Supporting Information

Transition-Metal-Free Regioselective Hydroamination of Styrenes with Amino-Heteroarenes

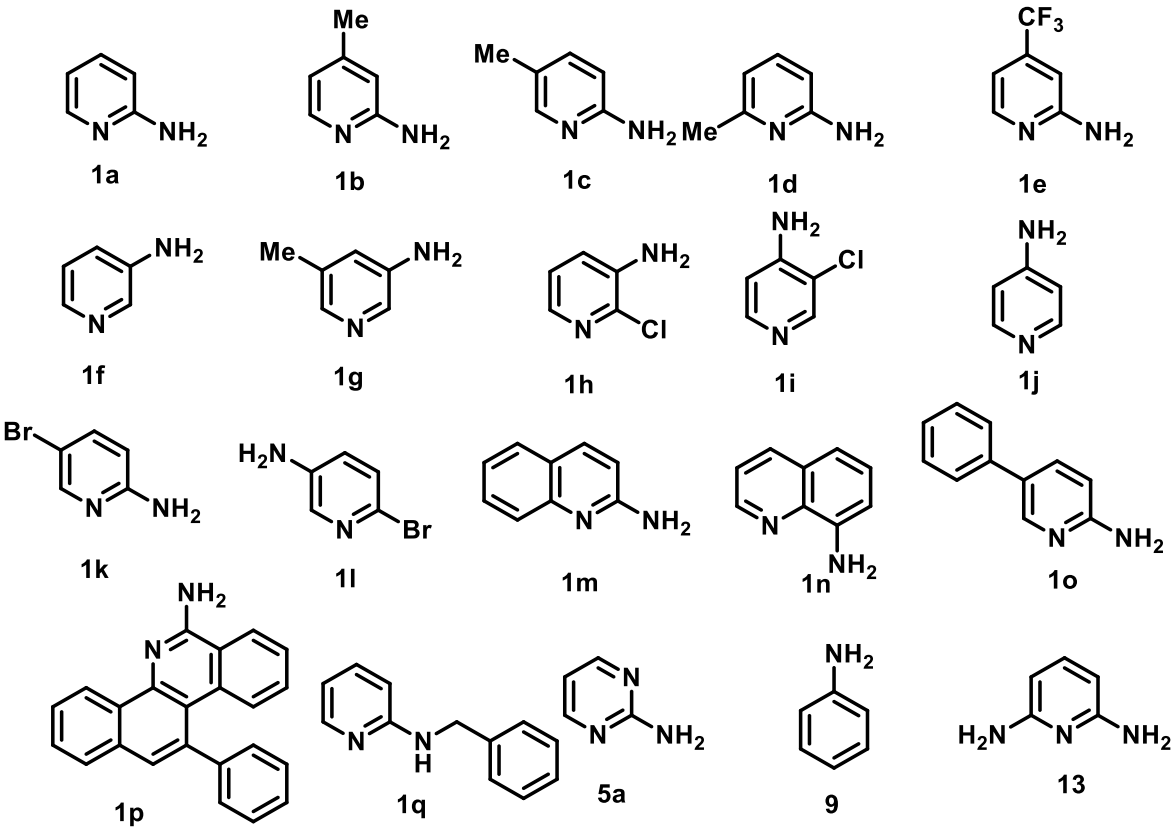
Priyanka Meena,[a] Ayushee,[a] Monika Patel,[a,b] and Akhilesh K. Verma [a,c]*

[a]Department of Chemistry, University of Delhi, Delhi-110007, India
[b]Department of Chemistry, Ramjas College, University of Delhi, Delhi-110007, India
[c]Institution of Eminence (IoE), University of Delhi, Delhi 110007

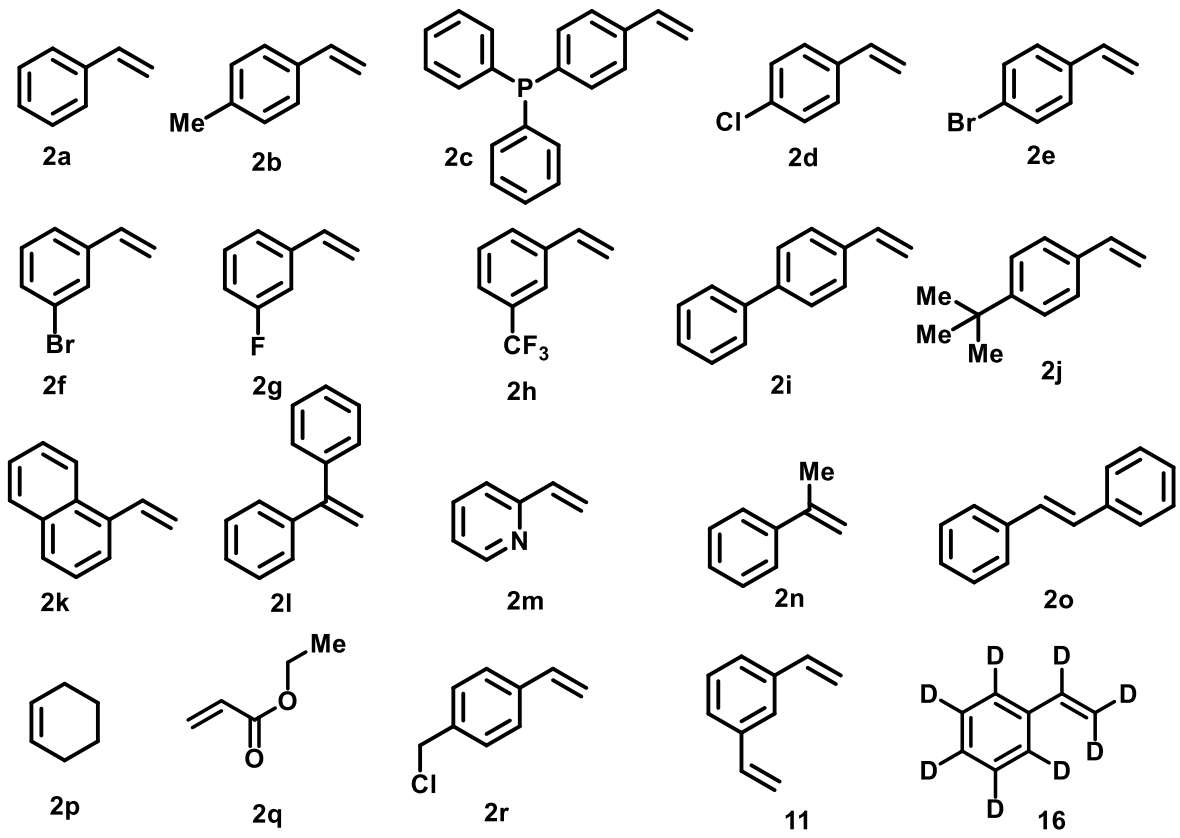
General Experimental

General Method. ^{1}H NMR (400 MHz) and ^{13}C NMR (100 MHz) spectra were recorded in $CDCl_3$/DMSO-d_6. Chemical shifts for protons and carbons are reported in ppm from tetra methyl silane and are referenced to the carbon resonance of the solvent. Data are reported as follows: chemical shift, multiplicity (s = singlet, br s = broad singlet, d = doublet, t = triplet, q = quartet, m = multiplet, dd = doublet of doublet), coupling constants in Hertz and integration. High-resolution mass spectra were recorded on electrospray mass spectrometer. TLC analysis was performed on commercially prepared 60 F_{254} silica gel plates and visualized by either UV irradiation or by staining with I_2. All purchased chemicals were used as received. All melting points are uncorrected.

Scope of Aminopyridine



Scope of Styrene



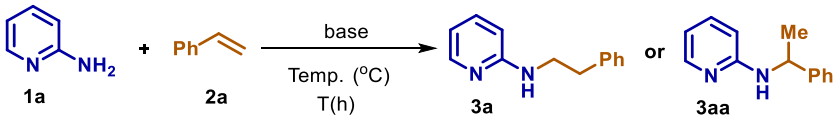
General Procedure for the Synthesis of *N*-Heterocyclic amines

N-Heterocyclic amines **(1a-n, 1q**, **5a,b, 9** and **13)** and Alkene **(2a-r**, **11**, and **16)** were commercially available from Sigma Aldrich Chemical Co and TCI Chemicals. And **1o**[1] and **1p**[2] aminopyridine were synthesized.

1. S. T. Handy and D. Mayi, *Tetrahedron Lett.*, 2007, **48**, 8108–8110.

2. B. Clement, M. Weide, U. Wolschendorf and I. Kock, Angew. *Chem. Int. Ed.*, 2005, **44**, 635–638.

Table 1. Reaction development[a]

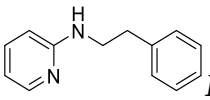


Entry	Base(equiv)	Solvent	Time (h)	Temp (°C)	Yield (%)[b] **3a**
1	KOH(1.0)	DMSO	3	120	60
2	KOH(1.0)	DMSO	3	100	72
3	**KOH(1.0)**	**DMSO**	**3**	**80**	**85**
4	KOH(1.0)	DMSO	3	60	73
5	KOH(0.5)	DMSO	3	80	50
6	KOH(0.2)	DMSO	3	80	Trace
7	KOH(1.5)	DMSO	3	80	57
8	KOH(1.0)	DMSO	1.5	80	70
9	KOH(1.0)	DMSO	1	80	60
10	KOH(1.0)	DCE	3	80	45
11	KOH(1.0)	NMP	3	80	n.r.
12	KOH(1.0)	DMPU	3	80	n.r.
13	KOH(1.0)	DMF	3	80	n.r.
14	KOH(1.0)	Toluene	3	80	n.r.
15	KO^{t}Bu(1.0)	DMSO	3	80	25
16	K_2CO_3(1.0)	DMSO	3	80	n.r.
17	K_3PO_4(1.0)	DMSO	3	80	n.r.

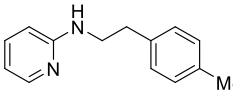
18	Cs_2CO_3(1.0)	DMSO	3	80	n.r.
19	KOAc(1.0)	DMSO	3	80	n.r.
20	Et_3N(1.0)	DMSO	3	80	n.r.

[a]Reactions were performed using 0.5 mmol of **1a**, 0.8 mmol of **2a** and base in 2.0 mL of solvent. [b]Isolated yield. n.r. = no reaction. DMSO = Dimethylsulfoxide, DMF = Dimethylformamide, DMPU = *N,N'*-Dimethylpropylene urea, DCE = Dichloroethane, NMP = *N*-Methylpyrrolidone.

***N*-Heterocyclic amines (3–8).** In an oven-dried 15 mL reaction vial, a solution of aminopyridine **1** (0.5 mmol), alkene **2** (0.8 mmol) and KOH (1.0equiv) in 2 mL of DMSO was heated in an oil bath at 80 °C for 3 h. Progression of the reaction was monitored by TLC analysis; after complete consumption of starting material, the reaction was cooled to room temperature. The reaction mixture was diluted with ethyl acetate (10 mL X 3) and water (10 mL X 3). The layers were separated, and the organic layer was washed with aqueous saturated brine solution and dried over Na_2SO_4. Organic layer was concentrated under reduced pressure. The crude material so obtained was purified by column chromatography on neutral/basic alumina. The structure and purity of products were confirmed by comparison of their physical and spectral data (^{1}H NMR, ^{13}C NMR, and HRMS).

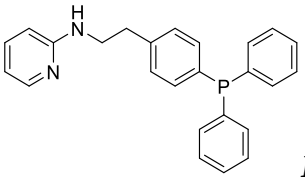


***N*-Phenethylpyridin-2-amine (3a).** The crude product was purified by column chromatography (hexane/EtOAc = 95/5) to afford **3a** as a yellow oil, (84.1 mg, 85%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.03 (d, J = 4.5 Hz, 1H), 7.37–7.33 (m, 1H), 7.31–7.24 (m, 4H), 7.21–7.17 (m, 1H), 6.57 (t, J = 5.5 Hz, 1H), 6.51–6.45 (m, 2H), 3.50 (q, J = 7.2 Hz, 2H), 2.86(t, J= 8.0 Hz, 2H); ^{13}C{^{1}H} NMR (100MHz, $(CD_3)_2SO$) δ 159.3, 148.2, 140.6, 137.0, 129.2, 128.8, 126.4, 112.0, 108.6, 43.1, 35.8;IR spectrum in film (ν_{max}, cm^{-1}) 3338, 1690, 1465, 1341; HRMS (ESI) *m/z* Calcd for $[C_{13}H_{14}N_2]$ requires $[M]^+$198.1157, found 198.1169.

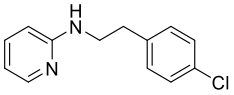


***N*-(4-Methylphenethyl)pyridin-2-amine (3b).** The crude product was purified by column chromatography (hexane/EtOAc = 95/5) to afford **3b** as a brown oil, (84.8 mg, 80%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.02 (dd, J_1 = 5.0, J_2 = 1.2 Hz, 1H), 7.37–7.32 (m, 1H), 7.13 (d, J = 8.0 Hz, 2H), 7.08 (d, J = 8.0 Hz, 2H), 6.54 (t, J = 5.6 Hz, 1H), 6.50–6.45 (m, 2H), 3.47 (dd, J_1 = 14.4, J_2 = 6.2 Hz, 2H), 2.81 (t , J= 8.0 Hz, 2H), 2.26 (s, 3H);^{13}C{^{1}H} NMR

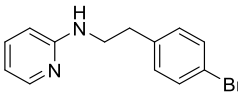
(100 MHz, $(CD_3)_2SO$) δ 159.3, 148.2, 137.4, 137.0, 135.3, 129.4, 129.1, 112.0, 108.6, 43.2, 35.4, 21.2; IR spectrum in film (ν_{max}, cm^{-1}) 3340, 1652, 1463, 1450, 1332; HRMS (ESI) *m/z* Calcd for $[C_{14}H_{16}N_2]$ requires $[M]^+$ 212.1313, found 212.1331.



***N*-(4-Diphenylphosphanyl)phenethyl)pyridin-2-amine (3c).** The crude product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **3c** as a pale yellow oil, (143.30 mg, 75%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.96–7.94 (m, 1H), 7.64–7.51 (m, 1H), 7.39–7.16 (m,14H), 6.56 (t, J = 5.4 Hz, 1H), 6.46–6.45 (m, 2H), 3.47 (q, J = 7.2 Hz, 2H), 2.91–2.81 (m, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 159.0, 147.8, 141.6, 137.4 (d, C-P, $^3J_{C\text{-}P}$ = 11.13 Hz),137.0, 134.1 (d, C-P, $^3J_{C\text{-}P}$ = 10.39 Hz), 133.9, 133.7, 133.6 (d, C-P, $^3J_{C\text{-}P}$ = 19.36 Hz), 132.4, 131.9, 131.8, 129.7 (d, C-P, $^3J_{C\text{-}P}$ = 7.12 Hz), 129.3, 129.2 (d, C-P, $^3J_{C\text{-}P}$ = 6.84 Hz), 129.1, 111.9, 108.6, 42.6, 35.4;^{31}P NMR (162 MHz, $(CD_3)_2SO$) δ -7.32–-7.55; IR spectrum in film (ν_{max}, cm^{-1}) 3342, 1649, 1464, 1346, 1332; HRMS (ESI) *m/z* Calcd for $[C_{25}H_{24}N_2P]$ requires $[M+H]^+$ 383.1677, found 383.1695.

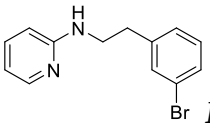


***N*-(4-Chlorophenethyl)pyridin-2-amine (3d).** The crude product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **3d** as a brown oil, (102.1 mg, 88%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.02 (d, J = 3.2 Hz, 1H), 7.34–7.21 (m, 5H), 6.50–6.44 (m, 3H), 3.50–3.47 (m, 2H), 2.85–2.82 (m, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 159.3, 148.2, 139.6, 137.0, 131.3, 131.0, 128.7, 112.1, 108.7, 42.9, 35.2; IR spectrum in film (ν_{max}, cm^{-1}) 3332, 1690, 1460, 1270, 1332, 850; HRMS (ESI) *m/z* Calcd for $[C_{13}H_{14}ClN_2]$ requires $[M+H]^+$ 233.0846, found 233.0816.

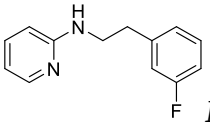


***N*-(4-Bromophenethyl)pyridin-2-amine (3e).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **3e** as a brown oil, (124.2 mg, 90%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.00 (d, J = 4.0 Hz, 1H), 7.47 (d, J = 8.3 Hz, 2H), 7.37–7.33 (m, 1H), 7.21 (d, J = 8.3 Hz, 2H), 6.52 (t, J = 5.5 Hz, 1H), 6.49–6.45 (m, 2H), 3.47 (dd, J_1 = 13.3, J_2 = 7.0 Hz, 2H), 2.82 (t, J = 7.3 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 159.2, 148.1, 140.0, 137.0, 131.5, 131.4,119.5, 111.9, 108.6, 42.6,

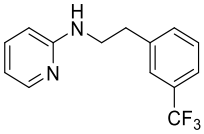
35.0; IR spectrum in film (ν_{max}, cm^{-1}) 3347, 1676, 1465, 1342, 690; HRMS (ESI) *m/z* Calcd for $[C_{13}H_{14}BrN_2]$ requires $[M+H]^+$ 277.0340, found 277.0351.



***N*-(3-Bromophenethyl)pyridin-2-amine (3f).** The crude product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **3f** as a brown oil, (125.5 mg, 91%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.97–7.96 (m, 1H), 7.43 (s, 1H), 7.36–7.30 (m, 2H), 7.22–7.18 (m, 2H), 6.50–6.43 (m, 3H), 3.45 (dd, J_1 = 12.9, J_2= 7.0 Hz, 2H), 2.82 (t, J = 7.1 Hz, 2H); ^{13}C{^{1}H} NMR (100 MHz, $(CD_3)_2SO$) δ 159.2, 148.1, 143.5, 137.1, 132.0, 131.0, 129.4, 128.4, 122.2, 112.1, 108.7, 42.7, 35.2; IR spectrum in film (ν_{max}, cm^{-1}) 3341, 1680, 1463, 1340, 650; HRMS (ESI) *m/z* Calcd for $[C_{13}H_{14}BrN_2]$ requires $[M+H]^+$ 277.0340, found 277.0352.

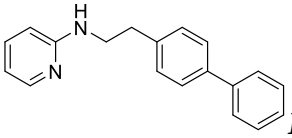


***N*-(3-Fluorophenethyl)pyridin-2-amine (3g).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **3g** as a brown oil, (101.5 mg, 94%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.06 (d, J = 3.7 Hz, 1H), 7.33 (ddd, J_1 = 22.2, J_2 = 11.5, J_3= 4.9 Hz, 2H), 7.08 (d, J = 7.1 Hz, 2H), 7.00 (dd, J_1 = 12.0, J_2 = 5.2 Hz, 1H), 6.56 (dd, J_1= 12.6, J_2=6.8 Hz, 2H), 6.51 – 6.46 (m, 1H), 3.56 (dd, J_1 = 13.1, J_2=6.8 Hz, 2H), 2.91 (t, J = 7.2 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 163.9, 161.5 159.2, 148.1, 143.5 (C-F, $^3J_{C\text{-}F}$ = 7.3 Hz), 136.9, 130.3 (C-F, $^3J_{C\text{-}F}$ = 8.1 Hz), 125.2 (C-F, $^4J_{C\text{-}F}$ = 2.5 Hz), 115.8 (C-F, $^3J_{C\text{-}F}$ = 20.4 Hz), 113.0 (C-F, $^3J_{C\text{-}F}$ = 20.7 Hz), 111.9, 108.5, 42.6, 35.3;^{19}F NMR (376 MHz, $(CD_3)_2SO$) δ -113.503 – -113.659; IR spectrum in film (ν_{max}, cm^{-1}) 3334, 1673, 1462, 1400, 1341;HRMS (ESI) *m/z* Calcd for $[C_{13}H_{14}FN_2]$ requires $[M+H]^+$ 217.1141, found 217.1145.

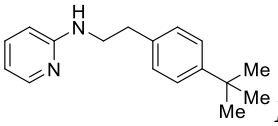


***N*-(3-(Trifluoromethyl)phenethyl)pyridin-2-amine (3h).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **3h** as a brown oil, (127.7 mg, 96%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.02 (d, J = 4.5 Hz, 1H), 7.62 (s, 1H), 7.58–7.50 (m, 3H), 7.38–7.35 (m, 1H), 6.63 (t, J = 5.2 Hz, 1H), 6.52–6.47 (m, 2H), 3.55 (dd, J_1 = 12.9,J_2 = 6.7 Hz, 2H), 2.98 (t, J = 7.1 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 159.2, 148.0, 142.1, 137.0, 133.4, 129.8, 129.6, 129.5, 125.7(C-F, $^3J_{C\text{-}F}$ = 3.8 Hz), 124.4 (C-F, $^1J_{C\text{-}F}$ = 254.9 Hz), 123.2 (C-F, $^4J_{C\text{-}F}$ = 2.9 Hz), 112.0, 108.7, 42.6, 35.3; ^{19}F NMR (376 MHz,

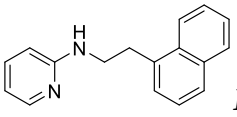
$(CD_3)_2SO$) δ -61.061; IR spectrum in film (ν_{max}, cm^{-1}) 3345, 1683, 1460, 1380, 1266; HRMS (ESI) *m/z* Calcd for $[C_{14}H_{14}F_3N_2]$ requires $[M+H]^+$ 267.1109, found 267.1119.



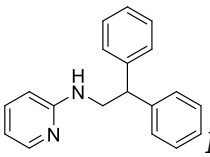
***N*-(2-([1,1'-Biphenyl]-4-yl)ethyl)pyridin-2-amine (3i).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **3i** as a brown oil, (120.6 mg, 88%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.05–8.04 (m, 1H), 7.63 (d, *J* = 7.2 Hz, 2H), 7.58 (d, *J* = 8.1 Hz, 2H), 7.46–7.42 (m, 2H), 7.38–7.28 (m, 4H), 6.99–6.56 (m, 1H), 6.53–6.47 (m, 2H), 3.54(q, *J* = 6.64 Hz, 2H), 2.91 (t, *J* = 7.4 Hz, 2H); $^{13}C\{^1H\}$NMR (100 MHz, $(CD_3)_2SO$) δ 159.3, 148.2, 140.6, 139.9, 138.4, 137.0, 129.8, 129.4, 127.6, 127.1, 127.0, 112.0, 108.6, 42.9, 35.3; IR spectrum in film (ν_{max}, cm^{-1}) 3336, 1689, 1462, 1342; HRMS (ESI) *m/z* Calcd for $[C_{19}H_{19}N_2]$ requires $[M+H]^+$ 275.1548, found 275.1559.



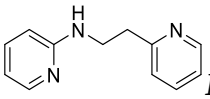
***N*-(4-(*tert*-Butyl)phenethyl)pyridin-2-amine (3j).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **3j** as a brown oil, (105.4 mg, 83%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.02 (d, *J* = 3.8 Hz, 1H), 7.33–7.28 (m,3H), 7.17 (d, *J* = 8.1 Hz, 2H), 6.53–6.49(m, 2H), 6.47–6.44 (m, 1H), 3.49 (q, *J* = 6.8 Hz, 2H), 2.84 (t, *J* = 7.5 Hz, 2H), 1.26 (s, 9H); $^{13}C\{^1H\}$NMR (100 MHz, $(CD_3)_2SO$) δ 159.3, 148.69 148.1, 137.4, 136.8, 128.8, 125.4, 111.9, 108.5, 43.1, 35.2, 34.5, 31.7;IR spectrum in film (ν_{max}, cm^{-1}) 3350, 1690, 1460, 1450, 1340; HRMS (ESI) *m/z* Calcd for $[C_{17}H_{23}N_2]$ requires $[M+H]^+$ 255.1861, found 255.1868.



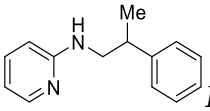
***N*-(2-(Naphthalen-1-yl)ethyl)pyridin-2-amine (3k).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **3k** as a brown oil, (105.4 mg, 85%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.31 (d, *J* = 8.3 Hz, 1H), 8.06 (d, *J* = 3.9 Hz, 1H), 7.92 (d, *J* = 7.9 Hz, 1H), 7.79 (d, *J* = 7.7 Hz, 1H), 7.55 (dt, J_1 = 14.6, J_2=6.9 Hz, 2H), 7.47 – 7.34 (m, 3H), 6.68 (t, *J* = 5.4 Hz, 1H), 6.53 – 6.44 (m, 2H), 3.58 (dd, J_1= 13.8, J_2= 6.9 Hz, 2H), 3.35 – 3.29 (m, 2H); $^{13}C\{^1H\}$NMR (100 MHz, $(CD_3)_2SO$) δ 159.2, 148.1, 137.1, 136.6, 134.0, 132.2, 129.0, 127.1, 127.0, 126.5, 126.0 (d, *J* = 2.9 Hz), 124.5, 111.9, 108.8, 42.4, 33.1; IR spectrum in film (ν_{max}, cm^{-1}) 3343, 1676, 1463, 1333; HRMS (ESI) *m/z* Calcd for $[C_{17}H_{17}N_2]$ requires $[M+H]^+$ 249.1392, found 249.1402.



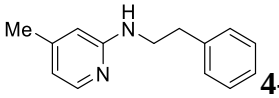
***N*-(2,2-Diphenylethyl)pyridin-2-amine (3l).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **3l** as a brown oil, (123.3 mg, 90%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.00–7.99 (m, 1H), 7.33–7.26 (m, 9H), 7.19–7.15 (m, 2H), 6.46–6.44 (m, 3H), 4.39–4.35 (m, 1H), 3.90 (t, J = 7.1 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 159.1, 148.0, 143.9, 136.9, 128.9, 128.5, 126.7, 112.0, 108.9, 50.4, 45.9; IR spectrum in film (ν_{max}, cm^{-1}) 3350, 1670, 1460, 1339; HRMS (ESI) *m/z* Calcd for $[C_{19}H_{19}N_2]$ requires $[M+H]^+$ 275.1548, found 275.1559.



***N*-(2-(Pyridin-2-yl)ethyl)pyridin-2-amine (3m).**The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **3m** as a brown oil, (74.6 mg, 75%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.54 (d, J = 4.8 Hz, 1H), 8.04 (d, J = 4.9 Hz, 1H), 7.68 (td, J_1 = 7.6, J_2=1.8 Hz, 1H), 7.39–7.35 (m, 1H), 7.28 (d, J = 7.7 Hz, 1H), 7.21 (dd, J_1 = 6.9, J_2 =5.3 Hz, 1H), 6.64 (t, J = 5.0 Hz, 1H), 6.53–6.47 (m, 2H), 3.67 (dd, J_1 = 12.8,J_2 =6.9 Hz, 2H), 3.05 (t, J = 7.2 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 160.2, 159.3, 149.5, 148.1, 137.1, 136.8, 123.7, 121.8, 112.0, 108.6, 41.3, 38.0; IR spectrum in film (ν_{max}, cm^{-1}) 3320, 1689, 1462, 1340; HRMS (ESI) *m/z* Calcd for $[C_{12}H_{14}N_3]$ requires $[M+H]^+$ 200.1188, found 200.1194.

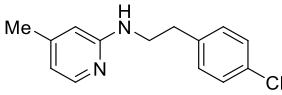


***N*-(2-Phenylpropyl)pyridin-2-amine (3n).**The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **3n** as a brown oil, (86.9 mg, 82%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.99 (d, J = 3.6 Hz, 1H), 7.34–7.25 (m, 5H), 7.21–7.17 (m, 1H), 6.49–6.43 (m, 3H), 3.49–3.34 (m, 2H), 3.07 (td, J_1 = 14.0, J_2 =7.0 Hz, 1H), 1.25 (d, J = 6.9 Hz, 3H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 159.4, 148.1, 146.0, 137.0, 128.8, 127.7, 111.9, 108.7, 48.5, 39.3, 20.0; IR spectrum in film (ν_{max}, cm^{-1}) 3338, 1691, 1465, 1450, 1341; HRMS (ESI) *m/z* Calcd for $[C_{14}H_{17}N_2]$ requires $[M+H]^+$ 213.1392, found 213.1396.

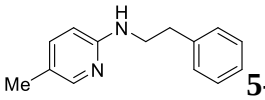


4-Methyl-*N*-phenethylpyridin-2-amine (4a). The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4a** as a

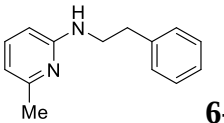
brown oil, (90.1 mg, 85%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 6.88 (d, J = 5.4 Hz, 1H), 6.38–6.25 (m, 5H), 5.49 (d, J = 5.2 Hz, 1H), 5.42 (s, 1H), 4.04 (s, 1H), 2.58 (t, J = 7.3 Hz, 2H), 1.97 (t, J = 7.3 Hz, 2H), 1.28 (s, 3H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 151.8, 141.8, 139.0, 132.6, 121.5, 121.0, 118.8, 106.5, 101.2, 35.9, 28.3, 12.8; IR spectrum in film (ν_{max}, cm^{-1}) 3349, 1687, 1462, 1449, 1340; HRMS (ESI) *m/z* Calcd for [$C_{14}H_{17}N_2$] requires [M+H]$^+$ 213.1392, found 213.1398.



***N*-(4-Chlorophenethyl)-4-methylpyridin-2-amine (4b).** The crude product was product was purified by column chromatography (hexane/EtOAc= 90/10) to afford **4b** as a brown oil, (107.0 mg, 87%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.85 (d, J = 5.1 Hz, 1H), 7.33 (d, J = 8.3 Hz, 2H), 7.25 (d, J = 8.3 Hz, 2H), 6.43–6.40 (m,1H), 6.32 (d, J = 4.6 Hz, 1H), 6.28 (s, 1H), 3.45 (q, J = 6.68 Hz, 2H), 2.82(t, J = 7.2 Hz, 2H), 2.14 (s, 3H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 159.4, 147.8, 147.2, 139.6, 131.0, 128.6, 113.6, 108.5, 42.7, 35.0, 21.0; IR spectrum in film (ν_{max}, cm^{-1}) 3350, 1680, 1461, 1450, 1256, 750; HRMS (ESI) *m/z* Calcd for [$C_{14}H_{16}ClN_2$] requires [M+H]$^+$247.1002, found 247.1009.

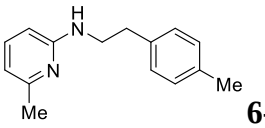


5-Methyl-*N*-phenethylpyridin-2-amine (4c). The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4c** as a brown oil, (76.3 mg, 72%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.81 (s, 1H), 7.30–7.13 (m, 6H), 6.39 (d, J = 8.4 Hz, 1H), 6.26 (t, J = 5.4 Hz, 1H), 3.41 (q, J = 6.8 Hz, 2H), 2.80 (t, J = 7.2 Hz, 2H), 2.08 (s, 3H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 157.5, 147.4, 140.6, 138.1, 129.1, 128.7, 126.4, 120.0, 108.2, 43.2, 35.7, 17.5; IR spectrum in film (ν_{max}, cm^{-1}) 3310, 1690, 1465, 1442, 1320; HRMS (ESI) *m/z* Calcd for [$C_{14}H_{17}N_2$] requires [M+H]$^+$ 213.1392, found 213.1333.

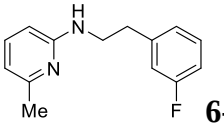


6-Methyl-*N*-phenethylpyridin-2-amine (4d). The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4d** as a brown oil, (80.6 mg, 76%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.35–7.29 (m, 3H), 7.25–7.20 (m, 3H), 6.44 (d, J = 7.3 Hz, 1H), 6.19 (d, J = 8.2 Hz, 1H), 4.58 (s, 1H), 3.50 (dd, J_1 = 13.0, J_2 = 7.1 Hz, 2H), 2.91 (t, J = 7.1 Hz, 2H), 2.36 (s, 3H); ^{13}C{^{1}H}NMR (100 MHz, $CDCl_3$) δ 158.4, 157.1, 139.3, 138.0, 128.9, 128.7, 126.5, 112.4, 102.9, 43.8, 35.8, 24.4; IR spectrum in film (ν_{max}, cm^{-1}) 3322, 1685,

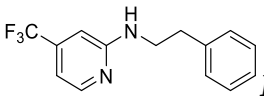
1461, 1450, 1340; HRMS (ESI) *m/z* Calcd for [$C_{14}H_{17}N_2$] requires [M+H]$^+$ 213.1392, found 213.1401.



6-Methyl-*N*-(4-methylphenethyl)pyridin-2-amine (4e). The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4e** as a brown oil, (89.3 mg, 79%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.83 (d, J = 5.2 Hz, 1H), 7.17–7.06 (m, 4H), 6.47 (t, J = 5.6 Hz, 1H), 6.32 (dd, J_1 = 5.3, J_2 =0.9 Hz, 1H), 6.29 (s, 1H), 3.41 (q, J = 6.4 Hz, 2H), 2.76(t, J = 8.0 Hz, 2H), 2.26 (s, 3H), 2.14 (s, 3H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 159.2, 147.6, 147.3, 137.4, 135.3, 129.4, 129.1, 113.6, 108.6, 43.2, 35.3, 21.2; IR spectrum in film (ν_{max}, cm^{-1}) 3343, 1633, 1460, 1450, 1259; HRMS (ESI) *m/z* Calcd for [$C_{15}H_{19}N_2$] requires [M+H]$^+$ 227.1548, found 227.1562.

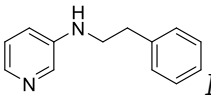


6-Methyl-*N*-(4-fluoromethylphenethyl)pyridin-2-amine (4f). The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4f** as a brown oil,(100.1 mg, 87%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.88 (d, J = 4.9 Hz, 1H), 7.32 (dd, J_1 = 14.3, J_2 = 7.6 Hz, 1H), 7.09 (d, J = 8.2 Hz, 2H), 7.01 (t, J = 8.9 Hz, 1H), 6.45 (s, 1H), 6.34 – 6.32 (m, 2H), 3.50 (dd, J_1 = 12.9, J_2 = 6.7 Hz, 2H), 2.87 (t, J = 7.2 Hz, 2H), 2.14 (s, 3H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 163.9, 161.5, 159.4, 147.4 (C-F, $^2J_{C\text{-}F}$ =50.6 Hz), 143.5 (C-F, $^3J_{C\text{-}F}$ =7.5 Hz), 130.4 (C-F, $^3J_{C\text{-}F}$ =8.4 Hz), 125.3, 115.8 (C-F, $^2J_{C\text{-}F}$ =20.6 Hz), 113.6, 113.0 (C-F, $^2J_{C\text{-}F}$ = 20.7 Hz), 108.4, 42.6, 35.3, 21.0; ^{19}F NMR (376 MHz, $(CD_3)_2SO$) δ-113.766 – -113.836; IR spectrum in film (ν_{max}, cm^{-1}) 3346, 1654, 1465, 1450, 1400, 1256; HRMS (ESI) *m/z* Calcd for [$C_{14}H_{16}FN_2$] requires [M+H]$^+$ 231.1298, found 231.1311.

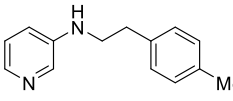


***N*-Phenethyl-4-(trifluoromethyl)pyridin-2-amine (4g).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4g** as a brown oil,(118.4 mg, 89%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.20 (d, J = 5.2 Hz, 1H), 7.32–7.26 (m, 5H),7.24–7.16 (m, 1H), 6.74 (s, 1H), 6.70 (d, J = 5.1 Hz, 1H), 3.55–3.50(m, 2H), 2.85–2.82 (m, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 159.4, 150.0, 140.2, 137.8,137.5, 129.1, 128.8, 126.5, 124.0(C-F, $^1J_{C\text{-}F}$ =270.7 Hz), 122.4, 106.2 (C-F, $^3J_{C\text{-}F}$ =5.9 Hz), 104.3, 42.8, 35.4; ^{19}F NMR (376 MHz, $(CD_3)_2SO$) δ –64.06; IR spectrum in film (ν_{max}, cm^{-1}) 3350, 1683,

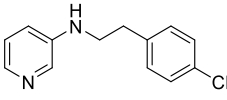
1462, 1450, 1350, 1250 ; HRMS (ESI) *m/z* Calcd for [$C_{14}H_{14}F_3N_2$] requires [M+H]$^+$ 267.1109, found 267.1119.



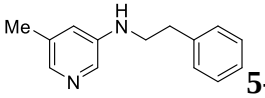
***N*-Phenethylpyridin-3-amine (4h).** The crude product was product was purified by column chromatography (hexane/EtOAc = 85/15) to afford **4h** as a brown oil, (66.3 mg, 67%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.06 (d, J = 2.3 Hz, 1H), 7.81 (d, J = 3.8 Hz, 1H), 7.33–7.28 (m, 4H), 7.23–7.19 (m, 1H), 7.08 (dd, J_1 = 8.1, J_2 = 4.6 Hz, 1H), 6.95 (dd, J_1 = 8.3, J_2 = 1.5 Hz, 1H), 5.95 (s, 1H), 3.29 (dd, J_1 = 11.8, J_2 = 7.0 Hz, 2H), 2.87 (t, J = 7.5 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 145.2, 140.1, 137.3, 135.9, 129.2, 128.9, 126.5, 124.1, 117.8, 44.6, 35.3; IR spectrum in film (ν_{max}, cm^{-1}) 3340, 1690, 1465, 1342; HRMS (ESI) *m/z* Calcd for [$C_{13}H_{15}N_2$] requires [M+H]$^+$ 199.1235, found 199.1243.



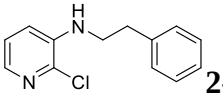
***N*-(4-Methylphenethyl)pyridin-3-amine (4i).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4i** as a brown oil, (67.8 mg, 64%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.05 (s, 1H), 7.80 (s, 1H), 7.16 (d, J = 7.9 Hz, 2H), 7.11 – 7.06 (m, 3H), 6.93 (d, J = 8.3 Hz, 1H), 5.92 (s, 1H), 3.26 (t, J = 7.2 Hz, 2H), 2.82 (t, J = 7.4 Hz, 2H), 2.26 (s, 3H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 157.8, 148.7, 138.0, 137.2, 135.6, 129.6, 129.4, 111.9, 106.3, 51.1, 33.5, 21.4; IR spectrum in film (ν_{max}, cm^{-1}) 3350, 1652, 1463, 1452, 1332; HRMS (ESI) *m/z* Calcd for [$C_{14}H_{17}N_2$] requires [M+H]$^+$ 213.1392, found 213.1390.



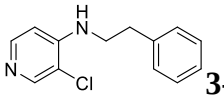
***N*-(4-Chlorophenethyl)pyridin-3-amine (4j).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4j** as a brown oil, (90.5 mg, 78%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.98 (s, 1H), 7.77 (s, 1H), 7.33 (dd, J_1 = 17.8, J_2 =8.3 Hz, 4H), 7.09 (dd, J_1 = 8.1,J_2 = 4.6 Hz, 1H), 6.95 (d, J = 8.3 Hz, 1H), 5.96 (s, 1H), 3.27 (t, J = 7.1 Hz, 2H), 2.83 (t, J = 7.3 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 145.2, 139.2, 136.9, 135.3, 131.2, 131.1, 128.7, 124.3, 118.2, 44.3, 34.4; IR spectrum in film (ν_{max}, cm^{-1}) 3340, 1672, 1464, 1333, 790; HRMS (ESI) *m/z* Calcd for [$C_{13}H_{14}ClN_2$] requires [M+H]$^+$ 233.0846, found 233.0844.



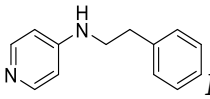
5-Methyl-*N*-phenethylpyridin-3-amine (4k).The crude product was product was purified by column chromatography (hexane/EtOAc = 80/20) to afford **4k** as a brown oil, (83.7 mg, 79%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.30 (t, J = 7.3 Hz, 2H), 7.24–7.20 (m, 3H), 6.98 (d, J = 8.5 Hz, 2H), 6.53 (d, J = 8.2 Hz, 2H), 3.36 (t, J = 7.0 Hz, 2H), 2.89 (t, J = 7.1 Hz, 2H), 2.23 (s, 3H); ^{13}C{^{1}H}NMR (100 MHz, $CDCl_3$) δ 145.9, 139.5, 129.9, 128.9, 128.7, 126.8, 126.5, 113.3, 45.6, 35.7, 20.5; IR spectrum in film (ν_{max}, cm^{-1}) 3345, 1650, 1460, 1449, 1332; HRMS (ESI) *m/z* Calcd for [$C_{14}H_{17}N_2$] requires [M+H]$^+$ 213.1392, found 213.1401.



2-Chloro-*N*-phenethylpyridin-3-amine (4l). The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4l** as a brown oil, (89.3 mg, 77%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.54 (d, J = 4.2 Hz, 1H), 7.32–7.27(m, 2H), 7.24–7.20 (m, 3H), 7.09–7.06 (m, 1H), 6.89 (d, J = 7.9 Hz, 1H), 4.58 (s, 1H), 3.39–3.37(m, 2H), 2.93–2.91 (m, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 159.5, 148.4, 139.8, 137.2, 131.5, 131.2, 128.9, 112.3, 108.9, 43.1, 35.3; IR spectrum in film (ν_{max}, cm^{-1}) 3350, 1687, 1461,1256, 749; HRMS (ESI) *m/z* Calcd for [$C_{13}H_{14}ClN_2$] requires [M+H]$^+$ 233.0846, found 233.0856.

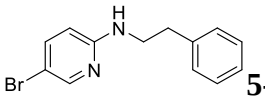


3-Chloro-*N*-phenethylpyridin-4-amine (4m). The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4m** as a brown oil, (92.8 mg, 80%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.16 (s, 1H), 8.06 (d, J= 4.5 Hz, 1H), 7.36 – 7.25 (m, 4H), 7.21 (t, J = 6.7 Hz, 1H), 6.73 (d, J = 5.6 Hz, 1H), 6.36 (t, J = 5.1 Hz, 1H), 3.44 (dd, J_1 = 14.4, J_2 =6.5 Hz, 2H), 2.86 (t, J = 7.5 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 149.3, 148.8, 148.0, 139.6, 129.2, 128.8, 126.7, 106.4, 43.9, 34.8; IR spectrum in film (ν_{max}, cm^{-1}) 3334, 1676, 1465, 1251, 750; HRMS (ESI) *m/z* Calcd for [$C_{13}H_{14}ClN_2$] requires [M+H]$^+$ 233.0846, found 233.0858.

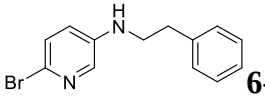


***N*-Phenethylpyridin-2-amine (4n).** The crude product was purified by column chromatography (hexane/EtOAc = 60/40) to afford **4n** as a yellow oil, (74.2 mg, 75%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.07 (s, 2H), 7.26–7.21 (m, 2H), 7.14 (dd, J_1 = 19.0, J_2 = 7.1 Hz, 3H), 6.36 (s, 2H), 4.76 (s, 1H), 3.33 (dd, J_1 = 12.0, J_2 = 6.5 Hz, 2H), 2.82 (t, J = 7.1 Hz, 2H); ^{13}C{1H} NMR (100MHz, $CDCl_3$) δ 153.5, 149.5, 138.7, 128.8, 128.8, 126.7, 107.7, 43.8, 35.1; IR

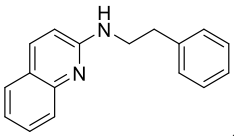
spectrum in film (ν_{max}, cm^{-1}) 3337, 1693, 1468, 1351; HRMS (ESI) *m/z* Calcd for [$C_{13}H_{14}N_2$] requires $[M]^+$ 198.1157, found 198.1140.



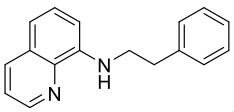
5-Bromo-*N*-phenethylpyridin-2-amine (4o). The crude product was product was purified by column chromatography (hexane/EtOAc = 95/5) to afford **4o** as a brown oil, (117.3 mg, 85%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.00 (d, J = 2.1 Hz, 1H), 7.35 (dd, J_1 = 8.8,J_2 = 2.4 Hz, 1H), 7.21 (t, J = 7.3 Hz, 2H), 7.13 (dd, J_1 = 13.2, J_2 =7.2 Hz, 3H), 6.16 (d, J = 8.9 Hz, 1H), 4.62 (s, 1H), 3.43 (d, J = 4.8 Hz, 2H), 2.81 (t, J = 6.9 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $CDCl_3$) δ 157.0, 148.4, 139.7, 138.9, 128.7, 128.6, 126.4, 108.3, 106.8, 43.3, 35.4; IR spectrum in film (ν_{max}, cm^{-1}) 3347, 1670, 1465, 1342, 680; HRMS (ESI) *m/z*Calcd for [$C_{13}H_{14}BrN_2$] requires $[M+H]^+$ 277.0340, found 277.0357.



6-Bromo-*N*-phenethylpyridin-3-amine (4p). The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4p** as a brown oil, (113.1 mg, 82%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.74 (d, J = 2.8 Hz, 1H), 7.32 – 7.18 (m, 6H), 6.94 (dd, J_1= 8.8, J_2 = 3.2 Hz, 1H), 6.18 (t , J = 5.6 Hz, 1H), 3.28 – 3.23 (m, 2H), 2.85 – 2.80 (m, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 145.2, 140.0, 135.0, 129.3, 128.8, 128.0, 126.7, 126.1, 122.4, 44.6, 35.1; IR spectrum in film (ν_{max}, cm^{-1}) 3350, 1690, 1462, 1340, 687; HRMS (ESI) *m/z* Calcd for [$C_{13}H_{14}BrN_2$] requires $[M+H]^+$ 277.0340, found 277.0353.

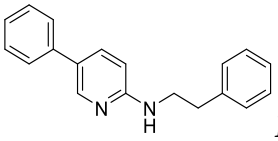


***N*-Phenethylquinolin-2-amine (4q).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4q** as a brown oil, (71.9 mg, 58%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.83 (d, J = 8.9 Hz, 1H), 7.61 (d, J = 8.0 Hz, 1H), 7.53 (d, J = 8.1 Hz, 1H), 7.48–7.44 (m, 1H), 7.34–7.29 (m, 4H), 7.24–7.19(m, 1H), 7.16–7.12 (m, 2H), 6.81–6.74 (m, 1H), 3.64–3.59(m, 2H), 2.92 (t, J = 7.6 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 159.3, 148.1, 140.6, 139.8, 138.4, 137.0, 129.8, 129.3, 127.6, 127.6, 127.0, 126.9, 111.9, 108.6, 42.9, 35.3; IR spectrum in film (ν_{max}, cm^{-1}) 3346, 1685, 1462, 1340; HRMS (ESI) *m/z* Calcd for [$C_{17}H_{17}N_2$] requires $[M+H]^+$ 249.1392, found 249.1403.

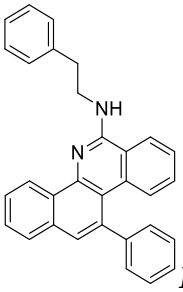


***N*-Phenethylquinolin-8-amine (4r).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4r** as a brown oil, (68.2

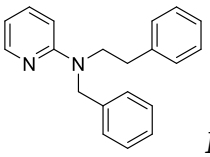
mg, 55%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.71 (d, J = 4.0, 1H), 8.20 (d, J = 6.8 Hz, 1H), 7.49–7.46 (m, 1H), 7.39–7.23 (m, 6H), 7.06 (d, J = 8.0 Hz, 1H), 6.74 (d, J = 7.6 Hz, 1H), 6.46 (t, J = 5.4 Hz, 1H), 3.52 (q, J = 6.8 Hz, 2H), 2.99 (t, J = 7.4 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 147.3, 144.7, 140.1, 136.4, 129.2, 128.9, 128.3, 126.6, 122.2, 113.7, 104.8, 44.5, 35.1; IR spectrum in film (ν_{max}, cm^{-1}) 3350, 1690, 1465, 1339; HRMS (ESI) *m/z* Calcd for $[C_{17}H_{17}N_2]$ requires $[M+H]^+$ 249.1392, found 249.1404.



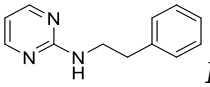
***N*-Phenethyl-5-phenylpyridin-2-amine (4s).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4s** as a brown oil, (106.9 mg, 78%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.34 (d, J = 2.3 Hz, 1H), 7.71 (dd, J_1= 8.8, J_2 =2.5 Hz, 1H), 7.58 (d, J = 7.3 Hz, 2H), 7.41 (t, J = 7.6 Hz, 2H), 7.33–7.19 (m, 6H), 6.79 (t, J = 5.3 Hz, 1H), 6.59 (d, J = 8.8 Hz, 1H), 3.53 (dd, J_1= 13.8, J_2 =6.5 Hz, 2H), 2.87 (t, J = 7.4 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 158.5, 145.8, 140.4, 138.6, 135.6, 129.3, 129.1, 128.8, 126.7, 126.4, 125.8, 124.0, 108.8, 43.0, 35.7; IR spectrum in film (ν_{max}, cm^{-1}) 3340, 1695, 1463, 1266; HRMS (ESI) *m/z* Calcd for $[C_{19}H_{19}N_2]$ requires $[M+H]^+$ 275.1548, found 275.1542.



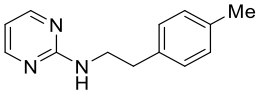
***N*-Phenethyl-11-phenylbenzo[*c*]phenanthridine-6-amine (4t).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4t** as a brown oil, (148.0 mg, 69%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 9.24 (d, J = 7.2 Hz, 1H), 7.78– 7.76 (m, 1H), 7.64– 7.51 (m, 4H), 7.47 (s, 1H), 7.40– 7.28(m, 10H), 7.23– 7.12 (m, 2H), 5.46 (t, J = 4.8 Hz, 1H), 4.11 (q, J = 6.8 Hz, 2H), 3.14 (t, J = 6.8 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $CDCl_3$) δ 152.9, 145.1, 142.9, 140.0, 137.6, 134.6, 133.0, 130.7, 129.1, 129.0, 128.8, 128.3, 127.4, 127.1, 126.5, 126.1, 125.9, 125.8, 125.2, 121.5, 119.5, 115.2, 43.2, 35.7; IR spectrum in film (ν_{max}, cm^{-1}) 3317,1644, 1461, 1331; HRMS (ESI) *m/z* Calcd for $[C_{30}H_{25}N_2]$ requires $[M+H]^+$ 425.2018, found 425.2029.



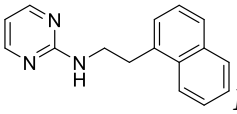
***N*-Benzyl-*N*-phenethylpyridin-2-amine (4u).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **4u** as a brown oil, (132.5 mg, 92%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.20 (d, J = 3.5 Hz, 1H), 7.41 – 7.31 (m, 1H), 7.30 – 7.21 (m, 4H), 7.18 (t, J = 7.0 Hz, 6H), 6.58 – 6.48 (m, 1H), 6.44 (d, J = 8.6 Hz, 1H), 4.62 (s, 2H), 3.73(t, J = 5.6 Hz, 2H), 2.90 (t, J = 7.8 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $CDCl_3$) δ158.1, 148.3, 139.8, 138.9, 137.3, 129.0, 128.7, 128.6,127.1, 127.0, 126.3, 112.0, 105.9, 52.0, 50.6, 33.9; IR spectrum in film (ν_{max}, cm^{-1}) 3346, 1686, 1461, 1341; HRMS (ESI) *m/z* Calcd for [$C_{20}H_{21}N_2$] requires [M+H]$^+$ 289.1705, found 289.1718.



***N*-Phenethylpyrimidin-2-amine (6a).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **6a** as a brown oil, (78.6 mg, 79%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.28(d, J = 4.2 Hz, 2H), 7.30–7.17 (m, 6H), 6.55 (t, J = 4.7 Hz, 1H), 3.51 (q, J = 6.3 Hz, 2H), 2.85(t, J = 7.6 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 162.7, 158.4, 140.2, 129.1, 128.7, 126.4, 110.4, 42.8, 35.5; IR spectrum in film (ν_{max}, cm^{-1}) 3338, 1695, 1460, 1340; HRMS (ESI) *m/z* Calcd for [$C_{12}H_{14}N_3$] requires [M+H]$^+$ 200.1188, found 200.1192.

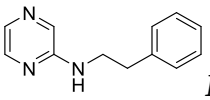


***N*-(4-Methylphenethyl)pyrimidin-2-amine (6b).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **6b** as a brown oil, (78.8 mg, 74%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.28 (d, J = 3.4 Hz, 2H), 7.21 (t, J = 5.6 Hz, 1H), 7.13 (d, J = 8.0 Hz, 2H), 7.09 (d, J = 8.0 Hz, 2H), 6.55 (t, J = 4.7 Hz, 1H), 3.49 (dd, J_1 = 14.8, J_2 = 6.1 Hz, 2H), 2.81 (t, J = 7.5 Hz, 2H), 2.26 (s, 3H); ^{13}C{^{1}H}NMR (100 MHz, $(CD_3)_2SO$) δ 162.7, 158.4, 137.1, 135.4, 129.4, 129.0, 110.4, 43.0, 35.1, 21.1; IR spectrum in film (ν_{max}, cm^{-1}) 3350, 1690, 1464, 1449, 1342; HRMS (ESI) *m/z* Calcd for [$C_{13}H_{16}N_3$] requires [M+H]$^+$ 214.1344, found 214.1348.

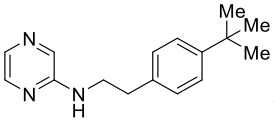


***N*-(2-(Naphthalen-1-yl)ethyl)pyrimidin-2-amine (6c).**The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **6c** as a brown oil, (105.8 mg, 85%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.28 (s, 2H), 8.18 (d, J = 8.2 Hz,

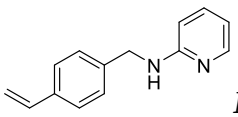
1H), 7.86 (d, *J* = 8.8 Hz, 1H), 7.74 (d, *J* = 8.0 Hz, 1H), 7.55–7.46 (m, 2H), 7.42–7.35 (m, 2H), 6.53 (t, *J* = 4.8 Hz, 1H), 5.47 (s, 1H), 3.81 (q, *J* = 6.8 Hz, 2H), 3.39 (t, *J* = 7.1 Hz, 2H); $^{13}C\{^{1}H\}$NMR (100 MHz, $(CD_3)_2SO$) δ 162.1, 158.1, 135.3, 134.0, 132.1, 129.0, 127.3, 127.0, 126.1, 125.7, 125.6, 123.9, 110.6, 42.1, 33.0; IR spectrum in film (ν_{max}, cm^{-1}) 3350, 1690, 1464, 1449, 1342; HRMS (ESI) *m/z* Calcd for $[C_{16}H_{16}N_3]$ requires $[M+H]^+$ 250.1344, found 250.1350.



***N*-Phenethylpyrazin-2-amine (7a).** The crude product was product was purified by column chromatography (hexane/EtOAc = 85/15) to afford **7a** as a brown oil, (74.6 mg, 75%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.96 (s, 2H), 7.66 (d, *J* = 2.2 Hz, 1H), 7.32–7.16 (m, 6H), 3.52 (q, *J* = 6.7 Hz, 2H), 2.86(t, *J* = 7.4 Hz, 2H); $^{13}C\{^{1}H\}$NMR (100 MHz, $(CD_3)_2SO$) δ 155.5, 142.0, 140.2, 133.8, 131.1, 129.1, 128.8, 126.5, 42.3, 35.3; IR spectrum in film (ν_{max}, cm^{-1}) 3347, 1687, 1462, 1343; HRMS (ESI) *m/z* Calcd for $[C_{12}H_{14}N_3]$ requires $[M+H]^+$ 200.1188, found 200.1190.

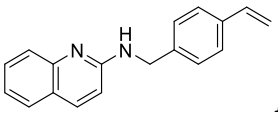


N-(4-(*tert*-Butyl)phenethyl)pyrazin-2-amine (7b).The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **7b** as a brown oil, (88.0 mg, 69%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.91 (s, 1H), 7.78 (s, 1H), 7.72 (d, *J* = 2.6 Hz, 1H), 7.27 (d, *J* = 8.1 Hz, 2H), 7.09 (d, *J* = 8.1 Hz, 2H), 4.57 (s, 1H), 3.55 (q, *J* = 6.5 Hz, 2H), 2.84 (t, *J* = 6.9 Hz, 2H), 1.24 (s, 9H); $^{13}C\{^{1}H\}$NMR (100 MHz, $(CD_3)_2SO$) δ 154.6, 149.6, 142.1, 135.8, 132.9, 132.2, 128.6, 125.7, 42.6, 35.0, 34.5, 31.4;IR spectrum in film (ν_{max}, cm^{-1}) 3350, 1695, 1461, 1452, 1341; HRMS (ESI) *m/z* Calcd for $[C_{16}H_{22}N_3]$ requires $[M+H]^+$ 256.1814, found 256.1819.

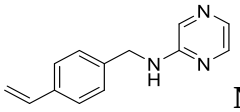


***N*-(4-Vinylbenzyl)pyridin-2-amine (8a).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **8a** as a brown oil, (71.4 mg, 68%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.09 (s, 1H), 7.34 (dd, J_1 = 25.0, J_2 = 7.7 Hz, 5H), 6.73–6.55 (m, 2H), 6.34 (d, *J* = 8.4 Hz, 1H), 5.73 (d, *J* = 17.6 Hz, 1H), 5.22 (d, *J* = 10.9 Hz, 1H), 5.10 (s, 1H), 4.47 (d, *J* = 5.5 Hz, 2H);$^{13}C\{^{1}H\}$NMR (100 MHz, $CDCl_3$) δ 158.7, 148.3, 139.0, 137.5, 136.6, 127.6, 126.5, 113.8, 113.2, 106.9, 46.1; IR spectrum in film (ν_{max}, cm^{-1})

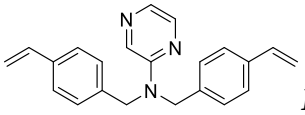
3334, 1644, 1458, 1280; HRMS (ESI) *m/z* Calcd for [$C_{14}H_{15}N_2$] requires [M+H]$^+$ 211.1235, found 211.1220.



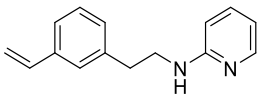
***N*-(4-Vinylbenzyl)quinolin-2-amine (8b).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **8b** as a brown oil, (101.4 mg, 78%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.72 (d, J = 8.9 Hz, 1H), 7.63 (d, J = 8.4 Hz, 1H), 7.54 – 7.41 (m, 2H), 7.35 – 7.23 (m, 4H), 7.14 (dd, J_1= 13.3, J_2= 5.7 Hz, 1H), 6.62 (dd, J_1= 17.6, J_2 = 10.9 Hz, 1H), 6.53 (d, J = 8.9 Hz, 1H), 5.65 (d, J = 17.6 Hz, 1H), 5.15 (d, J = 10.9 Hz, 1H), 5.07 (s, 1H), 4.62 (d, J = 5.5 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $CDCl_3$) δ156.7, 147.9, 139.0, 137.5, 136.7, 136.5, 129.6, 127.9, 127.5, 126.5, 123.6, 122.2, 113.8, 111.3, 45.6; IR spectrum in film (ν_{max}, cm^{-1}) 3342, 1868, 1664, 1464, 1275; HRMS (ESI) *m/z* Calcd for [$C_{18}H_{17}N_2$] requires [M+H]$^+$ 261.1392, found 261.1404.



N-(4-Vinylbenzyl)pyrazin-2-amine (8c). The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **8c** as a brown oil, (86.5 mg, 82%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.94–7.93 (m, 1H), 7.82 (d, J = 1.2 Hz, 1H), 7.76 (d, J = 2.7 Hz, 1H), 7.32 (d, J = 8.2 Hz, 2H), 7.24 (d, J = 8.1 Hz, 2H), 6.64 (dd, J_1=17.6, J_2 =11.0 Hz, 1H), 5.67 (d, J = 17.6 Hz, 1H), 5.18 (d, J = 10.9 Hz, 1H), 4.90 (s, 1H), 4.48 (d, J = 5.8 Hz, 2H); ^{13}C{^{1}H}NMR (100 MHz, $CDCl_3$) δ 163.0, 158.6, 138.5, 137.2, 137.1, 128.4, 127.0, 114.2, 110.7, 49.4; IR spectrum in film (ν_{max}, cm^{-1}) 3345, 1690, 1642, 1465, 1339; HRMS (ESI) *m/z* Calcd for [$C_{13}H_{14}N_3$] requires [M+H]$^+$ 212.1188, found 212.1201.

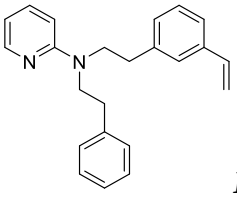


***N,N*-bis(4-Vinylbenzyl)pyrazin-2-amine (8d).** The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **8d** as a brown oil, (73.6 mg, 45%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.09 (dd, J_1= 2.5, J_2 = 1.6 Hz, 1H), 7.97 (d, J = 1.2 Hz, 1H),7.84 (d, J = 2.6 Hz, 1H), 7.36 (d, J = 8.2 Hz, 4H), 7.18 (d, J = 8.1 Hz, 4H), 6.70 (dd, J_1= 17.6, J_2 = 11.0 Hz, 2H), 5.73 (dd, J_1= 17.6, J_2 =0.8 Hz, 2H), 5.23 (dd, J_1= 10.9, J_2 =0.6 Hz, 2H), 4.78 (s, 4H); ^{13}C{^{1}H}NMR (100 MHz, $CDCl_3$) δ 154.4, 141.9, 137.0, 136.9, 136.4, 132.5, 130.1, 127.3, 126.6, 113.9, 50.6; IR spectrum in film (ν_{max}, cm^{-1}) 3332, 1694, 1638, 1462, 1340; HRMS (ESI) *m/z* Calcd for [$C_{22}H_{22}N_3$] requires [M+H]$^+$ 328.1814, found 328.1828.

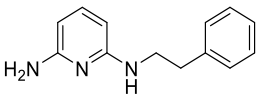


***N*-(3-Vinylphenethyl)pyridin-2-amine) (12).** The crude product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **12** as a yellow oil,(91.9 mg, 82%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.98 (d, J = 4.0 Hz, 1H), 7.44–7.11 (m, 5H), 6.77–6.65 (m, 1H), 6.52 (t, J = 5.6 Hz, 1H), 6.45 (dd, J_1 = 7.0, J_2= 4.9 Hz, 2H), 5.79 (dd, J_1 =17.0, J_2= 14.3 Hz, 1H), 5.22 (dd, J_1 = 15.2, J_2= 11.5 Hz, 1H), 3.54–3.40 (m, 2H), 2.83 (dd, J_1 = 13.9, J_2 = 6.6 Hz, 2H); ^{13}C{^{1}H} NMR (100MHz, $(CD_3)_2SO$) δ 159.2, 148.0, 140.8, 140.4, 137.5, 137.2, 137.0, 135.4, 129.4, 128.9, 128.8, 126.9, 126.5, 124.3, 114.5, 113.8, 111.9, 108.6, 42.8, 35.6, 35.9; IR spectrum in film (ν_{max}, cm^{-1}) 3349, 1690, 1646, 1460, 1340; HRMS (ESI) *m/z* Calcd for $[C_{15}H_{17}N_2]$ requires $[M+H]^+$ 225.1392, found 225.1405.

***N*-Phenethyl-*N*-(3-vinylphenethyl)pyridin-2-amine (12').** In an oven-dried 15 mL reaction vial, a solution of *N*-(3-Vinylphenethyl)pyridin-2-amine) **12** (0.5 mmol), alkene **2a** (0.8 mmol), and KOH (1.0 equiv) in 2 mL of DMSO was heated in an oil bath at 80 °C for 3 h. Progression of the reaction was monitored by TLC analysis; after complete consumption of starting material, the reaction was cooled to room temperature. The reaction mixture was diluted with ethyl acetate (10 mL X 3) and water (10 mL X 3). The layers were separated, and the organic layer was washed with aqueous saturated brine solution and dried over Na_2SO_4. Organic layer was concentrated under reduced pressure. The crude material so obtained was purified by column chromatography on neutral/basic alumina. The structure and purity of products were confirmed by comparison of their physical and spectral data (^{1}H NMR, ^{13}C NMR, and HRMS).

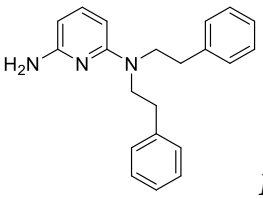


***N*-Phenethyl-*N*-(3-vinylphenethyl)pyridin-2-amine (12')**. The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **12'** as a brown oil, (68.92 mg, 42%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.41 (d, J = 4.1 Hz, 1H), 7.59–7.56 (m, 1H), 7.48– 7.18 (m, 9H), 6.88– 6.81 (m, 1H), 6.71– 6.65 (m, 2H), 5.87 (dd, J_1 = 17.6, J_2 = 13.1 Hz, 1H), 5.36 (dd, J_1 = 14.8, J_2 = 10.9 Hz, 1H), 3.76 (t, J = 7.3 Hz, 4H), 3.00–2.97 (m, 4H); ^{13}C{^{1}H}NMR (100 MHz, $CDCl_3$) δ 157.7, 148.7, 140.3, 139.8, 138.0, 137.4, 137.1, 136.9, 135.8, 129.3, 128.9, 128.7, 127.1, 126.6, 124.4, 114.1, 113.5, 111.7, 105.8, 51.5, 34.2, 34.0; IR spectrum in film (ν_{max}, cm^{-1}) 1687, 1660, 1644, 1464, 1342; HRMS (ESI) *m/z* Calcd for $[C_{23}H_{25}N_2]$ requires $[M+H]^+$ 329.2018, found 329.2026.



***N*^{2}-Phenethylpyridin-2,6-diamine (14).** The crude product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **14** as a yellow oil, (84.1 mg, 79%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.33–7.17 (m, 5H), 7.03 (t, J = 7.8 Hz, 1H), 5.90 (t, J = 5.6 Hz, 1H), 5.64–5.61 (m, 2H), 5.37 (s, 2H), 3.33 (q, J = 6.4 Hz, 2H), 2.79 (t, J = 8 Hz, 2H); ^{13}C{^{1}H} NMR (100MHz, $(CD_3)_2SO$) δ 159.2, 158.6, 140.7, 138.5, 129.2, 128.8, 126.4, 95.3, 95.1, 43.4, 35.9; IR spectrum in film (ν_{max}, cm^{-1}) 3500, 3487, 3338, 1690, 1465, 1341; HRMS (ESI) *m/z* Calcd for $[C_{13}H_{16}N_3]$ requires $[M+H]^+$ 214.1344, found 214.1354.

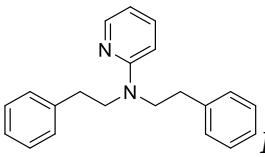
***N*^{2},*N*^{2}-Diphenethylpyridine-2,6-diamine (14')**. In an oven-dried 15 mL reaction vial, a solution of *N*^{2}-Phenethylpyridin-2,6-diamine **14** (0.5 mmol), alkene **2a** (0.8 mmol), and KOH (1.0 equiv) in 2 mL of DMSO was heated in an oil bath at 80 °C for 3 h. Progression of the reaction was monitored by TLC analysis; after complete consumption of starting material, the reaction was cooled to room temperature. The reaction mixture was diluted with ethyl acetate (10 mL X 3) and water (10 mL X 3). The layers were separated, and the organic layer was washed with aqueous saturated brine solution and dried over Na_2SO_4. Organic layer was concentrated under reduced pressure. The crude material so obtained was purified by column chromatography on neutral/basic alumina. The structure and purity of products were confirmed by comparison of their physical and spectral data (^{1}H NMR, ^{13}C NMR, and HRMS).



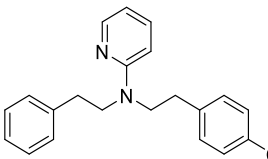
***N*^{2},*N*^{2}-Diphenethylpyridine-2,6-diamine (14')**.The crude product was product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **14'** as a brown oil, (76.12 mg, 48%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.24 – 7.16 (m, 5H), 7.12 (d, J = 6.7 Hz, 6H), 5.79 (dd, J_1 = 56.7, J_2 = 7.9 Hz, 2H), 4.07 (s, 2H), 3.51 – 3.44 (m, 4H), 2.80 – 2.73 (m, 4H); ^{13}C{^{1}H}NMR (100 MHz, $CDCl_3$) δ 157.5, 157.0, 140.1, 139.0, 128.9, 128.5, 126.1, 95.4, 95.1, 51.2, 34.2; IR spectrum in film (ν_{max}, cm^{-1}) 3450, 1686, 1650, 1645, 1465, 1341; HRMS (ESI) *m/z* Calcd for $[C_{21}H_{24}N_3]$ requires $[M+H]^+$ 318.1970, found 318.1971.

***N,N*-(Diphenethylpyridin-2-amine) (15a-c)**. In an oven-dried 15 mL reaction vial, a solution of *N*-Phenethylpyridin-2-amine **3a** (0.5 mmol), alkene **2** (0.8 mmol) and KOH (1.0 equiv) in 2 mL of DMSO was heated in an oil bath at 80 °C for 6 h. Progression of the reaction was

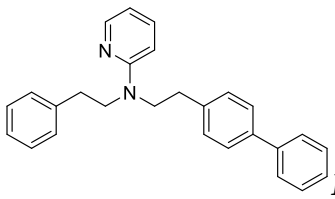
monitored by TLC analysis; after complete consumption of starting material, the reaction was cooled to room temperature. The reaction mixture was diluted with ethyl acetate (10 mL X 3) and water (10 mL X 3). The layers were separated, and the organic layer was washed with aqueous saturated brine solution and dried over Na_2SO_4. Organic layer was concentrated under reduced pressure. The crude material so obtained was purified by column chromatography on neutral/basic alumina. The structure and purity of products were confirmed by comparison of their physical and spectral data (^{1}H NMR, ^{13}C NMR, and HRMS).



***N,N*-(Diphenethylpyridin-2-amine) (15a).** The crude product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **15a** as a yellow oil, (113.3 mg, 75%): 1H NMR (400 MHz, $CDCl_3$) δ 8.22 (dd, J_1 = 4.9, J_2 = 1.4 Hz, 1H), 7.47–7.43 (m, 1H), 7.31–7.26 (m, 4H), 7.22–7.18 (m, 6H), 6.56–6.51 (m, 2H), 3.59 (t, J = 7.6 Hz, 4H), 2.84 (t, J = 7.6 Hz, 4H); ^{13}C{1H} NMR (100MHz, $CDCl_3$) δ 157.5, 148.4, 139.9, 137.2, 128.9, 128.5, 126.3, 111.4, 105.6, 51.3, 34.0; IR spectrum in film (ν_{max}, cm^{-1}) 3350, 1692, 1465, 1340; HRMS (ESI) *m/z* Calcd for [$C_{21}H_{23}N_2$] requires [M+H]$^+$ 303.1861, found 303.1875.

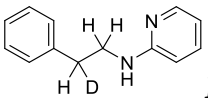


***N*-(4-Chlorophenethyl)-*N*-phenethylaniline (15b).** The crude product was purified by column chromatography (hexane/EtOAc = 98/2) to afford **15b** as a yellow oil, (139.4 mg, 83%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.13 (ddd, J_1 = 4.9, J_2 = 1.9, J_3 = 0.8 Hz, 1H), 7.39–7.35 (m, 1H), 7.23–7.10 (m, 6H), 7.04–7.01 (m, 2H), 6.49–6.46 (m, 1H), 6.42 (d, J = 8.7 Hz, 1H), 3.46–3.51 (m, 4H), 2.71–2.78 (m, 4H); ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 157.4, 148.4, 139.7, 138.4, 137.2, 132.0, 130.3, 129.0, 128.6, 126.3, 111.6, 105.7, 51.5, 51.2, 34.0, 33.5; IR spectrum in film (ν_{max}, cm^{-1}) 3354, 1682, 1469, 1345; HRMS (ESI) *m/z* Calcd for [$C_{21}H_{22}ClN_2$] requires [M+H]$^+$ 337.1472, found 337.1475.

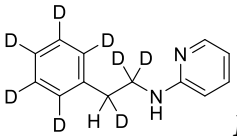


***N*-(2-([1,1'-Bipheny]-4-yl)ethyl)-*N*-phenethylaniline (15c).** The crude product was purified by column chromatography (hexane/EtOAc = 85/5) to afford **15c** as a yellow oil, (155.1 mg, 82%): ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.15 (d, J = 3.7 Hz, 1H), 7.50

(d, J = 7.3 Hz, 2H), 7.44 (d, J = 7.9 Hz, 2H), 7.40–7.33 (m, 3H), 7.27–7.12 (m, 8H), 6.50–6.45 (m, 2H), 3.56 (t, J = 7.3 Hz, 4H), 2.80 (q, J = 6.3 Hz, 4H); $^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$) δ 157.4, 148.4, 141.0, 140.0, 139.2, 139.0, 137.1, 129.3, 128.9, 128.7, 128.5, 127.2, 127.1, 127.0, 126.2, 111.4, 105.6, 51.3, 51.2, 34.0, 33.6; IR spectrum in film (ν_{max}, cm^{-1}) 3340, 1695, 1475, 1330; HRMS (ESI) *m/z* Calcd for $[C_{27}H_{27}N_2]$ requires $[M+H]^+$ 379.2174, found 379.2175.



***N*-(2-Phenethyl-2-*d*)pyridin-2-amine) (3a').** The crude product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **3a'** as a yellow oil, (77.6 mg, 78%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 7.98 (d, J = 2.7 Hz, 1H), 7.36–7.18 (m, 6H), 6.53 (s, 1H), 6.46 (d, J = 7.3 Hz, 2H), 3.44 (t, J = 6.0 Hz, 2H), 2.81 (t, J = 7.1 Hz, 1H); $^{13}C\{^{1}H\}$ NMR (100 MHz, $(CD_3)_2SO$) δ 159.3, 148.1, 140.5, 137.0, 129.2, 128.8, 126.4, 111.9, 108.6, 42.9, 35.7–35.2 (m); HRMS (ESI) *m/z* Calcd for $[C_{13}H_{13}DN_2]$ requires $[M]^+$ 199.1220, found 199.1240.

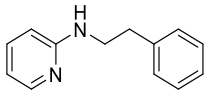


***N*-(2-(Phenyl-d_5)ethyl-1,1,2-d_3)pyridin-2-amine) (3a").**The crude product was purified by column chromatography (hexane/EtOAc = 90/10) to afford **3a"** as a yellow oil, (76.2 mg, 74%): ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 8.03 (d, J = 3.8 Hz, 1H), 7.37–7.33 (m, 1H), 6.52–6.46 (m, 3H), 2.86–2.84 (m, 1H); $^{13}C\{^{1}H\}$ NMR (100 MHz, $(CD_3)_2SO$) δ 159.3, 148.1, 140.3, 137.0, 129.3–128.0 (m), 126.1–125.6 (m), 112.0, 108.5, 42.9–42.0 (m), 35.6–35.0 (m); HRMS (ESI) *m/z* Calcd for $[C_{13}H_6D_8N_2]$ requires $[M]^+$ 206.1659, found 206.1660.

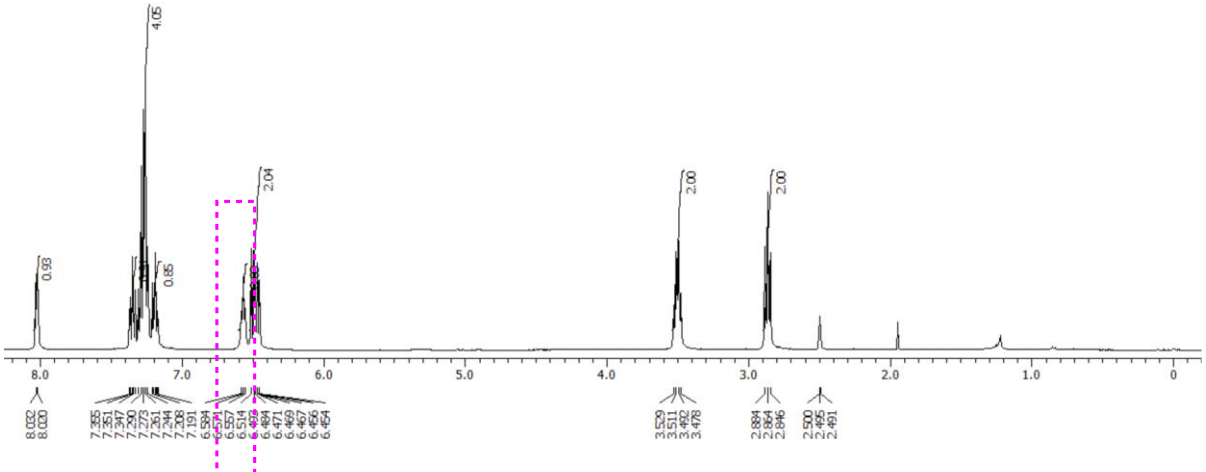
COPIES OF ^{1}H NMR, ^{13}C NMR, HRMS

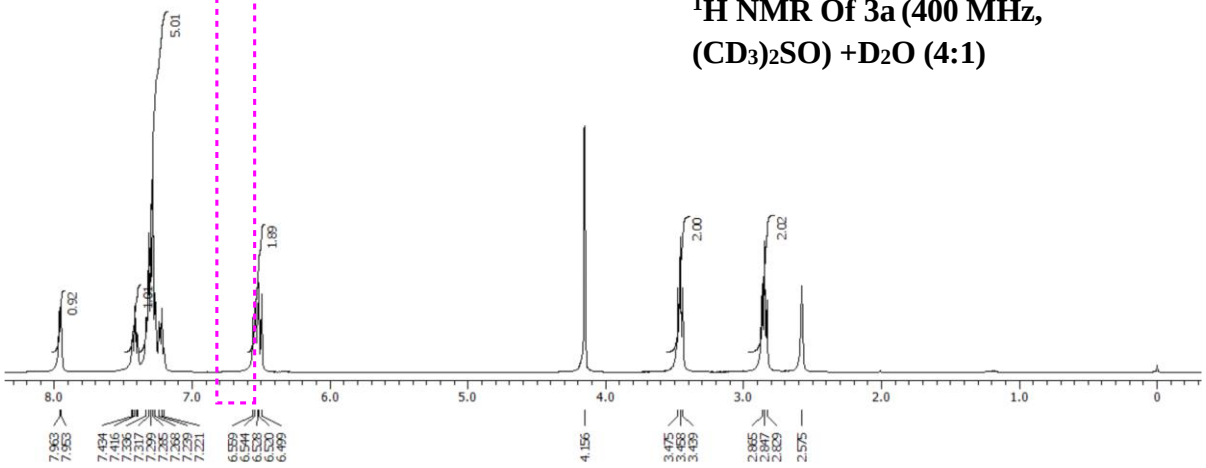
^{1}H NMR

(400 MHz, $(CD_3)_2SO$)



***N*-Phenethylpyridin-2-amine (3a)**

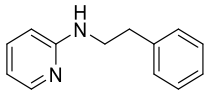




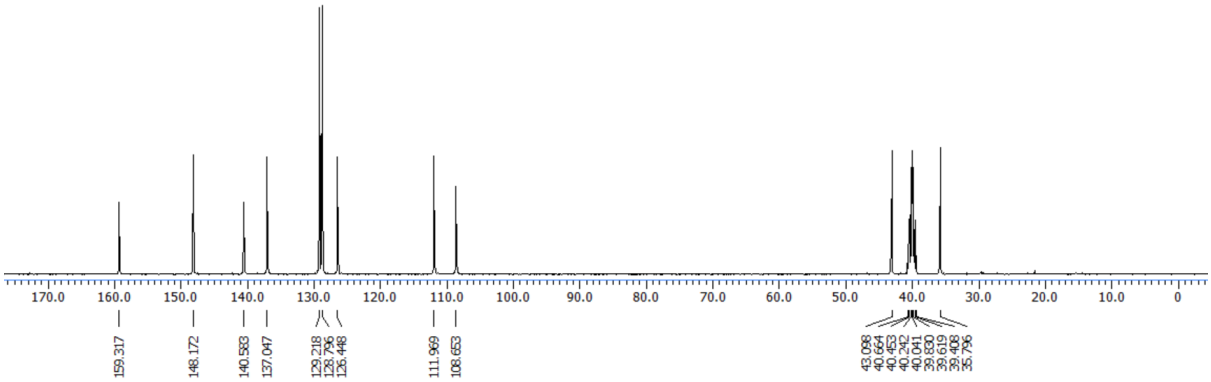
^{1}H NMR Of 3a (400 MHz, $(CD_3)_2SO$) +D_2O (4:1)

^{13}C NMR

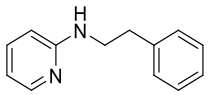
(100 MHz, $(CD_3)_2SO$)



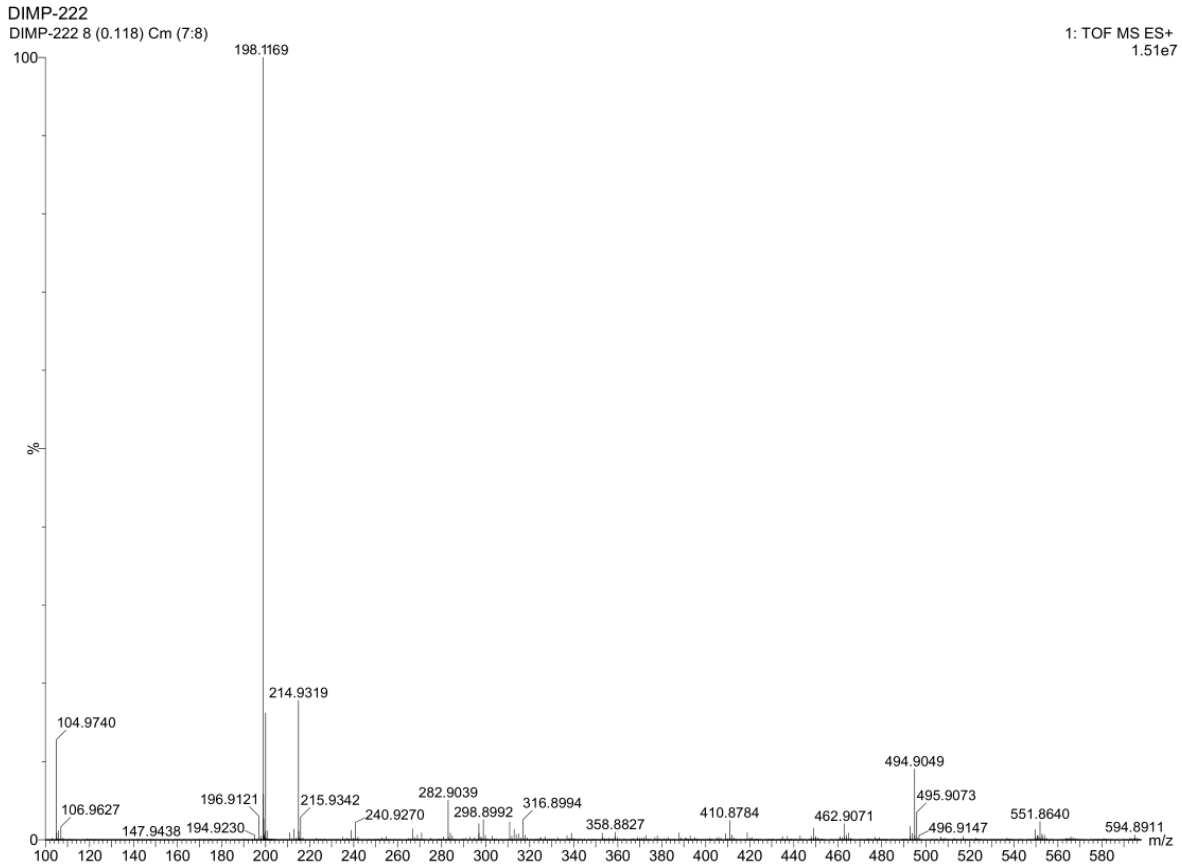
***N*-Phenethylpyridin-2-amine (3a)**



HRMS

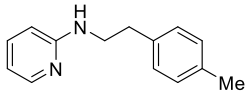


N-Phenethylpyridin-2-amine (3a)

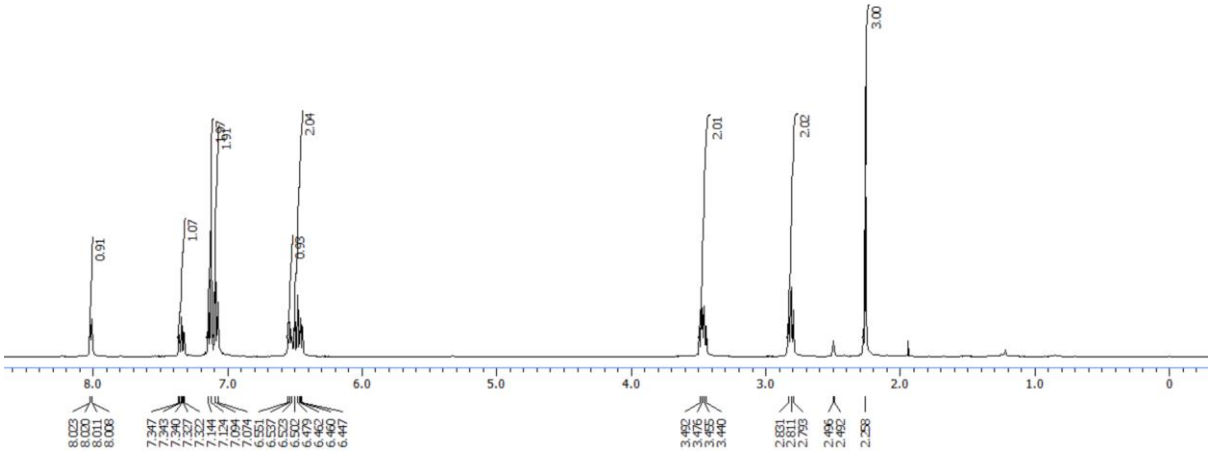


^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

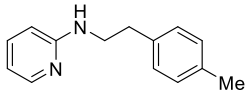


***N*-(4-Methylphenethyl)pyridin-2-amine (3b)**

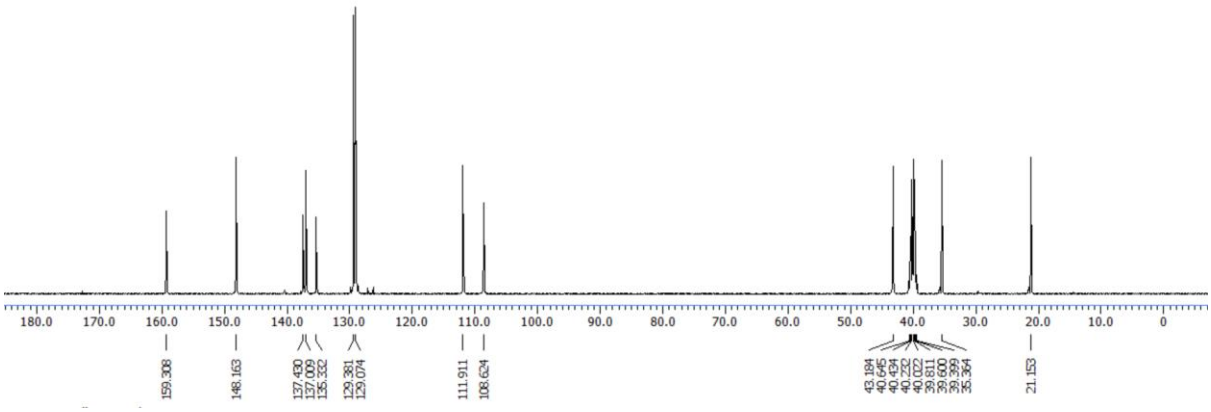


^{13}C NMR

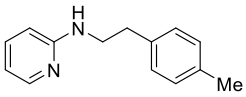
(100 MHz, $(CD_3)_2SO$)



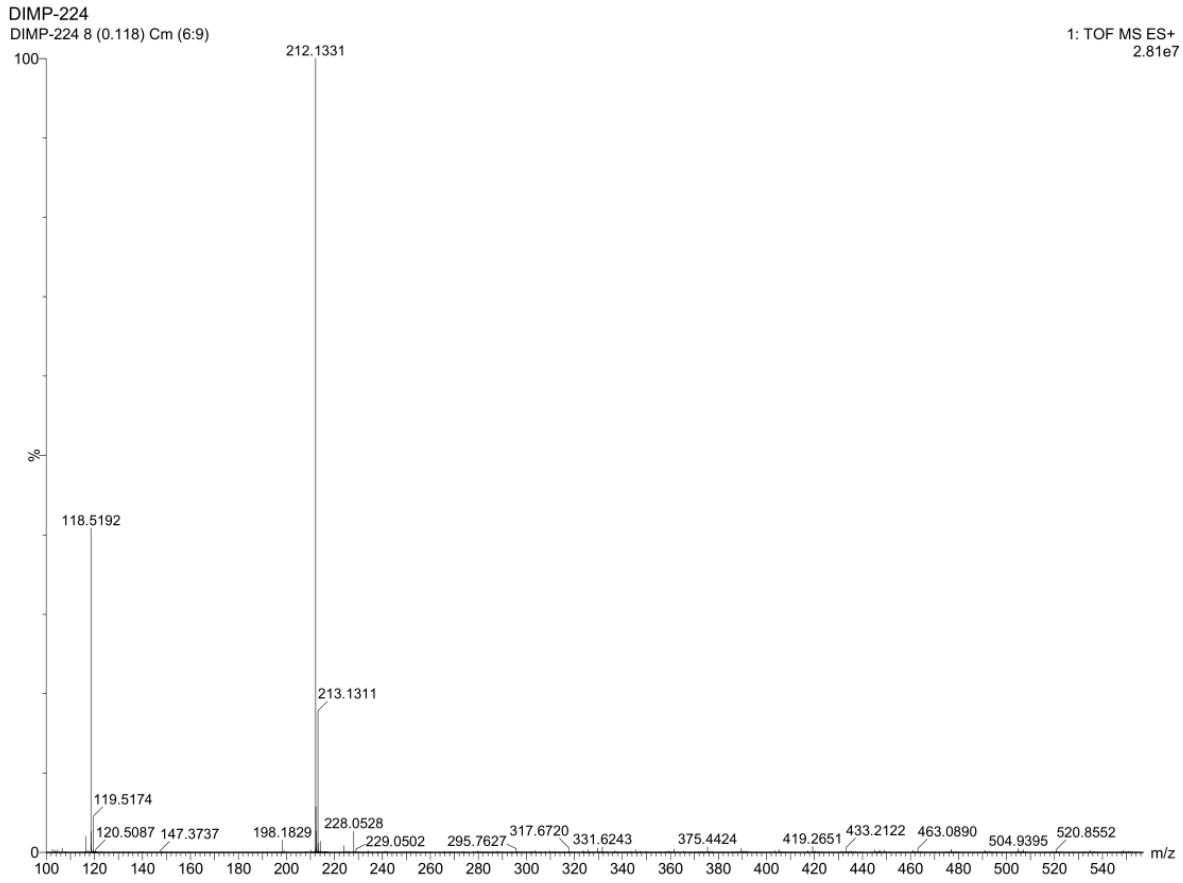
***N*-(4-Methylphenethyl)pyridin-2-amine (3b)**



HRMS

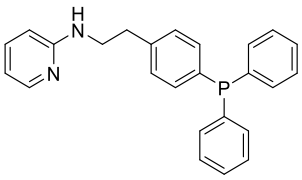


N-(4-Methylphenethyl)pyridin-2-amine (3b)

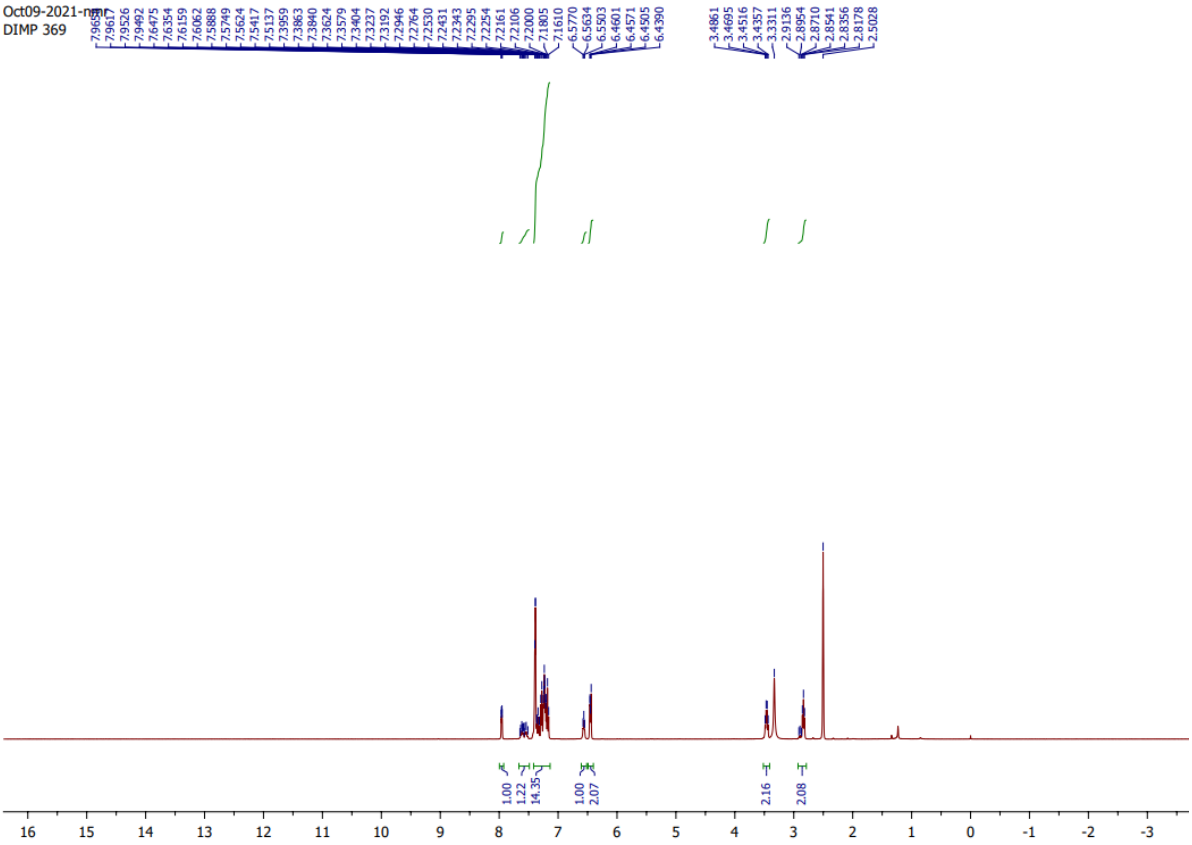


^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

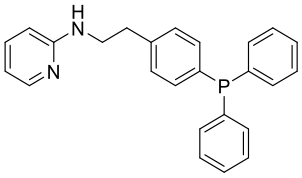


***N*-(4-diphenylphosphanyl)phenethyl)pyridin-2-amine (3c)**

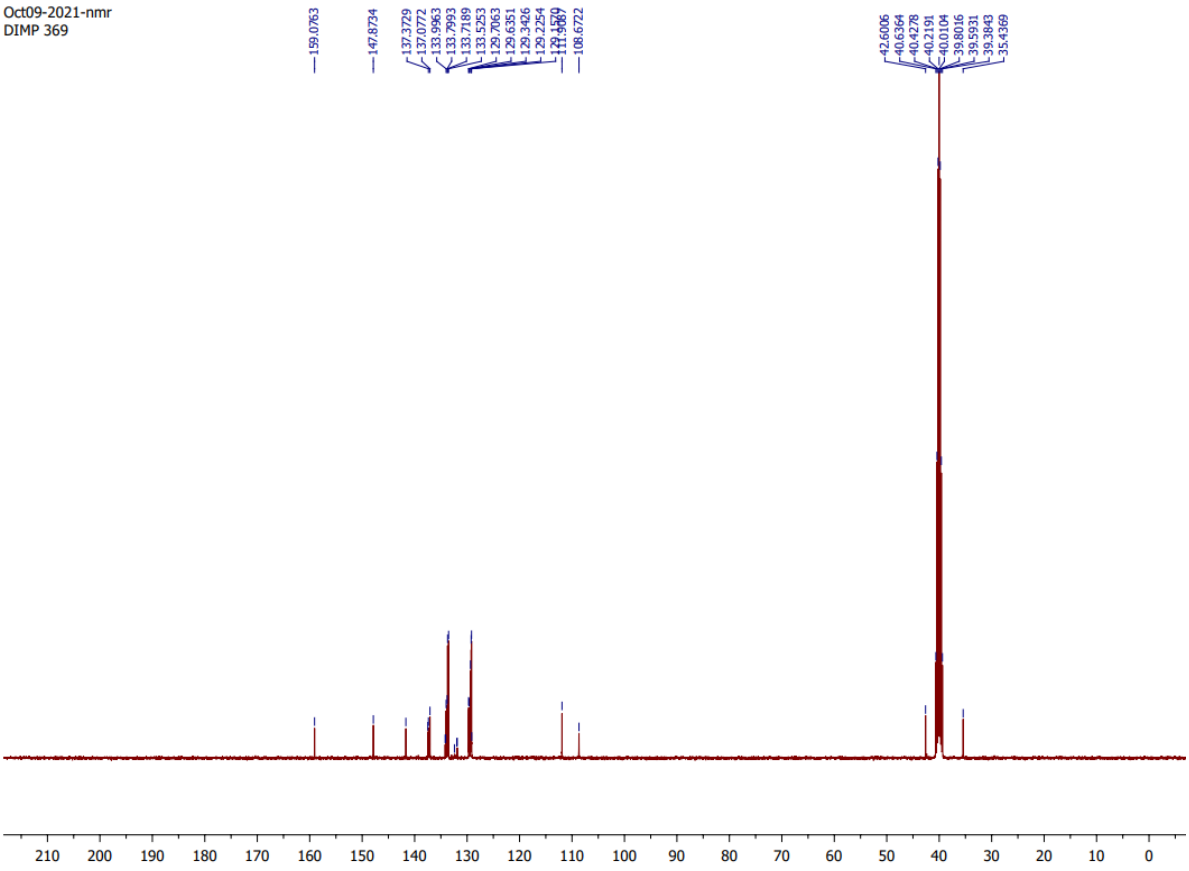


^{13}C NMR

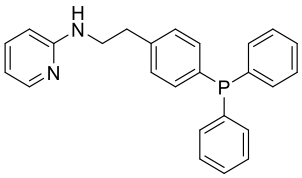
(100 MHz, $(CD_3)_2SO$)



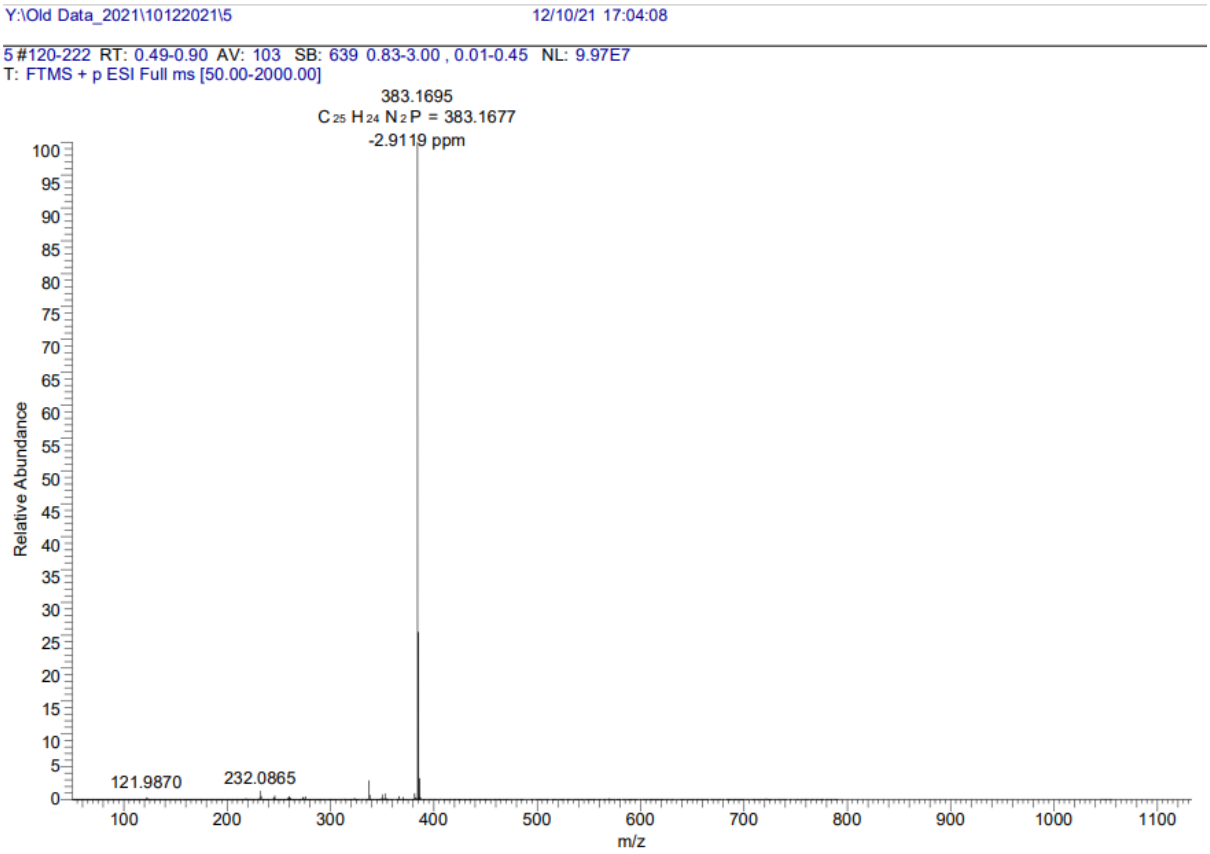
***N*-(4-diphenylphosphanyl)phenethyl)pyridin-2-amine (3c)**



HRMS

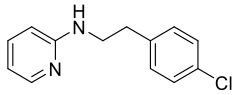


_N_-(4-diphenylphosphanyl)phenethyl)pyridin-2-amine (3c)

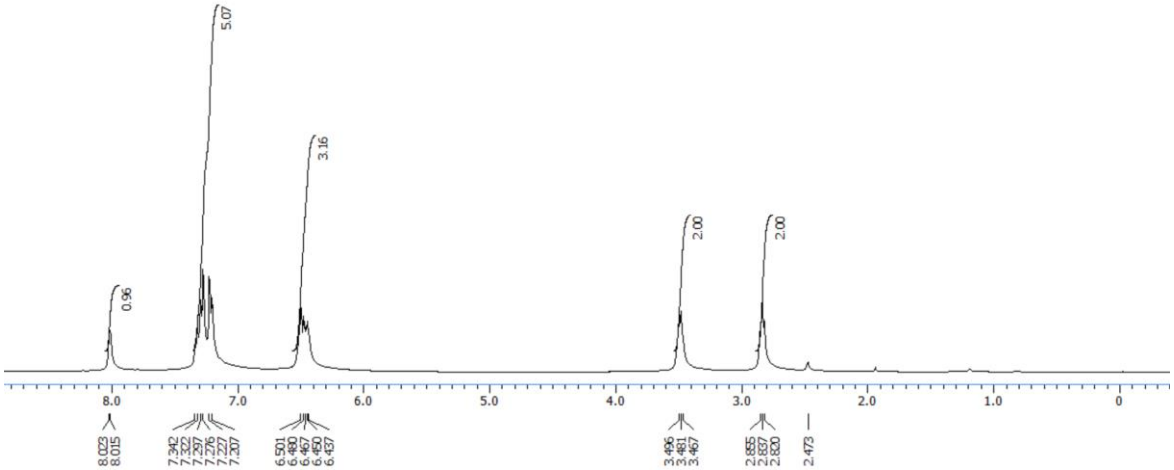


^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

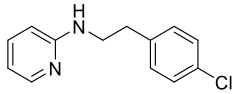


***N*-(4-Chlorophenethyl)pyridin-2-amine (3d)**

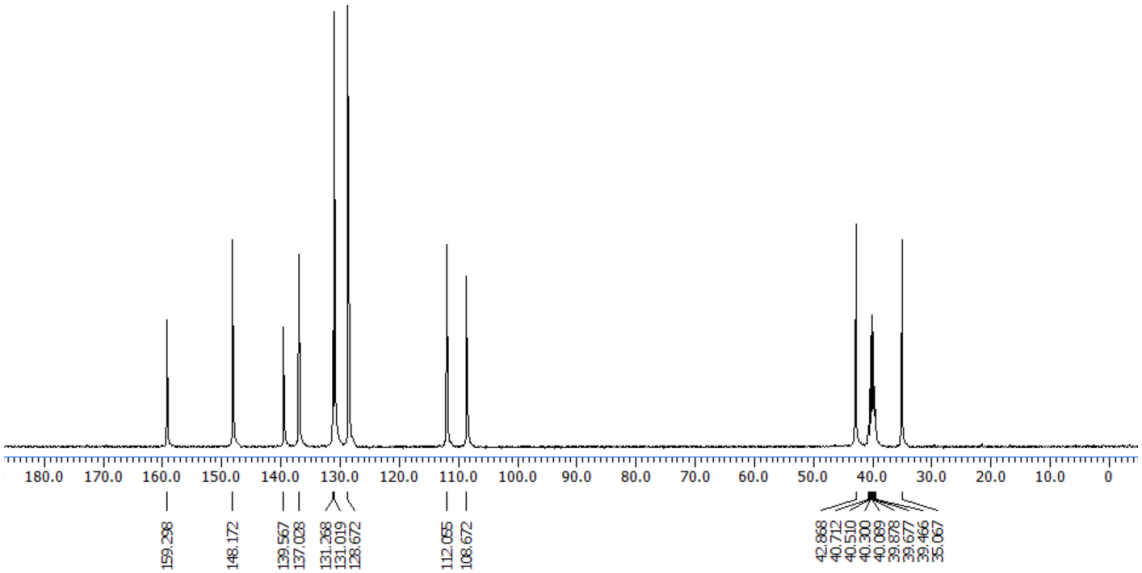


^{13}C NMR

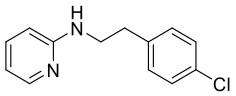
(100 MHz, $(CD_3)_2SO$)



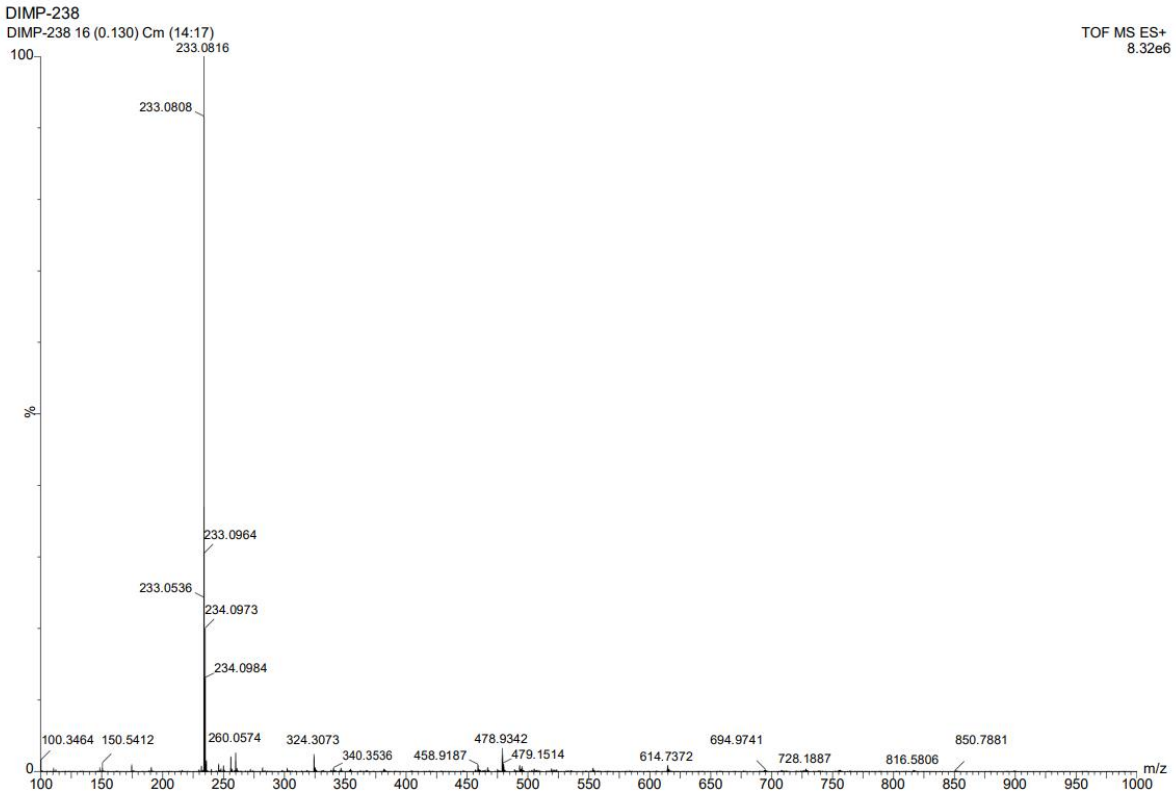
***N*-(4-Chlorophenethyl)pyridin-2-amine (3d)**



HRMS

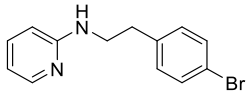


N-(4-Chlorophenethyl)pyridin-2-amine (3d)

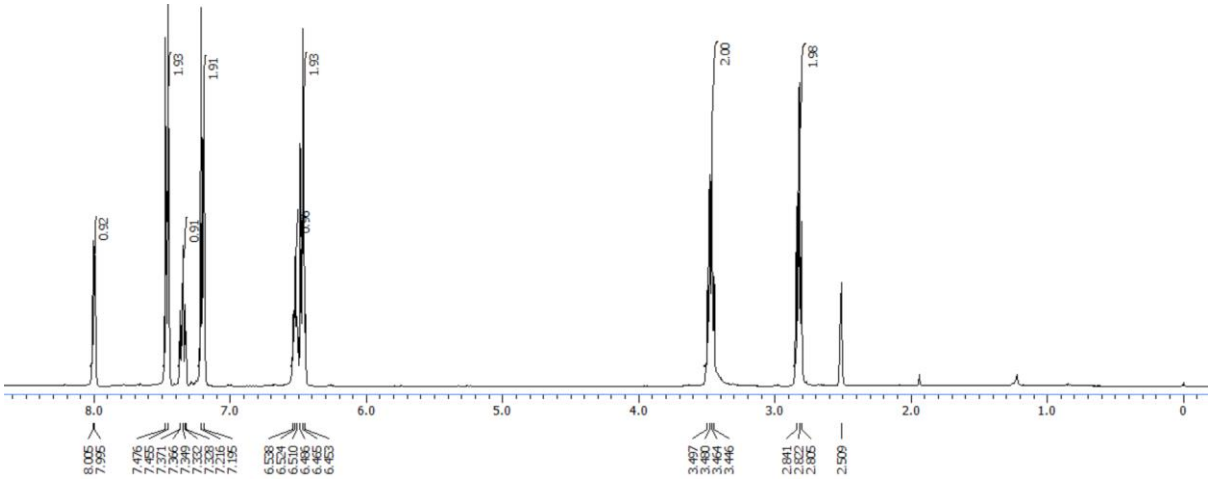


^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

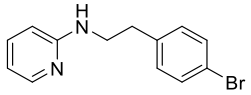


***N*-(4-Bromophenethyl)pyridin-2-amine (3e)**

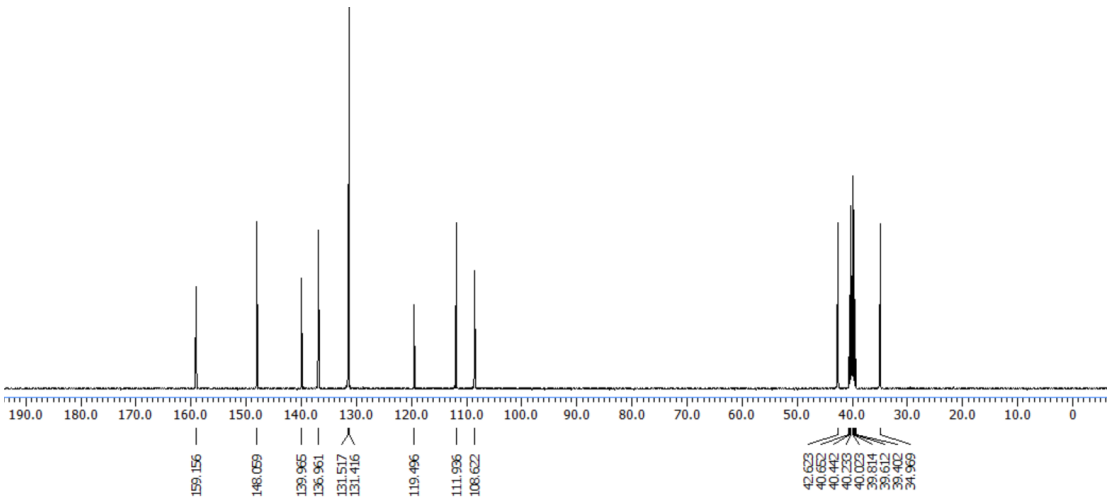


^{13}C NMR

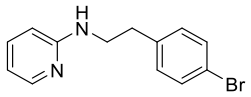
(100 MHz, $(CD_3)_2SO$)



***N*-(4-Bromophenethyl)pyridin-2-amine (3e)**



HRMS



N-(4-Bromophenethyl)pyridin-2-amine (3e)

Elemental Composition Report Page 1

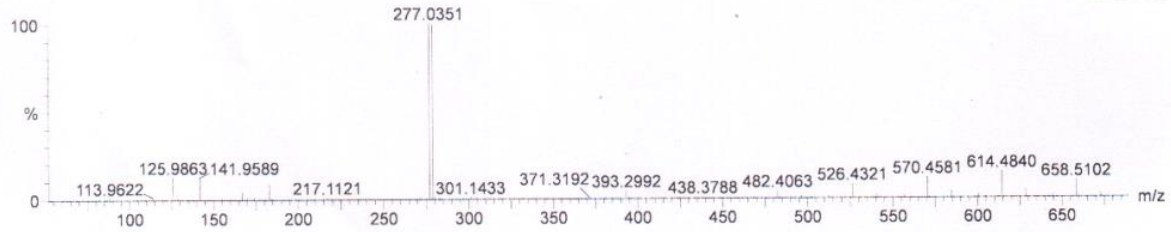
Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
7 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-13 H: 0-200 N: 0-2 Br: 0-1

DIMP-246
081121_04 71 (1.395) Cm (71:72)

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

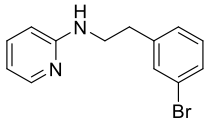
08-Nov-2021
11:51:57
1: TOF MS ES+
5.77e+005



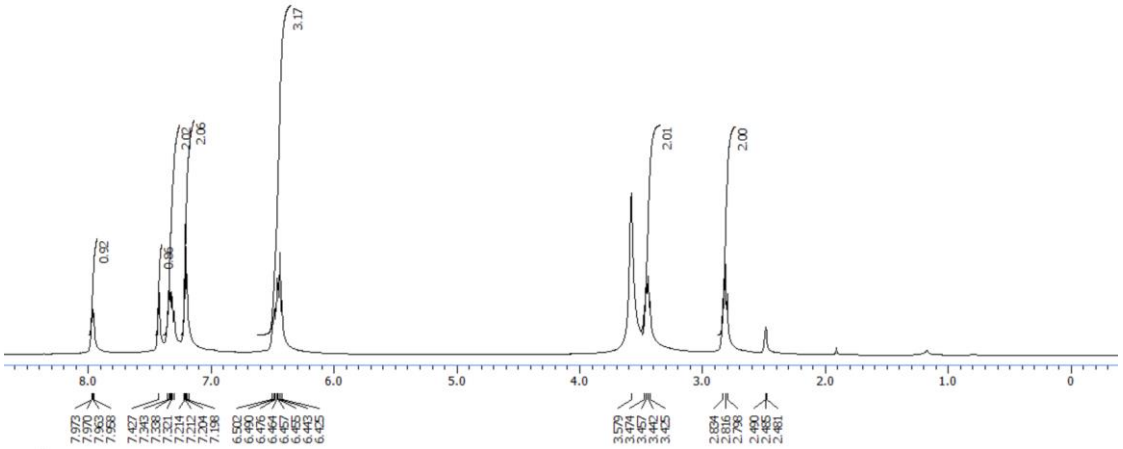
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
277.0351	277.0340	1.1	4.0	7.5	35.6	n/a	n/a	C13 H14 N2 Br

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

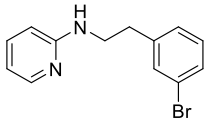


***N*-(3-Bromophenethyl)pyridin-2-amine (3f)**

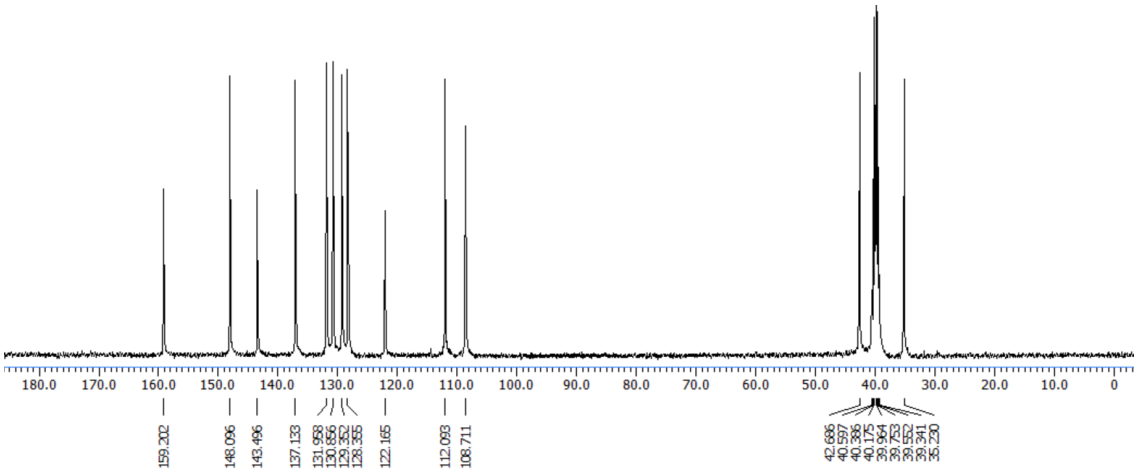


^{13}C NMR

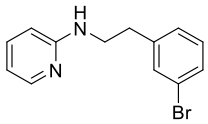
(100 MHz, $(CD_3)_2SO$)



***N*-(3-Bromophenethyl)pyridin-2-amine (3f)**



HRMS



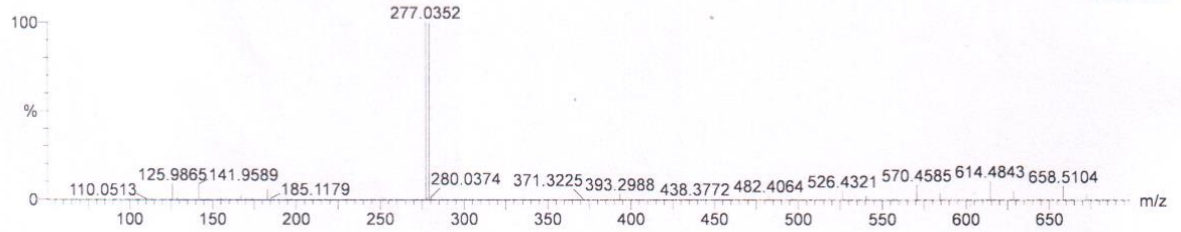
N-(3-Bromophenethyl)pyridin-2-amine (3f)

Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
7 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-13 H: 0-200 N: 0-2 Br: 0-1

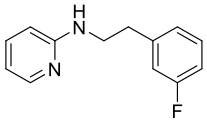
DIMP-237 QMI DIVISION, CSIR-IIIM JAMMU 08-Nov-2021
Xevo G2-XS QTOF YFC2015 11:54:30
081121_05 54 (1.068) Cm (54:55) 1: TOF MS ES+
8.60e+005



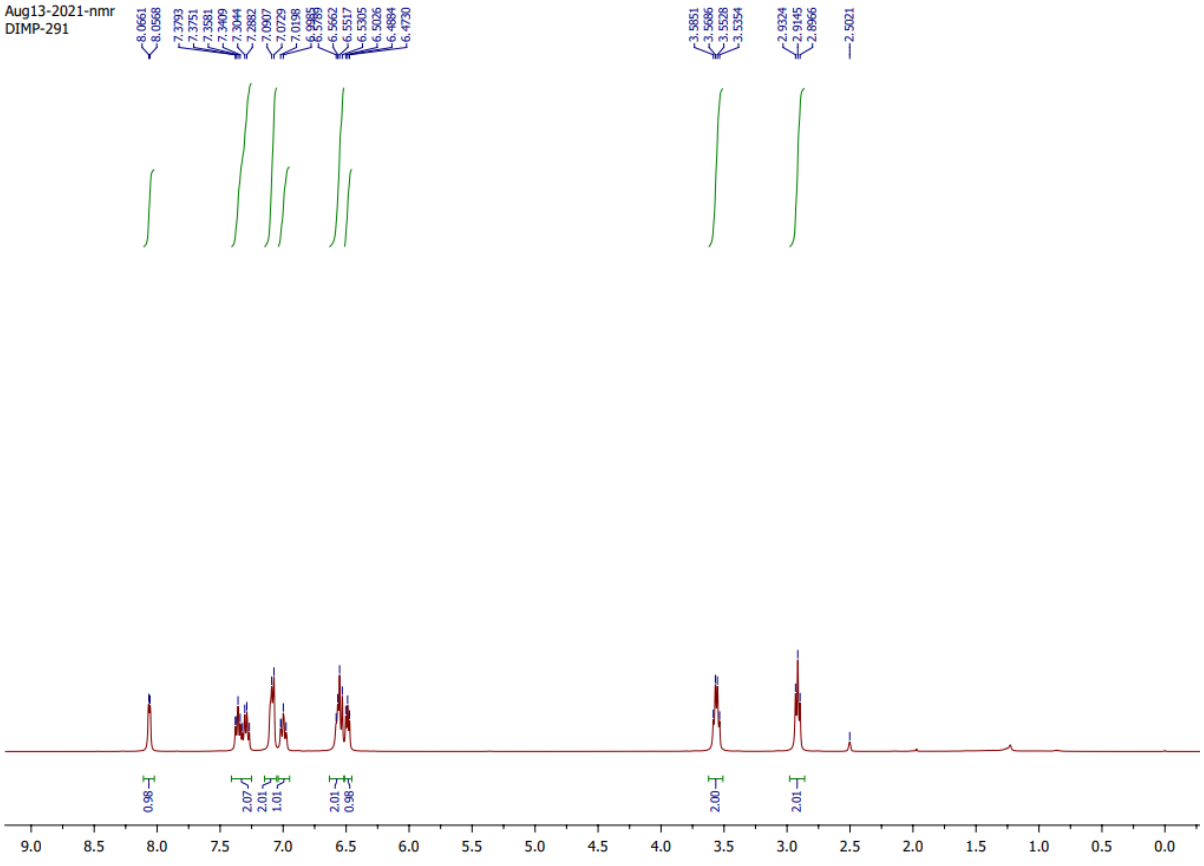
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
277.0352	277.0340	1.2	4.3	7.5	38.5	n/a	n/a	C13 H14 N2 Br

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

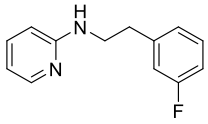


***N*-(3-Fluorophenethyl)pyridin-2-amine (3g)**

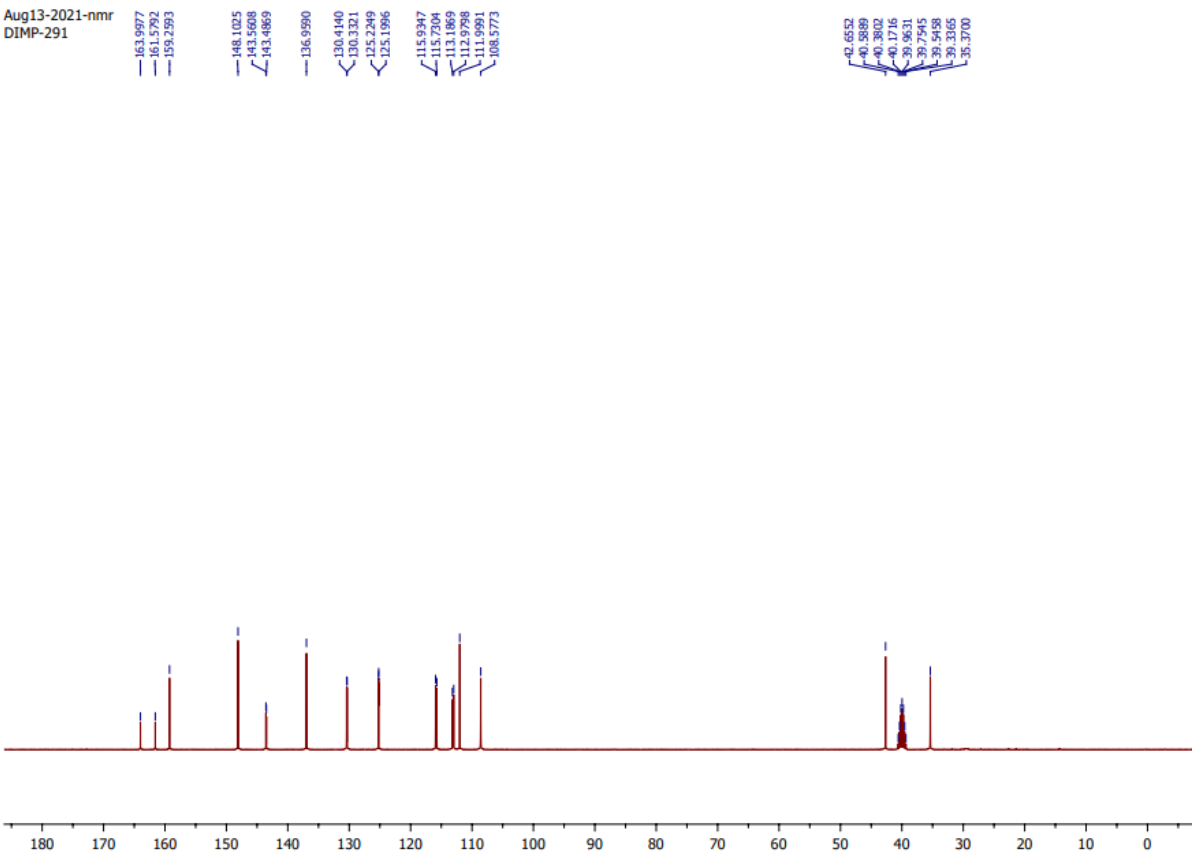


^{13}C NMR

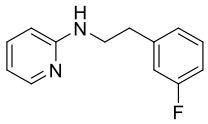
(100 MHz, $(CD_3)_2SO$)



***N*-(3-Fluorophenethyl)pyridin-2-amine (3g)**



HRMS



N-(3-Fluorophenethyl)pyridin-2-amine (3g)

Elemental Composition Report Page 1

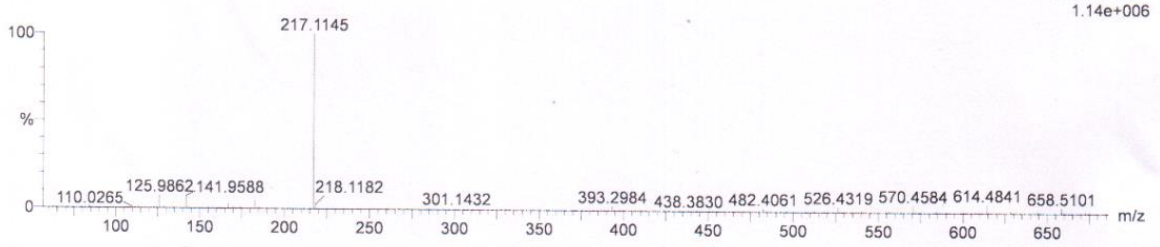
Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
7 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-13 H: 0-200 N: 0-2 F: 0-1

DIMP-291
081121_02 94 (1.843) Cm (94:95)

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

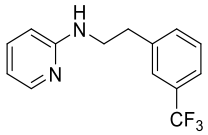
08-Nov-2021
11:46:48
1: TOF MS ES+
1.14e+006



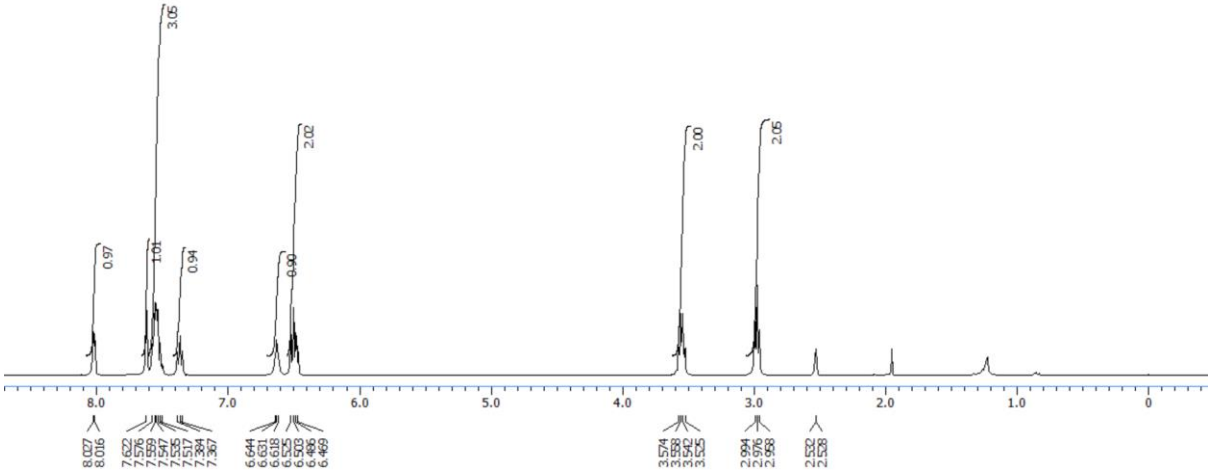
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
217.1145	217.1141	0.4	1.8	7.5	51.6	n/a	n/a	C13 H14 N2 F

^{1}H NMR

(400 MHz,$(CD_3)_2SO$)

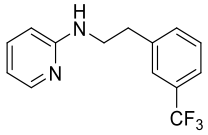


***N*-(3-(trifluoromethyl)phenethyl)pyridin-2-amine (3h)**

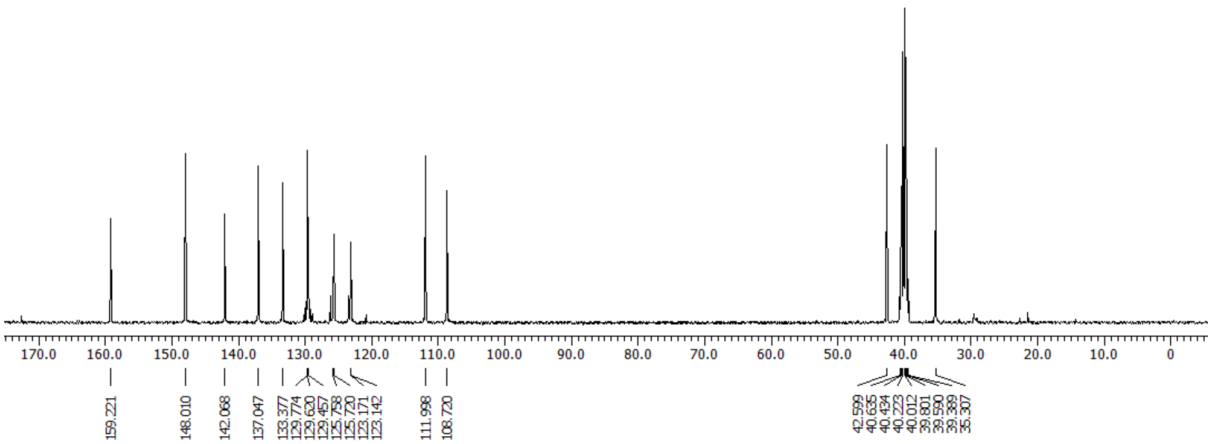


^{13}C NMR

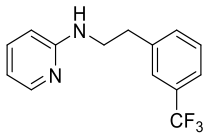
(100 MHz, $(CD_3)_2SO$)



***N*-(3-(trifluoromethyl)phenethyl)pyridin-2-amine (3h)**



HRMS



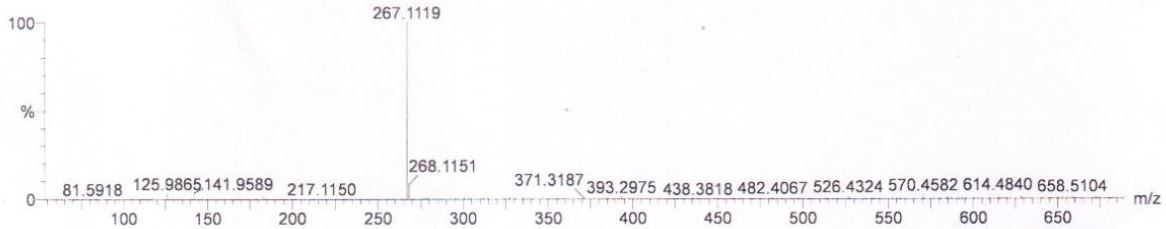
N-(3-(trifluoromethyl)phenethyl)pyridin-2-amine (3h)

Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 5.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
13 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-14 H: 0-200 N: 0-2 F: 0-3

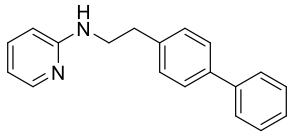
DIMP-292 QMI DIVISION, CSIR-IIIM JAMMU 08-Nov-2021 11:57:04
081121_06 51 (1.017) Cm (51) Xevo G2-XS QTOF YFC2015 1: TOF MS ES+ 1.10e+006



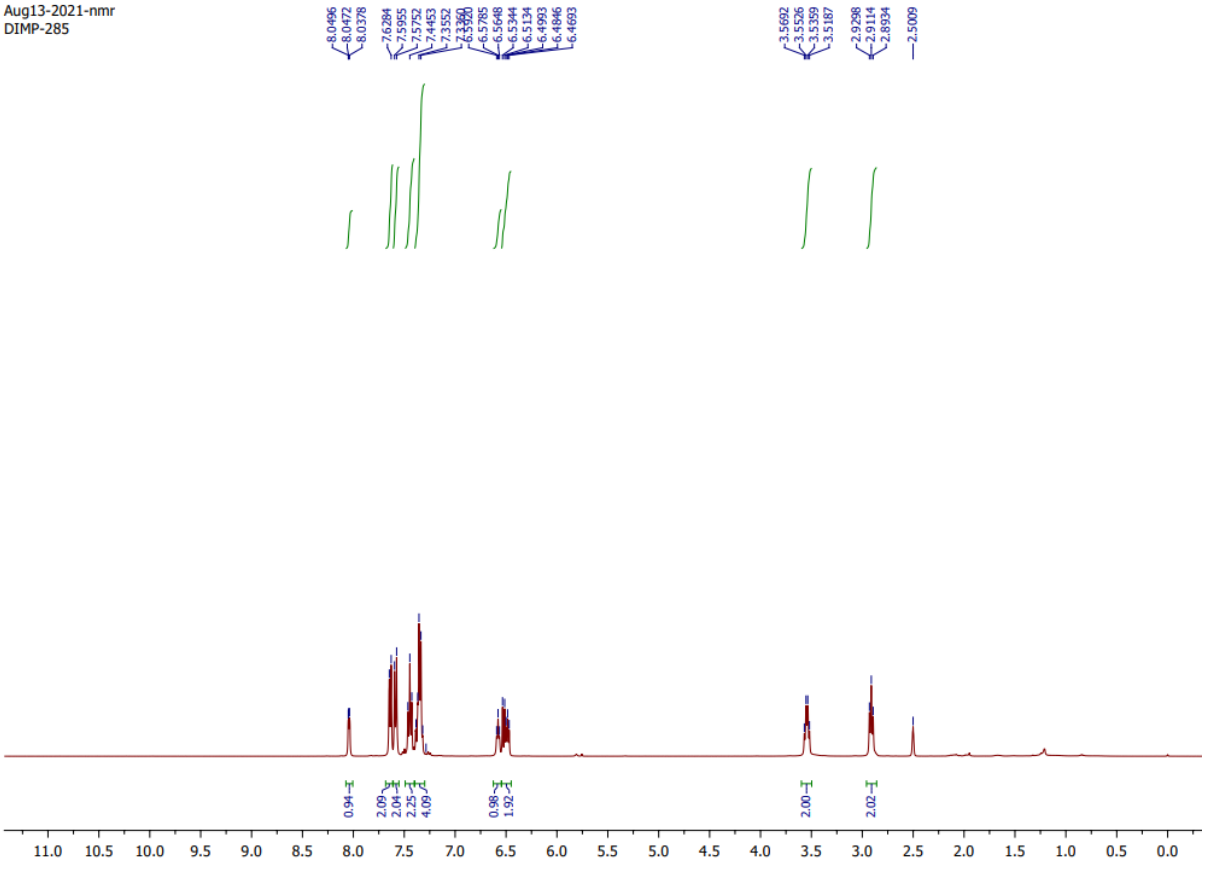
Minimum:				-1.5				
Maximum:		2.0	5.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
267.1119	267.1109	1.0	3.7	7.5	38.9	n/a	n/a	C14 H14 N2 F3

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

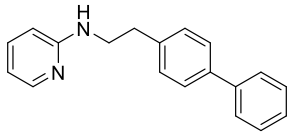


***N*-(2-([1,1'-biphenyl]-4-yl)ethyl)pyridin-2-amine (3i)**

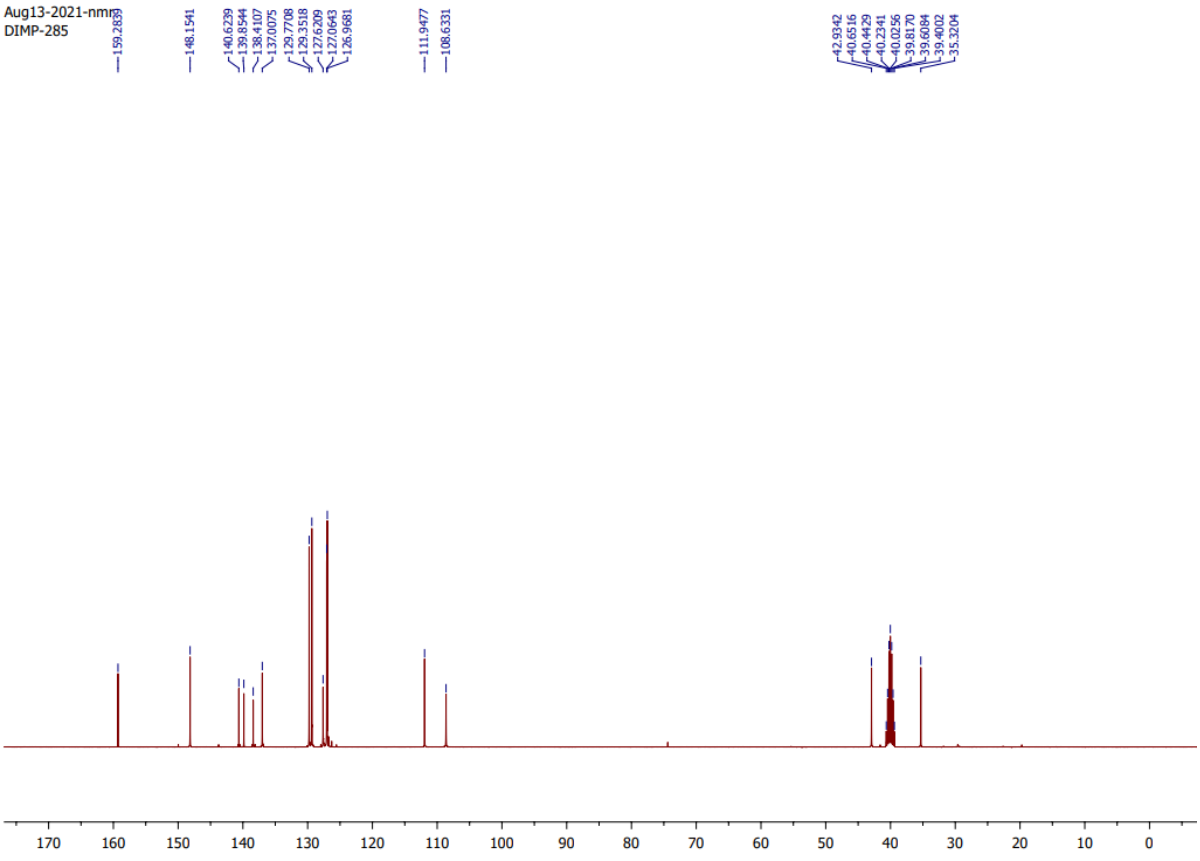


^{13}C NMR

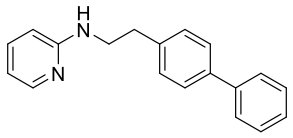
(100 MHz, $(CD_3)_2SO$)



N-(2-([1,1'-biphenyl]-4-yl)ethyl)pyridin-2-amine (3i)



HRMS



***N*-(2-([1,1'-biphenyl]-4-yl)ethyl)pyridin-2-amine (3i)**

Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
6 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-19 H: 0-200 N: 0-2

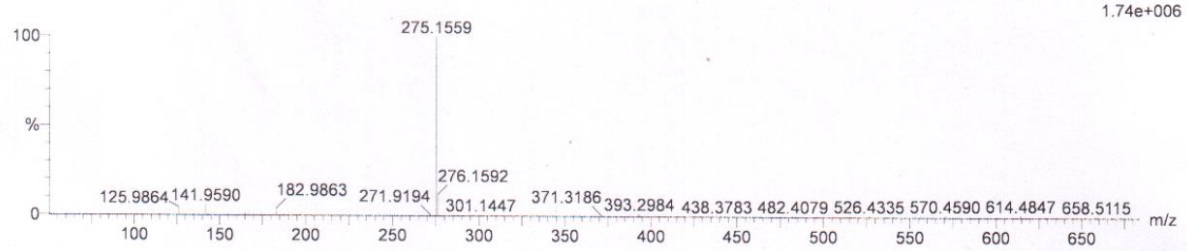
DIMP-285

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

08-Nov-2021
12:04:48

081121_09 26 (0.535) Cm (26:27)

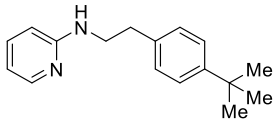
1: TOF MS ES+
1.74e+006



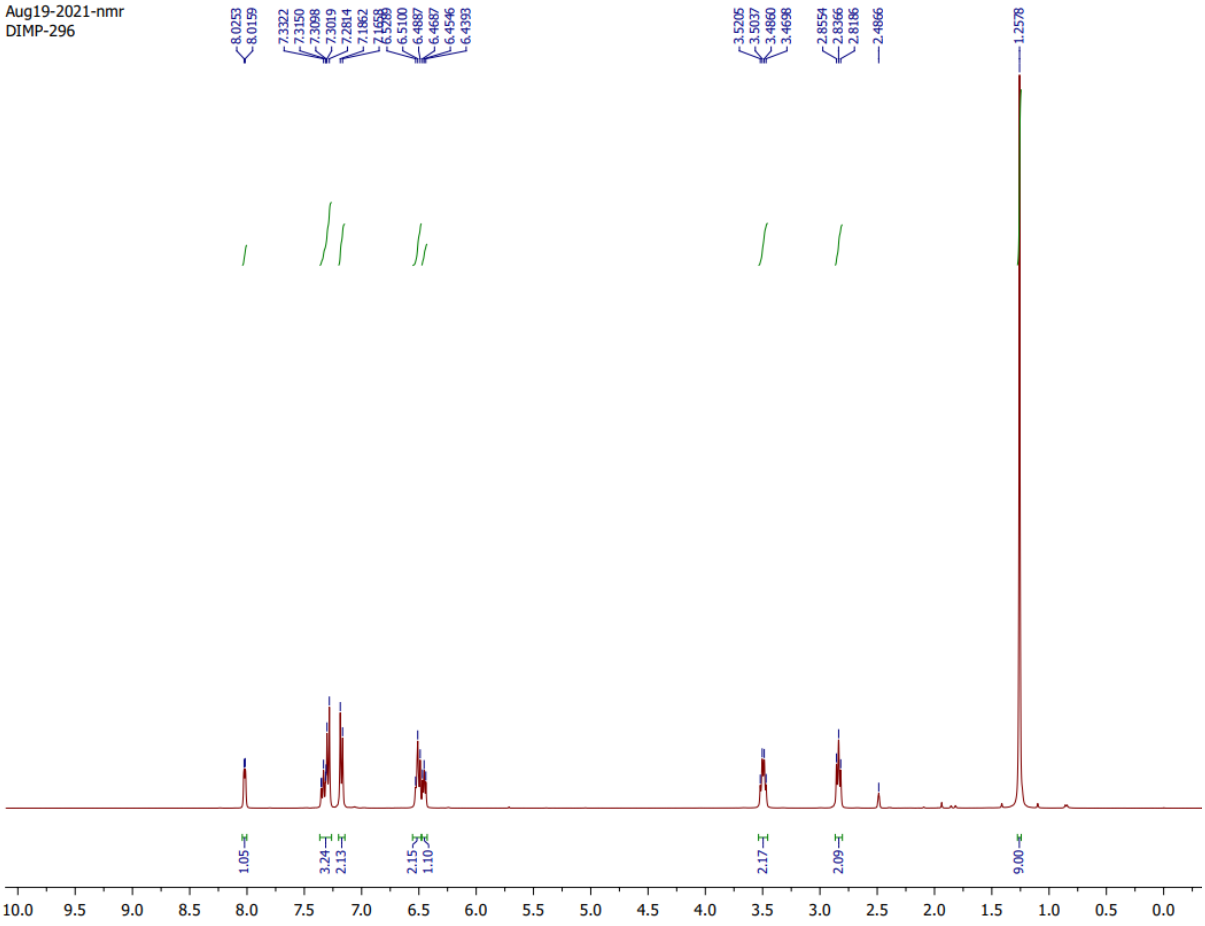
Minimum:				-1.5				
Maximum:		2.0	5.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
275.1559	275.1548	1.1	4.0	11.5	46.3	n/a	n/a	C19 H19 N2

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

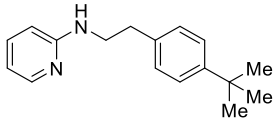


***N*-(4-(*tert*-butyl)phenethyl)pyridin-2-amine (3j)**

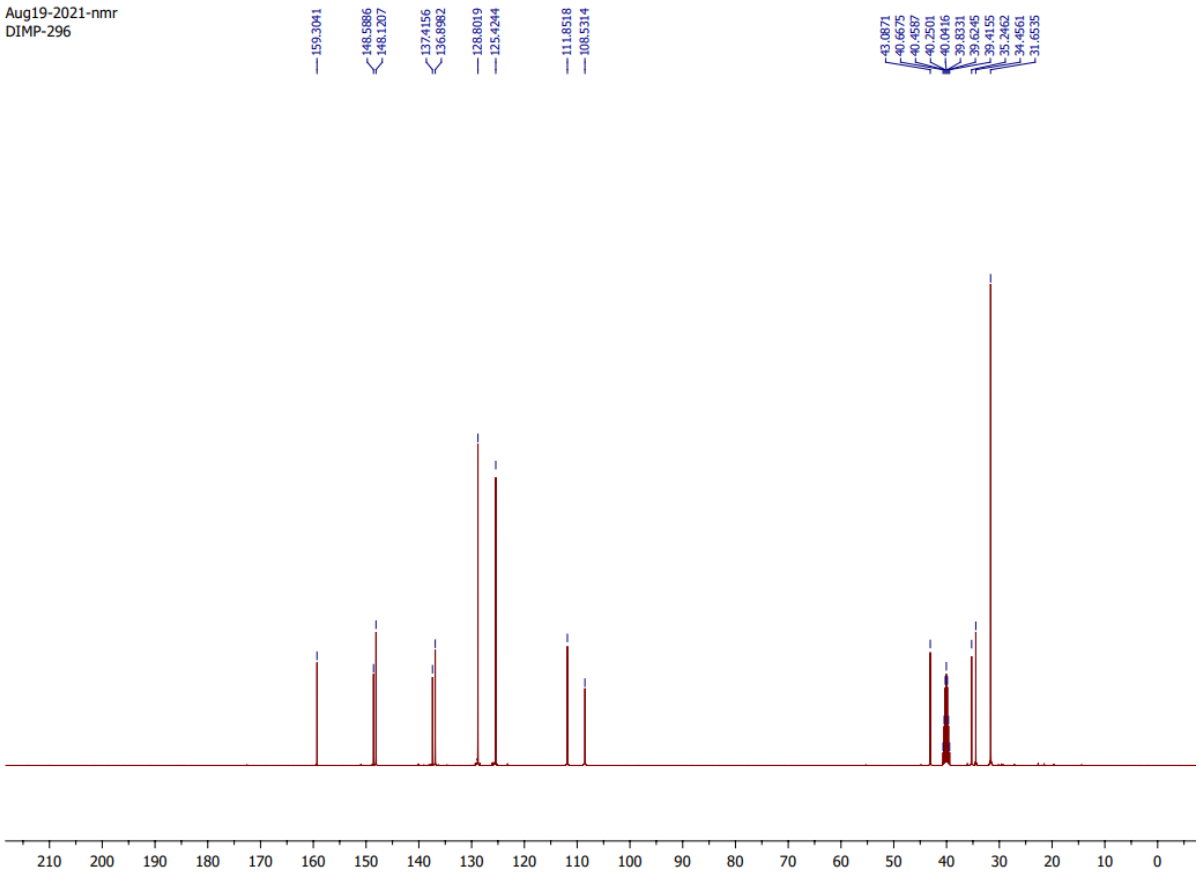


^{13}C NMR

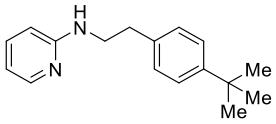
(100 MHz, $(CD_3)_2SO$)



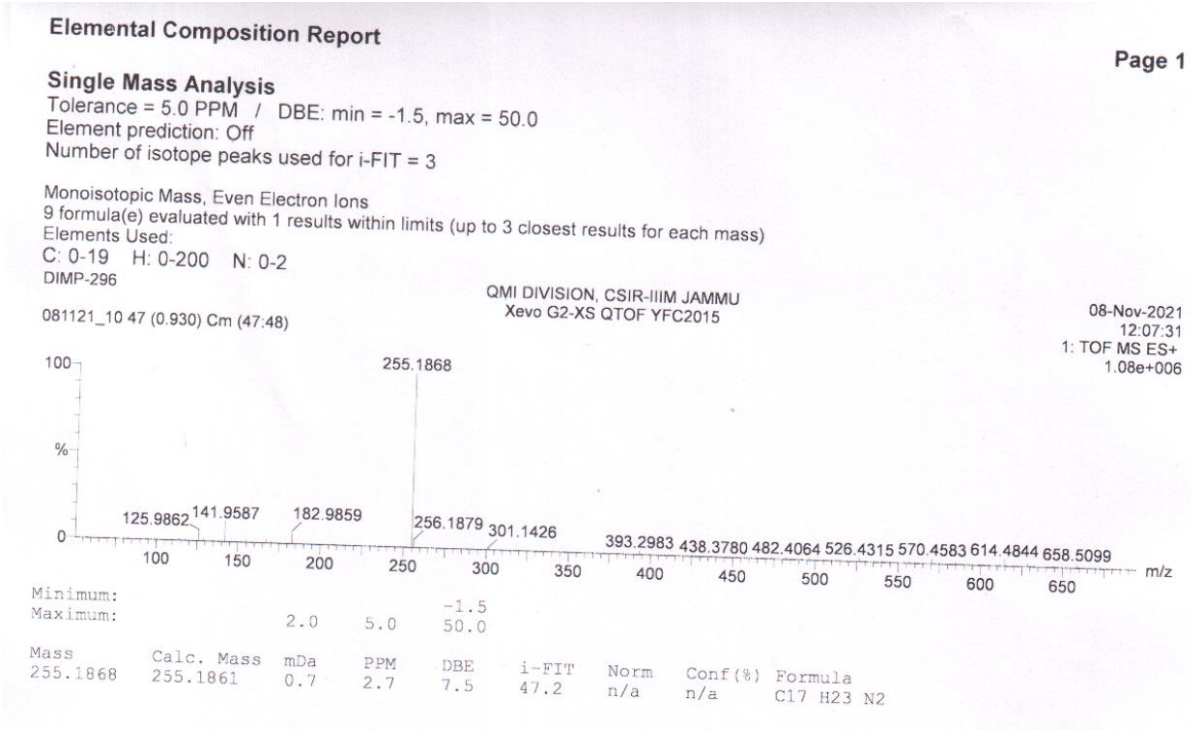
N-(4-(*tert*-butyl)phenethyl)pyridin-2-amine (3j)



HRMS

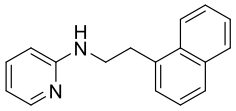


***N*-(4-(*tert*-butyl)phenethyl)pyridin-2-amine (3j)**

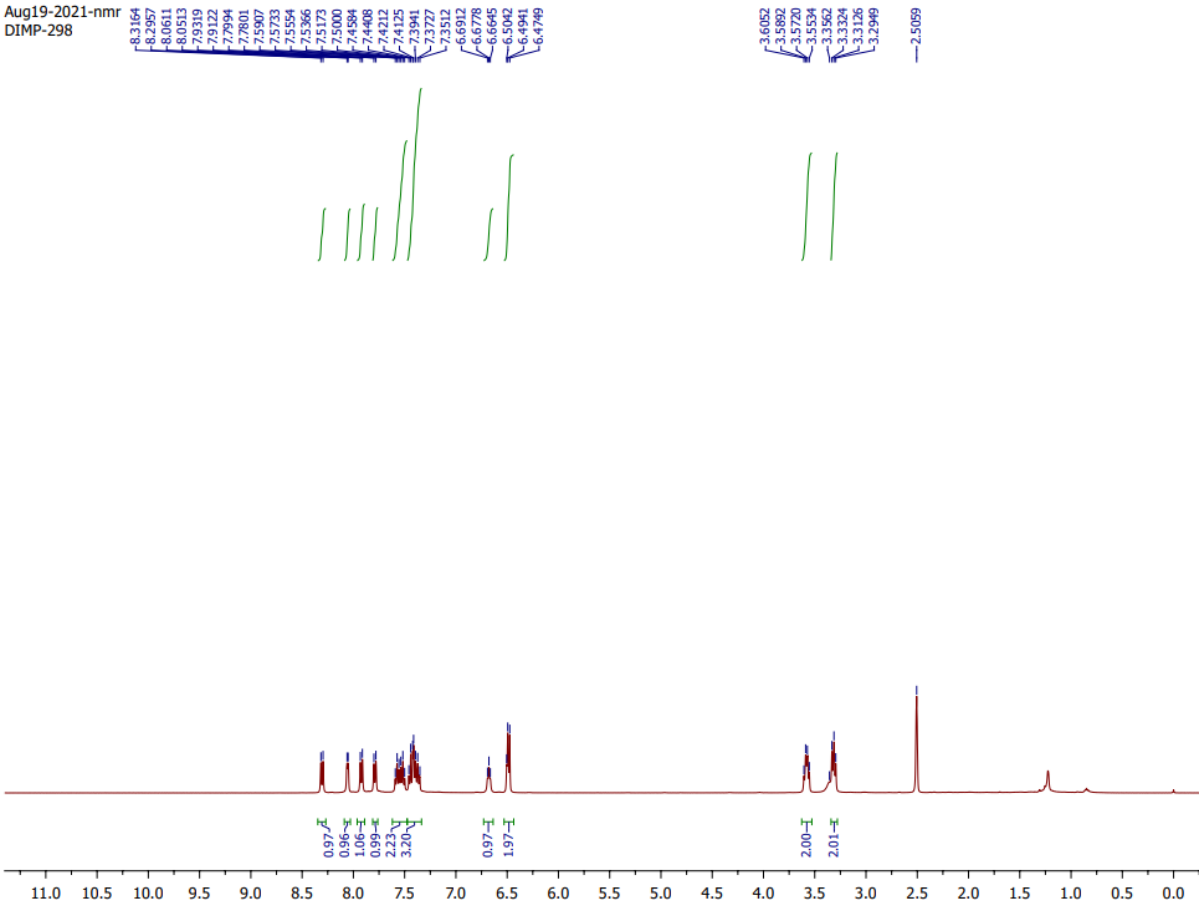


^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

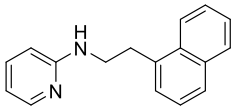


***N*-(2-(Naphthalen-1-yl)ethyl)pyridin-2-amine (3k)**

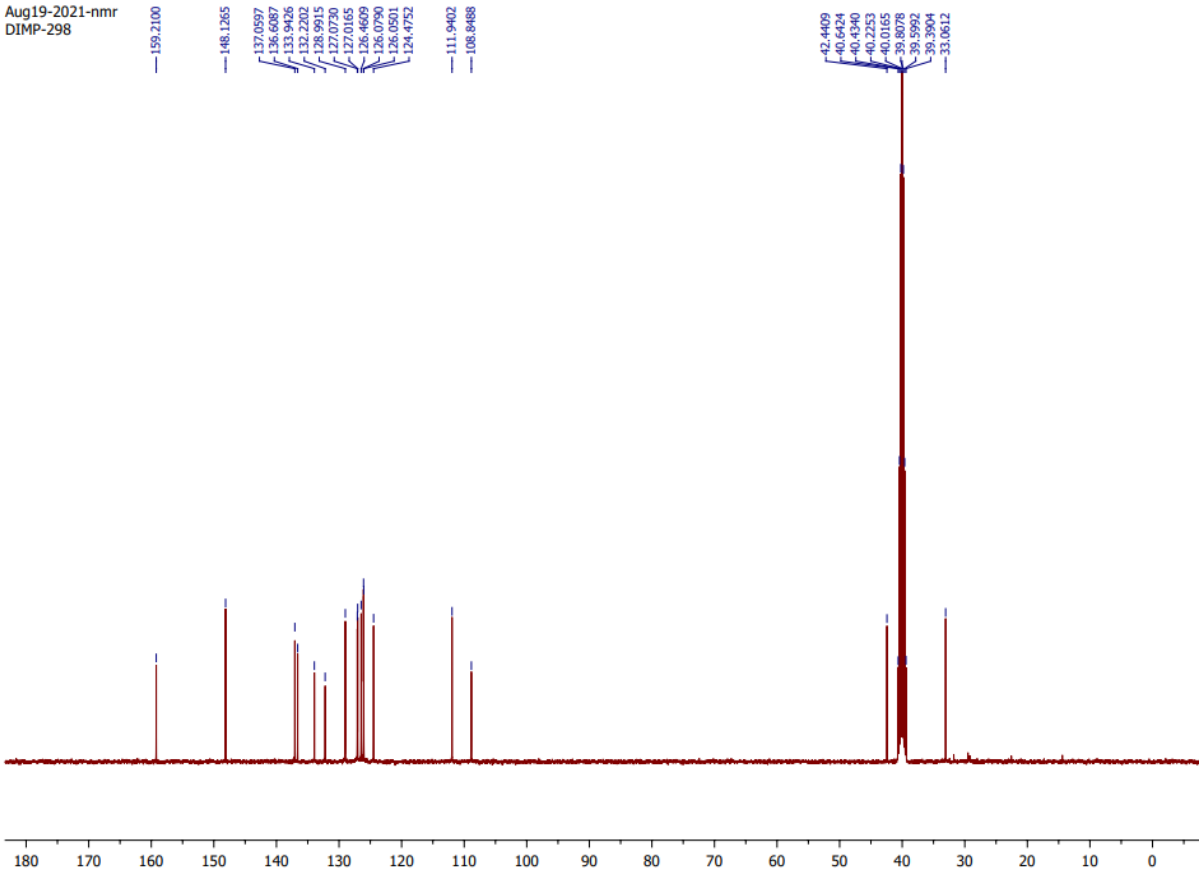


^{13}C NMR

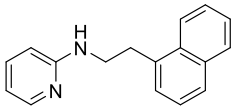
(100 MHz, $(CD_3)_2SO$)



***N*-(2-(Naphthalen-1-yl)ethyl)pyridin-2-amine (3k)**



HRMS



N-(2-(Naphthalen-1-yl)ethyl)pyridin-2-amine (3k)

Elemental Composition Report Page 1

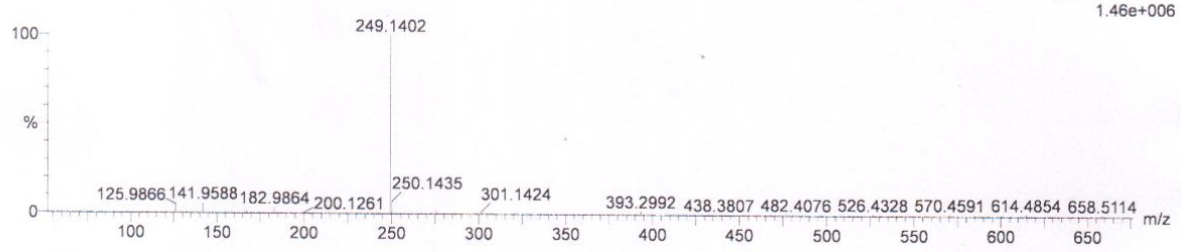
Single Mass Analysis
Tolerance = 5.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
11 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-19 H: 0-200 N: 0-2

DIMP-298
081121_08 19 (0.397) Cm (19:20)

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

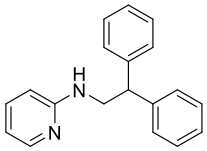
08-Nov-2021
12:02:13
1: TOF MS ES+
1.46e+006



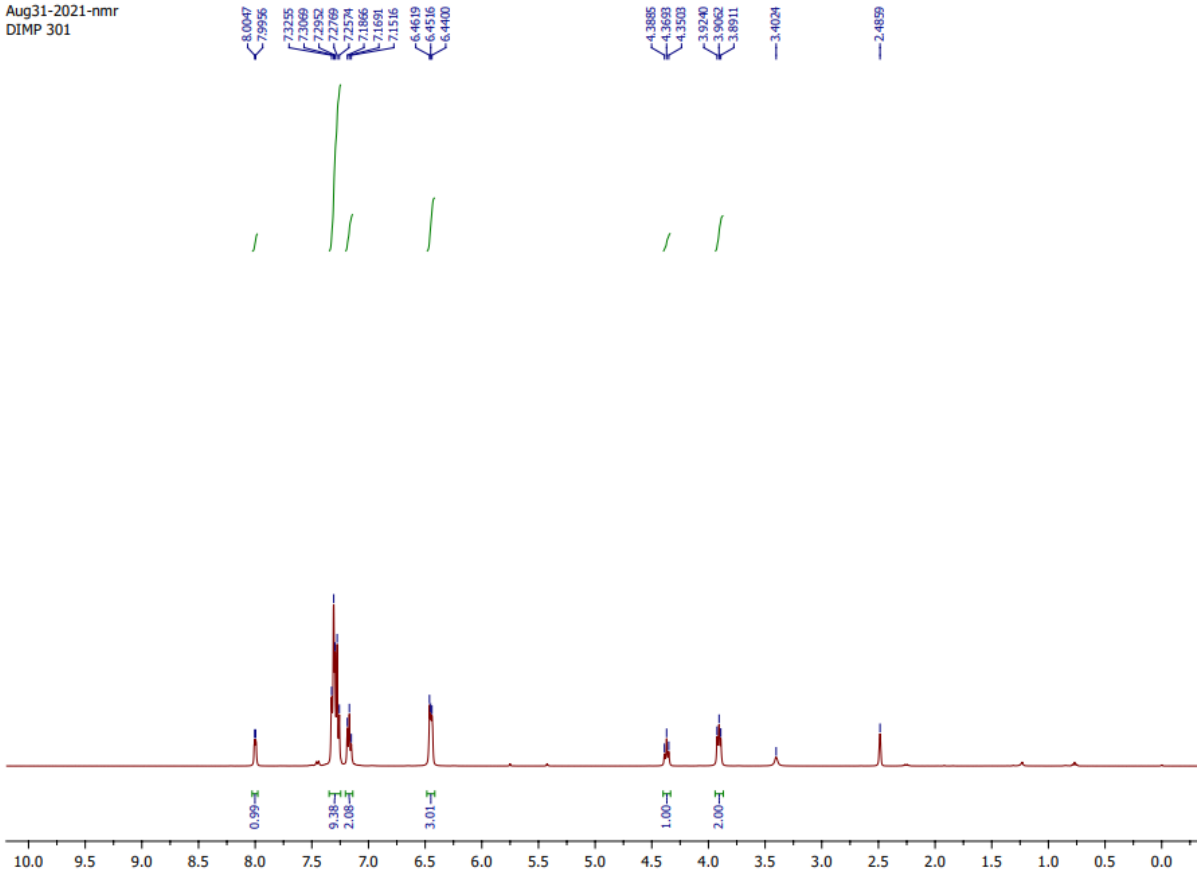
Minimum:				-1.5				
Maximum:		2.0	5.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
249.1402	249.1392	1.0	4.0	10.5	33.8	n/a	n/a	C17 H17 N2

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

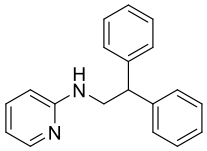


***N*-(2,2-diphenylethyl)pyridin-2-amine (3l)**

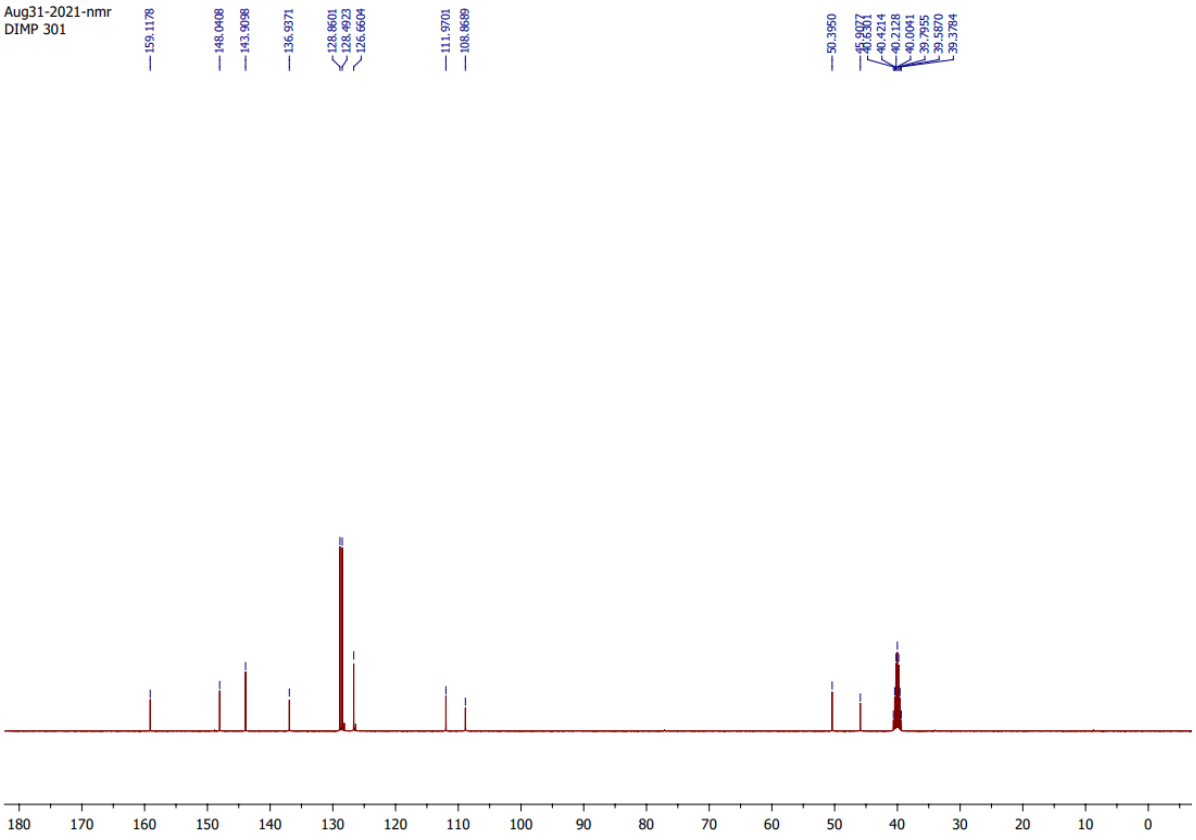


^{13}C NMR

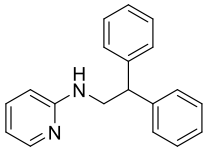
(100 MHz, $(CD_3)_2SO$)



N-(2,2-diphenylethyl)pyridin-2-amine (3l)



HRMS



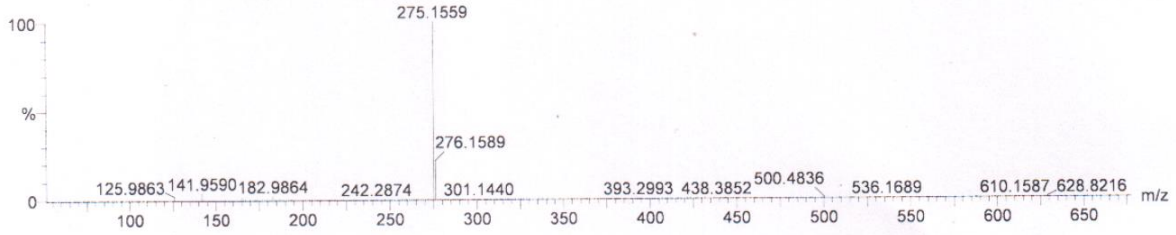
***N*-(2,2-diphenylethyl)pyridin-2-amine (3l)**

Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
6 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-19 H: 0-200 N: 0-2

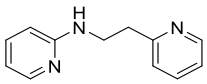
DIMP 301
QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015
16-Nov-2021
11:41:12
161121_04 35 (0.707) Cm (35)
1: TOF MS ES+
1.95e+006



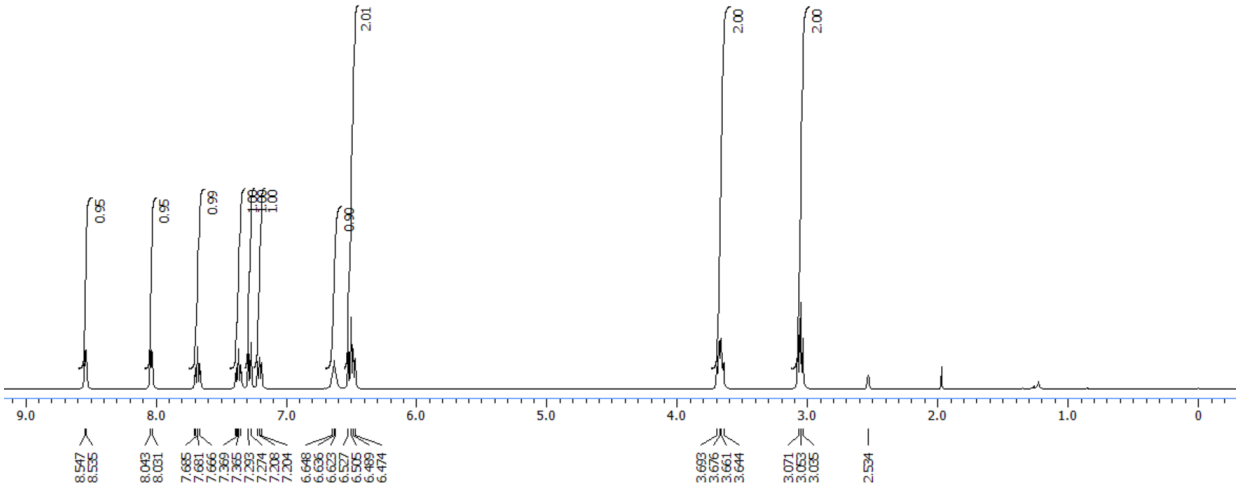
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
275.1559	275.1548	1.1	4.0	11.5	35.7	n/a	n/a	C19 H19 N2

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

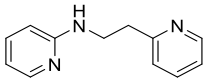


***N*-(2-(Pyridin-2-yl)ethyl)pyridin-2-amine (3m)**

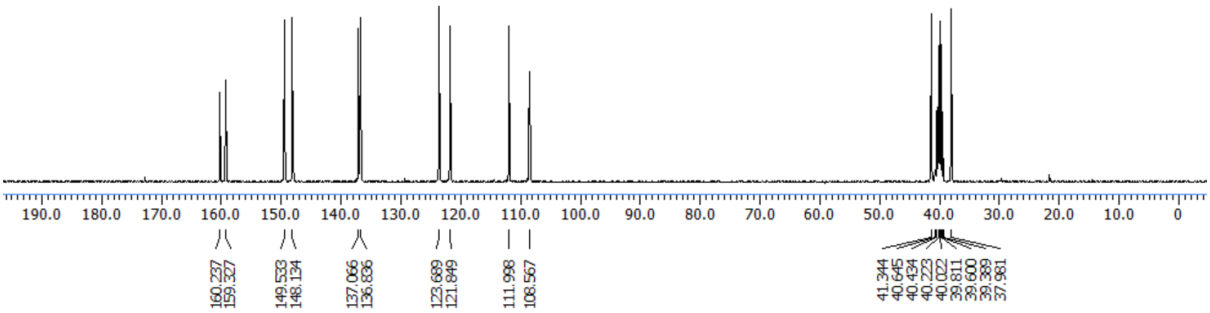


^{13}C NMR

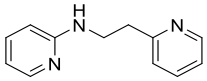
(100 MHz, $(CD_3)_2SO$)



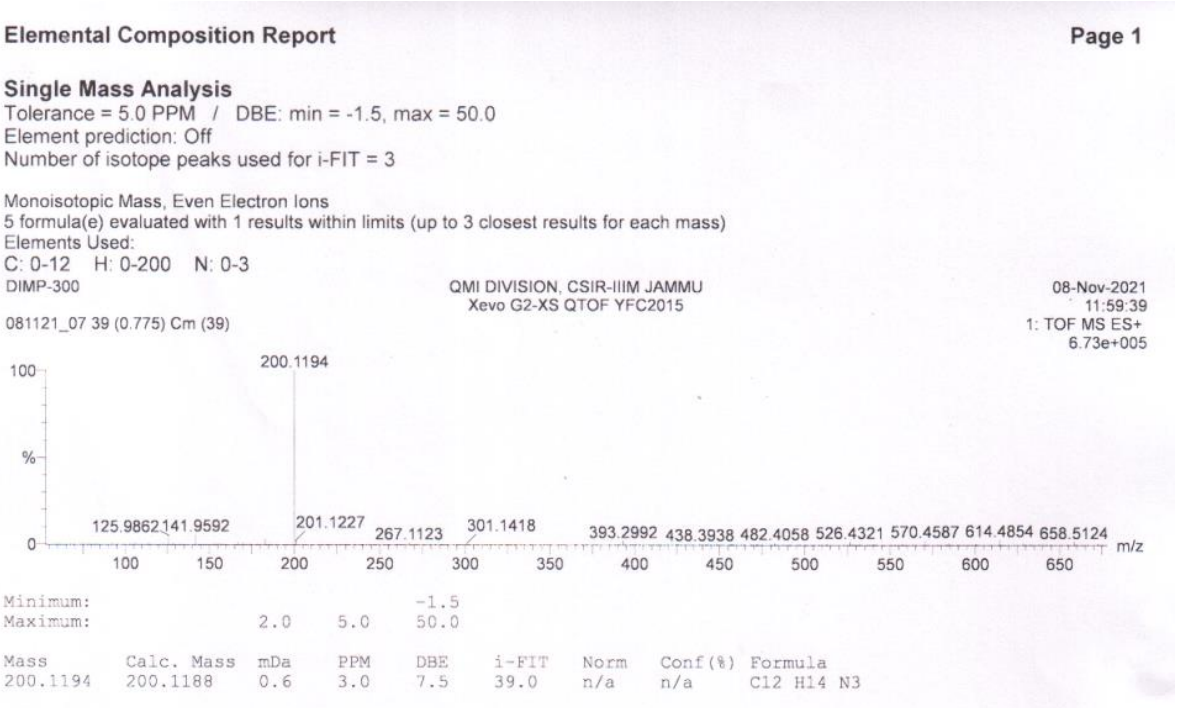
N-(2-(Pyridin-2-yl)ethyl)pyridin-2-amine (3m)



HRMS



N-(2-(Pyridin-2-yl)ethyl)pyridin-2-amine (3m)



Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 5.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

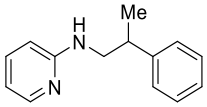
Monoisotopic Mass, Even Electron Ions
5 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-12 H: 0-200 N: 0-3

DIMP-300 QMI DIVISION, CSIR-IIIM JAMMU 08-Nov-2021
Xevo G2-XS QTOF YFC2015 11:59:39
081121_07 39 (0.775) Cm (39) 1: TOF MS ES+
6.73e+005

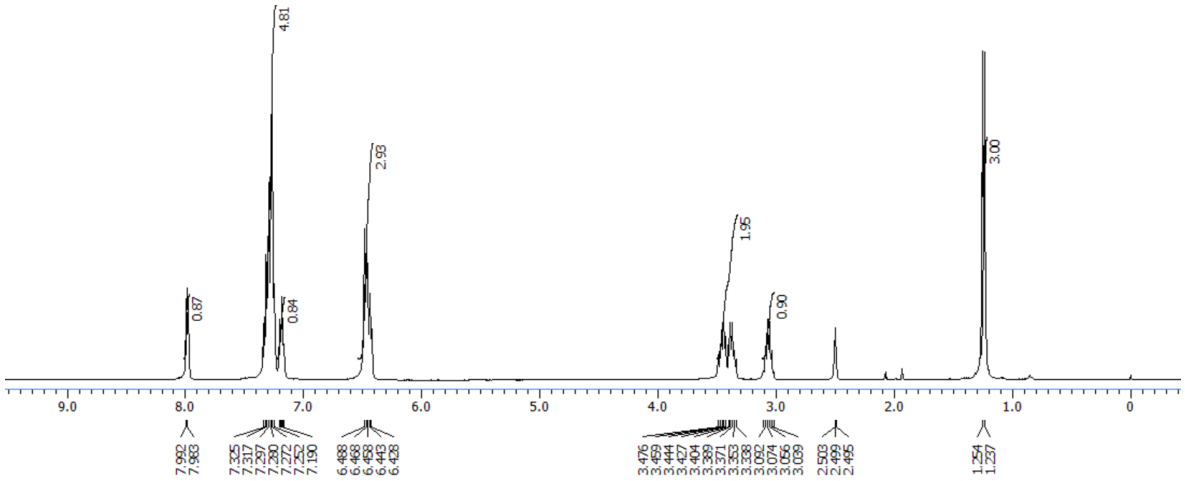
Minimum:				-1.5				
Maximum:		2.0	5.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
200.1194	200.1188	0.6	3.0	7.5	39.0	n/a	n/a	C12 H14 N3

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

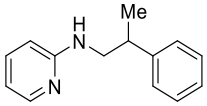


***N*-(2-Phenylpropyl)pyridin-2-amine (3n)**

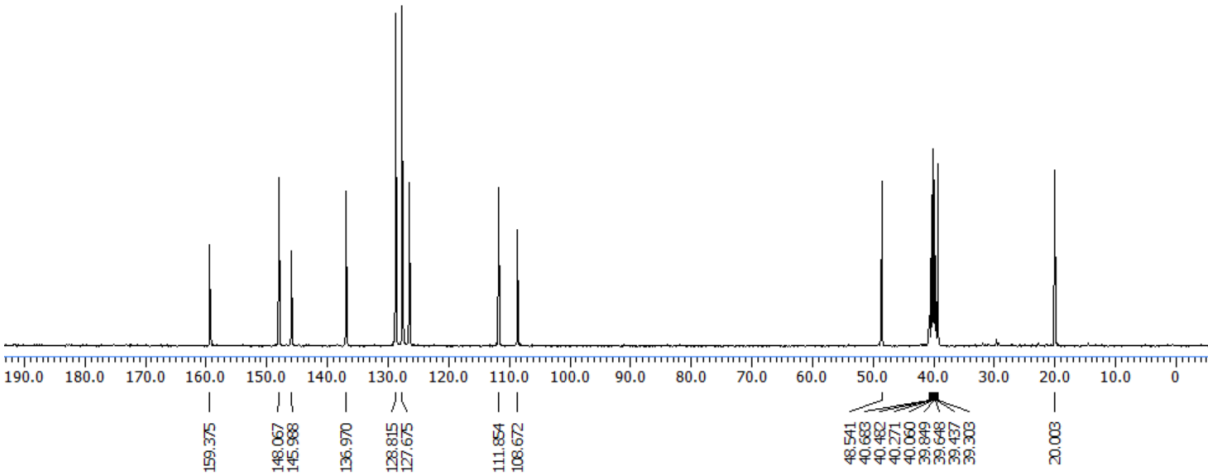


^{13}C NMR

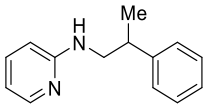
(100 MHz, $(CD_3)_2SO$)



N-(2-Phenylpropyl)pyridin-2-amine (3n)



HRMS



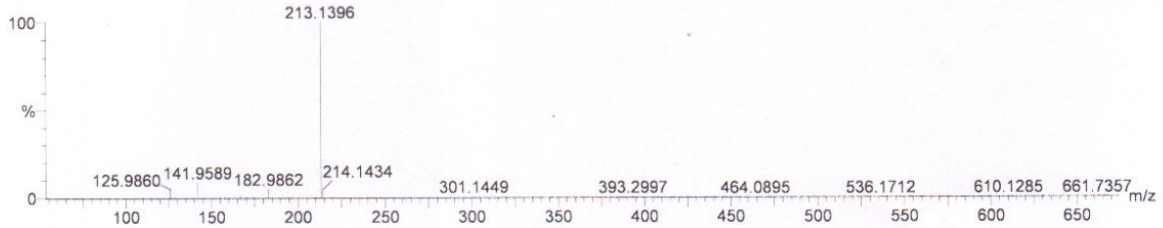
N-(2-Phenylpropyl)pyridin-2-amine (3n)

Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
4 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-14 H: 0-200 N: 0-2

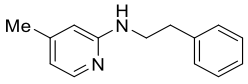
DIMP 302
QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015
16-Nov-2021
11:35:48
161121_02 35 (0.707) Cm (35:36)
1: TOF MS ES+
1.49e+006



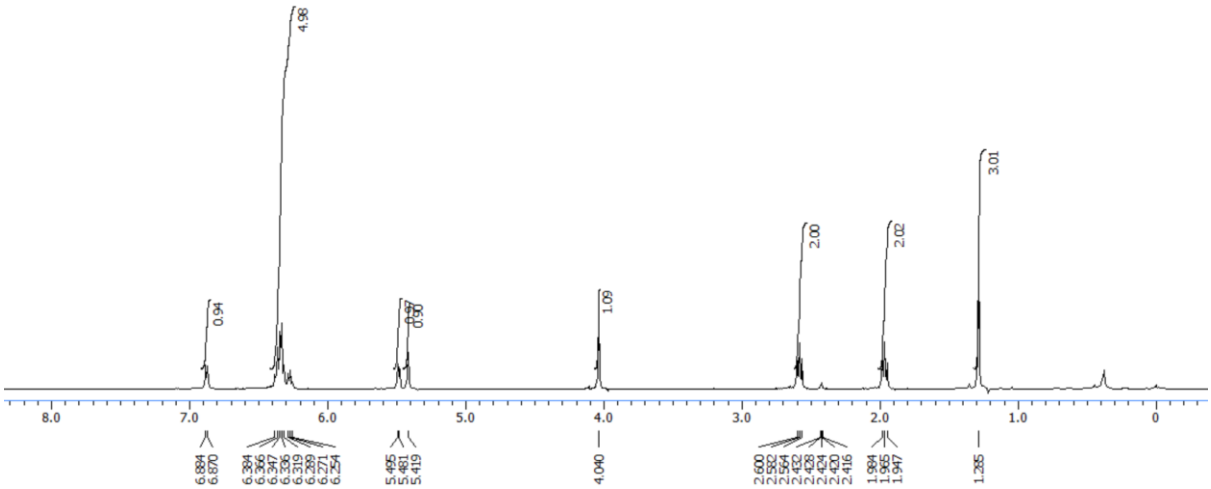
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
213.1396	213.1392	0.4	1.9	7.5	48.4	n/a	n/a	C14 H17 N2

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

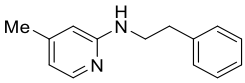


4-Methyl-*N*-phenethylpyridin-2-amine (4a)

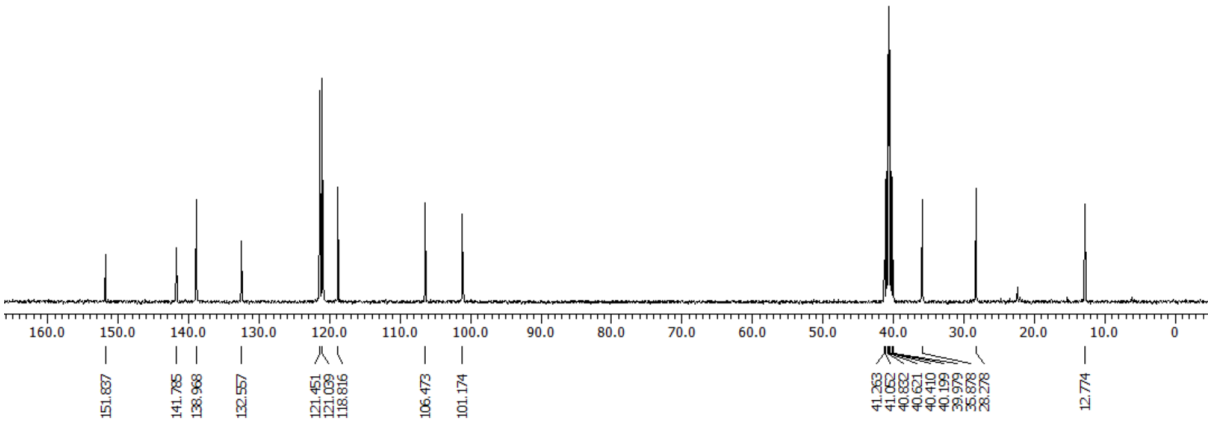


^{13}C NMR

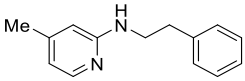
(100 MHz, $(CD_3)_2SO$)



4-Methyl-*N*-phenethylpyridin-2-amine (4a)



HRMS



4-Methyl-*N*-phenethylpyridin-2-amine (4a)

Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

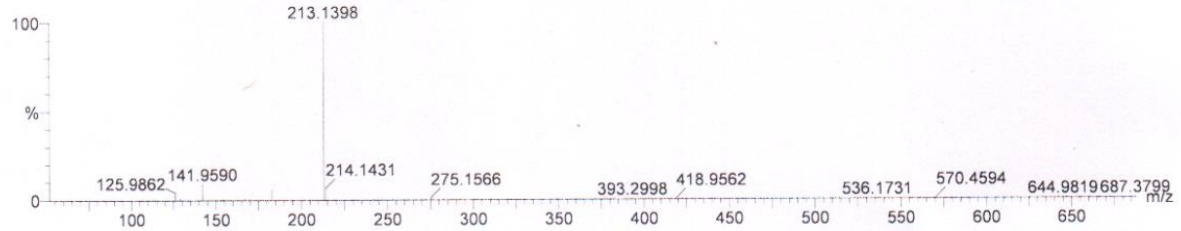
Monoisotopic Mass, Even Electron Ions
9 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-19 H: 0-200 N: 0-2

DIMP 306

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

16-Nov-2021
11:43:54
1: TOF MS ES+
9.39e+005

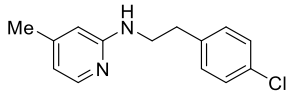
161121_05 22 (0.448) Cm (22)



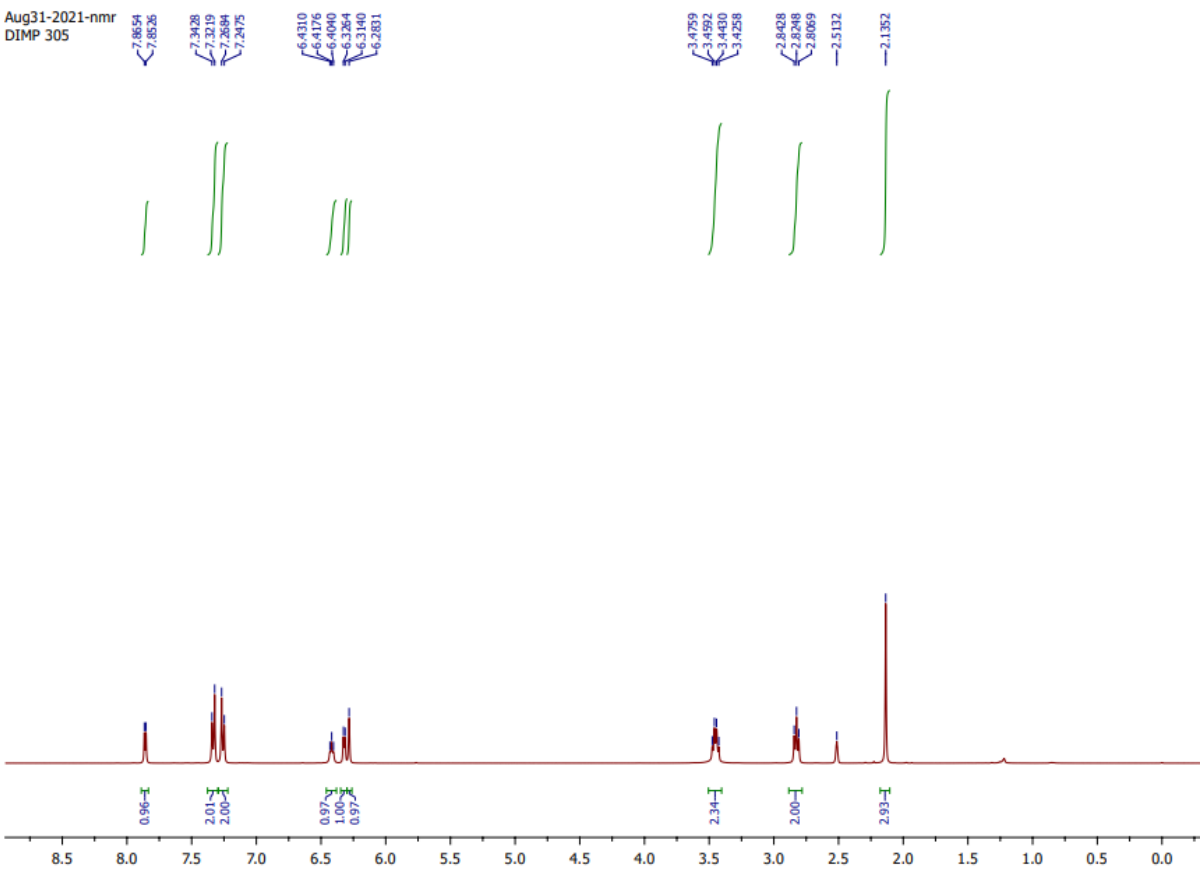
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
213.1398	213.1392	0.6	2.8	7.5	46.1	n/a	n/a	C14 H17 N2

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

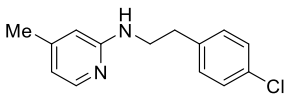


***N*-(4-Chlorophenethyl)-4-methylpyridin-2-amine (4b)**

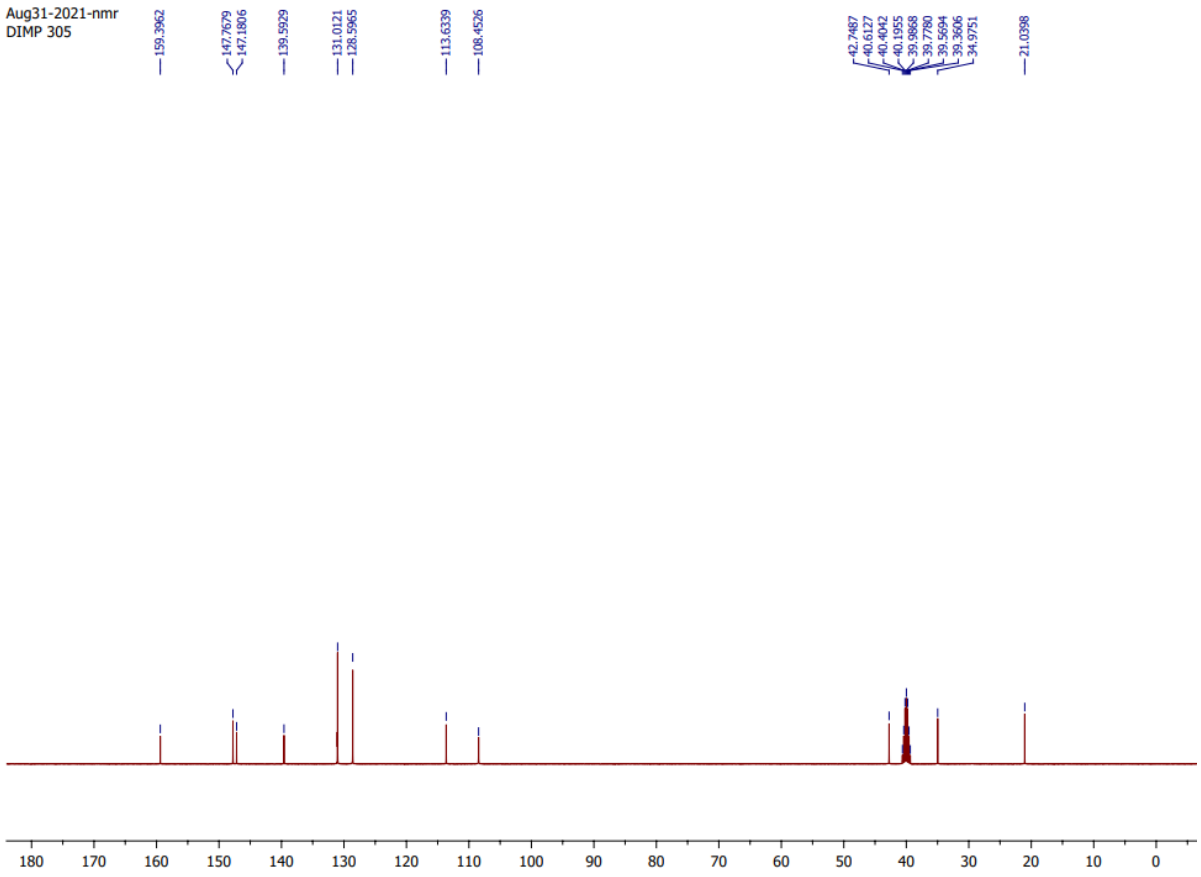


^{13}C NMR

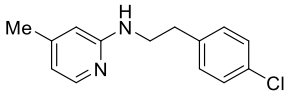
(100 MHz, $(CD_3)_2SO$)



***N*-(4-Chlorophenethyl)-4-methylpyridin-2-amine (4b)**



HRMS



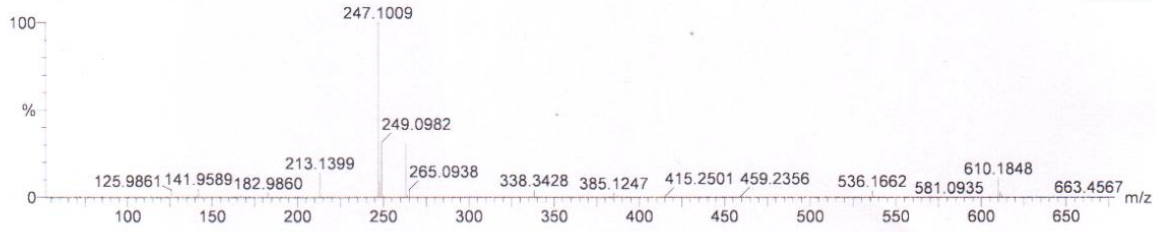
***N*-(4-Chlorophenethyl)-4-methylpyridin-2-amine (4b)**

Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
7 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-14 H: 0-200 N: 0-2 Cl: 0-1

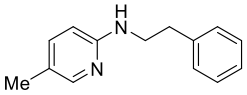
DIMP 305 QMI DIVISION, CSIR-IIIM JAMMU 16-Nov-2021
Xevo G2-XS QTOF YFC2015 11:38:29
161121_03 7 (0.155) Cm (7) 1: TOF MS ES+
1.07e+006



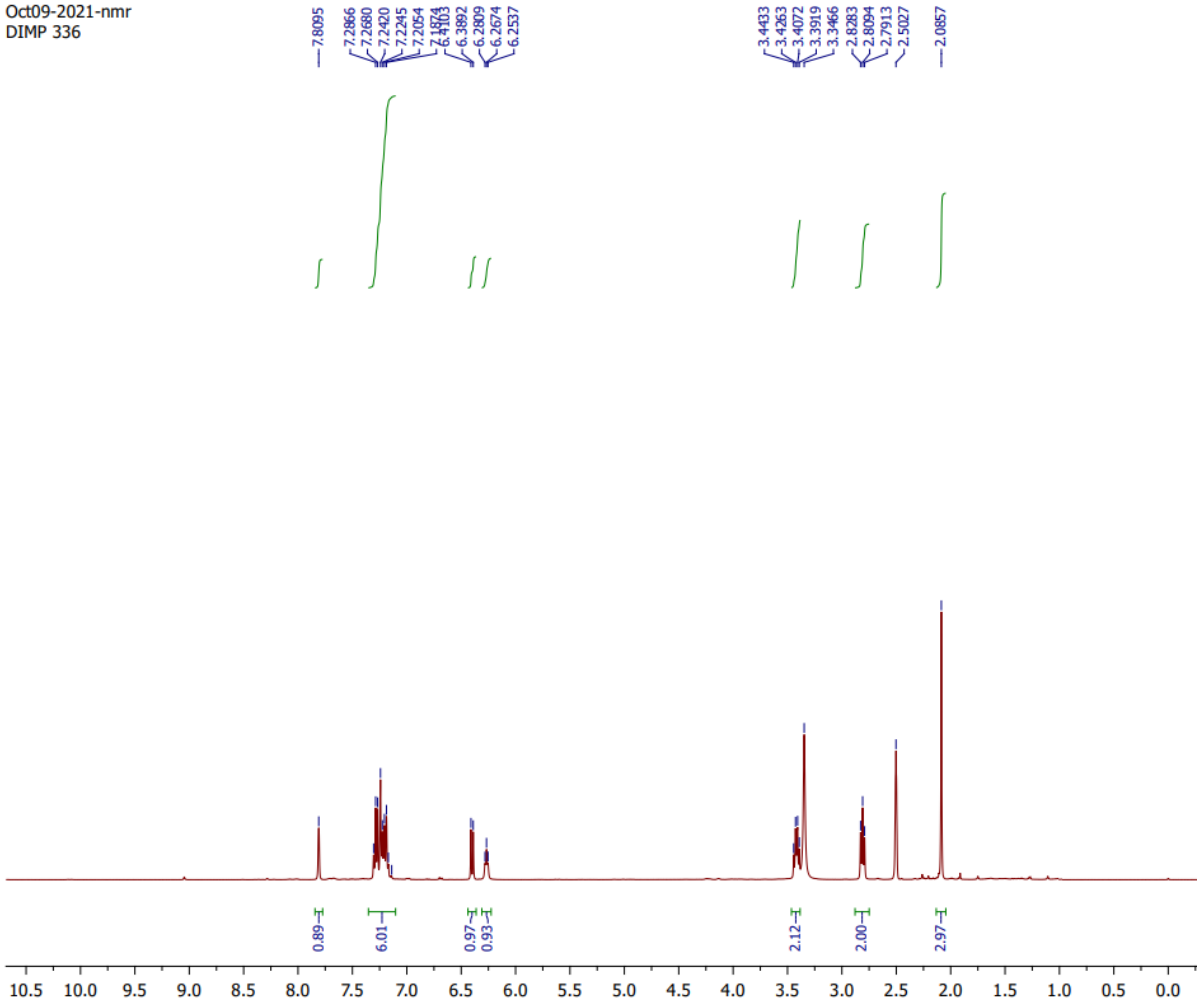
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
247.1009	247.1002	0.7	2.8	7.5	27.5	n/a	n/a	C14 H16 N2 Cl

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

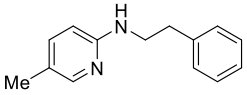


5-Methyl-*N*-phenethylpyridin-2-amine (4c)

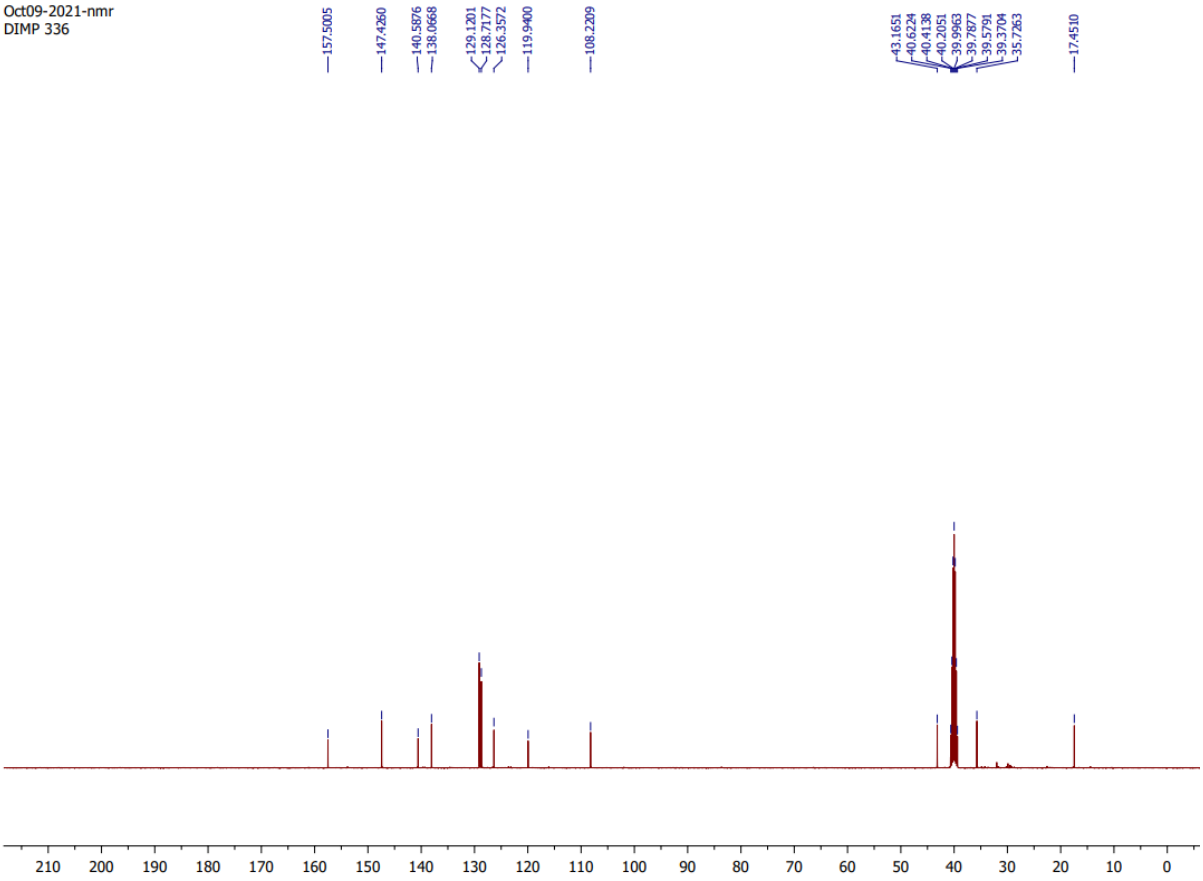


^{13}C NMR

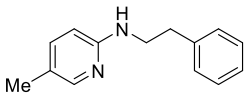
(100 MHz, $(CD_3)_2SO$)



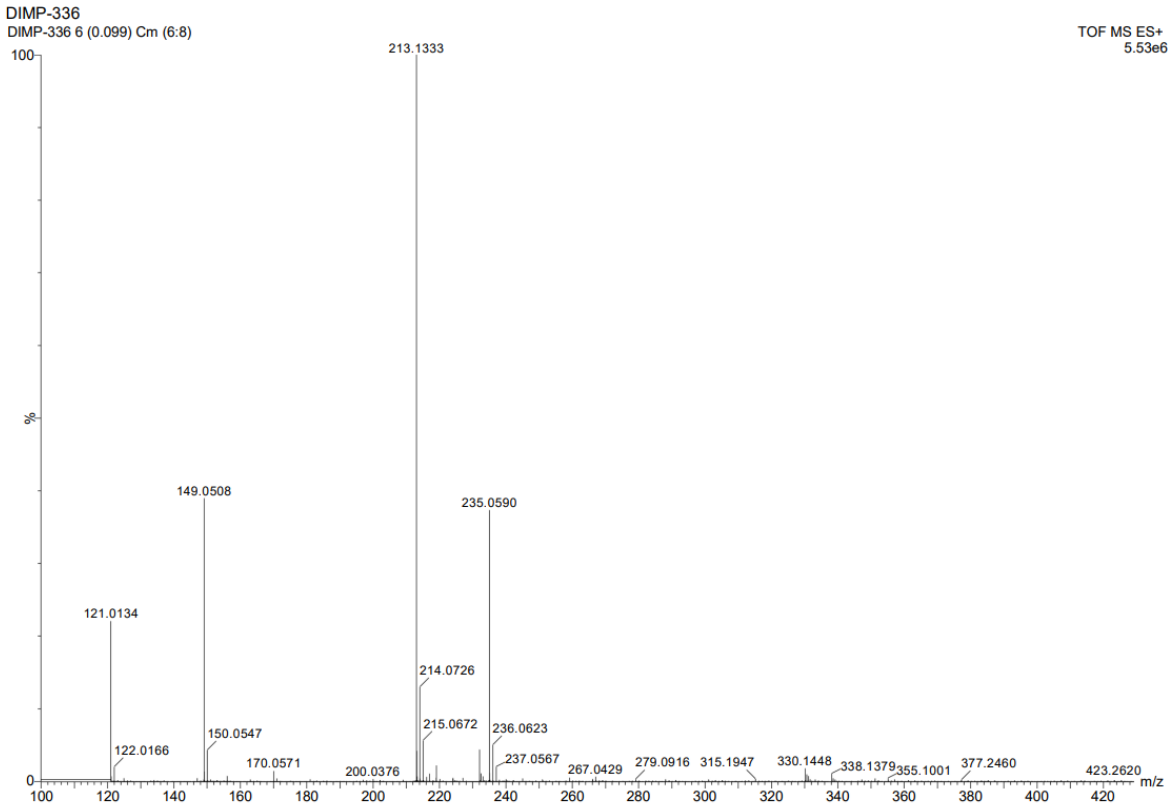
5-Methyl-*N*-phenethylpyridin-2-amine (4c)



HRMS

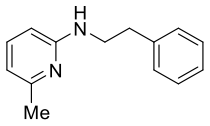


5-Methyl-*N*-phenethylpyridin-2-amine (4c)

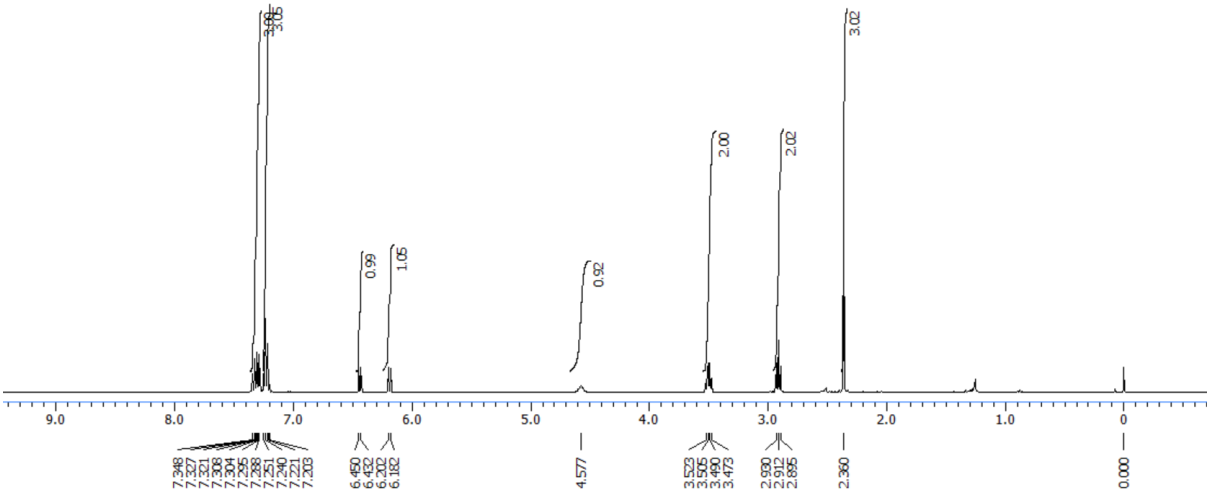


^{1}H NMR

(400 MHz, $CDCl_3$)

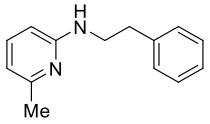


6-Methyl-*N*-phenethylpyridin-2-amine (4d)

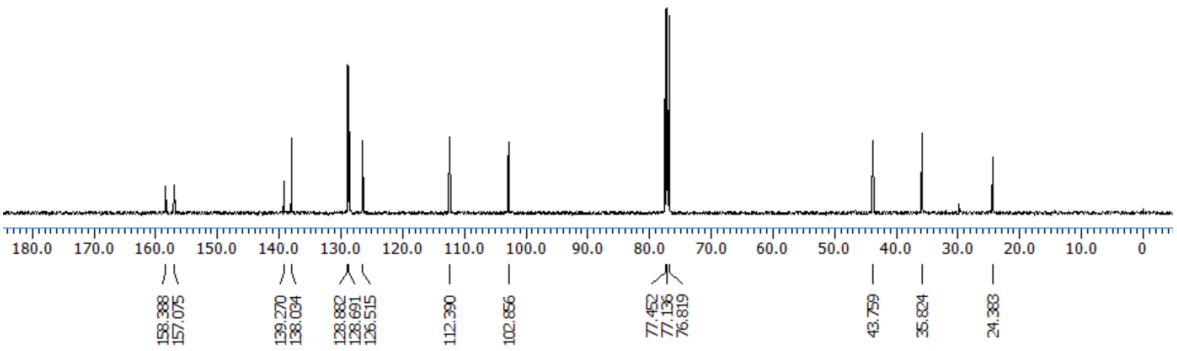


^{13}C NMR

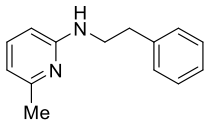
(100 MHz, $CDCl_3$)



6-Methyl-*N*-phenethylpyridin-2-amine (4d)



HRMS



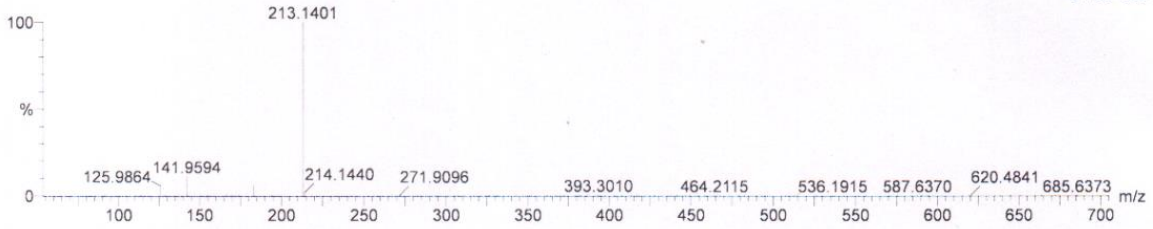
6-Methyl-*N*-phenethylpyridin-2-amine (4d)

Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
27 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-14 H: 0-200 N: 0-2 F: 0-3

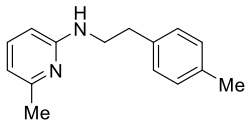
DIMP-313
QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015
22-Nov-2021
12:23:59
221121_17 35 (0.707) Cm (35)
1: TOF MS ES+
5.10e+005



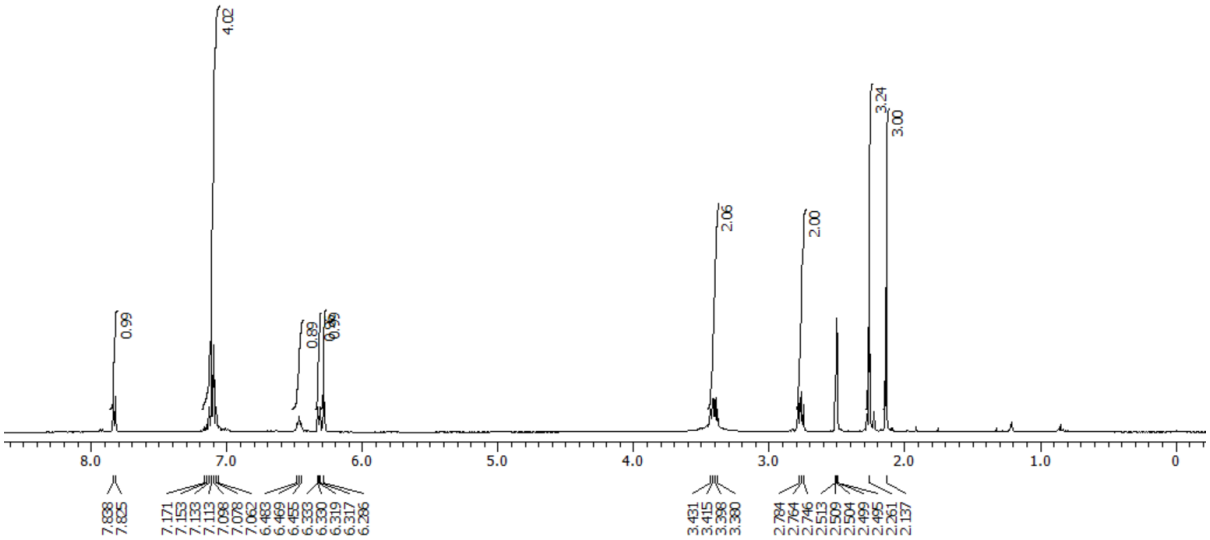
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
213.1401	213.1392	0.9	4.2	7.5	36.6	n/a	n/a	C14 H17 N2

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

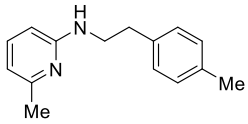


6-Methyl-*N*-(4-methylphenethyl)pyridin-2-amine (4e)

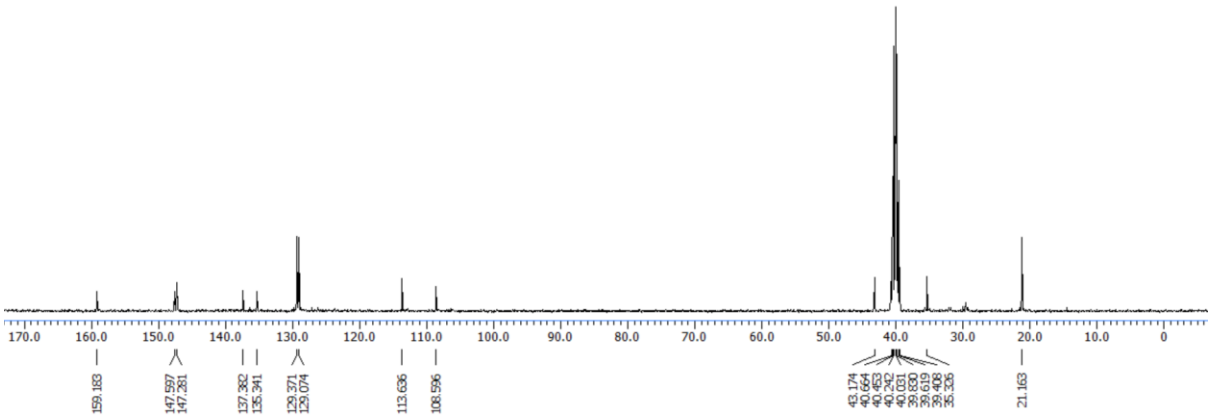


^{13}C NMR

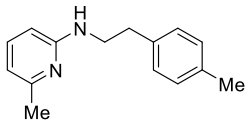
(100 MHz, $(CD_3)_2SO$)



6-Methyl-*N*-(4-methylphenethyl)pyridin-2-amine (4e)



HRMS



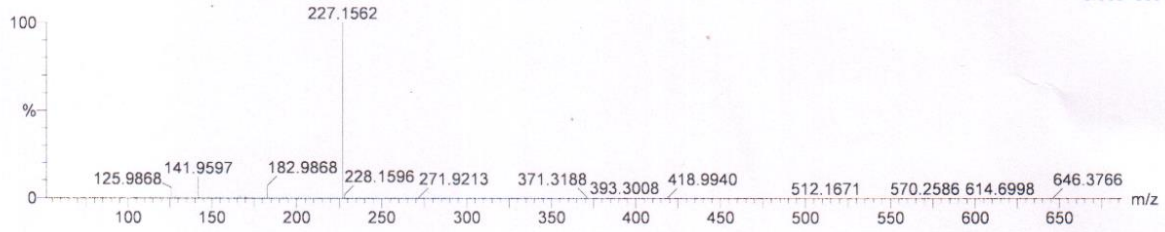
6-Methyl-*N*-(4-methylphenethyl)pyridin-2-amine (4e)

Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
4 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-15 H: 0-200 N: 0-2

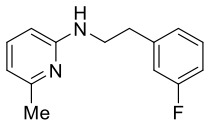
DIMP-331
QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015
22-Nov-2021
12:31:41
221121_20 19 (0.397) Cm (19:20)
1: TOF MS ES+
8.68e+005



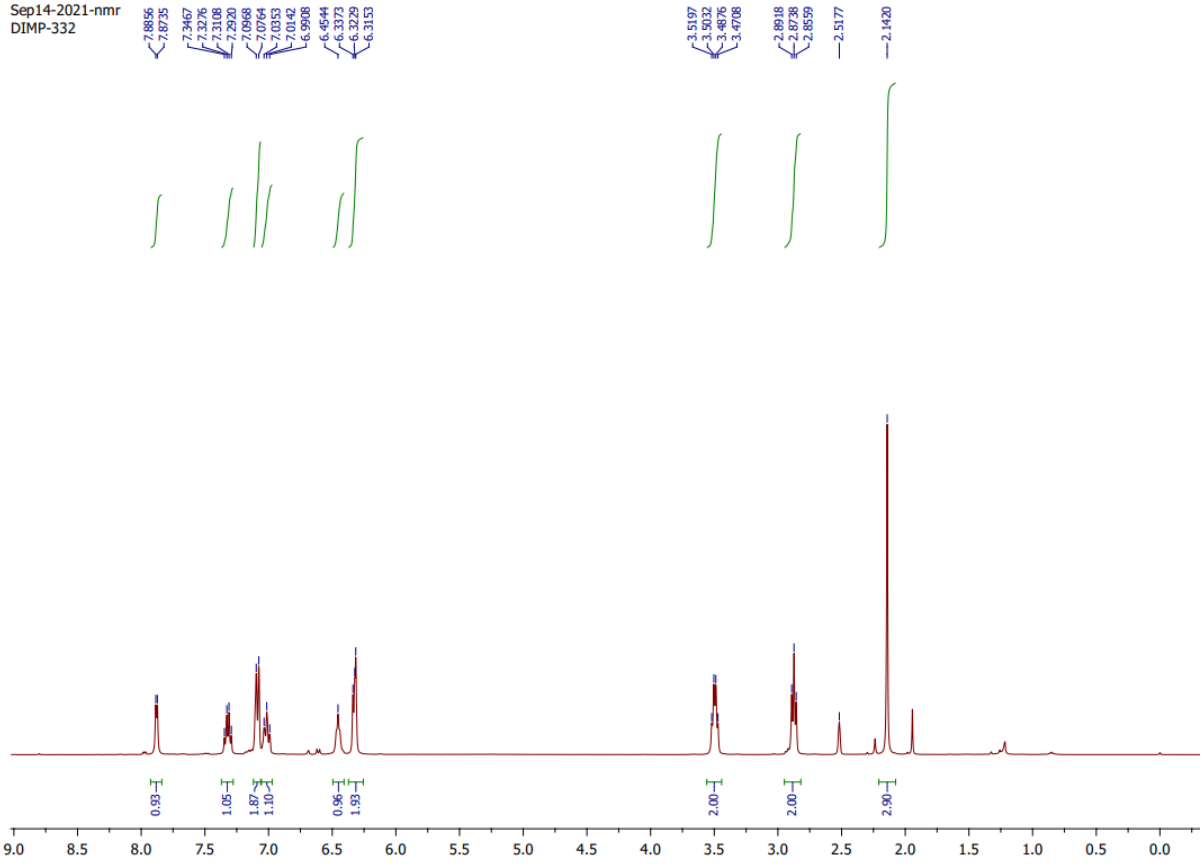
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
227.1562	227.1548	1.4	6.2	7.5	39.4	n/a	n/a	C15 H19 N2

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

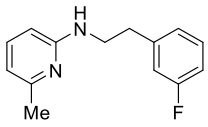


6-Methyl-*N*-(3-fluoromethylphenethyl)pyridin-2-amine (4f)

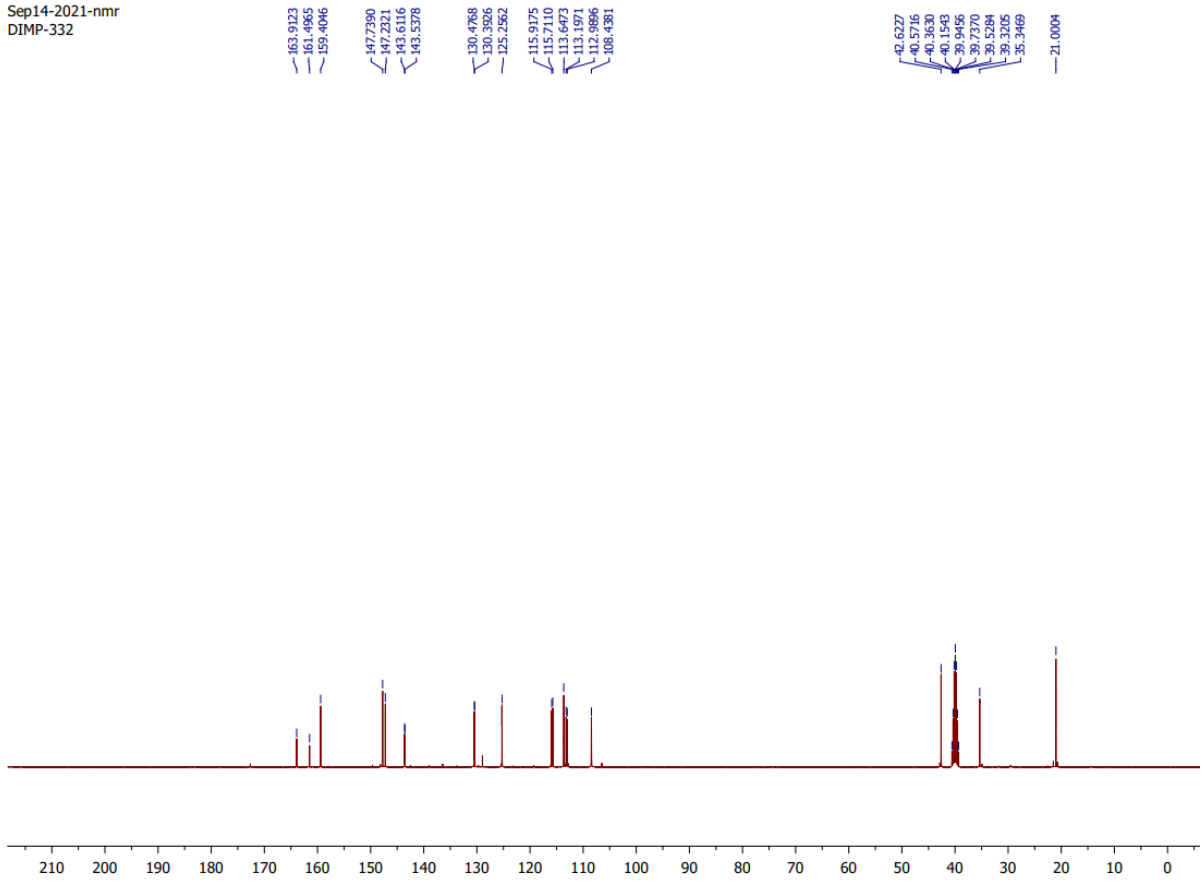


^{13}C NMR

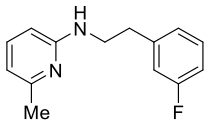
(100 MHz, $(CD_3)_2SO$)



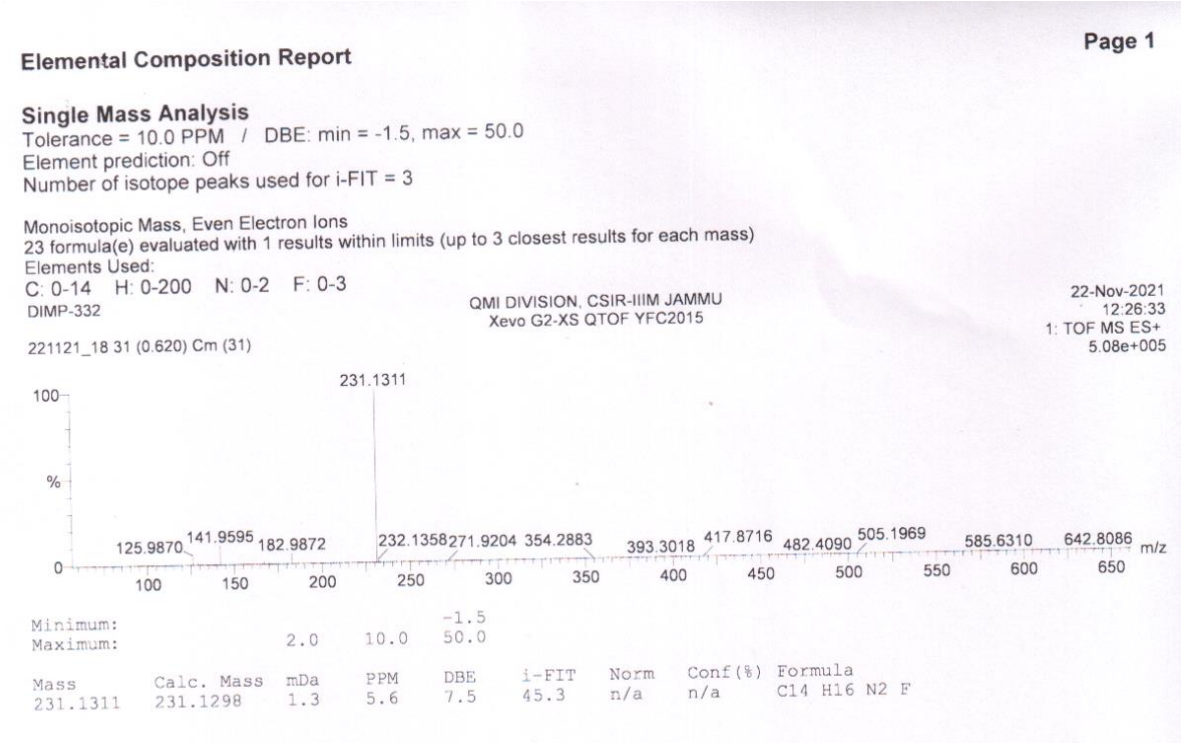
6-Methyl-*N*-(3-fluoromethylphenethyl)pyridin-2-amine (4f)



HRMS



6-Methyl-*N*-(3-fluoromethylphenethyl)pyridin-2-amine (4f)



Page 1

Elemental Composition Report

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
23 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-14 H: 0-200 N: 0-2 F: 0-3

DIMP-332

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

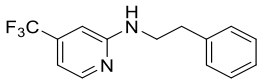
22-Nov-2021
12:26:33
1: TOF MS ES+
5.08e+005

221121_18 31 (0.620) Cm (31)

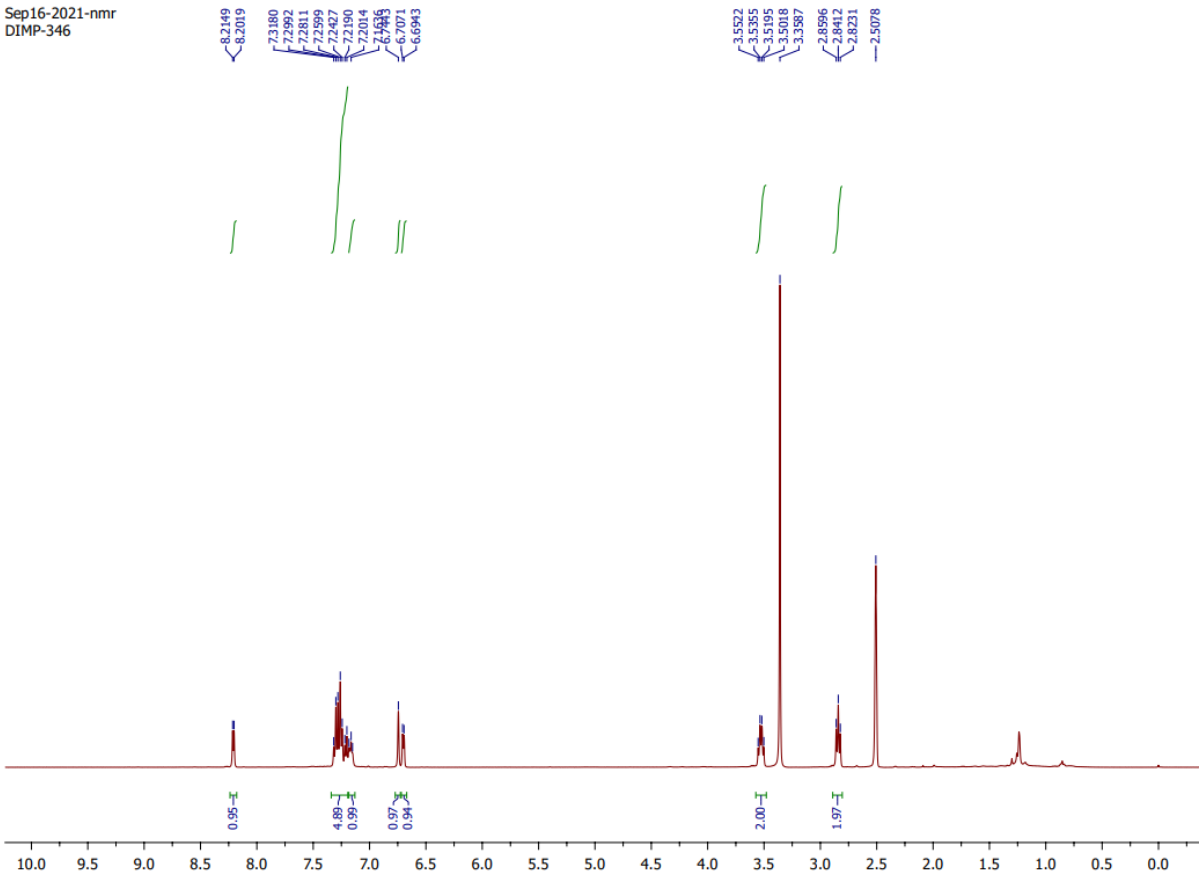
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
231.1311	231.1298	1.3	5.6	7.5	45.3	n/a	n/a	C14 H16 N2 F

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

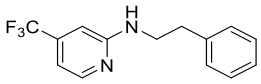


***N*-Phenethyl-4-(trifluoromethyl)pyridine-2-amine (4g)**

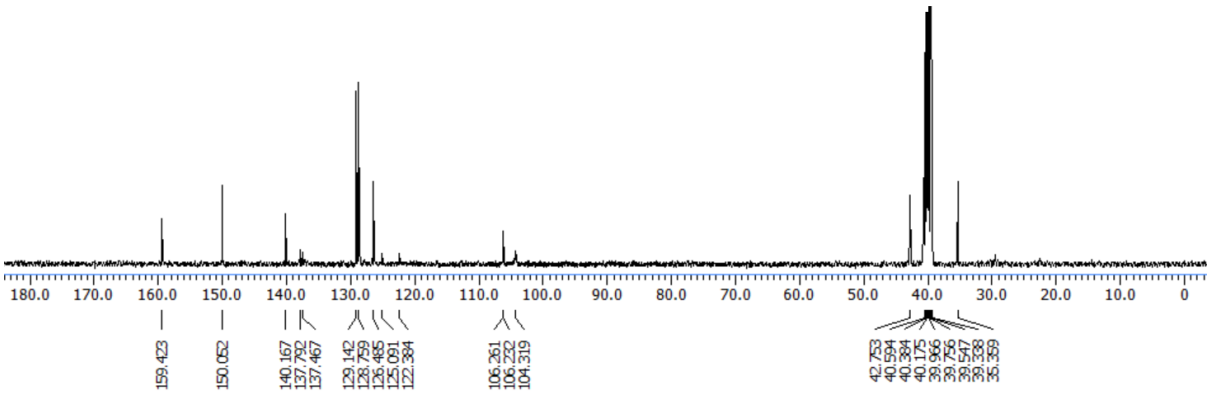


^{13}C NMR

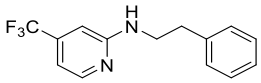
(100 MHz, $(CD_3)_2SO$)



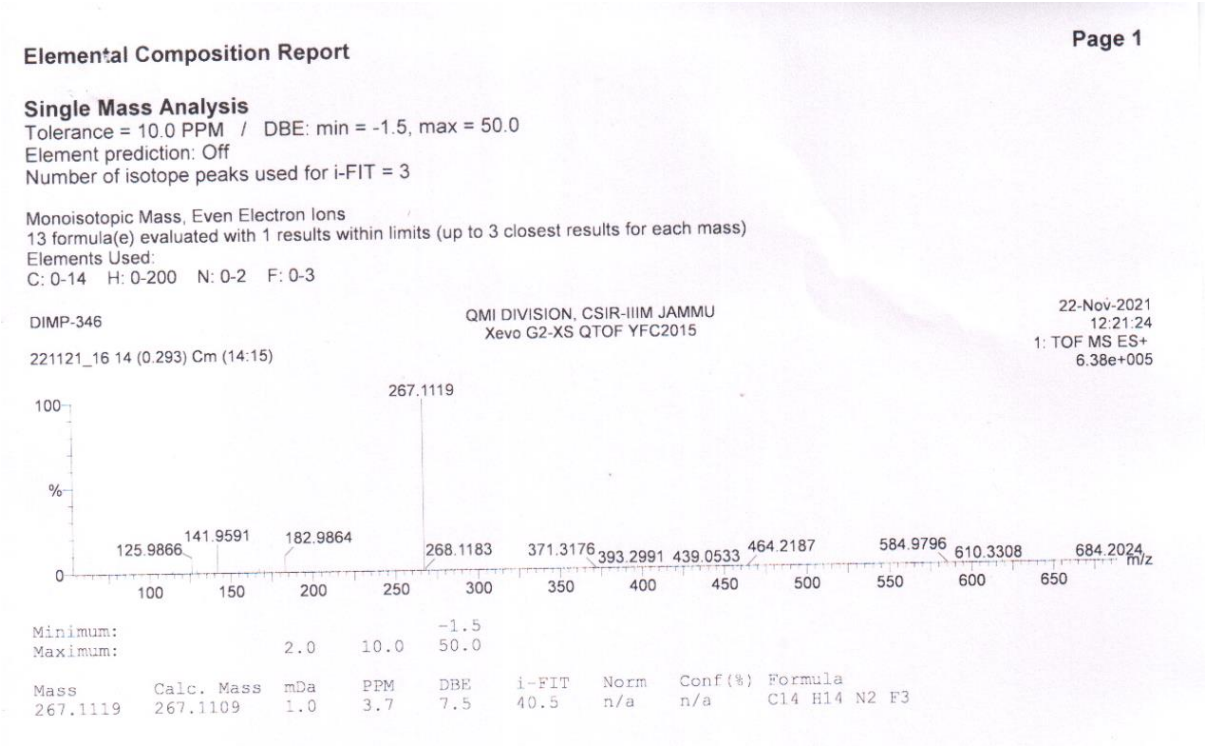
***N*-Phenethyl-4-(trifluoromethyl)pyridin-2-amine (4g)**



HRMS



N-Phenethyl-4-(trifluoromethyl)pyridine-2-amine (4g)



Elemental Composition Report

Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
13 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-14 H: 0-200 N: 0-2 F: 0-3

DIMP-346

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

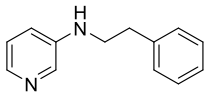
22-Nov-2021
12:21:24
1: TOF MS ES+
6.38e+005

221121_16 14 (0.293) Cm (14:15)

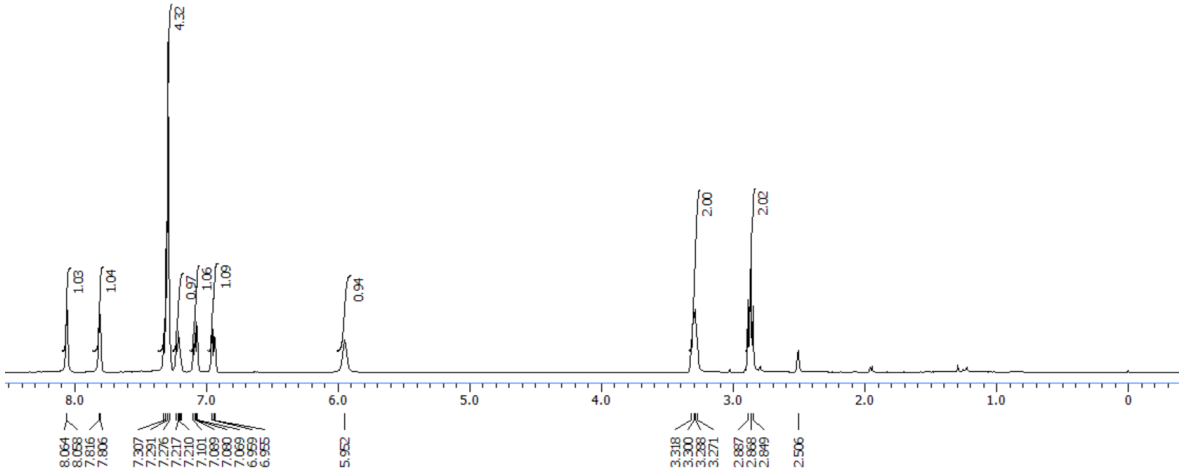
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
267.1119	267.1109	1.0	3.7	7.5	40.5	n/a	n/a	C14 H14 N2 F3

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

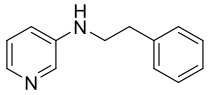


***N*-Phenethylpyridin-3-amine (4h)**

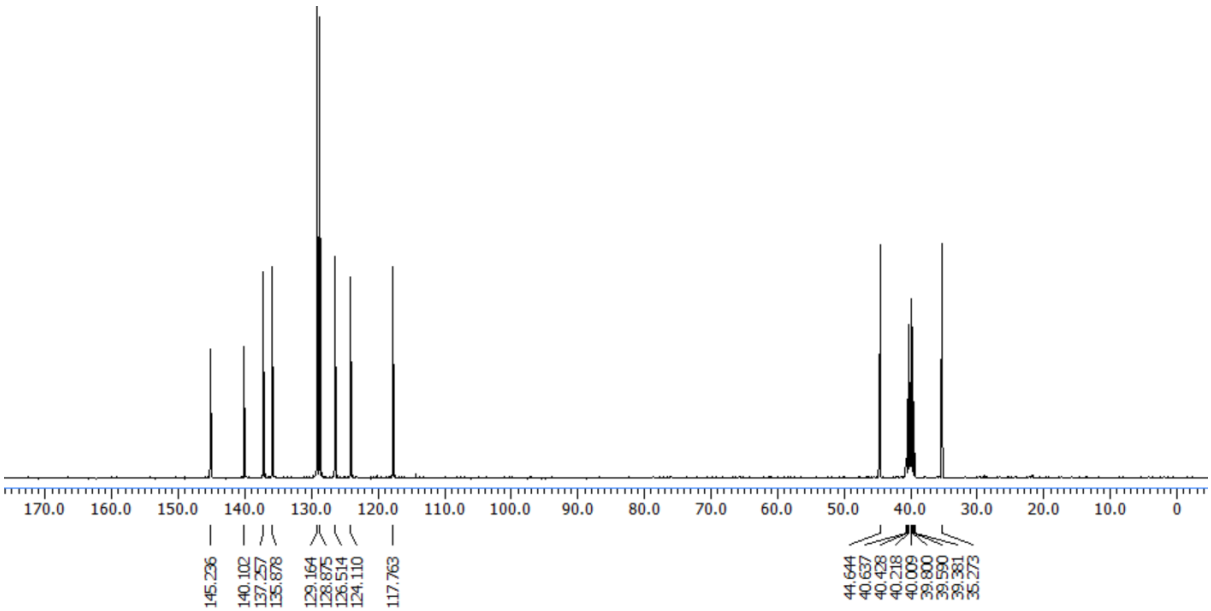


^{13}C NMR

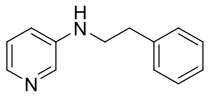
(100 MHz, $(CD_3)_2SO$)



***N*-Phenethylpyridin-3-amine (4h)**



HRMS



N-Phenethylpyridin-3-amine (4h)

Elemental Composition Report **Page 1**

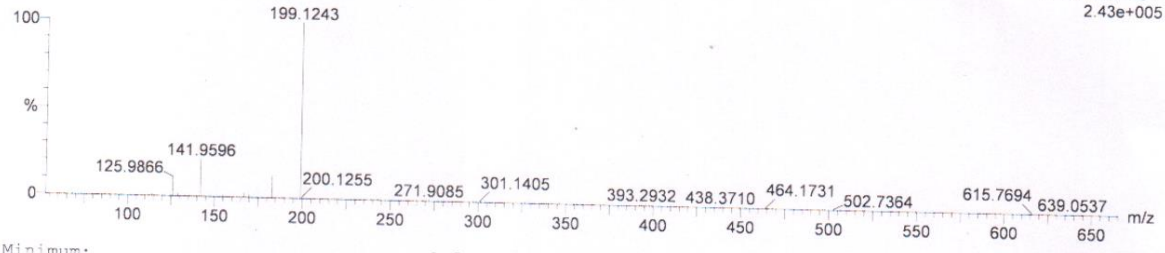
Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
29 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-14 H: 0-200 N: 0-2 F: 0-3
DIMP-255

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

221121_19 32 (0.637) Cm (32)

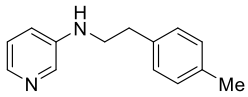
22-Nov-2021
12:29:07
1: TOF MS ES+
2.43e+005



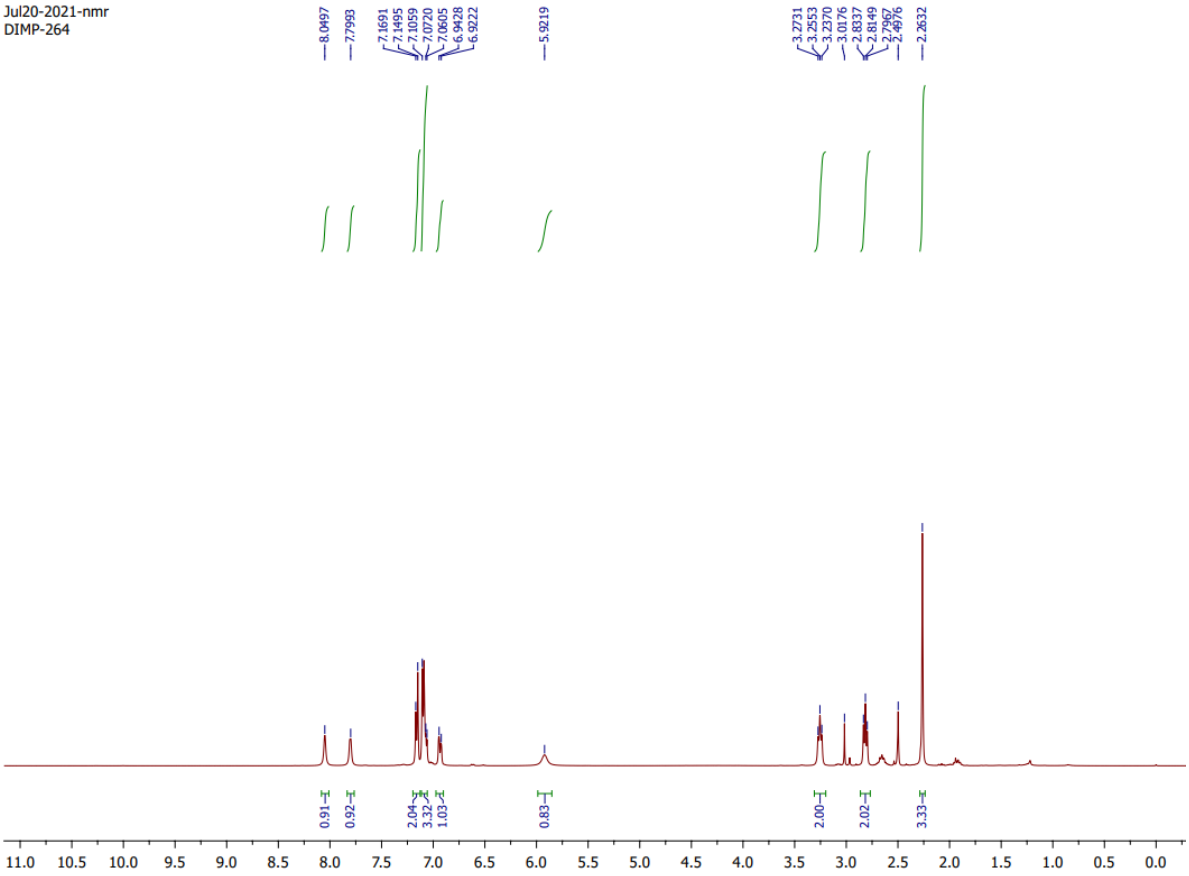
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
199.1243	199.1235	0.8	4.0	7.5	42.8	n/a	n/a	C13 H15 N2

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

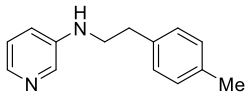


***N*-(4-Methylphenethyl)pyridin-3-amine (4i)**

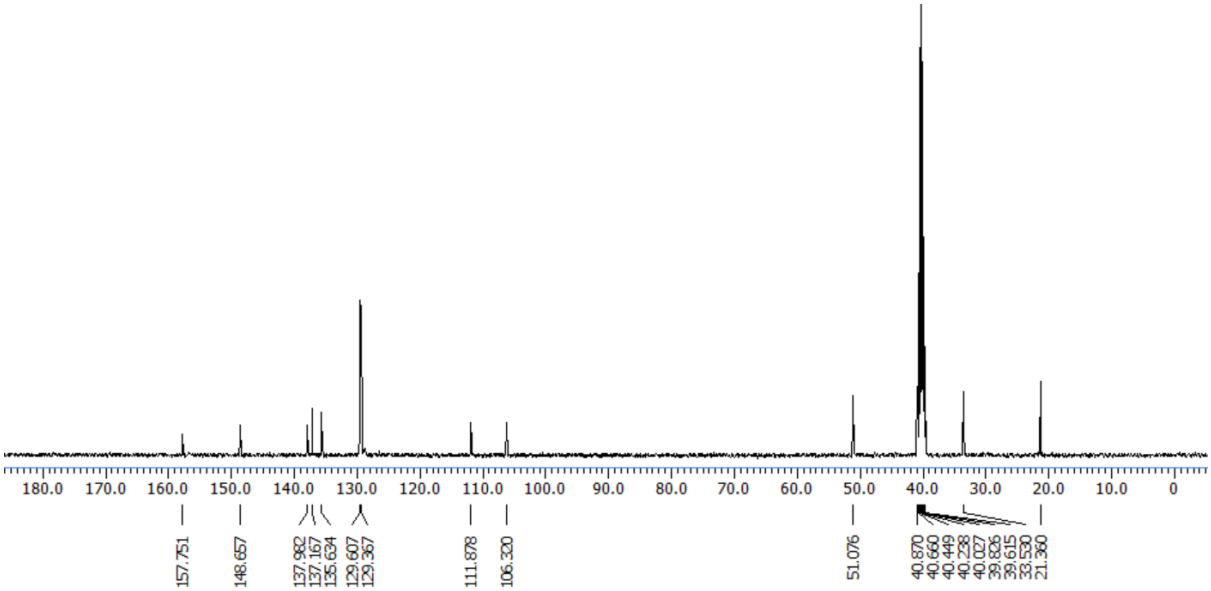


^{13}C NMR

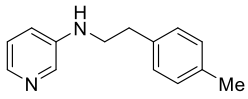
(100 MHz, $(CD_3)_2SO$)



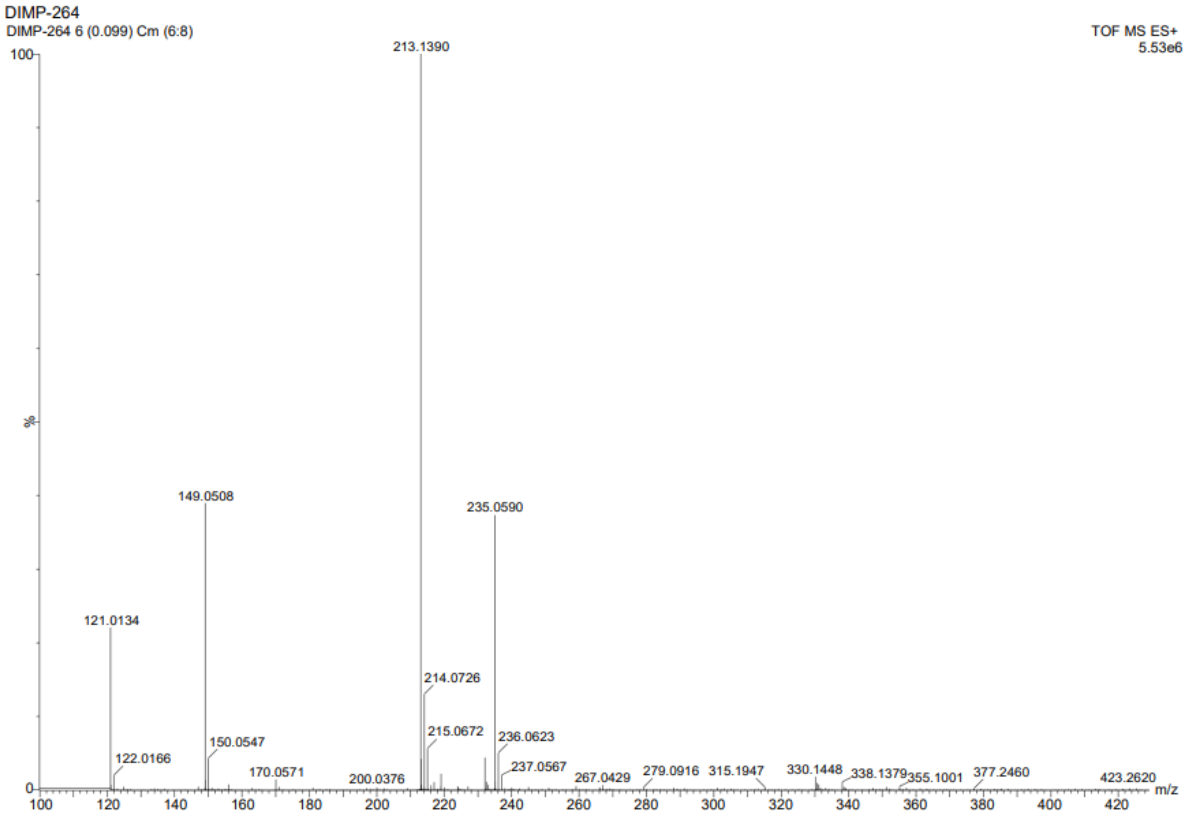
***N*-(4-Methylphenethyl)pyridin-3-amine (4i)**



HRMS

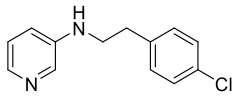


N-(4-Methylphenethyl)pyridin-3-amine (4i)

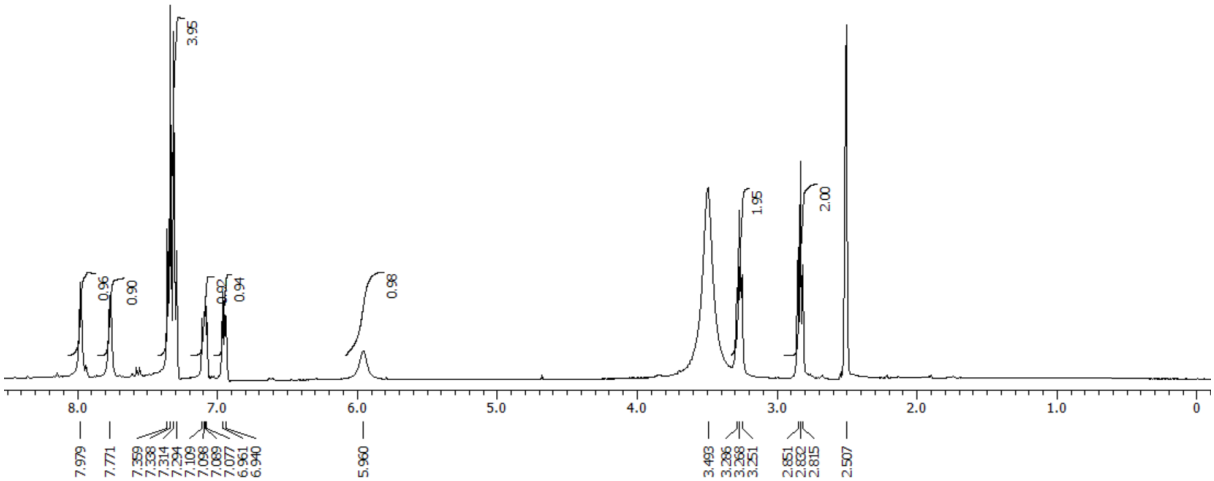


^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

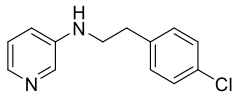


***N*-(4-Chlorophenethyl)pyridin-3-amine (4j)**

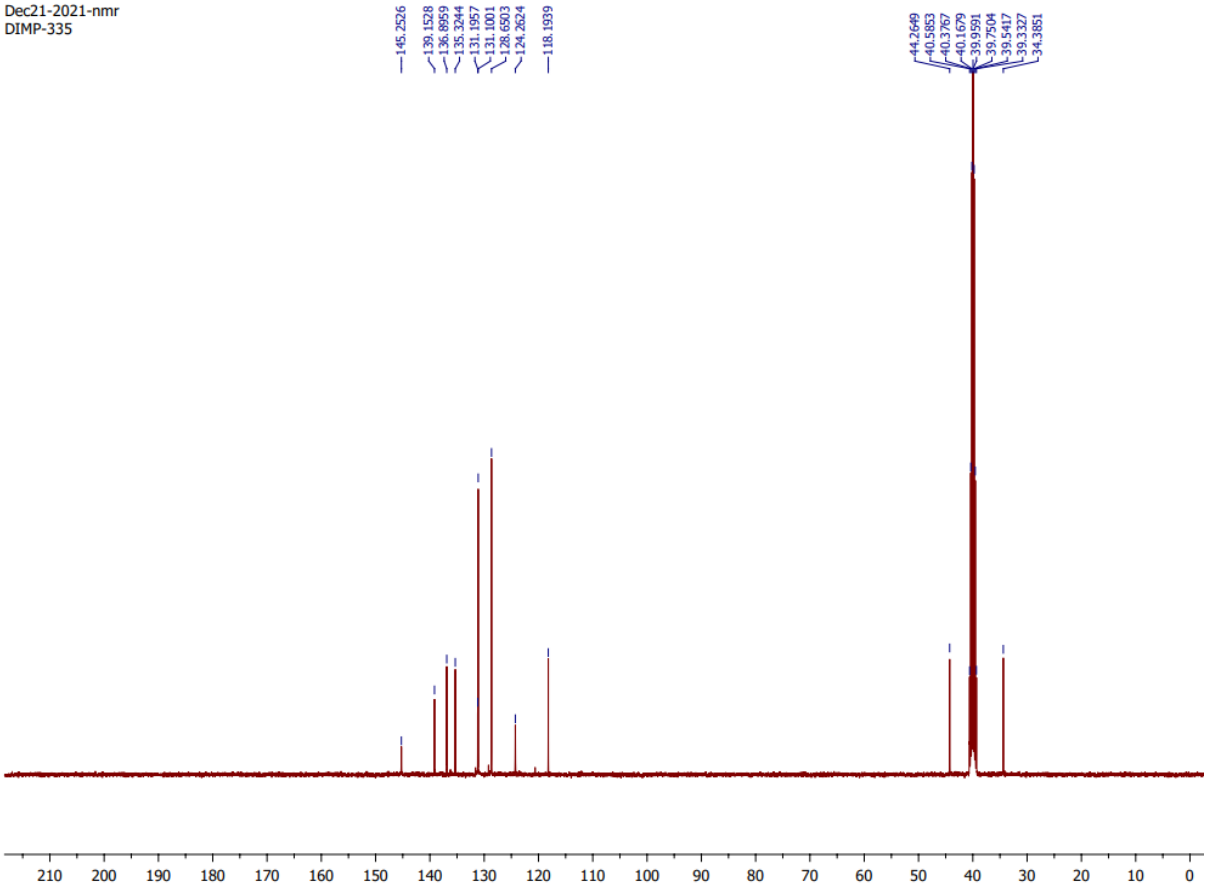


^{13}C NMR

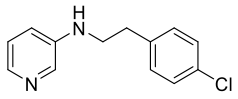
(100 MHz, $(CD_3)_2SO$)



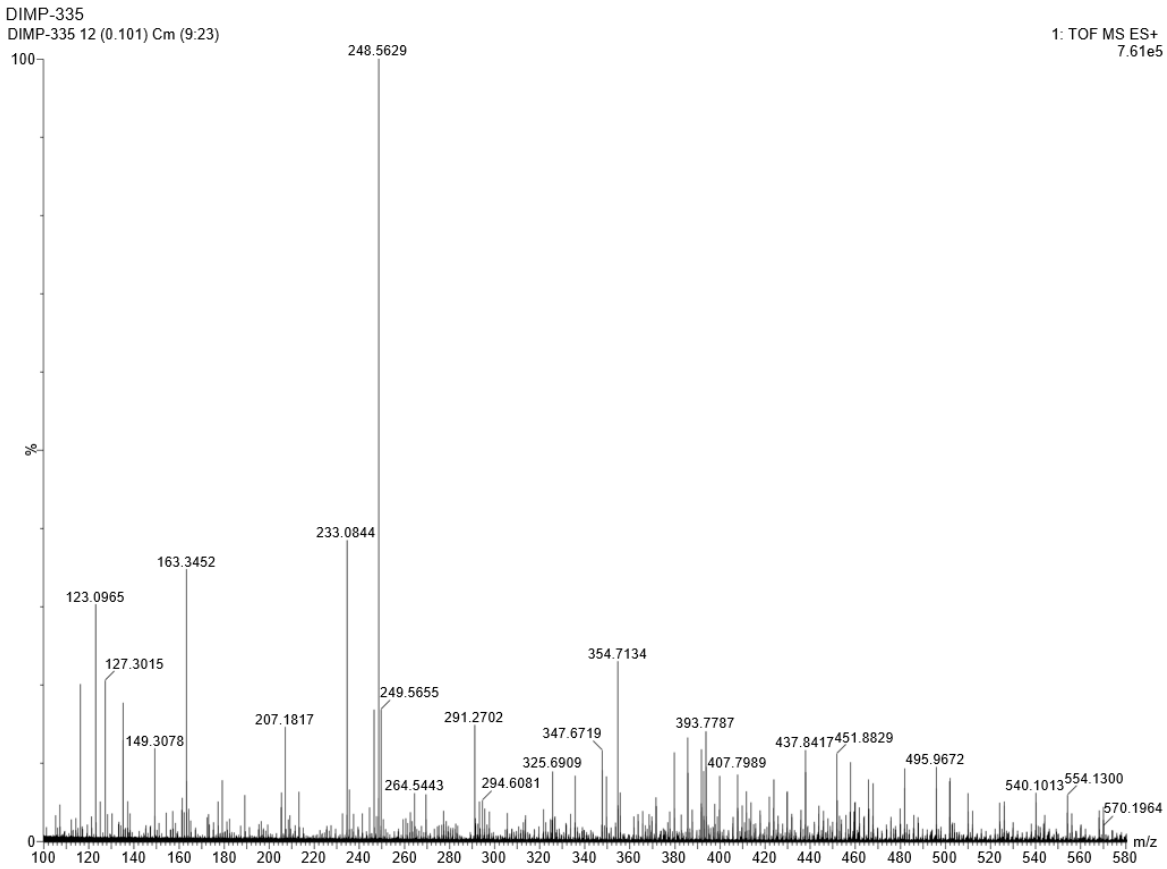
***N*-(4-Chlorophenethyl)pyridin-3-amine (4j)**



HRMS

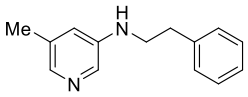


N-(4-Chlorophenethyl)pyridin-3-amine (4j)

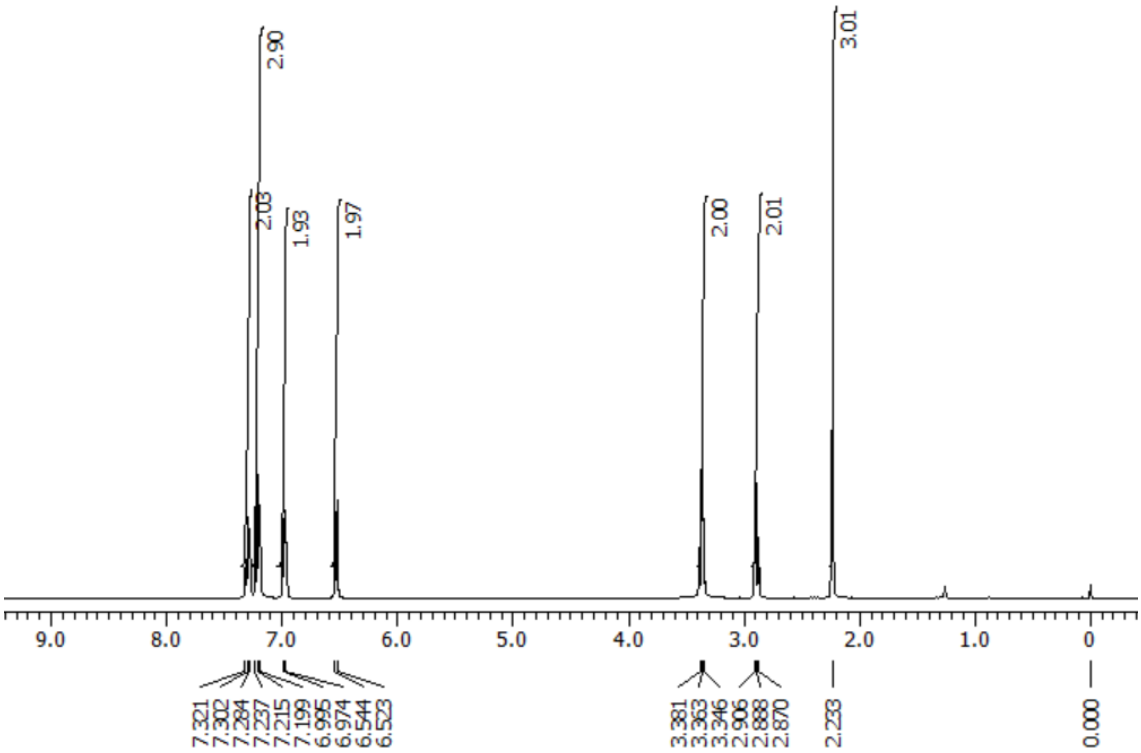


^{1}H NMR

(400 MHz, $CDCl_3$)

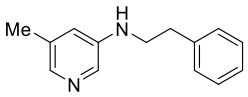


5-Methyl-*N*-phenethylpyridin-3-amine (4k)

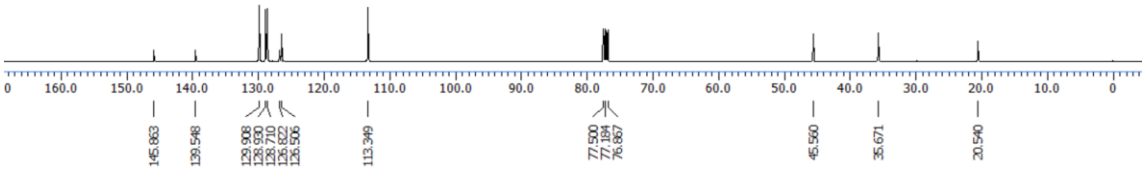


^{13}C NMR

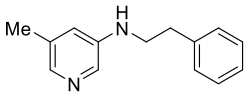
(100 MHz, $CDCl_3$)



5-Methyl-*N*-phenethylpyridin-3-amine (4k)



HRMS



5-Methyl-*N*-phenethylpyridin-3-amine (4k)

Elemental Composition Report Page 1

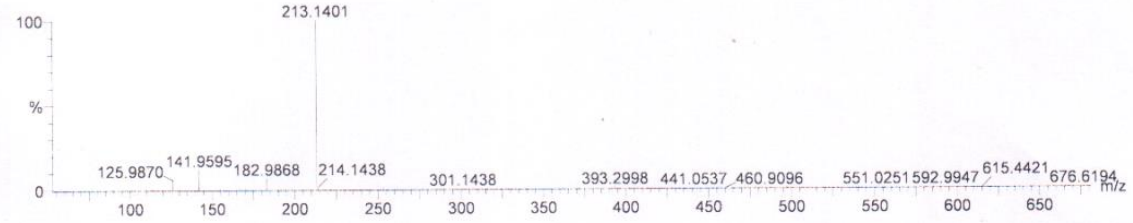
Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
9 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-20 H: 0-200 N: 0-2

DIMP-378
221121_11 21 (0.431) Cm (21:22)

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

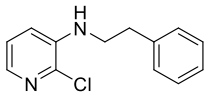
22-Nov-2021
12:08:34
1: TOF MS ES+
9.38e+005



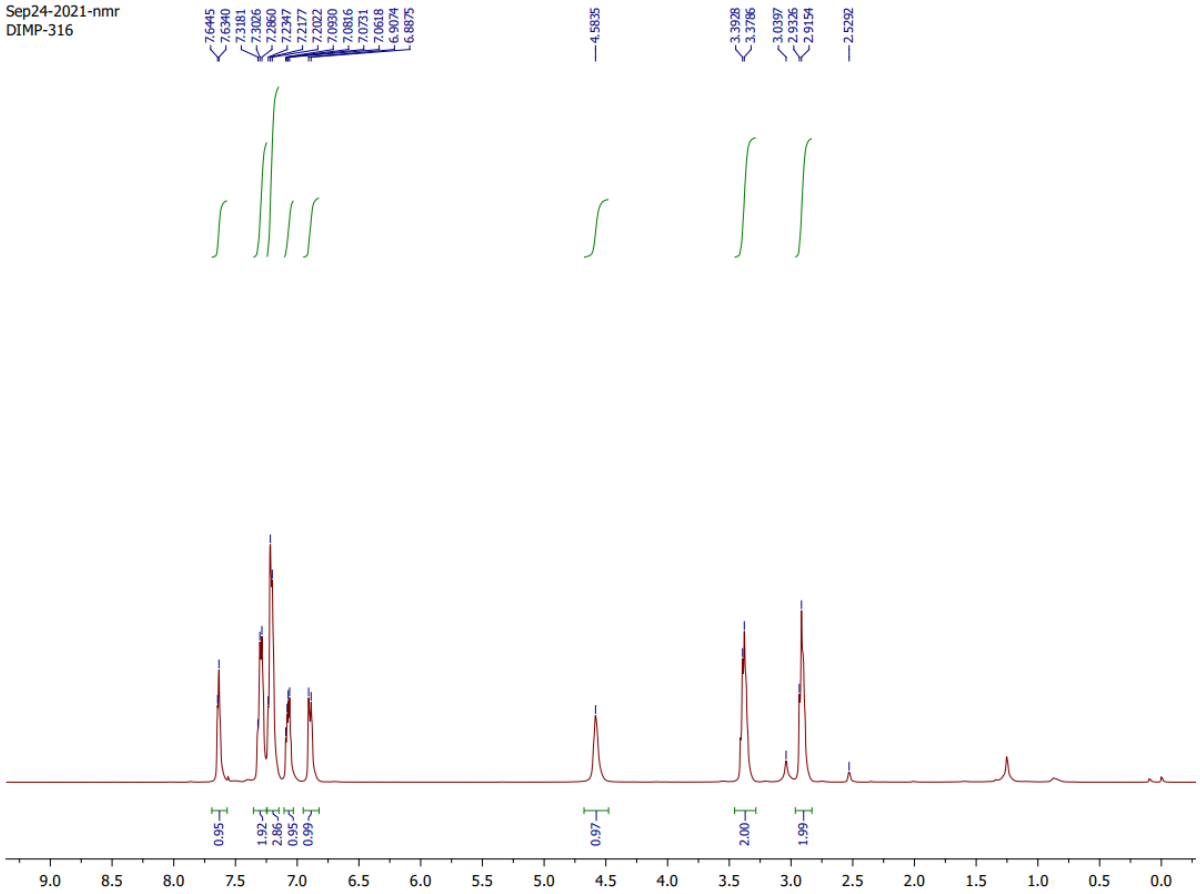
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
213.1401	213.1392	0.9	4.2	7.5	47.9	n/a	n/a	C14 H17 N2

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

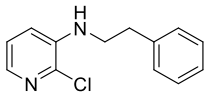


2-Chloro-*N*-phenethylpyridin-3-amine (4l)

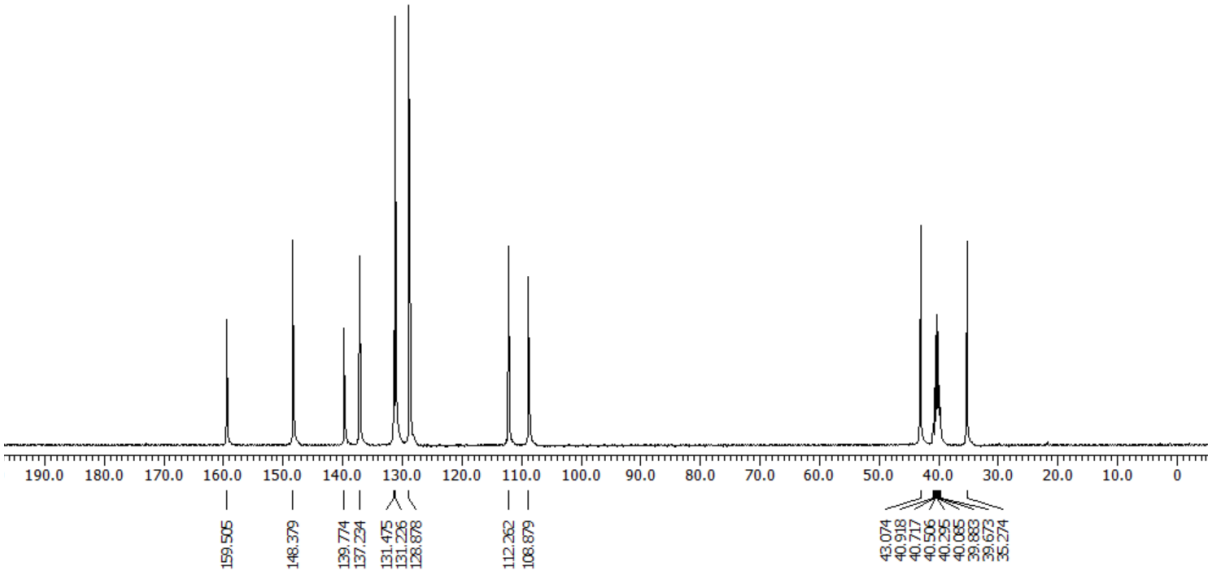


^{13}C NMR

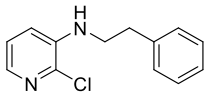
(100 MHz, $(CD_3)_2SO$)



2-Chloro-*N*-phenethylpyridin-3-amine (4l)



HRMS



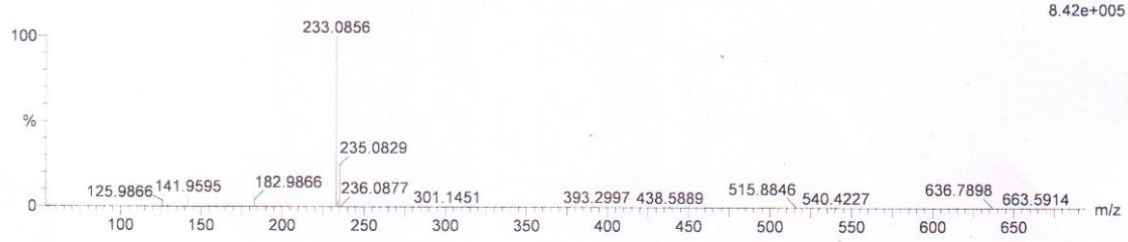
2-Chloro-*N*-phenethylpyridin-3-amine (4l)

Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
7 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-13 H: 0-200 N: 0-2 Cl: 0-1

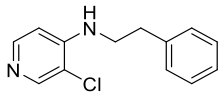
DIMP-316
QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015
22-Nov-2021
12:11:08
221121_12 34 (0.691) Cm (34)
1: TOF MS ES+
8.42e+005



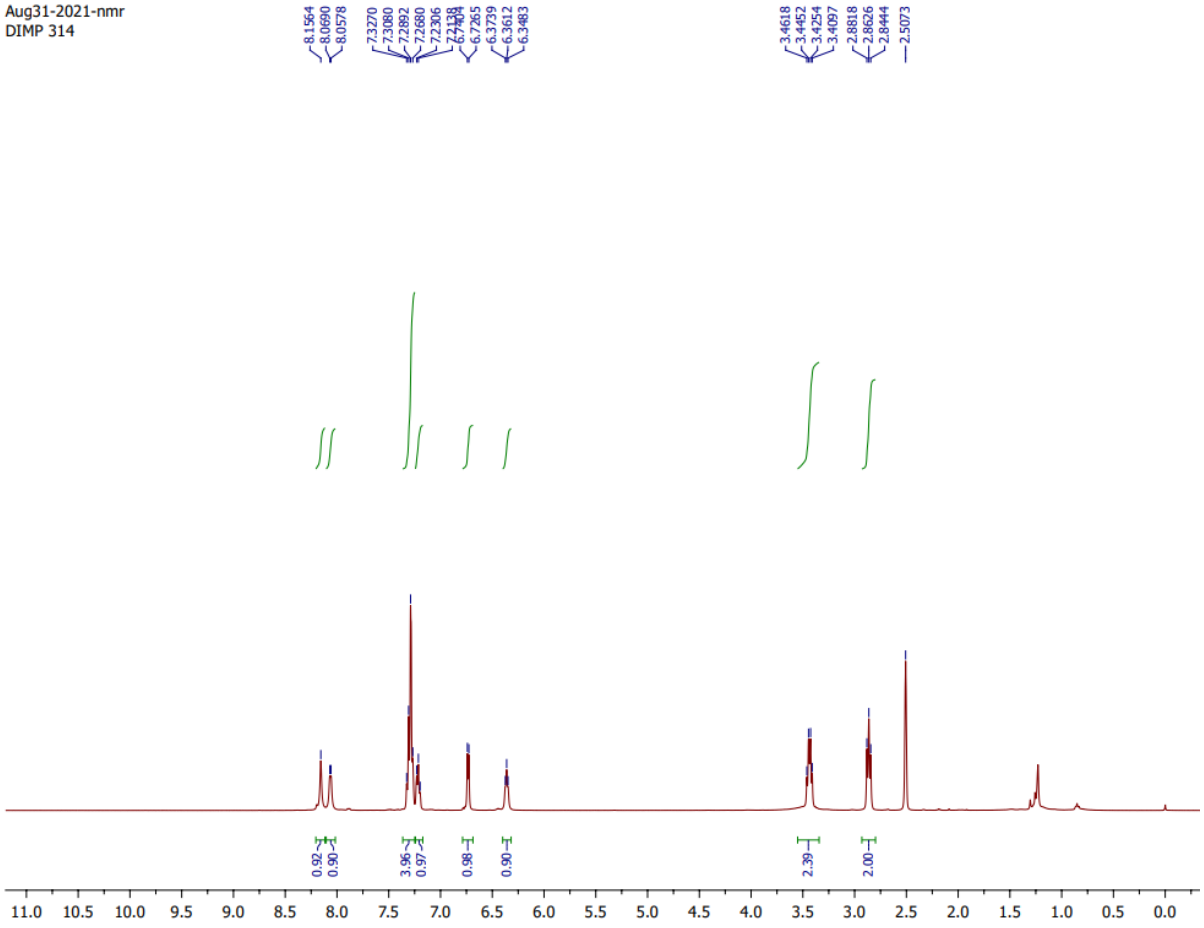
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
233.0856	233.0846	1.0	4.3	7.5	31.0	n/a	n/a	C13 H14 N2 Cl

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

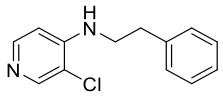


3-Chloro-*N*-phenethylpyridin-4-amine (4m)

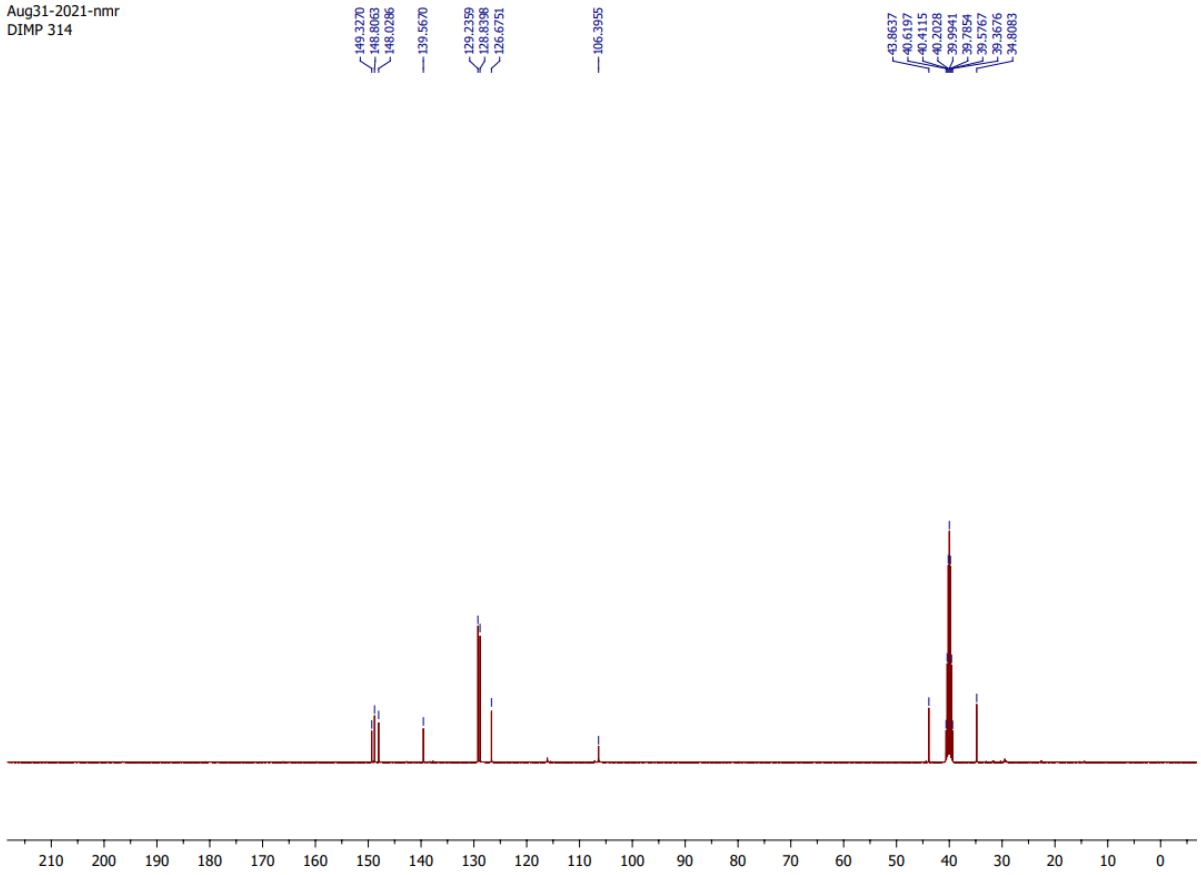


^{13}C NMR

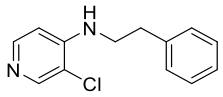
(100 MHz, $(CD_3)_2SO$)



3-Chloro-*N*-phenethylpyridin-4-amine (4m)



HRMS



3-Chloro-*N*-phenethylpyridin-4-amine (4m)

Elemental Composition Report Page 1

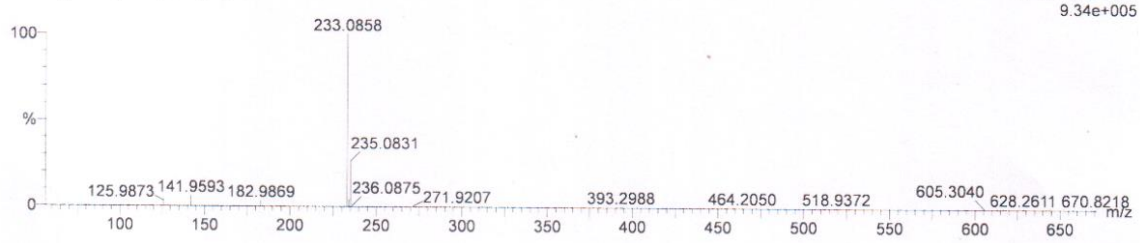
Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
7 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-13 H: 0-200 N: 0-2 Cl: 0-1

DIMP-314
221121_13 37 (0.741) Cm (37)

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

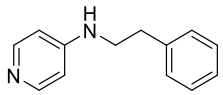
22-Nov-2021
12:13:42
1: TOF MS ES+
9.34e+005



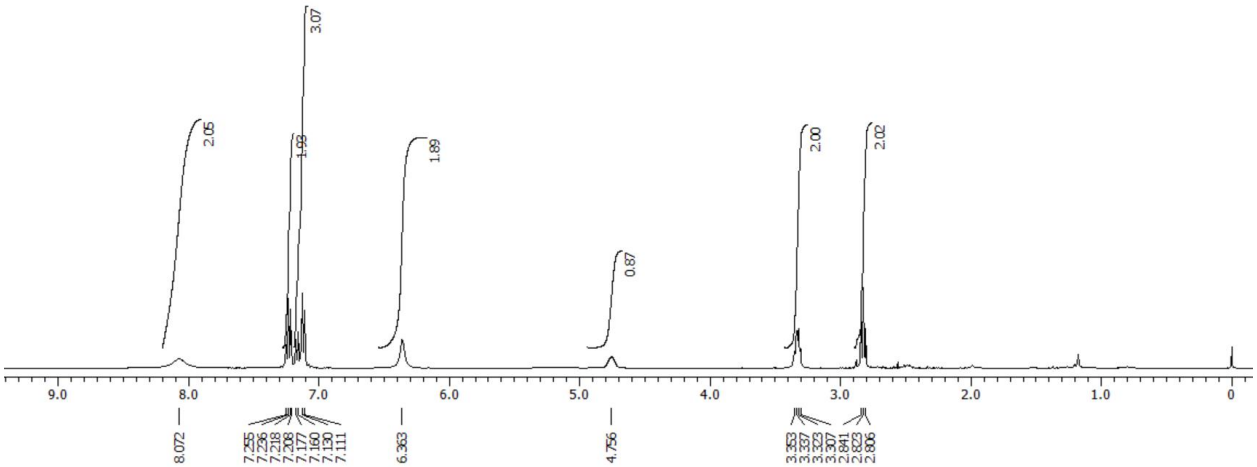
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
233.0858	233.0846	1.2	5.1	7.5	30.8	n/a	n/a	C13 H14 N2 Cl

^{1}H NMR

(400 MHz, $CDCl_3$)

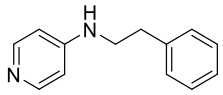


***N*-Phenethylpyridin-4-amine (4n)**

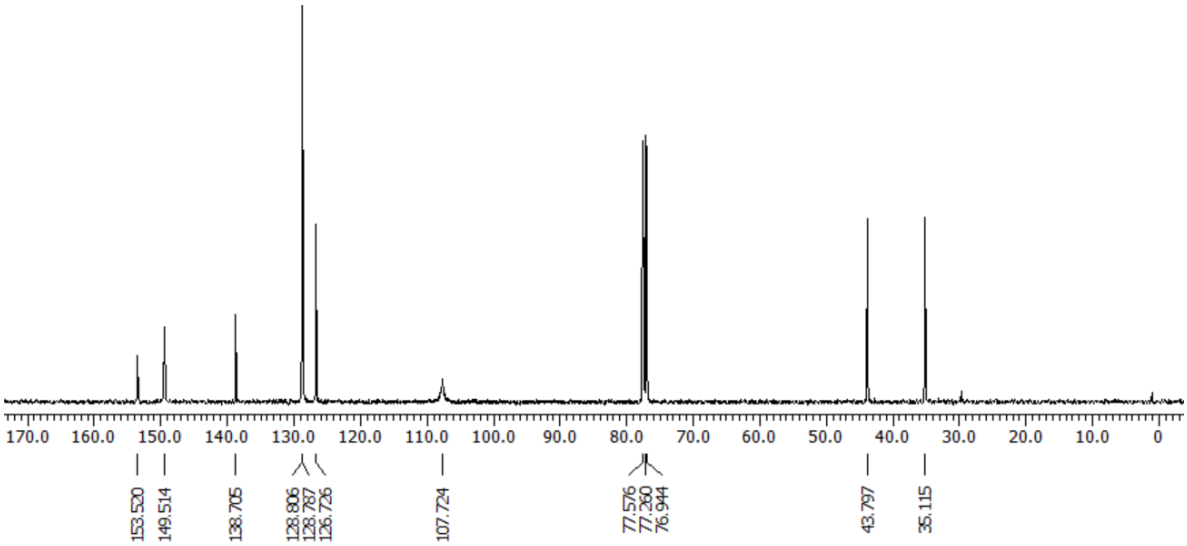


^{13}C NMR

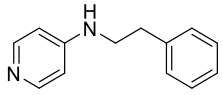
(100 MHz, $CDCl_3$)



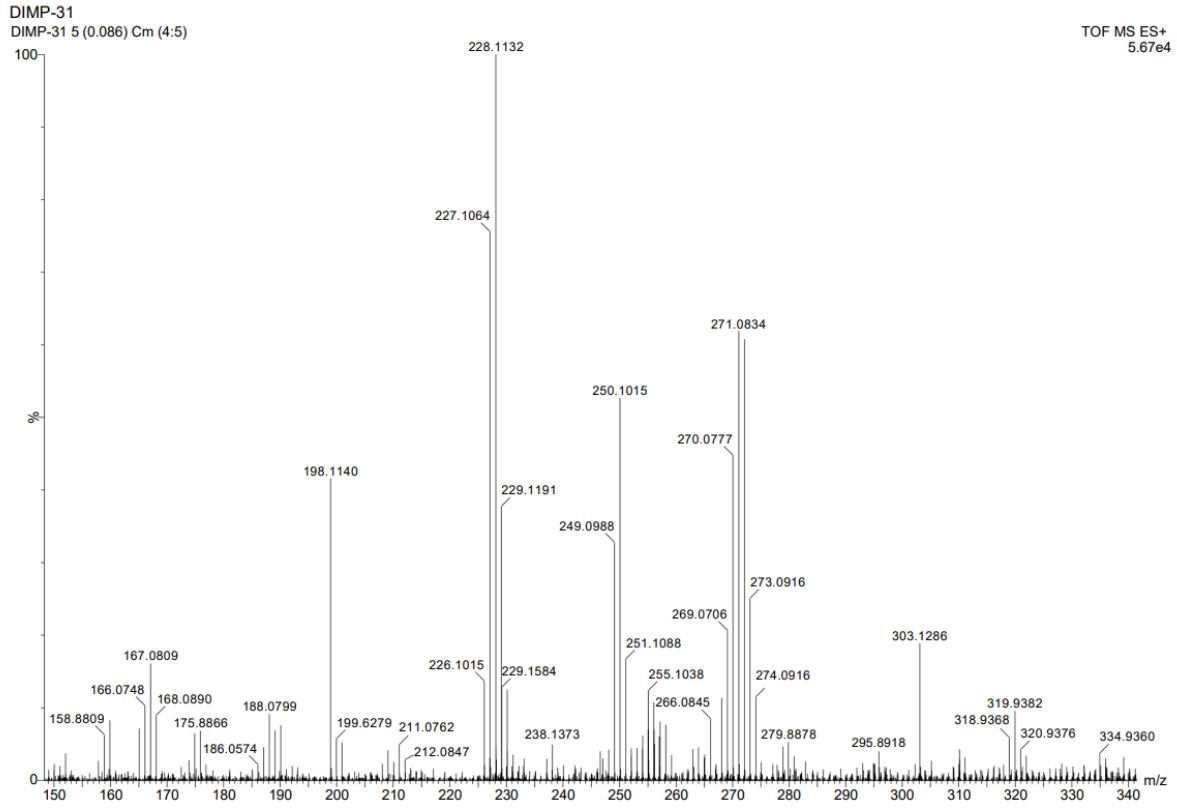
***N*-Phenethylpyridin-4-amine (4n)**



HRMS

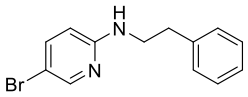


_N_-Phenethylpyridin-4-amine (4n)

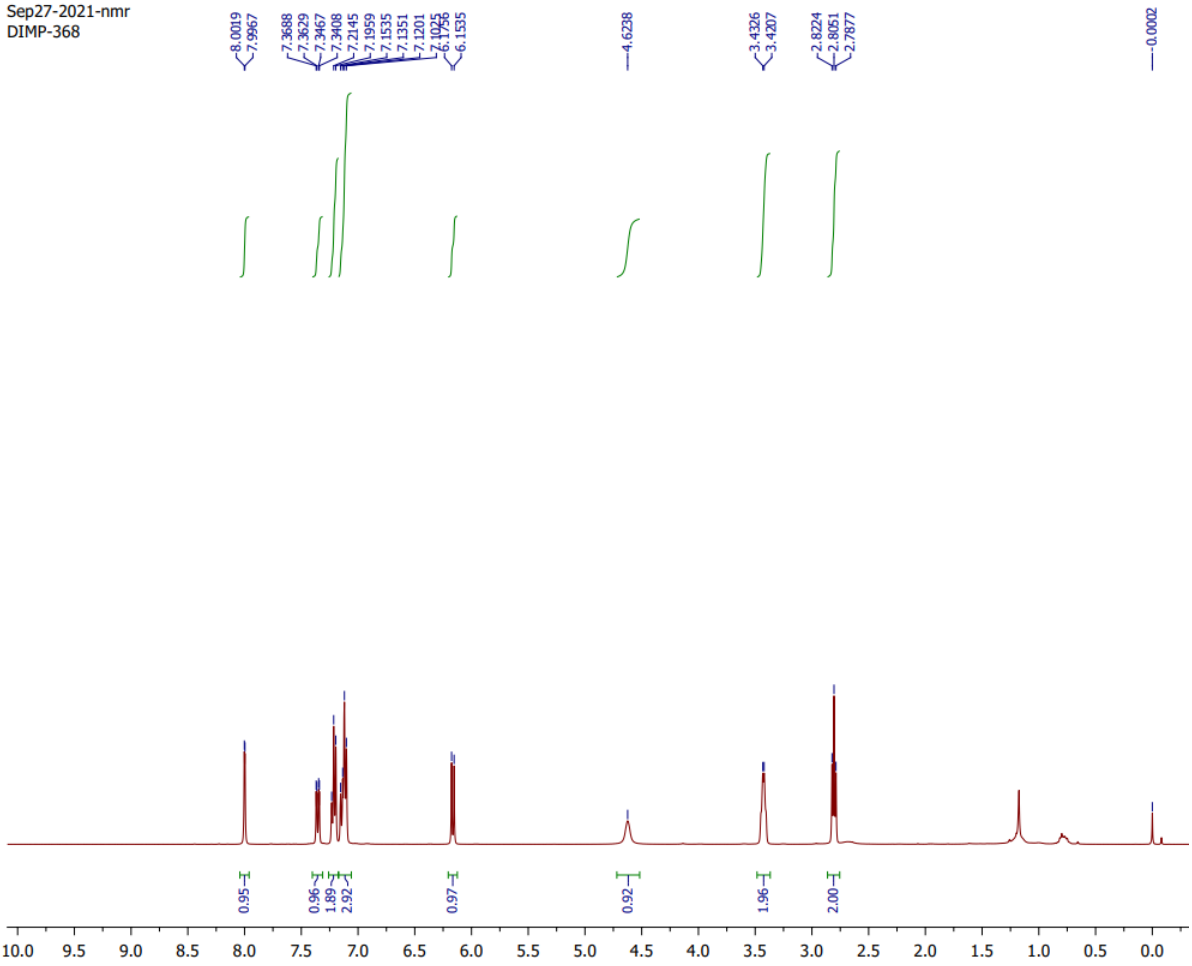


^{1}H NMR

(400 MHz, $CDCl_3$)

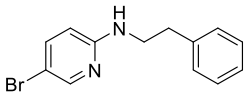


5-Bromo-*N*-phenethylpyridin-2-amine (4o)

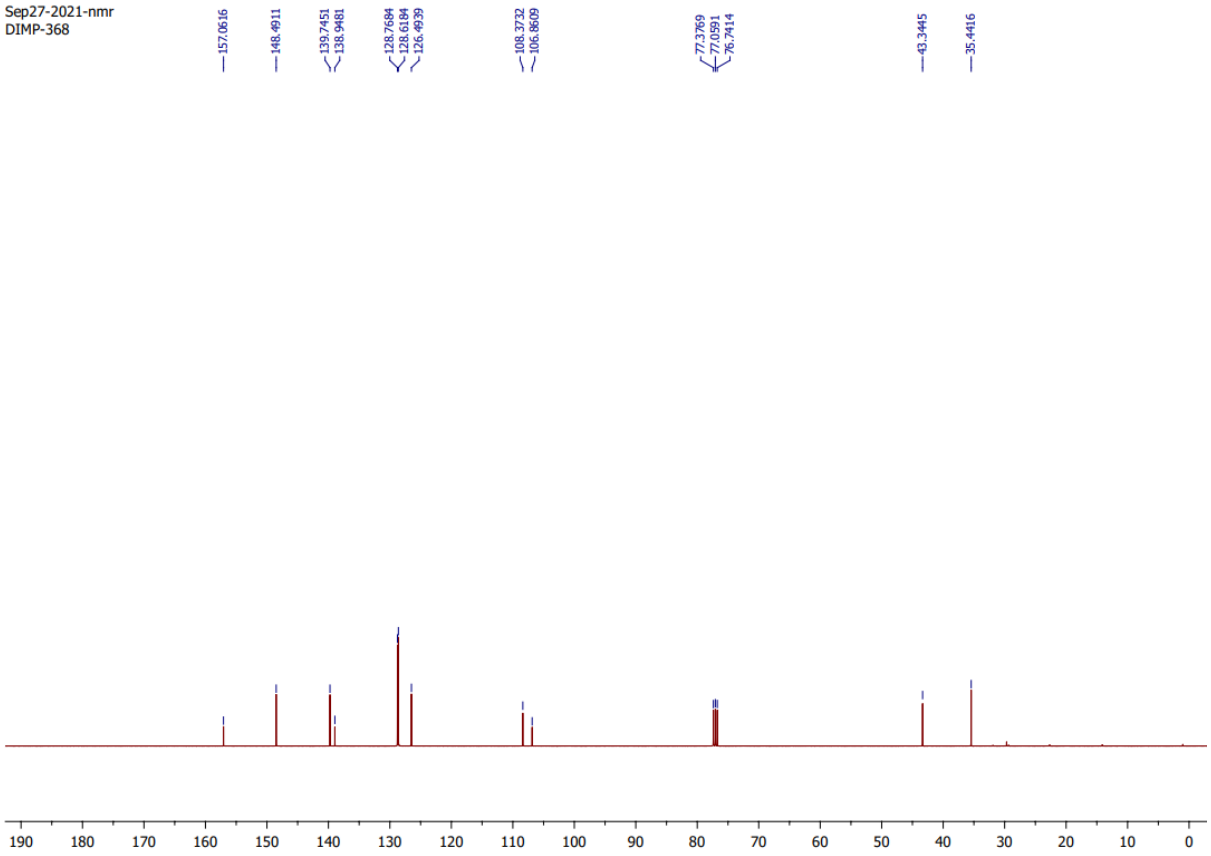


^{13}C NMR

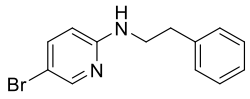
(100 MHz, $CDCl_3$)



5-Bromo-*N*-phenethylpyridin-2-amine (4o)



HRMS



5-Bromo-*N*-phenethylpyridin-2-amine (4o)

Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

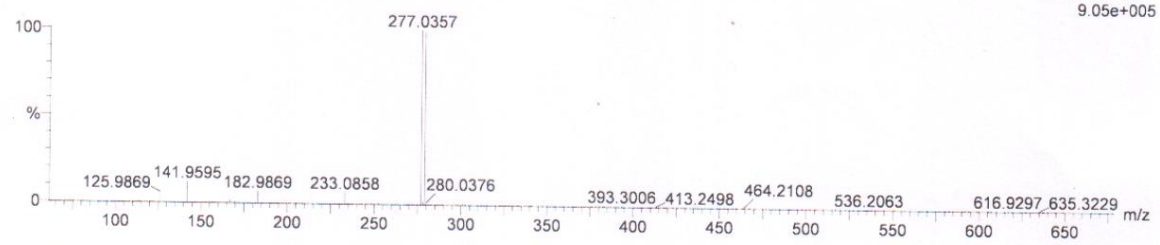
Monoisotopic Mass, Even Electron Ions
7 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-13 H: 0-200 N: 0-2 Br: 0-1

DIMP-368

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

22-Nov-2021
12:16:16
1: TOF MS ES+
9.05e+005

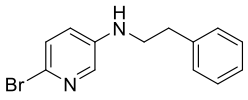
221121_14 29 (0.586) Cm (29:30)



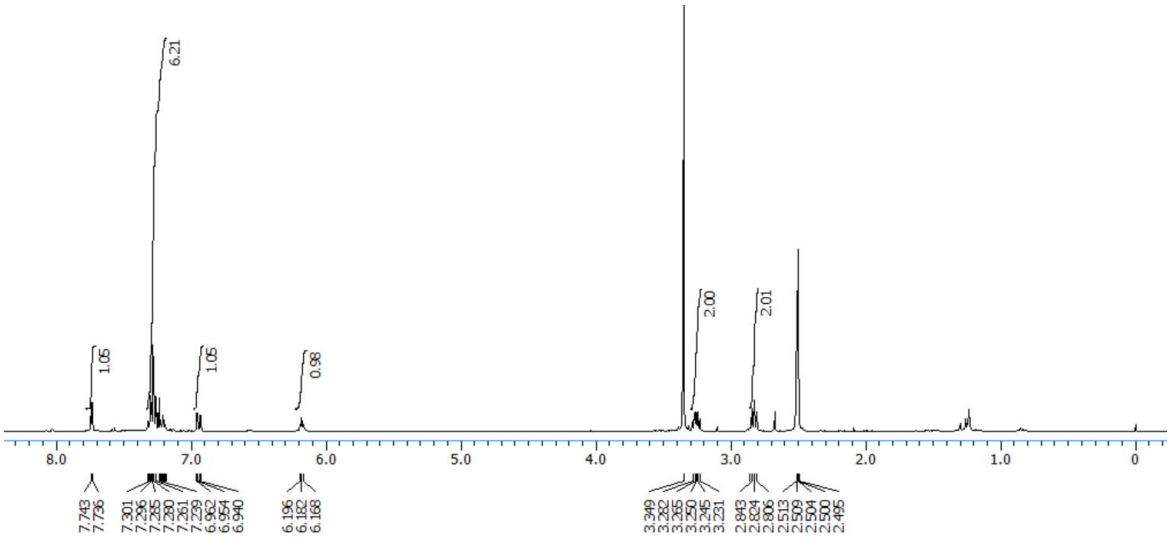
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
277.0357	277.0340	1.7	6.1	7.5	37.2	n/a	n/a	C13 H14 N2 Br

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

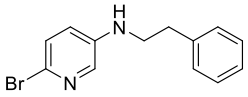


6-Bromo-*N*-phenethylpyridin-3-amine (4p)

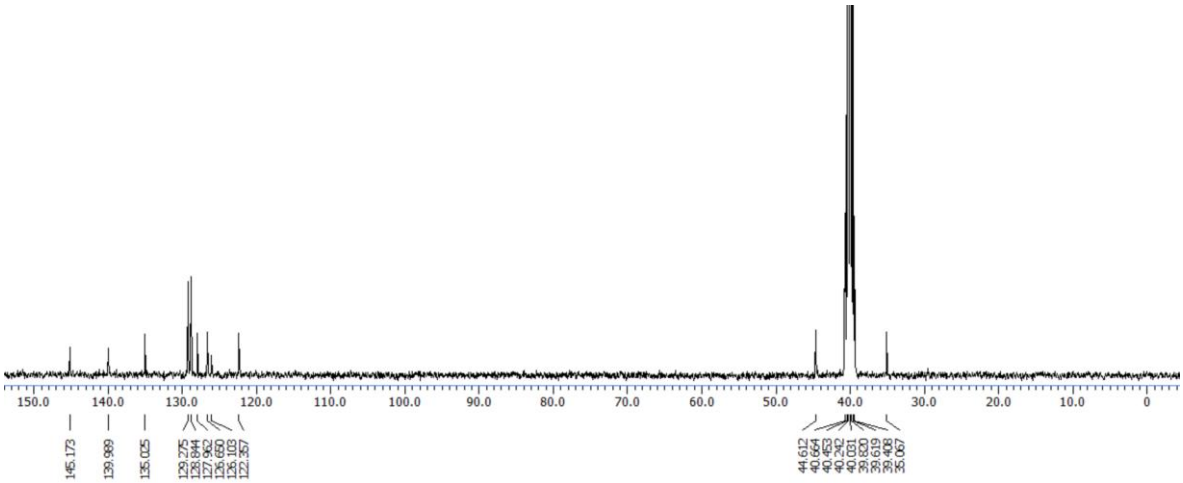


^{13}C NMR

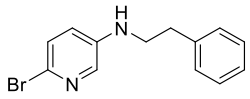
(100 MHz, $(CD_3)_2SO$)



6-Bromo-*N*-phenethylpyridin-3-amine (4p)



HRMS



6-Bromo-*N*-phenethylpyridin-3-amine (4p)

Elemental Composition Report

Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

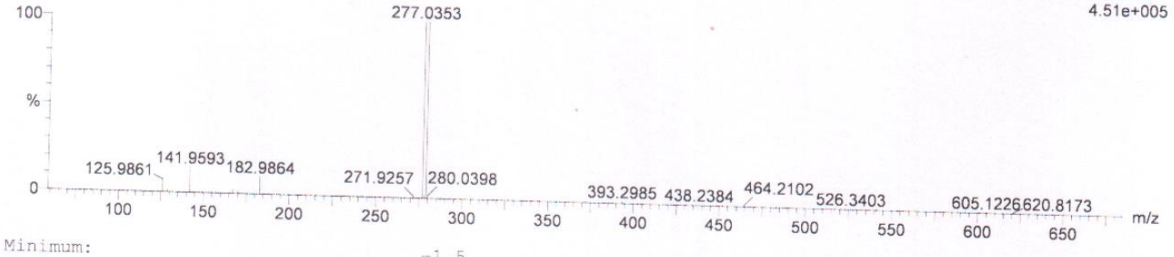
Monoisotopic Mass, Even Electron Ions
7 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-13 H: 0-200 N: 0-2 Br: 0-1

DIMP-362

221121_08 24 (0.482) Cm (24)

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

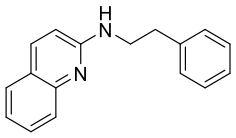
22-Nov-2021
12:00:42
1: TOF MS ES+
4.51e+005



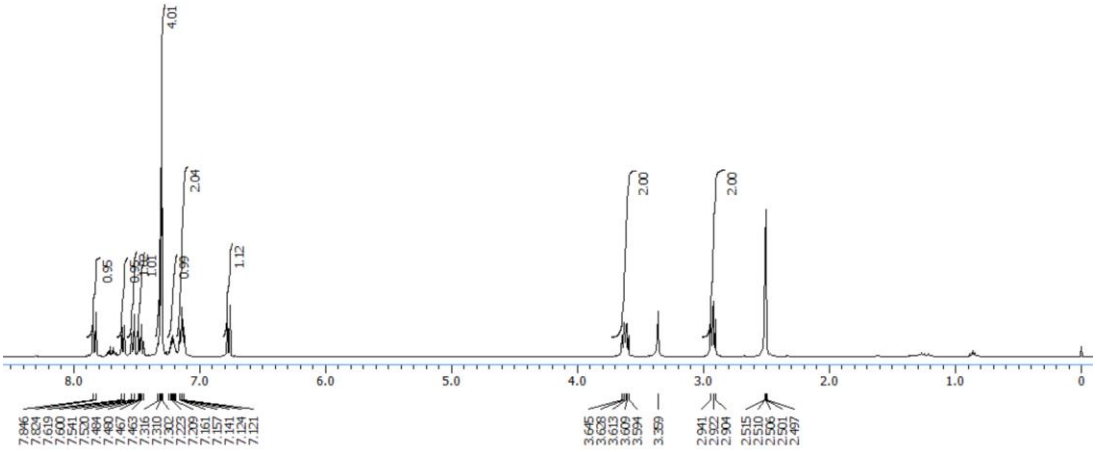
Minimum:			-1.5					
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
277.0353	277.0340	1.3	4.7	7.5	34.9	n/a	n/a	C13 H14 N2 Br

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

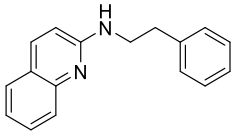


***N*-Phenethylquinolin-2-amine (4q)**

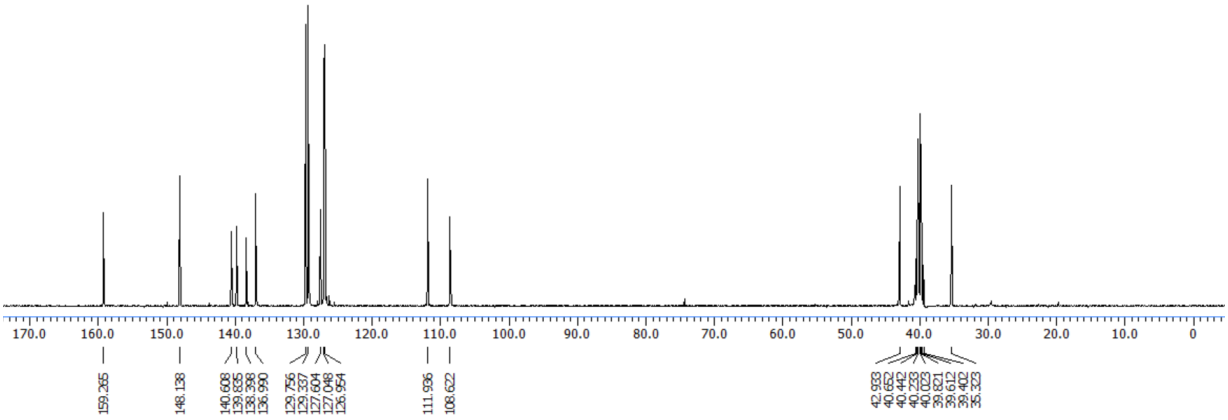


^{13}C NMR

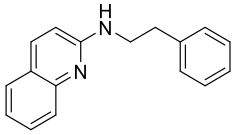
(100 MHz, $(CD_3)_2SO$)



***N*-Phenethylquinolin-2-amine (4q)**



HRMS



N-Phenethylquinolin-2-amine (4q)

Elemental Composition Report Page 1

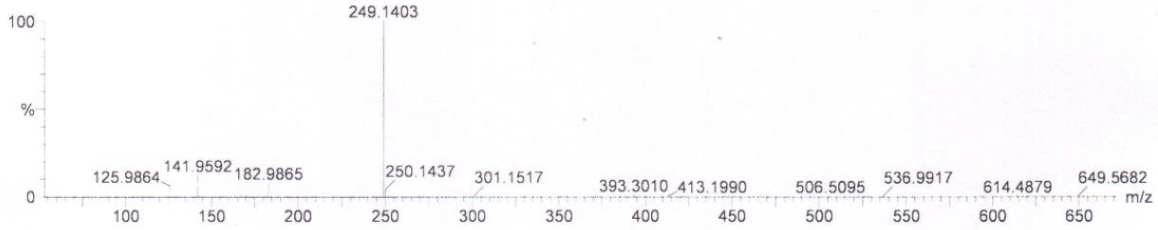
Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
6 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-17 H: 0-200 N: 0-2

DIMP-315
221121_07 25 (0.519) Cm (25)

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

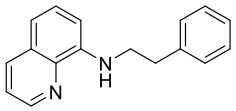
22-Nov-2021
11:58:08
1: TOF MS ES+
5.51e+005



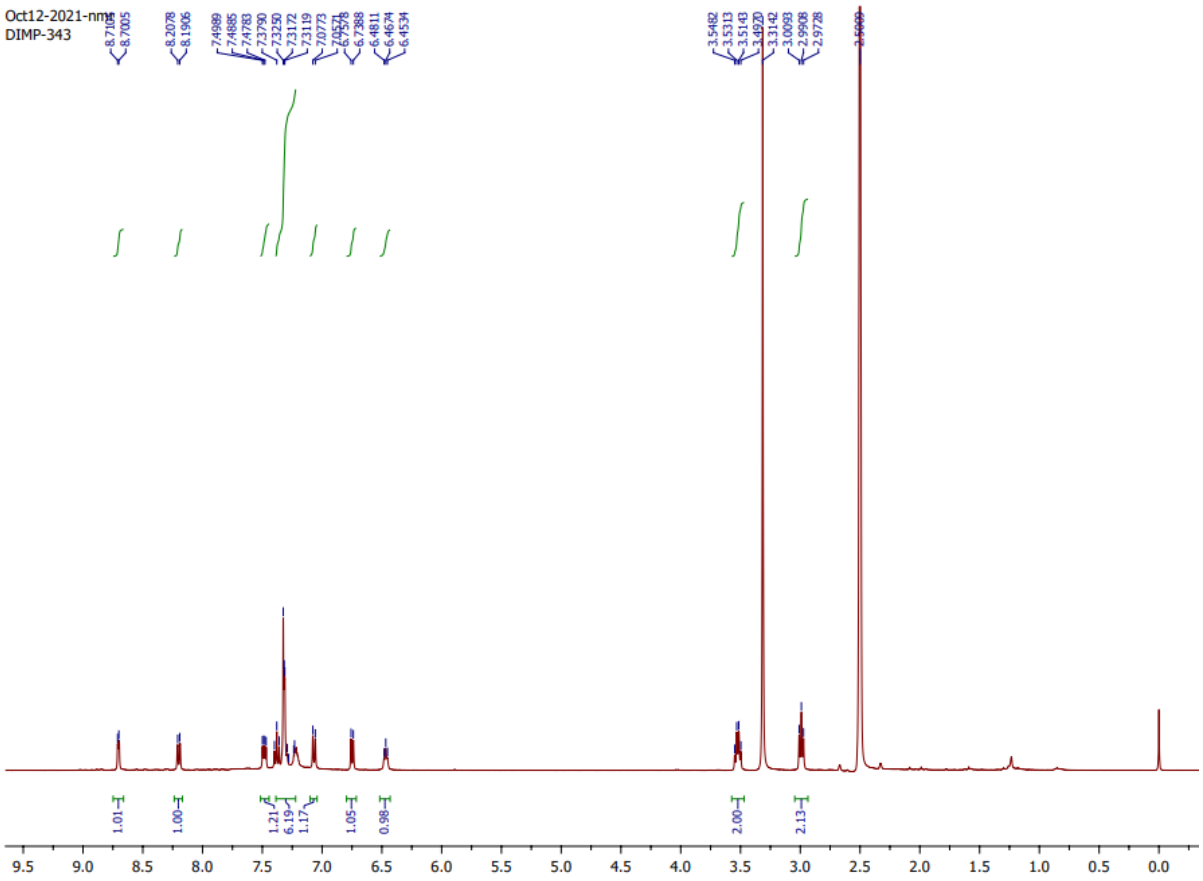
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
249.1403	249.1392	1.1	4.4	10.5	36.4	n/a	n/a	C17 H17 N2

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

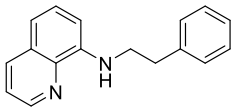


***N*-Phenethylquinolin-8-amine (4r)**

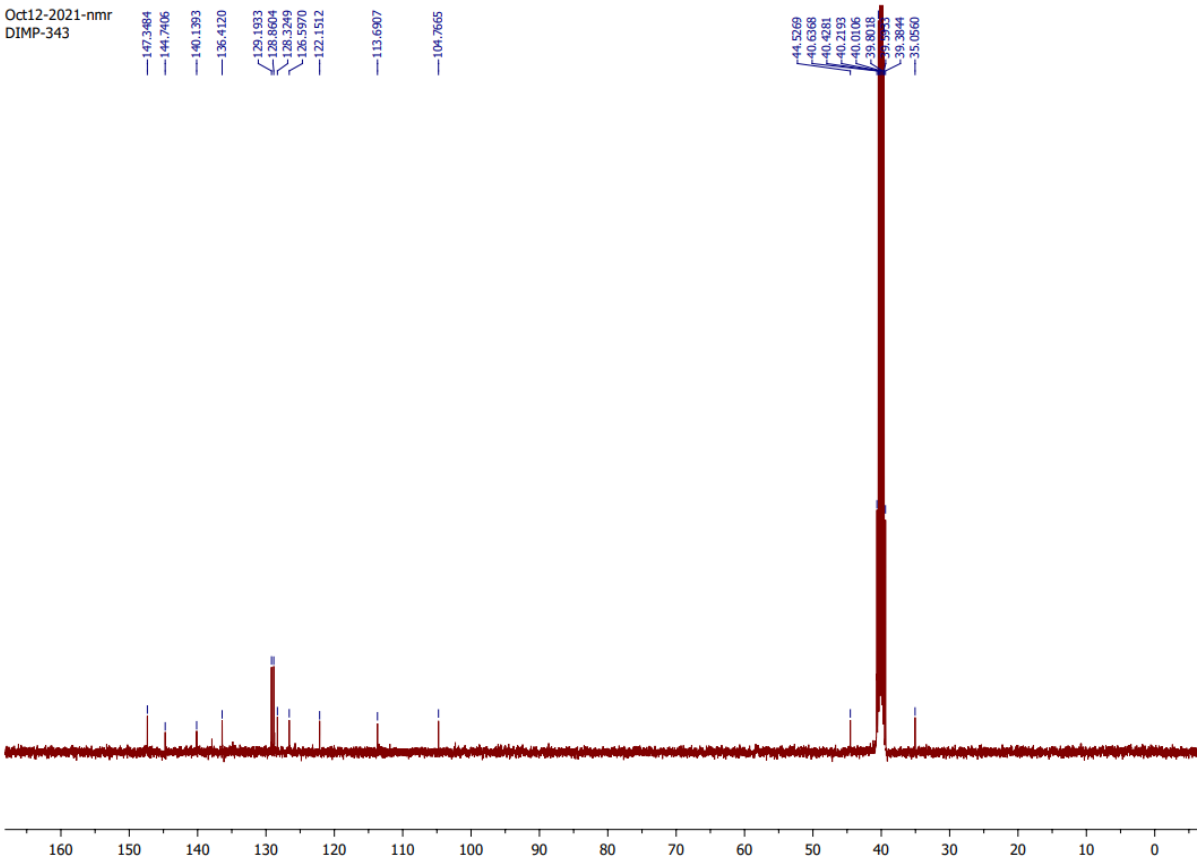


^{13}C NMR

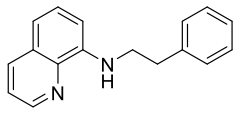
(100 MHz, $(CD_3)_2SO$)



***N*-Phenethylquinolin-8-amine (4r)**



HRMS



N-Phenethylquinolin-8-amine (4r)

Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

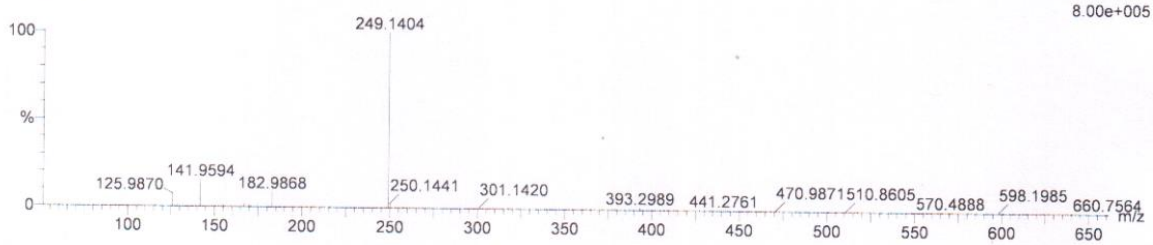
Monoisotopic Mass, Even Electron Ions
6 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-17 H: 0-200 N: 0-2

DIMP-343

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

22-Nov-2021
12:03:16
1: TOF MS ES+
8.00e+005

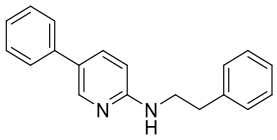
221121_09 14 (0.293) Cm (14:15)



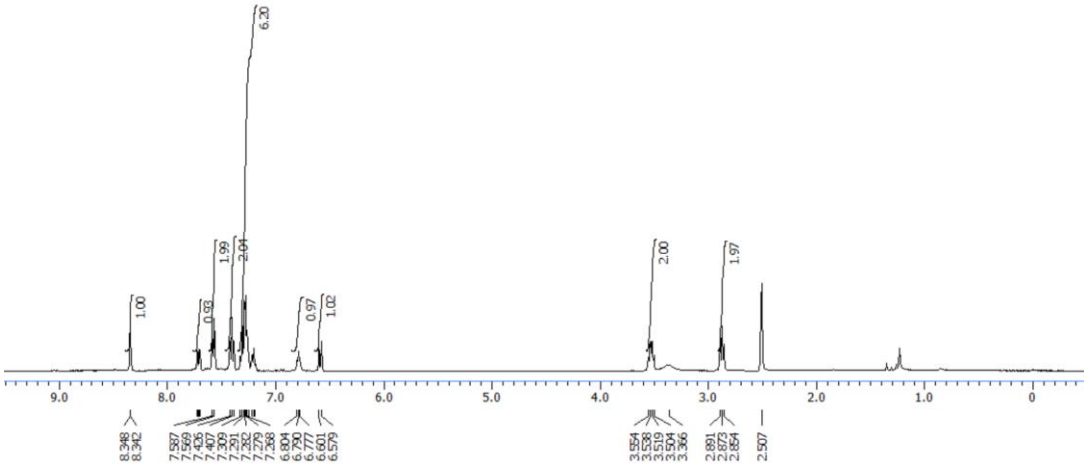
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
249.1404	249.1392	1.2	4.8	10.5	42.0	n/a	n/a	C17 H17 N2

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

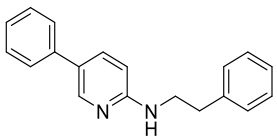


***N*-Phenethyl-5-phenylpyridin-2-amine (4s)**

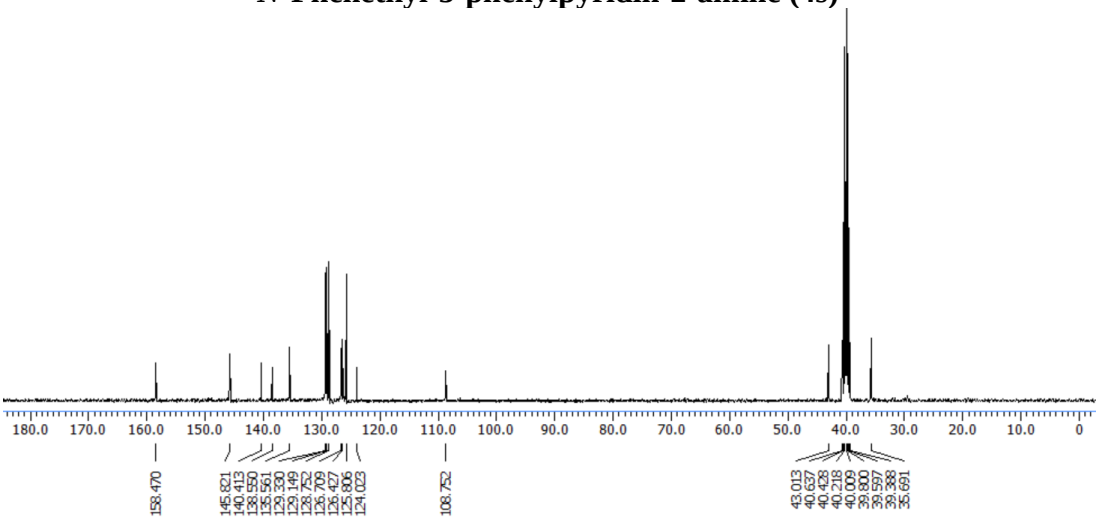


^{13}C NMR

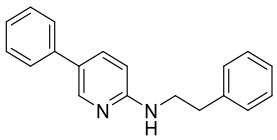
(100 MHz, $(CD_3)_2SO$)



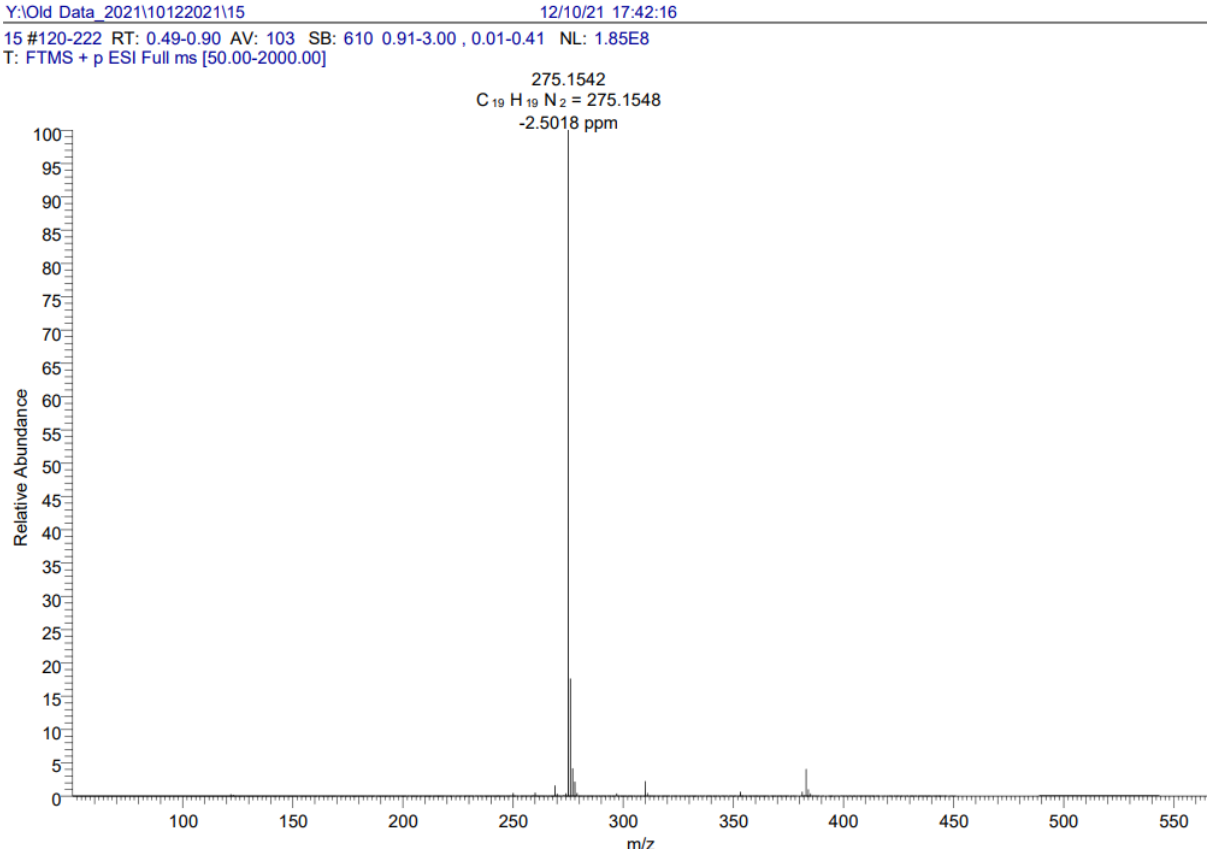
***N*-Phenethyl-5-phenylpyridin-2-amine (4s)**



HRMS

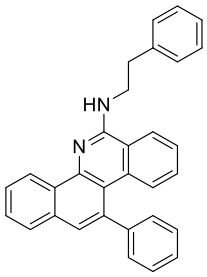


N-Phenethyl-5-phenylpyridin-2-amine (4s)

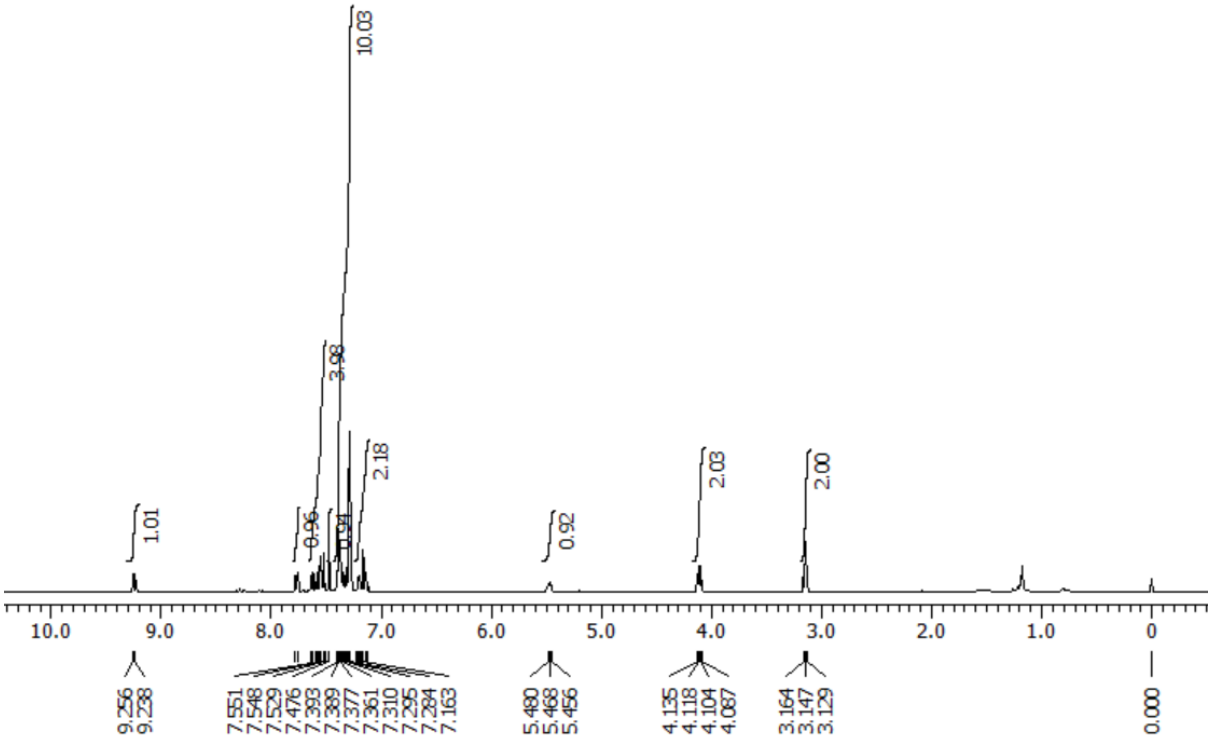


^{1}H NMR

(400 MHz, $CDCl_3$)

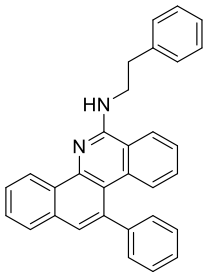


***N*-Phenethyl-11-phenylbenzo[*c*]phenanthridine-6-amine (4t)**

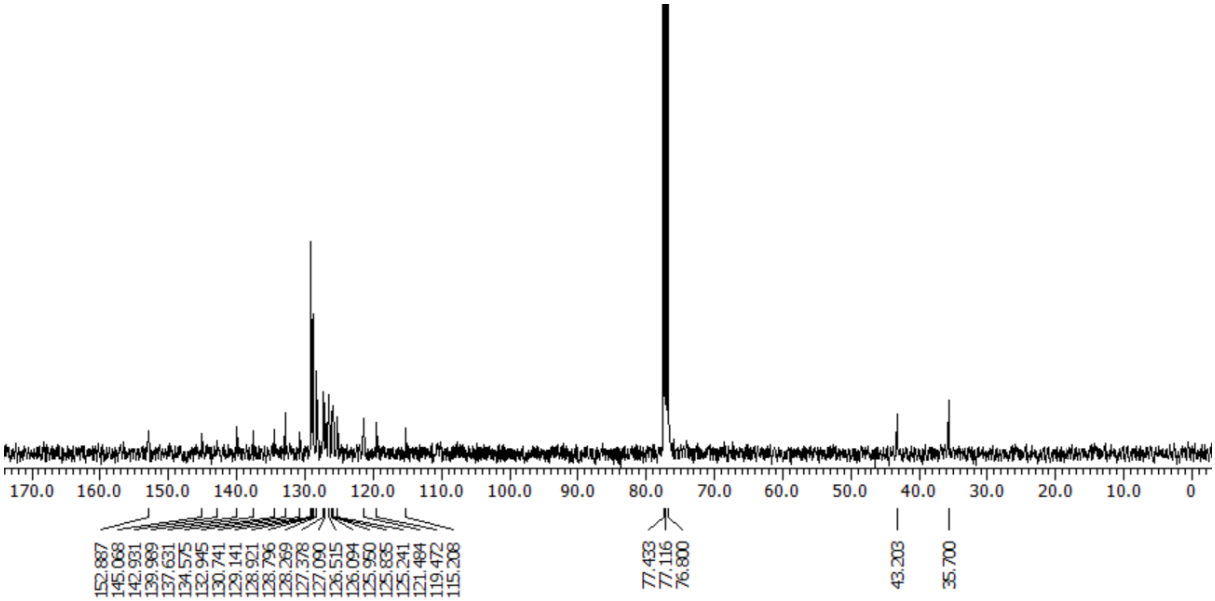


^{13}C NMR

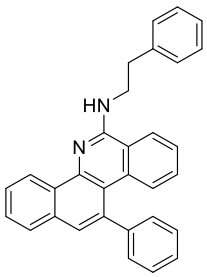
(100 MHz, $CDCl_3$)



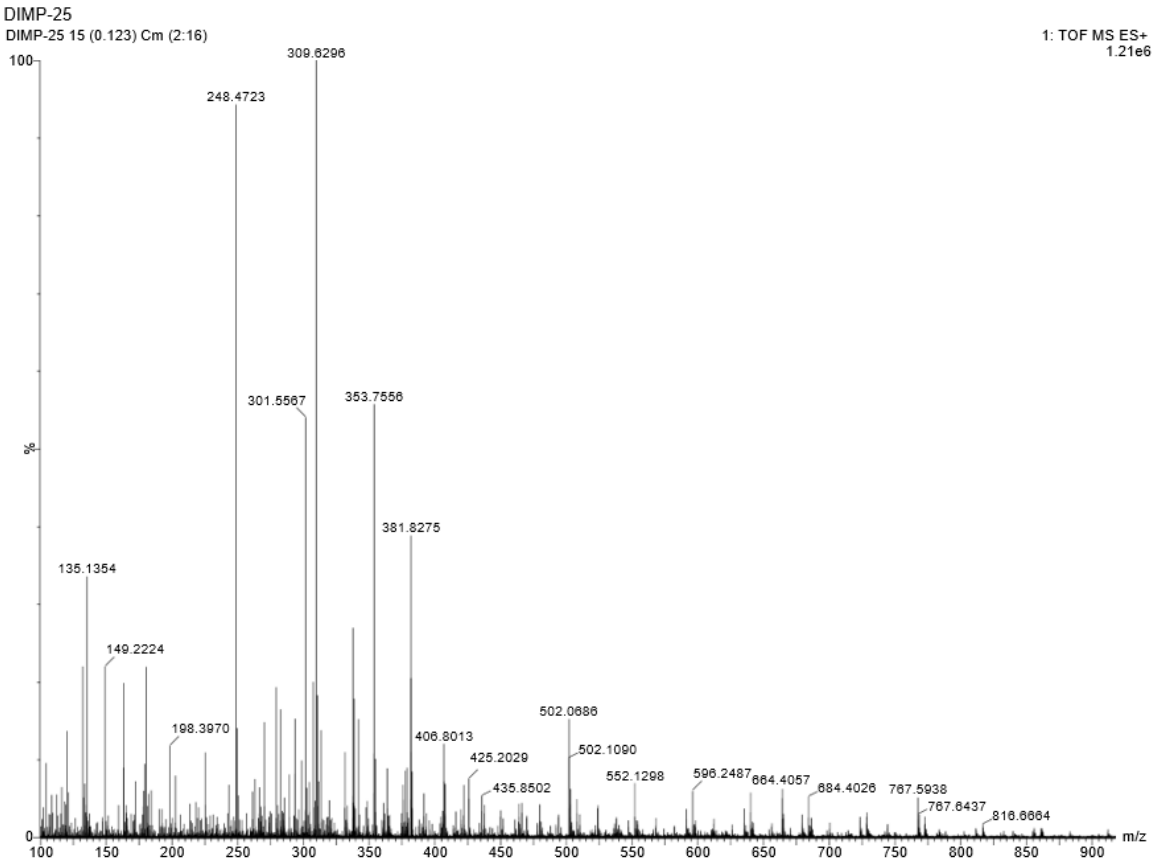
***N*-Phenethyl-11-phenylbenzo[*c*]phenanthridine-6-amine (4t)**



HRMS

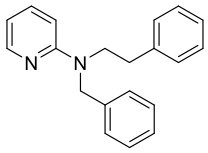


_N_-Phenethyl-11-phenylbenzo[_c_]phenanthridine-6-amine (4t)

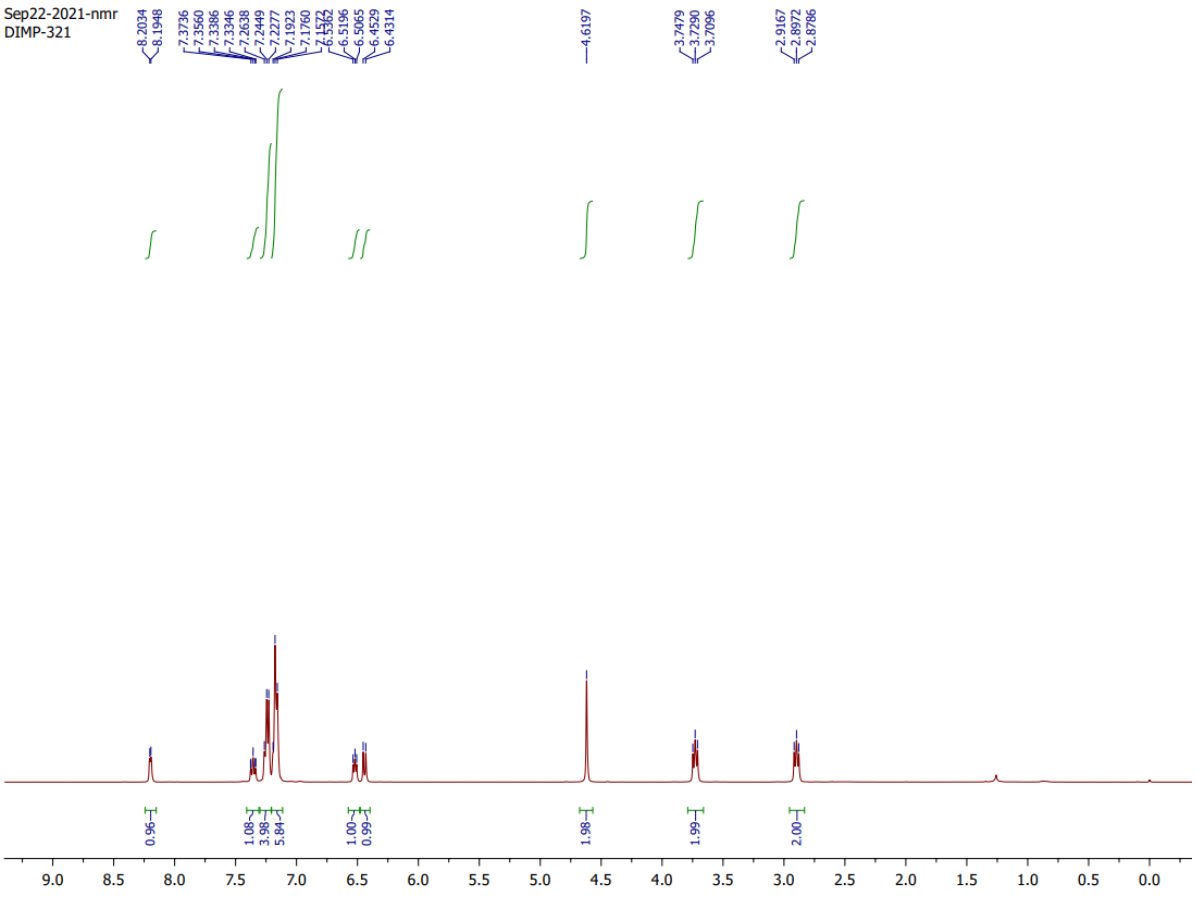


^{1}H NMR

(400 MHz, $CDCl_3$)

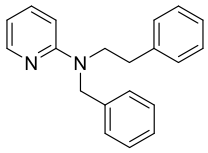


_N_-Benzyl-_N_-phenethylpyridin-2-amine (4u)

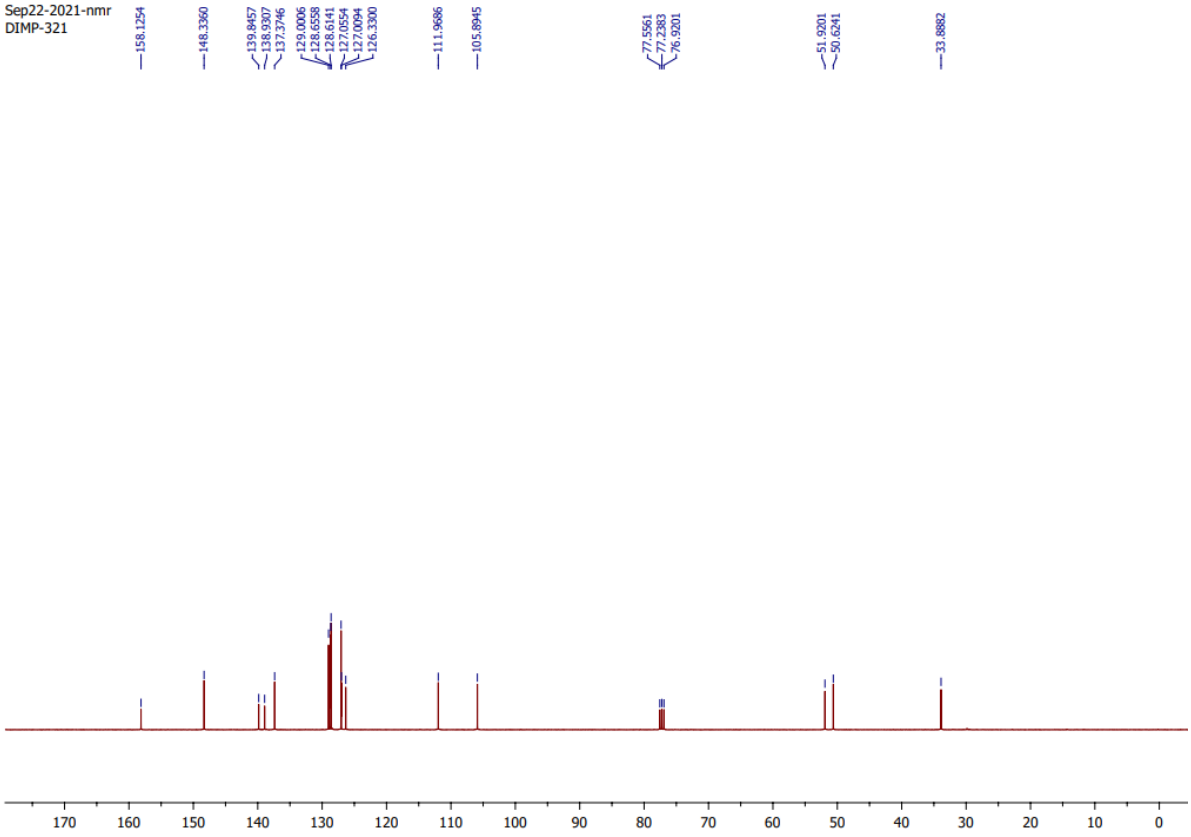


^{13}C NMR

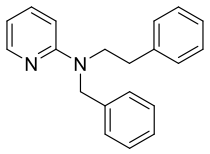
(100 MHz, $CDCl_3$)



***N*-Benzyl-*N*-phenethylpyridin-2-amine (4u)**



HRMS



N-Benzyl-N-phenethylpyridin-2-amine (4u)

Elemental Composition Report Page 1

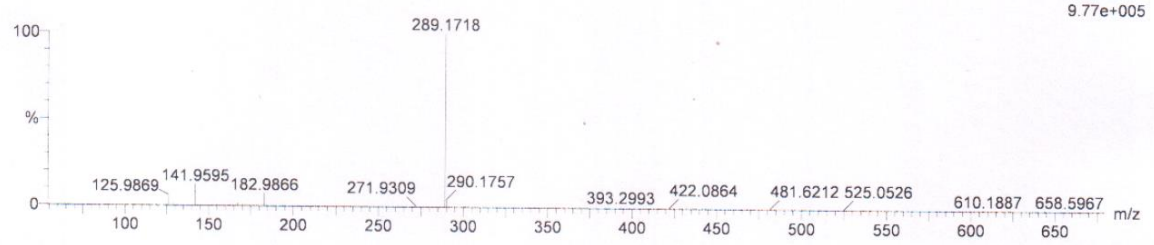
Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
6 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-20 H: 0-200 N: 0-2

DIMP-321
221121_10 30 (0.603) Cm (30:31)

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

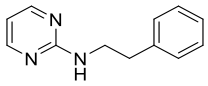
22-Nov-2021
12:05:59
1: TOF MS ES+
9.77e+005



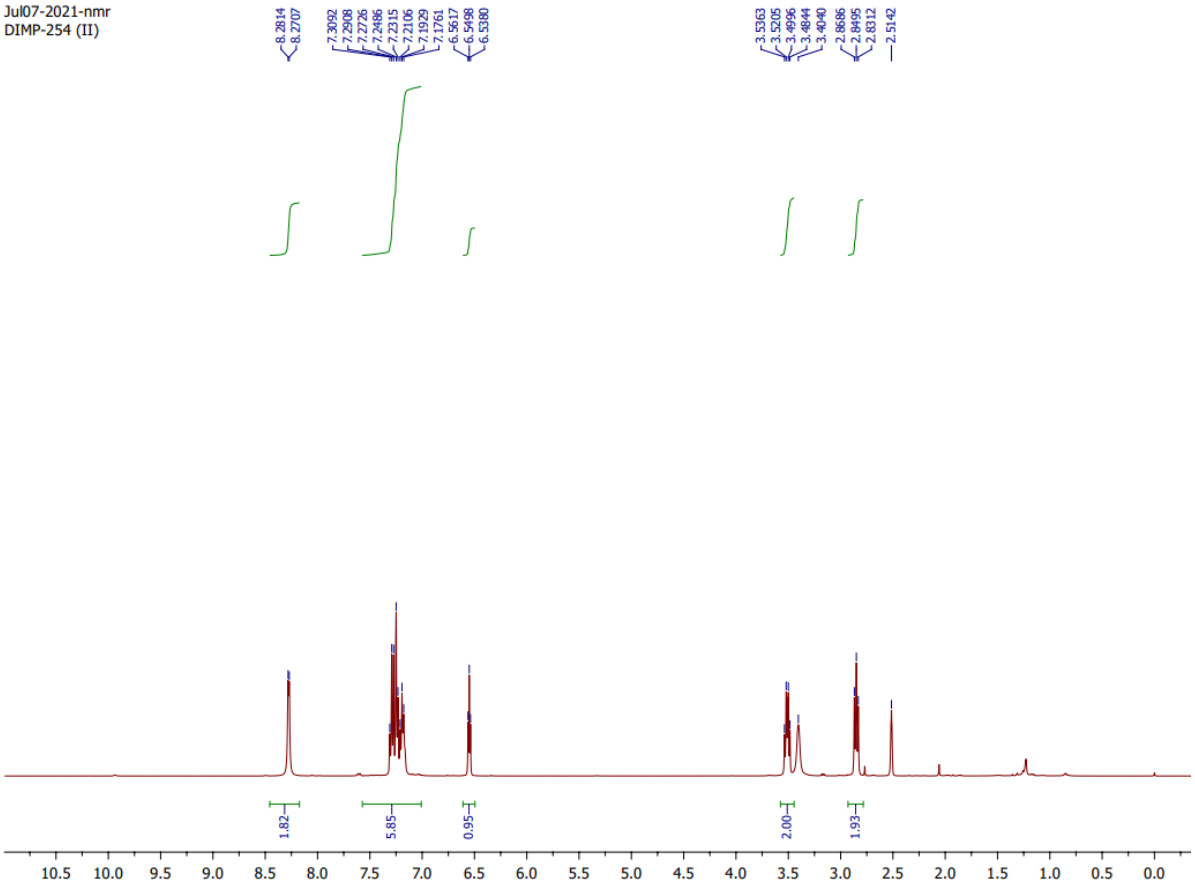
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
289.1718	289.1705	1.3	4.5	11.5	47.3	n/a	n/a	C20 H21 N2

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

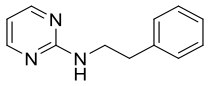


***N*-Phenethylpyrimidin-2-amine (6a)**

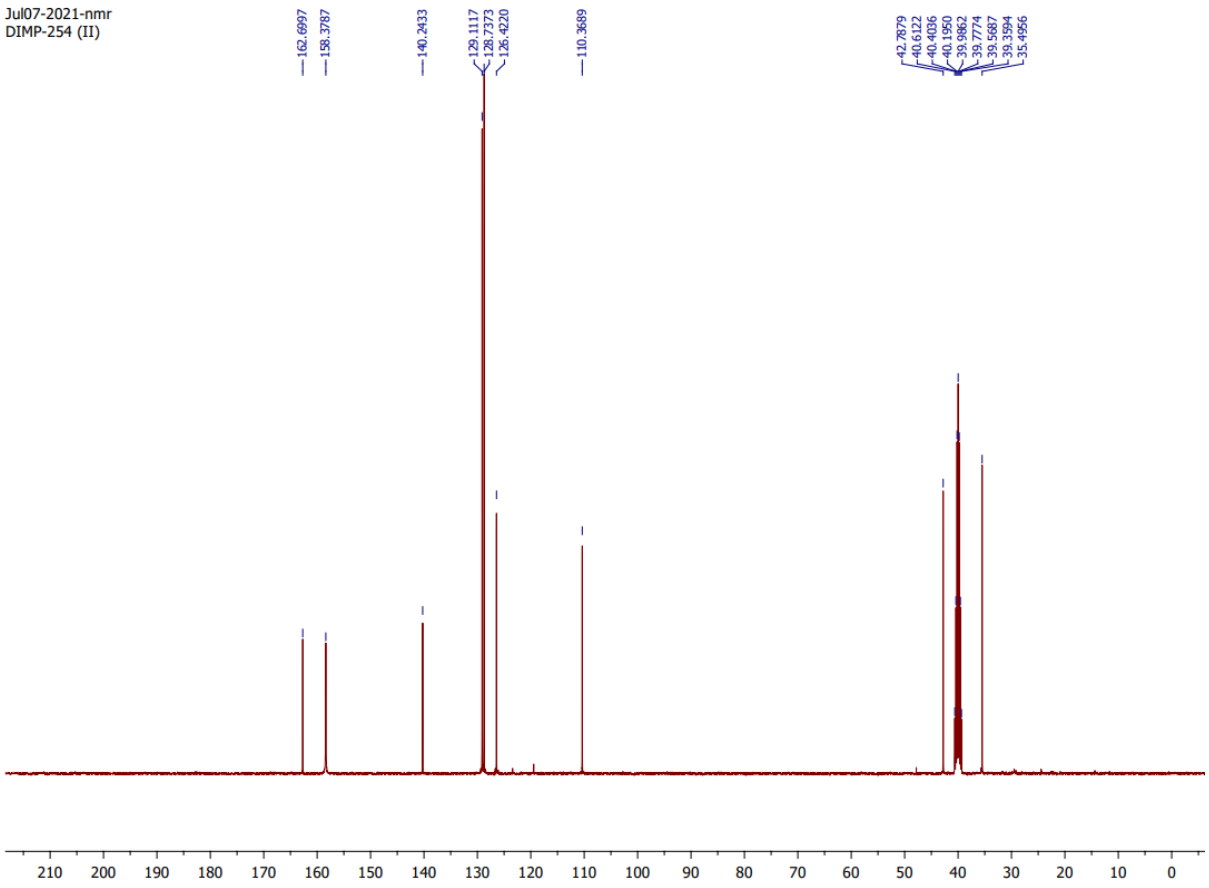


^{13}C NMR

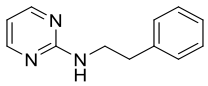
(100 MHz, $(CD_3)_2SO$)



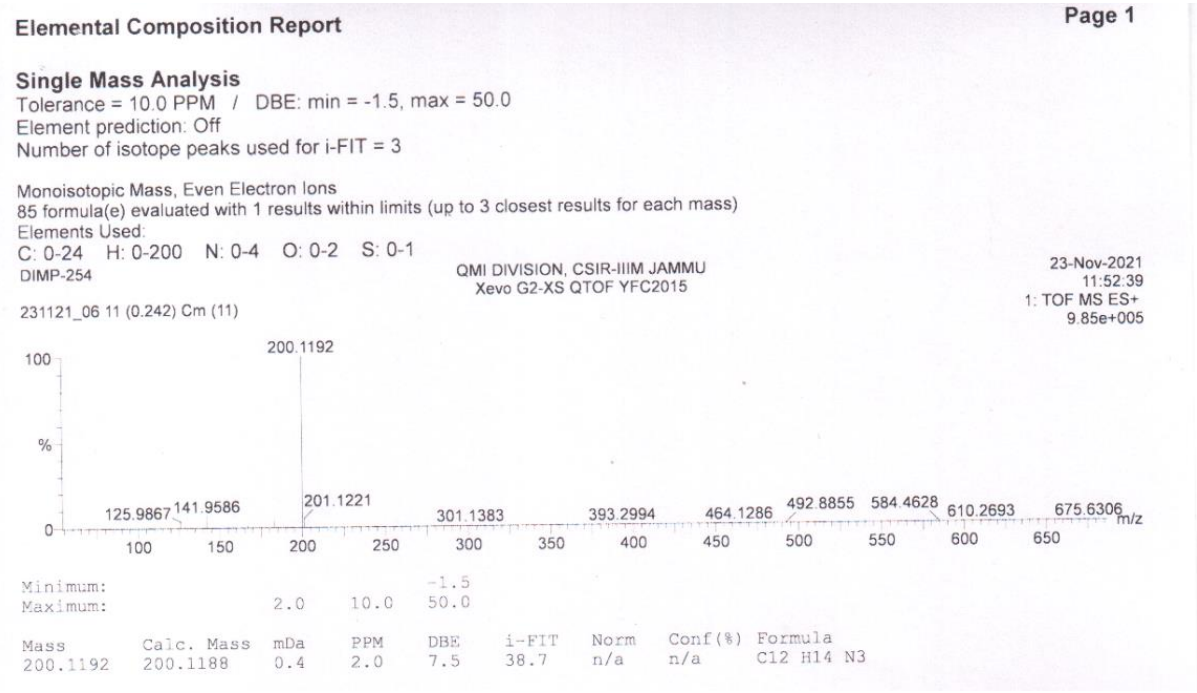
***N*-Phenethylpyrimidin-2-amine (6a)**



HRMS

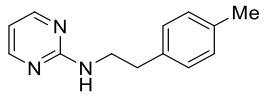


N-Phenethylpyrimidin-2-amine (6a)

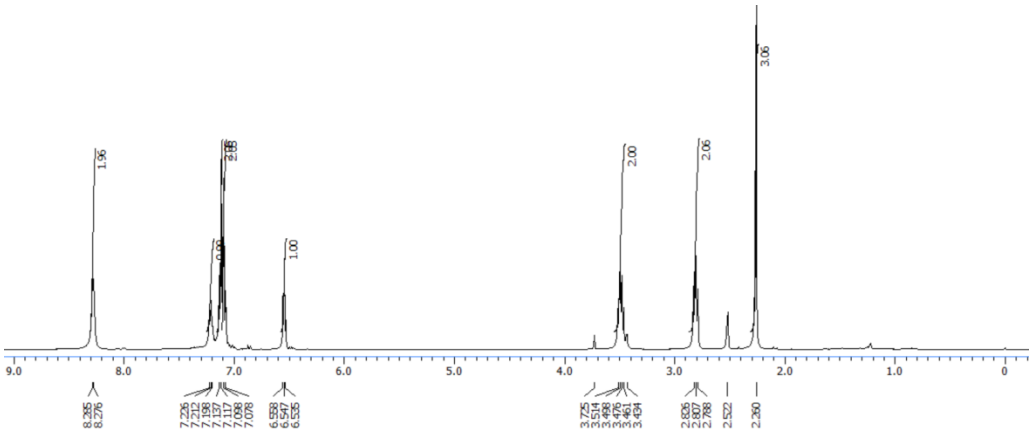


^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

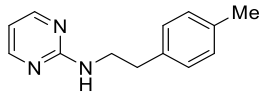


***N*-(4-Methylphenethyl)pyrimidin-2-amine (6b)**

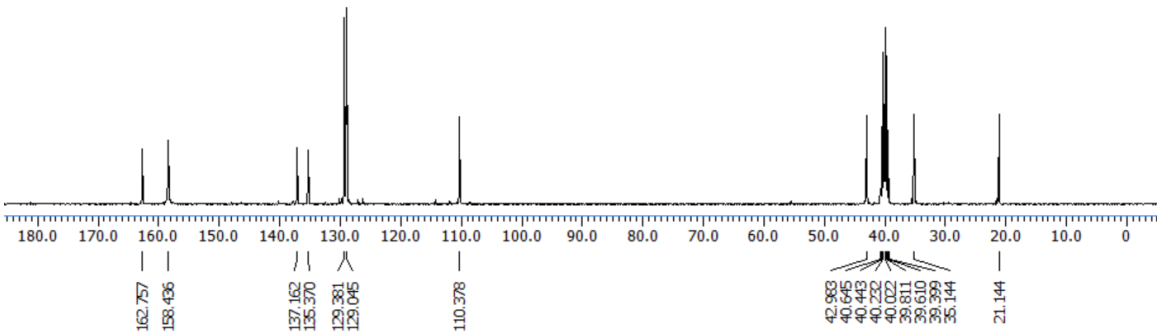


^{13}C NMR

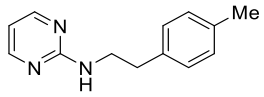
(100 MHz, $(CD_3)_2SO$)



***N*-(4-Methylphenethyl)pyrimidin-2-amine (6b)**



HRMS



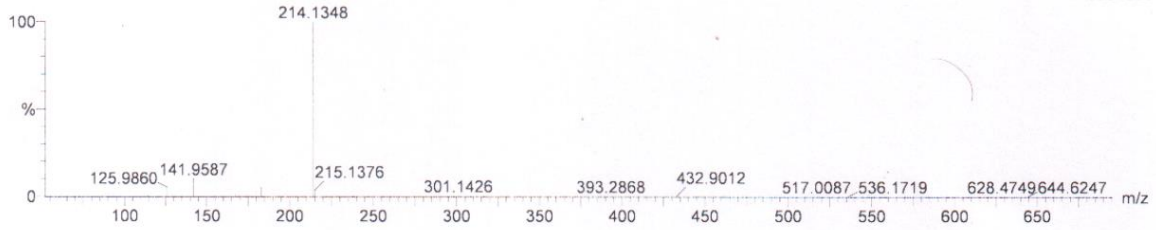
N-(4-Methylphenethyl)pyrimidin-2-amine (6b)

Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
89 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-24 H: 0-200 N: 0-4 O: 0-2 S: 0-1

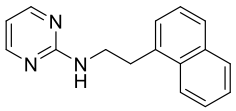
DIMP-265 QMI DIVISION, CSIR-IIIM JAMMU 23-Nov-2021
Xevo G2-XS QTOF YFC2015 11:57:57
231121_08 22 (0.448) Cm (22:23) 1: TOF MS ES+
1.39e+006



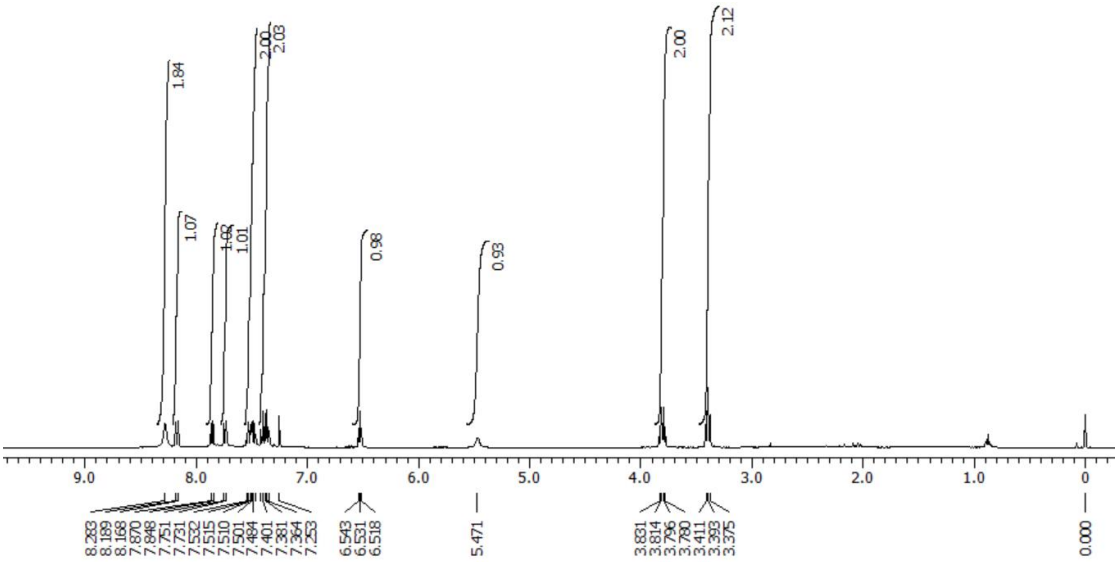
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
214.1348	214.1344	0.4	1.9	7.5	42.7	n/a	n/a	C13 H16 N3

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

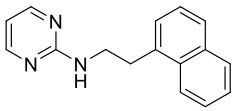


***N*-(2-(Naphthalen-1-yl)ethyl)pyrimidin-2-amine (6c)**

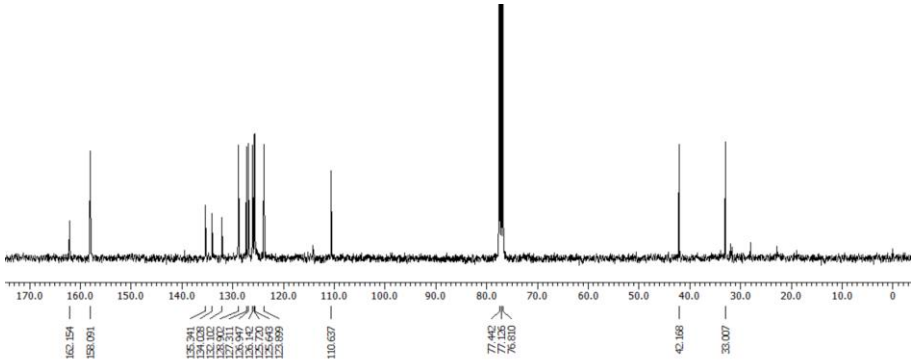


^{13}C NMR

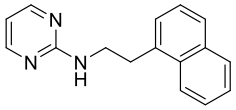
(100 MHz, $(CD_3)_2SO$)



***N*-(2-(Naphthalen-1-yl)ethyl)pyrimidin-2-amine (6c)**



HRMS



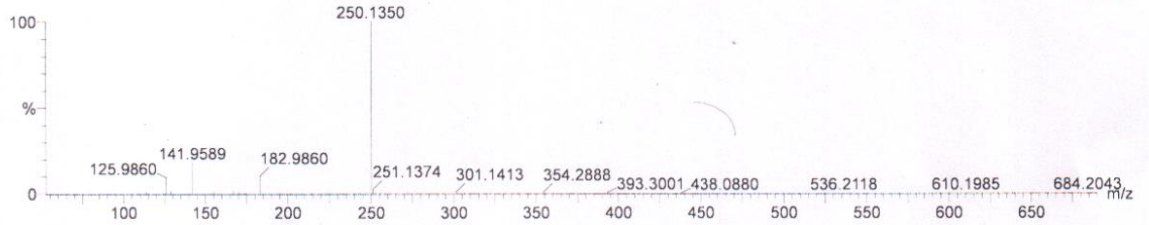
N-(2-(Naphthalen-1-yl)ethyl)pyrimidin-2-amine (6c)

Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
102 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-24 H: 0-200 N: 0-4 O: 0-2 S: 0-1

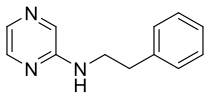
DIMP-375 QMI DIVISION, CSIR-IIIM JAMMU 23-Nov-2021
Xevo G2-XS QTOF YFC2015 12:00:32
231121_09 9 (0.208) Cm (9) 1: TOF MS ES+
4.11e+005



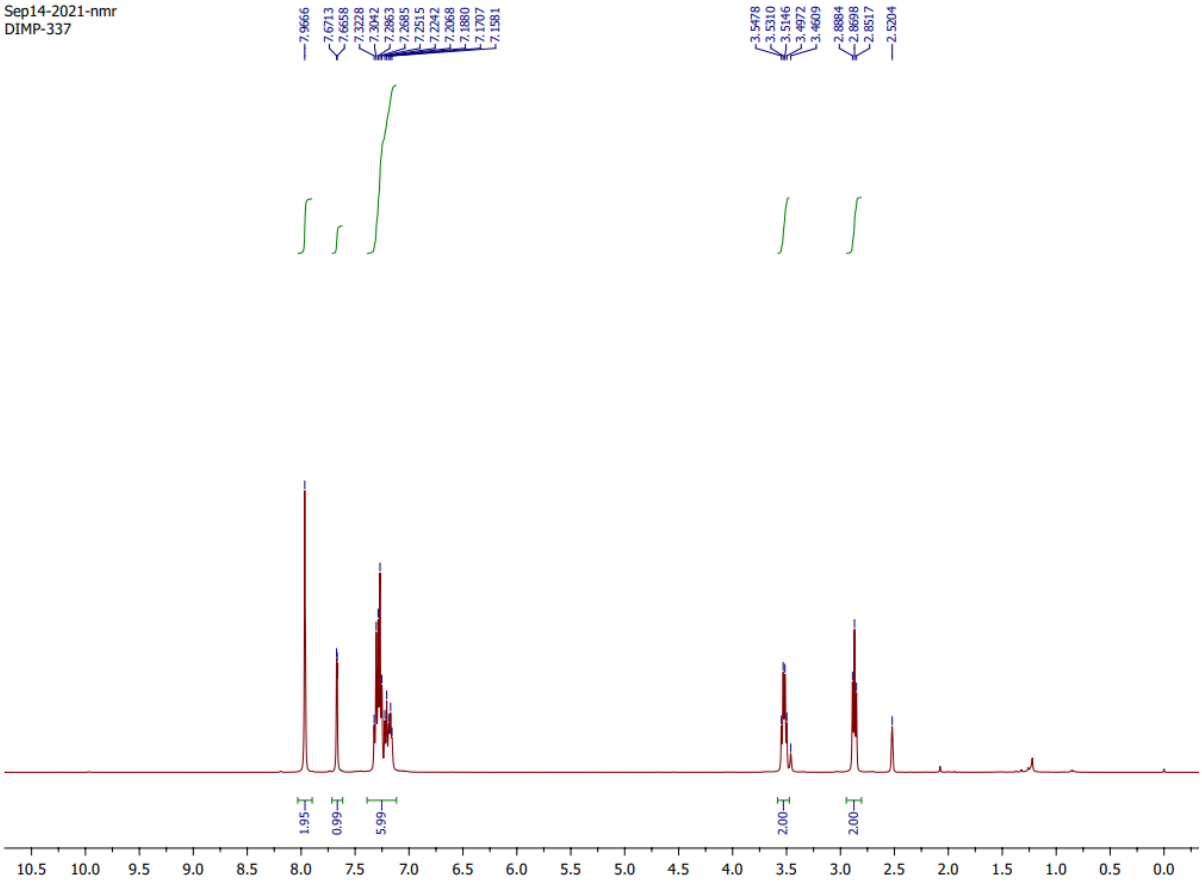
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
250.1350	250.1344	0.6	2.4	10.5	43.1	n/a	n/a	C16 H16 N3

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

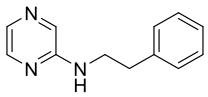


***N*-Phenethylpyrazin-2-amine (7a)**

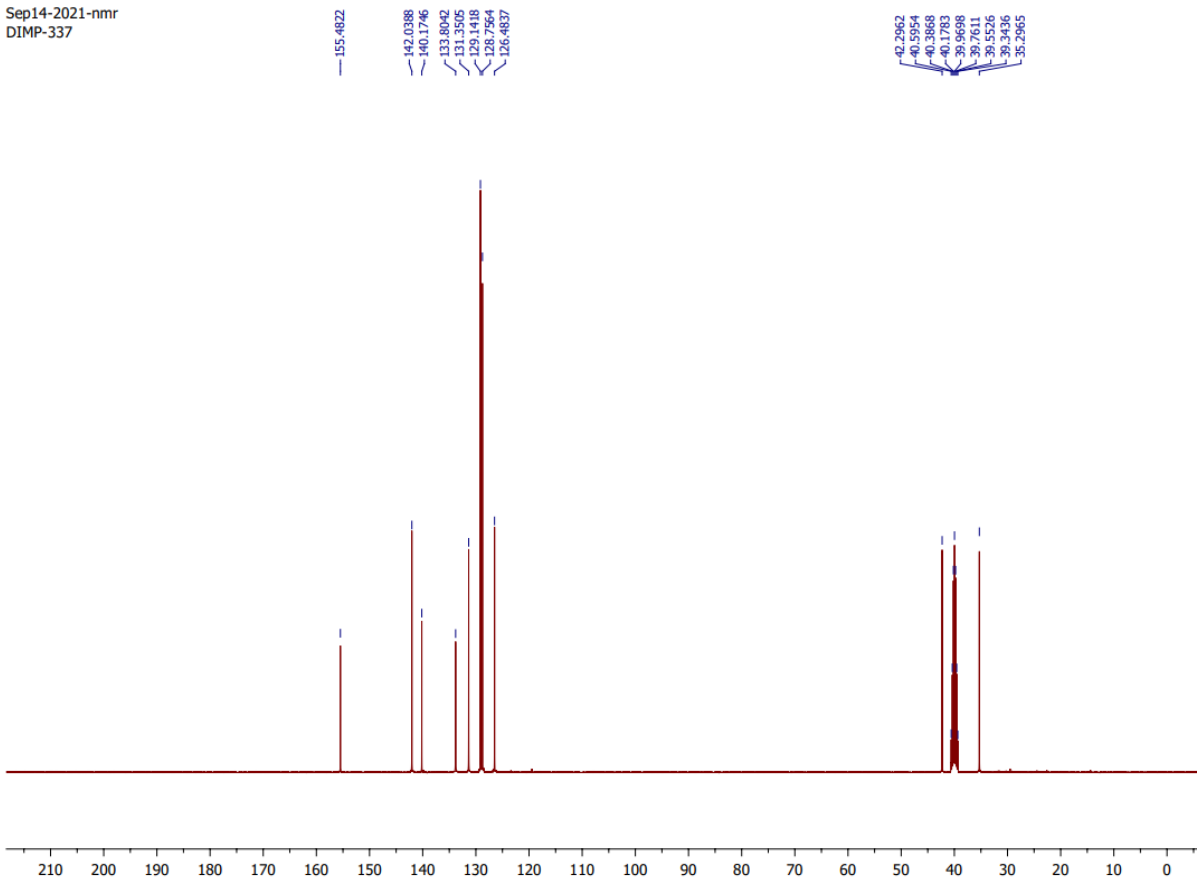


^{13}C NMR

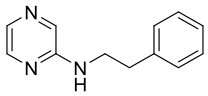
(100 MHz, $(CD_3)_2SO$)



N-Phenethylpyrazin-2-amine (7a)



HRMS



N-Phenethylpyrazin-2-amine (7a)

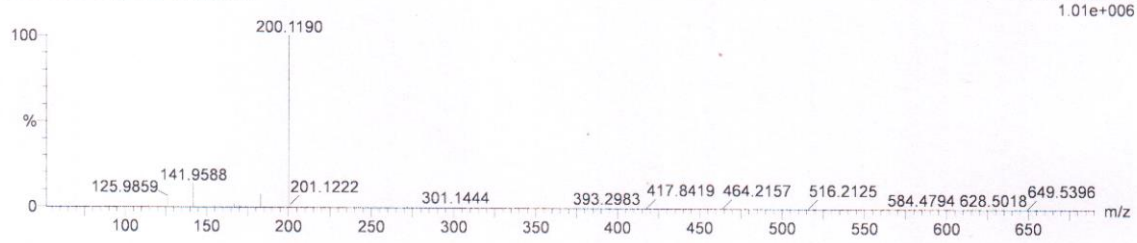
Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
85 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-24 H: 0-200 N: 0-4 O: 0-2 S: 0-1

DIMP-337 QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015
23-Nov-2021
11:50:05

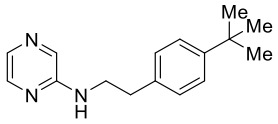
231121_05 22 (0.448) Cm (22:23)
1: TOF MS ES+
1.01e+006



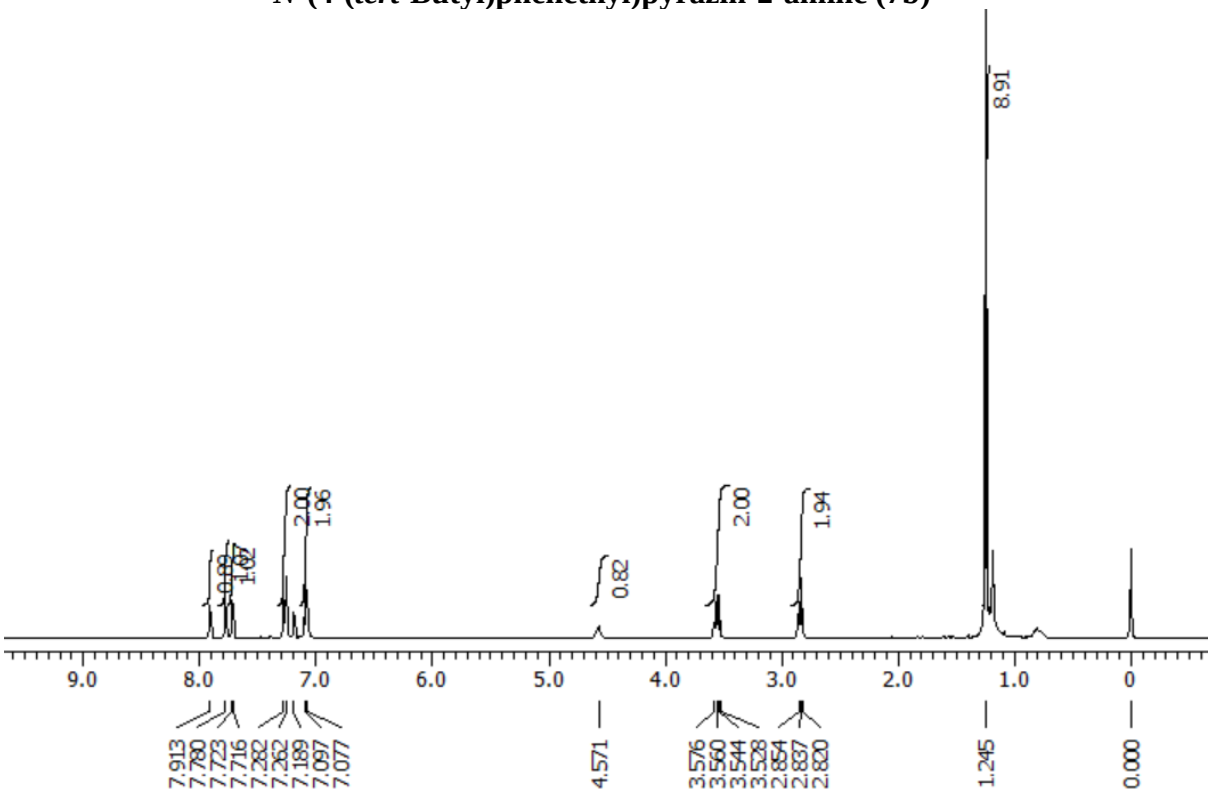
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
200.1190	200.1188	0.2	1.0	7.5	45.9	n/a	n/a	C12 H14 N3

^{1}H NMR

(400 MHz, ($CDCl_3$)

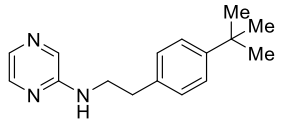


***N*-(4-(*tert*-Butyl)phenethyl)pyrazin-2-amine (7b)**

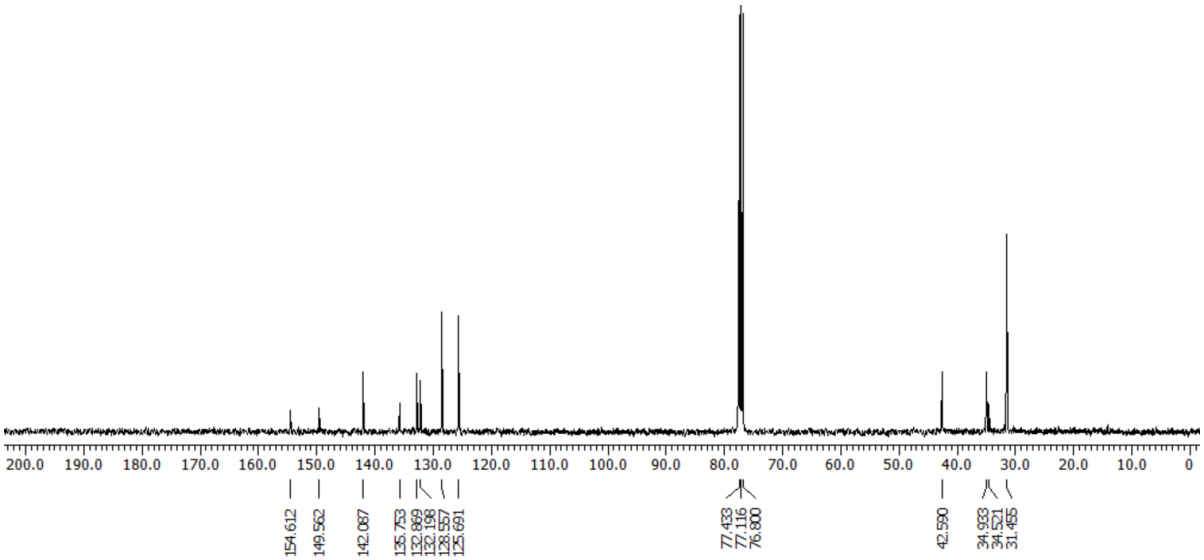


^{13}C NMR

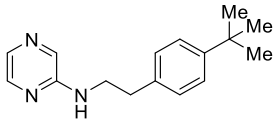
(100 MHz, $(CD_3)_2SO$)



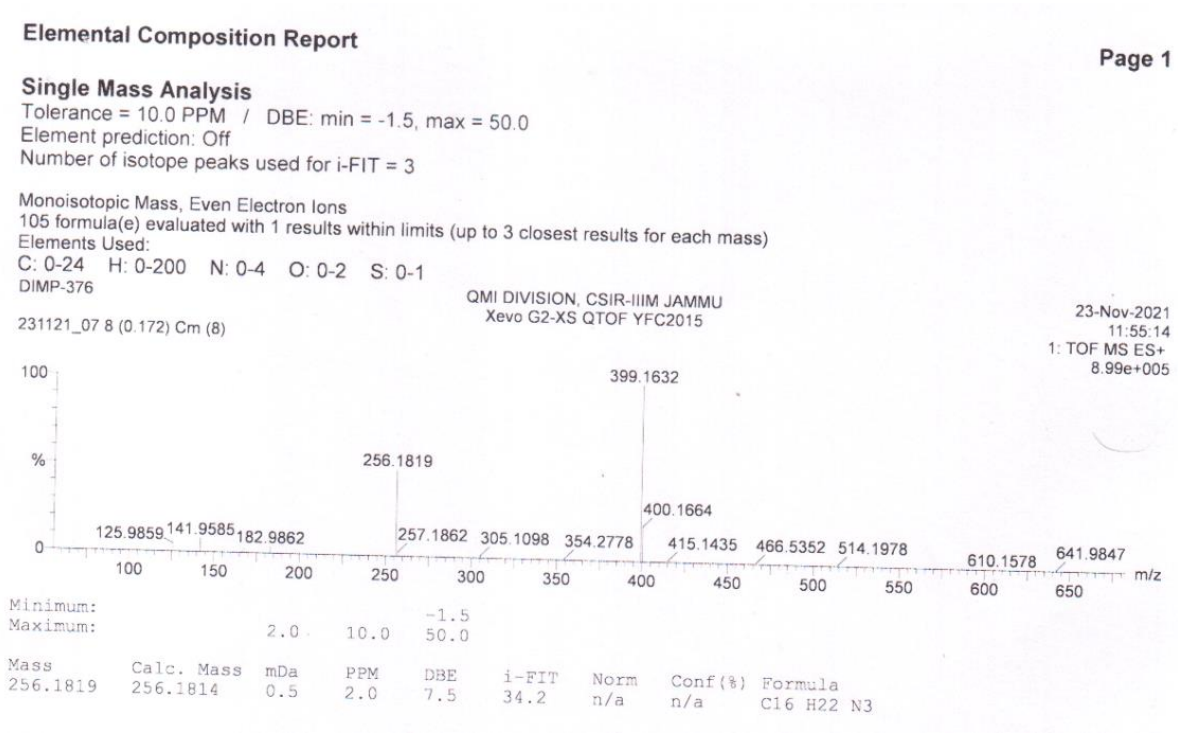
***N*-(4-(*tert*-Butyl)phenethyl)pyrazin-2-amine (7b)**



HRMS

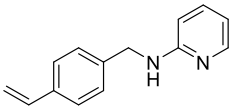


N-(4-(*tert*-Butyl)phenethyl)pyrazin-2-amine (7b)

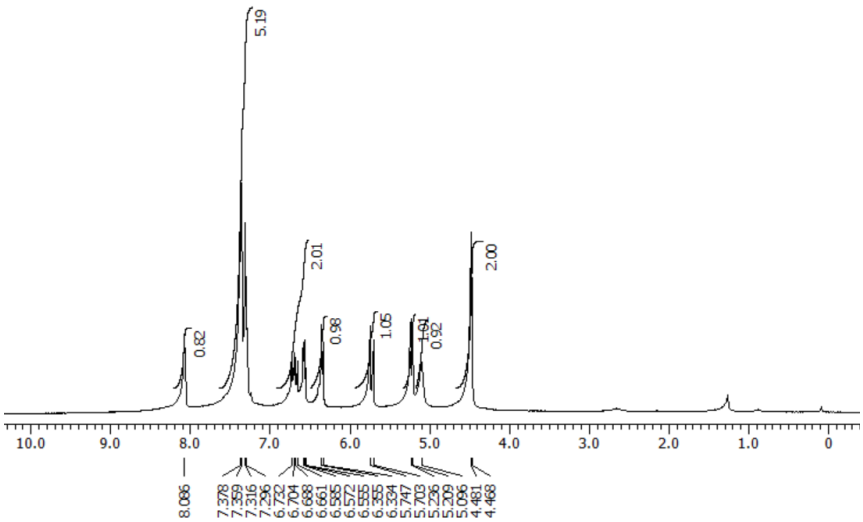


^{1}H NMR

(400 MHz, $CDCl_3$)

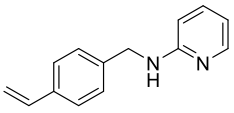


***N*-(4-Vinylbenzyl)pyridin-2-amine (8a)**

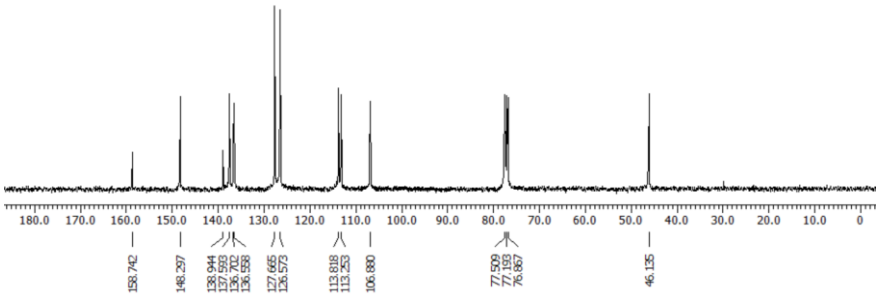


^{13}C NMR

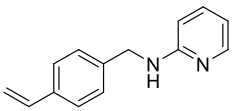
(100 MHz, $CDCl_3$)



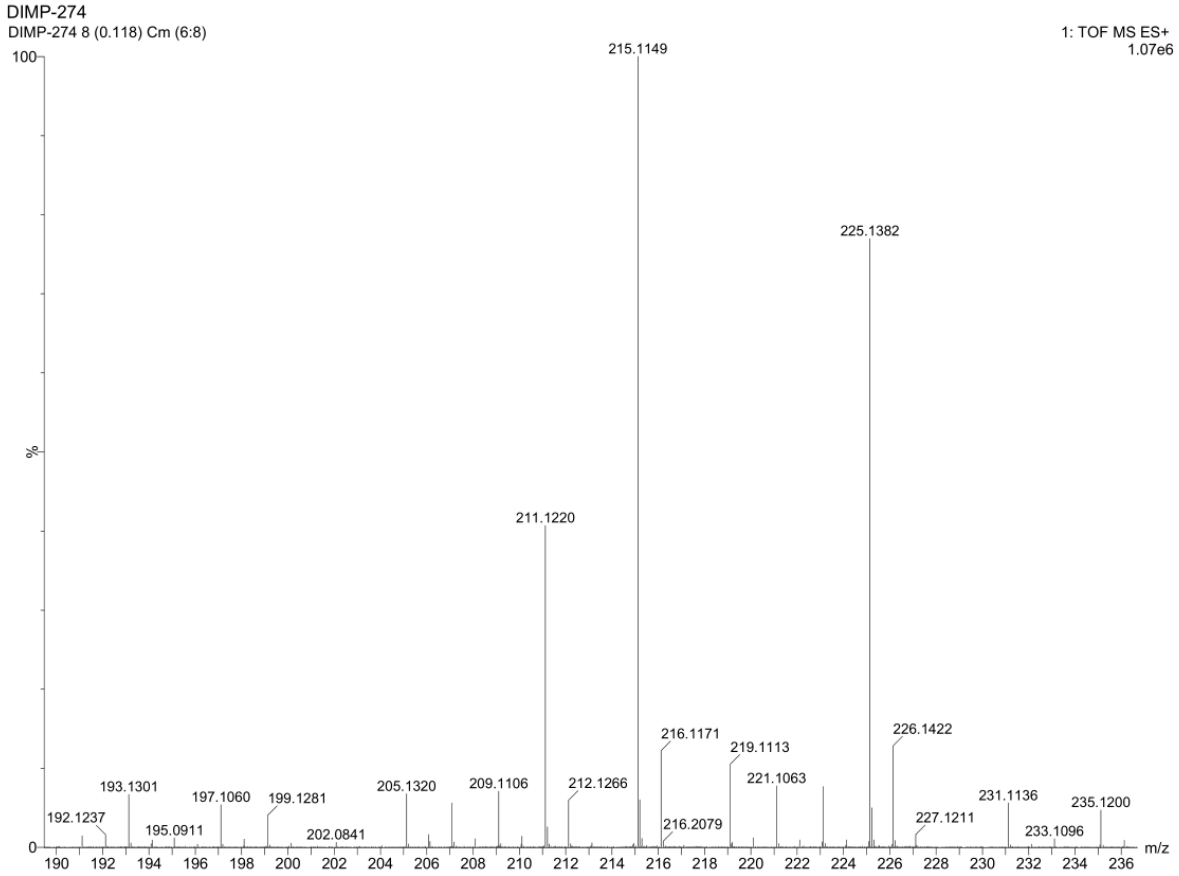
***N*-(4-Vinylbenzyl)pyridin-2-amine (8a)**



HRMS

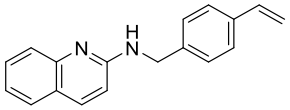


N-(4-Vinylbenzyl)pyridin-2-amine (8a)

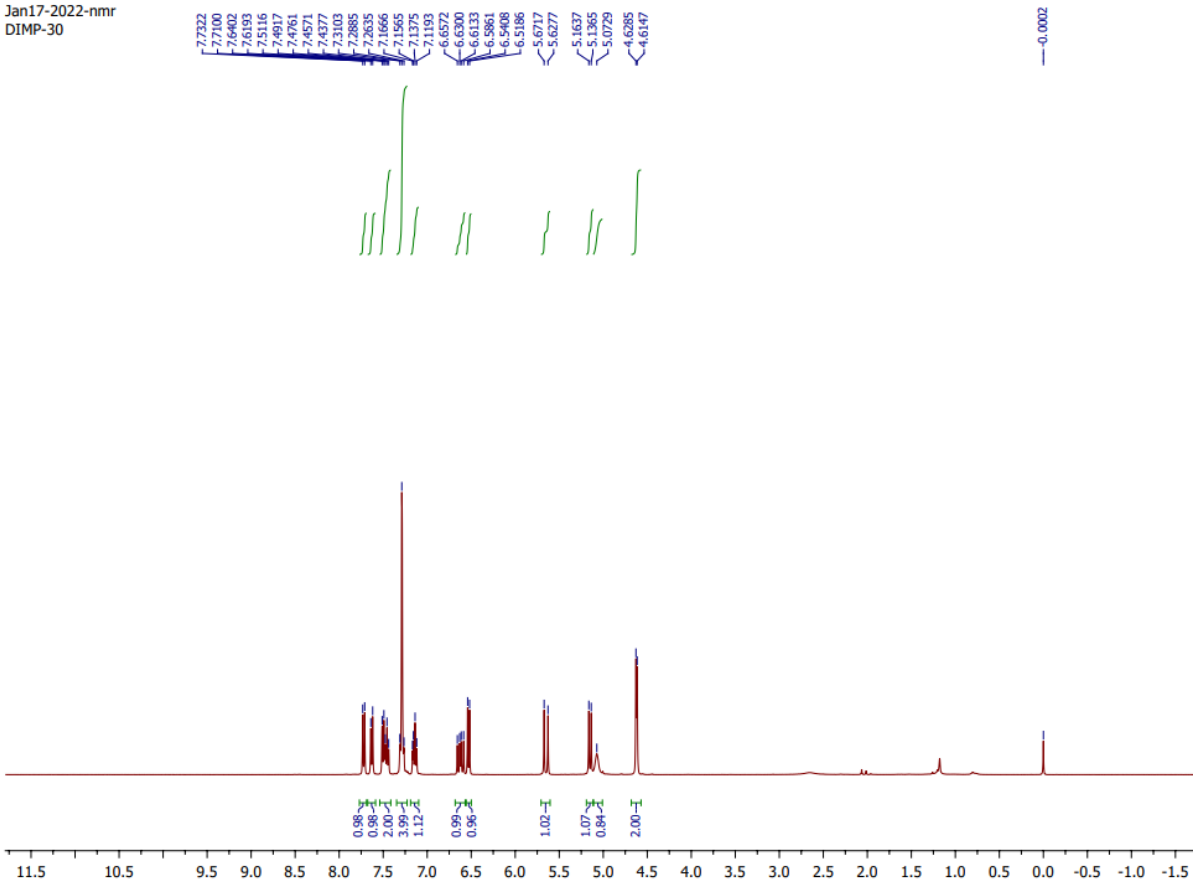


^{1}H NMR

(400 MHz, $CDCl_3$)

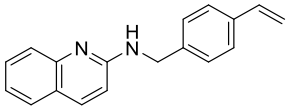


***N*-(4-Vinylbenzyl)quinolin-2-amine (8b)**

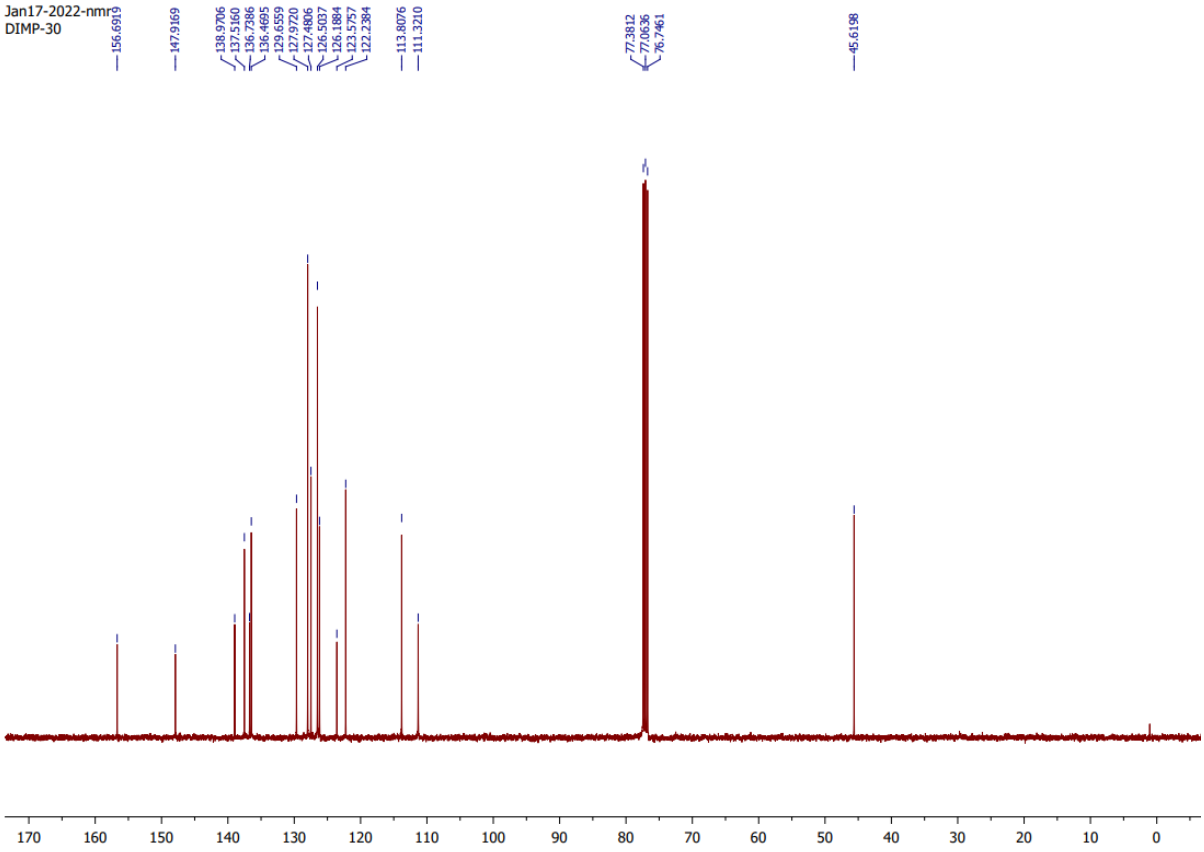


^{13}C NMR

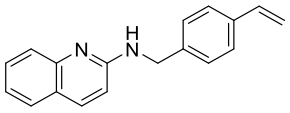
(100 MHz, $CDCl_3$)



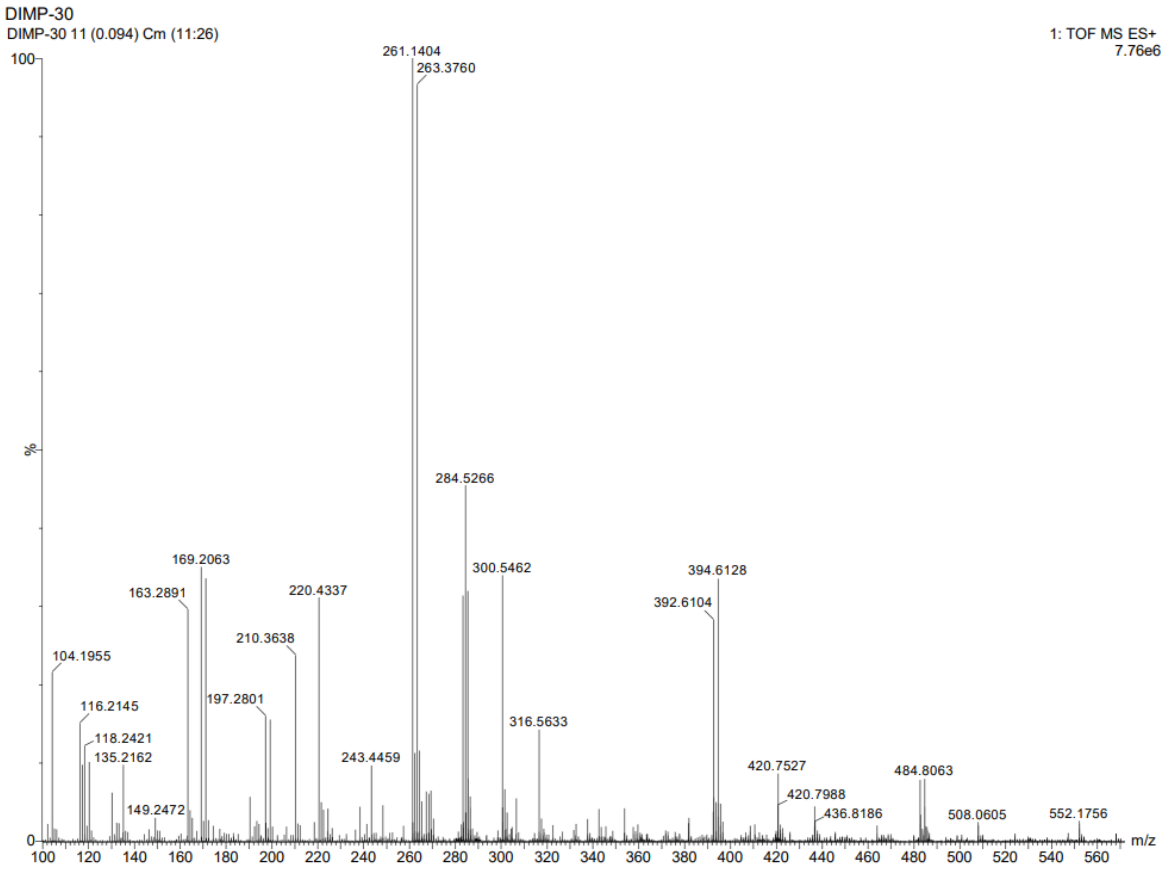
***N*-(4-Vinylbenzyl)quinolin-2-amine (8b)**



HRMS

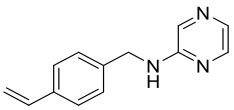


N-(4-Vinylbenzyl)quinolin-2-amine (8b)

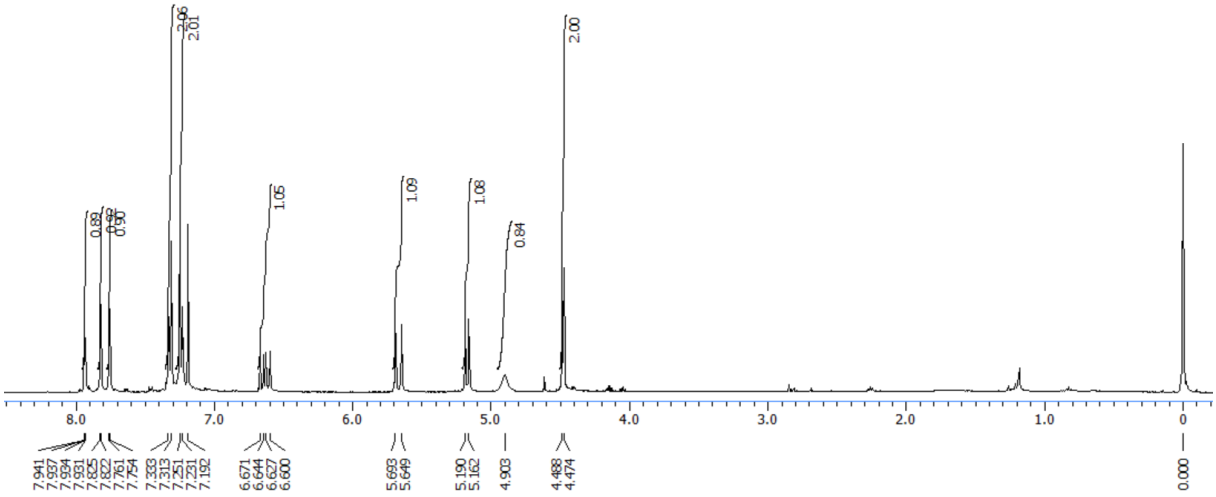


^{1}H NMR

(400 MHz, $CDCl_3$)

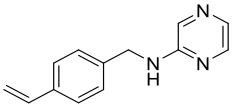


***N*-(4-Vinylbenzyl)pyrazin-2-amine (8c)**

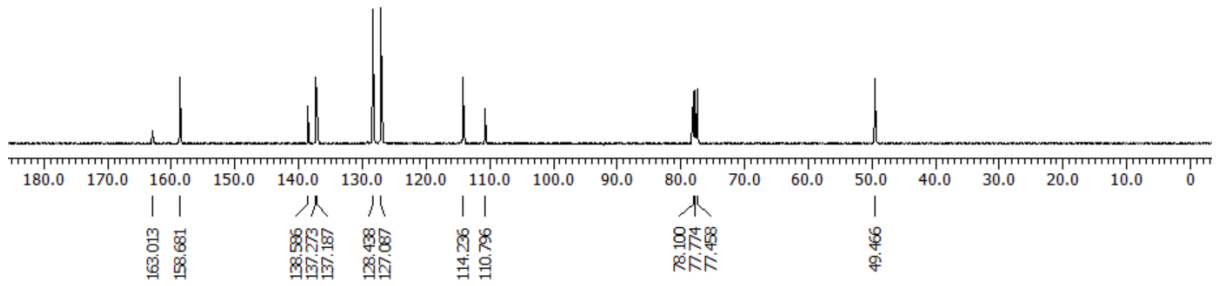


^{13}C NMR

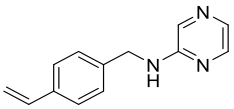
(100 MHz, $CDCl_3$)



***N*-(4-Vinylbenzyl)pyrazin-2-amine (8c)**



HRMS



N-(4-Vinylbenzyl)pyrazin-2-amine (8c)

Elemental Composition Report **Page 1**

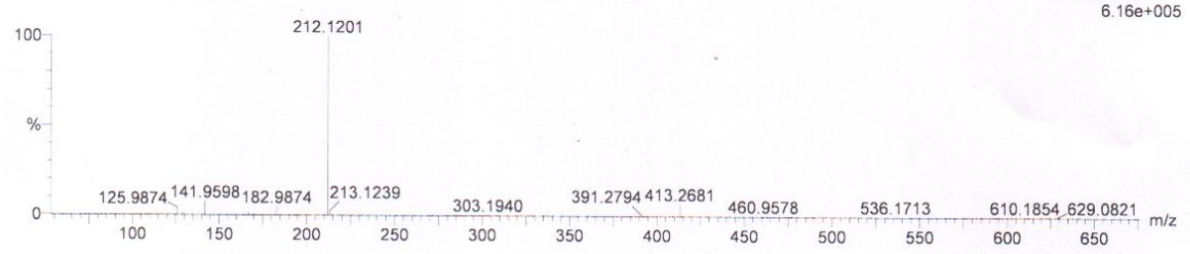
Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
12 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-22 H: 0-200 N: 0-3

DIMP-350B
241121_10 10 (0.225) Cm (10)

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

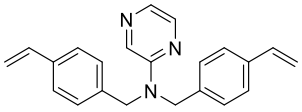
24-Nov-2021
11:48:34
1: TOF MS ES+
6.16e+005



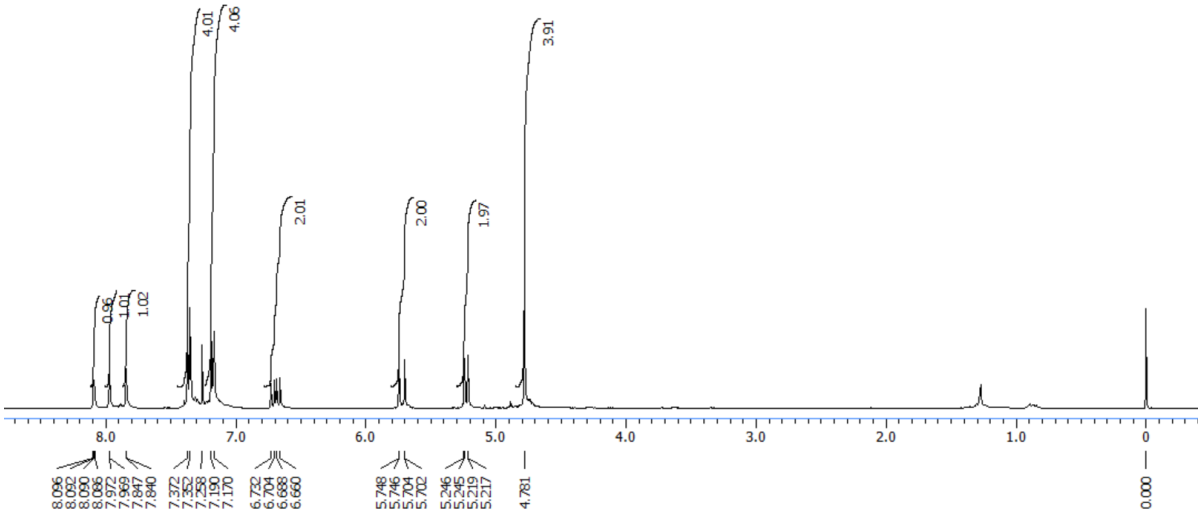
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
212.1201	212.1188	1.3	6.1	8.5	37.3	n/a	n/a	C13 H14 N3

^{1}H NMR

(400 MHz, $CDCl_3$)

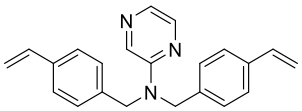


***N*,*N*-bis(4-Vinylbenzyl)pyrazin-2-amine (8d)**

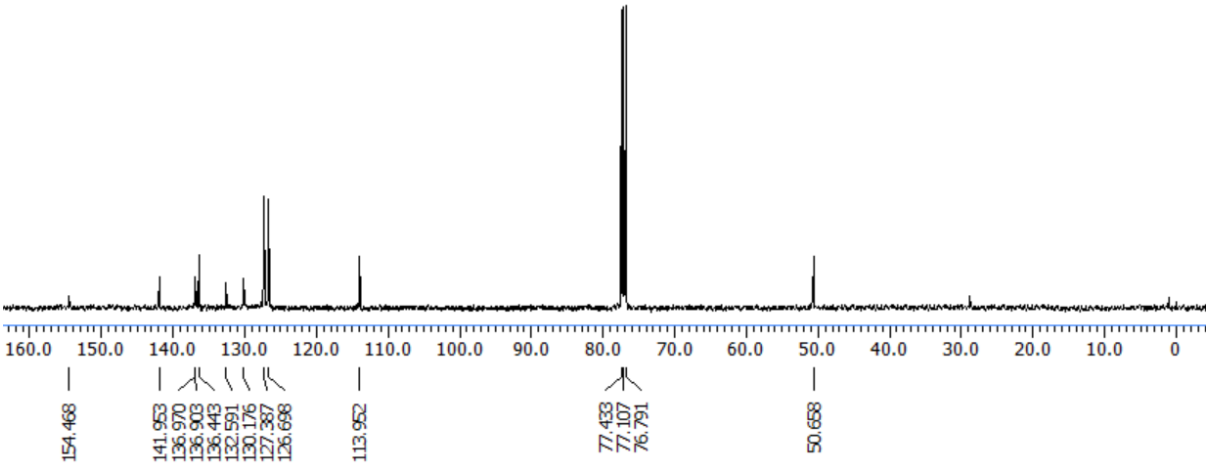


^{13}C NMR

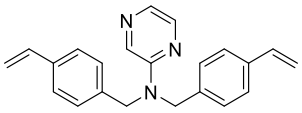
(100 MHz, $CDCl_3$)



***N*,*N*-bis(4-Vinylbenzyl)pyrazin-2-amine (8d)**



HRMS



N,*N*-bis(4-Vinylbenzyl)pyrazin-2-amine (8d)

Elemental Composition Report Page 1

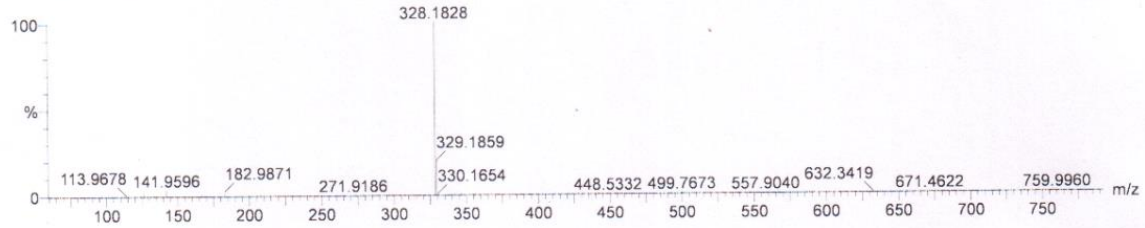
Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
7 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-22 H: 0-200 N: 0-3

DIMP-350A
241121_07 11 (0.242) Cm (11)

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

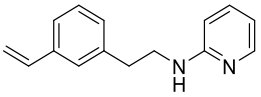
24-Nov-2021
11:40:52
1: TOF MS ES+
1.29e+006



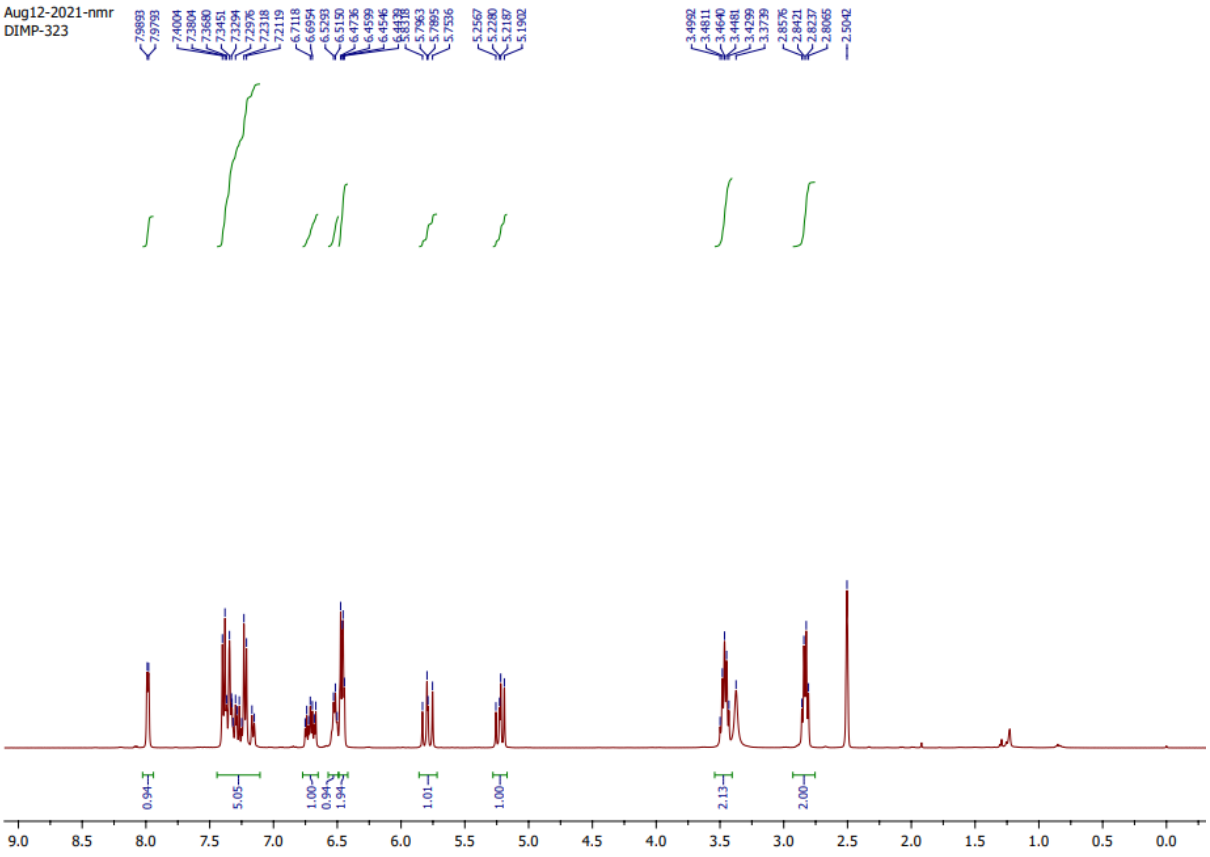
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
328.1828	328.1814	1.4	4.3	13.5	44.8	n/a	n/a	C22 H22 N3

^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

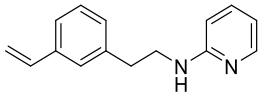


***N*-(3-Vinylphenethyl)pyridin-2-amine) (12)**

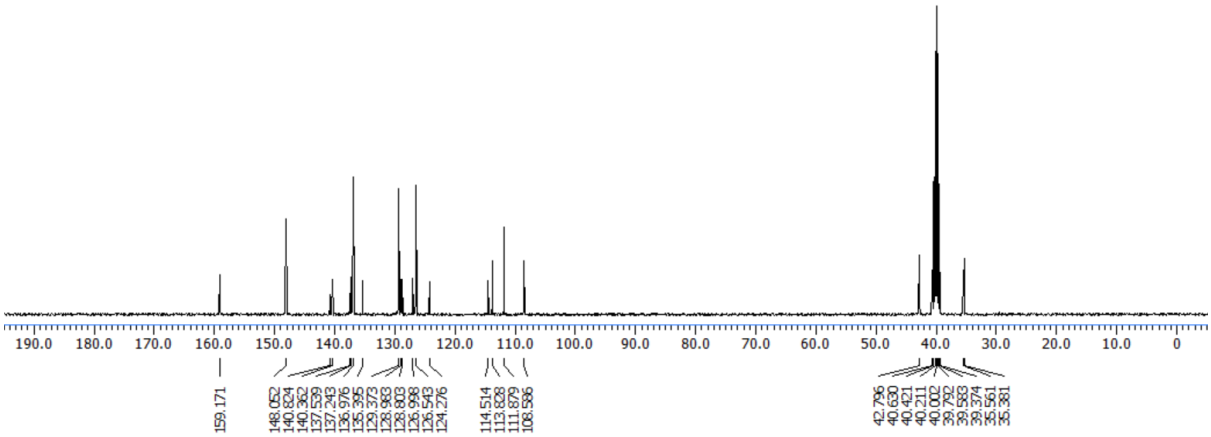


^{13}C NMR

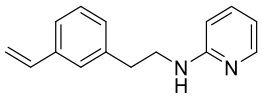
(100 MHz, $(CD_3)_2SO$)



***N*-(3-Vinylphenethyl)pyridin-2-amine) (12)**



HRMS



N-(3-Vinylphenethyl)pyridin-2-amine) (12)

Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

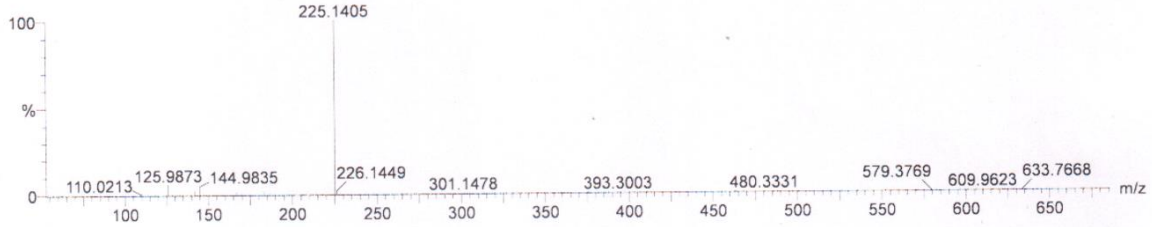
Monoisotopic Mass, Even Electron Ions
4 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-15 H: 0-200 N: 0-2

DIMP-323

QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015

25-Nov-2021
11:46:53
1: TOF MS ES+
4.55e+005

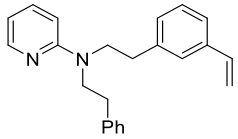
251121_08 49 (0.984) Cm (49)



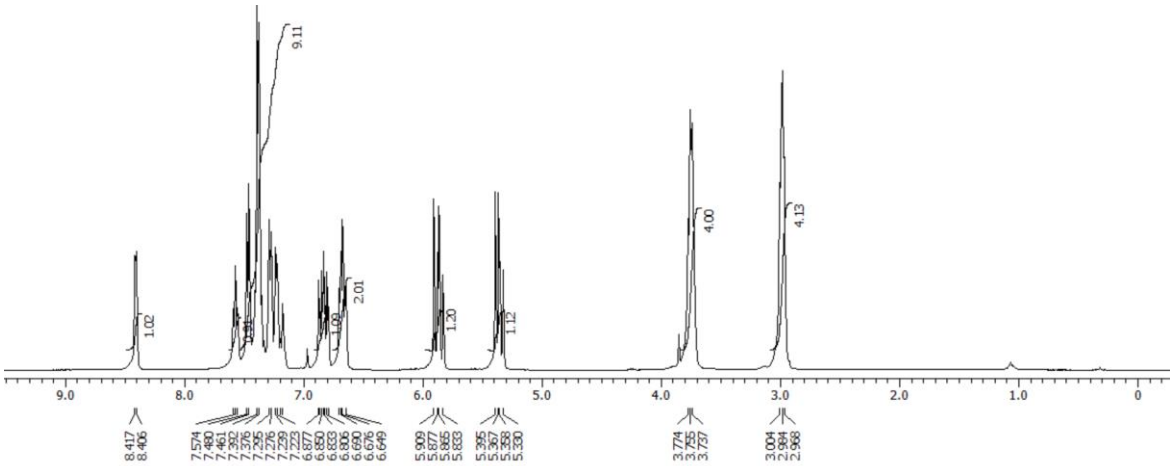
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
225.1405	225.1392	1.3	5.8	8.5	37.1	n/a	n/a	C15 H17 N2

^{1}H NMR

(400 MHz, $CDCl_3$)

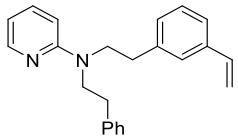


***N*-Phenethyl-*N*-(3-vinylphenethyl)pyridin-2-amine (12')**

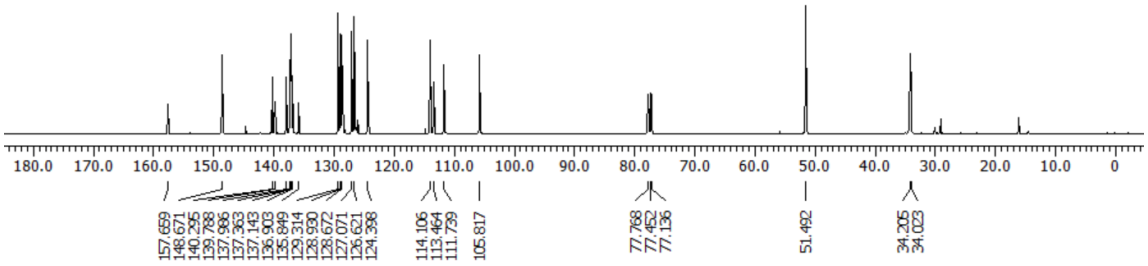


^{13}C NMR

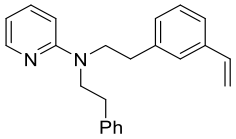
(100 MHz, $CDCl_3$)



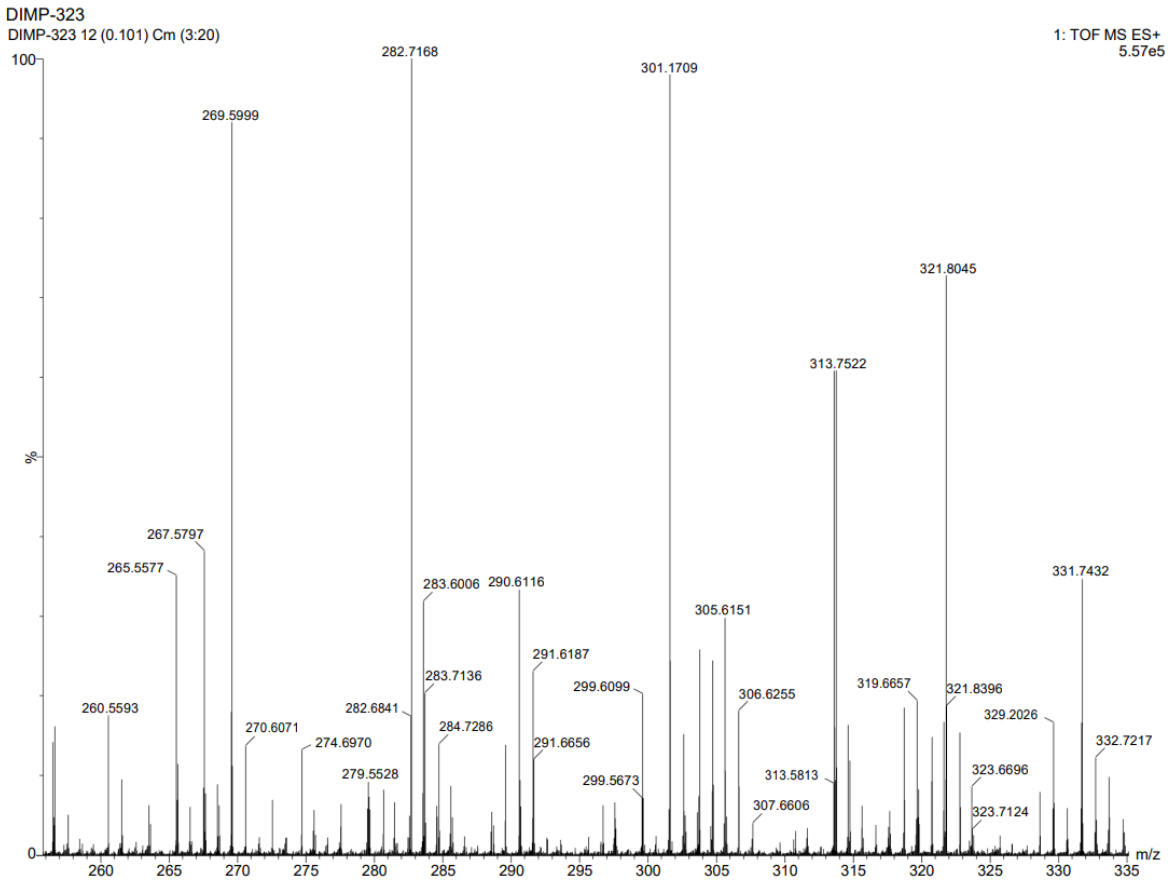
***N*-Phenethyl-*N*-(3-vinylphenethyl)pyridin-2-amine (12')**



HRMS

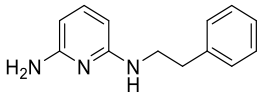


N-Phenethyl-*N*-(3-vinylphenethyl)pyridin-2-amine (12')

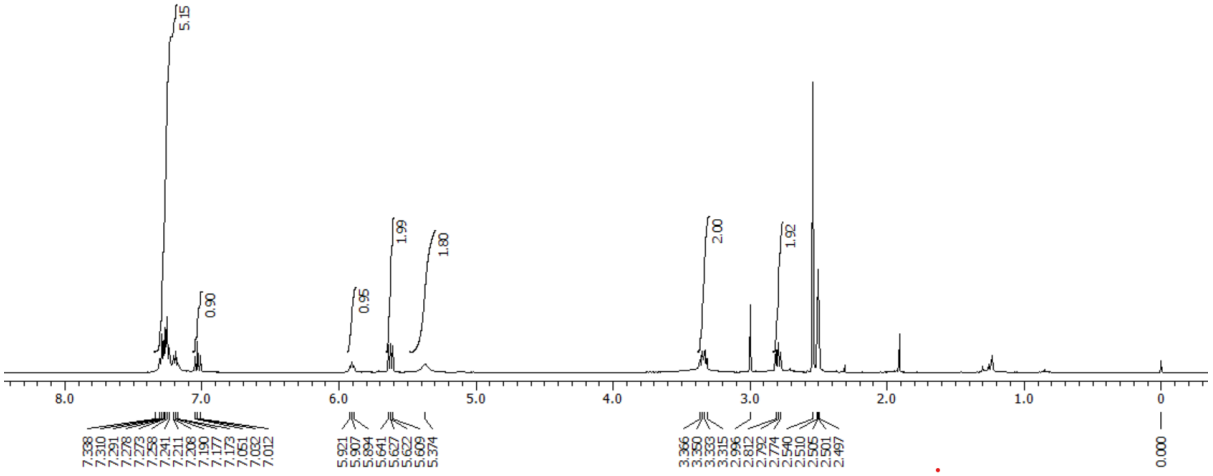


^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

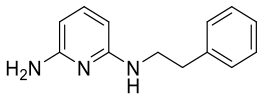


***N*^{2}-Phenethylpyridin-2,6-diamine (14)**

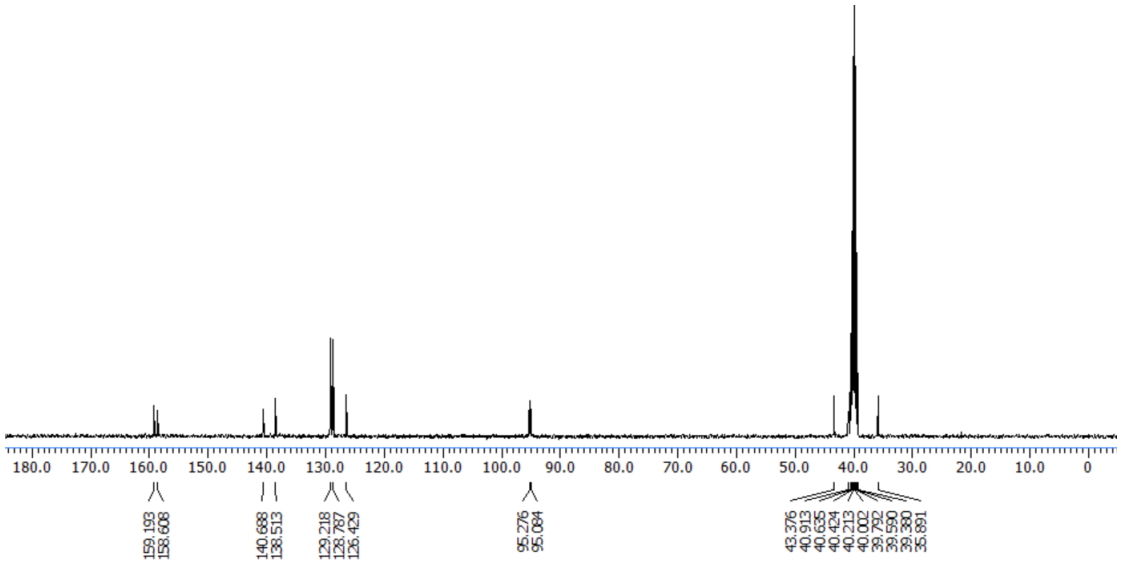


^{13}C NMR

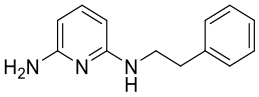
(100 MHz, $(CD_3)_2SO$)



***N*^{2}-Phenethylpyridin-2,6-diamine (14)**



HRMS



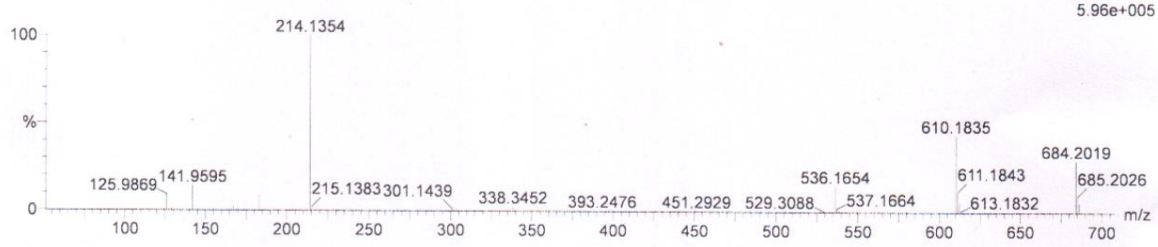
N^2-Phenethylpyridin-2,6-diamine (14)

Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
12 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-22 H: 0-200 N: 0-3

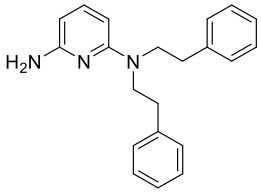
DIMP-317
QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015
24-Nov-2021
11:43:27
241121_08 7 (0.155) Cm (7:8)
1: TOF MS ES+
5.96e+005



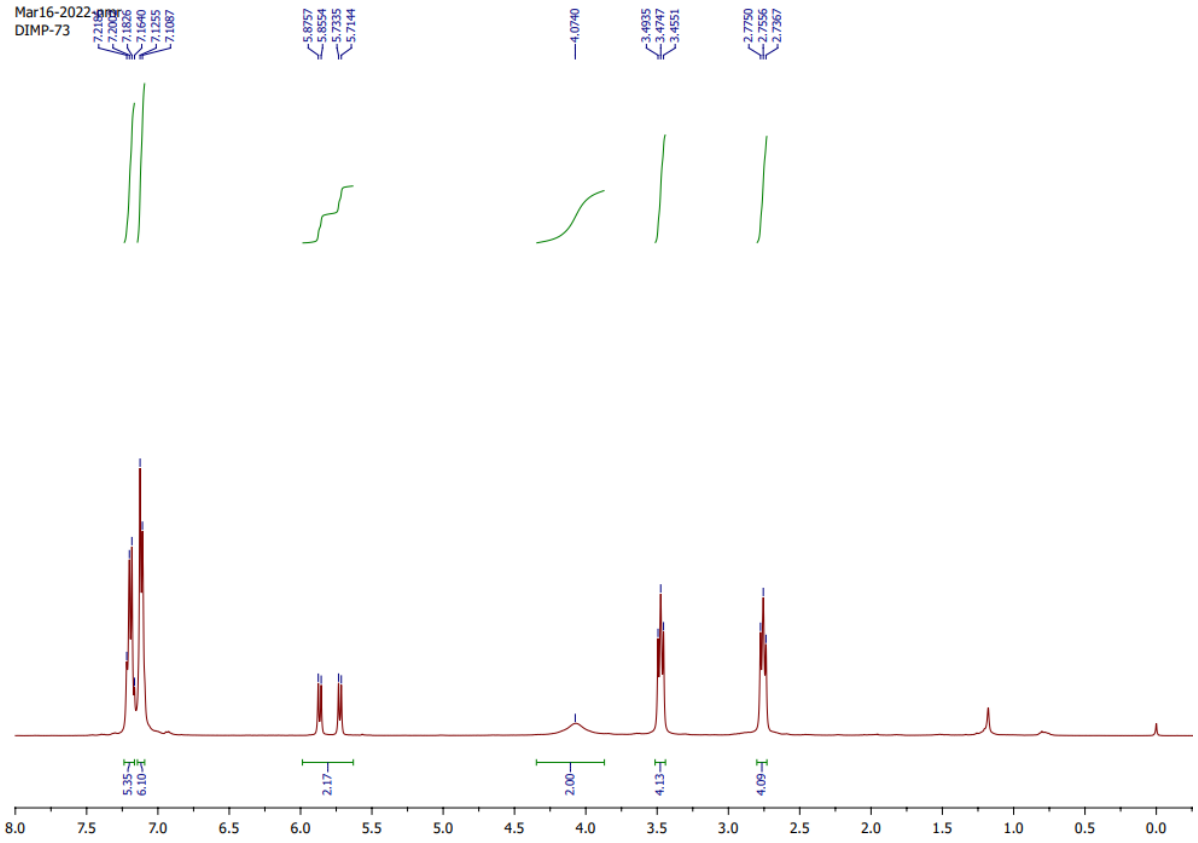
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
214.1354	214.1344	1.0	4.7	7.5	40.4	n/a	n/a	C13 H16 N3

^{1}H NMR

(400 MHz, ($CDCl_3$)

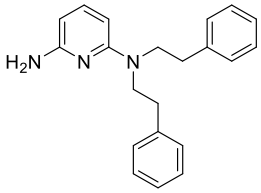


N^2,N^2-Diphenethylpyridine-2,6-diamine (14')

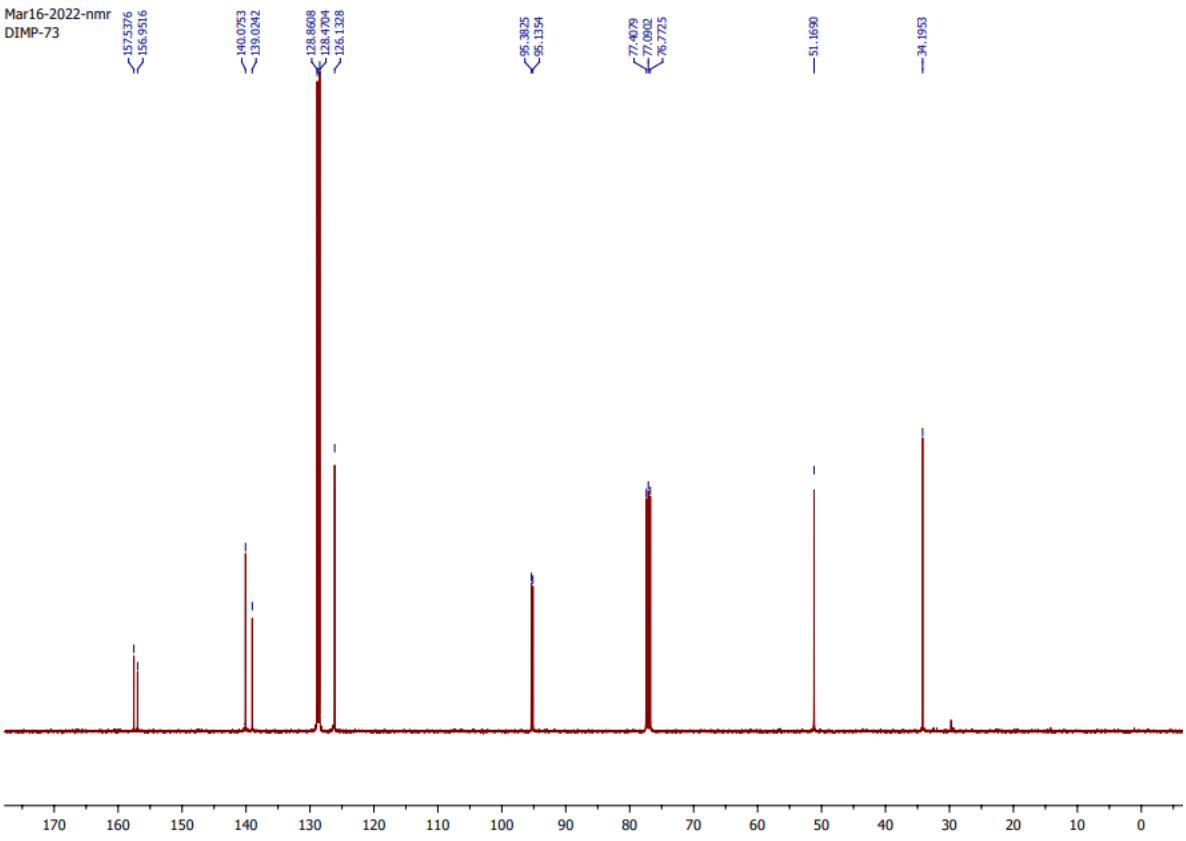


^{13}C NMR

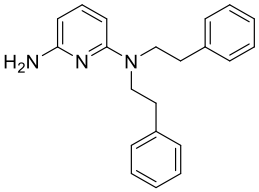
(100 MHz, ($CDCl_3$)



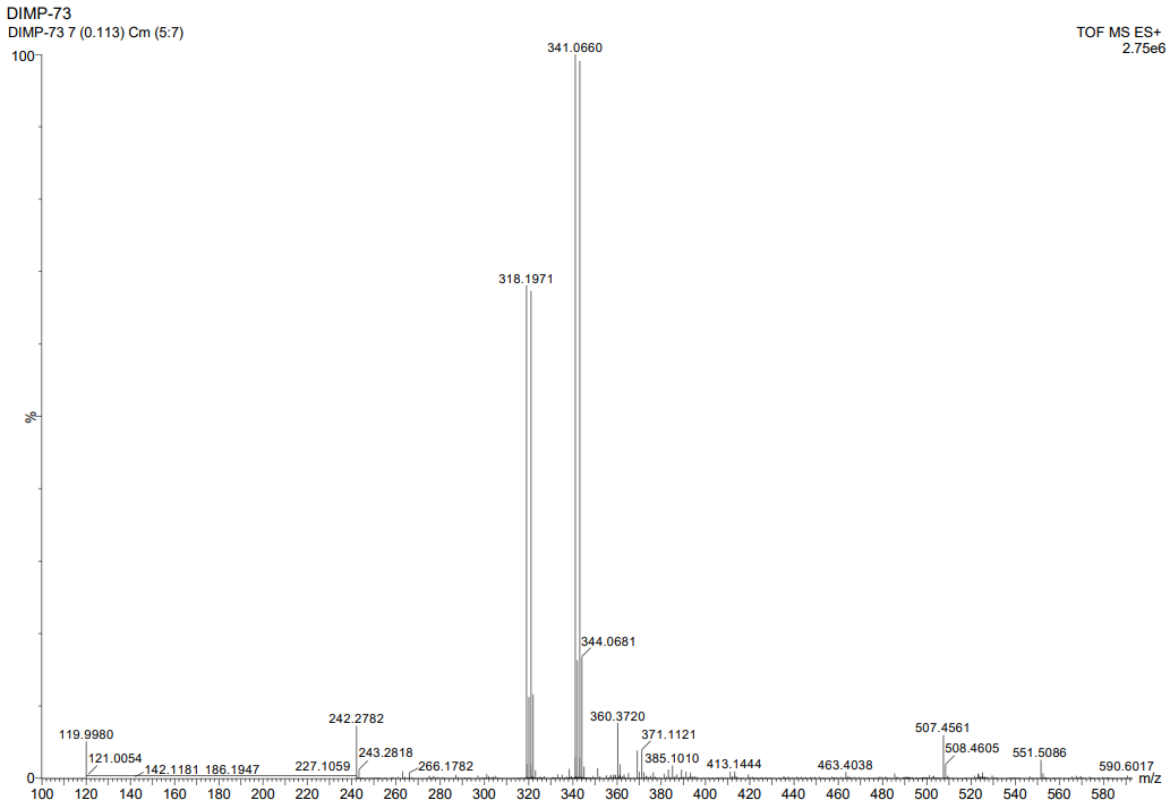
***N*^{2},*N*^{2}-Diphenethylpyridine-2,6-diamine (14')**



HRMS

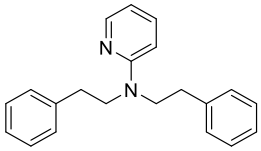


N^2,N^2-Diphenethylpyridine-2,6-diamine (14')

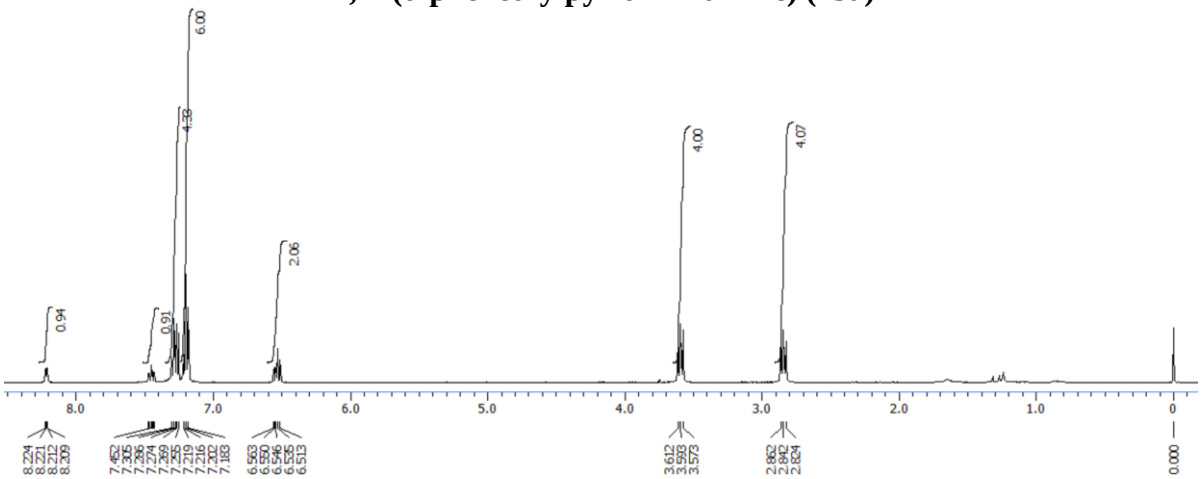


^{1}H NMR

(400 MHz, $CDCl_3$)

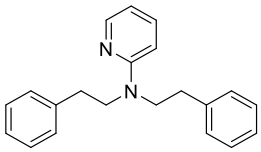


***N,N*-(diphenethylpyridin-2-amine) (15a)**

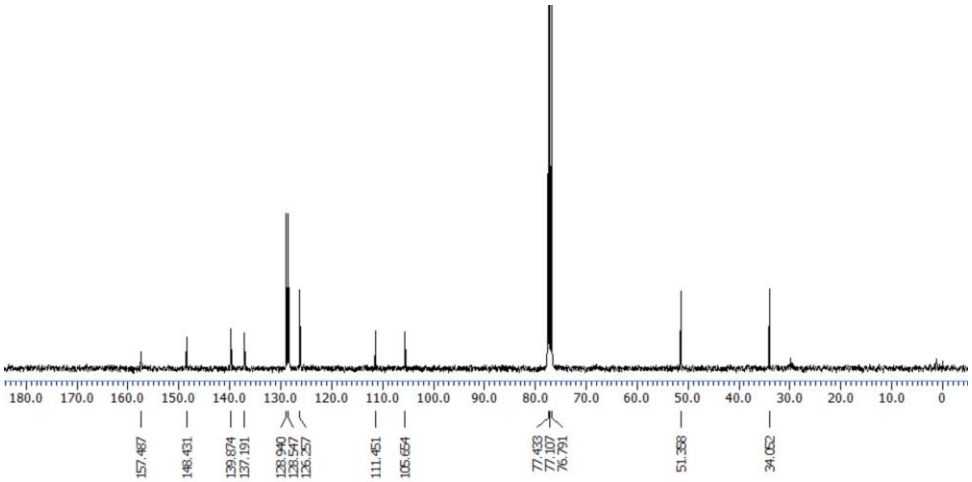


^{13}C NMR

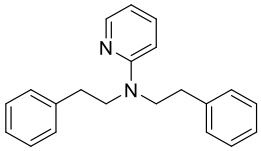
(100 MHz, $CDCl_3$)



***N,N*-(diphenethylpyridin-2-amine) (15a)**



HRMS



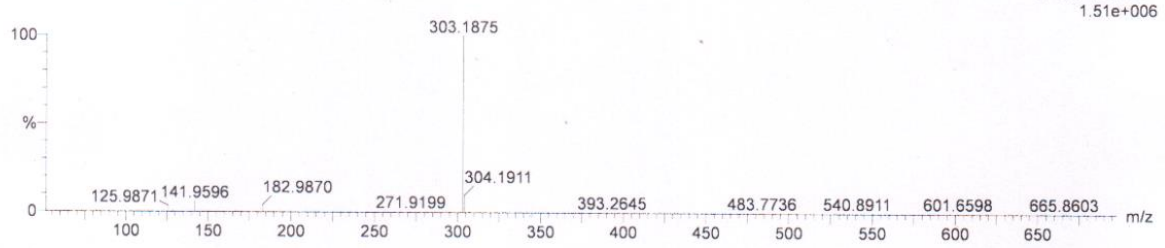
N,N-(diphenethylpyridin-2-amine) (15a)

Elemental Composition Report Page 1

Single Mass Analysis
Tolerance = 10.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
13 formula(e) evaluated with 1 results within limits (up to 3 closest results for each mass)
Elements Used:
C: 0-22 H: 0-200 N: 0-3

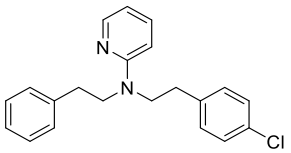
DIMP-383 QMI DIVISION, CSIR-IIIM JAMMU
Xevo G2-XS QTOF YFC2015
24-Nov-2021
11:46:00
241121_09 39 (0.775) Cm (39:40) 1: TOF MS ES+
1.51e+006



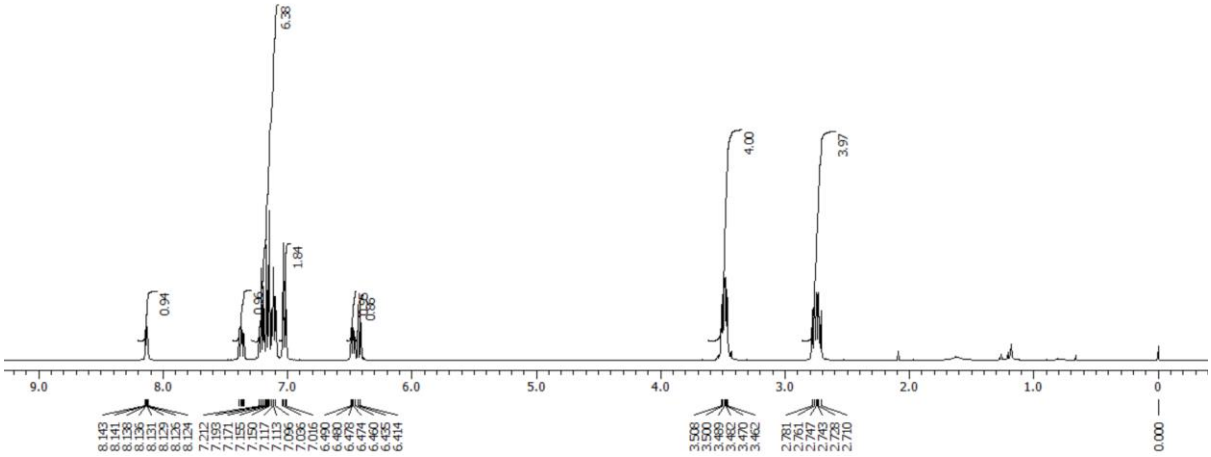
Minimum:				-1.5				
Maximum:		2.0	10.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
303.1875	303.1861	1.4	4.6	11.5	39.0	n/a	n/a	C21 H23 N2

^{1}H NMR

(400 MHz, $CDCl_3$)

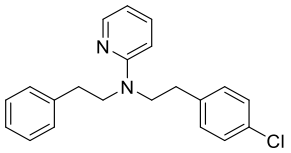


***N*-(4-Chlorophenethyl)-*N*-phenethylpyridin-2-amine (15b)**

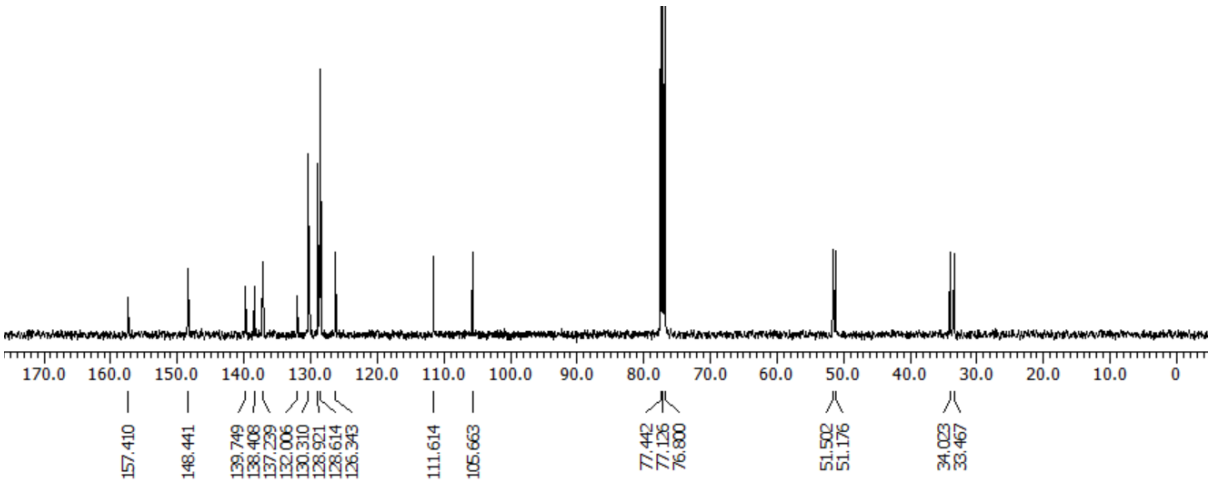


^{13}C NMR

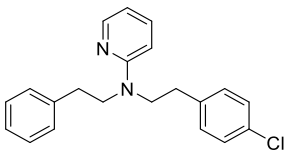
(100 MHz, $CDCl_3$)



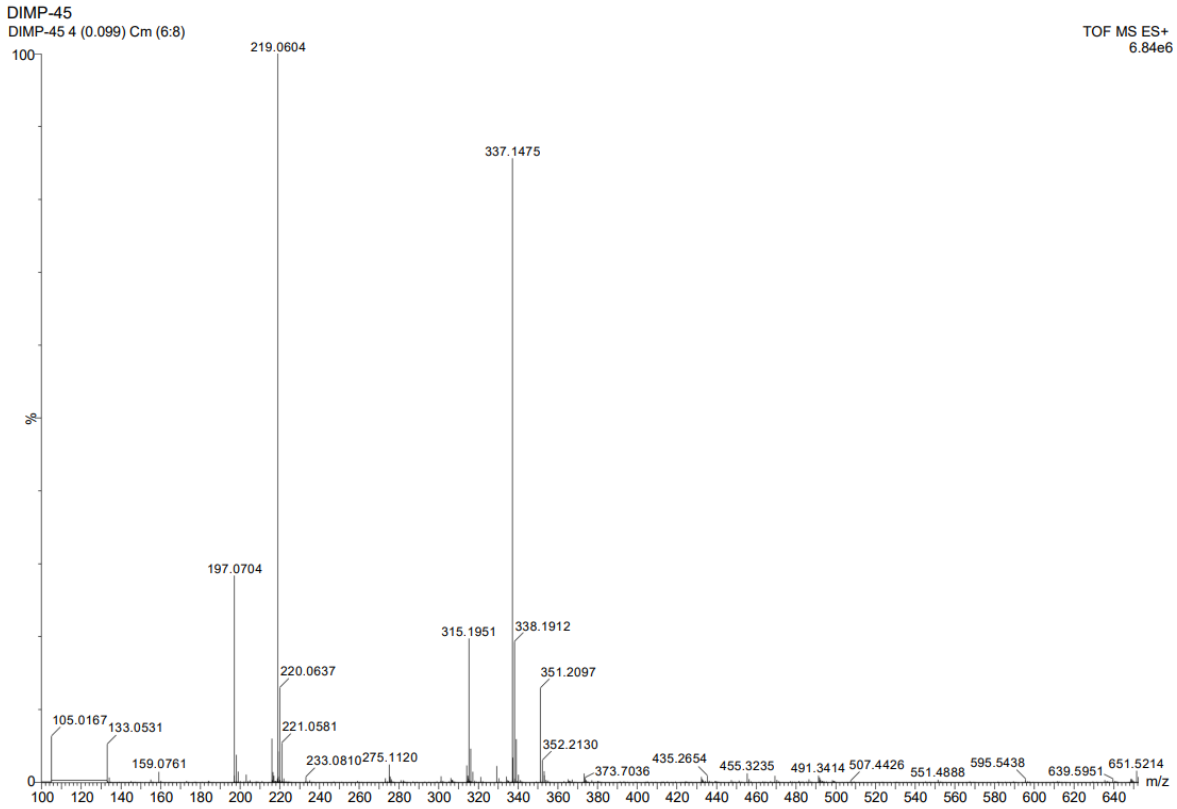
***N*-(4-Chlorophenethyl)-*N*-phenethylpyridin-2-amine (15b)**



HRMS

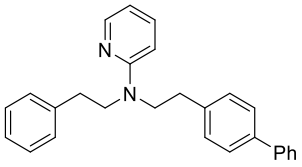


***N*-(4-Chlorophenethyl)-*N*-phenethylpyridin-2-amine (15b)**

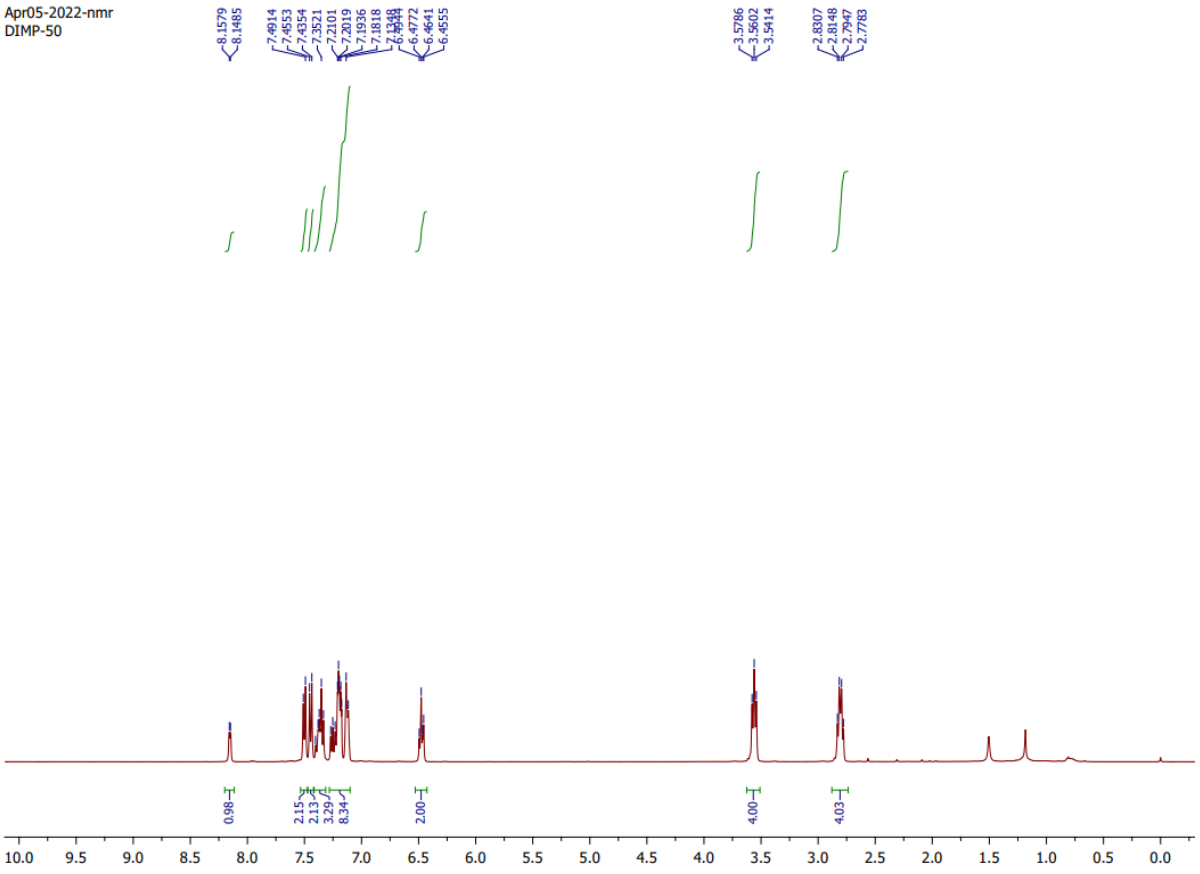


^{1}H NMR

(400 MHz, $CDCl_3$)

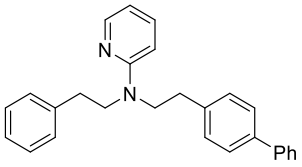


***N*-(2-([1,1'-Biphenyl]-4-yl)ethyl)-*N*-phenethylpyridin-2-amine (15c)**

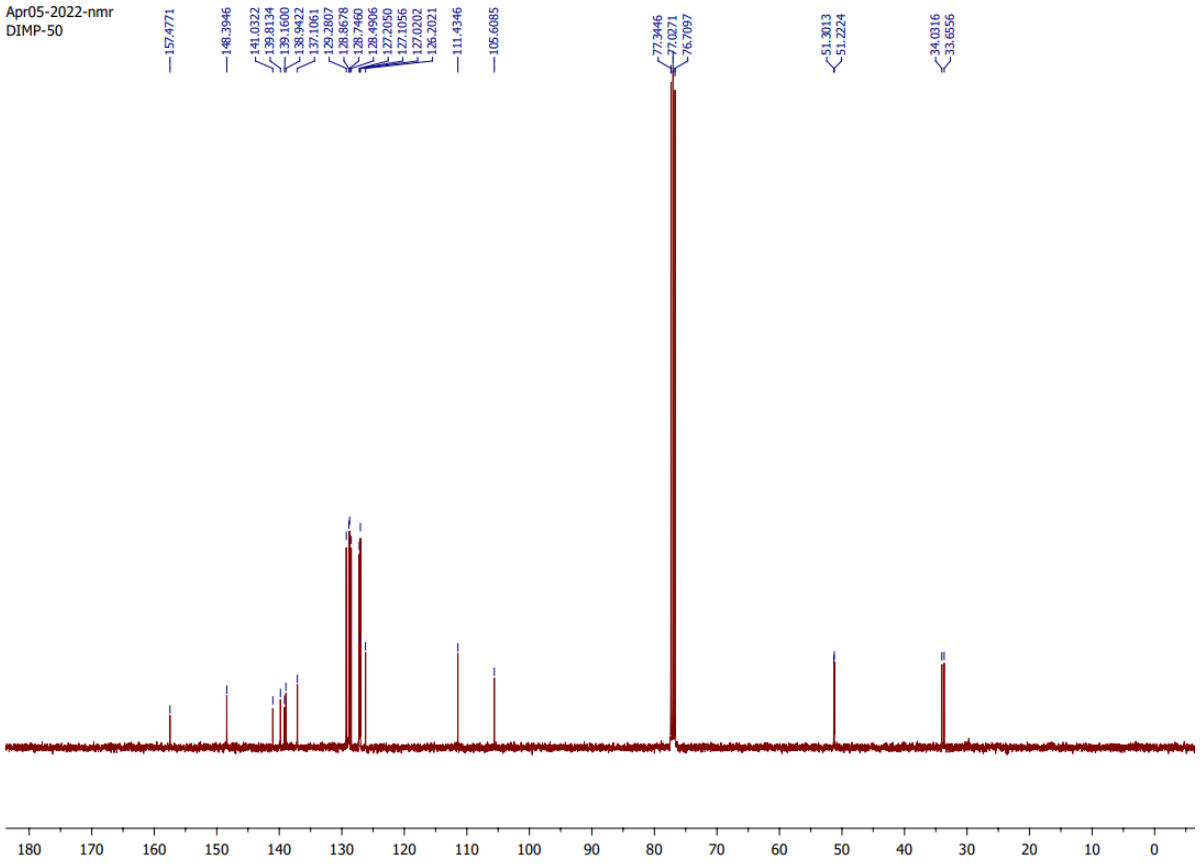


^{13}C NMR

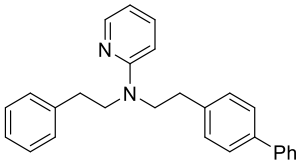
(100 MHz, $CDCl_3$)



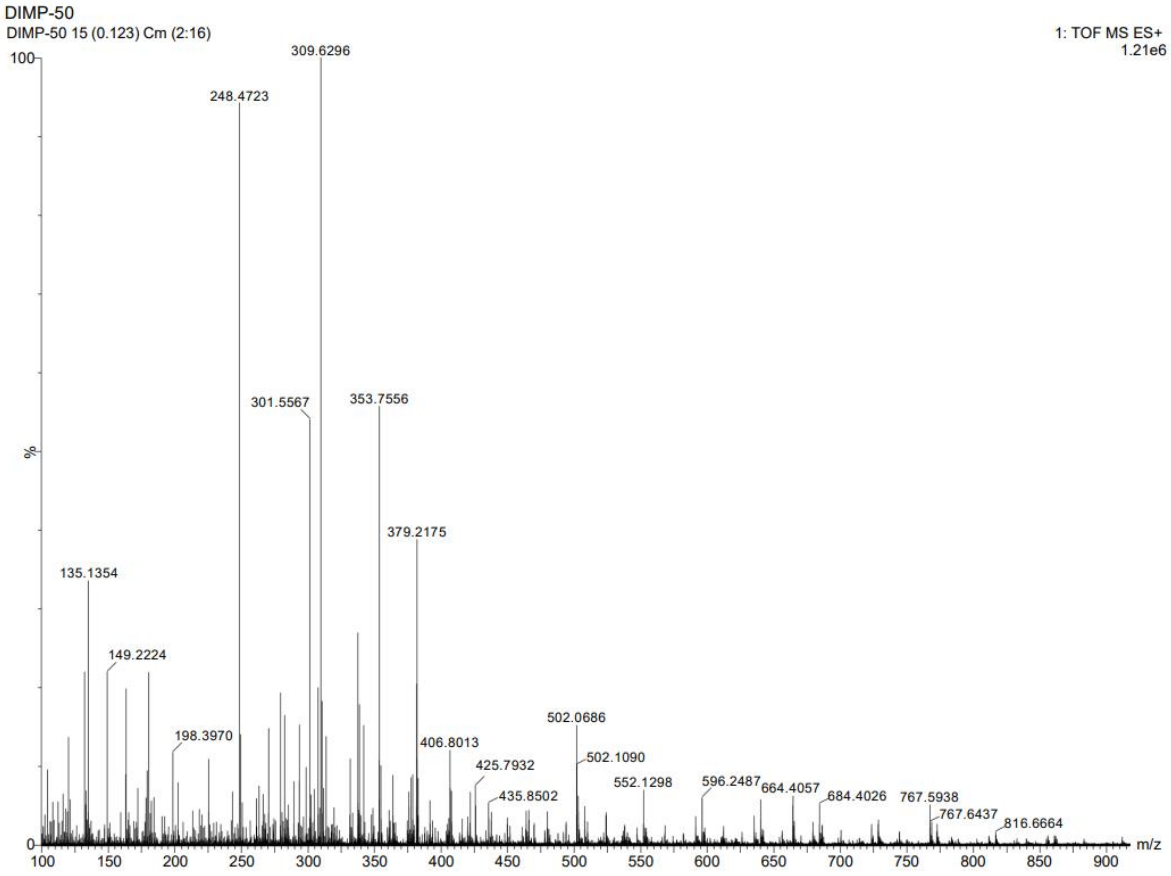
***N*-(2-([1,1'-Biphenyl]-4-yl)ethyl)-*N*-phenethylpyridin-2-amine (15c)**



HRMS

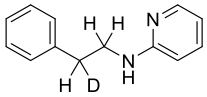


***N*-(2-([1,1'-Biphenyl]-4-yl)ethyl)-*N*-phenethylpyridin-2-amine (15c)**

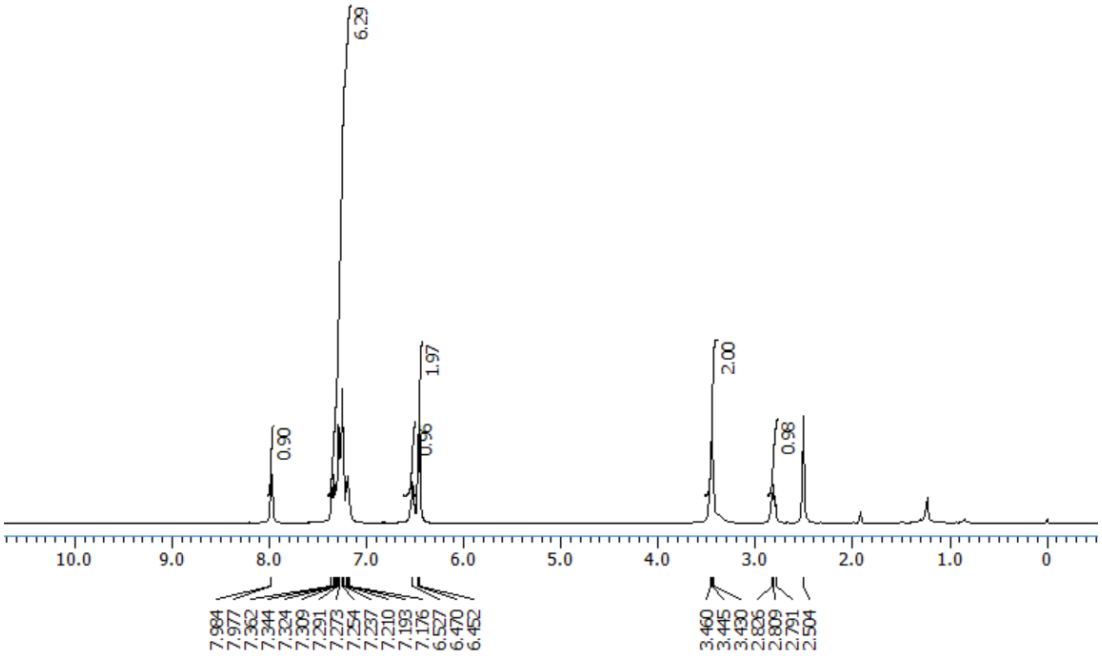


^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

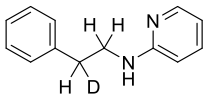


***N*-(2-Phenethyl-2-*d*)pyridin-2-amine) (3a')**

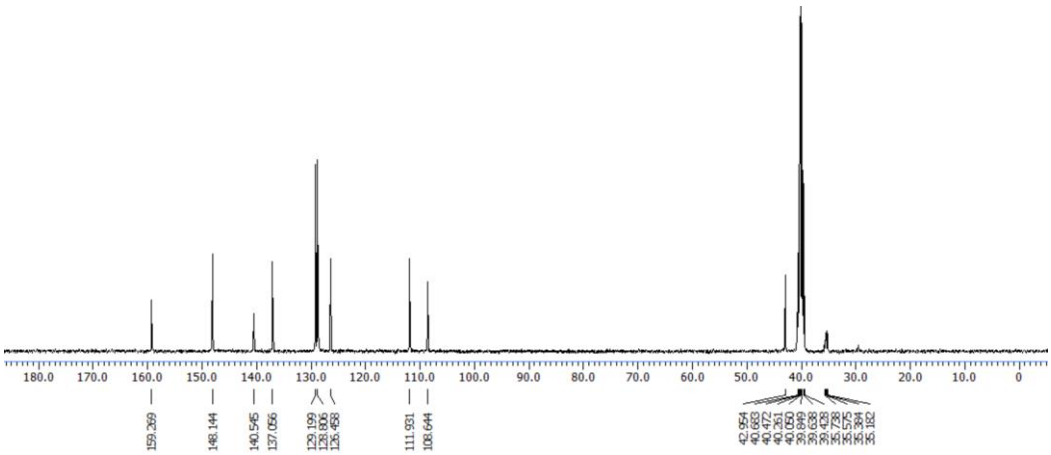


^{13}C NMR

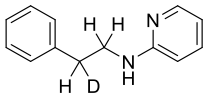
(100 MHz, $(CD_3)_2SO$)



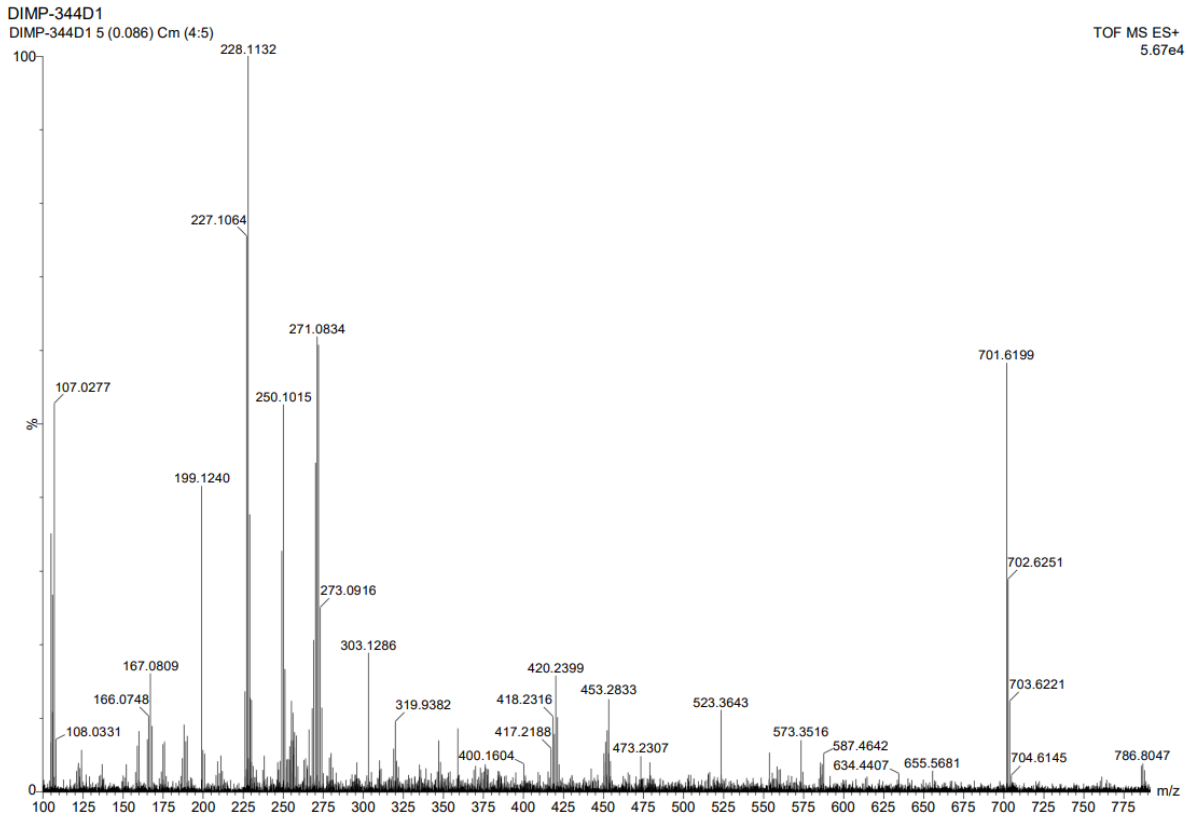
***N*-(2-Phenethyl-2-*d*)pyridin-2-amine) (3a')**



HRMS

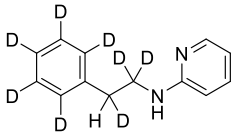


***N*-(2-Phenethyl-2-*d*)pyridin-2-amine) (3a')**

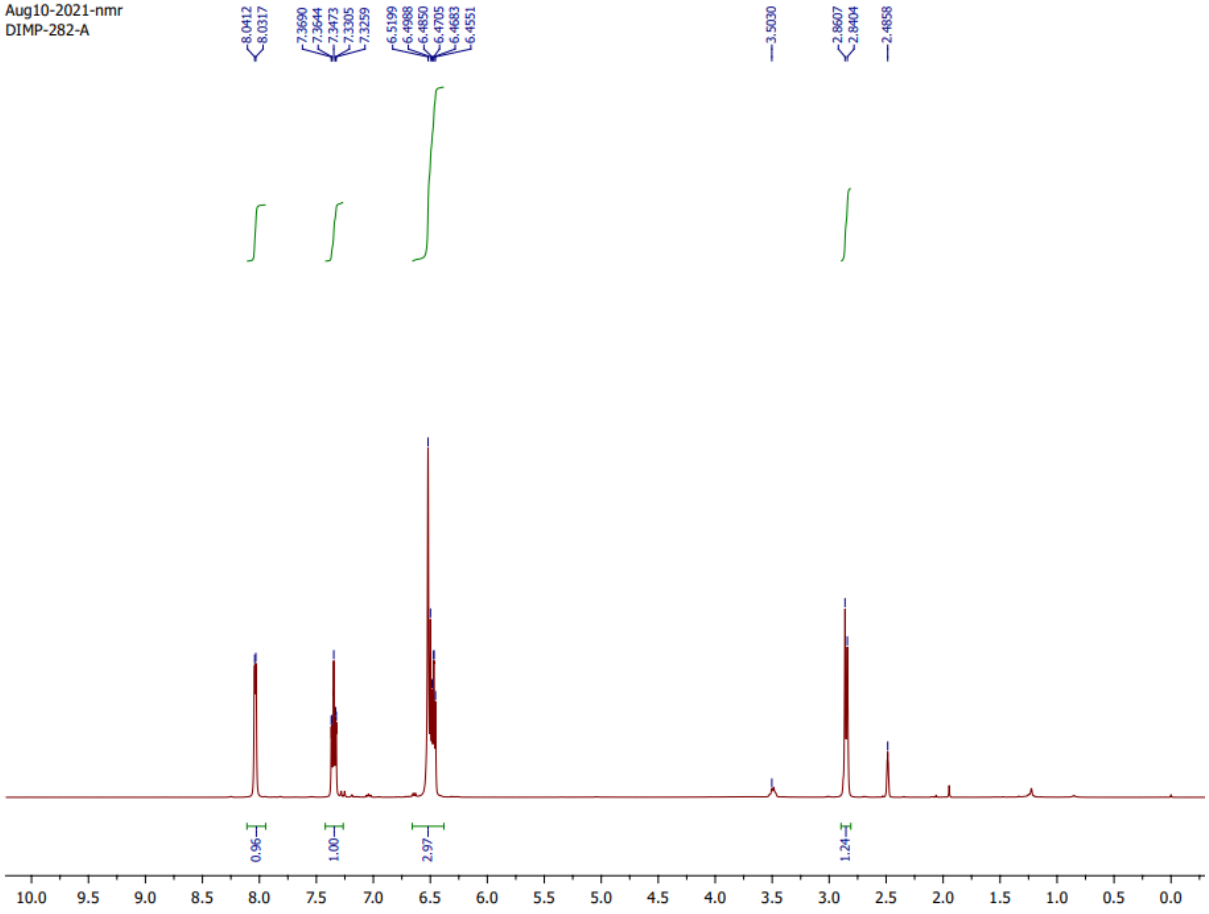


^{1}H NMR

(400 MHz, $(CD_3)_2SO$)

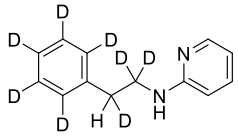


***N*-(2-(Phenyl-d_5)ethyl-1,1,2-d_3)pyridin-2-amine) (3a")**

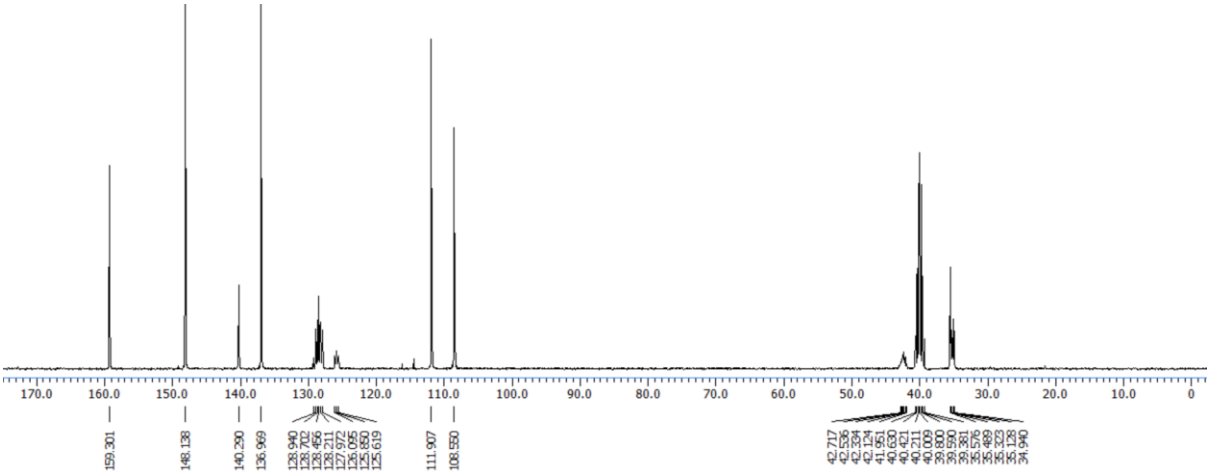


^{13}C NMR

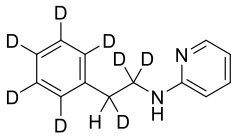
(100 MHz, $(CD_3)_2SO$)



***N*-(2-(Phenyl-*d*$_5$)ethyl-1,1,2-*d*$_3$)pyridin-2-amine) (3a")**



HRMS



_N_-(2-(Phenyl-d_5)ethyl-1,1,2-d_3)pyridin-2-amine) (3a")