

SUPPORTING INFORMATION

Diamines as interparticle linkers for silica-titania supported PdCu bimetallic nanoparticles in Chan-Lam and Suzuki cross-coupling reactions

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SI. FT-IR Spectra of STS and 12DA-STS

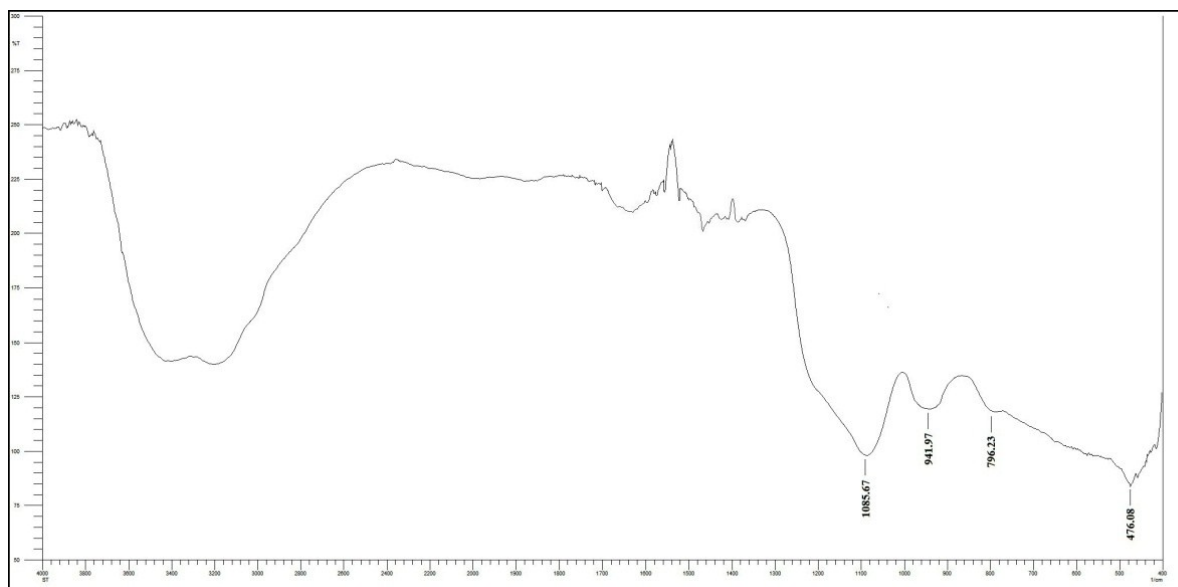


Fig. 1 FT-IR of STS

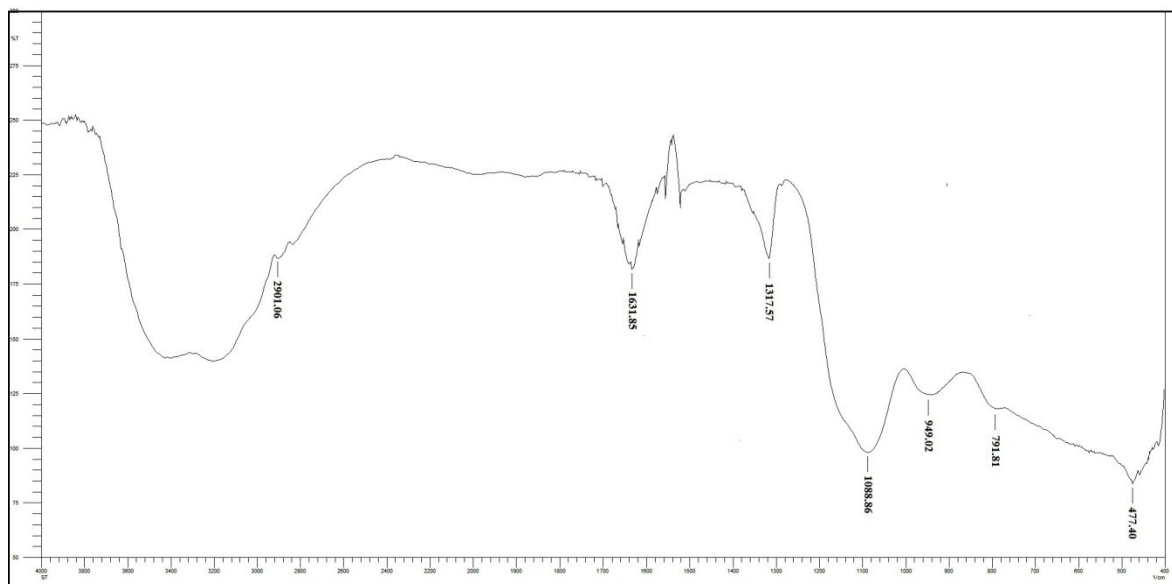


Fig. 2 FT-IR of 12DA-STS

S2. TGA of 1,2-Diamine functionalized silica-titania support and bimetallic catalysts

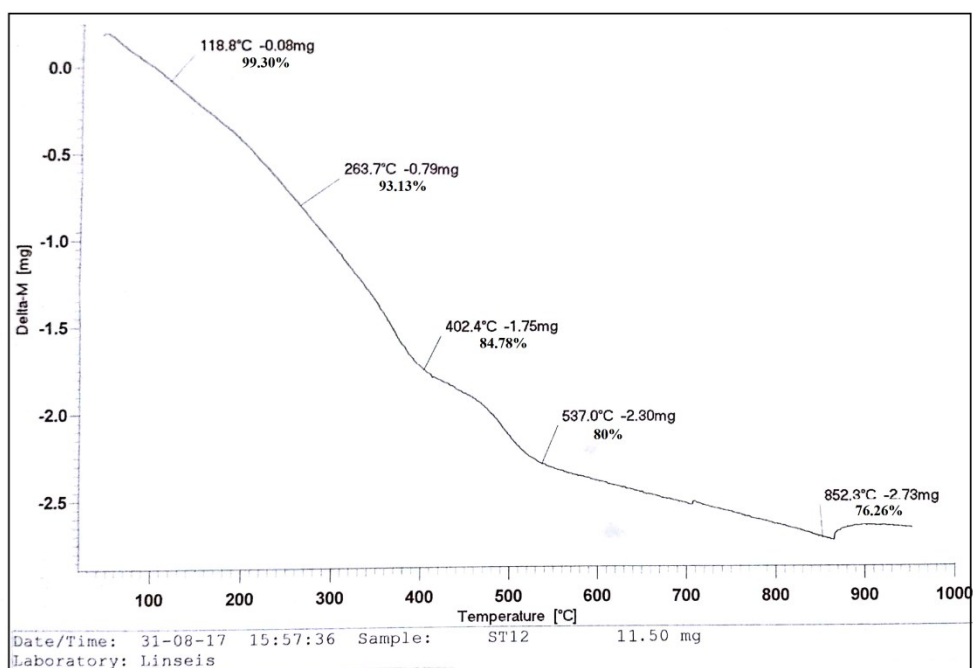


Fig. 1 TGA of 12DA-STs

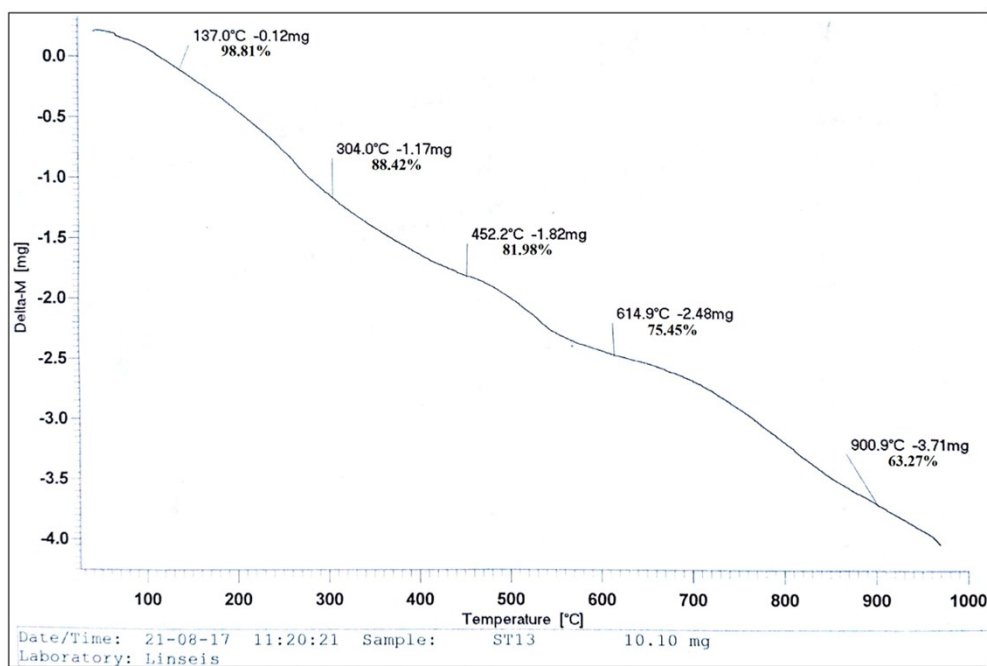


Fig. 2 TGA of Pd₁Cu₃@12DA-STs

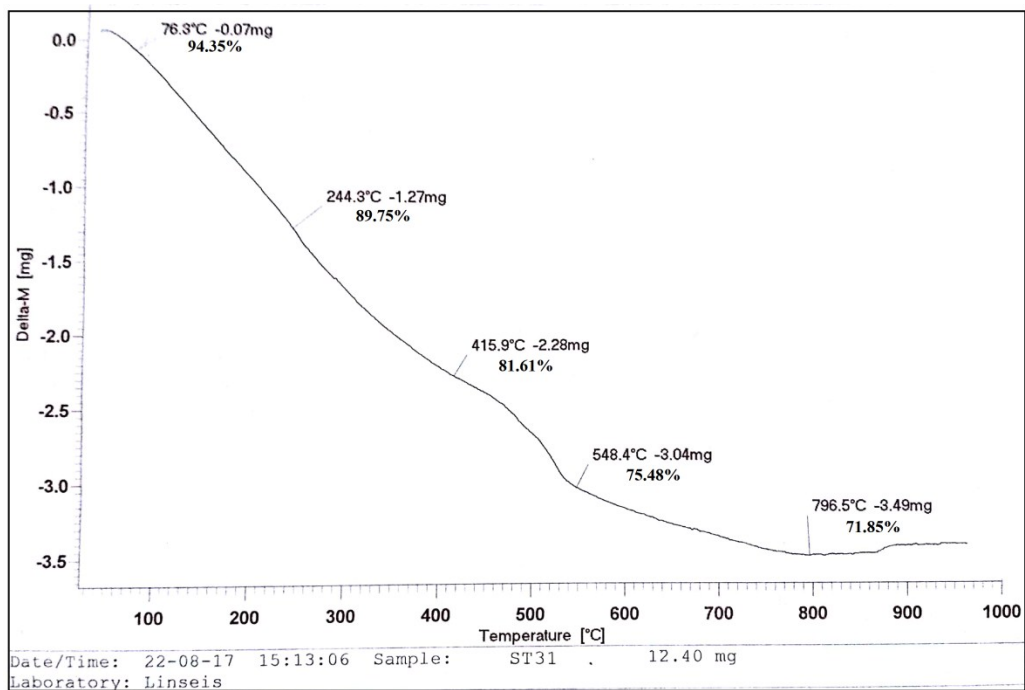
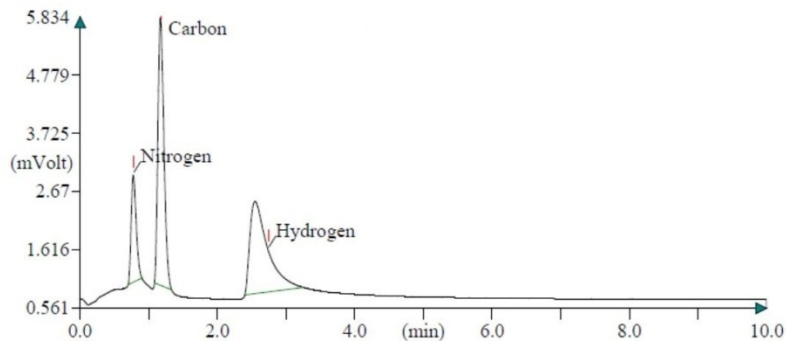


Fig. 3 TGA of Pd₃Cu₁@12DA-STs

S3. Carbon Hydrogen Nitrogen (CHN) analysis of Pd₁Cu₁@12DA-STs



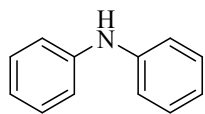
Peak Number (#)	Retention Time (min)	Area (.1*uV*sec)	Element %	Compone
1	0.783	98858	2.344	Nitroge
2	1.183	291854	2.894	Carbon
3	2.750	305092	1.526	Hydroge
		695804	6.764	

S4. EDX data of Pd₁Cu₁@12DA-STs

Element	Weight%	Atomic%
O K	36.08	56.60
Si K	18.36	19.06
C K	2.35	1.96
Ti K	38.42	20.73
Cu K	2.94	1.20
Pd L	1.85	0.45
Totals	100.00	

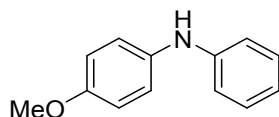
S5. Spectral details of the compounds listed in Table 3

Diphenylamine (2a)



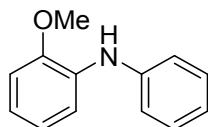
¹H NMR (400 MHz, CDCl₃): δ 5.75 (bs, 1H, NH, exchangeable with D₂O), 7.37-7.41 (t, 2H, J=8 Hz, Ar-H), 7.47-7.51 (t, 4H, J=8 Hz, Ar-H), 7.63-7.65 (d, 4H, J=8 Hz, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 112.8, 117.6, 129.3, 130.9, 145.2.

N-(4-Methoxyphenyl)benzenamine (2b)



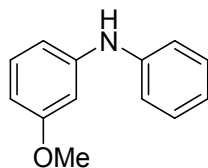
¹H NMR (400 MHz, CDCl₃): δ 3.83 (s, 3H, OCH₃), 5.55 (bs, 1H, NH, exchangeable with D₂O), 6.84-6.95 (m, 5H, Ar-H), 7.10-7.12 (d, 2H, J=8 Hz, Ar-H), 7.22-7.29 (m, 2H, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 55.3, 109.9, 115.6, 127.1, 129.3, 132.8, 143.6.

N-(2-Methoxyphenyl)benzenamine (2c)



¹H NMR (400 MHz, CDCl₃): δ 3.92 (s, 3H, OCH₃), 6.18 (bs, 1H, NH, exchangeable with D₂O), 6.89-6.91 (d, 2H, J=8 Hz, Ar-H), 6.95-6.99 (t, 1H, J=8 Hz, Ar-H), 7.17-7.19 (d, 2H, J=8 Hz, Ar-H), 7.29-7.35 (m, 4H, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 56.79, 112.83, 117.6, 122.2, 129.3, 130.9, 138.4, 143.1, 148.2.

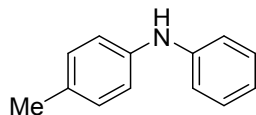
N-(3-Methoxyphenyl)benzenamine (2d)



¹H NMR (400 MHz, CDCl₃): δ 3.86 (s, 3H, OCH₃), 5.86 (bs, 1H, NH, exchangeable with D₂O), 6.96-7.02 (m, 5H, Ar-H), 7.35-7.37 (d, 2H, J=8 Hz, Ar-H), 7.53-7.59 (m, 2H, Ar-H);

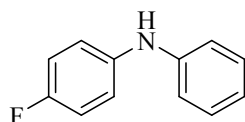
^{13}C NMR (100 MHz, CDCl_3): δ 56.7, 103.7, 112.7, 114.7, 118.1, 126.4, 129.6, 130.7, 138.2, 140.7, 161.3.

***N*-(4-Methylphenyl) benzenamine (2e)**



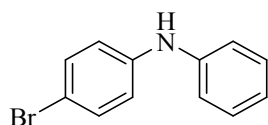
^1H NMR (400 MHz, CDCl_3): δ 2.51 (s, 3H, CH_3), 5.84 (bs, 1H, NH, exchangeable with D_2O), 7.36-7.39 (t, 2H, $J=8$ Hz, Ar-H), 7.45-7.49 (t, 3H, $J=8$ Hz, Ar-H), 7.61-7.63 (d, 4H, $J=8$ Hz, Ar-H); ^{13}C NMR (100 MHz, CDCl_3): δ 23.0, 109.9, 115.6, 127.1, 129.3, 132.8, 143.6.

***N*-(4-Fluorophenyl)benzenamine (2f)**



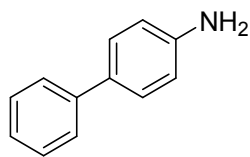
^1H NMR (400 MHz, CDCl_3): δ 5.40 (bs, 1H, NH, exchangeable with D_2O), 7.36-7.40 (t, 2H, $J=8$ Hz, Ar-H), 7.46-7.49 (t, 3H, $J=8$ Hz, Ar-H), 7.62-7.64 (d, 4H, $J=8$ Hz, Ar-H); ^{13}C NMR (100 MHz, CDCl_3): δ 116.6, 122.0, 127.1, 128.7, 130.2, 140.7.

***N*-(4-Bromophenyl)benzenamine (2g)**



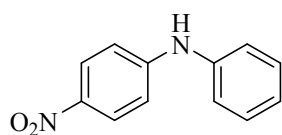
^1H NMR (400 MHz, CDCl_3): δ 5.74 (bs, 1H, NH, exchangeable with D_2O), 6.95-7.01 (m, 2H, Ar-H), 7.07-7.09 (d, 1H, $J=8$ Hz, Ar-H), 7.14-7.18 (t, 1H, $J=8$ Hz, Ar-H), 7.36-7.39 (t, 1H, $J=8$ Hz, Ar-H), 7.45-7.49 (m, 2H, Ar-H), 7.53-7.55 (d, 1H, $J=8$ Hz, Ar-H), 7.59-7.63 (t, 1H, $J=8$ Hz, Ar-H); ^{13}C NMR (100 MHz, CDCl_3): δ 113.1, 116.6, 122.0, 127.1, 128.7, 130.2, 138.1, 140.7.

4-Aminobiphenyl (2h)



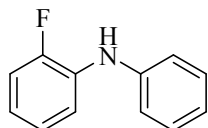
¹H NMR (400 MHz, CDCl₃): δ 4.95 (bs, 2H, NH₂, exchangeable with D₂O), 6.80-6.82 (d, 2H, $J = 8$ Hz, Ar-H), 7.46-7.49 (m, 3H, Ar-H), 7.64-7.72 (m, 4H, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 116.8, 126.5, 127.9, 128.5, 128.7, 136.5, 147.2.

N-(4-Nitrophenyl)benzenamine (2i)



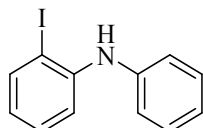
¹H NMR (400 MHz, CDCl₃): δ 5.78 (bs, 1H, NH, exchangeable with D₂O), 6.52-6.54 (d, 2H, $J=8$ Hz, Ar-H), 6.79-6.81 (d, 3H, $J=8$ Hz, Ar-H), 7.15-7.17 (d, 2H, $J=8$ Hz, Ar-H), 7.56-7.58 (d, 2H, $J=8$ Hz, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 112.7, 113.9, 114.8, 117.9, 128.7, 137.7, 147.8.

N-(2-Fluorophenyl)benzenamine (2j)



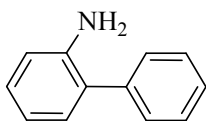
¹H NMR (400 MHz, CDCl₃): δ 5.40 (bs, 1H, NH, exchangeable with D₂O), 7.14-7.16 (dd, 3H, $J=8$ Hz, Ar-H), 7.33-7.38 (m, 3H, Ar-H), 7.55-7.57 (d, 3H, $J=8$ Hz, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 111.1, 113.9, 119.1, 124.0, 124.4, 128.7, 133.2, 147.1.

N-(2-Iodophenyl)benzenamine (2k)



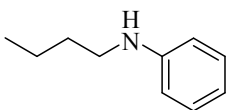
¹H NMR (400 MHz, CDCl₃): δ 4.81 (bs, 1H, NH, exchangeable with D₂O), 6.79-6.81 (d, 1H, $J=8$ Hz, Ar-H), 6.84-6.88 (t, 1H, $J=8$ Hz, Ar-H), 7.15-7.21 (m, 2H, Ar-H), 7.28-7.38 (m, 1H, Ar-H), 7.45-7.48 (m, 4H, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 115.9, 118.8, 127.1, 128.5, 128.8, 129.0, 130.4, 139.7, 143.9.

2-Aminobiphenyl (2l)



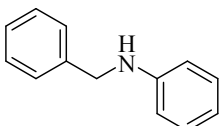
¹H NMR (400 MHz, CDCl₃): δ 3.18 (bs, 2H, NH₂, exchangeable with D₂O), 6.80-6.82 (d, 1H, J = 8 Hz, Ar-H), 6.85-6.89 (t, 1H, J =8 Hz, Ar-H), 7.15-7.28 (m, 1H, Ar-H), 7.37-7.39 (m, 1H, Ar-H), 7.44-7.48 (m, 3H, Ar-H), 7.62-7.64 (d, 2H, J =8 Hz, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 115.4, 119.1, 127.1, 128.0, 128.5, 129.3, 130.6, 139.4, 143.2.

N-Butylbenzenamine (2m)



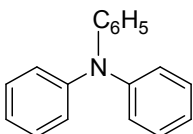
¹H NMR (400 MHz, CDCl₃): δ 0.98-1.0 (t, 3H, J =4 Hz, CH₃), 1.36-1.43 (m, 2H, CH₂), 1.50-1.57 (m, 2H, CH₂), 3.09-3.14 (m, 2H, CH₂), 4.33 (bs, 1H, NH, exchangeable with D₂O), 7.38-7.40 (d, 2H, J =8 Hz, Ar-H), 7.45-7.49 (t, 1H, J =8 Hz, Ar-H), 7.62-7.64 (d, 2H, J =8 Hz, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 13.8, 20.2, 32.4, 44.8, 113.5, 117.2, 129.6, 147.6.

N-Benylbenzenamine (2n)



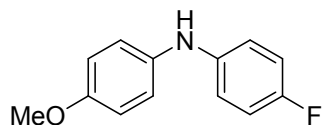
¹H NMR (400 MHz, CDCl₃): δ 4.01(s, 2H, CH₂), 4.48(bs, 1H, NH, exchangeable with D₂O), 6.55-6.57 (d, 2H, J =8 Hz, Ar-H), 6.66-6.69 (t, 1H, J =6 Hz, Ar-H), 7.13-7.16 (t, 2H, J =6 Hz, Ar-H), 7.20-7.23 (m, 1H, Ar-H), 7.26-7.31 (m, 4H, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 68.27, 112.9, 117.4, 127.9, 128.6, 130.8, 132.6, 134.3, 167.8.

N, N-Diphenylbenzenamine (2o)



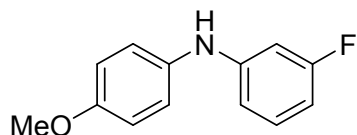
¹H NMR (400 MHz, CDCl₃): δ 6.93-6.96 (m, 3H, Ar-H), 7.07-7.09 (m, 6H, Ar-H), 7.22-7.23 (m, 6H, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 120.7, 130.5, 142.2.

***N*-(4-Methoxyphenyl)-4-fluorobenzenamine(2p)**



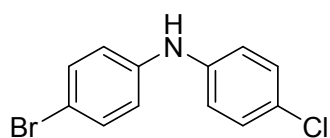
¹H NMR (400 MHz, CDCl₃): δ 3.82 (s, 3H, OCH₃), 5.39 (bs, 1H, NH, exchangeable with D₂O), 6.87-6.89 (d, 2H, J=8 Hz, Ar-H), 6.93-6.98 (m, 2H, Ar-H), 7.35-7.37(d, 2H, J=8 Hz, Ar-H), 7.52-7.54 (d, 2H, J=8 Hz, Ar-H). **¹³C NMR (100 MHz, CDCl₃):** δ 55.6, 114.7, 116.6, 122.5, 123.9, 129, 135.1, 138.3, 149.8, 155.5.

***N*-(4-Methoxyphenyl)-3-fluorobenzenamine (2q)**



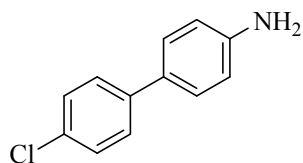
¹H NMR (400 MHz, CDCl₃): δ 3.82 (s, 3H, OCH₃), 5.57 (bs, 1H, NH, exchangeable with D₂O), 6.48-6.52 (m, 1H, Ar-H), 6.57-6.62 (m, 2H, Ar-H), 6.88-6.90 (d, 2H, J=8 Hz, Ar-H), 7.09-7.16 (m, 3H, Ar-H). **¹³C NMR (100 MHz, CDCl₃):** 55.2, 108.1, 110.2, 115.1, 116.6, 124.7, 132.2, 134.9, 139.9, 151.2, 158.3.

***N*-(4-bromophenyl) 4-chlorobenzenamine (2r)**



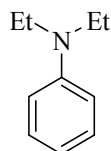
¹H NMR (400 MHz, CDCl₃): δ 5.46 (bs, 1H, NH, exchangeable with D₂O), 6.95-6.97 (d, J = 8.0 Hz, 2H), 7.03-7.05 (d, J = 8.0 Hz, 2H), 7.19-7.21 (d, J = 8.0 Hz, 2H), 7.33-7.35 (d, J = 8 Hz, 2H). **¹³C NMR (100 MHz, CDCl₃):** 116.7, 121.4, 125.3, 127.5, 129.3, 132.2, 140.7, 142.1.

4'-Chloro-4-aminobiphenyl



¹H NMR (400 MHz, CDCl₃): δ 4.65 (bs, 2H, NH₂, exchangeable with D₂O), 6.75-6.77 (d, 2H, $J = 8$ Hz, Ar-H), 7.43-7.45 (d, 2H, $J = 8$ Hz, Ar-H), 7.55-7.57 (d, 2H, $J = 8$ Hz, Ar-H), 7.61-7.63 (d, 2H, $J = 8$ Hz, Ar-H), **¹³C NMR (100 MHz, CDCl₃):** δ 116.7, 126.5, 127.9, 128.5, 129.2, 133.1, 134.5, 147.5.

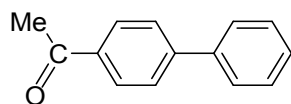
N,N-Diethylbenzenamine(2t)



¹H NMR (400 MHz, CDCl₃): δ 1.90 (s, 6H, 2 \times CH₃), 2.32 (s, 4H, 2 \times CH₂), 6.78-6.63 (m, 2H, Ar-H), 7.04-7.09 (m, 3H, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 12.5, 27.8, 112.6, 113.7, 114.8, 127.8, 129.6, 139.4, 143.8.

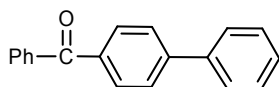
S6. Spectral details of the compounds listed in Table 4

4-Acetylbiphenyl (3a)



¹H NMR (400 MHz, CDCl₃): δ 2.62 (s, 3H, CH₃), 7.41-7.44 (m, 1H, Ar-H), 7.48-7.52 (t, 2H, $J = 8.0$ Hz, Ar-H), 7.65-7.66 (d, 2H, $J = 4.0$ Hz, Ar-H), 7.70-7.72 (d, 2H, $J = 8.0$ Hz, Ar-H), 8.05-8.07 (d, 2H, $J = 8.0$ Hz, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 26.6, 127.2, 128.2, 128.3, 128.9, 135.8, 139.8, 145.8, 197.7.

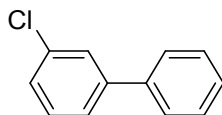
Phenyl-4-biphenyl ketone (3b)



¹H NMR (400 MHz, CDCl₃): δ 7.42-7.46 (m, 1H, Ar-H), 7.50-7.55 (m, 4H, Ar-H), 7.62-7.64 (m, 2H Ar-H) 7.68-7.70 (d, 1H, $J = 8.0$ Hz, Ar-H), 7.73-7.75 (d, 2H, $J = 8.0$ Hz, Ar-H),

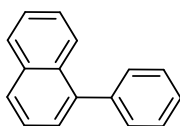
7.86-7.88 (d, 2H, J = 8.0 Hz, Ar-H), 7.92-7.94 (d, 2H, J = 8.0 Hz, Ar-H); ^{13}C NMR (100 MHz, CDCl_3): δ 126.4, 127.2, 128.3, 129.0, 130.1, 130.9, 132.8, 136.5, 137.4, 140.0, 145.3, 157.3, 196.8.

3-Chlorobiphenyl (3c)



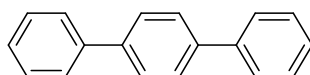
^1H NMR (400 MHz, CDCl_3): δ 7.29-7.35 (m, 3H, Ar-H), 7.42-7.47 (m, 3H, Ar-H), 7.54-7.58 (m, 3H, Ar-H); ^{13}C NMR (100 MHz, CDCl_3): δ 126.0, 127.7, 127.8, 127.9, 129.3, 130.7, 136.5, 137.9.

1-Phenylnaphthalene (3d)



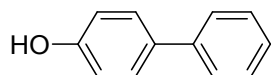
^1H NMR (400 MHz, CDCl_3): δ 7.58-7.66 (m, 4H, Ar-H), 7.65-7.72 (m, 5H, Ar-H), 8.04-8.06 (d, 1H, J = 8.0 Hz, Ar-H), 8.09-8.11 (d, 1H, J = 8.0 Hz, Ar-H), δ 8.14-8.16 (d, 1H, J = 8.0 Hz, Ar-H); ^{13}C NMR (100 MHz, CDCl_3): δ 125.7, 125.9, 126.2, 127.3, 127.4, 127.8, 128.3, 128.5, 129.2, 130.3, 131.8, 134.0, 140.7, 141.0.

4-(Phenyl) biphenyl (3e)



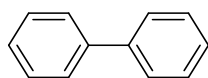
^1H NMR (400 MHz, CDCl_3): δ 7.35-7.38 (m, 2H, Ar-H), 7.46-7.50 (m, 4H, Ar-H), 7.60-7.62 (d, 4H, J = 8.0 Hz, Ar-H), 7.64-7.67 (m, 4H, Ar-H); ^{13}C NMR (100 MHz, CDCl_3): δ 122.3, 126.1, 126.3, 126.9, 129.0, 135.6, 140.2, 141.3.

4-Phenylphenol (3f)



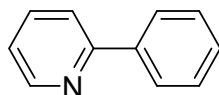
^1H NMR (400 MHz, CDCl_3): δ 4.93 (s, 1H, OH), 6.93-6.95 (d, 2H, $J = 8.0$ Hz, Ar-H), 7.31-7.35 (t, 1H, $J = 8.0$ Hz, Ar-H), 7.42-7.46 (t, 2H, $J = 8.0$ Hz, Ar-H), 7.50-7.52 (d, 2H, $J = 8.0$ Hz, Ar-H), 7.56-7.58 (d, 2H, $J = 8.0$ Hz, Ar-H); **^{13}C NMR (100 MHz, CDCl_3):** δ 119.1, 127.2, 127.7, 128.6, 128.7, 129.1, 136.1, 154.9.

Biphenyl (3g)



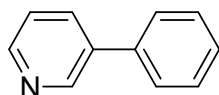
^1H NMR (400 MHz, CDCl_3): δ 7.38-7.42 (m, 2H, Ar-H), 7.50-7.53 (m, 4H Ar-H), 7.65-7.67 (d, 4H, $J = 8.0$ Hz, Ar-H); **^{13}C NMR (100 MHz, CDCl_3):** δ 141.0, 127.3, 127.4, 128.9, 141.0.

2-Phenylpyridine (3h)



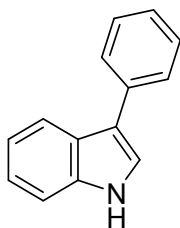
^1H NMR (400 MHz, CDCl_3): $\delta = 7.25$ – 7.29 (m, 1H, Ar-H), 7.45 – 7.52 (m, 3H, Ar-H), 7.74 – 7.81 (m, 2H, Ar-H), 8.00 – 8.02 (d, 2H, $J = 8$ Hz, Ar-H), 8.72 – 8.74 (d, 1H, $J = 8.0$ Hz, Ar-H); **^{13}C NMR (100 MHz, CDCl_3):** δ 119.1, 121.4, 126.4, 128.0, 128.9, 136.9, 139.8, 146.4, 157.8.

3-Phenylpyridine (3i)



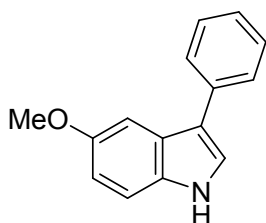
^1H NMR (400 MHz, CDCl_3): $\delta = 7.27$ – 7.32 (m, 2H, Ar-H), 7.36 – 7.40 (t, 2H, $J = 7.2$ Hz, Ar-H), 7.48 (d, 2H, $J = 7.2$ Hz, Ar-H), 7.76 – 7.78 (m, 1H, Ar-H), 8.49 – 8.50 (m, 1H, Ar-H), 8.75 (s, 1H, Ar-H); **^{13}C NMR (100 MHz, CDCl_3):** δ 123.5, 127.1, 128.1, 129.5, 134.3, 136.6, 137.6, 148.3, 148.6.

3-Phenyl-1H-indole (3j)



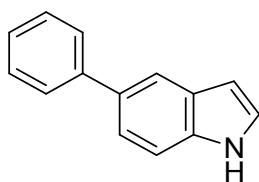
¹H NMR (400 MHz, CDCl₃): δ 6.96-6.97 (d, 2H, J = 4.0 Hz, Ar-H), 7.05-7.08 (t, 2H, J = 8.0 Hz, Ar-H), 7.18-7.20 (t, 2H, J = 8.0 Hz, Ar-H), 7.37-7.39 (d, 2H, J = 8.0 Hz, Ar-H), 7.59-7.61 (d, 2H, J = 8.0 Hz, Ar-H), 7.95 (bs, 1H, NH); **¹³C NMR (100 MHz, CDCl₃):** δ 110.0, 111.3, 118.0, 119.0, 122.1, 124.7, 127.0, 128.7, 128.8, 129.4, 129.9, 136.5, 138.2.

5-Methoxy-3-phenyl-1H-indole (3k)



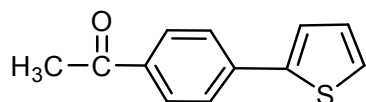
¹H NMR (400 MHz, CDCl₃): δ 3.80 (s, 3H, OCH₃), 6.75-6.79 (t, 2H, J = 8.0 Hz, Ar-H), 6.82-6.86 (t, 2H, J = 8.0 Hz, Ar-H), 6.95 (s, 1H, Ar-H), 7.01-7.04 (d, 2H, J = 12.0 Hz, Ar-H), 7.17-7.19 (d, 2H, J = 8.0 Hz, Ar-H), 7.84 (bs, 1H, NH); **¹³C NMR (100 MHz, CDCl₃):** δ 55.2, 102.3, 109.6, 110.7, 112.6, 124.9, 127.4, 128.6, 128.9, 129.7, 130.7, 136.6, 156.2.

5-Phenyl-1H-indole (3l)



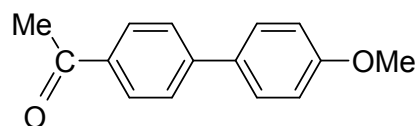
¹H NMR (400 MHz, CDCl₃): δ 6.64-6.65 (d, 1H, J = 4.0 Hz, Ar-H), 7.23-7.25 (t, 2H, J = 8.0 Hz, Ar-H), 7.34-7.36 (d, 2H, J = 8.0 Hz, Ar-H), 7.45-7.49 (m, 2H, Ar-H), 7.67-7.69 (d, 2H, J = 8.0 Hz, Ar-H), 7.89 (s, 1H, Ar-H), 8.23 (bs, 1H, NH); **¹³C NMR (100 MHz, CDCl₃):** δ 102.3, 111.2, 117.1, 124.1, 128.9, 129.3, 129.4, 133.0, 135.2, 144.8.

2-(4-Acetylphenyl)thiophene (3m)



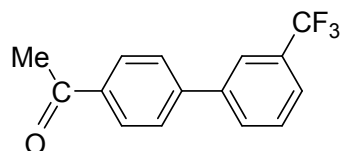
¹H NMR (400 MHz, CDCl₃): δ 2.65 (s, 3H, CH₃), 7.30-7.32 (d, 2H, J = 8.0 Hz, Ar-H), 7.44-7.47 (m, 2H, Ar-H), 7.60-7.61 (m, 1H, Ar-H), 8.01-8.03 (d, 2H, J = 8.0 Hz, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 26.8, 122.2, 126.6, 126.9, 129.0, 129.3, 135.3, 140.4, 140.9, 197.7.

4'-Methoxy-4-acetylbiphenyl(3n)



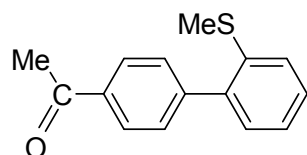
¹H NMR (400 MHz, CDCl₃): δ 2.64 (s, 3H, CH₃), 3.87 (s, 3H, OMe), 7.00-7.02 (d, 2H, J = 8.0Hz, Ar-H), 7.58-7.60 (d, 2H, J= 8.0Hz, Ar-H), 7.64-7.66 (d, 2H, J= 8.0Hz, Ar-H), 8.00-8.03(d, 2H, J= 8 Hz, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 21.6, 55.3, 114.2, 126.5, 127.2, 128.8, 129.9, 133.2, 141.1, 158.8, 196.7.

3'-Trifluoromethyl-4-acetylbiphenyl(3o)



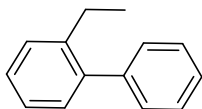
¹H NMR (400 MHz, CDCl₃): δ 2.65 (s, 3H, CH₃), 7.57-7.61 (t, 1H, J=8.0 Hz, Ar-H), 7.65-7.70(m, 3H, Ar-H), 7.78-7.80 (d, 1H, J=8.0Hz, Ar-H), 7.86 (s, 1H, Ar-H), 8.05-8.07 (d, 2H, J= 8.0 Hz, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 21.3, 124.2, 126.7, 127.9, 129.3, 131.3, 135.6, 136.8, 140.6, 142.3, 197.1.

2'-Thiomethyl-4-acetylbiphenyl(3p)



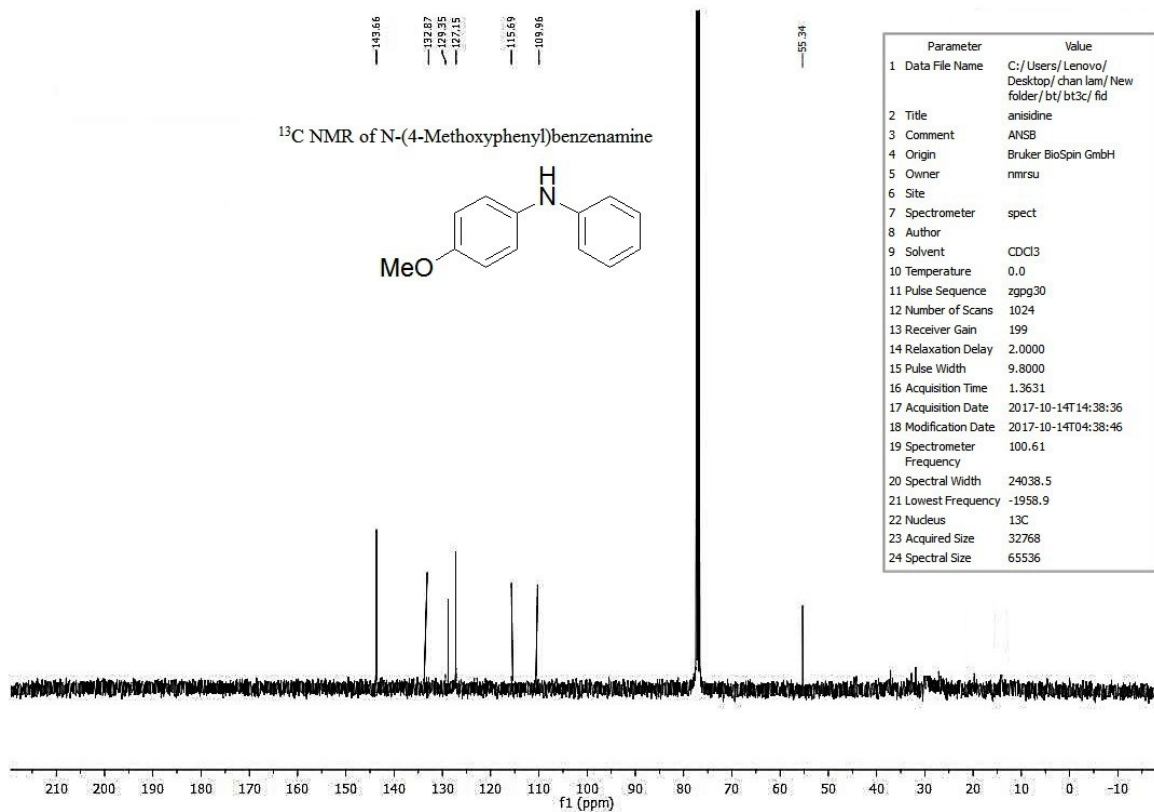
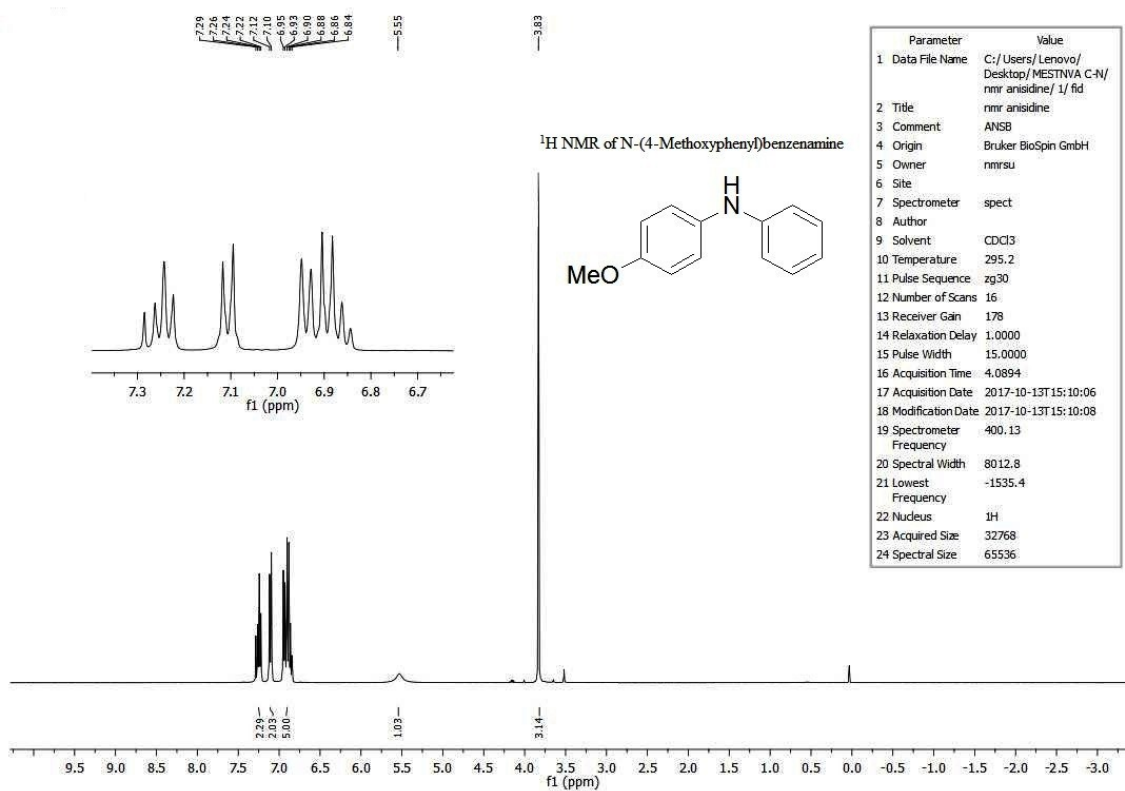
¹H NMR (400 MHz, CDCl₃): δ 2.47 (s, 3H, SCH₃), 2.65 (s, 3H, CH₃), 7.06-7.10 (m, 1H, Ar-H), 7.12-7.16 (m, 1H, Ar-H), 7.23-7.25 (d, 1H, J=8.0Hz, Ar-H), 7.37-7.39 (d, 1H, J=8.0Hz, Ar-H), 7.58-7.60 (d, 2H, J=8.0Hz, Ar-H), 7.91-7.93 (d, 2H, J=8.0Hz, Ar-H), **¹³C NMR (100 MHz, CDCl₃):** δ 15.6, 21.8, 125.3, 126.8, 127.4, 128.1, 128.9, 131.6, 135.1, 137.5, 140.2, 196.7.

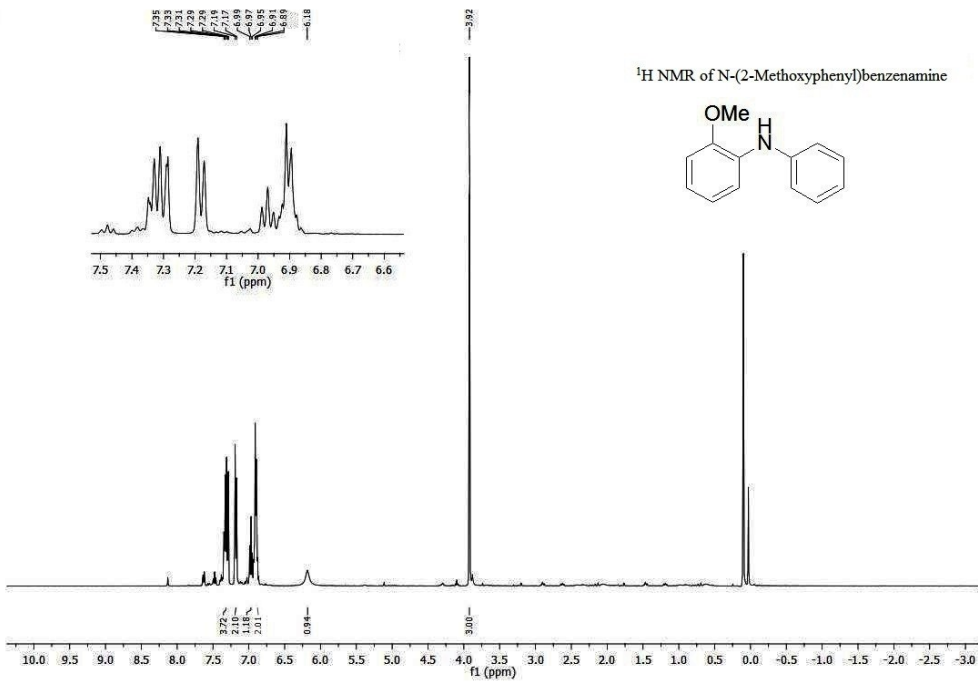
2-Ethylbiphenyl(3q)



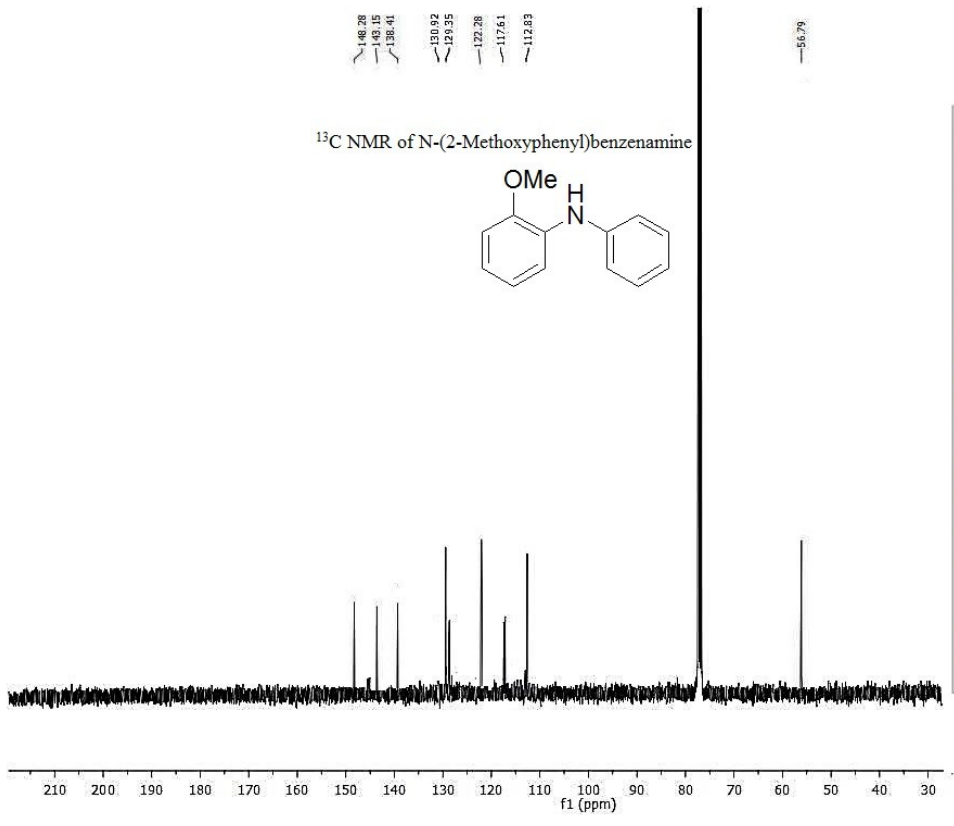
¹H NMR (400 MHz, CDCl₃): δ 1.38-1.42 (t, J = 8.0 Hz, 3H), 2.77-2.86(q, J = 12.0 Hz, 2H) 7.19-7.25 (m, 4H, Ar-H), 7.27-7.32 (m, 3H, Ar-H), 7.38-7.42 (m, 2H, Ar-H); **¹³C NMR (100 MHz, CDCl₃):** δ 15.6, 28.5, 125.6, 126.3, 127.6, 127.9, 128.2 129.2, 132.4, 138.7.

S7. ¹H NMR and ¹³C NMR spectra of some compounds of Table 3 and 4

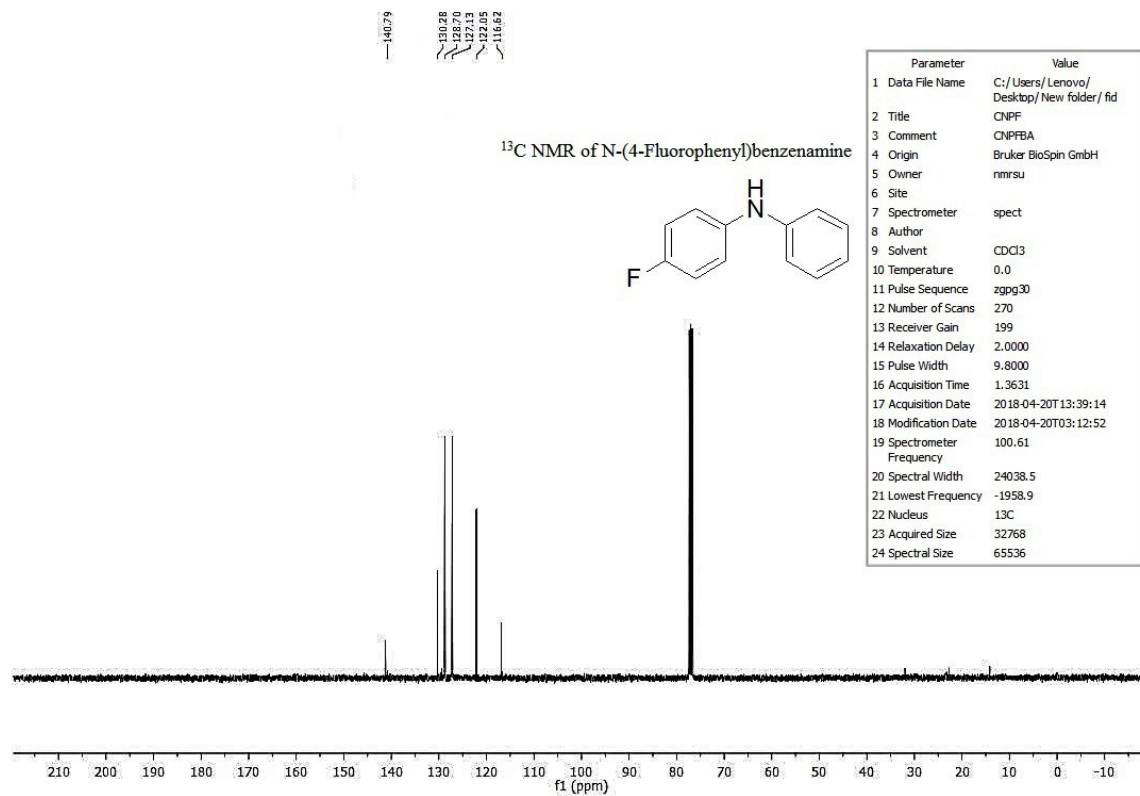
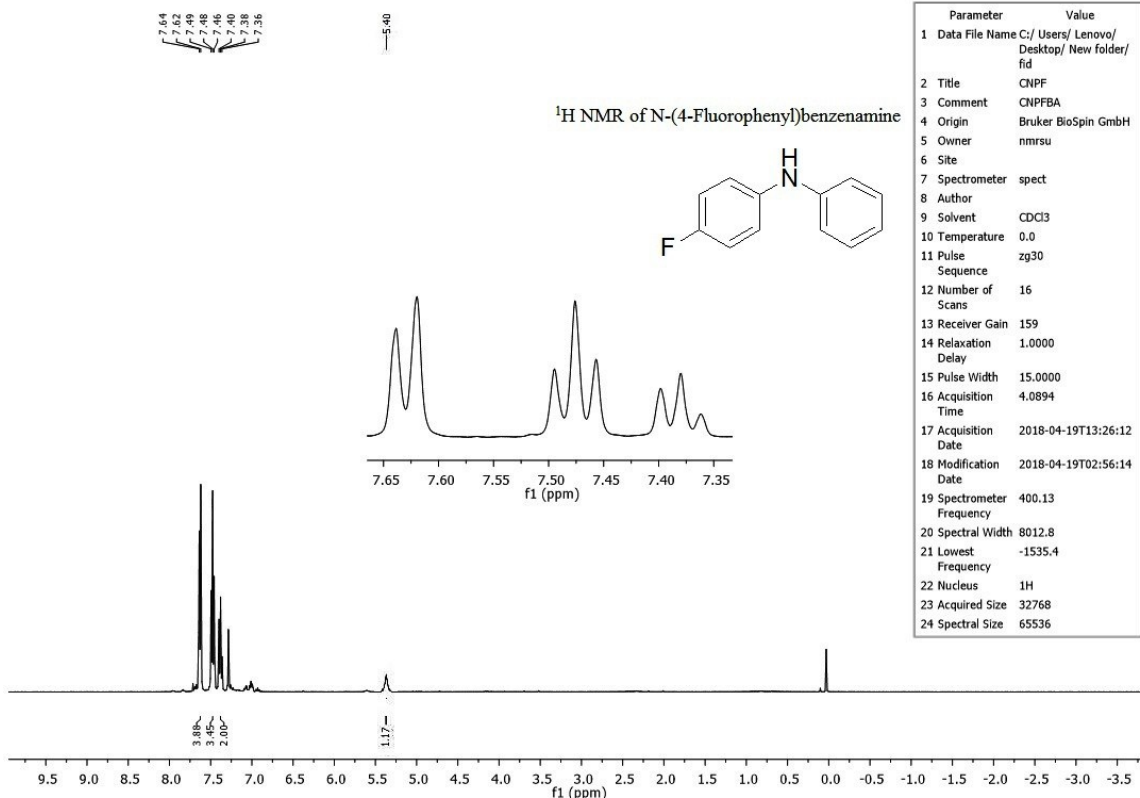


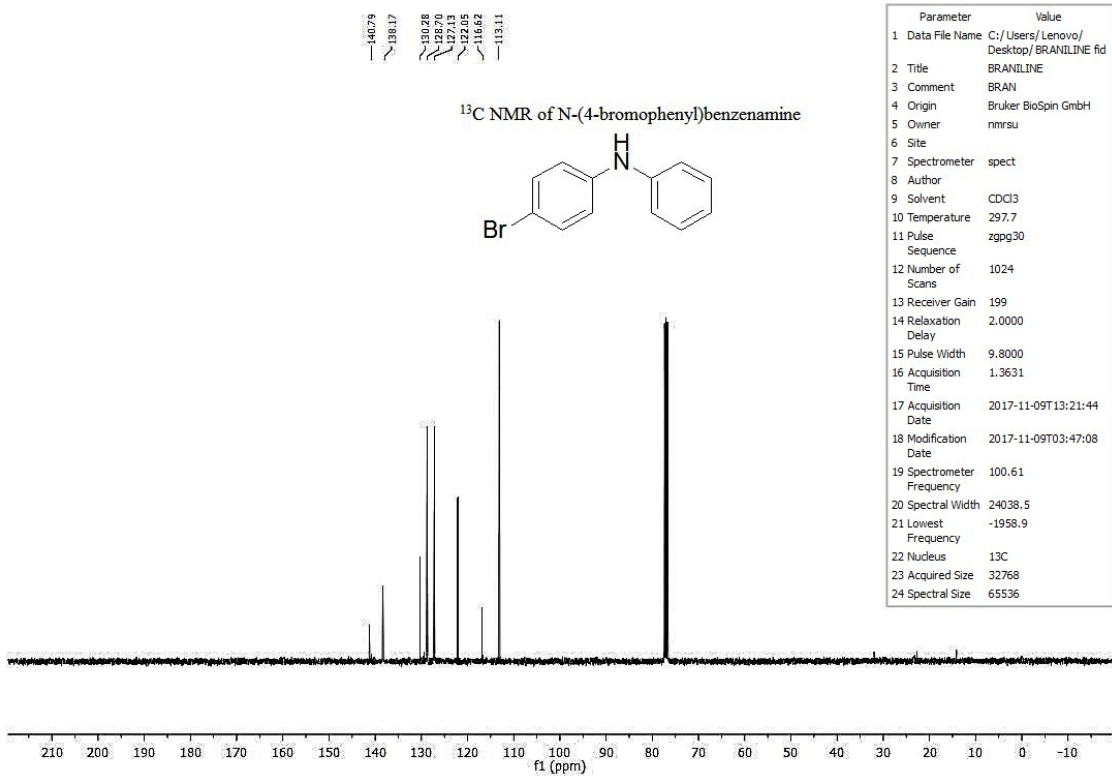
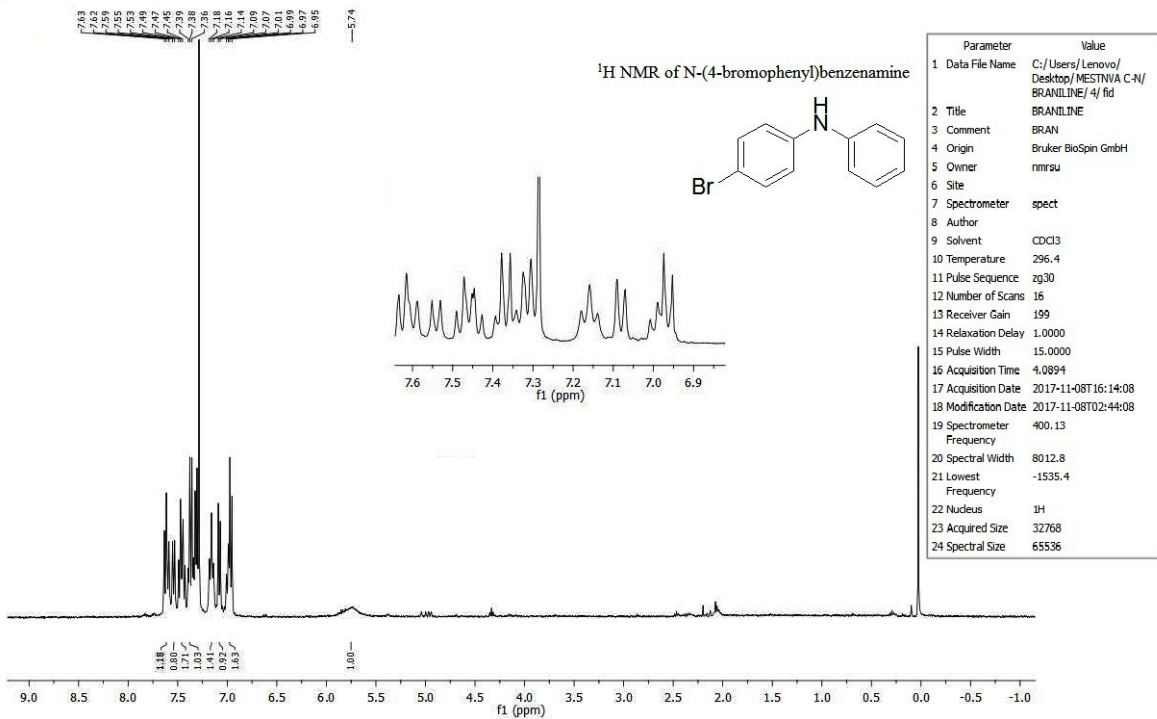


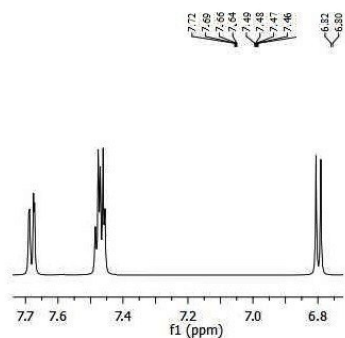
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23 Acquired Size	32768
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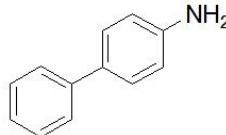
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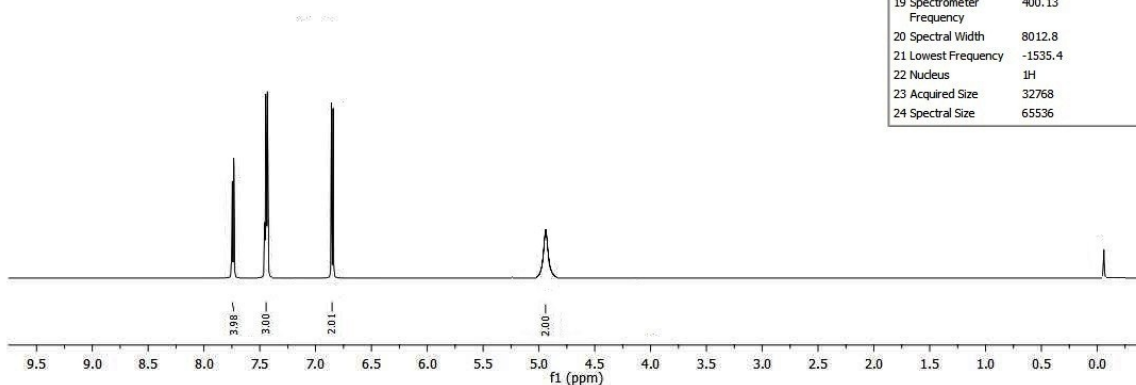




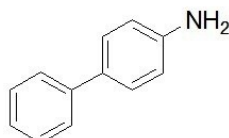
¹H NMR of 4-Aminodiphenyl



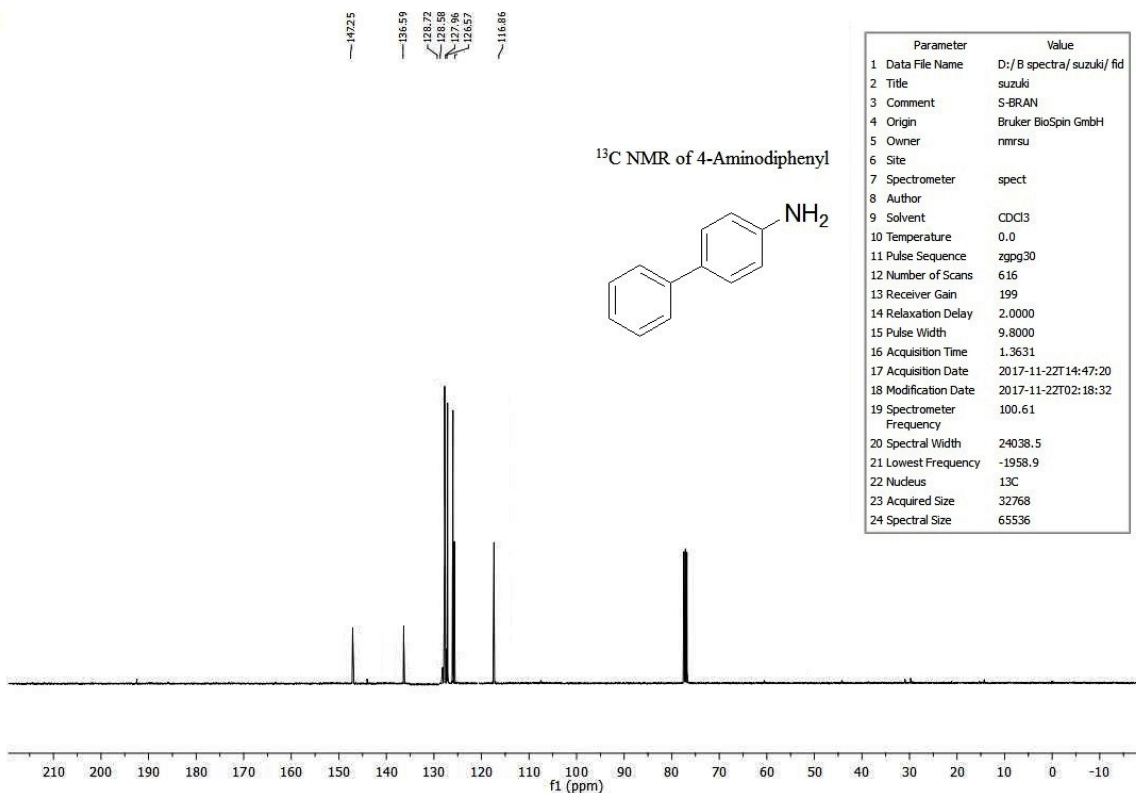
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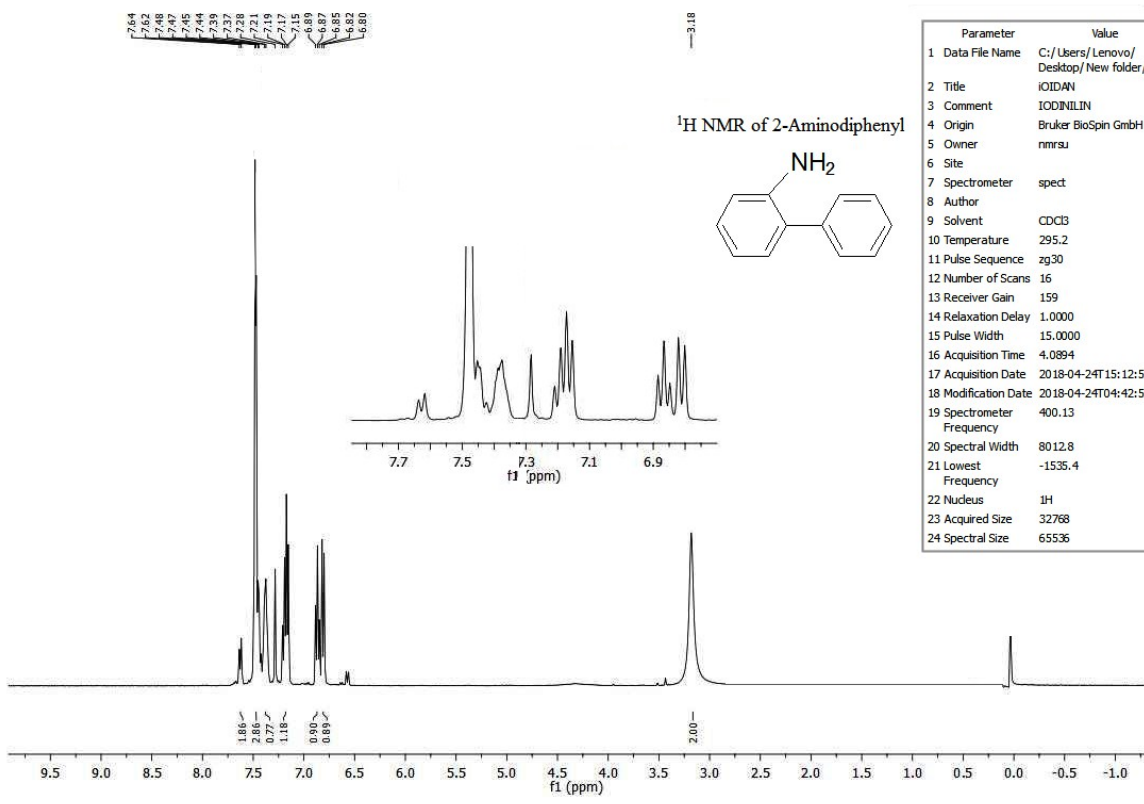


¹³C NMR of 4-Aminodiphenyl

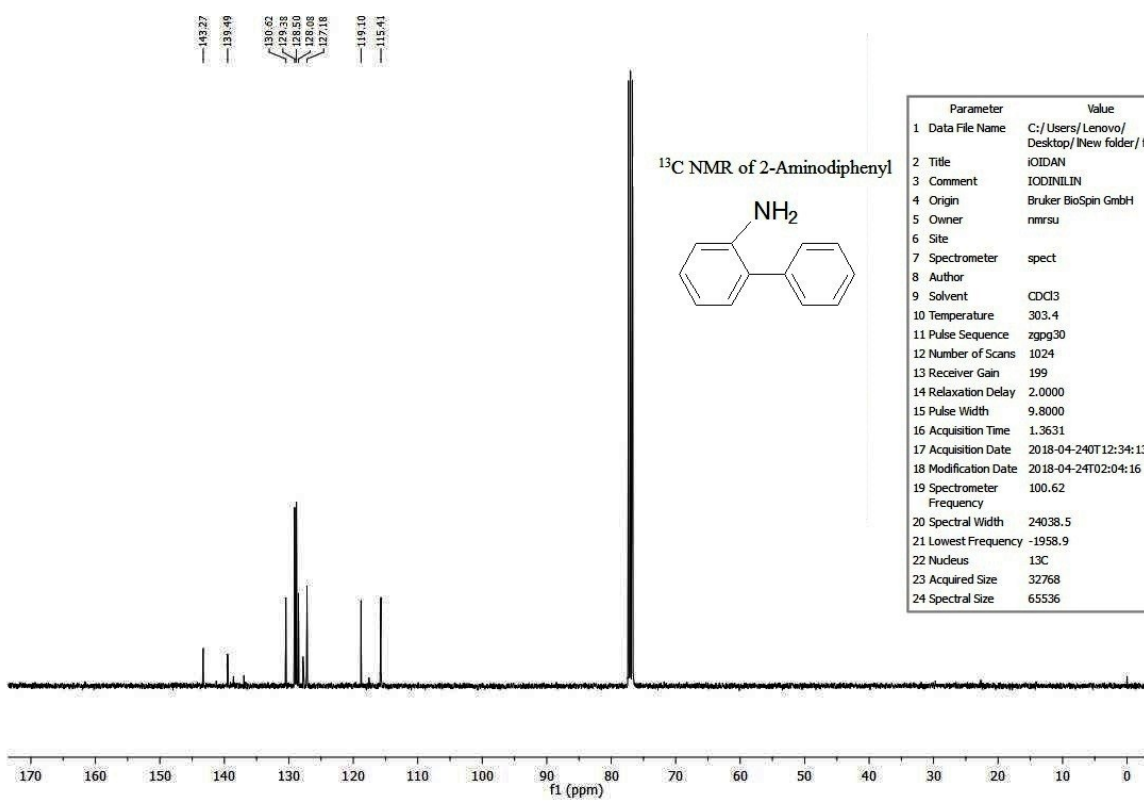


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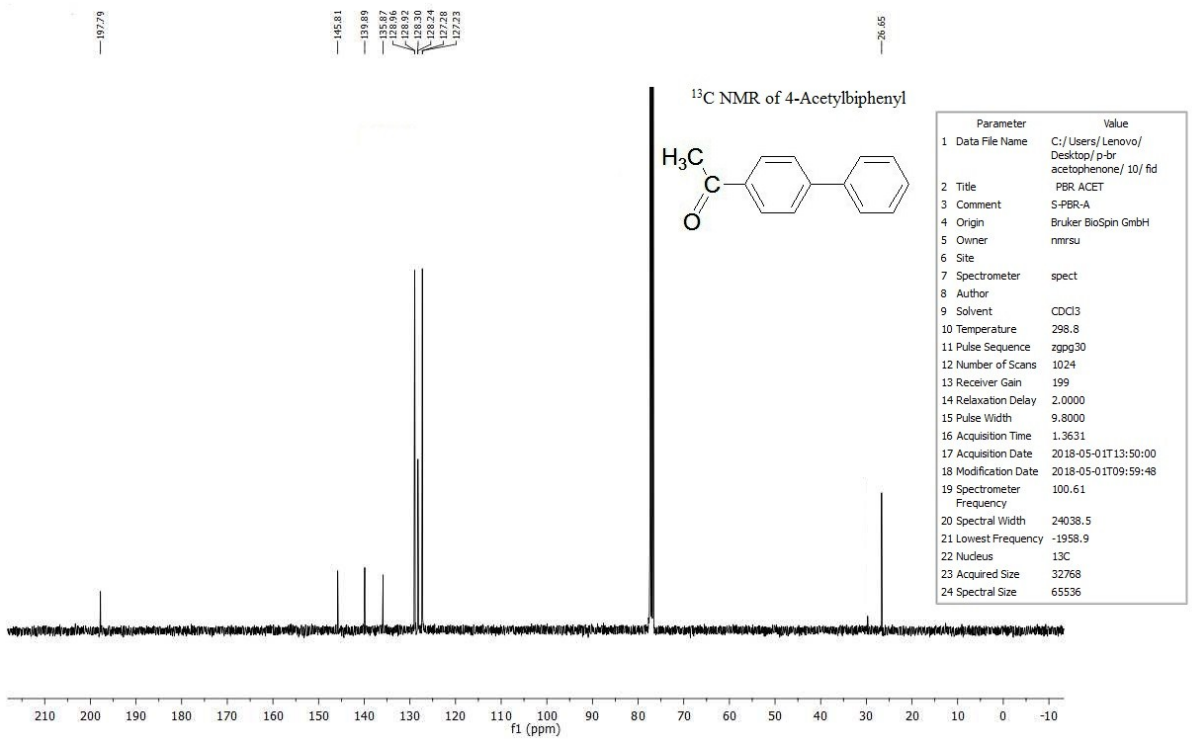
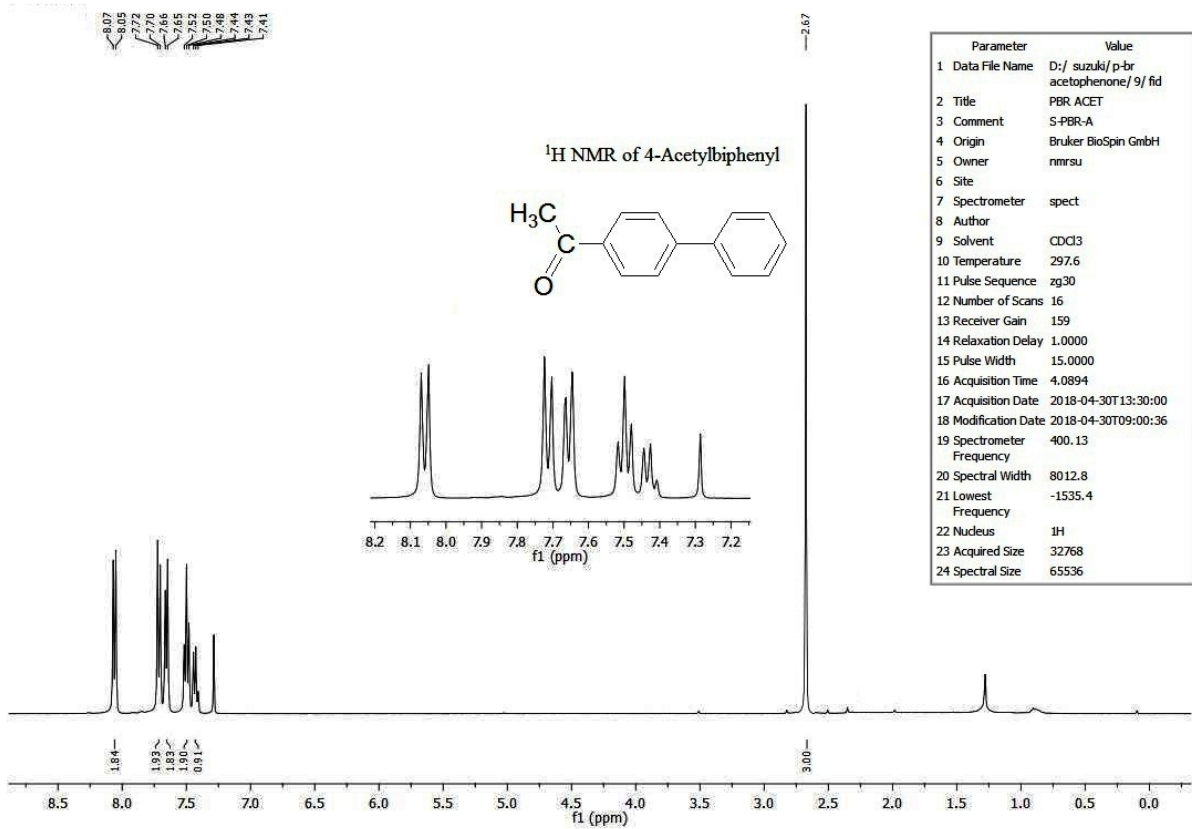


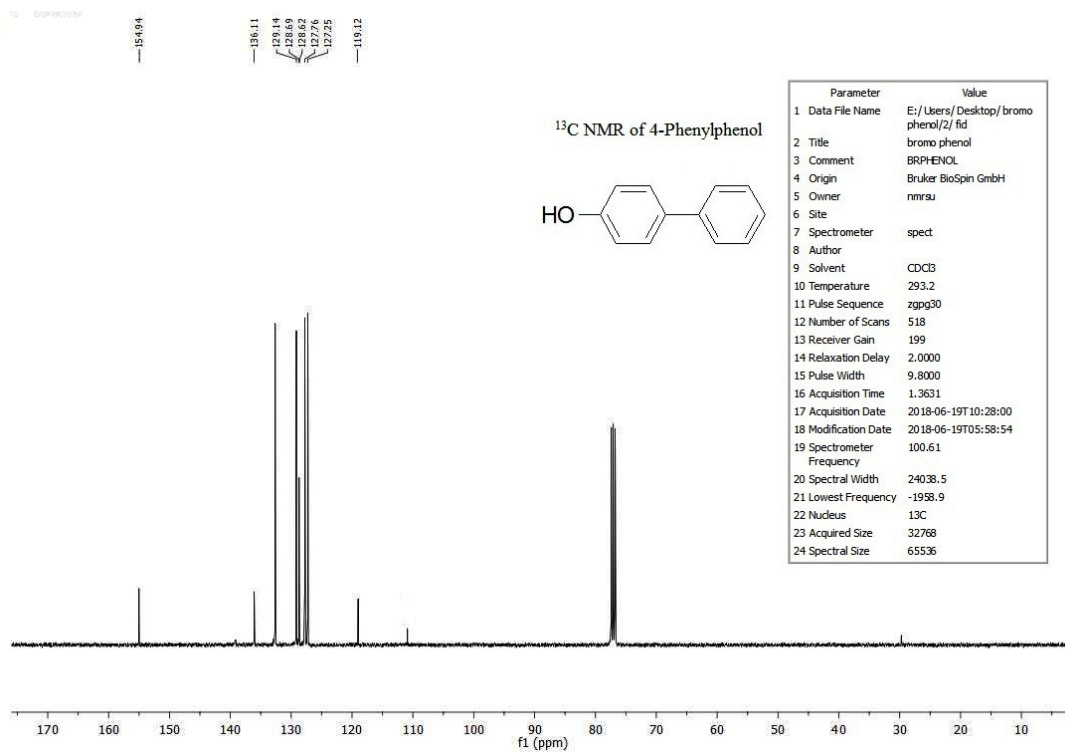
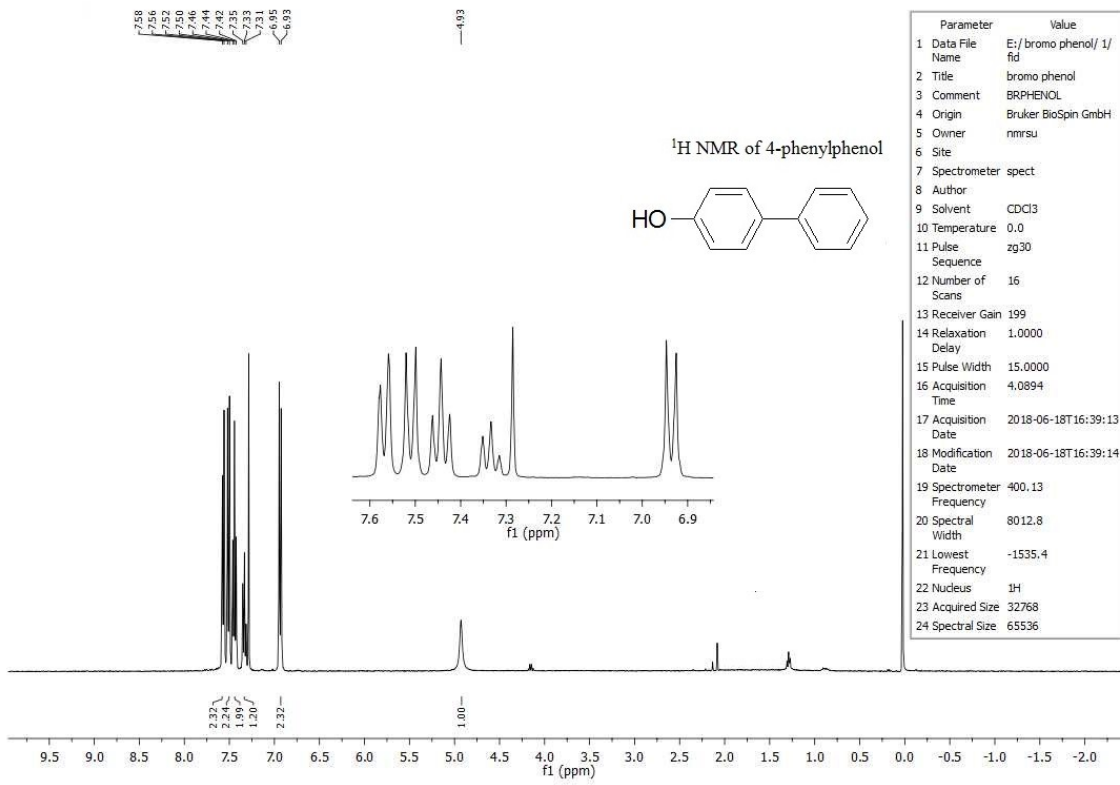


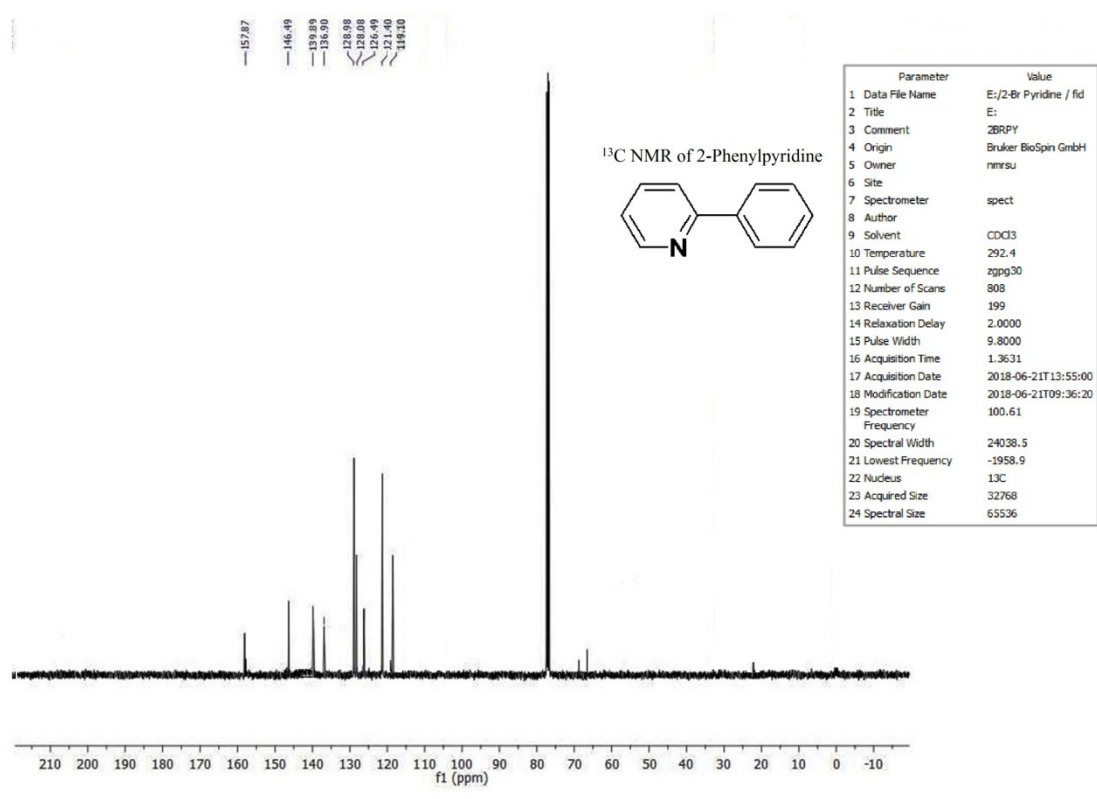
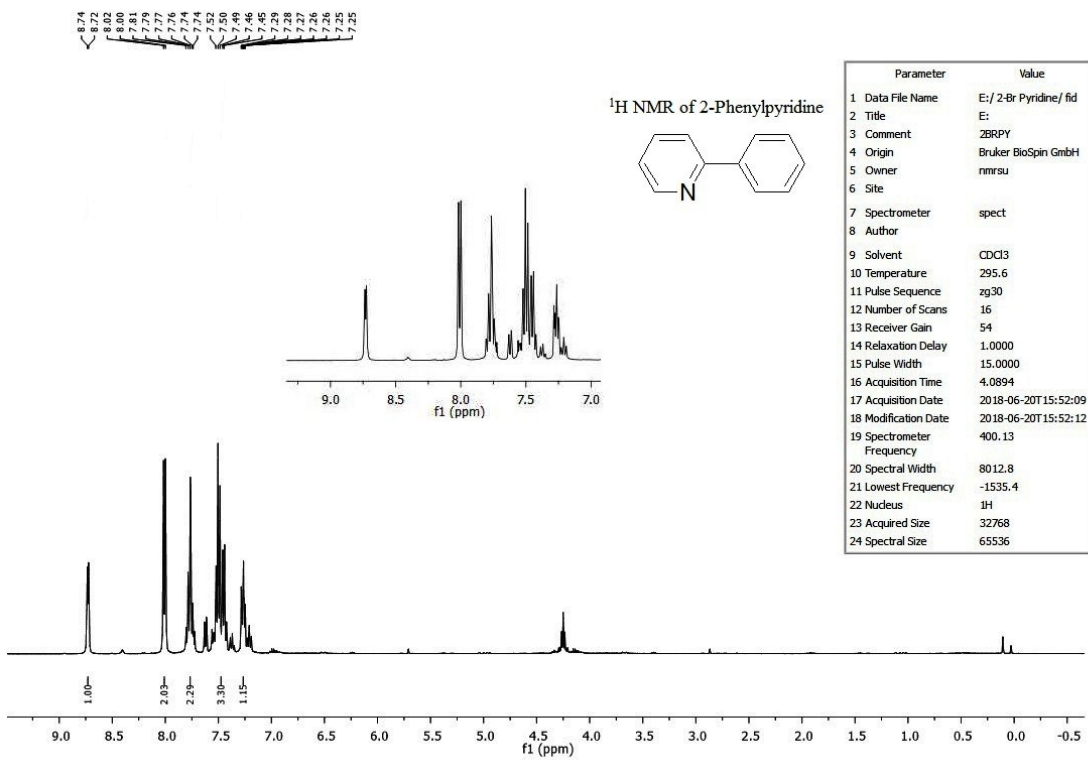
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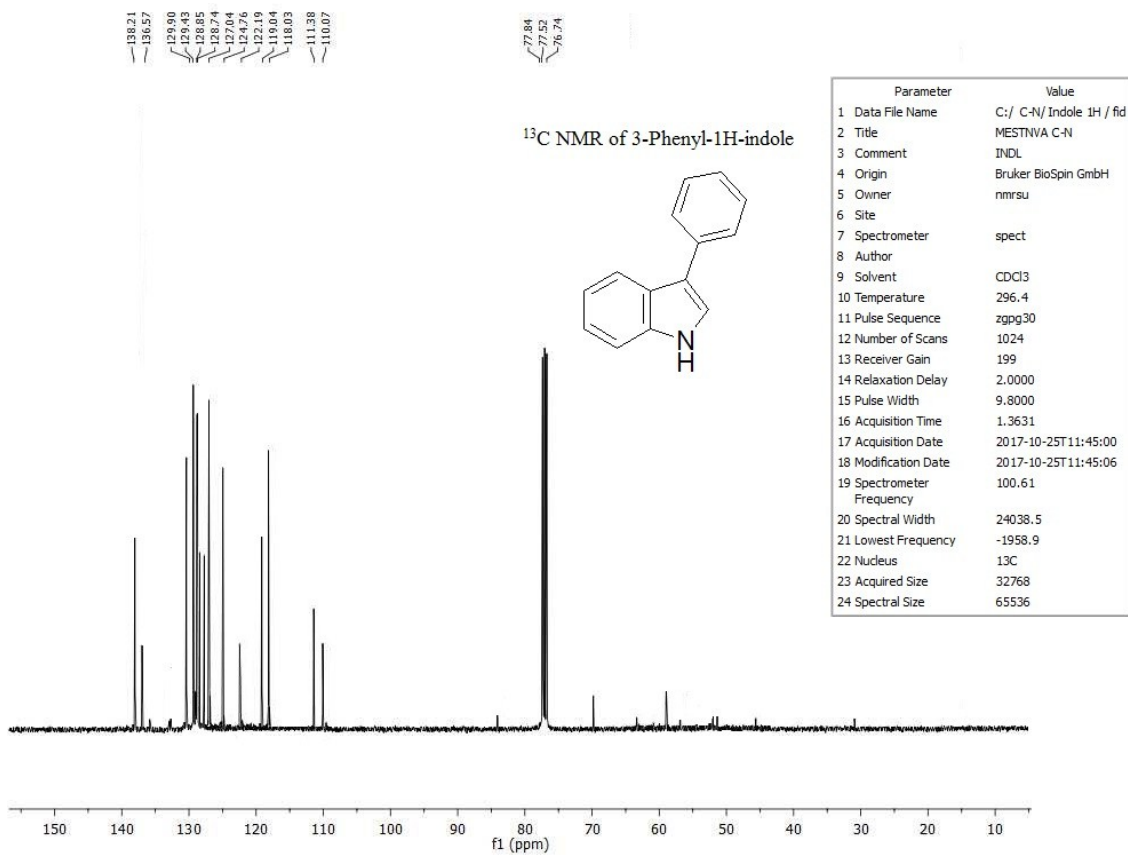
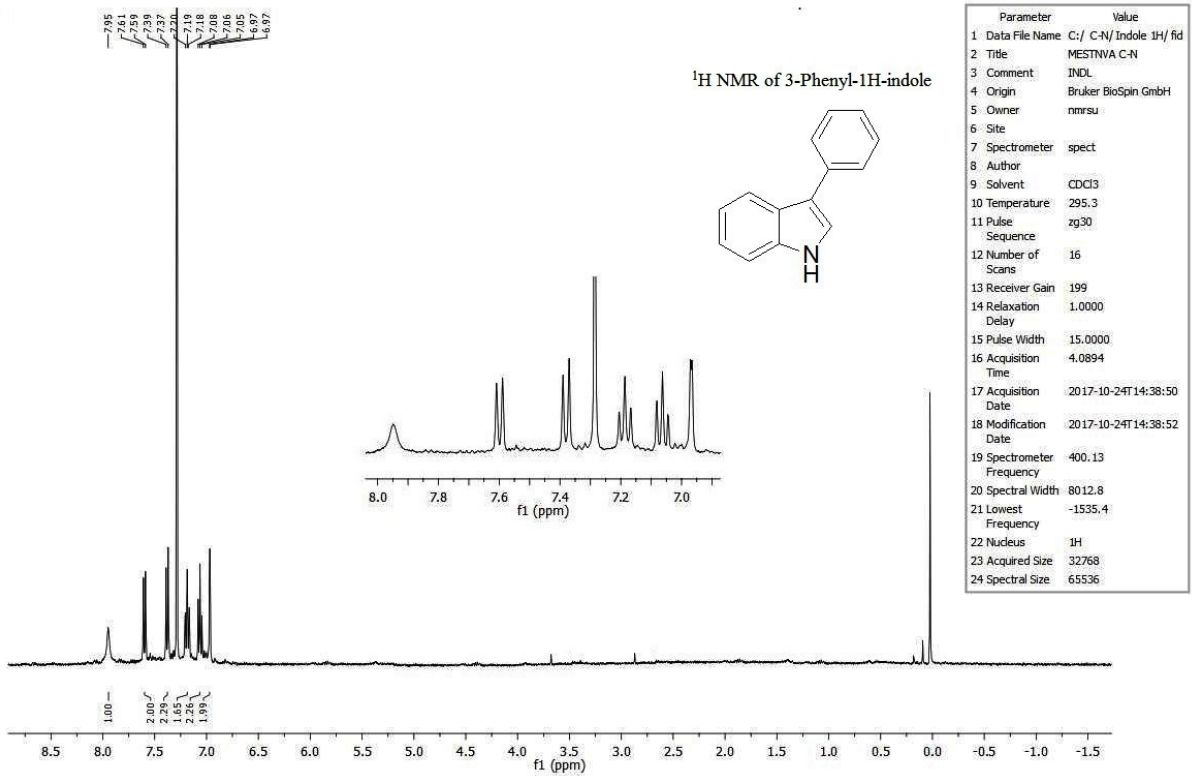


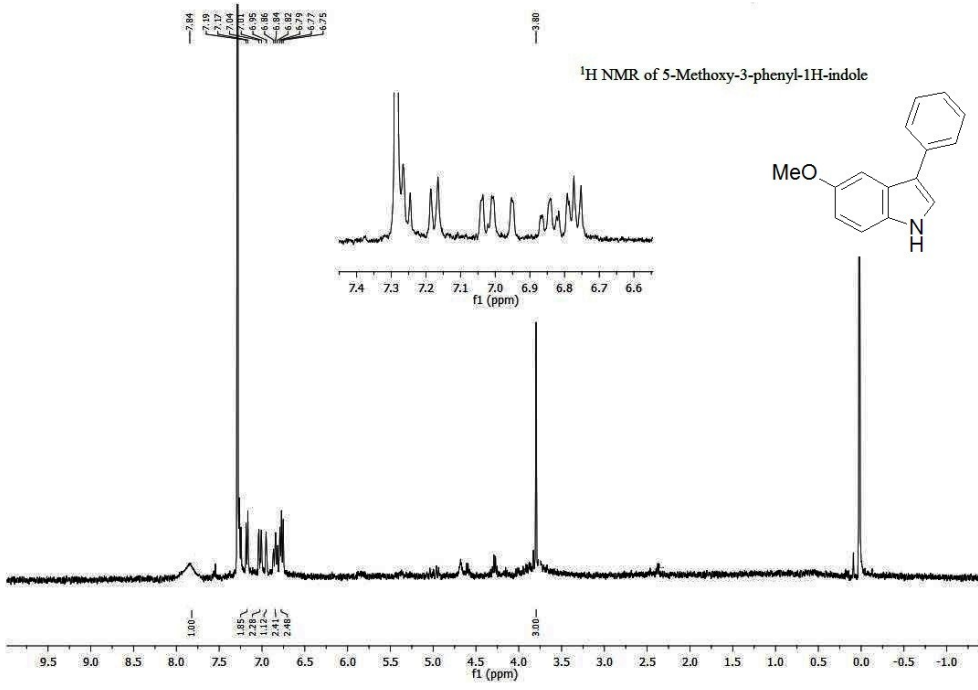
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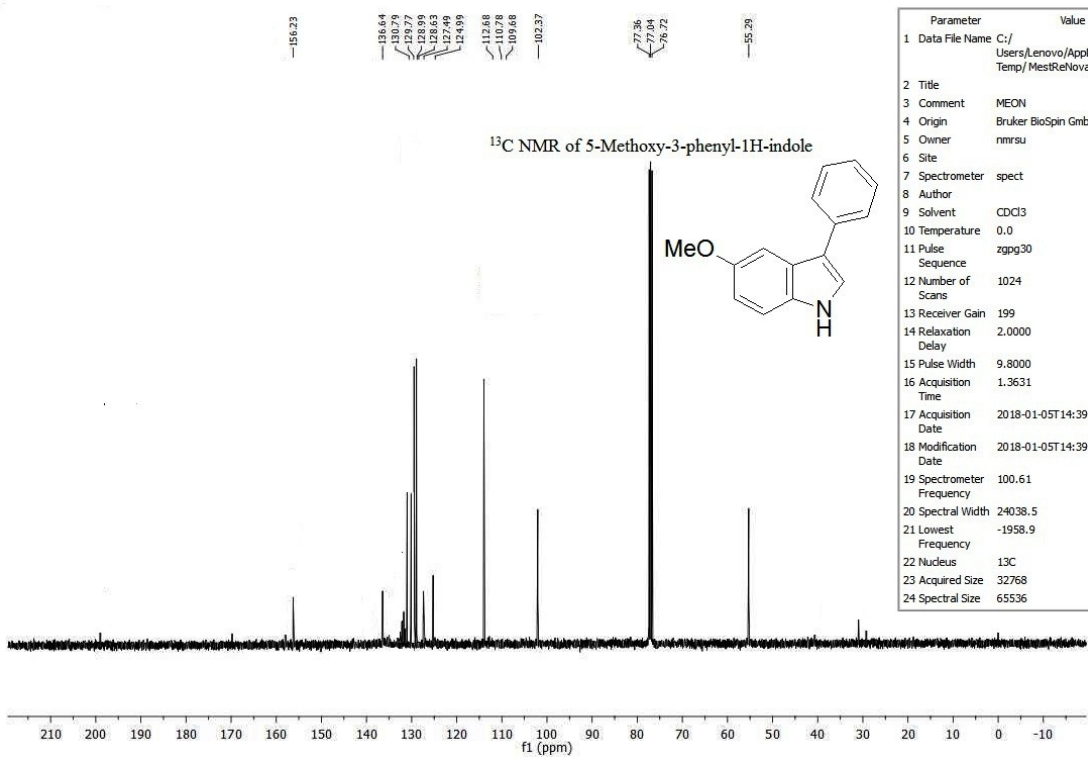
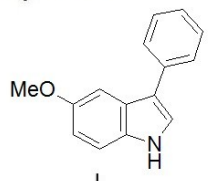








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