

Supplementary Information

Deep extractive and catalytic oxidative desulfurization of liquid fuels by using iron(III) based dication ionic liquids

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NMR Spectrometry (1-5)

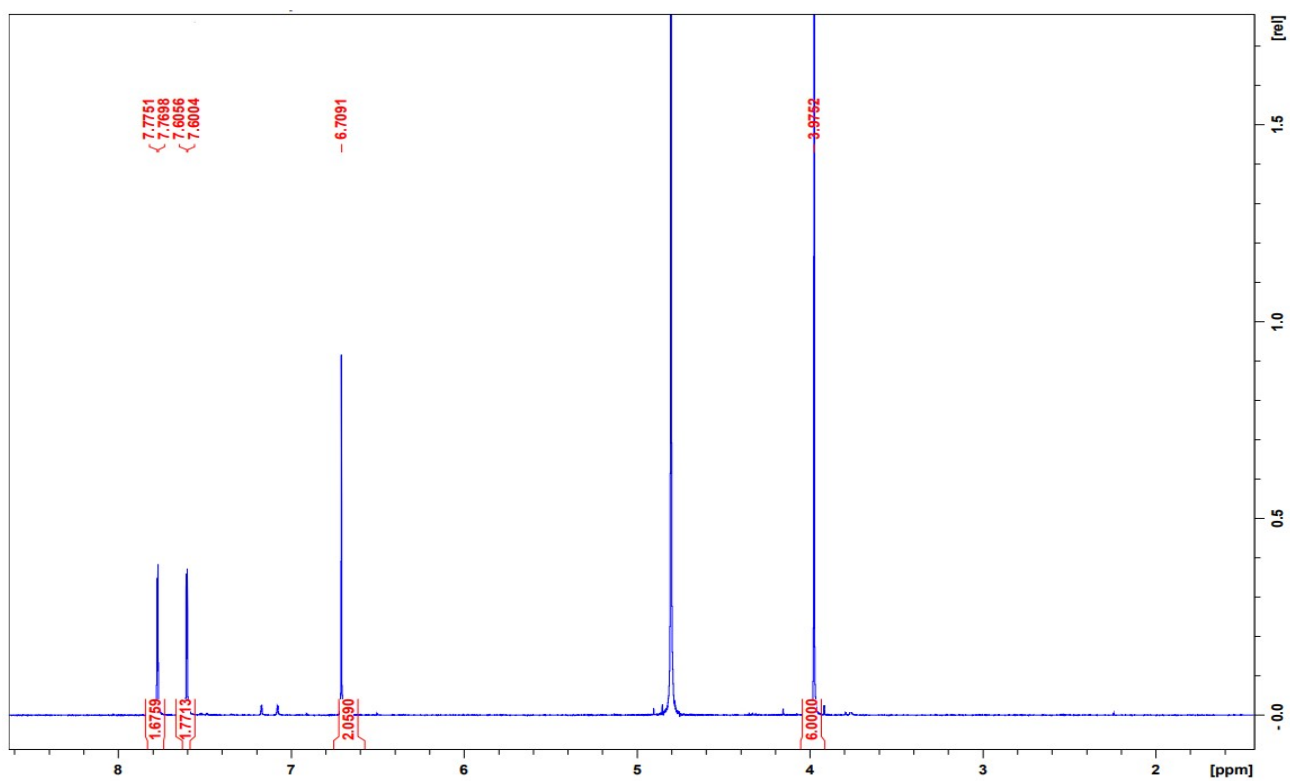


Fig.S1. ^1H NMR spectrum for **I**₁

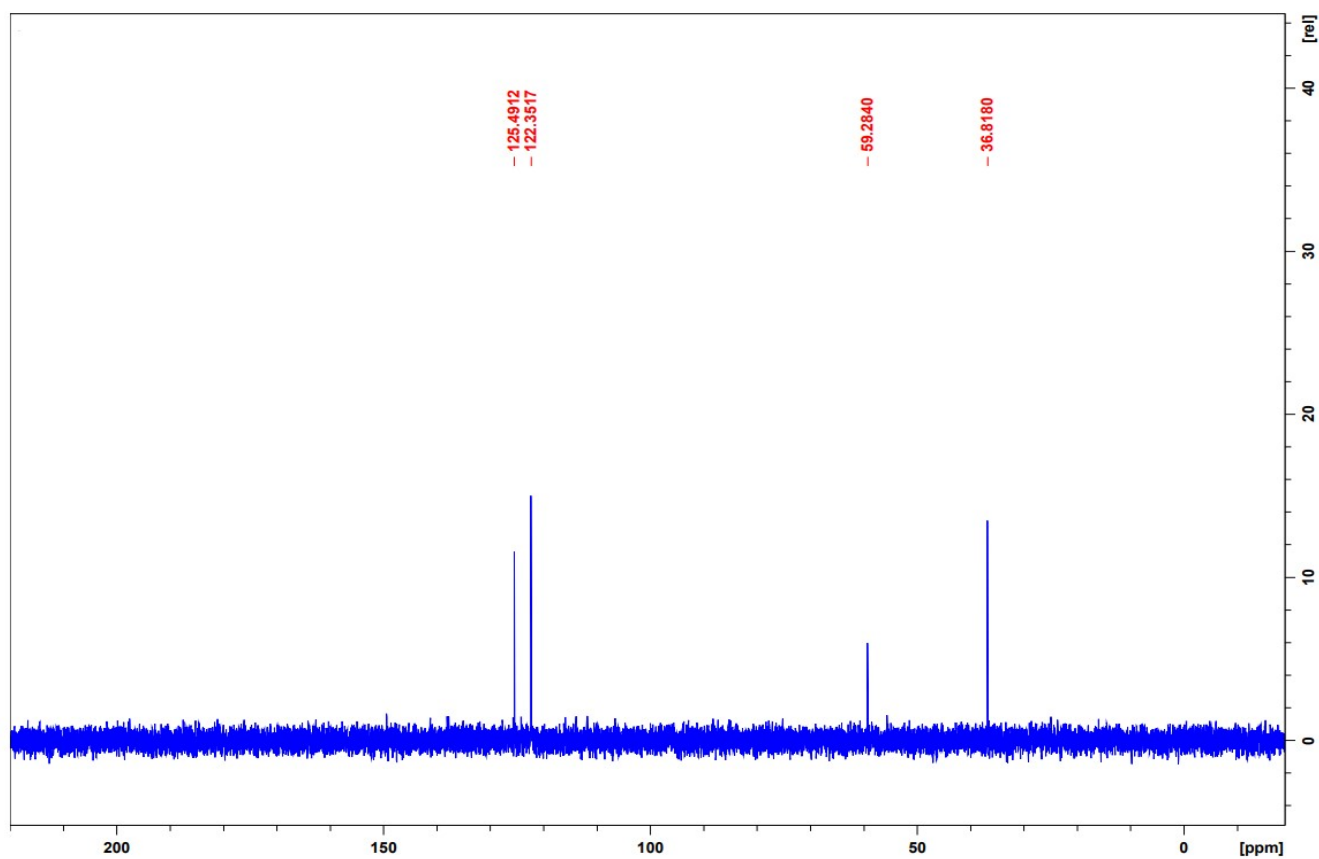


Fig.S2. ^{13}C NMR spectrum for **I**₁

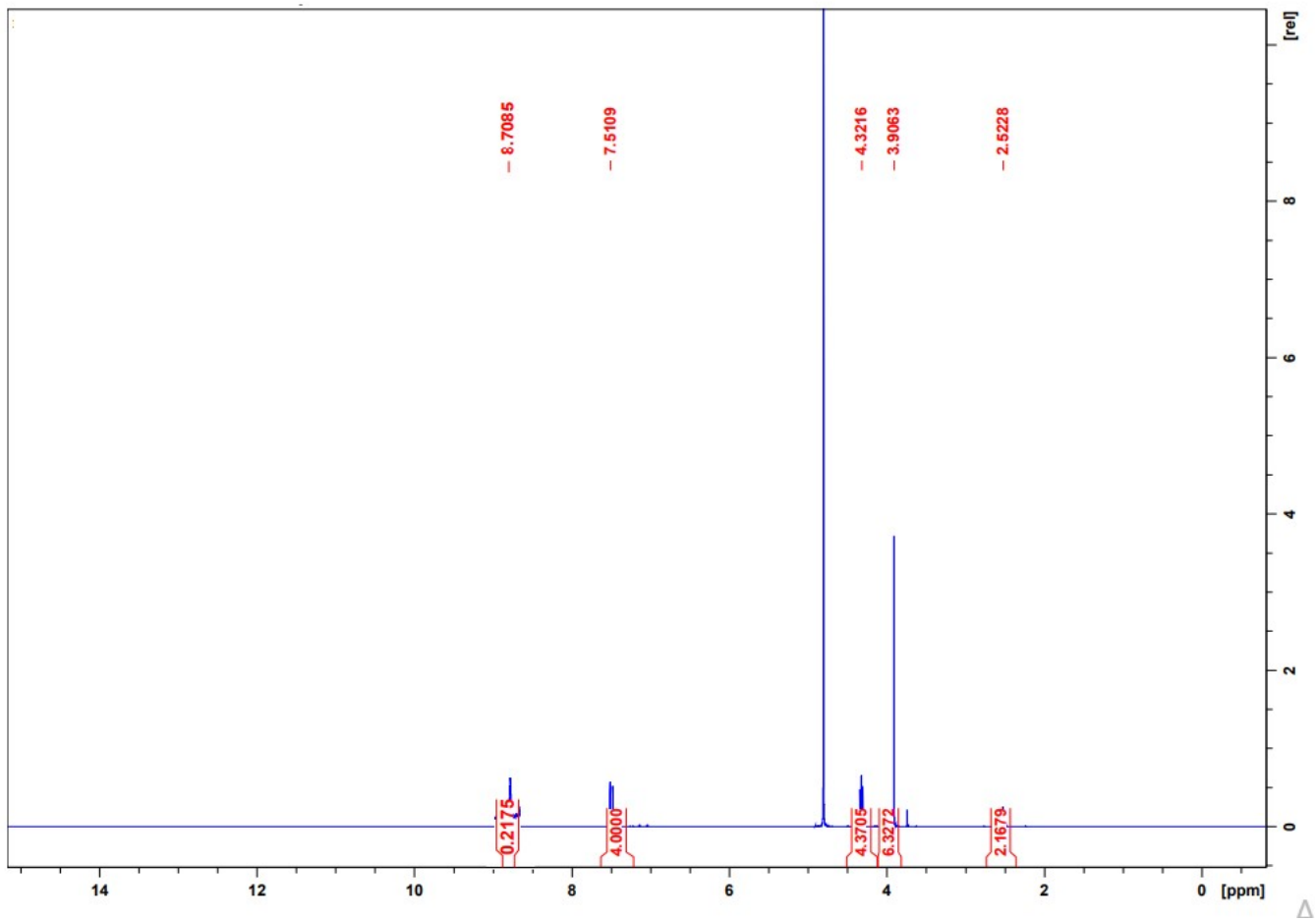


Fig.S3. ¹H NMR spectrum for I₂

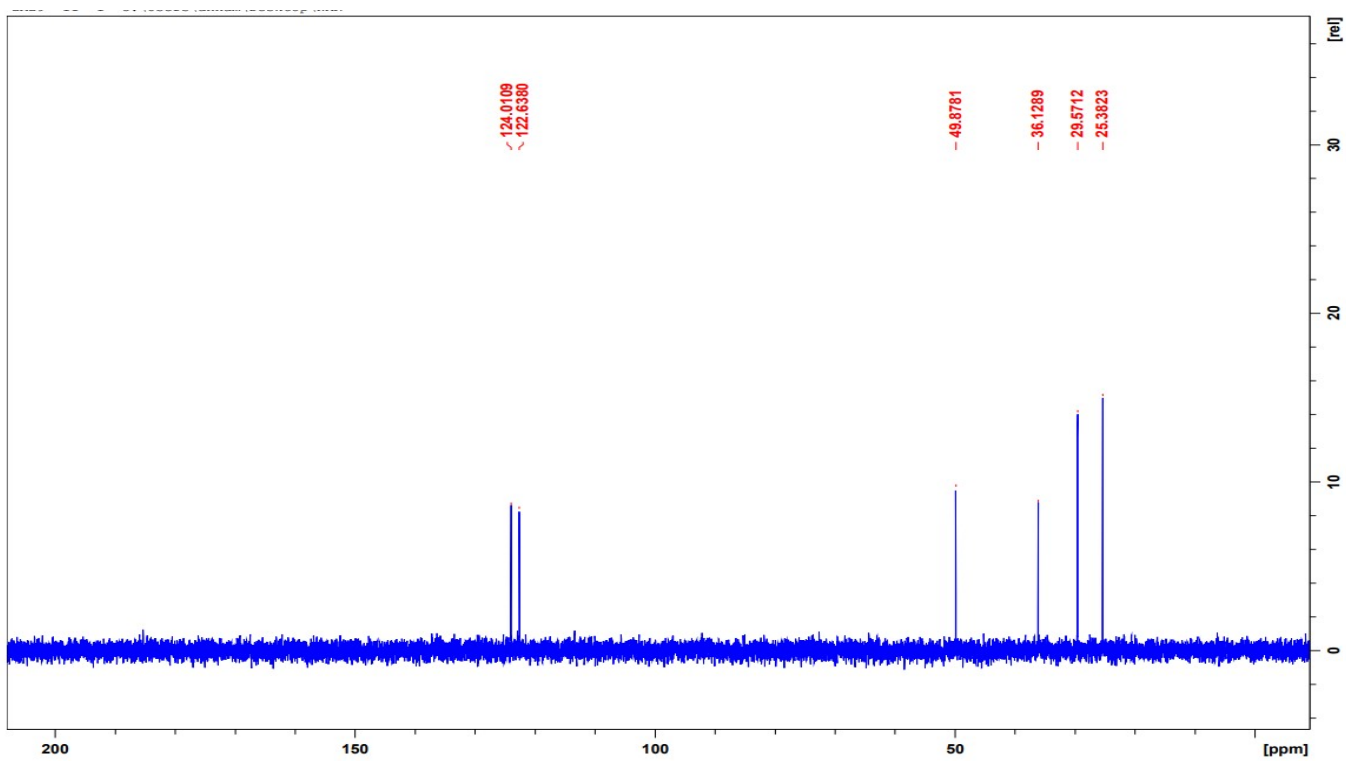


Fig.S4. ¹³C NMR spectrum for I₂

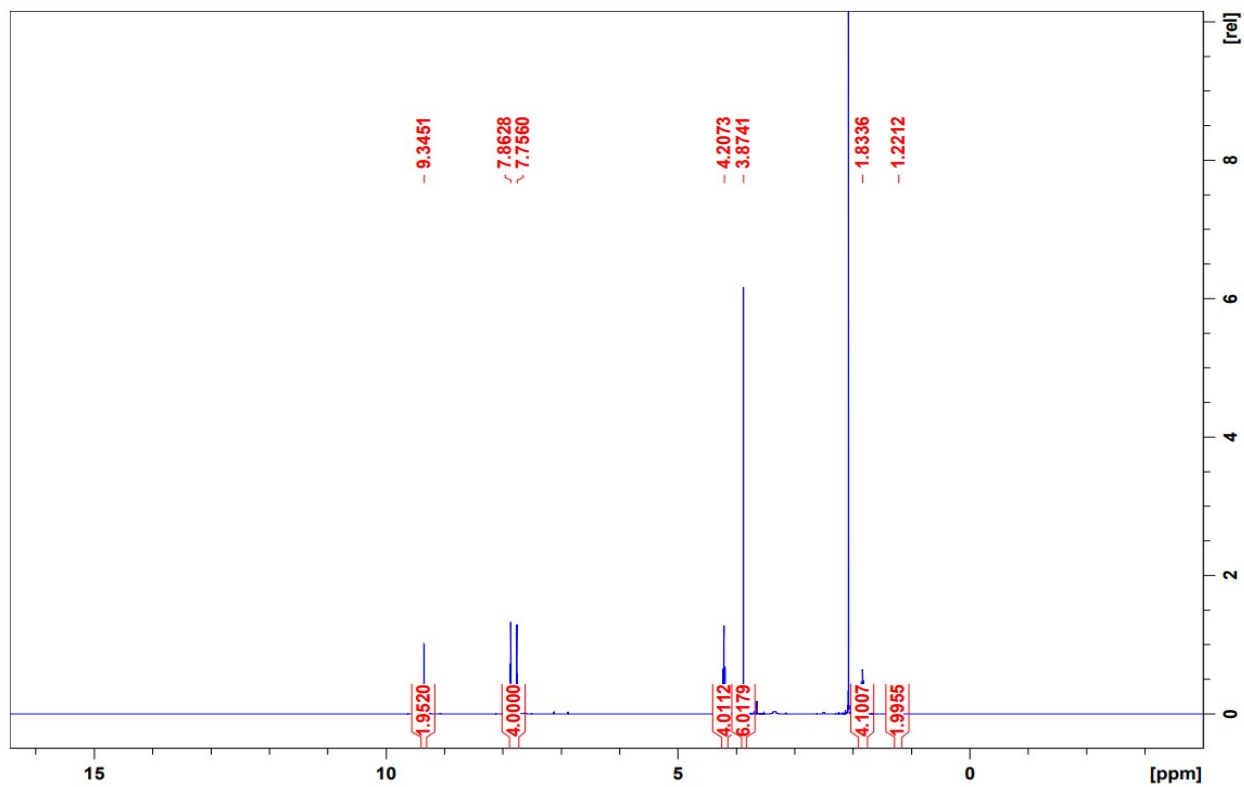


Fig.S5. ¹H NMR spectrum for I₃

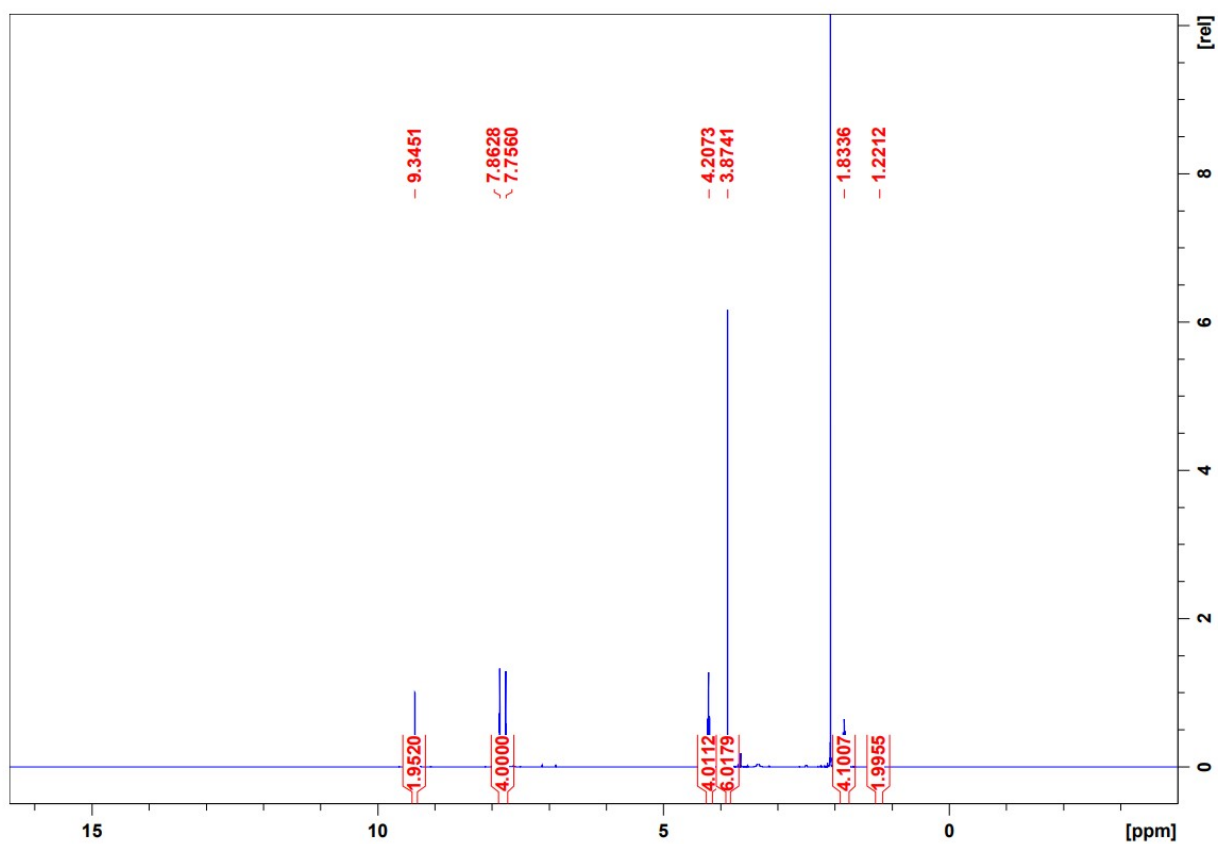


Fig.S6. ¹³C NMR spectrum for I₃

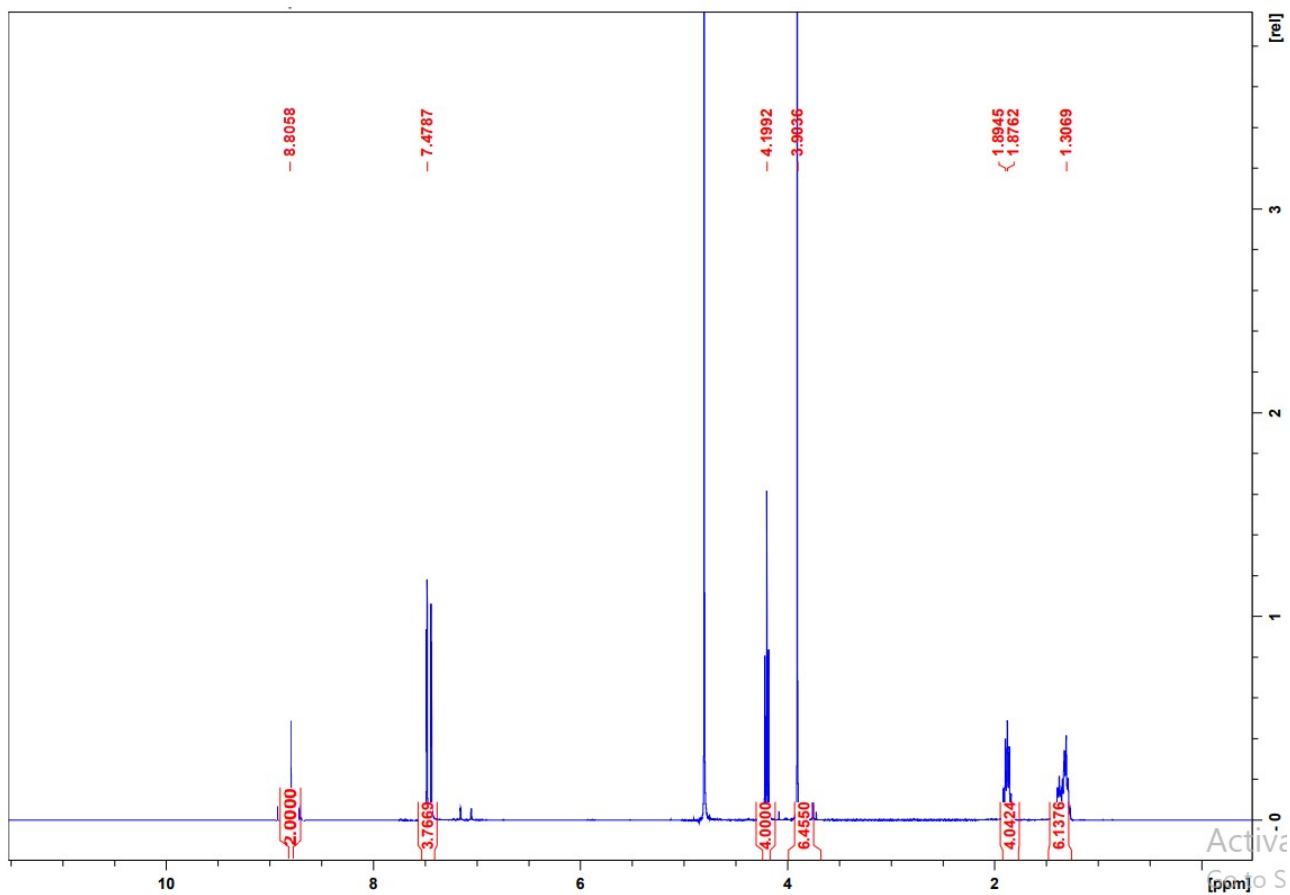


Fig.S7. ^1H NMR spectrum for I_4

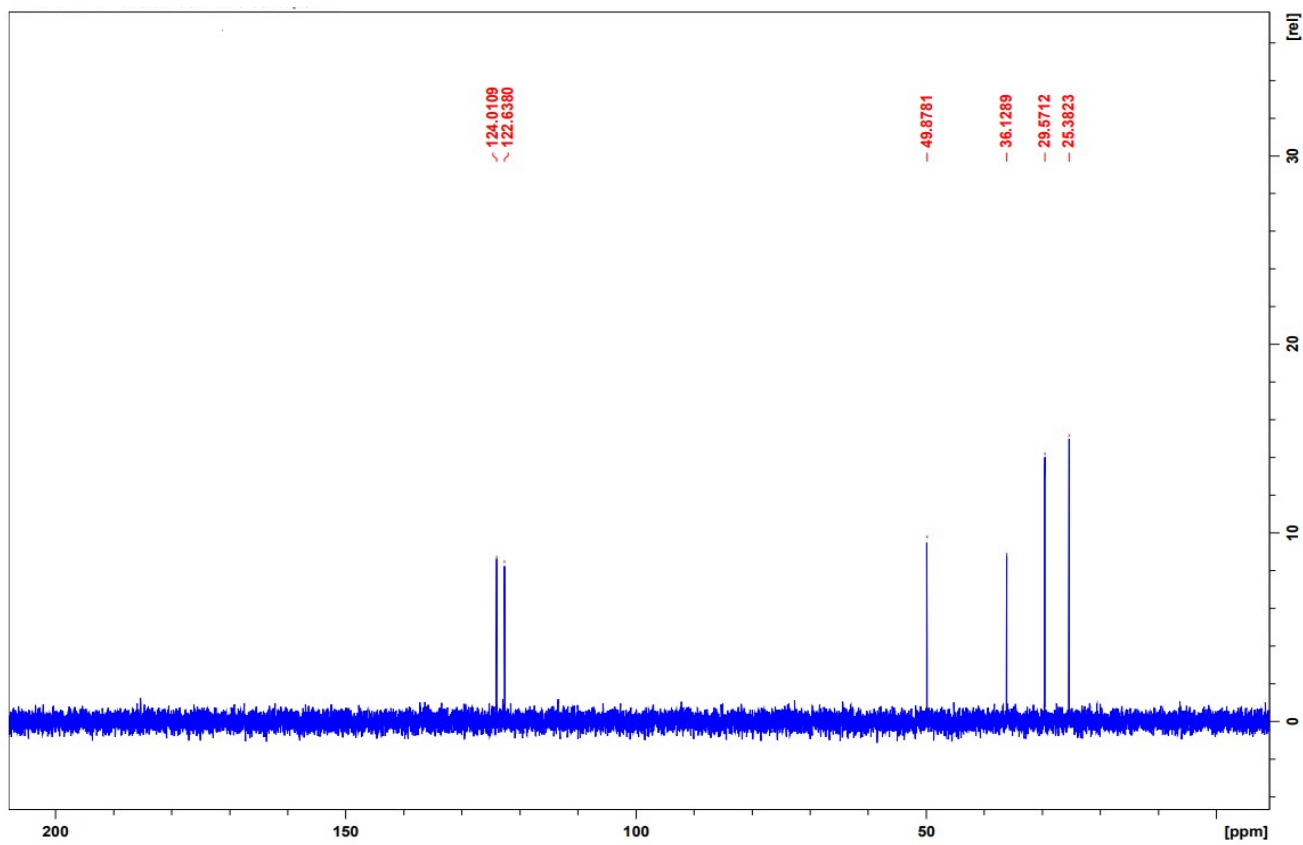


Fig.S8. ^{13}C NMR spectrum for I_4

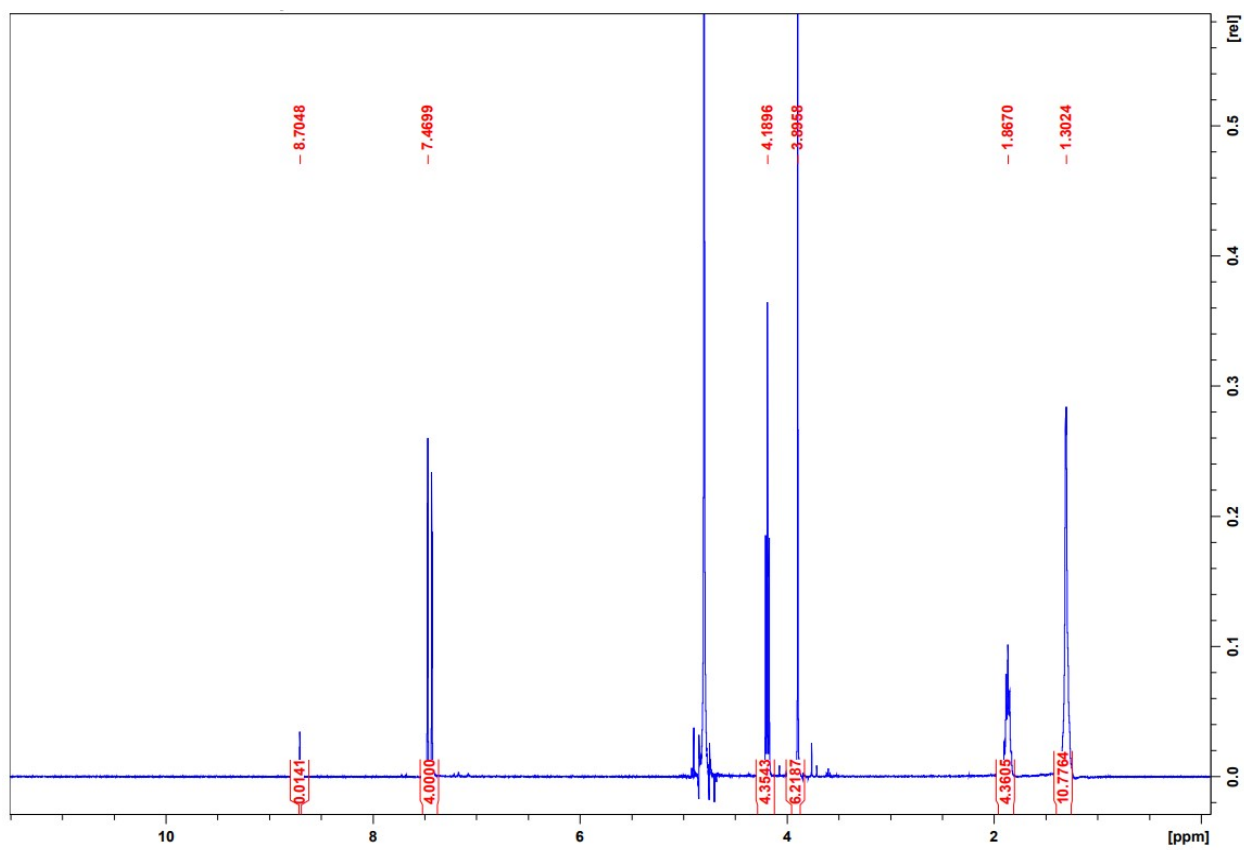


Fig.S9. ¹H NMR spectrum for I₅

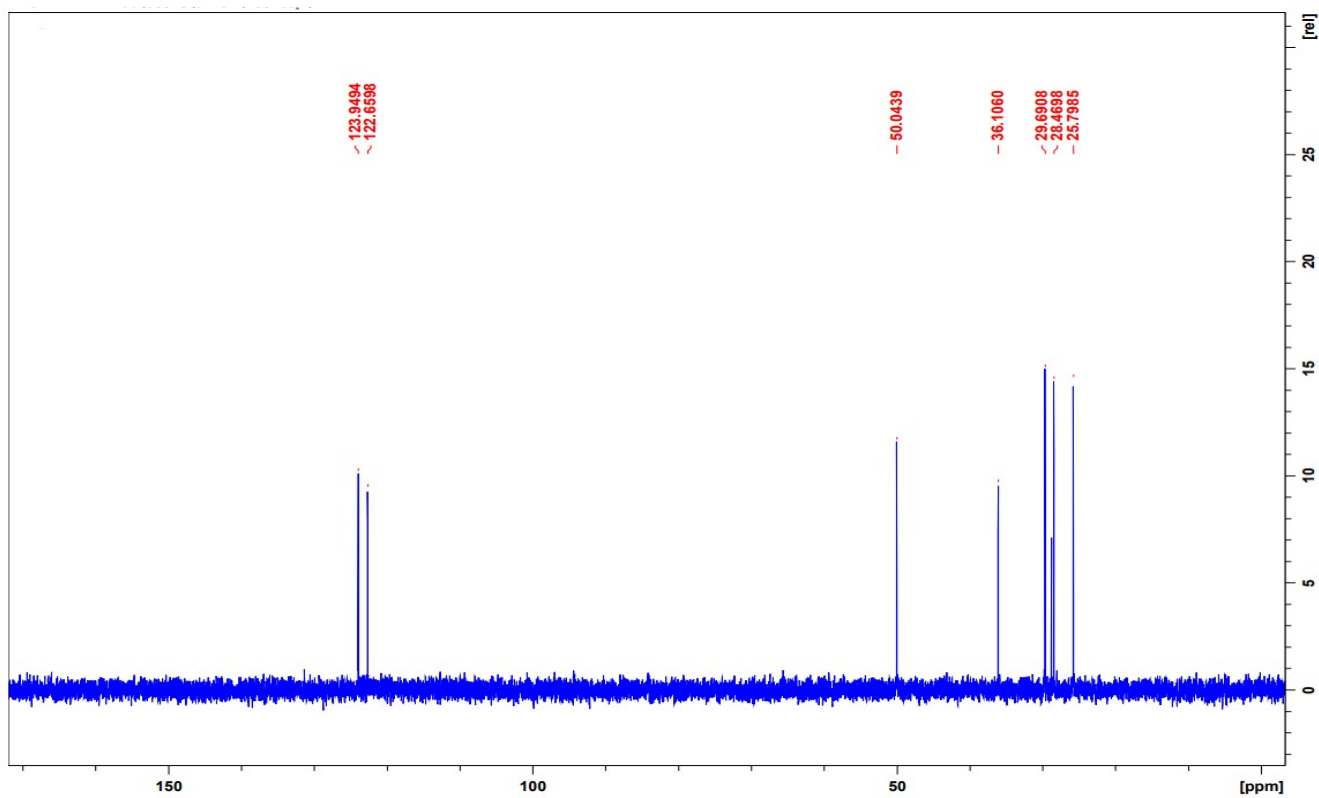


Fig.S10. ¹³C NMR spectrum for I₅

Mass Spectrometry (1-5)

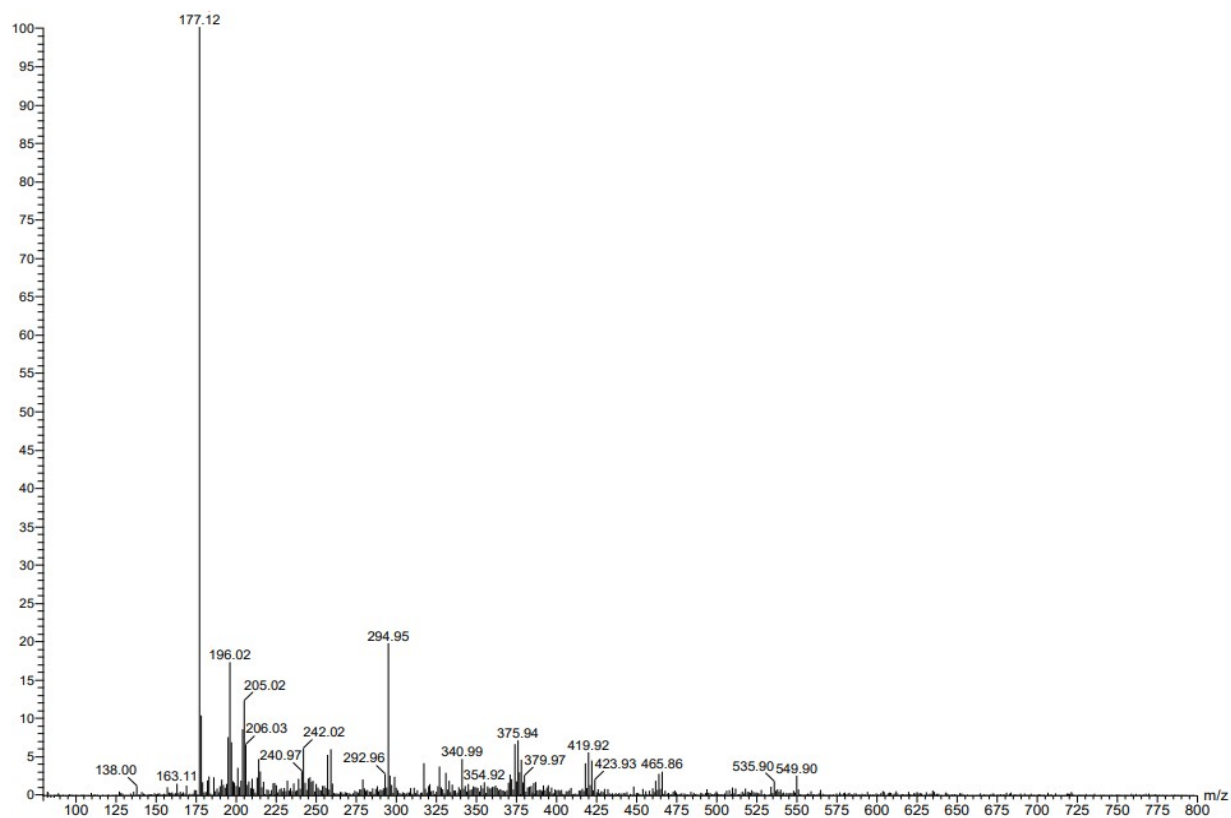


Fig.S11. ESI⁺ mass spectrum for (1)

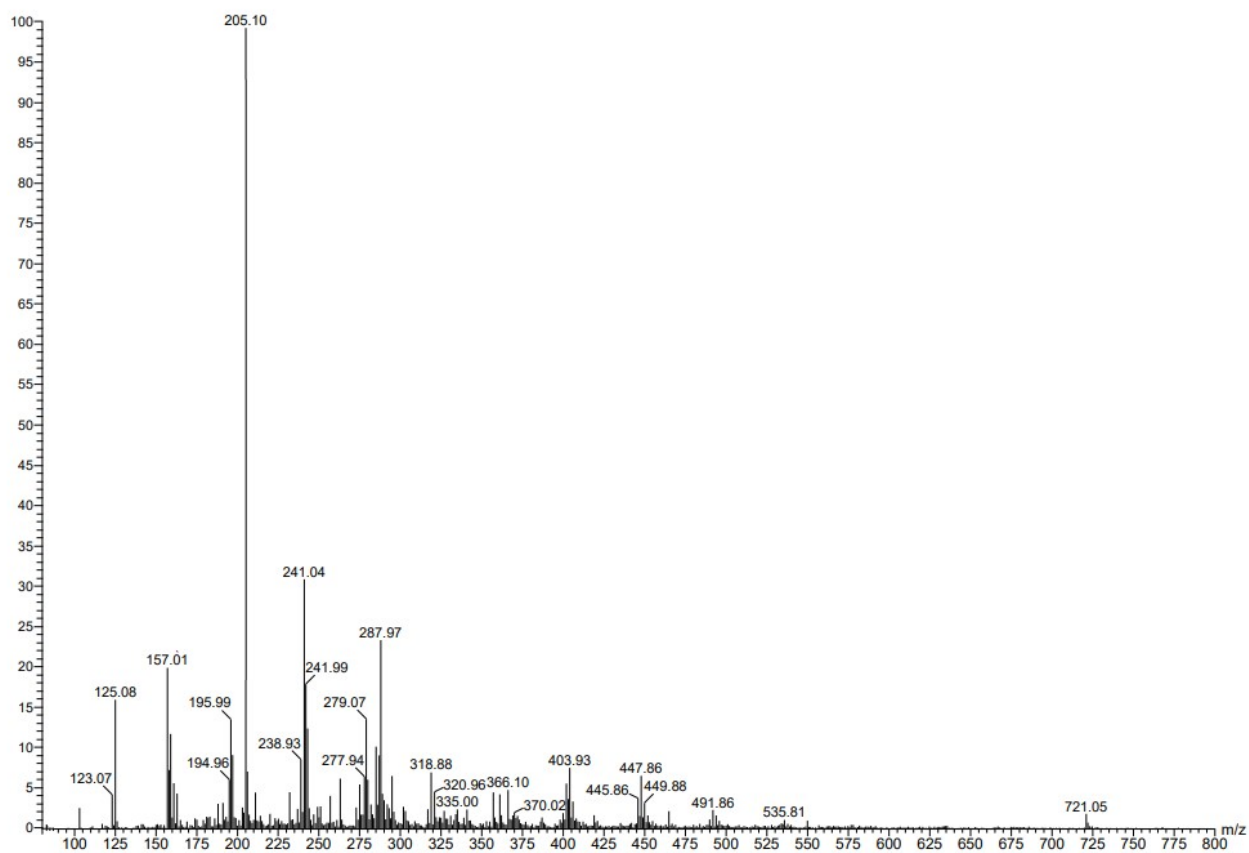


Fig.S12. ESI⁺ mass spectrum for (2)

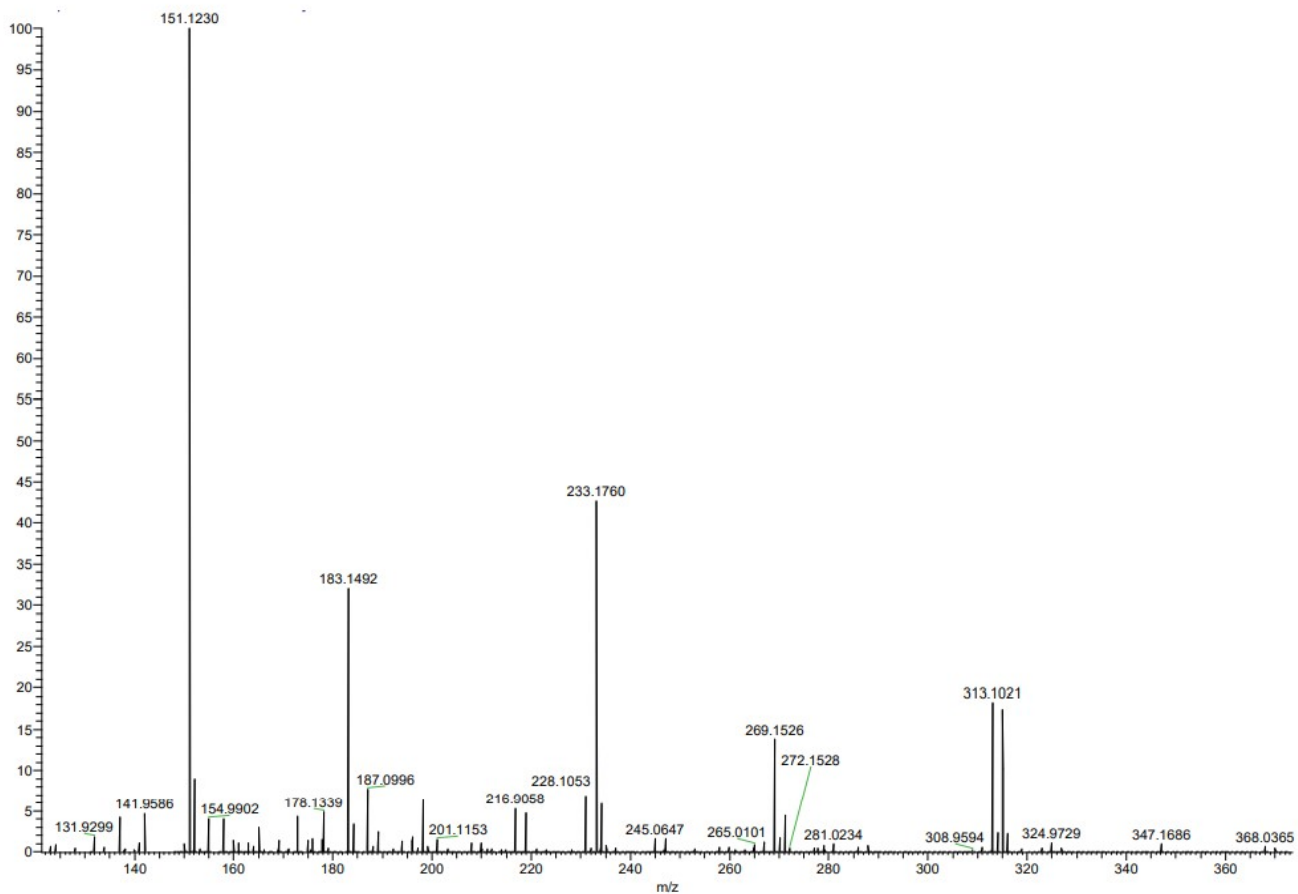


Fig.S13. ESI⁺ mass spectrum for (3)

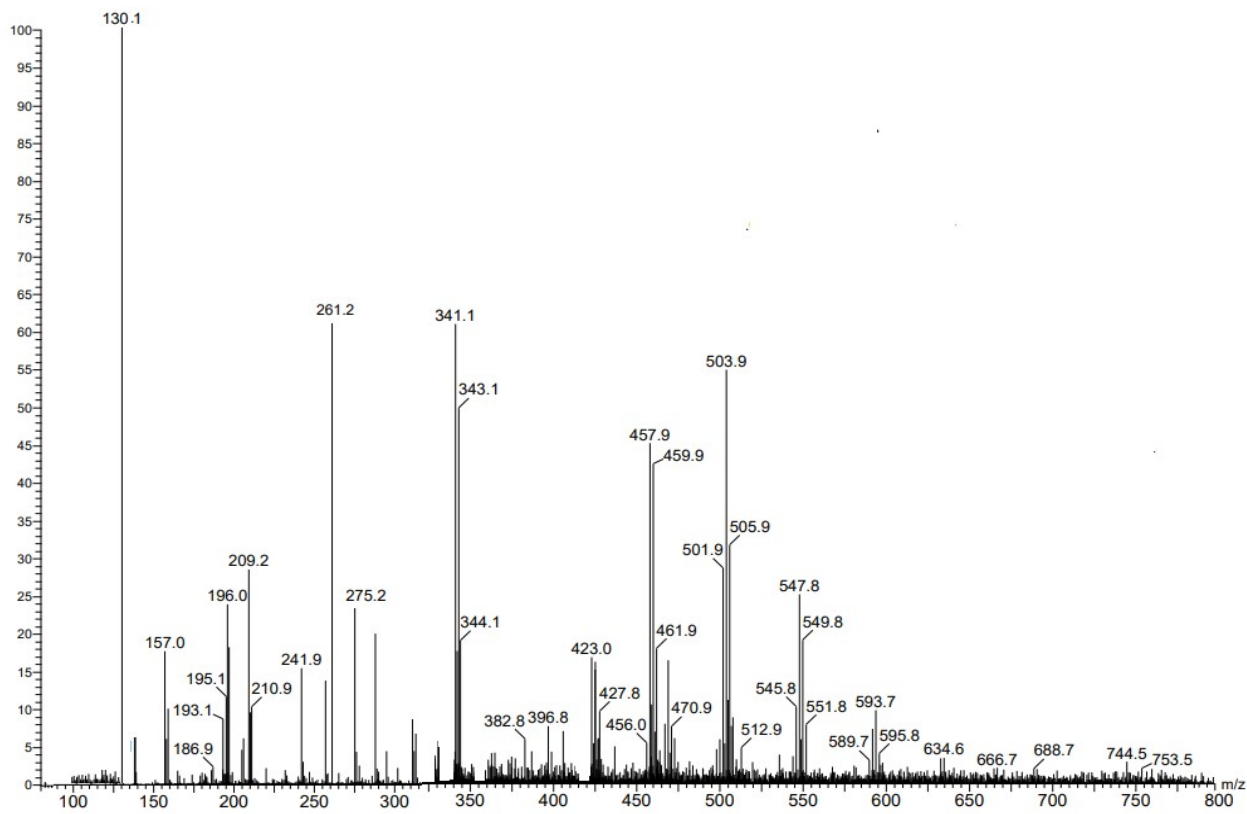


Fig.S14. ESI⁺ mass spectrum for (4)

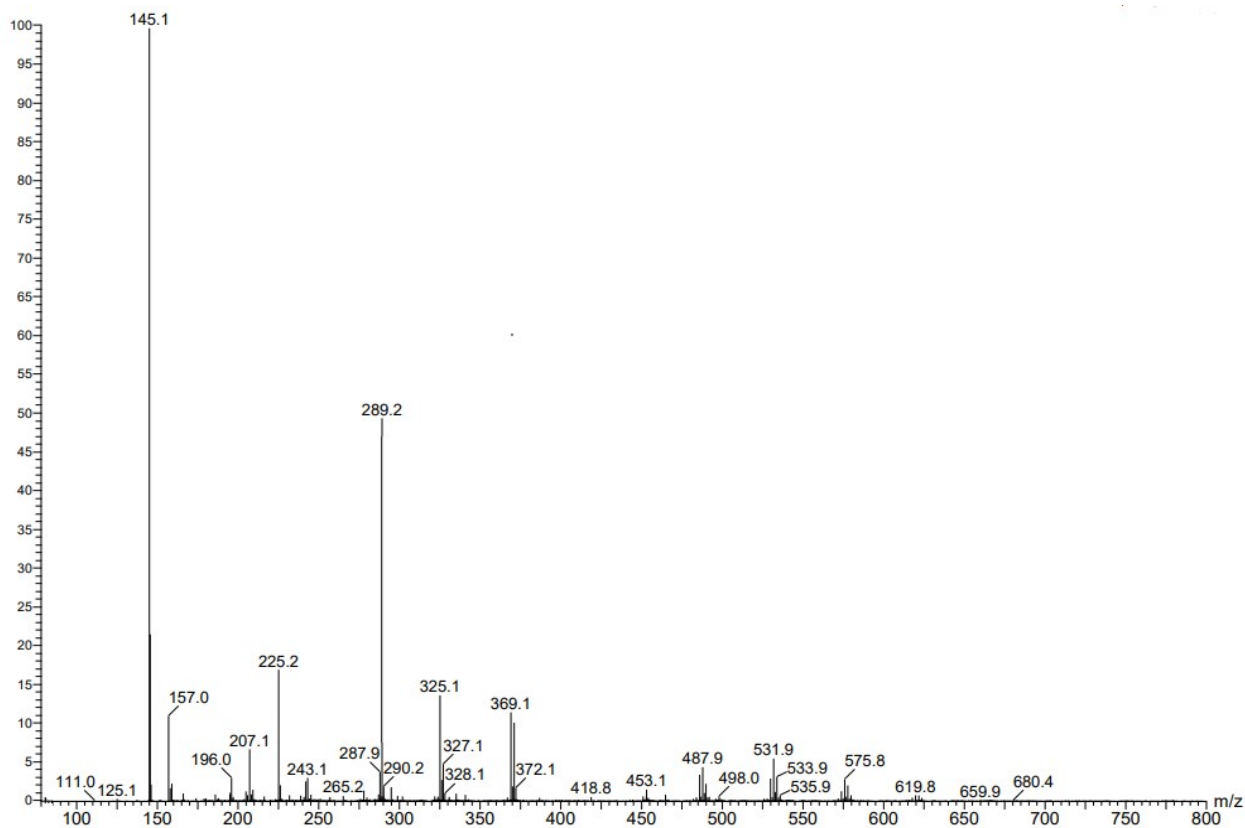


Fig.S15. ESI⁺ mass spectrum for (5)

Raman spectroscopy (1-5)

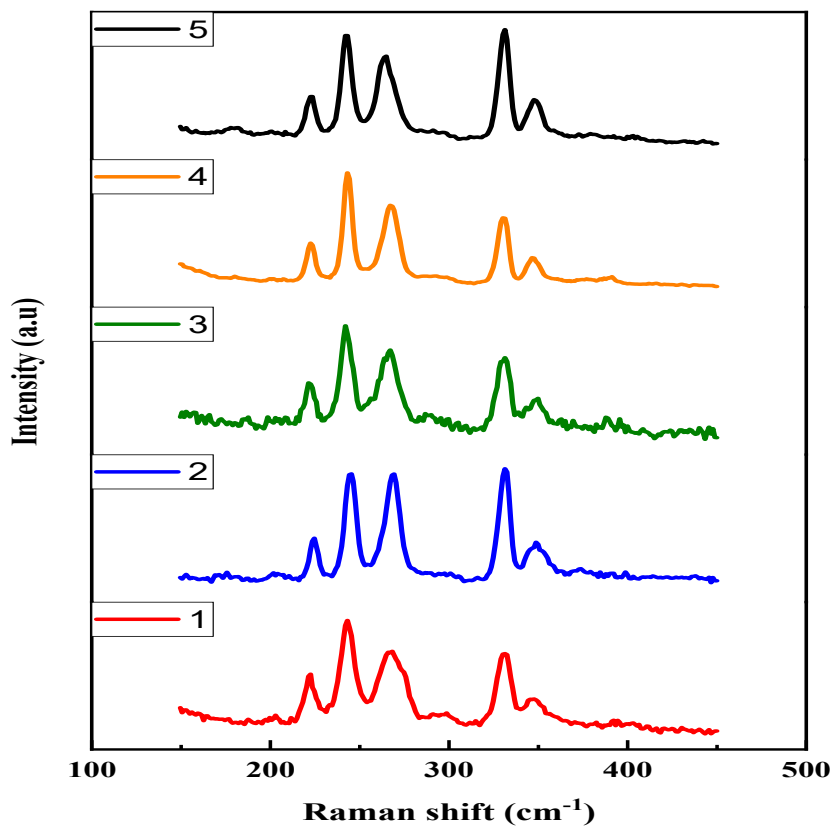


Fig.S16. Raman Spectra of DcILs (1-5)

X-ray photoelectron spectroscopy (1-5)

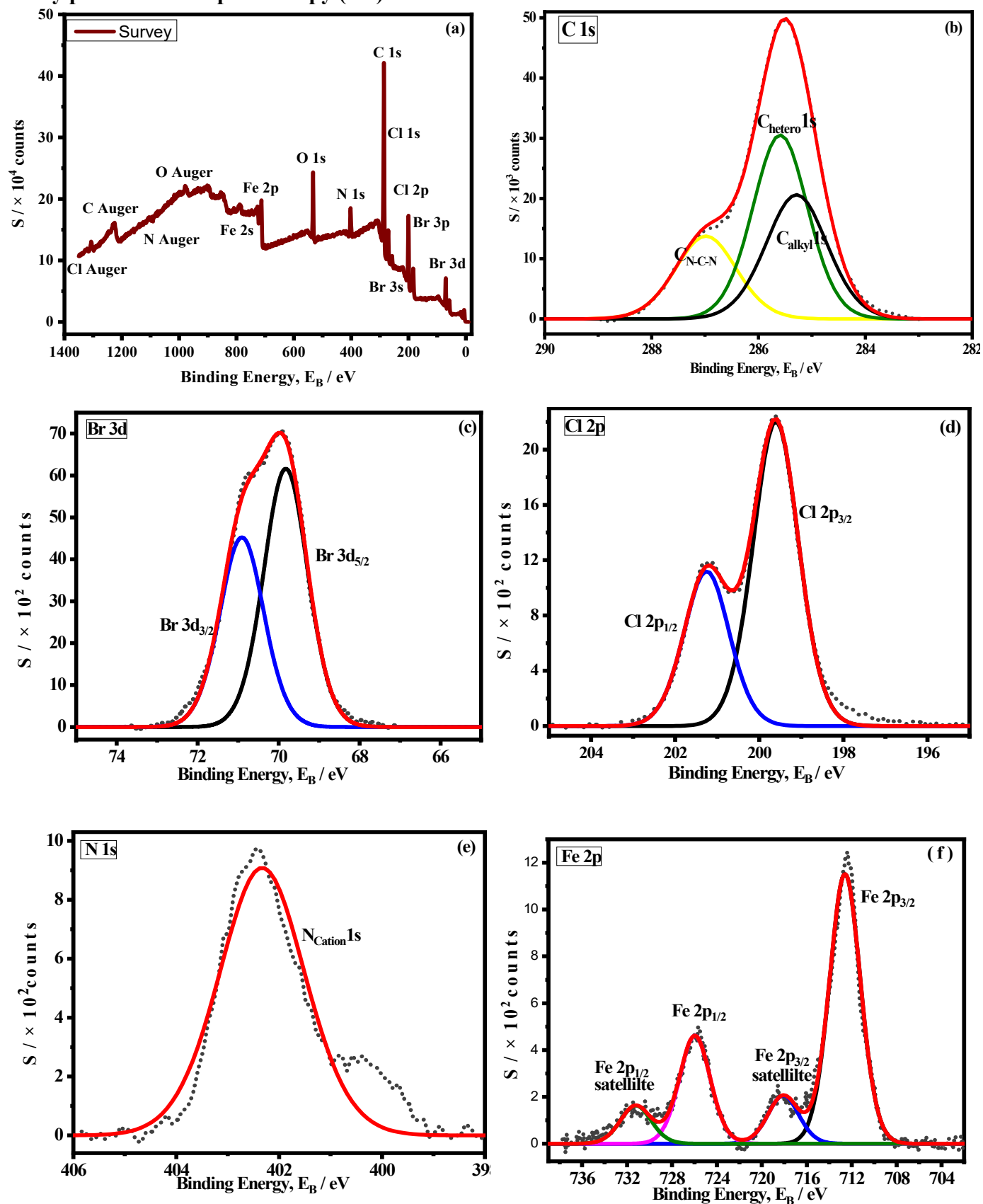


Fig.S17. High resolution XP spectra of **1** showing (a) full survey spectra, (b) peak fitted C 1s with structural assignment, (c) Br 3d, (d) Cl 2p, (e) N 1s and (f) Fe 2p

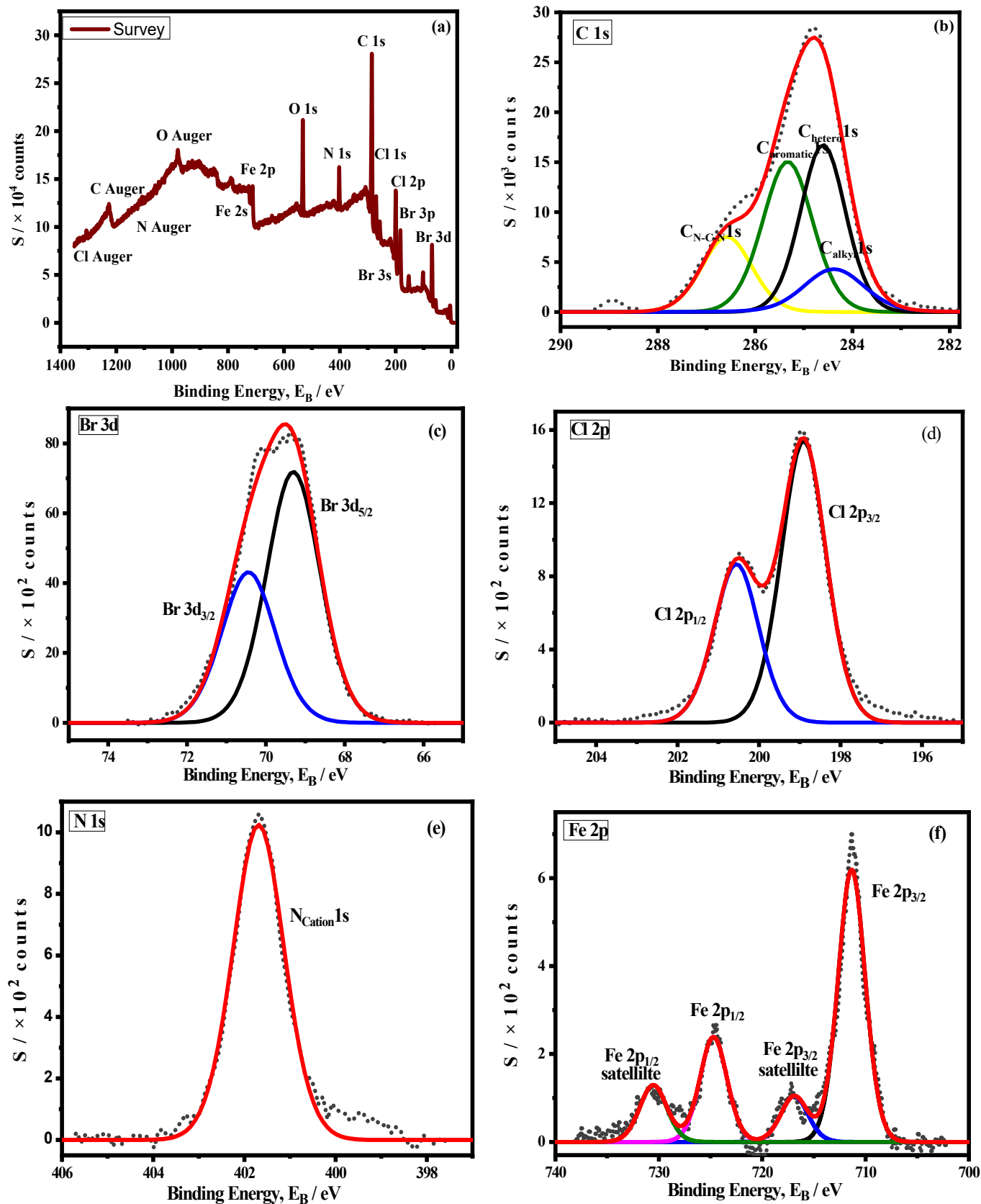


Fig.S18. High resolution XP spectra of (2) showing (a) full survey spectra, (b) peak fitted C 1s with structural assignment, (c) Br 3d, (d) Cl 2p, (e) N 1s and (f) Fe 2p

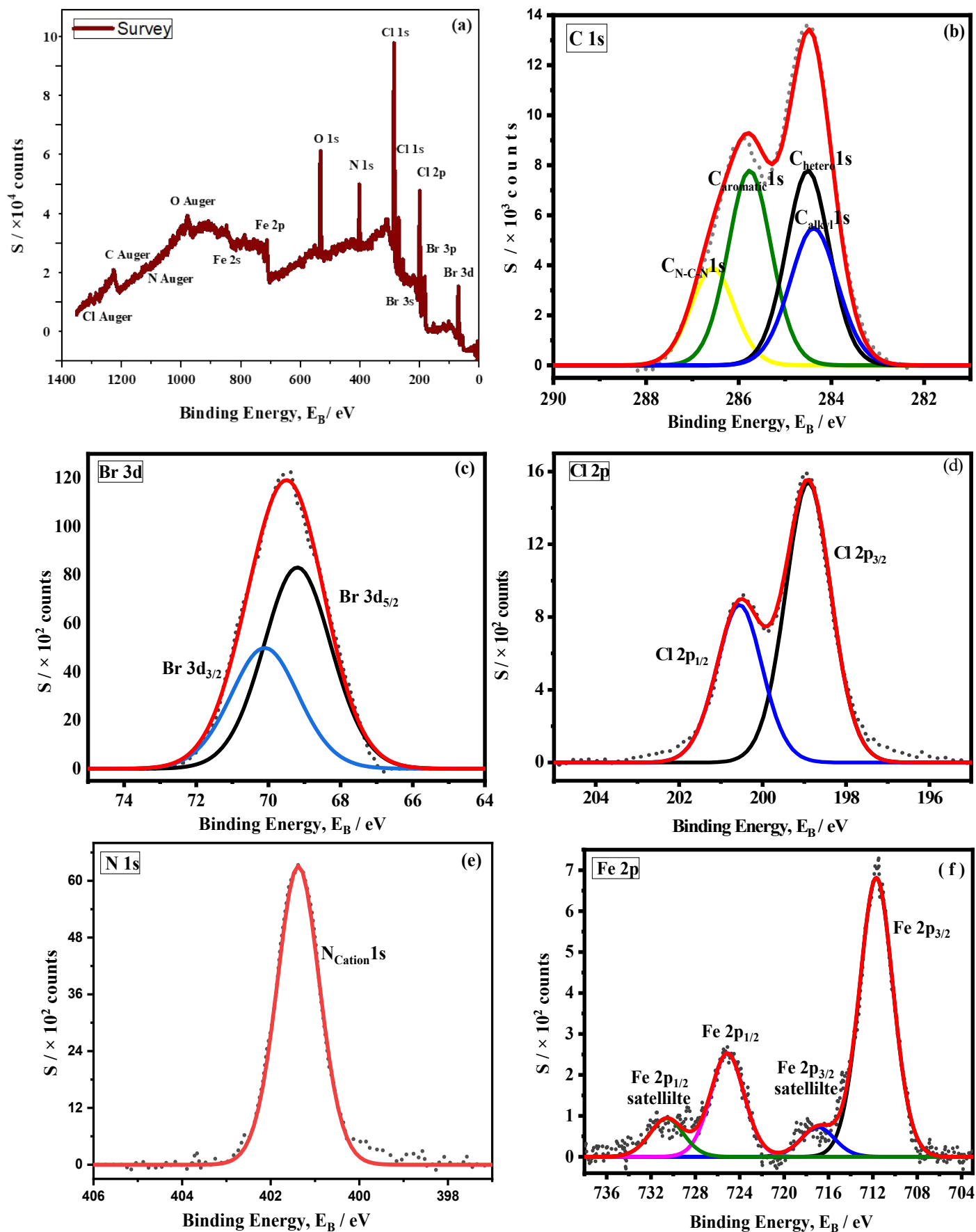


Fig.S19. High resolution XPS spectra of (3) showing (a) full survey spectra, (b) peak fitted C 1s with structural assignment, (c) Br 3d, (d) Cl 2p, (e) N 1s and (f) Fe 2p

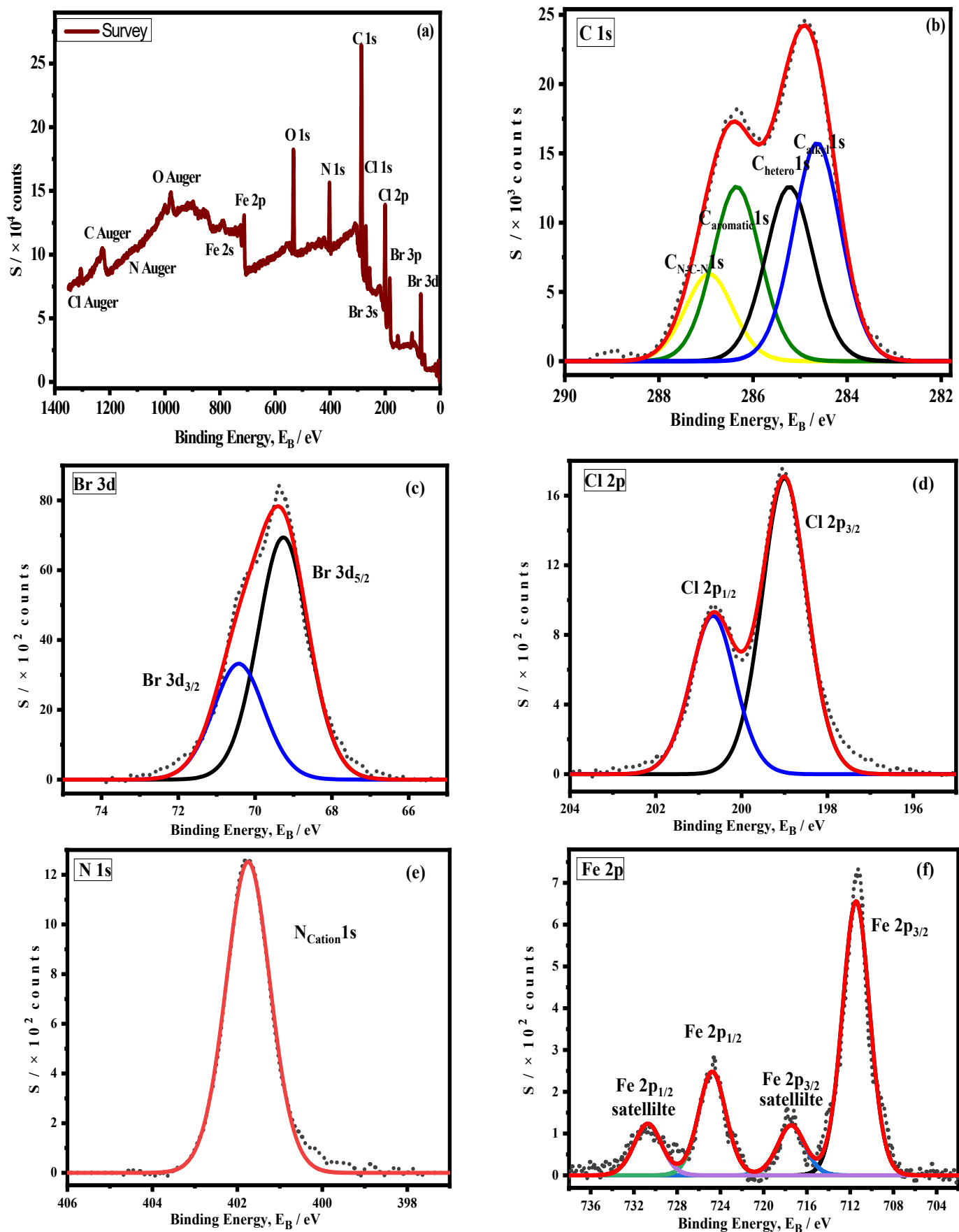


Fig.S20. High resolution XPS spectra of (4) showing (a) full survey spectra, (b) peak fitted C 1s with structural assignment, (c) Br 3d, (d) Cl 2p, (e) N 1s and (f) Fe 2p

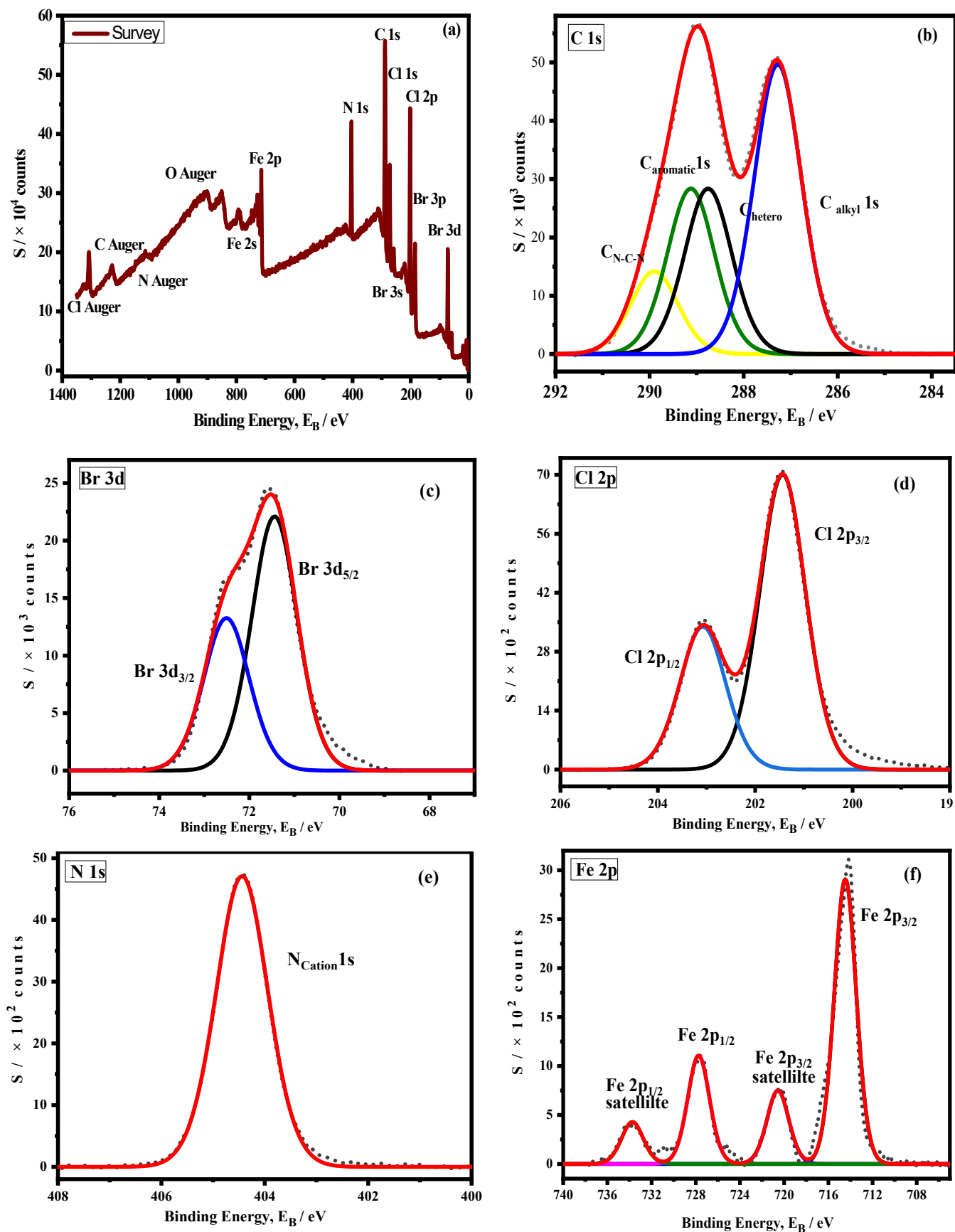


Fig.S21. High resolution XPS spectra of (5) showing (a) full survey spectra, (b) peak fitted C 1s with structural assignment, (c) Br 3d, (d) Cl 2p, (e) N 1s and (f) Fe 2p