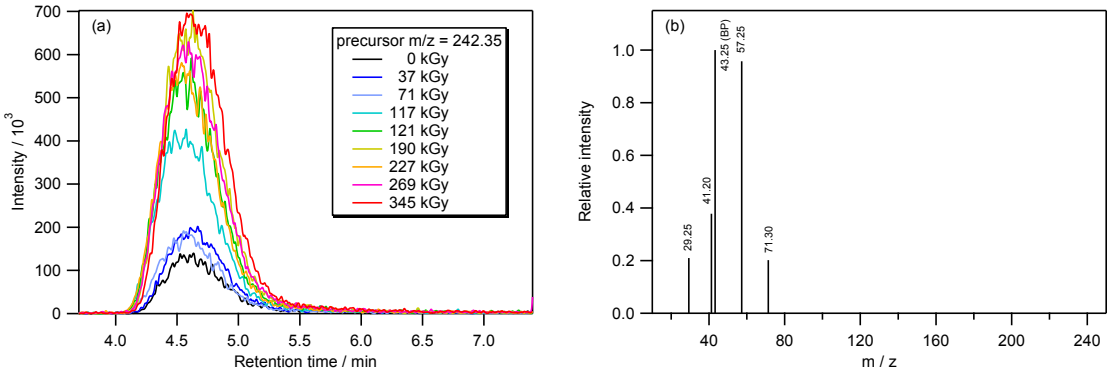

Fig. S2. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 242.35 from the gamma radiolysis of formally 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 35 eV collision energy. This product was assigned to dioctylamine (DOA, MW = 241.4) from the retention time and the MS/MS spectrum by using standard solutions.

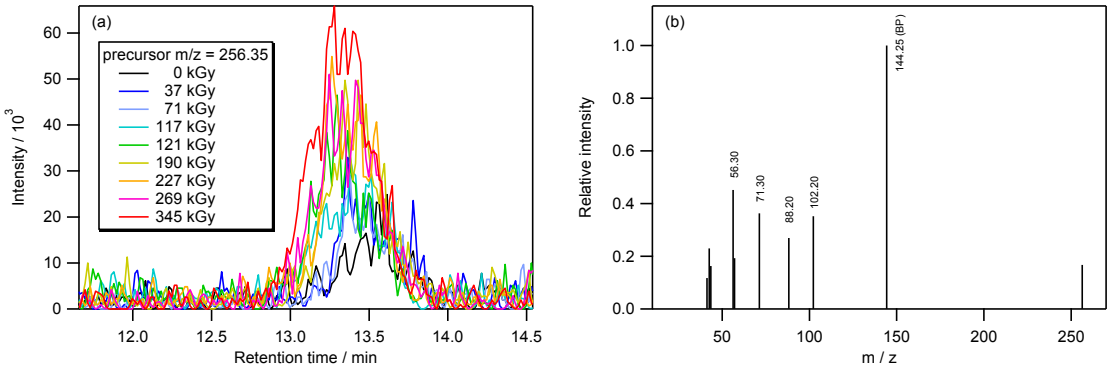

Fig. S3. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 256.35 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 30 eV collision energy.

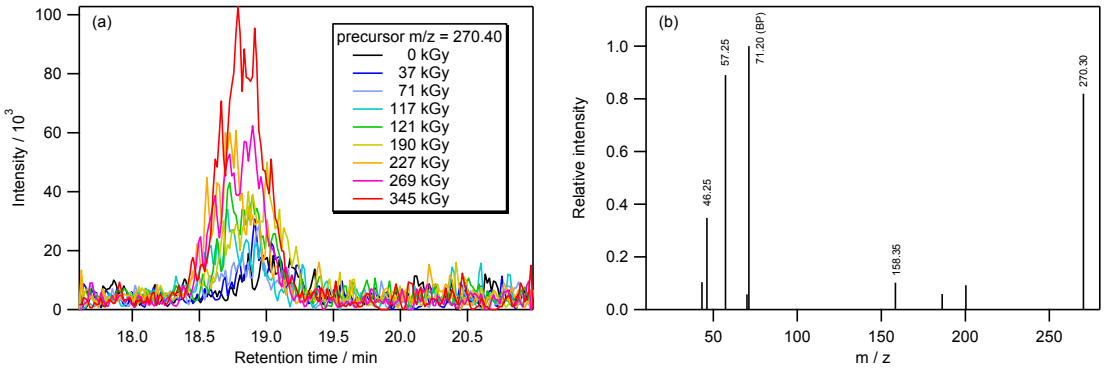

Fig. S4. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 270.40 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 25 eV collision energy. This product was assigned as dioctylformamide (DOFA, MW = 269.3) from the retention time and the MS/MS spectrum by using standard solutions.

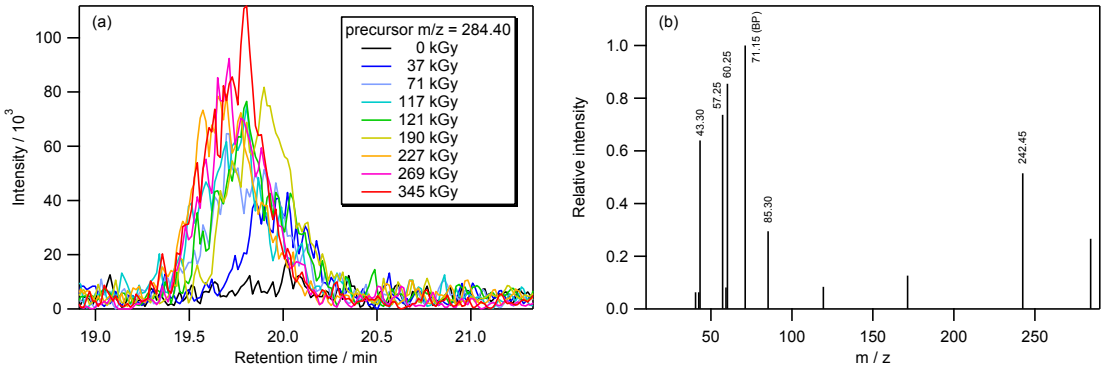

Fig. S5. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 284.40 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 30 eV collision energy. This product was assigned as dioctylacetamide (DOAA, MW = 283.5) from the retention time and the MS/MS spectrum by using standard solutions.

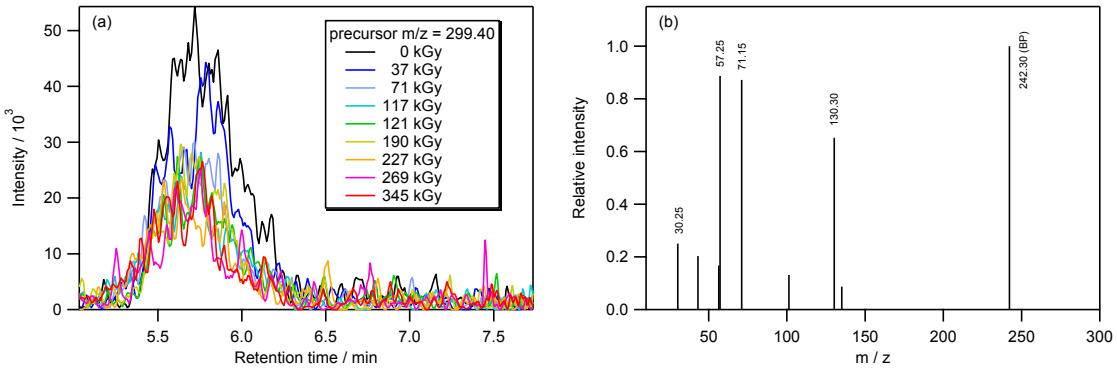

Fig. S6. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 299.40 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 30 eV collision energy.

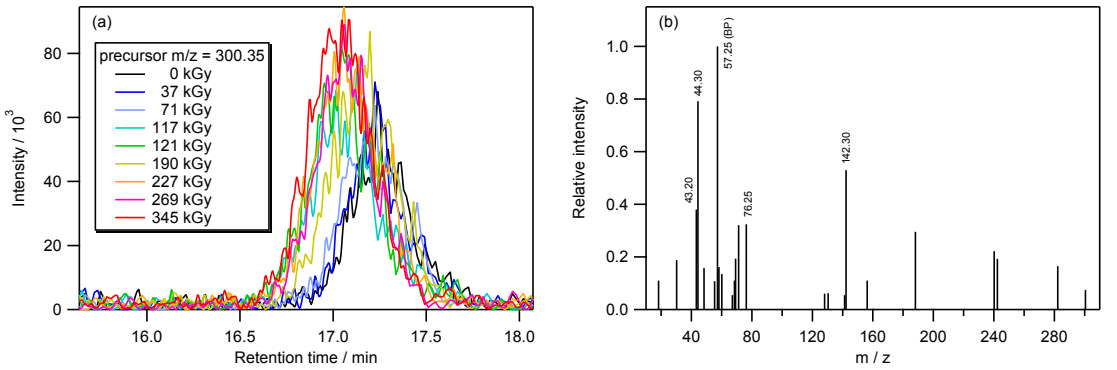

Fig. S7. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 300.35 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 30 eV collision energy.

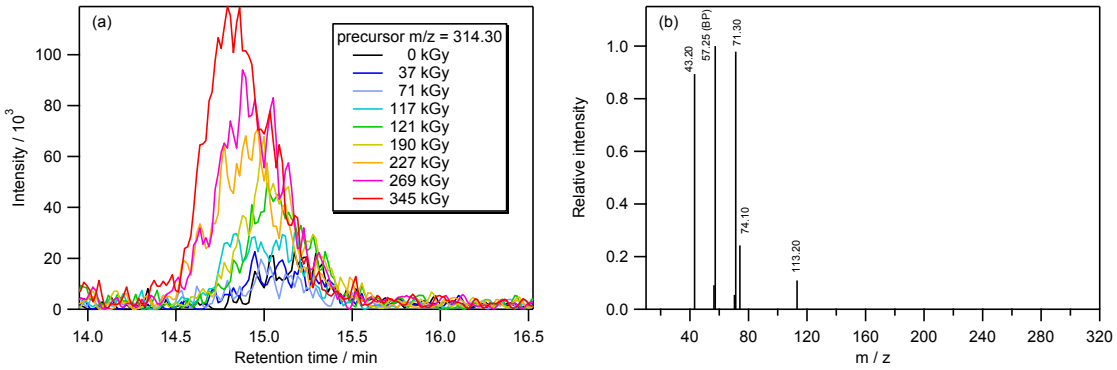

Fig. S8. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 314.30 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 40 eV collision energy.

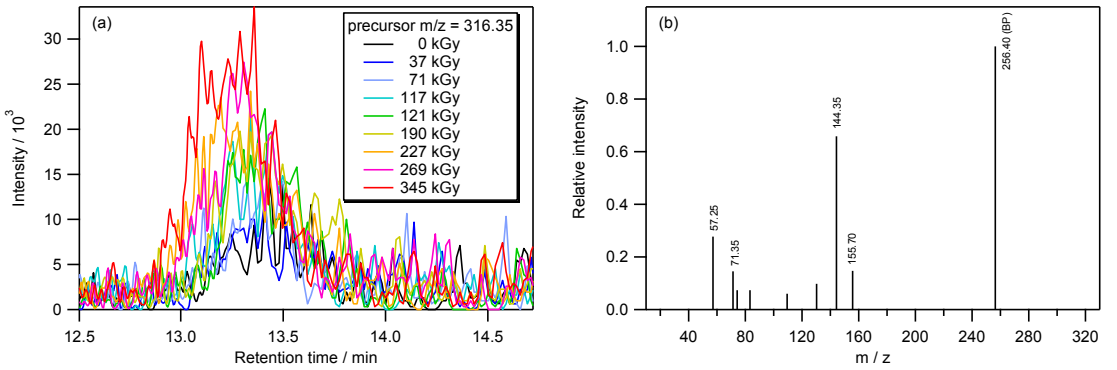

Fig. S9. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 316.35 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 30 eV collision energy.

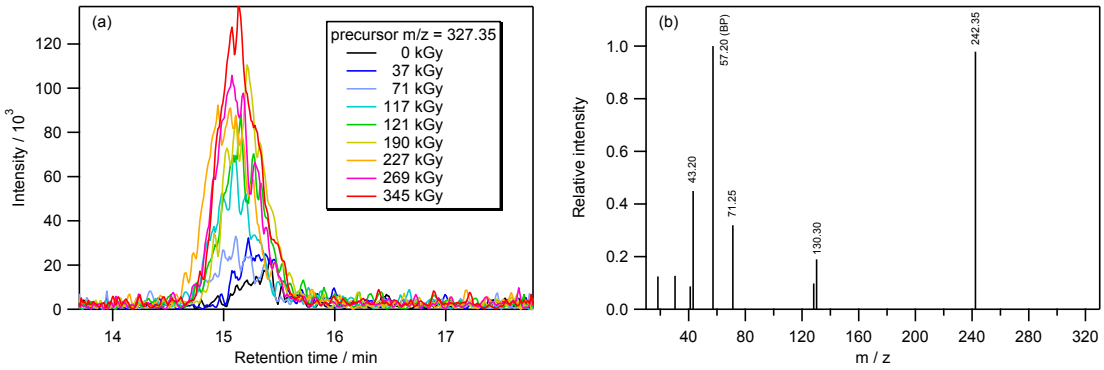

Fig. S10. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 327.35 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 35 eV collision energy.

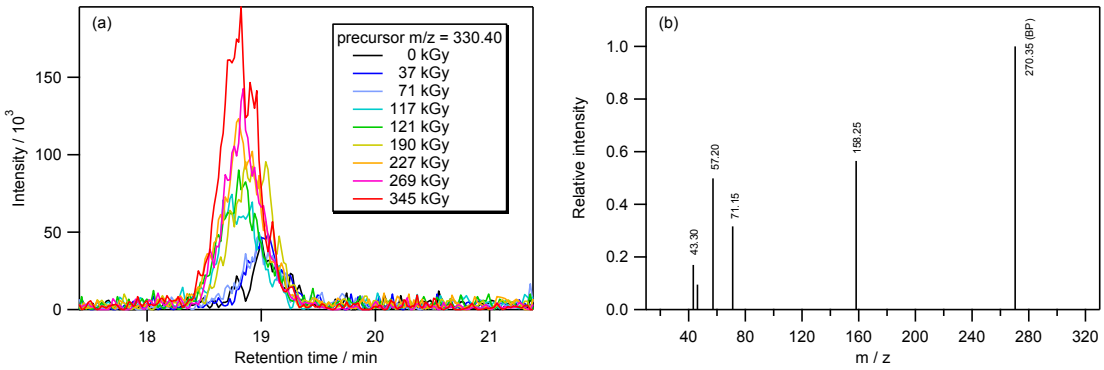

Fig. S11. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 330.40 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 30 eV collision energy.

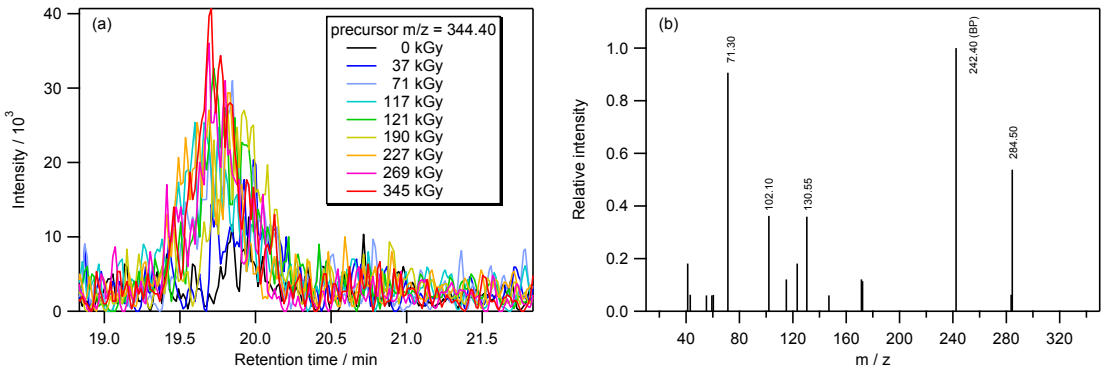

Fig. S12. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 344.40 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 35 eV collision energy.

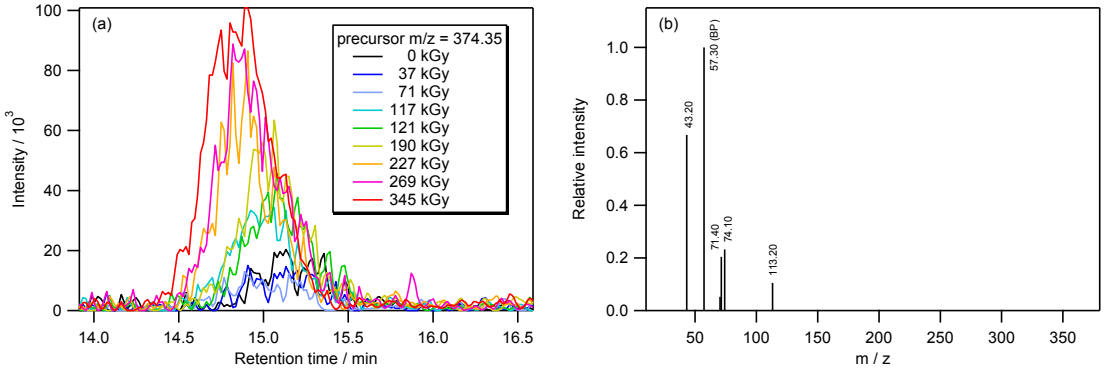

Fig. S13. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 374.35 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 40 eV collision energy.

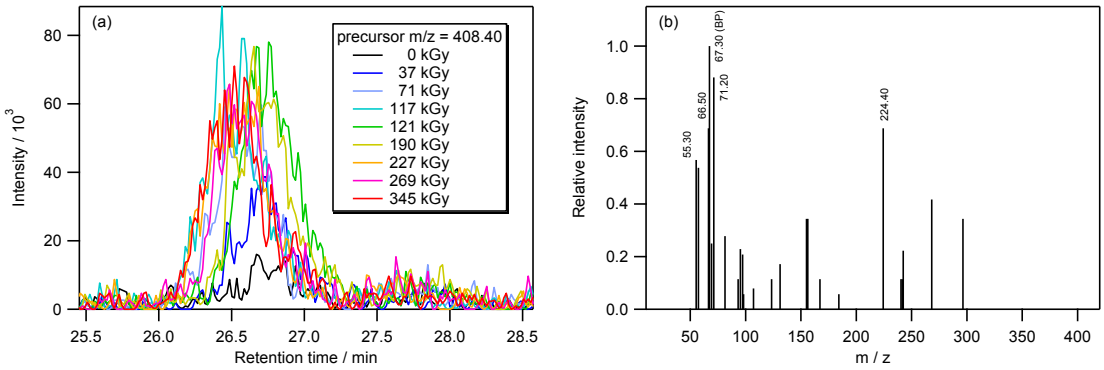

Fig. S14. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 408.40 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 35 eV collision energy.

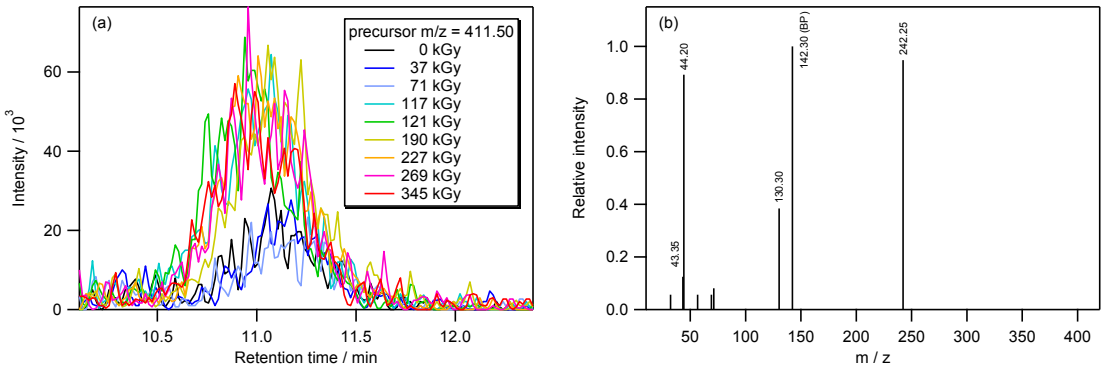

Fig. S15. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 411.50 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 35 eV collision energy.

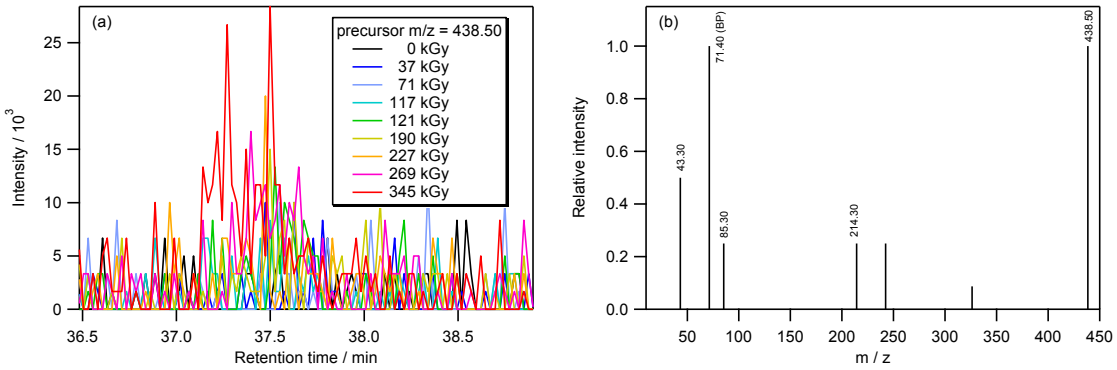

Fig. S16. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 438.50 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 35 eV collision energy.

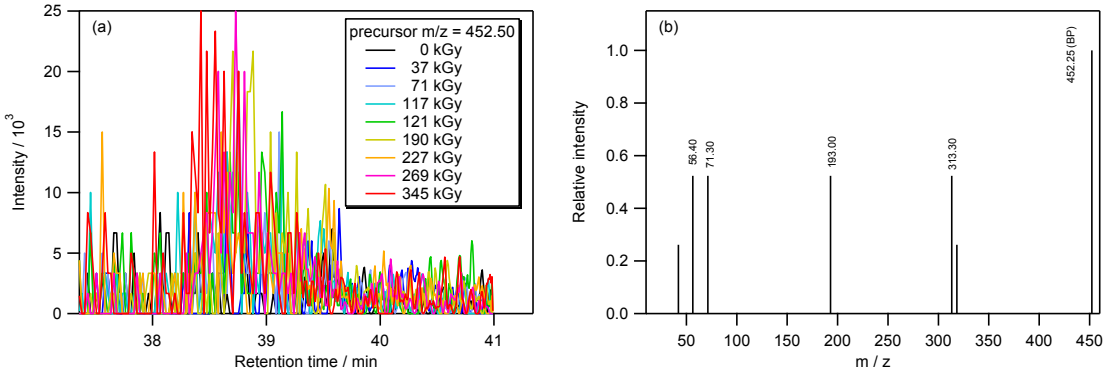

Fig. S17. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 452.50 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 35 eV collision energy.

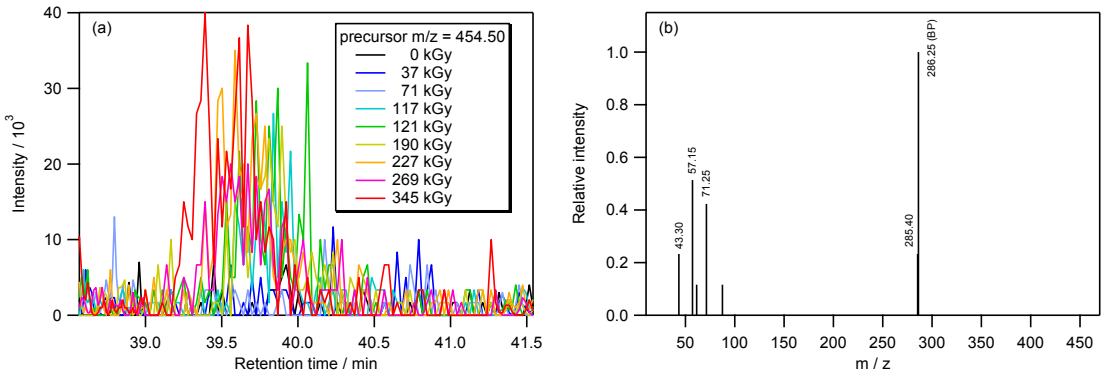

Fig. S18. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 454.50 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 35 eV collision energy.

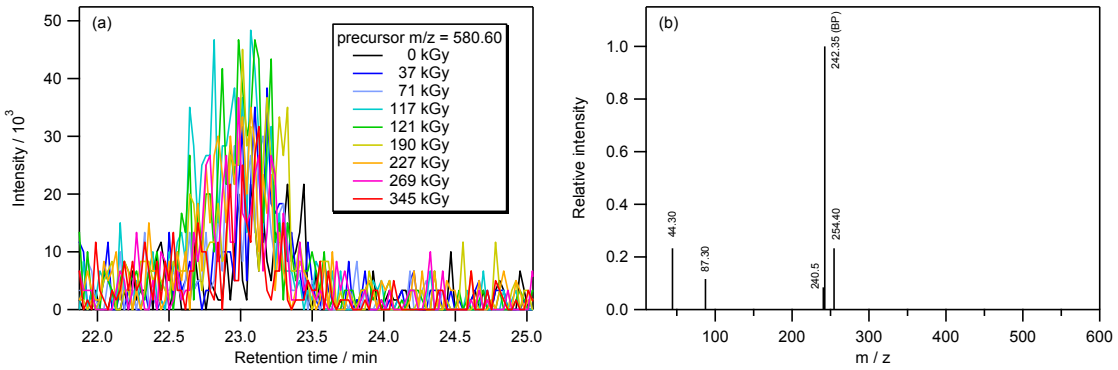

Fig. S19. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 580.60 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 40 eV collision energy.

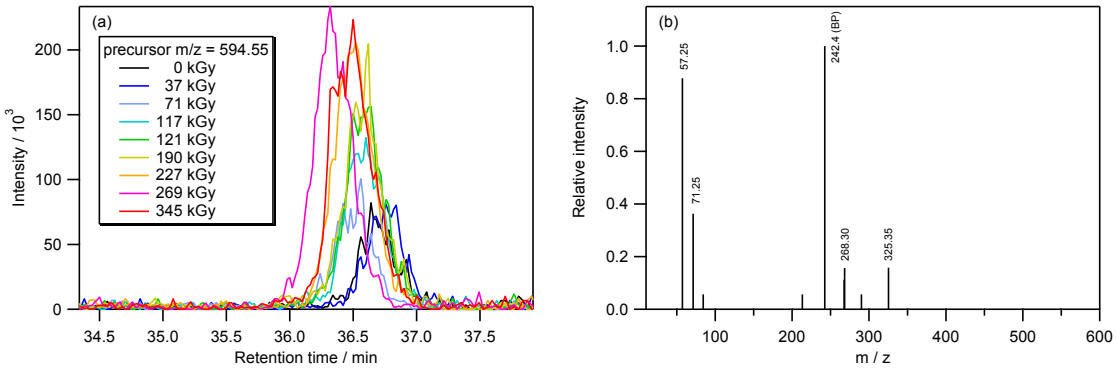

Fig. S20. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 594.55 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 35 eV collision energy.

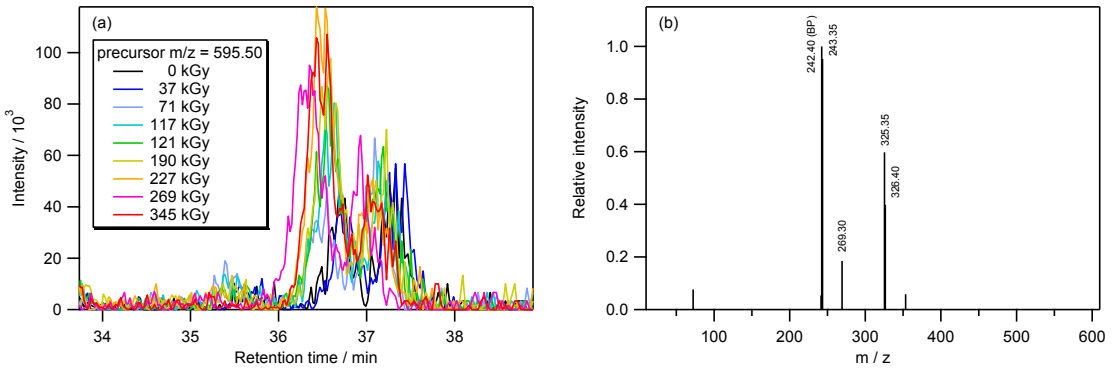

Fig. S21. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 595.50 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 30 eV collision energy.

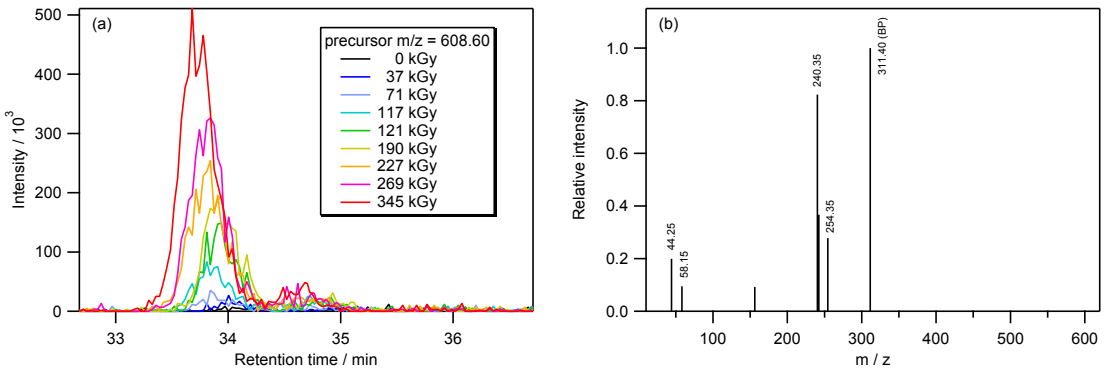

Fig. S22. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 608.60 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 40 eV collision energy.

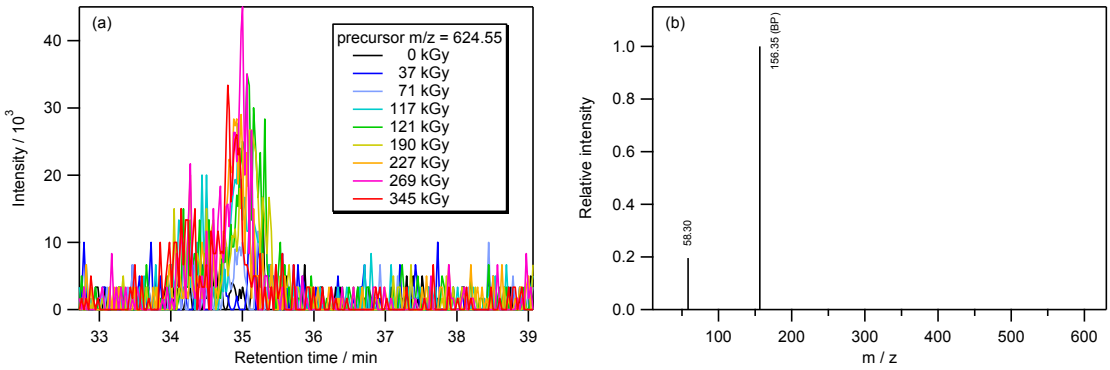

Fig. S23. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 624.55 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 35 eV collision energy.

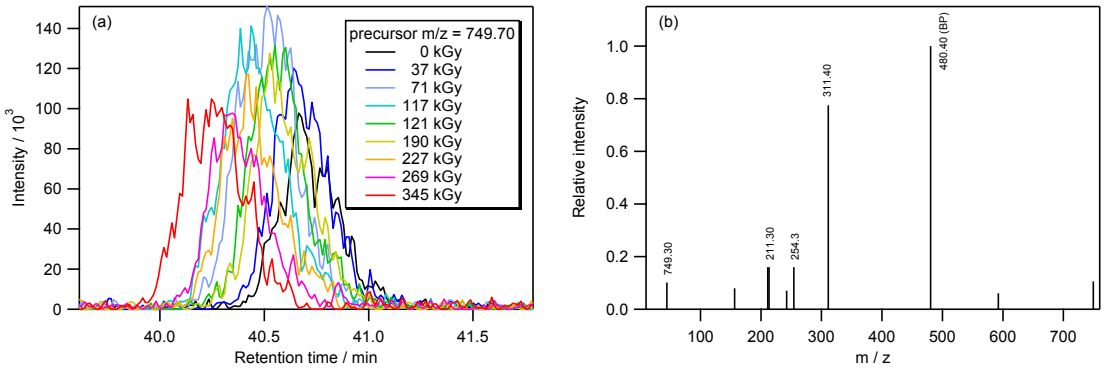

Fig. S24. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 749.70 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 30 eV collision energy.

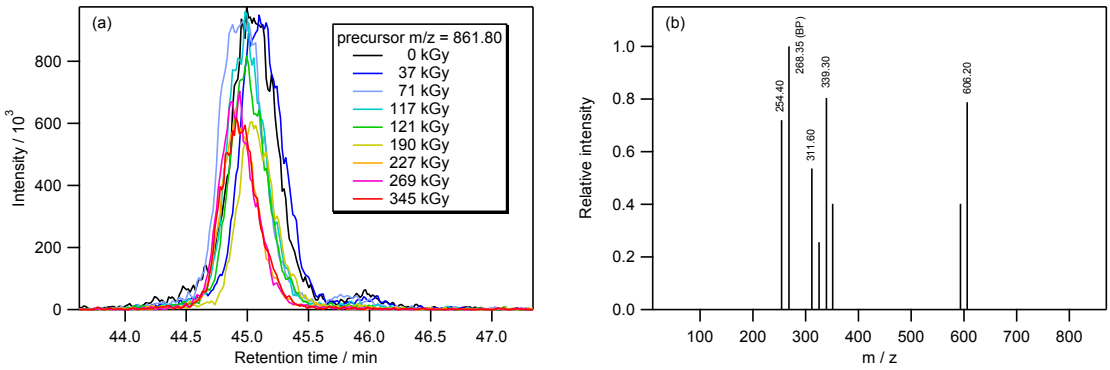

Figure S25. (a) HPLC-ESI-MS/MS total ion chromatogram for precursor m/z = 861.80 from the gamma radiolysis of 100 mM HONTA in *n*-dodecane contacted with a 0.1 M HNO_3 aqueous phase as a function of retention time and absorbed gamma dose (~2.03 kGy h^{-1}). **(b)** MS/MS spectrum obtained with 30 eV collision energy. This product was assigned as hexa-*n*-octylnitrilo-triacetamide (HONTA, MW = 861.5) from the retention time and the MS/MS spectrum by using standard solutions.