

Cu(II)-Promoted Palladium-Catalyzed Direct C–H *Ortho*-Arylation of *N,N*-Dimethylbenzylamines

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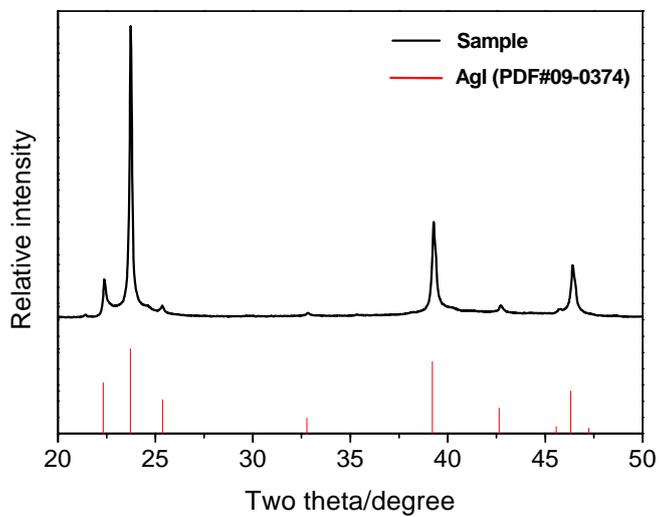
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Supporting Information

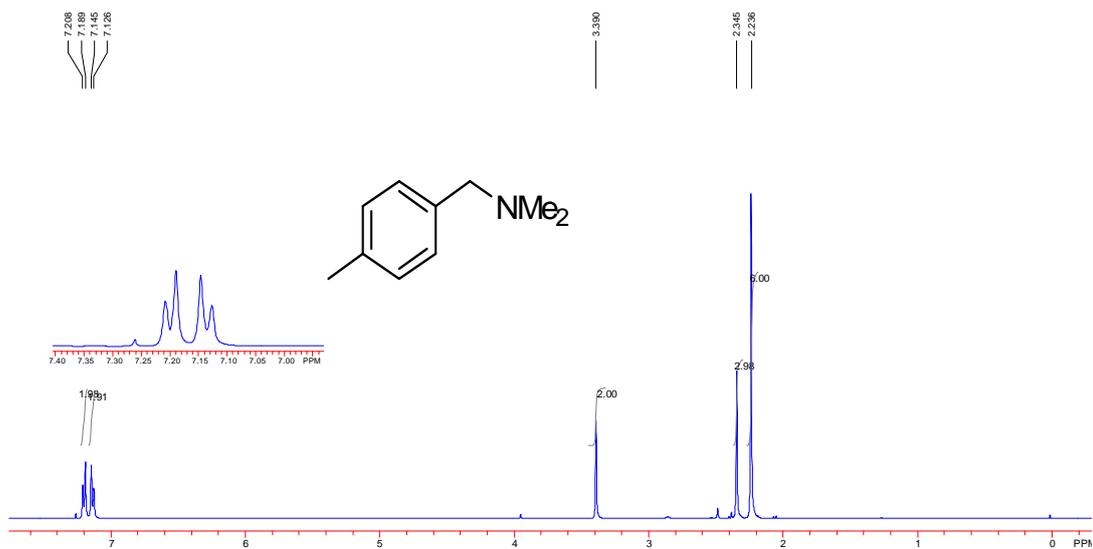
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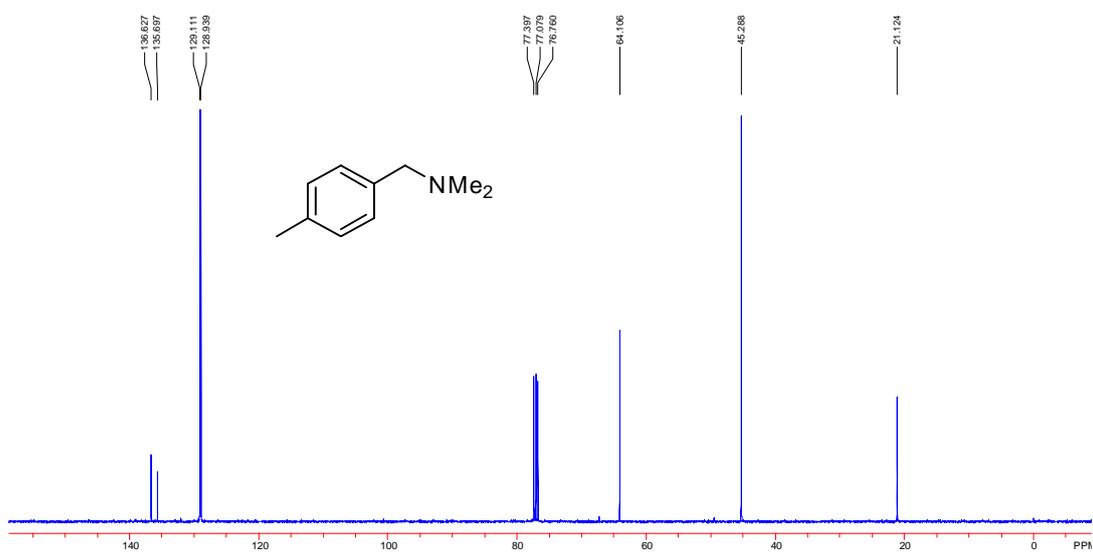
XRD analysis of the reaction residues:



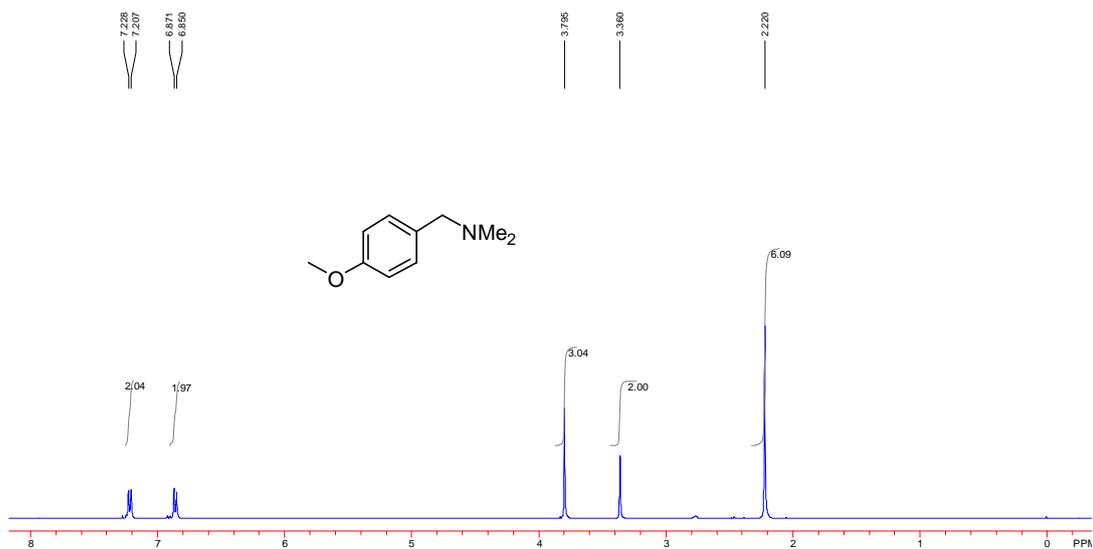
Picture 1



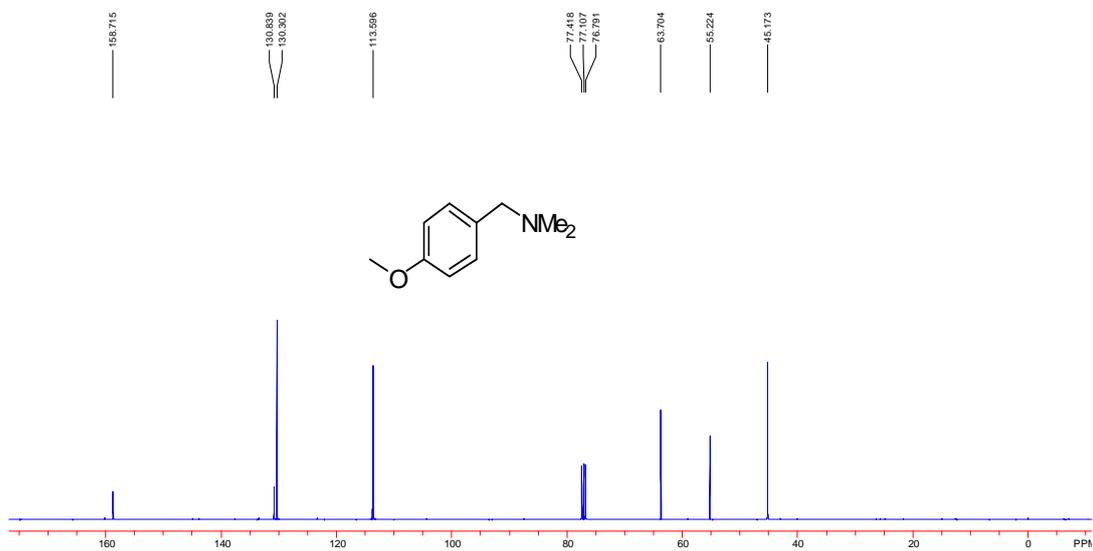
¹H NMR of *N,N*,4-trimethylbenzylamine [1b]



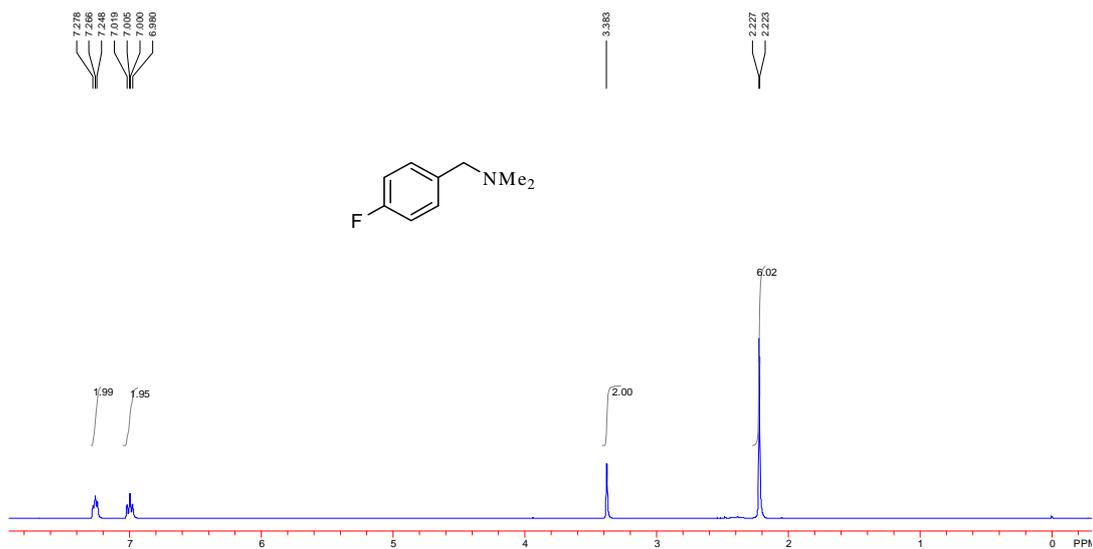
¹³C NMR of *N,N*,4-trimethylbenzylamine [1b]



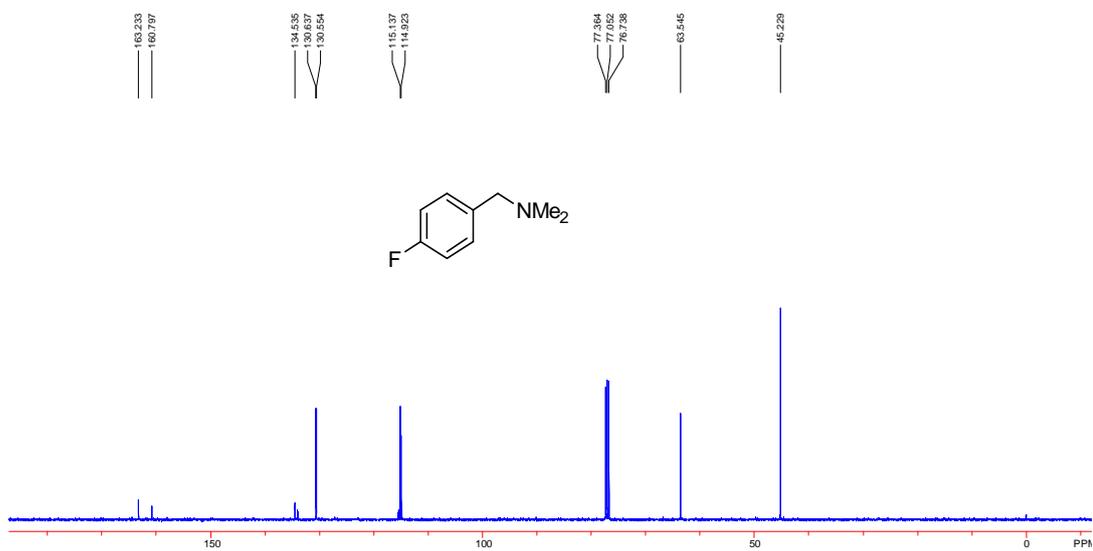
¹H NMR of 4-methoxy-*N,N*-dimethylbenzylamine [1c]



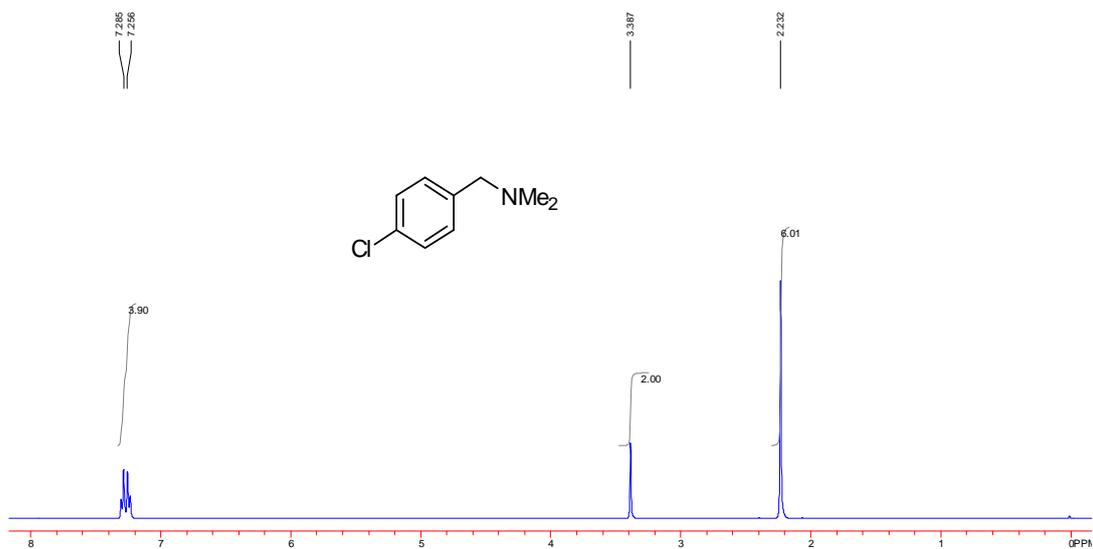
¹³C NMR of 4-methoxy-*N,N*-dimethylbenzylamine [1c]



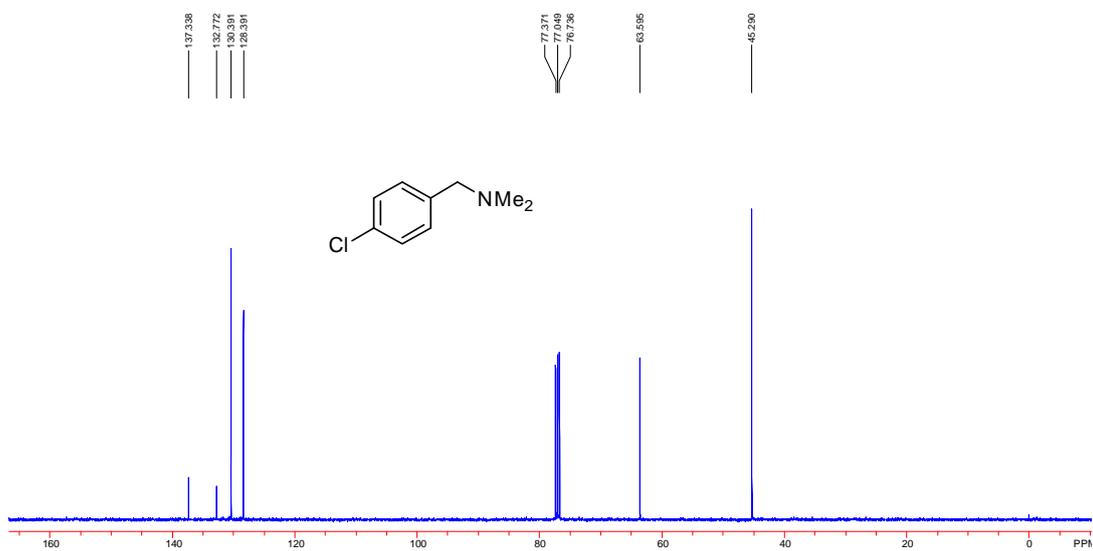
¹H NMR of 4-fluoro-*N,N*-dimethylbenzylamine [1d]



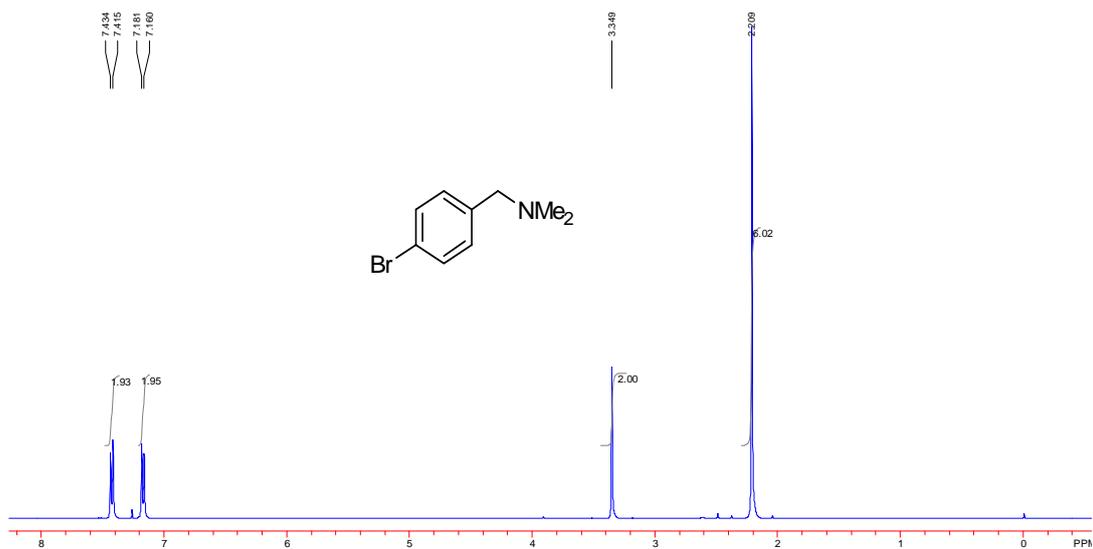
¹³C NMR of 4-fluoro-*N,N*-dimethylbenzylamine [1d]



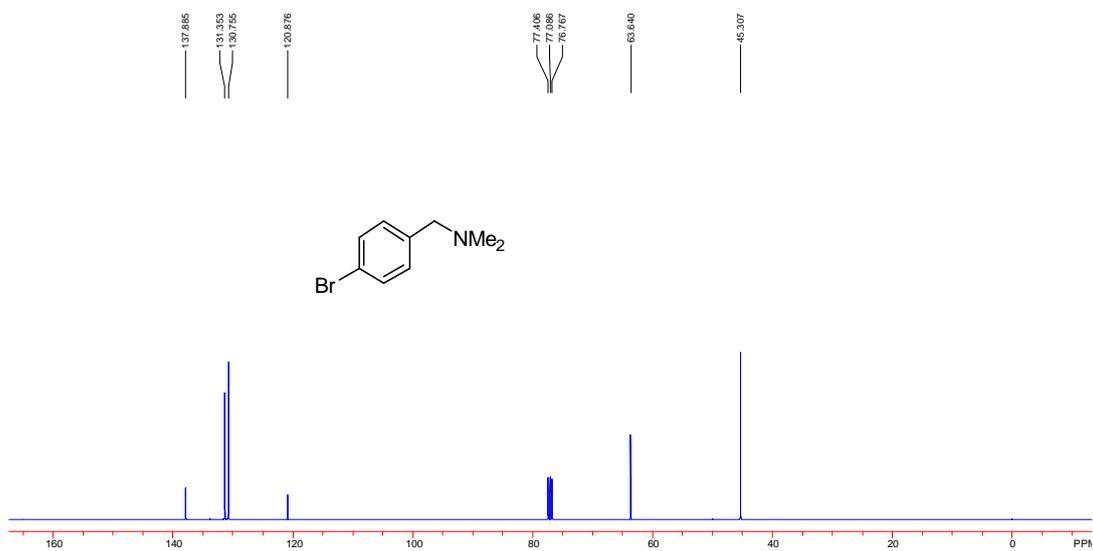
¹H NMR of 4-chloro-*N,N*-dimethylbenzylamine [1e]



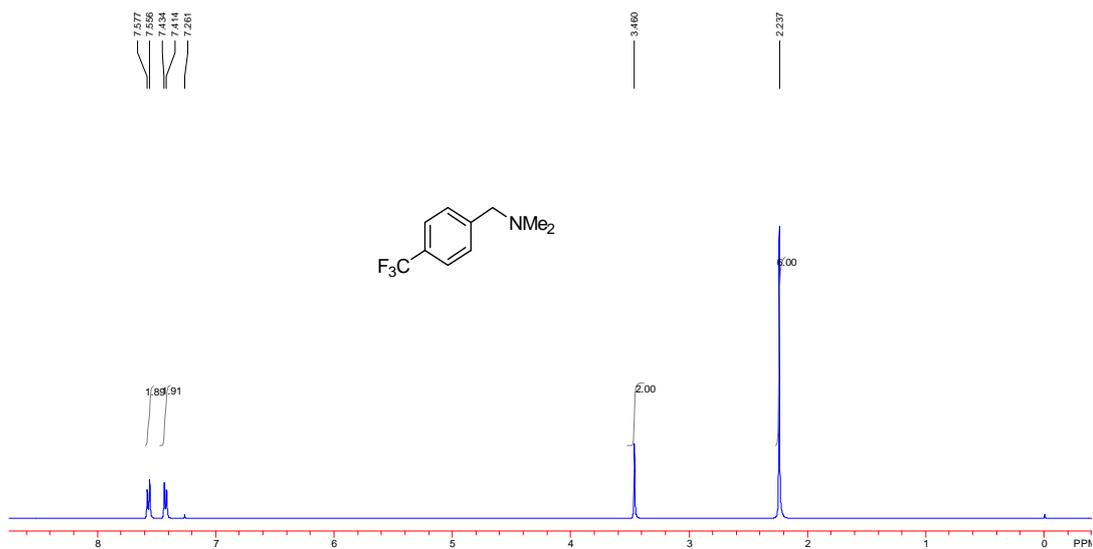
¹³C NMR of 4-chloro-*N,N*-dimethylbenzylamine [1e]



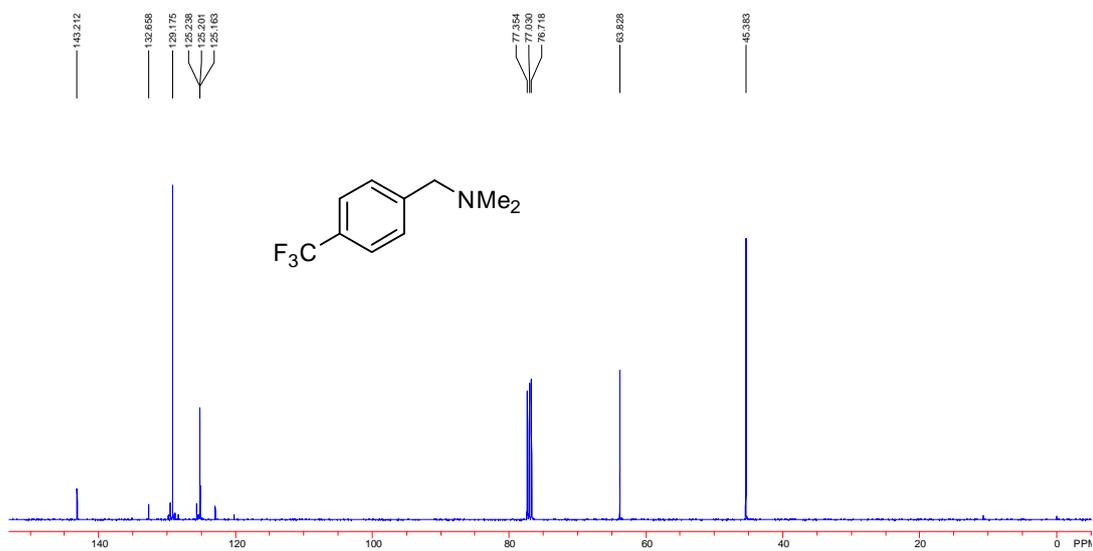
¹H NMR of 4-bromo-*N,N*-dimethylbenzylamine [1f]



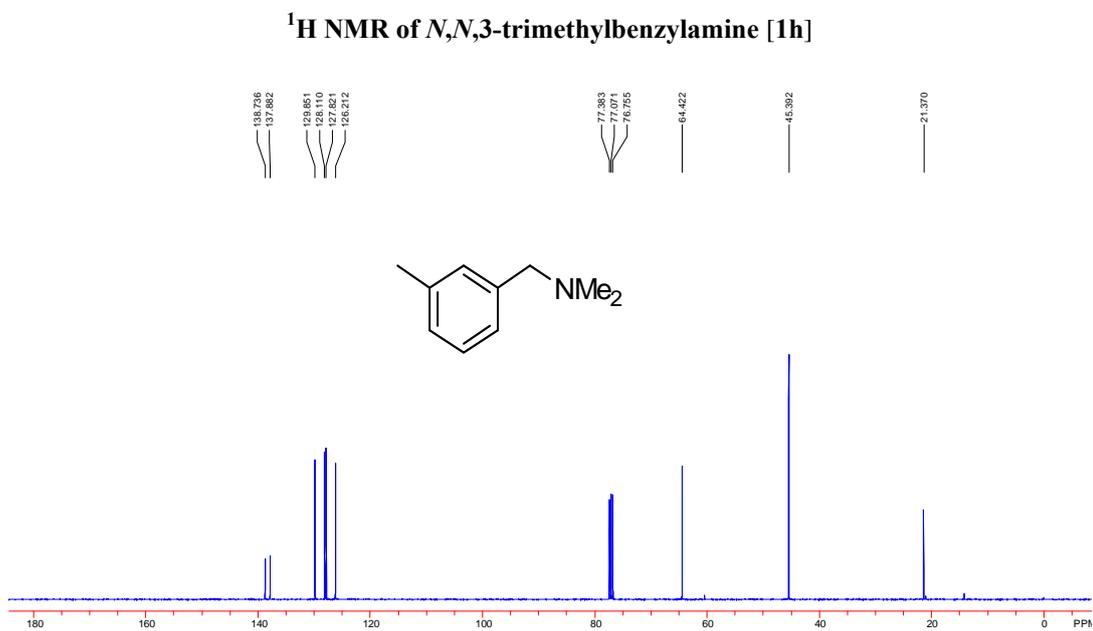
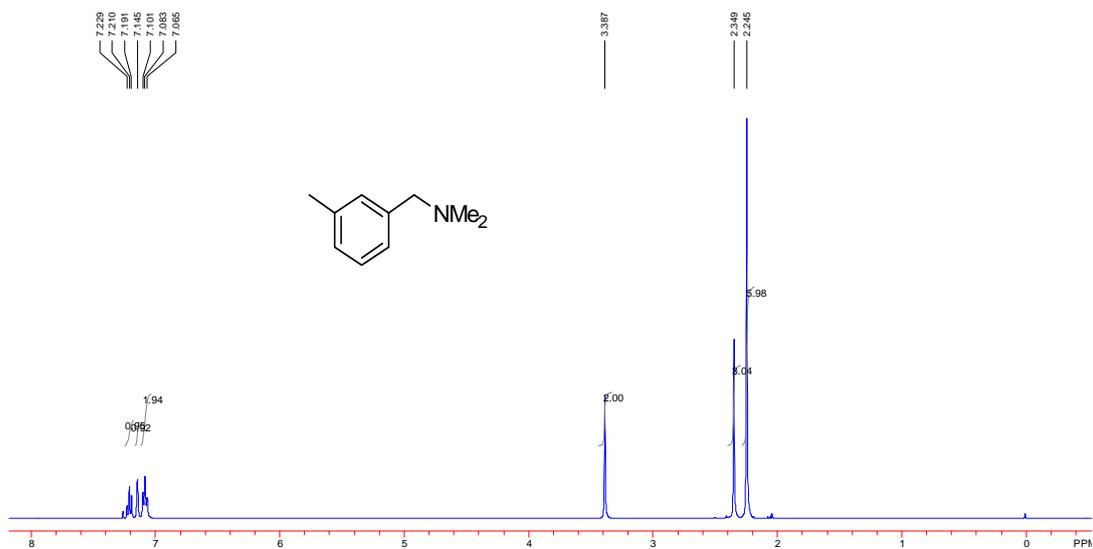
¹³C NMR of 4-bromo-*N,N*-dimethylbenzylamine [1f]

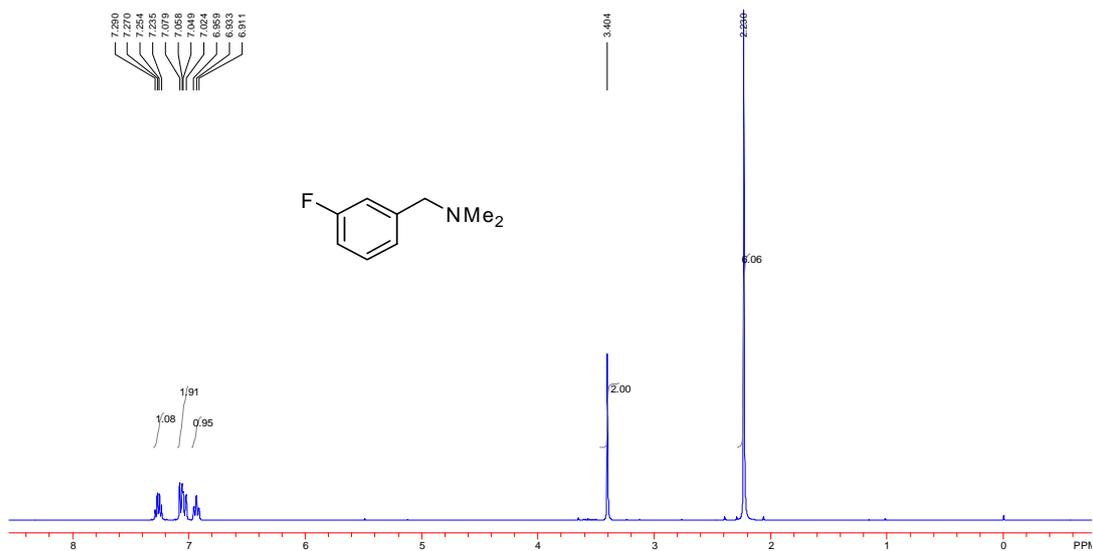


¹H NMR of 4-(trifluoromethyl)-*N,N*-dimethylbenzylamine [1g]

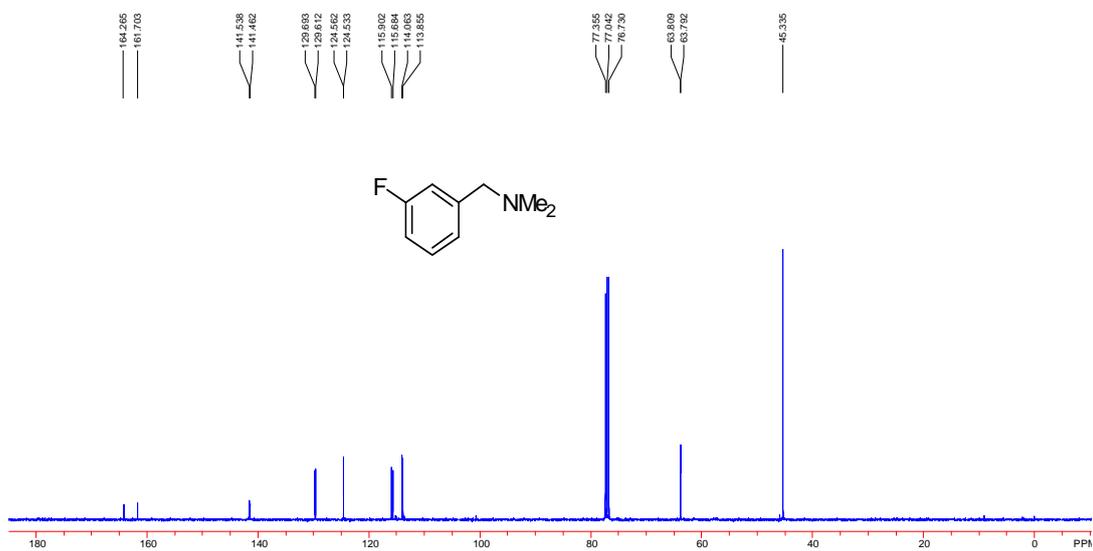


¹³C NMR of 4-(trifluoromethyl)-*N,N*-dimethylbenzylamine [1g]

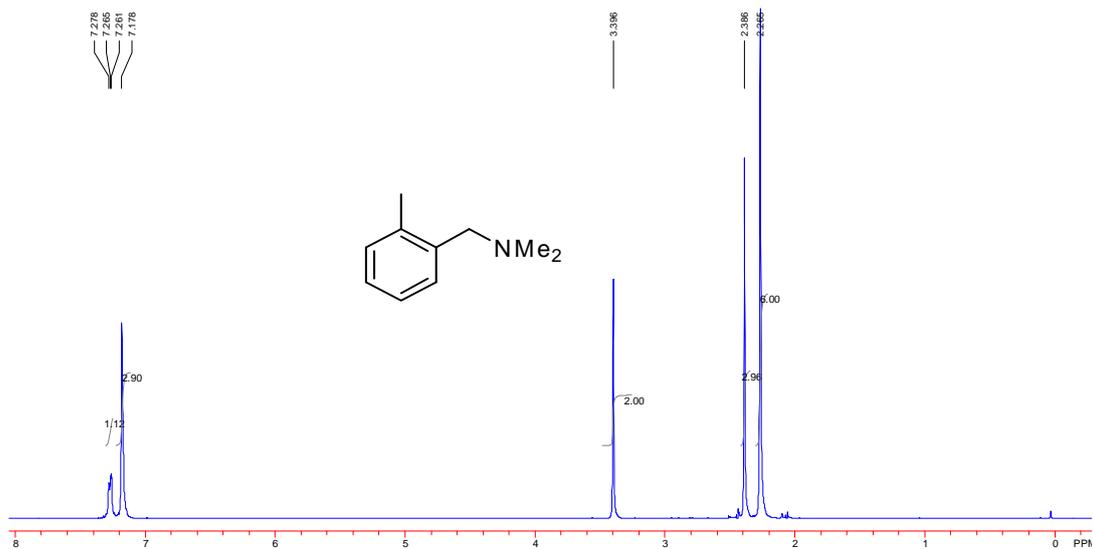




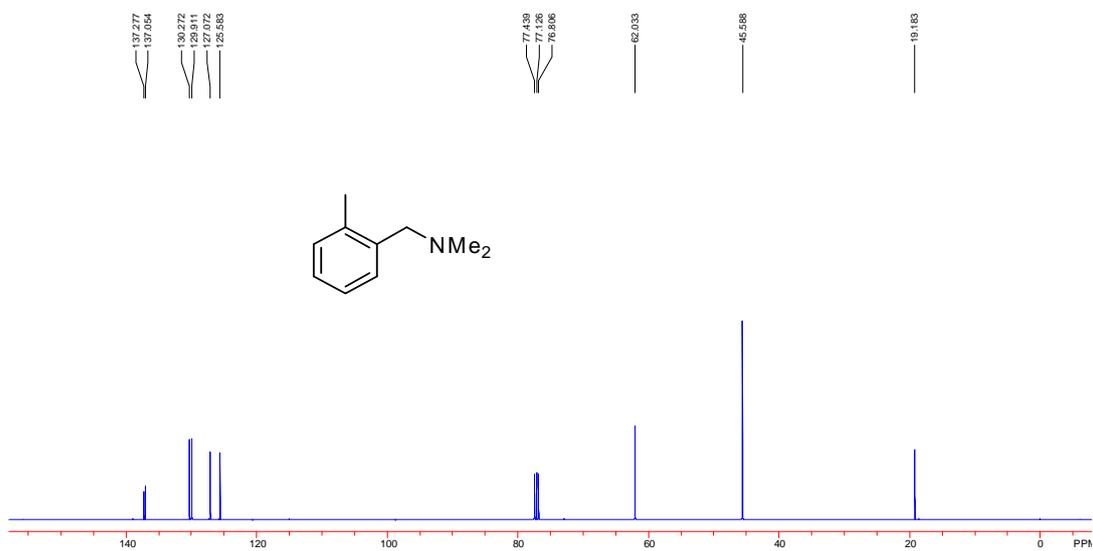
¹H NMR of 3-fluoro-*N,N*-dimethylbenzylamine [1i]



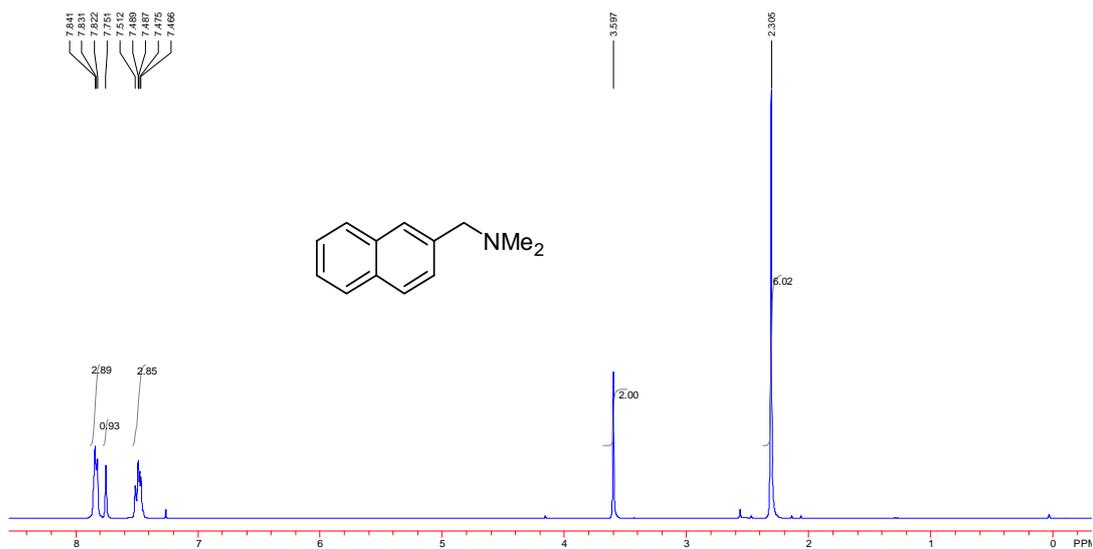
¹³C NMR of 3-fluoro-*N,N*-dimethylbenzylamine [1i]



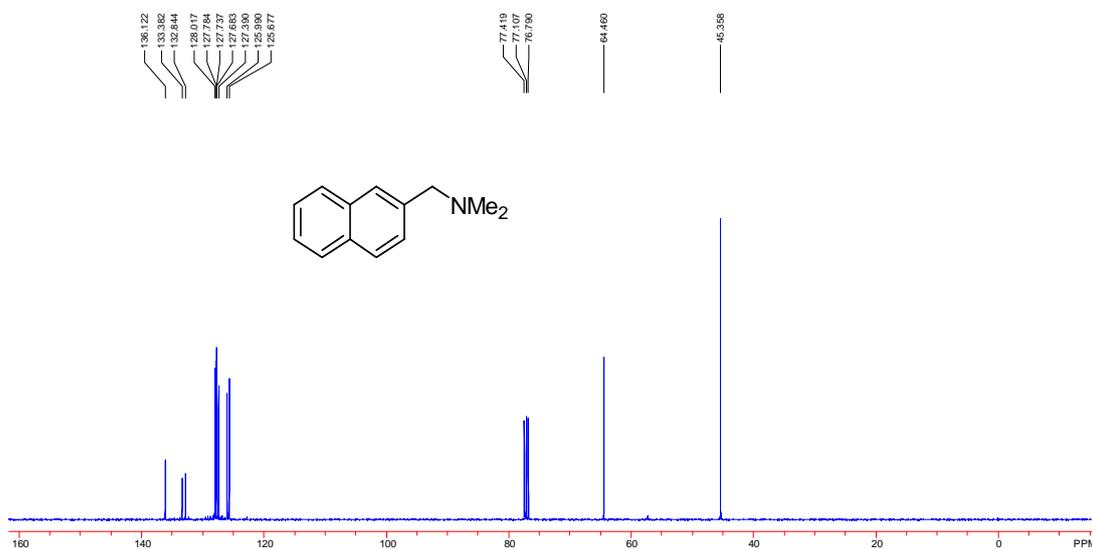
¹H NMR of *N,N,2*-trimethylbenzylamine [1j]



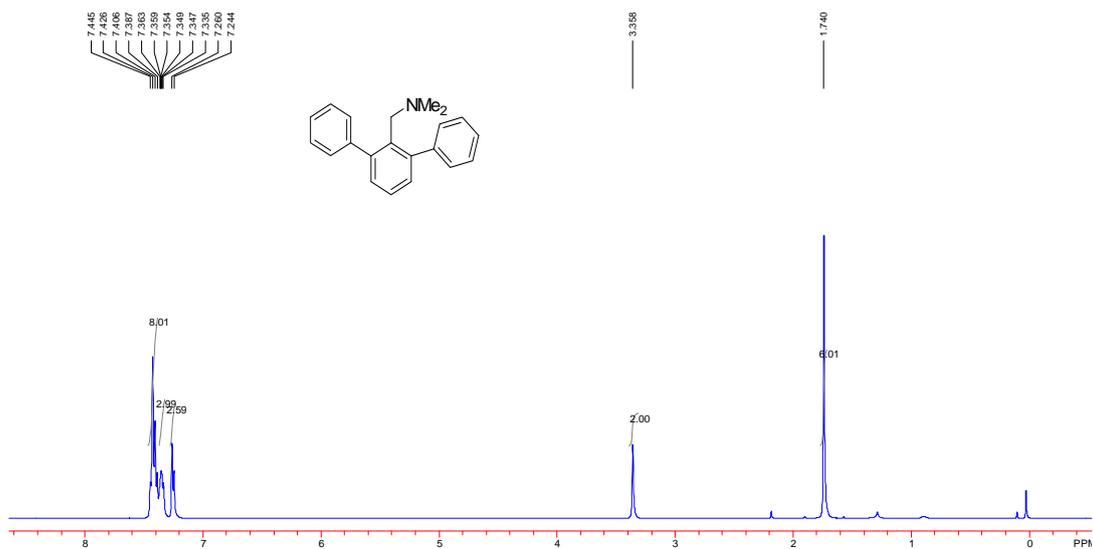
¹³C NMR of *N,N,2*-trimethylbenzylamine [1j]



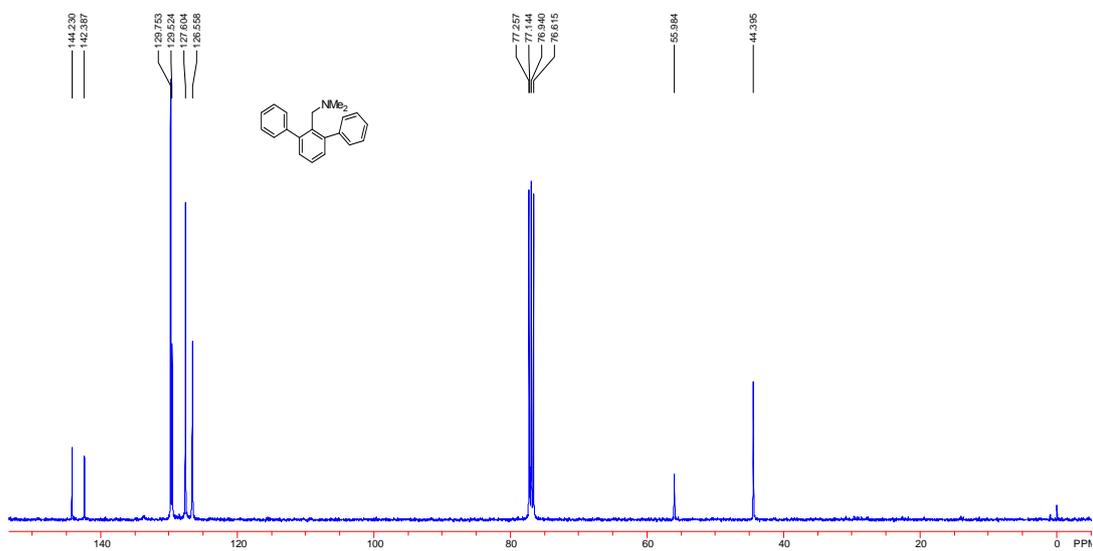
¹H NMR of *N,N*-dimethyl-2-naphthalenemethylamine [1k]



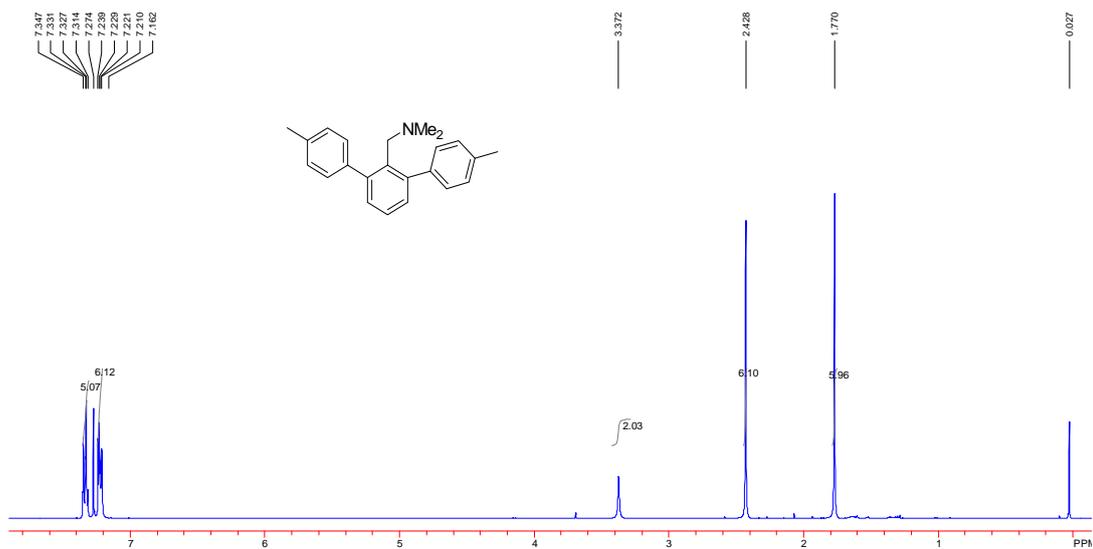
¹³C NMR of *N,N*-dimethyl-2-naphthalenemethylamine [1k]



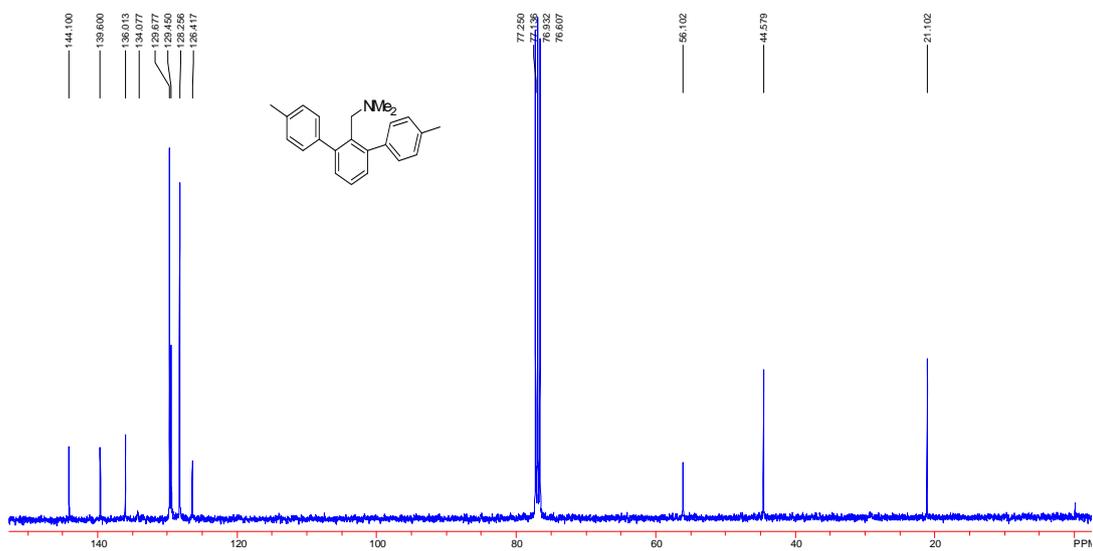
¹H NMR of 2,6-diphenyl-*N,N*-dimethylbenzylamine [3aa]



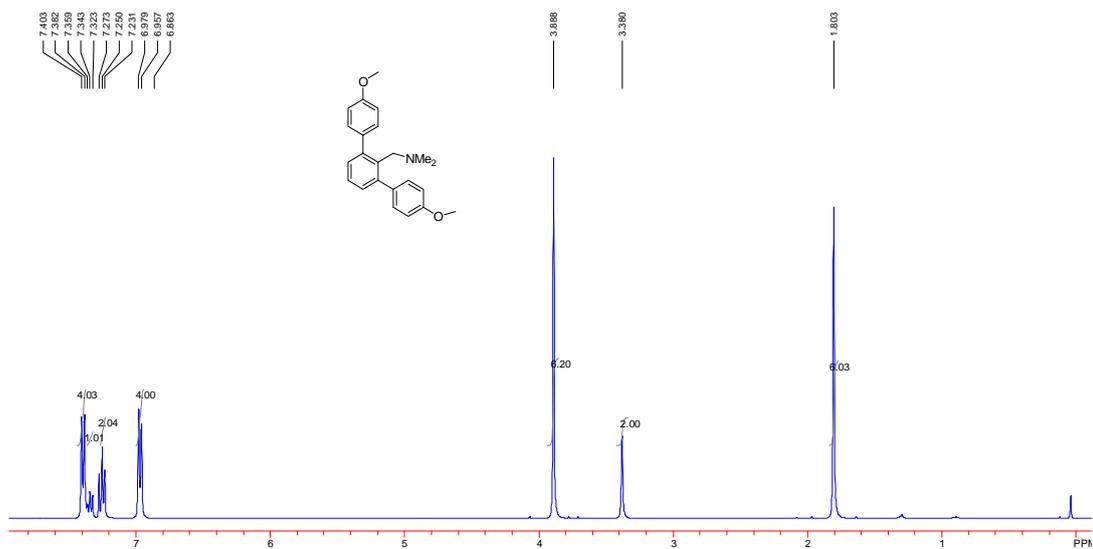
¹³C NMR of 2,6-diphenyl-*N,N*-dimethylbenzylamine [3aa]



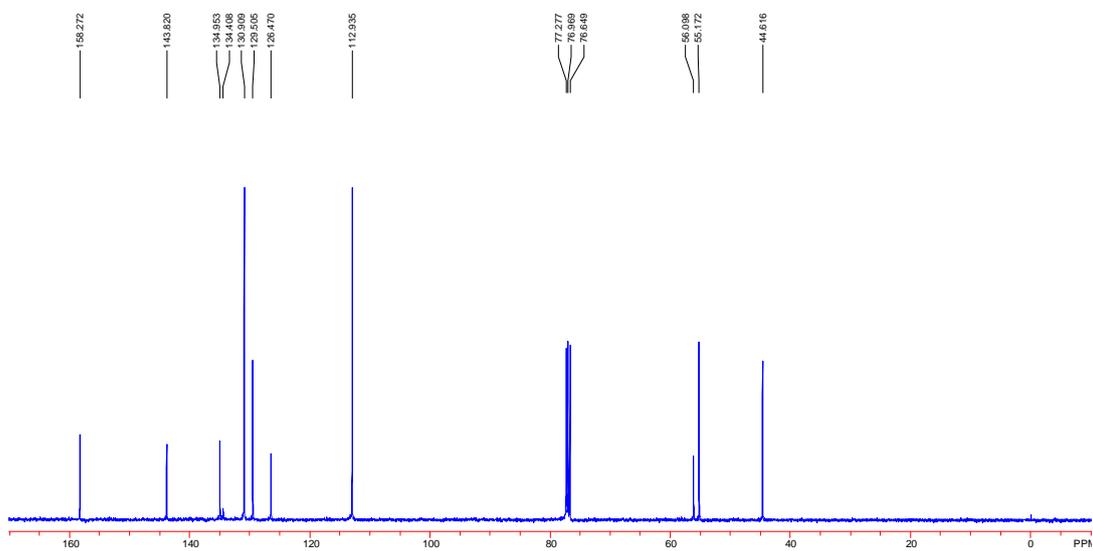
¹H NMR of 2,6-di(4-methylphenyl)-*N,N*-dimethylbenzylamine [3ab]



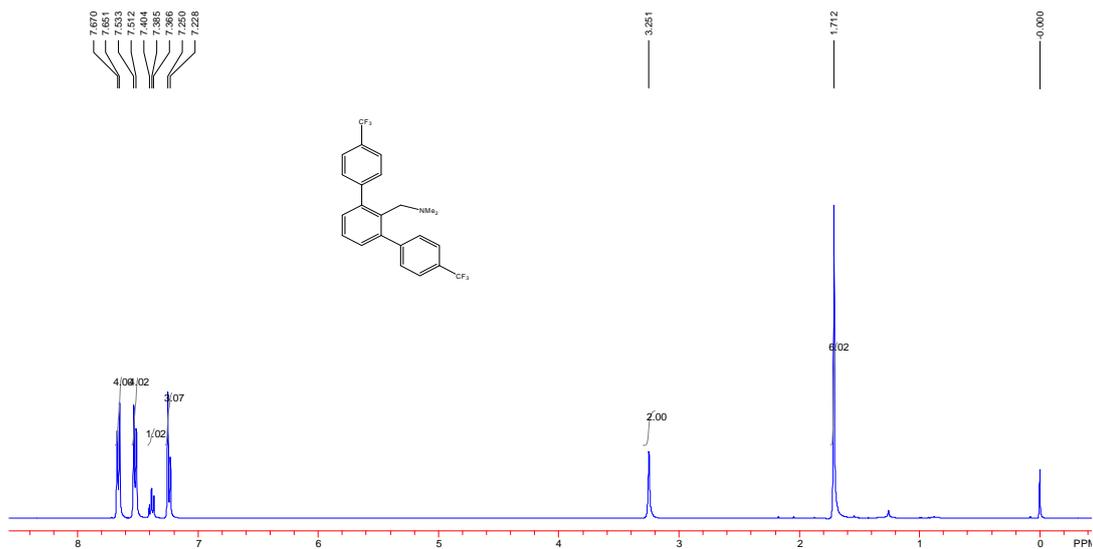
¹³C NMR of 2,6-di(4-methylphenyl)-*N,N*-dimethylbenzylamine [3ab]



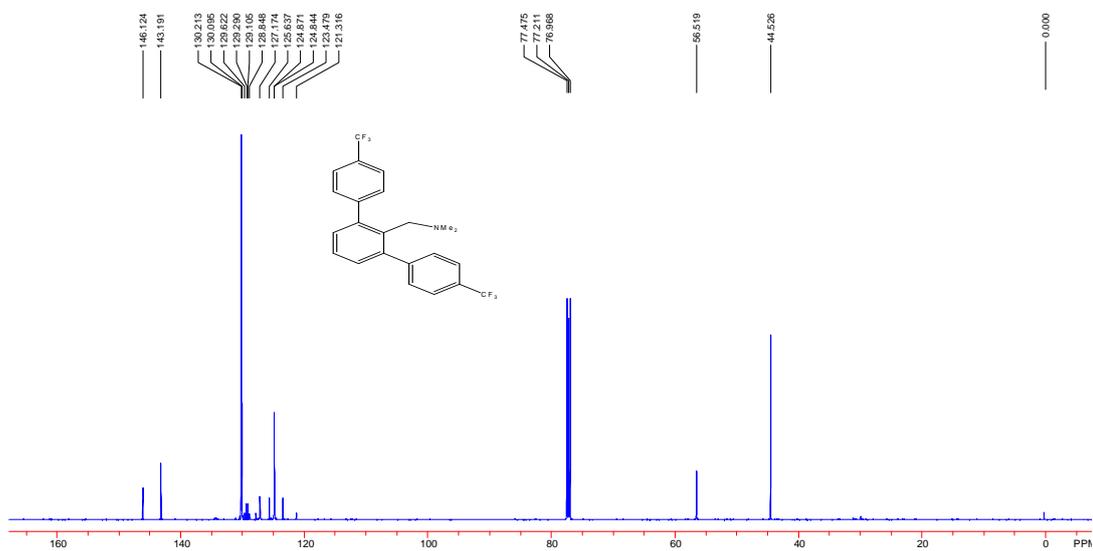
¹H CNM of 2,6-di(4-methoxy-phenyl)-*N,N*-dimethylbenzylamine [3ac]



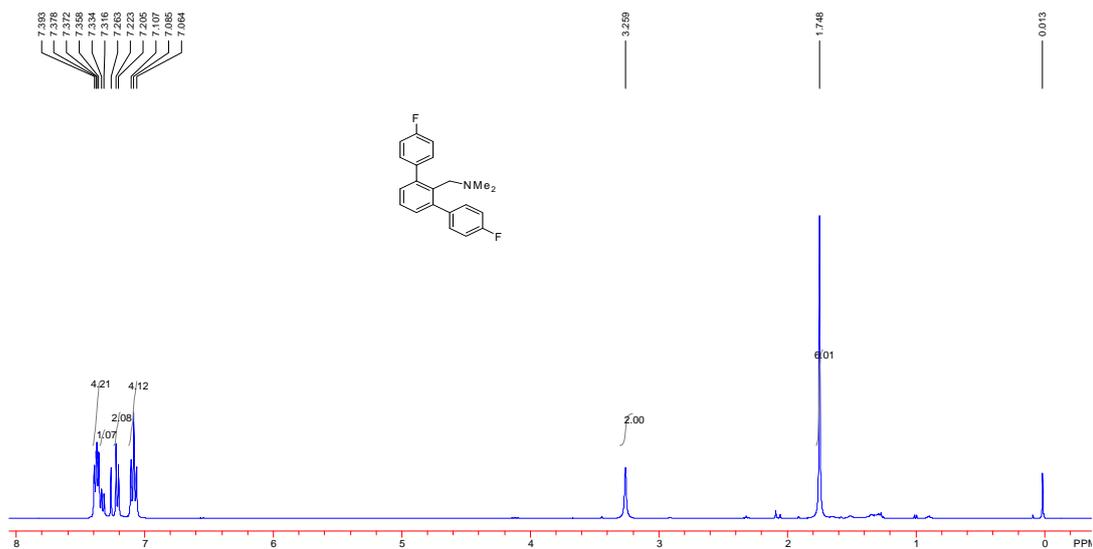
¹³C NMR of 2,6-di(4-methoxy-phenyl)-*N,N*-dimethylbenzylamine [3ac]



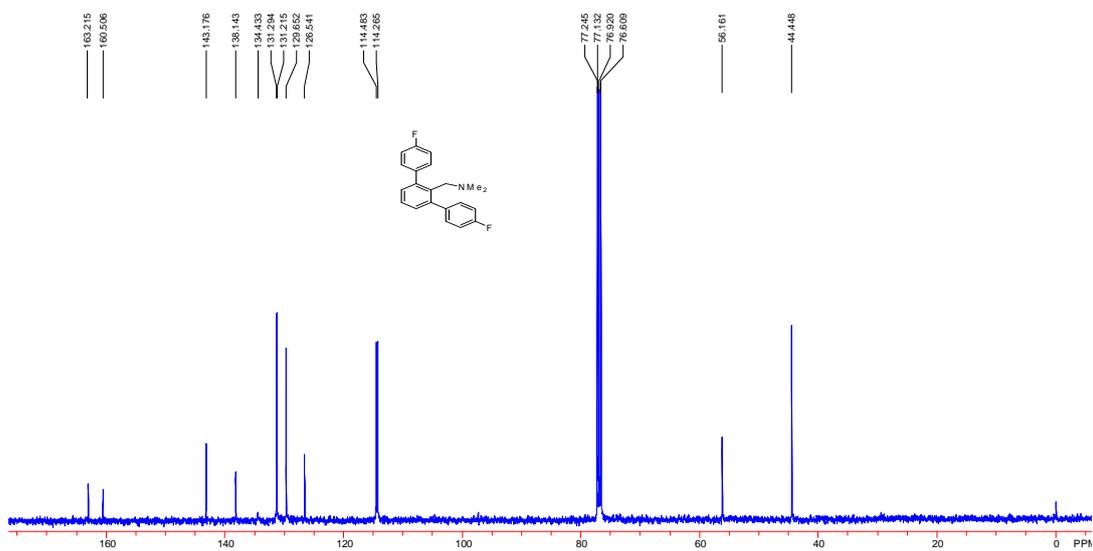
¹H NMR of 2,6-di(4-trifluoromethyl-phenyl)-*N,N*-dimethylbenzylamine [3ad]



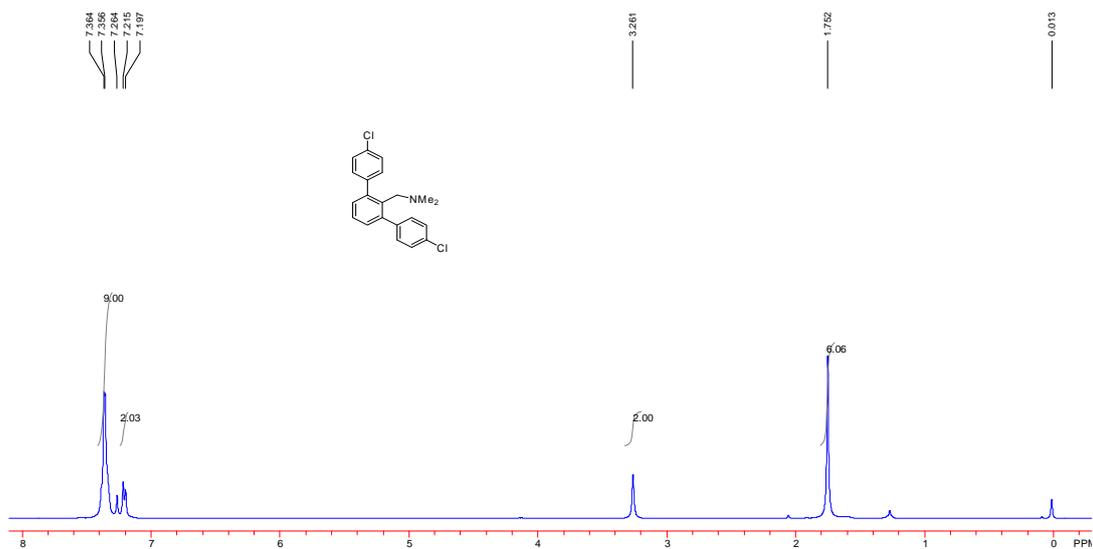
¹³C NMR of 2,6-di(4-trifluoromethyl-phenyl)-*N,N*-dimethylbenzylamine [3ad]



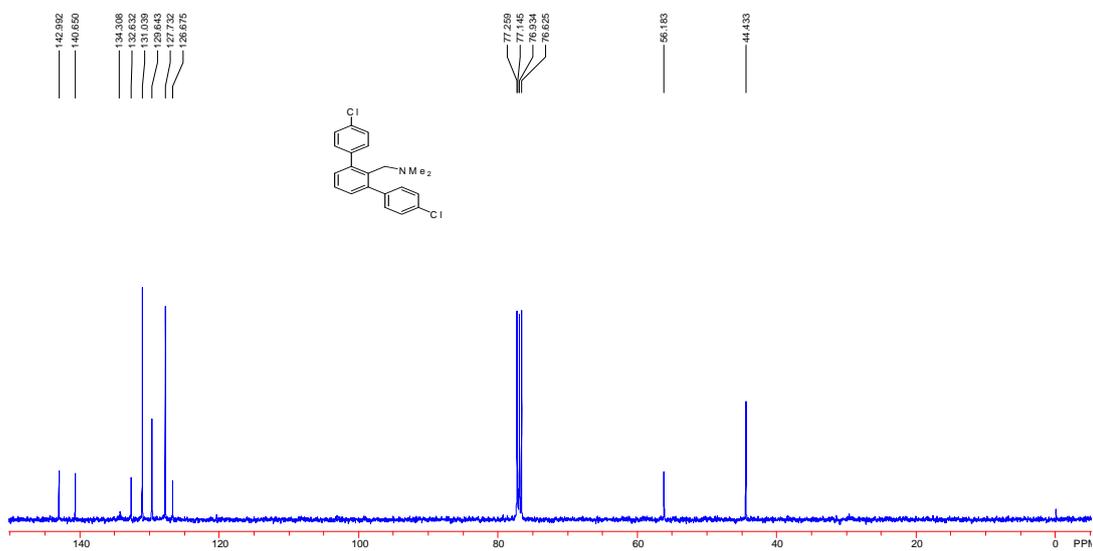
¹H NMR of 2,6-di(4-fluorophenyl)-*N,N*-dimethylbenzylamine [3ae]



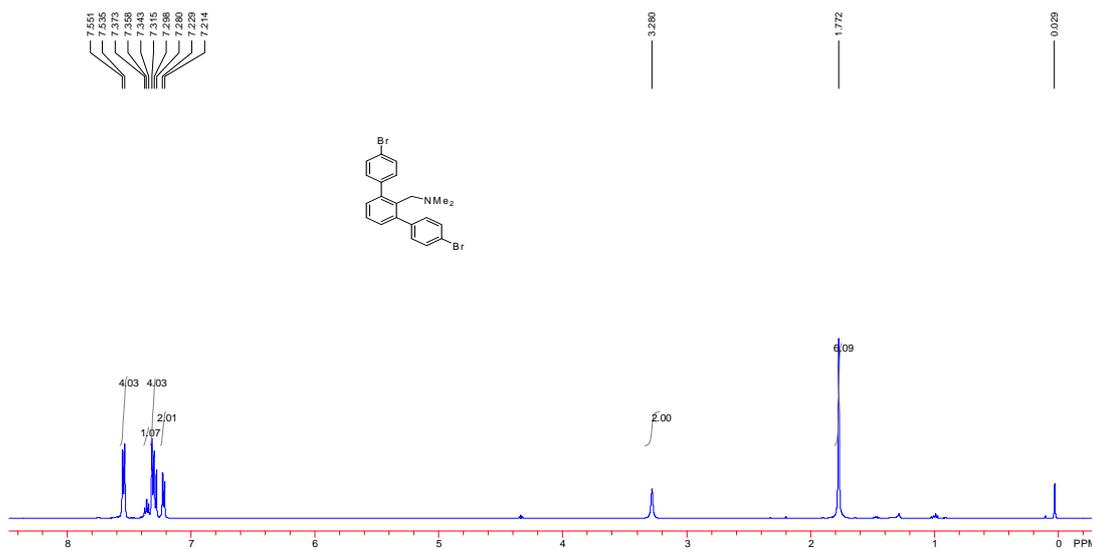
¹³C NMR of 2,6-di(4-fluorophenyl)-*N,N*-dimethylbenzylamine [3ae]



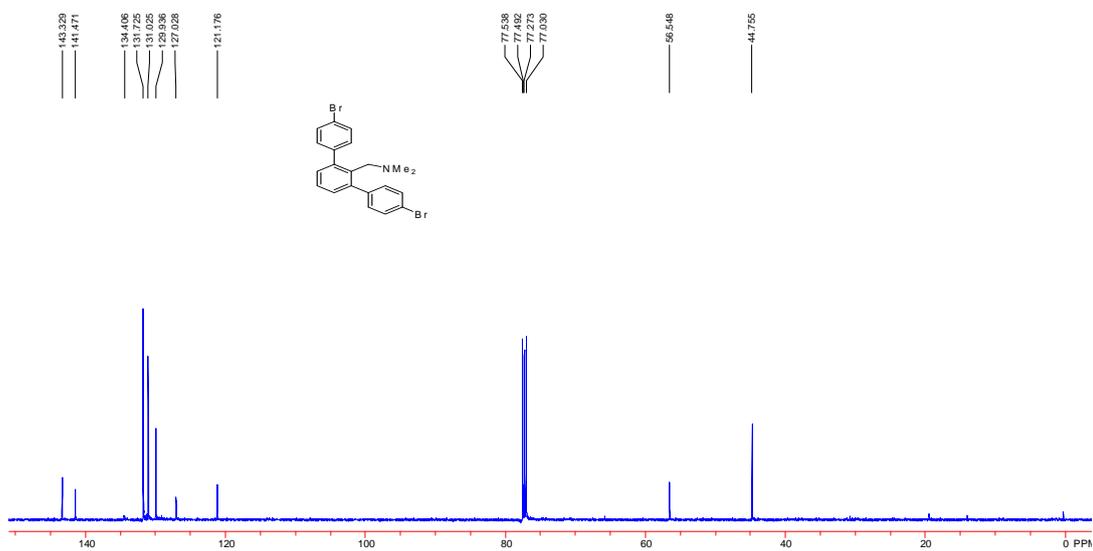
¹H NMR of 2,6-di(4-chlorophenyl)-*N,N*-dimethylbenzylamine [3af]



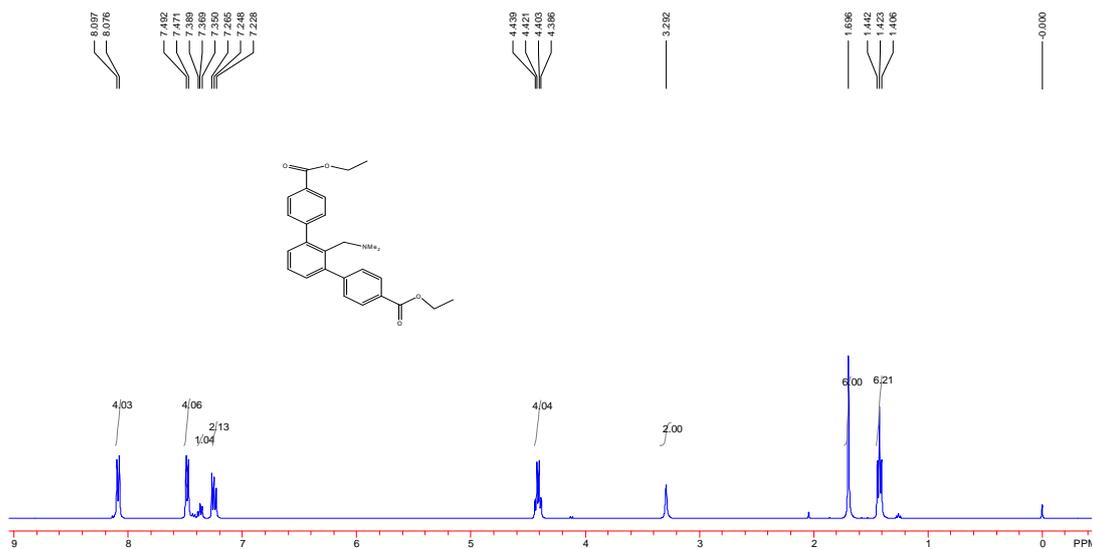
¹³C NMR of 2,6-di(4-chlorophenyl)-*N,N*-dimethylbenzylamine [3af]



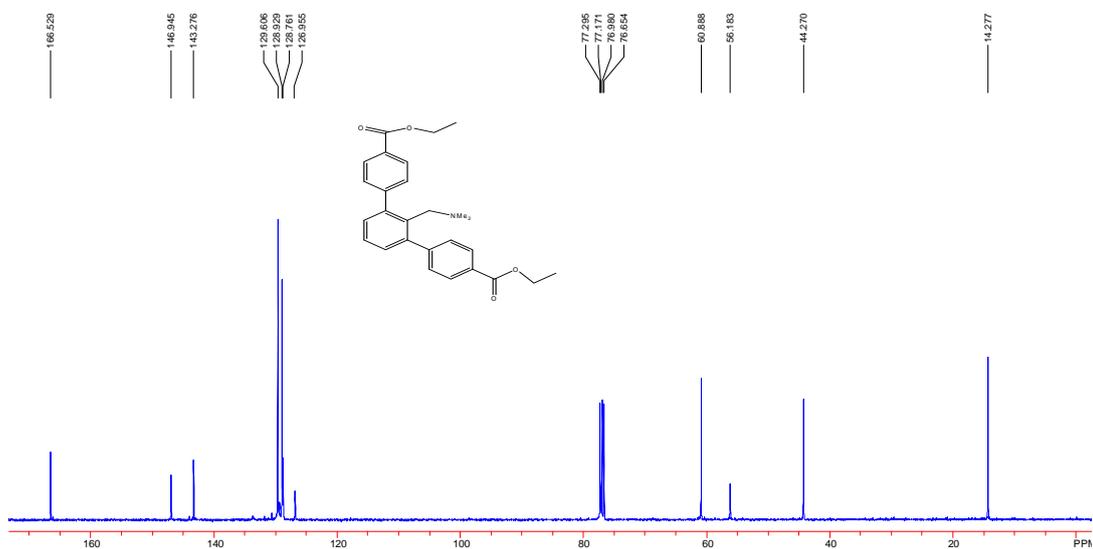
¹H NMR of 2,6-di(4-bromo-phenyl)-*N,N*-dimethylbenzylamine [3ag]



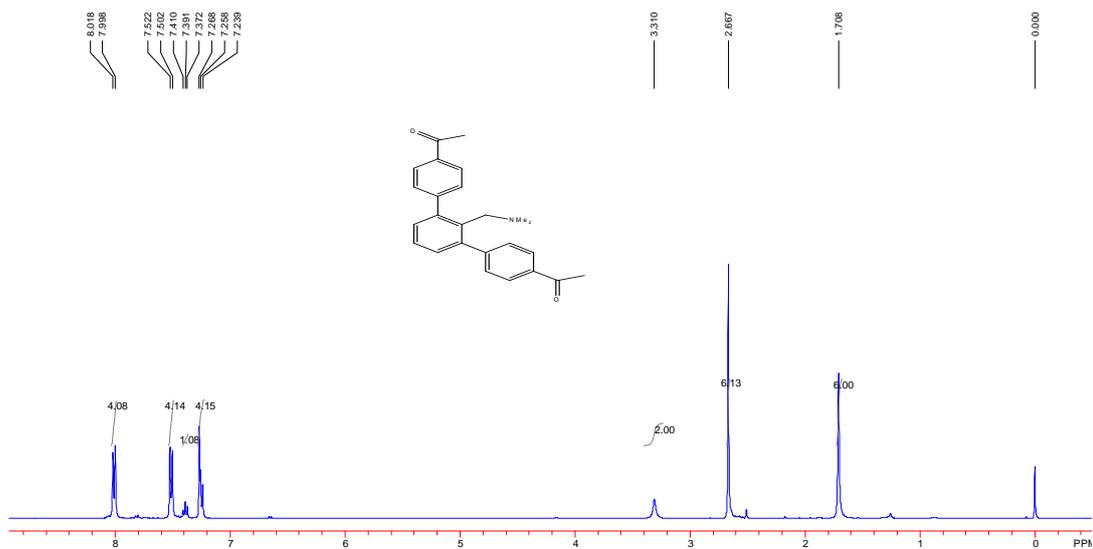
¹³C NMR of 2,6-di(4-bromo-phenyl)-*N,N*-dimethylbenzylamine [3ag]



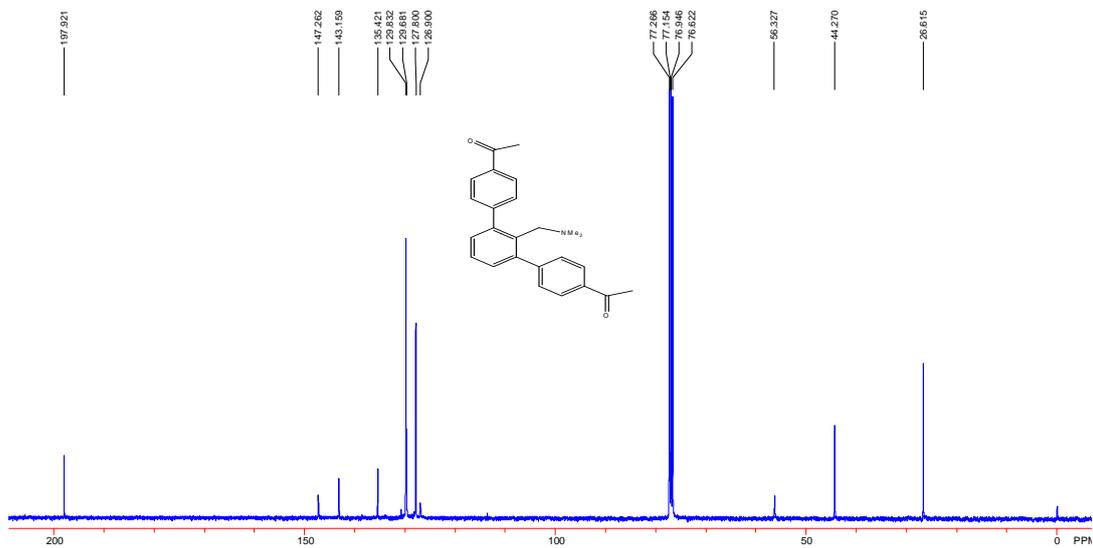
¹H NMR of diethyl 2'-((dimethylamino)methyl)-[1,1':3',1''-terphenyl]-4,4''-dicarboxylate [3ah]



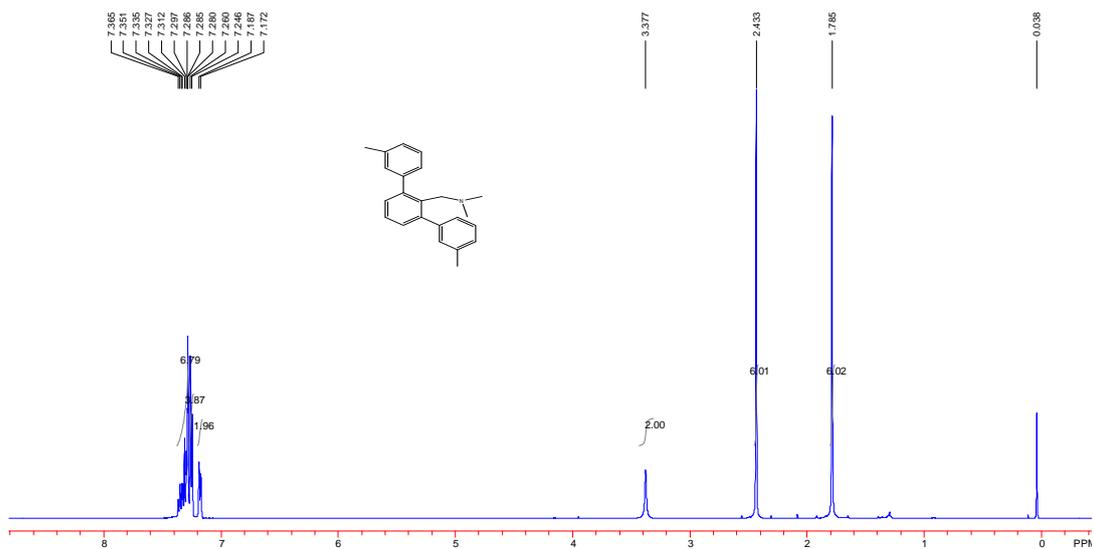
¹³C NMR of diethyl 2'-((dimethylamino)methyl)-[1,1':3',1''-terphenyl]-4,4''-dicarboxylate [3ah]



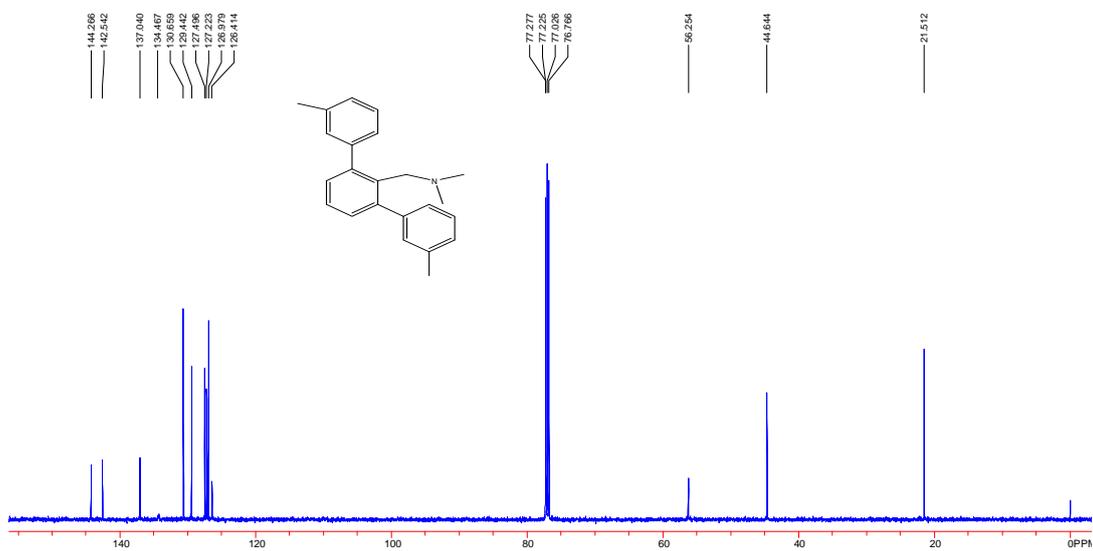
¹H NMR of 2,6-di(4-acetyl-phenyl)-*N,N*-dimethylbenzylamine [3ai]



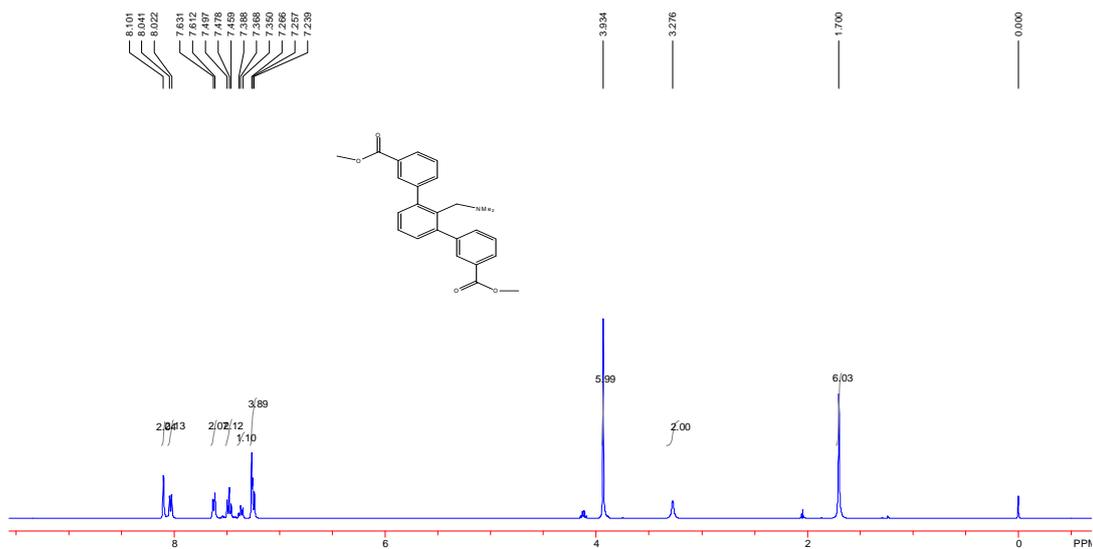
¹³C NMR of 2,6-di(4-acetyl-phenyl)-*N,N*-dimethylbenzylamine [3ai]



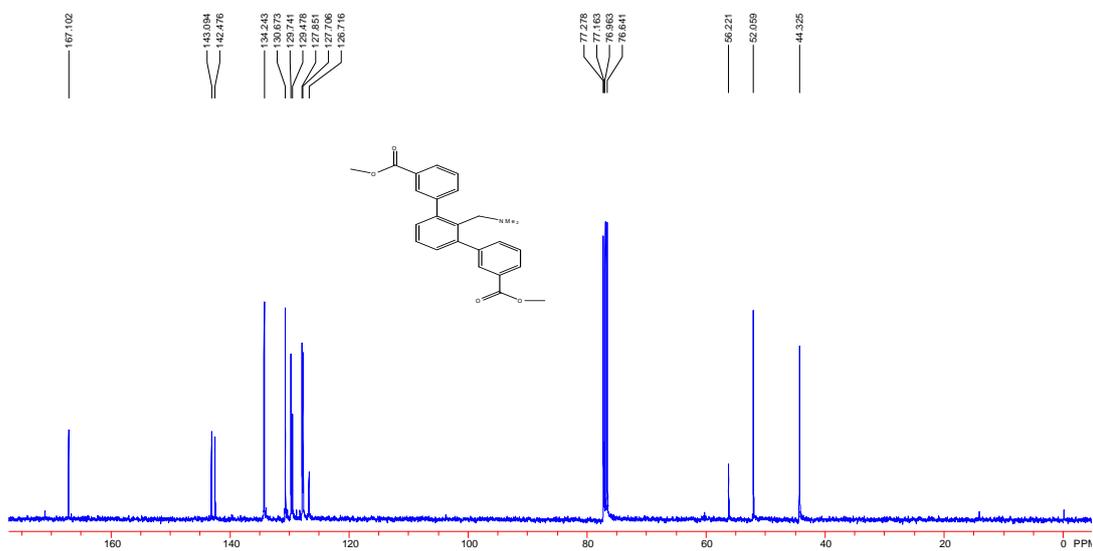
¹H NMR of 2,6-di(3-methyl-phenyl)-*N,N*-dimethylbenzylamine [3aj]



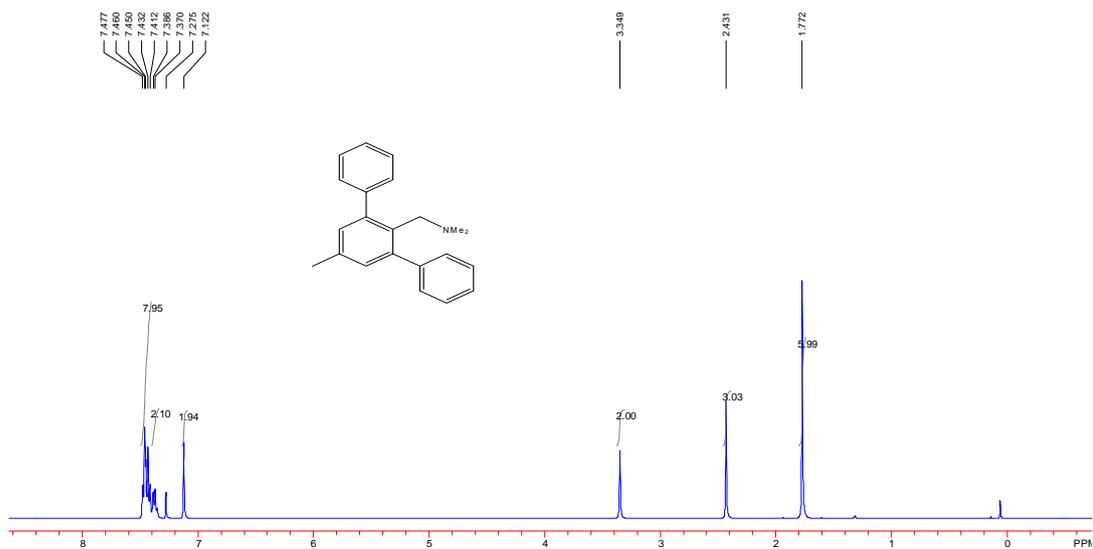
¹³C NMR of 2,6-di(3-methyl-phenyl)-*N,N*-dimethylbenzylamine [3aj]



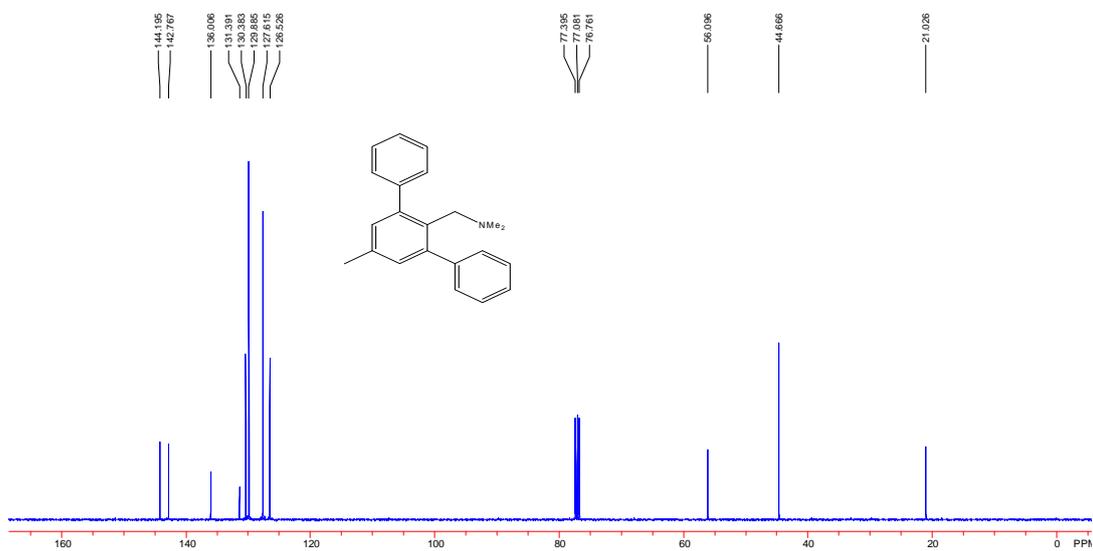
¹H NMR of dimethyl 2'-((dimethylamino)methyl)-[1,1':3',1''-terphenyl]-3,3''-dicarboxylate [3a]



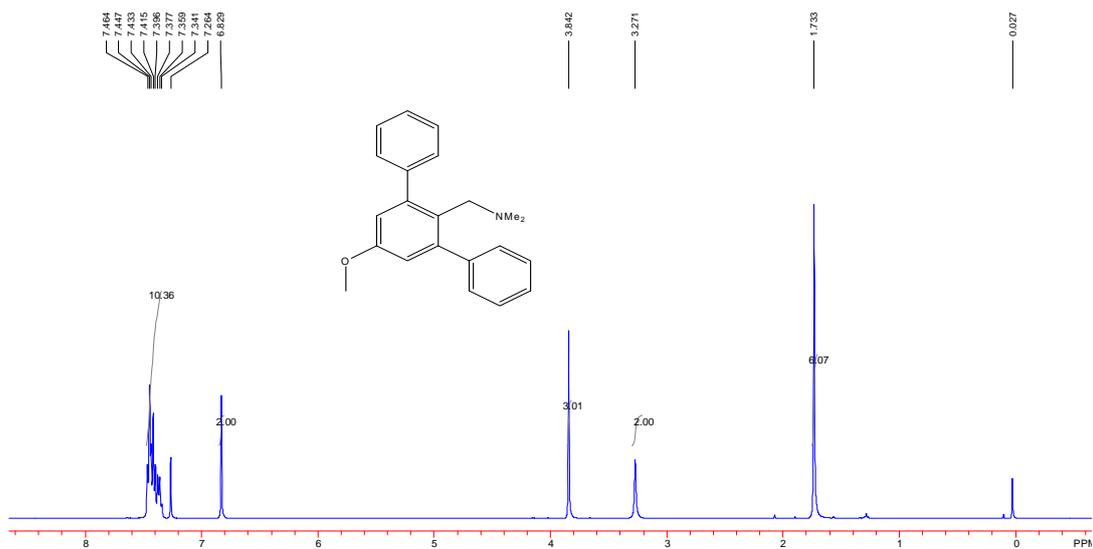
¹³C NMR of dimethyl 2'-((dimethylamino)methyl)-[1,1':3',1''-terphenyl]-3,3''-dicarboxylate [3a]



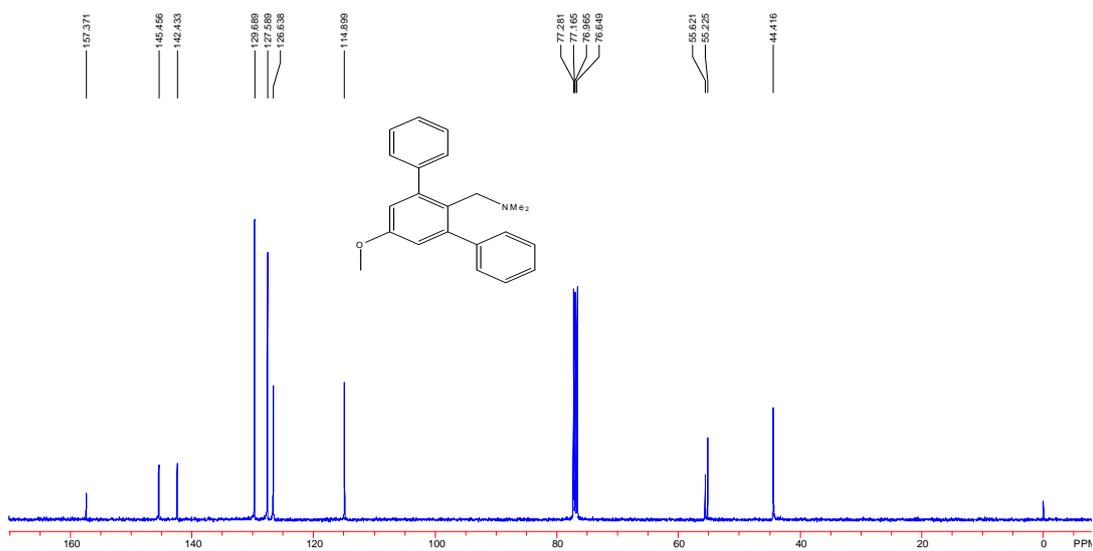
¹H NMR of 2,6-diphenyl-4-methyl-*N,N*-dimethylbenzylamine [3ba]



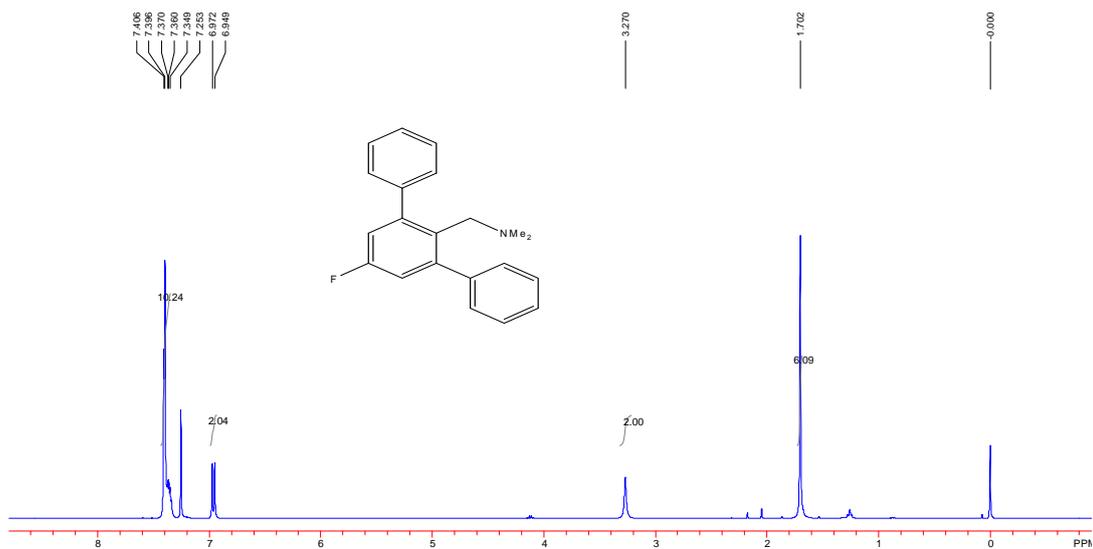
¹³C NMR of 2,6-diphenyl-4-methyl-*N,N*-dimethylbenzylamine [3ba]



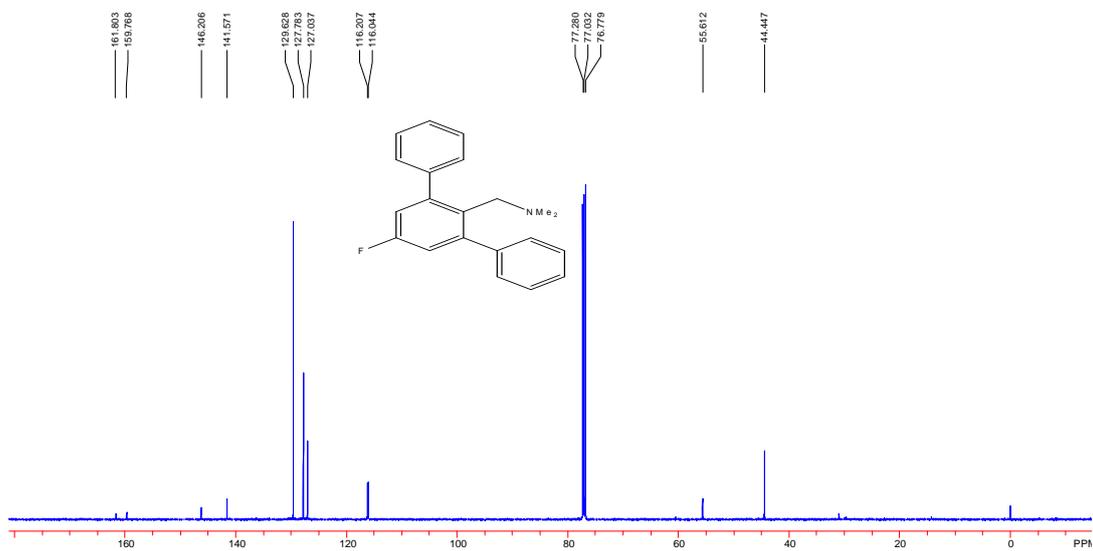
¹H NMR of 4-methoxy-2,6-diphenyl-*N,N*-dimethylbenzylamine [3ca]



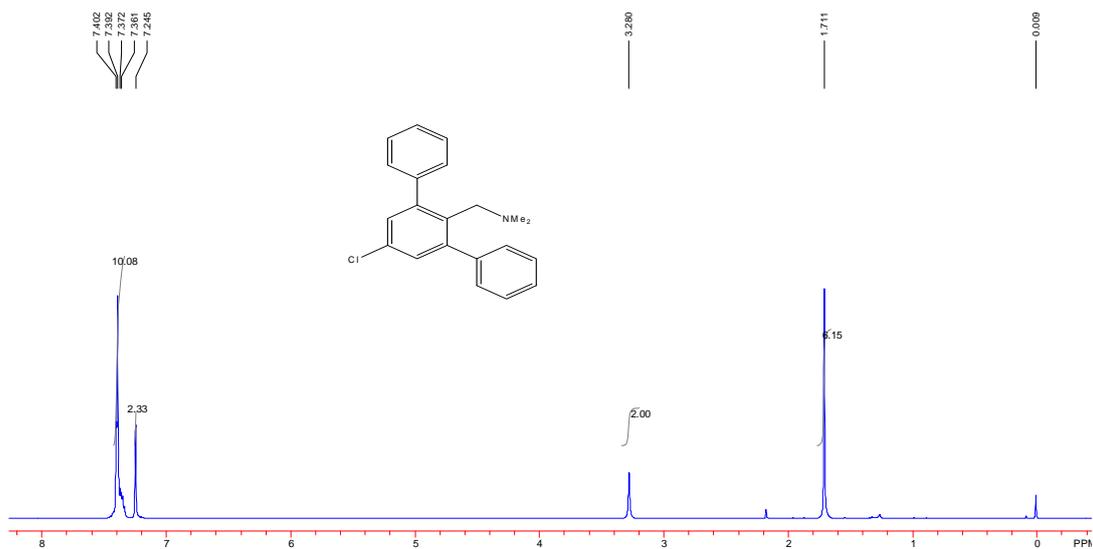
¹³C NMR of 4-methoxy-2,6-diphenyl-*N,N*-dimethylbenzylamine [3ca]



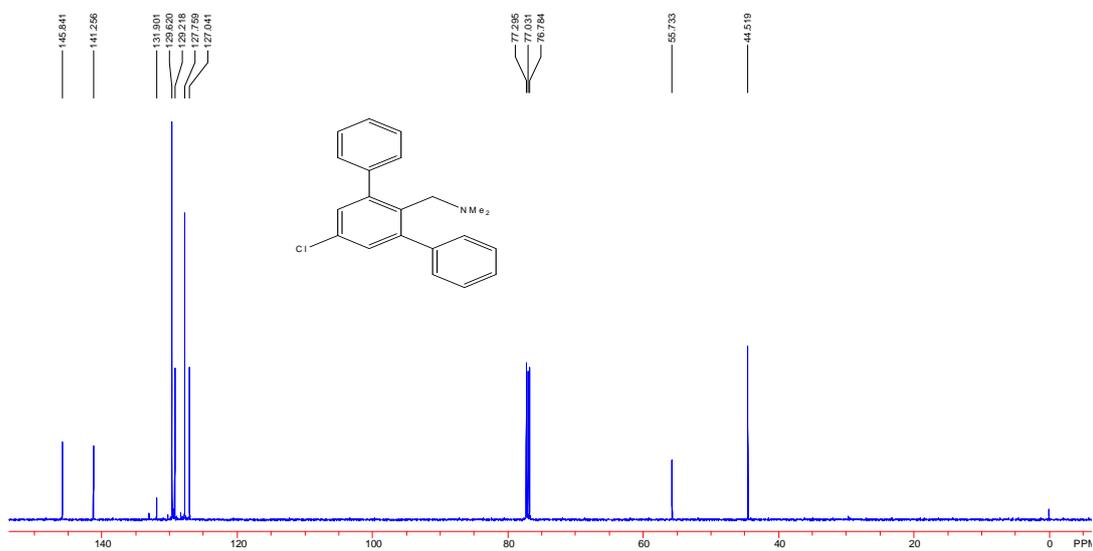
¹H NMR of 4-fluoro-2,6-diphenyl-*N,N*-dimethylbenzylamine [3da]



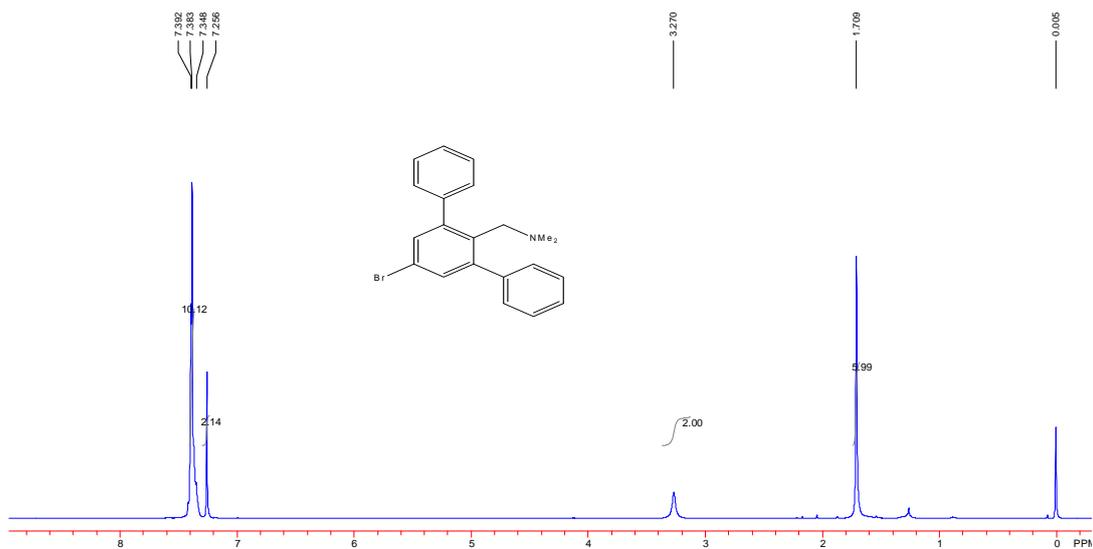
¹³C NMR of 4-fluoro-2,6-diphenyl-*N,N*-dimethylbenzylamine [3da]



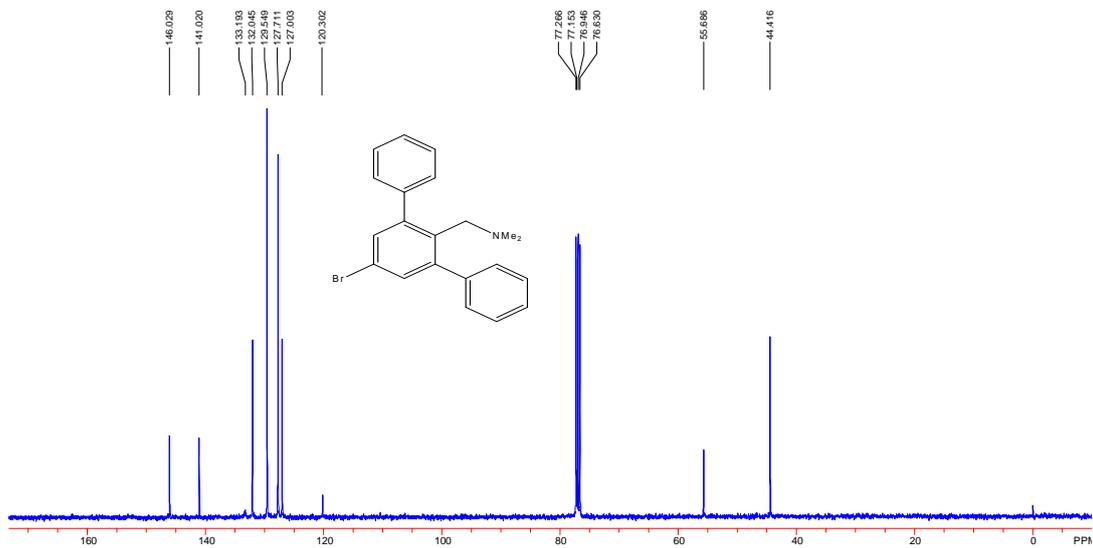
¹H NMR of 4-chloro-2,6-diphenyl-*N,N*-dimethylbenzylamine [3ea]



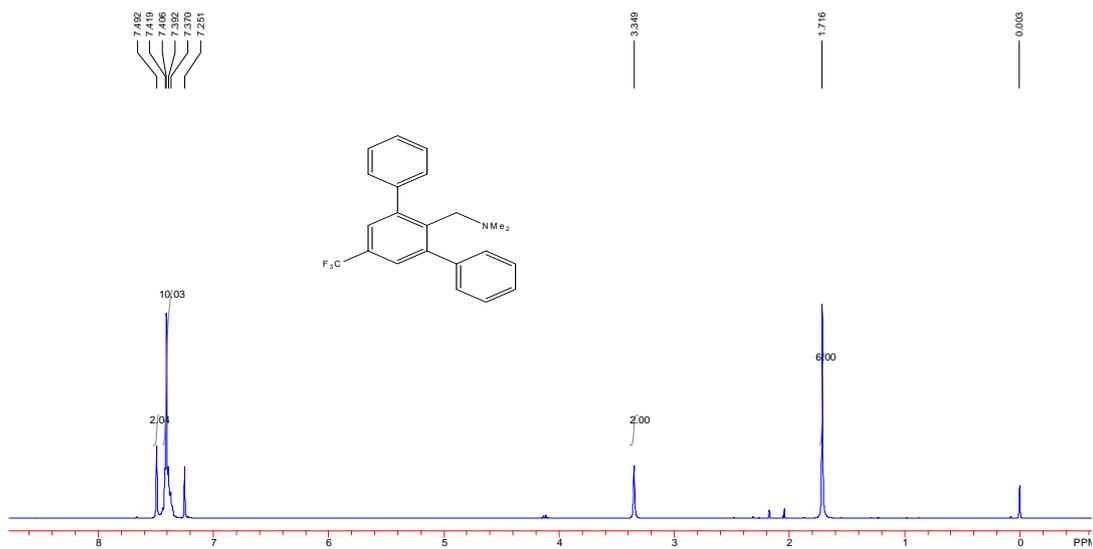
¹³C NMR of 4-chloro-2,6-diphenyl-*N,N*-dimethylbenzylamine [3ea]



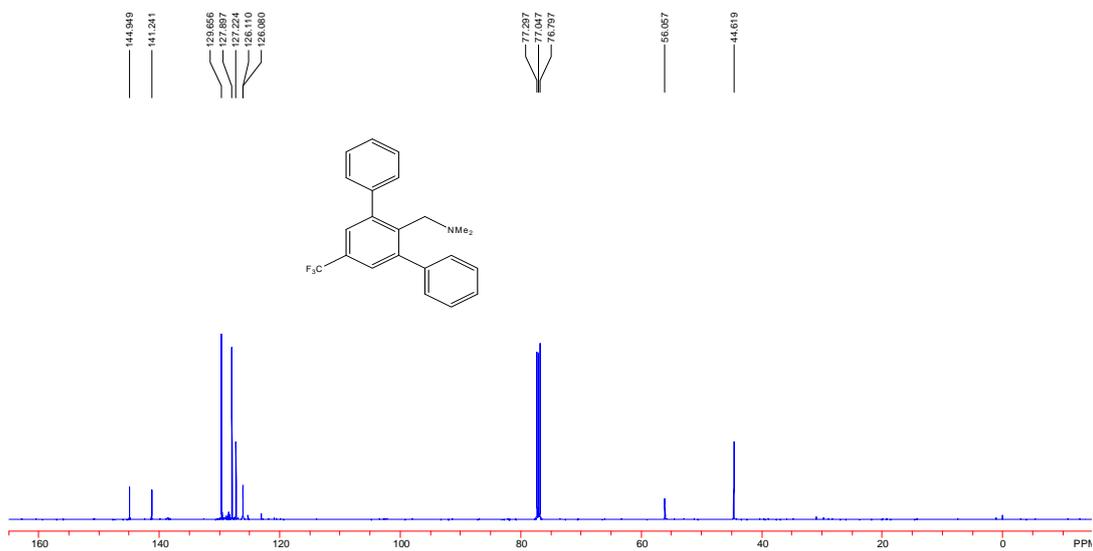
¹H NMR of 4-bromo-2,6-diphenyl-N,N-dimethylbenzylamine [3fa]



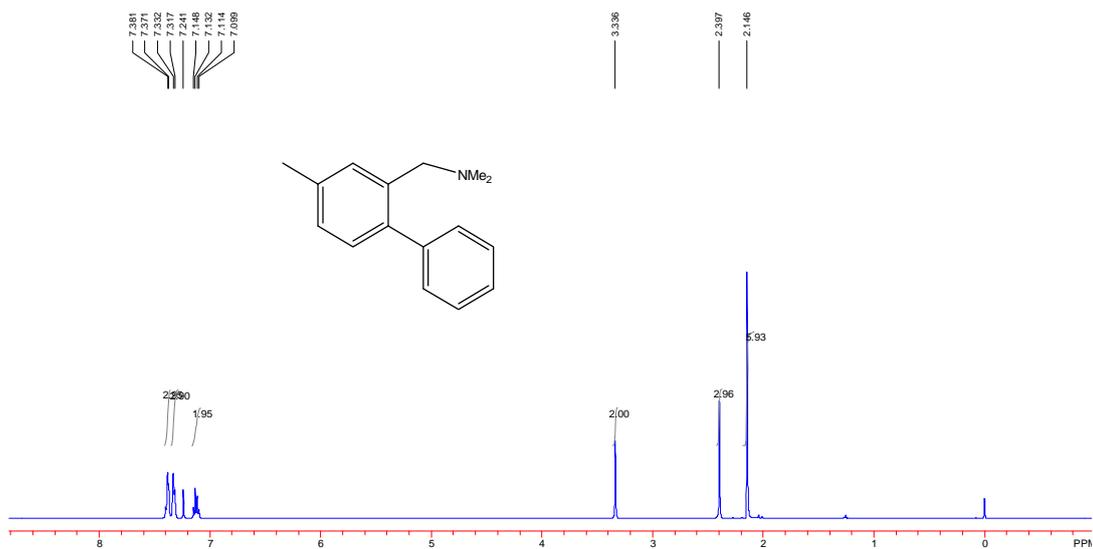
¹³C NMR of 4-bromo-2,6-diphenyl-N,N-dimethylbenzylamine [3fa]



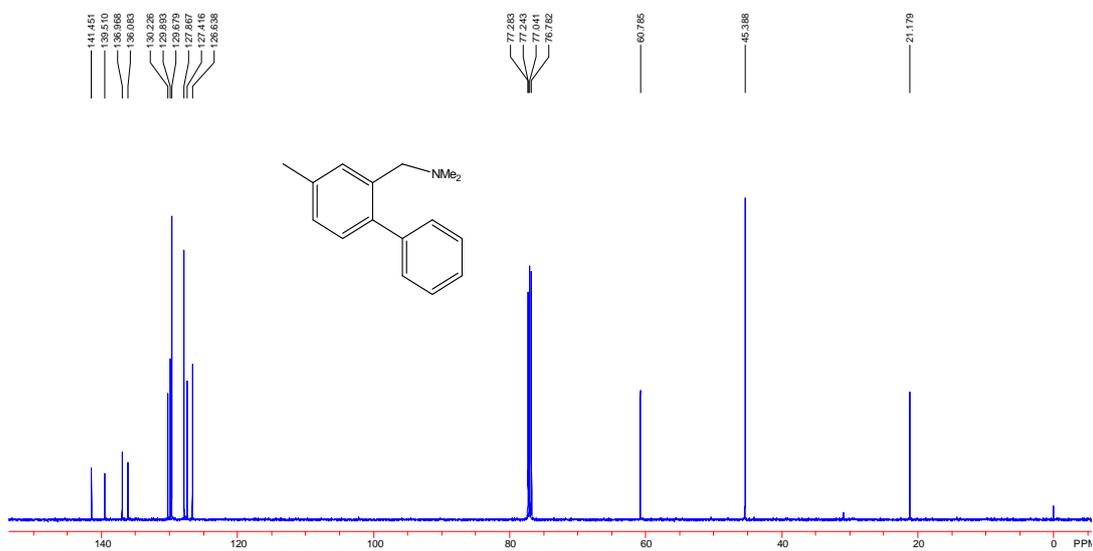
¹H NMR of 4-trifluoromethyl-2,6-diphenyl-*N,N*-dimethylbenzylamine [3ga]



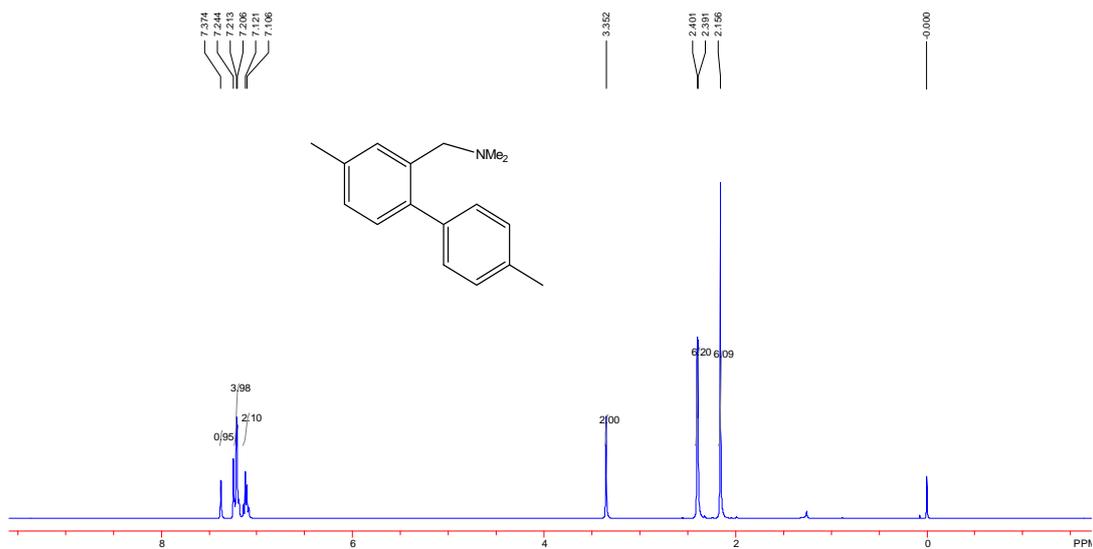
¹³C NMR of 4-trifluoromethyl-2,6-diphenyl-*N,N*-dimethylbenzylamine [3ga]

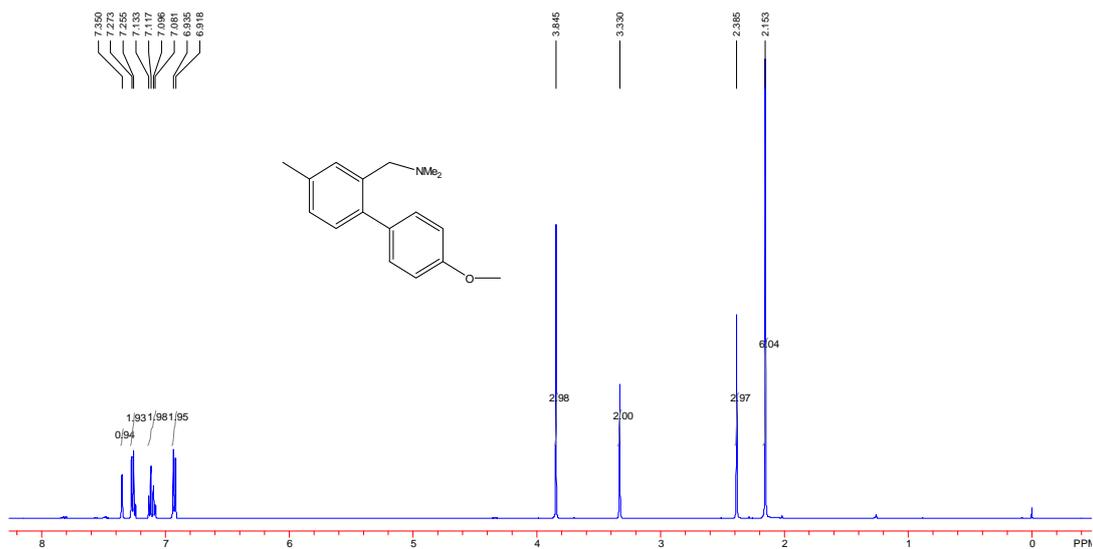


¹H NMR of *N,N*-dimethyl-1-(4-methylbiphenyl-2-yl)methanamine [3ha]

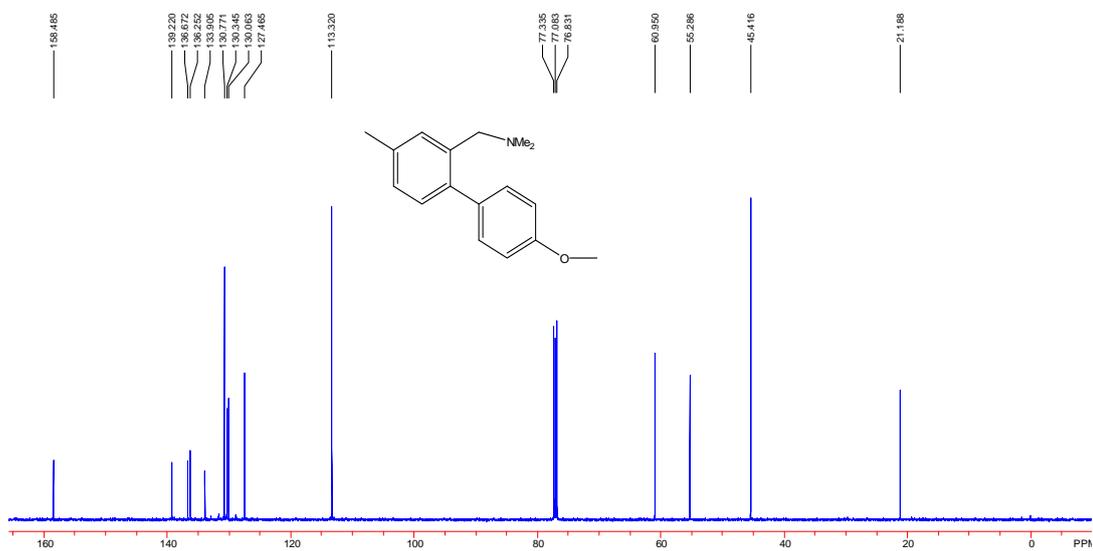


¹³C NMR of *N,N*-dimethyl-1-(4-methylbiphenyl-2-yl)methanamine [3ha]

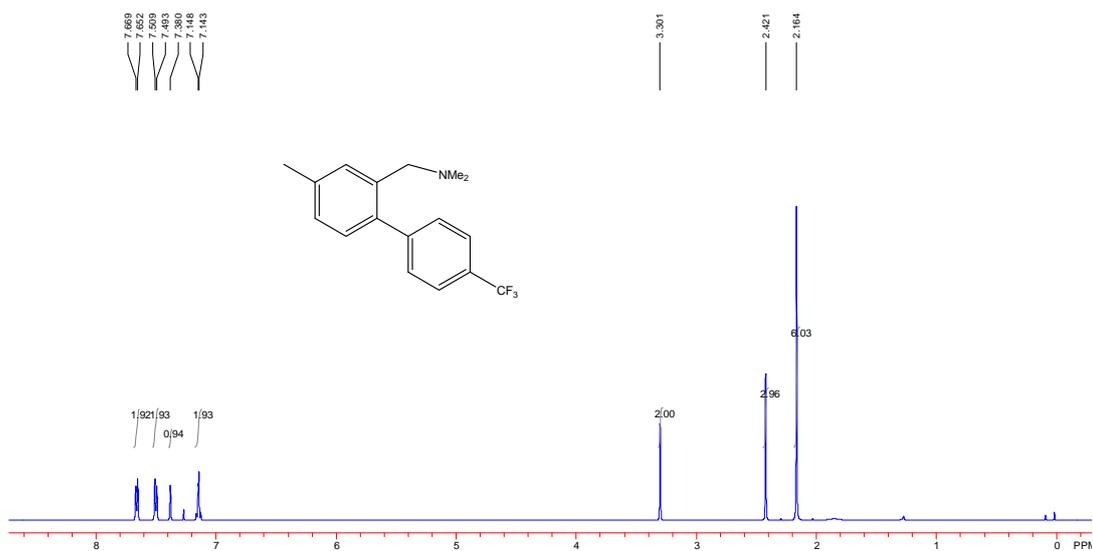




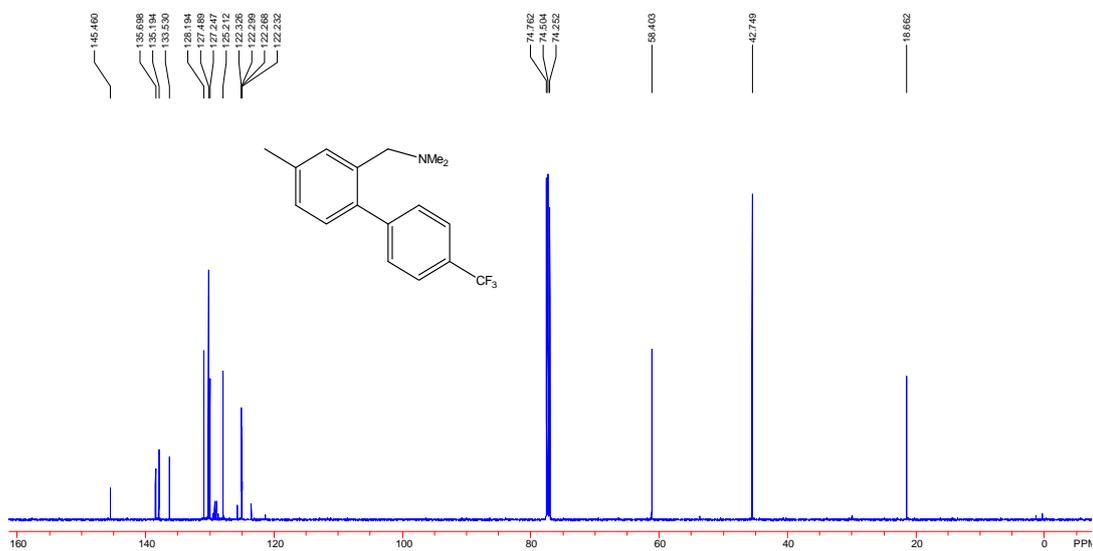
¹H NMR of 1-(4'-methoxy-4-methylbiphenyl-2-yl)-N,N-dimethylmethanamine [3hc]



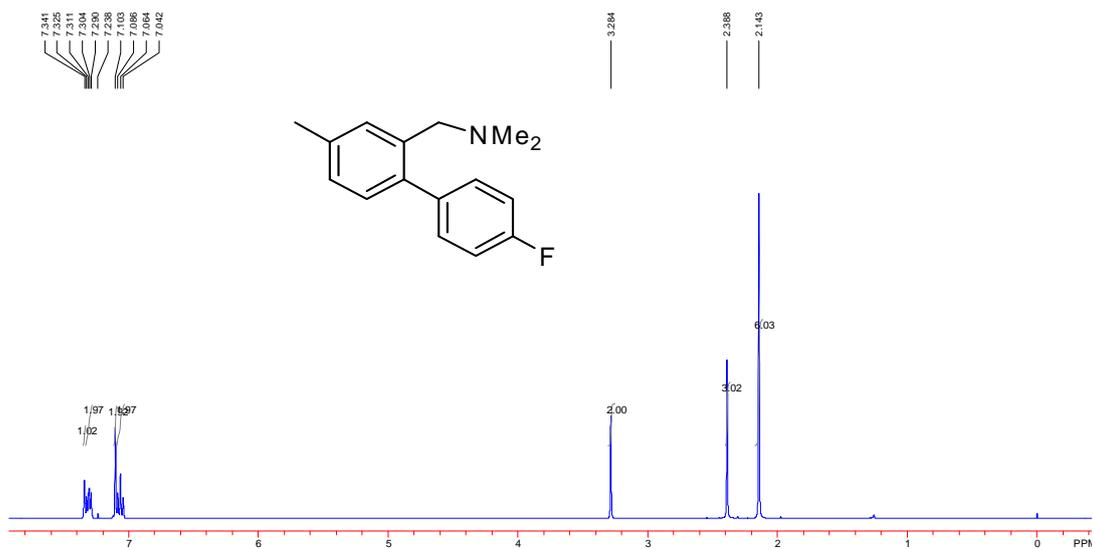
¹³C NMR of 1-(4'-methoxy-4-methylbiphenyl-2-yl)-N,N-dimethylmethanamine [3hc]



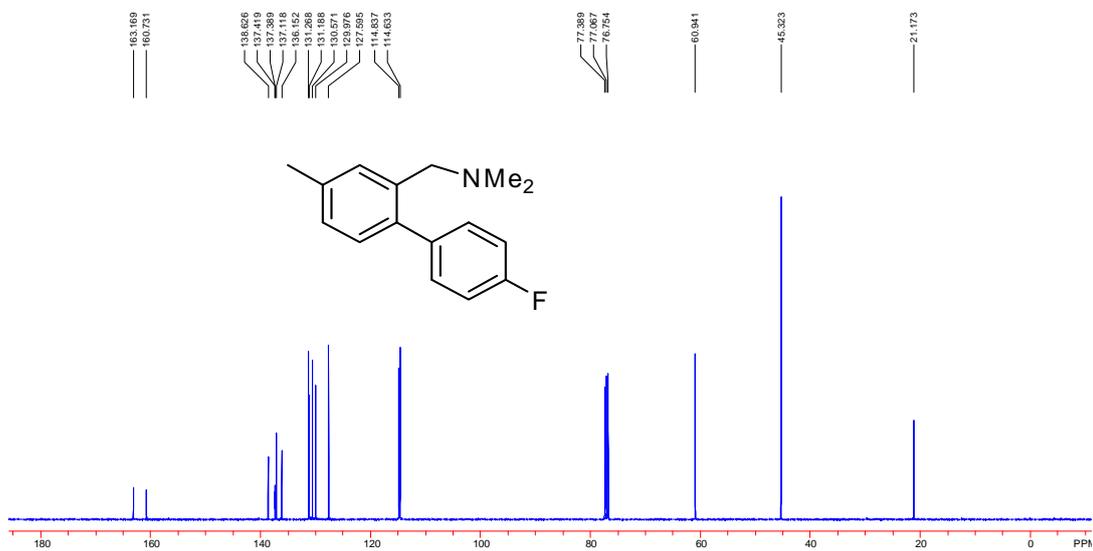
¹H NMR of *N,N*-dimethyl-1-(4-methyl-4'-(trifluoromethyl)biphenyl-2-yl)methanamine [3hd]



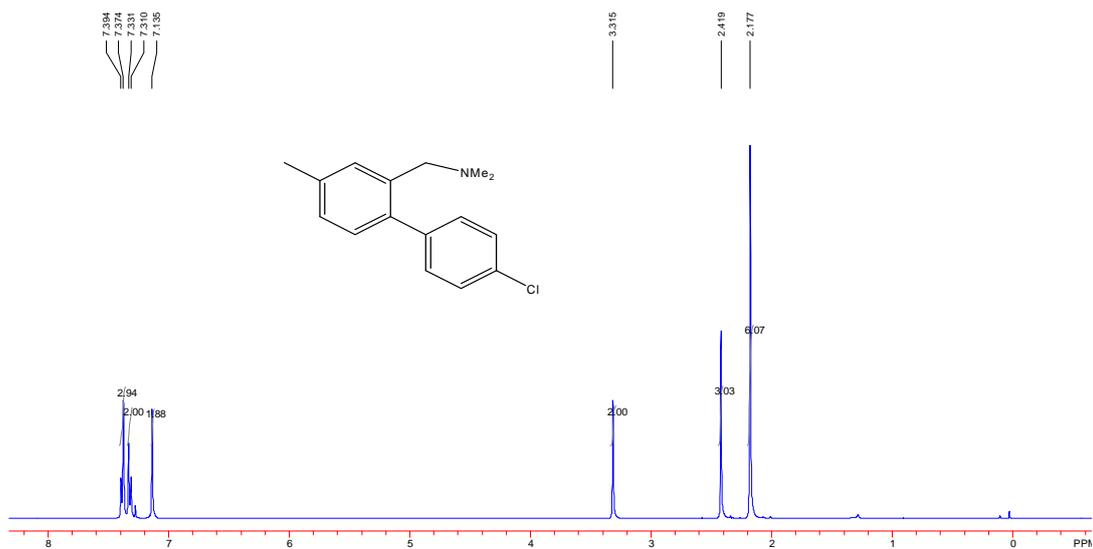
¹³C NMR of *N,N*-dimethyl-1-(4-methyl-4'-(trifluoromethyl)biphenyl-2-yl)methanamine [3hd]



¹H NMR of 1-(4'-fluoro-4-methylbiphenyl-2-yl)-N,N-dimethylmethanamine [3he]



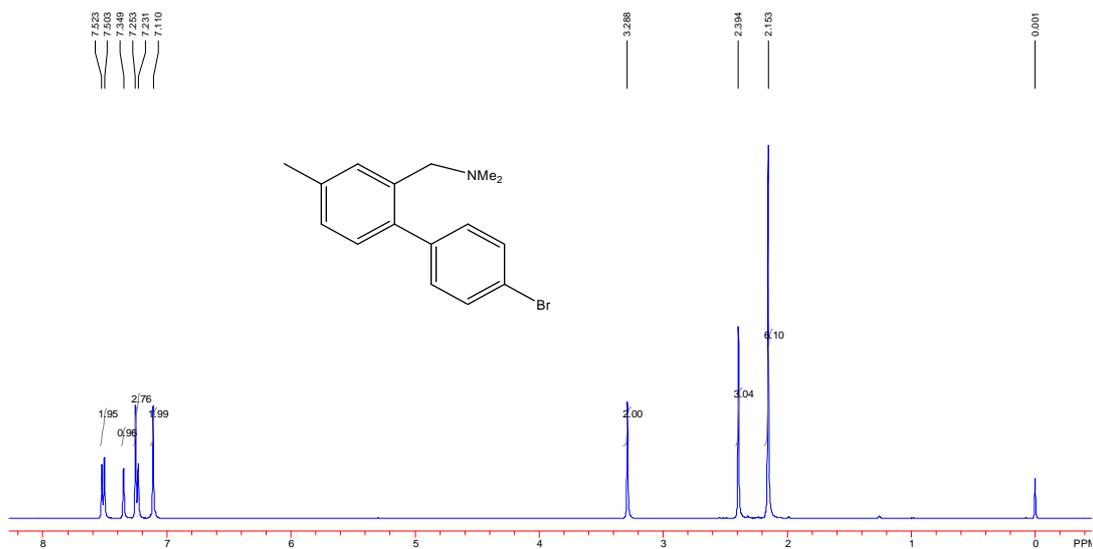
¹³C NMR of 1-(4'-fluoro-4-methylbiphenyl-2-yl)-N,N-dimethylmethanamine [3he]



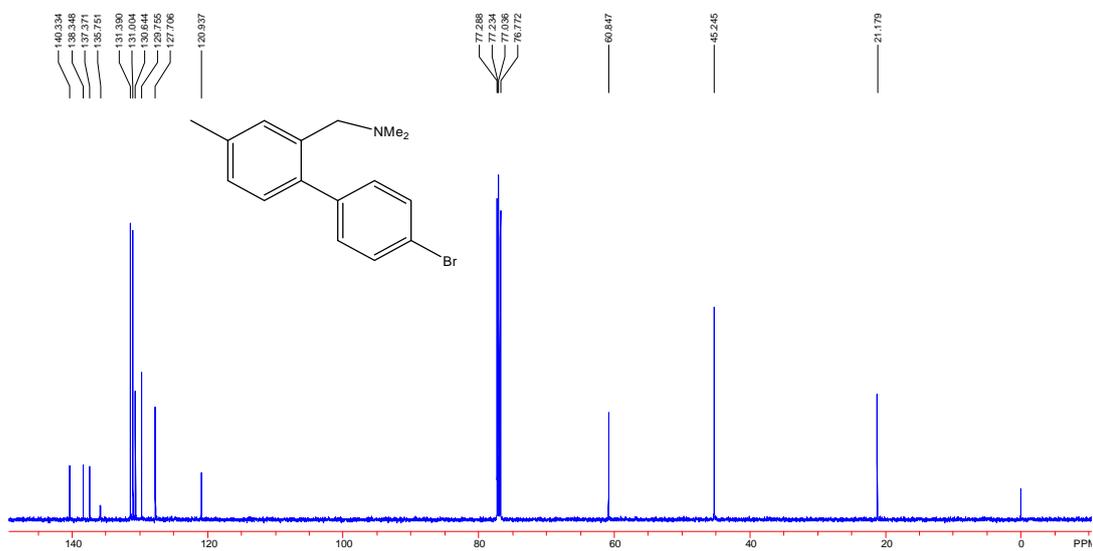
¹H NMR of 1-(4'-chloro-4-methylbiphenyl-2-yl)-N,N-dimethylmethanamine [3hf]



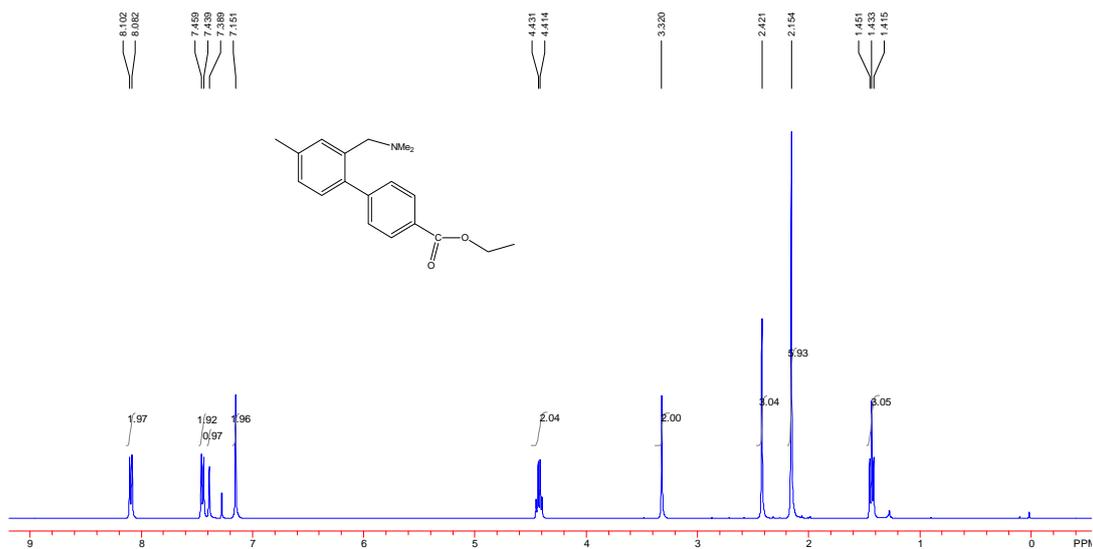
¹³C NMR of 1-(4'-chloro-4-methylbiphenyl-2-yl)-N,N-dimethylmethanamine [3hf]



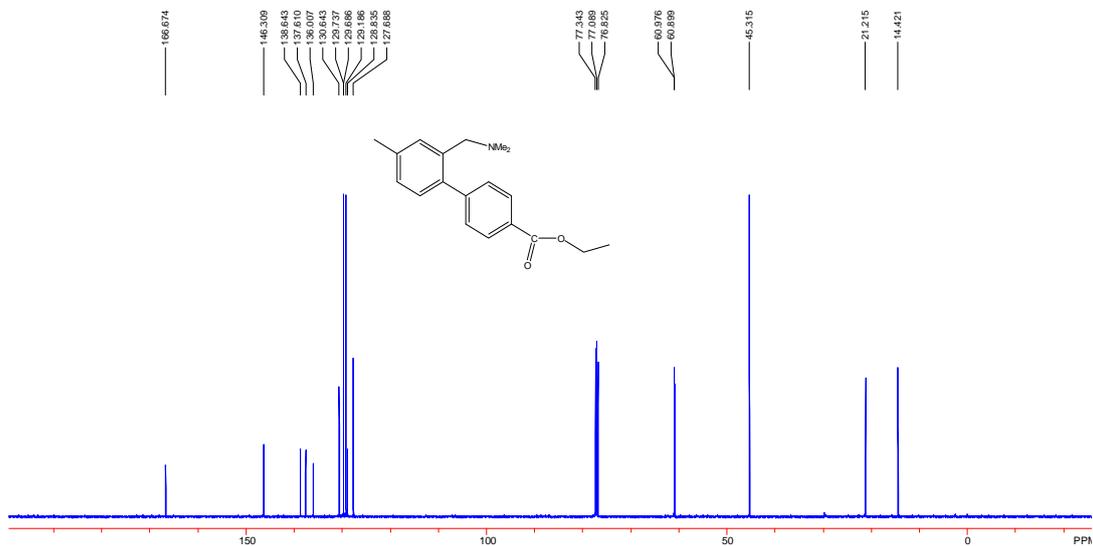
¹H NMR of 1-(4'-bromo-4-methylbiphenyl-2-yl)-N,N-dimethylmethanamine [3hg]



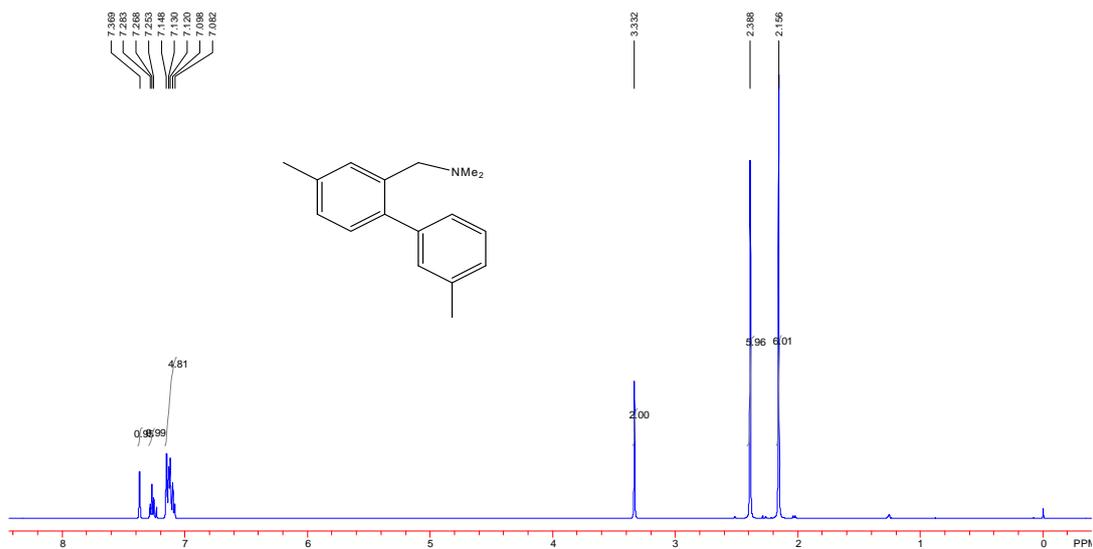
¹³C NMR of 1-(4'-bromo-4-methylbiphenyl-2-yl)-N,N-dimethylmethanamine [3hg]



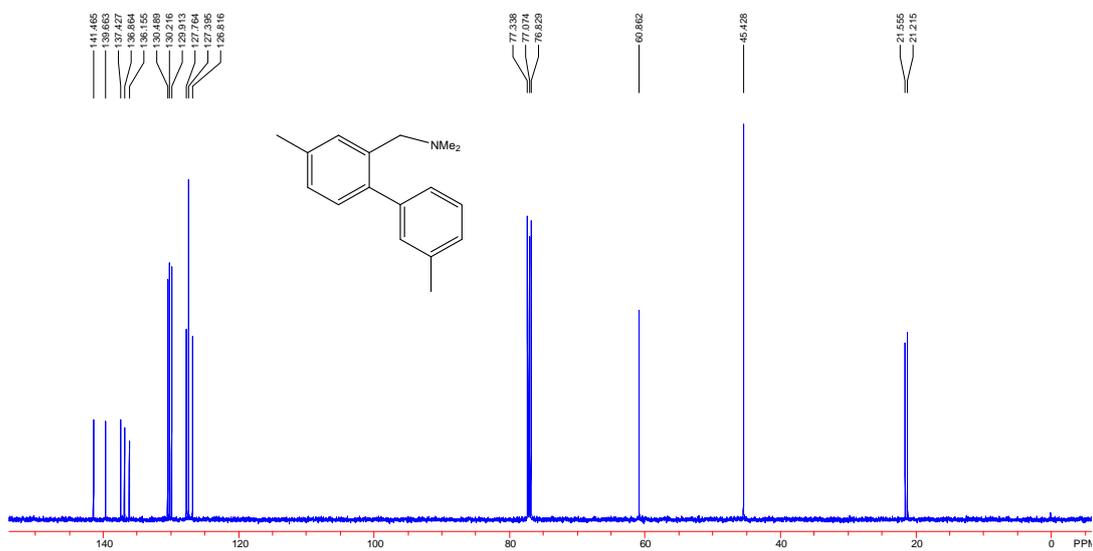
¹H NMR of ethyl 2'-((dimethylamino)methyl)-4'-methylbiphenyl-4-carboxylate [3hh]



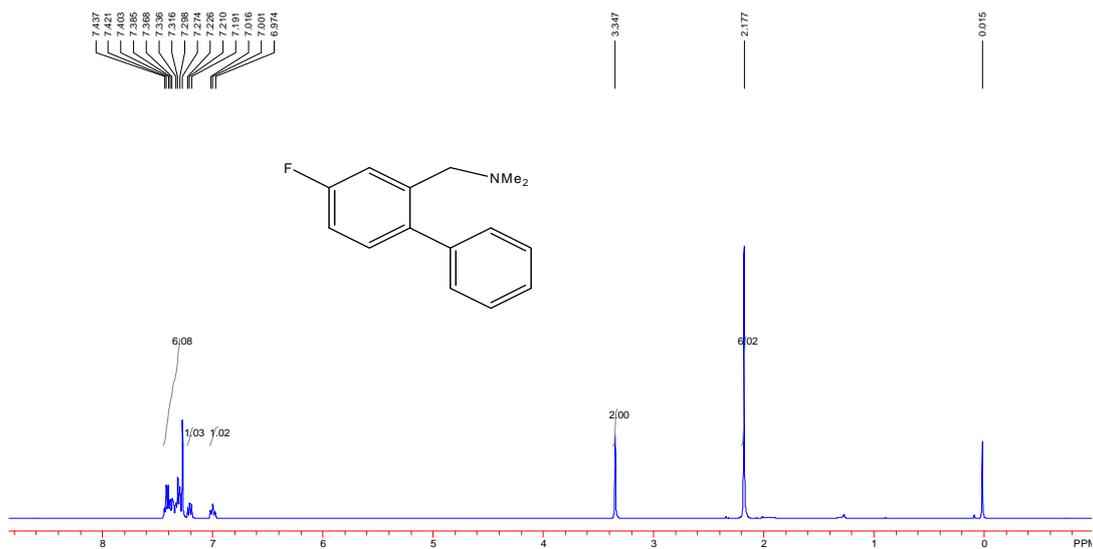
¹³C NMR of ethyl 2'-((dimethylamino)methyl)-4'-methylbiphenyl-4-carboxylate [3hh]



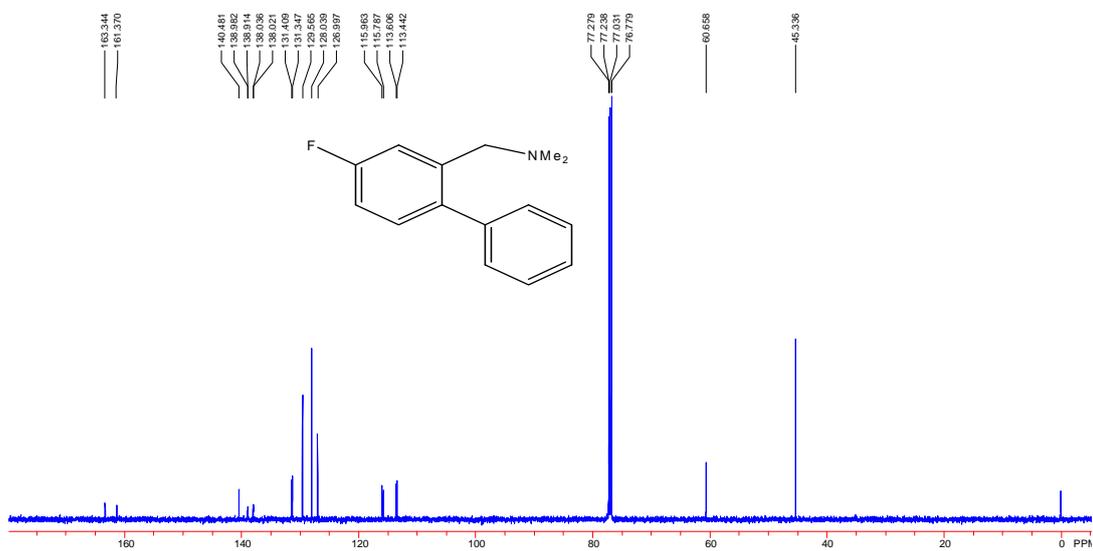
¹H NMR of 1-(3',4-dimethylbiphenyl-2-yl)-N,N-dimethylmethanamine [3hj]



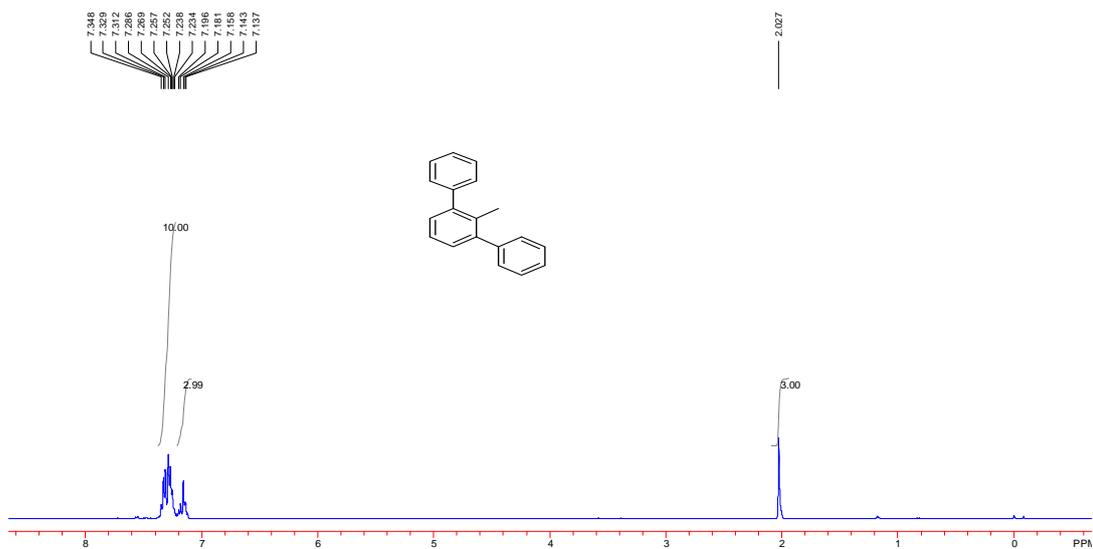
¹³C NMR of 1-(3',4-dimethylbiphenyl-2-yl)-N,N-dimethylmethanamine [3hj]



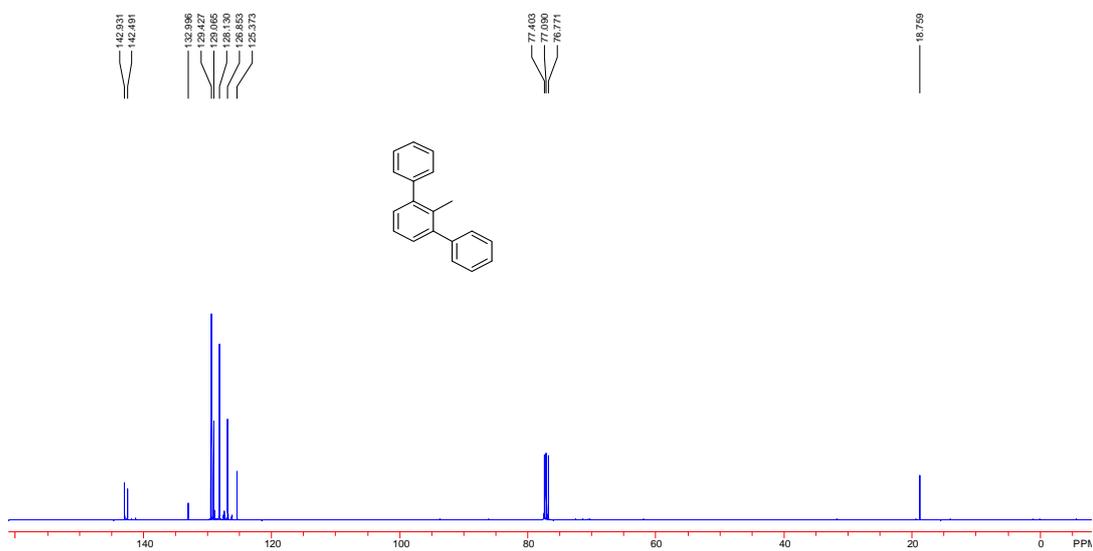
¹H NMR of 1-(4-fluorobiphenyl-2-yl)-N,N-dimethylmethanamine [3ia]



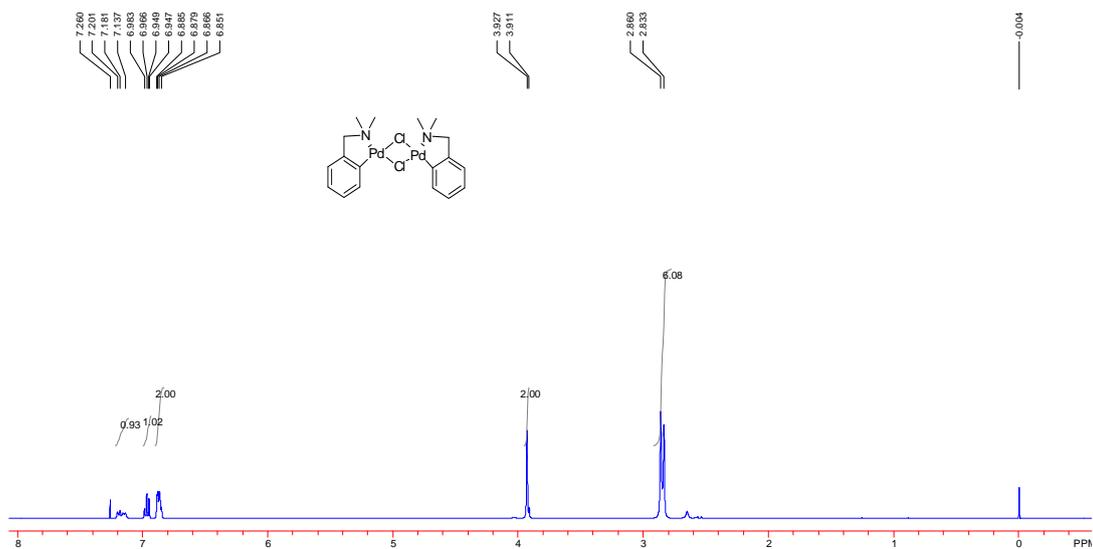
¹³C NMR of 1-(4-fluorobiphenyl-2-yl)-N,N-dimethylmethanamine [3ia]



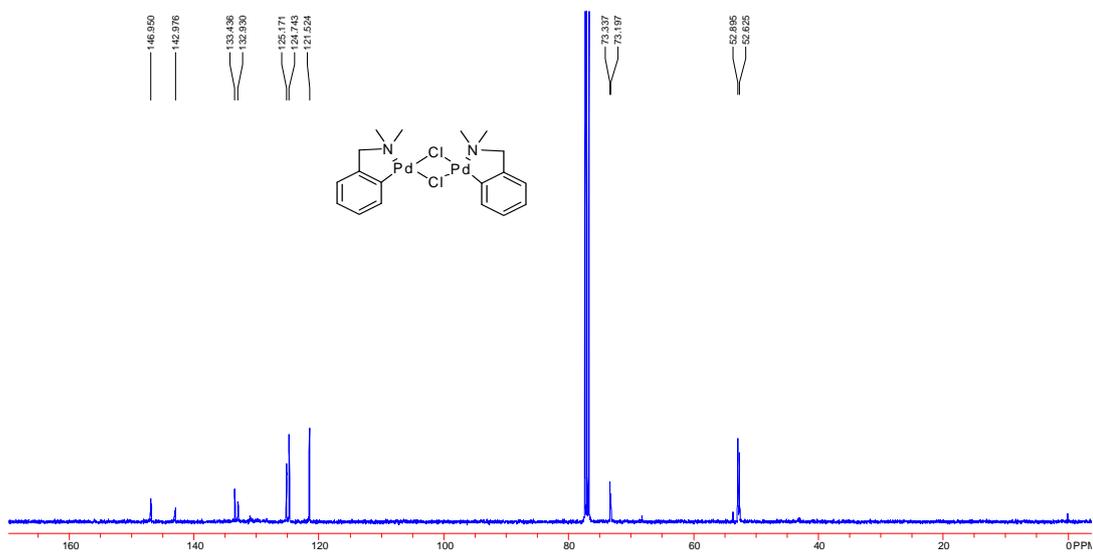
¹H NMR of 2'-Methyl-1,1':3,1''-terphenyl [4aa]



¹³C NMR of 2'-Methyl-1,1':3,1''-terphenyl [4aa]



¹H NMR of μ -(Dichloro)-bis(*N,N*-dimethylbenzylamine-*C,N*)dipalladium [5]



¹³C NMR of μ -(dichloro)-bis(*N,N*-dimethylbenzylamine-*C,N*)dipalladium [5]