SUPPORTING INFORMATION

Nickel-Catalyzed C(sp^3)−H Arylation of Diarylmethane Derivatives with Aryl Fluorides

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High-throughput Experimentation Screenings

Experiments were set up in a glove box under a nitrogen atmosphere. A 24-well aluminum block containing 1 mL glass vials was dosed with $Ni(COD)_2$ (1 μmol) and IMes (2 μmol) in THF and the solvent was removed to dryness using a GeneVac. Next, six different bases (30 μmol) were added to each vial in THF followed by removal of the volatile materials using the GeneVac. Next a parylene stir bar was added to each reaction vial. Then 4-fluorobiphenyl (10 μmol/reaction) and 4-benzylpyridine (12 μmol/reaction) were dosed into each reaction vial as a solution in each solvent (100 μL). The 24-well plate was then sealed and stirred for 16 h at 100 ^{o}C.

Work up: The plate was first cooled to room temperature. Upon opening the plate to air, 500 μL of acetonitrile containing 4,4'-di-*tert*bytuylbiphenyl (1.0 μmol, used as an internal standard to measure UPLC yields) was added into each vial. The plate was covered again and the vials stirred for 10 min to ensure good homogenization. Into a separate 96-well LC block was added 700 μL of acetonitrile, followed by 25 μL of the diluted reaction mixtures. The LC block was then sealed with a silicon-rubber storage mat and put on an automated UPLC instrument for analysis.

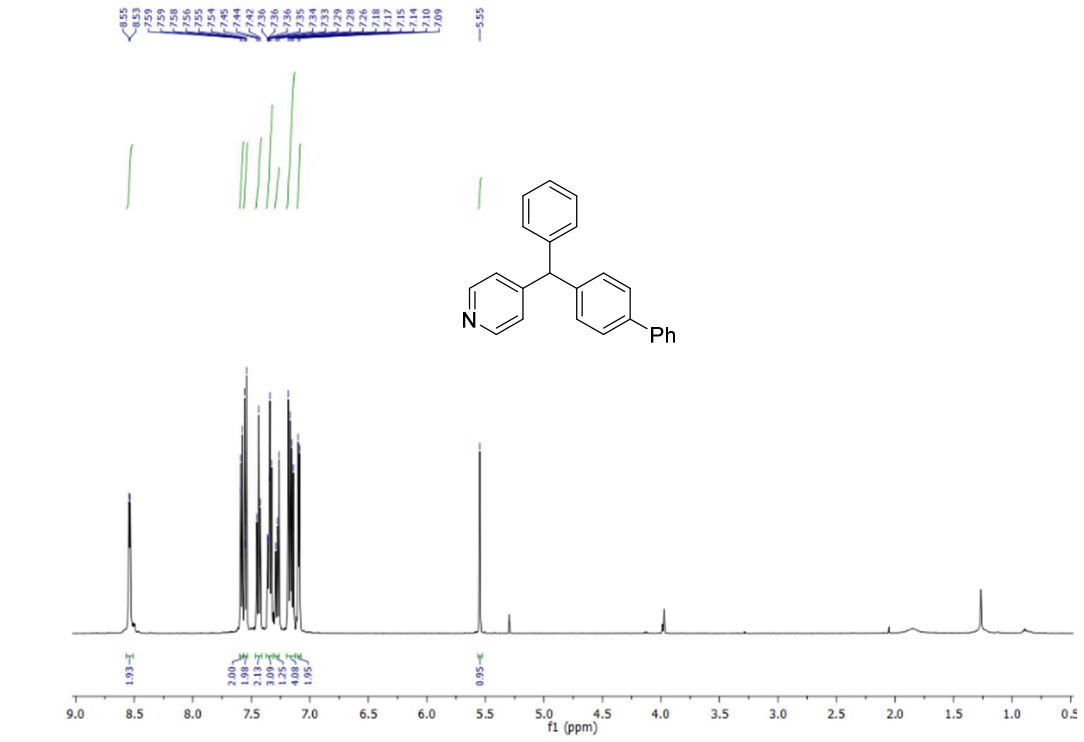
Base: $LiN(SiMe_3)_2$, $NaN(SiMe_3)_2$, $KN(SiMe_3)_2$, LiO^tBu, NaO^tBu, KO^tBu.

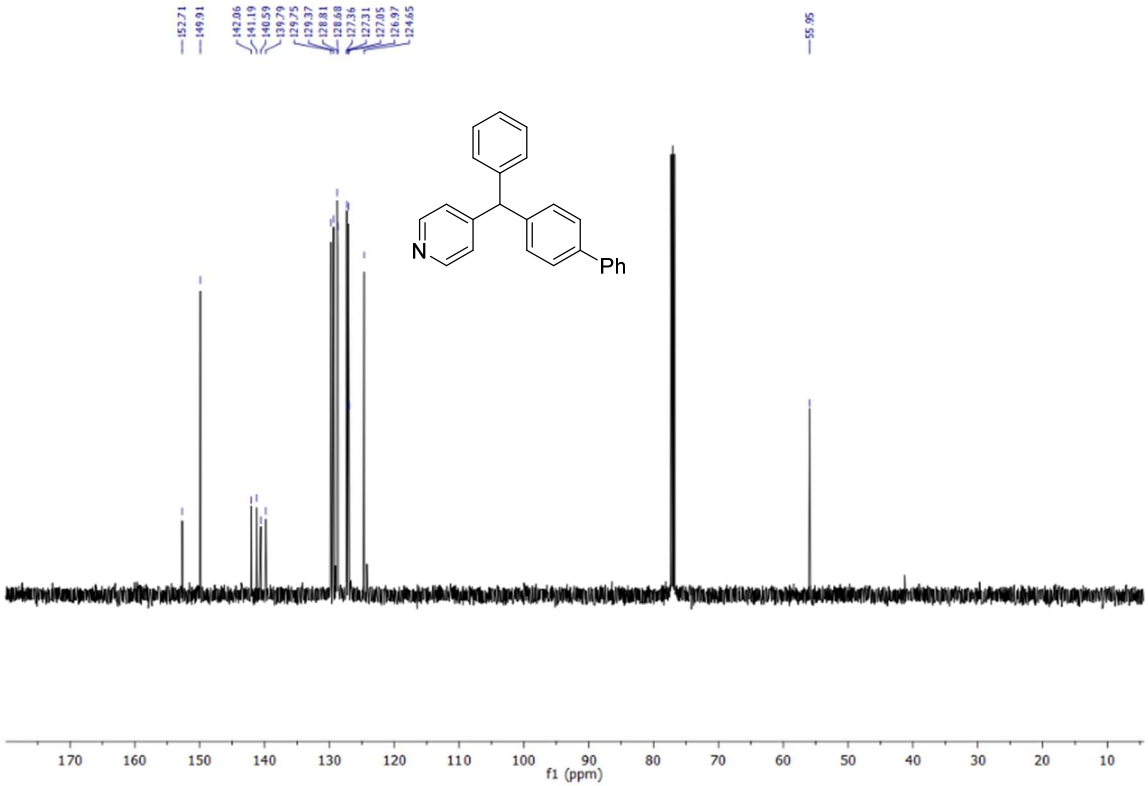
Solvent: toluene, DME (dimethoxyethane), CPME (cyclopentyl methyl ether), dioxane.

Well	Base	Solvent	Prod/IS[a]
A01	$LiN(SiMe_3)_2$	toluene	0.10
B01		DME	0.67
C01		CPME	2.51
D01		dioxane	0.10
A02	$NaN(SiMe_3)_2$	toluene	2.84
B02		DME	0.56
C02		CPME	2.83
D02		dioxane	1.82
A03	$KN(SiMe_3)_2$	toluene	0
B03		DME	0.44
C03		CPME	0.12
D03		dioxane	0.12
A04	LiO^tBu	toluene	0
B04		DME	0.55
C04		CPME	0.04

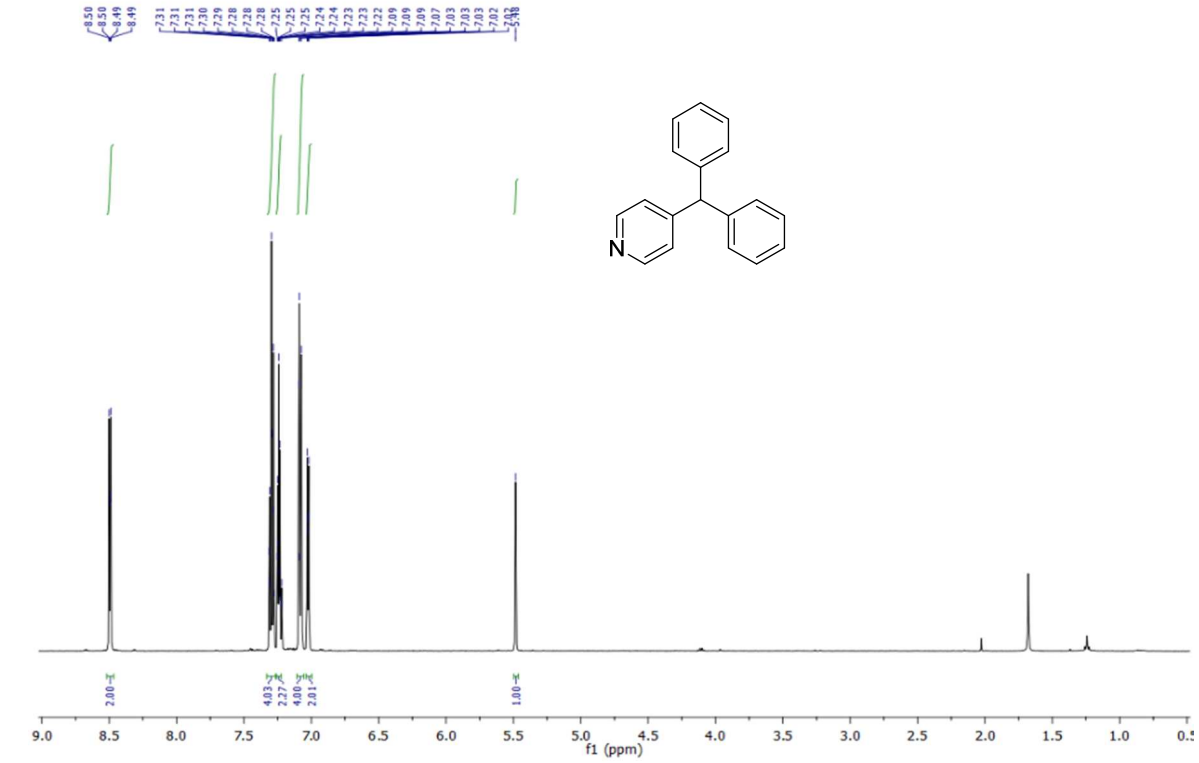
D04		dioxane	0
A05	NaO^tBu	toluene	0.55
B05		DME	1.12
C05		CPME	0.05
D05		dioxane	0.05
A06	KO^tBu	toluene	0.12
B06		DME	0.13
C06		CPME	0.13
D06		dioxane	0.17

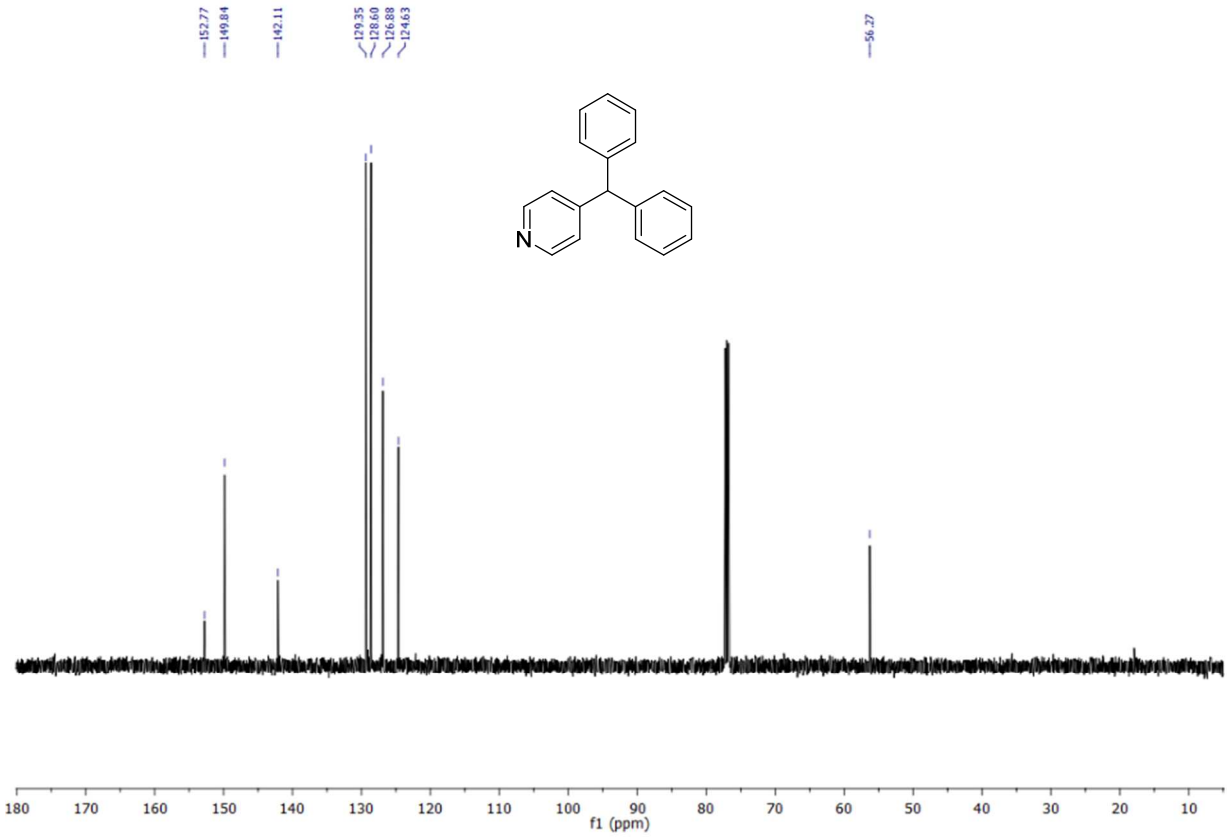
^{1}H and ^{13}C NMR Spectra of compound 3aa





^{1}H and ^{13}C NMR Spectra of compound 3ab





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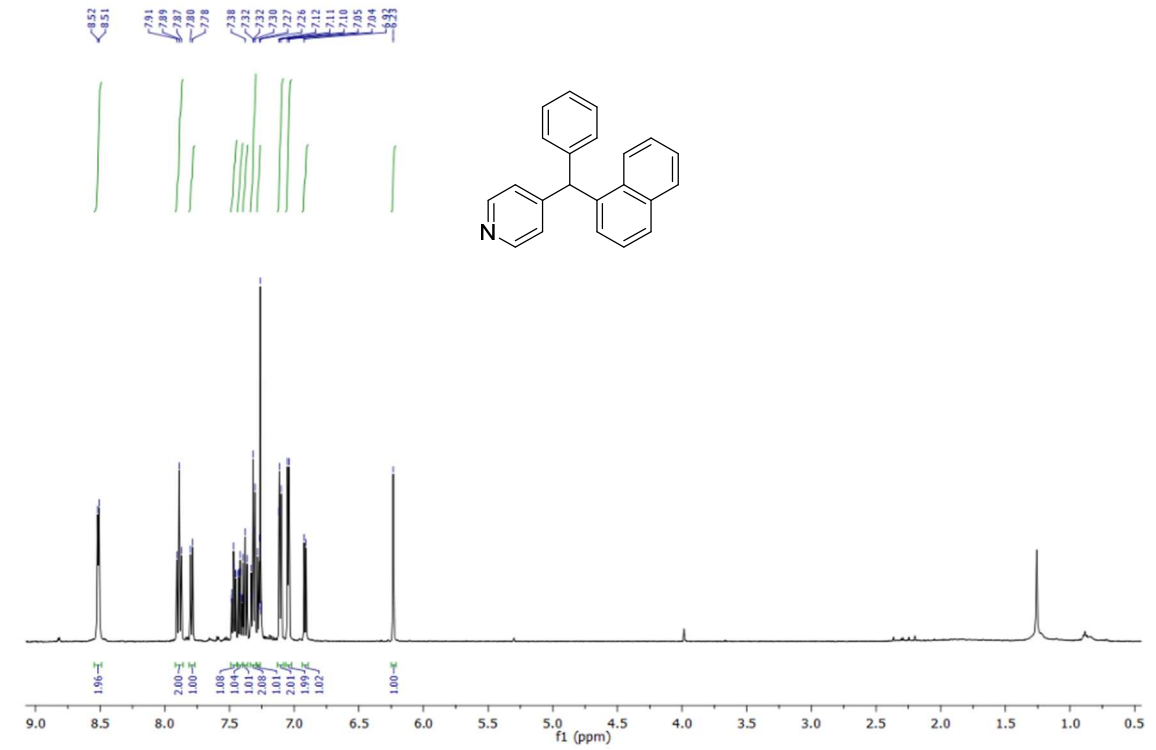

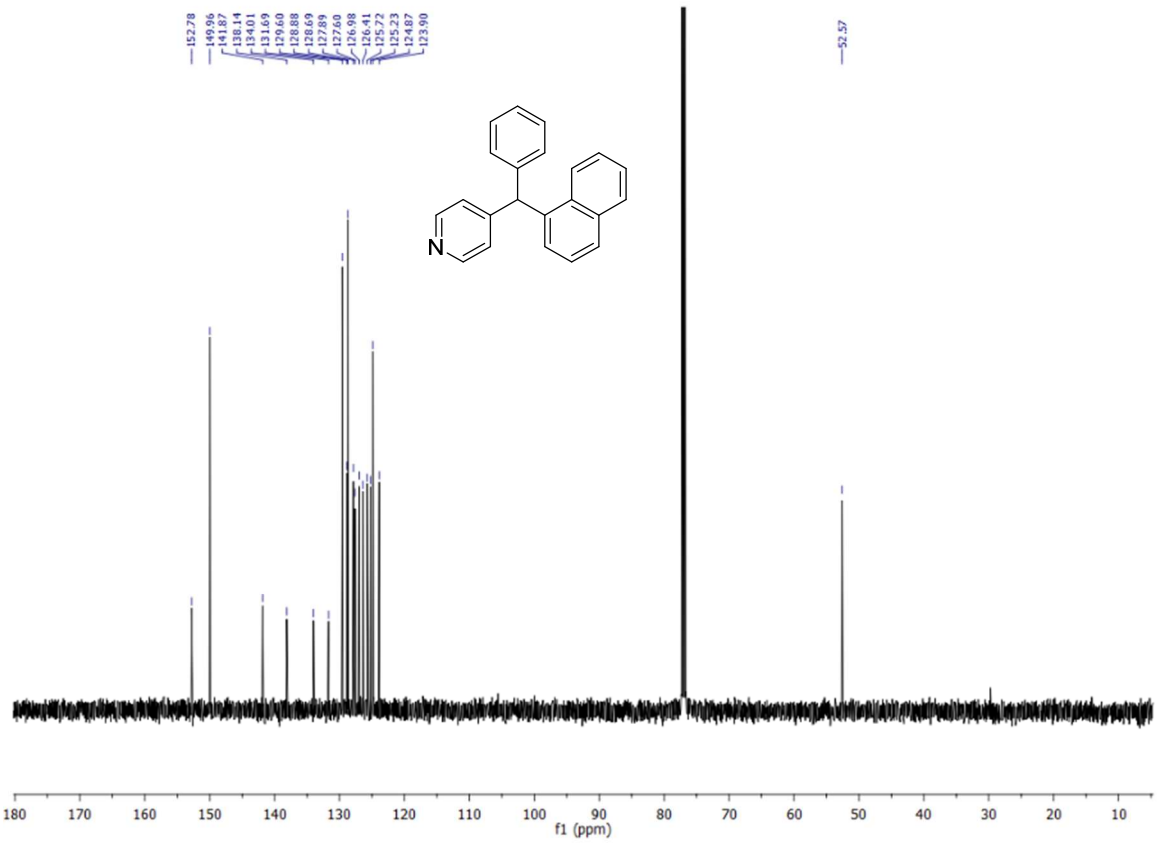

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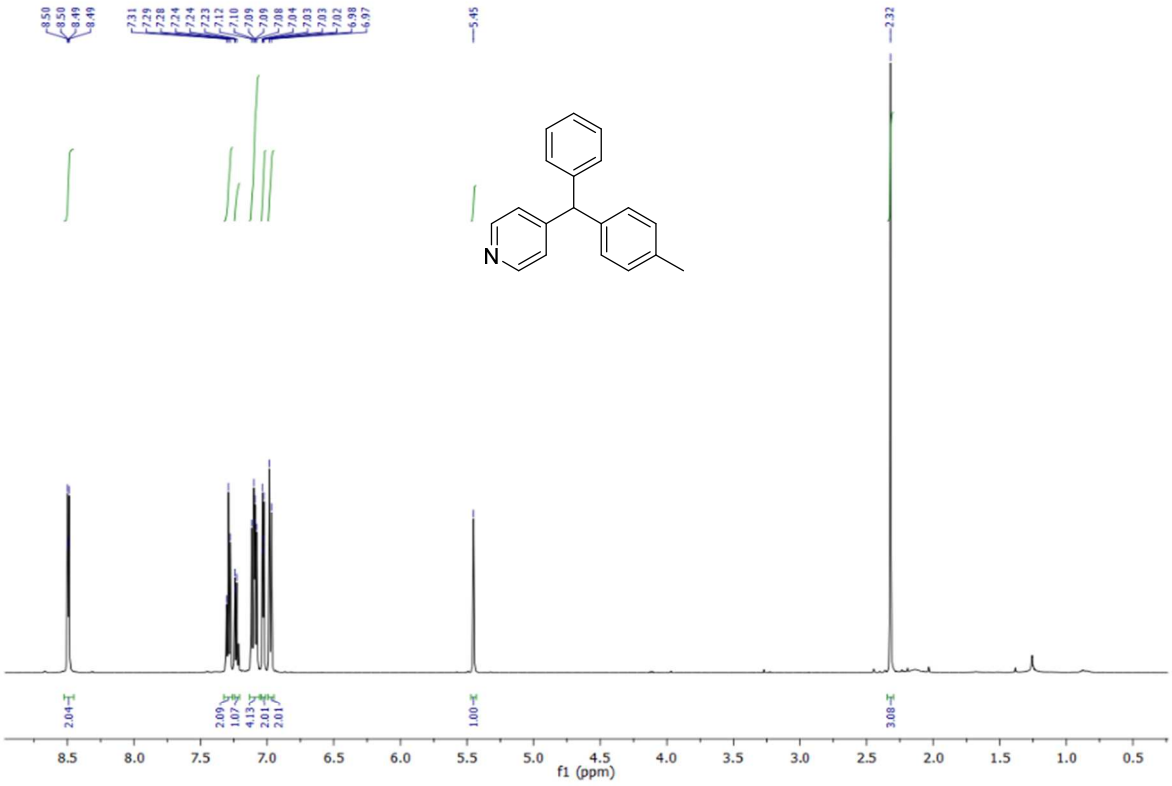
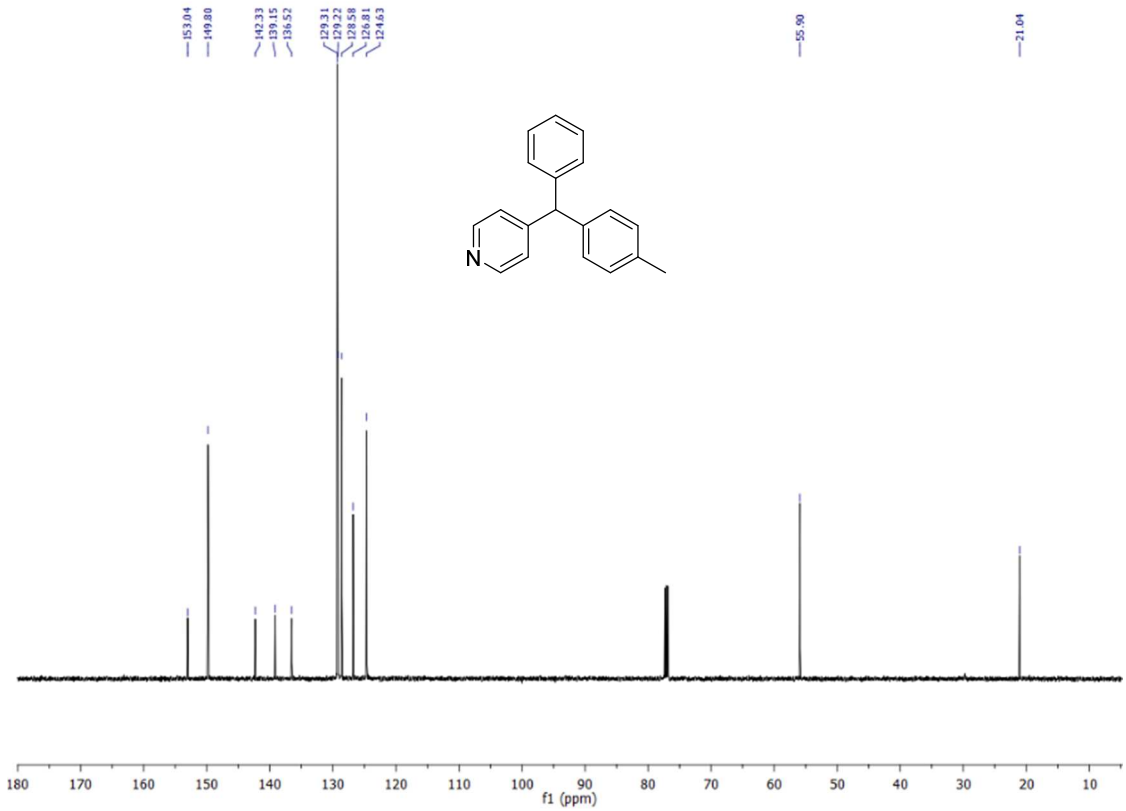
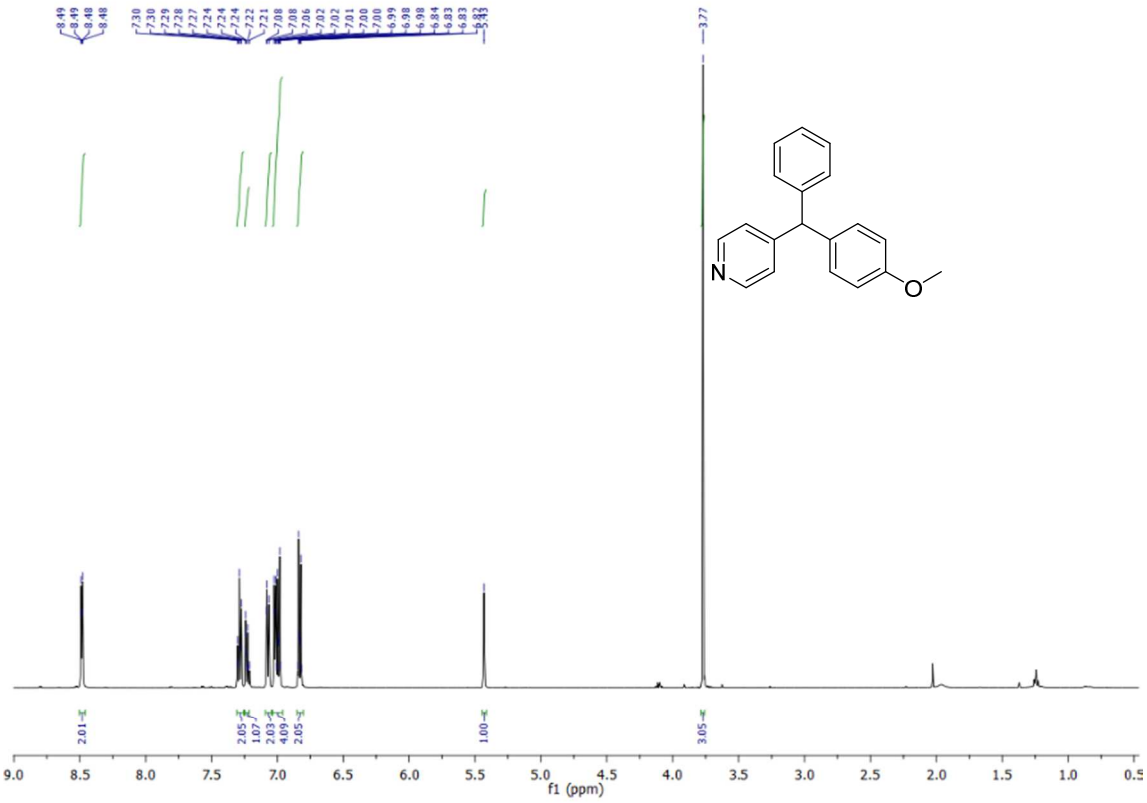
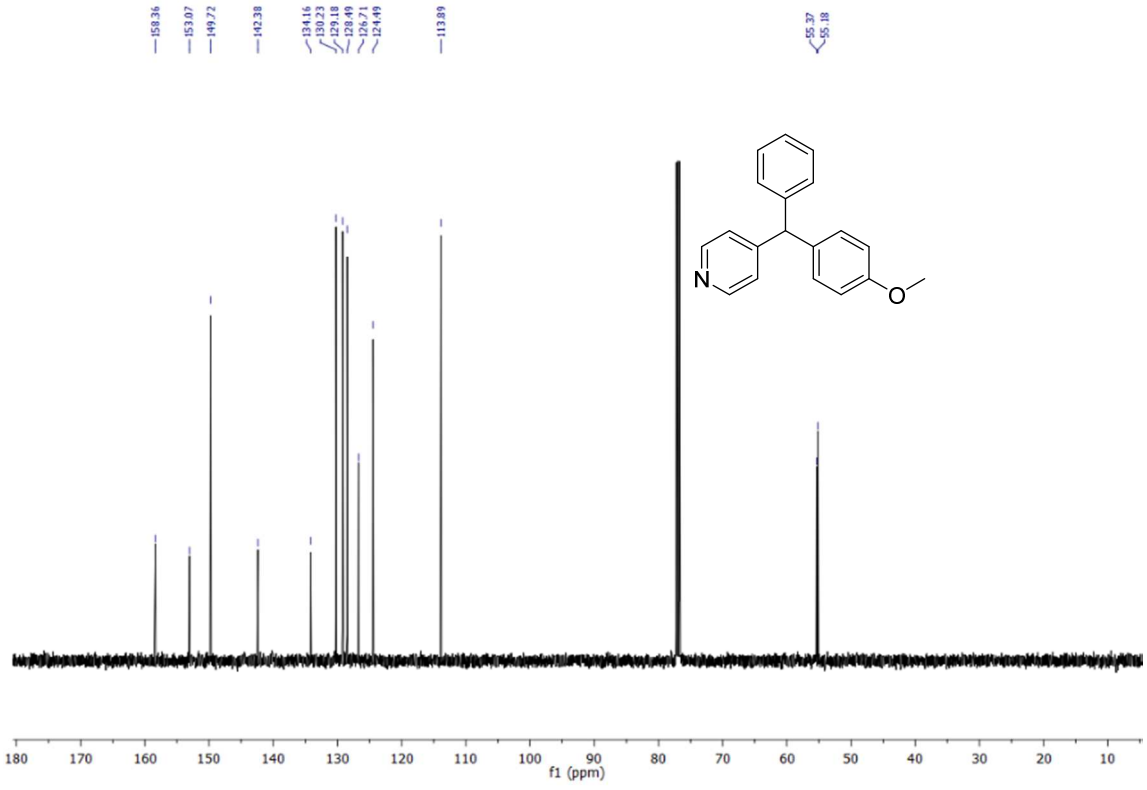




^{1}H and ^{13}C NMR Spectra of compound 3ae





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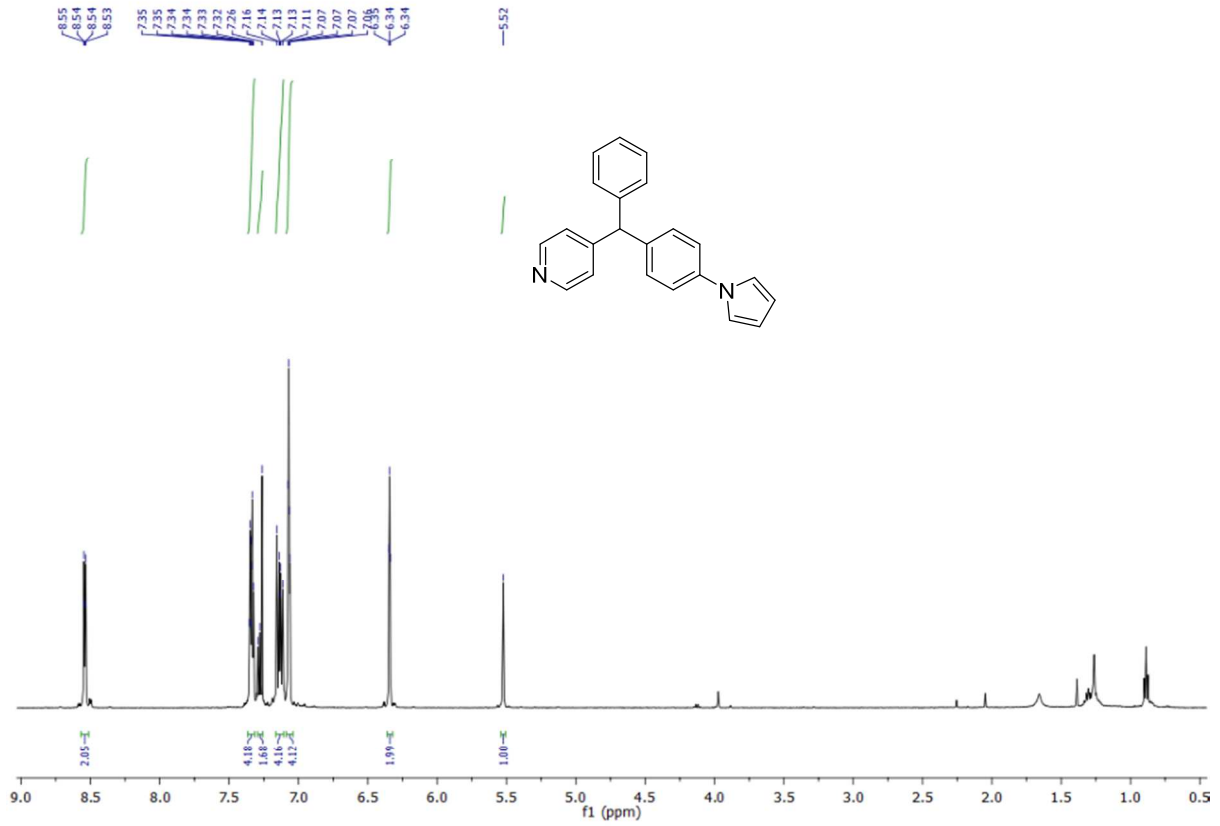

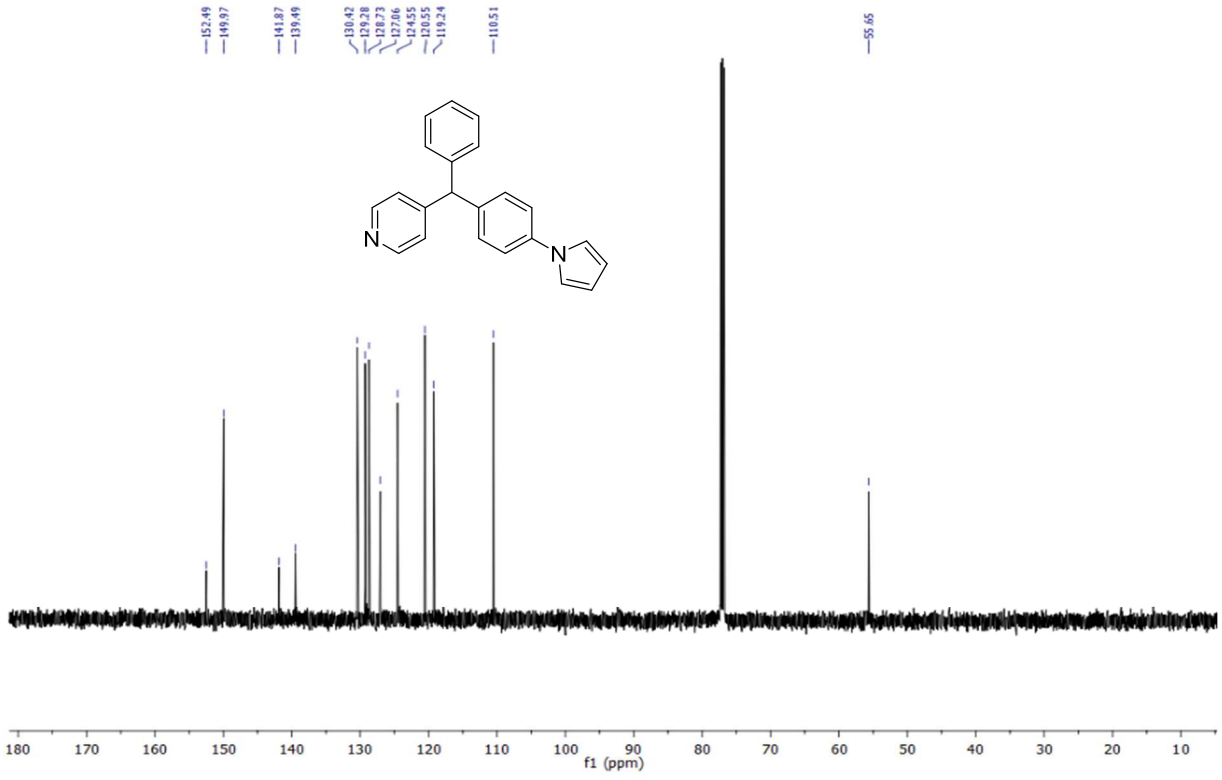

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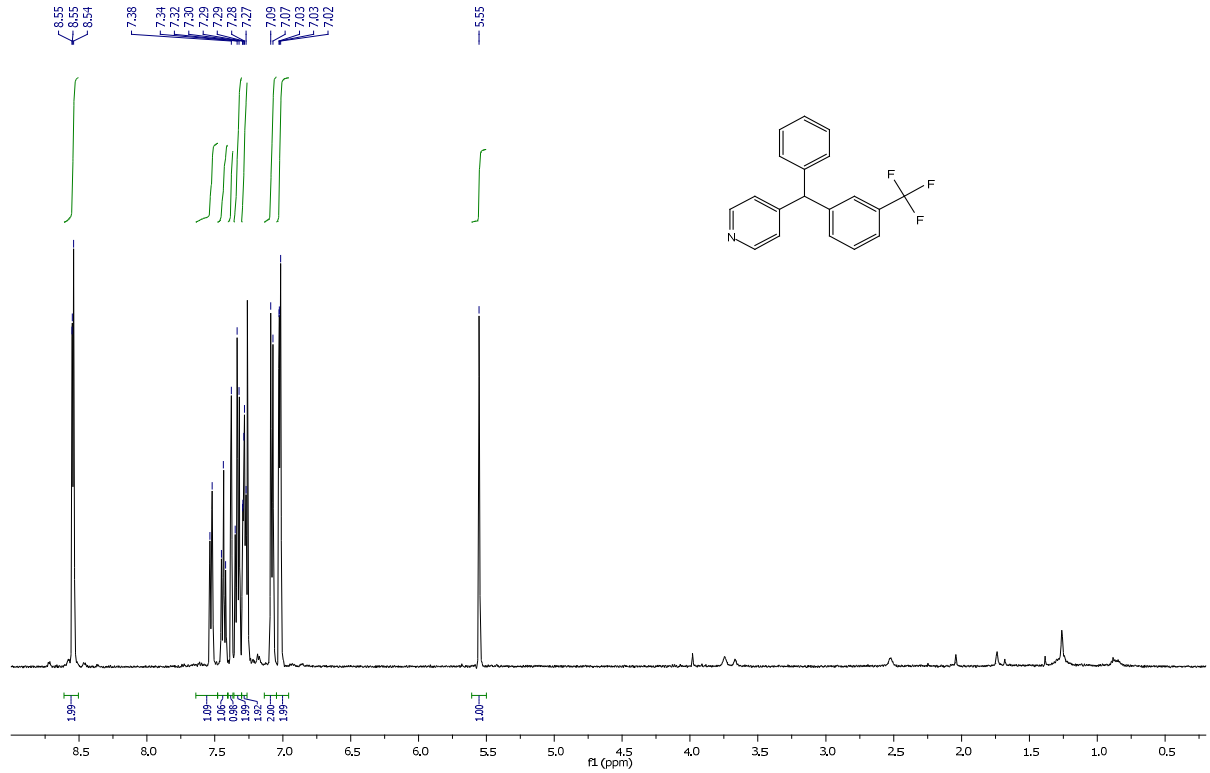
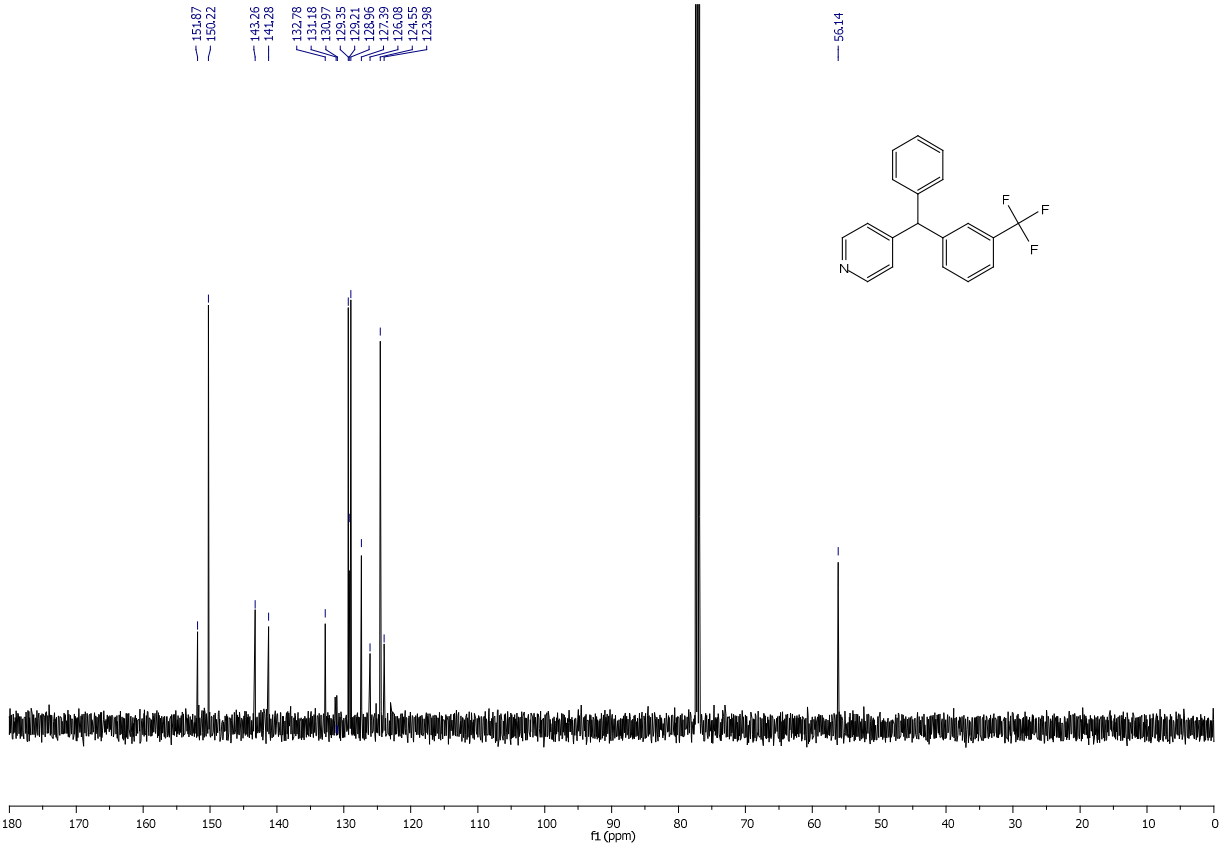
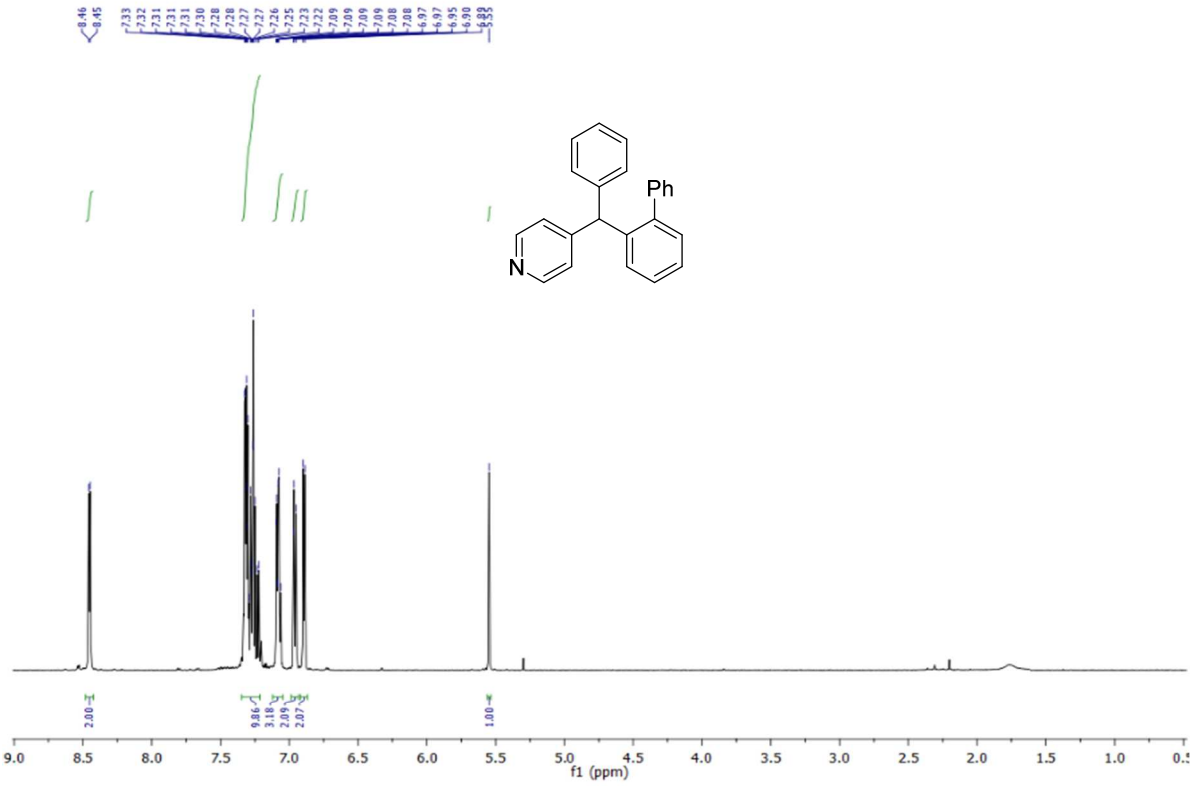
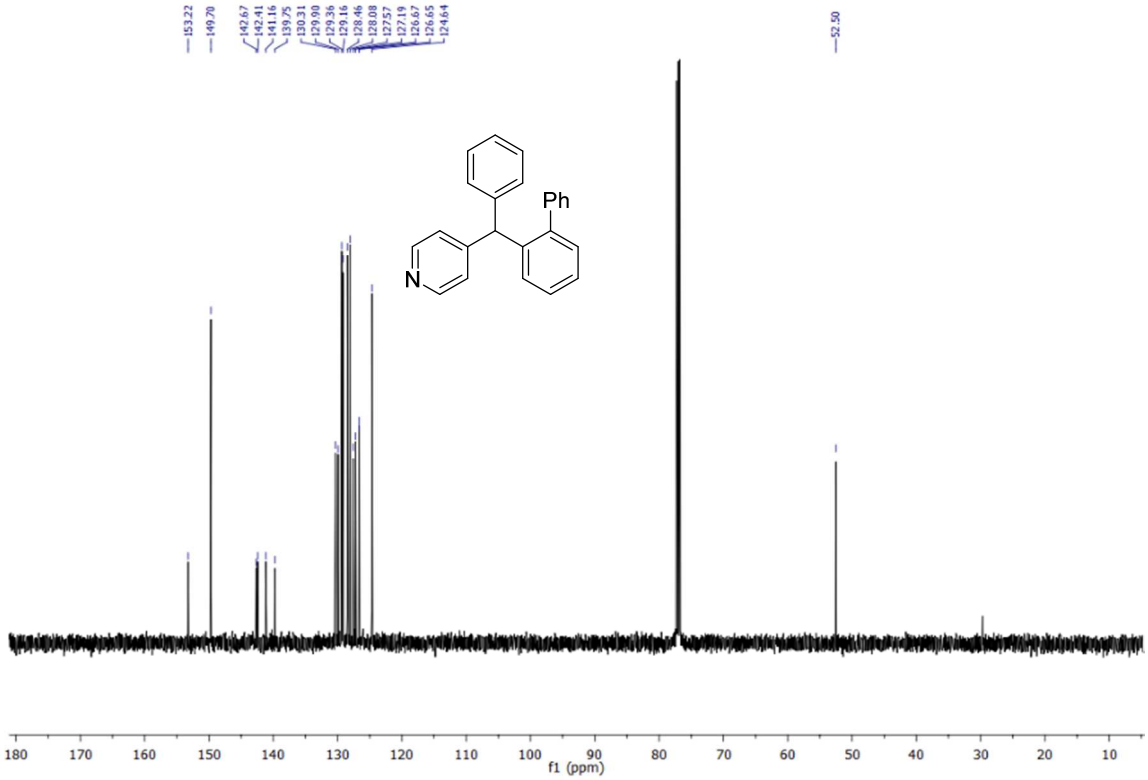


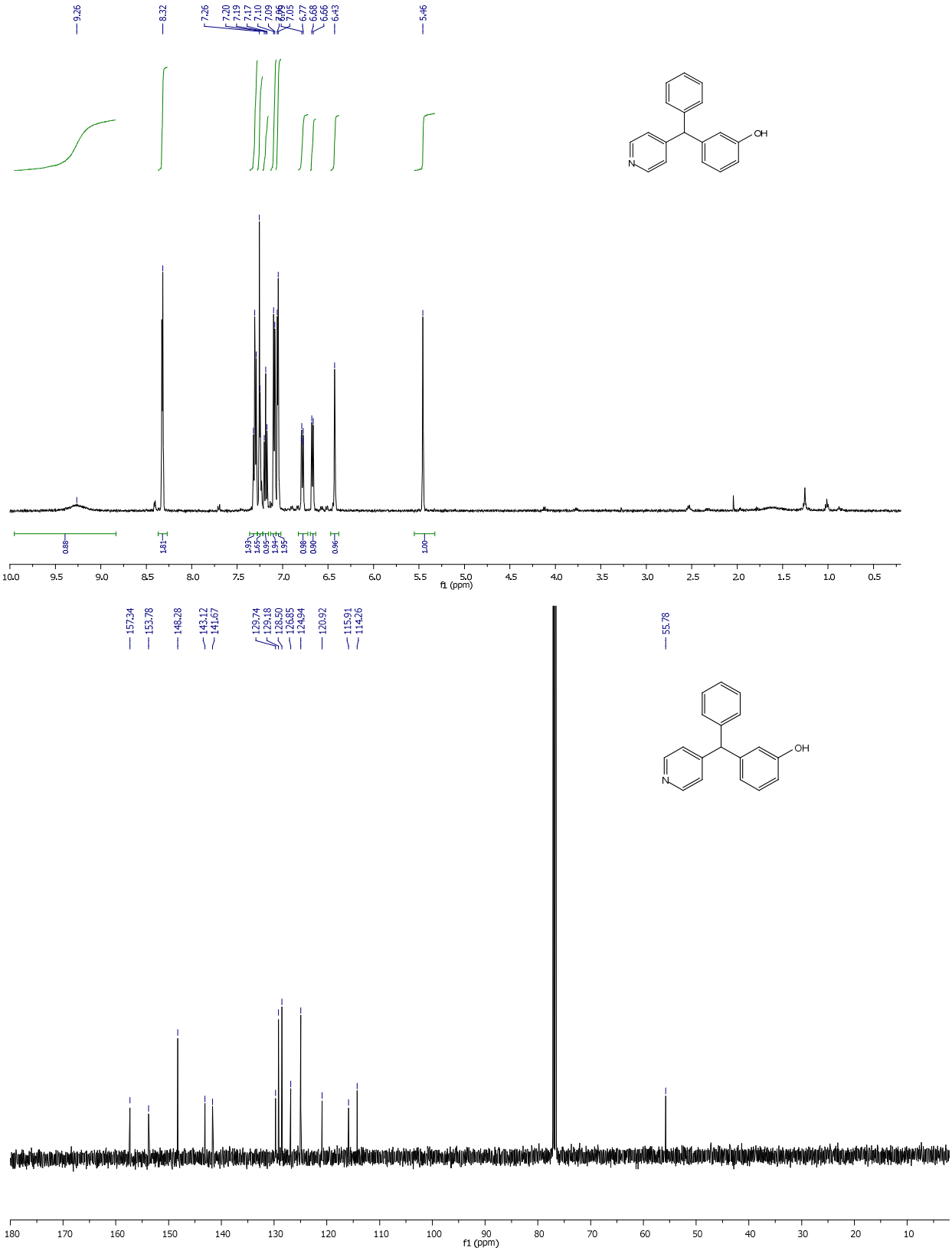


^{1}H and ^{13}C NMR Spectra of compound 3ah

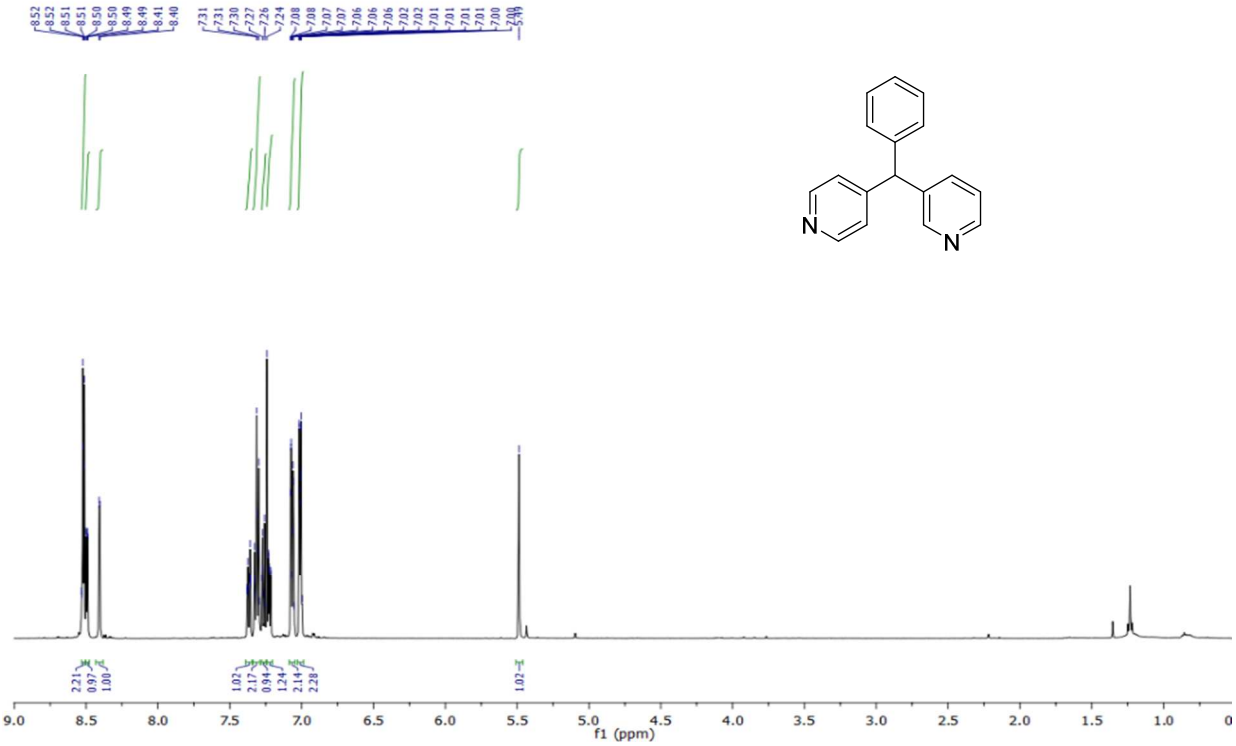


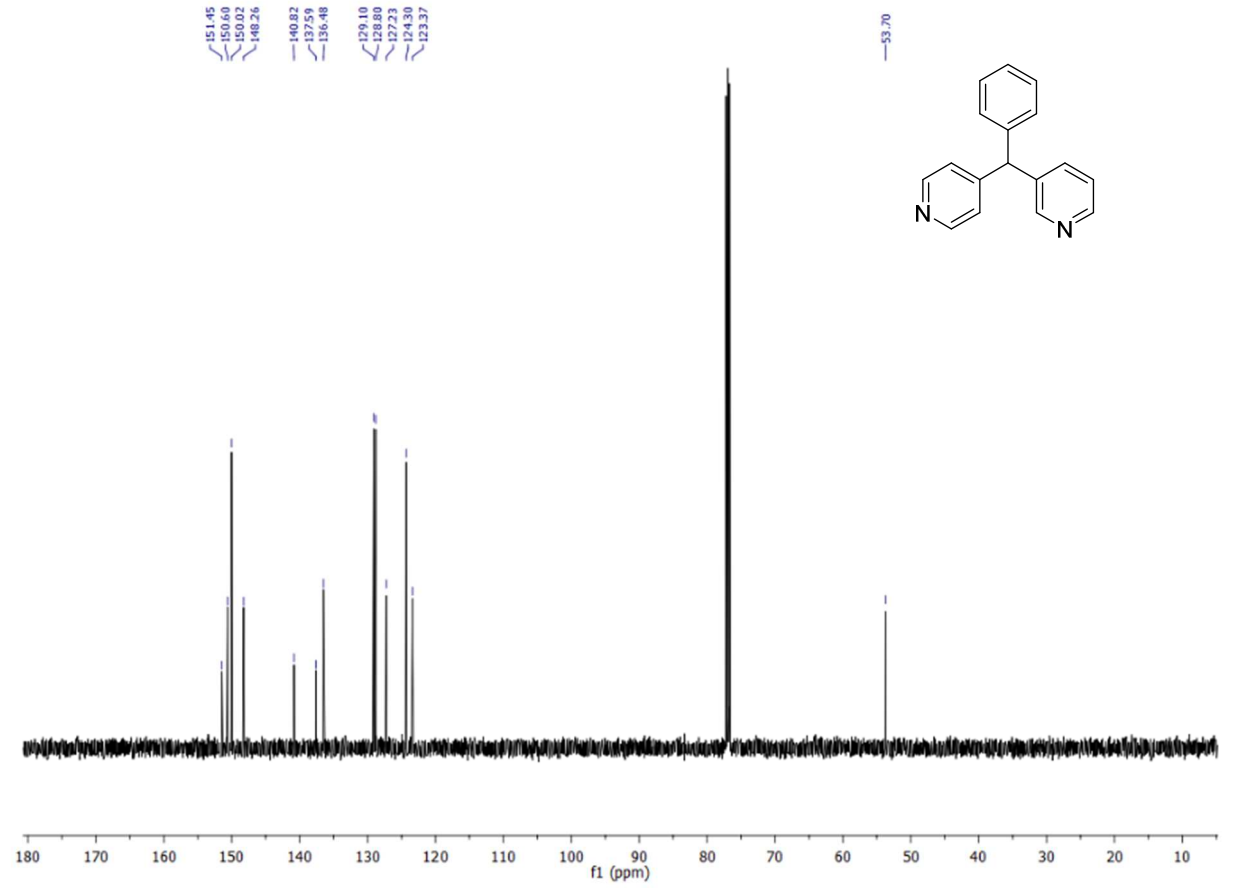


^{1}H and ^{13}C NMR Spectra of compound 3ai



^{1}H and ^{13}C NMR Spectra of compound 3aj





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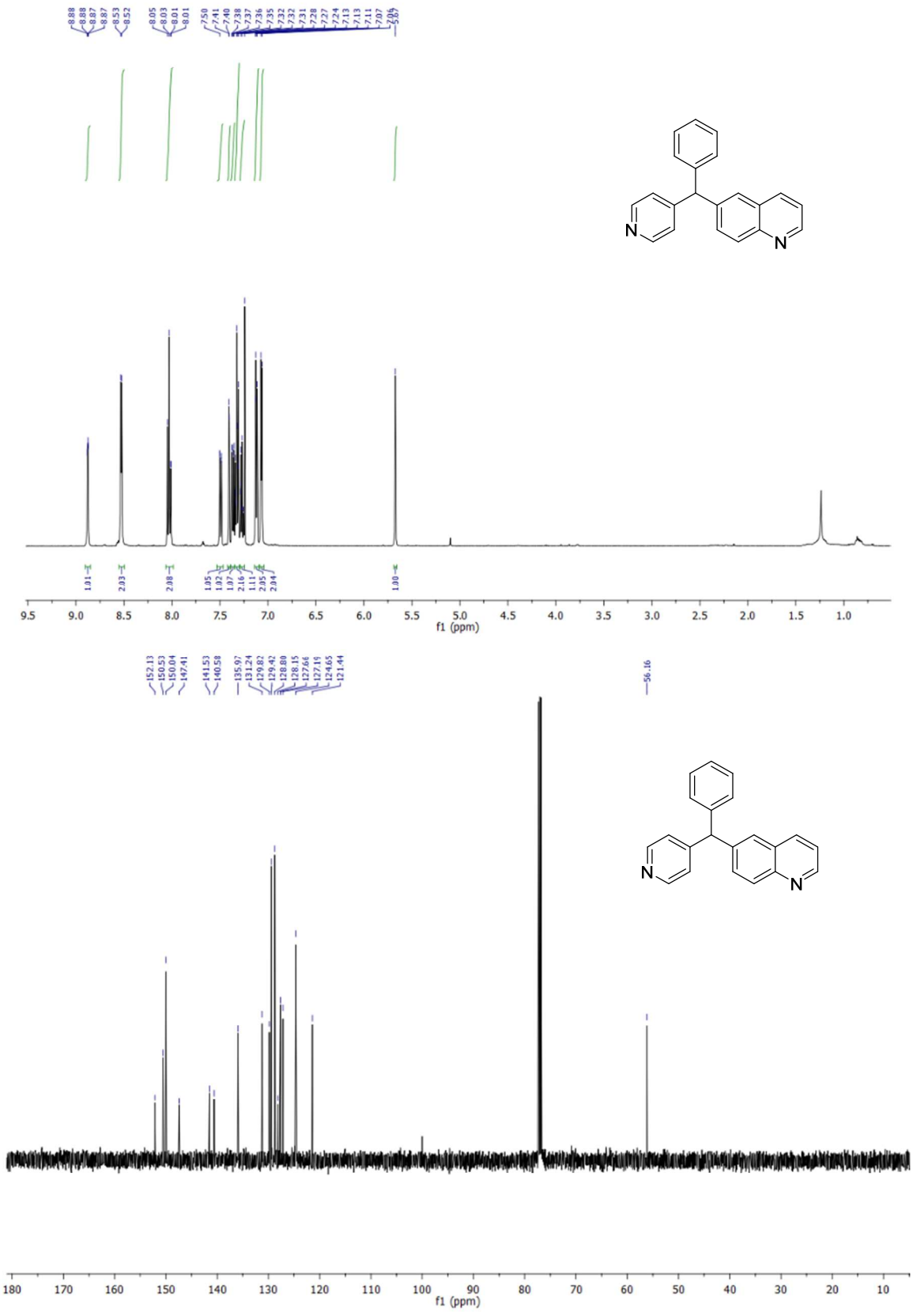

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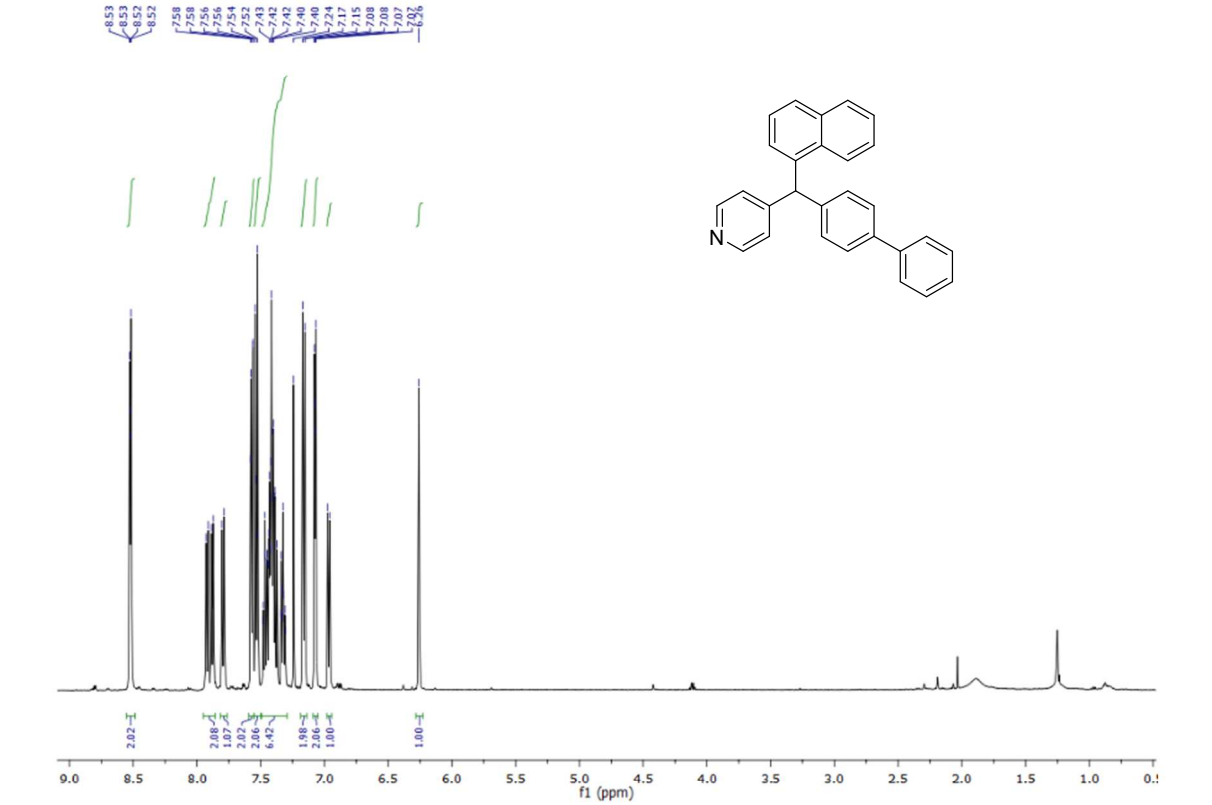

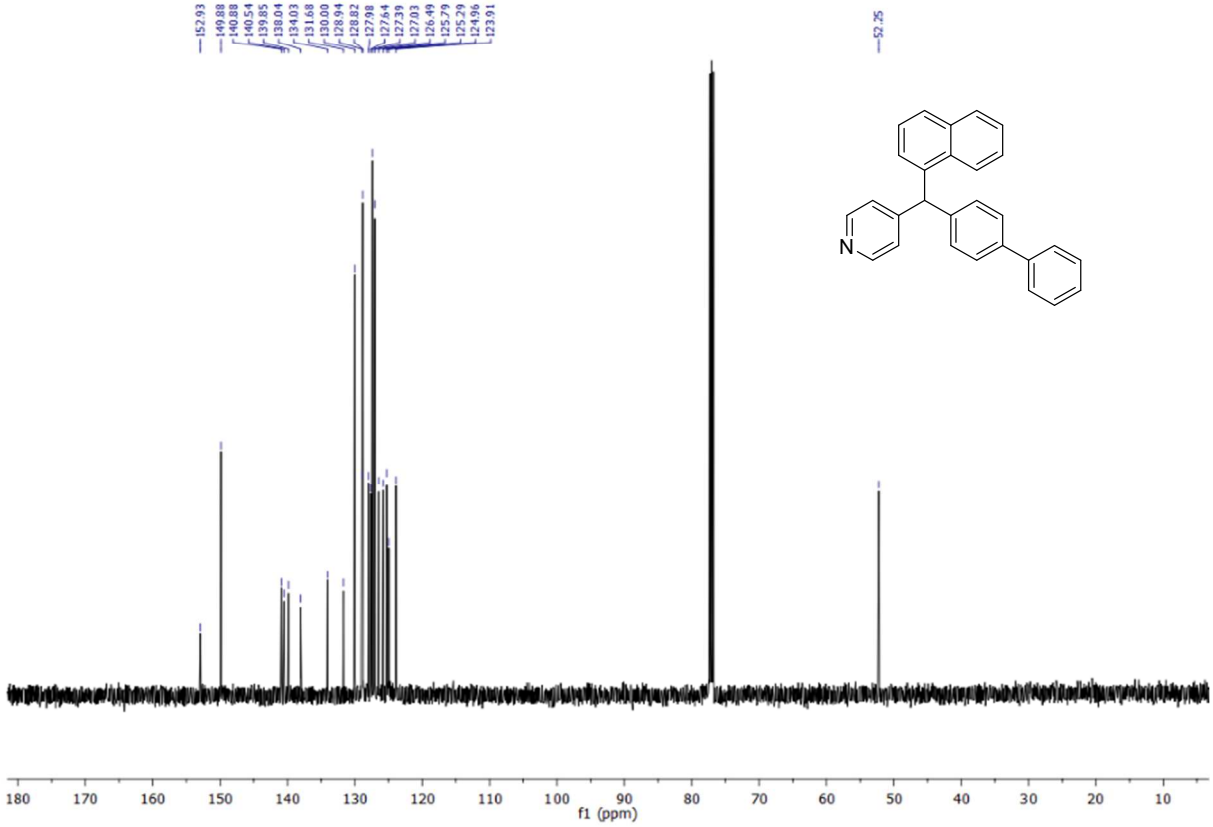

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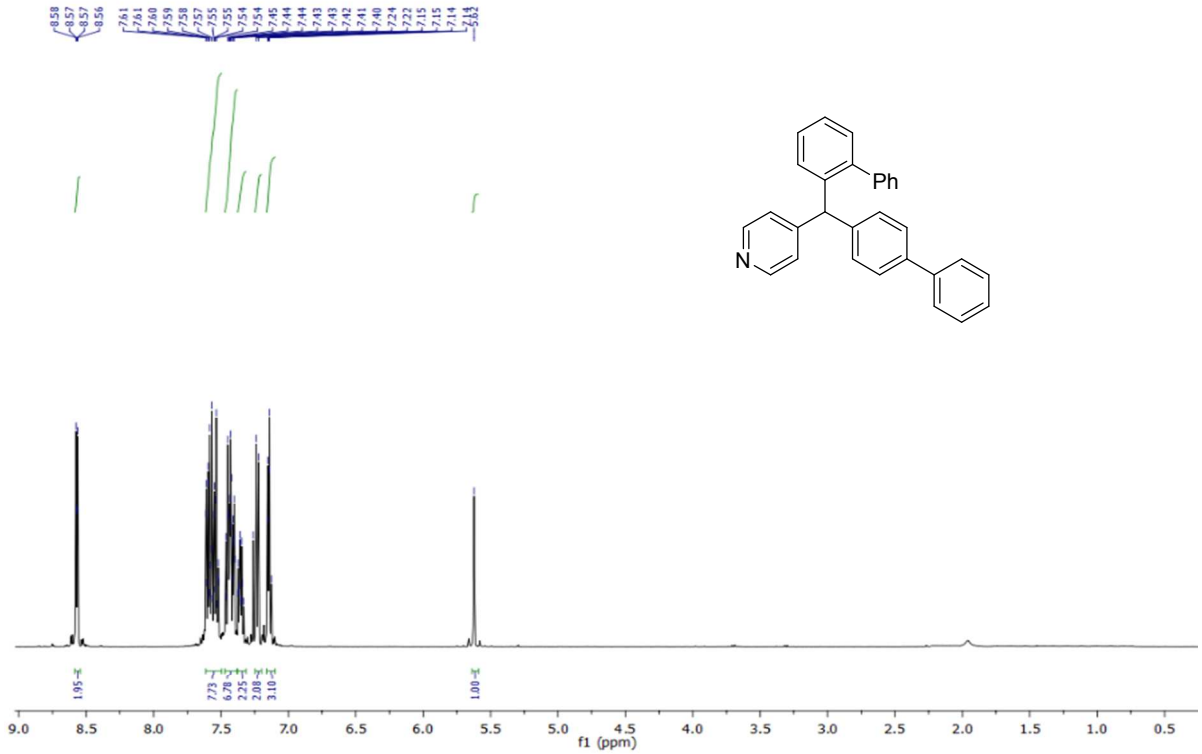
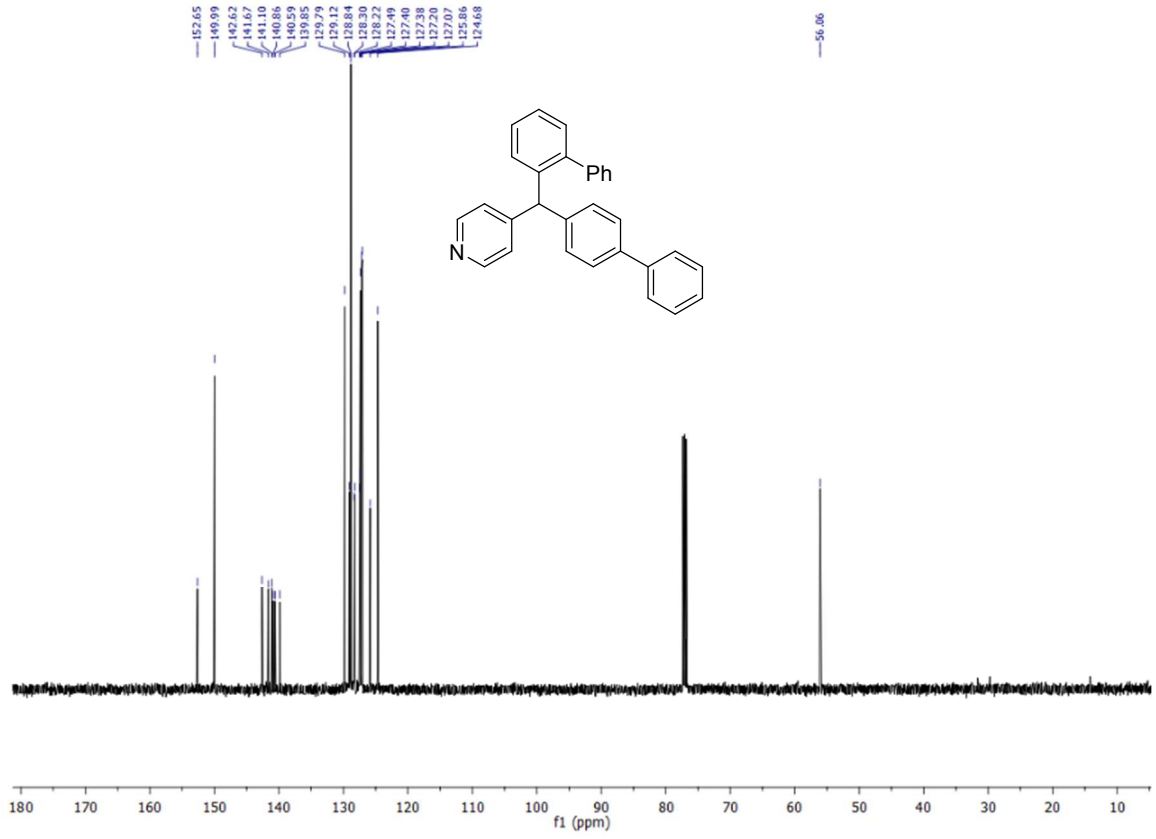
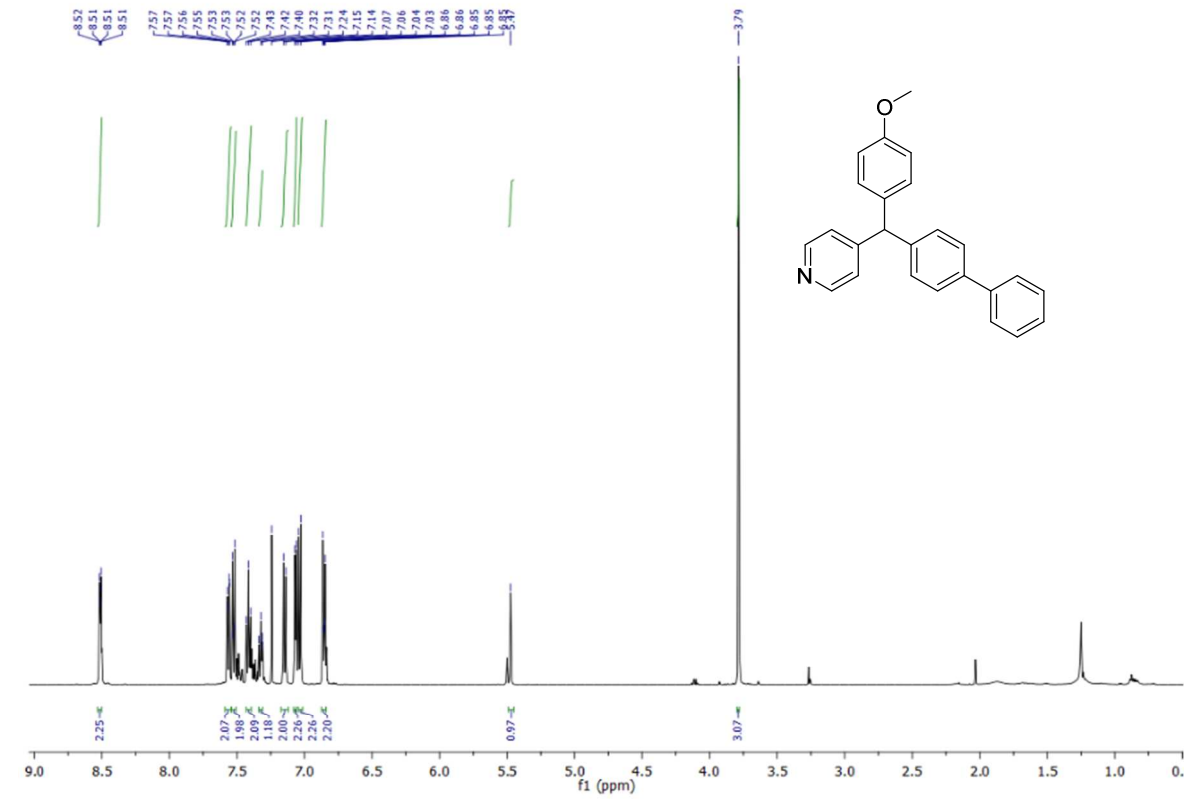
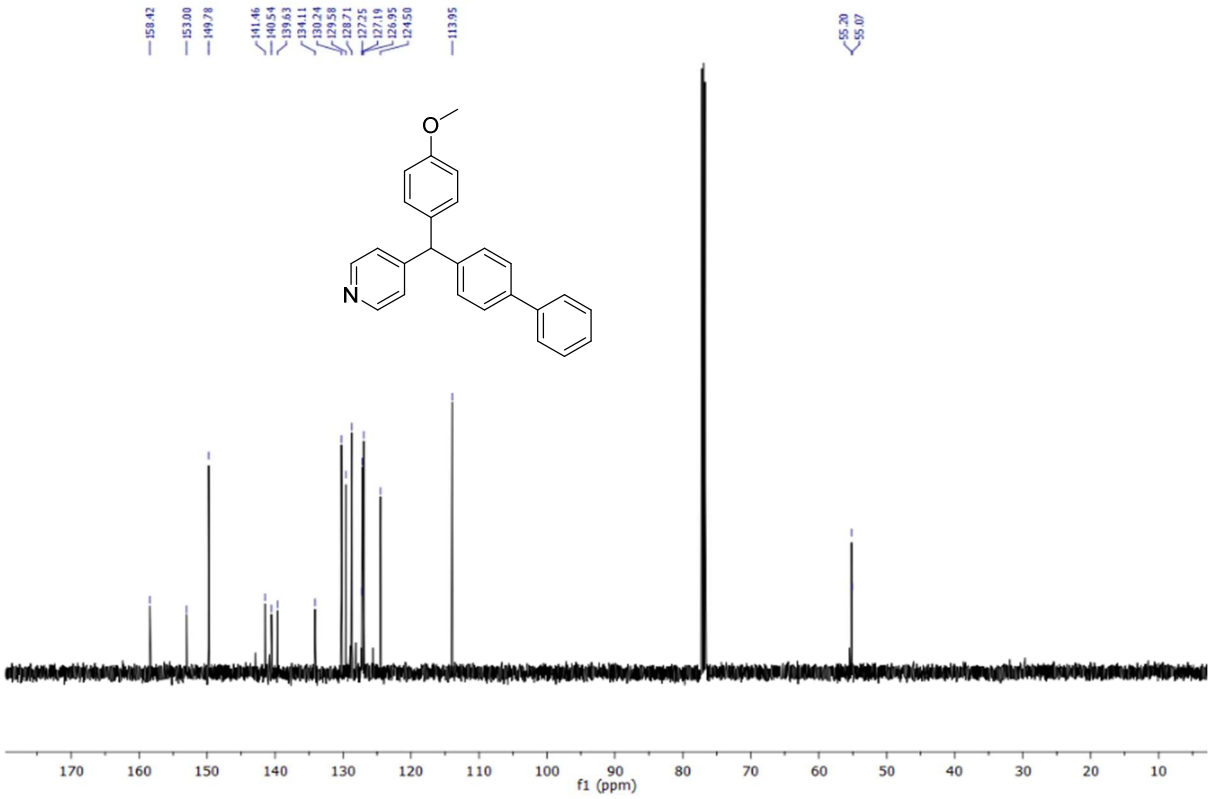


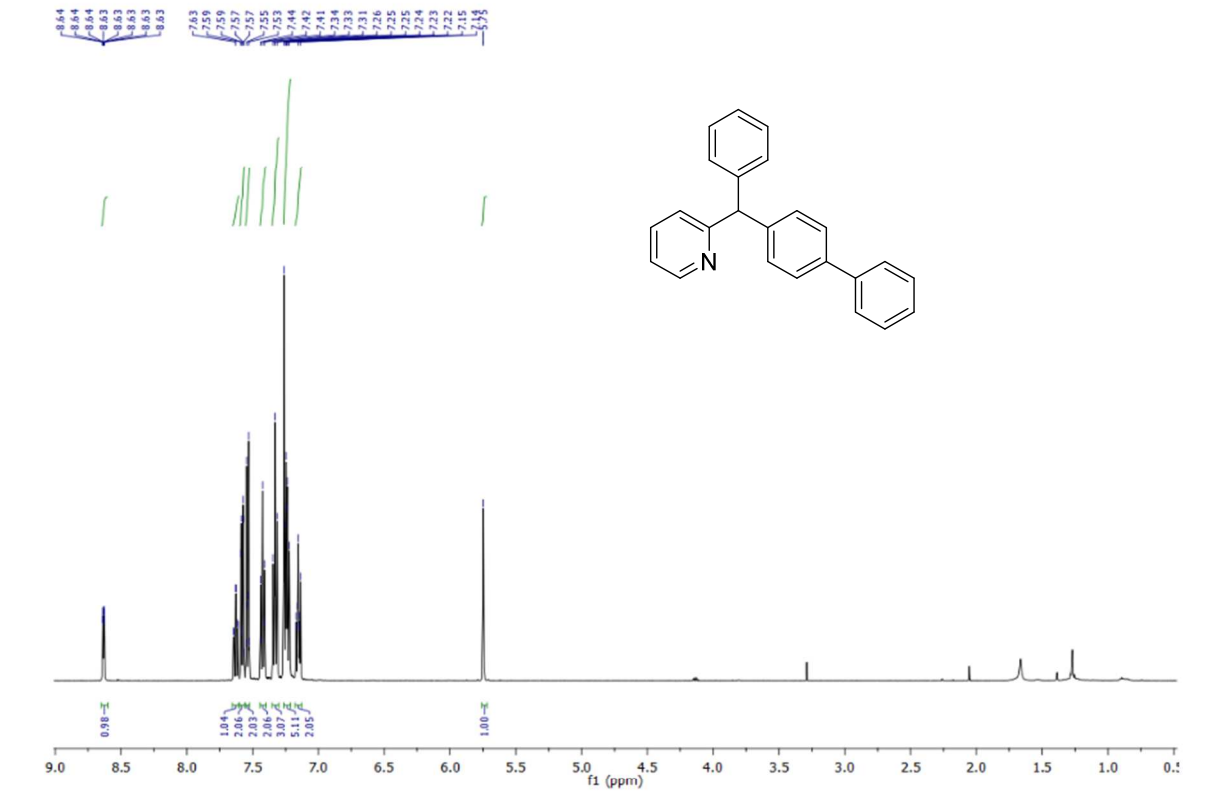


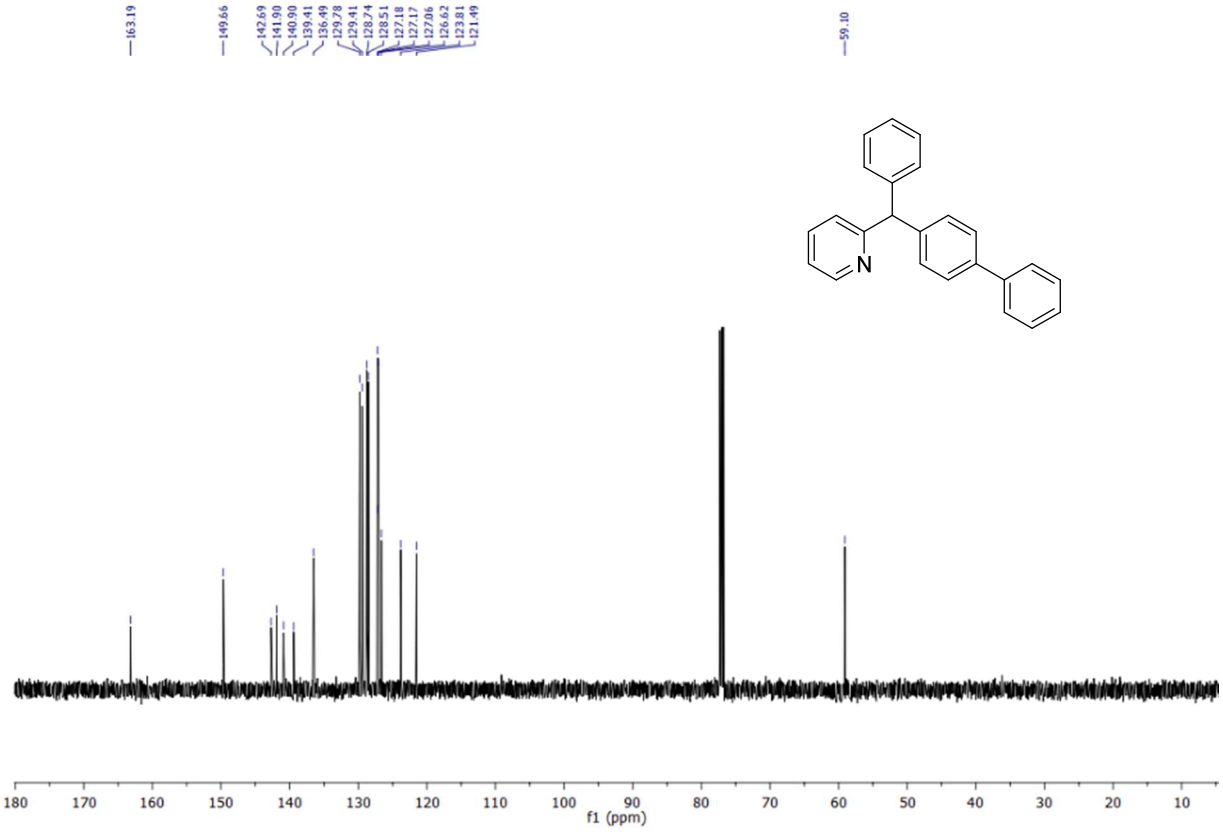
^{1}H and ^{13}C NMR Spectra of compound 3da



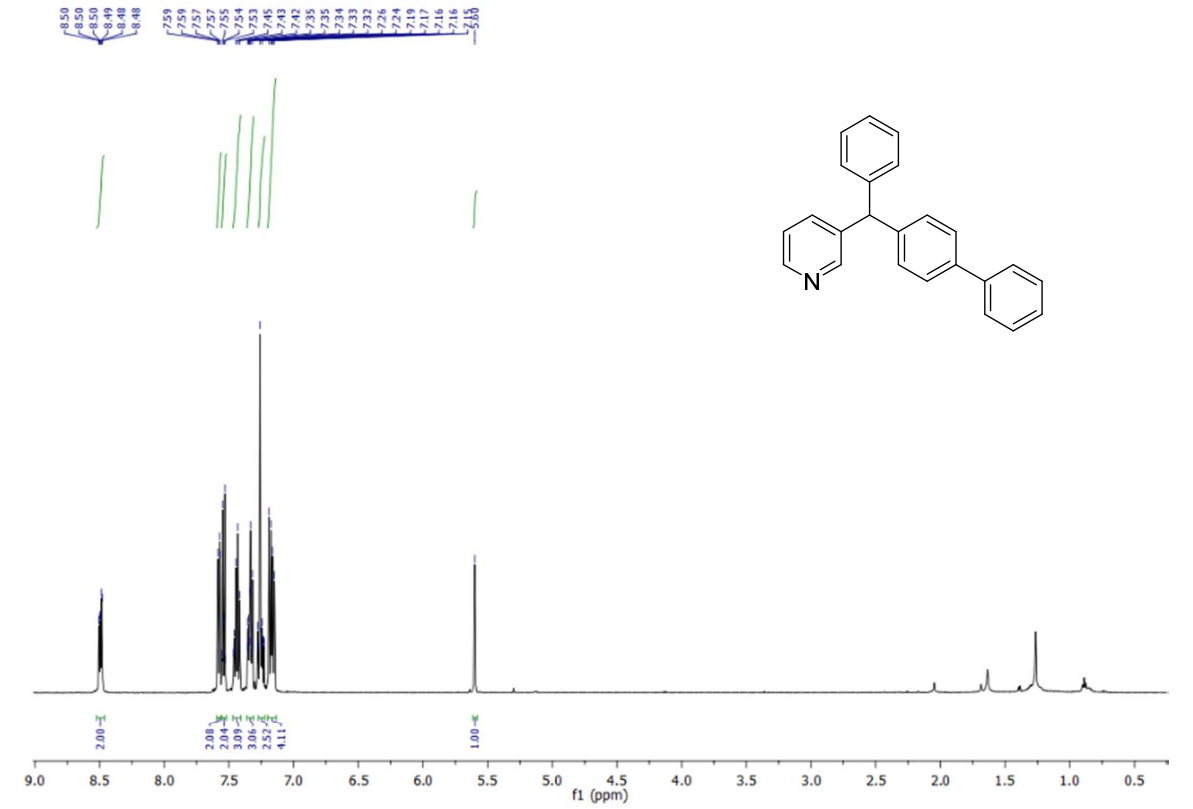


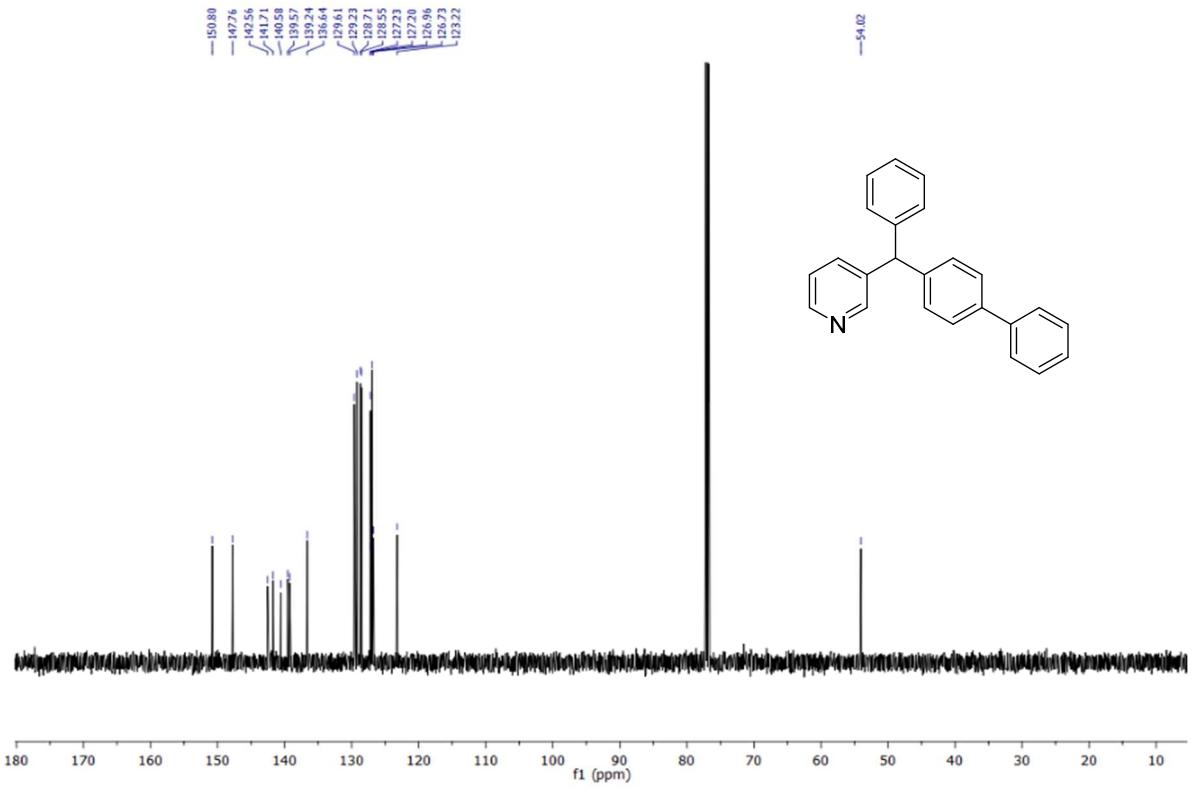
^{1}H and ^{13}C NMR Spectra of compound 3ea



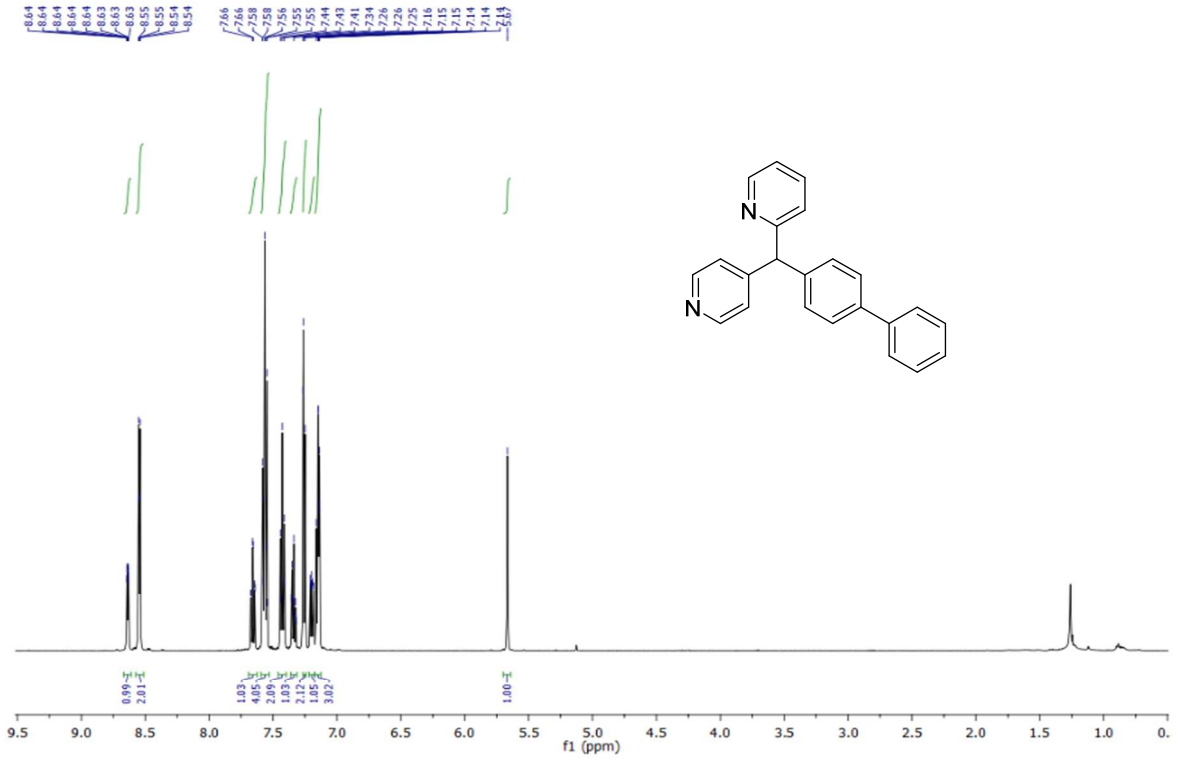


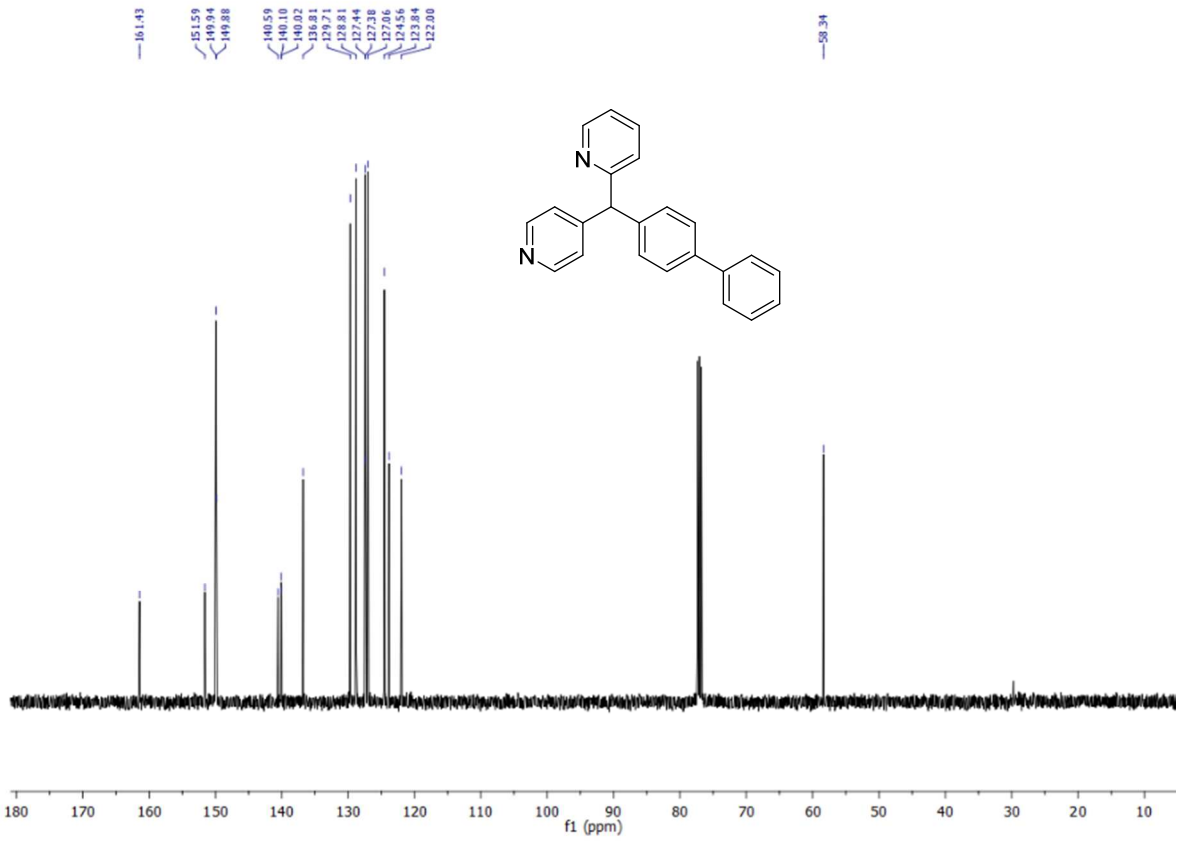
^{1}H and ^{13}C NMR Spectra of compound 3fa



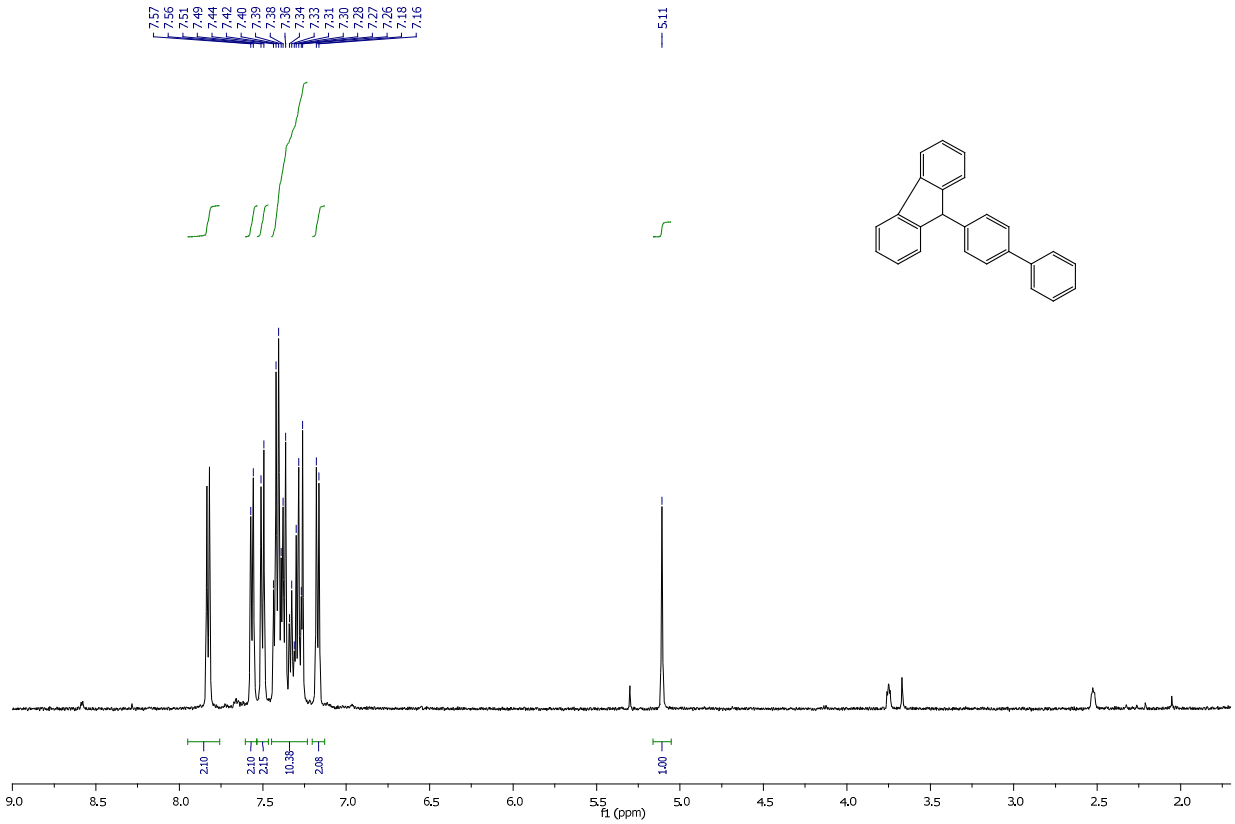


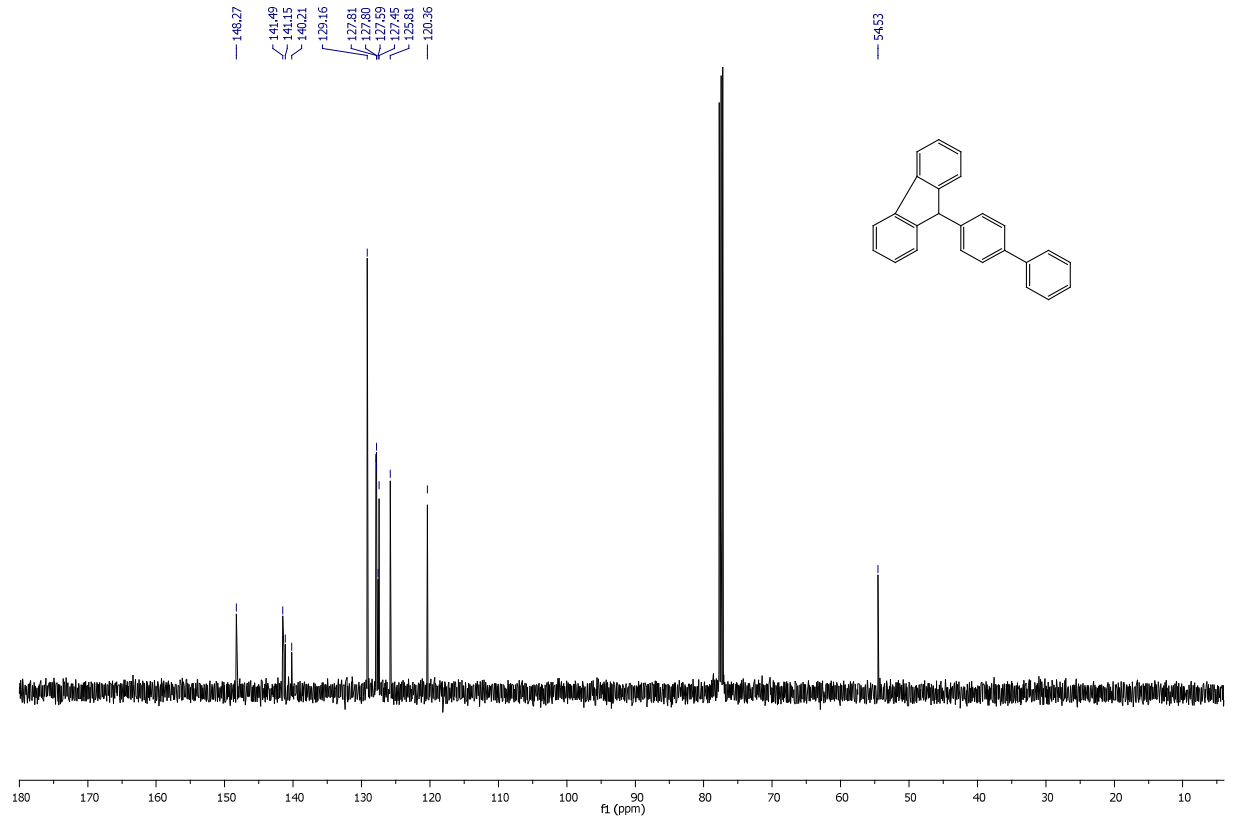
^{1}H and ^{13}C NMR Spectra of compound 3ga



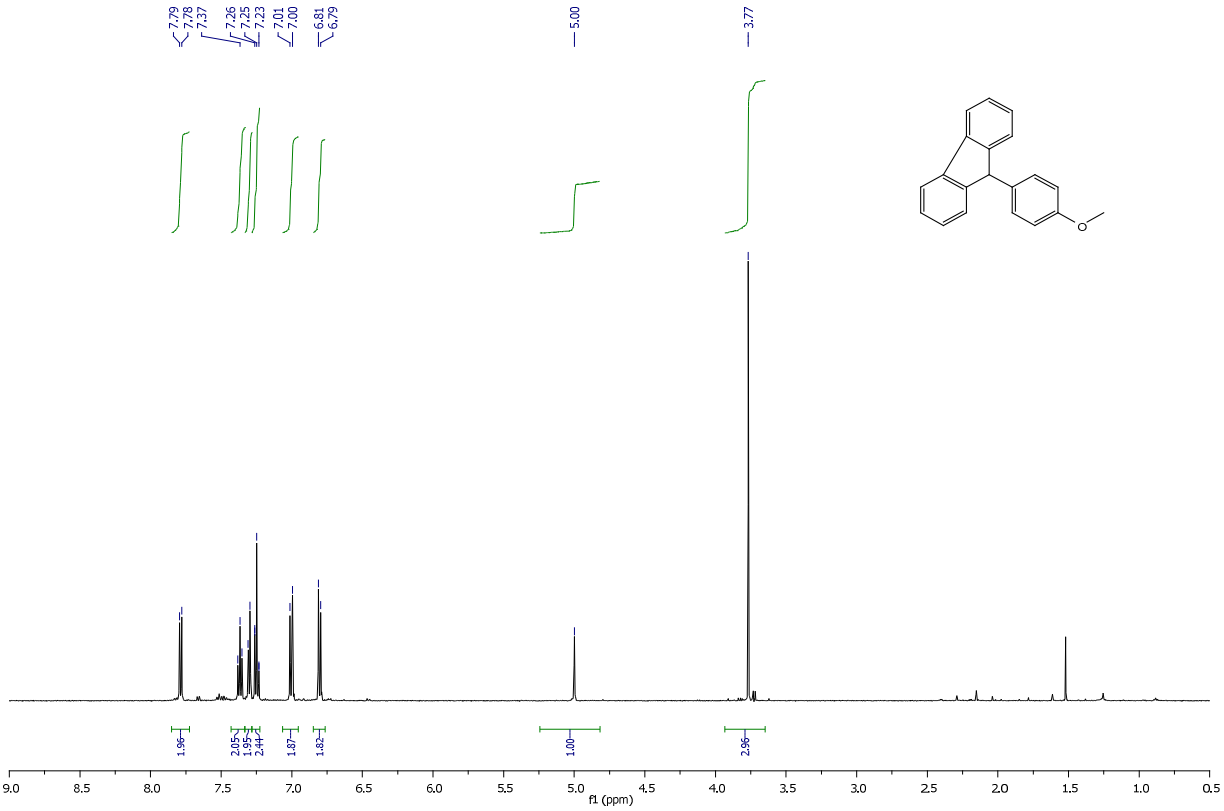


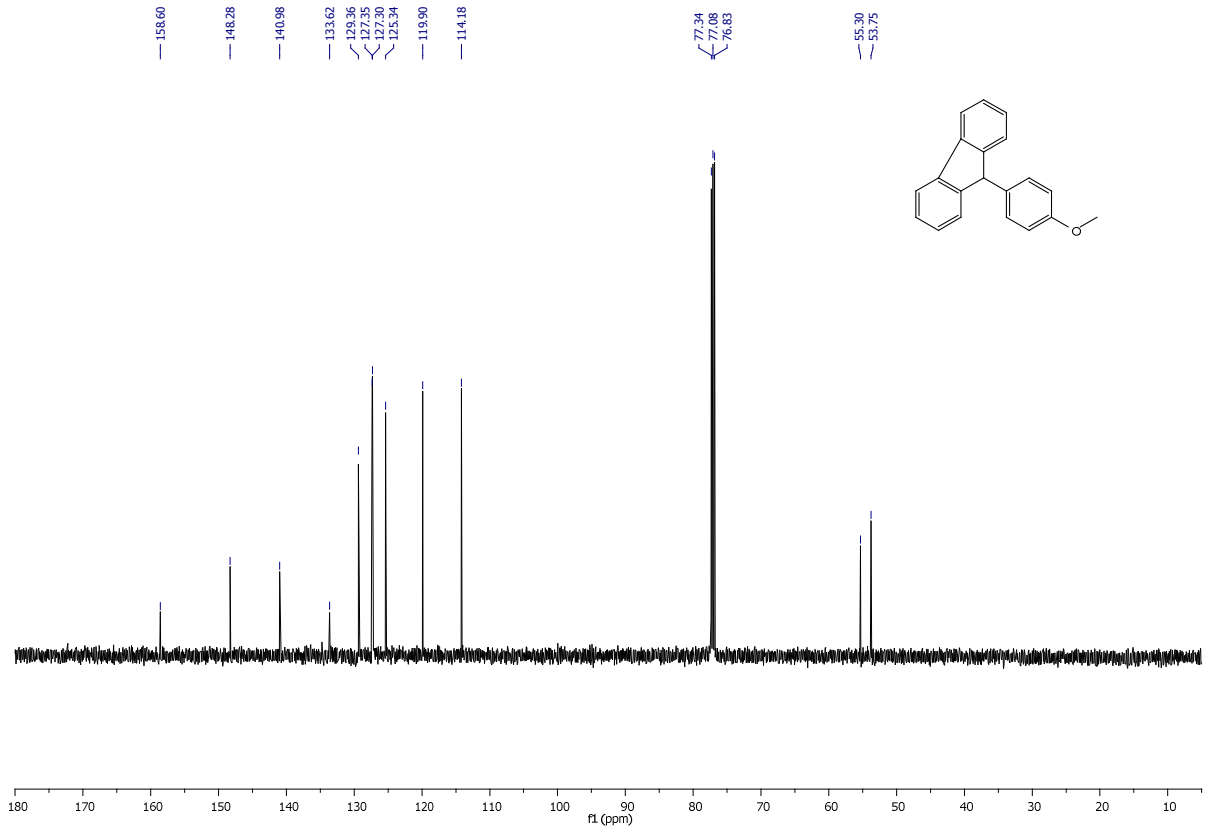
^{1}H and ^{13}C NMR Spectra of compound 3ha





^{1}H and ^{13}C NMR Spectra of compound 3he





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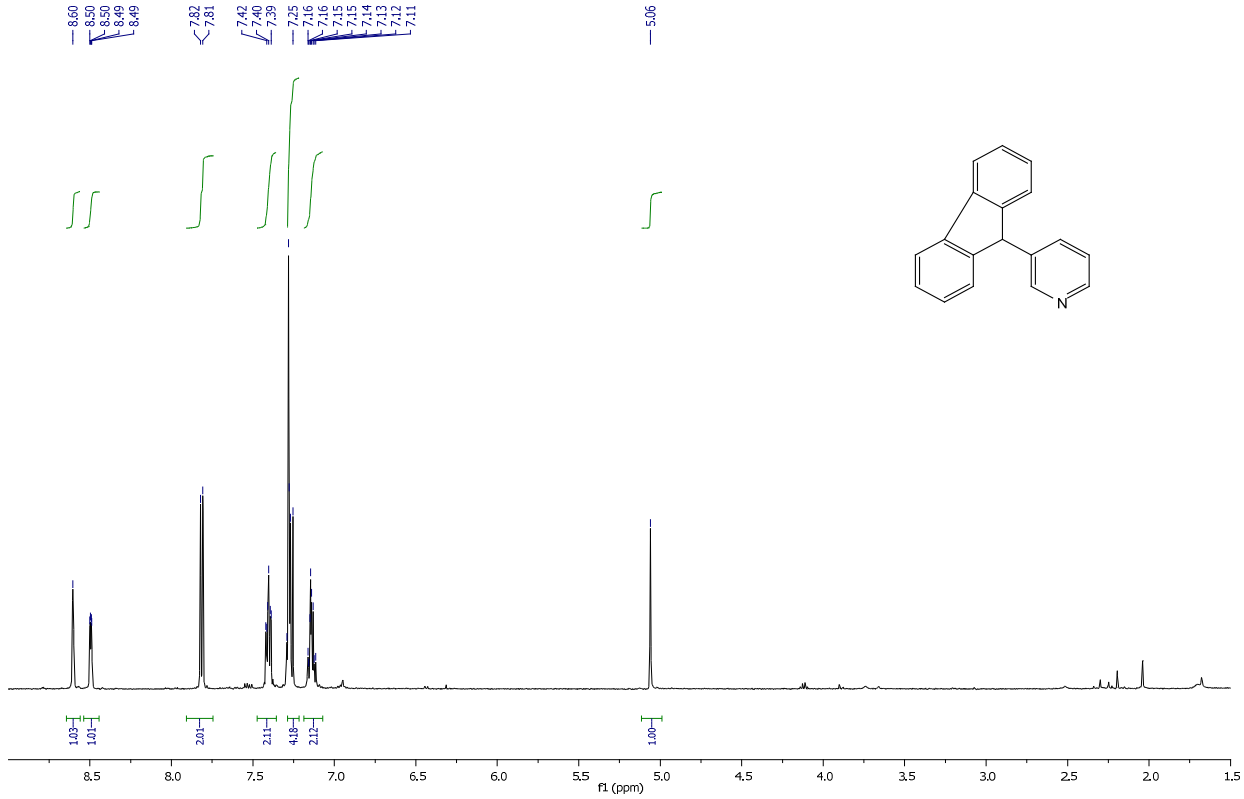

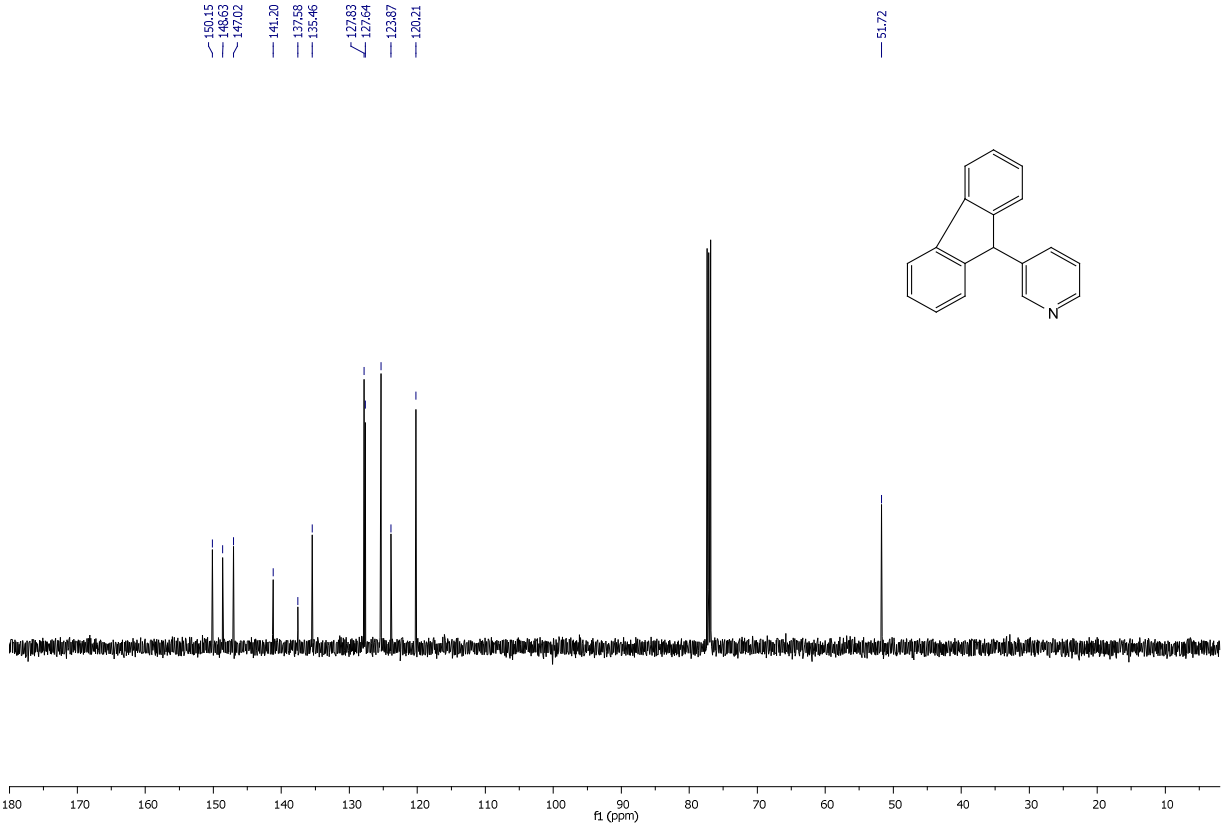

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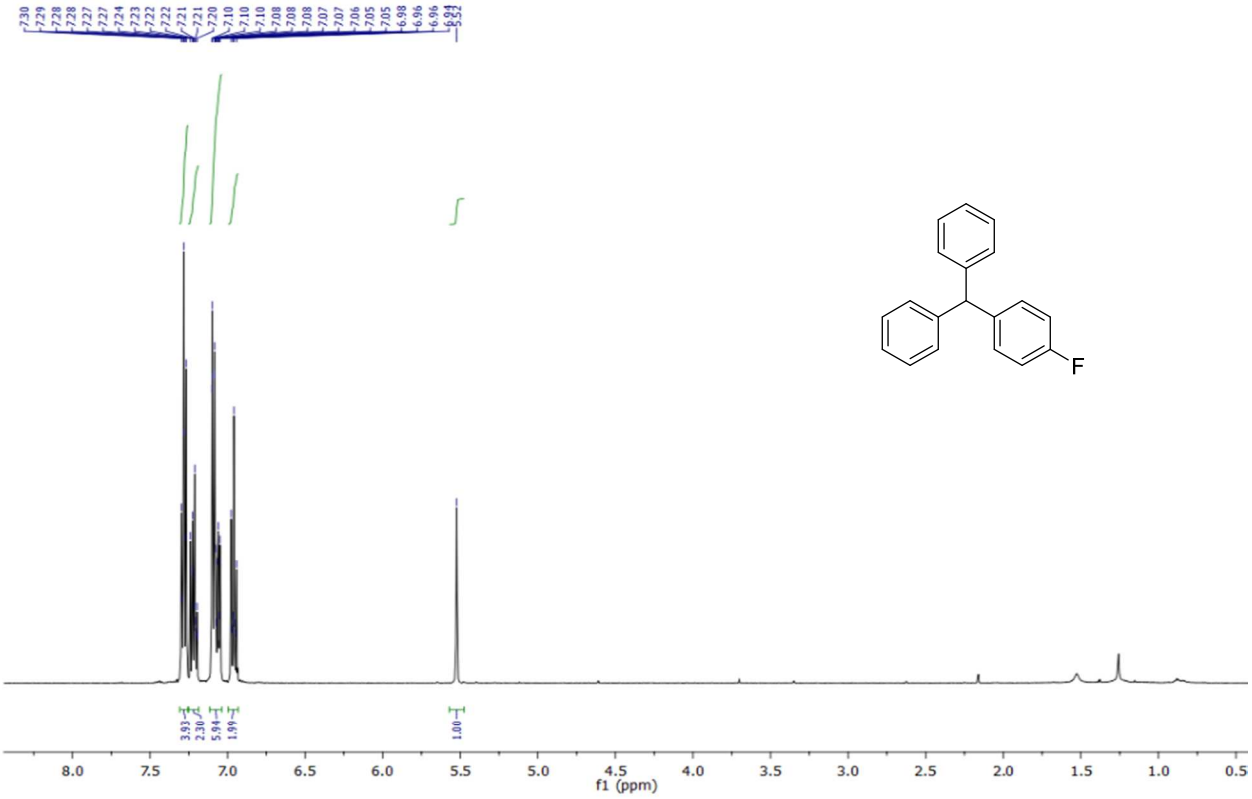

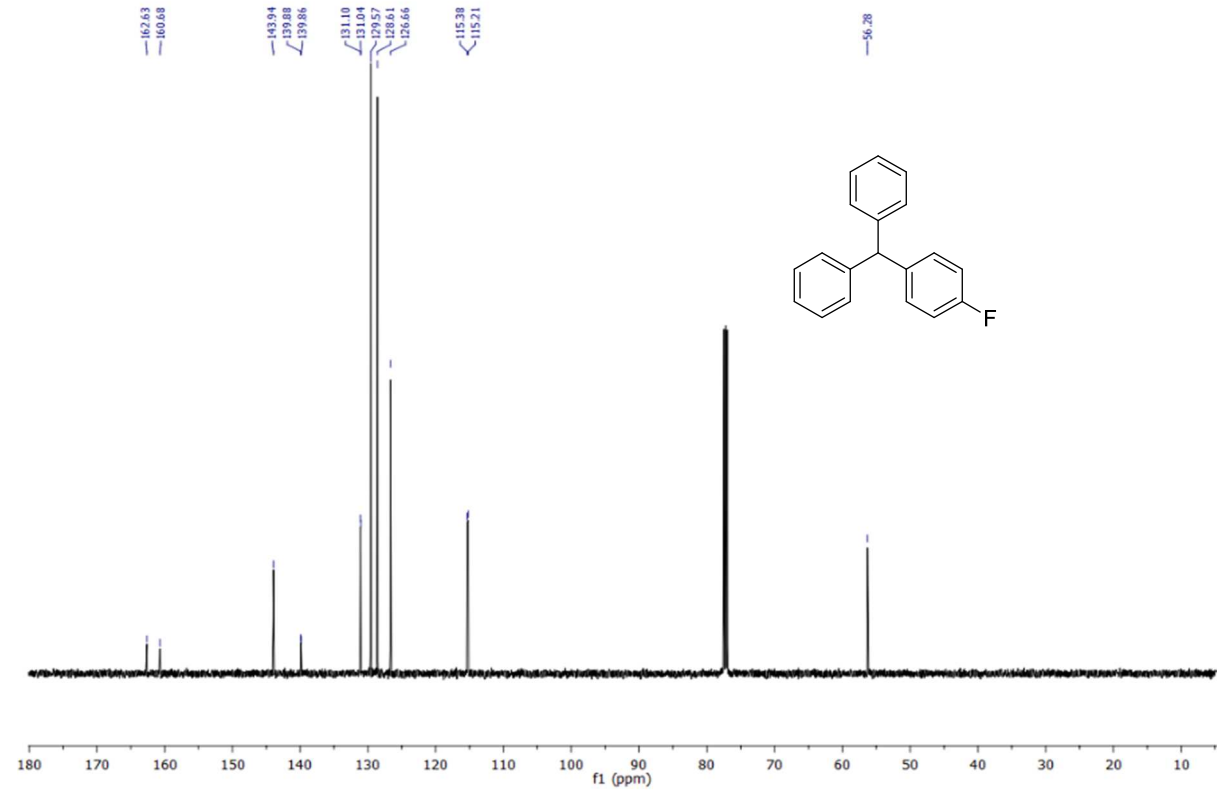

^{1}H and ^{13}C NMR Spectra of compound 5