Supplementary Information

Ru(II)/PEG-400 as a Highly Efficient and Recyclable Catalytic Media for Annulation and Olefination Reactions *via* C-H Bond Activation

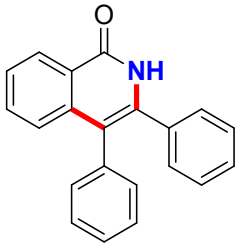
Subhash L. Yedage and Bhalchandra M. Bhanage*

Department of Chemistry, Institute of Chemical Technology,Matunga, Mumbai–400019, India.

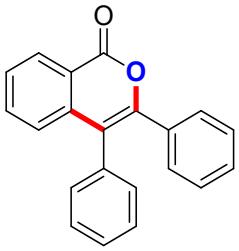
Tel.: +91-22-33612603; Fax: +91-22-33611020

E-mail: bm.bhanage@gmail.com, bm.bhanage@ictmumbai.edu.in

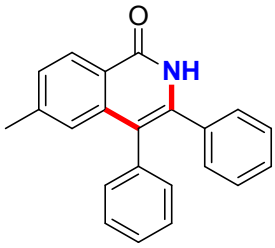
S1. Spectral data of the obtained compounds



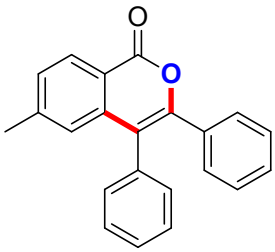
3,4-diphenylisoquinolin-1(2*H*)-one (1aa). ^{1}H NMR (400 MHz, $CDCl_3$) δ 9.05 (s, 1H), 8.45 (s, 1H), 7.69 – 6.46 (m, 13H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 163.2, 139.6, 138.6, 136.9, 135.7, 135.0, 132.7, 131.8, 129.1, 128.6, 128.4, 127.5, 127.3, 126.6, 125.7, 125.1, 114.0. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3063, 2922, 2852, 1638, 1599, 1492, 1442, 916, 753, 687. **LRMS**; *m/z*. 297.40 [M^+], calcd 297.35.



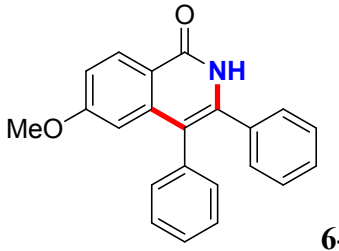
3,4-diphenyl-1*H*-isochromen-1-one (8aa). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.39 (d, J = 7.9 Hz, 1H), 7.61 (d, J = 7.4 Hz, 1H), 7.51 (d, J = 7.8 Hz, 1H), 7.45 – 6.97 (m, 11H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 162.3, 150.9, 138.8, 134.6, 134.2, 132.8, 131.2, 129.5, 129.2, 129.0, 128.9, 128.1, 128.1, 127.8, 125.3, 120.4, 116.9. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3049, 2920, 2851, 1736, 1723, 1603, 1310, 1178, 757, 781, 686. **GCMS (EI, 70 eV) *m/z* (%)** 298.25 (61.35) $[M]^+$, 270.20 (22.98), 221.15 (38.29), 193.10 (16.05), 165.15 (31.90), 105.10 (100), 77.05 (65.69), 44.00 (55.44).



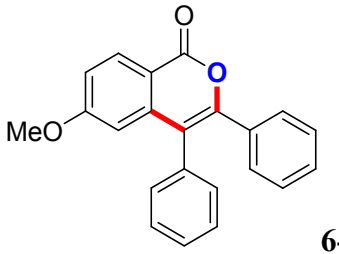
6-methyl-3,4-diphenylisoquinolin-1(2*H*)-one (1ba). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.93 (s, 1H), 8.35 (d, J = 8.2 Hz, 1H), 7.39 – 7.01 (m, 12H), 2.35 (s, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 162.5, 143.4, 138.7, 136.9, 135.8, 135.2, 131.8, 129.1, 128.6, 128.3, 128.2, 127.5, 127.2, 125.4, 122.9, 117.1, 22.1. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3071, 3021, 2900, 1650, 1615, 1488, 1343, 1032, 888, 832, 767, 784, 698, 677. **LRMS**; *m/z*. 311.40 $[M^+]$, calcd 311.38.



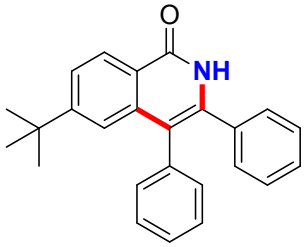
6-methyl-3,4-diphenyl-1*H*-isochromen-1-one (8ba). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.28 (d, J = 8.1 Hz, 1H), 7.40 – 7.14 (m, 12H), 6.94 (s, 1H), 2.35 (s, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 162.3, 150.9, 145.7, 138.8, 134.4, 132.9, 131.2, 129.5, 129.5, 129.2, 128.9, 128.8, 128.0, 127.8, 125.2, 118.0, 116.8, 22.2. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3058, 2917, 2849, 1726, 1606, 1557, 1481, 1441, 1317, 1293, 1172, 1072, 1047, 1027, 966, 889, 779, 769, 724. **GCMS (EI, 70 eV) *m/z* (%)** 312.25 (33.51) $[M]^+$, 284.20 (11.63), 235.15 (22.25), 207.10 (22.27), 178.15 (17.75), 152.15 (11.11), 105.05 (73.69), 77.05 (47.89), 44.00 (100).



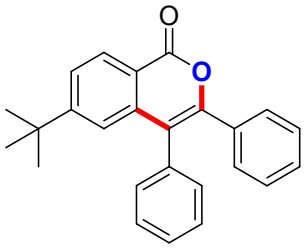
6-methoxy-3,4-diphenylisoquinolin-1(2*H*)-one (1ca). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.86 (s, 1H), 8.40 (d, J = 8.9 Hz, 1H), 7.65 – 6.97 (m, 13H), 3.71 (s, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 163.1, 162.3, 152.7, 140.8, 137.5, 135.6, 131.7, 129.6, 129.0, 128.7, 128.4, 128.4, 127.3, 123.4, 117.1, 115.4, 107.6, 55.3. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3165, 2923, 2854, 1638, 1607, 1455, 1274, 1055, 1033, 869, 779, 694. **LRMS**; *m/z*. 327.30 [M^{+}], calcd 327.38.



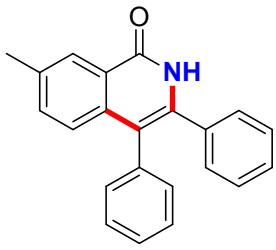
6-methoxy-3,4-diphenyl-1*H*-isochromen-1-one (8ca). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.32 (d, J = 8.8 Hz, 1H), 7.47 – 6.96 (m, 10H), 6.55 (d, J = 2.3 Hz, 1H), 3.73 (s, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 164.6, 141.2, 134.4, 132.9, 131.9, 131.1, 129.1, 129.0, 128.9, 128.1, 127.8, 116.7, 115.6, 113.6, 108.4, 55.4. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 2919, 2849, 1715, 1601, 1485, 1464, 1441, 1365, 1259, 1228, 1070, 1014, 849, 829, 780, 765, 724. **GCMS (EI, 70 eV) *m/z* (%)** 328.20 (5.69) [M]$^{+}$, 207.10 (12.11), 163.15 (22.68), 135.10 (15.58), 111.20 (20.88), 97.10 (40.19), 71.10 (38.84), 44.00 (100).



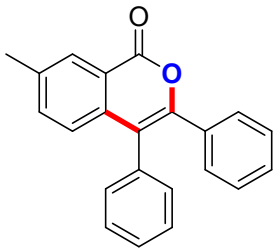
6-(*tert*-butyl)-3,4-diphenylisoquinolin-1(2*H*)-one (1da). ^{1}H NMR (400 MHz, $CDCl_3$) δ 9.72 (s, 1H), 8.41 (d, J = 8.5 Hz, 1H), 8.04 – 6.80 (m, 12H), 1.23 (s, 9H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 161.5, 156.3, 138.6, 136.9, 135.7, 131.8, 129.9, 129.3, 128.5, 128.3, 127.3, 127.2, 125.2, 124.8, 121.7, 117.9, 35.3, 30.9. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 2959, 2921, 2851, 1655, 1610, 1489, 1280, 1028, 973, 771, 706, 694. **LRMS**; *m/z*. 353.30 [M^{+}], calcd 353.46.



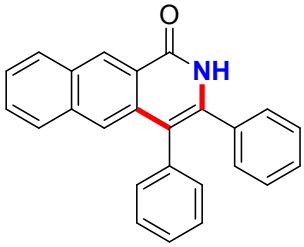
6-(*tert*-butyl)-3,4-diphenyl-1*H*-isochromen-1-one (8da). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.31 (d, J = 8.2 Hz, 1H), 7.57 – 7.18 (m, 12H), 1.22 (s, 9H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 162.3, 158.5, 150.8, 138.7, 134.4, 133.1, 131.2, 129.3, 129.2, 128.9, 128.8, 128.0, 127.8, 125.9, 121.7, 117.9, 117.2, 35.5, 30.8. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 2956, 2921, 2851, 1725, 1605, 1463, 1363, 1197, 1073, 767, 705. **GCMS (EI, 70 eV) *m/z* (%)** 354.40 (100) $[M]^+$, 298.35 (60.42), 221.20 (25.12), 134.20 (8.74), 105.10 (98.92), 77.10 (40.85), 57.10 (27.44).



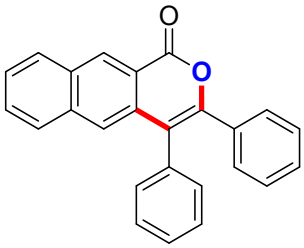
7-methyl-3,4-diphenylisoquinolin-1(*2H*)-one (1ea). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.82 (s, 1H), 8.27 (s, 1H), 7.54 – 6.92 (m, 12H), 2.48 (s, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 162.5, 136.8, 136.3, 135.8, 135.8, 135.1, 134.2, 131.7, 129.1, 128.5, 128.4, 128.3, 127.2, 127.0, 125.7, 124.9, 117.2, 21.3. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3028, 2921, 2851, 1641, 1620, 1489, 1446, 1345, 1102, 1026, 904, 830, 776. **LRMS**; *m/z*. 311.40 $[M^+]$, calcd 311.38.



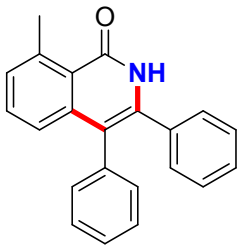
7-methyl-3,4-diphenyl-1*H*-isochromen-1-one (8ea). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.20 (s, 1H), 7.52 – 6.97 (m, 12H), 2.46 (s, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 163.1, 149.7, 138.4, 135.9, 132.9, 132.0, 131.1, 129.4, 129.2, 129.1, 128.9, 128.7, 128.0, 127.8, 125.3, 116.8, 114.0, 21.2. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3058, 2915, 2848, 1722, 1612, 1495, 1443, 1318, 1246, 1164, 1141, 1073, 1027, 962, 894, 835, 776, 768, 729. **GCMS (EI, 70 eV) *m/z* (%)** 312.20 (16.33) $[M]^+$, 235.10 (13.23), 207.10 (19.55), 105.05 (54.50), 44.00 (100).



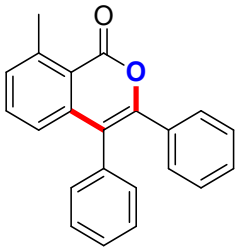
3,4-diphenylbenzo[*g*]isoquinolin-1(*2H*)-one (1fa). **^{1}H NMR (400 MHz, $CDCl_3$)** δ 9.08 (s, 1H), 8.65 (s, 1H), 8.05 (d, J = 6.4 Hz, 1H), 7.76 (s, 2H), 7.60 – 7.07 (m, 12H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 163.1, 137.1, 135.9, 135.5, 135.4, 135.3, 134.6, 131.7, 131.4, 129.2, 129.1, 128.9, 128.6, 128.5, 128.4, 128.2, 128.0, 127.4, 126.2, 124.6, 117.1. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3052, 2979, 2764, 1650, 1619, 1596, 1357, 1152, 1067, 860. **LRMS**; *m/z*. 347.30 [M^+], calcd 347.41.



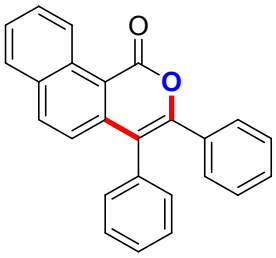
3,4-diphenyl-1*H*-benzo[*g*]isochromen-1-one (8fa). **^{1}H NMR (400 MHz, $CDCl_3$)** δ 9.01 (s, 1H), 8.03 (s, 1H), 7.74 (d, J = 7.5 Hz, 1H), 7.57 – 7.18 (m, 13H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 162.5, 149.3, 136.3, 134.7, 133.9, 133.1, 132.1, 131.8, 131.3, 129.4, 129.2, 129.1, 128.8, 128.2, 128.1, 127.8, 126.9, 124.4, 118.8, 116.9. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 2922, 2852, 1731, 1619, 1490, 1442, 1259, 1172, 1129, 1066, 911, 781, 774, 701. **LRMS**; *m/z*. 348.30 [M^+], calcd 348.39.



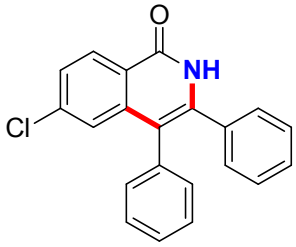
8-methyl-3,4-diphenylisoquinolin-1(2*H*)-one (1ga). **^{1}H NMR (400 MHz, $CDCl_3$)** δ 9.43 (s, 1H), 7.28 (m, 13H), 2.90 (s, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 163.8, 141.9, 140.5, 137.1, 136.4, 134.9, 131.9, 131.7, 129.6, 129.1, 128.4, 128.3, 128.2, 127.1, 123.9, 117.1 23.9 (one signal missing due to overlap). **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3055, 2920, 2852, 1735, 1633, 1595, 1557, 1486, 1465, 1375, 1310, 1145, 1048, 1033, 912, 755. **LRMS**; *m/z*. 311.40 [M^+], calcd 311.38.



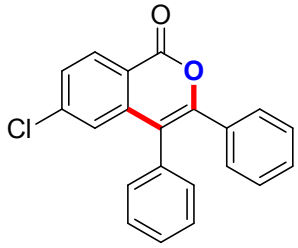
8-methyl-3,4-diphenyl-1*H*-isochromen-1-one (8ga). **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.50 – 7.11 (m, 11H), 6.98 (d, J = 8.0 Hz, 1H), 2.89 (s, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 161.5, 150.6, 143.4, 140.4, 134.9, 133.7, 132.9, 131.3, 131.0, 129.0, 128.9, 128.8, 127.9, 127.8, 123.8, 118.9, 116.9, 23.5. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 2922, 2851, 1726, 1623, 1666, 1443, 1303, 1230, 1201, 1088, 1028, 897, 803, 762, 705. **GCMS (EI, 70 eV) *m/z* (%)** 312.20 (43.08) $[M]^+$, 284.20 (14.09), 235.10 (17.80), 207.10 (12.23), 179.10 (18.80), 105.05 (100), 77.05 (52.90), 43.95 (24.66).



3,4-diphenyl-1H-benzo[*h*]isochromen-1-one (8ha). **^{1}H NMR (400 MHz, $CDCl_3$)** δ 9.84 (d, J = 8.7 Hz, 1H), 7.97 (d, J = 8.9 Hz, 1H), 7.89 – 7.72 (m, 2H), 7.60 (t, J = 7.4 Hz, 1H), 7.49 – 7.11 (m, 10H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 161.4, 152.5, 141.0, 139.2, 135.9, 134.7, 132.7, 132.6, 131.5, 131.5, 129.5, 129.2, 129.2, 129.1, 128.5, 128.2, 127.9, 127.0, 122.7, 117.4, 114.1. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 2920, 2850, 1708, 1591, 1463, 1257, 1051, 1033, 1016, 703. **LRMS**; *m/z*. 348.40 $[M^+]$, calcd 348.39.

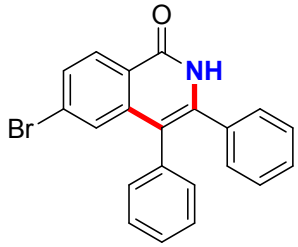


6-chloro-3,4-diphenylisoquinolin-1(2*H*)-one (1ia). **^{1}H NMR (400 MHz, $CDCl_3$)** δ 9.47 (s, 1H), 8.35 (d, J = 8.6 Hz, 1H), 7.41 (dd, J = 8.5, 1.9 Hz, 1H), 7.35 – 7.09 (m, 10H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 162.2, 140.0, 139.4, 138.5, 134.9, 134.6, 131.7, 129.3, 129.1, 128.9, 128.6, 128.4, 127.6, 127.1, 124.9, 123.4, 116.4. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3165, 2982, 2893, 2823, 1647, 1594, 1487, 1444, 1337, 1033, 885, 778, 705. **LRMS**; *m/z*. 331.30 $[M^+]$, calcd 331.79.

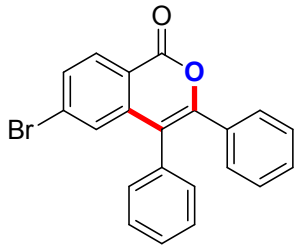


6-chloro-3,4-diphenyl-1*H*-isochromen-1-one (8ia)

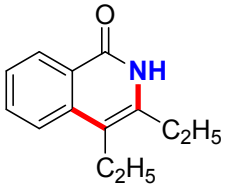
^{1}H NMR (500 MHz, $CDCl_3$) δ 8.23 (dd, J = 8.4, 1.5 Hz, 1H), 7.62 (d, J = 8.4 Hz, 1H), 7.42 (s, 3H), 7.36 – 7.14 (m, 8H); **^{13}C NMR (125 MHz, $CDCl_3$)** δ 161.6, 152.2, 140.4, 133.5, 132.5, 131.4, 131.1, 131.1, 130.5, 129.3, 129.2, 129.2, 128.4, 128.0, 127.9, 119.1, 115.9. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3062, 2919, 2850, 1728, 1587, 1444, 1309, 276, 1074, 883, 771, 765, 7702. **LRMS**; *m/z*. 332.20 [M$^+$], calcd 332.78.



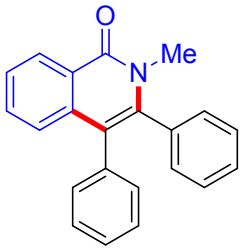
6-bromo-3,4-diphenylisoquinolin-1(2*H*)-one (1ja). ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.52 (s, 1H), 8.37 (d, J = 8.5 Hz, 1H), 7.54 – 7.05 (m, 12H); **^{13}C NMR (125 MHz, $CDCl_3$)** δ 162.18, 140.04, 139.43, 138.54, 134.98, 134.64, 131.68, 129.27, 129.17, 128.89, 128.60, 128.38, 127.61, 127.13, 125.01, 123.41, 116.41. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3168, 3023, 1645, 1594, 1487, 1440, 1337, 1081, 898, 885, 778, 705. **LRMS**; *m/z*. 377.10 [M+2], 375.10 [M$^+$], calcd 375.05.



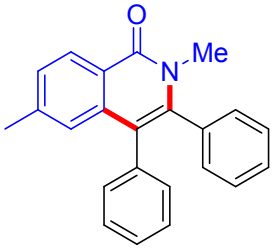
6-bromo-3,4-diphenyl-1*H*-isochromen-1-one (8ja). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.22 (d, J = 8.4 Hz, 1H), 7.61 (d, J = 8.4 Hz, 1H), 7.50 – 7.08 (m, 11H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 161.6, 152.2, 140.4, 133.5, 132.5, 131.4, 131.1, 131.1, 130.5, 129.3, 129.2, 129.2, 128.4, 128.0, 127.9, 119.1, 115.9. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 2920, 2851, 1723, 1587, 1469, 1444, 1309, 1275, 1074, 960, 883, 771, 765. **LRMS**; *m/z*. 378.10 [M+2], 376.10 [M$^+$], calcd 376.01.



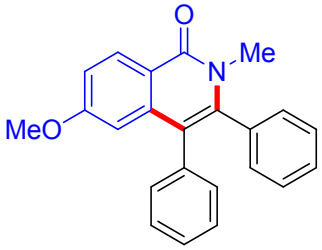
3,4-diethylisoquinolin-1(2*H*)-one (1ab). ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.88 (s, 1H), 8.44 (d, J = 7.9 Hz, 1H), 7.80 – 7.63 (m, 2H), 7.46 – 7.38 (m, 1H), 2.72 (dq, J = 15.3, 7.5 Hz, 4H), 1.31 (t, J = 7.6 Hz, 3H), 1.19 (t, J = 7.5 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 163.8, 138.9, 138.2, 132.4, 128.6, 127.7, 125.3, 122.8, 113.9, 24.2, 19.5, 14.9, 13.9. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3163, 2967, 2921, 1650, 1630, 1606, 1474, 1372, 1257, 1163, 1055, 1014, 866, 887, 769. **GCMS (EI, 70 eV) *m/z* (%)** 201.10 (46.15) $[M]^+$, 186.10 (100), 168.10 (12.32), 115.10 (16.10), 77.05 (5.68).



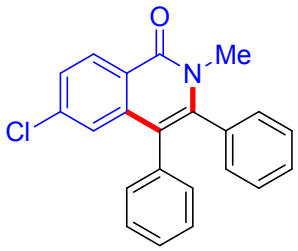
2-methyl-3,4-diphenylisoquinolin-1(2*H*)-one (4aa). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.61 – 8.57 (m, 1H), 7.59 – 7.49 (m, 2H), 7.30 – 7.13 (m, 9H), 7.11 – 7.07 (m, 2H), 3.38 (s, 3H); **^{13}C NMR (125 MHz, $CDCl_3$)** δ 162.8, 141.3, 137.2, 136.5, 135.1, 132.1, 131.6, 129.9, 128.2, 127.9, 127.9, 126.8, 126.6, 125.4, 124.9, 118.9, 77.3, 34.4. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3280, 2922, 2853, 1638, 1602, 1480, 1441, 1324, 1144, 1023, 849, 780, 754, 701. **GCMS (EI, 70 eV) *m/z* (%)** 311.20 (86.19) $[M]^+$, 310.20 (100), 252.10 (12.01), 232.10 (15.78), 165.10 (16.14), 132.10 (20.46), 77.00 (33.54), 43.95 (64.02).



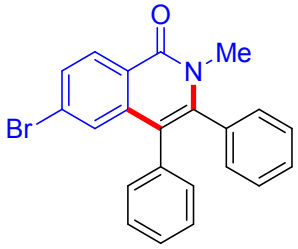
2,6-dimethyl-3,4-diphenylisoquinolin-1(2*H*)-one (4ba). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.48 (d, J = 8.2 Hz, 1H), 7.34 (dd, J = 8.2, 1.2 Hz, 1H), 7.30 – 7.17 (m, 6H), 7.15 – 7.12 (m, 2H), 7.10 – 7.06 (m, 2H), 6.95 (d, J = 0.6 Hz, 1H), 3.36 (s, 3H), 2.37 (s, 3H); **^{13}C NMR (125 MHz, $CDCl_3$)** δ 162.8, 142.6, 141.4, 137.3, 136.6, 135.2, 131.6, 129.9, 128.3, 128.2, 128.2, 127.9, 127.9, 126.7, 125.0, 122.8, 118.7, 34.3, 22.0. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 2922, 2853, 1642, 1614, 1589, 1482, 1323, 1178, 1145, 1026, 832, 798, 787, 723, 701. **GCMS (EI, 70 eV) *m/z* (%)** 325.25 (82.20) $[M]^+$, 324.20 (100), 246.10 (10.58), 207.05 (11.59), 178.10 (11.56), 146.05 (12.30), 118.15 (12.99), 77.05 (28.15), 44.00 (43.44). **HRMS** (H^+) calcd for $C_{23}H_{20}NO$ 326.1467, found 326.1531.



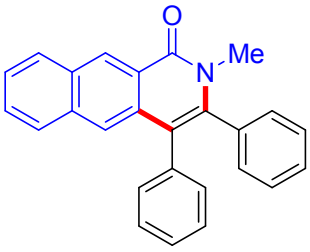
6-methoxy-2-methyl-3,4-diphenylisoquinolin-1(2H)-one (4ca). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.48 (d, J = 8.9 Hz, 1H), 7.21 – 7.05 (m, 11H), 6.51 (d, J = 1.5 Hz, 1H), 3.68 (s, 3H), 3.32 (s, 3H); **^{13}C NMR (125 MHz, $CDCl_3$)** δ 162.5, 162.4, 141.9, 139.2, 136.5, 135.2, 131.5, 129.9, 129.9, 128.2, 127.9, 126.8, 118.9, 118.6, 115.5, 106.9, 55.2, 34.2, **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 2923, 2845, 1641, 1605, 1557, 1482, 1464, 1321, 1281, 1227, 1142, 1050, 1033, 798, 768, 722, 701. **GCMS (EI, 70 eV) *m/z* (%)** 341.20 (79.09) $[M]^+$, 340.20 (100), 297.20 (8.45), 254.15 (7.23), 207.05 (9.08), 152.15 (16.02), 118.15 (16.53), 77.05 (31.45), 44.00 (57.70).



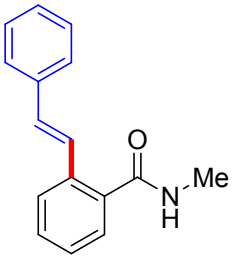
6-chloro-2-methyl-3,4-diphenylisoquinolin-1(2*H*)-one (4da). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.46 (d, J = 8.6 Hz, 1H), 7.41 (dd, J = 8.6, 1.9 Hz, 1H), 7.27 – 7.13 (m, 6H), 7.09 (t, J = 4.7 Hz, 3H), 7.05 – 6.96 (m, 2H), 3.31 (s, 3H); **^{13}C NMR (125 MHz, $CDCl_3$)** δ 162.17, 142.67, 138.68, 138.48, 135.68, 134.69, 131.37, 129.70, 128.37, 128.25, 128.11, 127.13, 127.09, 124.63, 123.19, 118.02, 34.40. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 2973, 2923, 2869, 1645, 1595, 1548, 1463, 1321, 1147, 1052, 1033, 1017, 1001, 935, 783, 767, 704. **GCMS (EI, 70 eV) *m/z* (%)** 345.20 (11.56) $[M]^+$, 344.15 (13.37), 309.10 (2.49), 281.10 (3.13), 207.00 (8.95), 151.10 (9.15), 105.05 (19.43), 77.05 (26.21), 43.95 (100).



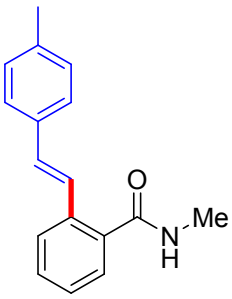
6-bromo-2-methyl-3,4-diphenylisoquinolin-1(2*H*)-one (4ea). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.38 (d, J = 8.6 Hz, 1H), 7.56 (dd, J = 8.6, 1.7 Hz, 1H), 7.31 – 6.96 (m, 11H), 3.31 (s, 3H); **^{13}C NMR (125 MHz, $CDCl_3$)** δ 162.3, 142.7, 138.7, 135.6, 134.7, 131.4, 129.9, 129.7, 128.4, 128.3, 128.1, 127.8, 127.5, 127.1, 123.5, 117.9, 34.4. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 2922, 2865, 1645, 1591, 1544, 1488, 1321, 1147, 1052, 1033, 1018, 930, 765, 703. **LRMS**; *m/z*. 391.10 [M+2], 389.10 $[M^+]$, calcd 389.04.



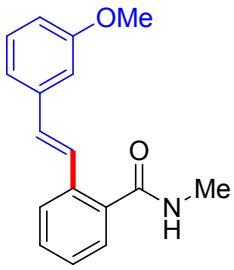
2-methyl-3,4-diphenylbenzo[g]isoquinolin-1(2H)-one (4fa). ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.20 (s, 1H), 8.18 – 8.04 (m, 1H), 7.79 – 7.74 (m, 1H), 7.63 (s, 1H), 7.58 – 7.48 (m, 2H), 7.30 – 7.15 (m, 10H), 3.40 (s, 3H); **^{13}C NMR (125 MHz, $CDCl_3$)** δ 163.4, 140.2, 136.9, 135.3, 135.1, 133.7, 131.7, 130.1, 129.3, 129.1, 128.2, 128.2, 128.0, 127.9, 127.9, 126.9, 125.9, 124.2, 123.7, 118.9, 34.2. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3052, 2922, 2852, 1645, 1616, 1596, 1489, 1021, 890, 796, 762, 753, 706. **LRMS**; *m/z*. 361.20 [M^{+}], calcd 361.15.



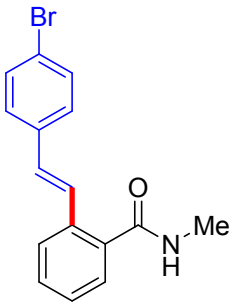
(E)-*N*-methyl-2-styrylbenzamide (4aa'). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.71 (d, J = 7.8 Hz, 1H), 7.53 (d, J = 7.4 Hz, 2H), 7.51 – 7.43 (m, 3H), 7.38 (t, J = 7.6 Hz, 2H), 7.33 – 7.29 (m, 2H), 7.08 (d, J = 16.2 Hz, 1H), 5.87 (s, 1H), 3.04 (d, J = 4.9 Hz, 3H); **^{13}C NMR (125 MHz, $CDCl_3$)** δ 170.2, 137.0, 135.6, 135.5, 131.4, 130.2, 128.7, 128.0, 127.6, 127.5, 126.8, 126.2, 125.9, 116.1, 26.9. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3319, 2922, 2853, 1626, 1530, 1493, 1151, 958, 847, 757, 685, 671. **GCMS (EI, 70 eV) *m/z* (%)** 237.15 (27.22) [M]$^{+}$, 206.10 (68.31), 178.10 (78.43), 160.10 (100), 152.15 (33.55), 89.05 (43.77), 76.00 (39.97), 44.00 (65.93).



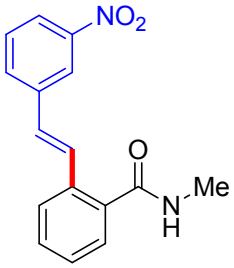
(*E*)-*N*-methyl-2-(4-methylstyryl)benzamide (4ab'). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.66 (d, J = 7.9 Hz, 1H), 7.48 – 7.35 (m, 5H), 7.27 (d, J = 7.6 Hz, 1H), 7.15 (d, J = 7.9 Hz, 2H), 7.01 (d, J = 16.2 Hz, 1H), 5.80 (s, 1H), 3.00 (d, J = 4.9 Hz, 3H), 2.34 (s, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 137.9, 135.6, 131.4, 130.1, 129.4, 127.6, 127.3, 126.7, 126.1, 124.8, 26.8, 21.2. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3284, 2920, 2851, 1887, 1629, 1538, 1514, 1443, 1316, 1257, 1151, 1117, 952, 802, 791, 742, 692. **GCMS (EI, 70 eV) *m/z* (%)** 251.15 (21.94) [M]$^{+}$, 220.10 (42.97), 178.10 (38.09), 160.10 (79.71), 115.10 (21.75), 89.05 (22.25), 43.95 (100).



(E)-2-(3-methoxystyryl)-*N*-methylbenzamide (4ac'). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.66 (d, J = 7.9 Hz, 1H), 7.48 – 7.38 (m, 3H), 7.31 – 7.25 (m, 2H), 7.10 (d, J = 7.7 Hz, 1H), 7.01 (dd, J = 9.2, 7.0 Hz, 2H), 6.82 (d, J = 12 Hz, 1H), 5.79 (s, 1H), 3.82 (s, 3H), 3.00 (d, J = 4.9 Hz, 3H); **^{13}C NMR (125 MHz, $CDCl_3$)** δ 170.2, 159.9, 138.5, 135.7, 135.3, 131.3, 130.2, 129.7, 127.7, 127.6, 126.2, 119.4, 113.6, 112.2, 55.3, 26.8. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3279, 3059, 2919, 2850, 1625, 1602, 1542, 1487, 1453,1286, 1269, 1153, 1045, 950, 860, 753. **GCMS (EI, 70 eV) *m/z* (%)** 267.35 (9.40) $[M]^+$, 236.25 (15.71), 207.15 (15.13), 194.20 (11.65), 160.25 (28.82), 105.10 (10.87), 44.00 (100). **HRMS** (H^+) calcd for $C_{17}H_{18}NO_2$ 268.1259, found 268.1333.

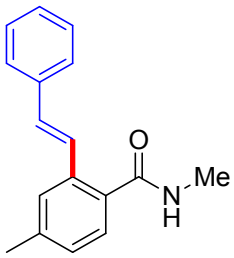


(E)-2-(4-bromostyryl)-*N*-methylbenzamide (4ad'). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.69 – 7.60 (m, 1H), 7.50 – 7.35 (m, 5H), 7.28 (td, J = 7.4, 1.0 Hz, 1H), 7.20 (t, J = 7.8 Hz, 1H), 6.94 (d, J = 16.2 Hz, 1H), 5.84 (s, 1H), 3.00 (d, J = 4.9 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 170.1, 139.2, 135.7, 135.1, 130.7, 130.2, 130.1, 129.7, 129.6, 127.8, 127.5, 127.4, 127.3, 126.2, 126.2, 125.3, 122.8, 26.9. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3284, 2923, 1629, 1569, 1543, 1406, 1323, 955, 770, 745. **GCMS (EI, 70 eV) *m/z* (%)** 317.10 (4.33) [M+2], 315.10 (4.58) $[M^+]$, 286.10 (7.86), 207.05 (12.90), 178.10 (22.98), 160.10 (42.52), 152.15 (11.72), 88.00 (20.00), 76.00 (23.82), 44.00 (100).

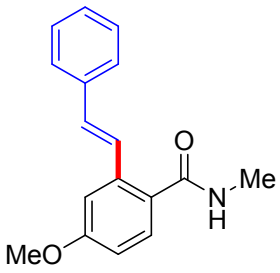


(E)-*N*-methyl-2-(3-nitrostyryl)benzamide (4ae'). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.28 (s, 1H), 8.09 (d, J = 8.2 Hz, 1H), 7.82 (d, J = 7.7 Hz, 1H), 7.70 (d, J = 7.6 Hz, 1H), 7.62 (d, J = 16.3 Hz, 1H), 7.53 – 7.41 (m, 3H), 7.33 (d, J = 8.4 Hz, 1H), 7.07 (d, J = 16.3 Hz, 1H), 5.86 (s, 1H), 3.02 (d, J = 4.9 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 138.9, 134.8,

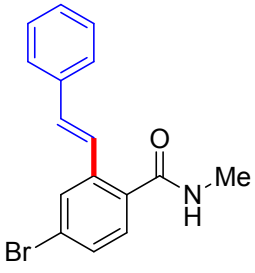
132.1, 130.3, 129.5, 129.1, 128.6, 128.2, 127.3, 126.3, 122.3, 121.6, 29.7, 26.9. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3298, 2921, 2851, 1628, 1522, 1350, 1169, 963, 749. **GCMS (EI, 70 eV) *m/z* (%)** 282.20 (1.21) $[M]^+$, 281.20 (2.02), 207.20 (9.32), 133.10 (3.68), 97.10 (6.54), 71.10 (8.25), 44.00 (100). **HRMS** (H^+) calcd for $C_{16}H_{15}N_2O_3$ 283.1004, found 283.1078.



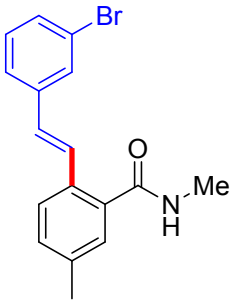
(E)-*N*,4-dimethyl-2-styrylbenzamide (4ba'). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.55 – 7.48 (m, 4H), 7.41 – 7.36 (m, 3H), 7.30 (dt, J = 3.6, 1.5 Hz, 1H), 7.12 (dd, J = 7.8, 0.8 Hz, 1H), 7.06 (d, J = 16.3 Hz, 1H), 5.88 (s, 1H), 3.01 (d, J = 4.9 Hz, 3H), 2.42 (s, 3H); **^{13}C NMR (125 MHz, $CDCl_3$)** δ 170.3, 140.2, 137.2, 135.5, 132.9, 131.1, 128.7, 128.3, 127.9, 127.8, 126.8, 126.2, 26.9, 21.4. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3326, 2921, 2852, 1626, 1536, 1446, 1307, 1262, 1169, 1008, 825, 780, 747. **GCMS (EI, 70 eV) *m/z* (%)** 251.15 (35.24) $[M]^+$, 220.10 (70.11), 178.10 (62.34), 174.10 (100), 152.10 (17.63), 115.10 (25.86), 89.05 (18.54), 43.95 (21.79). **HRMS** (H^+) calcd for $C_{17}H_{18}NO$ 252.1310, found 252.1384,



(E)-4-methoxy-*N*-methyl-2-styrylbenzamide (4ca'). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.56 – 7.51 (m, 3H), 7.46 (d, J = 8.5 Hz, 1H), 7.38 (dd, J = 10.4, 4.7 Hz, 2H), 7.32 – 7.27 (m, 1H), 7.17 (d, J = 2.5 Hz, 1H), 7.03 (d, J = 16.2 Hz, 1H), 6.82 (dd, J = 8.5, 2.6 Hz, 1H), 5.92 (s, 1H), 3.88 (s, 3H), 3.00 (d, J = 4.9 Hz, 3H); **^{13}C NMR (125 MHz, $CDCl_3$)** δ 169.9, 160.9, 137.6, 136.9, 131.5, 129.5, 128.7, 128.3, 128.1, 126.9, 126.3, 113.0, 111.3, 55.4, 26.9. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3308, 2999, 2959, 2923, 1625, 1594, 1531, 1489, 1311, 1038, 954, 840, 748. **GCMS (EI, 70 eV) *m/z* (%)** 267.15 (46.05) $[M]^+$, 236.10 (72.93), 209.10 (17.48), 190.10 (100), 166.10 (23.09), 115.10 (14.31), 43.95 (15.68).



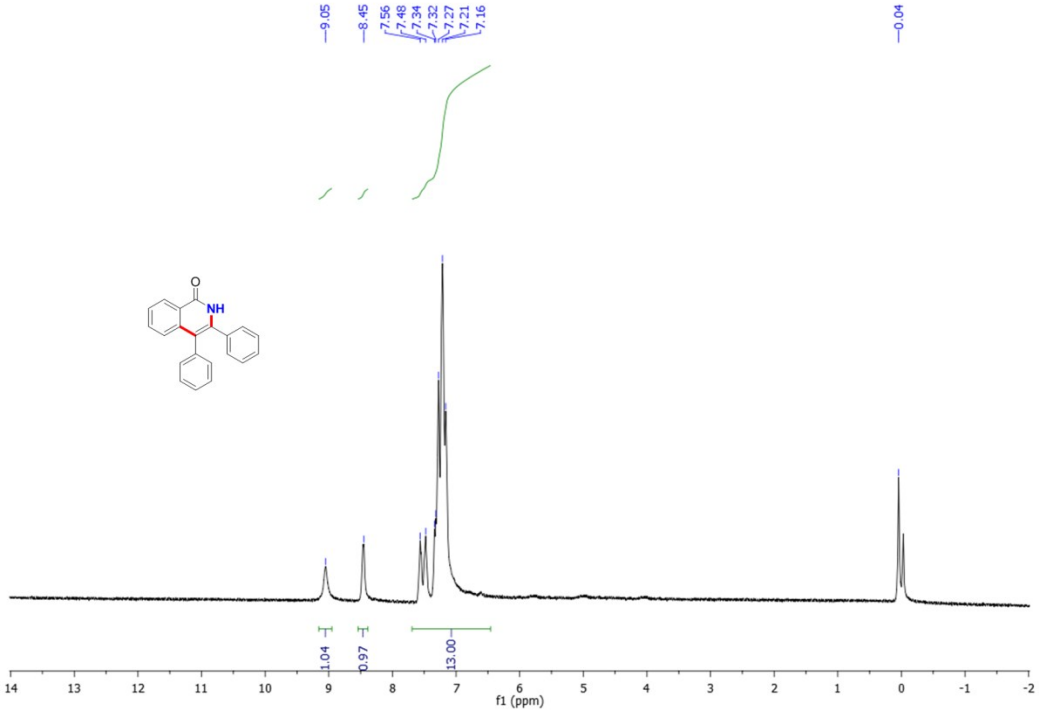
(E)-4-bromo-*N*-methyl-2-styrylbenzamide (4da'). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.80 (d, J = 1.7 Hz, 1H), 7.48 (d, J = 7.3 Hz, 2H), 7.41 – 7.36 (m, 2H), 7.33 (dd, J = 7.6, 2.3 Hz, 3H), 7.31 – 7.27 (m, 1H), 7.02 (d, J = 16.2 Hz, 1H), 5.84 (s, 1H), 2.98 (d, J = 4.9 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 169.3, 137.6, 136.5, 134.1, 132.6, 130.3, 129.2, 129.0, 128.8, 128.4, 126.9, 124.6, 124.4, 29.7, 26.9. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3296, 2921, 2851, 1628, 1556, 1393, 1309, 1165, 1108, 954, 896, 824, 751. **GCMS (EI, 70 eV) *m/z* (%)** 317.00 (5.79) [M+2], 315.00 (5.86) [M$^+$], 284.05 (11.58), 238.00 (17.14), 207.05 (18.06), 178.10 (31.94), 152.10 (16.72), 88.05 (26.11), 76.00 (26.23), 43.95 (100). **HRMS** (H^+) calcd for $C_{16}H_{15}BrNO$ 316.0259, found 316.0326.



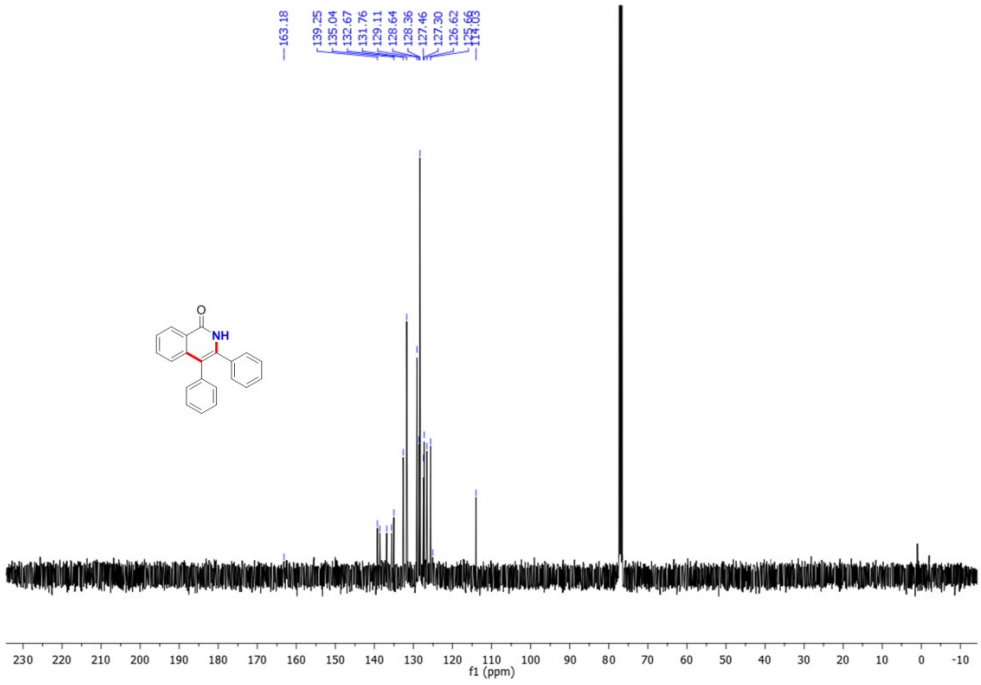
(E)-2-(3-bromostyryl)-*N*,5-dimethylbenzamide (4ee'). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.60 (s, 1H), 7.54 (d, J = 8.0 Hz, 1H), 7.44 – 7.33 (m, 3H), 7.25 (s, 1H), 7.20 (dd, J = 16.1, 8.3 Hz, 2H), 6.90 (d, J = 16.3 Hz, 1H), 5.80 (s, 1H), 3.00 (d, J = 4.9 Hz, 3H), 2.35 (s, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ 170.2, 139.4, 137.9, 135.6, 132.2, 131.0, 130.5, 130.1, 129.5, 128.8, 128.1, 127.3, 126.2, 126.1, 125.1, 122.8, 29.7, 29.6, 26.9, 21.1. **IR (ATR) $\tilde{\nu}$ (cm^{-1}):** 3289, 2922, 1636, 1625, 1548, 1474, 1413, 1322, 1225, 1163, 962, 808, 778, 708, 681. **GCMS (EI, 70 eV) *m/z* (%)** 331.10 (13.19) [M+2], 329.10 (2.10) [M$^+$], 302.10 (15.88), 252.15 (10.50), 221.10 (17.08), 178.10 (27.31), 162.10 (78.79), 133.10 (88.83), 105.10 (70.54), 77.00 (34.54), 44.00 (100). **HRMS** (H^+) calcd for $C_{17}H_{17}BrNO$ 330.0415, found 330.0488.

S2. Copies of ^{1}H NMR and ^{13}C NMR Spectra

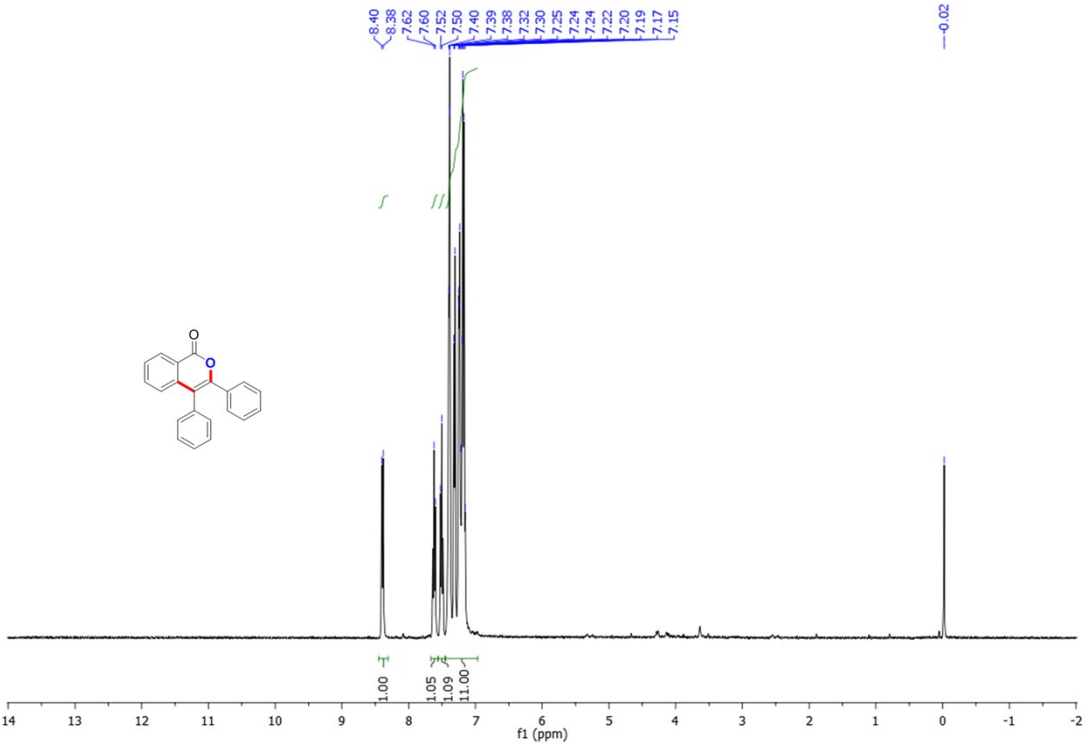
1aa) 3,4-diphenylisoquinolin-1(2*H*)-one, ^{1}H NMR



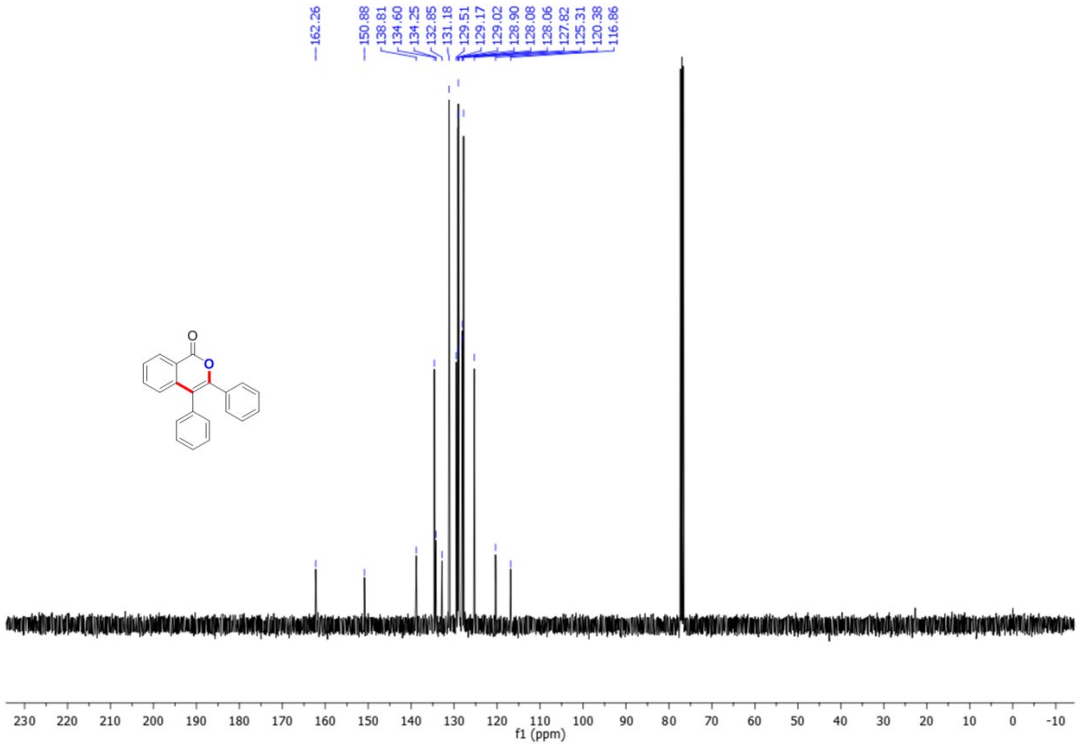
1aa) 3,4-diphenylisoquinolin-1(2*H*)-one, ^{13}C NMR



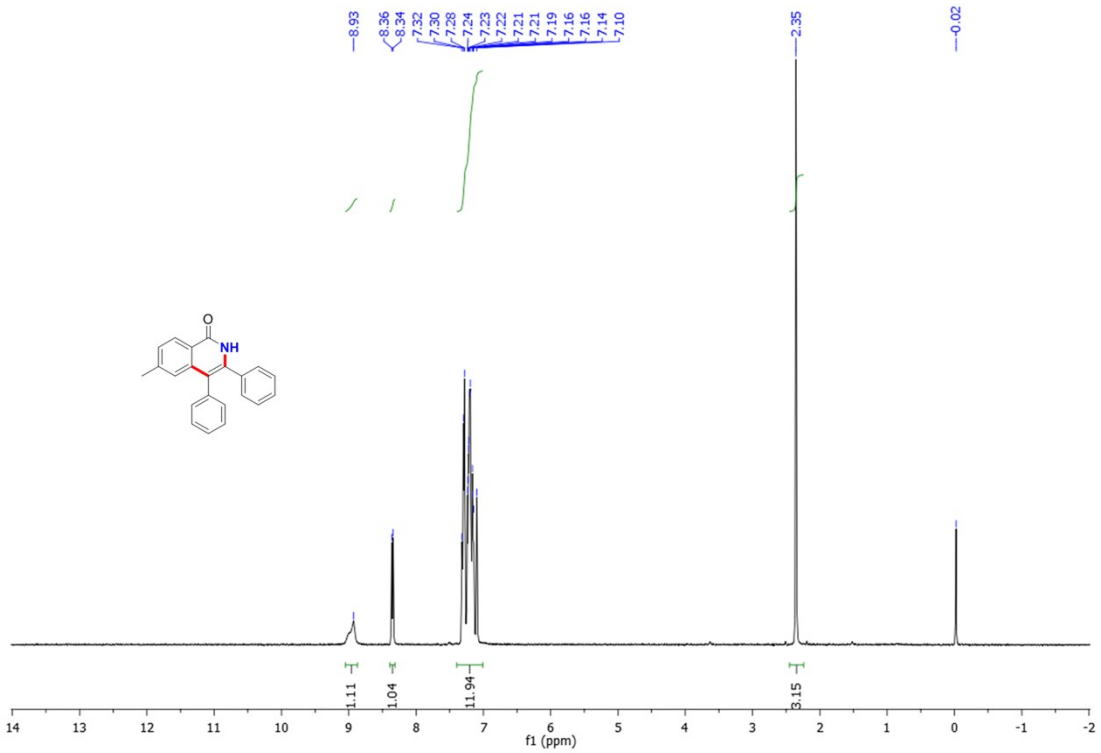
8aa) 3,4-diphenyl-1*H*-isochromen-1-one, ^{1}H NMR



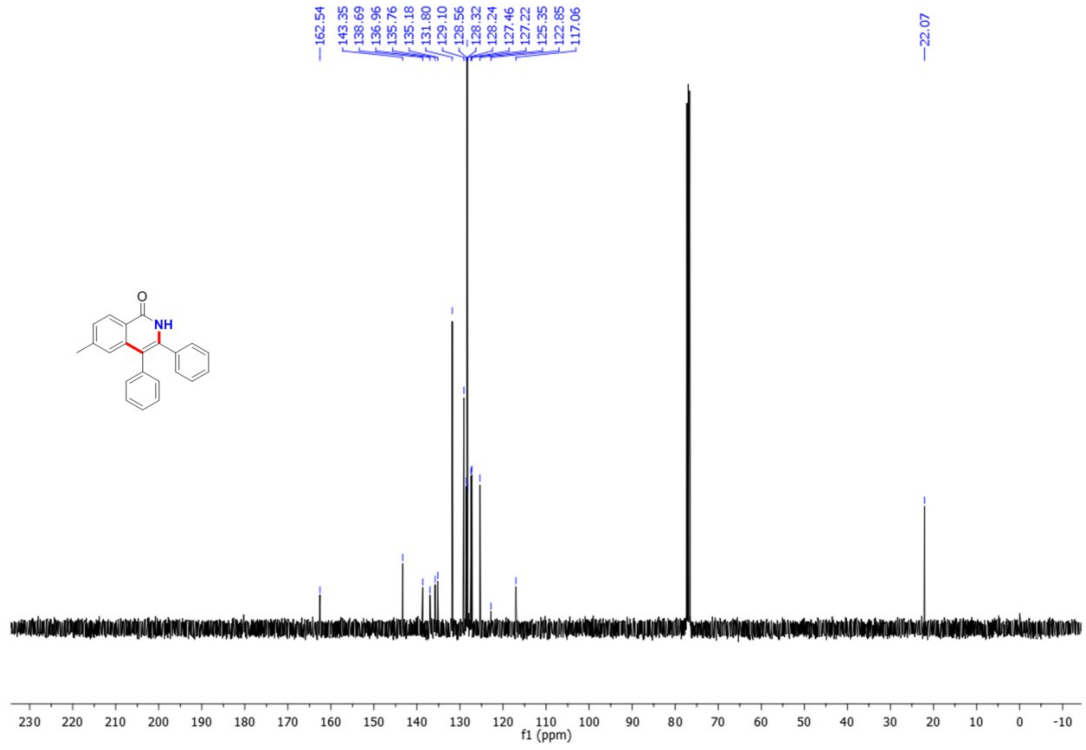
8aa) 3,4-diphenyl-1*H*-isochromen-1-one, ^{13}C NMR



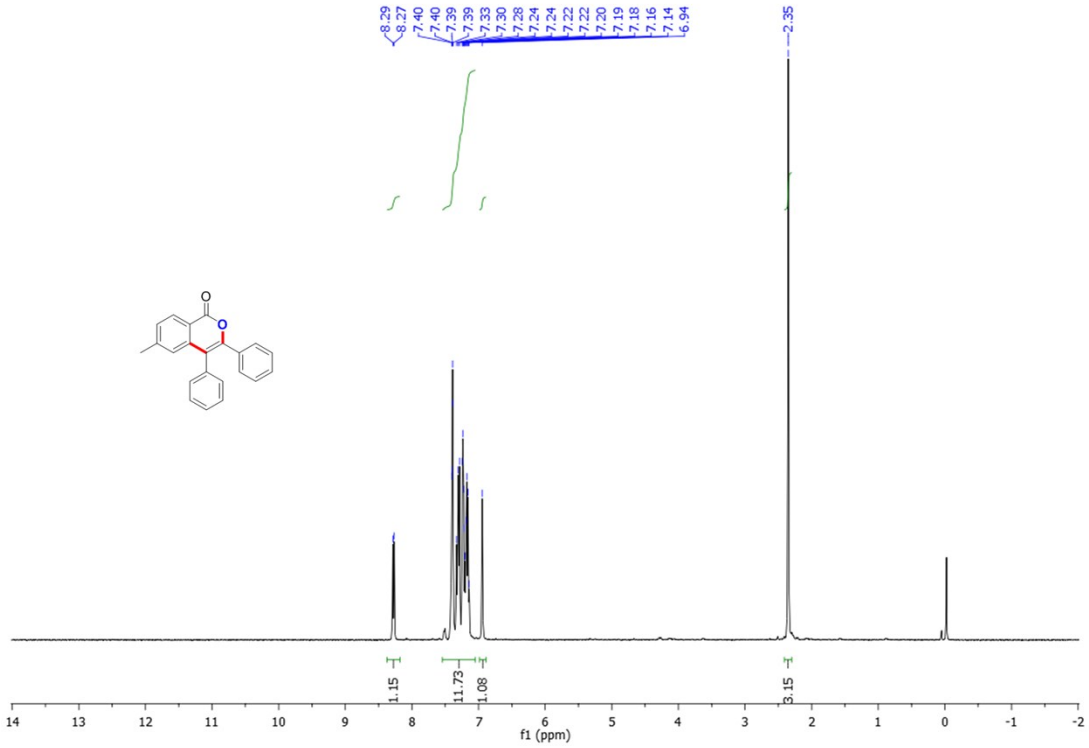
1ba) 6-methyl-3,4-diphenylisoquinolin-1(2*H*)-one, ^{1}H NMR



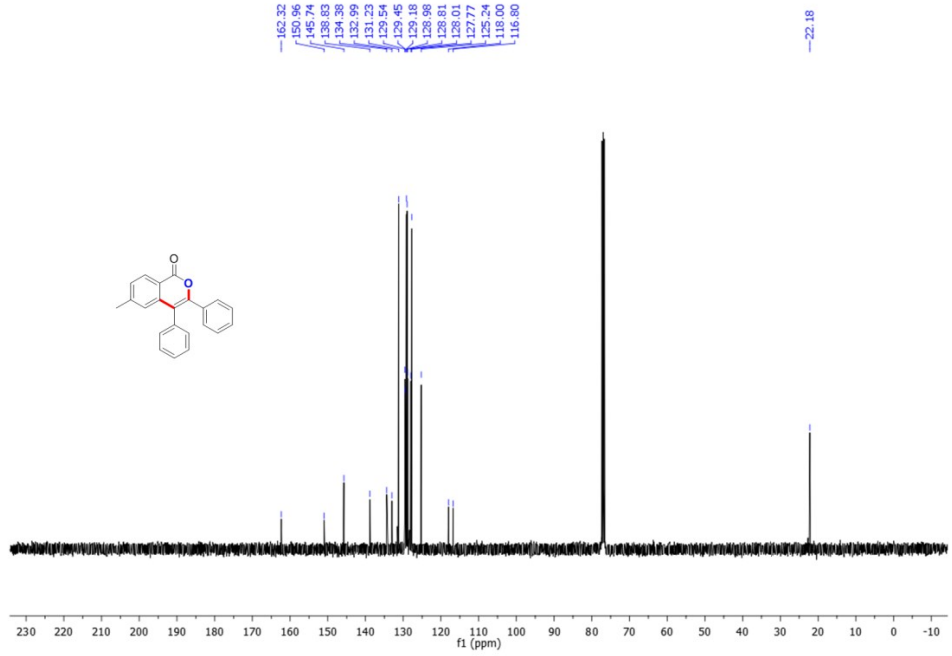
1ba) 6-methyl-3,4-diphenylisoquinolin-1(2*H*)-one, ^{13}C NMR



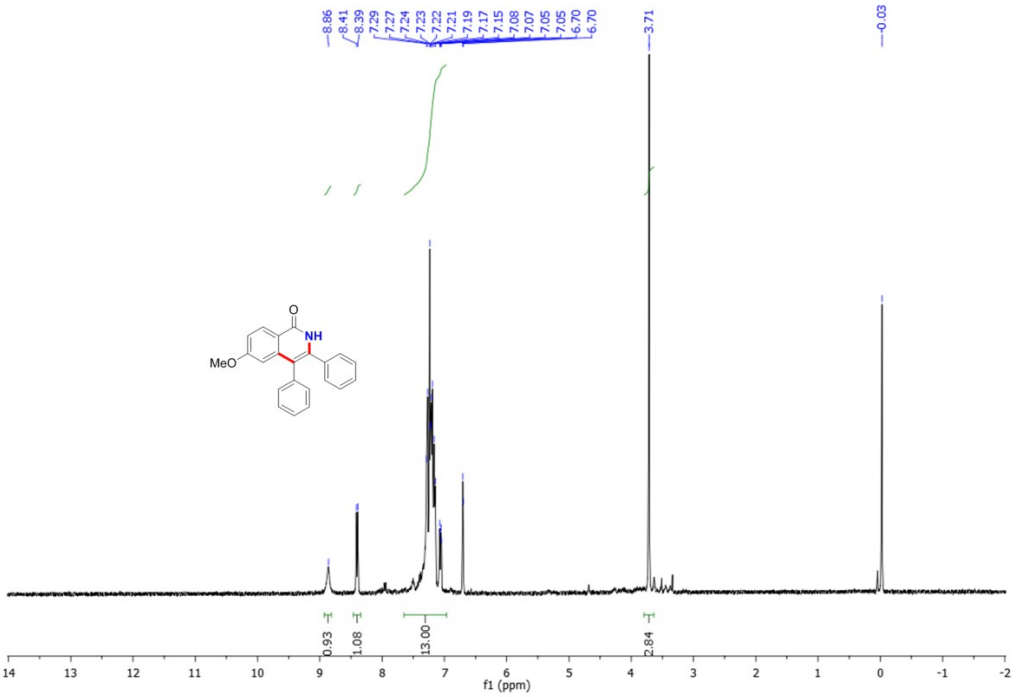
8ba) 6-methyl-3,4-diphenyl-1*H*-isochromen-1-one, ^{1}H NMR



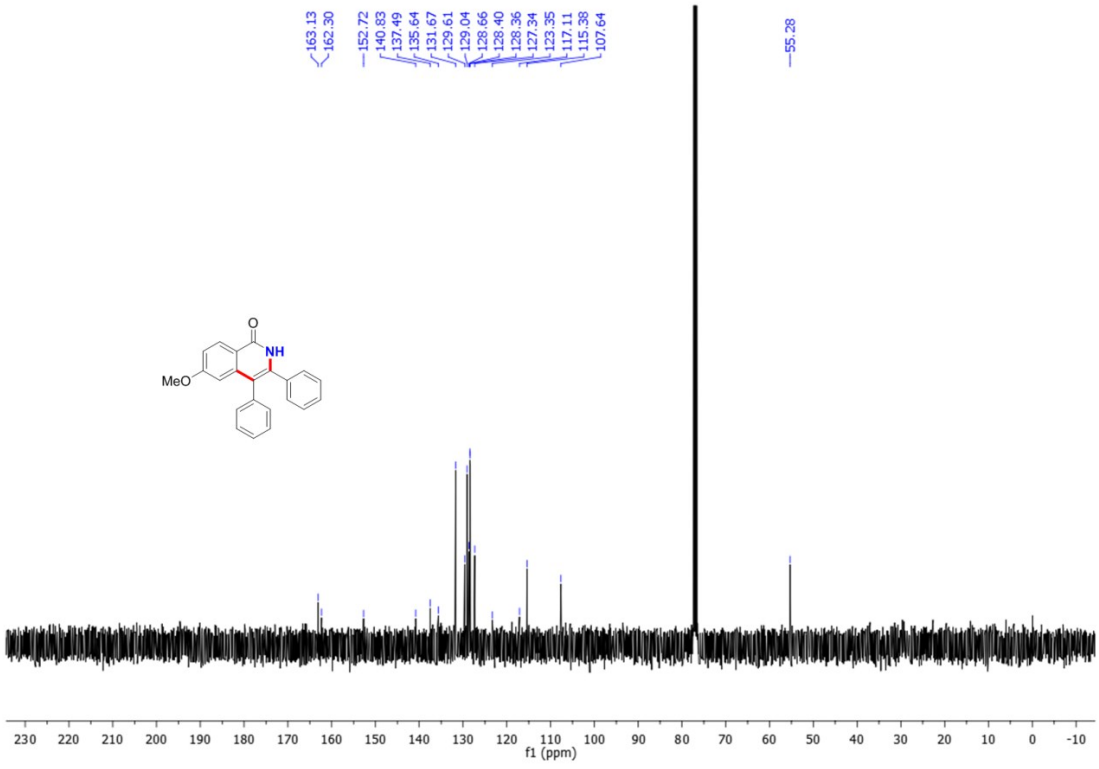
6-methyl-3,4-diphenyl-1*H*-isochromen-1-one, ^{13}C NMR



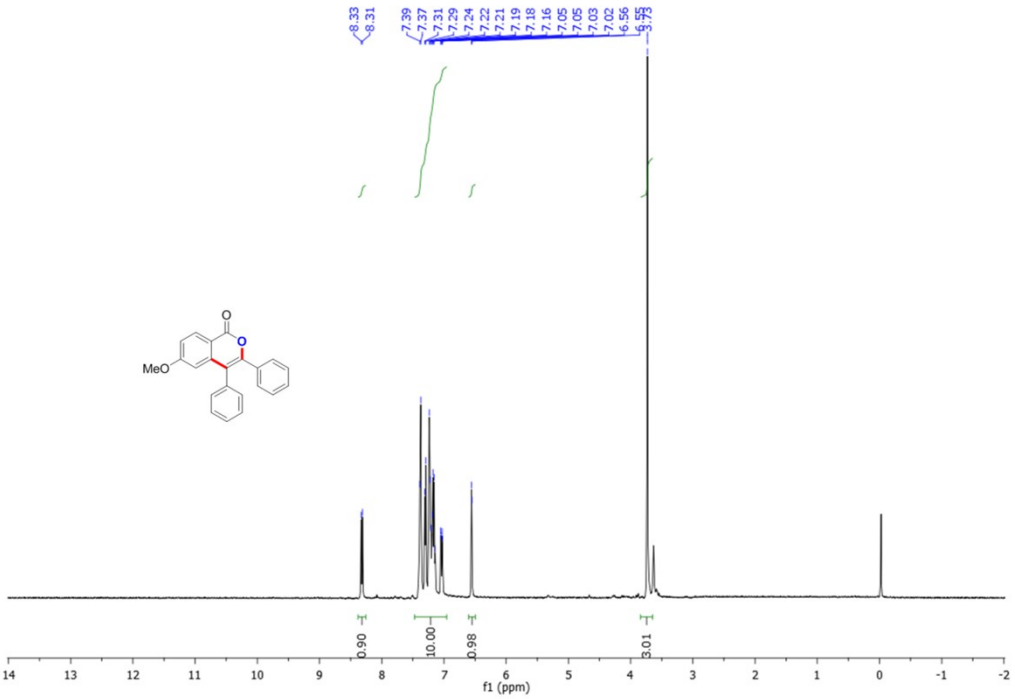
1ca) 6-methoxy-3,4-diphenylisoquinolin-1(2*H*)-one, ^{1}H NMR



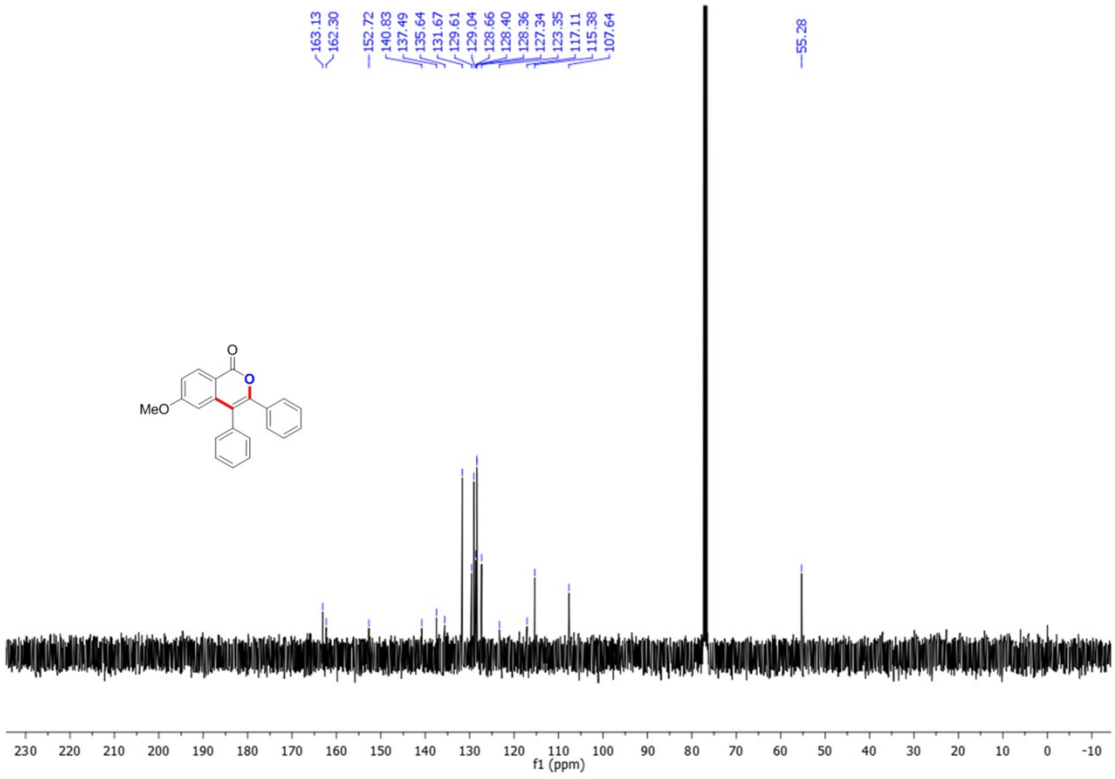
1ca) 6-methoxy-3,4-diphenylisoquinolin-1(2*H*)-one, ^{13}C NMR



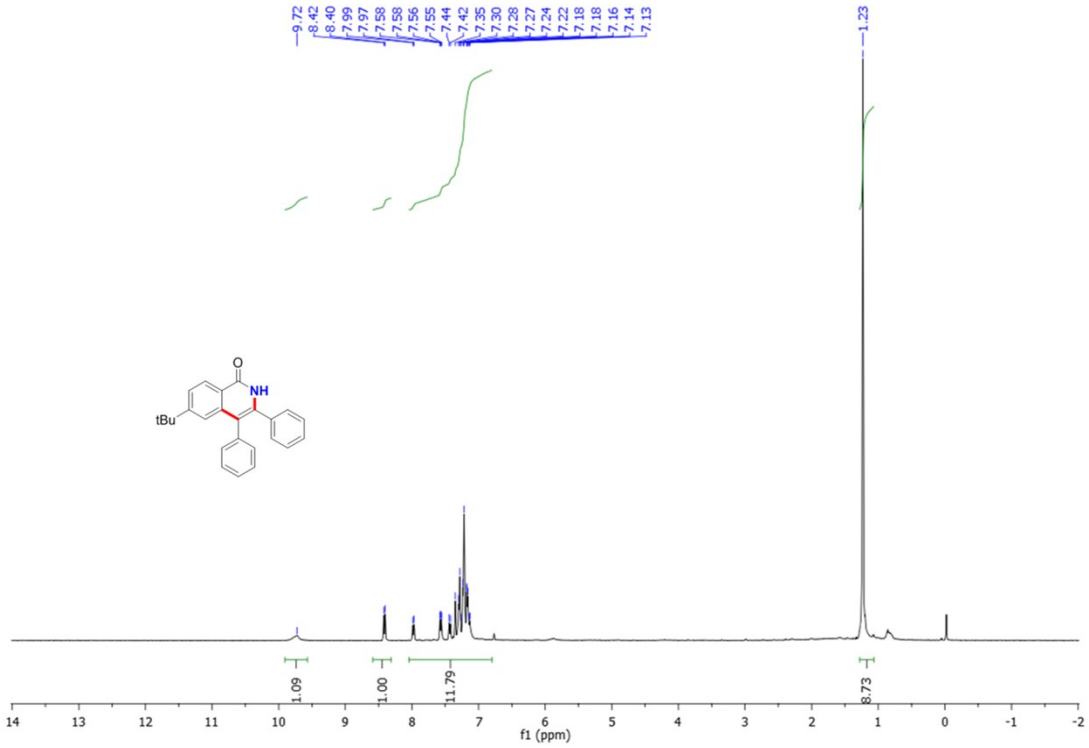
8ca) 6-methoxy-3,4-diphenyl-1*H*-isochromen-1-one, ^{1}H NMR



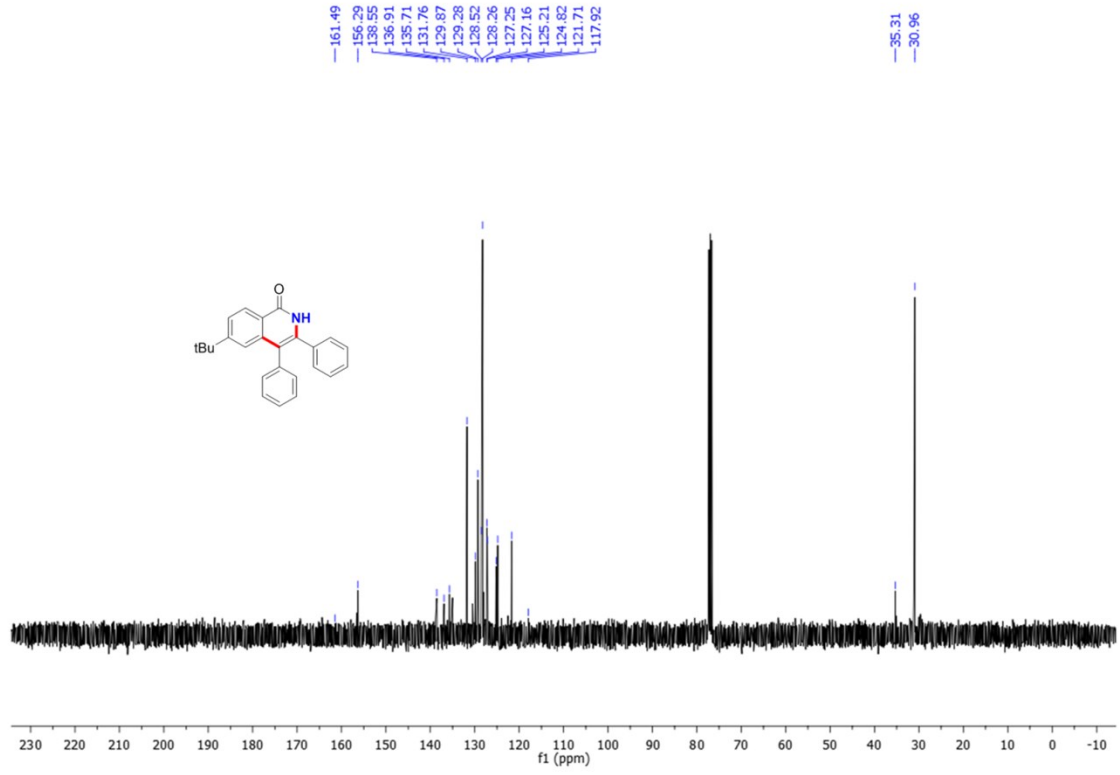
8ca) 6-methoxy-3,4-diphenyl-1*H*-isochromen-1-one, ^{13}C NMR



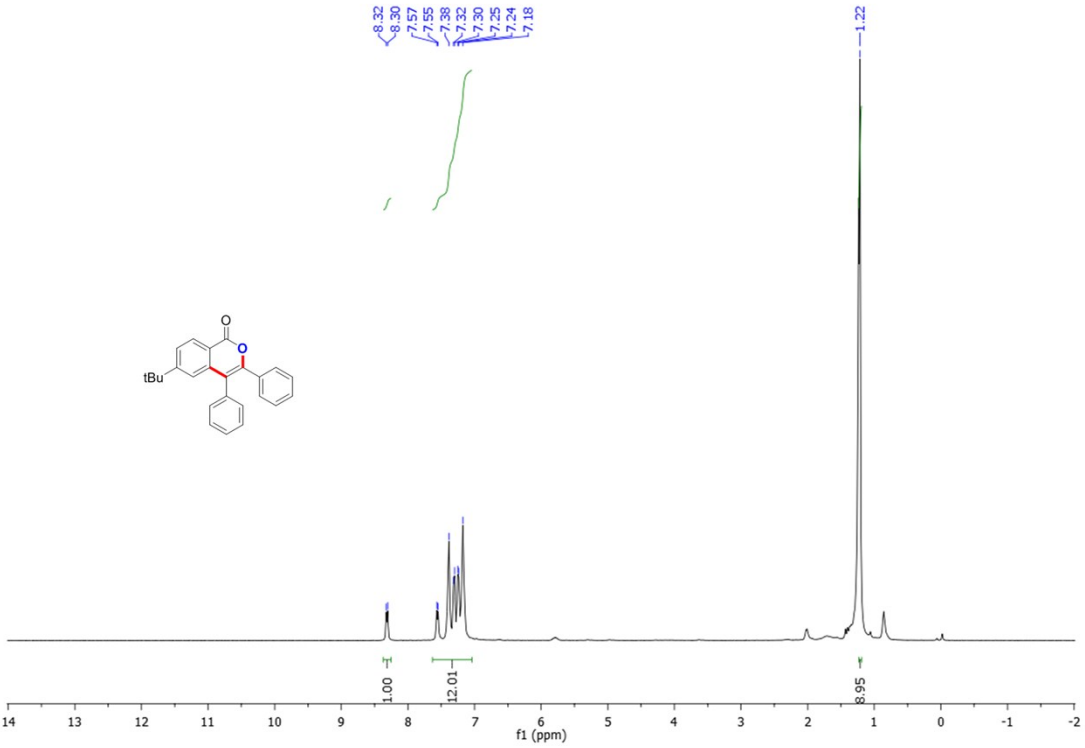
1da) 6-(*tert*-butyl)-3,4-diphenylisoquinolin-1(2*H*)-one, ^{1}H NMR



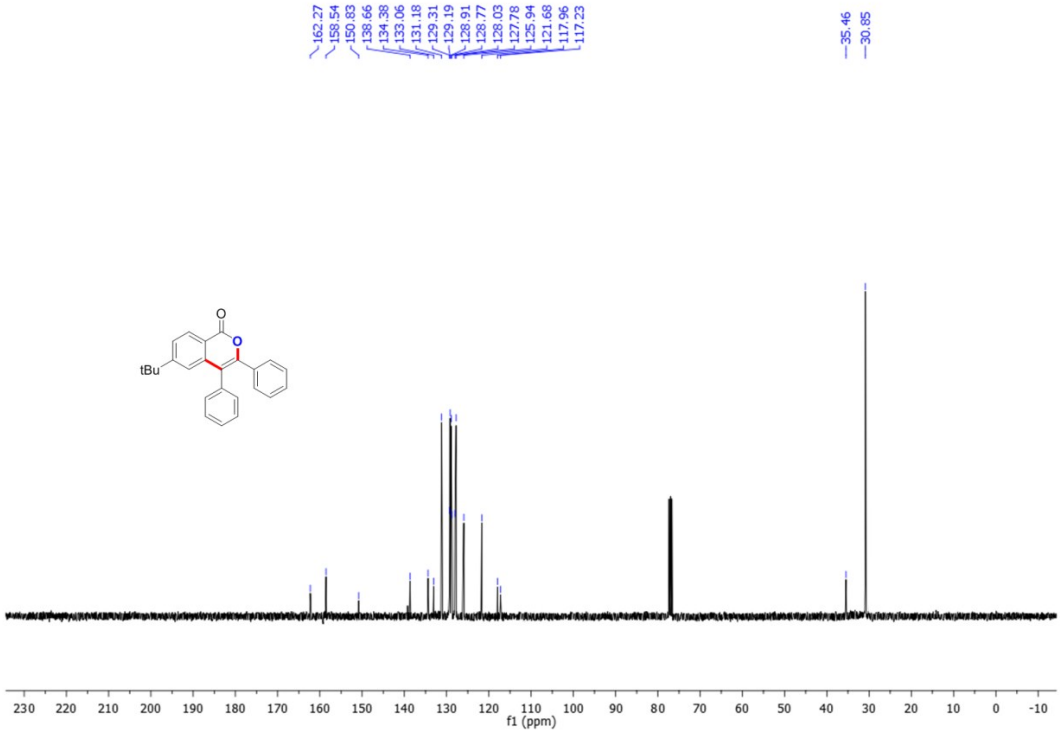
1da) 6-(*tert*-butyl)-3,4-diphenylisoquinolin-1(2*H*)-one, ^{13}C NMR



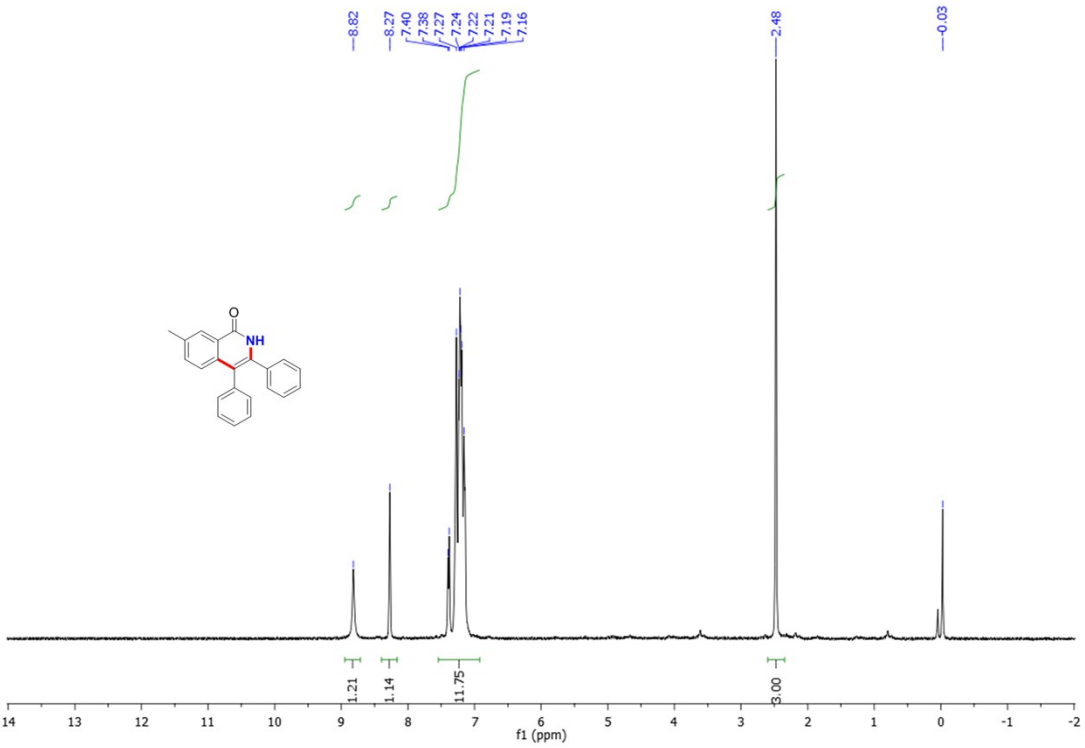
8da) 6-(*tert*-butyl)-3,4-diphenyl-1*H*-isochromen-1-one, ^{1}H NMR



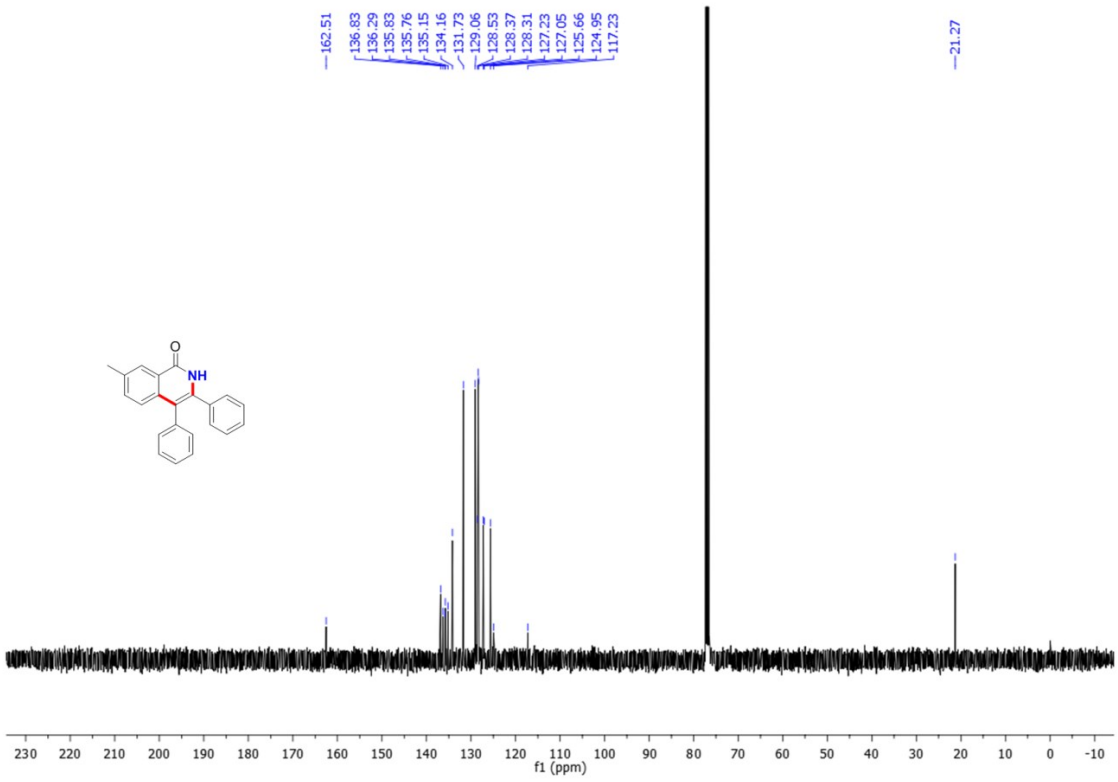
8da) 6-(*tert*-butyl)-3,4-diphenyl-1*H*-isochromen-1-one, ^{13}C NMR



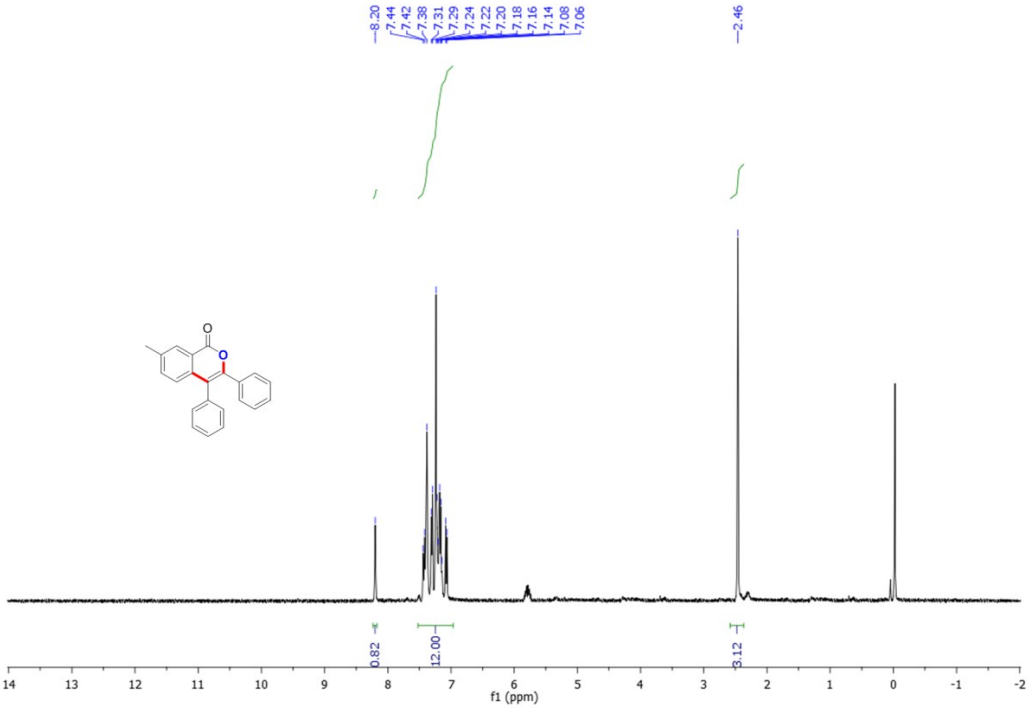
1ea) 7-methyl-3,4-diphenylisoquinolin-1(*2H*)-one, ^{1}H NMR



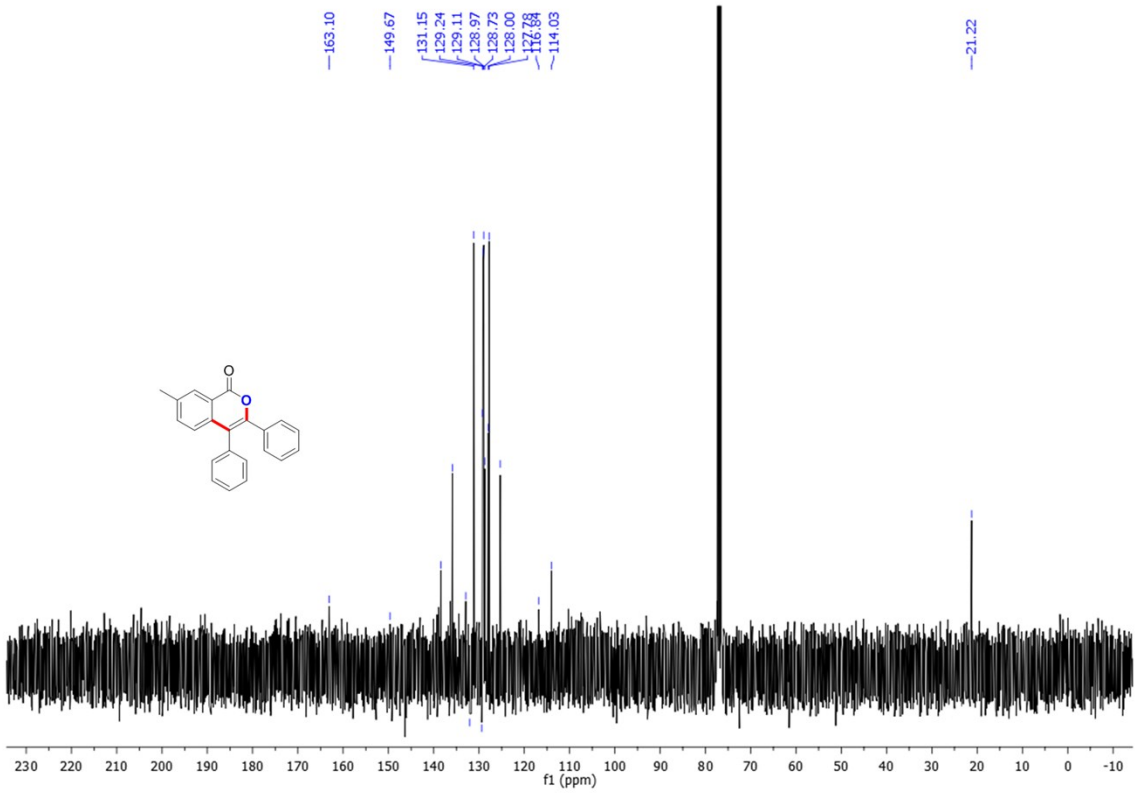
1ea) 7-methyl-3,4-diphenylisoquinolin-1(*2H*)-one, ^{13}C NMR



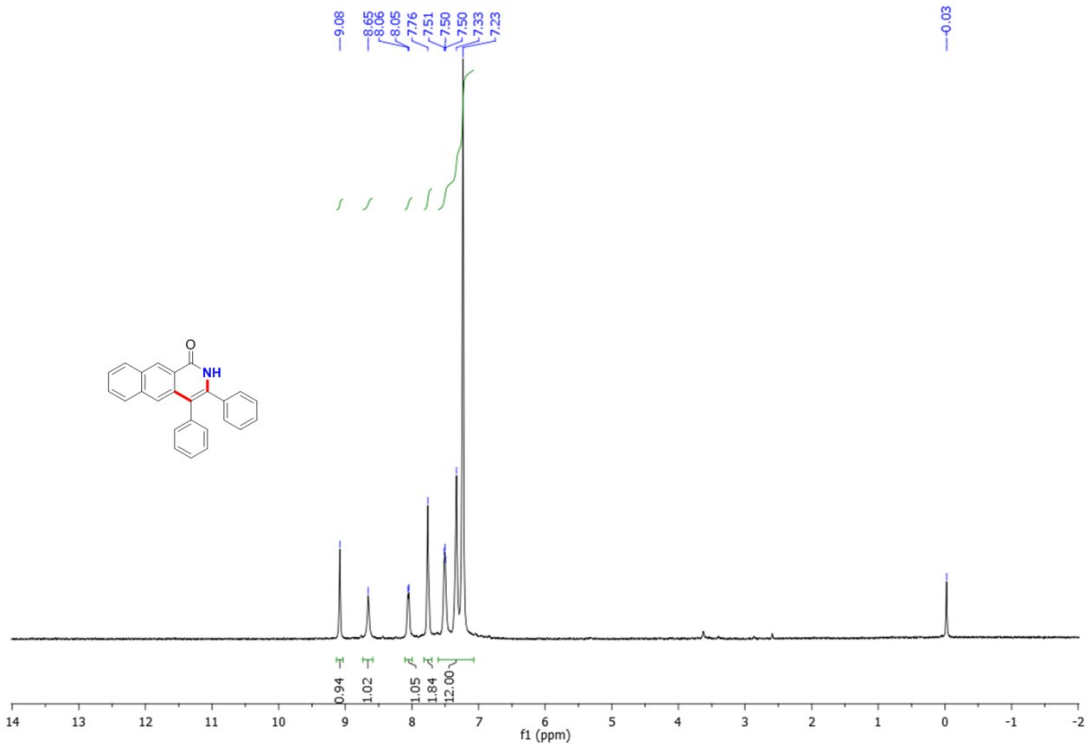
8ea) 7-methyl-3,4-diphenyl-1*H*-isochromen-1-one, ^{1}H NMR



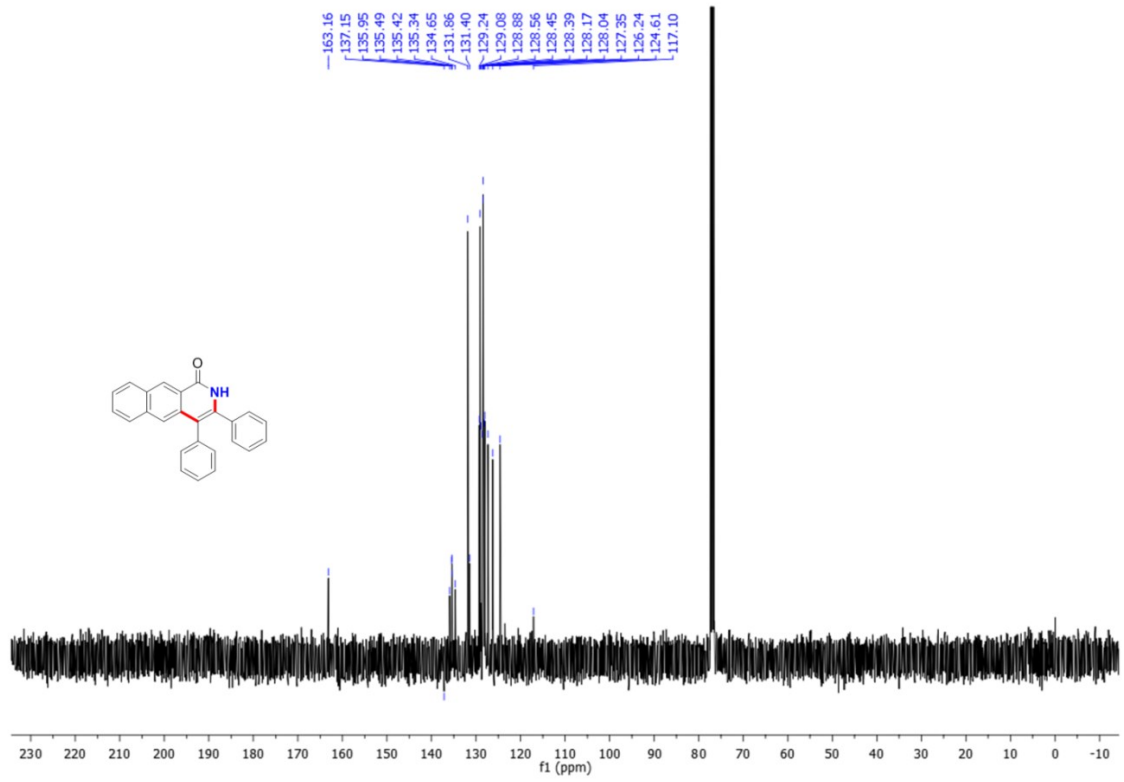
8ea) 7-methyl-3,4-diphenyl-1*H*-isochromen-1-one, ^{13}C NMR



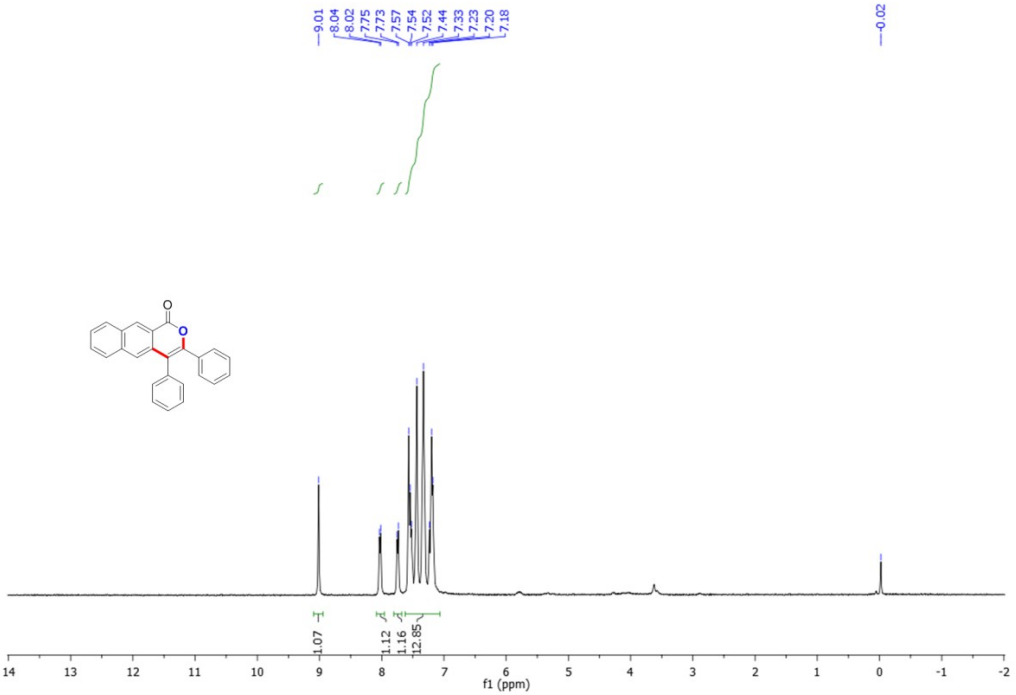
1fa) 3,4-diphenylbenzo[*g*]isoquinolin-1(*2H*)-one, ^{1}H NMR



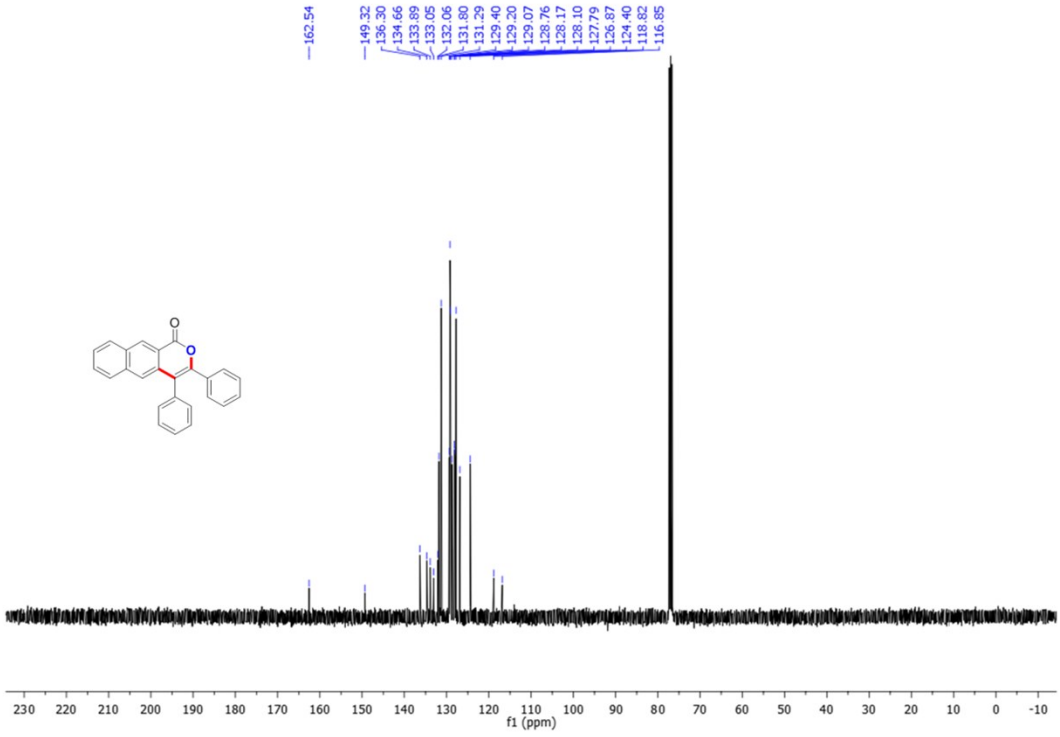
1fa) 3,4-diphenylbenzo[*g*]isoquinolin-1(*2H*)-one, ^{13}C NMR



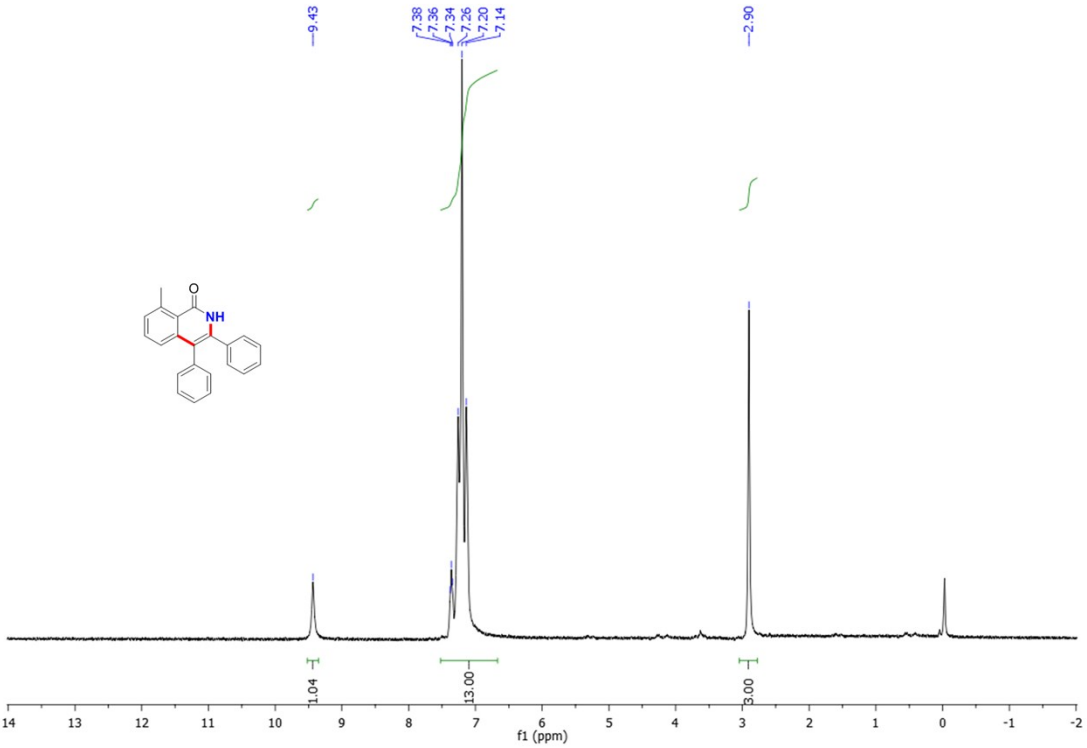
8fa) 3,4-diphenyl-1*H*-benzo[*g*]isochromen-1-one, ^{1}H NMR



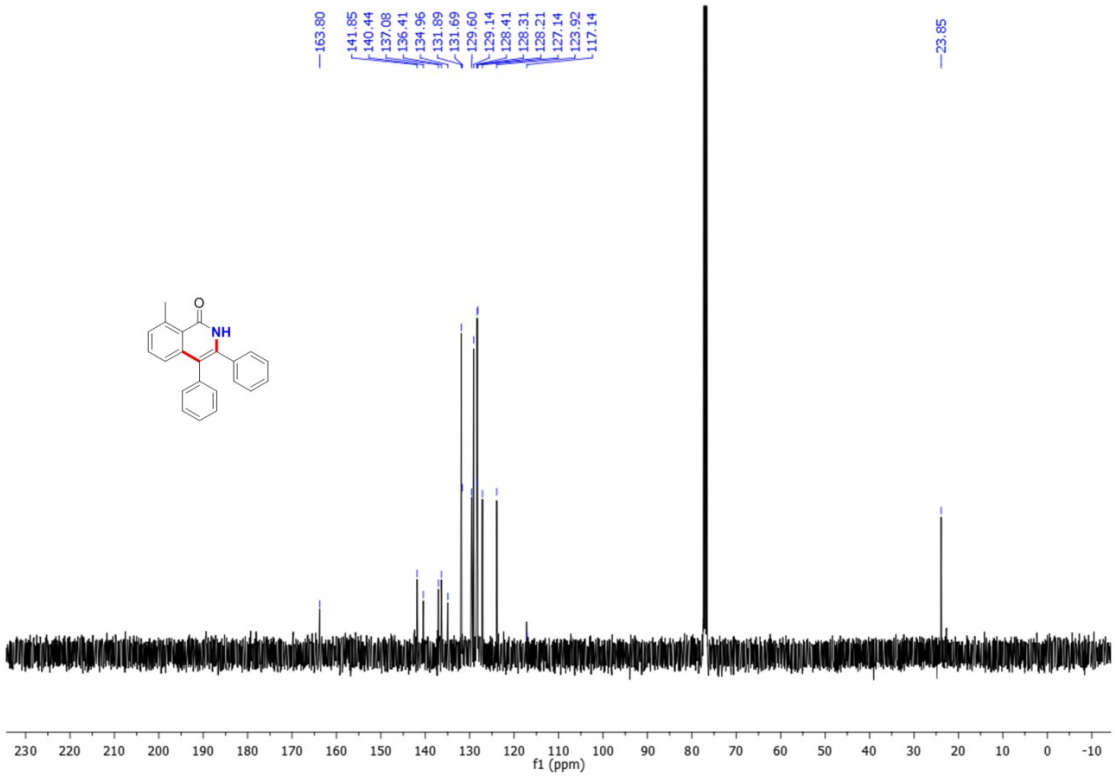
8fa) 3,4-diphenyl-1*H*-benzo[*g*]isochromen-1-one, ^{13}C NMR



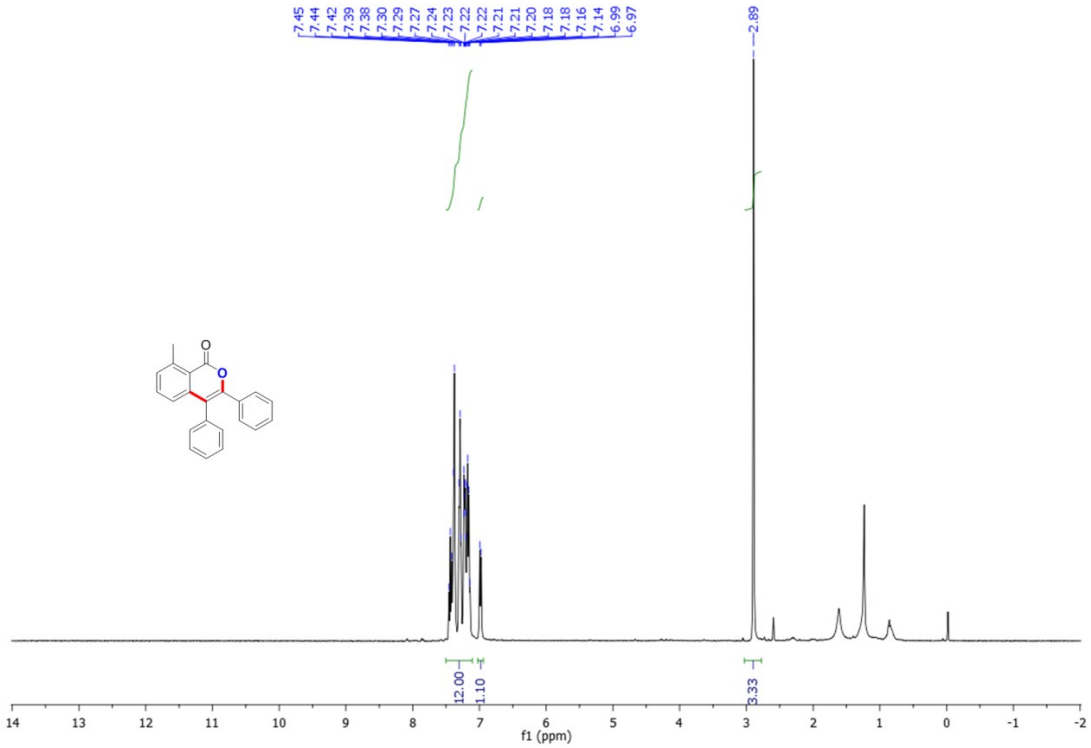
1ga) 8-methyl-3,4-diphenylisoquinolin-1(2*H*)-one, ^{1}H NMR



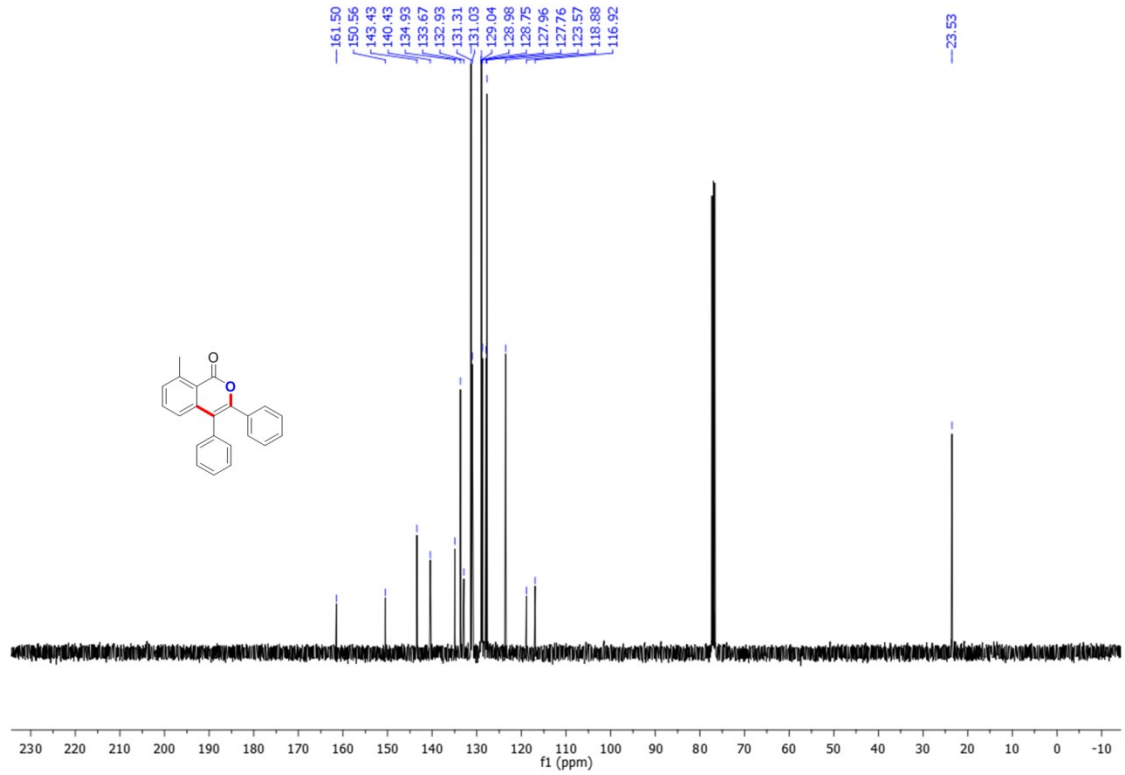
1ga) 8-methyl-3,4-diphenylisoquinolin-1(2*H*)-one, ^{13}C NMR



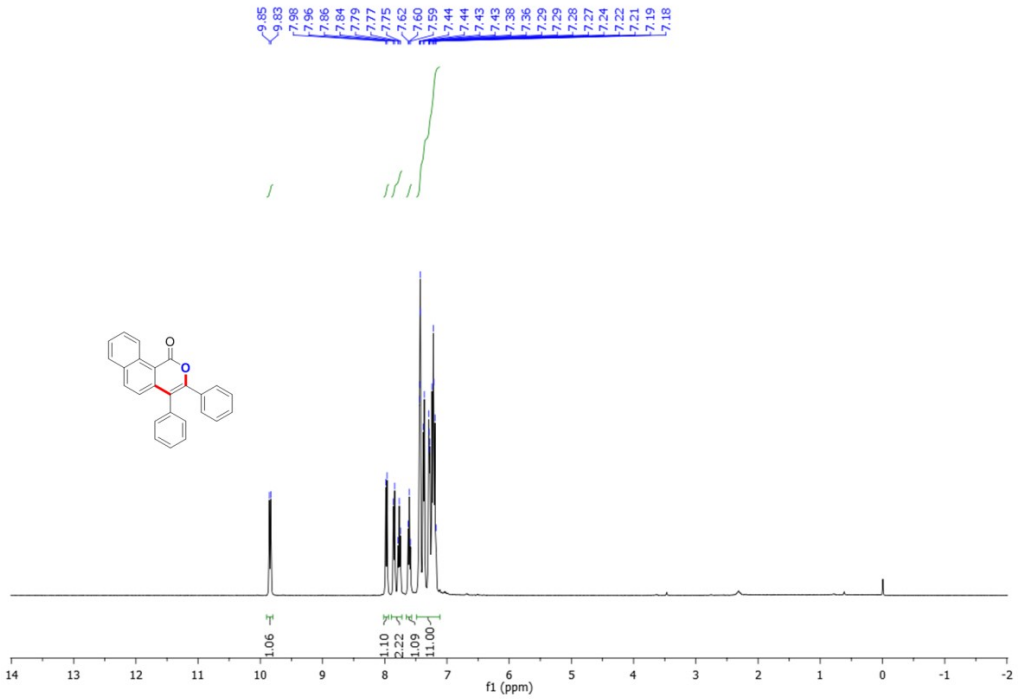
8ga) 8-methyl-3,4-diphenyl-1*H*-isochromen-1-one, ^{1}H NMR



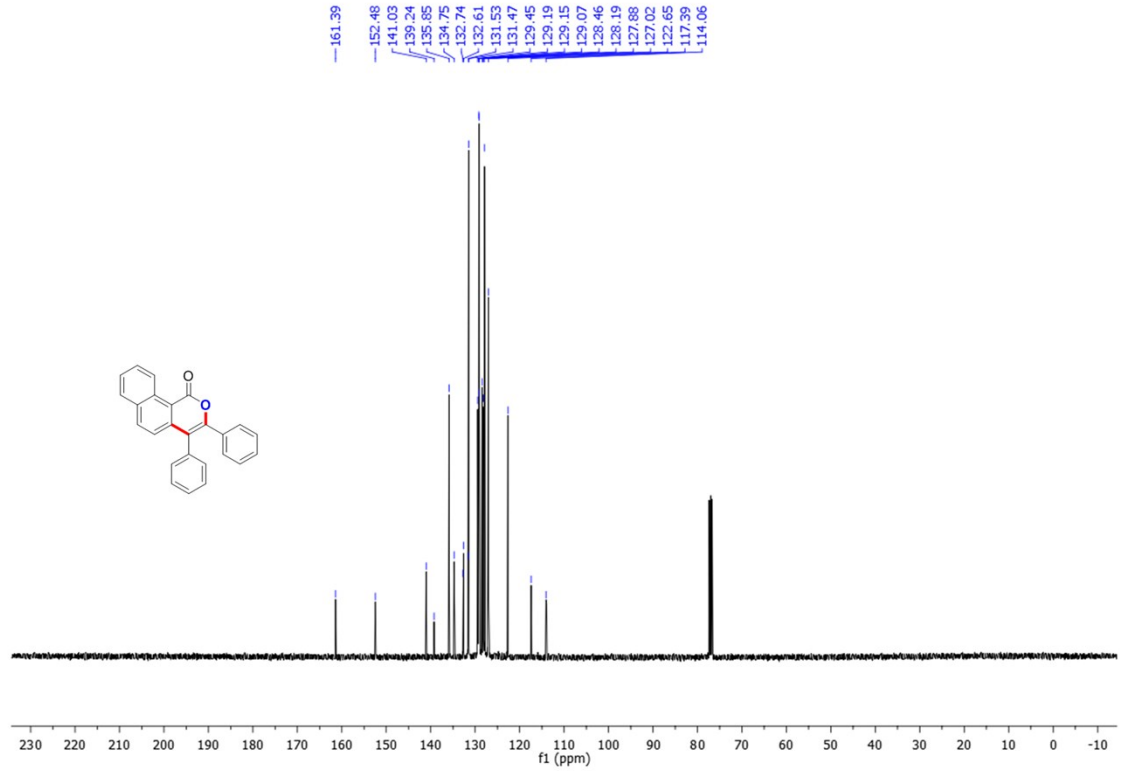
8ga) 8-methyl-3,4-diphenyl-1*H*-isochromen-1-one, ^{13}C NMR



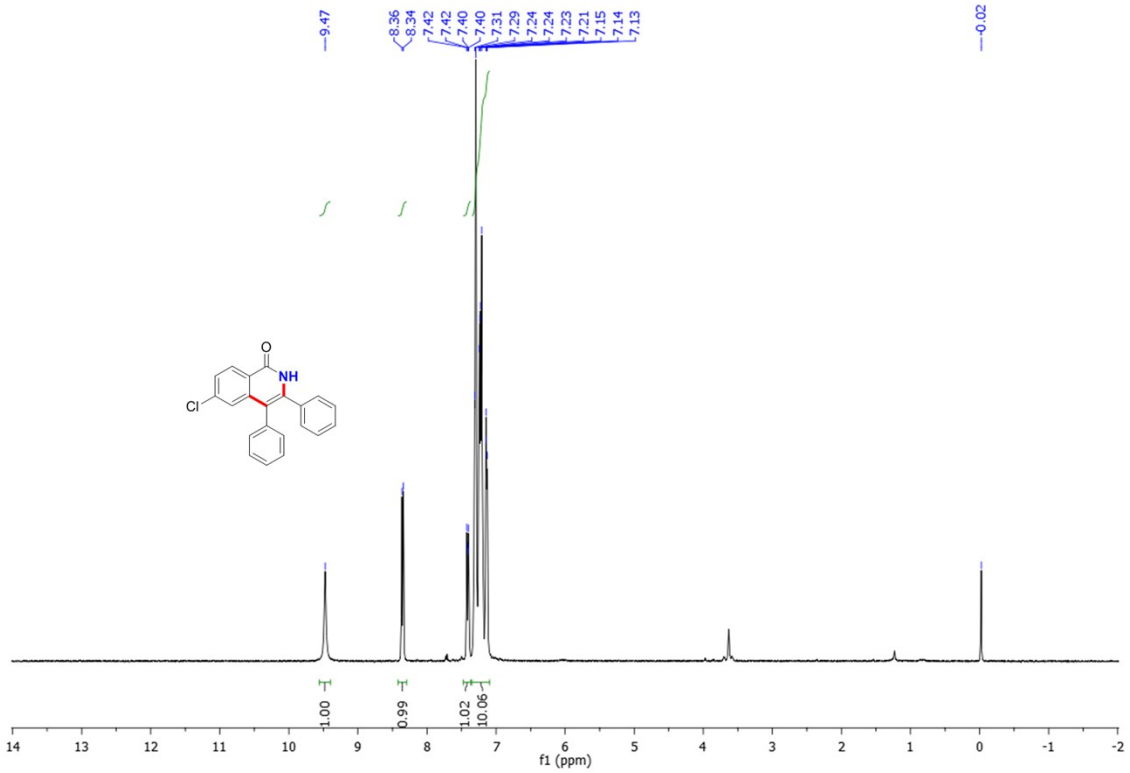
8ha) 3,4-diphenyl-1H-benzo[*h*]isochromen-1-one, ^{1}H NMR



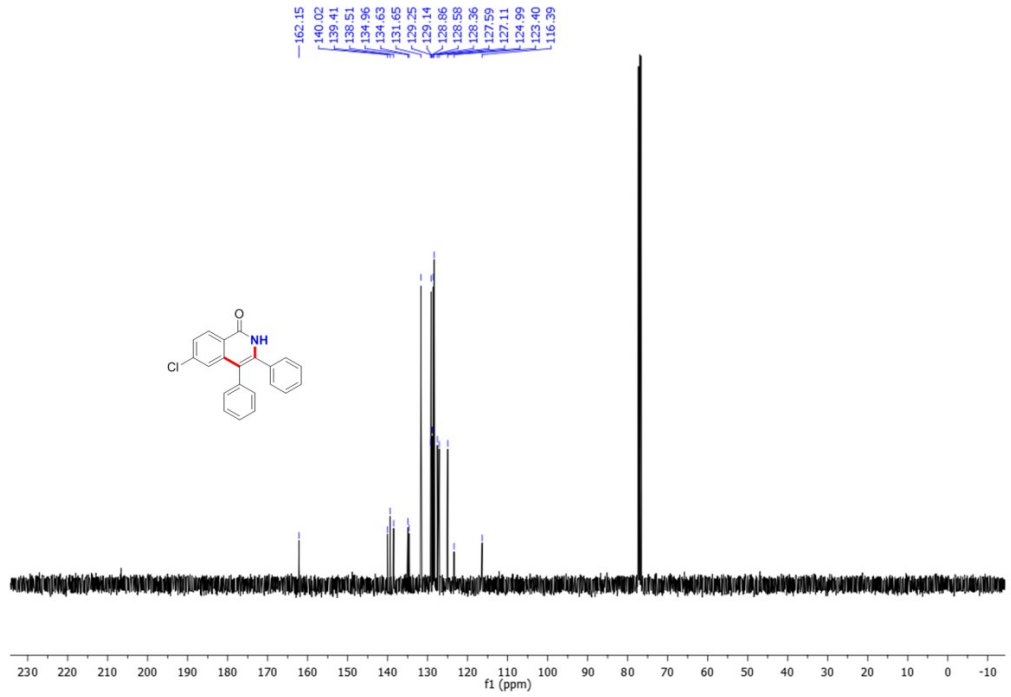
8ha) 3,4-diphenyl-1H-benzo[*h*]isochromen-1-one, ^{13}C NMR



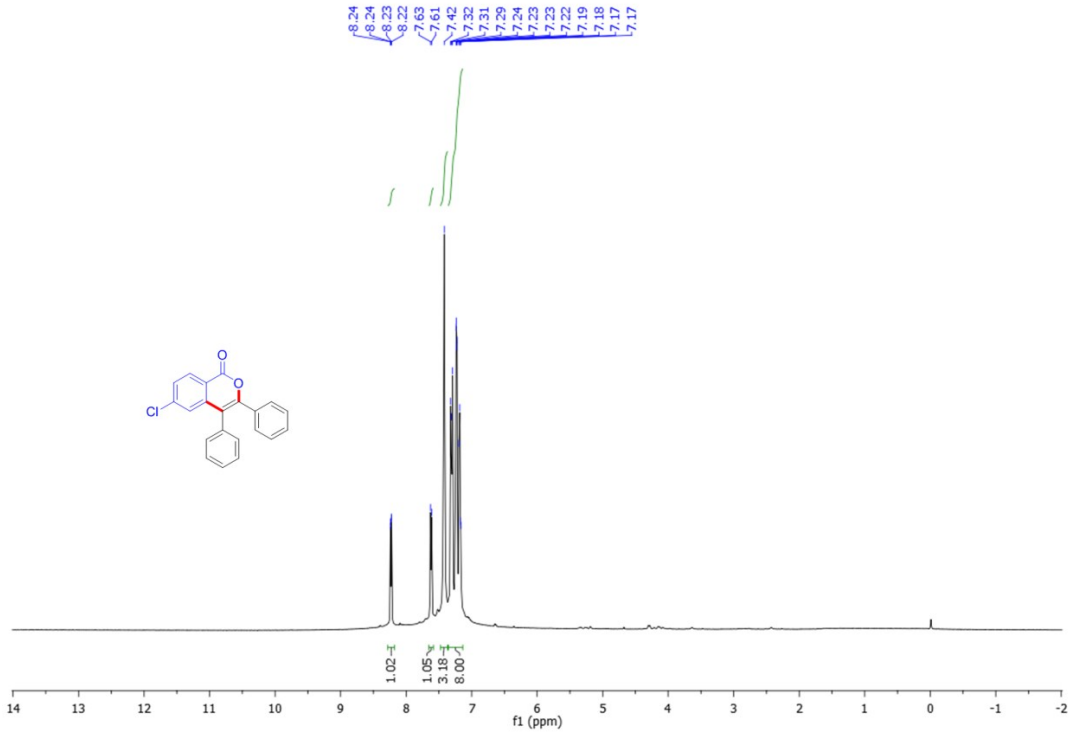
1ia) 6-chloro-3,4-diphenylisoquinolin-1(2*H*)-one, ^{1}H NMR



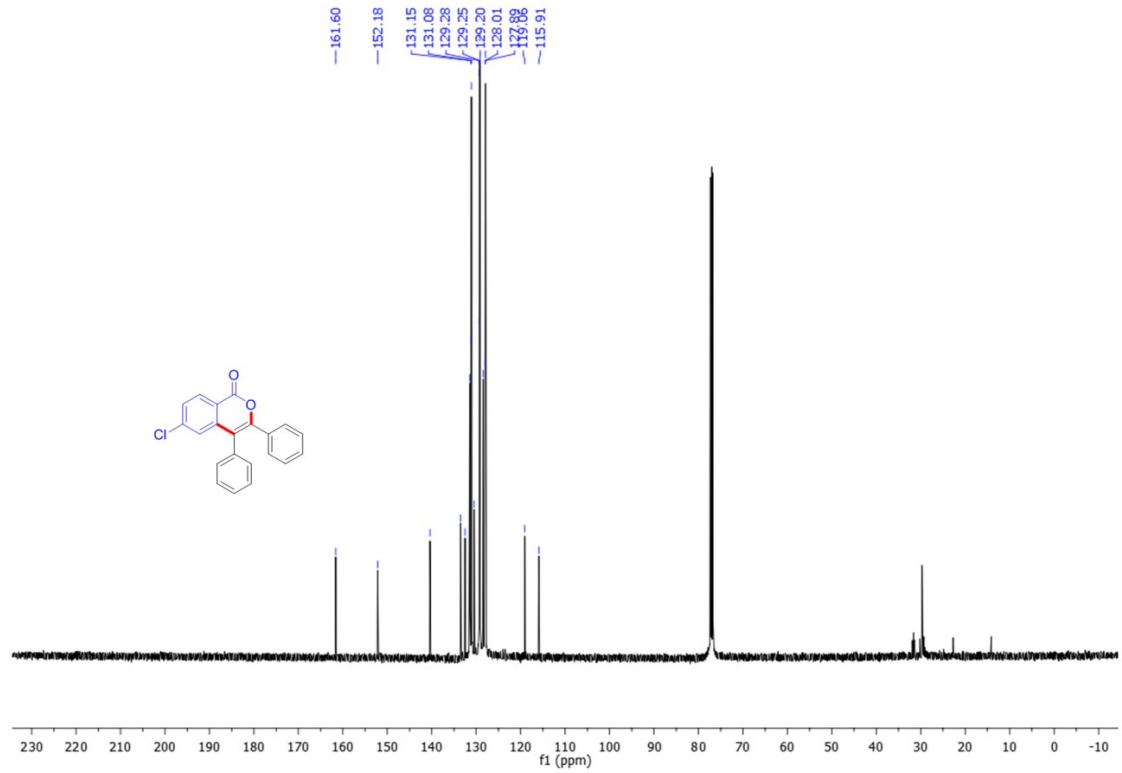
1ia) 6-chloro-3,4-diphenylisoquinolin-1(2*H*)-one, ^{13}C NMR



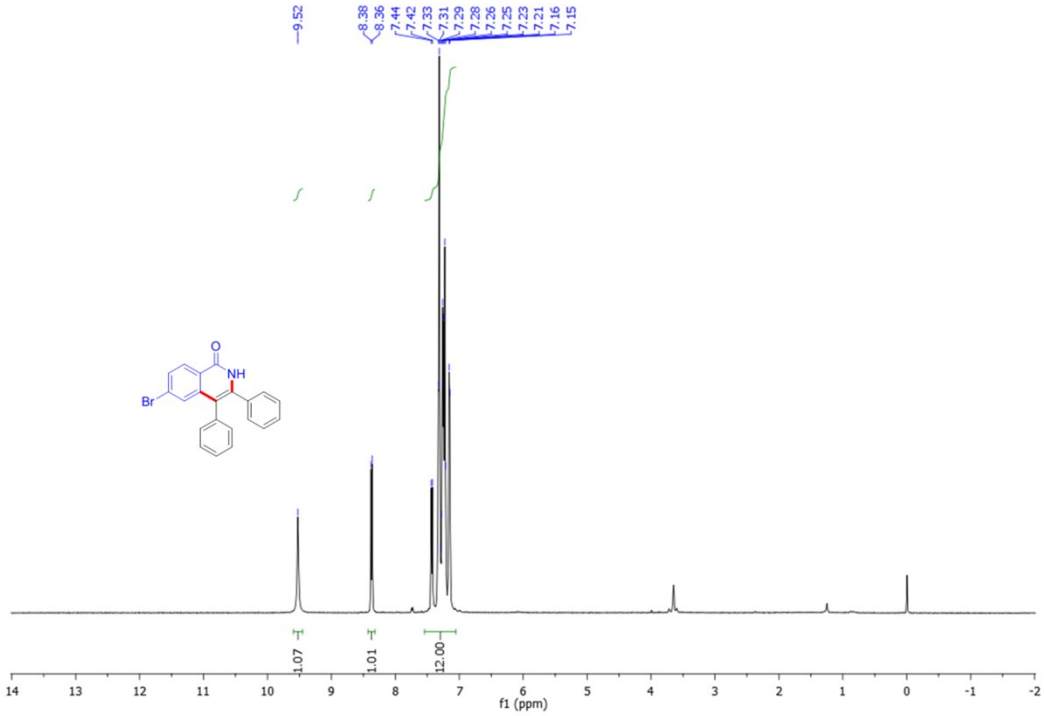
8ia) 6-chloro-3,4-diphenyl-1*H*-isochromen-1-one, ^{1}H NMR



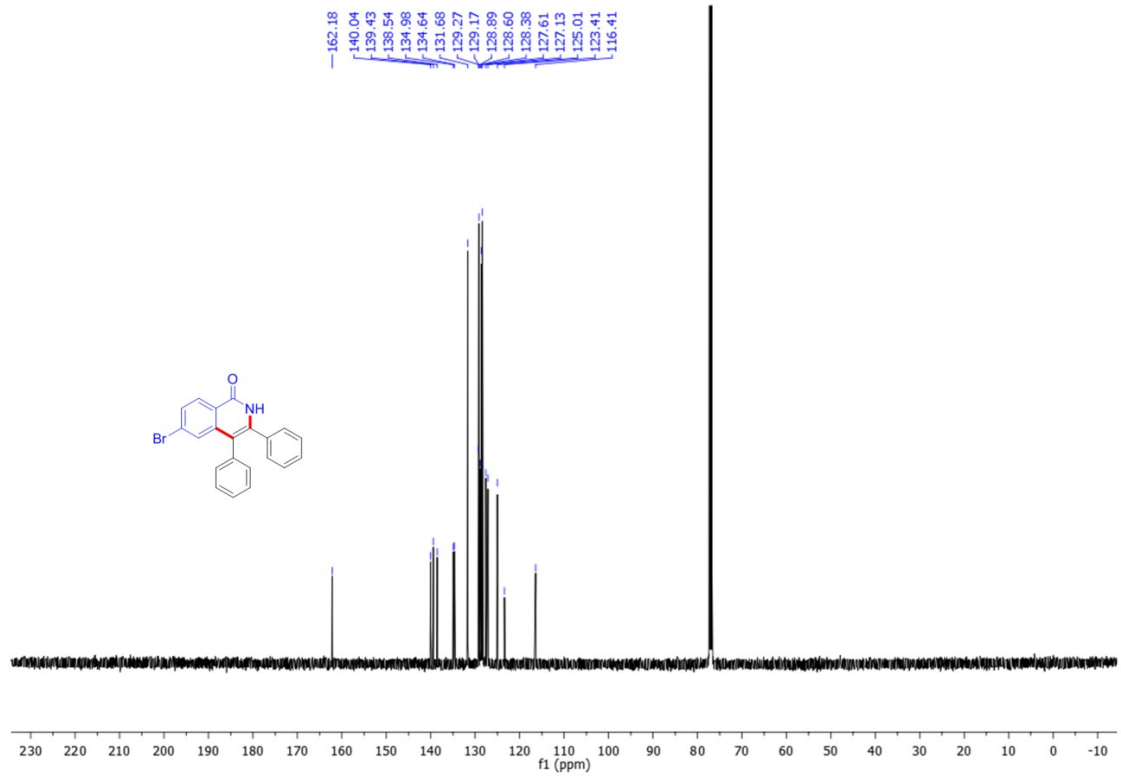
8ia) 6-chloro-3,4-diphenyl-1*H*-isochromen-1-one, ^{13}C NMR



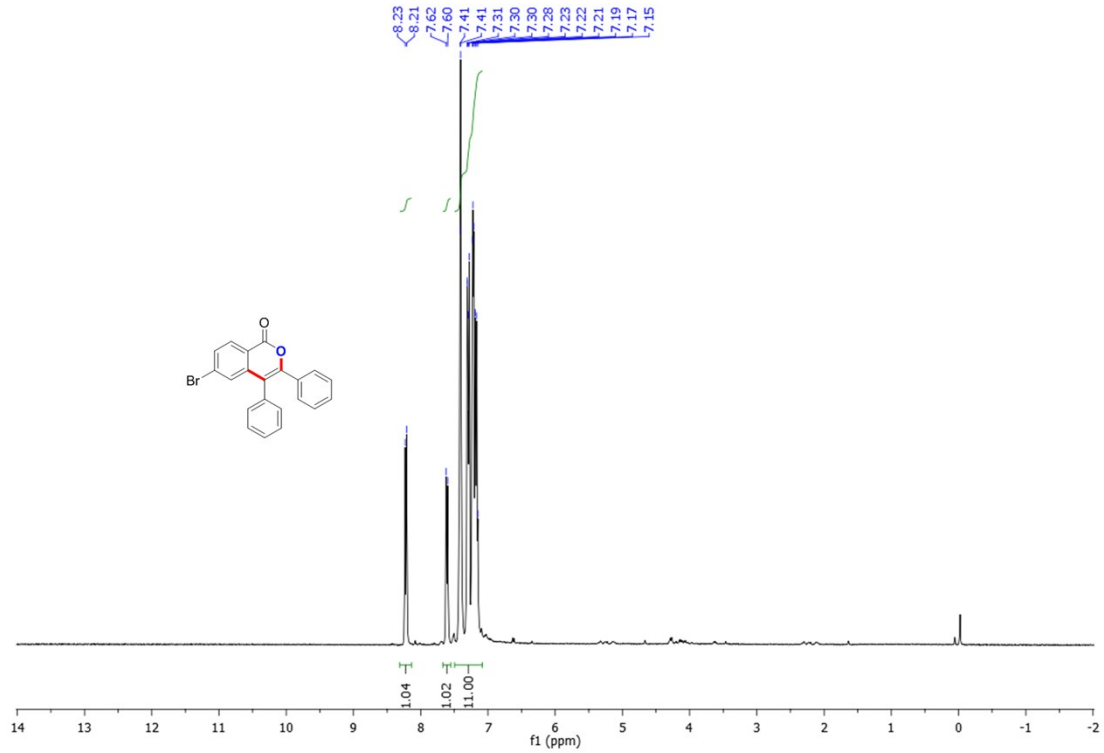
1ja) 6-bromo-3,4-diphenylisoquinolin-1(2*H*)-one, ^{1}H NMR



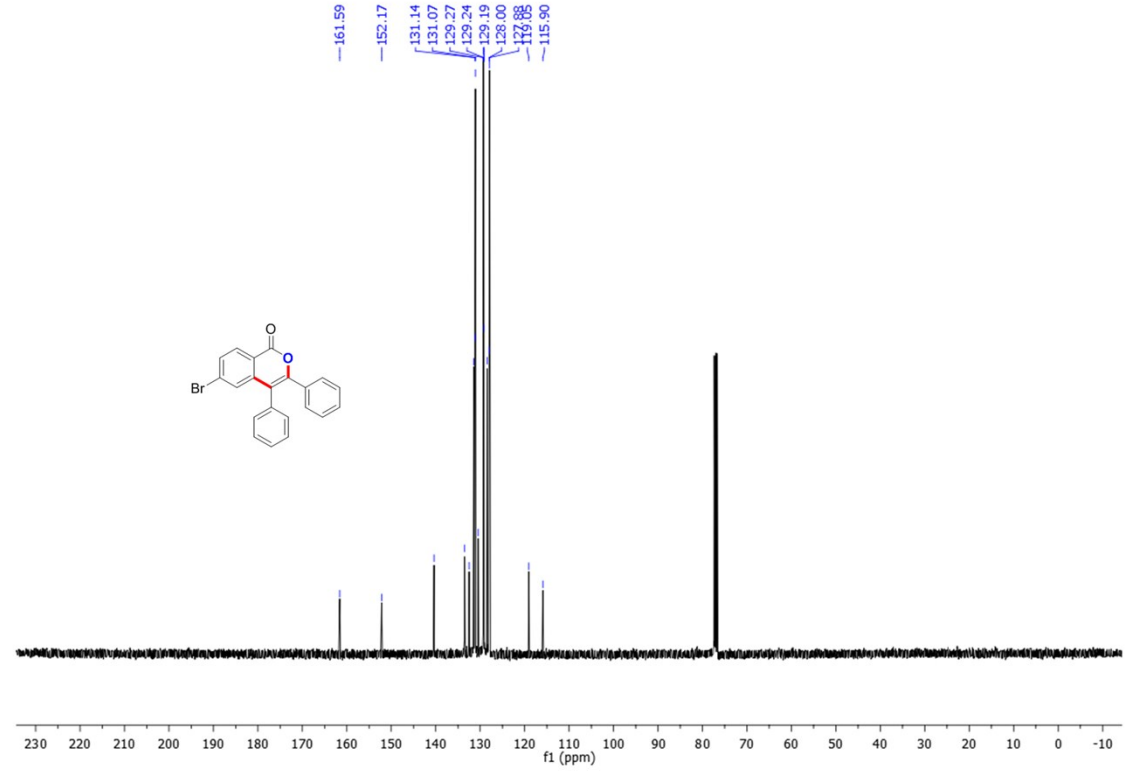
1ja) 6-bromo-3,4-diphenylisoquinolin-1(2*H*)-one, ^{13}C NMR



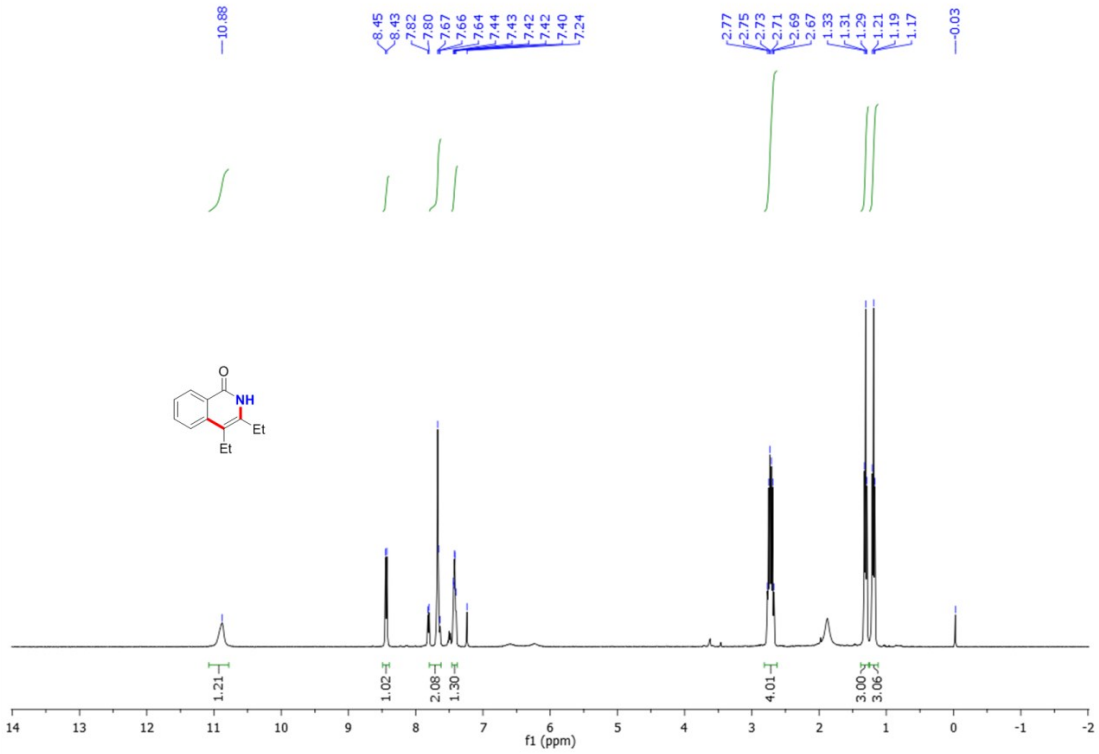
8ja) 6-bromo-3,4-diphenyl-1*H*-isochromen-1-one, ^{1}H NMR



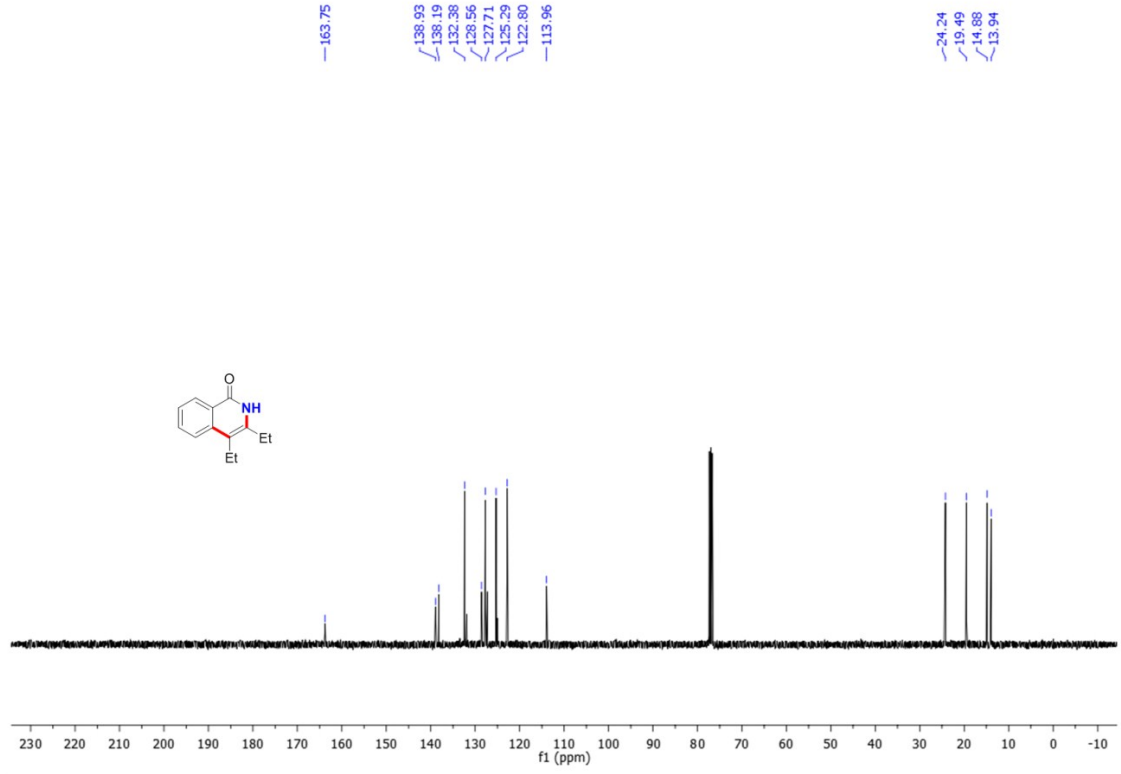
8ja) 6-bromo-3,4-diphenyl-1*H*-isochromen-1-one, ^{13}C NMR



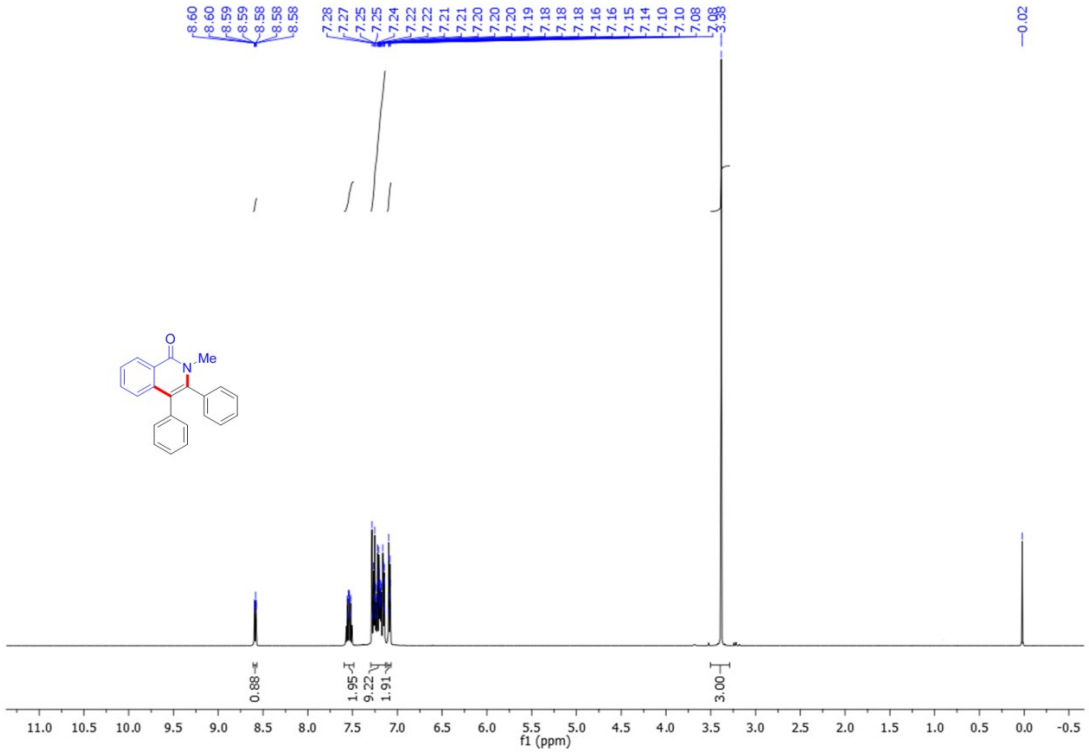
1ab) 3,4-diethylisoquinolin-1(2*H*)-one, ^{1}H NMR



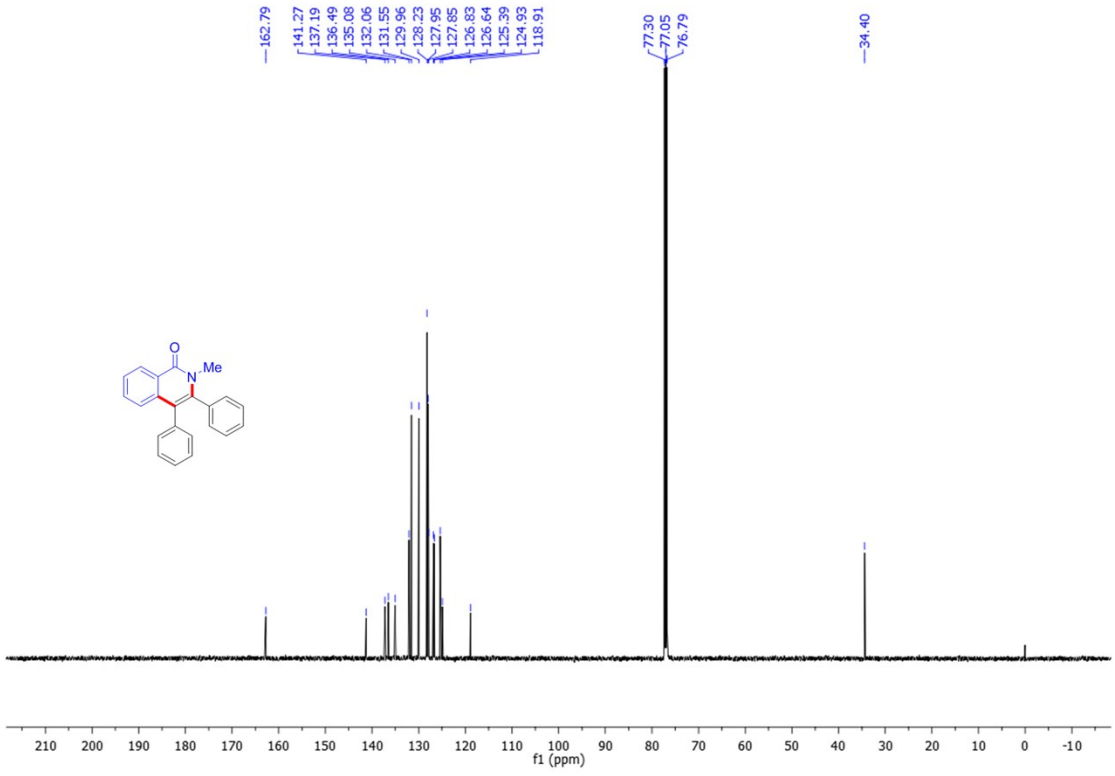
1ab) 3,4-diethylisoquinolin-1(2*H*)-one, ^{13}C NMR



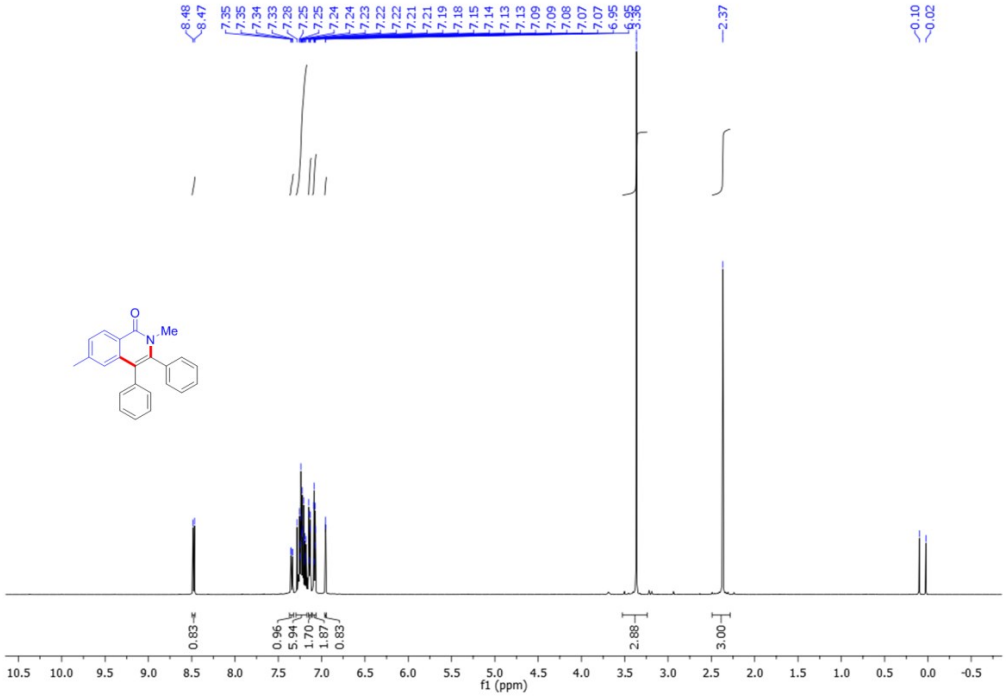
4aa) 2-methyl-3,4-diphenylisoquinolin-1(2*H*)-one, ^{1}H NMR



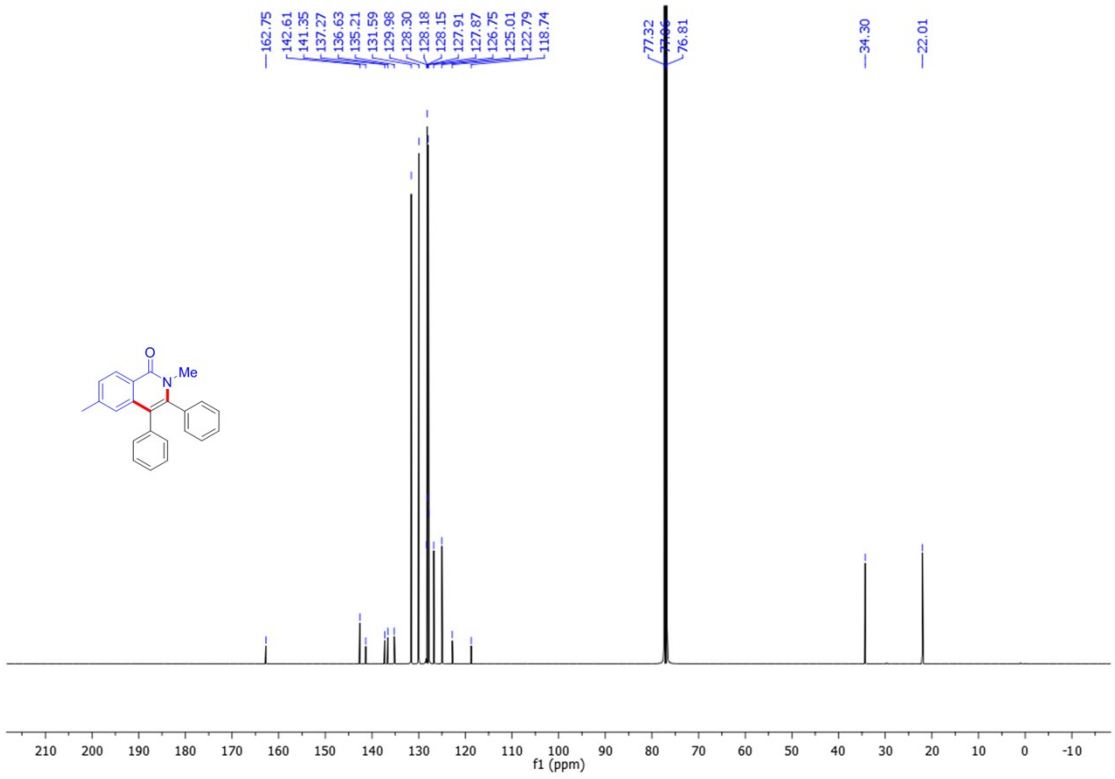
4aa) 2-methyl-3,4-diphenylisoquinolin-1(2*H*)-one, ^{13}C NMR



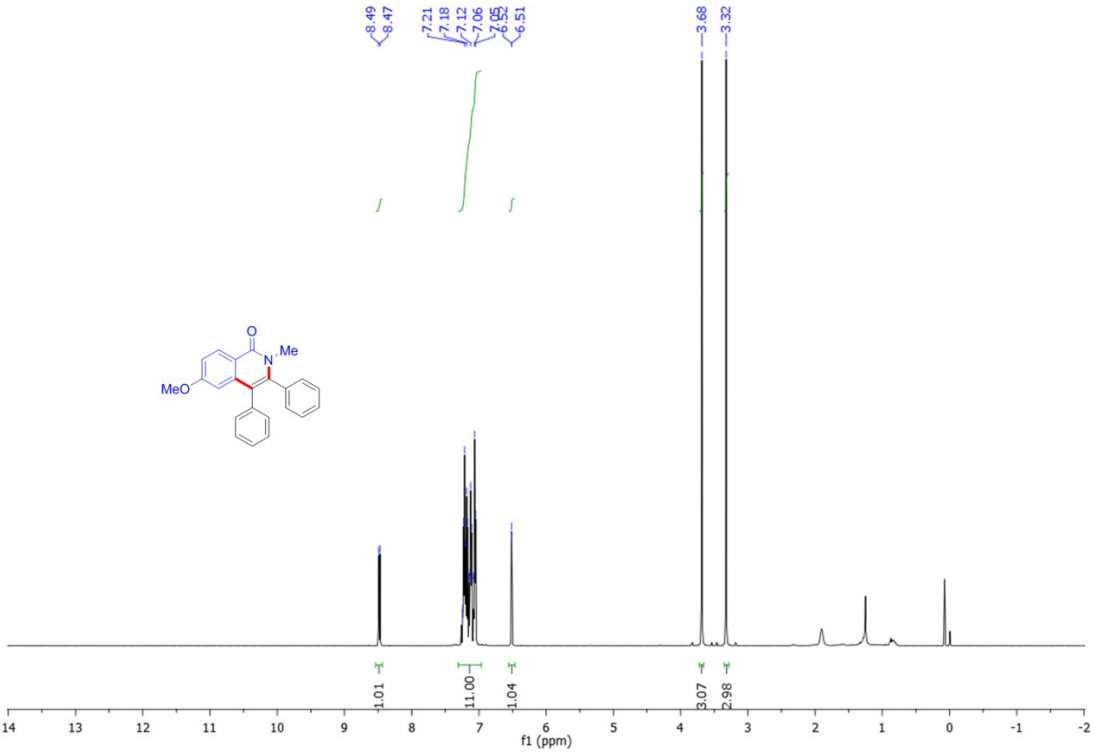
4ba) 2,6-dimethyl-3,4-diphenylisoquinolin-1(2*H*)-one, ^{1}H NMR



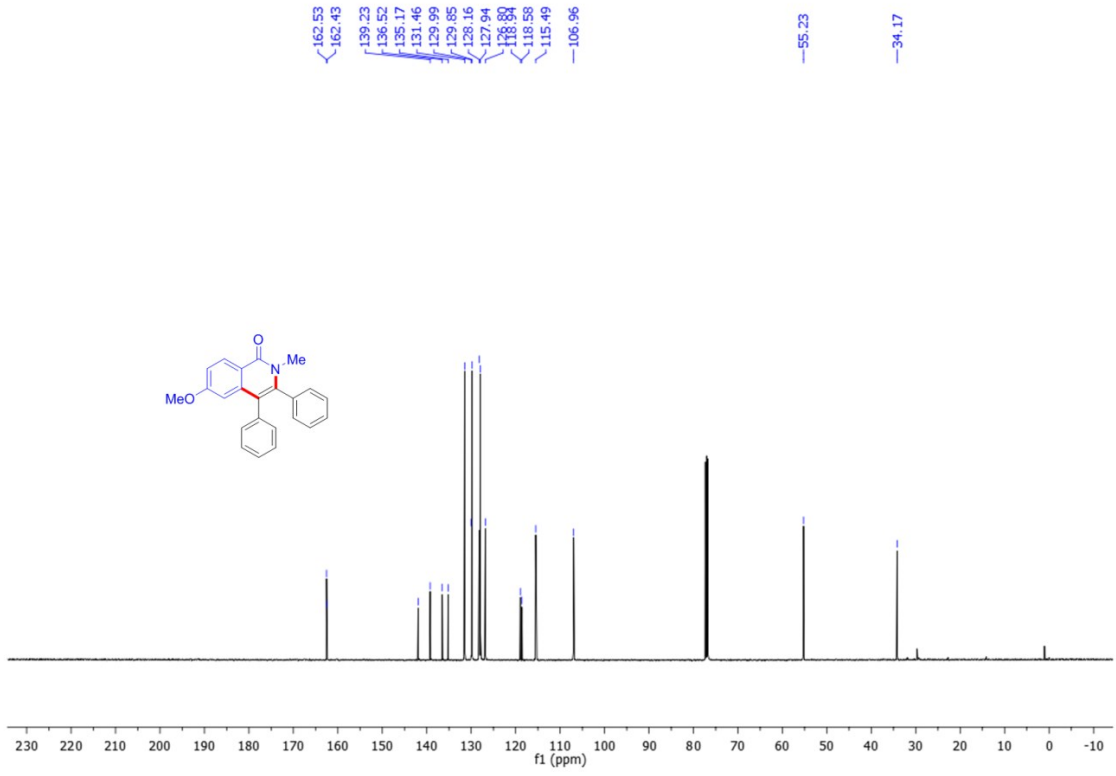
4ba) 2,6-dimethyl-3,4-diphenylisoquinolin-1(2*H*)-one, ^{13}C NMR



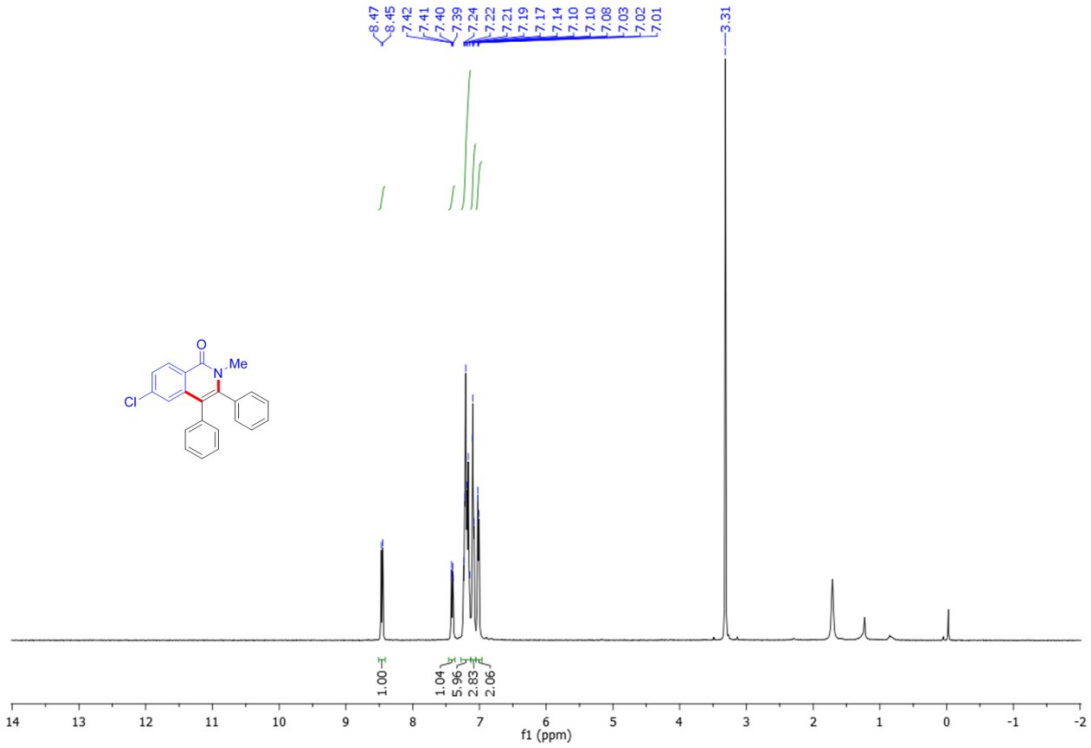
4ca) 6-methoxy-2-methyl-3,4-diphenylisoquinolin-1(2*H*)-one, ^{1}H NMR



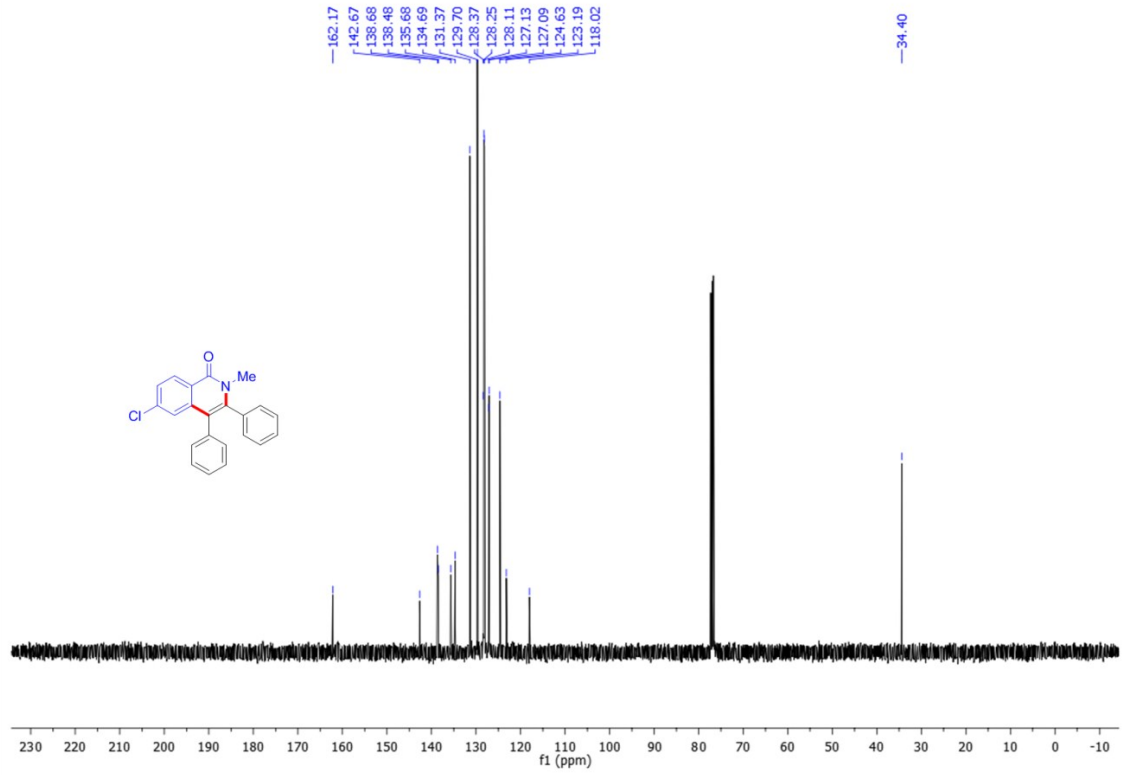
4ca) 6-methoxy-2-methyl-3,4-diphenylisoquinolin-1(2*H*)-one, ^{13}C NMR



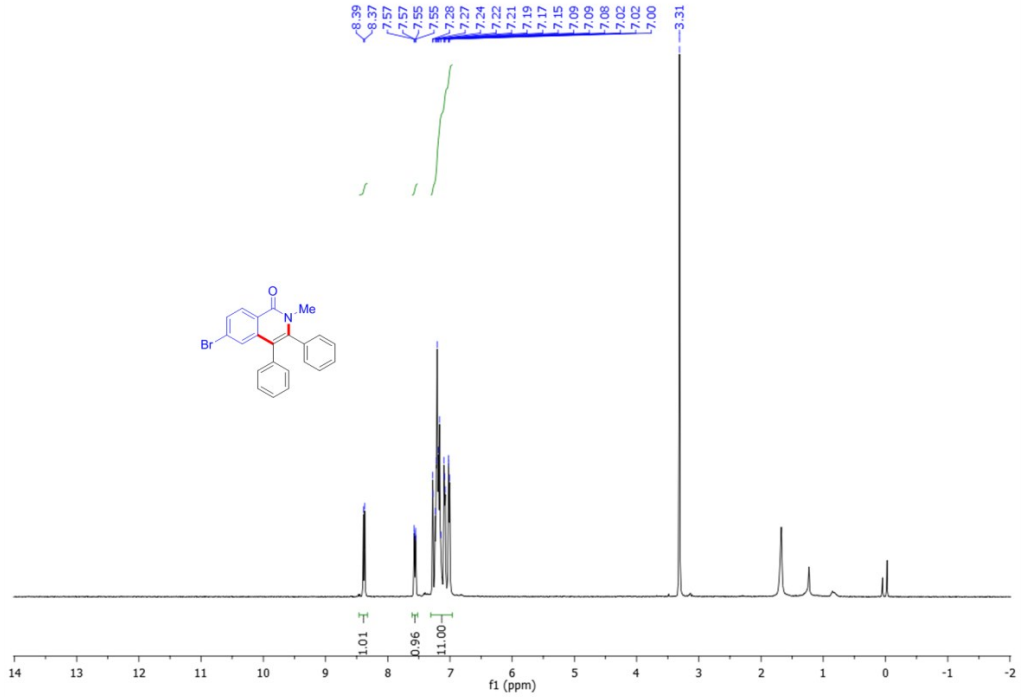
4da) 6-chloro-2-methyl-3,4-diphenylisoquinolin-1(2*H*)-one, ^{1}H NMR



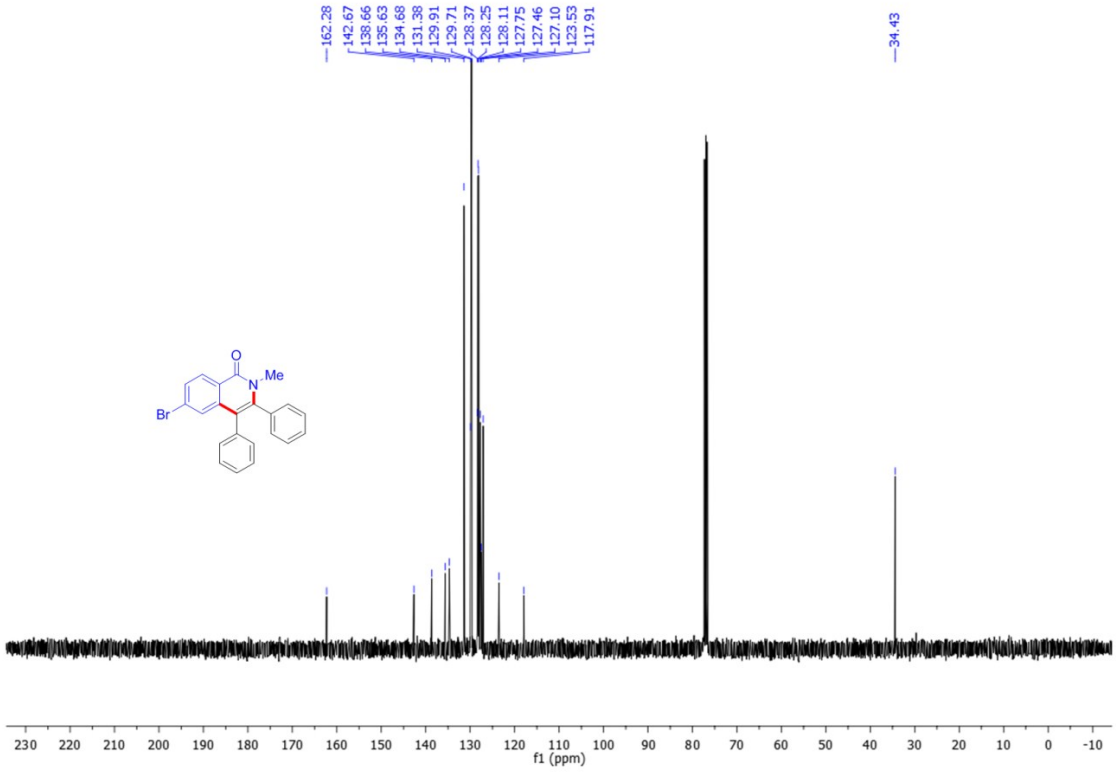
4da) 6-chloro-2-methyl-3,4-diphenylisoquinolin-1(2*H*)-one, ^{13}C NMR



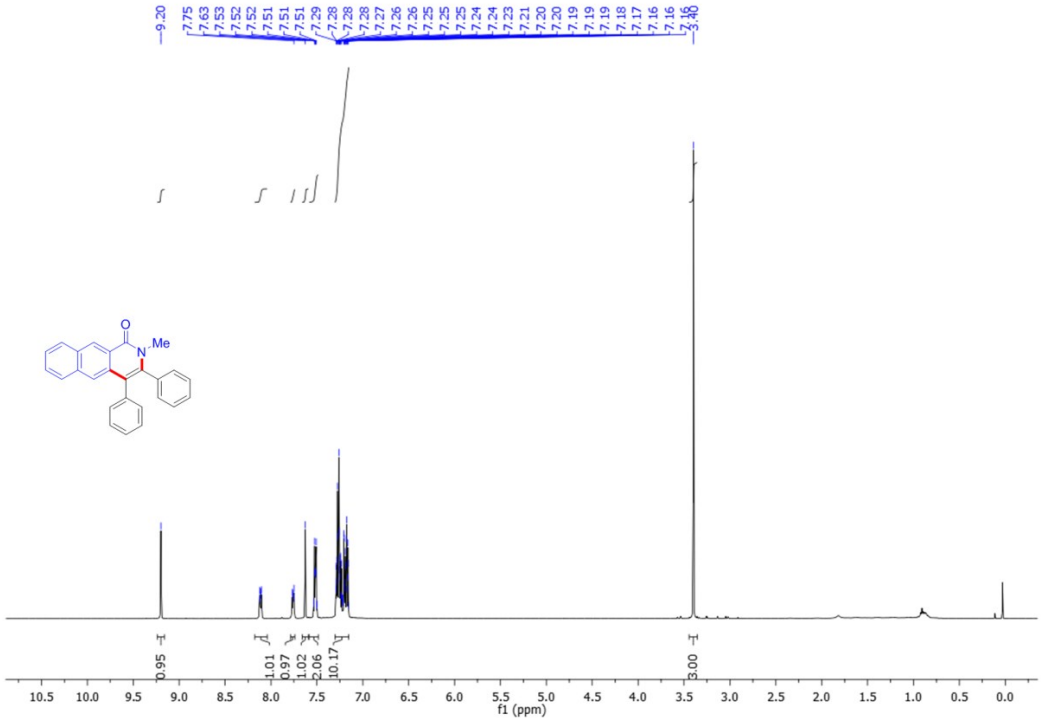
4ea) 6-bromo-2-methyl-3,4-diphenylisoquinolin-1(2*H*)-one, ^{1}H NMR



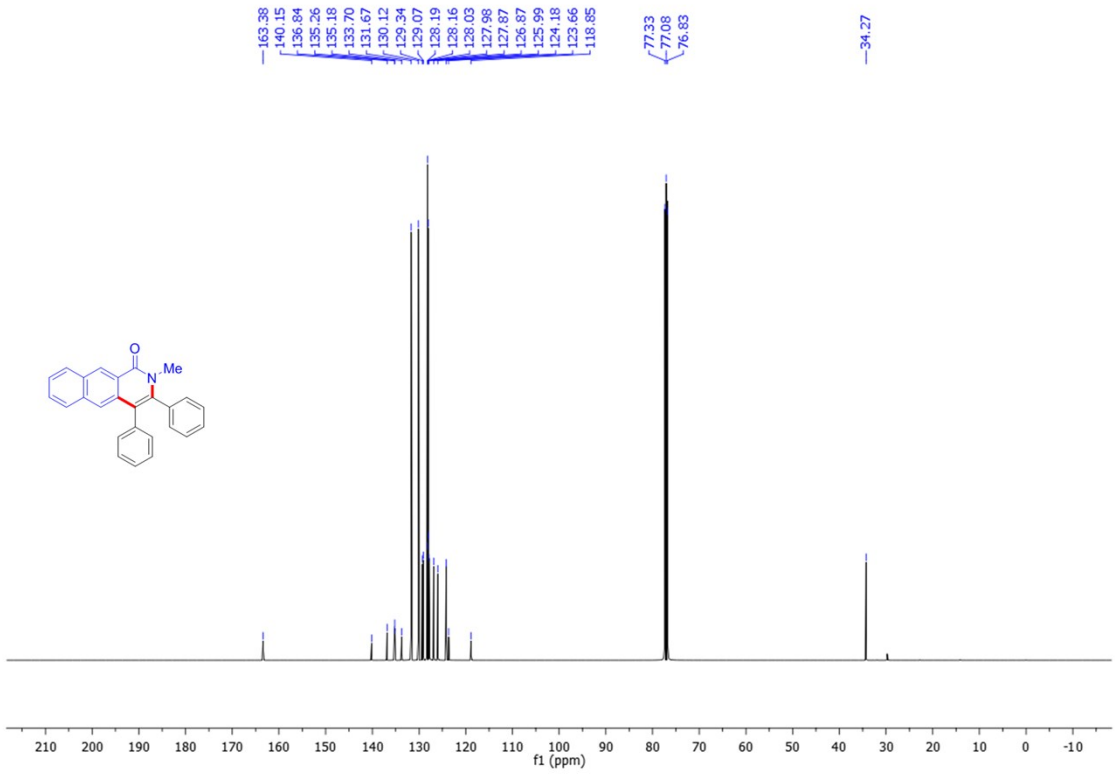
4ea) 6-bromo-2-methyl-3,4-diphenylisoquinolin-1(2*H*)-one, ^{13}C NMR



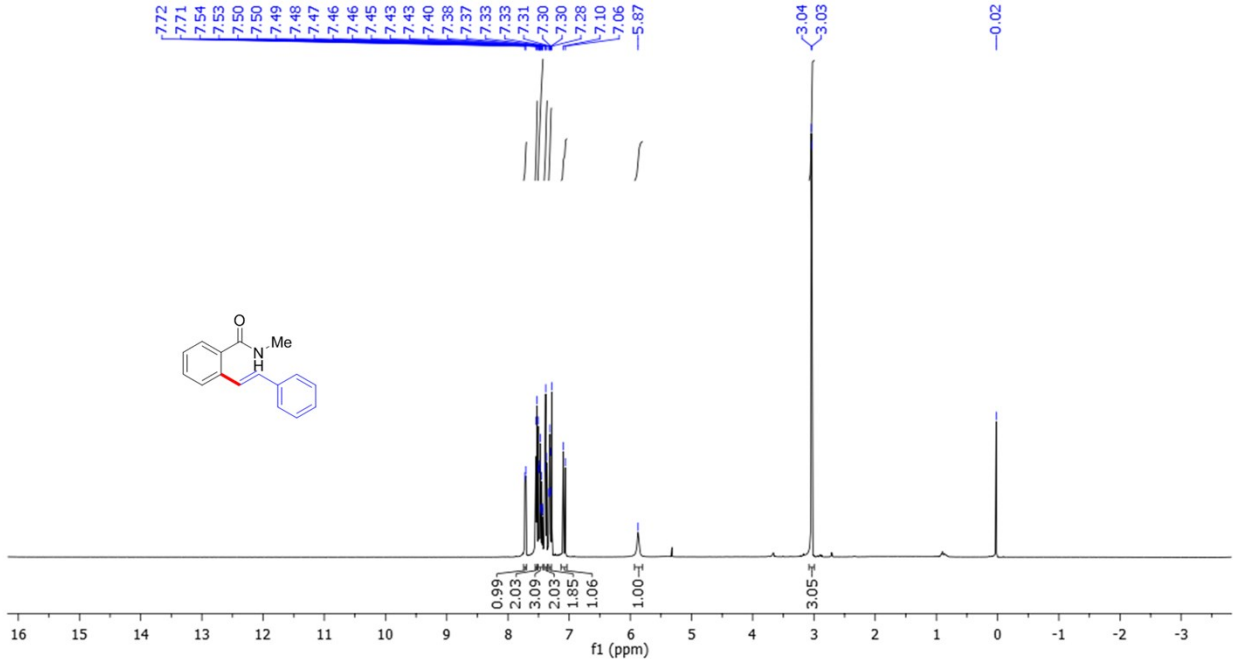
4fa) 2-methyl-3,4-diphenylbenzo[*g*]isoquinolin-1(2*H*)-one, ^{1}H NMR



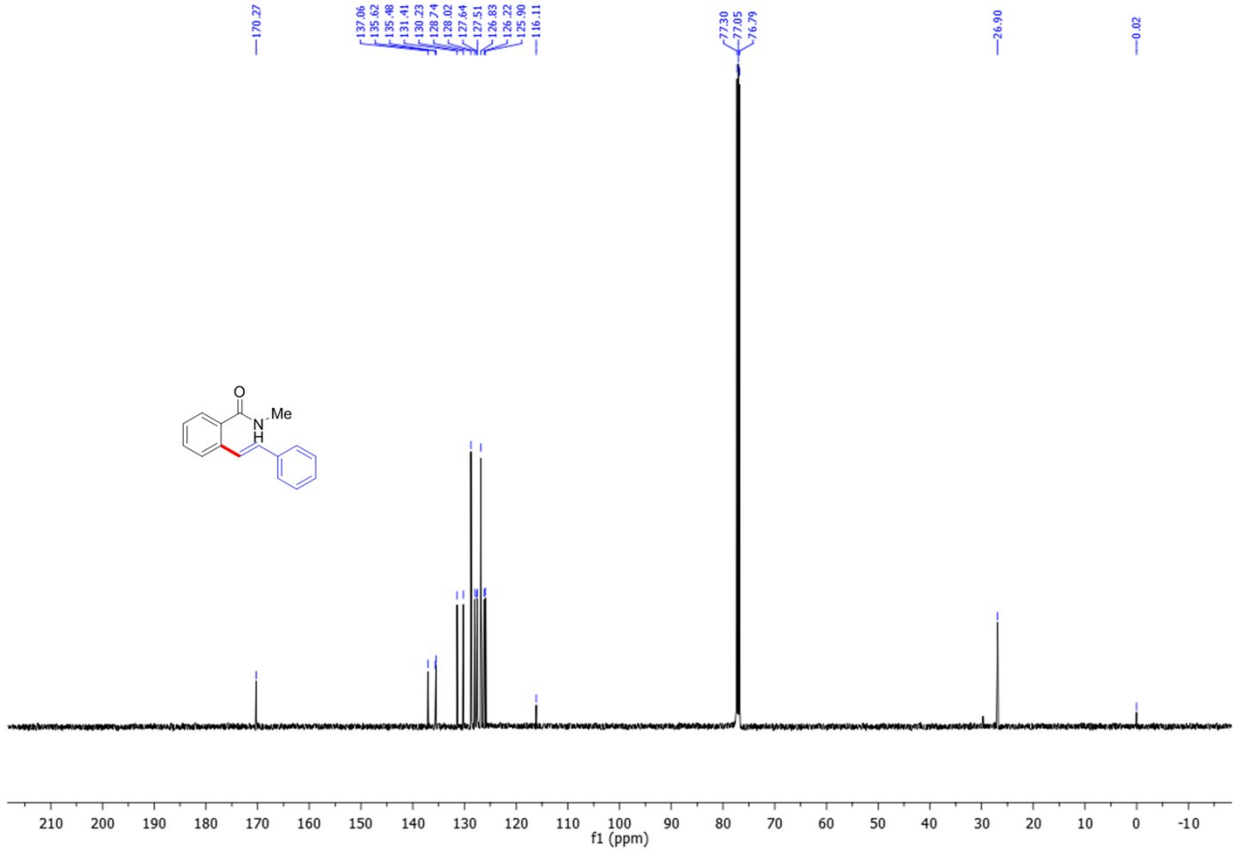
4fa) 2-methyl-3,4-diphenylbenzo[*g*]isoquinolin-1(2*H*)-one, ^{13}C NMR



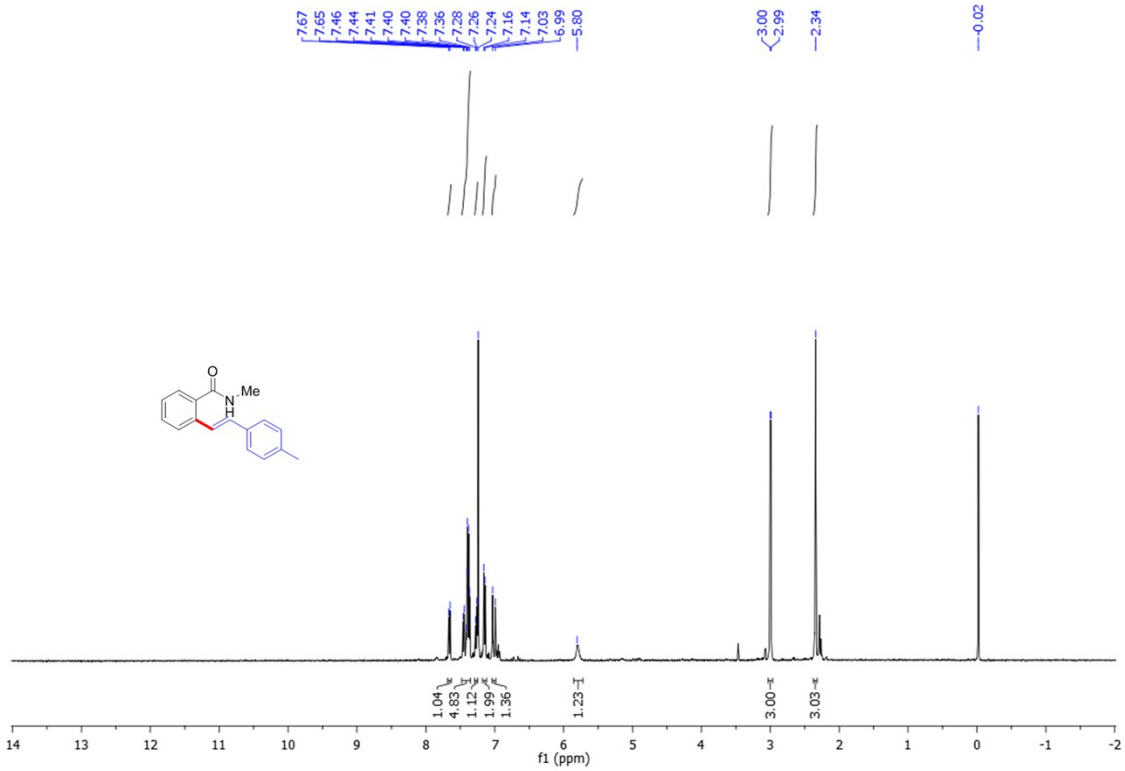
4aa') (*E*)-*N*-methyl-2-styrylbenzamide, ^{1}H NMR



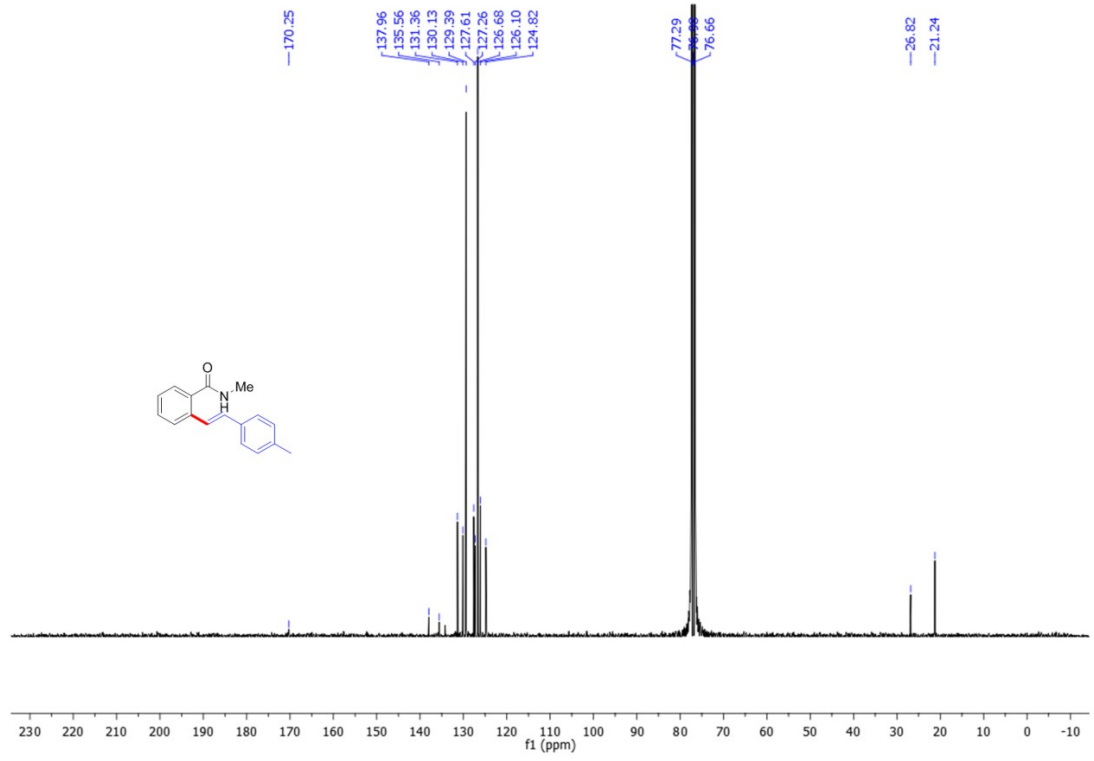
4aa') (*E*)-*N*-methyl-2-styrylbenzamide, ^{13}C NMR



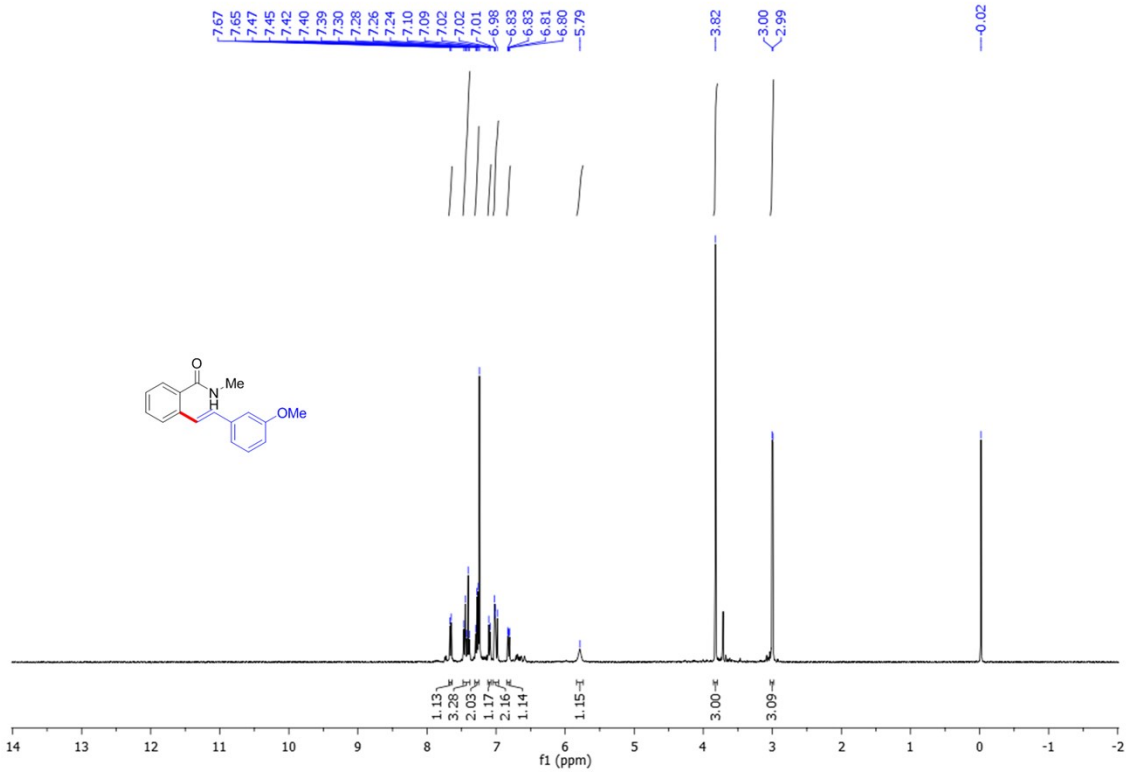
4ab') (*E*)-N-methyl-2-(4-methylstyryl)benzamide, ^{1}H NMR



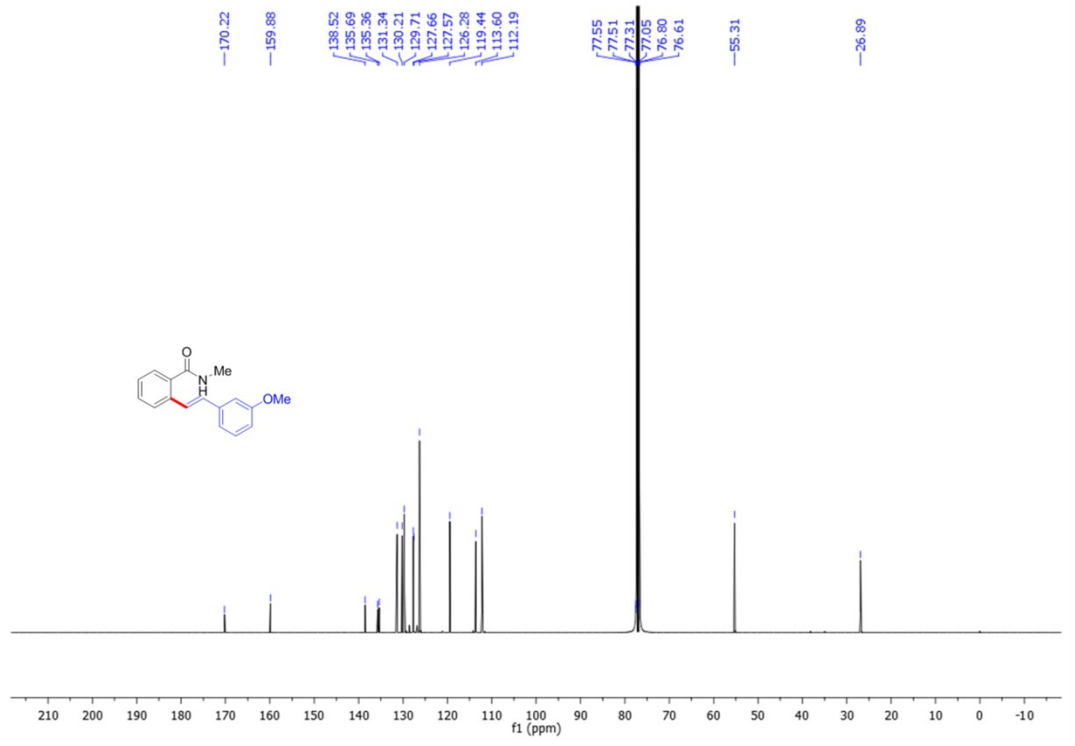
4ab') (*E*)-*N*-methyl-2-(4-methylstyryl)benzamide, ^{13}C NMR



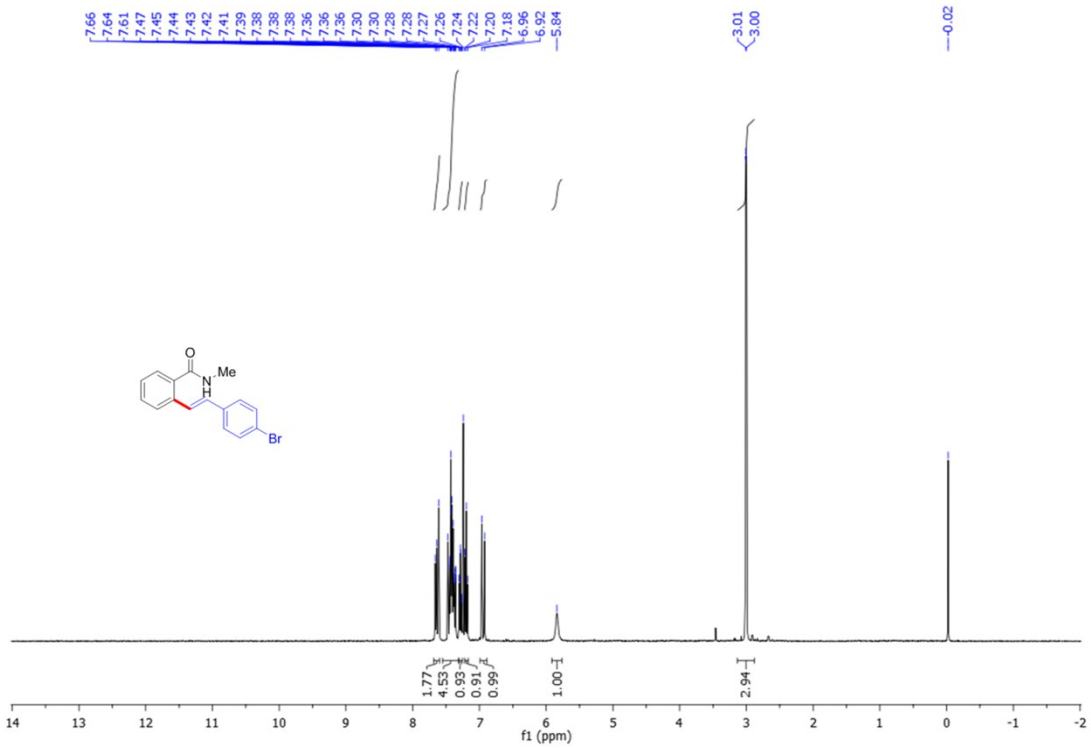
4ac') (*E*)-2-(3-methoxystyryl)-*N*-methylbenzamide, ^{1}H NMR



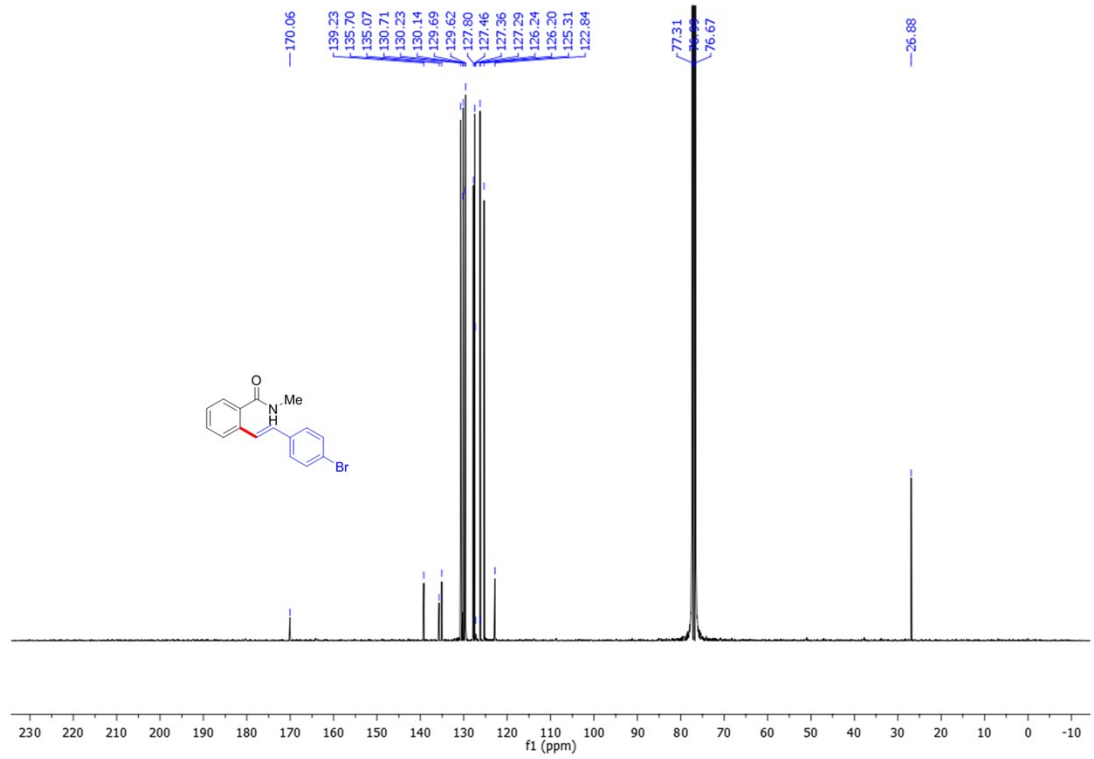
4ac') (*E*)-2-(3-methoxystyryl)-*N*-methylbenzamide, ^{13}C NMR



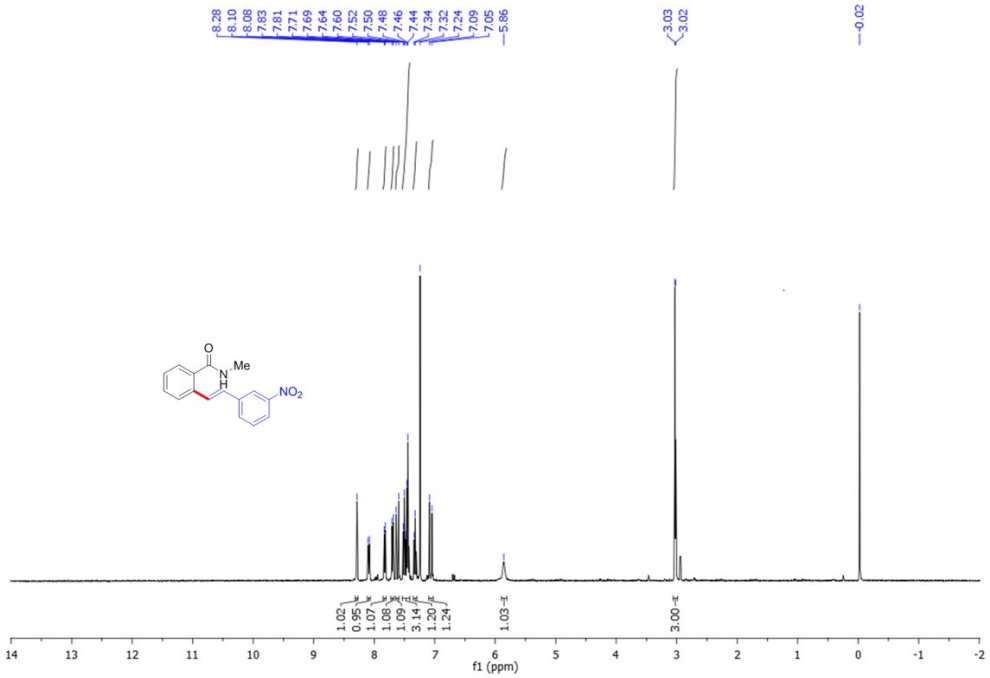
4ad') (*E*)-2-(4-bromostyryl)-*N*-methylbenzamide, ^{1}H NMR



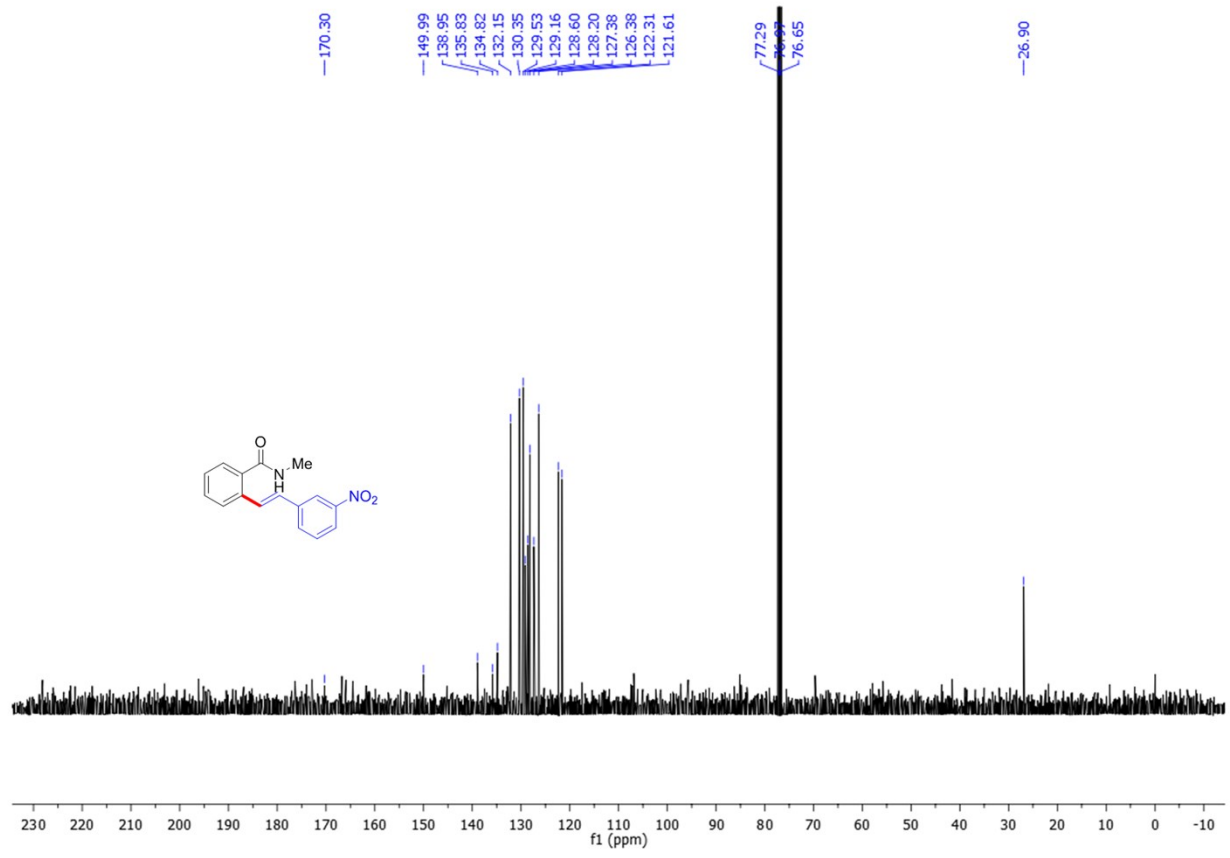
4ad') (*E*)-2-(4-bromostyryl)-*N*-methylbenzamide, ^{13}C NMR



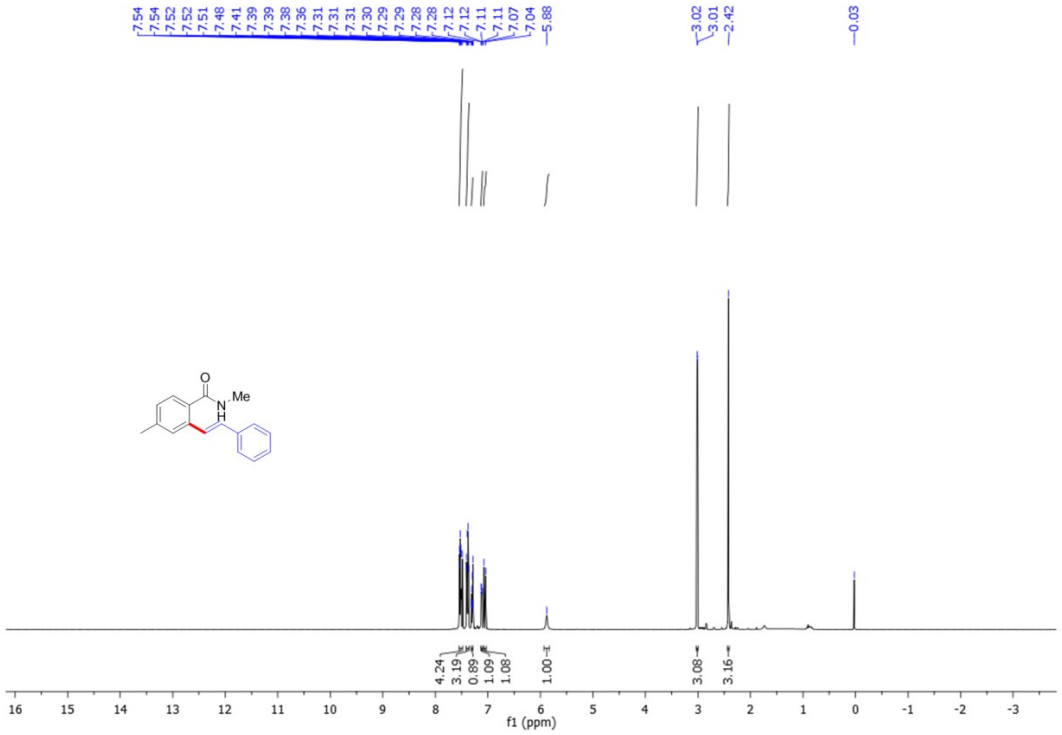
4ae') (*E*)-*N*-methyl-2-(3-nitrostyryl)benzamide, ^{1}H NMR



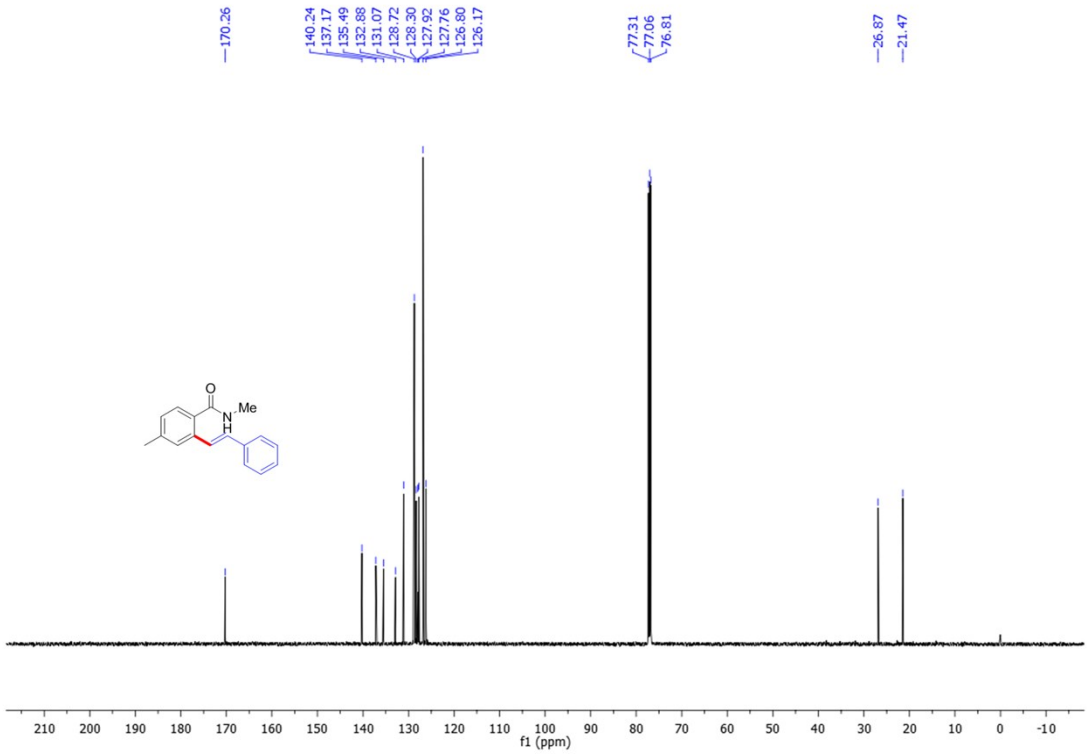
4ae') (*E*)-*N*-methyl-2-(3-nitrostyryl)benzamide, ^{13}C NMR



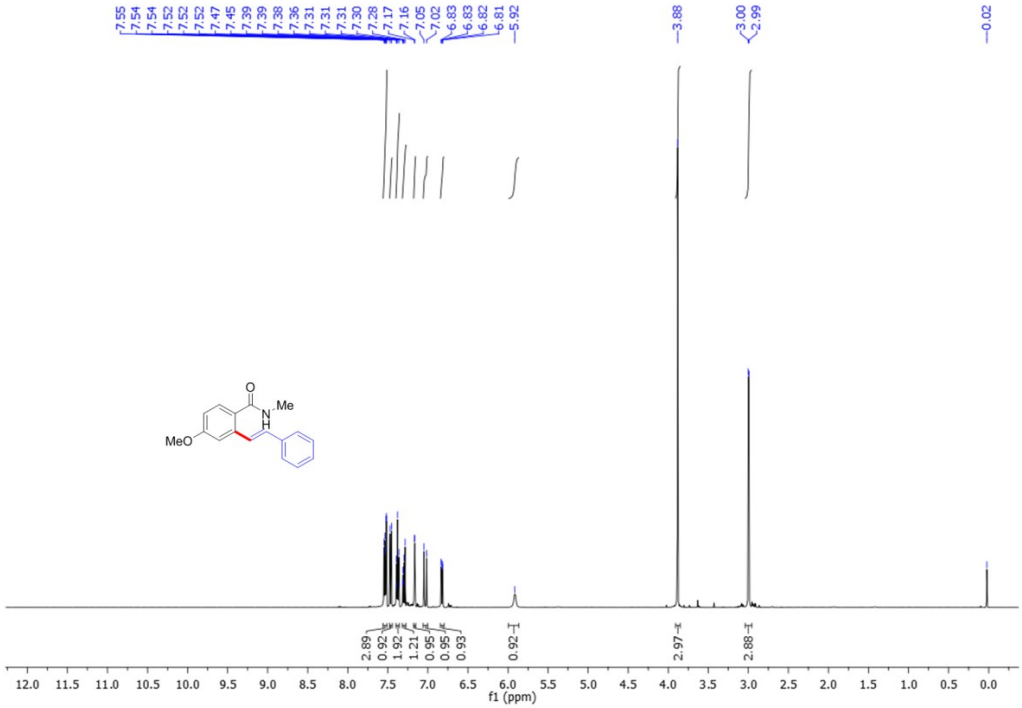
4ba') (*E*)-*N*,4-dimethyl-2-styrylbenzamide, ^{1}H NMR



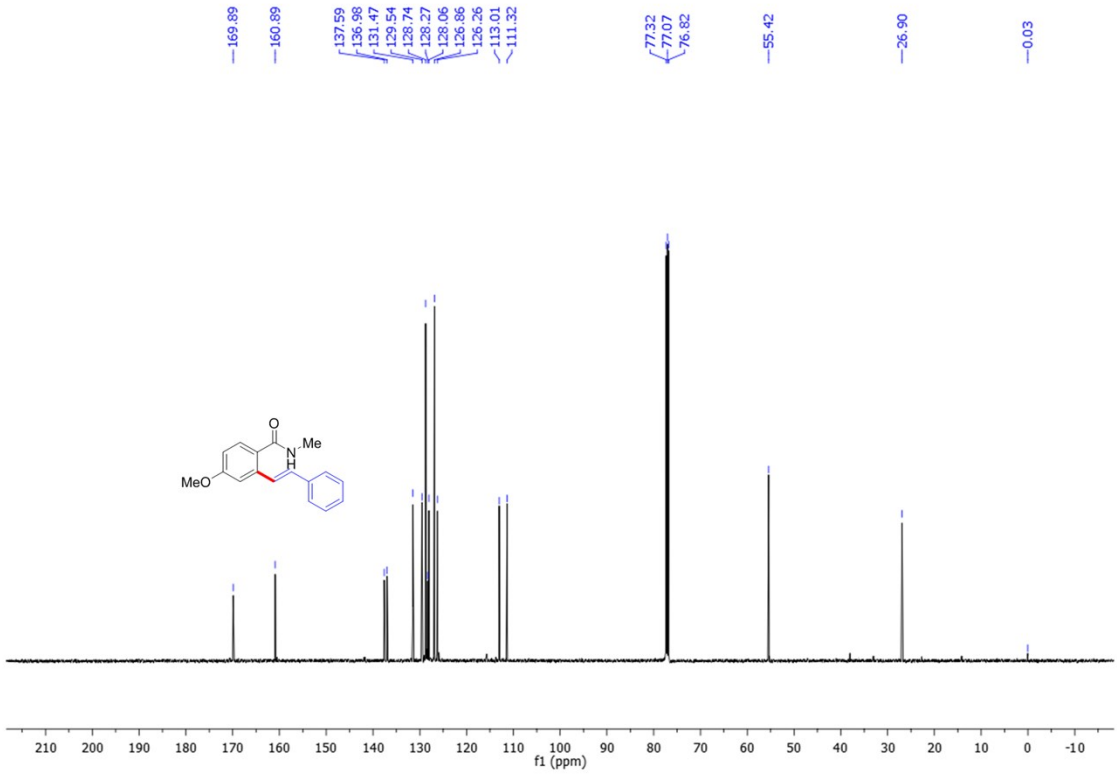
4ba') (*E*)-*N*,4-dimethyl-2-styrylbenzamide, ^{13}C NMR



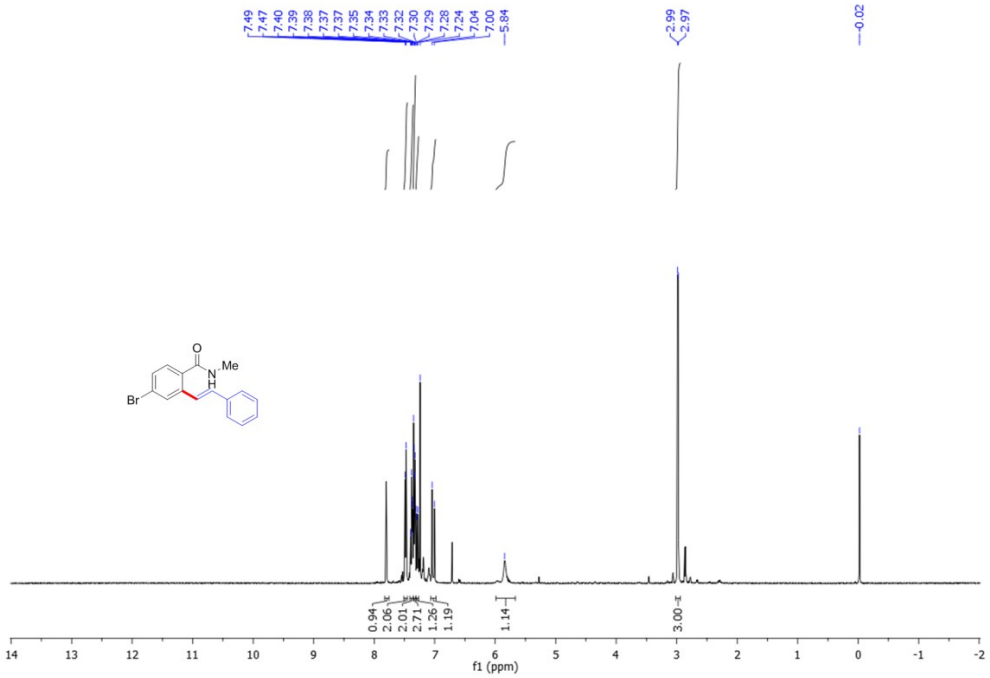
4ca') (*E*)-4-methoxy-*N*-methyl-2-styrylbenzamide, ^{1}H NMR



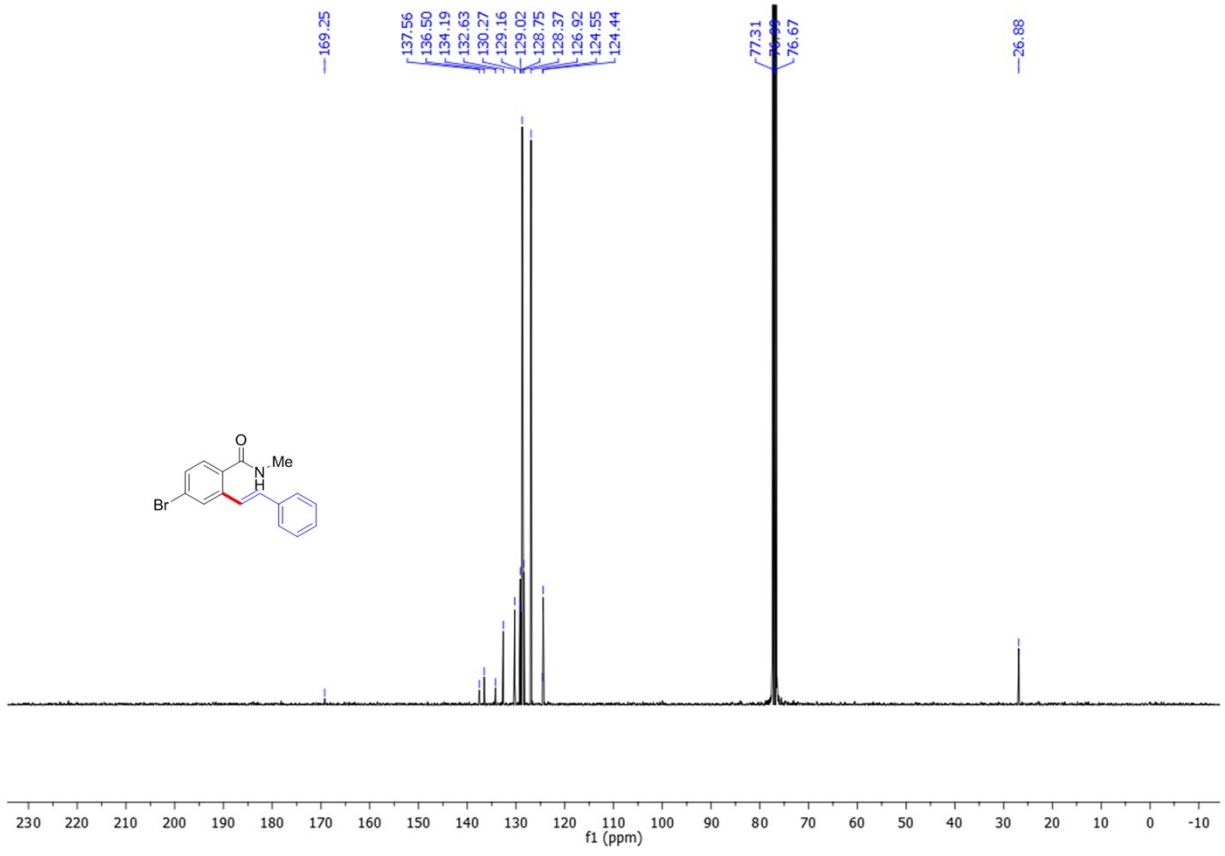
4ca') (*E*)-4-methoxy-*N*-methyl-2-styrylbenzamide, ^{13}C NMR



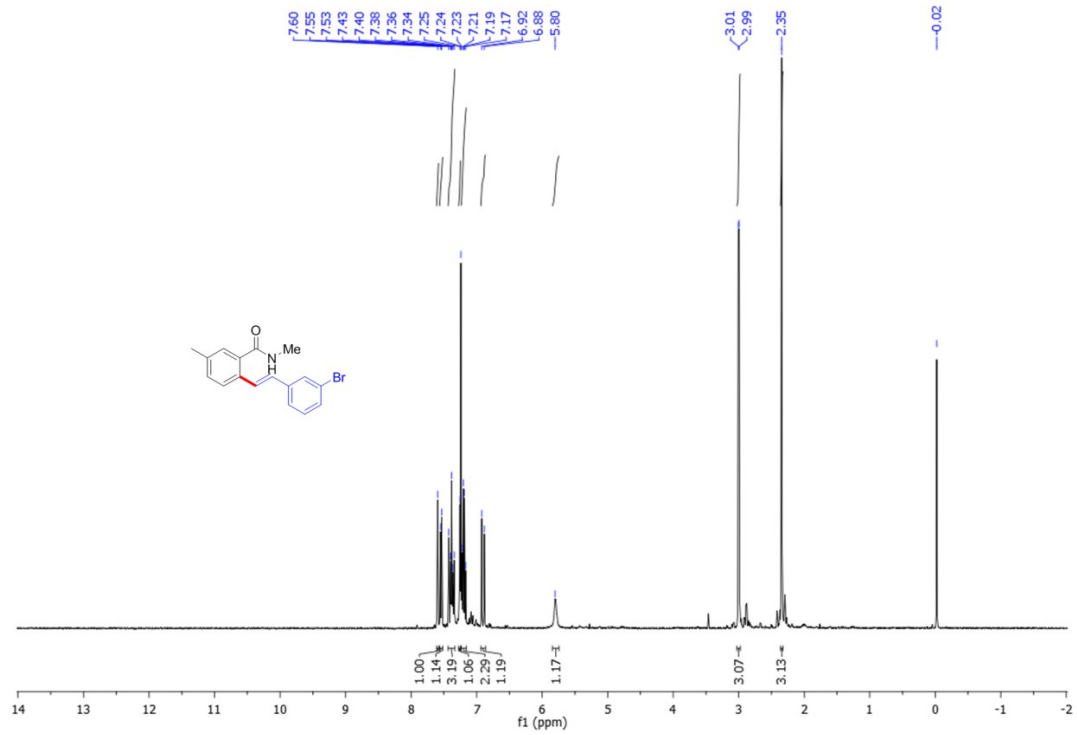
4ea') (*E*)-4-bromo-*N*-methyl-2-styrylbenzamide, ^{1}H NMR



4ea') (*E*)-4-bromo-*N*-methyl-2-styrylbenzamide, ^{13}C NMR



4ge') (*E*)-2-(3-bromostyryl)-*N*,5-dimethylbenzamide, ^{1}H NMR



4ge') (*E*)-2-(3-bromostyryl)-*N*,5-dimethylbenzamide, ^{13}C NMR