Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Information

for

Innovative Application of Magnetically Modified Bovine Horn as a Natural Keratin Resource in the Role of Value-Added Organocatalyst

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Spectra information of transamidation reaction derivatives

***N*-phenylacetamide (1c)**: The product was obtained as white solid in 90% isolated yield; Melting point: 110-112°C; IR (KBr) ν (cm^{-1}) = 3293, 2924, 2855, 1662, 1603, 1549, 1495, 1433, 1317, 1259, 753; ^{1}H-NMR: (500 MHz, DMSO-d_6, 25°C, TMS): δ (ppm) = 9.92 (s, 1H), 7.57 (d, *J* = 7.5 Hz, 2H), 7.27 (t, *J* = 7.5 Hz, 2H), 7.00 (t, *J* = 7.5 Hz, 1H), 2.03 (s, 3H).

***N*-*p*-tolylacetamide (2c)**: The product was obtained as white solid in 84% isolated yield; Melting point: 142-144°C; IR (KBr) ν (cm^{-1}) = 3296, 2930, 2863, 1663, 1607, 820; ^{1}H-NMR: (500 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 7.37 (d, *J* = 8.25 Hz, 2H), 7.26 (s, 1H), 7.1 (d, *J* = 8.05 Hz, 2H), 2.3 (s, 3H), 2.15 (s, 3H); ^{13}C-NMR (125 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 168.32, 135.33, 133.93, 129.52, 120.06, 24.46, 20.83.

***N*-(2-mercaptophenyl)acetamide (3c)**: The product was obtained as yellow solid in 76% isolated yield; Melting point: 150-152°C; IR (KBr): ν (cm^{-1}) = 3275, 2925, 1664, 1575, 1515, 1431, 1290, 752; ^{1}H-NMR (500 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 8.28 (d, *J* = 7.45 Hz,1H), 8.05 (s, 1H), 7.62 (m,1H), 7.41 (m, 1H), 7.31 (m,1H), 7.07 (m, 1H), 2.25 (s, 3H).

***N*-(4-bromophenyl)acetamide (4c)**: The product was obtained as white solid in 92% isolated yield; Melting point: 163-164°C; IR (KBr): ν (cm^{-1}) = 3294, 2923, 2854,1666, 1596, 1003, 920; MS (EI, 70 eV): m/z (%) = 213 (M^+, 77), 178 (100), 145 (12), 143 (12), 119 (6), 92 (67), 91 (36), 65 (46).

***N*-benzylacetamide (5c)**: The product was obtained as white solid in 95% isolated yield; Melting point: 58-60 °C; IR (KBr): ν (cm^{-1}) = 3291, 3084, 2926, 2855, 1641, 1550, 1442, 1366, 1287, 1080, 1025, 742, 693; ^{1}H-NMR (400 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 7.30-7.37 (m, 5H), 5.83 (br s, 1H), 4.45 (s, 2H), 2.05 (s, 3H).

***N*-benzylbenzamide (6c)**: The product was obtained as white solid in 96% isolated yield; Melting point: 100-102°C; IR (KBr): ν (cm^{-1}) = 3293, 2928, 2861, 1641, 1551, 1319, 594; ^{1}H-NMR (500 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 9.07 (t, *J* = 5 Hz, 1H), 7.92 (m, 2H), 7.54 (m, 1H), 7.48 (m, 2H), 7.34 (m, 4H), 7.24 (m, 1H), 4.50 (d, *J* = 5 Hz, 2H); ^{13}C-NMR (125 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 166.68, 140.18, 134.83, 131.70, 128.79, 127.72, 127.67, 127.19, 43.08.

***N*-(4-chlorobenzyl)benzamide (7c)**: The product was obtained as white solid in 78% isolated yield; IR (KBr) ν (cm^{-1}) = 3307, 3073, 2928, 1641, 1549, 1489, 1414, 1317, 1258, 1087, 990, 794, 692; ^{1}H-NMR (250 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 7.72 (d, *J* = 8 Hz, 2H), 7.24-7.48 (m, 3H), 7.20 (s, 4H), 7.09 (s, 1H), 4.56 (d, *J* = 5.75 Hz, 2H).

***N*-(pyridine-3-ylmethyl)benzamide (8c)**: The product was obtained as white solid in 75% isolated yield; Melting point: 153-154°C; IR (KBr): ν (cm^{-1}) = 3443, 2927, 2859, 1753, 1643, 1539, 1460, 1373, 1264, 1023, 803; ^{1}H-NMR (500 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 8.64 (s,

1H), 8.54 (s, 1H), 7.85 (d, *J* = 7.9 Hz, 2H), 7.81 (d, *J* = 7.3 Hz, 1H), 7.51 (t, *J* = 7.45 Hz,1H), 7.43 (t, *J* = 7.70 Hz, 2H), 7.32 (dd, *J* = 7.65, 5.05 Hz ,1H), 6.70 (s, 1H), 4.64 (d, *J* = 6.1Hz, 2H).

***N*-benzyl-4-methylbenzamide (9c)**: The product was obtained as white solid in 90% isolated yield; Melting point: 148-150°C; IR (KBr): ν (cm^{-1}) = 3310, 3065, 3056, 3025, 2916, 1640, 1547, 1420, 1360, 1323, 1257, 1057, 991, 842; ^{1}H-NMR (500 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 9.01 (t, *J* = 5 Hz, 1 H), 7.84 (m, 2H), 7.29 (m, 7H), 4.49 (d, *J* = 5 Hz, 2H), 2.35 (s, 3H); ^{13}C-NMR (125 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 166.58, 141.55, 140.30, 132.06, 129.30, 128.72, 127.76, 127.68, 127.15, 43.04, 21.41.

***N*-benzyl-4-chlorobenzamide (10c)**: The product was obtained as white solid in 87% isolated yield; Melting point: 157-160°C; IR (KBr): ν (cm^{-1}) = 3313, 3083, 3030, 1630, 1594, 1553, 1486, 1420, 1319, 1092, 849; ^{1}H-NMR (500 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 9.15 (t, *J* = 5 Hz, 1H), 7.94 (d, *J* = 10 Hz, 2H), 7.55 (d, *J* = 5 Hz, 2H), 7.33 (d, *J* = 5Hz, 4H), 7.25 (q, *J* = 5 Hz, 1H), 4.50 (d, *J* = 5 Hz, 2H); ^{13}C-NMR (125 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 165.65, 139.96, 136.57, 133.55, 129.68, 128.87, 128.76, 127.72, 127.25, 43.18.

***N*-benzyl-2-chlorobenzamide (11c)**: The product was obtained as white solid 79% isolated yield; Melting point: 158-161°C; IR (KBr): ν (cm^{-1}) = 3254, 3087, 3031, 2920, 2862, 1635, 1594, 1555, 1429, 1362, 1256, 1049, 767; ^{1}H-NMR (500 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 9.01 (t, *J* = 5 Hz, 1H), 7.42 (m, 9H), 4.49 (d, *J* = 5 Hz, 2H); ^{13}C-NMR (125 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 166.91, 139.63, 137.41, 131.23, 130.39, 130.10, 129.35, 128.78, 127.68, 127.58, 127.30, 42.95.

***N*-benzyl-4-nitrobenzamide (12c)**: The product was obtained as white solid 79% isolated yield; Melting point: 190-193°C; IR (KBr): ν (cm^{-1}) = 3430, 2252, 2125, 1619, 1584, 1341, 1026, 824, 762.^{1}H-NMR (500 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 9.15 (t, *J* = 5 Hz, 1H), 7.94 (d, *J* = 10 Hz, 2H), 7.55 (d, *J* = 10 Hz, 2H), 7.33 (d, *J* = 5 Hz, 4H), 7.25 (q, *J* = 5 Hz, 1H), 4.50 (d, *J* = 5 Hz, 2H); ^{13}C-NMR (125 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 168.41, 148.48, 145.89, 135.69, 130.47, 129.20, 128.94, 128.51, 123.22, 42.76.

***N*-propylbenzamide (13c)**: The product was obtained as white solid 91% isolated yield; Melting point: 105-107°C; IR (KBr): ν (cm^{-1}) = 3302, 3083, 2956, 2932, 2871, 1633, 1549, 1492, 1327, 1289, 1028, 803, 598; ^{1}H-NMR (500 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 8.45 (t, *J* = 5 Hz, 1H), 7.85 (d, *J* = 10 Hz, 2H), 7.48 (m, 3H), 3.23 (m, 2H), 1.54 (m, 2H), 0.89 (m, 3H) ; ^{13}C-NMR (125 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 166.6, 135.2, 131.4, 128.6, 127.5, 41.4, 22.9, 11.9.

Phenyl(piperidin-1-yl)methanone (14c): The product was obtained 70% isolated yield; IR (KBr): ν (cm^{-1}) = 3059, 2931, 2858, 1625, 1565, 1433, 1277; ^{1}H-NMR (250 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 7.39 (s, 5H), 3.72 (s, 2H), 3.35 (s, 2H), 1.42-1.68 (m, 6H); ^{13}C-NMR (62.9 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 170.4, 136.6, 129.5, 128.5, 126.9, 48.8, 43.2, 26.8, 25.8, 24.7; MS (EI, 70 eV): m/z (%) = 189 (M^+, 18), 160 (4), 133 (4), 111 (46), 105 (86), 84 (18), 77 (100).

4-benzoylmorpholin (15c): The product was obtained as colorless liquid 80% isolated yield; IR (KBr): ν (cm^{-1}) = 3296, 2956, 2927, 2867, 1637, 1535, 1454, 1048; ^{1}H-NMR: (250 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 7.40 (s, 5H), 3.70 (br s, 2H), 3.46 (br s, 2H); ^{13}C-NMR (62.9 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 170.6, 135.4, 130.0, 128.7, 127.2, 67.0, 48.2, 42.7; MS (EI, 70 eV): m/z (%) = 191 (M^+, 8), 176 (5), 148 (5), 114 (5), 105 (100), 86 (11), 77 (87).

***N*-(1-phenylethyl)benzamide (16c)**: The product was obtained as white solid 80% isolated yield; Melting point: 128-129°C; IR (KBr): ν (cm^{-1}) = 3329, 3030, 2967, 1635, 1525, 1449, 1080; ^{1}H-NMR (400 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 7.79-7.81 (m, 2H), 7.30-7.54 (m, 8H), 6.34 (d, *J* = 5.2 Hz, 1H), 5.32-5.41 (m, 2H), 1.64 (d, *J* = 7.2 Hz, 3H); ^{13}C-NMR (100 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 166.6, 143.1, 134.6, 131.5, 128.8, 128.6, 127.5, 126.9, 126.3, 49.2, 21.7; MS (EI, 70 eV): m/z (%) = 225 (M^+, 40), 210 (12), 120 (10), 105 (100), 91 (3), 77 (80).

4-methyl-*N*-(1-phenylethyl)benzamide (17c): The product was obtained as white solid 83% isolated yield; IR (KBr): ν (cm^{-1}) = 3331, 3032, 2973, 2925, 1632, 1522, 1450, 1270; ^{1}H-NMR (250 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 7.77 (d, *J* = 7.7 Hz, 2H), 7.31-7.47 (m, 7H), 6.31 (br s, 1H), 5.31-5.37 (m, 1H), 2.41 (s, 3H), 1.61 (d, *J* = 6.7 Hz, 3H).

4-methoxy-*N*-(1-phenylethyl)benzamide (18c): The product was obtained as white solid 87% isolated yield; IR (KBr): ν (cm^{-1}) = 3434, 3337, 2818, 2849, 1622, 1526, 1502, 1257; ^{1}H-NMR (250 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 7.74 (d, *J* = 8.7 Hz, 2H), 7.30-7.39 (m, 5H), 6.89-6.93 (m, 2H), 6.23 (br s, 1H), 5.31-5.36 (m, 1H), 3.84 (s, 3H), 1.60 (d, *J* = 6.7 Hz, 3H).

4-chloro-*N*-(1-phenylethyl)benzamide (19c): The product was obtained as white solid 78% isolated yield; IR (KBr): ν (cm^{-1}) = 3421, 3338, 2980, 1636, 1529, 1485, 1268; ^{1}H-NMR (250 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 7.71 (d, *J* = 8.2 Hz, 2H), 7.30-7.40 (m, 7H), 6.39 (br s, 1H), 5.28-5.34 (m, 1H), 1.60 (d, *J* = 7.0, 3H).

***N*-phenylbenzamide (20c)**: The product was obtained as white solid 81% isolated yield; Melting point: 162-164°C; IR (KBr): ν (cm^{-1}) = 3343, 3051, 1655, 1599, 1532, 1437, 1321, 1259, 884, 750, 715, 590; ^{1}H-NMR (500 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 9.30 (s, 1H), 7.8 (t, *J* = 10 Hz, 2H), 7.62 (d, *J* = 5 Hz, 2H), 7.37 (m, 1H), 7.30 (m, 2H), 7.19 (t, *J* = 5 Hz, 2H), 6.97 (t, *J* = 5 Hz, 1H); ^{13}C-NMR (125 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 166.3, 138.7, 135.3, 131.4, 128.6, 128.3, 127.5, 124.0, 120.6.

4-methyl-*N*-phenylbenzamide (21c): The product was obtained as white solid 76% isolated yield; Melting point: 146-148°C; IR (KBr): ν (cm^{-1}) = 3351, 3057, 2916, 1649, 1596, 1524, 1438, 1320, 1260, 885, 747, 588; ^{1}H-NMR (500 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 10.20 (s, 1H), 7.88 (m, 4H), 7.35 (m, 4H), 7.10 (m, 1H), 2.38 (s, 3H); ^{13}C-NMR (125 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 165.8, 142.0, 139.7, 132.5, 129.3, 129.0, 128.2, 124.0, 120.8, 21.4.

4-chloro-*N*-phenylbenzamide (22c): The product was obtained as white solid 75% isolated yield; Melting point: 197-200°C; IR (KBr): ν (cm^{-1}) = 3351, 3083, 3056, 1653, 1597, 1528,

1438, 1324, 1258, 1092, 847, 755, 589; ^{1}H-NMR (500 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 10.33 (s, 1H), 8.01 (m, 2H), 7.79 (m, 2H), 7.60 (m, 2H), 7.36 (m, 2H), 7.11 (m, 1H); ^{13}C-NMR (125 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 164.9, 139.4, 136.9, 134.1, 130.1, 129.1, 128.9, 124.3, 120.9.

2-chloro-*N*-phenylbenzamide (23c): The product was obtained as white solid 71% isolated yield; Melting point: 150-151°C; IR (KBr): ν (cm^{-1}) = 3238, 3187, 3134, 3078, 2980, 1651, 1599, 1546, 1488, 1329, 1262, 1123, 1049, 768, 691; ^{1}H-NMR (500 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 10.52 (s, 1H), 7.76 (d, *J* = 5 Hz, 2H), 7.59 (m, 2H), 7.50 (m, 2H), 7.37 (t, *J* = 5 Hz, 2H), 7.13 (t, *J* = 5 Hz, 1H) ; ^{13}C-NMR (125 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 165.4, 139.4, 137.5, 131.5, 130.4, 130.1, 129.4, 129.2, 127.7, 124.3, 120.1.

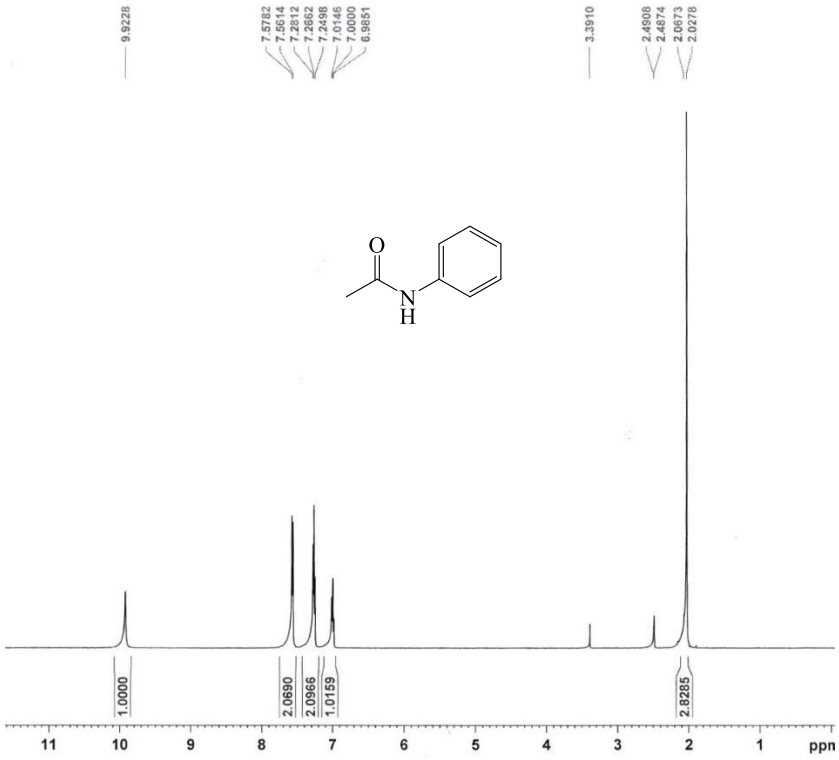
4-nitro-*N*-phenylbenzamide (24c): The product was obtained as white solid 72% isolated yield; Melting point: 181-182°C; IR (KBr): ν (cm^{-1}) = 3321, 3110, 1621, 1592, 1523, 1407, 1351, 1317, 1262, 1105, 832, 724, 506.^{1}H-NMR (500 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 10.93 (s, 1H), 8.33 (d, *J* = 10 Hz, 2H), 8.27 (d, *J* = 10 Hz, 2H), 7.85 (d, *J* = 10 Hz, 2H), 7.36 (t, *J* = 5 Hz, 2H), 7.13 (t, *J* = 5 Hz, 1H); ^{13}C-NMR (125 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 168.47, 164.37, 149.5, 148.3, 146.7, 141.1, 139.3, 130.5, 129.8, 129.1, 124.5, 123.9, 123.1, 121.1.

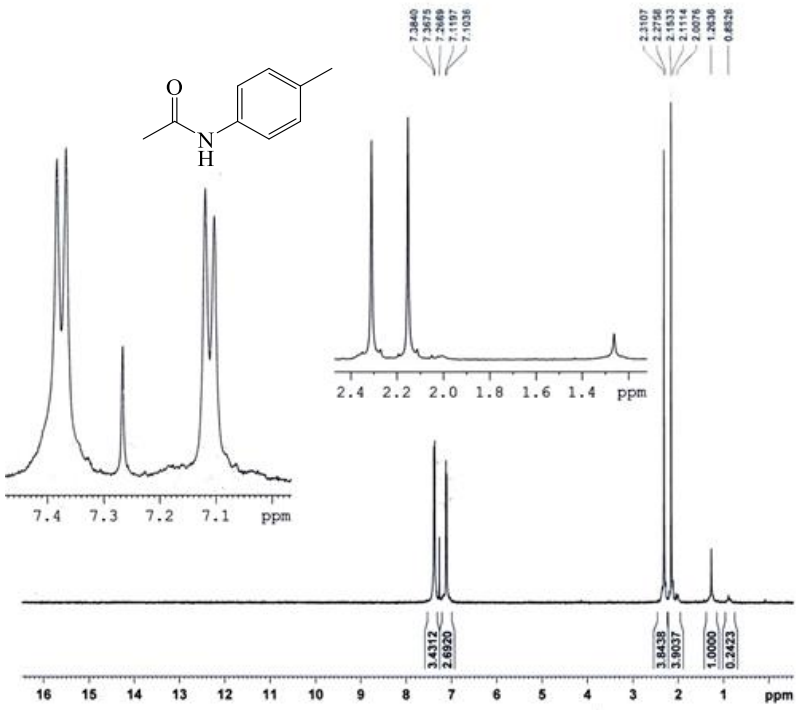
1,3-diphenylurea (25c): The product was obtained as white solid 86% isolated yield; Melting point: 238-241°C; IR (KBr): ν (cm^{-1}) = 3323, 1645, 1599, 1549, 1439, 1306, 1230.

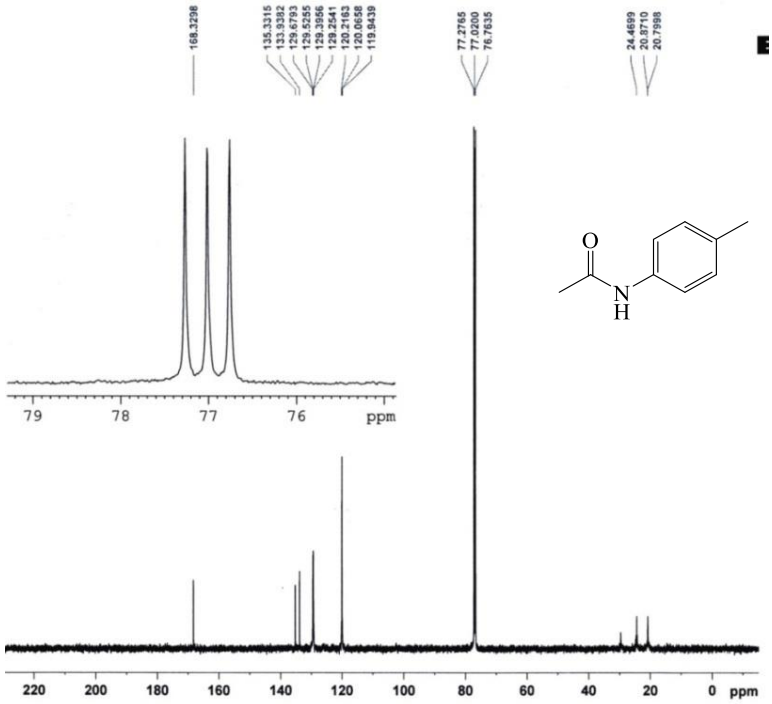
1,3-bis(1-phenylethyl)urea (26c): The product was obtained as white solid 90% isolated yield; IR (KBr): ν (cm^{-1}) = 3329, 2969, 1626, 1575, 1447, 1248, 1115; ^{1}H-NMR (400 MHz, $CDCl_3$, 25°C, TMS): δ (ppm) = 7.27-7.31 (m, 10H), 5.99 (br s, 2H), 4.79 (q, *J* =8.0 Hz, 2H), 1.43 (d, *J* =8.0 Hz, 6H).

1,3-diphenylthiourea (27c): The product was obtained as white solid 80% isolated yield; Melting point: 153-155°C; IR (KBr): ν (cm^{-1}) = 3204, 3020, 1545, 1449, 1339, 1234, 1068; ^{1}H-NMR (500 MHz, DMSO-d_6, 25°C, TMS): δ (ppm) = 9.79 (s, 2H), 7.47 (t, *J* = 7.5 Hz, 2H), 7.32 (t, *J* = 7.5 Hz, 2H), 7.11 (t, *J* = 7.5 Hz, 1H).

^{1}H-NMR, ^{13}C-NMR and mass spectra of amide derivatives



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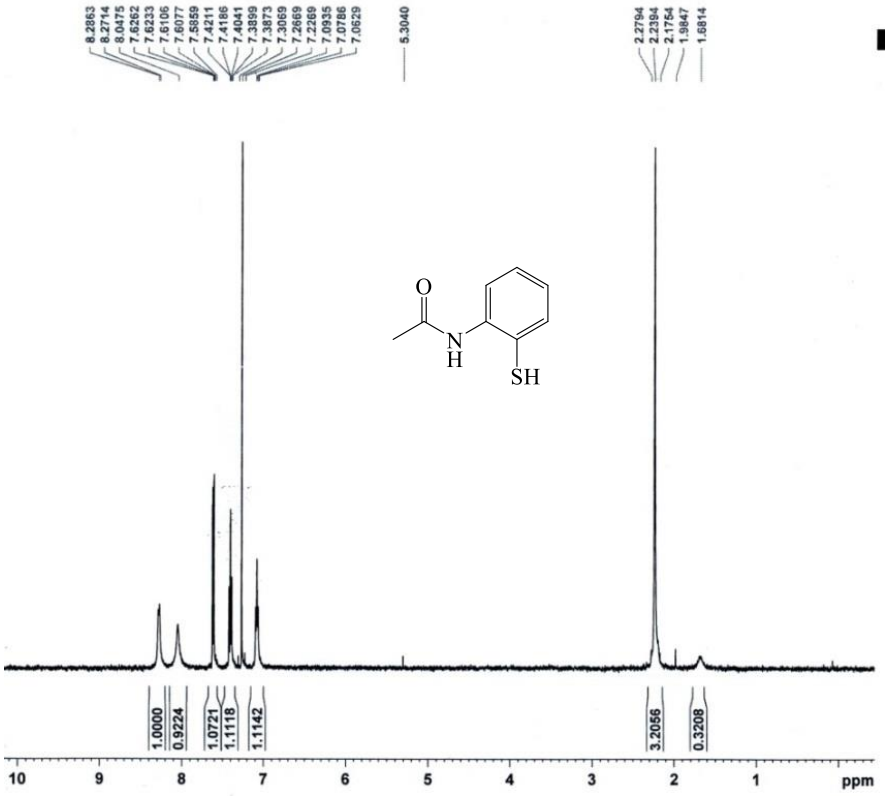
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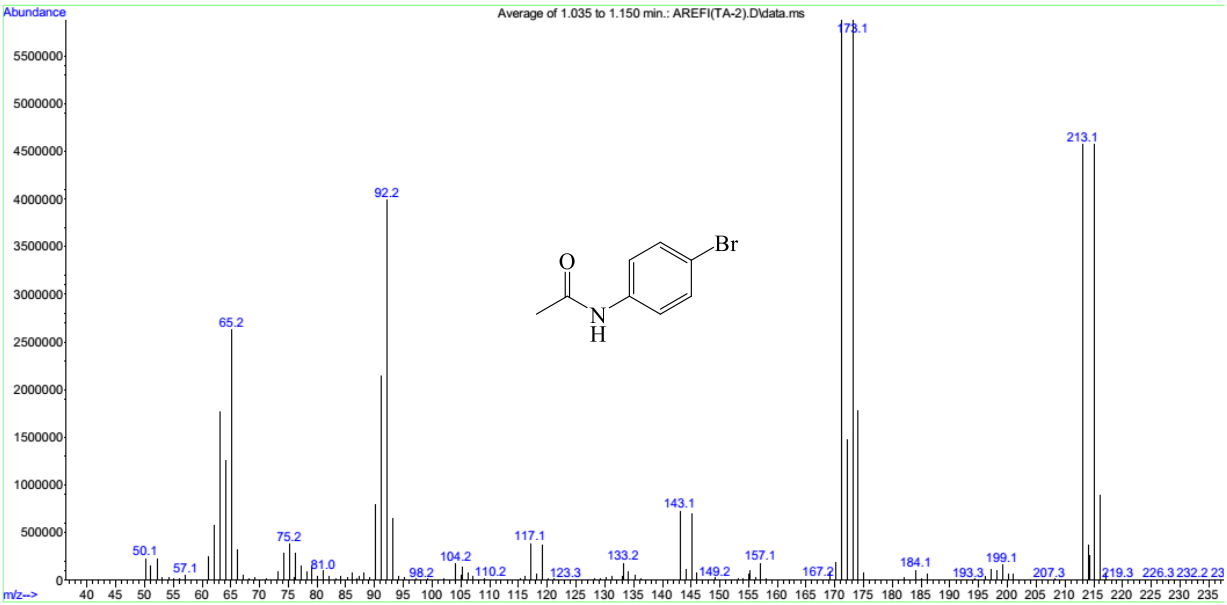
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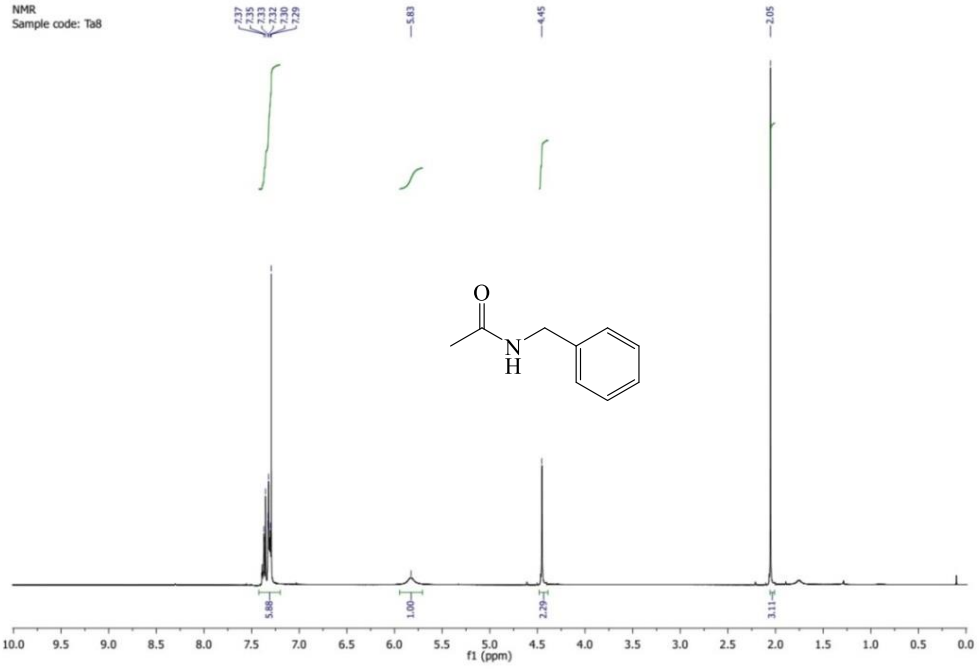
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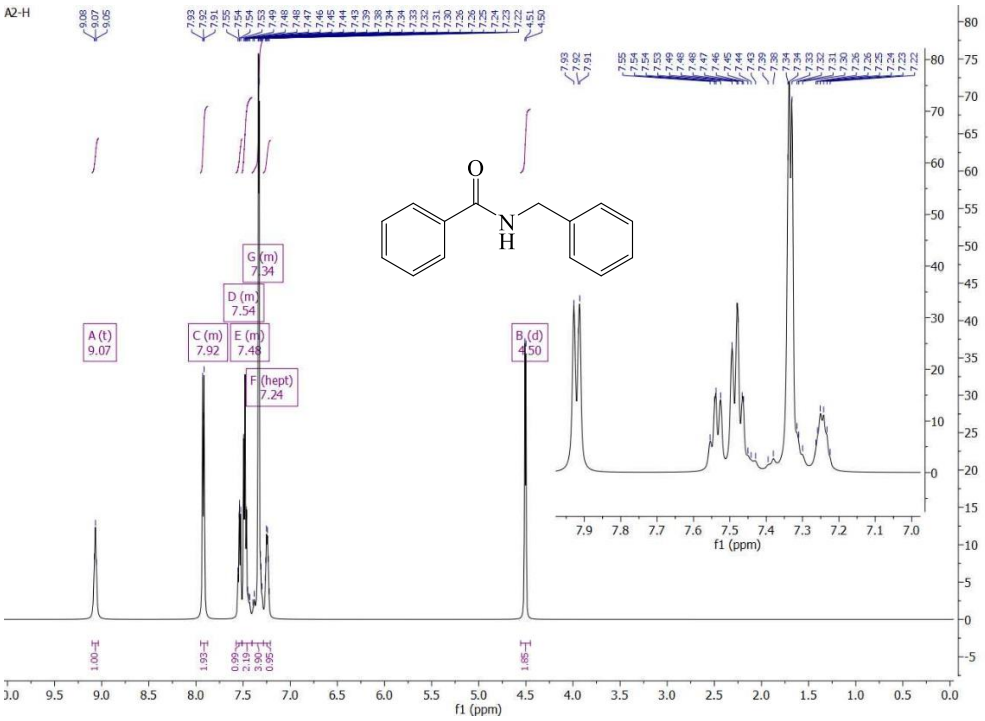
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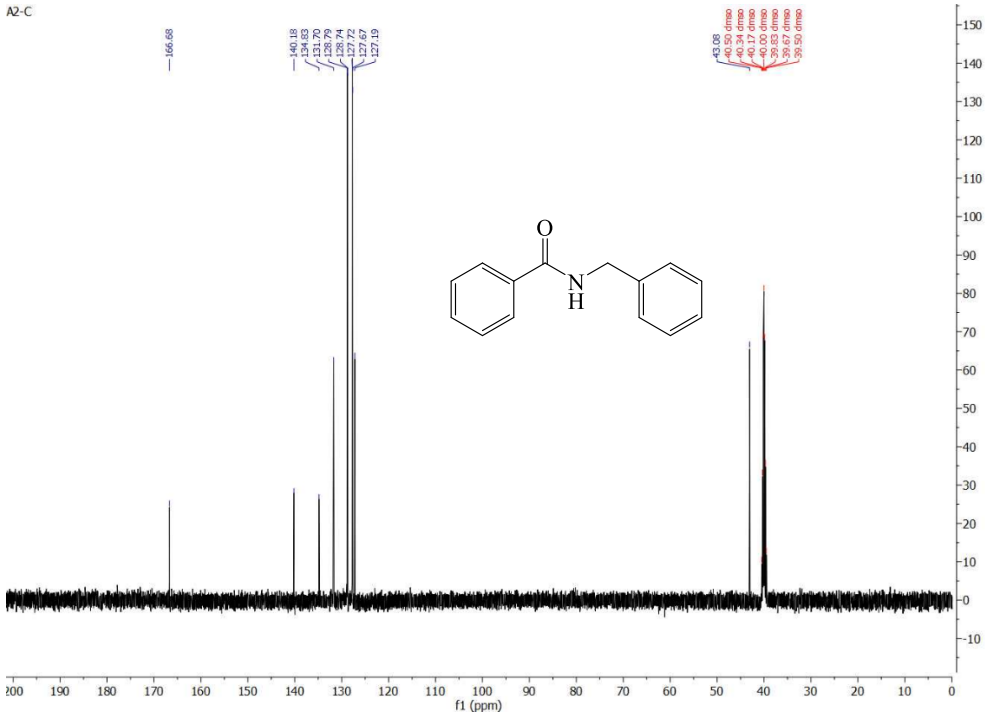
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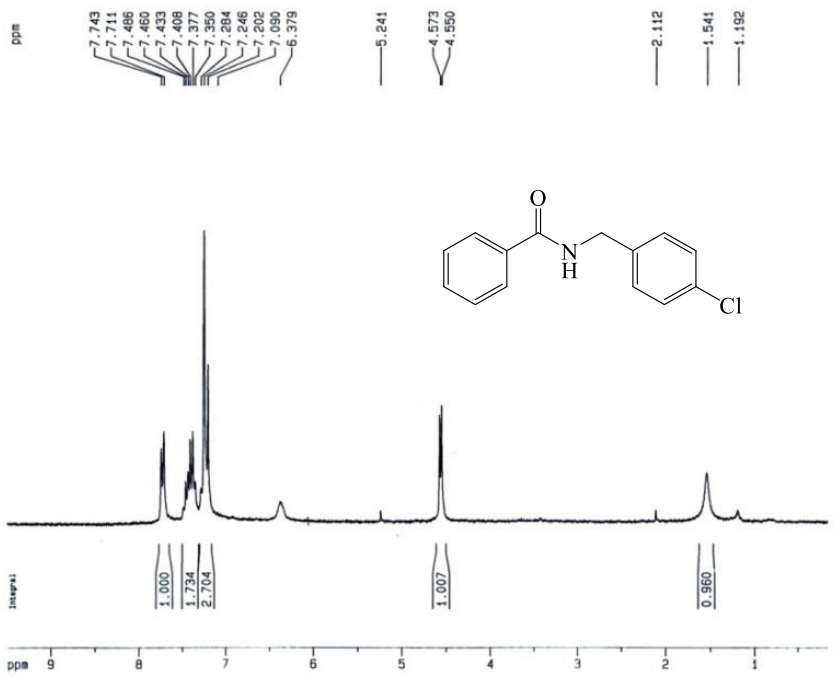
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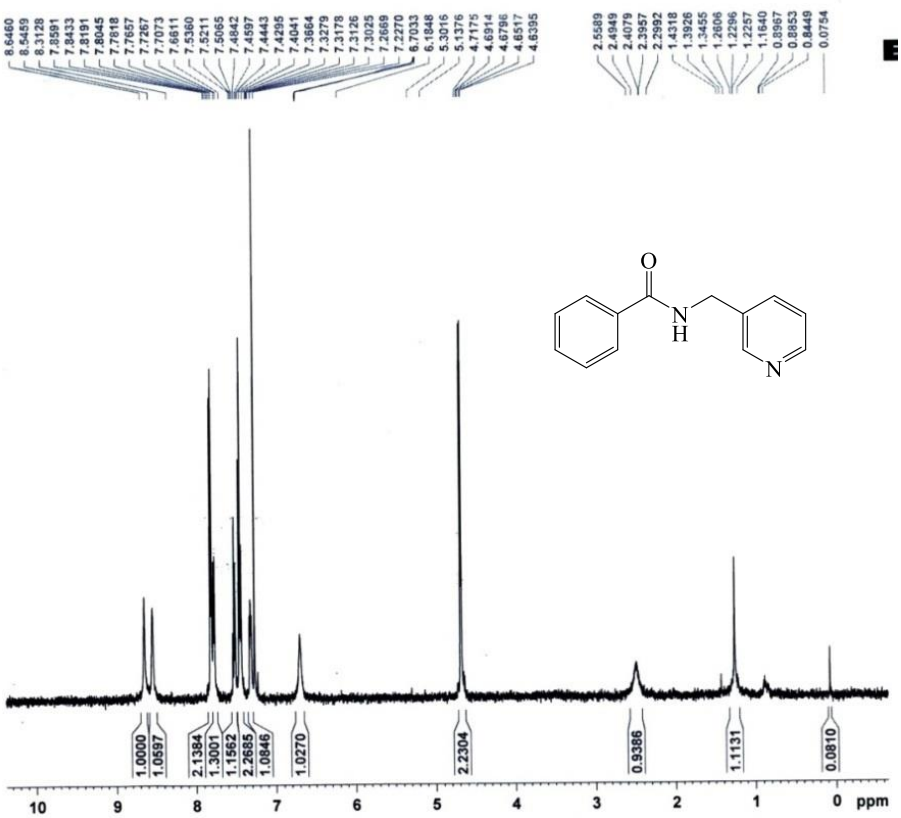
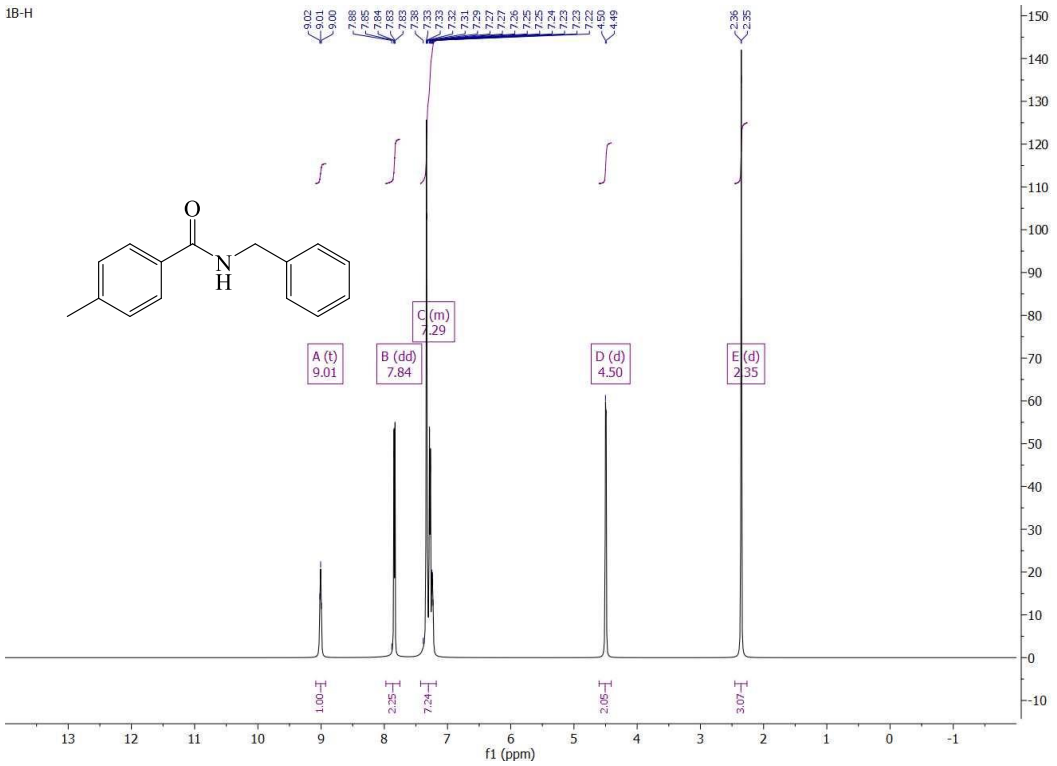
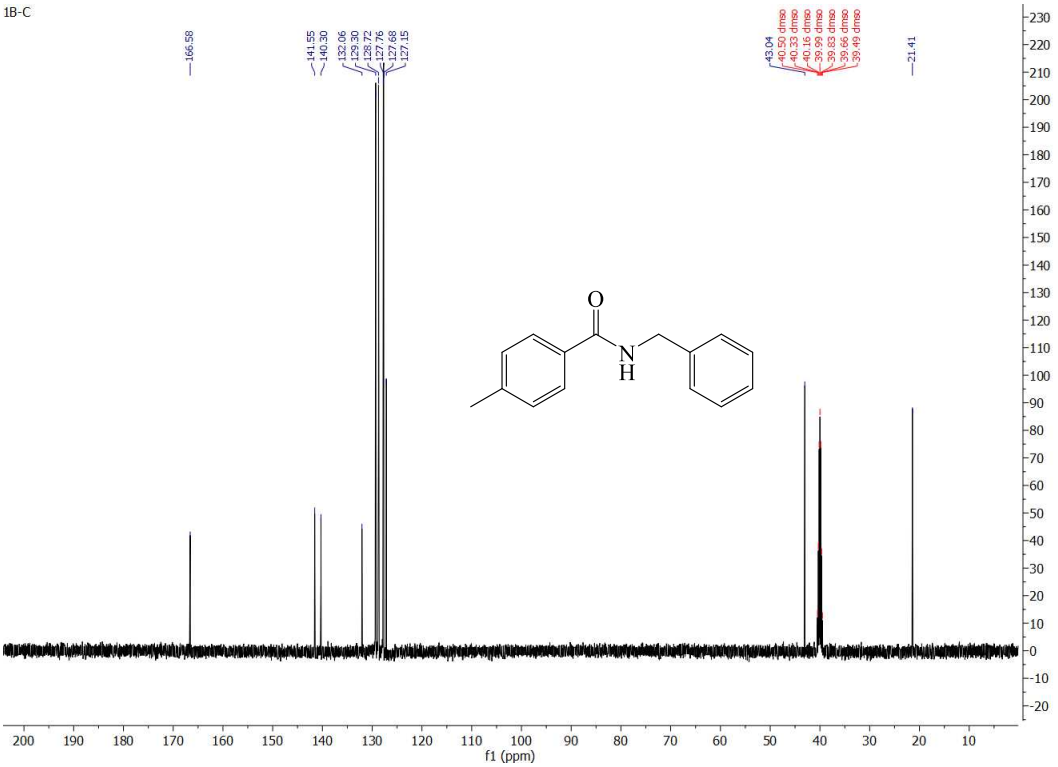
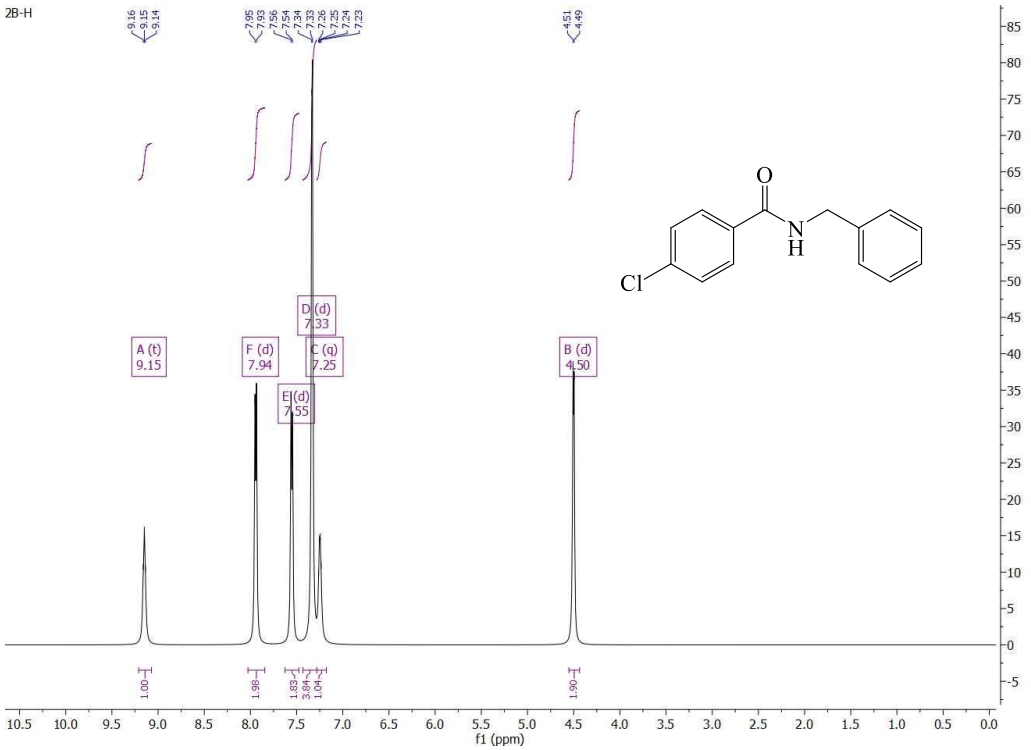
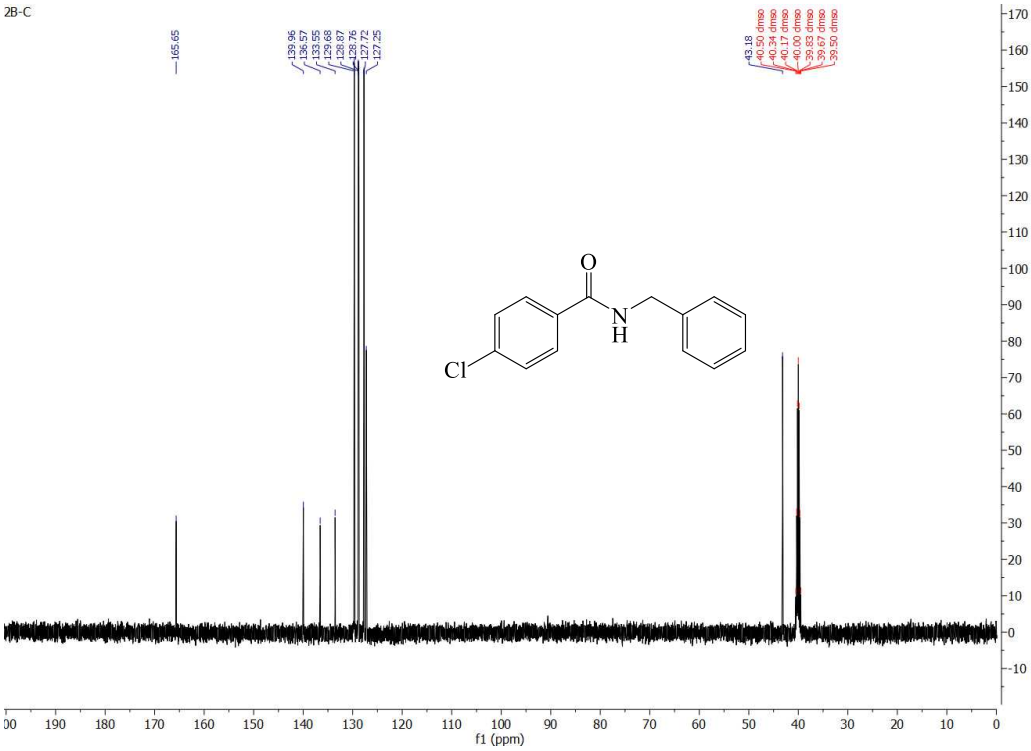
0.960
ppm 9 8 7 6 5 4 3 2 1

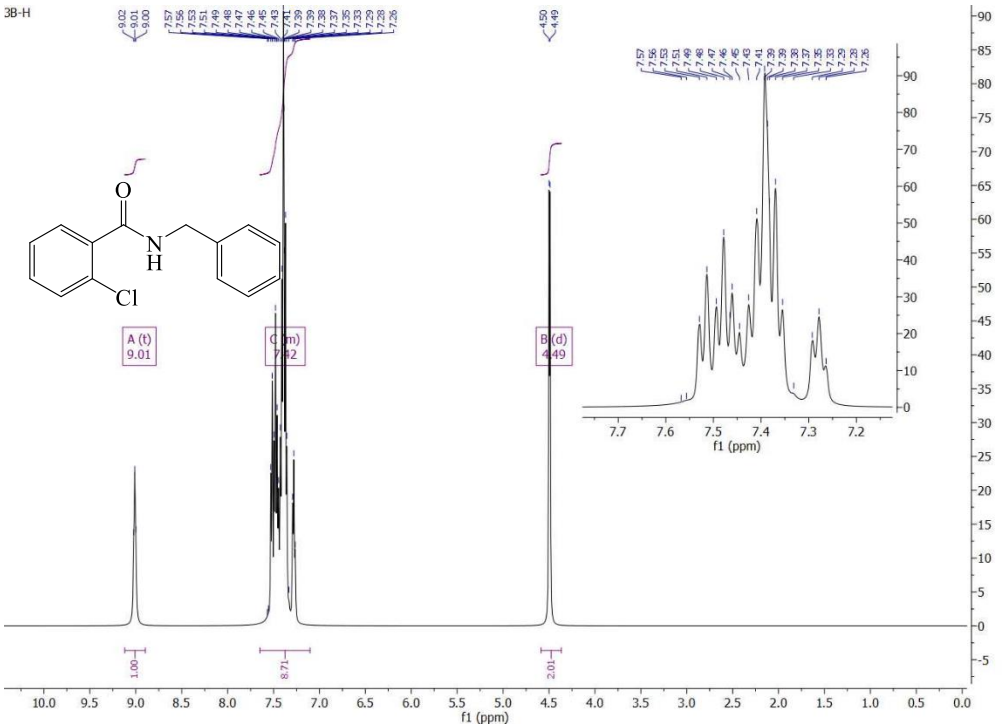

8.6460
8.5459
8.3128
7.8591
7.8433
7.8191
7.8045
7.7818
7.7657
7.7267
7.7073
7.6811
7.5360
7.5211
7.5065
7.4842
7.4597
7.4443
7.4295
7.4041
7.3664
7.3279
7.3178
7.3126
7.3025
7.2669
7.2270
6.7033
6.1848
5.3016
5.1376
4.7175
4.6914
4.6796
4.6517
4.6395
2.5589
2.4949
2.4079
2.3957
2.2992
1.4318
1.3926
1.3455
1.2606
1.2296
1.2257
1.1640
0.8967
0.8853
0.8449
0.0754
O
N
H
N
1.0000
1.0597
2.1384
1.3001
1.1562
2.2685
1.0846
1.0270
2.2304
0.9386
1.1131
0.0810
10 9 8 7 6 5 4 3 2 1 0 ppm

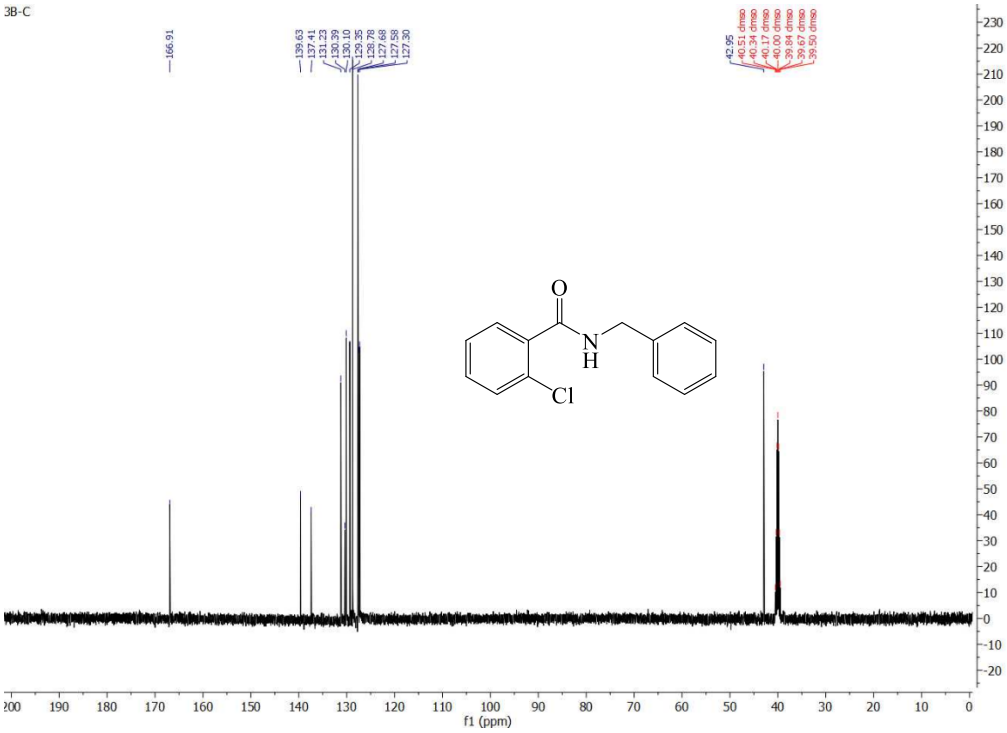

1B-H
A (t)
9.01
B (dd)
7.84
C (m)
7.29
D (d)
4.50
E (d)
2.35
f1 (ppm)

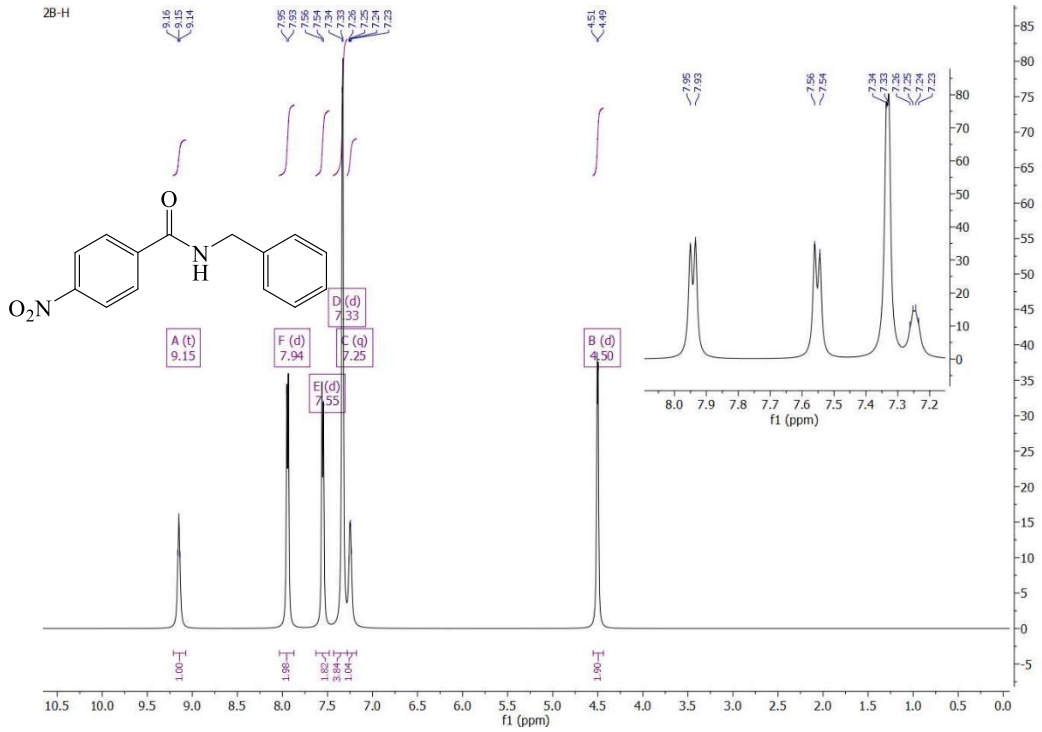

1B-C
f1 (ppm)

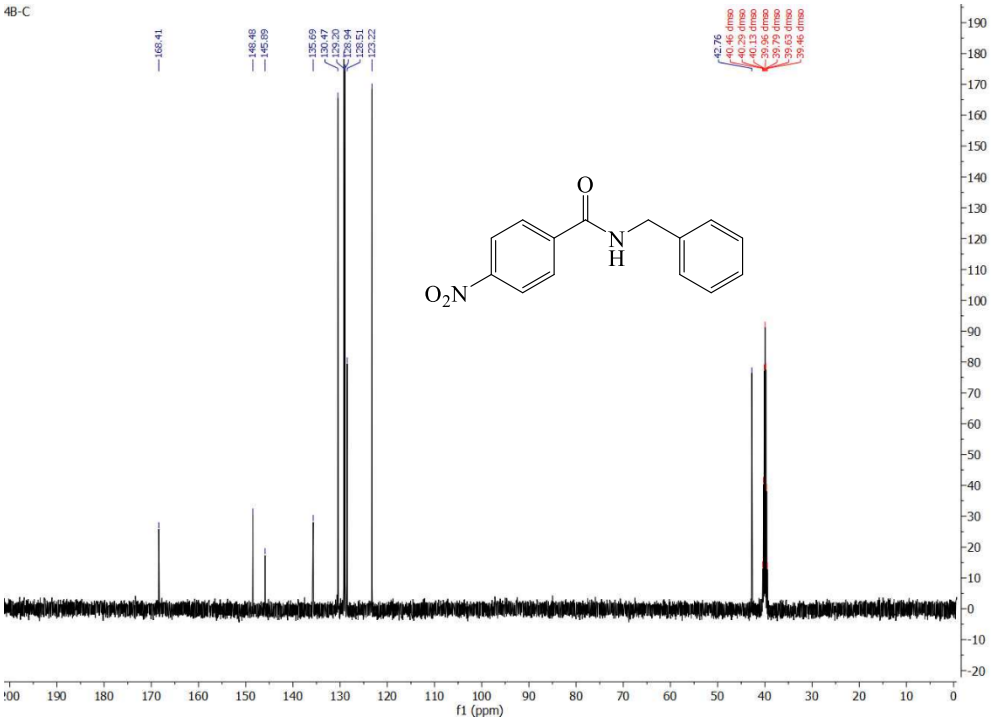

2B-H
A (t)
9.15
F (d)
7.94
C (q)
7.25
D (d)
7.33
E (d)
7.55
B (d)
4.50
f1 (ppm)

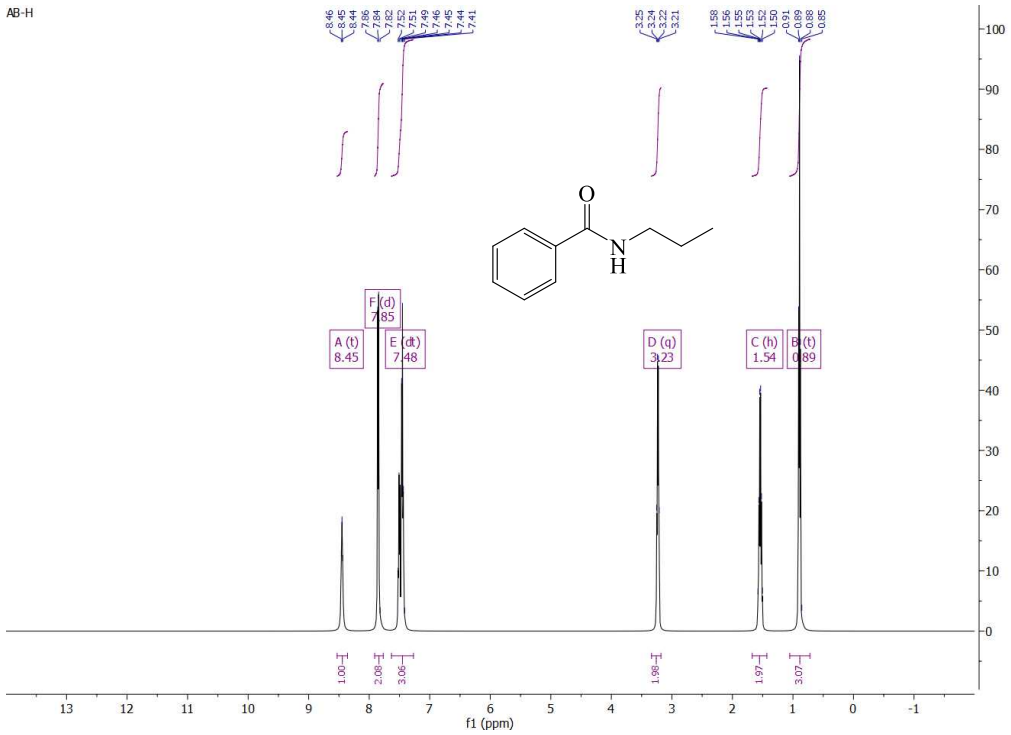

2B-C
f1 (ppm)

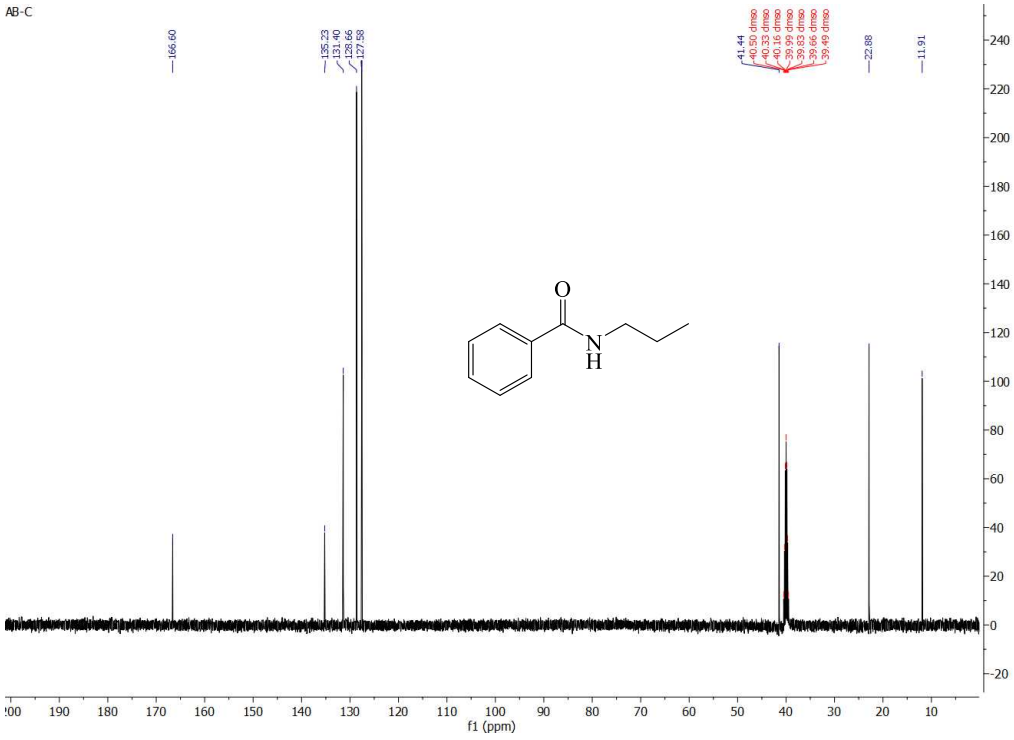

3B-H
A (t)
9.01
B (d)
4.49
1.00
8.71
2.01
f1 (ppm)

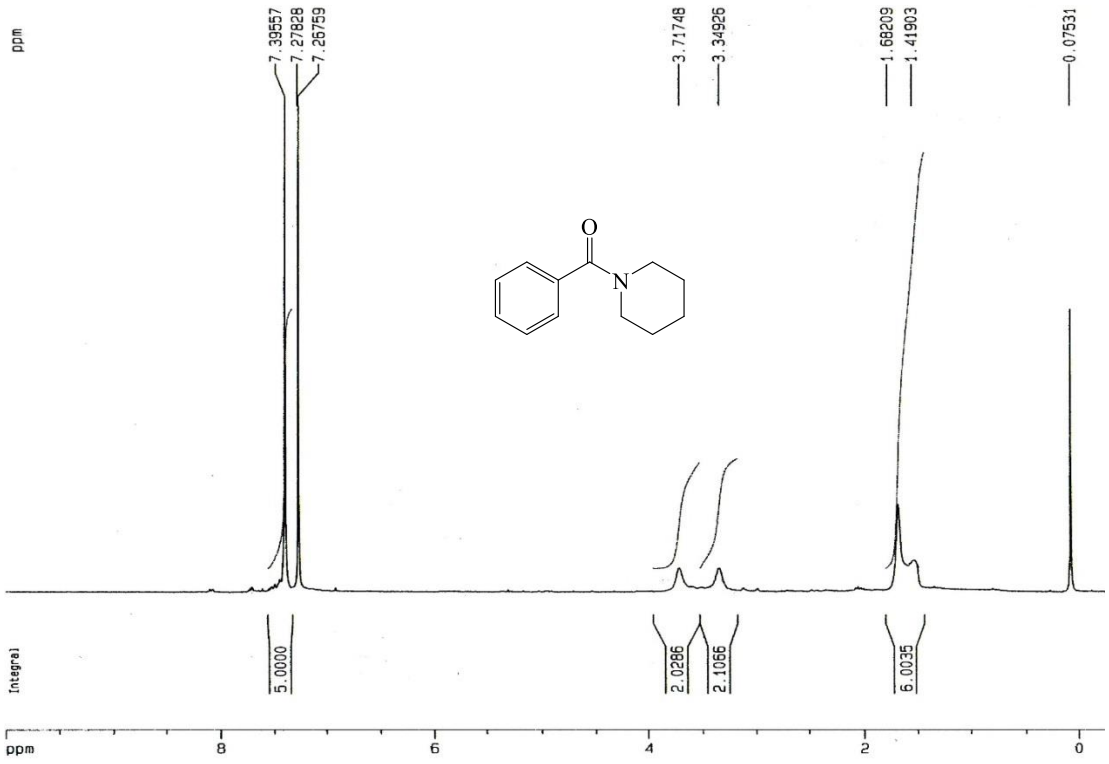

3B-C
166.91
139.63
137.41
131.23
130.39
130.10
129.35
128.78
127.68
127.58
127.30
42.95
40.51 dmso
40.34 dmso
40.17 dmso
40.00 dmso
39.84 dmso
39.67 dmso
39.50 dmso
f1 (ppm)

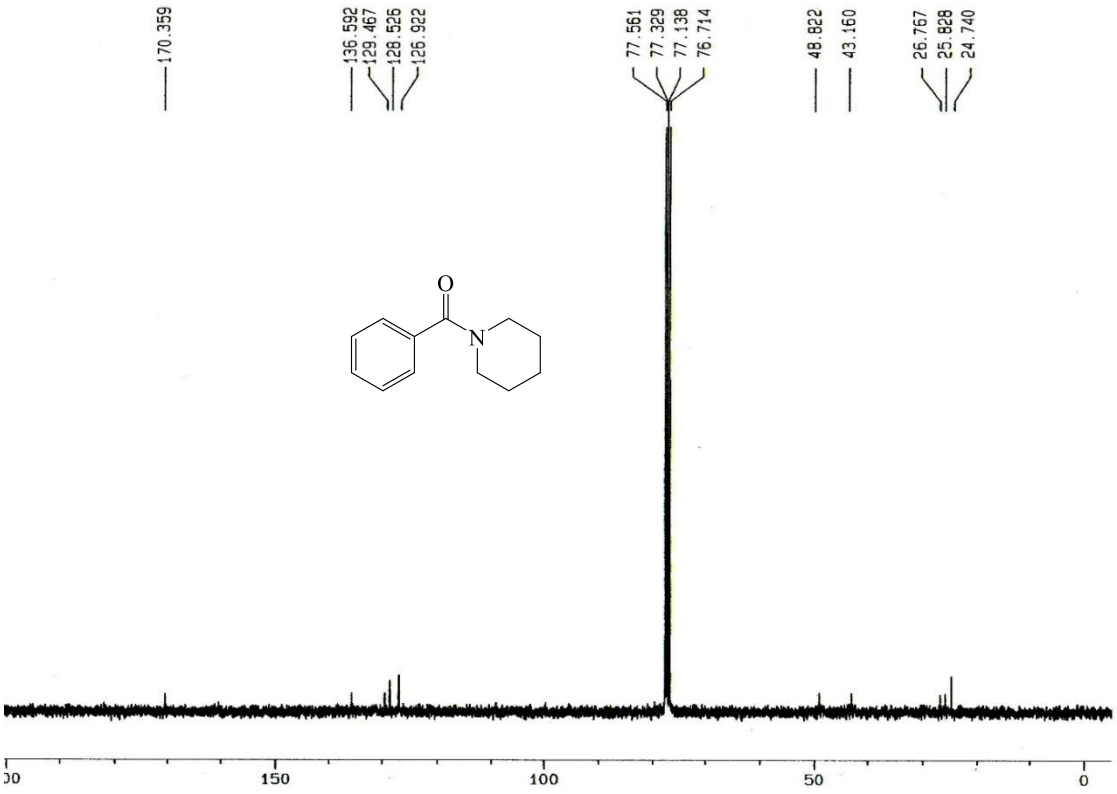

2B-H
A (t)
9.15
F (d)
7.94
C (q)
7.25
D (d)
7.33
E (d)
7.55
B (d)
4.50
f1 (ppm)

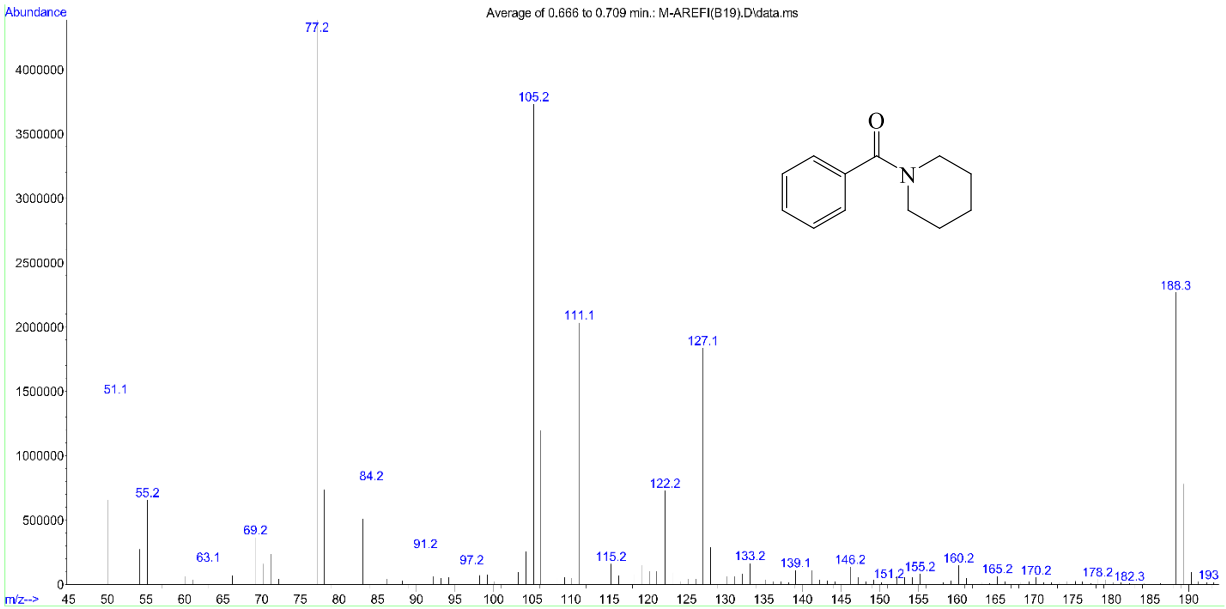

4B-C
f1 (ppm)

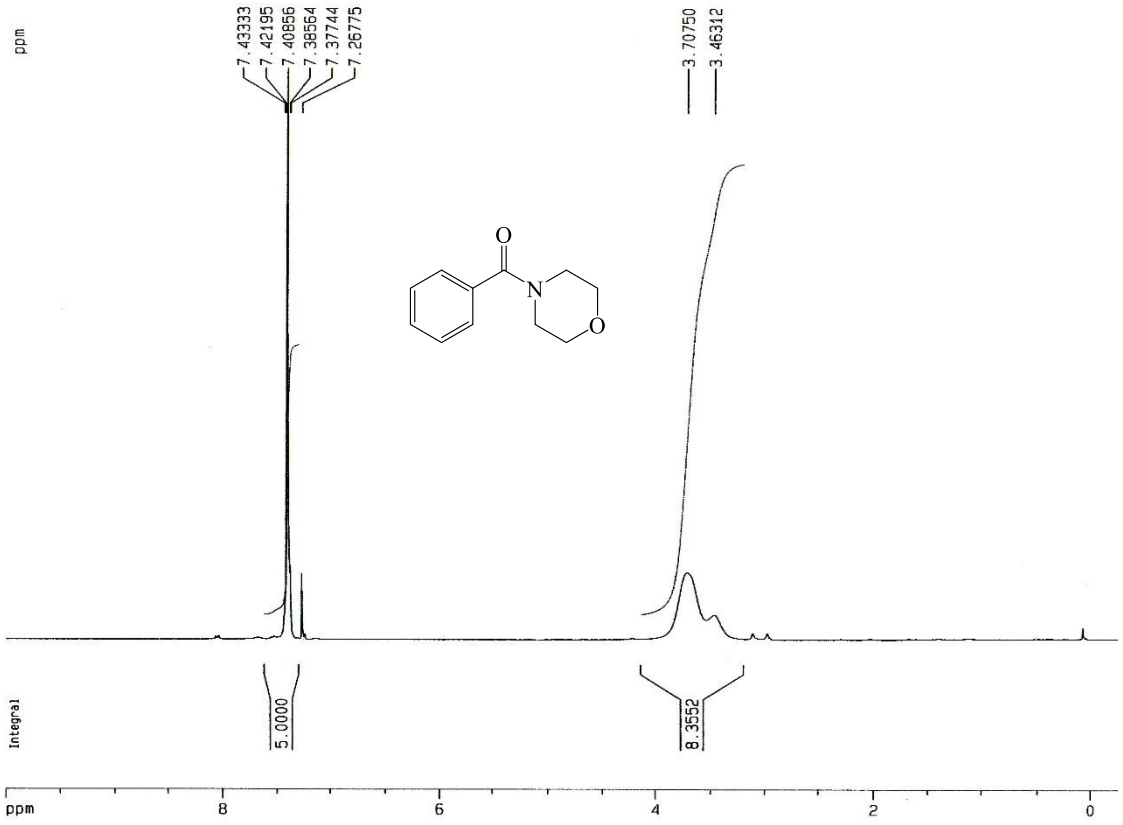

AB-H
8.46
8.45
8.44
7.86
7.84
7.82
7.52
7.51
7.49
7.46
7.45
7.44
7.41
3.25
3.24
3.22
3.21
1.58
1.56
1.55
1.53
1.52
1.50
0.91
0.89
0.88
0.85
A (t)
8.45
F (d)
7.85
E (dt)
7.48
D (q)
3.23
C (h)
1.54
B (t)
0.89
1.00
2.08
3.06
1.98
1.97
3.07
f1 (ppm)

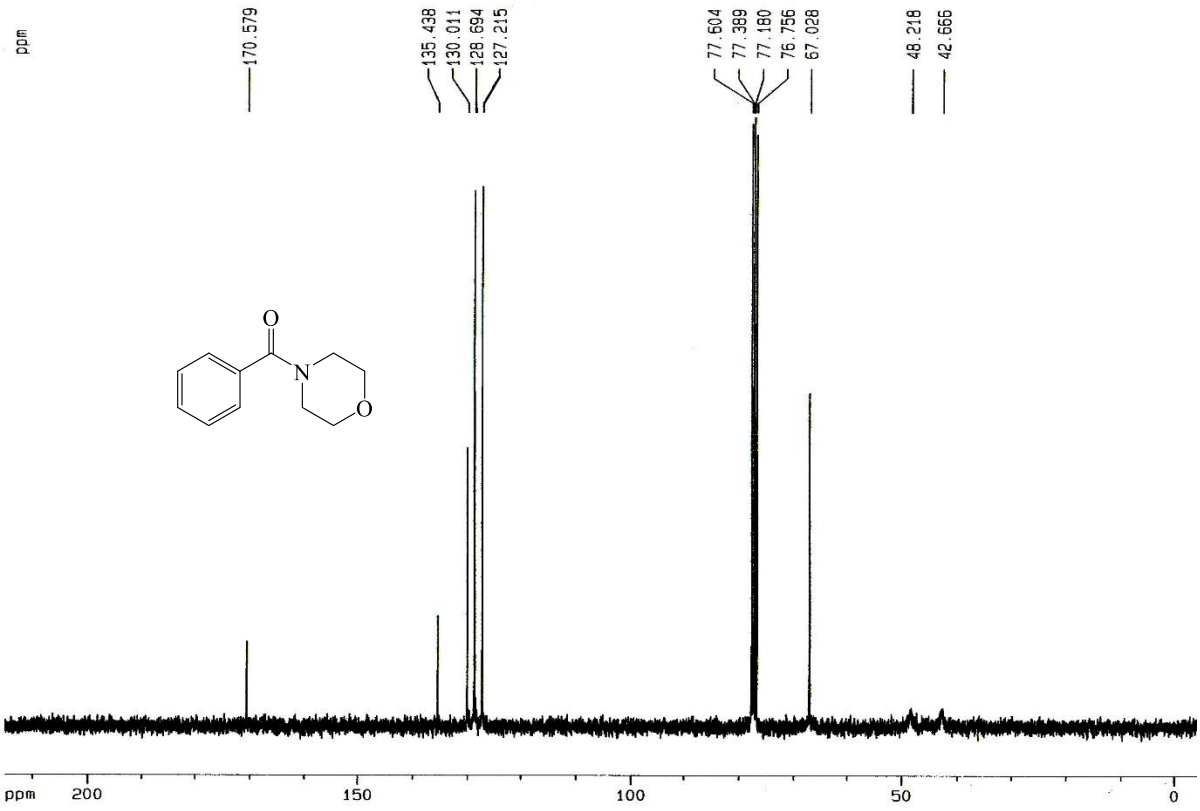

AB-C
166.60
135.23
131.40
128.86
127.58
41.44
40.50 dmso
40.33 dmso
40.16 dmso
39.99 dmso
39.83 dmso
39.66 dmso
39.49 dmso
22.88
11.91
f1 (ppm)

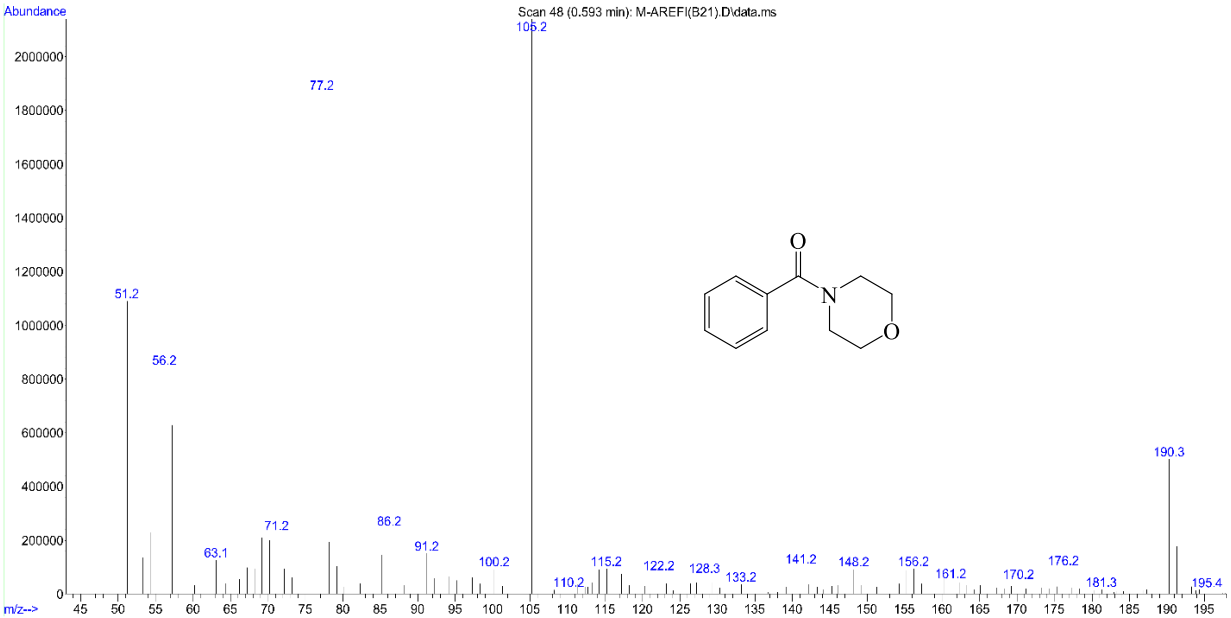

ppm
7.39557
7.27828
7.26759
3.71748
3.34926
1.68209
1.41903
0.07531
O
N
Integral
5.0000
2.0286
2.1066
6.0035
ppm
8
6
4
2
0

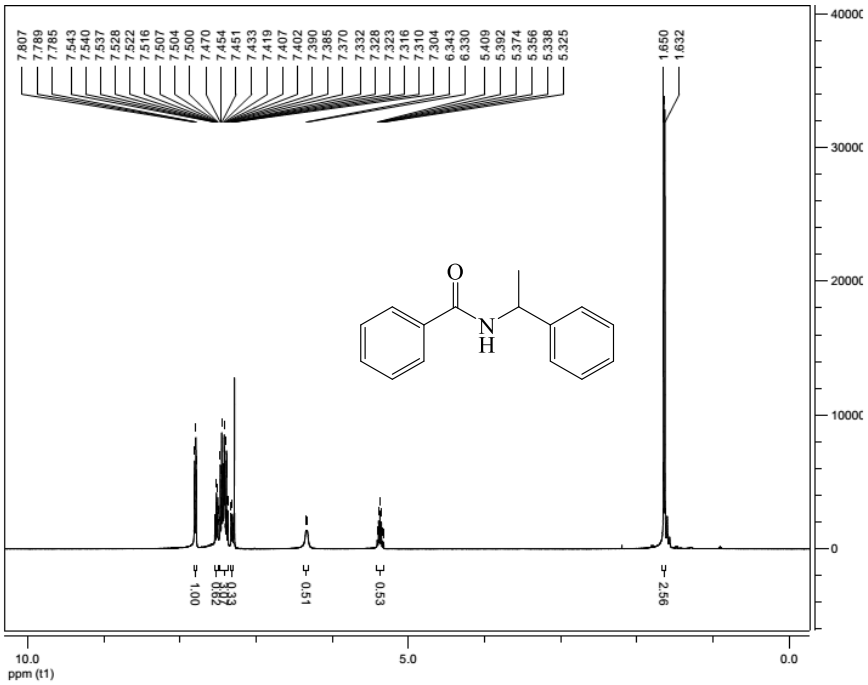

170.359
136.592
129.467
128.526
126.922
77.561
77.329
77.138
76.714
48.822
43.160
26.767
25.828
24.740
O
N
150
100
50
0

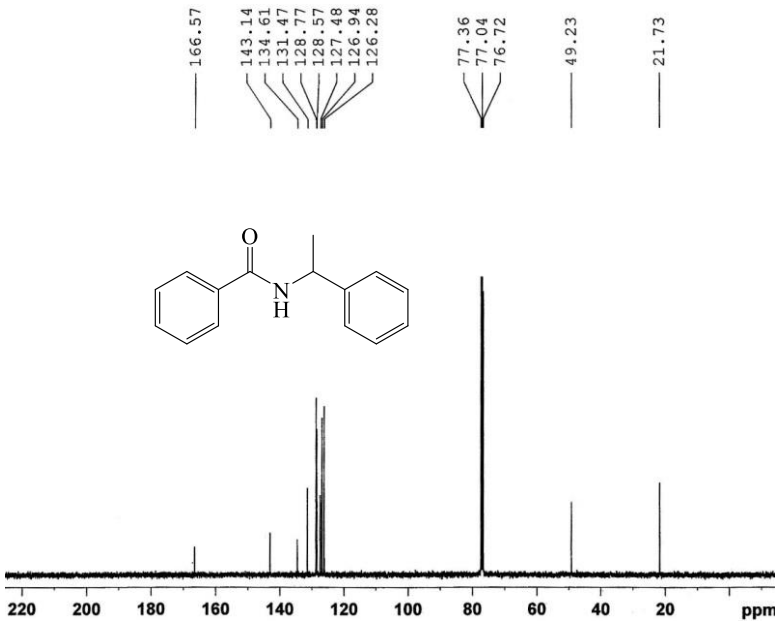

Abundance
Average of 0.666 to 0.709 min.: M-AREFI(B19).D\data.ms
77.2
105.2
188.3
111.1
127.1
51.1
84.2
122.2
55.2
69.2
91.2
63.1
97.2
115.2
133.2
139.1
146.2
151.2
155.2
160.2
165.2
170.2
178.2
182.3
193
m/z-->

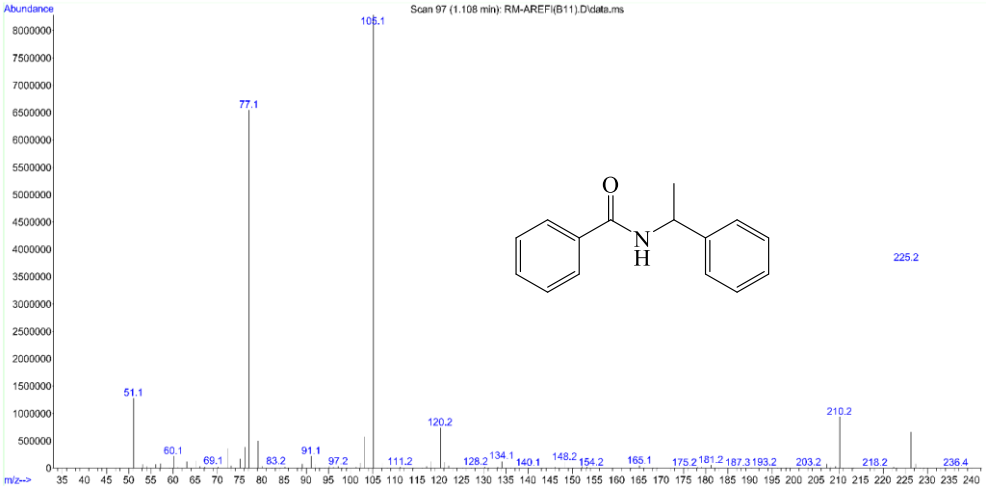

ppm
7.43333
7.42195
7.40856
7.38564
7.37744
7.26775
3.70750
3.46312
Integral
5.0000
8.3552
ppm

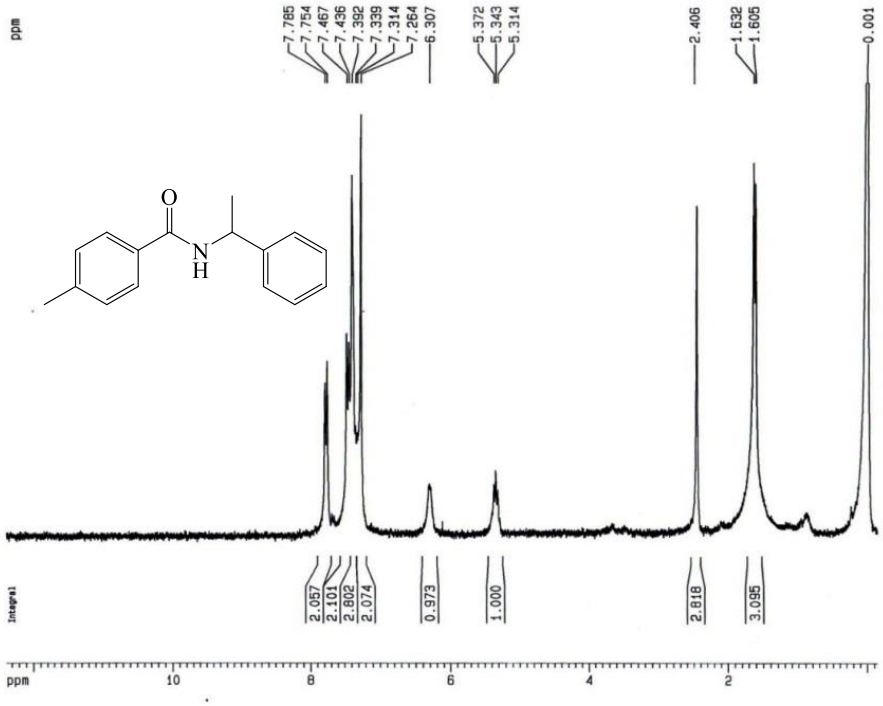

ppm
170.579
135.438
130.011
128.694
127.215
77.604
77.389
77.180
76.756
67.028
48.218
42.666
O
N
O
ppm
200
150
100
50
0

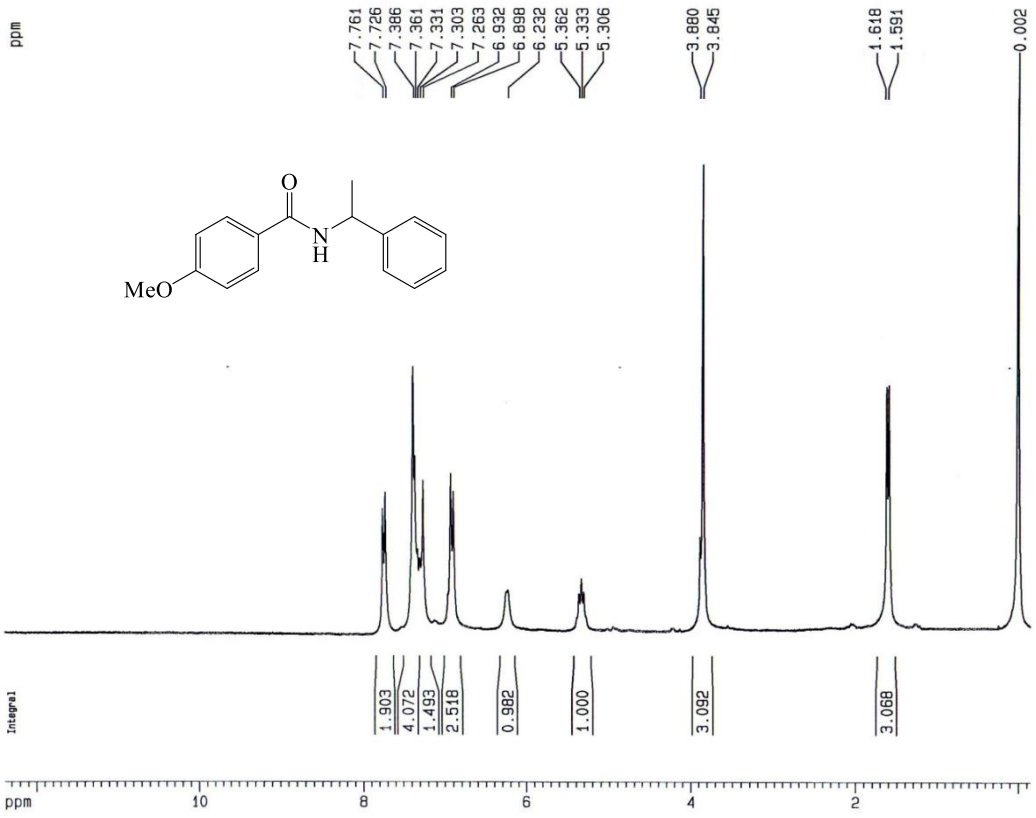

Abundance
Scan 48 (0.593 min): M-AREFI(B21).D\data.ms
105.2
77.2
51.2
56.2
63.1
71.2
86.2
91.2
100.2
110.2
115.2
122.2
128.3
133.2
141.2
148.2
156.2
161.2
170.2
176.2
181.3
190.3
195.4
O
N
O
m/z-->

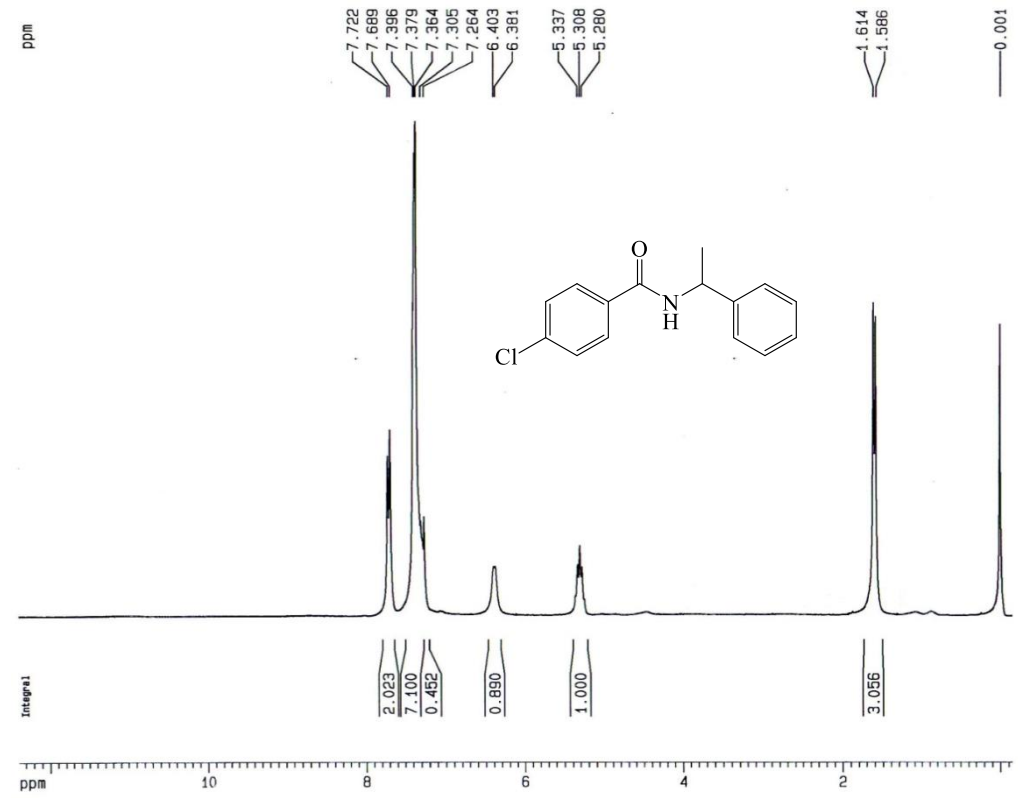

7.807
7.789
7.785
7.543
7.540
7.537
7.528
7.522
7.516
7.507
7.504
7.500
7.470
7.454
7.451
7.433
7.419
7.407
7.402
7.390
7.385
7.370
7.332
7.328
7.323
7.316
7.310
7.304
6.343
6.330
5.409
5.392
5.374
5.356
5.338
5.325
1.650
1.632
O
N
H
1.00
1.82
0.51
0.53
2.56
10.0
ppm (t1)
5.0
0.0

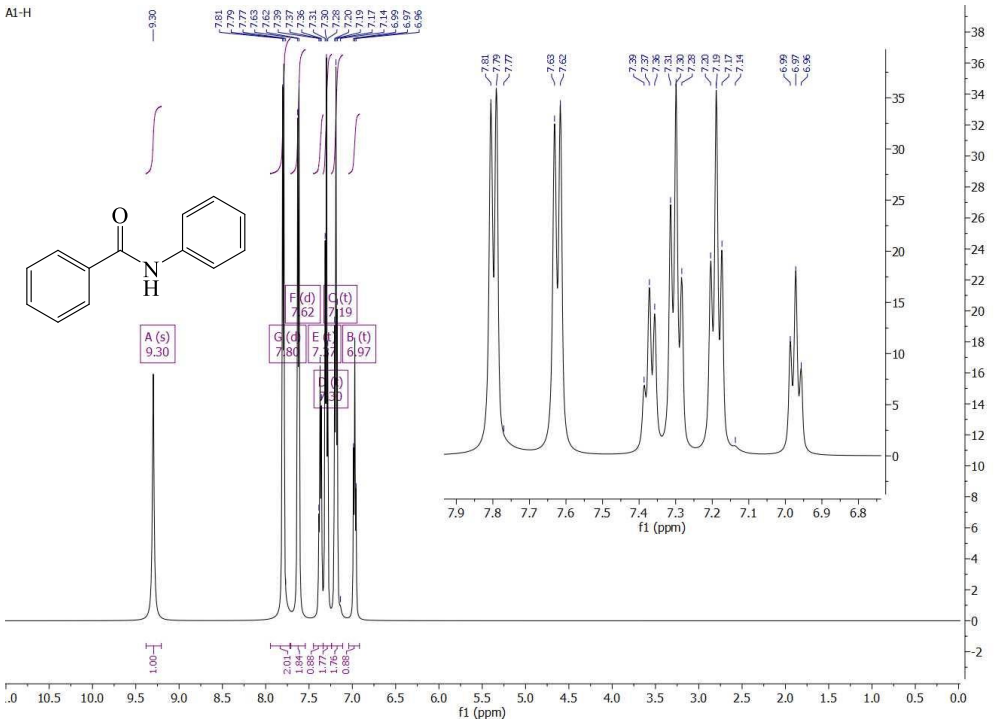

166.57
143.14
134.61
131.47
128.77
128.57
127.48
126.94
126.28
77.36
77.04
76.72
49.23
21.73
O
N
H
220
200
180
160
140
120
100
80
60
40
20
ppm

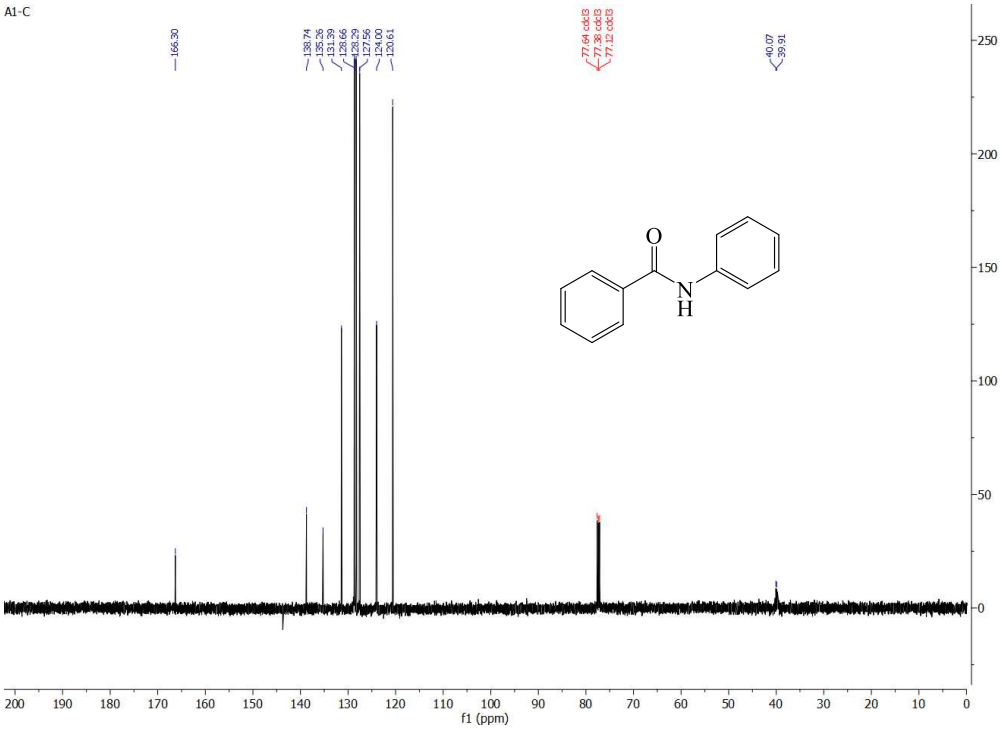

Abundance
Scan 97 (1.108 min): RM-AREFI(B11).D\data.ms
105.1
77.1
51.1
120.2
210.2
225.2
m/z-->

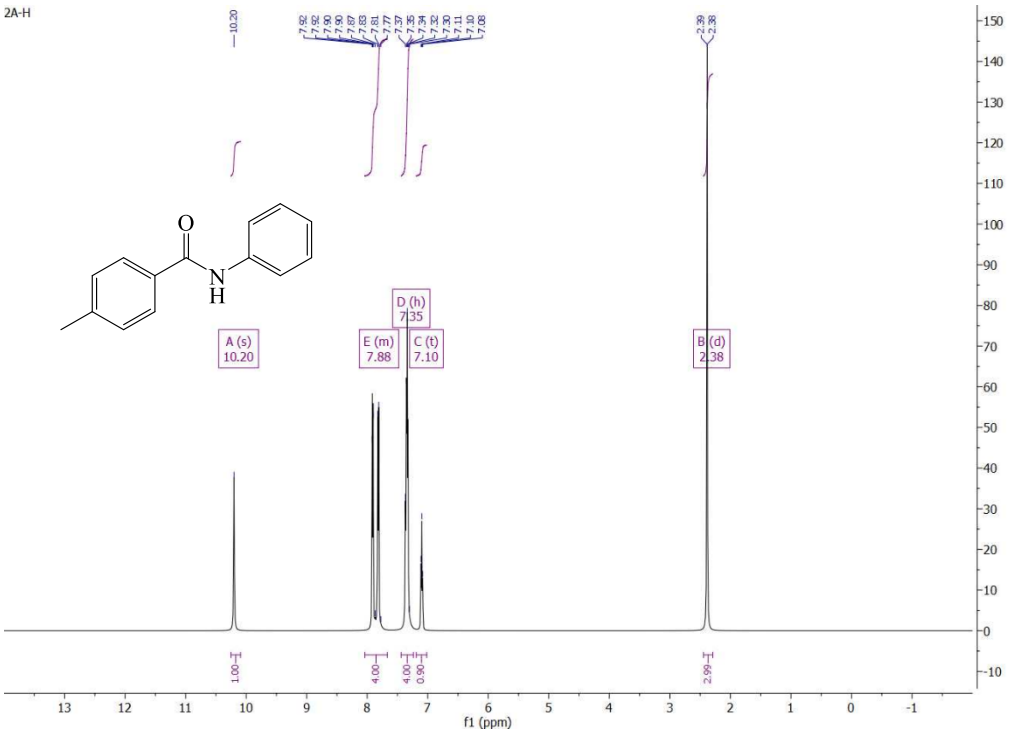

ppm
7.785
7.754
7.467
7.436
7.392
7.339
7.314
7.264
6.307
5.372
5.343
5.314
2.406
1.632
1.605
0.001
Integral
2.057
2.101
2.802
2.074
0.973
1.000
2.818
3.095
ppm

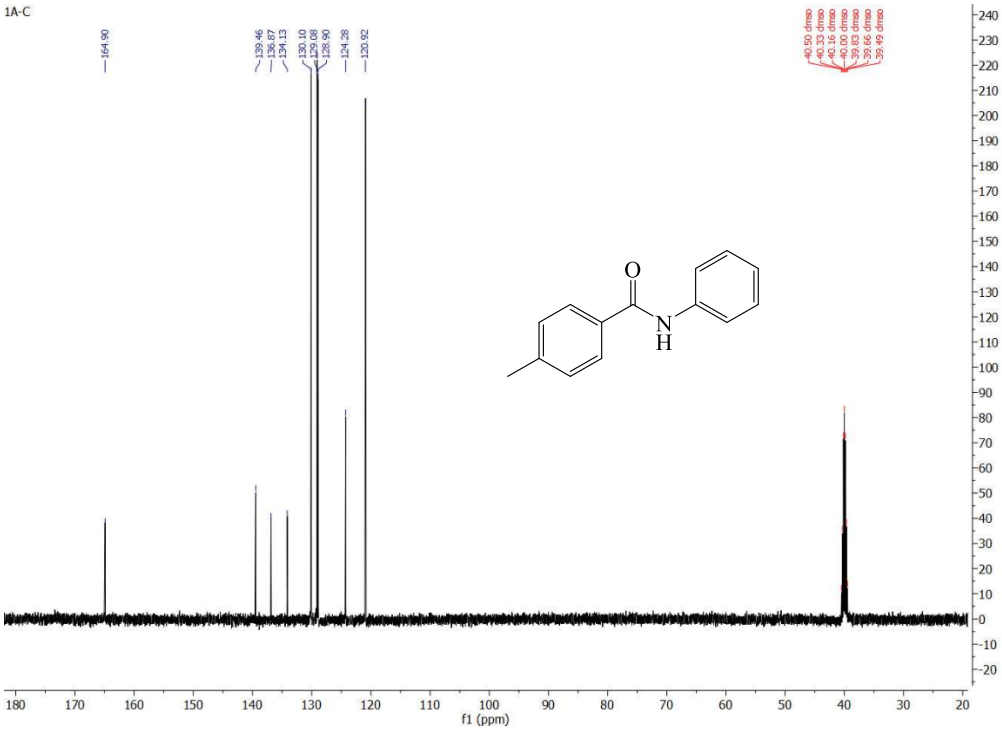

ppm
7.761
7.726
7.386
7.361
7.331
7.303
7.263
6.932
6.898
6.232
5.362
5.333
5.306
3.880
3.845
1.618
1.591
0.002
O
N
H
MeO
Integral
1.903
4.072
1.493
2.518
0.982
1.000
3.092
3.068
ppm
10
8
6
4
2

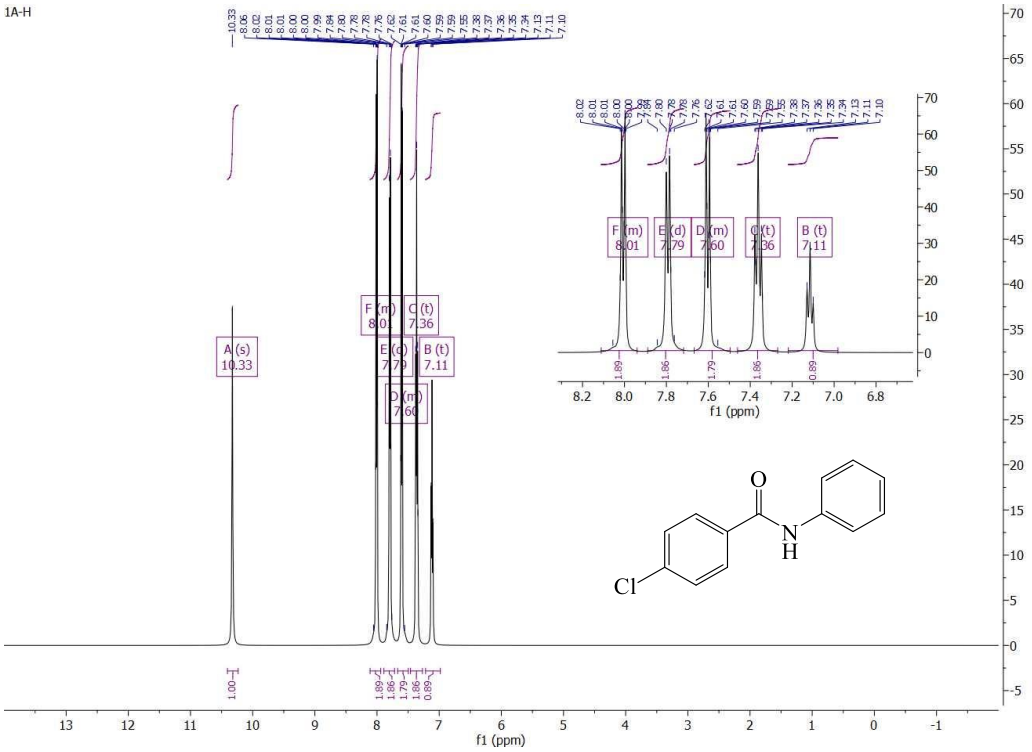

ppm
7.722
7.689
7.396
7.379
7.364
7.305
7.264
6.403
6.381
5.337
5.308
5.280
1.614
1.586
0.001
O
N
H
Cl
Integral
2.023
7.100
0.452
0.890
1.000
3.056
ppm
10
8
6
4
2

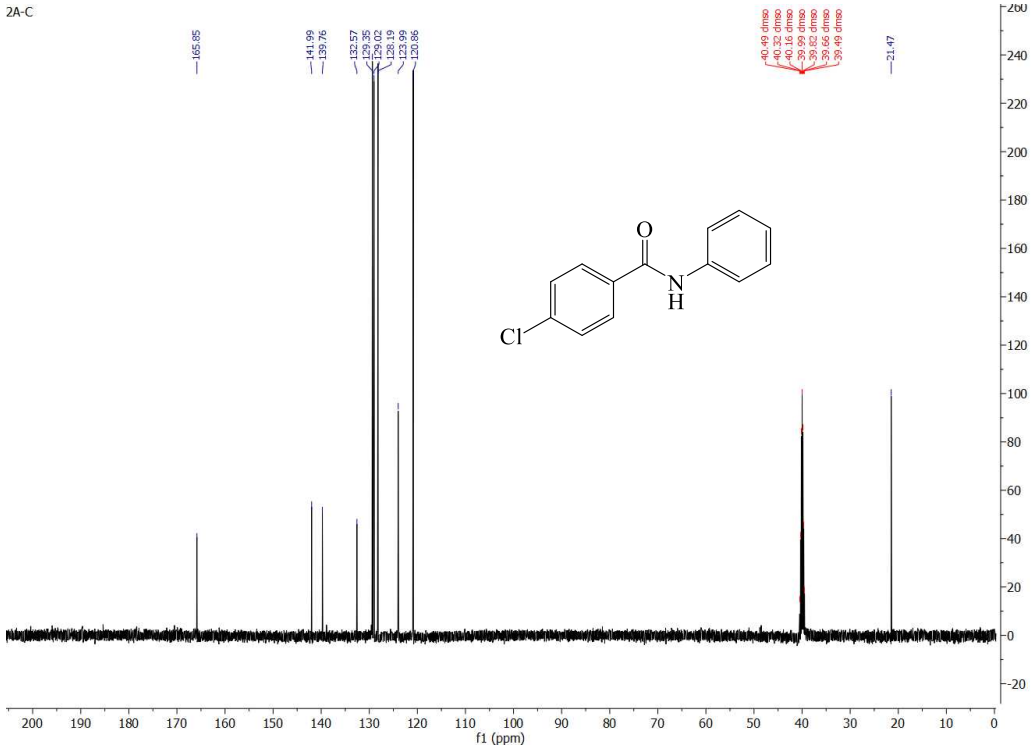

A1-H
f1 (ppm)

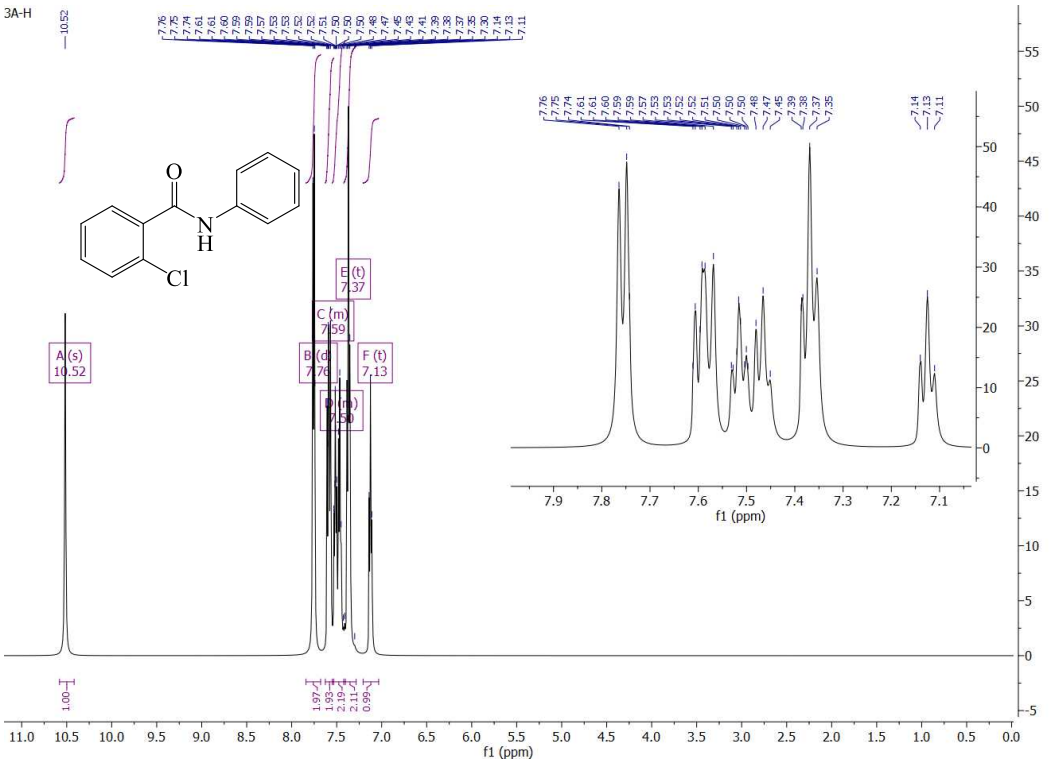

A1-C
f1 (ppm)

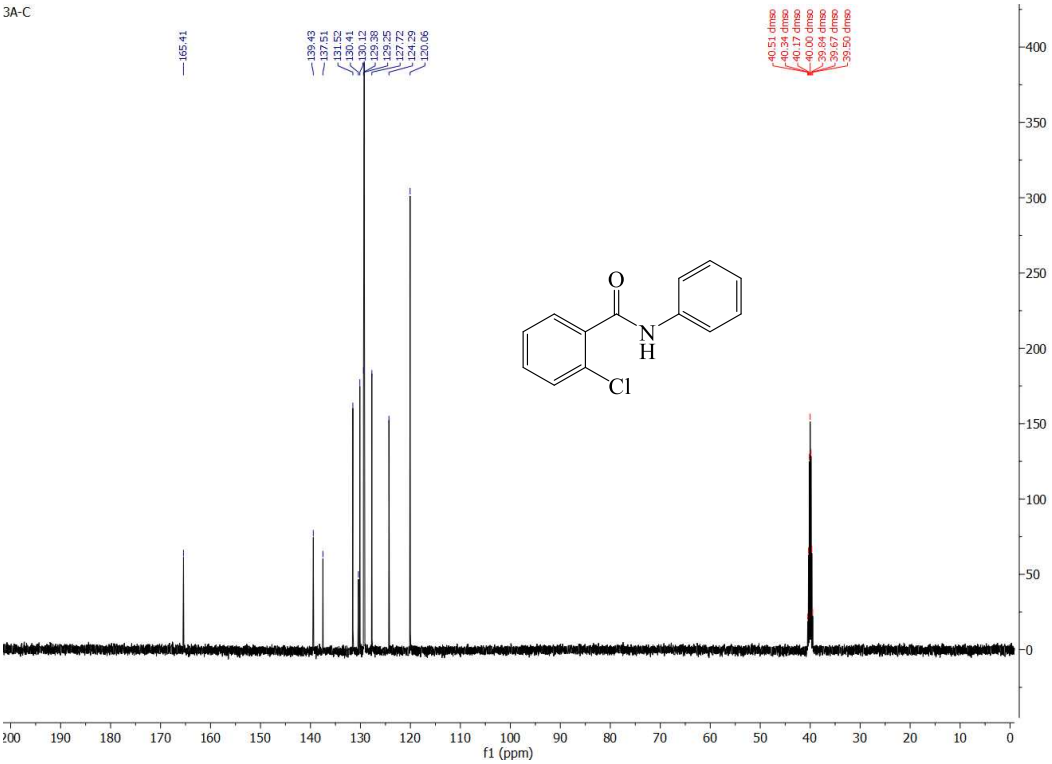

2A-H
A (s)
10.20
E (m)
7.88
D (h)
7.35
C (t)
7.10
B (d)
2.38
f1 (ppm)

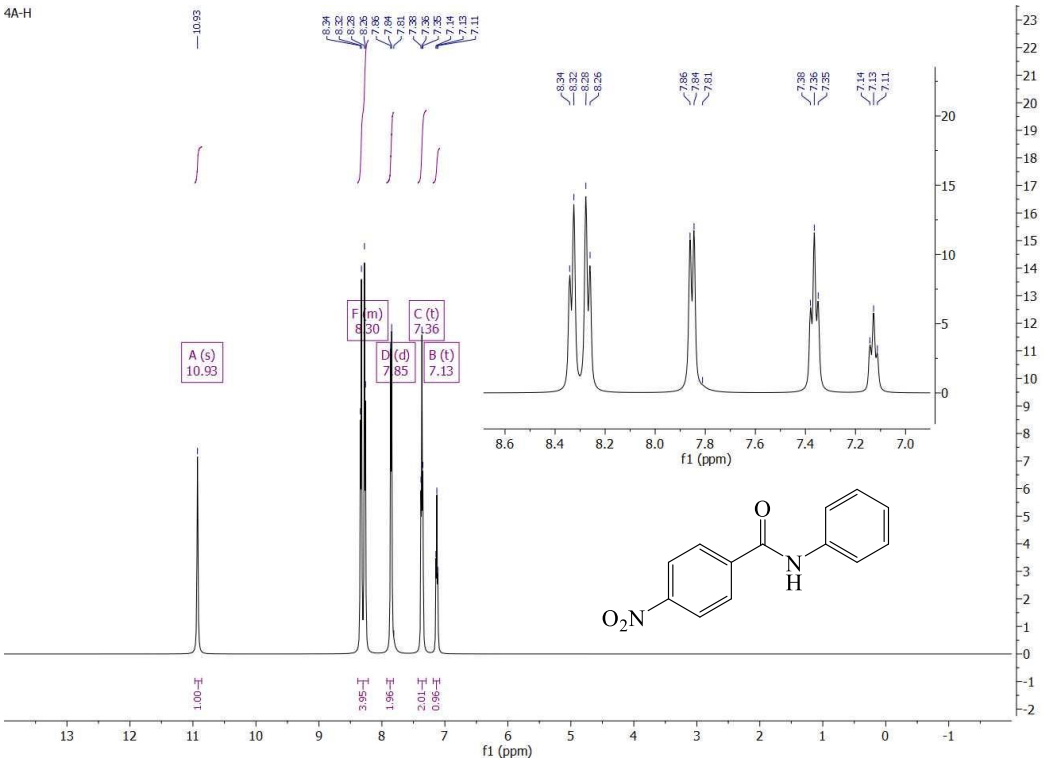

1A-C
164.90
139.46
136.67
134.13
130.10
129.08
128.90
124.28
120.92
f1 (ppm)

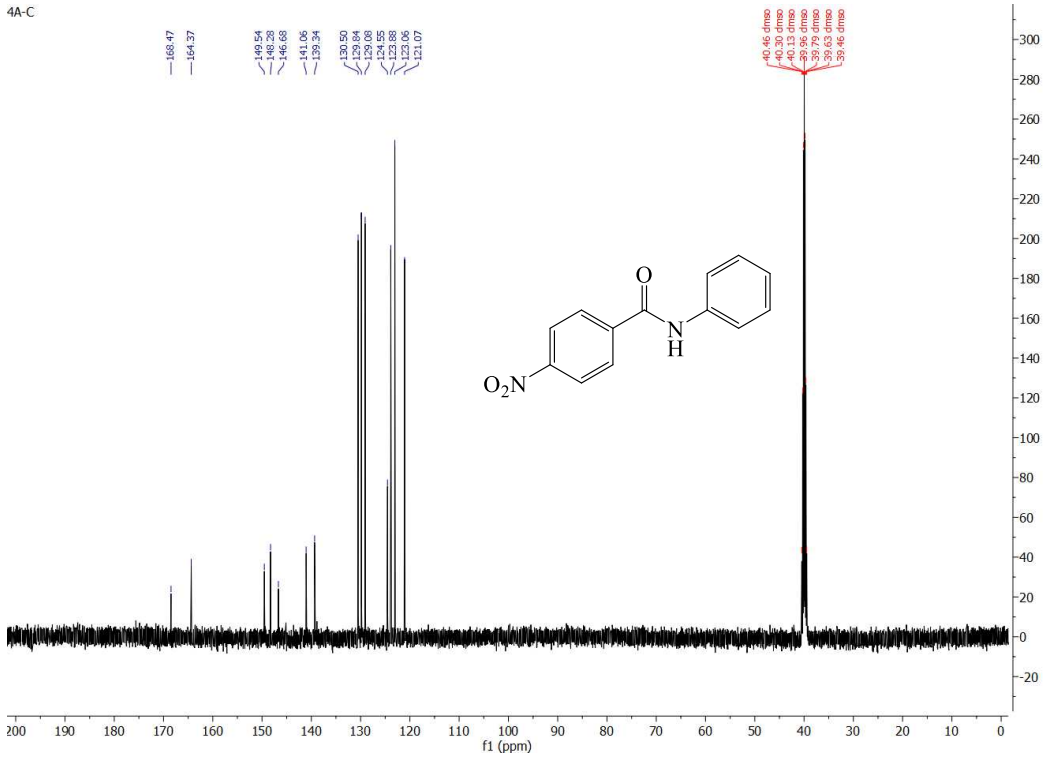

1A-H
A (s)
10.33
F (m)
8.01
C (t)
7.36
E (d)
7.79
B (t)
7.11
D (m)
7.60
f1 (ppm)
O
N
H
Cl

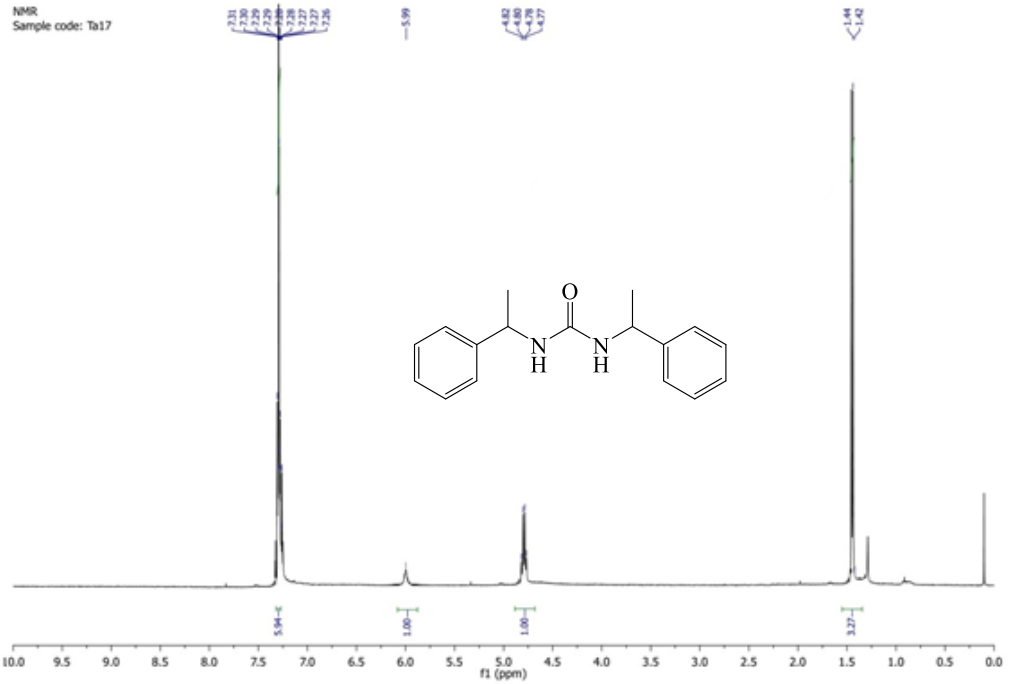

2A-C
165.85
141.99
139.76
132.57
129.35
129.02
128.19
125.99
120.86
21.47
f1 (ppm)
O
N
H
Cl

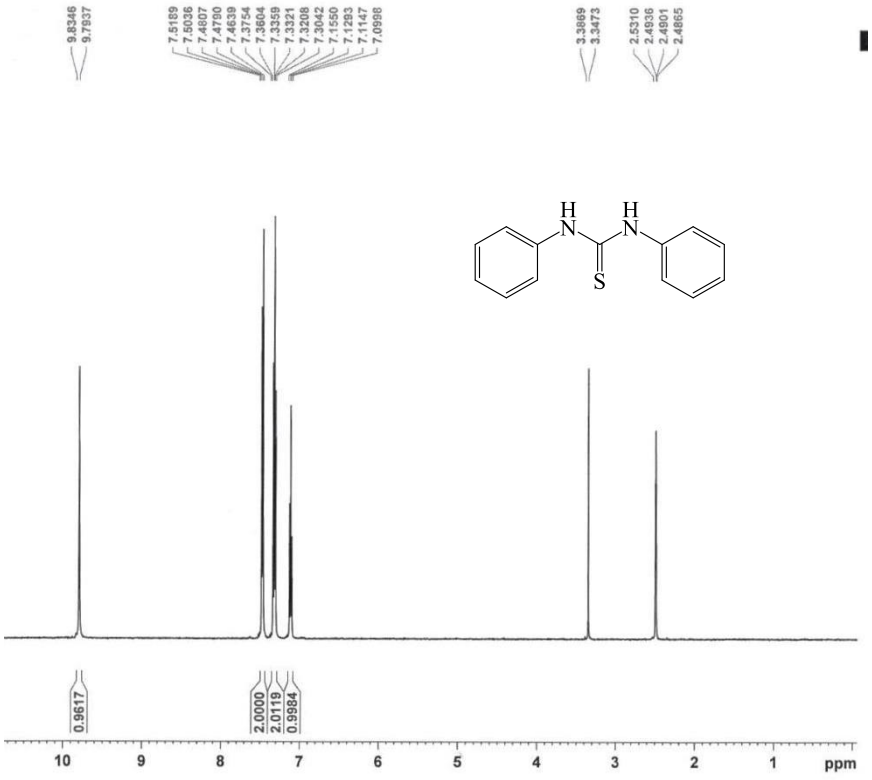

3A-H
A (s) 10.52
B (d) 7.76
C (m) 7.59
D (m) 7.50
E (t) 7.37
F (t) 7.13
f1 (ppm)


3A-C
f1 (ppm)


4A-H
A (s)
10.93
F (m)
8.30
D (d)
7.85
C (t)
7.36
B (t)
7.13
f1 (ppm)


4A-C
f1 (ppm)


NMR
Sample code: Ta17
O
N
H
N
H
f1 (ppm)


H
N
H
N
S
ppm