Supporting Information

Novel Polymer Containing Phosphorus-Nitrogen Ligands for Stabilization of Palladium Nanoparticles: Efficient and Recyclable Catalyst for Suzuki and Sonogashira Reactions in Neat Water

M. Gholinejad,[*a] F. Hamed,[a] P. Biji[b]

[a]Department of Chemistry, Institute for Advanced Studies in Basic Sciences (IASBS), P. O. Box 45195-1159, Gavazang, Zanjan 45137-6731, Iran.

[b] Nanotech Research, Innovation and Incubation Center, PSG Institute of Advanced Studies, Coimbatore-641 004, India.

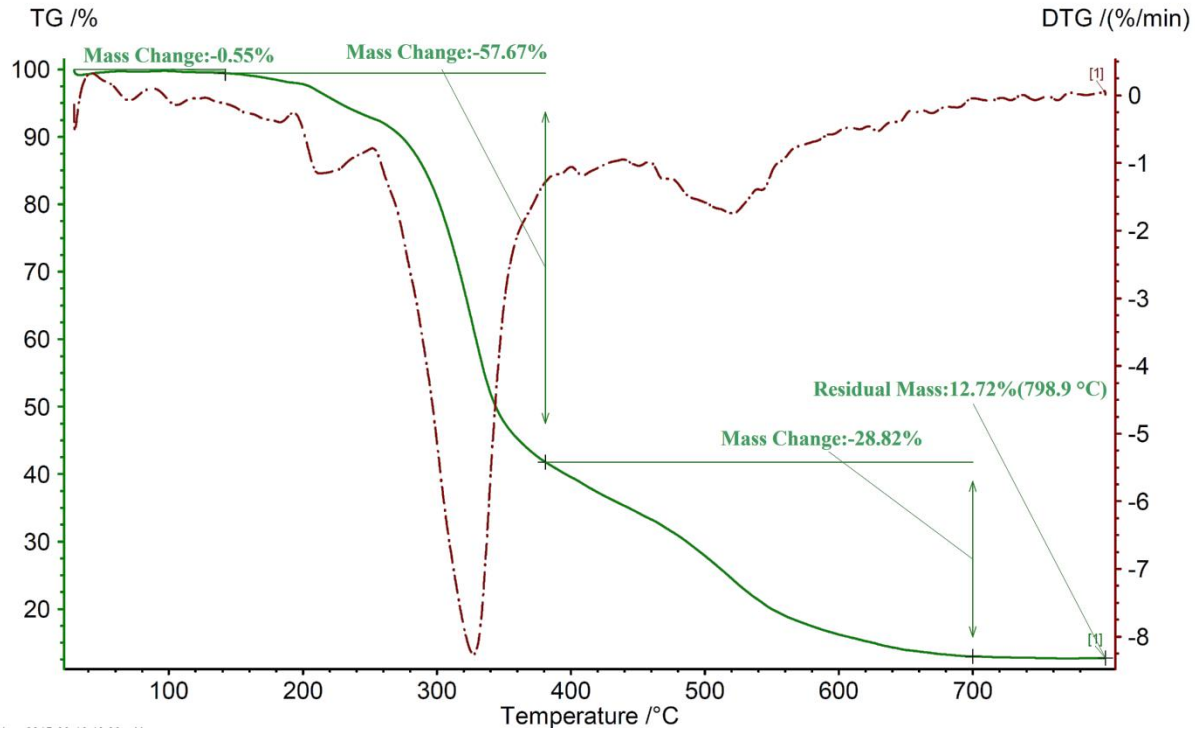


Figure 1. Thermogravimetric diagram of the polymer (**3**)

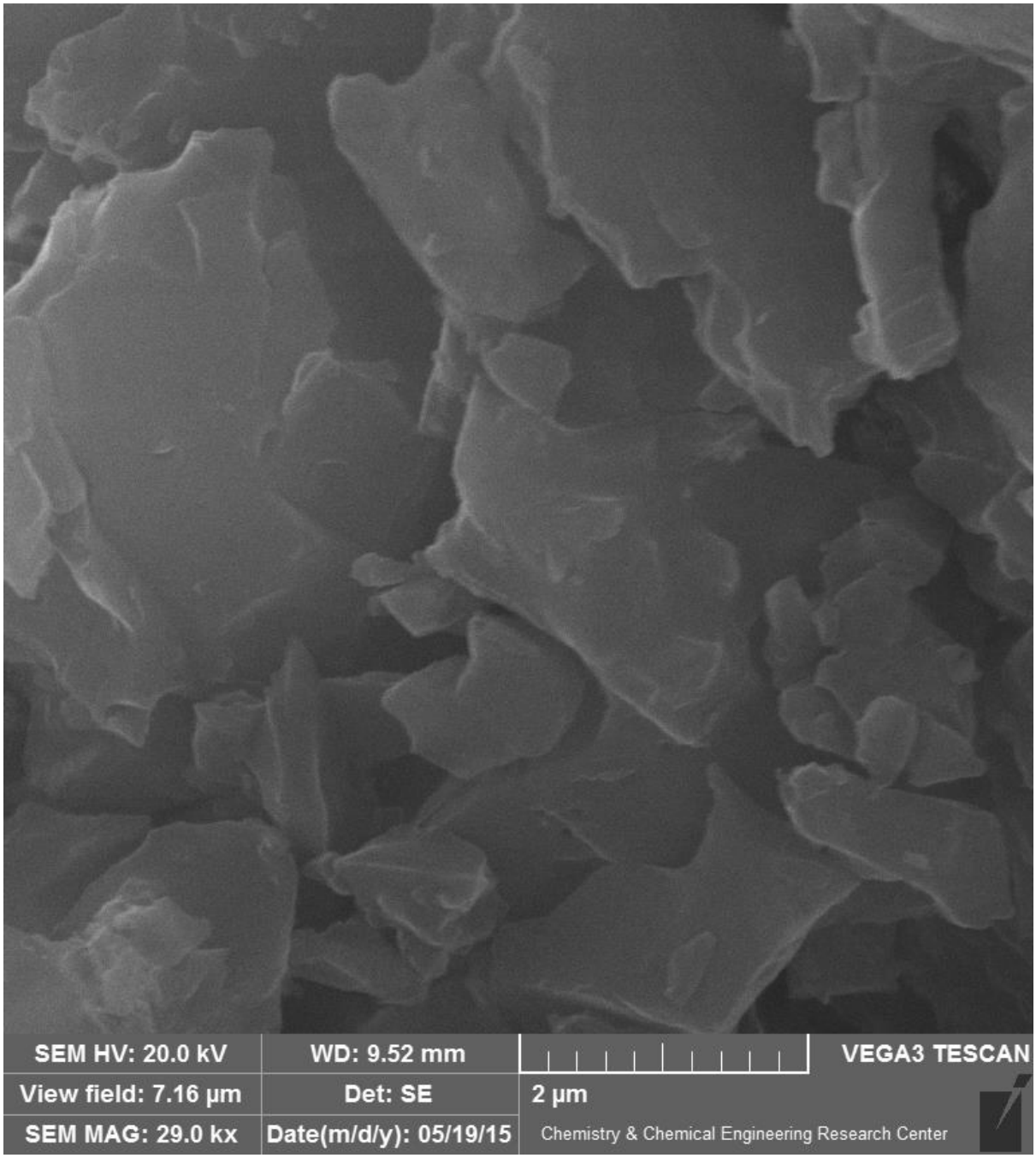
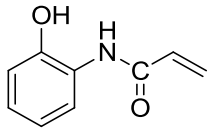


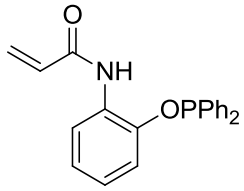
Figure 2. SEM image of the catalyst

N-(2-hydroxyphenyl)acrylamide:



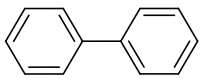
^{1}H NMR (400 MHz, $CDCl_3$) δ(ppm): 8.95 (s, 1H), 7.78 (s, 1H), 7.19-7.13 (m, 2H), 7.06 (d, *J*=8, 1H), 6.93-6.87 (m, 1H), 6.54 (d, *J*=16.4, 1H), 6.41-6.34 (dd, *J*= 16.8, *J*= 10.4, 1H), 5.89 (d, *J*=10.8, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 165.00, 148.82, 129.78, 129.40, 127.45, 125.33, 122.31, 120.56, 119.84; FT-IR (KBr): 3467, 3406, 3291, 2920, 2855, 2722, 1659, 1451, 1408, 1355, 1252, 1097, 799, 751, 611.

N-(2-((diphenylphosphino)oxy)phenyl)acrylamide:



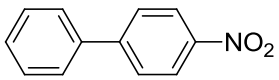
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 10.07 (s, 1H), 7.83-7.45 (m, 5H), 7.62-7.59 (m, 3H), 7.55-7.53 (m,5H), 7.31 (s,1H), 7.12-7.08 (m,1H), 7.06-7.01 (m,1H), 6.83-6.80 (m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 170.88, 170.74, 148.44, 132.47, 131.63, 130.74, 130.64, 129.14, 129.02, 126.21, 122.35, 119.87, 118.50; ^{31}P NMR: 36.97; FT-IR (KBr): 3411, 3312, 1533, 1450, 1158, 1116, 748, 705, 538.

1,1'-biphenyl:



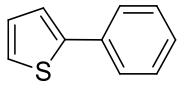
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 7.64 (d, *J*=7.6, 4H), 7.50-7.46 (m, 4H), 7.41-7.37 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 141.26, 128.78, 127.28, 127.20; FT-IR (KBr): 3439, 2957, 2918, 2855, 1260, 1090, 1024, 803.

4-Nitro-1,1'-biphenyl:



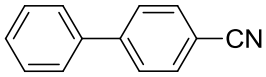
^{1}H NMR (400 MHz, $CDCl_3$) δ(ppm): 8.34 (d, *J*= 8.8, 2H), 7.78 (d, *J*= 8.8, 2H), 7.66 (d, *J*= 7.6, 2H), 7.56-7.46 (m, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 147.66, 147.10, 138.80, 129.19, 128.95, 127.84, 127.42, 124.15; FT-IR (KBr): 2957, 2920, 2855, 1345, 1262, 1096, 1024, 852, 805, 737, 692.

2-phenylthiophene:



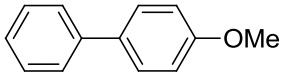
^{1}H NMR (400 MHz, $CDCl_3$) δ(ppm): 7.66 (d, *J*= 1.2, 2H), 7.64-7.35 (m, 2H), 7.34-7.31 (m, 3H), 7.13-7.11 (m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 144.45, 134.42, 128.91, 128.03, 127.49, 125.98, 124.83, 123.10; FT-IR (KBr):3580, 3428, 2957, 2918, 797, 597, 502, 461, 440.

[1,1'-biphenyl]-4-carbonitrile:



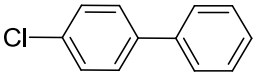
^{1}H NMR (400 MHz, $CDCl_3$) δ(ppm):7.77-7.71 (m, 4H), 7.63 (m, 2H), 7.54-7.44 (m, 2H), 7.29 (S, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm):145.70, 139.20, 132.64, 129.15, 128.70, 127.77, 127.27, 119.00, 110.93; FT-IR (KBr):2922, 2856, 2216, 1593, 1473, 1398, 842, 767, 692, 558, 511.

4-Methoxy-1,1'-biphenyl:



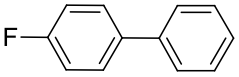
^{1}H NMR (400 MHz, $CDCl_3$) δ(ppm): 7.58 (m, 4H), 7.45 (m, 2H), 7.36 (d, *J*= 7.2, 1H), 7.03 (d, *J*= 8.8, 2H), 3.89 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 159.15, 140.85, 133.80, 128.74, 128.18, 126.76, 126.68, 114.21, 55.38; FT-IR (KBr): 2953,2920, 2848, 1608, 1521, 1478, 1452, 1280, 1246, 1033, 831, 804, 684, 484.

4-chloro-1,1'-biphenyl:



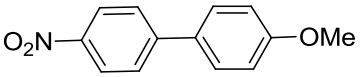
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 7.60-7.55 (m, 4H), 7.50-7.40 (m, 4H), 7.38 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm):140.02, 139.69, 133.40, 128.93, 128.91, 1228.42, 127.62, 127.02; FT-IR (KBr): 2922, 2856, 1467, 1387, 1262, 1010, 826, 754, 684, 468.

4-fluoro-1,1'-biphenyl:



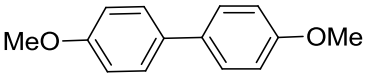
^{1}H NMR (400 MHz, $CDCl_3$) δ(ppm): 7.66-7.57 (m, 4H), 7.51-7.46 (m, 2H), 7.41-7.37 (s, 1H), 7.20-7.15(m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 140.29, 137.38, 137.35, 128.86, 128.79, 128.76, 128.68, 127.29, 127.20, 127.06, 115.75, 115.54; ^{19}F NMR (376 MHz, $CDCl_3$) δ (ppm): -115.86; FT-IR (KBr): 3552, 3481, 3415, 3235, 1642, 1256, 1093, 1018, 829, 798, 753, 688, 478.

4-methoxy-4'-nitro-1,1'-biphenyl:



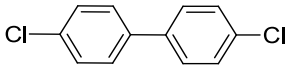
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 8.31 (d, *J*=8.8, 2H), 7.73 (d, *J*=8.8, 2H), 7.62 (d, *J*=8.8, 2H), 7.05(d, *J*=8.8, 2H), 3.91(s,3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 160.46, 147.24, 146.56, 131.10, 128.61, 127.11, 124.19, 114.63, 55.46; FT-IR (KBr): 1594, 1510, 1452, 1339, 1250, 1181, 1101, 1021.

4,4'-dimethoxy-1,1'-biphenyl:



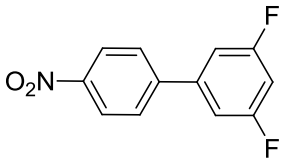
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 7.51 (d, *J*=8.8, 2H), 7.00 (d, *J*=8.8, 2H), 3.88 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm):158.69, 133.49, 127.77, 114.17, 55.38; FT-IR (KBr): 3415, 2952, 2922, 2842, 1610, 1498, 1264, 1180, 1039.

4,4'-dichloro-1,1'-biphenyl:



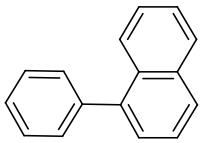
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 7.52-7.50 (d, *J*=8.4, 4H), 7.45-7.43 (d, *J*=8.4, 4H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm):138.44, 133.76, 129.08, 128.25; FT-IR (KBr): 2921, 2855, 1087, 1015, 850, 541, 499.

3,5-difluoro-4'-nitro-1,1'-biphenyl:



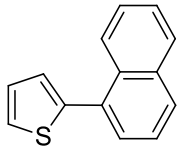
^{1}HNMR (400 MHz, $CDCl_3$) δ (ppm): 7.79 (d, *J*=8.4, 2H), 7.68 (d, *J*=8.8, 2H), 7.17-7.11(m, 2H), 6.93-6.87 (m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 164.75, 164.63, 162.27, 162.14, 147.82, 145.08, 141.98, 141.88, 138.69, 127.94, 124.88, 124.34, 110.61, 110.54, 110.42, 110.35, 104.47, 104.22, 103.97; ^{19}F NMR (376 MHz, $CDCl_3$) δ (ppm): -108.34; FT-IR (KBr): 1633, 1591, 1509, 1452, 1396, 1343, 1258, 1193, 1108, 1022, 839, 799, 745, 682, 595, 519.

1-phenylnaphthalene:



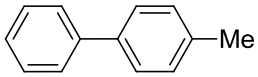
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 7.96-7.89 (m, 2H), 7.59-7.57 (m, 1H), 7.55-7.53 (m, 6H), 7.52-7.48 (m, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 140.77, 140.28, 133.80, 131.63, 131.62, 130.11, 130.10, 128.29, 127.66, 127.27, 126.96, 126.05, 125.80, 125.42; FT-IR (KBr): 3050, 2921, 2856, 1590, 1498, 1448, 1392, 701, 653, 565.

2-(naphthalen-1-yl)thiophene:



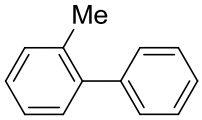
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 8.32-8.29 (m, 1H), 8.03-7.91 (m, 2H), 7.68-7.64(m, 1H), 7.60-7.56 (m, 3H), 7.54-7.46(m, 1H), 7.37-7.32(m, 1H), 7.27-7.24(m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 141.84, 133.91, 132.50, 131.94, 128.46, 128.40, 128.27, 127.46, 127.35, 126.51, 126.08, 125.83, 125.70, 123,32; FT-IR (KBr): 3051, 2960, 2856, 1586, 1505, 1433, 1387, 1329, 1262, 1217, 1167, 1092, 1023, 840, 794, 697, 610, 550.

4-methyl-1,1'-biphenyl:



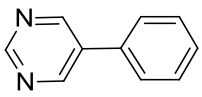
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 3.01 (s, 3H), 7.39 (d, 2H, *J*=7.6), 7.49-7.45 (t, 1H), 7.59-7.55 (t, 2H), 7.65 (d, 2H, *J*=8), 7.75-7.73 (t, 2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 141.33, 138.53, 137.16, 129.68, 129.67, 128.91, 127.18, 127.16, 21.29; FT-IR (KBr): 3416, 2958, 2368, 1626, 1508, 1023, 622, 545, 501, 482, 464, 442, 424.

2-methyl-1,1'-biphenyl:



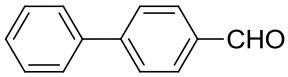
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 2.35 (s, 3H), 7.34-7.31 (t, 4H), 7.42-7.39 (t, 3H), 7.50-7.46 (t, 2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 142, 141.98, 135.40, 130.36, 129.86, 129.25, 128.12, 127.31, 126.82, 125.82, 20.55; FT-IR (KBr): 3677, 3527, 3440, 2921, 2857, 1736, 1456, 1261, 1094, 808, 557, 447.

5-phenylpyrimidine:



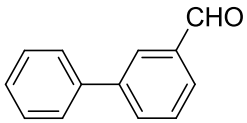
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 9.25 (s, 1H), 9.01 (s, 2H), 7.64-7.60 (m, 2H), 7.58-7.54 (m, 2H), 7.53-7.49 (m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 157.14, 154.91, 134.50, 134.10, 129.51, 129.16, 127.04; FT-IR (KBr): 3659, 3038, 2960, 2921, 2856, 1726, 1549, 1411, 1260, 1089, 1019, 867, 802, 696.

[1,1'-biphenyl]-4-carbaldehyde:



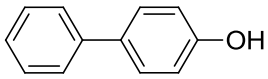
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 10.09 (s, 1H), 8.21-7.98 (m, 2H), 7.80-7.72 (m, 2H), 7.69-7.67 (m, 2H), 7.54-7.46 (m, 2H), 7.44 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 192.00, 147.24, 139.74, 135.21, 130.32, 129.06, 128.52, 127.73, 127.41; FT-IR (KBr): 1597, 1480, 1412, 1298, 1214, 832, 757, 698.

[1,1'-biphenyl]-3-carbaldehyde:



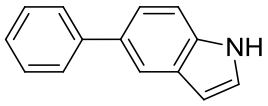
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 10.13 (s, 1H), 8.41 (s, 1H), 8.14 (s, 2H), 7.91-7.88 (m, 3H), 7.68-7.42 (m,3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 192.45, 142.19, 139.71, 136.93, 133.19, 129.54, 129.05, 128.69, 128.25, 128.06, 127.19; FT-IR (KBr): 1579,1316, 1260, 743, 694, 613.

[1,1'-biphenyl]-4-ol:



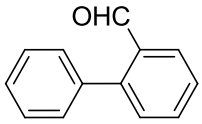
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 7.58 (d, *J*=7.6, 2H), 7.52 (d, *J*=8.4, 2H), 7.47-7.43 (m, 2H), 7.36-7.29 (m, 1H), 6.94 (d, *J*=8.4, 2H), 4.68 (s,1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 155.07, 140.77, 134.06, 128.75, 128.43, 128.42, 1226.75, 115.66; FT-IR (KBr): 3645, 3529, 3441, 2960, 2784, 2371, 1516, 1259, 1092, 1020, 802, 756, 690, 557, 429.

5-phenyl-1H-indole:



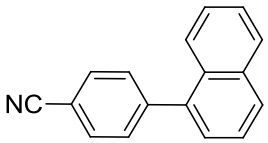
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm):8.23 (s, 1H), 7.9 (s, 1H), 7.69 (d, *J*=7.6, 2H), 7.45-7.49 (m, 4H), 7.29-7.36 (m, 2H), 6.65(s,1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm):142.57, 135.32, 133.46, 128.66, 128.41, 127.42, 126.33, 124.87,121.96, 119.29, 111.27, 103.08; FT-IR (KBr): 2959, 2922, 2855, 2357, 1713, 1463, 1264, 1093, 1022, 877, 805, 762, 697.

[1,1'-biphenyl]-2-carbaldehyde:



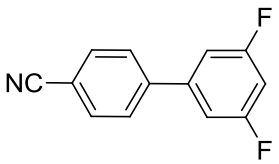
^{1}H NMR (400 MHz, $CDCl_3$) δ(ppm): 10.02 (s, 1H), 8.07 (d, *J*=8, 1H), 7.70-7.66 (m, 1H), 7.56-7.43 (m, 5H), 7.41 (s,2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 192.55, 146.01, 137.76, 133.72, 133.61, 130.81, 130.14, 128.46, 128.15,127.81, 127.59; FT-IR (KBr): 3639, 2921, 2855, 2751, 1695, 1597, 1462, 1395, 1260, 1193, 1085, 1019, 752, 702, 651.

4-(naphthalen-1-yl)benzonitrile:



^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 7.97 (m, 2H), 7.82 (m, 3H), 7.65(d, *J*=8, 2H), 7.61-7.55 (m, 2H), 7.53-7.49 (m, 1H), 7.44(d, *J*= 6.8, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 145.69, 138.21, 133.80, 132.18, 130.96, 130.85, 128.81, 128.58, 127.07, 126.68, 126.21, 125.38, 125.22, 118.99, 111.16; FT-IR (KBr): 3049, 2958, 2921, 2855, 2227, 1647, 1605, 1502, 1458, 1395, 1339, 1261, 1096, 1022, 966, 573.

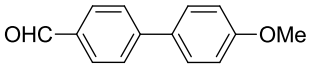
3',5'-difluoro-[1,1'-biphenyl]-4-carbonitrile:



^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 7.79 (d, 2H, *J*=8), 7.68 (d, 2H, *J*=8), 7.17-7.10(m, 2H), 6.93-6.87(m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 164.74, 164.62, 162.27, 162.14,

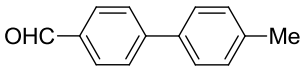
143.20, 142.39, 132.85, 127.74, 118.51, 112.25, 110.42, 110.35, 110.23, 110.16, 104.22, 103.97, 103.72; ^{19}F NMR (376 MHz, $CDCl_3$) δ (ppm): -108.49; FT-IR (KBr): 2219, 1594, 1556, 1447, 1396, 1334, 1259, 1205, 1112, 1023, 988, 871, 830, 675, 599, 539, 505.

4'-methoxy-[1,1'-biphenyl]-4-carbaldehyde:



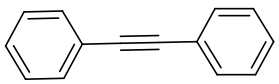
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 10.07 (s, 1H), 7.96 (d, *J*= 8.4, 2H), 7.75 (d, *J*= 8.4, 2H), 7.05(d, *J*= 8.8, 2H), 7,04(d, *J*= 8.4, 2H), 3.90 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 191.97, 160.13, 146.82, 134.69, 132.08, 130.37, 128.54, 127.09, 114.50, 55.44; FT-IR (KBr): 1682, 1600, 1292, 1260, 1183, 1088, 1025, 699, 490.

4'-methyl-[1,1'-biphenyl]-4-carbaldehyde:



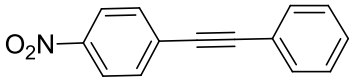
^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm): 10.08 (s, 1H), 7.97 (d, *J*=8, 2H), 7.79-7.73 (m, 2H), 7.59-7.56 (m, 2H), 7.38-7.32(m, 2H), 2.45(s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm): 191.99, 147.19, 138.57, 136.82, 134.99, 130.32, 129.78, 127.45, 127.23, 21.23; FT-IR (KBr): 2959, 2923, 2857, 2729, 1697, 1605, 1454, 1386, 1263, 1082, 1020, 695, 472.

1,2-diphenylethyne:



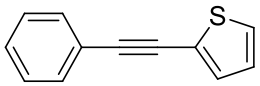
^{1}H NMR ($CDCl_3$, 400 MHz) δ (ppm): 7.58-7.56 (m, 4H), 7.41-7.37 (m, 6H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ (ppm): 131.66, 128.40, 128.32, 128.30, 89.42; FT-IR (KBr): 3687, 3062, 3023, 2920, 2288, 1535, 1439, 1381, 1066, 1023, 913, 754, 726, 688, 660, 541, 518

1-nitro-4-(phenylethynyl)benzene:



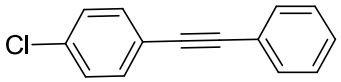
^{1}H NMR ($CDCl_3$, 400 MHz) δ (ppm): 8.25 (d, *J*=8, 2H), 7.70 (d, *J*=8, 2H), 7.61-7.57 (m, 2H), 7.46-7.40 (m, 3H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ (ppm): 146.99, 132.30, 131.88, 130.29, 129.32, 128.58, 123.68, 122.12, 94.74, 87.59; FT-IR (KBr): 2207, 1687, 1587, 1508, 1170, 1098, 819, 757, 685.

2-(phenylethynyl)thiophene:



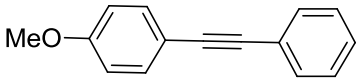
^{1}H NMR ($CDCl_3$, 400 MHz) δ (ppm): 7.59-7.56 (m, 2H), 7.42-7.38 (m, 3H), 7.36-7.33 (m, 2H), 7.07-7.05 (m, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ (ppm): 131.95, 131.46, 128.47, 128.42, 127.31, 127.15, 123.35, 122.96, 93.08, 82.66; FT-IR (KBr): 3551, 3473, 3411, 3233, 1625, 799, 751, 694.

1-chloro-4-(phenylethynyl)benzene:



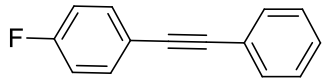
^{1}H NMR ($CDCl_3$, 400 MHz) δ (ppm): 7.58-7.54 (m, 2H), 7.50 (d, *J*= 8.4, 2H), 7.41-7.35 (m, 5H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ (ppm): 134.28, 132.84, 131.63, 128.73, 128.52, 128.43, 122.94, 121.80, 90.34, 88.26; FT-IR (KBr): 2207, 1687, 1587, 1508, 1170, 1098, 819, 757, 685.

1-methoxy-4-(phenylethynyl)benzene:



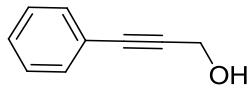
^{1}H NMR ($CDCl_3$, 400 MHz) δ (ppm): 7.56-7.50 (m, 4H), 7.40-7.34 (m, 3H), 6.91 (d, 2H, *J*= 8.8), 3.87 (s, 3H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ (ppm): 159.62, 133.08, 131.48, 128.34, 127.97, 123.60, 115.38, 114.01, 89.38, 88.08, 55.34; FT-IR (KBr): 3054, 2955, 2923, 2846, 1599,1507, 1450, 1252, 1177, 1139, 1100, 1073, 1026, 829, 804, 753, 692, 526.

1-fluoro-4-(phenylethynyl)benzene:



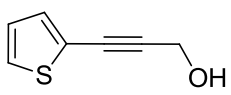
^{1}H NMR ($CDCl_3$, 400 MHz) δ (ppm): 7.58-7.54 (m, 4H), 7.42-7.36 (m, 3H), 7.11-7.06 (t, 2H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ (ppm): 163.76, 161.28, 133.56, 133.47, 132.54, 131.59, 129.25, 128.48, 128.42, 128.38, 123.10, 119.40, 119.37, 115.79, 115.57, 89.07, 89.06, 88.32; ^{19}F NMR (376 MHz, $CDCl_3$) δ (ppm): -110.96; FT-IR (KBr): 2921, 2856, 1882, 1746, 1589, 1557, 1443, 1272, 1219, 1155, 1096, 1021, 836, 798, 751, 685, 655, 504, 485.

3-phenylprop-2-yn-1-ol:



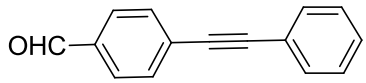
^{1}H NMR ($CDCl_3$, 400 MHz) δ (ppm): 7.49-7.45 (m, 2H), 7.38-7.32 (m, 3H), 4.54 (s, 2H), 1.23 (s, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ (ppm): 131.71, 128.53, 128.55, 122.53, 87.18, 85.76, 51.71; FT-IR (KBr): 3409, 3064, 2922, 2858, 2236, 1959, 1741, 1488, 1445, 1367, 1260, 1084, 1026, 801, 756, 691, 619, 574, 518.

3-(thiophen-2-yl)prop-2-yn-1-ol:



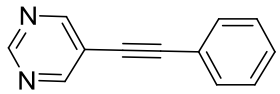
^{1}H NMR ($CDCl_3$, 400 MHz) δ (ppm): 7.30-7.29 (m, 1H), 7.25 (d, 1H, *J*= 3.6), 7.02-6.99 (m, 1H), 4.54 (s, 2H), 1.81 (s, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ (ppm): 132.44, 127.48, 127.01, 122.43, 91.12, 79.10, 51.77; FT-IR (KBr): 3374, 3103, 2921, 2856, 2221, 1635, 1516, 1418, 1356, 1258, 1227, 1188, 1082, 1016, 911, 837, 802, 701, 574.

4-(phenylethynyl)benzaldehyde:



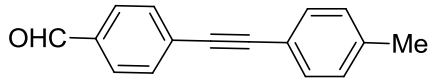
^{1}H NMR ($CDCl_3$, 400 MHz) δ (ppm): 10.06 (s, 1H), 7.91 (d, 2H, *J*= 8), 7.71 (d, 2H, *J*= 8), 7.61-7.58 (m, 2H), 7.42-7.41 (m, 3H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ (ppm): 191.51, 135.41, 132.14, 131.82, 129.64, 129.63, 129.01, 128.52, 122.50, 93.48, 88.54; FT-IR (KBr): 3734, 3426, 2920, 2845, 1695, 1634, 1603, 1563, 1094, 1022, 811, 751, 688, 627, 508.

5-(phenylethynyl)pyrimidine:



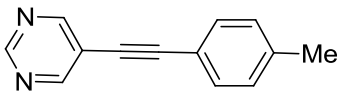
^{1}H NMR ($CDCl_3$, 400 MHz) δ (ppm): 9.19 (s, 1H), 8.91 (s, 2H), 7.61-7.58 (m, 2H), 7.45-7.40 (m, 3H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ (ppm): 158.63, 156.55, 131.82, 129.45, 128.60, 121.76, 120.06, 96.47, 82.25; FT-IR (KBr): 3037, 2878, 2394, 2219, 1950, 1713, 1539, 1493, 1445, 1412, 1334, 1180, 1068, 1019, 805, 757, 702, 635, 545.

4-(p-tolylethynyl)benzaldehyde



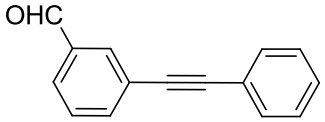
^{1}H NMR ($CDCl_3$, 400 MHz) δ (ppm): 10.05 (s, 1H), 7.89 (d, 2H, *J*= 8), 7.70 (d, 2H, *J*= 8), 7.48 (d, 2H, *J*= 8), 7.22 (d, 2H, *J*=8), 2.42 (s, 3H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ (ppm): 191.50, 139.32, 135.27, 132.05, 131.73, 129.90, 129.61, 129.29, 119.42, 93.83, 88.02, 21.62; FT-IR (KBr): 3552, 3476, 3413, 3238, 2960, 2921, 2842, 2209, 1697, 1606, 1512, 1257, 1204, 1170, 1091, 1020, 811, 623, 509, 478.

5-(p-tolylethynyl)pyrimidine:

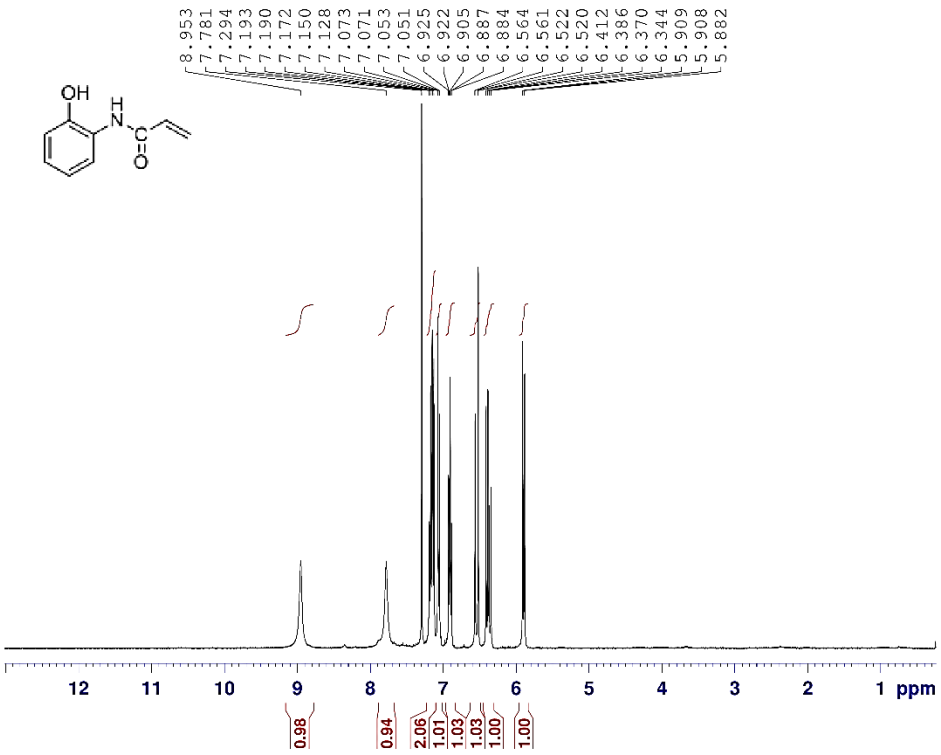


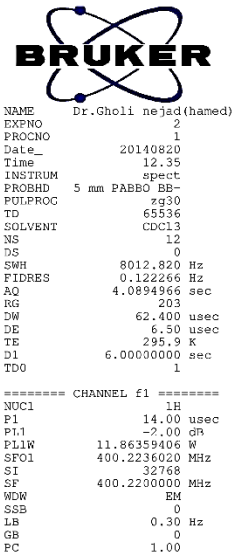
^{1}H NMR ($CDCl_3$, 400 MHz) δ (ppm): 9.17 (s, 1H), 8.89 (s, 2H), 7.48 (d, 2H, *J*= 8), 7.23 (d, 2H, *J*=8), 2.42 (s, 3H). ^{13}C NMR ($CDCl_3$, 100 MHz) δ (ppm): 158.57, 156.45, 139.81, 131.72, 129.37, 120.27, 118.69, 96.74, 81.72, 21.65; FT-IR (KBr): 3543, 2921, 2856, 2214, 1930, 1647, 1541, 1506, 1456, 1416, 1186, 1155, 1094, 1024, 813, 799, 714, 629, 463.

3-(phenylethynyl)benzaldehyde:

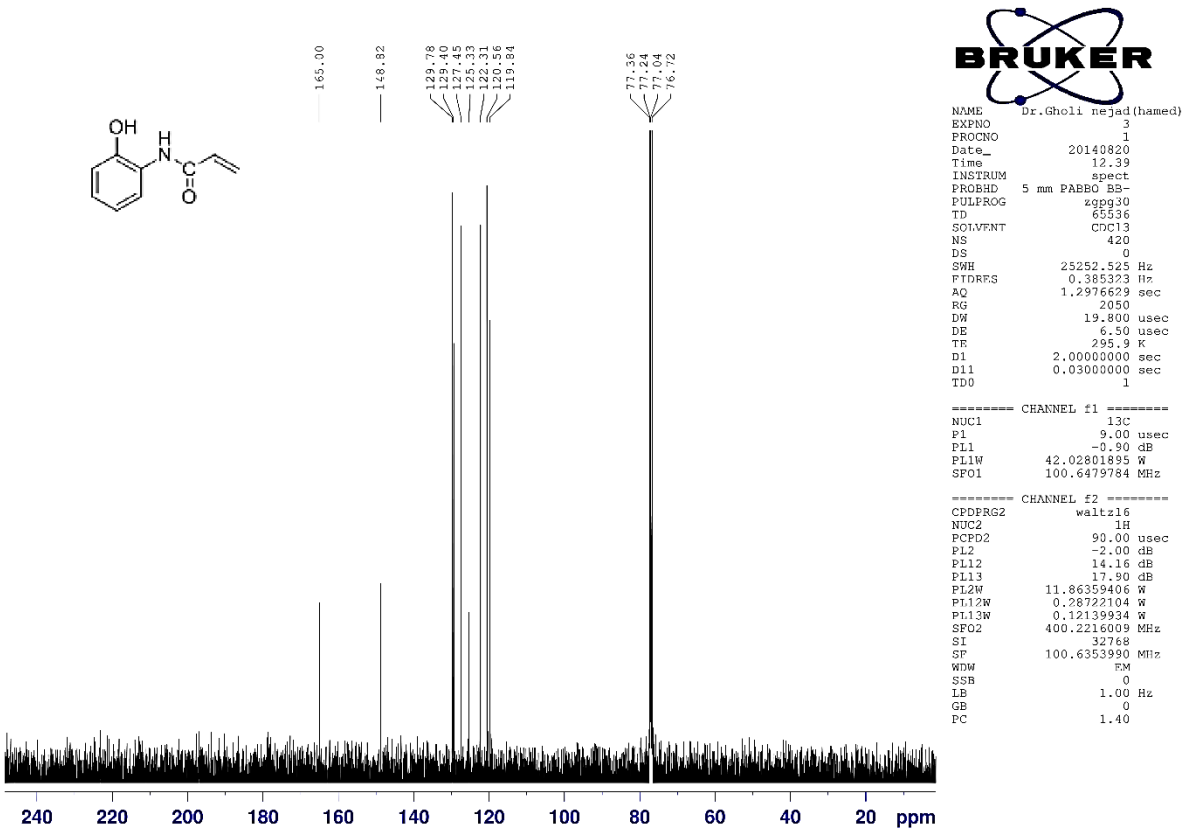


^{1}H NMR ($CDCl_3$, 400 MHz) δ (ppm): 10.06(s, 1H), 8.07(s, 1H), 7.88(d, 1H, *J*=7.6), 7.83-7.80(t, 1H), 7.60-7.55(m, 3H), 7.42-7.40(t, 3H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ (ppm): 191.60, 137.13, 136.52, 133.02, 131.73, 129.14, 128.92, 128.75, 128.47, 124.58, 122.68, 90.95, 87.85; FT-IR (KBr): 3415, 3060, 2962, 2922, 2855, 2355, 1789, 1488, 1442, 1263, 1192, 1092, 1024, 868, 801, 754, 685.





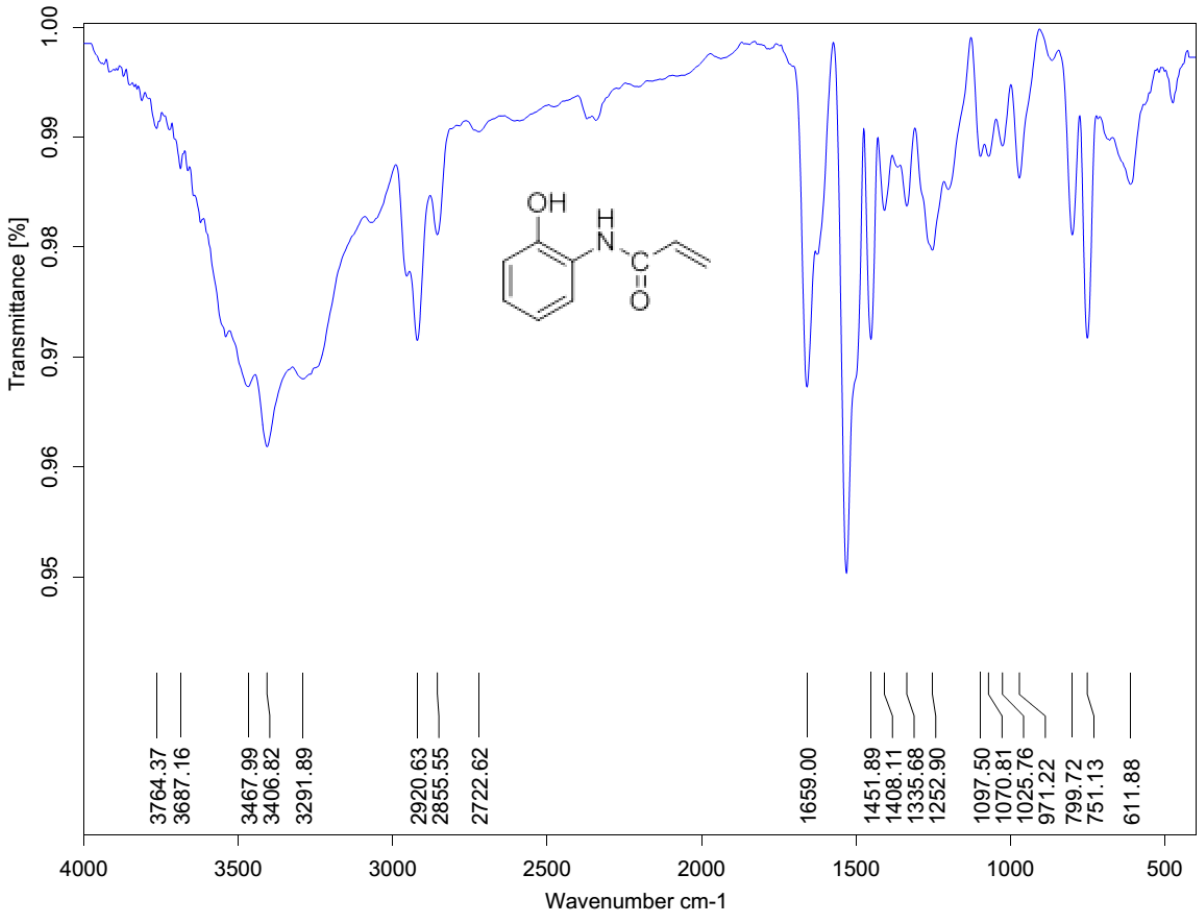
^{1}H NMR of N-(2-hydroxyphenyl)acrylamide (1)



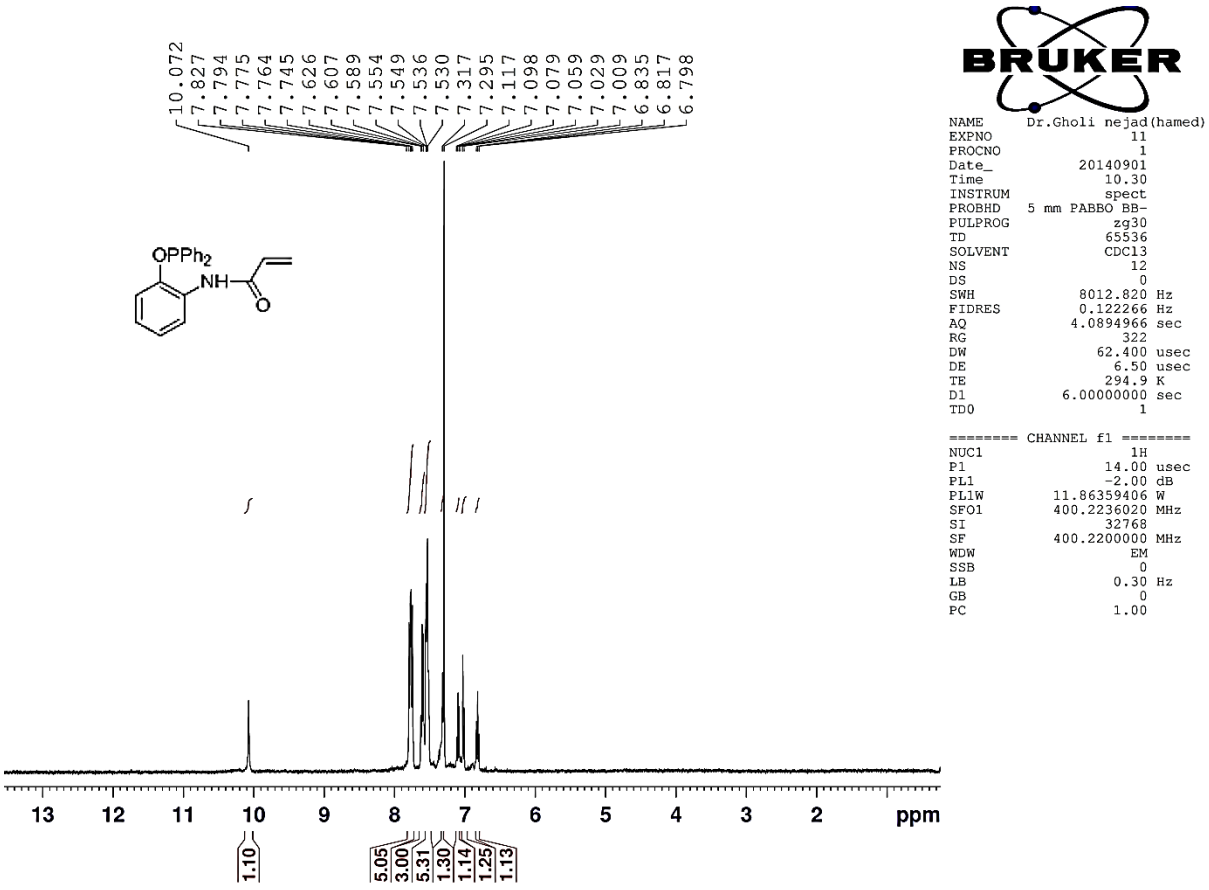
BRUKER

NAME	Dr.Gholi nejad(hamed)
EXPNO	3
PROCNO	1
Date_	20140820
Time	12.39
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	420
DS	0
SWH	25252.525 Hz
FIDRES	0.385323 Hz
AQ	1.2976629 sec
RG	2050
DW	19.800 usec
DE	6.50 usec
TE	295.9 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.00 usec
PL1	-0.90 dB
PL1W	42.02801895 W
SFO1	100.6479784 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	90.00 usec
PL2	-2.00 dB
PL12	14.16 dB
PL13	17.90 dB
PL2W	11.86359406 W
PL12W	0.28722104 W
PL13W	0.12139934 W
SFO2	400.2216009 MHz
SI	32768
SF	100.6353990 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

^{13}C NMR of N-(2-hydroxyphenyl)acrylamide (1)



FT-IR of N-(2-hydroxyphenyl)acrylamide (1)



NAME	Dr.Gholi nejad(hamed)
EXPNO	11
PROCNO	1
Date_	20140901
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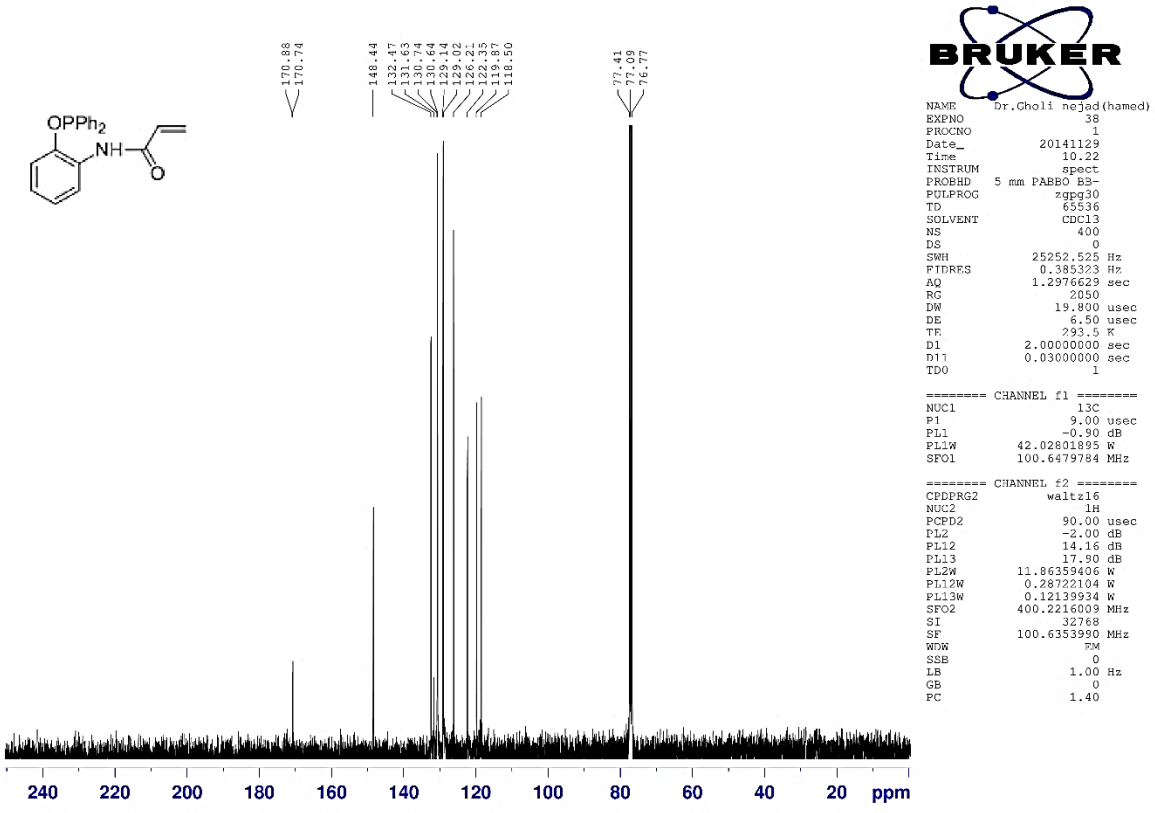
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	12
DS	0
SWH	8012.820 Hz
FIDRES	0.122266 Hz
AQ	4.0894966 sec
RG	322
DW	62.400 usec
DE	6.50 usec
TE	294.9 K
D1	6.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.00 usec
PL1	-2.00 dB
PL1W	11.86359406 W
SFO1	400.2236020 MHz
SI	32768
SF	400.2200000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

^{1}H NMR of phosphinite monomer (2)



BRUKER

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NAME          Dr.Choli nejad(hamed)
EXPNO                      38
PROCNO                      1
Date_                20141129
Time                    10.22
INSTRUM                 spect
PROBHD    5 mm PABBO BB-
PULPROG                 zgpg30
TD                       65536
SOLVENT                  CDCl3
NS                         400
DS                           0
SWH                  25252.525 Hz
FIDRES                0.385323 Hz
AQ                   1.2976629 sec
RG                        2050
DW                      19.800 usec
DE                       6.50 usec
TE                      293.5 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                       13C
P1                        9.00 usec
PL1                      -0.90 dB
PL1W               42.02801895 W
SFO1               100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                    90.00 usec
PL2                      -2.00 dB
PL12                     14.16 dB
PL13                     17.90 dB
PL2W               11.86359406 W
PL12W               0.28722104 W
PL13W               0.12139934 W
SFO2               400.2216009 MHz
SI                       32768
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WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
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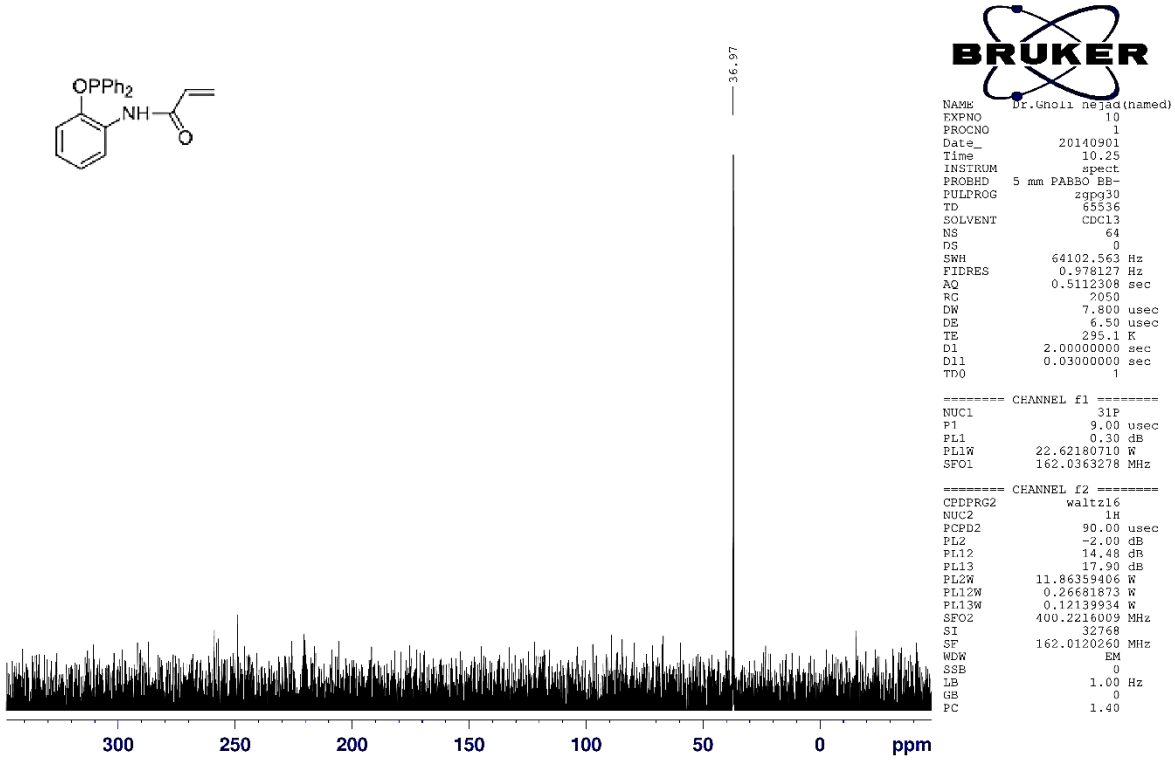
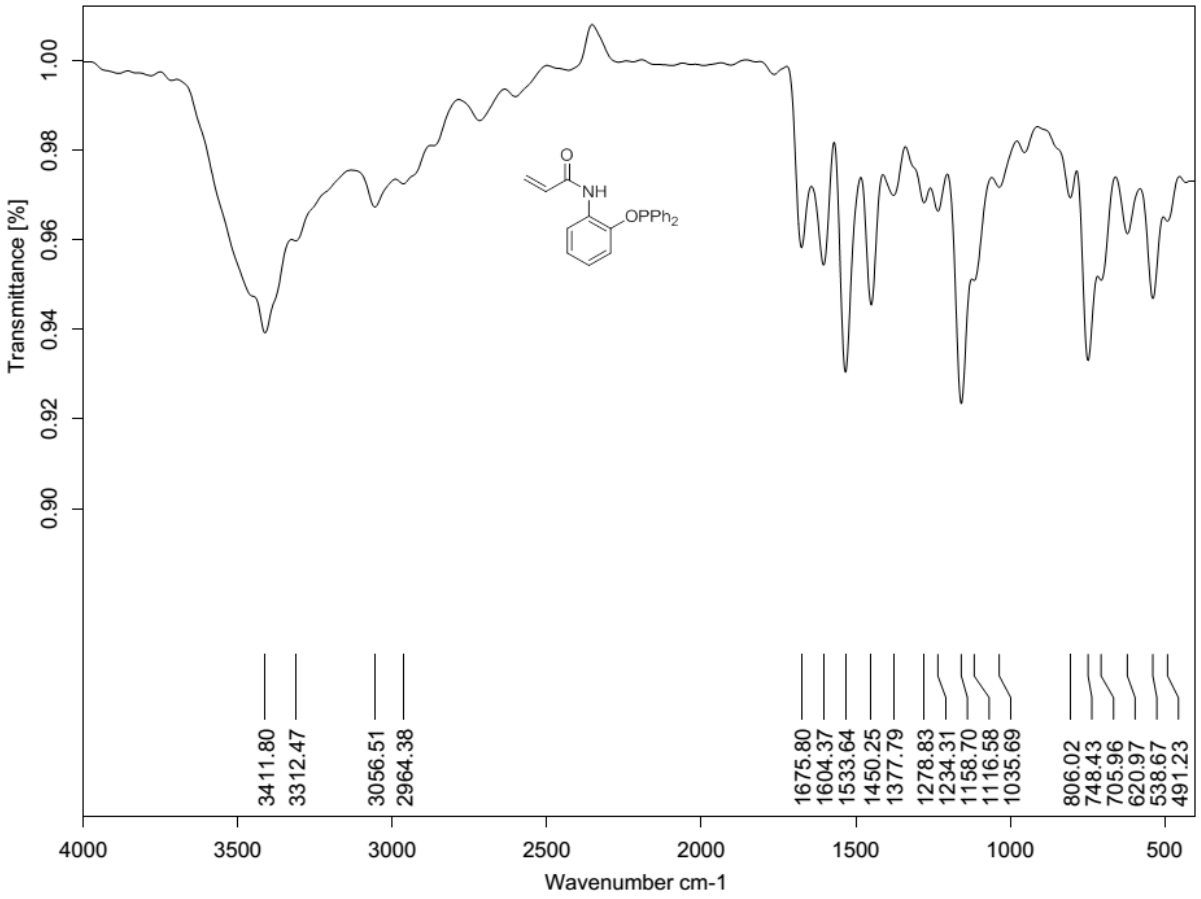
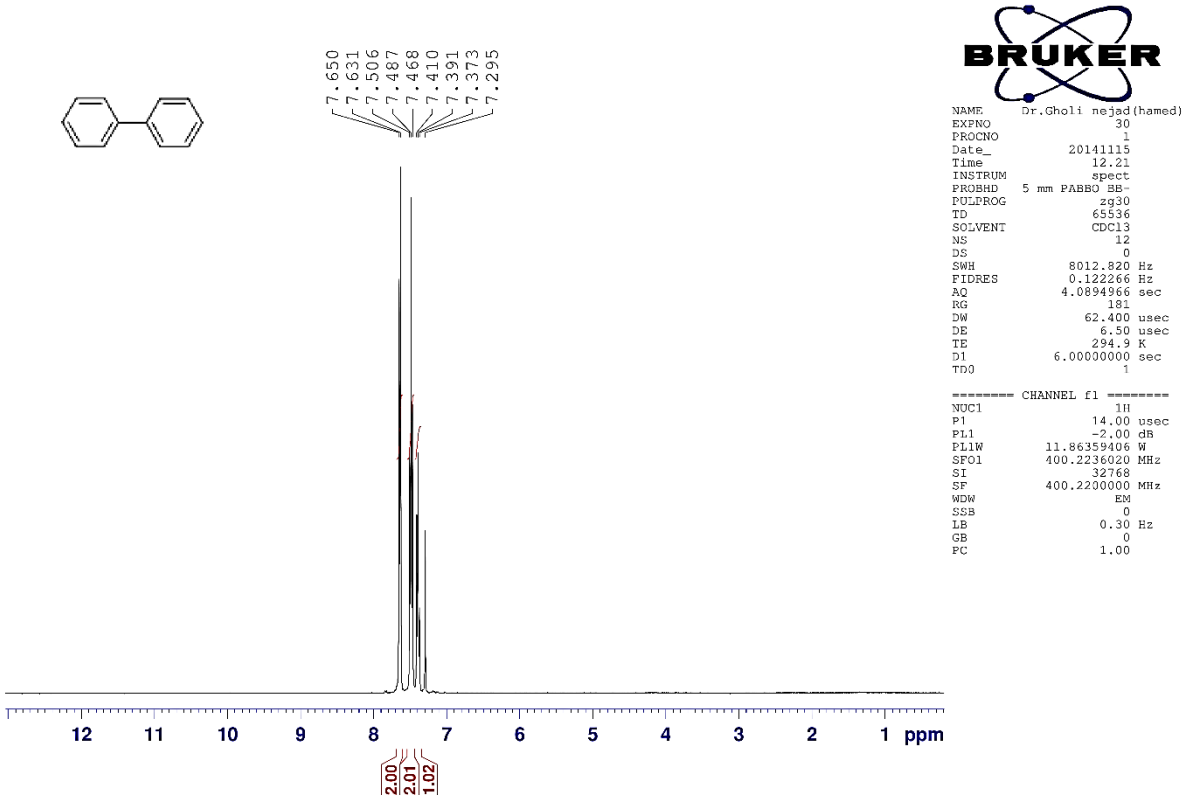
^{13}C NMR of phosphinite monomer (2)



^{31}P NMR of phosphinite monomer (2)



FT-IR of phosphinite monomer (2)

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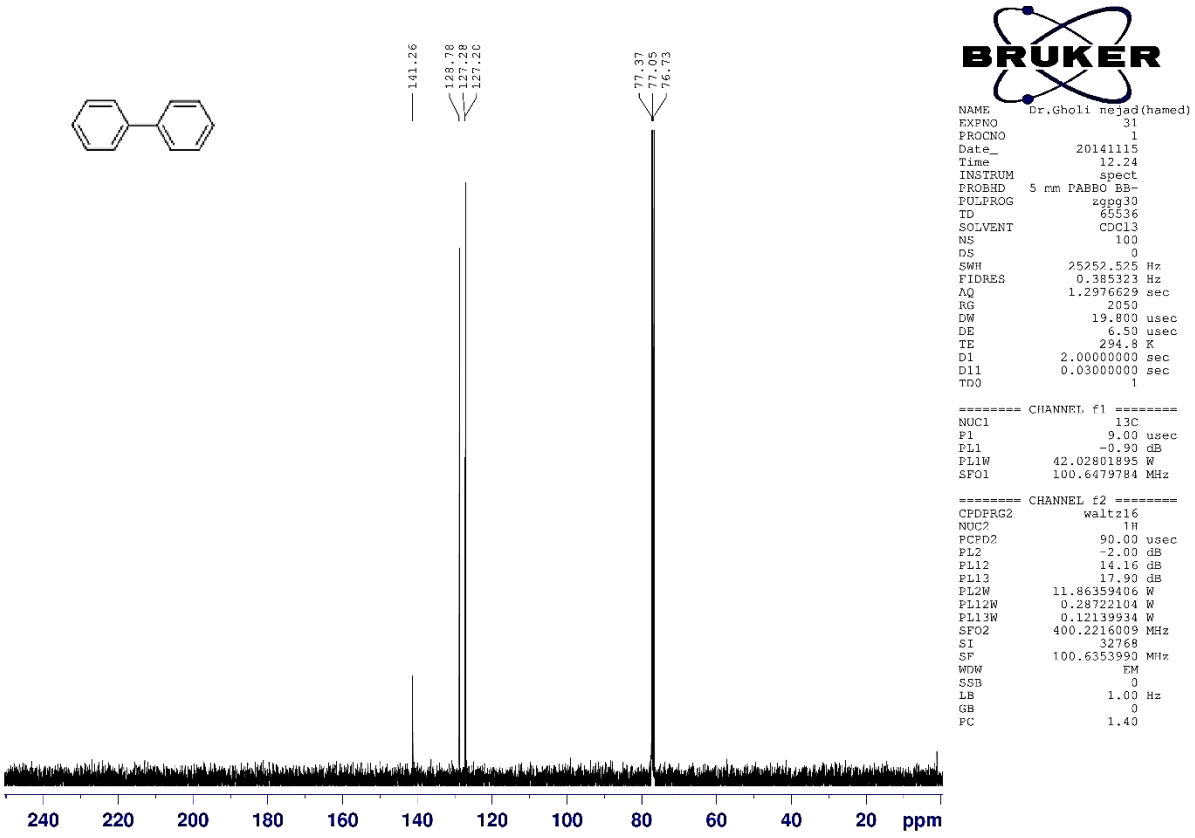
NAME        Dr.Gholi nejad(hamed)
EXPNO                         30
PROCNO                         1
Date_                   20141115
Time                       12.21
INSTRUM                    spect
PROBHD     5 mm PABBO BB-
PULPROG                    zg30
TD                        65536
SOLVENT                   CDCl3
NS                            12
DS                             0
SWH                     8012.820 Hz
FIDRES                  0.122266 Hz
AQ                      4.0894966 sec
RG                           181
DW                        62.400 usec
DE                         6.50 usec
TE                        294.9 K
D1                    6.00000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                          1H
P1                        14.00 usec
PL1                       -2.00 dB
PL1W                11.86359406 W
SFO1                400.2236020 MHz
SI                         32768
SF                  400.2200000 MHz
WDW                           EM
SSB                            0
LB                         0.30 Hz
GB                             0
PC                         1.00
```

^{1}H NMR of 1,1'-biphenyl

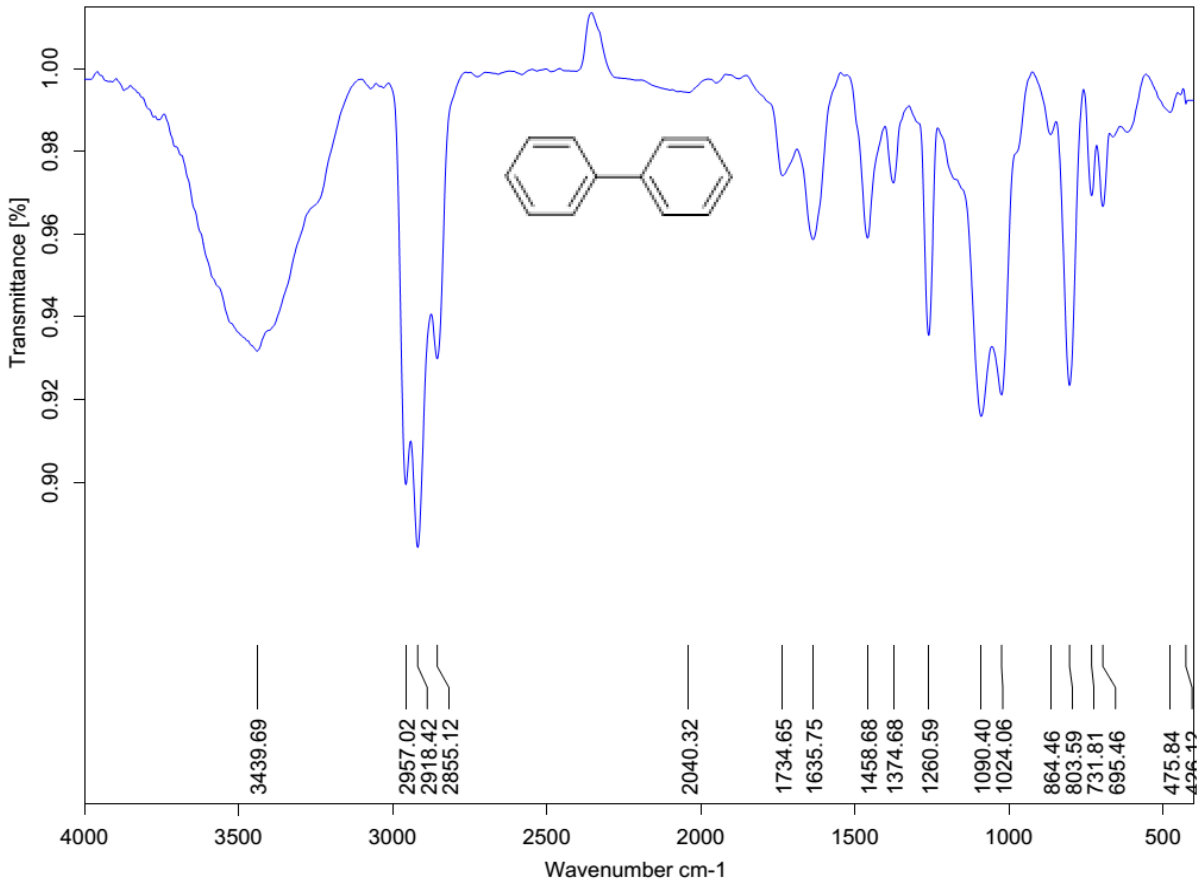



```
NAME          Dr.Gholi nejad(hamed)
EXPNO                           31
PROCNO                           1
Date_                     20141115
Time                         12.24
INSTRUM                      spect
PROBHD    5 mm PABBO BB-
PULPROG                    zgpg30
TD                            65536
SOLVENT                     CDCl3
NS                              100
DS                                0
SWH                     25252.525 Hz
FIDRES                   0.385323 Hz
AQ                       1.2976629 sec
RG                             2050
DW                          19.800 usec
DE                           6.50 usec
TE                          294.8 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                              1

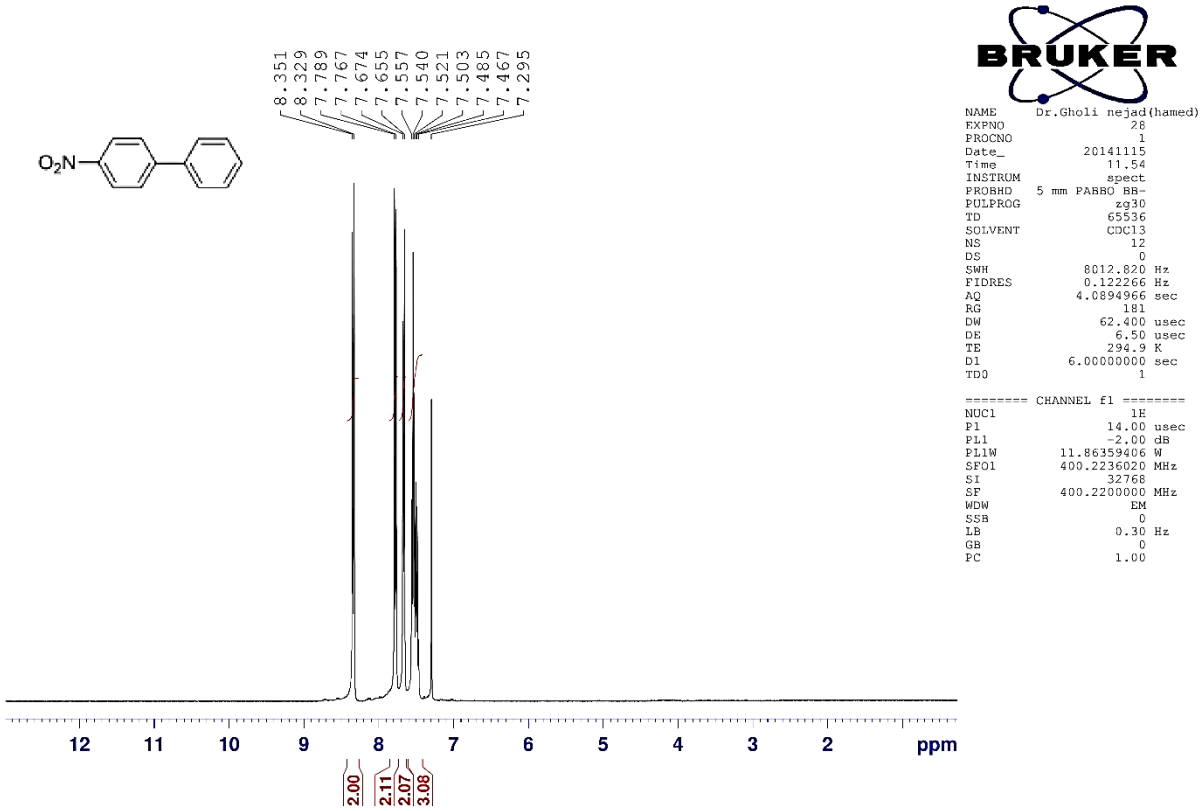
======== CHANNEL f1 ========
NUC1                           13C
P1                            9.00 usec
PL1                          -0.90 dB
PL1W                 42.02801895 W
SFO1                100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                   waltz16
NUC2                           1H
PCPD2                        90.00 usec
PL2                          -2.00 dB
PL12                         14.16 dB
PL13                         17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2                400.2216009 MHz
SI                           32768
SF                  100.6353990 MHz
WDW                             EM
SSB                              0
LB                            1.00 Hz
GB                               0
PC                            1.40
```

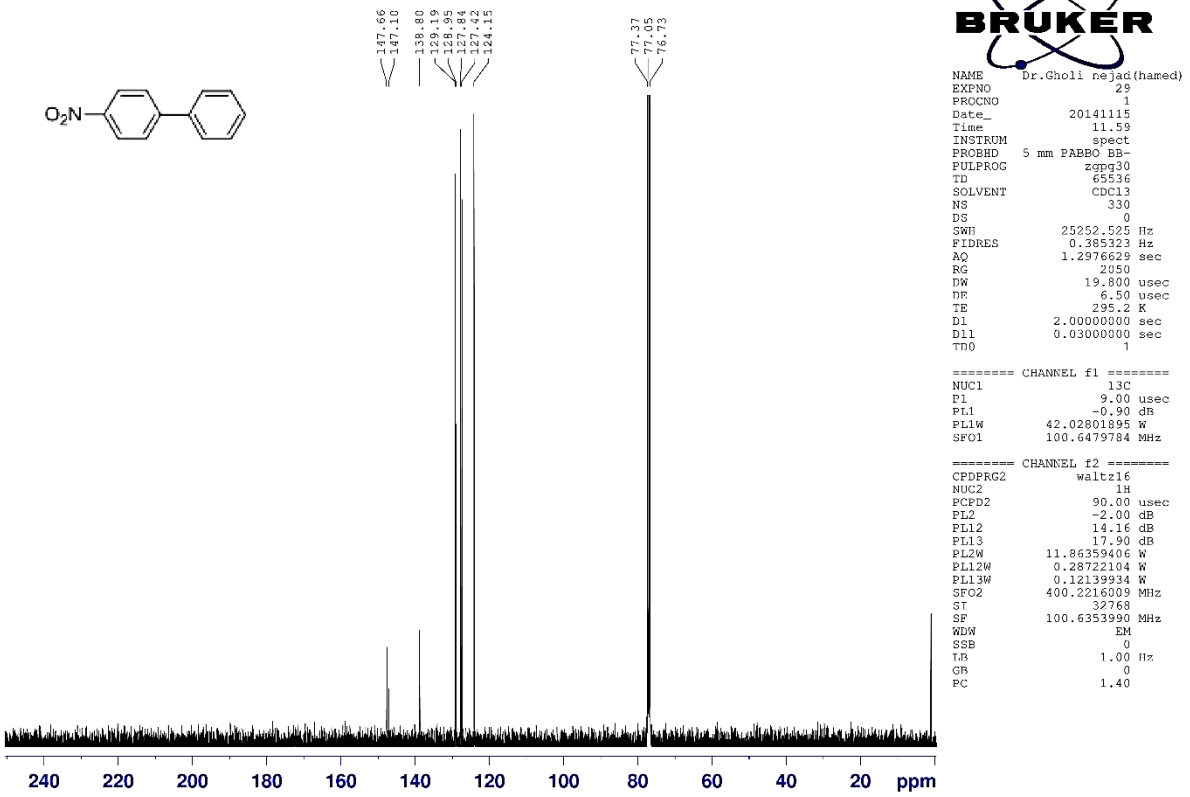
^{13}C NMR of 1,1'-biphenyl



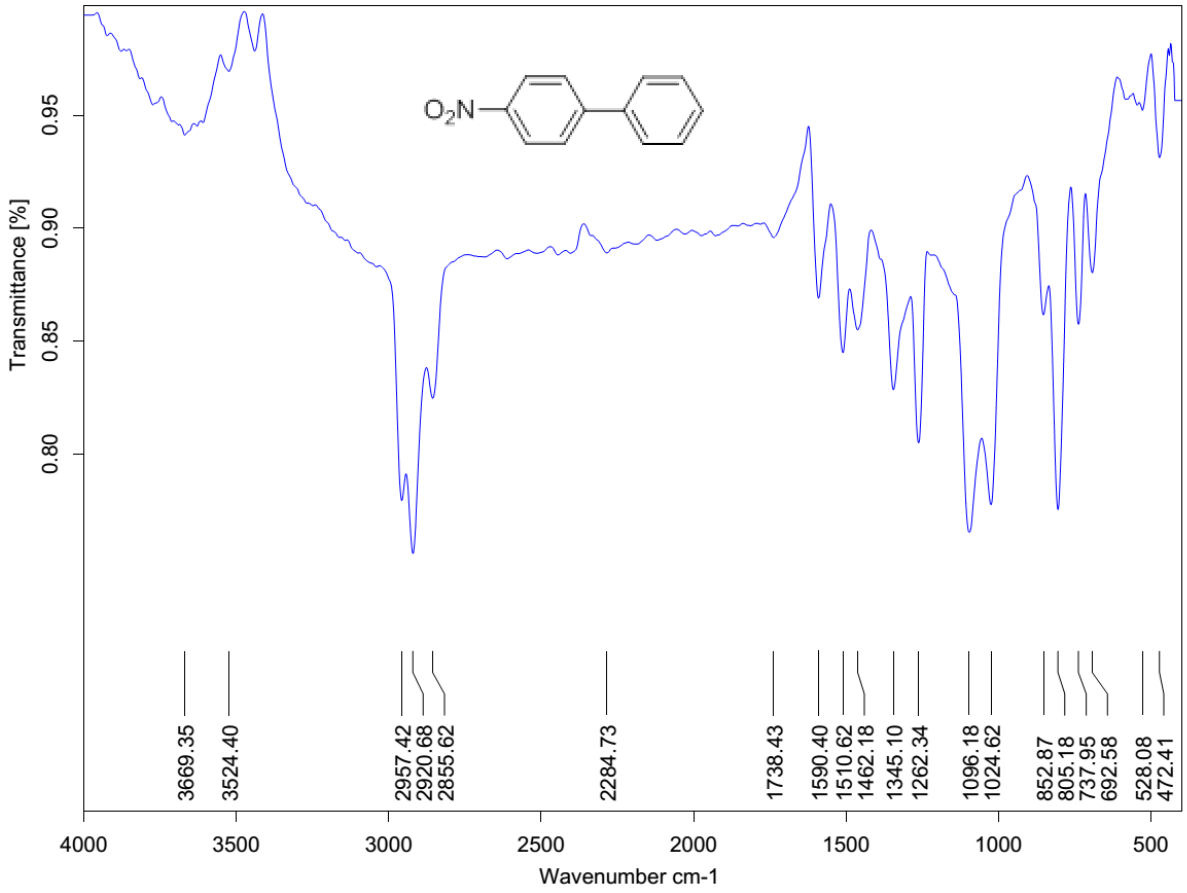
FT-IR of 1,1'-biphenyl



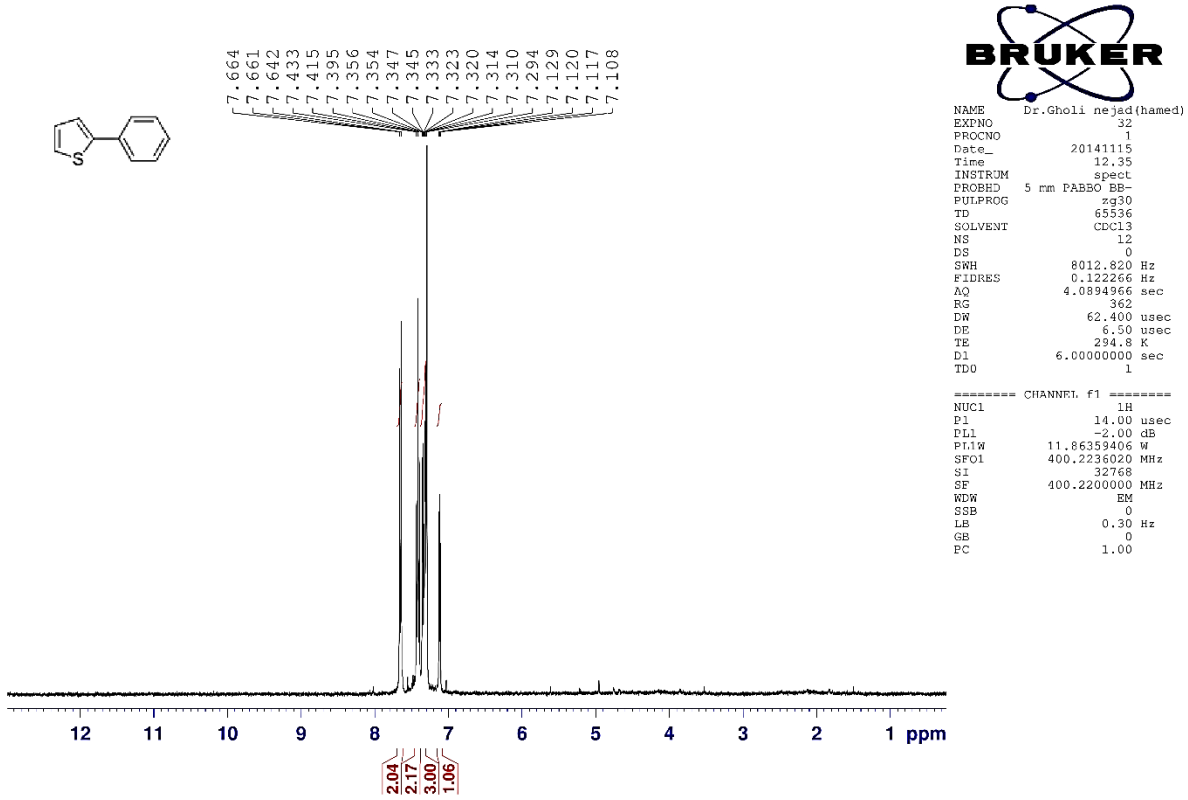
^{1}H NMR of 4-Nitro-1,1'-biphenyl



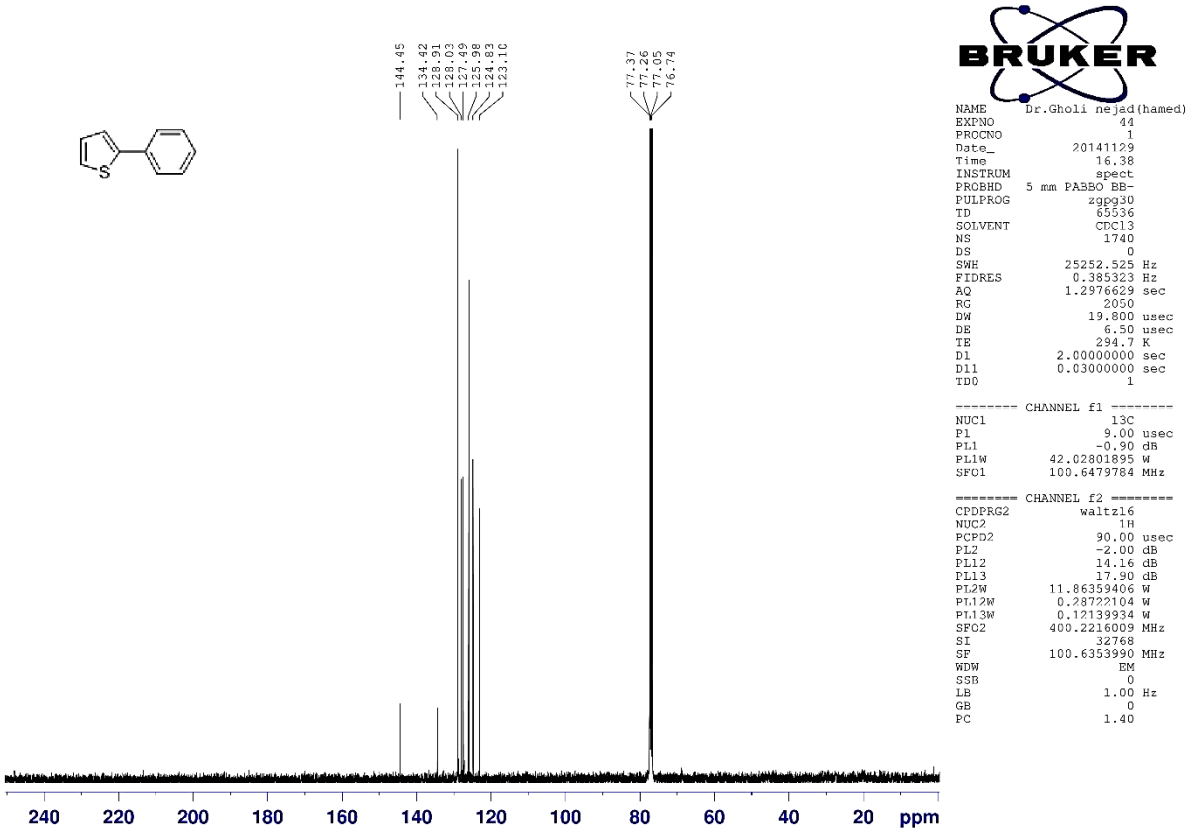
^{13}C NMR of 4-Nitro-1,1'-biphenyl



FT-IR of 4-Nitro-1,1'-biphenyl



^{1}H NMR of 2-phenylthiophene



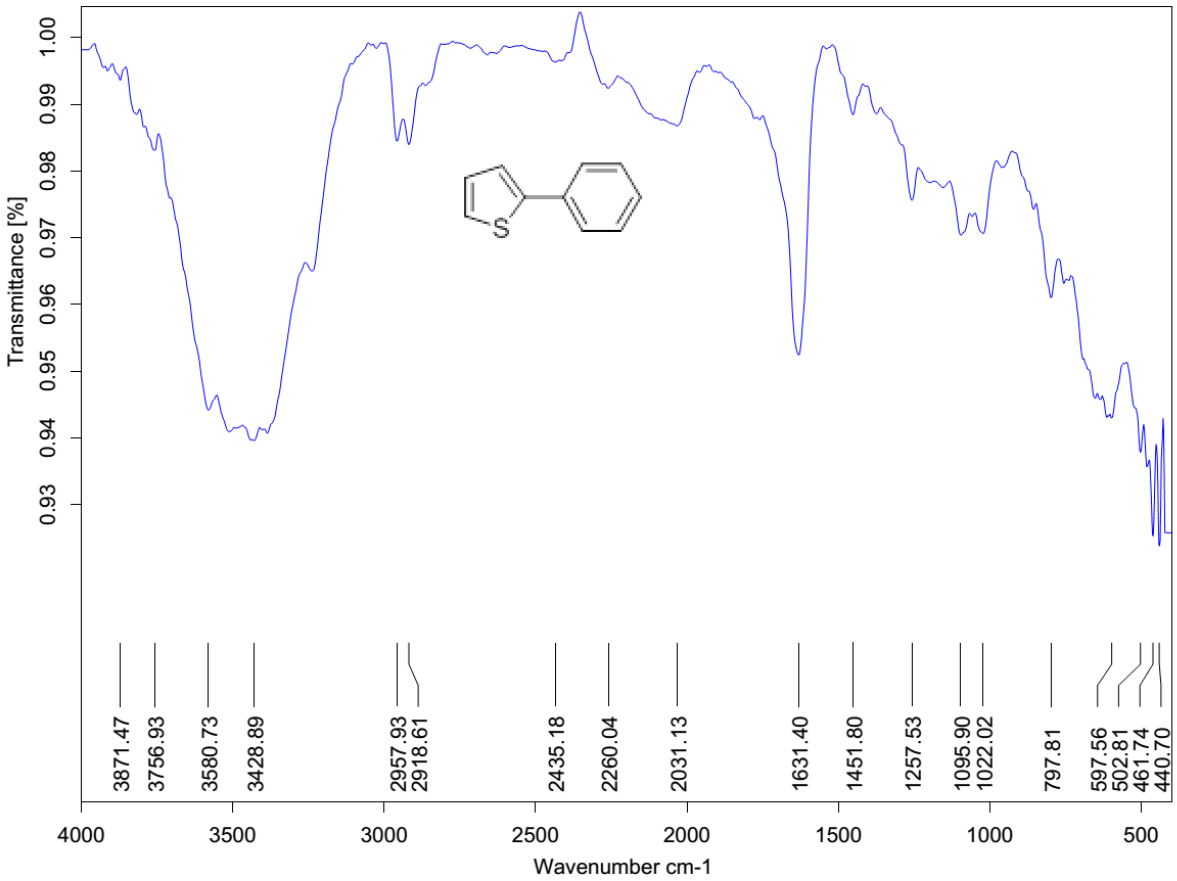
BRUKER

```
NAME          Dr.Gholi nejad(hamed)
EXPNO                          44
PROCNO                          1
Date_                    20141129
Time                        16.38
INSTRUM                     spect
PROBHD    5 mm PABBO BB-
PULPROG                   zgpg30
TD                         65536
SOLVENT                    CDCl3
NS                          1740
DS                             0
SWH                    25252.525 Hz
FIDRES                  0.385323 Hz
AQ                     1.2976629 sec
RG                          2050
DW                        19.800 usec
DE                         6.50 usec
TE                        294.7 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                            1

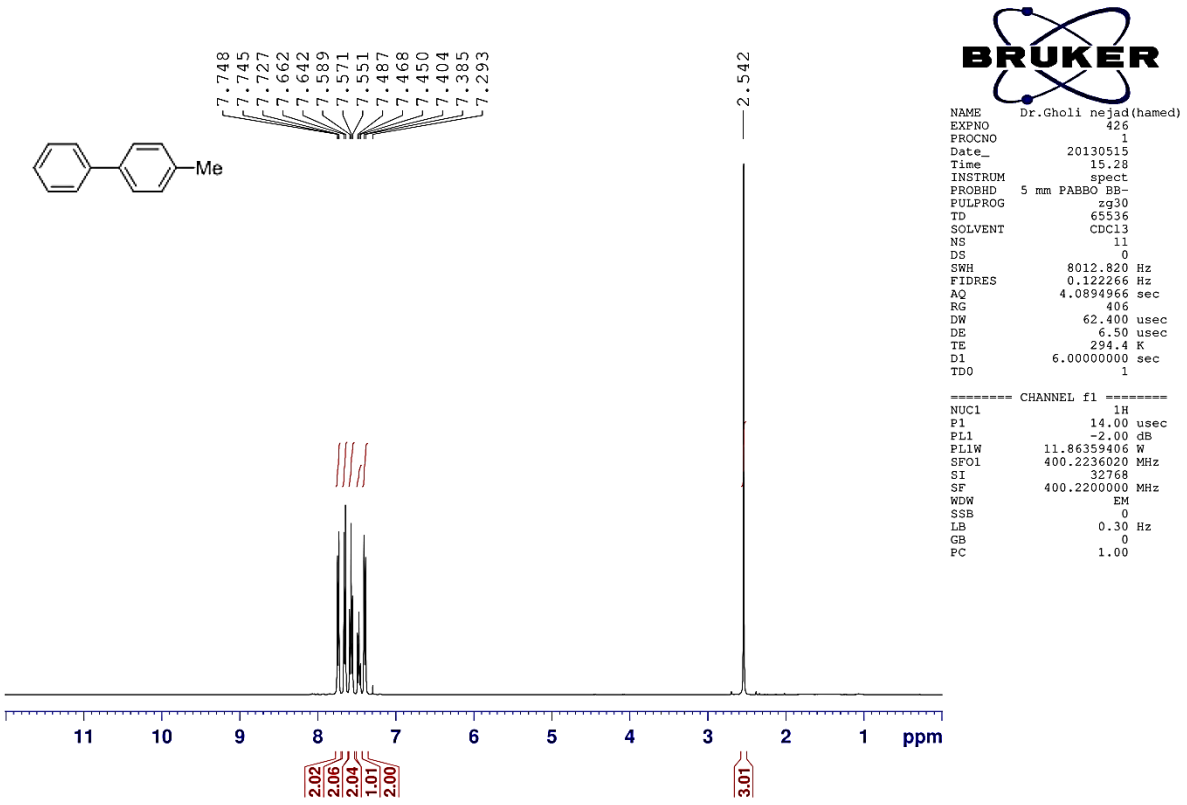
-------- CHANNEL f1 --------
NUC1                         13C
P1                         9.00 usec
PL1                       -0.90 dB
PL1W                42.02801895 W
SFO1                100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                         1H
PCPD2                     90.00 usec
PL2                       -2.00 dB
PL12                      14.16 dB
PL13                      17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2                400.2216009 MHz
SI                          32768
SF                  100.6353990 MHz
WDW                            EM
SSB                            0
LB                         1.00 Hz
GB                             0
PC                         1.40
```

^{13}C NMR of 2-phenylthiophene



FT-IR of 2-phenylthiophene

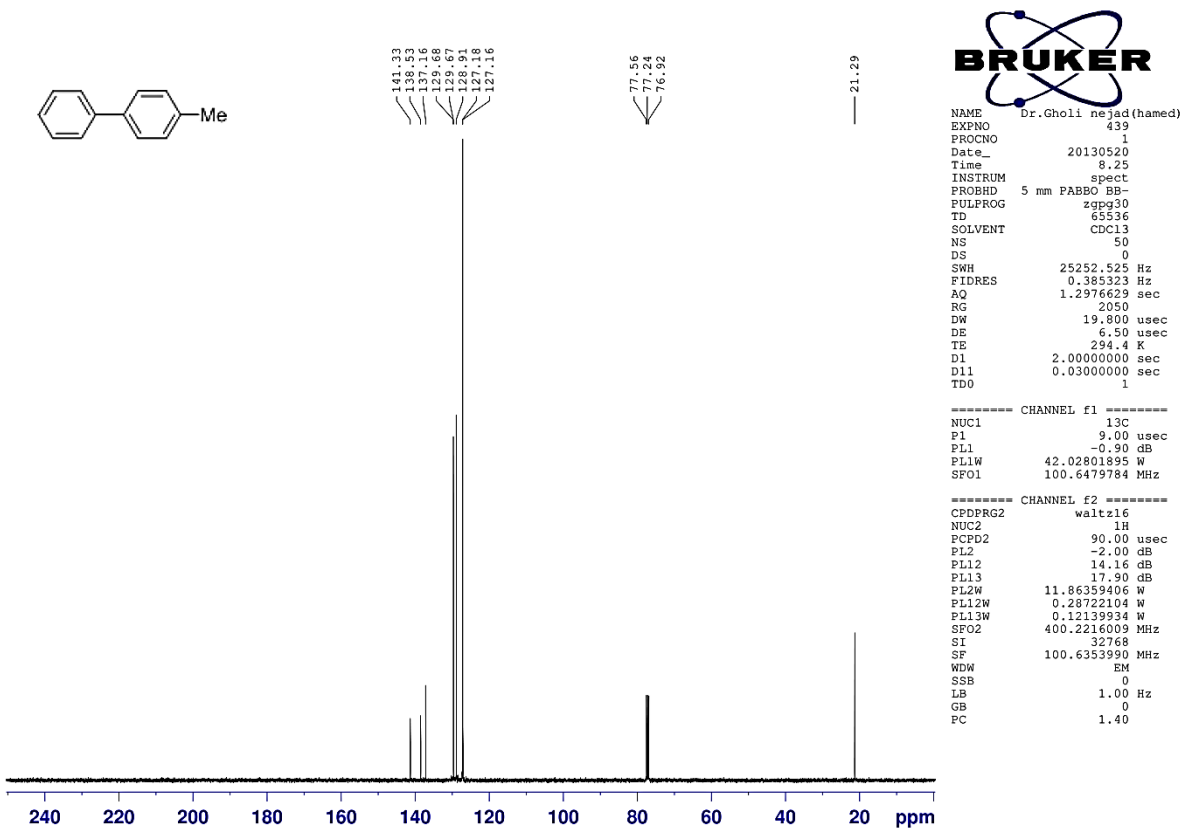


BRUKER

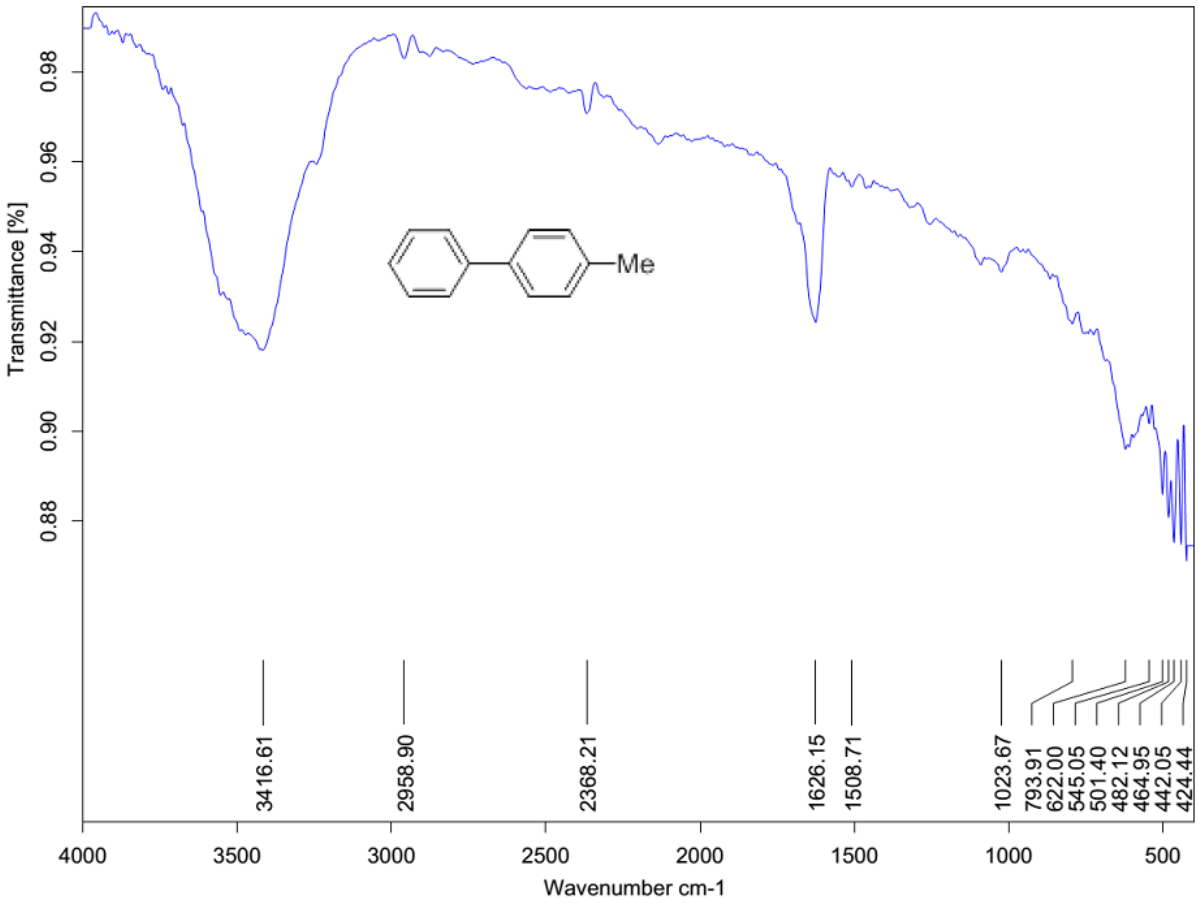
```
NAME        Dr.Gholi nejad(hamed)
EXPNO                        426
PROCNO                         1
Date_                   20130515
Time                       15.28
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                     zg30
TD                         65536
SOLVENT                    CDCl3
NS                            11
DS                             0
SWH                     8012.820 Hz
FIDRES                  0.122266 Hz
AQ                      4.0894966 sec
RG                           406
DW                        62.400 usec
DE                         6.50 usec
TE                        294.4 K
D1                     6.00000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                          1H
P1                         14.00 usec
PL1                        -2.00 dB
PL1W                11.86359406 W
SFO1                400.2236020 MHz
SI                         32768
SF                  400.2200000 MHz
WDW                           EM
SSB                            0
LB                          0.30 Hz
GB                             0
PC                          1.00
```

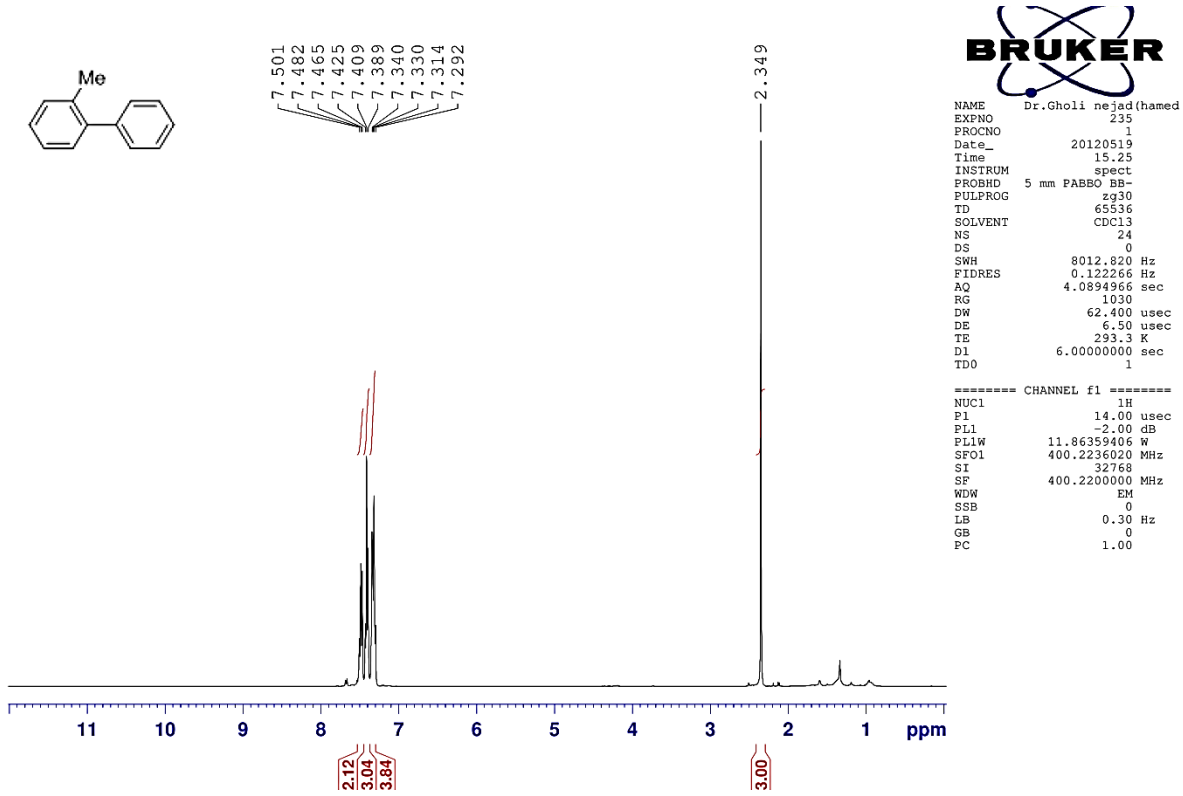
^{1}H NMR of 4-methyl-1,1'-biphenyl



^{13}C NMR of 4-methyl-1,1'-biphenyl



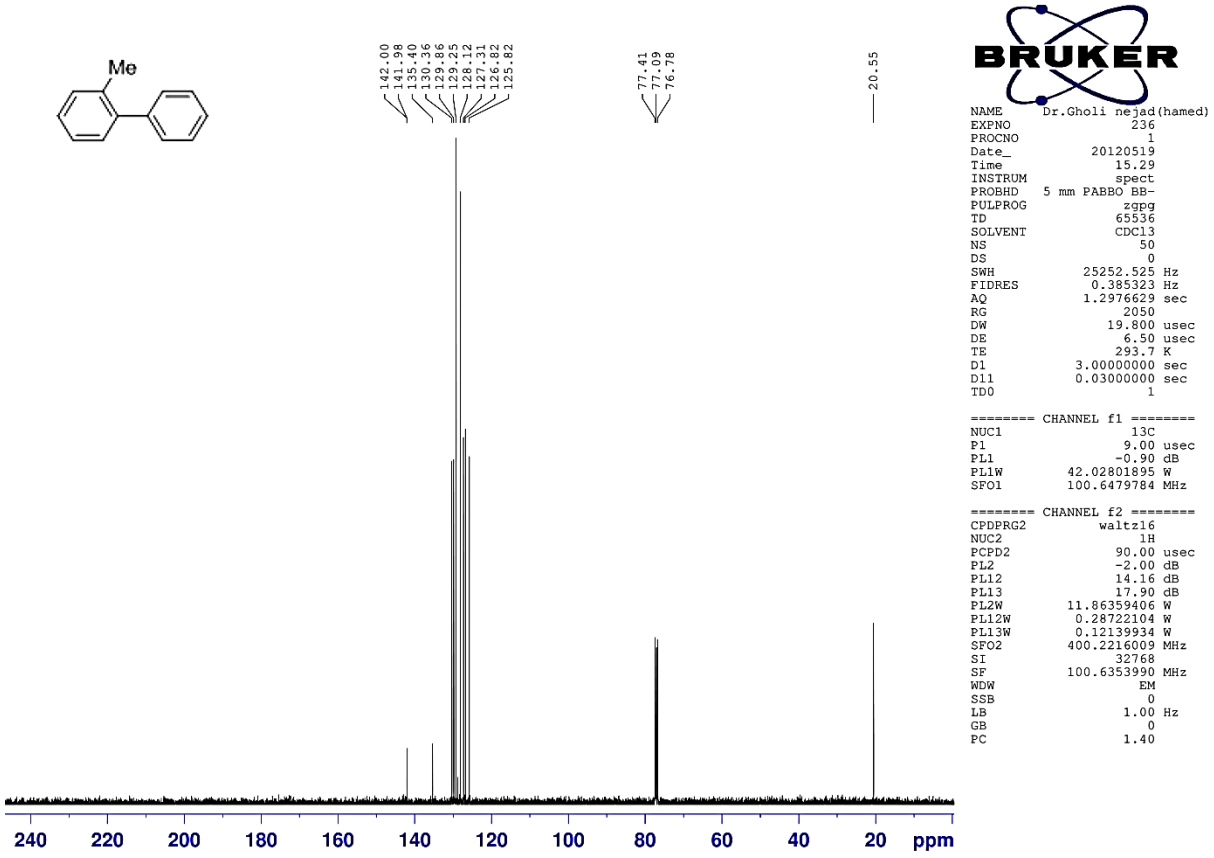
FT-IR of 4-methyl-1,1'-biphenyl




```
NAME          Dr.Gholi nejad(hamed
EXPNO                    235
PROCNO                     1
Date_               20120519
Time                   15.25
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       24
DS                        0
SWH                8012.820 Hz
FIDRES             0.122266 Hz
AQ                 4.0894966 sec
RG                      1030
DW                    62.400 usec
DE                     6.50 usec
TE                    293.3 K
D1                 6.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     14.00 usec
PL1                    -2.00 dB
PL1W           11.86359406 W
SFO1           400.2236020 MHz
SI                      32768
SF             400.2200000 MHz
WDW                       EM
SSB                        0
LB                      0.30 Hz
GB                         0
PC                      1.00
```

^{1}H NMR of 2-methyl-1,1'-biphenyl

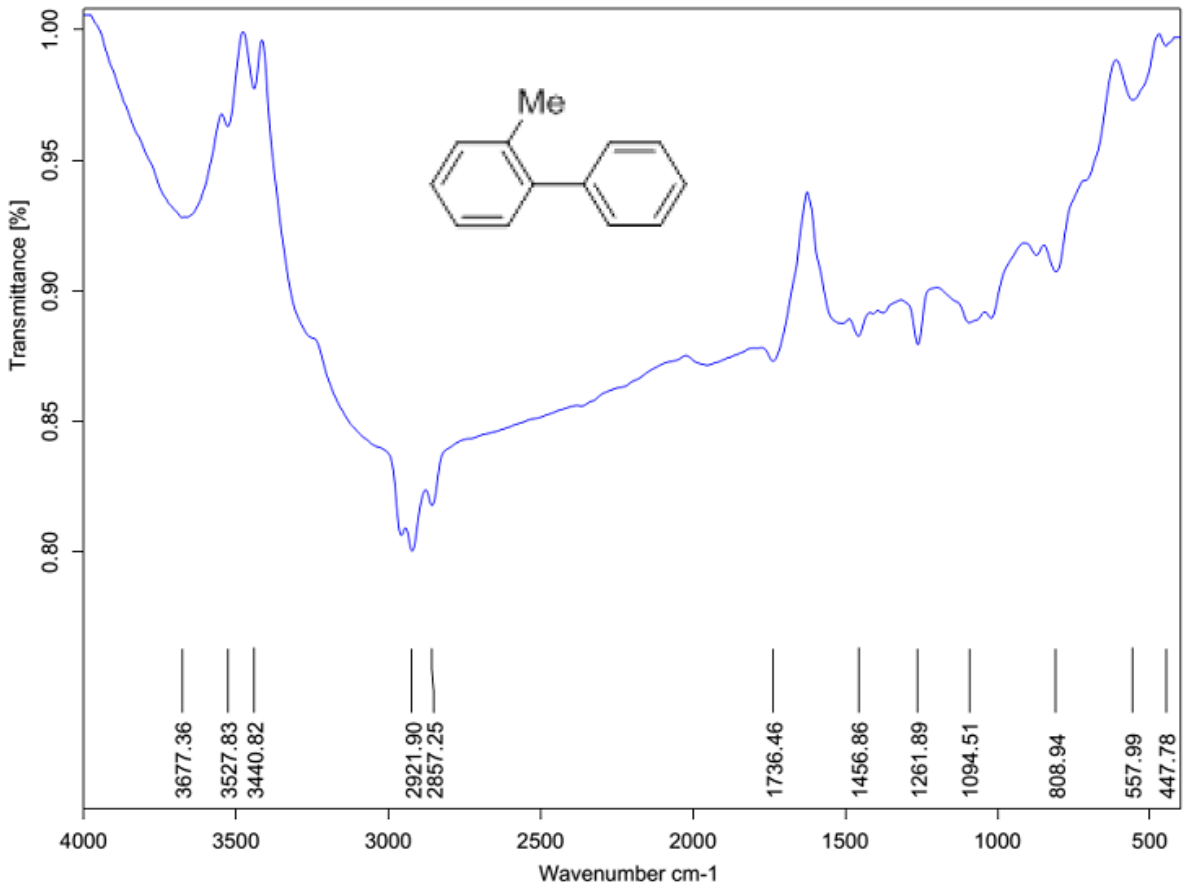



```
NAME          Dr.Gholi nejad(hamed)
EXPNO                          236
PROCNO                           1
Date_                     20120519
Time                         15.29
INSTRUM                      spect
PROBHD       5 mm PABBO BB-
PULPROG                      zgpg
TD                          65536
SOLVENT                     CDCl3
NS                             50
DS                              0
SWH                    25252.525 Hz
FIDRES                  0.385323 Hz
AQ                      1.2976629 sec
RG                           2050
DW                         19.800 usec
DE                          6.50 usec
TE                         293.7 K
D1                     3.00000000 sec
D11                    0.03000000 sec
TD0                              1

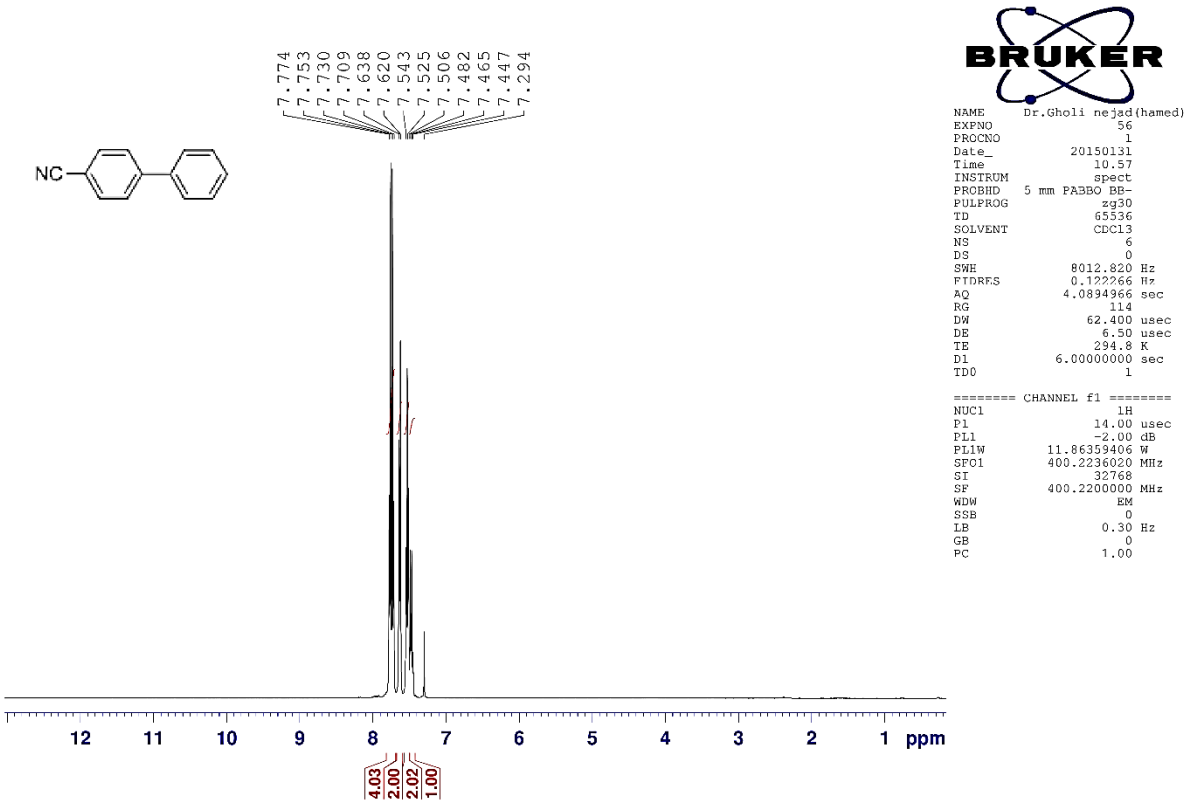
======== CHANNEL f1 ========
NUC1                           13C
P1                            9.00 usec
PL1                          -0.90 dB
PL1W                 42.02801895 W
SFO1                 100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                           1H
PCPD2                       90.00 usec
PL2                          -2.00 dB
PL12                         14.16 dB
PL13                         17.90 dB
PL2W                 11.86359406 W
PL12W                 0.28722104 W
PL13W                 0.12139934 W
SFO2                 400.2216009 MHz
SI                           32768
SF                   100.6353990 MHz
WDW                             EM
SSB                              0
LB                            1.00 Hz
GB                               0
PC                            1.40
```

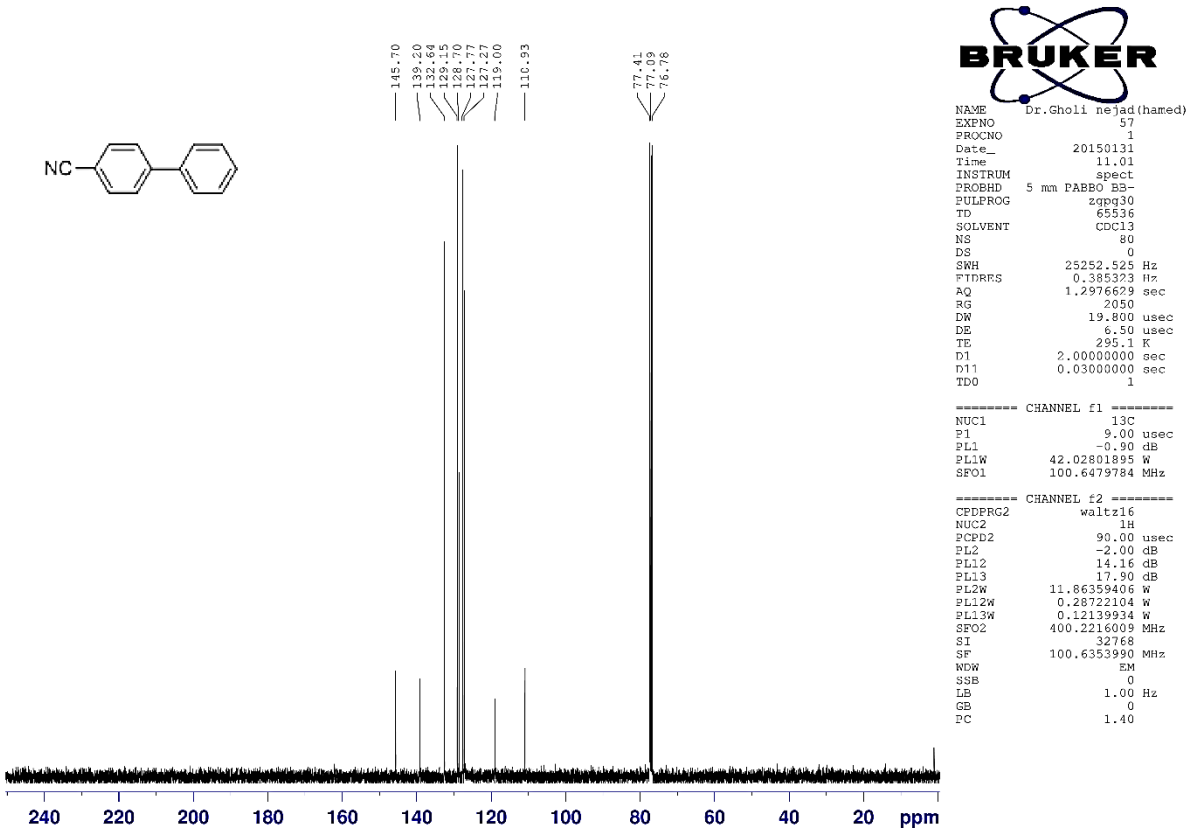
^{13}C NMR of 2-methyl-1,1'-biphenyl



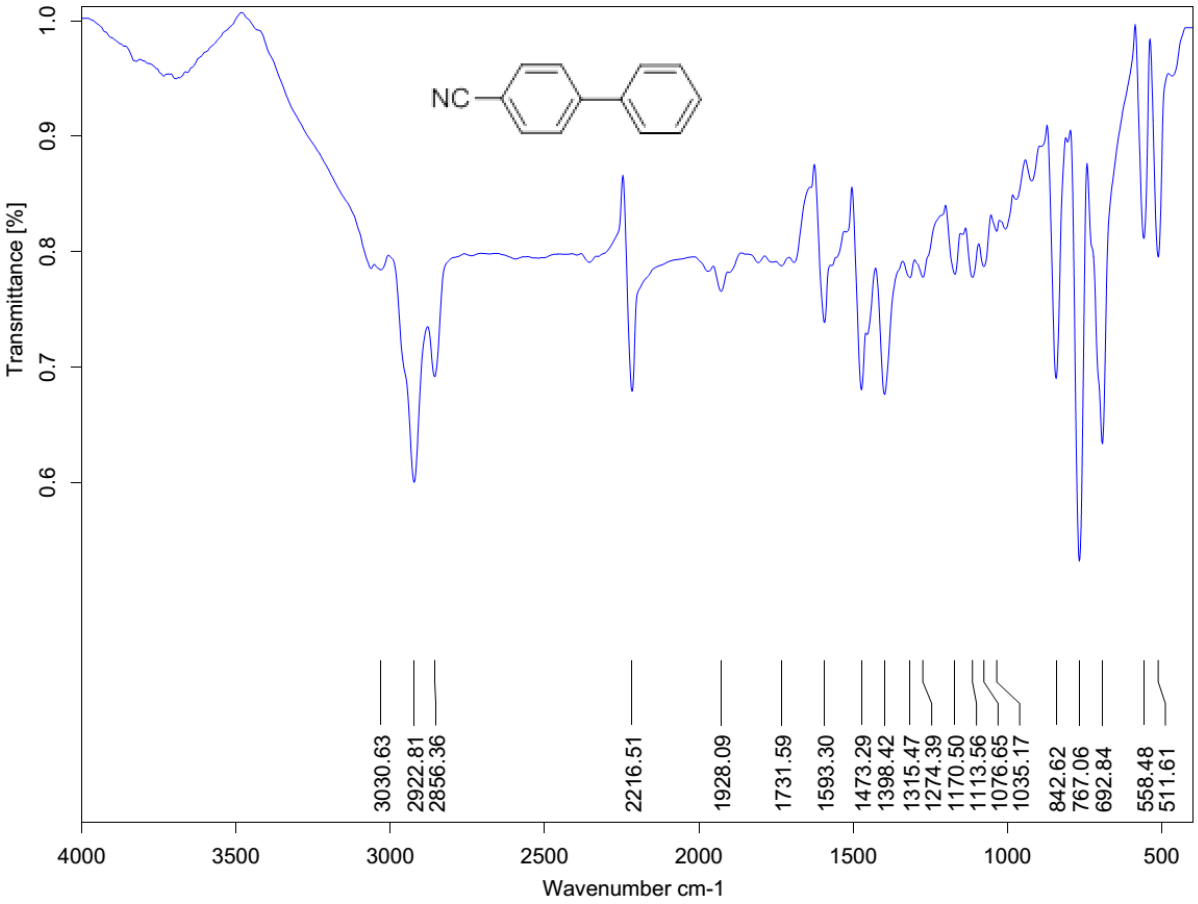
FT-IR of 2-methyl-1,1'-biphenyl



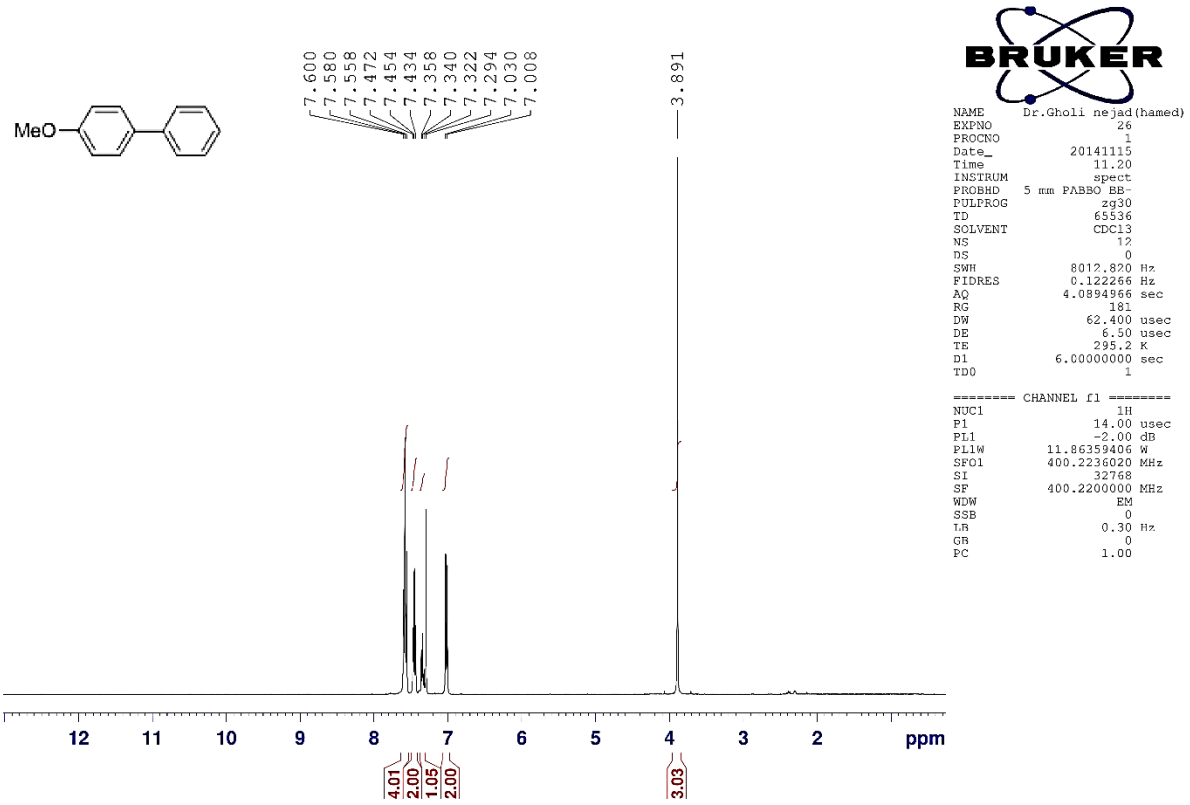
^{1}H NMR of [1,1'-biphenyl]-4-carbonitrile



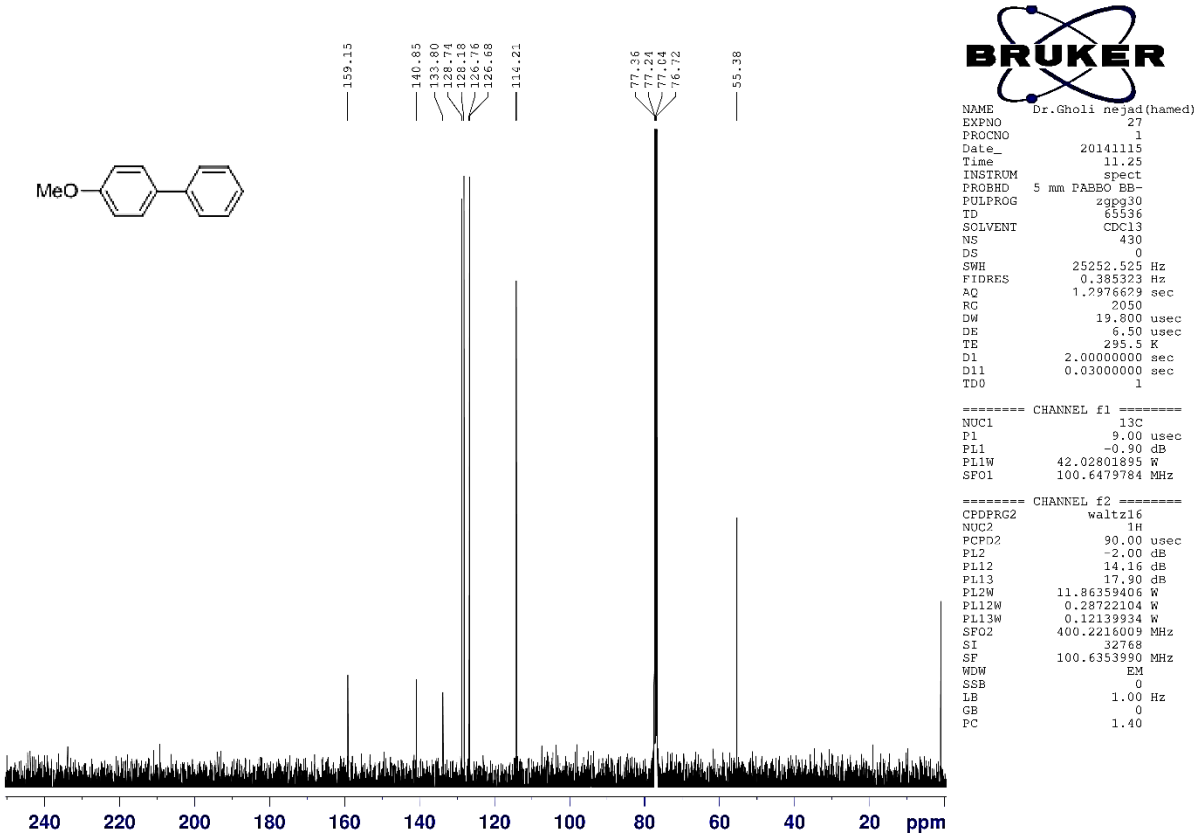
^{13}C NMR of [1,1'-biphenyl]-4-carbonitrile



FT-IR of [1,1'-biphenyl]-4-carbonitrile



^{1}H NMR of 4-Methoxy-1,1'-biphenyl

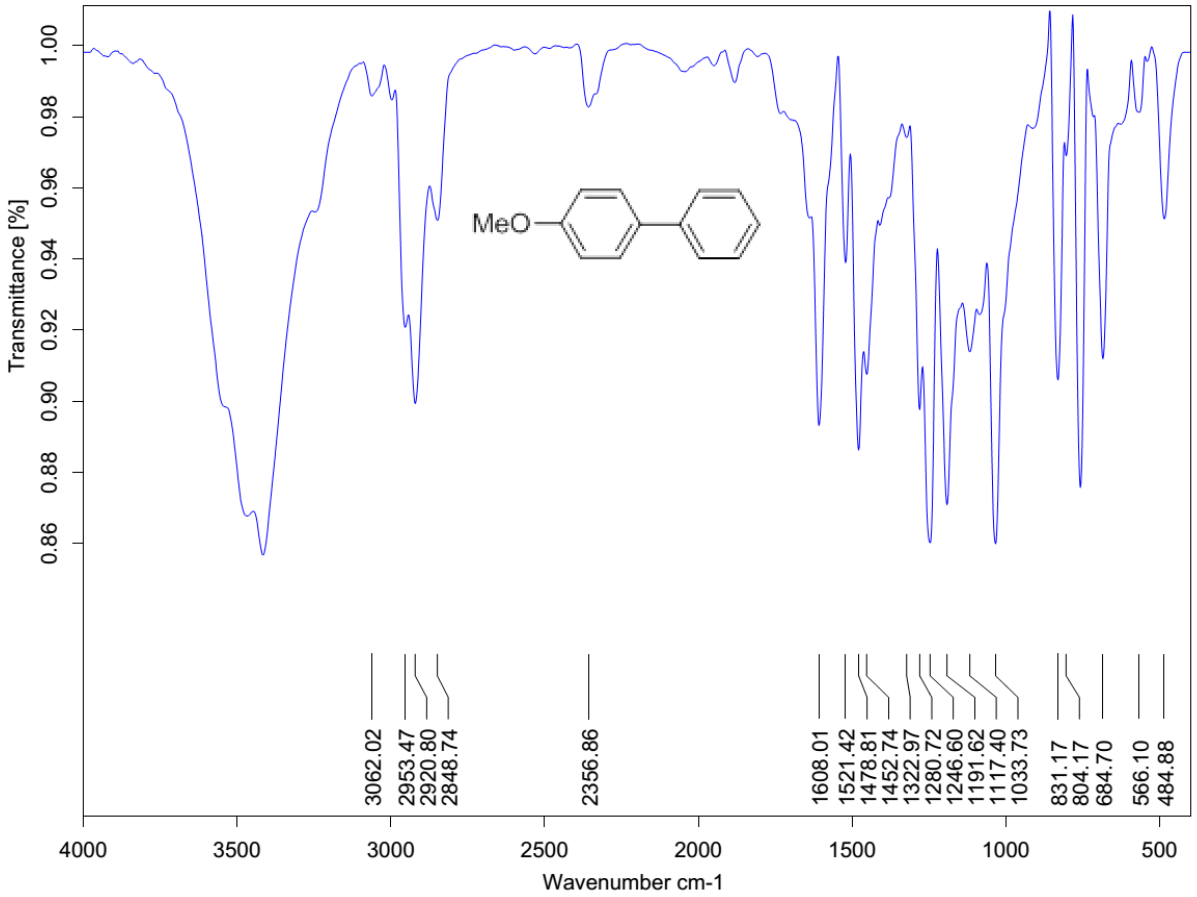



```
NAME        Dr.Gholi nejad(hamed)
EXPNO                        27
PROCNO                        1
Date_                  20141115
Time                      11.25
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG                 zgpg30
TD                       65536
SOLVENT                  CDCl3
NS                         430
DS                           0
SWH                  25252.525 Hz
FIDRES                0.385323 Hz
AQ                    1.2976629 sec
RG                         2050
DW                       19.800 usec
DE                        6.50 usec
TE                       295.5 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                          1

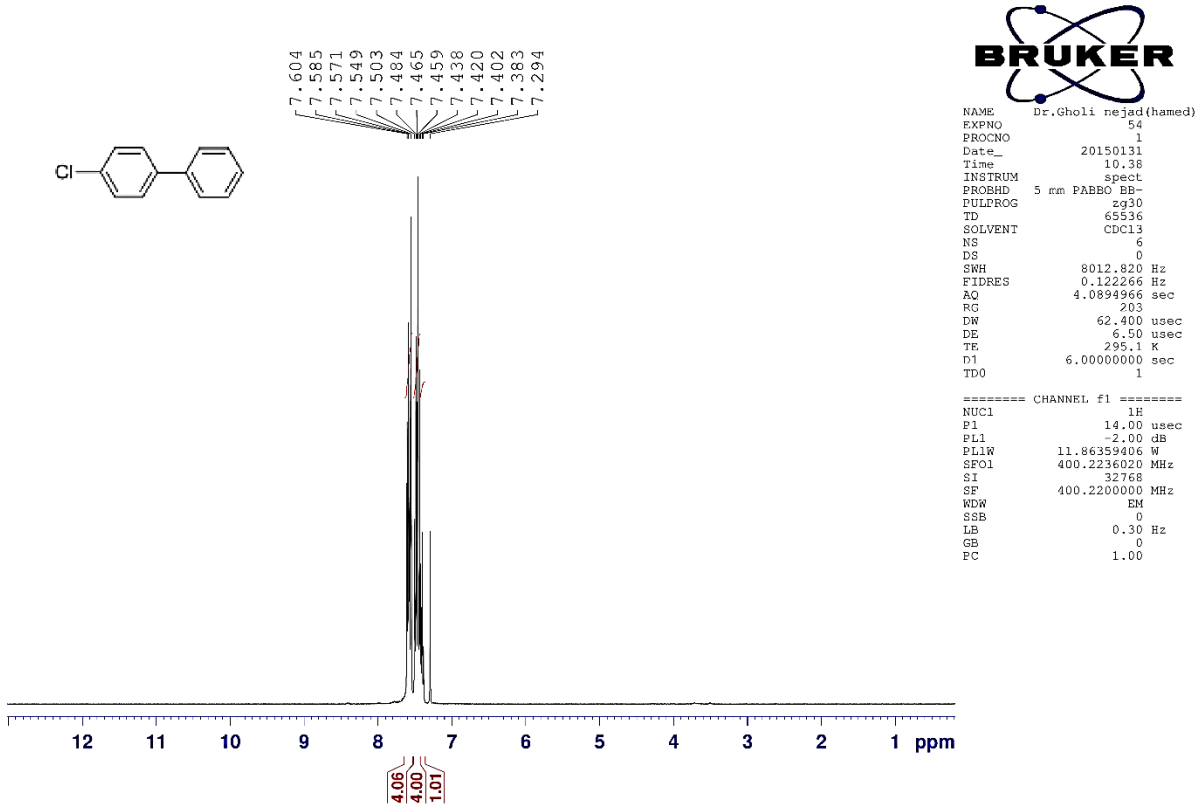
======== CHANNEL f1 ========
NUC1                       13C
P1                        9.00 usec
PL1                      -0.90 dB
PL1W              42.02801895 W
SFO1              100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                    90.00 usec
PL2                      -2.00 dB
PL12                     14.16 dB
PL13                     17.90 dB
PL2W              11.86359406 W
PL12W              0.28722104 W
PL13W              0.12139934 W
SFO2              400.2216009 MHz
SI                       32768
SF                100.6353990 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

^{13}C NMR of 4-Methoxy-1,1'-biphenyl



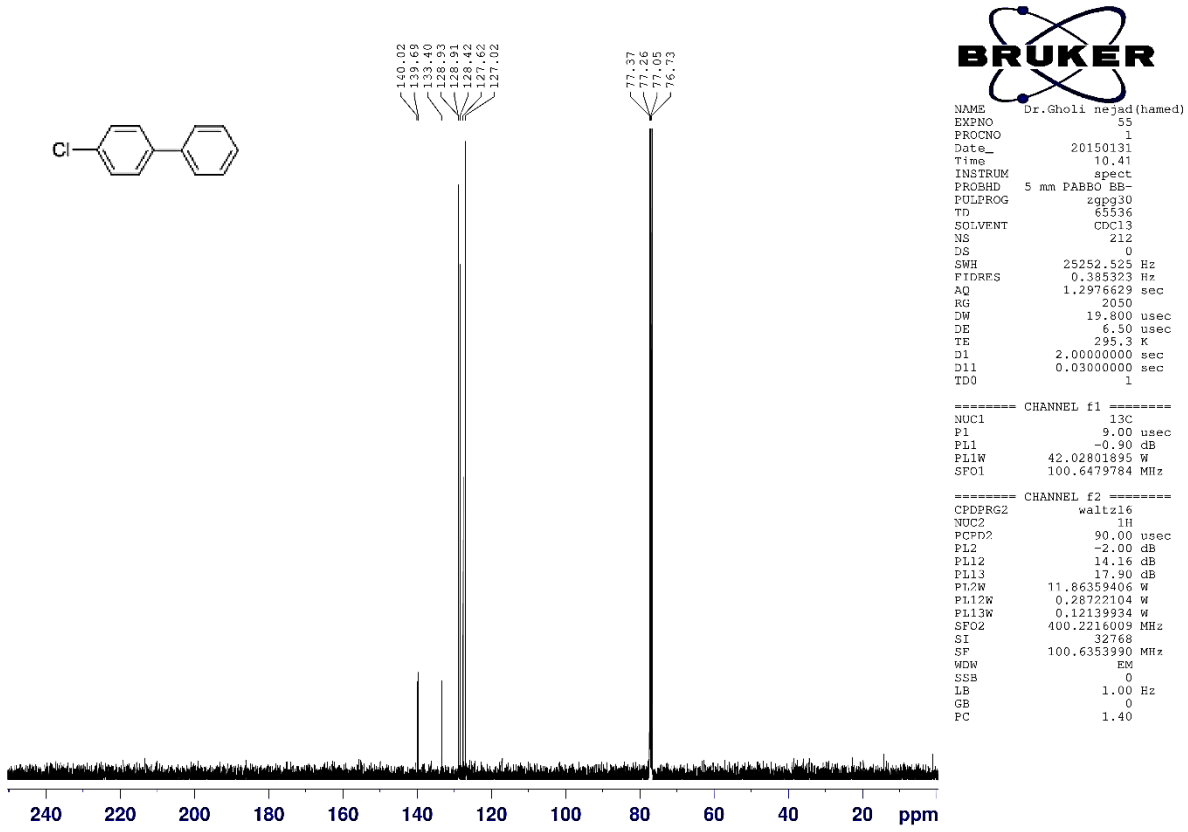
FT-IR of 4-Methoxy-1,1'-biphenyl



BRUKER

NAME	Dr.Gholi nejad(hamed)
EXPNO	54
PROCNO	1
Date_	20150131
Time	10.38
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	6
DS	0
SWH	8012.820 Hz
FIDRES	0.122266 Hz
AQ	4.0894966 sec
RG	203
DW	62.400 usec
DE	6.50 usec
TE	295.1 K
D1	6.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.00 usec
PL1	-2.00 dB
PL1W	11.86359406 W
SFO1	400.2236020 MHz
SI	32768
SF	400.2200000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

^{1}H NMR of 4-chloro-1,1'-biphenyl

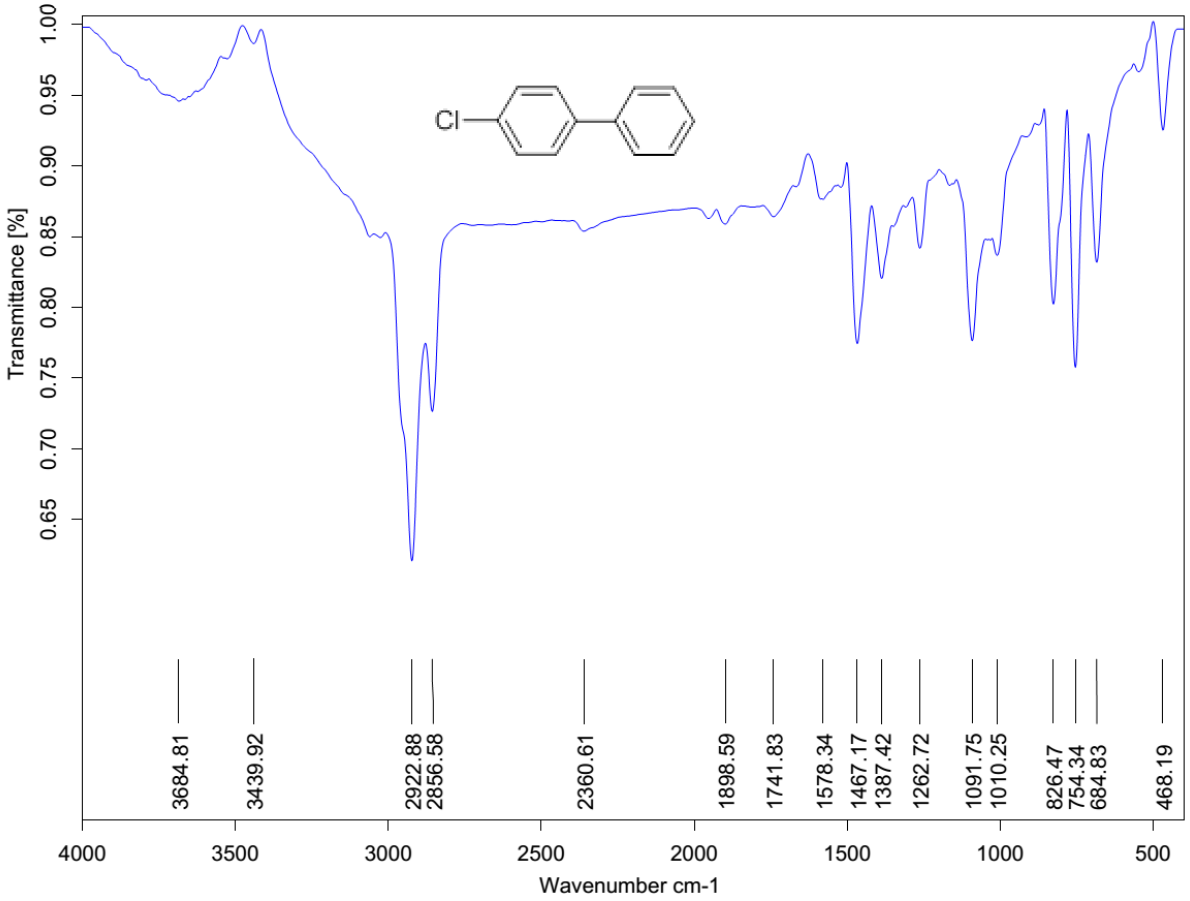



```
NAME          Dr.Gholi nejad(hamed)
EXPNO                           55
PROCNO                           1
Date_                     20150131
Time                         10.41
INSTRUM                      spect
PROBHD     5 mm PABBO BB-
PULPROG                   zgpg30
TD                             65536
SOLVENT                      CDCl3
NS                               212
DS                                 0
SWH                      25252.525 Hz
FIDRES                    0.385323 Hz
AQ                        1.2976629 sec
RG                              2050
DW                          19.800 usec
DE                           6.50 usec
TE                           295.3 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                              1

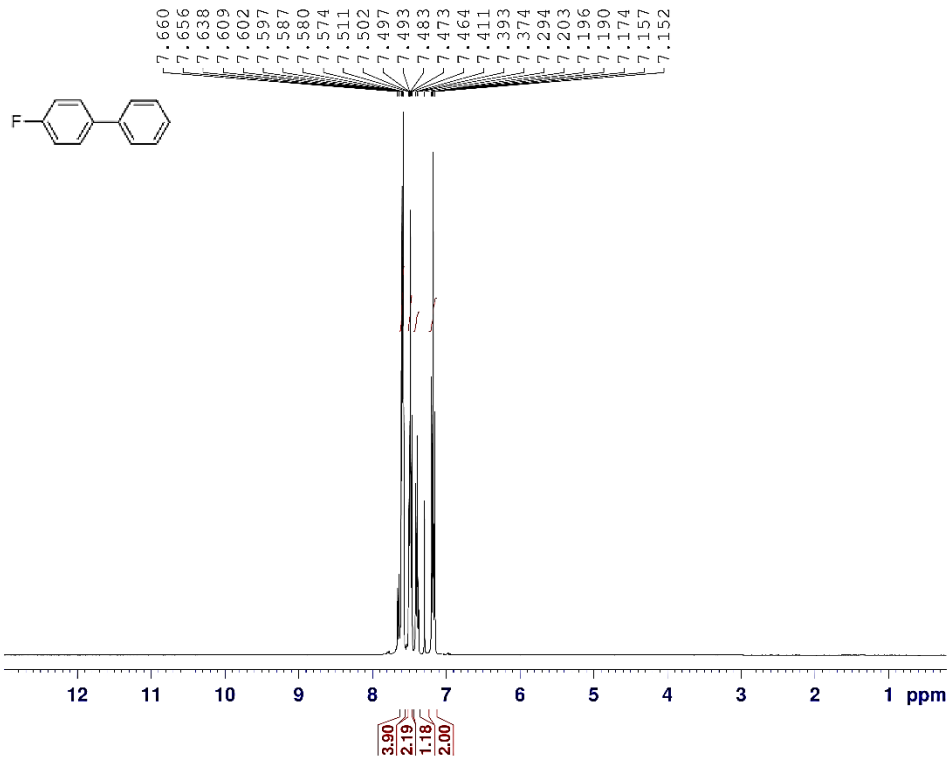
======== CHANNEL f1 ========
NUC1                           13C
P1                           9.00 usec
PL1                         -0.90 dB
PL1W                 42.02801895 W
SFO1                100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                   waltz16
NUC2                           1H
PCPD2                       90.00 usec
PL2                         -2.00 dB
PL12                        14.16 dB
PL13                        17.90 dB
PL2W                 11.86359406 W
PL12W                 0.28722104 W
PL13W                 0.12139934 W
SFO2                400.2216009 MHz
SI                           32768
SF                  100.6353990 MHz
WDW                            EM
SSB                             0
LB                           1.00 Hz
GB                              0
PC                           1.40
```

^{13}C NMR of 4-chloro-1,1'-biphenyl



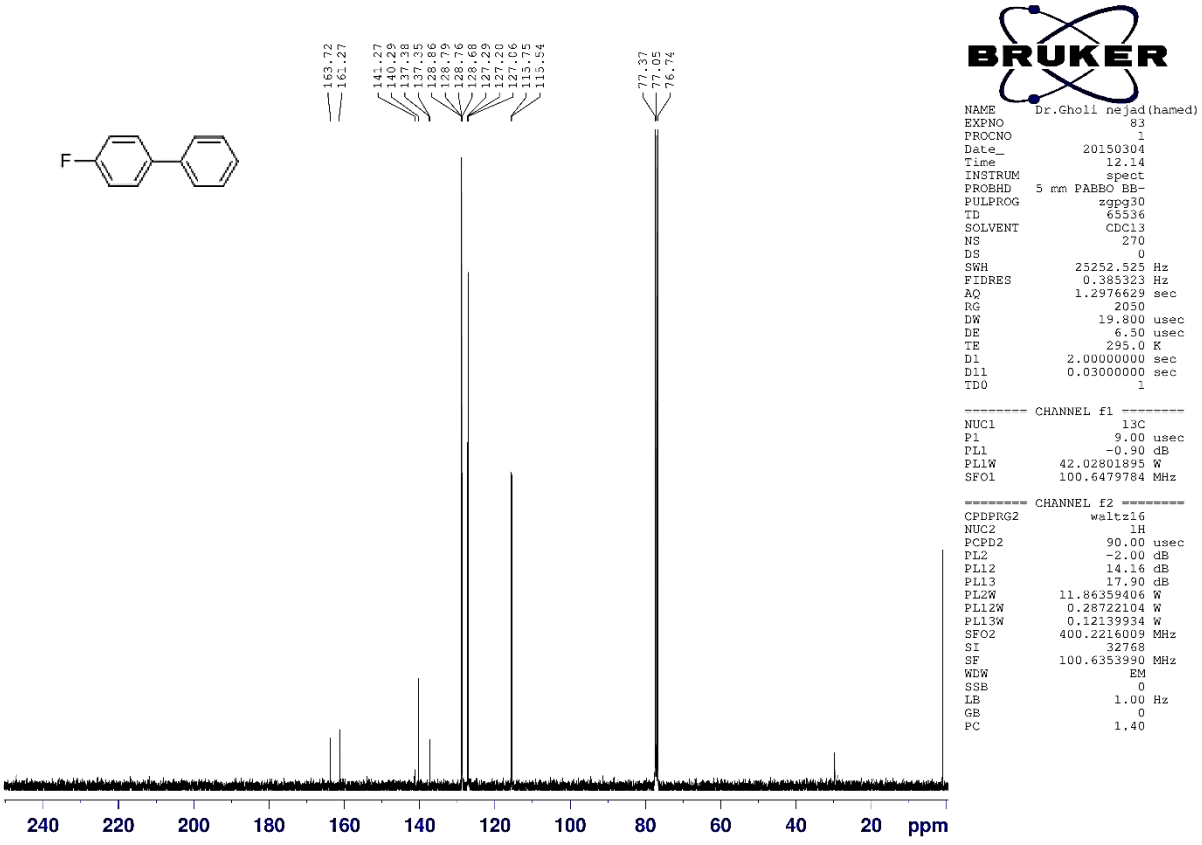
FT-IR of 4-chloro-1,1'-biphenyl



BRUKER

NAME	Dr.Gholi nejad(hamed)
EXPNO	82
PROCNO	1
Date_	20150304
Time	12.09
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	12
DS	0
SWH	8012.820 Hz
FIDRES	0.122266 Hz
AQ	4.0894966 sec
RG	128
DW	62.400 usec
DE	6.50 usec
TE	294.7 K
D1	6.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.00 usec
PL1	-2.00 dB
PL1W	11.86359406 W
SFO1	400.2236020 MHz
SI	32768
SF	400.2200000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

^{1}H NMR of 4-fluoro-1,1'-biphenyl

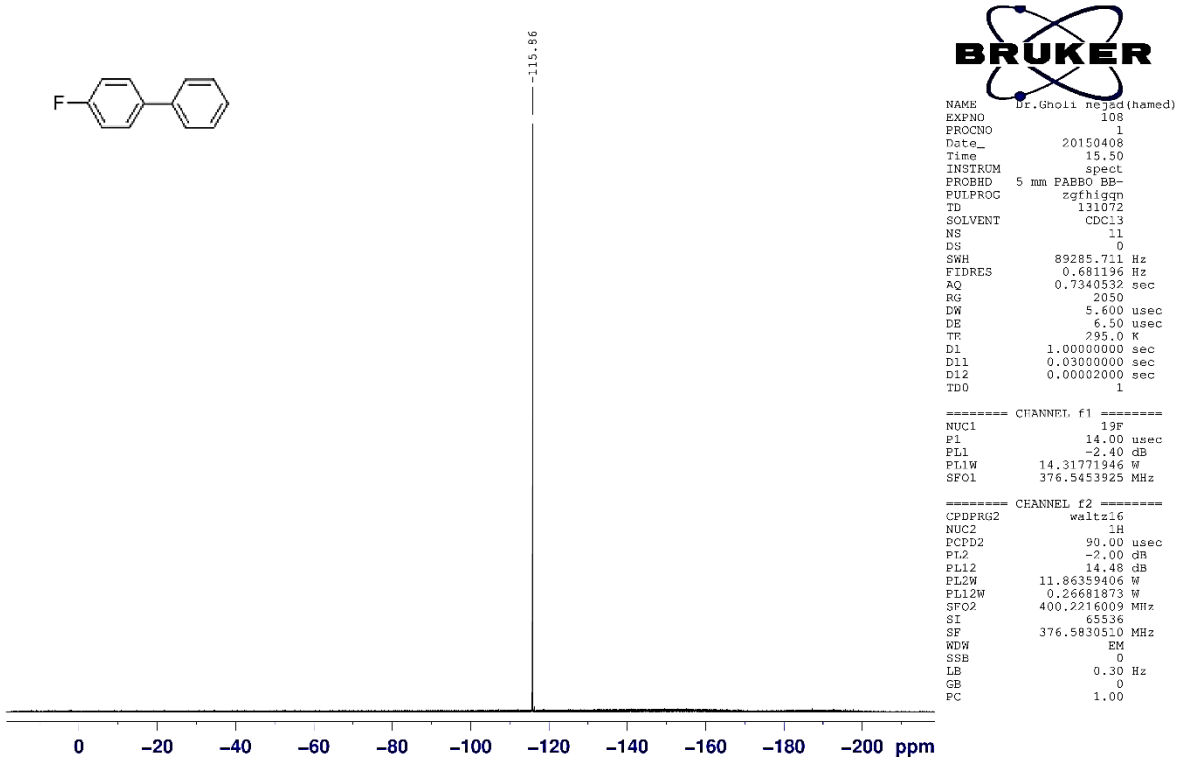



```
NAME          Dr.Gholi nejad(hamed)
EXPNO                           83
PROCNO                           1
Date_                     20150304
Time                         12.14
INSTRUM                      spect
PROBHD    5 mm PABBO BB-
PULPROG                     zgpg30
TD                           65536
SOLVENT                     CDCl3
NS                             270
DS                               0
SWH                    25252.525 Hz
FIDRES                  0.385323 Hz
AQ                     1.2976629 sec
RG                            2050
DW                       19.800 usec
DE                        6.50 usec
TE                          295.0 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                              1

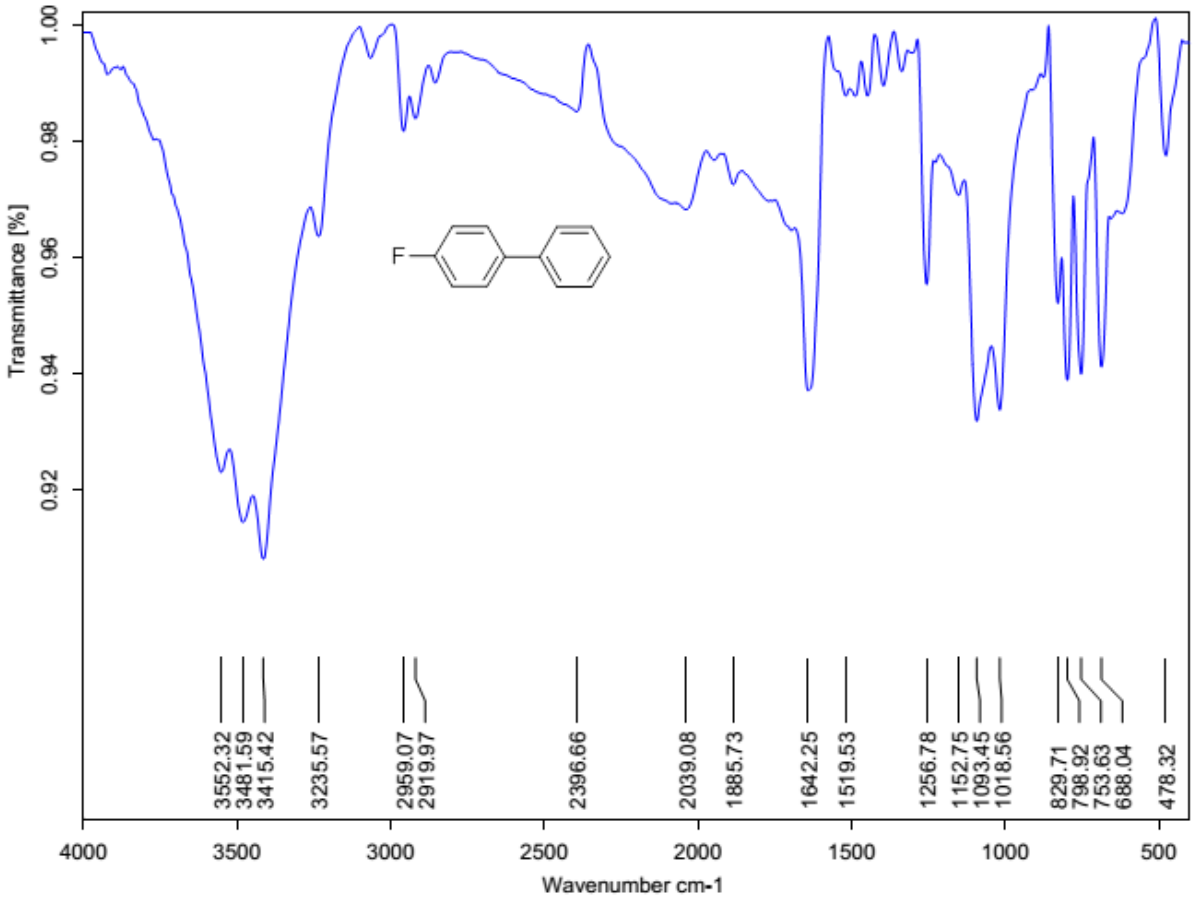
======== CHANNEL f1 ========
NUC1                           13C
P1                            9.00 usec
PL1                          -0.90 dB
PL1W                 42.02801895 W
SFO1                100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                           1H
PCPD2                     90.00 usec
PL2                          -2.00 dB
PL12                         14.16 dB
PL13                         17.90 dB
PL2W                 11.86359406 W
PL12W                 0.28722104 W
PL13W                 0.12139934 W
SFO2                400.2216009 MHz
SI                           32768
SF                  100.6353990 MHz
WDW                             EM
SSB                              0
LB                            1.00 Hz
GB                               0
PC                            1.40
```

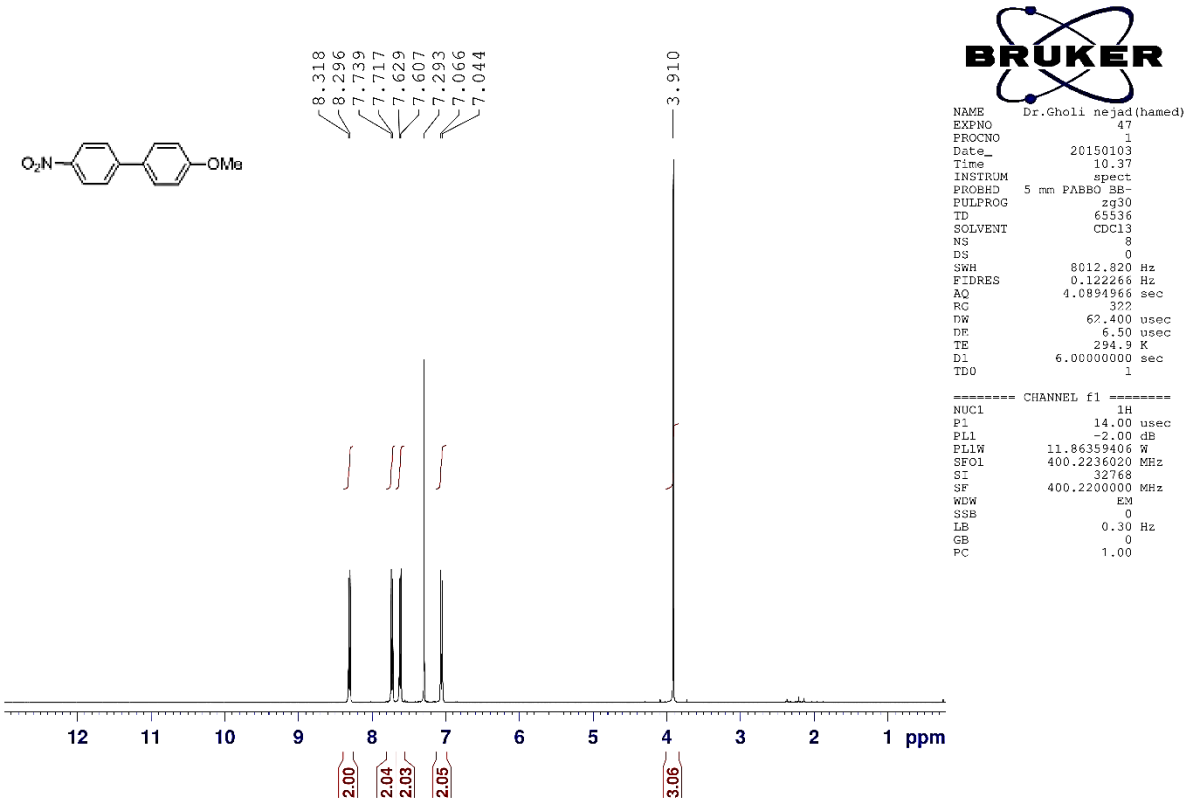
^{13}C NMR of 4-fluoro-1,1'-biphenyl



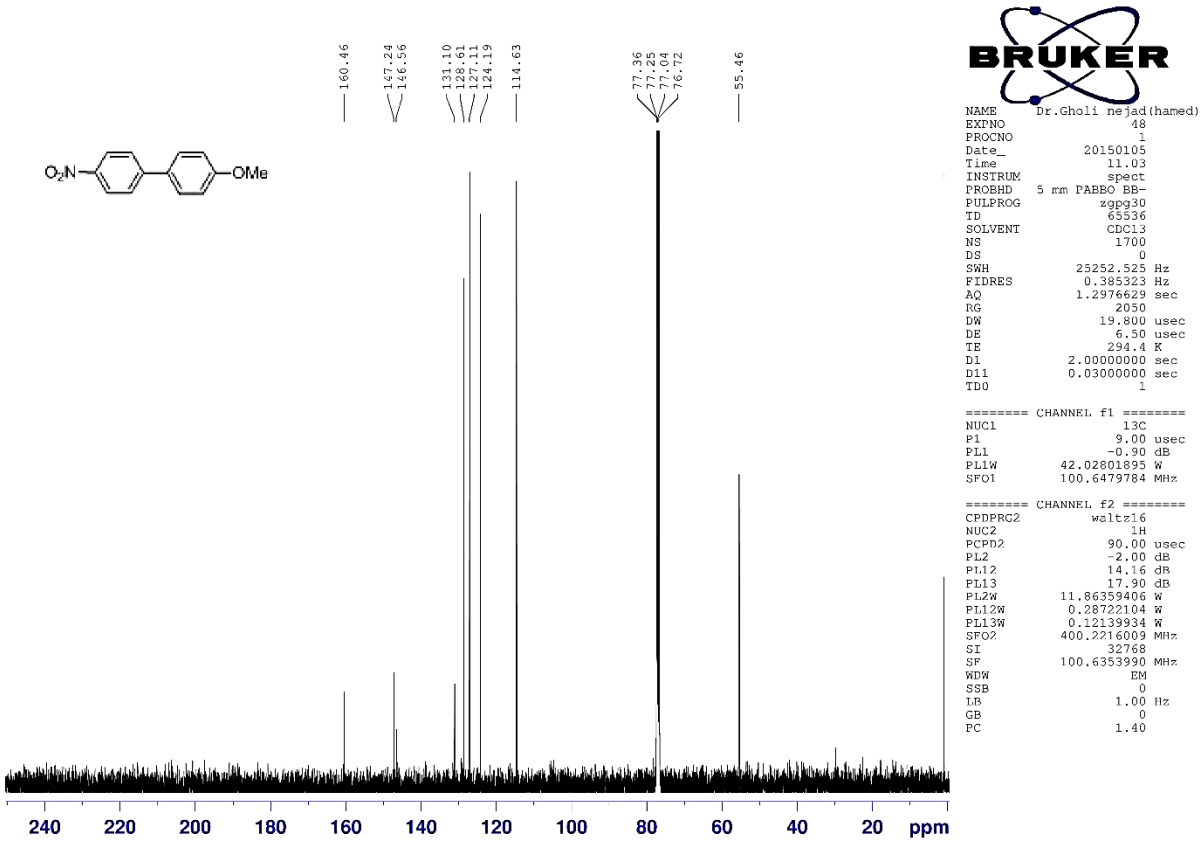
^{19}F NMR of 4-fluoro-1,1'-biphenyl



FT-IR of 4-fluoro-1,1'-biphenyl



^{1}H NMR of 4-methoxy-4'-nitro-1,1'-biphenyl

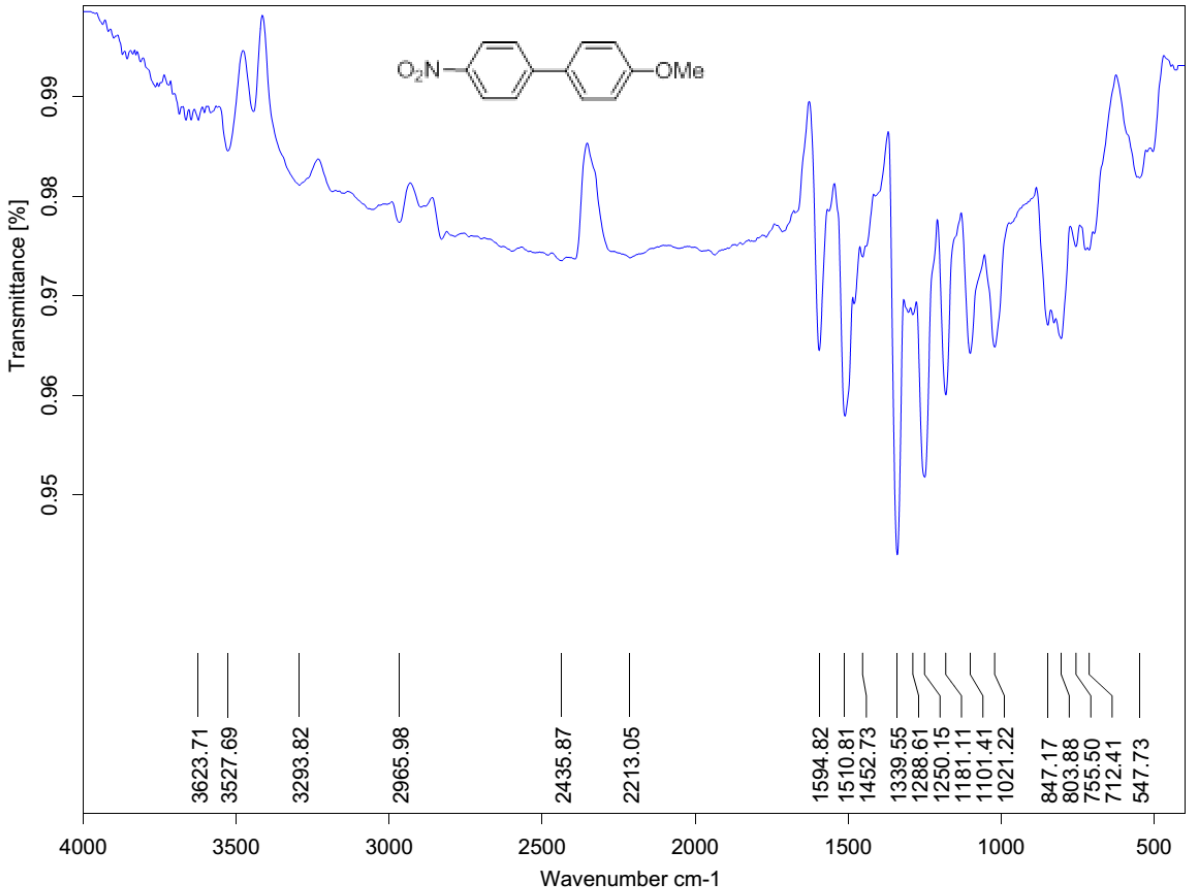



```
NAME        Dr.Gholi nejad(hamed)
EXPNO                         48
PROCNO                         1
Date_                   20150105
Time                       11.03
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                   zgpg30
TD                         65536
SOLVENT                    CDCl3
NS                          1700
DS                             0
SWH                    25252.525 Hz
FIDRES                  0.385323 Hz
AQ                     1.2976629 sec
RG                          2050
DW                        19.800 usec
DE                         6.50 usec
TE                        294.4 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                            1

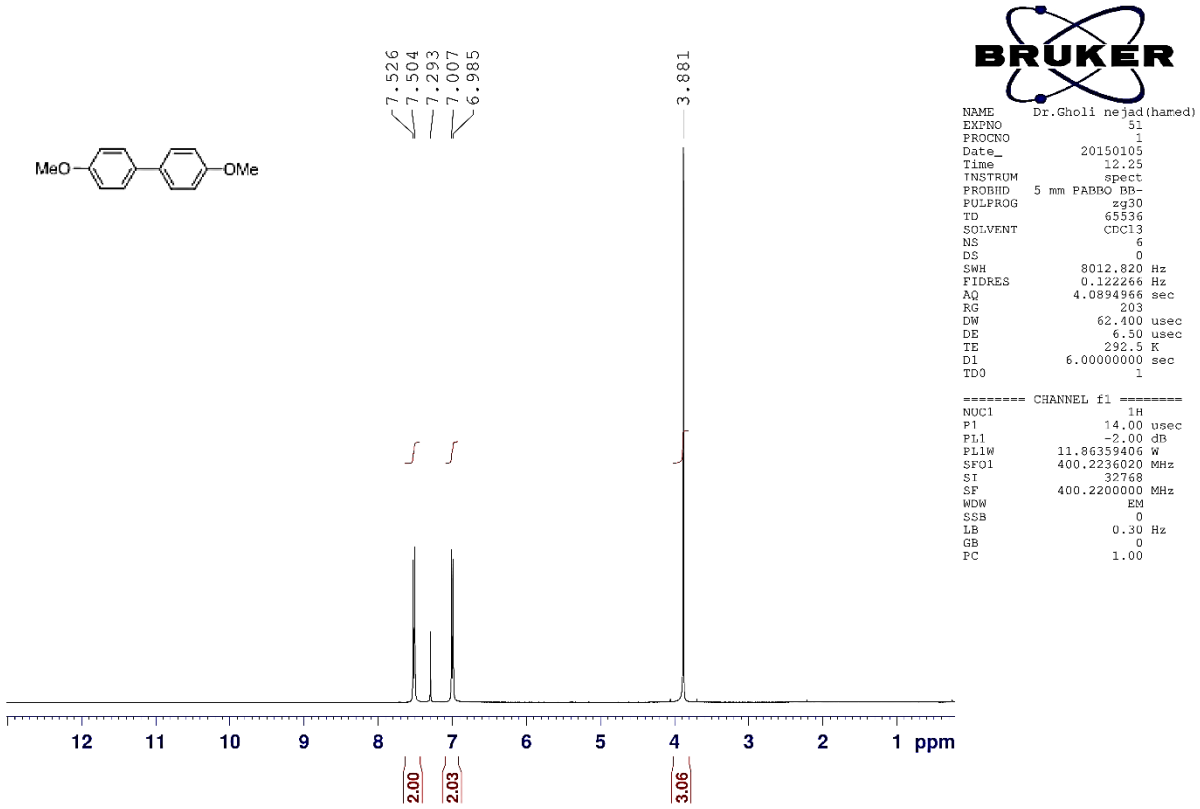
======== CHANNEL f1 ========
NUC1                         13C
P1                         9.00 usec
PL1                       -0.90 dB
PL1W                42.02801895 W
SFO1               100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                         1H
PCPD2                     90.00 usec
PL2                       -2.00 dB
PL12                      14.16 dB
PL13                      17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2               400.2216009 MHz
SI                         32768
SF                 100.6353990 MHz
WDW                           EM
SSB                            0
LB                         1.00 Hz
GB                             0
PC                         1.40
```

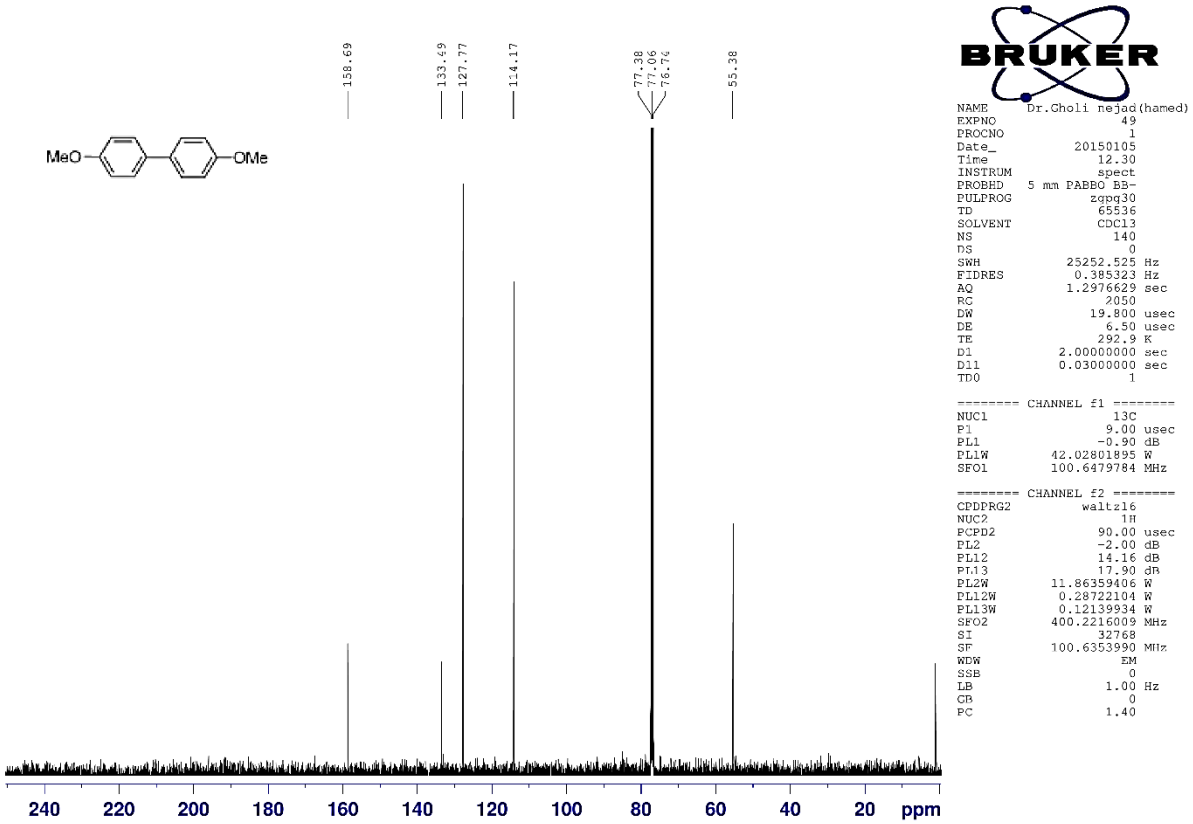
^{13}C NMR of 4-methoxy-4'-nitro-1,1'-biphenyl



FT-IR of 4-methoxy-4'-nitro-1,1'-biphenyl



^{1}H NMR of 4,4'-dimethoxy-1,1'-biphenyl



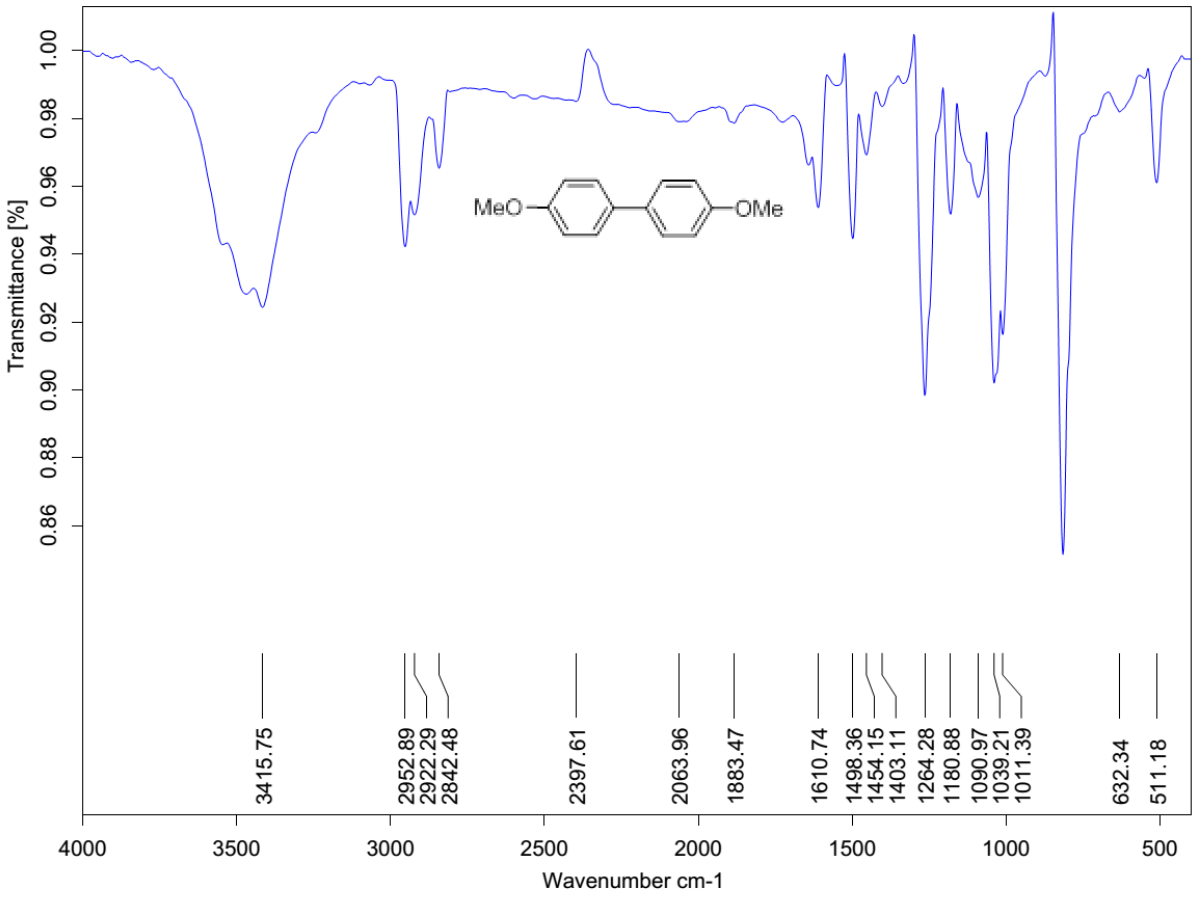
BRUKER

```
NAME        Dr.Gholi nejad(hamed)
EXPNO                        49
PROCNO                        1
Date_                  20150105
Time                      12.30
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG                 zgpg30
TD                       65536
SOLVENT                  CDCl3
NS                         140
DS                           0
SWH                  25252.525 Hz
FIDRES                0.385323 Hz
AQ                   1.2976629 sec
RG                        2050
DW                      19.800 usec
DE                        6.50 usec
TE                      292.9 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                           1

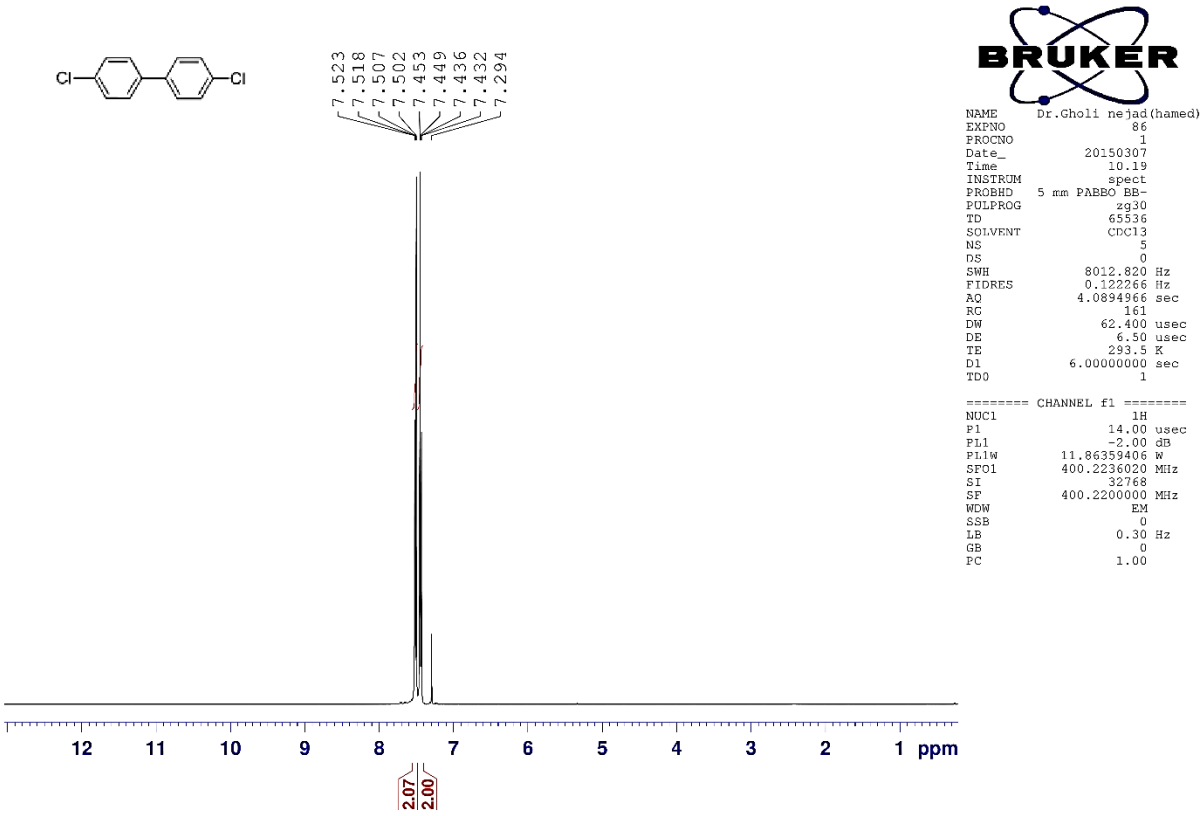
======== CHANNEL f1 ========
NUC1                        13C
P1                        9.00 usec
PL1                      -0.90 dB
PL1W                42.02801895 W
SFO1               100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                         1H
PCPD2                     90.00 usec
PL2                       -2.00 dB
PL12                      14.16 dB
PL13                      17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2               400.2216009 MHz
SI                        32768
SF                 100.6353990 MHz
WDW                          EM
SSB                           0
LB                        1.00 Hz
GB                            0
PC                        1.40
```

^{13}C NMR of 4,4'-dimethoxy-1,1'-biphenyl



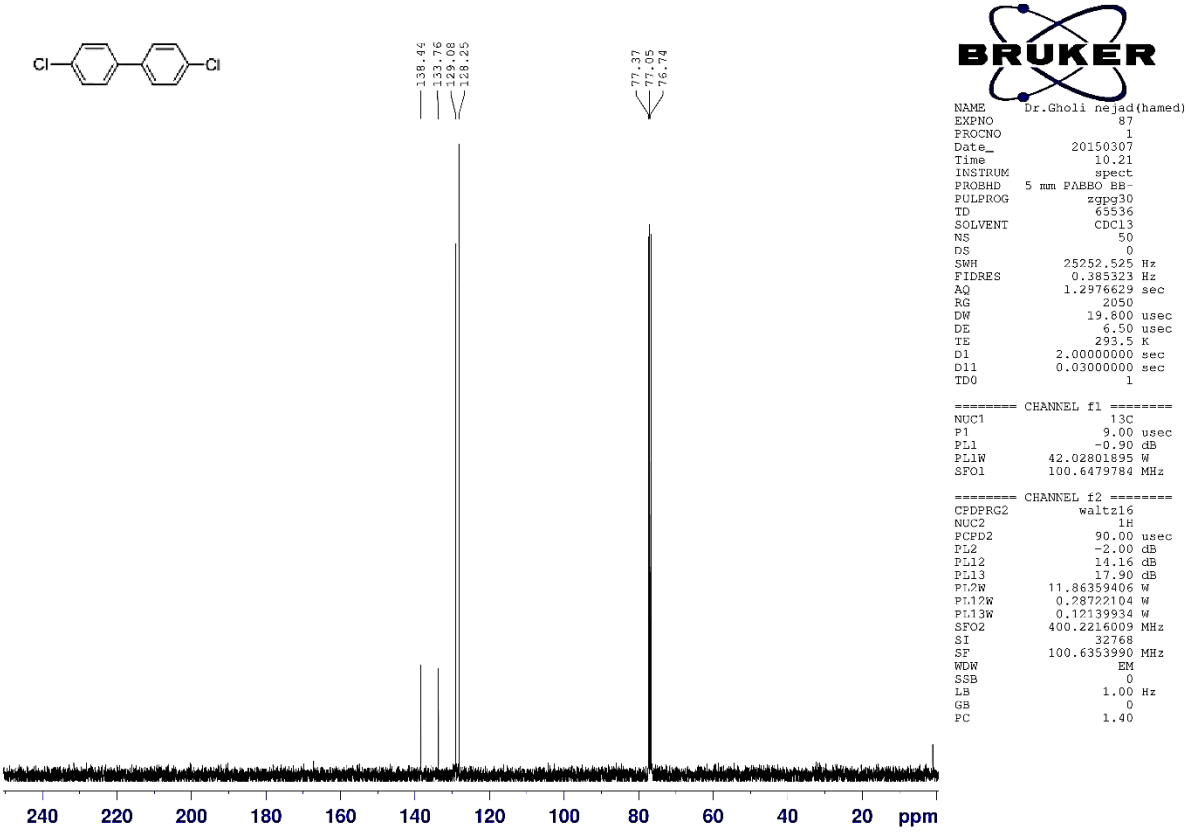
FT-IR of 4,4'-dimethoxy-1,1'-biphenyl




```
NAME        Dr.Gholi nejad(hamed)
EXPNO                         86
PROCNO                         1
Date_                   20150307
Time                       10.19
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                     zg30
TD                         65536
SOLVENT                    CDCl3
NS                             5
DS                             0
SWH                     8012.820 Hz
FIDRES                  0.122266 Hz
AQ                      4.0894966 sec
RG                           161
DW                        62.400 usec
DE                         6.50 usec
TE                        293.5 K
D1                    6.00000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                          1H
P1                        14.00 usec
PL1                       -2.00 dB
PL1W                11.86359406 W
SFO1                400.2236020 MHz
SI                         32768
SF                  400.2200000 MHz
WDW                           EM
SSB                            0
LB                         0.30 Hz
GB                             0
PC                         1.00
```

^{1}H NMR of 4,4'-dichloro-1,1'-biphenyl



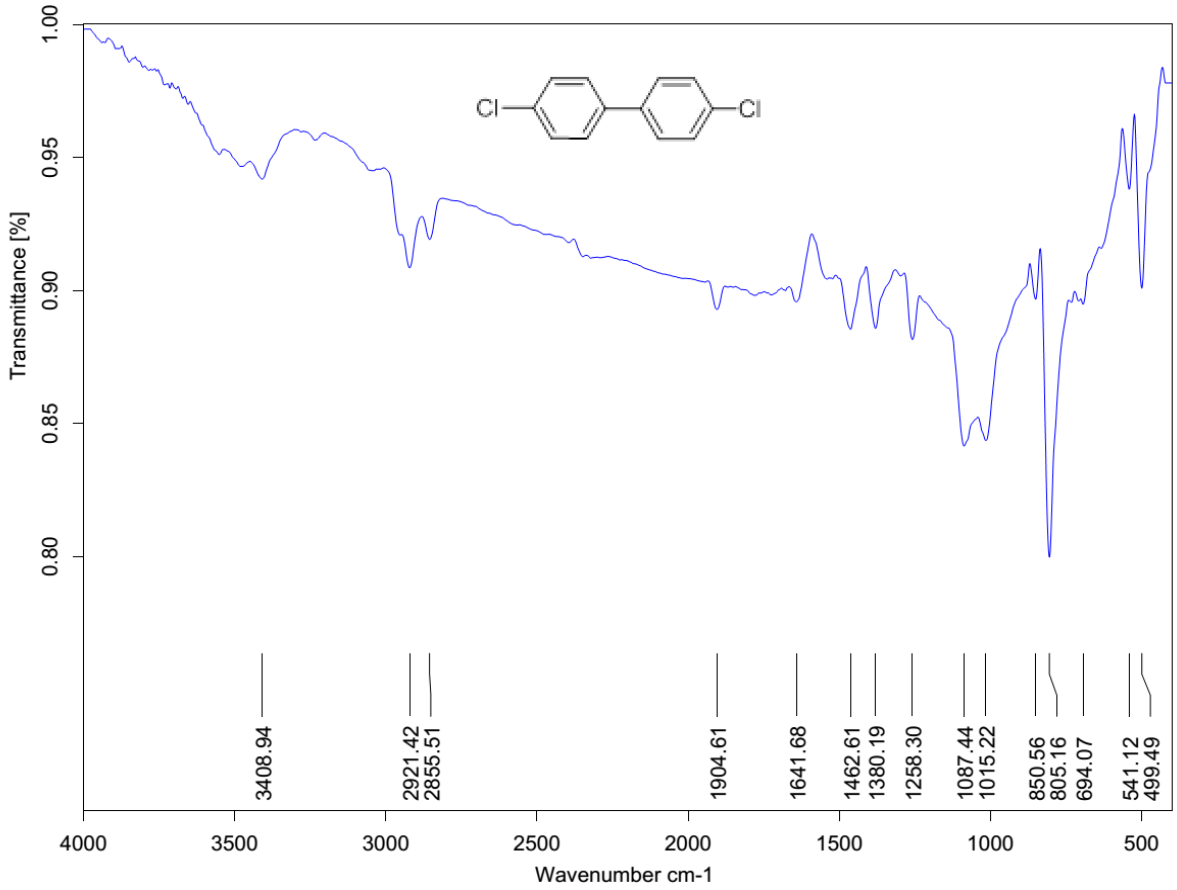
BRUKER

```
NAME        Dr.Gholi nejad(hamed)
EXPNO                         87
PROCNO                         1
Date_                   20150307
Time                       10.21
INSTRUM                    spect
PROBHD     5 mm PABBO BB-
PULPROG                  zgpg30
TD                        65536
SOLVENT                   CDCl3
NS                           50
DS                            0
SWH                   25252.525 Hz
FIDRES                0.385323 Hz
AQ                    1.2976629 sec
RG                         2050
DW                       19.800 usec
DE                        6.50 usec
TE                       293.5 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                           1

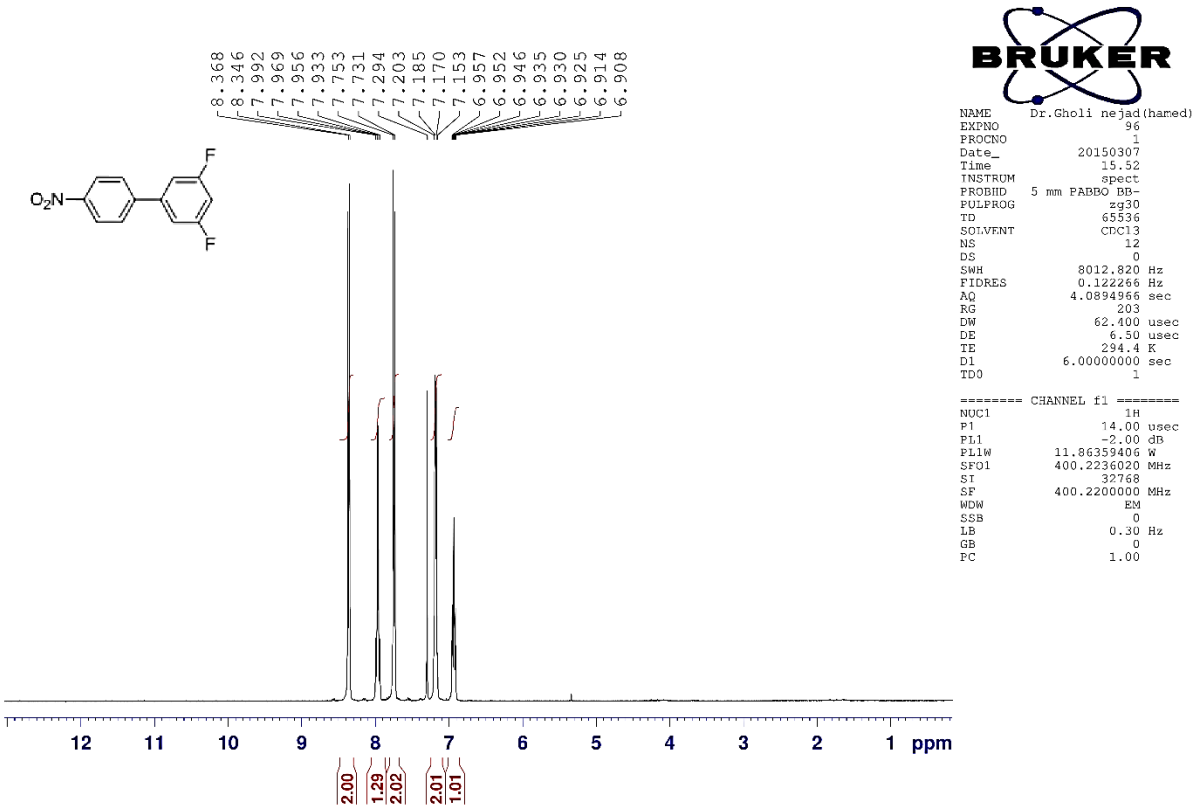
======== CHANNEL f1 ========
NUC1                         13C
P1                         9.00 usec
PL1                       -0.90 dB
PL1W                42.02801895 W
SFO1                100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                         1H
PCPD2                     90.00 usec
PL2                       -2.00 dB
PL12                      14.16 dB
PL13                      17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2                400.2216009 MHz
SI                         32768
SF                  100.6353990 MHz
WDW                           EM
SSB                            0
LB                          1.00 Hz
GB                             0
PC                          1.40
```

^{13}C NMR of 4,4'-dichloro-1,1'-biphenyl



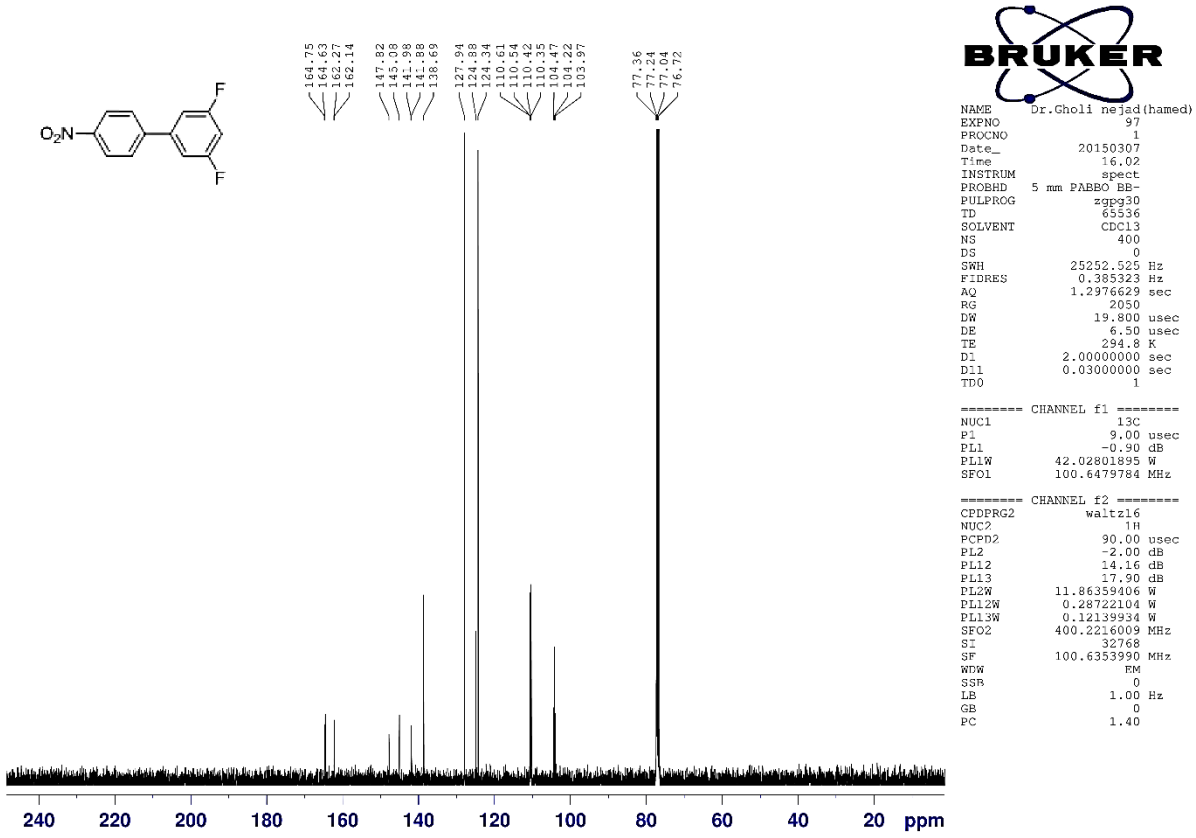
FT-IR of 4,4'-dichloro-1,1'-biphenyl



BRUKER

NAME	Dr.Gholi nejad(hamed)
EXPNO	96
PROCNO	1
Date_	20150307
Time	15.52
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	12
DS	0
SWH	8012.820 Hz
FIDRES	0.122266 Hz
AQ	4.0894966 sec
RG	203
DW	62.400 usec
DE	6.50 usec
TE	294.4 K
D1	6.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.00 usec
PL1	-2.00 dB
PL1W	11.86359406 W
SFO1	400.2236020 MHz
SI	32768
SF	400.2200000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

^{1}H NMR of 3,5-difluoro-4'-nitro-1,1'-biphenyl



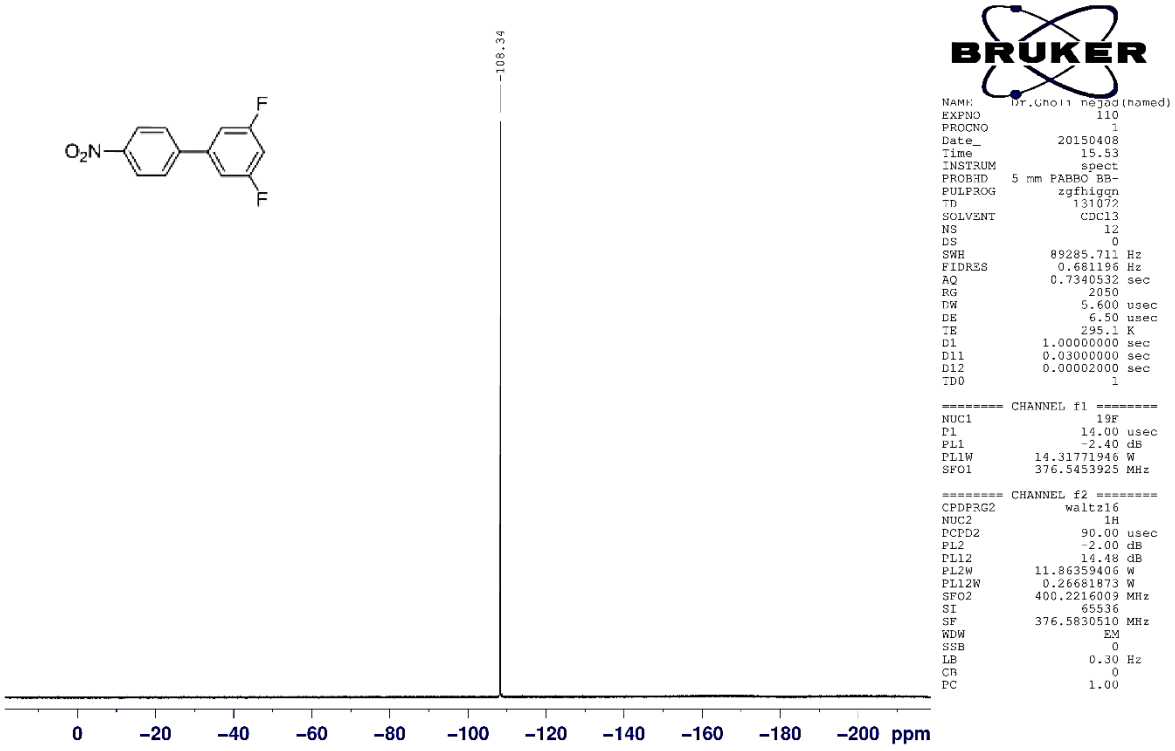
BRUKER

```
NAME          Dr.Gholi nejad(hamed)
EXPNO                           97
PROCNO                           1
Date_                     20150307
Time                         16.02
INSTRUM                      spect
PROBHD    5 mm PABBO BB-
PULPROG                   zgpg30
TD                            65536
SOLVENT                       CDCl3
NS                              400
DS                                0
SWH                     25252.525 Hz
FIDRES                   0.385323 Hz
AQ                       1.2976629 sec
RG                             2050
DW                          19.800 usec
DE                           6.50 usec
TE                          294.8 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                              1

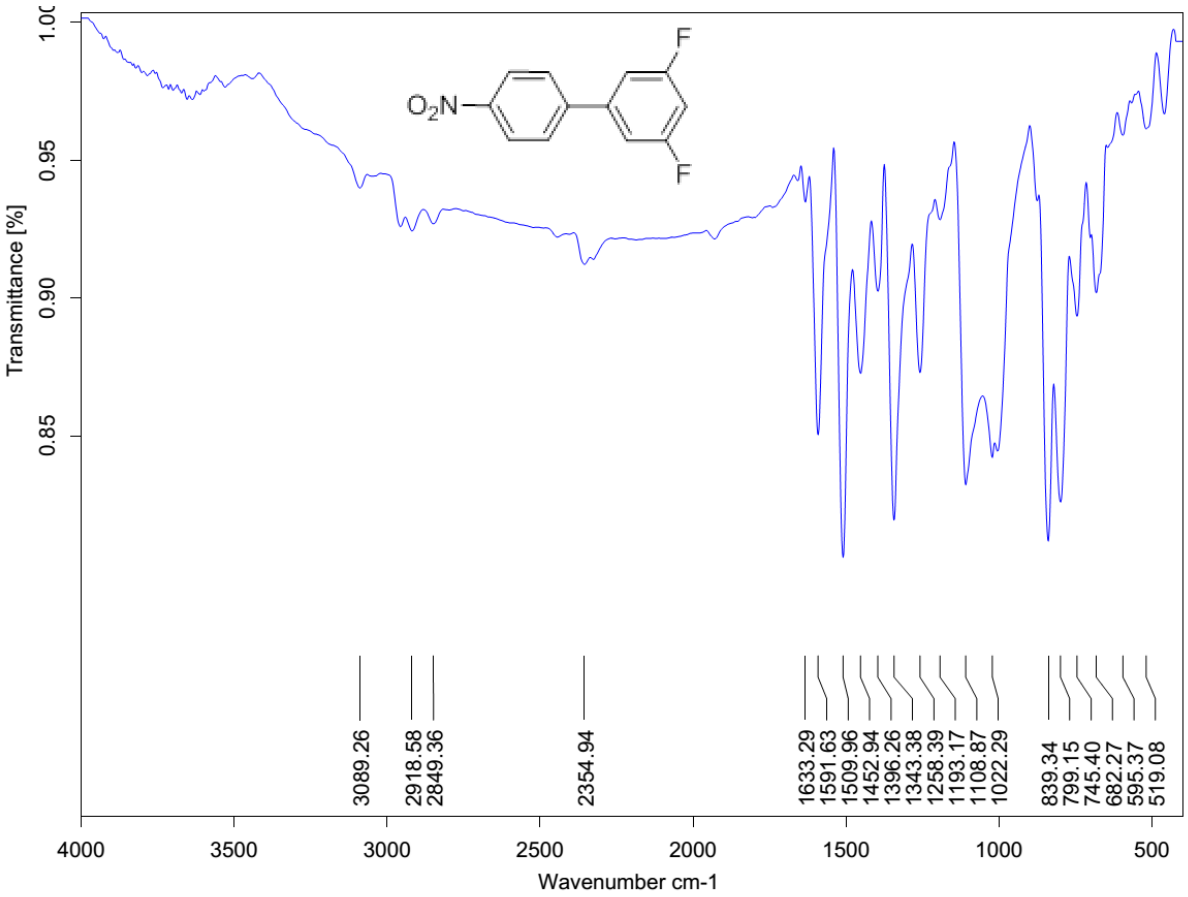
======== CHANNEL f1 ========
NUC1                          13C
P1                           9.00 usec
PL1                         -0.90 dB
PL1W                 42.02801895 W
SFO1                100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                   waltz16
NUC2                          1H
PCPD2                       90.00 usec
PL2                         -2.00 dB
PL12                        14.16 dB
PL13                        17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2                400.2216009 MHz
SI                           32768
SF                  100.6353990 MHz
WDW                             EM
SSB                              0
LB                           1.00 Hz
GB                               0
PC                           1.40
```

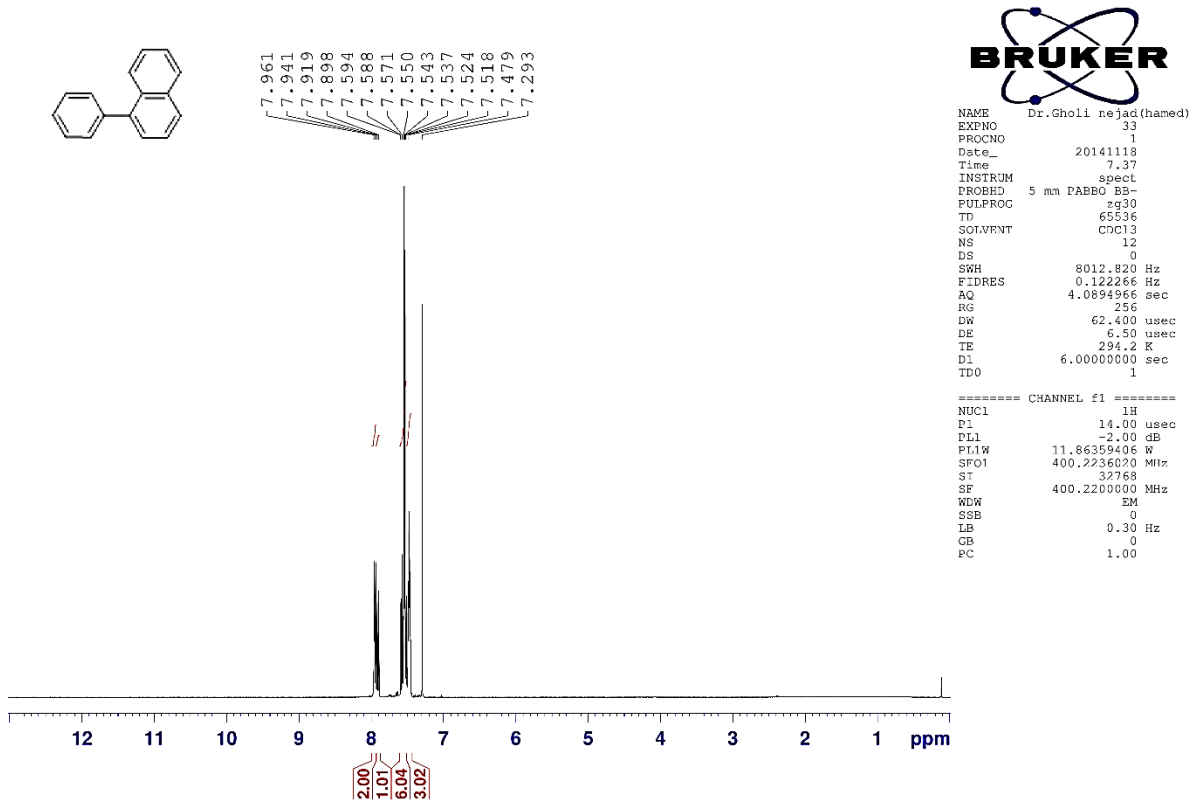
^{13}C NMR of 3,5-difluoro-4'-nitro-1,1'-biphenyl



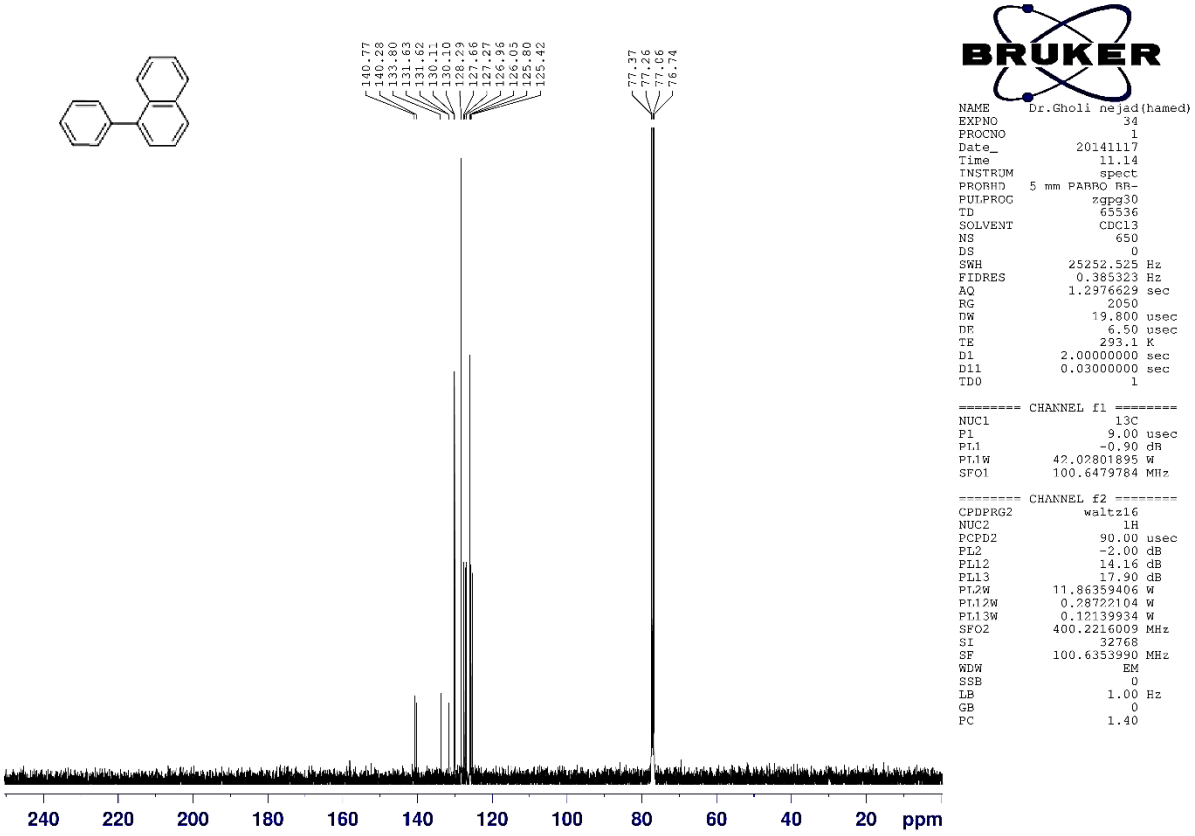
^{19}F NMR of 3,5-difluoro-4'-nitro-1,1'-biphenyl



FT-IR of 3,5-difluoro-4'-nitro-1,1'-biphenyl



^{1}H NMR of 1-phenylnaphthalene

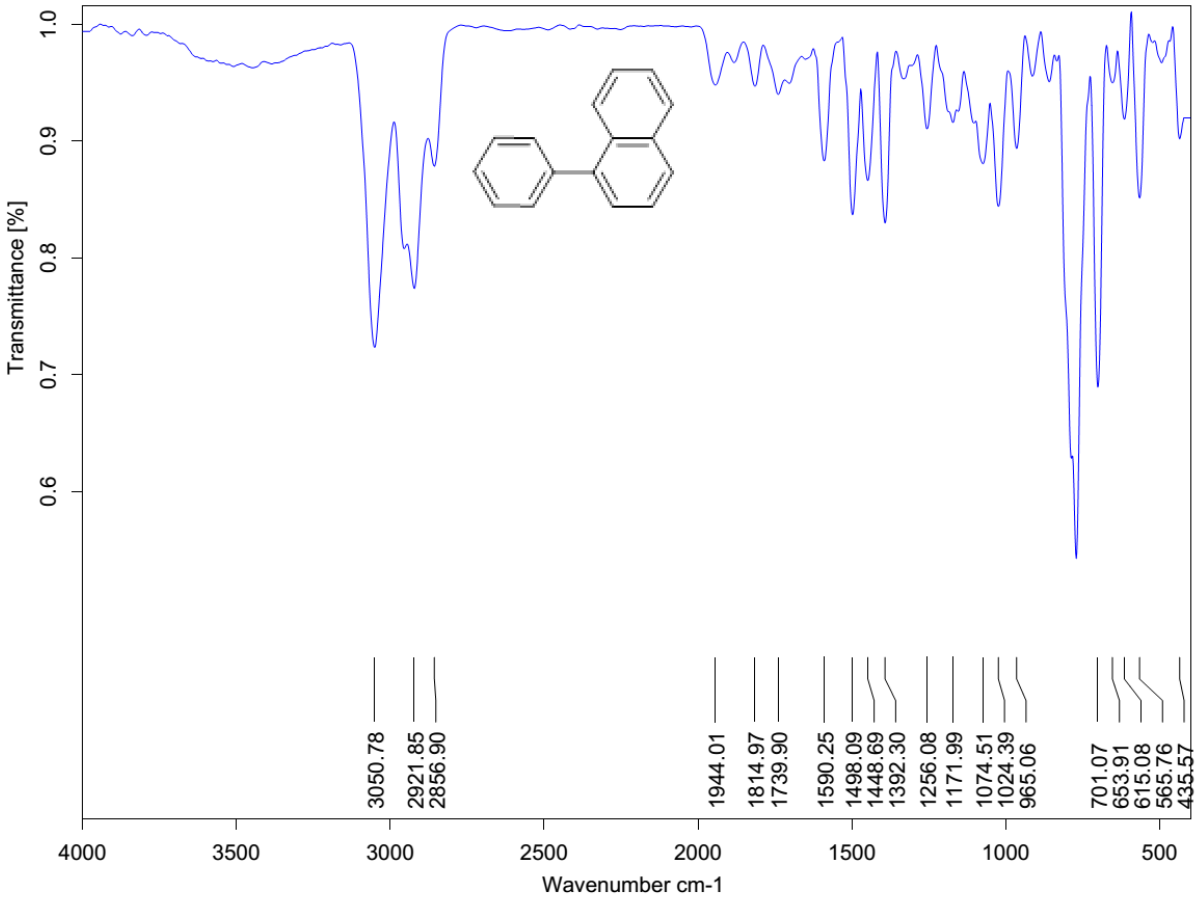



```
NAME          Dr.Gholi nejad(hamed)
EXPNO                           34
PROCNO                           1
Date_                     20141117
Time                         11.14
INSTRUM                      spect
PROBHD     5 mm PABBO BB-
PULPROG                   zgpg30
TD                            65536
SOLVENT                     CDCl3
NS                              650
DS                                0
SWH                   25252.525 Hz
FIDRES                 0.385323 Hz
AQ                    1.2976629 sec
RG                             2050
DW                       19.800 usec
DE                        6.50 usec
TE                          293.1 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                              1

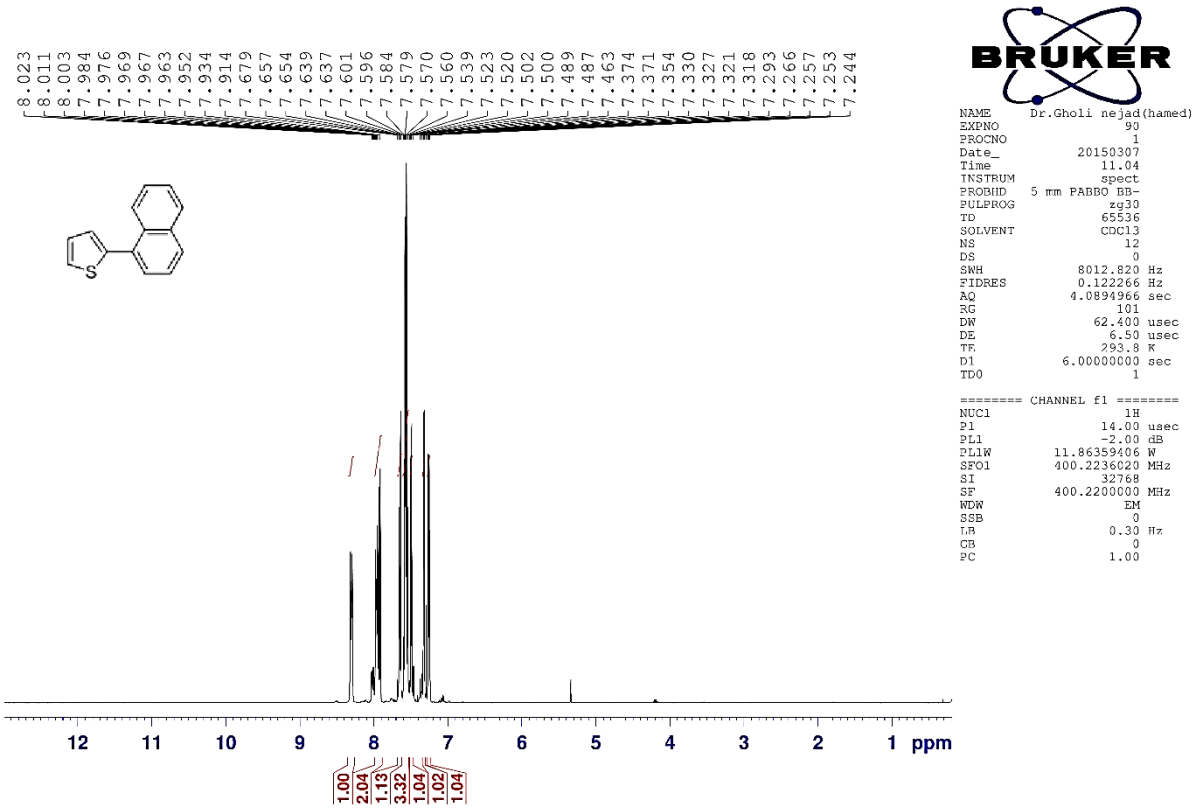
======== CHANNEL f1 ========
NUC1                           13C
P1                           9.00 usec
PL1                         -0.90 dB
PL1W                42.02801895 W
SFO1               100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                           1H
PCPD2                       90.00 usec
PL2                         -2.00 dB
PL12                        14.16 dB
PL13                        17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2               400.2216009 MHz
SI                           32768
SF                 100.6353990 MHz
WDW                            EM
SSB                             0
LB                           1.00 Hz
GB                              0
PC                           1.40
```

^{13}C NMR of 1-phenylnaphthalene



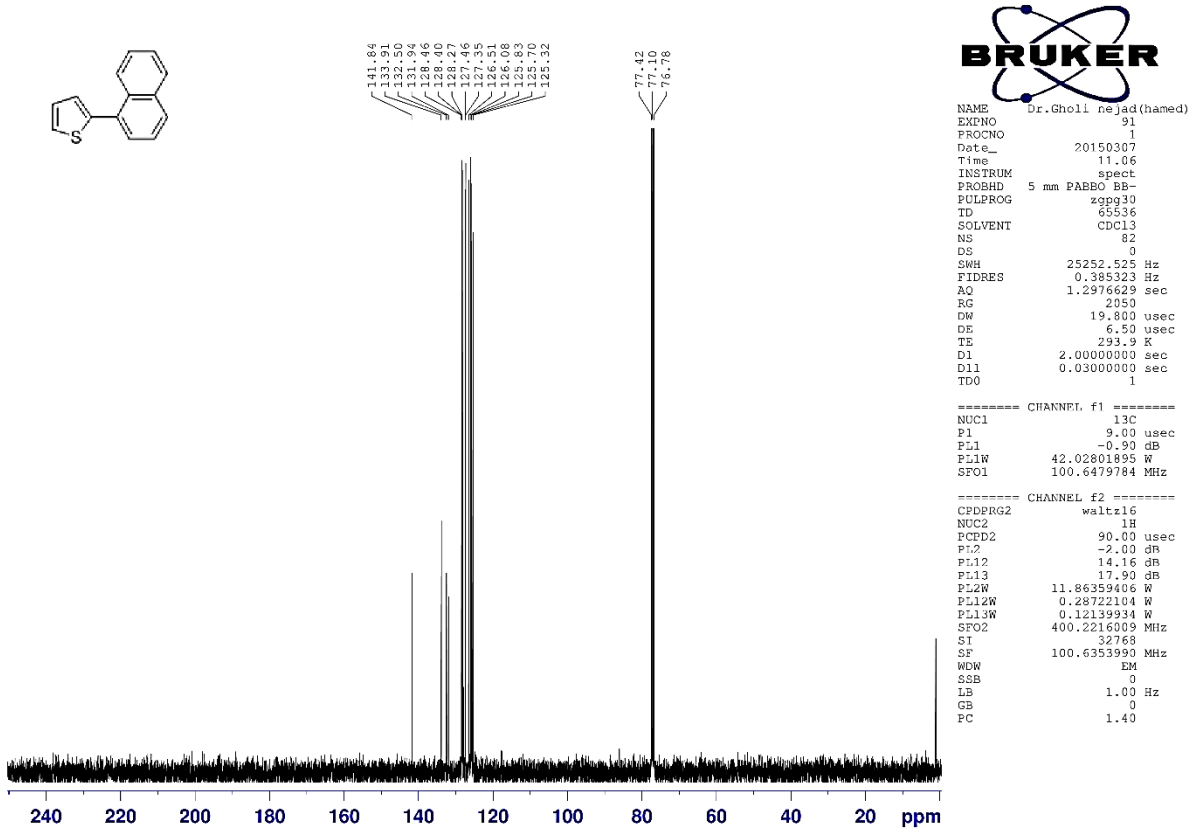
FT-IR of 1-phenylnaphthalene



BRUKER

NAME	Dr.Gholi nejad(hamed)
EXPNO	90
PROCNO	1
Date_	20150307
Time	11.04
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	12
DS	0
SWH	8012.820 Hz
FIDRES	0.122266 Hz
AQ	4.0894966 sec
RG	101
DW	62.400 usec
DE	6.50 usec
TE	293.8 K
D1	6.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.00 usec
PL1	-2.00 dB
PL1W	11.86359406 W
SFO1	400.2236020 MHz
SI	32768
SF	400.2200000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

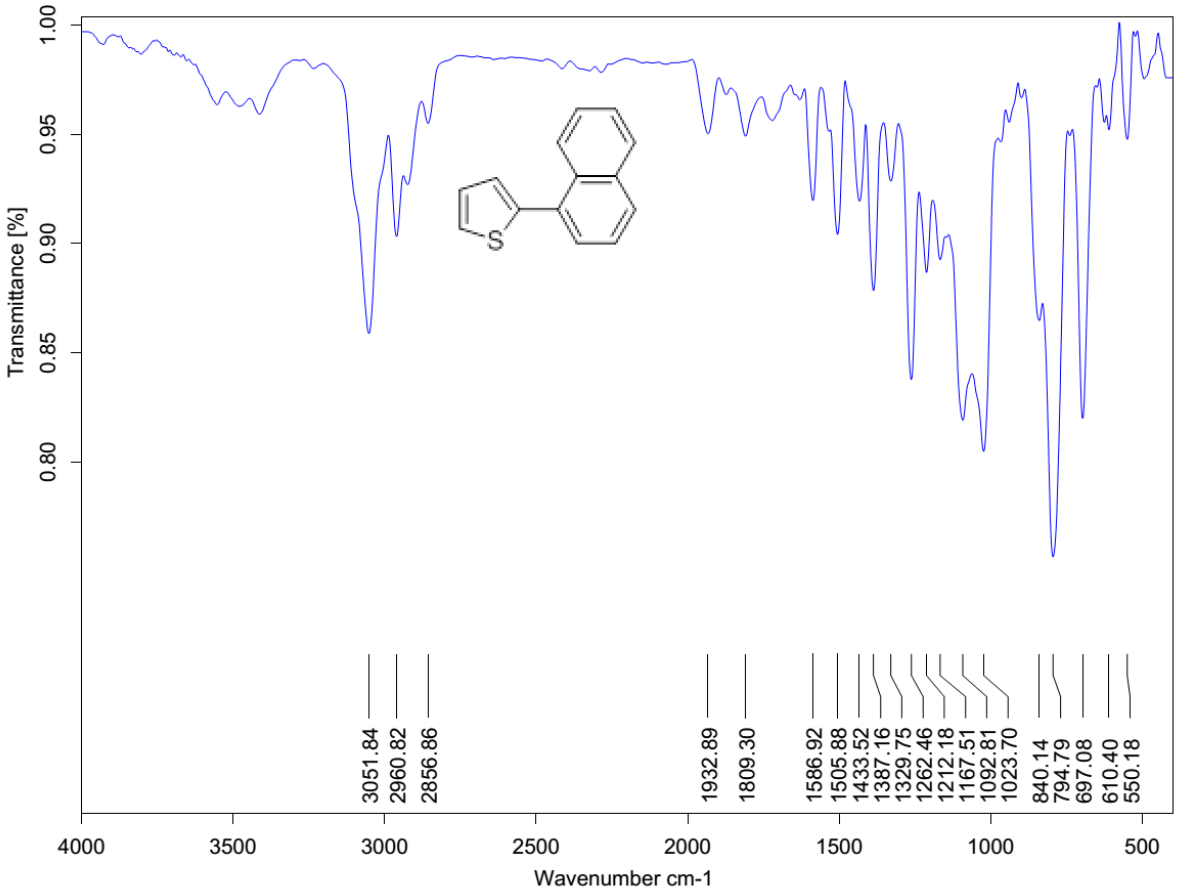
^{1}H NMR of 2-(naphthalen-1-yl)thiophene



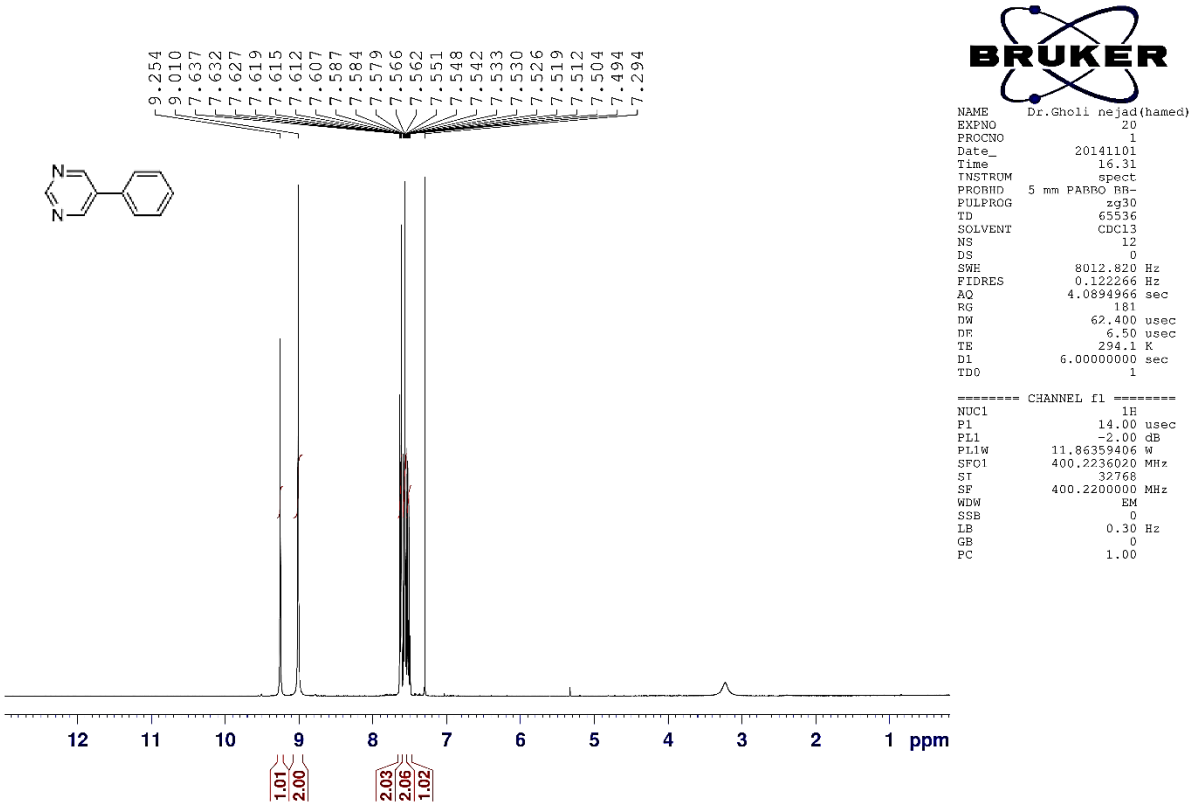
BRUKER

NAME	Dr.Gholi nejad(hamed)
EXPNO	91
PROCNO	1
Date_	20150307
Time	11.06
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	82
DS	0
SWH	25252.525 Hz
FIDRES	0.385323 Hz
AQ	1.2976629 sec
RG	2050
DW	19.800 usec
DE	6.50 usec
TE	293.9 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.00 usec
PL1	-0.90 dB
PL1W	42.02801895 W
SFO1	100.6479784 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	90.00 usec
PL2	-2.00 dB
PL12	14.16 dB
PL13	17.90 dB
PL2W	11.86359406 W
PL12W	0.28722104 W
PL13W	0.12139934 W
SFO2	400.2216009 MHz
SI	32768
SF	100.6353990 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

^{13}C NMR of 2-(naphthalen-1-yl)thiophene



FT-IR of 2-(naphthalen-1-yl)thiophene



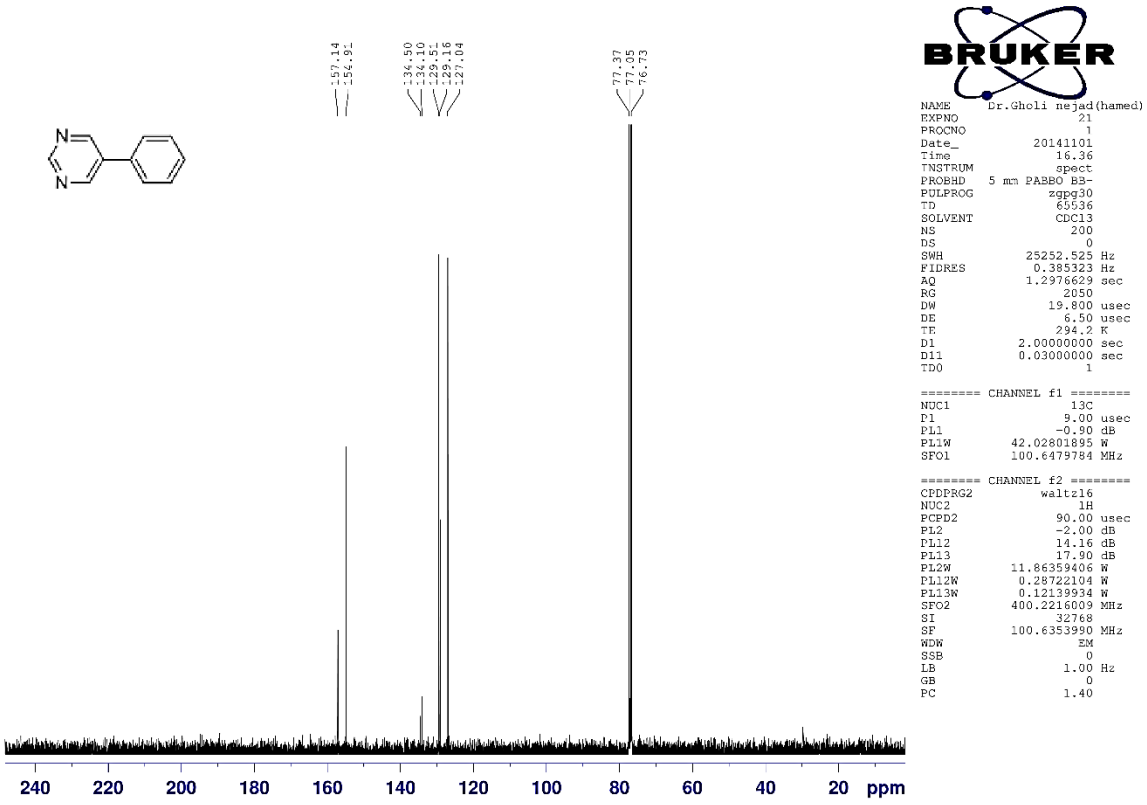
BRUKER

NAME	Dr.Gholi nejad(hamed)
EXPNO	20
PROCNO	1
Date_	20141101
Time	16.31
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	12
DS	0
SWH	8012.820 Hz
FIDRES	0.122266 Hz
AQ	4.0894966 sec
RG	181
DW	62.400 usec
DE	6.50 usec
TE	294.1 K
D1	6.00000000 sec
TD0	1

======== CHANNEL f1 ========

NUC1	1H
P1	14.00 usec
PL1	-2.00 dB
PL1W	11.86359406 W
SFO1	400.2236020 MHz
SI	32768
SF	400.2200000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

^{1}H NMR of 5-phenylpyrimidine

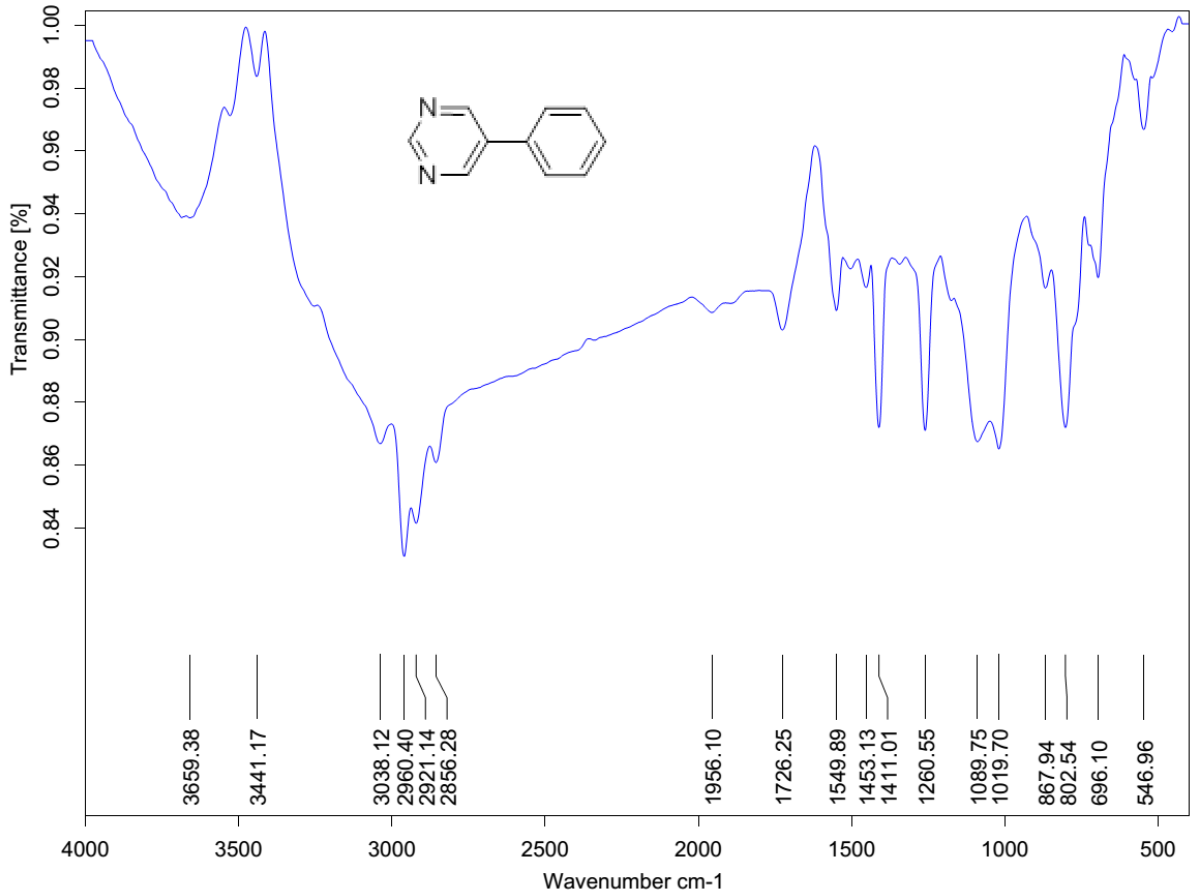



```
NAME        Dr.Gholi nejad(hamed)
EXPNO                         21
PROCNO                         1
Date_                   20141101
Time                       16.36
INSTRUM                    spect
PROBHD     5 mm PABBO BB-
PULPROG                   zgpg30
TD                         65536
SOLVENT                    CDCl3
NS                           200
DS                             0
SWH                    25252.525 Hz
FIDRES                 0.385323 Hz
AQ                     1.2976629 sec
RG                          2050
DW                        19.800 usec
DE                         6.50 usec
TE                        294.2 K
D1                     2.00000000 sec
D11                    0.03000000 sec
TD0                            1

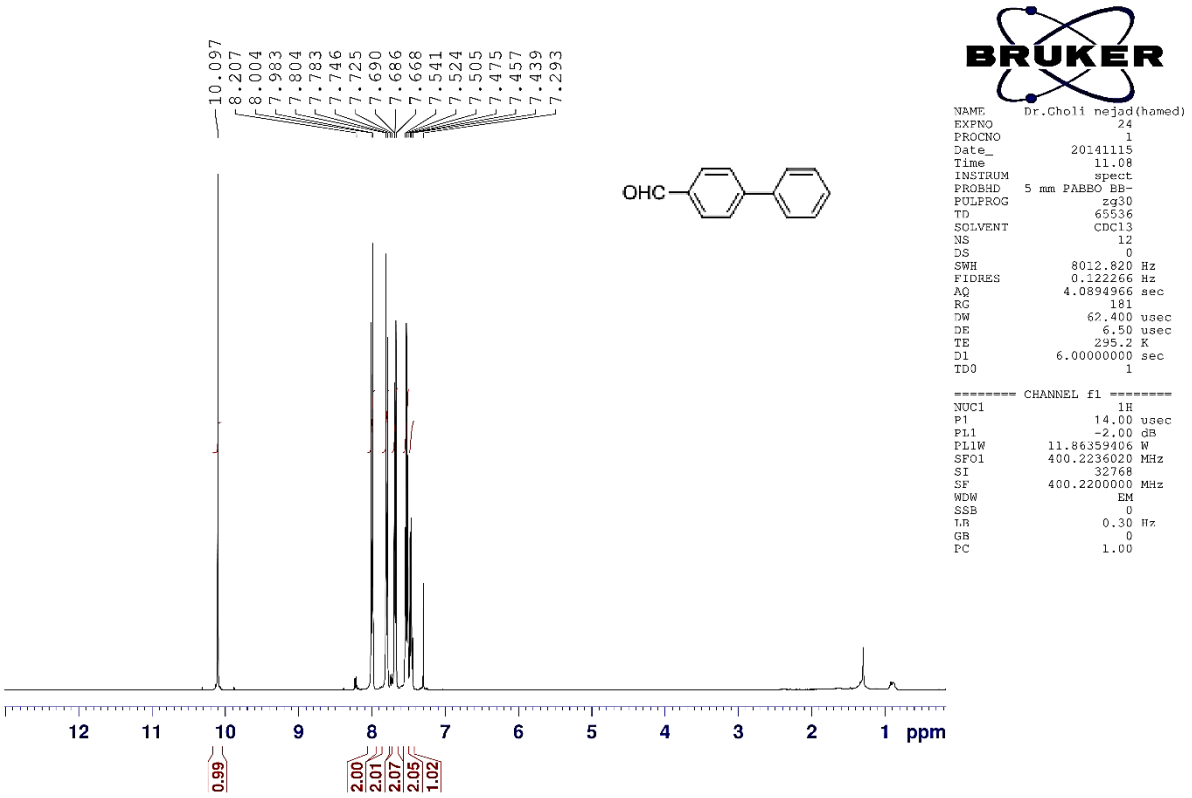
======== CHANNEL f1 ========
NUC1                         13C
P1                         9.00 usec
PL1                       -0.90 dB
PL1W                42.02801895 W
SFO1                100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                         1H
PCPD2                     90.00 usec
PL2                       -2.00 dB
PL12                      14.16 dB
PL13                      17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2                400.2216009 MHz
SI                         32768
SF                  100.6353990 MHz
WDW                           EM
SSB                            0
LB                          1.00 Hz
GB                             0
PC                          1.40
```

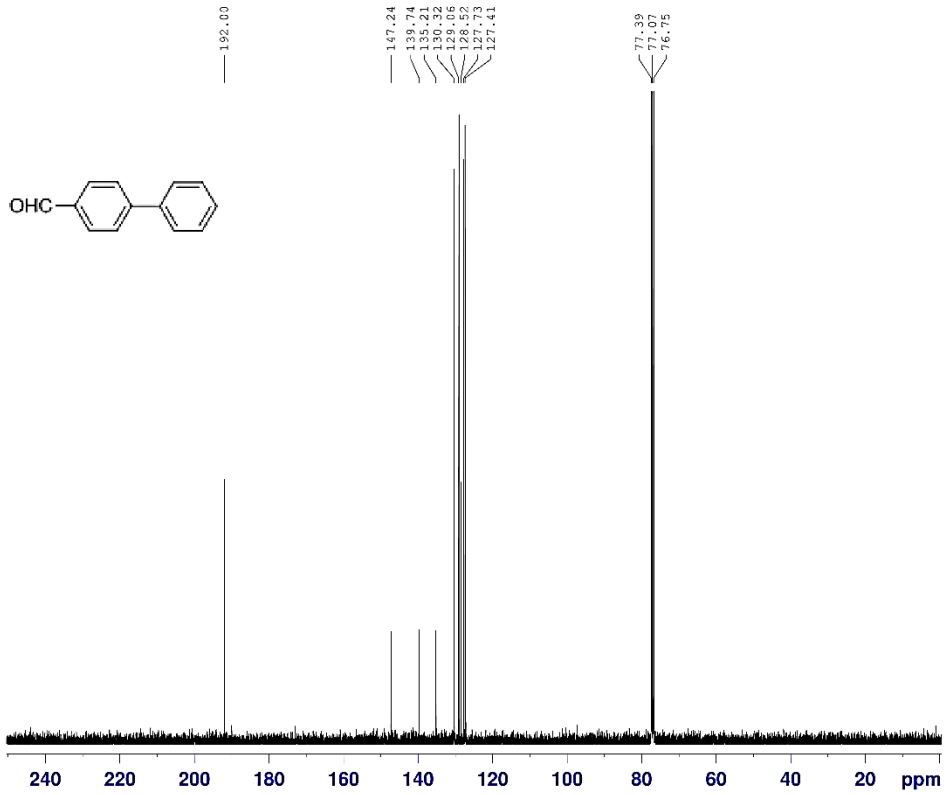
^{13}C NMR of 5-phenylpyrimidine



FT-IR of 5-phenylpyrimidine



^{1}H NMR of [1,1'-biphenyl]-4-carbaldehyde

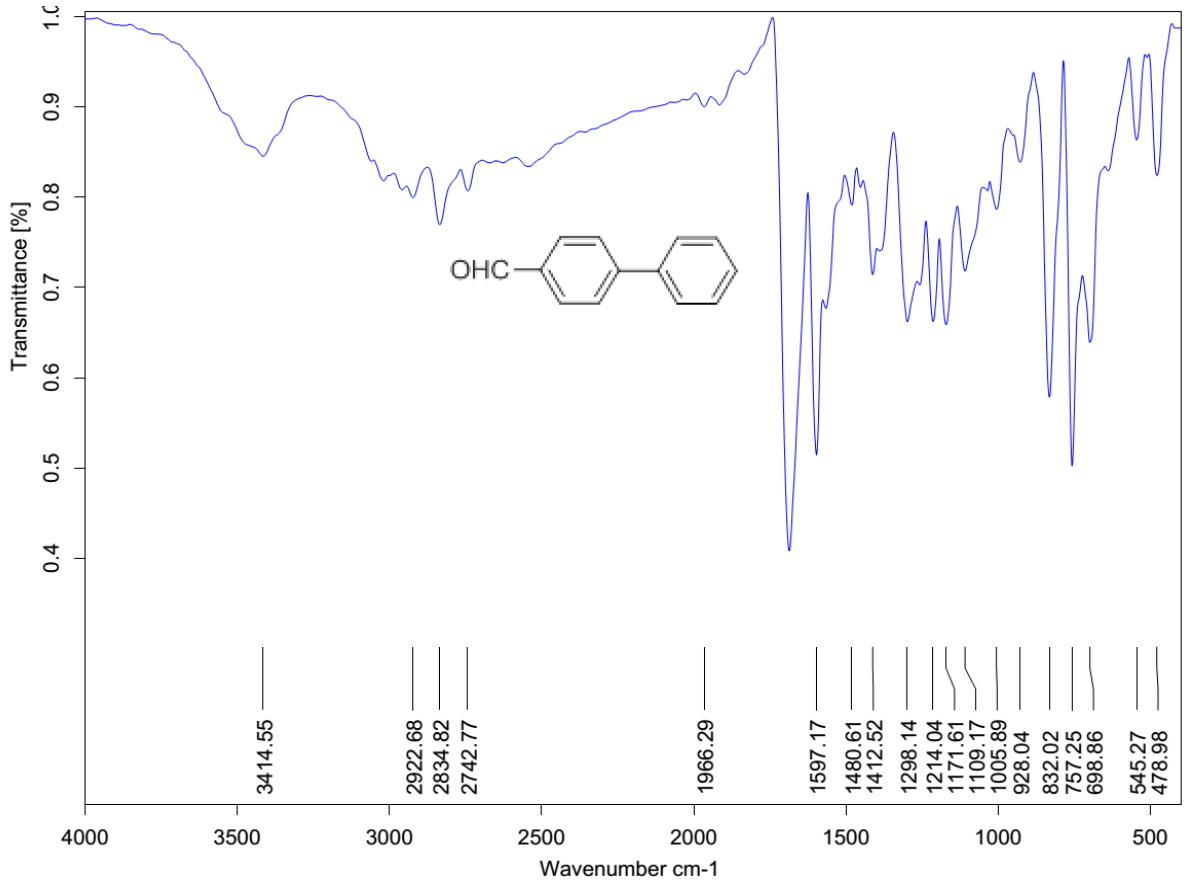



```
NAME        Dr.Gholi nejad(hamed)
EXPNO                         25
PROCNO                         1
Date_                   20141115
Time                       11.14
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                  zgpg30
TD                        65536
SOLVENT                   CDCl3
NS                          100
DS                            0
SWH                   25252.525 Hz
FIDRES                 0.385323 Hz
AQ                    1.2976629 sec
RG                         2050
DW                       19.800 usec
DE                        6.50 usec
TE                       295.6 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                            1

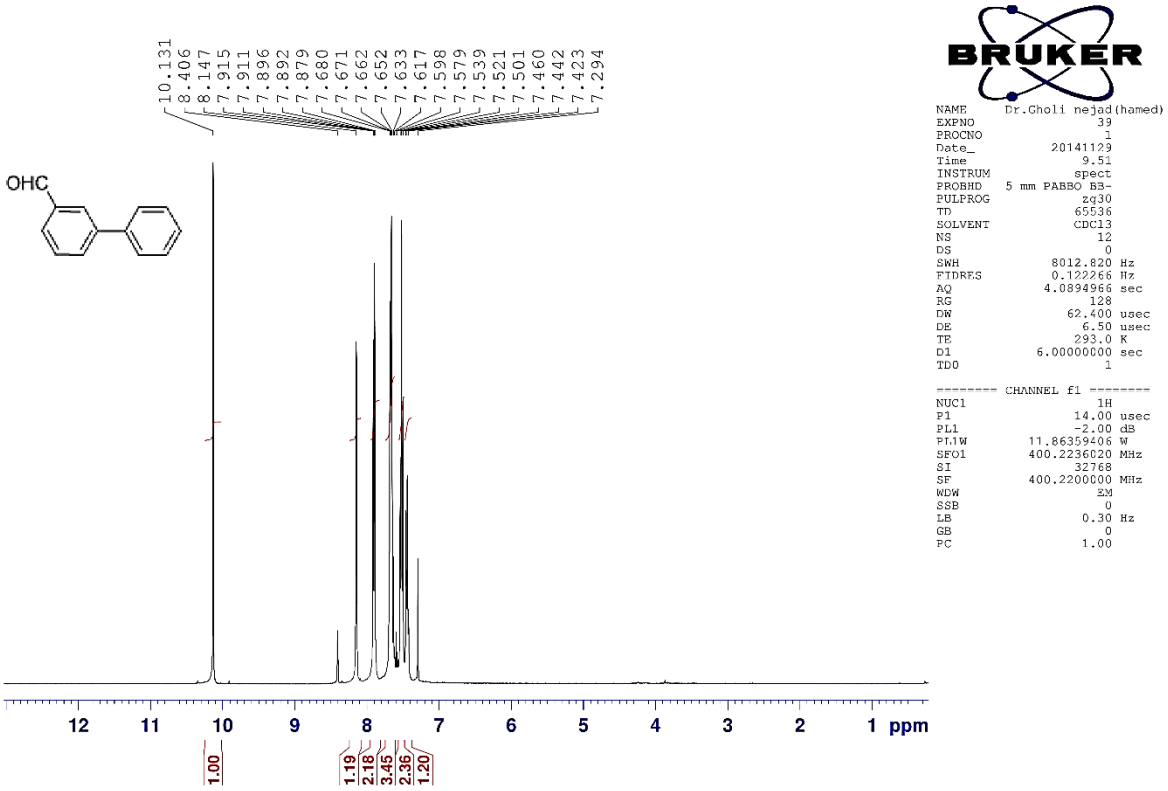
======== CHANNEL f1 ========
NUC1                         13C
P1                         9.00 usec
PL1                       -0.90 dB
PL1W                42.02801895 W
SFO1                100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                         1H
PCPD2                     90.00 usec
PL2                       -2.00 dB
PL12                      14.16 dB
PL13                      17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2                400.2216009 MHz
SI                         32768
SF                  100.6353990 MHz
WDW                           EM
SSB                            0
LB                         1.00 Hz
GB                             0
PC                          1.40
```

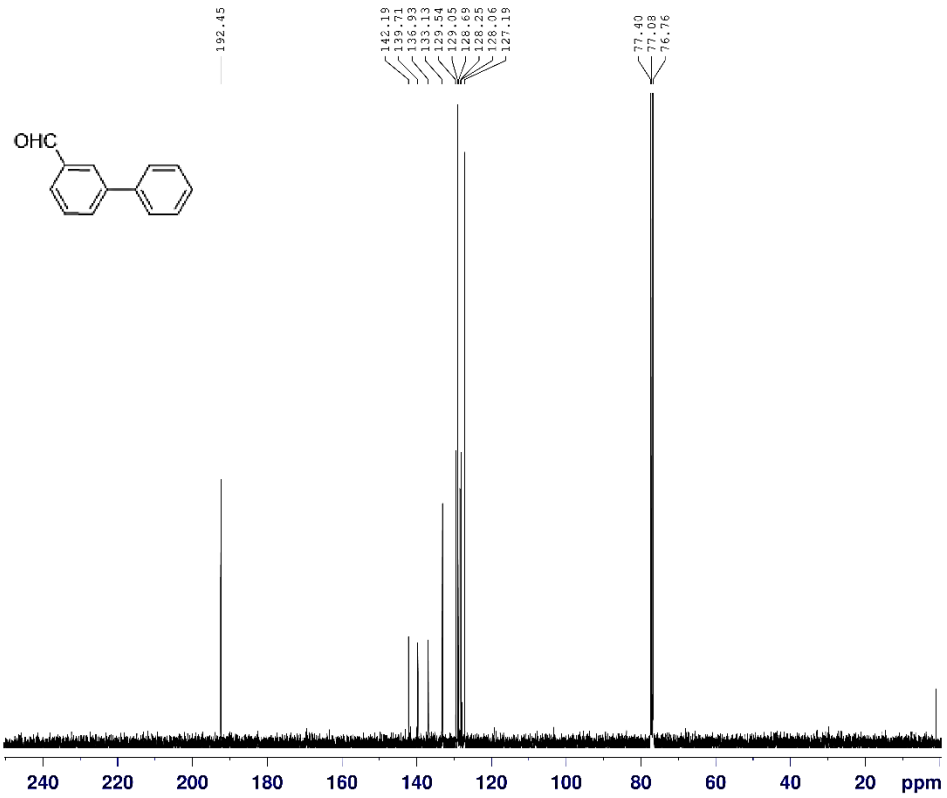
^{13}C NMR of [1,1'-biphenyl]-4-carbaldehyde



FT-IR of [1,1'-biphenyl]-4-carbaldehyde



^{1}H NMR of [1,1'-biphenyl]-3-carbaldehyde

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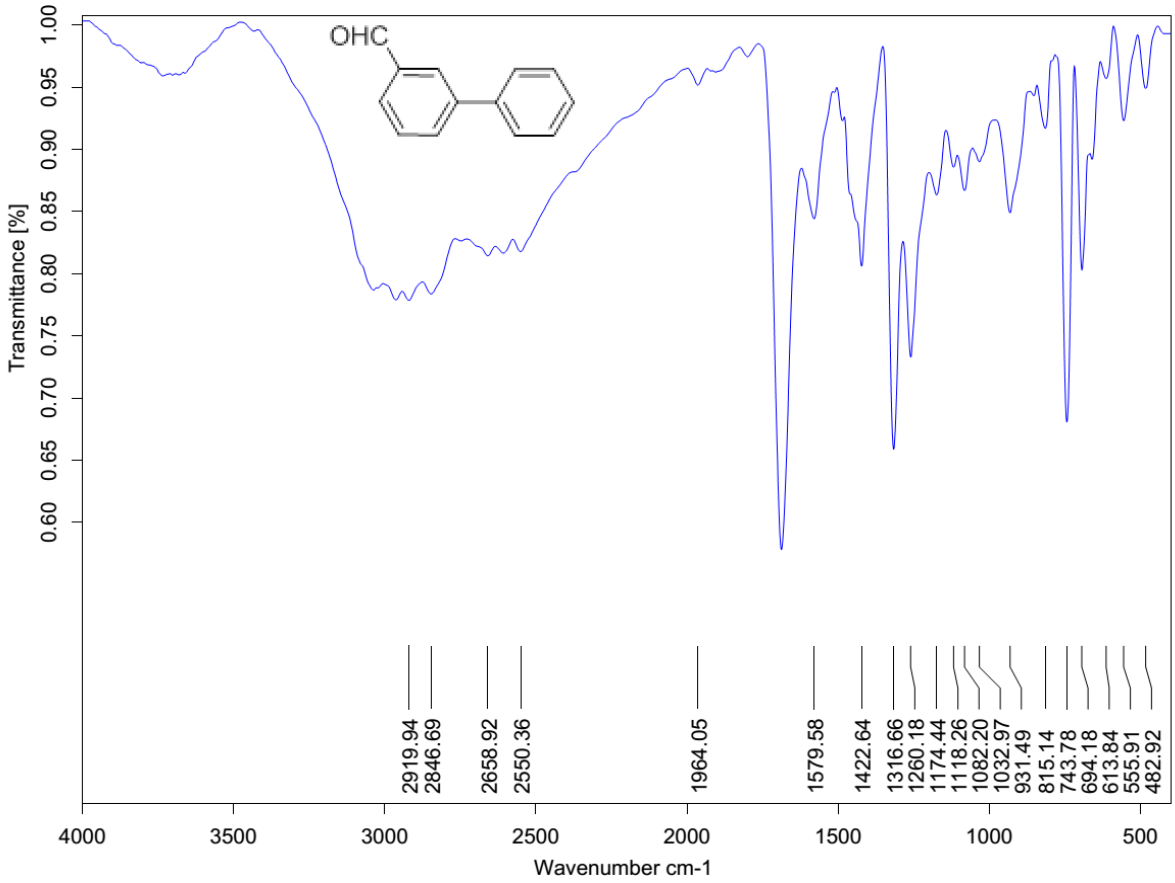
NAME        Dr.Gholi nejad(hamed)
EXPNO                         40
PROCNO                         1
Date_                   20141129
Time                        9.55
INSTRUM                    spect
PROBHD     5 mm PABBO BB-
PULPROG                   zgpg30
TD                         65536
SOLVENT                    CDCl3
NS                           122
DS                             0
SWH                    25252.525 Hz
FIDRES                 0.385323 Hz
AQ                     1.2976629 sec
RG                          2050
DW                        19.800 usec
DE                         6.50 usec
TE                        293.2 K
D1                     2.00000000 sec
D11                    0.03000000 sec
TD0                            1

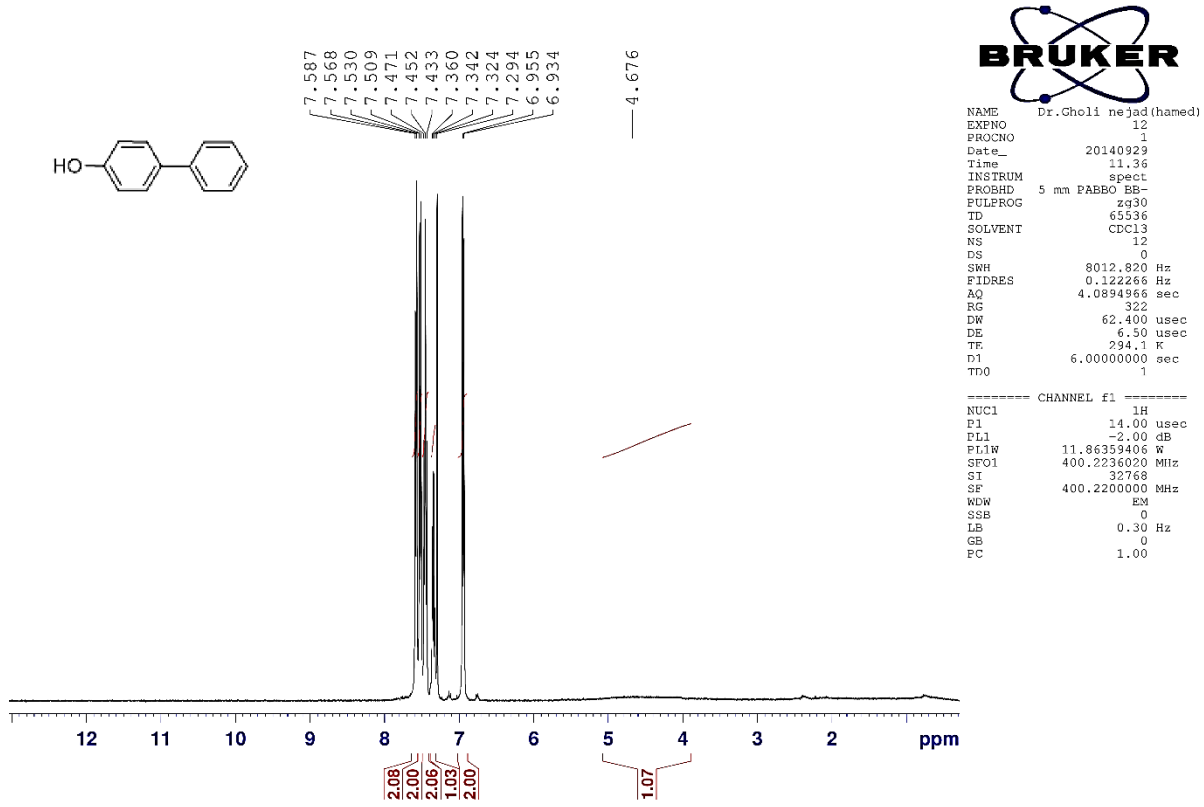
======== CHANNEL f1 ========
NUC1                         13C
P1                         9.00 usec
PL1                       -0.90 dB
PL1W                42.02801895 W
SFO1                100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                         1H
PCPD2                     90.00 usec
PL2                       -2.00 dB
PL12                      14.16 dB
PL13                      17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2                400.2216009 MHz
SI                         32768
SF                  100.6353990 MHz
WDW                           EM
SSB                            0
LB                         1.00 Hz
GB                             0
PC                         1.40
```

^{13}C NMR of [1,1'-biphenyl]-3-carbaldehyde



FT-IR of [1,1'-biphenyl]-3-carbaldehyde

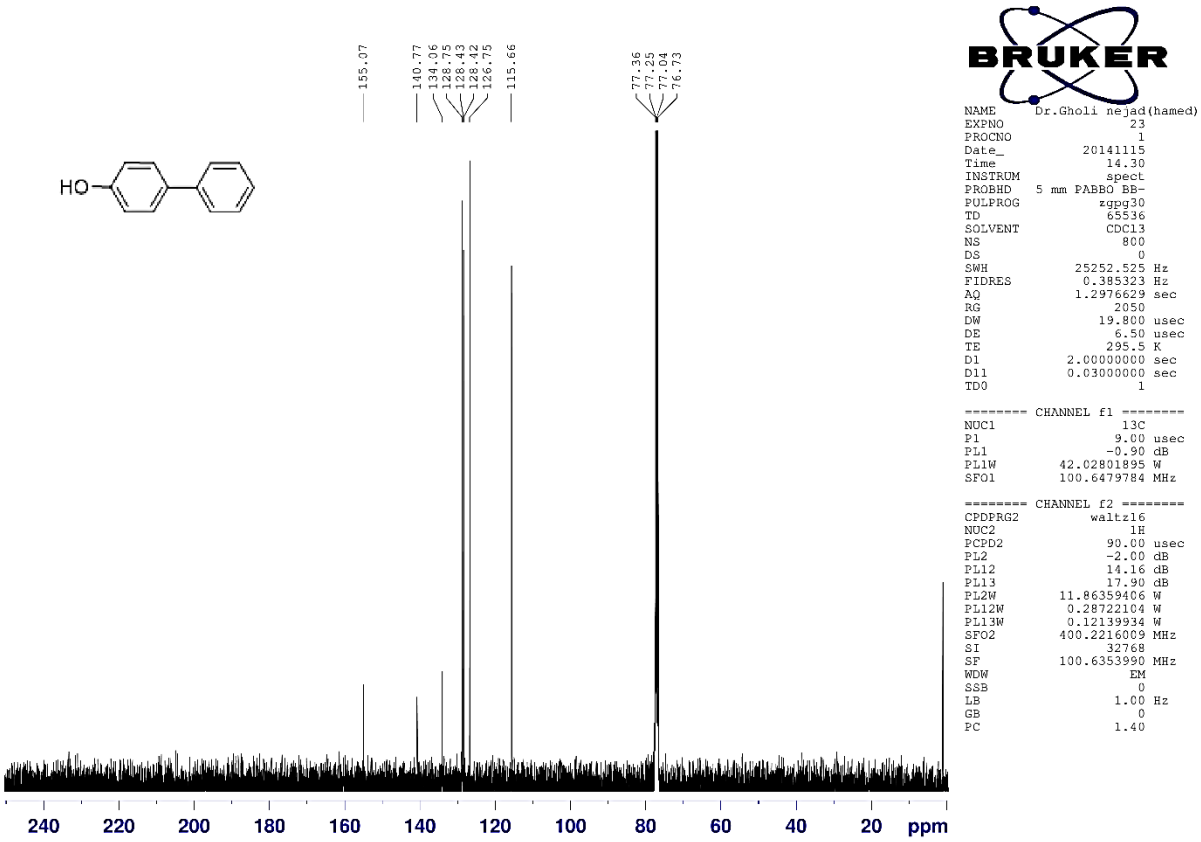


BRUKER

```
NAME          Dr.Gholi nejad(hamed)
EXPNO                           12
PROCNO                           1
Date_                     20140929
Time                         11.36
INSTRUM                      spect
PROBHD    5 mm PABBO BB-
PULPROG                      zg30
TD                          65536
SOLVENT                     CDCl3
NS                              12
DS                               0
SWH                       8012.820 Hz
FIDRES                    0.122266 Hz
AQ                        4.0894966 sec
RG                             322
DW                          62.400 usec
DE                           6.50 usec
TE                          294.1 K
D1                    6.00000000 sec
TD0                              1

======== CHANNEL f1 ========
NUC1                            1H
P1                          14.00 usec
PL1                         -2.00 dB
PL1W                11.86359406 W
SFO1                400.2236020 MHz
SI                           32768
SF                  400.2200000 MHz
WDW                             EM
SSB                              0
LB                            0.30 Hz
GB                               0
PC                            1.00
```

^{1}H NMR of [1,1'-biphenyl]-4-ol



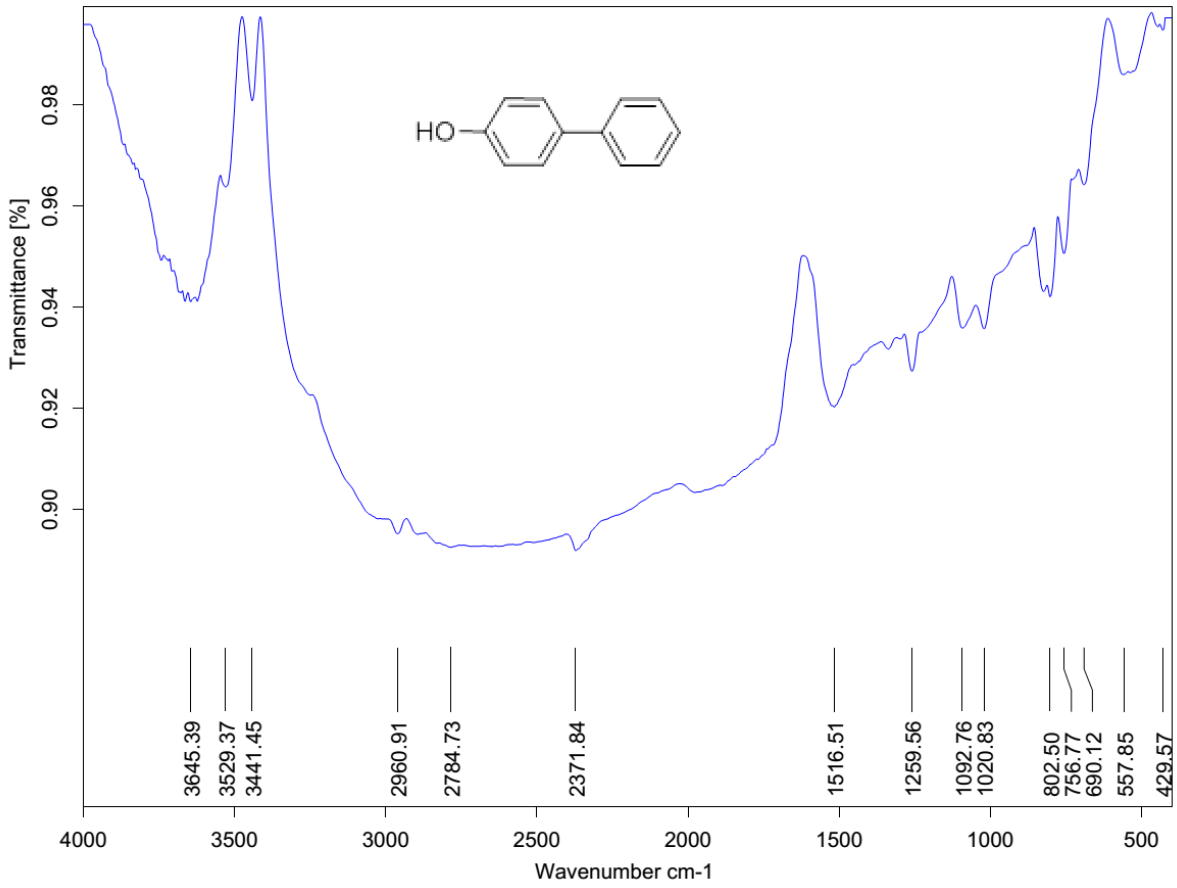
BRUKER

```
NAME        Dr.Gholi nejad(hamed)
EXPNO                        23
PROCNO                        1
Date_                  20141115
Time                      14.30
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG                  zgpg30
TD                        65536
SOLVENT                   CDCl3
NS                          800
DS                            0
SWH                   25252.525 Hz
FIDRES                 0.385323 Hz
AQ                    1.2976629 sec
RG                         2050
DW                       19.800 usec
DE                        6.50 usec
TE                       295.5 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                           1

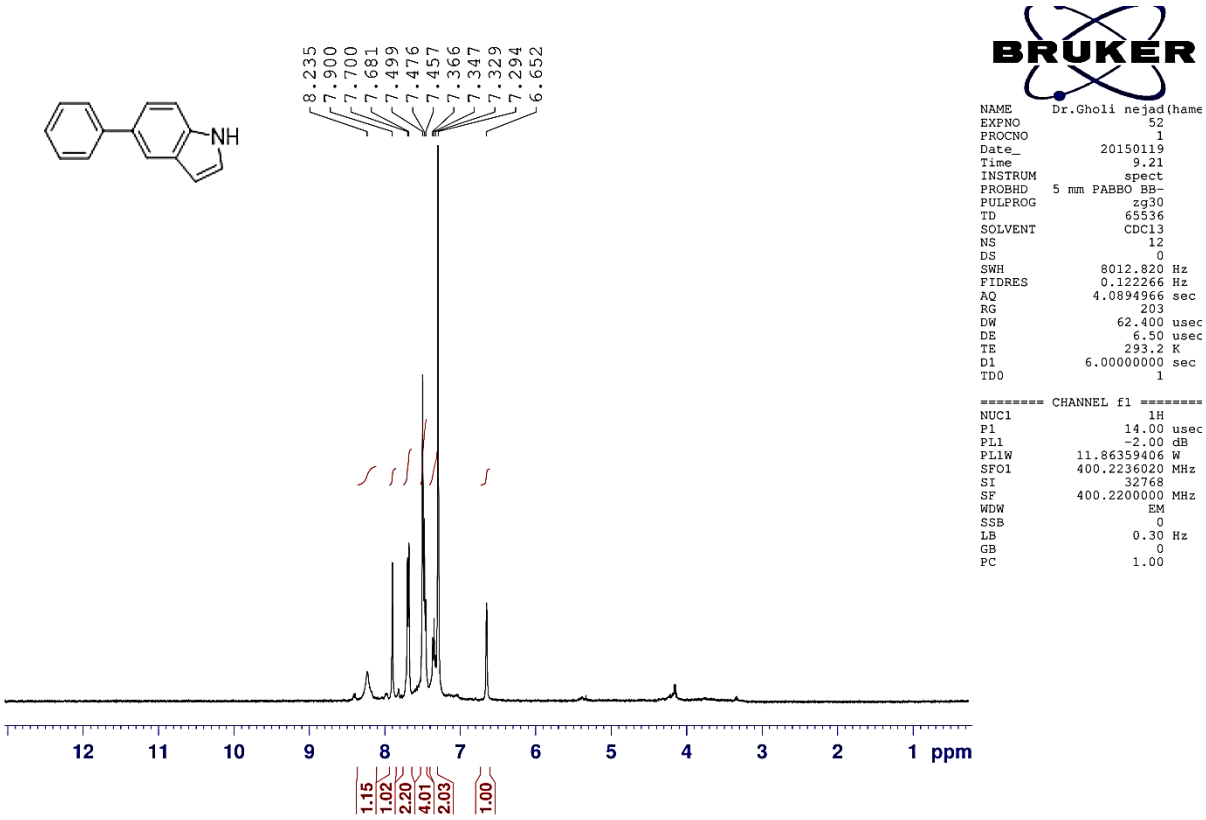
======== CHANNEL f1 ========
NUC1                        13C
P1                         9.00 usec
PL1                       -0.90 dB
PL1W                42.02801895 W
SFO1                100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                        1H
PCPD2                     90.00 usec
PL2                       -2.00 dB
PL12                      14.16 dB
PL13                      17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2                400.2216009 MHz
SI                         32768
SF                  100.6353990 MHz
WDW                           EM
SSB                           0
LB                         1.00 Hz
GB                            0
PC                         1.40
```

^{13}C NMR of [1,1'-biphenyl]-4-ol



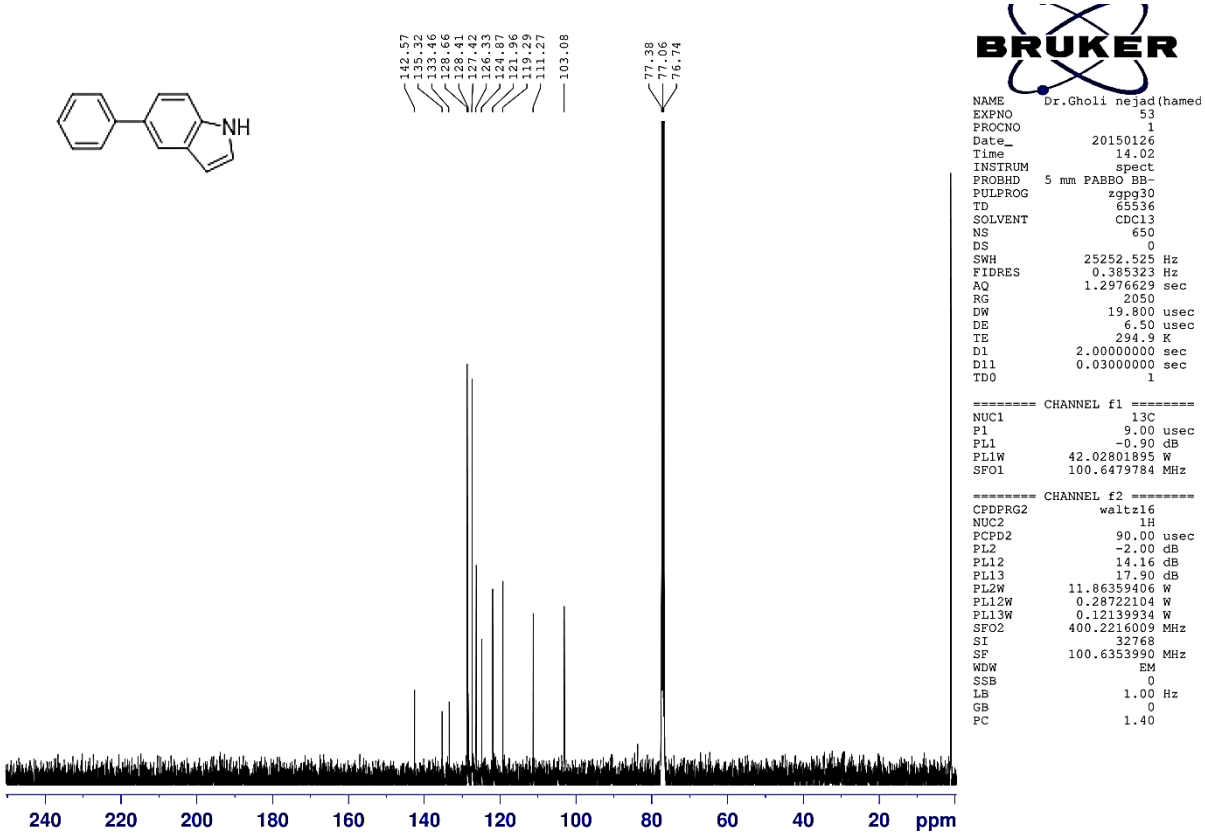
FT-IR of [1,1'-biphenyl]-4-ol




```
NAME        Dr.Gholi nejad(hame
EXPNO                   52
PROCNO                   1
Date_             20150119
Time                  9.21
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      12
DS                       0
SWH              8012.820 Hz
FIDRES           0.122266 Hz
AQ               4.0894966 sec
RG                     203
DW                  62.400 usec
DE                   6.50 usec
TE                  293.2 K
D1             6.00000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                    1H
P1                   14.00 usec
PL1                  -2.00 dB
PL1W          11.86359406 W
SFO1          400.2236020 MHz
SI                   32768
SF            400.2200000 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```

^{1}H NMR of 5-phenyl-1H-indole

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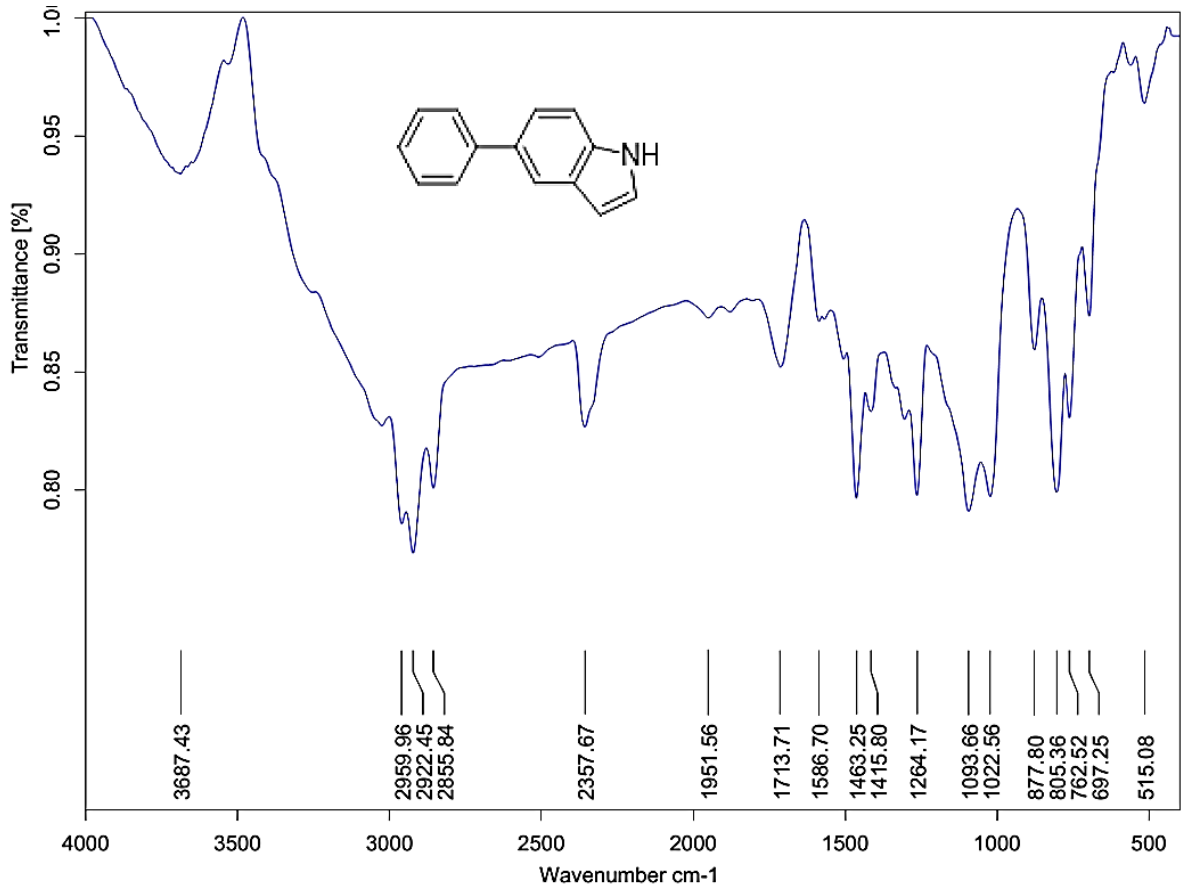
NAME            Dr.Gholi nejad(hamed
EXPNO                       53
PROCNO                       1
Date_                 20150126
Time                     14.02
INSTRUM                  spect
PROBHD     5 mm PABBO BB-
PULPROG                 zgpg30
TD                       65536
SOLVENT                  CDCl3
NS                         650
DS                           0
SWH                  25252.525 Hz
FIDRES               0.385323 Hz
AQ                   1.2976629 sec
RG                        2050
DW                      19.800 usec
DE                       6.50 usec
TE                      294.9 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                          1

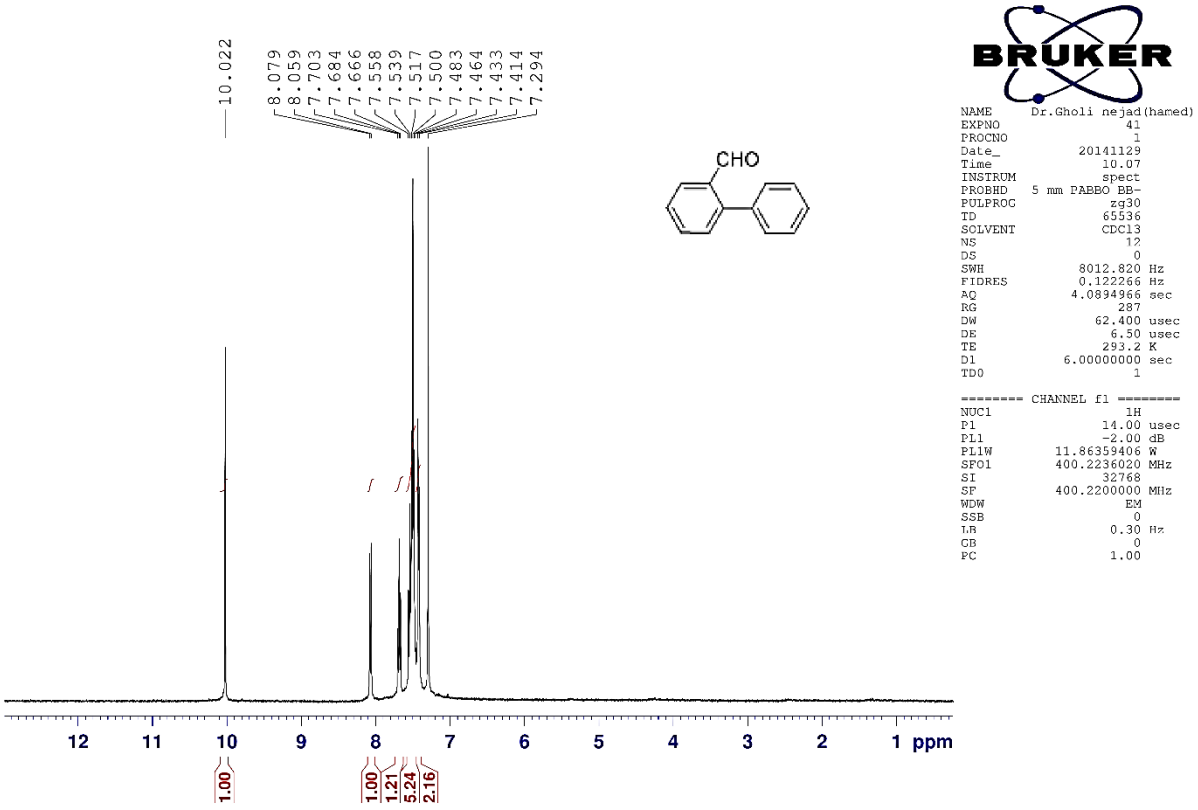
======== CHANNEL f1 ========
NUC1                        13C
P1                         9.00 usec
PL1                       -0.90 dB
PL1W                42.02801895 W
SFO1                100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                        1H
PCPD2                     90.00 usec
PL2                       -2.00 dB
PL12                      14.16 dB
PL13                      17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2                400.2216009 MHz
SI                        32768
SF                  100.6353990 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

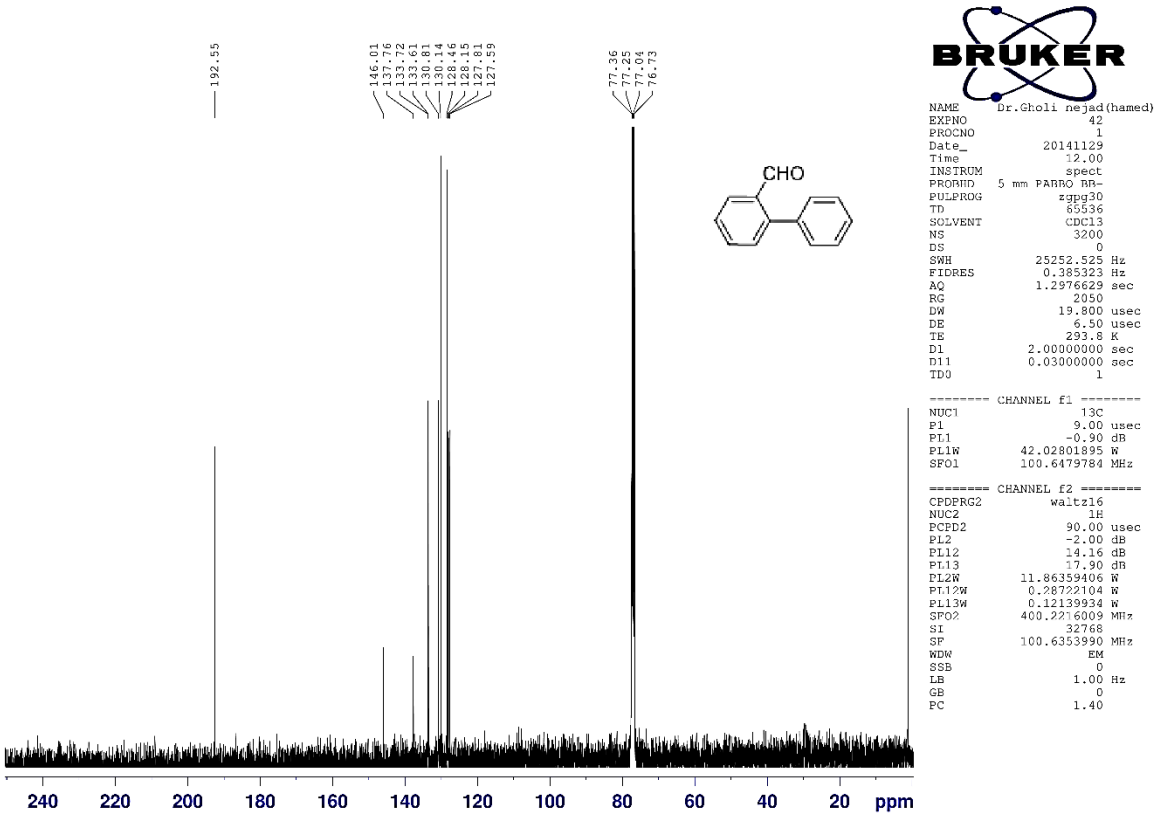
^{13}C NMR of 5-phenyl-1H-indole



FT-IR of 5-phenyl-1H-indole



^{1}H NMR of [1,1'-biphenyl]-2-carbaldehyde

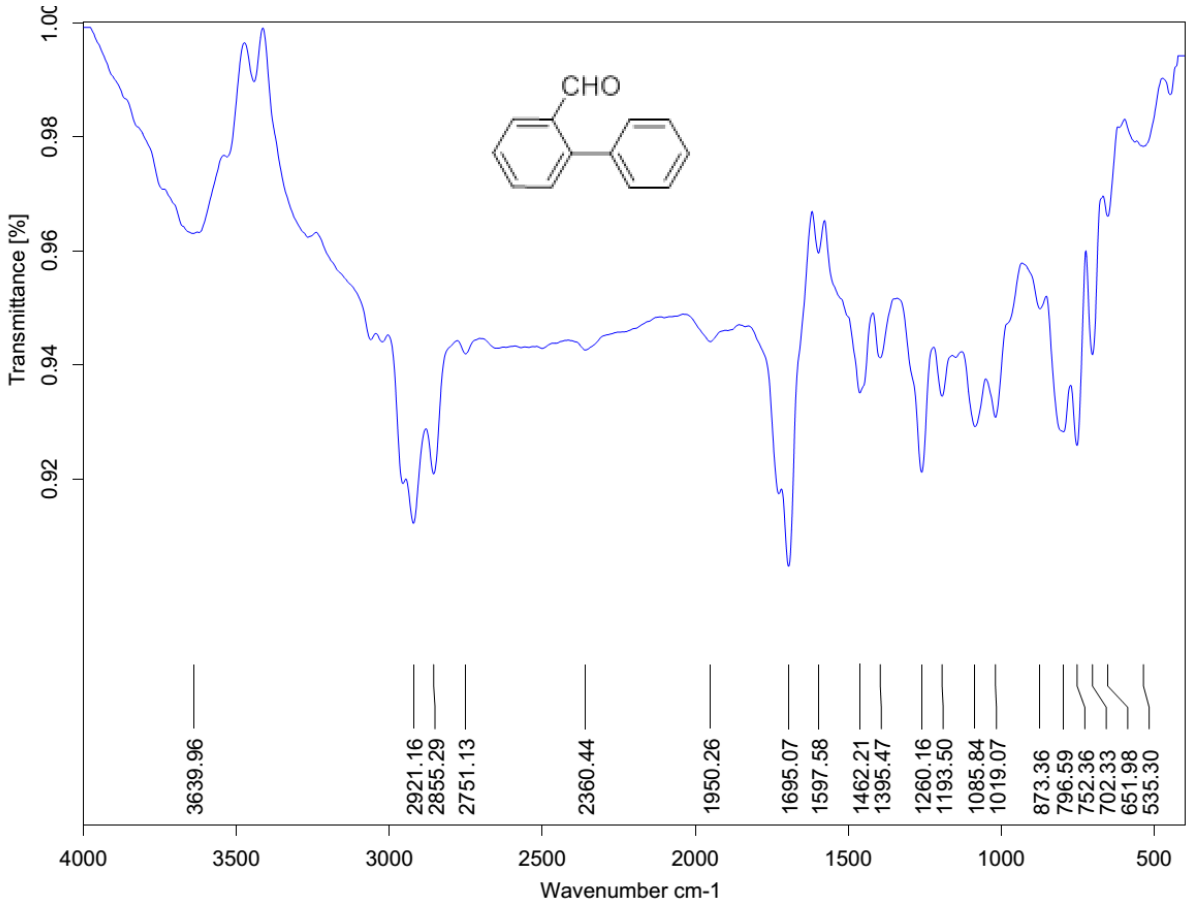



```
NAME          Dr.Gholi nejad(hamed)
EXPNO                           42
PROCNO                           1
Date_                     20141129
Time                         12.00
INSTRUM                      spect
PROBHD       5 mm PABBO BB-
PULPROG                   zgpg30
TD                             65536
SOLVENT                      CDCl3
NS                              3200
DS                                 0
SWH                     25252.525 Hz
FIDRES                   0.385323 Hz
AQ                       1.2976629 sec
RG                              2050
DW                         19.800 usec
DE                          6.50 usec
TE                            293.8 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                              1

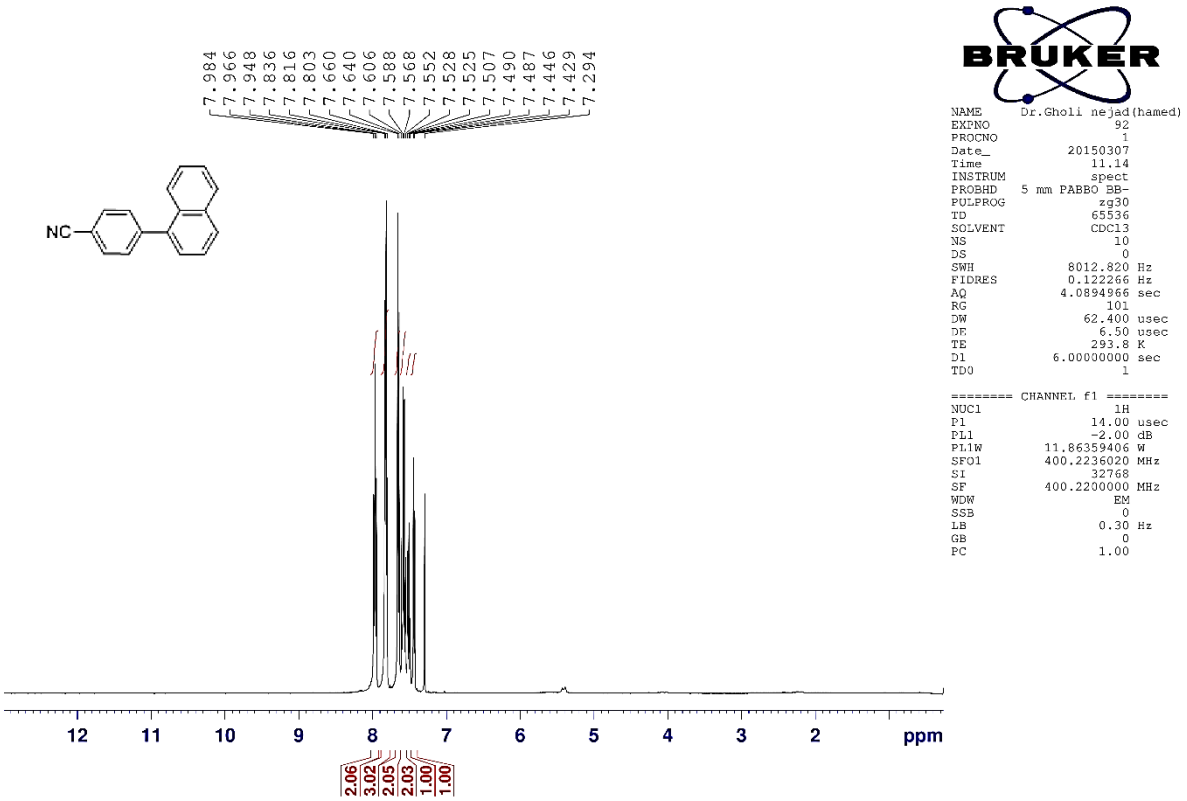
======== CHANNEL f1 ========
NUC1                           13C
P1                           9.00 usec
PL1                         -0.90 dB
PL1W                 42.02801895 W
SFO1                100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                           1H
PCPD2                       90.00 usec
PL2                         -2.00 dB
PL12                        14.16 dB
PL13                        17.90 dB
PL2W                 11.86359406 W
PL12W                 0.28722104 W
PL13W                 0.12139934 W
SFO2                400.2216009 MHz
SI                           32768
SF                  100.6353990 MHz
WDW                            EM
SSB                             0
LB                           1.00 Hz
GB                              0
PC                           1.40
```

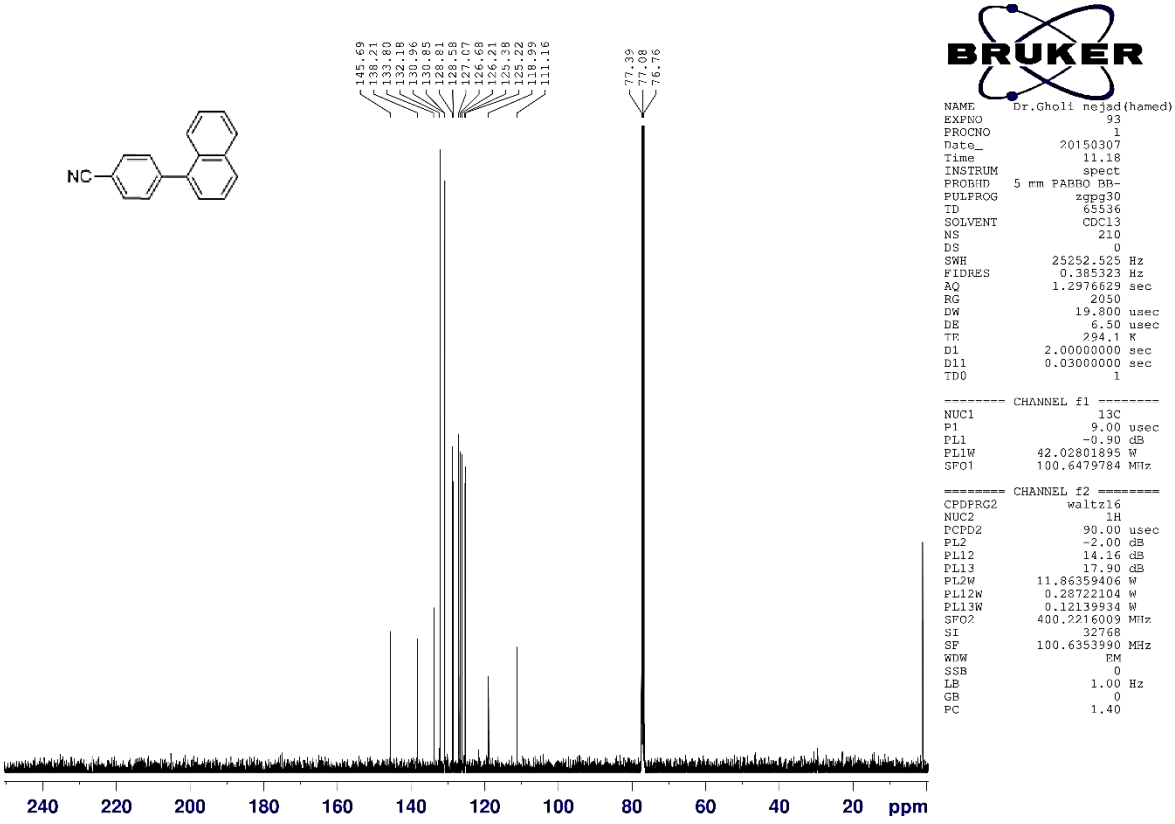
^{13}C NMR of [1,1'-biphenyl]-2-carbaldehyde



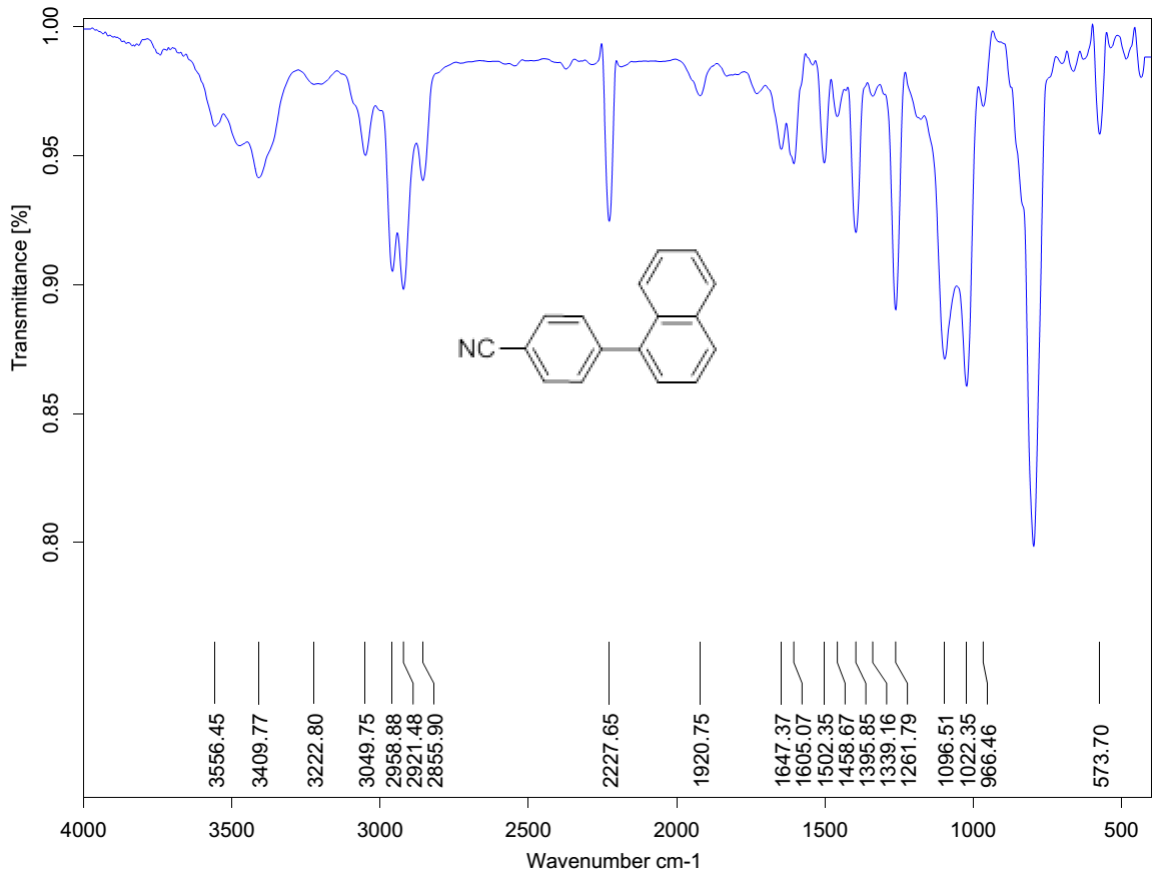
FT-IR of [1,1'-biphenyl]-2-carbaldehyde



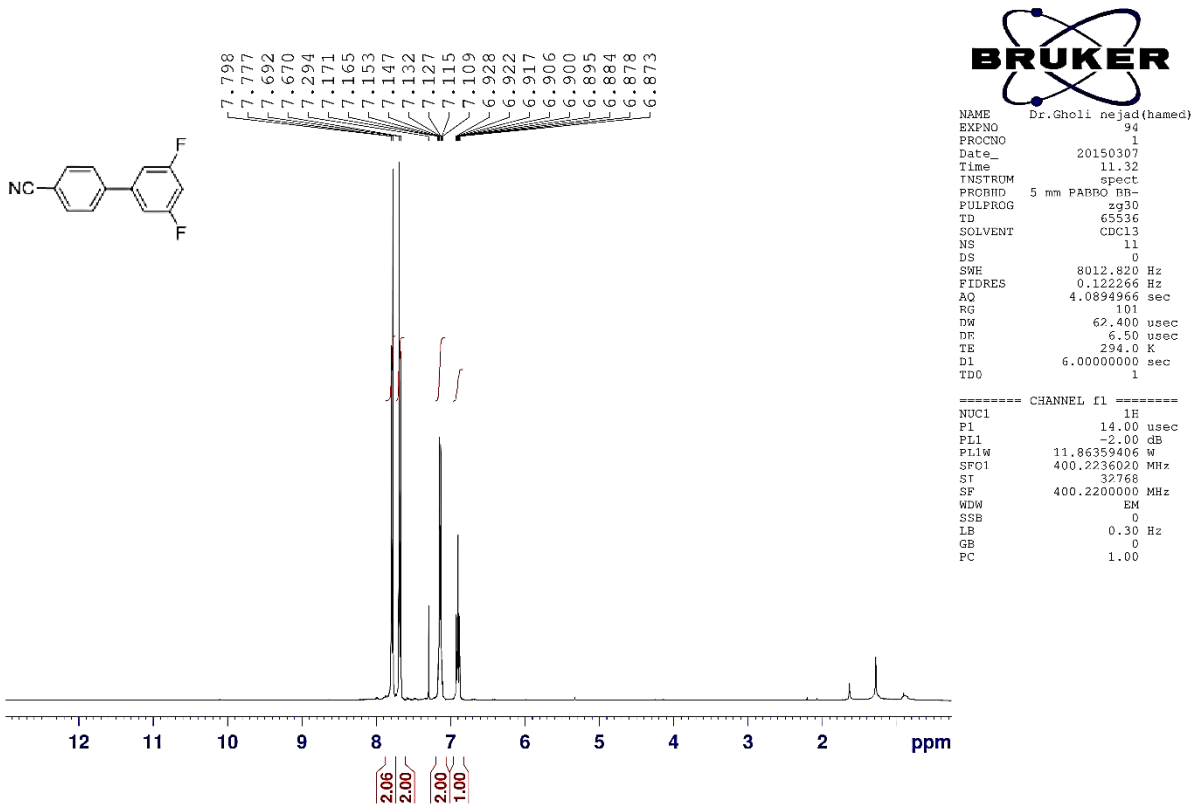
^{1}H NMR of 4-(naphthalen-1-yl)benzonitrile



^{13}C NMR of 4-(naphthalen-1-yl)benzonitrile



FT-IR of 4-(naphthalen-1-yl)benzonitrile

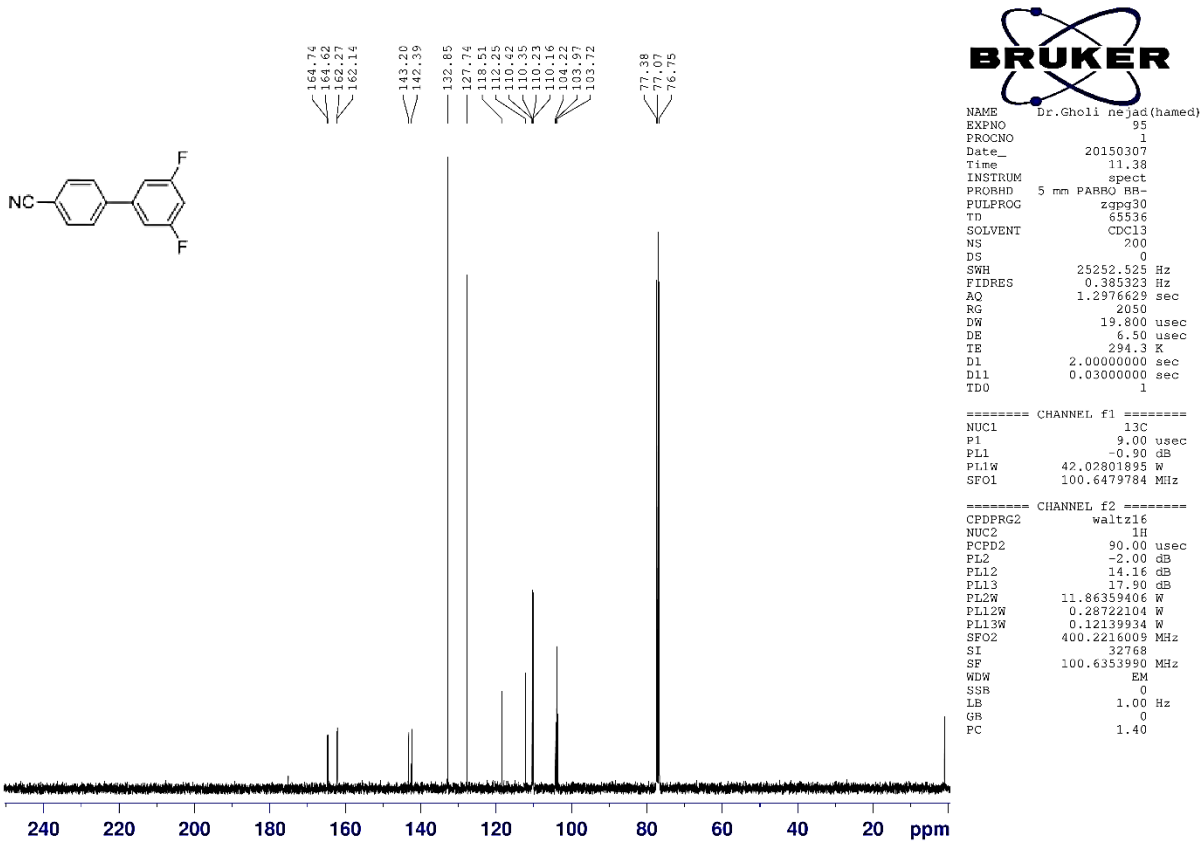


BRUKER

```
NAME          Dr.Gholi nejad(hamed)
EXPNO                           94
PROCNO                           1
Date_                     20150307
Time                         11.32
INSTRUM                      spect
PROBHD    5 mm PABBO BB-
PULPROG                       zg30
TD                           65536
SOLVENT                     CDCl3
NS                              11
DS                               0
SWH                      8012.820 Hz
FIDRES                   0.122266 Hz
AQ                       4.0894966 sec
RG                             101
DW                        62.400 usec
DE                         6.50 usec
TE                        294.0 K
D1                    6.00000000 sec
TD0                              1

======== CHANNEL f1 ========
NUC1                            1H
P1                        14.00 usec
PL1                       -2.00 dB
PL1W                 11.86359406 W
SFO1                 400.2236020 MHz
SI                           32768
SF                   400.2200000 MHz
WDW                             EM
SSB                              0
LB                        0.30 Hz
GB                               0
PC                        1.00
```

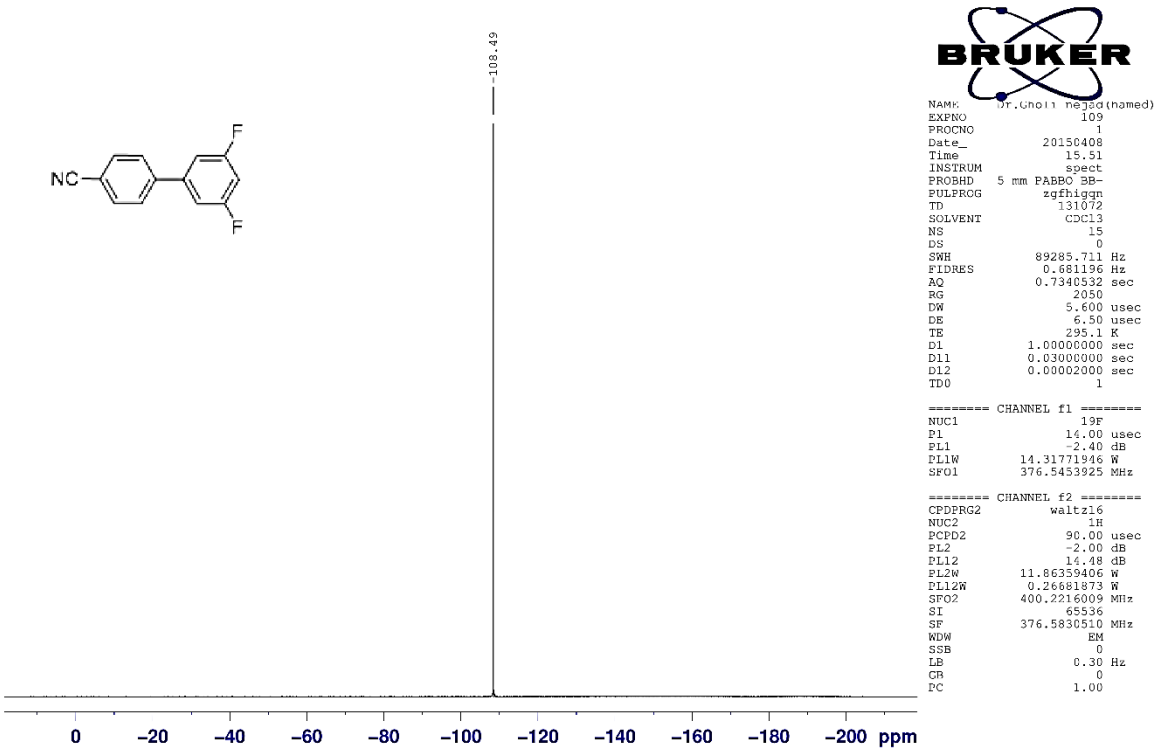
^{1}H NMR of 3',5'-difluoro-[1,1'-biphenyl]-4-carbonitrile



BRUKER

NAME	Dr.Gholi nejad(hamed)
EXPNO	95
PROCNO	1
Date_	20150307
Time	11.38
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	200
DS	0
SWH	25252.525 Hz
FIDRES	0.385323 Hz
AQ	1.2976629 sec
RG	2050
DW	19.800 usec
DE	6.50 usec
TE	294.3 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.00 usec
PL1	-0.90 dB
PL1W	42.02801895 W
SFO1	100.6479784 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	90.00 usec
PL2	-2.00 dB
PL12	14.16 dB
PL13	17.90 dB
PL2W	11.86359406 W
PL12W	0.28722104 W
PL13W	0.12139934 W
SFO2	400.2216009 MHz
SI	32768
SF	100.6353990 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

^{13}C NMR of 3',5'-difluoro-[1,1'-biphenyl]-4-carbonitrile

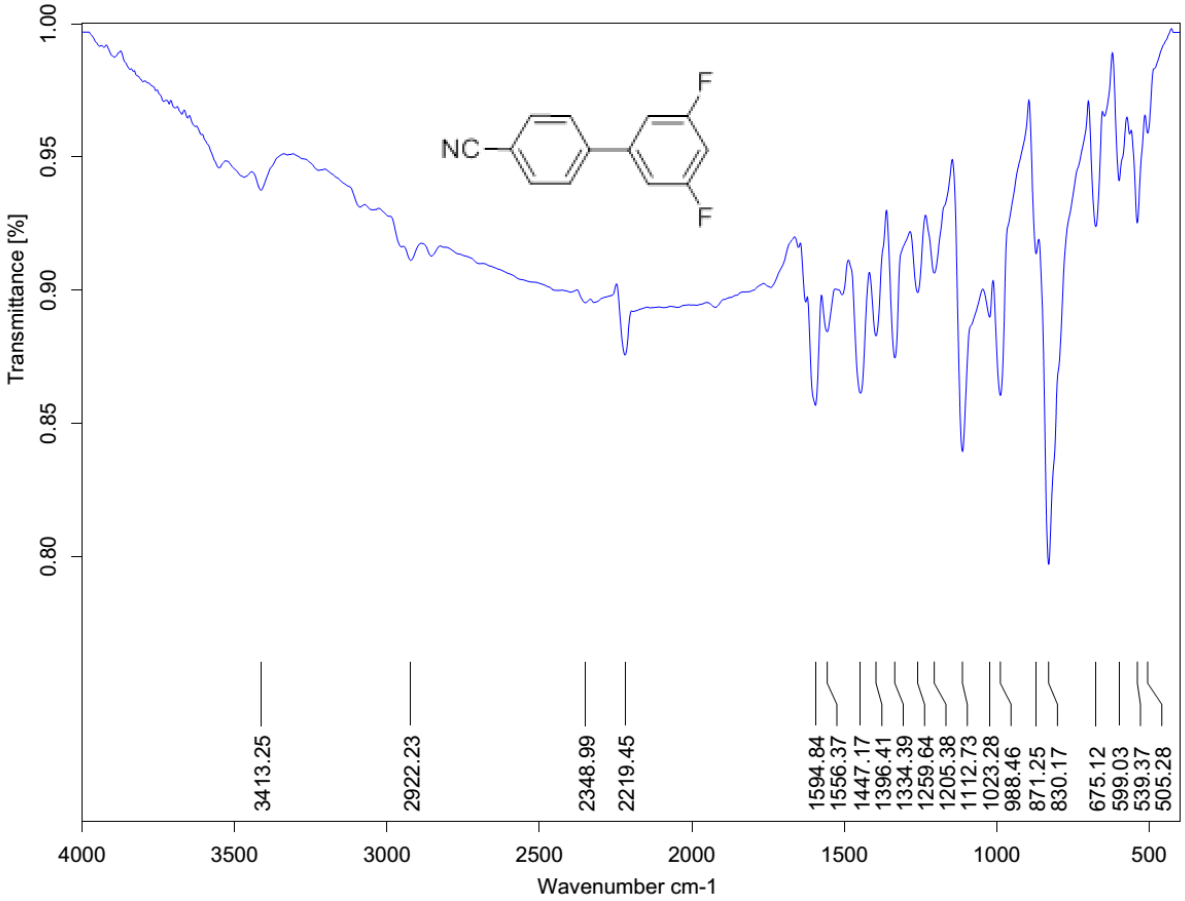



```
NAME       Dr.Gholi hejaz(named)
EXPNO                 109
PROCNO                  1
Date_            20150408
Time                15.51
INSTRUM             spect
PROBHD   5 mm PABBO BB-
PULPROG         zgfhigqn
TD                 131072
SOLVENT             CDCl3
NS                     15
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ               0.7340532 sec
RG                   2050
DW                  5.600 usec
DE                   6.50 usec
TE                  295.1 K
D1             1.00000000 sec
D11            0.03000000 sec
D12            0.00002000 sec
TD0                     1

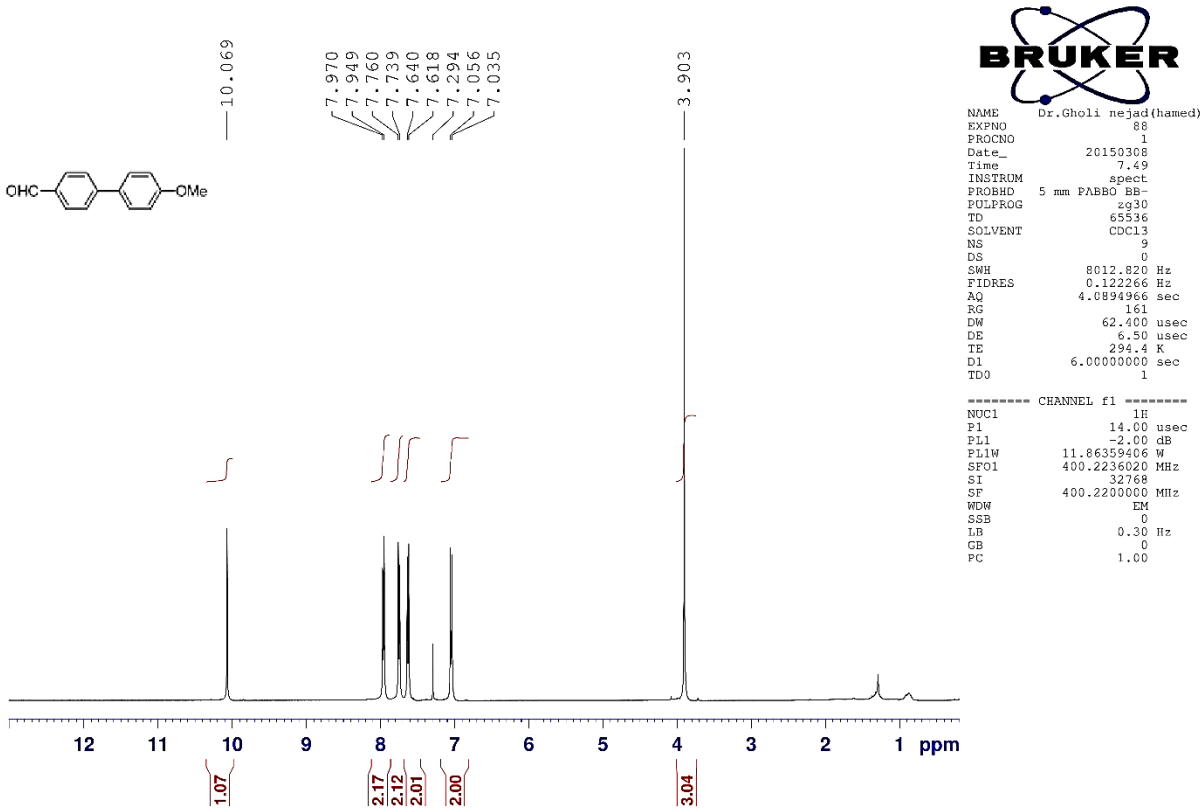
======== CHANNEL f1 ========
NUC1                  19F
P1                  14.00 usec
PL1                 -2.40 dB
PL1W         14.31771946 W
SFO1         376.5453925 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2               90.00 usec
PL2                 -2.00 dB
PL12                14.48 dB
PL2W         11.86359406 W
PL12W         0.26681873 W
SFO2         400.2216009 MHz
SI                  65536
SF           376.5830510 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

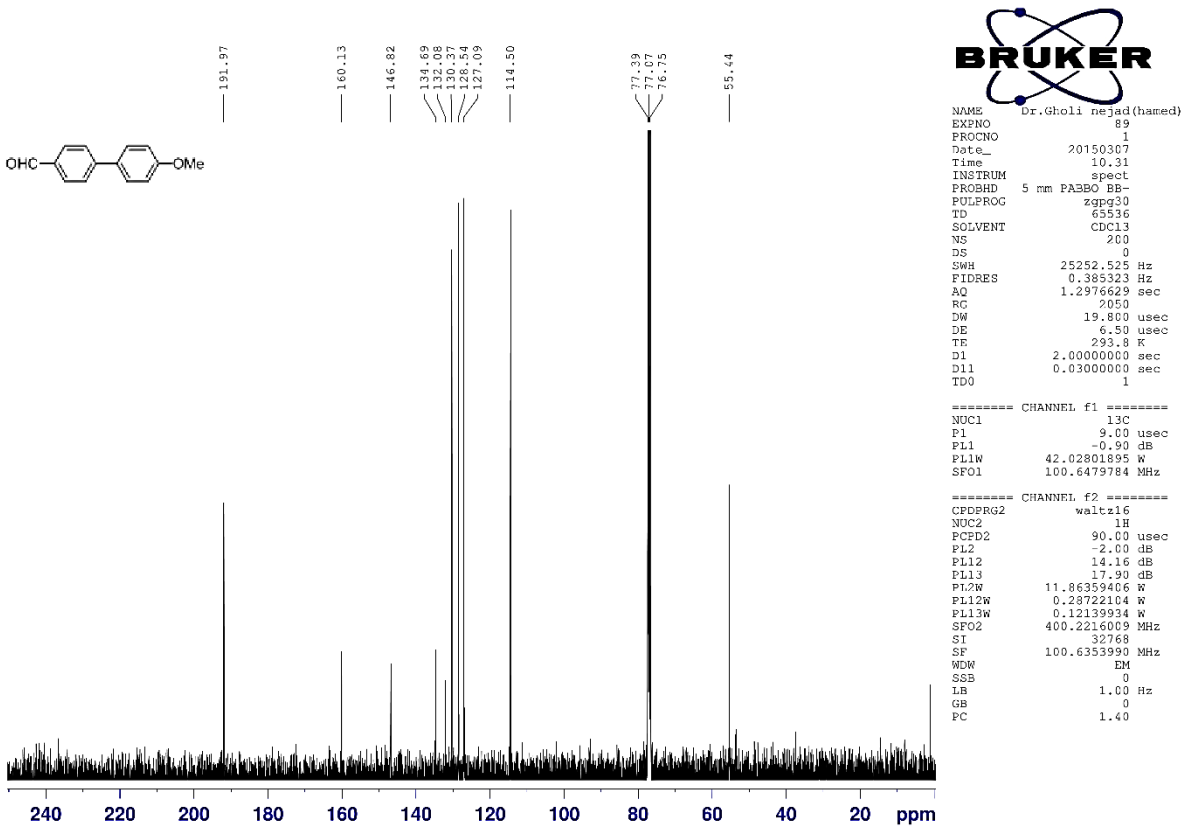
^{19}F NMR of 3',5'-difluoro-[1,1'-biphenyl]-4-carbonitrile



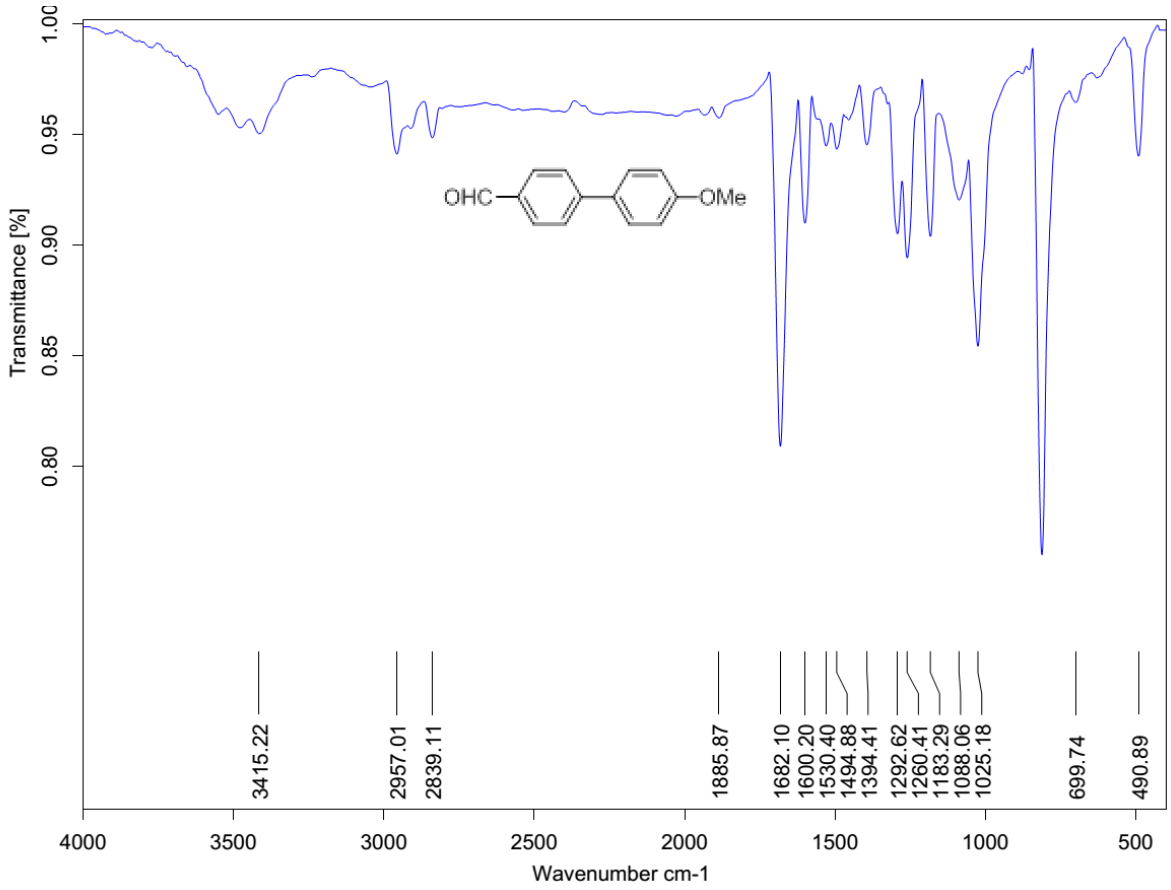
FT-IR of 3',5'-difluoro-[1,1'-biphenyl]-4-carbonitrile



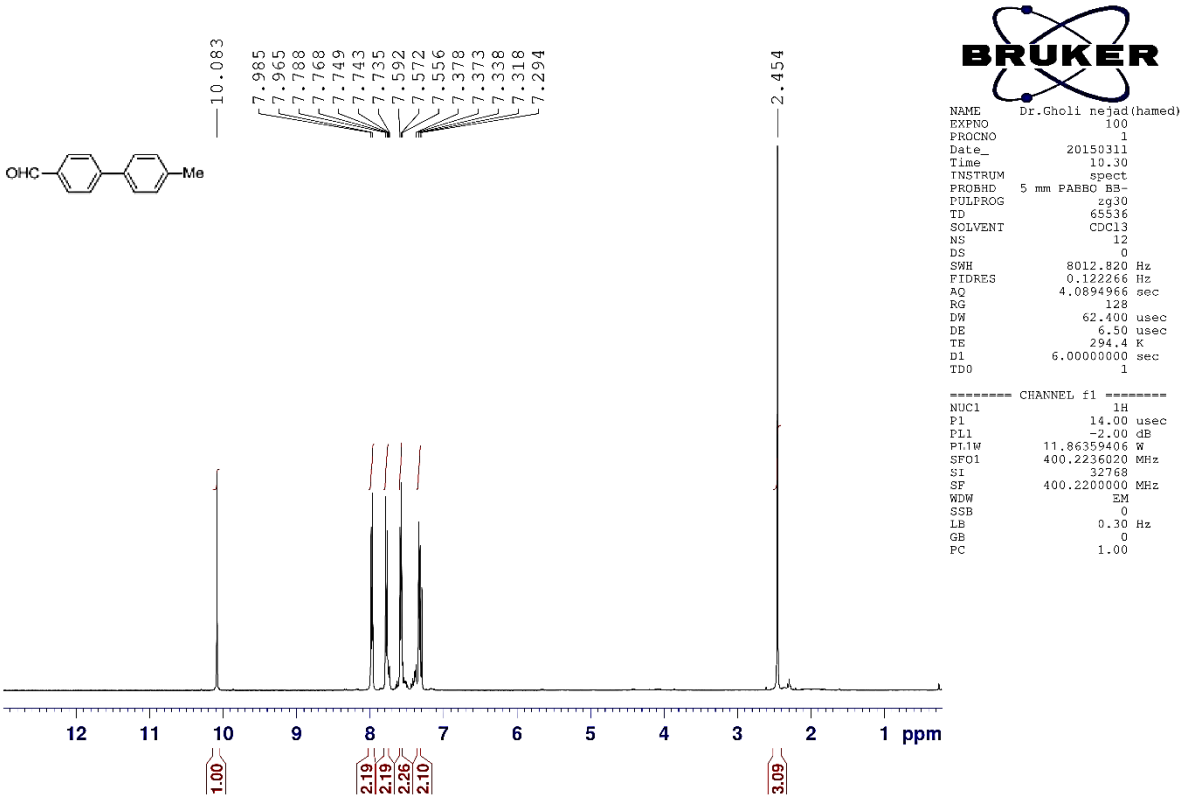
^{1}H NMR of 4'-methoxy-[1,1'-biphenyl]-4-carbaldehyde



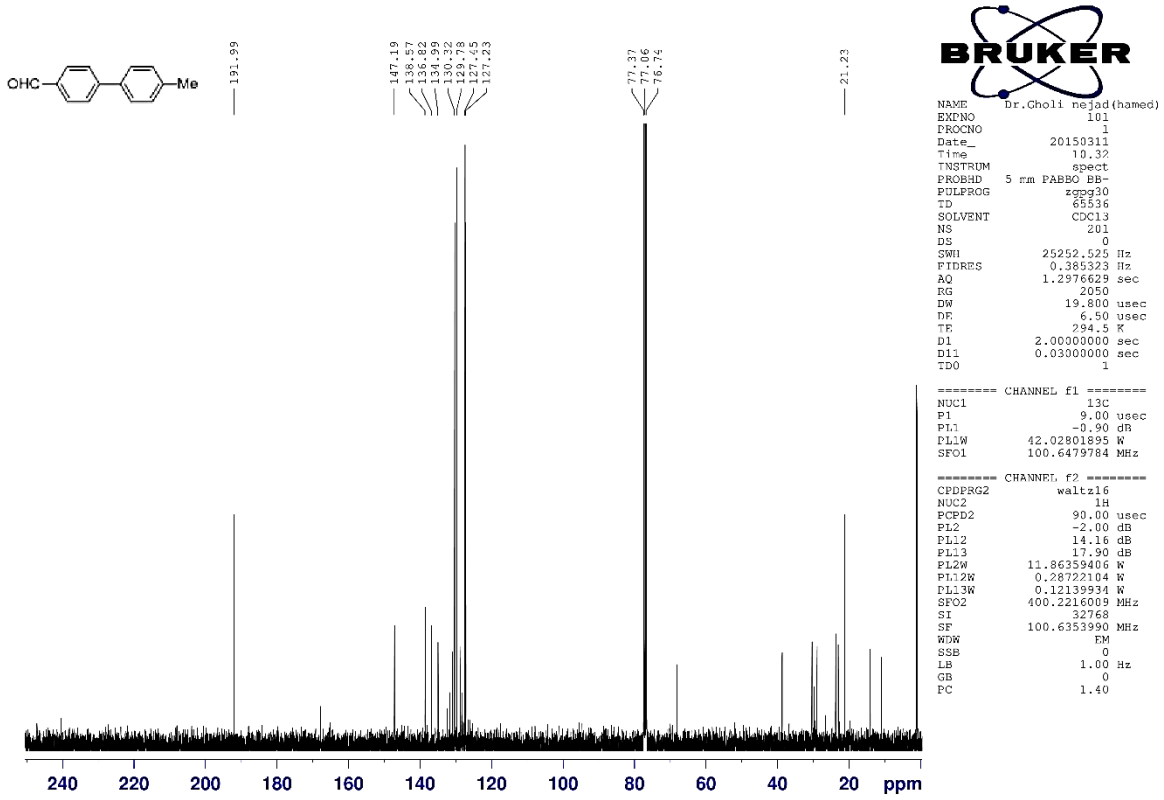
^{13}C NMR of 4'-methoxy-[1,1'-biphenyl]-4-carbaldehyde



FT-IR of 4'-methoxy-[1,1'-biphenyl]-4-carbaldehyde



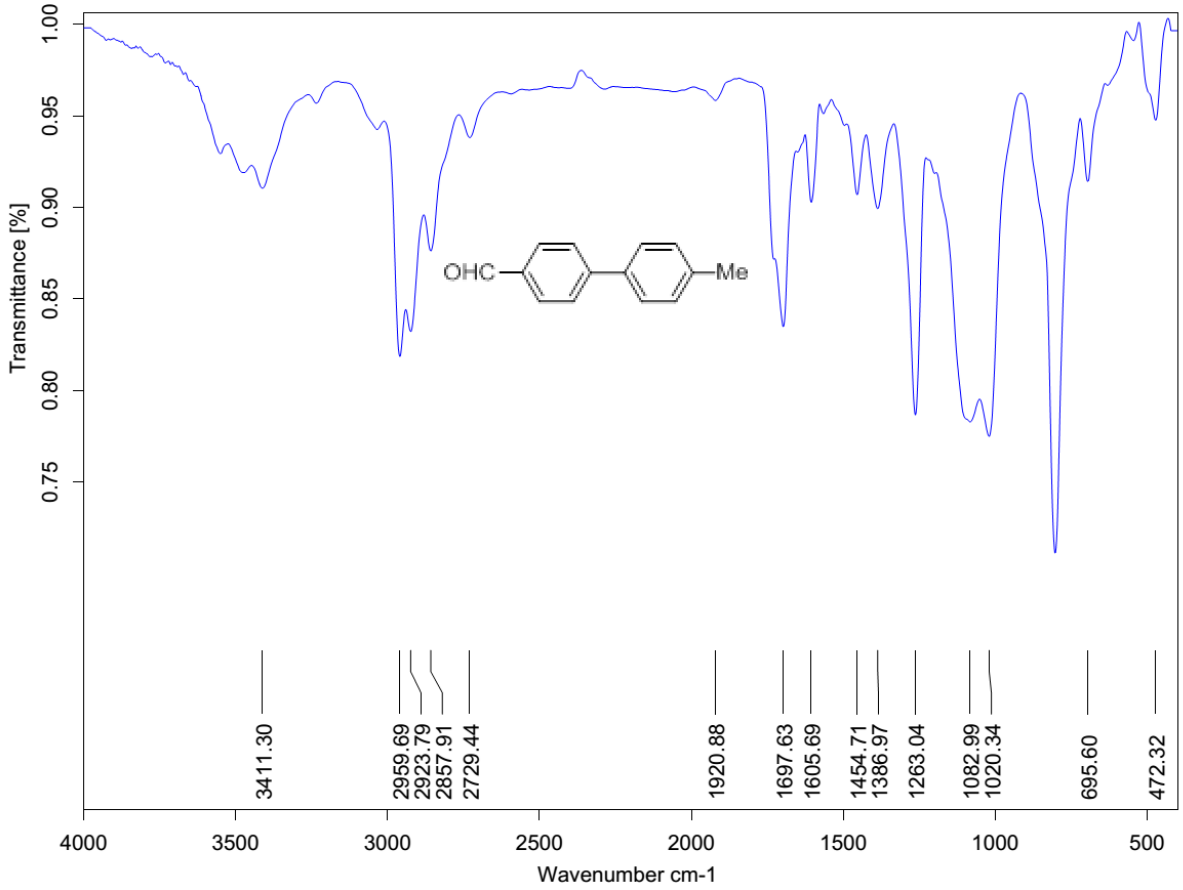
^{1}H NMR of 4'-methyl-[1,1'-biphenyl]-4-carbaldehyde



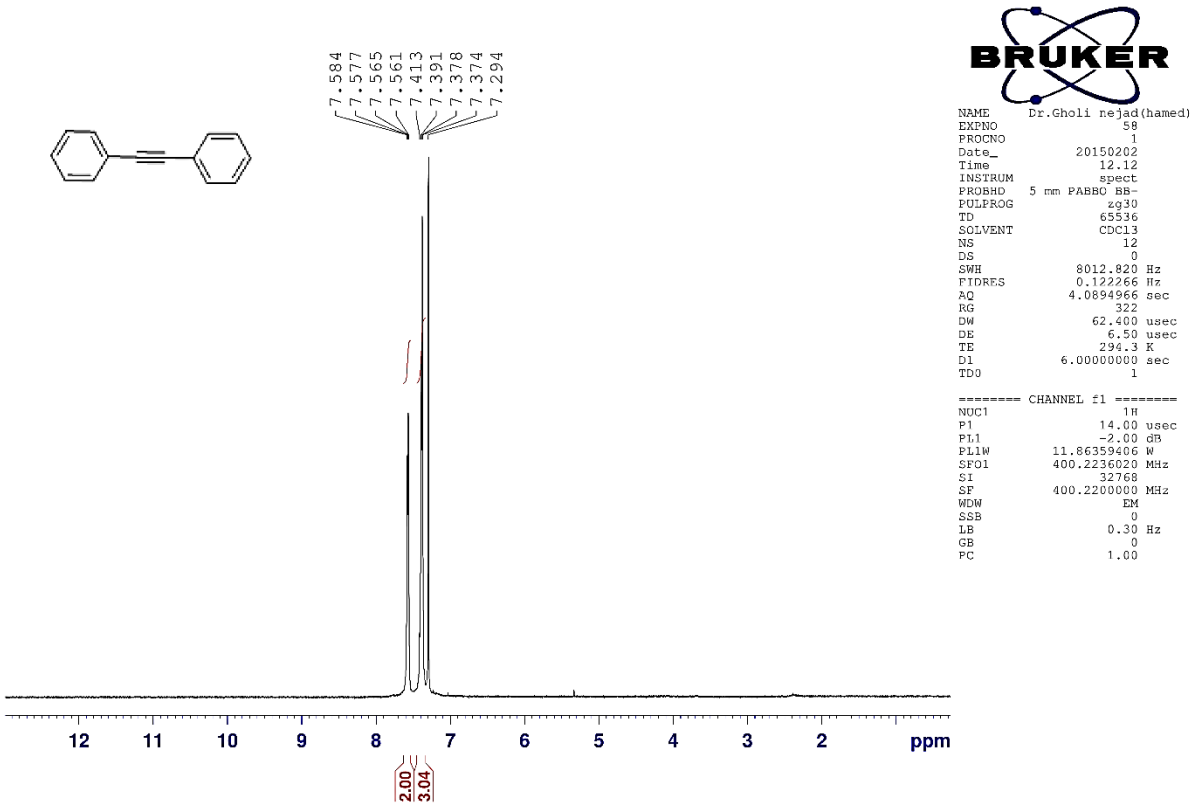
BRUKER

NAME	Dr.Gholi nejad(hamed)
EXPNO	101
PROCNO	1
Date_	20150311
Time	10.32
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	201
DS	0
SWH	25252.525 Hz
FIDRES	0.385323 Hz
AQ	1.2976629 sec
RG	2050
DW	19.800 usec
DE	6.50 usec
TE	294.5 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.00 usec
PL1	-0.90 dB
PL1W	42.02801895 W
SFO1	100.6479784 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	90.00 usec
PL2	-2.00 dB
PL12	14.16 dB
PL13	17.90 dB
PL2W	11.86359406 W
PL12W	0.28722104 W
PL13W	0.12139934 W
SFO2	400.2216009 MHz
SI	32768
SF	100.6353990 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

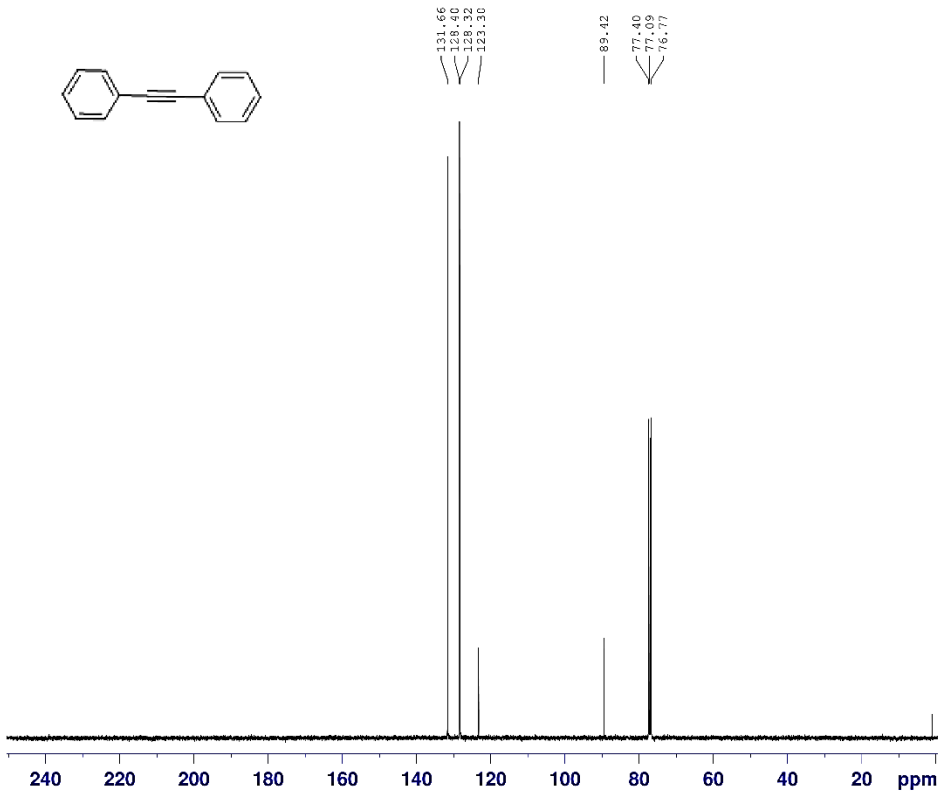
^{13}C NMR of 4'-methyl-[1,1'-biphenyl]-4-carbaldehyde



FT-IR of 4'-methyl-[1,1'-biphenyl]-4-carbaldehyde



^{1}H NMR of 1,2-diphenylethyne

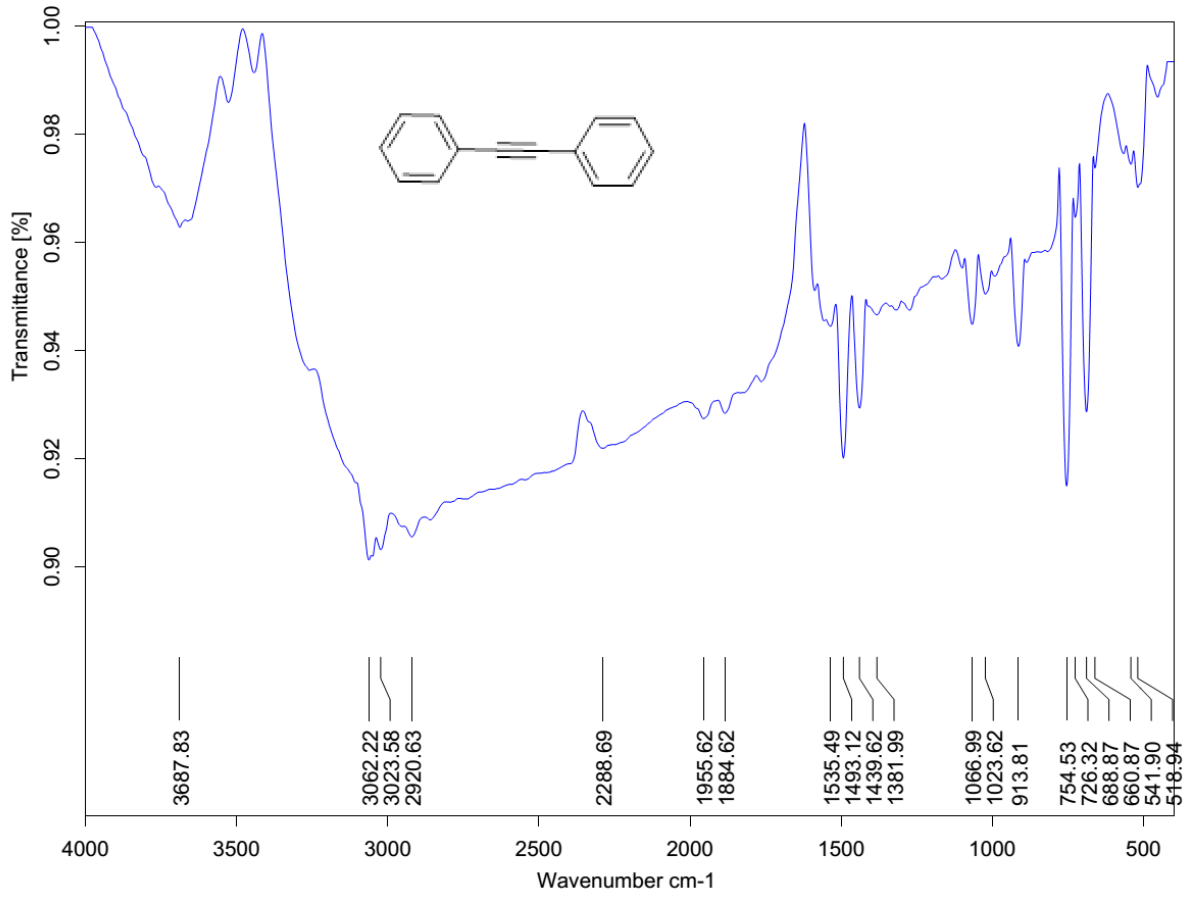



```
NAME        Dr.Gholi nejad(hamed)
EXPNO                         79
PROCNO                         1
Date_                   20150225
Time                       10.32
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                   zgpg30
TD                         65536
SOLVENT                    CDCl3
NS                           240
DS                             0
SWH                    25252.525 Hz
FIDRES                  0.385323 Hz
AQ                      1.2976629 sec
RG                          2050
DW                        19.800 usec
DE                         6.50 usec
TE                        293.2 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                            1

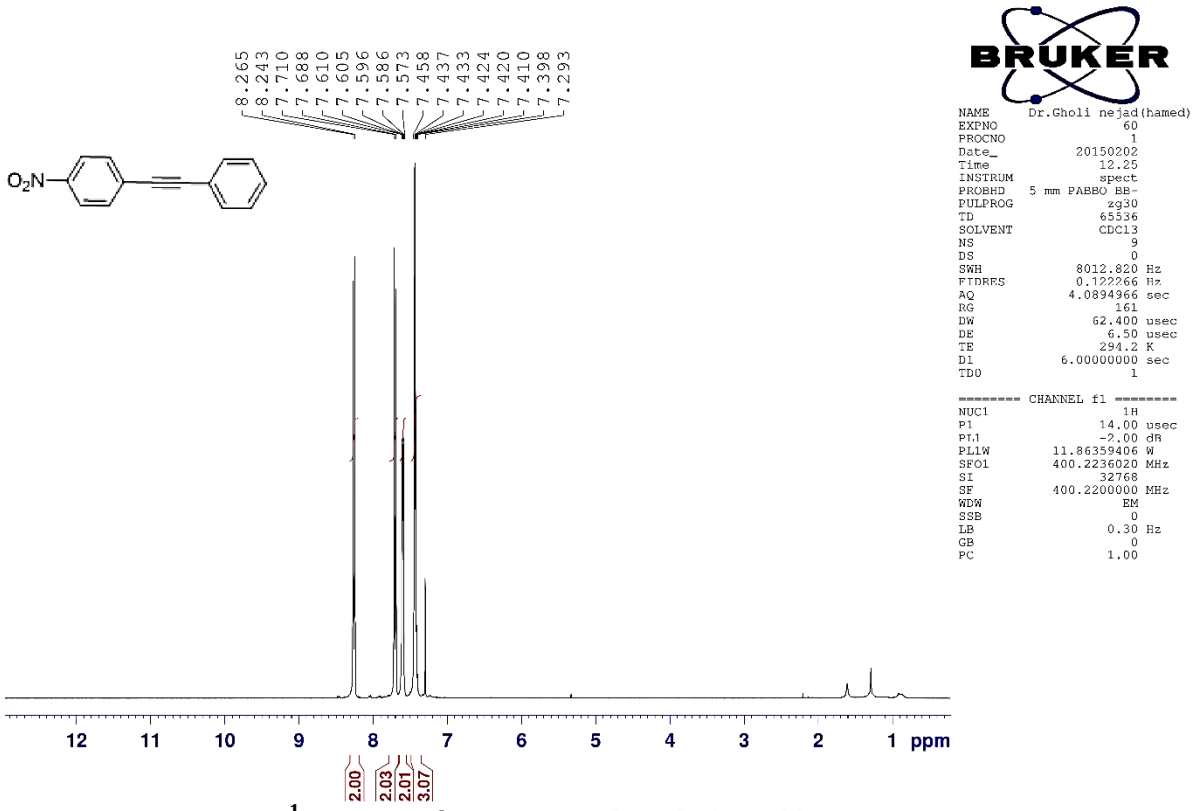
======== CHANNEL f1 ========
NUC1                         13C
P1                         9.00 usec
PL1                       -0.90 dB
PL1W                42.02801895 W
SFO1               100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                         1H
PCPD2                     90.00 usec
PL2                       -2.00 dB
PL12                      14.16 dB
PL13                      17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2               400.2216009 MHz
SI                         32768
SF                 100.6353990 MHz
WDW                           EM
SSB                            0
LB                         1.00 Hz
GB                             0
PC                         1.40
```

^{13}C NMR of 1,2-diphenylethyne



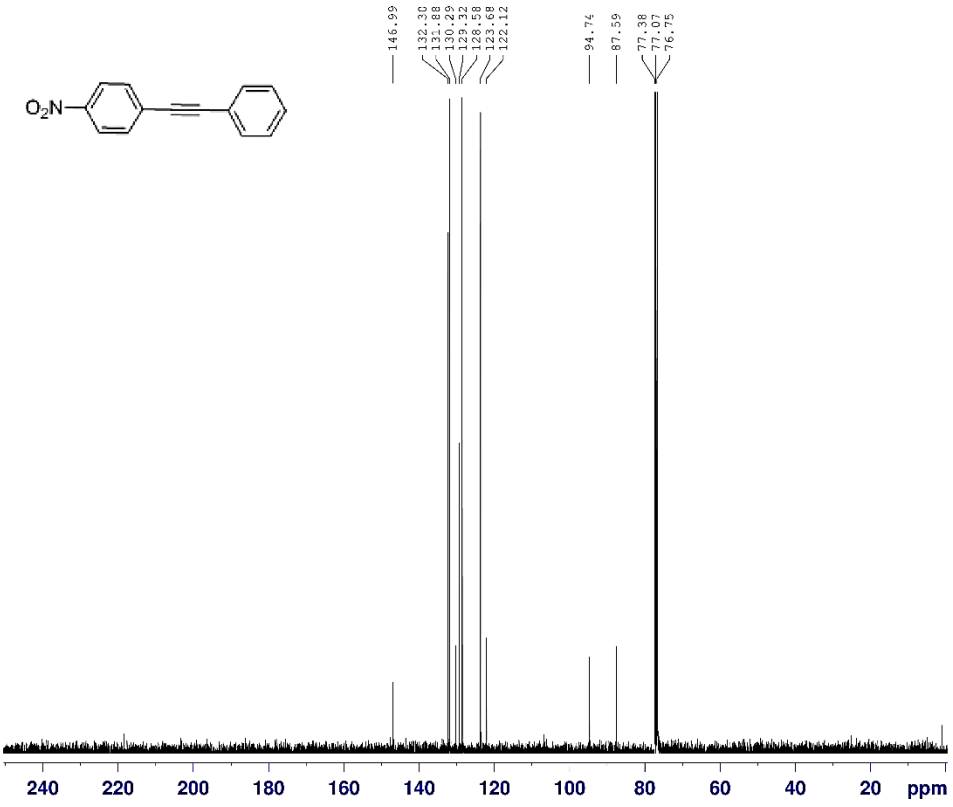
FT-IR of 1,2-diphenylethyne



NAME Dr.Gholi nejad(hamed)
EXPNO 60
PROCNO 1
Date_ 20150202
Time 12.25
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 9
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 161
DW 62.400 usec
DE 6.50 usec
TE 294.2 K
D1 6.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SFO1 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

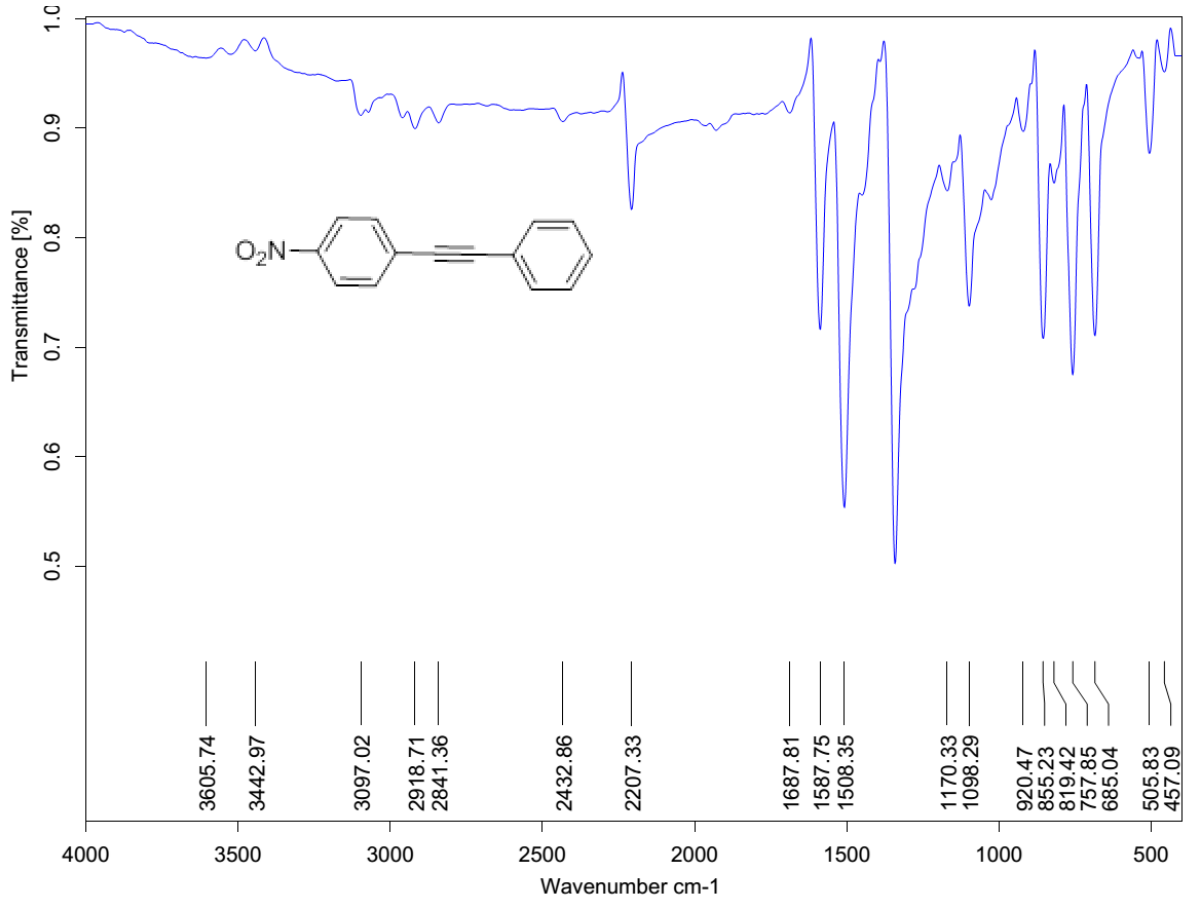
^{1}H NMR of 1-nitro-4-(phenylethynyl)benzene



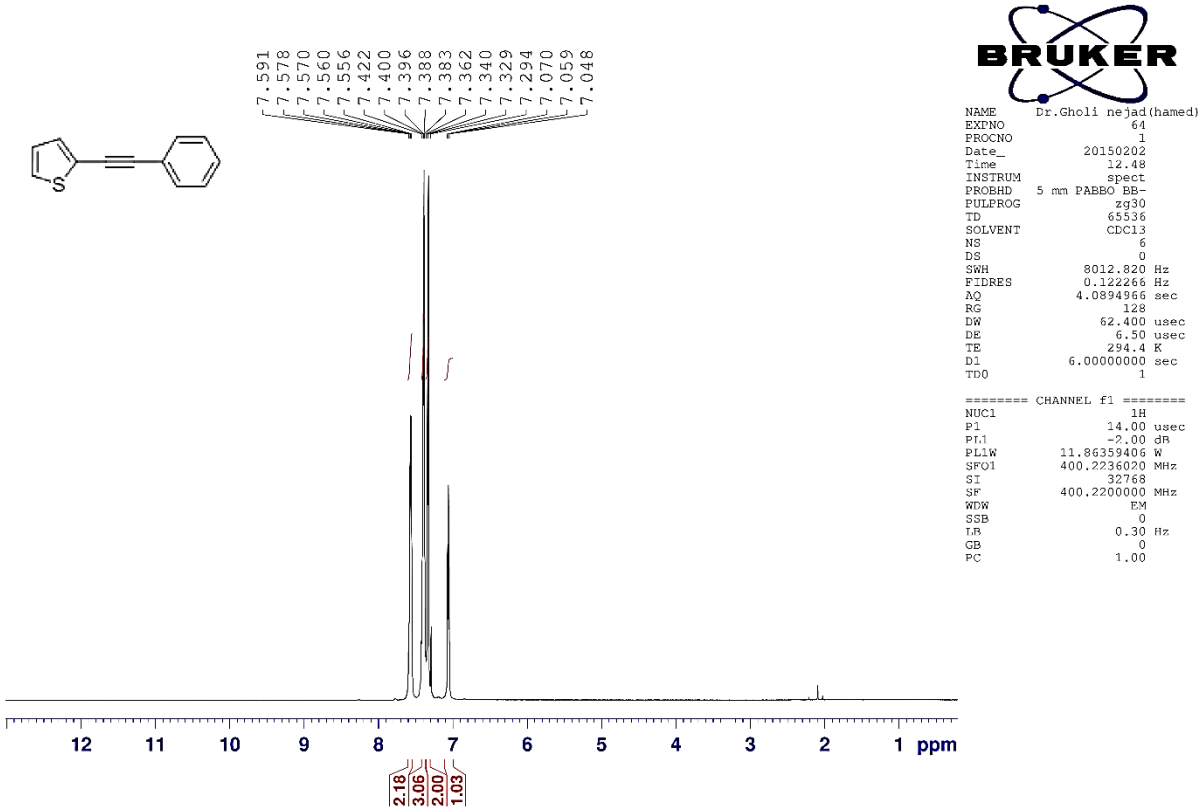
BRUKER

NAME	Dr.Gholi nejad(hamed)
EXPNO	61
PROCNO	1
Date_	20150202
Time	12.29
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	100
DS	0
SWH	25252.525 Hz
FIDRES	0.385323 Hz
AQ	1.2976629 sec
RG	2050
DW	19.800 usec
DE	6.50 usec
TE	294.5 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.00 usec
PL1	-0.90 dB
PL1W	42.02801895 W
SFO1	100.6479784 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	90.00 usec
PL2	-2.00 dB
PL12	14.16 dB
PL13	17.90 dB
PL2W	11.86359406 W
PL12W	0.28722104 W
PL13W	0.12139934 W
SFO2	400.2216009 MHz
SI	32768
SF	100.6353990 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

^{13} C NMR of 1-nitro-4-(phenylethynyl)benzene



FT-IR of 1-nitro-4-(phenylethynyl)benzene

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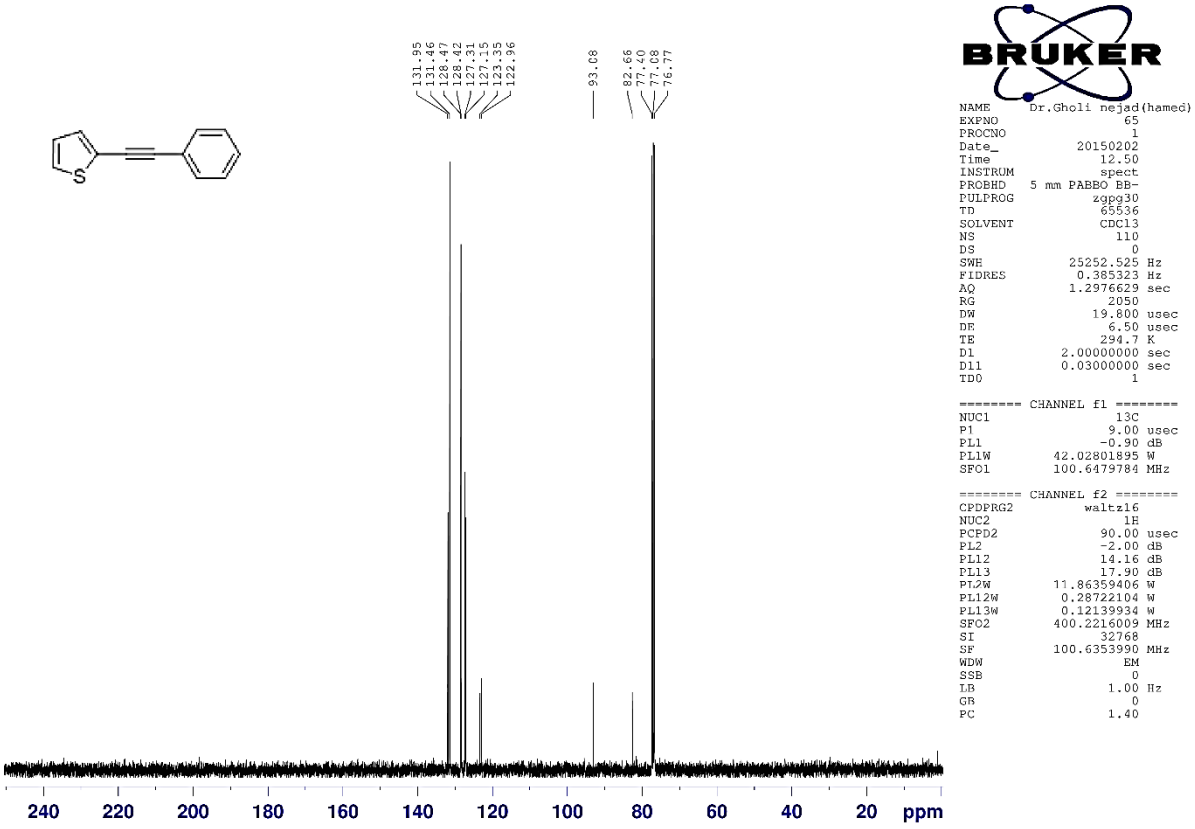
NAME        Dr.Gholi nejad(hamed)
EXPNO                         64
PROCNO                         1
Date_                   20150202
Time                       12.48
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                     zg30
TD                         65536
SOLVENT                    CDCl3
NS                             6
DS                             0
SWH                   8012.820 Hz
FIDRES                0.122266 Hz
AQ                    4.0894966 sec
RG                           128
DW                        62.400 usec
DE                         6.50 usec
TE                        294.4 K
D1                    6.00000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                          1H
P1                        14.00 usec
PL1                       -2.00 dB
PL1W                11.86359406 W
SFO1                400.2236020 MHz
SI                         32768
SF                  400.2200000 MHz
WDW                           EM
SSB                            0
LB                         0.30 Hz
GB                             0
PC                         1.00
```

^{1}H NMR of 2-(phenylethynyl)thiophene



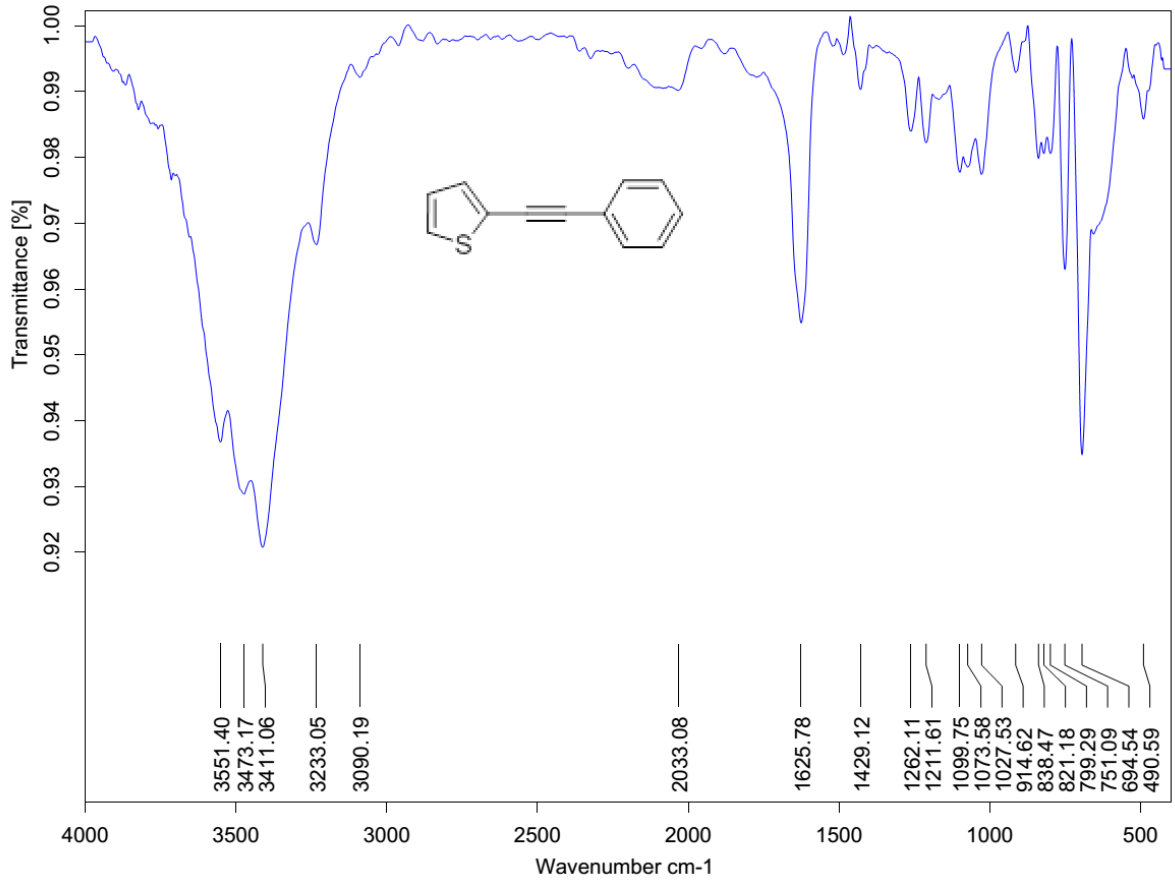
BRUKER

```
NAME          Dr.Gholi nejad(hamed)
EXPNO                           65
PROCNO                           1
Date_                     20150202
Time                         12.50
INSTRUM                      spect
PROBHD     5 mm PABBO BB-
PULPROG                   zgpg30
TD                            65536
SOLVENT                     CDCl3
NS                              110
DS                                0
SWH                   25252.525 Hz
FIDRES                 0.385323 Hz
AQ                    1.2976629 sec
RG                           2050
DW                       19.800 usec
DE                        6.50 usec
TE                         294.7 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                              1

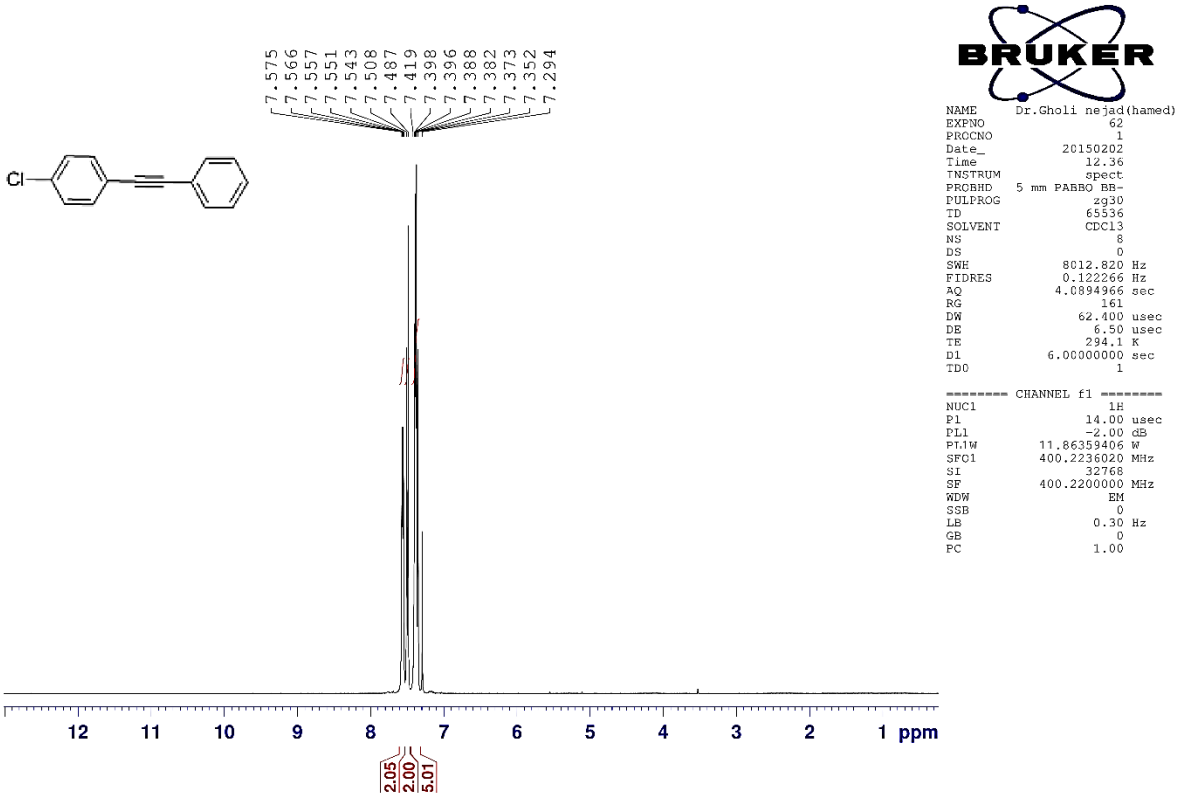
======== CHANNEL f1 ========
NUC1                          13C
P1                         9.00 usec
PL1                       -0.90 dB
PL1W                42.02801895 W
SFO1               100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                          1H
PCPD2                     90.00 usec
PL2                       -2.00 dB
PL12                      14.16 dB
PL13                      17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2               400.2216009 MHz
SI                           32768
SF                 100.6353990 MHz
WDW                            EM
SSB                             0
LB                           1.00 Hz
GB                              0
PC                           1.40
```

^{13}C NMR of 2-(phenylethynyl)thiophene



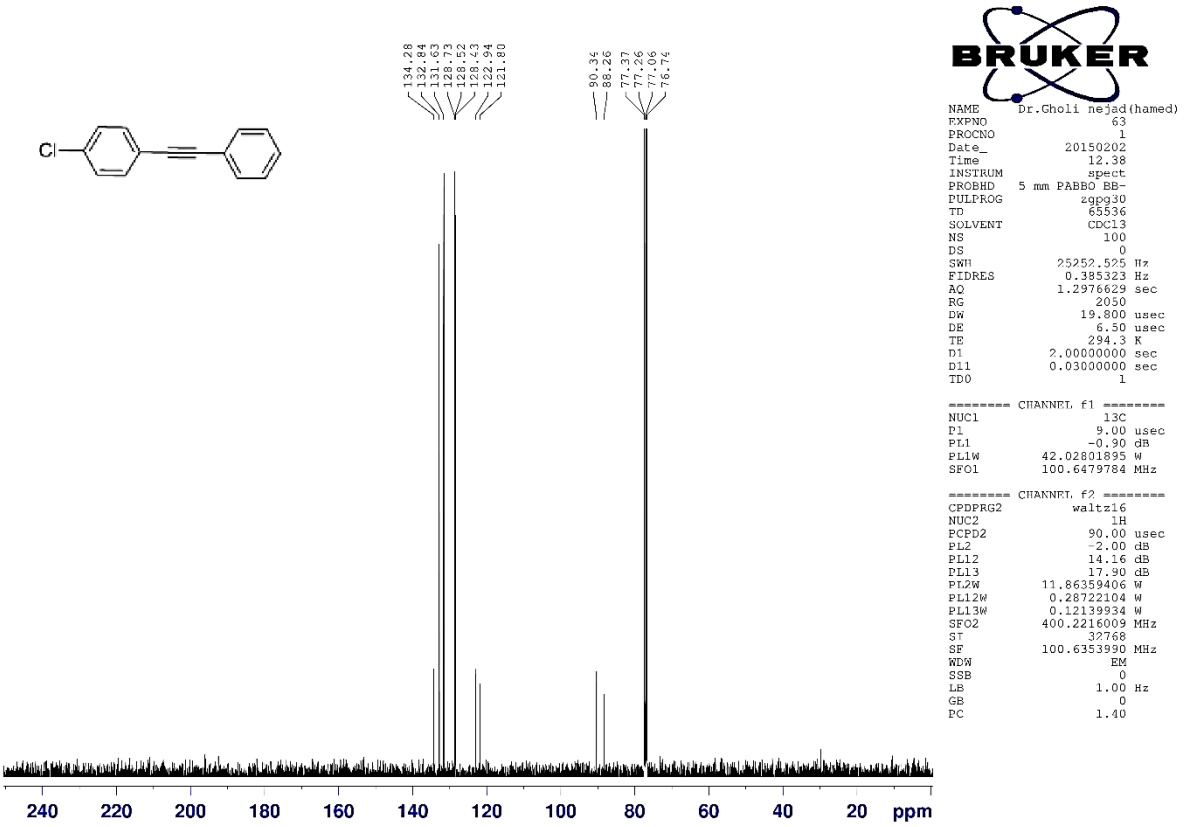
FT-IR of 2-(phenylethynyl)thiophene



BRUKER

NAME	Dr.Gholi nejad(hamed)
EXPNO	62
PROCNO	1
Date_	20150202
Time	12.36
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	8012.820 Hz
FIDRES	0.122266 Hz
AQ	4.0894966 sec
RG	161
DW	62.400 usec
DE	6.50 usec
TE	294.1 K
D1	6.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.00 usec
PL1	-2.00 dB
PL1W	11.86359406 W
SFO1	400.2236020 MHz
SI	32768
SF	400.2200000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

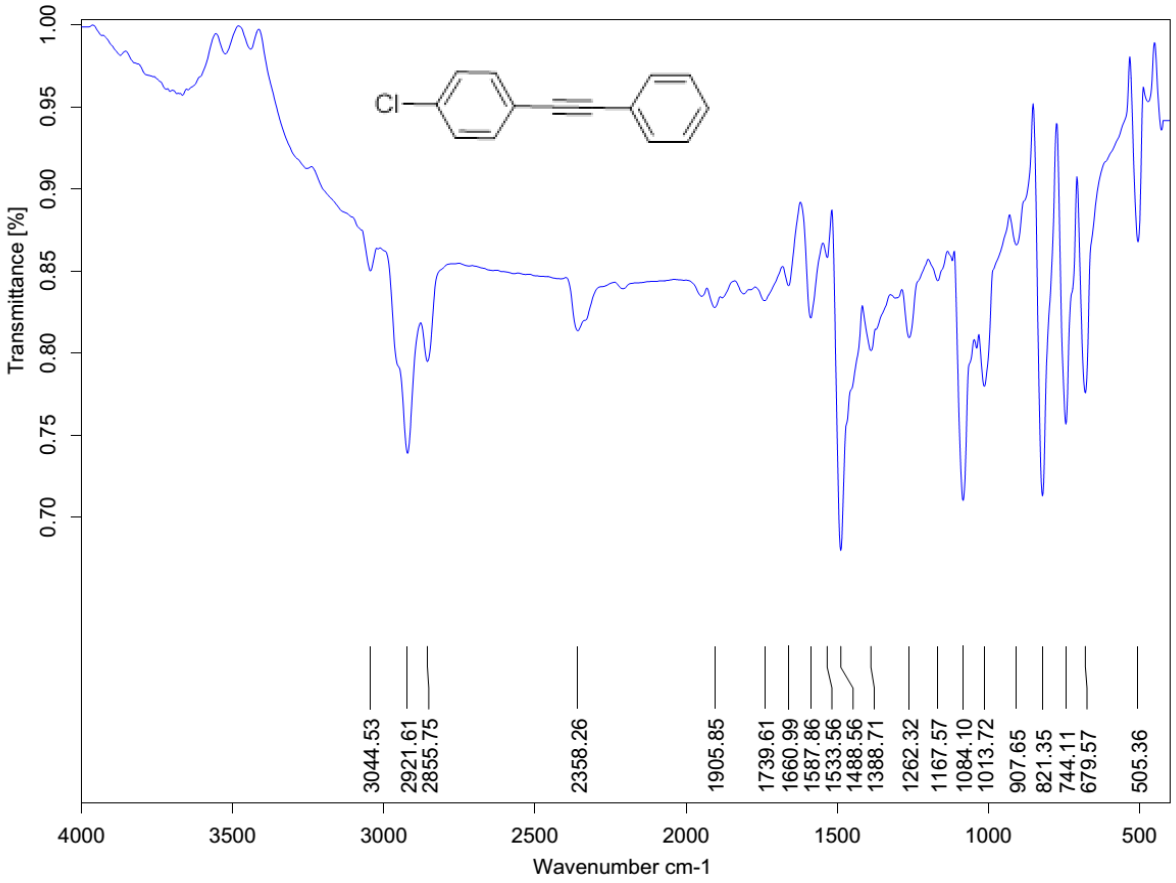
^{1}H NMR of 1-chloro-4-(phenylethynyl)benzene



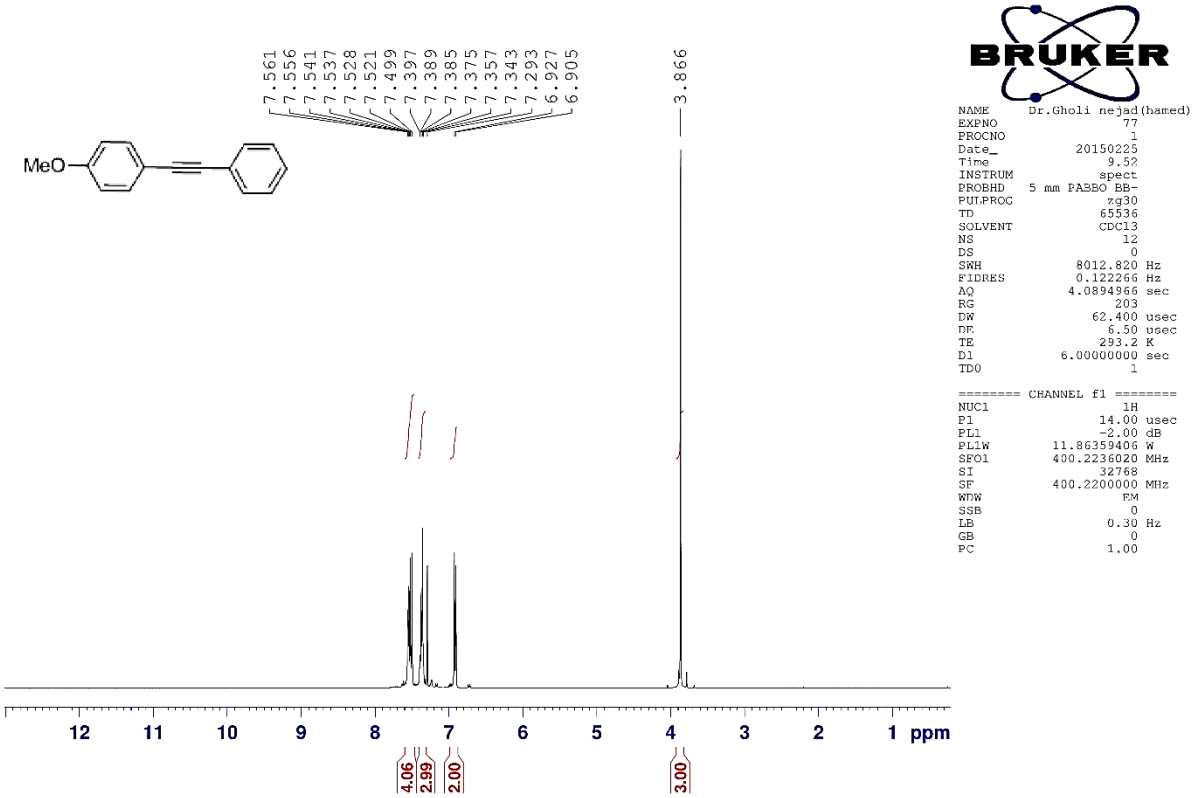
BRUKER

NAME	Dr.Gholi nejad(hamed)
EXPNO	63
PROCNO	1
Date_	20150202
Time	12.38
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	100
DS	0
SWH	25252.525 Hz
FIDRES	0.385323 Hz
AQ	1.2976629 sec
RG	2050
DW	19.800 usec
DE	6.50 usec
TE	294.3 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.00 usec
PL1	-0.90 dB
PL1W	42.02801895 W
SFO1	100.6479784 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	90.00 usec
PL2	-2.00 dB
PL12	14.16 dB
PL13	17.90 dB
PL2W	11.86359406 W
PL12W	0.28722104 W
PL13W	0.12139934 W
SFO2	400.2216009 MHz
ST	32768
SF	100.6353990 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

^{13}C NMR of 1-chloro-4-(phenylethynyl)benzene



FT-IR of 1-chloro-4-(phenylethynyl)benzene

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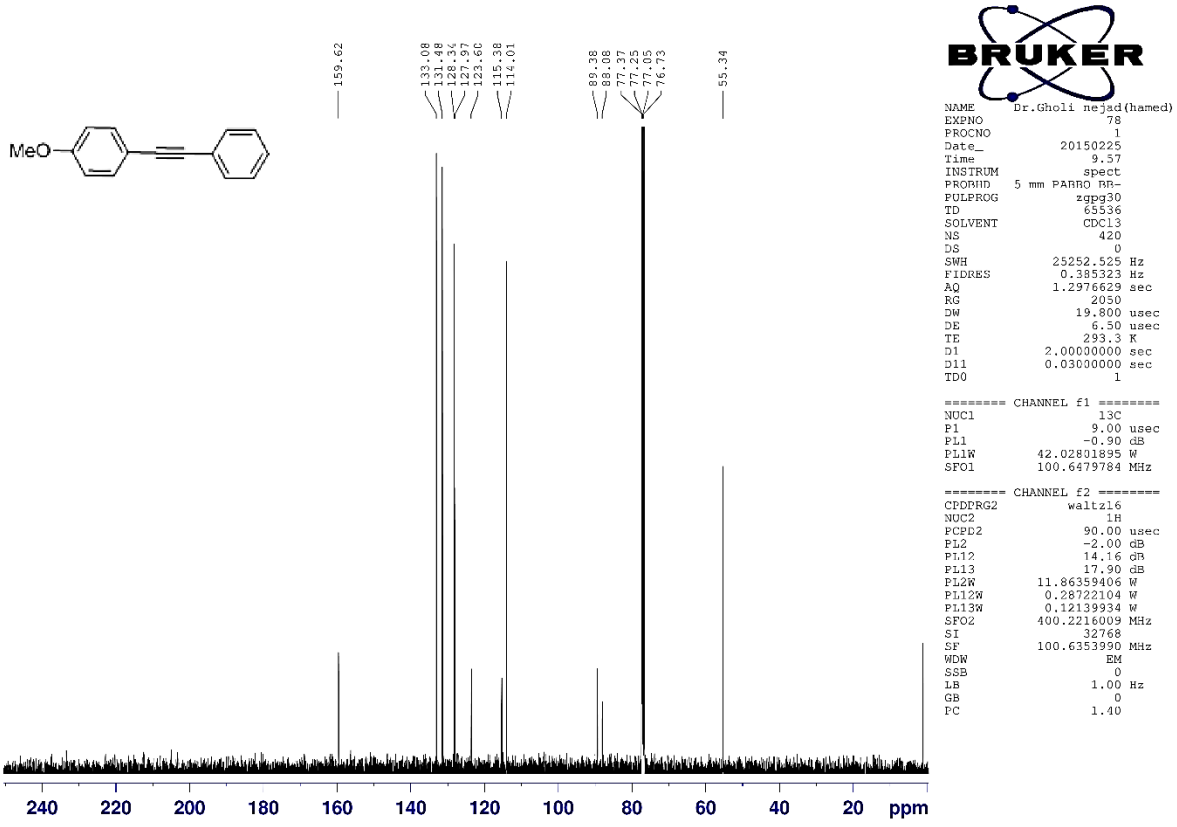
NAME          Dr.Gholi nejad(hamed)
EXPNO                          77
PROCNO                          1
Date_                    20150225
Time                         9.52
INSTRUM                     spect
PROBHD       5 mm PABBO BB-
PULPROG                      zg30
TD                          65536
SOLVENT                     CDCl3
NS                             12
DS                              0
SWH                    8012.820 Hz
FIDRES                 0.122266 Hz
AQ                     4.0894966 sec
RG                            203
DW                      62.400 usec
DE                       6.50 usec
TE                       293.2 K
D1                  6.00000000 sec
TD0                             1

======== CHANNEL f1 ========
NUC1                           1H
P1                      14.00 usec
PL1                      -2.00 dB
PLW                 11.86359406 W
SFO1               400.2236020 MHz
SI                          32768
SF                 400.2200000 MHz
WDW                            EM
SSB                             0
LB                       0.30 Hz
GB                              0
PC                           1.00
```

[1]H NMR of 1-methoxy-4-(phenylethynyl)benzene

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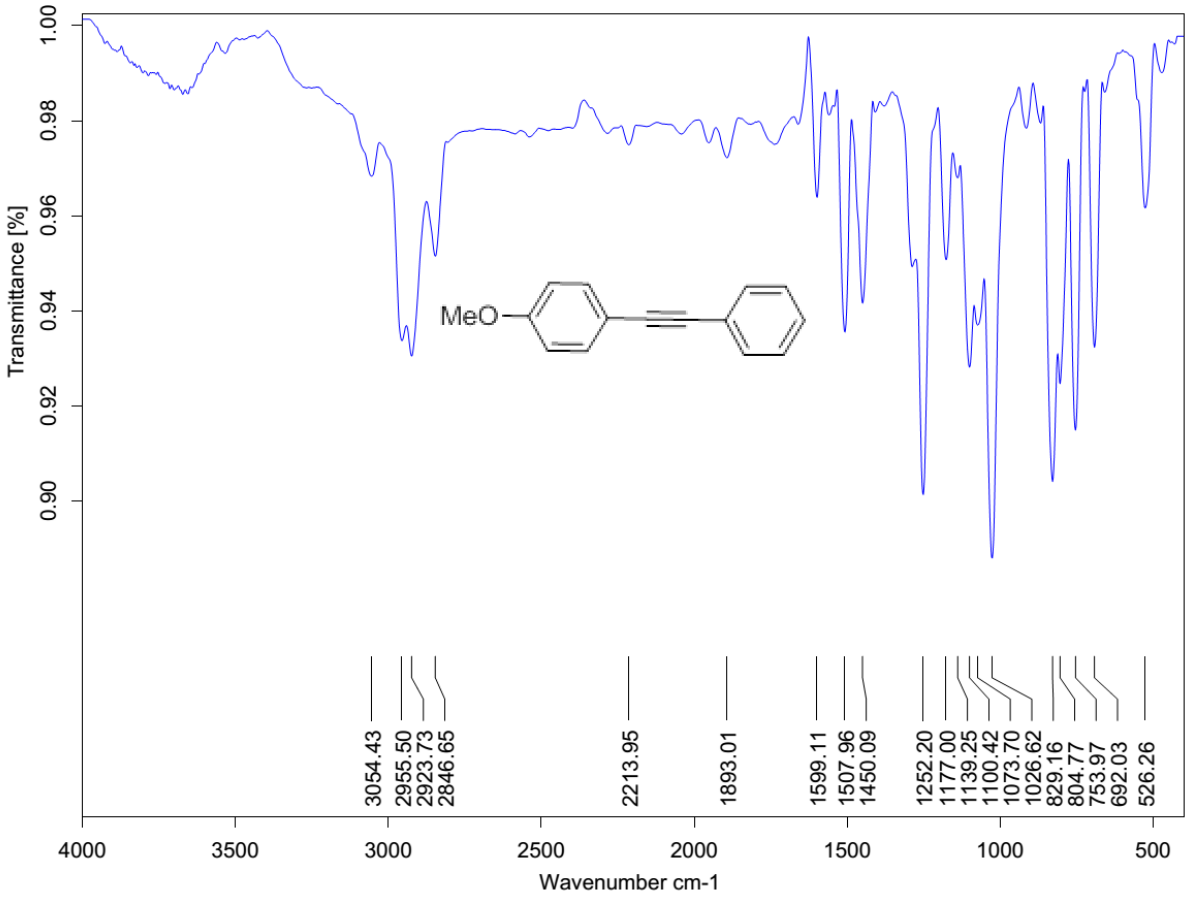
NAME          Dr.Gholi nejad(hamed)
EXPNO                          78
PROCNO                          1
Date_                    20150225
Time                         9.57
INSTRUM                     spect
PROBHD       5 mm PABBO BB-
PULPROG                   zgpg30
TD                         65536
SOLVENT                    CDCl3
NS                           420
DS                             0
SWH                    25252.525 Hz
FIDRES                 0.385323 Hz
AQ                     1.2976629 sec
RG                          2050
DW                        19.800 usec
DE                         6.50 usec
TE                        293.3 K
D1                     2.00000000 sec
D11                    0.03000000 sec
TD0                            1

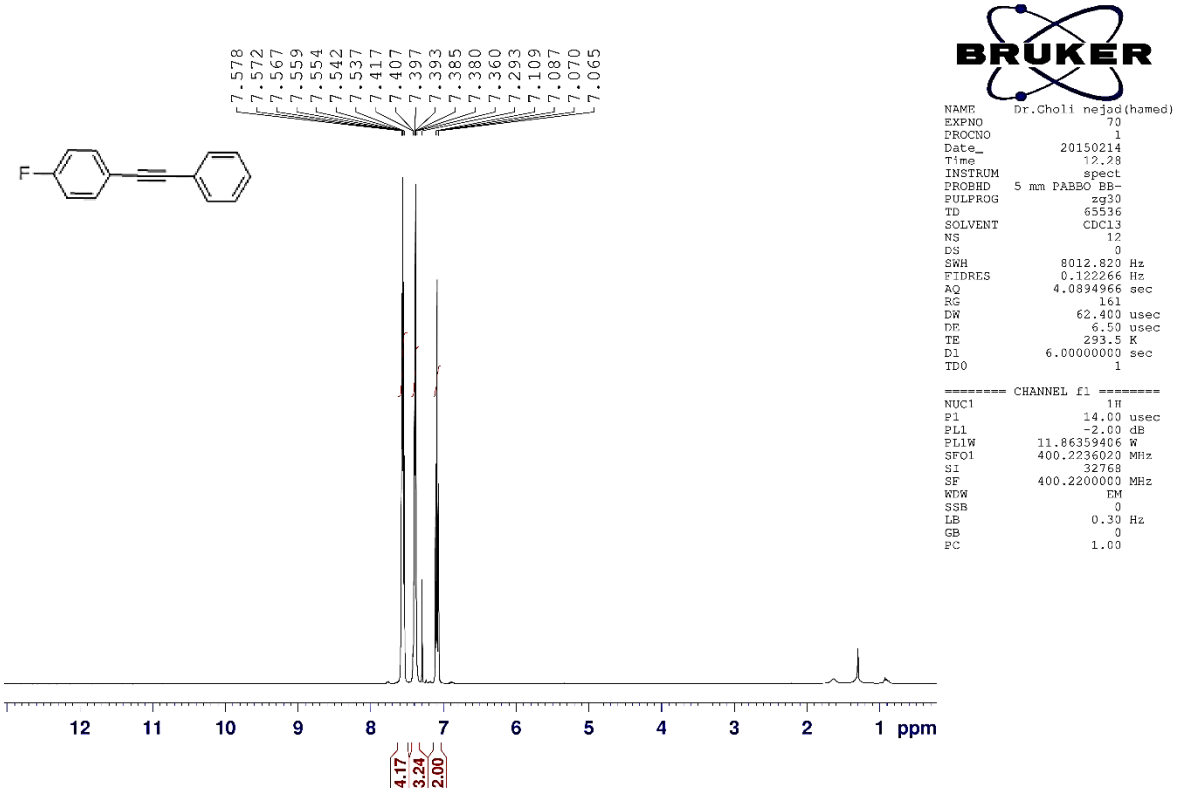
======== CHANNEL f1 ========
NUC1                         13C
P1                         9.00 usec
PL1                       -0.90 dB
PL1W                42.02801895 W
SFO1                100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                         1H
PCPD2                     90.00 usec
PL2                       -2.00 dB
PL12                      14.16 dB
PL13                      17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2                400.2216009 MHz
SI                         32768
SF                  100.6353990 MHz
WDW                           EM
SSB                            0
LB                         1.00 Hz
GB                             0
PC                         1.40
```

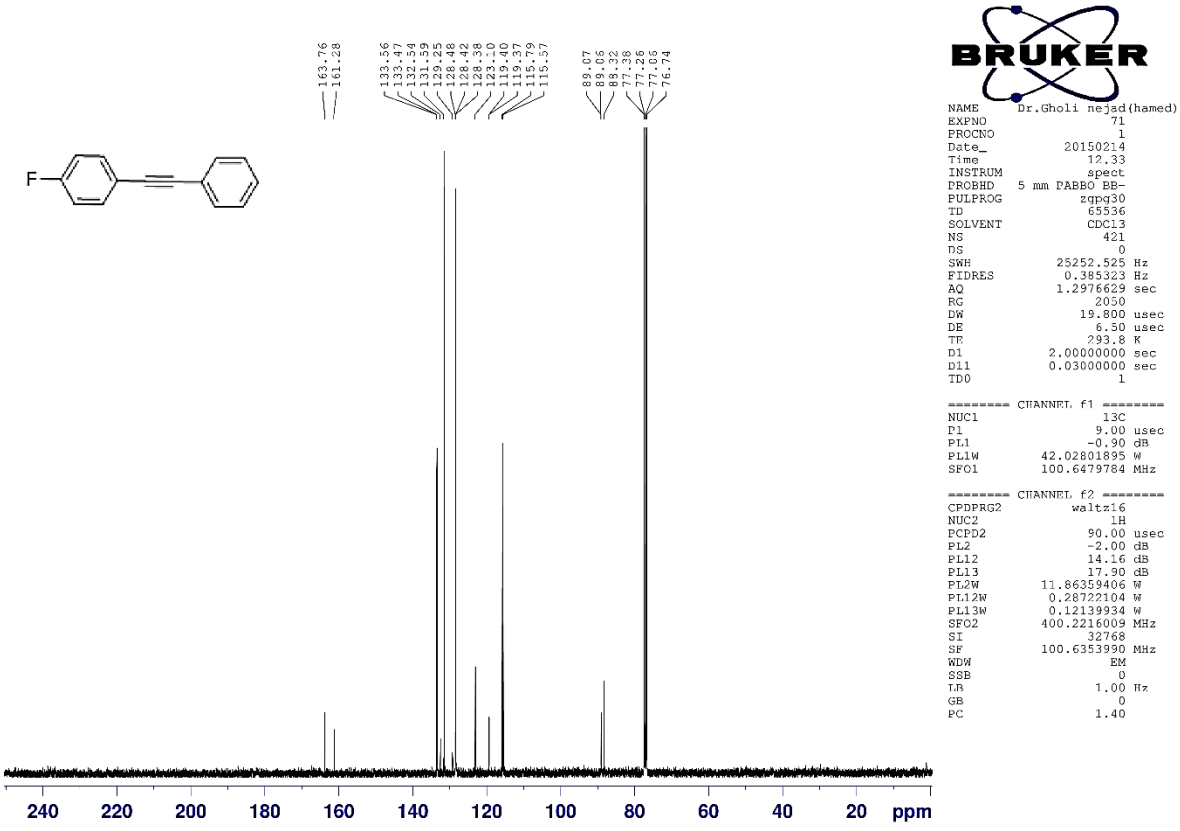
^{13}C NMR of 1-methoxy-4-(phenylethynyl)benzene



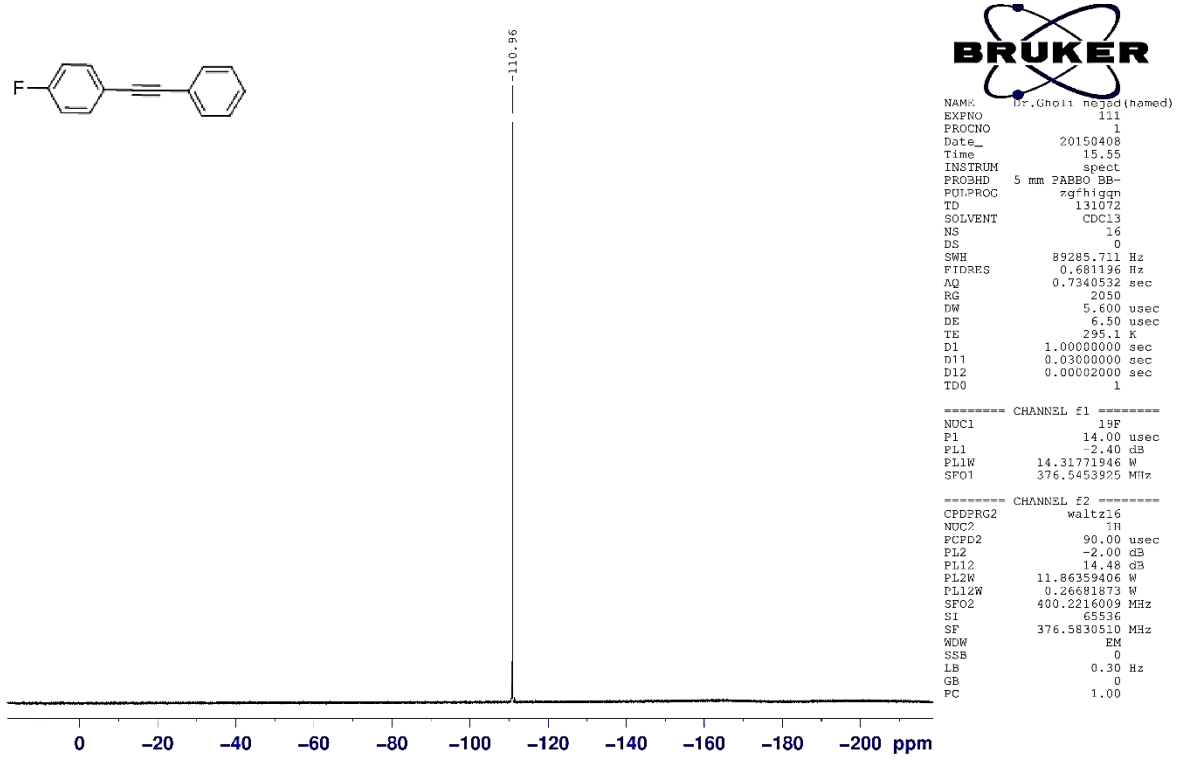
FT-IR of 1-methoxy-4-(phenylethynyl)benzene



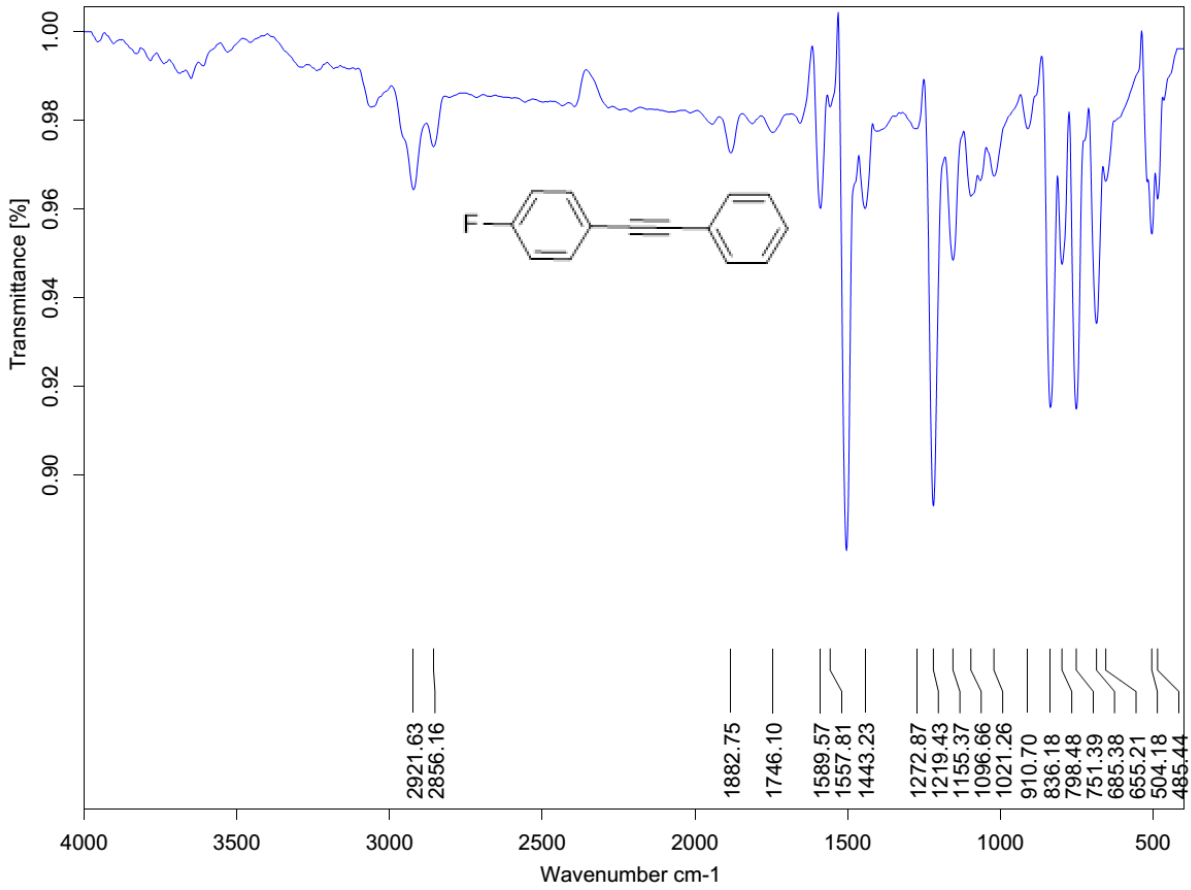
^{1}H NMR of 1-fluoro-4-(phenylethynyl)benzene



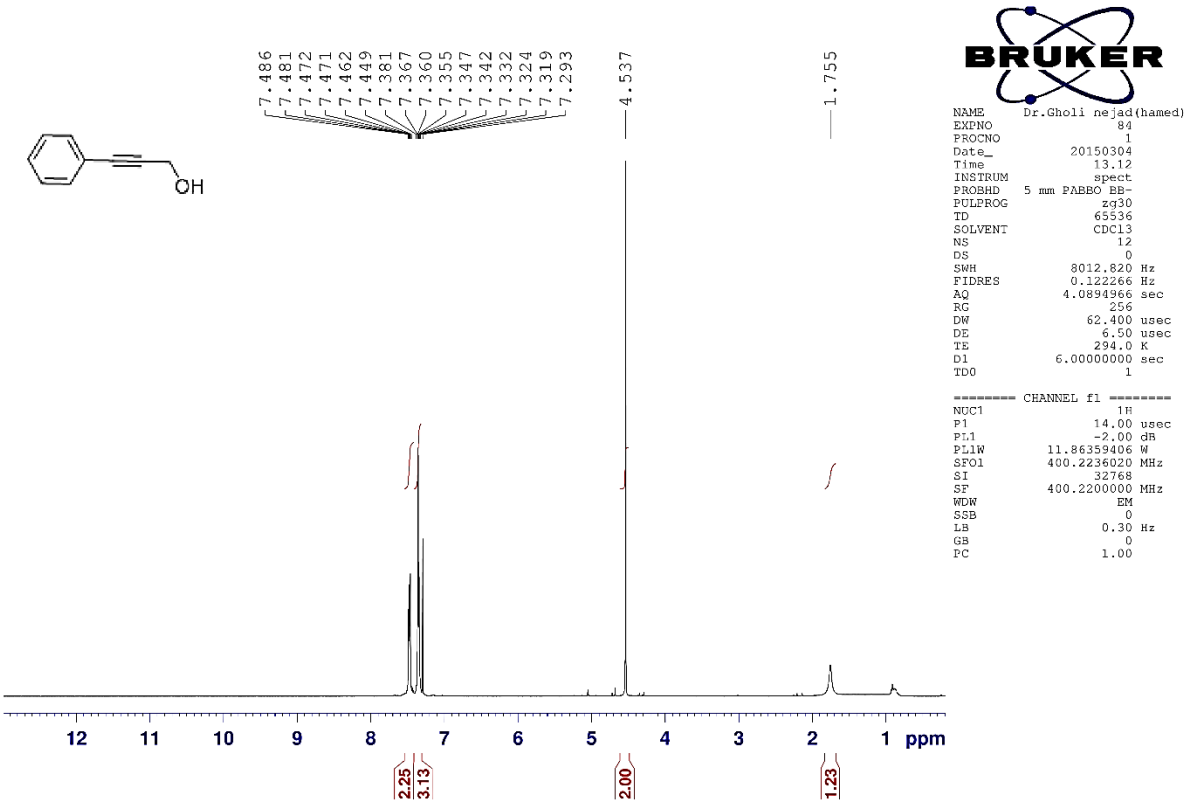
^{13}C NMR of 1-fluoro-4-(phenylethynyl)benzene



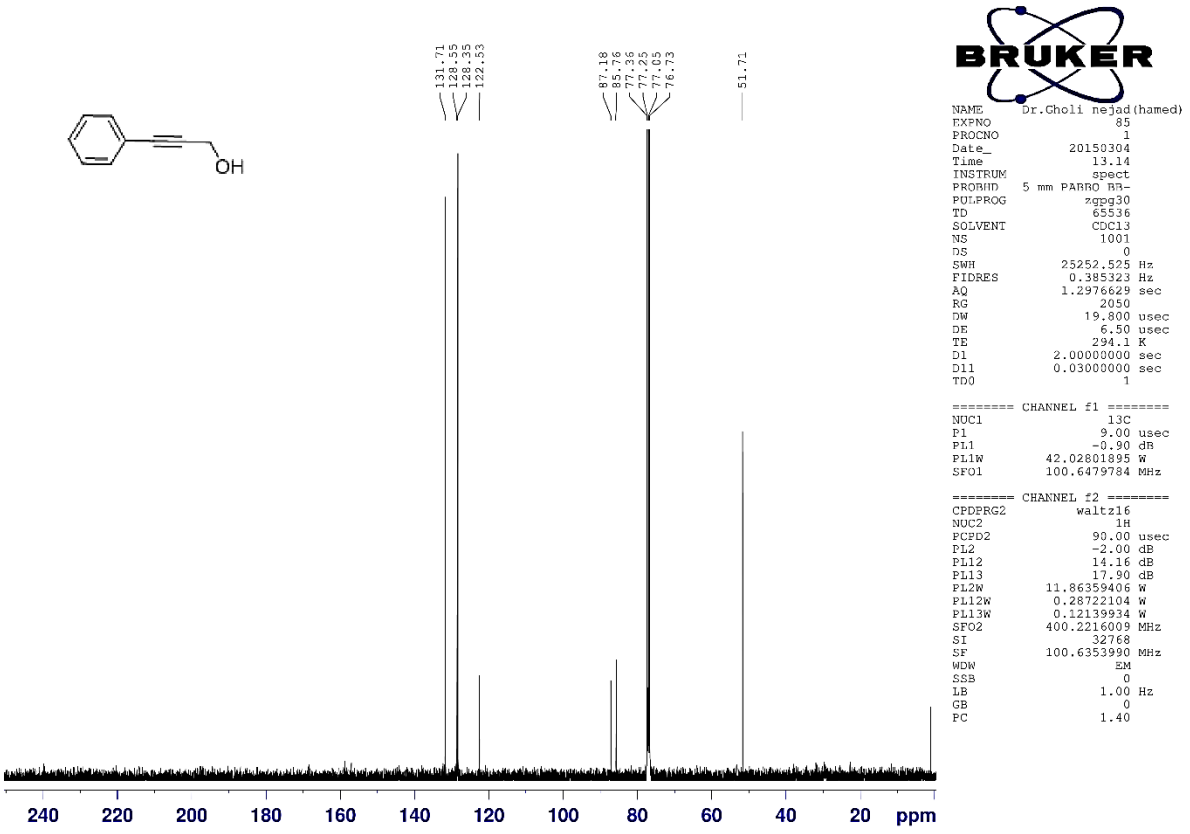
^{19}F NMR of 1-fluoro-4-(phenylethynyl)benzene



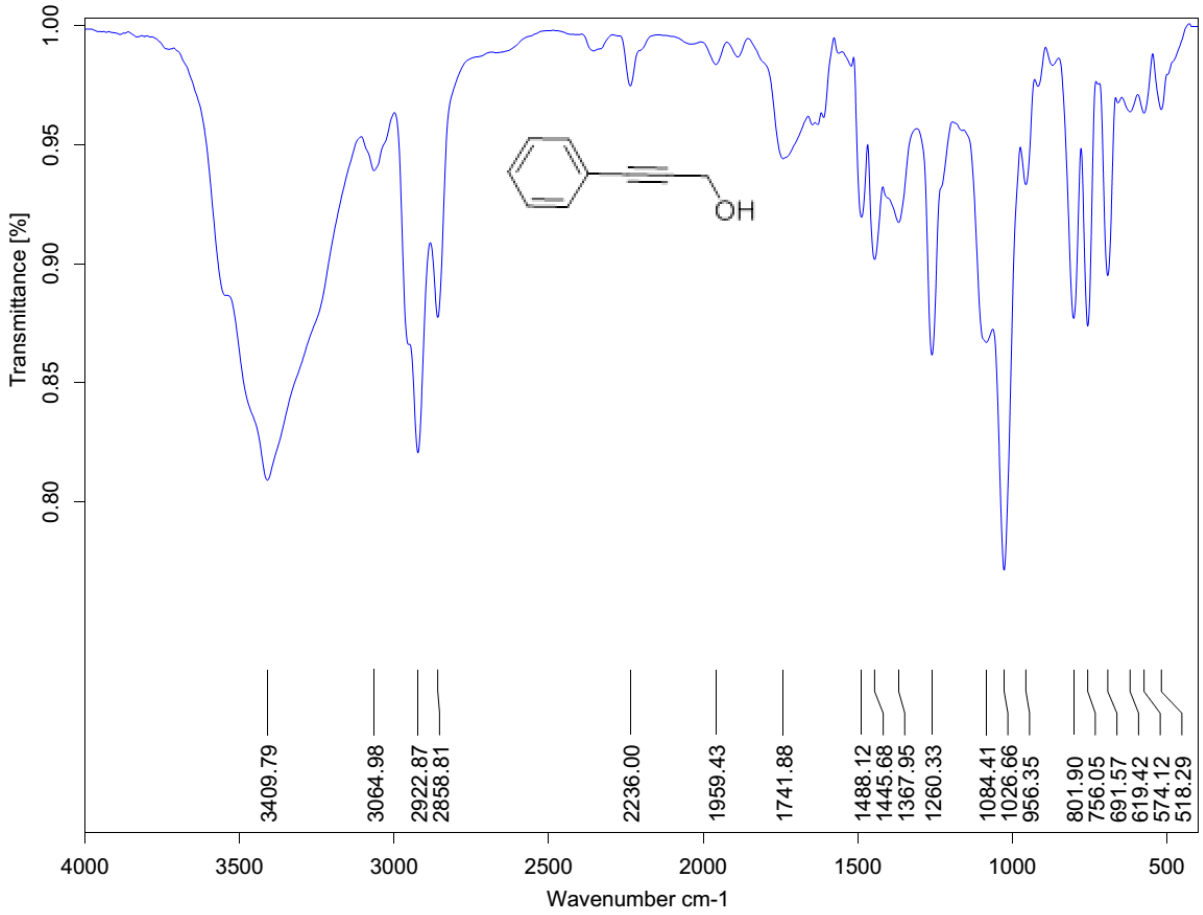
FT-IR of 1-fluoro-4-(phenylethynyl)benzene



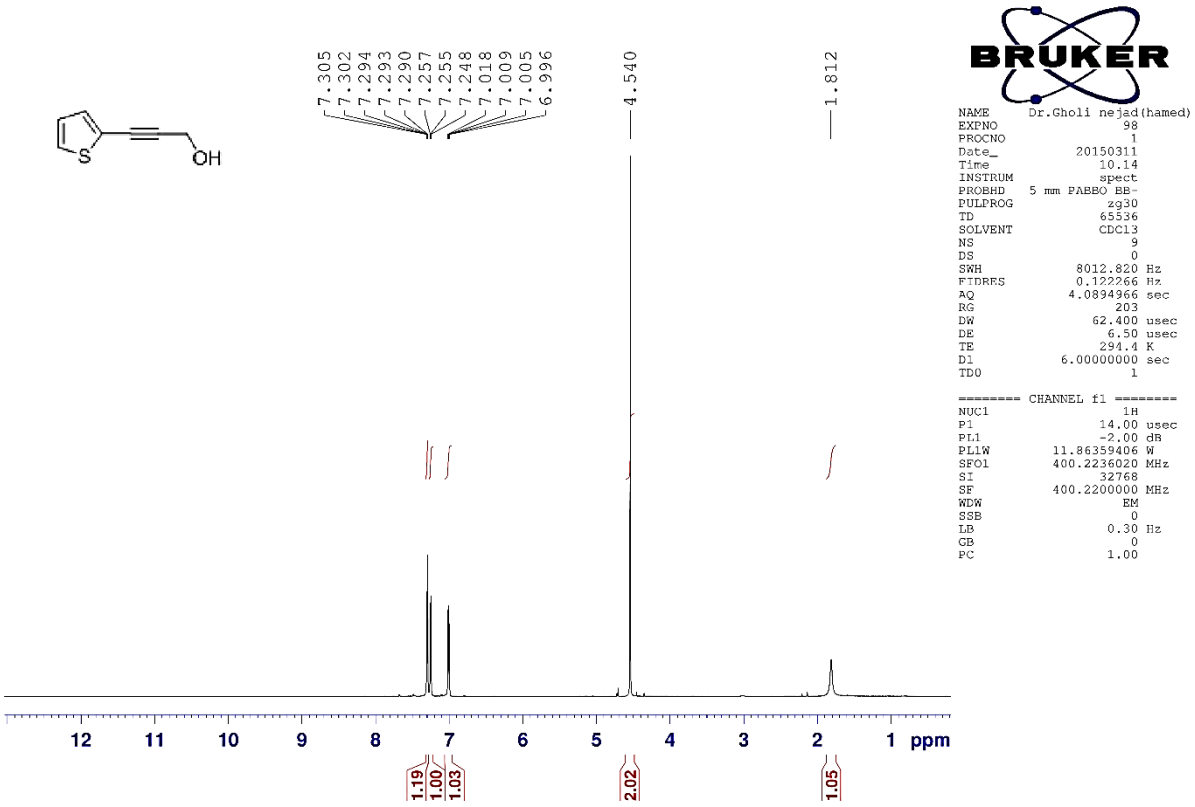
^{1}H NMR of 3-phenylprop-2-yn-1-ol



^{13}C NMR of 3-phenylprop-2-yn-1-ol



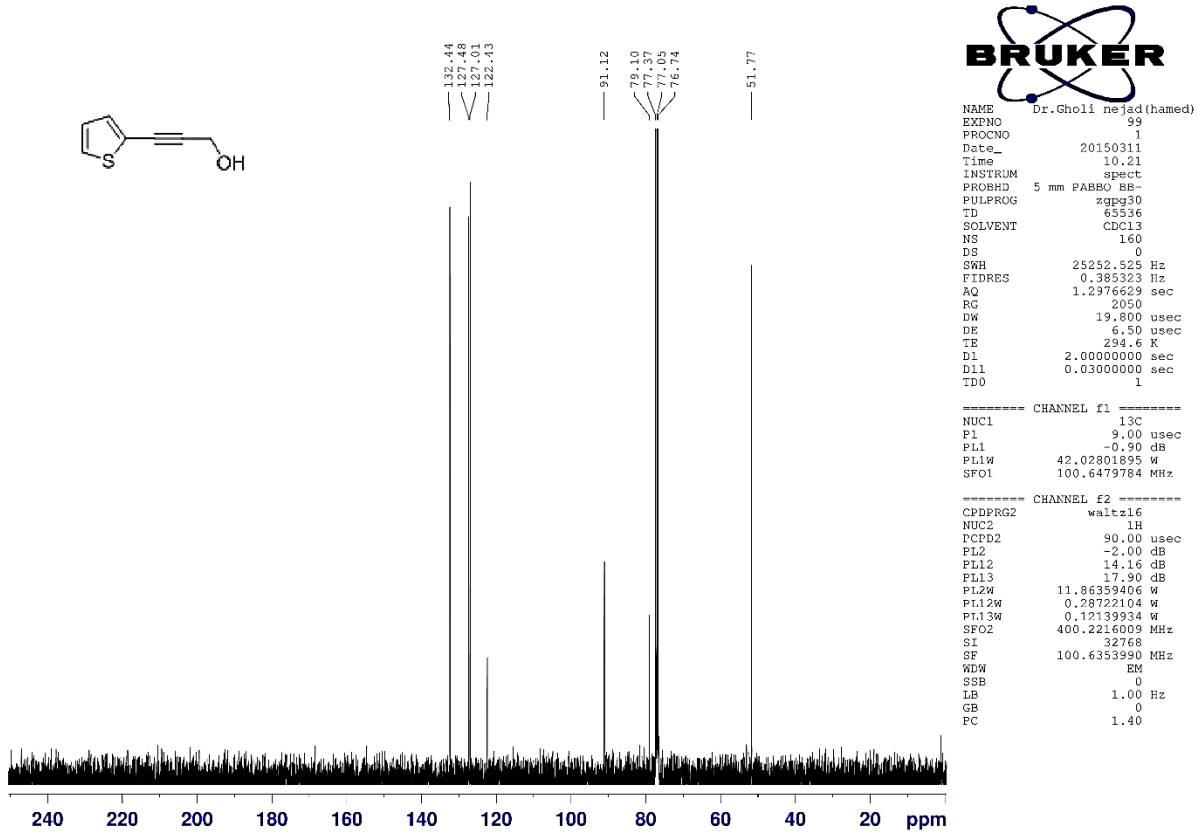
FT-IR of 3-phenylprop-2-yn-1-ol



BRUKER

NAME	Dr.Gholi nejad(hamed)
EXPNO	98
PROCNO	1
Date_	20150311
Time	10.14
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	9
DS	0
SWH	8012.820 Hz
FIDRES	0.122266 Hz
AQ	4.0894966 sec
RG	203
DW	62.400 usec
DE	6.50 usec
TE	294.4 K
D1	6.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.00 usec
PL1	-2.00 dB
PL1W	11.86359406 W
SFO1	400.2236020 MHz
SI	32768
SF	400.2200000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

^{1}H NMR of 3-(thiophen-2-yl)prop-2-yn-1-ol

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NAME        Dr.Gholi nejad(hamed)
EXPNO                         99
PROCNO                         1
Date_                   20150311
Time                       10.21
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                  zgpg30
TD                        65536
SOLVENT                   CDCl3
NS                          160
DS                            0
SWH                   25252.525 Hz
FIDRES                 0.385323 Hz
AQ                     1.2976629 sec
RG                         2050
DW                       19.800 usec
DE                        6.50 usec
TE                       294.6 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                         13C
P1                         9.00 usec
PL1                       -0.90 dB
PL1W                42.02801895 W
SFO1               100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                         1H
PCPD2                     90.00 usec
PL2                       -2.00 dB
PL12                      14.16 dB
PL13                      17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2               400.2216009 MHz
SI                        32768
SF                 100.6353990 MHz
WDW                          EM
SSB                           0
LB                         1.00 Hz
GB                            0
PC                         1.40
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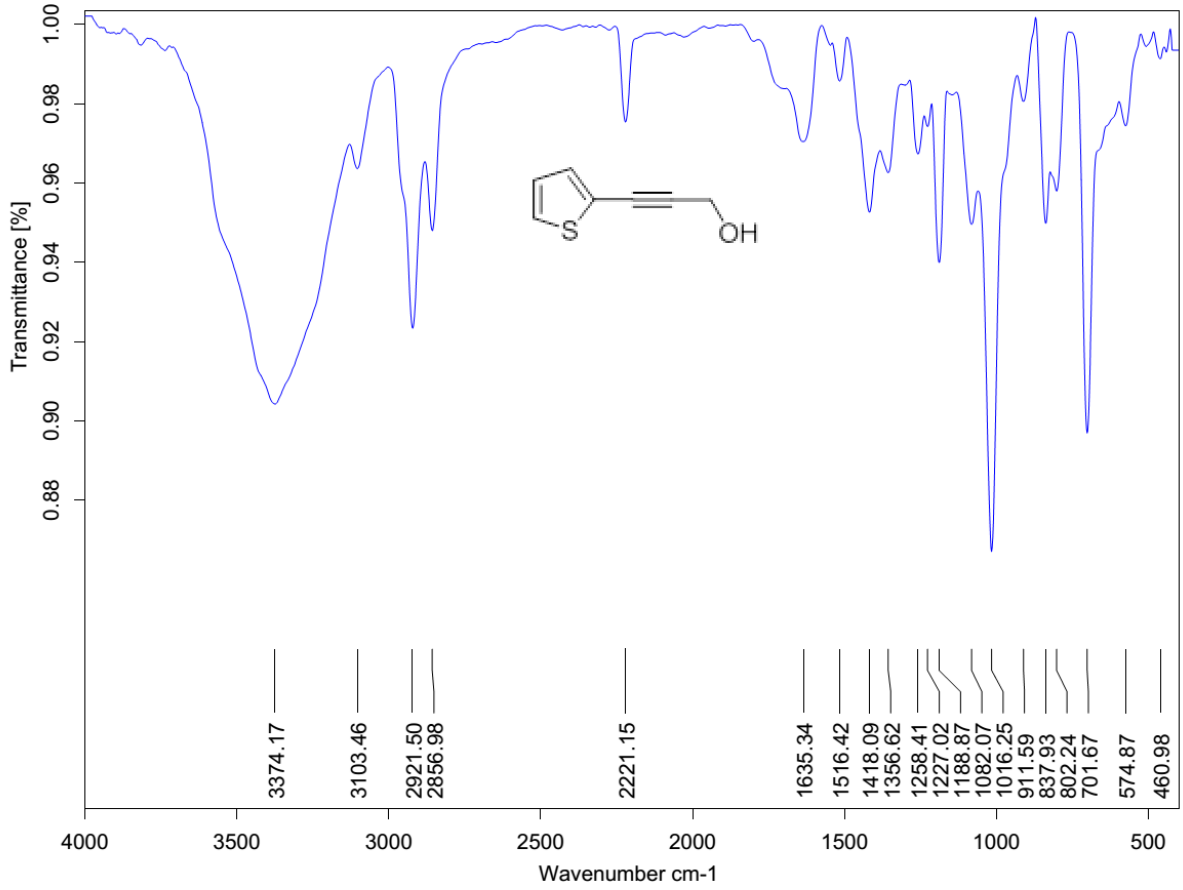
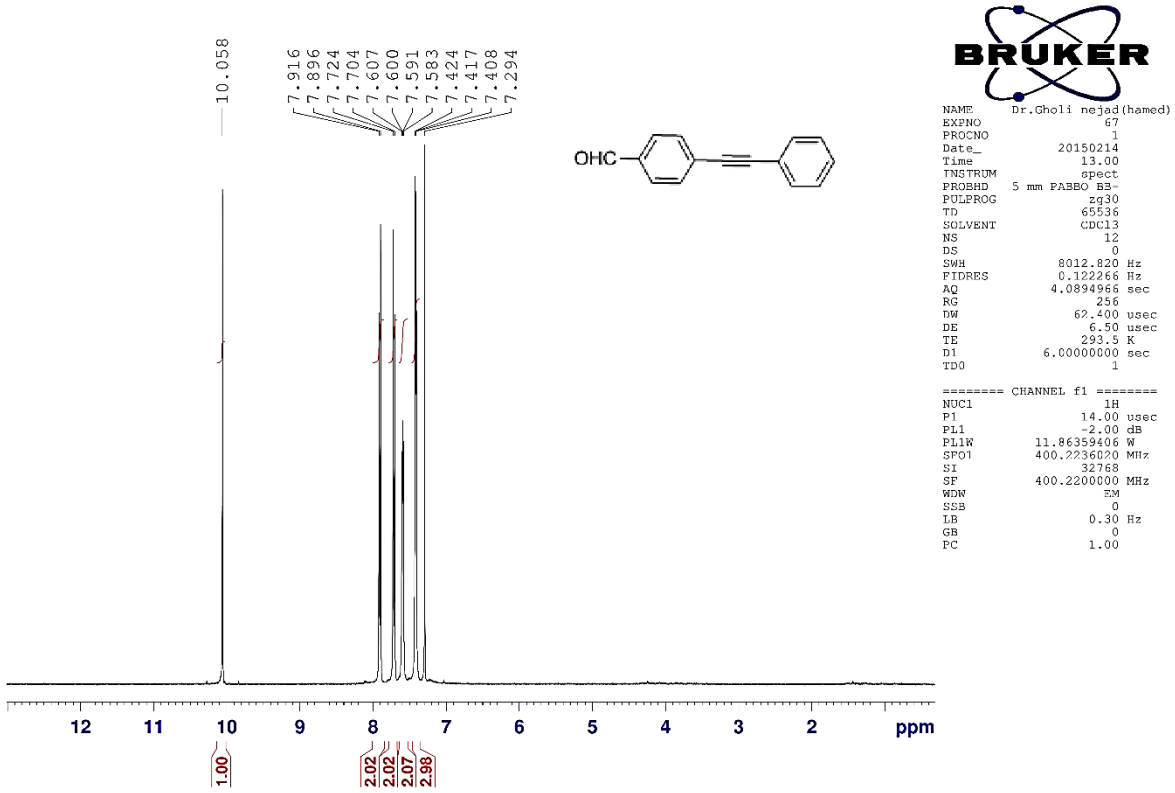
^{13}C NMR of 3-(thiophen-2-yl)prop-2-yn-1-ol



FT-IR of 3-(thiophen-2-yl)prop-2-yn-1-ol

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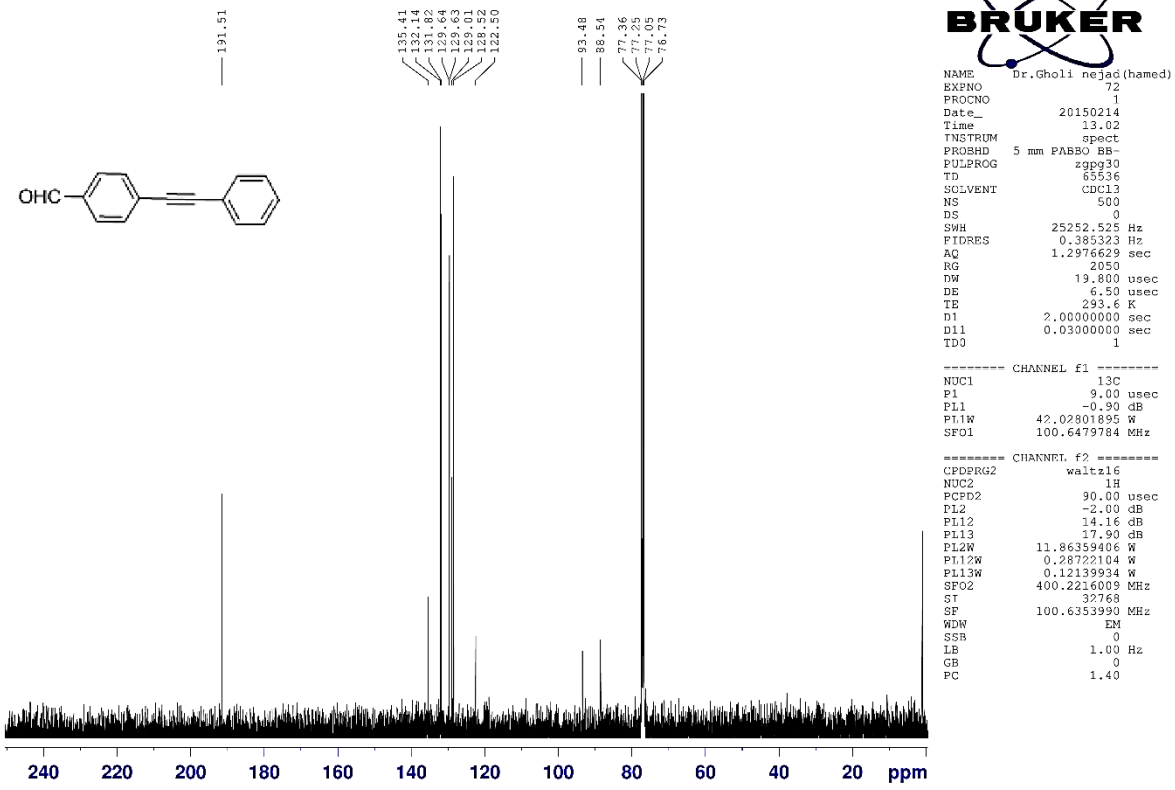
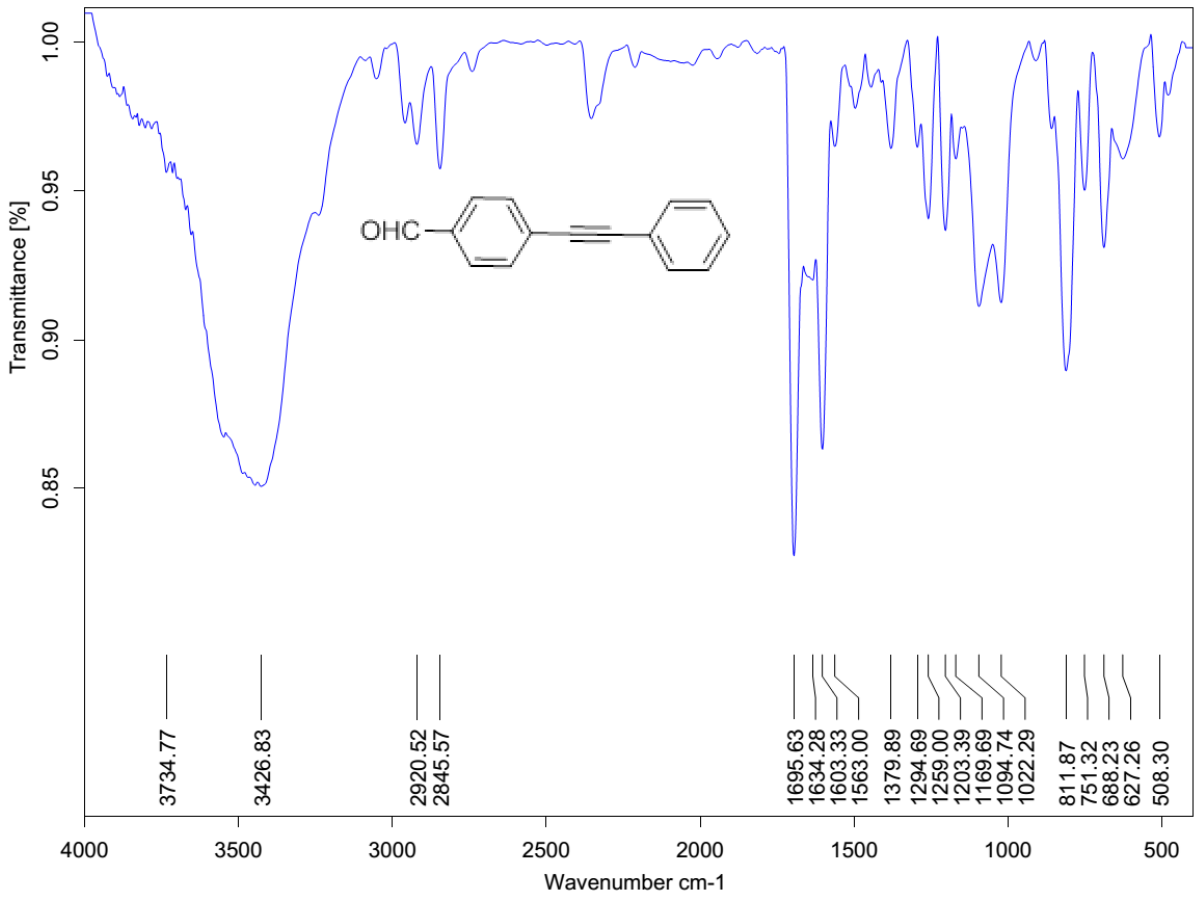
NAME          Dr.Gholi nejad(hamed)
EXPNO                   67
PROCNO                   1
Date_              20150214
Time                 13.00
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       12
DS                        0
SWH                8012.820 Hz
FIDRES             0.122266 Hz
AQ                 4.0894966 sec
RG                       256
DW                  62.400 usec
DE                   6.50 usec
TE                  293.5 K
D1                6.00000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                     1H
P1                  14.00 usec
PL1                 -2.00 dB
PL1W           11.86359406 W
SFO1           400.2236020 MHz
SI                    32768
SF             400.2200000 MHz
WDW                      EM
SSB                       0
LB                   0.30 Hz
GB                        0
PC                   1.00
```

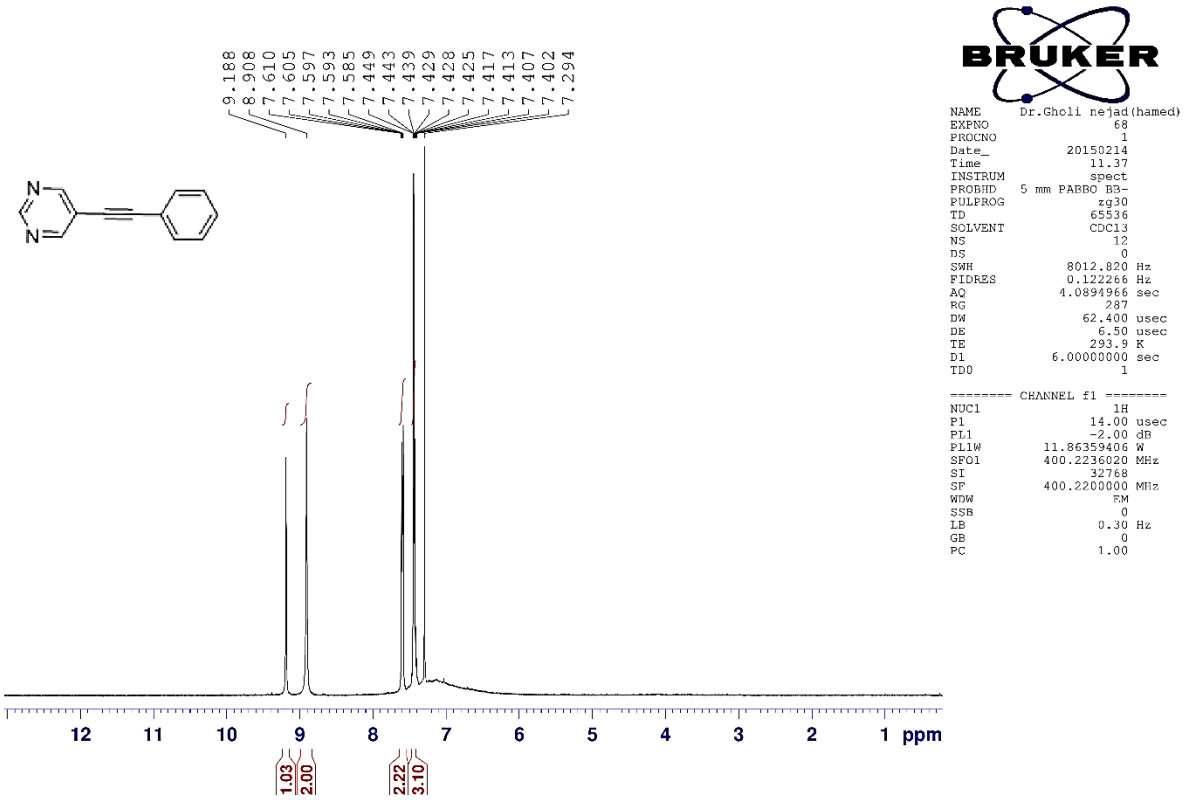
^{1}H NMR of 4-(phenylethynyl)benzaldehyde



^{13}C NMR of 4-(phenylethynyl)benzaldehyde



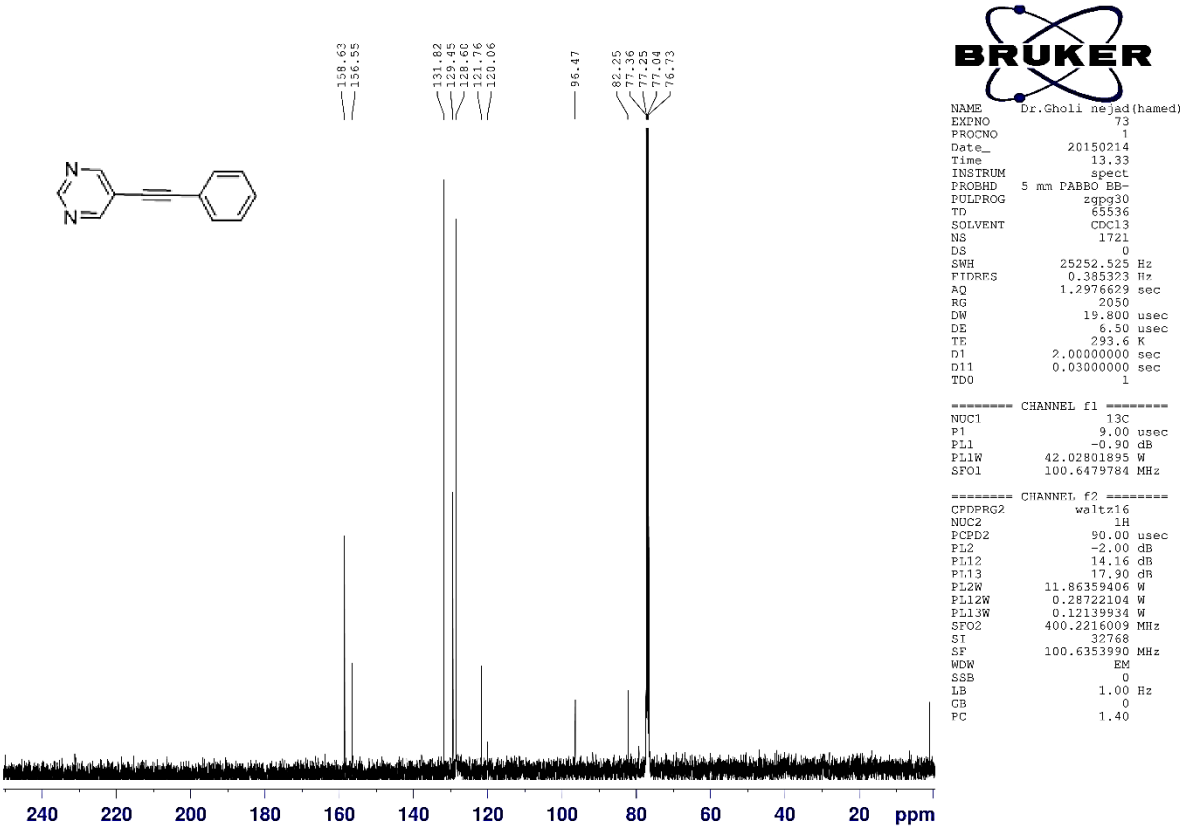
FT-IR of 4-(phenylethynyl)benzaldehyde




```
NAME        Dr.Gholi nejad(hamed)
EXPNO                         68
PROCNO                         1
Date_                   20150214
Time                       11.37
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                     zg30
TD                         65536
SOLVENT                    CDCl3
NS                            12
DS                             0
SWH                    8012.820 Hz
FIDRES                 0.122266 Hz
AQ                     4.0894966 sec
RG                           287
DW                        62.400 usec
DE                         6.50 usec
TE                        293.9 K
D1                     6.00000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                          1H
P1                        14.00 usec
PL1                       -2.00 dB
PL1W                11.86359406 W
SFO1                400.2236020 MHz
SI                         32768
SF                  400.2200000 MHz
WDW                           EM
SSB                            0
LB                         0.30 Hz
GB                             0
PC                          1.00
```

^{1}H NMR of 5-(phenylethynyl)pyrimidine

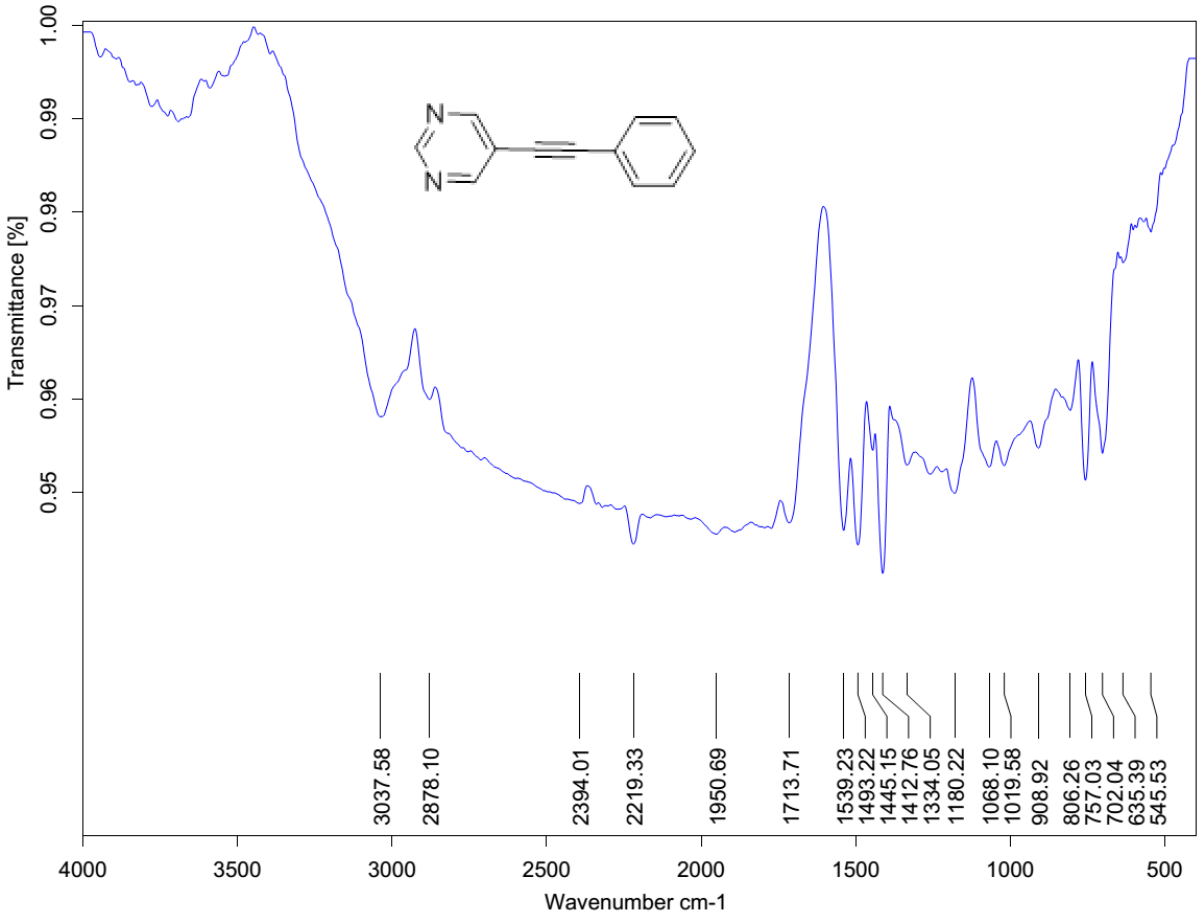



```
NAME          Dr.Gholi nejad(hamed)
EXPNO                           73
PROCNO                           1
Date_                     20150214
Time                         13.33
INSTRUM                      spect
PROBHD    5 mm PABBO BB-
PULPROG                   zgpg30
TD                             65536
SOLVENT                      CDCl3
NS                              1721
DS                                 0
SWH                    25252.525 Hz
FIDRES                   0.385323 Hz
AQ                       1.2976629 sec
RG                              2050
DW                         19.800 usec
DE                          6.50 usec
TE                           293.6 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                              1

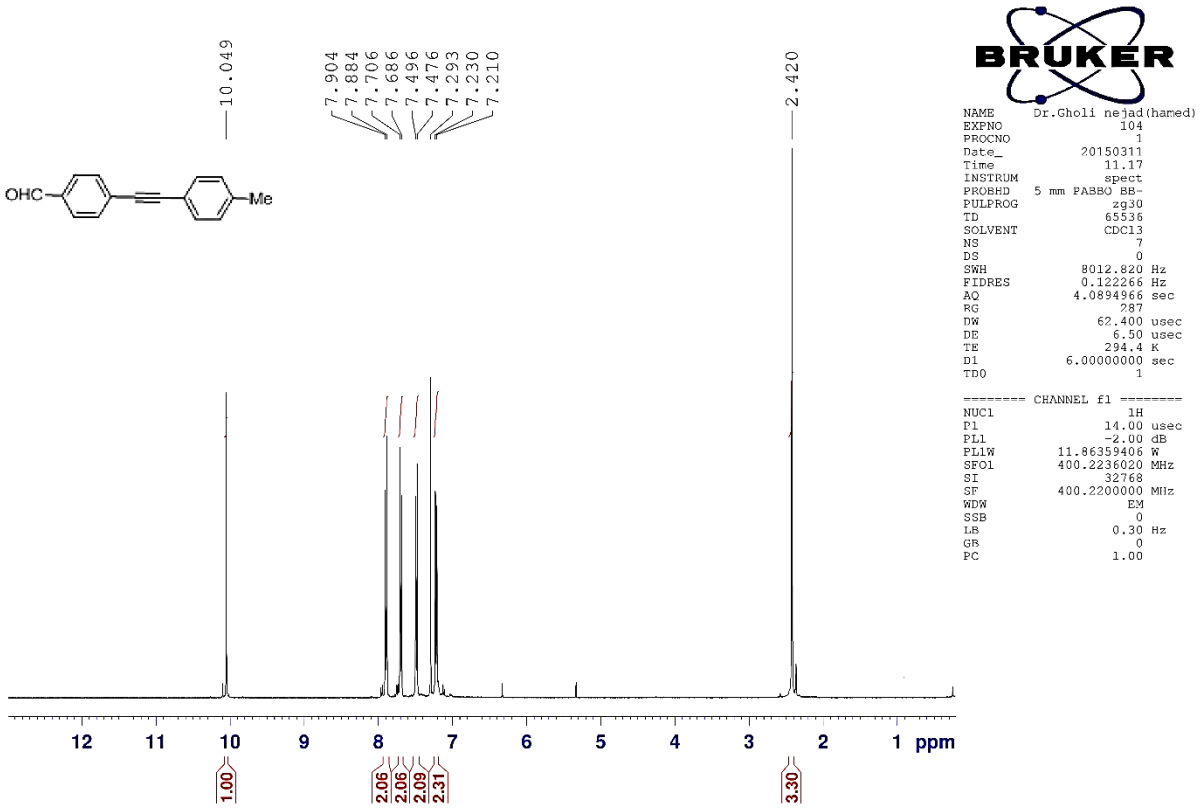
======== CHANNEL f1 ========
NUC1                           13C
P1                           9.00 usec
PL1                         -0.90 dB
PL1W                 42.02801895 W
SFO1                100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                           1H
PCPD2                      90.00 usec
PL2                         -2.00 dB
PL12                        14.16 dB
PL13                        17.90 dB
PL2W                 11.86359406 W
PL12W                 0.28722104 W
PL13W                 0.12139934 W
SFO2                400.2216009 MHz
SI                           32768
SF                  100.6353990 MHz
WDW                            EM
SSB                             0
LB                           1.00 Hz
GB                              0
PC                           1.40
```

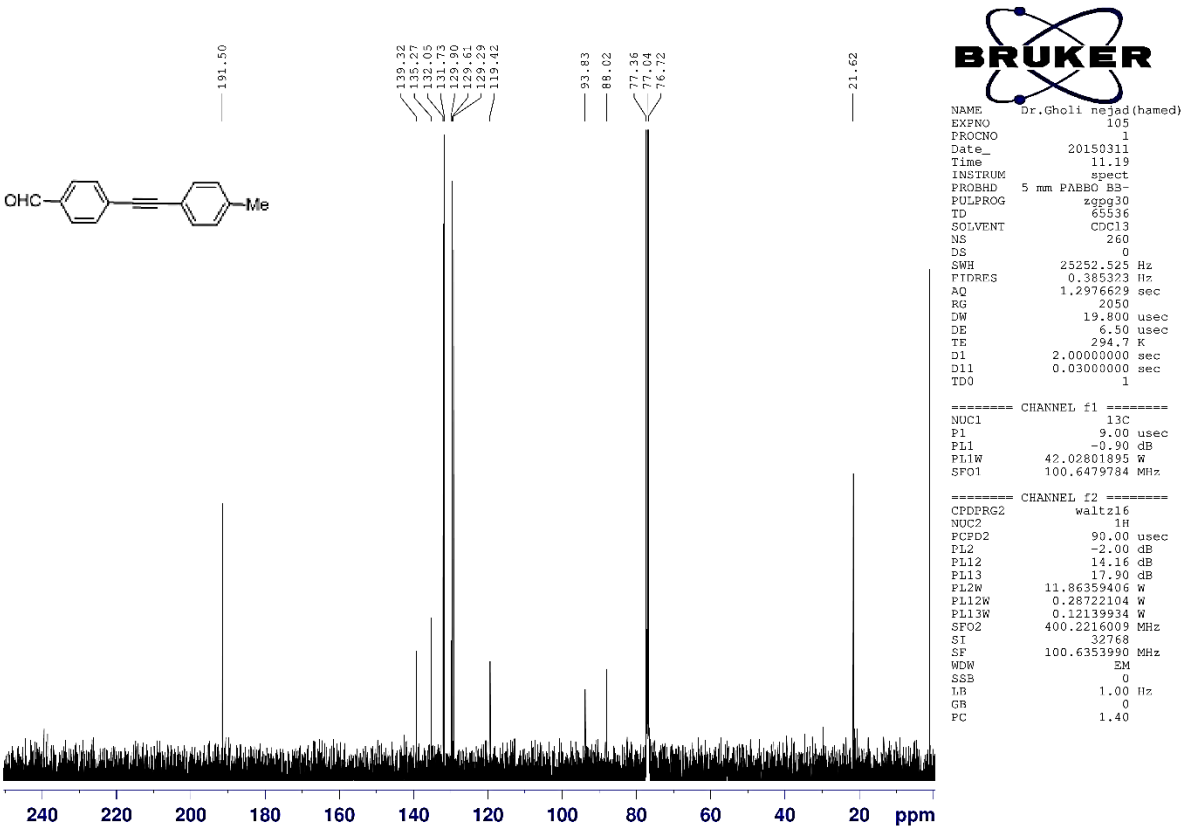
^{13}C NMR of 5-(phenylethynyl)pyrimidine



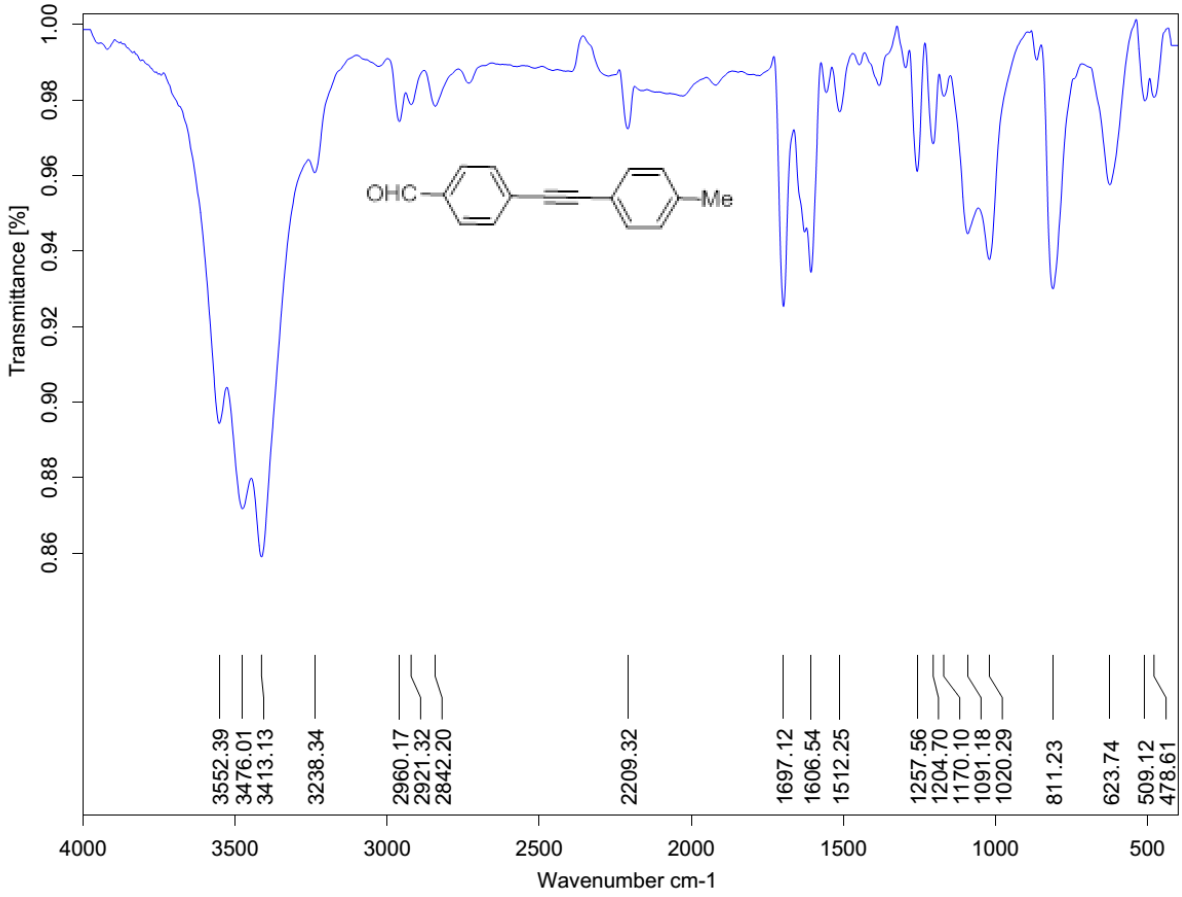
FT-IR of 5-(phenylethynyl)pyrimidine



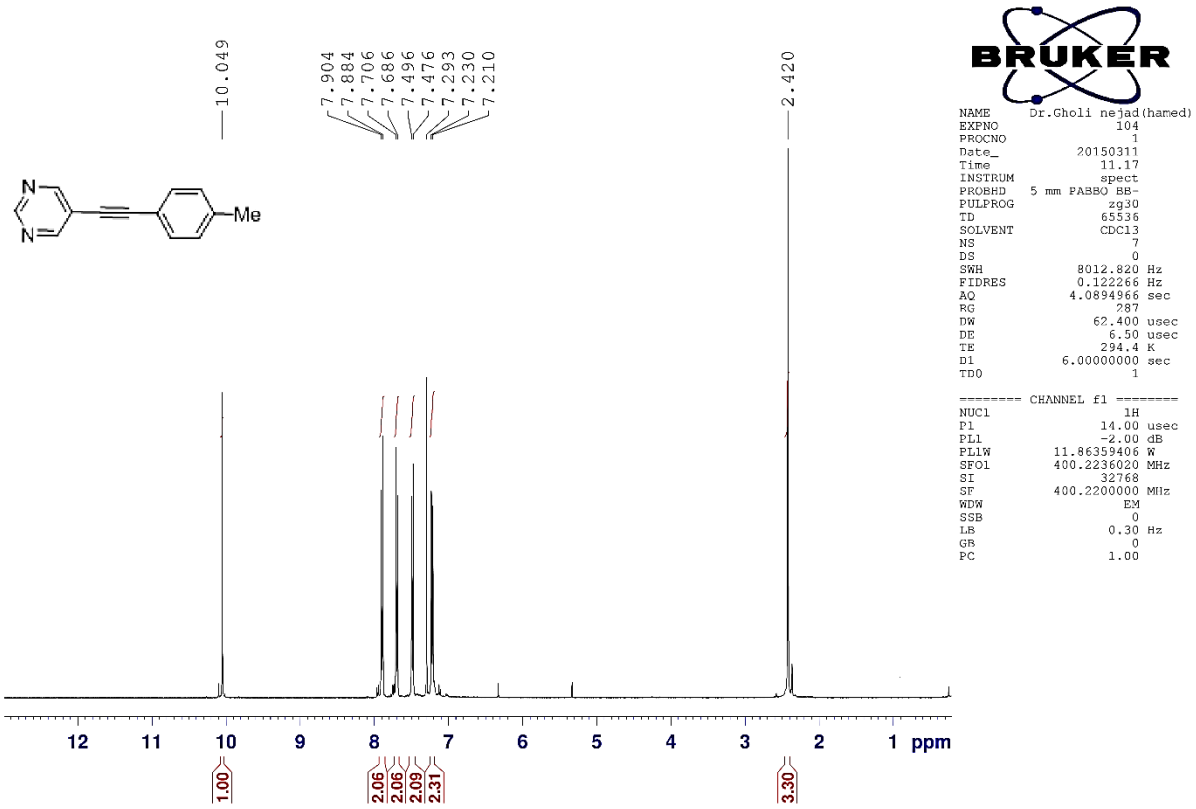
^{1}H NMR of 4-(p-tolylethynyl)benzaldehyde



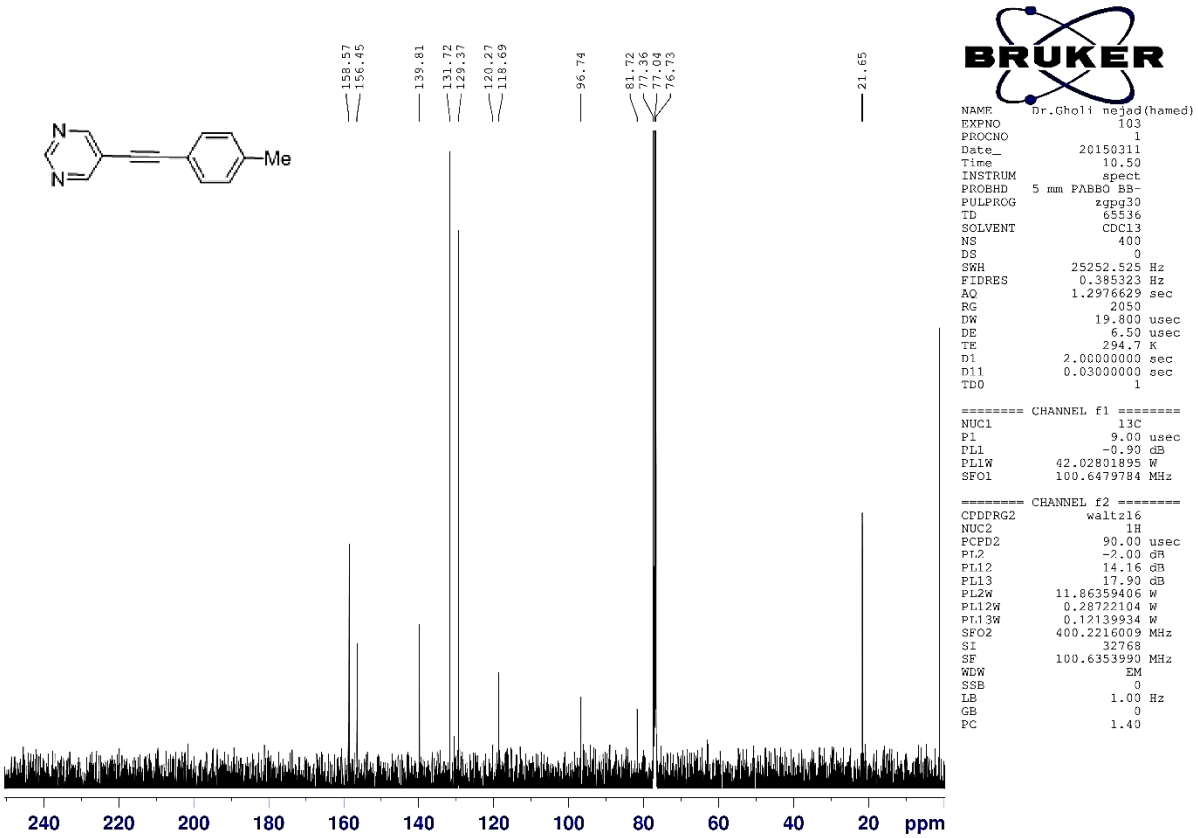
^{13}C NMR of 4-(p-tolylethynyl)benzaldehyde



FT-IR of 4-(p-tolylethynyl)benzaldehyde



^{1}H NMR of 5-(p-tolylethynyl)pyrimidine

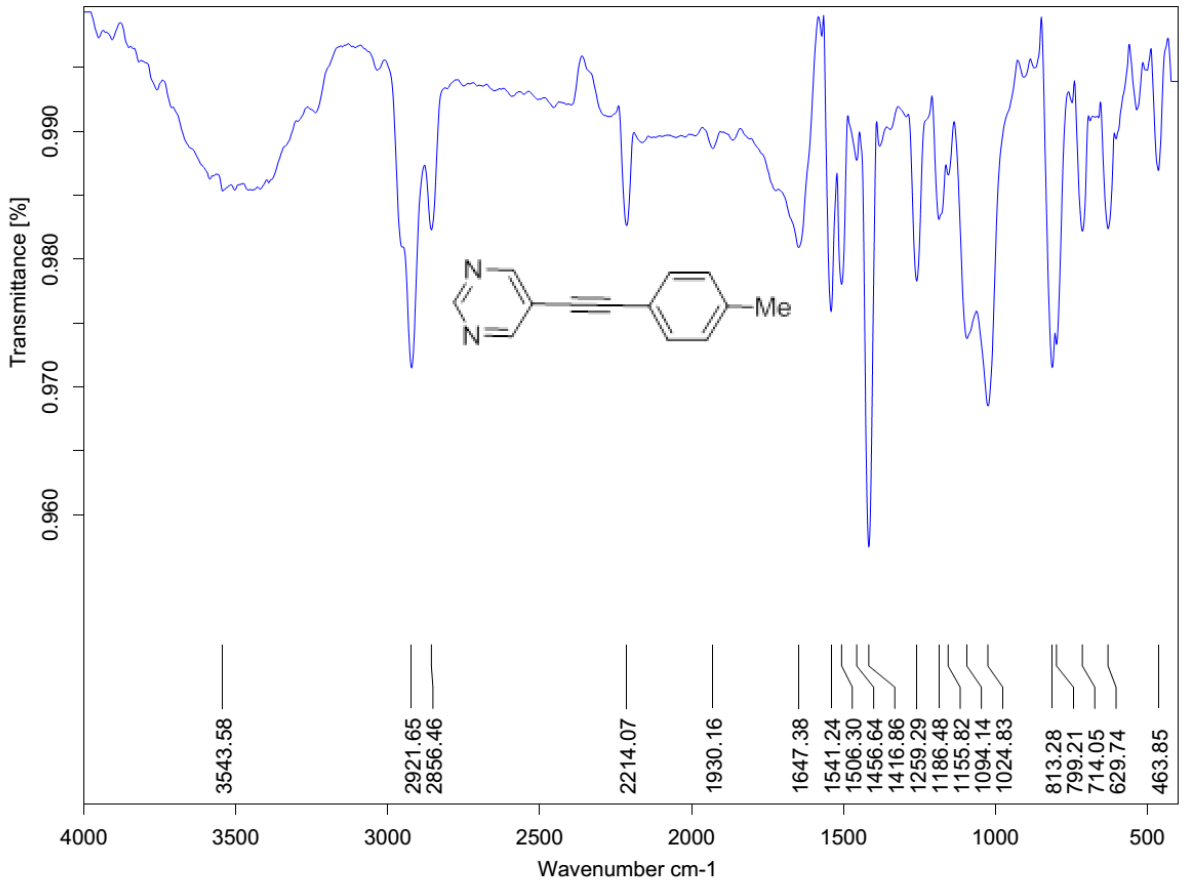



```
NAME        Dr.Gholi nejad(hamed)
EXPNO                        103
PROCNO                         1
Date_                   20150311
Time                       10.50
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                  zgpg30
TD                        65536
SOLVENT                   CDCl3
NS                          400
DS                            0
SWH                   25252.525 Hz
FIDRES                 0.385323 Hz
AQ                    1.2976629 sec
RG                         2050
DW                       19.800 usec
DE                        6.50 usec
TE                       294.7 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                            1

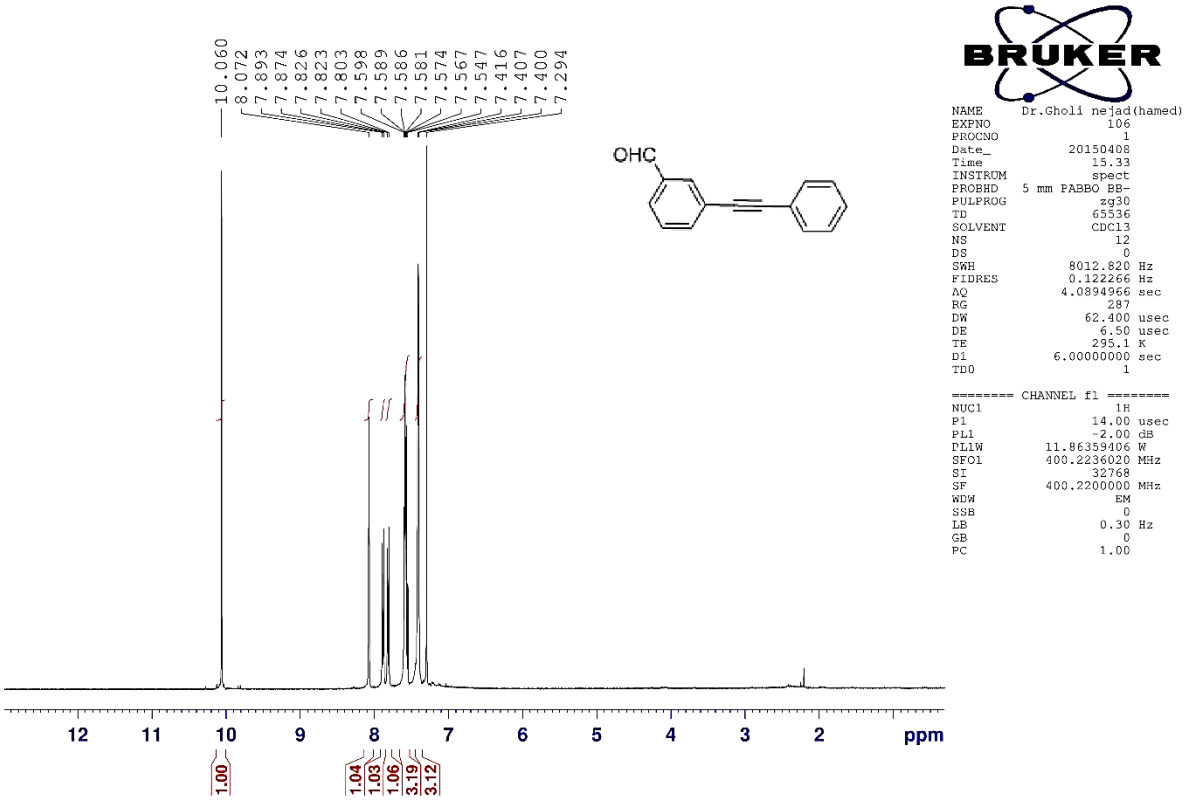
======== CHANNEL f1 ========
NUC1                         13C
P1                        9.00 usec
PL1                      -0.90 dB
PL1W                42.02801895 W
SFO1               100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                         1H
PCPD2                    90.00 usec
PL2                      -2.00 dB
PL12                     14.16 dB
PL13                     17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2               400.2216009 MHz
SI                         32768
SF                 100.6353990 MHz
WDW                           EM
SSB                            0
LB                        1.00 Hz
GB                             0
PC                        1.40
```

^{13}C NMR of 5-(p-tolylethynyl)pyrimidine



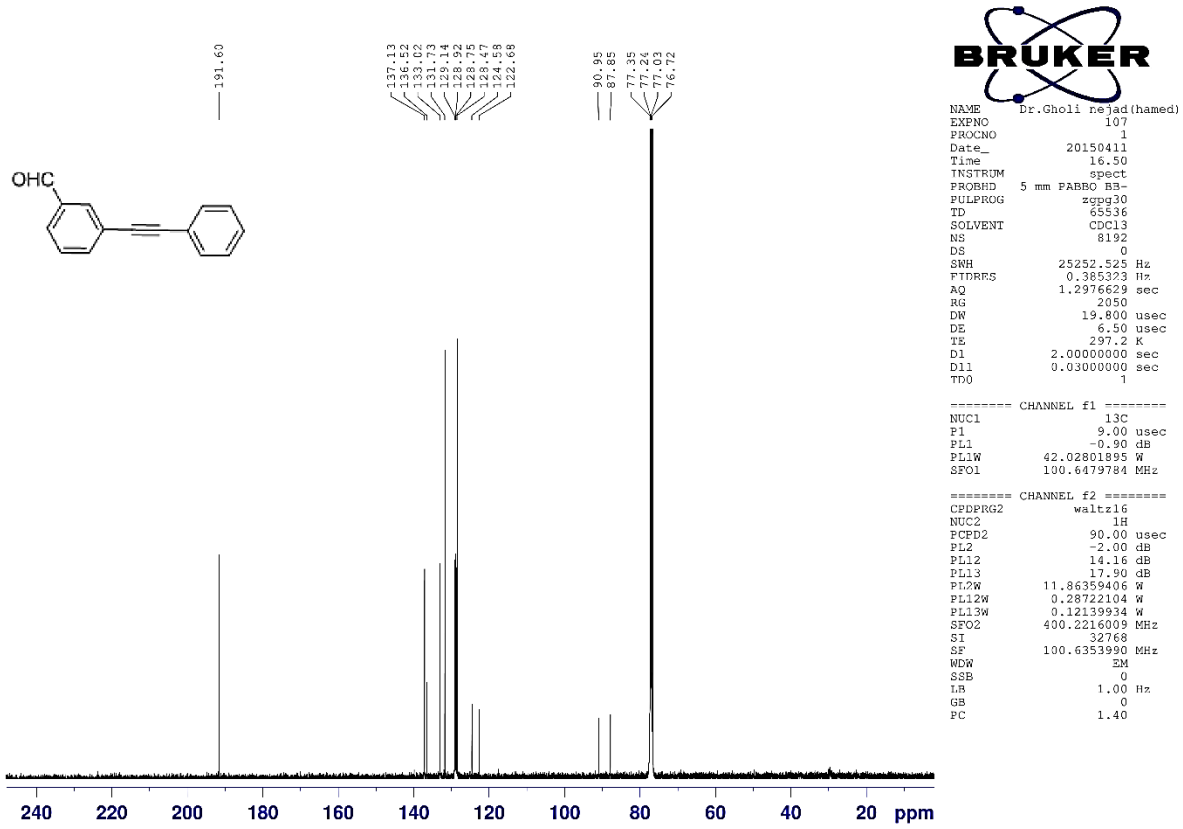
FT-IR of 5-(p-tolylethynyl)pyrimidine




```
NAME        Dr.Gholi nejad(hamed)
EXPNO                         106
PROCNO                          1
Date_                    20150408
Time                        15.33
INSTRUM                     spect
PROBHD    5 mm PABBO BB-
PULPROG                      zg30
TD                          65536
SOLVENT                     CDCl3
NS                             12
DS                              0
SWH                    8012.820 Hz
FIDRES                 0.122266 Hz
AQ                     4.0894966 sec
RG                            287
DW                       62.400 usec
DE                        6.50 usec
TE                       295.1 K
D1                    6.00000000 sec
TD0                             1

======== CHANNEL f1 ========
NUC1                           1H
P1                       14.00 usec
PL1                      -2.00 dB
PL1W                11.86359406 W
SFO1                400.2236020 MHz
SI                         32768
SF                  400.2200000 MHz
WDW                           EM
SSB                             0
LB                       0.30 Hz
GB                              0
PC                       1.00
```

^{1}H NMR of 3-(phenylethynyl)benzaldehyde

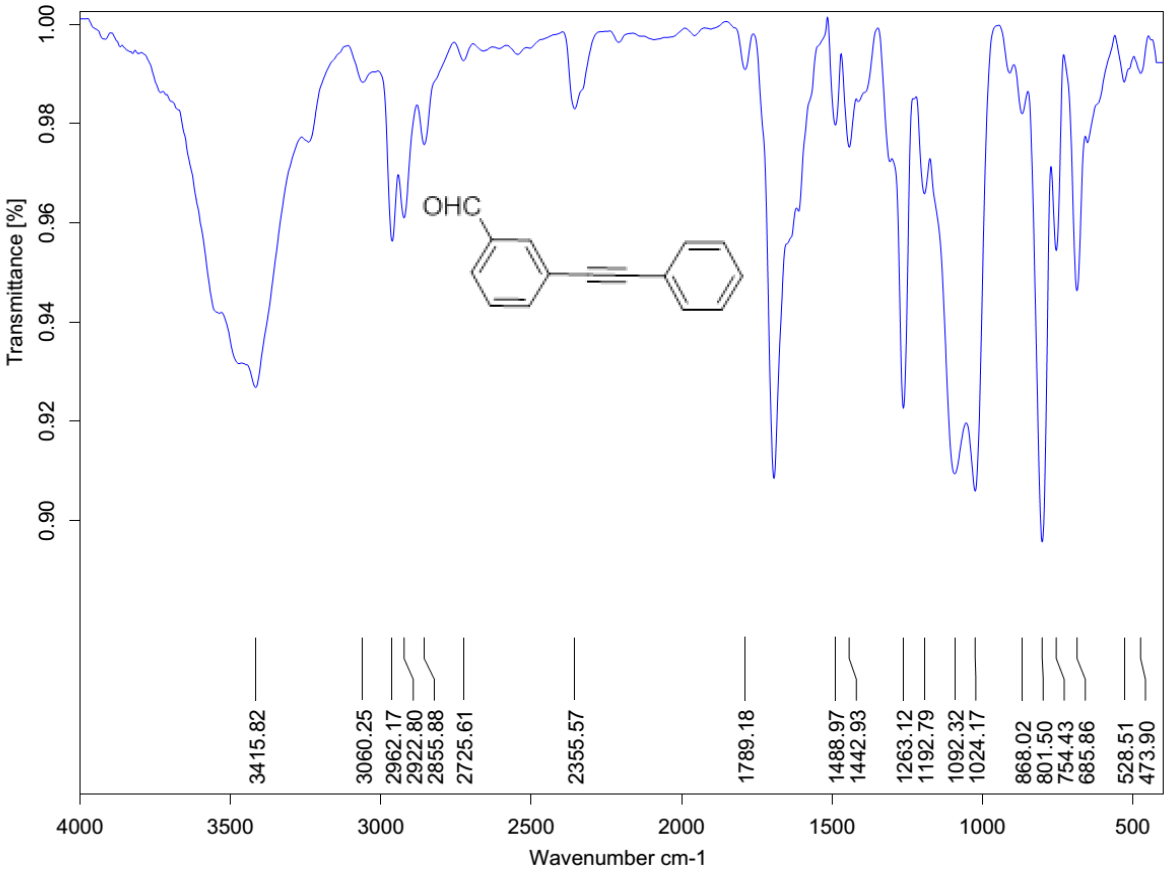



```
NAME        Dr.Gholi nejad(hamed)
EXPNO                        107
PROCNO                         1
Date_                   20150411
Time                       16.50
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                  zgpg30
TD                        65536
SOLVENT                   CDCl3
NS                         8192
DS                            0
SWH                   25252.525 Hz
FIDRES                 0.385323 Hz
AQ                    1.2976629 sec
RG                         2050
DW                       19.800 usec
DE                        6.50 usec
TE                       297.2 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                         13C
P1                        9.00 usec
PL1                      -0.90 dB
PL1W                42.02801895 W
SFO1               100.6479784 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                         1H
PCPD2                    90.00 usec
PL2                      -2.00 dB
PL12                     14.16 dB
PL13                     17.90 dB
PL2W                11.86359406 W
PL12W                0.28722104 W
PL13W                0.12139934 W
SFO2               400.2216009 MHz
SI                        32768
SF                 100.6353990 MHz
WDW                          EM
SSB                           0
LB                        1.00 Hz
GB                            0
PC                        1.40
```

^{13}C NMR of 3-(phenylethynyl)benzaldehyde



FT-IR of 3-(phenylethynyl)benzaldehyde