Supplementary Information

for

Continuous flow hydrogenation of olefins and nitrobenzenes catalysed by platinum nanoparticles dispersed in an amphiphilic polymer

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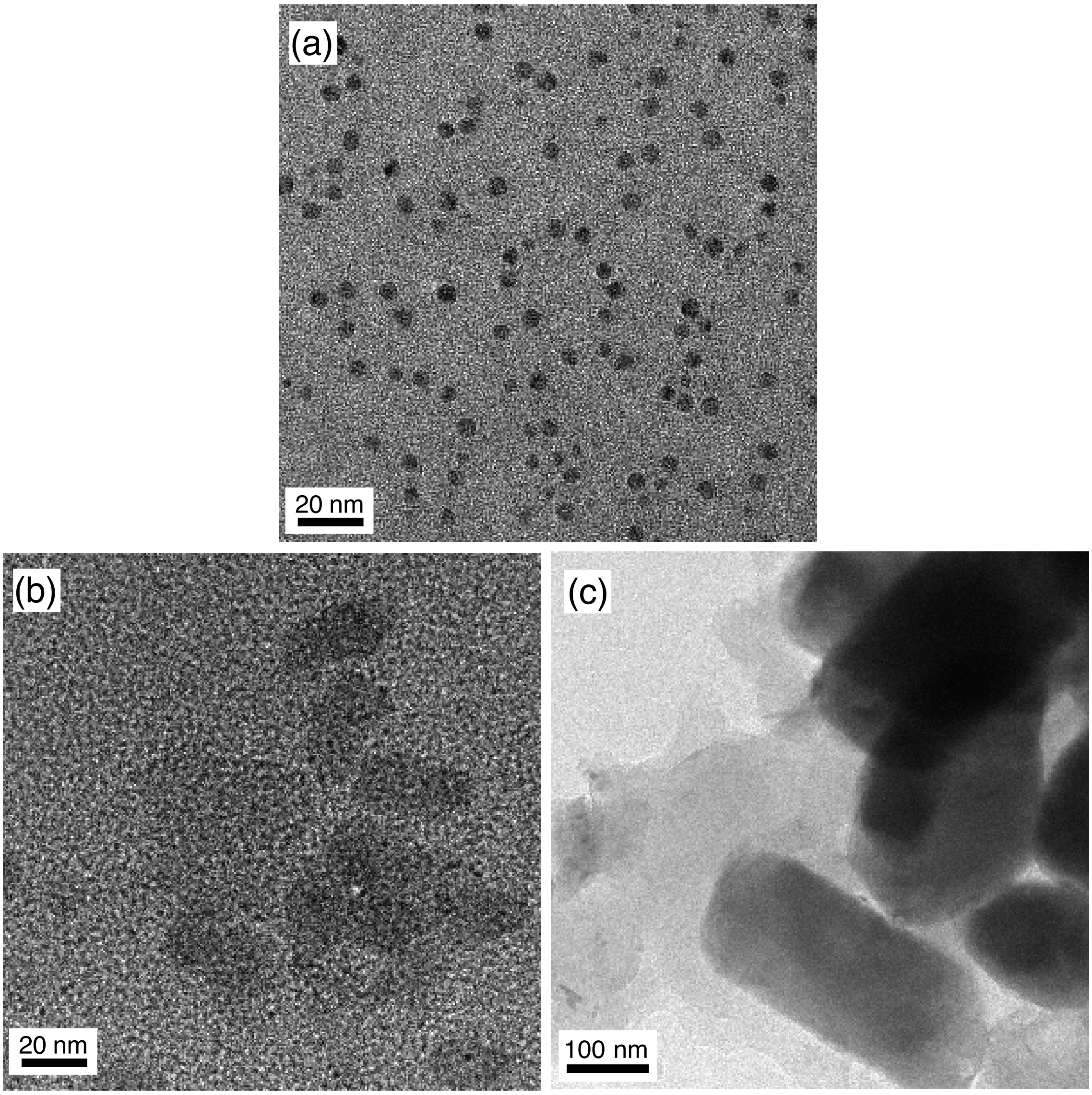


Fig. S1 TEM Images for the used catalysts. (a) Fresh ARP-Pt. (b) After the hydrogenation of styrene for 63 h. (c) After the hydrogenation of nitrobenzene for 70 h.

Characterization of products.

Ethylbenzene (**2a**) [CAS: 98-86-2]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.31-7.16 (m, 5H, Ph), 2.65 (q, J = 7.5 Hz, 2H, -CH_2-), 1.24 (t, J = 7.5 Hz, 2H, -CH_3). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$): δ = 144.25 (Ph), 128.28 (Ph), 127.84 (Ph), 125.57 (Ph), 28.87 (-CH_2-), 15.63 (-CH_3). MS (EI) m/z = 106 (M).

4-Ethylanisole (**2b**) [CAS: 1515-95-3]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.12 (d, J = 7.9 Hz, 2H, Ar_{H-2} and Ar_{H-6}), 6.83 (d, J = 7.9 Hz, 2H, Ar_{H-3} and Ar_{H-5}), 2.59 (q, J = 7.5 Hz, 2H, -CH_2-), 1.21 (t, J = 7.5 Hz, 3H, -CH_3). ^{13}C{^{1}H} NMR (99.55 MHz, $CDCl_3$): δ = 157.56 (Ar), 136.36 (Ar), 128.68 (Ar), 113.68 (Ar), 55.23 (OCH_3), 27.94 (-CH_2-), 15.90 (-CH_3). MS (EI) m/z = 136 (M).

4-Ethyltoluene (**2c**) [CAS: 622-96-8]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.10 (s, 4H, Ar), 2.61 (q, J = 7.5 Hz, 2H, -CH_2-), 2.32 (s, 3H, -CH_3), 1.22 (t, 3H, J = 7.5 Hz, -CH_3). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$): δ = 141.19 (Ar), 134.97 (Ar), 128.97 (Ar), 127.71 (Ar), 28.41 (-CH_2-), 20.96 (-CH_3), 15.78 (-CH_3). MS (EI) m/z = 120 (M).

2-Ethyltoluene (**2d**) [CAS: 611-14-3]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.16-7.08 (m, 4H, Ar), 2.63 (q, J = 7.9 Hz, 2H, -CH_2-), 2.31 (s, 3H, -CH_3), 1.21 (t, J = 7.9 Hz, 3H, -CH_3). ^{13}C{^{1}H} NMR (99.55 MHz, $CDCl_3$): δ = 142.28 (Ar), 135.74 (Ar), 129.98 (Ar), 127.85 (Ar), 125.98 (Ar), 125.70 (Ar), 26.16 (-CH_2-), 19.15 (CH_3), 14.35 (CH_3). MS (EI) m/z = 120 (M).

3-Ethyltoluene (**2e**) [CAS: 620-14-4]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.18 (t, J = 7.9 Hz, 1H, Ar_{H-5}), 7.02-6.99 (m, 3H, Ar), 2.61 (q, J = 7.9 Hz, 2H, -CH_2-), 2.33 (s, 3H, -CH_3), 1.23 (t, J = 7.9 Hz, 3H, -CH_3). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$): δ = 144.20 (Ar), 137.82 (Ar), 128.69 (Ar), 128.20 (Ar), 126.30 (Ar), 124.83 (Ar), 28.78 (-CH_2-), 21.40 (-CH_3), 15.65 (-CH_3). MS (EI) m/z = 120 (M).

1-Chloro-4-ethylbenzene (**2f**) [CAS: 622-98-0]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.24 (d, J = 8.7 Hz, 2H, Ar_{H-2} and Ar_{H-6}), 7.12 (d, J = 8.3 Hz, 2H, Ar_{H-3} and Ar_{H-5}), 2.61 (q, J = 7.9 Hz, -2H, CH_2-), 1.22 (t, J = 7.9 Hz, 3H, -CH_3). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$): δ = 142.61 (Ar), 131.22 (Ar), 129.18 (Ar), 128.34 (Ar), 28.24 (-CH_2-), 15.53 (-CH_3). MS (EI) m/z = 140 (M).

4-Ethylbenzenetrifluoride (**2g**) [CAS: 27190-69-8]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.53 (d, J = 7.9 Hz, 2H, Ar_{H-2} and Ar_{H-6}), 7.30 (d, J =7.9 Hz, 2H, Ar_{H-3} and Ar_{H-5}), 2.71 (q, J = 7.9 Hz, 2H, $-CH_2-$), 1.26 (t, J = 7.9 Hz, 3H, $-CH_3$). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$): δ = 148.28 (Ar), 128.51 (Ar), 125.24 (q, J = 3.8 Hz, Ar), 124.42 (q, J = 271 Hz, $-CF_3$), 28.77 ($-CH_2-$), 15.33 ($-CH_3$). MS (EI) m/z = 174 (M).

4-Ethylbenzonitrile (**2h**) [CAS: 25309-65-3]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.57 (d, J = 7.5 Hz, 2H, Ar_{H-2} and Ar_{H-6}), 7.30 (d, J = 7.1 Hz, 2H, Ar_{H-3} and Ar_{H-5}), 2.71 (q, J = 7.5 Hz, 2H, $-CH_2-$), 1.26 (t, J = 7.5 Hz, 3H, $-CH_3$). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$): δ = 149.81 (Ar), 132.19 (Ar), 128.68 (Ar), 119.22 (CN), 109.47 (Ar), 29.08 ($-CH_2-$), 15.05 ($-CH_3$). MS (EI) m/z = 131 (M).

4-Ethylacetophenone (**2i**) [CAS: 937-30-4]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.89 (dt, J = 8.7 and 2.0 Hz, 2H, Ar_{H-2} and Ar_{H-6}), 7.29 (d, J = 8.3 Hz, 2H, Ar_{H-3} and Ar_{H-5}), 2.71 (q, J = 7.9 Hz, 2H, $-CH_2-$), 2.59 (s, 3H, $-CH_3$), 1.26 (t, J = 7.9 Hz, 3H, $-CH_3$). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$): δ = 197.93 (CO), 150.05 (Ar), 134.86 (Ar), 128.52 (Ar), 128.04 (Ar), 28.91 ($-CH_2-$), 26.55 ($-CH_3$), 15.21 ($-CH_3$). MS (EI) m/z = 148 (M).

Methyl 4-ethylbenzoate (**2j**) [CAS: 6908-41-4]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.96 (d, J = 7.5 Hz, 2H, Ar_{H-2} and Ar_{H-6}), 7.26 (d, J = 7.9 Hz, 2H, Ar_{H-3} and Ar_{H-5}), 3.90 (s, 3H, OCH_3), 2.70 (q, J = 7.5 Hz, 2H, $-CH_2-$), 1.26 (t, J = 7.9 Hz, 3H, $-CH_3$). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$): δ = 167.17 (CO), 149.71 (Ar), 129.65 (Ar), 127.84 (Ar), 127.57 (Ar), 51.92 (OCH_3), 28.91 ($-CH_2-$), 15.20 ($-CH_3$). MS (EI) m/z = 164 (M).

Benzyl (4-ethylphenyl)carbamate (**2k**) [CAS: 957783-10-7]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.42-7.28 (m, 7H, Ar), 7.13 (d, J = 8.7 Hz, 2H, Ar), 6.61 (brs, 1H, NH), 5.19 (s, 2H, $-C\underline{H}_2Ph$), 2.60 (q, J = 7.5 Hz, 2H, $-CH_2-$), 1.21 (t, 3H, J = 7.5 Hz, $-CH_3$). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$): δ = 153.48 (CO), 139.57 (Ar), 136.12 (Ar), 135.32 (Ar), 128.59 (Ar), 128.37 (Ar), 128.29 (Ar), 118.87 (Ar), 66.92 ($\underline{C}H_2Ph$), 28.19 ($-CH_2-$), 15.69 ($-CH_3$). MS (EI) m/z = 255 (M).

2-Ethylnaphthalene (**2l**) [CAS: 939-27-5]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.81-7.76 (m, 3H, Ar), 7.62 (s, 1H, Ar_{H-1}), 7.46-7.38 (m, 2H, Ar), 7.35 (d, J = 8.3 Hz, 1H, Ar), 2.81 (q, J = 7.5 Hz, 2H, -CH_2-), 1.33 (t, J = 7.5 Hz, 3H, -CH_3). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$): δ = 141.73 (Ar), 133.65 (Ar), 131.88 (Ar), 127.76 (Ar), 127.57 (Ar), 127.37 (Ar), 127.06 (Ar), 125.79 (Ar), 125.50 (Ar), 124.97 (Ar), 29.01 (-CH_2-), 15.52 (-CH_3). MS (EI) m/z = 156 (M).

2-Ethylpyridine (**2m**) [CAS: 100-71-0]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 8.53 (d, J = 4.5 Hz, 1H, Py_{H-6}), 7.59 (td, J = 7.5 Hz, 1H, Py_{H-4}), 7.16 (d, J = 7.5 Hz, 1H, Py_{H-3}), 7.10 (t, J = 7.5 Hz, 1H, Py_{H-5}), 2.83 (q, J = 7.5 Hz, 2H, -CH_2-), 1.31 (t, J = 7.5 Hz, 3H, -CH_3). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$): δ = 163.43 (Py), 149.08 (Py), 136.33 (Py), 121.99 (Py), 120.83 (Py), 31.32 (-CH_2-), 13.87 (-CH_3). MS (EI) m/z = 107 (M).

2-Ethylthiophene (**2n**) [CAS: 872-55-9]: The flow hydrogenation of 2-vinylthiophene gave a mixture of 2-ethylthiophene and unreacted 2-vinylthiophene. Therefore the yield of **2n** was determined with ^{1}H NMR using an internal standard (1,1,2,2-tetrachloroethane: δ = 5.79). ^{1}H NMR (396 MHz, $CDCl_3$): δ = 6.96 (dd, J = 5.1 and 1.2 Hz, 1H, Ar), 6.79-6.77 (m, 1H, Ar), 6.67-6.66 (m, 1H, Ar), 2.76 (q, J = 7.5 Hz, 2H, -CH_2-), The peak (near 1.3 ppm) derived from protons of the methyl group was overlapped with the solvent peak. MS (EI) m/z = 112 (M).

Cumene (**2o**) [CAS: 98-82-8]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.31-7.16 (m, 5H, Ar), 2.91 (sep, J = 7.5 Hz, 1H, -CH-), 1.25 (d, J = 7.5 Hz, 6H, -CH_3). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$): δ = 148.99 (Ar), 128.43 (Ar), 126.55 (Ar), 34.25 (-CH-), 24.15 (-CH_3). MS (EI) m/z = 120 (M).

1,2-Diphenylethane (**2p**) [CAS: 103-29-7]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.31-7.26 (m, 5H, Ar), 7.21-7.15 (m, 5H, Ar), 2.92 (s, 4H, -CH_2-). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$): δ = 141.75 (Ar), 128.42 (Ar), 128.30 (Ar), 125.89 (Ar), 37.93 (-CH_2-). MS (EI) m/z = 182 (M).

3-Phenylpropan-1-ol (**2q**) [CAS: 122-97-4]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.30-7.27 (m, 2H, Ph), 7.21-7.16 (m, 3H, Ph), 3.66 (t, J = 6.7 Hz, 2H, -$C\underline{H}_2OH$), 2.70 (t, J = 7.5 Hz, 2H, $PhC\underline{H}_2$-), 1.93-1.85 (m, 2H, $-CH_2-$). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$): δ = 141.77 (Ar), 128.38 (Ar), 128.35 (Ar), 125.81 (Ar), 62.19 ($-CH_2-$), 34.16 ($-CH_2-$), 32.01 ($-CH_2-$). MS (EI) m/z = 136 (M).

N-Benzylaniline (**2r**) [CAS: 103-32-2]: ^1H NMR (396 MHz, $CDCl_3$): δ = 7.39-7.25 (m, 5H, Ph), 7.18 (t, J = 7.5 Hz, 2H, Ph), 6.72 (t, J = 7.5 Hz, 1H, Ph), 6.64 (t, J = 7.5 Hz, 2H, Ph), 4.33 (s, 2H, $-CH_2-$), 4.03 (brs, 1H, NH). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$): δ = 148.12 (Ar), 139.39 (Ar), 129.25 (Ar), 128.62 (Ar), 127.49 (Ar), 127.21 (Ar), 117.53 (Ar), 112.79 (Ar), 48.29 ($-CH_2-$). MS (EI) m/z = 183 (M).

Octane (**2s**) [CAS: 111-65-9]: ^1H NMR (396 MHz, $CDCl_3$): δ = 1.35-1.26 (m, 12H, CH_2), 0.88 (t, J = 6.3 Hz, 6H, $-CH_3$). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$): δ = 31.91 ($-CH_2-$), 29.32 ($-CH_2-$), 22.69 ($-CH_2-$), 14.12 ($-CH_3$). MS (EI) m/z = 114 (M).

Decane (**2t**) [CAS: 124-18-5]: ^1H NMR (396 MHz, $CDCl_3$): δ = 1.34-1.26 (m, 16H, CH_2), 0.88 (t, J = 6.7 Hz, 6H, $-CH_3$). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$): δ = 31.93 ($-CH_2-$), 29.67 ($-CH_2-$), 29.38 ($-CH_2-$), 22.70 ($-CH_2-$), 14.12 ($-CH_3$). MS (EI) m/z = 142 (M).

Cyclooctane (**2v**) [CAS: 292-64-8]: ^1H NMR (396 MHz, $CDCl_3$): δ = 1.53 (s, 16H, $-CH_2-$). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$): δ = 26.67 ($-CH_2-$). MS (EI) m/z = 112 (M).

4-Isopropyl-1-methylcyclohex-1-ene (**2w**) [CAS: 1195-31-9]: ^1H NMR (396 MHz, $CDCl_3$): δ = 5.39-5.35 (m, 1H), 2.02-1.93 (m, 3H), 1.77-1.64 (m, 5H), 1.50-1.42 (m, 1H), 1.25-1.18 (m, 2H), 0.88 (dd, J = 6.7 and 5.9 Hz, 6H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$): δ = 133.95 (C=C), 121.00 (C=C), 39.99, 32.28, 30.80, 28.94, 26.47, 23.47, 20.00, 19.68. MS (EI) m/z = 138 (M).

[[(3,7-Dimethyloctyl)oxy]methyl]benzene (**2x**) [CAS: 215942-19-1]: ^1H NMR (396 MHz, $CDCl_3$): δ = 7.35-7.26 (m, 5H, Ar), 4.50 (s, 2H, CH_2Ph), 3.55-3.45 (m, 2H, $-CH_2O-$), 1.70-1.37 (m, 4H, $-CH_2-$), 1.36-1.20 (m, 3H), 1.16-1.06 (m, 3H), 0.88-0.85 (m, 9H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$): δ = 138.68 (Ar), 128.32 (Ar), 127.60 (Ar), 127.44 (Ar), 72.87 (CH_2), 68.76 (CH_2), 39.25 (CH_2), 37.32 (CH_2), 36.77 (CH_2), 29.86 (CH_2), 27.94 (CH_2), 24.65 (CH_2), 22.70 (CH_3), 22.59 (CH_3), 19.66 (CH_3). MS (EI) m/z = 248 (M), 157 (M–Bn).

Aniline hydrochloride (**4a**) [CAS: 142-04-1]: ^{1}H NMR (396 MHz, CD_3OD): δ = 7.57-7.46 (m, 3H, Ar), 7.42 (dd, J = 7.2 and 1.4 Hz, 2H, Ar). ^{13}C{^{1}H} NMR (100 MHz, CD_3OD): δ = 131.97 (Ar), 131.28 (Ar), 130.22 (Ar), 124.29 (Ar). After neutralization, Mass analysis was performed. MS (EI) m/z = 93 (M) for aniline.

p-Anisidine (**4b**) [CAS: 104-94-9]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 6.75 (ddd, J = 9.1, 3.2, and 2.3 Hz, 2H, Ar), 6.65 (ddd, J = 9.1, 3.2 and 2.3 Hz, 2H, Ar), 3.75 (s, 3H, OCH_3), 3.41 (brs, 2H, NH_2). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$): δ = 152.78 (Ar), 139.84 (Ar), 116.41 (Ar), 114.77 (Ar), 55.71 (OCH_3). MS (EI) m/z = 123 (M).

p-Toluidine (**4c**) [CAS: 106-49-0]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 6.96 (d, J = 7.7 Hz, 2H, Ar), 6.61 (dt, J = 8.2 and 2.3 Hz, 2H, Ar), 3.52 (brs, 2H, NH_2), 2.24 (s, 3H, CH_3). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$): δ = 134.75 (Ar), 129.71 (Ar), 127.76 (Ar), 115.22 (Ar), 20.42 (CH_3). MS (EI) m/z = 107 (M).

o-Toluidine hydrochloride (**4d**) [CAS: 636-21-5]: ^{1}H NMR (396 MHz, CD_3OD): δ = 7.39-7.33 (m, 4H, Ar), 2.41 (t, J = 2.4 Hz, 3H, CH_3). ^{13}C{^{1}H} NMR (100 MHz, CD_3OD): δ = 132.95 (Ar), 130.65 (Ar), 130.46 (Ar), 128.68 (Ar), 124.26 (Ar), 124.21 (Ar), 17.02 (CH_3). After neutralization, Mass analysis was performed. MS (EI) m/z = 107 (M) for *o*-toluidine.

m-Toluidine hydrochloride (**4e**) [CAS: 638-03-9]: ^{1}H NMR (396 MHz, CD_3OD): δ = 7.32 (t, J = 7.9 Hz, 1H, Ar), 7.22 (d, J = 7.9 Hz, 1H, Ar), 7.13-7.07 (m, 2H, Ar), 2.31 (s, 3H, CH_3). ^{13}C{^{1}H} NMR (100 MHz, CD_3OD): δ = 141.97 (Ar), 131.81 (Ar), 131.11 (Ar), 130.90 (Ar), 142.47 (Ar), 121.03 (Ar), 21.25 (CH_3). After neutralization, Mass analysis was performed. MS (EI) m/z = 107 (M).

4-Chloroaniline hydrochloride (**4f**) [CAS: 20265-96-7]: The resulting product was obtained as mixture of 4-chloroaniline and aniline hydrochlorides (3:1). ^{1}H NMR (396 MHz, CD_3OD): δ = 7.54 (d, J = 7.7 Hz, 2H, Ar), 7.41-7.37 (m, 2H, Ar). ^{13}C{^{1}H} NMR (100 MHz, CD_3OD): δ = 135.88 (Ar), 131.35 (Ar), 130.28 (Ar), 125.77 (Ar). MS (EI) m/z = 127 (M).

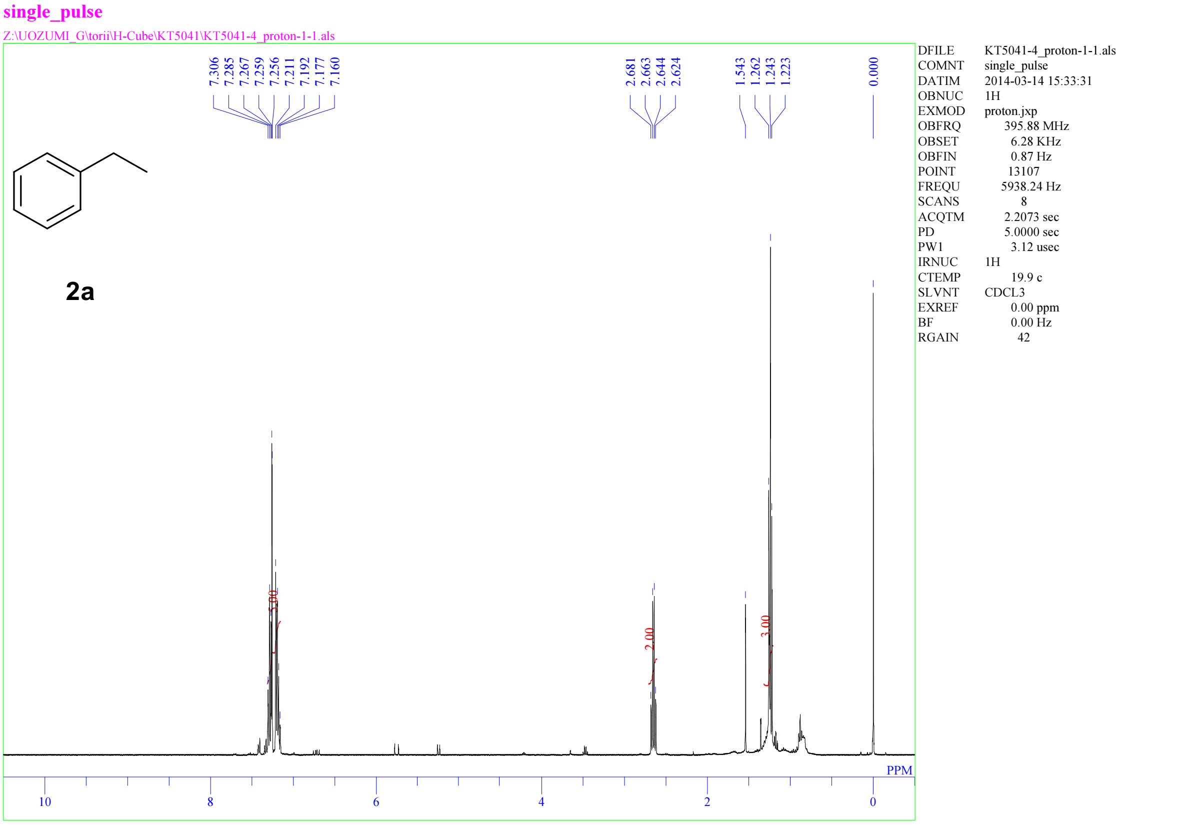
4-Trifluoromethylaniline (**4g**) [CAS: 455-14-1]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.39 (d, J = 8.2 Hz, 2H, Ar), 6.68 (d, J = 8.2 Hz, 2H, Ar), 3.94 (brs, 2H, NH_2). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$): δ = 149.34 (Ar), 126.70 (q, J = 3.8 Hz, Ar), 124.81 (q, J = 268.9 Hz, CF_3), 120.16 (q, J = 32.4 Hz, Ar), 114.18 (Ar). MS (EI) m/z = 161 (M).

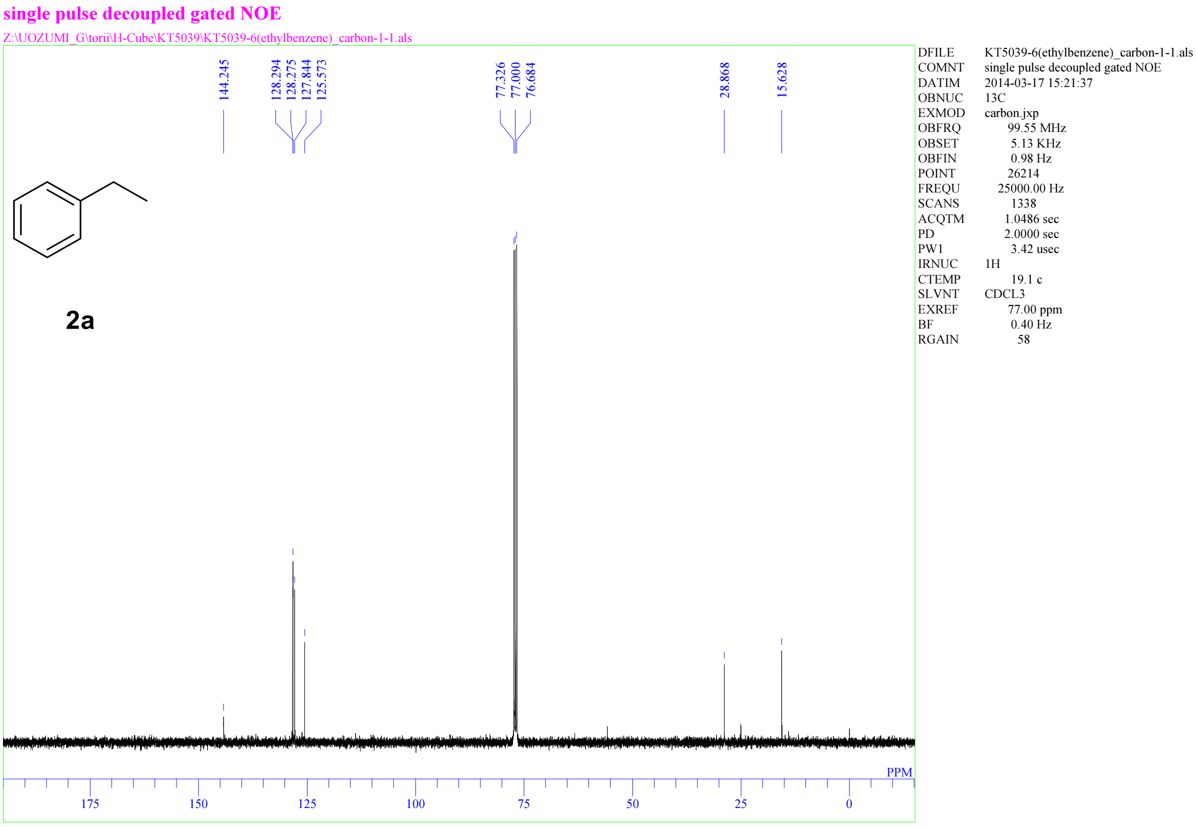
4-Aminoacetopheone (**4h**) [CAS: 99-92-3]: In the flow reaction, a mixture of 4-aminoacetopheone **4h** and the polymeric imine derived from **4h** was obtained (the ratio = 2:3 in ^{1}H NMR). Therefore the yield of **4h** was determined with GC-MS using an internal standard.

^{1}H NMR for **4h** (396 MHz, $CDCl_3$): δ = 7.81 (ddd, J = 8.3, 2.8, and 1.6 Hz, 2H, Ar), 6.65 (ddd, J = 8.7, 2.8, and 1.6 Hz, 2H, Ar), 4.13 (brs, 2H, NH_2), 2.51 (s, 3H, CH_3). MS (EI) m/z = 135 (M).

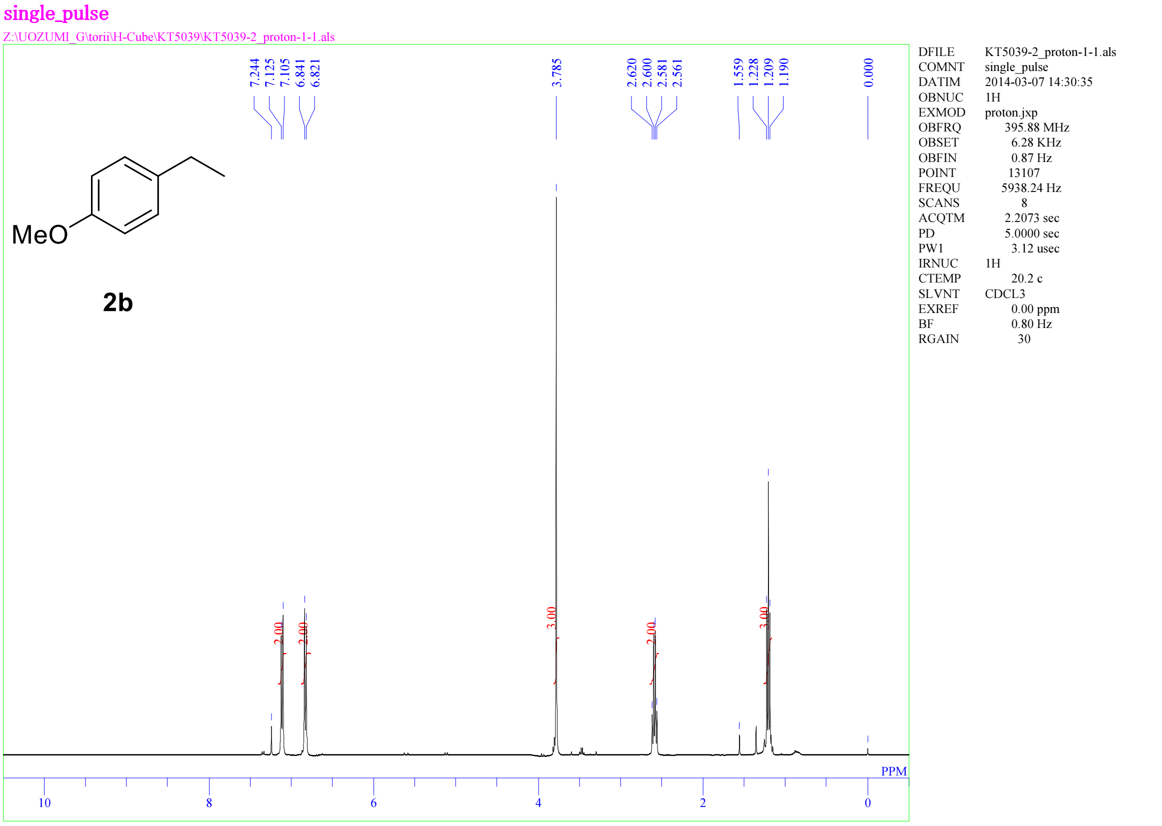
Methyl 4-aminobenzoate (**4i**) [CAS: 619-45-4]: ^{1}H NMR (396 MHz, $CDCl_3$): δ = 7.85 (ddd, J = 8.6, 2.7, and 1.8 Hz, 2H, Ar), 6.64 (ddd, J = 8.6, 2.7, and 1.8 Hz, 2H, Ar), 4.07 (brs, 2H, NH_2), 3.85 (s, 3H, CH_3). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$): δ = 167.13 (C=O), 150.76 (Ar), 131.56 (Ar), 119.66 (Ar), 113.75 (Ar), 51.59 (CH_3). MS (EI) m/z = 151 (M).

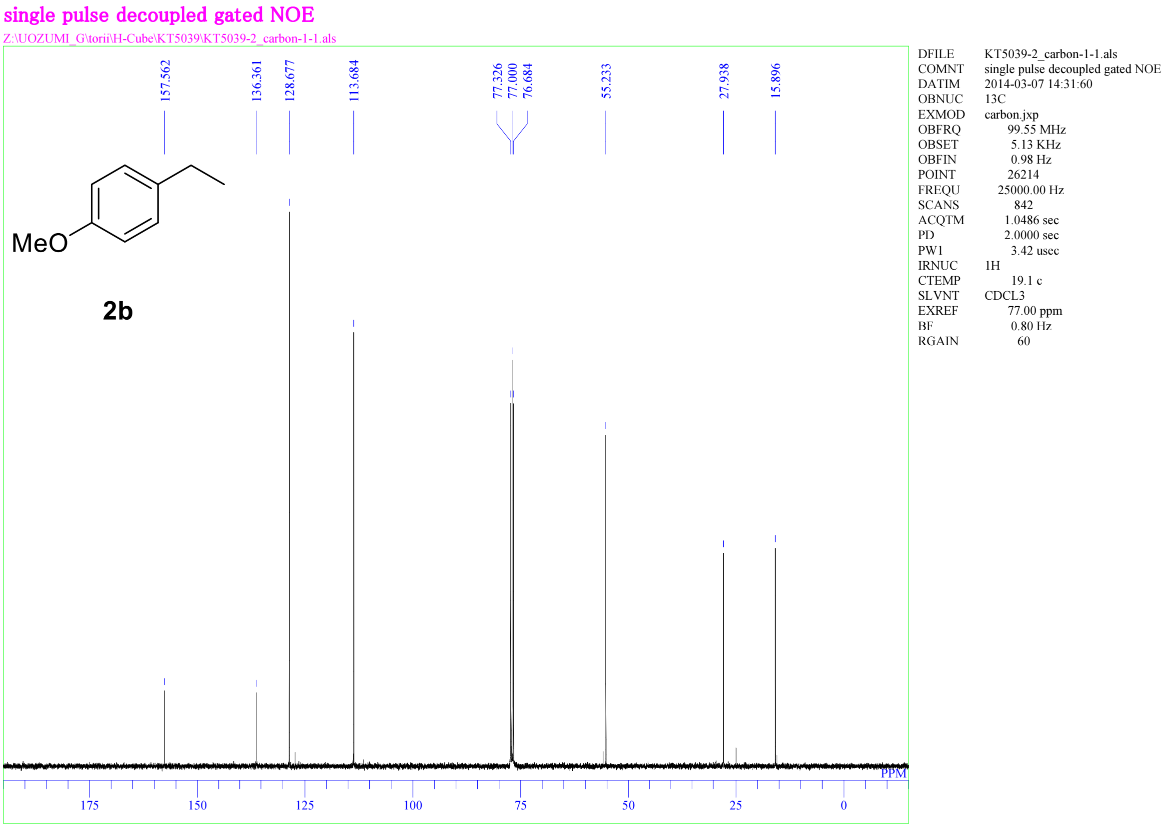
[1]H and [13]C{[1]H} NMR spectra of ethylbenzene (**2a**).



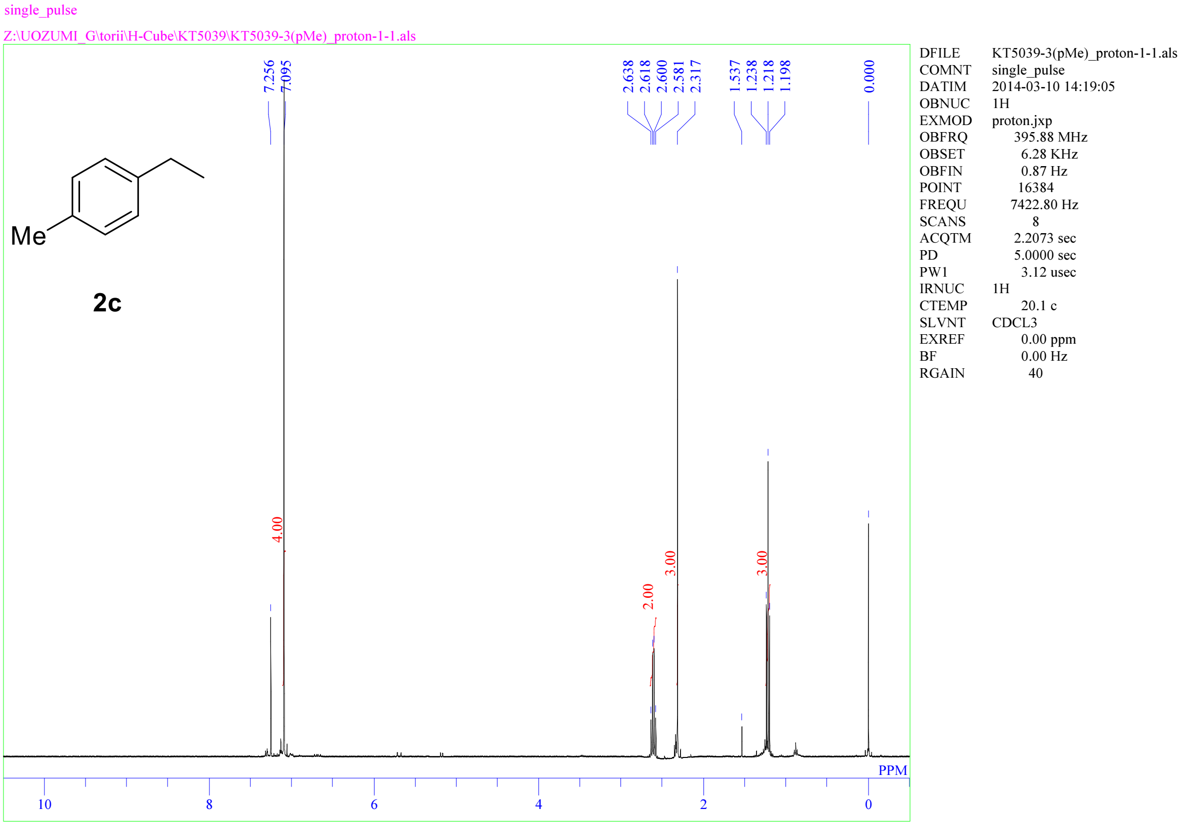


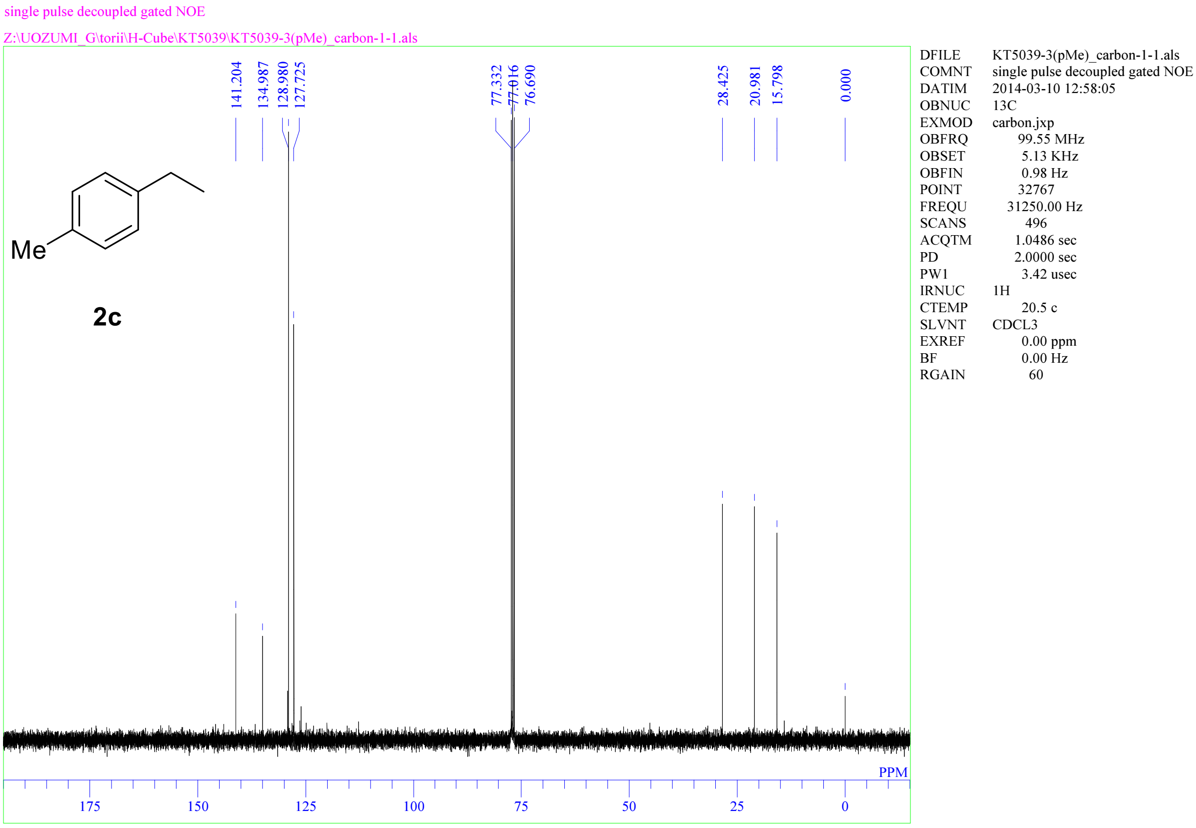
^{1}H and $^{13}C\{^{1}H\}$ NMR spectra of 4-ethylanisole (**2b**).



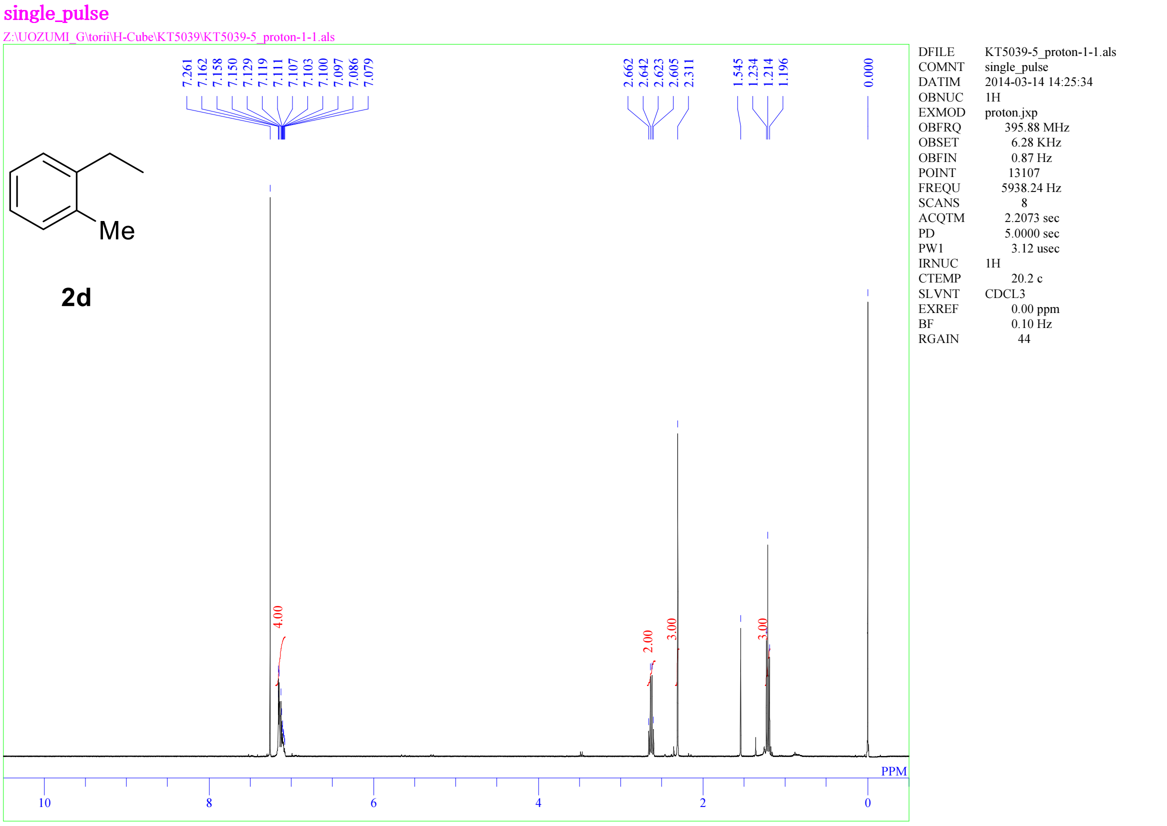


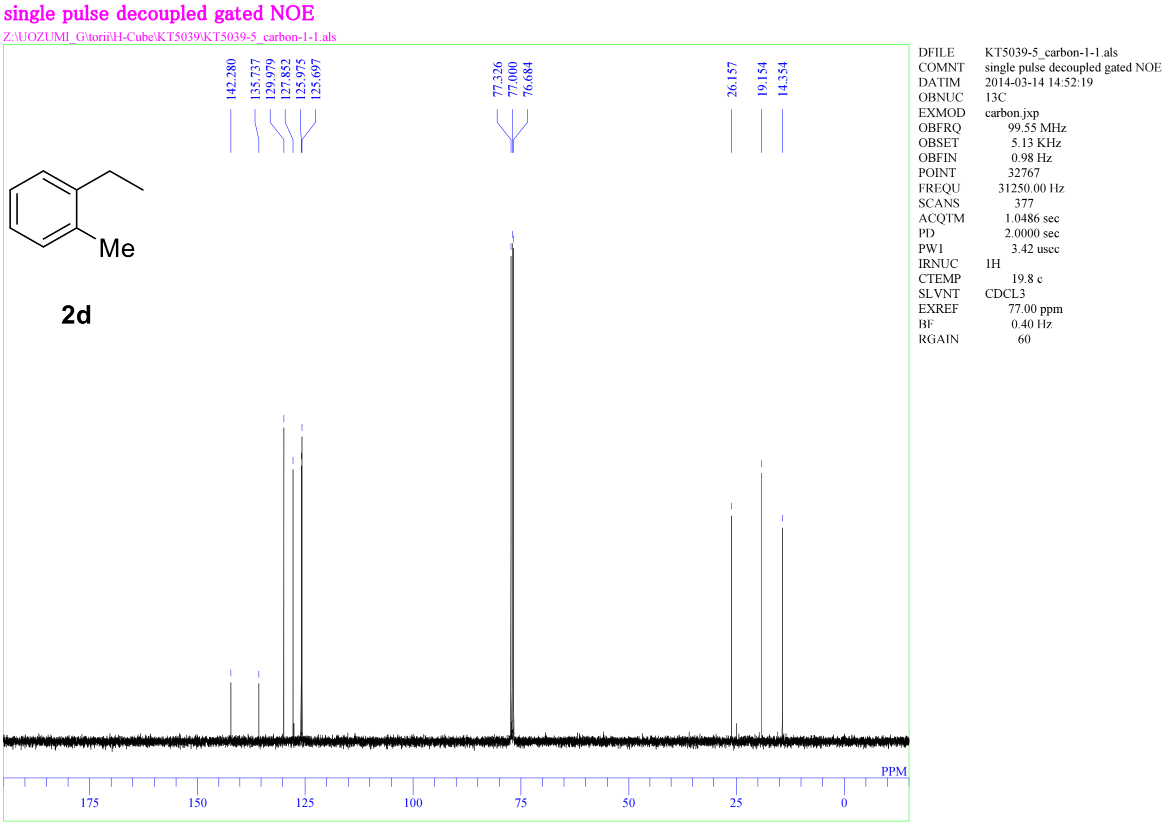
[1]H and [13]C{[1]H} NMR spectra of 4-ethyltoluene (**2c**).



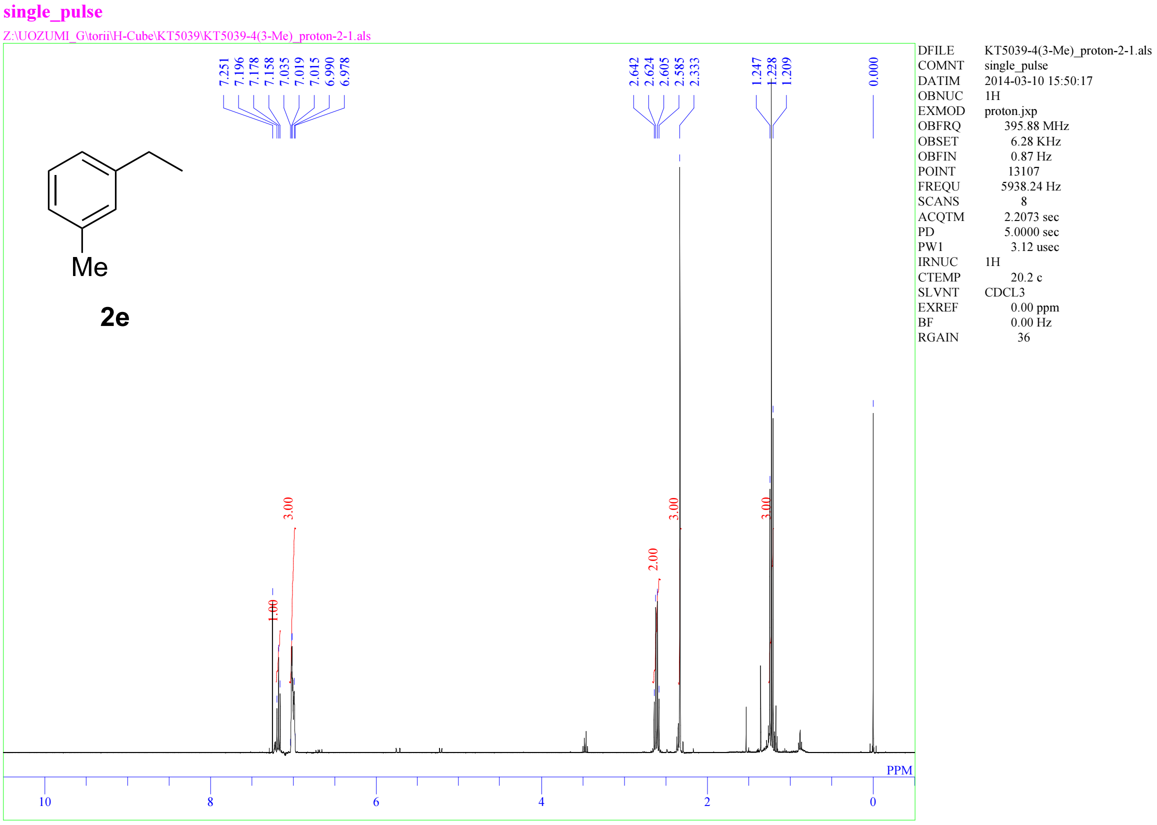


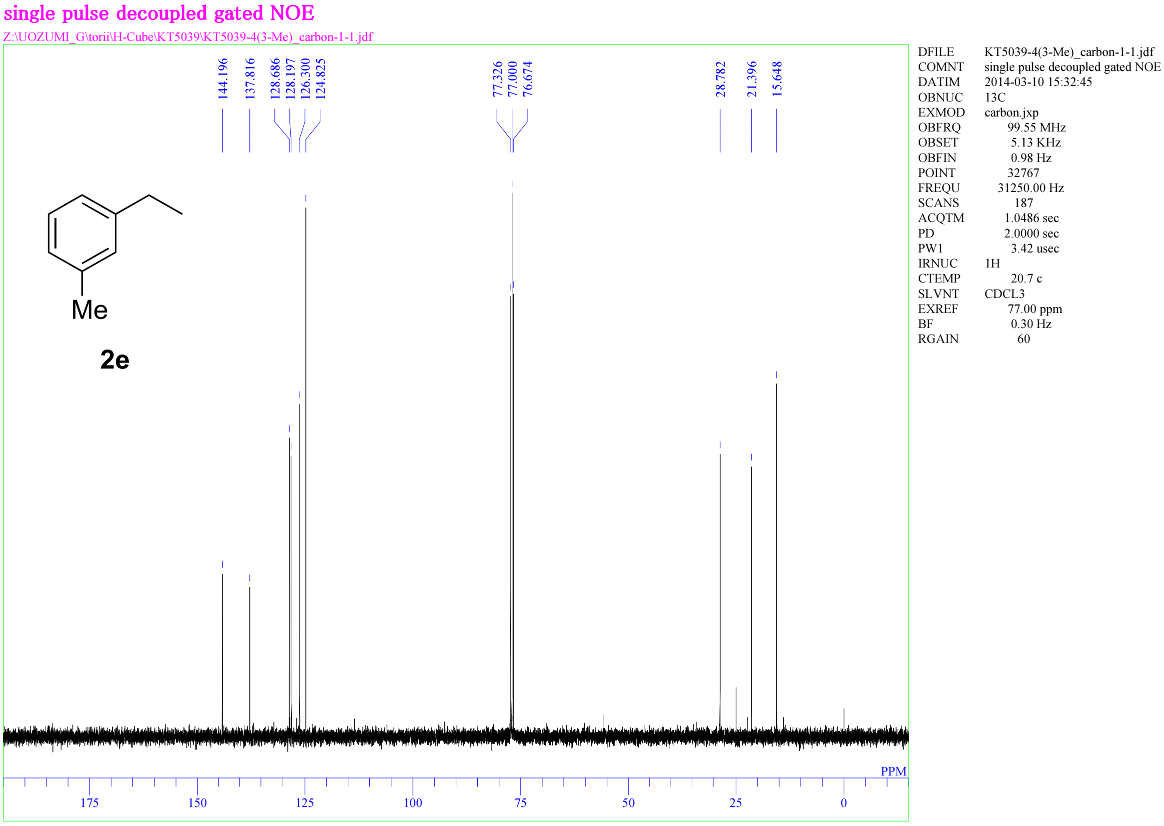
[1]H and [13]C{[1]H} NMR spectra of 2-ehyltoluene (**2d**).



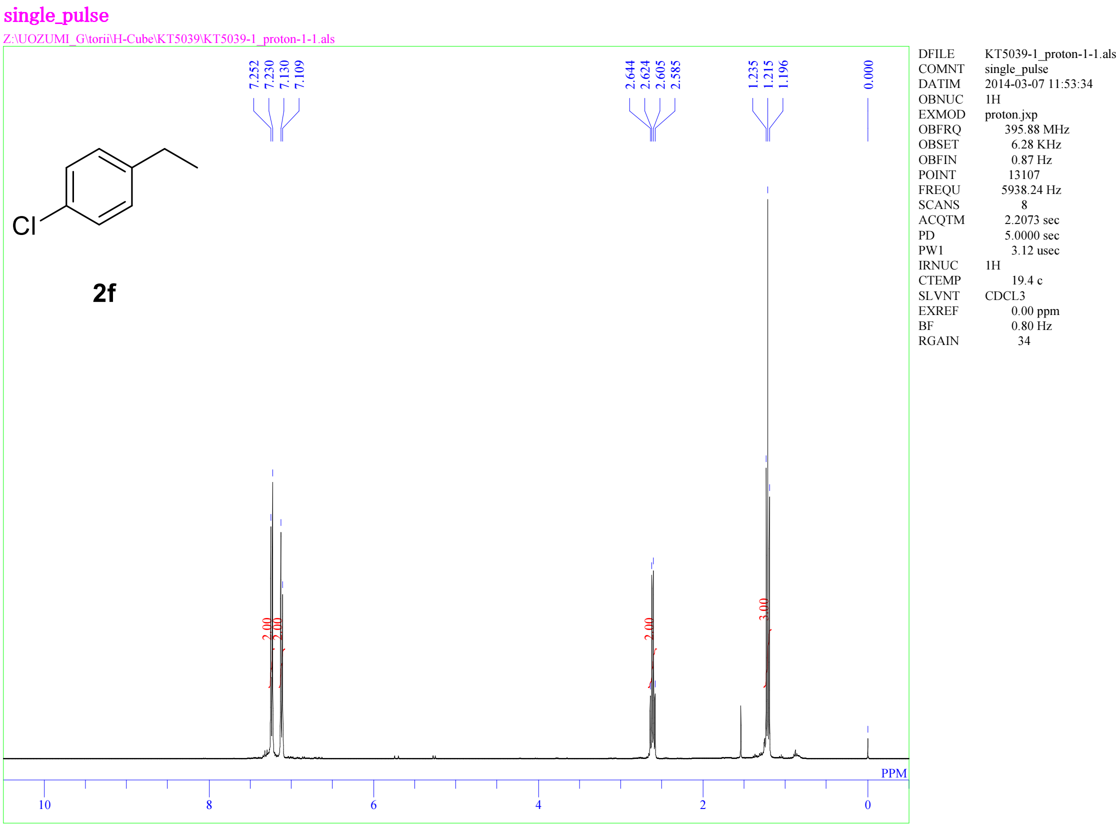


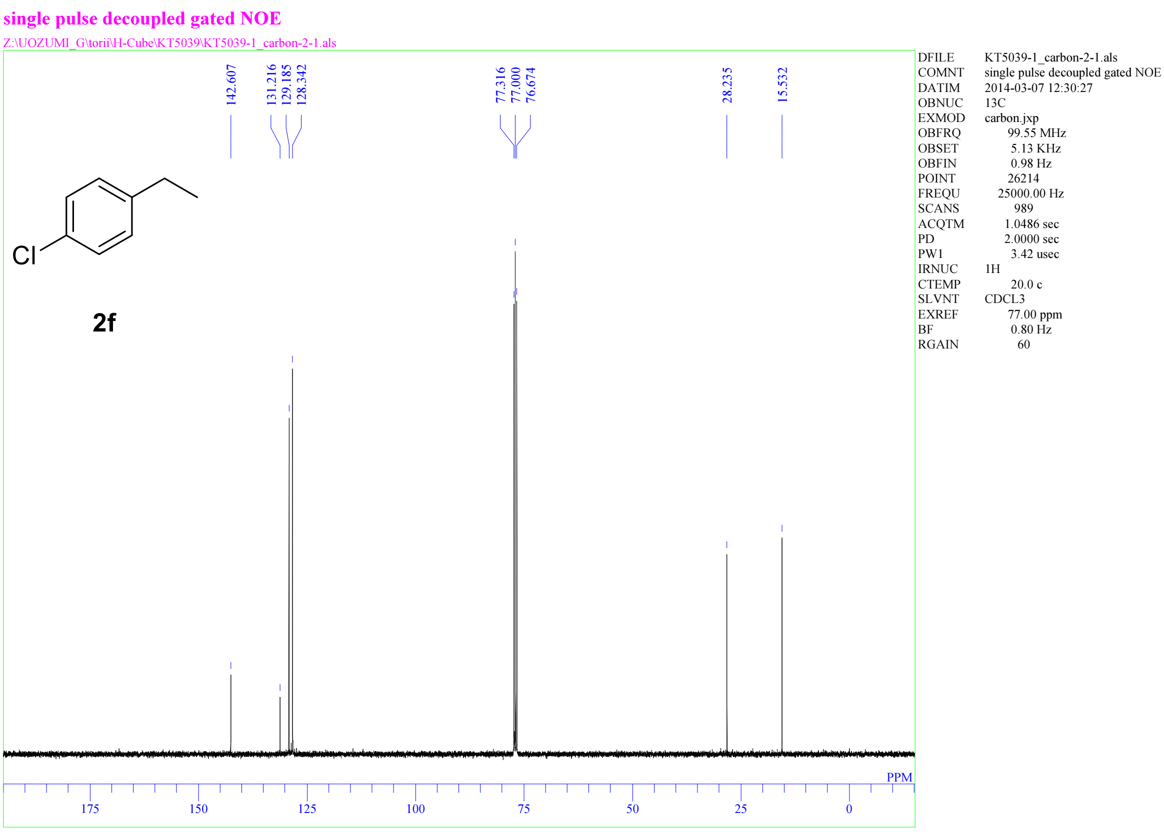
[1]H and [13]C{[1]H} NMR spectra of 3-ethyltoluene (**2e**).



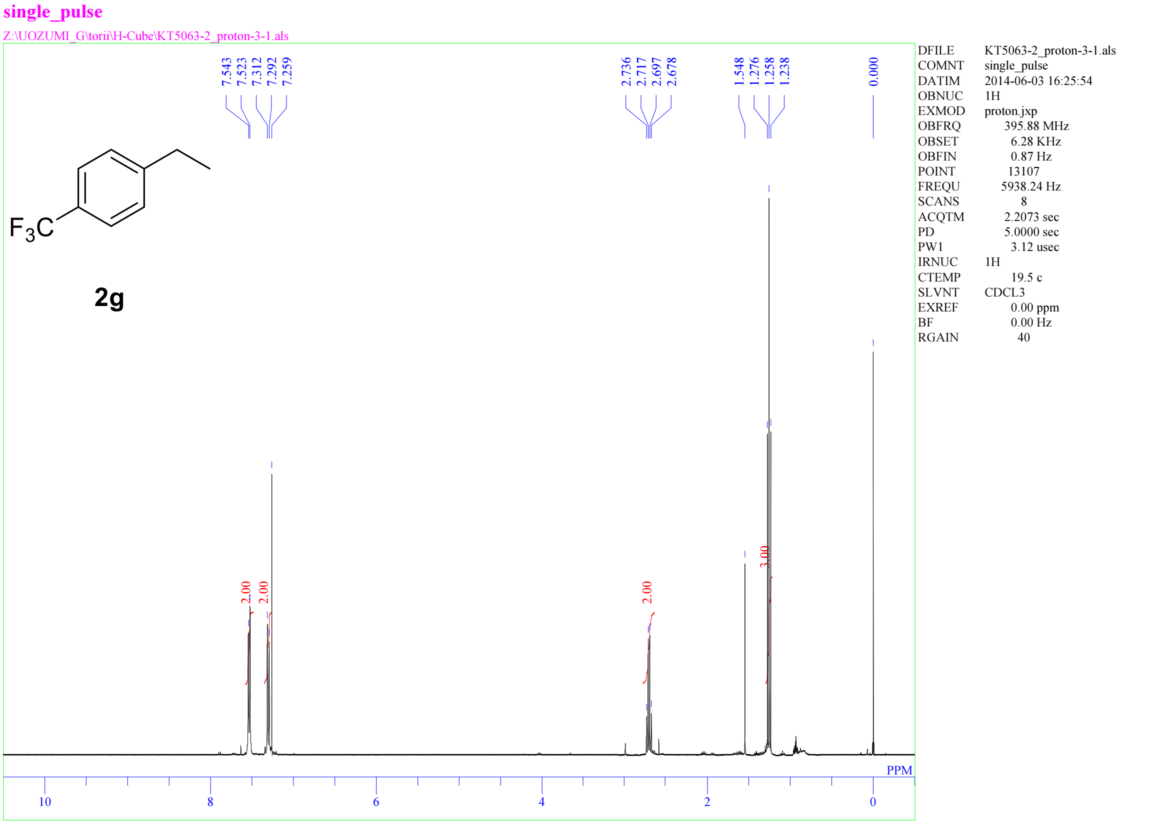


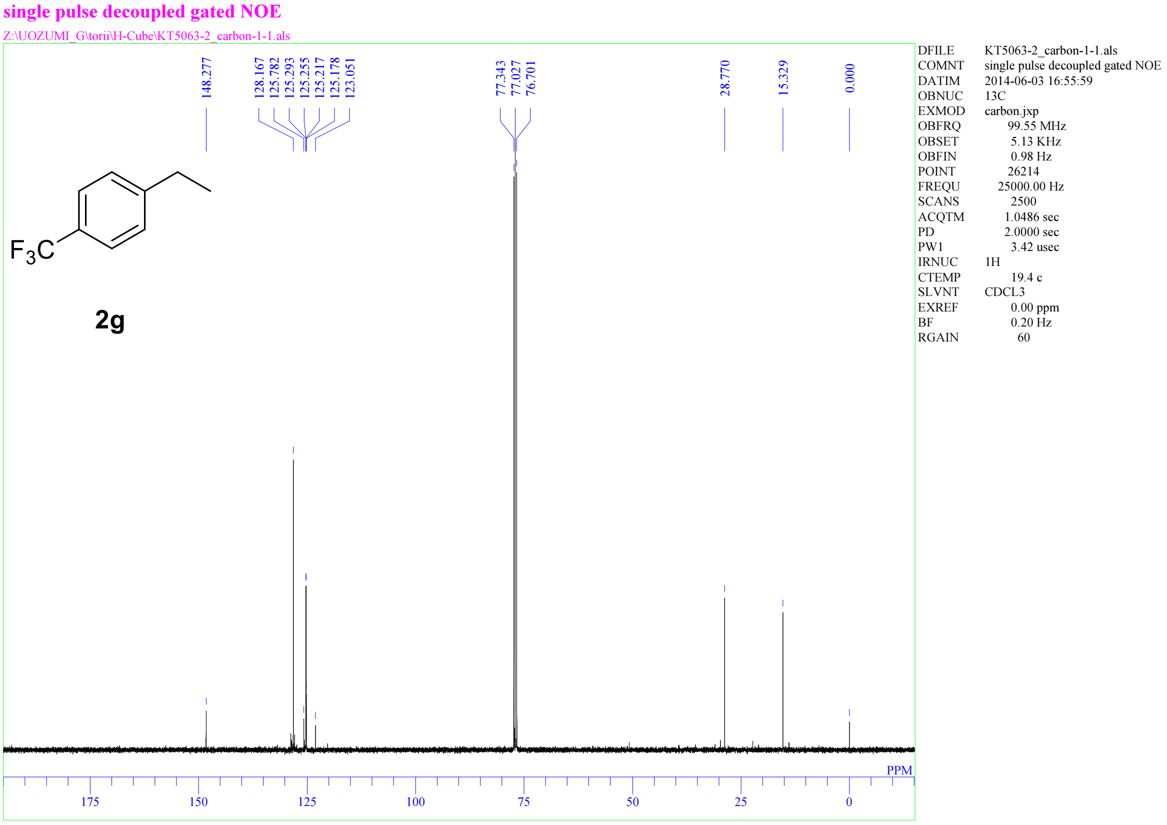
^{1}H and ^{13}C{^{1}H} NMR spectra of 1-chloro-4-ethylbenzene (**2f**).



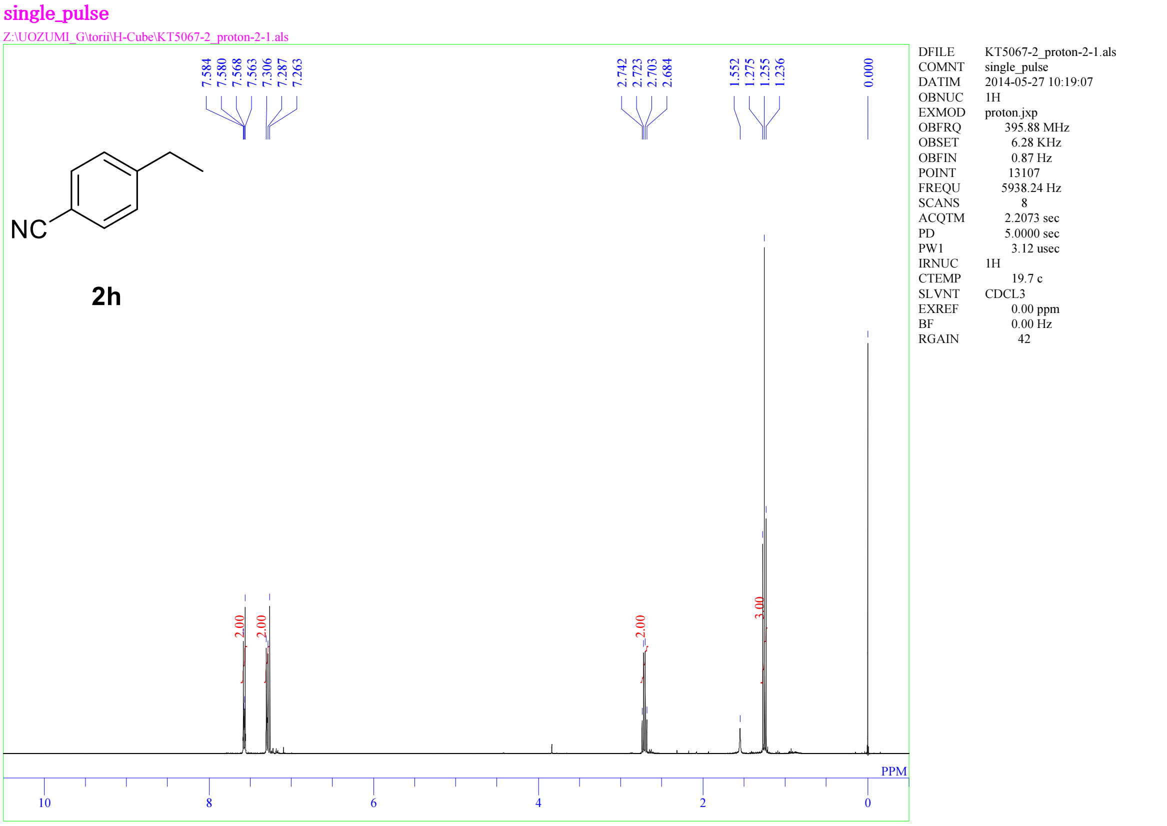


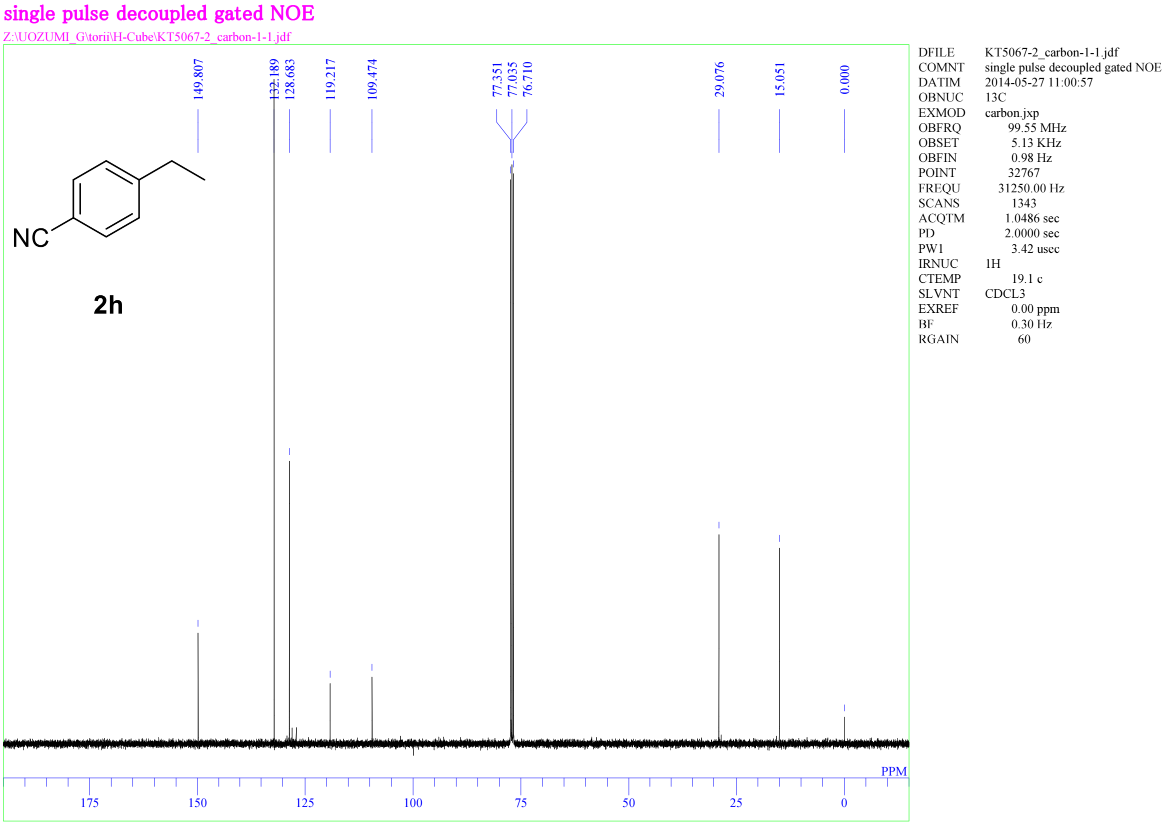
[1]H and [13]C{[1]H} NMR spectra of 4-ethylbenzenetrifluoride (**2g**).



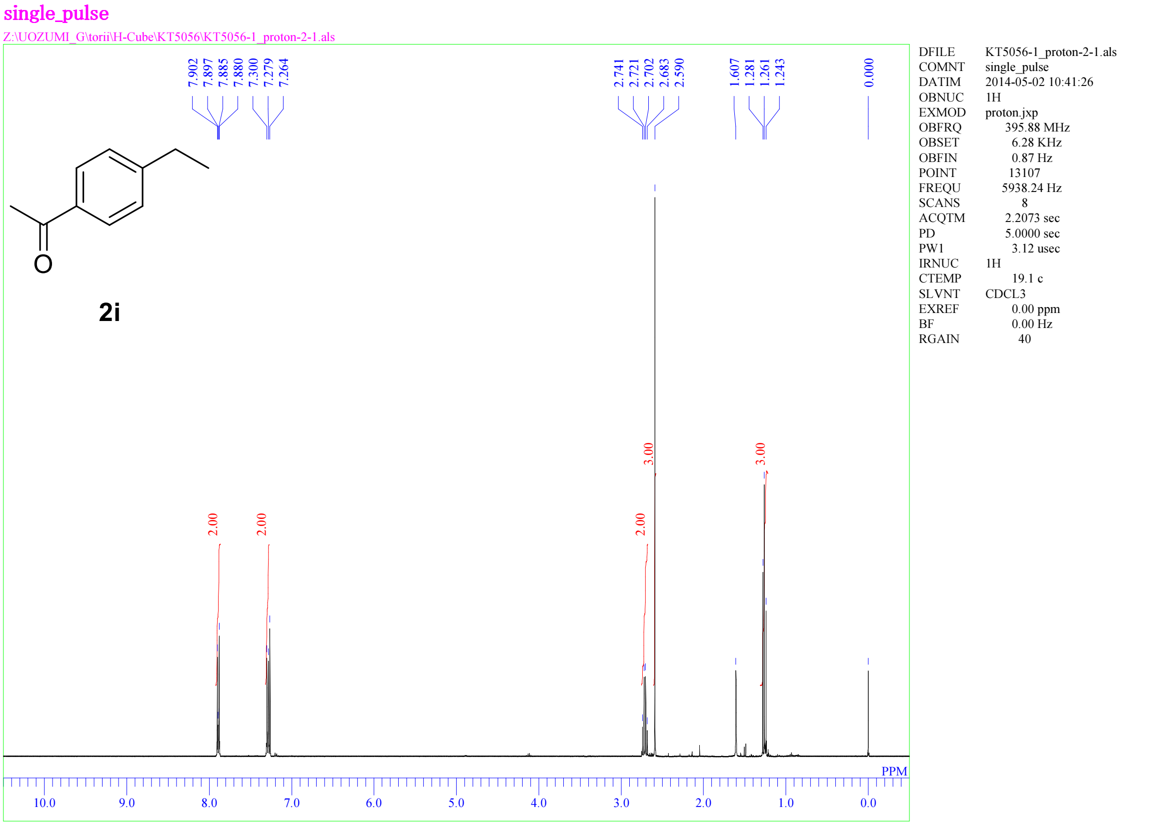


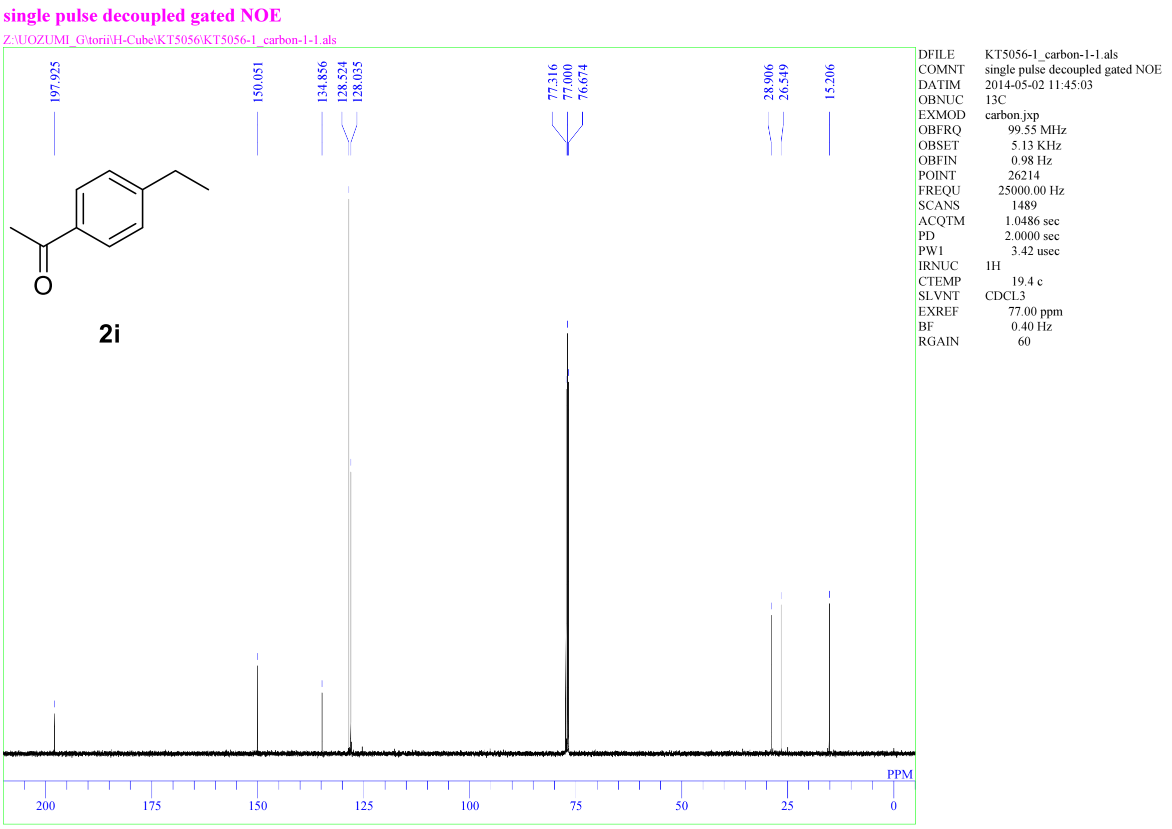
[1]H and [13]C{[1]H} NMR spectra of 4-ethylbenzonitrile (**2h**).



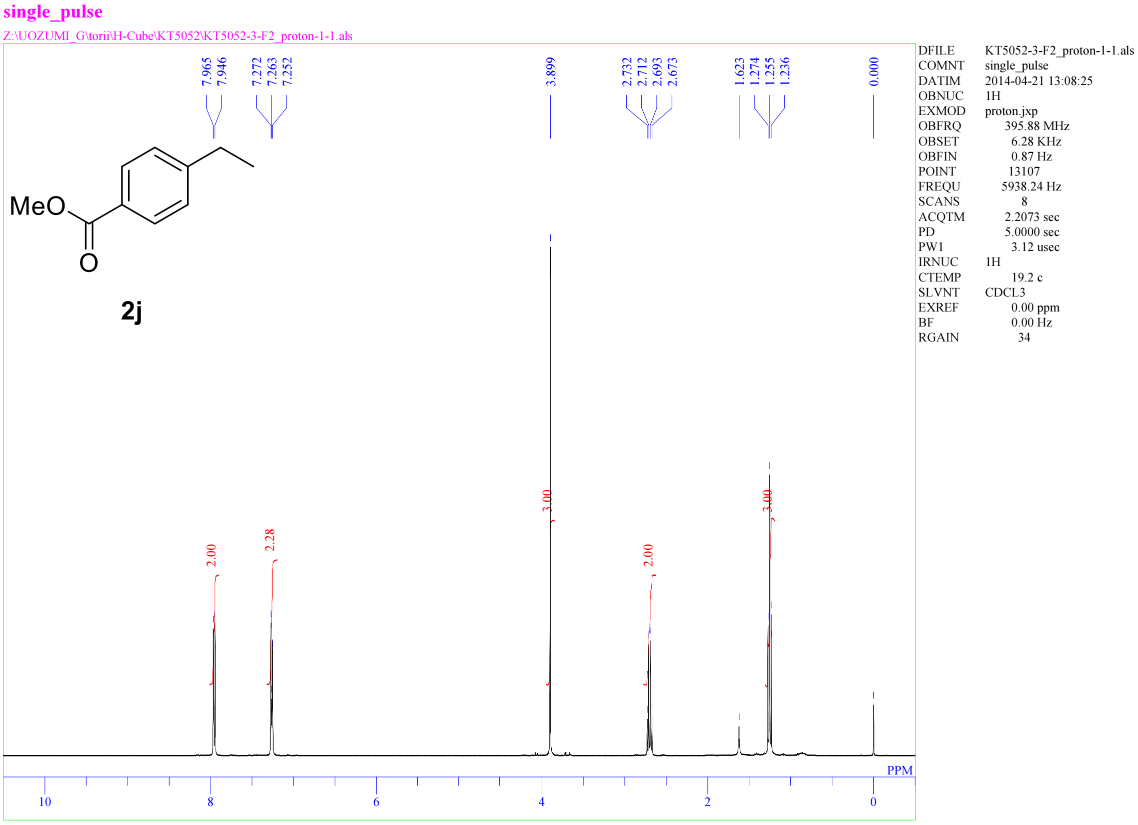


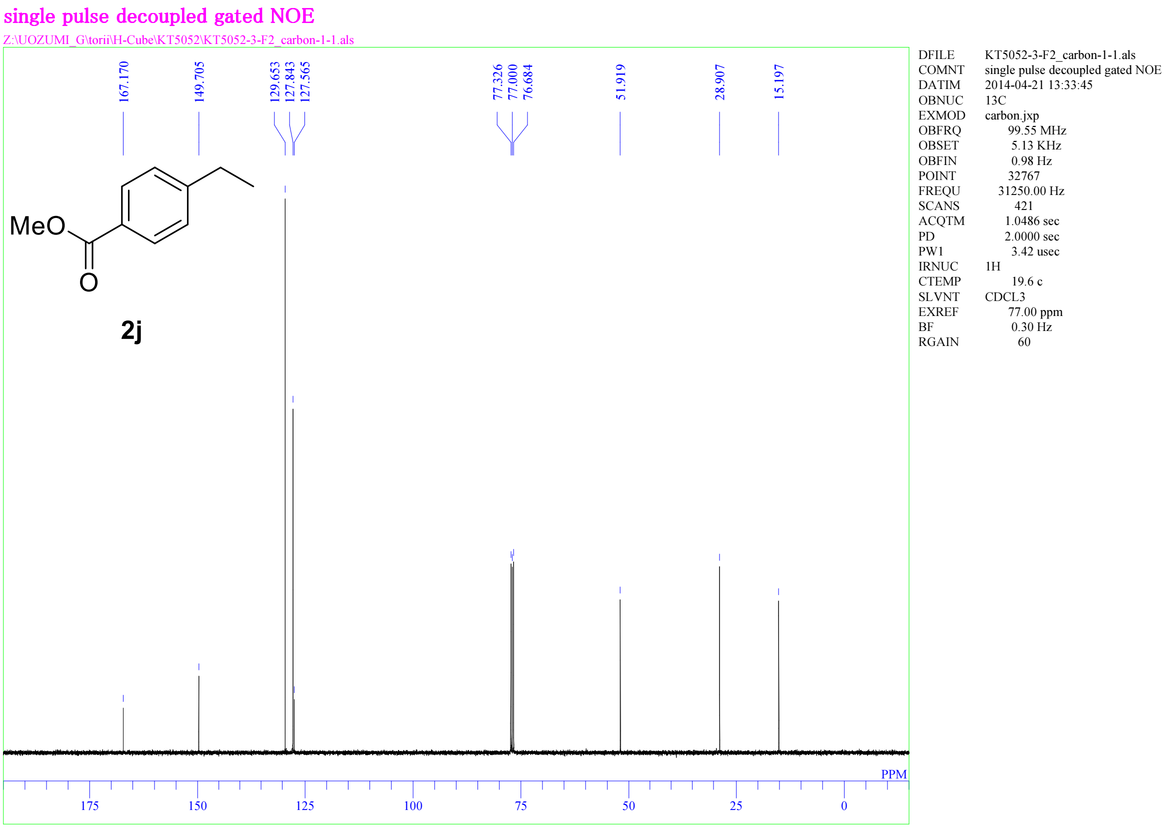
^{1}H and $^{13}C\{^{1}H\}$ NMR spectra of 4-ethylacetophenone (**2i**).



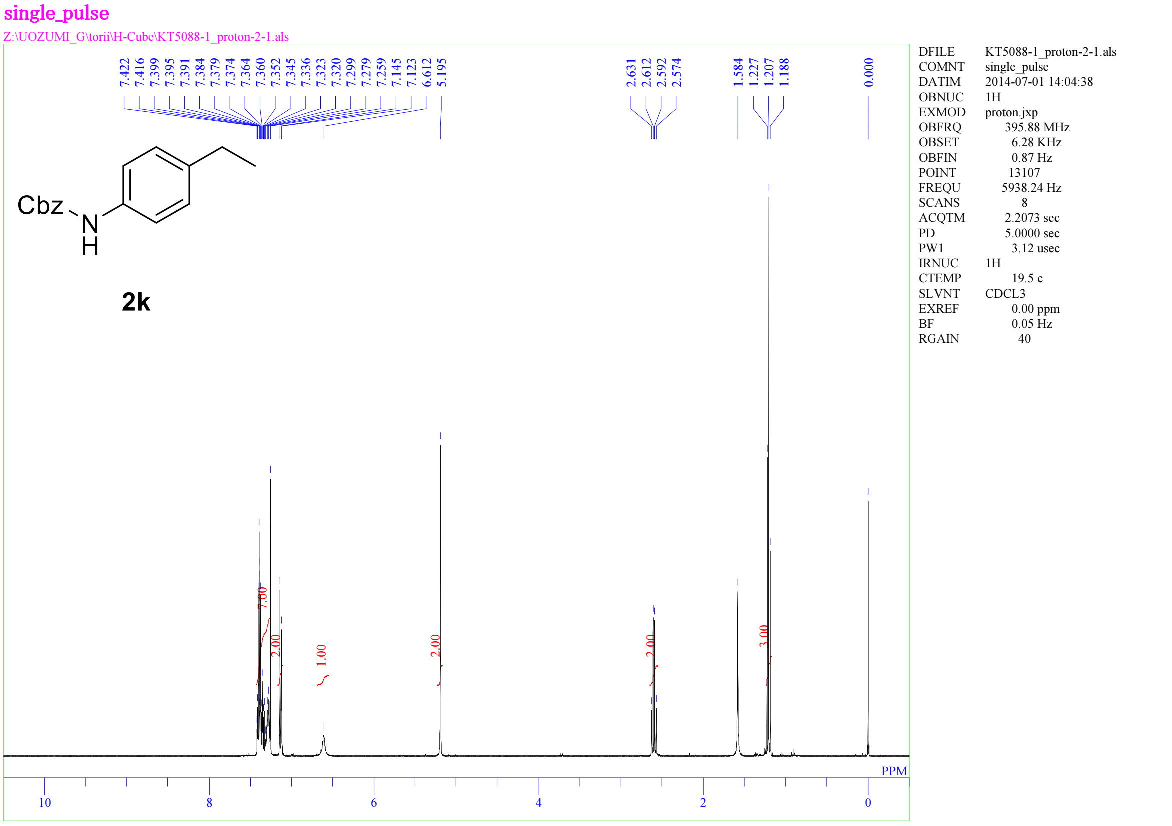


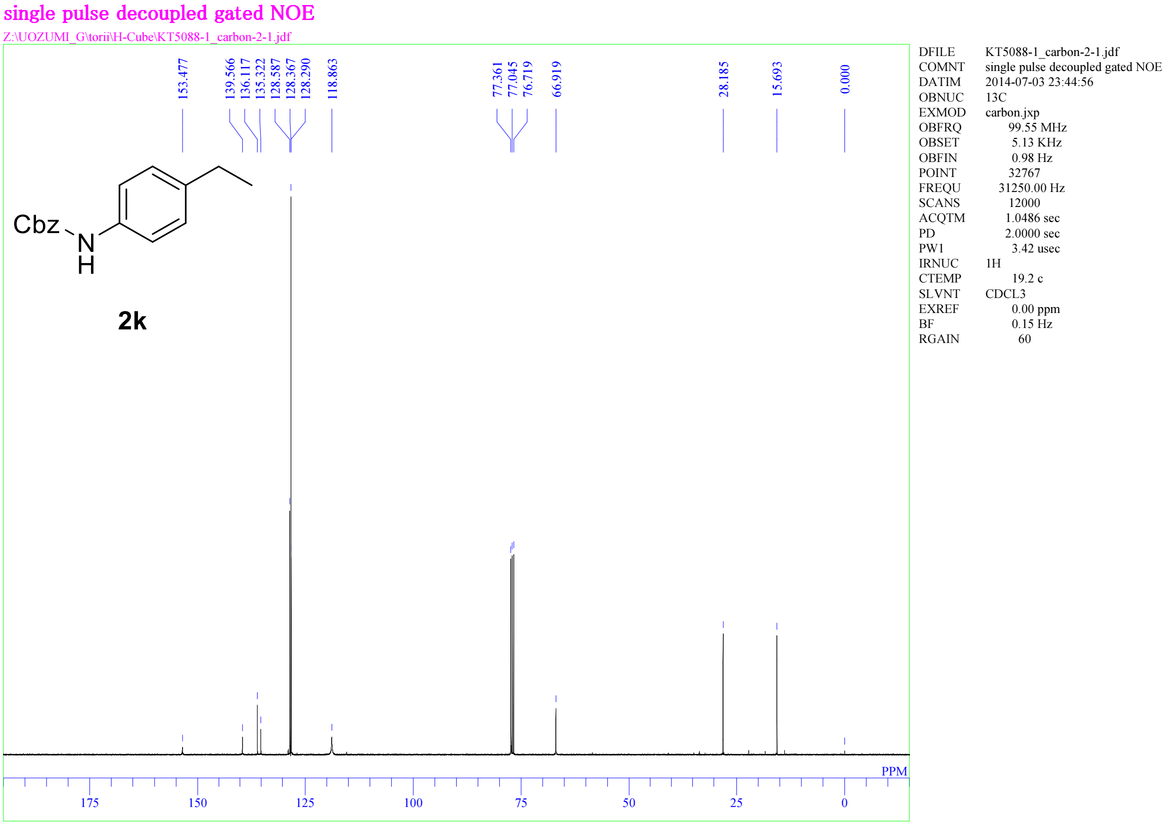
^{1}H and ^{13}C{^{1}H} NMR spectra of methyl 4-ethylbenzoate (**2j**).



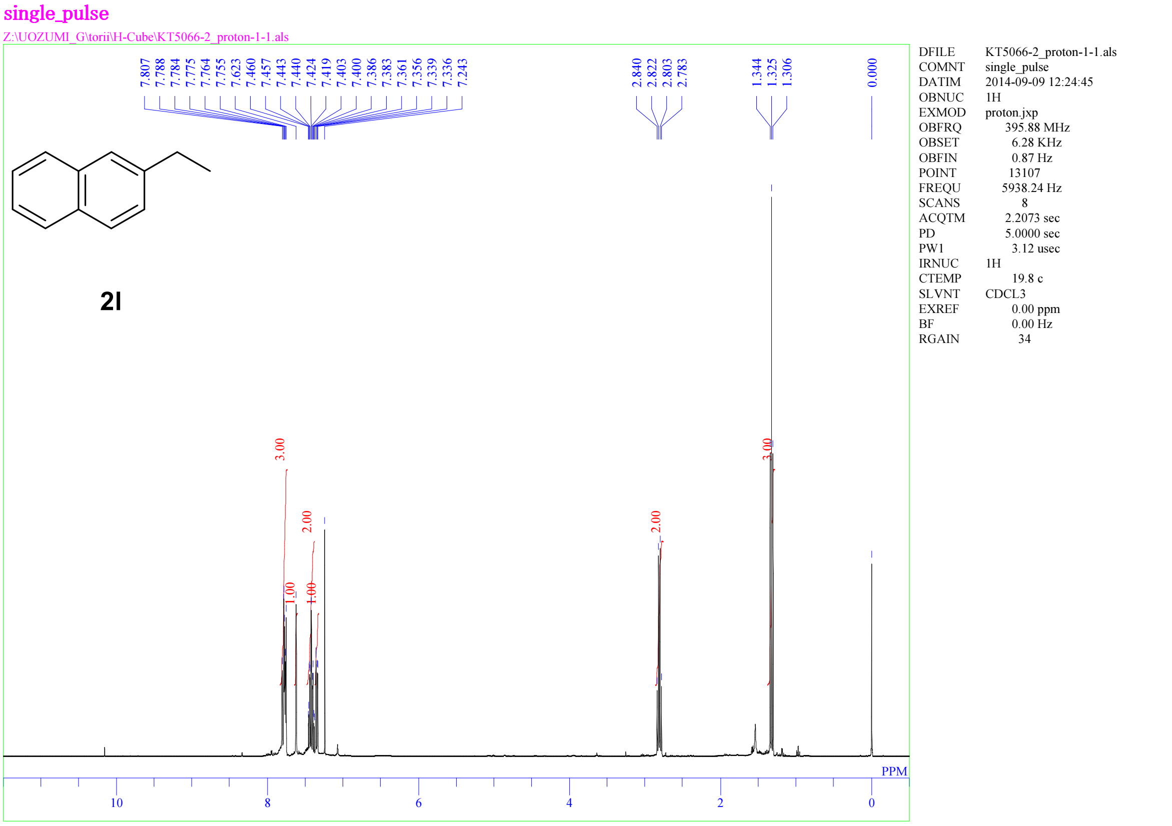


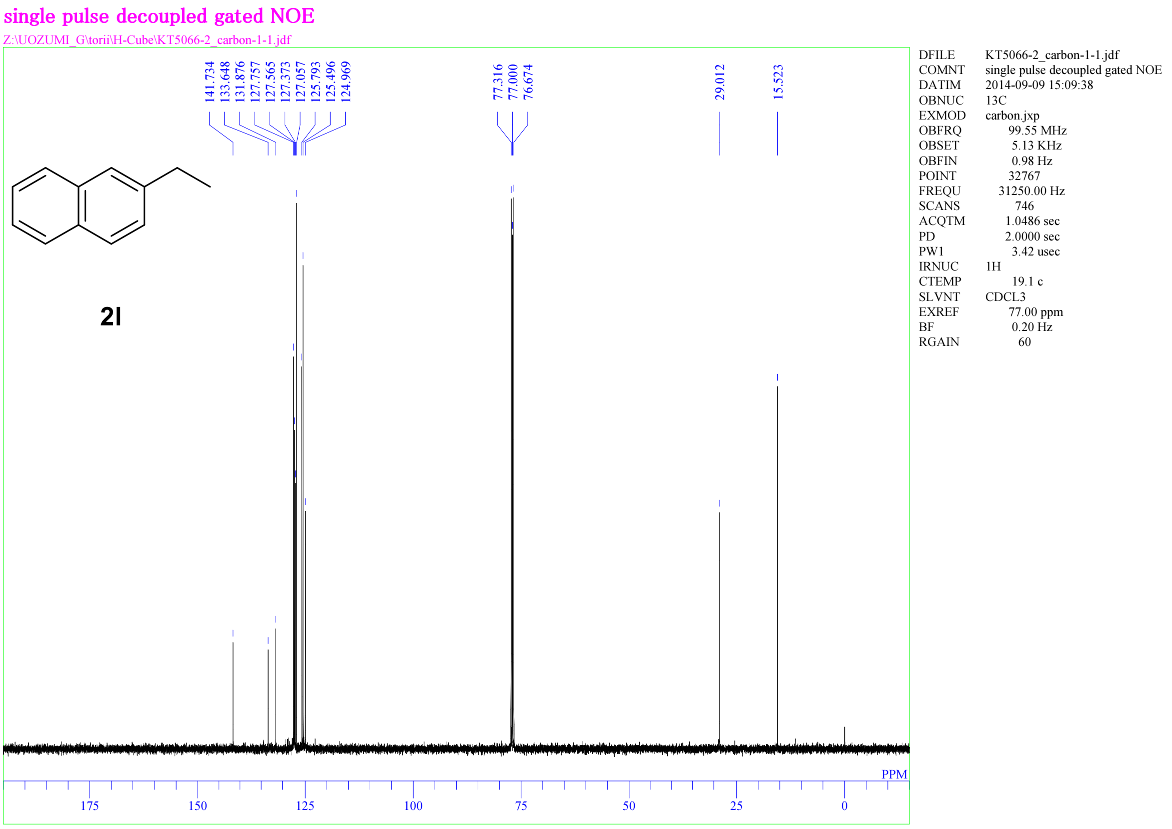
^{1}H and $^{13}C\{^{1}H\}$ NMR spectra of benzyl (4-ethyl)carbamate (**2k**).



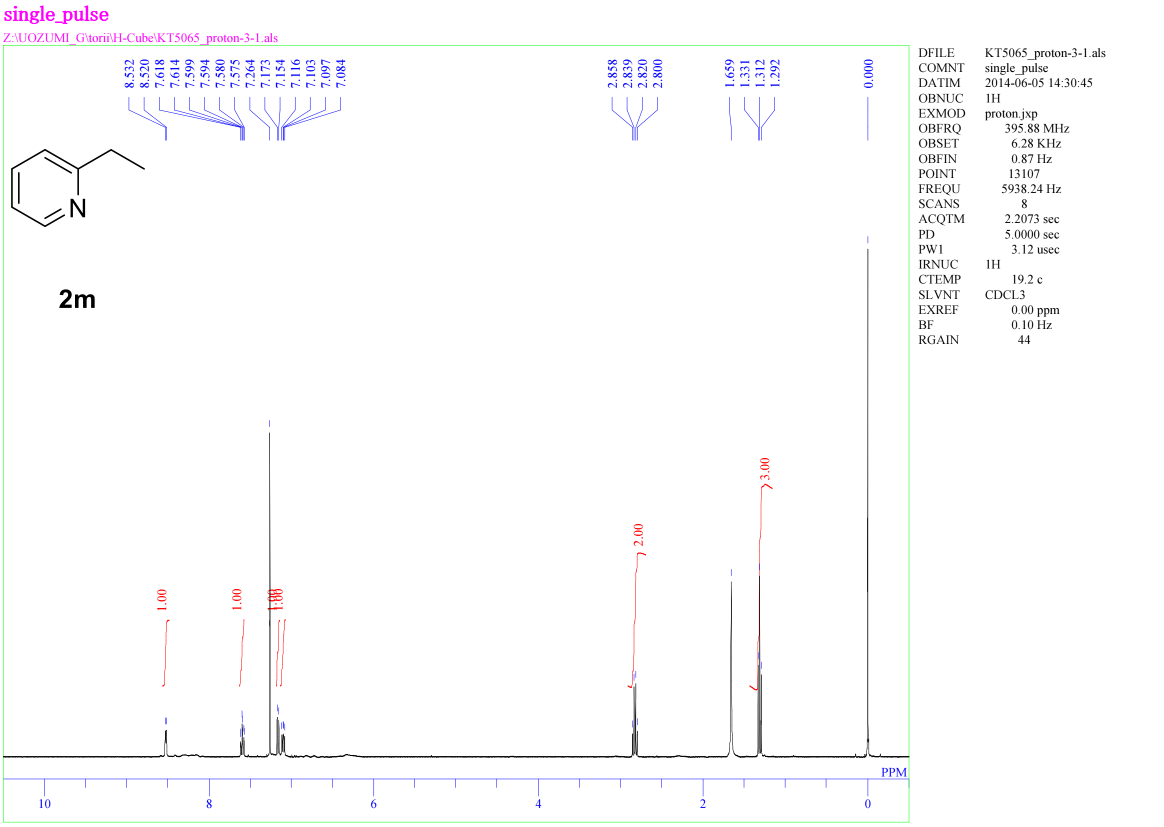


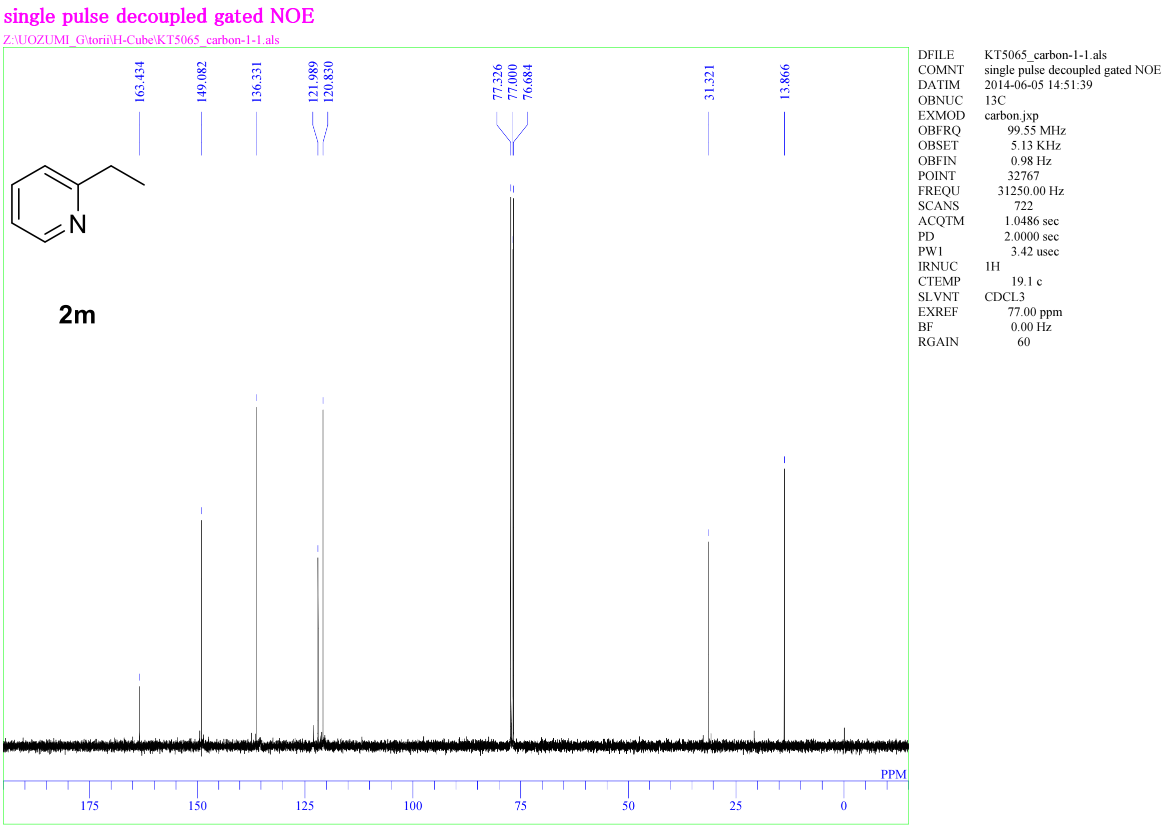
^{1}H and $^{13}C\{^{1}H\}$ NMR spectra of 2-ethylnaphthalene (**2l**).



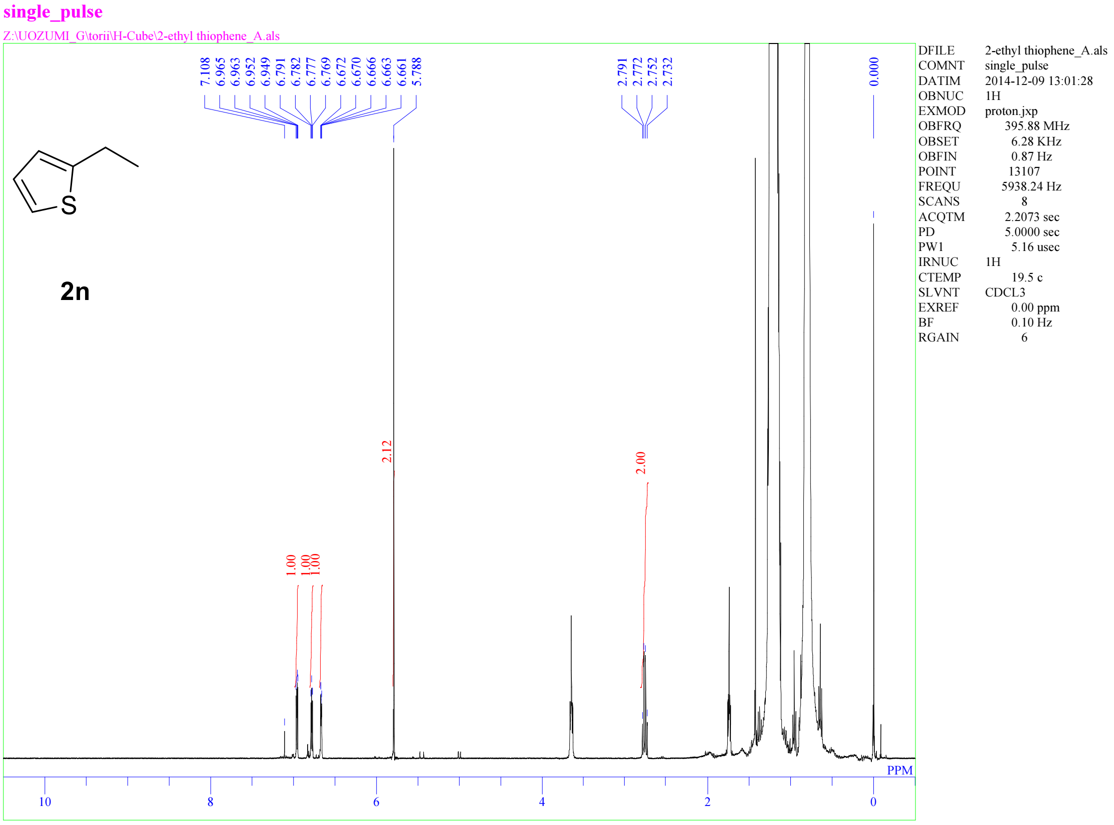


[1]H and [13]C{[1]H} NMR spectra of 2-ethylpyridine (**2m**).

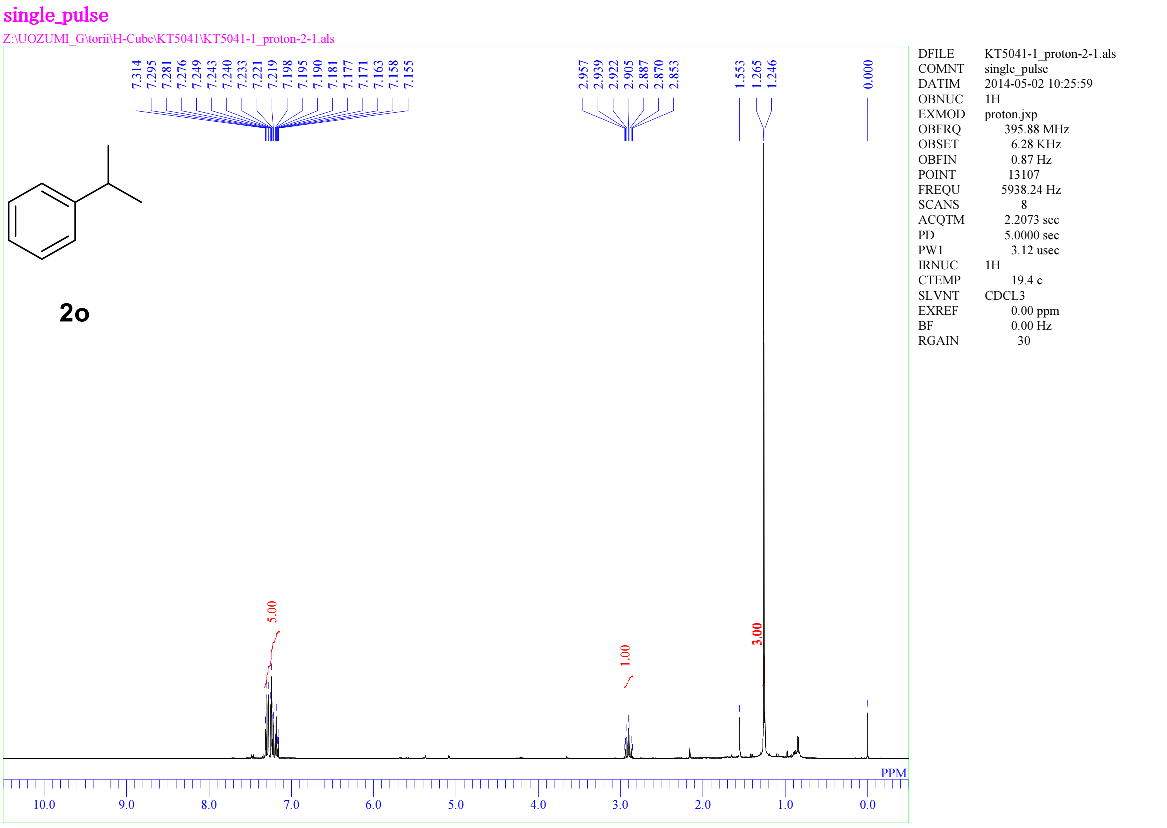


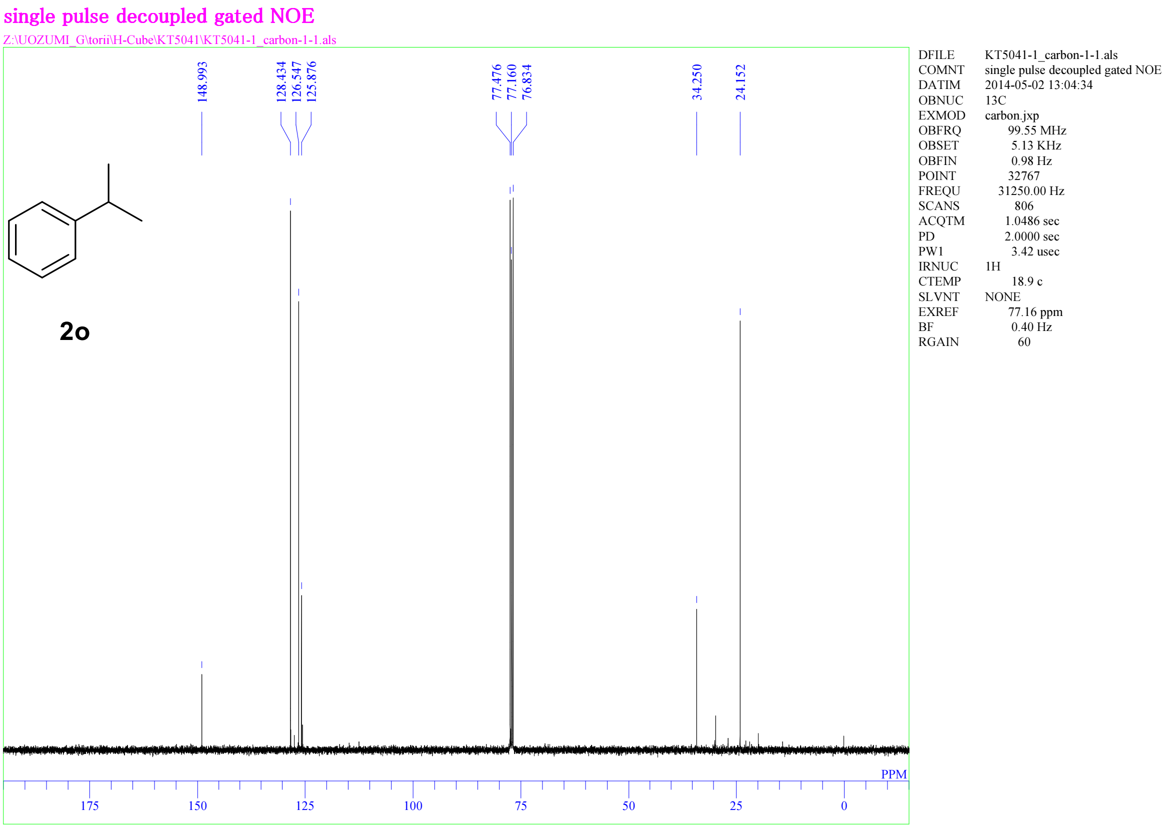


[1]H NMR spectra of 2-ethylthiophene (**2n**).

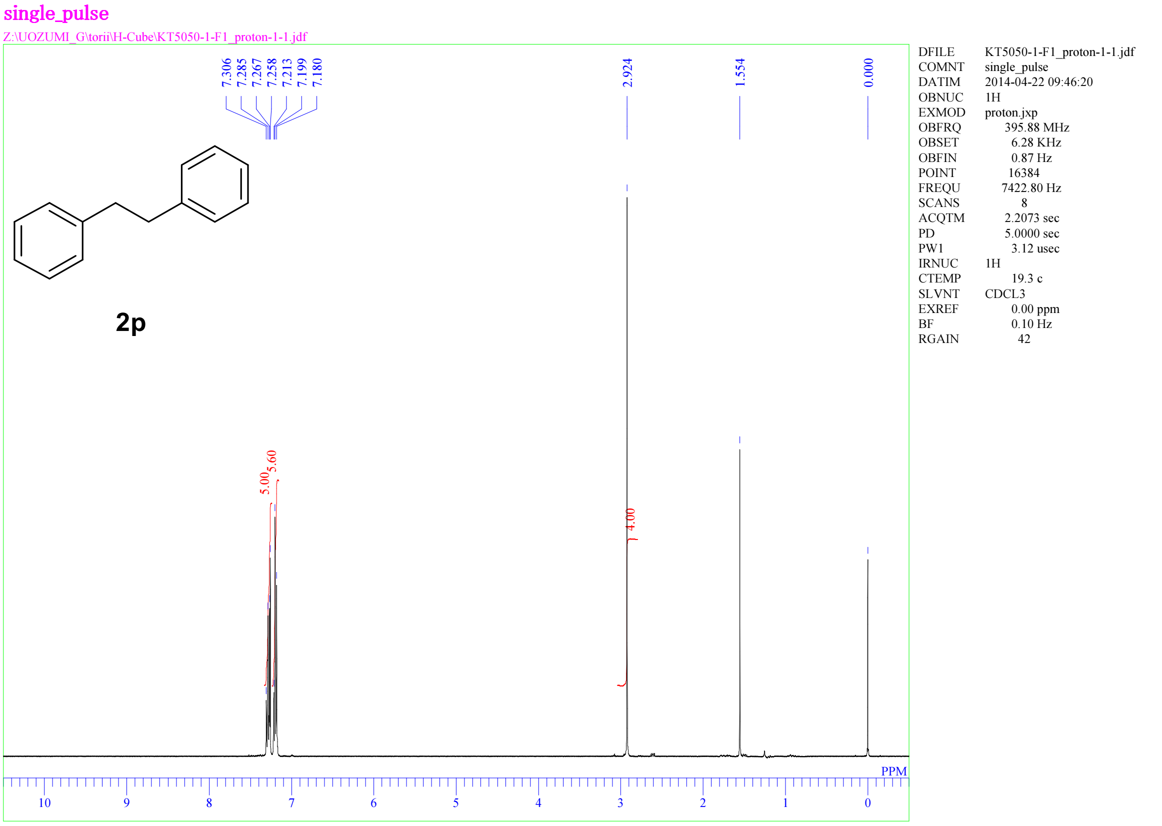


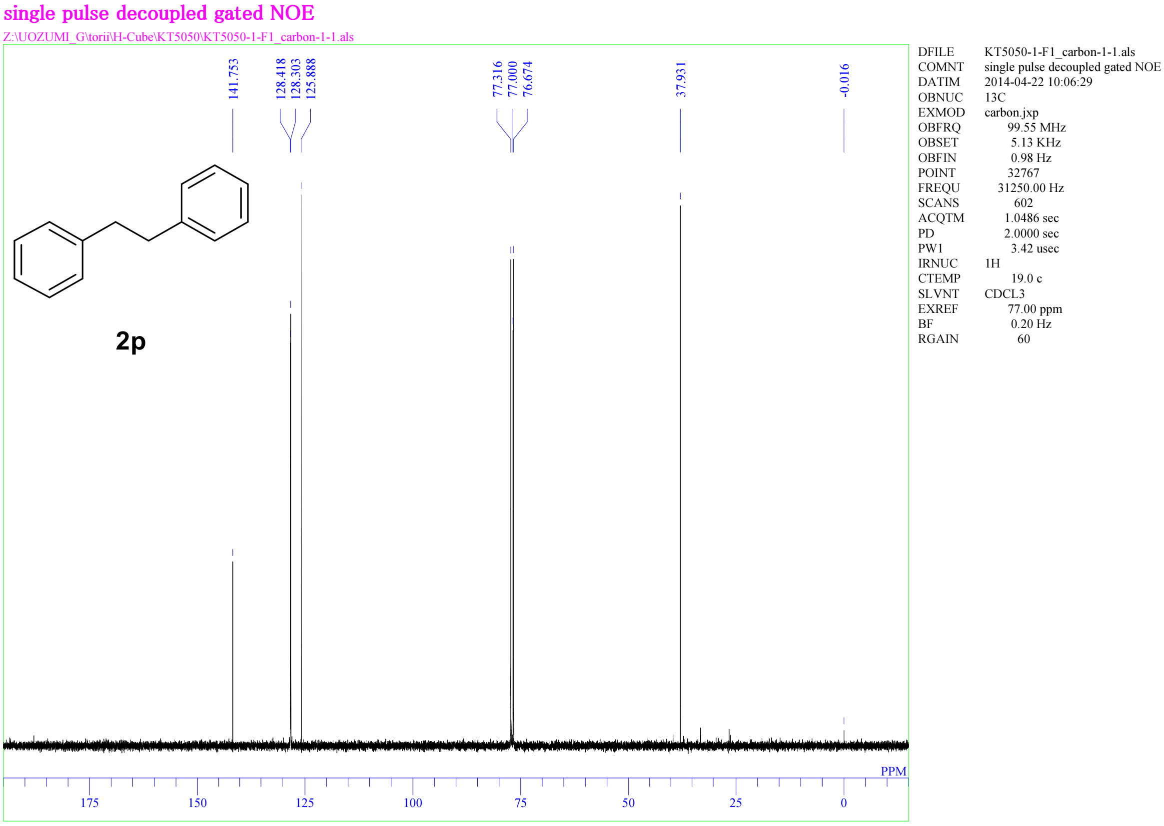
[1]H and [13]C{[1]H} NMR spectra of cumene (**2o**).



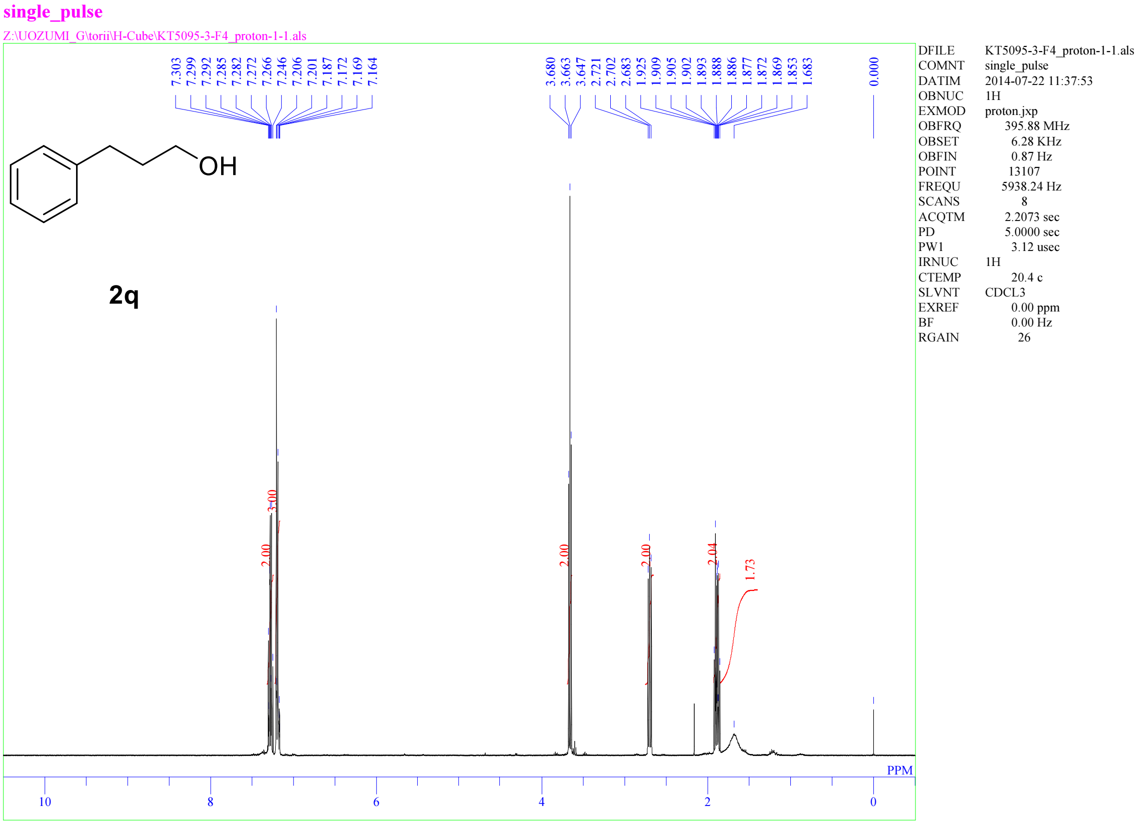


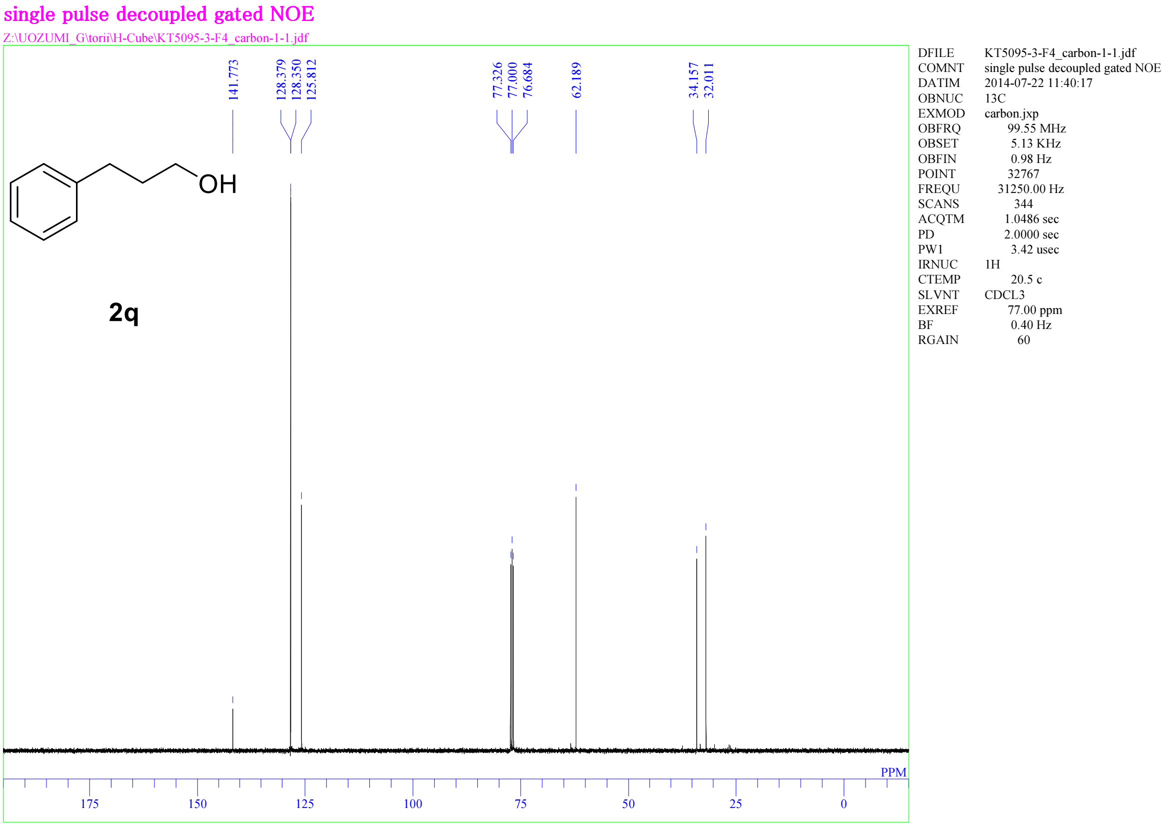
[1]H and [13]C{[1]H} NMR spectra of 1,2-diphenylethane (**2p**).



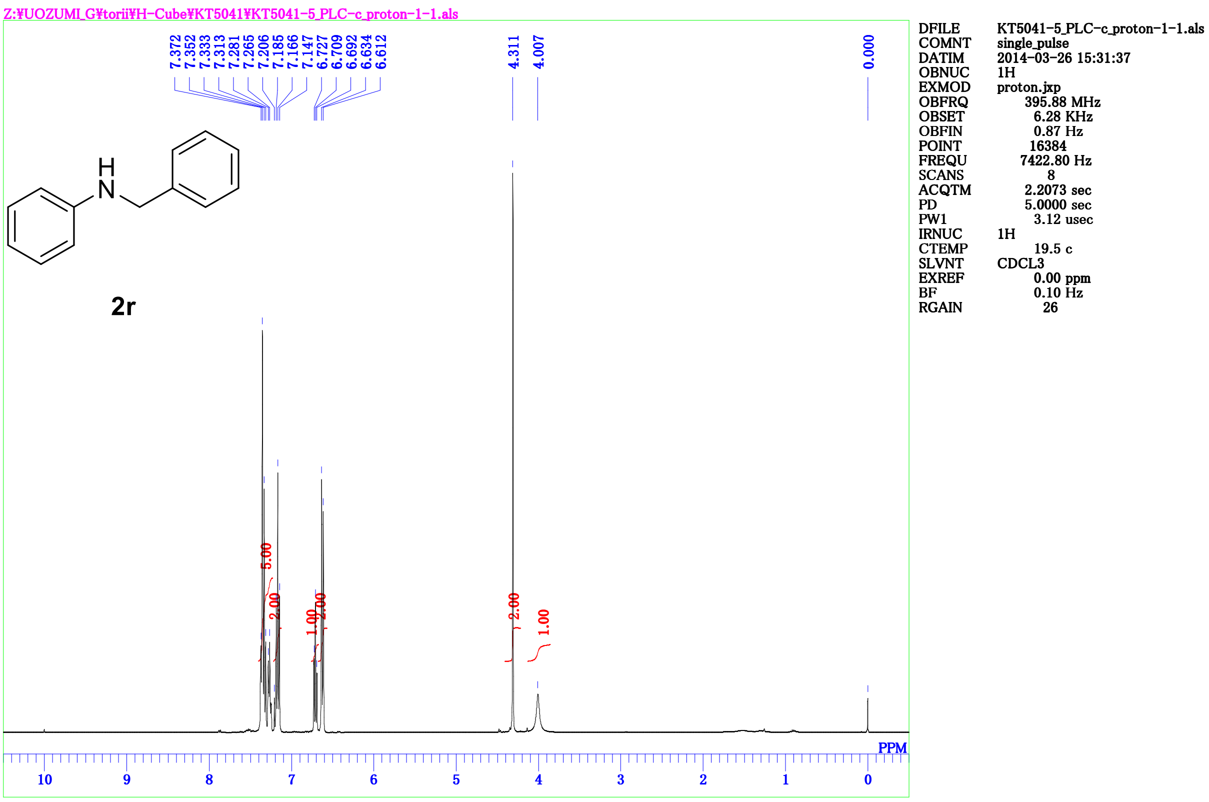


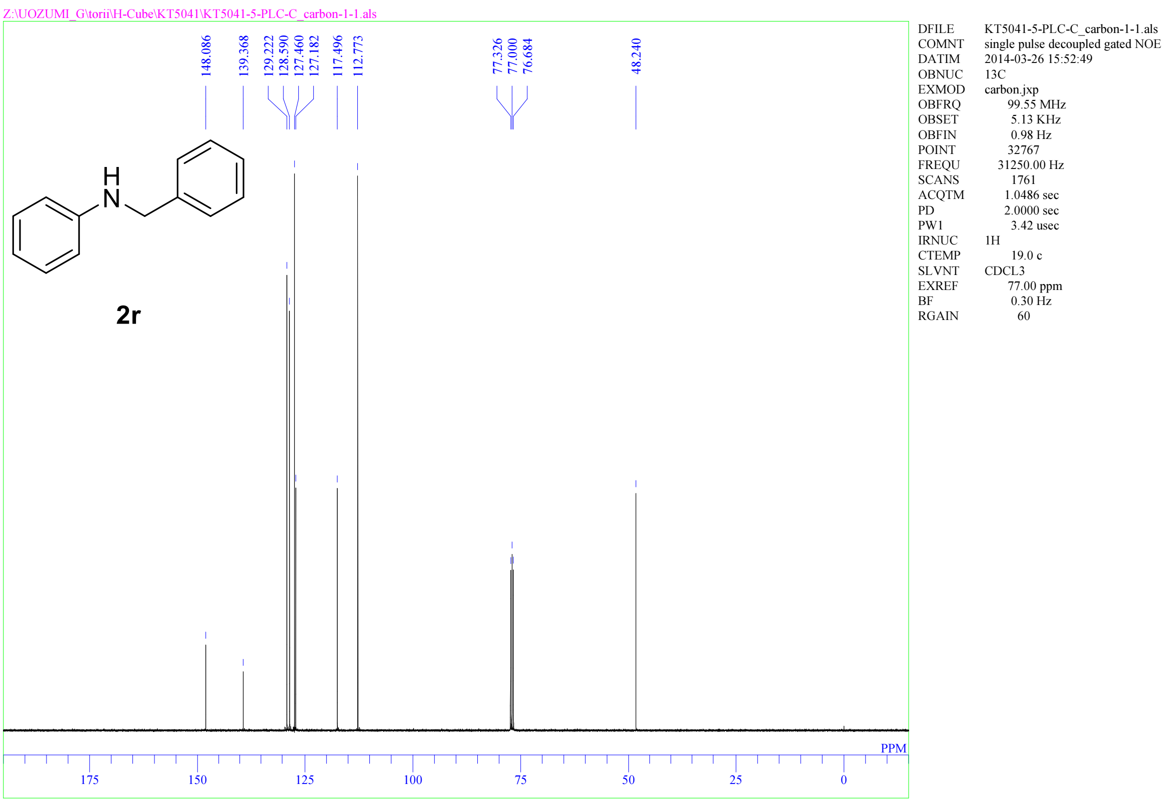
^{1}H and $^{13}C\{^{1}H\}$ NMR spectra of 3-phenylpropan-1-ol (**2q**).



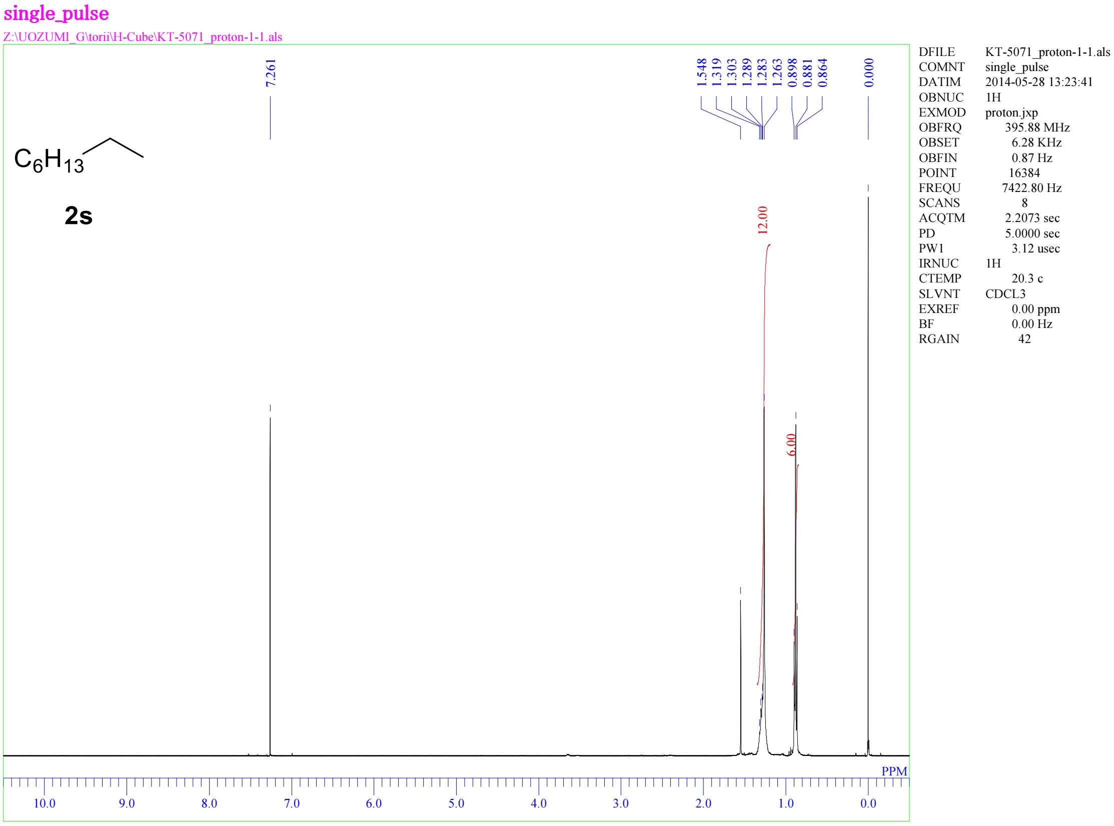


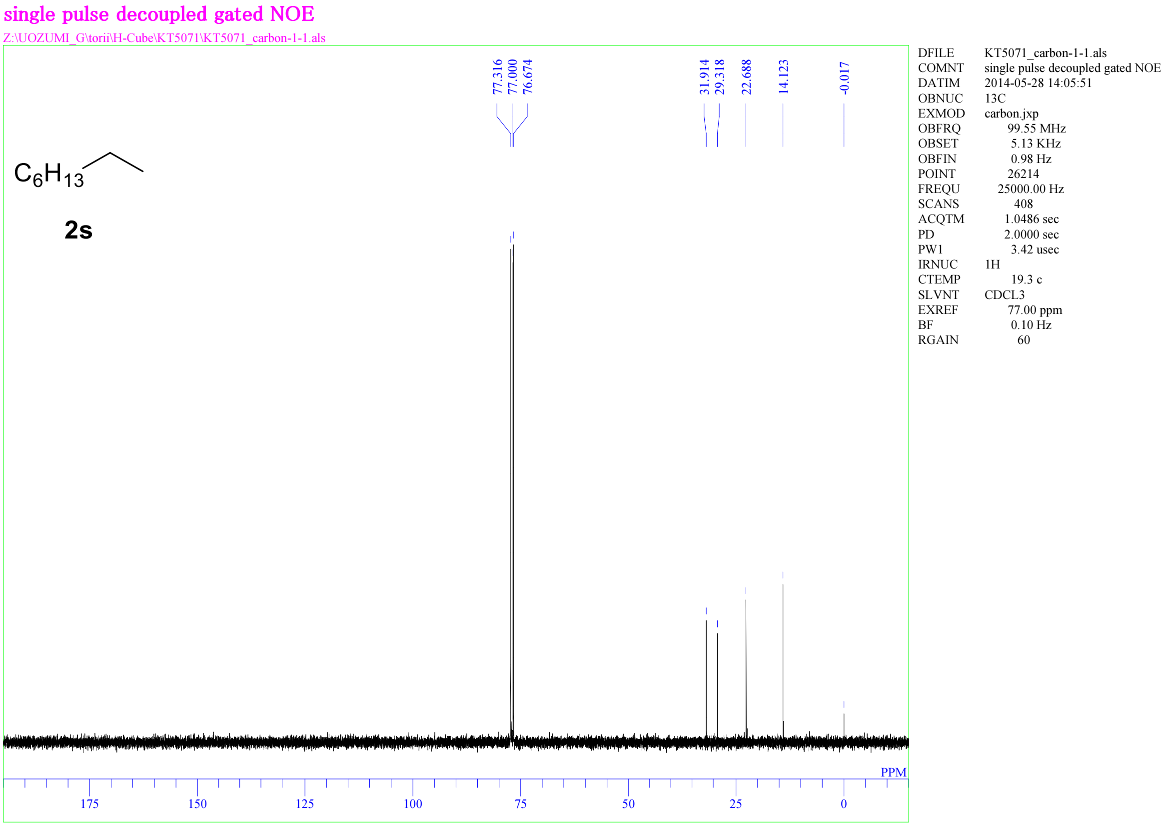
^{1}H and $^{13}C\{^{1}H\}$ NMR spectra of *N*-benzylaniline (**2r**).



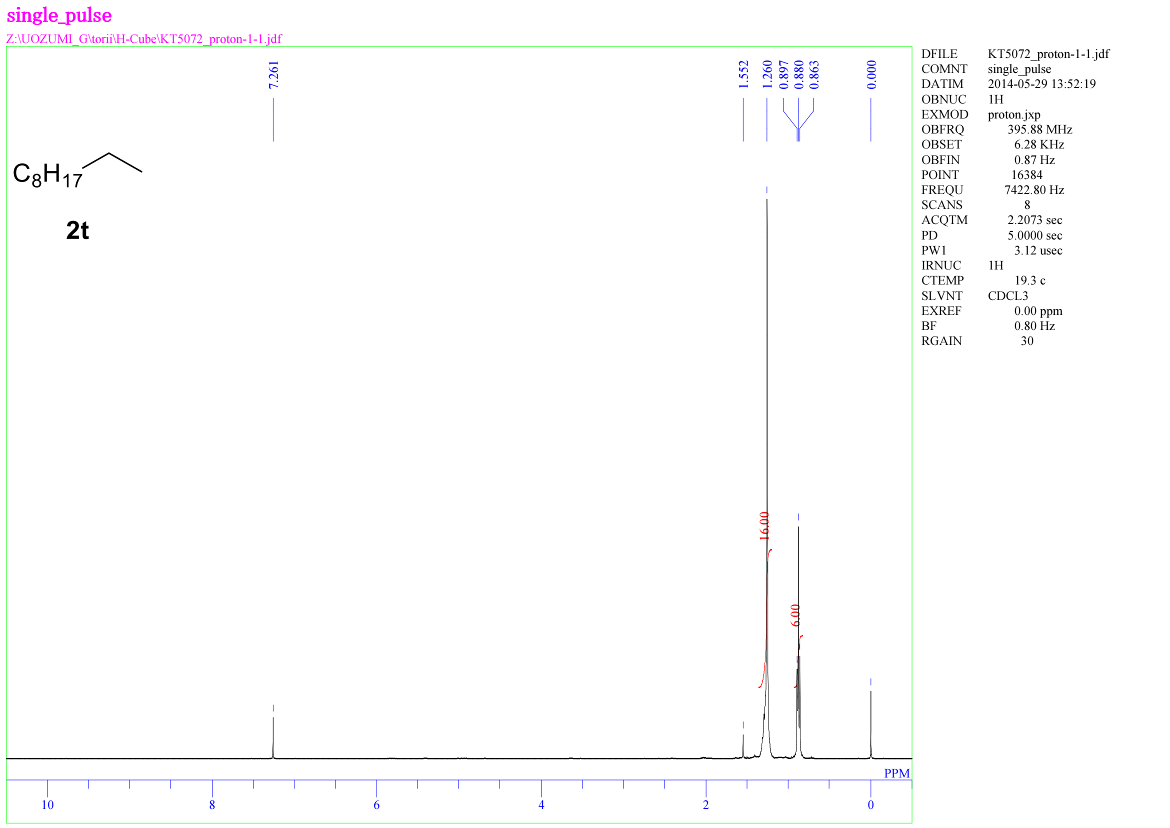


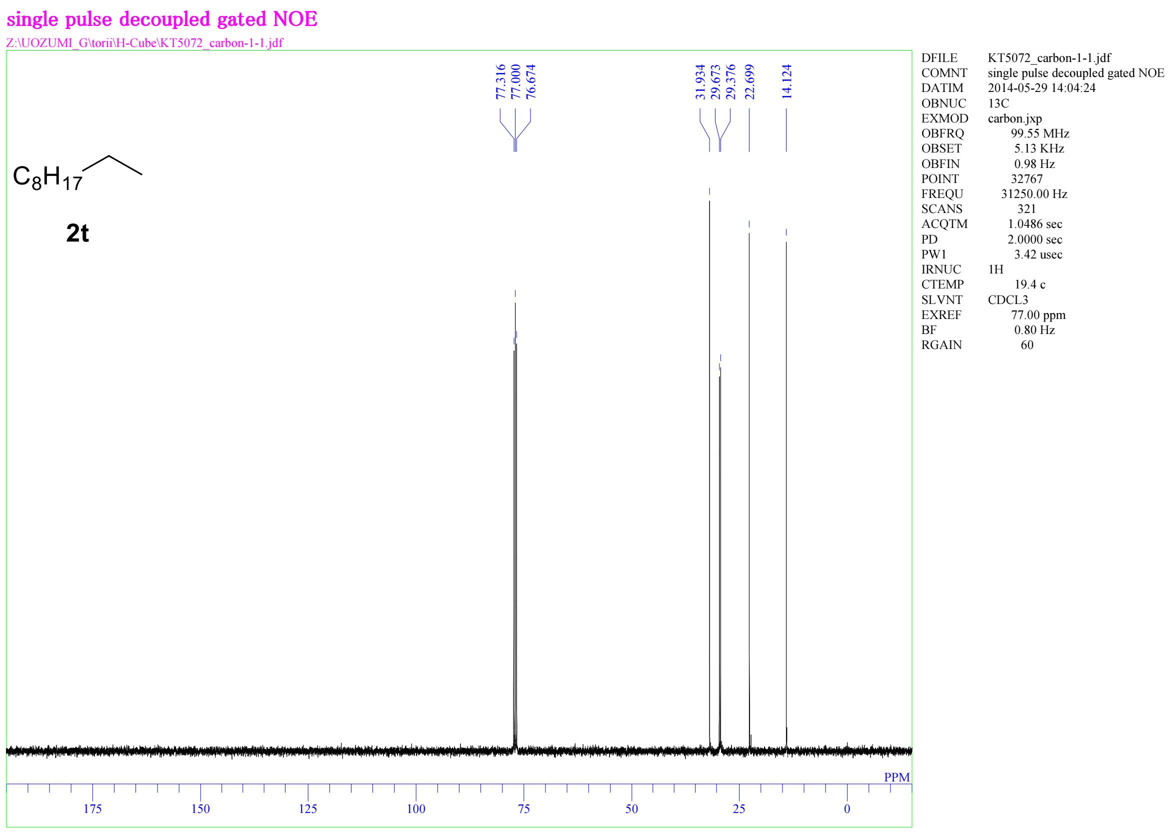
^{1}H and $^{13}C\{^{1}H\}$ NMR spectra of octane (**2s**).



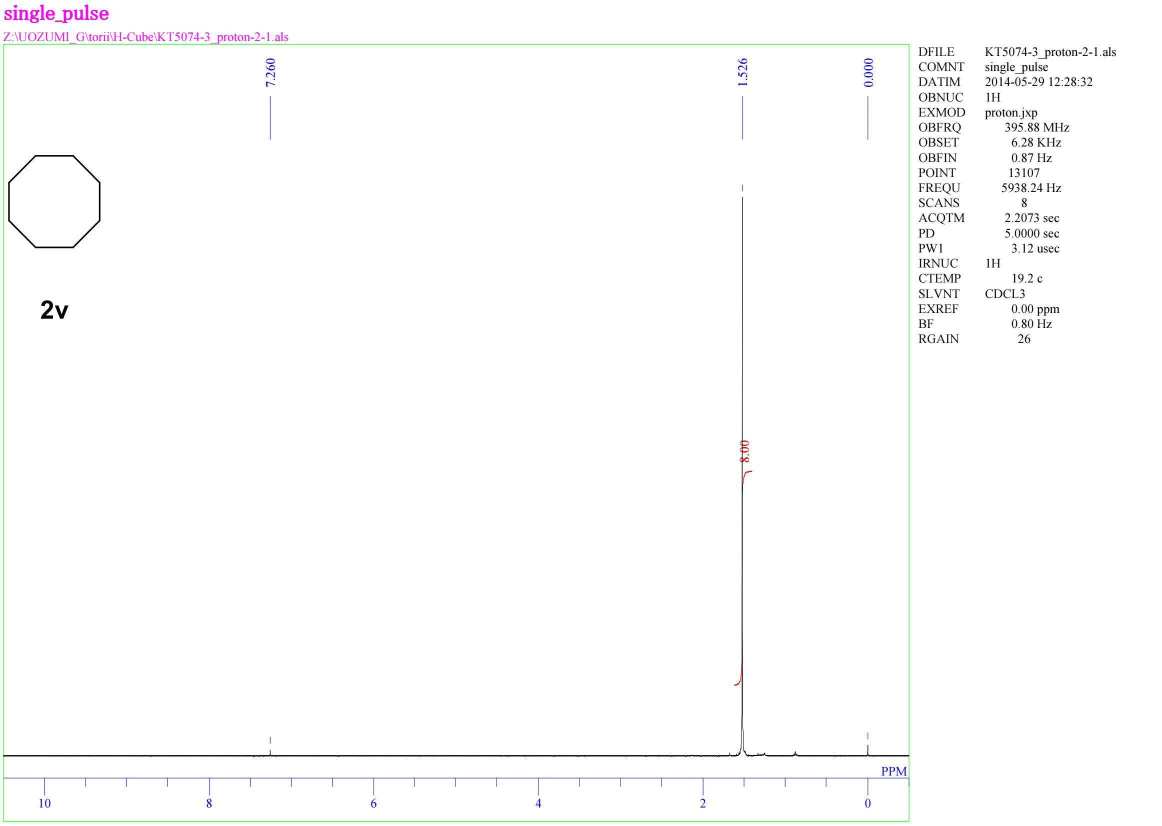


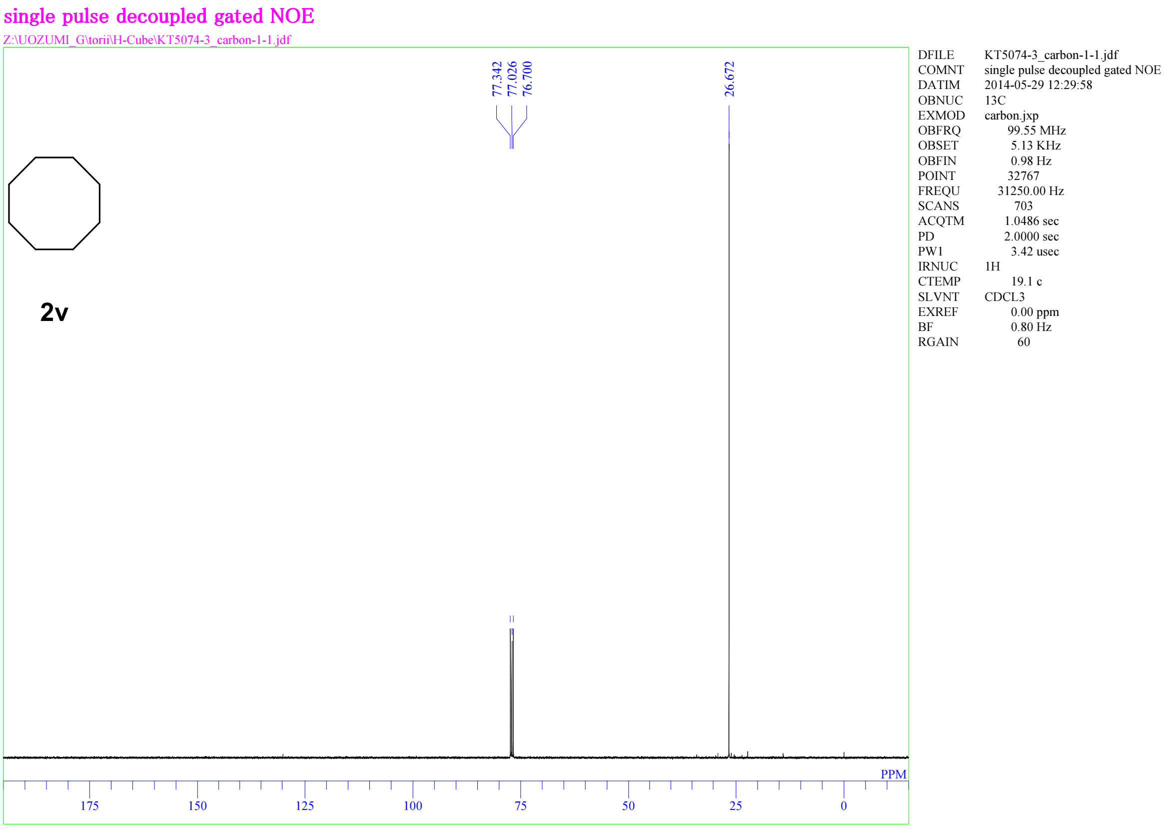
^{1}H and $^{13}C\{^{1}H\}$ NMR spectra of decane (**2t**).



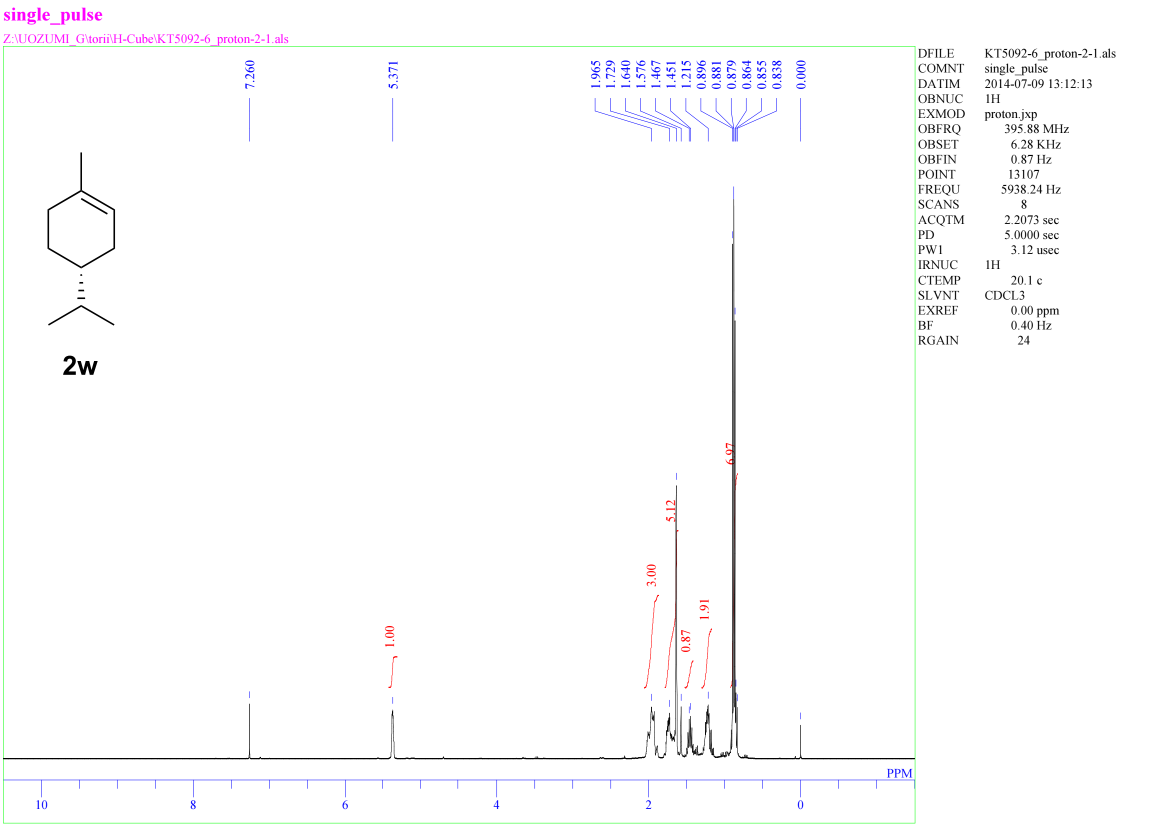


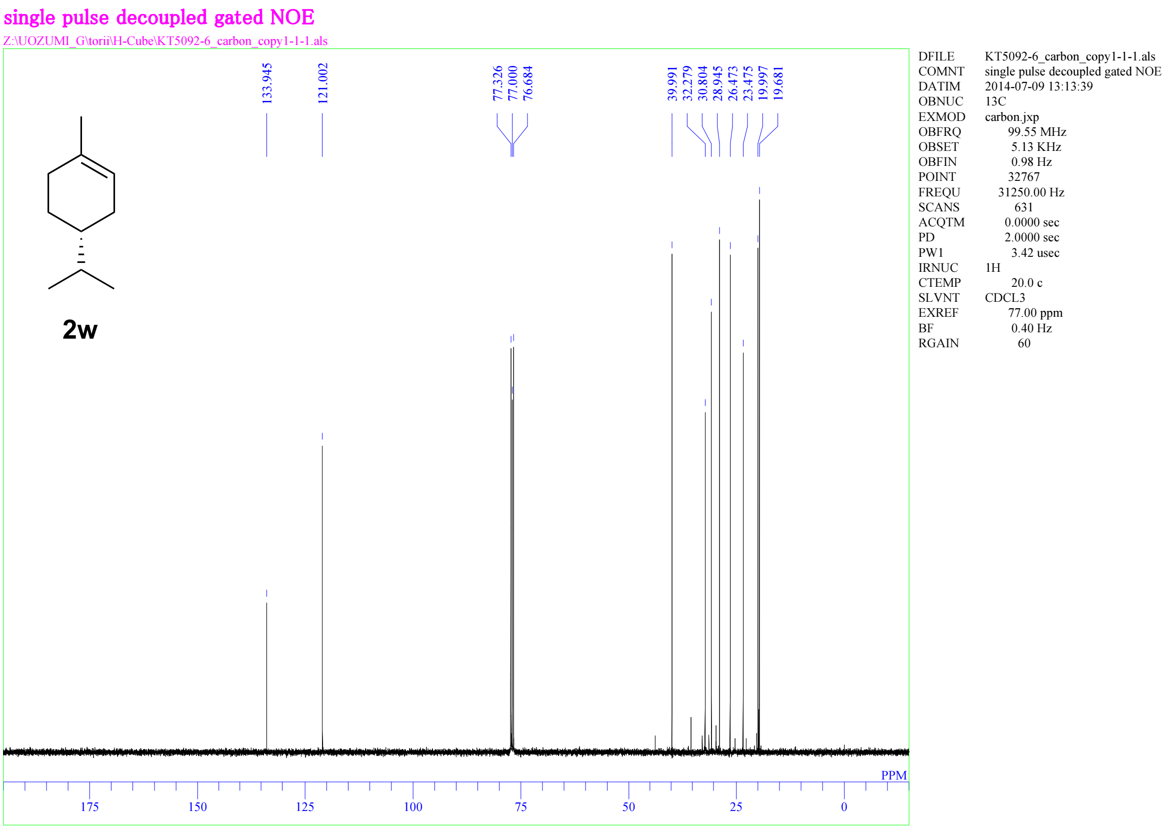
^{1}H and $^{13}C\{^{1}H\}$ NMR spectra of cyclooctane (**2v**).



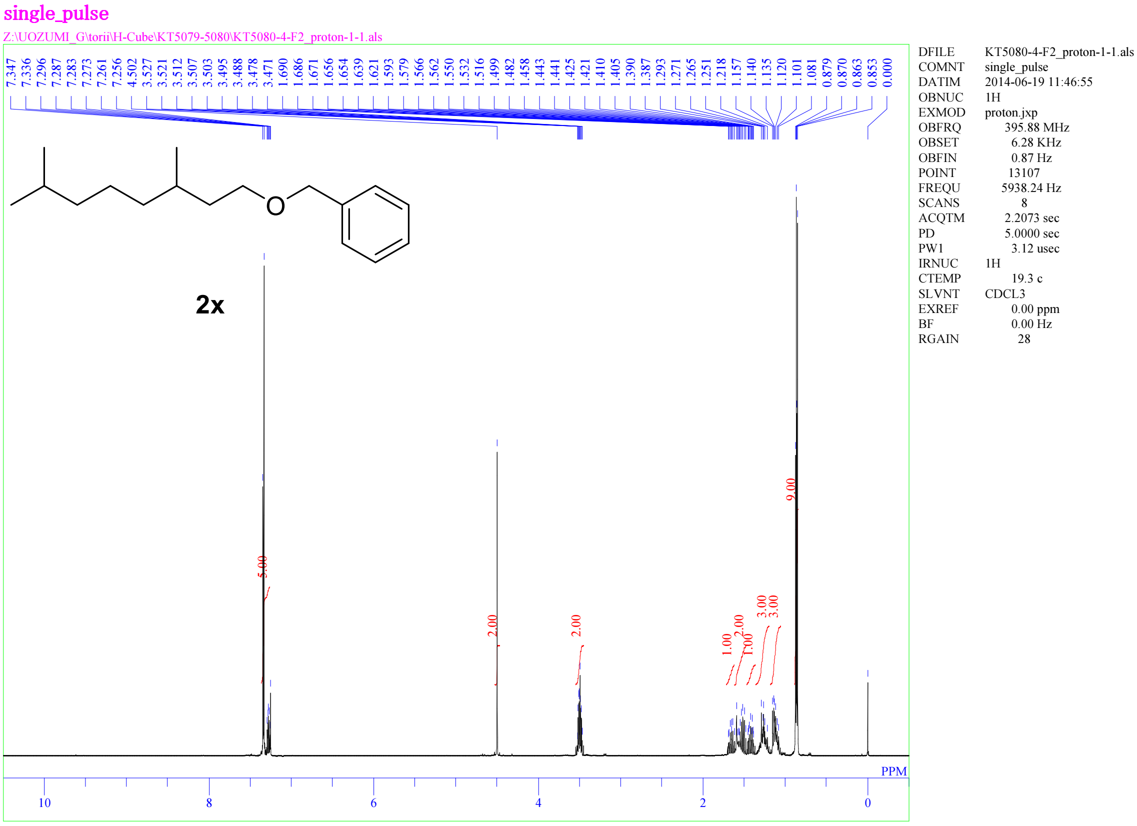


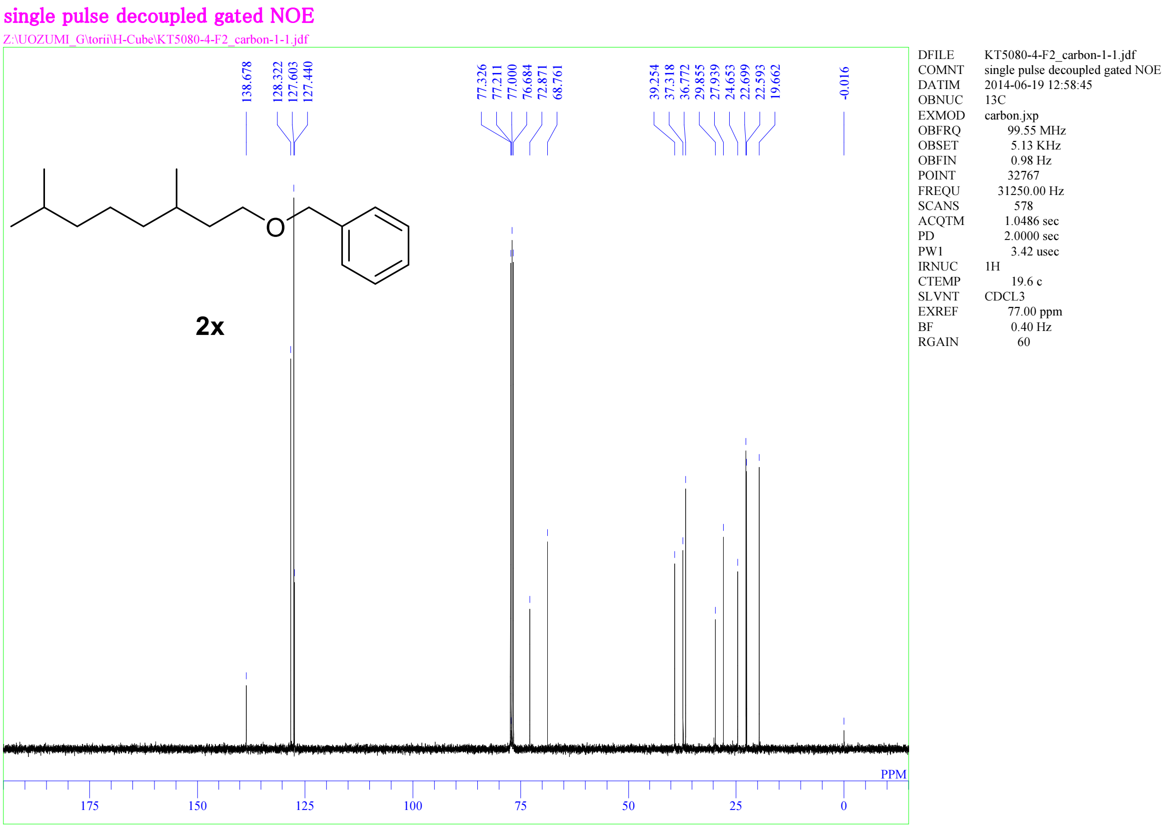
[1]H and [13]C{[1]H} NMR spectra of 4-isopropy-1-methylcyclohex-1-ene (**2w**).



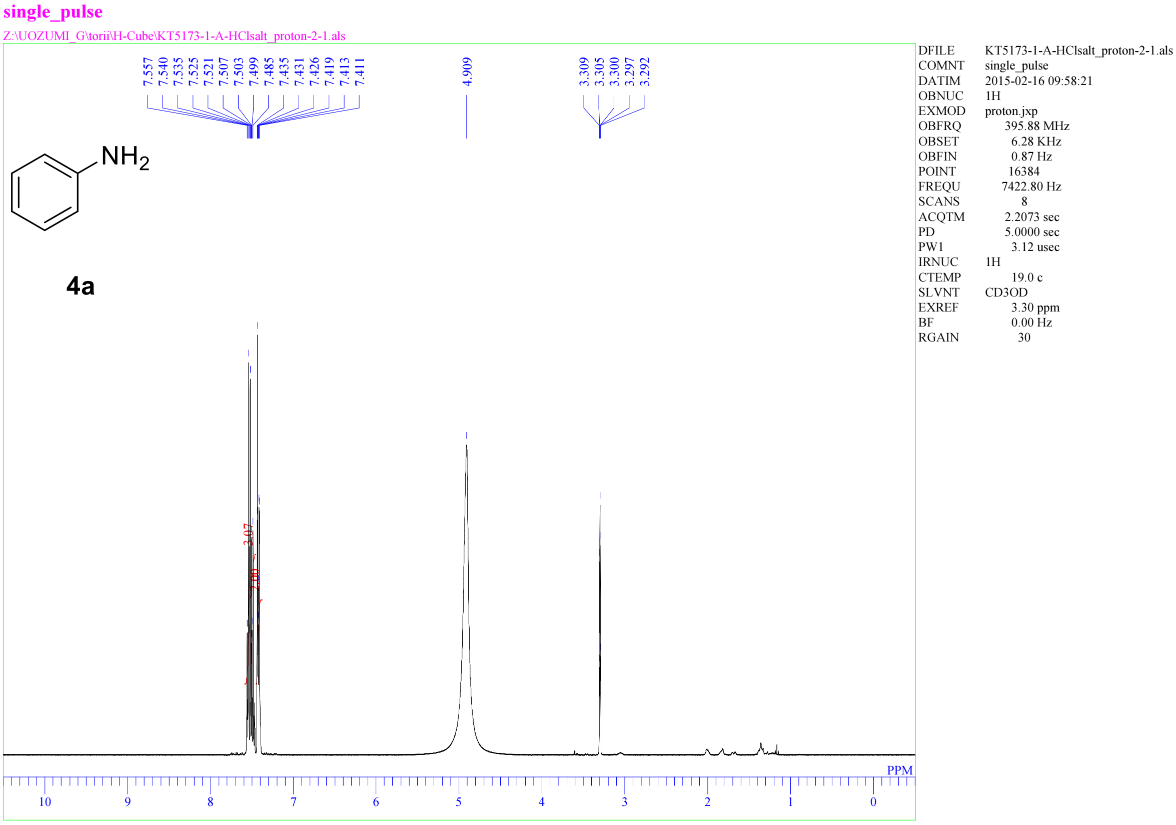


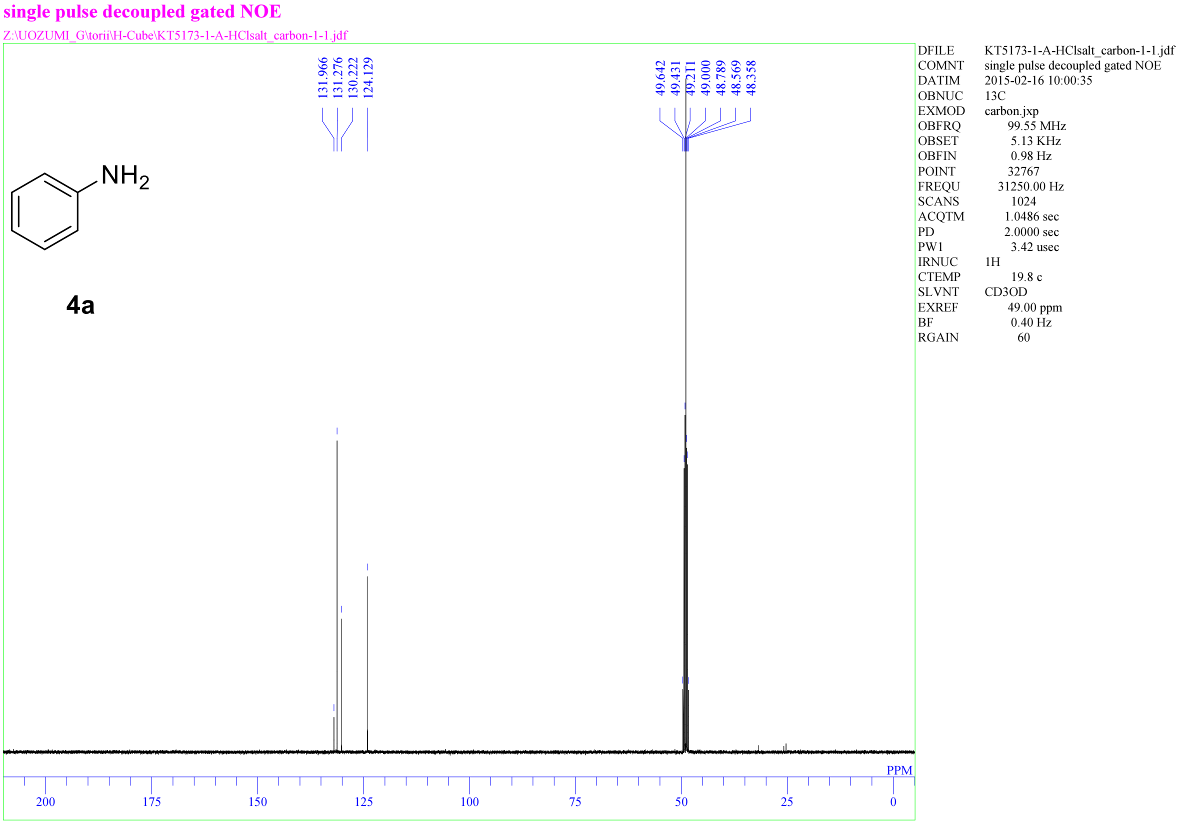
[1]H and [13]C{[1]H} NMR spectra of [[(3,7-dimethylocyl)oxy]methyl]benzene (**2x**).



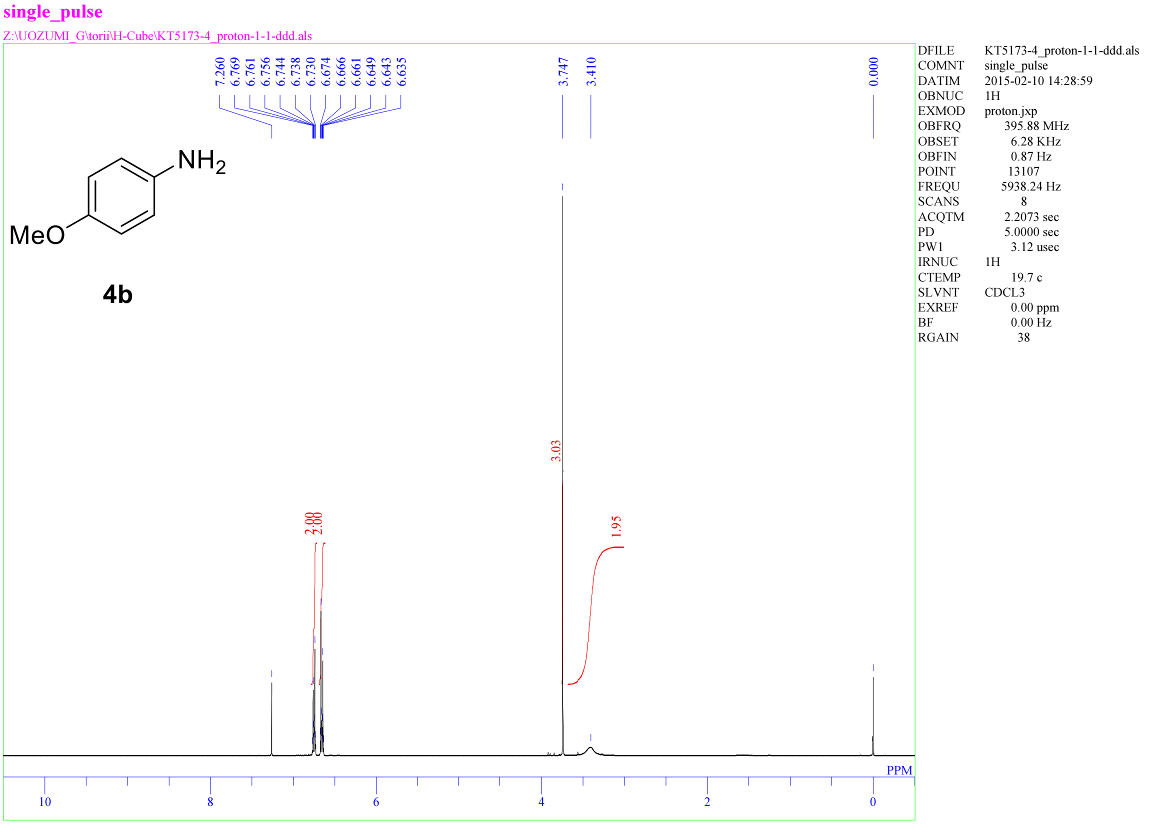


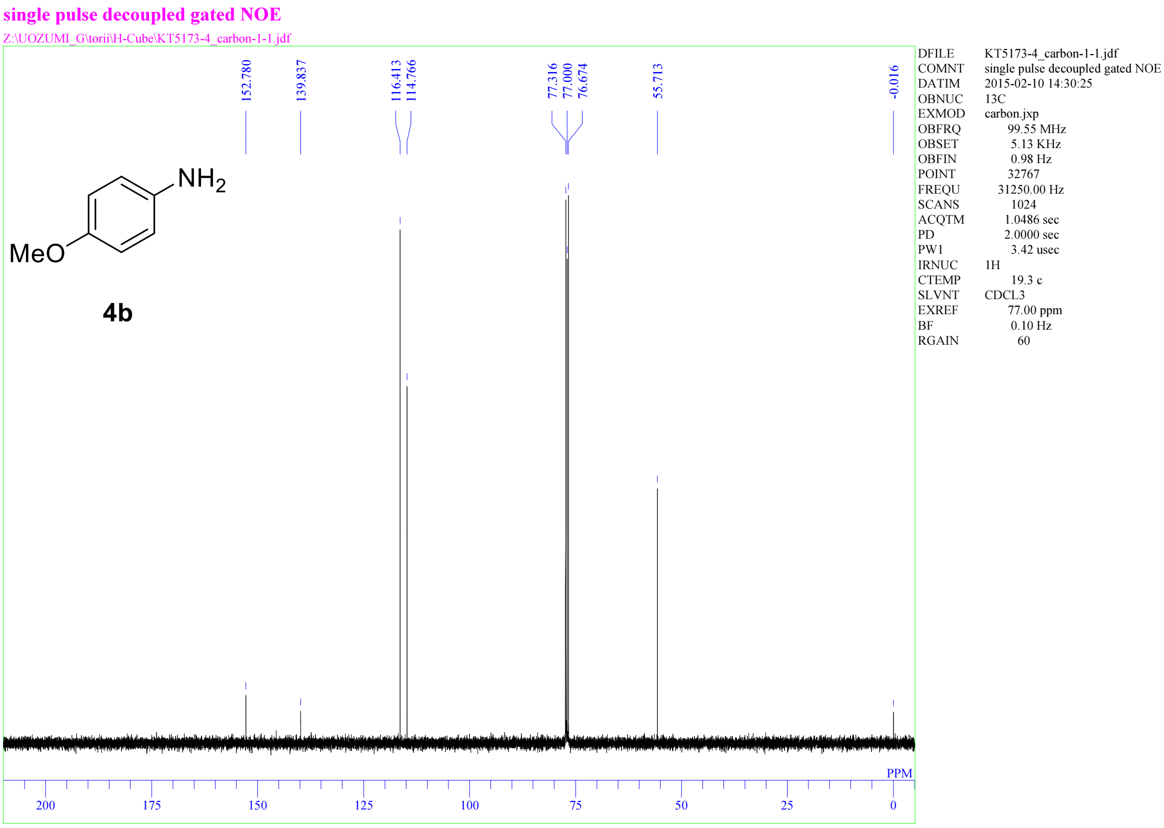
^{1}H and $^{13}C\{^{1}H\}$ NMR spectra of aniline hydrochloride (**4a**).



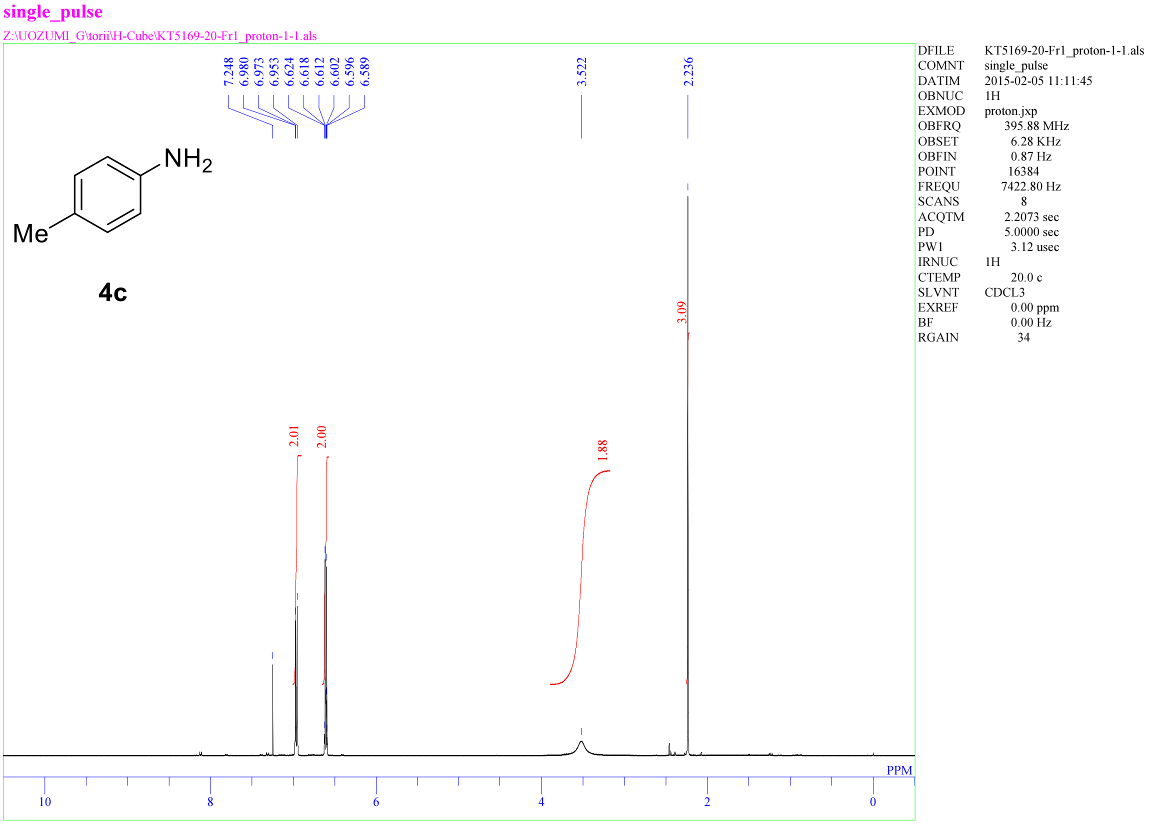


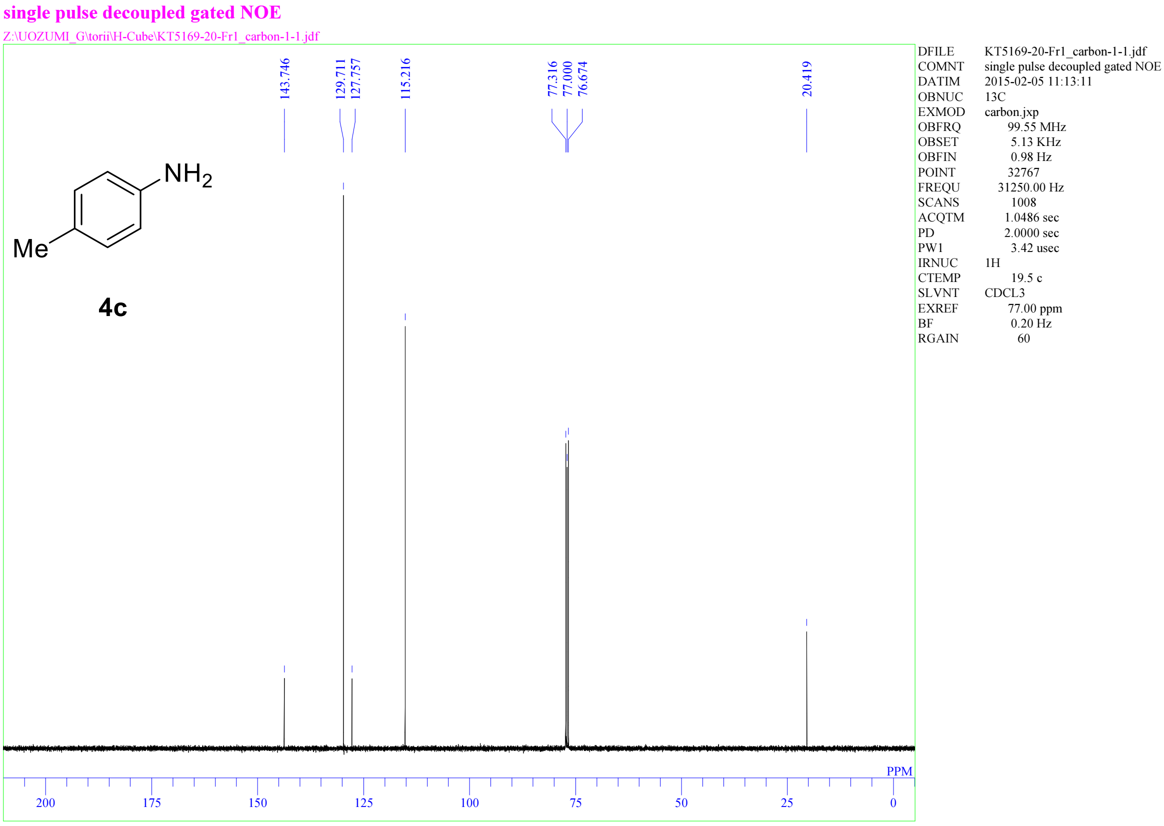
[1]H and [13]C{[1]H} NMR spectra of *p*-anisidine (**4b**).



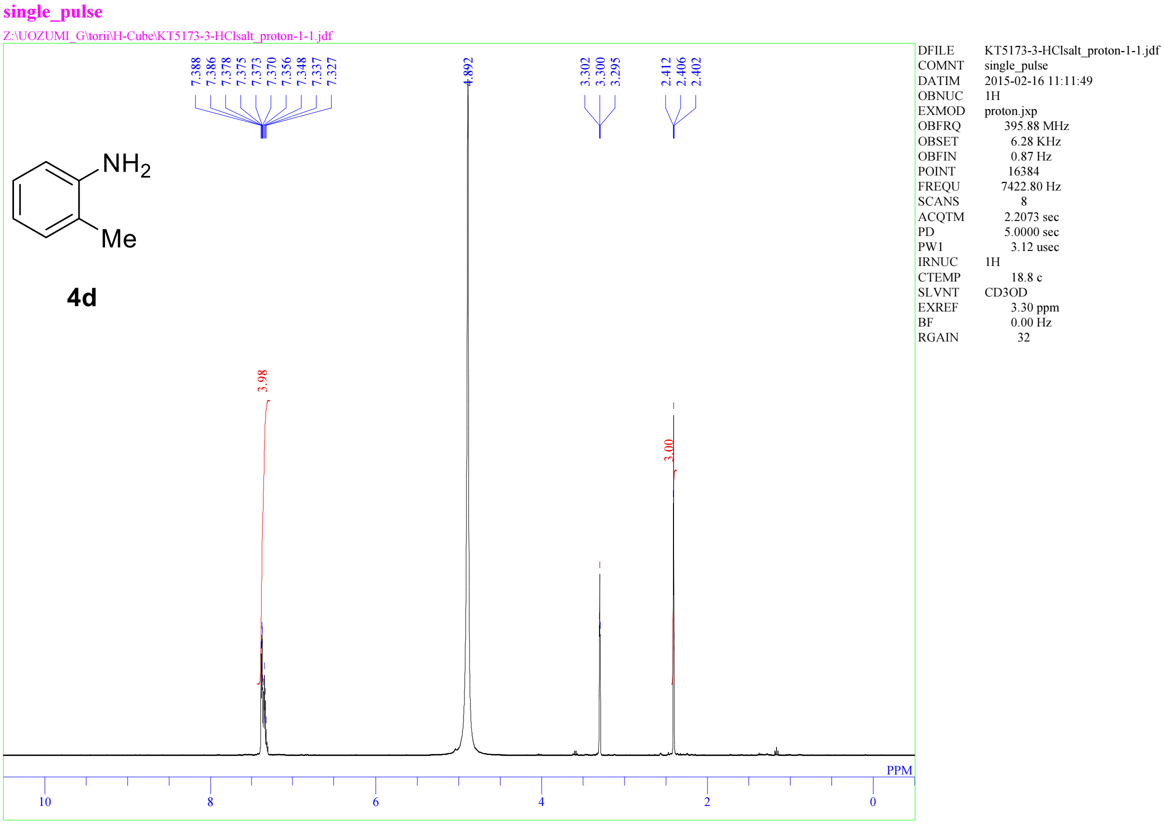


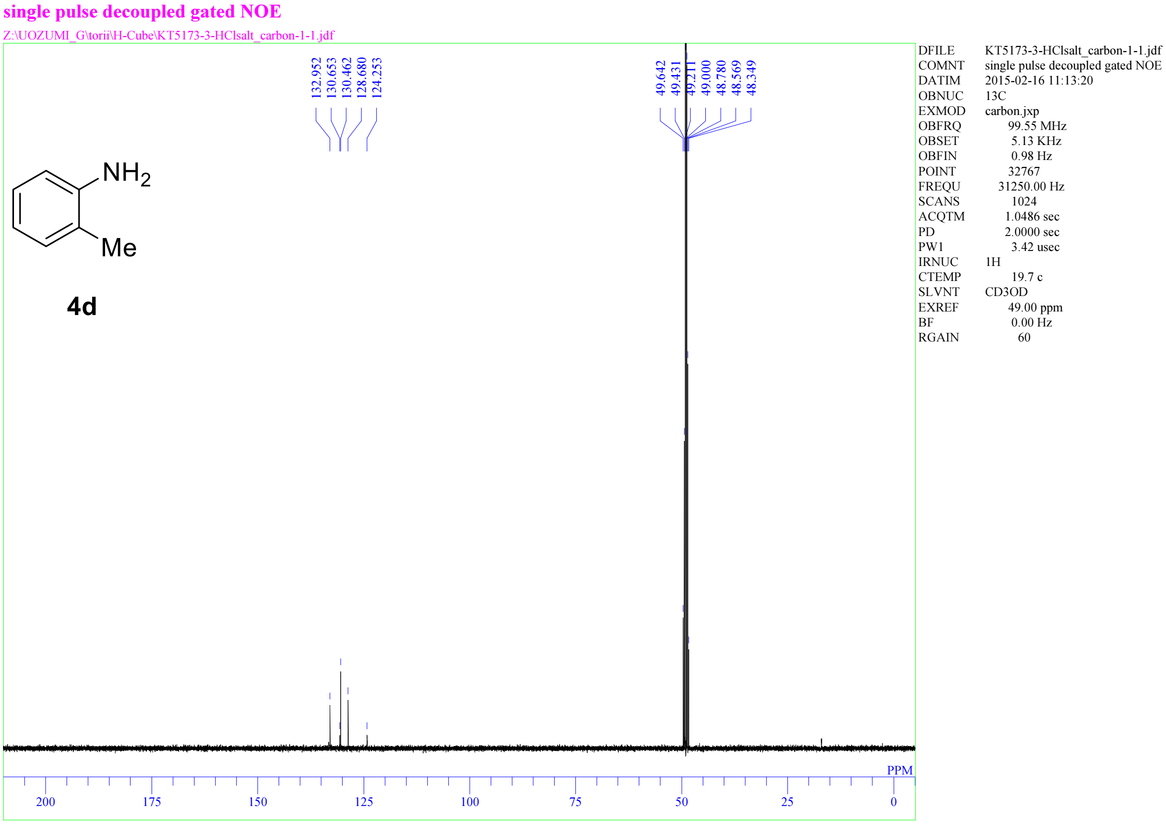
^{1}H and ^{13}C{^{1}H} NMR spectra of *p*-toluidine (**4c**).



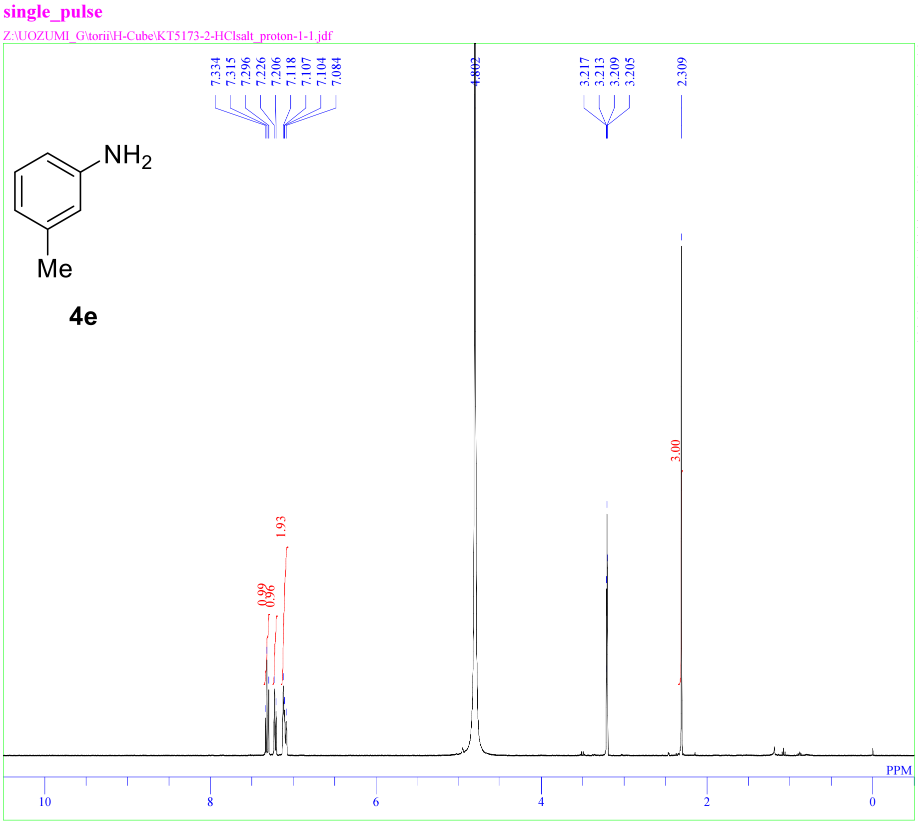


^1H and $^{13}C\{^1H\}$ NMR spectra of *o*-toluidine hydrochloride (**4d**).





^{1}H and $^{13}C\{^{1}H\}$ NMR spectra of *m*-toluidine hydrochloride (**4e**).



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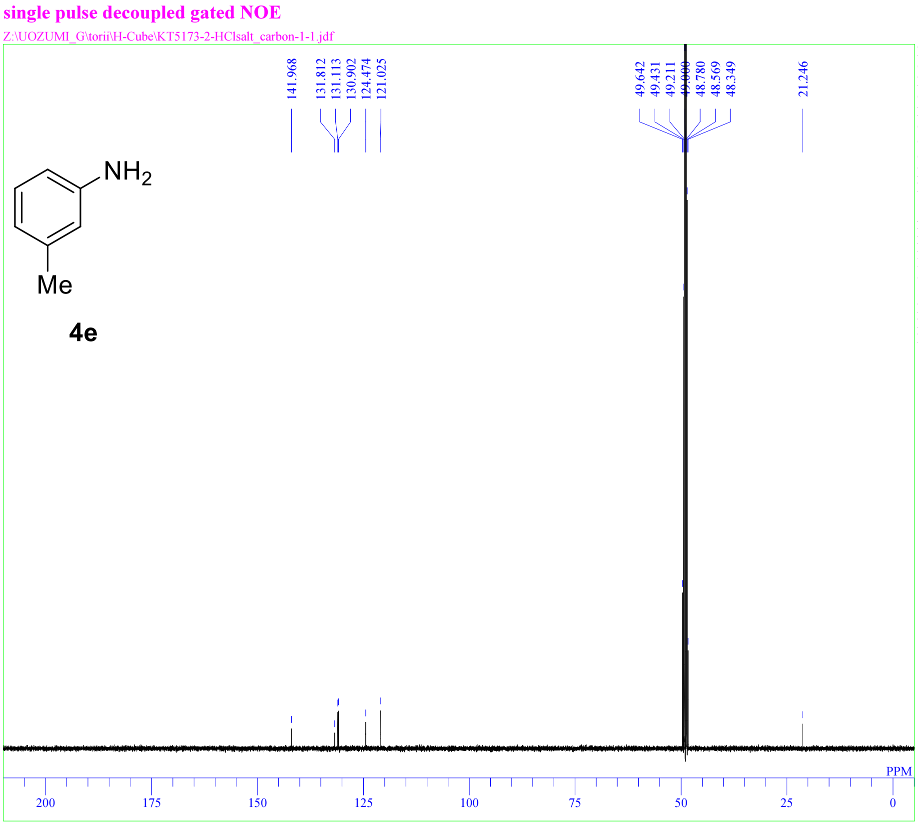
OBSET 6.28 KHz
OBFIN 0.87 Hz
POINT 16384
FREQU 7422.80 Hz
SCANS 8
ACQTM 2.2073 sec
PD 5.0000 sec
PW1 3.12 usec
IRNUC 1H
CTEMP 19.4 c
SLVNT CD3OD
EXREF 0.00 ppm
BF 0.00 Hz
RGAIN 32



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EXMOD carbon.jxp
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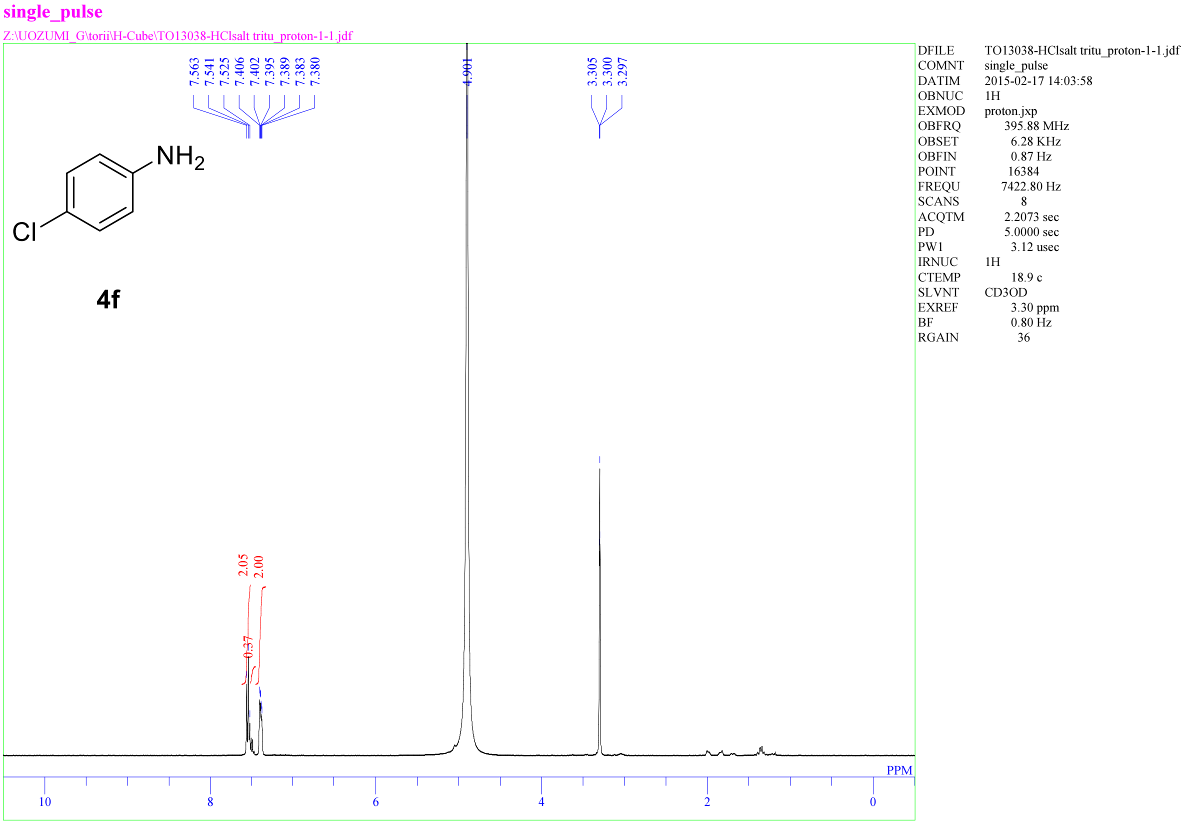
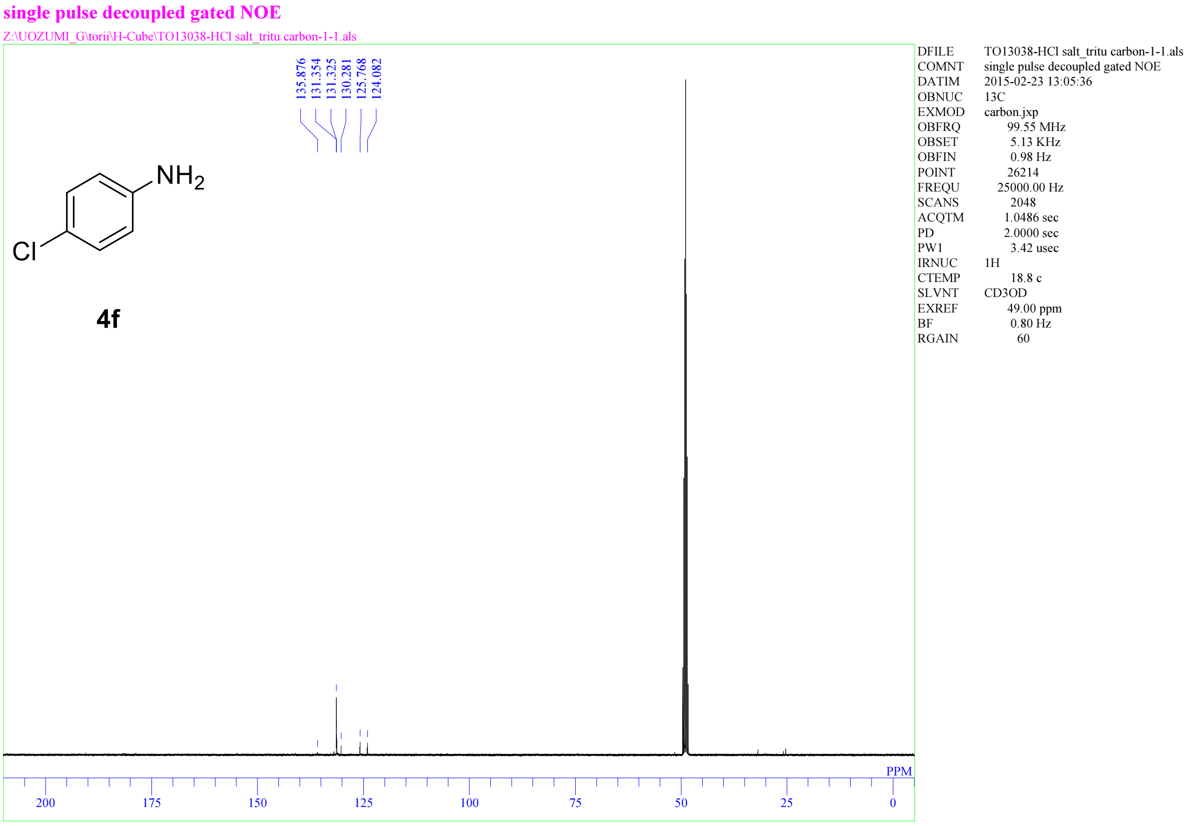
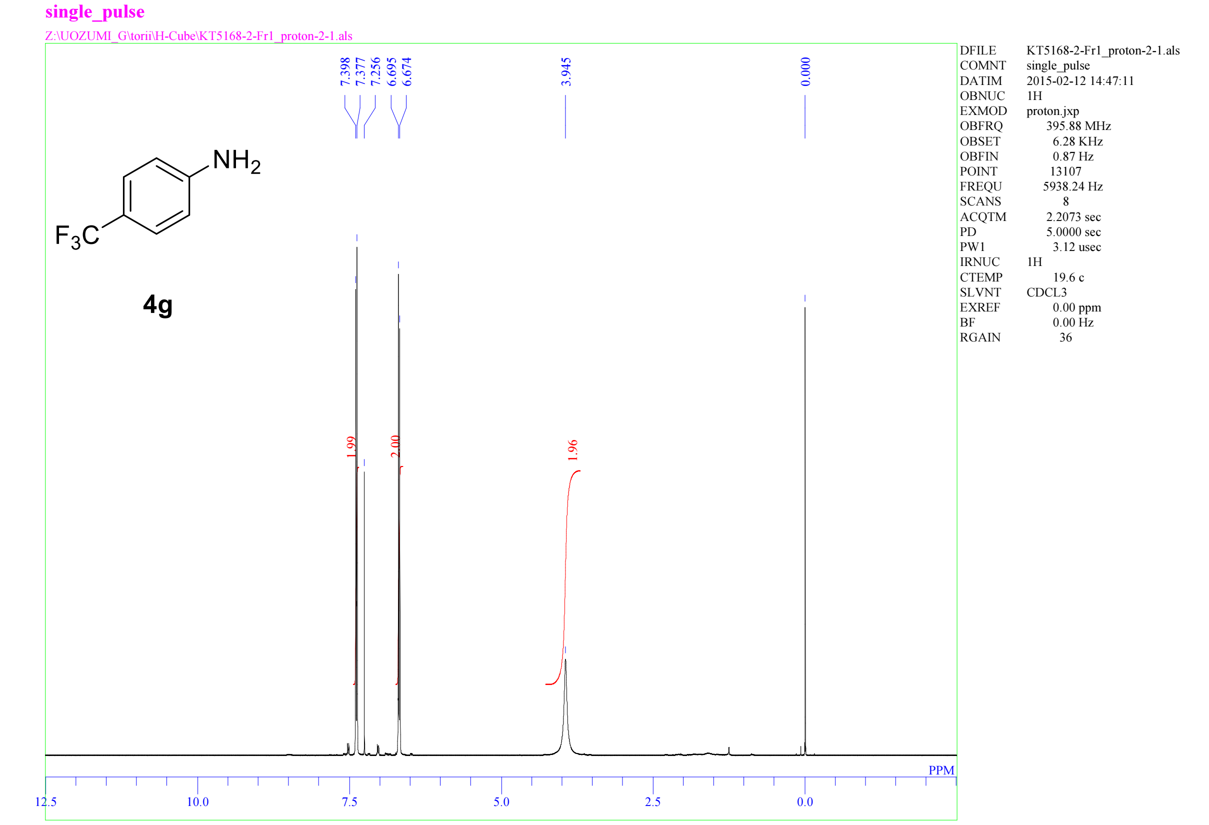
OBSET 5.13 KHz
OBFIN 0.98 Hz
POINT 32767
FREQU 31250.00 Hz
SCANS 1024
ACQTM 1.0486 sec
PD 2.0000 sec
PW1 3.42 usec
IRNUC 1H
CTEMP 19.7 c
SLVNT CD3OD
EXREF 49.00 ppm
BF 0.00 Hz
RGAIN 60

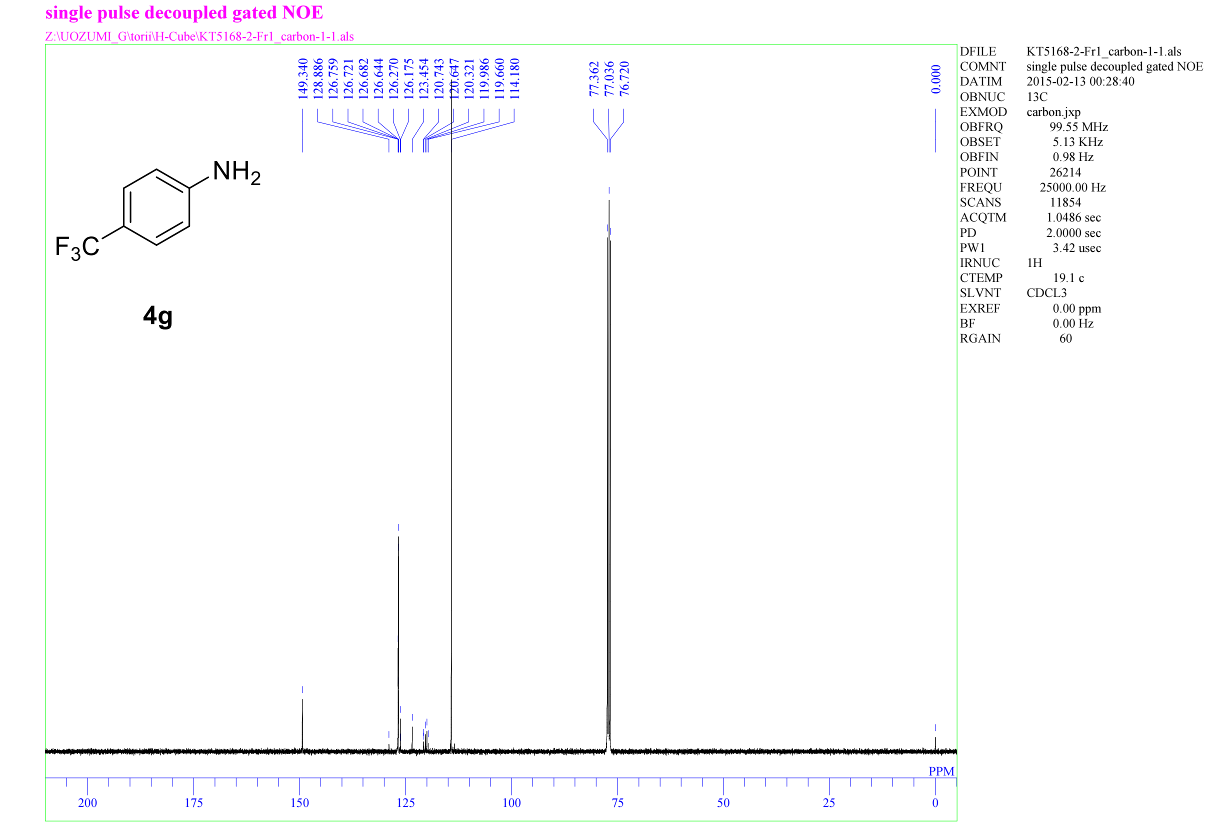
[1]H and [13]C{[1]H} NMR spectra of 4-chloroaniline hydrochloride (**4f**).



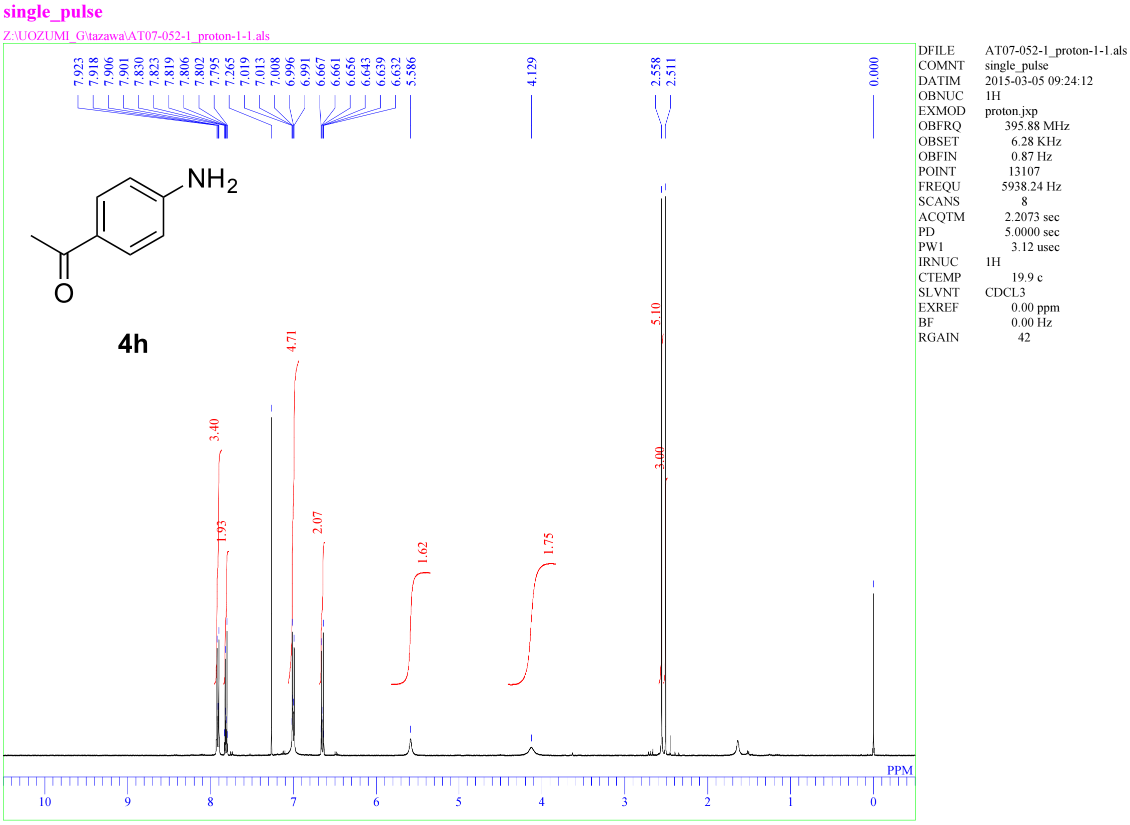


^{1}H and $^{13}C\{^{1}H\}$ NMR spectra of 4-(trifluoromethyl)aniline (**4g**).





[1]H NMR spectra of 4-aminoacetophenone (**4h**).



[1]H and [13]C{[1]H} NMR spectra of methyl 4-aminobenzoate (**4i**).