Electronic Supplementary Material (ESI) for Organic & Biomolecular Chemistry.

SUPPORTING INFORMATION

A convergent synthesis of vinyloxyimidazopyridine *via* Cu(I)-catalyzed three-component coupling

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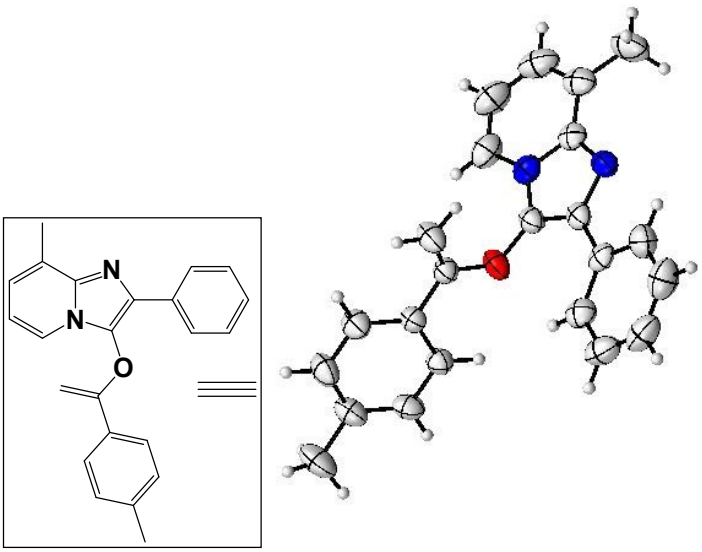
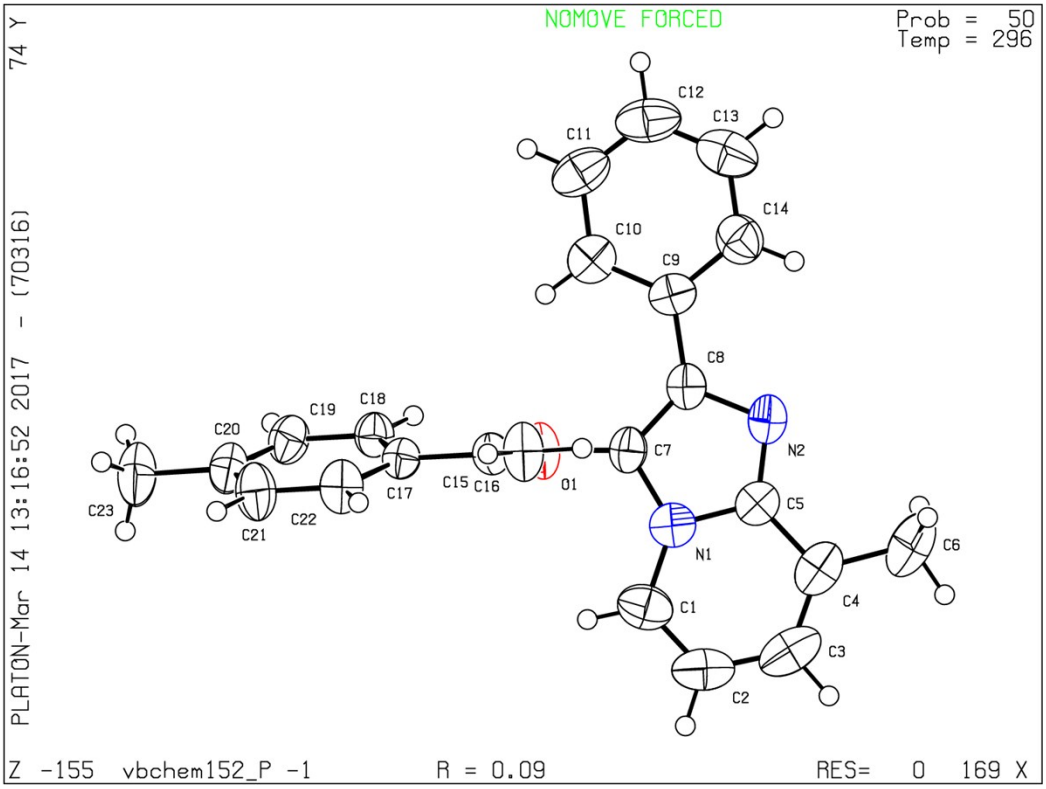
Contents

1. X-ray crystallographic data:

1.1. X-ray crystallographic data for 4b.

The white crystals of **4b** were obtained by crystallization from a solution in dichloromethane/petroleum ether after purification by column chromatography. Chemical Formula**:** $C_{23}H_{20}N_2O$.





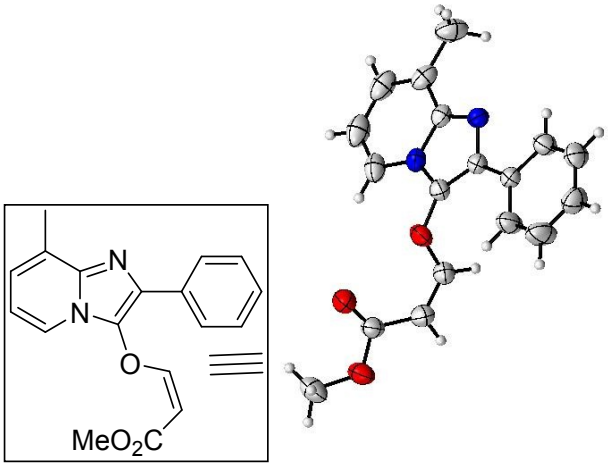
ORTEP (with 50% probability) diagram for the structure **8-Methyl-2-phenyl-3-((1-(*p*-tolyl)vinyl)oxy)imidazo[1,2-*a*]pyridine (4b).**

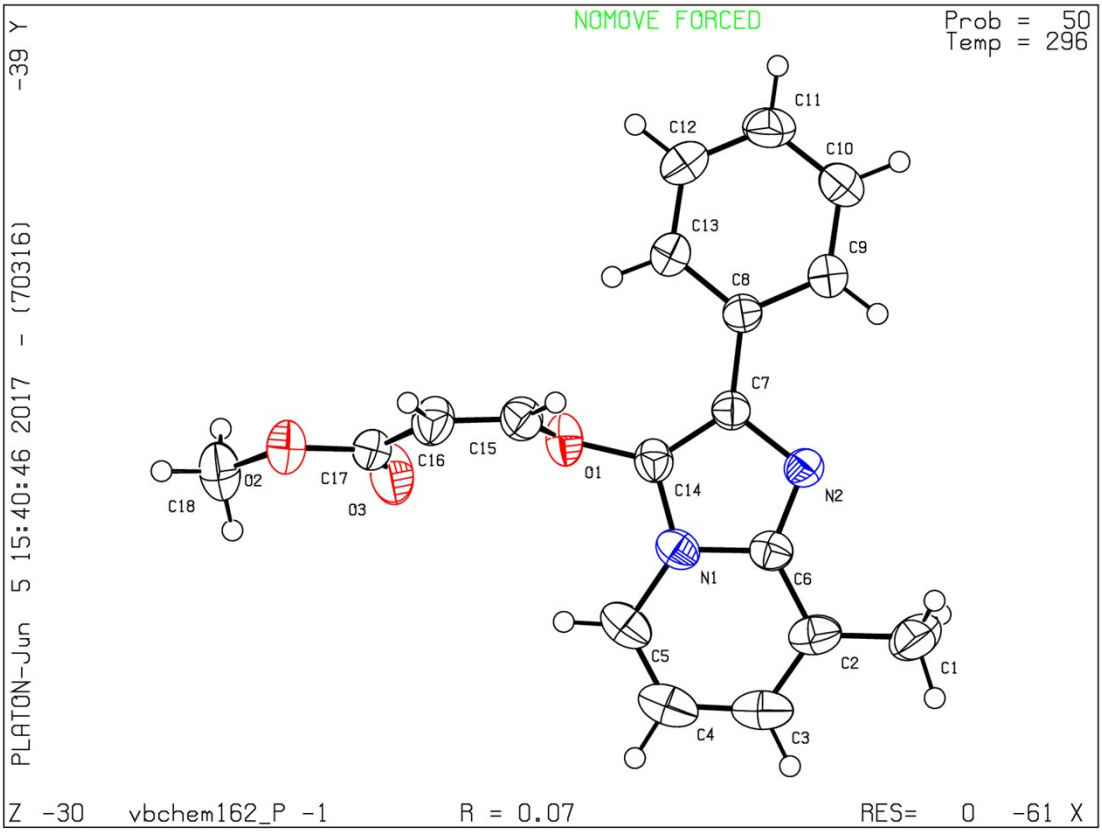
Wavelength	0.71073 Å	
Formula	C23H20N2O	
Crystal system	Triclinic	
Space group	P -1	
Unit cell dimensions	a = 9.5942(6) Å	α = 101.242(3) °
	b = 9.7522(7) Å	β = 98.692(3) °
	c = 10.4775(6) Å	γ = 100.998(3) °
Volume	925.62(10)Å^3	
Z	2	
R-factor (%)	9.23	

The crystallographic data have been deposited with the Cambridge Crystallographic Data Centreas supplementary publication with a CCDC reference number CCDC **1566643**.

1.2. Structure Determination (X-ray crystallographic data for 7b).

The white crystals of **7b** were obtained by crystallization from a solution in dichloromethane/petroleum ether after purification by column chromatography. Chemical Formula**:** $C_{18}H_{16}N_2O_3$.





ORTEP (with 50% probability) diagram for the structure **Methyl (*Z*)-3-((8-methyl-2-phenylimidazo[1,2-*a*]pyridin-3-yl)oxy)acrylate (7b):**

Wavelength	0.71073 Å	
Formula	C18 H16 N2 O3	
Crystal system	Triclinic	
Space group	P -1	
Unit cell dimensions	a = 8.2376(4) Å	α = 98.745(2) °
	b = 8.7359(4) Å	β = 102.654(2) °
	c = 11.8649(6) Å	γ = 102.432(2) °
Volume	795.58(7) $Å^3$	
Z	2	
R-factor (%)	6.70	

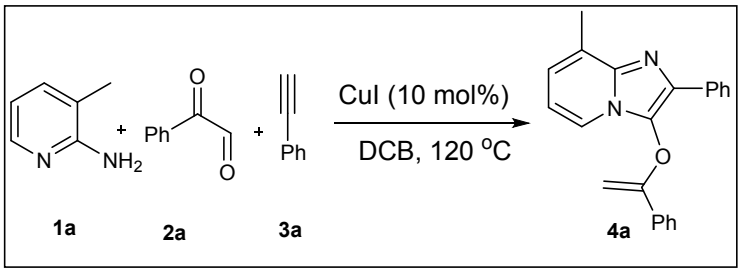
The crystallographic data have been deposited with the Cambridge Crystallographic Data Centreas supplementary publication with a CCDC reference number CCDC **1566644**.

2. General information:

All reagents were purchased from commercial sources and used without further purification. ^{1}H NMR spectra were determined on 400 MHz spectrometer as solutions in $CDCl_3$. Chemical shifts are expressed in parts per million (δ) and the signals were reported as s (singlet), d (doublet), t (triplet), m (multiplet), dd (double doublet) and coupling constants (*J*) were given in Hz. ^{13}C{1H} NMR spectra were recorded at 100 MHz in $CDCl_3$ solution. Chemical shifts as internal standard are referenced to $CDCl_3$ (δ = 7.26 for ^{1}H and δ = 77.16 for ^{13}C{^{1}H} NMR) as internal standard. TLC was done on silica gel coated glass slide. All solvents were dried and distilled before use. Commercially available solvents were freshly distilled before the reaction. All reactions involving moisture sensitive reactants were executed using oven dried glassware. X-ray single crystal data were collected using MoKα (λ = 0.71073 Å) radiation with CCD area detector.

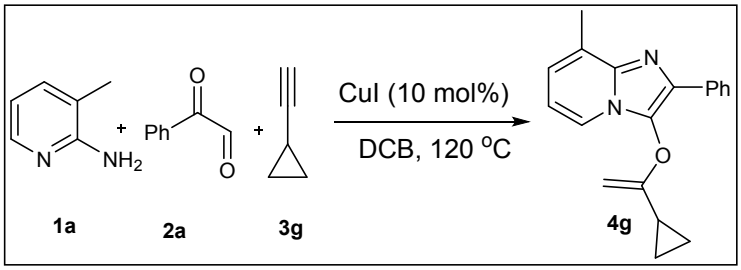
3. Experimental procedures:

3.1. Experimental procedure for the synthesis of 4a.



A mixture of 2-amino-3-methylpyridine (**1a**) (0.2 mmol, 22 mg) and phenylglyoxal hydrate (**2a**) (0.21 mmol, 29 mg) were taken in a sealed tube. Then 1,2-dichlorobenzene (2 mL) was added to it and stirred at room temperature for few seconds. Then phenylacetylene (**3a**) (0.22 mmol, 23 mg) and CuI (10 mol%, 3.8 mg) was added to it and stirred at 120 °C for 5 hours under open atmosphere. After completion of the reaction (TLC) the reaction mixture was cooled to room temperature and extracted with dichloromethane. The organic phase was dried over anhydrous Na_2SO_4. The crude residue was obtained after evaporation of the solvent in vacuum and purified by column chromatography on silica gel (60−120 mesh) using *n*-hexane/ EtOAc (9:1) as the eluent to afford pure **4a** as a yellow gummy mass (52 mg, 81% yield).

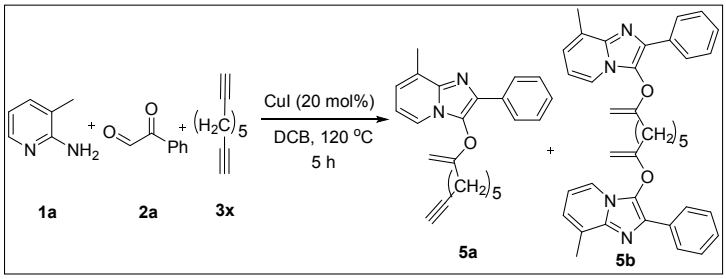
3.2. Synthesis of 4g on 1 mmol scale.



A mixture of 2-amino-3-methylpyridine (**1a**) (1 mmol, 109 mg) and phenylglyoxal hydrate (**2a**) (1.05 mmol, 142 mg) were taken in a sealed tube. Then 1,2-dichlorobenzene (6 mL) was added to it and stirred at room temperature for few seconds. Then ethynylcyclopropane (**3g**) (1.1 mmol, 73 mg) and CuI (10 mol%, 19 mg) was added to it and stirred at 120 °C for 5 hours under open atmosphere. After completion of the reaction (TLC) the reaction mixture was cooled to room temperature and extracted with dichloromethane. The organic phase was dried over

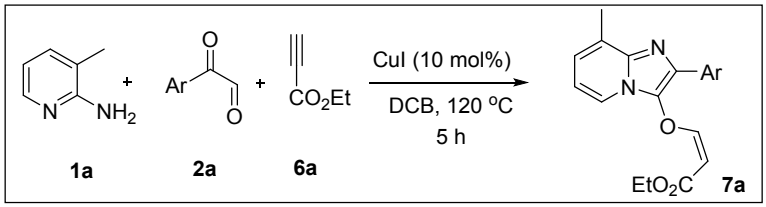
anhydrous Na_2SO_4. The crude residue was obtained after evaporation of the solvent in vacuum and purified by column chromatography on silica gel (60−120 mesh) using *n*-hexane/ EtOAc (9:1) as the eluent to afford pure **4g** as a brown oil (275 mg, 95% yield).

3.3. Experimental procedure for the synthesis of 5.



A mixture of 2-amino-3-methylpyridine (**1a**) (0.4 mmol, 44 mg) and phenylglyoxal hydrate (**2a**) (0.42 mmol, 58 mg) were taken in a sealed tube. Then 1,2-dichlorobenzene (4 mL) was added to it and stirred at room temperature for few seconds. Then 1,8-nonadiyne (**3x**) (0.22 mmol, 26 mg) and CuI (20 mol%, 7.6 mg) was added to it and stirred at 120 °C for 5 hours under open atmosphere. After completion of the reaction (TLC) the reaction mixture was cooled to room temperature and extracted with dichloromethane. The organic phase was dried over anhydrous Na_2SO_4. The crude residue was obtained after evaporation of the solvent in vacuum and purified by column chromatography on silica gel (60−120 mesh) using *n*-hexane/ EtOAc as the eluent to afford pure **5** as a brown oil.

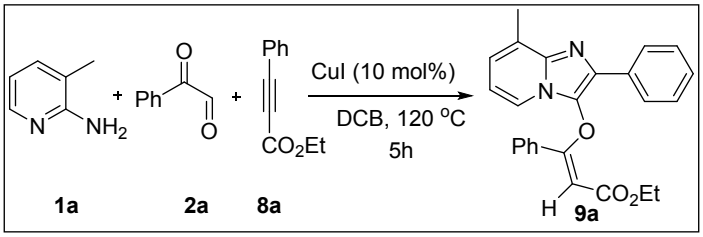
3.4. Experimental procedure for the synthesis of 7a.



A mixture of 2-amino-3-methylpyridine (**1a**) (0.2 mmol, 22 mg) and phenylglyoxal hydrate (**2a**) (0.21 mmol, 29 mg) were taken in a sealed tube. Then 1,2-dichlorobenzene (2 mL) was added to it and stirred at room temperature for few seconds. Then ethylpropiolate (**6a**) (0.22 mmol, 22 mg) and CuI (10 mol%, 3.8 mg) was added to it and stirred at 120 °C for 5 hours under open atmosphere. After completion of the reaction (TLC) the reaction mixture was cooled to room

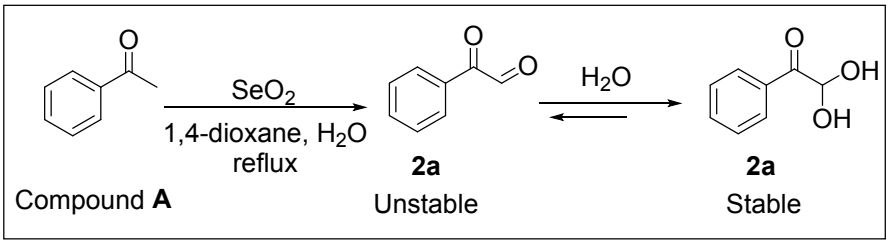
temperature and extracted with dichloromethane. The organic phase was dried over anhydrous Na_2SO_4. The crude residue was obtained after evaporation of the solvent in vacuum and purified by column chromatography on silica gel (60−120 mesh) using *n*-hexane/ EtOAc (4:1) as the eluent to afford pure **7a** as a yellow solid (60 mg, 94% yield).

3.5. Experimental procedure for the synthesis of 9a.



A mixture of 2-amino-3-methylpyridine (**1a**) (0.2 mmol, 22 mg) and phenylglyoxal hydrate (**2a**) (0.21 mmol, 29 mg) were taken in a sealed tube. Then 1,2-dichlorobenzene (2 mL) was added to it and stirred at room temperature for few seconds. Then ethylphenylpropiolate (**8a**) (0.22 mmol, 35 mg) and CuI (10 mol%, 3.8 mg) was added to it and stirred at 120 °C for 5 hours under open atmosphere. After completion of the reaction (TLC) the reaction mixture was cooled to room temperature and extracted with dichloromethane. The organic phase was dried over anhydrous Na_2SO_4. The crude residue was obtained after evaporation of the solvent in vacuum and purified by column chromatography on silica gel (60−120 mesh) using *n*-hexane/ EtOAc (9:1) as the eluent to afford pure **9a** as a yellow gummy mass (56 mg, 71% yield).

3.6. General procedure for the synthesis of 2a.[1]

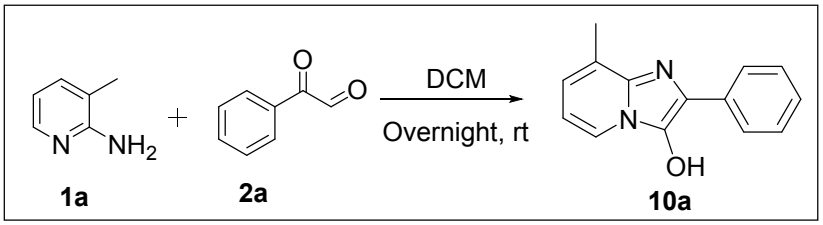


SeO_2 (15 mmol), 1,4-dioxane (9 mL) and water (1 mL) were added to a 100 mL three-necked bottle and fitted it with an condenser. The mixture was heated to 50-55 ℃ and stirred until the solid dissolved. It was followed by addition of Compound **A** (10 mmol) and the reaction was maintained at reflux temperature. After the reaction was complete, as monitored by TLC, the

mixture was filtered through a pad of celite. The filtrate was evaporated to afford a crude product that was purified by distillation under reduced pressure to give a yellow liquid. This liquid was dissolved in hot water (5 mL) to afford **2a**·H_2O as a white solid.

White solid (85%, 1.29 g); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.13-8.11 (m, 2H), 7.69-7.58 (m, 1H), 7.54-7.47 (m, 2H), 5.98 (s, 1H), 4.51 (s, 2H); ^{13}C NMR (100 MHz): δ 195.0, 189.7, 134.7, 130.6, 130.0, 128.9, 87.3.

3.7. General procedure for the synthesis of 10a.[2]

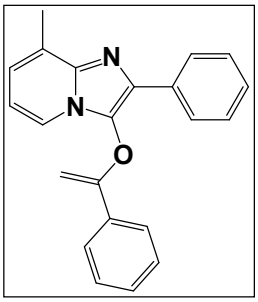


1a **2a** **10a**

To a solution of 2-amino-3-methylpyridine (**1a**) (108 mg, 1 mmol) in CH_2Cl_2 (4 mL), phenylglyoxal hydrate (**2a**) (154 mg, 1 mmol) was added portion wise and the reaction mixture was stirred overnight at rt. The reaction mixture was then concentrated under reduced pressure to give 2-phenylimidazo[1,2-*a*]pyridin-3-ol (203 mg, 91%) as a yellowish amorphous powder.

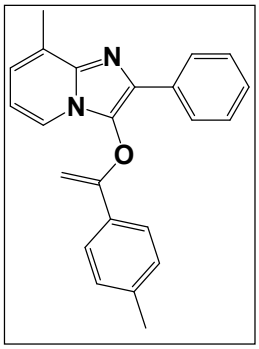
^{1}H NMR (400 MHz, DMSO-d_6): δ 8.14-8.12 (m, 3H), 7.35 (t, J = 8.0 Hz, 2H), 7.21 (d, J = 6.8 Hz, 1H), 7.04 (t, J = 7.2 Hz, 1H), 6.96 (t, J = 6.8 Hz, 1H), 2.50 (s, 3H).

4. **Characterization data for the products**:



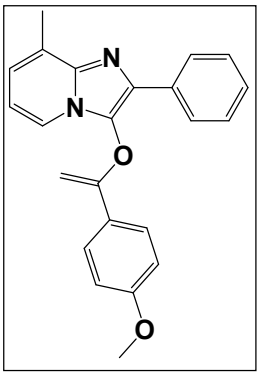
8-Methyl-2-phenyl-3-((1-phenylvinyl)oxy)imidazo[1,2-*a*]pyridine (**4a**):

Yellow gummy mass (81%, 52 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.11-8.08 (m, 2H), 7.91-7.88 (m, 2H), 7.65 (d, J = 6.8 Hz, 1H), 7.51-7.46 (m, 3H), 7.43-7.39 (m, 2H), 7.31-7.27 (m, 1H), 6.98-6.96 (m, 1H), 6.69 (t, J = 7.2 Hz, 1H), 4.95 (d, J = 3.6 Hz, 1H), 4.17 (d, J = 3.6 Hz, 1H), 2.69 (s, 3H); ^{13}C NMR (100 MHz): δ 156.3, 140.4, 133.6, 133.0, 130.7, 130.0, 129.5, 128.75, 128.71, 127.8, 127.6, 126.5, 125.5, 123.0, 119.5, 112.3, 88.0, 16.5; HRMS calcd for $C_{22}H_{19}N_2O$ $[M+H]^+$: 327.1492; found $[M+H]^+$: 327.1494.



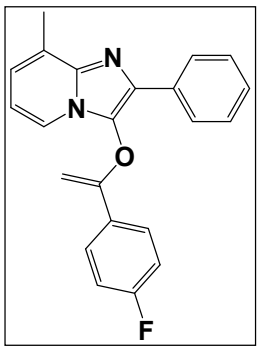
8-Methyl-2-phenyl-3-((1-(*p*-tolyl)vinyl)oxy)imidazo[1,2-*a*]pyridine (4b):

White solid (85%, 57 mg); m.p.: 148-149 °C. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.10-8.07 (m, 2H), 7.78 (d, J = 8.4 Hz, 2H), 7.64 (d, J = 6.4 Hz, 1H), 7.41-7.38 (m, 2H), 7.30-7.26 (m, 3H), 6.97-6.95 (m, 1H), 6.68 (t, J = 6.8 Hz, 1H), 4.89 (d, J = 3.6 Hz, 1H), 4.11 (d, J = 3.2 Hz, 1H), 2.68 (s, 3H), 2.44 (s, 3H); ^{13}C NMR (100 MHz): δ 156.4, 140.4, 139.6, 133.1, 130.9, 130.8, 130.1, 129.4, 128.7, 127.9, 127.6, 126.6, 125.4, 122.9, 119.6, 112.2, 87.2, 21.4, 16.5; Anal. Calcd for $C_{23}H_{20}N_2O$: C, 81.15; H, 5.92; N, 8.23%; Found: C, 80.94; H, 5.80; N, 8.09%.



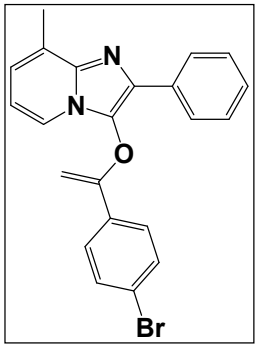
3-((1-(4-Methoxyphenyl)vinyl)oxy)-8-methyl-2-phenylimidazo[1,2-*a*]pyridine (**4c**):

Yellow gummy mass (73%, 51 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.08-8.06 (m, 2H), 7.83-7.80 (m, 2H), 7.64 (d, J = 6.8 Hz, 1H), 7.39 (t, J = 7.6 Hz, 2H), 7.28 (d, J = 7.2 Hz, 1H), 7.01-6.95 (m, 3H), 6.68 (t, J = 7.2 Hz, 1H), 4.81 (d, J = 4.0 Hz, 1H), 4.05 (d, J = 3.6 Hz, 1H), 3.88 (s, 3H), 2.67 (s, 3H); ^{13}C NMR (100 MHz): δ 160.7, 156.1, 140.4, 133.1, 130.7, 130.1, 128.7, 127.9, 127.5, 126.9, 126.6, 126.3, 123.0, 119.6, 114.1, 112.2, 86.3, 55.5, 16.5; HRMS calcd for $C_{23}H_{21}N_2O_2$ $[M+H]^+$: 357.1598; found $[M+H]^+$: 357.1591.



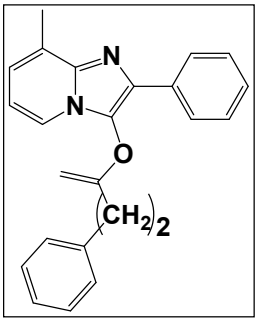
3-((1-(4-Fluorophenyl)vinyl)oxy)-8-methyl-2-phenylimidazo[1,2-*a*]pyridine (4d):

Yellow gummy mass (81%, 55 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.07-8.05 (m, 2H), 7.87-7.84 (m, 2H), 7.62 (d, J = 6.8 Hz, 1H), 7.42-7.38 (m, 2H), 7.31-7.27 (m, 1H), 7.18-7.14 (m, 2H), 6.98-6.96 (m, 1H), 6.70 (t, J = 6.8 Hz, 1H), 4.87 (d, J = 4.0 Hz, 1H), 4.14 (d, J = 3.6 Hz, 1H), 2.68 (s, 3H); ^{13}C NMR (100 MHz): δ 163.6 ($J_{C\text{-}F}$ = 248 Hz), 155.5, 140.4, 133.0, 130.8, 129.9, 129.8 ($J_{C\text{-}F}$ = 4 Hz), 128.7, 127.9, 127.6, 127.4 ($J_{C\text{-}F}$ = 8 Hz), 126.6, 123.0, 119.4, 115.7 ($J_{C\text{-}F}$ = 22 Hz), 112.4, 87.8, 16.5; Anal. Calcd for $C_{22}H_{17}FN_2O$: C, 76.73; H, 4.98; N, 8.13%; Found: C, 76.90; H, 5.04; N, 8.21%.



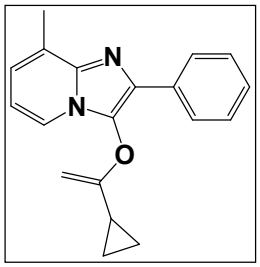
3-((1-(4-Bromophenyl)vinyl)oxy)-8-methyl-2-phenylimidazo[1,2-*a*]pyridine (**4e**):

Yellow gummy mass (82%, 66 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.05-8.02 (m, 2H), 7.76-7.72 (m, 2H), 7.62-7.59 (m, 3H), 7.41-7.37 (m, 2H), 7.30-7.27 (m, 1H), 6.98-6.96 (m, 1H), 6.70 (t, J = 6.8 Hz, 1H), 4.94 (d, J = 4.0 Hz, 1H), 4.18 (d, J = 4.0 Hz, 1H), 2.67 (s, 3H); ^{13}C NMR (100 MHz): δ 155.5, 140.4, 132.9, 132.5, 131.9, 130.8, 129.8, 128.7, 128.0, 127.7, 127.0, 126.6, 123.8, 123.1, 119.4, 112.4, 88.6, 16.5; Anal. Calcd for $C_{22}H_{17}BrN_2O$: C, 65.20; H, 4.23; N, 6.91%; Found: C, 65.39; H, 4.31; N, 6.79%.



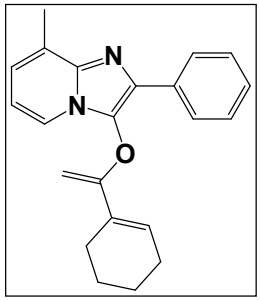
8-Methyl-2-phenyl-3-((4-phenylbut-1-en-2-yl)oxy)imidazo[1,2-*a*]pyridine (**4f**):

Yellow solid (95%, 67 mg); m.p.: 93-94 °C. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.02-8.00 (m, 2H), 7.41-7.37 (m, 3H), 7.32-7.26 (m, 5H), 7.23-7.19 (m, 1H), 6.88-6.86 (m, 1H), 6.58 (t, J = 6.8 Hz, 1H), 4.13 (d, J = 3.2 Hz, 1H), 3.79 (d, J = 3.2 Hz, 1H), 3.06 (t, J = 8.0 Hz, 2H), 2.78-2.74 (m, 2H), 2.61 (s, 3H); ^{13}C NMR (100 MHz): δ 159.0, 140.7, 140.2, 133.1, 130.4, 130.1, 128.6, 128.58, 128.51, 127.7, 127.4, 126.6, 126.3, 122.7, 119.5, 112.0, 88.0, 35.0, 33.3, 16.4; Anal. Calcd for $C_{24}H_{22}N_2O$: C, 81.33; H, 6.26; N, 7.90%; Found: C, 81.15; H, 6.35; N, 8.01%.



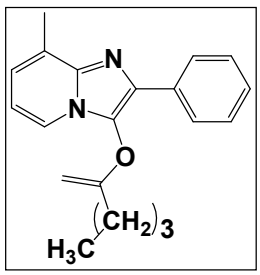
3-((1-Cyclopropylvinyl)oxy)-8-methyl-2-phenylimidazo[1,2-*a*]pyridine (**4g**):

Brown oil (98%, 56 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.92-7.90 (m, 2H), 7.43 (d, J = 6.8 Hz, 1H), 7.31 (t, J = 8.0 Hz, 2H), 7.19-7.14 (m, 1H), 6.77-6.75 (m, 1H), 6.52 (t, J = 6.8 Hz, 1H), 4.04 (d, J = 2.8 Hz, 1H), 3.66 (d, J = 2.8 Hz, 1H), 2.51 (s, 3H), 1.64-1.57 (m, 1H), 0.87-0.83 (m, 2H), 0.73-0.70 (m, 2H); ^{13}C NMR (100 MHz): δ 159.7, 140.1, 133.0, 130.3, 129.8, 128.5, 127.6, 127.3, 126.5, 122.6, 119.3, 112.0, 85.6, 16.4, 13.6, 5.3; HRMS calcd for $C_{19}H_{19}N_2O$ $[M+H]^+$: 291.1492; found $[M+H]^+$: 291.1493.



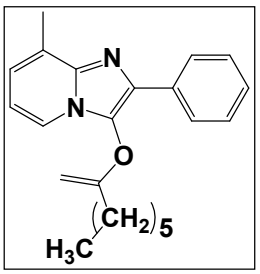
3-((1-(Cyclohex-1-en-1-yl)vinyl)oxy)-8-methyl-2-phenylimidazo[1,2-*a*]pyridine (**4h**):

Brown oil (71%, 46 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.06-8.03 (m, 2H), 7.59 (d, J = 6.8 Hz, 1H), 7.43-7.39 (m, 2H), 7.30-7.27 (m, 1H), 6.94-6.92 (m, 1H), 6.72 (t, J = 4.4 Hz, 1H), 6.67 (t, J = 6.8 Hz, 1H), 4.35 (d, J = 3.2 Hz, 1H), 3.90 (d, J = 3.2 Hz, 1H), 2.65 (s, 3H), 2.30-2.24 (m, 4H), 1.80-1.76 (m, 2H), 1.73-1.68 (m, 2H); ^{13}C NMR (100 MHz): δ 157.1, 140.4, 133.2, 130.5, 130.1, 128.6, 127.8, 127.4, 127.1, 126.5, 124.3, 122.8, 119.7, 112.0, 86.5, 25.6, 25.2, 22.7, 22.1, 16.5; HRMS calcd for $C_{22}H_{23}N_2O$ $[M+H]^+$: 331.1805; found $[M+H]^+$: 331.1813.



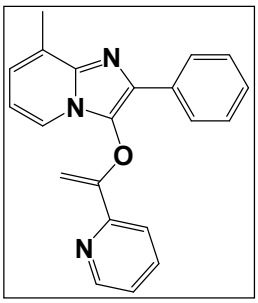
3-(Hex-1-en-2-yloxy)-8-methyl-2-phenylimidazo[1,2-*a*]pyridine (**4i**):

Yellow solid (96%, 58 mg); m.p.: 57-58 °C. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.01 (d, J = 7.2 Hz, 2H), 7.54 (d, J = 6.8 Hz, 1H), 7.39 (t, J = 8.0 Hz, 2H), 7.28-7.24 (m, 1H), 6.87 (d, J = 6.8 Hz, 1H), 6.63 (t, J = 6.8 Hz, 1H), 4.07 (d, J = 3.2 Hz, 1H), 3.75 (d, J = 2.8 Hz, 1H), 2.61 (s, 3H), 2.41 (t, J = 8.0 Hz, 2H), 1.75-1.68 (m, 2H), 1.50-1.41 (m, 2H), 0.97 (t, J = 7.6 Hz, 3H); ^{13}C NMR (100 MHz): δ 159.9, 140.1, 133.1, 130.3, 130.2, 128.5, 127.7, 127.4, 126.6, 122.7, 119.4, 112.0, 87.1, 33.2, 29.2, 22.3, 16.4, 13.9; Anal. Calcd for $C_{20}H_{22}N_2O$: C, 78.40; H, 7.24; N, 9.14%; Found: C, 78.20; H, 7.36; N, 9.21%.



8-Methyl-3-(oct-1-en-2-yloxy)-2-phenylimidazo[1,2-*a*]pyridine (**4j**):

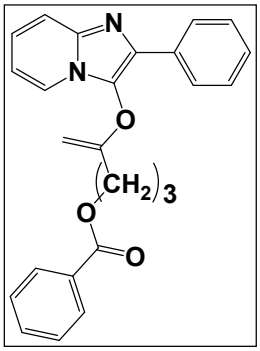
Yellow solid (97%, 64 mg); m.p.: 52-53 °C. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.02-8.00 (m, 2H), 7.52 (d, J = 6.8 Hz, 1H), 7.38 (t, J = 7.6 Hz, 2H), 7.26-7.22 (m, 1H), 6.84 (d, J = 6.8 Hz, 1H), 6.60 (t, J = 6.8 Hz, 1H), 4.06 (d, J = 3.2 Hz, 1H), 3.74 (d, J = 2.8 Hz, 1H), 2.59 (s, 3H), 2.39 (t, J = 8.0 Hz, 2H), 1.75-1.67 (m, 2H), 1.43-1.39 (m, 2H), 1.34-1.30 (m, 4H), 0.91-0.87 (m, 3H); ^{13}C NMR (100 MHz): δ 159.9, 140.1, 133.2, 130.3, 130.2, 128.4, 127.6, 127.3, 126.6, 122.6, 119.4, 111.9, 87.1, 33.5, 31.7, 28.9, 27.0, 22.6, 16.4, 14.1; Anal. Calcd for $C_{22}H_{26}N_2O$: C, 79.00; H, 7.84; N, 8.38%; Found: C, 79.19; H, 7.74; N, 8.49%.



8-Methyl-2-phenyl-3-((1-(pyridin-2-yl)vinyl)oxy)imidazo[1,2-*a*]pyridine (**4k**):

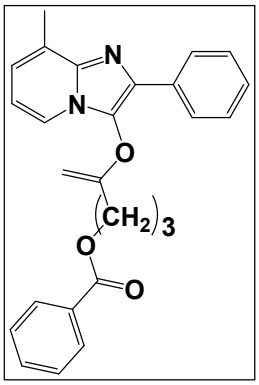
Brown gummy mass (75%, 49 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.70-8.69 (m, 1H), 8.07-8.05 (m, 2H), 8.00 (d, J = 8.0 Hz, 1H), 7.87-7.82 (m, 1H), 7.66 (d, J = 6.8 Hz, 1H), 7.41-7.34 (m, 3H), 7.29-7.26 (m, 1H), 6.98-6.96 (m, 1H), 6.69 (t, J = 6.8 Hz, 1H), 5.68 (d, J = 3.2 Hz, 1H),

4.33 (d, J = 3.2 Hz, 1H), 2.68 (s, 3H); ^{13}C NMR (100 MHz): δ 155.4, 151.3, 149.8, 140.4, 137.1, 132.9, 130.7, 129.9, 128.7, 128.3, 127.9, 127.6, 126.6, 124.0, 123.1, 119.6, 112.3, 91.2, 16.5; Anal. Calcd for $C_{21}H_{17}N_3O$: C, 77.04; H, 5.23; N, 12.84%; Found: C, 77.21; H, 5.30; N, 12.72%.



4-((2-Phenylimidazo[1,2-*a*]pyridin-3-yl)oxy)pent-4-en-1-yl benzoate (4l):

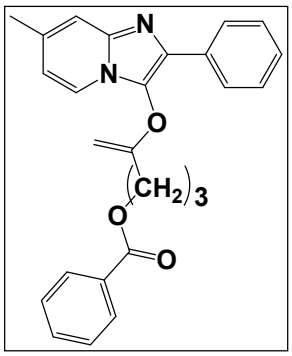
Brown oil (87%, 69 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.08-8.06 (m, 2H), 8.02-7.99 (m, 2H), 7.74-7.72 (m, 1H), 7.59-7.54 (m, 2H), 7.46-7.41 (m, 4H), 7.32-7.28 (m, 1H), 7.16-7.11 (m, 1H), 6.79-6.76 (m, 1H), 4.49 (t, J = 6.4 Hz, 2H), 4.20 (d, J = 3.2 Hz, 1H), 3.86 (d, J = 3.2 Hz, 1H), 2.63 (t, J = 8.0 Hz, 2H), 2.28-2.21 (m, 2H); ^{13}C NMR (100 MHz): δ 166.7, 158.7, 139.9, 133.1, 132.8, 130.9, 130.3, 129.77, 129.72, 128.7, 128.5, 127.8, 126.6, 124.2, 121.6, 117.9, 112.3, 88.2, 64.1, 30.3, 26.4; Anal. Calcd for $C_{25}H_{22}N_2O_3$: C, 75.36; H, 5.57; N, 7.03%; Found: C, 75.13; H, 5.66; N, 7.11%.



4-((8-Methyl-2-phenylimidazo[1,2-*a*]pyridin-3-yl)oxy)pent-4-en-1-yl benzoate (**4m**):

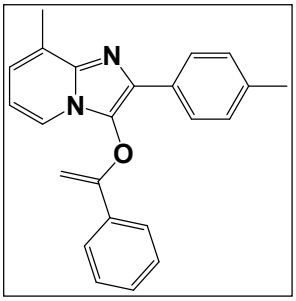
Brown oil (91%, 74 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.03-7.98 (m, 4H), 7.53 (d, J = 6.8 Hz, 1H), 7.50-7.46 (m, 1H), 7.39-7.35 (m, 4H), 7.25-7.21 (m, 1H), 6.85-6.83 (m, 1H), 6.60 (t, J = 6.8 Hz, 1H), 4.41 (t, J = 6.4 Hz, 2H), 4.12 (d, J = 3.2 Hz, 1H), 3.80 (d, J = 2.8 Hz, 1H), 2.58 (s, 3H), 2.55 (t, J = 8.0 Hz, 2H), 2.21-2.14 (m, 2H); ^{13}C NMR (100 MHz): δ 166.4, 158.6, 140.1, 133.0, 132.9, 130.2, 130.1, 129.8, 129.5, 128.4, 128.3, 127.6, 127.4, 126.5, 122.7, 119.3, 112.1, 87.9,

63.9, 30.1, 26.2, 16.3; HRMS calcd for $C_{26}H_{25}N_2O_3$ [M +H]$^+$: 413.1860; found [M +H]$^+$: 413.1867.



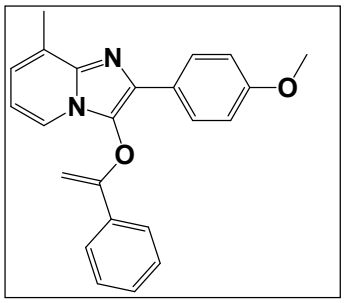
4-((7-Methyl-2-phenylimidazo[1,2-*a*]pyridin-3-yl)oxy)pent-4-en-1-yl benzoate (**4n**):

Yellow gummy mass (89%, 73 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.09-8.06 (m, 2H), 7.99-7.97 (m, 2H), 7.63 (d, J = 6.8 Hz, 1H), 7.59-7.55 (m, 1H), 7.47-7.40 (m, 4H), 7.33 (s, 1H), 7.31-7.26 (m, 1H), 6.63-6.61 (m, 1H), 4.49 (t, J = 6.8 Hz, 2H), 4.20 (d, J = 3.2 Hz, 1H), 3.87 (d, J = 2.8 Hz, 1H), 2.63 (t, J = 8.0 Hz, 2H), 2.39 (s, 3H), 2.29-2.22 (m, 2H); ^{13}C NMR (100 MHz): δ 166.7, 158.8, 140.4, 135.1, 133.1, 133.0, 130.4, 130.3, 129.7, 129.4, 128.6, 128.5, 127.6, 126.5, 120.9, 116.2, 114.9, 88.1, 64.1, 30.3, 26.4, 21.5; Anal. Calcd for $C_{26}H_{24}N_2O_3$: C, 75.71; H, 5.86; N, 6.79%; Found: C, 75.50; H, 5.79; N, 6.88%.



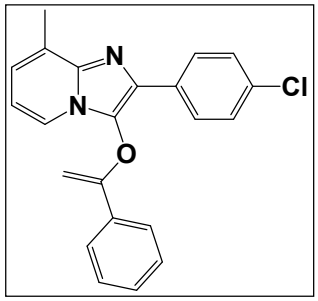
8-Methyl-3-((1-phenylvinyl)oxy)-2-(*p*-tolyl)imidazo[1,2-*a*]pyridine (**4o**):

Brown gummy mass (84%, 57 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.95 (d, J = 8.4 Hz, 2H), 7.85-7.83 (m, 2H), 7.58 (d, J = 6.8 Hz, 1H), 7.45-7.40 (m, 3H), 7.17 (d, J = 8.0 Hz, 2H), 6.90-6.88 (m, 1H), 6.60 (t, J = 6.8 Hz, 1H), 4.88 (d, J = 3.6 Hz, 1H), 4.10 (d, J = 3.6 Hz, 1H), 2.64 (s, 3H), 2.31 (s, 3H); ^{13}C NMR (100 MHz): δ 156.2, 140.2, 137.2, 133.6, 130.8, 130.1, 129.6, 129.4, 129.3, 128.6, 127.6, 126.4, 125.4, 122.8, 119.3, 112.1, 87.9, 21.3, 16.5; Anal. Calcd for $C_{23}H_{20}N_2O$: C, 81.15; H, 5.92; N, 8.23%; Found: C, 80.97; H, 5.81; N, 8.36%.



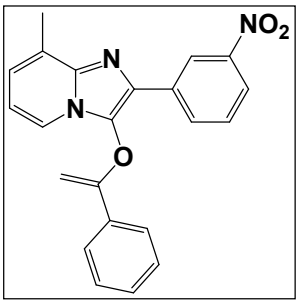
2-(4-Methoxyphenyl)-8-methyl-3-((1-phenylvinyl)oxy)imidazo[1,2-*a*]pyridine (**4p**):

Brown gummy mass (81%, 57 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.01 (d, J = 8.8 Hz, 2H), 7.89-7.87 (m, 2H), 7.63 (d, J = 6.8 Hz, 1H), 7.50-7.45 (m, 3H), 6.96-6.93 (m, 3H), 6.67 (t, J = 6.8 Hz, 1H), 4.94 (d, J = 3.6 Hz, 1H), 4.15 (d, J = 3.6 Hz, 1H), 3.81 (s, 3H), 2.67 (s, 3H); ^{13}C NMR (100 MHz): δ 159.2, 156.3, 140.3, 133.7, 130.8, 129.5, 129.2, 128.7, 127.9, 127.6, 125.8, 125.5, 122.9, 119.4, 114.1, 112.1, 88.0, 55.3, 16.5; HRMS calcd for $C_{23}H_{21}N_2O_2$ $[M+H]^+$: 357.1598; found $[M+H]^+$: 357.1593.



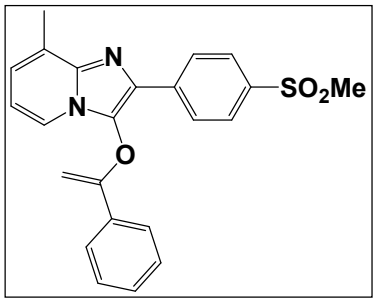
2-(4-Chlorophenyl)-8-methyl-3-((1-phenylvinyl)oxy)imidazo[1,2-*a*]pyridine (**4q**):

Brown gummy mass (91%, 65 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.04-8.00 (m, 2H), 7.89-7.86 (m, 2H), 7.63 (d, J = 6.8 Hz, 1H), 7.51-7.46 (m, 3H), 7.38-7.35 (m, 2H), 6.98-6.96 (m, 1H), 6.69 (t, J = 6.8 Hz, 1H), 4.95 (d, J = 4.0 Hz, 1H), 4.14 (d, J = 3.6 Hz, 1H), 2.67 (s, 3H); ^{13}C NMR (100 MHz): δ 156.2, 140.4, 133.4, 133.3, 131.6, 130.1, 129.7, 129.6, 128.88, 128.80, 127.9, 127.8, 125.4, 123.2, 119.5, 112.4, 88.1, 16.5; Anal. Calcd for $C_{22}H_{17}ClN_2O$: C, 73.23; H, 4.75; N, 7.76%; Found: C, 73.05; H, 7.66; N, 7.63%.



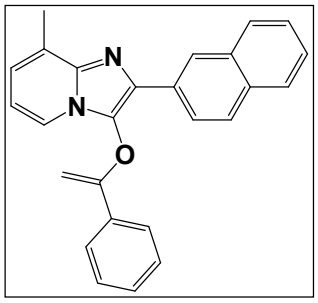
8-Methyl-2-(3-nitrophenyl)-3-((1-phenylvinyl)oxy)imidazo[1,2-*a*]pyridine (**4r**):

Yellow solid (86%, 63 mg); m.p.: 155-156 °C. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.96 (t, J = 2.0 Hz, 1H), 8.35 (d, J = 8.0 Hz, 1H), 8.10-8.08 (m, 1H), 7.89-7.87 (m, 2H), 7.67 (d, J = 6.8 Hz, 1H), 7.54-7.46 (m, 4H), 7.01 (d, J = 6.8 Hz, 1H), 6.73 (t, J = 6.8 Hz, 1H), 4.95 (d, J = 3.6 Hz, 1H), 4.12 (d, J = 3.6 Hz, 1H), 2.67 (s, 3H); ^{13}C NMR (100 MHz): δ 156.6, 148.7, 140.6, 134.9, 133.2, 132.0, 130.8, 129.8, 129.5, 128.8, 128.4, 128.2, 125.5, 123.6, 122.0, 121.4, 119.6, 112.8, 88.2, 16.4; HRMS calcd for $C_{22}H_{18}N_3O_3$ $[M+H]^+$: 372.1343; found $[M+H]^+$: 372.1346.



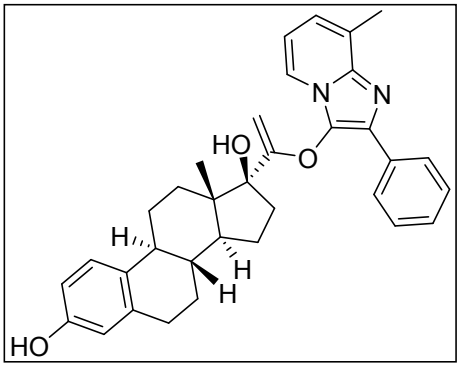
8-Methyl-2-(4-(methylsulfonyl)phenyl)-3-((1-phenylvinyl)oxy)imidazo[1,2-*a*]pyridine (**4s**):

Brown solid (83%, 67 mg); m.p.: 184-185 °C. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.25 (d, J = 8.4 Hz, 2H), 7.93 (d, J = 8.4 Hz, 2H), 7.87-7.85 (m, 2H), 7.65 (d, J = 6.4 Hz, 1H), 7.50-7.47 (m, 3H), 7.00 (d, J = 6.8 Hz, 1H), 6.72 (t, J = 6.8 Hz, 1H), 4.96 (d, J = 4.0 Hz, 1H), 4.12 (d, J = 4.0 Hz, 1H), 3.03 (s, 3H), 2.66 (s, 3H); ^{13}C NMR (100 MHz): δ 156.3, 140.7, 138.7, 138.5, 133.1, 131.3, 129.8, 128.8, 128.7, 128.2, 127.7, 127.0, 125.3, 123.7, 119.6, 112.9, 88.2, 44.6, 16.4; HRMS calcd for $C_{23}H_{21}N_2O_3S$ $[M+H]^+$: 405.1267; found $[M+H]^+$: 405.1273.

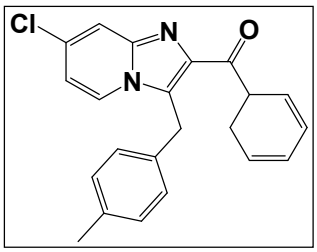


8-Methyl-2-(naphthalen-2-yl)-3-((1-phenylvinyl)oxy)imidazo[1,2-*a*]pyridine (**4t**):

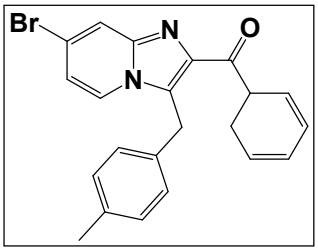
Brown gummy mass (88%, 66 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.60 (s, 1H), 8.27-8.24 (m, 1H), 7.95-7.93 (m, 2H), 7.89-7.80 (m, 3H), 7.69 (d, J = 6.4 Hz, 1H), 7.54-7.42 (m, 5H), 7.00-6.98 (m, 1H), 6.70 (t, J = 6.8 Hz, 1H), 4.97 (d, J = 3.6 Hz, 1H), 4.21 (d, J = 3.6 Hz, 1H), 2.74 (s, 3H); ^{13}C NMR (100 MHz): δ 156.4, 140.5, 133.73, 133.70, 132.9, 130.7, 130.6, 130.5, 130.4, 129.6, 128.7, 128.5, 128.2, 127.8, 127.7, 126.0, 125.9, 125.5, 124.6, 123.1, 119.5, 112.3, 88.2, 16.6; HRMS calcd for $C_{26}H_{21}N_2O$ $[M+H]^+$: 377.1648; found $[M+H]^+$: 377.1676.



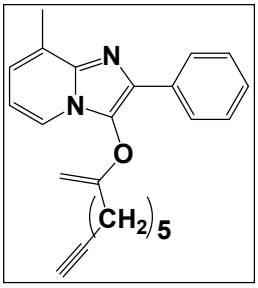
(8R,9S,13S,14S,17S)-13-Methyl-17-(1-((8-methyl-2-phenylimidazo[1,2-*a*]pyridin-3-yl)oxy)vinyl)-7,8,9,11,12,13,14,15,16,17-decahydro-6H-cyclopenta[*a*]phenanthrene-3,17-diol (**4u**): White gummy mass (72%, 74 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.01 (d, J = 7.2 Hz, 2H), 7.86 (d, J = 6.8 Hz, 1H), 7.40 (t, J = 8.0 Hz, 2H), 7.30 (t, J = 7.2 Hz, 1H), 7.15 (d, J = 8.8 Hz, 1H), 6.98 (d, J = 6.8 Hz, 1H), 6.73 (t, J = 6.8 Hz, 1H), 6.65-6.63 (m, 1H), 6.55 (d, J = 2.4 Hz, 1H), 4.42 (d, J = 4.0 Hz, 1H), 4.23 (d, J = 3.6 Hz, 1H), 2.92 (s, 1H), 2.83-2.76 (m, 2H), 2.65 (s, 3H), 2.34-2.26 (m, 2H), 2.19-2.11 (m, 2H), 1.91-1.85 (m, 2H), 1.75-1.69 (m, 3H), 1.55-1.49 (m, 2H), 1.36-1.25 (m, 2H), 1.04 (s, 3H); ^{13}C NMR (100 MHz): δ 162.7, 153.8, 140.5, 138.3, 132.7, 132.3, 131.6, 129.6, 128.5, 127.9, 127.6, 126.5, 123.3, 120.1, 115.5, 112.9, 112.5, 91.2, 86.0, 48.8, 47.7, 43.7, 39.6, 36.1, 34.2, 29.7, 27.5, 26.6, 23.0, 16.6, 14.6; HRMS calcd for $C_{34}H_{37}N_2O_3$ $[M+H]^+$: 521.2799; found $[M+H]^+$: 521.2797.



(7-Chloro-3-(4-methylbenzyl)imidazo[1,2-*a*]pyridin-2-yl)(cyclohexa-2,4-dien-1-yl)methanone (**4v**): White solid (83%, 60 mg); m.p.: 165-166 °C. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.29-8.27 (m, 2H), 8.04-8.03 (m, 1H), 7.60-7.56 (m, 2H), 7.52-7.48 (m, 2H), 7.28-7.25 (m, 1H), 7.14-7.08 (m, 4H), 4.66 (s, 2H), 2.30 (s, 3H); ^{13}C NMR (100 MHz): δ 190.8, 142.0, 140.6, 138.0, 136.7, 133.0, 132.7, 130.9, 129.7, 129.2, 128.8, 128.2, 128.1, 123.9, 119.9, 108.7, 29.4, 21.1; Anal. Calcd for $C_{22}H_{19}ClN_2O$: C, 72.82; H, 5.28; N, 7.72%; Found: C, 73.00; H, 5.19; N, 7.59%.

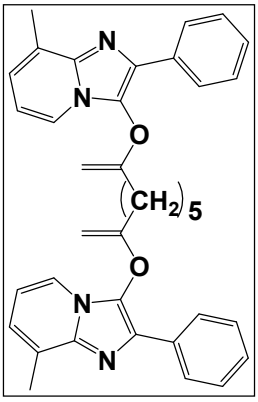


(7-Bromo-3-(4-methylbenzyl)imidazo[1,2-*a*]pyridin-2-yl)(cyclohexa-2,4-dien-1-yl)methanone (**4w**): White solid (82%, 66 mg); m.p.: 161-162 °C. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.29-8.27 (m, 2H), 7.93 (d, J = 1.6 Hz, 1H), 7.64-7.57 (m, 2H), 7.53-7.49 (m, 2H), 7.20-7.17 (m, 1H), 7.14-7.08 (m, 4H), 4.66 (s, 2H), 2.30 (s, 3H); ^{13}C NMR (100 MHz): δ 190.8, 141.9, 140.8, 138.1, 136.7, 133.0, 132.8, 130.9, 129.7, 129.0, 128.3, 128.1, 127.2, 122.1, 121.7, 119.7, 29.4, 21.1; Anal. Calcd for $C_{22}H_{19}BrN_2O$: C, 64.87; H, 4.70; N, 6.88%; Found: C, 64.65; H, 4.81; N, 7.00%.



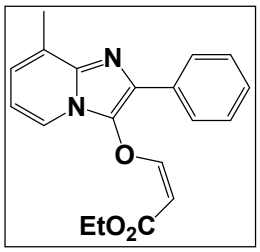
8-Methyl-3-(non-1-en-8-yn-2-yloxy)-2-phenylimidazo[1,2-*a*]pyridine (**5a**):

Brown oil (44%, 30 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.03-8.01 (m, 2H), 7.59 (d, J = 6.4 Hz, 1H), 7.44-7.41 (m, 2H), 7.31-7.27 (m, 1H), 6.95-6.93 (m, 1H), 6.69 (t, J = 6.8 Hz, 1H), 4.13 (d, J = 3.2 Hz, 1H), 3.80 (d, J = 2.8 Hz, 1H), 2.65 (s, 3H), 2.46 (t, J = 8.0 Hz, 2H), 2.27-2.23 (m, 2H), 1.97 (t, J = 2.8 Hz, 1H), 1.83-1.76 (m, 2H), 1.66-1.56 (m, 4H); ^{13}C NMR (100 MHz): δ 159.8, 140.2, 133.2, 130.4, 130.2, 128.5, 127.8, 127.5, 126.7, 122.7, 119.5, 112.1, 87.4, 84.5, 68.5, 33.5, 28.3, 26.6, 18.5, 16.5; HRMS calcd for $C_{23}H_{25}N_2O$ $[M+H]^+$: 345.1961; found $[M+H]^+$: 345.1965.



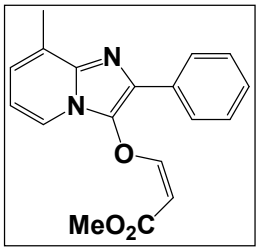
3,3'-(Nona-1,8-diene-2,8-diylbis(oxy))bis(8-methyl-2-phenylimidazo[1,2-*a*]pyridine) (**5b**):

Brown oil (26%, 30 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.06-8.04 (m, 4H), 7.60 (d, J = 6.8 Hz, 2H), 7.44 (t, J = 7.6 Hz, 4H), 7.29 (t, J = 7.6 Hz, 2H), 6.94-6.92 (m, 2H), 6.67 (t, J = 6.8 Hz, 2H), 4.16 (d, J = 2.8 Hz, 2H), 3.84 (d, J = 2.8 Hz, 2H), 2.65 (s, 6H), 2.51 (t, J = 8.0 Hz, 4H), 1.92-1.84 (m, 4H), 1.70-1.60 (m, 2H); ^{13}C NMR (100 MHz): δ 159.8, 140.3, 133.2, 130.4, 130.2, 128.6, 127.9, 127.5, 126.7, 122.8, 119.5, 112.1, 87.5, 33.6, 28.8, 27.0, 16.5; HRMS calcd for $C_{37}H_{37}N_4O_2$ $[M+H]^+$: 569.2911; found $[M+H]^+$: 569.2920.



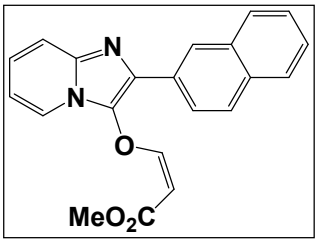
Ethyl (*Z*)-3-((8-methyl-2-phenylimidazo[1,2-*a*]pyridin-3-yl)oxy)acrylate (**7a**):

Yellow solid (94%, 60 mg); m.p.: 97-98 °C. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.98 (d, J = 7.2 Hz, 2H), 7.84 (d, J = 6.8 Hz, 1H), 7.39 (t, J = 7.6 Hz, 2H), 7.28-7.25 (m, 1H), 6.92 (d, J = 6.8 Hz, 1H), 6.70 (t, J = 6.8 Hz, 1H), 6.51 (d, J = 6.8 Hz, 1H), 5.22 (d, J = 6.8 Hz, 1H), 4.27 (q, J = 14.0 Hz, J = 7.2 Hz, 2H), 2.58 (s, 3H), 1.33 (t, J = 7.2 Hz, 3H); ^{13}C NMR (100 MHz): δ 164.0, 155.7, 139.6, 133.3, 132.2, 128.7, 127.7, 127.6, 126.9, 123.2, 119.2, 112.6, 102.5, 60.3, 16.3, 14.3; Anal. Calcd for $C_{19}H_{18}N_2O_3$: C, 70.79; H, 5.63; N, 8.69%; Found: C, 70.98; H, 5.55; N, 8.81%.



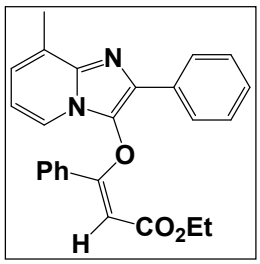
Methyl (*Z*)-3-((8-methyl-2-phenylimidazo[1,2-*a*]pyridin-3-yl)oxy)acrylate (7b):

White solid (93%, 57 mg); m.p.: 94-95 °C. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.00-7.97 (m, 2H), 7.85 (d, J = 6.4 Hz, 1H), 7.43-7.39 (m, 2H), 7.31-7.27 (m, 1H), 6.95-6.93 (m, 1H), 6.72 (t, J = 6.8 Hz, 1H), 6.54 (d, J = 6.8 Hz, 1H), 5.24 (d, J = 6.8 Hz, 1H), 3.82 (s, 3H), 2.60 (s, 3H); ^{13}C NMR (100 MHz): δ 164.5, 156.0, 139.7, 133.3, 132.2, 128.7, 127.8, 127.7, 127.0, 123.3, 119.2, 112.7, 102.0, 51.5, 16.4; HRMS calcd for $C_{18}H_{17}N_2O_3$ $[M+H]^+$: 309.1234; found $[M+H]^+$: 309.1242.



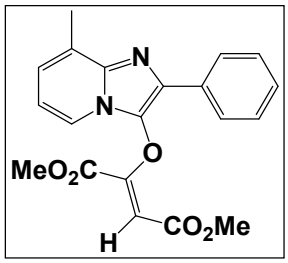
Methyl (*Z*)-3-((2-(naphthalen-2-yl)imidazo[1,2-*a*]pyridin-3-yl)oxy)acrylate (**7c**):

Brown gummy mass (68%, 46 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.51 (s, 1H), 8.14-8.11 (m, 1H), 8.08-8.06 (m, 1H), 7.93-7.89 (m, 2H), 7.85-7.83 (m, 1H), 7.63 (d, J = 9.2 Hz, 1H), 7.50-7.47 (m, 2H), 7.25-7.21 (m, 1H), 6.91-6.87 (m, 1H), 6.61 (d, J = 6.8 Hz, 1H), 5.31 (d, J = 6.8 Hz, 1H), 3.89 (s, 3H); ^{13}C NMR (100 MHz): δ 164.6, 155.9, 139.7, 133.7, 133.4, 133.1, 129.3, 128.6, 128.5, 127.8, 126.48, 126.43, 126.3, 124.9, 124.7, 121.6, 117.9, 112.9, 102.6, 51.7; Anal. Calcd for $C_{21}H_{16}N_2O_3$: C, 73.24; H, 4.68; N, 8.13%; Found: C, 73.45; H, 4.77; N, 8.02%.



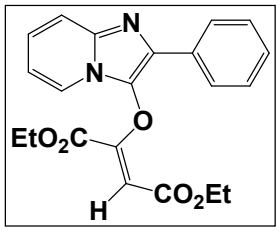
Ethyl (*Z*)-3-((8-methyl-2-phenylimidazo[1,2-*a*]pyridin-3-yl)oxy)-3-phenylacrylate (**9a**):

Yellow gummy mass (71%, 56 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.98 (d, J = 6.8 Hz, 1H), 7.86 (d, J = 7.6 Hz, 2H), 7.40 (t, J = 7.6 Hz, 2H), 7.31 (t, J = 7.6 Hz, 1H), 7.19-7.16 (m, 1H), 7.04-6.99 (m, 4H), 6.89 (d, J = 6.8 Hz, 1H), 6.74 (t, J = 6.8 Hz, 1H), 5.55 (s, 1H), 4.23 (q, J = 14.4 Hz, J = 7.2 Hz, 2H), 2.53 (s, 3H), 1.30 (t, J = 7.2 Hz, 3H); ^{13}C NMR (100 MHz): δ 164.5, 163.5, 132.9, 132.8, 130.5, 130.2, 128.5, 128.25, 128.22, 127.7, 127.69, 127.65, 127.60, 127.1, 122.6, 119.3, 112.5, 103.3, 60.5, 16.5, 14.4; Anal. Calcd for $C_{25}H_{22}N_2O_3$: C, 75.36; H, 5.57; N, 7.03%; Found: C, 75.56; H, 5.50; N, 6.93%.



Dimethyl 2-((8-methyl-2-phenylimidazo[1,2-*a*]pyridin-3-yl)oxy)fumarate (**9b**):

Brown gummy mass (79%, 57 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.92 (d, J = 6.8 Hz, 1H), 7.87-7.85 (m, 2H), 7.39-7.35 (m, 2H), 7.31-7.27 (m, 1H), 6.99-6.97 (m, 1H), 6.77 (t, J = 6.8 Hz, 1H), 6.19 (s, 1H), 3.68 (s, 3H), 3.56 (s, 3H), 2.62 (s, 3H); ^{13}C NMR (100 MHz): δ 163.7, 161.4, 149.6, 139.8, 132.3, 131.4, 129.5, 128.4, 127.8, 127.6, 127.4, 123.2, 120.3, 112.2, 109.9, 53.2, 52.1, 16.5; HRMS calcd for $C_{20}H_{19}N_2O_5$ $[M+H]^+$: 367.1288; found $[M+H]^+$: 367.1293.



Diethyl 2-((2-phenylimidazo[1,2-*a*]pyridin-3-yl)oxy)fumarate (**9c**):

Brown gummy mass (73%, 55 mg); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.05 (d, J = 6.8 Hz, 1H), 7.83 (d, J = 7.6 Hz, 2H), 7.62 (d, J = 9.2 Hz, 1H), 7.33 (t, J = 8.0 Hz, 2H), 7.28-7.24 (m, 1H), 7.21-7.17 (m, 1H), 6.86 (t, J = 6.8 Hz, 1H), 6.19 (s, 1H), 4.17 (q, J = 14.4 Hz, J = 7.2 Hz, 2H), 3.96 (q, J = 14.4 Hz, J = 7.2 Hz, 2H), 1.25 (t, J = 7.2 Hz, 3H), 0.91 (t, J = 7.2 Hz, 3H); ^{13}C NMR (100 MHz): δ 163.3, 160.8, 149.9, 139.4, 131.7, 131.3, 129.7, 128.4, 127.9, 127.6, 124.7, 122.5, 117.5, 112.3, 110.3, 62.6, 61.3, 14.1, 13.6; Anal. Calcd for $C_{21}H_{20}N_2O_5$: C, 66.31; H, 5.30; N, 7.36%; Found: C, 66.10; H, 5.21; N, 7.47%.

5. References

1. *a*) H. A. Riley and A. R. Gray, *Organic Syntheses*; Wiley & Sons: New York, NY, 1943; Collect. Vol. II, p 509; *b*) P. Wang, W.-J. Tao, X.-L. Sun, S. Liao and Y. Tang, *J. Am. Chem. Soc*., 2013, **135**, 16849; *c*) S. Batra and H. Batchu, *Eur. J. Org. Chem*., 2012, 2935.

2. *a*) B. Alcaide, J. Plumet, M. A. Sierra and C. Vicent, *J. Org. Chem.,* 1989, **54***,* 5763; *b*) B. Alcaide, R. Pgrez-Ossorio, J. Plumet and M. A. Sierra, *Tetrahedron Lett.,* 1986, **27**, 1627.

6. NMR spectra for the synthesized compounds: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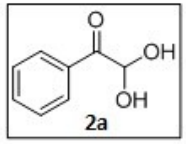
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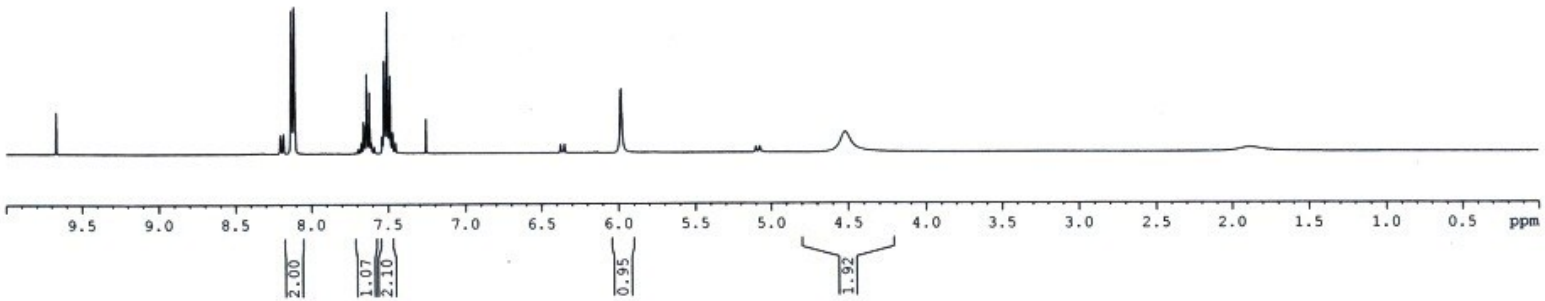
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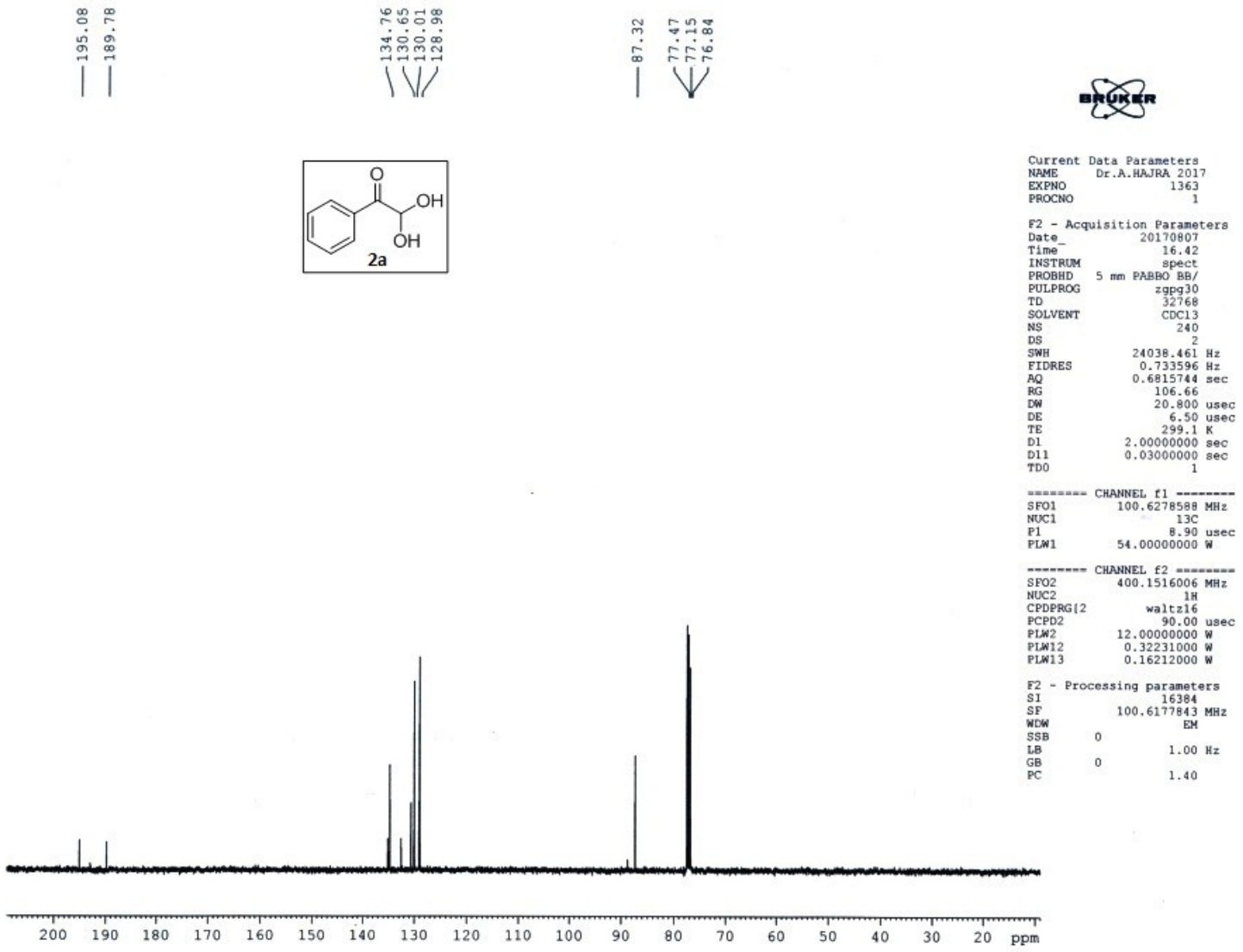
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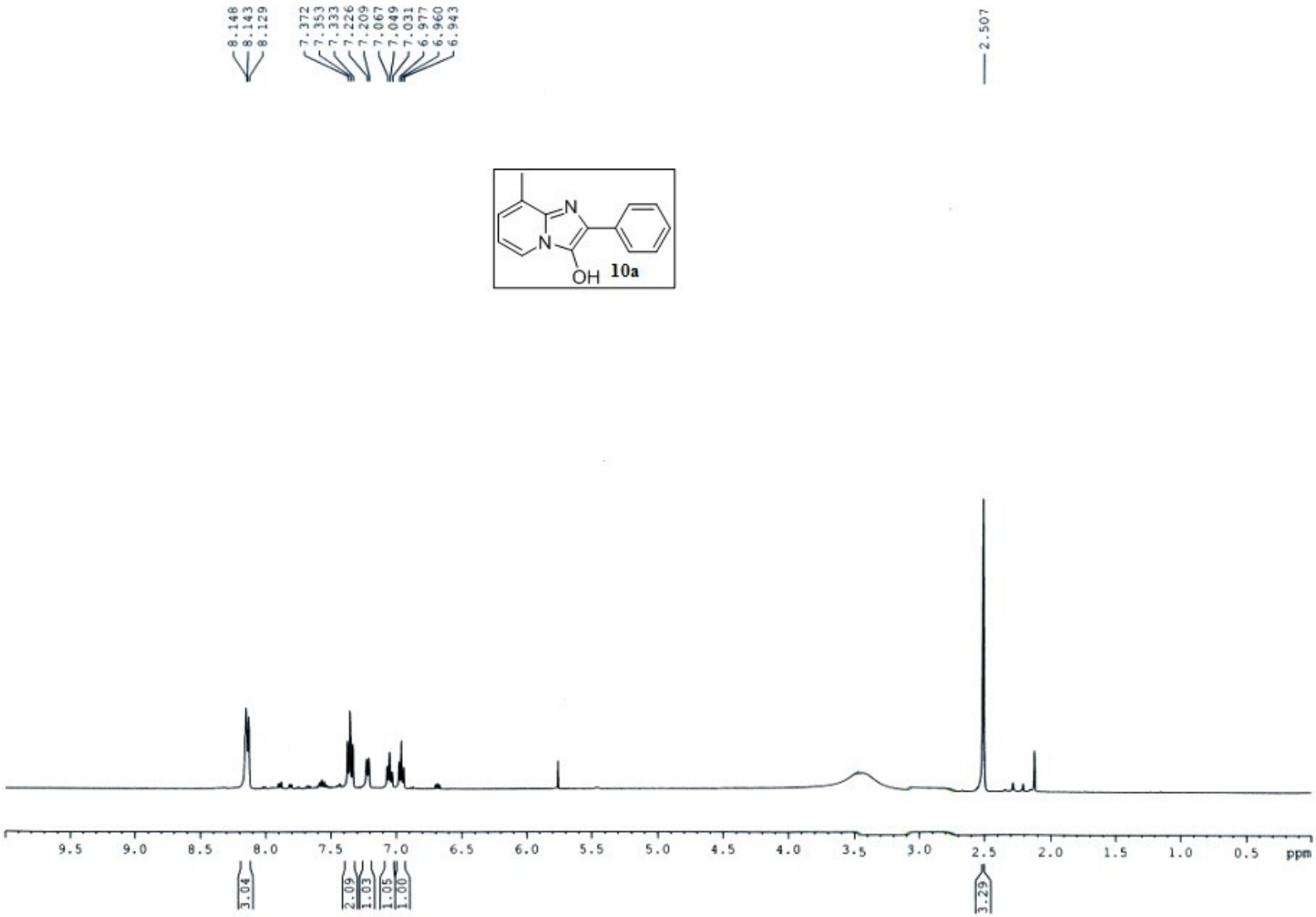
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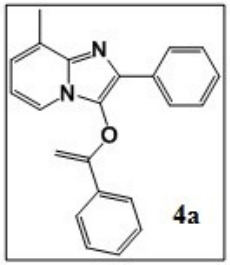
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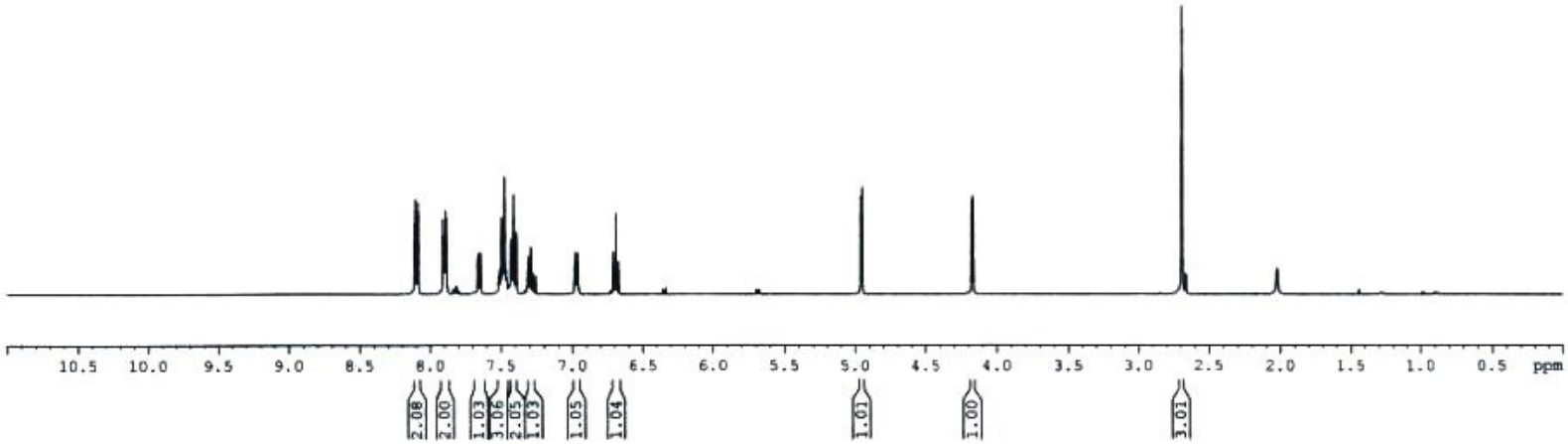
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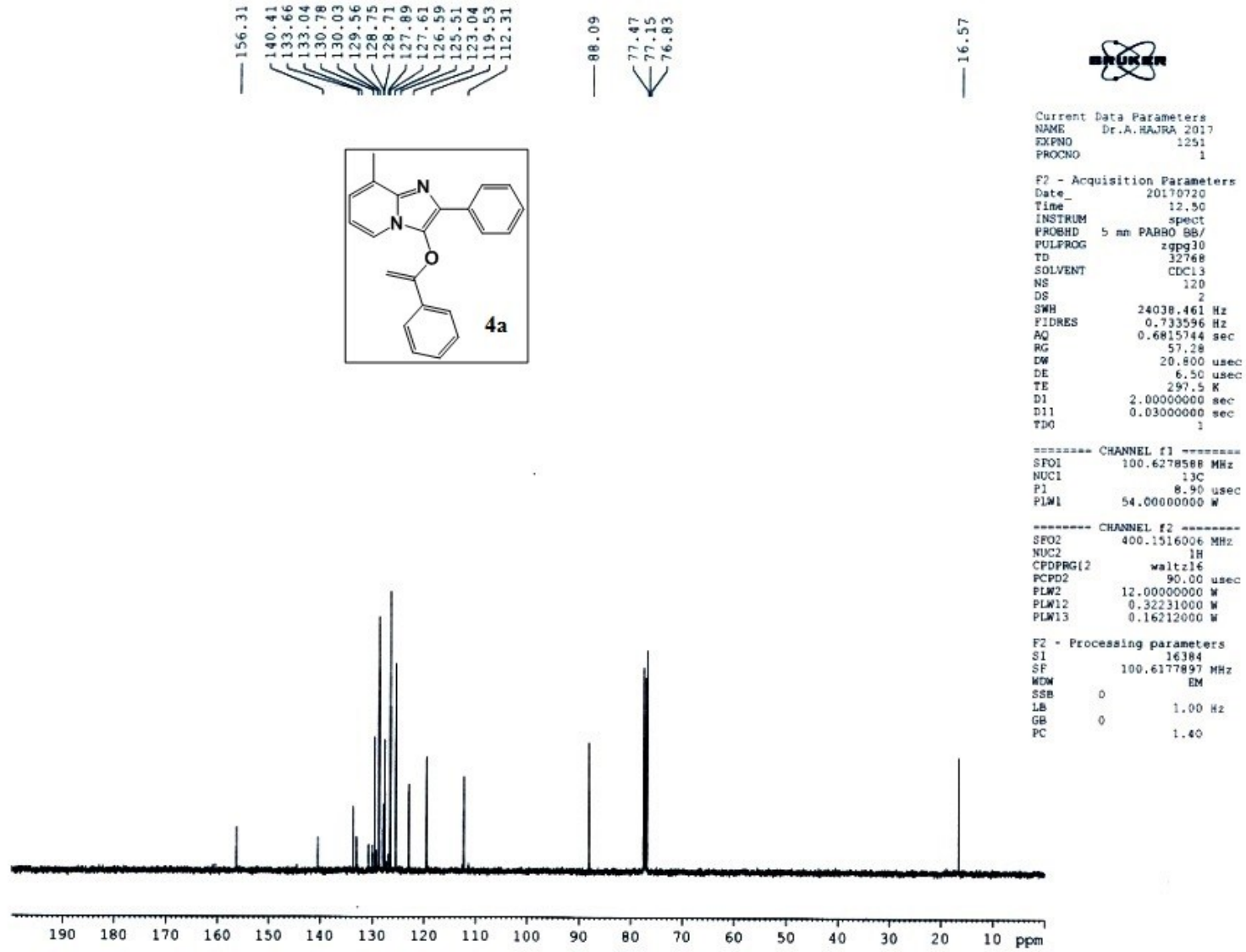
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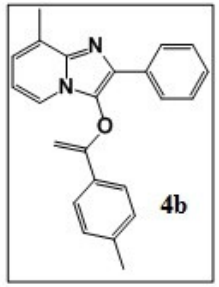
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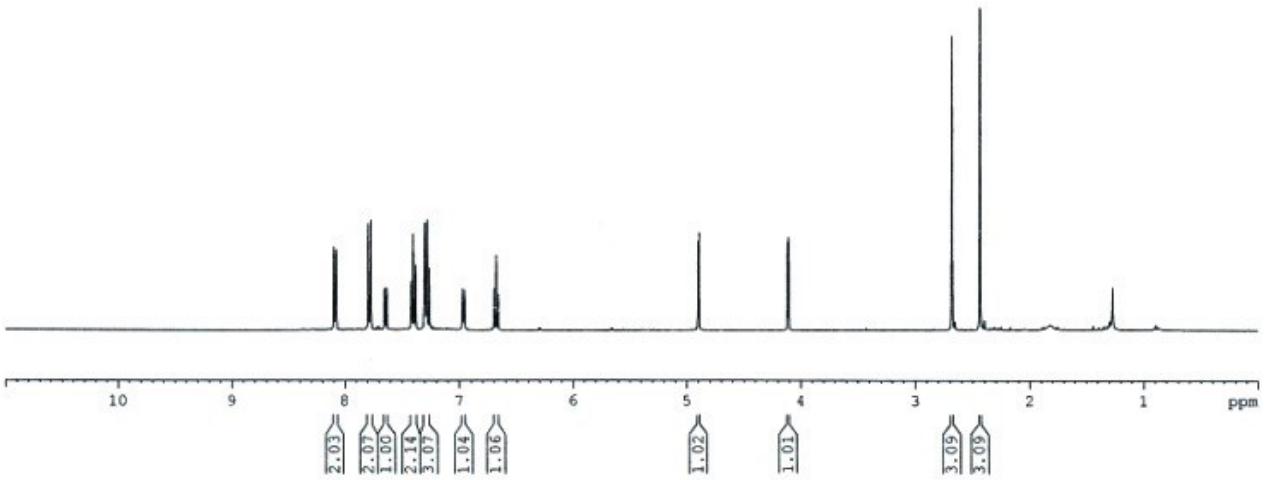
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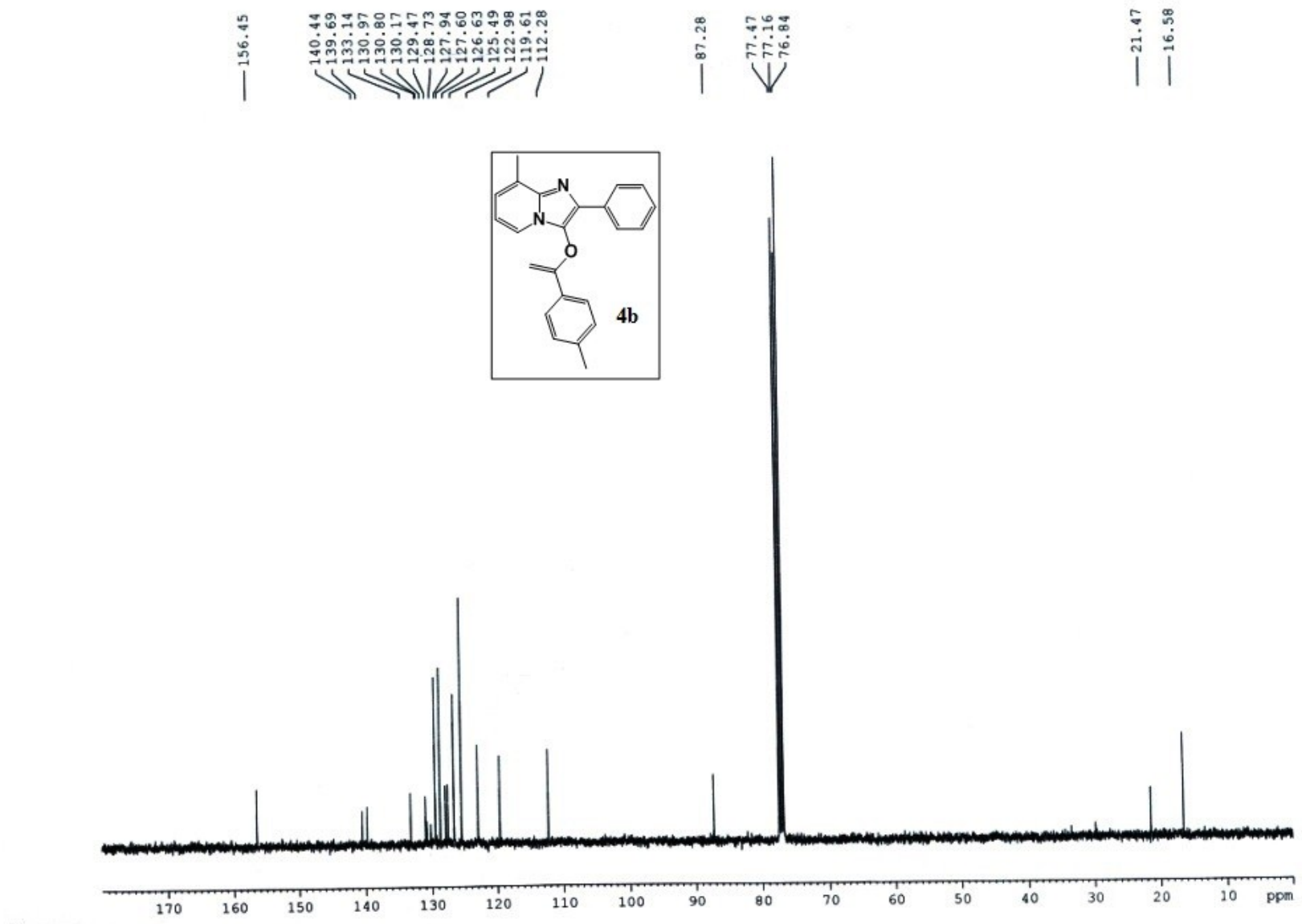
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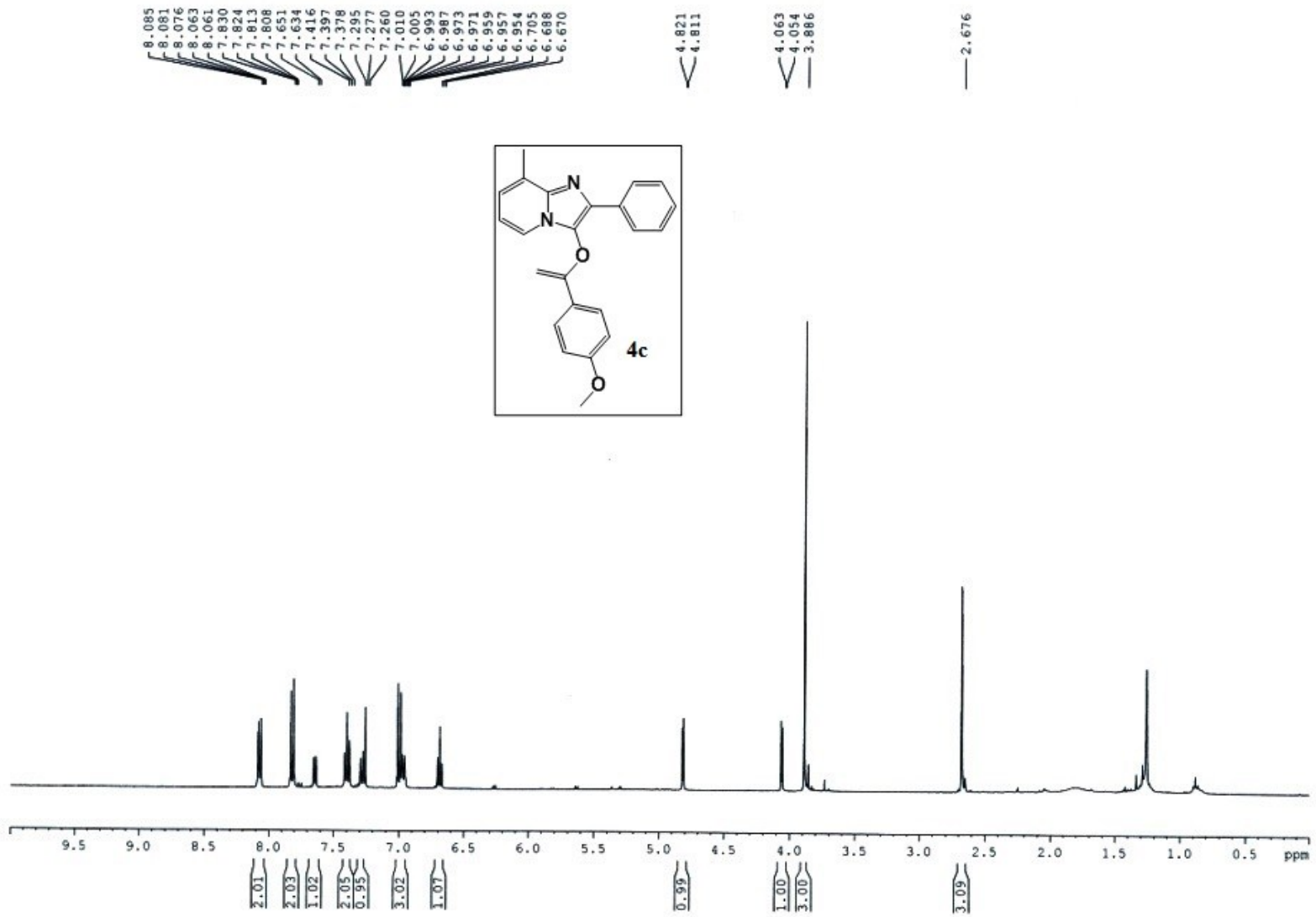
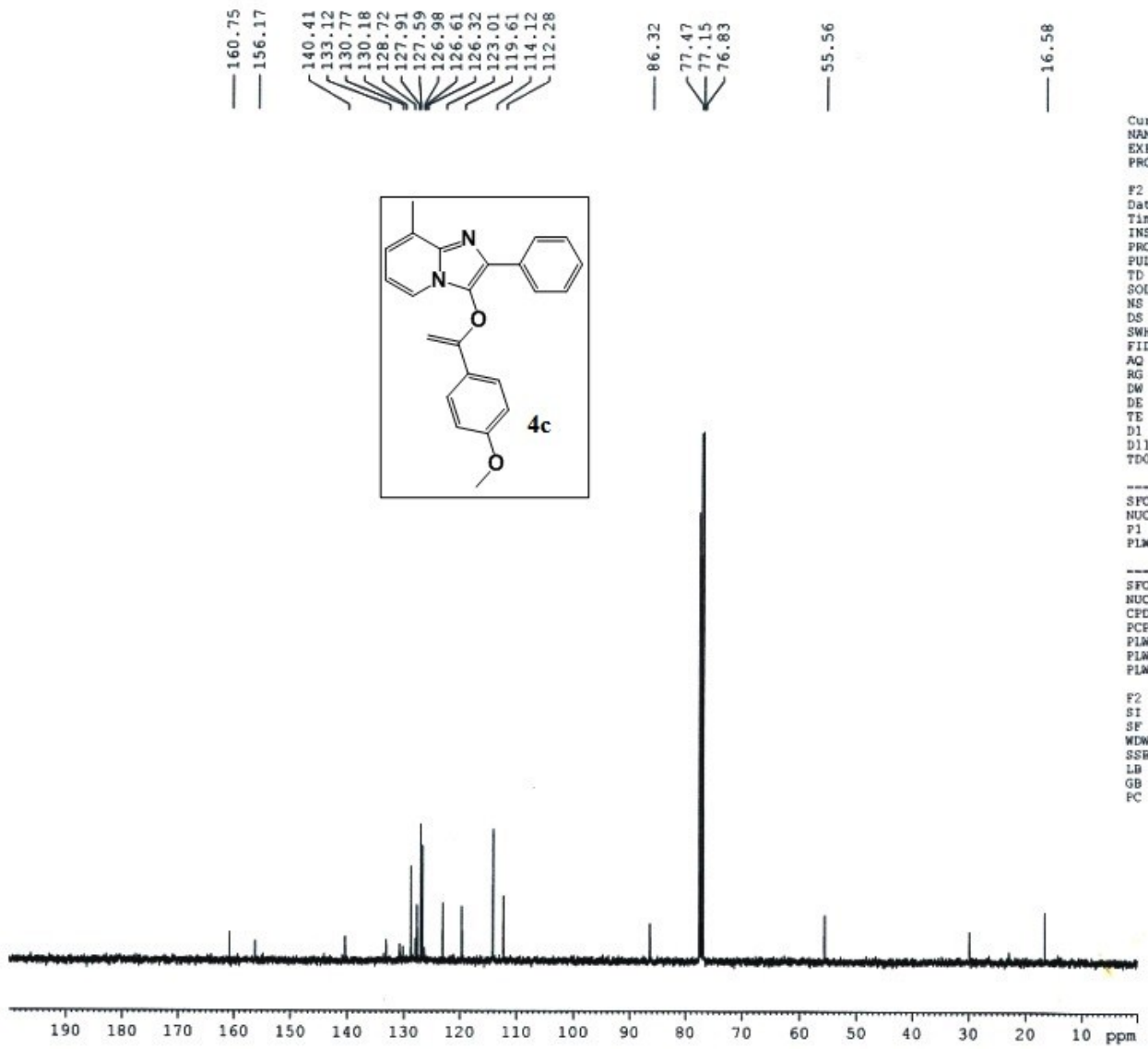
112.28
87.28
77.47
77.16
76.84
21.47
16.58
N
N
O
4b
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
ppm


8.085
8.081
8.076
8.063
8.061
7.830
7.824
7.813
7.808
7.651
7.634
7.416
7.397
7.378
7.295
7.277
7.260
7.010
7.005
6.993
6.987
6.973
6.971
6.959
6.957
6.954
6.705
6.688
6.670
4.821
4.811
4.063
4.054
3.886
2.676
N
N
O
O
4c
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.01
2.03
1.02
2.05
0.95
3.02
1.07
0.99
1.00
3.00
3.09



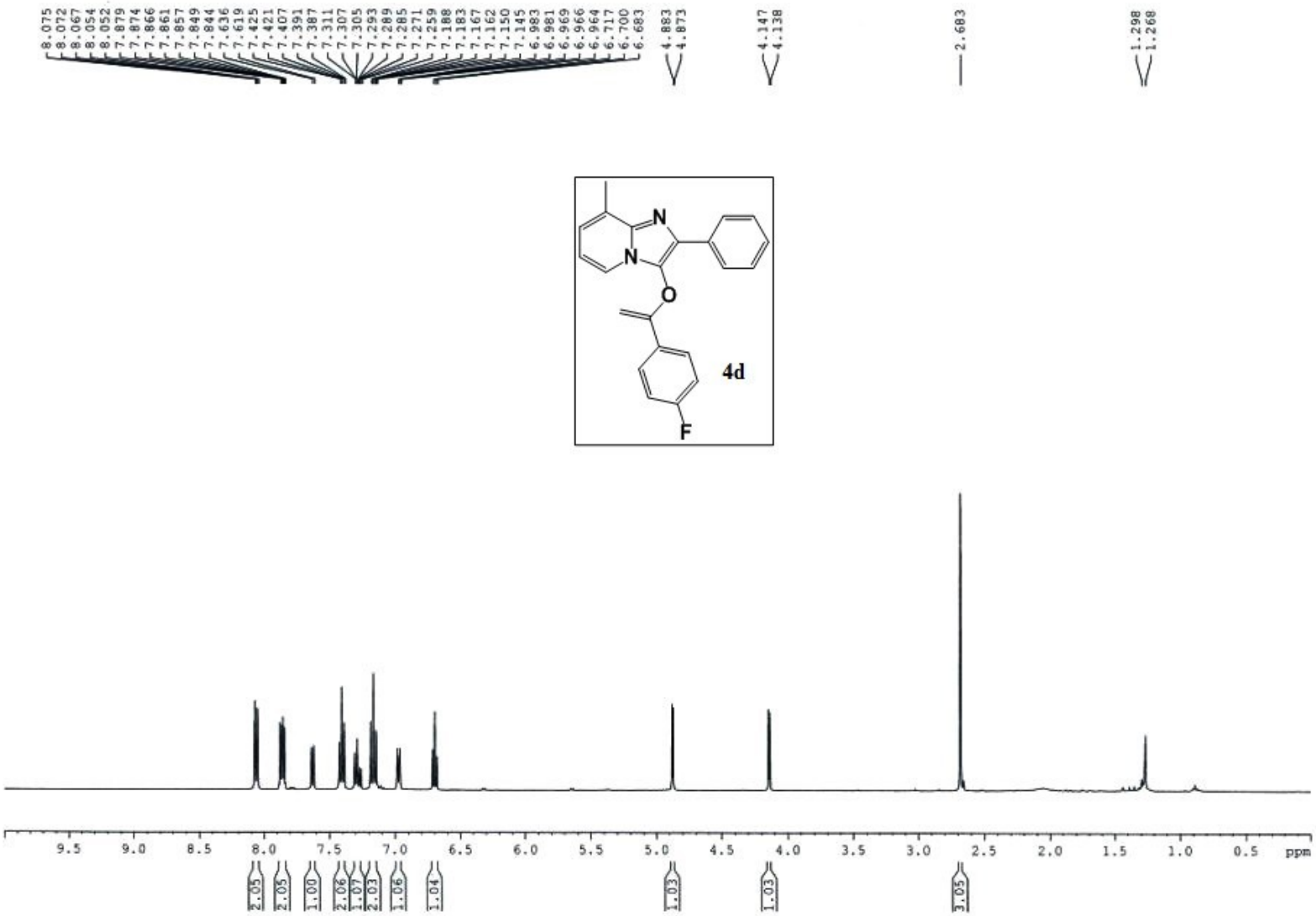
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 179
PROCNO 1

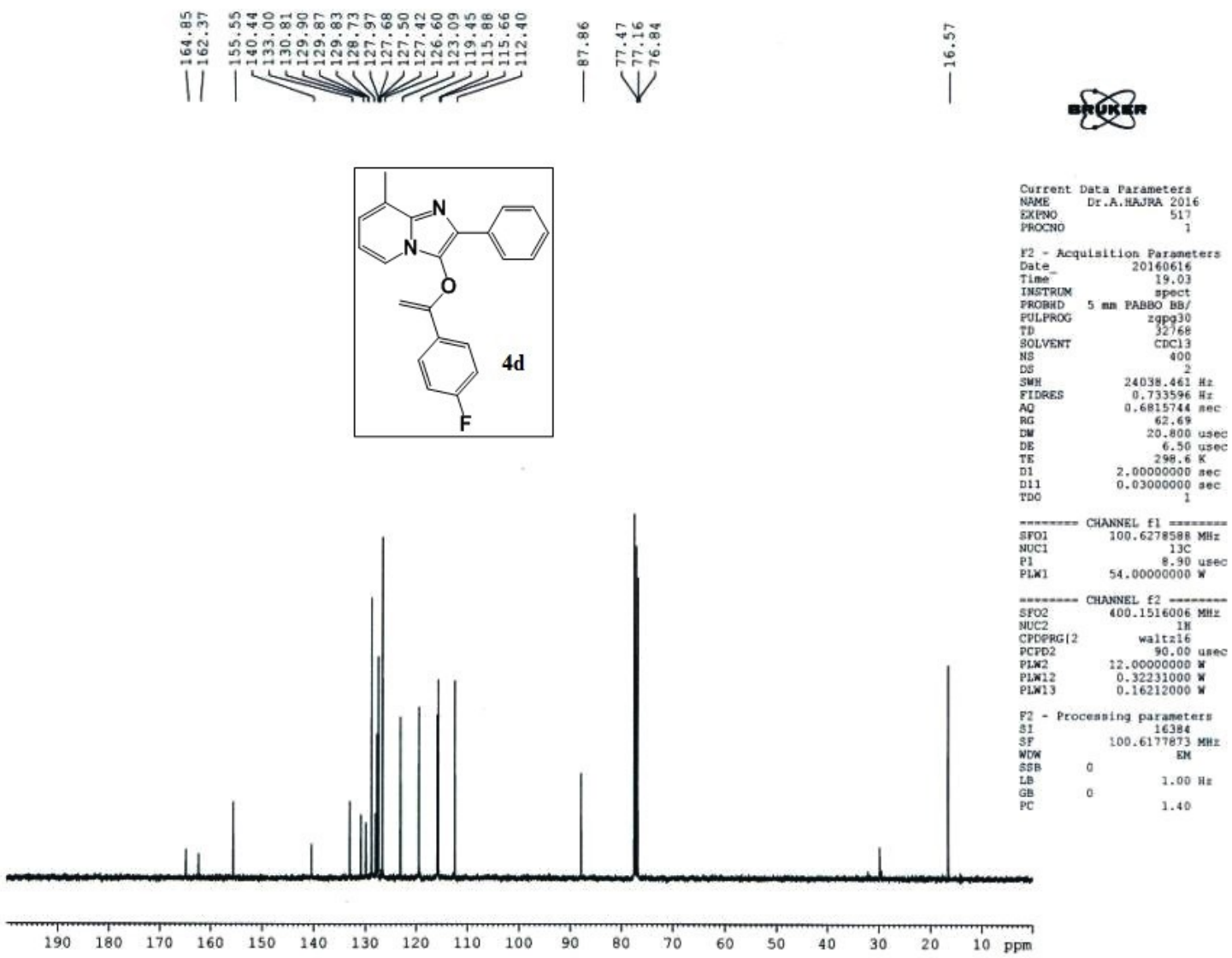
F2 - Acquisition Parameters
Date_ 20160506
Time 9.50
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 480
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 120.16
DW 20.800 usec
DE 6.50 usec
TE 298.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

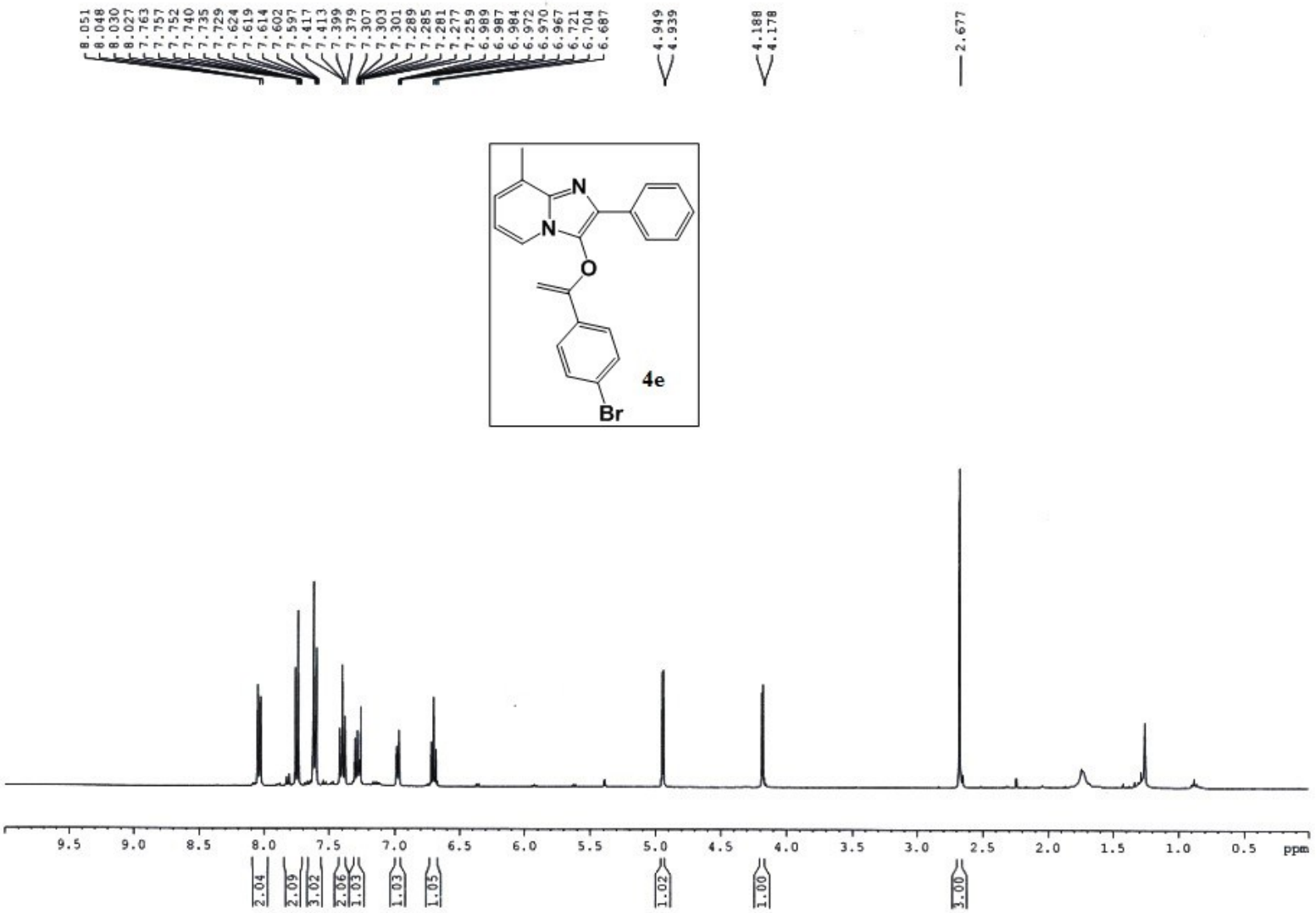
======== CHANNEL f1 ========
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W

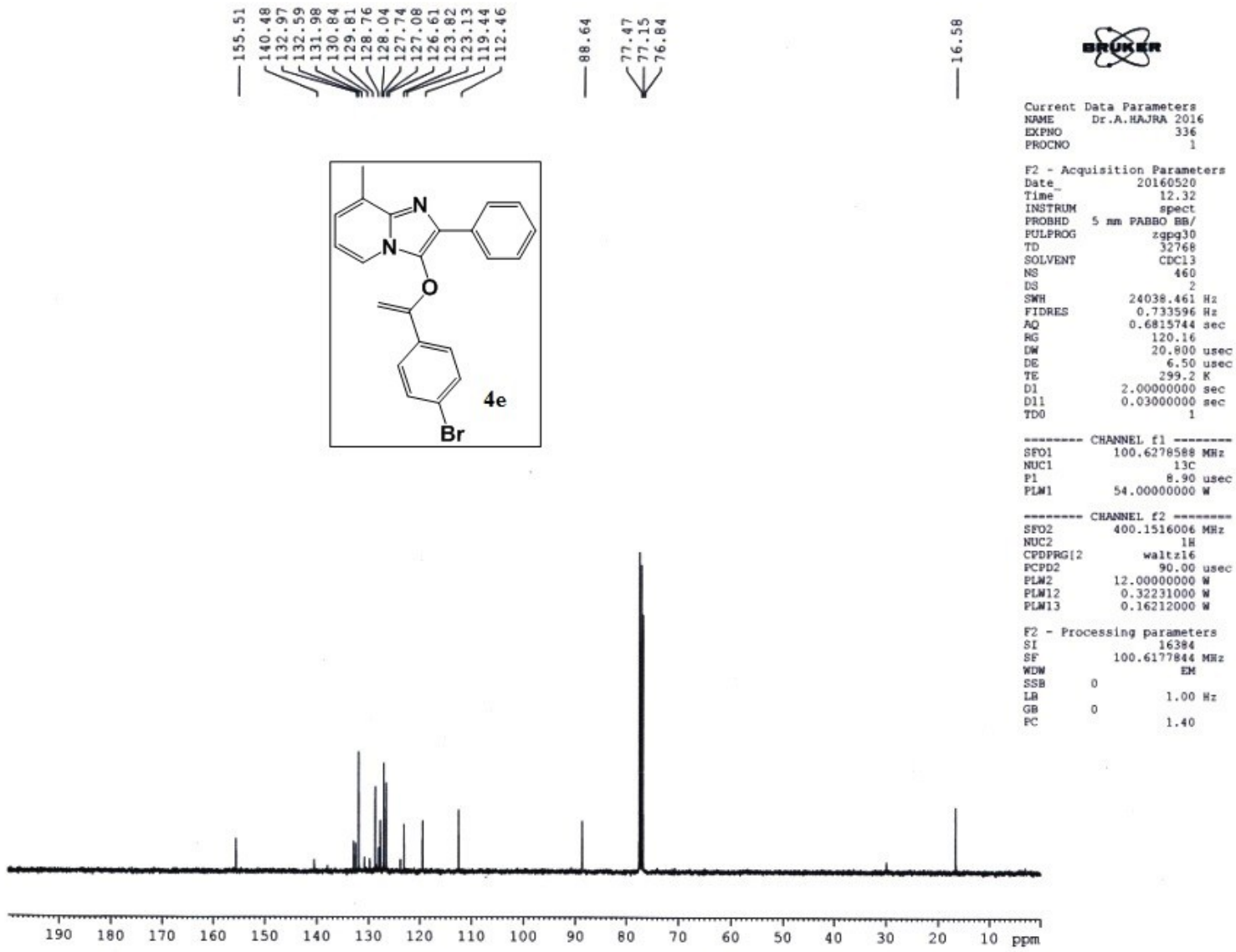
======== CHANNEL f2 ========
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W

F2 - Processing parameters
SI 16384
SF 100.6177843 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

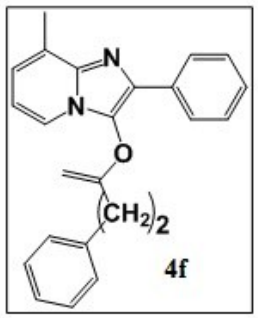

8.075
8.072
8.067
8.054
8.052
7.879
7.874
7.866
7.861
7.857
7.849
7.844
7.636
7.619
7.425
7.421
7.407
7.391
7.387
7.311
7.307
7.305
7.293
7.289
7.285
7.271
7.259
7.188
7.183
7.167
7.162
7.150
7.145
6.983
6.981
6.969
6.966
6.964
6.717
6.700
6.683
4.883
4.873
4.147
4.138
2.683
1.298
1.268
N
N
O
4d
F
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.05
2.05
1.00
2.06
1.07
2.03
1.06
1.04
1.03
1.03
3.05

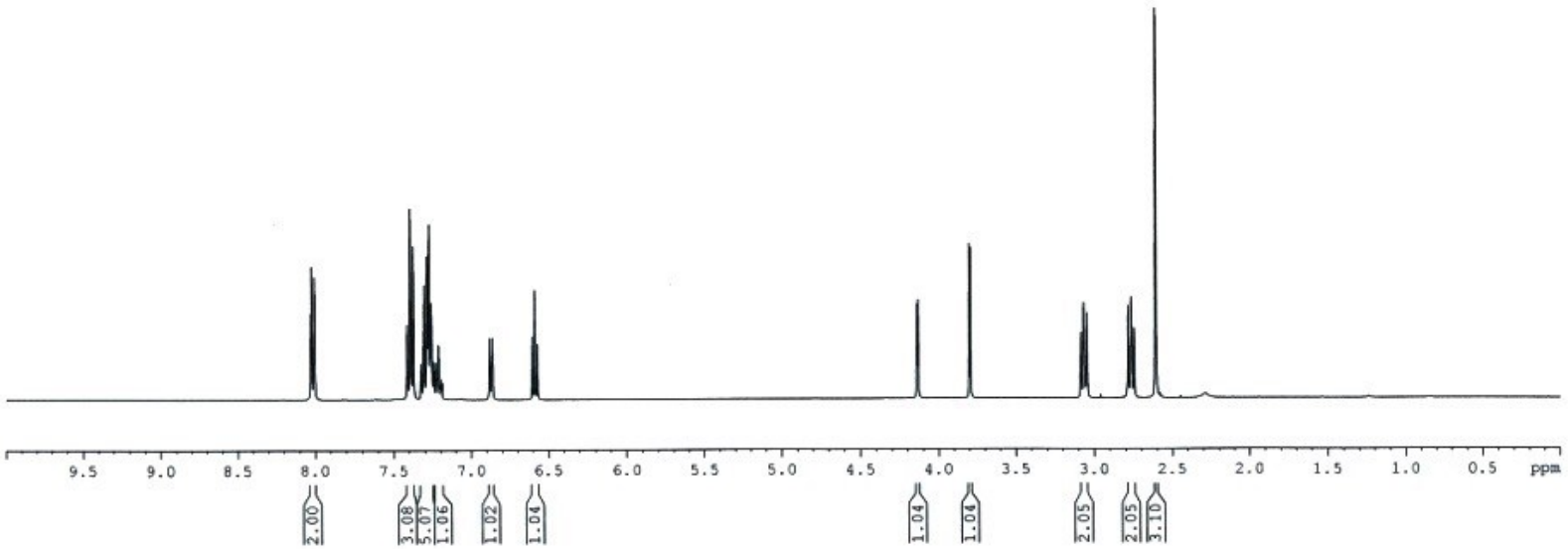

164.85
162.37
155.55
140.44
133.00
130.81
129.90
129.87
129.83
128.73
127.97
127.68
127.50
127.42
126.60
123.09
119.45
115.88
115.66
112.40
87.86
77.47
77.16
76.84
16.57
4d
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 517
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160616
Time 19.03
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 400
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 62.69
DW 20.800 usec
DE 6.50 usec
TE 298.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
======== CHANNEL f2 ========
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177873 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

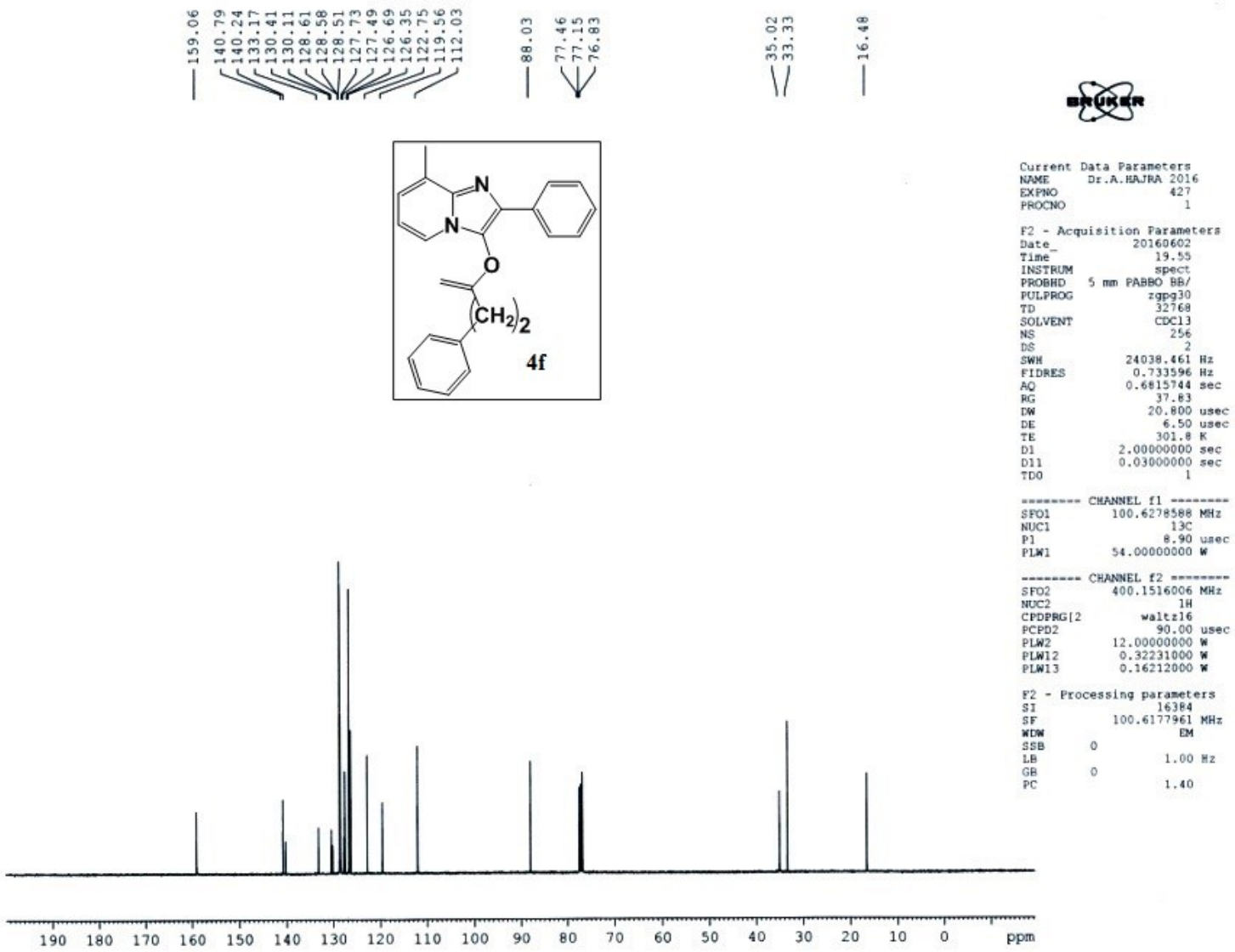

8.051
8.048
8.030
8.027
7.763
7.757
7.752
7.740
7.735
7.729
7.624
7.619
7.614
7.602
7.597
7.417
7.413
7.399
7.379
7.307
7.303
7.301
7.289
7.285
7.281
7.277
7.259
6.989
6.987
6.984
6.972
6.970
6.967
6.721
6.704
6.687
4.949
4.939
4.188
4.178
2.677
N
N
O
Br
4e
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.04
2.09
3.02
2.06
1.03
1.03
1.05
1.02
1.00
3.00

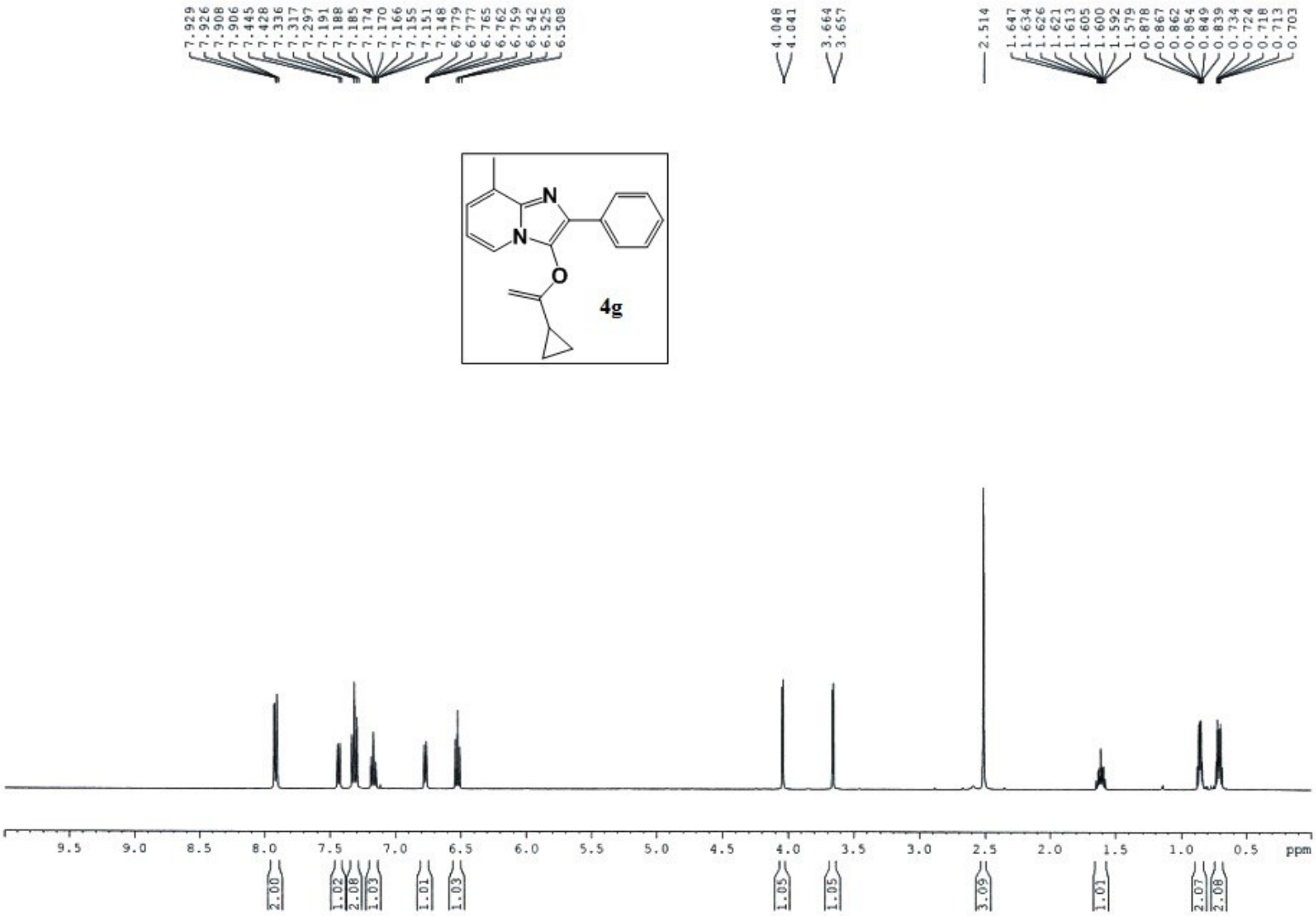

155.51
140.48
132.97
132.59
131.98
130.84
129.81
128.76
128.04
127.74
127.08
126.61
123.82
123.13
119.44
112.46
88.64
77.47
77.15
76.84
16.58
N
N
O
Br
4e
BRUKER
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 336
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160520
Time 12.32
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 460
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 120.16
DW 20.800 usec
DE 6.50 usec
TE 299.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177844 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

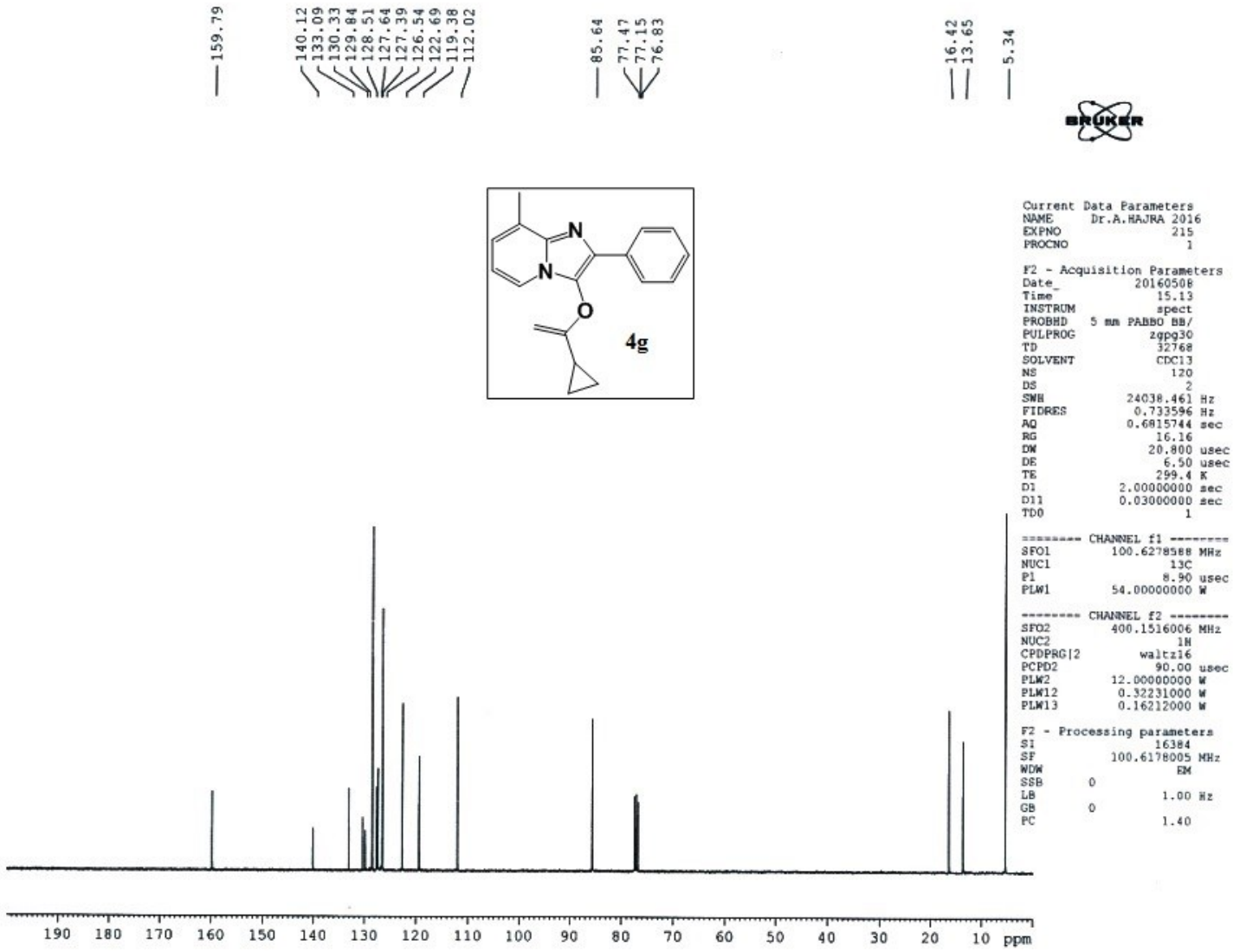

8.028
8.024
8.020
8.007
8.004
7.415
7.410
7.396
7.376
7.329
7.326
7.322
7.307
7.295
7.289
7.279
7.276
7.268
7.264
7.259
7.235
7.231
7.219
7.214
7.197
7.190
6.884
6.882
6.880
6.868
6.864
6.862
6.605
6.588
6.571
4.140
4.132
3.801
3.793
3.086
3.067
3.047
2.787
2.772
2.767
2.748
2.610

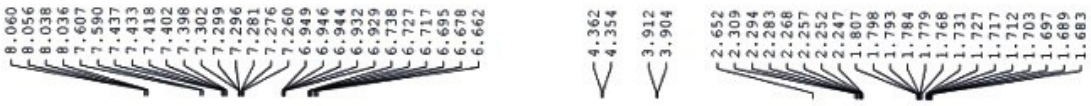

N
N
O
(CH2)2
4f

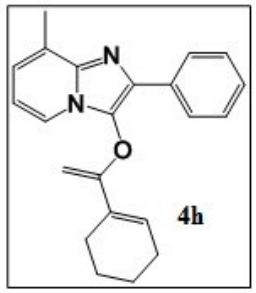

9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.00
3.08
5.07
1.06
1.02
1.04
1.04
1.04
2.05
2.05
3.10


159.06
140.79
140.24
133.17
130.41
130.11
128.61
128.58
128.51
127.73
127.49
126.69
126.35
122.75
119.56
112.03
88.03
77.46
77.15
76.83
35.02
33.33
16.48
4f
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 427
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160602
Time 19.55
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 37.83
DW 20.800 usec
DE 6.50 usec
TE 301.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177961 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

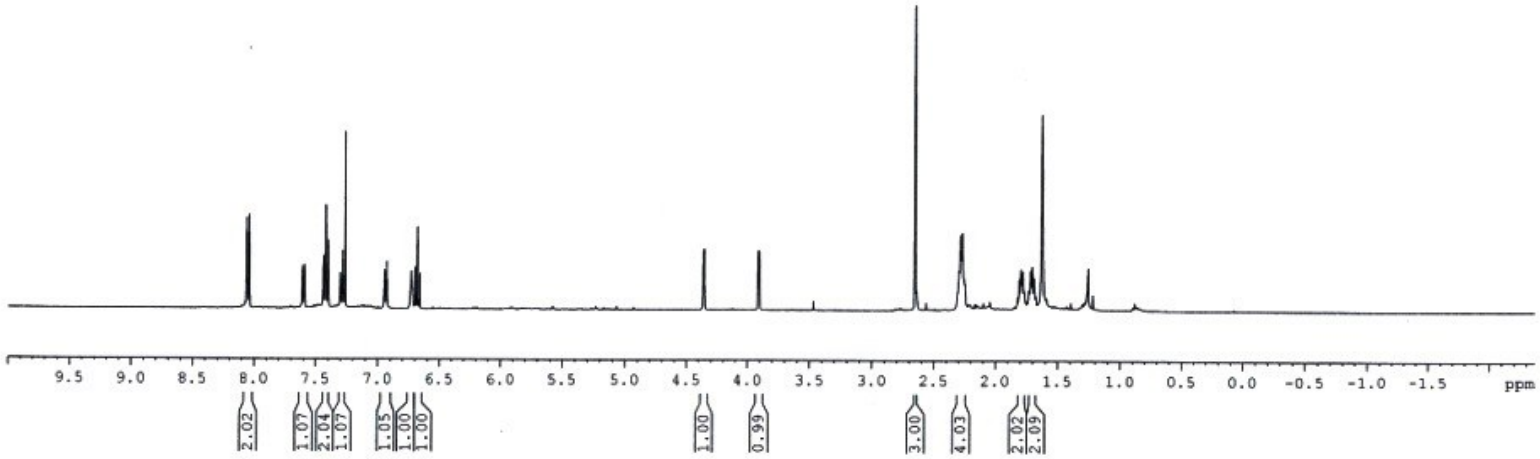

7.929
7.926
7.908
7.906
7.445
7.428
7.336
7.317
7.297
7.191
7.188
7.185
7.174
7.170
7.166
7.155
7.151
7.148
6.779
6.777
6.765
6.762
6.759
6.542
6.525
6.508
4.048
4.041
3.664
3.657
2.514
1.647
1.634
1.626
1.621
1.613
1.605
1.600
1.592
1.579
0.878
0.867
0.862
0.854
0.849
0.839
0.734
0.724
0.718
0.713
0.703
N
N
O
4g
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.00
1.02
2.08
1.03
1.01
1.03
1.05
1.05
3.09
1.01
2.07
2.08

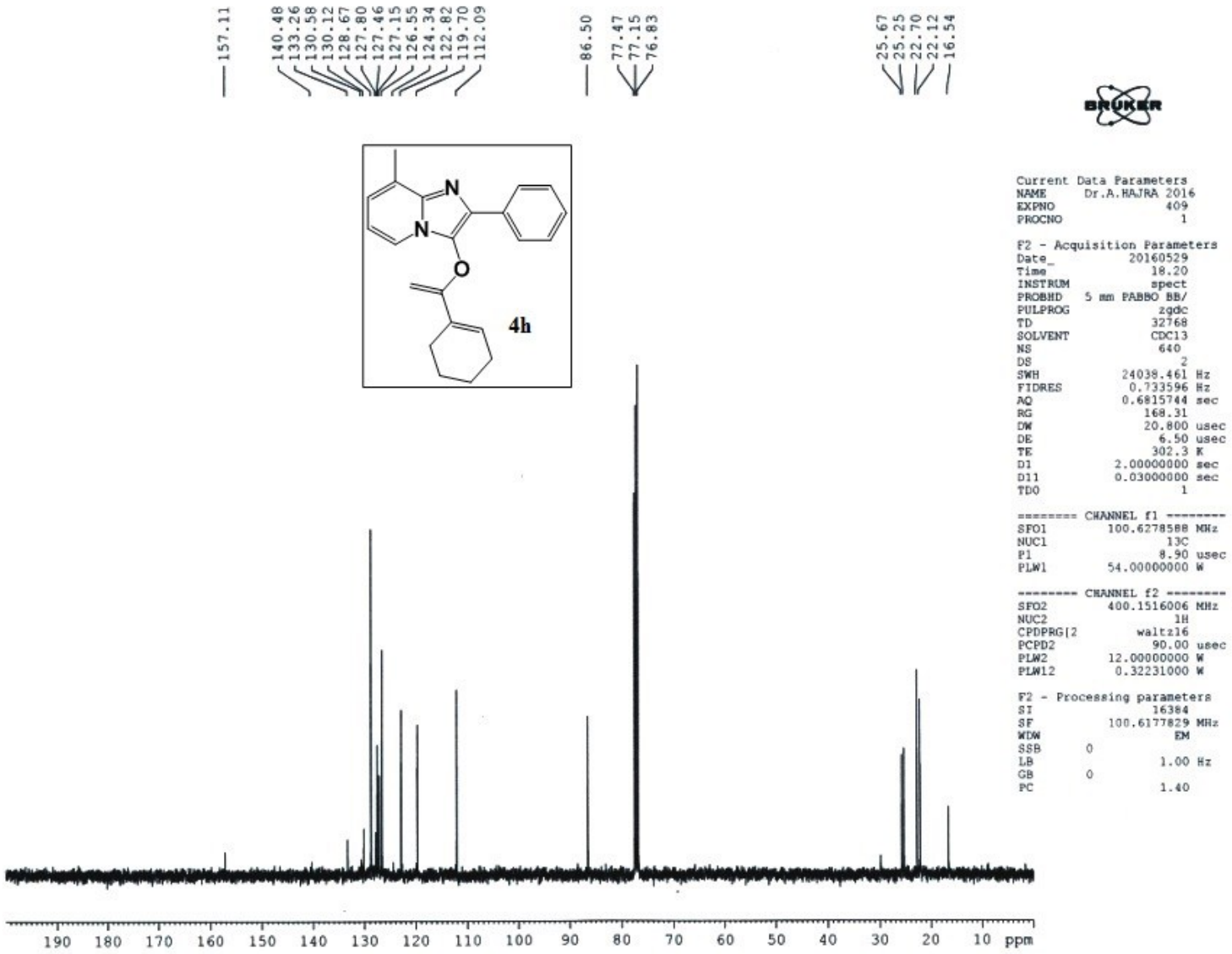

159.79
140.12
133.09
130.33
129.84
128.51
127.64
127.39
126.54
122.69
119.38
112.02
85.64
77.47
77.15
76.83
16.42
13.65
5.34
4g
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 215
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160508
Time 15.13
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 120
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 16.16
DW 20.800 usec
DE 6.50 usec
TE 299.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
======== CHANNEL f2 ========
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6178005 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

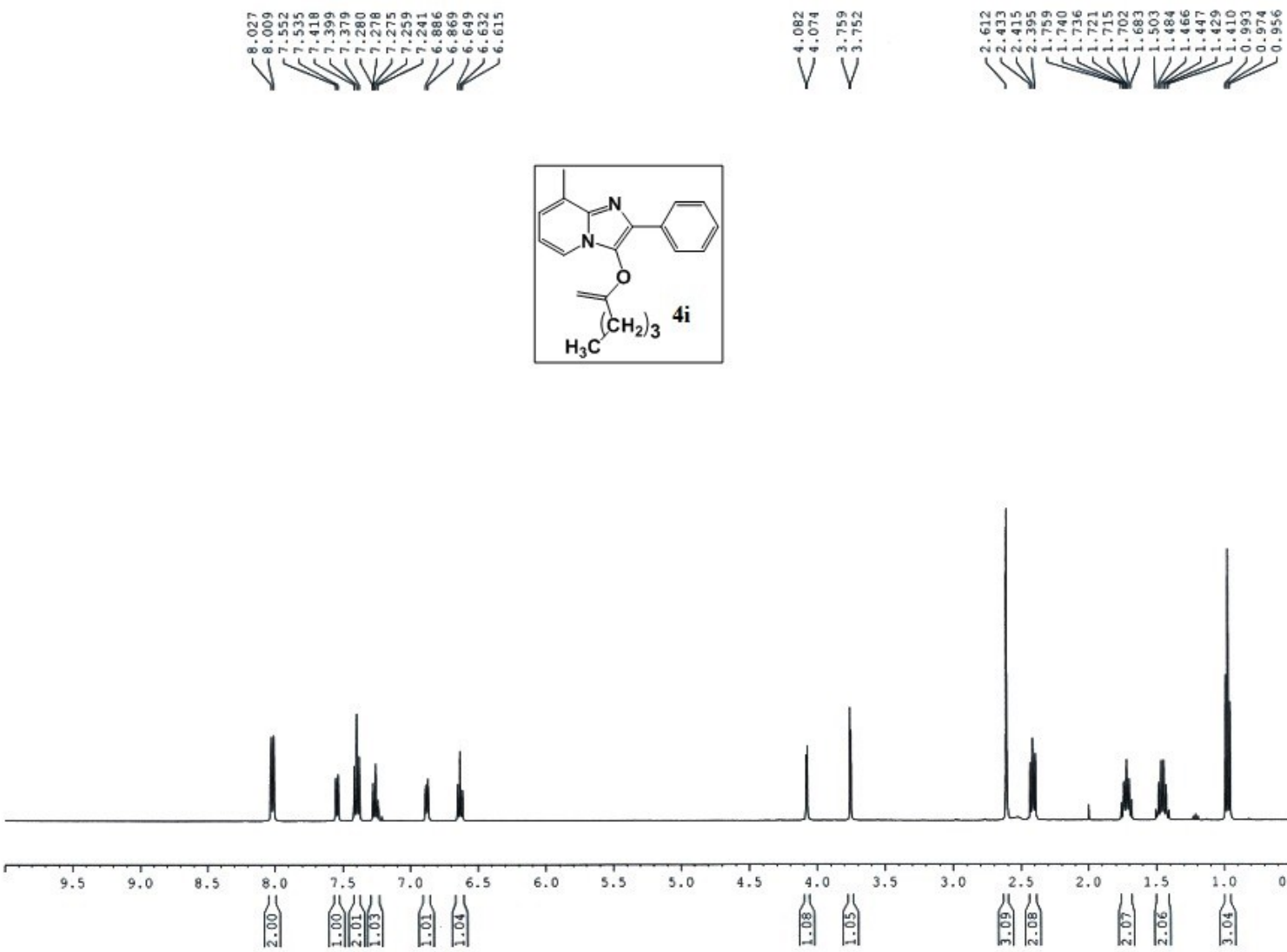

8.060
8.056
8.038
8.036
7.607
7.590
7.437
7.433
7.418
7.402
7.398
7.302
7.299
7.296
7.281
7.276
7.260
6.949
6.946
6.944
6.932
6.929
6.738
6.727
6.717
6.695
6.678
6.662
4.362
4.354
3.912
3.904
2.652
2.309
2.294
2.283
2.268
2.257
2.252
2.247
1.807
1.798
1.793
1.784
1.779
1.768
1.731
1.727
1.717
1.712
1.703
1.697
1.689
1.683

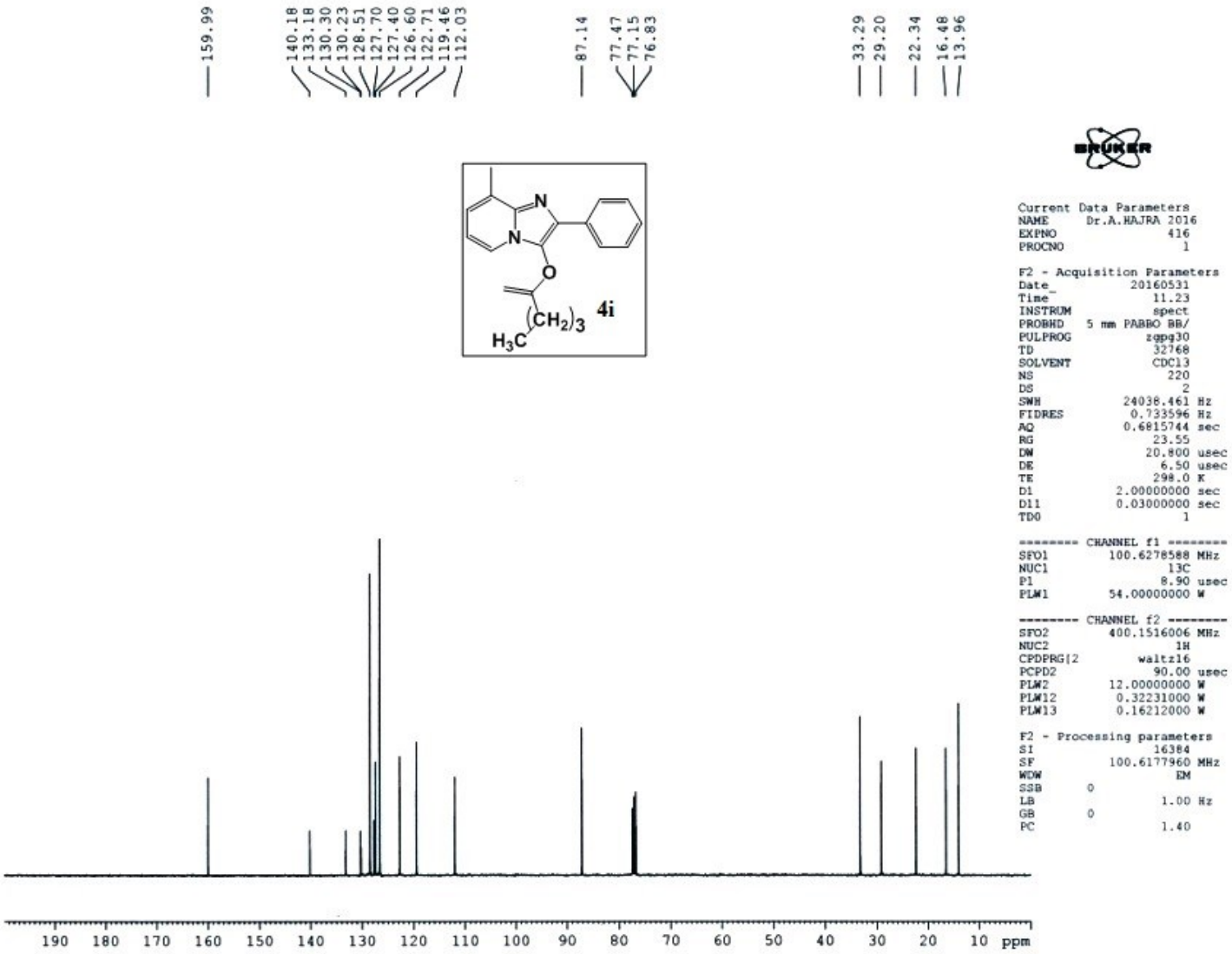

N
N
O

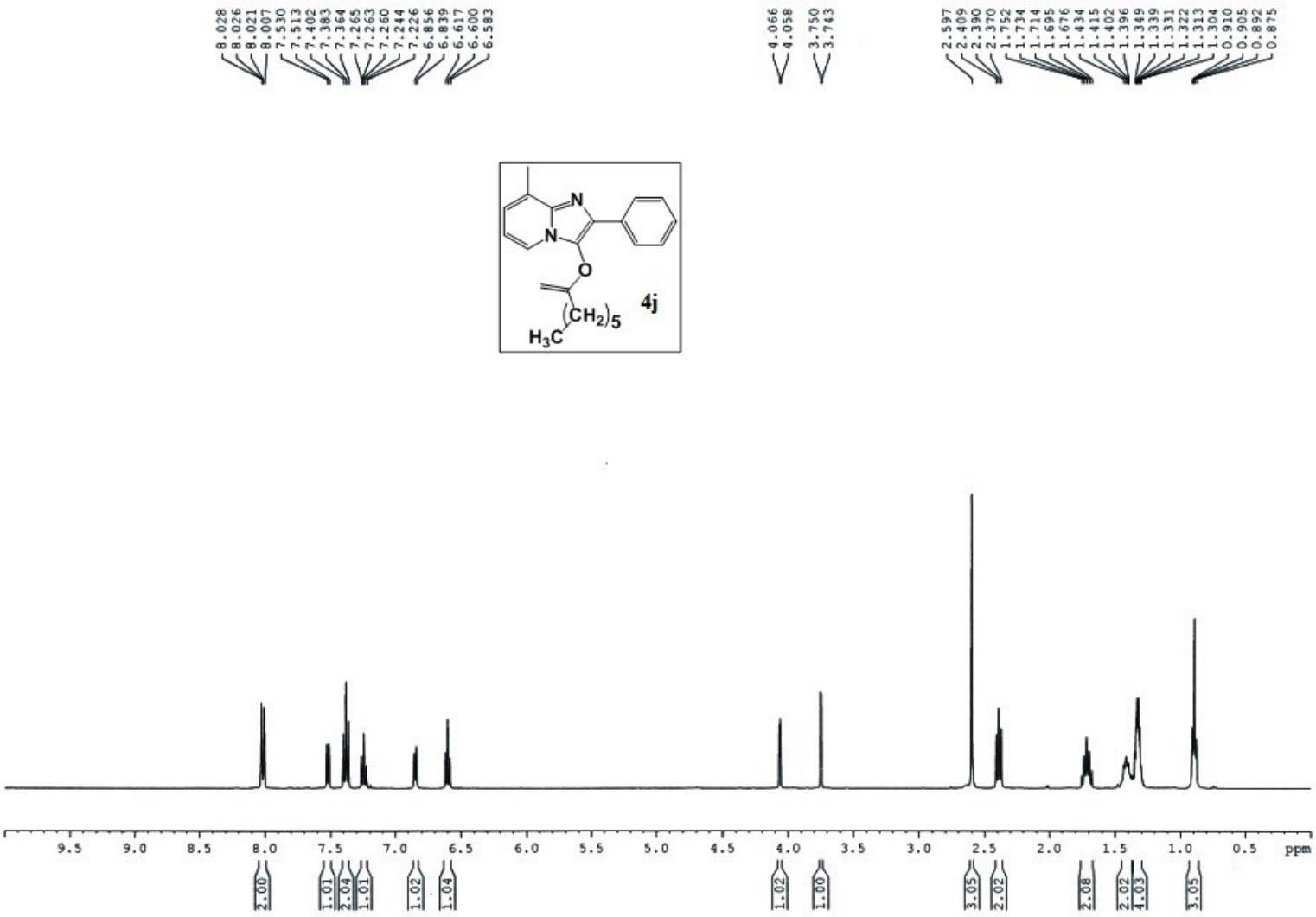
4h


9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
ppm
2.02
1.07
2.04
1.07
1.05
1.00
1.00
1.00
0.99
3.00
4.03
2.02
2.09


157.11
140.48
133.26
130.58
130.12
128.67
127.80
127.46
127.15
126.55
124.34
122.82
119.70
112.09
86.50
77.47
77.15
76.83
25.67
25.25
22.70
22.12
16.54
4h
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 409
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160529
Time 18.20
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgdc
TD 32768
SOLVENT CDCl3
NS 640
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 168.31
DW 20.800 usec
DE 6.50 usec
TE 302.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
======== CHANNEL f2 ========
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
F2 - Processing parameters
SI 16384
SF 100.6177829 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm


8.027
8.009
7.552
7.535
7.418
7.399
7.379
7.280
7.278
7.275
7.259
7.241
6.886
6.869
6.649
6.632
6.615
4.082
4.074
3.759
3.752
2.612
2.433
2.415
2.395
1.759
1.740
1.736
1.721
1.715
1.702
1.683
1.503
1.484
1.466
1.447
1.429
1.410
0.993
0.974
0.956
N
N
O
(CH2)3
H3C
4i
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.00
1.00
2.01
1.03
1.01
1.04
1.08
1.05
3.09
2.08
2.07
2.06
3.04


159.99
140.18
133.18
130.30
130.23
128.51
127.70
127.40
126.60
122.71
119.46
112.03
87.14
77.47
77.15
76.83
33.29
29.20
22.34
16.48
13.96
4i
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 416
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160531
Time 11.23
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 220
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 23.55
DW 20.800 usec
DE 6.50 usec
TE 298.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177960 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm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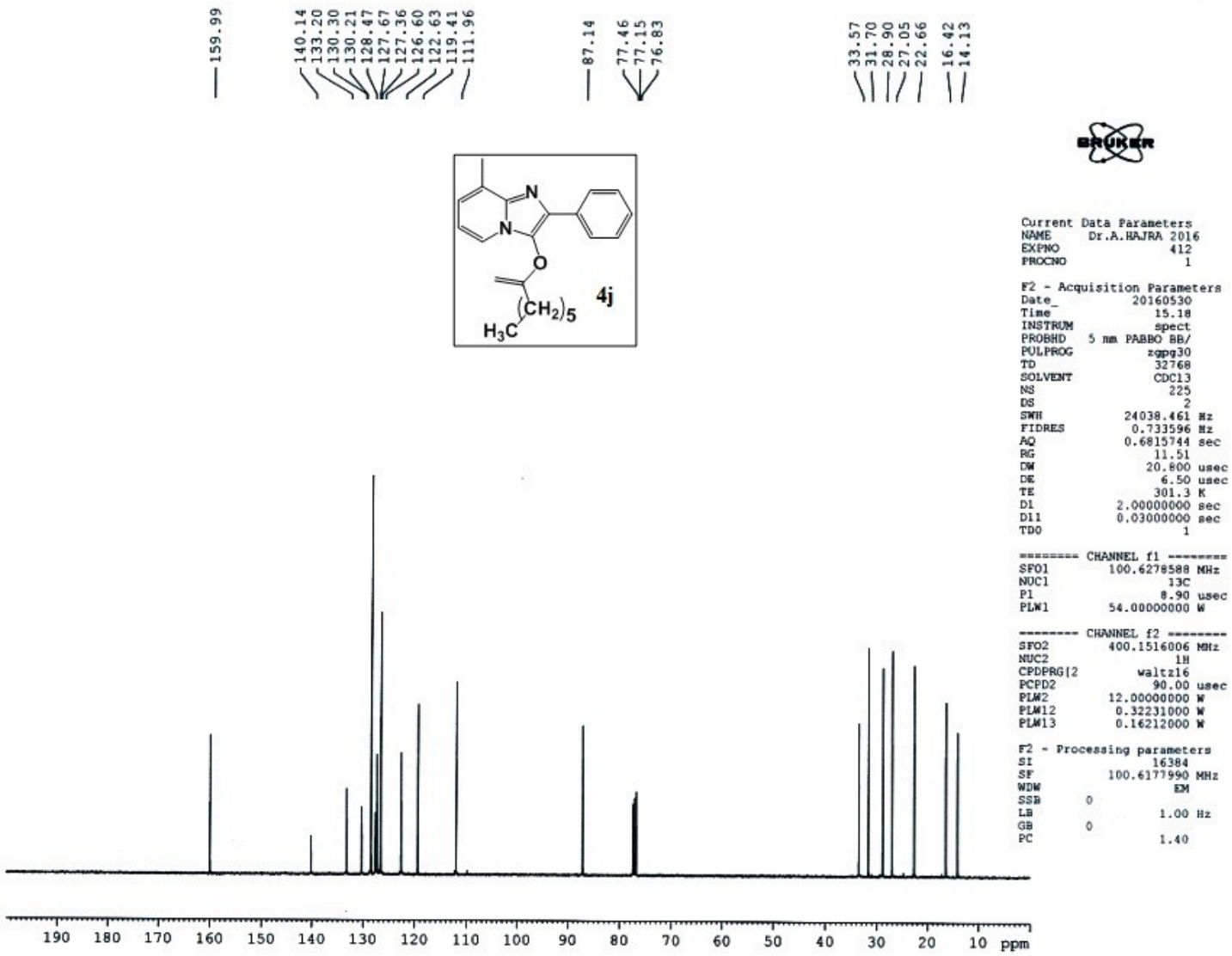
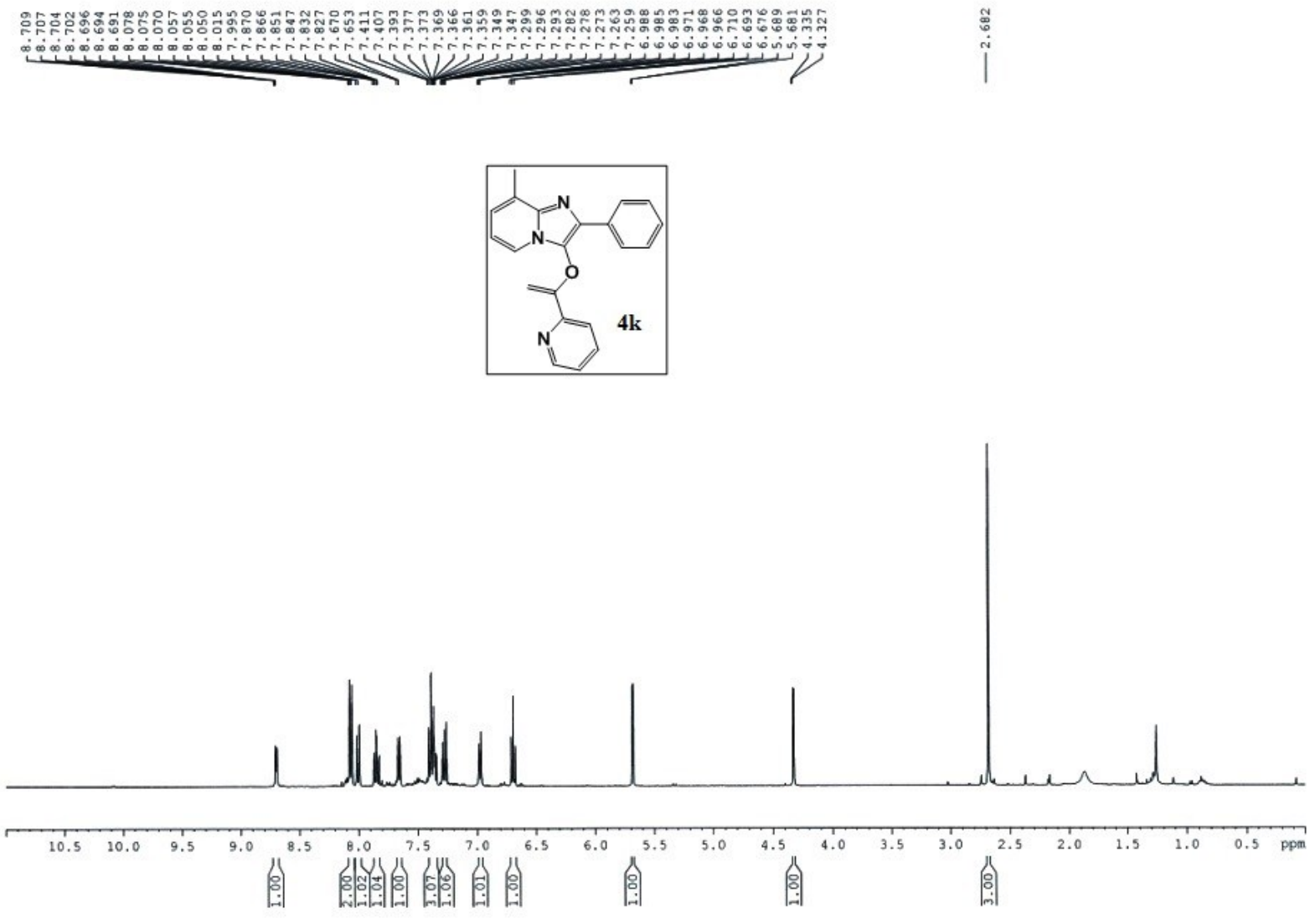
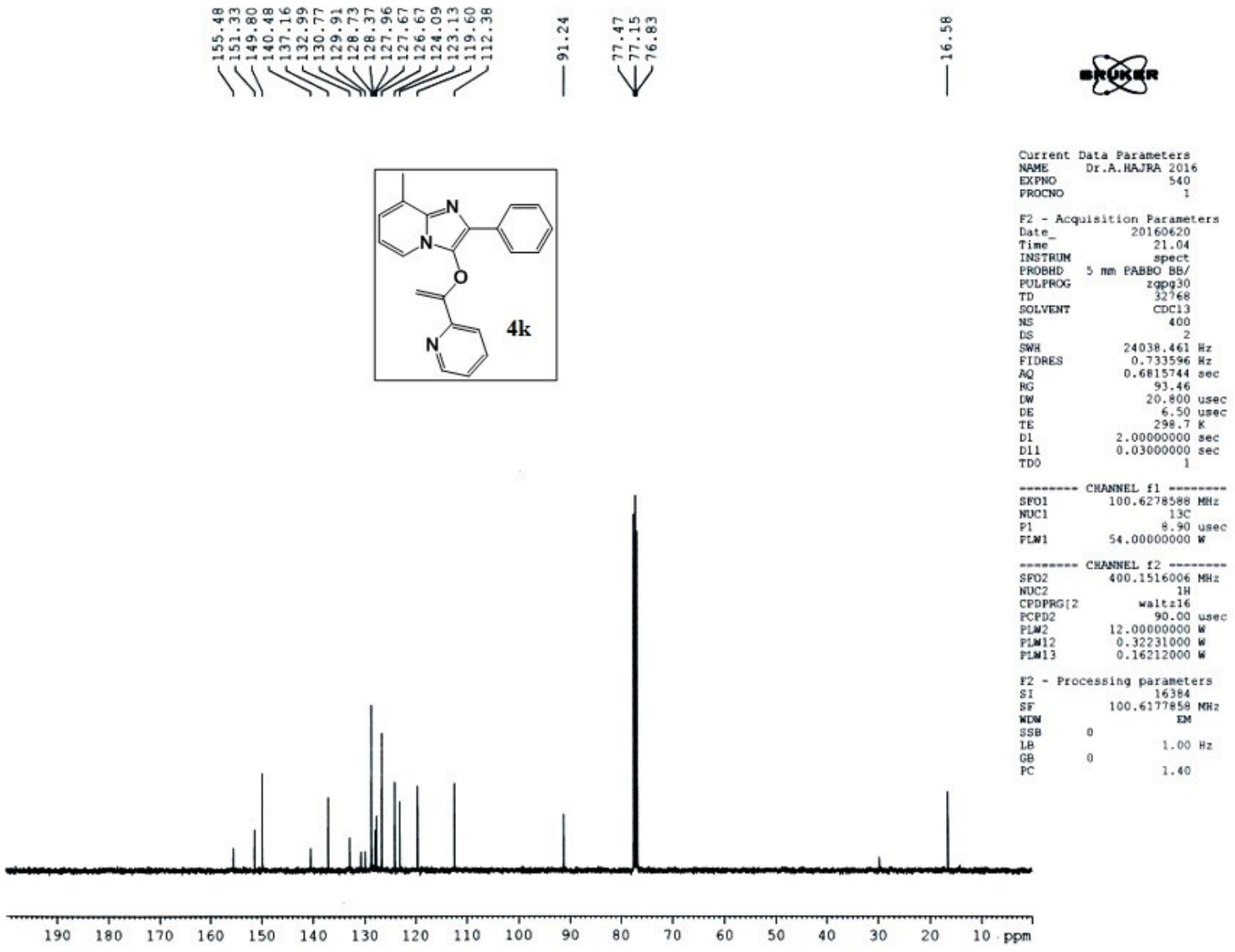
8.026
8.021
8.007
7.530
7.513
7.402
7.383
7.364
7.265
7.263
7.260
7.244
7.226
6.856
6.839
6.617
6.600
6.583
4.066
4.058
3.750
3.743
2.597
2.409
2.390
2.370
1.752
1.734
1.714
1.695
1.676
1.434
1.415
1.402
1.396
1.349
1.339
1.331
1.322
1.313
1.304
0.910
0.905
0.892
0.875
N
N
O
(CH2)5
H3C
4j
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.00
1.01
2.04
1.01
1.02
1.04
1.02
1.00
3.05
2.02
2.08
2.02
4.03
3.05


159.99
140.14
133.20
130.30
130.21
128.47
127.67
127.36
126.60
122.63
119.41
111.96
87.14
77.46
77.15
76.83
33.57
31.70
28.90
27.05
22.66
16.42
14.13
4j
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 412
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160530
Time 15.18
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 225
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 11.51
DW 20.800 usec
DE 6.50 usec
TE 301.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm


8.709
8.707
8.704
8.702
8.696
8.694
8.691
8.078
8.075
8.070
8.057
8.055
8.050
8.015
7.995
7.870
7.866
7.851
7.847
7.832
7.827
7.670
7.653
7.411
7.407
7.393
7.377
7.373
7.369
7.366
7.361
7.359
7.349
7.347
7.299
7.296
7.293
7.282
7.278
7.273
7.263
7.259
6.988
6.985
6.983
6.971
6.968
6.966
6.710
6.693
6.676
5.689
5.681
4.335
4.327
2.682
N
N
O
N
4k
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
1.00
2.00
1.02
1.04
1.00
3.07
1.06
1.01
1.00
1.00
1.00
3.00


155.48
151.33
149.80
140.48
137.16
132.99
130.77
129.91
128.73
128.37
127.96
127.67
126.67
124.09
123.13
119.60
112.38
91.24
77.47
77.15
76.83
16.58
4k
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 540
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160620
Time 21.04
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 400
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 93.46
DW 20.800 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177858 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm


8.088
8.086
8.069
8.065
8.022
8.019
8.001
7.999
7.745
7.743
7.731
7.728
7.725
7.591
7.589
7.566
7.559
7.540
7.463
7.459
7.450
7.444
7.431
7.425
7.416
7.412
7.321
7.317
7.315
7.303
7.299
7.295
7.281
7.259
7.160
7.157
7.143
7.140
7.134
7.120
7.117
6.796
6.794
6.780
6.763
6.760
4.507
4.491
4.475
4.206
4.198
3.866
3.858
2.656
2.638
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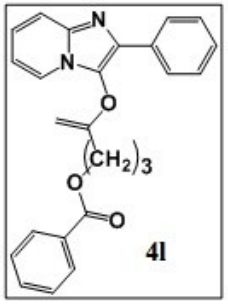
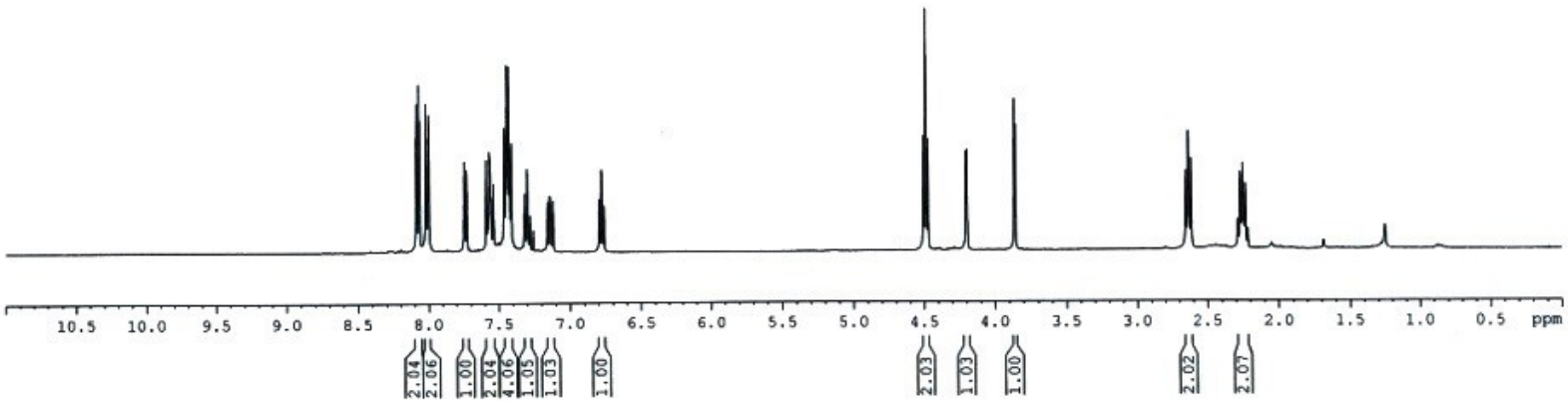
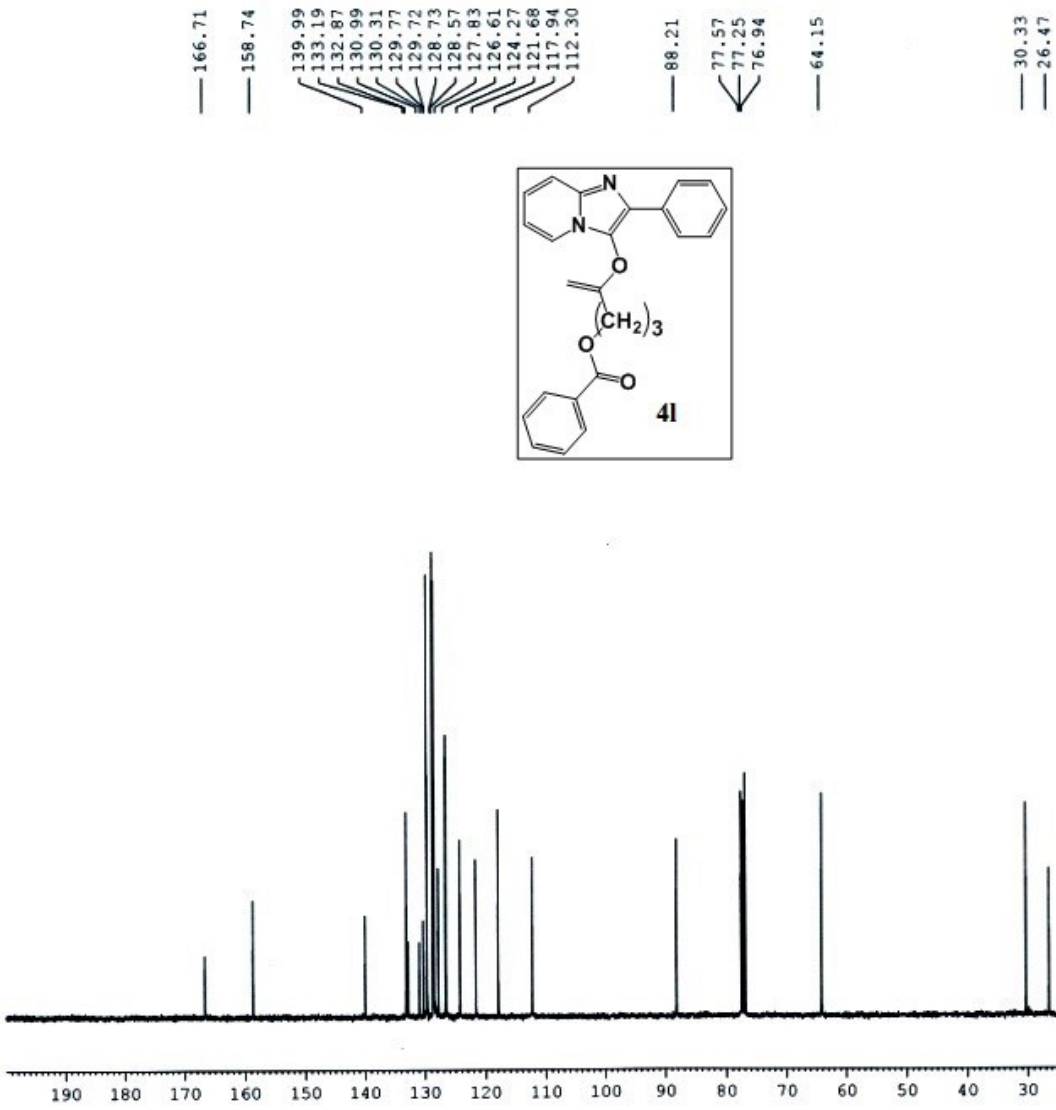
2.288
2.272
2.256
2.252
2.235
2.218


N
N
O
(CH2)3
O
O
4l


10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.04
2.06
1.00
2.04
4.06
1.05
1.03
1.00
2.03
1.03
1.00
2.02
2.07



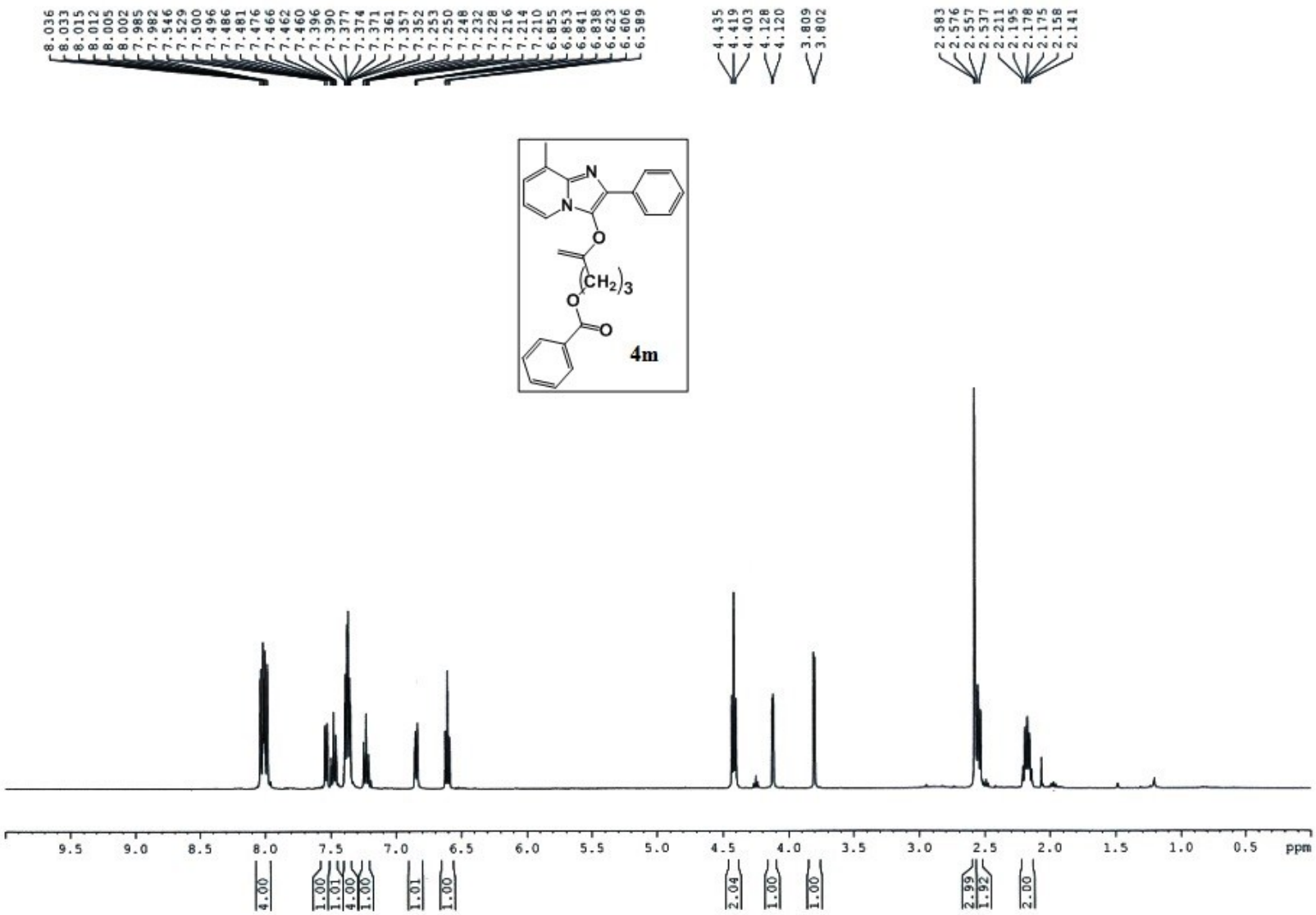

```
Current Data Parameters
NAME      Dr.A.HAJRA 2016
EXPNO              520
PROCNO               1

F2 - Acquisition Parameters
Date_          20160617
Time              12.59
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG        zgpg30
TD              32768
SOLVENT           CDCl3
NS                  256
DS                    2
SWH           24038.461 Hz
FIDRES         0.733596 Hz
AQ             0.6815744 sec
RG                19.02
DW               20.800 usec
DE                6.50 usec
TE               297.3 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                  1

======== CHANNEL f1 ========
SFO1        100.6278588 MHz
NUC1                13C
P1                 8.90 usec
PLW1         54.00000000 W

======== CHANNEL f2 ========
SFO2        400.1516006 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             90.00 usec
PLW2         12.00000000 W
PLW12         0.32231000 W
PLW13         0.16212000 W

F2 - Processing parameters
SI                 16384
SF          100.6177654 MHz
WDW                   EM
SSB          0
LB                 1.00 Hz
GB           0
PC                 1.40
```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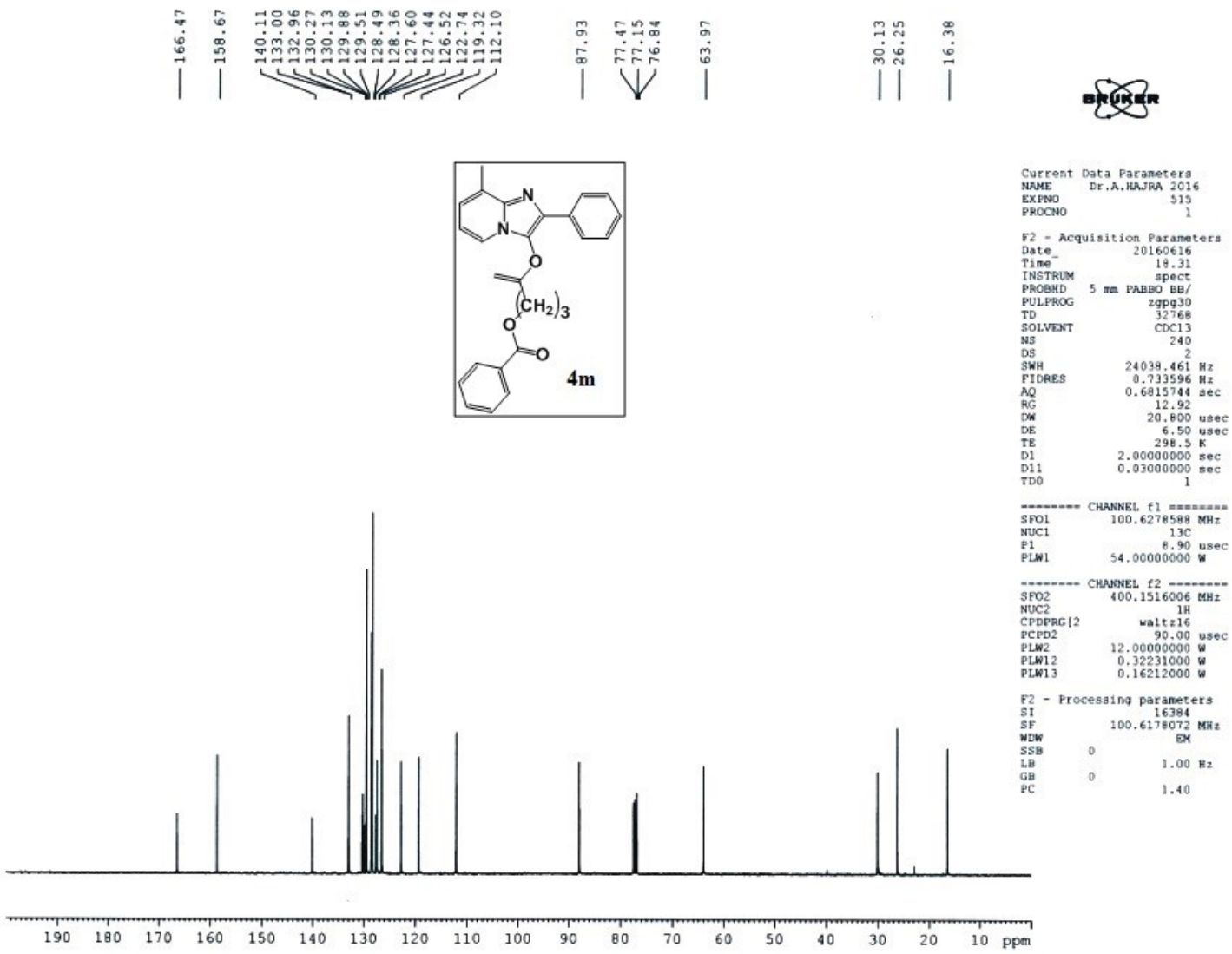
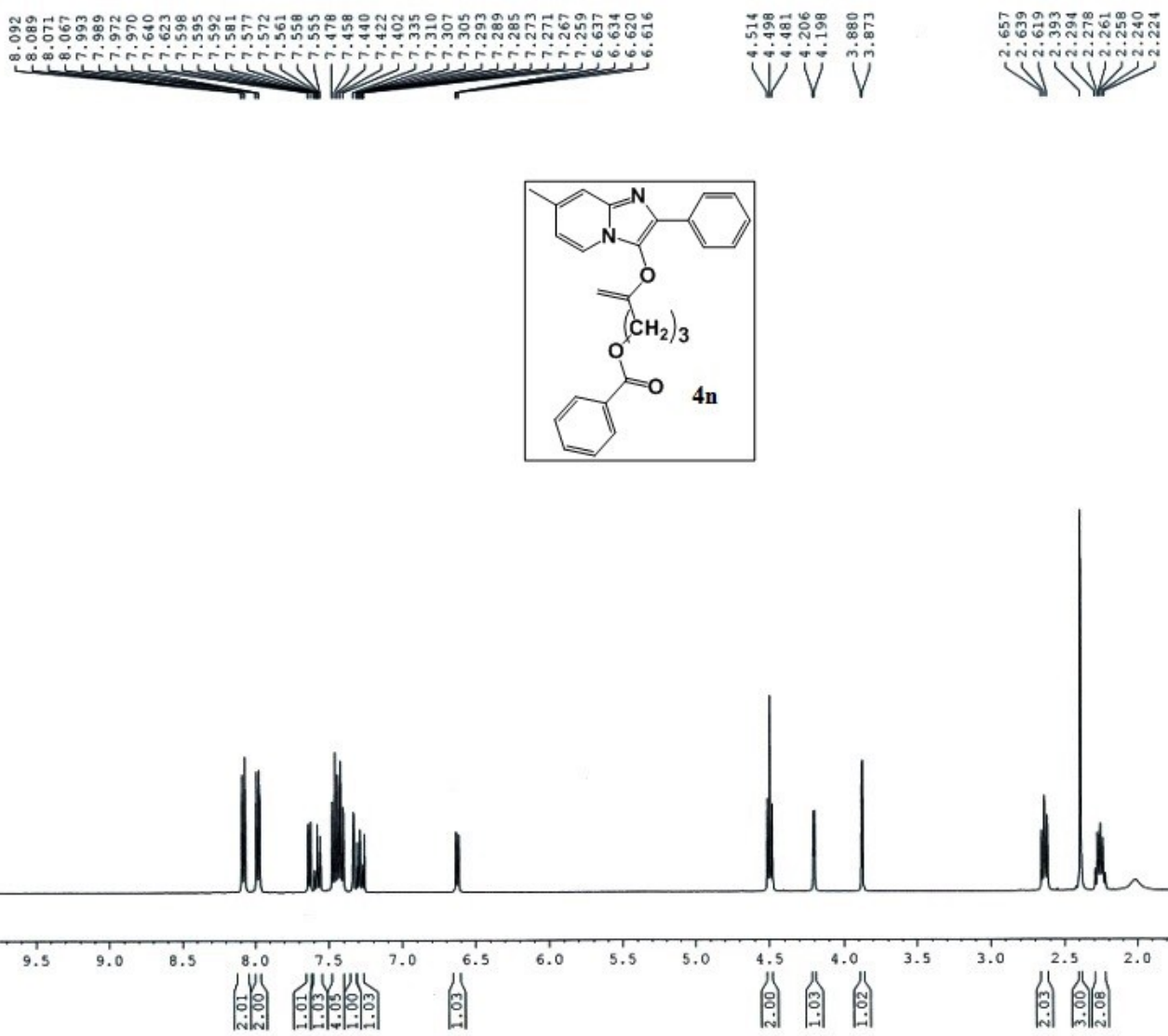
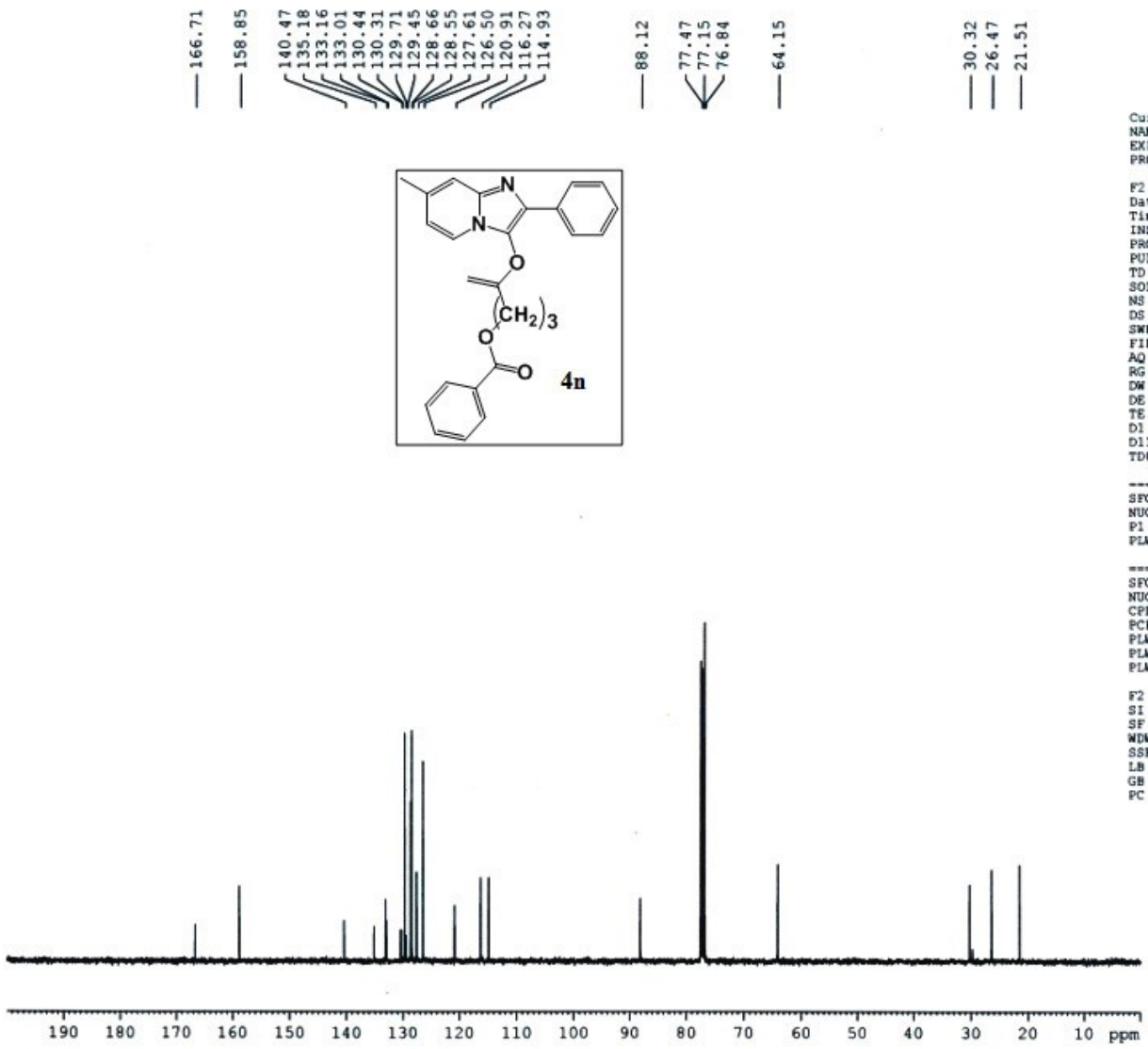
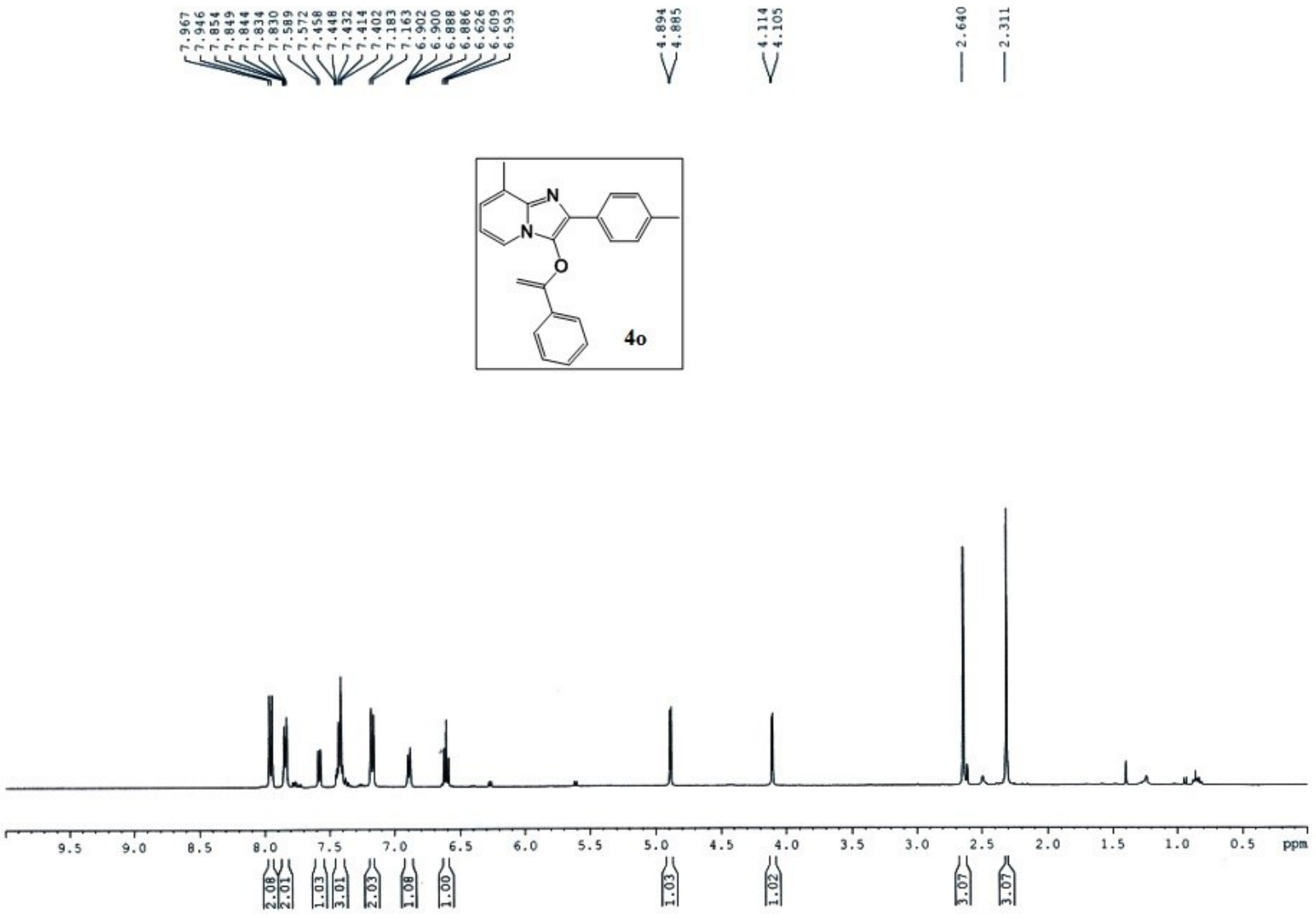
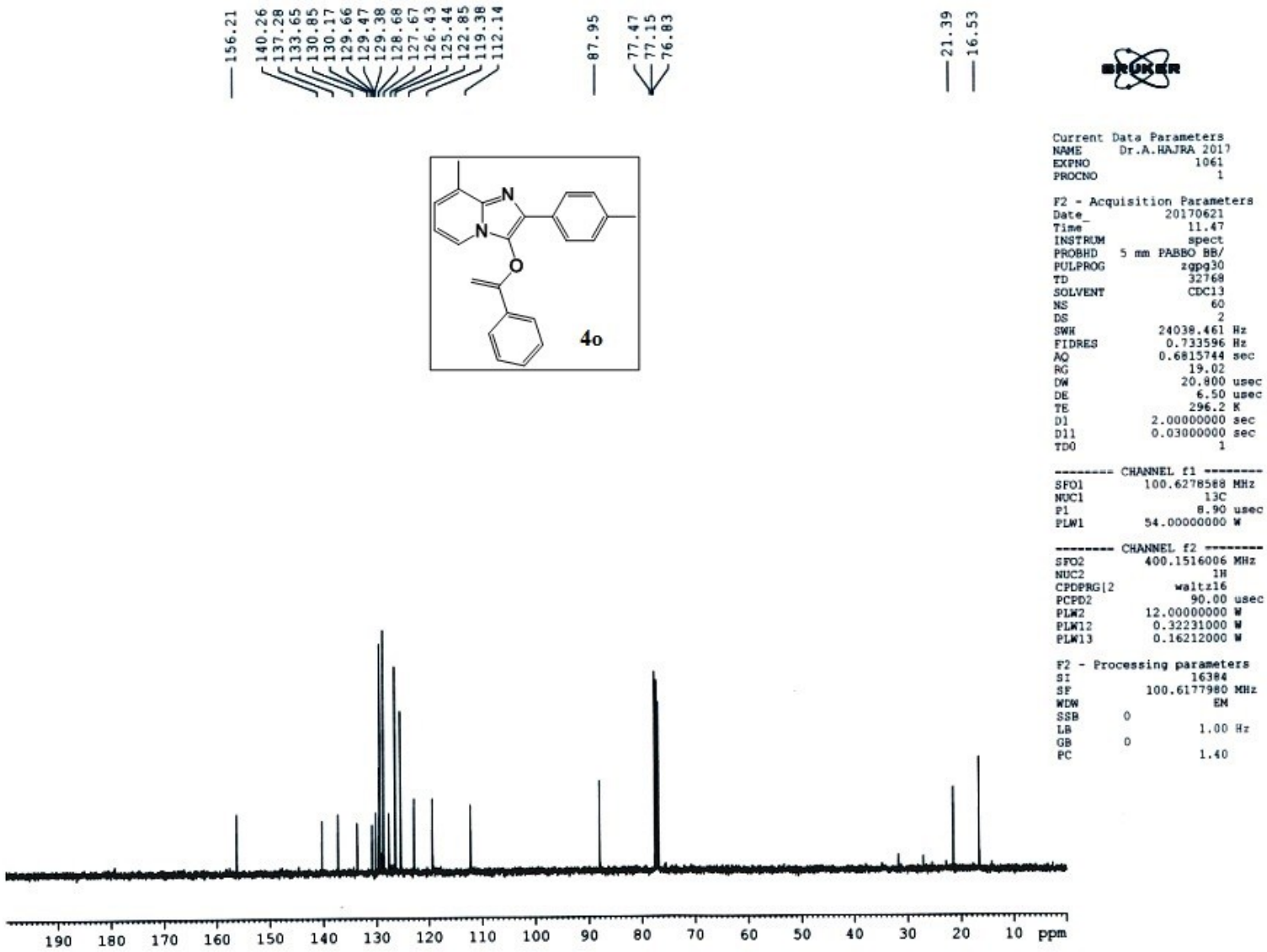
8.033
8.015
8.012
8.005
8.002
7.985
7.982
7.546
7.529
7.500
7.496
7.486
7.481
7.476
7.466
7.462
7.460
7.396
7.390
7.377
7.374
7.371
7.361
7.357
7.352
7.253
7.250
7.248
7.232
7.228
7.216
7.214
7.210
6.855
6.853
6.841
6.838
6.623
6.606
6.589
4.435
4.419
4.403
4.128
4.120
3.809
3.802
2.583
2.576
2.557
2.537
2.211
2.195
2.178
2.175
2.158
2.141
N
N
O
(CH2)3
O
O
4m
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
4.00
1.00
1.01
1.01
4.00
1.00
1.01
1.00
2.04
1.00
1.00
2.99
1.92
2.00

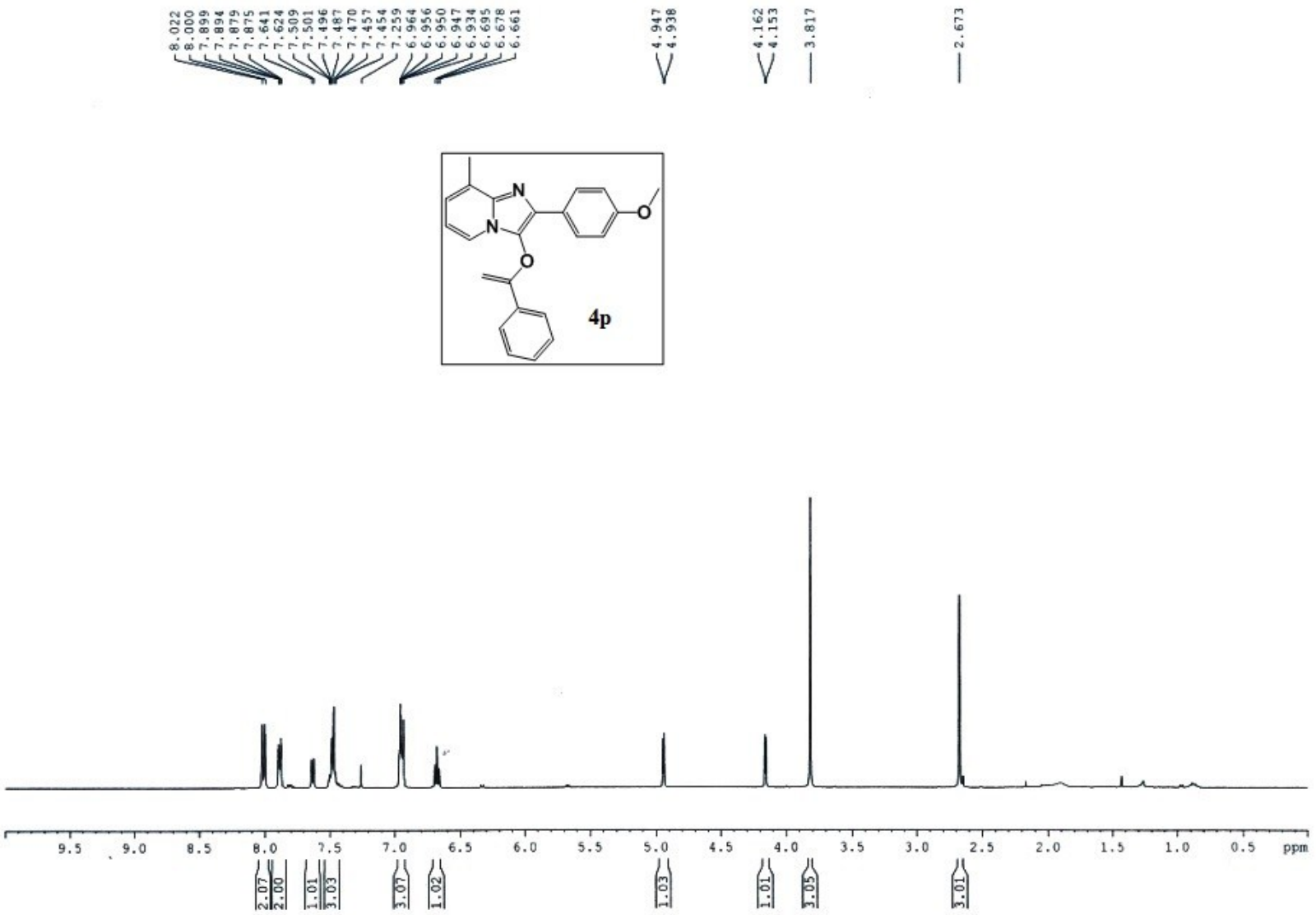

166.47
158.67
140.11
133.00
132.96
130.27
130.13
129.88
129.51
128.49
128.36
127.60
127.44
126.52
122.74
119.32
112.10
87.93
77.47
77.15
76.84
63.97
30.13
26.25
16.38
4m
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 515
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160616
Time 18.31
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 240
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 12.92
DW 20.800 usec
DE 6.50 usec
TE 298.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6178072 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm


8.092
8.089
8.071
8.067
7.993
7.989
7.972
7.970
7.640
7.623
7.598
7.595
7.592
7.581
7.577
7.572
7.561
7.558
7.555
7.478
7.458
7.440
7.422
7.402
7.335
7.310
7.307
7.305
7.293
7.289
7.285
7.273
7.271
7.267
7.259
6.637
6.634
6.620
6.616
4.514
4.498
4.481
4.206
4.198
3.880
3.873
2.657
2.639
2.619
2.393
2.294
2.278
2.261
2.258
2.240
2.224
N
N
O
(CH2)3
O
O
4n
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.01
2.00
1.01
1.03
4.05
1.00
1.03
1.03
2.00
1.03
1.02
2.03
3.00
2.08


166.71
158.85
140.47
135.18
133.16
133.01
130.44
130.31
129.71
129.45
128.66
128.55
127.61
126.50
120.91
116.27
114.93
88.12
77.47
77.15
76.84
64.15
30.32
26.47
21.51
4n
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 513
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160616
Time 18.00
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 400
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 93.46
DW 20.800 usec
DE 6.50 usec
TE 298.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177867 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm


7.967
7.946
7.854
7.849
7.844
7.834
7.830
7.589
7.572
7.458
7.448
7.432
7.414
7.402
7.183
7.163
6.902
6.900
6.888
6.886
6.626
6.609
6.593
4.894
4.885
4.114
4.105
2.640
2.311
N
N
O
4o
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.08
2.01
1.03
3.01
2.03
1.08
1.00
1.03
1.02
3.07
3.07


156.21
140.26
137.28
133.65
130.85
130.17
129.66
129.47
129.38
128.68
127.67
126.43
125.44
122.85
119.38
112.14
87.95
77.47
77.15
76.83
21.39
16.53
4o
Current Data Parameters
NAME Dr.A.HAJRA 2017
EXPNO 1061
PROCNO 1
F2 - Acquisition Parameters
Date_ 20170621
Time 11.47
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 60
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 19.02
DW 20.800 usec
DE 6.50 usec
TE 296.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177980 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm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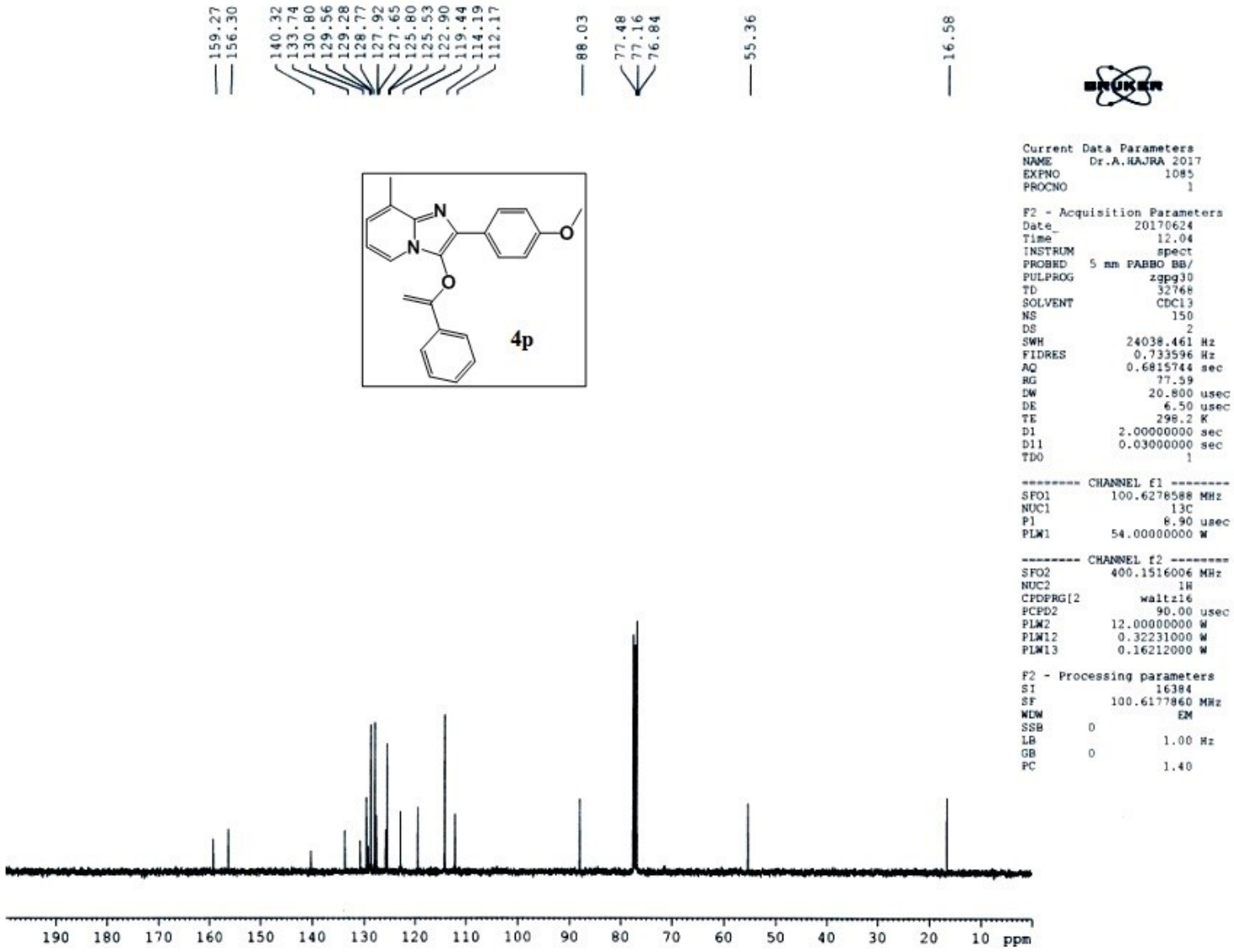
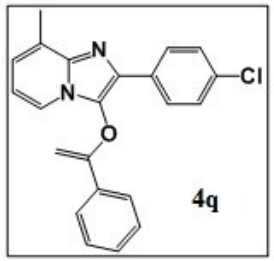
8.000
7.899
7.894
7.879
7.875
7.641
7.624
7.509
7.501
7.496
7.487
7.470
7.457
7.454
7.259
6.964
6.956
6.950
6.947
6.934
6.695
6.678
6.661
4.947
4.938
4.162
4.153
3.817
2.673
N
N
O
O
4p
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.07
2.00
1.01
3.03
3.07
1.02
1.03
1.01
3.05
3.01


159.27
156.30
140.32
133.74
130.80
129.56
129.28
128.77
127.92
127.65
125.80
125.53
122.90
119.44
114.19
112.17
88.03
77.48
77.16
76.84
55.36
16.58
4p
Current Data Parameters
NAME Dr.A.HAJRA 2017
EXPNO 1085
PROCNO 1
F2 - Acquisition Parameters
Date_ 20170624
Time 12.04
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 150
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 77.59
DW 20.800 usec
DE 6.50 usec
TE 298.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177860 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm


8.043
8.037
8.032
8.020
8.015
8.009
7.891
7.885
7.879
7.877
7.872
7.867
7.648
7.631
7.518
7.508
7.504
7.495
7.487
7.480
7.476
7.469
7.464
7.385
7.378
7.374
7.362
7.357
7.351
7.259
6.987
6.984
6.981
6.969
6.967
6.710
6.693
6.676
4.960
4.950
4.145
4.136
2.674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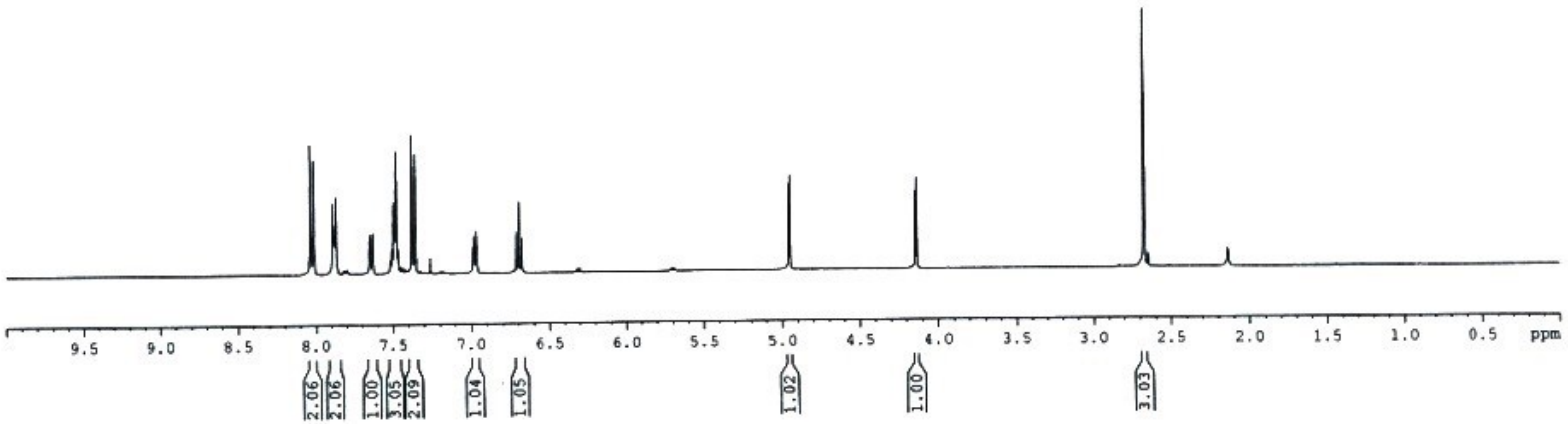
N
Cl
O
4q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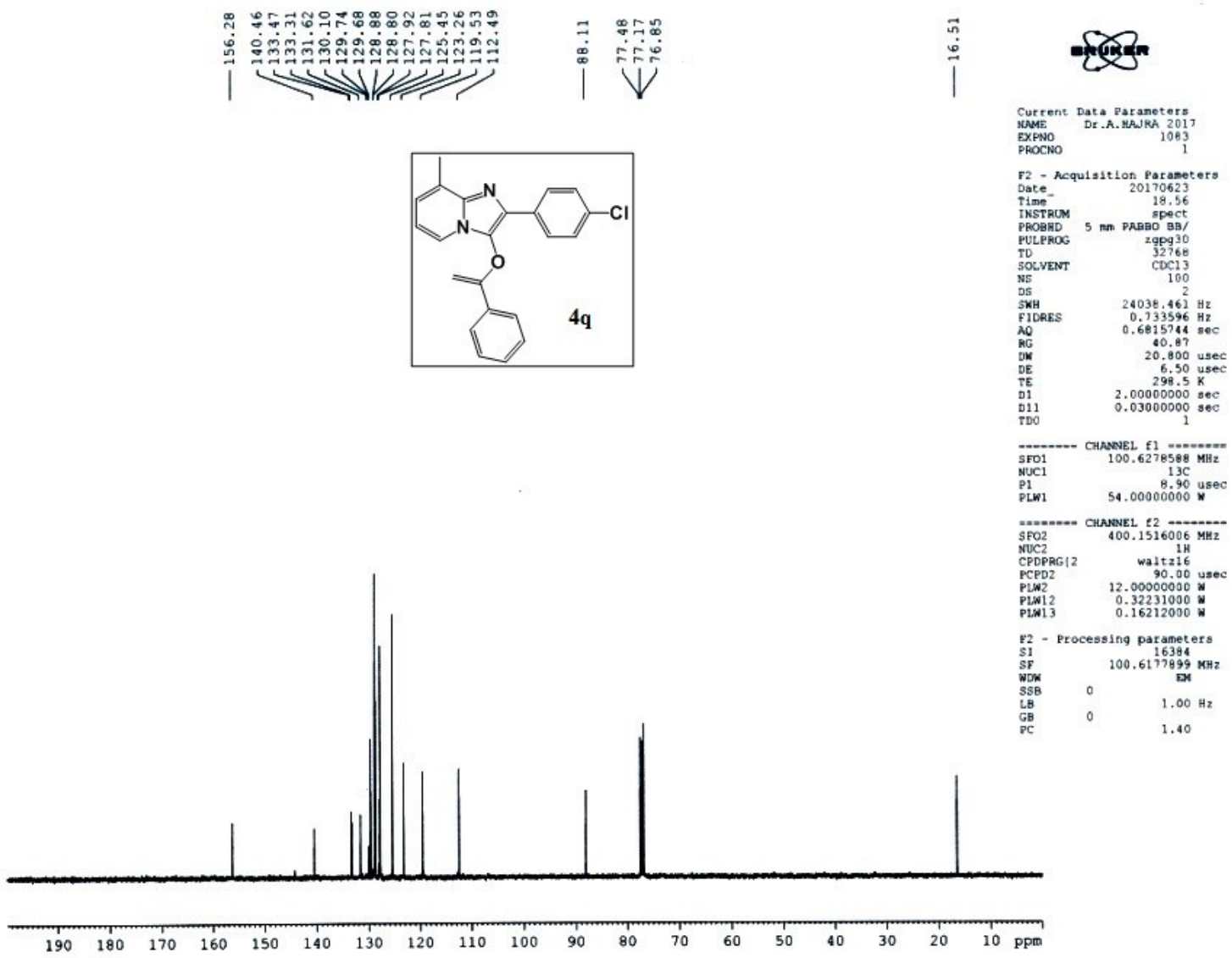
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.06
2.06
1.00
3.05
2.09
1.04
1.05
1.02
1.00
3.03


156.28
140.46
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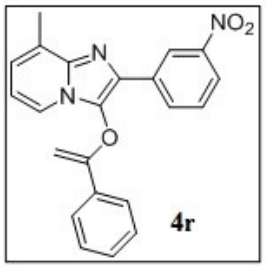
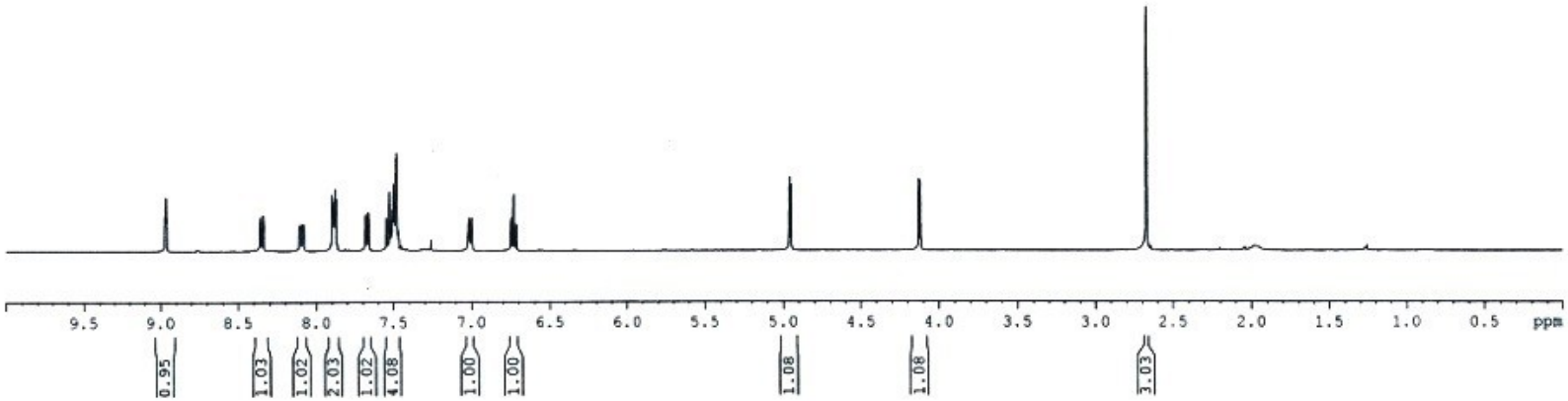
133.31
131.62
130.10
129.74
129.68
128.88
128.80
127.92
127.81
125.45
123.26
119.53
112.49
88.11
77.48
77.17
76.85
16.51
N
N
O
Cl
4q
BRUKER
Current Data Parameters
NAME Dr.A.HAJRA 2017
EXPNO 1083
PROCNO 1
F2 - Acquisition Parameters
Date_ 20170623
Time 18.56
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 100
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 40.87
DW 20.800 usec
DE 6.50 usec
TE 298.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
======== CHANNEL f2 ========
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177899 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm


8.970
8.966
8.961
8.361
8.341
8.109
8.107
8.104
8.088
8.086
8.083
7.899
7.893
7.883
7.879
7.875
7.680
7.663
7.547
7.527
7.514
7.507
7.501
7.484
7.482
7.472
7.468
7.259
7.019
7.002
6.750
6.733
6.716
4.960
4.951
4.128
4.119
2.674


NO2
N
N
O

4r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9.0
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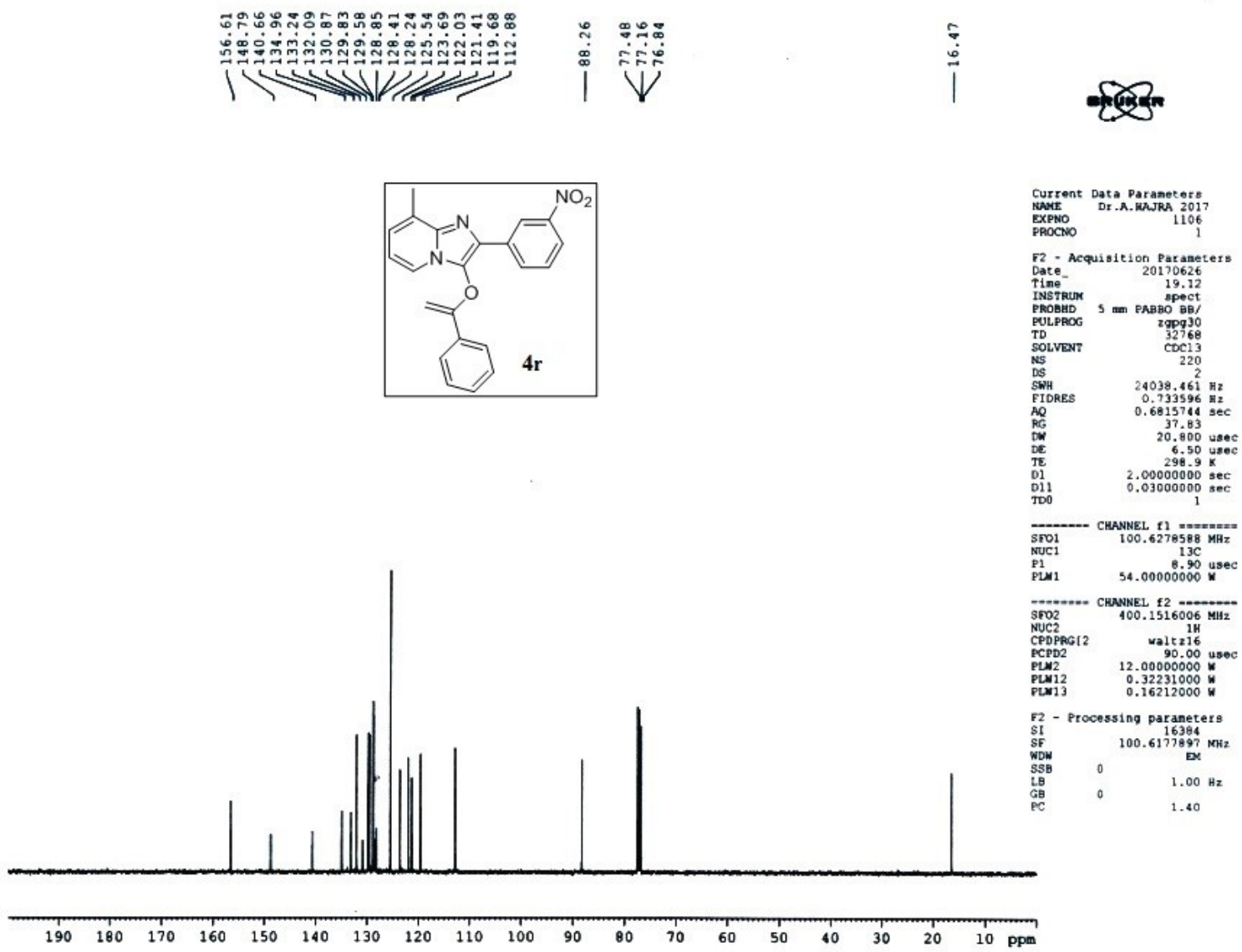
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
0.95
1.03
1.02
2.03
1.02
4.08
1.00
1.00
1.08
1.08
3.03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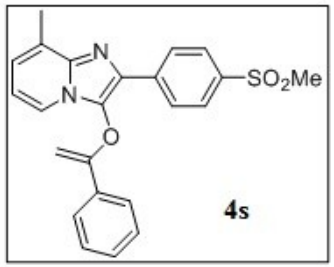
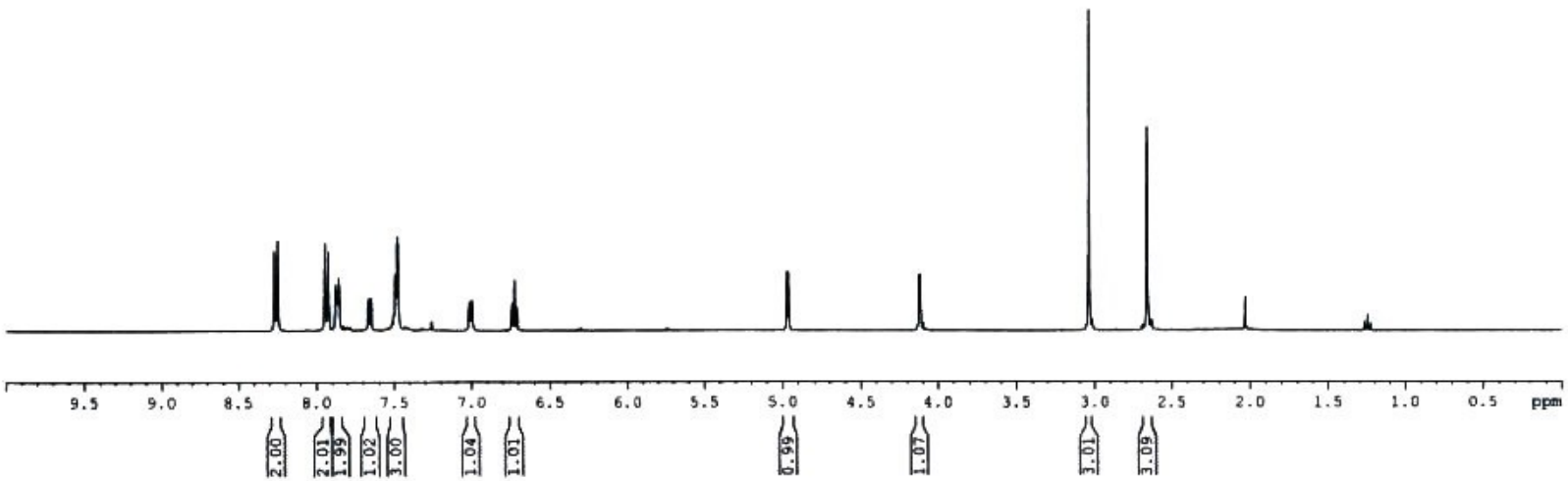
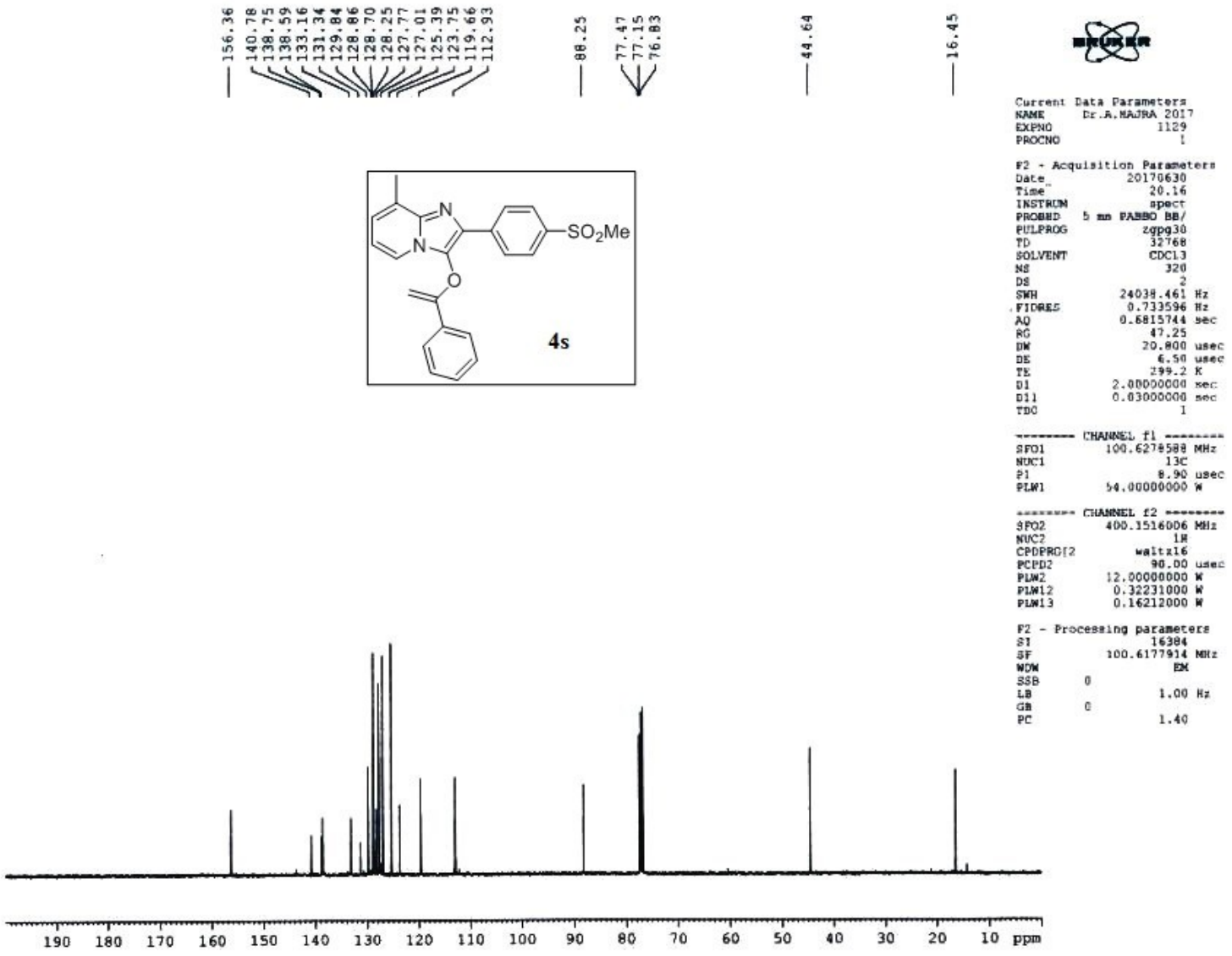
148.79
140.66
134.96
133.24
132.09
130.87
129.83
129.58
128.85
128.41
128.24
125.54
123.69
122.03
121.41
119.68
112.88
88.26
77.48
77.16
76.84
16.47
NO2
N
N
O
4r
Current Data Parameters
NAME Dr.A.RAJRA 2017
EXPNO 1106
PROCNO 1
F2 - Acquisition Parameters
Date_ 20170626
Time 19.12
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 220
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 37.83
DW 20.800 usec
DE 6.50 usec
TE 298.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177897 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

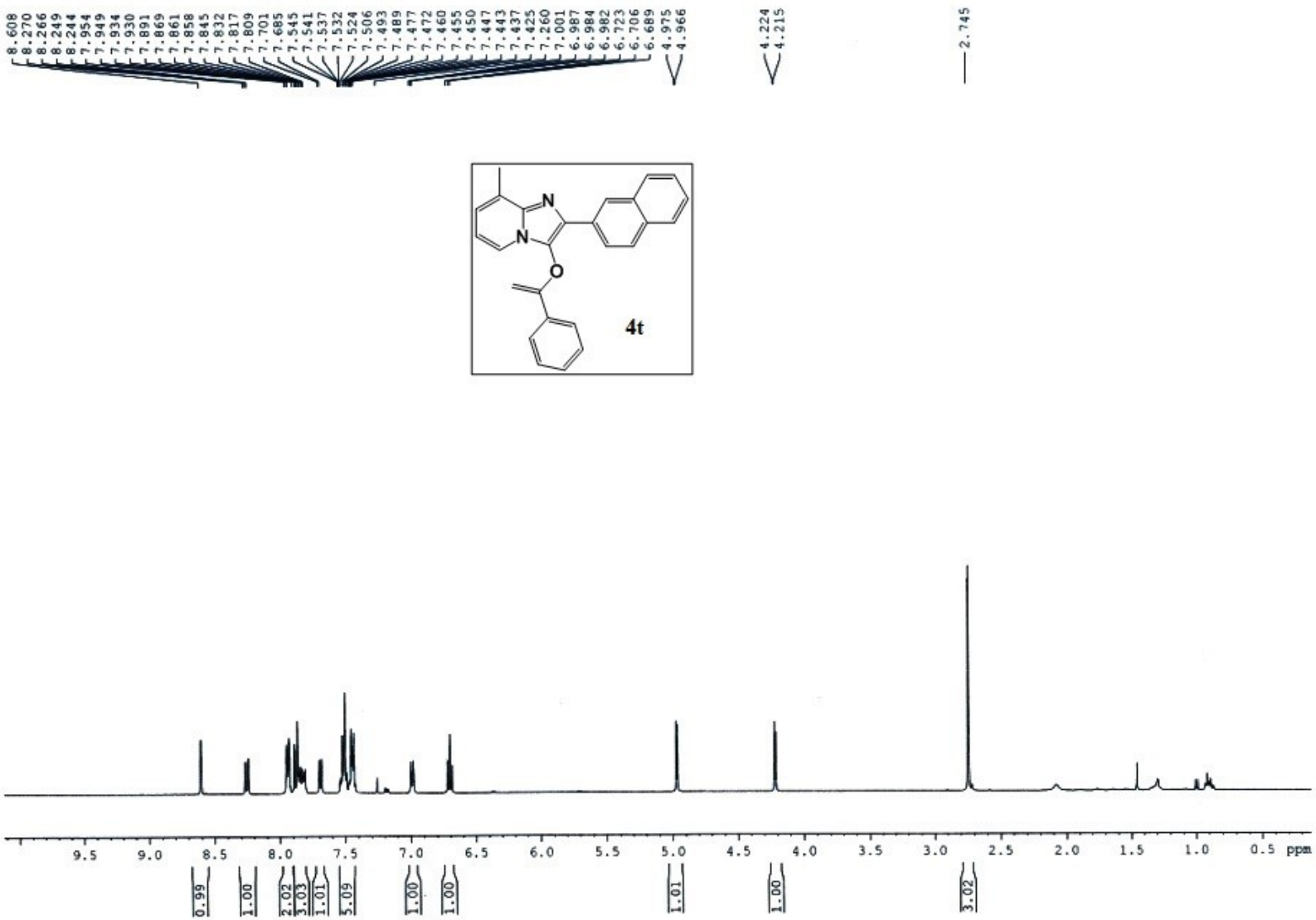

8.269
8.248
7.947
7.926
7.879
7.872
7.868
7.859
7.855
7.667
7.651
7.506
7.502
7.495
7.489
7.481
7.477
7.259
7.015
6.998
6.743
6.726
6.709
4.973
4.963
4.125
4.115
3.039
2.661


N
N
O
SO2Me

4s


9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.00
2.01
1.99
1.02
3.00
1.04
1.01
0.99
1.07
3.01
3.09


156.36
140.78
138.75
138.59
133.16
131.34
129.84
128.86
128.70
128.25
127.77
127.01
125.39
123.75
119.66
112.93
88.25
77.47
77.15
76.83
44.64
16.45
SO2Me
4s
Current Data Parameters
NAME Dr.A.MAJRA 2017
EXPNO 1129
PROCNO 1
F2 - Acquisition Parameters
Date_ 20170630
Time 20.16
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 320
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 47.25
DW 20.800 usec
DE 6.50 usec
TE 299.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177914 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm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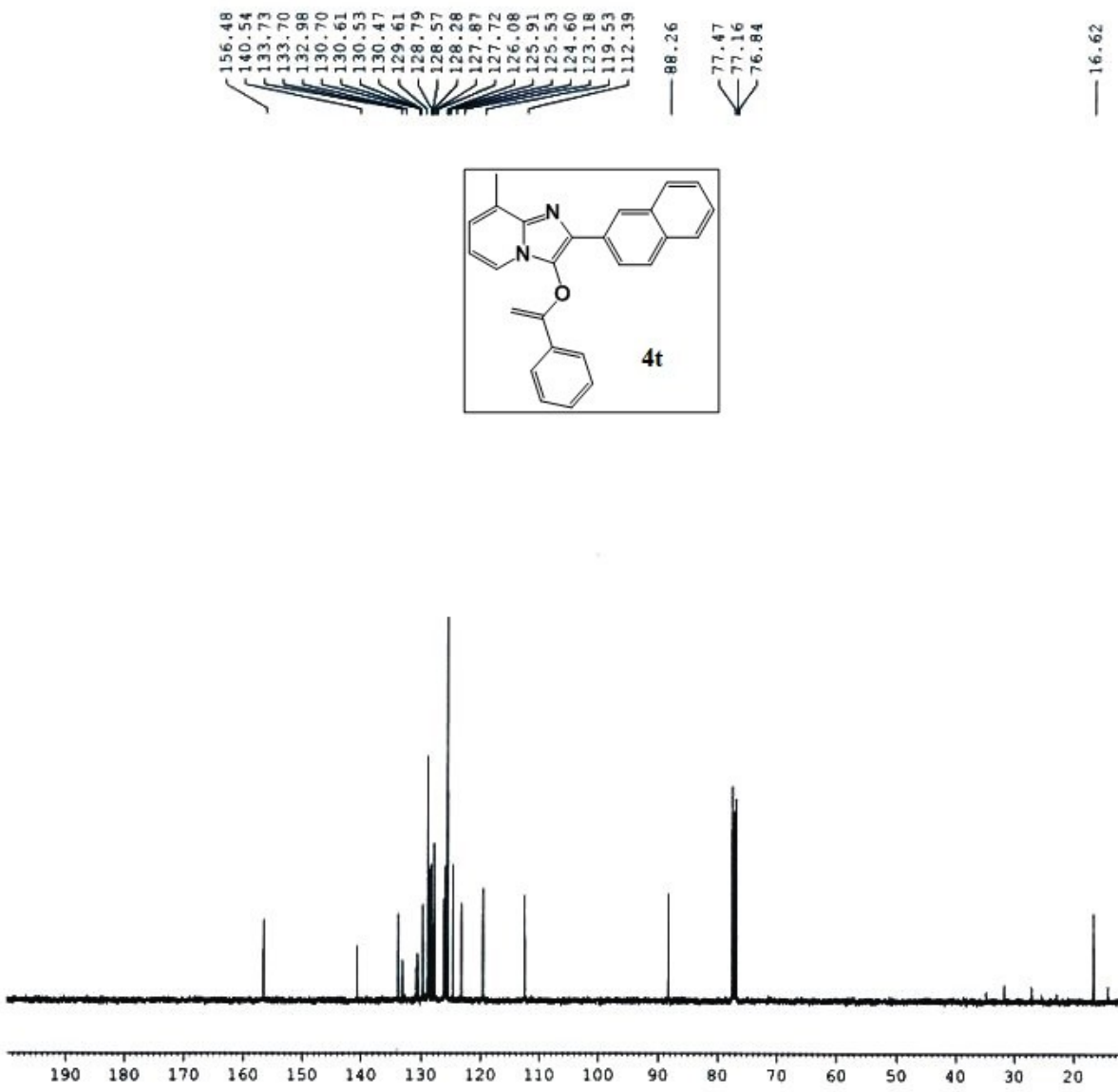
7.954
7.949
7.934
7.930
7.891
7.869
7.861
7.858
7.845
7.832
7.817
7.809
7.701
7.685
7.545
7.541
7.537
7.532
7.524
7.506
7.493
7.489
7.477
7.472
7.460
7.455
7.450
7.447
7.443
7.437
7.425
7.260
7.001
6.987
6.984
6.982
6.723
6.706
6.689
4.975
4.966
4.224
4.215
2.745
N
N
O
4t
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5 ppm
0.99
1.00
2.02
3.03
1.01
5.09
1.00
1.00
1.01
1.00
3.02


156.48
140.54
133.73
133.70
132.98
130.70
130.61
130.53
130.47
129.61
128.79
128.57
128.28
127.87
127.72
126.08
125.91
125.53
124.60
123.18
119.53
112.39
88.26
77.47
77.16
76.84
16.62
N
N
O
4t
Current Data Parameters
NAME Dr.A.HAJRA 2017
EXPNO 1068
PROCNO 1
F2 - Acquisition Parameters
Date_ 20170622
Time 10.55
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 120
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 47.25
DW 20.800 usec
DE 6.50 usec
TE 296.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
======== CHANNEL f2 ========
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177919 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm


8.022
8.004
7.869
7.852
7.426
7.408
7.388
7.322
7.304
7.286
7.259
7.163
7.141
6.990
6.973
6.756
6.739
6.722
6.659
6.652
6.638
6.631
6.560
6.554
4.430
4.420
4.244
4.235
2.925
2.834
2.819
2.805
2.791
2.764
2.655
2.349
2.341
2.333
2.318
2.305
2.299
2.282
2.268
2.260
2.193
2.183
2.174
2.163
2.153
2.138
2.127
2.116
1.915
1.907
1.902
1.892
1.884
1.863
1.856
1.756
1.734
1.723
1.714
1.701
1.694
1.552
1.542
1.527
1.512
1.497
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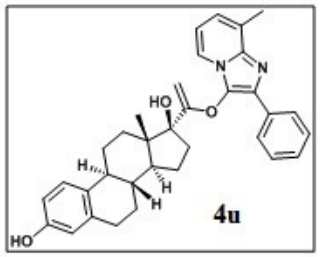
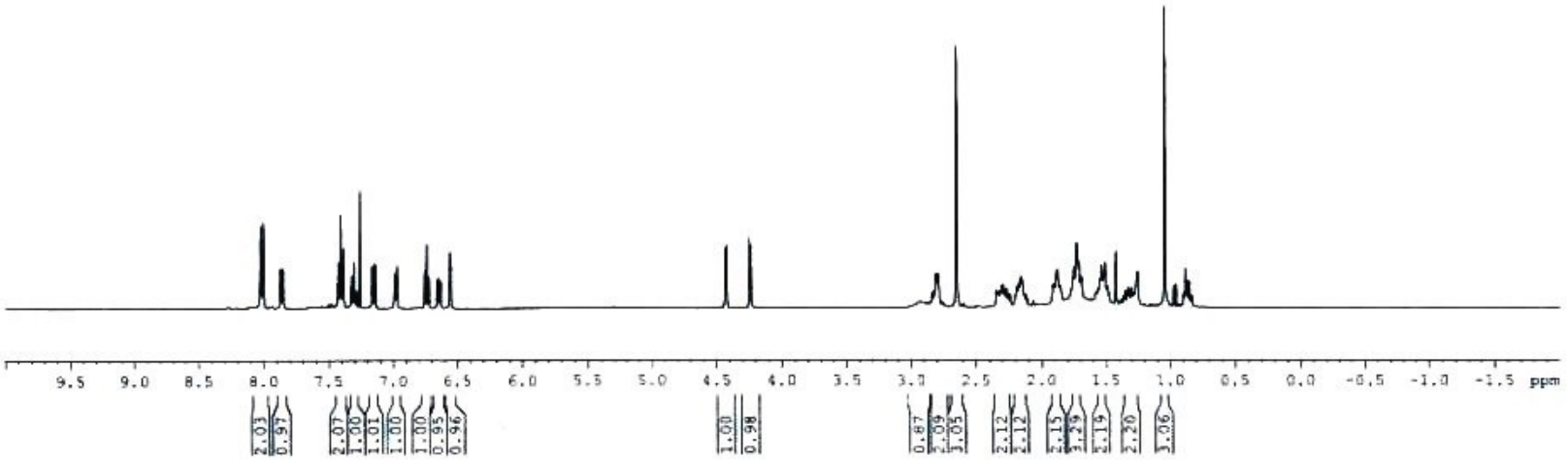
1.353
1.335
1.321
1.304
1.289
1.256
1.045


HO
O
N
N
H
H
H
HO
4u


9.5
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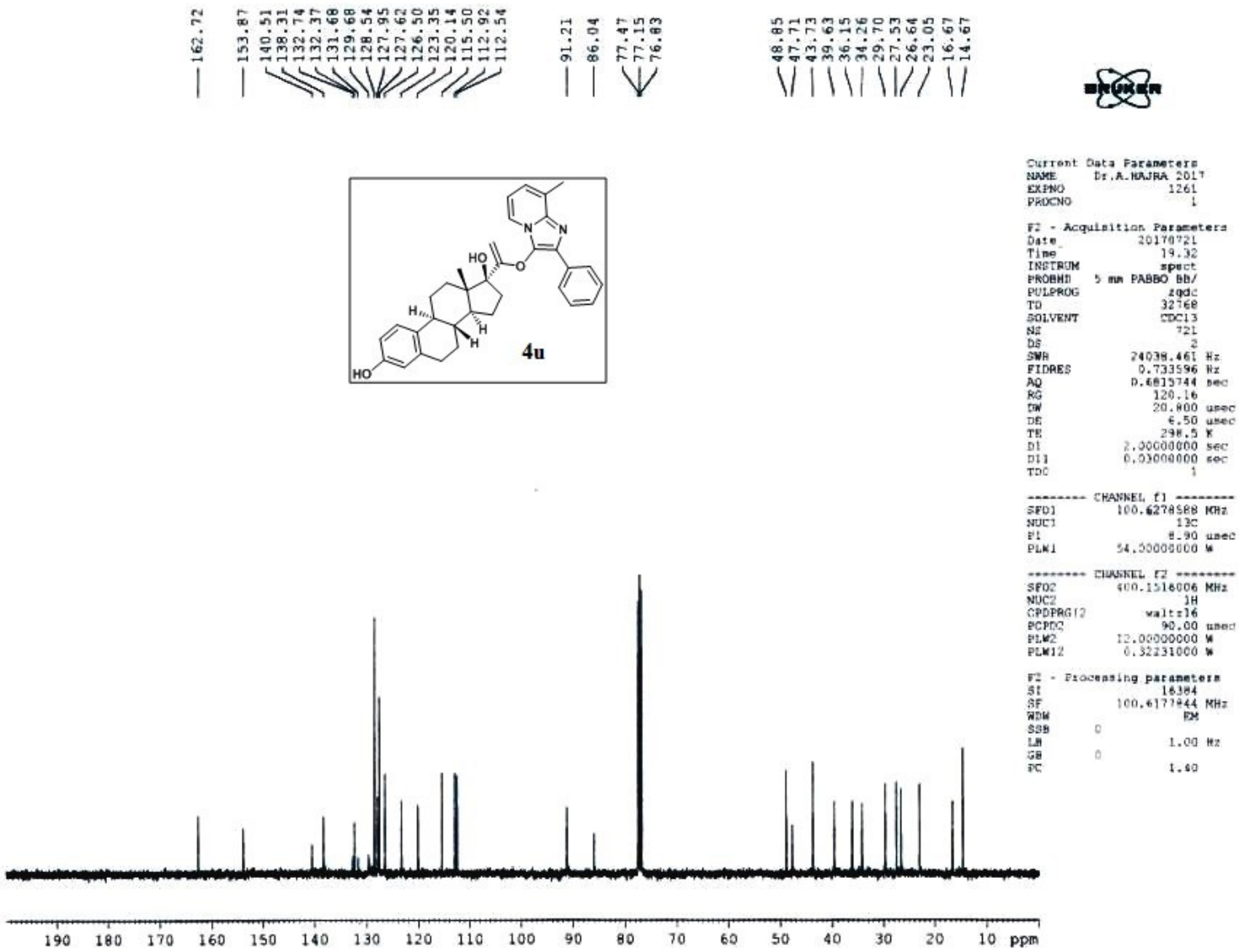
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
ppm
2.03
0.97
2.07
1.00
1.01
1.00
1.00
0.95
0.96
1.00
0.98
0.87
3.00
3.05
2.12
2.12
5.15
3.29
5.19
2.20
3.06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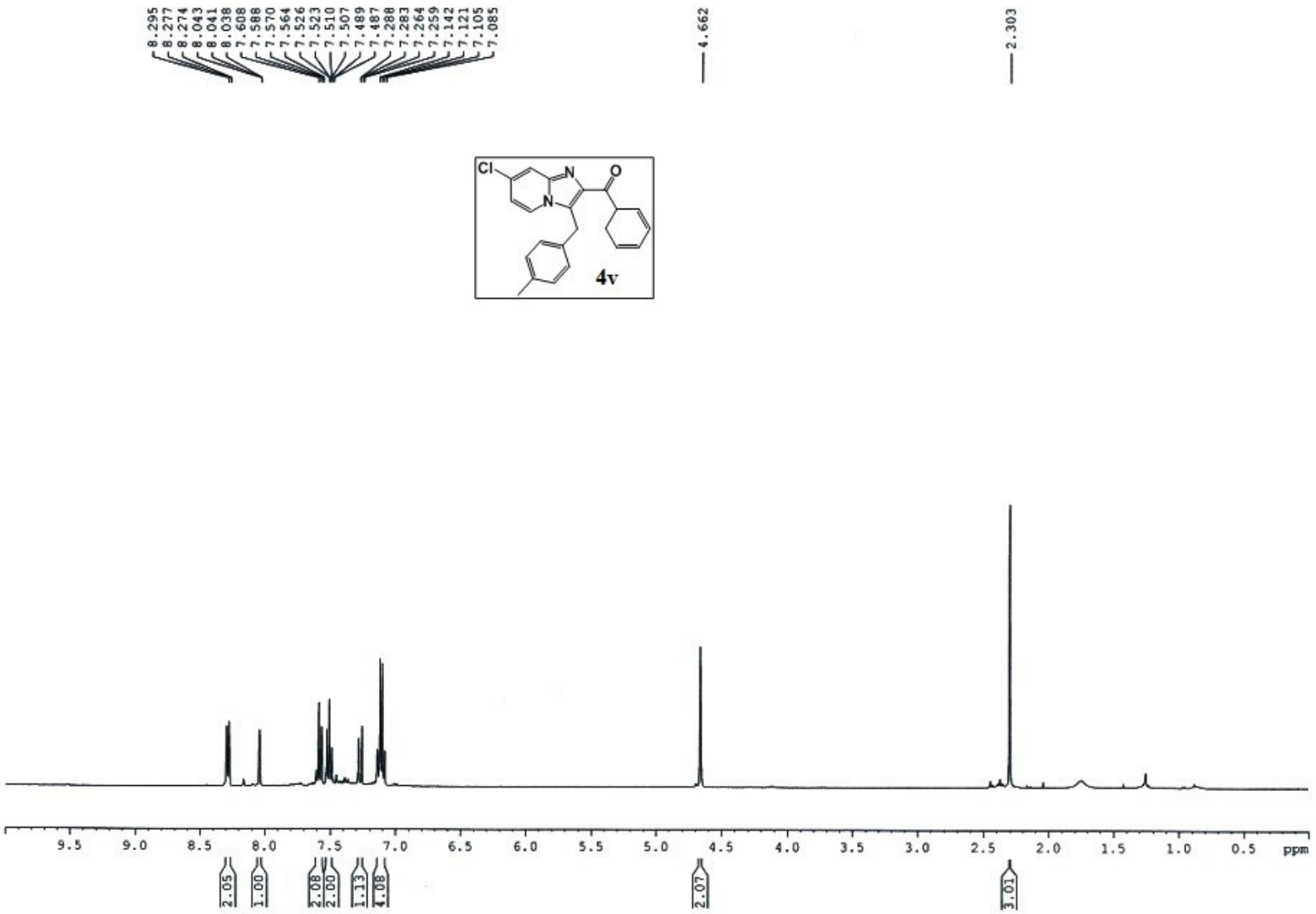
153.87
140.51
138.31
132.74
132.37
131.68
129.68
128.54
127.95
127.62
126.50
123.35
120.14
115.50
112.92
112.54
91.21
86.04
77.47
77.15
76.83
48.85
47.71
43.73
39.63
36.15
34.26
29.70
27.53
26.64
23.05
16.67
14.67
4u
Current Data Parameters
NAME Dr.A.HAJRA 2017
EXPNO 1261
PROCNO 1
F2 - Acquisition Parameters
Date 20170721
Time 19.32
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgdc
TD 32768
SOLVENT CDCl3
NS 721
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 120.16
DW 20.800 usec
DE 6.50 usec
TE 298.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
F2 - Processing parameters
SI 16384
SF 100.6177944 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm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8.041
8.038
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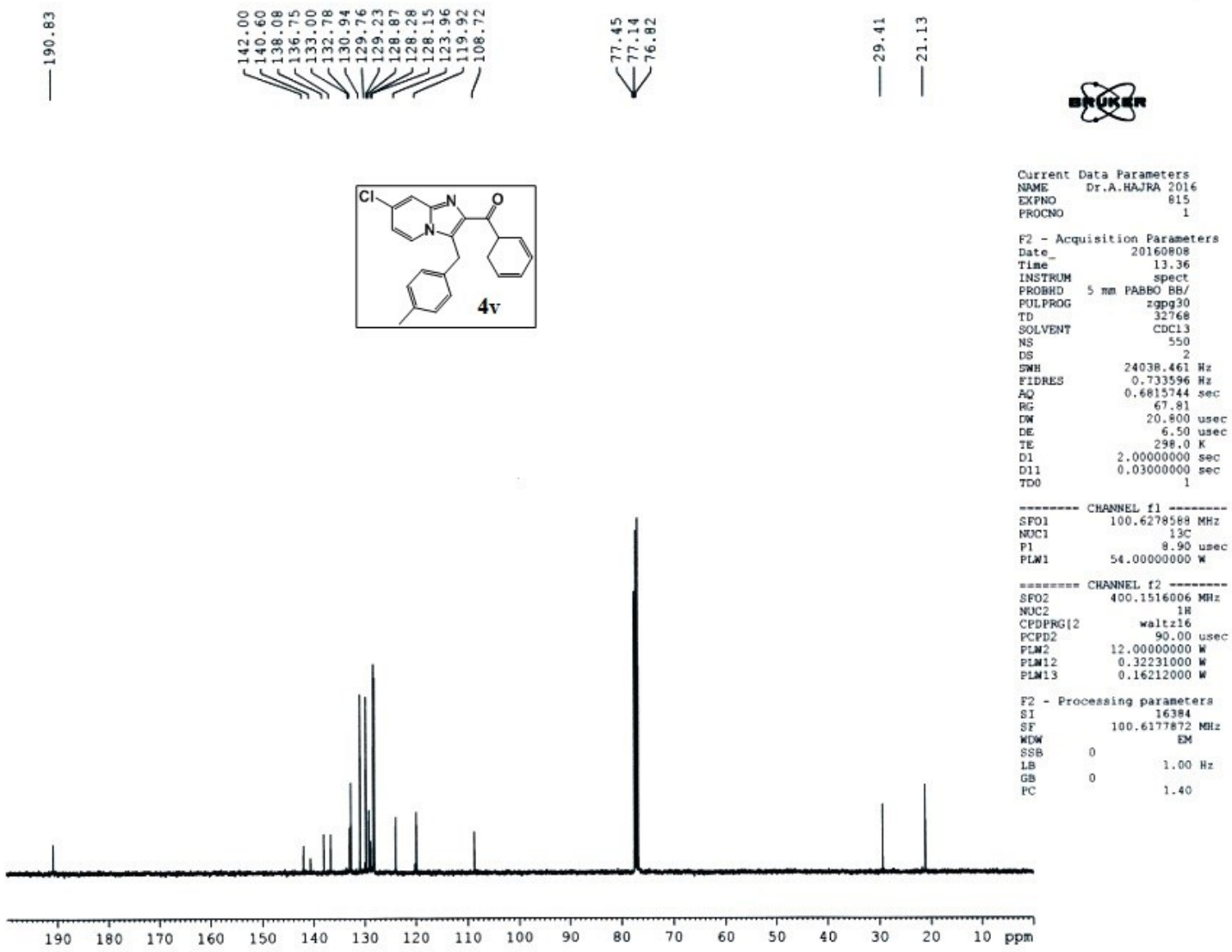
7.588
7.570
7.564
7.526
7.523
7.510
7.507
7.489
7.487
7.288
7.283
7.264
7.259
7.142
7.121
7.105
7.085
4.662
2.303
Cl
N
O
N
4v
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.05
1.00
2.08
2.00
1.13
1.08
2.07
3.01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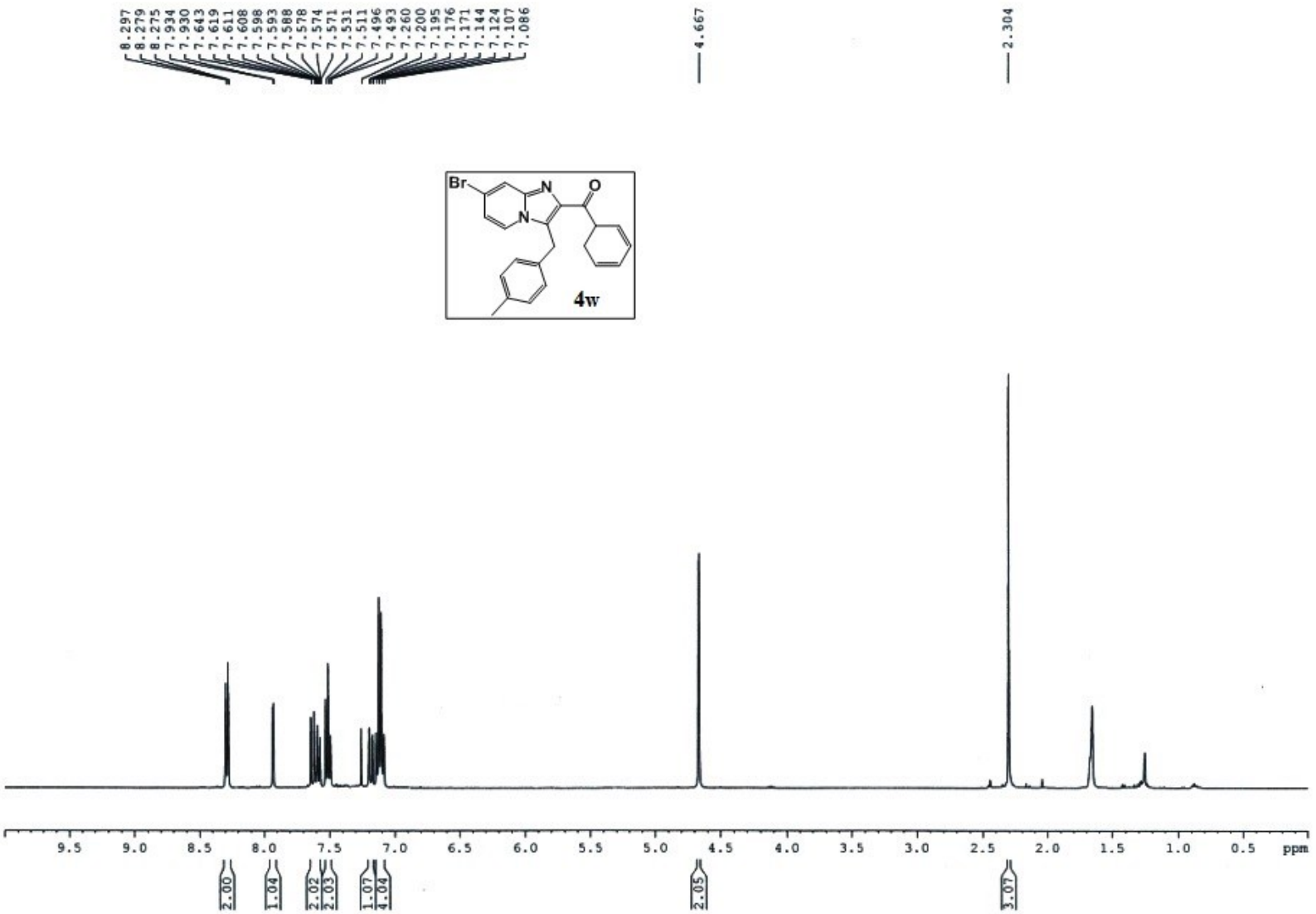
140.60
138.08
136.75
133.00
132.78
130.94
129.76
129.23
128.87
128.28
128.15
123.96
119.92
108.72
77.45
77.14
76.82
29.41
21.13
Cl
N
N
O
4v
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 815
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160808
Time 13.36
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 550
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 67.81
DW 20.800 usec
DE 6.50 usec
TE 298.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177872 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm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7.934
7.930
7.643
7.619
7.611
7.608
7.598
7.593
7.588
7.578
7.574
7.571
7.531
7.511
7.496
7.493
7.260
7.200
7.195
7.176
7.171
7.144
7.124
7.107
7.086
4.667
2.304
Br
N
O
N
4w
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
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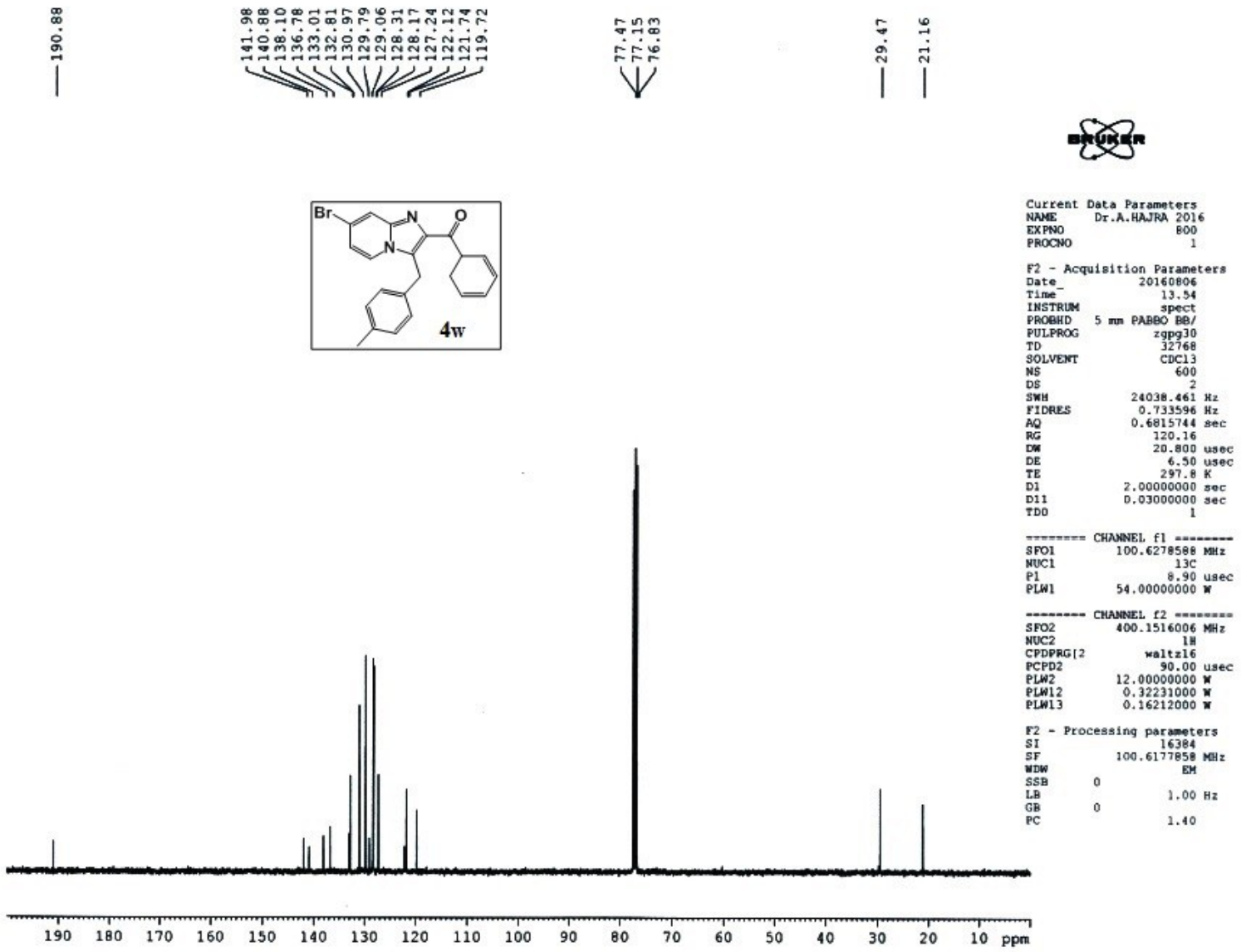
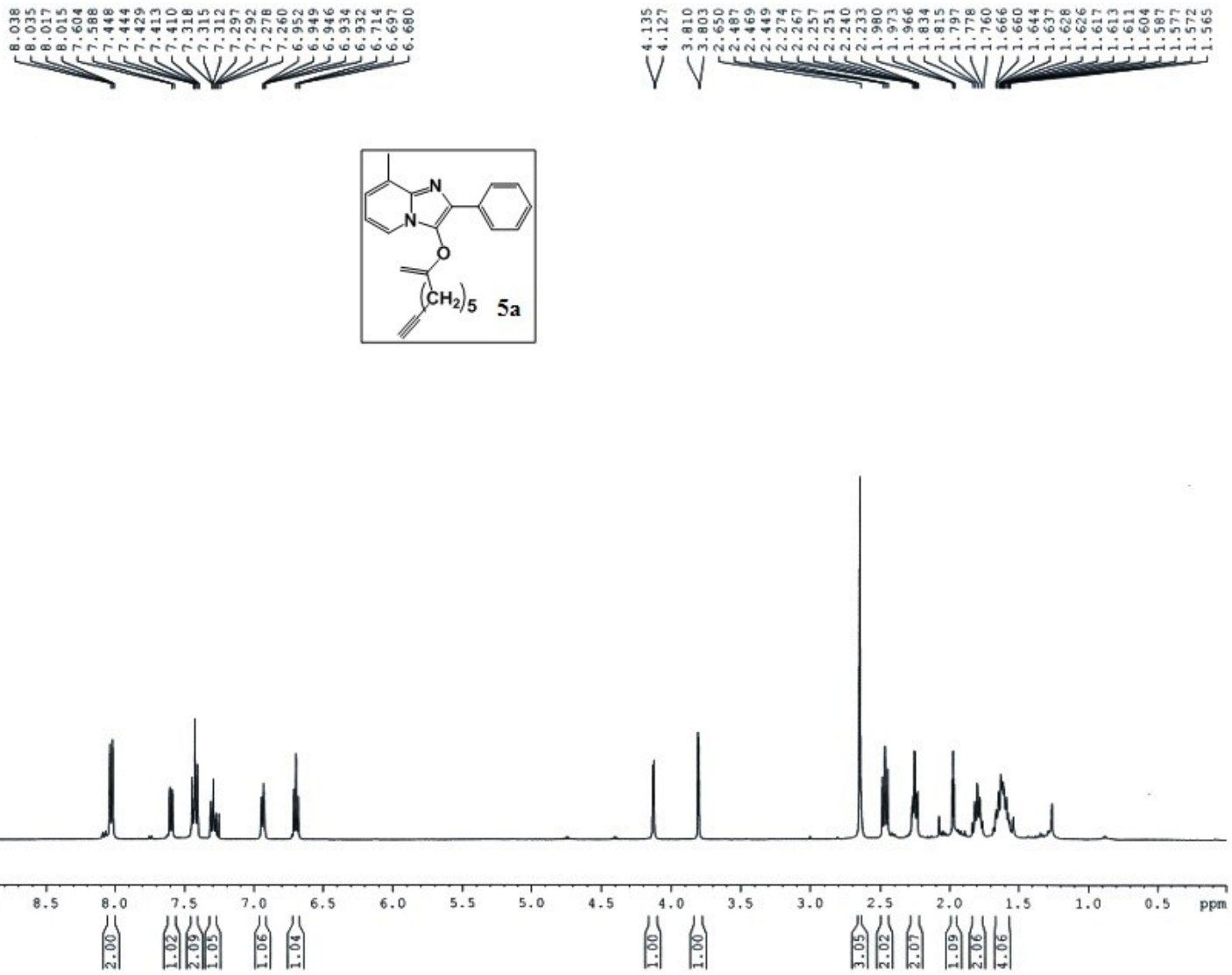
1.04
2.02
2.03
1.07
4.04
2.05
3.07


190.88
141.98
140.88
138.10
136.78
133.01
132.81
130.97
129.79
129.06
128.31
128.17
127.24
122.12
121.74
119.72
77.47
77.15
76.83
29.47
21.16
Br
N
O
N
4w
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 800
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160806
Time 13.54
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 600
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 120.16
DW 20.800 usec
DE 6.50 usec
TE 297.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177858 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm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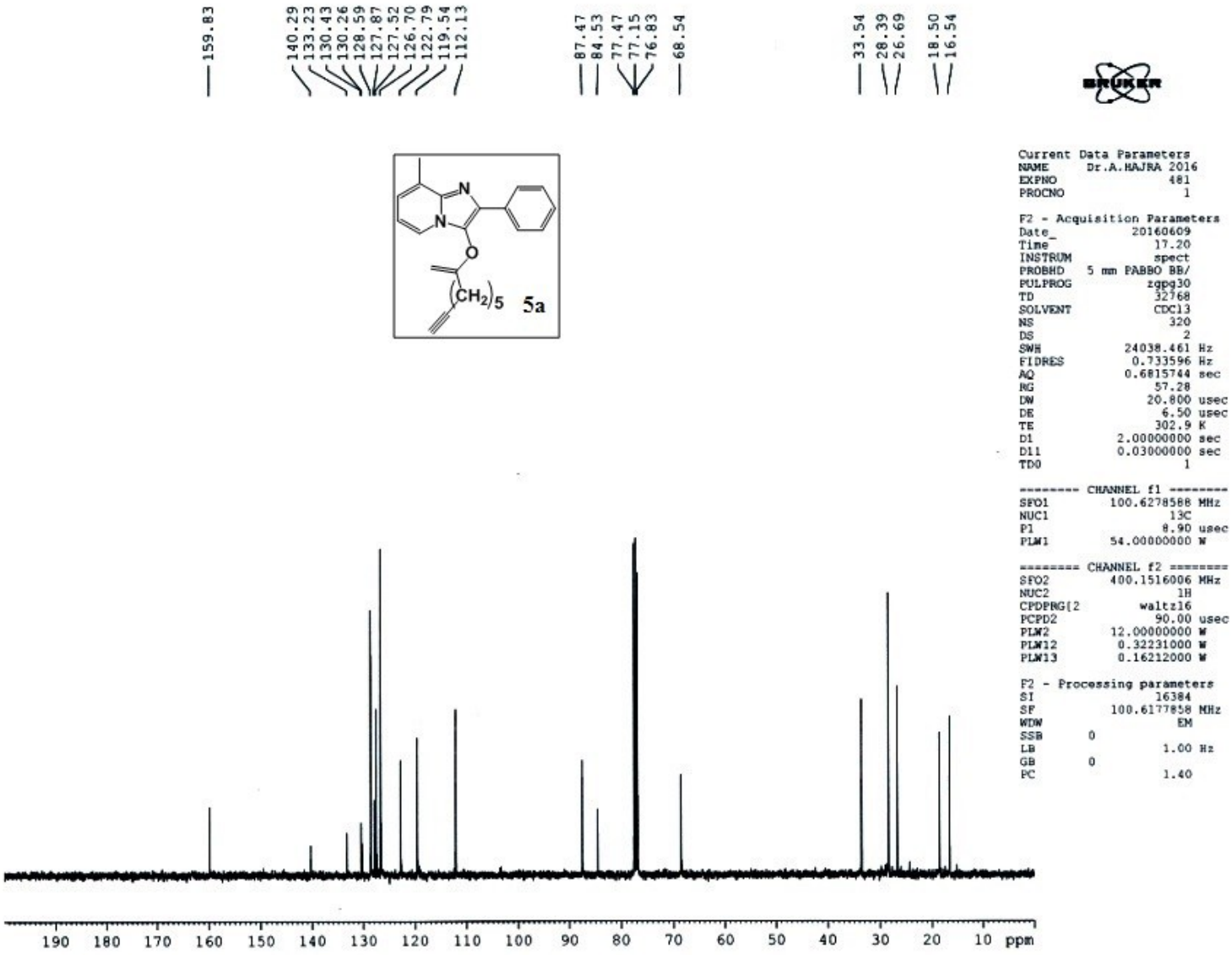
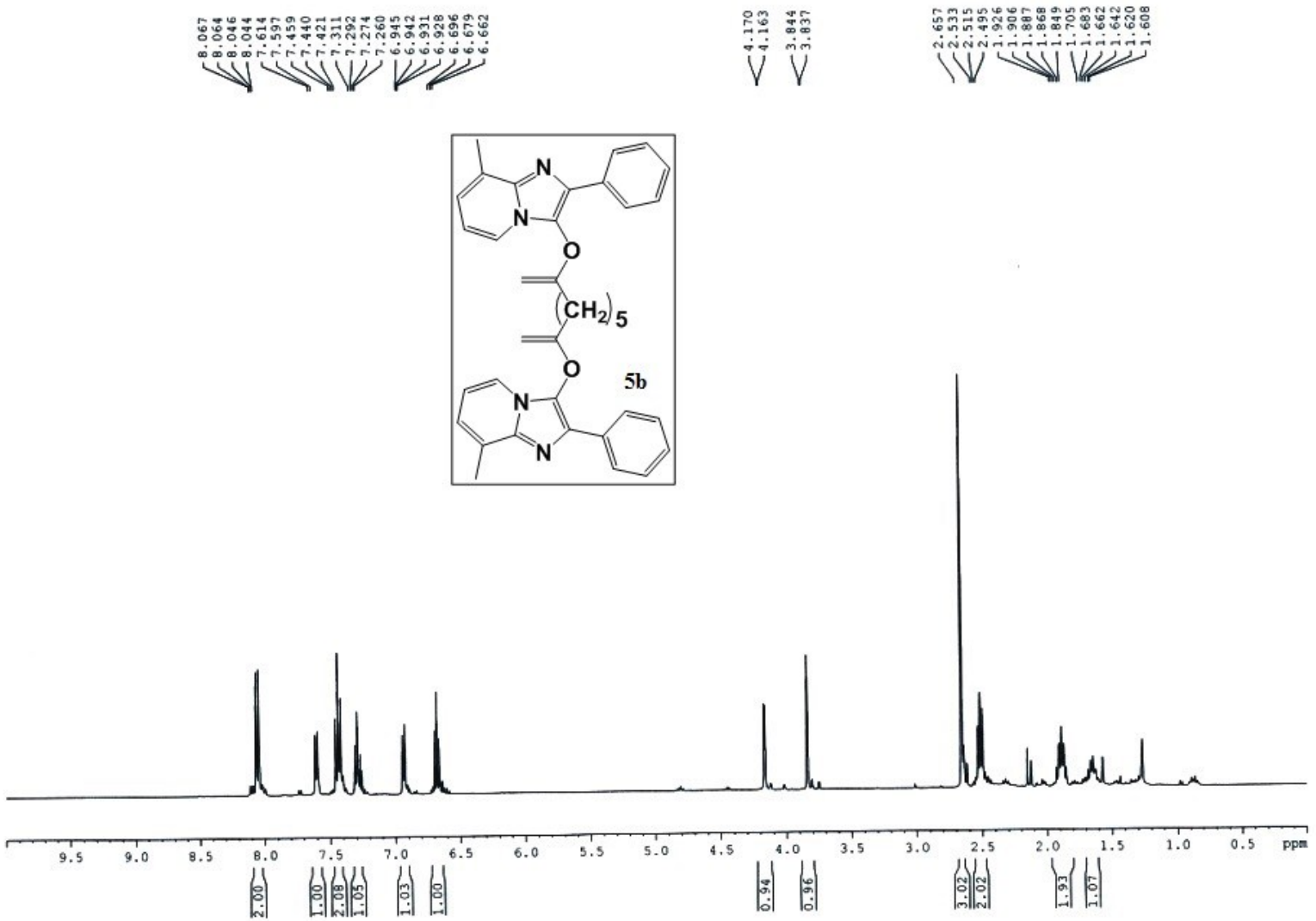
8.035
8.017
8.015
7.604
7.588
7.448
7.444
7.429
7.413
7.410
7.318
7.315
7.312
7.297
7.292
7.278
7.260
6.952
6.949
6.946
6.934
6.932
6.714
6.697
6.680
4.135
4.127
3.810
3.803
2.650
2.487
2.469
2.449
2.274
2.267
2.257
2.251
2.240
2.233
1.980
1.973
1.966
1.834
1.815
1.797
1.778
1.760
1.666
1.660
1.644
1.637
1.628
1.626
1.617
1.613
1.611
1.604
1.587
1.577
1.572
1.565
N
N
O
(CH2)5
5a
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.00
1.02
2.09
1.05
1.06
1.04
1.00
1.00
3.05
2.02
2.07
1.09
2.06
4.06


159.83
140.29
133.23
130.43
130.26
128.59
127.87
127.52
126.70
122.79
119.54
112.13
87.47
84.53
77.47
77.15
76.83
68.54
33.54
28.39
26.69
18.50
16.54
5a
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 481
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160609
Time 17.20
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 320
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 57.28
DW 20.800 usec
DE 6.50 usec
TE 302.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
======== CHANNEL f2 ========
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177858 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm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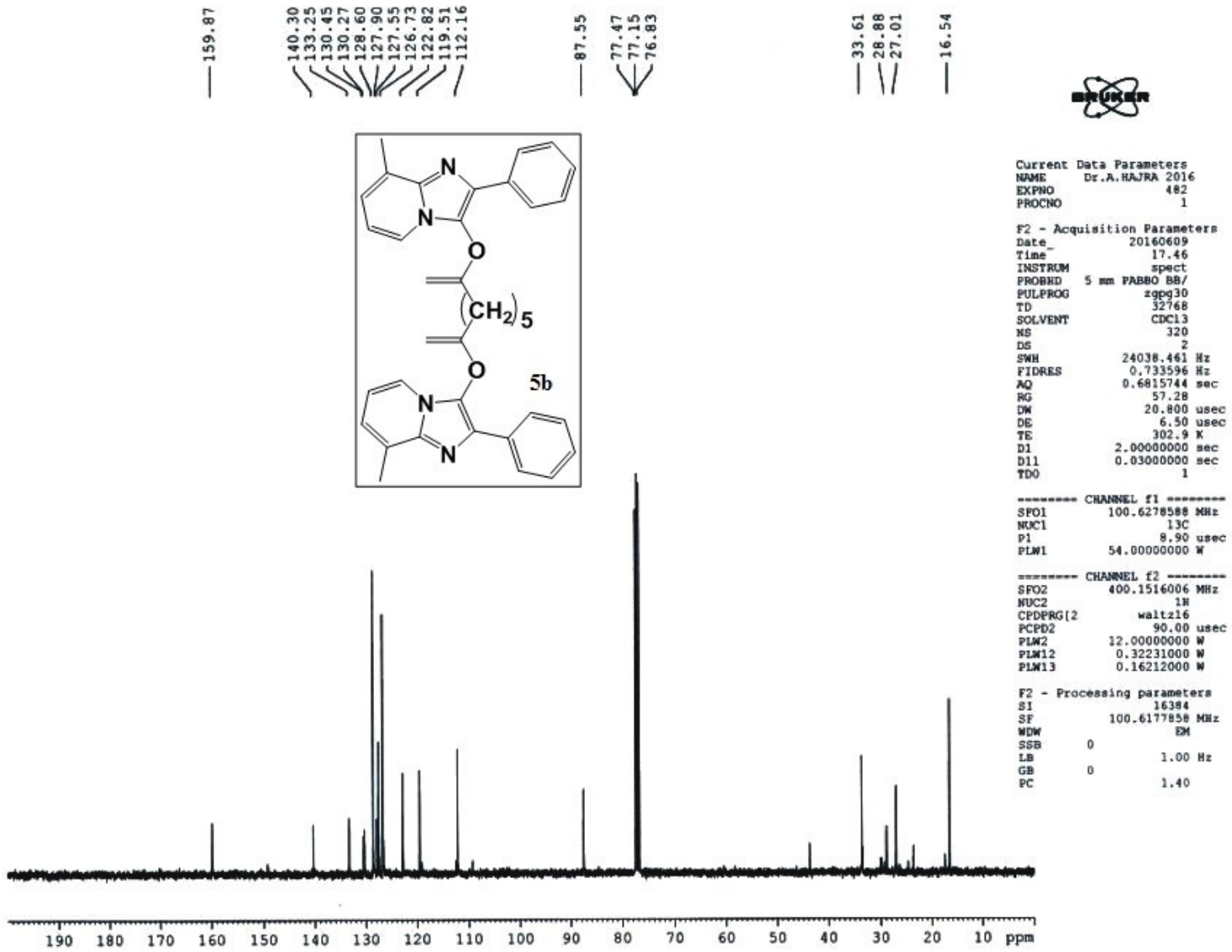
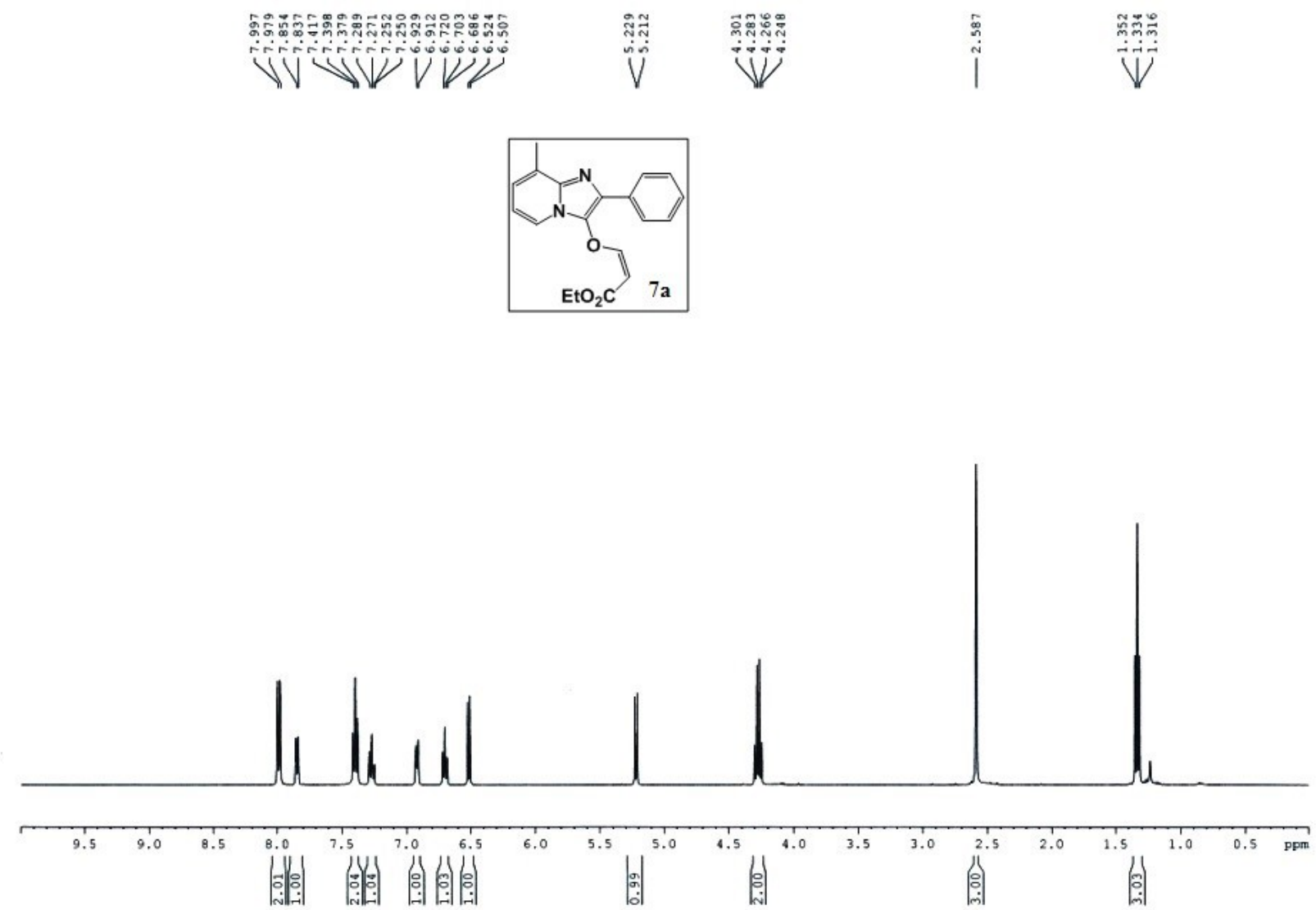
8.064
8.046
8.044
7.614
7.597
7.459
7.440
7.421
7.311
7.292
7.274
7.260
6.945
6.942
6.931
6.928
6.696
6.679
6.662
4.170
4.163
3.844
3.837
2.657
2.533
2.515
2.495
1.926
1.906
1.887
1.868
1.849
1.705
1.683
1.662
1.642
1.620
1.608
N
N
O
(CH2)5
O
N
N
5b
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
2.00
1.00
2.08
1.05
1.03
1.00
0.94
0.96
3.02
2.02
1.93
1.07


159.87
140.30
133.25
130.45
130.27
128.60
127.90
127.55
126.73
122.82
119.51
112.16
87.55
77.47
77.15
76.83
33.61
28.88
27.01
16.54
5b
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 482
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160609
Time 17.46
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 320
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 57.28
DW 20.800 usec
DE 6.50 usec
TE 302.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177858 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm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7.837
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7.289
7.271
7.252
7.250
6.929
6.912
6.720
6.703
6.686
6.524
6.507
5.229
5.212
4.301
4.283
4.266
4.248
2.587
1.352
1.334
1.316
N
N
O
EtO2C
7a
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
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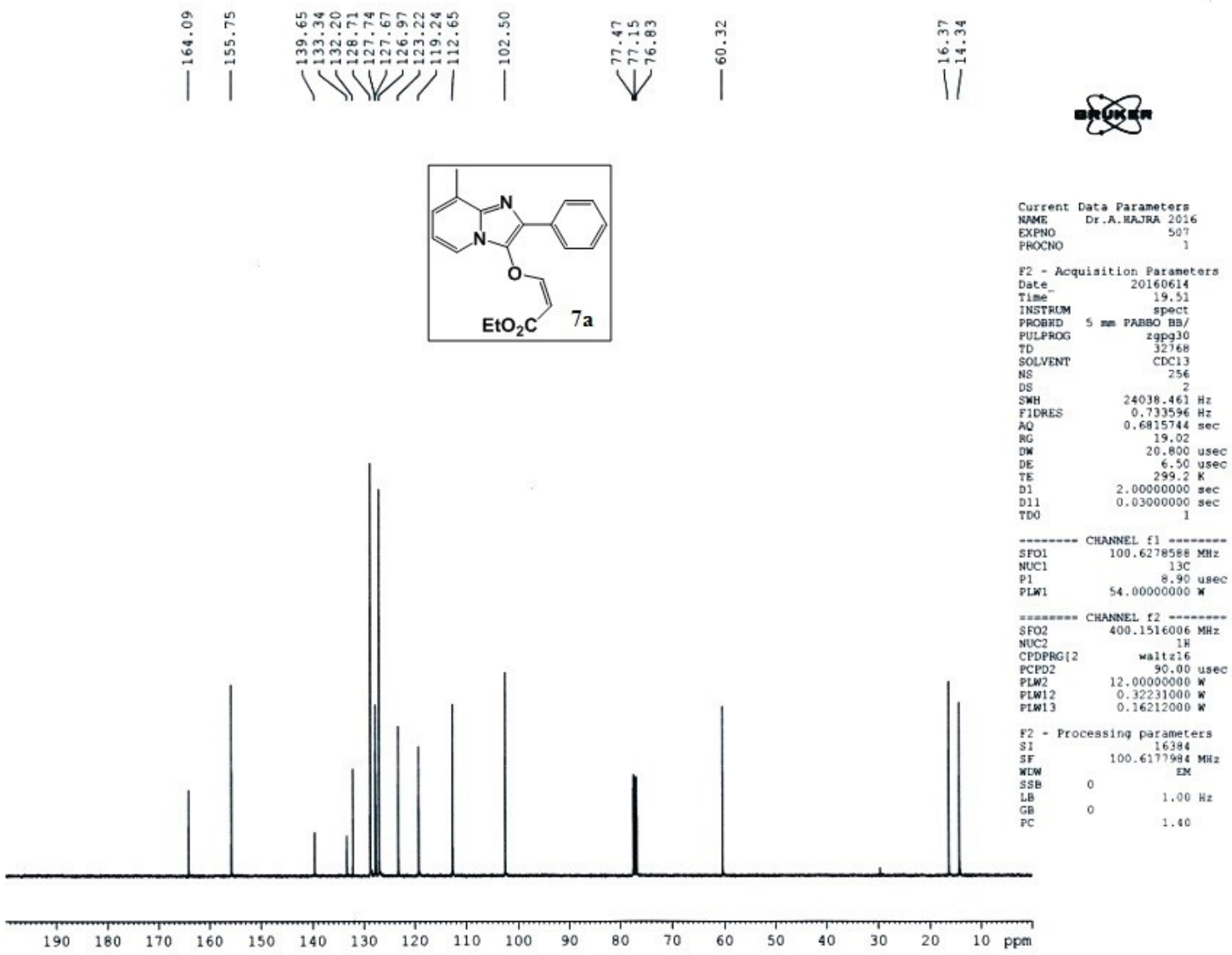
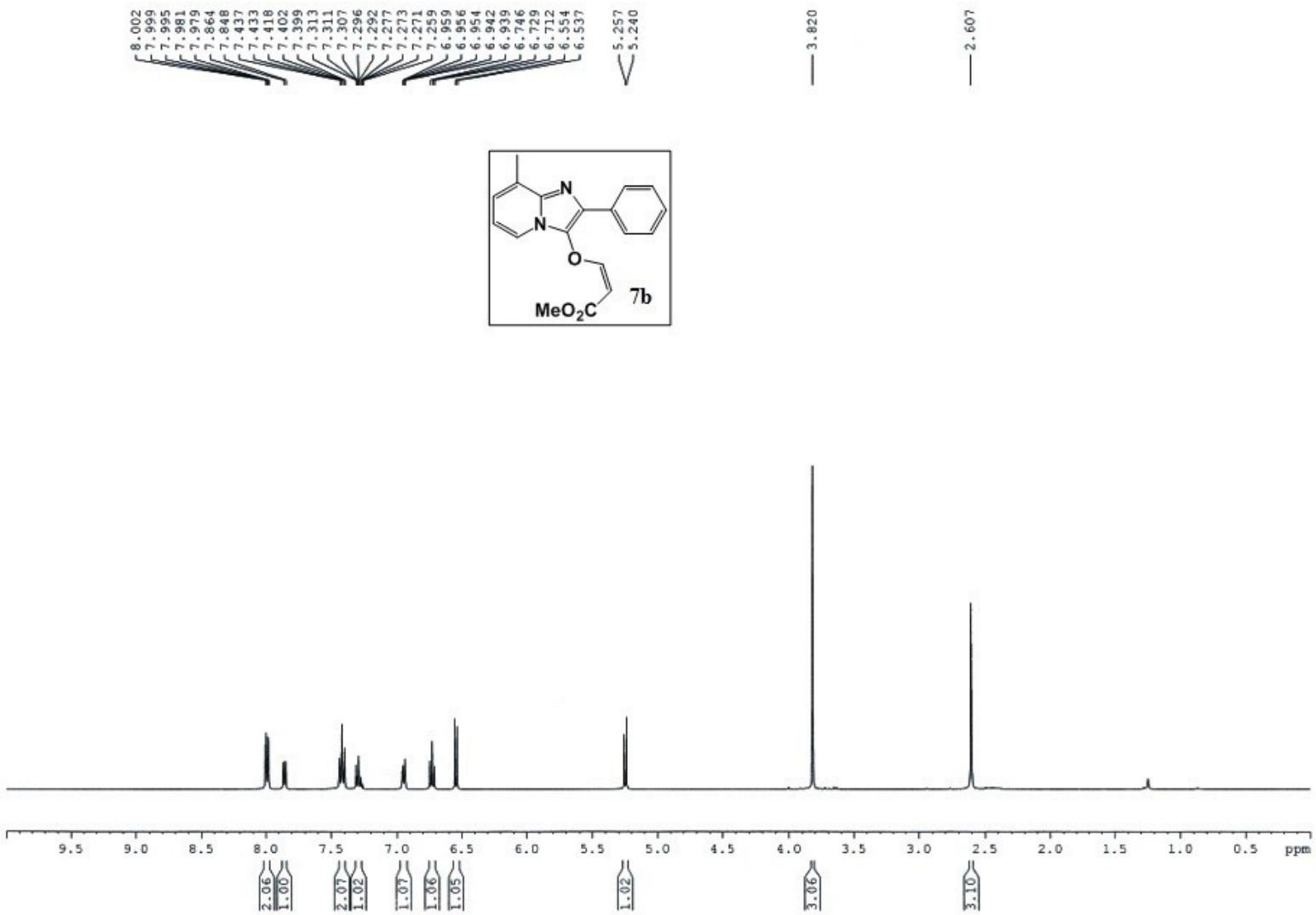
1.00
2.04
1.04
1.00
1.03
1.00
0.99
2.00
3.00
3.03


164.09
155.75
139.65
133.34
132.20
128.71
127.74
127.67
126.97
123.22
119.24
112.65
102.50
77.47
77.15
76.83
60.32
16.37
14.34
EtO2C
7a
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 507
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160614
Time 19.51
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 19.02
DW 20.800 usec
DE 6.50 usec
TE 299.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
======== CHANNEL f2 ========
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177984 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm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7.437
7.433
7.418
7.402
7.399
7.313
7.311
7.307
7.296
7.292
7.277
7.273
7.271
7.259
6.959
6.956
6.954
6.942
6.939
6.746
6.729
6.712
6.554
6.537
5.257
5.240
3.820
2.607
N
N
O
MeO2C
7b
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
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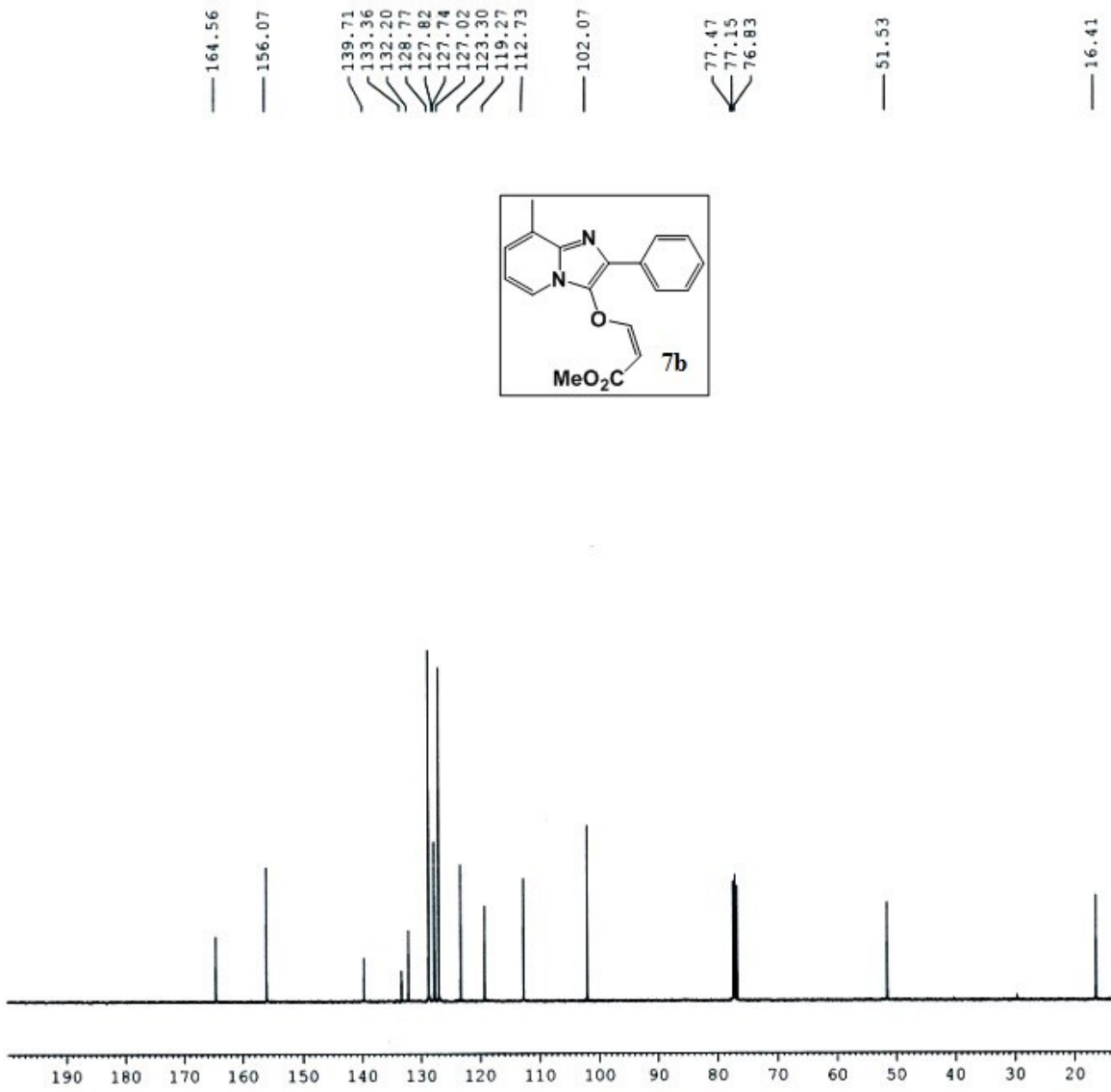
1.00
2.07
1.02
1.07
1.06
1.05
1.02
3.06
3.10




```
Current Data Parameters
NAME      Dr.A.HAJRA 2016
EXPNO              497
PROCNO               1

F2 - Acquisition Parameters
Date_          20160613
Time             13.35
INSTRUM          spect
PROBHD   5 mm PABBO BB/
PULPROG        zgpg30
TD             32768
SOLVENT        CDCl3
NS               320
DS                 2
SWH          24038.461 Hz
FIDRES        0.733596 Hz
AQ            0.6815744 sec
RG               23.55
DW              20.800 usec
DE               6.50 usec
TE              299.3 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                1

======== CHANNEL f1 ========
SFO1       100.6278588 MHz
NUC1              13C
P1                8.90 usec
PLW1      54.00000000 W

======== CHANNEL f2 ========
SFO2       400.1516006 MHz
NUC2              1H
CPDPRG(2       waltz16
PCPD2            90.00 usec
PLW2      12.00000000 W
PLW12      0.32231000 W
PLW13      0.16212000 W

F2 - Processing parameters
SI                16384
SF           100.6177947 MHz
WDW                EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```


8.510
8.143
8.139
8.121
8.117
8.082
8.068
8.065
8.063
7.937
7.915
7.906
7.892
7.858
7.845
7.835
7.645
7.622
7.501
7.499
7.497
7.489
7.481
7.478
7.259
7.255
7.252
7.238
7.234
7.232
7.229
7.215
7.212
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6.891
6.876
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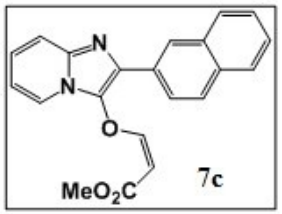
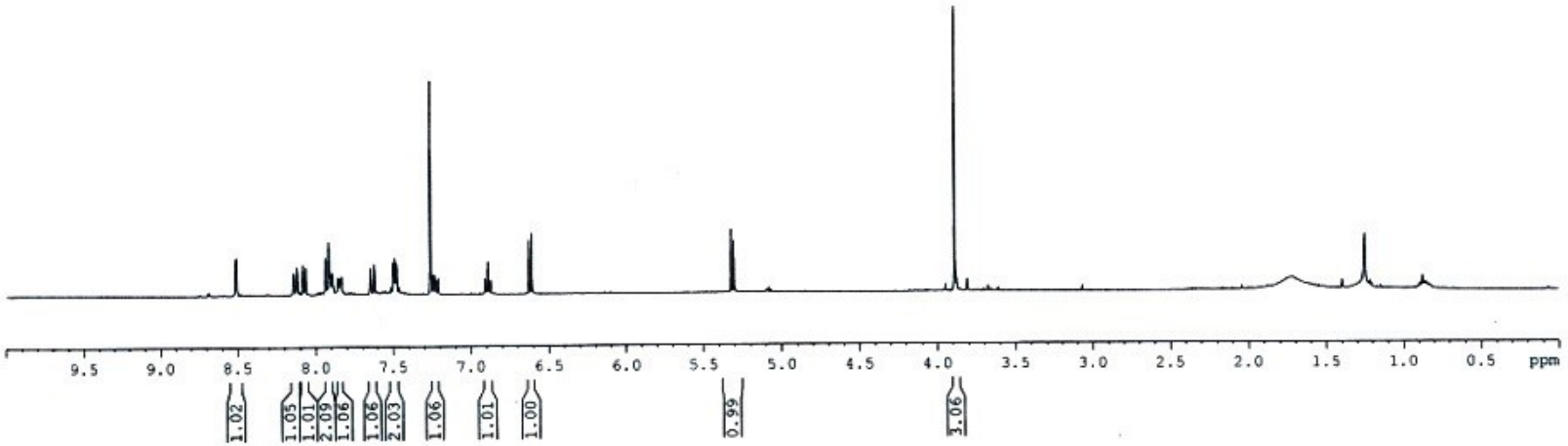
5.321
5.304
3.890


N
N
O
MeO2C
7c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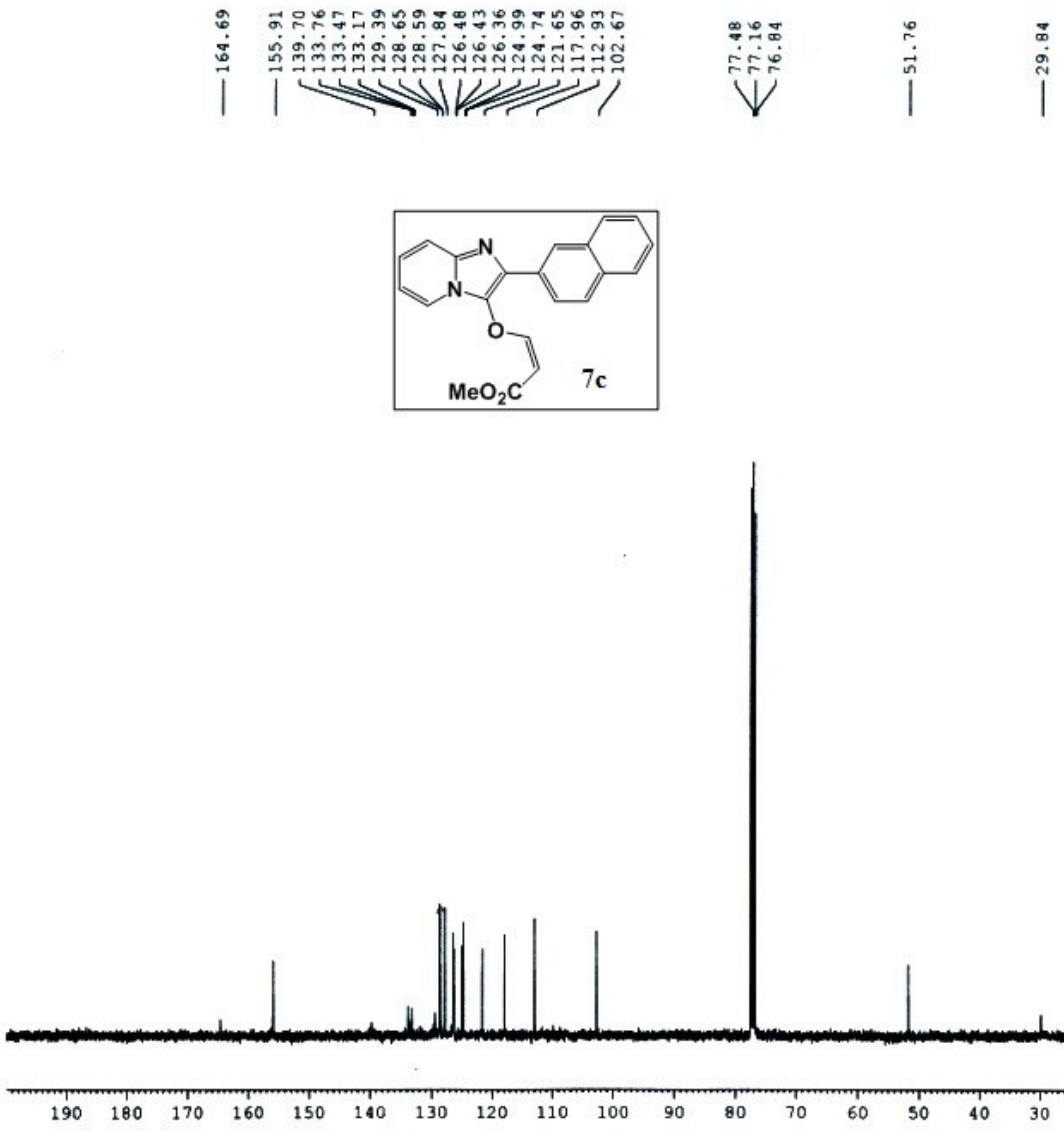
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
1.02
1.05
1.01
2.09
1.06
1.06
2.03
1.06
1.01
1.00
0.99
3.06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155.91
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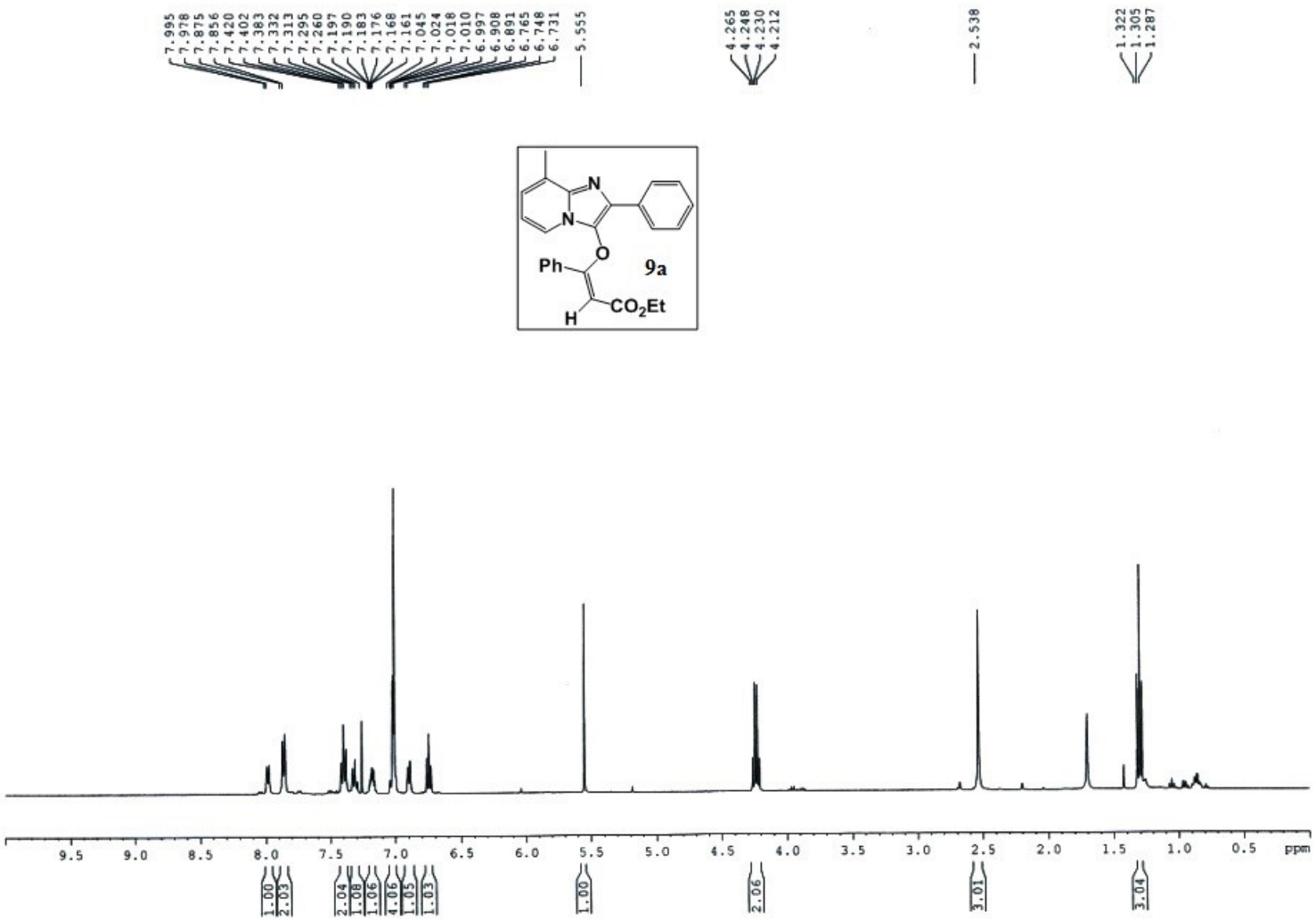
133.76
133.47
133.17
129.39
128.65
128.59
127.84
126.48
126.43
126.36
124.99
124.74
121.65
117.96
112.93
102.67
77.48
77.16
76.84
51.76
29.84
BRUKER
N
N
O
MeO2C
7c
Current Data Parameters
NAME Dr.A.HAJRA 2017
EXPNO 1095
PROCNO 1
F2 - Acquisition Parameters
Date_ 20170624
Time 22.13
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgdc
TD 32768
SOLVENT CDCl3
NS 2048
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 186.42
DW 20.800 usec
DE 6.50 usec
TE 299.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
======== CHANNEL f2 ========
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
F2 - Processing parameters
SI 16384
SF 100.6177824 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm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7.332
7.313
7.295
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7.190
7.183
7.176
7.168
7.161
7.045
7.024
7.018
7.010
6.997
6.908
6.891
6.765
6.748
6.731
5.555
4.265
4.248
4.230
4.212
2.538
1.322
1.305
1.287
N
N
O
Ph
9a
H
CO2Et
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
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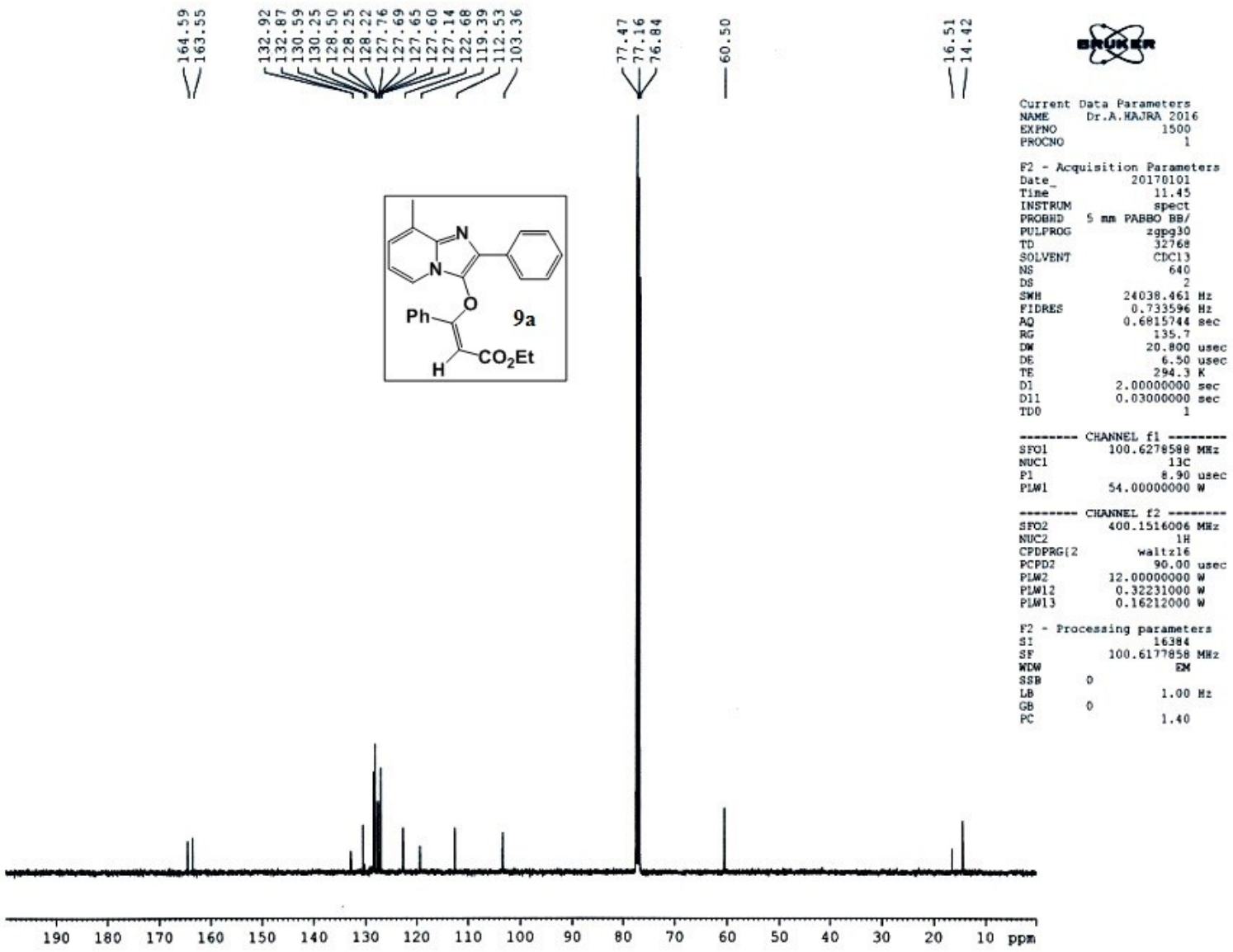
2.04
1.08
1.06
4.06
1.05
1.03
1.00
2.06
3.01
3.04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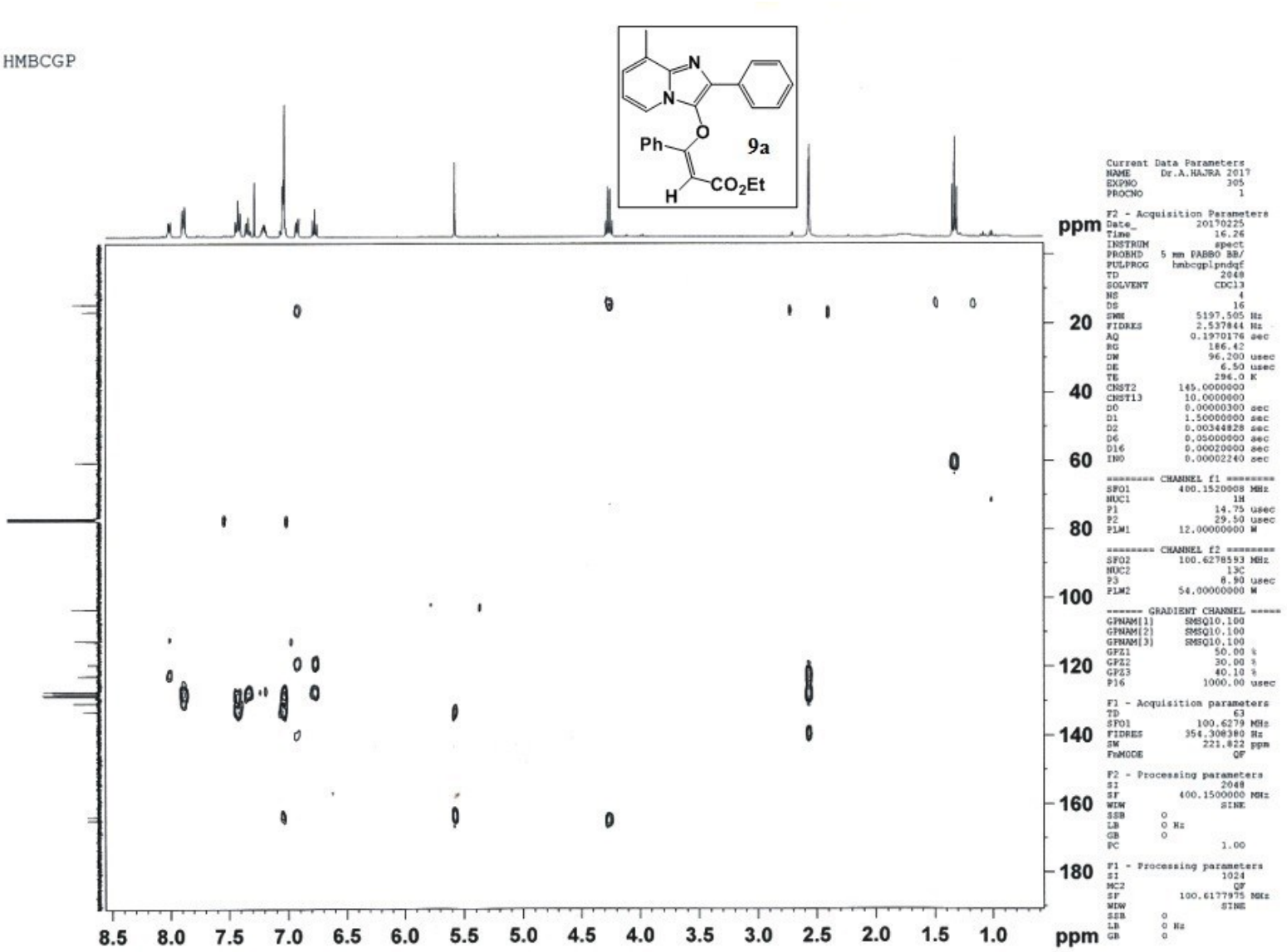
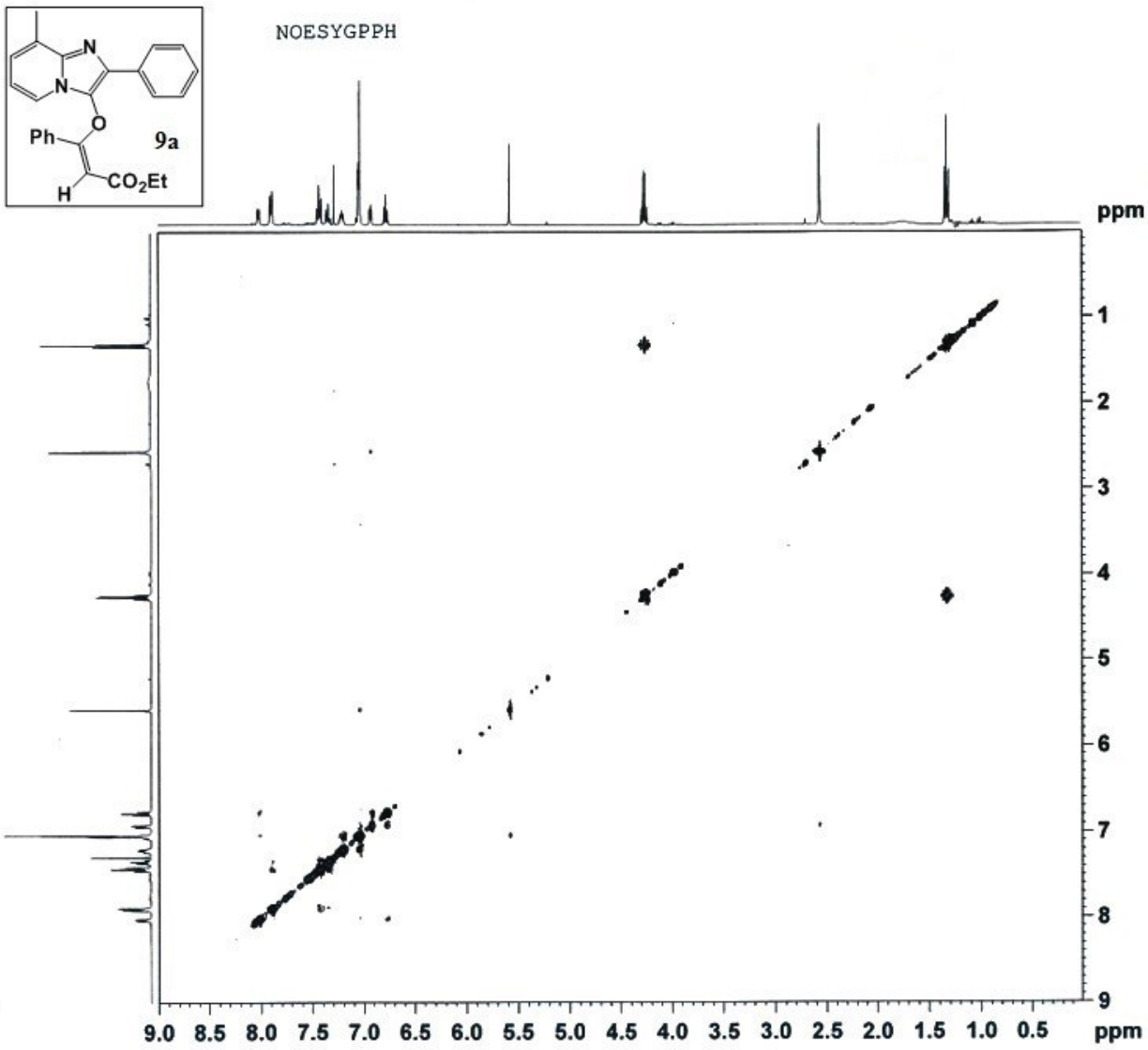
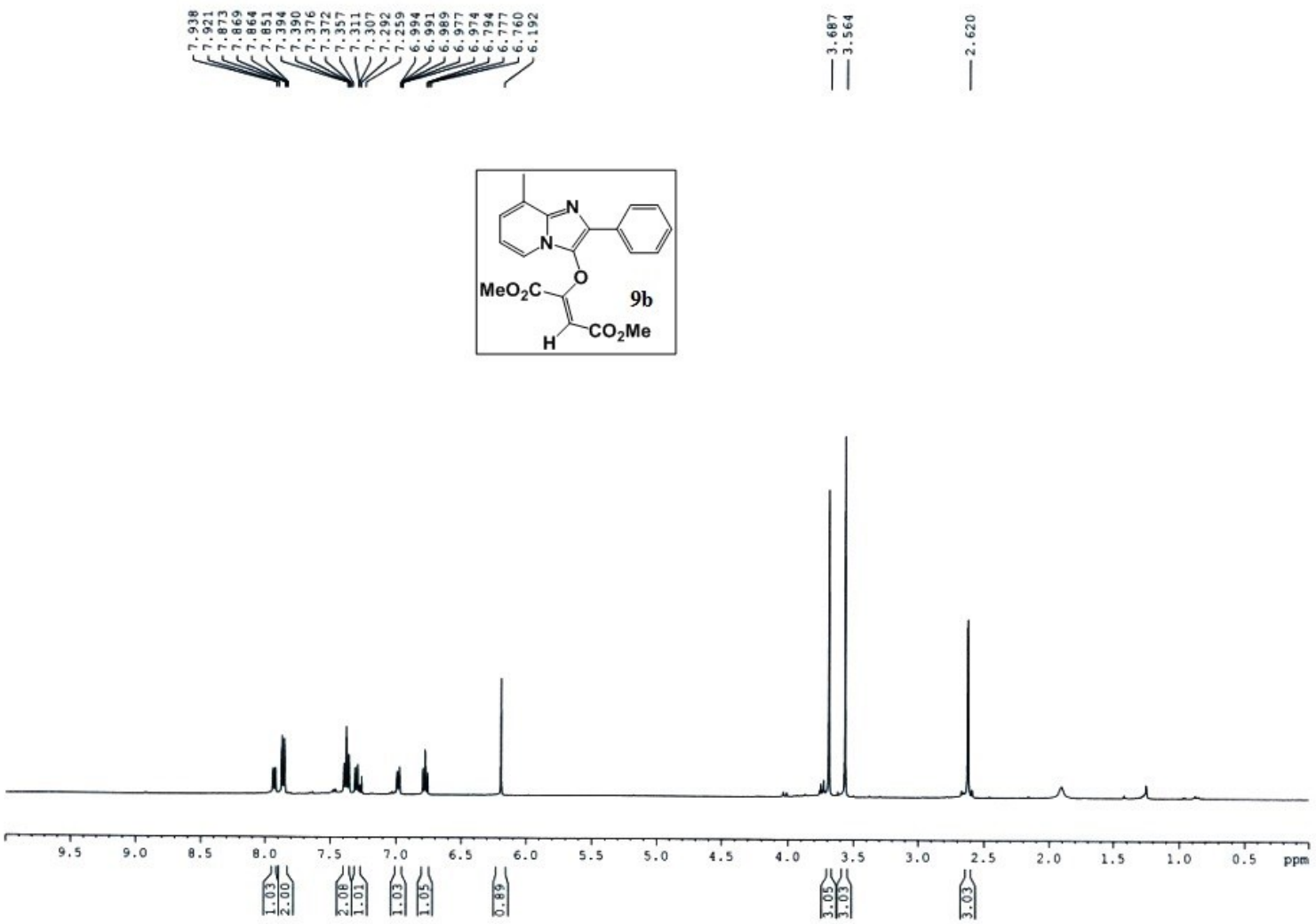
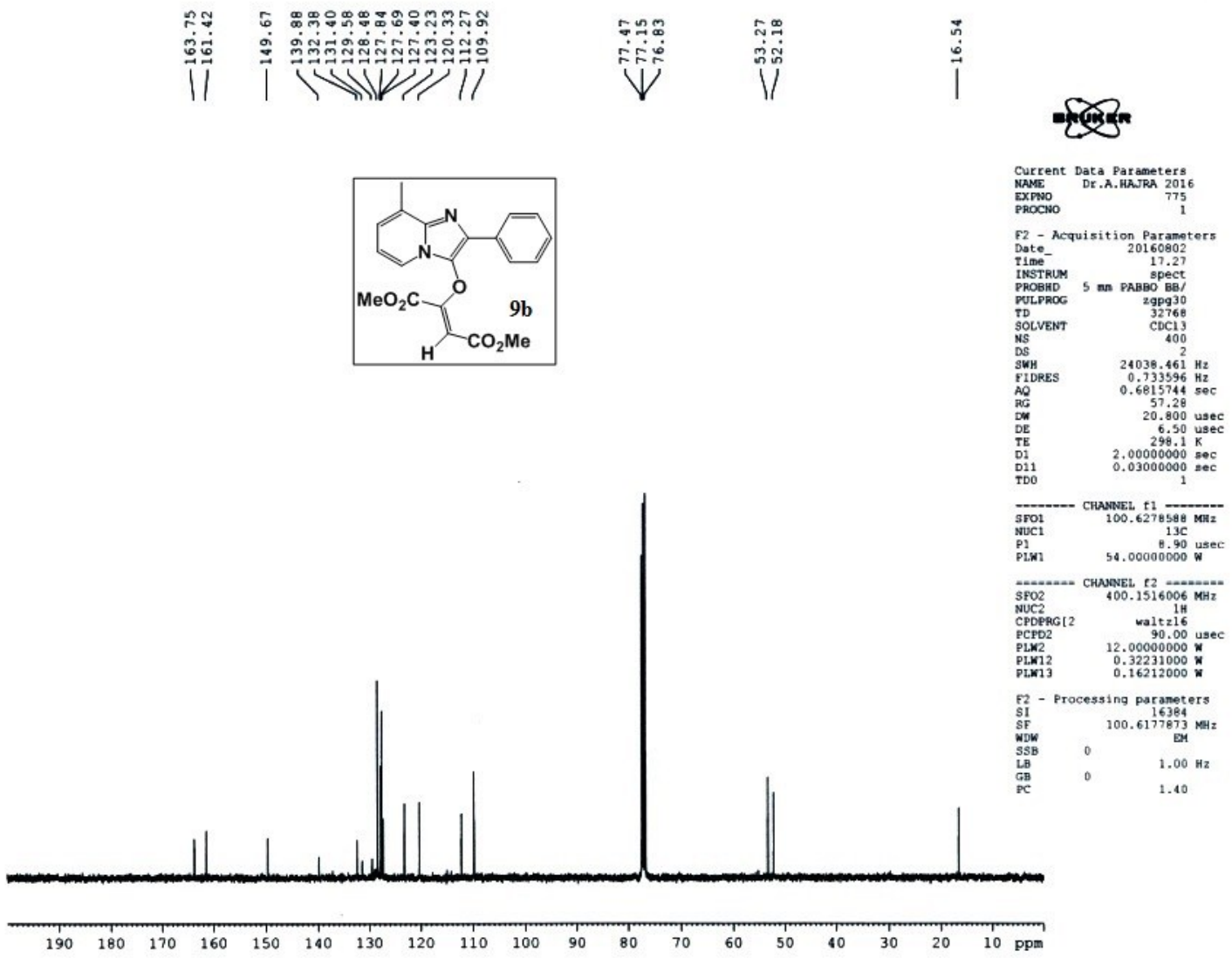
132.92
132.87
130.59
130.25
128.50
128.25
128.22
127.76
127.69
127.65
127.60
127.14
122.68
119.39
112.53
103.36
77.47
77.16
76.84
60.50
16.51
14.42
N
N
O
Ph
9a
CO2Et
H
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 1500
PROCNO 1
F2 - Acquisition Parameters
Date_ 20170101
Time 11.45
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 640
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 135.7
DW 20.800 usec
DE 6.50 usec
TE 294.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
-------- CHANNEL f1 --------
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
-------- CHANNEL f2 --------
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177858 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

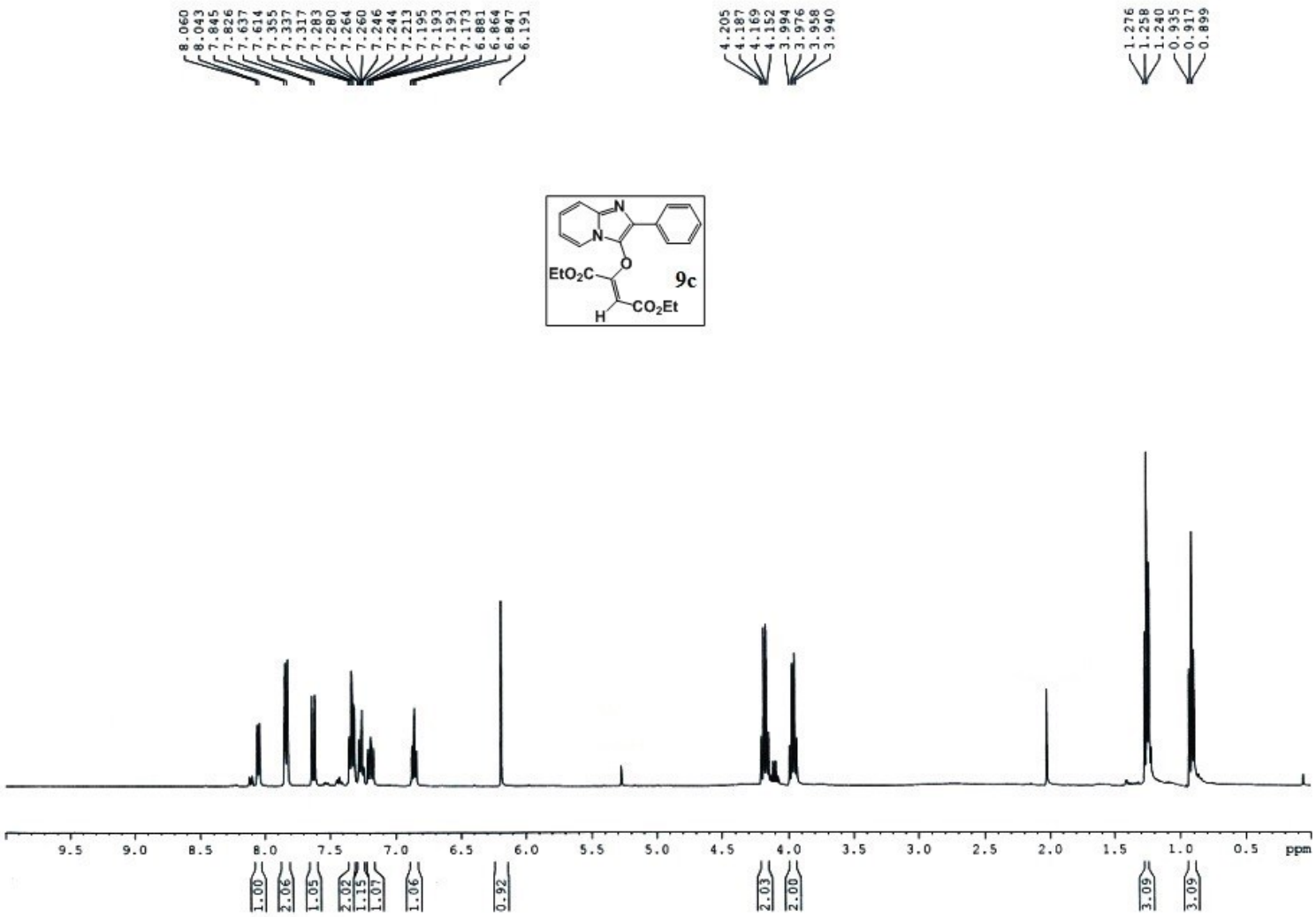

HMBCGP
9a
Ph
CO2Et
ppm
8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 ppm
20 40 60 80 100 120 140 160 180
Current Data Parameters
NAME Dr.A.HAJRA 2017
EXPNO 305
PROCNO 1
F2 - Acquisition Parameters
Date_ 20170225
Time 16.26
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG hmbcgplpndqf
TD 2048
SOLVENT CDCl3
NS 4
DS 16
SWH 5197.505 Hz
FIDRES 2.537844 Hz
AQ 0.1970176 sec
RG 186.42
DW 96.200 usec
DE 6.50 usec
TE 296.0 K
CNST2 145.0000000
CNST13 10.0000000
D0 0.00000300 sec
D1 1.50000000 sec
D2 0.00344828 sec
D6 0.05000000 sec
D16 0.00020000 sec
IN0 0.00002240 sec
======== CHANNEL f1 ========
SFO1 400.1520008 MHz
NUC1 1H
P1 14.75 usec
P2 29.50 usec
PLW1 12.00000000 W
======== CHANNEL f2 ========
SFO2 100.6278593 MHz
NUC2 13C
P3 8.90 usec
PLW2 54.00000000 W
====== GRADIENT CHANNEL =====
GPNAM[1] SMSQ10.100
GPNAM[2] SMSQ10.100
GPNAM[3] SMSQ10.100
GPZ1 50.00 %
GPZ2 30.00 %
GPZ3 40.10 %
P16 1000.00 usec
F1 - Acquisition parameters
TD 63
SFO1 100.6279 MHz
FIDRES 354.308380 Hz
SW 221.822 ppm
FnMODE QF
F2 - Processing parameters
SI 2048
SF 400.1500000 MHz
WDW SINE
SSB 0
LB 0 Hz
GB 0
PC 1.00
F1 - Processing parameters
SI 1024
MC2 QF
SF 100.6177975 MHz
WDW SINE
SSB 0
LB 0 Hz
GB 0

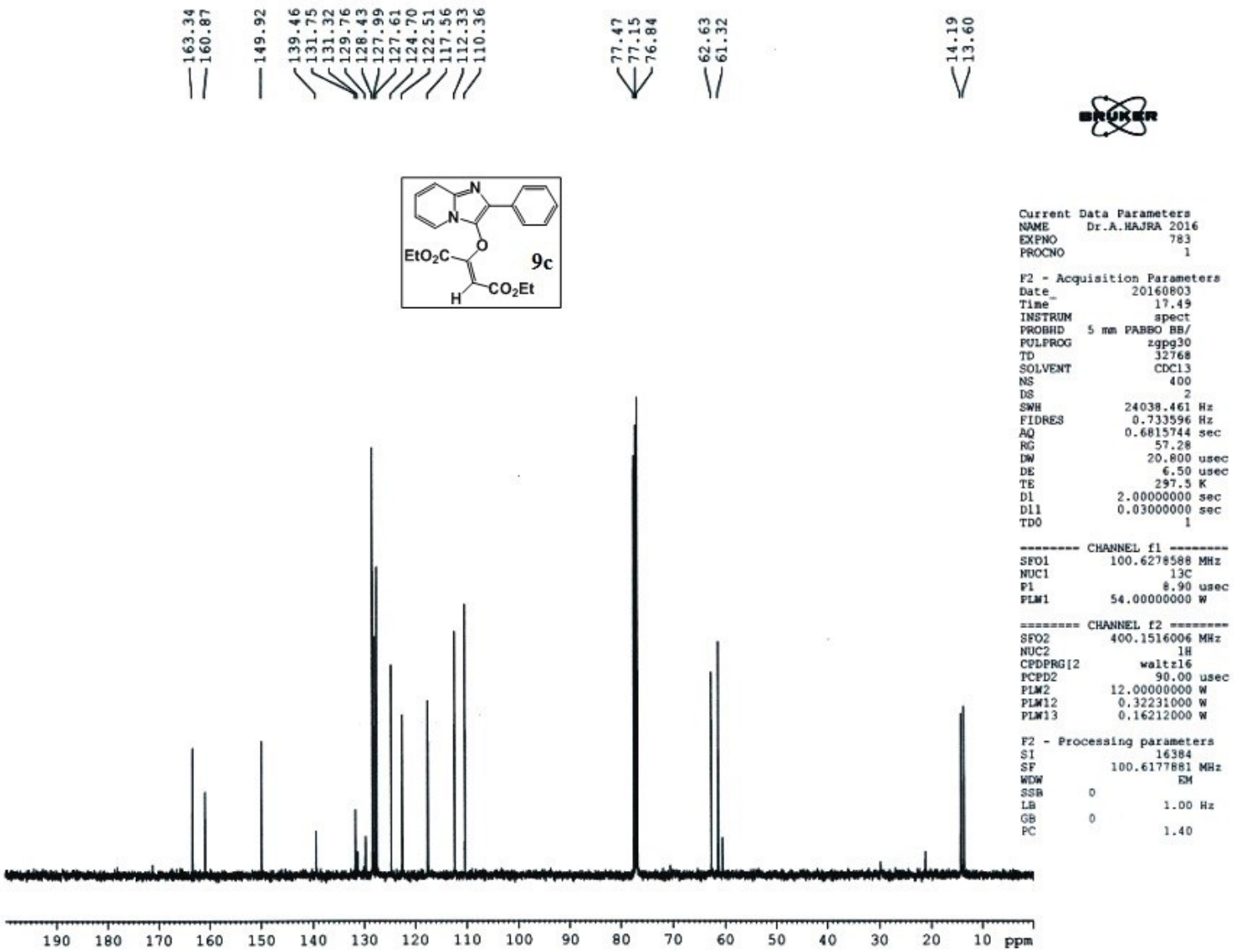


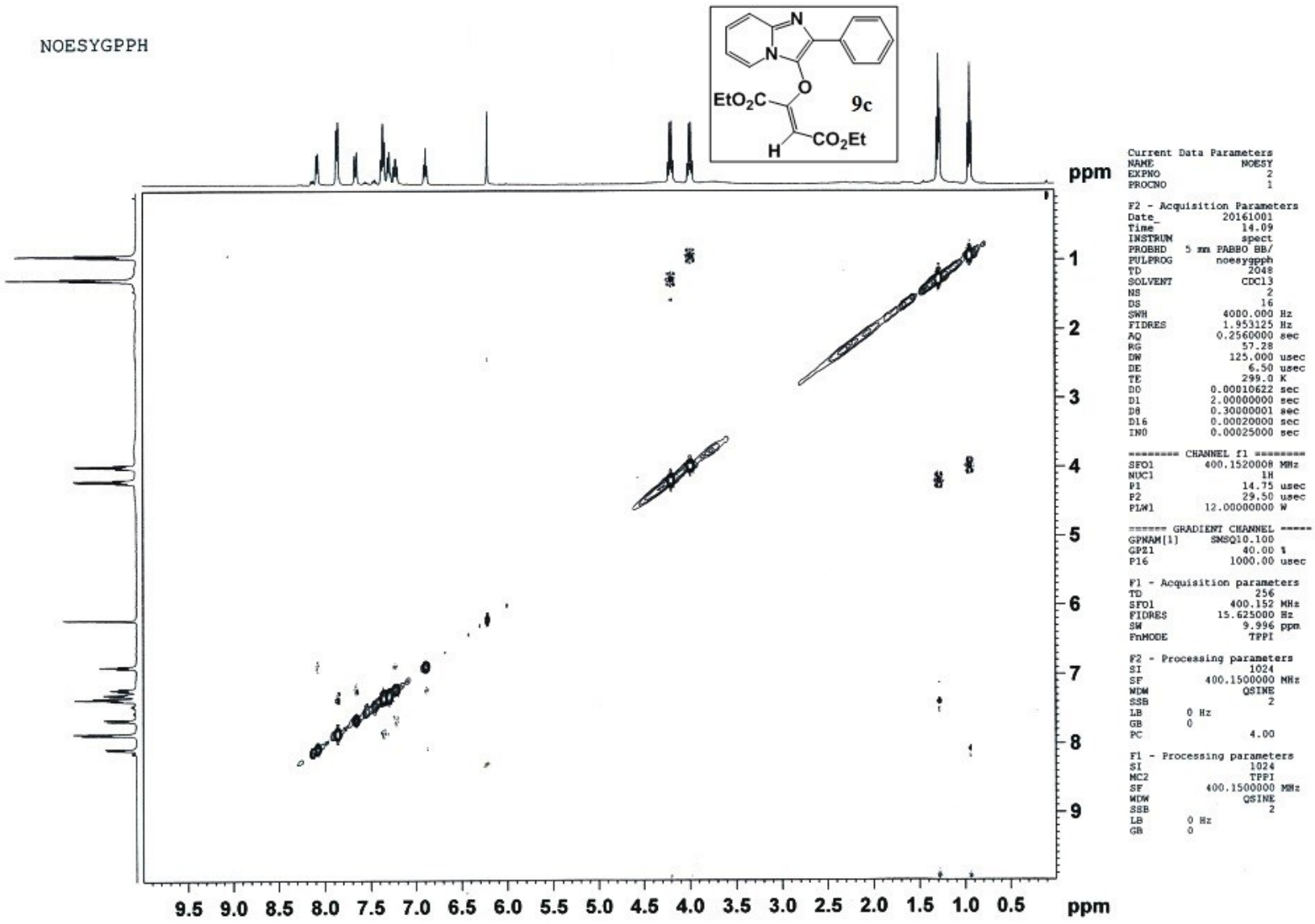

```
Current Data Parameters
NAME        Dr.A.HAJRA 2017
EXPNO                302
PROCNO                 1

F2 - Acquisition Parameters
Date_           20170225
Time               16.00
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG     noesygpphpp
TD                 2048
SOLVENT            CDCl3
NS                    2
DS                   16
SWH           4000.000 Hz
FIDRES           1.953125 Hz
AQ             0.2560000 sec
RG                62.69
DW              125.000 usec
DE                6.50 usec
TE              296.0 K
D0             0.00010622 sec
D1             2.00000000 sec
D8             0.40000001 sec
D11            0.03000000 sec
D12            0.00002000 sec
D16            0.00020000 sec
IN0            0.00025000 sec

======== CHANNEL f1 ========
SFO1          400.1520008 MHz
NUC1               1H
P1                14.75 usec
P2                29.50 usec
P17             2500.00 usec
PLW1          12.00000000 W
PLW10          2.90079999 W

====== GRADIENT CHANNEL =====
GPNAM[1]      SMSQ10.100
GPZ1              40.00 %
P16             1000.00 usec

F1 - Acquisition parameters
TD                   256
SFO1          400.152 MHz
FIDRES        15.625000 Hz
SW              9.996 ppm
FnMODE       States-TPPI

F2 - Processing parameters
SI                  1024
SF            400.1500000 MHz
WDW                 QSINE
SSB                    2
LB          0 Hz
GB          0
PC                  1.00

F1 - Processing parameters
SI                  1024
MC2          States-TPPI
SF            400.1500000 MHz
WDW                 QSINE
SSB                    2
LB          0 Hz
GB          0
```


7.938
7.921
7.873
7.869
7.864
7.851
7.394
7.390
7.376
7.372
7.357
7.311
7.307
7.292
7.259
6.994
6.991
6.989
6.977
6.974
6.794
6.777
6.760
6.192
3.687
3.564
2.620
N
N
O
MeO2C
H
CO2Me
9b
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
1.03
2.00
2.08
1.01
1.03
1.05
0.89
3.05
3.03
3.03


163.75
161.42
149.67
139.88
132.38
131.40
129.58
128.48
127.84
127.69
127.40
123.23
120.33
112.27
109.92
77.47
77.15
76.83
53.27
52.18
16.54
MeO2C
CO2Me
H
9b
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 775
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160802
Time 17.27
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 400
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 57.28
DW 20.800 usec
DE 6.50 usec
TE 298.1 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
CHANNEL f1
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
CHANNEL f2
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177873 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm


8.060
8.043
7.845
7.826
7.637
7.614
7.355
7.337
7.317
7.283
7.280
7.264
7.260
7.246
7.244
7.213
7.195
7.193
7.191
7.173
6.881
6.864
6.847
6.191
4.205
4.187
4.169
4.152
3.994
3.976
3.958
3.940
1.276
1.258
1.240
0.935
0.917
0.899
EtO2C
CO2Et
H
9c
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
1.00
2.06
1.05
2.02
1.15
1.07
1.06
0.92
2.03
2.00
3.09
3.09


163.34
160.87
149.92
139.46
131.75
131.32
129.76
128.43
127.99
127.61
124.70
122.51
117.56
112.33
110.36
77.47
77.15
76.84
62.63
61.32
14.19
13.60
BRUKER
EtO2C
CO2Et
H
9c
Current Data Parameters
NAME Dr.A.HAJRA 2016
EXPNO 783
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160803
Time 17.49
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 400
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6815744 sec
RG 57.28
DW 20.800 usec
DE 6.50 usec
TE 297.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
SFO1 100.6278588 MHz
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
======== CHANNEL f2 ========
SFO2 400.1516006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.32231000 W
PLW13 0.16212000 W
F2 - Processing parameters
SI 16384
SF 100.6177881 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm


NOESYGPPH
N
N
O
EtO2C
9c
CO2Et
H
ppm
1
2
3
4
5
6
7
8
9
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5
ppm
Current Data Parameters
NAME NOESY
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20161001
Time 14.09
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG noesygpph
TD 2048
SOLVENT CDCl3
NS 2
DS 16
SWH 4000.000 Hz
FIDRES 1.953125 Hz
AQ 0.2560000 sec
RG 57.28
DW 125.000 usec
DE 6.50 usec
TE 299.0 K
D0 0.00010622 sec
D1 2.00000000 sec
D8 0.30000001 sec
D16 0.00020000 sec
IN0 0.00025000 sec
======== CHANNEL f1 ========
SFO1 400.1520008 MHz
NUC1 1H
P1 14.75 usec
P2 29.50 usec
PLW1 12.00000000 W
====== GRADIENT CHANNEL =====
GPNAM[1] SMSQ10.100
GPZ1 40.00 %
P16 1000.00 usec
F1 - Acquisition parameters
TD 256
SFO1 400.152 MHz
FIDRES 15.625000 Hz
SW 9.996 ppm
FnMODE TPPI
F2 - Processing parameters
SI 1024
SF 400.1500000 MHz
WDW QSINE
SSB 2
LB 0 Hz
GB 0
PC 4.00
F1 - Processing parameters
SI 1024
MC2 TPPI
SF 400.1500000 MHz
WDW QSINE
SSB 2
LB 0 Hz
GB 0