

Cycloaddition of alkyl azides to fullerene C₆₀ in the presence of Cu(OTf)₂

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Characteristics of compounds 1c,e,g.

N-Ethylaziridino[2',3':1,9](C₆₀-I_h)[5,6]fullerene 1c: yield 33%. IR: 526, 565, 755, 1143, 1628, 2867, 2926 cm⁻¹. UV (CHCl₃), λ_{max}, nm: 256, 325, 424. ¹H NMR (500.17 MHz, CDCl₃:CS₂ 1:5): δ 1.80 (t, 3H, CH₃, *J* = 7.0 Hz), 3.74 (q, 2H, CH₂, *J* = 7.0 Hz). ¹³C NMR (125.76 MHz, CDCl₃:CS₂ 1:5): δ 14.63, 45.91, 85.37, 140.87, 142.23, 142.37, 142.96, 143.15, 143.84, 144.54, 144.61, 144.69, 145.18, 145.21 MALDI TOF: *m/z* 763.034 [M]⁻ (C₆₂NH₅).

N-Nonylaziridino[2',3':1,9](C₆₀-I_h)[5,6]fullerene 1e: yield 35%. IR: 526, 574, 794, 1171, 1619, 2851, 2923 cm⁻¹. UV (CHCl₃), λ_{max}, nm: 259, 325, 424. ¹H NMR (500.17 MHz, CDCl₃:CS₂ 1:5): δ 0.96 (t, 3H, CH₃, *J* = 7 Hz), 1.49–1.37 (m, 8H, 4CH₂), 1.58 (m, 2H, CH₂), 1.82 (m, 2H, CH₂), 2.18 (m, 2H, CH₂), 3.68 (t, 2H, CH₂, *J* = 7 Hz). ¹³C NMR (125.76 MHz, CDCl₃:CS₂ 1:5): δ 14.70, 23.38, 27.89, 29.89, 30.02, 30.17, 30.26, 32.42, 51.26, 85.52, 140.88, 142.24, 142.39, 142.97, 143.16, 143.86, 144.54, 144.61, 144.69, 145.17, 145.21. MALDI TOF: *m/z* 861.152 [M]⁻ (C₆₉NH₁₉).

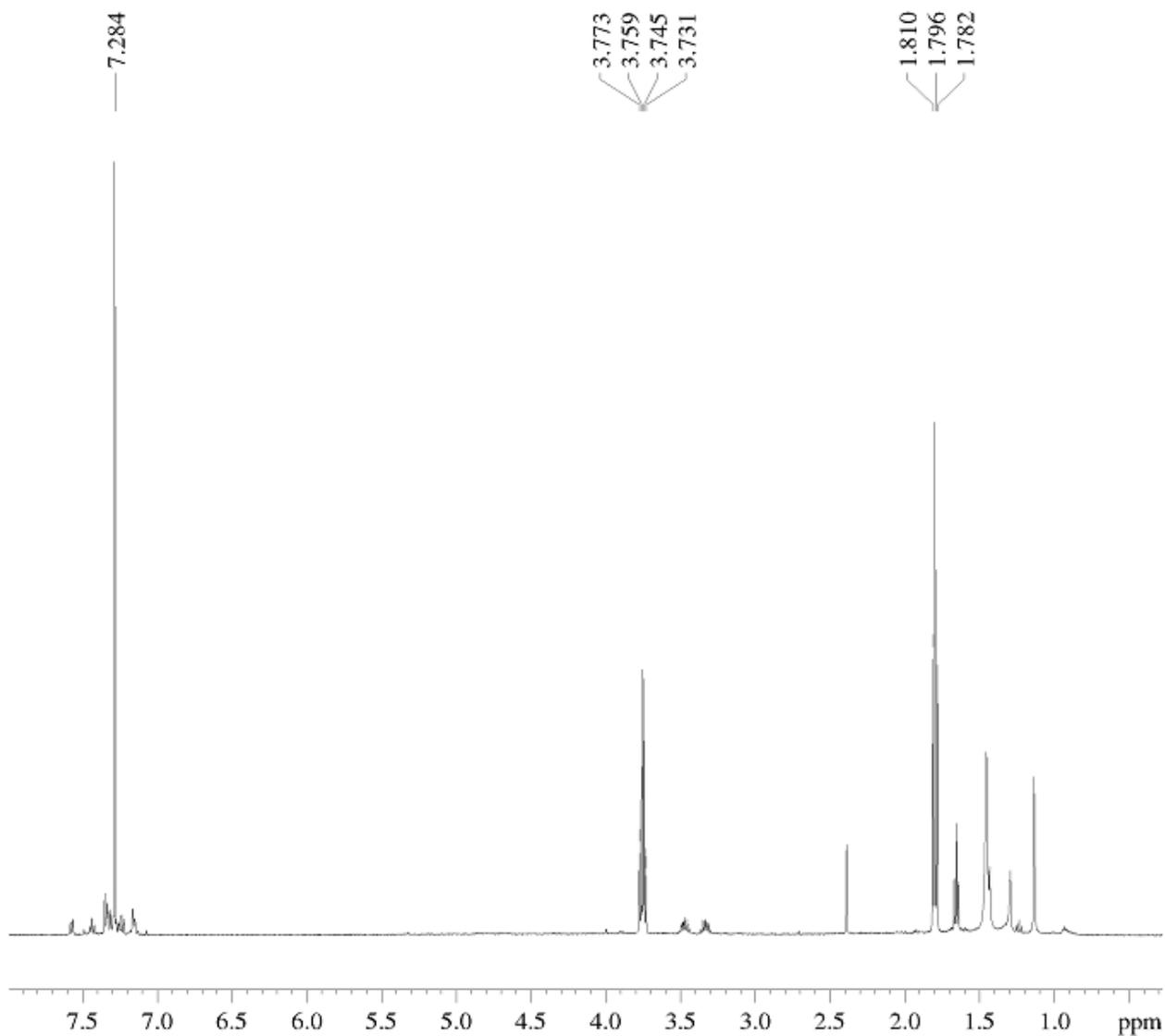
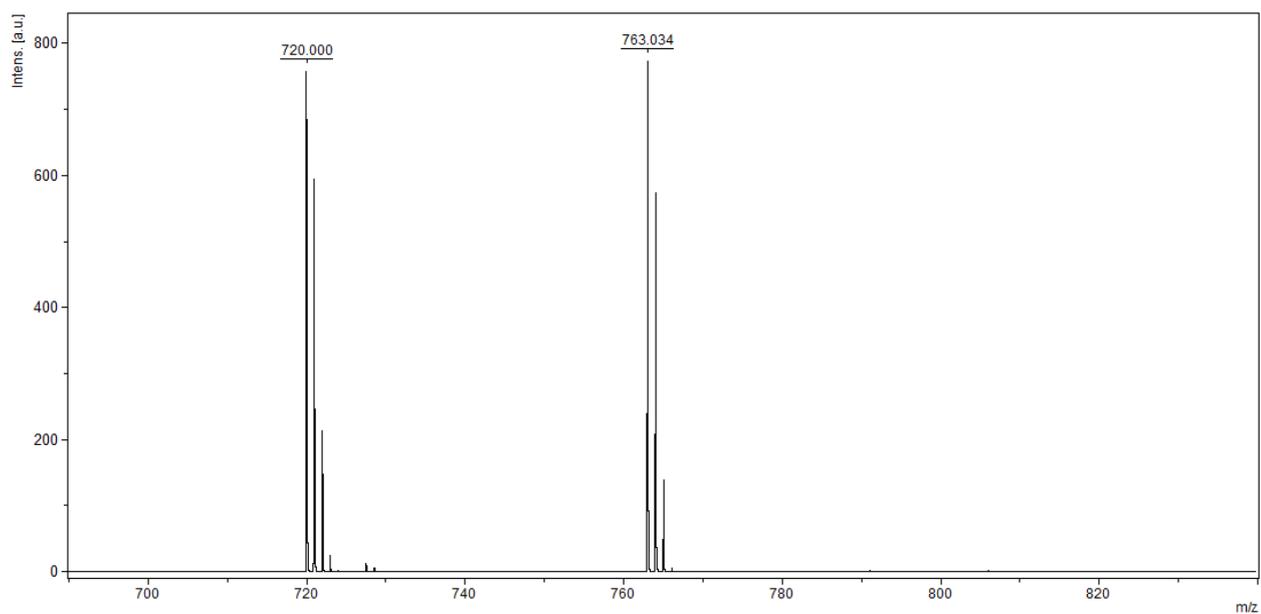
N-Cyclooctylaziridino[2',3':1,9](C₆₀-I_h)[5,6]fullerene 1g: yield 27%. IR: 526, 571, 755, 1183, 1631, 2852, 2920 v/cm⁻¹. UV (CHCl₃), λ_{max}, nm: 257, 325, 424. ¹H NMR (500.17 MHz, CDCl₃:CS₂ 1:5): δ 1.46–1.29 (m, 2H, CH₂), 1.88–1.71 (m, 4H, 2CH₂), 2.12–2.09 (m, 4H, 2CH₂), 2.40 (m, 4H, 2CH₂), 3.62 (m, H, CH). ¹³C NMR (125.76 MHz, CDCl₃:CS₂ 1:5): δ 24.77, 26.51, 27.88, 31.72, 60.01, 85.76, 140.83, 142.23, 142.44, 142.98, 143.15, 143.86, 144.52, 144.61, 144.67, 145.17, 145.21. MALDI TOF: *m/z* 845.183 [M]⁻ (C₆₈NH₁₅).

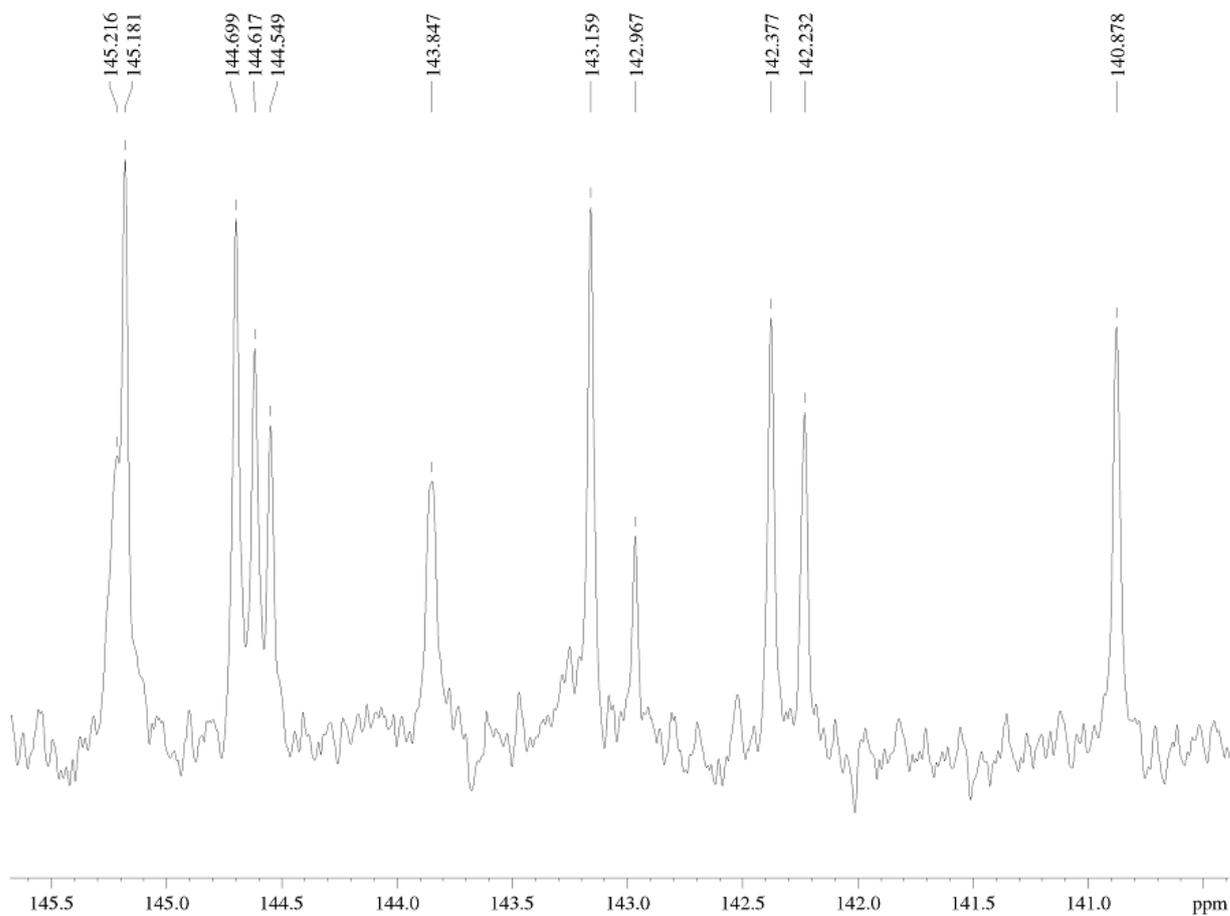
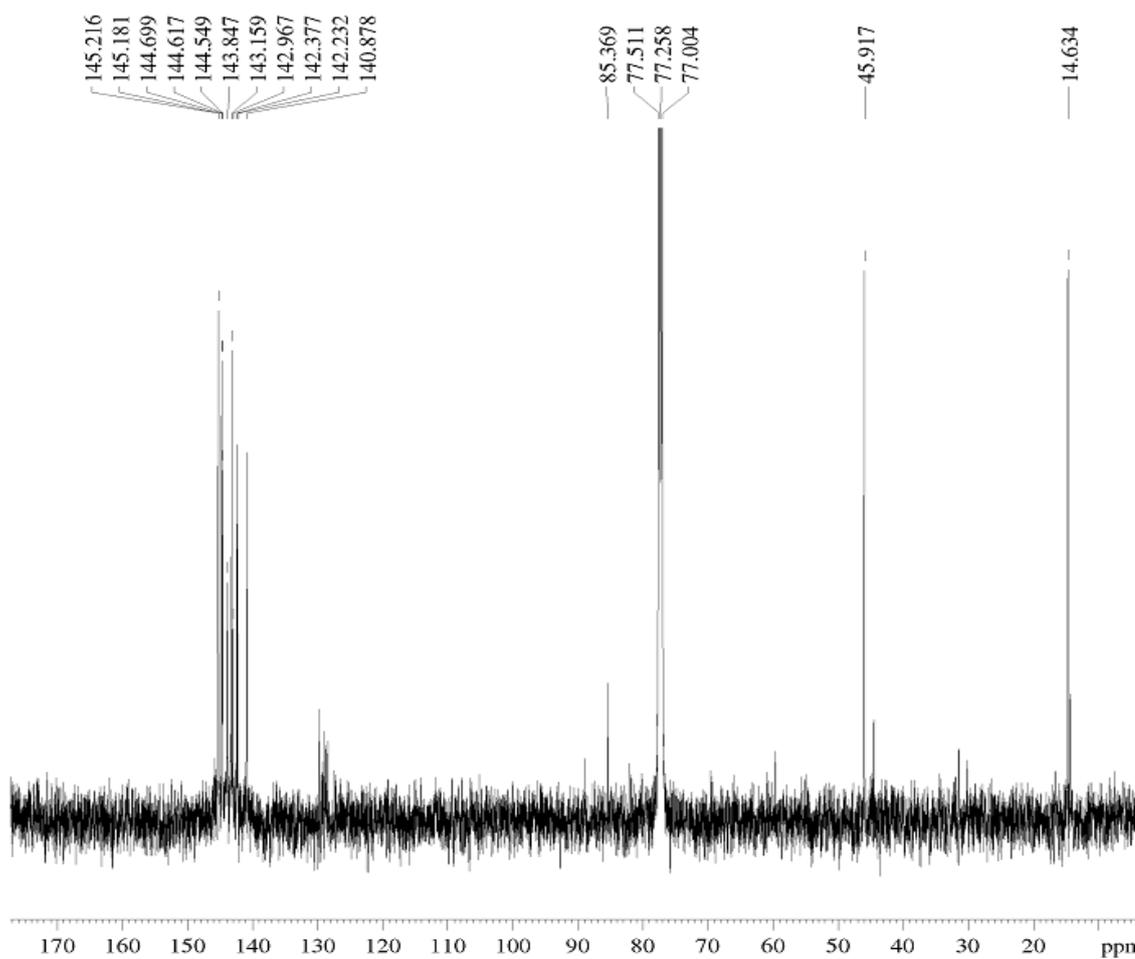
MALDI TOF Experiments

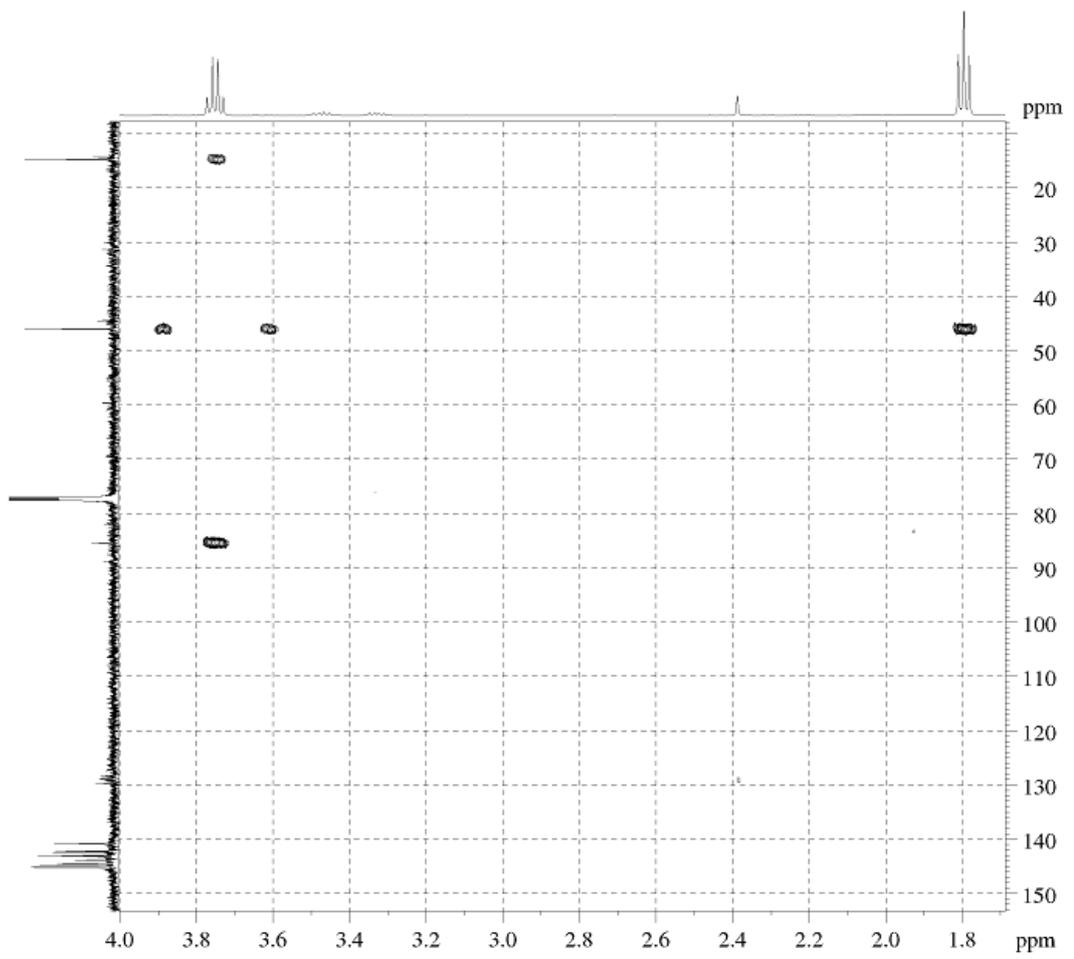
MALDI MS spectra were recorded in both reflection negative and positive ion modes on a BRUKER Autoflex III MALDI-TOF/TOF SmartBeam mass spectrometer using elemental sulfur as a matrix. The sample preparation for the MALDI MS spectrometry analysis was performed by using the dry drop method: the solutions of matrix and analyte (50:1 –100:1) were mixed in a separate test tube, then the drop of the solution was deposited on the target and dried in a warm air stream. The sample was vaporized with laser impulses (200 impulses with the frequency of 100 Hz). A solid-state UV laser with 355 nm wavelength was used.

Identification of compounds

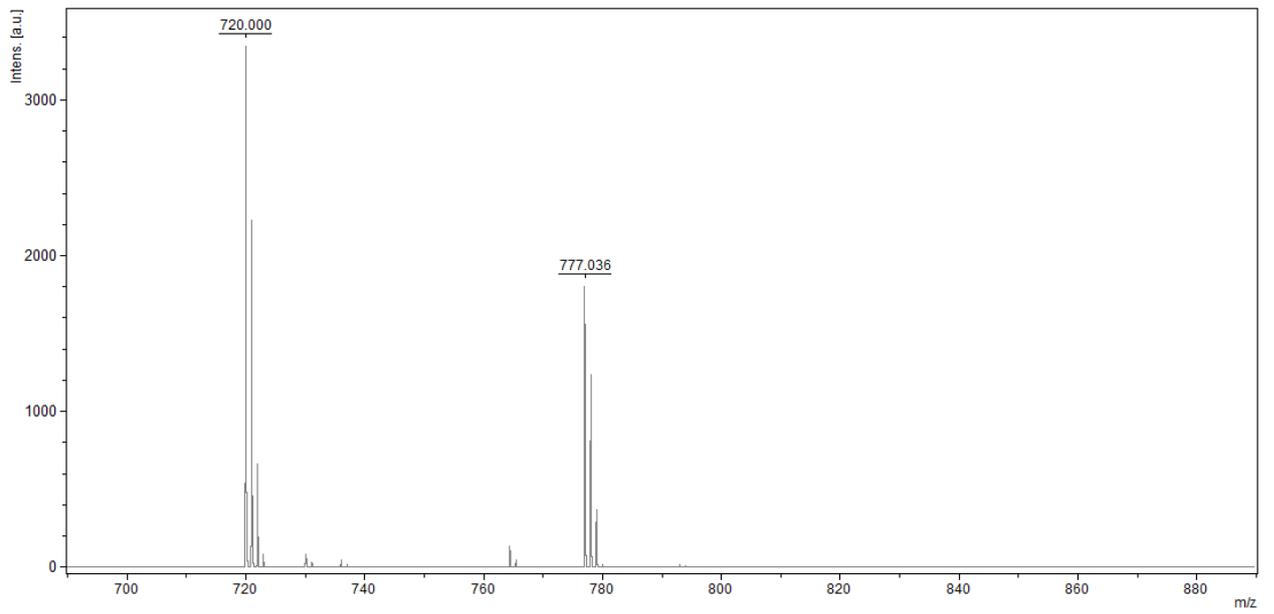
Compound 1c

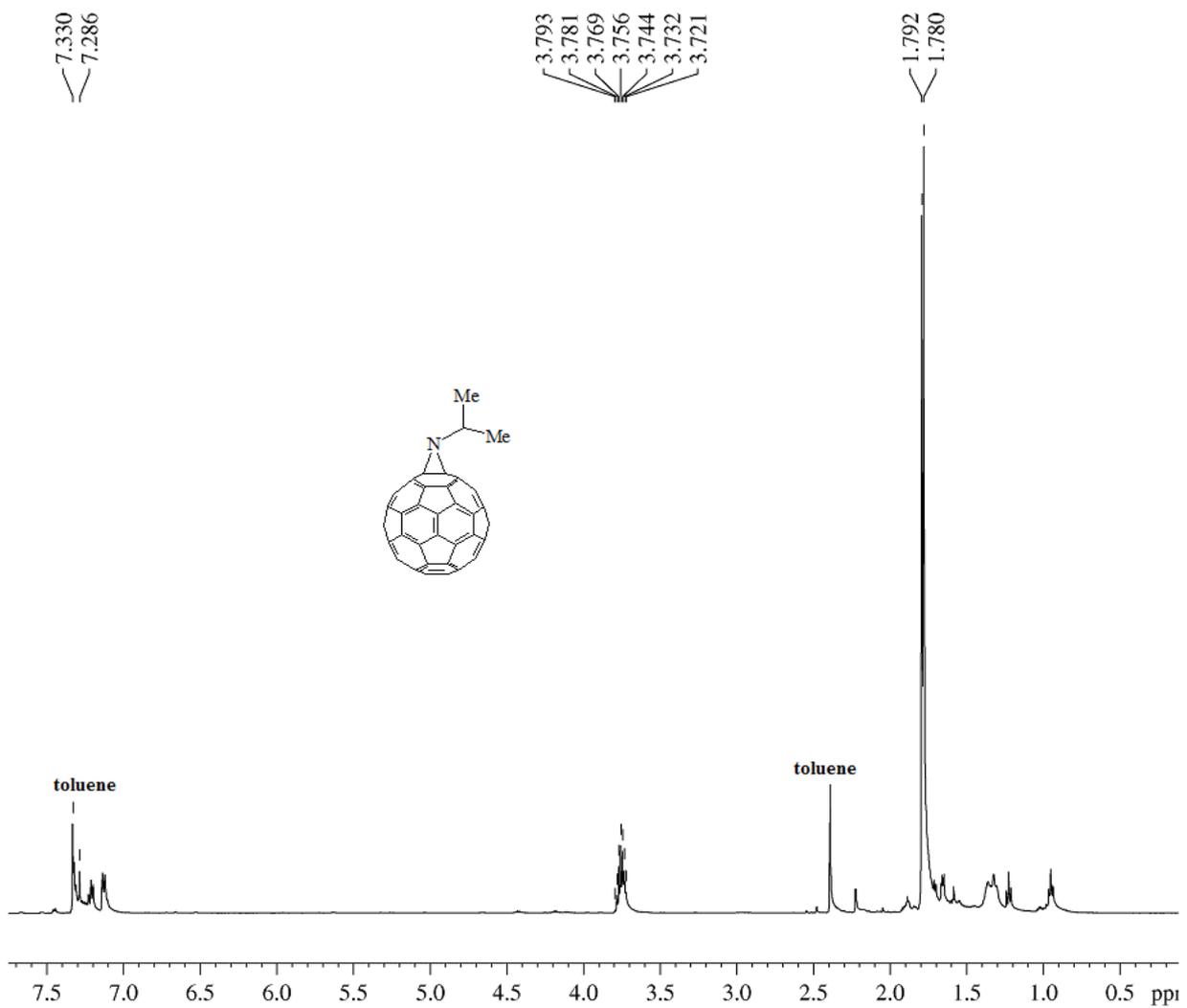


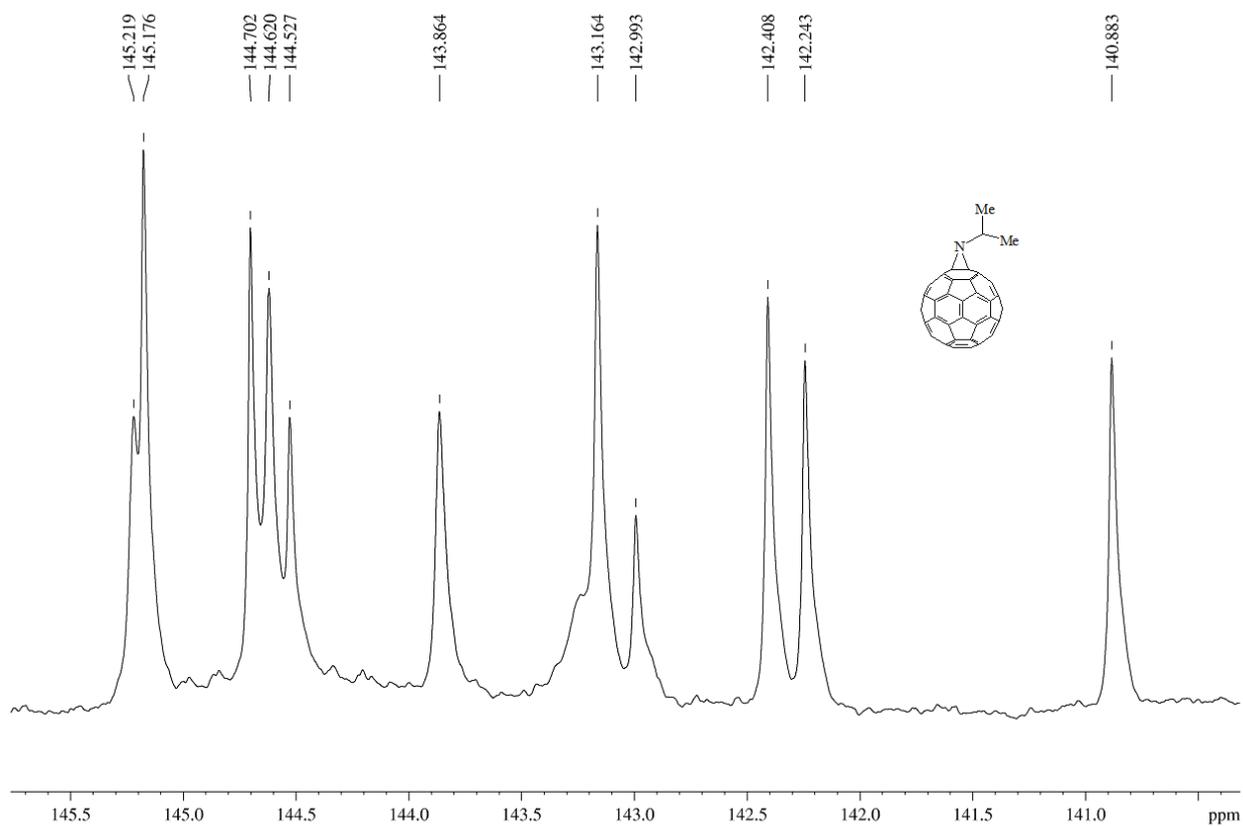
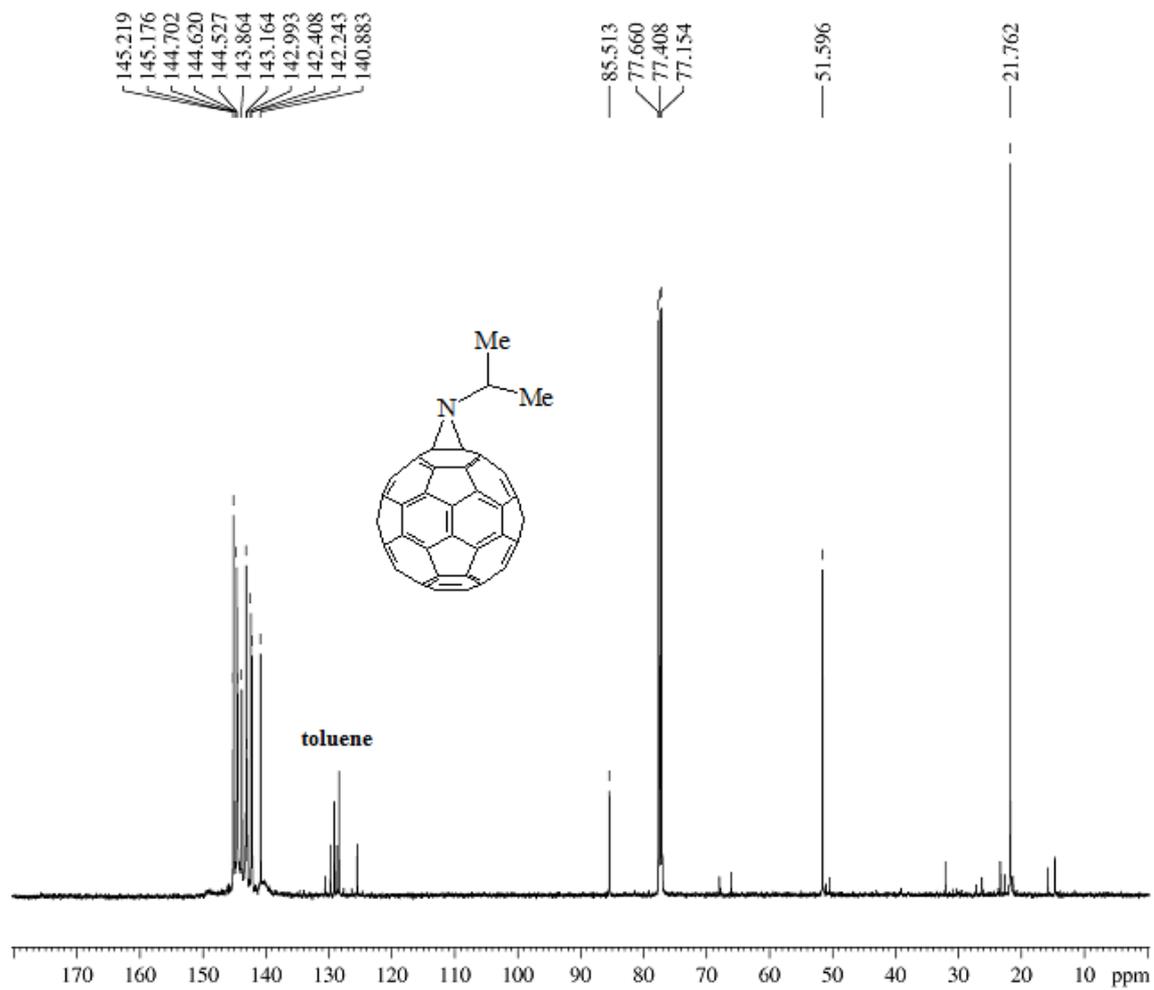


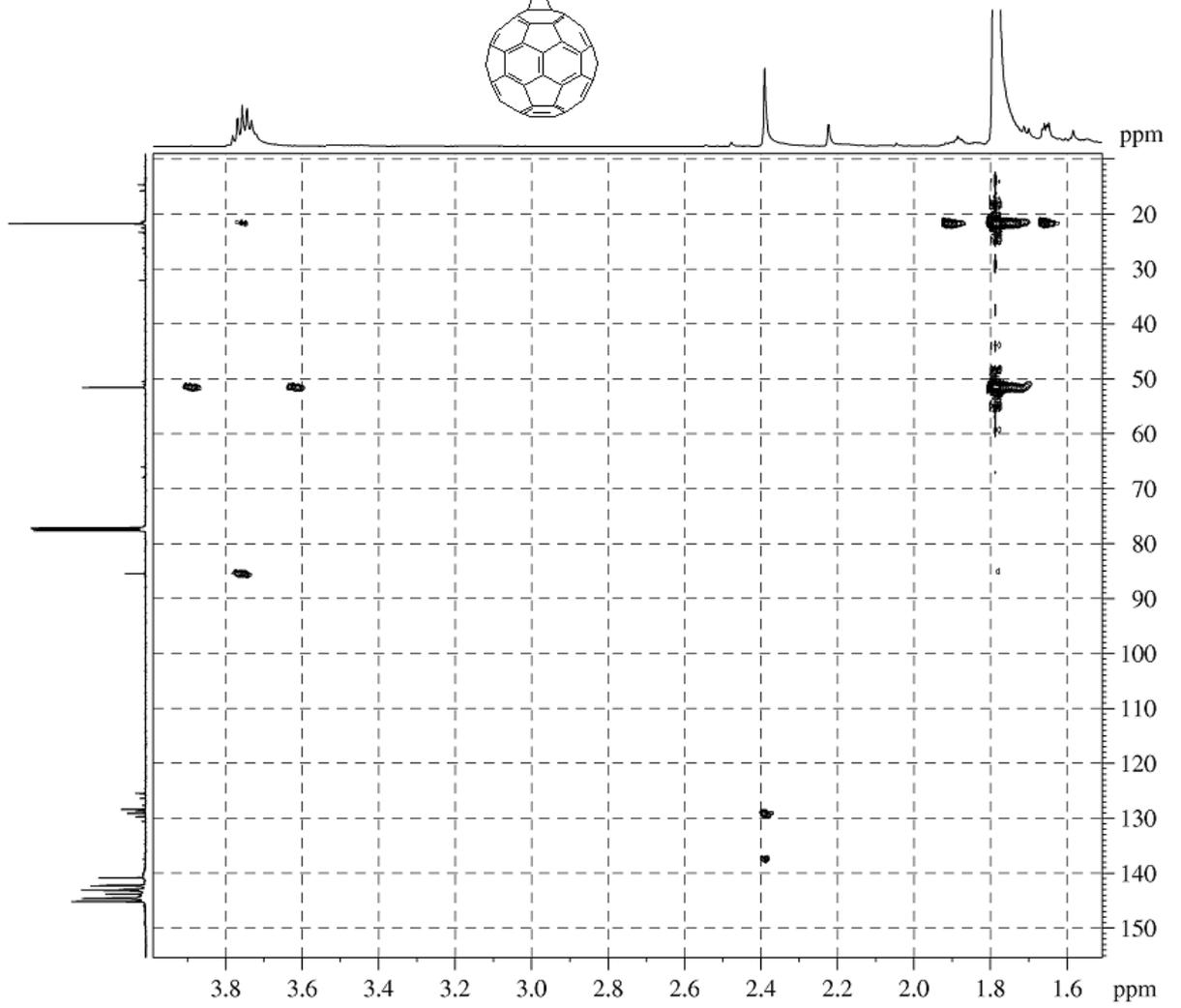
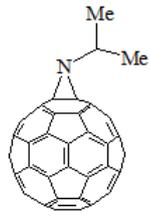


Compound 1d

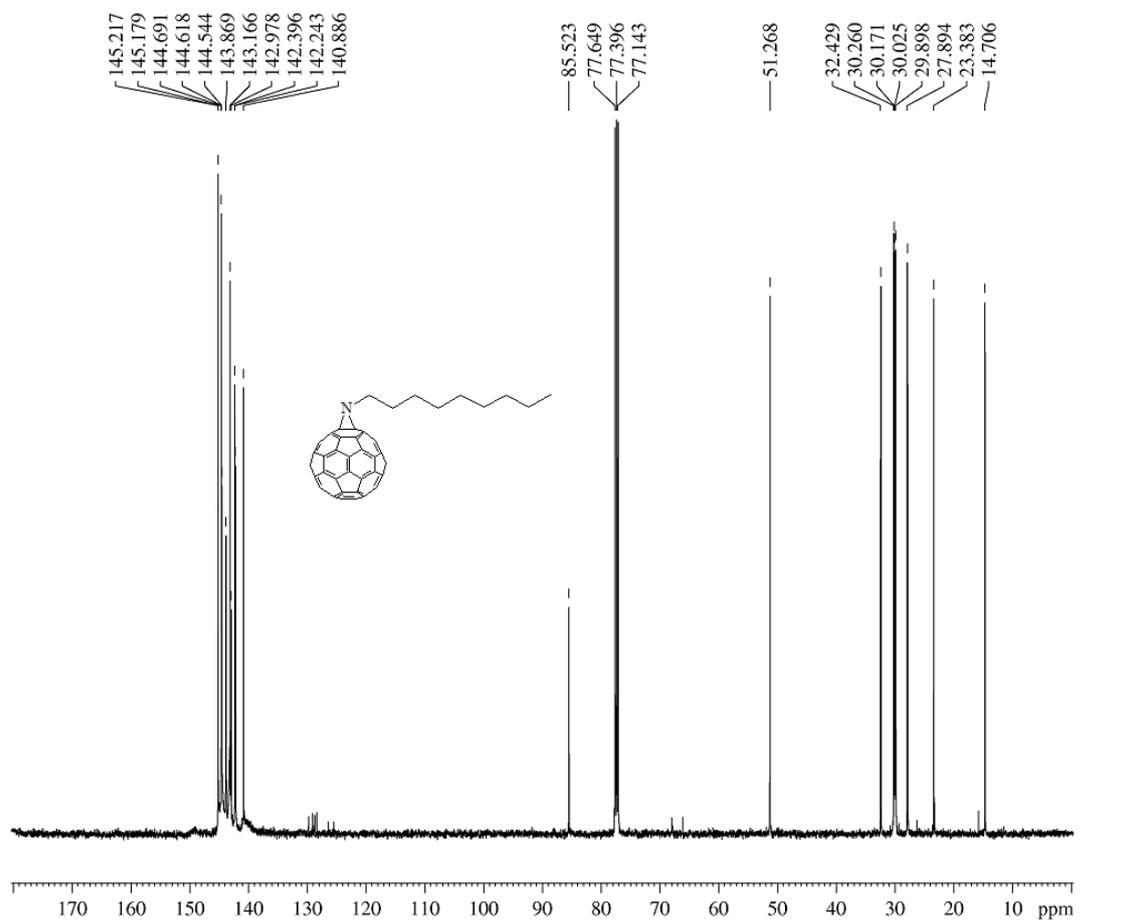
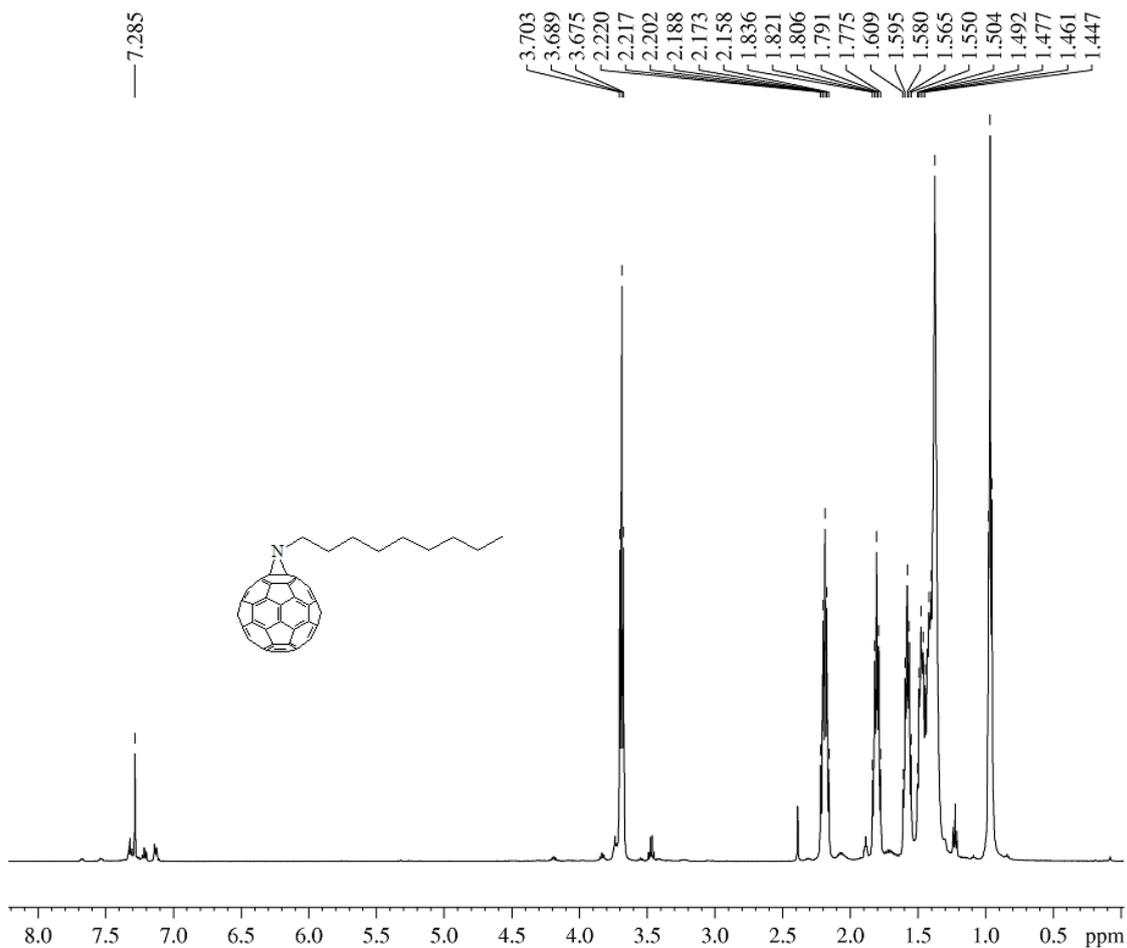


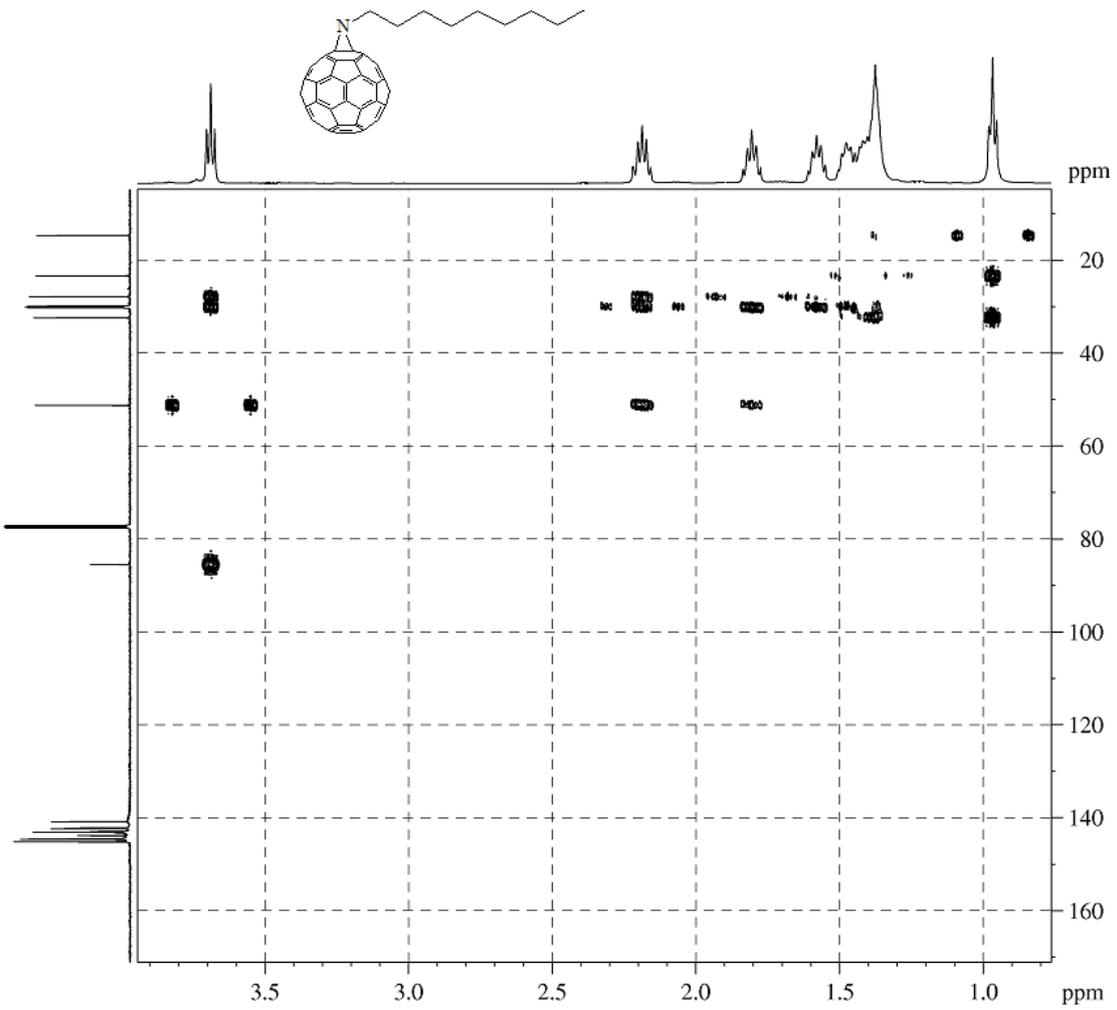
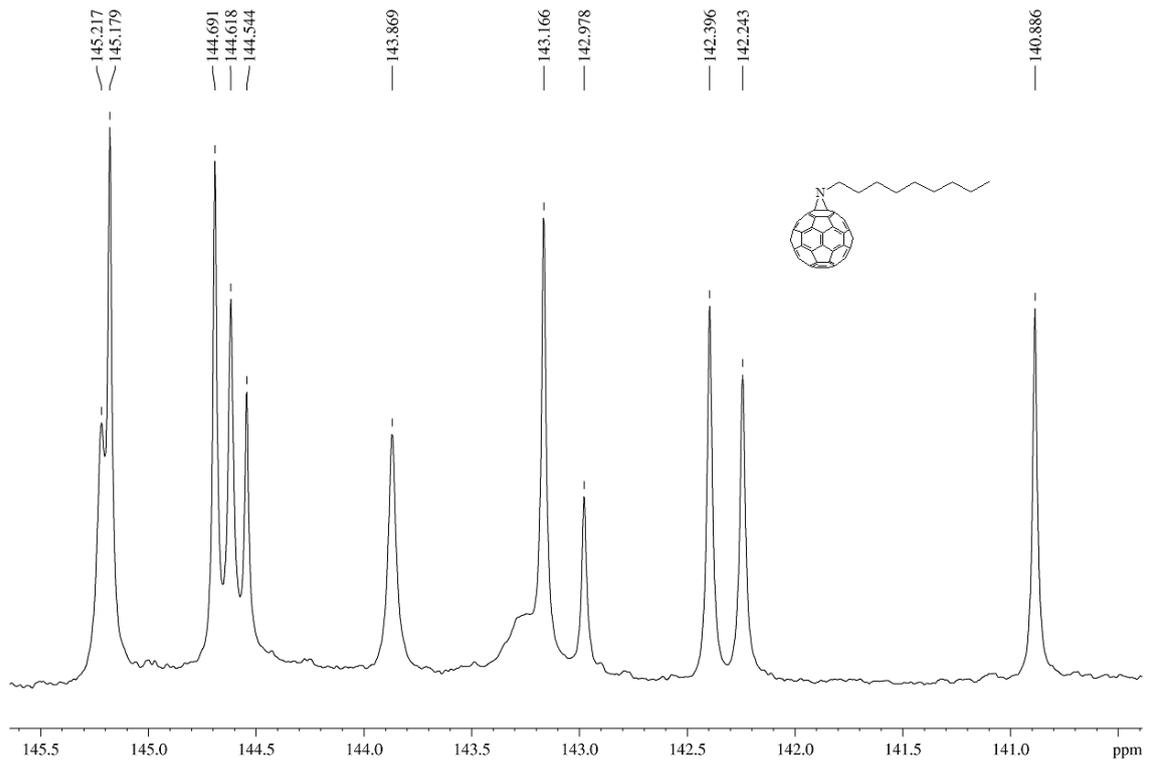




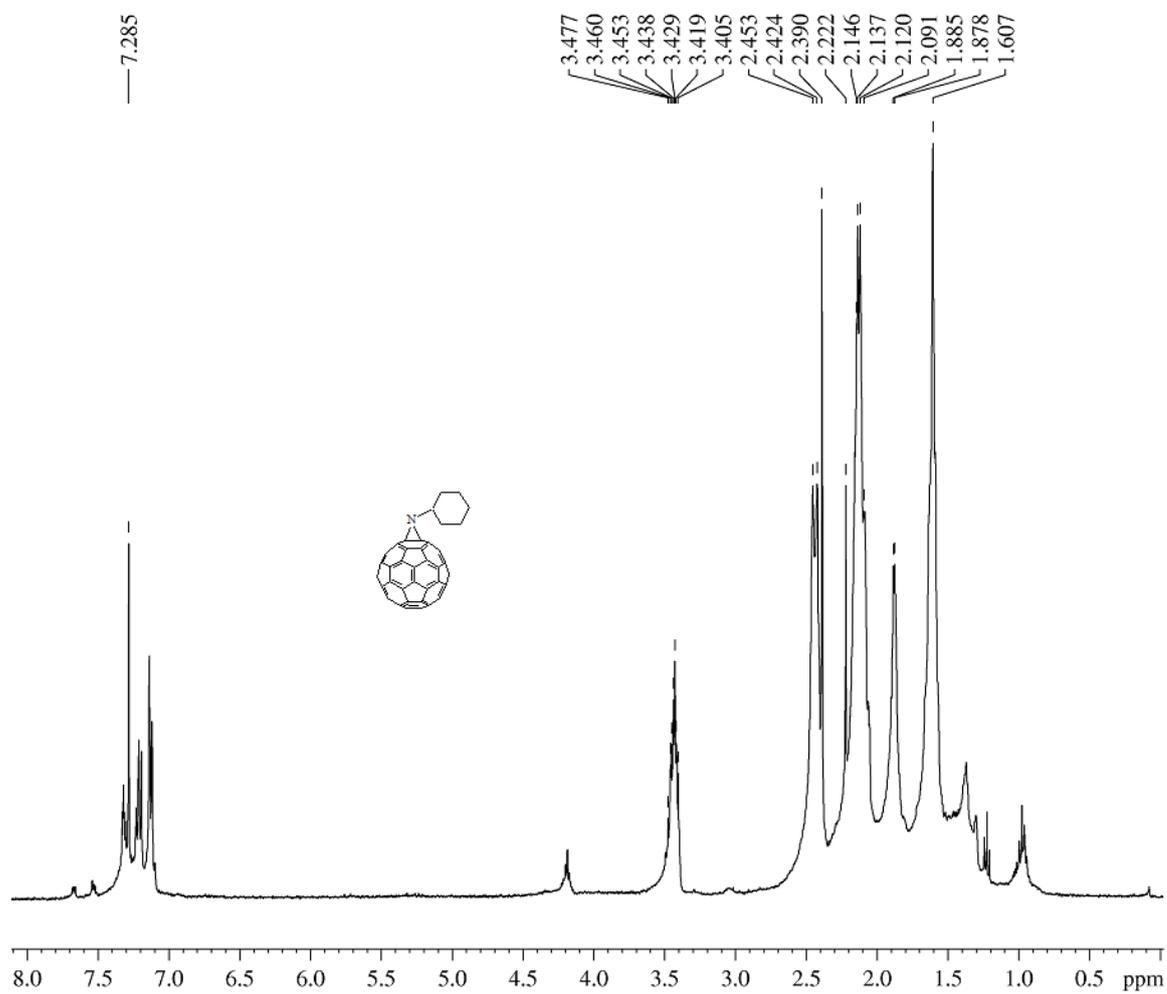
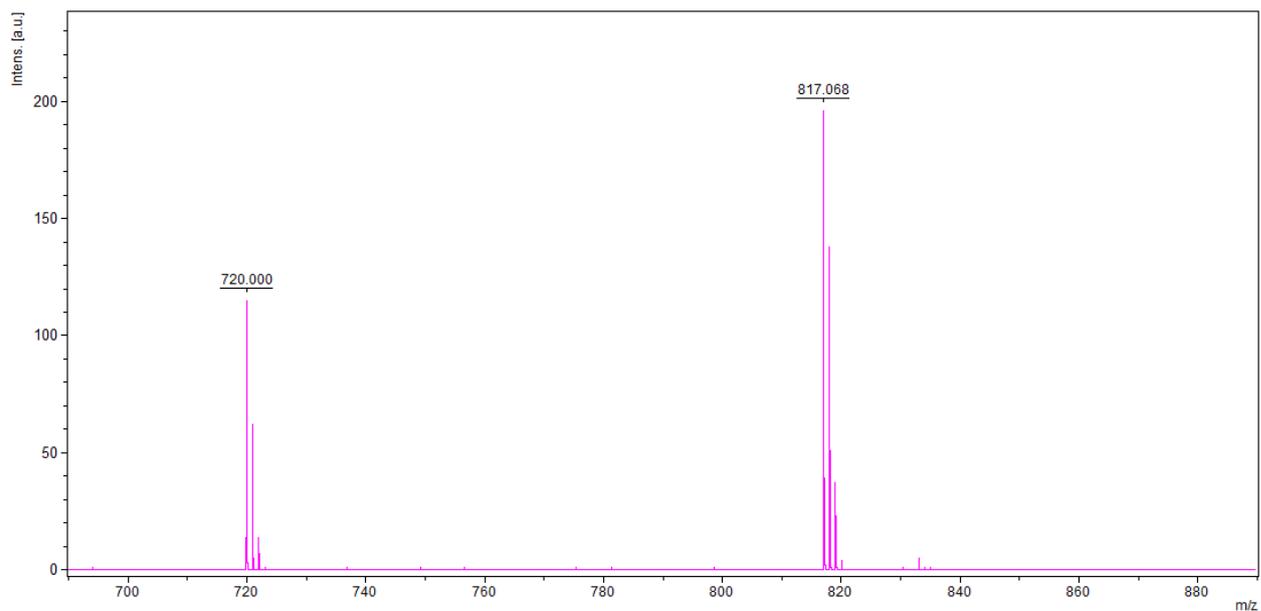


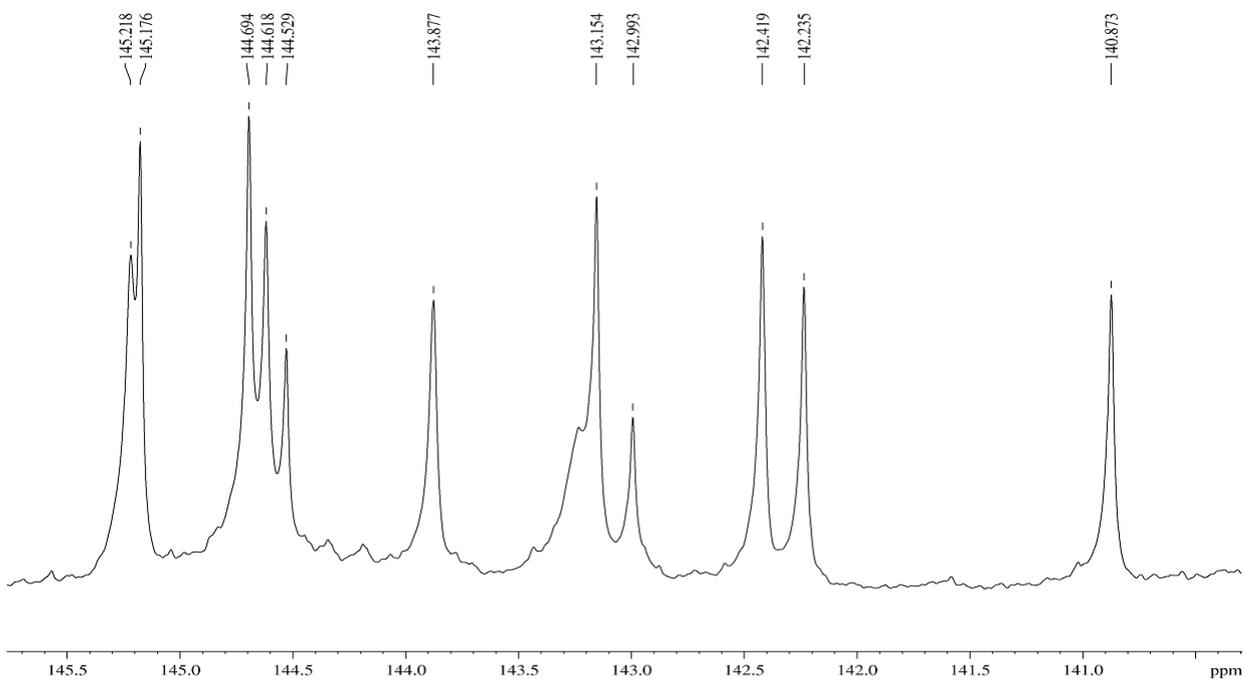
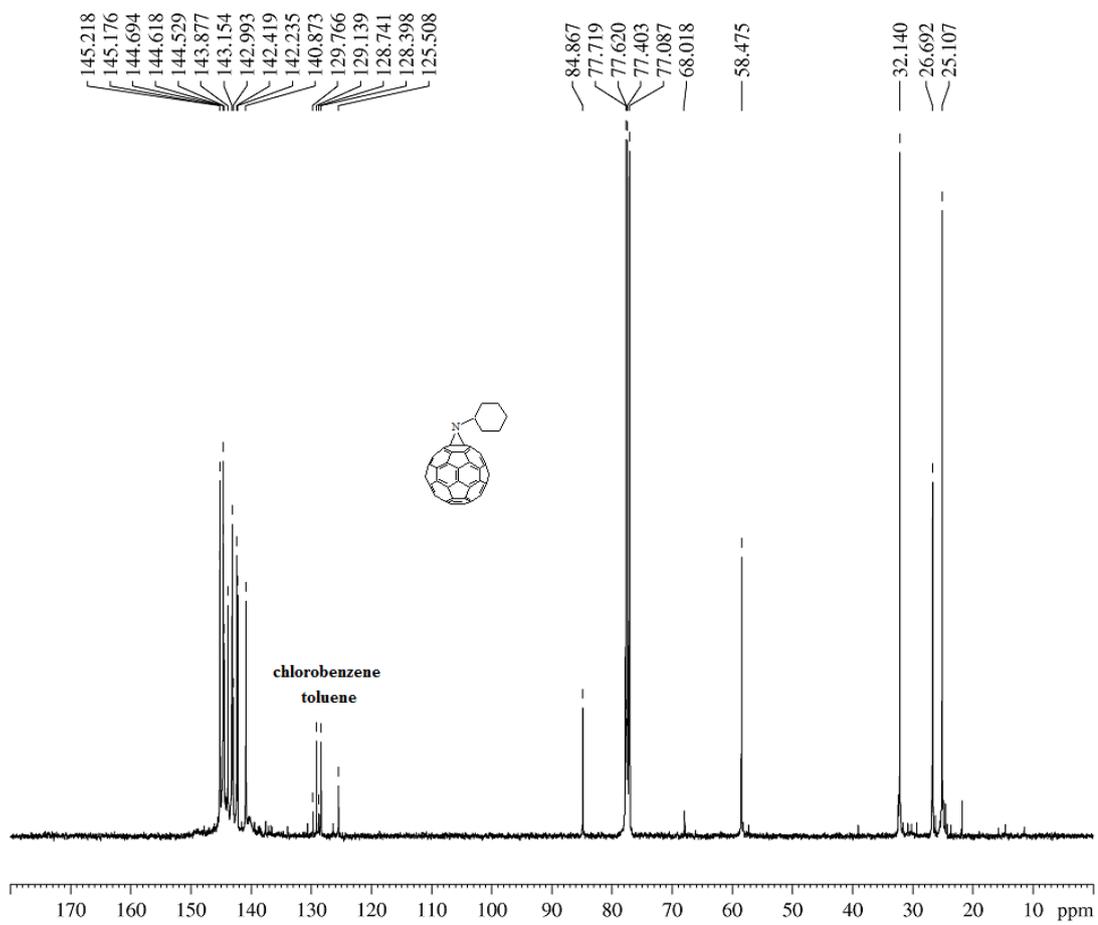
Compound 1e

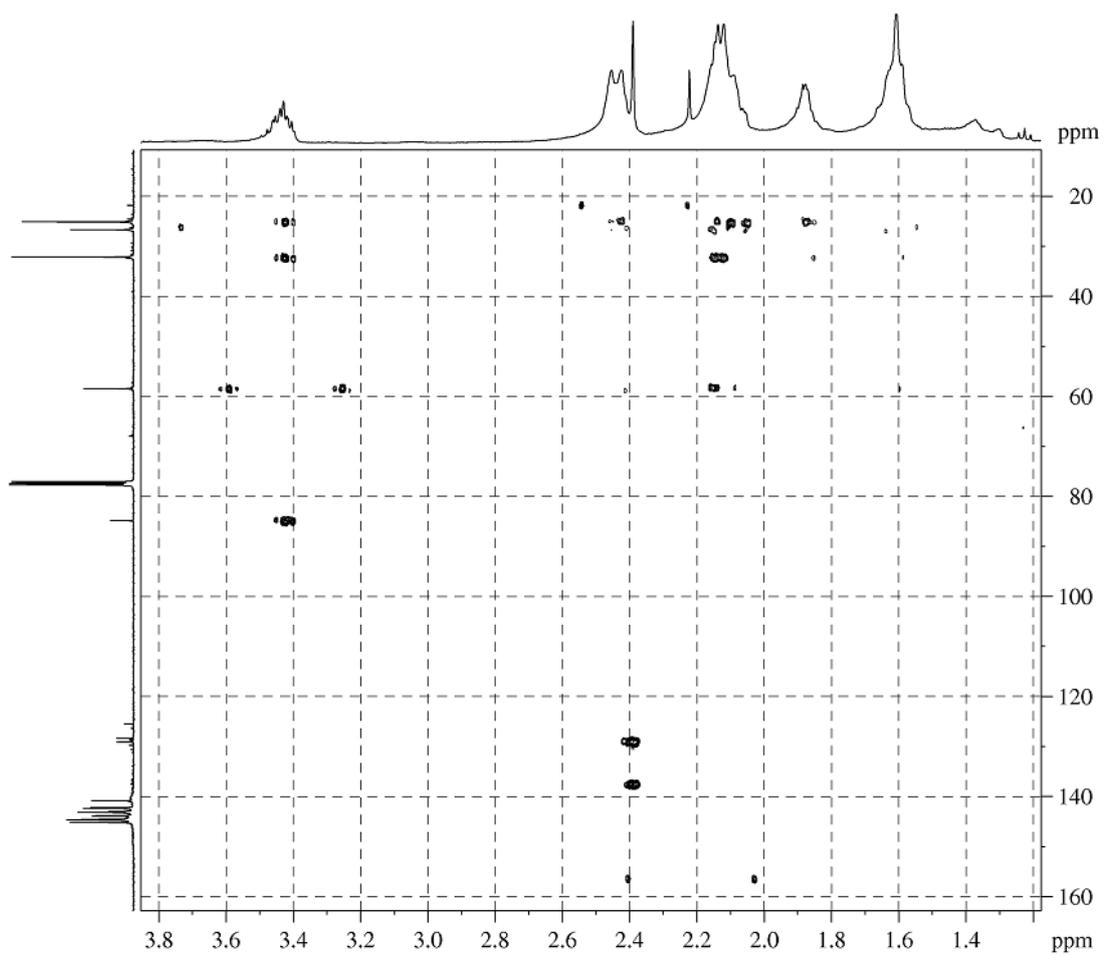




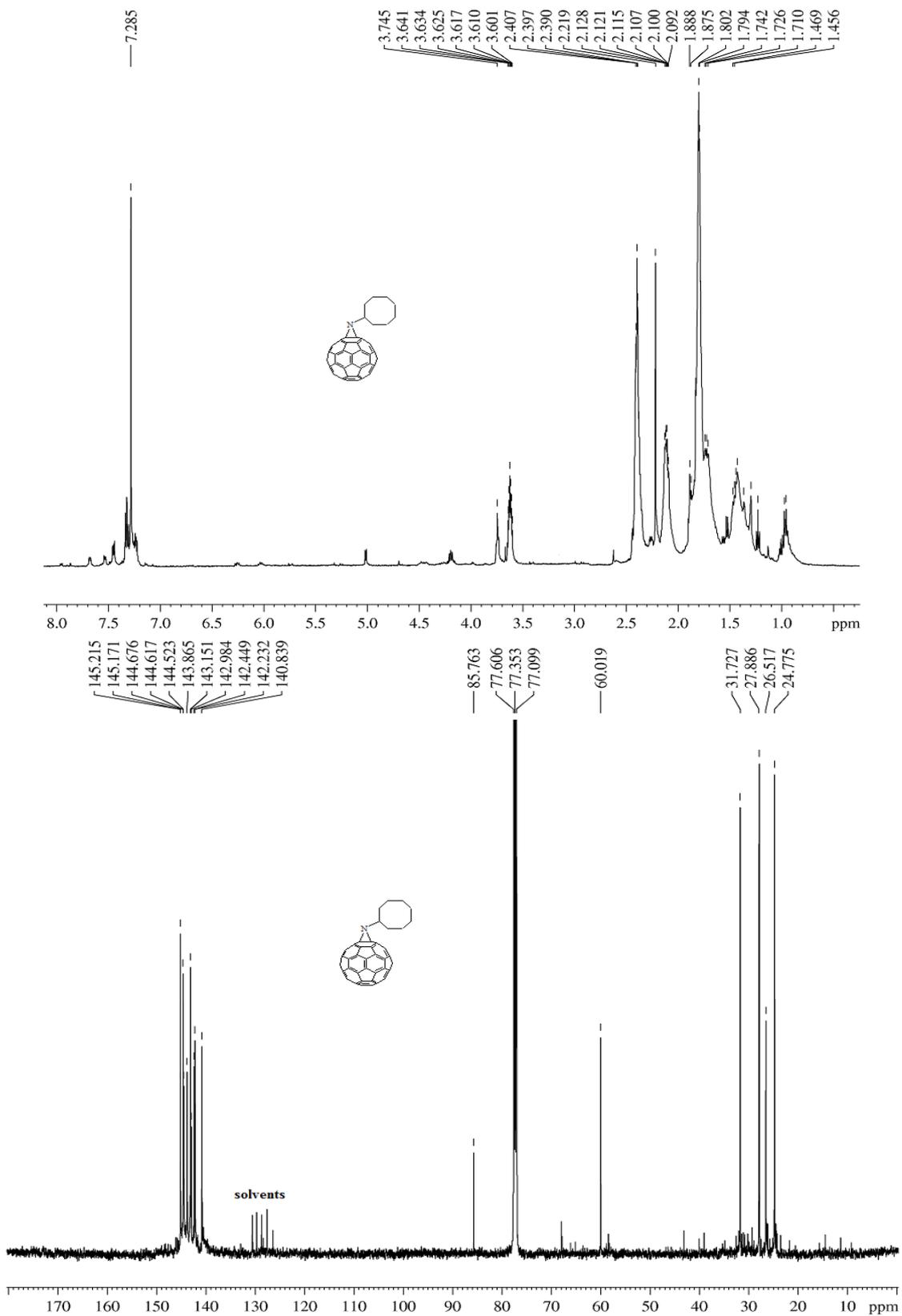
Compound 1f

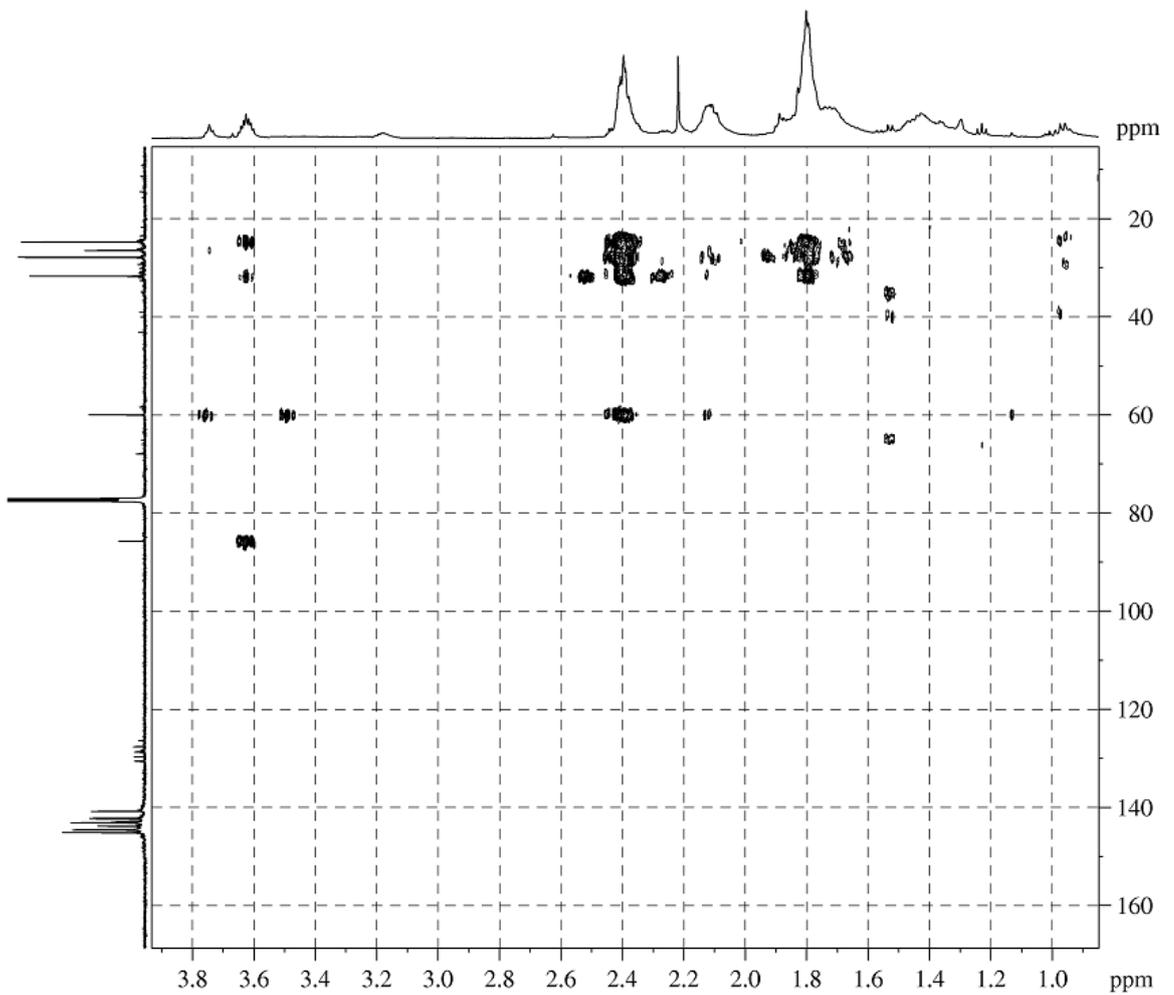
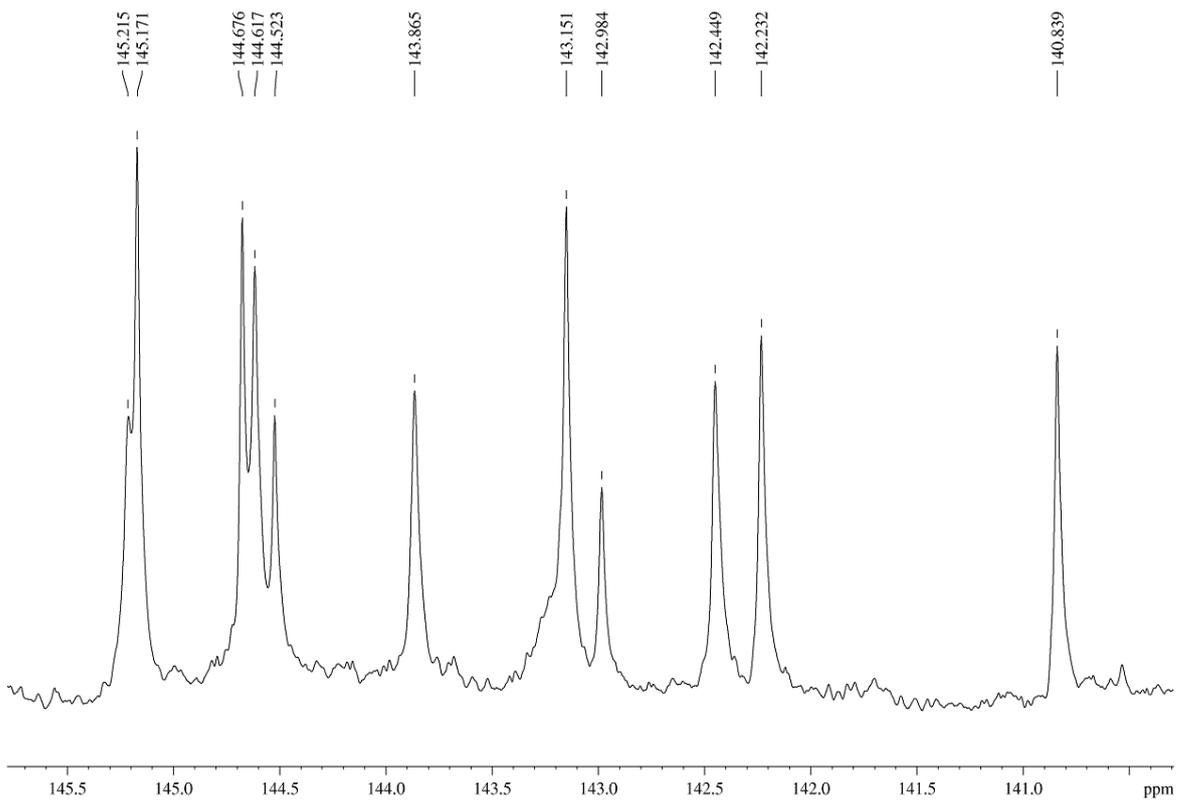




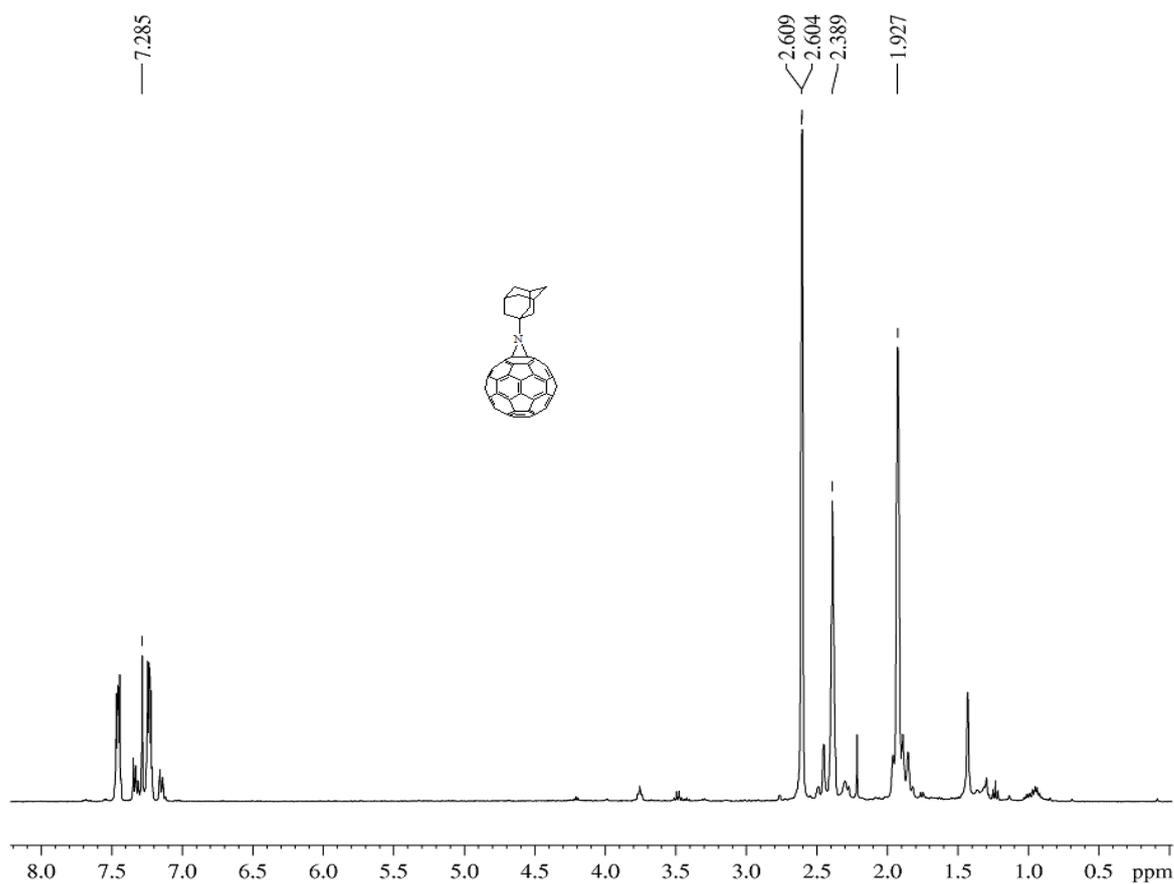
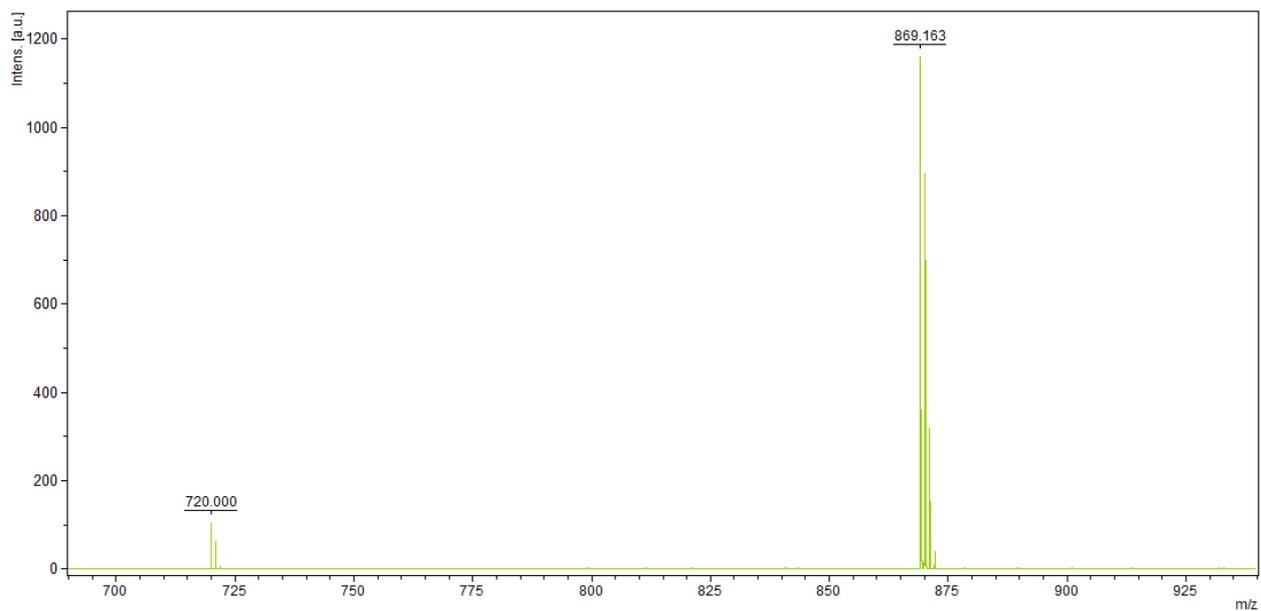


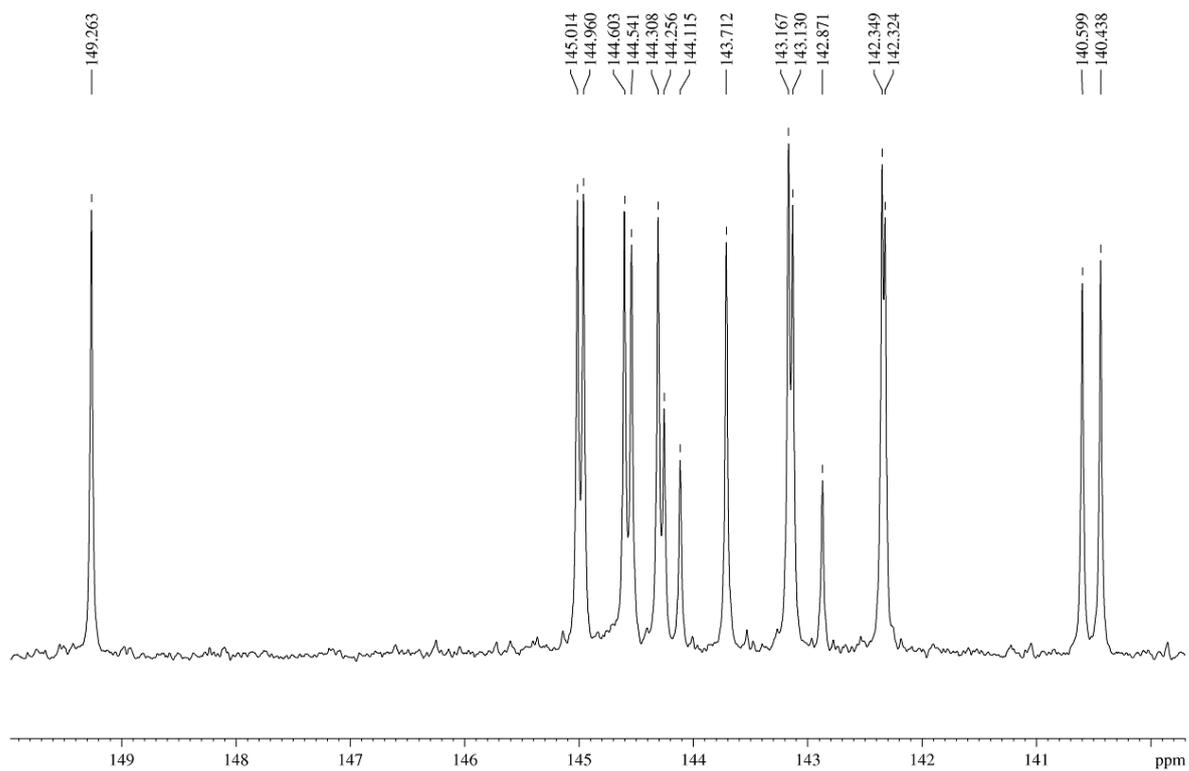
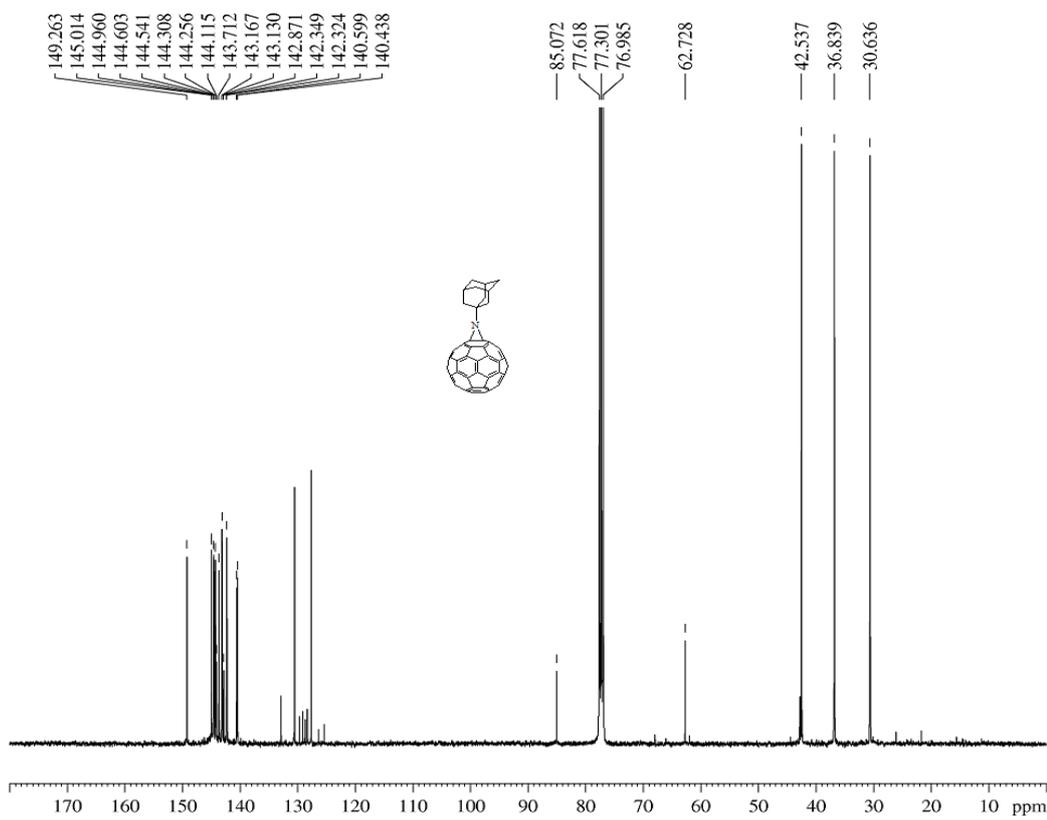
Compound 1g

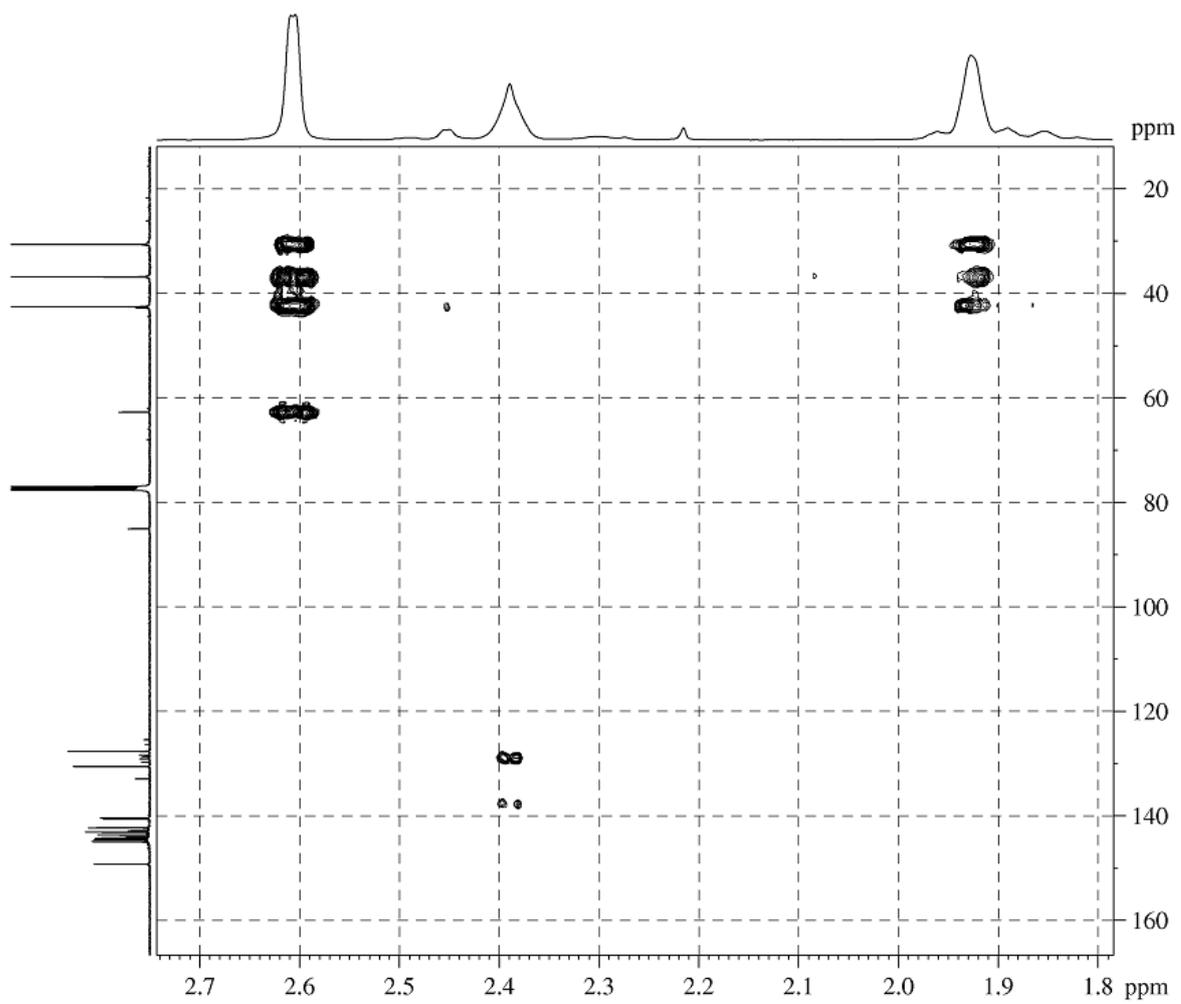




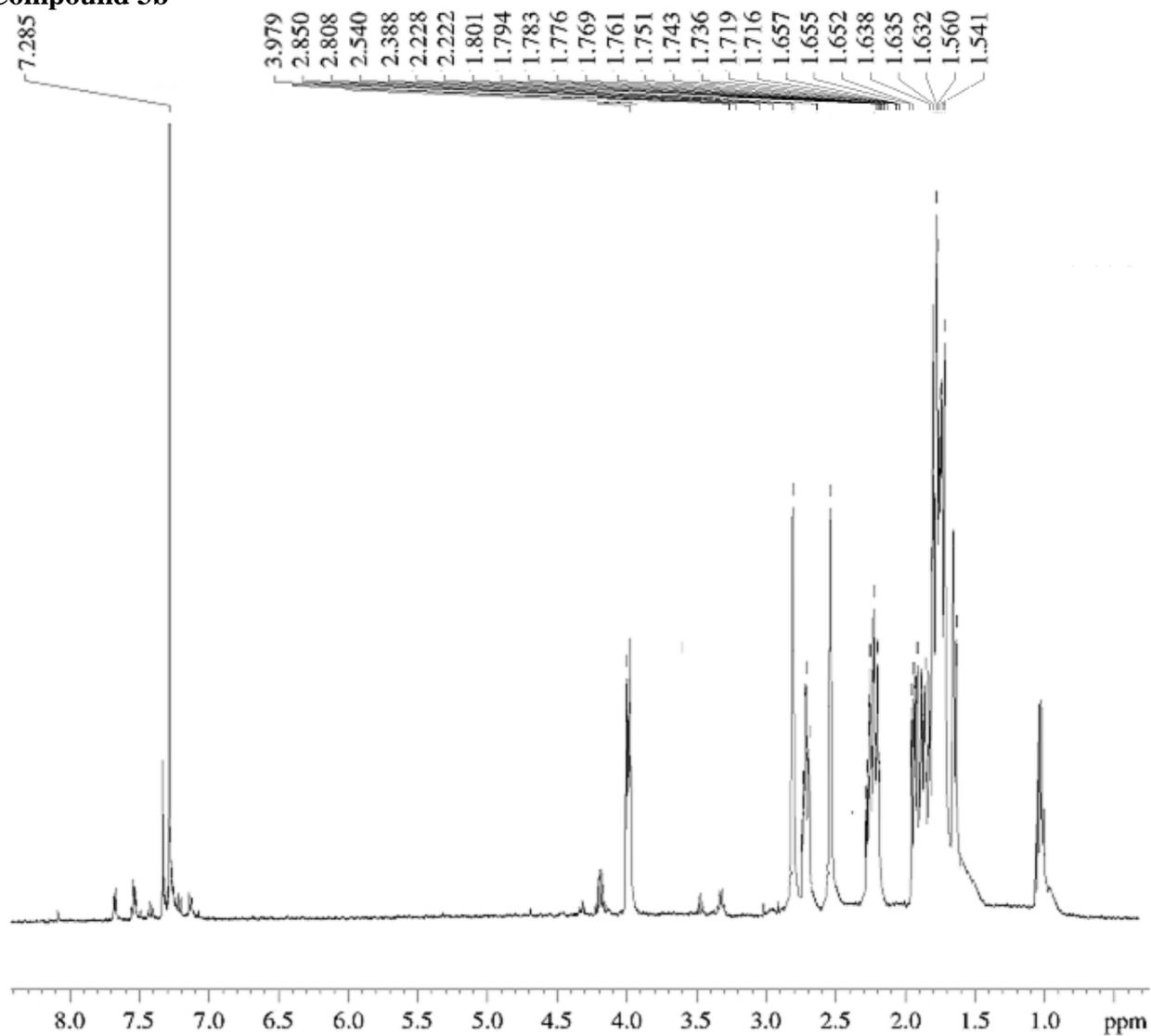
Compound 3a

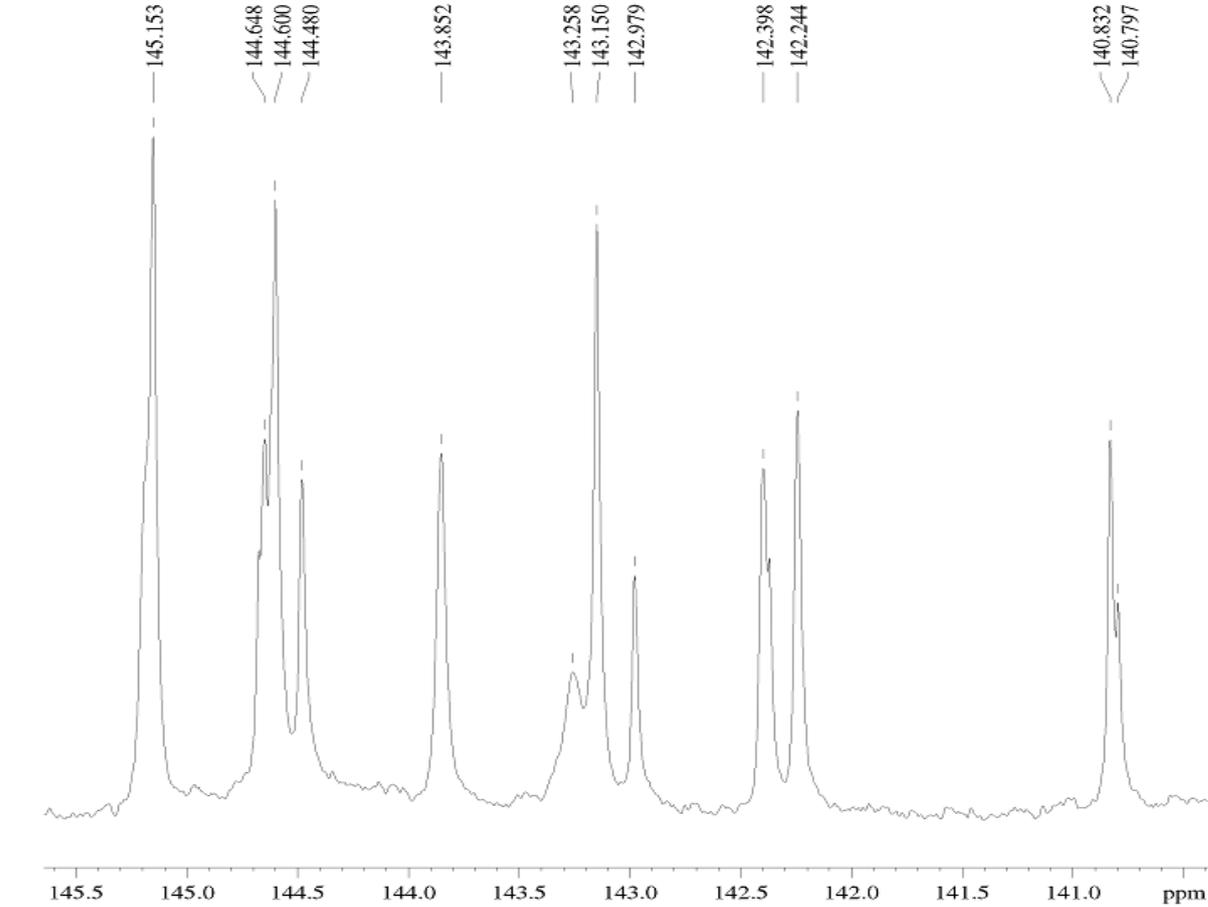
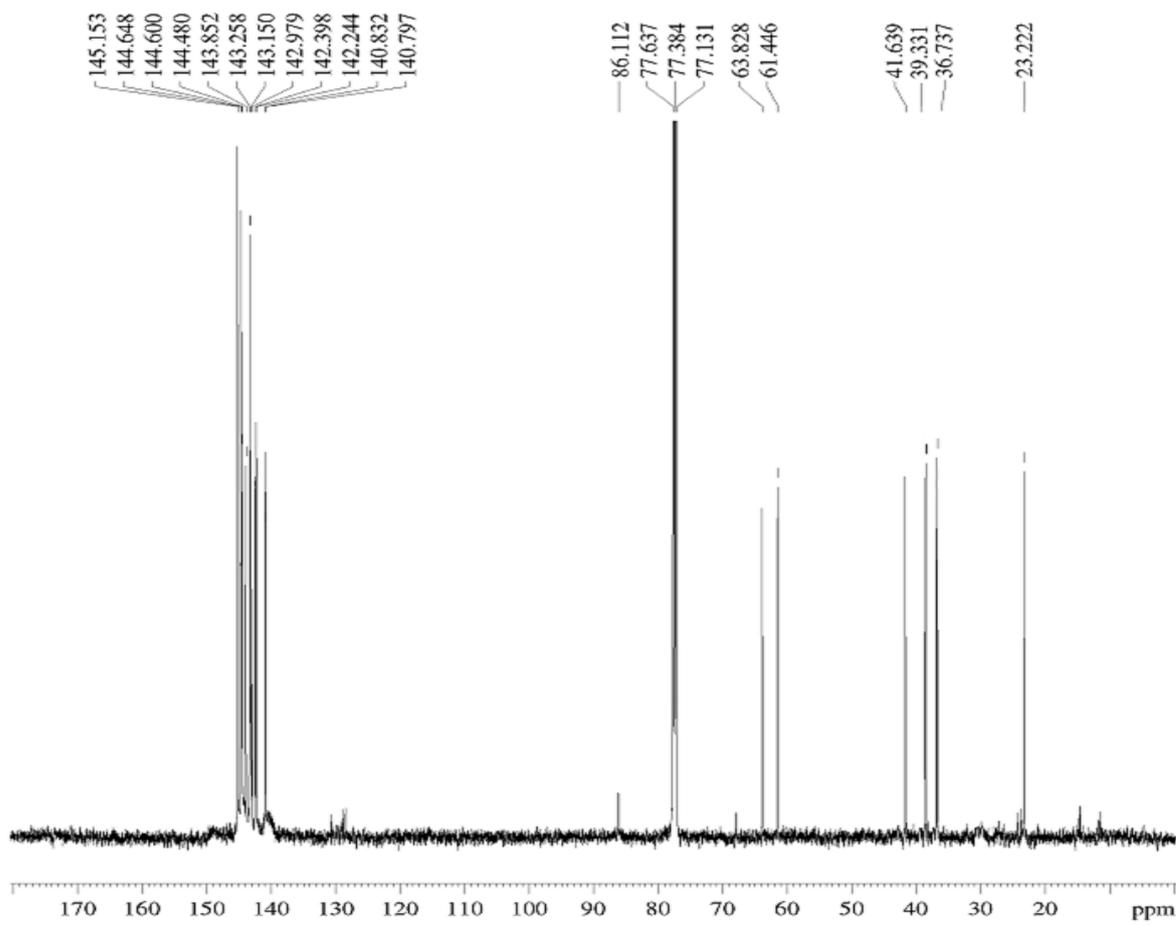


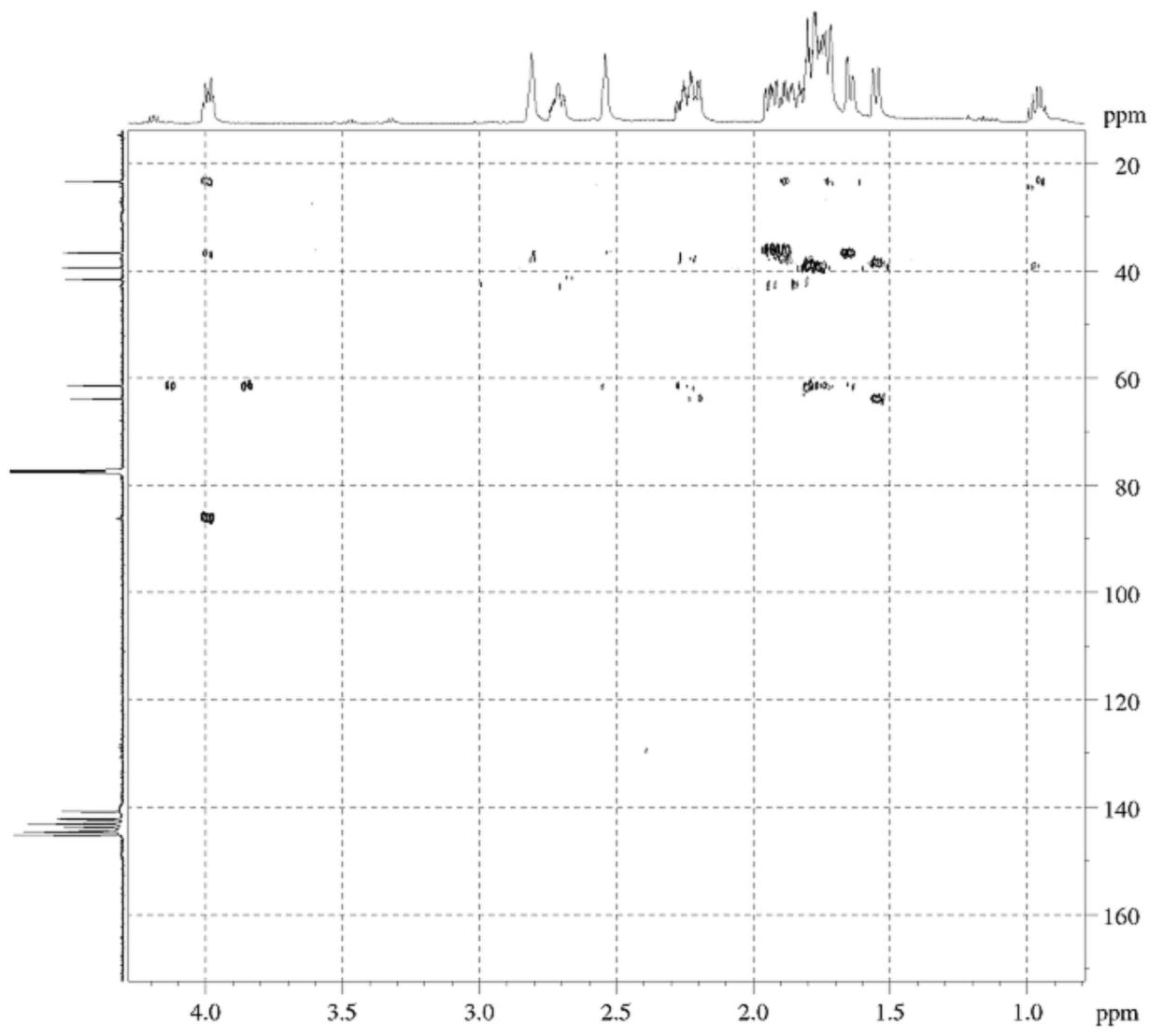




Compound 3b







Compound 3c

