

Supporting Information

Efficient solvent system containing Malonamides in Room Temperature Ionic Liquids: Actinide extraction, Fluorescence and Radiolytic Degradation Studies

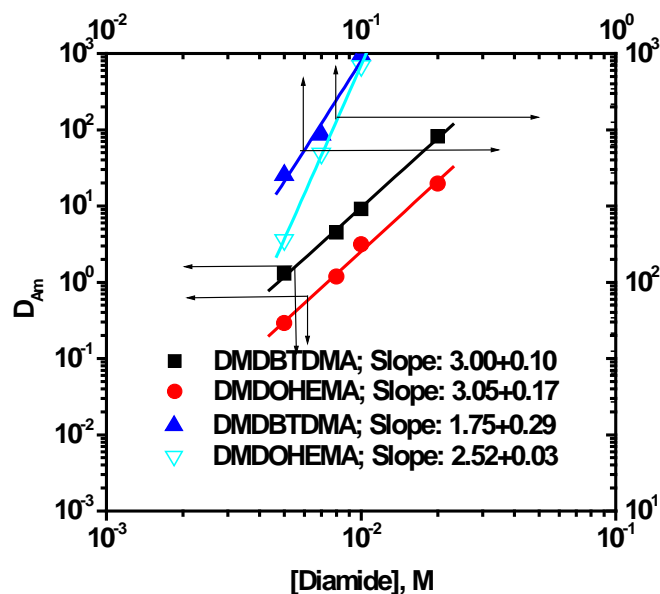
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A. Nature of extracted species

Plot of varying diamides concentrations against the D_{Am} values varying from 0.005 – 0.1M DMDBTDMA and DMOHEMA ligands in ionic liquid diluents.



SF 1: Variation of D_{Am} with diamide concentration;
Diluent: $[C_4mim][Tf_2N]$; $[HNO_3]$: 0.01 M; T: 298 K

B. Radiolytic degradation studies

B.1. Infra Red Spectroscopy

IR spectra of γ irradiated samples were recorded on Shimadzu FTIR spectrometer. The spectrum for DMDBTDMA and DMDOHEMA samples irradiated with different doses are shown in figures SF-2 and SF-3 respectively.

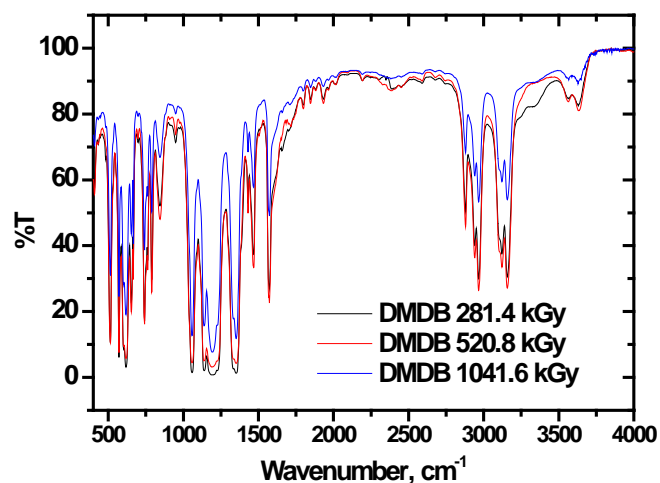


Figure SF-2: IR spectrum of irradiated DMDBTDMA in [C₄mim][Tf₂N]

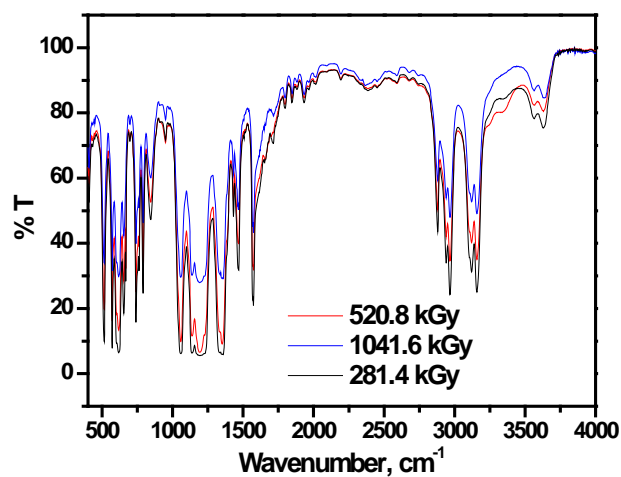
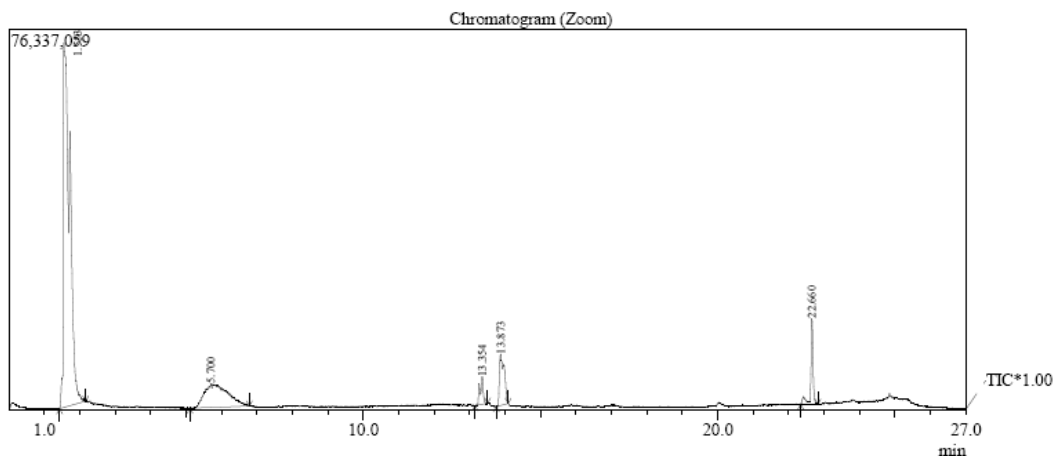
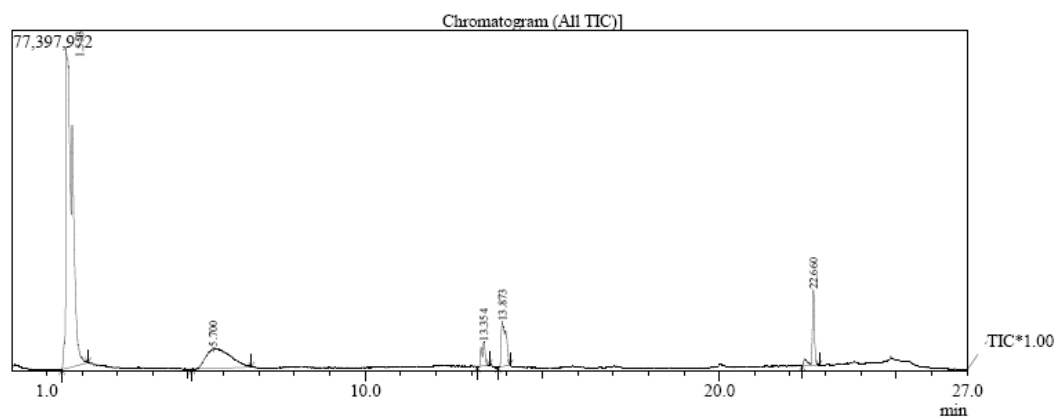


Figure SF-3: IR spectrum of irradiated DMDOHEMA in [C₄mim][Tf₂N]

B.2. GC-MS analysis

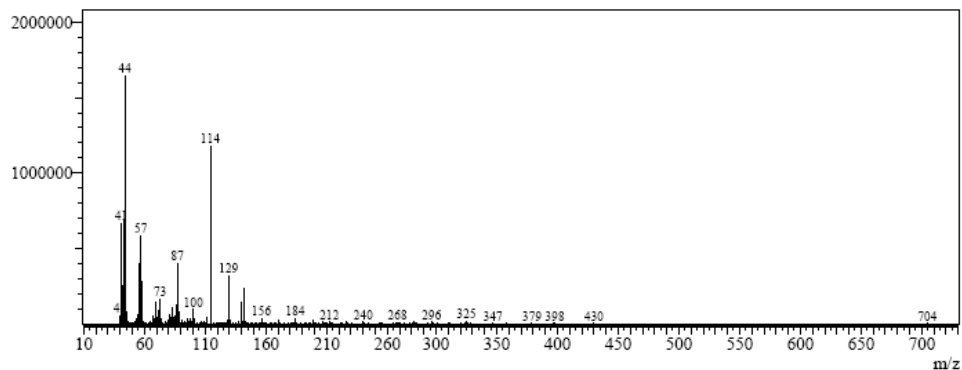
GCMS spectra of irradiated samples have been recorded using Shimadzu Gas chromatography - mass spectrum analyzer.

DMDBTDMA: 281.4 kGy irradiated sample-

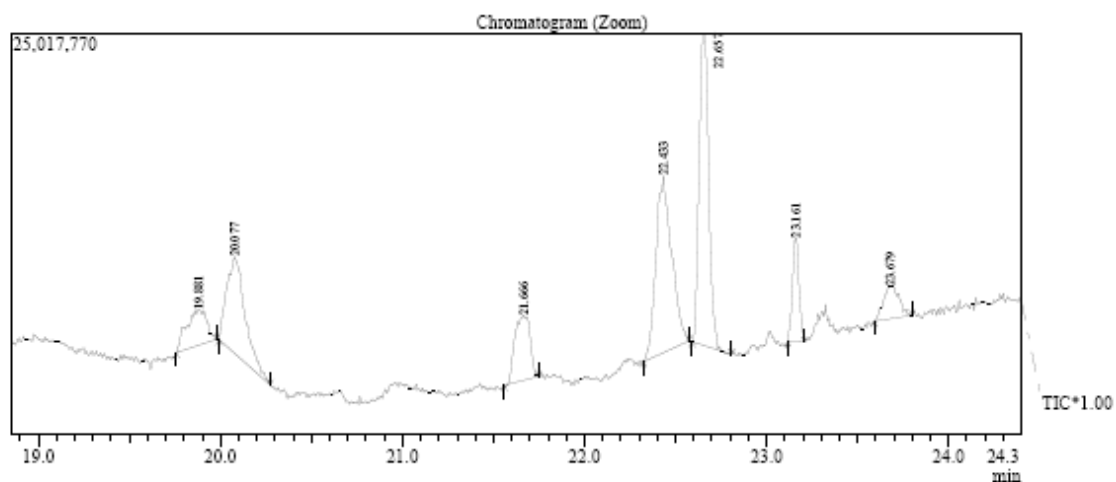
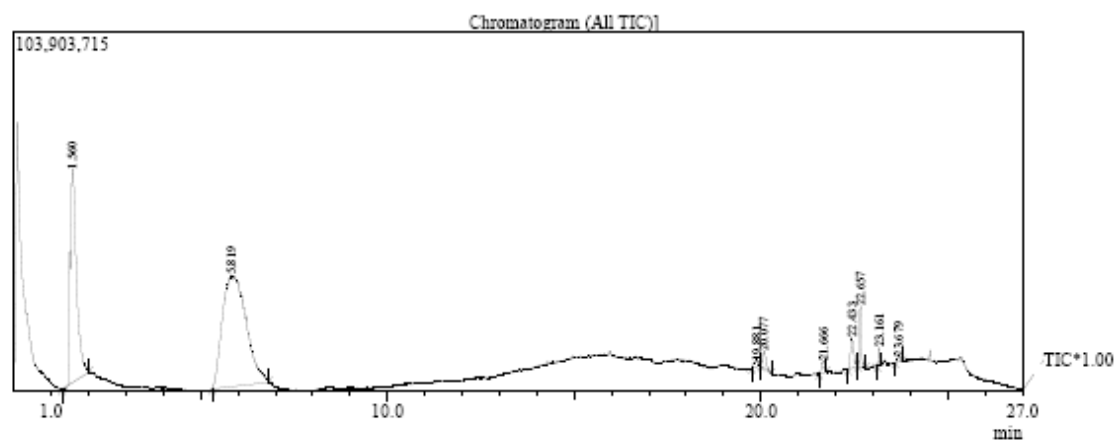


Spectrum

Line#:1 R.Time:22.633(Scan#:2716)
MassPeaks:181
RawMode:Single 22.633(2716) BasePeak:44.05(1644903)
BG Mode:None

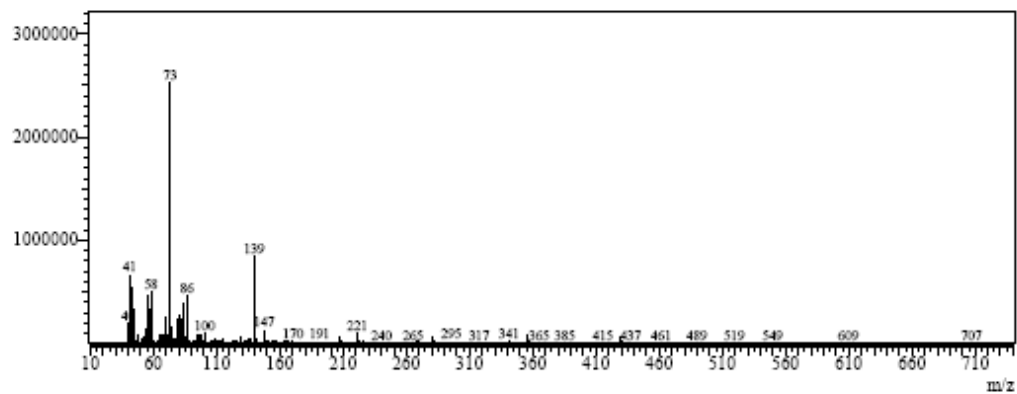


DMDBTDMA: 1041.6 kGy irradiated sample-

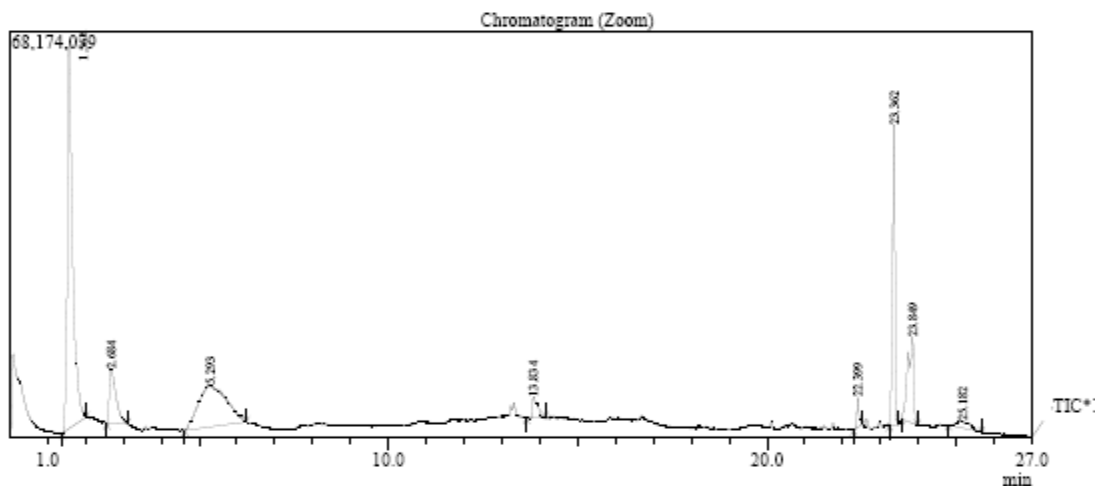
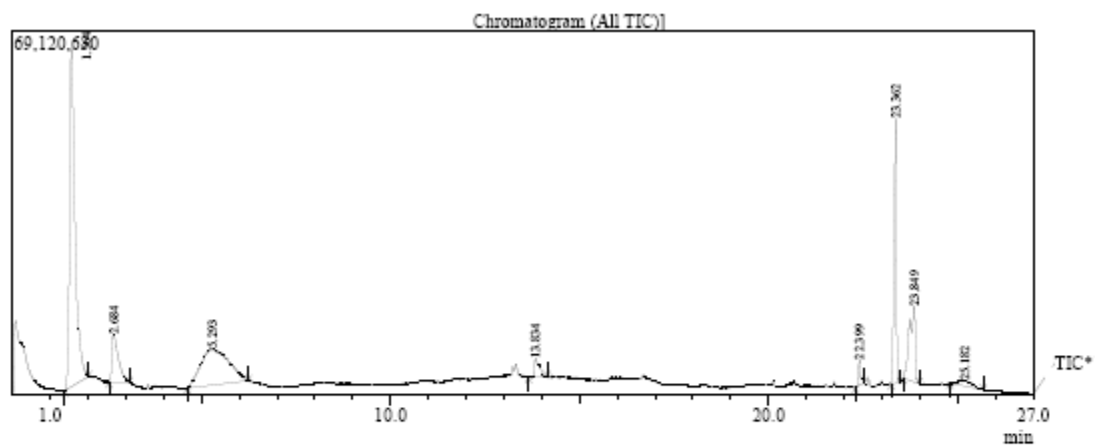


Spectrum

Line#1 R.Time:20.083(Scan#2410)
MassPeaks:334
RawMode:Single 20.083(2410) BasePeak:73.15(2526628)
BG Mode:None

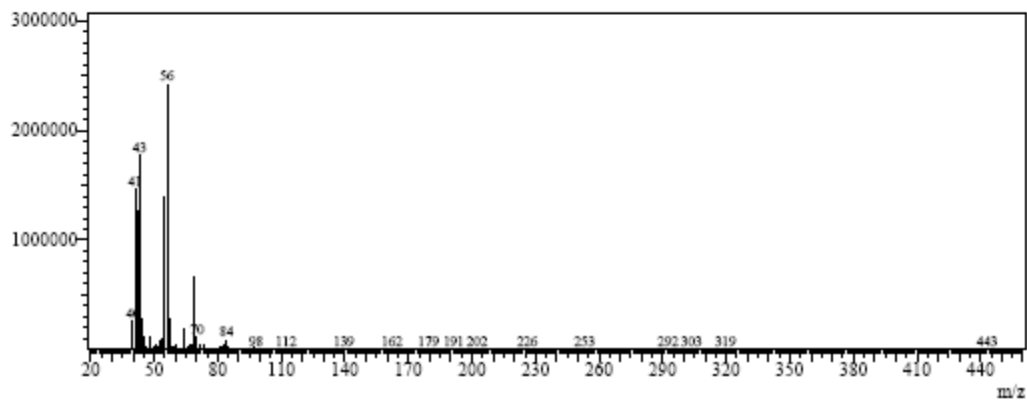


DMDOHEMA: 281.4 kGy irradiated sample-

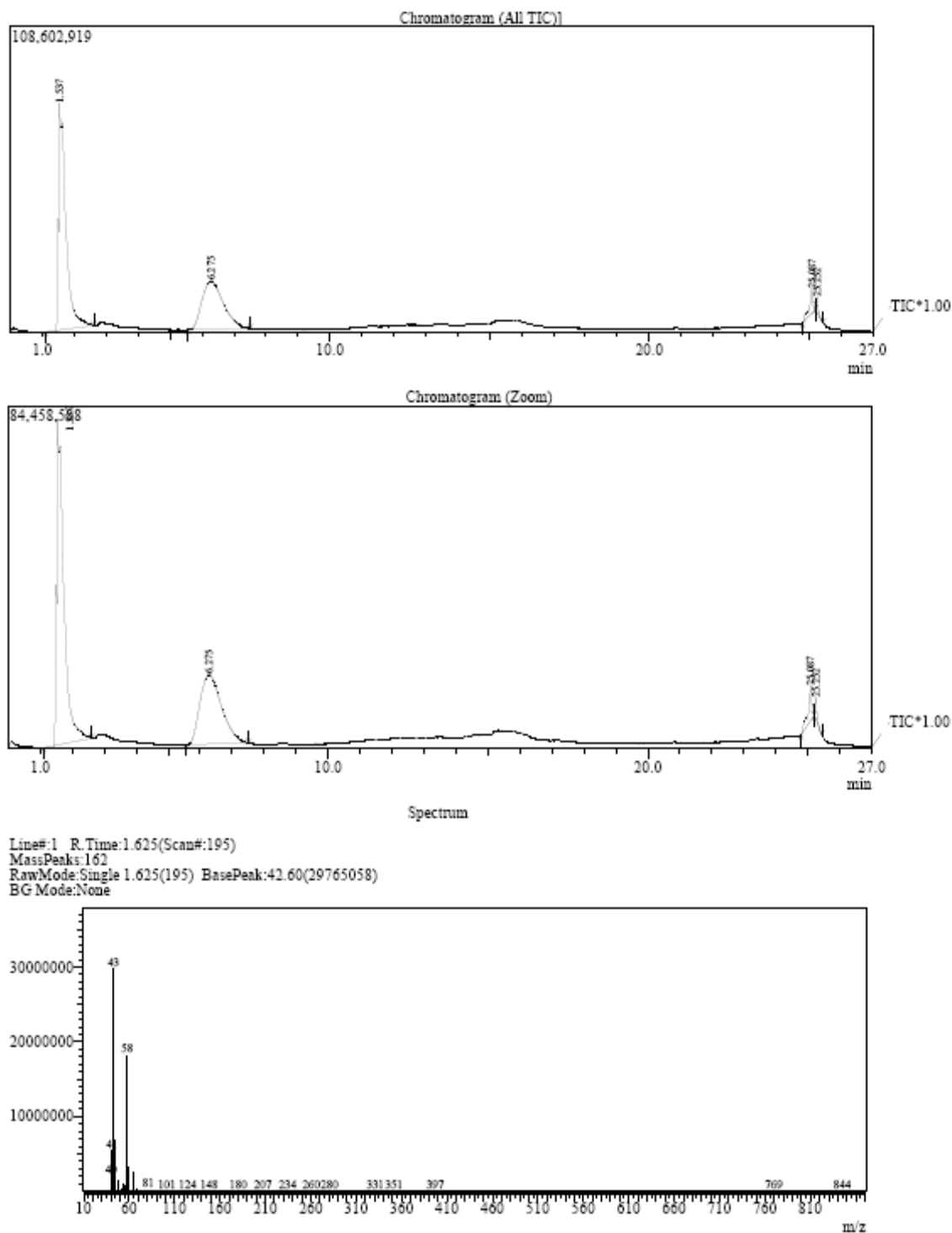


Spectrum

Line#1 R.Time:2.658(Scan#319)
MassPeaks:114
RawMode:Single 2.658(319) BasePeak:56.05(2420624)
BG Mode:None



DMDOHEMA: 1041.6 kGy irradiated sample-



The detailed analysis of the GCMS data has been explained in manuscript under section 3.3.3 GC-MS studies on irradiated samples, in results and discussion. The desired

fragment peaks were exposed to mass spectrometric data analysis. The comparison with available literature fragmentation data and possible fragmentation mechanism as shown in Figure 12 in manuscript was used to characterize the fragments formed at different irradiated samples.