Supporting information

for

Gold Nanoparticles Supported by Imidazolium-based Porous Organic Polymers for Nitroarenes Reduction

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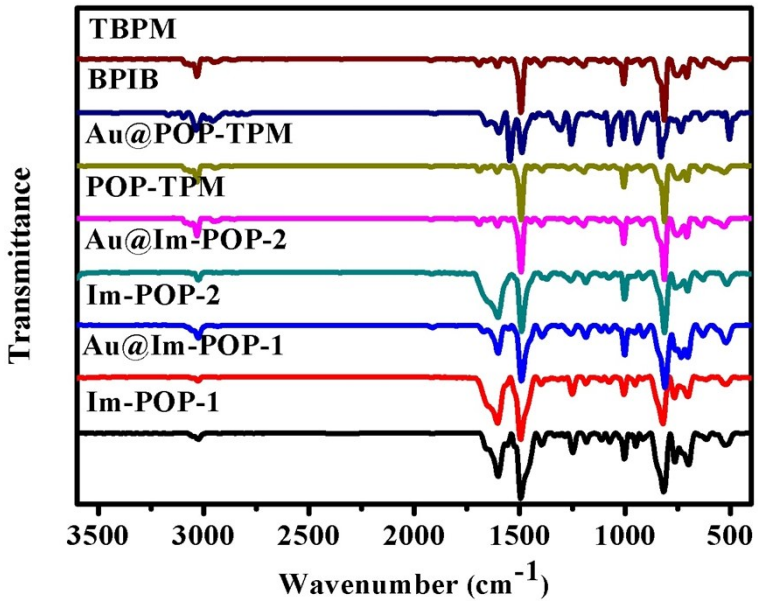


Figure S1. FTIR spectra of monomers and POPs.

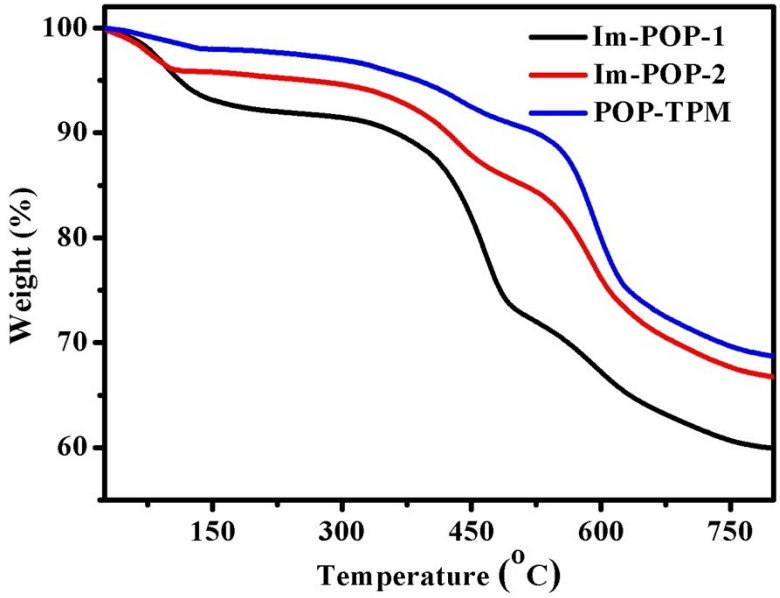


Figure S2. TGA curves of POPs.

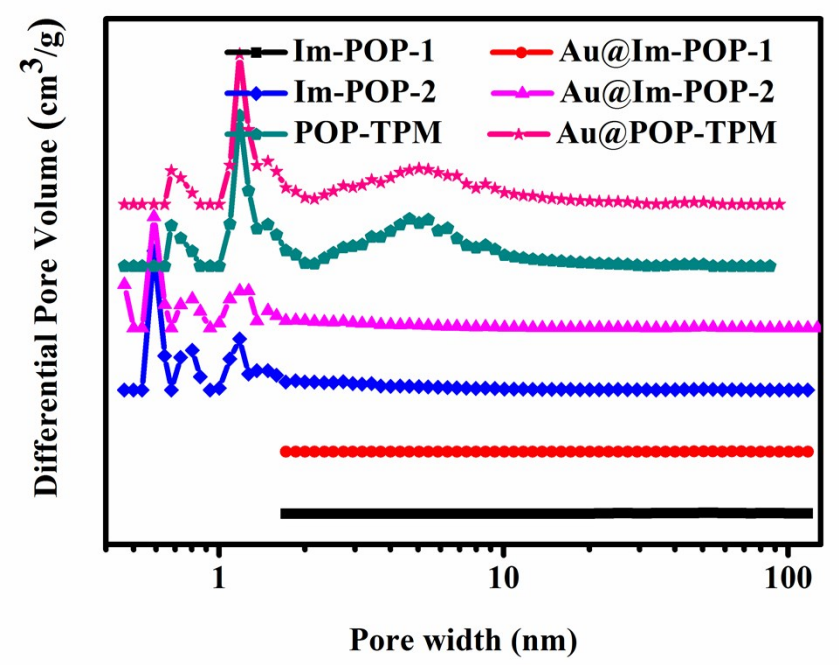


Figure S3 Pore size distributions of POPs and Au@POPs.

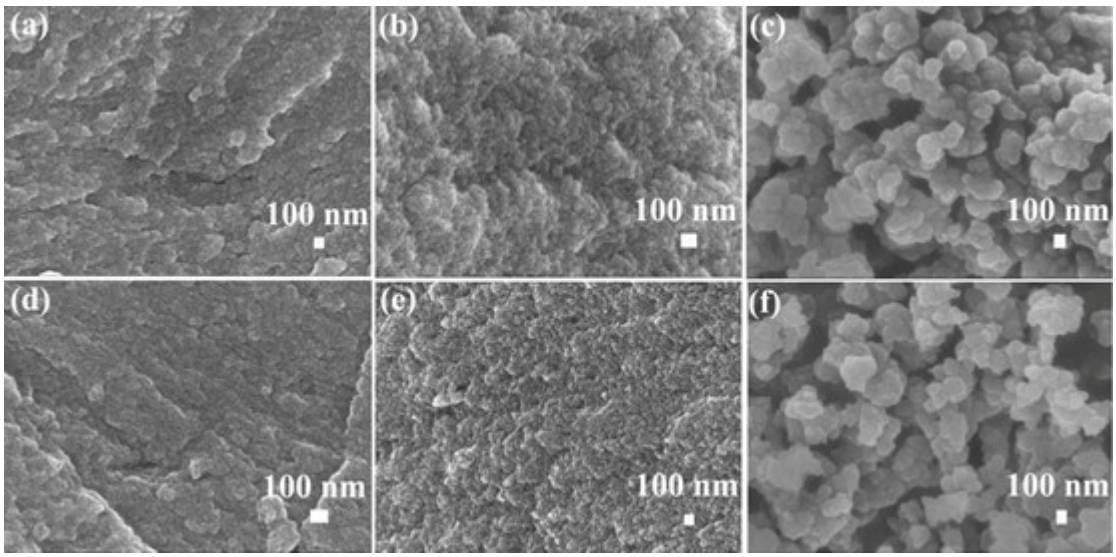


Figure S4. SEM images of (a) Im-POP-1, (b) Im-POP-2, (c) POP-TPM, (d) Au@Im-POP-1, (e) Au@Im-POP-2, (f) Au@POP-TPM.

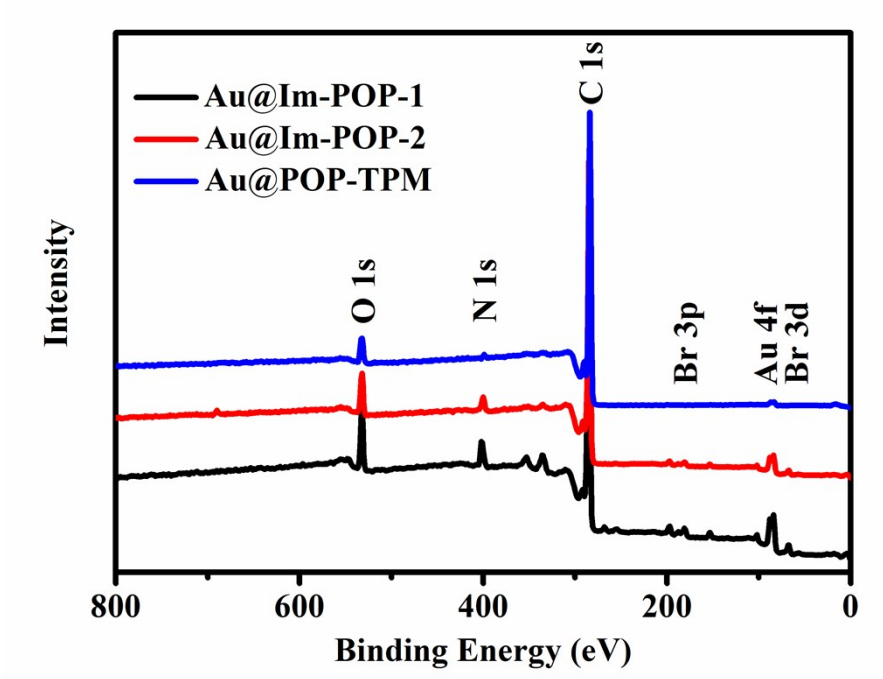


Figure S5 XPS survey spectra of Au@POPs.

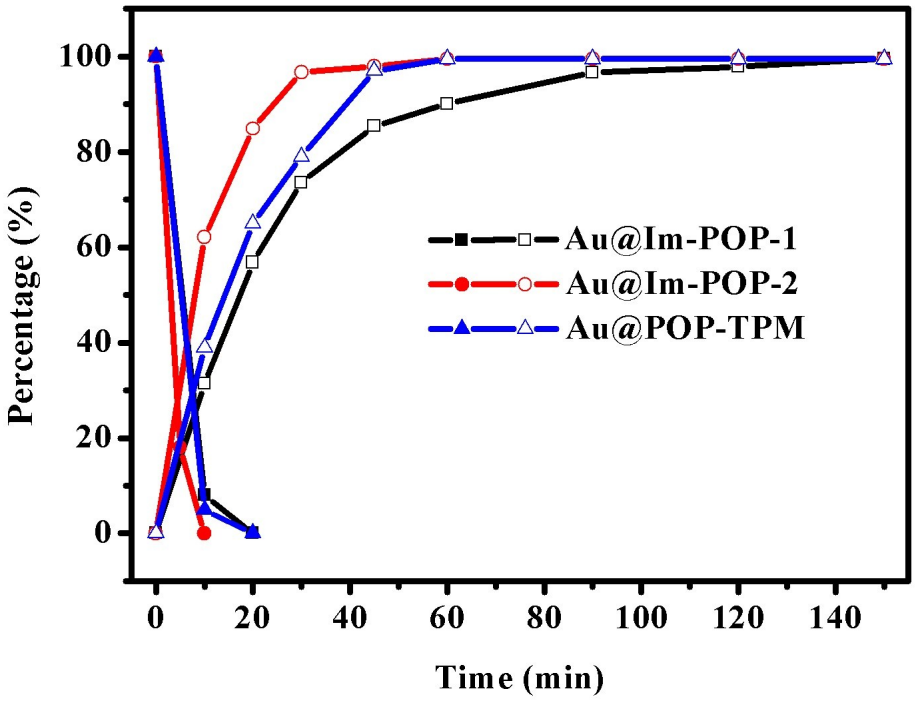


Figure S6. Conversion of nitrobenzene and selectivity of nitrobenzene to aniline as a function of time in nitrobenzene reduction reaction. Reaction conditions: nitrobenzene (0.5 mmol), $NaBH_4$ (2.5 mmol), [Au] (0.1 mol%), 3 mL H_2O/THF (2 : 1, v/v) at 25 ^oC.

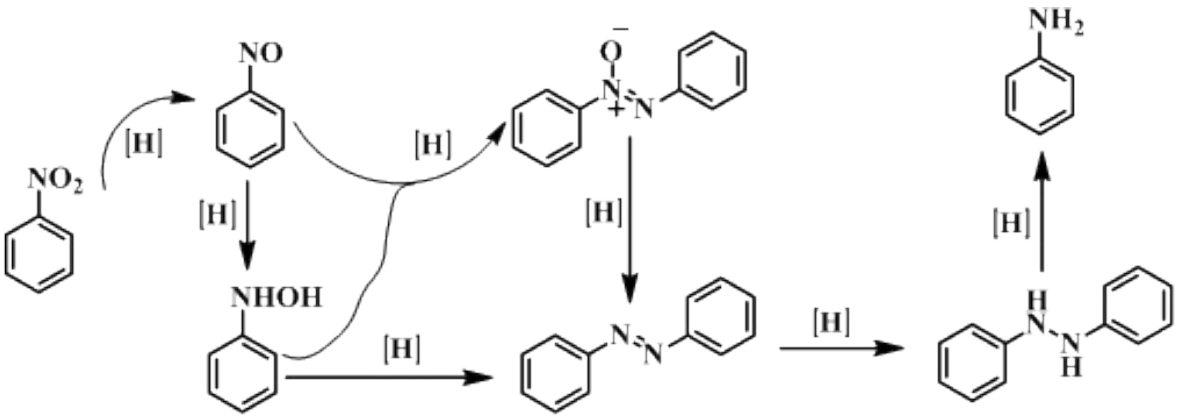


Figure S7. Plausible pathways for the hydrogenation of nitrobenzene.

Characterization data for the reduction of nitroarenes

Aniline. ^{1}H NMR (400 MHz, [D_6] DMSO): δ 7.28 (t, J=7.54 Hz, 2H), 6.89 (t, J=7.36 Hz, 1H), 6.77 (d, J=8.0 Hz, 2H), 3.66 (w, 2H). ^{13}C NMR (100 MHz, [D_6] DMSO): δ 146.58, 129.52, 118.65, 115.40.

p-Toluidine. ^{1}H NMR (400 MHz, [D_6] DMSO): δ 7.08 (d, J=8.48 Hz, 2H), 6.70 (d, J=8.36 Hz, 2H), 3.59 (w, 2H), 2.36 (s, 3H). ^{13}C NMR (100 MHz, [D_6] DMSO): δ 144.00, 129.81, 127.77, 115.43, 20.47.

m-Toluidine. ^{1}H NMR (400 MHz, [D_6] DMSO): δ 7.07 (t, J=7.64 Hz, 1H), 6.61 (d, J=7.48 Hz, 1H), 6.55 (s, 2H), 3.64 (w, 2H), 2.29 (s, 3H). ^{13}C NMR (100 MHz, [D_6] DMSO): δ 146.28, 139.13, 129.19, 119.60, 116.09, 112.45, 21.59.

o-Toluidine. ^{1}H NMR (400 MHz, [D_6] DMSO): δ 7.17 (t, J=7.36 Hz, 2H), 6.84 (t, J=7.36 Hz, 1H), 6.77 (t, J=7.40 Hz, 1H), 3.62 (w, 2H), 2.27 (s, 3H). ^{13}C NMR (100 MHz, [D_6] DMSO): δ 144.77, 130.51, 127.12, 122.40, 118.82, 115.05, 17.43.

p-Anisidine. ^{1}H NMR (400 MHz, [D_6] DMSO): δ 6.78 (d, J=8.76 Hz, 2H), 6.78 (d, J=8.80 Hz, 2H), 3.77 (s, 3H), 3.47 (w, 2H). ^{13}C NMR (100 MHz, [D_6] DMSO): δ 152.86, 140.05, 116.54, 114.81, 55.71.

4-Aminophenol. ^{1}H NMR (400 MHz, [D_6] DMSO): δ 8.49 (w,1H), 6.46 (dd, J_1=8.80 Hz, J_2 =30.32 Hz, 4H), 4.38 (w, 2H). ^{13}C NMR (100 MHz, [D_6] DMSO): δ 148.70, 141.10, 116.21, 115.70.

4-*tert*-Butylaniline. ^{1}H NMR (400 MHz, [D_6] DMSO): δ 7.25 (d, J=8.60 Hz, 2H), 6.70 (d, J=8.64 Hz, 2H), 3.39 (w, 2H), 1.34 (s, 9H). ^{13}C NMR (100 MHz, [D_6] DMSO): δ 143.88, 141.50, 126.12, 115.13, 33.99, 31.60.

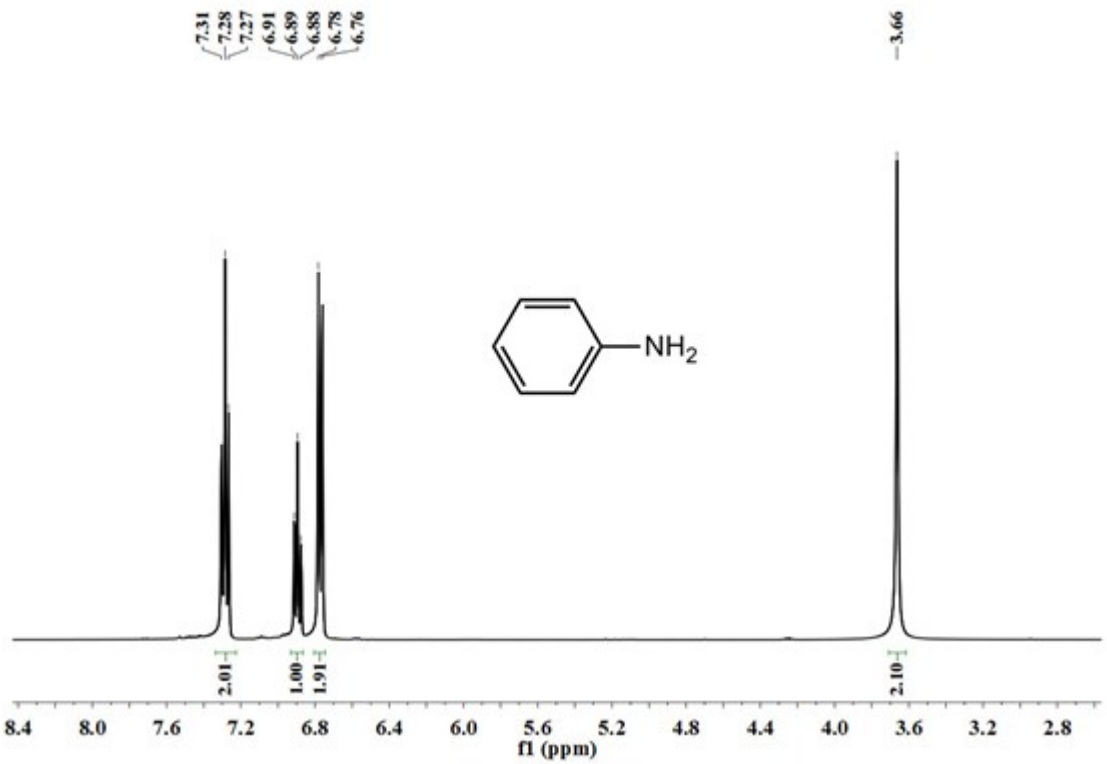
4-Chloroaniline. ^{1}H NMR (400 MHz, [D_6] DMSO): δ 7.13 (d, J=8.68 Hz, 2H), 6.62 (d, J=8.72 Hz, 2H), 3.69 (w, 2H). ^{13}C NMR (100 MHz, [D_6] DMSO): δ 145.01, 129.17, 123.12, 116.30.

4-Aminophenylmethanol. ^{1}H NMR (400 MHz, [D_6] DMSO): δ 7.13 (d, J=8.44 Hz, 2H), 6.65 (d, J=8.40 Hz, 2H), 4.51 (s, 2H), 3.46 (w, 2H). ^{13}C NMR (100 MHz, [D_6] DMSO): δ 145.90, 131.18, 128.85, 115.24, 65.04.

p-Phenylenediamine. ^{1}H NMR (400 MHz, [D_6] DMSO): δ 6.59 (s, 4H), 3.19 (w, 4H). ^{13}C NMR (100 MHz, [D_6] DMSO): δ 138.61, 116.83.

m-Phenylenediamine. ^{1}H NMR (400 MHz, [D_6] DMSO): δ 6.65 (t, J=7.88 Hz, 1H), 6.65 (t, J=7.88 Hz, 1H), 5.82 (s, 1H), 5.78 (dd, J_1=2.08 Hz, J_2 =7.80 Hz, 2H), 4,29 (w, 4H). ^{13}C NMR (100 MHz, [D_6] DMSO): δ 149.53, 129.50, 103.56, 100.61.

NMR spectra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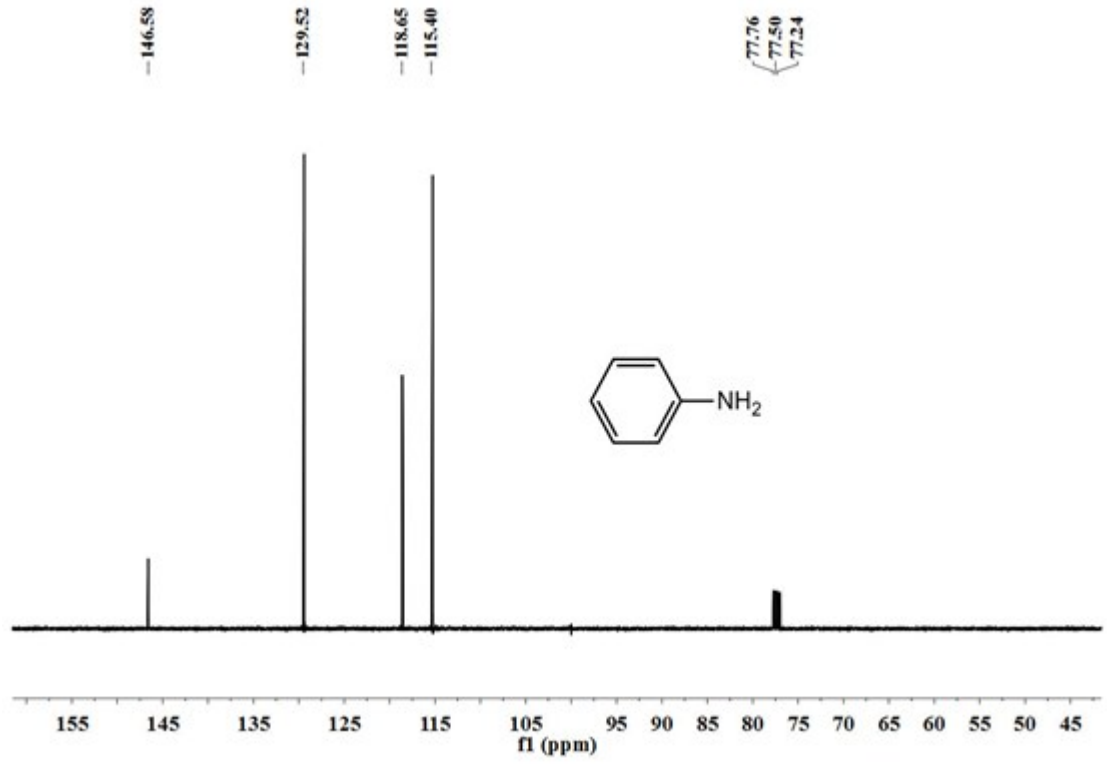
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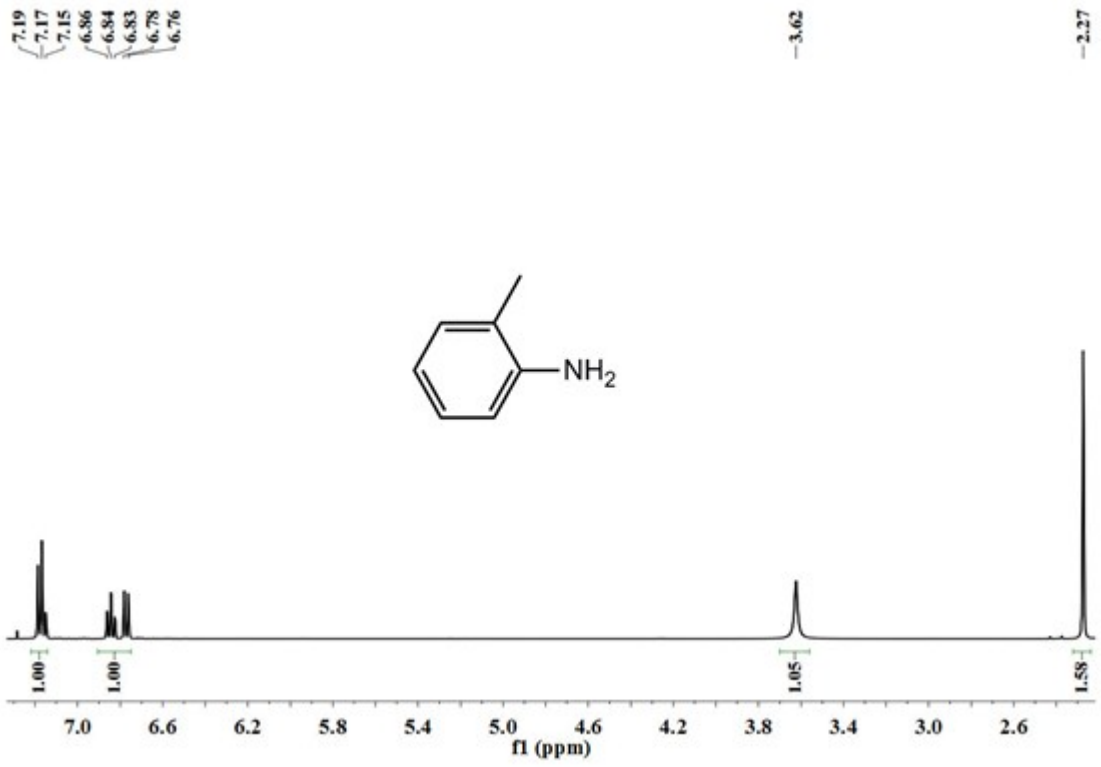
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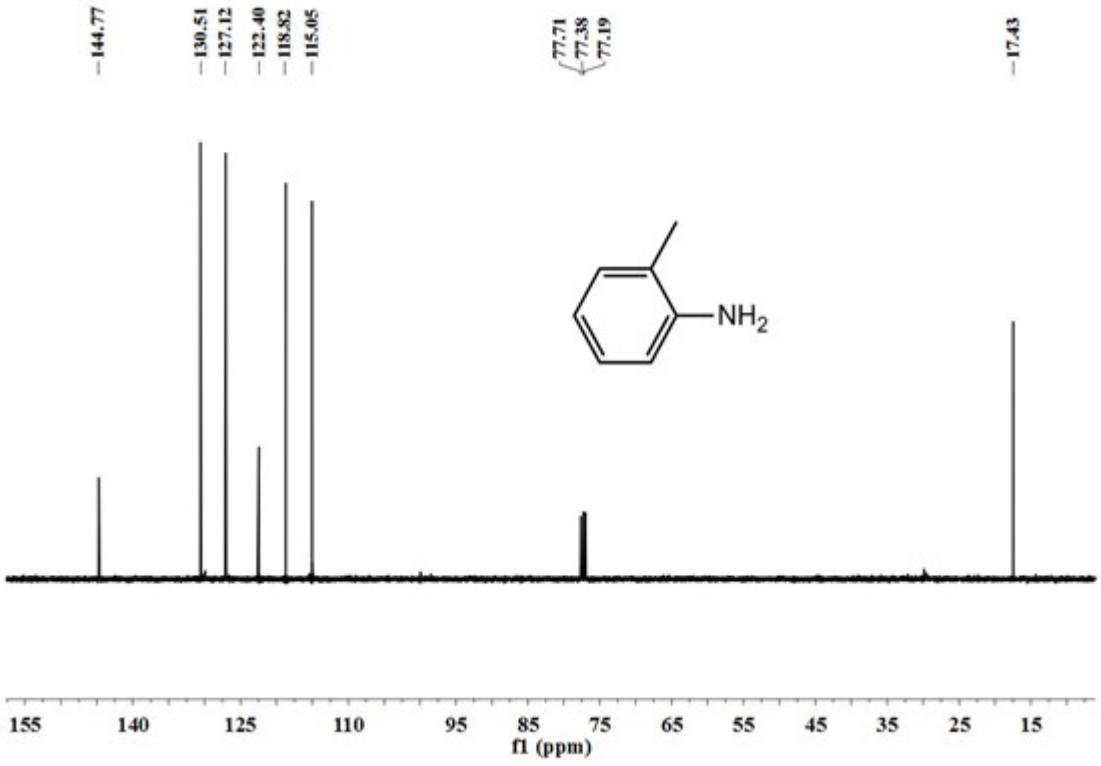
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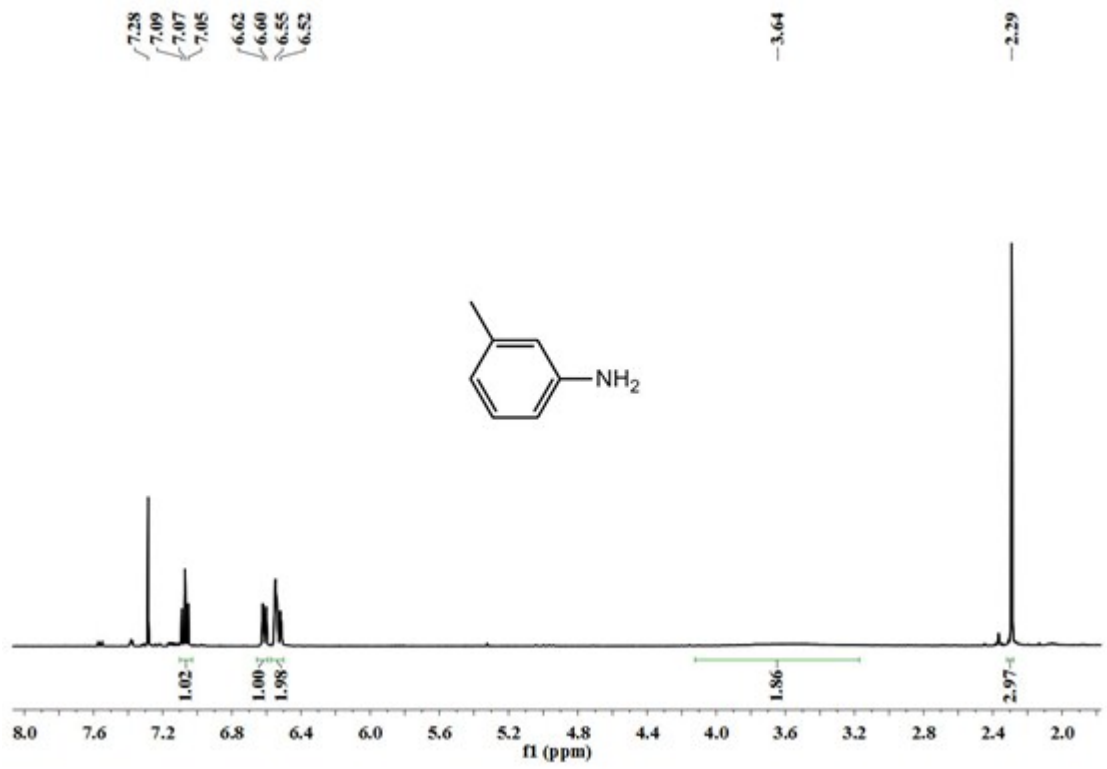
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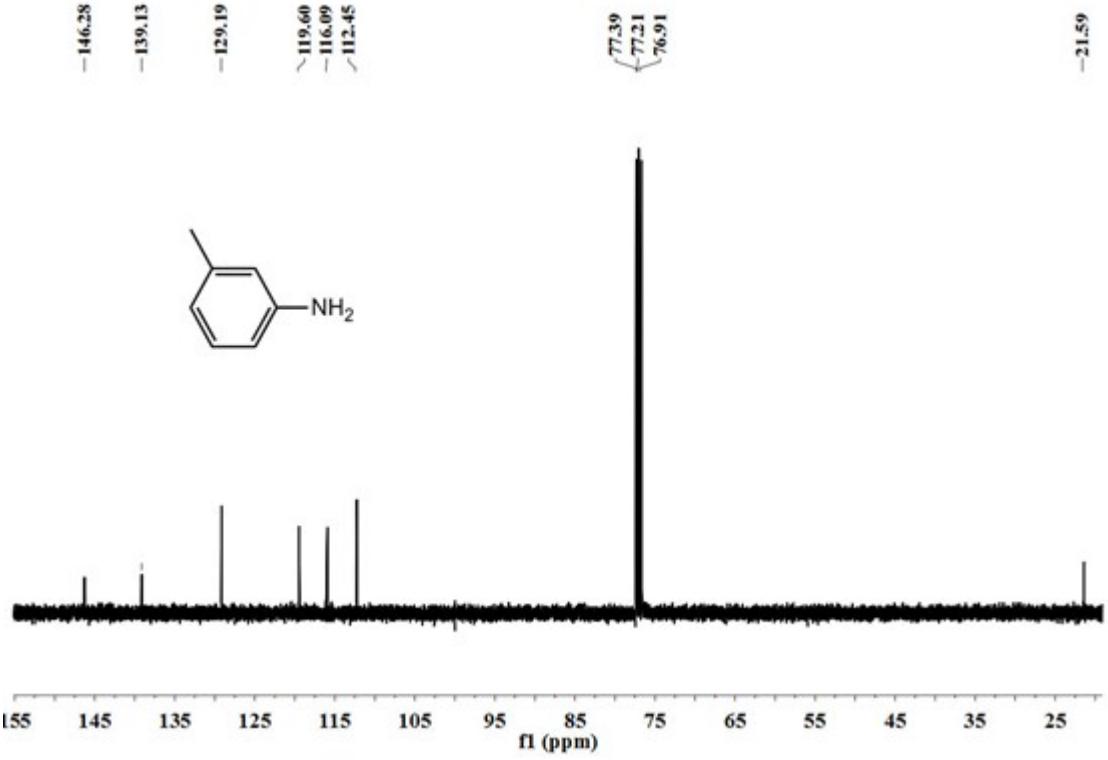
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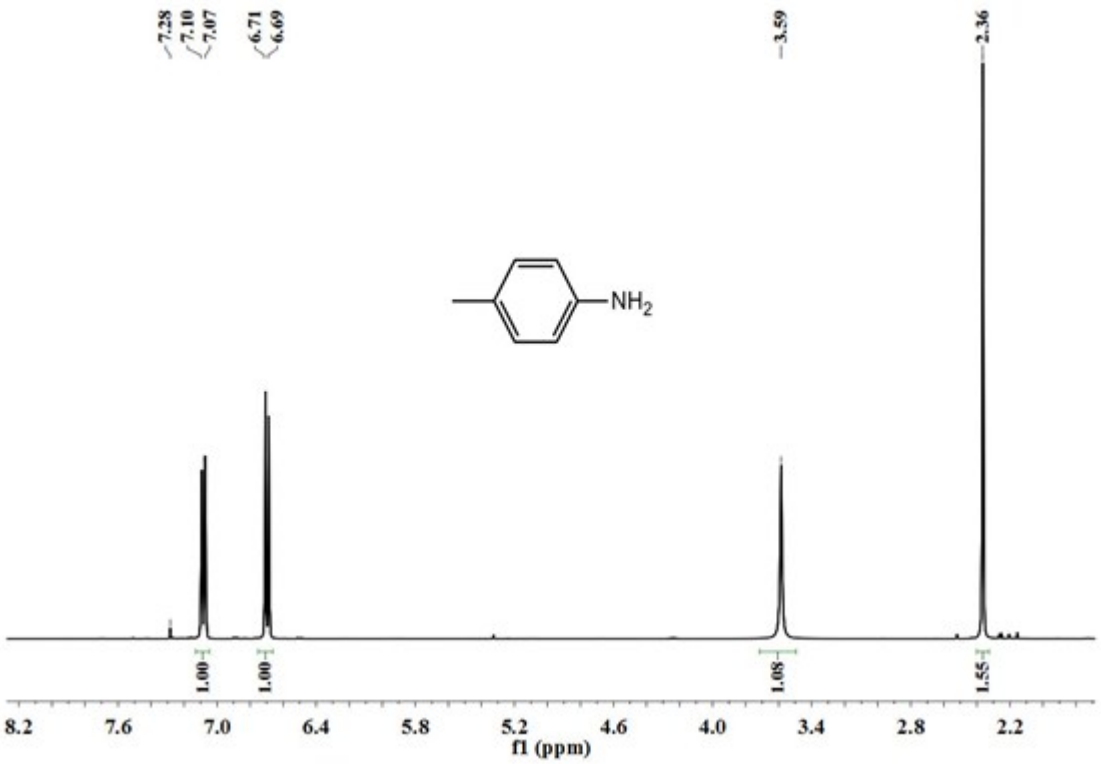
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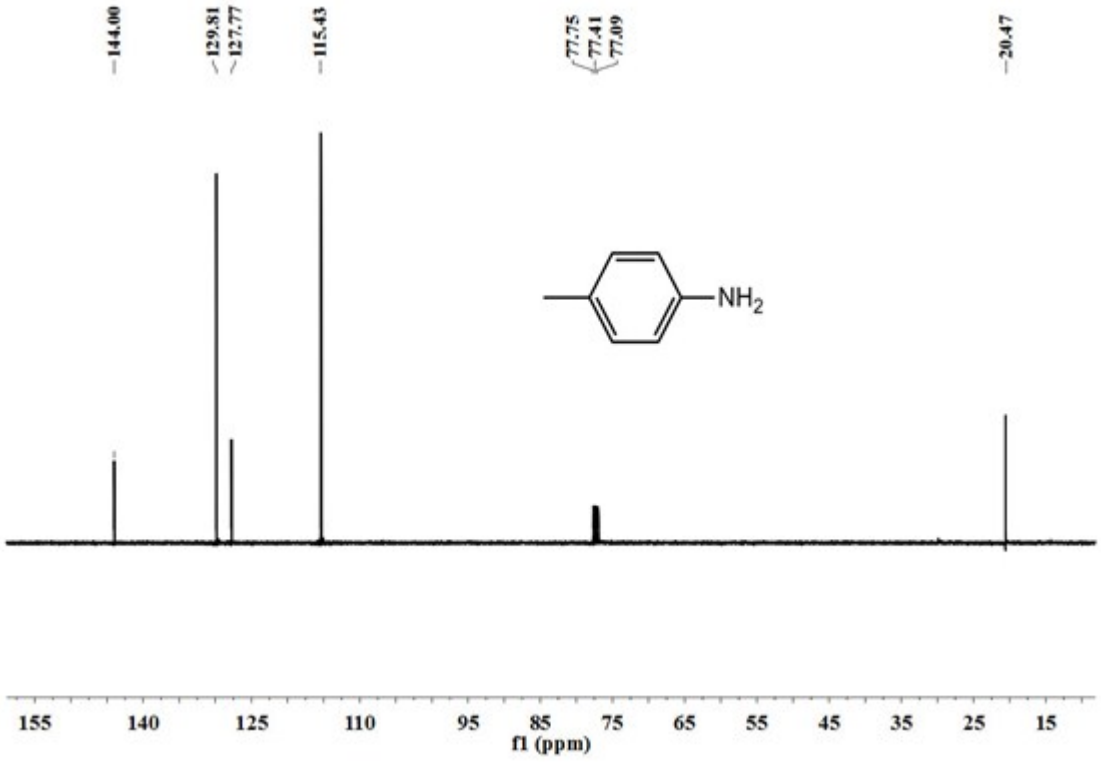
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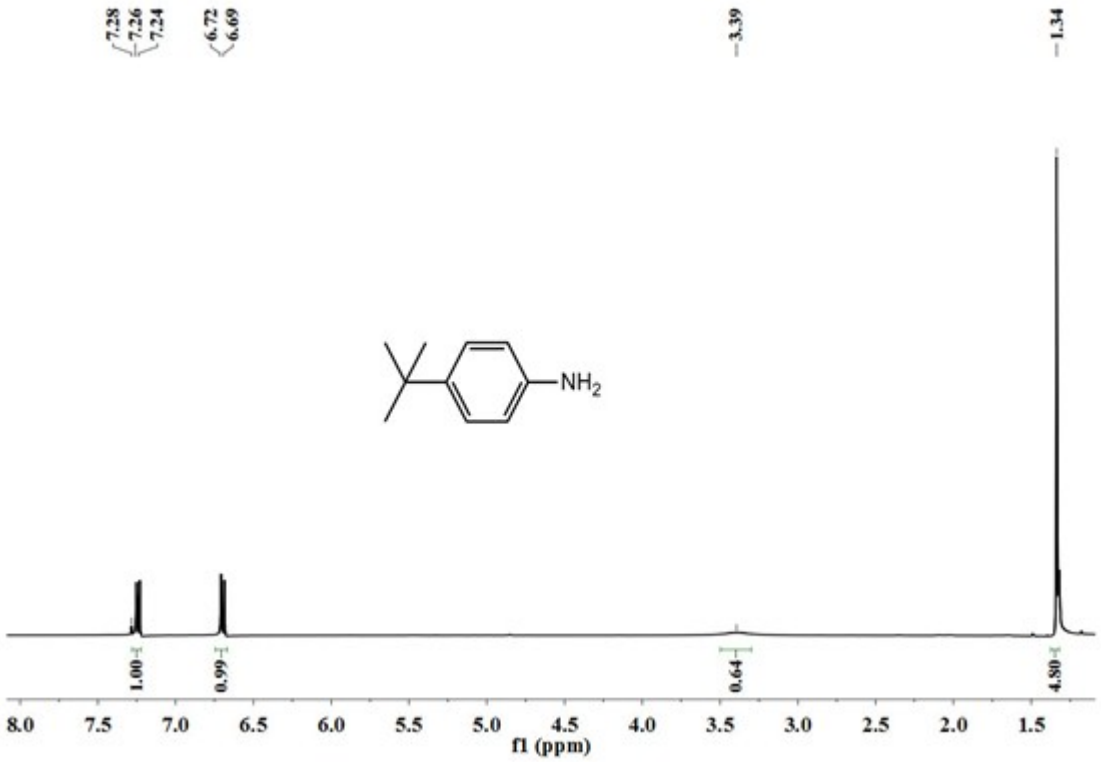
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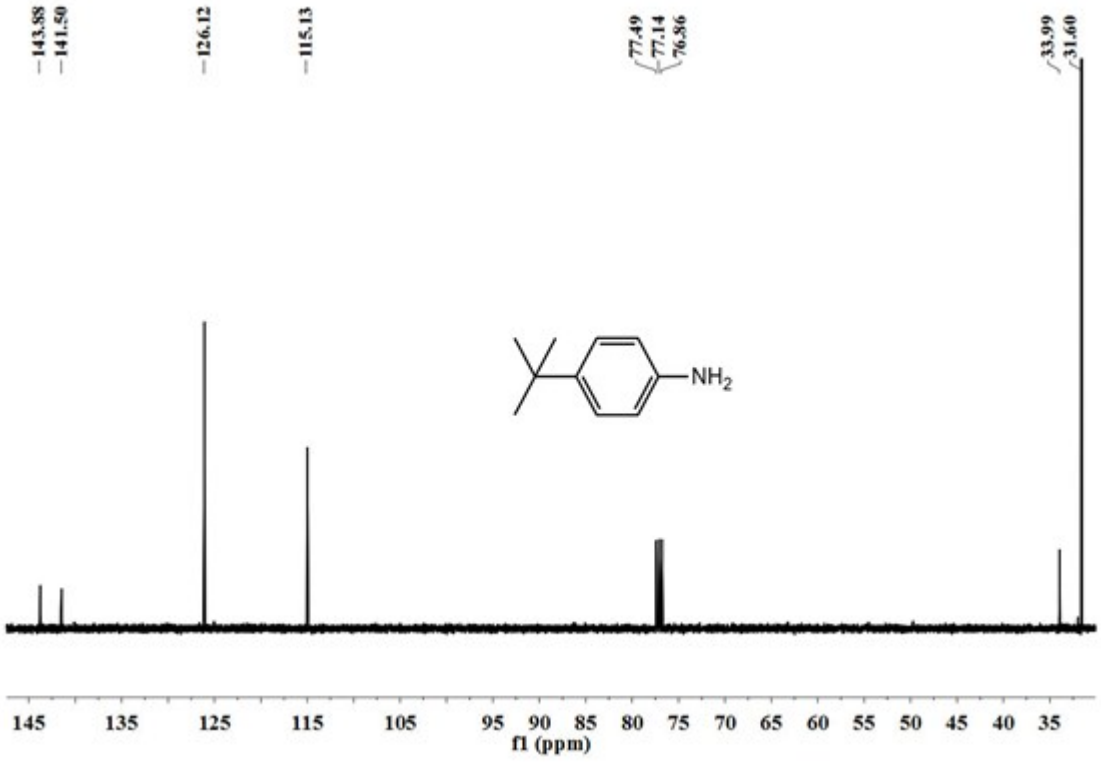
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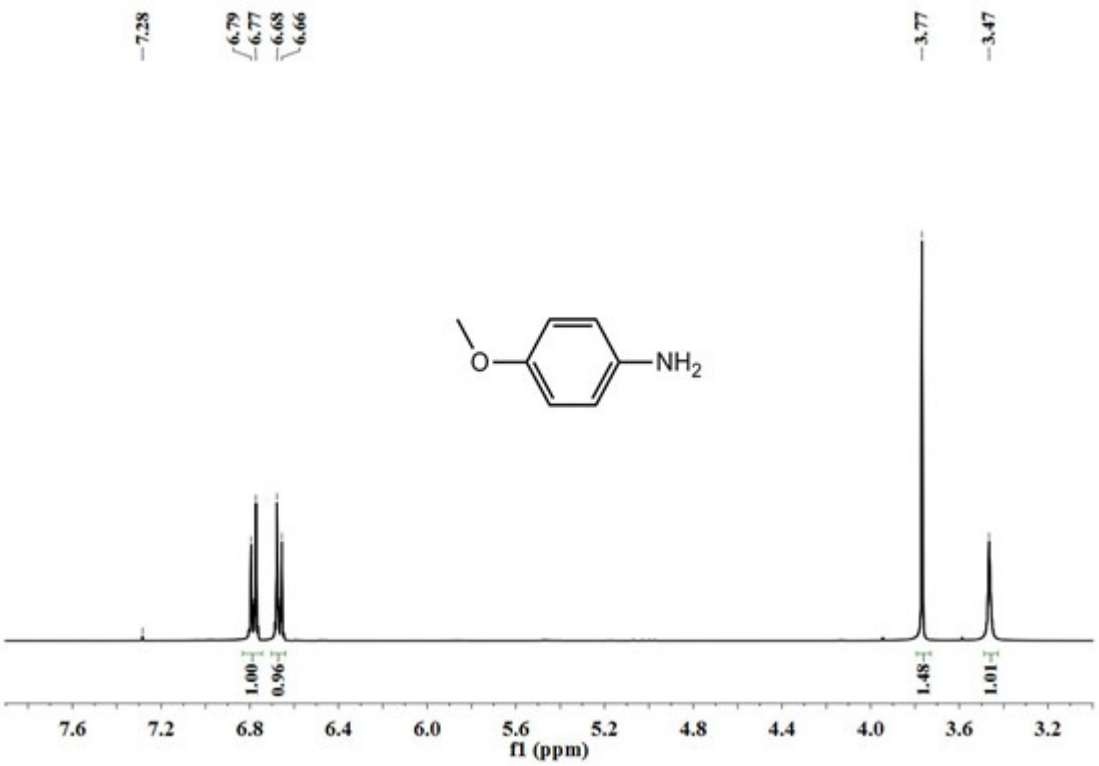
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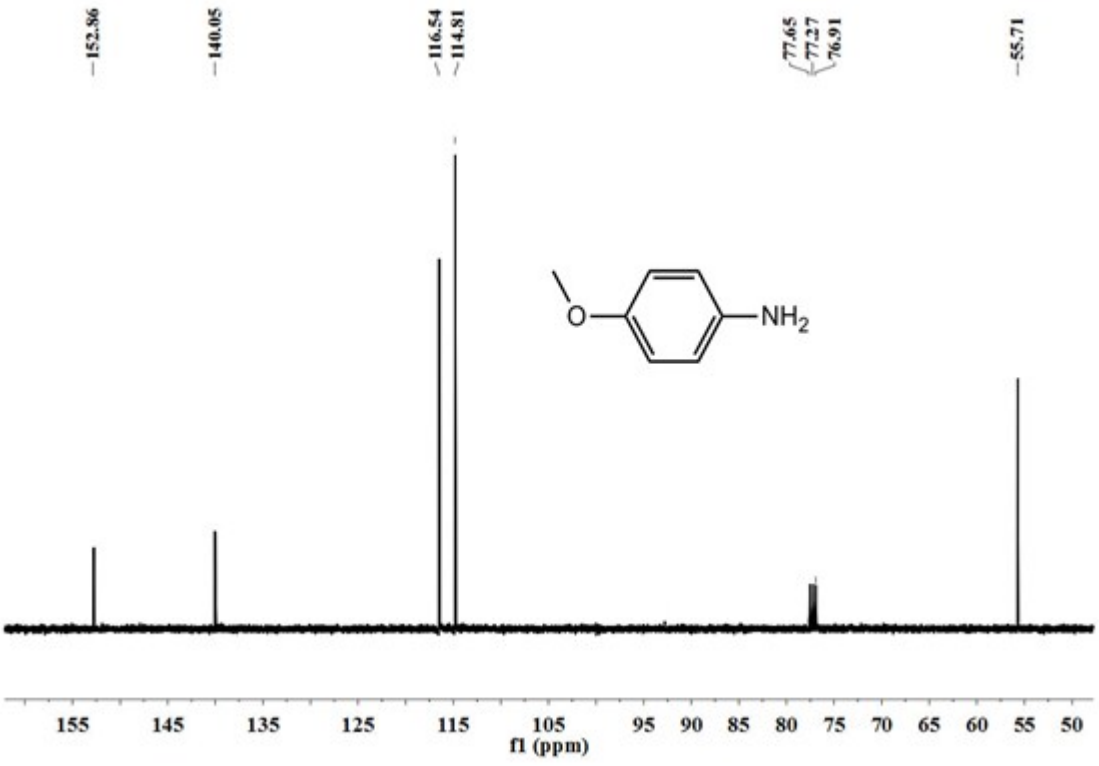
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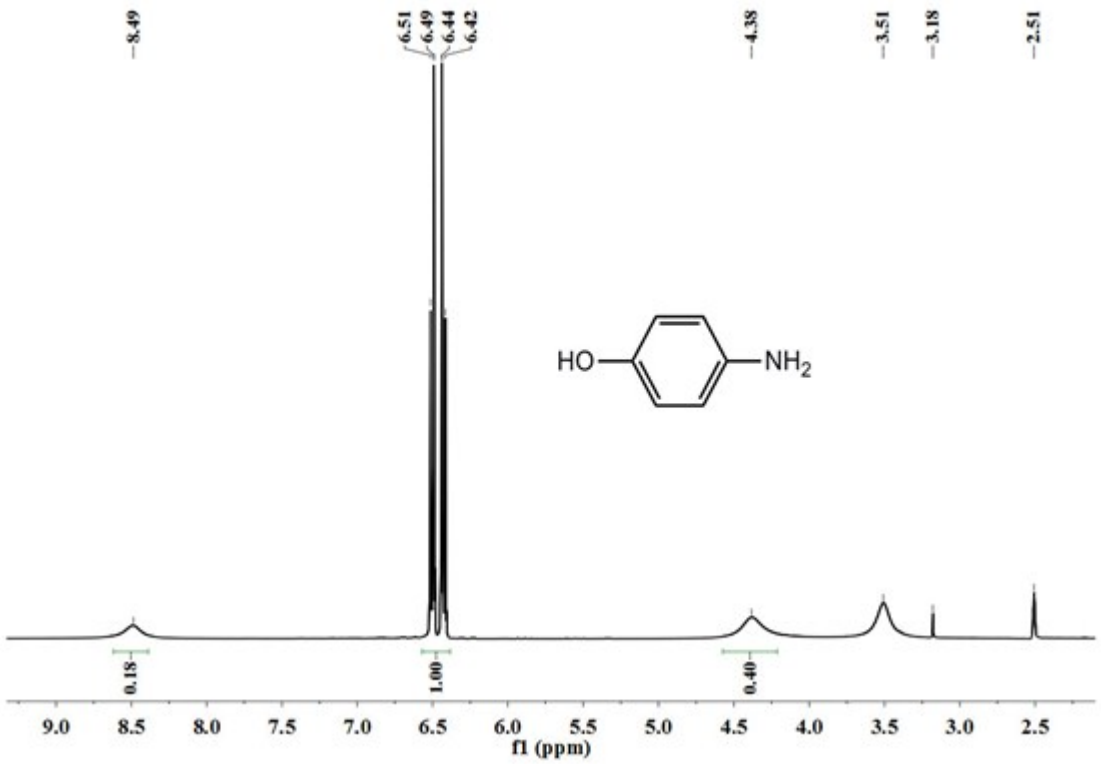
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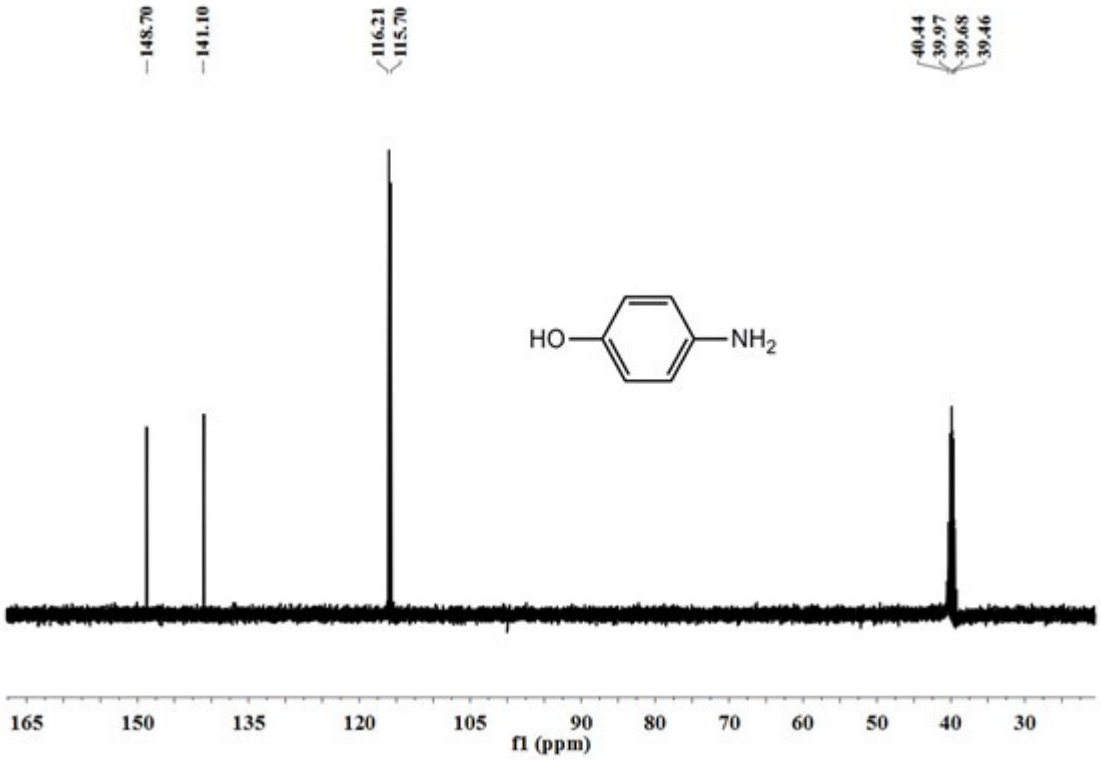
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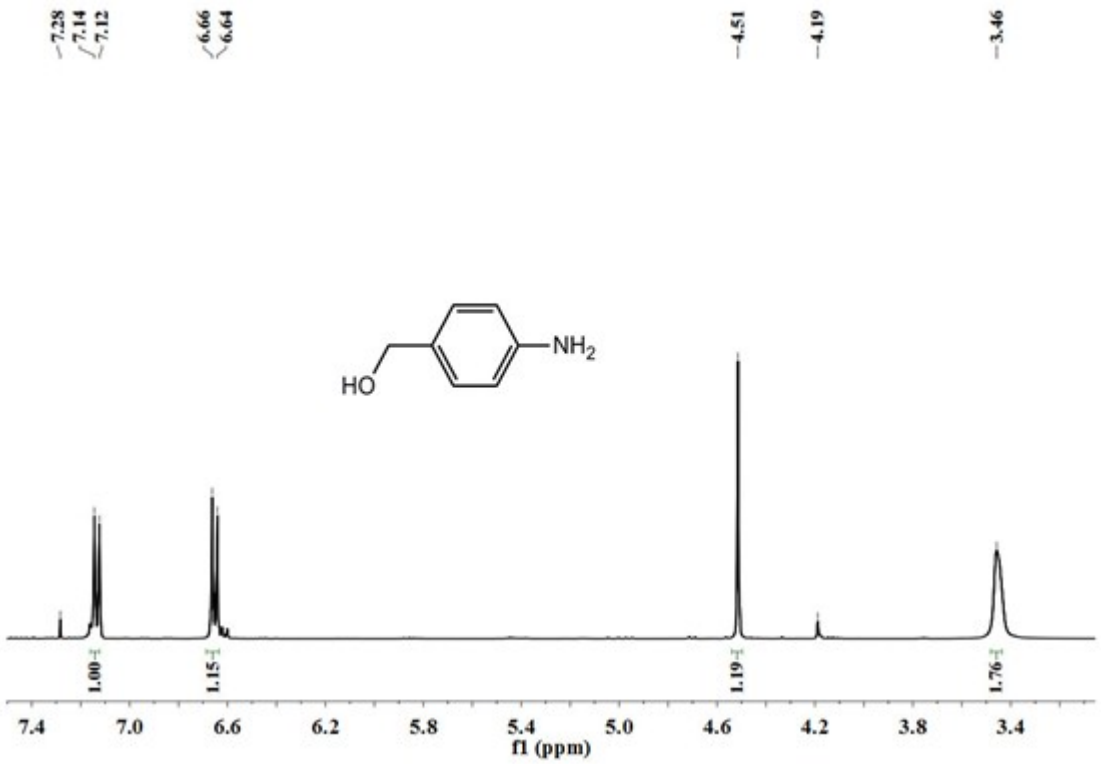
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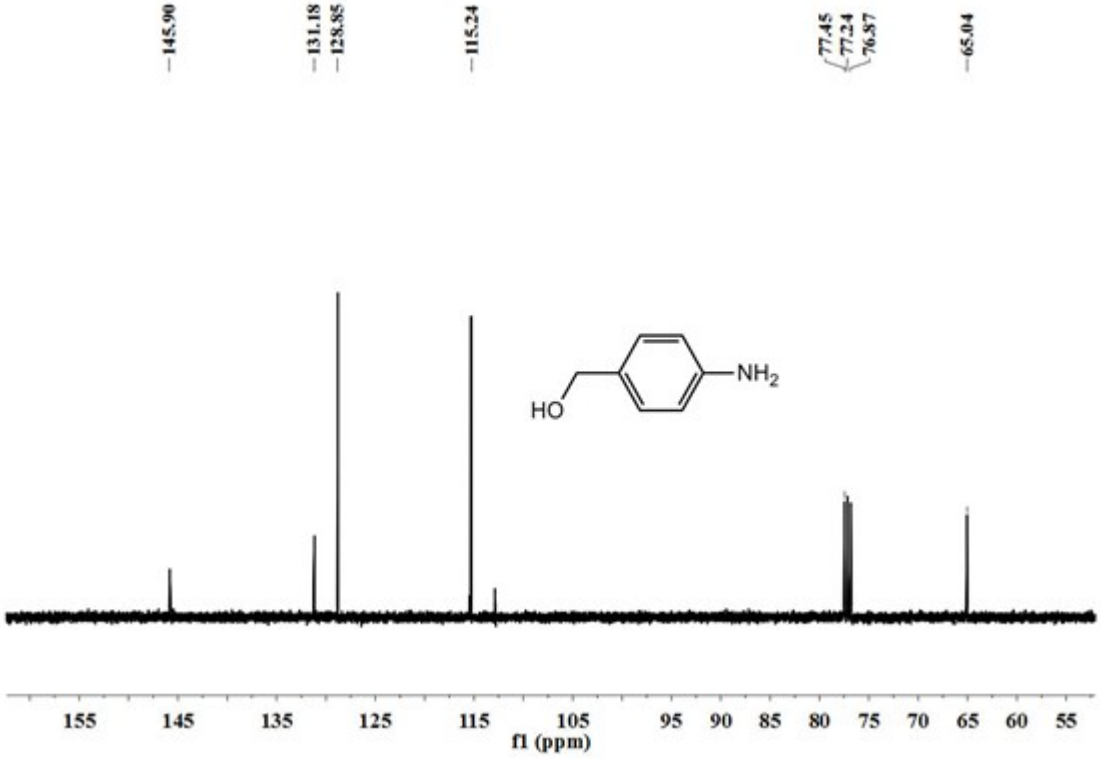
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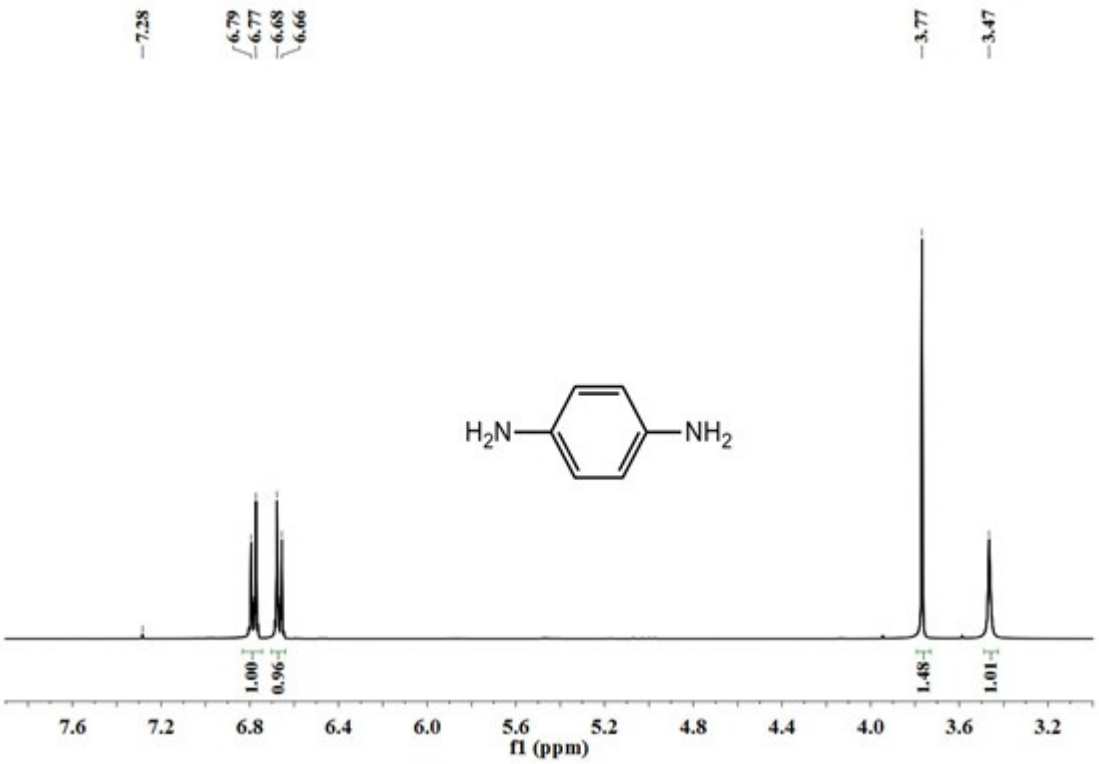
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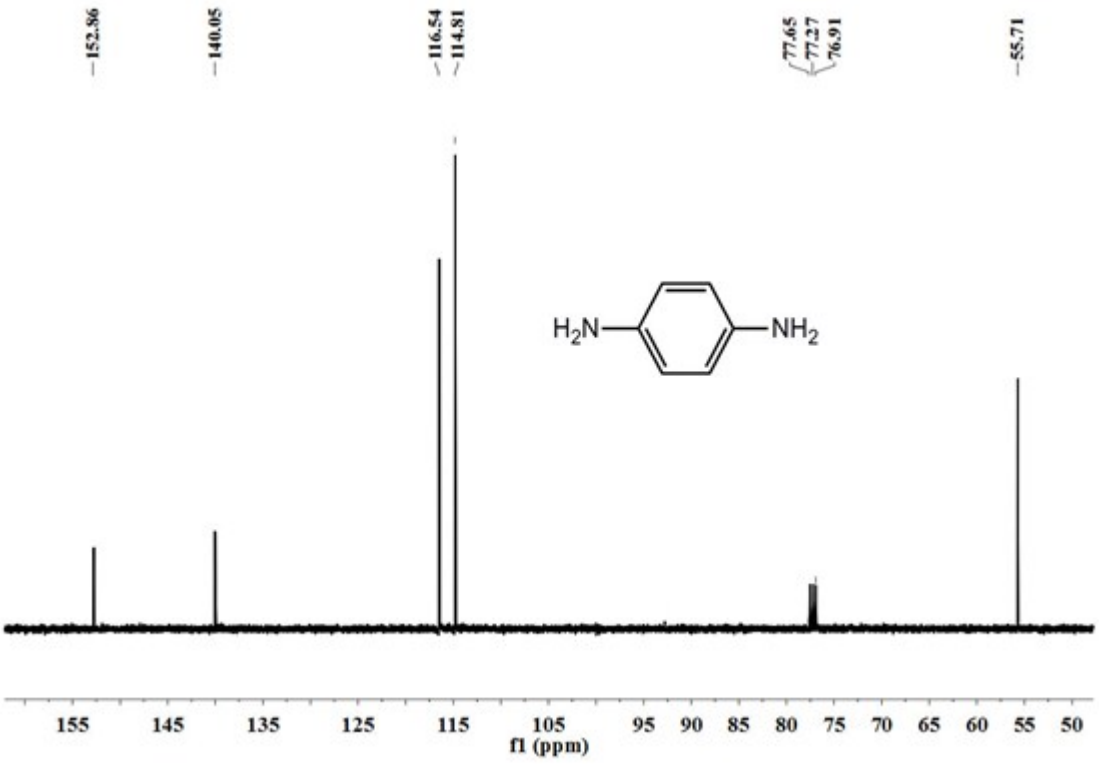
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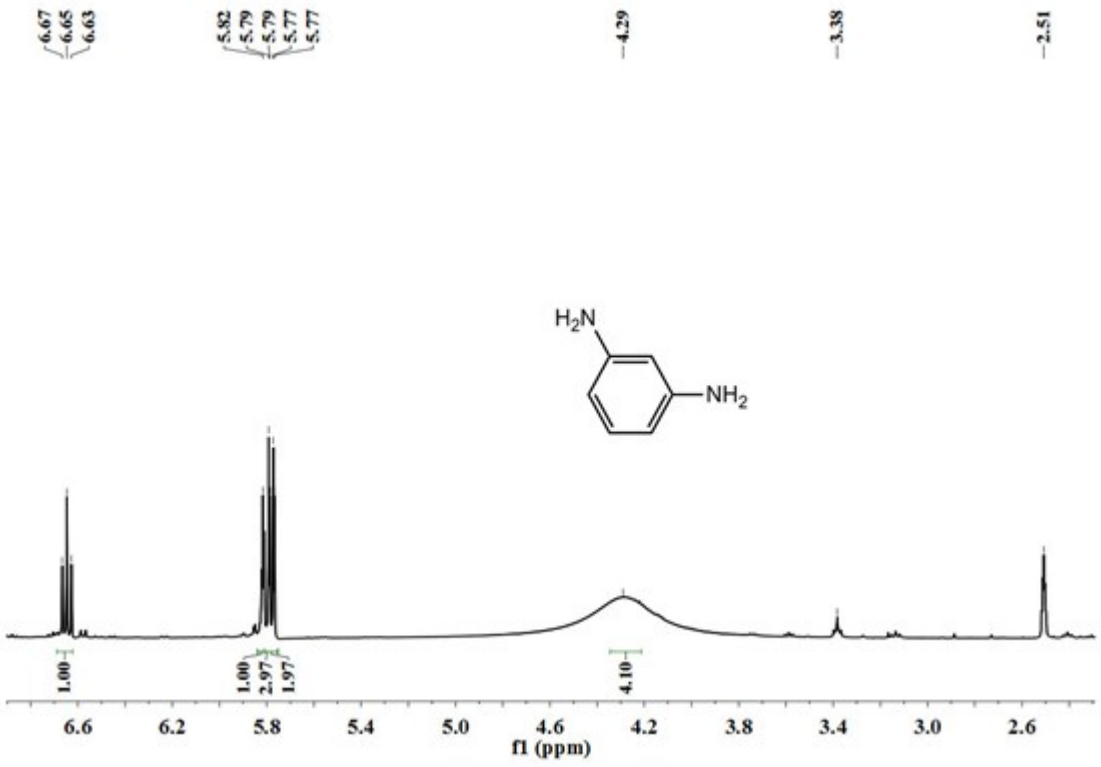
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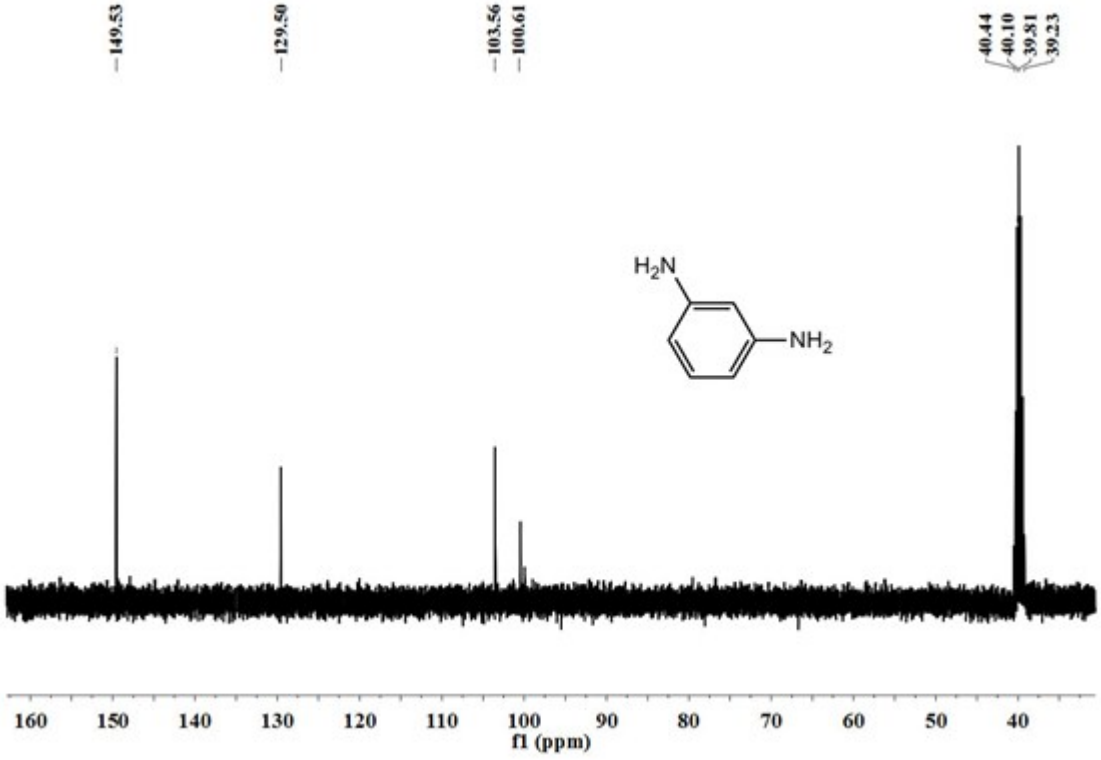
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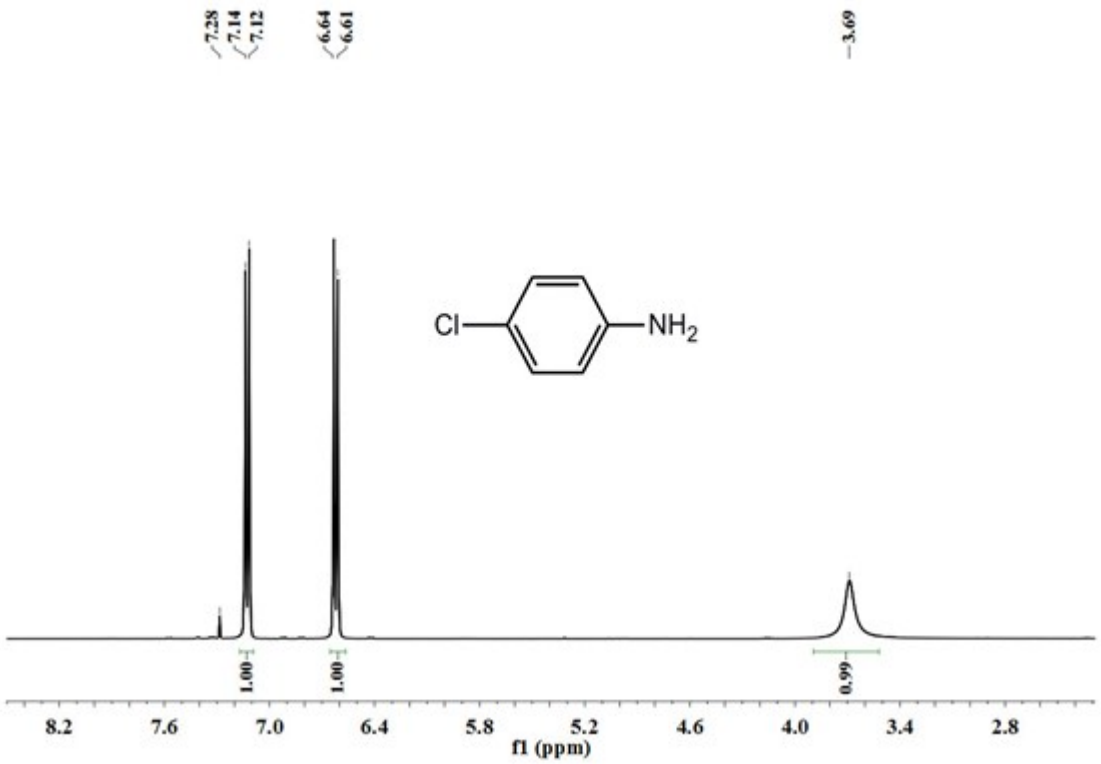
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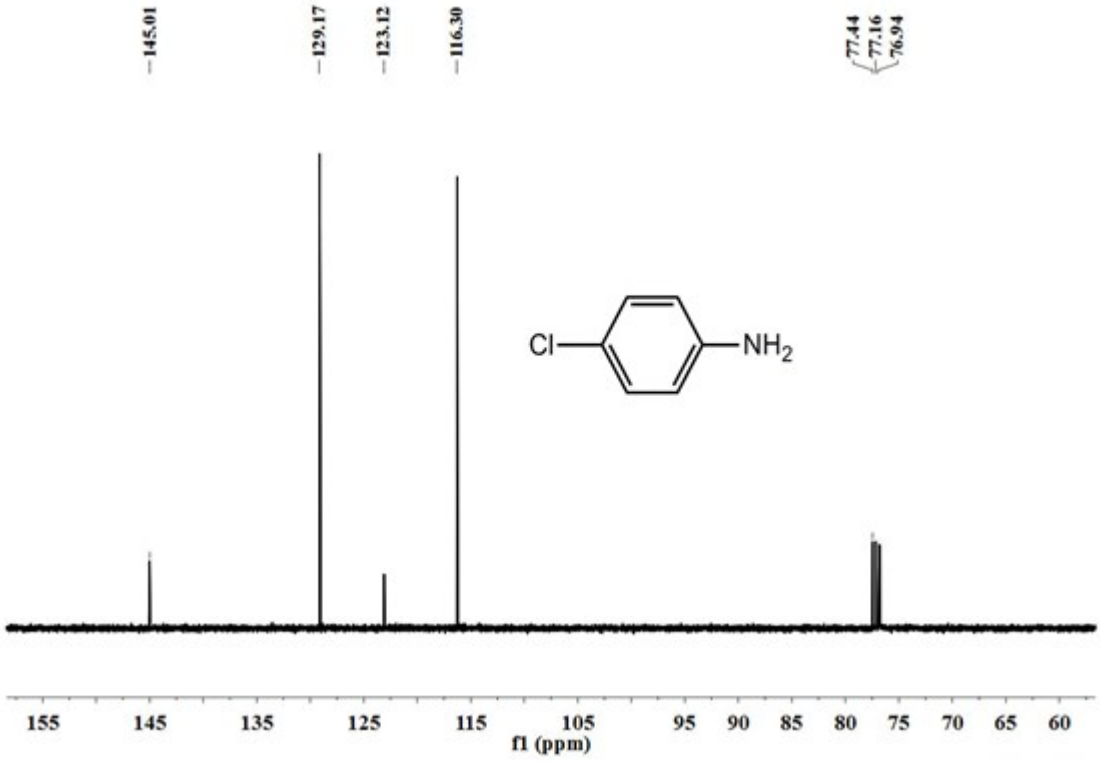
2.8
f1 (ppm)


145.01
129.17
123.12
116.30
77.44
77.16
76.94
Cl
NH2
155
145
135
125
115
105
95
90
85
80
75
70
65
60
f1 (ppm)