Supplementary Information

Nickel-Catalyzed Intermolecular Insertion of Aryl Iodides to Nitriles: A Novel Method to Synthesize Arylketones

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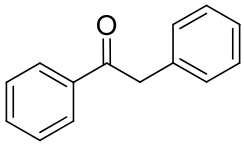
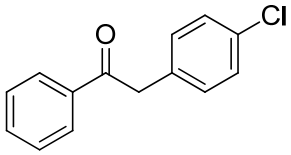
General information: All reagents were purchased from Sigma-Aldrich, Fisher-Acros, TCI, or Alfa-Aesar, and were used without further purification unless otherwise noted. THF and Et_2O were distilled from sodium, and CH_3CN was distilled from CaH_2. All manipulations of oxygen- and moisture-sensitive materials were conducted with a standard Schlenk technique. Flash column chromatography was performed using silica gel (230-400 mesh). Analytical thin layer chromatography (TLC) was performed on 60 F_{254} (0.25 mm) plates and visualization was accomplished with UV light (254 and 354 nm) and/or an aqueous alkaline $KMnO_4$ solution followed by heating. Proton and carbon nuclear magnetic resonance spectra (^{1}H NMR and ^{13}C NMR) were recorded on a Bruck 600 spectrometer with Me_4Si or solvent resonance as the internal standard (^{1}H NMR, Me_4Si at 0 ppm, $CHCl_3$ at 7.26 ppm; ^{13}C NMR, Me_4Si at 0 ppm, $CDCl_3$ at 77.0 ppm). ^{1}H NMR data are reported as follows: chemical shift, multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, quint = quintet, sext = sextet, sept = septet, br = broad, m = multiplet), coupling constants (Hz), and integration. IR spectral data were recorded on a Brucker TENSOR 37 spectrometer. Melting points (mp) were determined using a Fargo MP-1D. High Resolution Mass spectral data were obtained from the MAT-95XL HRMS by using EI method.

General procedure for the intermolecular insertion of iodoarenes with nitriles:

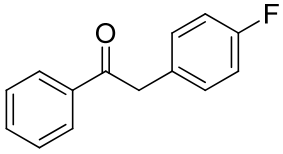
To a screw-capped vial (4-mL) were added $NiBr_2$(DME) (0.1 mmol, 16 mg), dppp (0.1 mmol, 21 mg) zinc powder (1.0 mmol, 65 mg) in DME (1,2-dimethoxyethane, 0.3 mL). The vial was sealed with septum and allowed to stir at r.t. for a while; the aryl iodides (0.5 mmol), nitriles (1.0 mmol) and H_2O (1.2 mmol) were then injected into the reaction mixture via a syringe. The septum was removed, and the vial was sealed with a screw cap. The reaction mixture was stirred at 100 °C for 36 h. The crude reaction mixture was diluted with CH_2Cl_2, filtered through a thin Celite pad, and concentrated *in vacuo*. The residue was isolated through a column chromatography by using hexane and ethyl acetate as eluent to give the pure product. Products **3** were obtained according to this procedure. The known structures were characterized by the HRMS and the ^{1}H NMR and ^{13}C NMR spectra of reported literatures.[1-11] Spectral data, melting point, HRMS data and the copies of ^{1}H NMR and ^{13}C NMR spectra for all compounds are listed below.



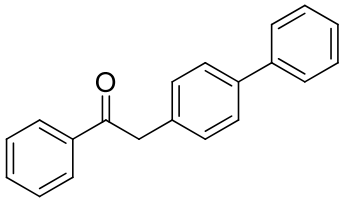
1,2-Diphenylethanone (3aa):[1] White solid, mp: 53–55 °C; IR (KBr): 2966, 2964, 1658, 1632, 1469, 750, 690 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 8.02 (d, J = 7.2 Hz, 2 H), 7.56 (t, J = 7.2 Hz, 1 H), 7.46 (t, J = 7.8 Hz, 2 H), 7.33 (t, J = 7.8 Hz, 2 H), 7.24–7.28 (m, 3 H), 4.29 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.6, 136.6, 134.5, 133.1, 129.5, 128.7, 128.6, 126.9, 45.5; HRMS: $C_{14}H_{12}O$ calculated 196.0888, found 196.0885; Registry Number: [451-40-1].



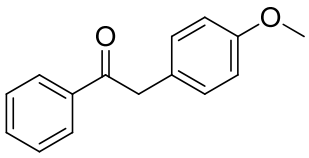
2-(4-Chlorophenyl)-1-phenylethanone (3ab):[2] White solid, mp: 129–130 °C; IR (KBr): 3059, 2938, 2912, 1684, 1448, 1412, 1334, 1104, 868, 753, 689, 571, 500 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 8.00 (dd, J_1 = 8.4 Hz, J_2 = 1.2 Hz, 2 H), 7.58 (t, J = 7.2 Hz, 1 H), 7.47 (t, J = 7.8 Hz, 2 H), 7.30 (dd, J_1 = 6.6 Hz, J_2 = 1.8 Hz, 2 H), 7.20 (dd, J_1 = 6.6 Hz, J_2 = 1.8 Hz, 2 H), 4.26 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.1, 136.4, 133.4, 133.0, 132.9, 130.9, 128.8, 128.7, 128.5, 44.7; HRMS: $C_{14}H_{11}ClO$ calculated 230.0498, found 230.0499; Registry Number: [6332-83-8].



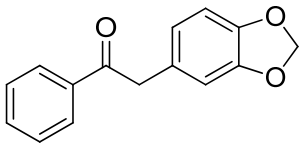
2-(4-Fluorophenyl)-1-phenylethanone (3ac):[3] White solid, mp: 125–127 °C; IR (KBr): 2919, 2850, 1683, 1653, 1559, 1541, 1508, 1449, 1420, 1336, 1093, 867, 847, 830, 797, 753, 690, 652, 571, 523, 420 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 8.01 (d, J = 7.8 Hz, 2 H), 7.58 (t, J = 7.8 Hz, 1 H), 7.47 (t, J = 7.8 Hz, 2 H), 7.23 (dd, J_1 = 7.8 Hz, J_2 = 5.4 Hz, 2 H), 7.02 (dd, J_1 = 7.8 Hz, J_2 = 5.4 Hz, 2 H), 4.27 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.4, 161.9 (d, J = 244.5 Hz), 136.5, 133.3, 131.0 (d, J = 7.5 Hz), 130.1, 128.7, 128.5, 115.5 (d, J = 21 Hz), 44.5; HRMS: $C_{14}H_{11}FO$ calculated 214.0794, found 214.0799; Registry Number: [347-91-1].



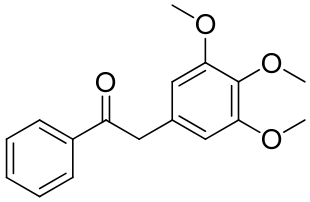
2-([1,1'-Biphenyl]-4-yl)-1-phenylethanone (3ad):[3] White solid, mp: 146–148 °C; IR (KBr): 2922, 2851, 1655, 1561, 1384, 1117, 751, 688, 484 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$): δ 8.05 (dd, J_1 = 7.8 Hz, J_2 = 1.2 Hz, 2 H), 7.56–7.59 (m, 5 H), 7.48 (t, J = 7.8 Hz, 2 H), 7.43 (t, J = 7.8 Hz, 2 H), 7.32–7.35 (m, 3 H), 4.34 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.6, 140.8, 139.9, 136.6, 133.5, 133.2, 129.9, 128.7, 128.7, 128.6, 127.4, 127.2, 127.0, 45.1; HRMS: $C_{20}H_{16}O$ calculated 272.1201, found 272.1206; Registry Number: [27644-00-4].



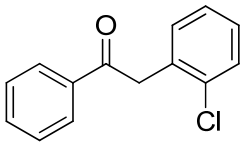
2-(4-Methoxyphenyl)-1-phenylethanone (3ae):[3] White solid, mp: 106–107 °C; IR (KBr): 3056, 2954, 2835, 1742, 1692, 1586, 1516, 1446, 1411, 1335, 1246, 1183, 1107, 1035, 862, 823, 793, 756, 691, 656, 570, 521 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$): δ 8.02 (dt, J_1 = 8.4 Hz, J_2 = 1.8 Hz, 2 H), 7.56 (td, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 7.46 (td, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 2 H), 7.20 (dt, J_1 = 8.4 Hz, J_2 = 1.8 Hz, 2 H), 6.88 (dt, J_1 = 9.6 Hz, J_2 = 2.4 Hz, 2 H), 4.23 (s, 2 H), 3.78 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.8, 158.5, 136.6, 133.0, 130.4, 128.5, 128.5, 126.4, 114.1, 55.2, 44.5; HRMS: $C_{15}H_{14}O_2$ calculated 226.0994, found 226.0999; Registry Number: [24845-40-7].



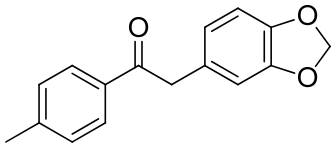
2-(Benzo[d][1,3]dioxol-5-yl)-1-phenylethanone (3af):[3] Yellow solid, mp: 65–67 °C; IR (KBr): 2921, 2852, 1677, 1638, 1490, 1446, 1384, 1248, 1190, 1101, 1039, 927, 692, 591, 498 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$): δ 8.00 (dd, J_1 = 7.8 Hz, J_2 = 1.2 Hz, 2 H), 7.56 (td, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 7.46 (dt, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 2 H), 6.76 (d, J = 8.4 Hz, 2 H), 6.71 (dd, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 5.92 (s, 2 H), 4.20 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.6, 147.8, 146.5, 136.5, 133.1, 128.6, 128.5, 128.0, 122.5, 109.9, 108.4, 101.0, 45.0; HRMS: $C_{15}H_{12}O_3$ calculated 240.0786, found 240.0789; Registry Number: [40804-81-7].



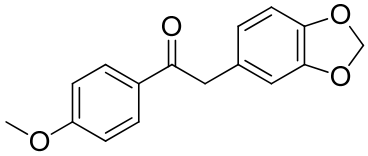
1-Phenyl-2-(3,4,5-trimethoxyphenyl)ethanone (3ag): Colorless oil; IR (KBr): 2925, 2842, 1685, 1655, 1637, 1591, 1508, 1458, 1422, 1385, 1324, 1241, 1211, 1125, 1006, 691, 597 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 8.02 (dd, J_1 = 7.8 Hz, J_2 = 1.2 Hz, 2 H), 7.57 (t, J = 7.2 Hz, 1 H), 7.47 (t, J = 7.8 Hz, 2 H), 6.48 (s, 2 H), 4.22 (s, 2 H), 3.83 (d, J = 4.8 Hz, 9 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.6, 153.3, 137.0, 136.6, 133.2, 130.0, 128.7, 128.6, 106.6, 60.8, 56.1, 45.7; HRMS: $C_{17}H_{18}O_4$ calculated 286.1205, found 286.1199; New compound.



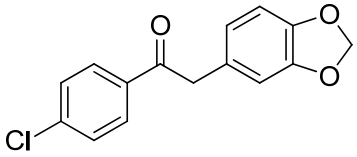
2-(2-Chlorophenyl)-1-phenylethanone (3ah):[4] Yellow solid, mp: 75–77 °C; IR (KBr): 3058, 2908, 1692, 1595, 1579, 1475, 1448, 1406, 1333, 1220, 1201, 1179, 1161, 1075, 1050, 993, 953, 909, 764, 753, 688, 657, 568, 446 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 8.04 (d, J = 7.8 Hz, 2 H) 7.58 (t, J = 7.8 Hz, 1 H), 7.48 (t, J = 7.8 Hz, 2 H), 7.40–7.42 (m, 1 H), 7.22–7.25 (m, 3 H), 4.44 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.3, 136.6, 134.4, 133.3, 133.1, 131.6, 129.5, 128.7, 128.5, 128.3, 126.9, 43.2; HRMS: $C_{14}H_{11}ClO$ calculated 230.0498, found 230.0494; Registry Number: [57479-60-4].



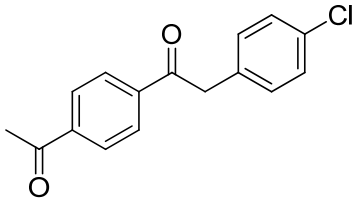
2-(Benzo[d][1,3]dioxol-5-yl)-1-(p-tolyl)ethanone (3bf): Yellow solid, mp: 89–91 °C; IR (KBr): 3026, 2093, 2780, 1685, 1604, 1505, 1448, 1406, 1385, 1358, 1327, 1258, 1221, 1194, 1102, 1037, 987, 926, 871, 812, 778, 755, 691, 631, 605, 579, 563, 524, 467, 423 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.91 (d, J = 8.4 Hz, 2 H), 7.25 (d, J = 8.4 Hz, 2 H), 6.75 (dd, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 2 H), 6.71 (dd, J_1 = 8.4 Hz, J_2 = 1.8 Hz, 1 H), 5.90 (s, 2 H), 4.16 (s, 2 H), 2.40 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.1, 147.7, 146.4, 143.8, 133.9, 129.2, 128.5, 128.2, 122.4, 109.8, 108.2, 100.8, 44.9, 21.5; HRMS: $C_{16}H_{14}O_3$ calculated 254.0943, found 254.0936; New compound.



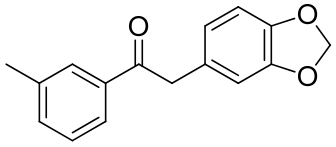
2-(Benzo[d][1,3]dioxol-5-yl)-1-(4-methoxyphenyl)ethanone (3cf): Pale yellow solid, mp: 103–104 °C; IR (KBr): 2900, 2840, 1671, 1600, 1575, 1504, 1490, 1444, 1419, 1375, 1313, 1251, 1219, 1171, 1119, 1037, 992, 928, 830, 805, 785, 605, 566, 419 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.98 (dd, J_1 = 7.2 Hz, J_2 = 1.8 Hz, 2 H) 6.92 (d, J = 8.4 Hz, 2 H) 6.74 (dd, J_1 = 7.8 Hz, J_2 = 2.4 Hz, 2 H), 6.70 (dd, J_1 = 7.8 Hz, J_2 = 1.2 Hz, 1 H), 5.90 (s, 2 H), 4.13 (s, 2 H), 3.85 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.2, 163.5, 147.7, 146.4, 130.8, 129.5, 128.4, 122.4, 113.7, 109.8, 108.3, 100.9, 55.4, 44.7; HRMS: $C_{16}H_{14}O_4$ calculated 270.0892, found 270.0897; New compound.



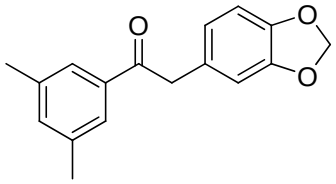
2-(Benzo[d][1,3]dioxol-5-yl)-1-(4-chlorophenyl)ethanone (3df): Yellow solid, mp: 72–74 °C; IR (KBr): 2896, 1686, 1589, 1490, 1444, 1399, 1306, 1248, 1190, 1092, 1039, 992, 928, 815, 767, 521 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.93 (d, J = 8.4 Hz, 2 H), 7.42 (d, J = 8.4 Hz, 2 H), 6.76 (d, J = 7.8 Hz, 1 H), 6.73 (s, 1 H), 6.69 (d, J = 7.8 Hz, 1 H), 5.93 (s, 2 H), 4.15 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.4, 147.9, 146.4, 139.6, 134.7, 130.0, 128.9, 127.6, 122.5, 109.7, 108.5, 101.0, 45.1; HRMS: $C_{15}H_{11}ClO_3$ calculated 274.0397, found 274.0395; New compound.



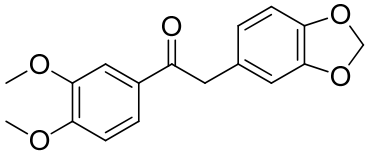
1-(4-Acetylphenyl)-2-(4-chlorophenyl)ethanone (3eb): Yellow solid, mp: 128–130 °C; IR (KBr): 1682, 1404, 1332, 1307, 1267, 1096, 831, 597, 509 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$): δ 8.06 (d, J = 8.4 Hz, 2 H), 8.03 (d, J = 8.4 Hz, 2 H), 7.31 (d, J = 8.4 Hz, 2 H), 7.19 (d, J = 8.4 Hz, 2 H), 4.28 (s, 2 H), 2.64 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.3, 196.5, 140.3, 139.5, 133.1, 132.3, 130.8, 128.9, 128.7, 128.6, 45.0, 26.9; HRMS: $C_{16}H_{13}ClO_2$ calculated 272.0604, found 272.0595; New compound.



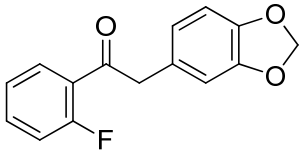
2-(Benzo[d][1,3]dioxol-5-yl)-1-(m-tolyl)ethanone (3ff): Brown oil; IR (KBr): 2898, 2778, 1742, 1679, 1603, 1585, 1490, 1444, 1328, 1248, 1187, 1157, 1100, 1039, 928, 786, 736, 691, 614 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.79–7.81 (m, 2 H), 7.33–7.38 (m, 2 H), 6.76 (d, J = 7.8 Hz, 2 H), 6.71 (dd, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 5.93 (s, 2 H), 4.18 (s, 2 H), 2.41 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.9, 147.8, 146.5, 138.5, 136.6, 133.9, 129.0, 128.5, 128.2, 125.8, 122.5, 109.9, 108.4, 101.0, 45.1, 21.4; HRMS: $C_{16}H_{14}O_3$ calculated 254.0943, found 254.0944; New compound.



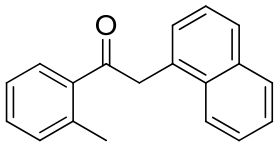
2-(Benzo[d][1,3]dioxol-5-yl)-1-(3,5-dimethylphenyl)ethanone (3gf): Brown oil; IR (KBr): 2927, 2855, 1655, 1638, 1629, 1561, 1509, 1384, 1093, 670, 592, 504, 484, 438, 428, 409 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.61 (s, 2 H), 7.20 (s, 1 H), 6.75–6.77 (m, 2 H), 6.70 (dd, J_1 = 8.4 Hz, J_2 = 1.2 Hz, 1 H), 5.92 (s, 2 H), 4.17 (s, 2 H), 2.37 (s, 6 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 198.0, 147.7, 146.4, 138.2, 136.6, 134.8, 128.2, 126.5, 126.3, 126.3, 122.5, 109.9, 108.3, 100.9, 45.0, 21.2 (2 C); HRMS: $C_{17}H_{16}O_3$ calculated 268.1099, found 268.1100; New compound.



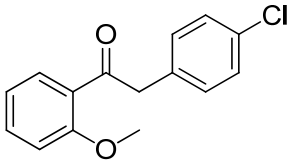
2-(Benzo[d][1,3]dioxol-5-yl)-1-(3,4-dimethoxyphenyl)ethanone (3hf): Yellow solid, mp: 87–89 °C; IR (KBr): 2962, 2935, 2839, 1672, 1587, 1515, 1490, 1444, 1417, 1384, 1268, 1247, 1151, 1130, 1036, 1023, 928, 872, 811, 785, 626, 588 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.64 (dd, J_1 = 8.4 Hz, J_2 = 1.8 Hz, 1 H), 7.55 (d, J = 1.8 Hz, 1 H), 6.88 (d, J = 8.4 Hz, 1 H), 6.75–6.76 (m, 2 H), 6.71–6.73 (m, 1 H), 5.92 (s, 2 H), 4.15 (s, 2 H), 3.94 (s, 3 H), 3.92 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.3, 153.4, 149.1, 147.8, 146.5, 129.7, 128.6, 123.4, 122.4, 110.7, 110.0, 109.8, 108.4, 101.0, 56.1, 56.0, 44.8; HRMS: $C_{17}H_{16}O_5$ calculated 300.0998, found 300.0987; New compound.



2-(Benzo[d][1,3]dioxol-5-yl)-1-(2-fluorophenyl)ethanone (3if): Brown oil; IR (KBr): 3079, 2899, 2779, 1686, 1609, 1577, 1504, 1491, 1450, 1332, 1269, 1249, 1212, 1189, 1152, 1100, 1039, 995, 929, 822, 788, 764, 606, 538, 513, 495, 421 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.84 (td, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 7.50–7.52 (m, 1 H), 7.21 (td, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 7.13 (dd, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 6.74 (t, J = 1.8 Hz, 2 H), 6.69 (dd, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 5.93 (s, 2 H), 4.20 (d, J = 2.4 Hz, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.2 (d, J = 3.0 Hz), 161.7 (d, J = 252 Hz), 147.7, 146.6, 134.6 (d, J = 9.0 Hz), 131.0, 127.5, 125.5 (d, J = 13.5 Hz), 124.5 (d, J = 3.0 Hz), 122.8, 116.6 (d, J = 24.0 Hz), 110.1, 108.3, 100.9, 49.5 (d, J = 7.5 Hz); HRMS: $C_{15}H_{11}FO_3$ calculated 258.0692, found 258.0696; New compound.

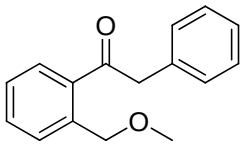


2-(Naphthalen-1-yl)-1-(o-tolyl)ethanone (3ji): Yellow oil; IR (KBr): 2927, 1678, 1598, 1562, 1482, 1384, 784 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.86–7.89 (m, 2 H), 7.83 (dd, J_1 = 7.8 Hz, J_2 = 1.2 Hz, 1 H), 7.79 (d, J = 8.4 Hz, 1 H), 7.47–7.51 (m, 2 H), 7.42 (t, J = 7.8 Hz, 1 H), 7.38 (td, J_1 = 7.2 Hz, J_2 = 1.8 Hz, 1 H), 7.35 (d, J = 6.6 Hz, 1 H), 7.28 (t, J = 7.8 Hz, 1 H), 7.24 (d, J = 7.2 Hz, 1 H), 4.67 (s, 2 H), 2.42 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 201.5, 138.6, 137.6, 133.9, 132.3, 132.1, 131.4, 131.3, 128.8, 128.5, 128.3, 127.9, 126.3, 125.7, 125.6, 125.5, 123.9, 46.2, 21.2; HRMS: $C_{19}H_{16}O$ calculated 260.1201, found 260.1206; New compound.

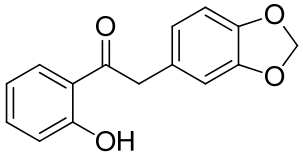


2-(4-Chlorophenyl)-1-(2-methoxyphenyl)ethanone (3kb): Yellow oil; IR (KBr): 3073, 2967, 2943, 2839, 1676, 1598, 1486, 1465, 1436, 1331, 1283, 1246, 1163, 1092, 1017, 993, 804, 756, 628, 495 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.68 (dd, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 7.47 (td, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 7.27 (d, J = 8.4 Hz, 2 H), 7.16 (d, J = 8.4 Hz, 2 H), 7.00 (td, J_1 = 7.8 Hz, J_2 = 1.2 Hz, 1 H), 6.97 (d, J = 8.4 Hz, 1 H), 4.27 (s, 2 H), 3.92 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 199.4, 158.4, 133.7, 133.7, 132.4, 131.0, 130.6, 128.4, 127.8, 120.7, 111.5, 55.4, 49.4; HRMS:

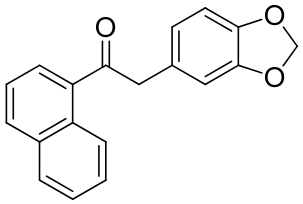
$C_{15}H_{13}ClO_2$ calculated 260.0604, found 260.0595; New compound.



1-(2-(Methoxymethyl)phenyl)-2-phenylethanone (3la): Yellow oil; IR (KBr): 3064, 3030, 2925, 2822, 1685, 1601, 1573, 1496, 1453, 1375, 1320, 1262, 1195, 1100, 970, 758, 730, 698, 667, 594, 476 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.78 (d, J = 7.8 Hz, 1 H), 7.67 (d, J = 7.2 Hz, 1 H), 7.51 (t, J = 7.8 Hz, 1 H), 7.34–7.38 (m, 3 H), 7.27–7.30 (m, 3 H), 4.74 (s, 2 H), 4.25 (s, 2 H), 3.40 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 201.0, 139.4, 136.2, 134.2, 131.5, 129.5, 128.5, 128.4, 127.7, 126.8, 126.7, 72.4, 58.4, 47.8; HRMS: $C_{16}H_{16}O_2$ calculated 240.1150, found 240.1145; New compound.

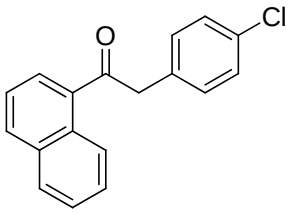


2-(Benzo[d][1,3]dioxol-5-yl)-1-(2-hydroxyphenyl)ethanone (3'f): Yellow oil; IR (KBr): 3459, 2899, 1638, 1612, 1579, 1489, 1445, 1357, 1339, 1308, 1245, 1188, 1156, 1038, 993, 928, 789, 754, 715, 622 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 12.20 (s, 1 H), 7.84 (dd, J_1 = 7.8 Hz, J_2 = 1.2 Hz, 1 H), 7.47 (td, J_1 = 8.4 Hz, J_2 = 1.2 Hz, 1 H), 6.99 (d, J = 8.4 Hz, 1 H), 6.91 (td, J_1 = 7.8 Hz, J_2 = 1.2 Hz, 1 H), 6.79 (d, J = 8.4 Hz, 1 H), 6.76 (d, J = 1.8 Hz, 1 H), 6.72 (dd, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 5.95 (s, 2 H), 4.21 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 203.9, 162.9, 148.0, 146.8, 136.6, 130.3, 127.4, 127.4, 122.6, 119.0, 118.7, 109.8, 108.5, 101.1, 44.7; HRMS: $C_{15}H_{12}O_4$ calculated 256.0736, found 256.0738; New compound.

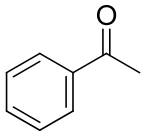


2-(Benzo[d][1,3]dioxol-5-yl)-1-(naphthalen-1-yl)ethanone (3nf): Brown oil; IR (KBr): 2920, 2852, 1684, 1489, 1443, 1385, 1246, 1172, 1090, 1038, 927, 773, 739, 613, 483 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 8.58 (d, J = 8.4 Hz, 1 H), 7.98 (d, J = 8.4 Hz, 1 H), 7.93 (dd, J_1 = 7.2 Hz, J_2 = 1.2 Hz, 1 H), 7.86 (d, J = 7.8 Hz, 1 H), 7.57 (td, J_1 = 8.4 Hz, J_2 = 1.2 Hz, 1 H), 7.53 (td, J_1 = 8.4 Hz, J_2 = 1.2 Hz, 1 H), 7.49 (t, J = 7.8 Hz, 1 H), 6.81 (d, J = 1.2 Hz, 1 H), 6.76 (d, J = 7.8 Hz, 1 H), 6.74 (dd, J_1 = 8.4 Hz,

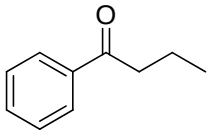
J_2 = 1.2 Hz, 1 H), 5.92 (s, 2 H), 4.28 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 201.5, 147.8, 146.5, 135.4, 133.9, 132.7, 130.4, 128.3, 127.9, 127.8, 126.4, 125.8, 124.2, 122.6, 109.9, 108.9, 108.4, 100.9, 48.4; HRMS: $C_{19}H_{14}O_3$ calculated 290.0943, found 290.0938; New compound.



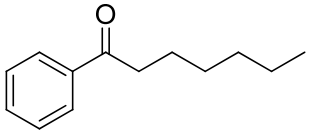
2-(4-Chlorophenyl)-1-(naphthalen-1-yl)ethanone (3nb): Brown solid, mp: 105–106 °C; IR (KBr): 2922, 2852, 1679, 1595, 1505, 1399, 1318, 1174, 1092, 1014, 970, 946, 927, 906, 863, 838, 807, 789, 773, 756, 669, 646, 618, 562, 516, 498, 447 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$): δ 8.58 (d, J = 8.4 Hz, 1 H), 8.00 (d, J = 8.4 Hz, 1 H), 7.94 (d, J = 7.2 Hz, 1 H), 7.88 (d, J = 8.4 Hz, 1 H), 7.58 (td, J_1 = 7.2 Hz, J_2 = 1.8 Hz, 1 H), 7.54 (t, J = 7.2 Hz, 1 H), 7.50 (t, J = 7.8 Hz, 1 H), 7.30 (dd, J_1 = 8.4 Hz, J_2 = 1.8 Hz, 2 H), 7.23 (d, J = 8.4 Hz, 2 H), 4.34 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 200.9, 135.2, 134.0, 133.0, 132.9, 130.9, 130.3, 128.8, 128.4, 128.1, 127.9, 126.6, 125.7, 124.2, 48.0; HRMS (ESI): $C_{18}H_{13}ClO$ calculated 280.0655, found 280.0649; New compound.



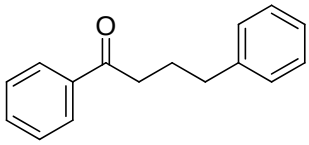
Acetophenone (3aj):[5] Colorless oil; IR (KBr): 2922, 2852, 1629, 1385, 1113 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.96 (d, J = 7.2 Hz, 2 H), 7.56 (t, J = 7.2 Hz, 1 H), 7.46 (t, J = 7.8 Hz, 2 H), 2.61 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 198.1, 137.2, 133.1, 128.6, 128.3, 26.6; HRMS: C_8H_8O calculated 120.0575, found 120.0577; Registry Number: [98-86-2].



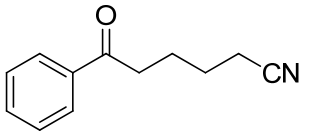
1-Phenylbutan-1-one (3ak):[1] Colorless oil; IR (KBr): 2923, 2853, 1648, 1559, 1541, 1508, 1449, 1385, 1111, 804, 738, 443 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.95 (dd, J_1 = 8.4 Hz, J_2 = 1.2 Hz, 2 H), 7.52–7.54 (m, 1 H), 7.44 (t, J = 7.2 Hz, 2 H), 2.93 (t, J = 7.2 Hz, 2 H), 1.76 (sext, J = 7.2 Hz, 2 H), 1.00 (t, J = 7.2 Hz, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 200.3, 137.1, 132.8, 128.5, 127.9, 40.4, 17.7, 13.8; HRMS: $C_{10}H_{12}O$ calculated 148.0888, found 148.0883; Registry Number: [495-40-9].



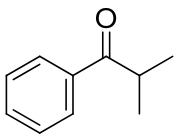
1-Phenylheptan-1-one (3am):[6] Colorless oil; IR (KBr): 2959, 2928, 2856, 1686, 1638, 1384, 1103, 733, 696, 592, 506 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.96 (d, *J* = 7.8 Hz, 2 H), 7.55 (t, *J* = 7.2 Hz, 1 H), 7.46 (t, *J* = 7.8 Hz, 2 H), 2.96 (t, *J* = 7.2 Hz, 2 H), 1.74 (quint, *J* = 7.2 Hz, 2 H), 1.26–1.42 (m, 6 H), 0.88–0.90 (m, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 200.6, 137.1, 132.8, 128.5, 128.1, 38.6, 31.7, 29.1, 24.4, 22.5, 14.0; HRMS: $C_{13}H_{18}O$ calculated 190.1358, found 190.1354; Registry Number: [1671-75-6].



1,4-Diphenylbutan-1-one (3an):[7] White solid, mp: 59–61 °C; IR (KBr): 3085, 3061, 3026, 2924, 2854, 1685, 1598, 1496, 1449, 1368, 1264, 1226, 1120, 1001, 743, 691, 562, 488 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.93 (d, *J* = 7.2, 2 H), 7.55 (t, *J* = 7.8, 1 H), 7.45 (t, *J* = 7.8 Hz, 2 H), 7.30 (t, *J* = 7.2 Hz, 2 H), 7.20–7.23 (m, 3 H), 2.99 (t, *J* = 7.2 Hz, 2 H), 2.74 (t, *J* =7.8 Hz, 2 H), 2.10 (quint, *J* = 7.8 Hz, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 200.1, 141.7, 137.0, 132.9, 128.5, 128.5, 128.4, 128.0, 125.9, 37.7, 35.2, 25.7; HRMS: $C_{16}H_{16}O$ calculated 224.1201, found 224.1204; Registry Number: [5407-91-0].

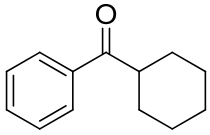


6-Oxo-6-phenylhexanenitrile (3ao): Pale yellow solid, mp: 68–70 °C; IR (KBr): 2958, 2872, 2248, 1676, 1541, 1458, 1385, 1111, 1075, 755, 729, 692, 569, 419 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.94 (d, *J* = 7.2 Hz, 2 H), 7.56 (t, *J* = 7.8 Hz , 1 H), 7.46 (t, *J* = 7.8 Hz, 2 H), 3.03 (t, *J* = 7.2 Hz, 2 H), 2.39 (t, *J* = 7.2 Hz, 2 H), 1.87–1.92 (m, 2 H), 1.73–1.78 (m, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 199.0, 136.6, 133.1, 128.6, 127.9, 119.4, 37.3, 24.9, 23.0, 17.1; HRMS: $C_{12}H_{13}NO$ calculated 187.0997, found 187.0994; New compound.

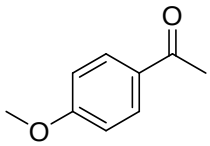


2-Methyl-1-phenylpropan-1-one (3ap):[1] Colorless oil; IR (KBr): 2922, 2851, 1655, 1638, 1560, 1499, 1459, 1385, 1114, 744, 479 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ

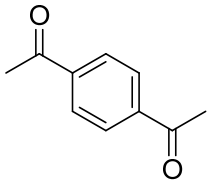
7.94 (d, J = 7.8 Hz, 2 H), 7.53 (t, J = 7.8 Hz, 1 H), 7.45 (t, J = 7.8 Hz, 2 H), 3.53–3.57 (m, 1 H), 1.21 (d, J = 7.2 Hz, 6 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 204.4, 136.2, 132.7, 128.5, 128.2, 35.3, 19.1; HRMS: $C_{10}H_{12}O$ calculated 148.0888, found 148.0886; Registry Number: [611-70-1].



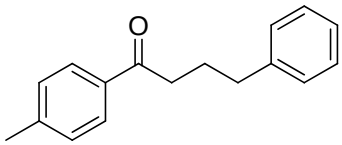
Cyclohexyl(phenyl)methanone (3aq):[1] White solid, mp: 60–62 °C; IR (KBr): 3061, 2932, 2854, 1681, 1597, 1448, 1373, 1252, 1207, 974, 765, 698 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.94 (dd, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 2 H), 7.54 (tt, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 7.45 (td, J_1 = 7.2 Hz, J_2 = 1.8 Hz, 2 H), 3.26 (tt, J_1 = 11.4 Hz, J_2 = 3.6 Hz, 1 H), 1.83–1.91 (m, 4 H), 1.72–1.76 (m, 1 H), 1.47–1.53 (m, 2 H), 1.36–1.43 (m, 2 H), 1.24–1.31 (m, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 203.9, 136.4, 132.7, 128.6, 128.2, 45.6, 29.4, 26.0, 25.9; HRMS: $C_{13}H_{16}O$ calculated 188.1201, found 188.1204; Registry Number: [712-50-5].



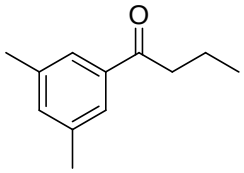
1-(4-Methoxyphenyl)ethanone (3cj):[8] Colorless oil; IR (KBr): 2923, 2842, 1675, 1601, 1510, 1358, 1258, 1172, 1028, 957, 835, 564 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.92 (d, J = 9.0 Hz, 2 H), 6.92 (d, J = 9.0 Hz, 2 H), 3.85 (s, 3 H), 2.54 (s. 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.7, 163.4, 130.5, 130.3, 113.6, 55.4, 26.3; HRMS: $C_9H_{10}O_2$ calculated 150.0681, found 150.0677; Registry Number: [100-06-1].



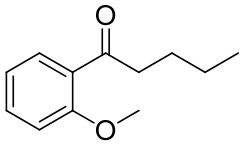
1,1'-(1,4-Phenylene)diethanone (3ej):[9] Yellow solid, mp: 120–121 °C; IR (KBr): 2922, 2852, 1677, 1384, 1312, 1119, 835, 604 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$): δ 8.03 (s, 4 H), 2.65 (s, 6 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.5, 140.2, 128.5, 26.9; HRMS: $C_{10}H_{10}O_2$ calculated 162.0681, found 162.0684; Registry Number: [1009-61-6].



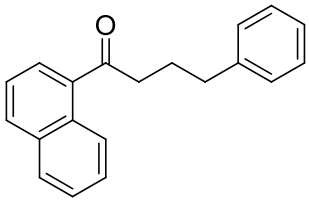
4-Phenyl-1-(p-tolyl)butan-1-one (3bn): Colorless oil; IR (KBr): 2925, 1679, 1655, 1638, 1384, 815, 700, 590, 502, 435 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.83 (d, *J* = 8.4 Hz, 2 H), 7.29 (t, *J* = 7.8 Hz, 2 H), 7.25 (t, *J* = 6.6 Hz, 2 H), 7.19–7.22 (m, 3 H), 2.96 (t, *J* = 7.2 Hz, 2 H), 2.72 (t, *J* = 7.2 Hz, 2 H), 2.41 (s, 3 H), 2.08 (quint, *J* = 7.8 Hz, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 199.8, 143.7, 141.7, 134.5, 129.2, 128.5, 128.4, 128.1, 125.9, 37.6, 35.2, 25.8, 21.6; HRMS: $C_{17}H_{18}O$ calculated 238.1358, found 238.1361; New compound.



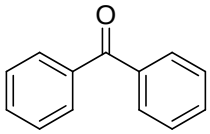
1-(3,5-Dimethylphenyl)butan-1-one (3gk): Yellow oil; IR (KBr): 2964, 2931, 1685, 1637, 1607, 1560, 1458, 1383, 1316, 1183, 1055, 847, 789, 687 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.56 (s, 2 H), 7.19 (s, 1 H), 2.92 (t, *J* = 7.2 Hz, 2 H), 2.37 (s, 6 H), 1.76 (sext, *J* = 7.2 Hz, 2 H), 1.00 (t, *J* = 7.2 Hz, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 200.9, 138.1, 137.3, 134.5, 125.8, 40.6, 21.2, 17.9, 13.9; HRMS: $C_{12}H_{16}O$ calculated 176.1201, found 176.1199; New compound.



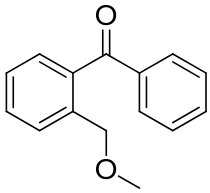
1-(2-Methoxyphenyl)pentan-1-one (3kl): Yellow oil; IR (KBr): 2961, 2934, 2873, 1677, 1599, 1486, 1466, 1438, 1384, 1287, 1246, 1163, 1026, 757 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.64 (dd, J_1 = 7.2 Hz, J_2 = 1.8 Hz, 1 H), 7.44 (td, J_1 = 7.2 Hz, J_2 = 1.8 Hz, 1 H), 6.99 (td, J_1 = 7.2 Hz, J_2 = 1.8 Hz, 1 H), 6.95 (d, *J* = 8.4 Hz, 1 H), 3.89 (s, 3 H), 2.96 (t, *J* = 7.8 Hz, 2 H), 1.66 (quint, *J* = 7.8 Hz, 2 H), 1.37 (sext, *J* = 7.8 Hz, 2 H), 0.93 (t, *J* = 7.8 Hz, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 203.3, 158.3, 133.0, 130.1, 129.1, 120.7, 111.6, 55.5, 43.5, 26.6, 22.5, 13.9; HRMS: $C_{12}H_{16}O_2$ calculated 192.1150, found 192.1147; New compound.



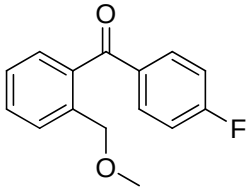
1-(Naphthalen-1-yl)-4-phenylbutan-1-one (3nn): Colorless oil; IR (KBr): 2962, 2926, 2854, 1638, 1384, 700, 663, 594, 505 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 8.55 (d, *J* = 8.4 Hz, 1 H), 7.97 (d, *J* = 7.8 Hz, 1 H), 7.88 (d, *J* = 7.8 Hz, 1 H), 7.79 (d, *J* = 7.2 Hz, 1 H), 7.58 (td, J_1 = 7.2 Hz, J_2 = 1.2 Hz, 1 H), 7.53 (td, J_1 = 7.2 Hz, J_2 = 1.2 Hz, 1 H), 7.48 (t, *J* = 7.2 Hz, 1 H), 7.29 (t, *J* = 7.8 Hz, 2 H), 7.19–7.22 (m, 3 H), 3.07 (t, *J* = 7.2 Hz, 2 H), 2.76 (t, *J* = 7.8 Hz, 2 H), 2.15 (quint, *J* = 7.8 Hz, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 204.6, 141.6, 136.3, 134.0, 132.4, 130.1, 128.5, 128.4, 127.8, 127.2, 126.4, 126.0, 125.7, 124.3, 41.4, 35.2, 26.1; HRMS: $C_{20}H_{18}O$ calculated 274.1358, found 274.1357; New compound.



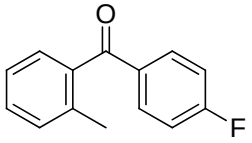
Benzophenone (3ar):[10] White solid, mp: 48–50 °C; IR (KBr): 2924, 2853, 1656, 1447, 1431, 1384, 1277, 1114, 941, 919, 809, 763, 699, 638 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.79 (d, *J* = 7.2 Hz, 4 H), 7.56 (t, *J* = 7.8 Hz, 2 H), 7.46 (t, *J* = 7.8 Hz, 4 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.5, 137.4, 132.2, 129.8, 128.1; HRMS: $C_{13}H_{10}O$ calculated 182.0732, found 182.0734; Registry Number: [119-61-9].



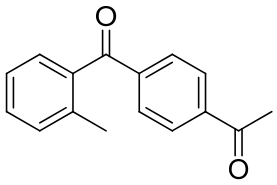
(2-(Methoxymethyl)phenyl)(phenyl)methanone (3lr): Colorless oil; IR (KBr):, 3064, 2985, 2926, 2891, 2824, 1666, 1598, 1448, 1384, 1315, 1271, 1195, 1154, 1094, 927, 766, 736, 701, 641 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.80 (d, *J* = 7.2 Hz, 2 H), 7.55–7.59 (m, 2 H), 7.50 (td, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 7.45 (t, *J* = 7.8 Hz, 2 H), 7.34–7.38 (m, 2 H), 4.54 (s, 2 H), 3.25 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.8, 138.0, 137.7, 133.0, 130.4, 130.0, 128.8, 128.3, 128.3 (3 C), 126.9, 72.1, 58.3; HRMS: $C_{15}H_{14}O_2$ calculated 226.0994, found 226.0996; New compound.



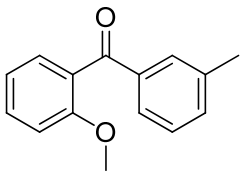
(4-Fluorophenyl)(2-(methoxymethyl)phenyl)methanone (3ls): Yellow oil; IR (KBr): 3070, 2986, 2927, 2824, 1666, 1598, 1504, 1448, 1149, 1094, 1013, 957, 929, 853, 781, 749, 683, 632, 602, 573, 505 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.81–7.84 (m, 2 H), 7.54 (d, J =7.8 Hz, 1 H), 7.49 (td, J_1 = 7.8 Hz, J_2 = 2.4 Hz, 1 H), 7.33–7.37 (m, 2 H), 710–7.14 (m, 2 H), 4.52 (s, 2 H), 3.23 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.3, 165.7 (d, J = 253 Hz), 137.8, 137.5, 134.0, 132.6 (d, J = 9.0 Hz), 130.5, 128.5 (d, J = 6.0 Hz), 127.0, 115.5 (d, J = 21.0 Hz), 115.0, 72.1, 58.4; HRMS: $C_{15}H_{13}FO_2$ calculated 244.0900, found 244.0904; New compound.



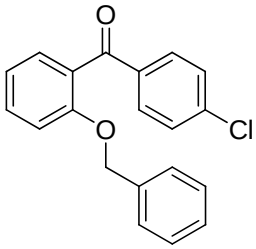
(4-Fluorophenyl)(o-tolyl)methanone (3js):[11] Pale yellow oil; IR (KBr): 3069, 2927, 1920, 1665, 1598, 1504, 1455, 1410, 1294, 1268, 1230, 1149, 927, 853, 793, 748, 606 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.82–7.84 (m, 2 H), 7.39 (td, J_1 = 7.2 Hz, J_2 = 1.2 Hz, 1 H), 7.29 (d, J = 8.4 Hz, 2 H), 7.25 (t, J = 8.4 Hz, 1 H), 7.10–7.14 (m, 2 H), 2.32 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.0, 165.8 (d, J = 253.5 Hz), 138.4, 136.6, 134.1, 132.7 (d, J = 9.9 Hz), 131.0, 130.3, 128.2, 125.3, 115.6 (t, J = 22.5 Hz), 19.9; HRMS: $C_{14}H_{11}FO$ calculated 214.0794, found 214.0802; Registry Number: [68295-42-1]



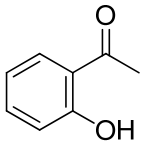
1-(4-(2-Methylbenzoyl)phenyl)ethanone (3jt): Yellow solid, mp: 86–87 °C; IR (KBr): 3064, 2961, 2925, 1686, 1668, 1559, 1457, 1403, 1292, 1261, 959, 927, 856, 782, 752, 729, 692, 664, 591, 419 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 8.02 (d, J = 7.8 Hz, 2 H), 7.86 (d, J = 8.4 Hz, 2 H), 7.42 (td, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 7.30–7.32 (m, 2 H), 7.25–7.27 (m, 1 H), 2.65 (s, 3 H), 2.35 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.8, 197.5, 141.2, 140.0, 137.8, 137.2, 131.2, 130.8, 130.2, 128.9, 128.3, 125.3, 26.9, 20.1; HRMS: $C_{16}H_{14}O_2$ calculated 238.0994, found 238.0997; New compound.



(2-Methoxyphenyl)(m-tolyl)methanone (3kv): Yellow oil; IR (KBr): 3025, 2923, 2838, 1667, 1599, 1489, 1462, 1436, 1301, 1247, 1207, 1110, 1048, 1024, 958, 830, 756, 723, 640 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.68 (s, 1 H), 7.58 (d, J = 7.2 Hz, 1 H), 7.44–7.46 (m, 1 H), 7.33–7.36 (m, 2 H), 7.29 (t, J = 7.8 Hz, 1 H), 7.03 (td, J_1 = 7.8 Hz, J_2 = 1.2 Hz, 1 H), 6.99 (d, J = 8.4 Hz, 1 H), 3.70 (s, 3 H), 2.37 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.4, 157.1, 137.8, 137.6, 133.6, 131.6, 129.8, 129.2, 128.8, 127.9, 127.1, 120.2, 111.3, 55.4, 21.1; HRMS: $C_{15}H_{14}O_2$ calculated 226.0994, found 226.0991; New compound.



(2-(Benzyloxy)phenyl)(4-chlorophenyl)methanone (3mu): Colorless oil; IR (KBr): 3066, 3033, 2924, 2852, 1656, 1598, 1485, 1448, 1400, 1384, 1307, 1260, 1239, 1109, 1090, 1014, 926, 844, 753, 696 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 7.73 (dd, J_1 = 6.6 Hz, J_2 = 1.8 Hz, 2 H), 7.44–7.48 (m, 2 H), 7.38 (dd, J_1 = 6.6 Hz, J_2 = 1.8 Hz, 2 H), 7.23–7.24 (m, 3 H), 7.08 (t, J = 7.8 Hz, 1 H), 7.03 (d, J = 8.4 Hz, 1 H), 6.98–7.00 (m, 2 H), 5.00 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 195.5, 156.4, 139.1, 136.8, 136.2, 132.4, 131.0, 130.0, 128.9, 128.5, 128.3, 127.8, 126.7, 121.1, 112.8, 70.2; HRMS: $C_{20}H_{15}ClO_2$ calculated 322.0761, found 322.0766; New compound.



1-(2-Hydroxyphenyl)ethanone (3'j):[12] Yellow oil; IR (KBr): 3051, 2923, 1642, 1488, 1448, 1368, 1303, 1245, 1221, 962, 754, 621, 522 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$): δ 12.26 (s, 1 H), 7.73 (dd, J_1 = 7.8 Hz, J_2 = 1.8 Hz, 1 H), 7.47 (td, J_1 = 8.4 Hz, J_2 = 1.8 Hz, 1 H), 6.98 (d, J = 7.8 Hz, 1 H), 6.90 (td, J_1 = 7.8 Hz, J_2 = 1.2 Hz, 1 H), 2.63 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 204.5, 162.4, 136.5, 130.7, 119.7, 118.9, 118.4, 26.6; HRMS: $C_8H_8O_2$ calculated 136.0524, found 136.0528; Registry Number: [118-93-4].

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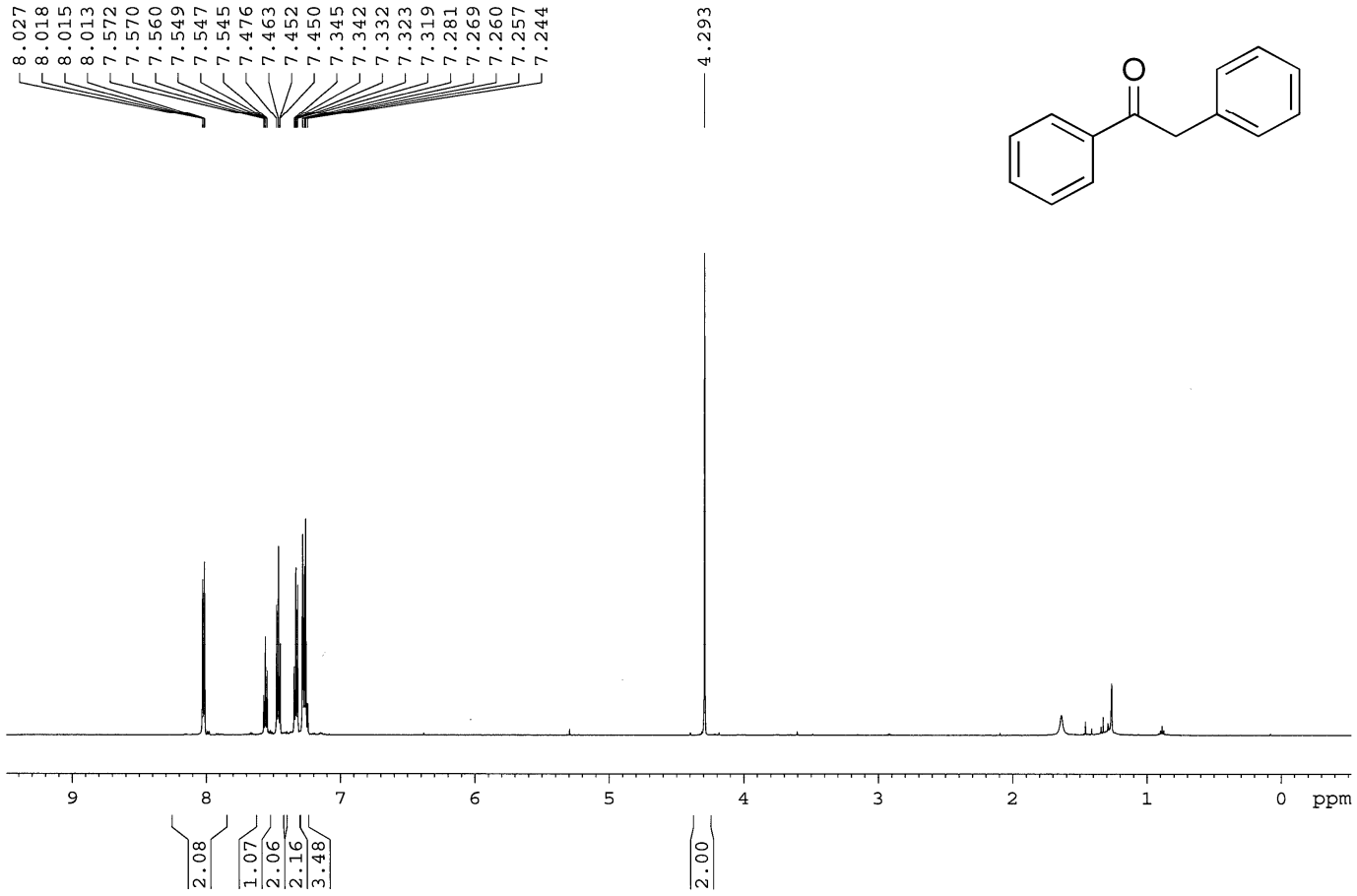
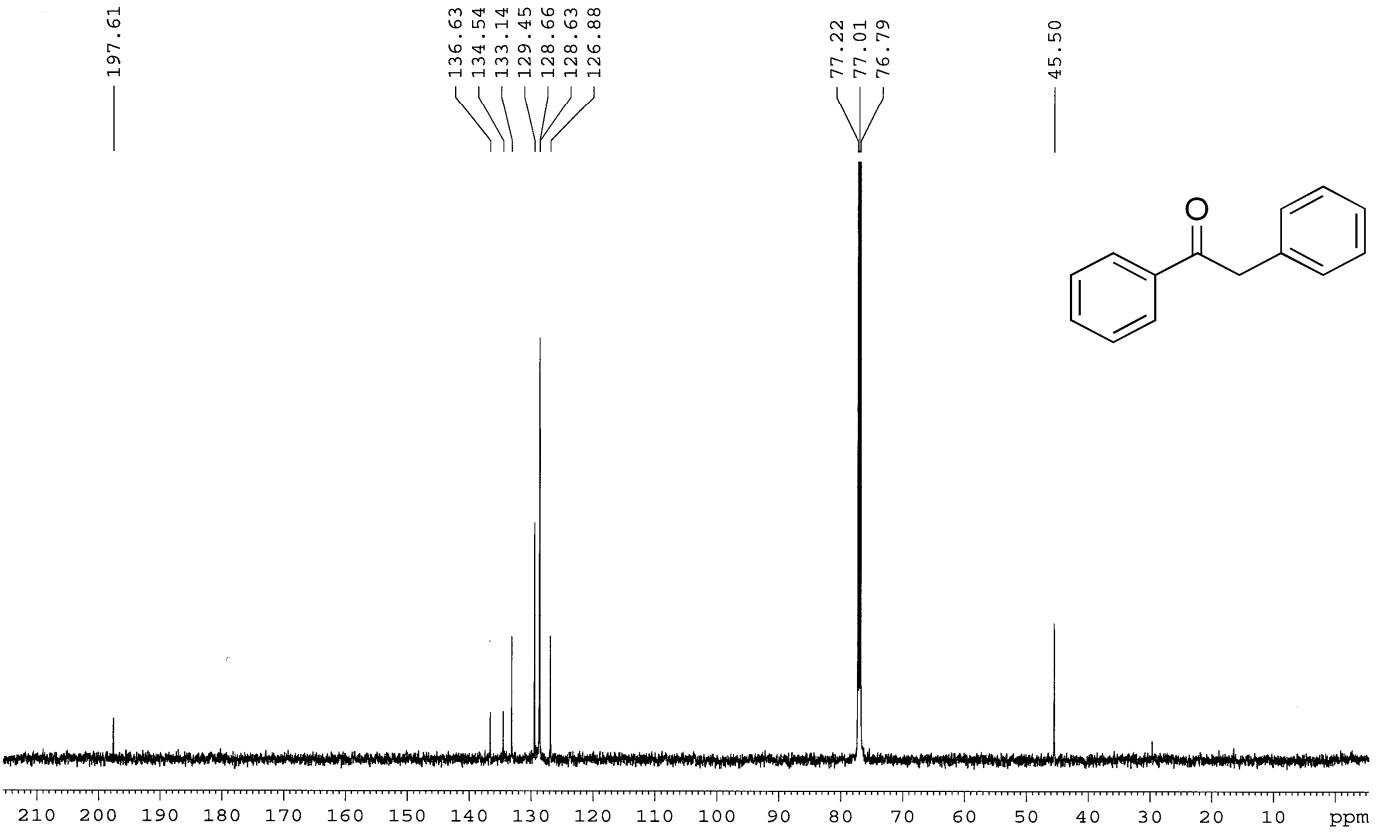
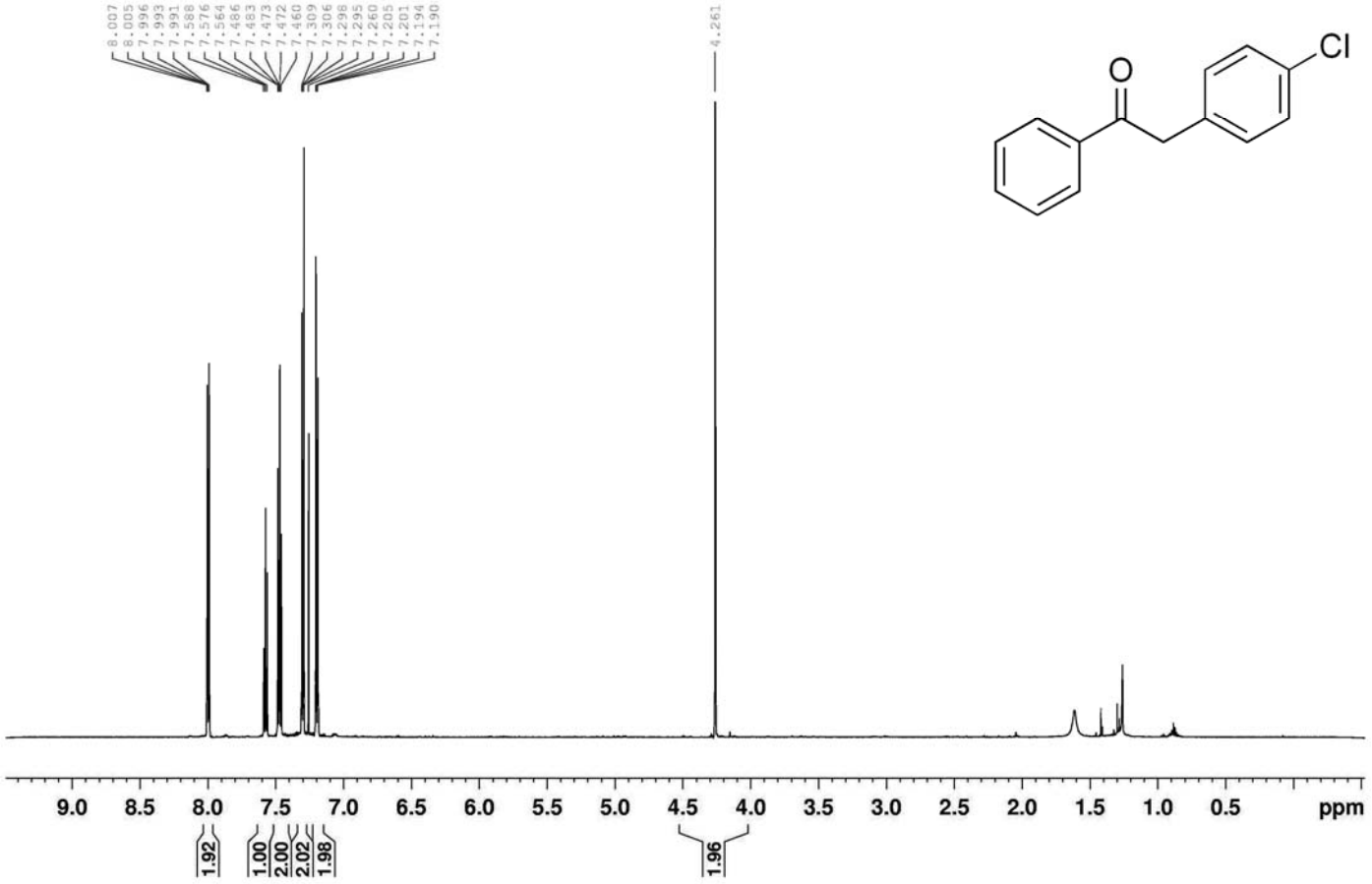
^{1}H and ^{13}C NMR Spectra (600 MHz, $CDCl_3$) for all compounds

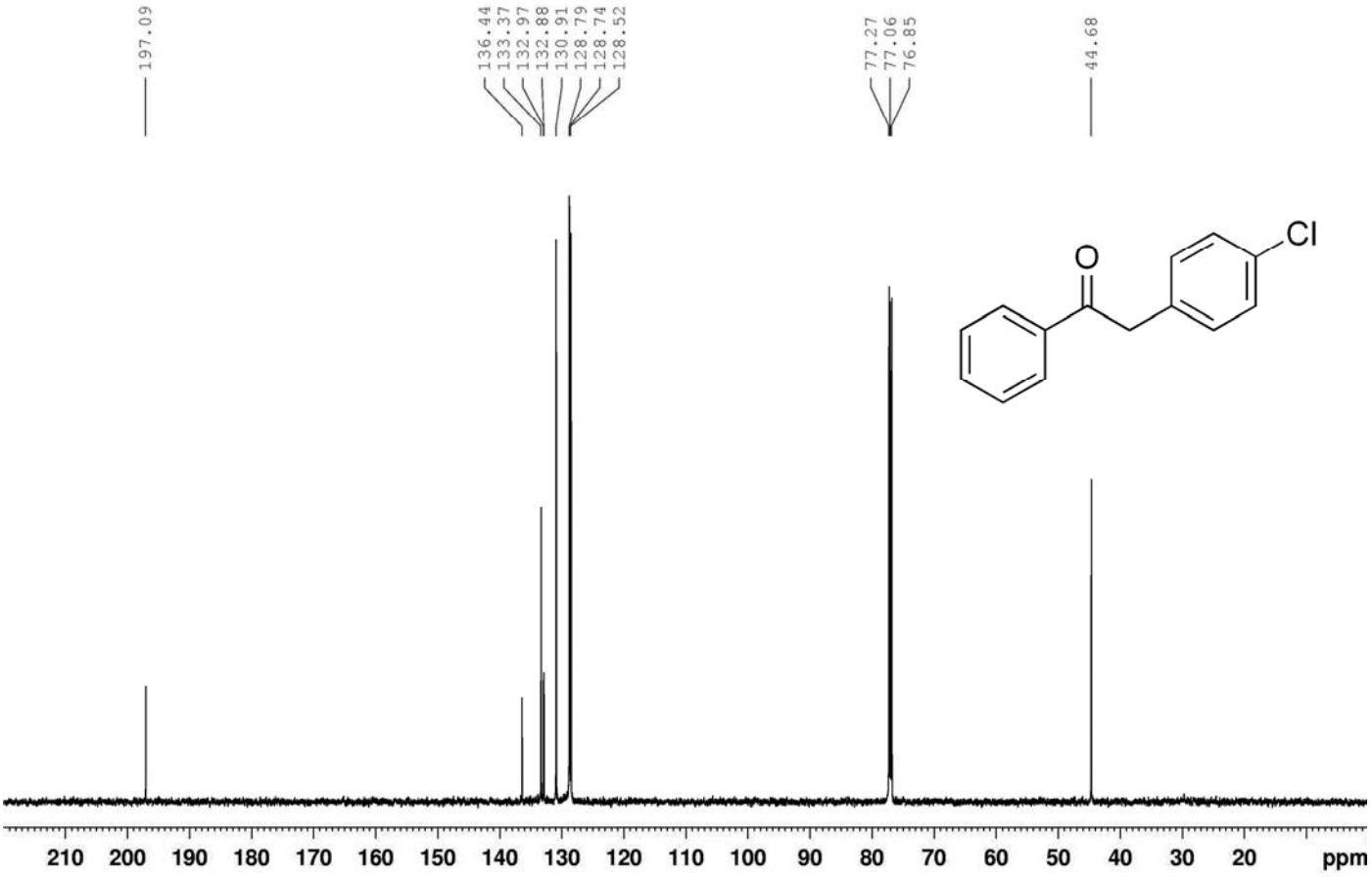
1,2-Diphenylethanone (3aa)



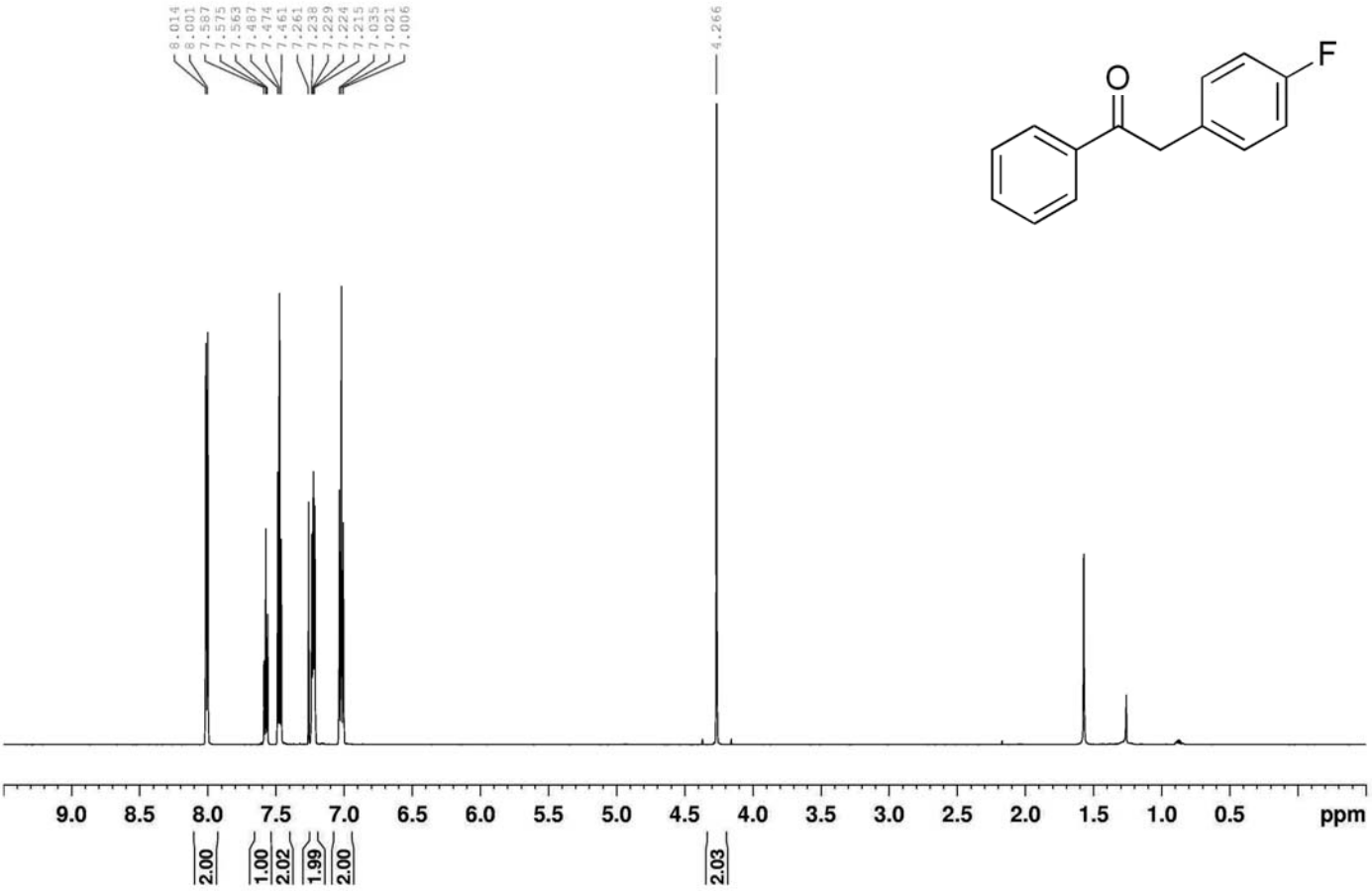


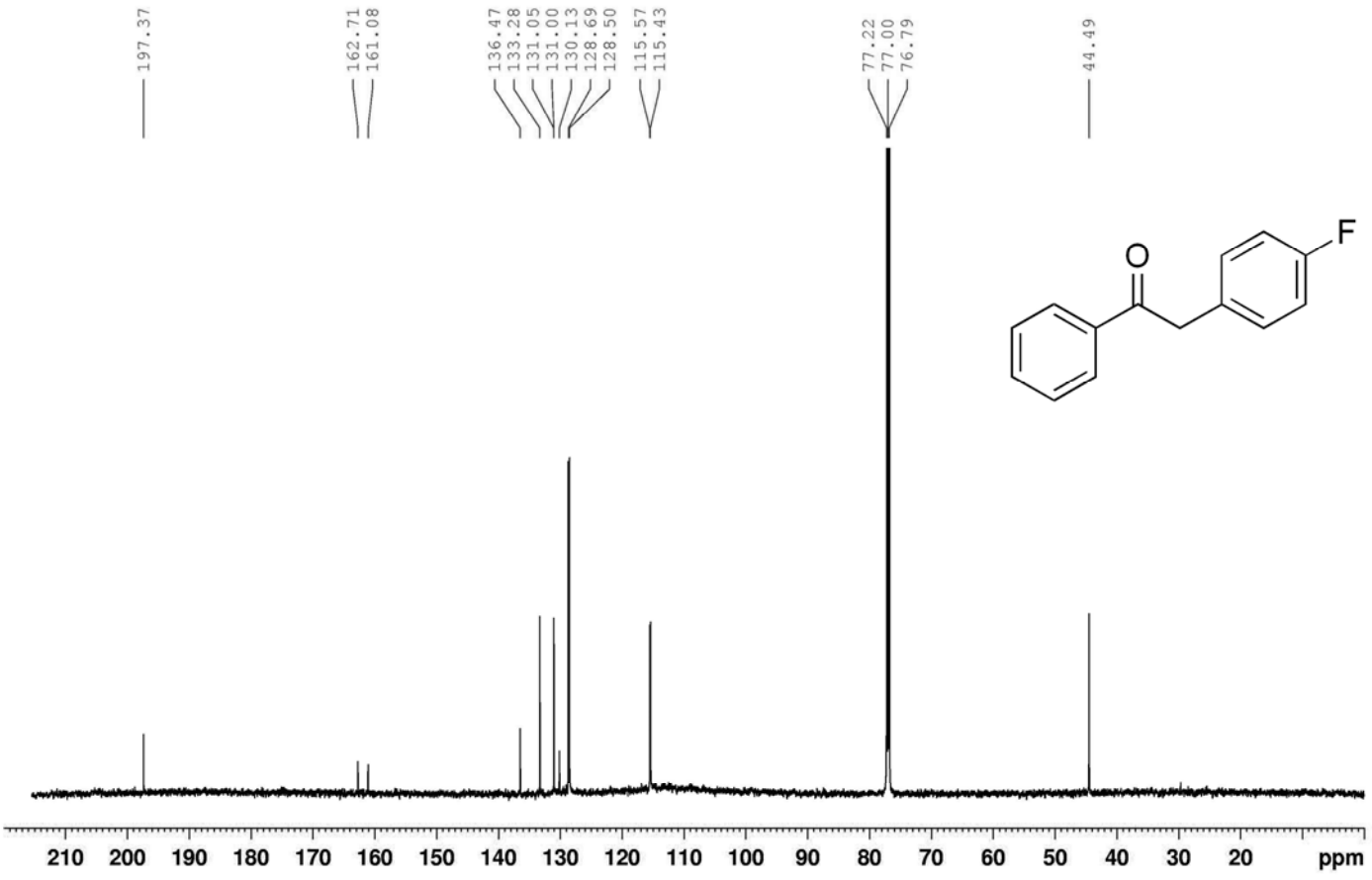
2-(4-Chlorophenyl)-1-phenylethanone (3ab)



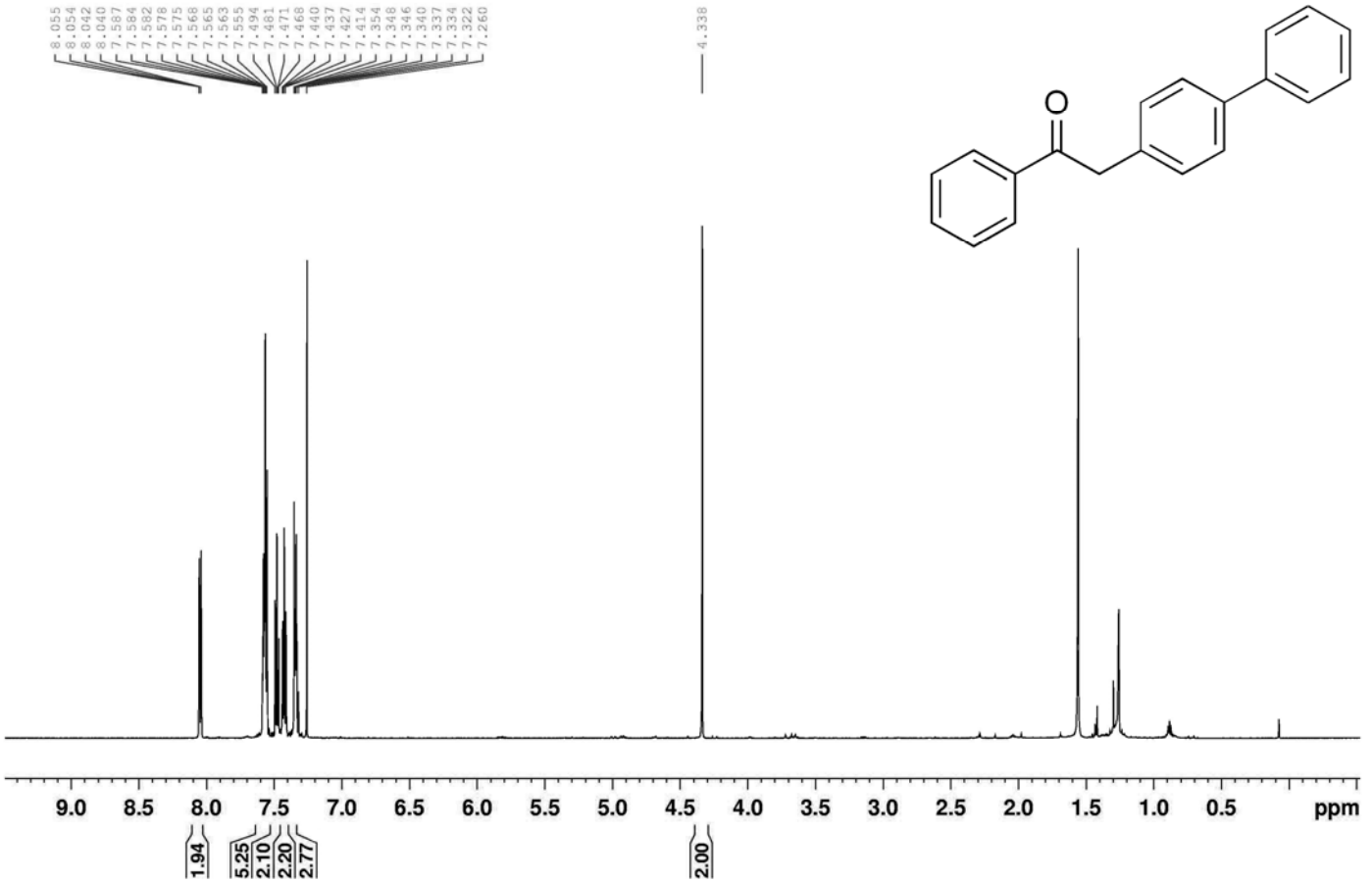


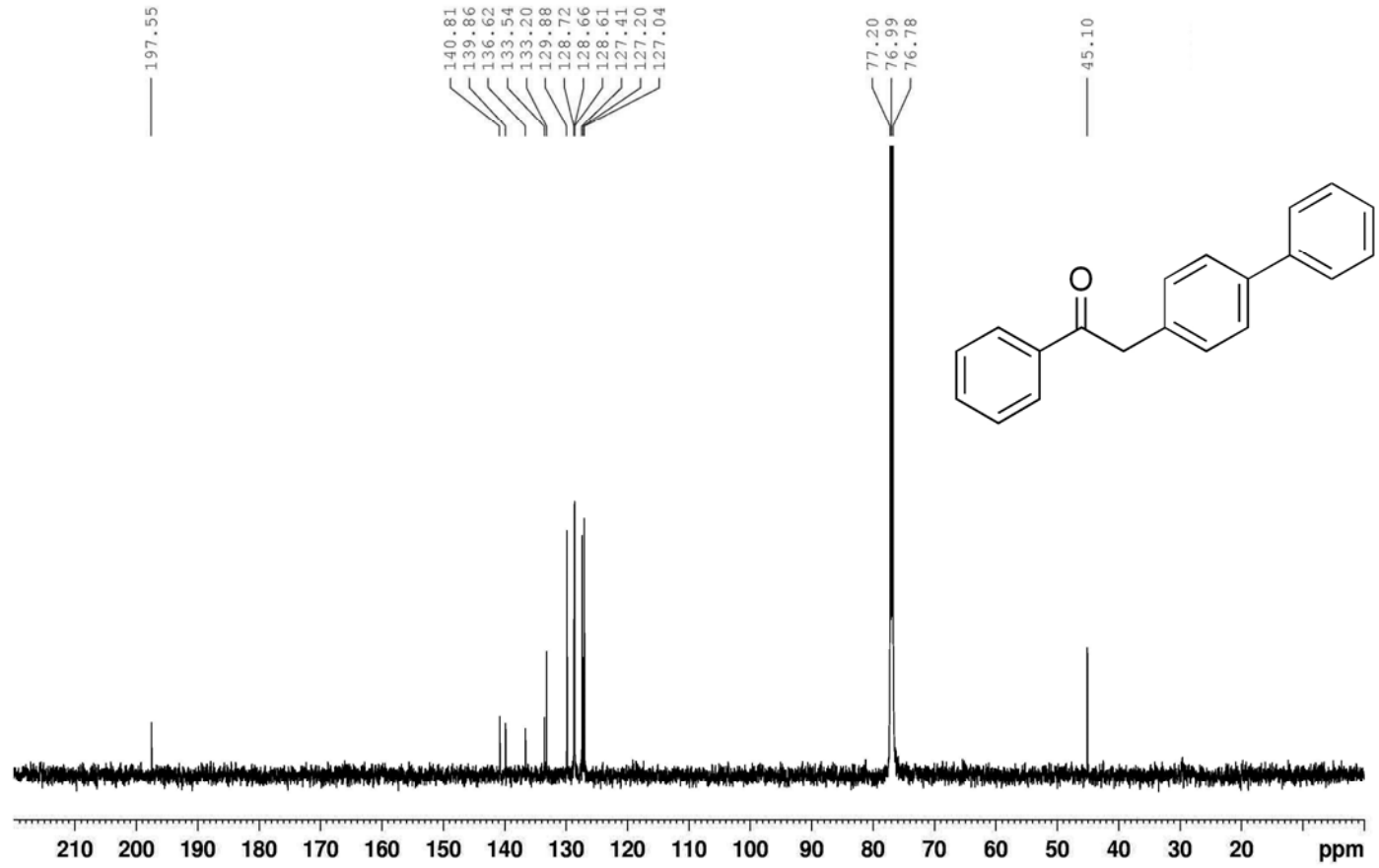
2-(4-fluorophenyl)-1-phenylethanone (3ac)



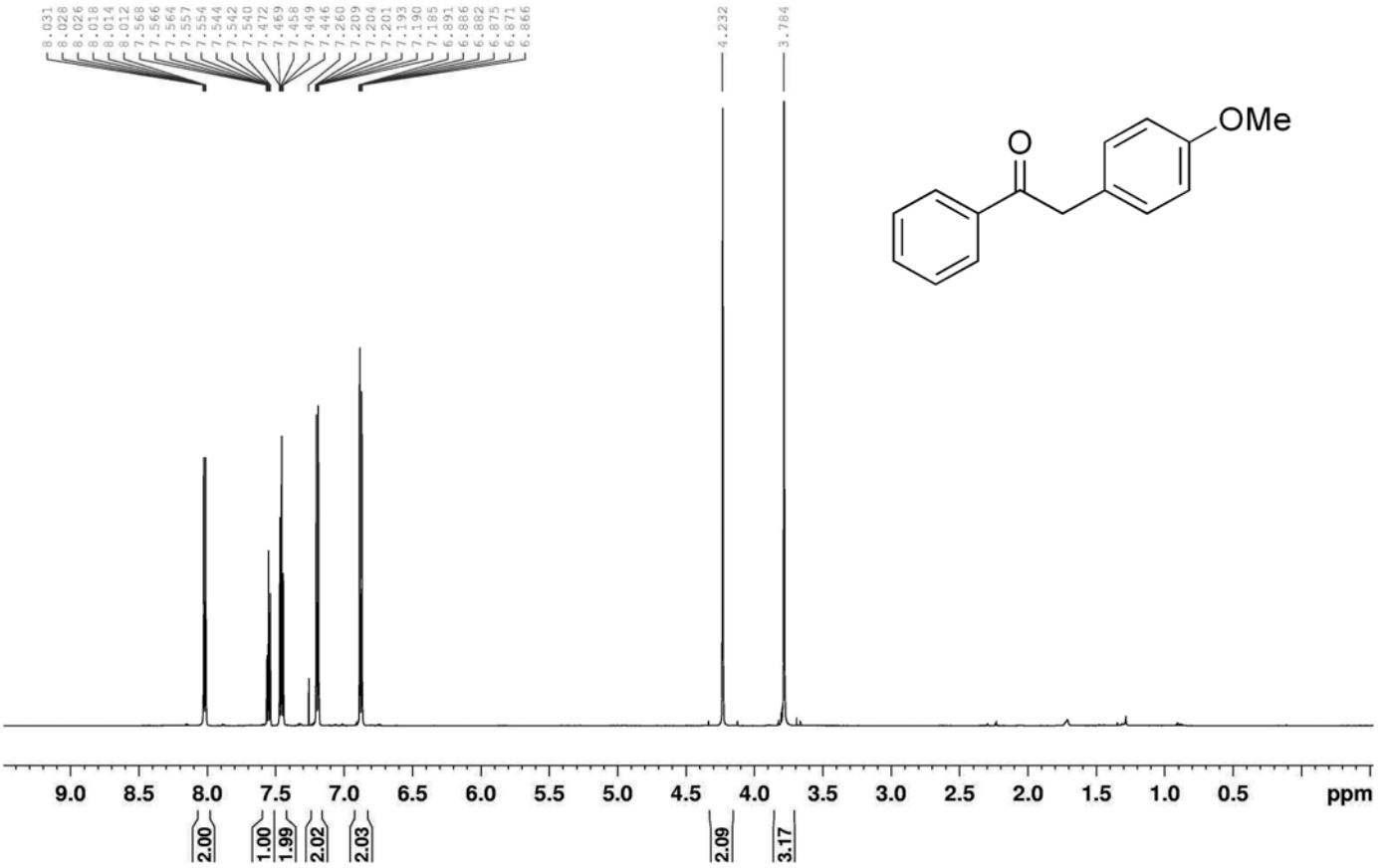


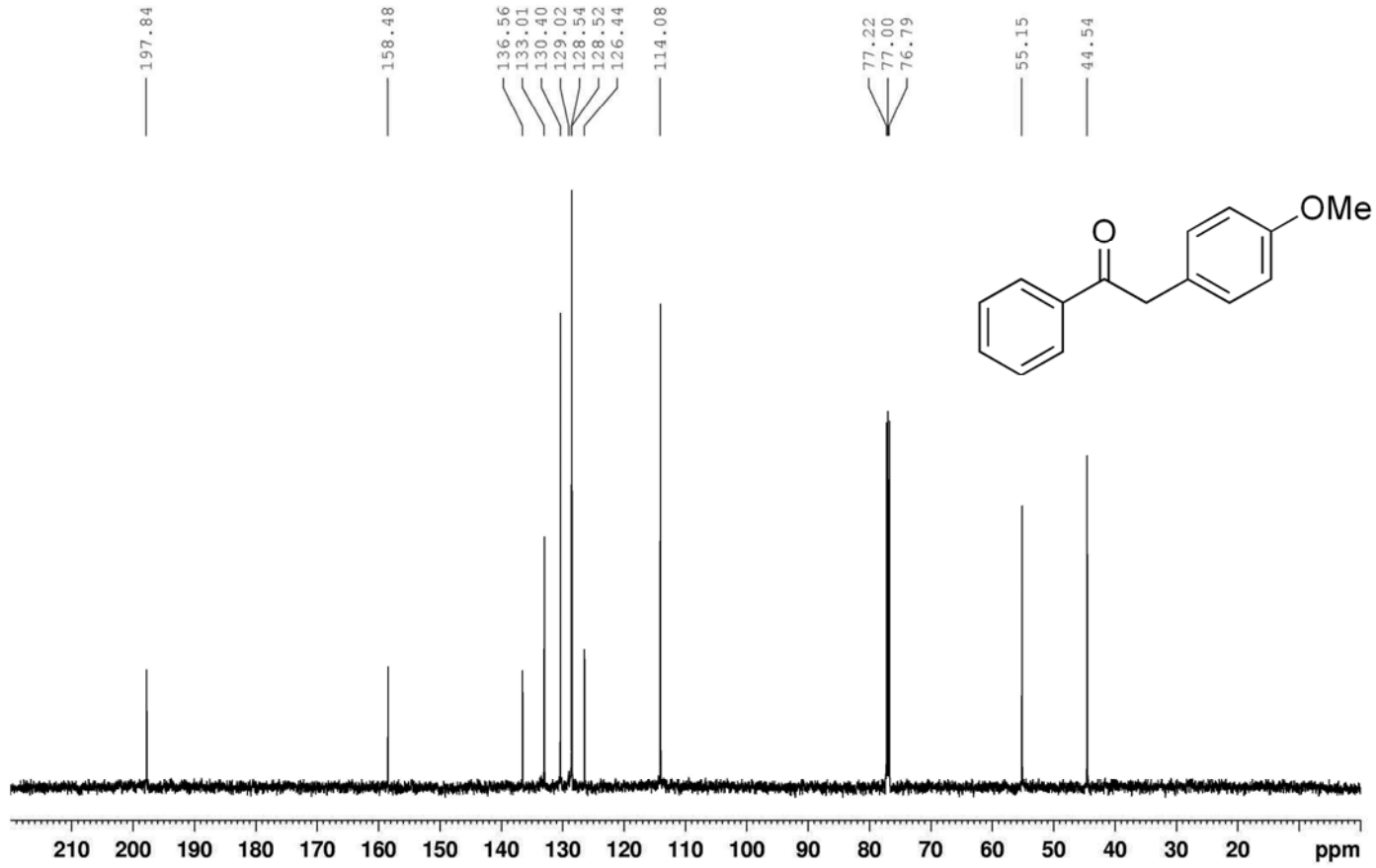
2-([1,1'-Biphenyl]-4-yl)-1-phenylethanone (3ad)



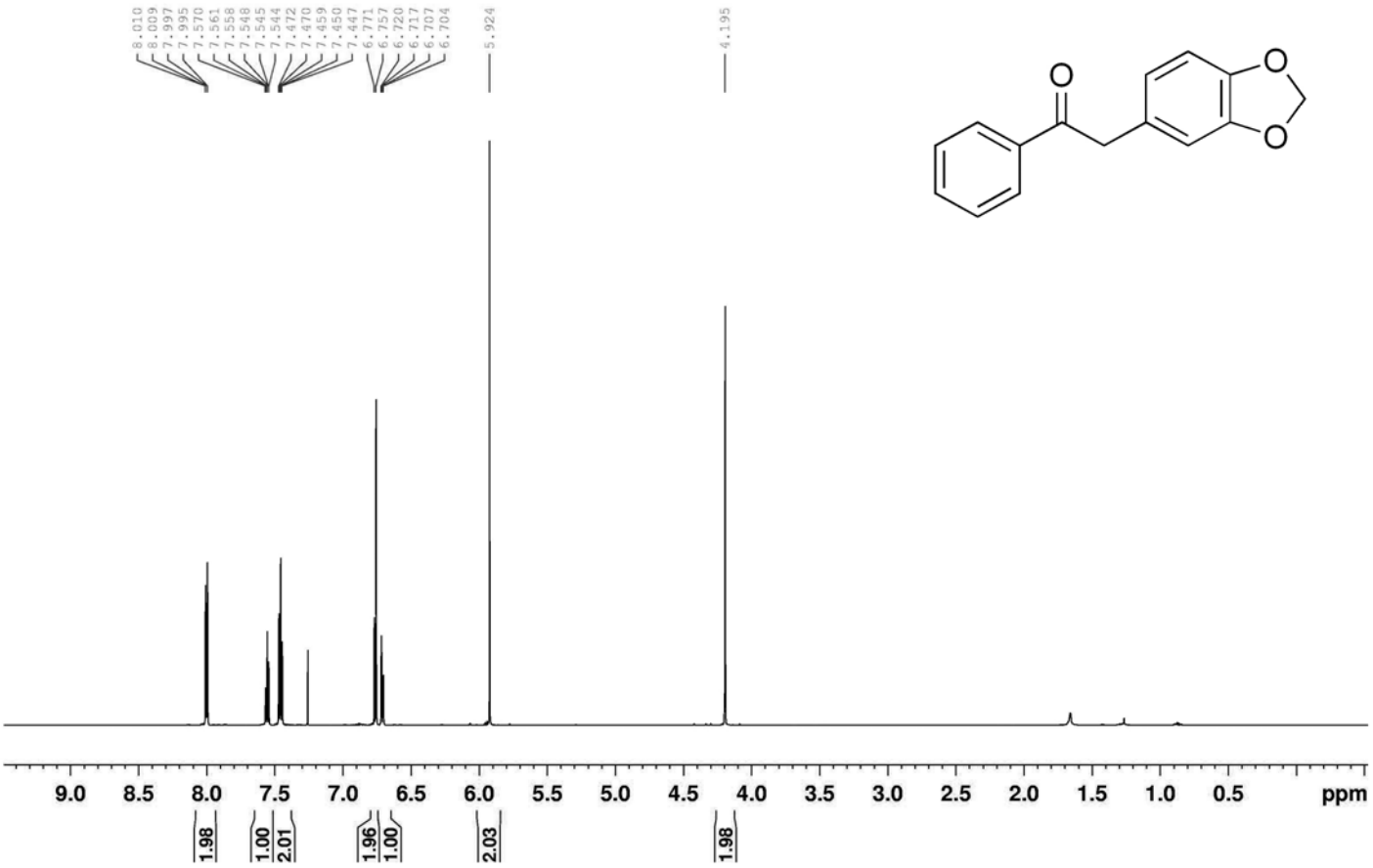


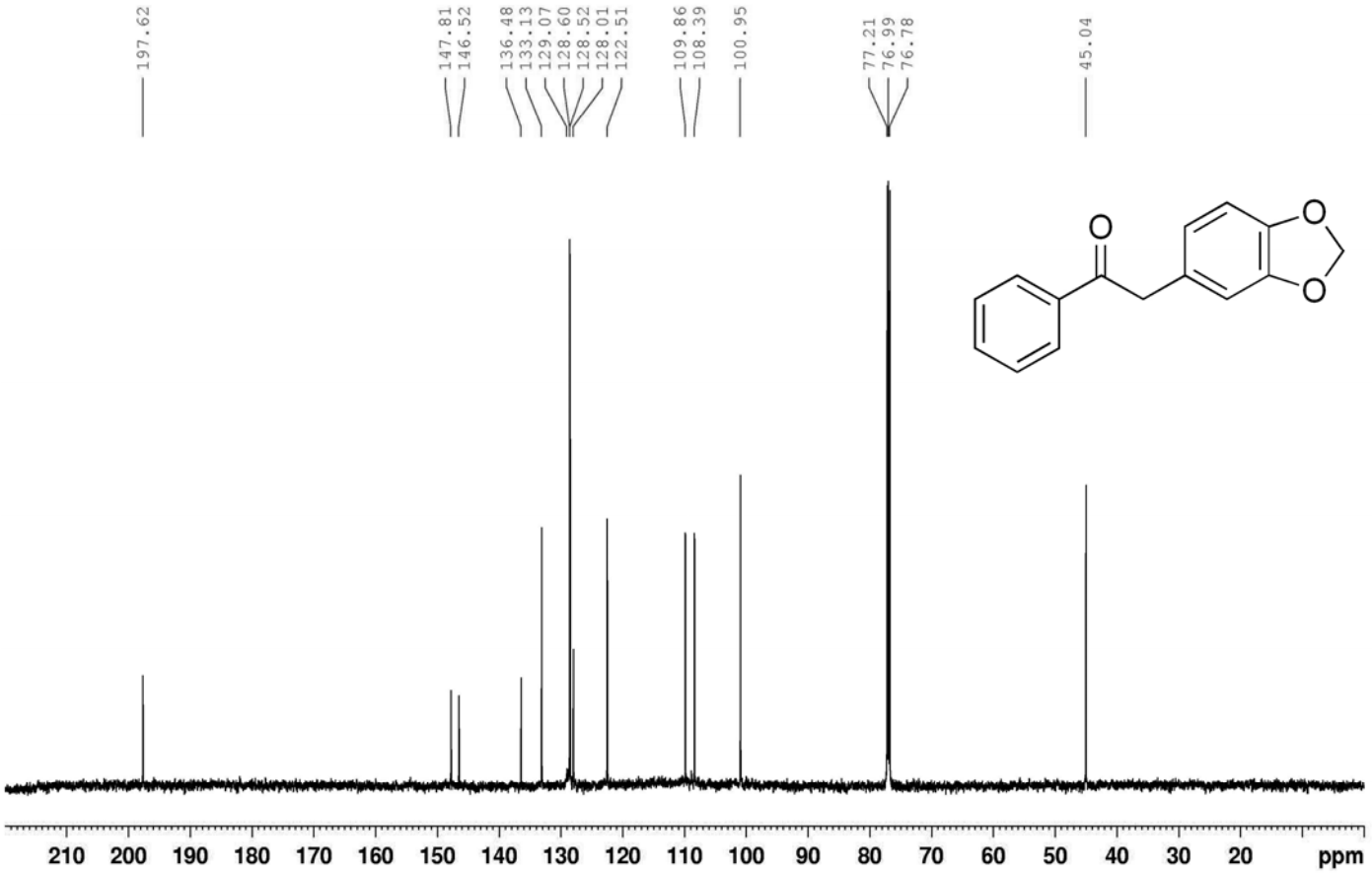
2-(4-Methoxyphenyl)-1-phenylethanone (3ae)



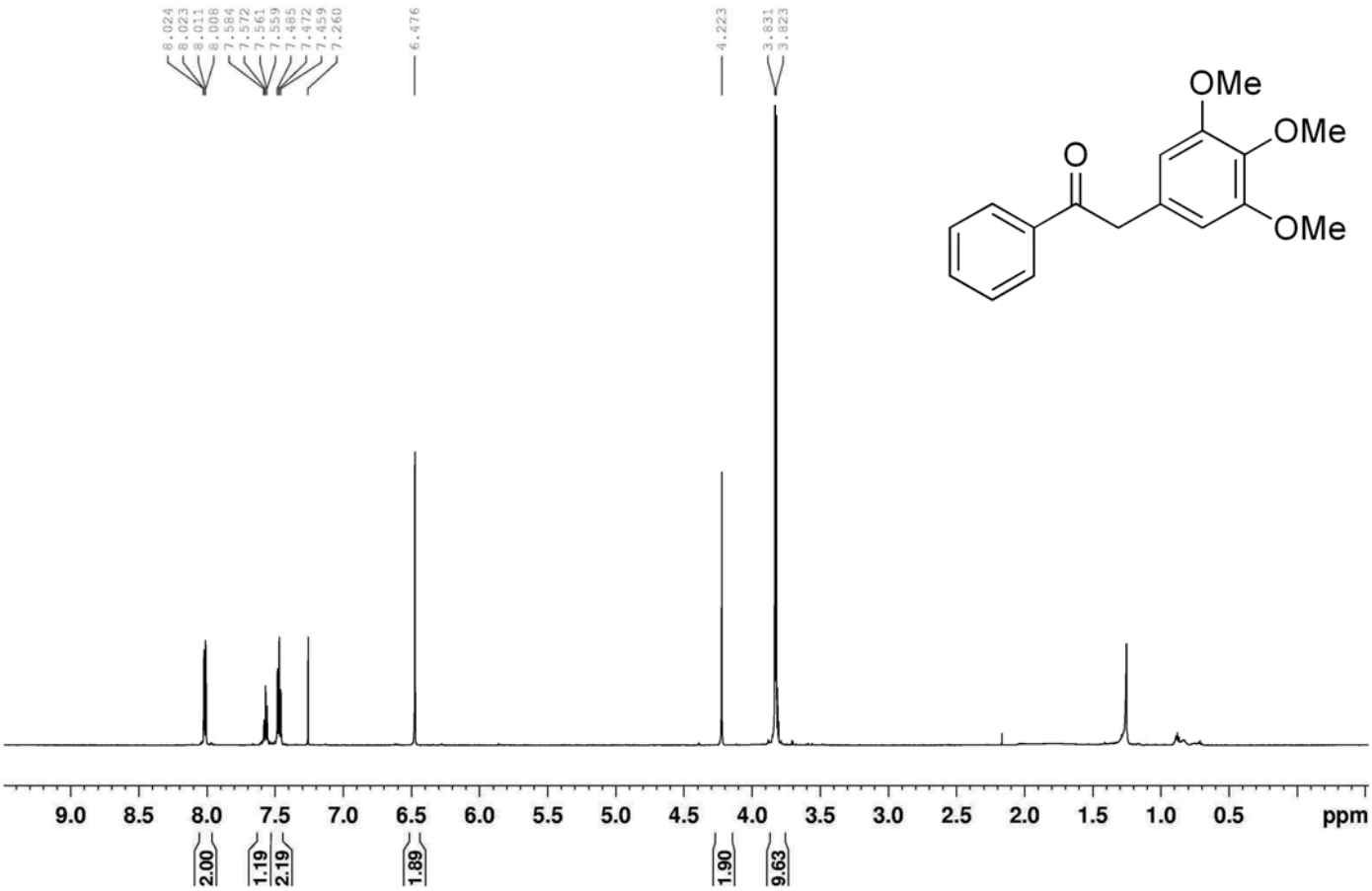


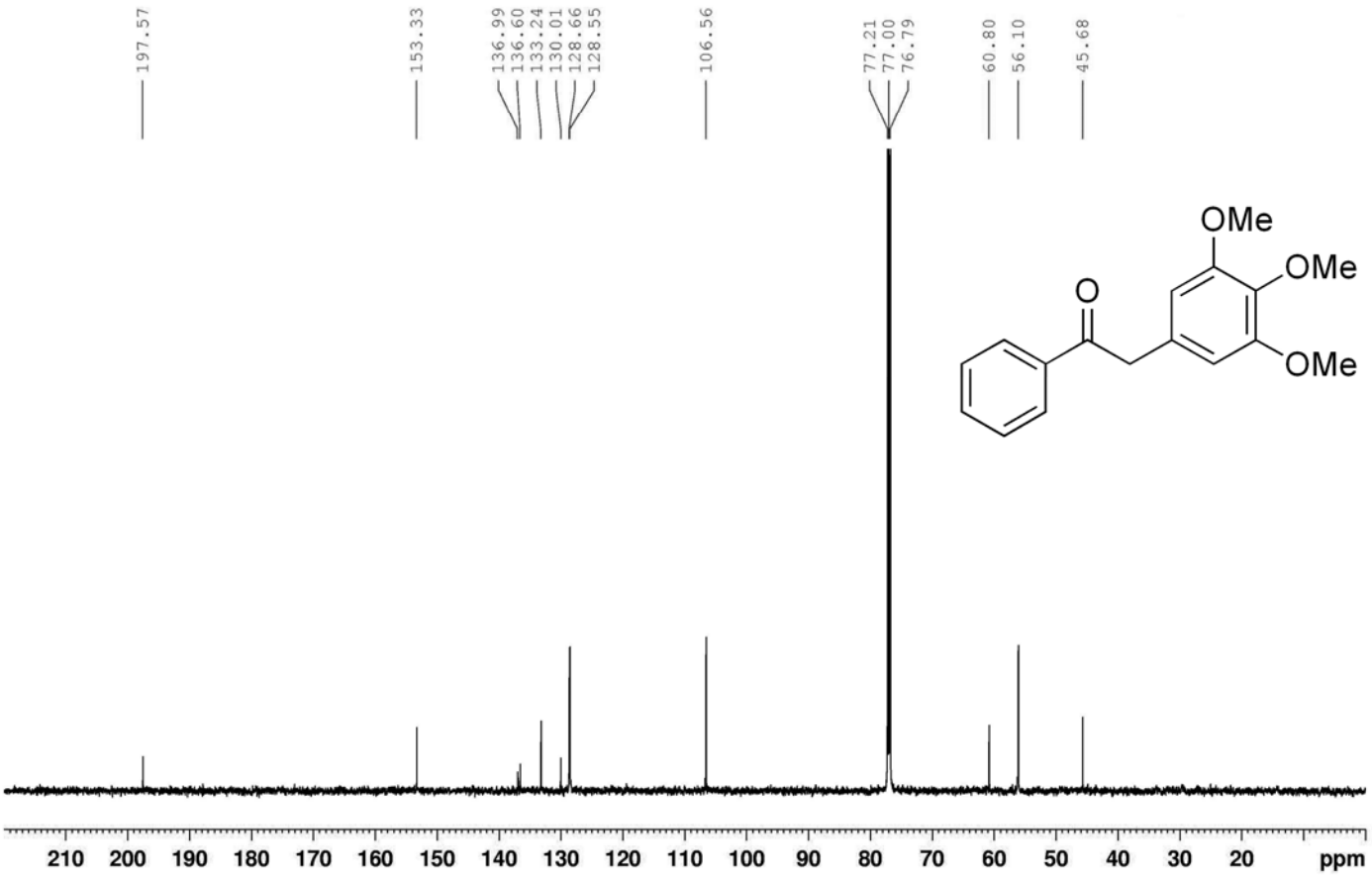
2-(Benzo[d][1,3]dioxol-5-yl)-1-phenylethanone (3af)



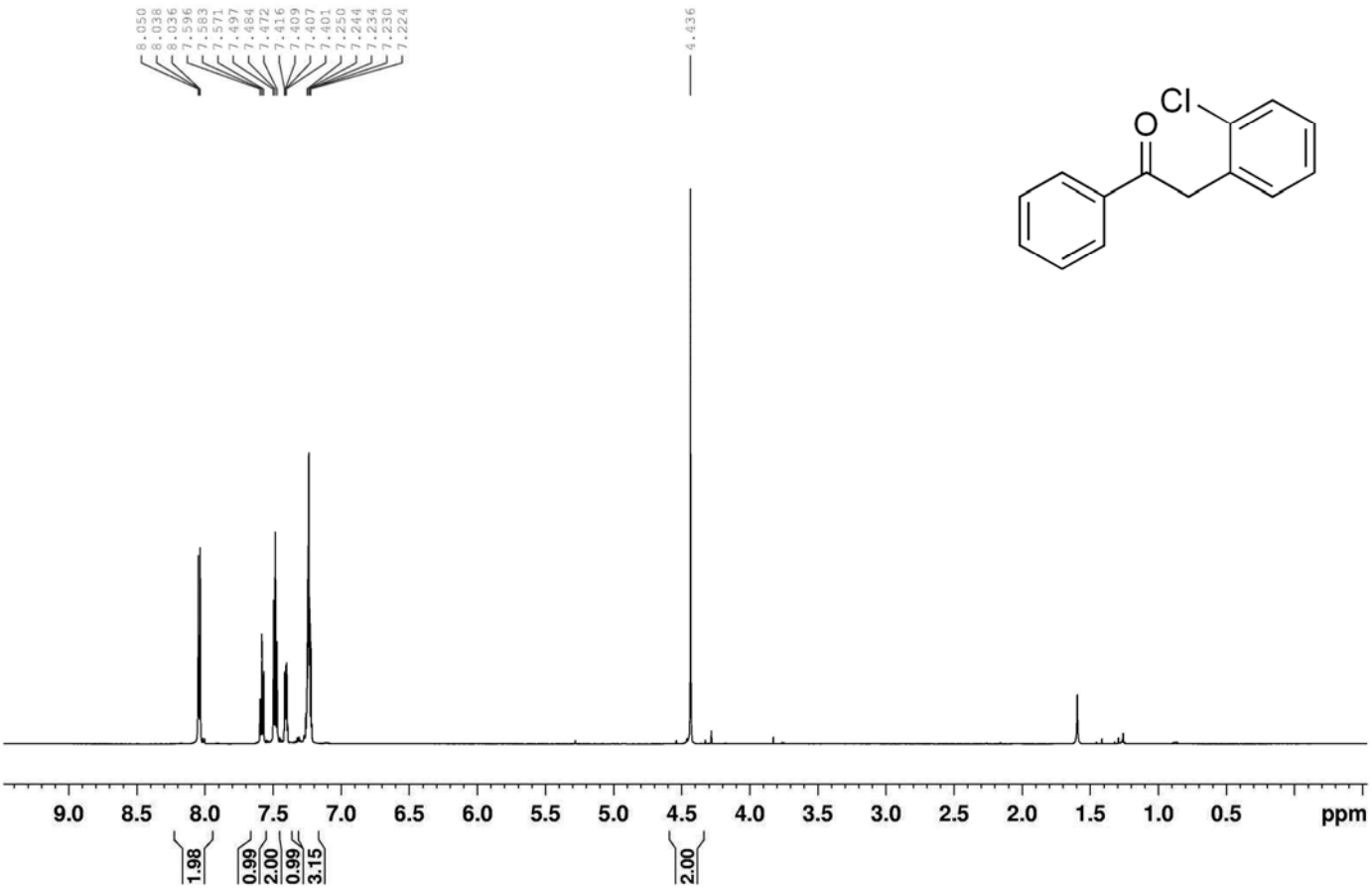


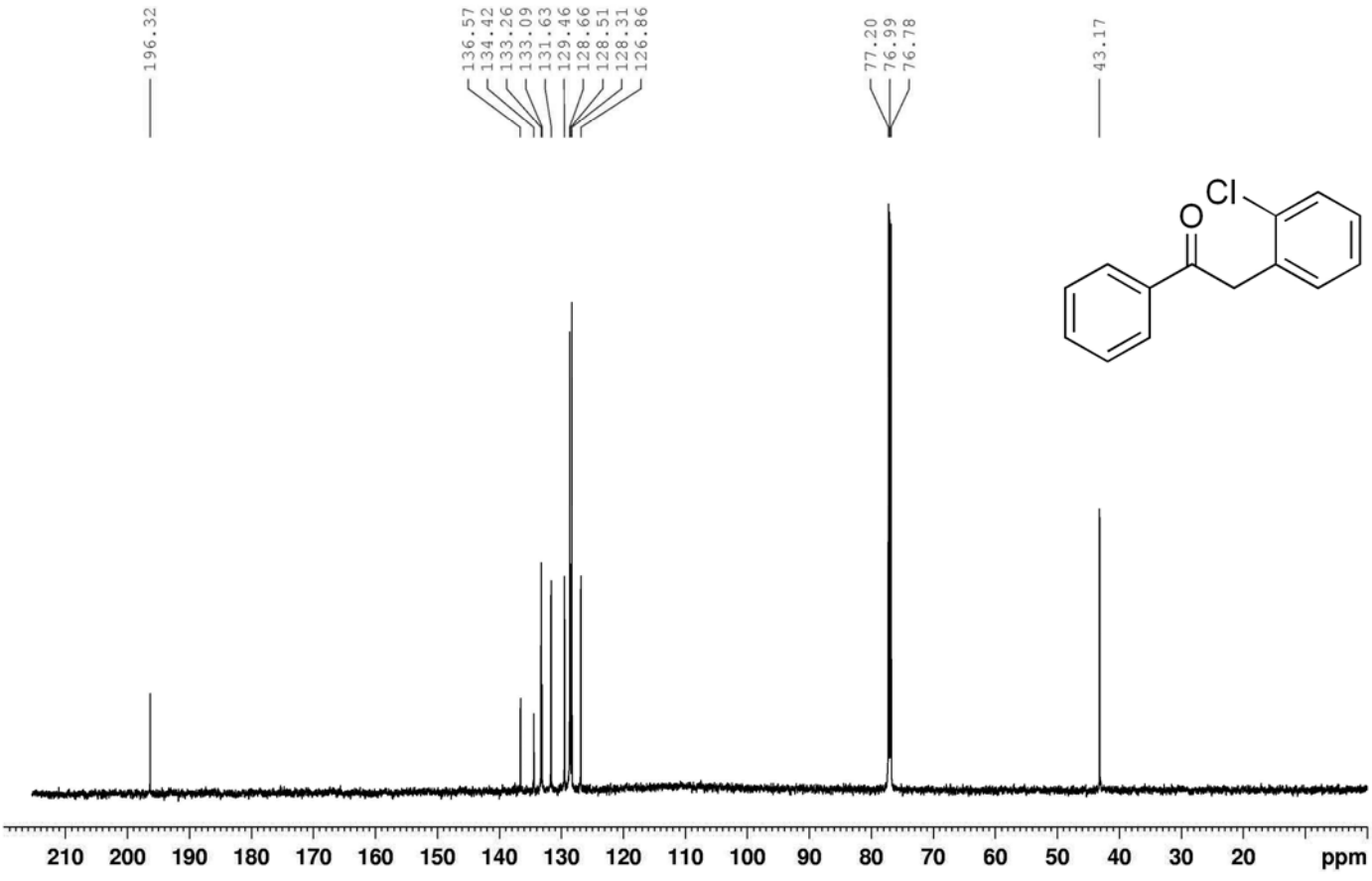
1-Phenyl-2-(3,4,5-trimethoxyphenyl)ethanone (3ag)



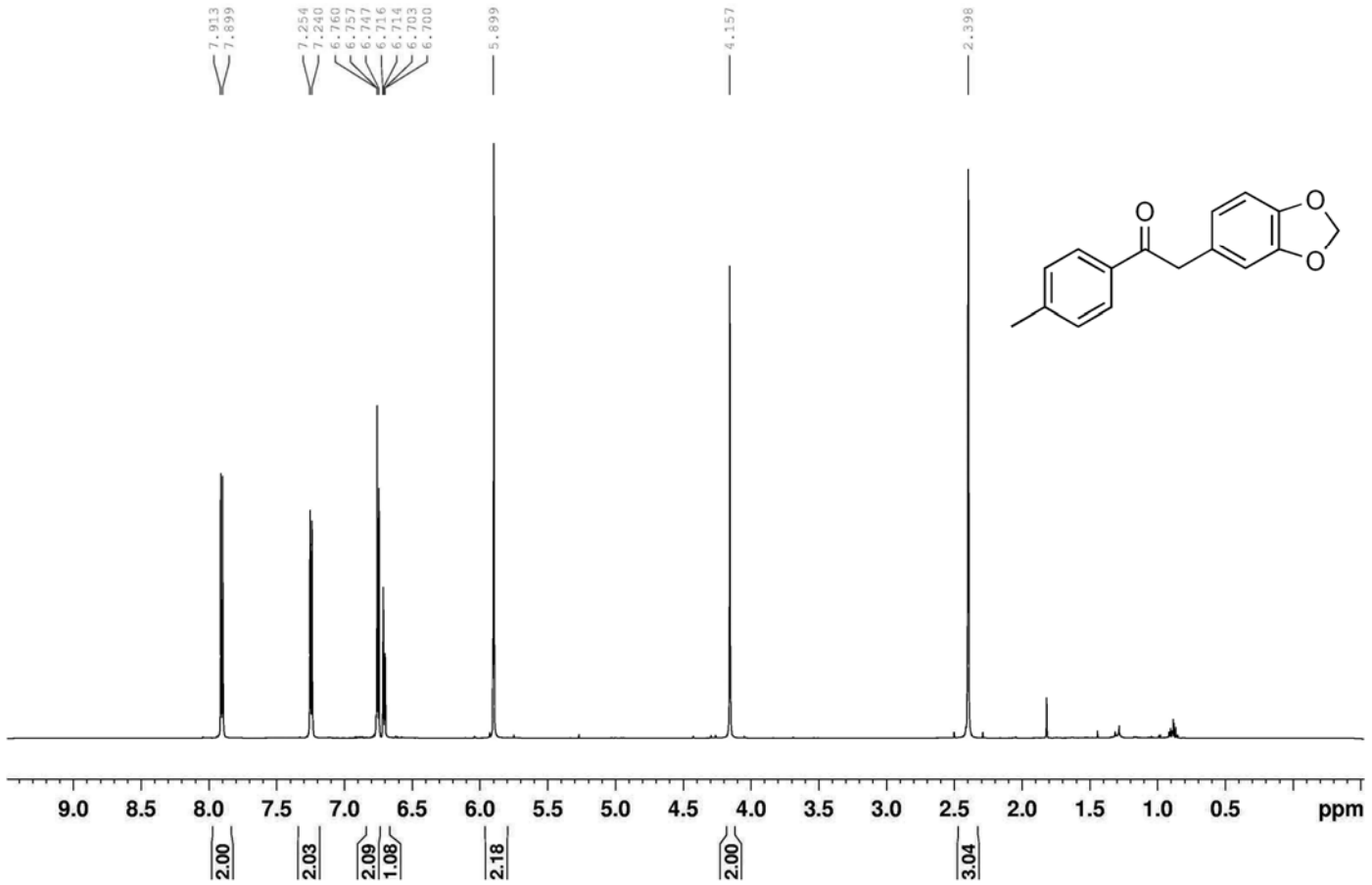


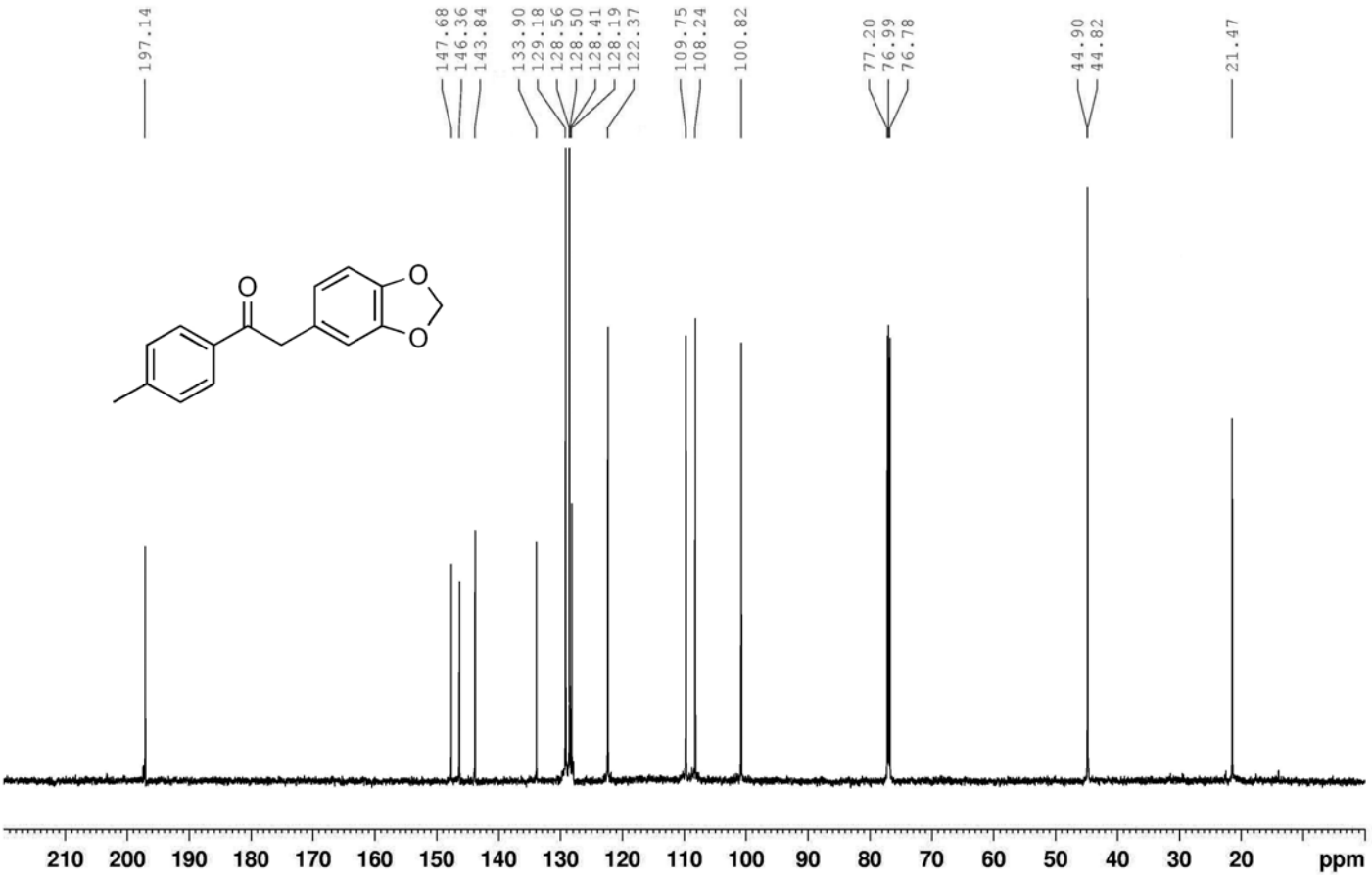
2-(2-Chlorophenyl)-1-phenylethanone (3ah)



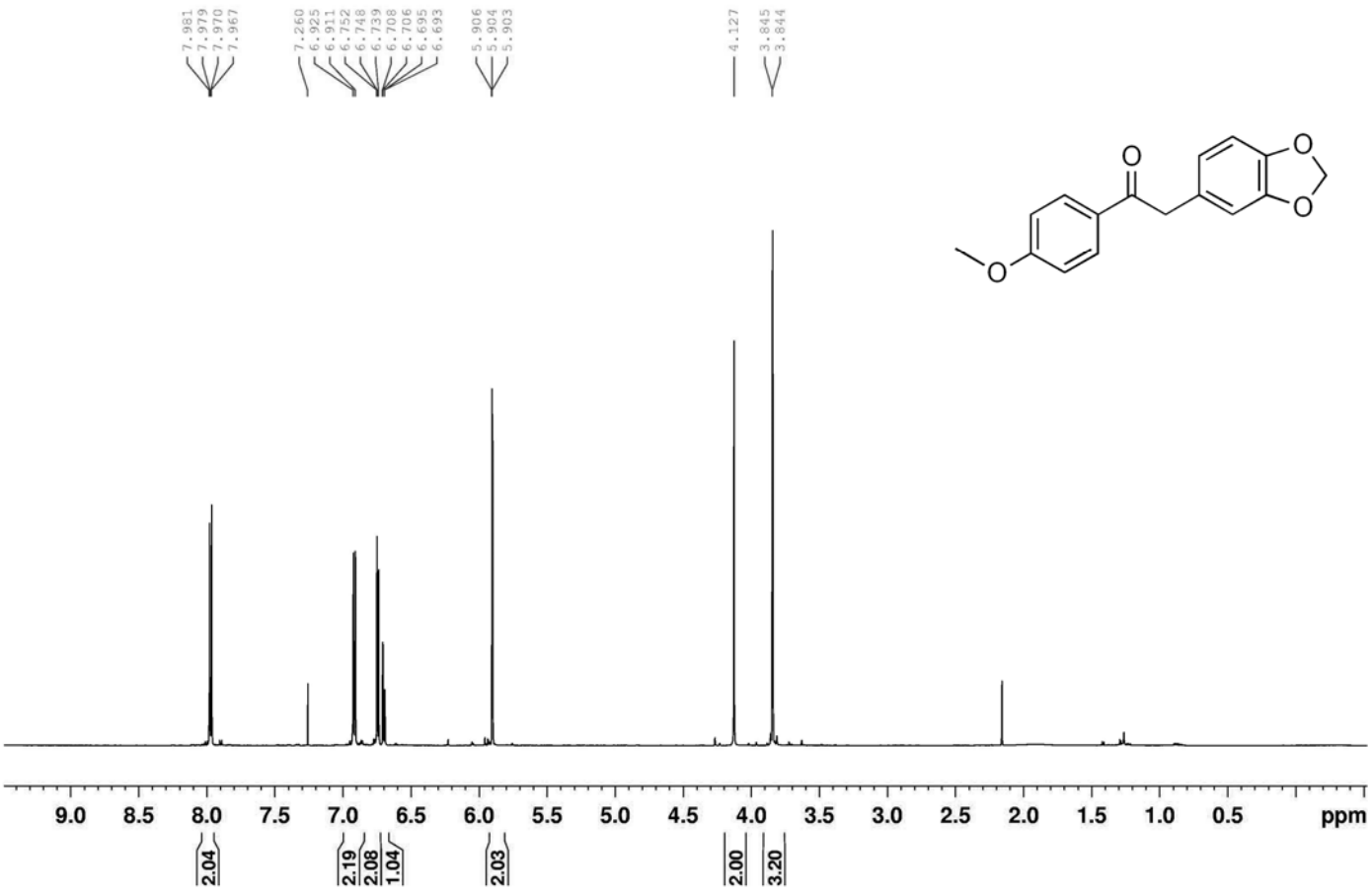


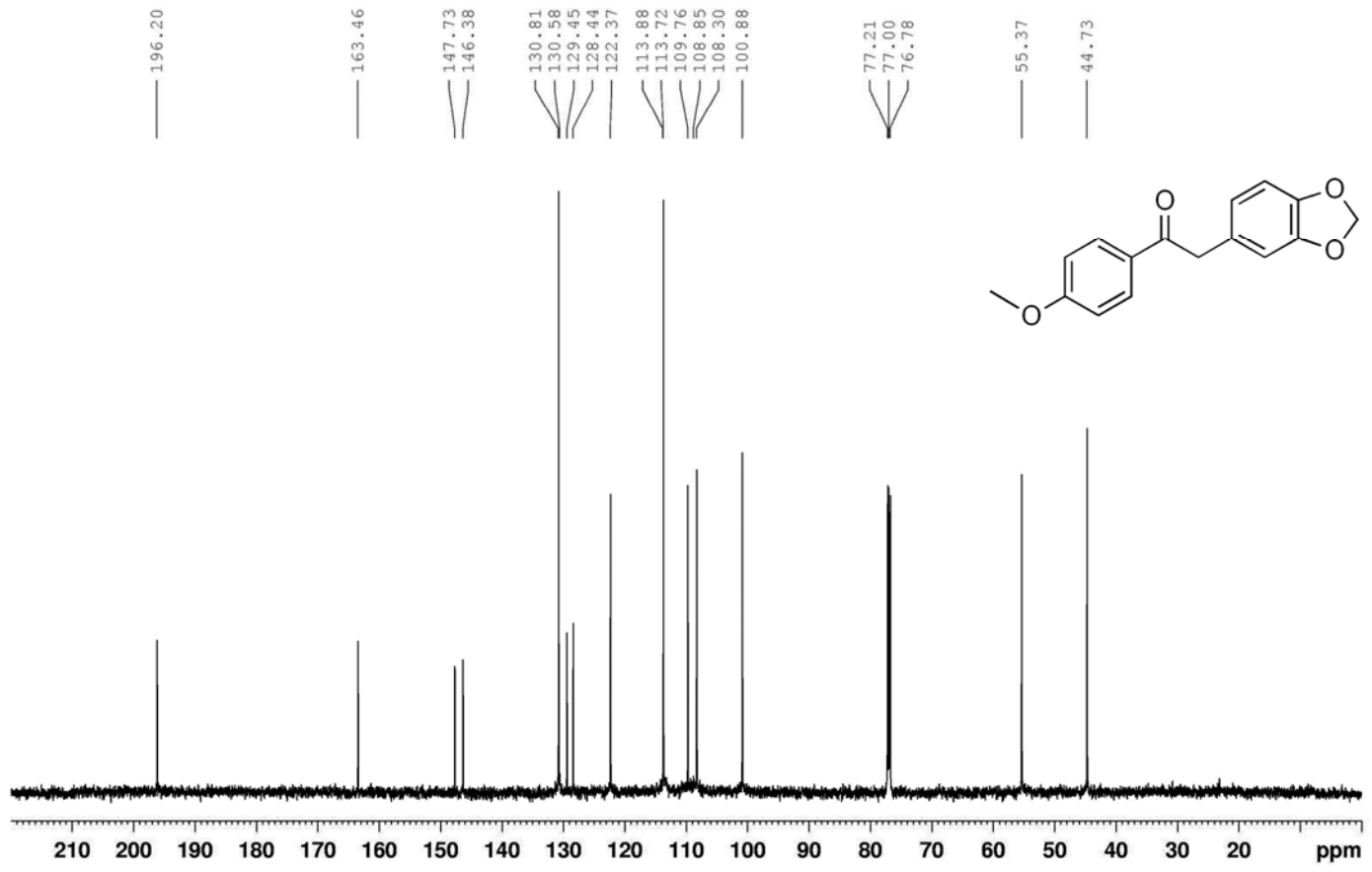
2-(Benzo[d][1,3]dioxol-5-yl)-1-(p-tolyl)ethanone (3bf)



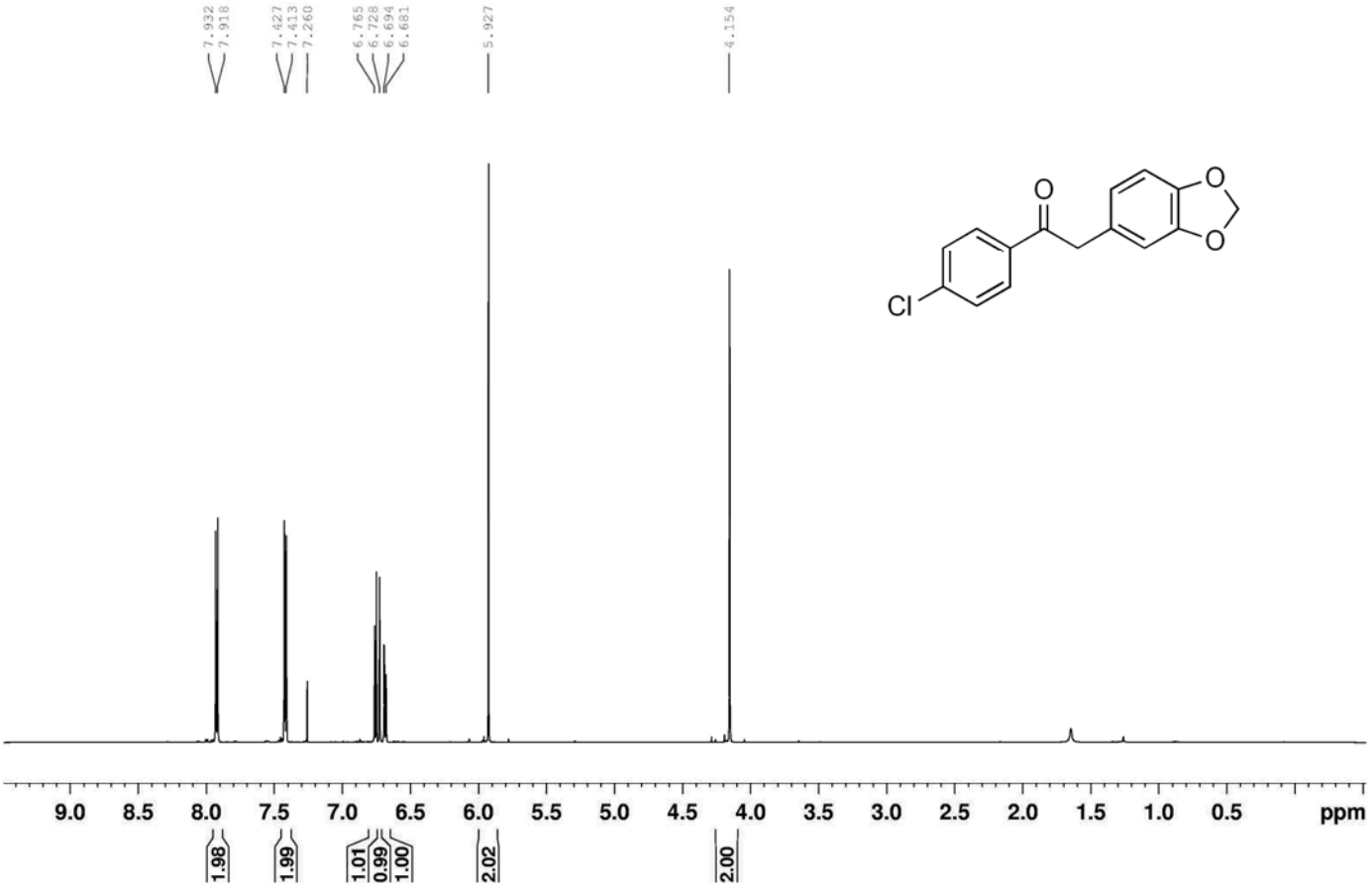


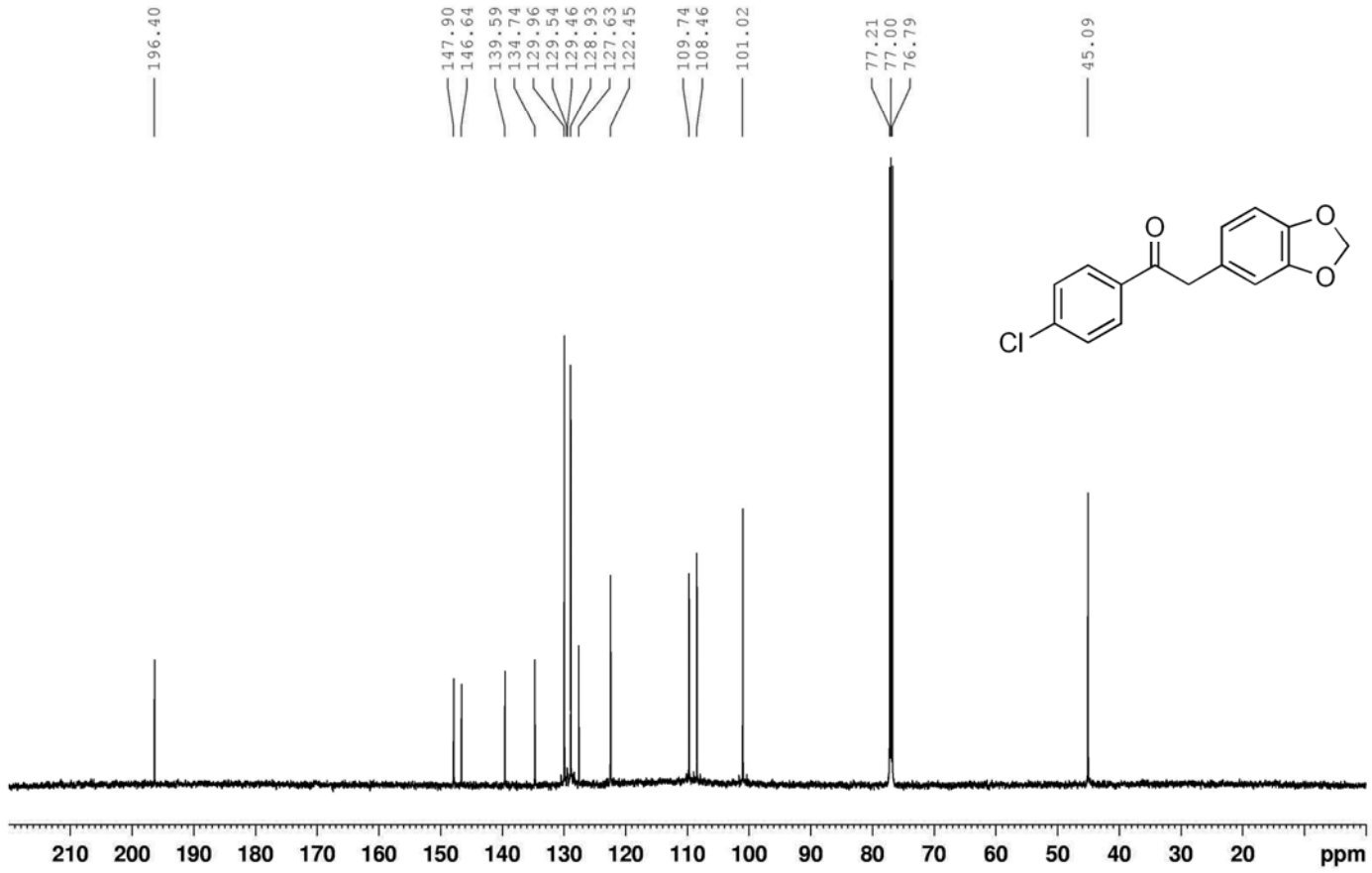
2-(Benzo[d][1,3]dioxol-5-yl)-1-(4-methoxyphenyl)ethanone (3cf)



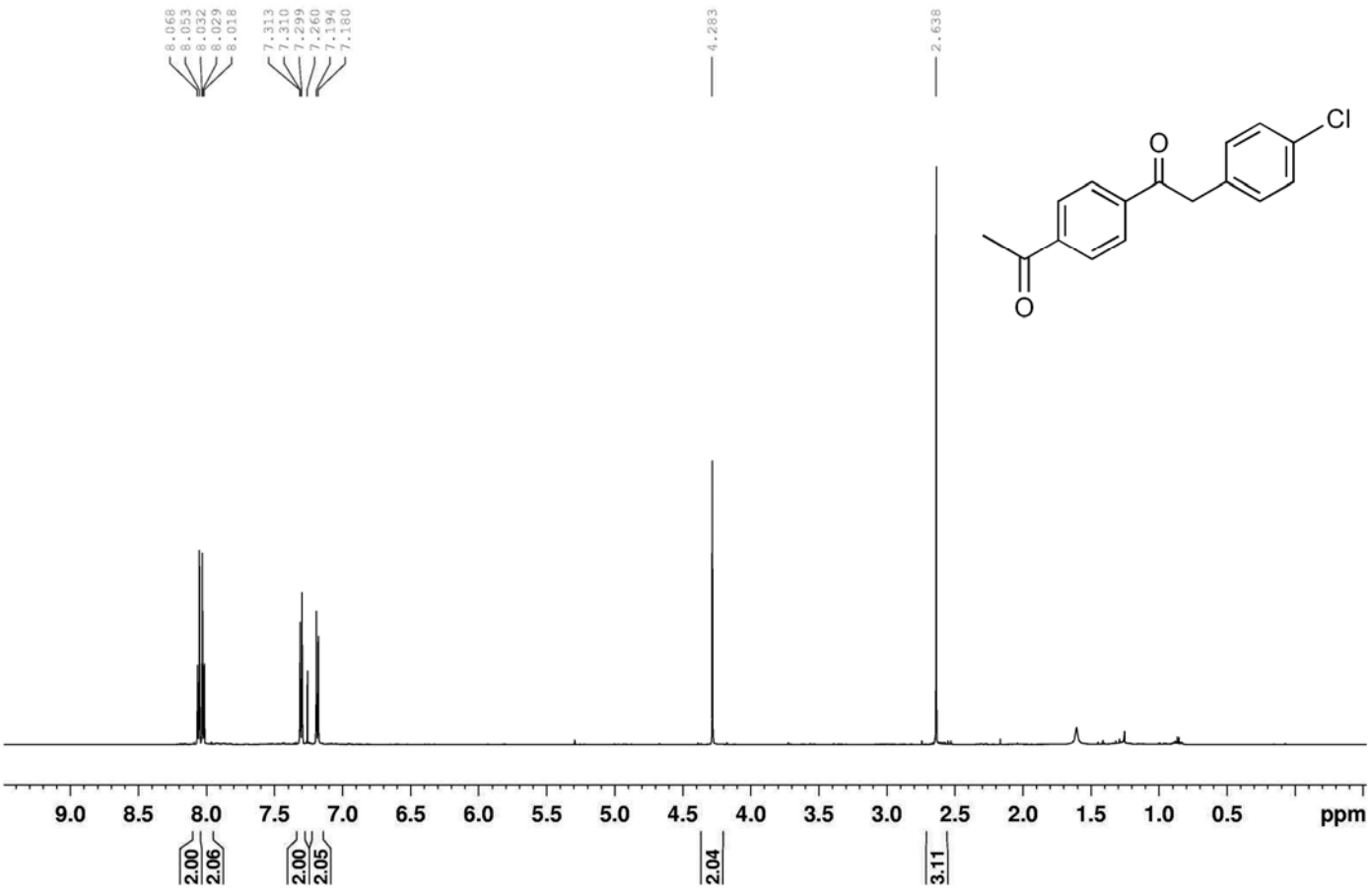


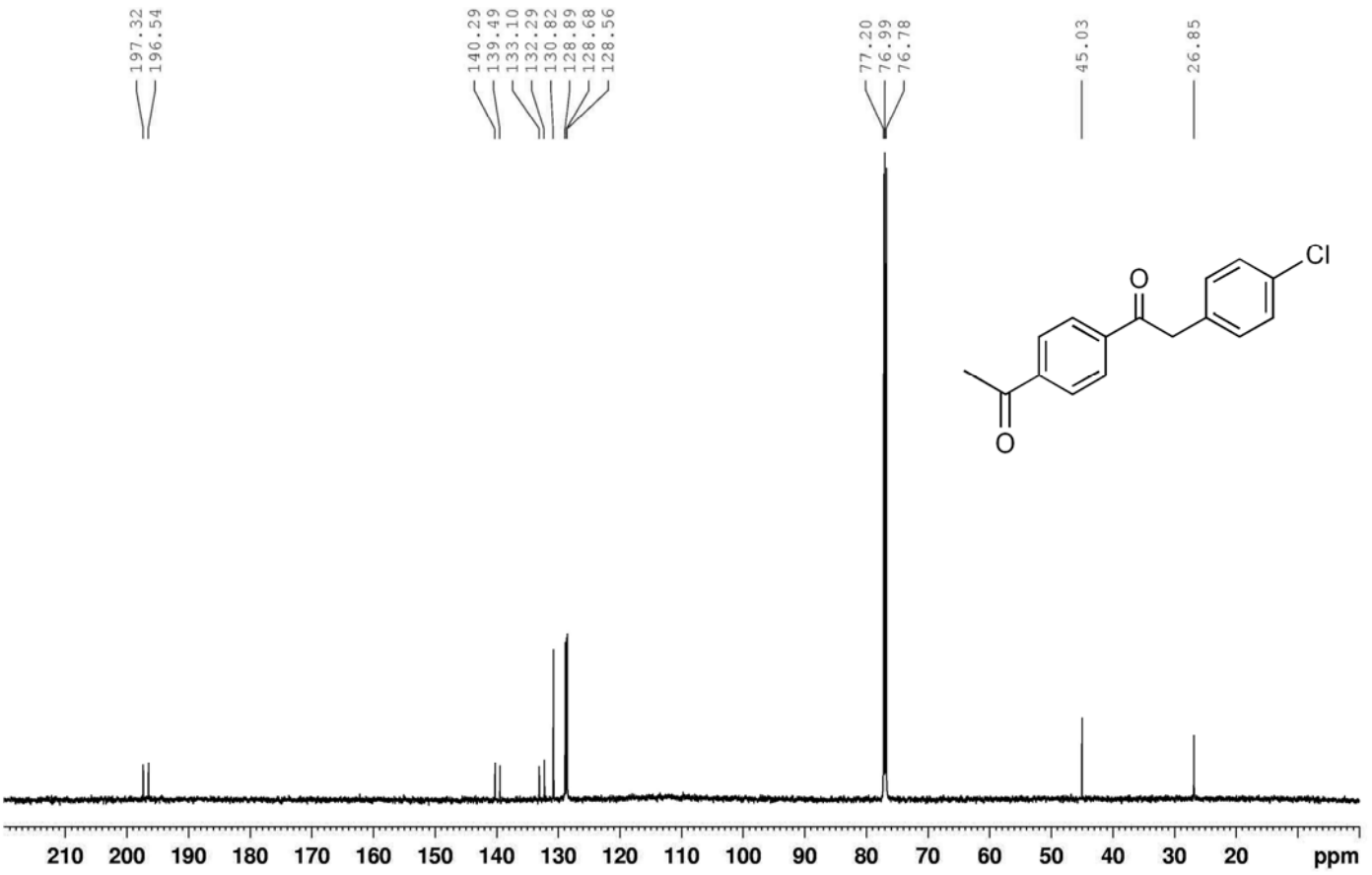
2-(Benzo[d][1,3]dioxol-5-yl)-1-(4-chlorophenyl)ethanone (3df)



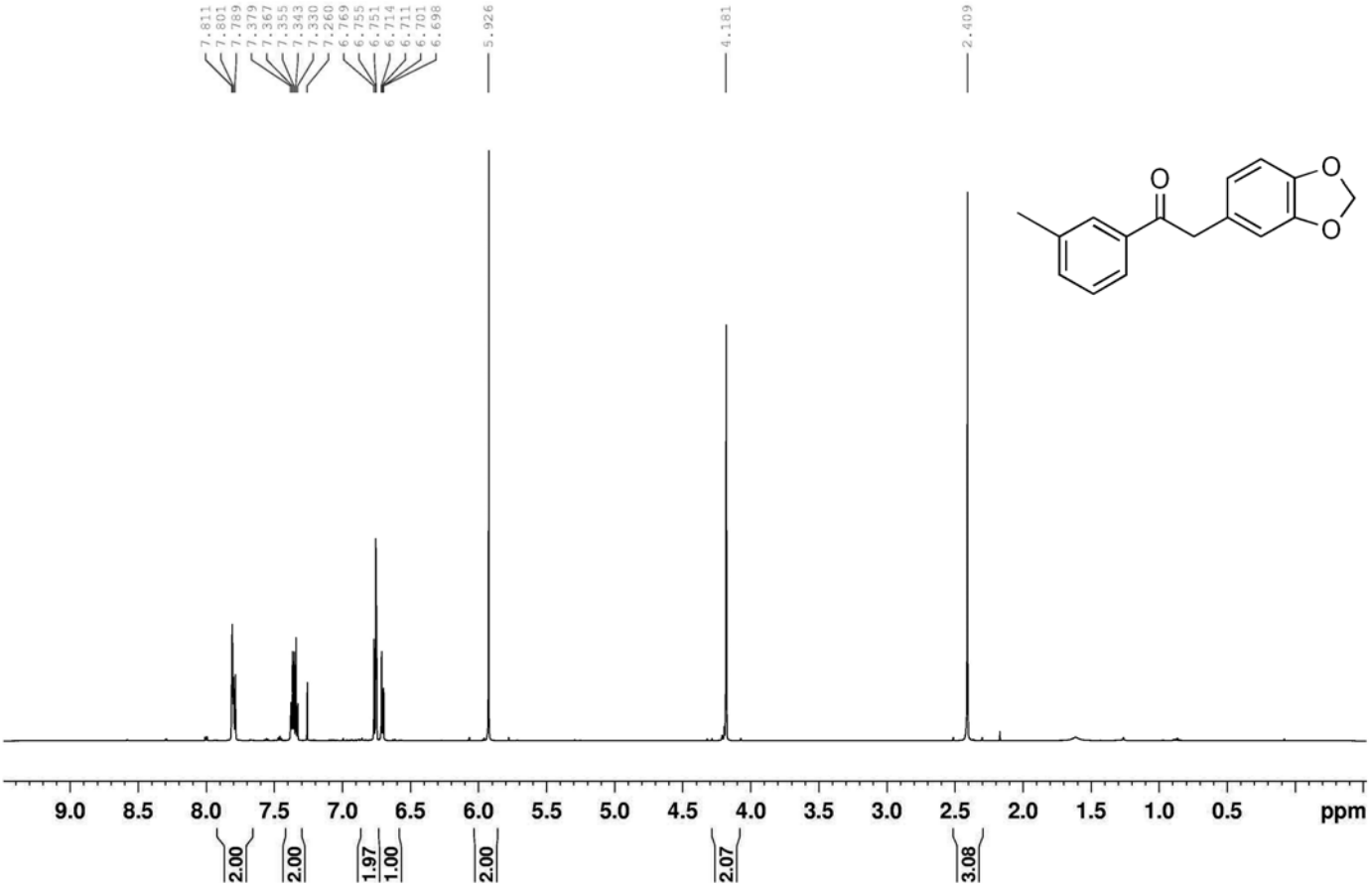


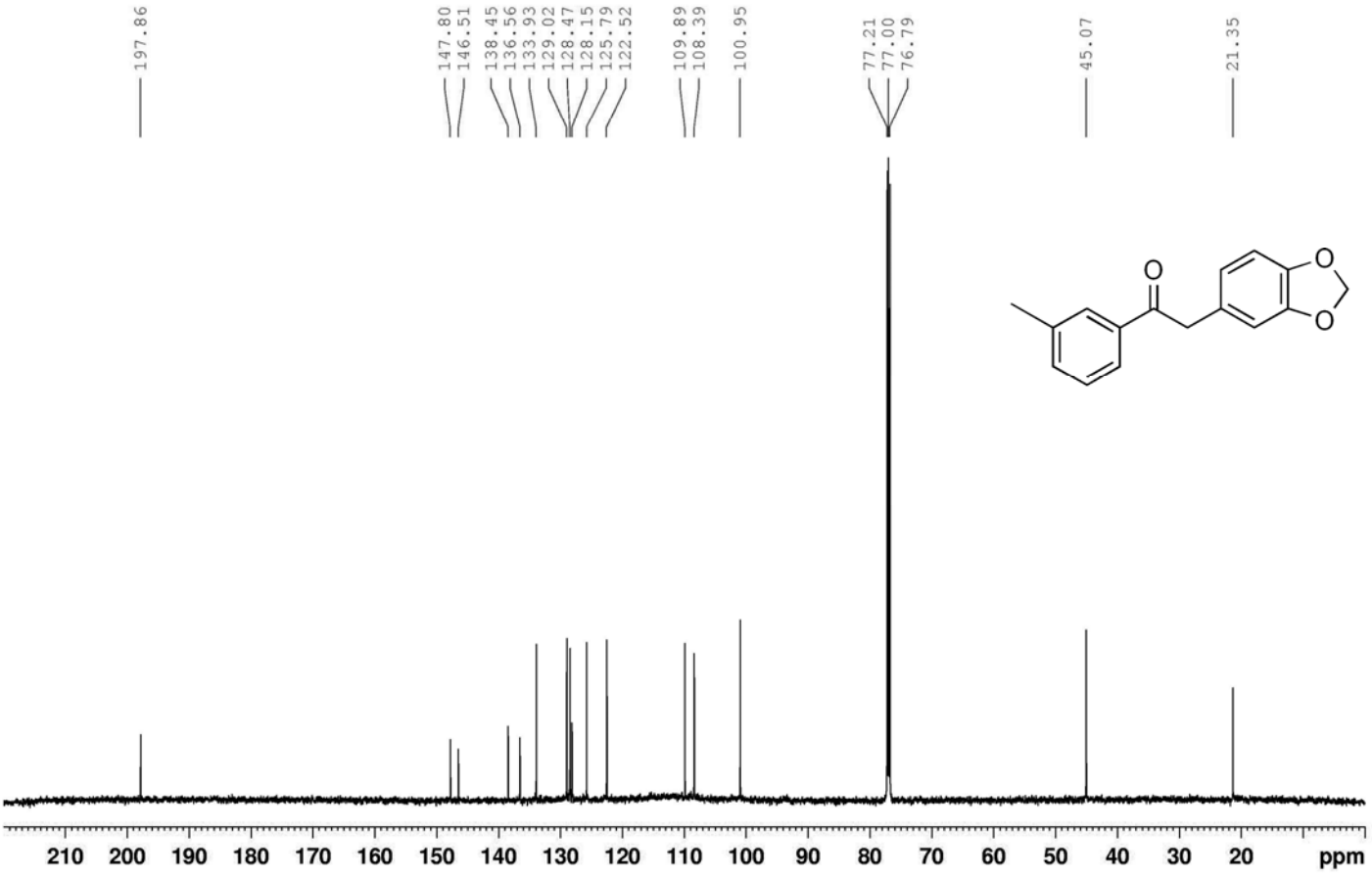
1-(4-Acetylphenyl)-2-(4-chlorophenyl)ethanone (3eb)



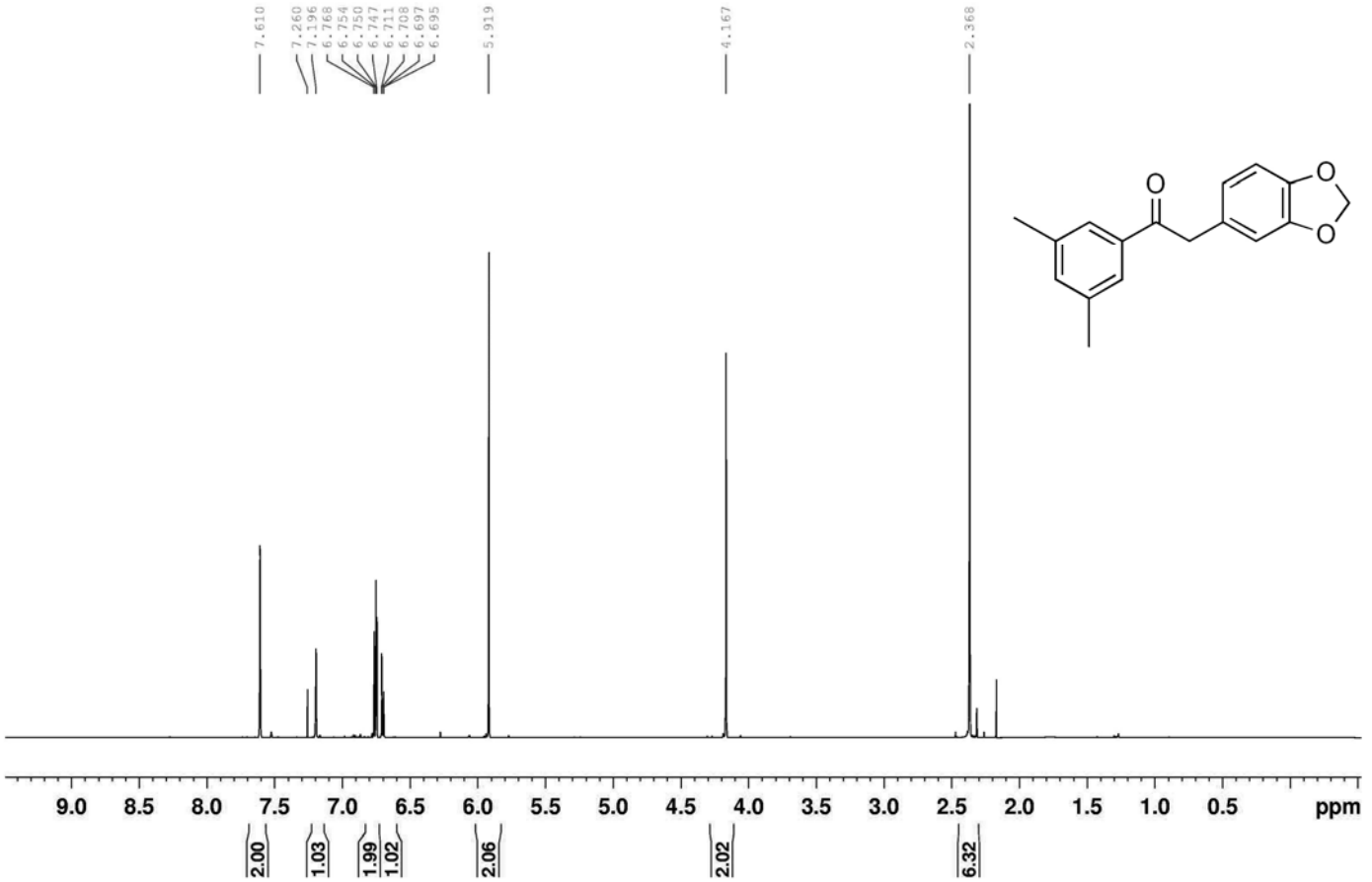


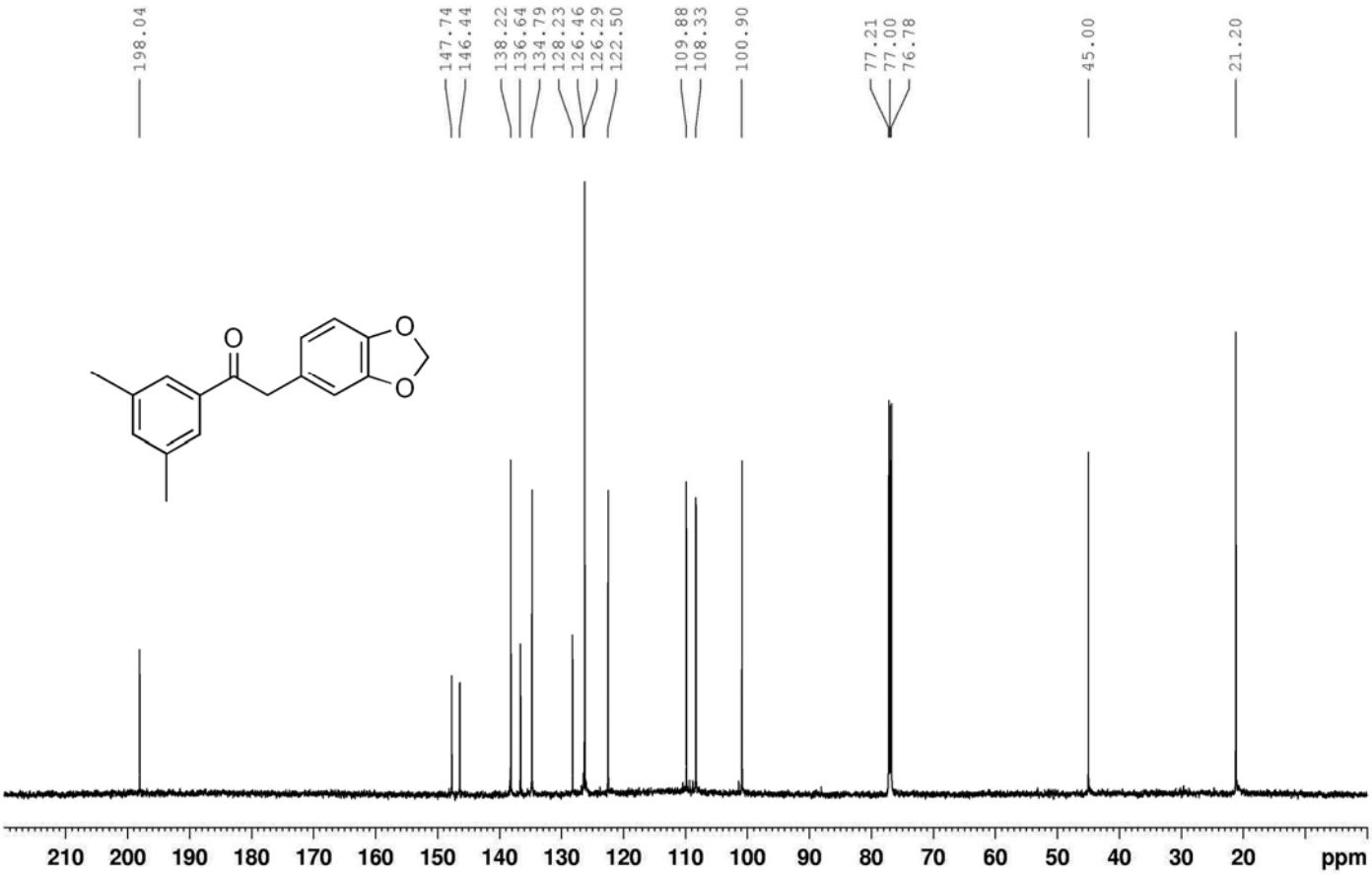
2-(Benzo[d][1,3]dioxol-5-yl)-1-(m-tolyl)ethanone (3ff)



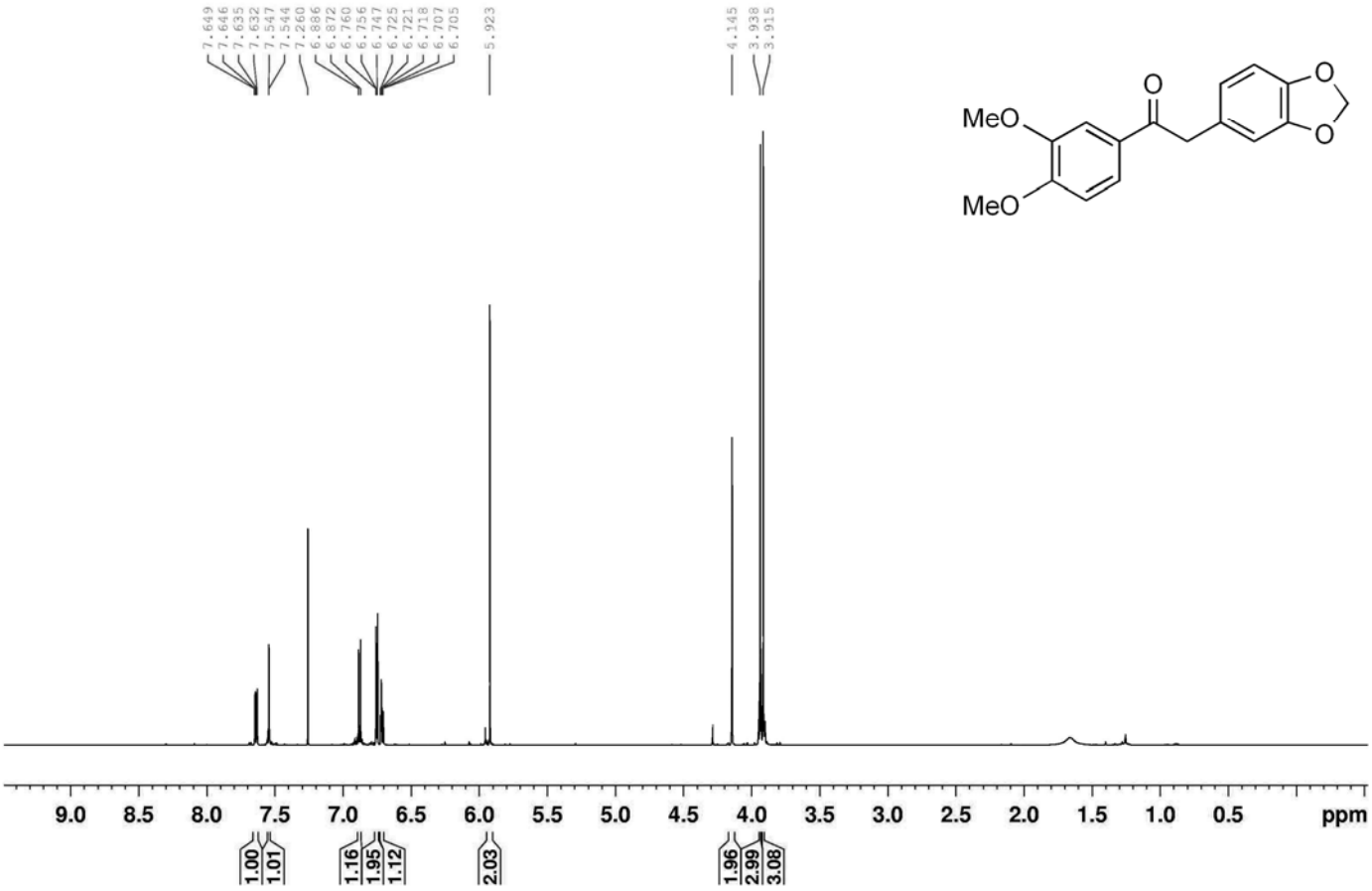


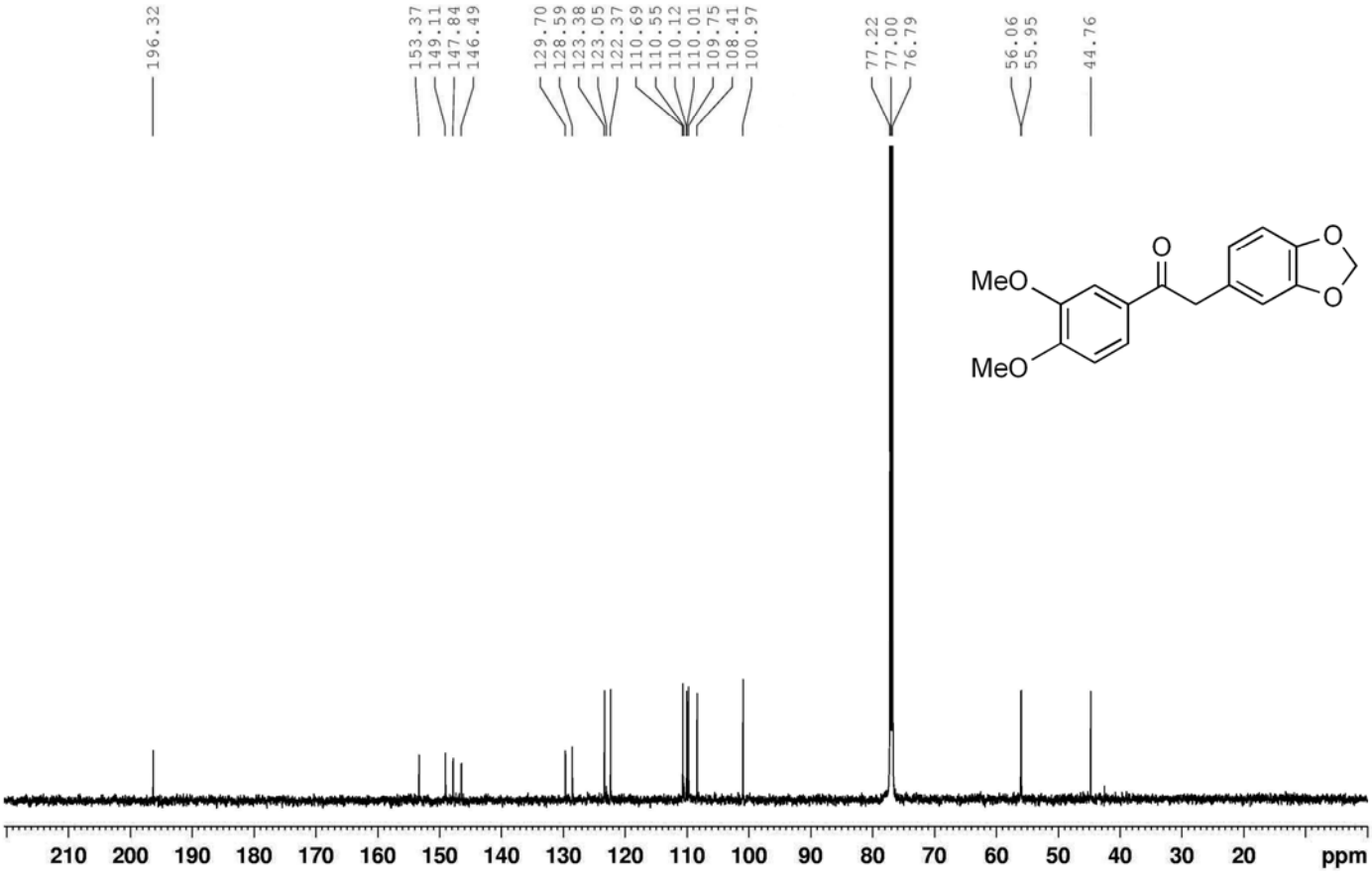
2-(Benzo[d][1,3]dioxol-5-yl)-1-(3,5-dimethylphenyl)ethanone (3gf)



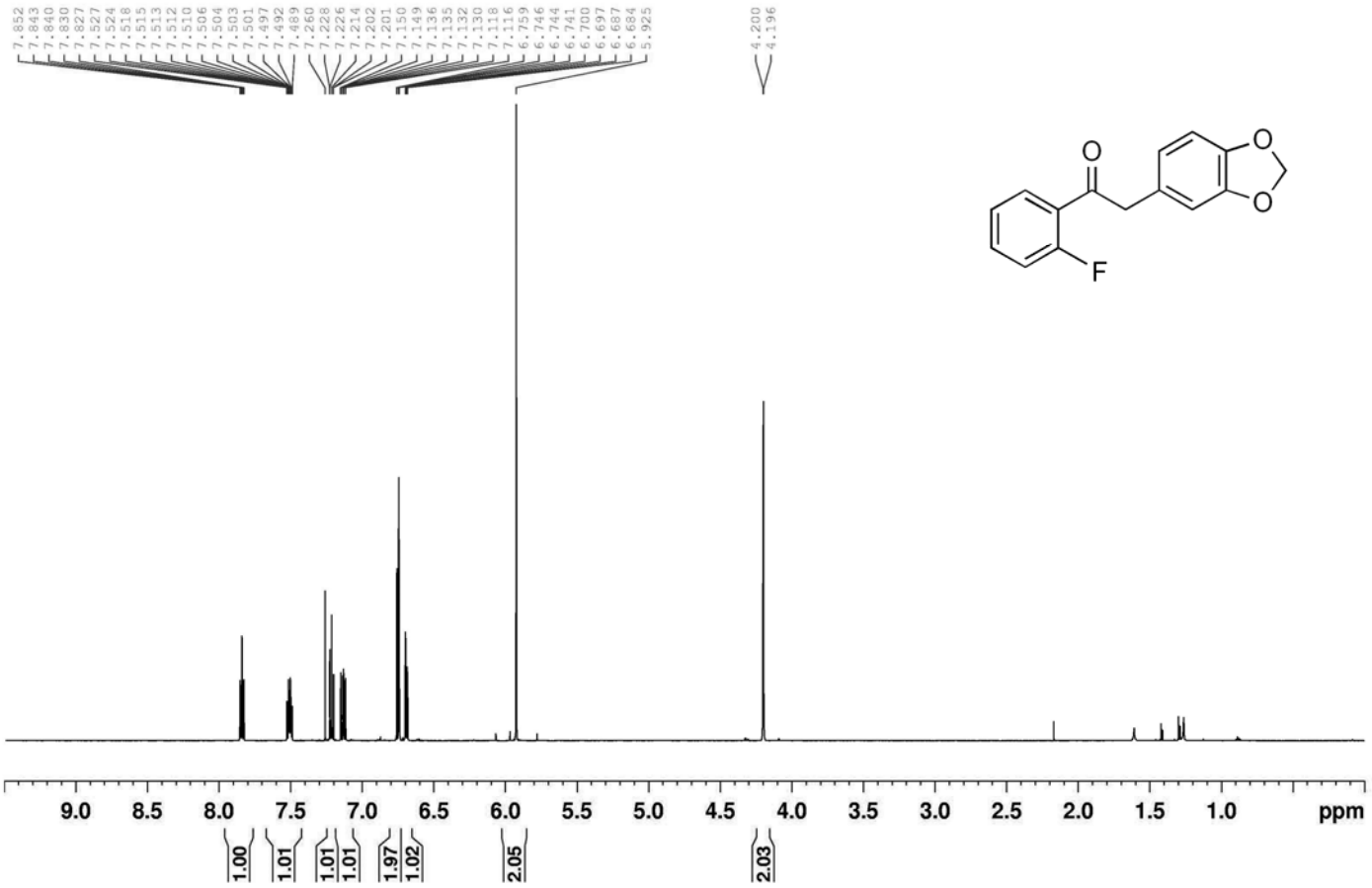


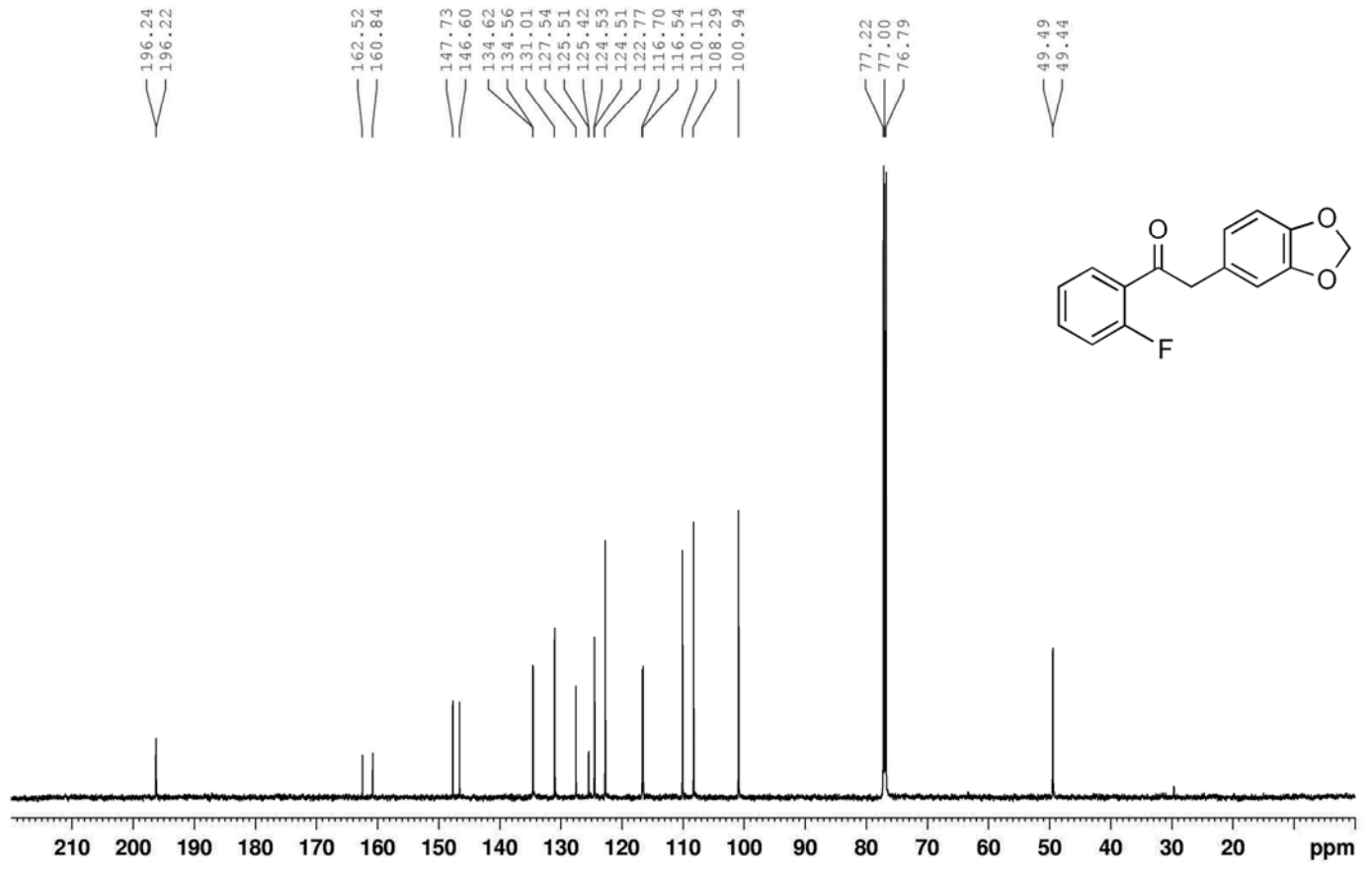
2-(Benzo[d][1,3]dioxol-5-yl)-1-(3,4-dimethoxyphenyl)ethanone (3hf)



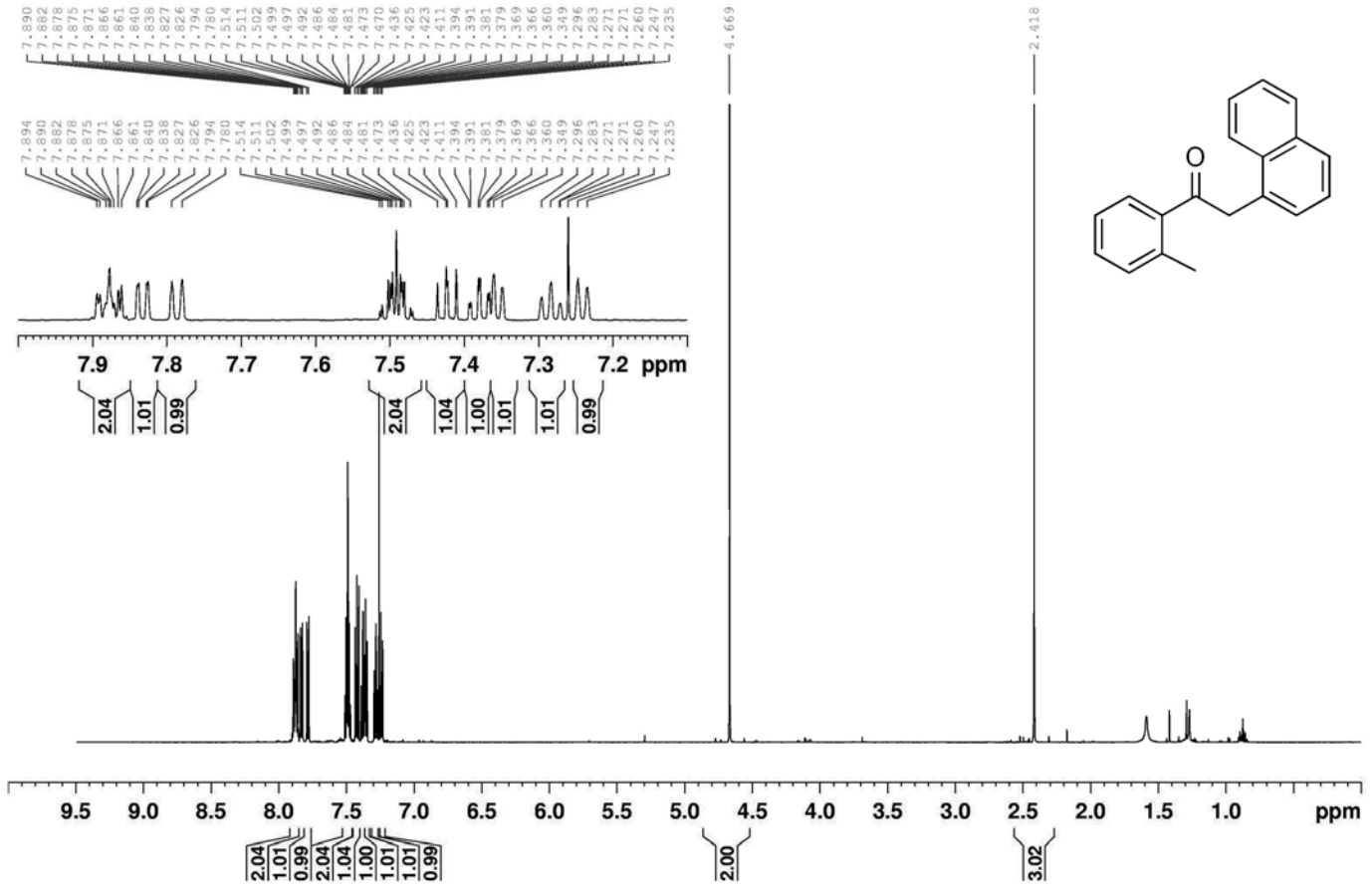


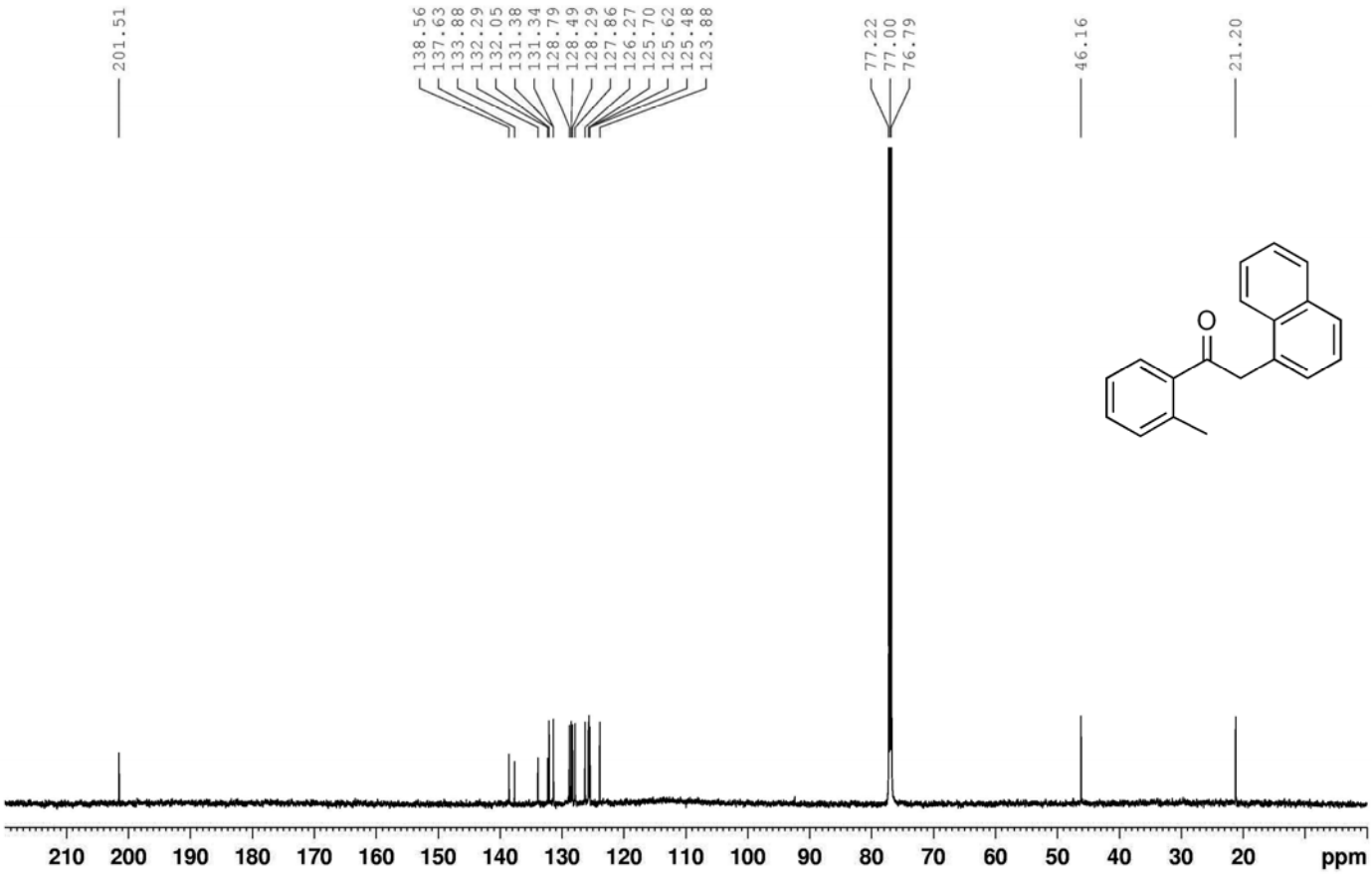
2-(Benzo[d][1,3]dioxol-5-yl)-1-(2-fluorophenyl)ethanone (3if)



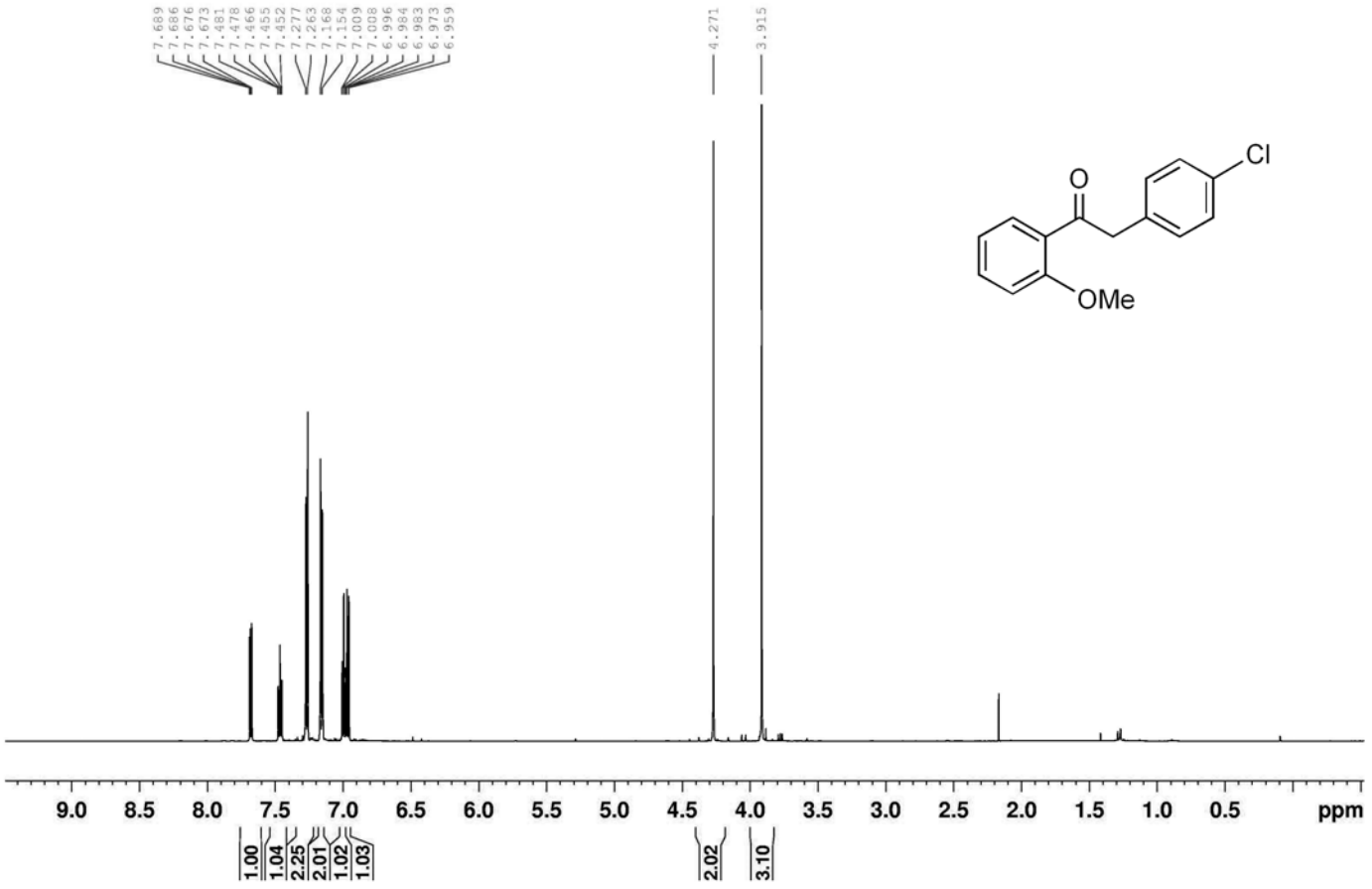


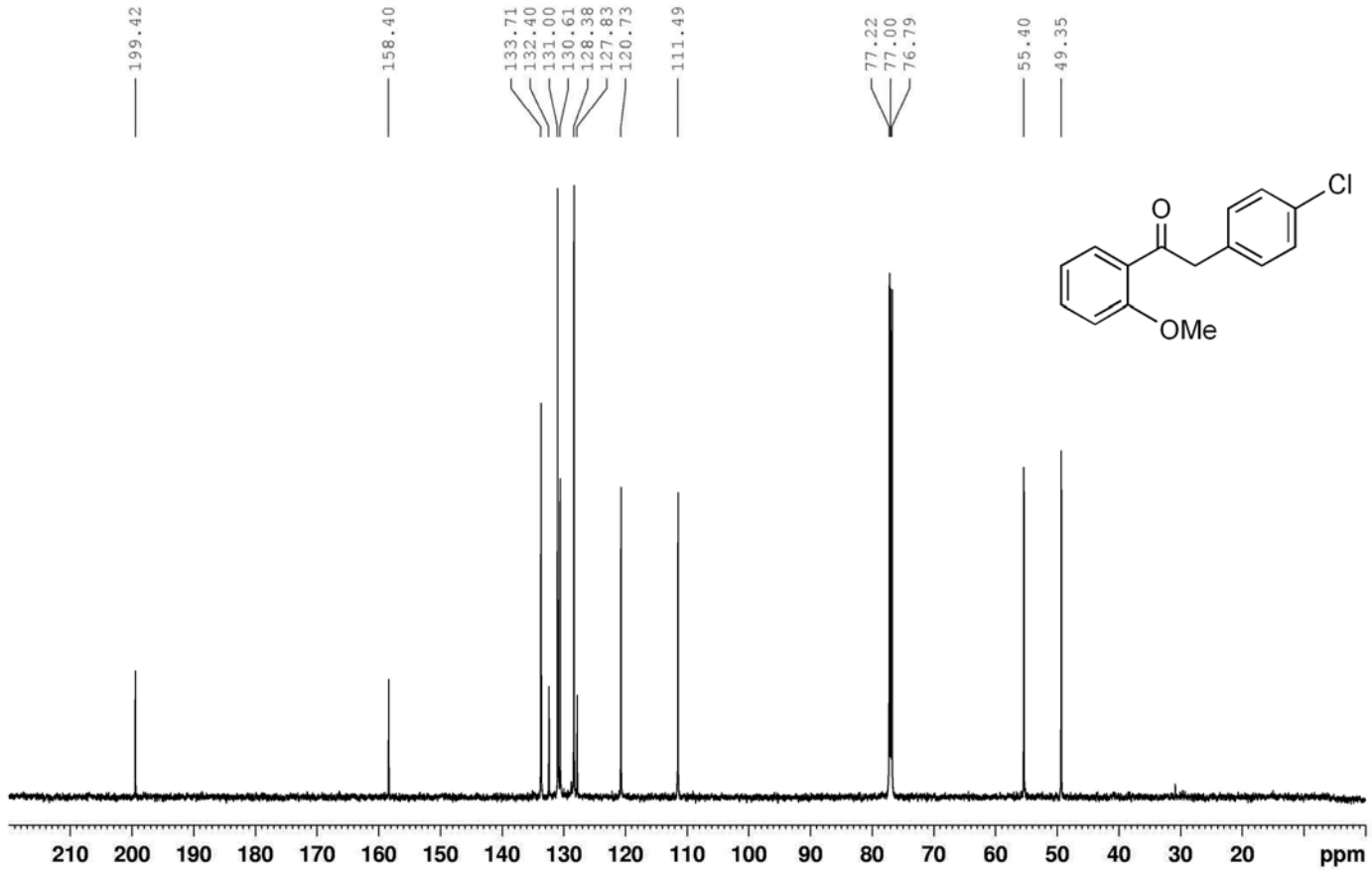
2-(Naphthalen-1-yl)-1-(o-tolyl)ethanone (3ji)



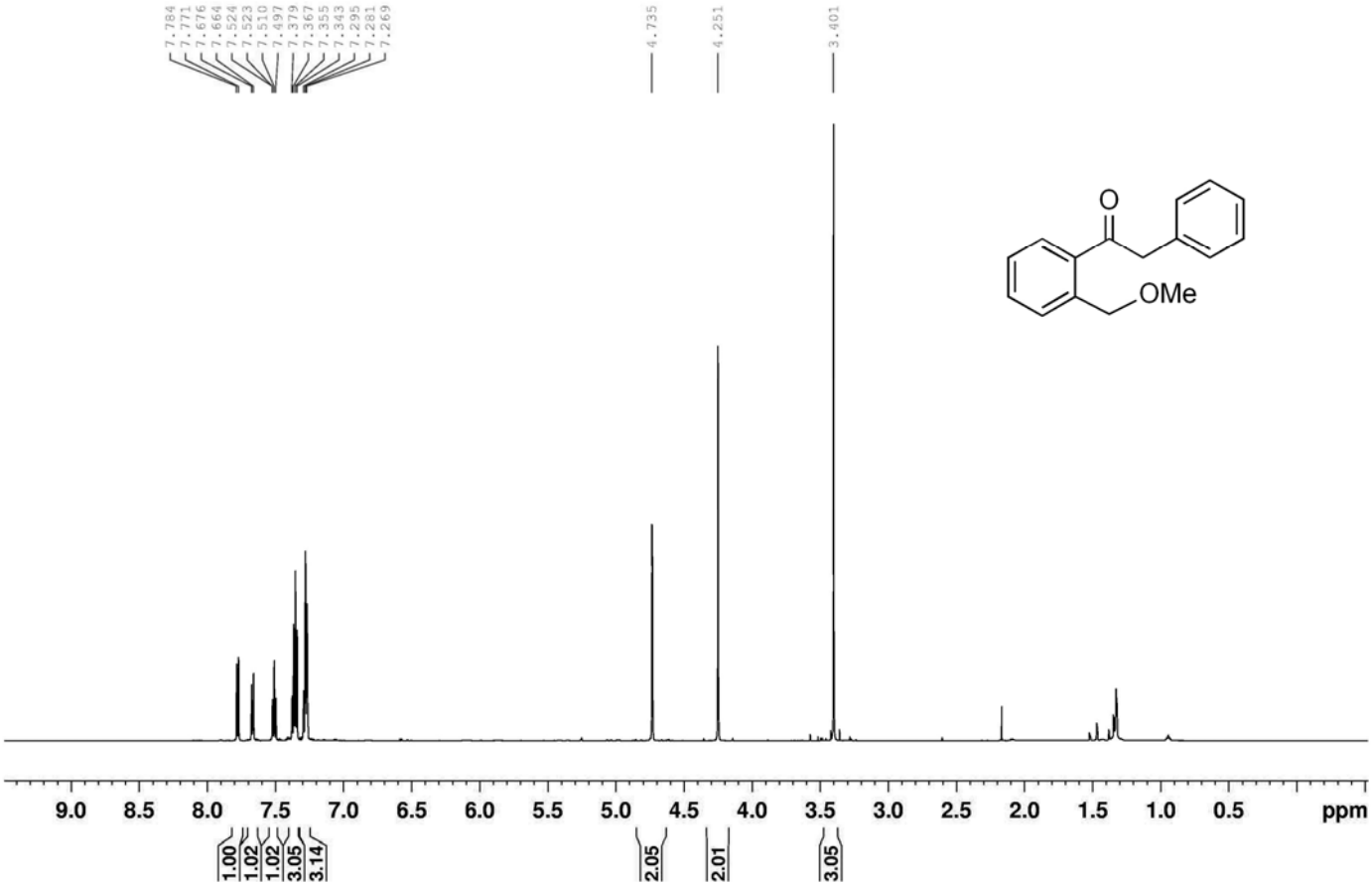


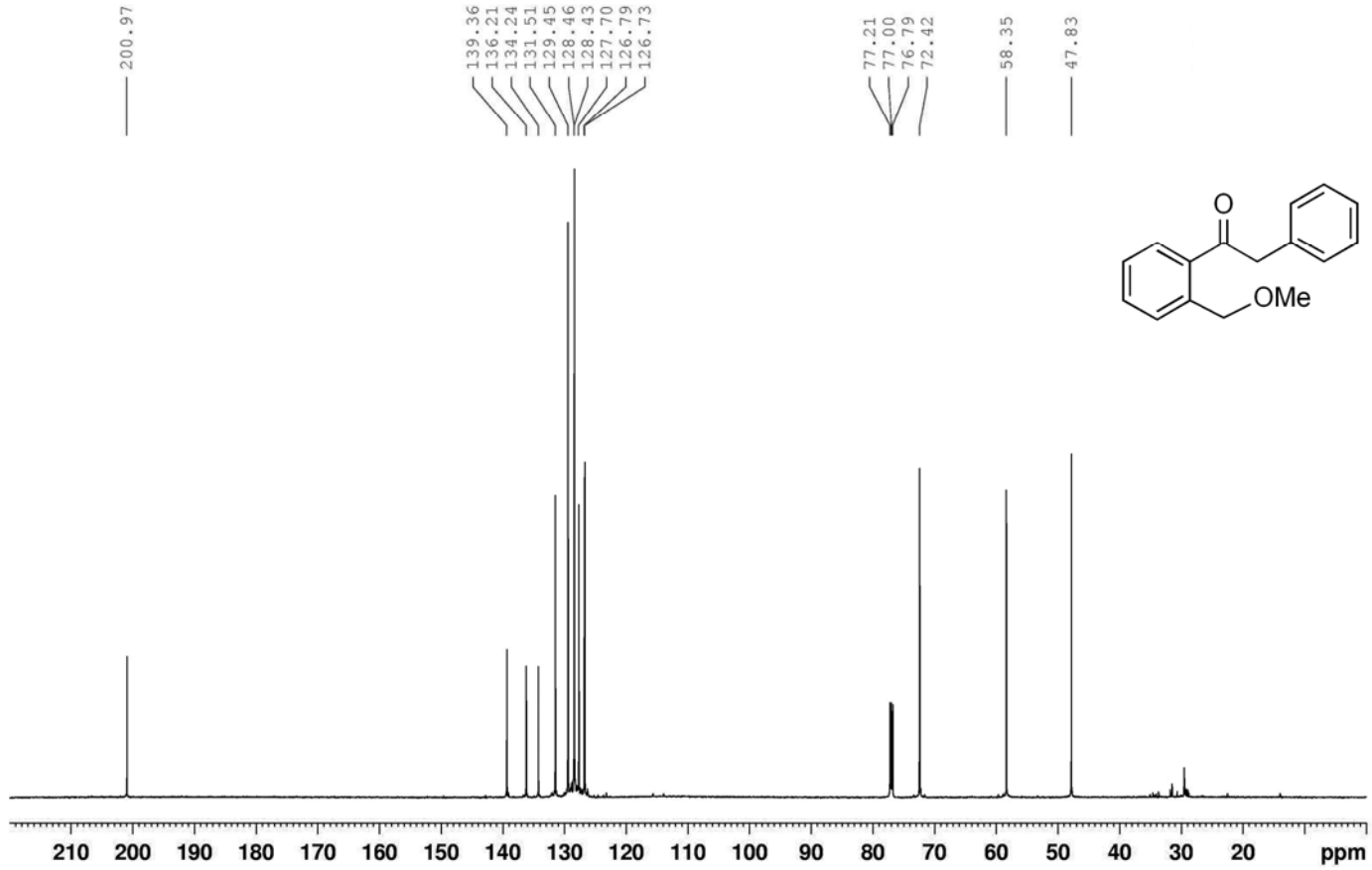
2-(4-Chlorophenyl)-1-(2-methoxyphenyl)ethanone (3kb)



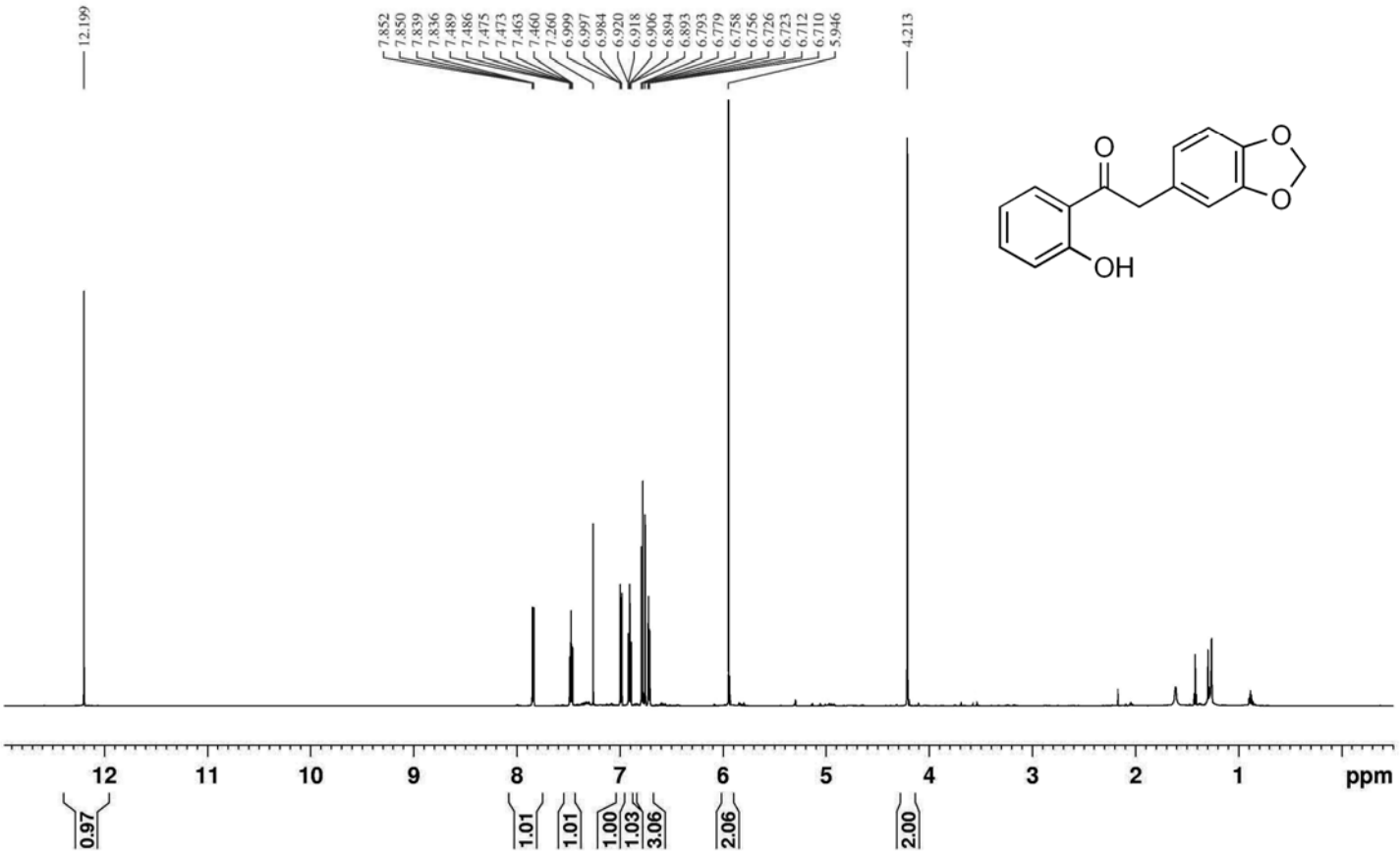


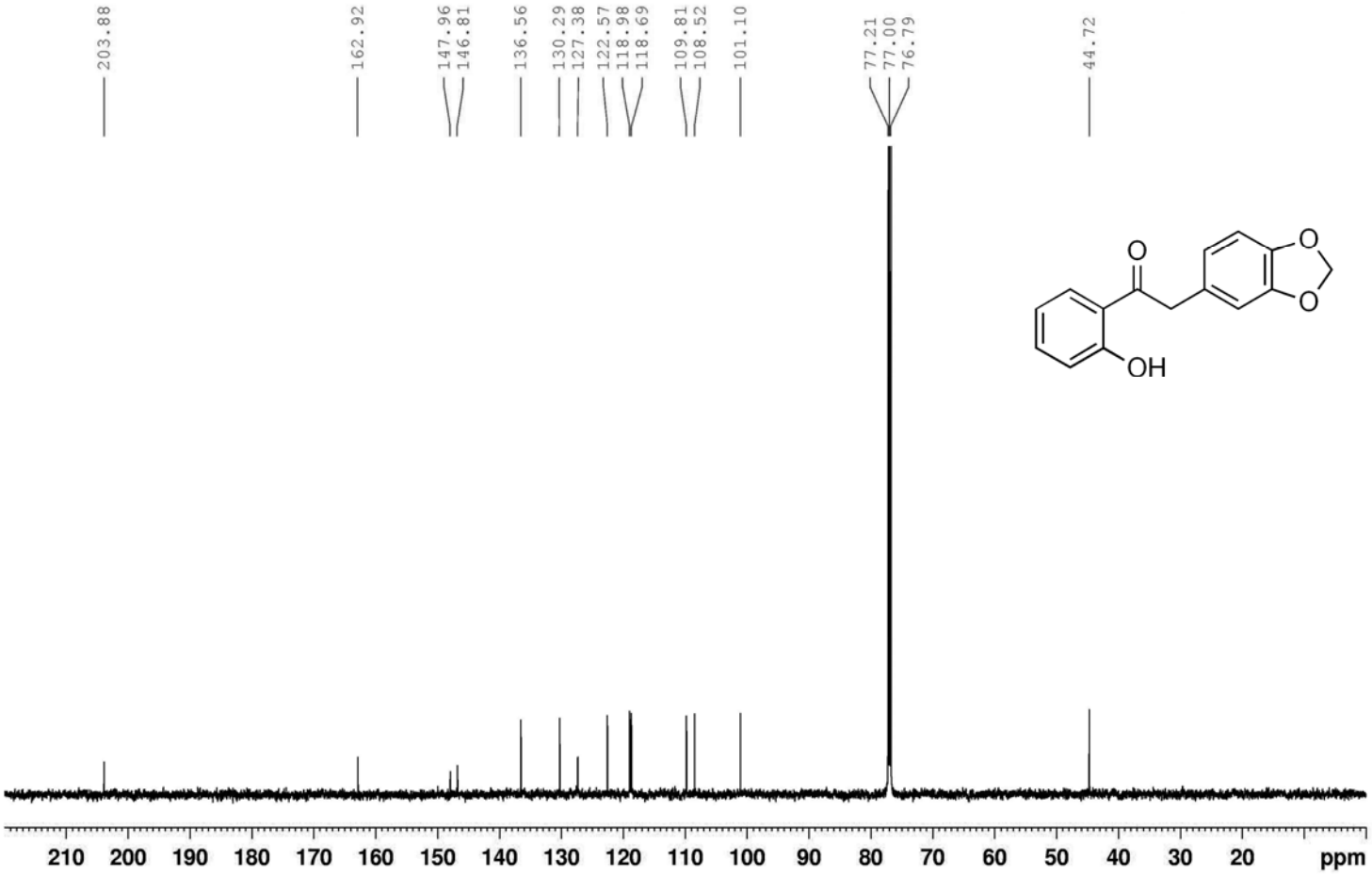
1-(2-(Methoxymethyl)phenyl)-2-phenylethanone (3la)



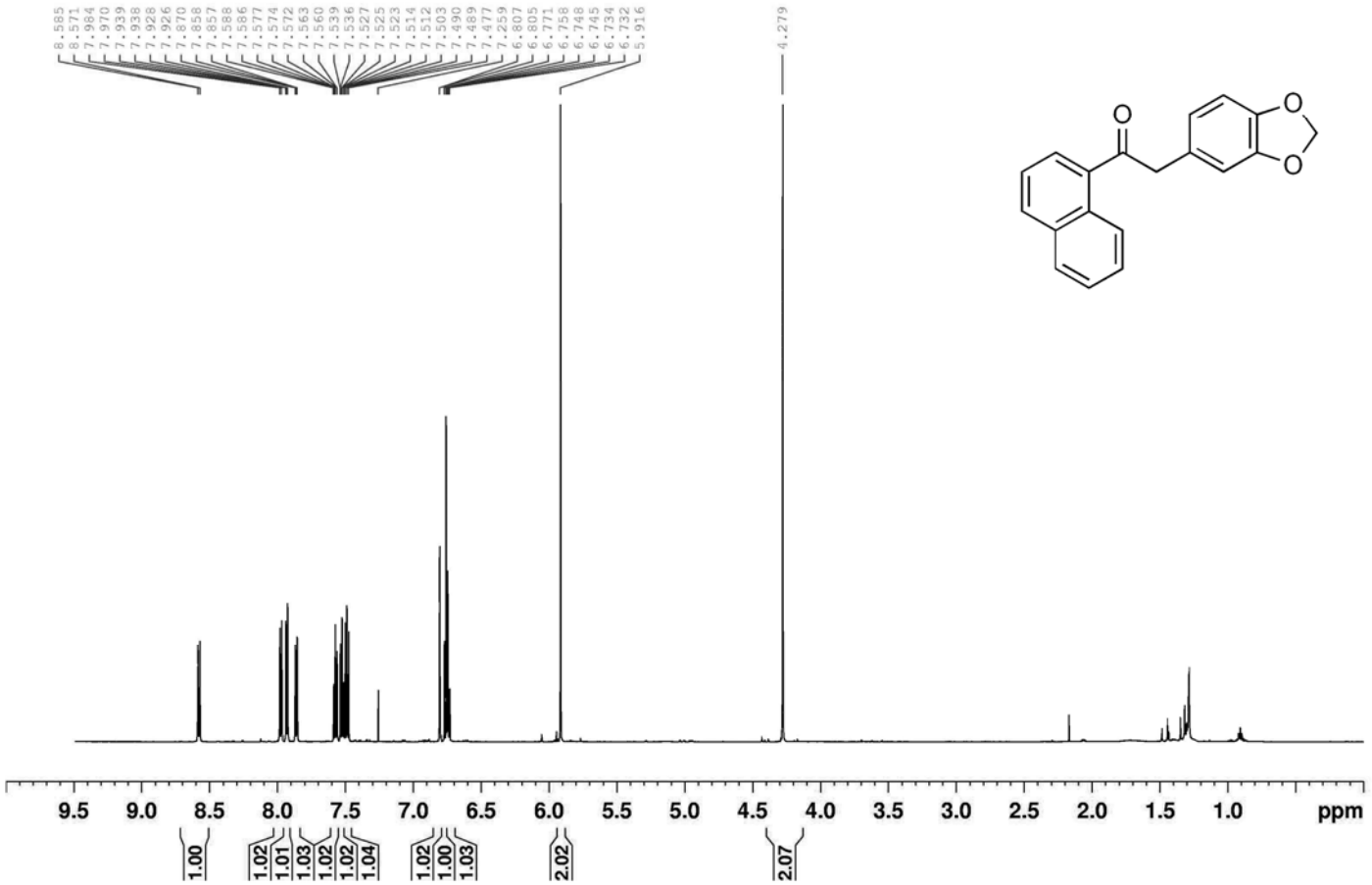


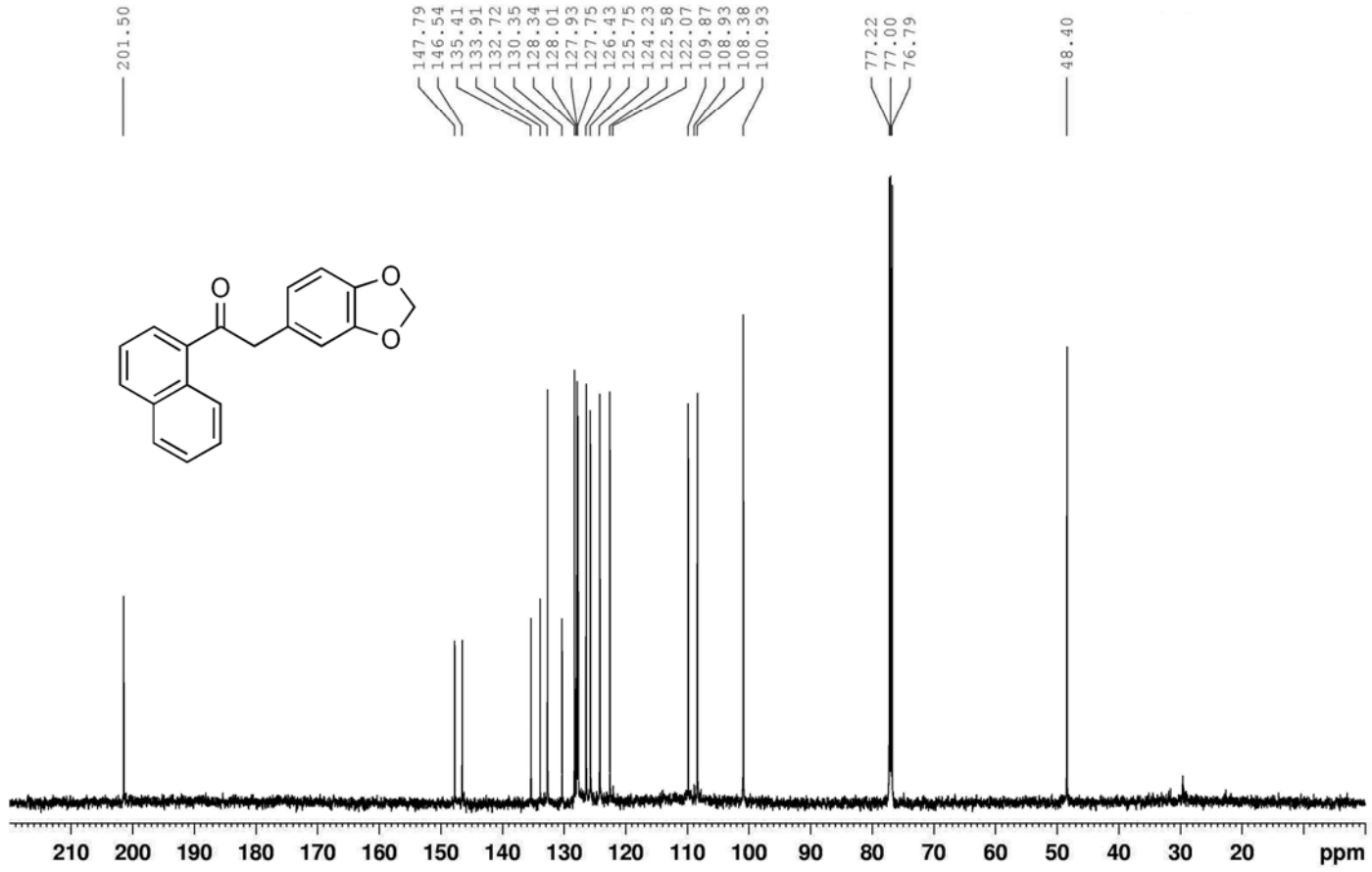
2-(Benzo[d][1,3]dioxol-5-yl)-1-(2-hydroxyphenyl)ethanone (3'f)



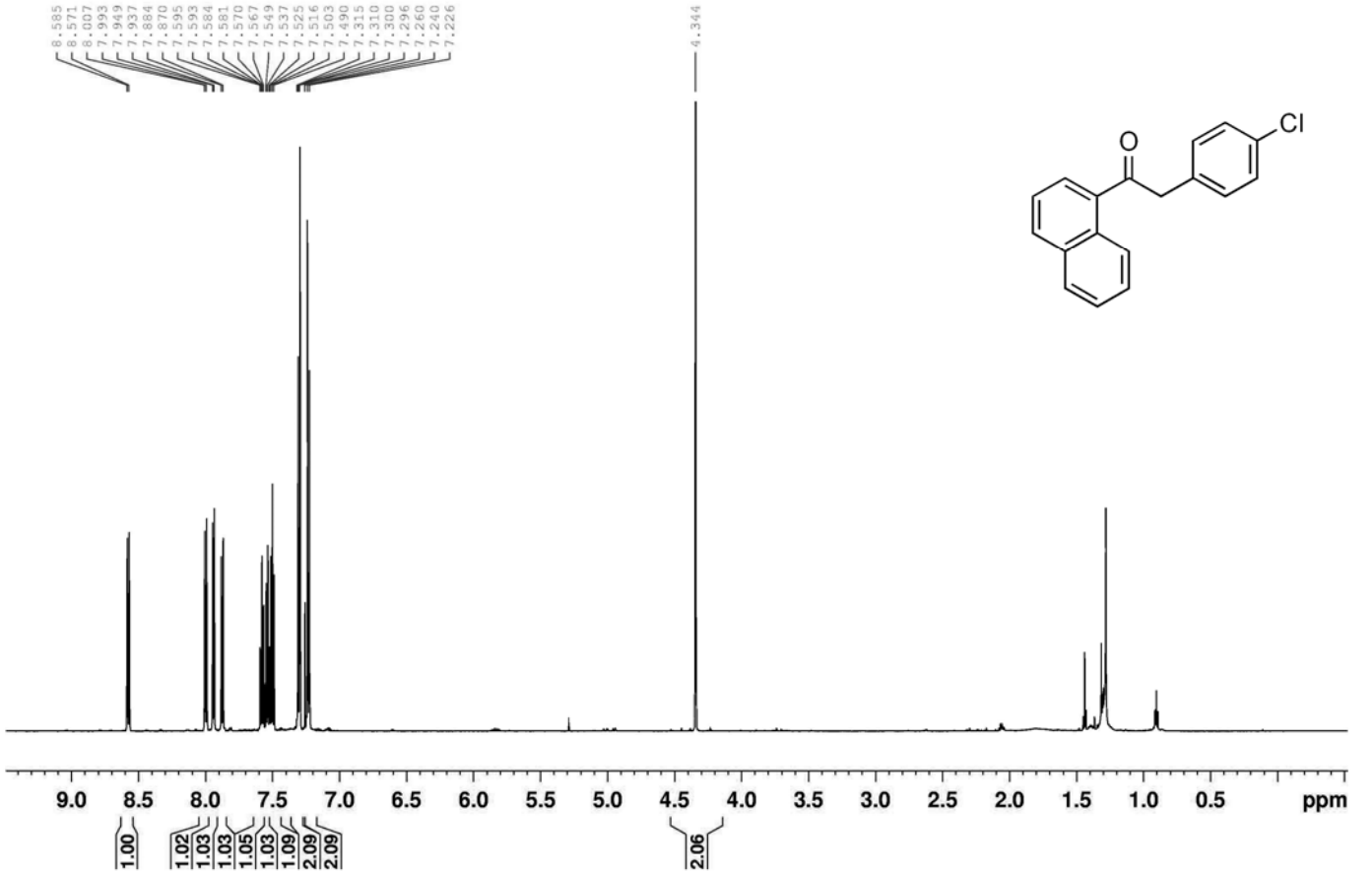


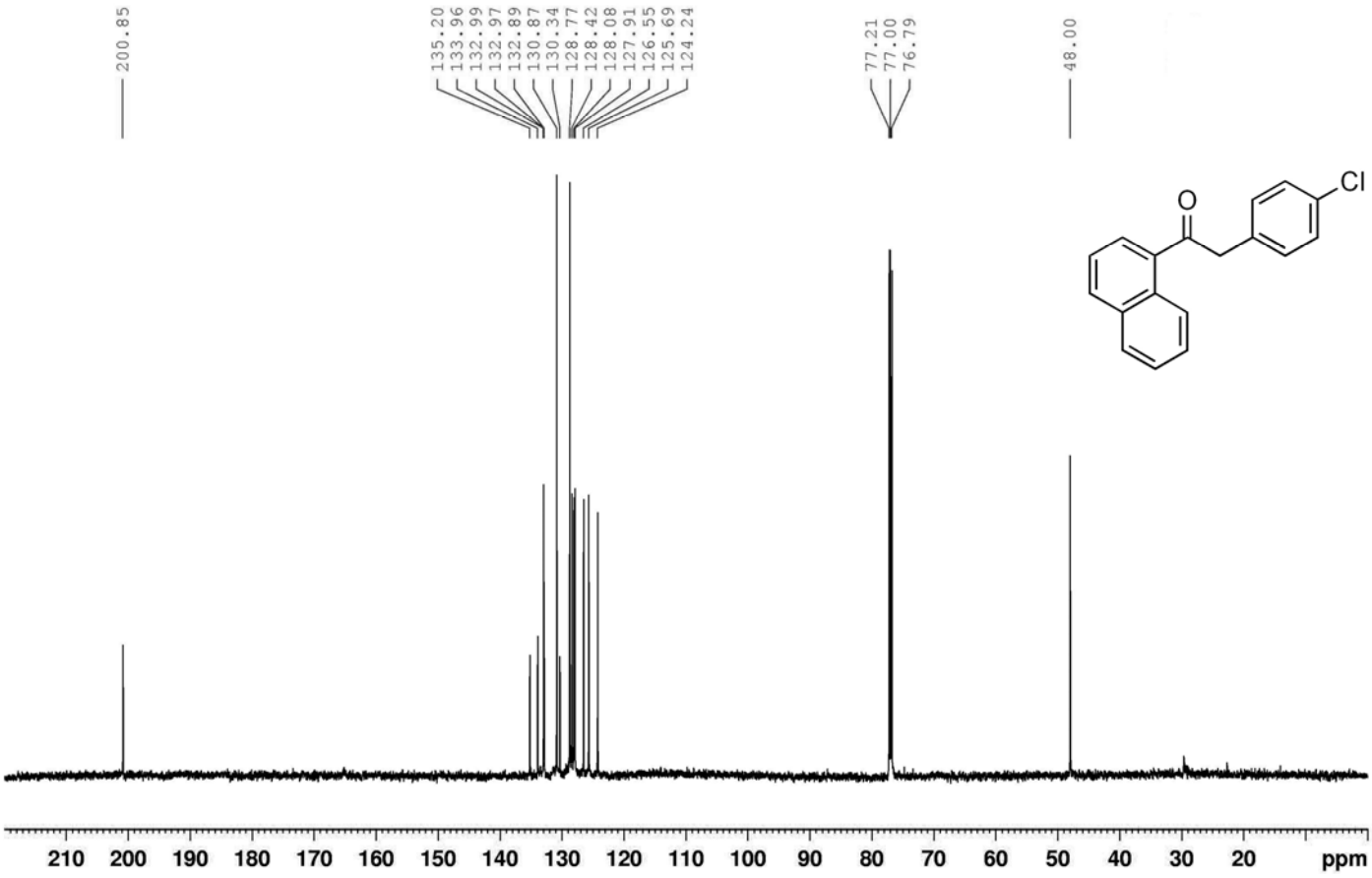
2-(Benzo[d][1,3]dioxol-5-yl)-1-(naphthalen-1-yl)ethanone (3nf)



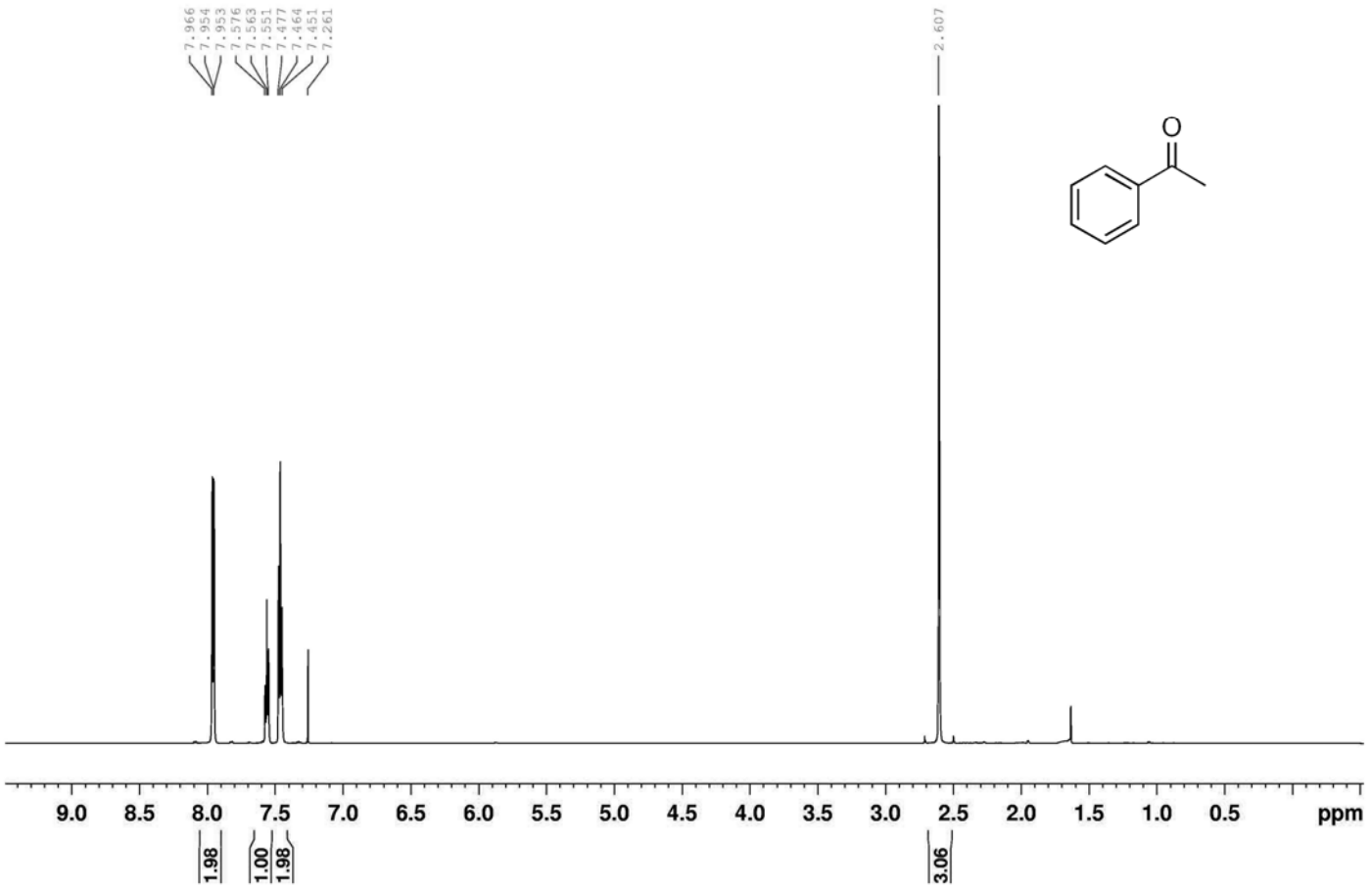


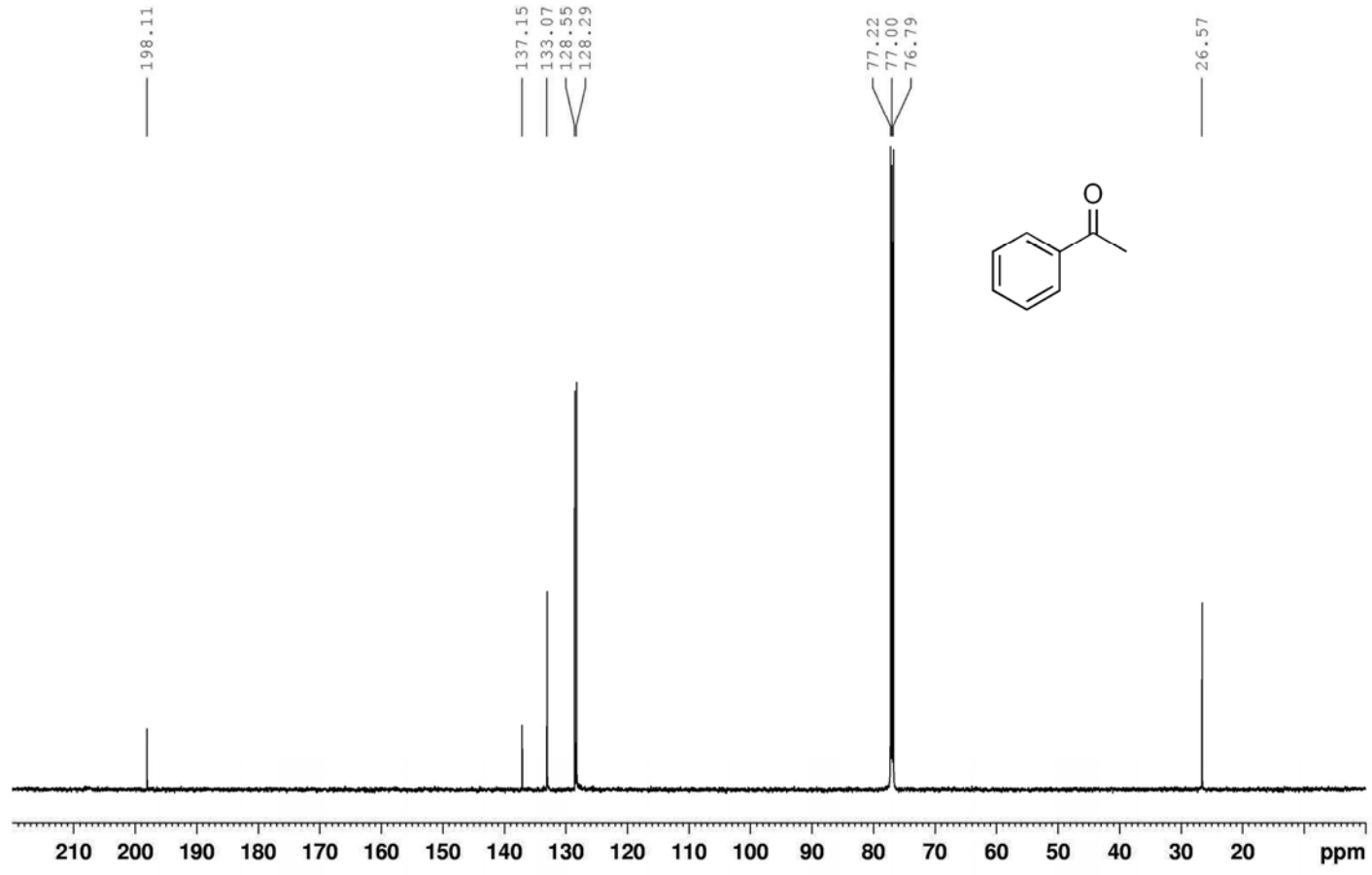
2-(4-Chlorophenyl)-1-(naphthalen-1-yl)ethanone (3nb)



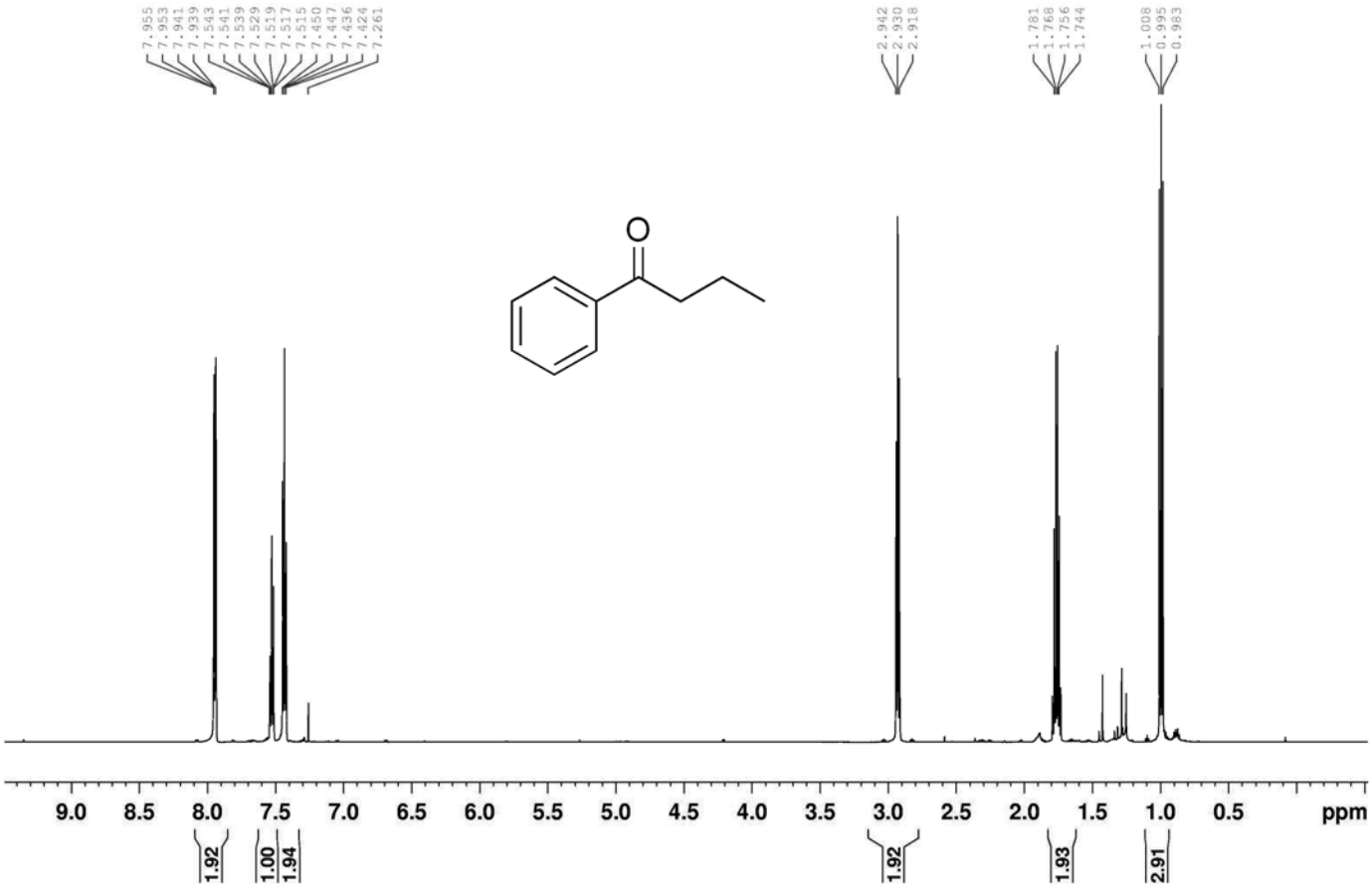


Acetophenone (3aj)

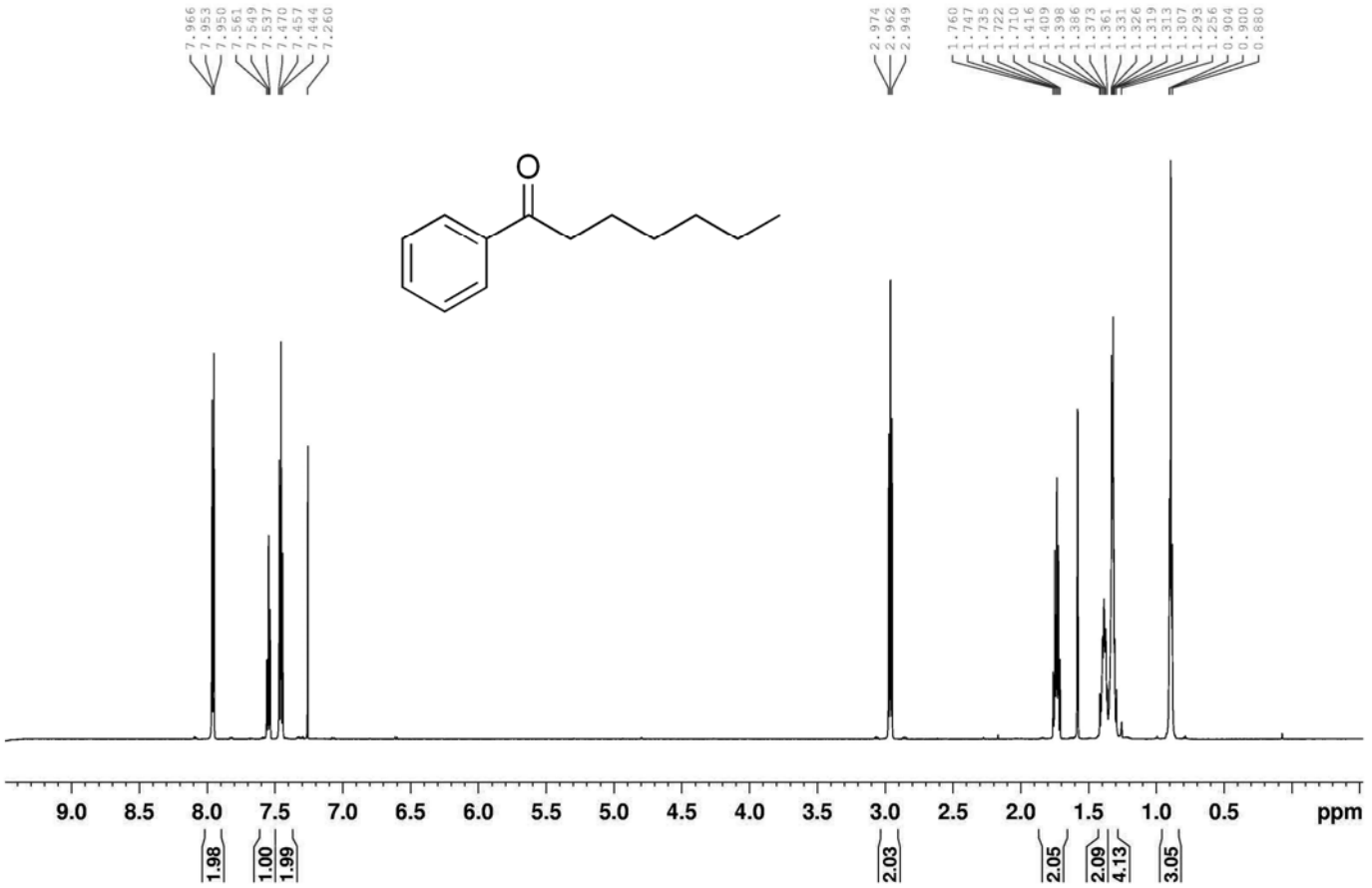


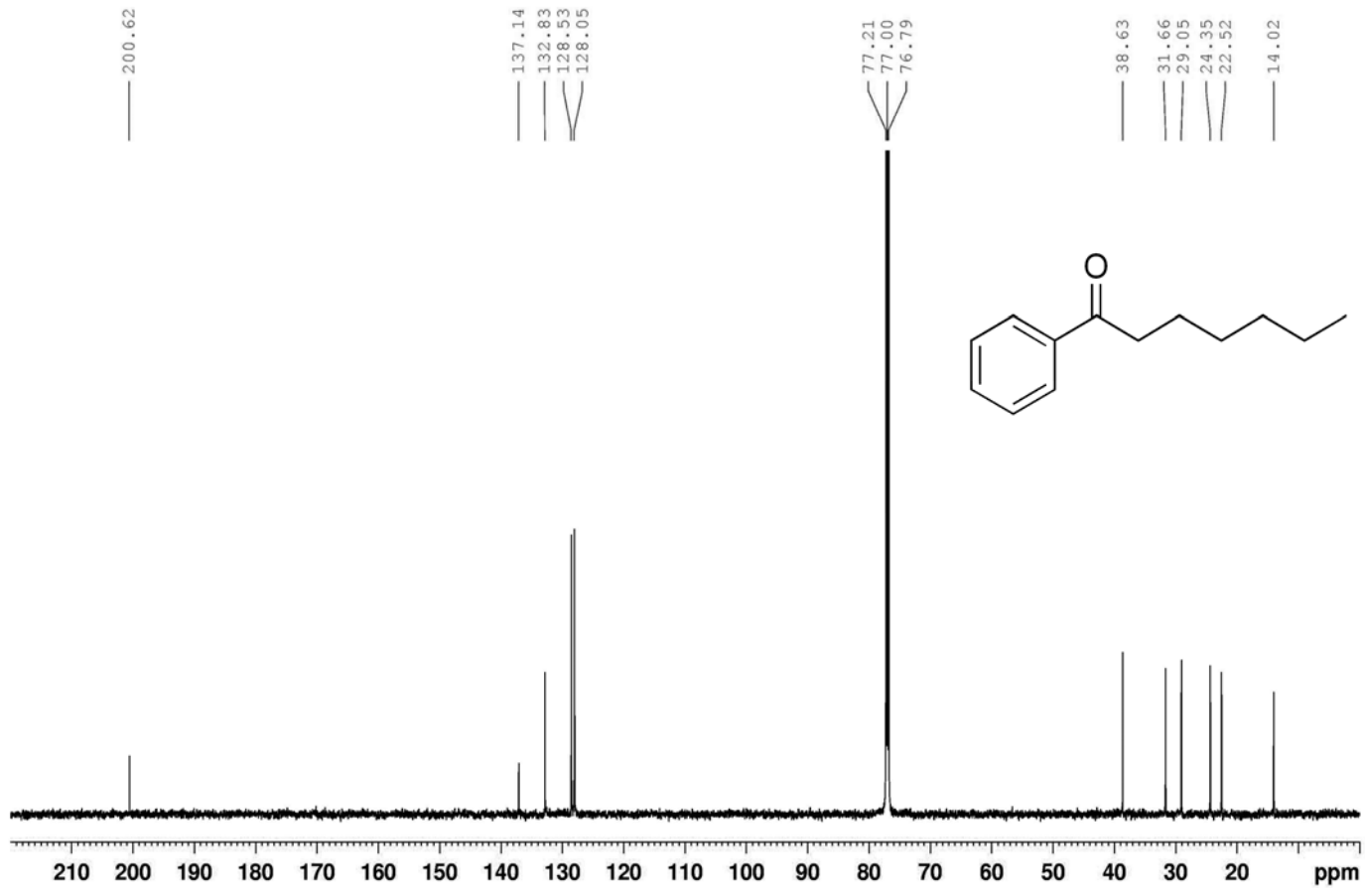


1-Phenylbutan-1-one (3ak)

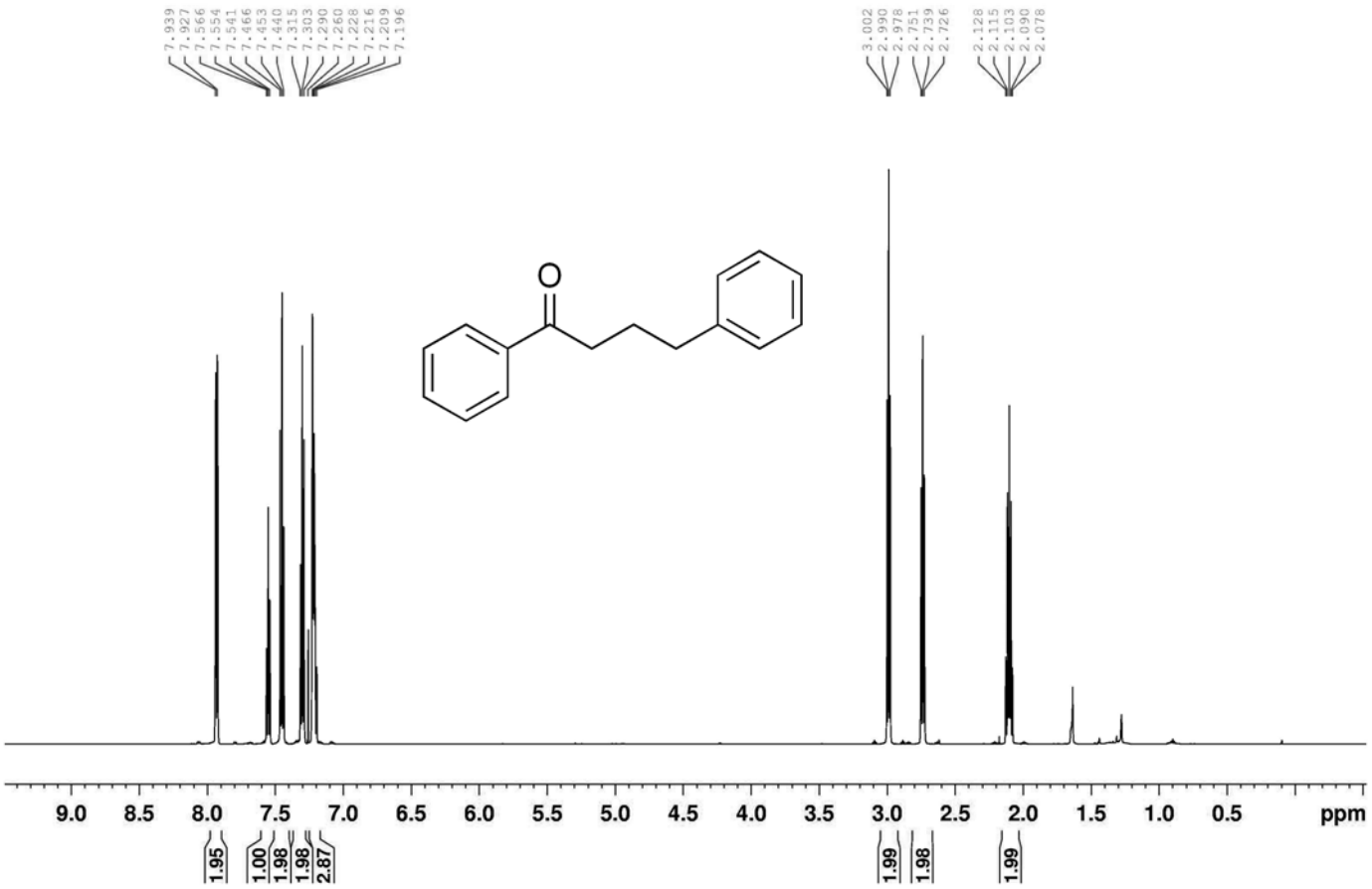


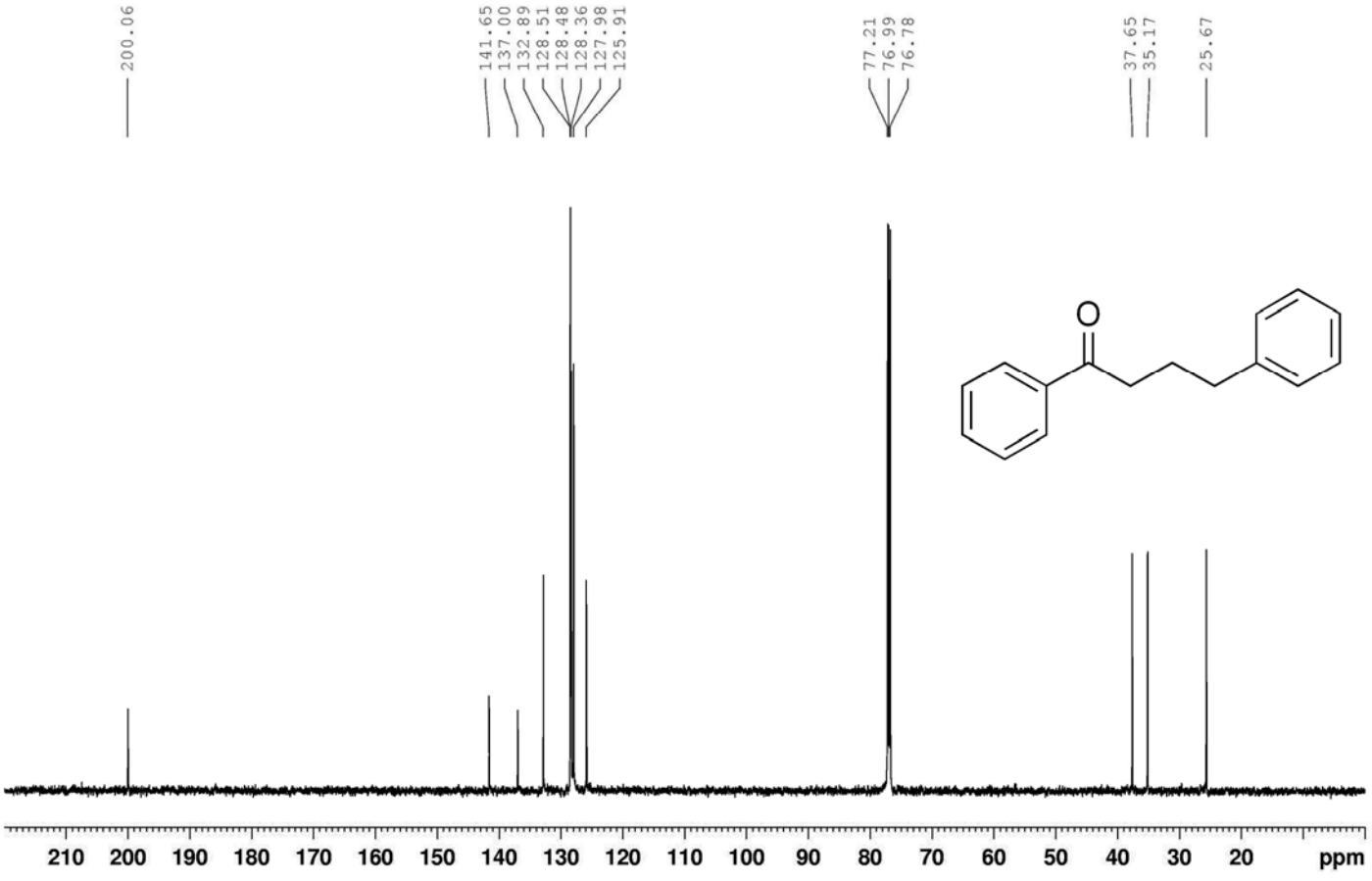
1-Phenylheptan-1-one (3am)



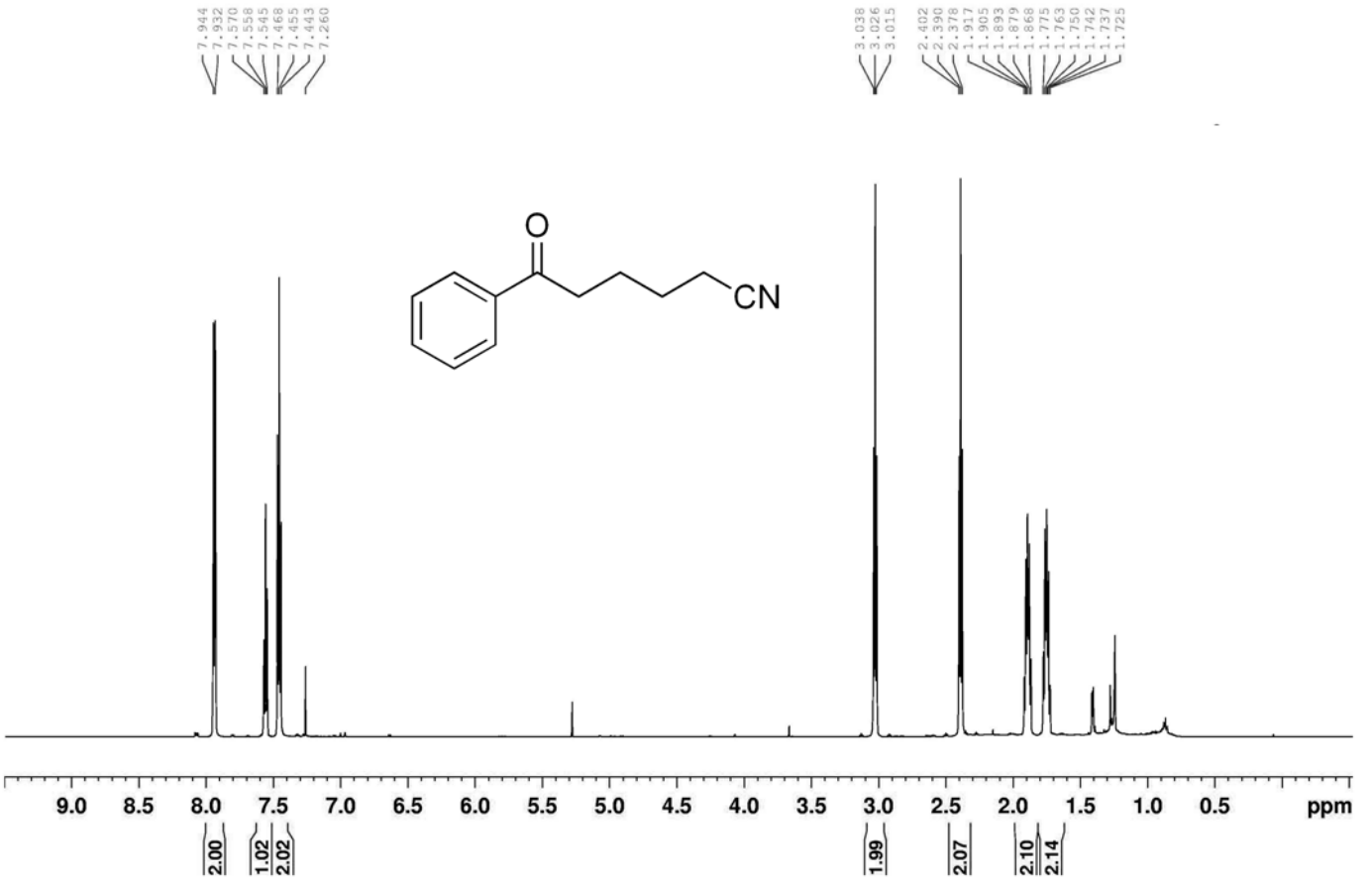


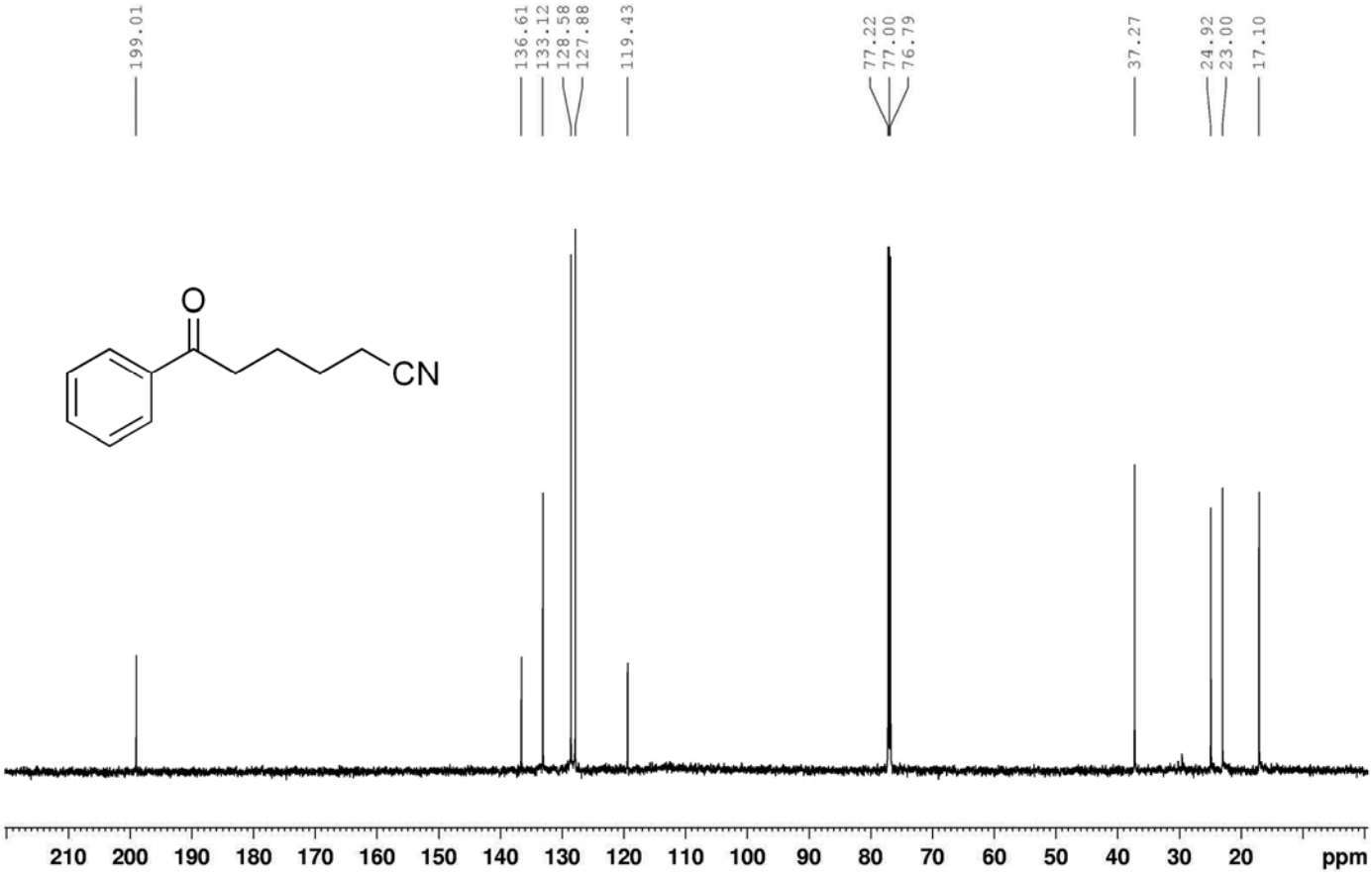
1,4-Diphenylbutan-1-one (3an)



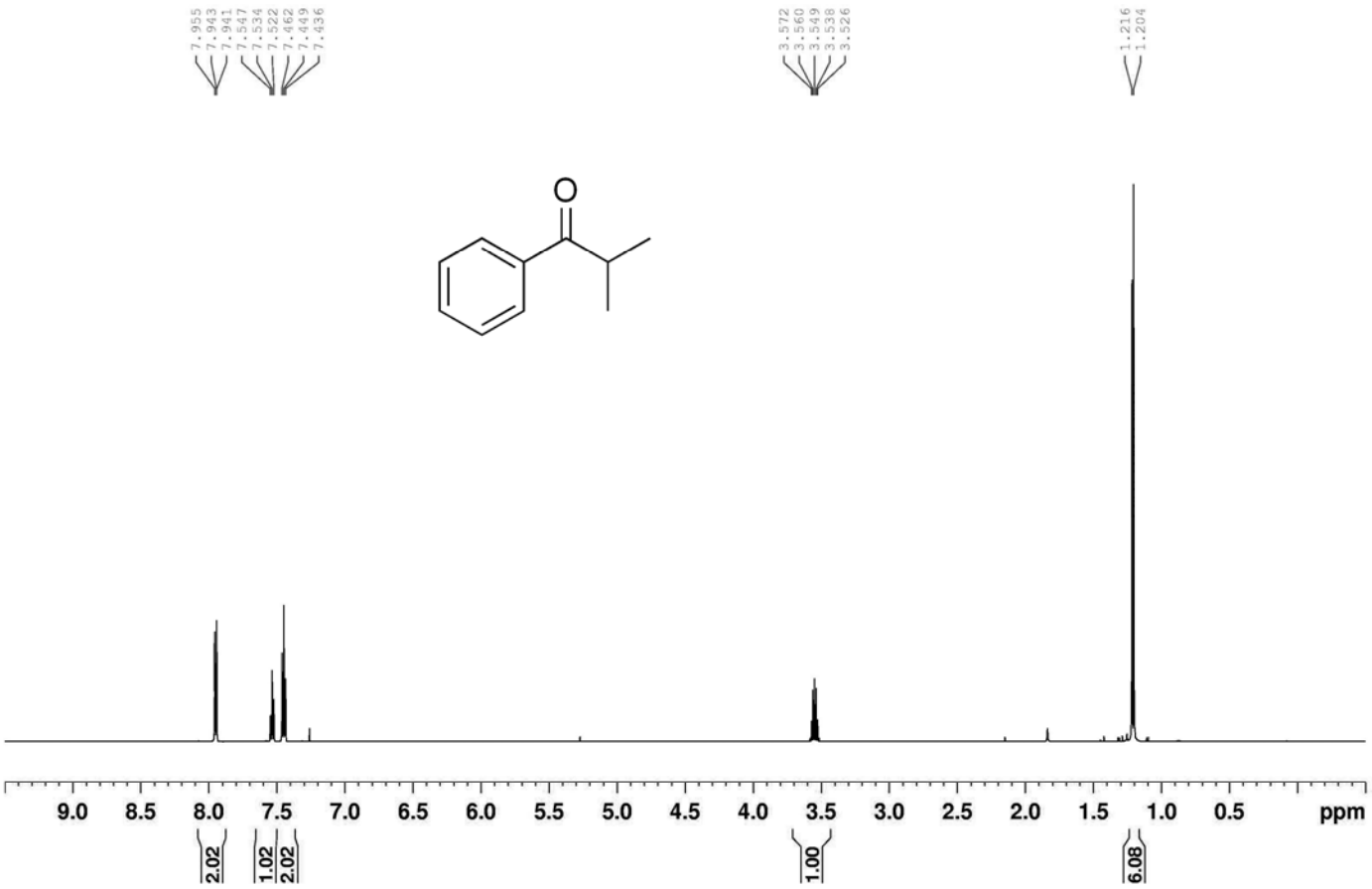


6-Oxo-6-phenylhexanenitrile (3ao)

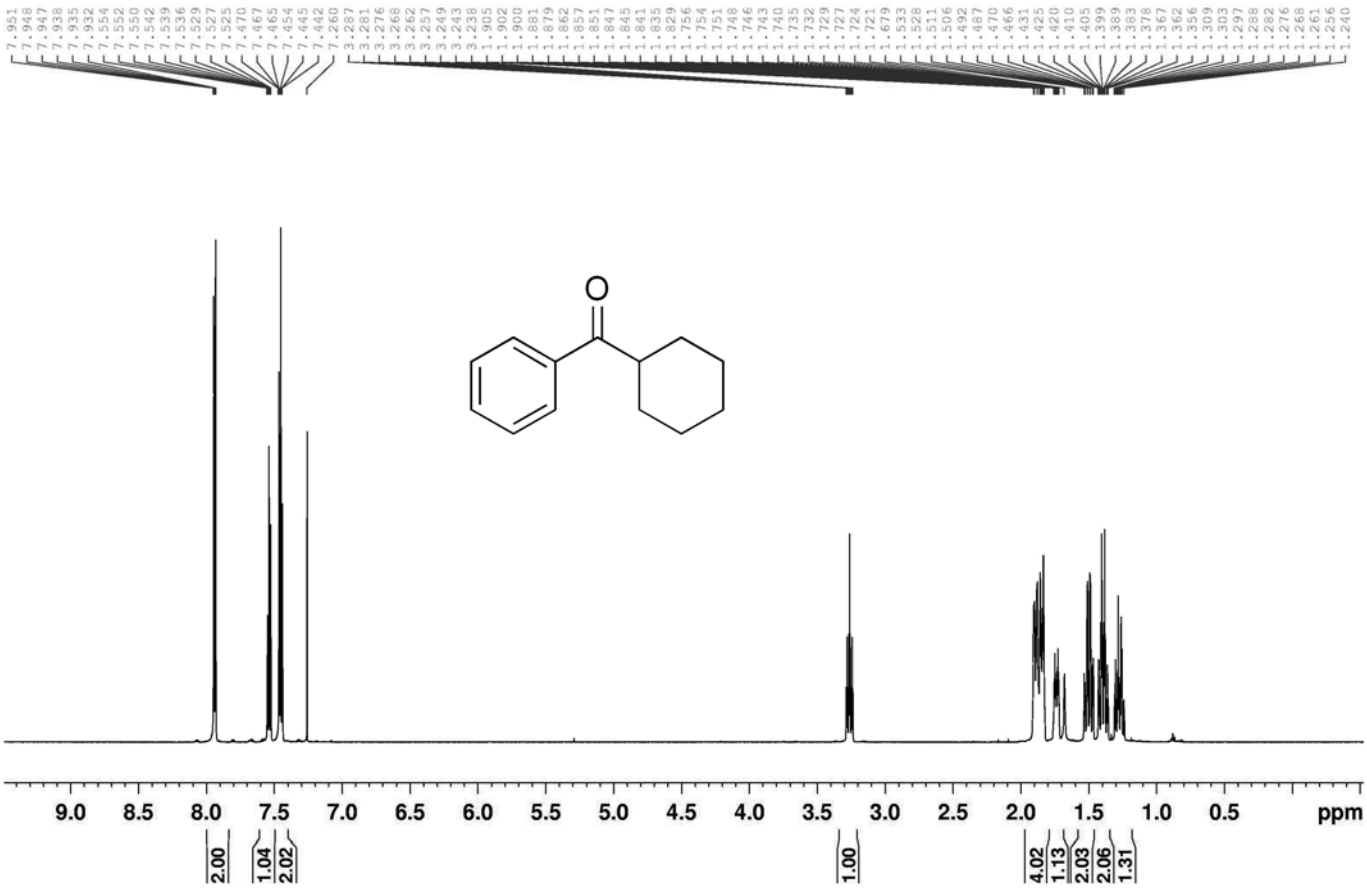


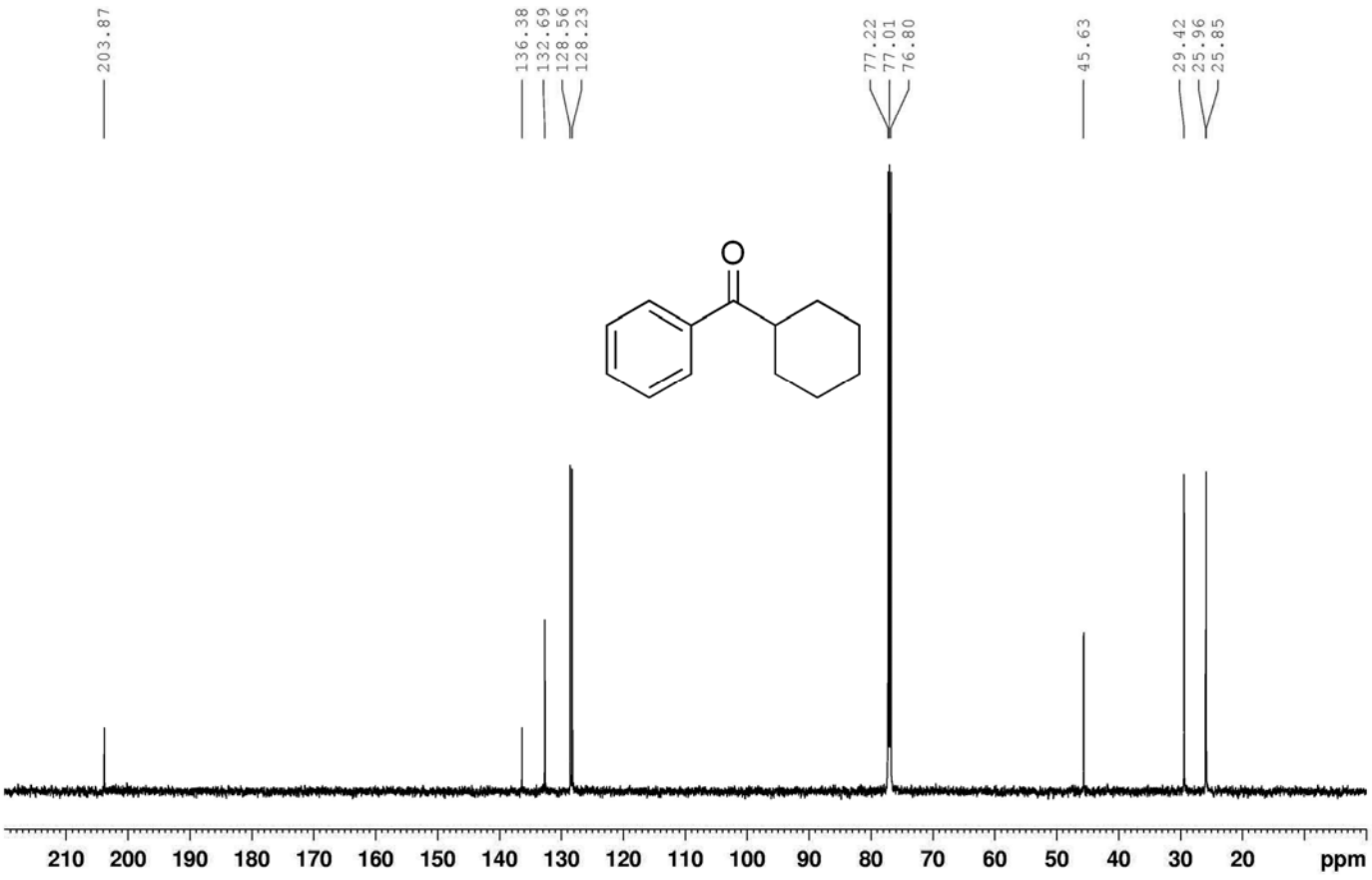


2-Methyl-1-phenylpropan-1-one (3ap)

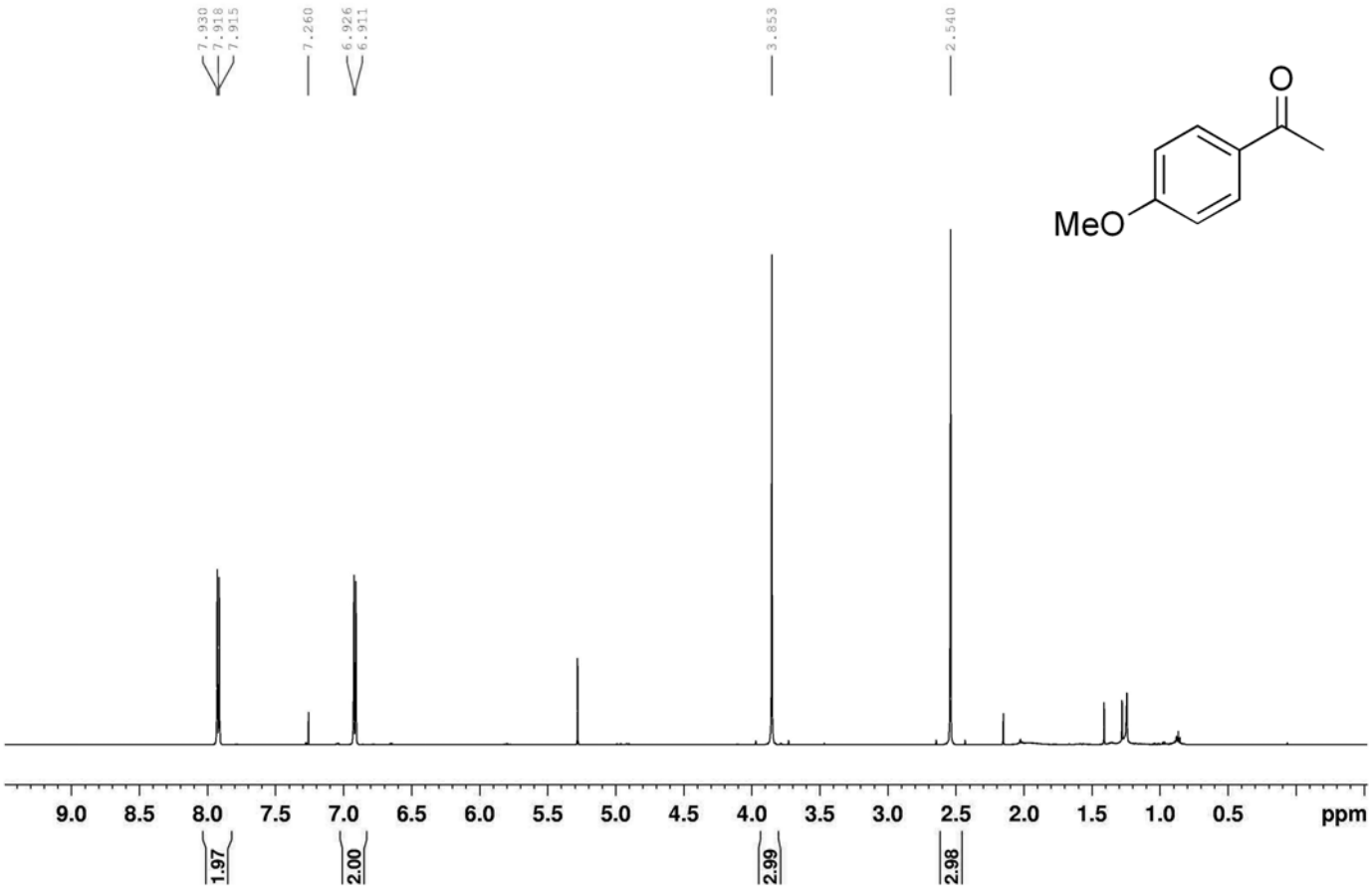


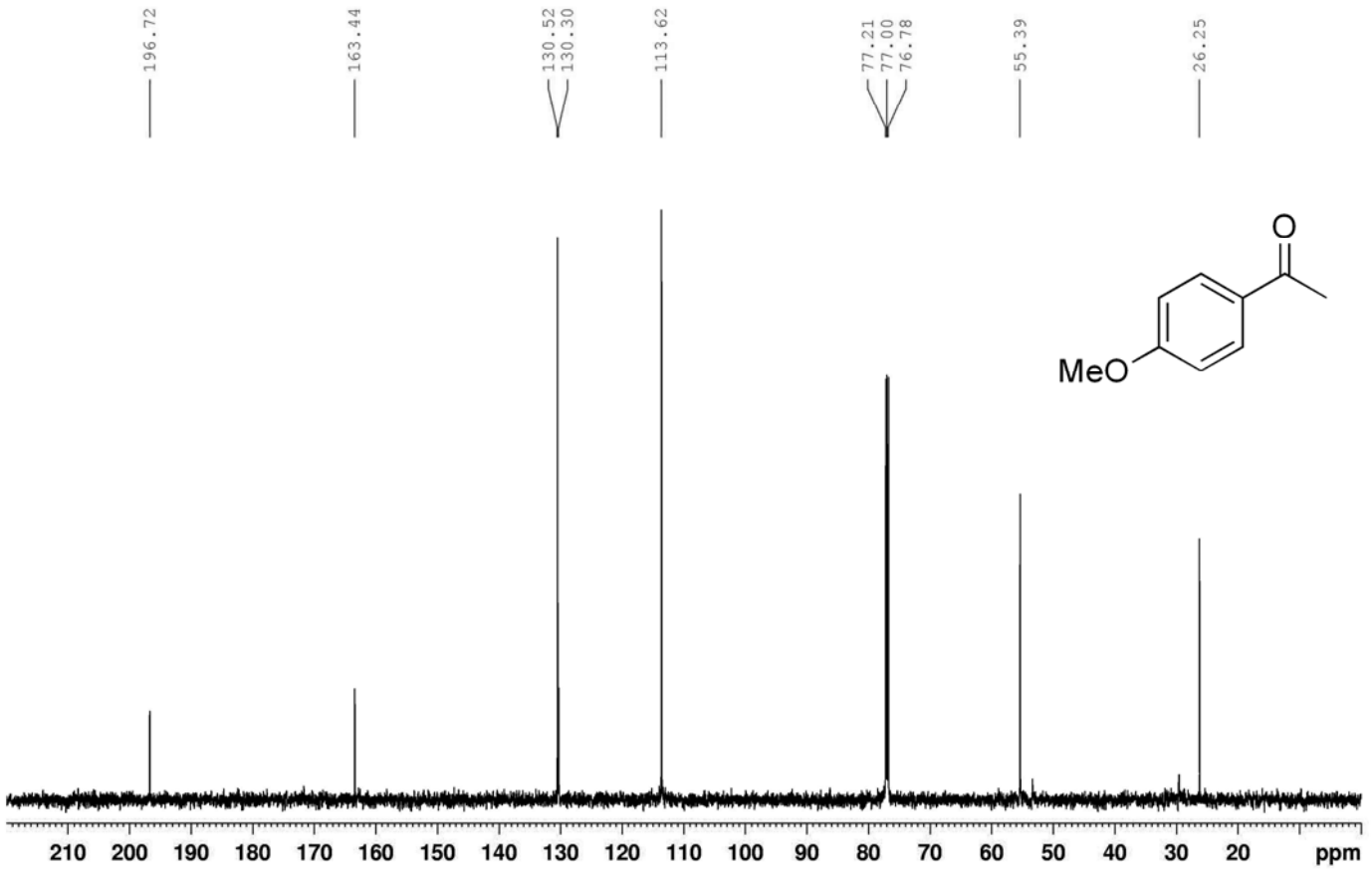
Cyclohexyl(phenyl)methanone (3aq)



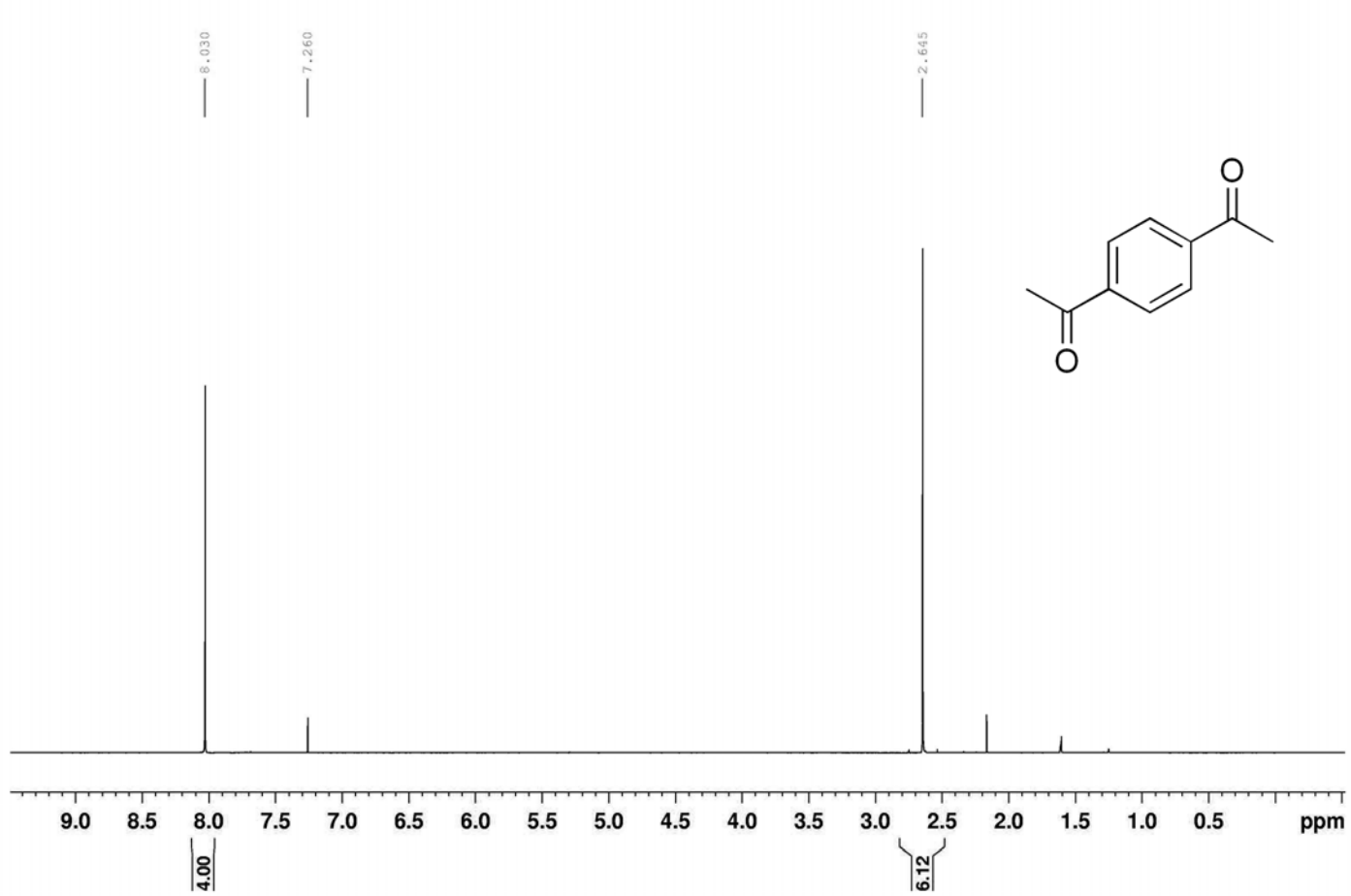


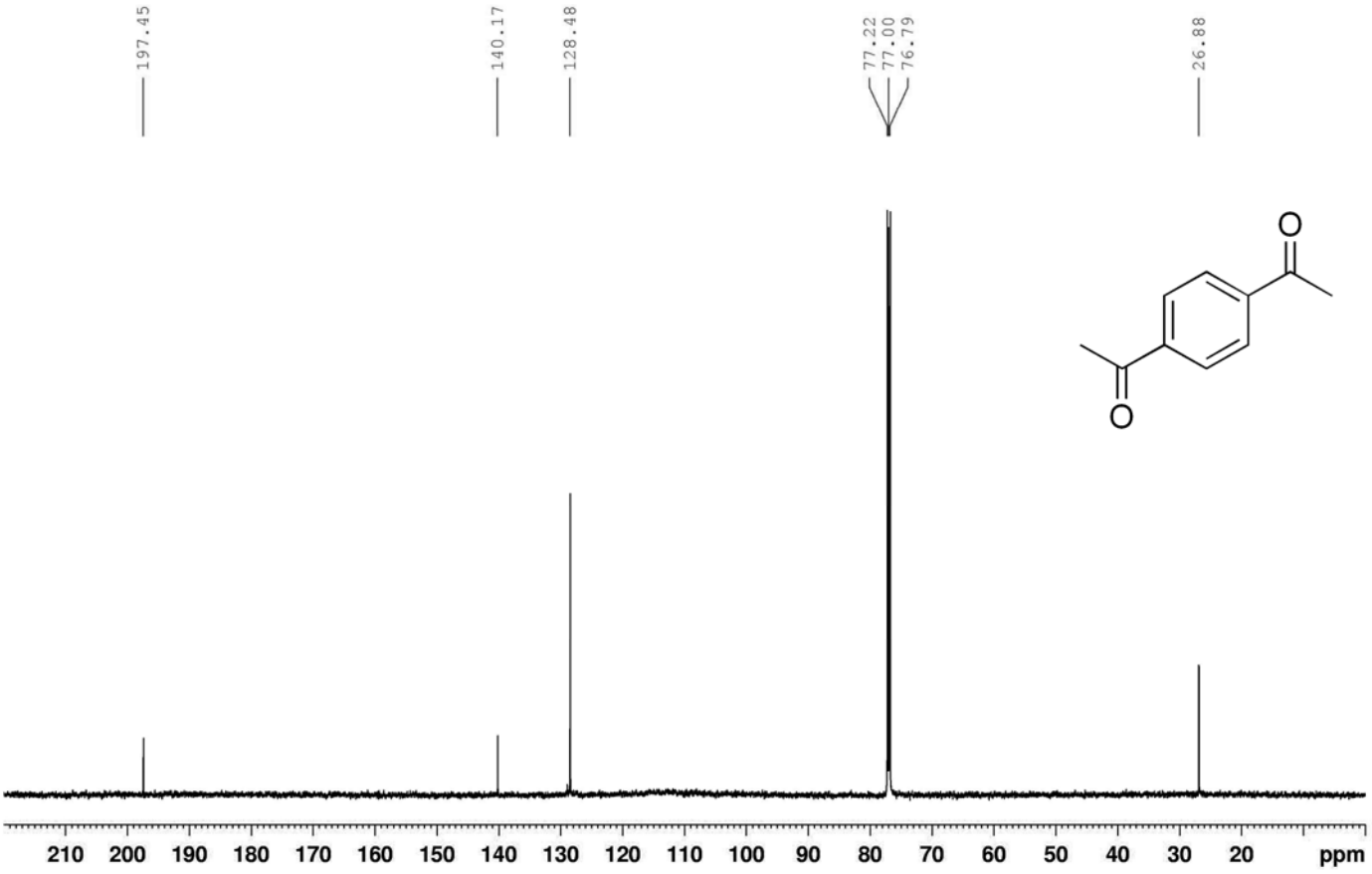
1-(4-Methoxyphenyl)ethanone (3cj)



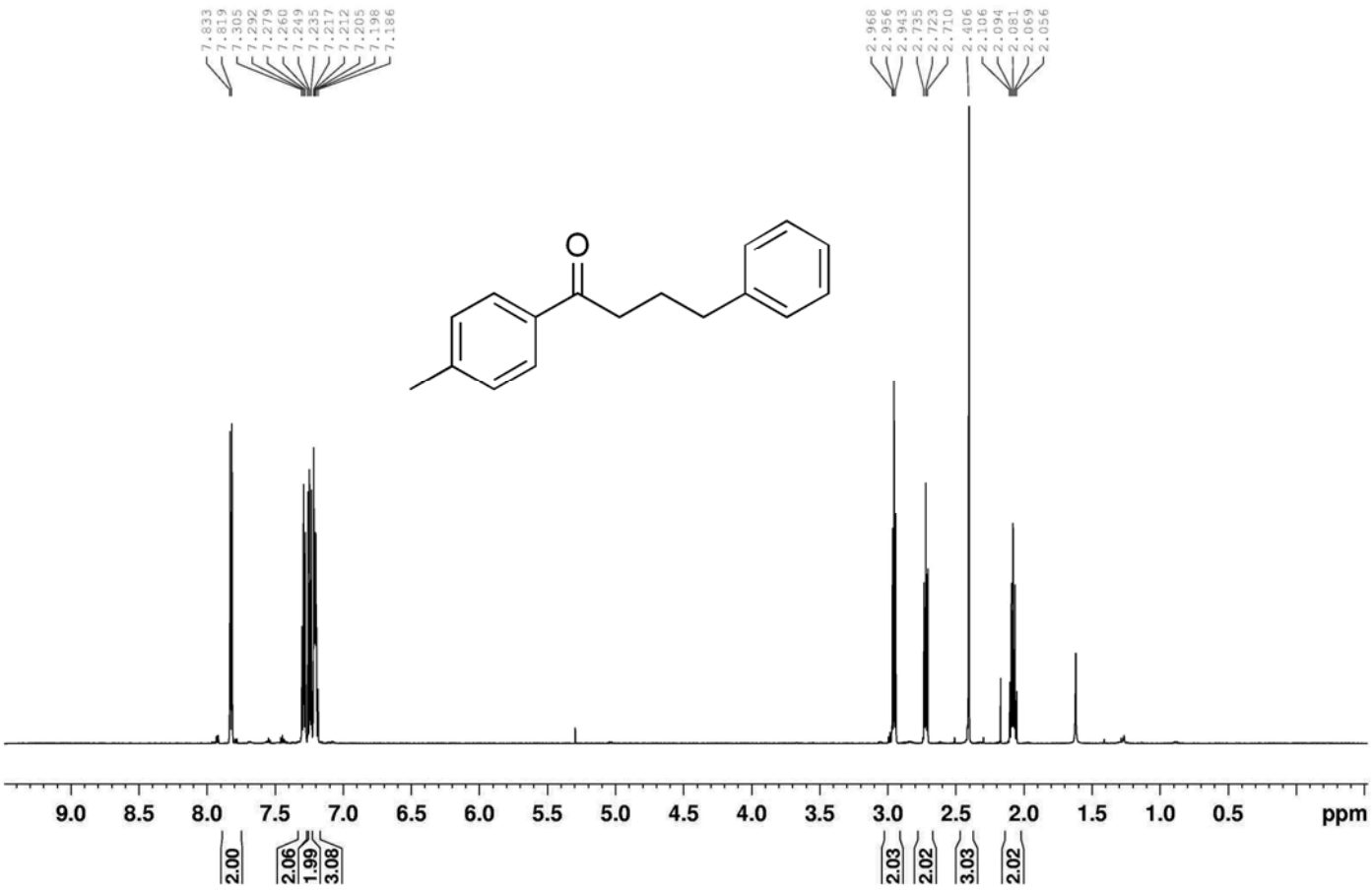


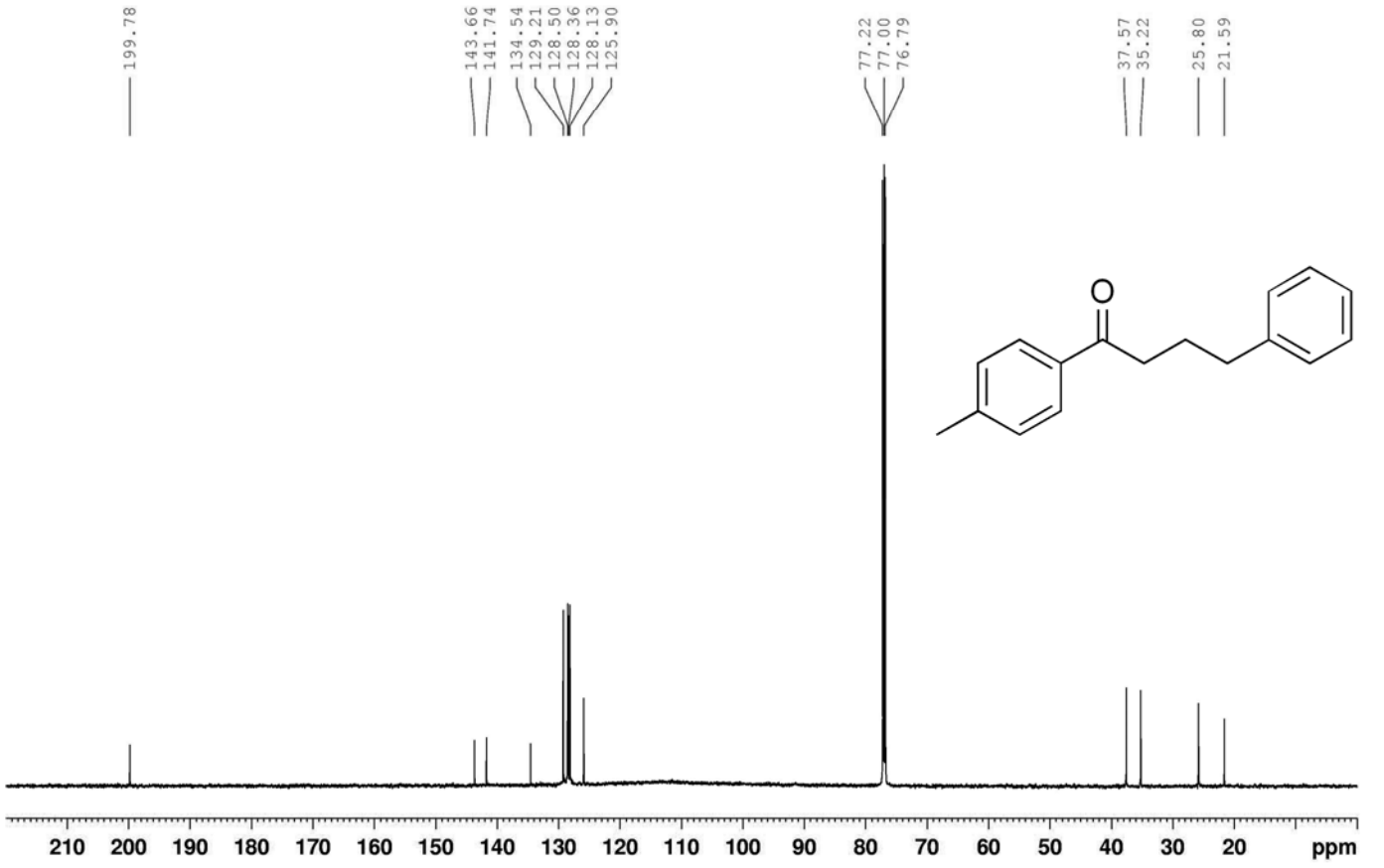
1,1'-(1,4-Phenylene)diethanone (3ej)



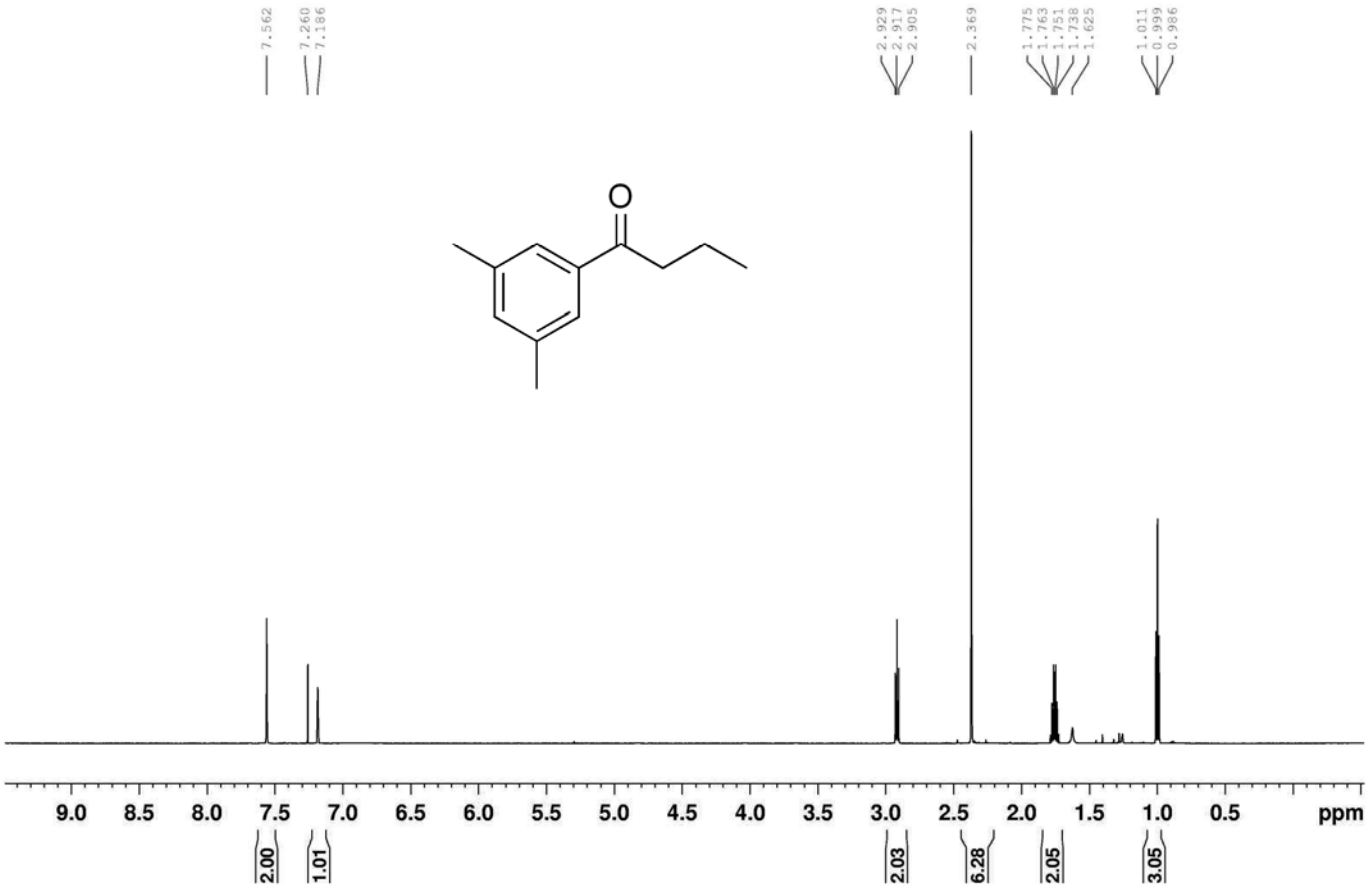


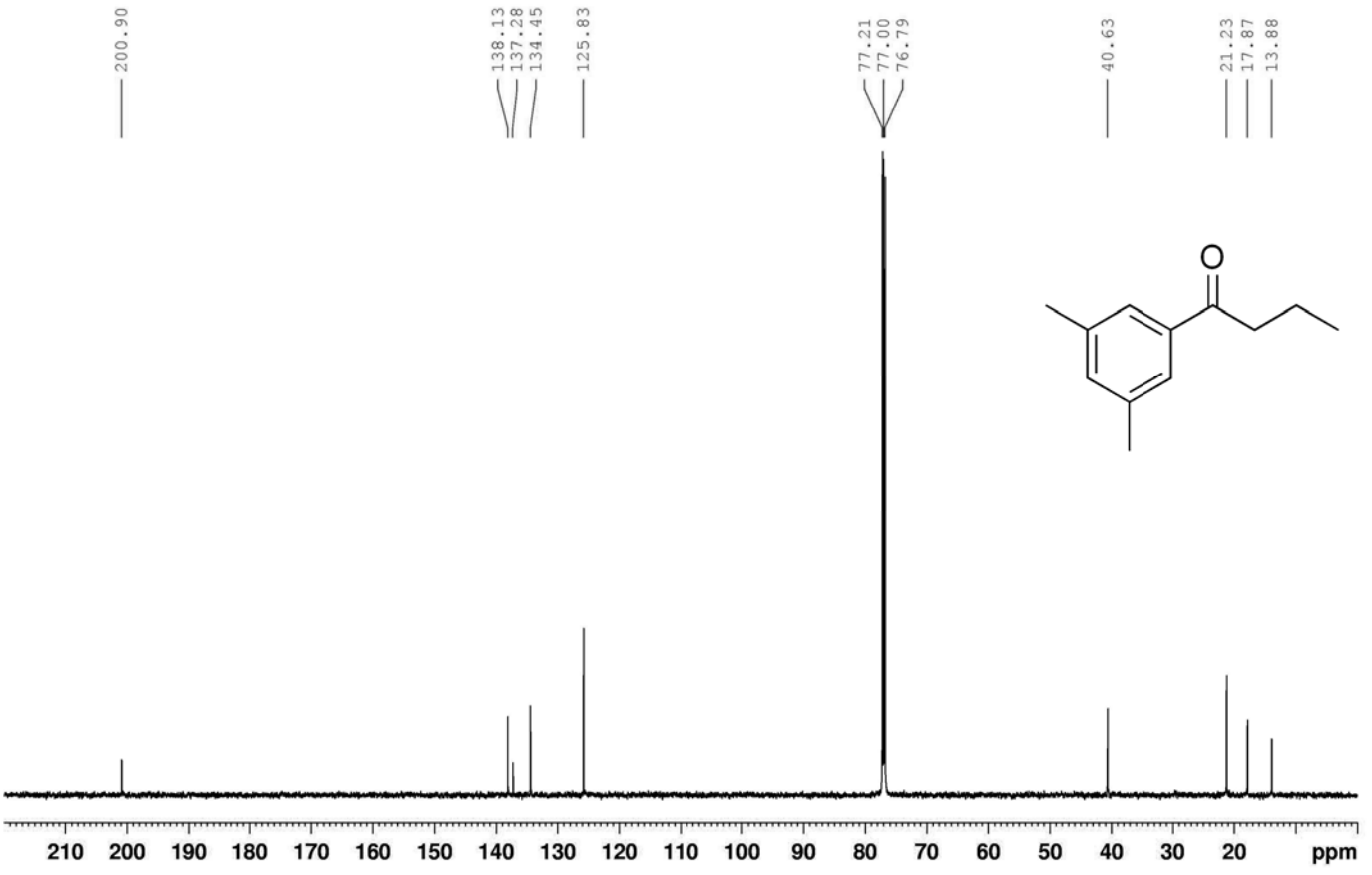
4-Phenyl-1-(p-tolyl)butan-1-one (3bn)



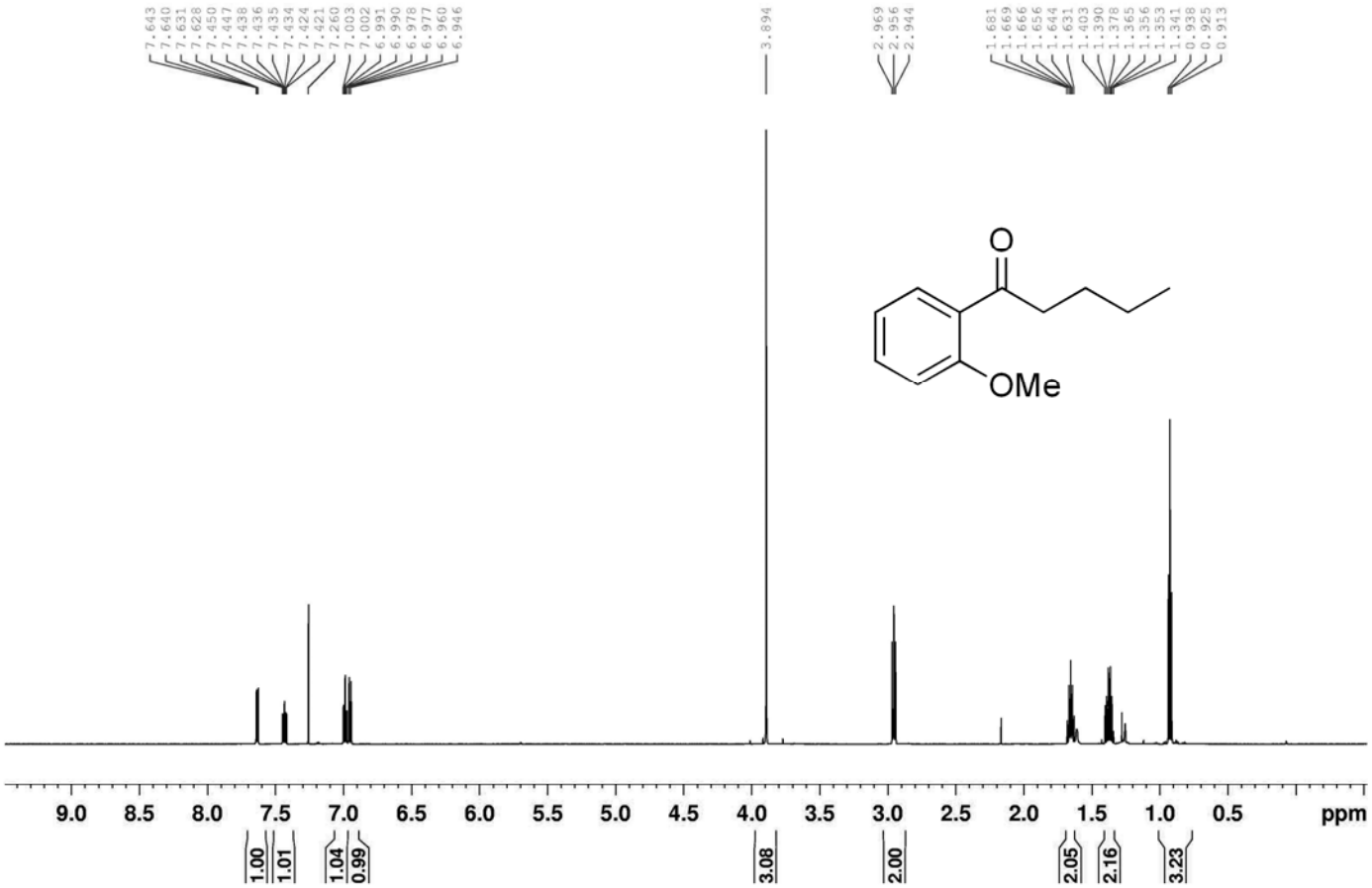


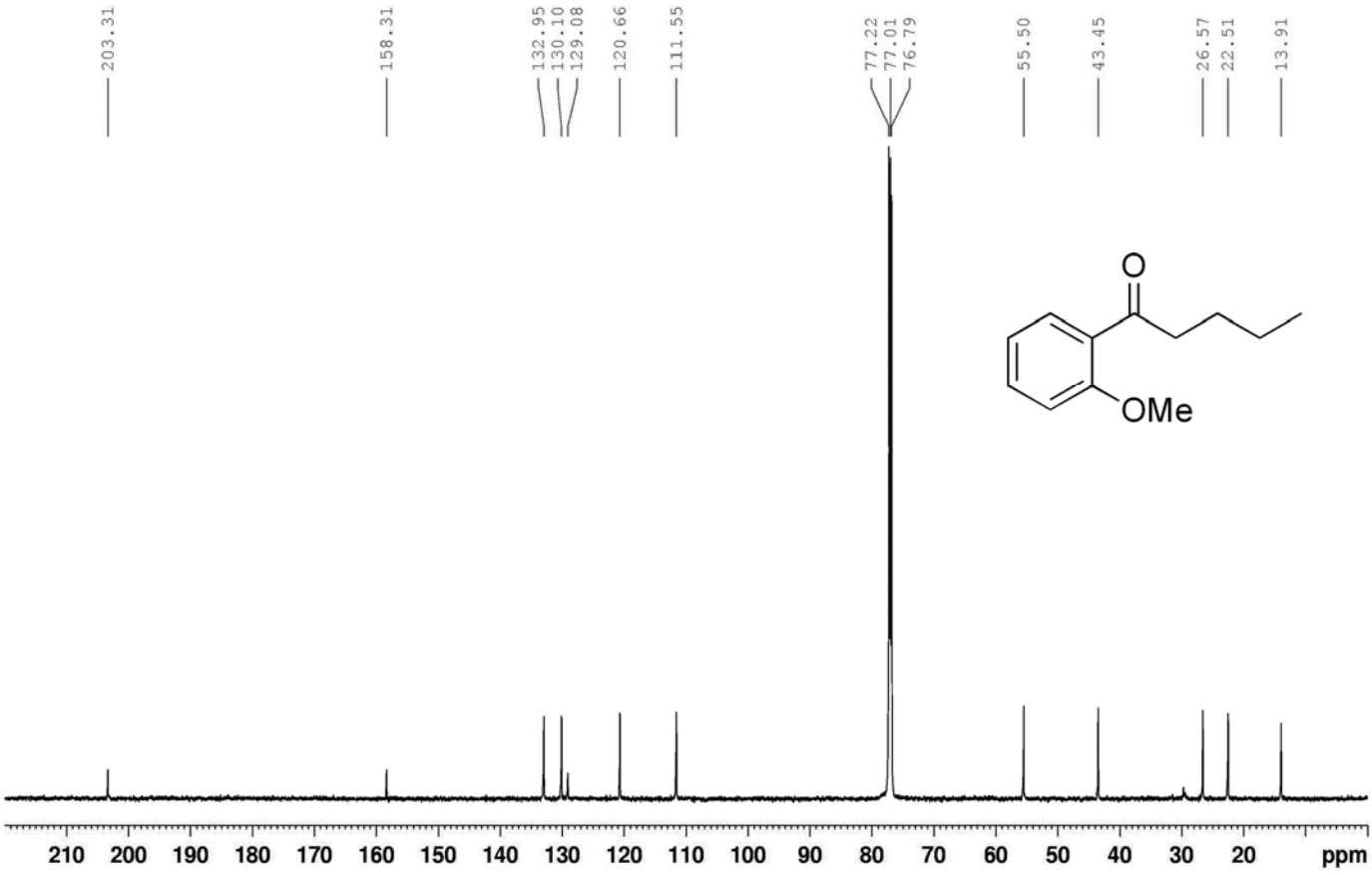
1-(3,5-Dimethylphenyl)butan-1-one (3gl)



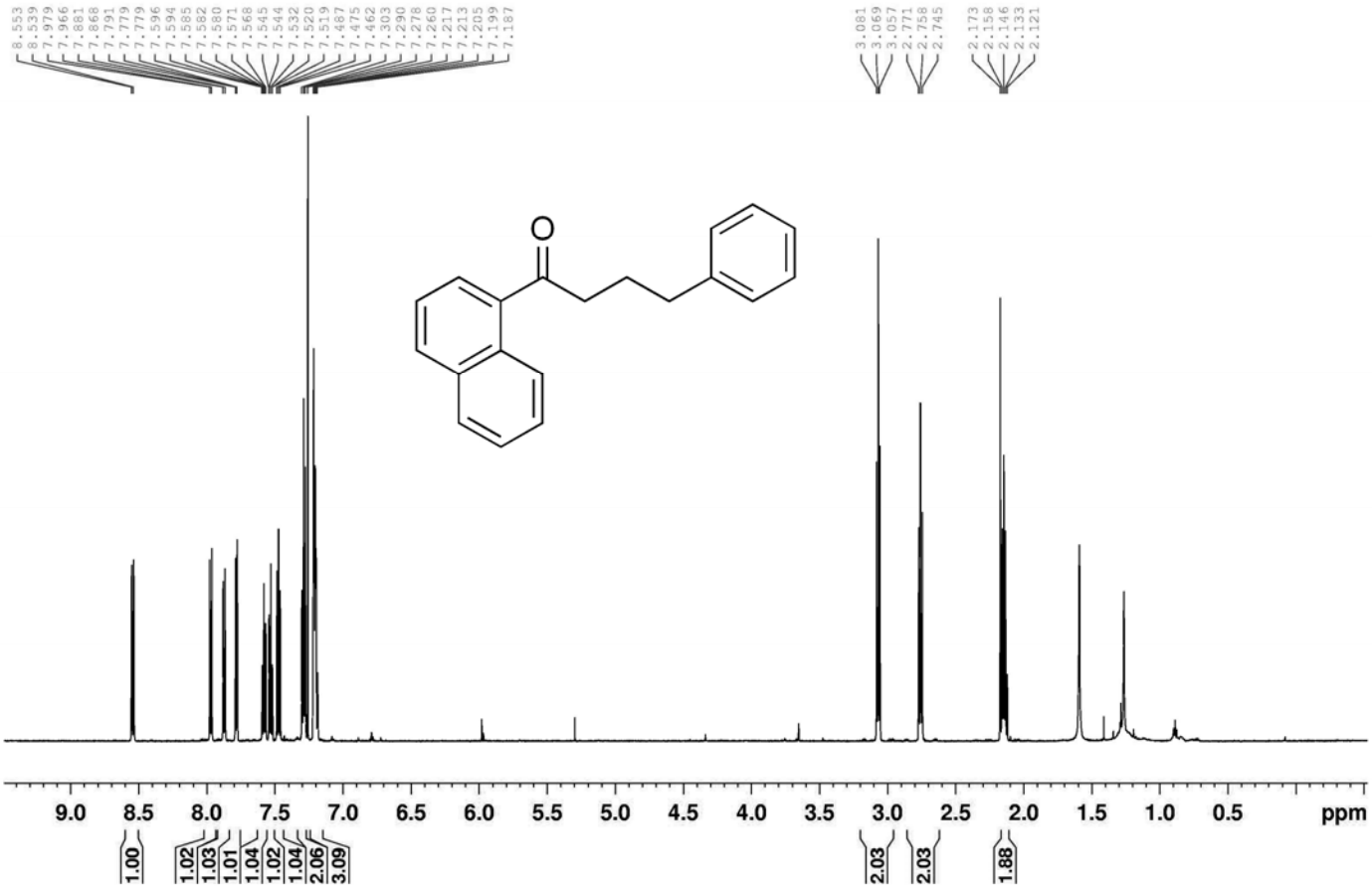


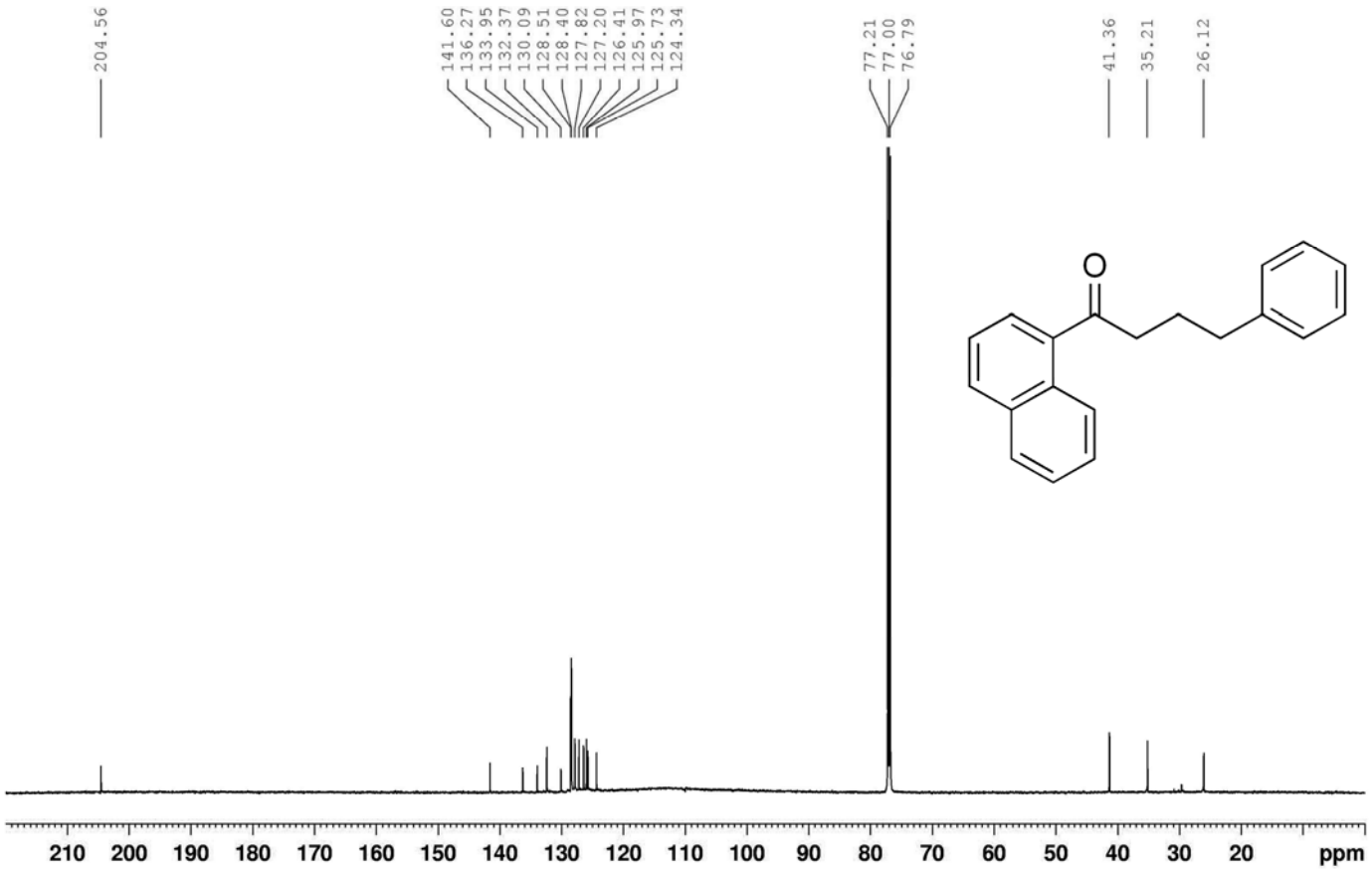
1-(2-Methoxyphenyl)pentan-1-one (3kl)



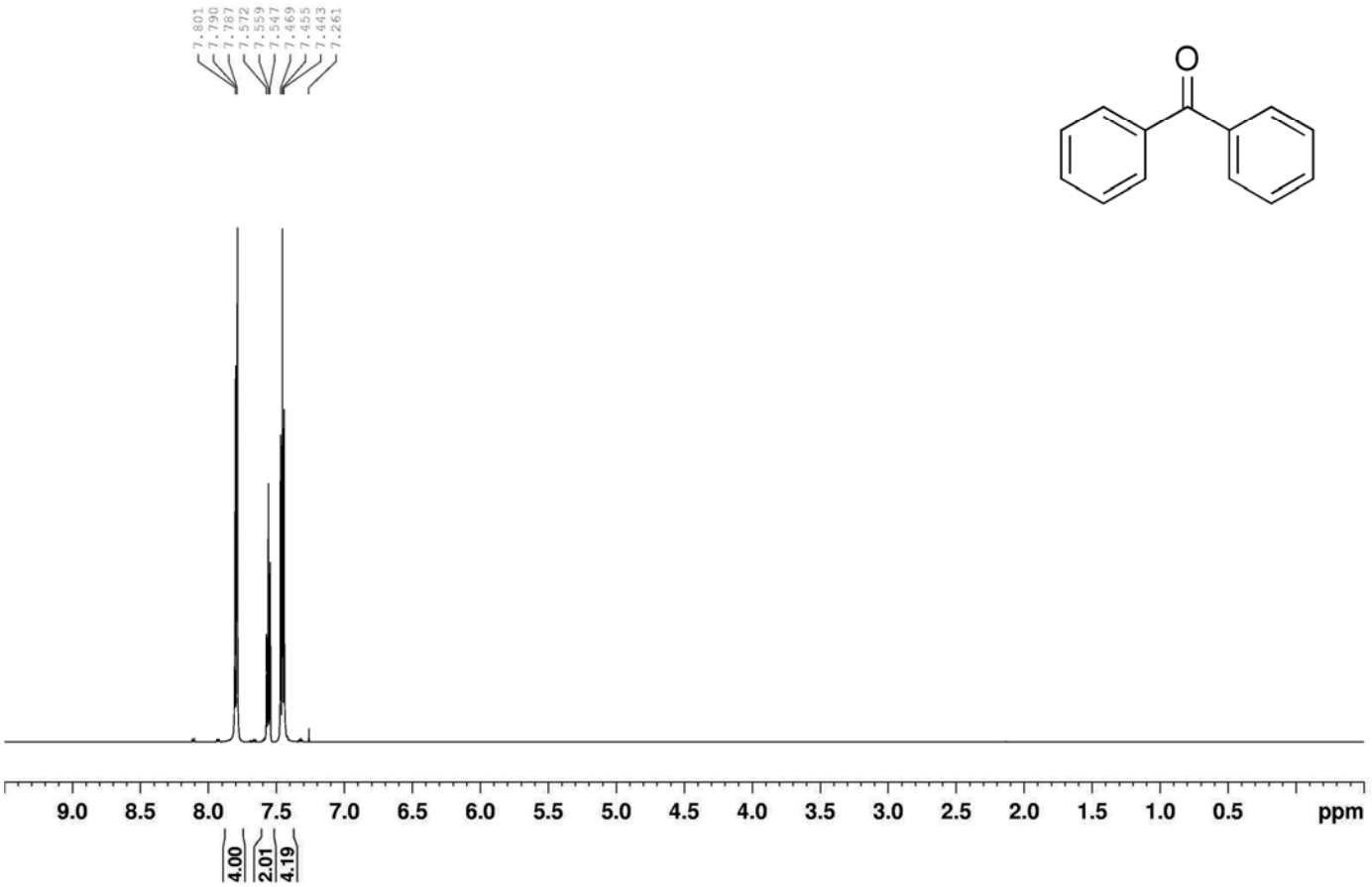


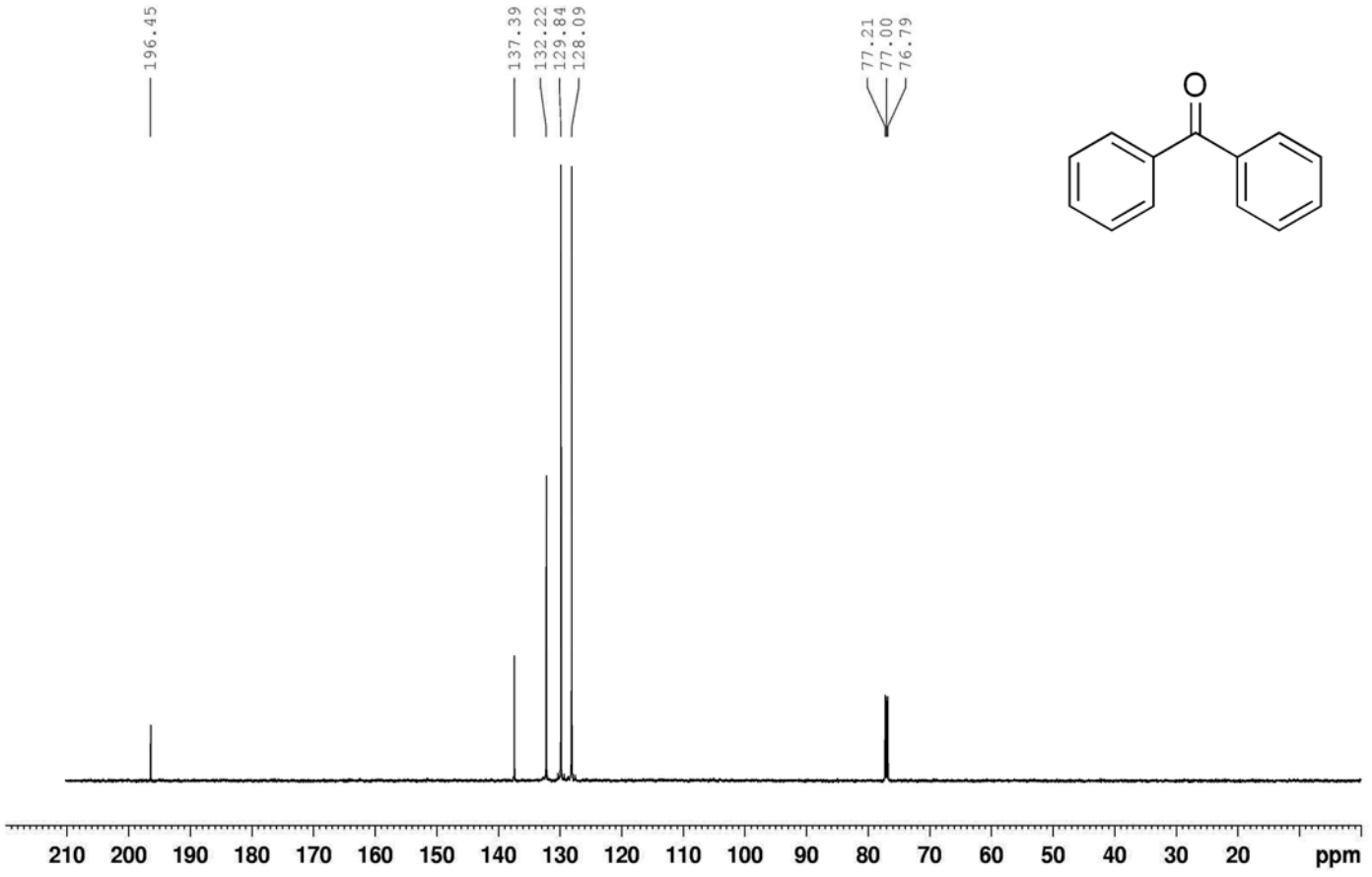
1-(Naphthalen-1-yl)-4-phenylbutan-1-one (3nn)



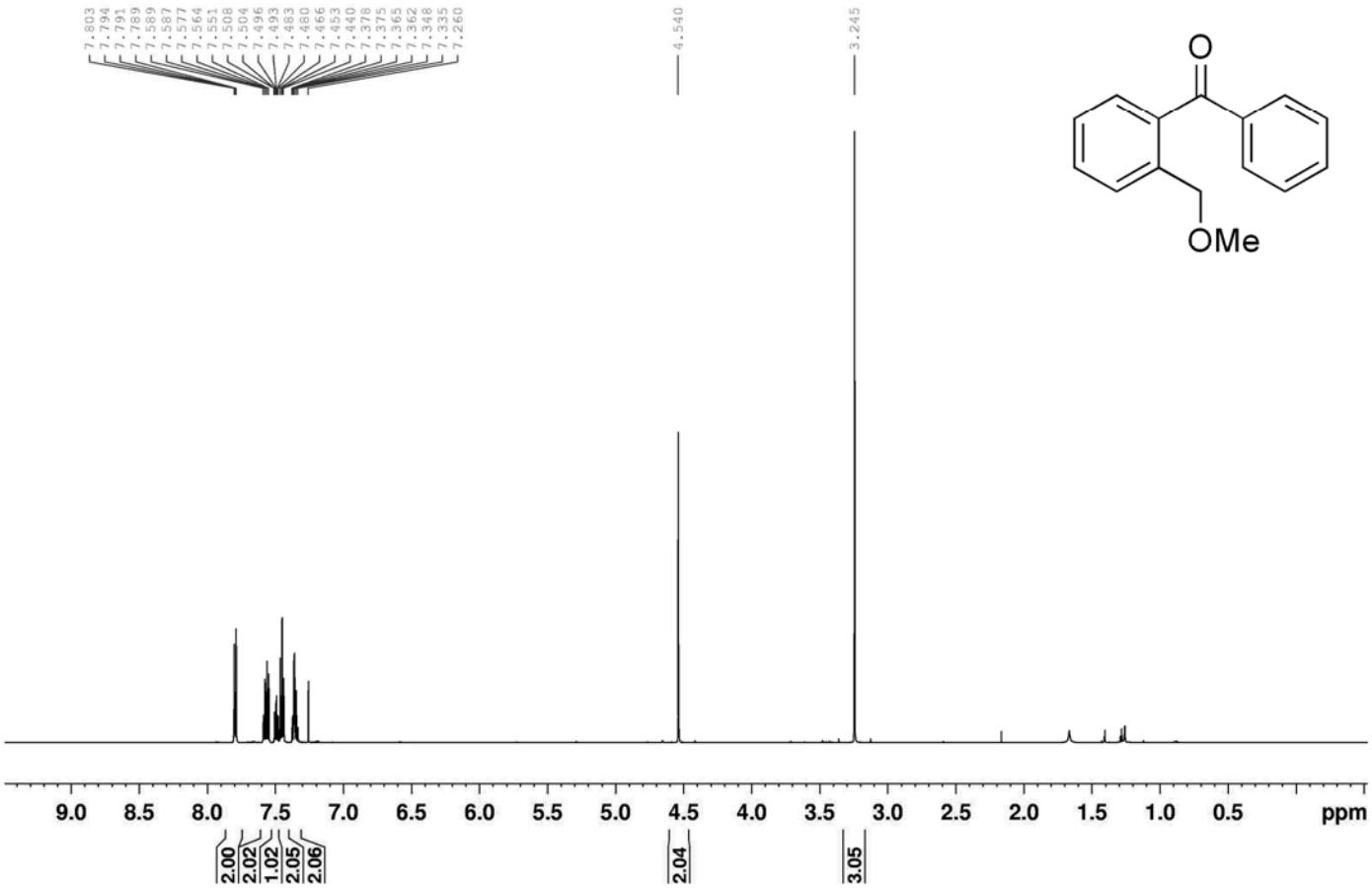


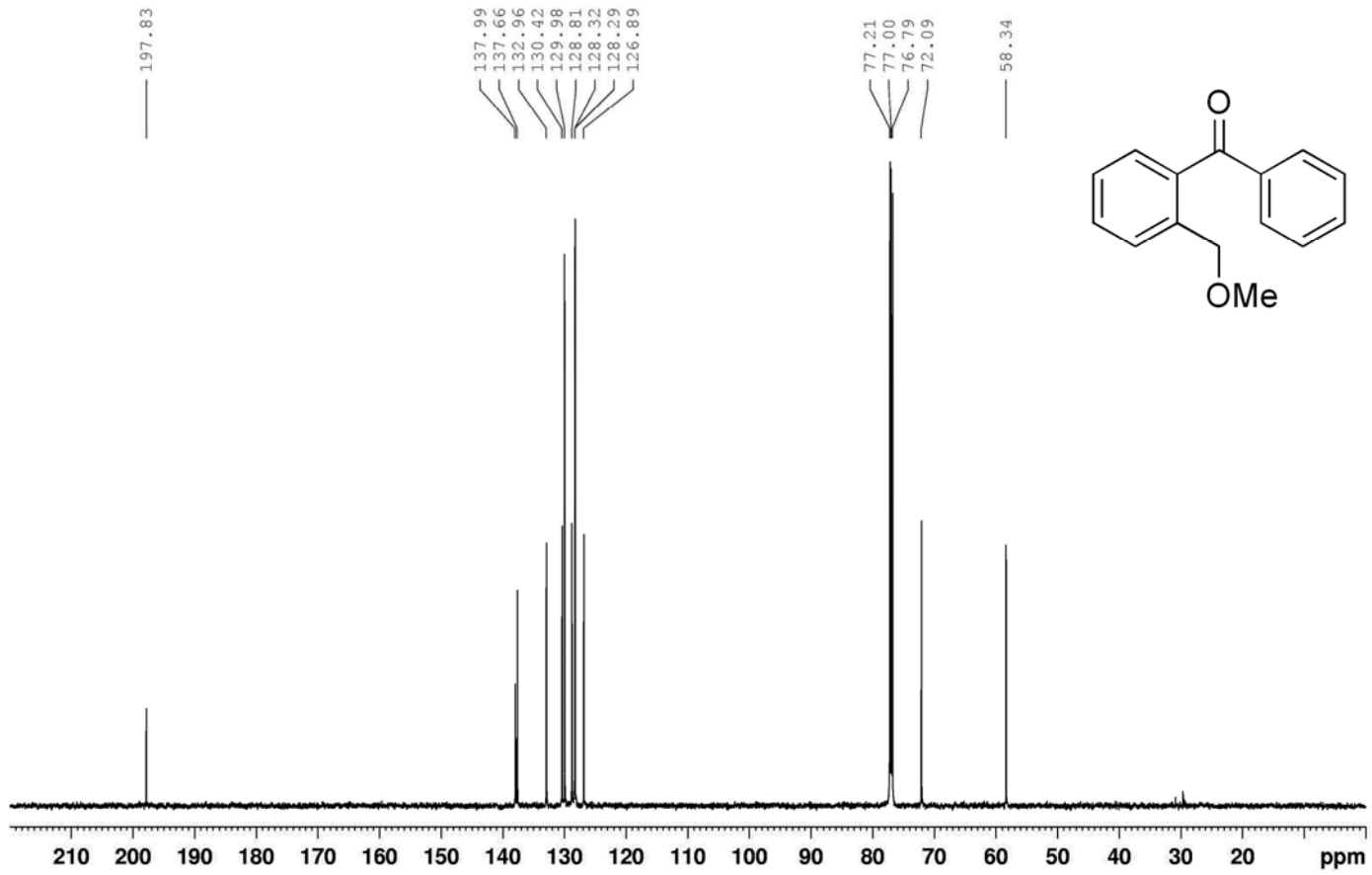
Benzophenone (3ar)



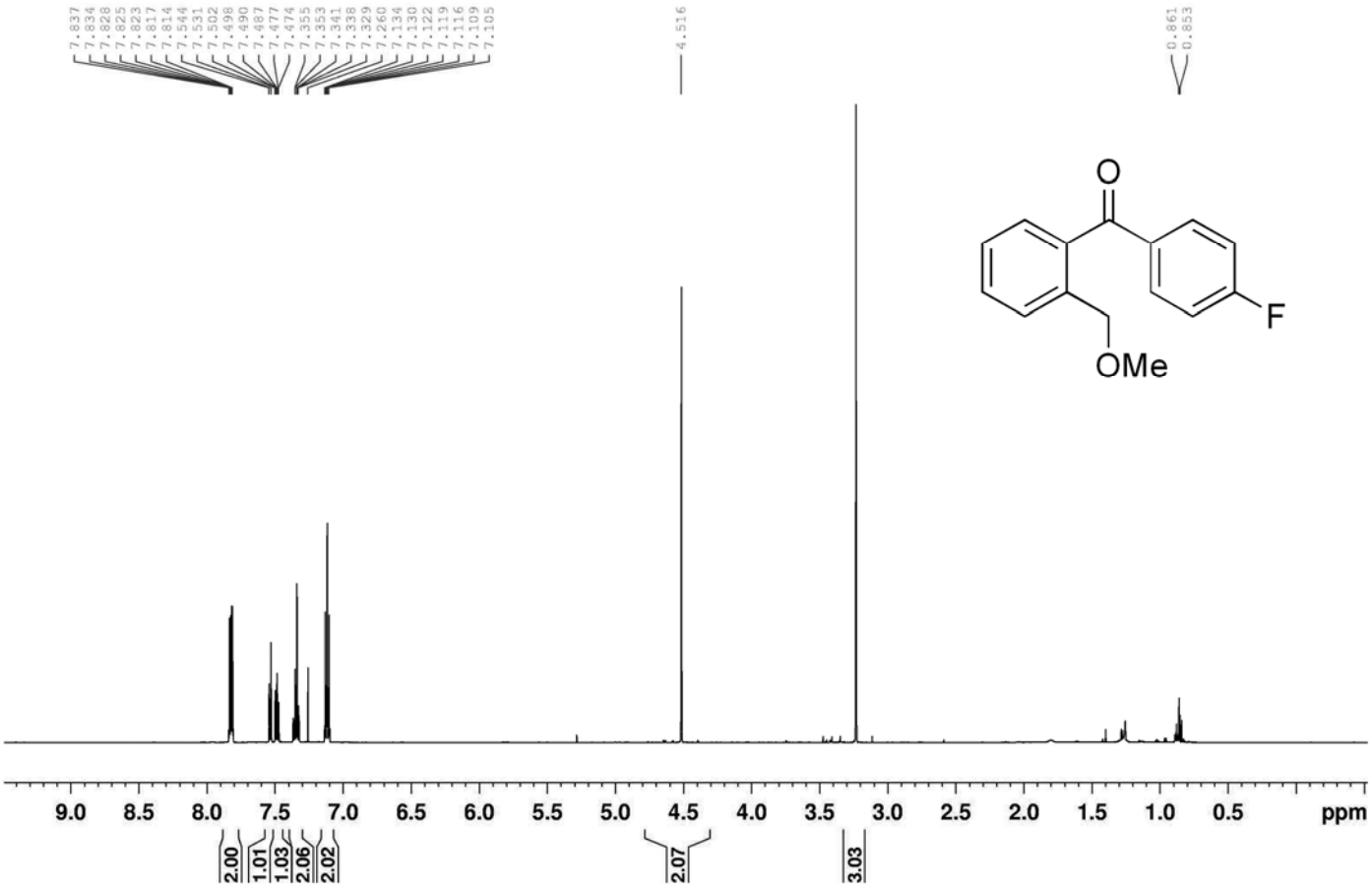


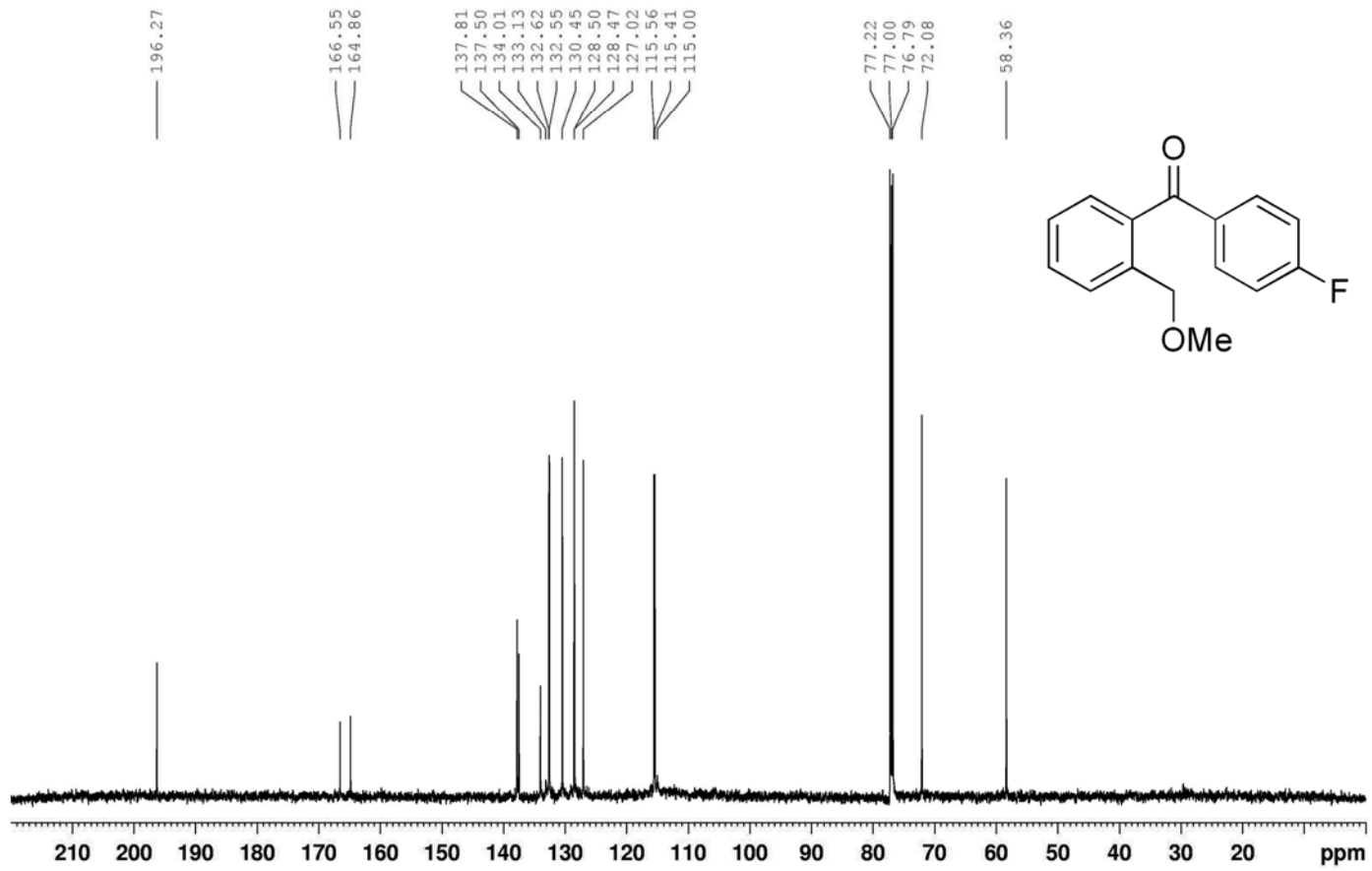
(2-(Methoxymethyl)phenyl)(phenyl)methanone (3lr)



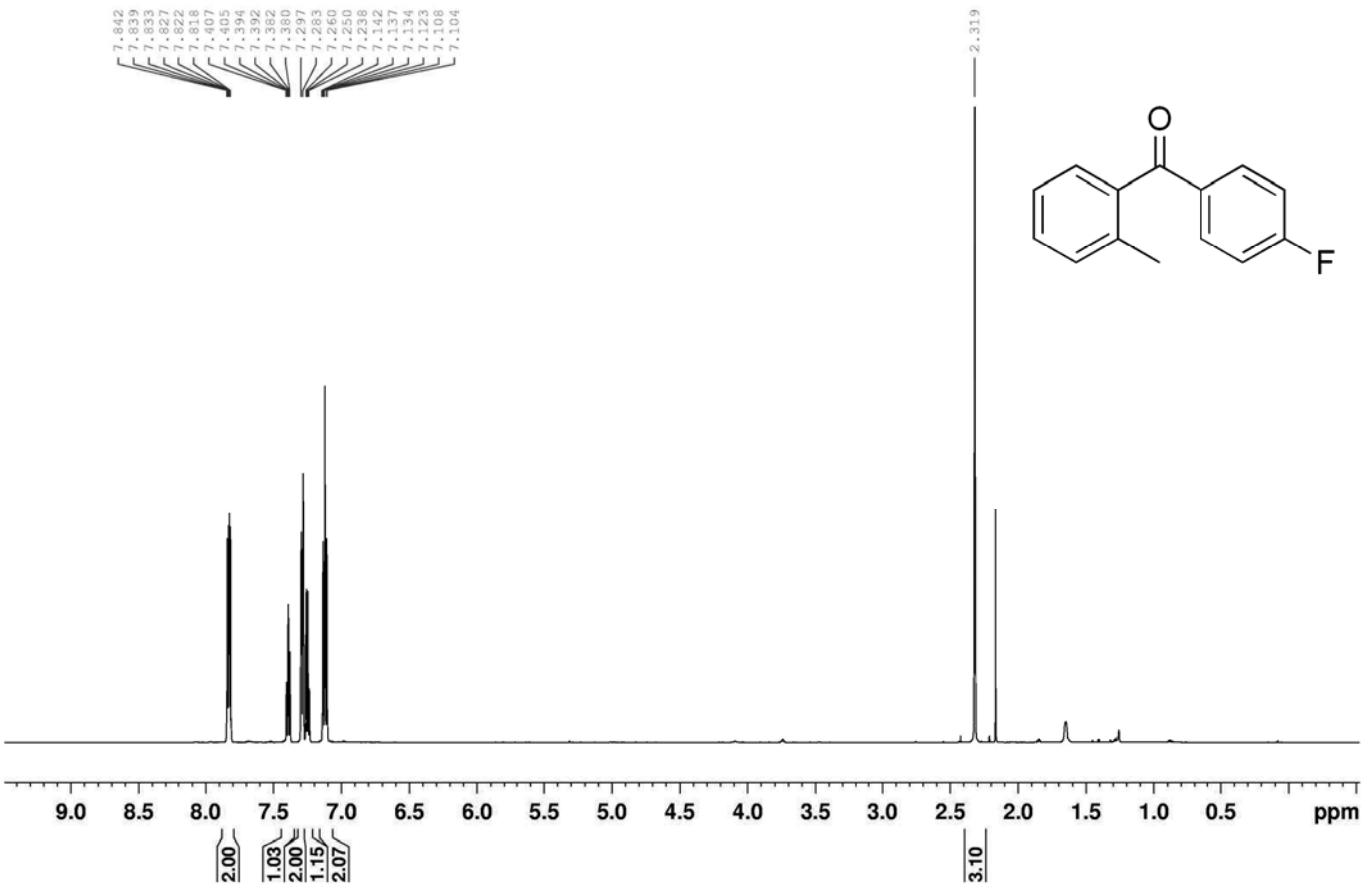


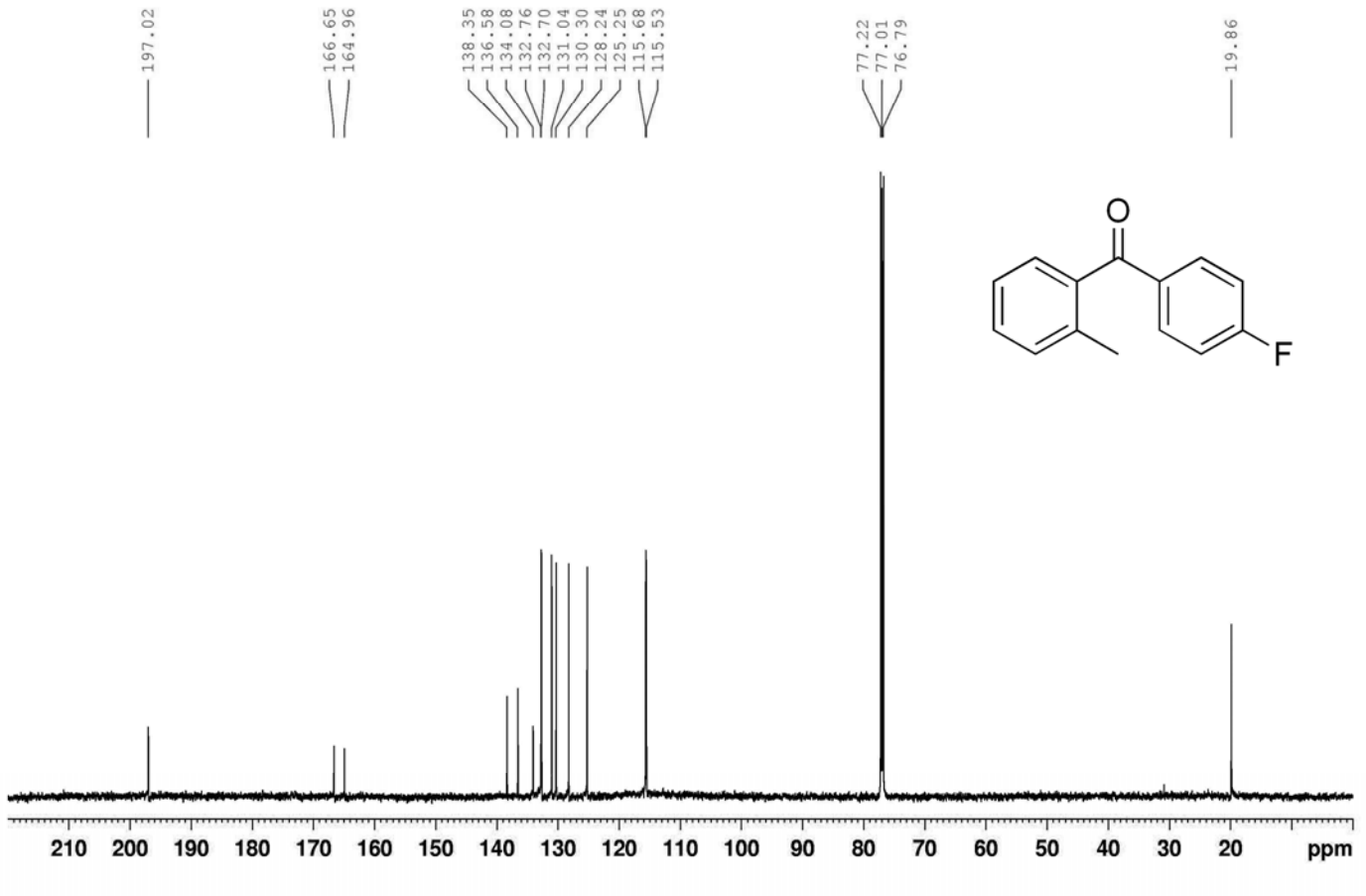
(4-Fluorophenyl)(2-(methoxymethyl)phenyl)methanone (3ls)



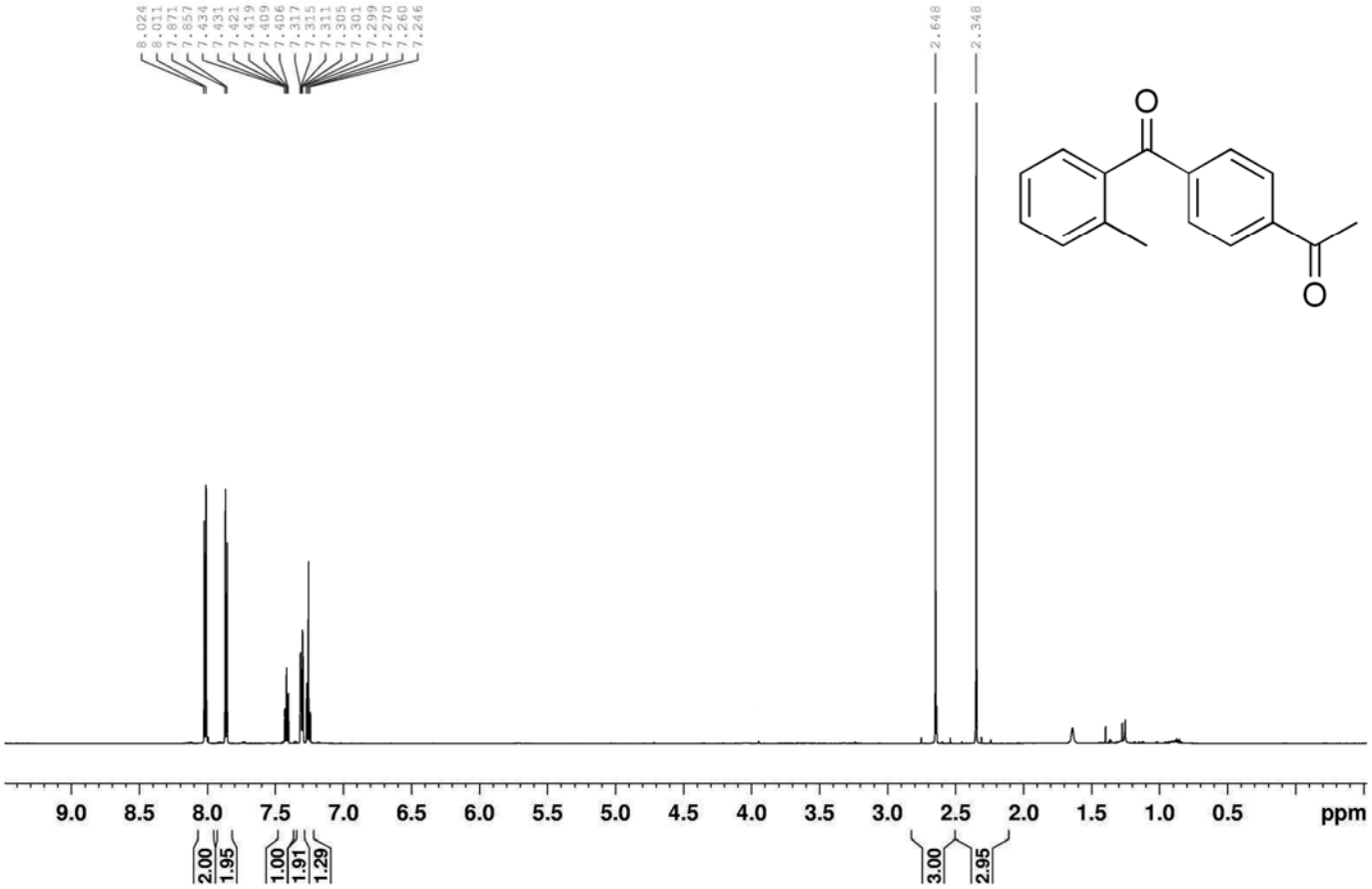


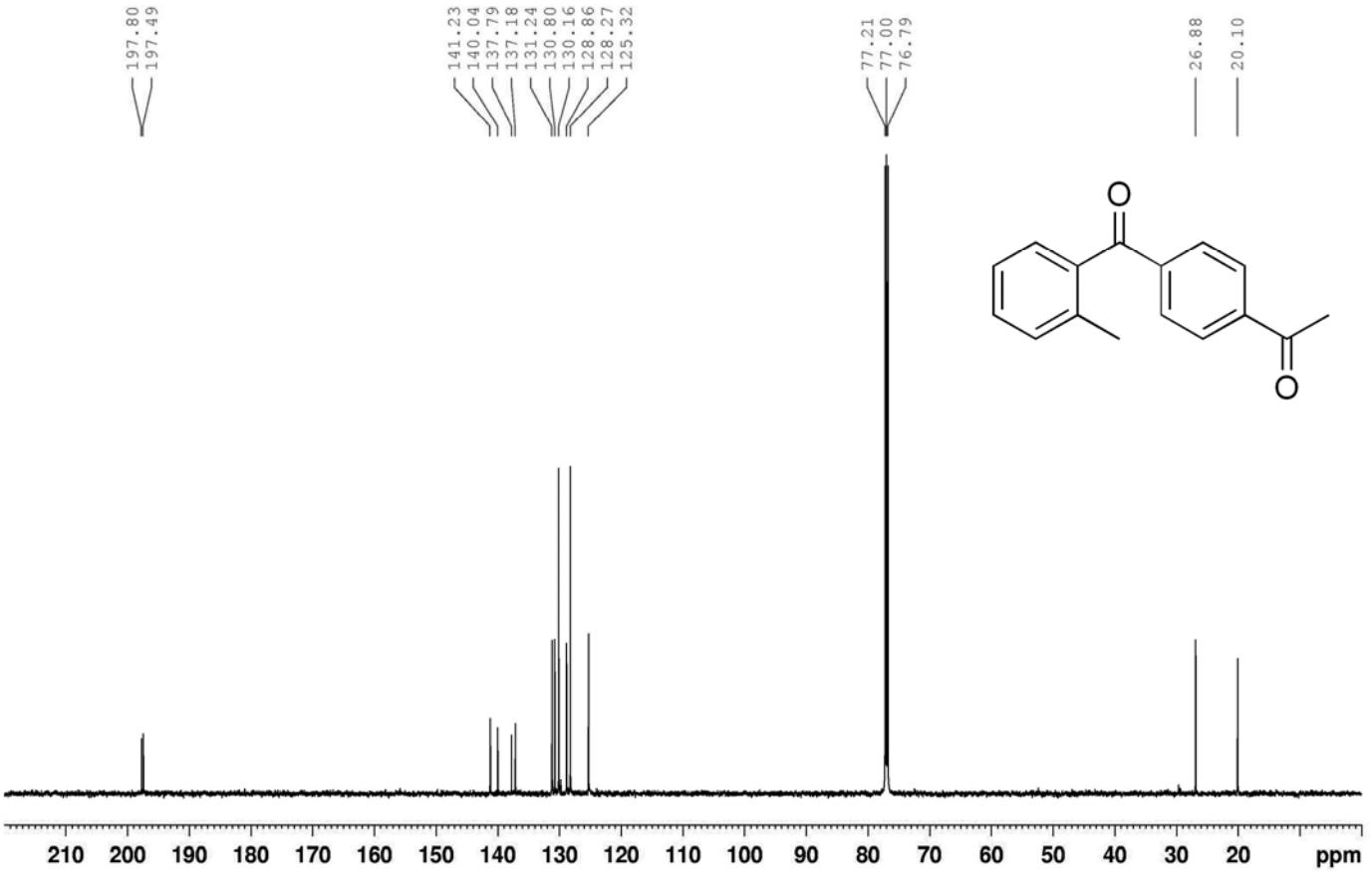
(4-Fluorophenyl)(o-tolyl)methanone (3js)



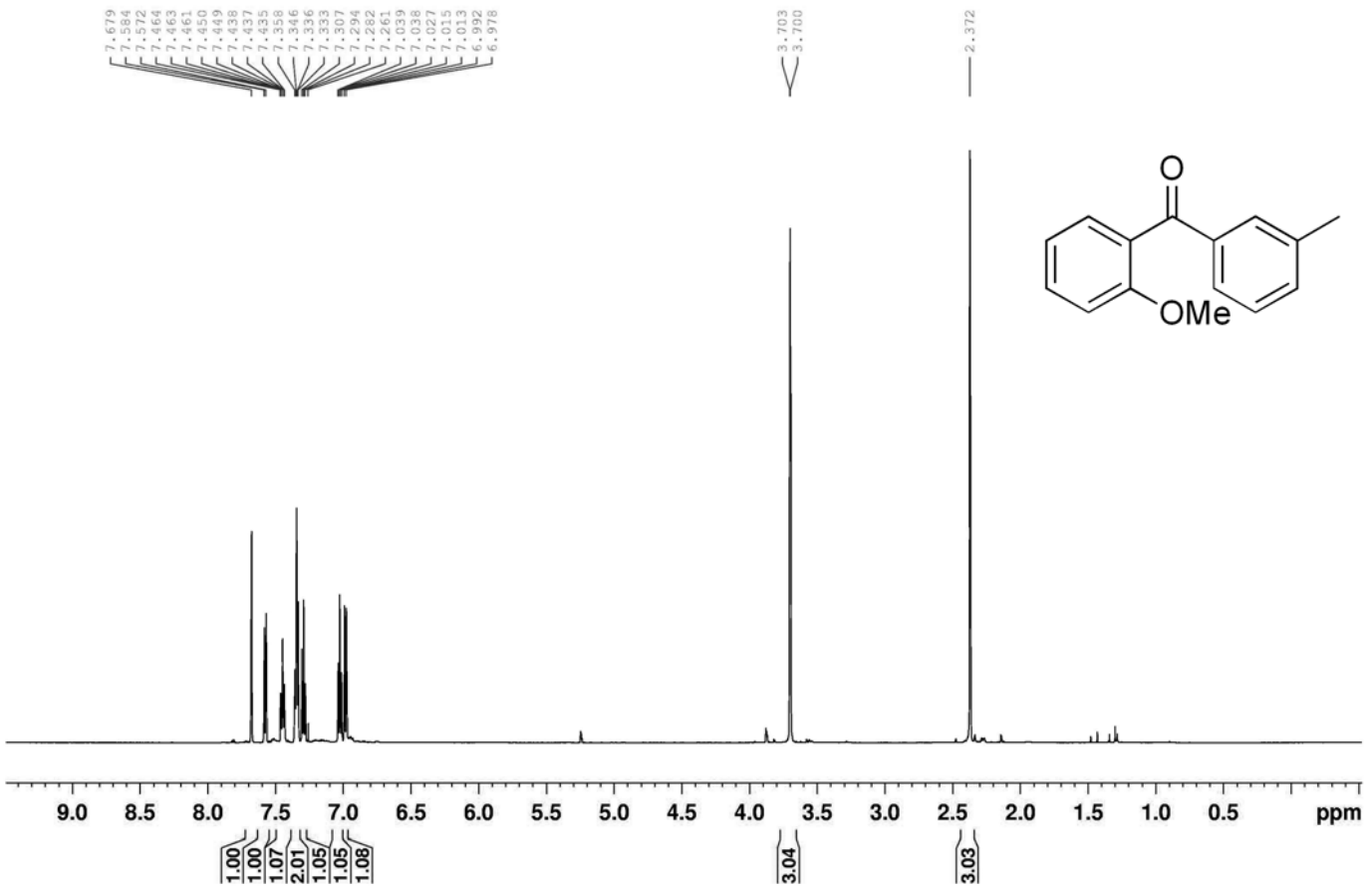


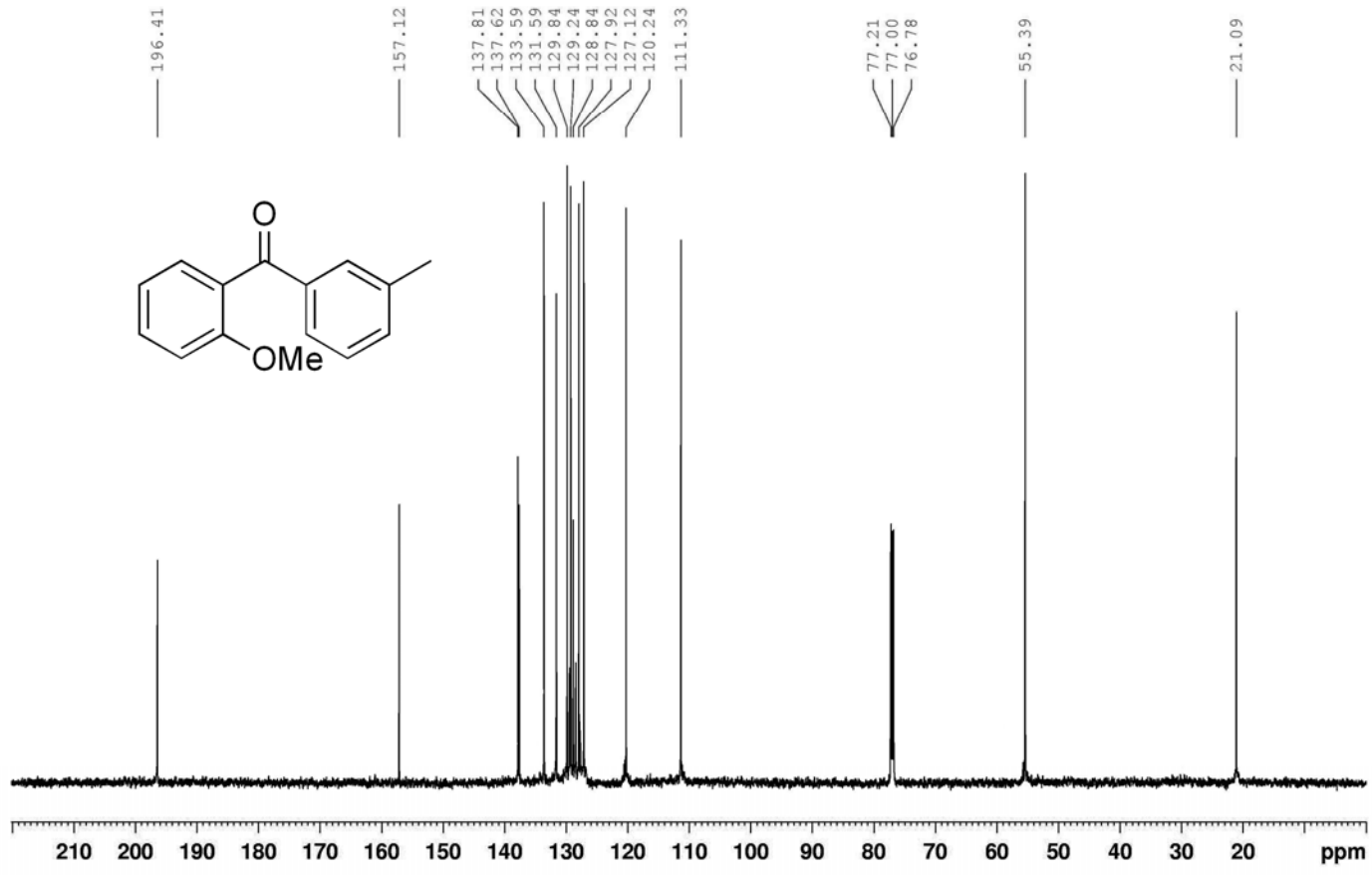
1-(4-(2-Methylbenzoyl)phenyl)ethanone (3jt)



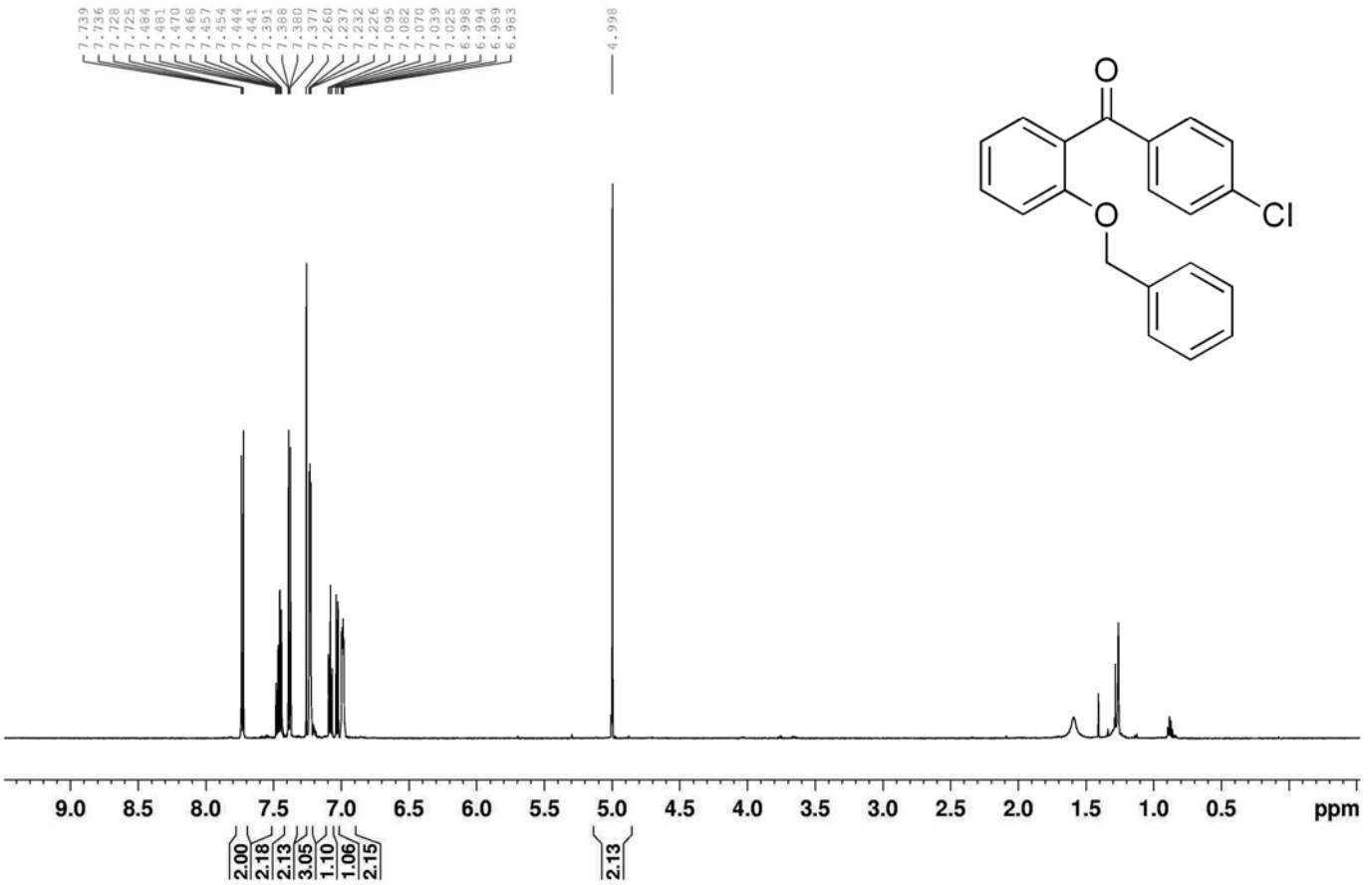


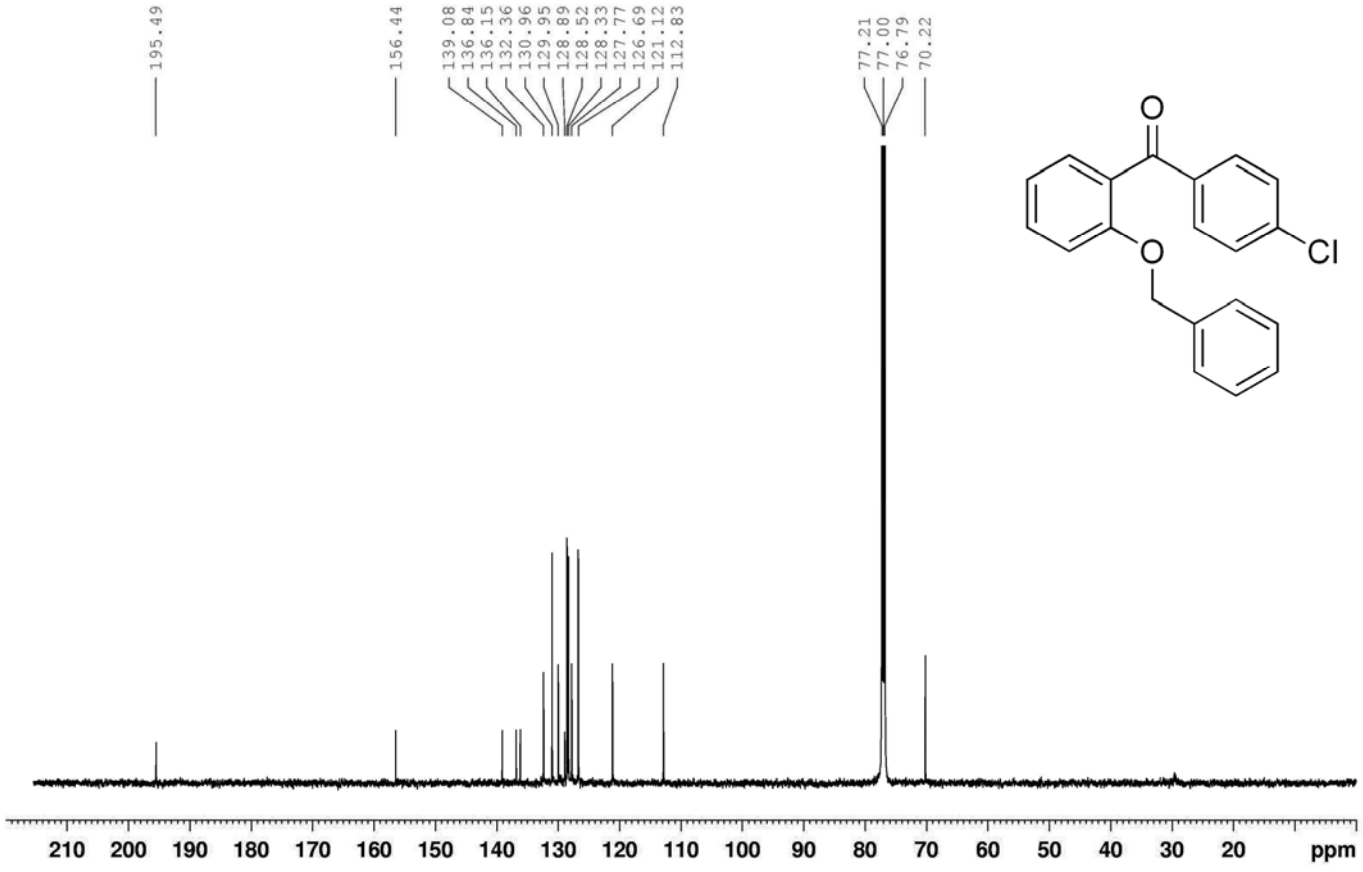
(2-Methoxyphenyl)(m-tolyl)methanone (3kv)





(2-(Benzyloxy)phenyl)(4-chlorophenyl)methanone (3mu)





1-(2-Hydroxyphenyl)ethanone (3’j)