Supporting Information for

"*A Jack of Trio*"- Robust One-pot Metal free Oxidative Amination, Azidation and Peroxidation of Phenols

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Experimental Methods-

All reactions were carried out under oven dried glassware. THF was dried over potassium carbonate then by metallic sodium& benzophenone for use. All other reagents were purchased from, Avrachemicals, Sigma-Aldrich, and HIMEDIA and used without further purification. Na_2SO_4 wasdried in oven &used for drying the crude reaction mixture before chromatrography.

Chromatography was performed using (100-200mesh) silica gel& neutral aluminium oxide. Analytical TLC was performed with 0.25 mm coated commercial silica gel plates (E.Merck, DC-kiesel gel 60 F_{254}) and visualized with UV light, iodine and vanillin stain. ^{1}H and ^{13}C NMR spectra were recorded on a Bruker (400 MHz, 100 MHz respectively). Chemical shifts are reported in delta (δ) , chemical shift relative to deuterochloroform (7.28 ppm) for ^{1}H NMR & 77.0 for ^{13}C NMR). Data for ^{1}H reported as follows- Chemical shift (δ ppm) (multiplicity, coupling constant (Hz), integration). Multiplicity recorded as follows s= singlet, d= doublet, t= triplet, q= quartet, m= multiplate, dd= doublet of a doublet. IR spectra were examined by using of a perkin Elmer spectrum-2 spectrometer using Thin film deposit on NaCl plated and frequency reported in absorption (cm^{-1}). High Resolution Mass Spectra (HRMS) were measured in a QTOF I (quadrupolehexapole-TOF) mass spectrometer with an orthogonal Z-spray-electrospray interface on Micro (YA-263) mass spectrometer.

List of Abbreviations:

THF= Tetrahydrofuran ,

EtOAc= Ethyl acetate

TLC= Thin layer chromatography

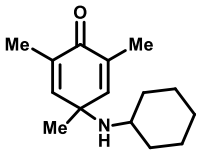
DCM = Dichloro methane

PTAB = Phenyl trimethyl ammonium tribromide

TBHP = Tert-butyl hydroperoxide

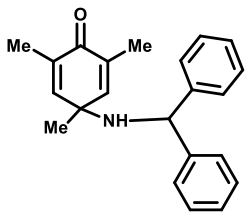
General Experimental procedure (A): To a well stirred solution of substituted phenols/substituted naphthols (1 eq.) and appropriate nucleophilic nitrogen containing reagent (amine/azide) as well as the base (2 eq.) in dry THF, PTAB (1 eq.) was added. The mixture was stirred for 4-12h at room temperature. Then the mixture was quenched with distilled water and extract with ethyl acetate and dried over oven dried sodium sulphate and solvent was removed using rota evaporator. Then the crude reaction mass was subjected to column chromatography over neutral alumina with appropriate solvent (ethyl acetate and petroleum ether) afforded the desired amino-cyclohexadienone/ aminonaphthalone.

4-(cyclohexylamino)-2, 4, 6-trimethylcyclohexa-2, 5-dienone (1):



To a well stirred solution of 2, 4, 6-trimethylphenol (68 mg, 0.5 mmol) and cyclohexylamine (100 mg, 1mmol) in dry THF (3 ml), PTAB (188 mg, 0.5mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 30% ethyl acetate in petroleum ether afforded 4-(cyclohexylamino)-2, 4, 6-trimethylcyclohexa-2, 5-dienone**(1)** as a yellow oil (88 mg, 75%) R_f = 0.3 in 15 % ethyl acetate in petroleum ether. **^{1}H NMR**(400 MHz, CD_3OD) δ = 6.70 (s, 2H), 2.22-2.16 (m, 1H), 1.87(s, 6H), 1.75-1.66(m, 4H), 1.57-1.54(m, 2H), 1.29(s, 3H), 1.15-1.10(m, 4H); **^{13}C NMR** (100 MHz,CD_3OD) δ = 187.1, 151.0, 133.7, 54.9, 53.5, 35.0, 25.8, 25.1, 24.8, 14.4; **IR** (Neat Film, NaCl) 3355, 1650, 1261, 749 cm^{-1}, **HRMS** (ESI) calc'd for $C_{15}H_{23}NNaO$ $[M + Na]^+$ = 256.1677 Found $[M + Na]^+$= 256.1671.

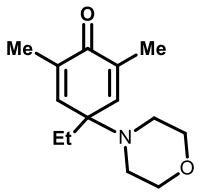
4-(benzhydrylamino)-2, 4, 6-trimethylcyclohexa-2, 5-dienone (2):



To a well stirred solution of 2, 4, 6-trimethylphenol (68 mg, 0.5 mmol) and benzhydrylamine(185 mg, 1mmol) in dry THF (5 ml), PTAB (188 mg, 0.5 mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by with ethyl acetate (3X5 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 3% ethyl acetate in petroleum ether afforded 4-(benzhydrylamino)-2,4,6-trimethylcyclohexa-2,5-dienone **(2)** as a colourless solid (95 mg, 60 %) R_f = 0.7 in 20 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.33-7.17(m, 10H), 6.32(m, 2H), 4.66(s, 1H), 1.73(s, 6H), 1.34(s, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ =187.0, 150.1, 145.0, 134.4, 128.2, 127.1, 126.8,

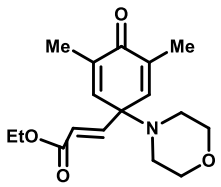
63.16, 55.3, 27.4, 15.6; **IR** (Neat Film, NaCl) 3345, 1655, 1255, 757 cm^{-1}**HRMS** (ESI) calc'd for $C_{22}H_{23}NNaO[M + Na]^+$: 340.1677 Found :340.1672;

4-ethyl-2,6-dimethyl-4-morpholinocyclohexa-2,5-dienone (3):



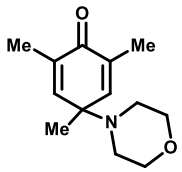
To a well stirred solution of 4-ethyl-2,6-dimethylphenol**(1a)**(60 mg, 0.4 mmol) and morpholine (70 mg, 0.8 mmol) in dry THF (3 ml), PTAB (150 mg, 0.4 mmol) was added and stirred for 10h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5 % ethyl acetate in petroleum ether afforded 4-ethyl-2,6-dimethyl-4-morpholinocyclohexa-2,5-dienone **(3)** as a yellow oil (66 mg, 70 %) R_f = 0.6 in 10 % ethyl acetate in petroleum ether. **^{1}H NMR**(400 MHz, $CDCl_3$) δ = 6.58(s, 2H), 3.69(t, *J* = 4.4 Hz, 4H), 2.63(t, *J* = 4.4 Hz, 4H), 1.92(s, 6H), 1.69(q, *J* = 7.2Hz, 2H), 0.77(t, *J* = 8 Hz, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 187.1, 146.4, 137.1, 67.5, 61.9, 47.0, 28.8, 16.0, 8.0; **IR** (Neat Film, NaCl) 1654, 1260, 750cm^{-1}**HRMS** (ESI) calc'd for $C_{14}H_{21}NO_2[M]^+$: 235.1572 Found :235.1567.

(E)-ethyl 3-(3,5-dimethyl-1-morpholino-4-oxocyclohexa-2,5-dien-1-yl)acrylate (4) :



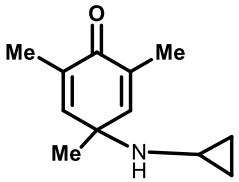
To a well stirred solution of (E)-ethyl 3-(4-hydroxy-3,5-dimethylphenyl)acrylate**(p)**[1](50 mg, 0.22 mmol) and morpholine(40 mg, 0.45 mmol) in dry THF (3 ml), PTAB (86 mg, 0.22 mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 10 % ethyl acetate in petroleum ether afforded (E)-ethyl 3-(3,5-dimethyl-1-morpholino-4-oxocyclohexa-2,5-dien-1-yl)acrylate **(4)**as a yellow liquid (44 mg, 65 %) R_f = 0.2 in 20 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 6.87 (d, *J* = 16 Hz, 1H), 6.63(s, 2H), 5.90(d, *J* = 16 Hz, 1H), 4.17(q, *J* = 6.8 Hz, 2H), 3.70(t, *J* = 4.4 Hz, 4H), 2.61 (t, *J* = 4.8 Hz, 4H), 1.94(s, 6H), 1.29(t, *J* = 8.8 Hz, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 186.2, 165.6, 147.8, 141.7, 137.6, 122.1,67.3, 62.7, 60.7, 47.5, 16.1, 14.0;**IR** (Neat Film, NaCl) 1670, 1630, 1267, 759 cm^{-1}**HRMS** (ESI) calc'd for $C_{17}H_{23}NO_4[M]^+$: 305.1627 Found : 305.1621;

2, 4, 6-trimethyl-4-morpholinocyclohexa-2,5-dienone (5):



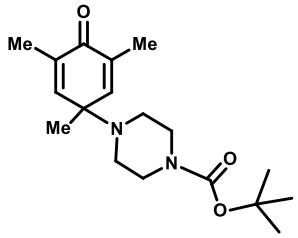
To a well stirred solution of 2, 4, 6-trimethylphenol (68 mg, 0.5 mmol) and morpholine (90 mg, 1.03 mmol) in dry THF (3 ml), PTAB (188 mg, 1 mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 10% ethyl acetate in petroleum ether afforded 2,4,6-trimethyl-4-morpholinocyclohexa-2,5-dienone **(5)** as a yellow oil (72 mg, 65 %) R_f = 0.5 in 20 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 6.65(s, 2H), 3.69 (t, *J* = 4.8 Hz, 4H), 2.63(t, *J* = 4.8 Hz, 4H), 1.91 (s, 6H), 1.31(s, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 186.7, 147.4, 135.6, 67.6, 58.1, 47.0, 23.8, 15.9;**IR** (Neat Film, NaCl)1644, 1261, 749,cm^{-1}**HRMS** (ESI) calc'd for $C_{13}H_{19}NO_2$[M]+: 221.1416 Found : 221.1409.

4-(cyclopropylamino)-2,4,6-trimethylcyclohexa-2,5-dienone (6) :



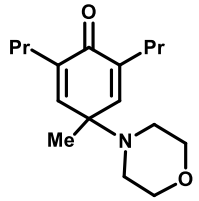
To a well stirred solution of 2, 4, 6-trimethylphenol (68 mg, 0.5 mmol) and cyclopropyl ammine (60 mg, 1.05 mmol) in dry THF (3 ml), PTAB (188 mg, 0.5 mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 2% ethyl acetate in petroleum ether afforded 4-(cyclopropylamino)-2,4,6-trimethylcyclohexa-2,5-dienone **(6)**as a yellow oil (60 mg, 62 %) R_f = 0.3 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 6.56(s, 2H), 2.00-1.97(m, 1H), 1.92(s, 6H), 1.27(s, 3H), 0.39-0.34(m, 2H), 0.29-0.25(m, 2H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 187.2, 149.9, 134.2, 55.3, 26.6, 26.0, 15.8, 7.0; **IR** (Neat Film, NaCl)3346, 1657, 1251, cm^{-1}**HRMS** (ESI) calc'd for $C_{12}H_{17}NNaO$ [M + Na]$^+$: 214.1208 Found : 214.1202;

Tert-butyl 4-(1, 3, 5-trimethyl-4-oxocyclohexa-2,5-dien-1-yl)piperazine-1-carboxylate (7)



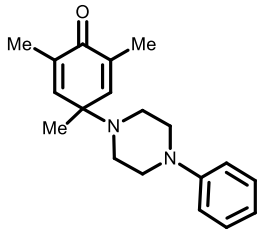
To a well stirred solution of 2, 4, 6-trimethylphenol (68 mg, 0.5 mmol) and tert-butyl piperazine-1-carboxylate (186 mg, 1mmol) in dry THF (3 ml), PTAB (188 mg, 0.5 mmol) was added and stirred for 14h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5% ethyl acetate in petroleum ether afforded tert-butyl 4-(1,3,5-trimethyl-4-oxocyclohexa-2,5-dien-1-yl)piperazine-1-carboxylate **(7)**as a yellow oil (96 mg, 60 %) R_f = 0.4 in 15 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 6.63(s, 2H), 3.41(t, *J* = 4.4 Hz, 4H), 2.58(bs, 4H), 1.90(s, 6H), 1.46(s, 9H), 1.33(s, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 186.7,154.4, 147.5, 135.5, 79.5, 58.1, 46.5, 29.4, 28.2, 24.2, 16.0;**IR** (Neat Film, NaCl) 3344, 1659, 1261, 759 cm^{-1}**HRMS** (ESI) calc'd for $C_{18}H_{28}N_2O_3[M]^+$: 320.2100 Found : 320.2108;

4-methyl-4-morpholino-2, 6-dipropylcyclohexa-2,5-dienone (8) :



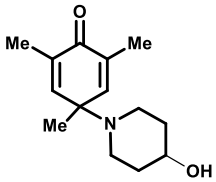
To a well stirred solution of 4-methyl-2,6-dipropylphenol**(1b)**(90 mg, 0.46 mmol) and morpholine (80 mg, 0.91 mmol) in dry THF (3 ml), PTAB (176 mg, 0.46 mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5 % ethyl acetate in petroleum ether afforded 4-methyl-4-morpholino-2,6-dipropylcyclohexa-2,5-dienone **(8)**as a yellow oil (82 mg, 64 %) R_f = 0.5 in 15 % ethyl acetate in petroleum ether.^{1}H NMR (400 MHz, $CDCl_3$) δ = 6.58(s, 2H), 3.70(t, *J*= 4.4 Hz, 4H), 2.63 (t, *J* = 4.4 Hz, 4H), 2.30-2.24(m, 4H), 1.51-1.45(m, 4H), 1.32(s, 3H), .91(t, *J* = 7.6 Hz, 6H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 185.8, 146.4, 139.6, 67.4, 58.0, 47.1, 31.4, 24.1, 21.4, 13.8;**IR** (Neat Film, NaCl) 3351, 1647, 1260, 747 cm^{-1}**HRMS** (ESI) calc'd for $C_{17}H_{27}NO_2[M]^+$: 277.2042 Found : 277.2037;

2,4,6-trimethyl-4-(4-phenylpiperazin-1-yl)cyclohexa-2,5-dienone (9) :



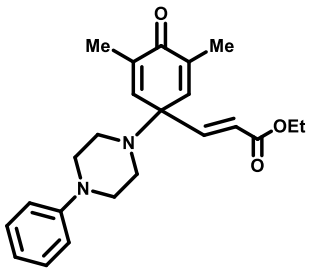
To a well stirred solution of 2,4,6-trimethylphenol (68 mg, 0.5 mmol) and 1-phenylpiperazine(162 mg, 1 mmol) in dry THF (3 ml), PTAB (188 mg, 0.5mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5% ethyl acetate in petroleum ether afforded 2,4,6-trimethyl-4-(4-phenylpiperazin-1-yl)cyclohexa-2,5-dienone **(9)**as a white solid (96 mg, 65 %) R_f = 0.3 in 20 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.28 (m, 2H), 6.94-6.92(m, 3H), 6.71(s, 2H), 3.19(t, *J* = 4.8 Hz, 4H), 2.82(t, *J* = 5.2 Hz, 4H), 1.93(s, 6H), 1.38(s, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 186.8, 151.0, 147.7, 135.5, 129.0, 119.8, 116.0, 58.0, 49.8, 46.6, 24.2, 16.0; **IR** (Neat Film, NaCl) 3358, 1656, 1251, 750 cm^{-1}**HRMS** (ESI) calc'd for $C_{19}H_{24}N_2O[M]^+$: 296.1889 Found : 296.1881;

4-(4-hydroxypiperidin-1-yl)-2,4,6-trimethylcyclohexa-2,5-dienone (10):



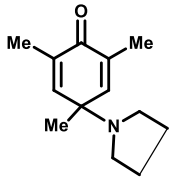
To a well stirred solution of 2,4,6-trimethylphenol (68 mg, 0.5 mmol) and piperidin-4-ol (101mg, 1 mmol) in dry THF (3 ml), PTAB (188 mg, 0.5 mmol) was added and stirred for 12 h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 80 % ethyl acetate in petroleum ether afforded4-(4-hydroxypiperidin-1-yl)-2,4,6-trimethylcyclohexa-2,5-dienone**(10)** as a yellow liquid (76 mg, 65 %) R_f = 0.2 in 30 % ethyl acetate in petroleum ether.**^{1}H NMR** (400 MHz, $CDCl_3$) δ = 6.78(s, 2H), 3.70-3.67(m, 1H), 2.41-2.35(m, 2H), 1.91-1.84(m, 4H), 1.84(s, 6H), 1.60-1.51(m, 2H), 1.40(s, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ= 186.8, 148.3, 135.1, 67.7, 58.2, 44.2, 35.0, 24.7, 16.0;**IR** (Neat Film, NaCl) 3456, 1653, 1262, 749 cm^{-1}**HRMS** (ESI) calc'd for $C_{14}H_{21}NO_2[M]^+$: 235.1572 Found : 235.1569;

(E)-ethyl 3-(3,5-dimethyl-4-oxo-1-(4-phenylpiperazin-1-yl)cyclohexa-2,5-dien-1-yl)acrylate (11) :



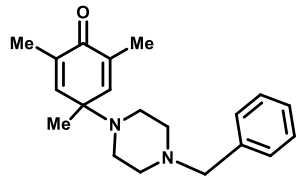
To a well stirred solution of (E)-ethyl 3-(4-hydroxy-3,5-dimethylphenyl)acrylate(**1p**)[1](50 mg, 0.22 mmol) and 1-phenylpiperazine(75 mg, 0.46 mmol) in dry THF (3 ml), PTAB (86 mg, 0.22 mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 10 % ethyl acetate in petroleum ether afforded (E)-ethyl 3-(3,5-dimethyl-4-oxo-1-(4-phenylpiperazin-1-yl)cyclohexa-2,5-dien-1-yl)acrylate **(11)**as a pale yellow oil (50 mg, 60%) R_f = 0.5 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.28 – 7.26 (m, 2H), 6.95 – 6.89 (m, 4H), 6.68 (s, 2H), 5.94 (d, *J* = 16 Hz, 1H), 4.24 (q, *J* = 7.2 Hz, 2H), 3.21-3.15 (m, 4H), 2, 1.96 (s,4H), 1.30 (t, *J* = 7.6 Hz, 3H); **IR** (Neat Film, NaCl) 1701, 1650, 1262, 759 cm^{-1}**HRMS** (ESI) calc'd for $C_{23}H_{28}N_2O_3[M]^+$: 380.2100 Found : 380.2109;

2, 4, 6-trimethyl-4-(pyrrolidin-1-yl) cyclohexa-2,5-dienone (12) :



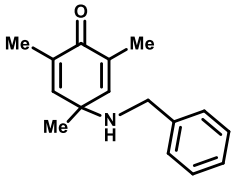
To a well stirred solution of 2,4,6-trimethylphenol (68 mg, 0.5 mmol) and pyrrolidin (70 mg, 0.98mmol) in dry THF (3 ml), PTAB (188 mg, 0.5 mmol) was added and stirred for 14h at room temperature. Then the mixture was quenched with distilled water and extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 7% ethyl acetate in petroleum ether afforded 2, 4, 6-trimethyl-4-(pyrrolidin-1-yl) cyclohexa-2,5-dienone **(12)**as a yellow liquid (60 mg, 60%) R_f = 0.3 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 6.69(s, 2H), 2.67-2.64(m, 4H), 1.89(s, 6H), 1.76-1.70 (m, 4H) 1.35(s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$) δ = 186.8, 147.7, 134.9, 63.2, 56.1, 46.6, 25.5, 23.3, 15.8; **IR** (Neat Film, NaCl) 1670, 1255, 747 cm^{-1} **HRMS** (ESI) calc'd for $C_{13}H_{19}NO[M]^+$: 205.1467 Found : 205.1462;

4-(4-benzylpiperazin-1-yl)-2, 4, 6-trimethylcyclohexa-2, 5-dienone (14) :



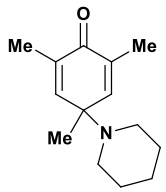
To a well stirred solution of 2, 4, 6-trimethylphenol (68 mg, 0.5 mmol) and 1-benzylpiperazine (180 mg, 1.02mmol) in dry THF (5 ml), PTAB (188 mg, 0.5 mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 3% ethyl acetate in petroleum ether afforded 4-(4-benzylpiperazin-1-yl)-2,4,6-trimethylcyclohexa-2,5-dienone **(14)**as a (93 mg, 60 %) R_f = 0.5 in 15 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ =7.32-7.31 (m, 5H), 6.68 (s, 2H), 3.51(s, 2H), 2.68(bs, 4H), 2.49 (bs, 4H), 1.90(s, 6H), 1.32(s, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 186.9, 148.1, 135.3, 129.19, 128.9, 128.1, 127.0, 62.9, 58.0, 53.4, 46.3, 24.1, 16.0; **IR** (Neat Film, NaCl) 1652, 1259, 741 cm^{-1}**HRMS** (ESI) calc'd for $C_{20}H_{26}N_2O[M]^+$: 310.2045 Found : 310.2039;

4-(benzyl amino)-2,4,6-trimethylcyclohexa-2,5-dienone (15):



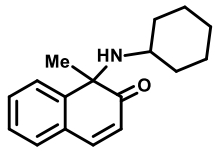
To a well stirred solution of 2,4,6-trimethylphenol (68 mg, 0.5mmol) and benzyl amine (110mg, 1 mmol) in dry THF (3 ml), PTAB (188 mg, 0.5 mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 10% ethyl acetate in petroleum ether afforded 4-(benzyl amino)-2,4,6-trimethylcyclohexa-2,5-dienone **(15)** as a yellow oil (75 mg, 62%) R_f = 0.4 in 15 % ethyl acetate in petroleum ether.**^{1}H NMR** (400 MHz, $CDCl_3$) δ = 7.33-7.24(m,5H), 6.55 (s, 2H), 3.57(s, 2H), 1.92(s, 6H), 1.34(s, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ= 186.9, 149.9, 140.4, 135.1, 128.2, 127.9, 126.9, 54.9, 48.7, 27.0, 15.9; **IR** (Neat Film, NaCl)1657, 1220, 738 cm^{-1}**HRMS** (ESI) calc'd for $C_{16}H_{19}NNaO[M+Na]^+$: 264.1364 Found :264.1357.

2, 4, 6-trimethyl-4-(piperidin-1-yl) cyclohexa-2, 5-dienone (16):



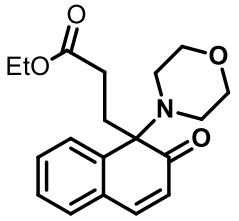
To a well stirred solution of 2, 4, 6-trimethylphenol (68 mg, 0.5 mmol) and piperidin(85 mg,1 mmol) in dry THF (3 ml), PTAB (188 mg, 0.5 mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 10% ethyl acetate in petroleum ether afforded 2,4,6-trimethyl-4-(piperidin-1-yl)cyclohexa-2,5-dienone **(16)** as a yellow oil (71 mg, 65%) R_f = 0.5 in 20 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 6.70(s, 2H), 2.58(t, *J* = 4.4 Hz, 4H), 2.22(s, 6H), 1.60- 1.54(m, 4H), 1.45-1.1.41 (m, 2H), 1.31(s, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 187.0, 148.7, 134.9, 58.6, 47.8, 26.6, 25.4,24.4, 15.7; **IR** (Neat Film, NaCl)1646, 1210, 740 cm^{-1}**HRMS** (ESI) calc'd for $C_{14}H_{21}NO$: $[M]^+$: 219.1623 Found :219.1619.

1-(cyclohexylamino)-1-methylnaphthalen-2(1H)-one (17):



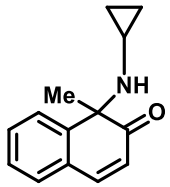
To a well stirred solution of 1-methylnaphthalen-2-ol (40 mg, 0.25 mmol) and cyclohexylammine (50 mg, 0.5mmol) in dry THF (3 ml), PTAB (95 mg, 0.25 mmol) was added and stirred for 10h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 10% ethyl acetate in petroleum ether afforded 1-(cyclohexylamino)-1-methylnaphthalen-2(1H)-one **(17)**as a yellow oil (42 mg, 66 %) R_f = 0.5 in 20 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.81 (d, *J* = 8 Hz, 1H), 7.48-7.42(m, 2H), 7.35-7.29 (m, 2H), 6.24(d, *J* = 10 Hz, 1H), 2.28-2.18(m, 1H), 1.54-1.42(m, 6H), 1.37(s, 3H), 0.99-0.93(m, 4H); **^{13}C NMR** (100 MHz,$CDCl_3$) **δ** = 206.3, 145.5, 145.1, 129.9, 129.4, 129.3, 128.0, 127.0, 124.4, 64.0,53.9, 35.1, 34.7, 33.1, 29.57,25.2, 25.6;**IR** (Neat Film, NaCl) 3321,1661, 1255, 742 cm^{-1}**HRMS** (ESI) calc'd for $C_{17}H_{21}NNaO[M+ Na]^+$: 278.1521 Found : 278.1517;

Ethyl 3-(1-morpholino-2-oxo-1,2-dihydronaphthalen-1-yl)propanoate (18):



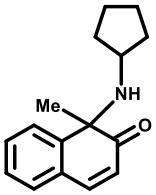
To a well stirred solution of ethyl 3-(2-hydroxynaphthalen-1-yl) propanoate**(1s)**[1](50 mg, 0.2 0mmol) and morpholine(40 mg, 0.45 mmol) in dry THF (3 ml), PTAB (77 mg, 0.20 mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 30 % ethyl acetate in petroleum ether afforded ethyl 3-(1-morpholino-2-oxo-1,2-dihydronaphthalen-1-yl)propanoate**(18)** as a pale yellow oil (45 mg, 68 %) R_f = 0.4 in 20 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.79 (d, J = 8 Hz, 1H), 7.48-7.29(m, 4H), 6.10 (d, J = 10 Hz, 1H), 4.01-3.93(m, 2H), 3.62-3.56(m, 4H), 2.75-2.68(m, 4H), 2.52-2.47(m,1H), 2.08(td, J^1 = 7.6 Hz, J^2 = 12.4 Hz, 1H), 1.97-1.90(m, 1H), 1.82-1.74 (m, 1H), 1.16(t, J = 6.8 Hz, 3H);**^{13}C NMR** (100 MHz,$CDCl_3$) δ = 203.7, 172.3, 144.9, 143.5, 131.5, 130.4, 129.0, 128.2, 127.8, 126.0, 69.0, 67.8, 60.3, 47.5, 33.7, 28.5, 13.9;**IR** (Neat Film, NaCl) 1690, 1662, 1257, 749 cm^{-1}**HRMS** (ESI) calc'd for $C_{19}H_{23}NO_4[M]^+$: 329.1627Found :329.1619 ;

1-(cyclopropylamino)-1-methylnaphthalen-2(1H)-one (19):



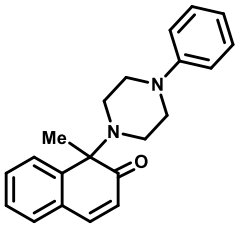
To a well stirred solution of 1-methylnaphthalen-2-ol (20 mg, 0.12 mmol) and cyclopropanamine(20 mg, 0.3 mmol) in dry THF (3 ml), PTAB (48 mg, 0.12 mmol) was added and stirred for 10h at room temperature. Then the mixture was quenched with distilled water and extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5% ethyl acetate in petroleum ether afforded 1-(cyclopropylamino)-1-methylnaphthalen-2(1H)-one **(19)** (24 mg, 94 %) R_f = 0.6 in 20 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.75(d, J = 8 Hz, 1H), 7.49 (d, J = 10 Hz, 1H), 7.46-7.41 (m, 1H), 7.35-7.32(m, 2H), 6.26(d, J = 9.6 Hz, 1H), 2.84(bs, 1H), 1.76-1.71(m, 1H), 1.35(s, 3H), 0.32-0.14(m, 4H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 206.1, 145.5, 145.3, 129.8, 129.2, 128.1, 127.2, 124.6, 65.3, 31.3, 27.4, 7.18, 5.27; **IR** (Neat Film, NaCl) 3310, 1665, 1242, 757 cm^{-1}**HRMS** (ESI) calc'd for $C_{14}H_{15}NNaO[M + Na]^+$: 236.1051 Found : 236.1048;

1-(cyclopentylamino)-1-methylnaphthalen-2(1H)-one (20):



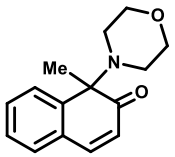
To a well stirred solution of 1-methylnaphthalen-2-ol (27 mg, 0.17 mmol) and cyclopentanamine(50 mg, 0.5 mmol) in dry THF (3 ml), PTAB (65 mg, 0.17 mmol) was added and stirred for 10h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 7 % ethyl acetate in petroleum ether afforded 1-(cyclopentylamino)-1-methylnaphthalen-2(1H)-one **(20)** (35 mg, 85 %) R_f = 0.6 in 20 % ethyl acetate in petroleum ether.**^{1}H NMR** (400 MHz, $CDCl_3$) δ = 7.82 (d, *J* = 8 Hz, 1H), 7.49-7.43 (m, 2H), 7.35-7.27(m, 2H), 6.24 (d, *J* = 9.6 Hz, 1H), 2.64-2.56 (m, 1H), 1.57-1.47(m, 3H), 1.43-1.38(m, 1H), 1.35(s, 3H), 1.29-1.19(m, 2H), 1.18-1.13(m, 2H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 206.8, 145.3, 129.9, 129.6, 129.4, 128.1, 127.1, 124.4, 64.9, 57.8, 34.1, 34.0, 32.5, 23.1, 22.9; **IR** (Neat Film, NaCl) 3315, 1667, 1212, 750 cm^{-1}**HRMS** (ESI) calc'd for $C_{16}H_{19}NNaO[M + Na]^+$: 264.1364 Found : 264.1360;

1-methyl-1-(4-phenylpiperazin-1-yl) naphthalen-2(1H)-one (21) :



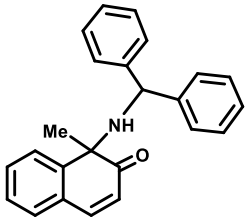
To a well stirred solution of 1-methylnaphthalen-2-ol (25 mg, 0.15 mmol) and 1-phenylpiperazine (50 mg, 0.30 mmol) in dry THF (3 ml), PTAB (60 mg, 0.15 mmol) was added and stirred for 8h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 7 % ethyl acetate in petroleum ether afforded 1-methyl-1-(4-phenylpiperazin-1-yl) naphthalen-2(1H)-one **(21)**(35 mg, 73 %) R_f = 0.5 in 15 % ethyl acetate in petroleum ether. **^{1}H NMR**(400 MHz, $CDCl_3$) δ =7.87 (d, *J* = 7.6 Hz, 1H), 7.47-7.41(m, 3H), 7.36-7.31(m, 2H), 7.28-7.24(m, 2H), 6.92-6.83(m, 3H), 6.10(d, *J* = 10 Hz, 1H), 3.18-3.05(m, 4H), 2.99-2.85 (m, 4H), 1.51(s, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 204.8, 151.4, 144.6, 131.6, 130.2, 130.1, 129.0, 128.9, 128.9, 127.6, 127.5, 127.4, 127.3, 125.3, 119.2, 115.7, 66.9, 50.1, 47.0, 29.6; **IR** (Neat Film, NaCl) 1680, 1222, 744 cm^{-1}**HRMS** (ESI) calc'd for $C_{21}H_{22}N_2O[M]^+$: 318.1732 Found : 318.1728;

1-methyl-1-morpholinonaphthalen-2(1H)-one (22) :



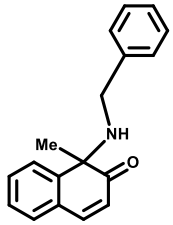
To a well stirred solution of 1-methylnaphthalen-2-ol (40 mg, 0.25 mmol) and morpholine (50 mg, 0.57mmol) in dry THF (3 ml), PTAB (95 mg, 0.25 mmol) was added and stirred for 10h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 10% ethyl acetate in petroleum ether afforded 1-methyl-1-morpholinonaphthalen-2(1H)-one **(22)** as a yellow oil (41 mg, 68 %) R_f = 0.3 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR** (400 MHz, $CDCl_3$) δ = 7.87 (d, *J* = 8 Hz, 1H), 7.46-7.38(m, 2H), 7.32-7.30(m, 2H), 6.07(d, *J* = 10 Hz, 1H), 3.68-3.58(m, 4H), 2.78-2.74(m, 4H), 1.45(s, 1H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 204.9, 146.8, 144.6, 130.2, 130.1, 128.9, 127.6, 127.3, 125.3, 67.7, 67.0, 47.6, 26.7;**IR** (Neat Film, NaCl) 1685, 1210, 743 cm^{-1} **HRMS** (ESI) calc'd for $C_{15}H_{17}NO_2[M]^+$: 243.1259 Found : 243.1250;

1-(benzhydrylamino)-1-methylnaphthalen-2(1H)-one (23) :



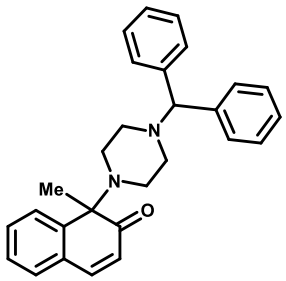
To a well stirred solution of 1-methylnaphthalen-2-ol (20 mg, 0.12 mmol) and diphenylmethanamine (50 mg, 0.27 mmol) in dry THF (3 ml), PTAB (50 mg, 0.13 mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 7 % ethyl acetate in petroleum ether afforded 1-(benzhydrylamino)-1-methylnaphthalen-2(1H)-one (**23**)(27 mg, 66 %) R_f = 0.5 in 15 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.72(d, *J* = 7.6 Hz, 1H), 7.30- 7.05 (m, 14H), 5.98(d, *J* = 10 Hz, 1H), 4.62(s, 1H), 3.19(bs, 1H), 1.43(s, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 204.6, 144.7, 144.2, 143.9, 143.3, 129.7, 129.4, 129.1, 128.4, 128.1, 128.0, 127.6, 127.5, 127.0, 126.8, 126.3, 124.6, 63.9, 63.2, 32.5;**IR** (Neat Film, NaCl) 3325, 1680, 1221, 720 cm^{-1}**HRMS** (ESI) calc'd for $C_{24}H_{21}NNaO$[M + Na]: 362.1521 Found : 362.1517;

1-(benzyl amino)-1-methylnaphthalen-2(1H)-one (24) :



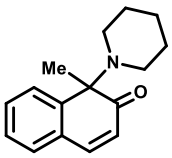
To a well stirred solution of 1-methylnaphthalen-2-ol (30 mg, 0.18 mmol) and benzylamine(50 mg, 0.4 mmol) in dry THF (3 ml), PTAB (69 mg, 0.18 mmol) was added and stirred for 10h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5% ethyl acetate in petroleum ether afforded 1-(benzyl amino)-1-methylnaphthalen-2(1H)-one **(24)** (36 mg, 76 %) R_f = 0.5 in 20 % ethyl acetate in petroleum ether. **^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.99 (d, *J* = 7.6 Hz, 1H), 7.52-7.48(m, 2H), 7.38-7.24(m, 7H), 6.28(d, *J* = 9.6 Hz, 1H), 3.50 (s, 2H), 3.34(d, *J* = 12 Hz, 1H), 3.17(d, *J* = 12 Hz, 1H), 1.41(s, 3H) ; **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 205.9, 145.4, 144.7, 140.3, 130.5, 129.5, 128.2, 128.1, 127.4, 127.1, 126.8, 124.7, 66.1, 49.2, 31.9; **IR** (Neat Film, NaCl) 3309, 1670, 1212, 710 cm^{-1}**HRMS** (ESI) calc'd for $C_{18}H_{17}NNaO$[M + Na]: 286.1208 Found : 286.1201;

1-(4-benzhydrylpiperazin-1-yl)-1-methylnaphthalen-2(1H)-one (25) :



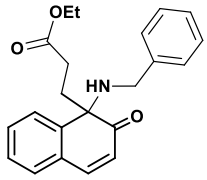
To a well stirred solution of 1-methylnaphthalen-2-ol (30 mg, 0.19 mmol) and 1-benzhydrylpiperazine (96 mg, 0.38 mmol) in dry THF (3 ml), PTAB (72 mg, 0.19 mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5 % ethyl acetate in petroleum ether afforded 1-(4-benzhydrylpiperazin-1-yl)-1-methylnaphthalen-2(1H)-one **(25)**(47 mg, 61 %) R_f = 0.5 in 15 % ethyl acetate in petroleum ether. **^{1}H NMR** (400 MHz, $CDCl_3$) δ = 7.82(d, *J* = 8 Hz, 1H), 7.61- 7.13 (m, 14H), 6.09 (d, *J* = 9.6 Hz, 1H), 4.21(s, 1H), 2.82(bs, 4H) 2.25(bs, 4H), 1.45(s, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 205.3, 147.3, 144.6, 142.8, 130.0, 128.7, 128.3, 128.2, 127.8, 127.6, 127.1, 126.7, 126.6, 125.3, 76.60, 66.73, 52.9, 46.9, 29.6; **IR** (Neat Film, NaCl) 1675, 1200, 730 cm^{-1}**HRMS** (ESI) calc'd for $C_{28}H_{28}N_2O[M]^+$: 408.2202 Found : 408.2211;

1-methyl-1-(piperidin-1-yl) naphthalen-2(1H)-one (26) :



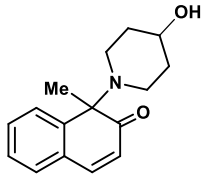
To a well stirred solution of 1-methylnaphthalen-2-ol (40 mg, 0.25 mmol) and piperidine (50 mg, 0.58 mmol) in dry THF (3 ml), PTAB (95 mg, 0.25 mmol) was added and stirred for 8h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5 % ethyl acetate in petroleum ether afforded 1-methyl-1-(piperidin-1-yl)naphthalen-2(1H)-one (26)(48 mg, 80 %) R_f = 0.6 in 15 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.87(d, *J* = 8 Hz, 1H), 7.44-7.39(m, 2H), 7.31-7.26(m, 2H), 6.04(d, *J* = 10 Hz, 1H), 2.73(bs, 2H), 2.61(bs, 2H), 1.87(bs, 1H), 1.50-1.44(m, 5H), 1.41(s, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ =205.9, 148.4, 144.4, 130.1, 129.9, 128.7, 127.4, 126.9, 125.3, 67.7, 48.2, 27.3, 27.1, 24.8 **IR** (Neat Film, NaCl) 1690, 1230, 740 cm^{-1}**HRMS** (ESI) calc'd for $C_{16}H_{19}NO[M]^+$: 241.1467 Found : 241.1459;

Ethyl 3-(1-(benzylamino)-2-oxo-1,2-dihydronaphthalen-1-yl)propanoate (27):



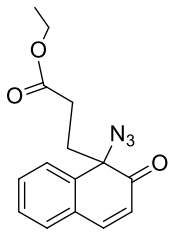
To a well stirred solution of ethyl 3-(2-hydroxynaphthalen-1-yl) propanoate**(1s)**[1](50 mg, 0.2 mmol) and benzylamine(50 mg, 0.46mmol) in dry THF (3 ml), PTAB (77 mg, 0.20 mmol) was added and stirred for 16 h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 10 % ethyl acetate in petroleum ether afforded ethyl 3-(1-(benzylamino)-2-oxo-1,2-dihydronaphthalen-1-yl)propanoate (**27**) as a pale yellow oil (42 mg, 60 %) R_f = 0.5 in 20 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ =7.92 (d, *J* = 7.6 Hz, 1H), 7.52-7.23(m, 9H), 6.29 (d, *J* = 10 Hz, 1H), 3.99(q, *J* = 7.2 Hz, 2H), 3.33(d, *J* = 12.4, 1H), 3.19(d, *J* = 12 Hz, 1H), 2.18 - 2.07(m, 4H), 1.64(bs, 1H), 1.17(t, *J* = 7.2 Hz, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 205.5, 172.4, 145.7, 142.2, 140.2, 131.0, 130.3, 129.6, 128.1, 128.0, 127.9, 127.8, 126.8, 125.3, 68.3, 60.3, 48.7, 39.4, 28.2, 13.9; **IR** (Neat Film, NaCl) 3325, 1685, 1690, 1209 cm^{-1}**HRMS** (ESI) calc'd for $C_{22}H_{23}NNaO_3$ $[M + Na]^+$: 372.1576 Found :372.1570

1-(4-hydroxypiperidin-1-yl)-1-methylnaphthalen-2(1H)-one (28):



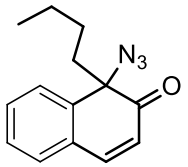
To a well stirred solution of 1-methylnaphthalen-2-ol (40 mg, 0.25 mmol) and 4-hydroxypiperidine (50 mg, 0.50 mmol) in dry THF (3 ml), PTAB (95 mg, 0.25 mmol) was added and stirred for 10h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 60 % ethyl acetate in petroleum ether afforded 1-(4-hydroxypiperidin-1-yl)-1-methylnaphthalen-2(1H)-one (**28**) as a yellow oil(50 mg, 78 %) R_f = 0.3 in 30 % ethyl acetate in petroleum ether. **^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.86(d, *J* = 8 Hz, 1H), 7.45-7.28(m, 4H), 6.06(d, *J* = 10 Hz, 1H), 3.67(bs, 1H), 3.26(t, *J* = 5.2 Hz, 1H), 2.93-2.86 (m, 1H), 2.55-2.30(m, 2H), 2.06 – 1.94 (m, 1H), 1.74 – 1.69 (m, 1H), 1.57 – 1.50 (m, 1H), 1.48 (s, 3H), 1.43 – 1.40 (m, 1H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 205.8, 148.0, 144.7, 130.2, 129.8, 128.8, 128.2, 127.2, 127.1, 125.2, 68.8, 67.4, 45.6, 44.3, 36.0, 35.4, 27.7; **IR** (Neat Film, NaCl) 3485, 1680, 1120, 750cm^{-1}**HRMS** (ESI) calc'd for $C_{26}H_{19}NO_2$ [M]$^+$: 257.1416 Found :257.1412

Ethyl 3-(1-azido-2-oxo-1,2-dihydronaphthalen-1-yl)propanoate (29):



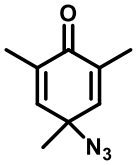
To a well stirred solution of ethyl 3-(2-hydroxynaphthalen-1-yl)propanoate**(1s)**[1](70 mg, 0.28 mmol) and sodium azide(70 mg, 1.07mmol) in dry THF (3 ml), PTAB (108 mg, 0.28 mmol) was added and stirred for 8h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 3 % ethyl acetate in petroleum ether afforded ethyl 3-(1-azido-2-oxo-1,2-dihydronaphthalen-1-yl)propanoate(29)as a pale yellow oil (70 mg, 88 %) R_f = 0.5 in 20 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.60(d, *J* =8 Hz, 1H), 7.49-7.34(m, 4H), 6.20(d, *J* = 10 Hz, 1H), 4.06-4.0(m, 2H), 2.36-2.17(m, 4H), 1.22-1.18(m, 3H);**^{13}C NMR** (100 MHz,$CDCl_3$) δ = 198.7, 171.8, 145.3, 139.7, 130.5, 129.8, 129.5, 128.8, 127.3, 124.0, 70.6, 60.6, 36.2, 28.4, 13.9; **IR** (Neat Film, NaCl) 2111, 1732, 1667,1264 cm^{-1}, **HRMS** (ESI) calc'd for $C_{15}H_{15}N_3NaO_3$[M + Na]$^+$: 308.1011 Found : 308.1007;

1-azido-1-butylnaphthalen-2(1H)-one (30) :



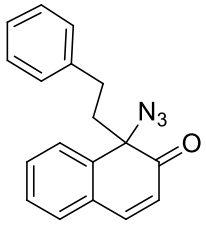
To a well stirred solution of 1-butylnaphthalen-2-ol**(1t)**[2](10 mg, 0.05 mmol) and sodium azide(20 mg, 0.3mmol) in dry THF (3 ml), PTAB (20 mg, 0.05 mmol) was added and stirred for 6h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5% ethyl acetate in petroleum ether afforded 1-azido-1-butylnaphthalen-2(1H)-one (30)as a colourless oil (11 mg, 91 %) R_f = 0.5 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.58(d, *J* = 7.6 Hz, 1H), 7.49-7.33(m, 4H), 6.20(d, *J* =10 Hz, 1H), 2.15-2.07(m, 1H), 1.97-1.91(m, 1H), 1.23-1.03(m, 4H), 0.8(t, *J* = 4.8 Hz, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 199.6, 145.3, 140.5, 130.3, 129.6, 129.5, 128.4, 127.4, 124.2, 70.6, 41.5, 25.5, 22.4, 13.6;**IR** (Neat Film, NaCl) 2102, 1670, 1261, 753 cm^{-1},**HRMS** (ESI) calc'd for $C_{14}H_{15}N_3NaO[M + Na]^+$: 264.1113 Found : 264.1103;

4-azido-2, 4,6-trimethylcyclohexa-2,5-dienone (31):



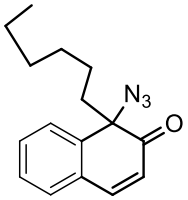
To a well stirred solution of 2, 4, 6-trimethylphenol (68 mg, 0.5 mmol) and sodium azide(160 mg, 2.4 mmol) in dry THF (5 ml), PTAB (188 mg, 1 mmol) was added and stirred for 10h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5 % ethyl acetate in petroleum ether afforded 4-azido-2, 4,6-trimethylcyclohexa-2,5-dienone **(31)**as a colourless oil (63 mg, 71 %) R_f = 0.4 in 20 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 6.54 (s, 2H), 1.92 (s, 6H), 1.36 (s, 3H)**^{13}C NMR** (100 MHz, $CDCl_3$) δ = 185.7, 142.4, 135.8, 59.8, 25.2, 15.6; **IR** (Neat Film, NaCl) 2099, 1650, 1630, 1223, 749 cm^{-1}, **HRMS** (ESI) calc'd for $C_9H_{11}N_3NaO[M + Na]$+: 200.0800 Found : 200.0810;

1-azido-1-phenethylnaphthalen-2(1H)-one (32) :



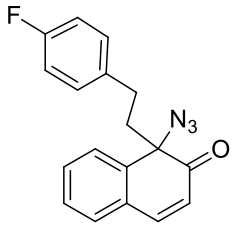
To a well stirred solution of 1-phenethylnaphthalen-2-ol**(1u)**[1](25 mg, 0.10mmol) and sodium azide(30 mg, 0.46mmol) in dry THF (3 ml), PTAB (38 mg, 0.10mmol) was added and stirred for 6h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5% ethyl acetate in petroleum ether afforded 1-azido-1-phenethylnaphthalen-2(1H)-one **(32)**as a pale yellow oil (26 mg, 90 %) R_f = 0.4 in 10 % ethyl acetate in petroleum ether.^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.65-7.14(m, 8H), 7.03 (d, *J* = 6.8 Hz, 2H), 6.24(d, *J* = 10 Hz, 1H), 2.54-2.19(m, 4H); **^{13}C NMR** (100 MHz, $CDCl_3$) δ = 199.1, 145.4, 140.2, 140.1, 130.4, 129.7, 129.6, 128.6, 128.3, 128.1, 127.4, 126.1, 124.1, 70.7, 43.4, 29.9; **IR** (Neat Film, NaCl) 2119, 1690, 1243, 735 cm^{-1}, HRMS (ESI) calc'd for $C_{18}H_{15}N_3NaO$[M + Na]: 312.1113Found : 312.1108

1-azido-1-hexylnaphthalen-2(1H)-one (33) :



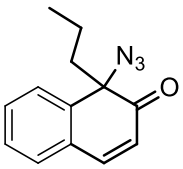
To a well stirred solution of 1-hexylnaphthalen-2-ol**(1v)**(20 mg, 0.08 mmol) and sodium azide(26 mg, 0.4mmol) in dry THF (3 ml), PTAB (33 mg, 0.08 mmol) was added and stirred for 6h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5% ethyl acetate in petroleum ether afforded 1-azido-1-hexylnaphthalen-2(1H)-one (33) as a pale yellow oil (15 mg, 70 %) R_f = 0.5 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR** (400 MHz, $CDCl_3$) δ = 7.73 (d, *J* = 8 Hz, 1H), 7.59-7.33 (m, 4H), 6.20 (d, *J* = 10 Hz, 1H), 2.13-2.06(m, 1H), 1.95-1.92(m, 1H), 1.64-0.80 (m, 13H);**IR** (Neat Film, NaCl) 2113, 1710, 1220, 744 cm^{-1}, **HRMS** (ESI) calc'd for $C_{16}H_{19}N_3NaO$[M + Na]$^+$: 292.1426 Found : 292.1415

1-azido-1-(4-fluorophenethyl)naphthalen-2(1H)-one (34) :



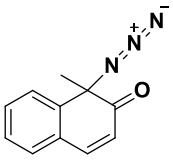
To a well stirred solution of 1-(4-fluorophenethyl)naphthalen-2-ol**(1c)**(25 mg, 0.09 mmol) and sodium azide(30 mg, 0.46mmol) in dry THF (3 ml), PTAB (36 mg, 0.09 mmol) was added and stirred for 6h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5% ethyl acetate in petroleum ether afforded 1-azido-1-(4-fluorophenethyl)naphthalen-2(1H)-one (34) as a pale yellow oil (26 mg, 94 %) R_f = 0.5 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.64 (d, *J* = 7.2 Hz, 1H), 7.53-7.36(m, 4H), 6.99-6.88(m, 4H), 6.23(d, *J* = 10 Hz), 2.52-2.15(m, 4H); **^{13}C NMR** (100 MHz, $CDCl_3$) δ = 199.0, 145.4, 139.9, 135.9, 130.5, 129.7, 129.5, 129.50, 128.7, 127.3, 124.1, 115.2, 115.0, 70.6, 43.4, 29.1;**IR** (Neat Film, NaCl) 2105, 1690, 1230, 741 cm^{-1}, **HRMS** (ESI) calc'd for $C_{18}H_{14}FN_3NaO$[M + Na]$^+$: 330.1019 Found : 330.1012;

1-azido-1-propylnaphthalen-2(1H)-one (35) :



To a well stirred solution of 1-propylnaphthalen-2-ol**(1w)**[2](186 mg, 1mmol) and sodium azide(325 mg, 5mmol) in dry THF (5 ml), PTAB (376 mg, 1 mmol) was added and stirred for 6h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 2 % ethyl acetate in petroleum ether afforded 1-azido-1-propylnaphthalen-2(1H)-one (35) as a yellow oil (160 mg, 71 %) R_f = 0.3 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.58(d, *J* = 7.6 Hz, 1H), 7.48-7.32(m, 4H), 6.20 (d, *J* = 10 Hz, 1H), 2.13-2.05(m, 1H), 1.95-1.87(m, 1H), 1.64-1.10(m, 4H), 0.80(t, *J* =7.2 Hz, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$) δ = 199.7, 145.3, 140.5, 130.2, 129.8, 129.6, 129.4, 128.4, 127.4, 124.1, 70.7, 43.8, 16.9, 13.7;**IR** (Neat Film, NaCl) 2089, 1705, 1225, 740 cm^{-1}, **HRMS** (ESI) calc'd for $C_{13}H_{13}N_3NaO$[M + Na]$^+$: 250.0956 Found : 250.0951;

1-**azido-1-methylnaphthalen-2(1H)-one (36):**

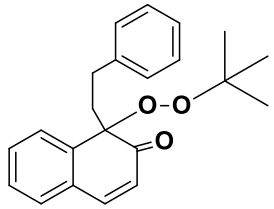


To a well stirred solution of 1-methylnaphthalen-2-ol(80 mg, .50 mmol) and sodium azide(165 mg, 2.53 mmol) in dry THF (5 ml), PTAB (188 mg, 0.5mmol) was added and stirred for 6h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5 % ethyl acetate in petroleum ether afforded 1-azido-1-methylnaphthalen-2(1H)-one (36)as a colourless oil (85 mg, 85 %) R_f = 0.3 in 10 % ethyl acetate in petroleum ether. **^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.61(d, J = 8 Hz, 1H), 7.48 – 7.32(m, 4H), 6.19 (d, J = 10 Hz, 1H), 1.69(s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$) δ = 199.6, 145.4, 141.8, 130.6, 129.6, 128.6, 128.4, 126.9, 123.2, 67.3, 28.1; **IR** (Neat Film, NaCl) 2100, 1715,1200, 750 cm^{-1}, **HRMS** (ESI) calc'd for$C_{11}H_9N_3NaO$[M + Na]$^+$:222.0643 Found : 222.0641;

General experimental Procedure (B) for the synthesis of peroxo compounds:

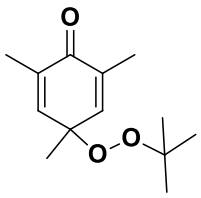
To a well stirred solution of 2-naphthol/phenol derivatives (0.2mmol) & K_2CO_3 (0.20mmol) in THF (3 ml), PTAB (0.20mmol) and tert-butyl hydrogen peroxide (70 % in water , 2 equivalent, 0.4 mmol) was added and stirred for 3h at room temperature. Then the mixture was quenched with distilled water and extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 5 % ethyl acetate in petroleum ether delivered the desired peroxo compounds.

1-(tert-butylperoxy)-1-phenethylnaphthalen-2(1H)-one (37):



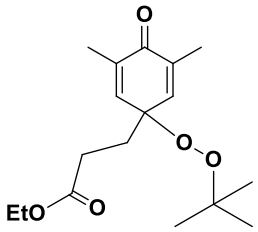
Reaction performed following the general experimental procedure (B). Colourless oil; Yield - 90 %;R_f = 0.5 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR** (400MHz, $CDCl_3$) δ = 7.68(d, *J* = 8Hz,1H), 7.50-7.13(m,7H including $CDCl_3$), 7.00(d, *J* = 7.2Hz,2H), 6.23(d, *J* = 10Hz,1H), 2.51-2.44(m, 1H), 2.35-2.19(m,2H), 2.09-1.99(m,1H), 1.17(s,9H) **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 199.1, 144.6, 143.0, 140.7, 130.9, 129.7, 128.9, 128.1, 128.1, 127.8, 127.1, 125.8, 125.7, 84.9, 80.0, 42.1, 28.6, 26.4; **IR** (Neat Film, NaCl) 1683, 1185cm^{-1}, **HRMS** (ESI) calc'd for $C_{22}H_{24}NaO_3$[M + Na]$^+$:359.1623Found : 359.1620 ;

4-(tert-butylperoxy)-2,4,6-trimethylcyclohexa-2,5-dienone (38):



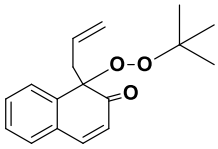
Reaction performed following the general experimental procedure (B). Colourless oil; Yield - 62 %; R_f = 0.5 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR** (400MHz, $CDCl_3$) δ = 6.64(S, 2H), 1.90(s, 6H), 1.35(s, 3H), 1.20(s, 9H)**^{13}C NMR** (100 MHz,$CDCl_3$) δ = 186.9, 145.7, 134.8, 79.6, 75.9, 26.3, 23.3, 15.8; **IR** (Neat Film, NaCl) 1670, 1100cm^{-1}, **HRMS** (ESI) calc'd for $C_{13}H_{20}NaO_3$[M + Na]$^+$:247.1310Found : 247.1308 ;

Ethyl 3-(1-(tert-butylperoxy)-3,5-dimethyl-4-oxocyclohexa-2,5-dien-1-yl)propanoate (39):



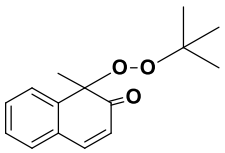
Reaction performed following the general experimental procedure (B). Colourless oil; Yield - 75 %; R_f = 0.5 in 10 % ethyl acetate in petroleum ether. **^{1}H NMR** (400MHz, $CDCl_3$) δ = 6.57(s, 2H), 4.12-4.05(m, 2H), 2.24 (m, 2H), 2.04-2.01(m,2H), 1.24-1.15(m, 12H) ; **IR** (Neat Film, NaCl) 1670, 1660, 1152 cm^{-1}, **HRMS** (ESI) calc'd for $C_{17}H_{26}NaO_5$ [M + Na]$^+$: 333.1678Found : 333.1672;

1-allyl-1-(tert-butylperoxy)naphthalen-2(1H)-one (40):



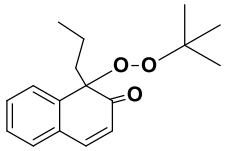
Reaction performed following the general experimental procedure (B). Colourless oil; Yield - 68 %; R_f = 0.6 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR** (400MHz, $CDCl_3$) δ = 7.64(d, *J* = 7.6Hz, 1H), 7.47-7.43(m, 1H),7.37-7.28(m, 3H), 6.16(d, *J* = 10Hz,1H), 5.40-5.30(m, 1H), 4.92-4.85(m, 3H), 2.73-2.67(m, 1H), 2.53-2.48(m, 1H), 1.15(s, 9H)**^{13}C NMR** (100 MHz, $CDCl_3$) δ = 198.8, 144.6, 142.5, 130.8, 129.4, 129.4, 128.7, 127.7, 127.3, 125.7, 119.5, 84.5, 80.0, 45.0, 26.4; **IR** (Neat Film, NaCl) 1682, 1200 cm^{-1}**HRMS** (ESI) calc'd for $C_{17}H_{20}NaO_3$[M + Na]$^+$: 295.1310Found : 295.1301;

1-(tert-butylperoxy)-1-methylnaphthalen-2(1H)-one (41):



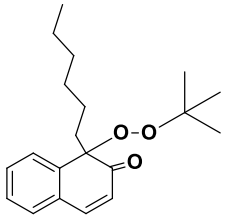
Reaction performed following the general experimental procedure (B). Pale yellow oil; Yield - 75 %; R_f = 0.6 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR** (400MHz, $CDCl_3$) δ = 7.66(d, *J* = 8 Hz, 1H), 7.47-7.23(m, 4H), 6.18(d, *J* = 10 Hz,1H), 1.45 (s, 3H), 1.17(s, 9H)**^{13}C NMR** (100 MHz, $CDCl_3$) δ = 199.4, 144.5, 144.3, 129.8, 129.7, 128.8, 127.6, 126.8, 124.8, 82.3, 79.8, 26.6, 26.4; **IR** (Neat Film, NaCl) 1678, 1170 cm^{-1}**HRMS** (ESI) calc'd for $C_{15}H_{18}NaO_3$[M + Na]$^+$: 269.1154 Found : 269.1149;

1-(tert-butylperoxy)-1-propylnaphthalen-2(1H)-one (42):



Reaction performed following the general experimental procedure (B). Pale yellow oil; Yield - 72 %; R_f = 0.6 in 10 % ethyl acetate in petroleum ether.R_f = 0.4 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR** (400MHz, $CDCl_3$) δ = 7.61(d,*J* = 7.2 Hz,1H), 7.43(td, *J* = 8 Hz, 1.2 Hz, 1H), 7.37-7.27(m, 3H), 6.17(d, *J* = 10 Hz, 1H)**^{13}C NMR**(100 MHz,$CDCl_3$) δ = 199.7, 144.5, 143.4, 130.8, 129.5, 128.7, 127.6, 127.1, 125.7, 85.2, 79.7, 42.8, 26.4, 15.8, 14.0;**IR** (Neat Film, NaCl) 1678, 1180 cm^{-1}, **HRMS** (ESI) calc'd for $C_{17}H_{22}NaO_3$[M + Na]$^+$: 297.1467 Found : 297.1462;

1-(tert-butylperoxy)-1-hexylnaphthalen-2(1H)-one (43):

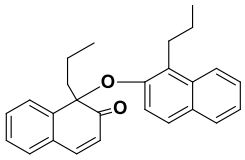


Reaction performed following the general experimental procedure (B). Colourless oil; Yield - 70 %; R_f = 0.5 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR** (400MHz, $CDCl_3$) δ = 7.62(d, *J* = 8Hz, 1H), 7.44-7.28(m, 5H including $CDCl_3$), 6.18(d, *J* = 10 Hz, 1H), 2.01-1.94(m,1H), 1.75-1.55(m, 1H), 1.31-1.26(m, 2H), 1.15(s,10H), 0.822(t, *J* = 6.8Hz, 3H)**^{13}C NMR** (100 MHz, $CDCl_3$) δ = 199.6, 144.5, 143.4, 130.9, 129.5, 128.6, 127.5, 127.1, 125.8, 85.1, 79.7, 40.6, 31.1, 29.2, 26.4, 22.3, 22.1, 13.8; **IR** (Neat Film, NaCl) 1680, 1170 cm^{-1}, **HRMS** (ESI) calc'd for $C_{20}H_{28}NaO_3$[M + Na]$^+$: 339.1936 Found : 339.1931;

General experimental Procedure (C) for the oxidative dimerization reactions:

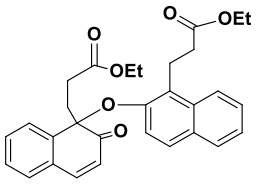
To a well stirred solution of 2-naphthol derivatives (0.5mmol) & K_2CO_3 (0.50mmol) in THF (5 ml), PTAB (0.50mmol) and hydrogen peroxide(30 % in water, 2 equivalent, 1 mmolas added and stirred for 3h at room temperature. Then the mixture was quenched with distilled water and extracted with ethyl acetate (3X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with appropriate ethyl acetate in petroleum ether delivered the desired compounds.

1-propyl-1-((1-propylnaphthalen-2-yl)oxy)naphthalen-2(1H)-one (44):



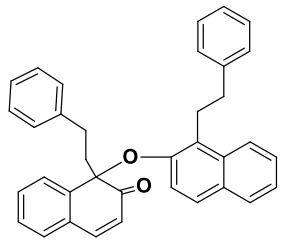
Reaction performed following the general experimental procedure (C). Colourless oil; Yield – 82 %) R_f = 0.7 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR** (400MHz, $CDCl_3$) δ = 8.02(d, *J* = 8.4Hz, 1H), 7.64-7.56(m, 2H), 7.48-7.43 (m, 3H), 7.36-7.27(m, 4H), 6.36(d, *J* = 10Hz, 1H), 6.03(d, *J* = 9.2Hz, 1H), 3.35-3.272(m, 2H), 2.17-2.06(m, 2H), 1.95-1.86(m, 2H), 1.56-1.42(m, 2H), 1.21(t, *J* = 8 Hz, 3H), 0.93(t, *J* = 8Hz, 3H);**^{13}C NMR**(100 MHz,$CDCl_3$) δ = 199.6, 150.0, 144.5, 143.7, 133.1, 130.2, 129.6, 128.7, 128.2, 127.9, 127.7, 126.1, 125.8, 125.7, 124.2, 123.1, 122.9, 115.8, 84.6, 48.5, 46.8, 27.5, 23.2, 16.2, 14.7, 14.0; **IR** (Neat Film, NaCl) 1684, 1210 cm^{-1}, **HRMS** (ESI) calc'd for $C_{26}H_{26}NaO_2$[M + Na]$^+$: 393.1830Found : 393.1826;

Ethyl3-(2-((1-(3-ethoxy-3-oxopropyl)-2-oxo-1,2-dihydronaphthalen-1-yl)oxy)naphthalen-1-yl)propanoate (45):



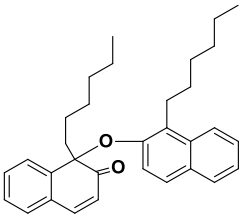
Reaction performed following the general experimental procedure (C). Yield – 63 %) as yellow oil. R_f = 0.3 in 10 % ethyl acetate in petroleum ether. **^{1}H NMR** (400MHz, $CDCl_3$) δ = 8.02(d, *J* = 8Hz, 1H), 7.64-7.59(m, 2H), 7.48-7.29(m, 6H), 6.33(d, *J* = 10Hz, 1H), 6.00(d, 1H, *J* = 9.2Hz), 4.16-4.08(m, 4H), 3.71-3.55(m, 2H), 2.97-2.22(m, 6H), 1.32-1.22(m, 6H);**^{13}C NMR**(100 MHz, $CDCl_3$) δ = 198.4, 173.4, 172.5, 149.9, 144.6, 132.7, 130.6, 129.9, 129.8, 129.5, 128.7, 128.4, 128.3, 127.0, 126.3, 126.0, 125.4, 123.3, 122.6, 122.1, 115.6, 83.6, 60.4, 60.2, 38.5, 34.1, 27.5, 21.1, 14.1, 14.0; **IR** (Neat Film, NaCl) 1688, 1670, 1669, 1100 cm^{-1}, **HRMS** (ESI) calc'd for $C_{30}H_{30}NaO_6$[M + Na]$^+$: 509.1940, Found : 509.1936;

1-phenethyl-1-((1-phenethylnaphthalen-2-yl)oxy)naphthalen-2(1H)-one (46):



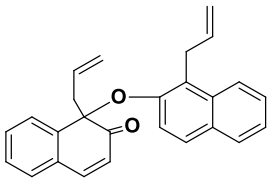
Reaction performed following the general experimental procedure (C). Yield – 80 %) as yellow oil. R_f = 0.5 in 10 % ethyl acetate in petroleum ether. ^{1}H NMR (400MHz, $CDCl_3$) δ = 8.06(d, *J* = 8 Hz, 1H), 7.67-7.60(m, 2H), 7.51-7.11(m, 18H) 6.39(d, *J* = 10Hz, 1H), 6.06(d, *J* = 8Hz, 1H), 3.73-3.638(m,2H), 3.30-3.315(m, 2H), 2.94-2.90(m, 1H), 2.79-2.75(m, 1H), 2.44-2.33(m, 2H); **^{13}C NMR**(100 MHz, $CDCl_3$) δ = 198.9, 149.9, 144.6, 143.3, 142.6, 140.8, 132.9, 130.4, 129.8, 128.7, 128.5, 128.5, 128.3, 128.1, 127.7, 126.6, 126.1, 125.9, 125.7, 125.5, 123.2, 123.1, 122.9, 122.8, 122.6, 117.7, 115.8, 84.5, 45.9, 35.9, 29.5, 27.7; **IR** (Neat Film, NaCl) 1680, 1150 cm^{-1}, **HRMS** (ESI) calc'd for $C_{36}H_{30}NNaO_2$[M + Na]$^+$: 517.2143Found : 517.2140;

1-hexyl-1-((1-hexylnaphthalen-2-yl)oxy)naphthalen-2(1H)-one (47) :



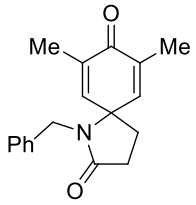
Reaction performed following the general experimental procedure (C). Yield – 75 %) as yellow oil. R_f = 0.4 in 10 % ethyl acetate in petroleum ether.**^{1}H NMR** (400MHz, $CDCl_3$) δ = 7.99(d, *J* = 8.4 Hz,1H), 7.62-7.56(m,2H), 7.46-7.40(m,2H), 7.36-7.26(m,4H including $CDCl_3$) , 6.34(d, *J* = 10 Hz,1H), 6.00(d, *J* = 8.8 Hz, 1H), 3.31-3.24(m , 2H), 2.15-2.05(m, 2H), 1.95-1.75(m,2H), 1.64-1.59(m, 4H), 1.50-1.39(m, 7H), 0.98-0.94(m, 3H), 0.89-0.86(m, 3H).**^{13}C NMR**(100 MHz,$CDCl_3$) δ = 199.5, 149.8,144.4, 143.7, 133.0, 130.2, 129.7, 129.6, 128.6, 128.2, 127.8, 126.1, 126.0, 125.7, 125.6, 124.5, 123.0, 122.8, 115.8, 84.6, 44.6, 31.8, 31.5, 30.0, 29.8, 29.2, 25.5, 22.7, 22.4, 14.0, 13.9;**IR** (Neat Film, NaCl) 1673, 1157 cm^{-1}, **HRMS** (ESI) calc'd for $C_{32}H_{38}NaO_2$[M + Na]$^+$: 477.2770, Found : 477.2767;

1-allyl-1-((1-allylnaphthalen-2-yl)oxy)naphthalen-2(1H)-one (48):



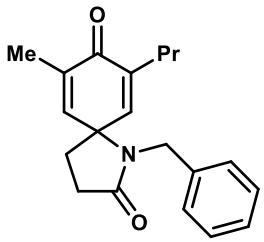
Reaction performed following the general experimental procedure (C). Yield – 80 %) as yellow oil. R_f = 0.6 in 10 % ethyl acetate in petroleum ether. **^{1}H NMR**(400MHz, $CDCl_3$) δ = 7.96 (d, *J* = 8.4 Hz, 1H), 7.62 – 7.45 (m, 2H), 7.44-7.22 (m, 6H), 6.35 (d, *J* = 10 Hz, 1H), 6.30 -6.15 (m, 1 H), 6.04 (d, *J* = 9.2 Hz, 1H), 5.88-5.71 (m, 1H), 5.18 – 4.95 (m, 4H), 4.16 -4.11(m, 1H), 3.92-4.01(m, 1H), 2.88 -2.83 (m, 2H);**IR** (Neat Film, NaCl) 1668, 1172 cm^{-1}, **HRMS** (ESI) calc'd for $C_{26}H_{22}NaO_2$[M + Na]$^+$: 389.1517Found : 389.1512;

1-benzyl-7,9-dimethyl-1-azaspiro[4.5]deca-6,9-diene-2,8-dione (49) :



To a well stirred solution of ethyl 3-(4-hydroxy-3,5-dimethylphenyl)propanoate(50 mg, 0.22 mmol) , Li_2CO_3 (35 mg, 0.47 mmol) and benzylamine (50 mg, 0.46 mmol) in dry THF (5 ml), PTAB (81 mg, 0.21mmol) was added and stirred for 12h at refluxing temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 30% ethyl acetate in petroleum ether 1-benzyl-7,9-dimethyl-1-azaspiro[4.5]deca-6,9-diene-2,8-dione (**49**)(44 mg, 71 %) R_f = 0.3 in 15 % ethyl acetate in petroleum ether**^{1}H NMR**(400 MHz, $CDCl_3$) δ = 7.26 – 7.13 (m, 5 H), 6.26 (s, 2H), 4.28 (s, 2H), 2.63 (t, *J* = 8 Hz, 2H), 2.08 (t, *J* = 8 Hz, 2H), 1.78(s, 6H); **^{13}C NMR** (100 MHz, $CDCl_3$) δ = 185.8, 174.4, 144.2, 137.9, 136.0, 128.6, 128.2, 127.4, 62.0, 44.4, 30.1, 29.31, 15.7;**IR** (Neat Film, NaCl) 1675, 1645 cm^{-1}, **HRMS** (ESI) calc'd for $C_{18}H_{19}NO_2$[M]$^+$:281.1416; Found : 281.1409;

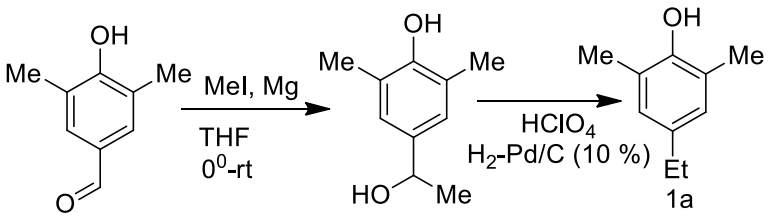
1-benzyl-7-methyl-9-propyl-1-azaspiro[4,5]deca-6,9-diene-2,8-dione (50) :



To a well stirred solution of ethyl 3-(4-hydroxy-3-methyl-5-propylphenyl)propanoate**(r)**[1](35 mg, 0.14 mmol) and benzylamine (30 mg, 0.28 mmol) in dry THF (3 ml), PTAB (53 mg, 0.14 mmol) was added and stirred for 12h at room temperature. Then the mixture was quenched with distilled water followed by extracted with ethyl acetate (2X3 ml) and dried over sodium sulphate. Solvent was evaporated and the mass was subjected to neutral alumina column, elution with 30% ethyl acetate in petroleum ether afforded 1-benzyl-7-methyl-9-propyl-1-azaspiro[4.5]deca-6,9-diene-2,8-dione**(50)**as a pale yellow oil (32 mg, 74 %) R_f = 0.3 in 15 % ethyl acetate in petroleum ether.**^{1}H NMR** (400 MHz, $CDCl_3$) δ = 7.28 -7.12 (m, 5H), 6.25-6.21(m,2H), 4.27 (d, *J* = 11.2 Hz, 2H), 2.64 (t, *J* = 8 Hz, 2H),2.30-2.11(m, 2H), 1.28-1.23(m, 2H) 2.09 (t, *J* = 7.6 Hz, 2H), 0.90 (t, J = 7.6 Hz, 3H), 1.76 (s, 3H); **^{13}C NMR** (100 MHz,$CDCl_3$) δ = 185.4, 174.5, 143.9, 143.5, 139.9, 137.9, 136.2, 128.4, 128.2, 127.3, 62.1, 44.4, 30.9, 30.3, 29.3, 20.9, 15.7, 13.7; **IR** (Neat Film, NaCl) 1670, 1640, 1255, 750 cm^{-1}**HRMS** (ESI) calc'd for $C_{20}H_{23}NO_2[M]^+$: 309.1729 Found : 309.1723;

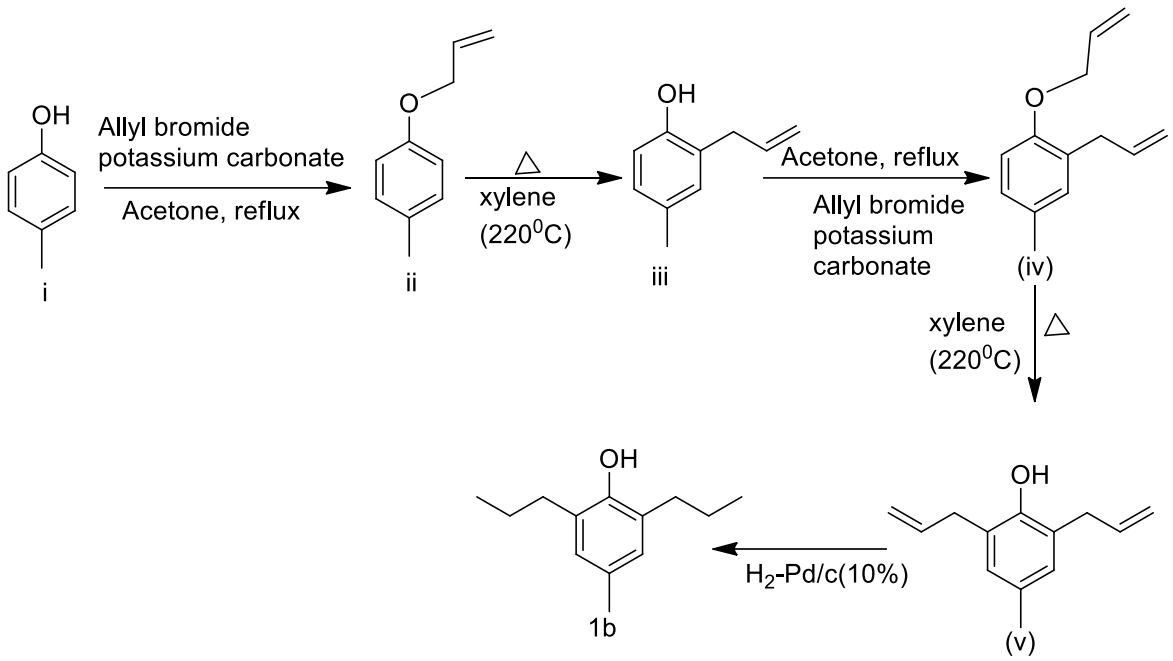
Preparation of Substrate:

4-ethyl-2,6-dimethylphenol (1a) :



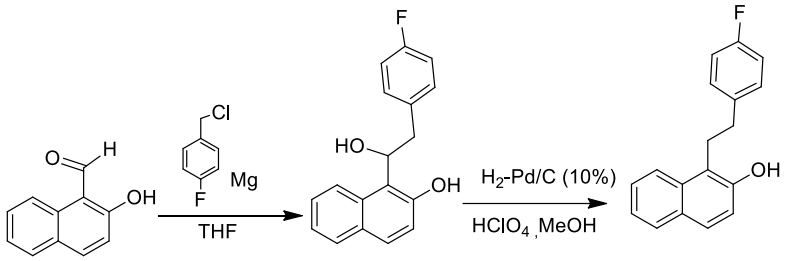
^{1}H NMR (400 MHz, $CDCl_3$) δ = 6.88(s, 2H), 4.62(bs, 1H), 2.58(q, *J* = 7.6 Hz, 2H), 2.29(s, 6H), 1.26 (t, *J* = 8 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ =150.0, 135.8, 129.0, 127.8, 122.7, 27.9, 15.8;

4-methyl-2, 6-dipropylphenol (1b):



4-methyl-2,6-dipropylphenol (1b) : ^{1}H NMR (400 MHz, $CDCl_3$) δ = 6.80 (s, 2H),4.50 (s, 1H), 2.55(t, J = 7.6 Hz, 4H), 2.26(s, 3H), 1.70-1.61(m, 4H), 1.01(t, J = 7.2 Hz, 6 H); ^{13}C NMR (100 MHz, $CDCl_3$) δ =149. 0, 129.0, 128.1, 127.4, 32.1, 22.9, 20.4, 14.0;

1-(4-fluorophenethyl)naphthalene-2-ol (1c) :



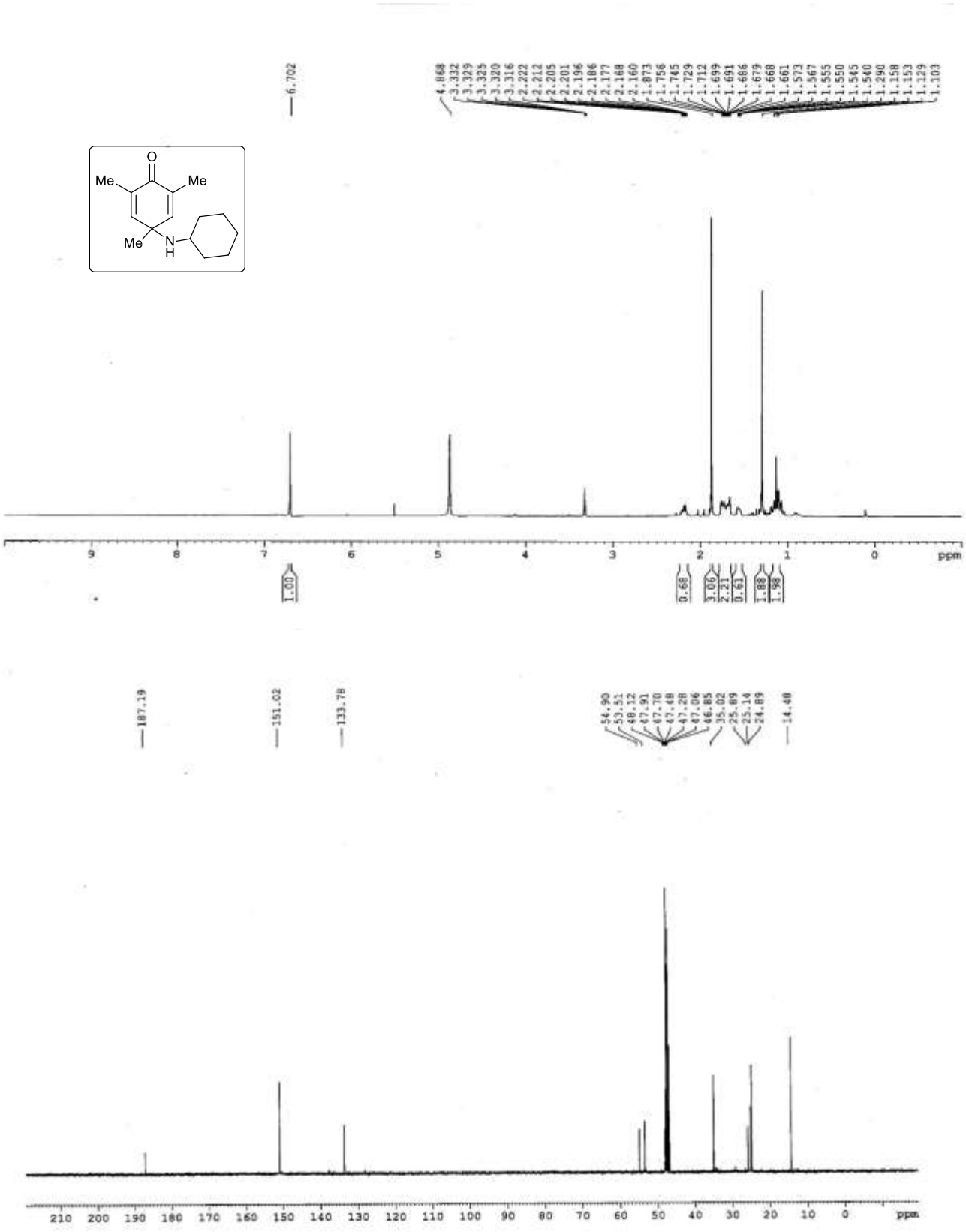
^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.96 (d, *J* = 8.8 Hz, 1H), 7.81(d, *J* = 8.4 Hz, 1H) , 7.66(d, *J* = 8.8 Hz, 1H), 7.54 -7.39(m, 1H), 7.39- 7.35(m, 1H), 7.22-7.18(m, 2H), 7.05-6.97(m, 3H), 4.79(s, 1H), 3.33(t, *J* = 6 Hz, 2H), 2.96 (t, *J* = 7.6 Hz, 2H);**^{13}C NMR** (100 MHz, $CDCl_3$) δ = 150.4, 132.9, 132.4, 129.7, 129.6, 129.3, 128.6, 127.8, 126.4, 123.0, 122.5, 119.1, 117.6, 115.2, 114.9, 34.8, 27.4;

References:

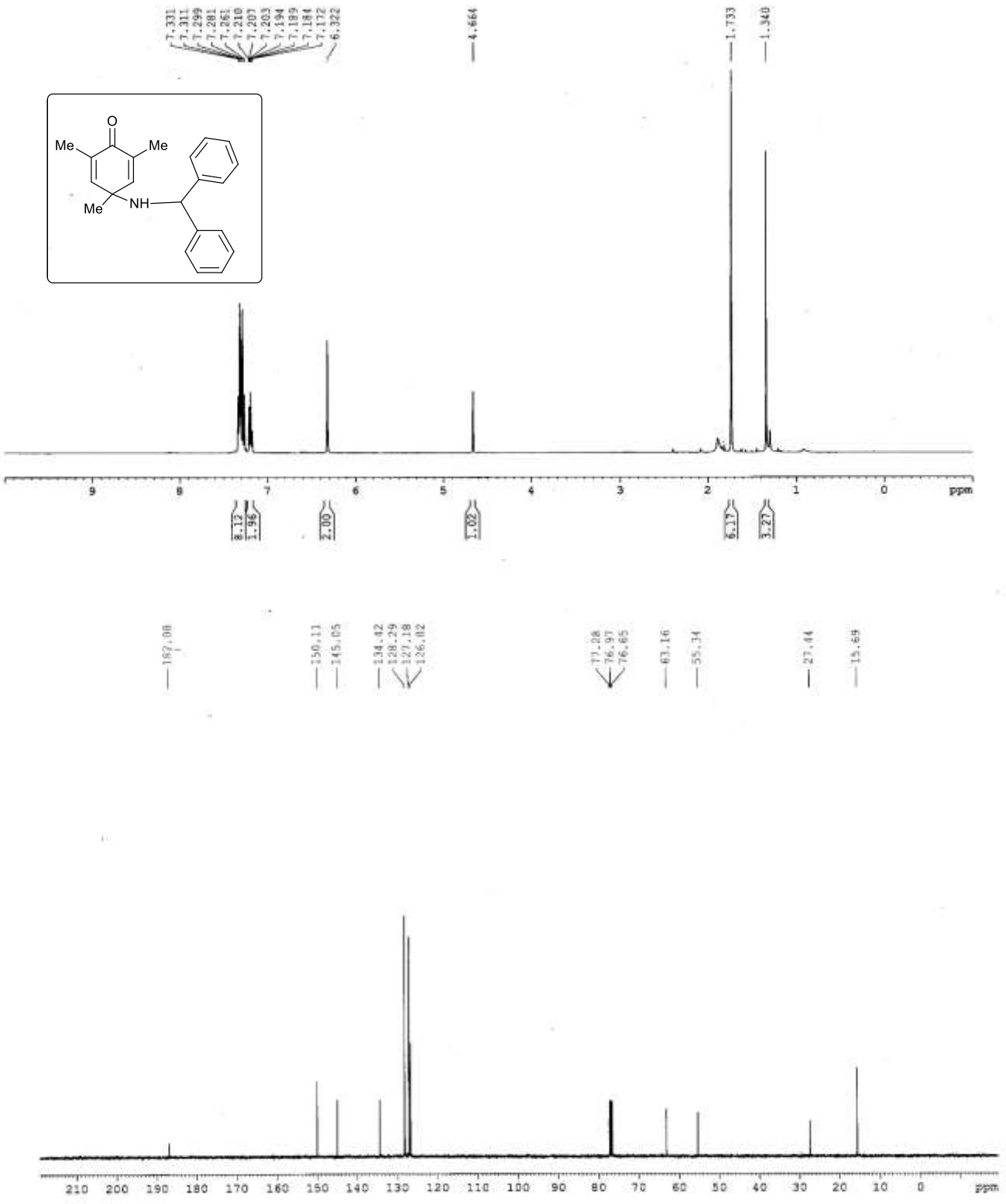
1. D. Sarkar, M. K. Ghosh and N. Rout, *Org. Biomol. Chem.,* 2016, **14**, 7883.
2. T. Kito and K. Ota, *J. Org. Chem.*, 1977, **42**, 2020

^{1}H and ^{13}C NMR

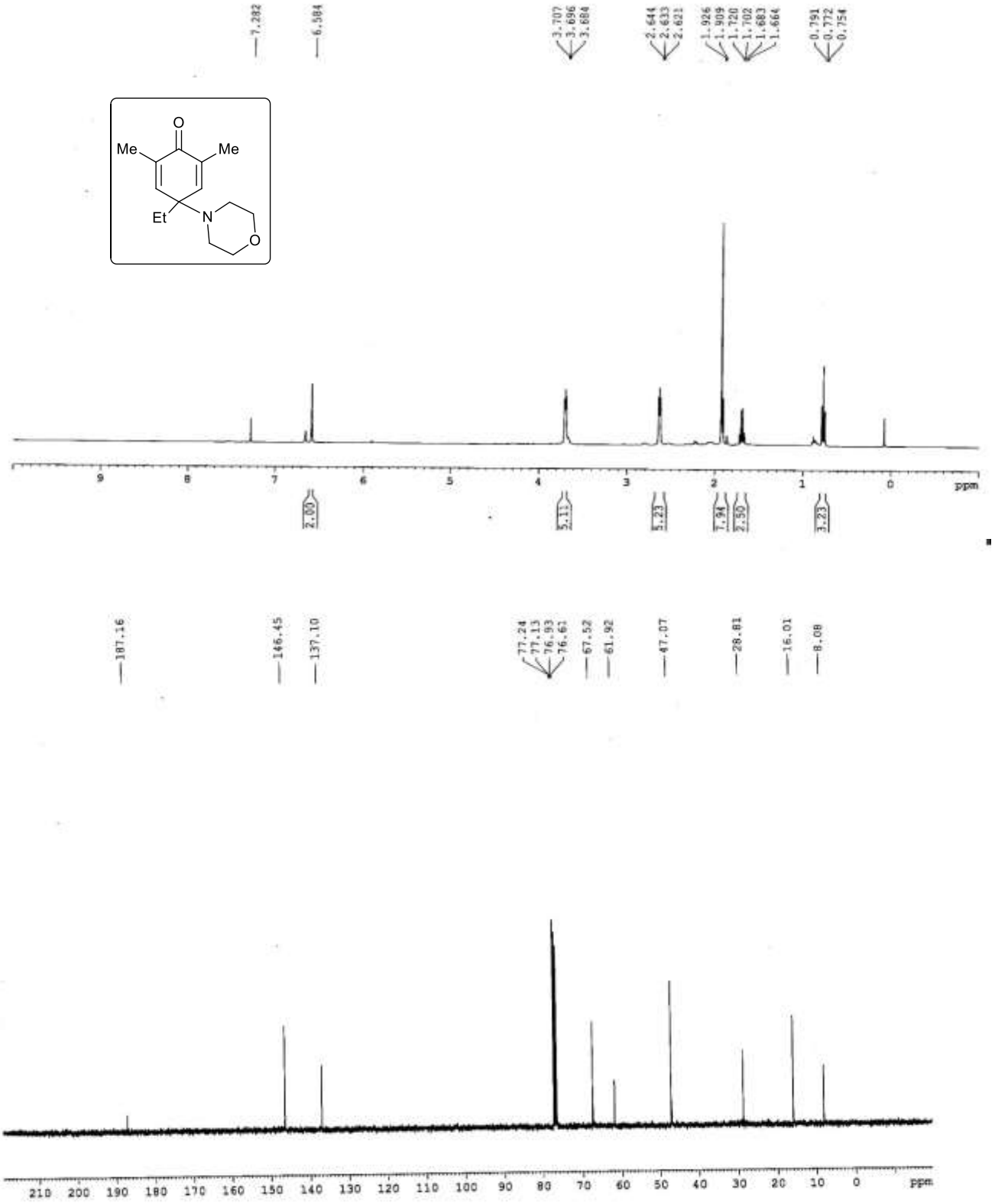
4-(cyclohexylamino)-2, 4, 6-trimethylcyclohexa-2, 5-dienone (1)



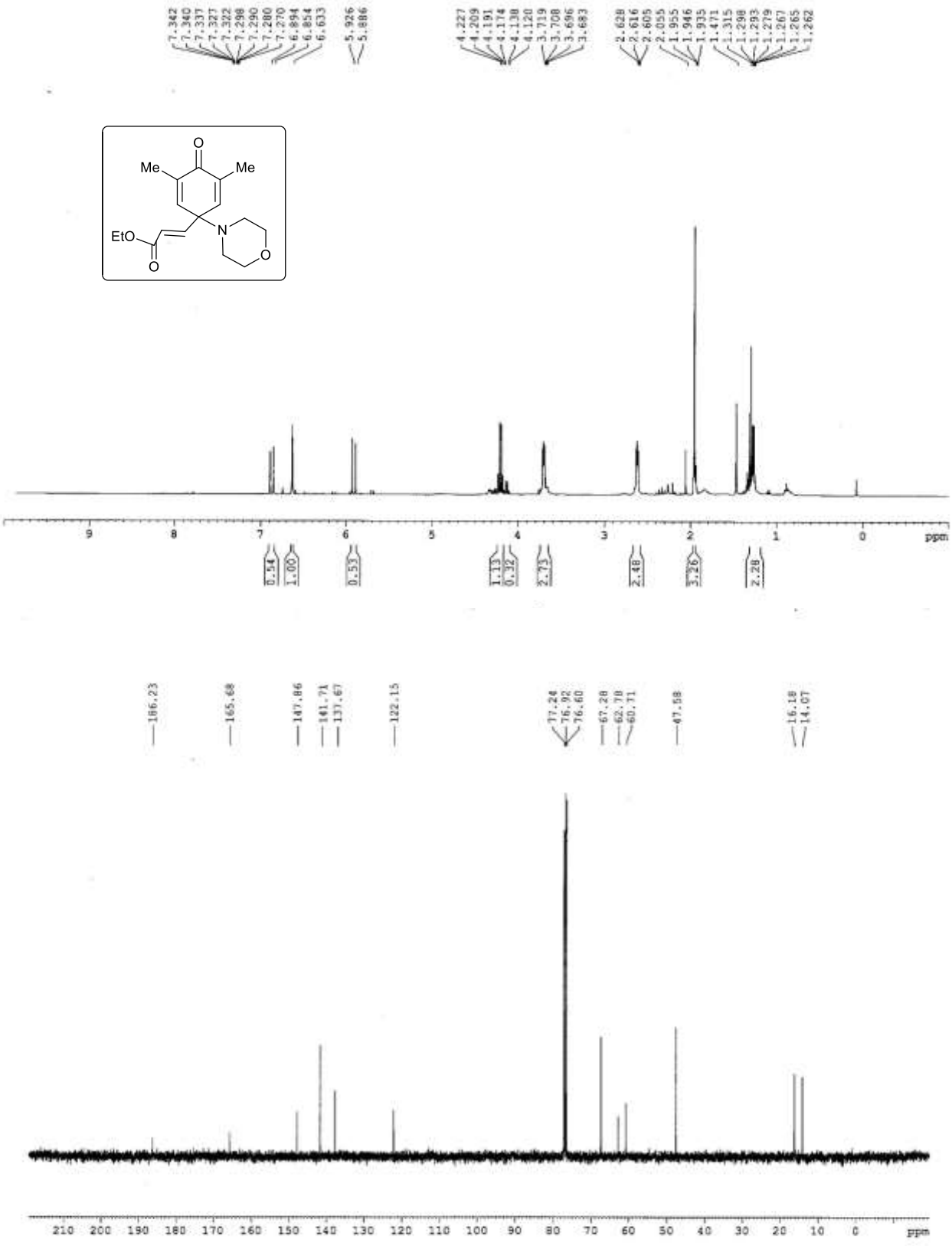
4-(benzhydrylamino)-2, 4, 6-trimethylcyclohexa-2, 5-dienone (2)



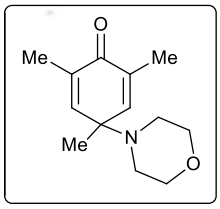
4-ethyl-2,6-dimethyl-4-morpholinocyclohexa-2,5-dienone (3)

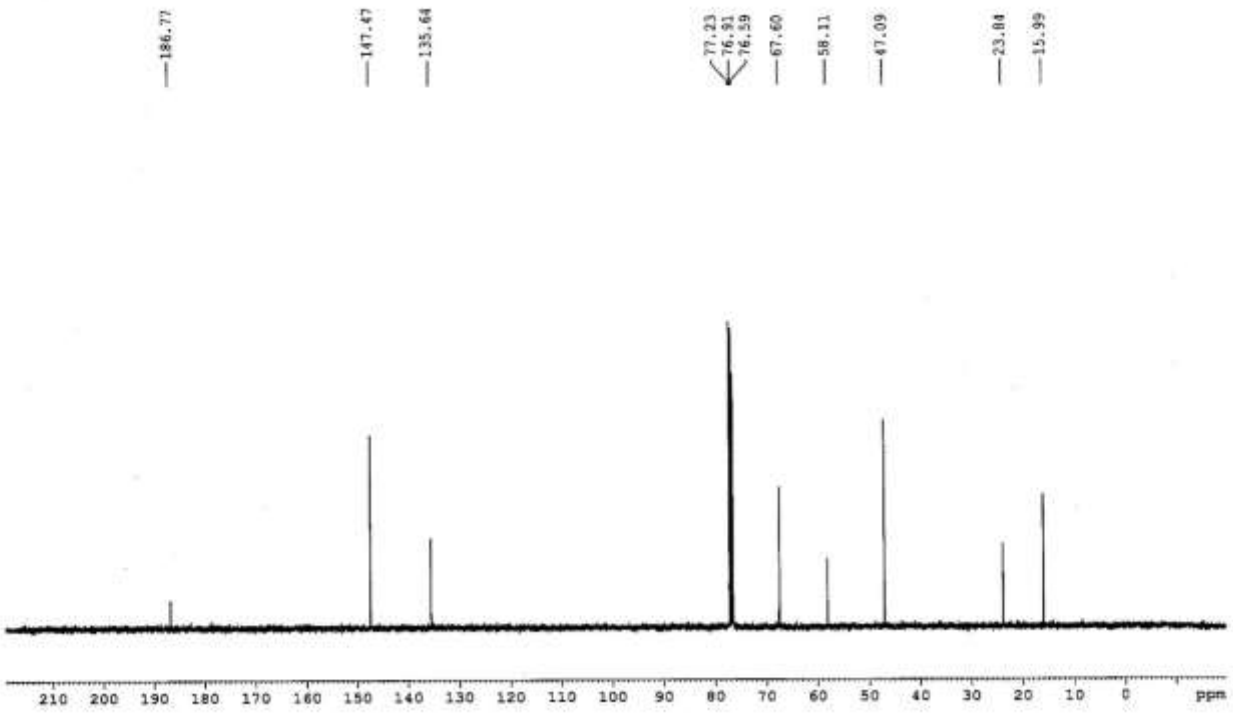


(E)-ethyl 3-(3,5-dimethyl-1-morpholino-4-oxocyclohexa-2,5-dien-1-yl)acrylate (4)

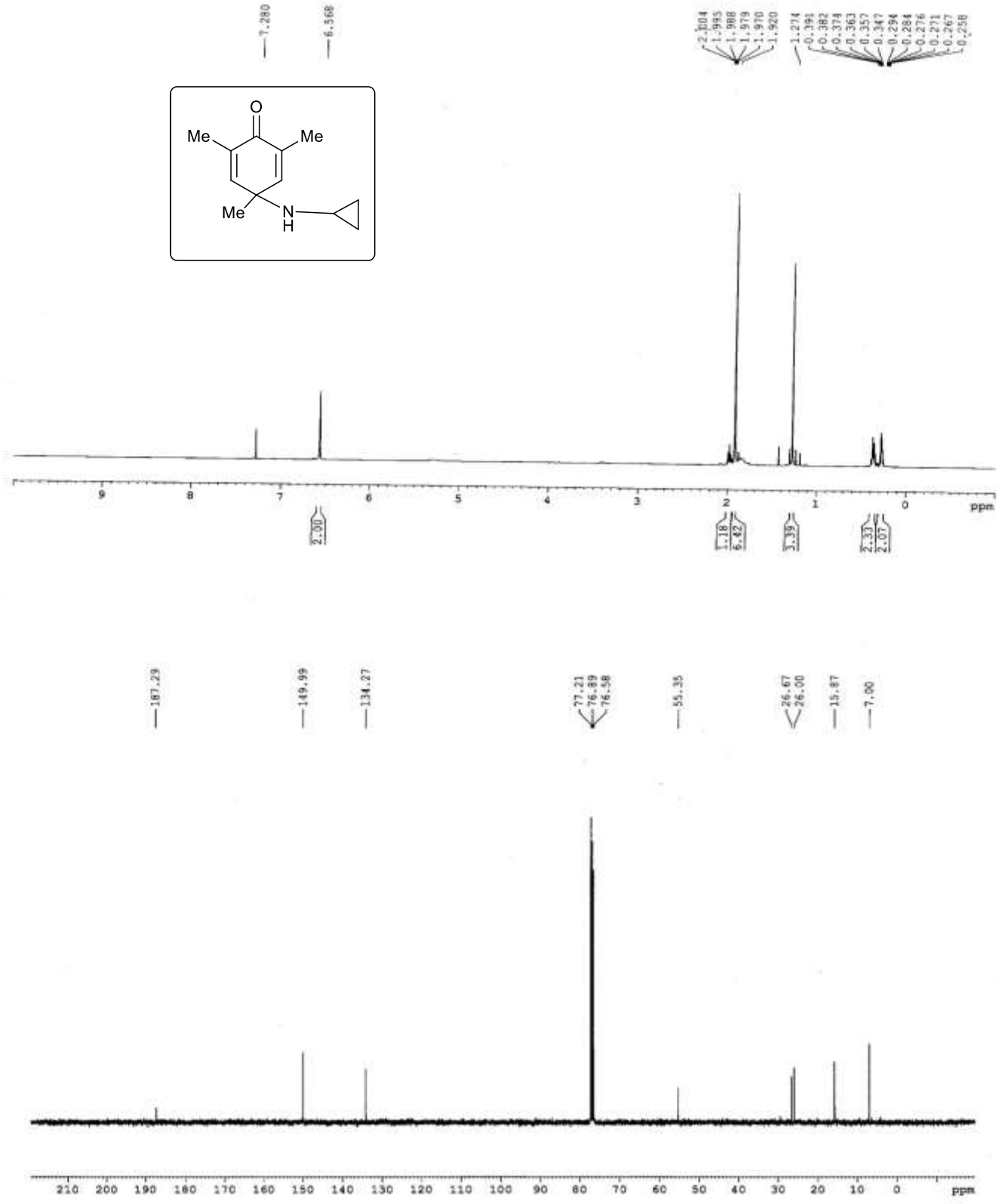


2, 4, 6-trimethyl-4-morpholinocyclohexa-2,5-dienone (5)

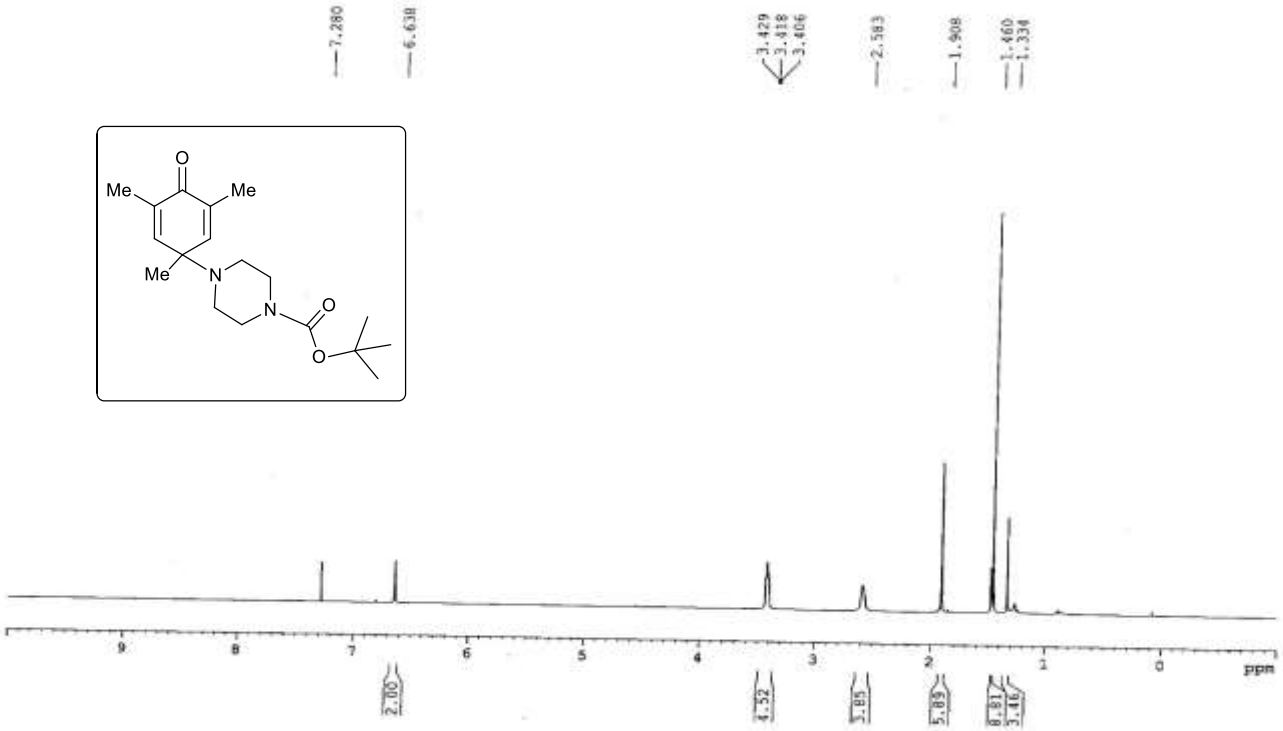


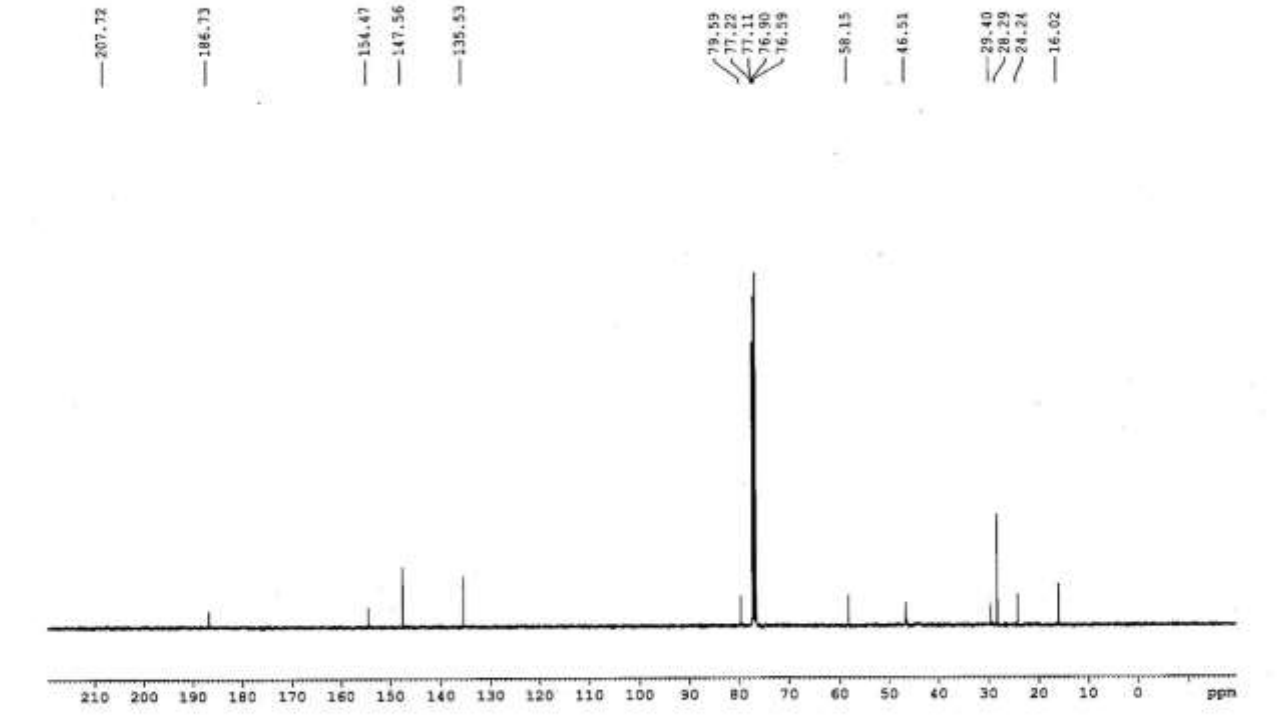


4-(cyclopropylamino)-2,4,6-trimethylcyclohexa-2,5-dienone (6)

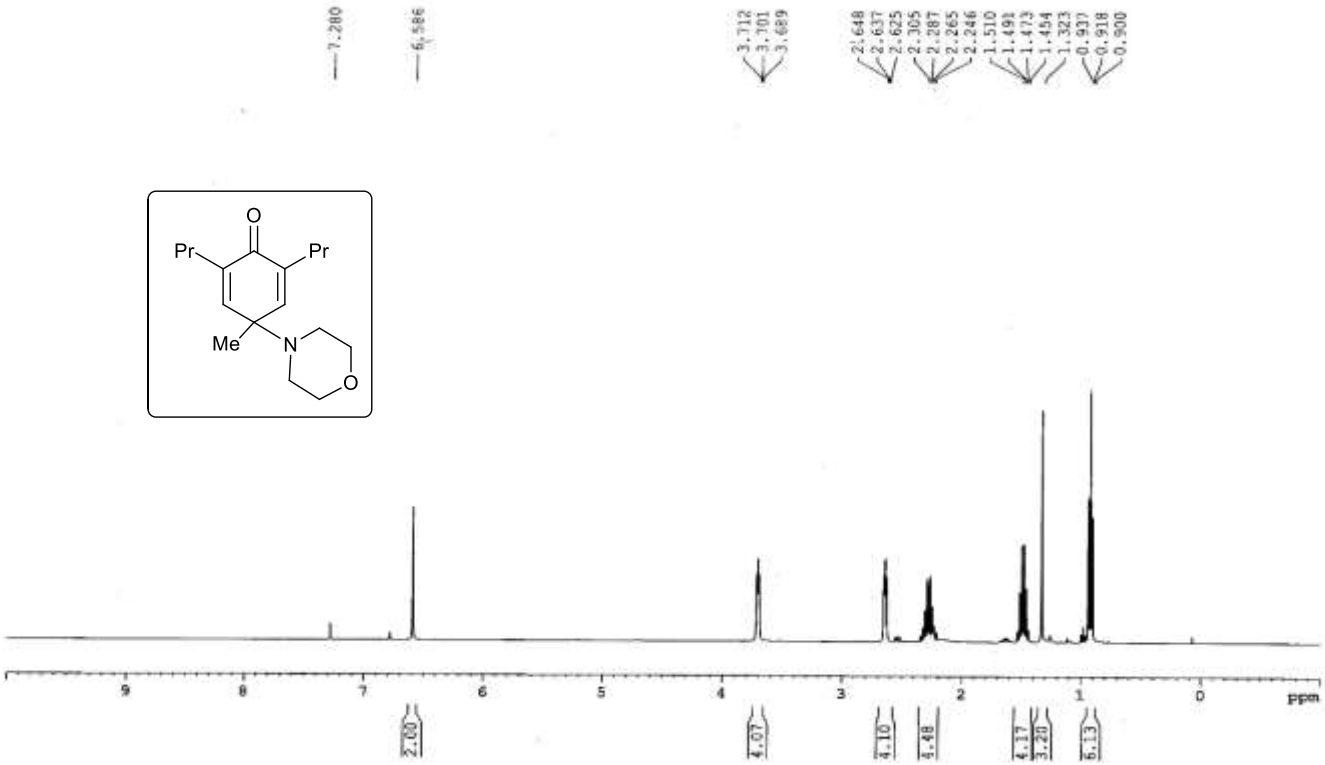


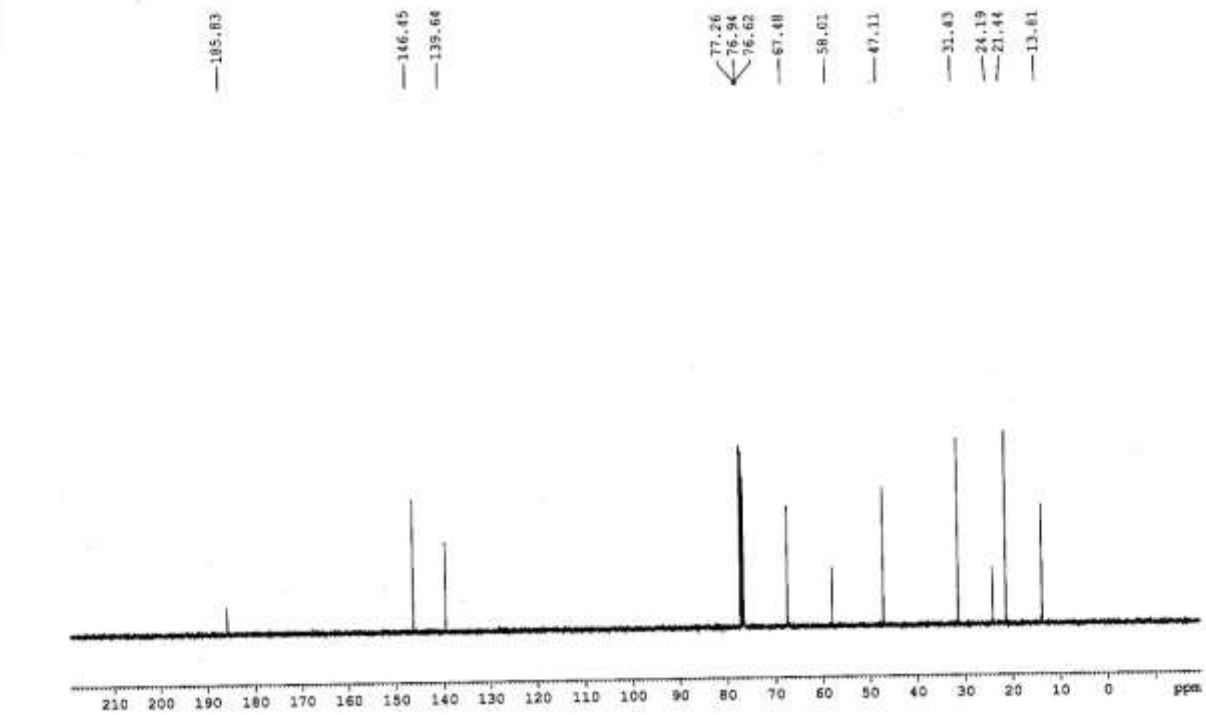
Tert-butyl 4-(1, 3, 5-trimethyl-4-oxocyclohexa-2,5-dien-1-yl)piperazine-1-carboxylate (7)



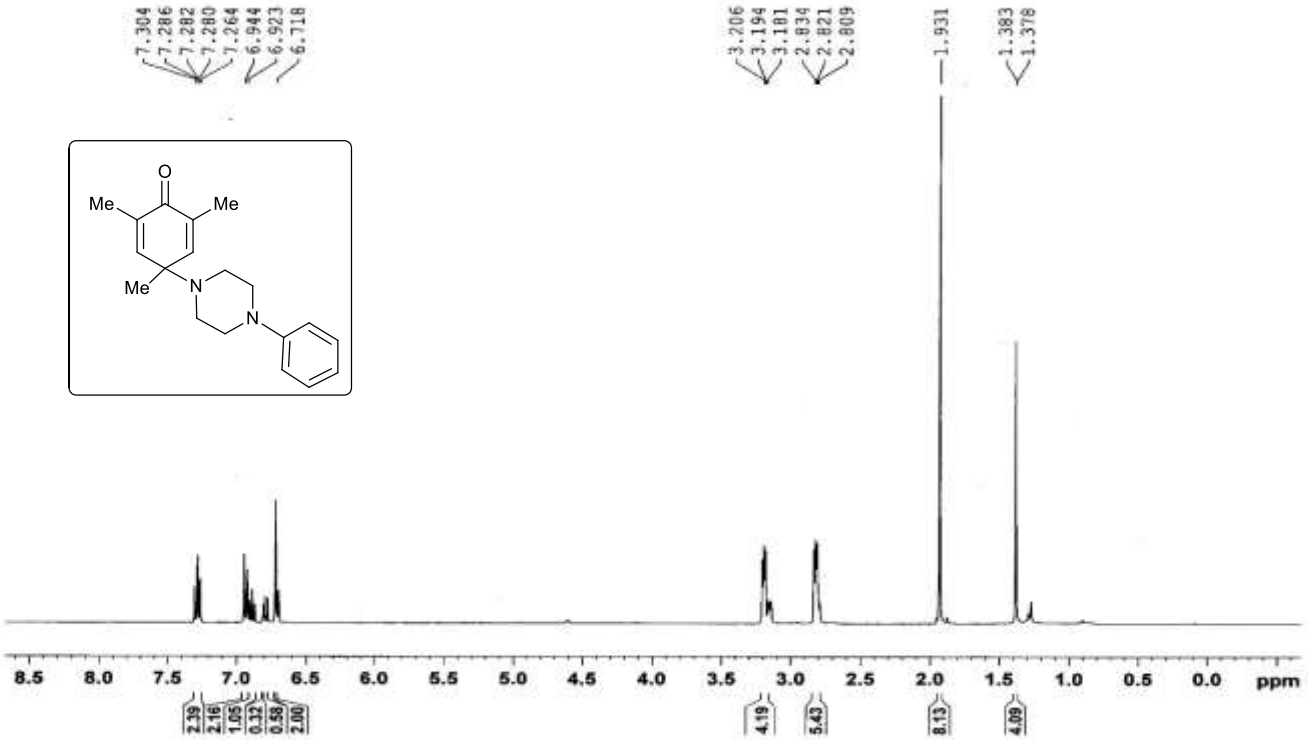


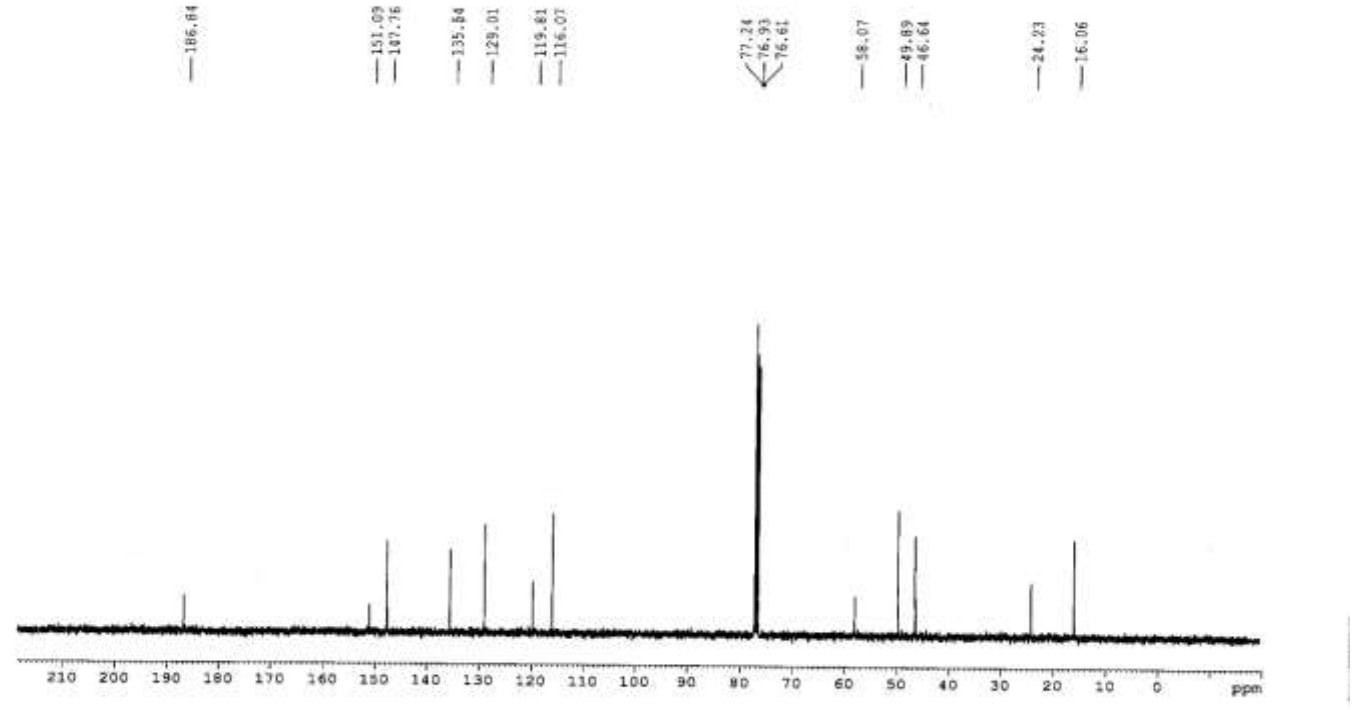
4-methyl-4-morpholino-2,6-dipropylcyclohexa-2,5-dienone (8)



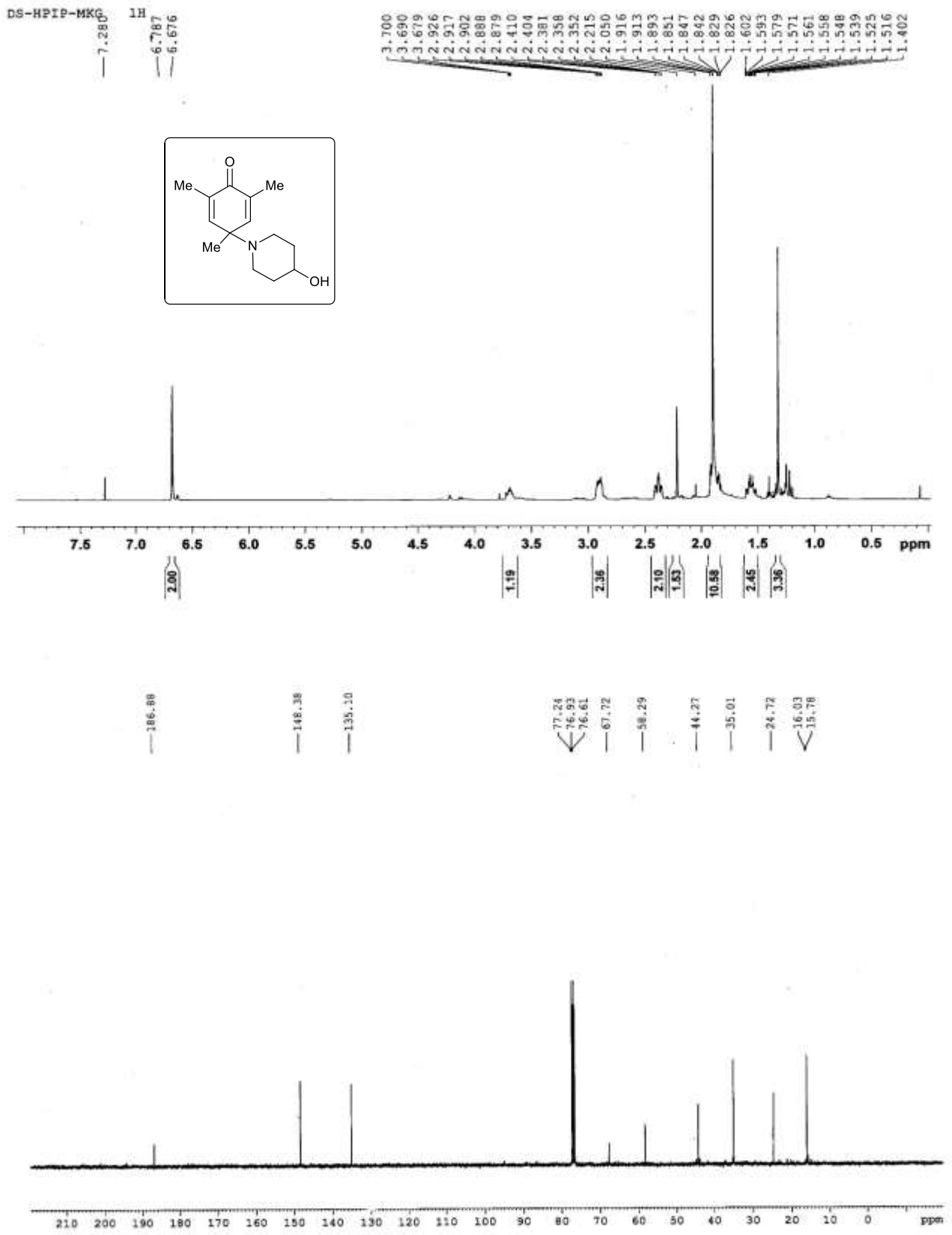


2,4,6-trimethyl-4-(4-phenylpiperazin-1-yl)cyclohexa-2,5-dienone (9)

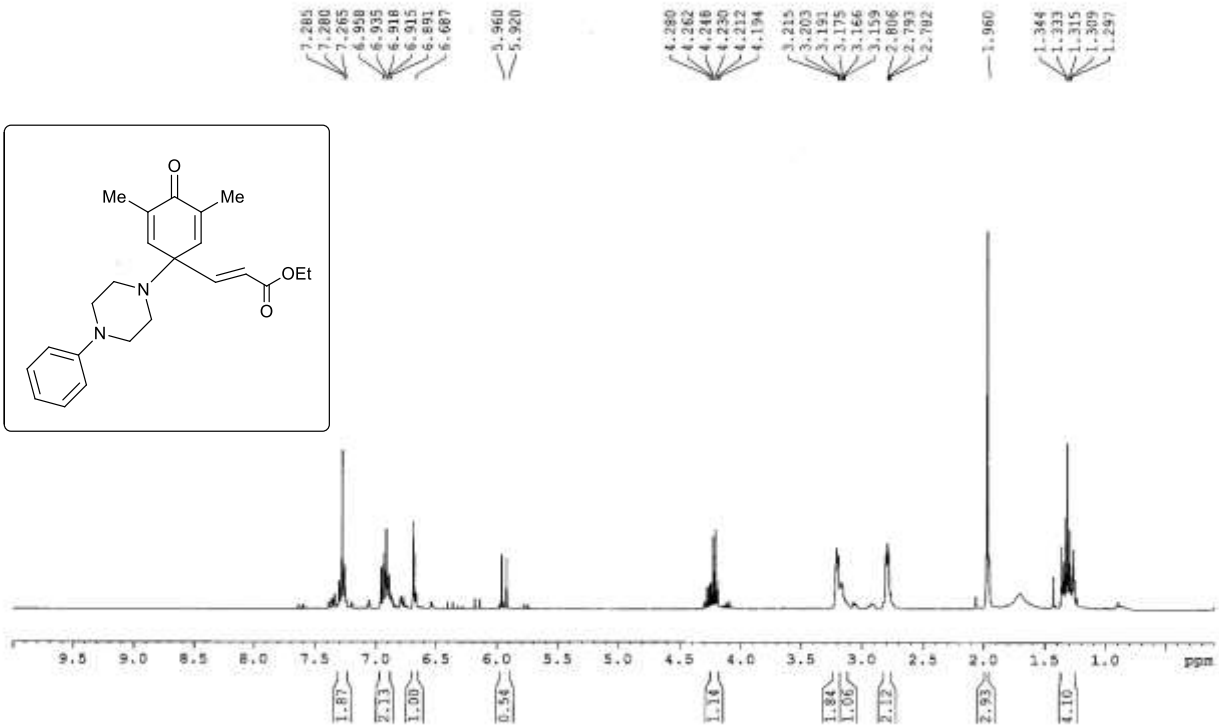




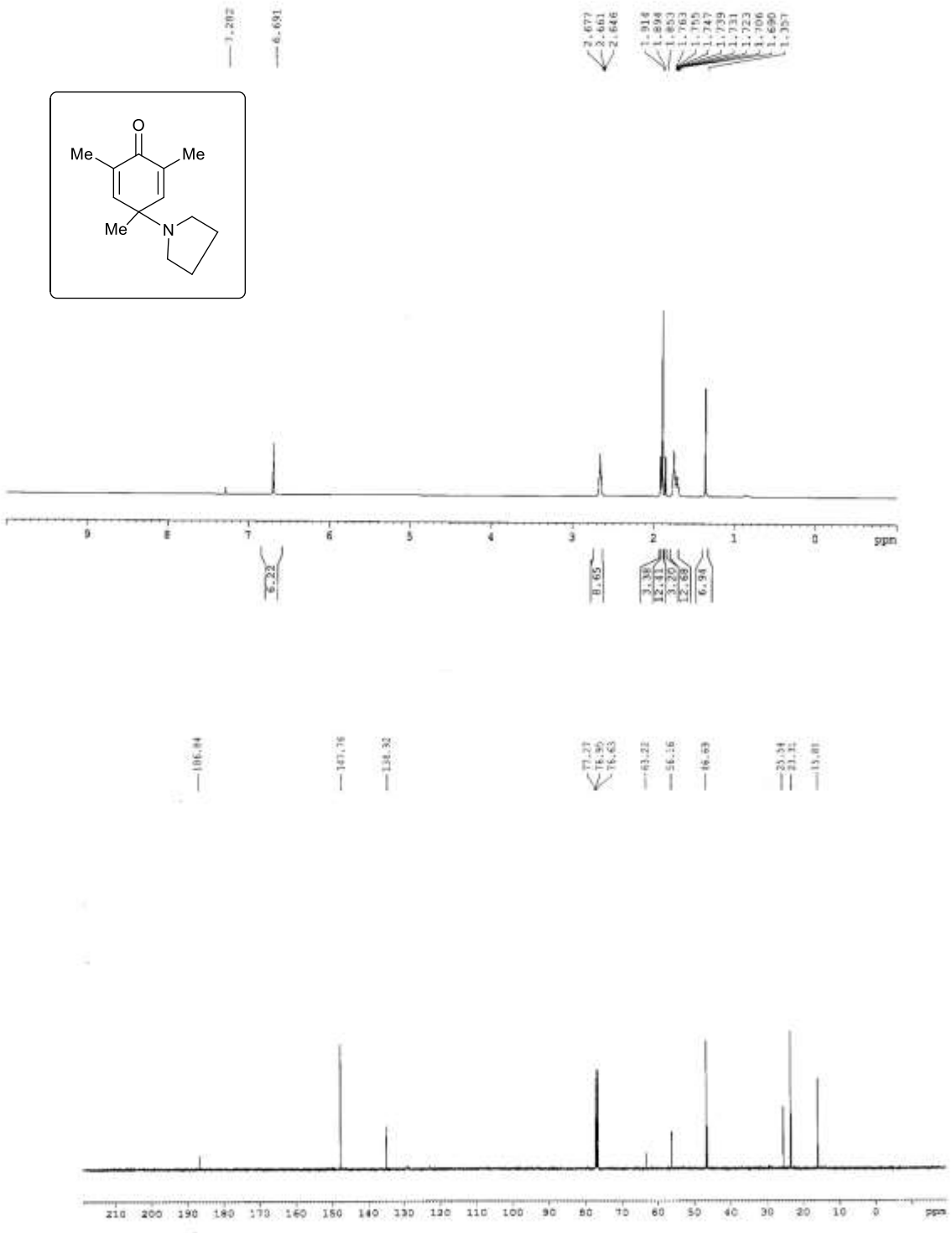
4-(4-hydroxypiperidin-1-yl)-2,4,6-trimethylcyclohexa-2,5-dienone (10)



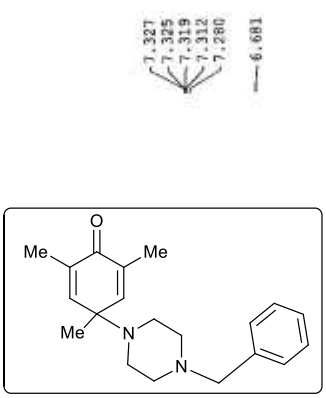
(E)-ethyl 3-(3,5-dimethyl-4-oxo-1-(4-phenylpiperazin-1-yl)cyclohexa-2,5-dien-1-yl)acrylate (11)

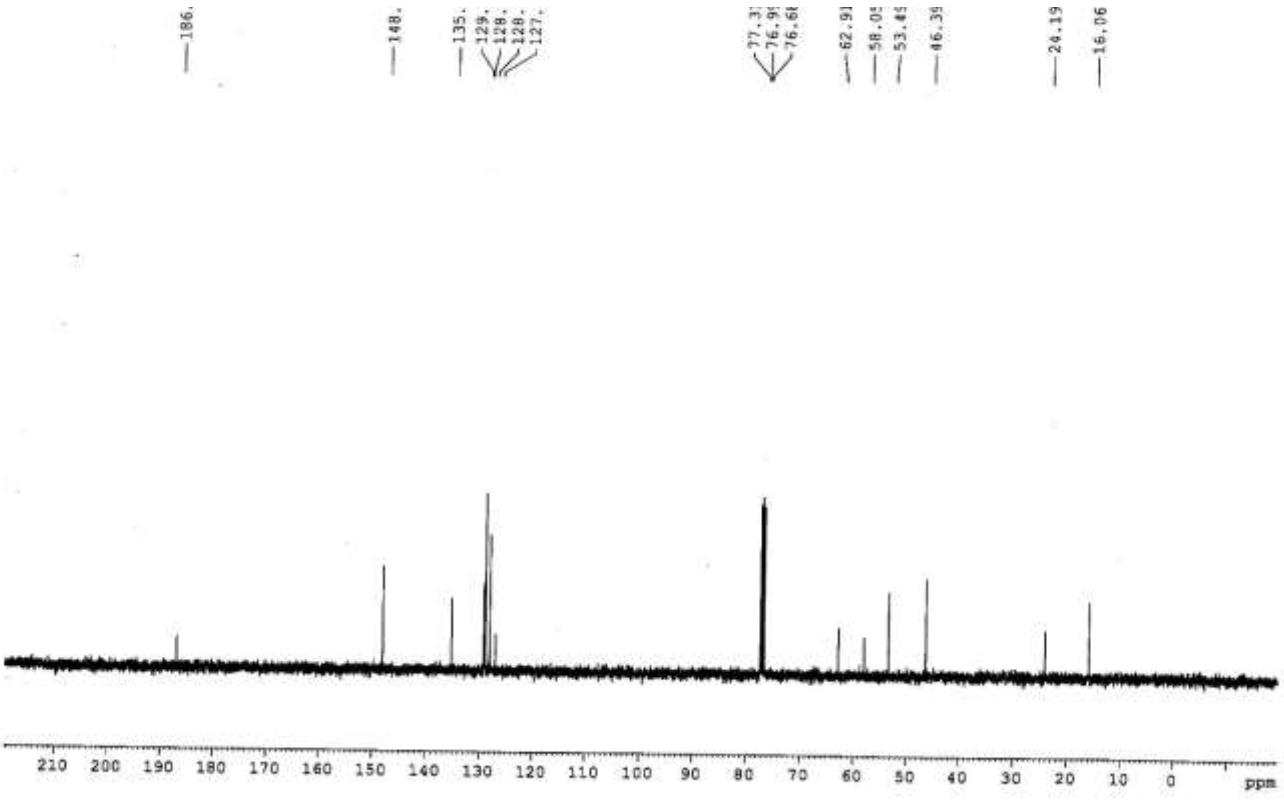


2, 4, 6-trimethyl-4-(pyrrolidin-1-yl) cyclohexa-2,5-dienone (12)

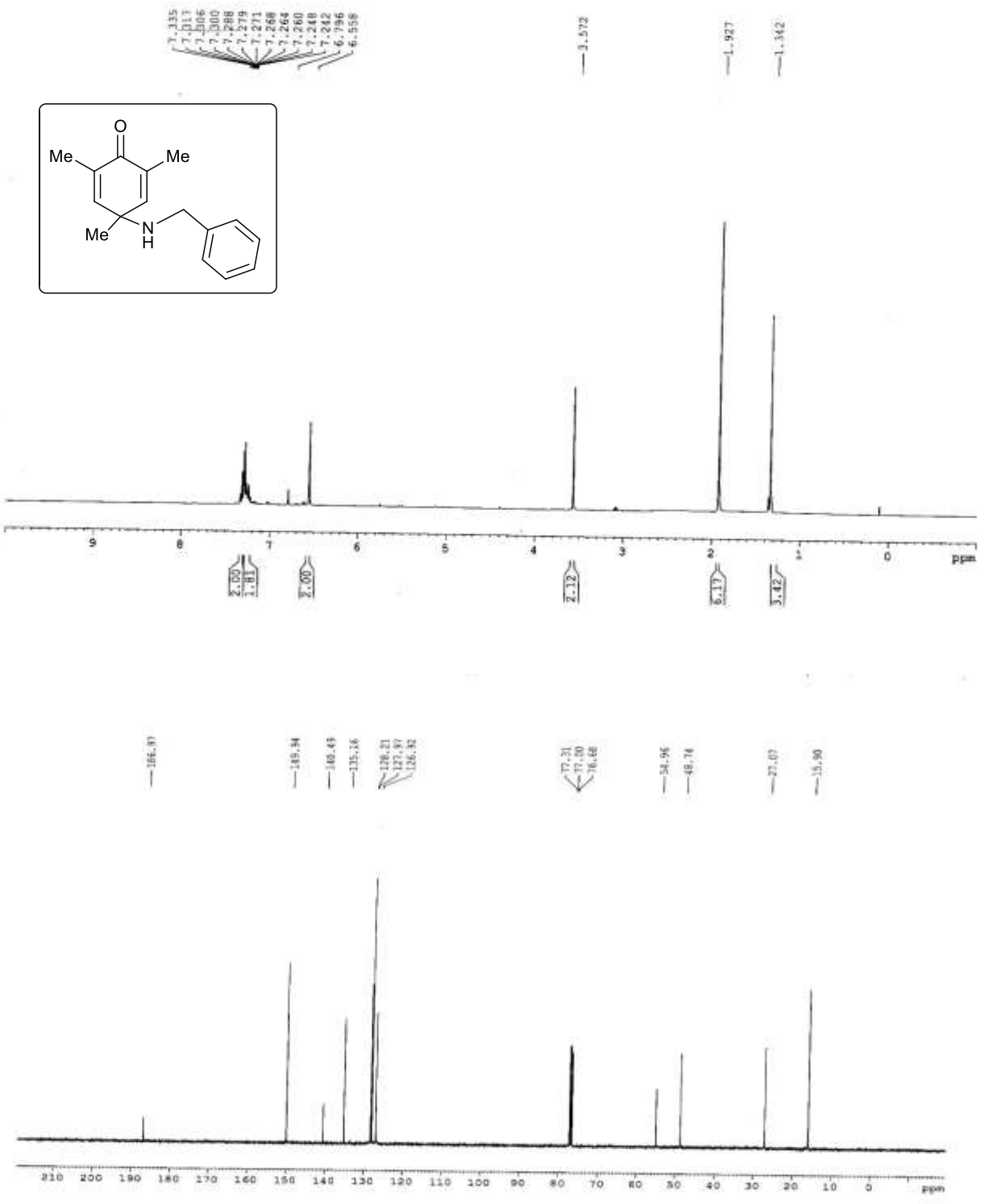


4-(4-benzylpiperazin-1-yl)-2,4,6-trimethylcyclohexa-2,5-dienone (14)

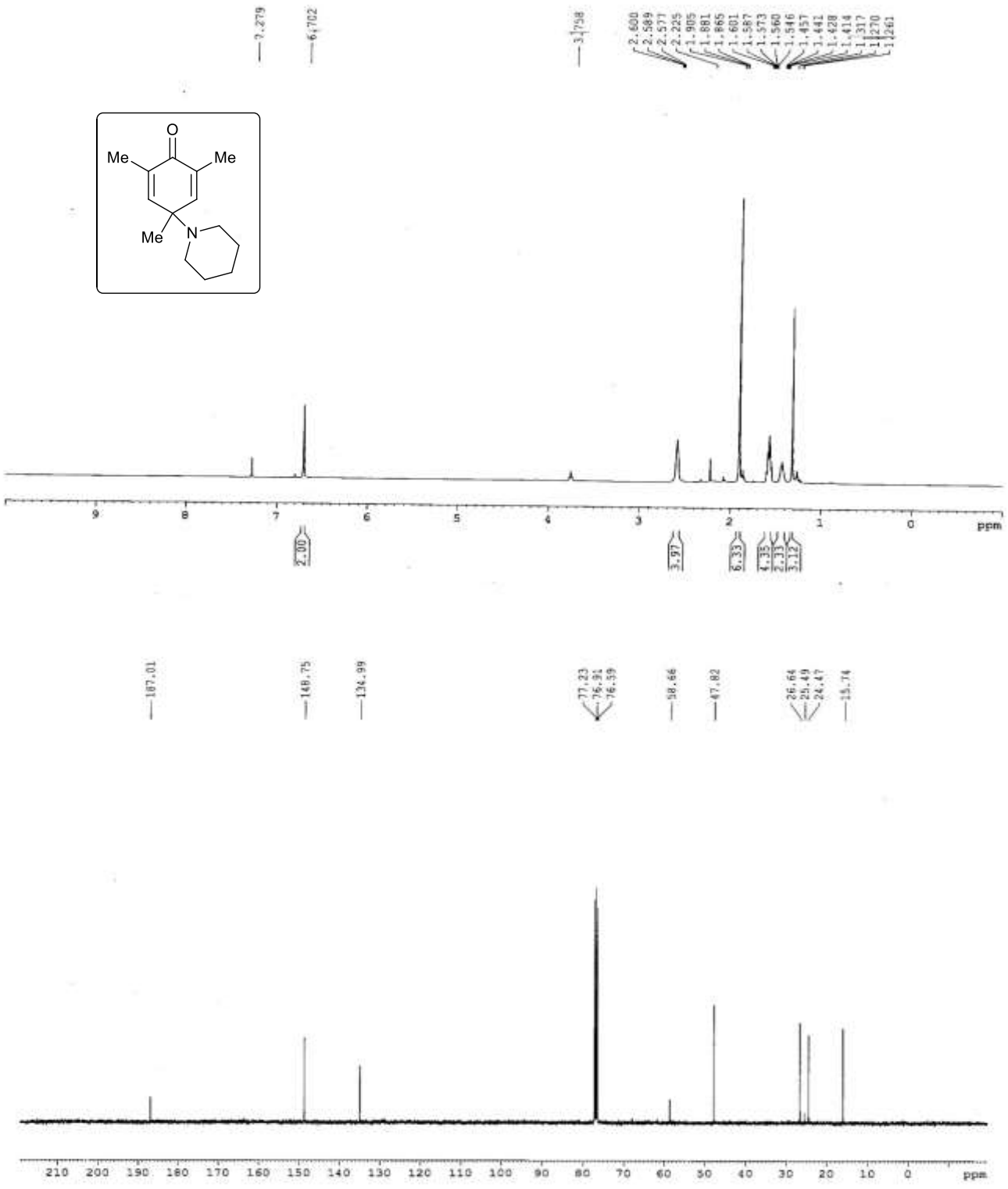




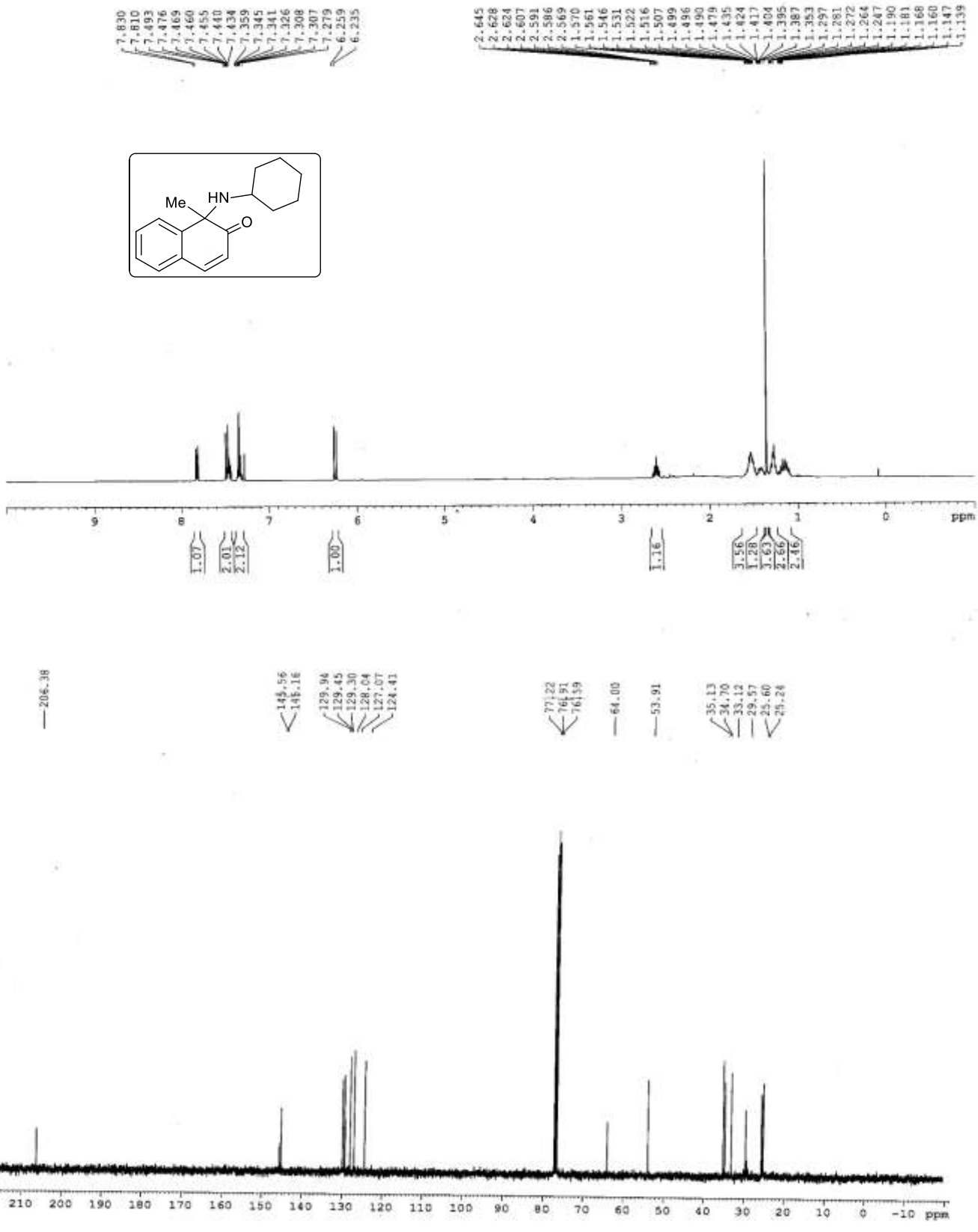
4-(benzyl amino)-2,4,6-trimethylcyclohexa-2,5-dienone (15)



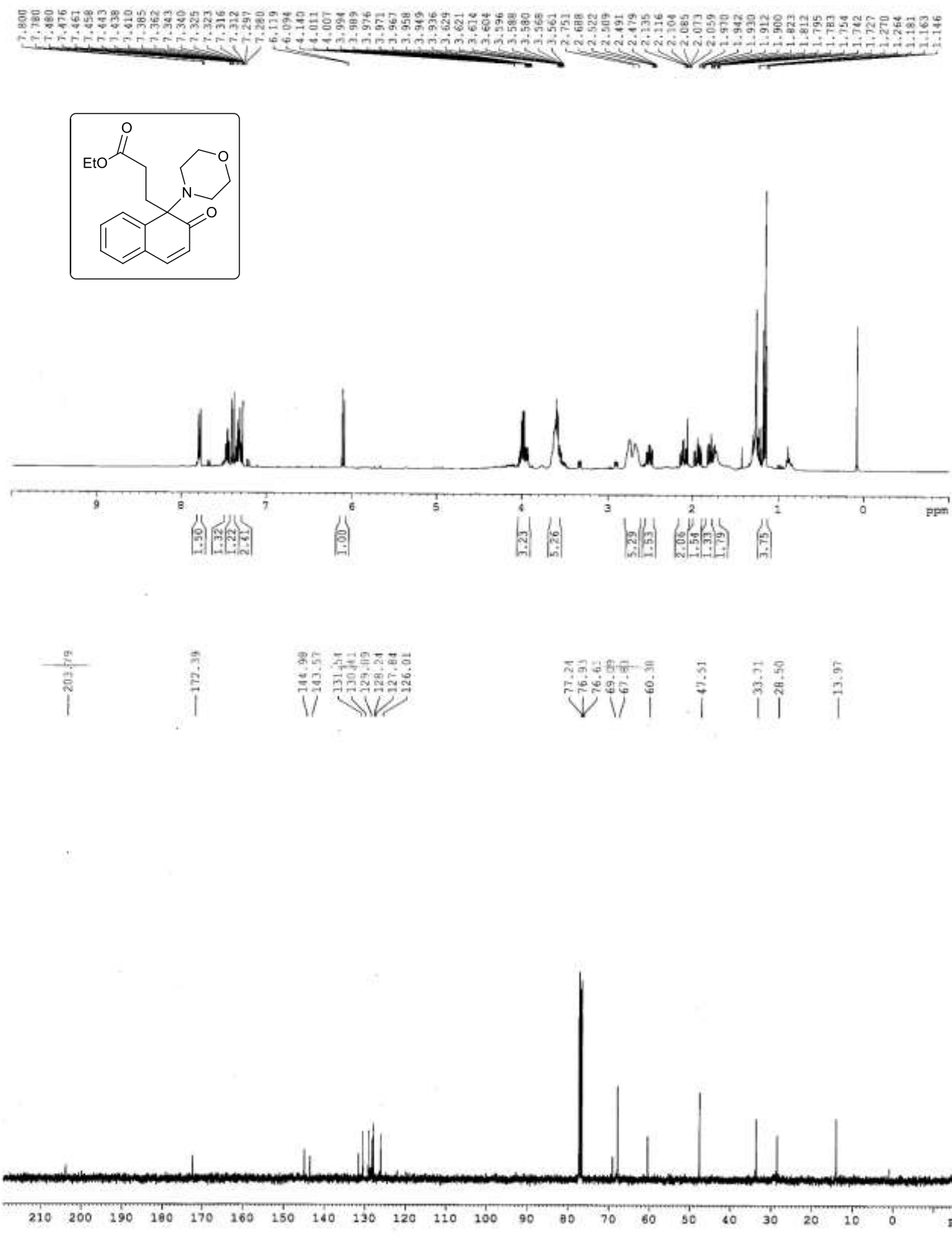
2, 4, 6-trimethyl-4-(piperidin-1-yl) cyclohexa-2, 5-dienone (16)



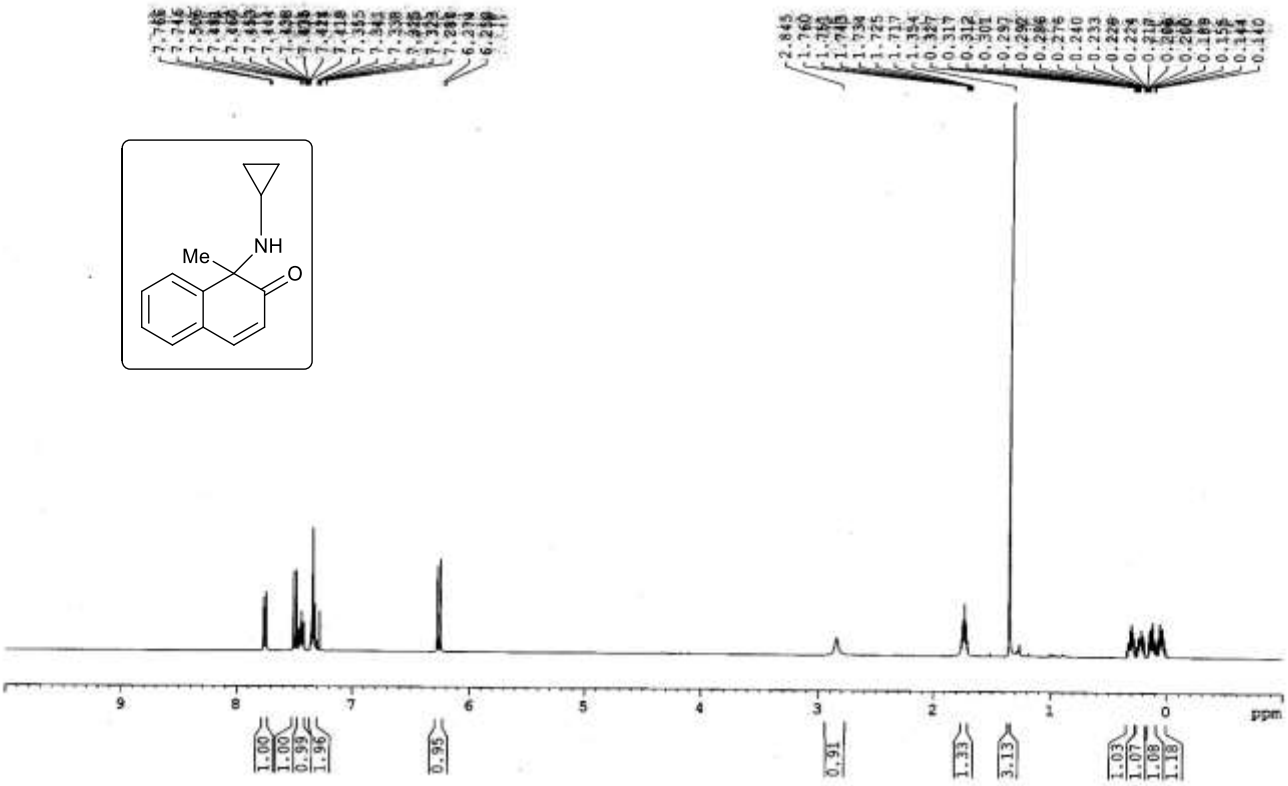
1-(cyclohexylamino)-1-methylnaphthalen-2(1H)-one (17)

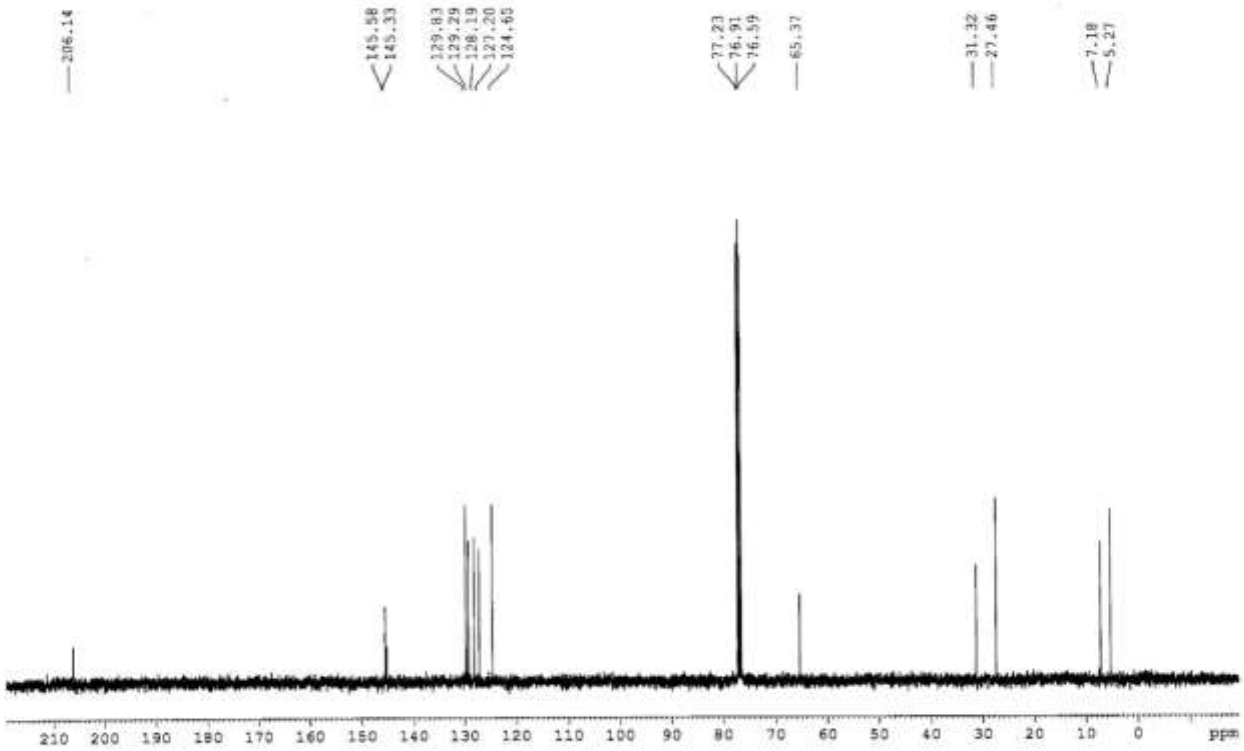


ethyl 3-(1-morpholino-2-oxo-1,2-dihydronaphthalen-1-yl)propanoate (18)

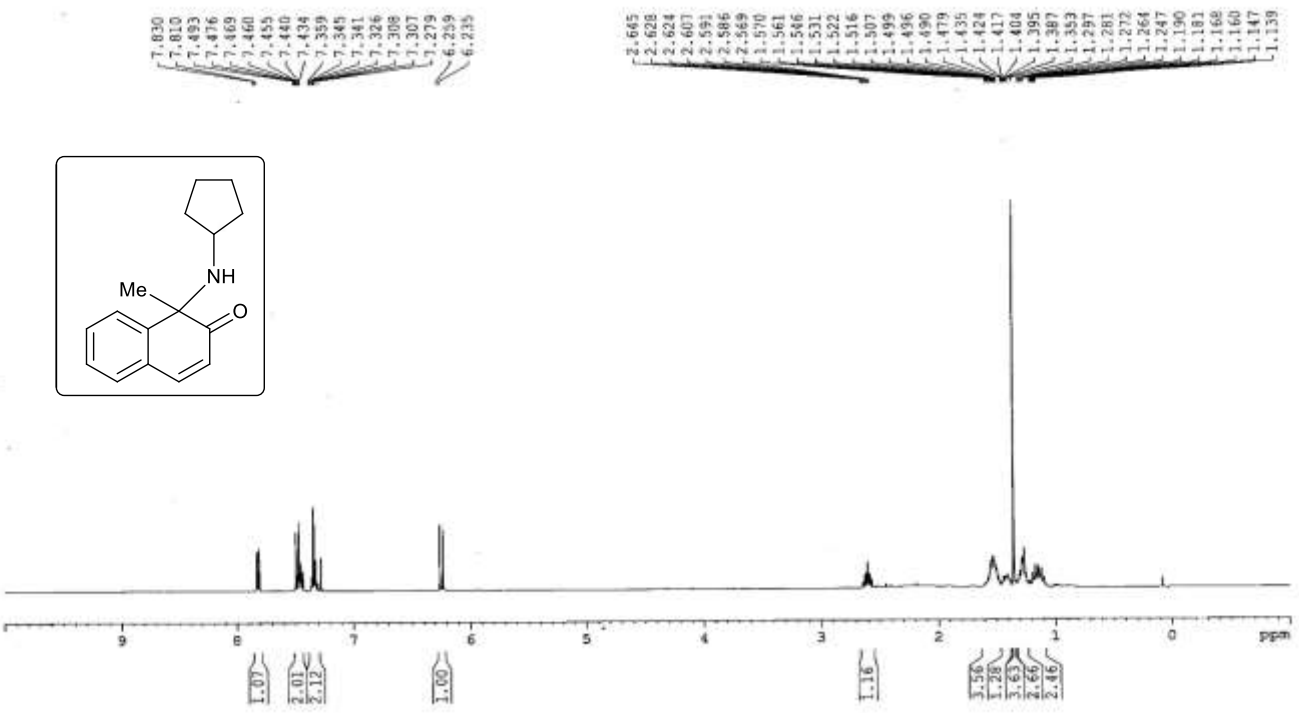


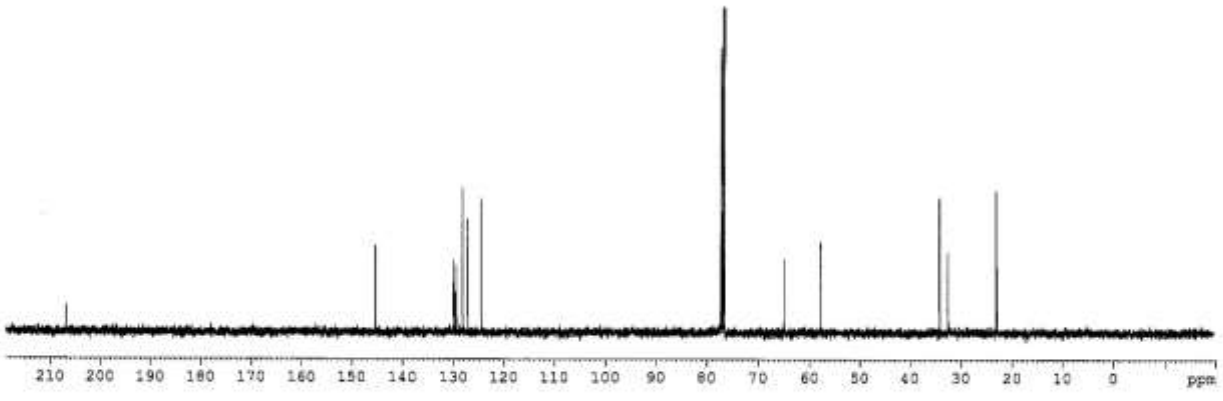
1-(cyclopropylamino)-1-methylnaphthalen-2(1H)-one (19)



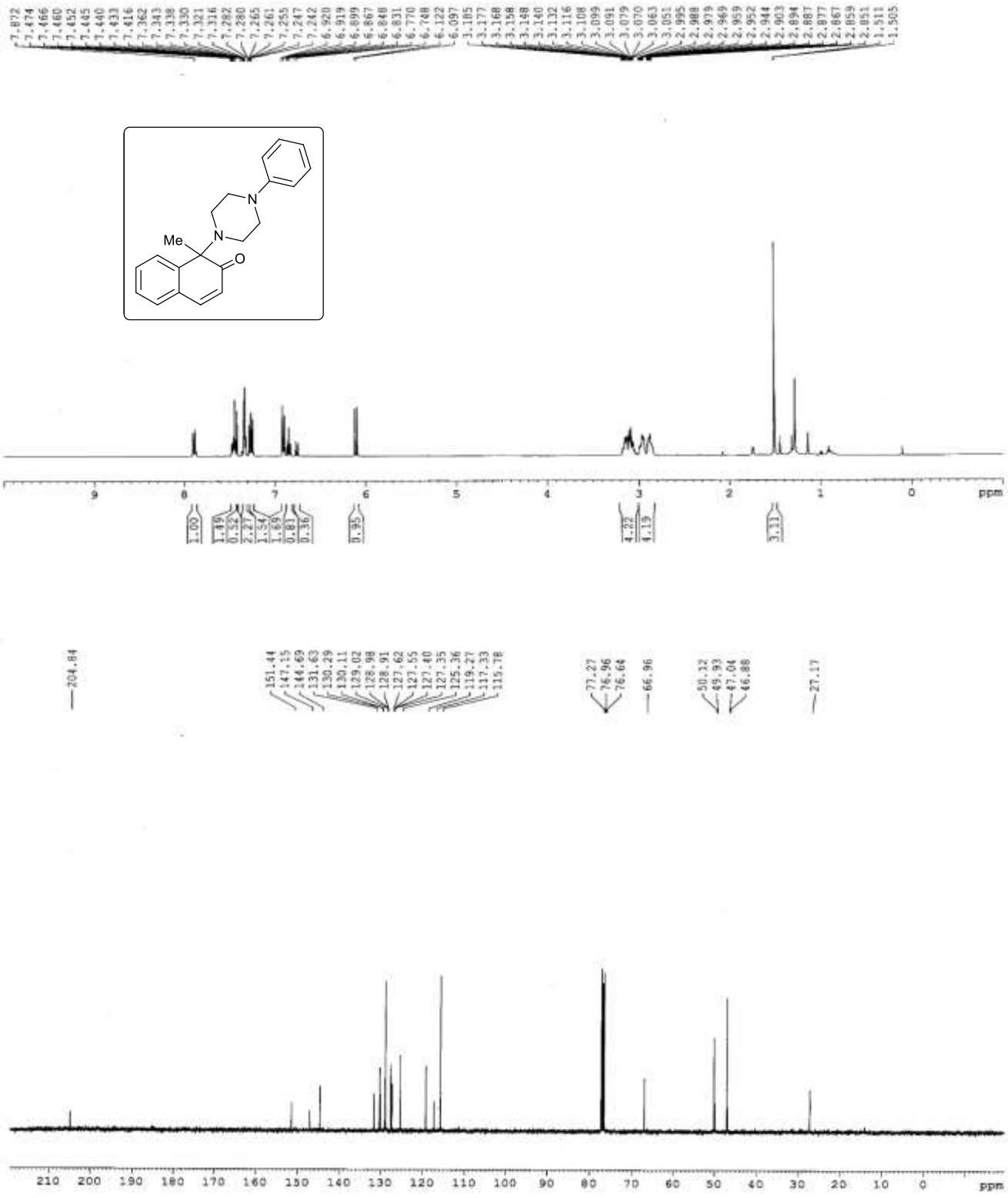


1-(cyclopentylamino)-1-methylnaphthalen-2(1H)-one (20)

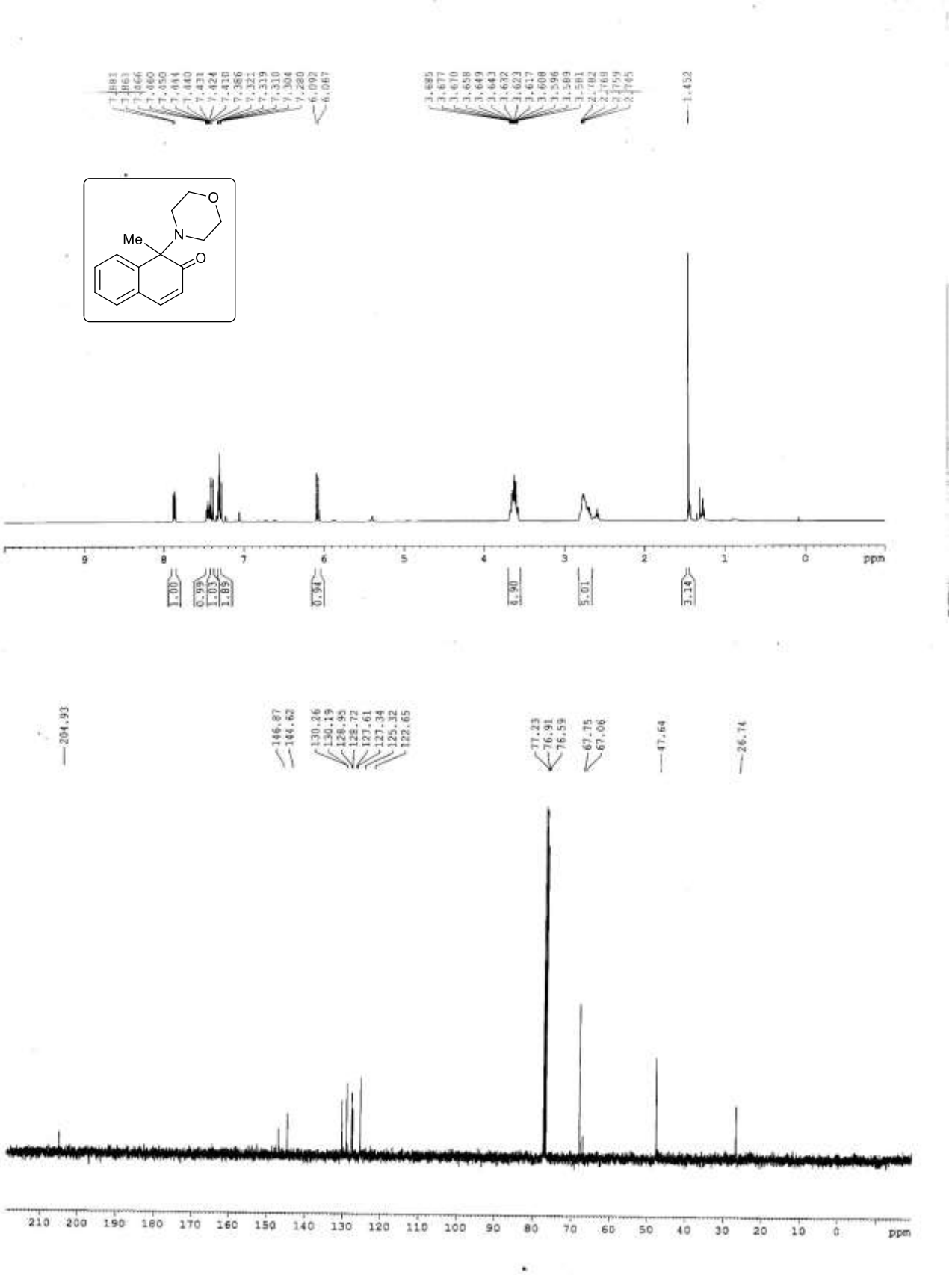




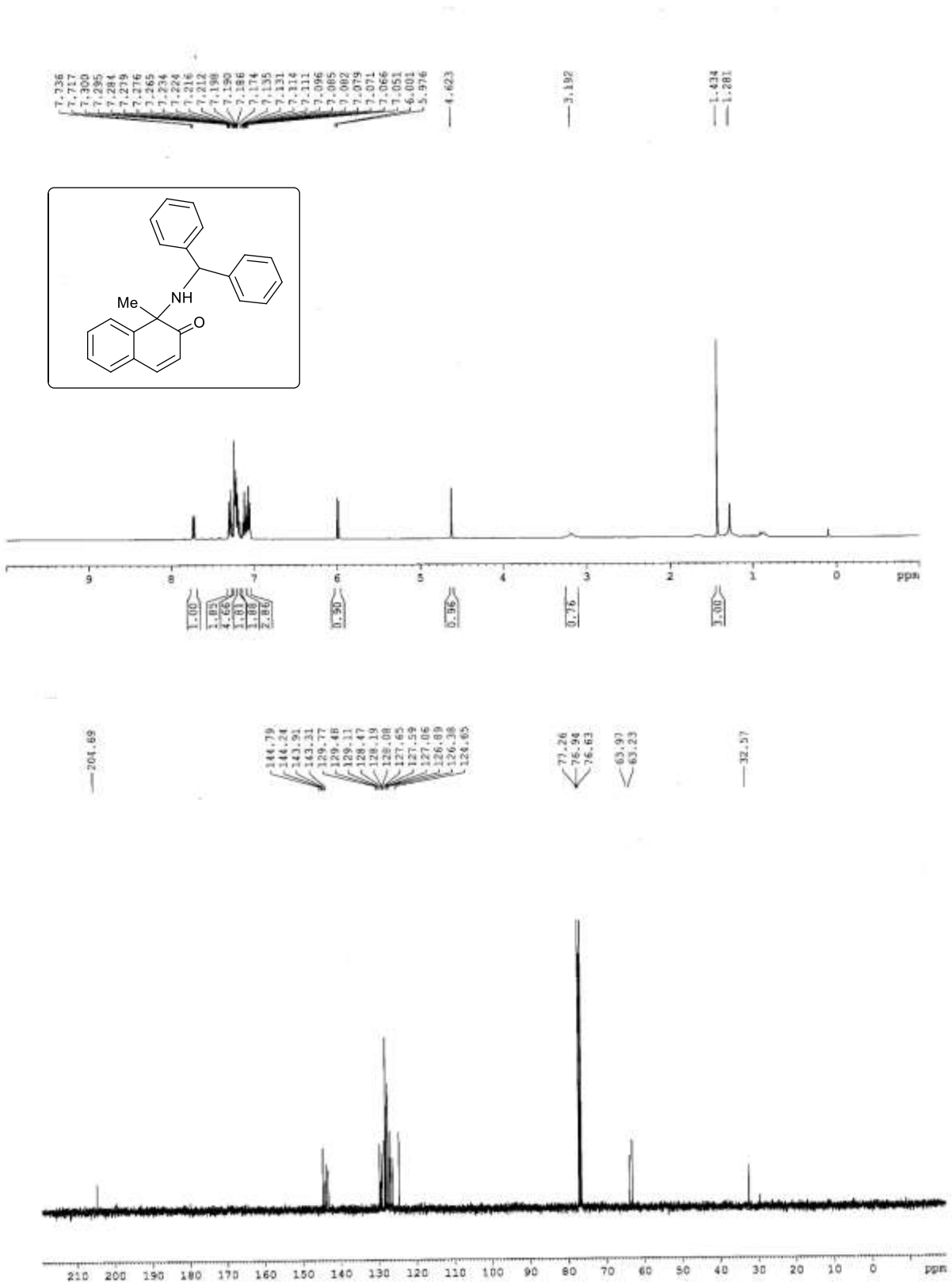
1-methyl-1-(4-phenylpiperazin-1-yl) naphthalen-2(1H)-one (21)



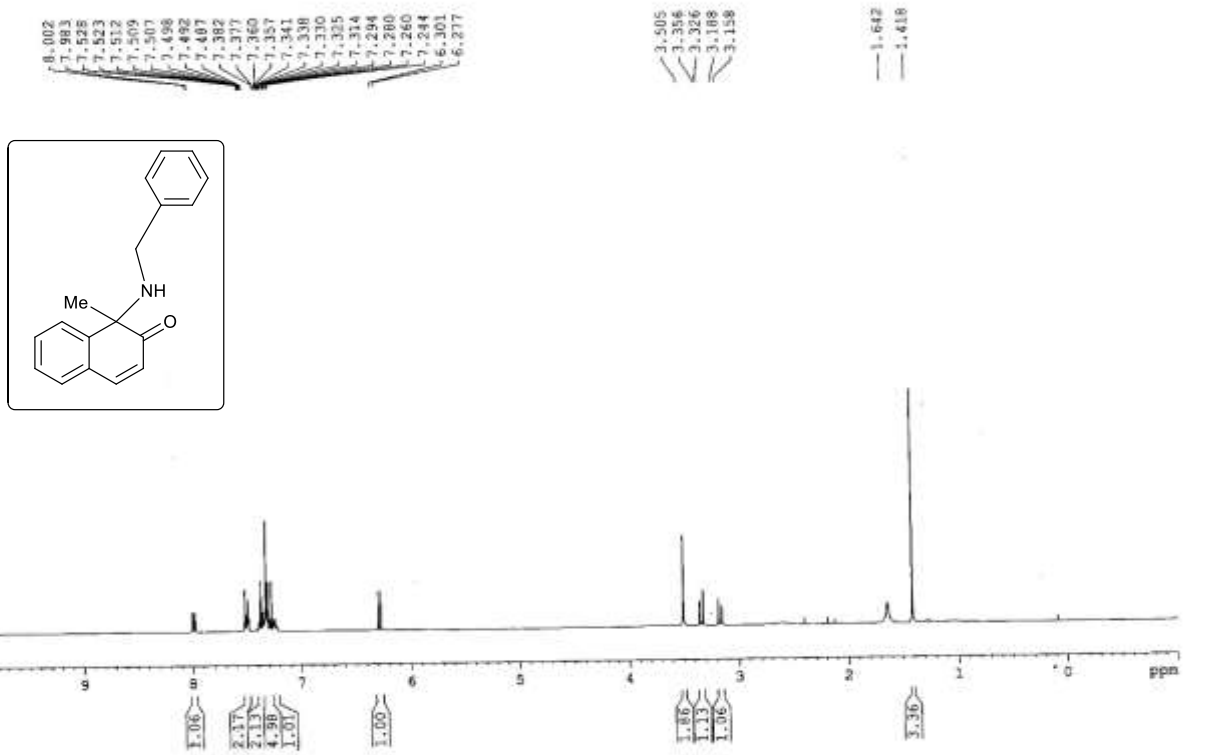
1-methyl-1-morpholinonaphthalen-2(1H)-one (22)

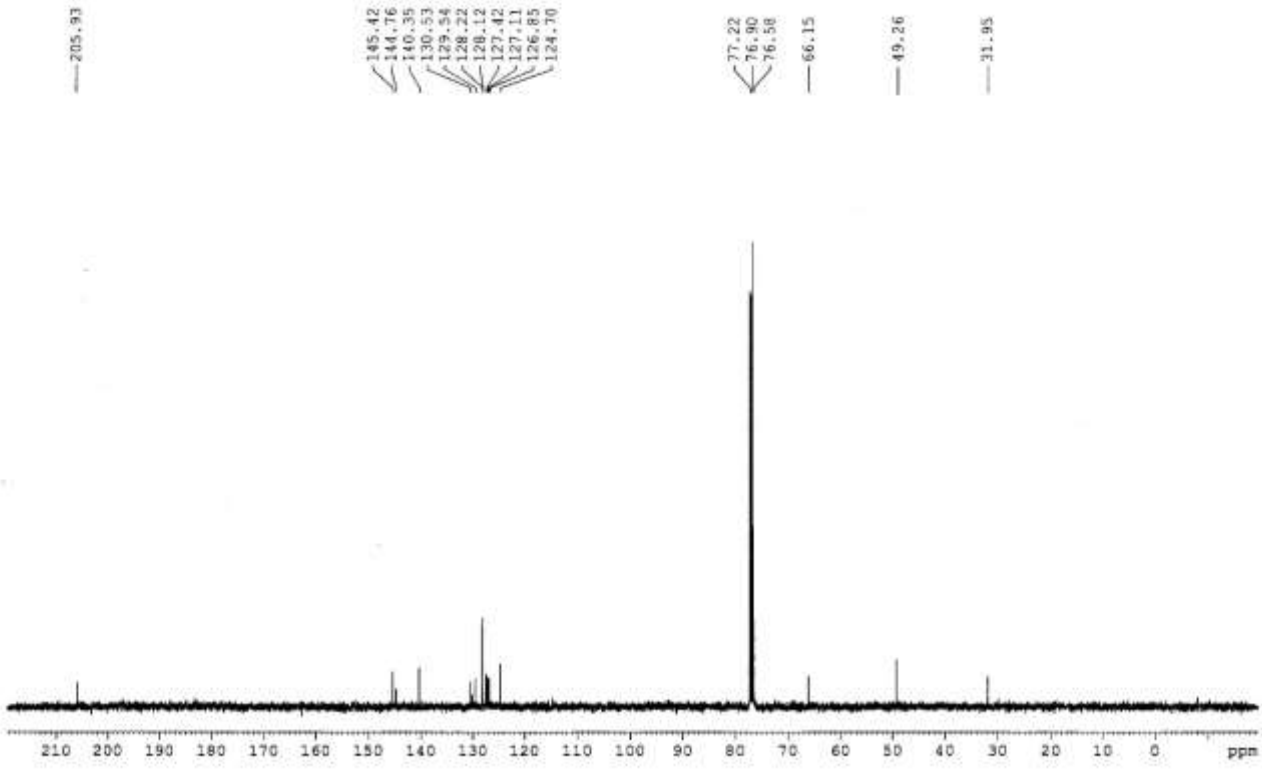


1-(benzhydrylamino)-1-methylnaphthalen-2(1H)-one (23)

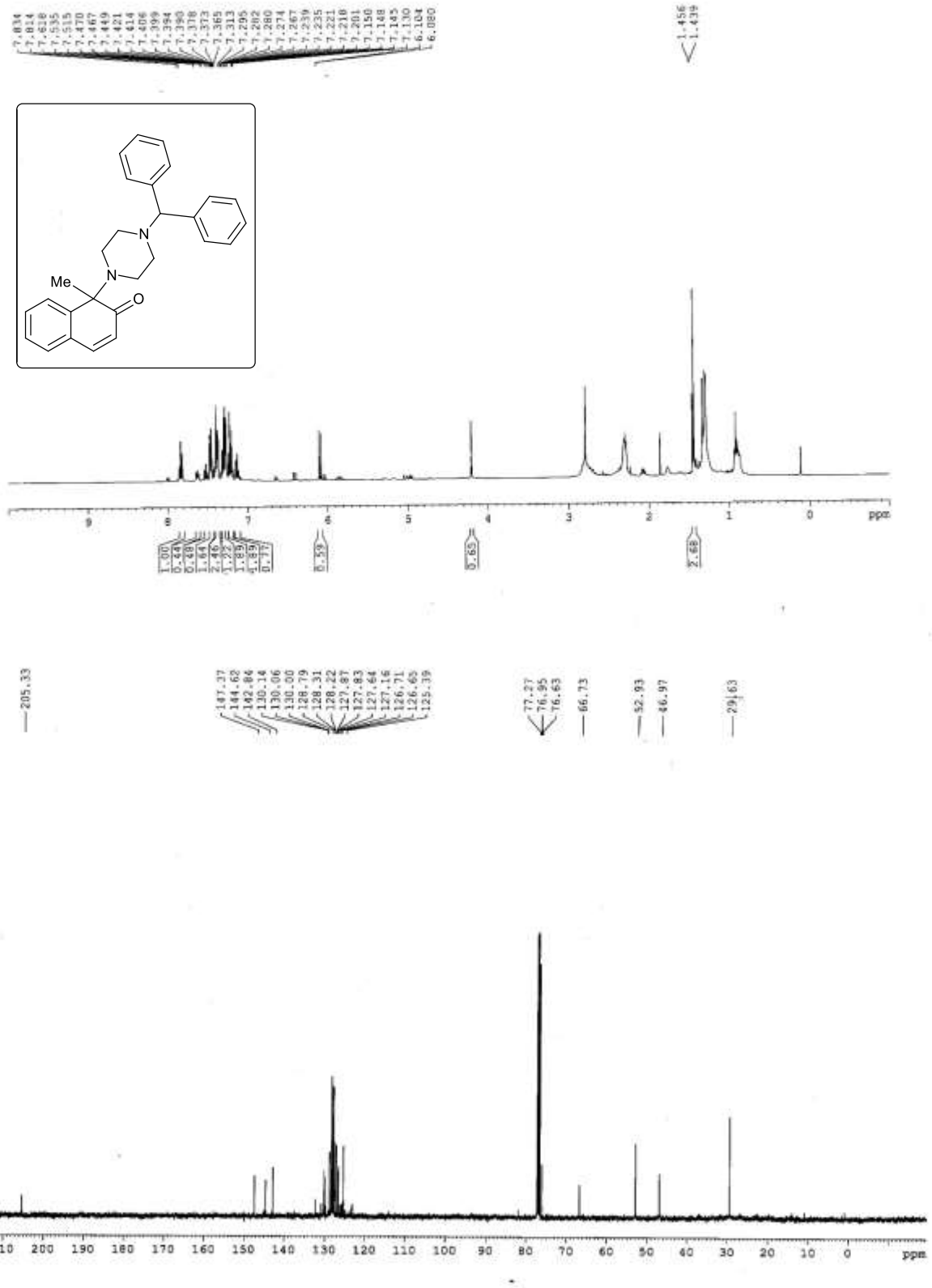


1-(benzyl amino)-1-methylnaphthalen-2(1H)-one (24)

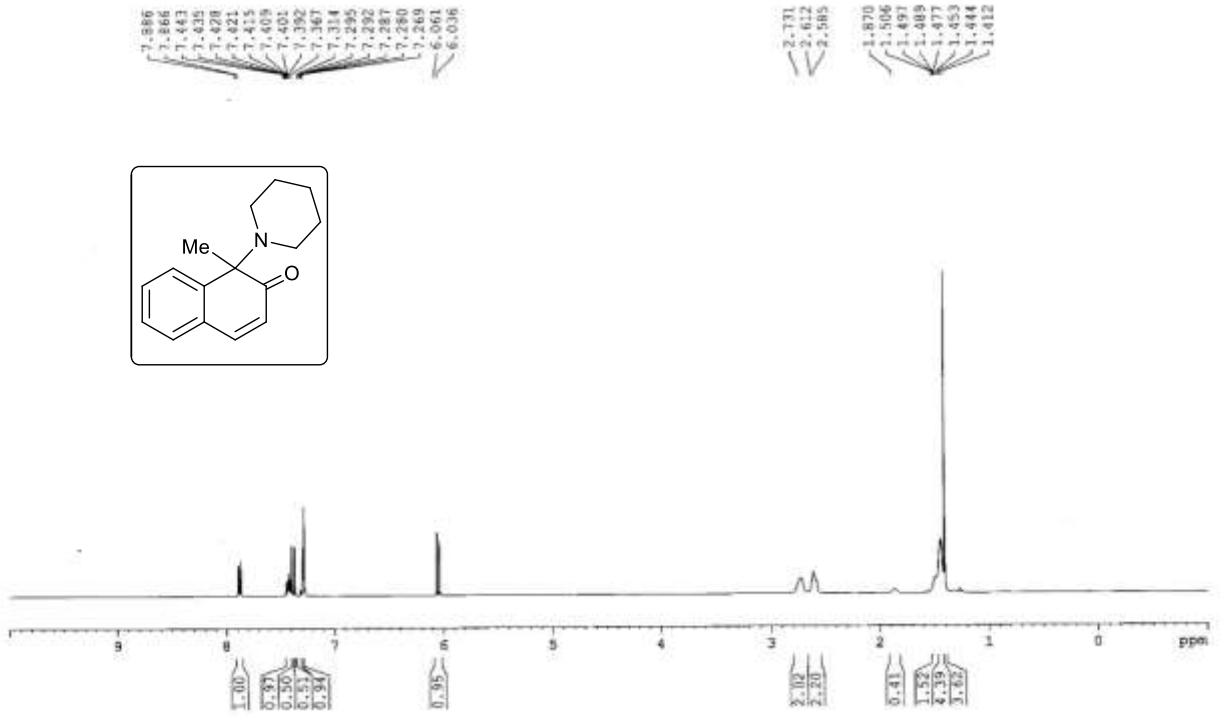


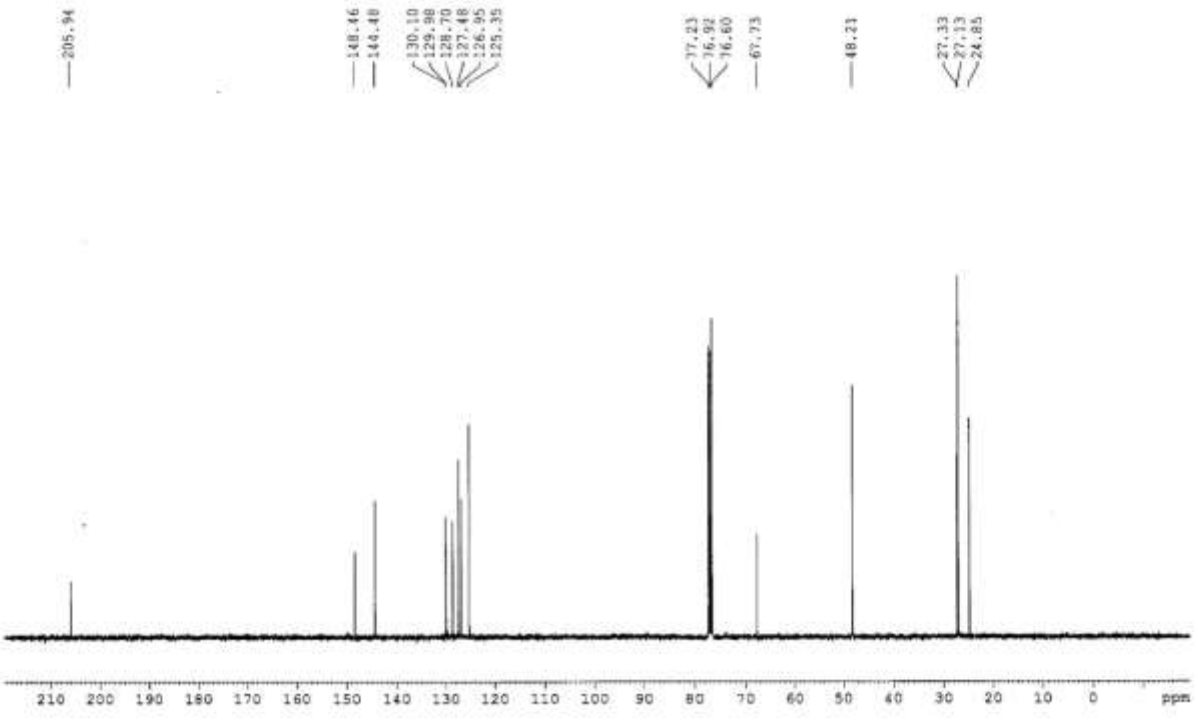


1-(4-benzhydrylpiperazin-1-yl)-1-methylnaphthalen-2(1H)-one (25)

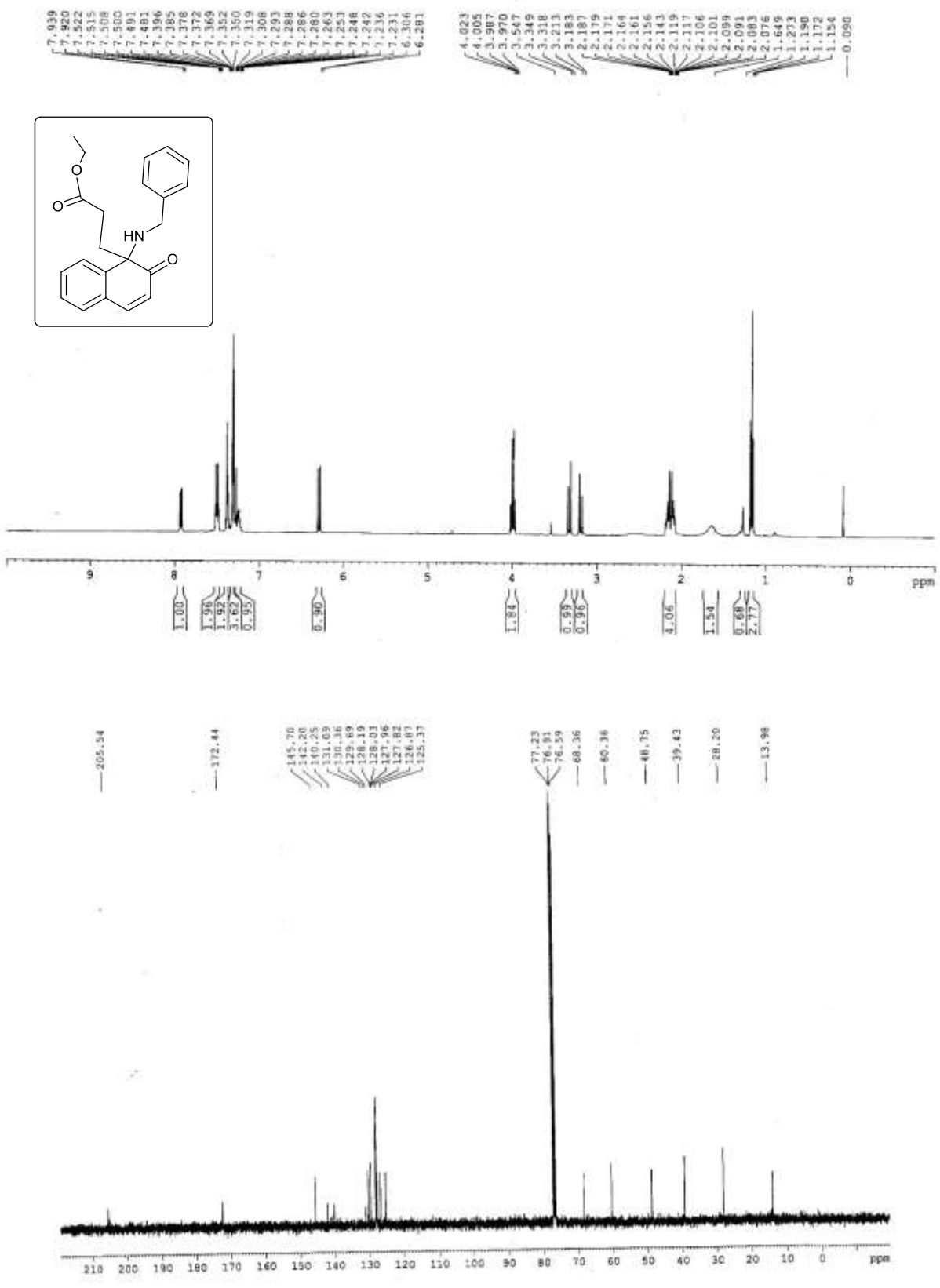


1-methyl-1-(piperidin-1-yl)naphthalen-2(1H)-one (26)

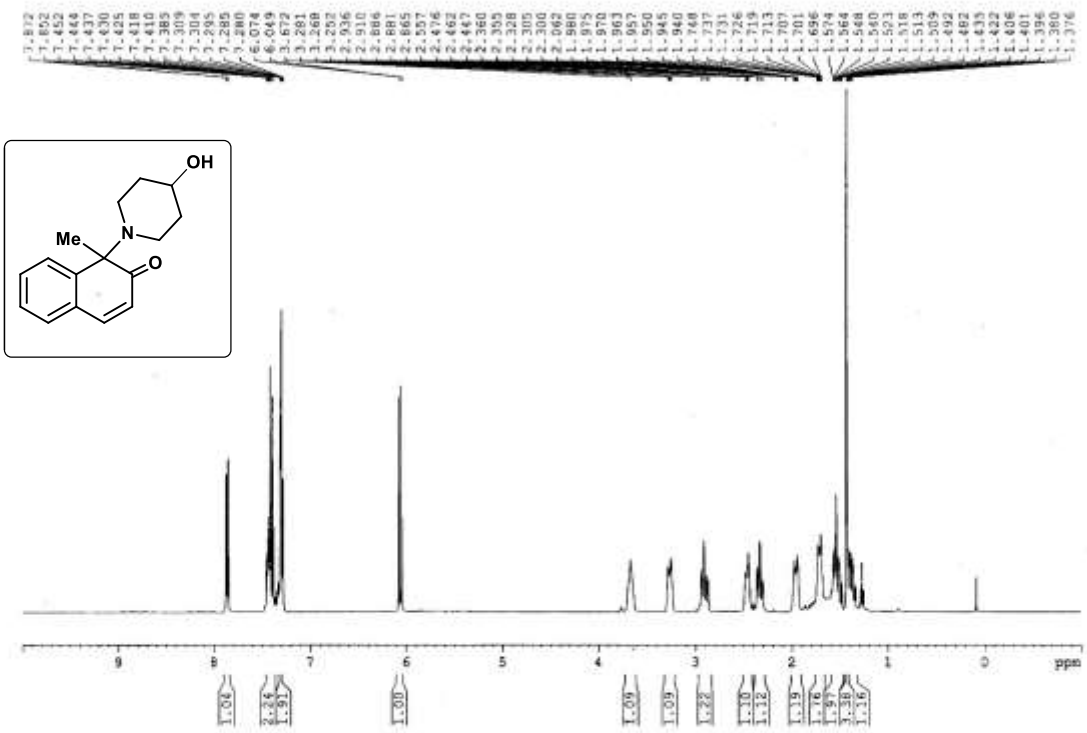


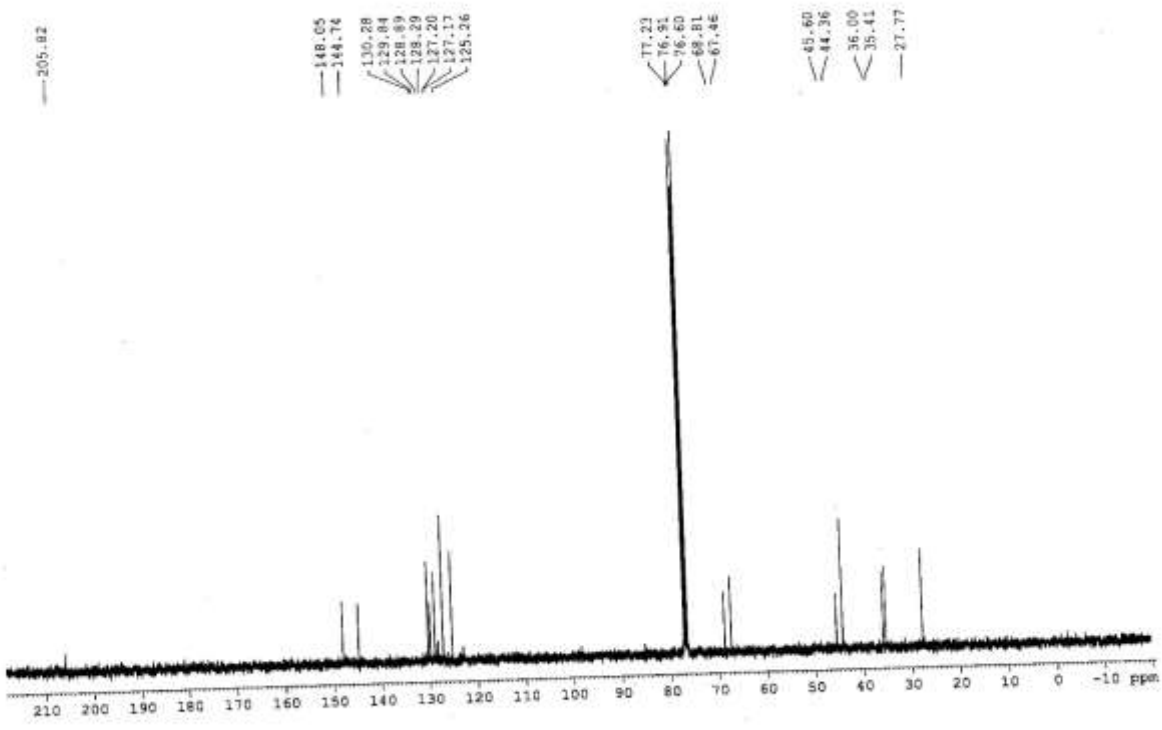


Ethyl 3-(1-(benzylamino)-2-oxo-1,2-dihydronaphthalen-1-yl)propanoate (27)

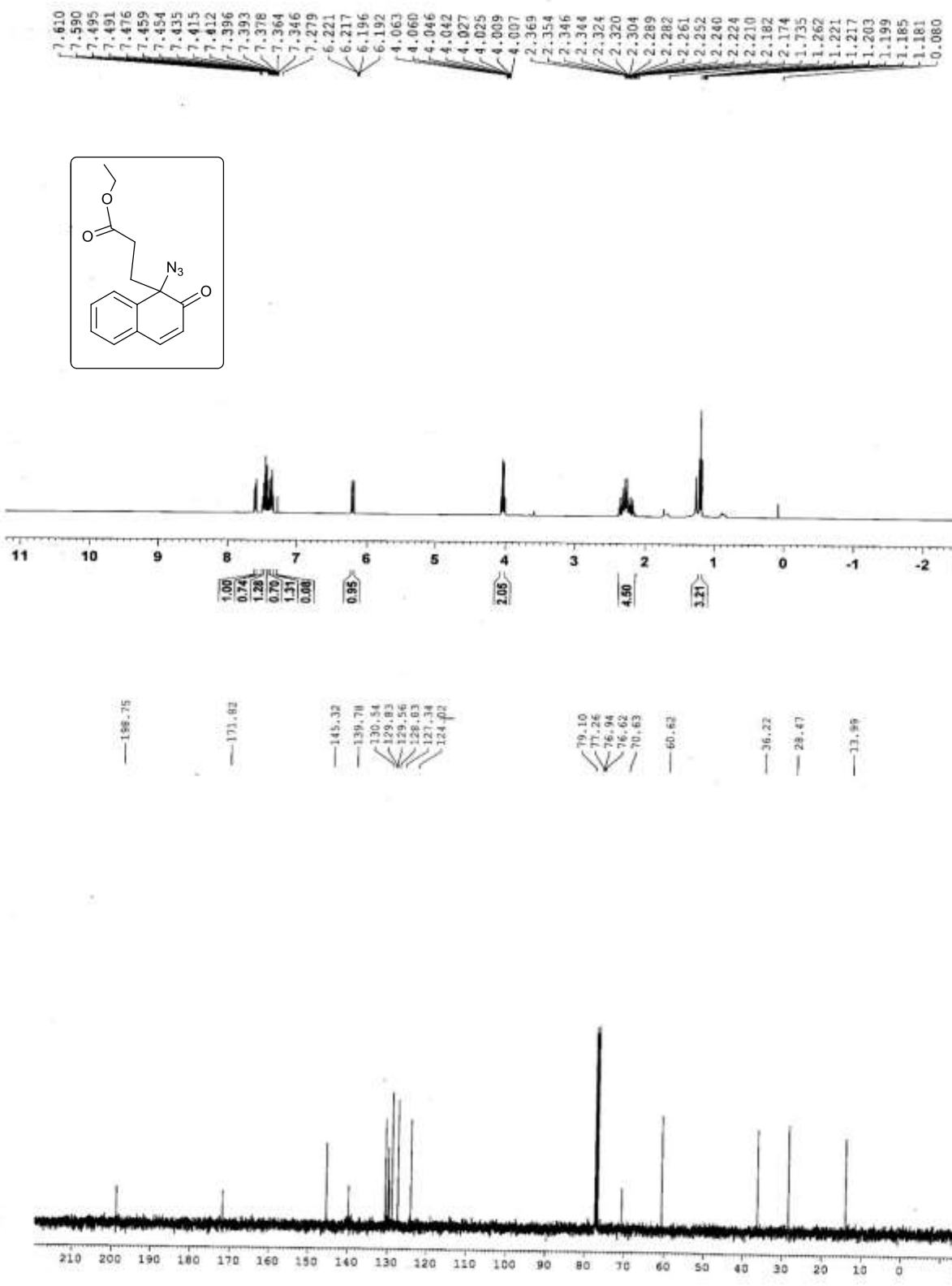


1-(4-hydroxypiperidin-1-yl)-1-methylnaphthalen-2(1H)-one (28)

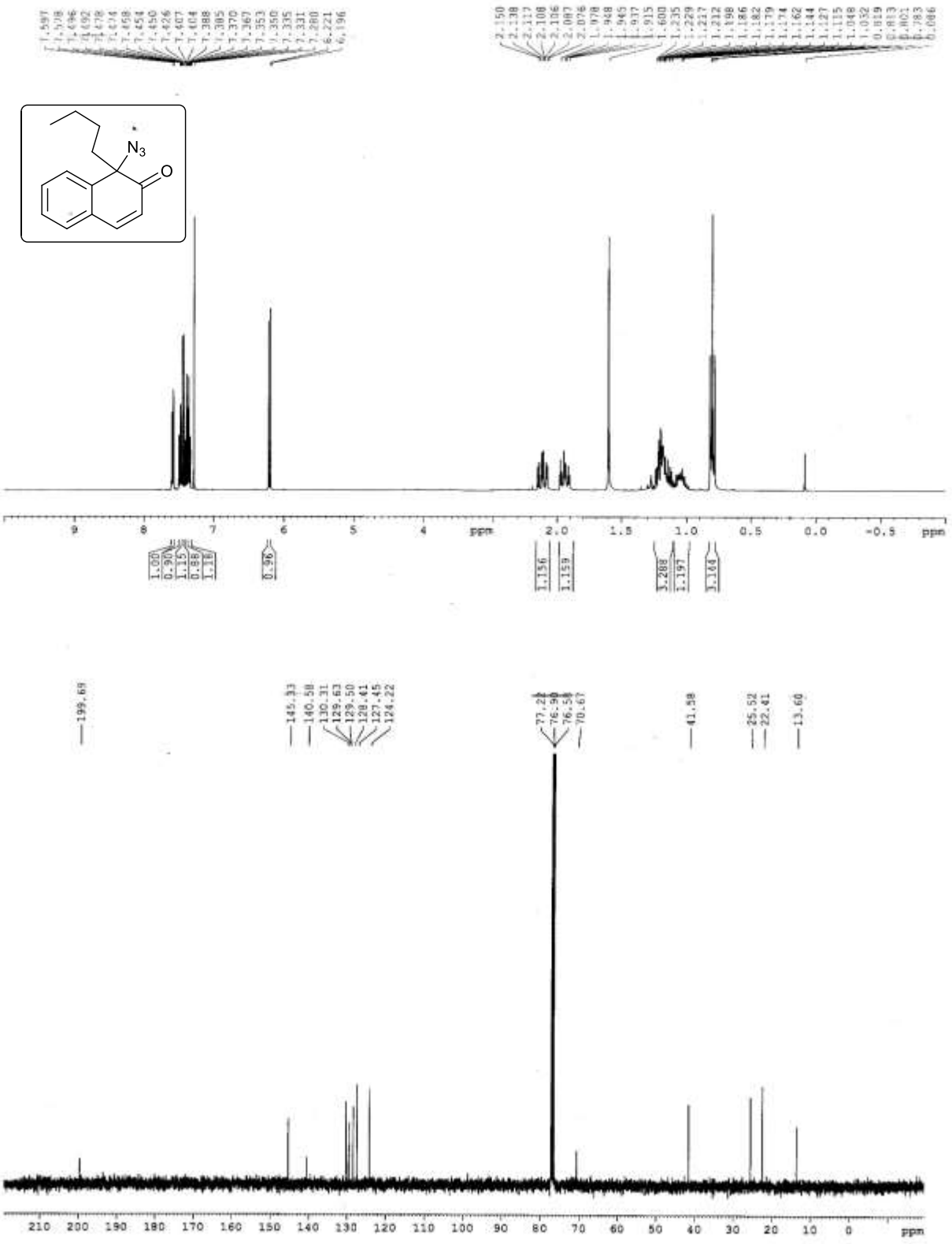




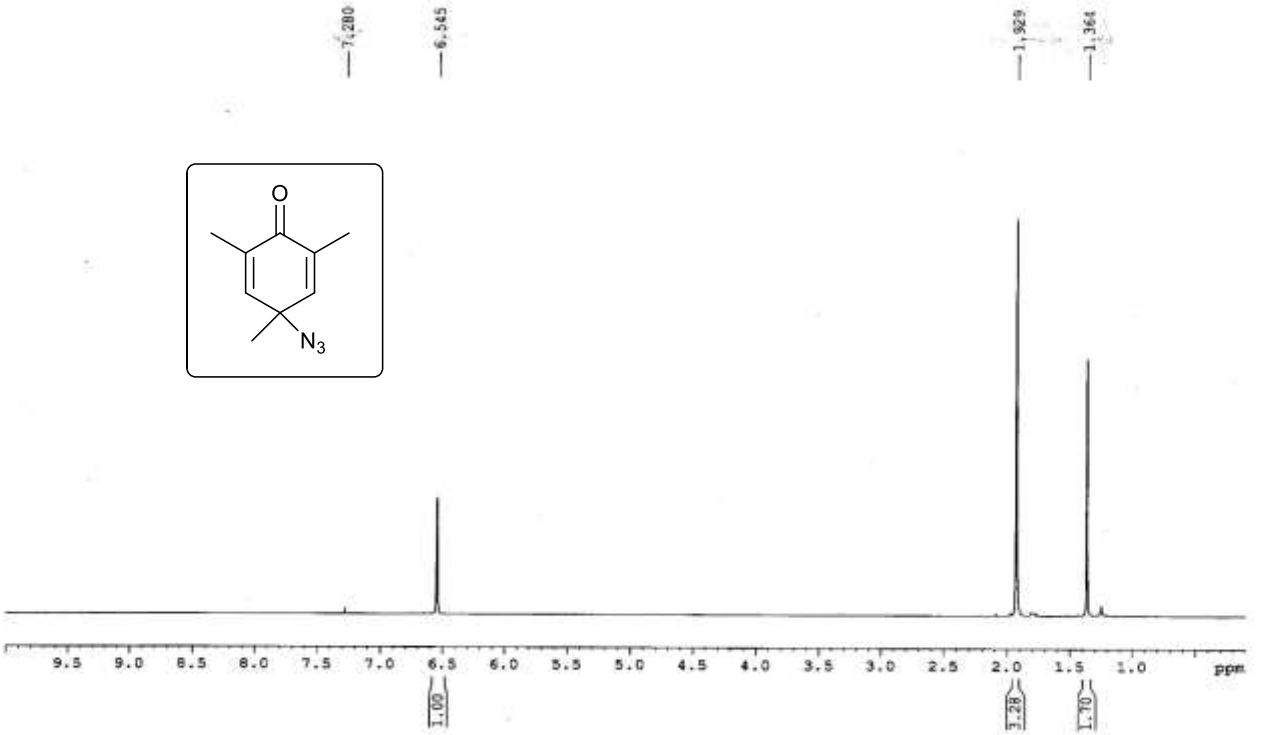
Ethyl 3-(1-azido-2-oxo-1,2-dihydronaphthalen-1-yl)propanoate (29)

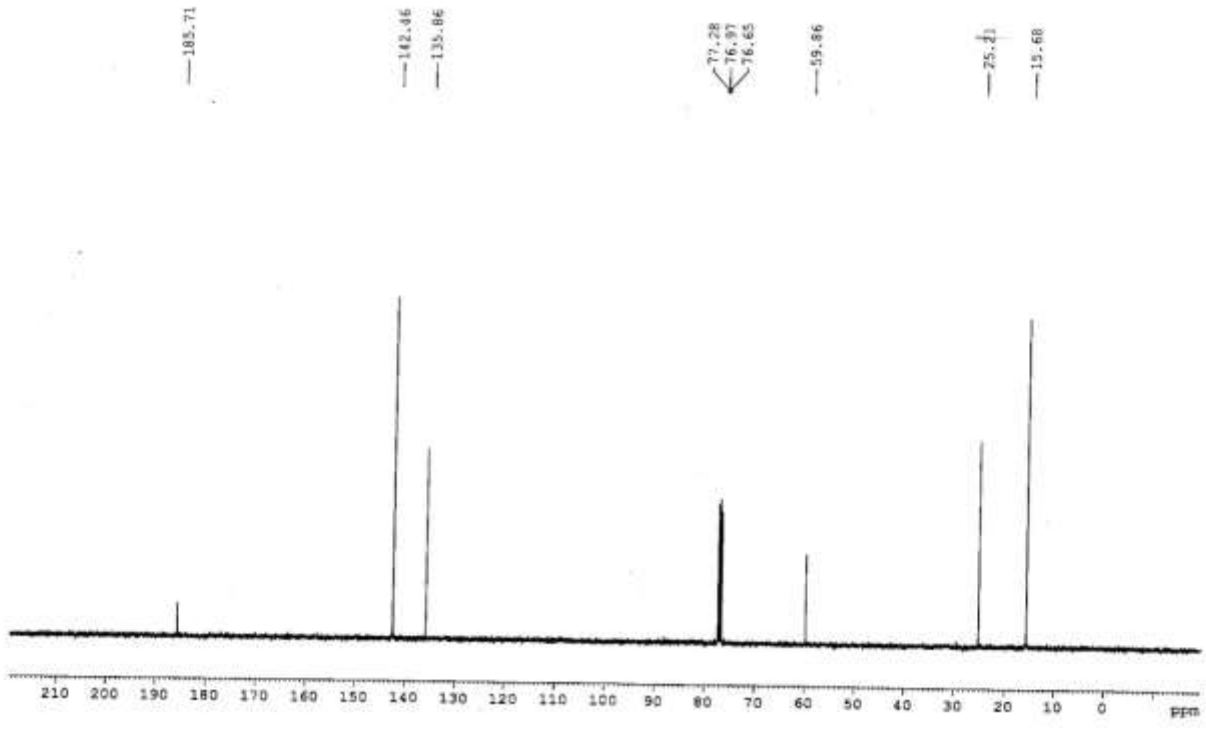


1-azido-1-butylnaphthalen-2(1H)-one (30)

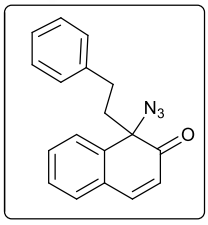


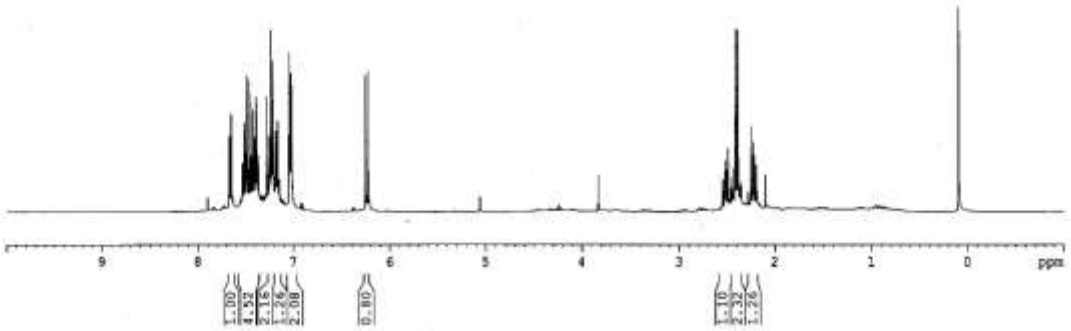
4-azido-2, 4,6-trimethylcyclohexa-2,5-dienone (31)

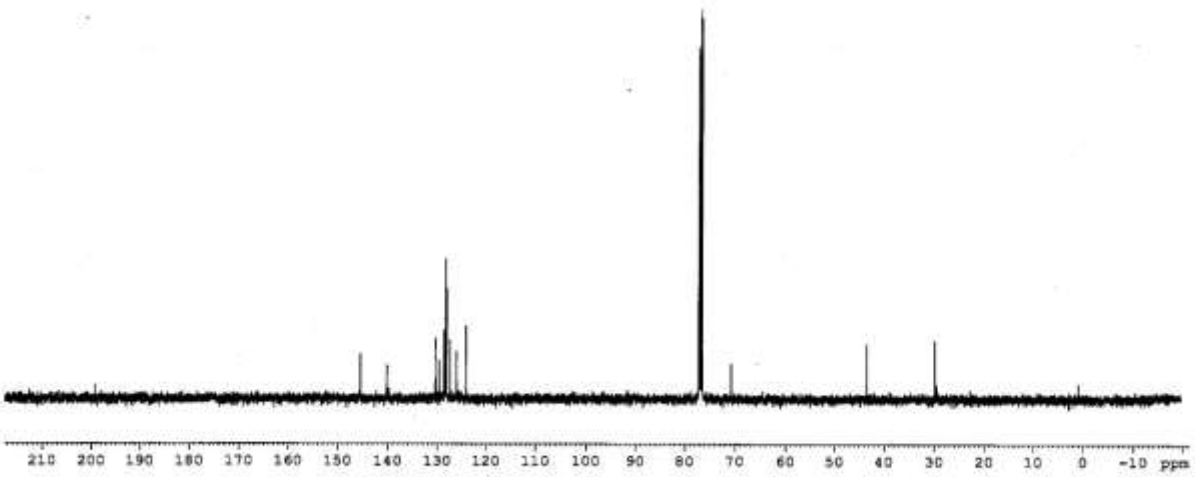




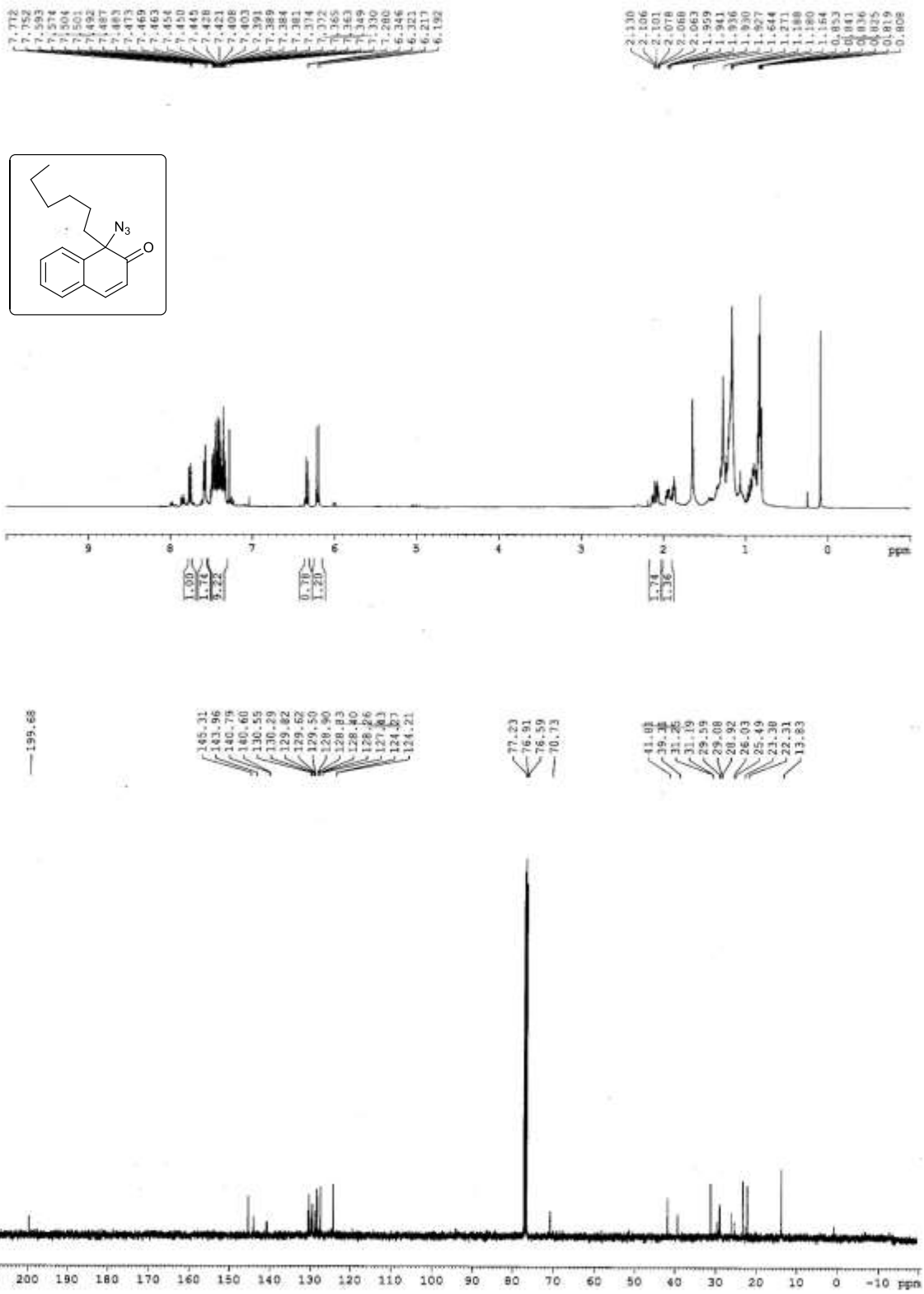
1-azido-1-phenethylnaphthalen-2(1H)-one (32)



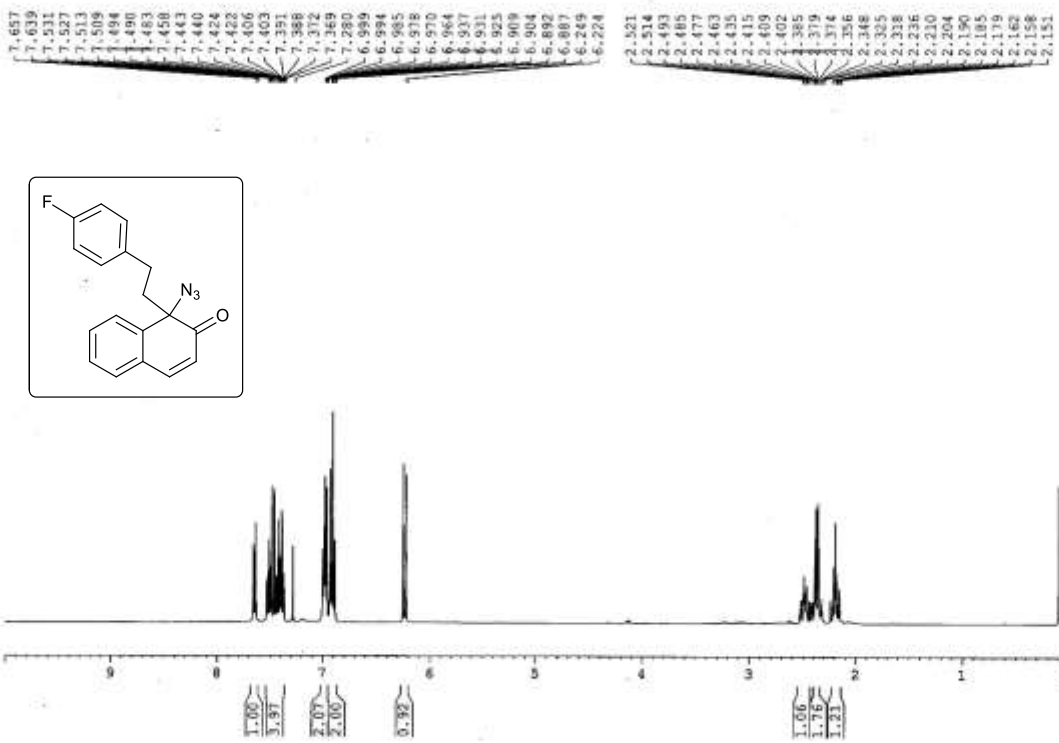


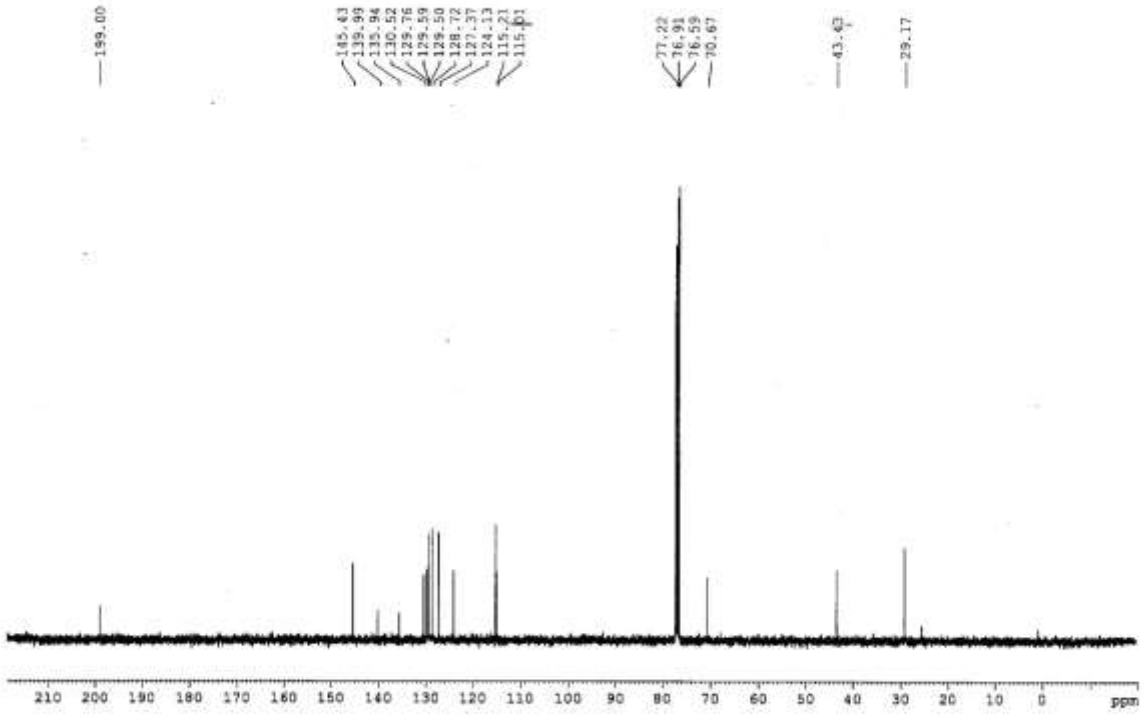


1-azido-1-hexylnaphthalen-2(1H)-one (33)

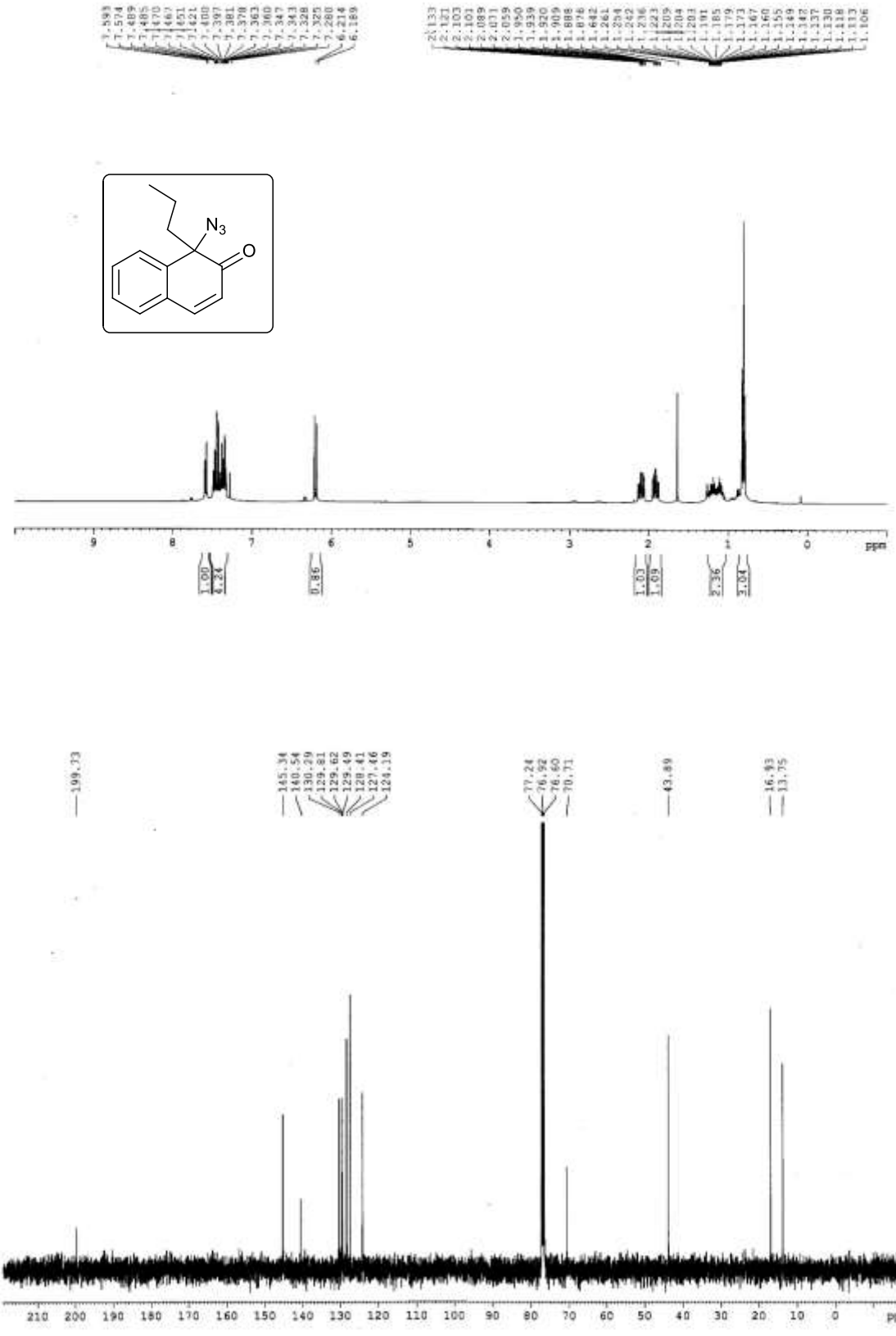


1-azido-1-(4-fluorophenethyl)naphthalen-2(1H)-one (34)

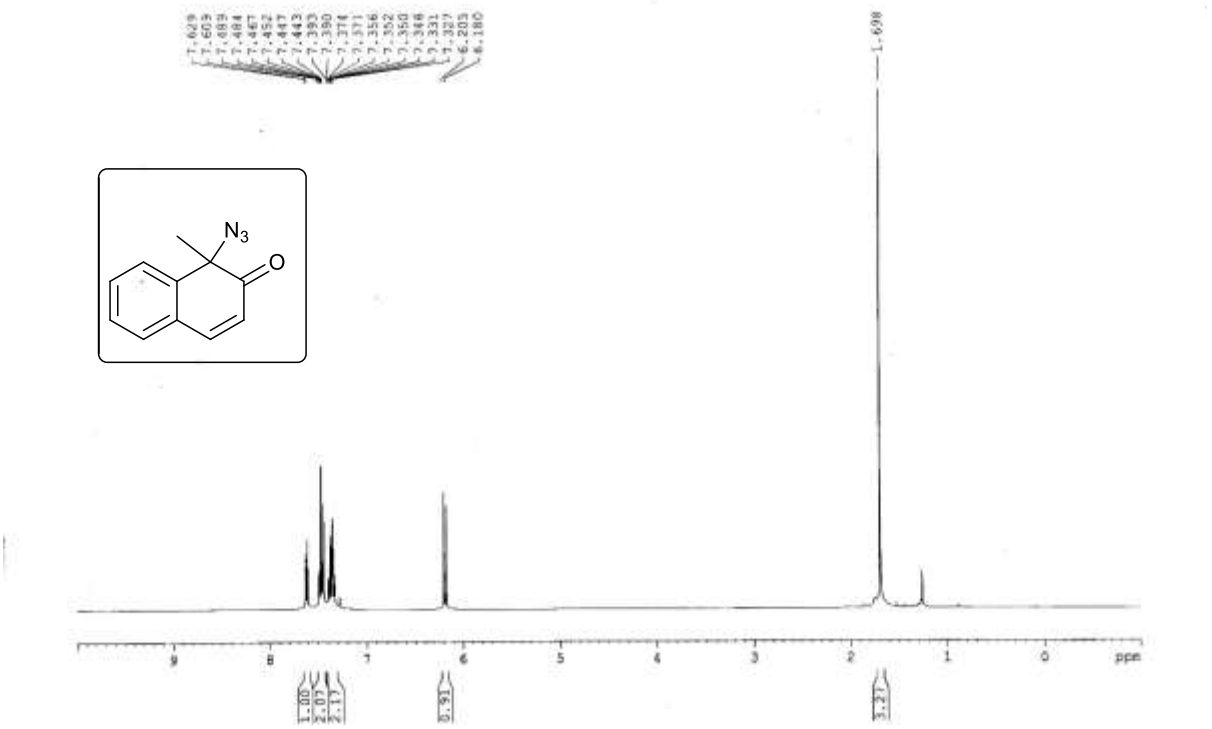


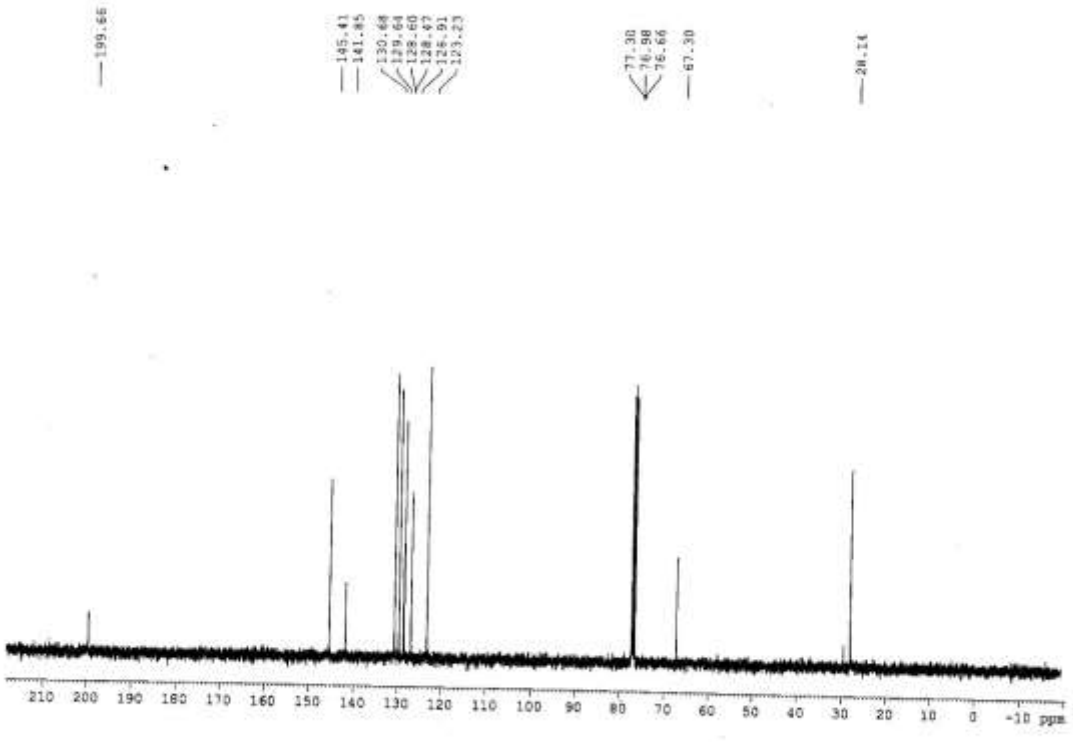


1-azido-1-propylnaphthalen-2(1H)-one (35)

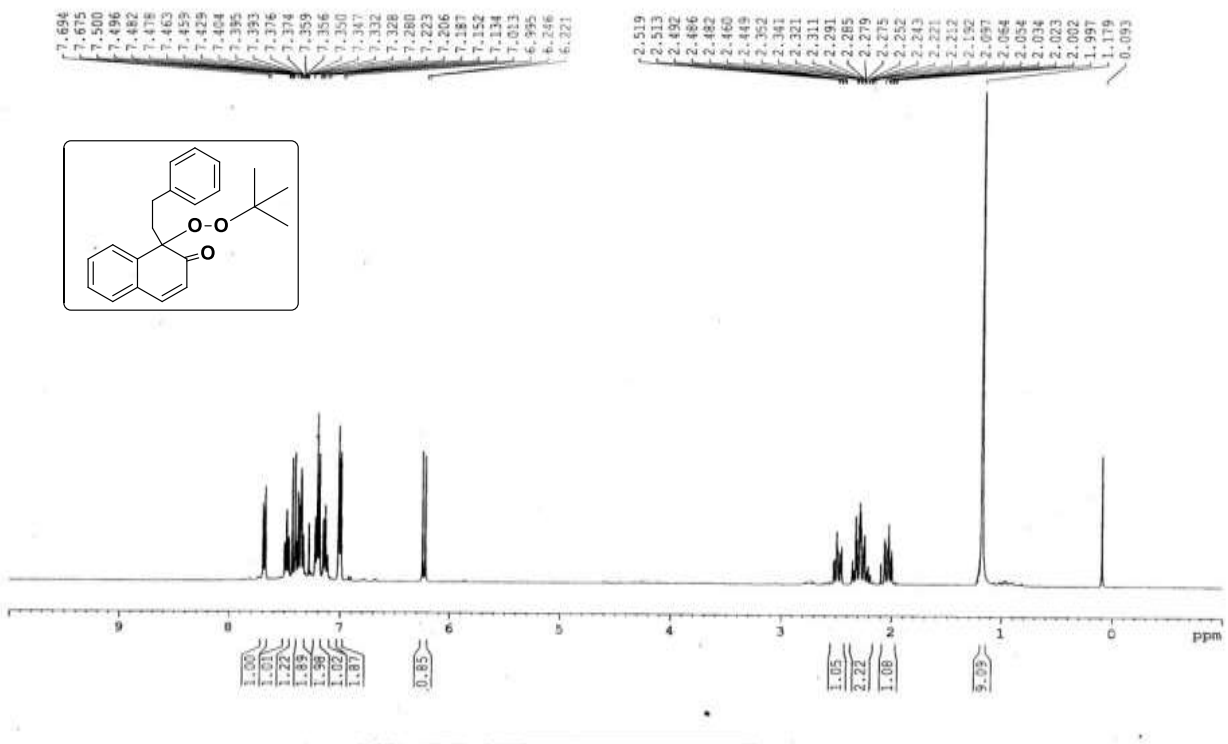


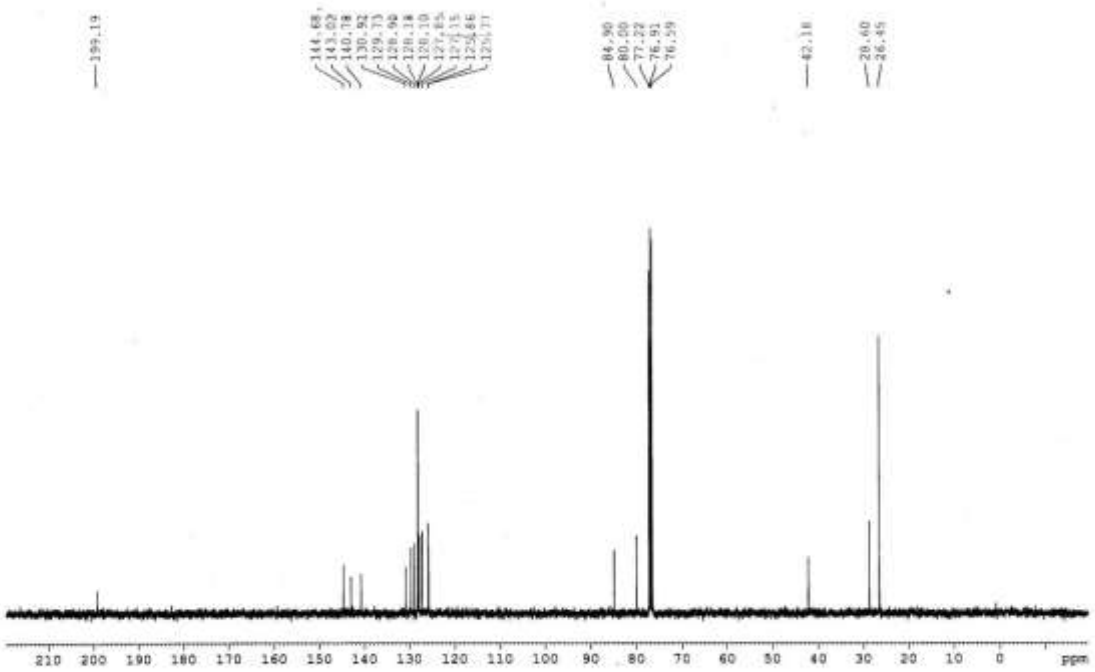
1-azido-1-methylnaphthalen-2(1H)-one (36)



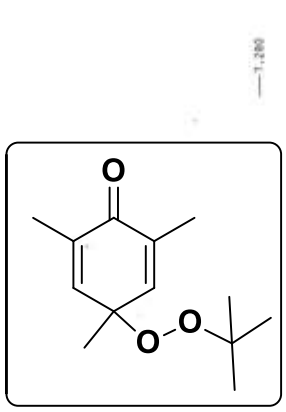


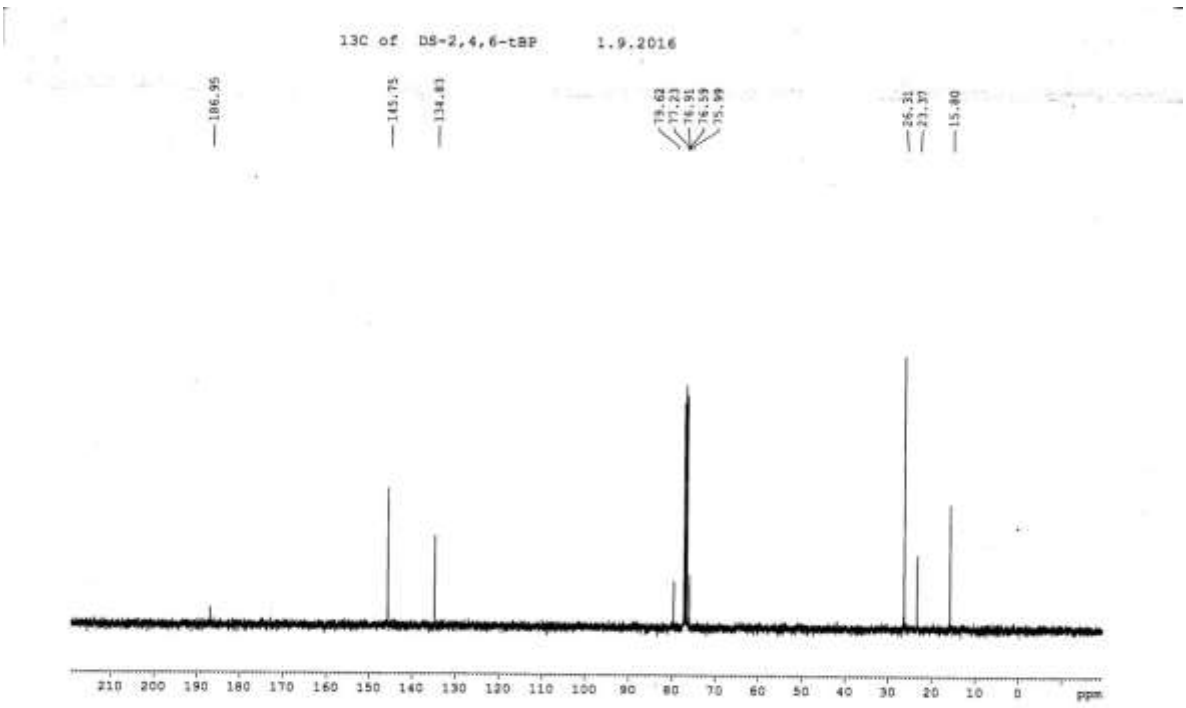
1-(tert-butylperoxy)-1-phenethylnaphthalen-2(1H)-one (37)



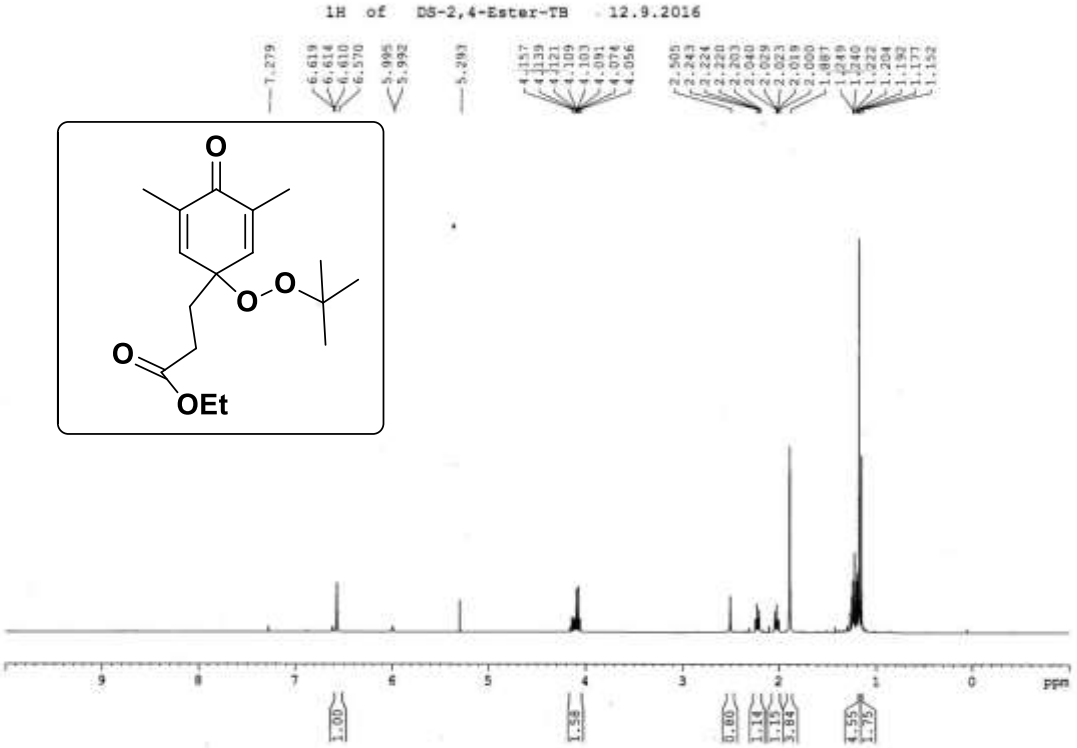


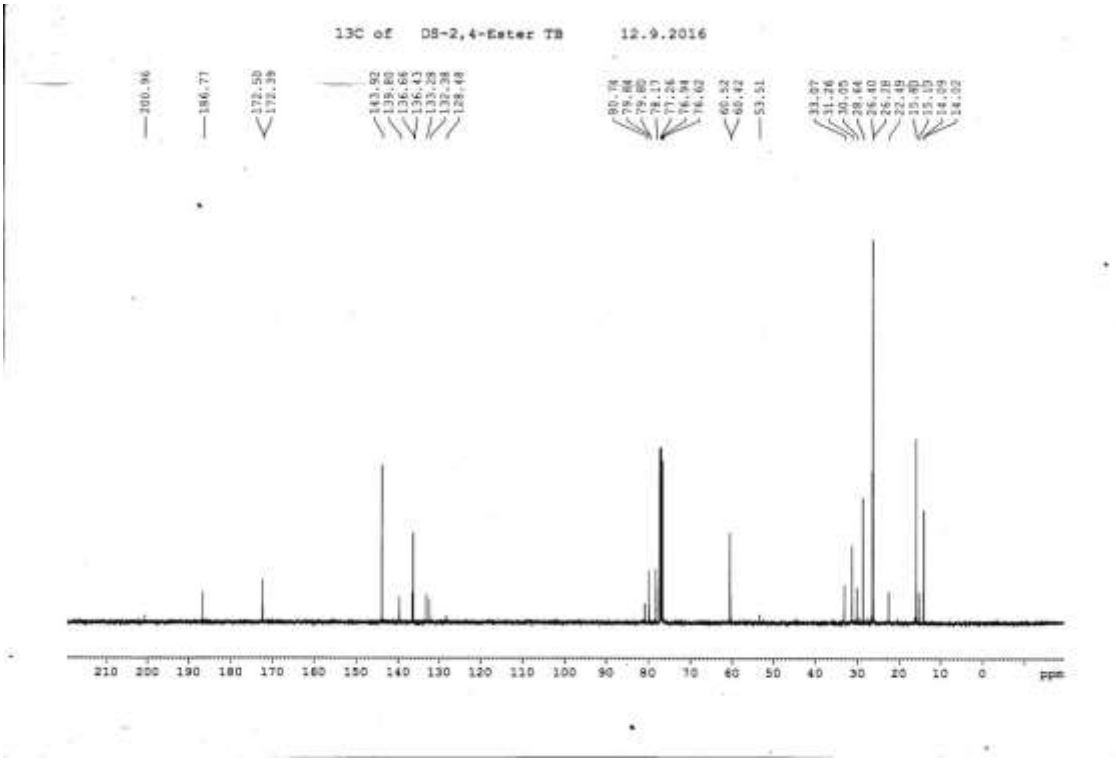
4-(tert-butylperoxy)-2,4,6-trimethylcyclohexa-2,5-dienone (38)



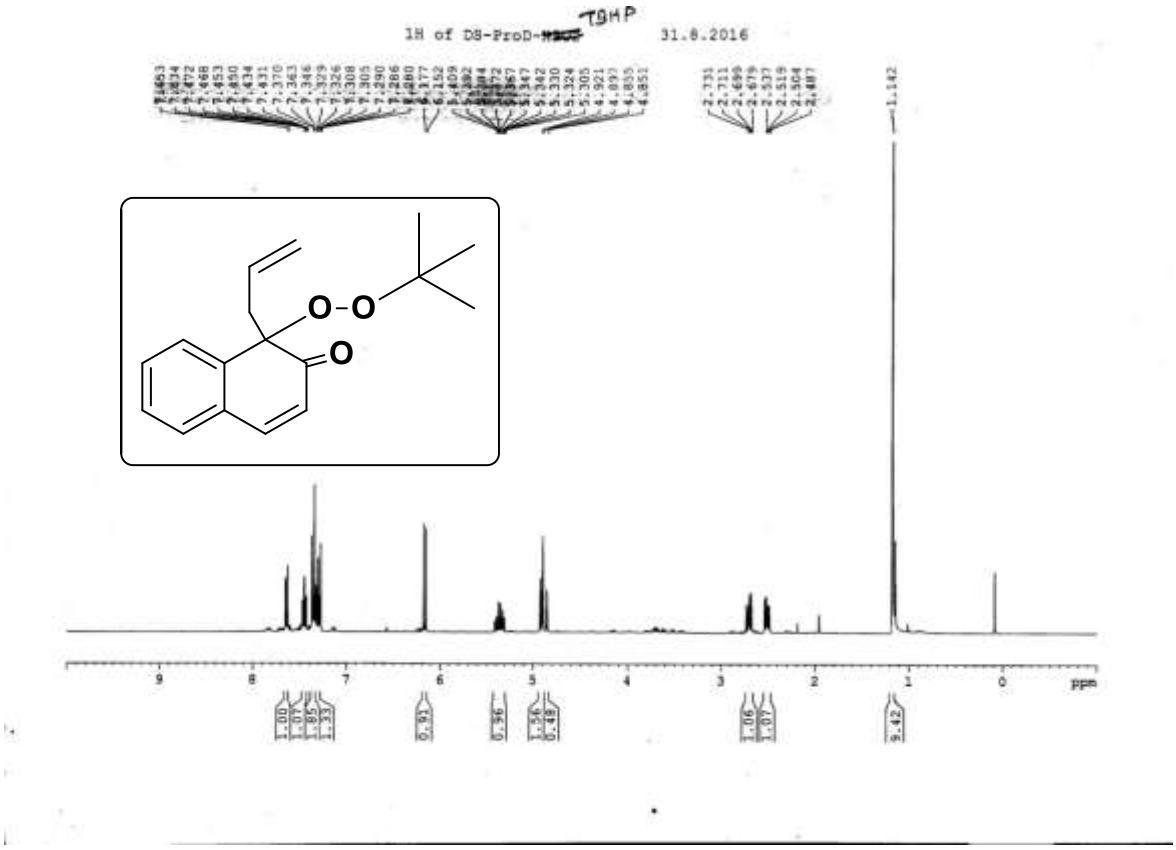


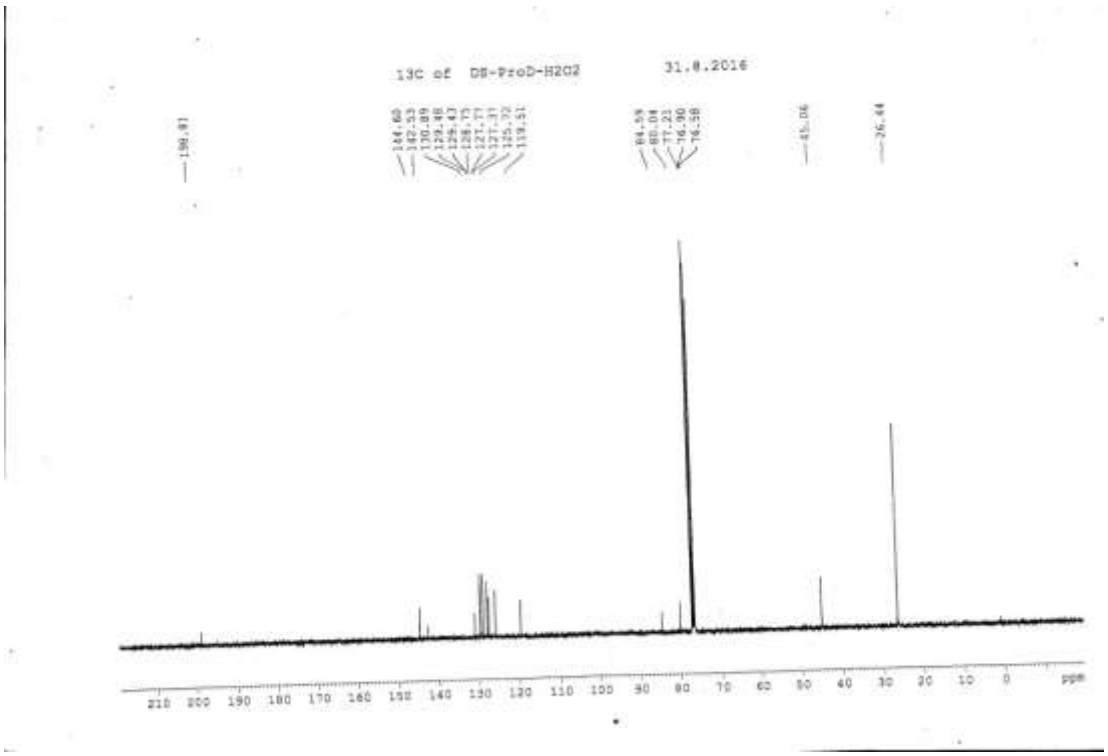
Ethyl 3-(1-(tert-butylperoxy)-3,5-dimethyl-4-oxocyclohexa-2,5-dien-1-yl)propanoate (39)



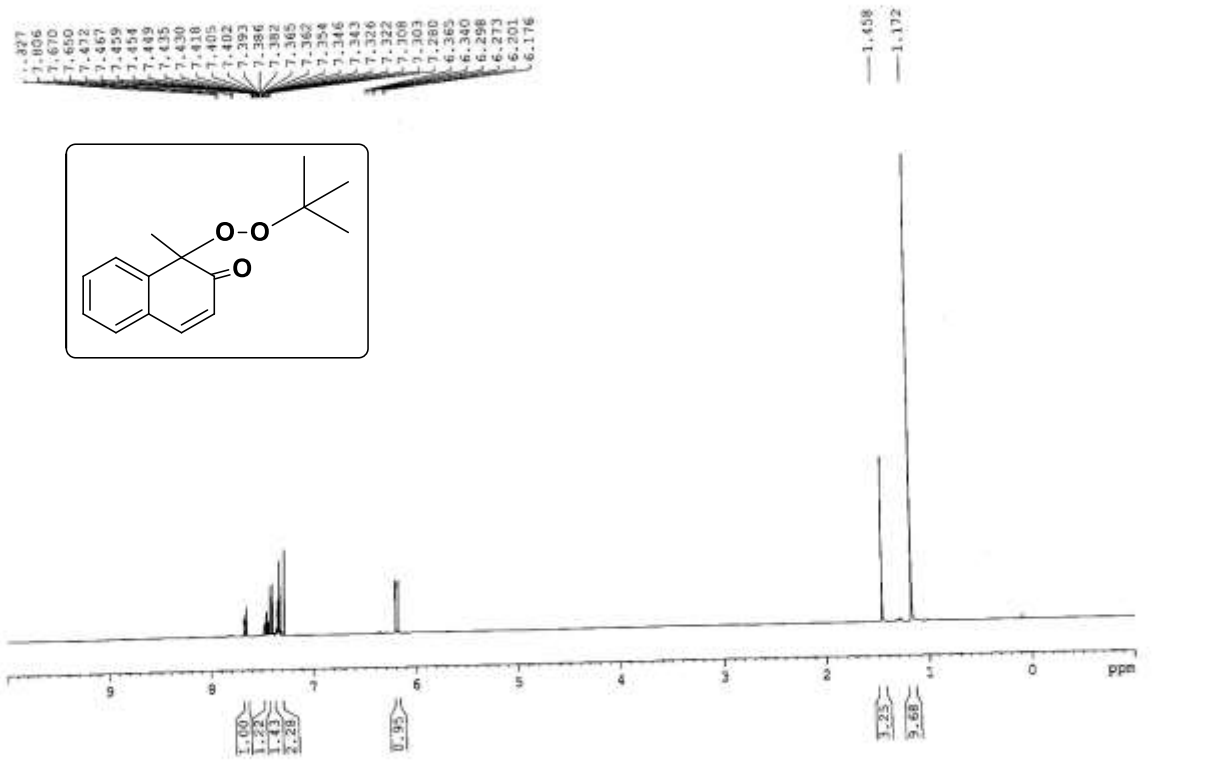


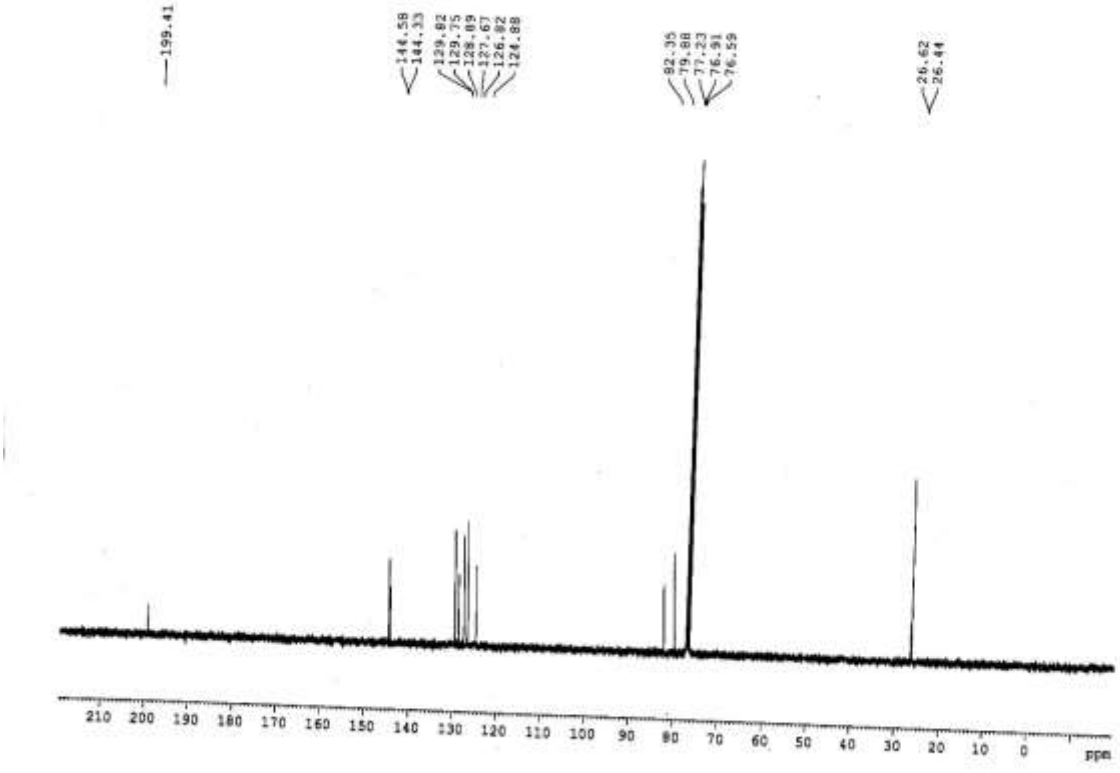
1-allyl-1-(tert-butylperoxy)naphthalen-2(1H)-one (40)



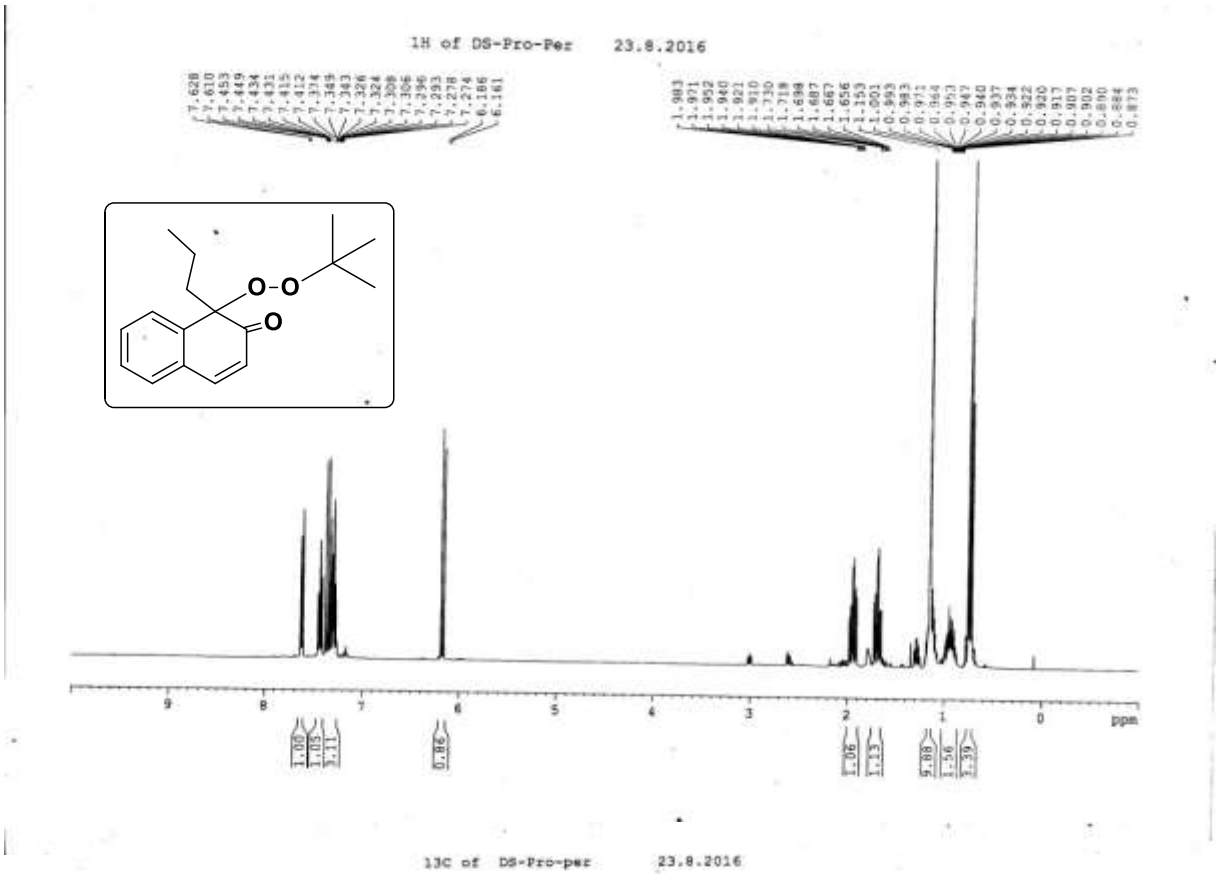


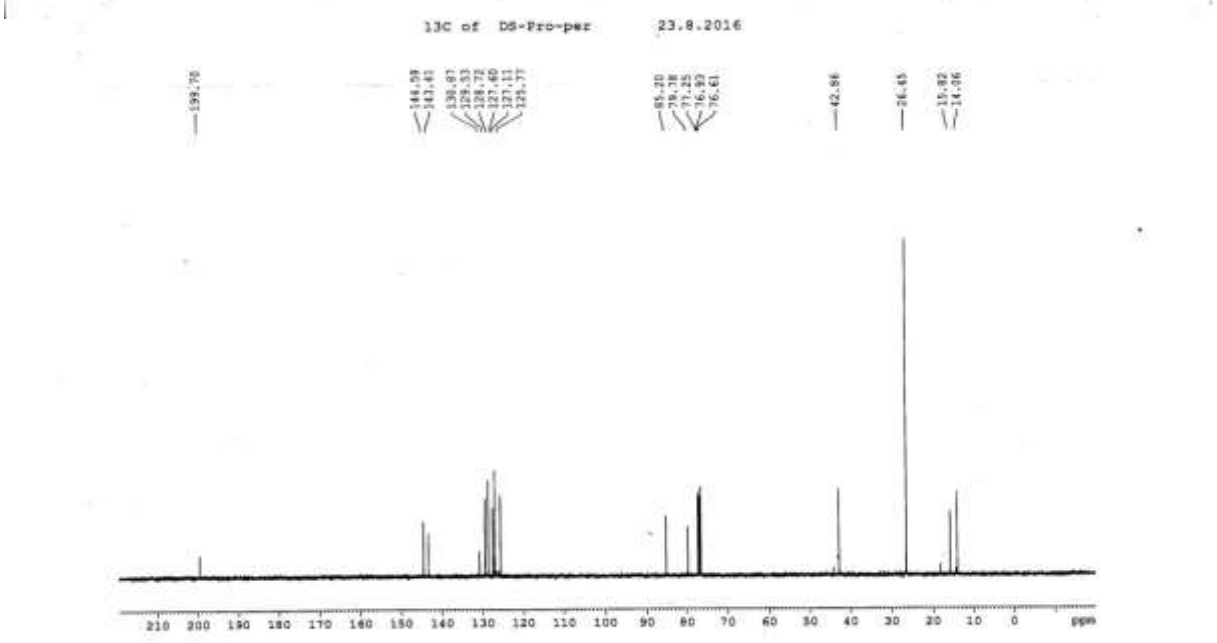
1-(tert-butylperoxy)-1-methylnaphthalen-2(1H)-one (41)



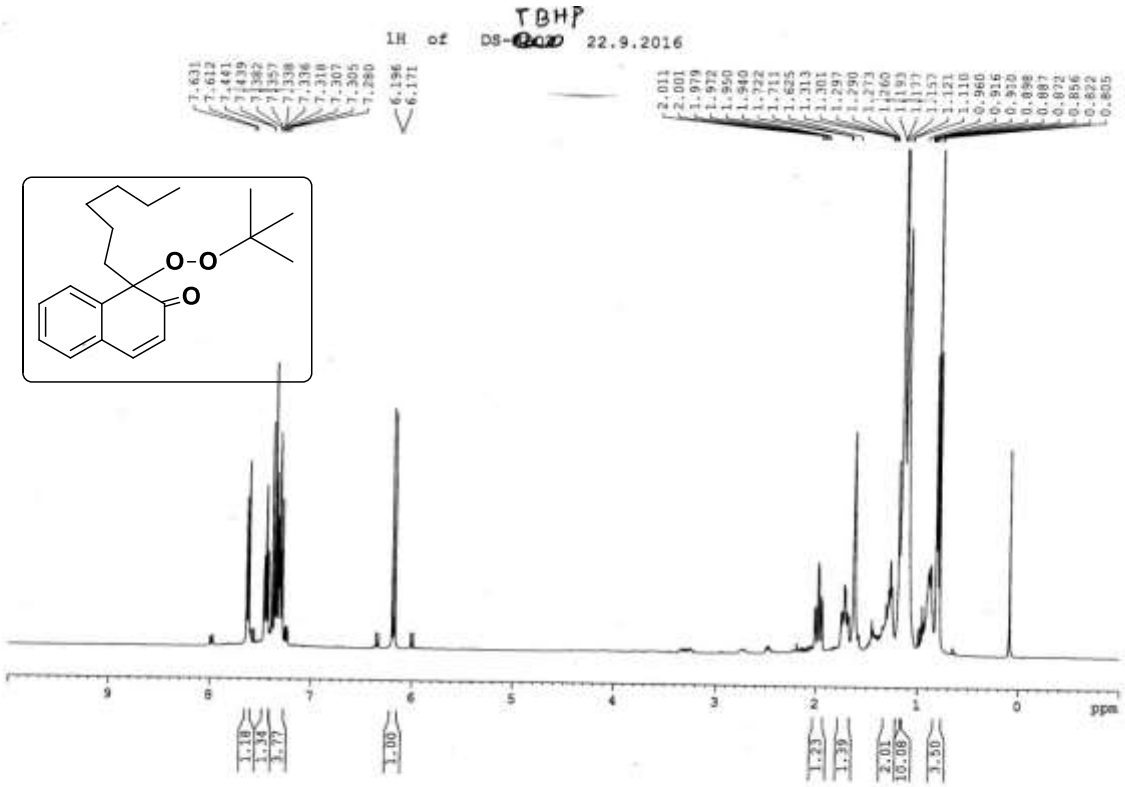


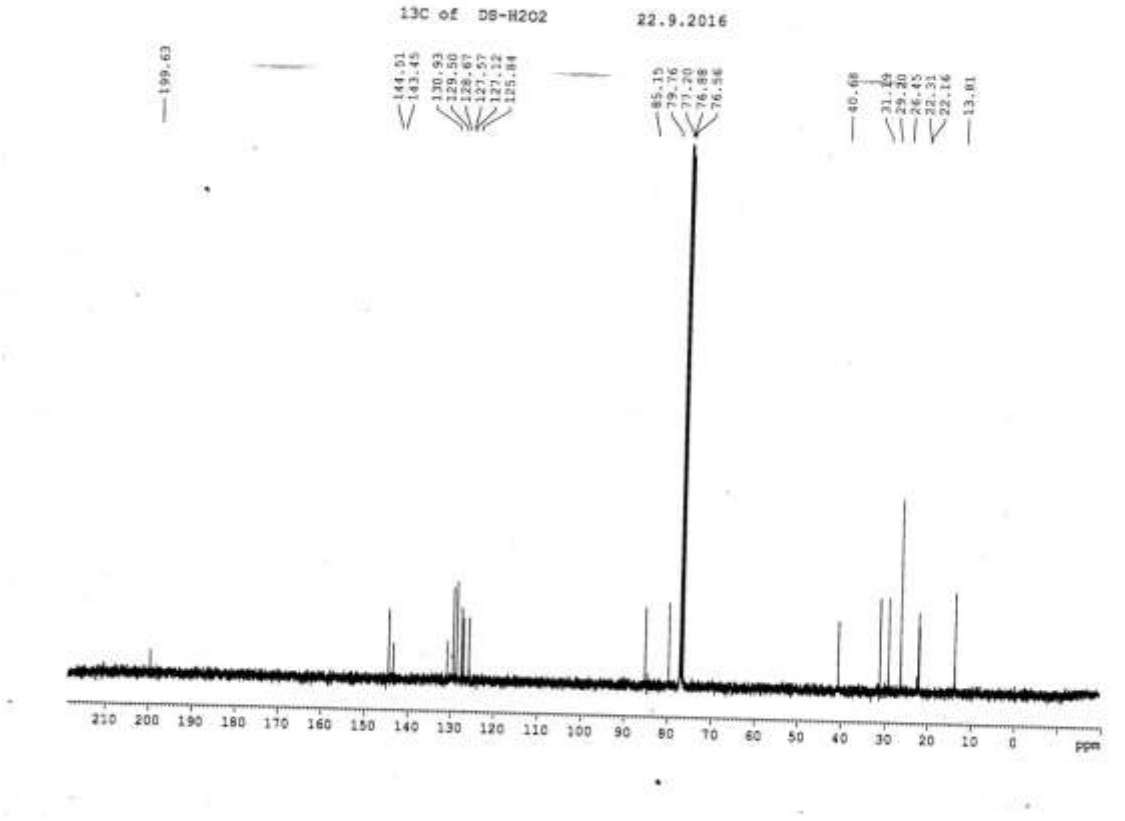
1-(tert-butylperoxy)-1-propylnaphthalen-2(1H)-one (42)



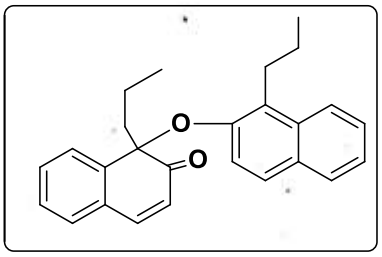


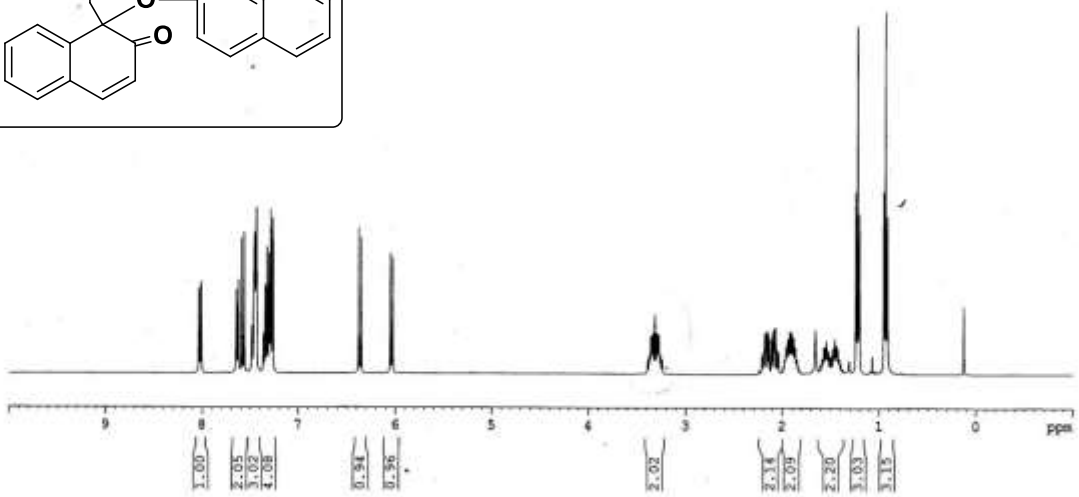
1-hexyl-1-(neopentylperoxy) naphthalen-2(1H)-one (43)

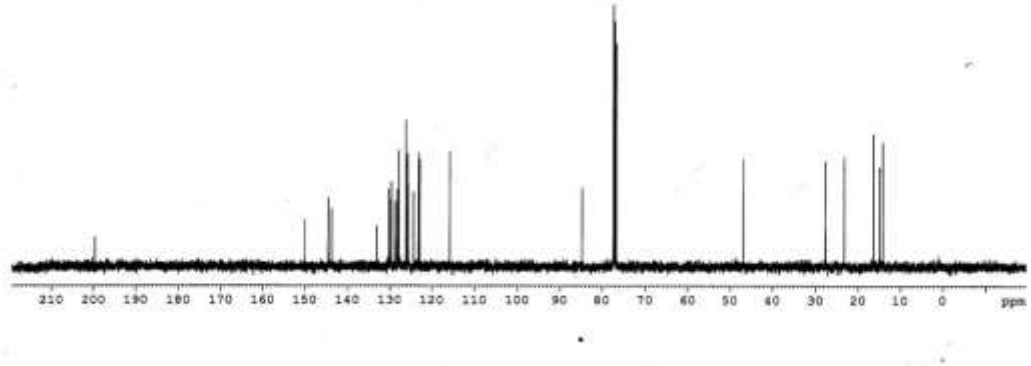




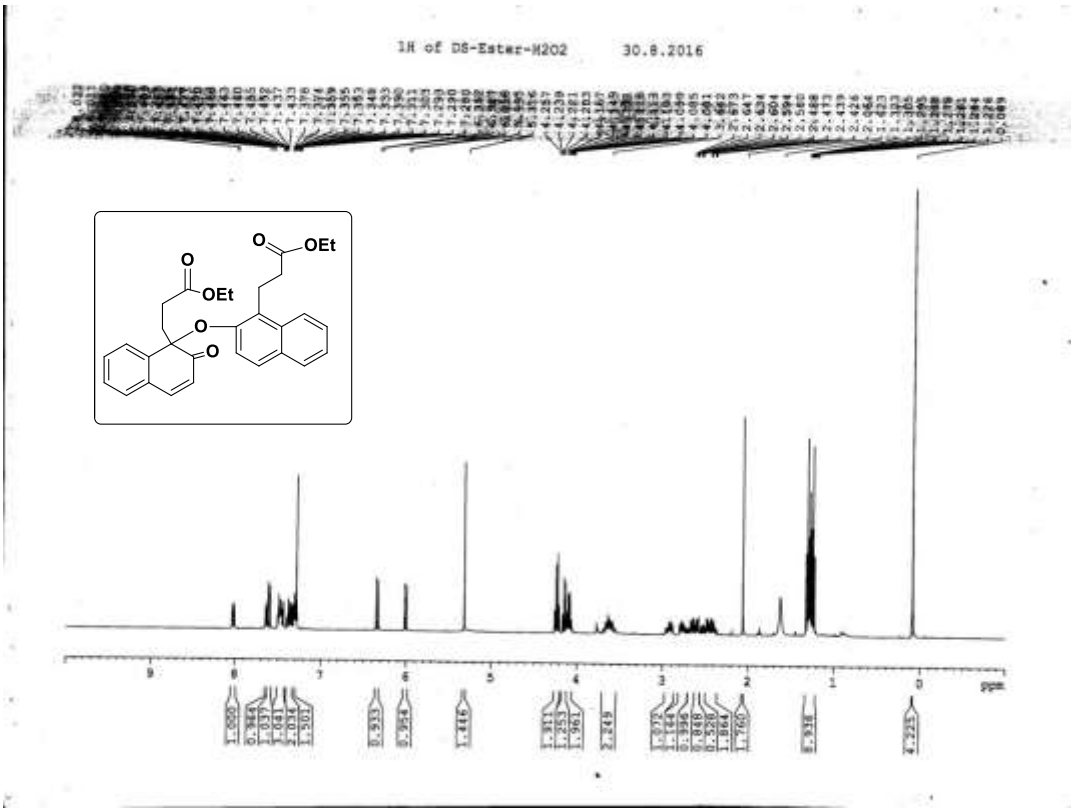
1-propyl-1-((1-propylnaphthalen-2-yl)oxy)naphthalen-2(1H)-one (44)



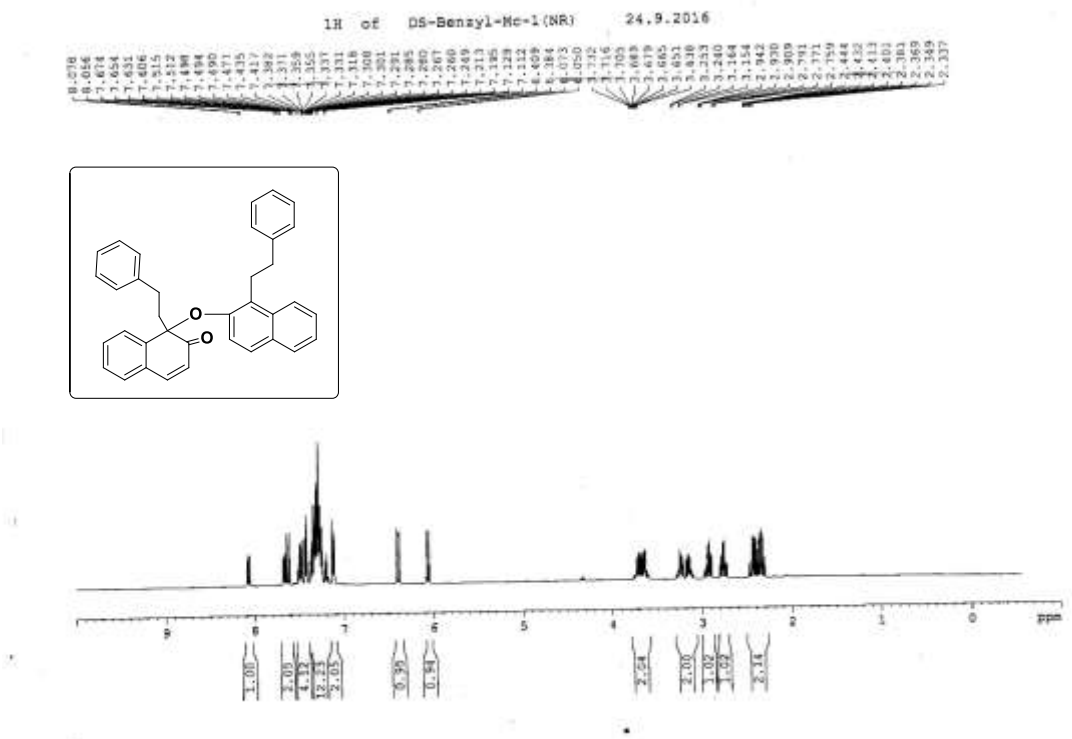




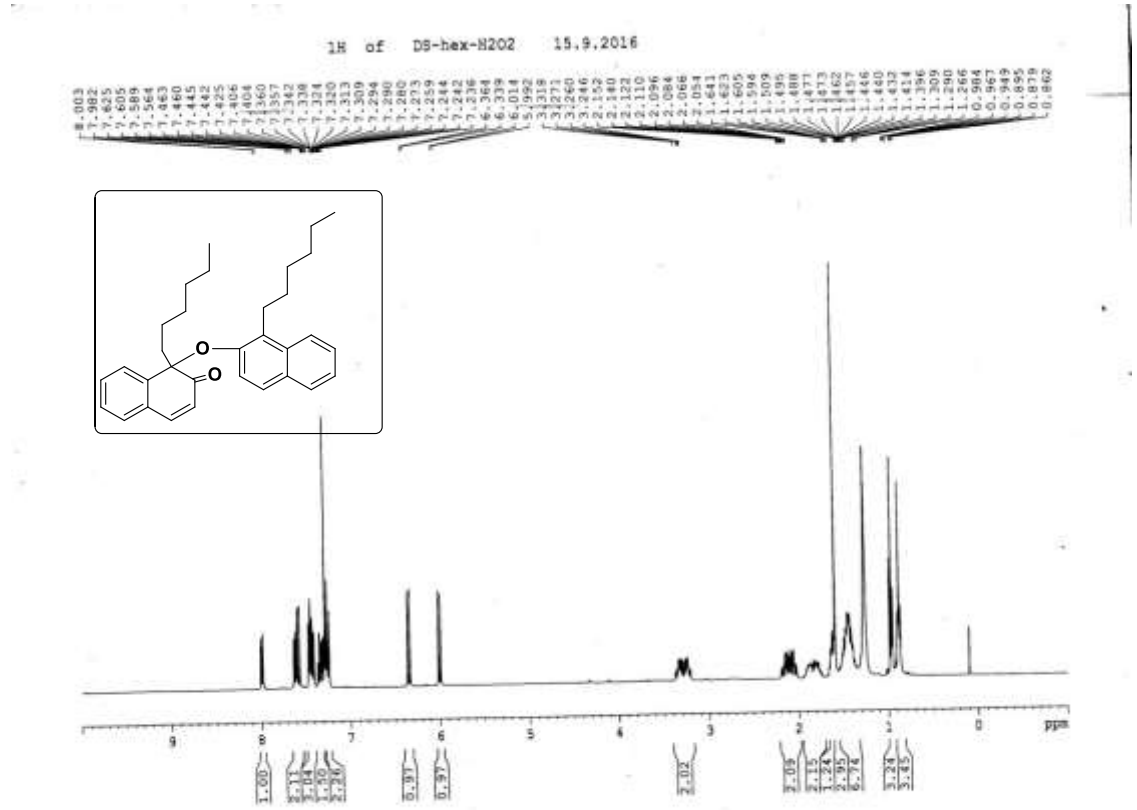
Ethyl3-(2-((1-(3-ethoxy-3-oxopropyl)-2-oxo-1,2-dihydronaphthalen-1-yl)oxy)naphthalen-1-yl)propanoate (45)

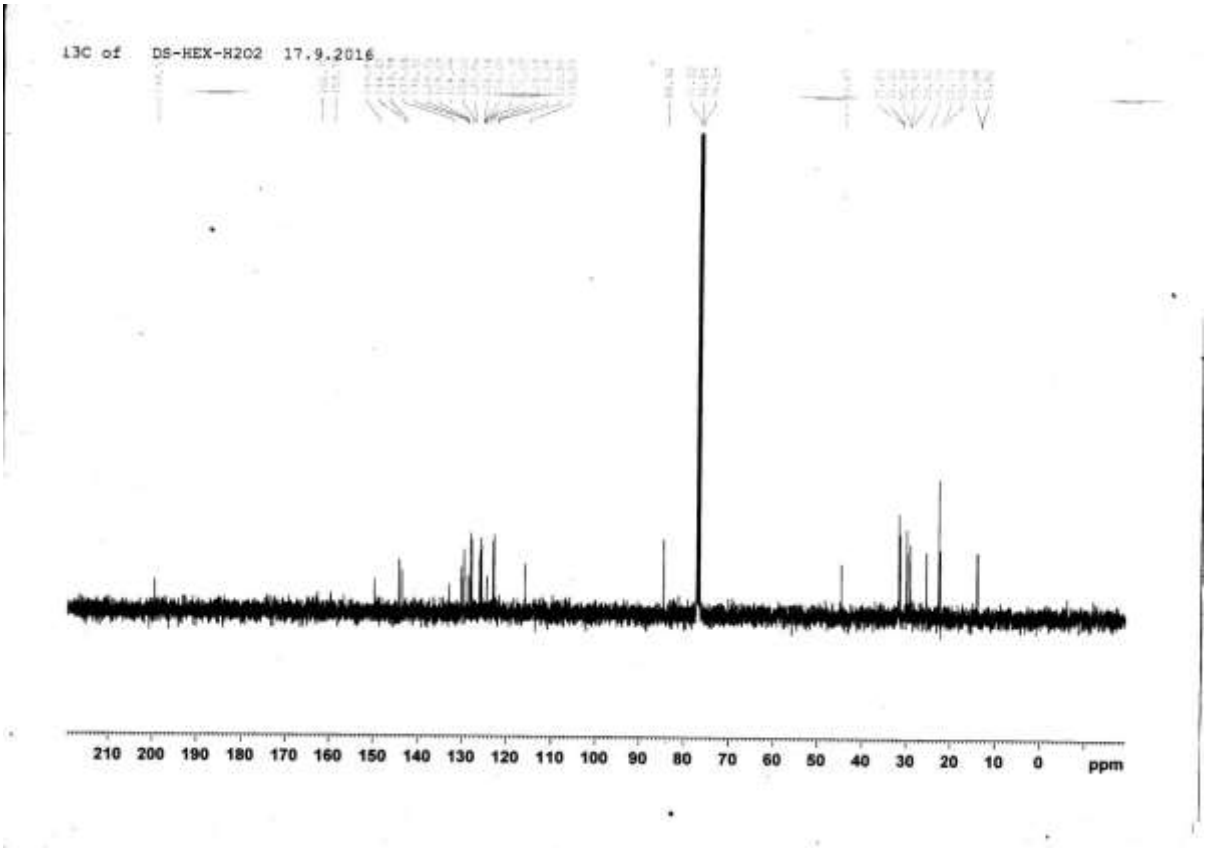


1-phenethyl-1-((1-phenethylnaphthalen-2-yl)oxy)naphthalen-2(1H)-one (46)

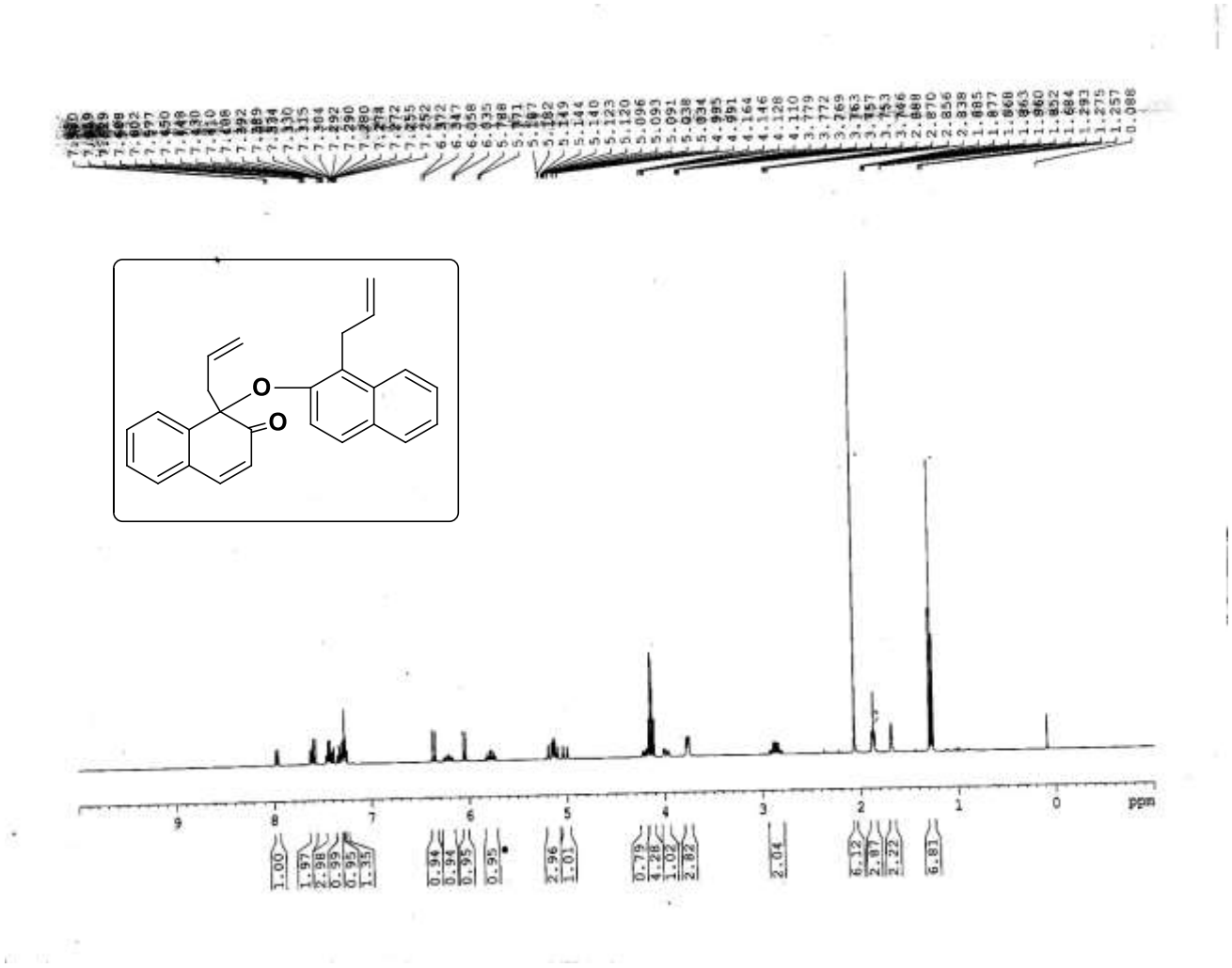


1-hexyl-1-((1-hexylnaphthalen-2-yl)oxy)naphthalen-2(1H)-one (47)

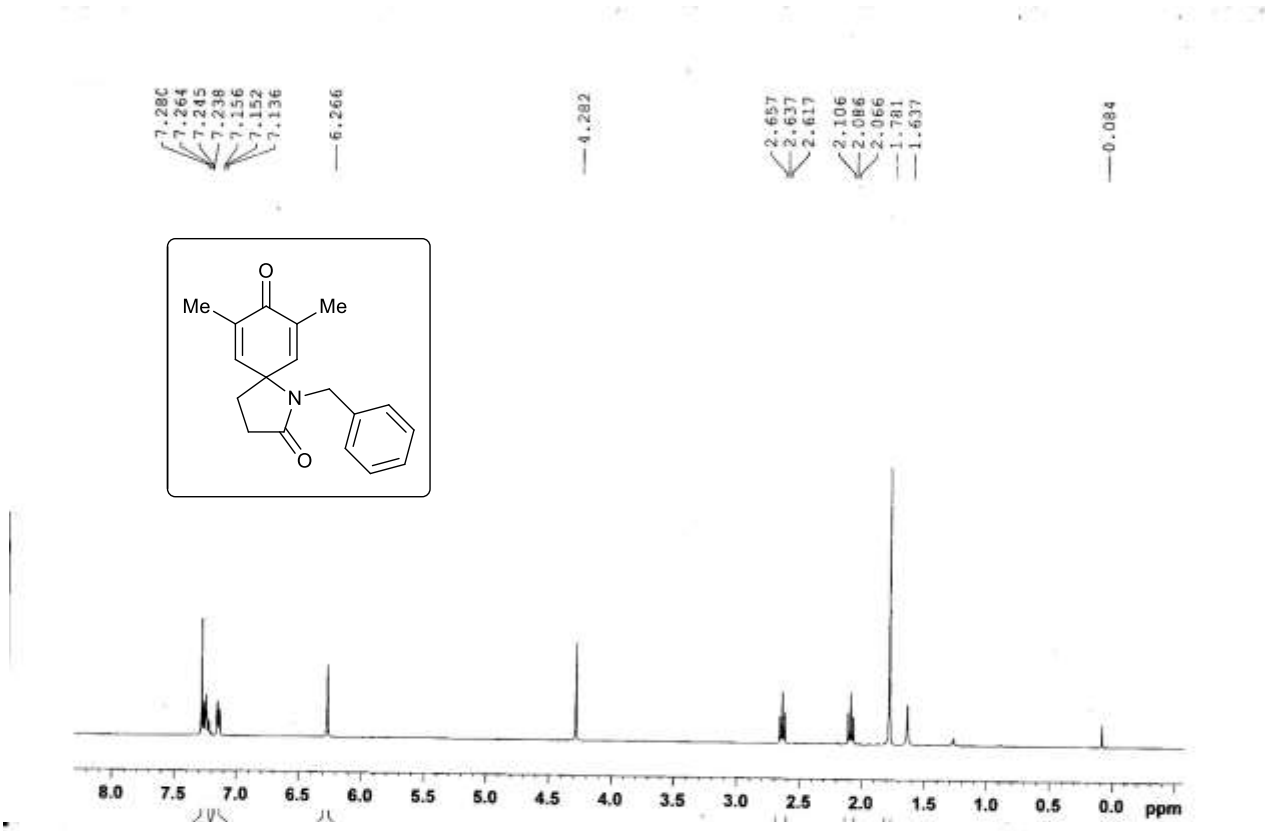


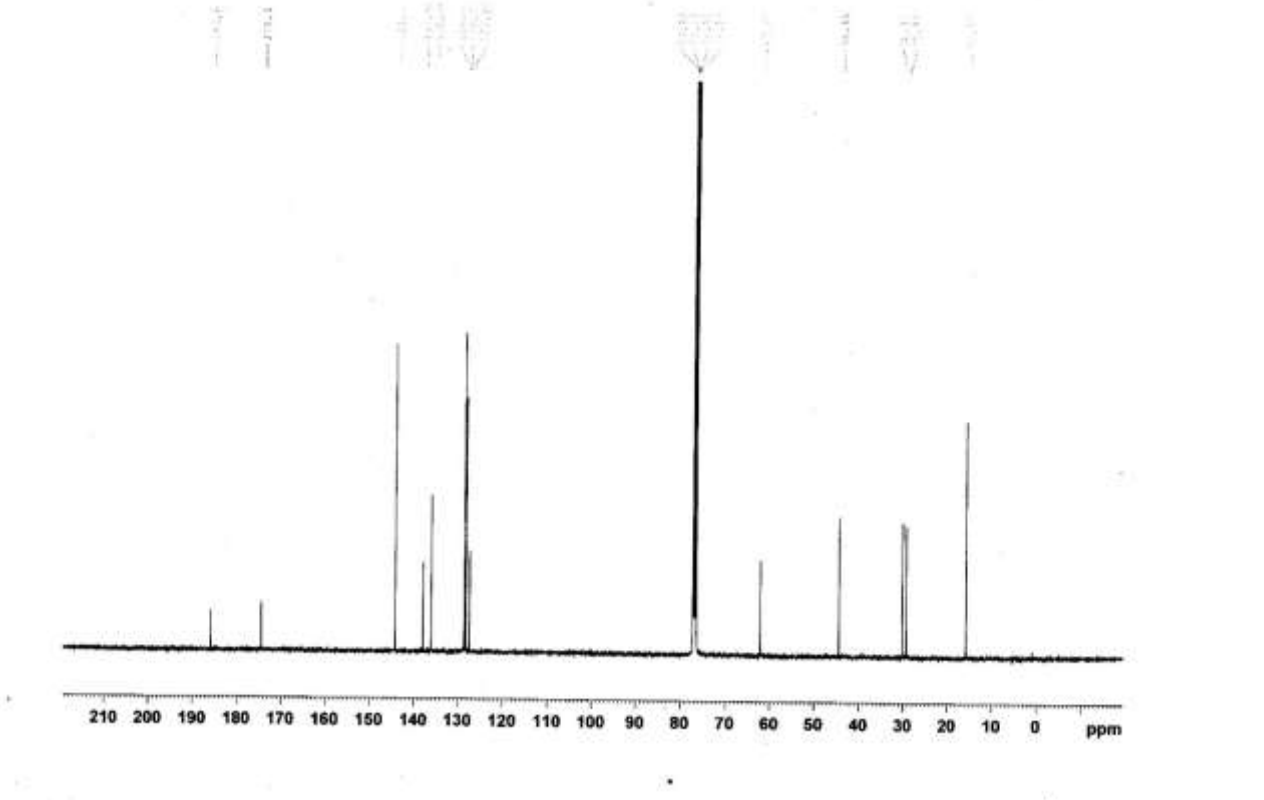


1-allyl-1-((1-allylnaphthalen-2-yl)oxy)naphthalen-2(1H)-one (48)

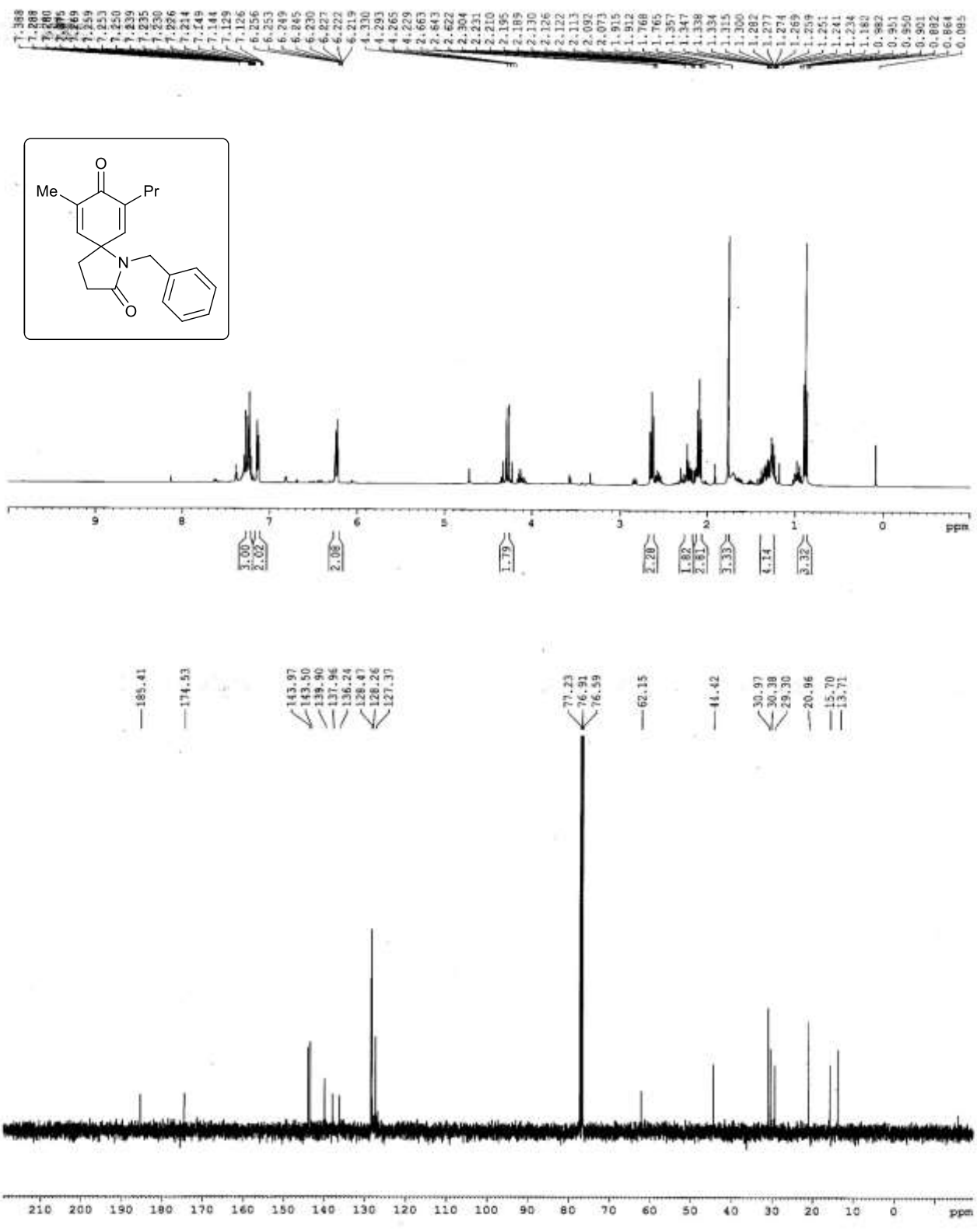


1-benzyl-7,9-dimethyl-1-azaspiro[4.5]deca-6,9-diene-2,8-dione (49)

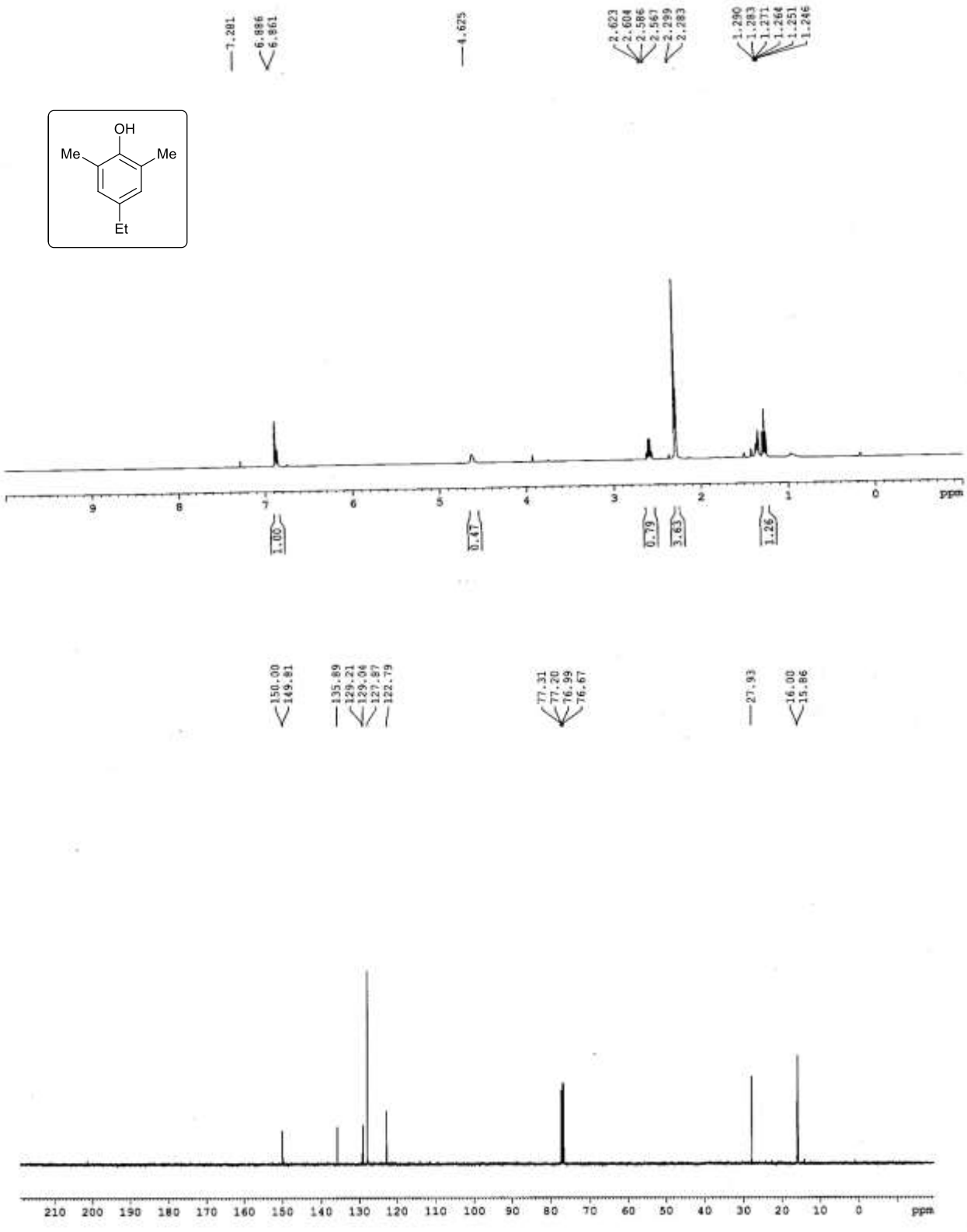




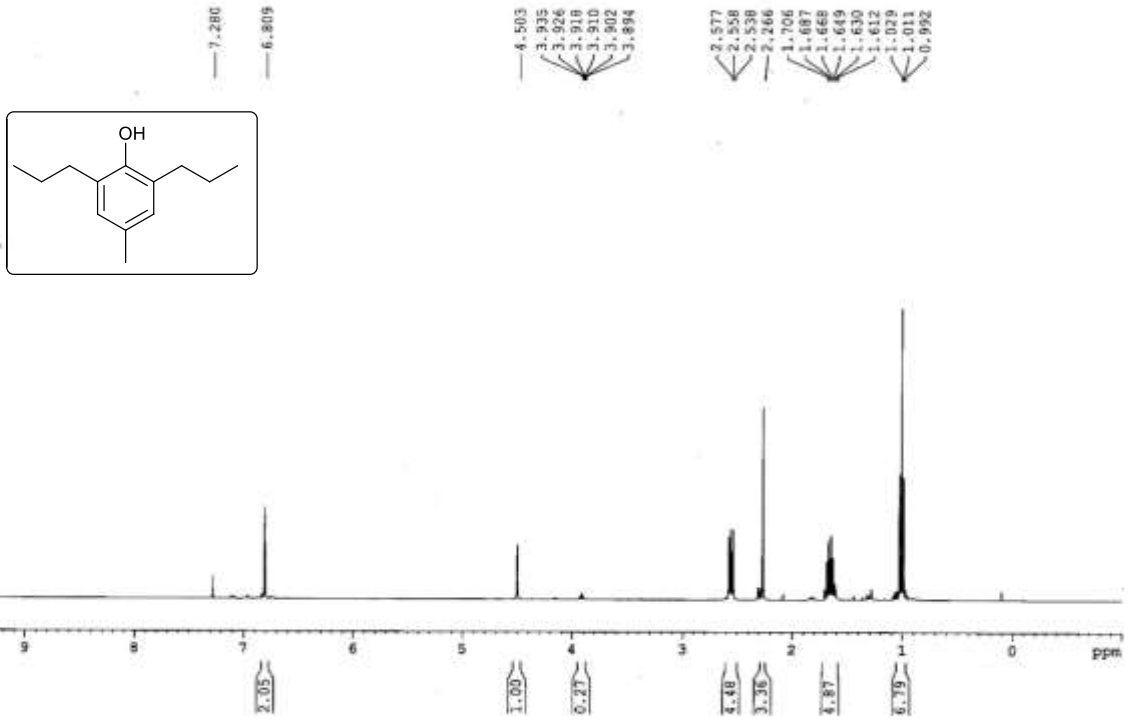
1-benzyl-7-methyl-9-propyl-1-azaspiro[4.5]deca-6,9-diene-2,8-dione (50)

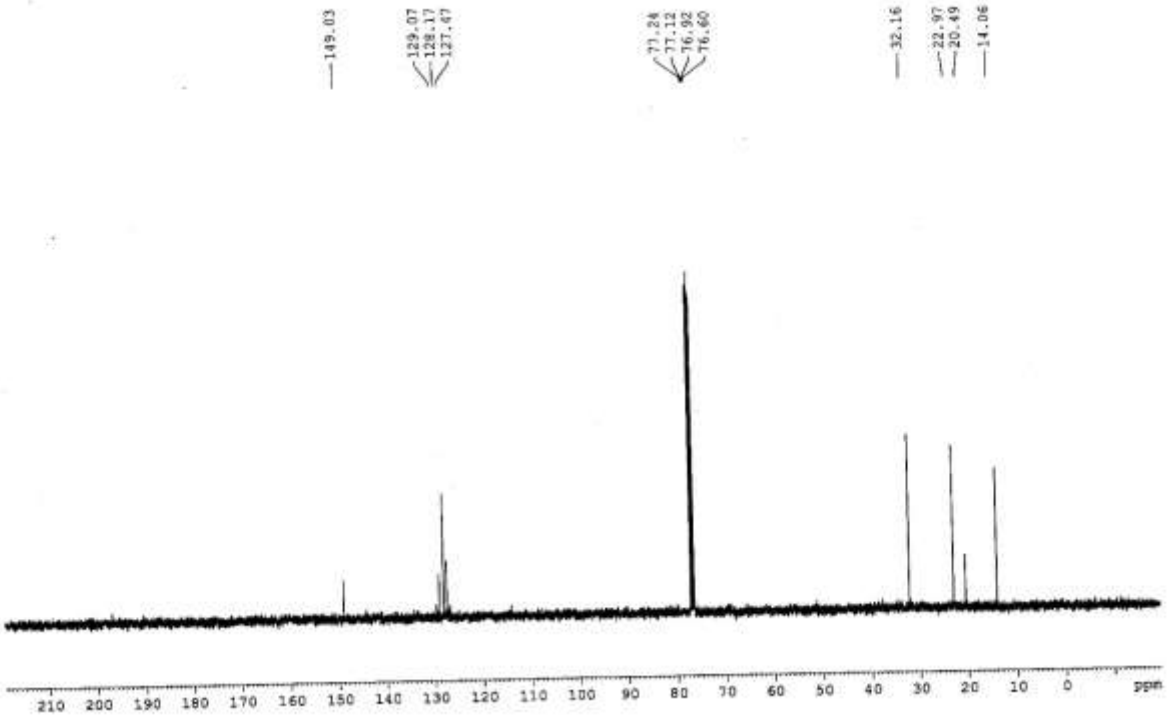


4-ethyl-2,6-dimethylphenol (1a)



4-methyl-2,6-dipropylphenol (1b)





1-(4-fluorophenethyl)naphthalen-2-ol (1c)