SUPPORTING INFORMATION

$Cu(OAc)_2$ Catalysed Aerobic Oxidation of Aldehydes to Nitriles under Ligand-Free Condition

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Experimental Section

Materials and methods

All reactants were purchased from SRL, AVRA Chemicals, Alfa-aesar, Spectrochem, and Sigma Aldrich and used as received without further purification. ^1H and ^{13}C NMR spectra were obtained on a Bruker-300 spectrometer (300 MHz and 400 MHz) and JEOL Spectrometer (500 MHz) in $CDCl_3$ and DMSO-d_6 solutions with TMS as an internal reference. Melting points were determined in open capillary on electrical bath which is uncorrected. Column chromatography was performed on silica gel (60-120 mesh) from SRL, India. Thin layer chromatographic separations were performed on pre-coated silica gel plates using silica gel G for TLC (E. Merck).

General experimental procedure for the $Cu(OAc)_2$ catalyzed oxidative transformation of aldehydes to nitriles:

To a stirred suspension of aldehyde **1** (1.0 mmol) and ammonium acetate (1.5 mmol) in DMSO (3 mL), $Cu(OAc)_2$ (10 mol %) was added. The reaction mixture was stirred for an appropriate time at 60°C under ambient atmosphere. The progress of the reaction was monitored with TLC. Then the reaction mixture was cooled to room temperature, ethyl acetate (15 mL) was

added to dissolve the product. The reaction mixture was repeatedly extracted with ethyl acetate (3×5 mL). The combined organic extracts were washed with water (3×5 mL) and dried over anhydrous Na_2SO_4. The crude product **2** was obtained by removal of the solvent under reduced pressure which was further purified by column chromatography on a short column of silica gel using 1-10% ethyl acetate-hexane as eluent.

Procedure for the $Cu(OAc)_2$ catalyzed gram-scale synthesis of nitrile (2a):

To a stirred suspension of 4-methoxybenzaldehyde **1a** (20.0 mmol, 2.723 g) and ammonium acetate (30.0 mmol, 2.310 g) in DMSO (60 mL), $Cu(OAc)_2$ (0.336 g, 10 mol %) was added and the reaction mixture was stirred for the appropriate time at 60°C under ambient atmosphere. The progress of the reaction was monitored with TLC. Then the reaction mixture was cooled to room temperature, ethyl acetate (300 mL) was added to dissolve the product. The reaction mixture was repeatedly extracted with ethyl acetate (3×100 mL). The combined organic extracts were washed with water (3× 100 mL). After drying with anhydrous sodium sulfate, the solvent was removed under reduced pressure to furnish the crude product **2a**, which was further purified by column chromatography of silica gel using ethyl acetate-hexane as eluent. (Yield: 89%, 2.370 g).

Determination of Reaction Order:

To determine the order of the reaction, two identical experiments were carried out following the general procedure varying only the concentration of 4-methoxybenzaldehyde **1a**. The initial rate of the reaction for the different run was calculated to determine the order with respect to aldehyde **1a**.

Table S1 Experimental details to determine the reaction order

Run	4-methoxybenzaldehyde **1a**	NH_4OAc	$Cu(OAc)_2$	DMSO
Run 1	1 mmol	1.5 mmol	10 mol%	3 mL
Run 2	2 mmol	1.5 mmol	10 mol%	3 mL

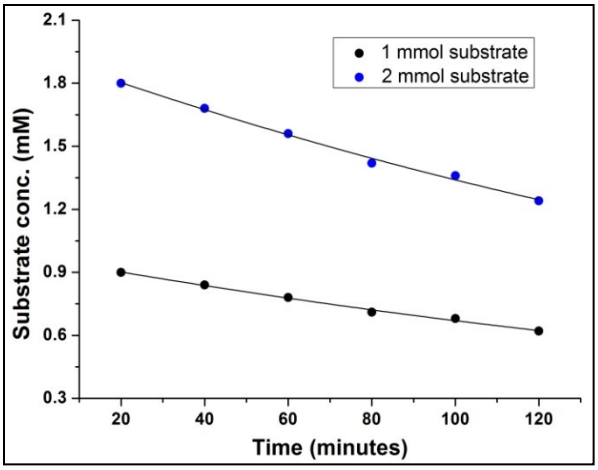

Figure S1 Dependence of [4-methoxybenzaldehyde] on the initial rate of the reaction using $Cu(OAc)_2$ (10 mol%), NH_4OAc (1.5 mmol), DMSO (3 mL), 60°C, under ambient condition.

Initial slope for Run 1 at 60 minutes = 0.0135 = 13.5×10^{-3} (mM)/min

Initial slope for Run 2 at 60 minutes = 0.0269 = 26.9×10^{-3} (mM)/min

Simplified rate equation for this system (r) = k [4-methoxybenzaldehyde]^a [NH_4OAc]^b [$Cu(OAc)_2$]^c [DMSO]^d (all terms have their usual significance)

Now for Run 1, $r_1 = 13.5\times10^{-3}$ (mM)/min = k [1]^a [NH_4OAc]^b [$Cu(OAc)_2$]^c [DMSO]^d .....(1)

Now for Run 2, $r_2 = 26.9\times10^{-3}$ (mM)/min = k [2]^a [NH_4OAc]^b [$Cu(OAc)_2$]^c [DMSO]^d .....(2)

Comparing the initial rate,

$r_1/r_2 = (13.5/26.9) = (1/2)^a$

or, $0.502 = 0.5^a$

or, log 0.502 = a log 0.5

or, a = log 0.502 / log 0.5

or, a = -0.299 / -0.301

or, a = 0.99 ~ 1

So, Rate = k [4-methoxybenzaldehyde]^1

The kinetic studies showed that the reaction rate depends on the concentration of 4-methoxybenzaldehyde **1a** only. Therefore, the aforesaid oxidative protocol follows first order kinetics.

Spectral and analytical data of the compounds:

4-methoxybenzonitrile (2a)[1]: Yield: 90%; White solid; Mp 57-59 ^{0}C (Lit.[10] 58-60 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.57 (2H, d, *J* = 8.4 Hz); 6.93 (2H, d, *J* = 8.4 Hz); 3.84 (3H, s). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 159.3, 131.5, 119.6, 117.1, 114.0, 56.1.

4-tolunitrile (2b)[1]: Yield: 91%; Colorless liquid; ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.50 (2H, d, *J* = 7.8 Hz); 7.24 (2H, d, *J* = 7.8 Hz); 2.38 (3H, s). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 145.1, 132.6, 128.9, 119.8, 111.6, 22.5.

2-tolunitrile (2c)[1]: Yield: 89%; Colorless liquid; ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.44-7.59 (2H, m); 7.23-7.31 (2H, m); 2.53 (3H, s). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 141.9, 132.6, 132.4, 130.2, 126.2, 118.1, 112.7, 20.4.

Benzonitrile (2d)[2]: Yield: 90%; Colorless liquid; ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.57-7.64 (3H, m); 7.43-7.48 (2H, m). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 133.9, 133.1, 129.6, 119.5, 113.4.

3, 4-dimethoxybenzonitrile (2e)[2]: Yield: 90%; White solid; Mp 70-72 ^{0}C (Lit.[10] 69-71 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.24 (1H, d, *J* = 1.5 Hz); 7.04 (1H, s); 6.87 (1H, d, *J* = 8.1 Hz); 3.94 (3H, s); 3.90 (3H, s). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 152.8, 149.4, 126.5, 119.1, 113.8, 111.2, 103.6, 56.0, 55.8.

4-hydroxy-3-methoxybenzonitrile (2f)[3]: Yield: 89%; White solid; Mp 88-90 ^{0}C (Lit.[10] 87-89 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.19 (1H, d, *J* = 7.5 Hz); 7.06 (1H, s); 6.92 (1H, d, *J* = 7.8 Hz); 3.89 (3H, s). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 150.1, 146.8, 127.5, 119.3, 113.9, 109.0, 103.1, 56.2.

4-hydroxybenzonitrile (2g)[3]: Yield: 87%; White solid; Mp 110-112 ^{0}C (Lit.[10] 111-112 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.54 (2H, d, *J* = 8.4 Hz); 6.94 (2H, d, *J* = 8.4 Hz). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 160.5, 134.3, 119.3, 116.5, 102.7.

3-hydroxybenzonitrile (2h)[4]: Yield: 89%; White solid; Mp 79-81 ^{0}C; ^{1}H NMR (DMSO-d_6, 300 MHz); δ (ppm): 7.28-7.33 (2H, m); 7.19 (1H, s); 7.09-7.17 (1H, m). ^{13}C NMR (DMSO-d_6, 75 MHz); δ (ppm): 156.5, 131.2, 124.7, 121.2, 119.5, 117.8, 110.4.

2-hydroxybenzonitrile (2i)[3]: Yield: 88%; White solid; Mp 97-99 ^{0}C (Lit.[11] 96-98 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.48-7.51 (2H, m); 6.95-6.98 (2H, m); 4.89 (1H, br s). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 158.8, 134.7, 132.9, 120.7, 119.1, 116.7, 102.8.

4-(dimethylamino)benzonitrile (2j)[3]: Yield: 88%; White solid; Mp 70-72 ^{0}C (Lit.[5] 71-73 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.45 (2H, d, *J* = 8.7 Hz); 6.63 (2H, d, *J* = 8.7 Hz). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 152.5, 133.6, 120.6, 111.8, 97.4, 39.8.

2-aminobenzonitrile (2k)[5]: Yield: 89%; Yellow solid; Mp 48-50 ^{0}C (Lit.[5] 49-51 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.29-7.38 (2H, m); 6.70-6.75 (2H, m); 4.41 (2H, br s). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 149.7, 134.0, 132.4, 117.9, 117.6, 115.2, 95.9.

4-chlorobenzonitrile (2l)[1]: Yield: 93%; White solid; Mp 92-94 ^{0}C (Lit.[5] 91-93 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.60 (2H, d, *J* = 8.4 Hz); 7.46 (2H, d, *J* = 8.4 Hz). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 139.3, 132.8, 129.2, 118.8, 110.3.

4-bromobenzonitrile (2m)[1]: Yield: 91%; White solid; Mp 108-110 ^{0}C (Lit.[5] 109-111 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.62 (2H, d, *J* = 8.4 Hz); 7.51 (2H, d, *J* = 8.4 Hz). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 133.4, 132.6, 127.9, 118.0, 111.3.

4-nitrobenzonitrile (2n)[1]: Yield: 95%; Yellow solid; Mp 147-150 ^{0}C (Lit.[5] 146-148 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 8.36 (2H, d, *J* = 8.7 Hz); 7.88 (2H, d, *J* = 8.7 Hz). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 150.1, 133.5, 124.2, 118.3, 116.8.

3-nitrobenzonitrile (2o)[3]: Yield: 94%; White solid; Mp 114-116 ^{0}C (Lit.[11] 115-116 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.18-7.25 (1H, m); 7.00 (1H, d, *J* = 7.5 Hz); 6.84-6.89 (2H, m). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 147.0, 130.1, 121.9, 119.2, 117.4, 112.8.

4-formylbenzonitrile (2p)[5]: Yield: 88%; White solid; Mp 98-100 ^{0}C (Lit.[5] 100-101 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 10.1 (1H, s); 7.98 (2H, d, *J* = 8.1 Hz); 7.84 (2H, d, *J* = 8.1 Hz). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 190.6, 138.7, 132.9, 130.6, 129.9, 117.6.

Terephthalonitrile (2q)[5]: Yield: 87%; White solid; Mp 225-227 ^{0}C (Lit.[5] 224-226 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.52 (s, 4H). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 132.7, 118.2, 116.6.

4-acetylbenzonitrile (2r)[5]: Yield: 88%; Light yellow solid; Mp 56-58 ^{0}C (Lit.[5] 55-57 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 8.03 (2H, d, *J* = 8.1 Hz); 7.77 (2H, d, *J* = 8.1 Hz); 2.64 (3H, s). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 196.6, 139.9, 132.5, 128.7, 117.9, 116.3, 26.7.

1-naphthonitrile (2s)[6]: Yield: 86%; White solid; Mp 33-35 ^{0}C (Lit.[5] 35-37 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 8.21 (1H, d, *J* = 8.4 Hz,), 8.02 (1H, d, *J* = 8.6 Hz), 7.76–7.83 (4H, m), 7.48 (1H, t, *J* = 7.8 Hz). ^{13}C NMR (75 MHz, $CDCl_3$); δ (ppm): 133.5, 132.9, 132.1, 131.8, 128.7, 128.1, 127.0, 125.6, 124.7, 118.1, 110.2.

Benzo[d][1,3]dioxole-5-carbonitrile (2t)[1]: Yield: 88%; White solid; Mp 92-94 ^{0}C; ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.41 (1H, s); 7.14-7.20 (1H, m), 6.98 (1H, d, *J* = 8.2 Hz), 6.01 (2H, s). ^{13}C NMR (75 MHz, $CDCl_3$); δ (ppm): 150.6, 148.2, 127.9, 119.0, 111.1, 108.8, 105.7, 101.3.

Cinnamonitrile (2u)[2]: Yield: 83%; Colorless oil; ^{1}H NMR ($CDCl_3$, 400 MHz); δ (ppm): 7.37-7.49 (6H, m), 5.83 (1H, d, *J* = 16.3 Hz). ^{13}C NMR (100 MHz, $CDCl_3$); δ (ppm): 150.1, 132.9, 131.4, 129.3, 127.5, 118.8, 95.8.

Furan-2-carbonitrile (2v)[1]: Yield: 79%; Viscous oil; ^{1}H NMR ($CDCl_3$, 400 MHz); δ (ppm): 7.58 (1H, d, *J* = 1.5 Hz), 6.96-7.02 (2H, m). ^{13}C NMR (100 MHz, $CDCl_3$); δ (ppm): 147.5, 132.2, 125.3, 119.8, 111.6.

Thiophene-2-carbonitrile (2w)[1]: Yield: 81%; Colorless liquid; ^{1}H NMR ($CDCl_3$, 400 MHz); δ (ppm): 7.60 (2H, d, *J* = 4.3 Hz), 7.01-7.06 (1H, m). ^{13}C NMR (100 MHz, $CDCl_3$); δ (ppm): 138.2, 131.4, 126.5, 118.1, 109.2.

Picolinonitrile (2x)[6]: Yield: 83%; Colorless liquid; ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 8.72 (1H, d, *J* = 4.5Hz), 7.62-7.71 (3H, m). ^{13}C NMR (75 MHz, $CDCl_3$); δ (ppm): 151.3, 135.7, 133.3, 127.6, 124.9, 117.6.

Isonicotinonitrile (2y)[7]: Yield: 80%; White solid; Mp 78-79 ^{0}C (Lit.[10] 77-78 ^{0}C); ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 8.82 (2H, d, *J* = 13.5 Hz); 7.55 (2H, d, *J* = 13.5 Hz). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 152.3, 126.8, 120.7, 117.3.

4-(benzyloxy)benzonitrile (2z)[6]: Yield: 86%; White solid; Mp 95-98 ^{0}C; ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.59-7.63 (2H, m); 7.38-7.44 (5H, m); 7.00-7.07 (2H, m); 5.14 (2H, s). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 161.9, 135.7, 134.0, 128.7, 128.4, 127.5, 119.2, 115.6, 104.3, 70.3.

4-(allyloxy)-3-methoxybenzonitrile (2za)[8]: Yield: 84%; Light yellow liquid; ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.24 (1H, d, *J* = 9.0 Hz); 7.08 (1H, s); 6.88 (1H, d, *J* = 8.4 Hz); 6.00-6.11 (1H, m); 5.31-5.45 (2H, m); 4.65 (2H, d, *J* = 4.8 Hz); 3.88 (3H, s). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 151.9, 149.5, 132.1, 126.2, 119.2, 118.8, 114.3, 112.9, 104.0, 69.7, 56.2.

4-((tert-butyldimethylsilyl)oxy)-3-methoxybenzonitrile (2zb)[9]: Yield: 85%; Colorless liquid; ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 7.05 (1H, s); 6.94 (2H, m); 3.89 (3H, s); 0.88 (9H, s); 0.06 (6H, s). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 150.2, 146.9, 126.9, 119.2, 115.4, 113.9, 103.1, 56.2, 25.6, 17.9, -3.64.

Heptanenitrile (2zc)[3]: Yield: 78%; Colorless liquid; ^{1}H NMR ($CDCl_3$, 300 MHz); δ (ppm): 1.56 (3H, t); 1.24-1.30 (7H, m); 0.88 (3H, t). ^{13}C NMR ($CDCl_3$, 75 MHz); δ (ppm): 119.2, 31.9, 30.5, 29.3, 28.8, 22.6, 14.0.

Pentanenitrile (2zd)[12]: Yield: 79%; Colorless liquid; ^{1}H NMR ($CDCl_3$, 500 MHz); δ (ppm): 2.32 (2H, t, J = 7.2 Hz); 1.61-1.63 (2H, m); 1.46-1.47 (2H, m); 0.93 (3H, t, J = 7.4 Hz). ^{13}C NMR ($CDCl_3$, 125 MHz); δ (ppm): 119.9, 27.4, 21.9, 16.9, 13.3.

2-Phenylacetonitrile (2ze)[6]: Yield: 84%; Colorless liquid; ^{1}H NMR ($CDCl_3$, 500 MHz); δ (ppm): 7.32-7.36 (5H, m); 3.74 (2H, s). ^{13}C NMR ($CDCl_3$, 125 MHz); δ (ppm): 130.0, 129.2, 128.1, 128.0, 117.9, 23.7.

^{1}H NMR & ^{13}C NMR Spectra of the Representative Compounds

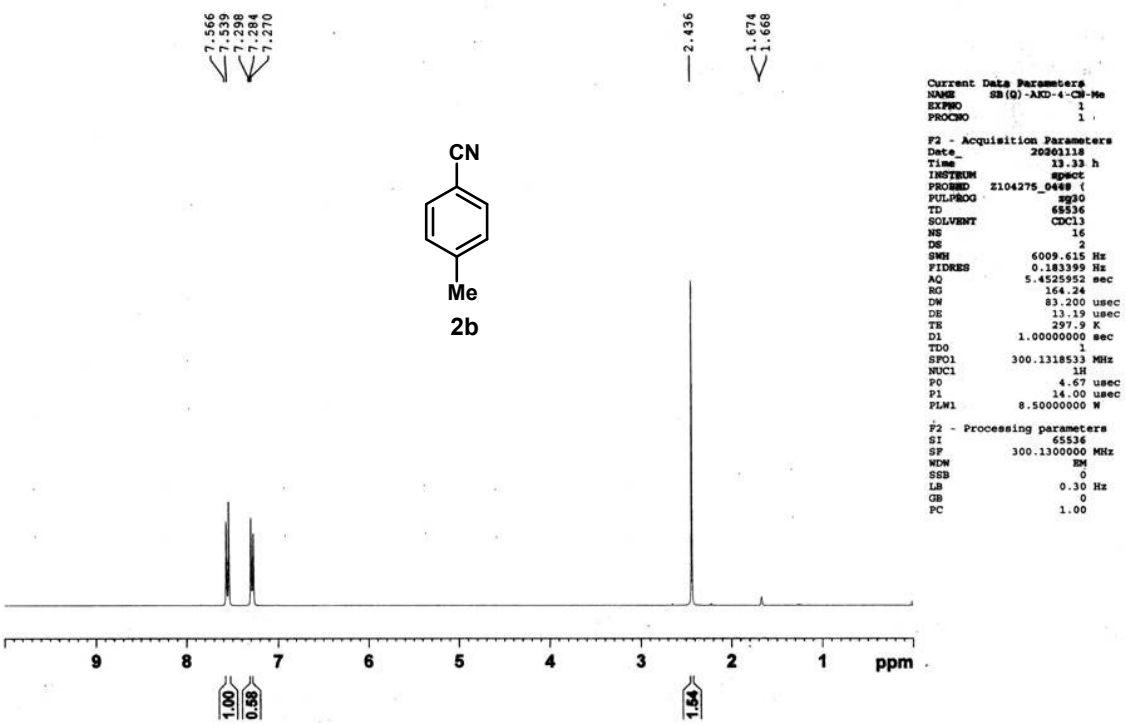

Figure 1 ^{1}H NMR of 4-tolunitrile (2b)

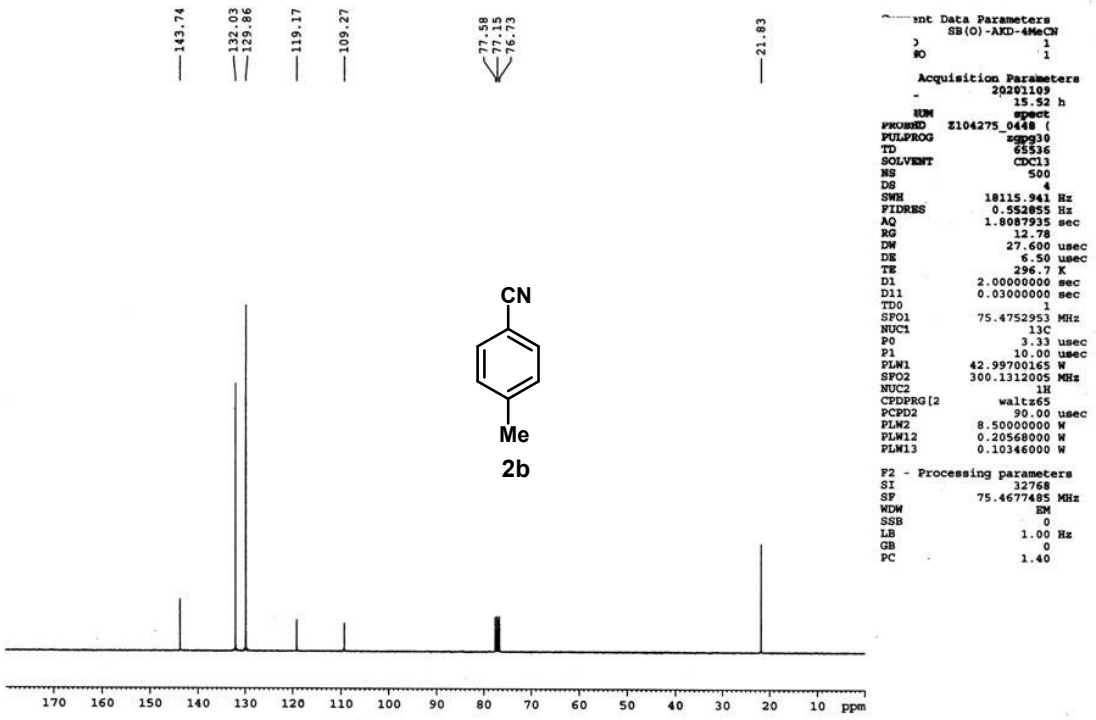

Figure 2 ^{13}C NMR of 4-tolunitrile (2b)

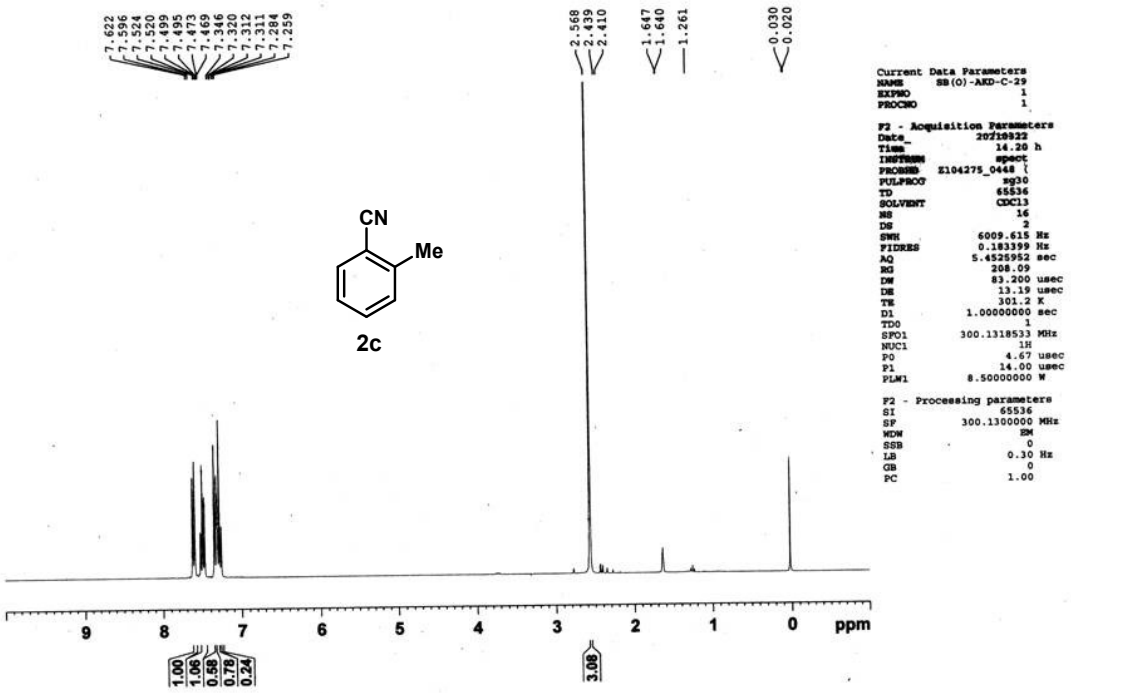

Figure 3 ^{1}H NMR of 2-tolunitrile (2c)

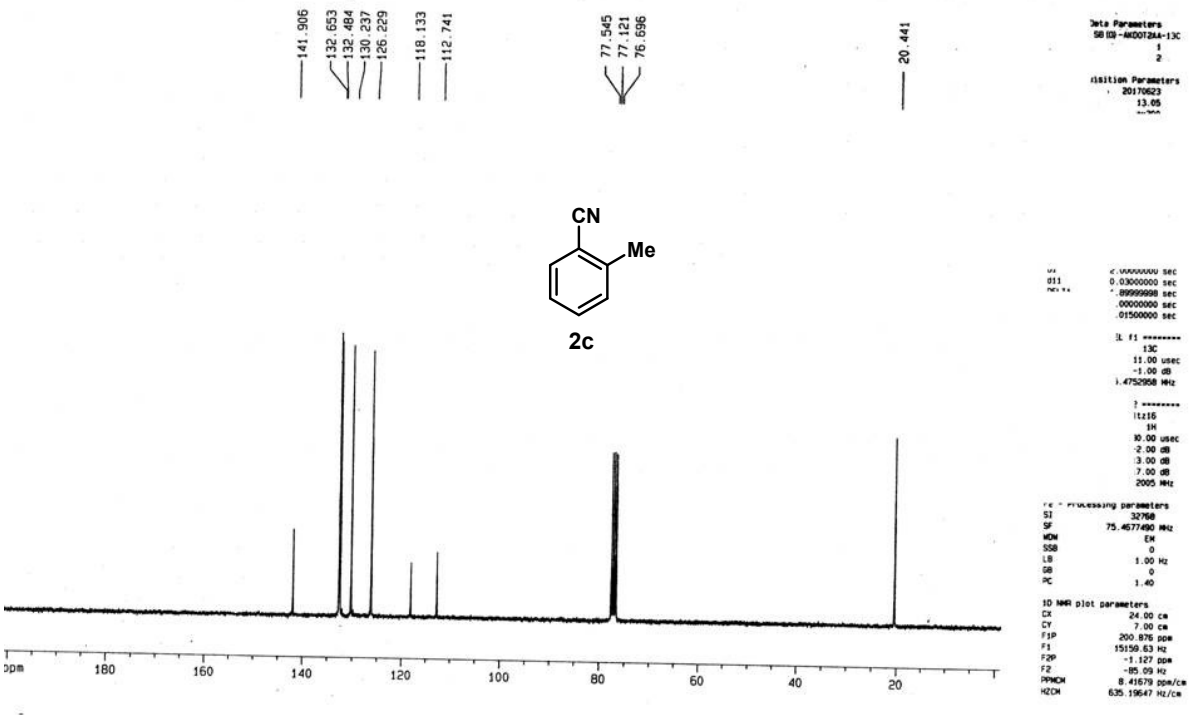

Figure 4 ^{13}C NMR of 2-tolunitrile (2c)

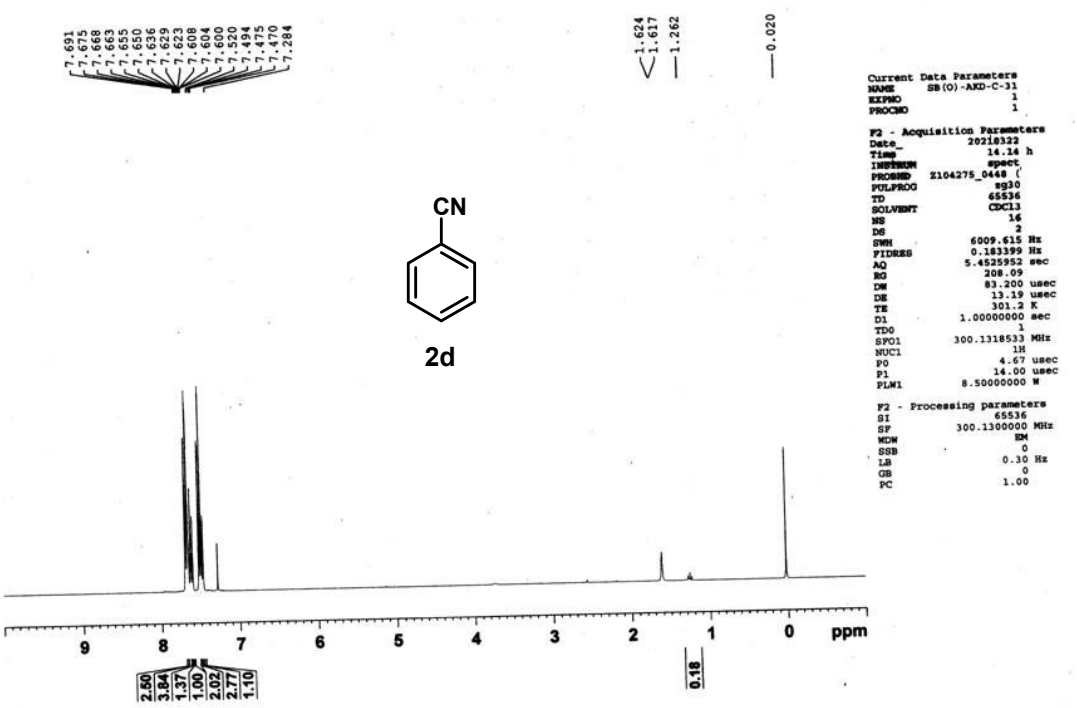

Figure 5 ^{1}H NMR of Benzonitrile (2d)

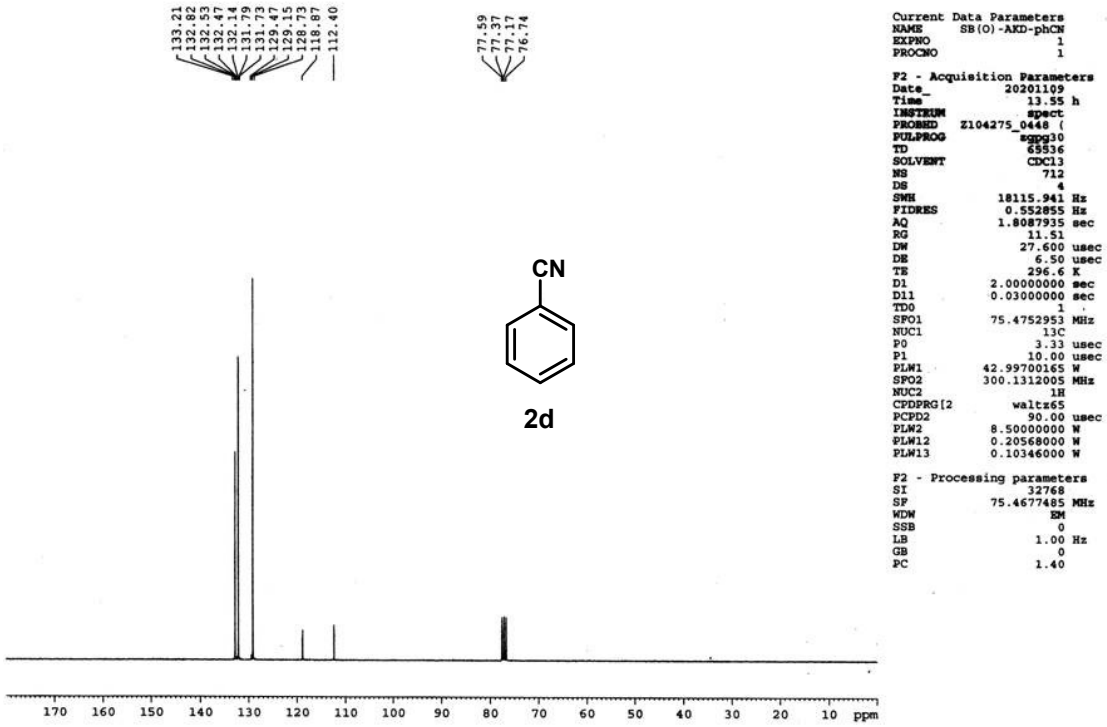

Figure 6 ^{13}C NMR of Benzonitrile (2d)

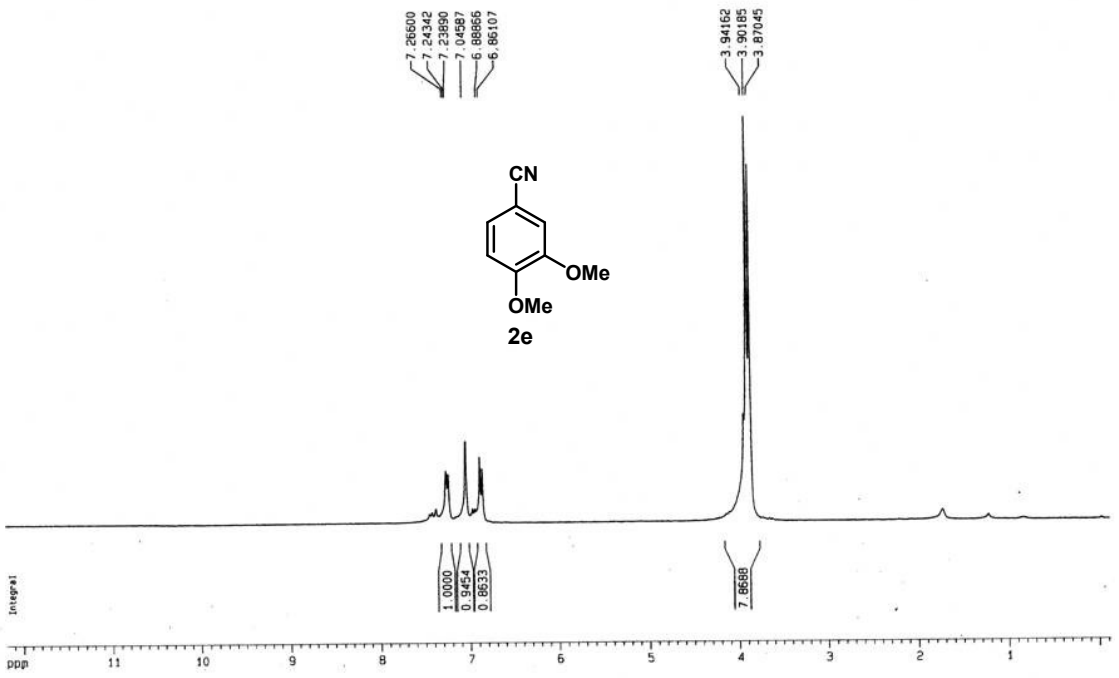

Figure 7 ^{1}H NMR of 3, 4-dimethoxybenzonitrile (2e)

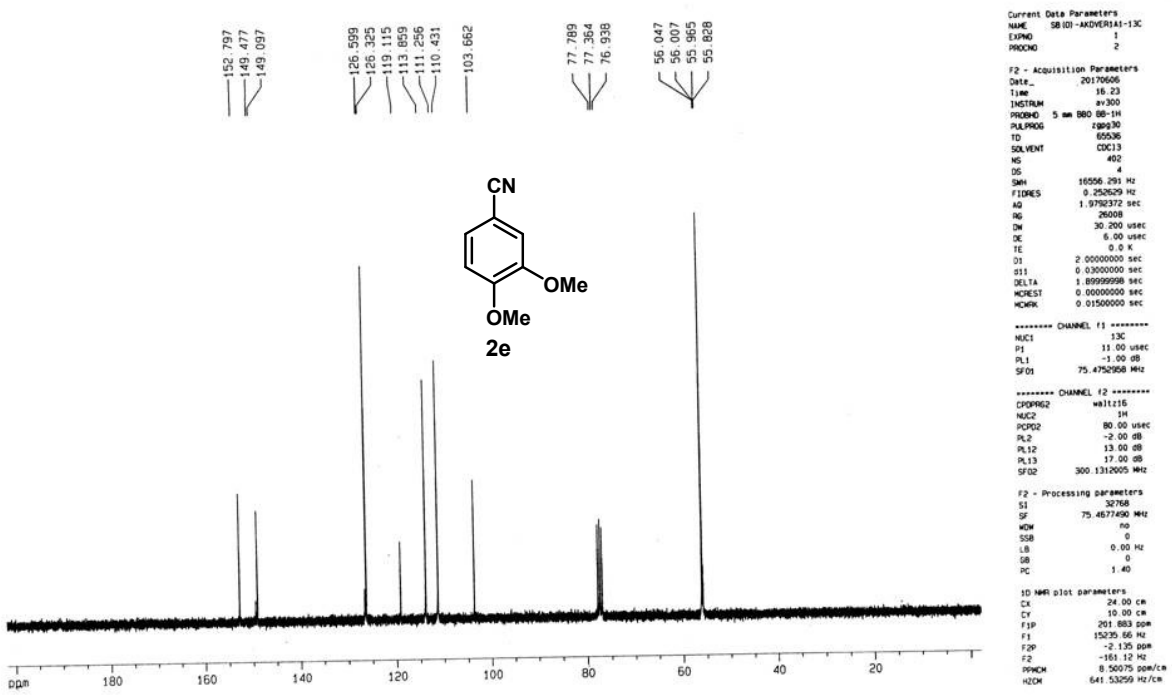

Figure 8 ^{13}C NMR of 3, 4-dimethoxybenzonitrile (2e)

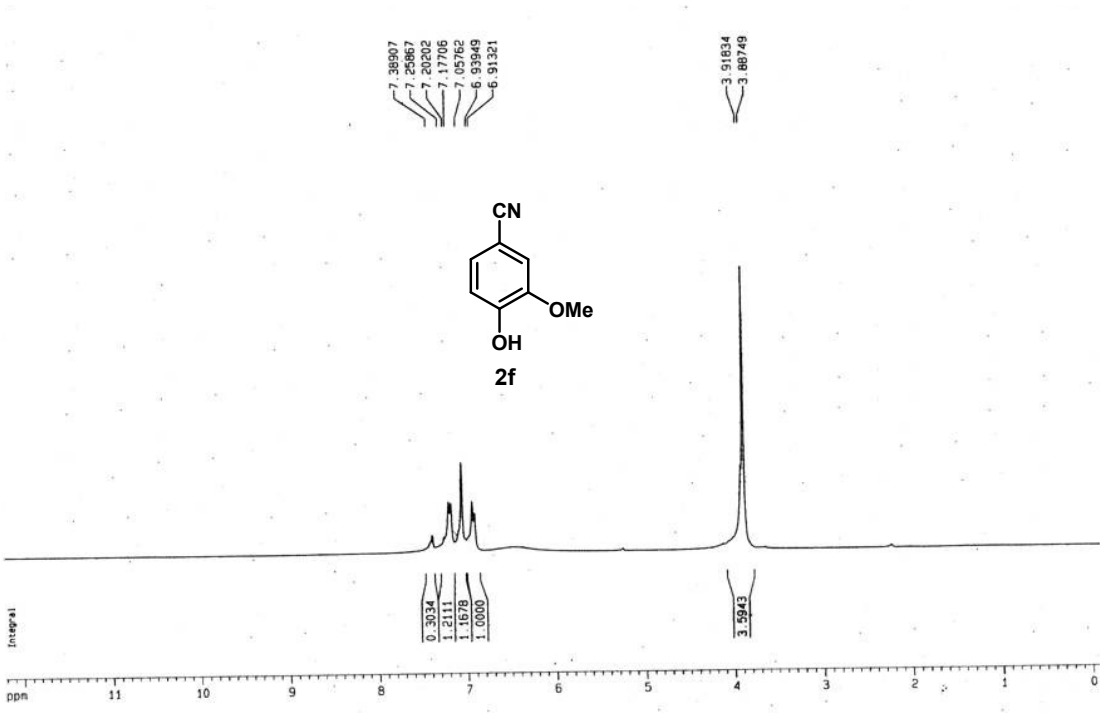

Figure 9 ^{1}H NMR of 4-hydroxy-3-methoxybenzonitrile (2f)

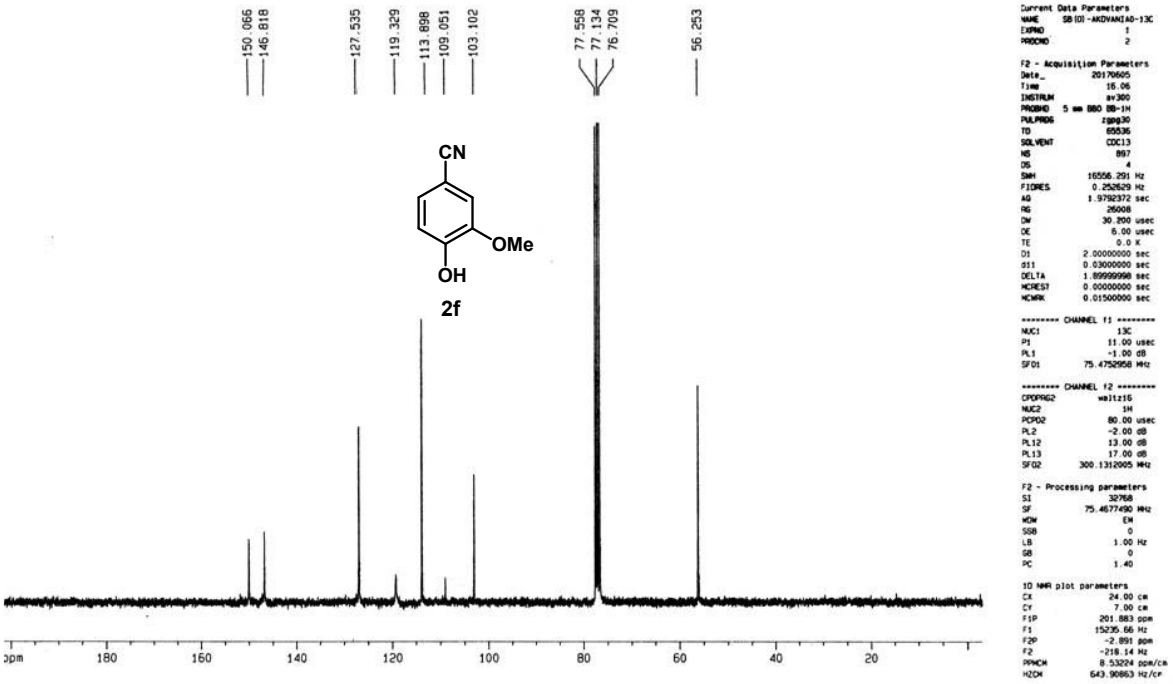

Figure 10 ^{13}C NMR of 4-hydroxy-3-methoxybenzonitrile (2f)

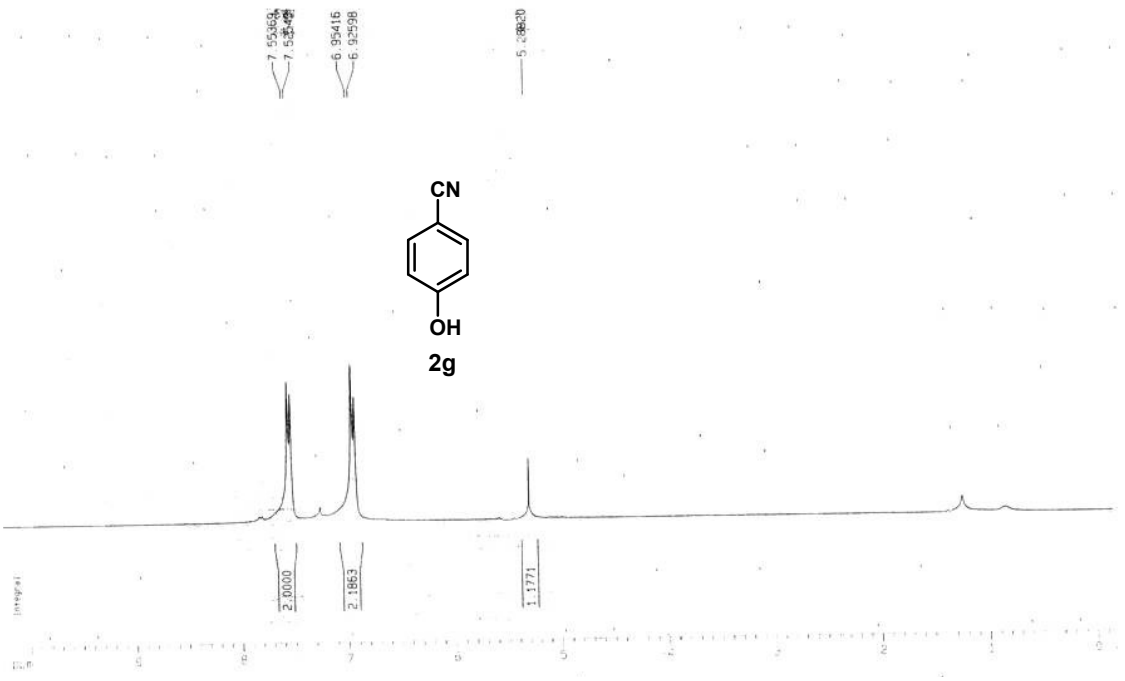

Figure 11 ^{1}H NMR of 4-hydroxybenzonitrile (2g)

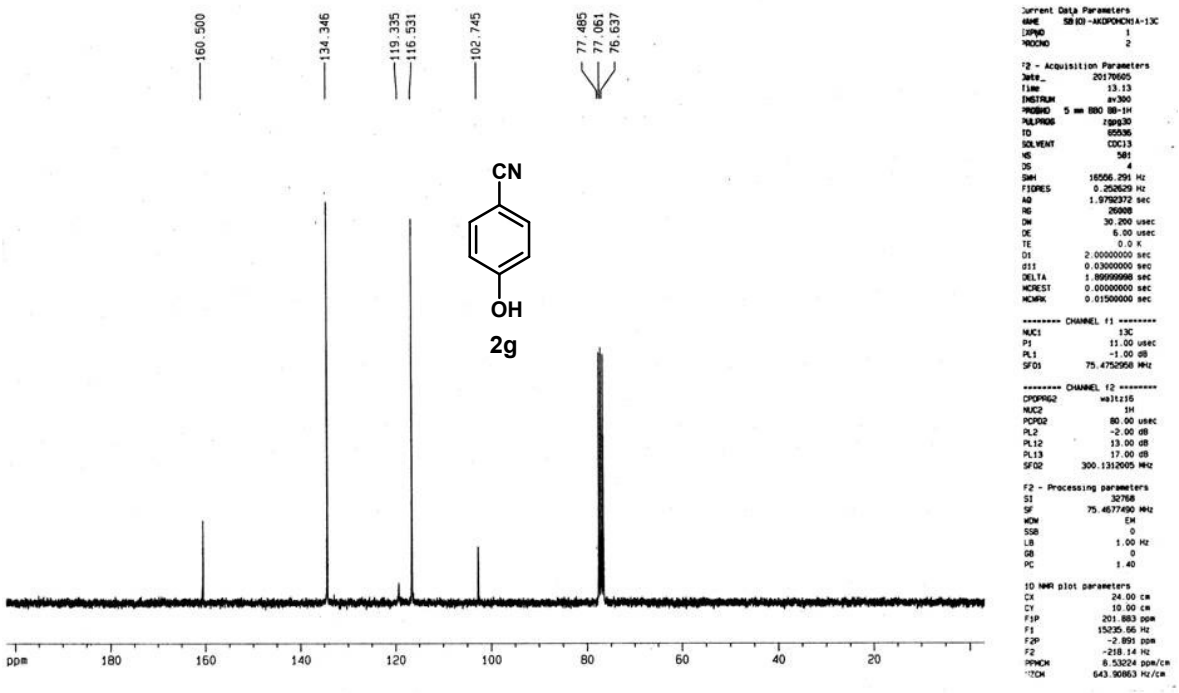

Figure 12 ^{13}C NMR of 4-hydroxybenzonitrile (2g)

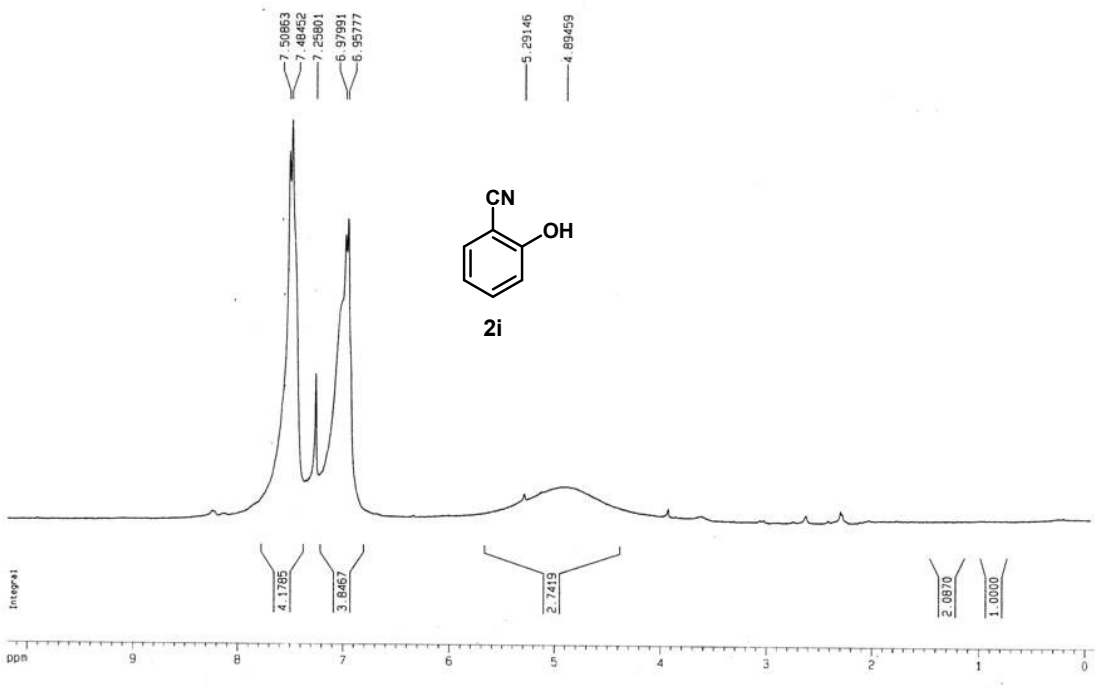

Figure 13 ^{1}H NMR of 2-hydroxybenzonitrile (2i)

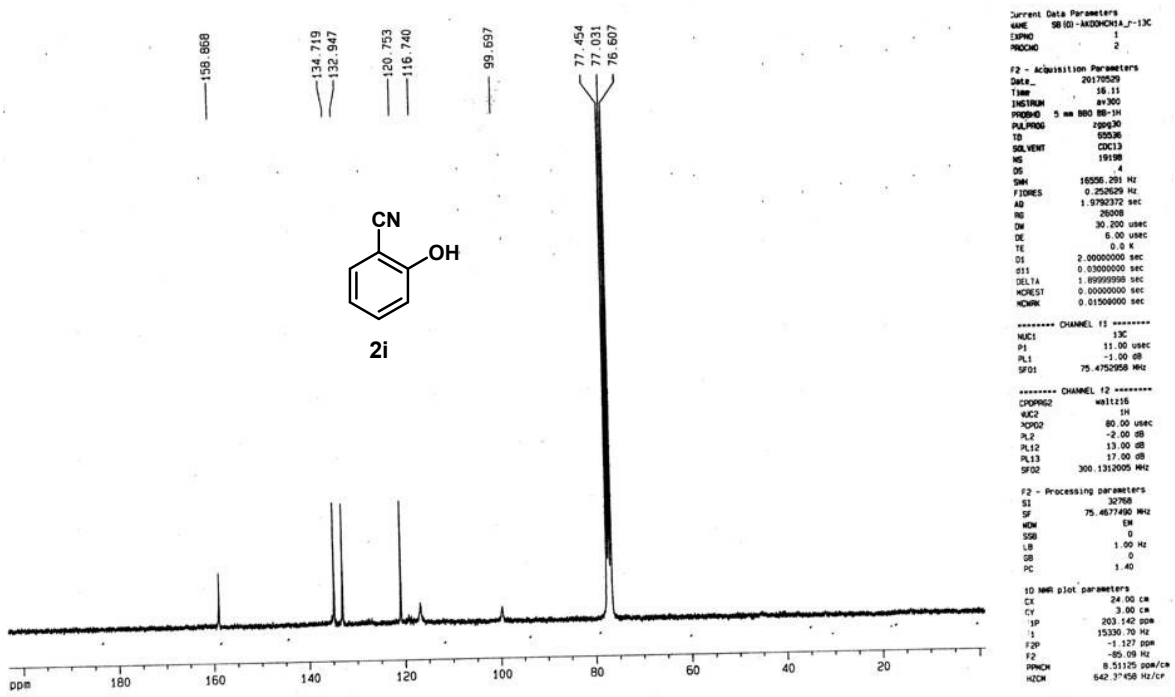

Figure 14 ^{13}C NMR of 2-hydroxybenzonitrile (2i)

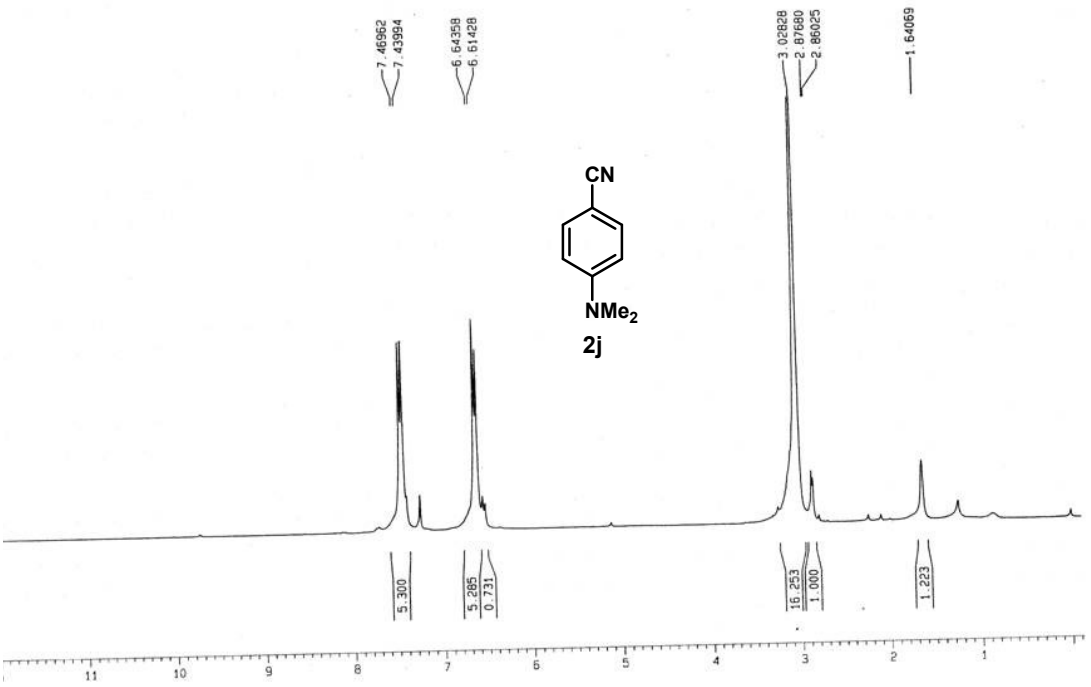

Figure 15 ^{1}H NMR of 4-(dimethylamino)benzonitrile (2j)

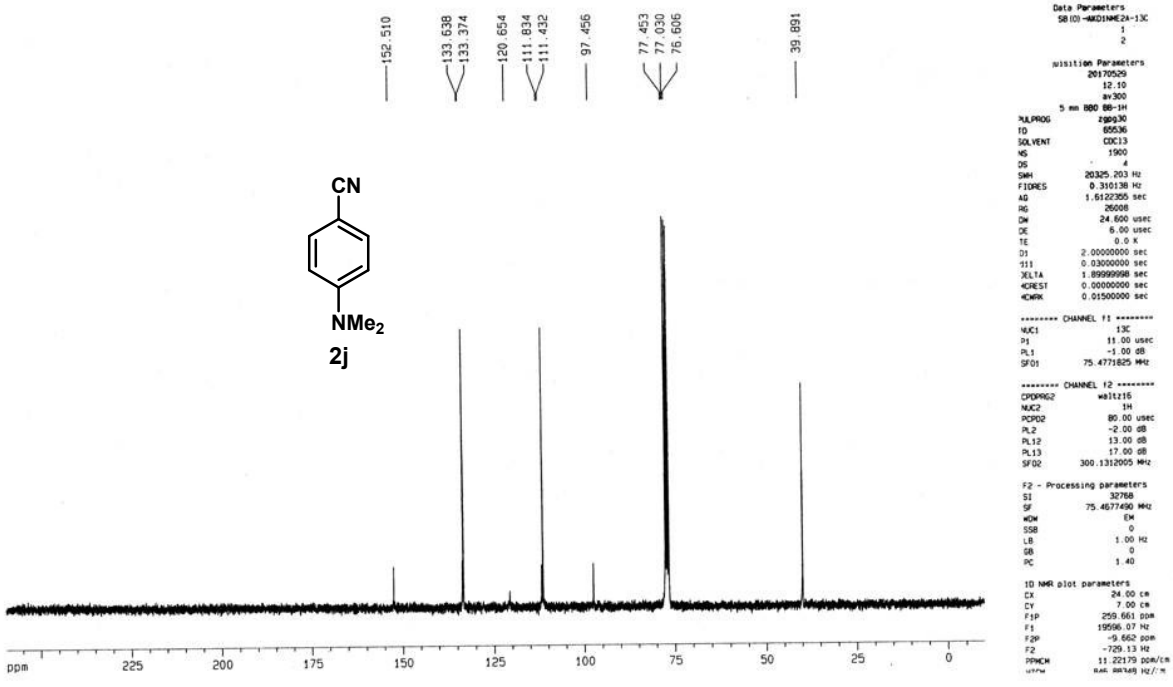

Figure 16 ^{13}C NMR of 4-(dimethylamino)benzonitrile (2j)

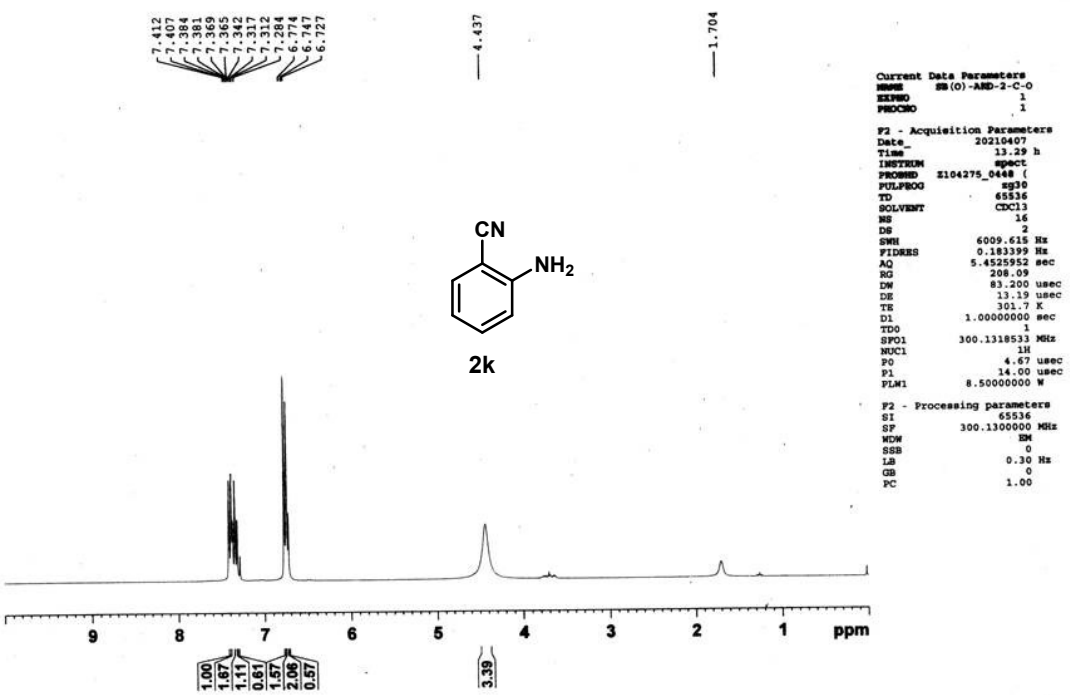

Figure 17 ^{1}H NMR of 2-aminobenzonitrile (2k)

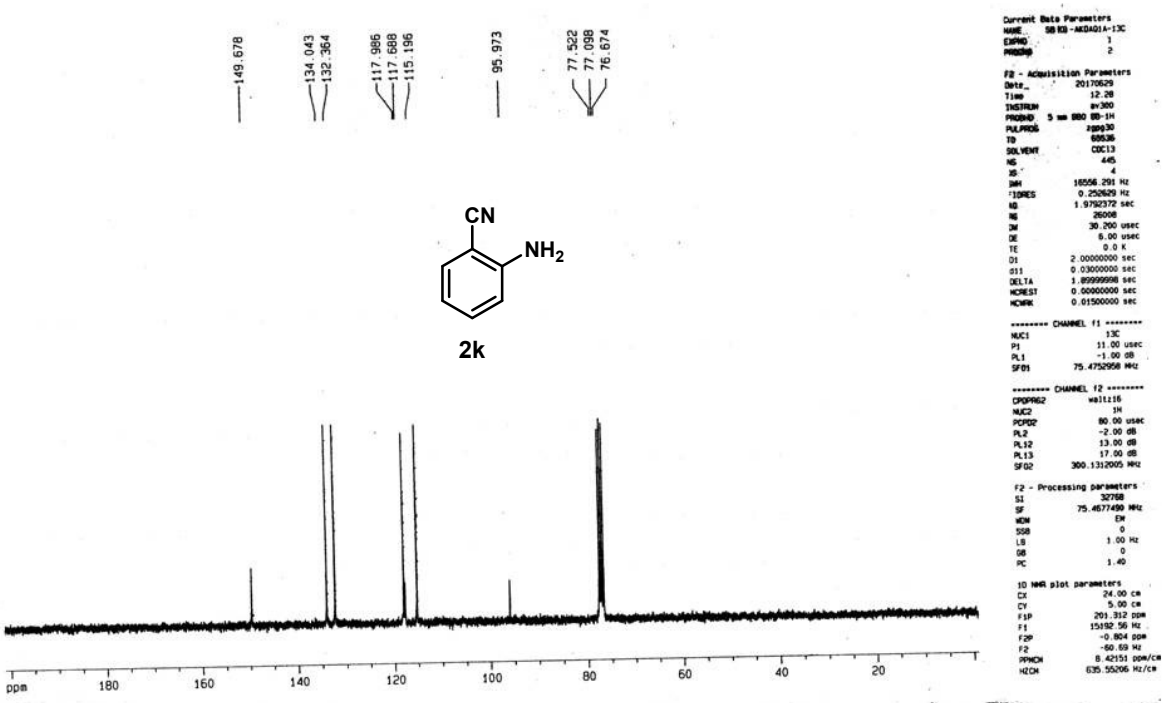

Figure 18 ^{13}C NMR of 2-aminobenzonitrile (2k)

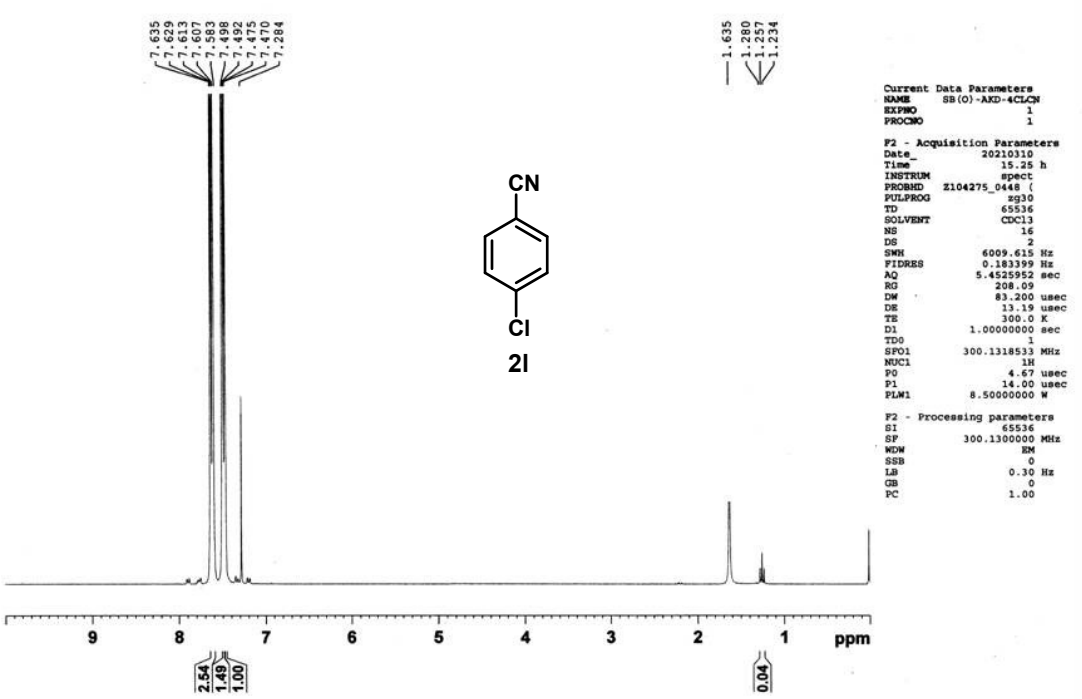

Figure 19 ^{1}H NMR of 4-chlorobenzonitrile (2l)

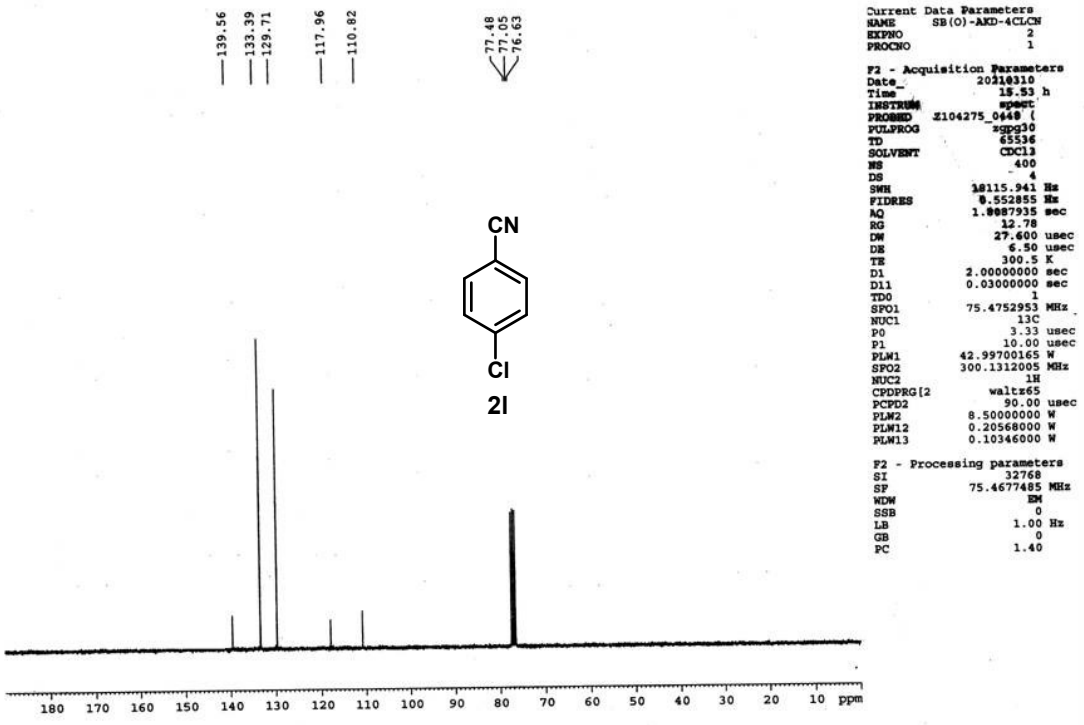

Figure 20 ^{13}C NMR of 4-chlorobenzonitrile (2l)

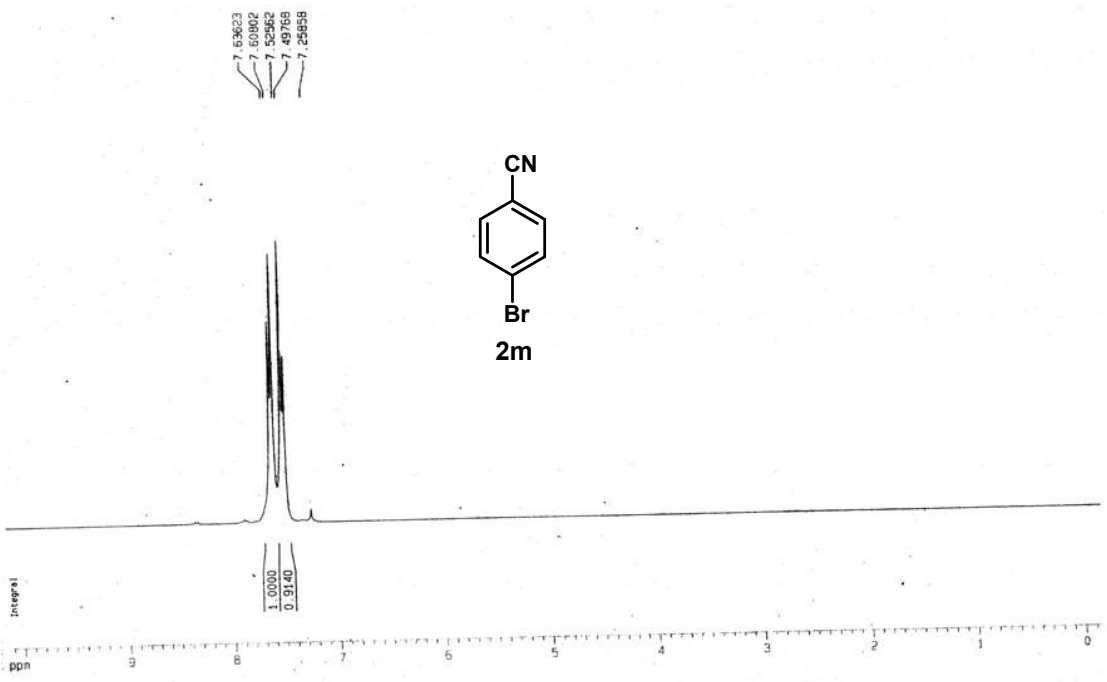

Figure 21 ^{1}H NMR of 4-bromobenzonitrile (2m)

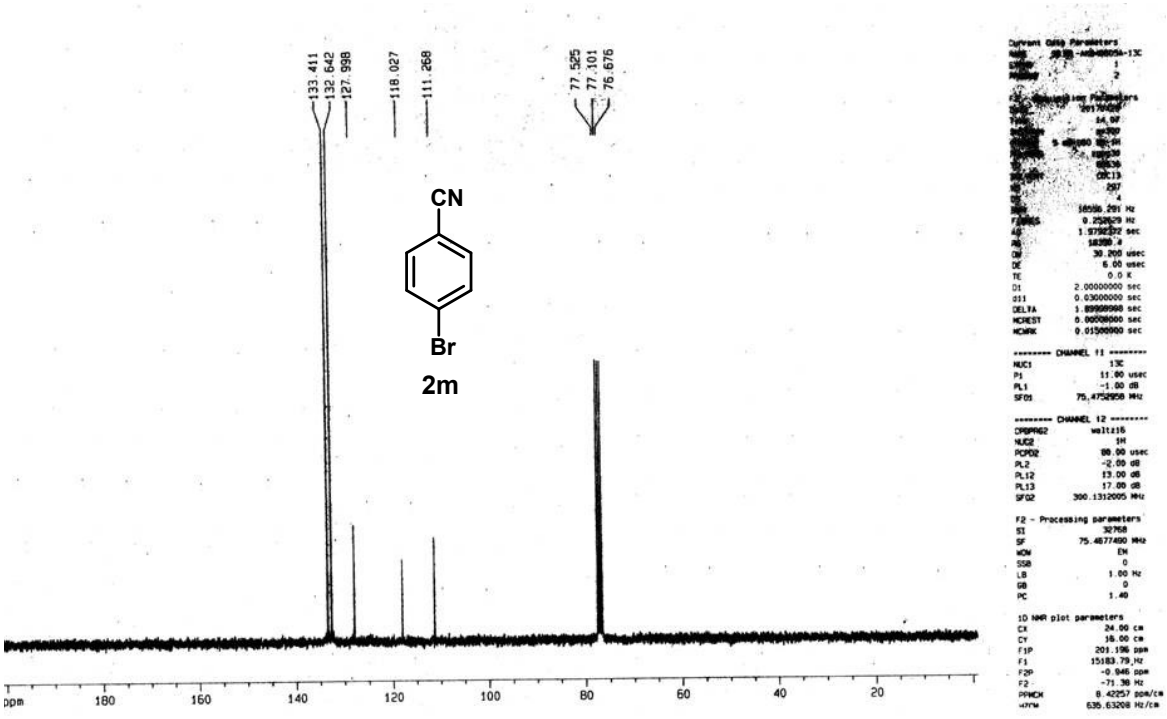

Figure 22 ^{13}C NMR of 4-bromobenzonitrile (2m)

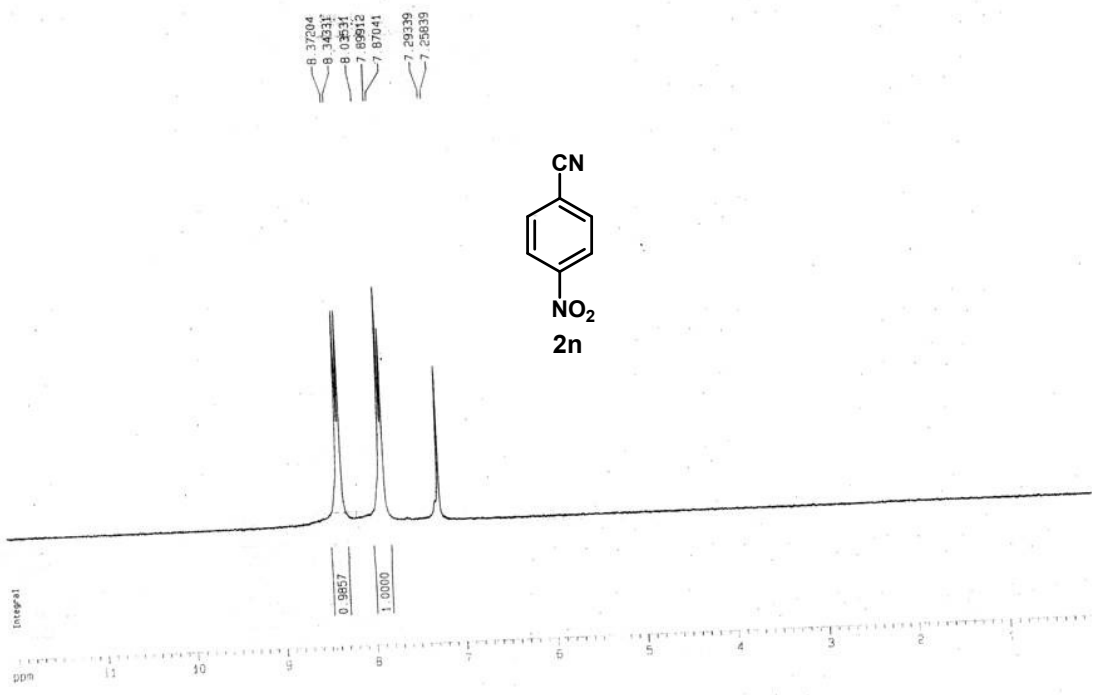

Figure 23 ^{1}H NMR of 4-nitrobenzonitrile (2n)

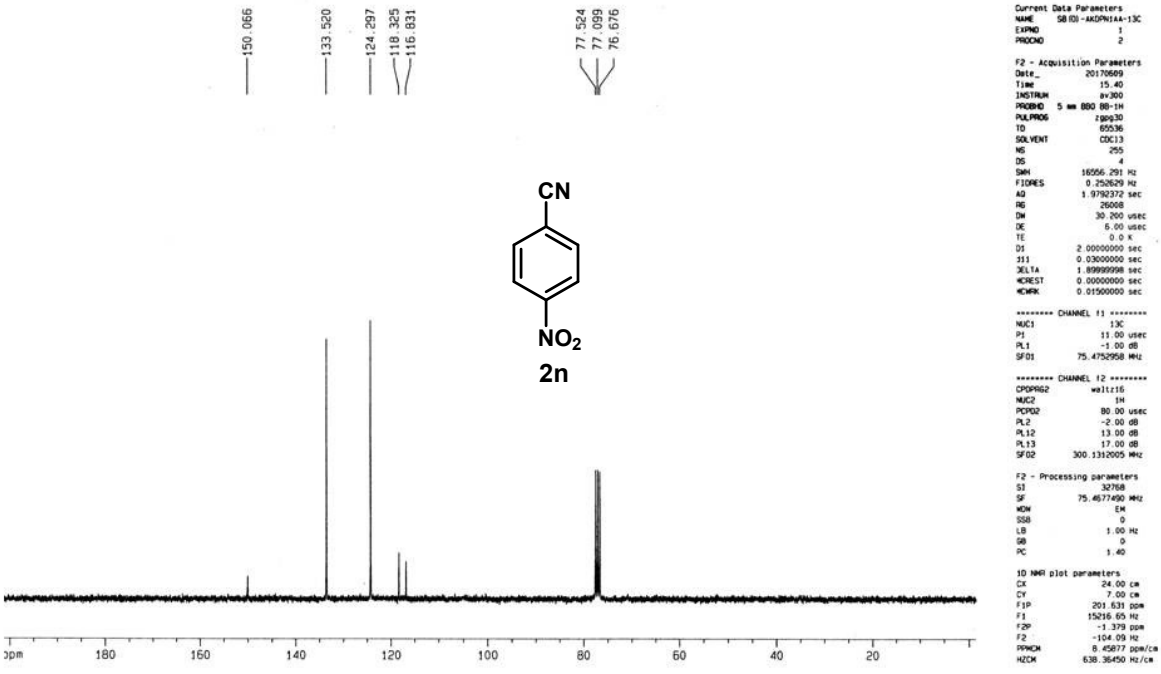

Figure 24 ^{13}C NMR of 4-nitrobenzonitrile (2n)

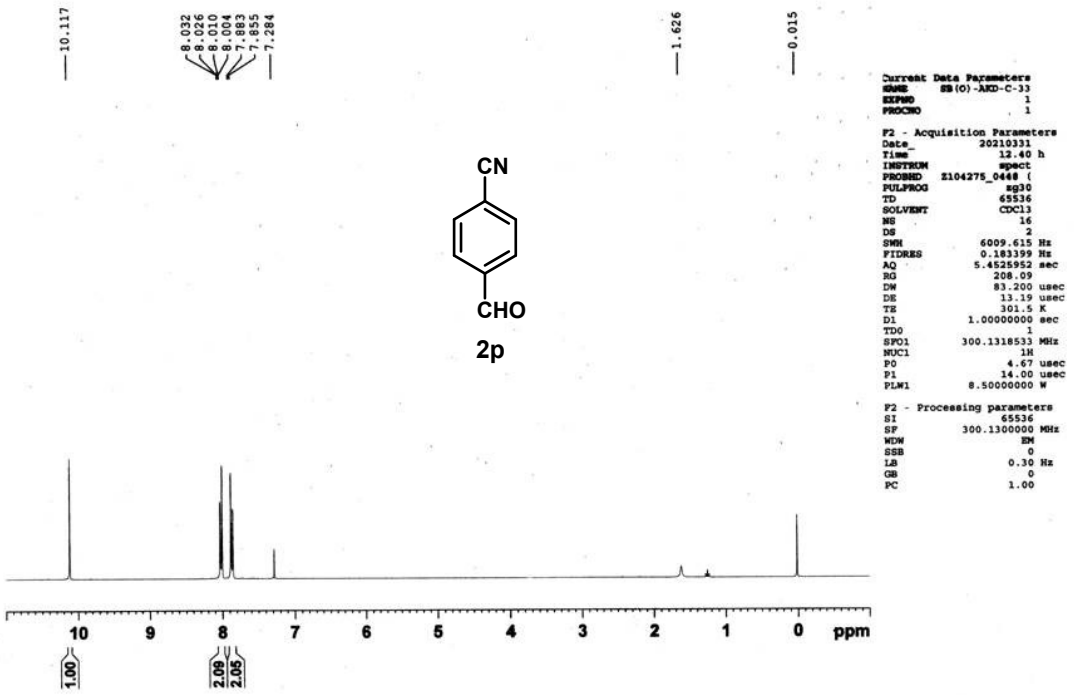

Figure 25 ^{1}H NMR of 4-formylbenzonitrile (2p)

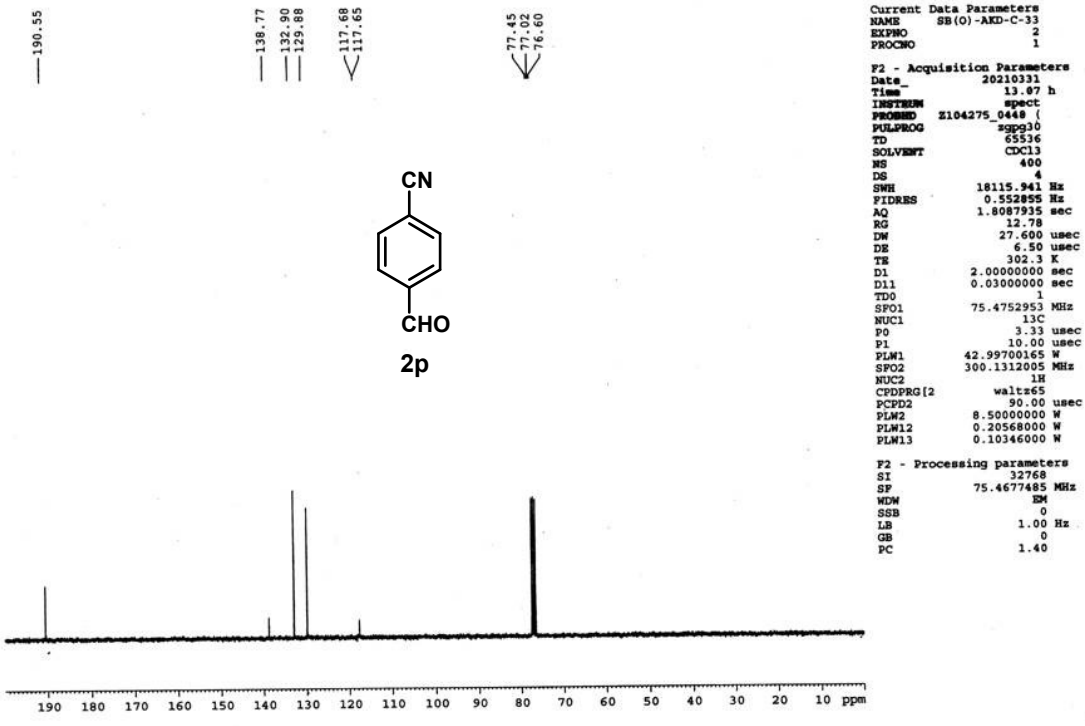

Figure 26 ^{13}C NMR of 4-formylbenzonitrile (2p)

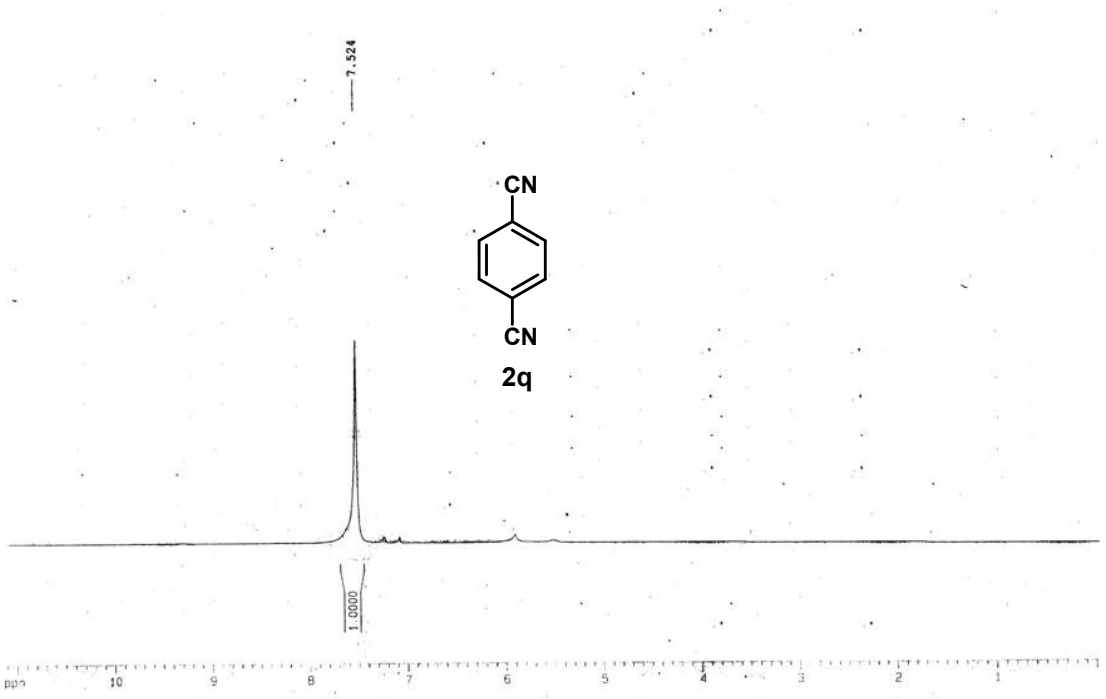

Figure 27 ^{1}H NMR of Terephthalonitrile (2q)

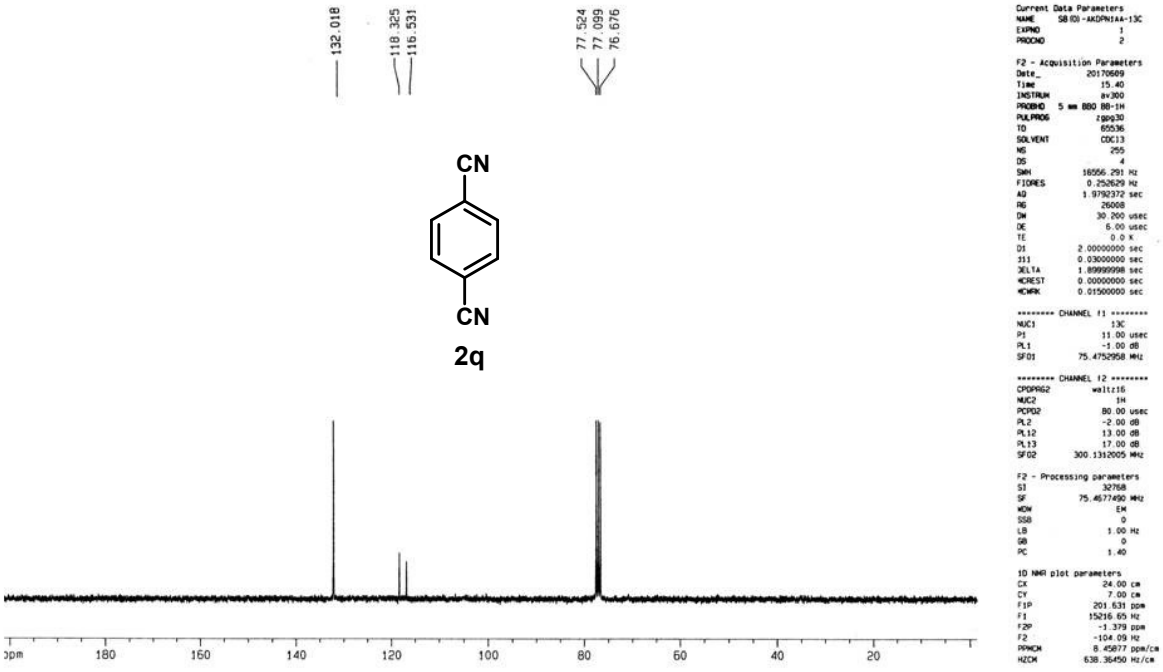

Figure 28 ^{13}C NMR of Terephthalonitrile (2q)

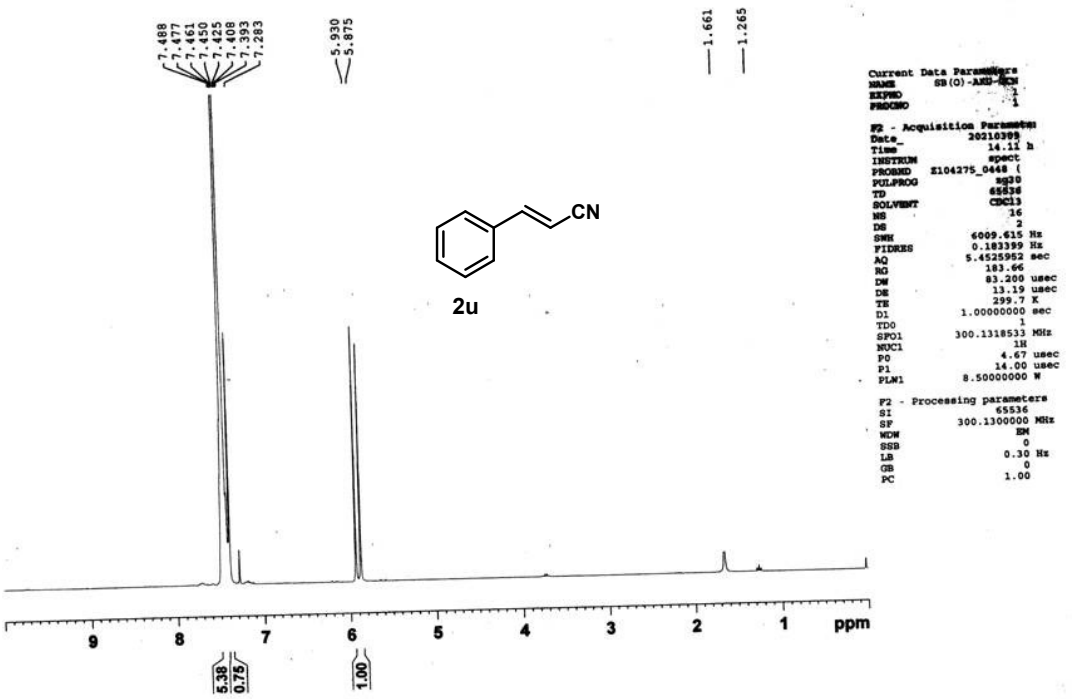

Figure 29 ^{1}H NMR of Cinnamonitrile (2u)

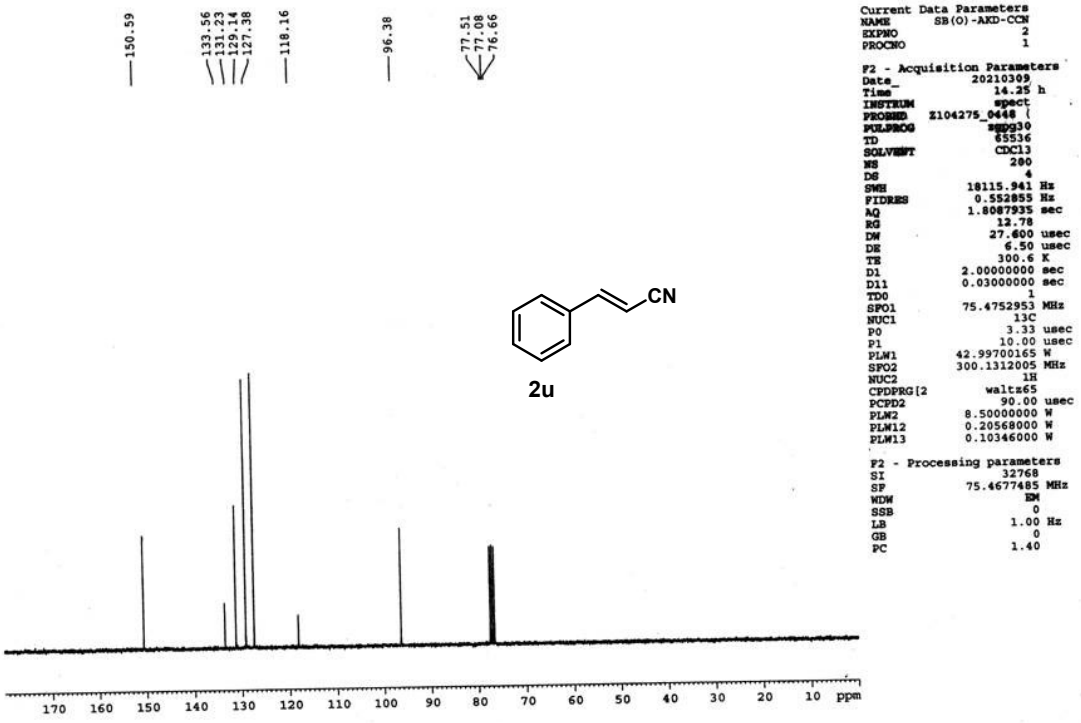

Figure 30 ^{13}C NMR of Cinnamonitrile (2u)

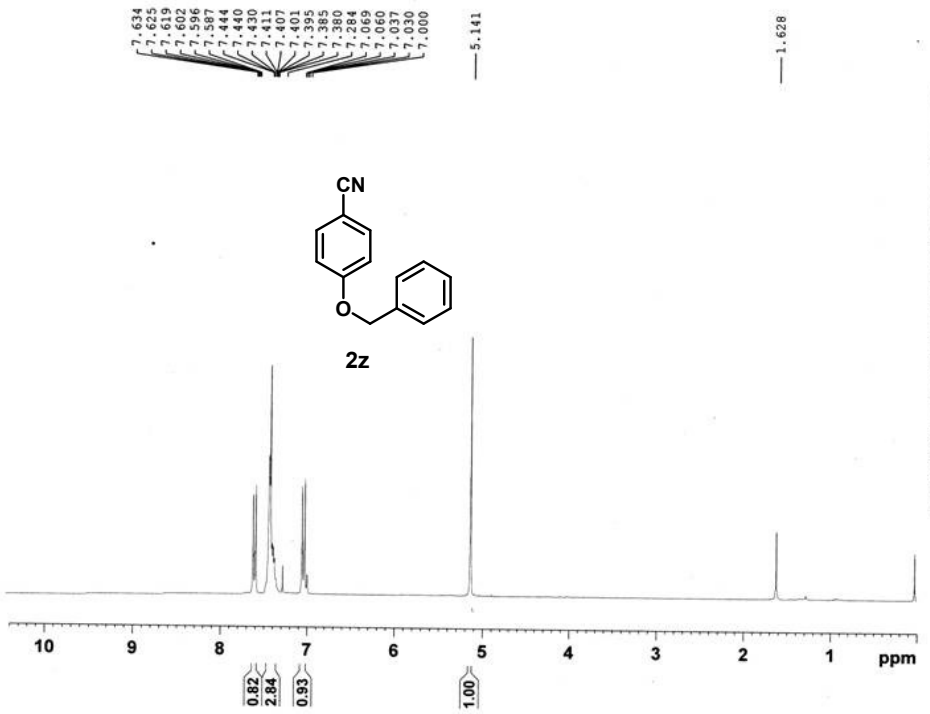

Figure 31 ^{1}H NMR of 4-(benzyloxy)benzonitrile (2z)

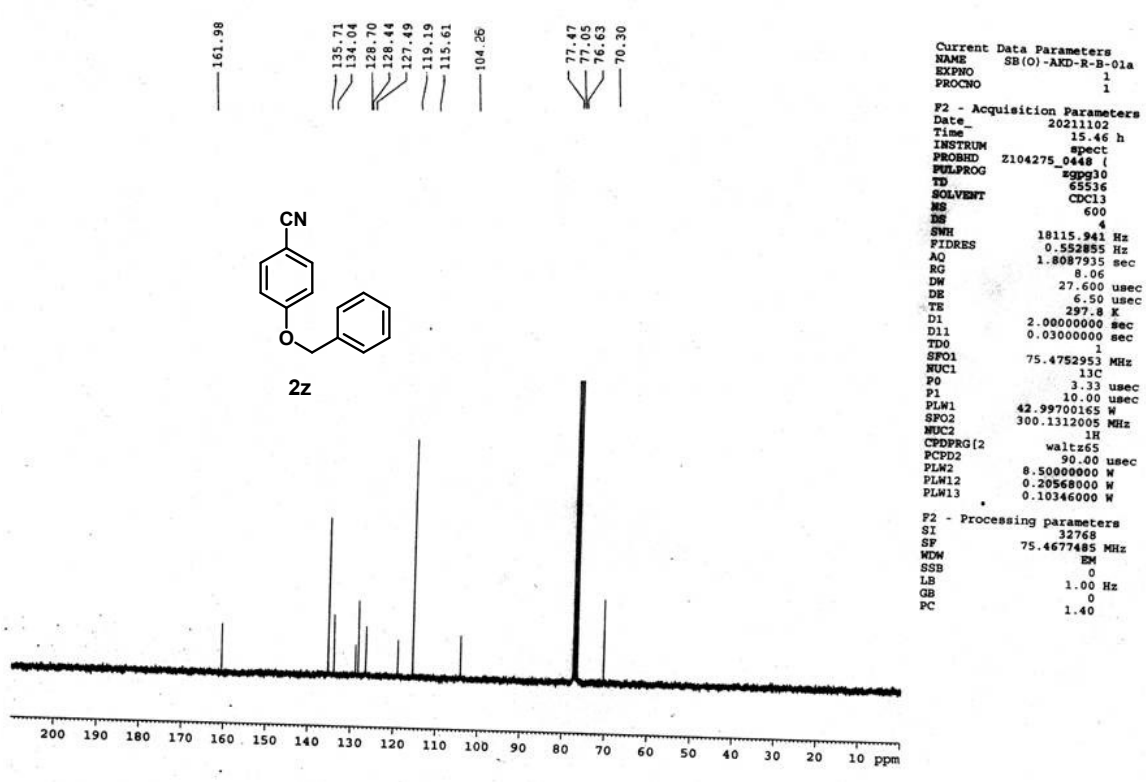

Figure 32 ^{13}C NMR of 4-(benzyloxy)benzonitrile (2z)

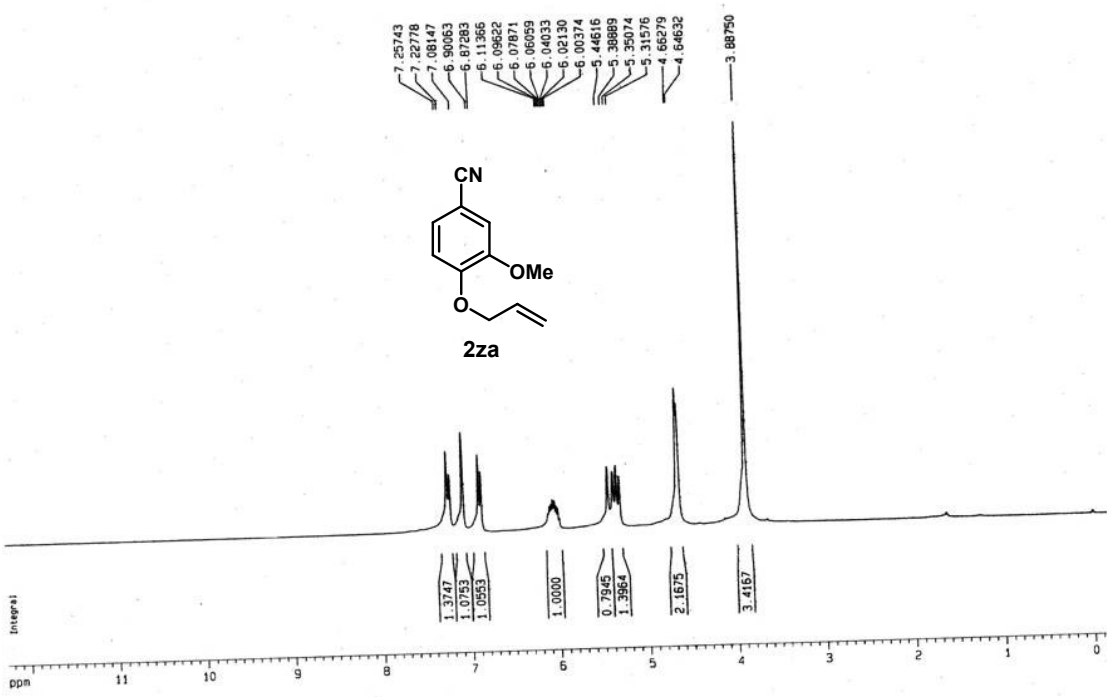

Figure 33 ^{1}H NMR of 4-(allyloxy)-3-methoxybenzonitrile (2za)

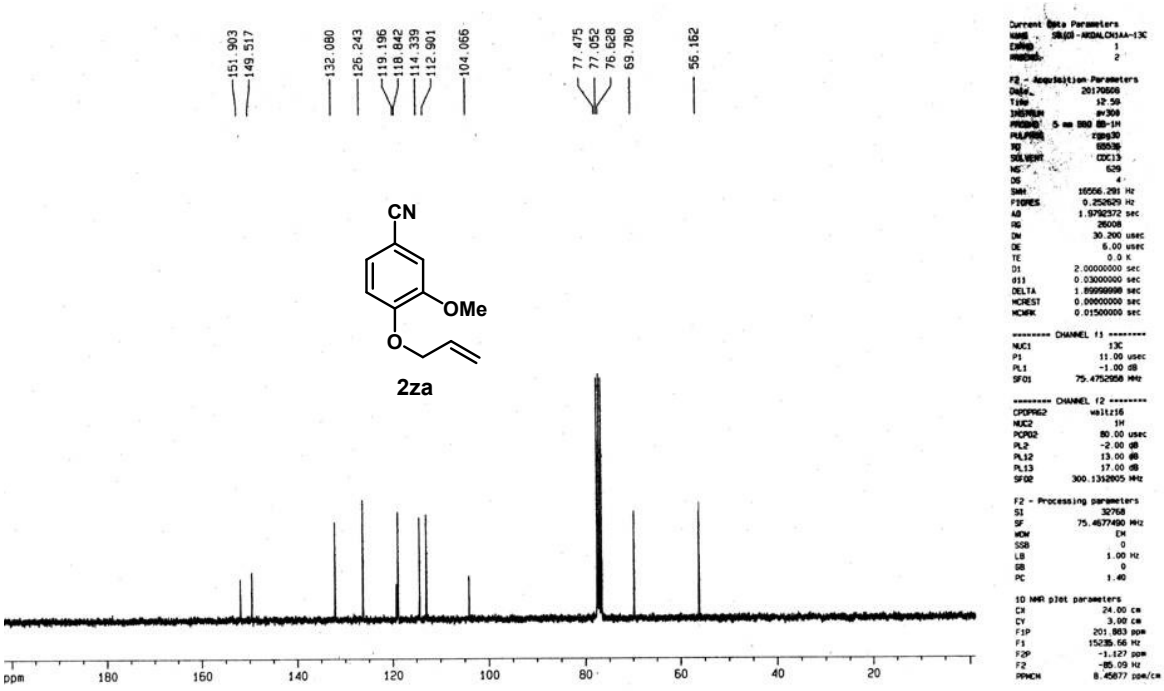

Figure 34 ^{13}C NMR of 4-(allyloxy)-3-methoxybenzonitrile (2za)

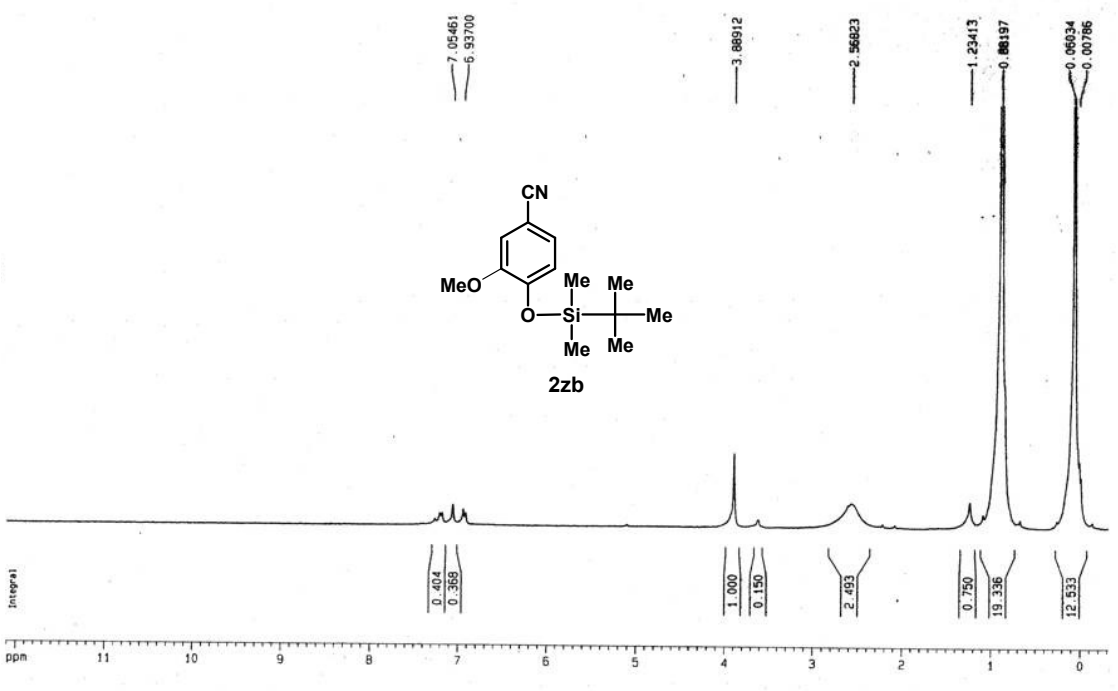

Figure 35 ^{1}H NMR of 4-((tert-butyldimethylsilyl)oxy)-3-methoxybenzonitrile (2zb)

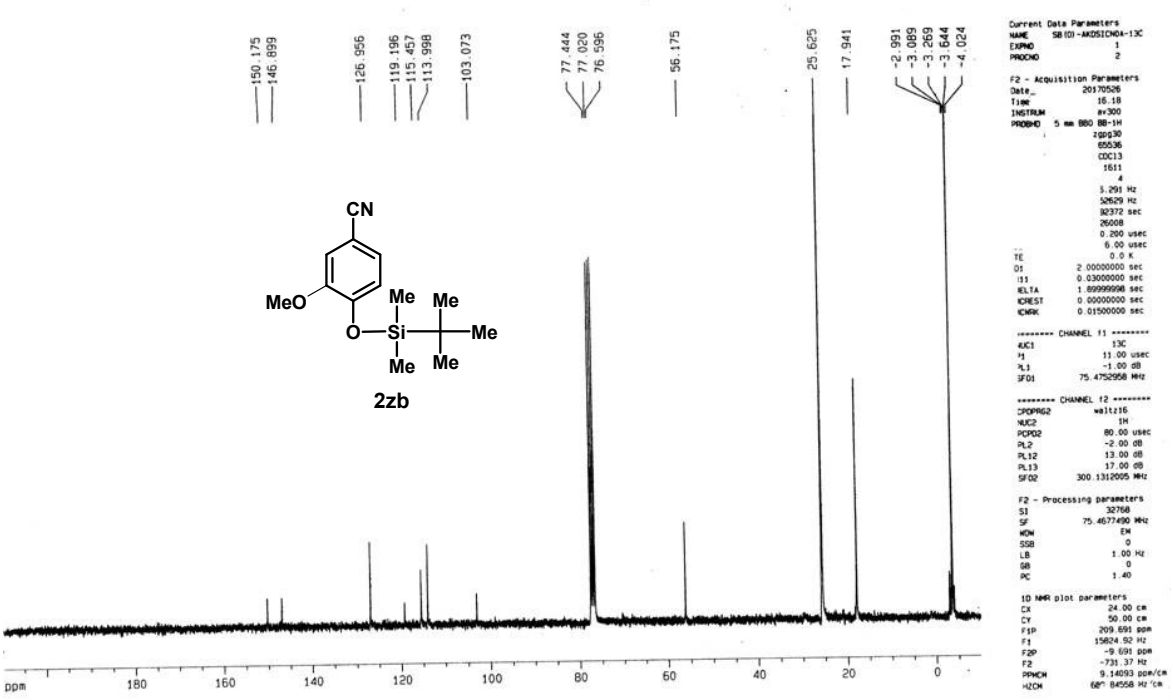

Figure 36 ^{13}C NMR of 4-((tert-butyldimethylsilyl)oxy)-3-methoxybenzonitrile (2zb)

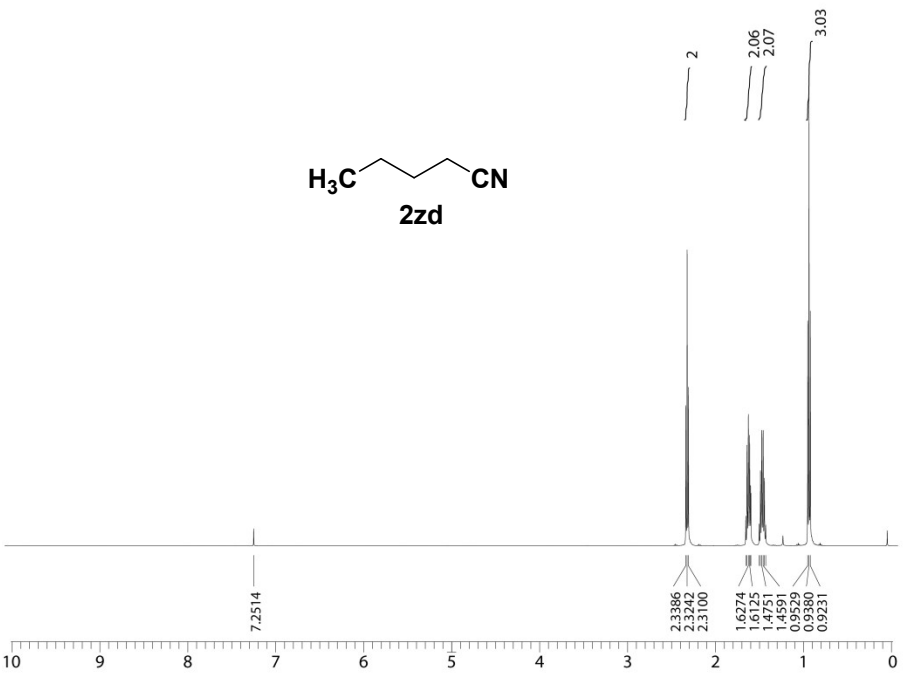

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Figure 37 ^{1}H NMR of Pentanenitrile (2zd)

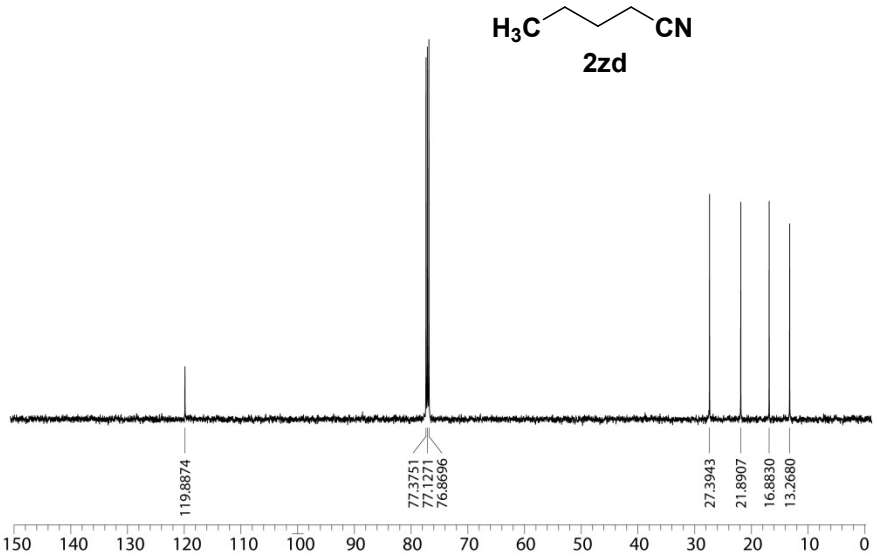

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Figure 38 ^{13}C NMR of Pentanenitrile (2zd)

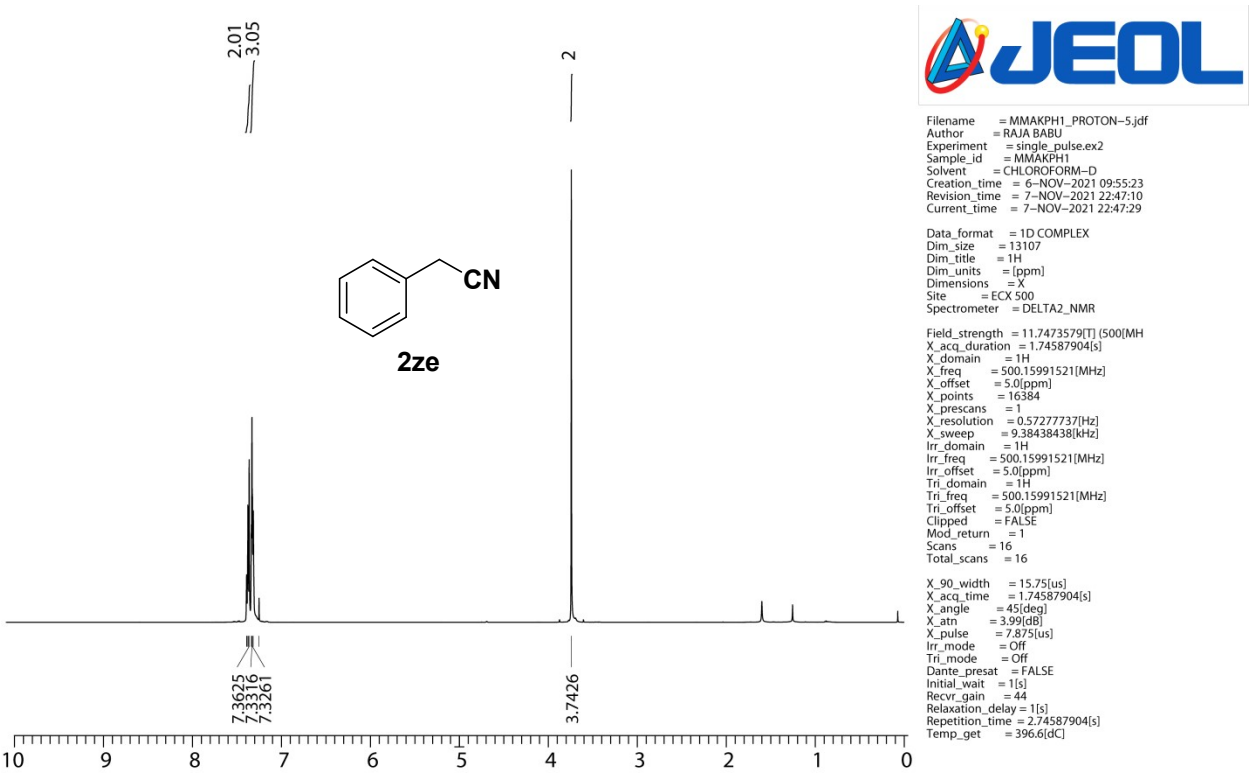

Figure 39 ^{1}H NMR of 2-Phenylacetonitrile (2ze)

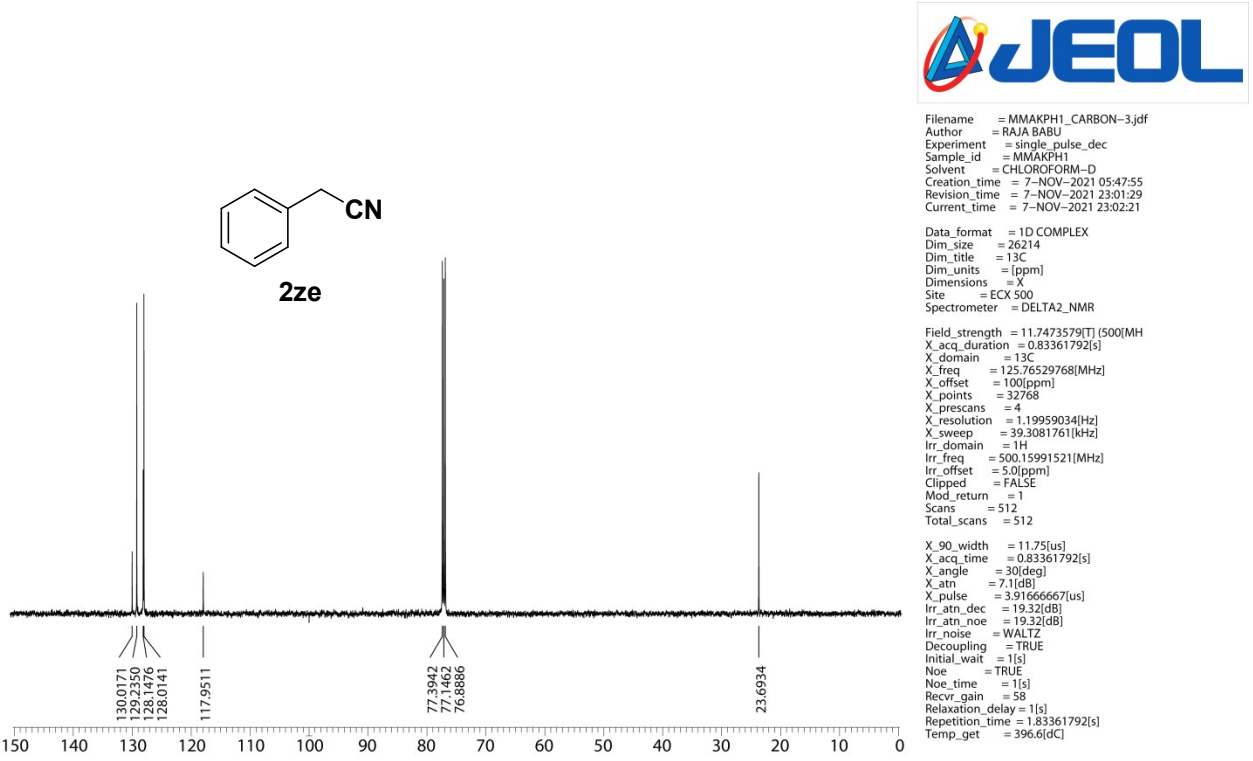

Figure 40 ^{13}C NMR of 2-Phenylacetonitrile (2ze)

References:

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