Supporting Information for

Asymmetric hydrogenation of dibenzo-fused azepines with chiral cationic ruthenium diamine catalysts

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Contents

1. General information

Unless otherwise noted, all experiments were carried out under an atmosphere of nitrogen using standard Schlenk techniques or in a nitrogen-filled glovebox. ^{1}H NMR and ^{13}C NMR spectra were recorded on a Bruker Model Avance DMX 300 Spectrometer (^{1}H 300 MHz and ^{13}C 75 MHz, respectively) or Bruker Model Avance DMX 400 Spectrometer (^{1}H 400 MHz and ^{13}C 100 MHz, respectively) or Bruker Model Avance DMX 500 Spectrometer (^{1}H 500 MHz and ^{13}C 125 MHz, respectively). Chemical shifts (δ) were given in ppm and were referenced to residual solvent or TMS peaks. Optical rotations were measured with Rudolph Autopl VI polarimeter. High resolution MS (P-ESI HRMS) were obtained on Bruker Apex IV FTMS spectrometer or Thermo Fisher Q Exactive Mass Spectrometer. HPLC analyses were performed on an Agilent 1260 liquid chromatograph. All organic solvents were dried using standard, published methods and were distilled before use. All other chemicals were used as received from Aldrich or Acros without further purification. The catalysts were prepared according to the published methods.[1] Seven-membered cyclic imines were synthesized according to modified literature methods.[2-4]

2. Optimization of conditions for asymmetric hydrogenation

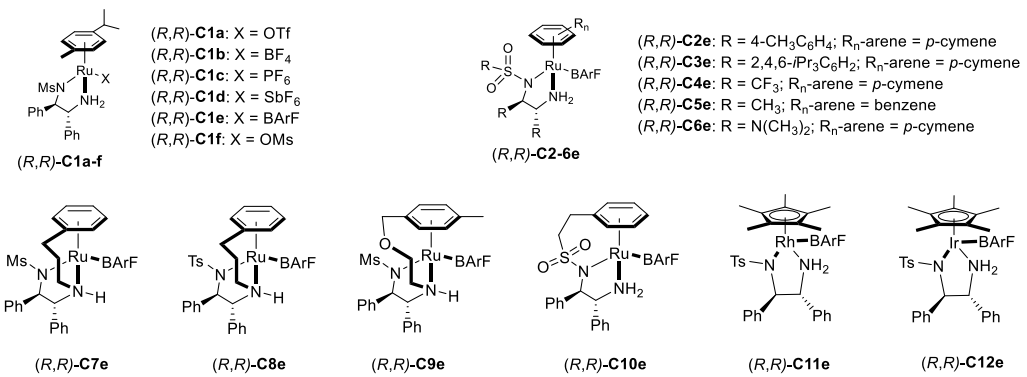
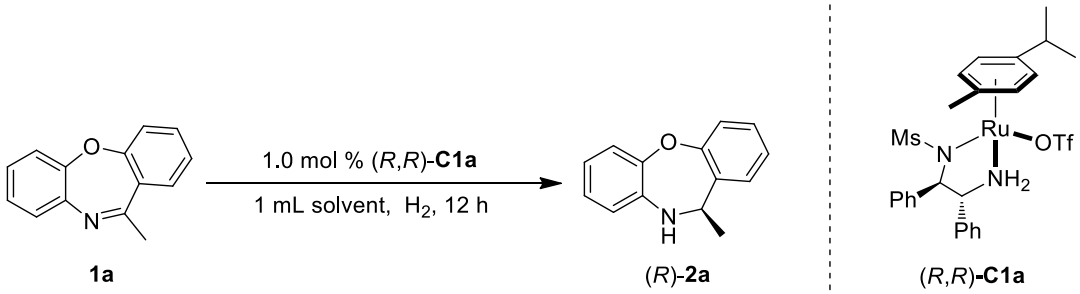


Figure S1. Chiral ruthenium diamine catalysts used in this study

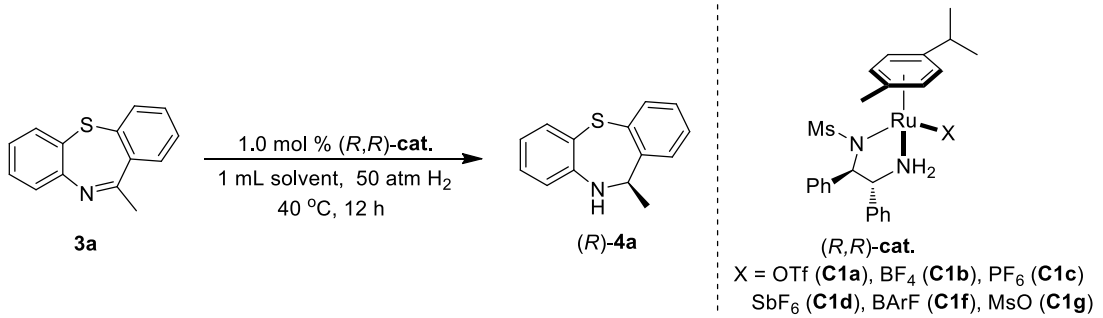
***Table S1*:** Optimization of conditions for asymmetric hydrogenation of **1a**[a]



Entry	Solvent	H_2 (atm); Temp. (^oC)	Conv. (%)[b]	ee (%)[c]
1	MeOH	50; 40	>99	91
2	EtOH	50; 40	>99	93
3	*i*-PrOH	50; 40	>99	96
4	*n*-BuOH	50; 40	>99	92
5	*t*-BuOH	50; 40	>99	96
6	*t*-AmylOH	50; 40	>99	92
7	TFE	50; 40	68	97
8	HFIP	50; 40	>99	97
9	acetone	50; 40	>99	88
10	1,4-dioxane	50; 40	>99	81
11	THF	50; 40	>99	84
12	EA	50; 40	>99	94
13	$CHCl_3$	50; 40	>99	96
14	DCM	50; 40	>99	96
15	DCE	50; 40	>99	96
16	toluene	50; 40	>99	84
17	HFIP	50; 25	>99	97
18	HFIP	50; 70	>99	97
19	HFIP	80; 40	>99	97
20	HFIP	1; 40	96	97
21[d]	**HFIP**	**1; 40**	**>99**	**97**

[a]Reaction conditions: **1a** (0.1 mmol) in solvent (1.0 mL), (*R*,*R*)-**C1a** catalyst (1.0 mol%), reaction for 12 h. [b]The conversions were determined by ^{1}H NMR spectroscopy of the crude reaction mixture. [c]The enantiomeric excesses were determined by HPLC with a chiral AD-H column. [d]Reaction for 24 h. (TFE: Trifluoroethanol, HFIP: hexafluoroisopropanol).

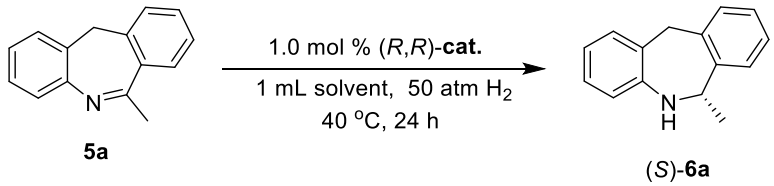
***Table S2*:** Optimization of conditions for asymmetric hydrogenation of **3a**[a]



Entry	Solvent	Catalyst	$[X]^-$	Conv. (%)[b]	ee (%)[c]
1	HFIP	(*R*,*R*)-**C1a**	OTf	27	65
2	MeOH	(*R*,*R*)-**C1a**	OTf	27	82
3	EtOH	(*R*,*R*)-**C1a**	OTf	81	90
4	*i*-PrOH	(*R*,*R*)-**C1a**	OTf	97	93
5	THF	(*R*,*R*)-**C1a**	OTf	31	76
6	DCM	(*R*,*R*)-**C1a**	OTf	96	89
7	DCM	(*R*,*R*)-**C1b**	BF_4	28	87
8	DCM	(*R*,*R*)-**C1c**	PF_6	89	93
9	DCM	(*R*,*R*)-**C1d**	SbF_6	80	91
10	**DCM**	**(*R*,*R*)-C1e**	**BArF**	**>99**	**99**
11	DCM	(*R*,*R*)-**C1f**	OMs	32	71

[a]Reaction conditions: **3a** (0.1 mmol) in solvent (1 mL), (*R*,*R*)-**cat. (**1.0 mol%), H_2 (50 atm), stirred at 40 °C for 12 h. [b]The conversions were determined by ^{1}H NMR spectroscopy of the crude reaction mixture. [c]The enantiomeric excesses were determined by HPLC with a chiral AD-H column.

***Table S3*:** Optimization of conditions for asymmetric hydrogenation of **5a**[a]

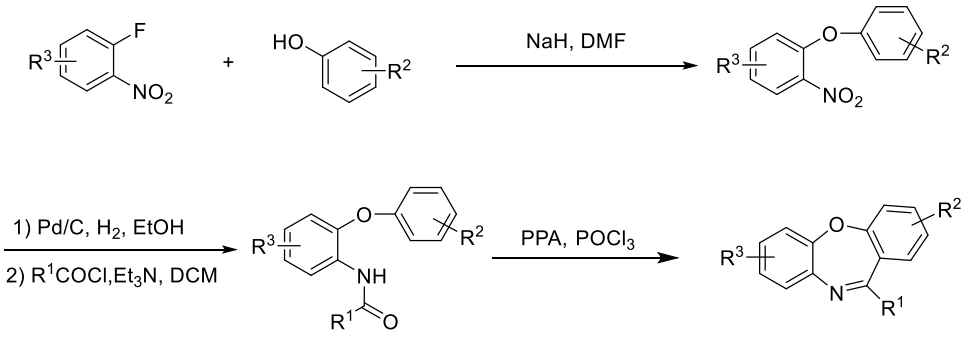


Entry	Solvent	Catalyst	$[X]^-$	Conv. (%)[b]	ee (%)[c]
1	HFIP	(*R*,*R*)-**C1a**	OTf	>99	12
2	DCM	(*R*,*R*)-**C1e**	BArF	>99	78
3	DCM	(*R*,*R*)-**C1a**	OTf	>99	72
4	DCM	(*R*,*R*)-**C1b**	BF_4	>99	70
5	DCM	(*R*,*R*)-**C1c**	PF_6	>99	70
6	DCM	(*R*,*R*)-**C1d**	SbF_6	>99	67
7	DCM	(*R*,*R*)-**C1f**	OMs	>99	5
8	DCM	(*R*,*R*)-**C2e**	BArF	>99	48
9	DCM	(*R*,*R*)-**C3e**	BArF	>99	21
10	DCM	(*R*,*R*)-**C4e**	BArF	>99	17
11	DCM	(*R*,*R*)-**C5e**	BArF	>99	53
12	DCM	(*R*,*R*)-**C6e**	BArF	73	26
13	DCM	(*R*,*R*)-**C7e**	BArF	>99	83
14	**DCM**	**(*R*,*R*)-C8e**	**BArF**	**>99**	**87**
15	DCM	(*R*,*R*)-**C9e**	BArF	>99	2
16	DCM	(*R*,*R*)-**C10e**	BArF	>99	20
17	DCM	(*R*,*R*)-**C11e**	BArF	>99	65
18	DCM	(*R*,*R*)-**C12e**	BArF	>99	37

[a]Reaction conditions: **5a** (0.1 mmol) in solvent (1 mL), (*R*,*R*)-**cat**. **(**1.0 mol%), H_2 (50 atm), stirred at 40 °C for 12 h. [b]The conversions were determined by ^1H NMR spectroscopy of the crude reaction mixture. [c]The enantiomeric excesses were determined by HPLC with a chiral AD-H column.

3. General procedure for the synthesis of dibenzo-fused azepines[2-4]

Procedure A (for dibenzo[*b,f*][1,4]oxazepines)[2]:



Tipycal procedure:

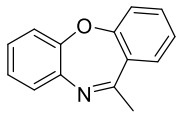
Step 1: To a reaction mixture of NaH (0.32 g, 8 mmol) and DMF (10 mL) was added dropwise a solution of phenol (0.71 g, 7.5 mmol) in DMF, it was stirred for 1 h at room temperature. Subsequently, o-fluoro nitrobenzene (0.71 g, 5 mmol) in DMF (2 mL) was dropped slowly to the mixture above and stirred for another 1 h at room temperature, then stirred for 12 h at 50 ^{o}C. After routine workup, the crude product was purified by flash chromatography on silica gel using petroleum ether and EtOAc to give the diphenyl ether derivative.

Step 2: The diphenyl ether derivative (2.0 g, 9.3 mmol) was dissolved in 5 mL of EtOH, 5% palladium on charcoal (0.10 g) and 0.25 mL of AcOH were added to the solution, the reduction was carried out with hydrogen gas at an initial pressure of 60 psi for 12 h. The catalyst was filtered off. Then concentration in vacuo and purification by flash chromatography afforded aniline derivative.

Step 3: The aniline derivative was dissolved in 20 mL of CH_2Cl_2 and cooled to 0 ^{o}C, then acetyl chloride (0.70 g, 8.9 mmol) was added slowly to the solution, the temperature increased spontaneous to ambient temperature, and monitored by TLC. Then water (20 mL) was added to the mixture. The organic layers was washed by brine (1×30 mL), dried by anhydrous Na_2SO_4, concentrated in vacuo. The residue was purified by flash chromatography on silica gel using petroleum ether and EtOAc to give amido derivative.

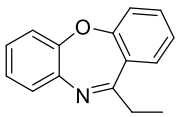
Step 4: To a mixture of polyphosphoric acid (PPA) (7.0 g) and phosphorus

oxychloride (2.1 g, 13.5 mmol) was added amido derivative of diphenyl ether (0.62 g, 2.7 mmol). The reaction mixture was heated at 120 ^{o}C for 3 h and poured into ice-cold water, then treated with aqueous ammonia and extracted with CH_2Cl_2 (3×50 mL), dried with anhydrous Na_2SO_4, and concentrated under vacuum. The crude product was purified by flash chromatography on silica gel eluted by petroleum ether and EtOAc to give **dibenzo[*b,f*][1,4]oxazepine**.



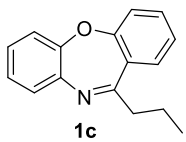
1a

11-methyldibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow solid; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.45-7.39 (m, 2H), 7.29-7.25 (m, 1H), 7.21-7.13 (m, 5H), 2.64 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 167.4, 161.0, 152.6, 140.8, 132.8, 129.2, 128.6, 127.8, 127.3, 125.7, 125.2, 120.9, 120.8, 27.7.



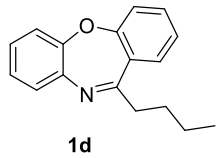
1b

11-ethyldibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow solid; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.44-7.39 (m, 2H), 7.32-7.25 (m, 1H), 7.22-7.12 (m, 5H), 2.95 (q, *J* = 7.4 Hz, 2H), 1.30 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 171.7, 161.6, 152.7, 140.8, 132.7, 128.2, 127.8, 127.2, 125.6, 125.2, 121.0, 120.7, 33.3, 11.9.

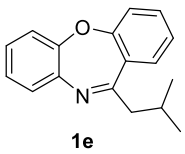


1c

11-propyldibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow solid; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.39-7.34 (m, 2H), 7.31-7.27 (m, 1H), 7.17-7.08 (m, 5H), 2.89 (t, *J* = 7.5 Hz, 2H), 1.80-1.67 (m, 2H), 1.01 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 170.8, 161.5, 152.6, 140.8, 132.5, 128.2, 127.7, 127.1, 125.5, 125.1, 120.8, 120.6, 42.1, 20.9, 13.8.

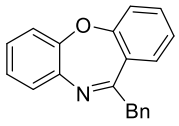

1d

11-butyldibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. O. Lars, E. Fredrik, O. Roger, *Org. Lett.* **2006**, *8*, 1771). Yellow solid; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.45-7.39 (m, 2H), 7.32-7.29 (m, 1H), 7.22-7.14 (m, 5H), 2.94 (t, *J* = 7.5 Hz, 2H), 1.76-1.66 (m, 2H), 1.52-1.40 (m, 2H), 0.95 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 171.2, 161.5, 152.7, 140.8, 132.6, 128.5, 128.3, 127.8, 127.2, 125.6, 125.2, 120.9, 120.7, 40.1, 29.8, 22.6, 14.1.

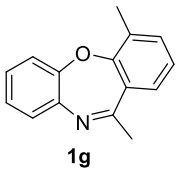

1e

11-isobutyldibenzo[*b,f*][1,4]oxazepine: (New compound). Yellow solid; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.41-7.39 (m, 2H), 7.29-7.25 (m, 1H), 7.20-7.13 (m, 5H), 2.82 (d, *J* = 7.2 Hz, 2H), 2.09-1.96 (m, 1H), 1.00 (d, *J* = 6.6 Hz, 6H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 170.8, 161.6, 152.8, 140.8, 132.6, 128.6, 128.4, 127.8, 127.2, 125.6, 125.1, 121.0, 120.7, 49.4, 27.6, 22.6.

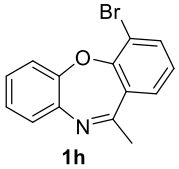
HRMS-ESI exact mass calcd. for $C_{15}H_{14}NS^{+}$([M+H]$^{+}$) requires m/z 252.13829, found m/z 252.13870.


1f

11-benzyldibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow solid; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.45-7.42 (m, 1H), 7.39-7.34 (m, 4H), 7.29-7.25 (m, 2H), 7.21-7.09 (m, 6H), 4.29 (s, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 168.7, 161.6, 152.6, 140.7, 137.5, 132.7, 128.9, 128.7, 128.4, 128.2, 127.9, 127.5, 126.7, 125.6, 125.0, 120.9, 120.7, 46.9.

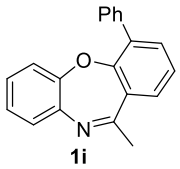

1g

4,11-dimethyldibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow solid; ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.28-7.24 (m, 3H), 7.16-7.13 (m, 3H), 7.07-7.04 (m, 1H), 2.62 (s, 3H), 2.47 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 167.9, 158.8, 152.4, 141.1, 133.9, 130.2, 129.1, 127.7, 127.0, 126.2, 125.5, 124.7, 121.0, 27.9, 16.4.



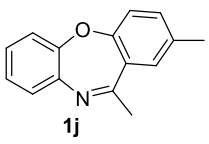
1h

4-bromo-11-methyldibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow solid; ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.67 (d, *J* = 8.0 Hz, 2H), 7.44-7.37 (m, 2H), 7.29-7.26 (m, 1H), 7.19-7.17 (m, 2H), 7.09-7.05 (m, 1H), 2.64 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 166.4, 156.5, 152.0, 140.4, 135.8, 130.6, 127.7, 127.6, 127.5, 126.1, 121.7, 115.7, 27.8.



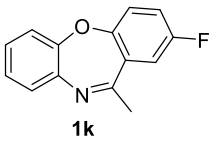
1i

11-methyl-4-phenyldibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow solid; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.59-7.39 (m, 7H), 7.26-7.18 (m, 2H), 7.06-7.02 (m, 1H), 6.91-6.86 (m, 1H), 6.33 (d, *J* = 7.8 Hz, 1H), 2.68 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 167.5, 157.2, 152.2, 140.9, 137.1, 134.8, 133.4, 130.0, 129.8, 128.2, 127.7, 127.5, 127.3, 127.0, 125.5, 125.0, 120.8, 27.9.



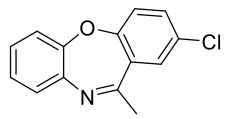
1j

2,11-dimethyldibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow solid; ^{1}H NMR (500 MHz, $CDCl_3$): δ (ppm) 7.27-7.25 (m, 1H), 7.20-7.19 (m, 2H), 7.13-7.11 (m, 3H), 7.06-7.04 (m, 1H), 2.62 (s, 3H), 2.31 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$): δ (ppm) 167.4, 158.9, 152.8, 140.8, 134.7, 133.4, 128.8, 128.8, 127.7, 127.2, 125.5, 120.6, 120.5, 27.6, 20.9.



1k

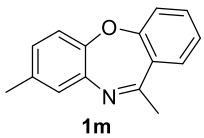
2-fluoro-11-methyldibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow solid; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.29-7.26 (m, 1H), 7.18-7.09 (m, 6H), 2.62 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 165.9, 159.5 (d, $J_{1C\text{-}F}$ = 243.0 Hz), 156.8, 152.5, 140.4, 130.1 (d, $J_{3C\text{-}F}$ = 6.8 Hz), 127.9, 127.7, 125.9, 122.2 (d, $J_{3C\text{-}F}$ = 6.8 Hz), 120.6, 119.4 (d, $J_{2C\text{-}F}$ = 23.3 Hz), 114.8 (d, $J_{2C\text{-}F}$ = 23.3 Hz), 27.5.



1l

2-chloro-11-methyldibenzo[*b,f*][1,4]oxazepine: (New compound). Yellow oil; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.38-7.34 (m, 2H), 7.29-7.26 (m, 1H), 7.19-7.08 (m, 4H), 2.61 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 165.9, 159.4, 152.2, 140.4, 132.6, 130.6, 130.3, 128.3, 127.9, 127.7, 125.9, 122.3, 120.7, 27.5.

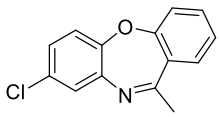
HRMS-ESI exact mass calcd. for $C_{15}H_{14}NS^{+}$([M+H]$^{+}$) requires m/z 244.05237, found m/z 244.05313.



1m

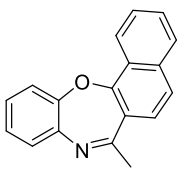
8,11-dimethyldibenzo[*b,f*][1,4]oxazepine: (New compound). Yellow oil; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.44-7.39 (m, 2H), 7.20-7.15 (m, 1H), 7.09 (s, 1H), 7.04-7.02 (m, 1H), 6.96-6.93 (m, 1H), 2.64 (s, 3H), 2.29 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 167.3, 161.0, 150.5, 140.2, 135.3, 132.7, 129.2, 128.5, 128.1, 127.9, 125.0, 120.8, 120.3, 27.6, 20.8.

HRMS-ESI exact mass calcd. for $C_{15}H_{14}NS^{+}$([M+H]$^{+}$) requires m/z 224.10699, found m/z 224.10750.



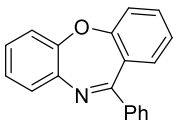
1n

8-chloro-11-methyldibenzo[*b,f*][1,4]oxazepine: (Known compound, see: P. Li, Y. Huang, X. Hu, X.-Q. Dong, X. Zhang, *Org. Lett.* **2017**, *19*, 3855). Yellow solid; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.42-7.37 (m, 2H), 7.25 (s, 1H), 7.22-7.11 (m, 2H), 7.08-7.01 (m, 2H), 2.60 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 168.6, 160.6, 151.1, 141.7, 133.0, 130.5, 128.8, 128.6, 127.4, 126.9, 125.3, 121.6, 120.7, 27.6.



1o

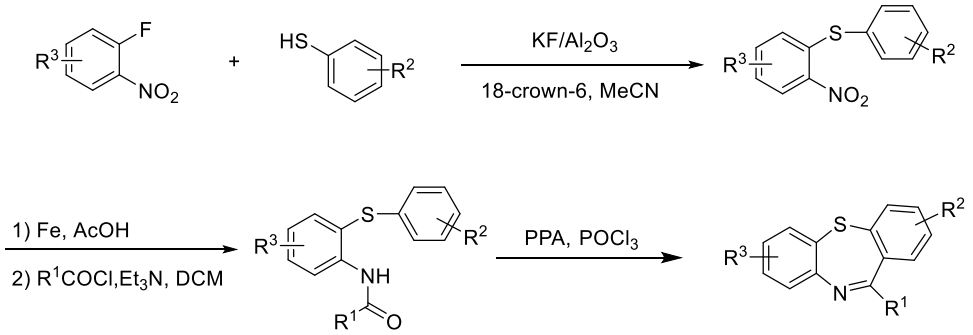
7-methylbenzo[*b*]naphtho[2,1-*f*][1,4]oxazepine: (Known compound, see: P. Li, Y. Huang, X. Hu, X.-Q. Dong, X. Zhang, *Org. Lett.* **2017**, *19*, 3855). Yellow solid; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 8.57 (d, *J* = 8.1 Hz, 1H), 7.81 (d, *J* = 7.8 Hz, 1H), 7.64-7.54 (m, 3H), 7.44 (d, *J* = 8.7 Hz, 1H), 7.34-7.24 (m, 2H), 7.17-7.13 (m, 2H), 2.70 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 168.1, 156.6, 152.6, 141.3, 136.0, 128.1, 127.8, 127.7, 127.5, 127.2, 126.6, 125.7, 124.9, 124.3, 123.9, 123.2, 120.9, 27.8.



1p

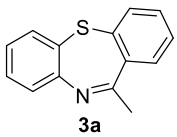
11-phenyldibenzo[*b*,*f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow solid; ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.88-7.86 (m, 2H), 7.54-7.49 (m, 5H), 7.32-7.16 (m, 6H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 167.3, 162.2, 152.6, 140.8, 140.1, 133.2, 131.5, 130.6, 129.9, 128.3, 127.7, 127.5, 125.7, 124.6, 121.1, 120.8.

Procedure B (for dibenzo[*b*,*f*][1,4]thiazepines)[3]:



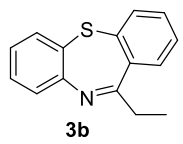
Typical procedure:

The diphenyl thioether derivatives were obtained by the treatment of o-fluoro nitrobenzenes with substituted thiophenols in the presence of KF/Al_2O_3 and 18-crown-6 in acetonitrile. Then the reduction of nitro group with Fe/AcOH followed by acylation with acyl chloride afforded amide derivatives. Subsequently, amide derivatives were transformed to dibenzothiazepines via cyclization with polyphosphoric acid (PPA) and $POCl_3$ at 120 ℃.



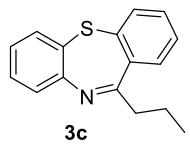
3a

11-methyldibenzo[*b*,*f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Yellow solid; ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.46-7.38 (m, 3H), 7.31-7.23 (m, 3H), 7.19-7.17 (m, 1H), 7.05-7.01 (m, 1H), 2.65 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 169.8, 148.7, 139.9, 139.4, 132.4, 132.0, 130.7, 129.2, 128.8, 128.4, 127.9, 125.6, 125.4, 29.6.



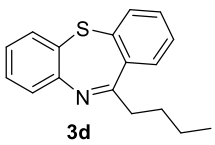
3b

11-ethyldibenzo[*b,f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Yellow solid; ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.46-7.36 (m, 3H), 7.31-7.22 (m, 3H), 7.19-7.17 (m, 1H), 7.04-7.00 (m, 1H), 2.96-2.90 (m, 2H), 1.26 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 174.2, 148.8, 140.6, 139.0, 132.4, 131.9, 130.5, 129.1, 128.9, 128.4, 127.6, 125.3, 125.3, 35.4, 11.7.



3c

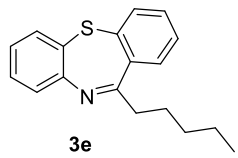
11-propyldibenzo[*b,f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Yellow solid; ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.45-7.36 (m, 3H), 7.30-7.22 (m, 3H), 7.19-7.17 (m, 1H), 7.04-7.00 (m, 1H), 3.02-2.95 (m, 1H), 2.85-2.78 (m, 1H), 1.74-1.65 (m, 2H), 1.04 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 173.4, 148.8, 140.6, 138.9, 132.4, 132.0, 130.5, 129.1, 128.9, 128.4, 127.8, 125.4, 44.4, 20.8, 14.0.



3d

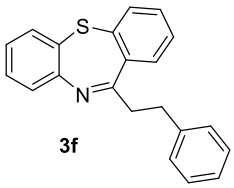
11-butyldibenzo[*b,f*][1,4]thiazepine: (New compound). Yellow solid; ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.46-7.36 (m, 3H), 7.31-7.16 (m,, 4H), 7.04-7.00 (m, 1H), 3.00-2.84 (m, 2H), 1.71-1.42 (m, 4H), 0.92 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 173.6, 148.8, 140.6, 139.0, 132.4, 131.9, 130.5, 129.1, 128.9, 128.4, 127.7, 125.4, 125.4, 42.3, 29.6, 22.6, 14.1.

HRMS-ESI exact mass calcd. for $C_{17}H_{18}NS^{+}$([M+H]$^{+}$) requires m/z 268.11545, found m/z 268.11541.



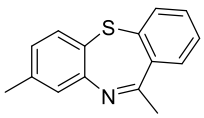
3e

11-pentyldibenzo[*b,f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Yellow oil; ^{1}H NMR (300 MHz, CD_2Cl_2): δ (ppm) 7.48-7.24 (m, 6H), 7.16-7.02 (m, 2H), 3.02-2.81 (m, 2H), 1.71-1.64 (m, 2H), 1.48-1.36 (m, 4H), 0.90 (t, *J* = 7.1 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 173.6, 148.8, 140.6, 139.0, 132.4, 131.9, 130.5, 129.1, 128.9, 128.4, 127.7, 125.4, 42.5, 31.7, 27.1, 22.6, 14.1.



3f

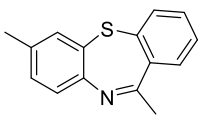
11-phenethyldibenzo[*b*,*f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Yellow solid; ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.45-7.40 (m, 2H), 7.34-7.17 (m, 10H), 7.05-7.01 (m, 1H), 3.27-3.12 (m, 3H), 3.03-2.96 (m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 172.1, 148.8, 141.7, 140.7, 138.9, 132.4, 132.0, 130.6, 129.2, 128.8, 128.7, 128.5, 128.5, 127.7, 126.1, 125.5, 125.4, 43.9, 33.3.



3g

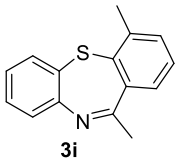
8,11-dimethyldibenzo[*b*,*f*][1,4]thiazepine: (New compound). Yellow oil; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.44-7.37 (m, 2H), 7.30-7.24 (m, 3H), 7.01 (s, 1H), 6.85 (d, *J* = 7.8 Hz, 1H), 2.64 (s, 3H), 2.27 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 169.7, 148.5, 140.2, 139.5, 139.3, 132.2, 131.9, 130.7, 128.3, 127.9, 126.5, 125.9, 125.6, 29.6, 21.2.

HRMS-ESI exact mass calcd. for $C_{15}H_{14}NS^{+}$([M+H]$^{+}$) requires m/z 240.08415, found m/z 240.08429.



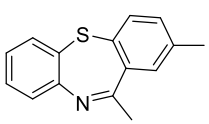
3h

7,11-dimethyldibenzo[*b*,*f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Yellow oil; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.46-7.37 (m, 2H), 7.32-7.26 (m, 2H), 7.24 (s, 1H), 7.10-7.00 (m, 1H), 2.65 (s, 3H), 2.27 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 169.3, 146.4, 139.9, 139.5, 135.5, 132.8, 131.9, 130.7, 130.1, 128.4, 128.0, 125.3, 29.6, 20.7.



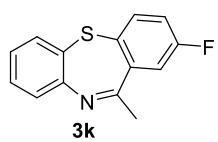
3i

4,11-dimethyldibenzo[*b*,*f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Yellow oil; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.44 (d, *J* = 7.2 Hz, 1H), 7.27-7.15 (m, 5H), 7.05-6.99 (m, 1H), 2.64 (s, 3H), 2.53 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 170.6, 149.3, 140.0, 139.5, 139.4, 132.8, 131.8, 129.2, 128.6, 128.0, 125.5, 125.3, 125.1, 29.8, 21.2.



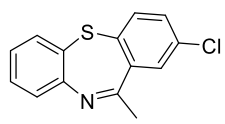
3j

2,11-dimethyldibenzo[*b*,*f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Yellow oil; ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.40-7.38 (m, 1H), 7.40-7.38 (m, 1H), 7.32 (d, *J* = 8.0 Hz, 1H), 7.04-7.00 (m, 1H), 2.64 (s, 3H), 2.31 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 169.9, 148.8, 139.2, 138.5, 136.7, 132.3, 131.8, 131.6, 129.1, 129.1, 128.5, 125.5, 125.3, 29.6, 21.3.



3k

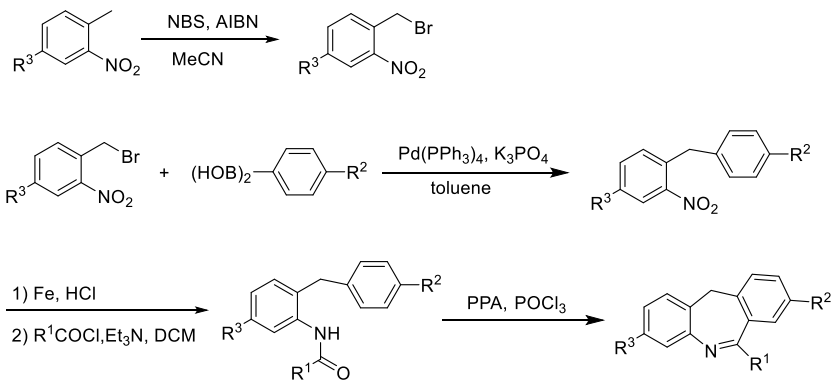
2-fluoro-11-methyldibenzo[*b*,*f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Yellow oil; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.44-7.39 (m, 2H), 7.30-7.25 (m, 1H), 7.19-7.16 (m, 1H), 7.11-6.99 (m, 3H), 2.64 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 168.2, 162.7 (d, $J_{C\text{-}F}$ = 248.0 Hz), 148.5, 140.9 (d, $J_{C\text{-}F}$ = 7.0 Hz), 135.3 (d, $J_{C\text{-}F}$ = 3.0 Hz), 133.7 (d, $J_{C\text{-}F}$ = 8.0 Hz), 132.4, 129.4, 128.6, 125.8, 125.4, 117.9 (d, $J_{C\text{-}F}$ = 21.0 Hz), 114.9 (d, $J_{C\text{-}F}$ = 23.0 Hz), 29.3.



3l

2-chloro-11-methyldibenzo[*b*,*f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Yellow oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ (ppm) 7.40-7.36 (m, 3H), 7.29-7.26 (m, 2H), 7.18-7.17 (m, 1H), 7.07-7.05 (m, 1H), 2.64 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$): δ (ppm) 168.2, 148.6, 140.6, 138.5, 134.7, 133.2, 132.5, 130.8, 129.5, 128.3, 127.9, 125.9, 125.5, 29.4.

Procedure C (for dibenzo[*b*,*e*]azepines)[4]:



Typical procedure for the synthesis of 5h:

Step 1: To a solution of 4-chloro-1-methyl-2-nitrobenzene (20 g, 1 eq.) in CH_3CN, NBS (26 g, 1 eq.) and AIBN (2.3 g, 0.1 eq) was added under N_2. The reaction was allowed to reflux overnight. Solvent was removed by distillation and the resulting mixture was filtered to remove solid particles. The residue was purified by silica gel, (PET/EA = 20 : 1) to provide 1-(bromomethyl)-4-chloro-2-nitrobenzene (yellow solid, 30 g).

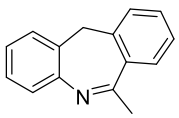
Step 2: To a solution of 1-(bromomethyl)-4-chloro-2-nitrobenzene (5 g, 1 eq.) in toluene, K_2CO_3 (6 g, 2 eq.), $Pd(PPh_3)_4$ (0.26 g, 0.01 eq.) and phenylboronic acid (1 eq.) was added under N_2. After stirring at 80 ^oC overnight, the reaction mixture was poured into water and extracted with dichloromethane. The combined extracts were washed with brine, dried with anhydrous magnesium sulfate, and evaporated in vacuo. The residue was purified by silica gel column chromatography (PE/EA = 5:1) to provide 1-benzyl-4-chloro-2-nitrobenzene (yellow oil, 2.4-2.9 g).

Step 3: To a solution of 1-benzyl-4-chloro-2-nitrobenzene (2.4-2.9 g, 1 eq.) in EtOH and H_2O, con. HCl and Fe powder (5 eq.) was added under N_2. The reaction was allowed to reflux overnight. Solvent was removed by distillation and the resulting mixture was filtered to remove solid particles. The residue was neutralized with 7M NaOH aqueous solution until pH >7. The result aqueous phase was extracted with dichloromethane, dried with anhydrous magnesium sulfate, and evaporated in vacuo. The residue was purified by silica gel column chromatography (PE/EA = 10:1) to provide 2-benzyl-5-chloroaniline (yellow oil, 2.0-2.5 g).

Step 4: To a solution of 2-benzyl-5-chloroaniline (2.0-2.5 g, 1 eq.) in DCM, AcCl (1.1 eq.) and Et_3N (2 eq.) was added at 0 ^oC under N_2. After stirring at room temperature for 1 h, the reaction mixture was poured into water and extracted with dichloromethane. The combined extracts were washed with brine, dried with anhydrous magnesium sulfate, and evaporated in vacuo. The residue was purified by silica gel column chromatography (PE/EA = 5:1) to provide *N*-(2-benzyl-5-chlorophenyl)acetamide (yellow oil, 2.4-3.0 g).

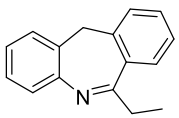
Step 5: To a solution of *N*-(2-benzyl-5-chlorophenyl)acetamide (2.4-3.0 g, 1 eq.)

in PPA, $POCl_3$ (5 eq.) was added under N_2. After stirring at 120 ^oC for 3 h, the reaction mixture was added ice water and neutralized with ammonia until pH >7. The resulting aqueous phase was extracted with dichloromethane, dried over anhydrous magnesium sulfate, and evaporated in vacuo. The residue was purified by silica gel column chromatography (PE/EA = 20:1) to provide 3-chloro-6-methyl-11*H*-dibenzo[*b*,*e*]azepine **5h** (yellow oil, 2.2-2.8 g).



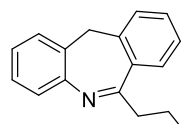
5a

6-methyl-11*H*-dibenzo[*b*,*e*]azepine: (Known compound, see: P. Li, Y. Huang, X. Hu, X.-Q. Dong, X. Zhang, *Org. Lett.* **2017**, *19*, 3855). Yellow solid; ^1H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.39 (d, *J* = 7.5 Hz, 1H), 7.28-7.24 (m, 2H), 7.17-7.12 (m, 4H), 7.06-7.01 (m, 1H), 3.52 (s, 2H), 2.63 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 167.4, 145.6, 142.4, 133.7, 132.8, 130.8, 127.2, 127.0, 126.6, 126.5, 125.9, 125.2, 39.1, 28.6.



5b

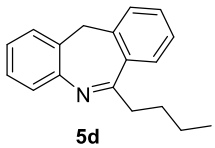
6-methyl-11*H*-dibenzo[*b*,*e*]azepine: (Known compound, see: P. Li, Y. Huang, X. Hu, X.-Q. Dong, X. Zhang, *Org. Lett.* **2017**, *19*, 3855). Yellow oil; ^1H NMR (300 MHz, $CDCl_3$): 7.45 (d, *J* = 7.2 Hz, 1H), 7.35-7.30 (m, 1H), 7.25-7.15 (m, 5H), 7.09-7.04 (m, 1H), 3.55 (s, 2H), 3.00-2.96 (m, 2H), 1.25 (t, *J* = 7.5 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 172.0, 145.7, 143.1, 133.0, 132.9, 130.7, 127.1, 127.0, 126.9, 126.6, 126.5, 125.7, 125.2, 39.1, 34.4, 12.3.



5c

6-methyl-11*H*-dibenzo[*b*,*e*]azepine: (New compound). Yellow solid; ^1H NMR (300 MHz, $CDCl_3$): 7.43 (d, *J* = 7.2 Hz, 1H), 7.33-7.14 (m, 6H), 7.08-7.03 (m, 1H), 3.54 (s, 2H), 3.05-2.87 (m, 2H), 1.73-1.63 (m, 2H), 0.99 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 171.2, 145.7, 143.1, 133.0, 132.9, 130.7, 127.1, 127.0, 127.0, 126.6, 126.5, 125.7, 125.3, 43.4, 39.2, 21.4, 14.1.

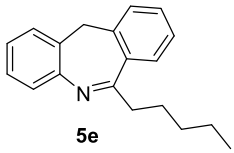
HRMS-ESI exact mass calcd. for $C_{17}H_{18}N^+$([M+H]$^+$) requires m/z 236.14338, found m/z 236.14344.



5d

6-methyl-11*H*-dibenzo[*b*,*e*]azepine: (New compound). Yellow oil; ^{1}H NMR (300 MHz, $CDCl_3$): 7.46 (d, *J* = 7.2 Hz, 1H), 7.36-7.04 (m, 7H), 3.56 (s, 2H), 3.07-2.91 (m, 2H), 1.67-1.64 (m, 2H), 1.46-1.39 (m, 2H), 0.92 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 171.4, 145.7, 143.1, 133.0, 132.9, 130.7, 127.0, 127.0, 126.6, 126.5, 125.7, 125.3, 41.3, 39.1, 30.3, 22.8, 14.1.

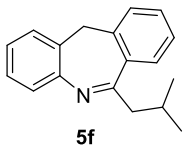
HRMS-ESI exact mass calcd. for $C_{18}H_{20}N^{+}$([M+H]$^{+}$) requires m/z 250.15903, found m/z 250.15922.



5e

6-pentyl-11*H*-dibenzo[*b*,*e*]azepine: (New compound). Yellow oil; ^{1}H NMR (400 MHz, $CDCl_3$): 7.54-7.52 (m, 1H), 7.41-7.24 (m, 6H), 7.16-7.13 (m, 1H), 3.63 (s, 2H), 3.15-2.98 (m, 2H), 1.76-1.74 (m, 2H), 1.45 (s, 4H), 0.98-0.94 (m, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 171.3, 145.6, 143.0, 132.9, 132.9, 130.6, 127.0, 126.9, 126.5, 126.4, 125.7, 125.2, 41.4, 39.1, 31.8, 27.7, 22.6, 14.1.

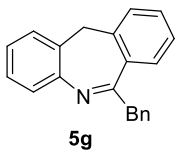
HRMS-ESI exact mass calcd. for $C_{19}H_{22}N^{+}$([M+H]$^{+}$) requires m/z 264.17468, found m/z 264.17468.



5f

6-isobutyl-11*H*-dibenzo[*b*,*e*]azepine: (New compound). Yellow oil; ^{1}H NMR (400 MHz, $CDCl_3$): 7.46 (d, *J* = 7.2 Hz, 1H), 7.37-7.33 (m, 1H), 7.26-7.17 (m, 5H), 7.10-7.07 (m, 1H), 3.61-3.59 (m, 2H), 3.16-3.13 (m, 1H), 2.69-2.64 (m, 1H), 2.04-1.98 (m, 1H), 0.98-0.97 (m, 6H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 170.9, 145.6, 142.9, 133.0, 132.9, 130.8, 127.3, 127.1, 127.0, 126.7, 126.5, 125.9, 125.4, 50.6, 39.2, 27.5, 23.4, 22.2.

HRMS-ESI exact mass calcd. for $C_{18}H_{20}N^{+}$([M+H]$^{+}$) requires m/z 250.15903, found m/z 250.15897.

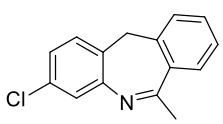


5g

6-methyl-11*H*-dibenzo[*b*,*e*]azepine: (New compound). Yellow oil; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.51 (d, *J* = 7.2 Hz, 1H),

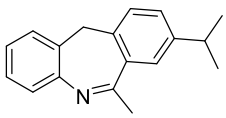
7.31-7.05 (m, 12H), 4.40-4.21 (m, 1H), 3.43 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 169.4, 145.4, 143.2, 138.1, 132.9, 132.7, 130.8, 129.1, 128.6, 127.1, 127.1, 127.0, 126.6, 126.4, 126.1, 125.4, 48.1, 39.1.

HRMS-ESI exact mass calcd. for $C_{21}H_{18}N^+$([M+H]$^+$) requires m/z 284.14338, found m/z 284.14350.



5h

3-chloro-6-methyl-11*H*-dibenzo[*b,e*]azepine: (Known compound, see: P. Li, Y. Huang, X. Hu, X.-Q. Dong, X. Zhang, *Org. Lett.* **2017**, *19*, 3855). Yellow solid; ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.49 (d, *J* = 8.0 Hz, 1H), 7.39-7.35 (m, 1H), 7.29-7.23 (m, 3H), 7.11-7.04 (m, 2H), 3.58 (s, 2H), 2.68(s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 169.0, 146.6, 142.1, 133.6, 132.4, 131.4, 131.2, 128.1, 127.3, 126.8, 126.7, 125.8, 125.1, 38.4, 28.7.

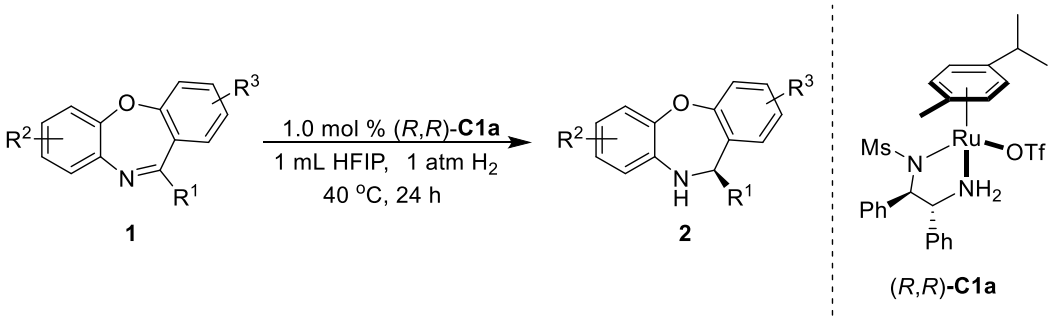


5i

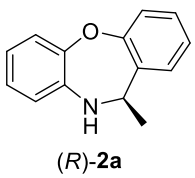
8-isopropyl-6-methyl-11*H*-dibenzo[*b,e*]azepine: (Known compound, see: P. Li, Y. Huang, X. Hu, X.-Q. Dong, X. Zhang, *Org. Lett.* **2017**, *19*, 3855). Yellow solid; ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.31 (s, 1H), 7.25-7.11 (m, 5H), 7.08-7.04 (m, 1H), 3.55 (s, 2H), 2.89-2.82 (m, 1H), 2.69 (s, 3H), 1.20-1.18 (m, 6H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 167.6, 147.0, 145.7, 140.0, 133.6, 133.0, 129.0, 127.0, 126.9, 126.6, 125.7, 125.2, 125.2, 38.6, 33.9, 28.6, 24.0.

4. General procedure for the asymmetric hydrogenation of dibenzo-fused azepines

Procedure A (for dihydrodibenzo[*b,f*][1,4]oxazepines)



General procedure: A 30 mL glass-lined stainless-steel reactor equipped with a magnetic stirrer bar was charged with substrate dibenzo[*b,f*][1,4]oxazepine (0.2 mmol), Ru-catalyst (*R,R*)-**C1a** (0.002 mmol) in 1 mL of HFIP under N_2 atmosphere in a glove box. The autoclave was closed, and the final pressure of the hydrogen gas was adjusted to 1 atm after purging the autoclave with hydrogen gas three times. The reaction mixture was stirred at 40 ^oC for 24 h. Then the hydrogen gas was carefully released. The conversion was determined by ^1H NMR spectroscopy of the crude reaction mixture. The reaction mixture was filtered through a short pad of silica eluted with EA and PET to give isolated product dihydrodibenzo[*b,f*][1,4]oxazepine, and the enantiomeric excess of the product was determined by HPLC with a chiral column.

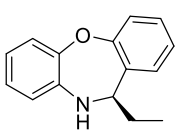


(*R*)-**2a**

(*R*)-11-methyl-10,11-dihydrodibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow oil, isolated yield 95%, 97% ee; $[\alpha]_D^{25}$ = +41.4 (*c* = 1.0, $CHCl_3$), [Lit.[2] $[\alpha]_D^{30}$ = -109.1 (*c* = 1.26, $CHCl_3$), 94% ee for *S* enantiomer]; ^1H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.26-7.08 (m, 5H), 6.86-6.80 (m, 1H), 6.68-6.64 (m, 1H), 6.54 (d, *J* = 8.0 Hz, 1H), 5.05 (q, *J* = 6.8 Hz, 1H), 3.60 (s, br, 1H), 1.63 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (100

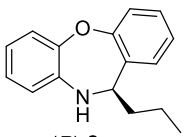
MHz, $CDCl_3$): δ (ppm) 157.7, 144.4, 138.2, 135.3, 129.0, 125.6, 124.6, 124.5, 121.9, 120.9, 119.1, 118.5, 50.1, 20.1.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 7.7 min (minor), t_{R2} = 9.3 min (major).


(*R*)-**2b**

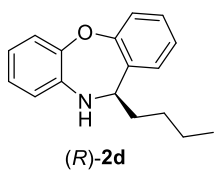
(*R*)-11-ethyl-10,11-dihydrodibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow oil, isolated yield 98%, 95% ee; $[\alpha]_D^{25}$ = +23.0 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.24-7.20 (m, 1H), 7.17-7.12 (m, 2H), 7.08-7.04 (m, 2H), 6.87-6.81 (m, 1H), 6.68-6.63 (m, 1H), 6.57-6.54 (m, 1H), 4.29 (t, *J* = 7.4 Hz, 1H), 3.99 (s, br, 1H), 2.11-2.03 (m, 2H), 1.01 (t, *J* = 7.5 Hz, 3H),; ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 157.3, 144.1, 137.8, 134.2, 128.9, 127.3, 124.5, 124.3, 121.8, 121.2, 118.9, 118.7, 59.0, 28.0, 11.6.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 7.2 min (minor), t_{R2} = 7.9 min (major).


(*R*)-**2c**

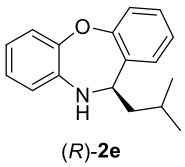
(*R*)-11-propyl-10,11-dihydrodibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow solid, isolated yield 97%, 93% ee; $[\alpha]_D^{25}$ = +28.9 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.24-7.04 (m, 5H), 6.86-6.82 (m, 1H), 6.67-6.63 (m, 1H), 6.54 (d, *J* = 7.6 Hz, 1H), 4.44 (t, *J* = 7.2 Hz, 1H), 2.06-1.99 (m, 2H), 1.54-1.32 (m, 2H), 0.96 (t, *J* = 7.6 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 157.4, 144.0, 137.8, 134.4, 128.8, 127.1, 124.5, 124.3, 121.9, 121.2, 118.9, 118.6, 56.8, 37.0, 20.2, 14.1.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 6.9 min (minor), t_{R2} = 7.7 min (major).


(*R*)-**2d**

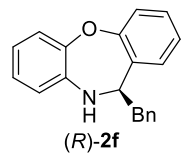
(*R*)-11-butyl-10,11-dihydrodibenzo[*b,f*][1,4]oxazepine: (New compound). Yellow solid, isolated yield 93%, 95% ee; $[\alpha]_D^{25}$ = -17.4 (*c* = 1.0, $CHCl_3$); ^1H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.25-7.03 (m, 5H), 6.87-6.82 (m, 1H), 6.69-6.64 (m, 1H), 6.57 (d, *J* = 7.8 Hz, 1H), 4.42 (t, *J* = 7.4 Hz, 1H), 3.89 (s, br, 1H), 2.11-1.96 (m, 2H), 1.47-1.26 (m, 4H), 0.90 (t, *J* = 6.6 Hz, 3H),; ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 157.3, 144.1, 137.6, 134.3, 128.9, 127.2, 124.5, 124.3, 121.9, 121.2, 119.1, 118.8, 57.2, 34.5, 29.2, 22.7, 14.2. HRMS-ESI exact mass calcd. for $C_{15}H_{14}NS^+$([M+H]$^+$) requires m/z 254.15394, found m/z 254.15403.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 1.0 mL/min, 25 ^oC, UV detection at λ = 254 nm), t_{R1} = 6.5 min (minor), t_{R2} = 7.3 min (major).


(*R*)-**2e**

(*R*)-11-isobutyl-10,11-dihydrodibenzo[*b,f*][1,4]oxazepine: (New compound). Yellow solid, isolated yield 95%, 98% ee; $[\alpha]_D^{25}$ = -17.4 (*c* = 1.0, $CHCl_3$); ^1H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.25-7.03 (m, 5H), 6.87-6.82 (m, 1H), 6.69-6.64 (m, 1H), 6.52 (d, *J* = 7.8 Hz, 1H), 4.55 (t, *J* = 7.5 Hz, 1H), 3.76 (s, br, 1H), 1.94-1.89 (m, 2H), 1.75-1.64 (m, 1H), 0.97-0.94 (m, 6H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 157.5, 143.9, 137.9, 134.6, 128.8, 126.9, 124.5, 124.3, 121.9, 121.2, 118.8, 118.6, 54.6, 43.7, 25.1, 23.1, 22.5. HRMS-ESI exact mass calcd. for $C_{15}H_{14}NS^+$([M+H]$^+$) requires m/z 254.15394, found m/z 254.15466.

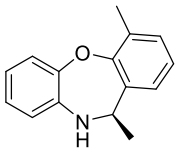
The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 1.0 mL/min, 25 ^oC, UV detection at λ = 254 nm), t_{R1} = 5.8 min (minor), t_{R2} = 7.2 min (major).


(*R*)-**2f**

(*R*)-11-benzyl-10,11-dihydrodibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). white solid, isolated yield 90%, 98% ee; $[\alpha]_D^{25}$ = +70.7 (*c* = 1.0, $CHCl_3$); ^1H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.31-7.10 (m,

10H), 6.86-6.81 (m, 1H), 6.72-6.67 (m, 1H), 6.45 (d, *J* = 7.8 Hz, 1H), 4.58-4.53 (m, 1H), 3.78 (s, br, 1H), 3.46-3.26 (m, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 157.2, 144.1, 138.8, 137.3, 133.5, 129.5, 129.2, 128.7, 127.7, 126.7, 124.5, 124.4, 121.9, 121.3, 119.3, 119.0, 59.5, 41.6.

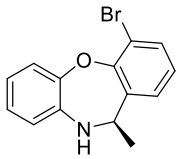
The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 7.9 min (minor), t_{R2} = 9.5 min (major).



(*R*)-**3g**

(*R*)-4,11-dimethyl-10,11-dihydrodibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow oil, isolated yield 93%, 95% ee; $[\alpha]_D^{25}$ = +78.6 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.13-7.08 (m, 2H), 7.01-6.97 (m, 2H), 6.83-6.79 (m, 1H), 6.65-6.60 (m, 1H), 6.49-6.47 (m, 1H), 5.04 (q, *J* = 6.8 Hz, 1H), 3.59 (s, 3H), 2.40 (s, 3H), 1.58 (d, *J* = 6.8 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 155.8, 143.6, 138.7, 135.4, 130.4, 130.2, 124.6, 124.2, 122.7, 122.1, 118.6, 118.3, 49.5, 19.8, 16.3.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 6.1 min (minor), t_{R2} = 6.5 min (major).

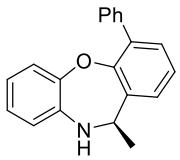


(*R*)-**2h**

(*R*)-4-bromo-11-methyl-10,11-dihydrodibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow oil, isolated yield 92%, 97% ee; $[\alpha]_D^{25}$ = -29.9 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.49 (d, *J* = 8.0 Hz, 1H), 7.34 (d, *J* = 8.0 Hz, 1H), 7.15 (d, *J* = 7.6 Hz, 1H), 6.98 (t, *J* = 7.8 Hz, 1H), 6.88 (t, *J* = 7.6 Hz, 1H), 6.68 (t, *J* = 7.6 Hz, 1H), 6.53 (d, *J* = 8.0 Hz, 1H), 5.12 (q, *J* = 6.8 Hz, 1H), 3.73 (s, br, 1H), 1.64 (d, *J* = 6.8 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 154.3, 143.2, 138.2, 137.4, 132.5, 125.6, 125.2, 124.4, 122.9, 118.9, 118.1, 115.7, 49.7, 19.8.

The enantiomeric excess was determined by HPLC on a Chiralcel OD-H column

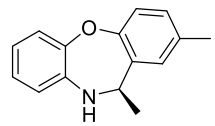
(*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 9.1 min (major), t_{R2} = 10.1 min (minor).



(*R*)-**2i**

(*R*)-11-methyl-4-phenyl-10,11-dihydrodibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow oil, isolated yield 97%, 96% ee; $[\alpha]_D^{25}$ = -89.7 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.54-7.52 (m, 2H), 7.47-7.37 (m, 3H), 7.31-7.30 (m, 1H), 7.25-7.15 (m, 2H), 6.80-6.76 (m, 1H), 6.50-6.49 (m, 3H), 5.17 (q, *J* = 6.8 Hz, 1H), 3.72 (s, br, 1H), 1.68 (d, *J* = 6.8 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 154.6, 144.0, 138.7, 138.1, 136.4, 135.0, 130.3, 130.1, 128.0, 127.4, 124.6, 124.5, 124.4, 122.2, 118.8, 118.1, 49.8, 19.8.

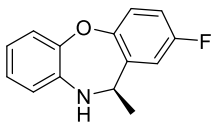
The enantiomeric excess was determined by HPLC on a Chiralcel OD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 6.5 min (major), t_{R2} = 7.7 min (minor).



(*R*)-**2j**

(*R*)-2,11-dimethyl-10,11-dihydrodibenzo[*b,f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow oil, isolated yield 96%, 95% ee; $[\alpha]_D^{25}$ = +49.2 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.09-7.01 (m, 4H), 6.86-6.82 (m, 1H), 6.68-6.64 (m, 1H), 6.54-6.52 (m, 1H), 5.03 (q, *J* = 6.8 Hz, 1H), 3.72 (s, 1H), 2.32 (s, 3H), 1.64 (d, *J* = 6.8 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 155.5, 144.6, 138.3, 134.8, 134.0, 129.3, 125.9, 124.5, 121.8, 120.6, 119.0, 118.5, 50.0, 21.1, 20.1.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 5.5 min (major), t_{R2} = 6.1 min (minor).

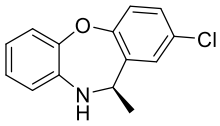


(*R*)-**2k**

(*R*)-2-fluoro-11-methyl-10,11-dihydrodibenzo[*b,f*][1,4]oxazepine:

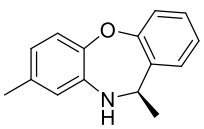
(Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow solid, isolated yield 94%, 95% ee; $[\alpha]_D^{25}$ = +60.1 (*c* = 1.0, $CHCl_3$); ^1H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.14-7.07 (m, 2H), 6.94-6.84 (m, 3H), 6.69-6.65 (m, 1H), 6.55-6.53 (m, 1H), 5.07 (q, *J* = 6.8 Hz, 1H), 3.69 (s, br, 1H), 1.62 (d, *J* = 6.8 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 159.4 (d, $J_{1C\text{-}F}$ = 241.0 Hz), 153.7, 144.3, 138.1, 137.1 (d, $J_{3C\text{-}F}$ = 7.0 Hz), 124.9, 122.1 (d, $J_{3C\text{-}F}$ = 8.0 Hz), 121.8, 119.2, 118.5, 115.0 (d, $J_{2C\text{-}F}$ = 23.0 Hz), 112.1 (d, $J_{2C\text{-}F}$ = 24.0 Hz), 49.3, 19.6.

The enantiomeric excess was determined by HPLC on a Chiralcel OD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 0.8 mL/min, 25 °C, UV detection at λ = 254 nm), t_{R1} = 6.2 min (major), t_{R2} = 7.2 min (minor).


(*R*)-**2l**

(*R*)-2-chloro-11-methyl-10,11-dihydrodibenzo[*b*,*f*][1,4]oxazepine: (New compound). Yellow oil, isolated yield 95%, 96% ee; $[\alpha]_D^{25}$ = +77.5 (*c* = 1.0, $CHCl_3$); ^1H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.22-7.18 (m, 2H), 7.11-7.07 (m, 2H), 6.89-6.85 (m, 1H), 6.70-6.66 (m, 1H), 6.54 (d, *J* = 8.0 Hz, 1H), 5.03 (q, *J* = 6.8 Hz, 1H), 3.70 (s, br, 1H), 1.62 (d, *J* = 6.8 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 156.1, 144.1, 137.9, 136.9, 129.5, 128.7, 125.6, 124.9, 122.4, 121.8, 119.3, 118.6, 49.7, 19.8. HRMS-ESI exact mass calcd. for $C_{15}H_{14}NS^+$($[M+H]^+$) requires m/z 246.06802, found m/z 246.06845.

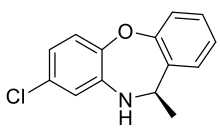
The enantiomeric excess was determined by HPLC on a Chiralcel OD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 0.8 mL/min, 25 °C, UV detection at λ = 254 nm), t_{R1} = 7.8 min (major), t_{R2} = 9.3 min (minor).


(*R*)-**2m**

(*R*)-8,11-dimethyl-10,11-dihydrodibenzo[*b*,*f*][1,4]oxazepine: (New compound). Yellow oil, isolated yield 93%, 96% ee; $[\alpha]_D^{25}$ = +14.6 (*c* = 1.0, $CHCl_3$); ^1H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.25-7.07 (m, 4H), 6.98 (d, *J* = 8.0 Hz, 1H), 6.46 (d, *J* = 8.0 Hz, 1H), 6.35 (s, 1H), 5.03 (q, *J* = 6.8 Hz, 1H), 2.17 (s, 3H), 1.63 (d, *J* = 6.8 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 157.9, 142.5, 137.7, 135.3, 134.2, 128.9, 125.4, 124.5, 121.6, 120.8,

119.8, 118.9, 50.0, 20.8, 20.1. HRMS-ESI exact mass calcd. for $C_{15}H_{14}NS^+$([M+H]$^+$) requires m/z 226.12264, found m/z 226.12300.

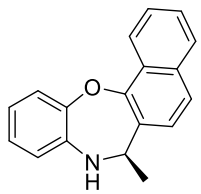
The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 0.8 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 9.7 min (minor), t_{R2} = 11.2 min (major).



(*R*)-**2n**

(*R*)-8-chloro-11-methyl-10,11-dihydrodibenzo[*b*,*f*][1,4]oxazepine: (Known compound, see: P. Li, Y. Huang, X. Hu, X.-Q. Dong, X. Zhang, *Org. Lett.* **2017**, *19*, 3855). Yellow solid, isolated yield 96%, 97% ee; $[\alpha]_D^{25}$ = +23.5 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.28-7.24 (m, 1H), 7.20-7.18 (m, 1H), 7.15-7.10 (m, 2H), 6.99 (d, *J* = 8.4 Hz, 1H), 6.59-6.56 (m, 1H), 6.49 (s, 1H), 5.03 (q, *J* = 6.8 Hz, 1H), 3.79 (s, 1H), 1.63 (d, *J* = 6.8 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 157.5, 142.8, 139.4, 135.0, 129.5, 129.2, 125.4, 124.8, 123.0, 120.8, 118.4, 117.5, 49.8, 20.0.

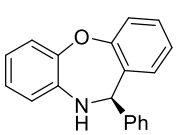
The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 7.7 min (minor), t_{R2} = 11.6 min (major).



(*R*)-**2o**

(*R*)-7-methyl-7,8-dihydrobenzo[*b*]naphtho[2,1-*f*][1,4]oxazepine: (Known compound, see: P. Li, Y. Huang, X. Hu, X.-Q. Dong, X. Zhang, *Org. Lett.* **2017**, *19*, 3855). Yellow oil, isolated yield 97%, 95% ee; $[\alpha]_D^{25}$ = -89.7 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 8.47 (d, *J* = 8.4 Hz, 1H), 7.82 (d, *J* = 8.0 Hz, 1H), 7.63-7.47 (m, 3H), 7.36-7.34 (m, 2H), 6.89-6.86 (m, 1H), 6.74-6.70 (m, 1H), 6.60-6.58 (m, 1H), 5.21 (q, *J* = 6.8 Hz, 1H), 3.76 (s, br, 1H), 1.74 (d, *J* = 6.8 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 152.6, 144.4, 138.8, 134.3, 130.2, 127.8, 127.4, 126.4, 126.3, 124.8, 124.0, 123.4, 122.2, 122.0, 119.2, 118.9, 50.5, 20.6.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 0.8 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 12.9 min (major), t_{R2} = 18.9 min (minor).

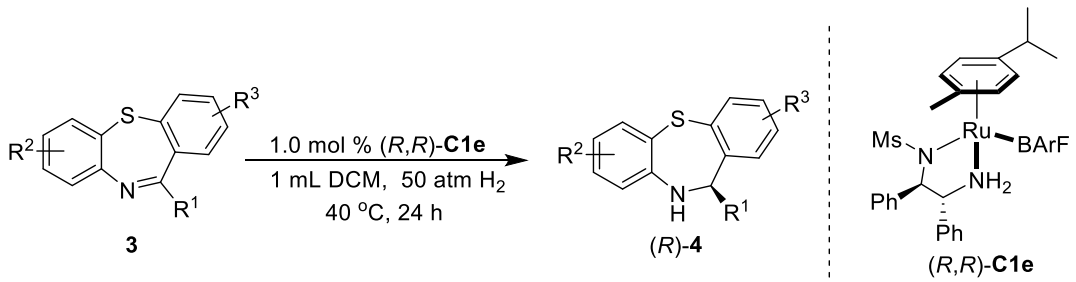


(*R*)-**2p**

(*R*)-11-phenyl-10,11-dihydrodibenzo[*b*,*f*][1,4]oxazepine: (Known compound, see: K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845). Yellow oil, isolated yield 95%, 62% ee; $[\alpha]_D^{25}$ = -15.7 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.47-7.35 (m, 5H), 7.31-7.27 (m, 1H), 7.24-7.22 (m, 1H), 7.16-7.13 (m, 1H), 7.09-7.05 (m, 1H), 6.95-6.91 (m, 2H), 6.77-6.73 (m, 1H), 6.69-6.66 (m, 1H), 5.94 (s, 1H), 4.12 (s, br, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 157.6, 144.9, 141.2, 138.3, 134.4, 129.3, 128.8, 128.6, 127.8, 127.4, 124.8, 124.3, 122.0, 121.3, 119.6, 118.8, 60.5.

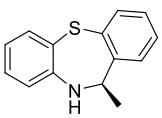
The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 0.8 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 7.0 min (minor), t_{R2} = 9.2 min (major).

Procedure B (for dihydrodibenzo[*b*,*f*][1,4]thiazepines)



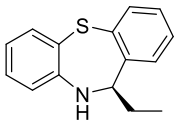
General procedure: A 30 mL glass-lined stainless-steel reactor equipped with a magnetic stirrer bar was charged with substrate dibenzo[*b*,*f*][1,4]thiazepine (0.2 mmol), Ru-catalyst (*R*,*R*)-**C1e** (0.002 mmol) in 1 mL of DCM under N_2 atmosphere in a glove box. The autoclave was closed, and the final pressure of the hydrogen gas was adjusted to 50 atm after purging the autoclave with hydrogen gas three times. The reaction mixture was stirred at room temperature for 24 h. Then the hydrogen gas was carefully released. The conversion was determined by ^{1}H NMR spectroscopy of the crude reaction mixture. The reaction mixture was filtered through a short pad of silica eluted with EA and PET to give isolated product dihydrodibenzo[*b*,*f*][1,4]thiazepine, and the enantiomeric excess of the product was determined by HPLC with a chiral

column.


(*R*)-**4a**

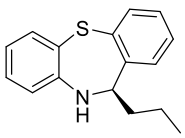
(*R*)-11-methyl-10,11-dihydrodibenzo[*b,f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett*. **2013**, *54*, 5956). Colorless oil; isolated yield 98%, 99% ee; $[\alpha]_D^{25}$ = -102.4 (*c* = 0.5, CH_2Cl_2), [Lit.[5] $[\alpha]_D^{20}$ = -87.1 (c 0.48, $CHCl_3$), 92% ee for *R* enantiomer]; ^{1}H NMR (400 MHz, CD_2Cl_2): δ (ppm) 7.54 (d, *J* = 7.6 Hz, 1H), 7.38-7.31 (m, 2H), 7.29-7.25 (m, 1H), 7.14-7.12 (m, 1H), 6.92-6.87 (m, 1H), 6.54-6.51 (m, 1H), 6.35 (d, *J* = 8.0 Hz, 1H), 6.15-6.12 (m, 1H), 3.74 (s, br, 1H), 1.62-1.60 (m, 3H); ^{13}C NMR (100 MHz, CD_2Cl_2): δ (ppm) 147.1, 146.2, 136.7, 132.5, 132.1, 129.2, 128.7, 128.5, 124.5, 118.3, 117.8, 116.0, 50.4, 19.7.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 8.6 min (minor), t_{R2} = 9.3 min (major).


(*R*)-**4b**

(*R*)-11-ethyl-10,11-dihydrodibenzo[*b,f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Colorless oil; isolated yield 97%, 95% ee; $[\alpha]_D^{25}$ = -40.2 (*c* = 0.5, CH_2Cl_2); ^{1}H NMR (400 MHz, CD_2Cl_2): δ (ppm) 7.54 (d, *J* = 7.6 Hz, 1H), 7.37-7.33 (m, 1H), 7.27-7.24 (m, 2H), 7.13 (d, *J* = 7.6 Hz, 1H), 6.92-6.88 (m, 1H), 6.53 (t, *J* = 7.6 Hz, 1H), 6.38 (d, *J* = 8.0 Hz, 1H), 5.73 (t, *J* = 7.2 Hz, 1H), 3.68 (s, br, 1H), 2.15-2.04 (m, 1H), 1.99-1.88 (m, 1H), 1.13 (t, *J* = 7.2 Hz, 3H) ; ^{13}C NMR (100 MHz, CD_2Cl_2): δ (ppm) 147.2, 145.4, 136.7, 132.4, 132.2, 129.1, 128.6, 128.3, 125.2, 118.3, 118.0, 116.3, 57.3, 26.9, 11.7.

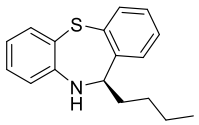
The enantiomeric excess was determined by HPLC on a Chiralpak AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220nm), t_{R1} = 7.4 min (major), t_{R2} =8.5 min (minor).


(*R*)-**4c**

(*R*)-11-propyl-10,11-dihydrodibenzo[*b,f*][1,4]thiazepine: (Known

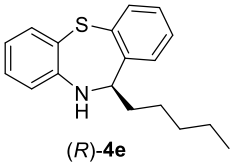
compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Colorless oil; isolated yield 99%, 93% ee; $[\alpha]_D^{25}$ = -34.4 (*c* = 0.5, CH_2Cl_2); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.54-7.51 (m, 1H), 7.30-7.28 (m, 1H), 7.23-7.19 (m, 2H), 7.14-7.12 (m, 1H), 6.89-6.85 (m, 1H), 6.54-6.50 (m, 1H), 6.34-6.32 (m, 1H), 5.87-5.84 (m, 1H), 3.59 (s, br, 1H), 2.00-1.84 (m, 2H), 1.58-1.52 (m, 2H), 1.02 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 146.8, 145.3, 136.4, 132.2, 132.1, 128.8, 128.2, 128.1, 124.7, 118.2, 117.8, 116.1, 54.7, 35.8, 20.1, 14.2.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 6.2 min (major), t_{R2} = 7.7 min (minor).


(*R*)-**4d**

(*R*)-11-butyl-10,11-dihydrodibenzo[*b*,*f*][1,4]thiazepine: (New compound). Colorless oil; isolated yield 97%, 91% ee; $[\alpha]_D^{25}$ = -30.2 (*c* = 0.5, CH_2Cl_2); ^{1}H NMR (400 MHz, CD_2Cl_2): δ (ppm) 7.54-7.52 (m, 1H), 7.37-7.23 (m, 3H), 7.13-7.10 (m, 1H), 6.91-6.87 (m, 1H), 6.54-6.50 (m, 1H), 6.38-6.35 (m, 1H), 5.85-5.82 (m, 1H), 3.72 (s, br, 1H), 2.08-201 (m, 1H), 1.93-1.88 (m, 1H), 1.58-1.42 (m, 4H), 0.98-0.95 (m, 3H); ^{13}C NMR (100 MHz, CD_2Cl_2): δ (ppm) 147.2, 145.7, 136.7, 132.4, 132.2, 129.1, 128.6, 128.3, 125.2, 118.3, 117.9, 116.2, 55.4, 33.6, 29.4, 23.1, 14.2. HRMS-ESI exact mass calcd. for $C_{17}H_{20}NS^+$([M+H]$^+$) requires m/z 270.13110, found m/z 270.13125.

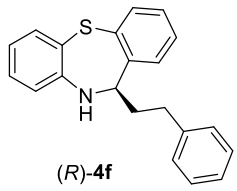
The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 6.8 min (major), t_{R2} = 7.8 min (minor).


(*R*)-**4e**

(*R*)-11-pentyl-10,11-dihydrodibenzo[*b*,*f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Colorless oil; isolated yield 98%, 90% ee; $[\alpha]_D^{25}$ = -29.5 (*c* = 0.5, CH_2Cl_2); ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.55-7.52 (m, 1H), 7.38-7.23 (m, 3H), 7.13-7.10 (m, 1H), 6.92-6.87 (m, 1H), 6.55-6.50 (m, 2H), 6.38-6.35 (m, 1H), 5.86-5.83 (m, 1H), 3.72 (d, *J* = 4.8 Hz, 1H), 2.06-1.88 (m, 2H),

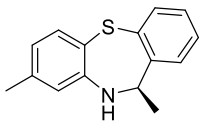
1.59-1.35 (m, 6H), 0.93 (t, *J* = 6.9 Hz, 3H); ^{13}C NMR (125 MHz, $CDCl_3$): δ (ppm) 146.8, 145.4, 136.5, 132.2, 132.1, 128.8, 128.2, 128.0, 124.7, 118.3, 117.8, 116.3, 55.2, 33.8, 32.0, 26.7, 22.7, 14.2.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 5.5 min (major), t_{R2} = 6.2 min (minor).


(*R*)-**4f**

(*R*)-11-phenethyl-10,11-dihydrodibenzo[*b*,*f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Colorless oil; isolated yield 97%, 85% ee; $[\alpha]_D^{25}$ = -14.6 (*c* = 0.5, CH_2Cl_2); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.54-7.51 (m, 1H), 7.32-7.27 (m, 3H), 7.23-7.19 (m, 5H), 7.15-7.13 (m, 1H), 6.90-6.86 (m, 1H), 6.56-6.52 (m, 1H), 6.32-6.30 (m, 1H), 5.83-5.79 (m, 1H), 3.62 (s, 1H), 2.90-2.78 (m, 2H), 2.41-2.31 (m, 1H), 2.26-2.17 (m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 146.5, 144.9, 141.6, 136.3, 132.2, 132.2, 128.8, 128.7, 128.6, 128.2, 128.2, 126.3, 124.9, 118.4, 118.1, 116.4, 55.1, 35.6, 33.3.

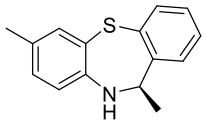
The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 9.1 min (major), t_{R2} = 9.9 min (minor).


(*R*)-**4g**

(*R*)-8,11-dimethyl-10,11-dihydrodibenzo[*b*,*f*][1,4]thiazepine: (New compound). Light yellow oil; isolated yield 98%, 99% ee; $[\alpha]_D^{25}$ = -127.3 (*c* = 0.5, CH_2Cl_2); ^{1}H NMR (400 MHz, CD_2Cl_2): δ (ppm) 7.52 (d, *J* =7.6 Hz, 1H), 7.37-7.30 (m, 2H), 7.27-7.23 (m, 1H), 7.01 (d, *J* =8.0 Hz, 1H), 6.36 (d, *J* =7.6 Hz, 1H), 6.18 (s, 1H), 6.11 (q, *J* =6.6 Hz, 1H), 3.67 (s, 1H), 2.12 (s, 3H), 1.60 (d, *J* =6.8 Hz, 3H); ^{13}C NMR (100 MHz, CD_2Cl_2): δ (ppm) 146.8, 146.2, 138.8, 137.0, 132.5, 132.0, 129.1, 128.4, 124.5, 119.4, 118.3, 112.8, 50.3, 21.0, 19.8. HRMS-ESI exact mass calcd. for $C_{15}H_{16}NS^+$([M+H]$^+$) requires m/z 242.09980, found m/z 242.09985.

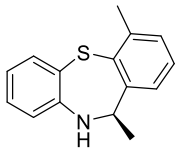
The enantiomeric excess was determined by HPLC on a Chiralcel OJ-H column

(*n*-hexane : isopropanol = 70 : 30, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 19.5 min (major), t_{R2} = 23.2 min (minor).


(*R*)-**4h**

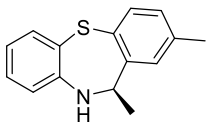
(*R*)-7,11-dimethyl-10,11-dihydrodibenzo[*b,f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Light yellow oil; isolated yield 97%, 99% ee; $[\alpha]_D^{25}$ = -17.4 (*c* = 0.5, CH_2Cl_2); ^{1}H NMR (400 MHz, CD_2Cl_2): δ (ppm) 7.52 (d, *J* =7.6 Hz, 1H), 7.36-7.23 (m, 3H), 6.96 (s, 1H), 6.72 (d, *J* =8.4 Hz, 1H), 6.29 (d, *J* =8.0 Hz, 1H), 6.03 (q, *J* =6.8 Hz, 1H), 3.64 (s, 1H), 2.13 (s, 3H), 1.59 (d, *J* =6.8 Hz, 3H); ^{13}C NMR (100 MHz, CD_2Cl_2): δ (ppm) 146.2, 144.6, 136.6, 132.6, 132.0, 129.4, 129.1, 128.4, 128.0, 124.7, 118.1, 116.2, 50.6, 20.1, 19.9.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 10.1 min (major), t_{R2} = 11.9 min (minor).


(*R*)-**4i**

(*R*)-4,11-dimethyl-10,11-dihydrodibenzo[*b,f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Light yellow oil; isolated yield 99%, 98% ee; $[\alpha]_D^{25}$ = -295.4 (*c* = 0.5, CH_2Cl_2); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.23-7.11 (m, 4H), 6.89-6.85 (m, 1H), 6.49 (t, *J* = 7.4 Hz, 1H), 6.32-6.28 (m, 2H), 3.58 (s, 1H), 2.53 (s, 3H), 1.57 (d, *J* = 7.2 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 147.1, 146.0, 139.9, 136.4, 133.3, 129.9, 128.6, 128.2, 121.6, 117.9, 117.3, 115.4, 50.0, 21.6, 20.0.

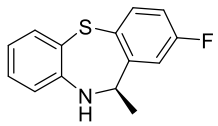
The enantiomeric excess was determined by HPLC on a Chiralcel OD-H column (*n*-hexane : isopropanol = 70 : 30, flowing rate = 0.7 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 6.5 min (minor), t_{R2} = 7.7 min (major).


(*R*)-**4j**

(*R*)-2,11-dimethyl-10,11-dihydrodibenzo[*b,f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Light yellow oil; isolated yield 97%, 99% ee; $[\alpha]_D^{25}$ = -54.2 (*c* = 0.5, CH_2Cl_2); ^{1}H NMR (400 MHz, CD_2Cl_2): δ (ppm) 7.41 (d, *J* =7.6 Hz, 1H),

7.14-7.07 (m, 3H), 6.88 (t, *J* =7.6 Hz, 1H), 6.50 (t, *J* =7.4 Hz, 1H), 6.33 (d, *J* =8.4 Hz, 1H), 6.13 (q, *J* = 6.6 Hz, 1H), 3.70 (s, 1H), 2.36 (s, 3H), 1.59 (d, *J* =6.8 Hz, 3H); ^{13}C NMR (100 MHz, CD_2Cl_2): δ (ppm) 147.1, 145.9, 136.4, 133.2, 132.4, 132.0, 129.0, 128.6, 125.3, 118.2, 117.7, 116.3, 50.2, 21.6, 16.7.

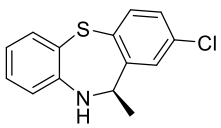
The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 7.6 min (minor), t_{R2} = 8.0 min (major).



(*R*)-**4k**

(*R*)-2-fluoro-11-methyl-10,11-dihydrodibenzo[*b,f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Yellow oil; isolated yield 97%, 95% ee; $[\alpha]_D^{25}$ = -75.2 (*c* = 0.5, CH_2Cl_2); ^{1}H NMR (400 MHz, CD_2Cl_2): δ (ppm) 7.56-7.52 (m, 1H), 7.14-7.12 (m, 1H), 7.07-7.04 (m, 1H), 7.00-6.95 (m, 1H), 6.93-6.89 (m, 1H), 6.53 (t, *J* = 7.4 Hz, 1H), 6.35 (d, *J* =8.0 Hz, 1H), 6.15 (q, *J* =6.8 Hz, 1H), 3.69 (s, 1H), 1.58 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (100 MHz, CD_2Cl_2): δ (ppm) 163.5 (d, $J_{C\text{-}F}$ = 246.0 Hz), 148.6 (d, $J_{C\text{-}F}$ = 7.0 Hz), 146.8, 134.5 (d, $J_{C\text{-}F}$ = 8.0 Hz), 132.5, 131.8 (d, $J_{C\text{-}F}$ = 3.0 Hz), 128.9, 118.4, 117.7, 115.7, 115.1 (d, $J_{C\text{-}F}$ = 22.0 Hz), 112.0 (d, $J_{C\text{-}F}$ = 22.0 Hz), 50.1 (d, $J_{C\text{-}F}$ = 1.0 Hz), 19.5.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 6.7 min (major), t_{R2} = 8.7 min (minor).

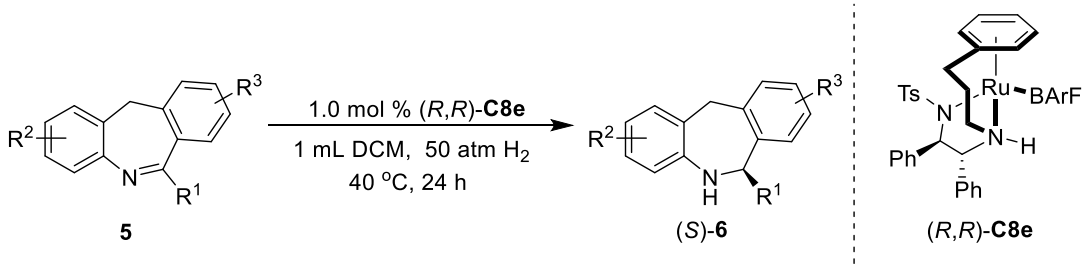


(*R*)-**4l**

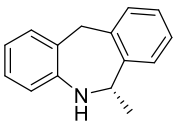
(*R*)-2-chloro-11-methyl-10,11-dihydrodibenzo[*b,f*][1,4]thiazepine: (Known compound, see: J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956). Light yellow oil; isolated yield 96%, 96% ee; $[\alpha]_D^{25}$ = -50.4 (*c* = 0.5, CH_2Cl_2); ^{1}H NMR (400 MHz, CD_2Cl_2): δ (ppm) 7.48 (d, *J* =8.4 Hz, 1H), 7.30 (d, *J* =2.4 Hz, 1H), 7.26-7.23 (m, 1H), 7.12-7.10 (m, 1H), 6.93-6.88 (m, 1H), , 6.55-6.51 (m, 1H), 6.37-6.35 (m, 1H), 6.11 (q, *J* = 7.0 Hz, 1H), 3.77 (s, 1H), 1.59 (d, *J* =6.8 Hz, 3H); ^{13}C NMR (100 MHz, CD_2Cl_2): δ (ppm) 147.8, 146.8, 135.0, 134.9, 133.4, 132.5, 128.9, 128.4, 125.0, 118.6, 117.8, 115.4, 50.3, 19.6.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 6.9 min (major), t_{R2} = 8.8 min (minor).

Procedure C (for dihydrodibenzo[b,e]azepines)



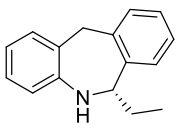
General procedure: A 30 mL glass-lined stainless-steel reactor equipped with a magnetic stirrer bar was charged with substrate dibenzo[*b*,*e*]azepine (0.2 mmol), Ru-catalyst (*R*,*R*)-**C8e** (0.002 mmol) in 1 mL of DCM under N_2 atmosphere in a glove box. The autoclave was closed, and the final pressure of the hydrogen gas was adjusted to 50 atm after purging the autoclave with hydrogen gas three times. The reaction mixture was stirred at room temperature for 24 h. Then the hydrogen gas was carefully released. The conversion was determined by ^{1}H NMR spectroscopy of the crude reaction mixture. The reaction mixture was filtered through a short pad of silica eluted with EA and PET to give isolated product dihydrodibenzo[*b*,*e*]azepine, and the enantiomeric excess of the product was determined by HPLC with a chiral column.



(*S*)-**6a**

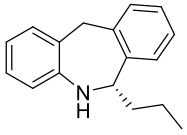
(*S*)-6-methyl-6,11-dihydro-5*H*-dibenzo[*b*,*e*]azepine: (Known compound, see: P. Li, Y. Huang, X. Hu, X.-Q. Dong, X. Zhang, *Org. Lett.* **2017**, *19*, 3855). Yellow oil, isolated yield 93%, 87% ee; $[\alpha]_D^{25}$ = -36.3 (*c* =1.0, $CHCl_3$), [Lit.[4] $[\alpha]_D^{25}$ = -30.0 (c = 0.4, $CHCl_3$), 97% ee for *S* enantiomer]; ^{1}H NMR (300 MHz, $CDCl_3$): δ (ppm) 7.22-7.21 (m, 4H), 6.98-6.90 (m, 2H), 6.62-6.57 (m, 1H), 6.40 (d, *J* = 8.1 Hz, 1H), 5.20 (q, *J* = 6.6 Hz, 1H), 4.81 (d, *J* = 15.0 Hz, 1H), 3.57-3.52 (m, 2H), 1.60 (d, *J* = 6.6 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ (ppm) 145.7, 140.4, 139.7, 130.5, 128.2, 127.7, 127.6, 127.1, 123.7, 123.1, 118.2, 117.3, 49.8, 40.0, 20.2.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 6.8 min (minor), t_{R2} = 8.9 min (major).


(*S*)-**6b**

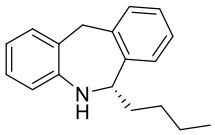
(*S*)-6-ethyl-6,11-dihydro-5*H*-dibenzo[*b*,*e*]azepine: (Known compound, see: P. Li, Y. Huang, X. Hu, X.-Q. Dong, X. Zhang, *Org. Lett.* **2017**, *19*, 3855). Yellow oil, isolated yield 95%, 88% ee; $[\alpha]_D^{25}$ = -116.6 (*c* =1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.25-7.16 (m, 4H), 7.01-6.92 (m, 2H), 6.61 (t, *J* = 7.2 Hz, 1H), 6.45 (d, *J* = 7.6 Hz, 1H), 4.81-4.77 (m, 1H), 4.63 (d, *J* = 15.2 Hz, 1H), 3.71 (d, *J* = 15.2 Hz, 1H), 3.64 (s, 1H), 2.12-2.03 (m, 1H), 1.96-1.85 (m, 1H), 1.14 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 145.8, 139.7, 139.7, 130.4, 128.4, 127.6, 127.6, 127.0, 124.7, 123.8, 118.3, 117.6, 57.1, 40.1, 27.7, 11.5.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 6.2 min (minor), t_{R2} = 7.6 min (major).


(*S*)-**6c**

(*S*)-6-propyl-6,11-dihydro-5*H*-dibenzo[*b*,*e*]azepine: (New compound). Yellow solid, isolated yield 96%, 90% ee; $[\alpha]_D^{25}$ = -108.4 (*c* =1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.24-7.16 (m, 4H), 7.01-6.91 (m, 2H), 6.60 (t, *J* = 7.4 Hz, 1H), 6.42 (d, *J* = 8.0 Hz, 1H), 4.91-4.88 (m, 1H), 4.66 (d, *J* = 15.2 Hz, 1H), 3.68 (d, *J* = 15.2 Hz, 1H), 3.62 (s, 1H), 2.01-1.98 (m, 1H), 1.89-1.86 (m, 1H), 1.62-1.54 (m, 2H), 1.03 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 145.8, 139.9, 139.7, 130.5, 128.4, 127.6, 127.6, 127.0, 124.5, 123.5, 118.2, 117.5, 54.9, 40.1, 36.8, 20.0, 14.3. HRMS-ESI exact mass calcd. for $C_{17}H_{20}N^+$($[M+H]^+$) requires m/z 238.15903, found m/z 238.15904.

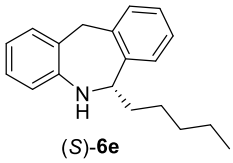
The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 6.6 min (minor), t_{R2} = 7.9 min (major).



(*S*)-**6d**

(*S*)-6-butyl-6,11-dihydro-5*H*-dibenzo[*b,e*]azepine: (New compound). Yellow oil, isolated yield 95%, 88% ee; $[\alpha]_D^{25}$ = -94.6 (*c* =1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.23-7.16 (m, 4H), 7.00-6.91 (m, 2H), 6.60 (t, *J* = 7.2 Hz, 1H), 6.42 (d, *J* = 8.0 Hz, 1H), 4.89-4.86 (m, 1H), 4.66 (d, *J* = 15.2 Hz, 1H), 3.68 (d, *J* = 14.8 Hz, 1H), 3.63 (s, 1H), 2.04-2.01 (m, 1H), 1.90-1.86 (m, 1H), 1.56-1.40 (m, 4H), 0.95 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 145.8, 139.9, 139.7, 130.4, 128.4, 127.6, 127.5, 127.0, 124.5, 123.5, 118.2, 117.5, 55.2, 40.1, 34.3, 29.0, 22.9, 14.2. HRMS-ESI exact mass calcd. for $C_{18}H_{22}N^+$([M+H]$^+$) requires m/z 252.17468, found m/z 252.17474.

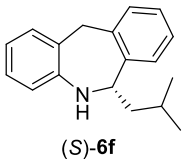
The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 6.0 min (minor), t_{R2} = 7.2 min (major).



(*S*)-**6e**

(*S*)-6-pentyl-6,11-dihydro-5*H*-dibenzo[*b,e*]azepine: (New compound). Yellow oil, isolated yield 98%, 92% ee; $[\alpha]_D^{25}$ = -76.0 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.23-7.16 (m, 4H), 7.00-6.91 (m, 2H), 6.62-6.58 (m, 1H), 6.43 (d, *J* = 7.6 Hz, 1H), 4.89-4.86 (m, 1H), 4.66 (d, *J* = 14.8 Hz, 1H), 3.68 (d, *J* = 14.8 Hz, 1H), 2.03-1.82 (m, 2H), 1.56-1.37 (m, 6H), 0.91 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 145.8, 139.9, 139.7, 130.4, 128.4, 127.6, 127.5, 127.0, 124.5, 123.5, 118.2, 117.5, 55.2, 40.1, 34.6, 32.0, 26.6, 22.8, 14.2. HRMS-ESI exact mass calcd. for $C_{19}H_{24}N^+$([M+H]$^+$) requires m/z 266.19033, found m/z 266.19040.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 6.3 min (minor), t_{R2} = 7.0 min (major).

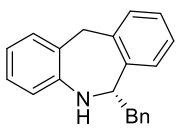


(*S*)-**6f**

(*S*)-6-isobutyl-6,11-dihydro-5*H*-dibenzo[*b,e*]azepine: (New compound). Yellow oil, isolated yield 94%, 94% ee; $[\alpha]_D^{25}$ = -122.7 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.22-7.16 (m, 4H), 7.00 (d, *J* = 7.6 Hz, 1H),, 6.95-6.91 (m, 1H), 6.62-6.59 (m, 1H), 6.43 (d, *J* = 7.6

Hz, 1H), 5.01-4.98 (m, 1H), 4.73 (d, *J* = 15.2 Hz, 1H), 3.66 (d, *J* = 15.2 Hz, 1H), 1.93-1.78 (m, 3H), 1.03-1.01 (m, 6H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 145.5, 140.0, 139.7, 130.6, 128.4, 127.6, 127.0, 124.3, 123.2, 118.3, 117.6, 52.6, 43.5, 40.2, 24.9, 23.5, 22.4. HRMS-ESI exact mass calcd. for $C_{18}H_{22}N^+$([M+H]$^+$) requires m/z 252.17468, found m/z 252.17479.

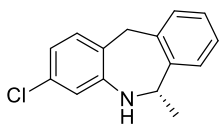
The enantiomeric excess was determined by HPLC on a Chiralcel OD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 4.9 min (minor), t_{R2} = 5.3 min (major).



(*S*)-**6g**

(*S*)-6-benzyl-6,11-dihydro-5*H*-dibenzo[*b*,*e*]azepine: (New compound). Yellow oil, isolated yield 98%, 91% ee; $[\alpha]_D^{25}$ = -105.2 (*c* =1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.37-7.19 (m, 9H), 7.01 (d, *J* = 7.2 Hz, 1H), 6.90-6.88 (m, 2H), 6.65-6.63 (m, 1H), 6.36 (d, *J* = 8.0 Hz, 1H), 5.14 (dd, J_1 = 22.2 Hz, J_2 = 4.0 Hz, 1H), 4.50 (d, *J* = 15.2 Hz, 1H), 3.87 (d, *J* = 14.8 Hz, 1H), 3.36-3.32 (m, 1H), 3.18-3.12 (m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 145.7, 139.5, 139.5, 138.6, 130.1, 129.4, 128.9, 128.7, 127.8, 127.5, 127.1, 126.9, 125.7, 125.3, 119.0, 118.2, 57.4, 42.0, 40.1. HRMS-ESI exact mass calcd. for $C_{21}H_{20}N^+$([M+H]$^+$) requires m/z 286.15903, found m/z 286.15917.

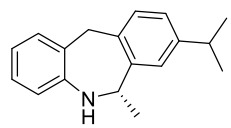
The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 220 nm), t_{R1} = 7.2 min (minor), t_{R2} = 8.3 min (major).



(*S*)-**6h**

(*S*)-3-chloro-6-methyl-6,11-dihydro-5*H*-dibenzo[*b*,*e*]azepine: (Known compound, see: P. Li, Y. Huang, X. Hu, X.-Q. Dong, X. Zhang, *Org. Lett.* **2017**, *19*, 3855). Yellow solid, isolated yield 98%, 84% ee; $[\alpha]_D^{25}$ = -16.2 (*c* =1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.27-7.20 (m, 4H), 6.88 (d, *J* = 8.0 Hz, 1H), 6.53 (d, *J* = 8.0 Hz, 1H), 6.36 (S, 1H), 5.20 (d, *J* = 6.8 Hz, 1H), 4.75 (d, *J* = 14.8, Hz, 1H), 3.48 (d, *J* = 15.2 Hz, 1H), 1.60 (d, *J* = 6.8 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 146.6, 139.9, 139.3, 132.8, 131.5, 128.1, 128.0, 127.3, 127.1, 123.6, 121.1, 117.8, 116.5, 49.5, 39.4, 19.9.

The enantiomeric excess was determined by HPLC on a Chiralcel AS-H column (*n*-hexane : isopropanol = 95 : 5, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 9.7 min (major), t_{R2} = 10.8 min (minor).



(*S*)-**6i**

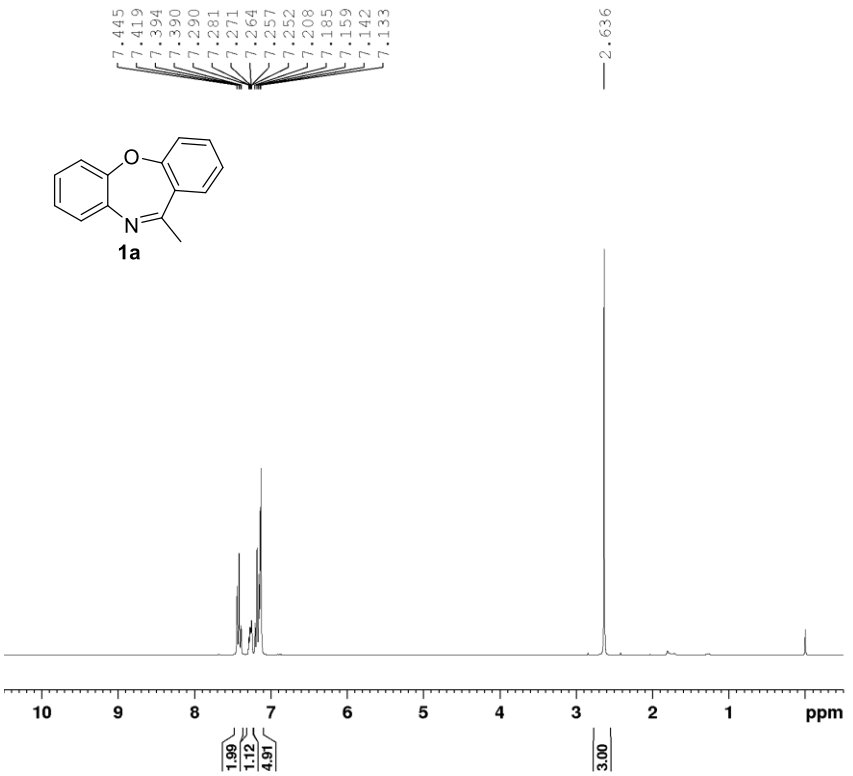
(*S*)-8-isopropyl-6-methyl-6,11-dihydro-5*H*-dibenzo[*b*,*e*]azepine: (Known compound, see: P. Li, Y. Huang, X. Hu, X.-Q. Dong, X. Zhang, *Org. Lett.* **2017**, *19*, 3855). Yellow oil, isolated yield 98%, 76% ee; $[\alpha]_D^{25}$ = -69.2 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ (ppm) 7.15-7.13 (m, 1H), 7.07-7.06 (m, 2H), 6.99 (d, *J* = 7.2 Hz, 1H), 6.94-6.91 (m, 1H), 6.62-6.58 (m, 1H), 6.43 (d, *J* = 8.0 Hz, 1H), 5.18 (d, *J* = 6.4 Hz, 1H), 4.76 (d, *J* = 11.2 Hz, 1H), 3.55 (d, *J* = 11.2 Hz, 1H), 2.89-2.84 (m, 1H), 1.62 (d, *J* = 6.4 Hz, 3H), 1.23-1.22 (m, 6H); ^{13}C NMR (100 MHz, $CDCl_3$): δ (ppm) 147.6, 145.6, 140.2, 137.0, 130.4, 128.3, 127.5, 125.4, 123.7, 122.1, 118.4, 117.5, 118.2, 50.1, 39.6, 34.2, 24.3, 24.2, 20.3.

The enantiomeric excess was determined by HPLC on a Chiralcel AD-H column (*n*-hexane : isopropanol = 90 : 10, flowing rate = 1.0 mL/min, 25 ^{o}C, UV detection at λ = 254 nm), t_{R1} = 6.9 min (minor), t_{R2} = 7.4 min (major).

5. References

1. (a) K.-J. Haack, S. Hashiguchi, A. Fujii, T. Ikariya, R. Noyori, *Angew. Chem., Int. Ed.* **1997**, *36*, 285; (b) F. Chen, T. Wang, Z. Ding, Y. He, Z. Li, L. Xu, Q.-H. Fan, *Chem. Eur. J*. **2011**, *17*, 1109.
2. K. Gao, C.-B. Yu, W. Li, Y.-G. Zhou, X. Zhang, *Chem. Commun.* **2011**, *47*, 7845.
3. R.-N. Guo, K. Gao, Z.-S. Ye, L. Shi, Y. Li, Y.-G. Zhou, *Pure Appl. Chem.* **2013**, *85*, 843.
4. P. Li, Y. Huang, X. Hu, X.-Q. Dong, X. Zhang, *Org. Lett.* **2017**, *19*, 3855.
5. J. Wang, *Tetrahedron Lett.* **2013**, *54*, 5956.

6. **Copy of NMR spectra**

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PROCNO                   1

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NS                      16
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FIDRES               0.183399 Hz
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RG                   209.09
DW                   83.200 usec
DE                    6.50 usec
TE                   301.6 K
D1              1.00000000 sec
TD0                      1
SFO1           300.1318534 MHz
NUC1                    1H
P1                    8.00 usec
PLW1           18.00000000 W

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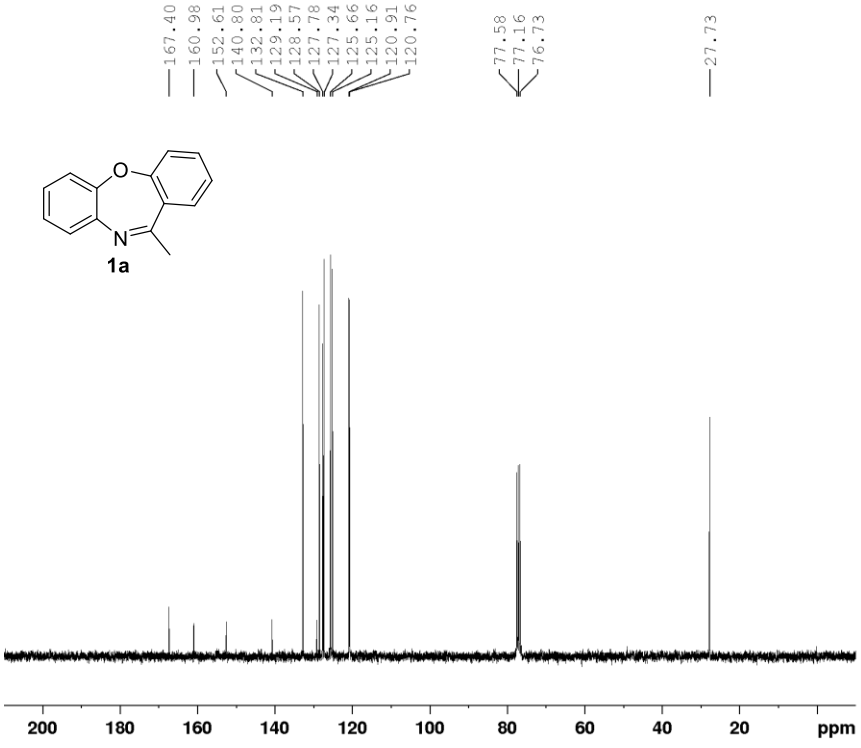


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EXPNO                  173
PROCNO                   1

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DS                       4
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FIDRES               0.550197 Hz
AQ                1.8175317 sec
RG                   209.09
DW                   27.733 usec
DE                    6.50 usec
TE                   301.8 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                      1
SFO1           75.4752949 MHz
NUC1                    13C
P1                   11.00 usec
PLW1          195.00000000 W
SFO2          300.1312005 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2                90.00 usec
PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

F2 - Processing parameters
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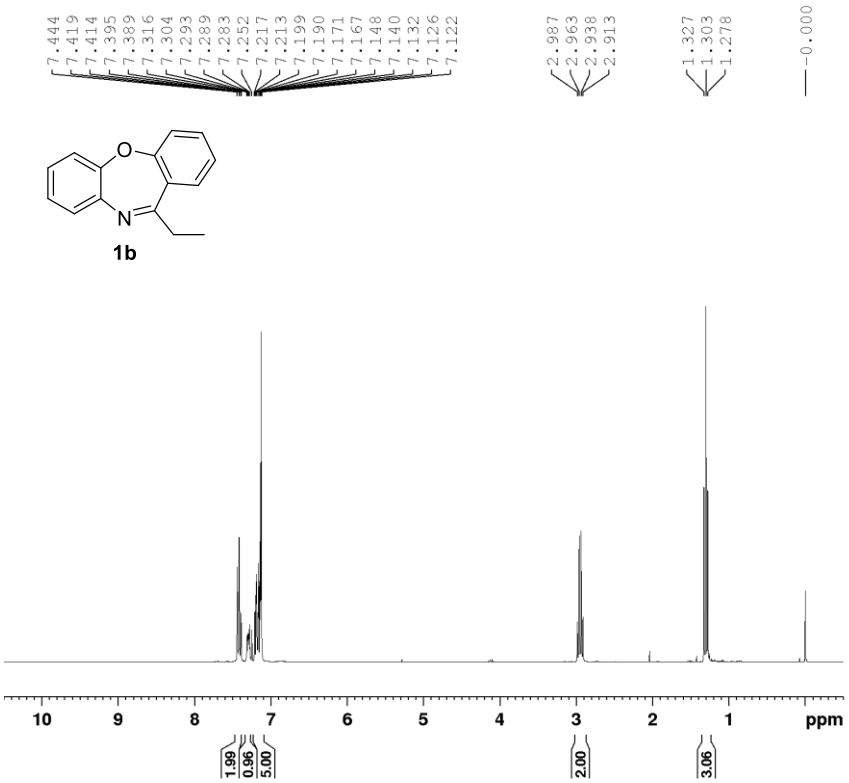


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EXPNO                    3
PROCNO                   1

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PULPROG               zg30
TD                   65536
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NS                      16
DS                       2
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FIDRES             0.183399 Hz
AQ              5.4525952 sec
RG                   209.09
DW                  83.200 usec
DE                   6.50 usec
TE                  297.6 K
D1              1.00000000 sec
TD0                      1
SFO1          300.1318534 MHz
NUC1                    1H
P1                   8.00 usec
PLW1          18.00000000 W

F2 - Processing parameters
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WDW                     EM
SSB                      0
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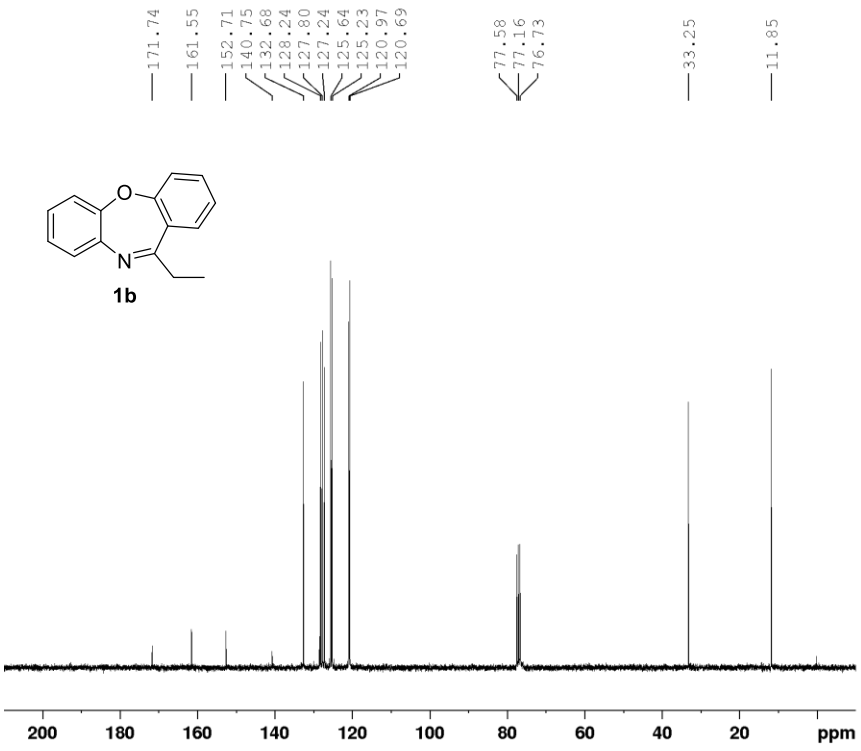


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EXPNO                    4
PROCNO                   1

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PULPROG           zgpg30
TD                   65536
SOLVENT              CDC13
NS                    1024
DS                       4
SWH            18028.846 Hz
FIDRES             0.550197 Hz
AQ              1.8175317 sec
RG                   209.09
DW                  27.733 usec
DE                   6.50 usec
TE                  298.6 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                      1
SFO1          75.4752949 MHz
NUC1                    13C
P1                  11.00 usec
PLW1         195.00000000 W
SFO2         300.1312005 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2                90.00 usec
PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

F2 - Processing parameters
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WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
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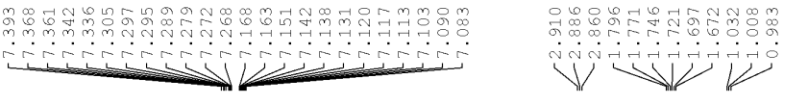

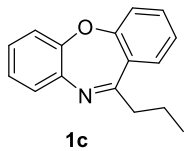

1c

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EXPNO                    5
PROCNO                   1

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NS                     16
DS                      2
SWH              6009.615 Hz
FIDRES           0.183399 Hz
AQ               5.4525952 sec
RG                  56.57
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DE                  6.50 usec
TE                 297.8 K
D1              1.00000000 sec
TD0                     1
SFO1           300.1318534 MHz
NUC1                   1H
P1                  8.00 usec
PLW1           18.00000000 W

F2 - Processing parameters
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WDW                    EM
SSB                     0
LB                   0.30 Hz
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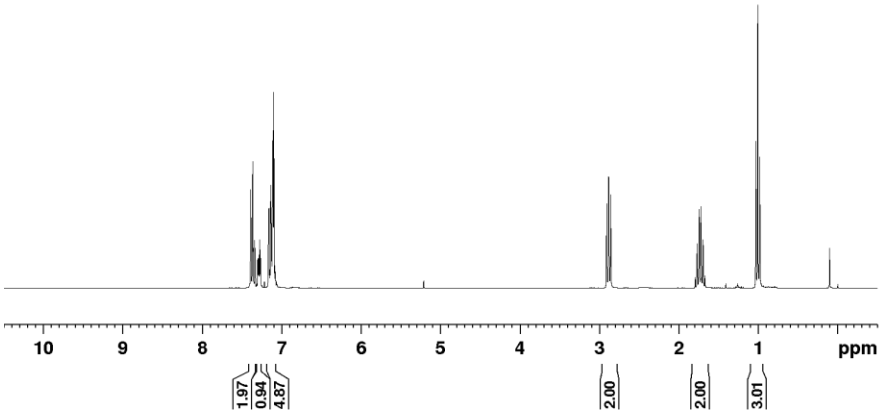

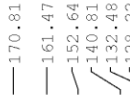

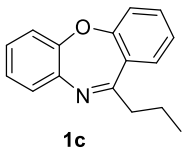

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NS                   1024
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SWH             18028.846 Hz
FIDRES           0.550197 Hz
AQ               1.8175317 sec
RG                  209.09
DW                 27.733 usec
DE                  6.50 usec
TE                 297.5 K
D1              2.00000000 sec
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TD0                     1
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NUC1                   13C
P1                 11.00 usec
PLW1          195.00000000 W
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NUC2                   1H
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PCPD2              90.00 usec
PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

F2 - Processing parameters
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GB                      0
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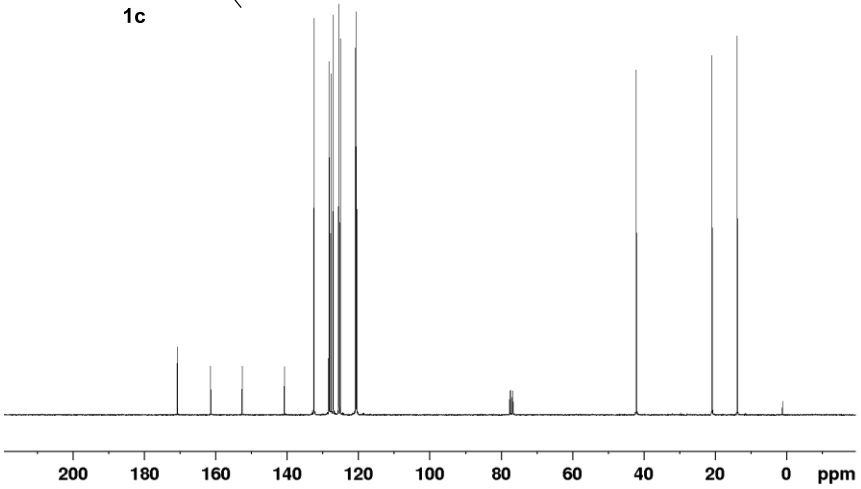

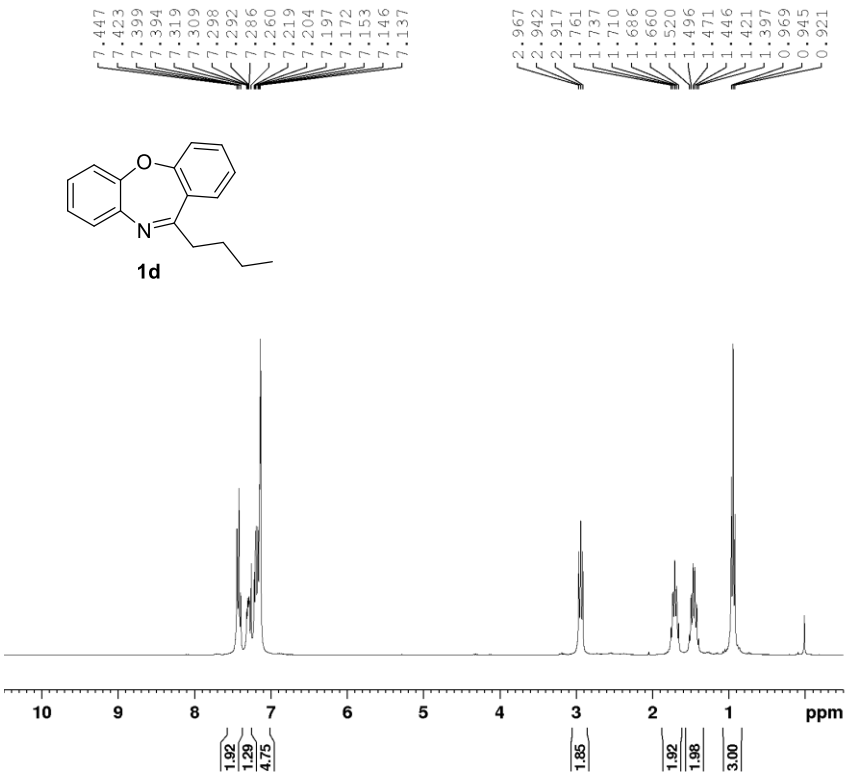


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EXPNO                    7
PROCNO                   1

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PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             6009.615 Hz
FIDRES          0.183399 Hz
AQ              5.4525952 sec
RG                126.88
DW                83.200 usec
DE                 6.50 usec
TE                296.7 K
D1             1.00000000 sec
TD0                    1
SFO1         300.1318534 MHz
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P1                 8.00 usec
PLW1          18.00000000 W

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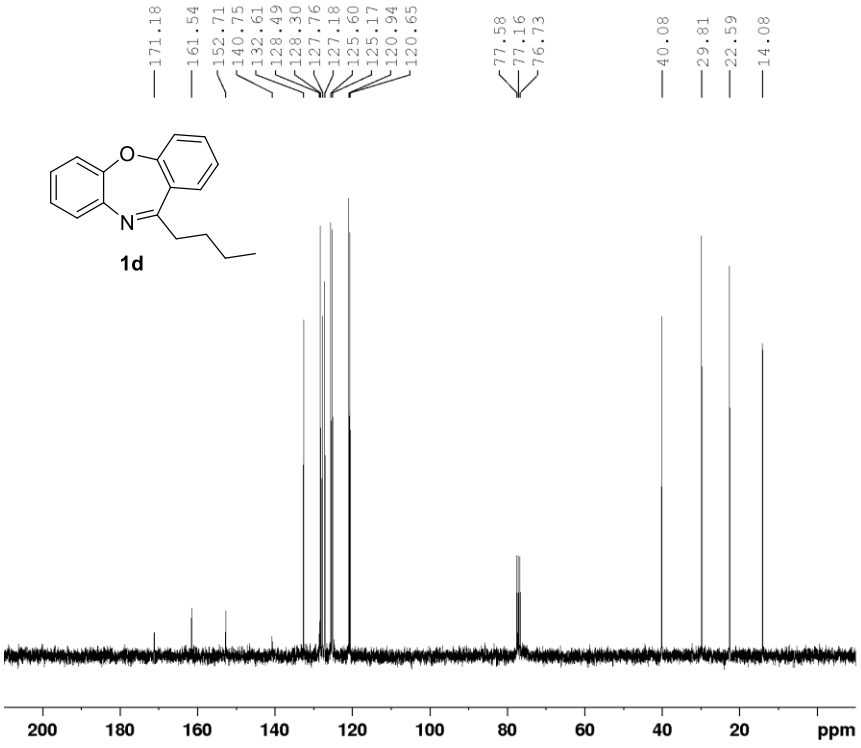


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DS                     4
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FIDRES          0.550197 Hz
AQ              1.8175317 sec
RG                209.09
DW                27.733 usec
DE                 6.50 usec
TE                297.2 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                    1
SFO1          75.4752949 MHz
NUC1                  13C
P1                11.00 usec
PLW1         195.00000000 W
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NUC2                  1H
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PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

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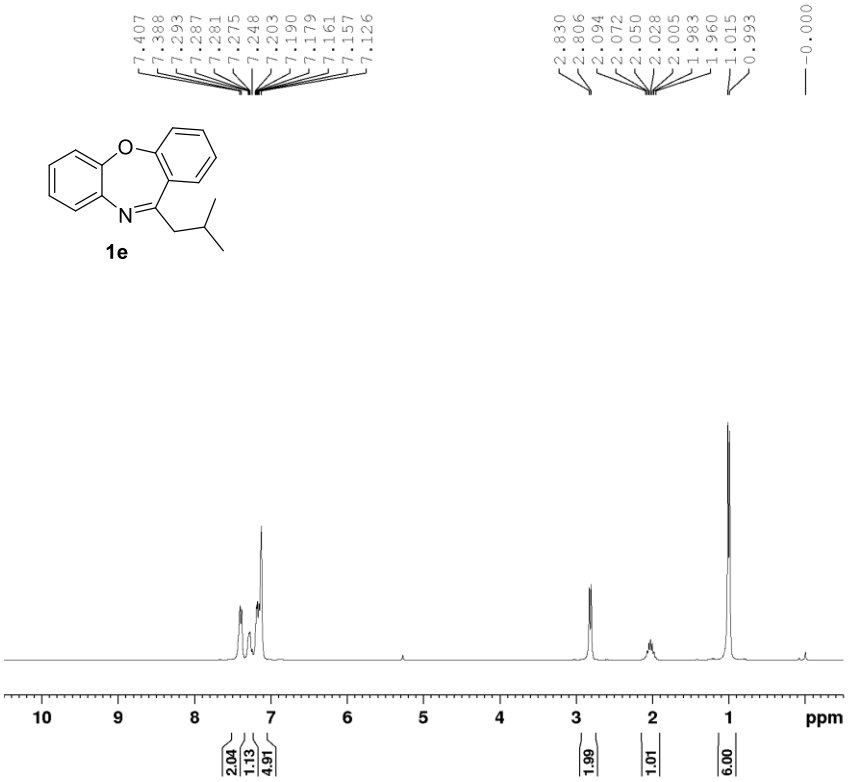


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SOLVENT              CDC13
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FIDRES             0.183399 Hz
AQ                 5.4525952 sec
RG                    142.81
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DE                     6.50 usec
TE                    298.3 K
D1              1.00000000 sec
TD0                      1
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P1                     8.00 usec
PLW1           18.00000000 W

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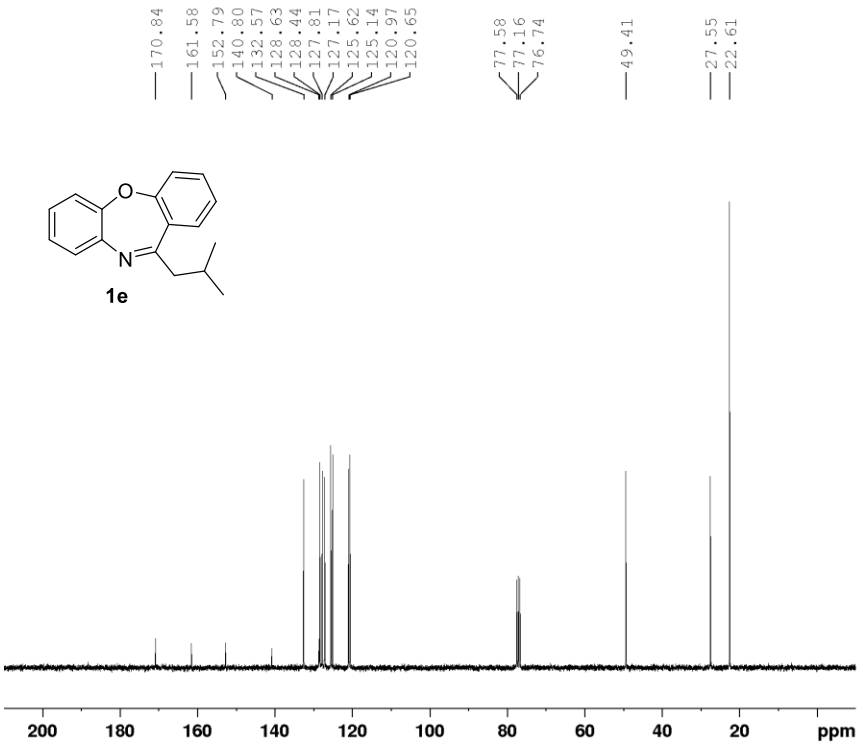


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TD                   65536
SOLVENT              CDC13
NS                     252
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FIDRES             0.550197 Hz
AQ                 1.8175317 sec
RG                    209.09
DW                    27.733 usec
DE                     6.50 usec
TE                    298.3 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                      1
SFO1           75.4752949 MHz
NUC1                    13C
P1                    11.00 usec
PLW1          195.00000000 W
SFO2          300.1312005 MHz
NUC2                    1H
CPDPRG[2             waltz16
PCPD2                 90.00 usec
PLW2           14.00000000 W
PLW12           0.17284000 W
PLW13           0.14000000 W

F2 - Processing parameters
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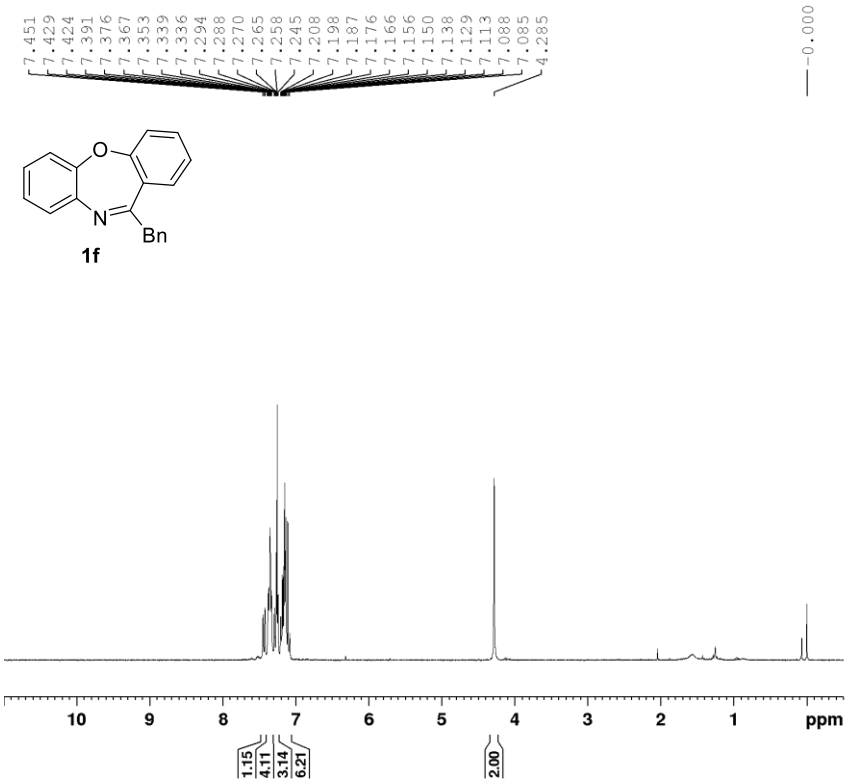


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RG                    209.09
DW                   83.200 usec
DE                    6.50 usec
TE                   298.2 K
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PLW1          18.00000000 W

F2 - Processing parameters
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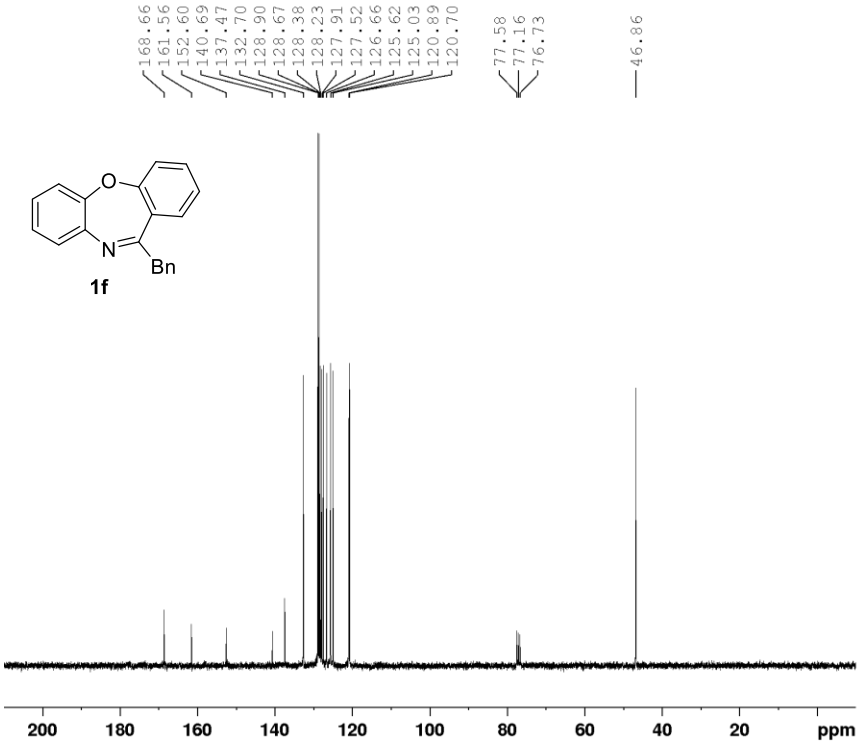
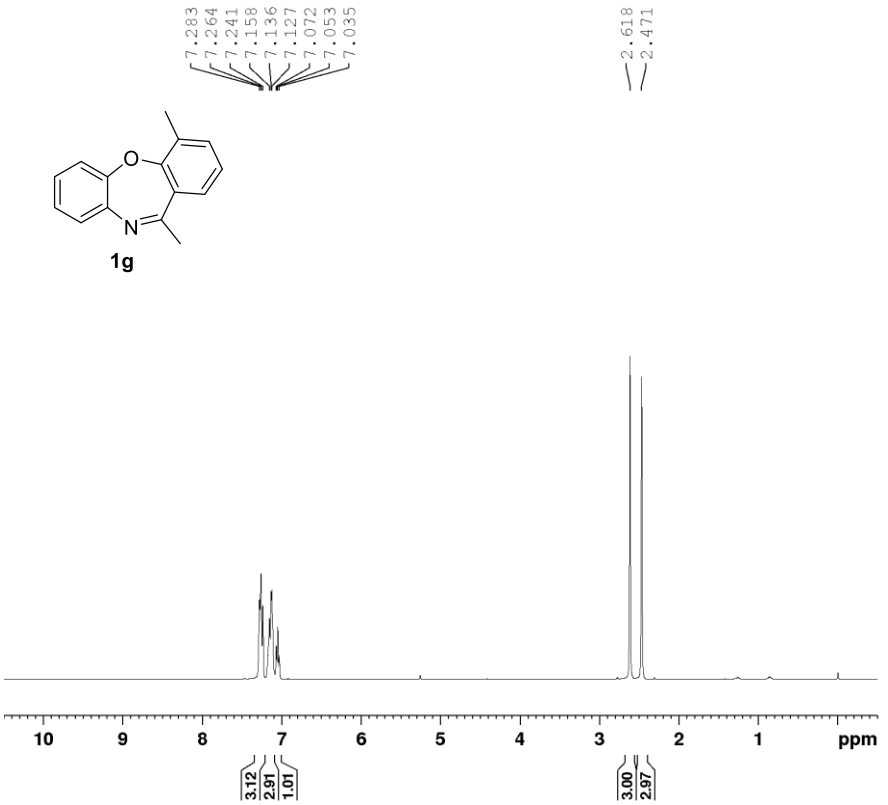
PC                    1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                   12
PROCNO                   1

F2 - Acquisition Parameters
Date_              20211229
Time                 13.41 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG           zgpg30
TD                   65536
SOLVENT              CDC13
NS                      40
DS                       4
SWH              18028.846 Hz
FIDRES               0.550197 Hz
AQ                1.8175317 sec
RG                    209.09
DW                   27.733 usec
DE                    6.50 usec
TE                   298.2 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                      1
SFO1          75.4752949 MHz
NUC1                    13C
P1                   11.00 usec
PLW1         195.00000000 W
SFO2         300.1312005 MHz
NUC2                    1H
CPDPRG[2          waltz16
PCPD2                90.00 usec
PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

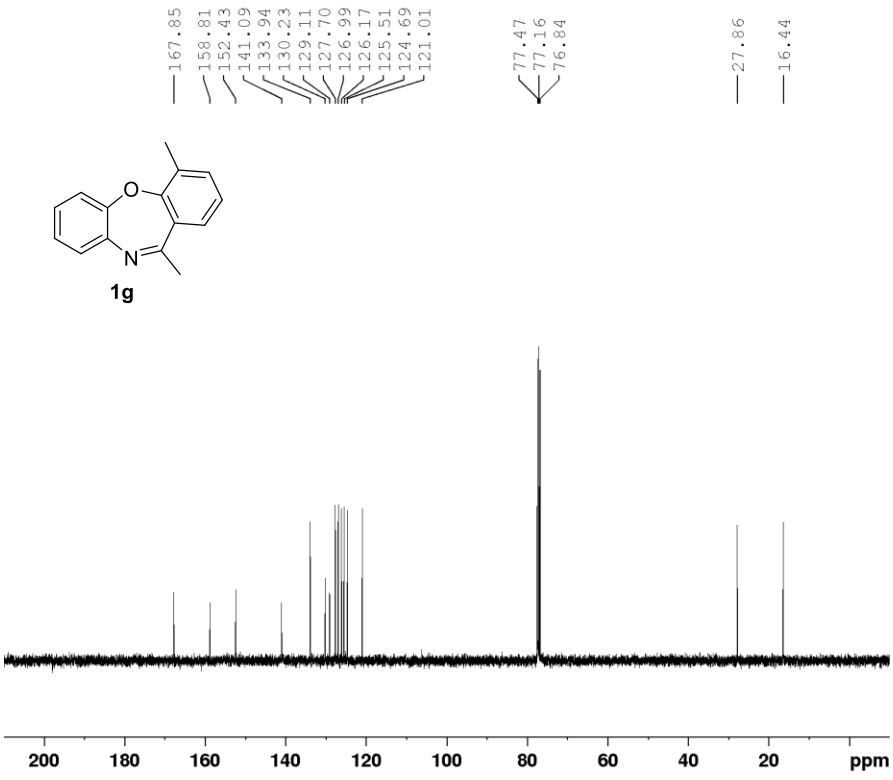
F2 - Processing parameters
SI                   32768
SF            75.4677503 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   13
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230202
Time                10.37 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDC13
NS                     16
DS                      0
SWH              8012.820 Hz
FIDRES           0.489064 Hz
AQ               2.0447233 sec
RG                  65.71
DW                62.400 usec
DE                 6.50 usec
TE                298.0 K
D1             2.00000000 sec
TD0                     1
SFO1          400.2424716 MHz
NUC1                   1H
P1                 14.30 usec
PLW1          12.00000000 W

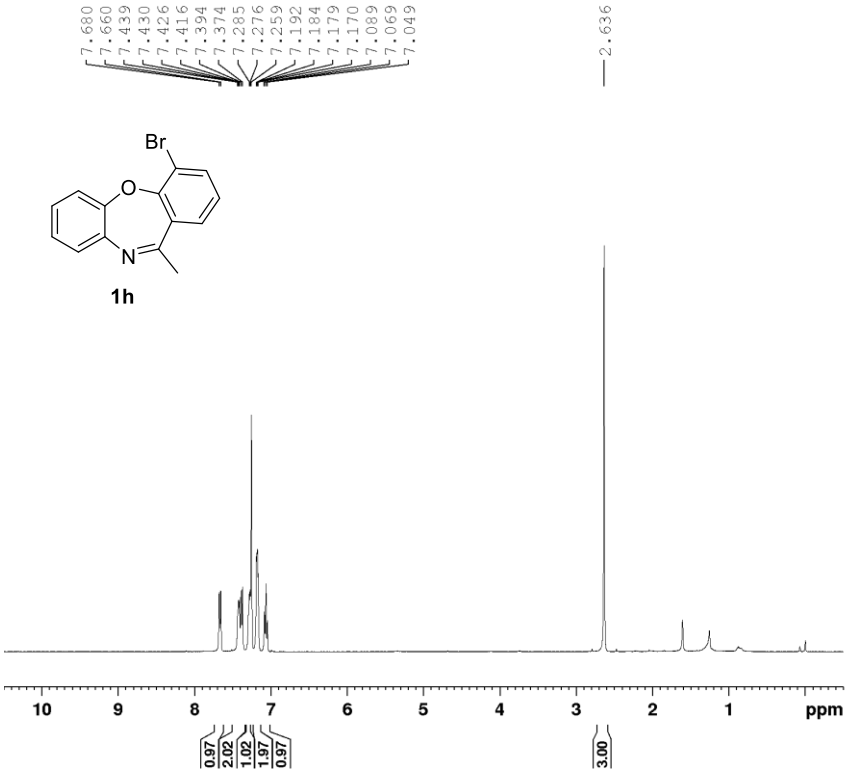
F2 - Processing parameters
SI                  65536
SF            400.2400178 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                   14
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230202
Time                10.38 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG            zgpg30
TD                  65536
SOLVENT             CDC13
NS                     55
DS                      4
SWH             24038.461 Hz
FIDRES           0.733596 Hz
AQ               1.3631488 sec
RG                 206.33
DW                20.800 usec
DE                 6.50 usec
TE                298.1 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                     1
SFO1          100.6504916 MHz
NUC1                  13C
P1                 10.00 usec
PLW1           54.00000000 W
SFO2          400.2416010 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

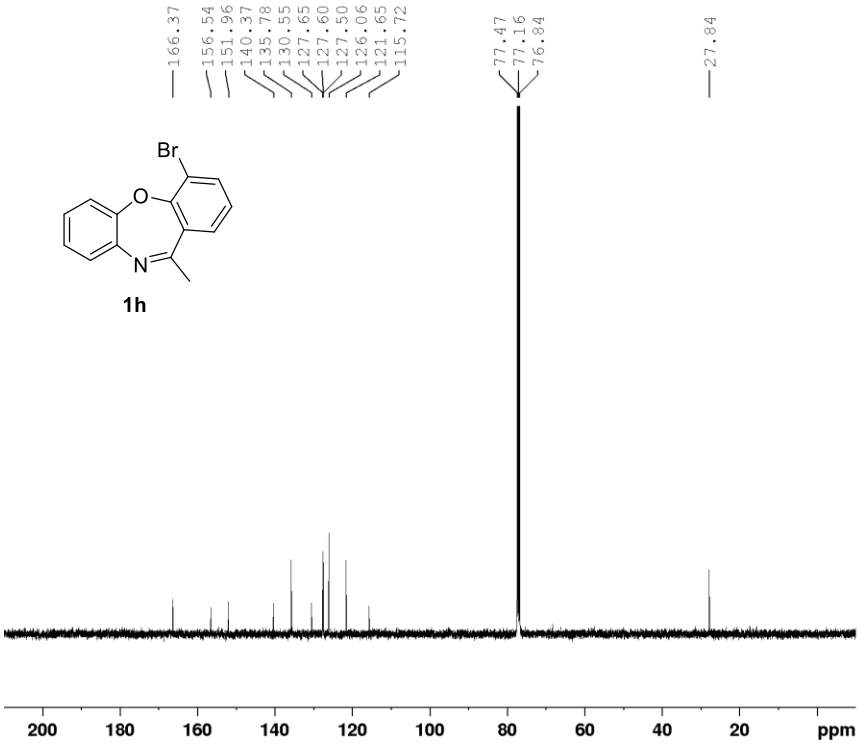
F2 - Processing parameters
SI                  32768
SF            100.6404220 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  244
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time              16.42 h
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             8012.820 Hz
FIDRES          0.489064 Hz
AQ              2.0447233 sec
RG                 206.33
DW                 62.400 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
TD0                     1
SFO1          400.2424716 MHz
NUC1                   1H
P1                  14.30 usec
PLW1          12.00000000 W

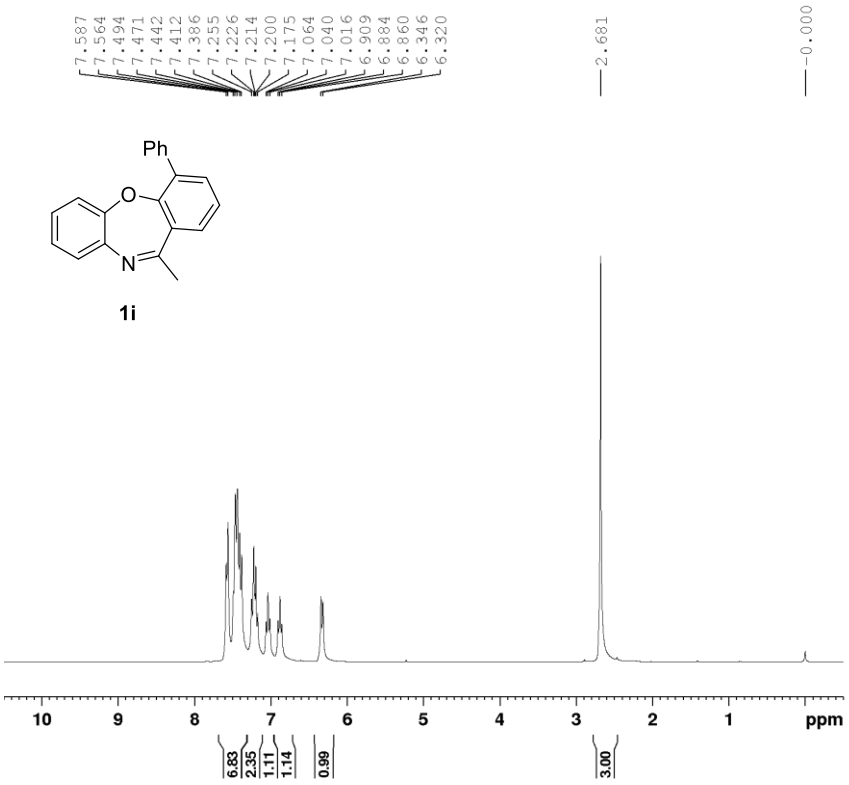
F2 - Processing parameters
SI                  65536
SF            400.2400103 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  265
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time              23.13 h
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT             CDCl3
NS                   1024
DS                      4
SWH            24038.461 Hz
FIDRES          0.733596 Hz
AQ              1.3631488 sec
RG                 206.33
DW                 20.800 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                     1
SFO1          100.6504916 MHz
NUC1                  13C
P1                  10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2               90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

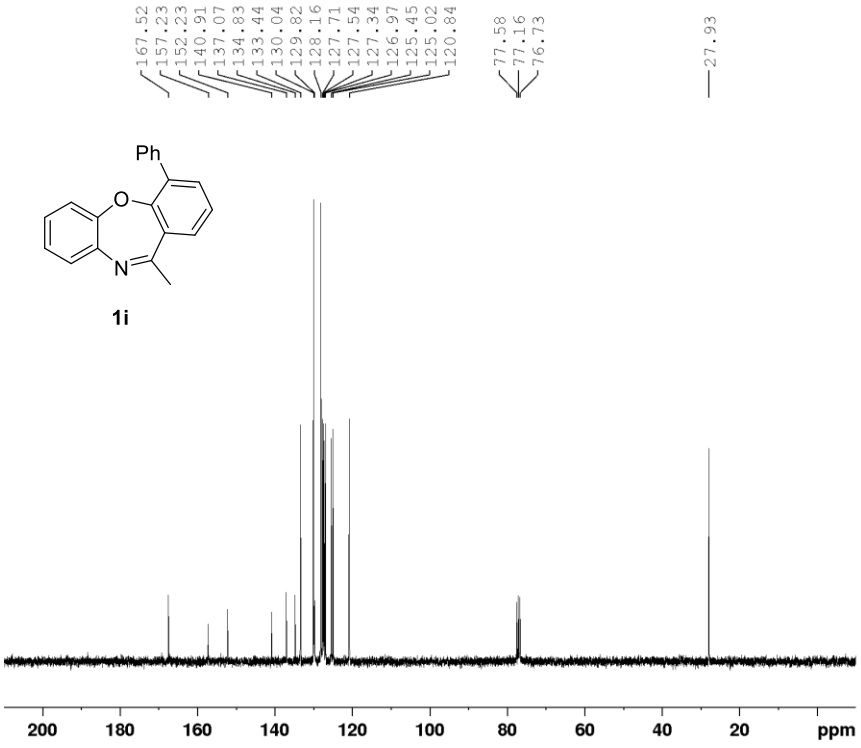
F2 - Processing parameters
SI                  32768
SF            100.6404150 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   19
PROCNO                   1

F2 - Acquisition Parameters
Date_              20221009
Time                 23.29 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG               zg30
TD                   65536
SOLVENT              CDC13
NS                      16
DS                       2
SWH               6009.615 Hz
FIDRES               0.183399 Hz
AQ                5.4525952 sec
RG                     74.53
DW                   83.200 usec
DE                    6.50 usec
TE                   298.2 K
D1             1.00000000 sec
TD0                      1
SFO1          300.1318534 MHz
NUC1                    1H
P1                    8.00 usec
PLW1          18.00000000 W

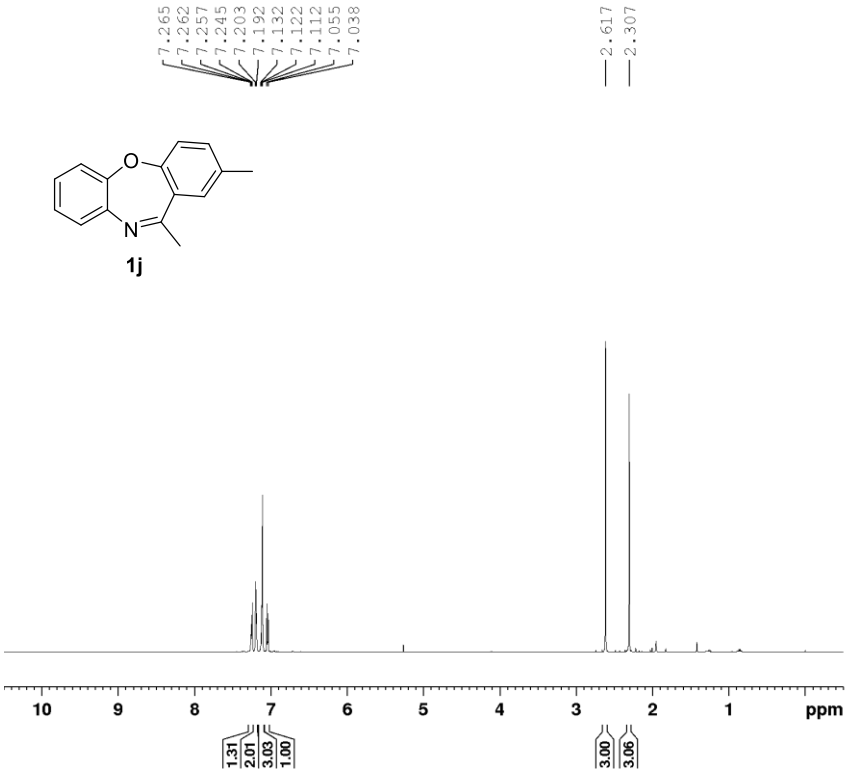
F2 - Processing parameters
SI                   65536
SF            300.1300211 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                   20
PROCNO                   1

F2 - Acquisition Parameters
Date_              20221009
Time                 23.48 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG            zgpg30
TD                   65536
SOLVENT              CDC13
NS                      66
DS                       4
SWH              18028.846 Hz
FIDRES               0.550197 Hz
AQ                1.8175317 sec
RG                   209.09
DW                   27.733 usec
DE                    6.50 usec
TE                   298.3 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                      1
SFO1          75.4752949 MHz
NUC1                   13C
P1                   11.00 usec
PLW1         195.00000000 W
SFO2          300.1312005 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2                90.00 usec
PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

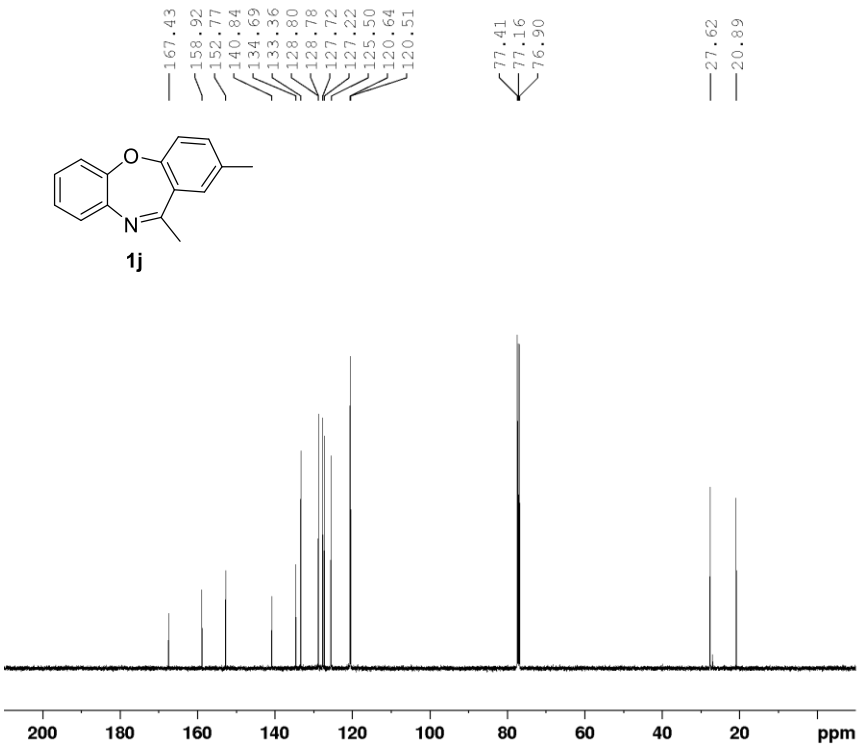
F2 - Processing parameters
SI                   32768
SF            75.4677475 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   21
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221114
Time                19.49 h
INSTRUM               spect
PROBHD   5 mm PADUL 13C
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH             10000.000 Hz
FIDRES              0.305176 Hz
AQ              3.2767999 sec
RG                   87.79
DW                  50.000 usec
DE                   6.50 usec
TE                      0 K
D1              1.00000000 sec
TD0                      1
SFO1          500.1330885 MHz
NUC1                    1H
P1                  11.30 usec
PLW1          20.00000000 W

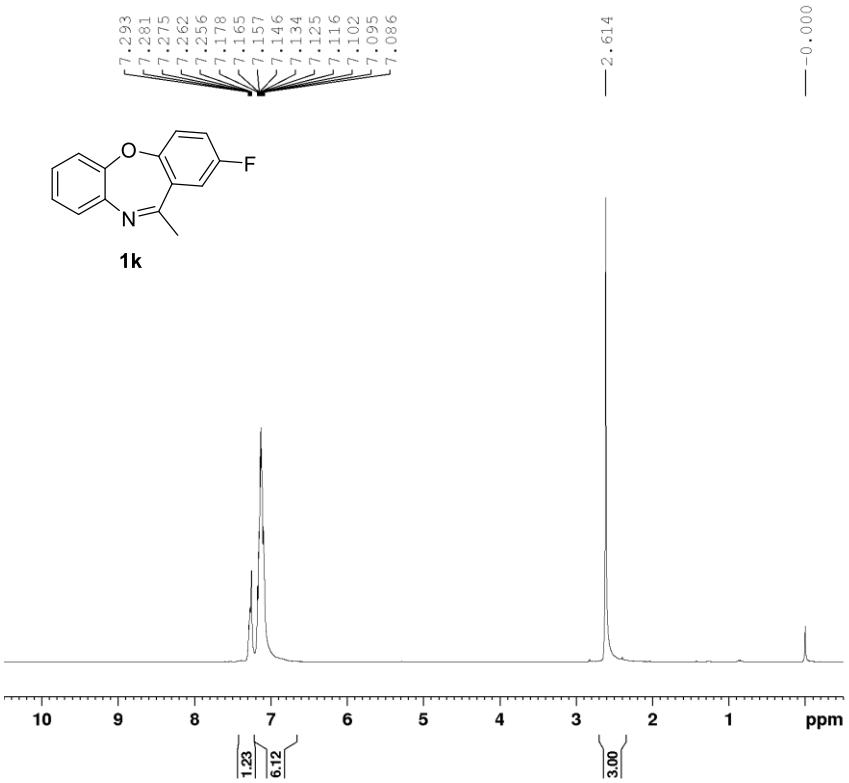
F2 - Processing parameters
SI                   65536
SF            500.1300202 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                   22
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221114
Time                19.53 h
INSTRUM               spect
PROBHD   5 mm PADUL 13C
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     190
DS                       4
SWH             29761.904 Hz
FIDRES              0.908261 Hz
AQ              1.1010048 sec
RG                  192.89
DW                  16.800 usec
DE                   6.50 usec
TE                      0 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                      1
SFO1          125.7703637 MHz
NUC1                   13C
P1                  10.00 usec
PLW1          80.00000000 W
SFO2          500.1320005 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2               80.00 usec
PLW2          20.00000000 W
PLW12          0.39903000 W
PLW13          0.25538000 W

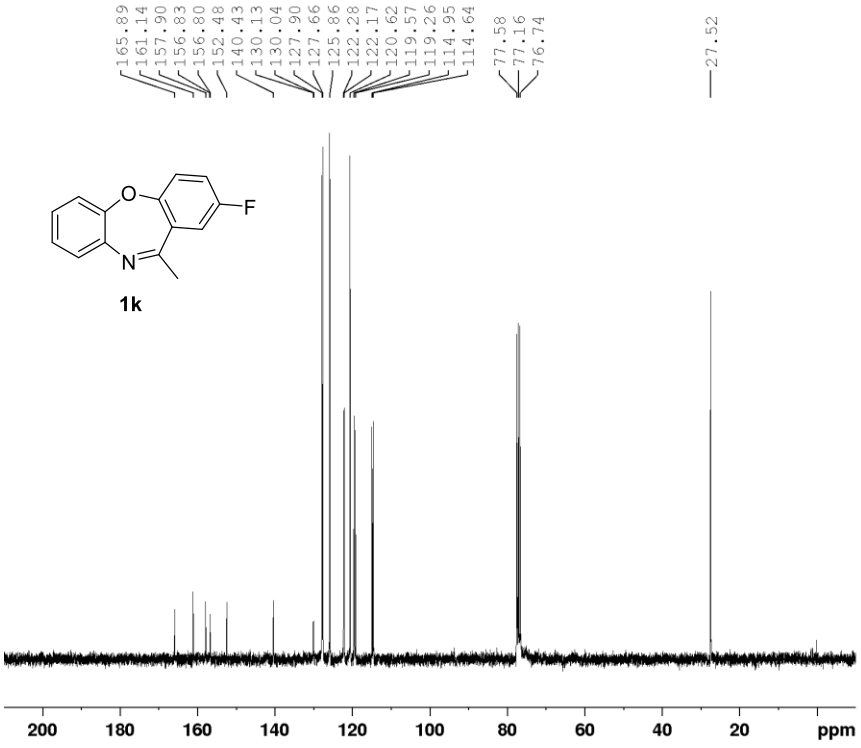
F2 - Processing parameters
SI                   32768
SF            125.7577761 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   21
PROCNO                   1

F2 - Acquisition Parameters
Date_              20221010
Time                  1.05 h
INSTRUM              spect
PROBHD    5 mm DUL 13C-1
PULPROG               zg30
TD                   65536
SOLVENT              CDC13
NS                      16
DS                       2
SWH               6009.615 Hz
FIDRES               0.183399 Hz
AQ                5.4525952 sec
RG                     186.23
DW                   83.200 usec
DE                    6.50 usec
TE                   298.3 K
D1             1.00000000 sec
TD0                      1
SFO1          300.1318534 MHz
NUC1                    1H
P1                    8.00 usec
PLW1          18.00000000 W

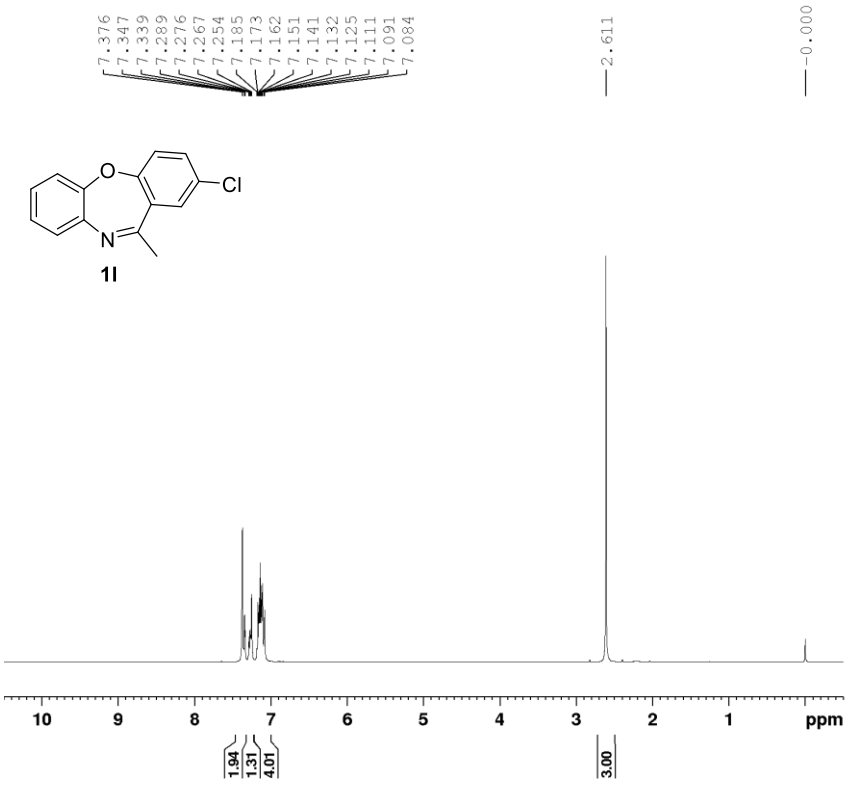
F2 - Processing parameters
SI                   65536
SF            300.1300086 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                   22
PROCNO                   1

F2 - Acquisition Parameters
Date_              20221010
Time                  0.56 h
INSTRUM              spect
PROBHD    5 mm DUL 13C-1
PULPROG           zgpg30
TD                   65536
SOLVENT              CDC13
NS                     923
DS                       4
SWH              18028.846 Hz
FIDRES               0.550197 Hz
AQ                1.8175317 sec
RG                     209.09
DW                   27.733 usec
DE                    6.50 usec
TE                   298.2 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                      1
SFO1          75.4752949 MHz
NUC1                   13C
P1                   11.00 usec
PLW1         195.00000000 W
SFO2         300.1312005 MHz
NUC2                    1H
CPDPRG[2             waltz16
PCPD2                90.00 usec
PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

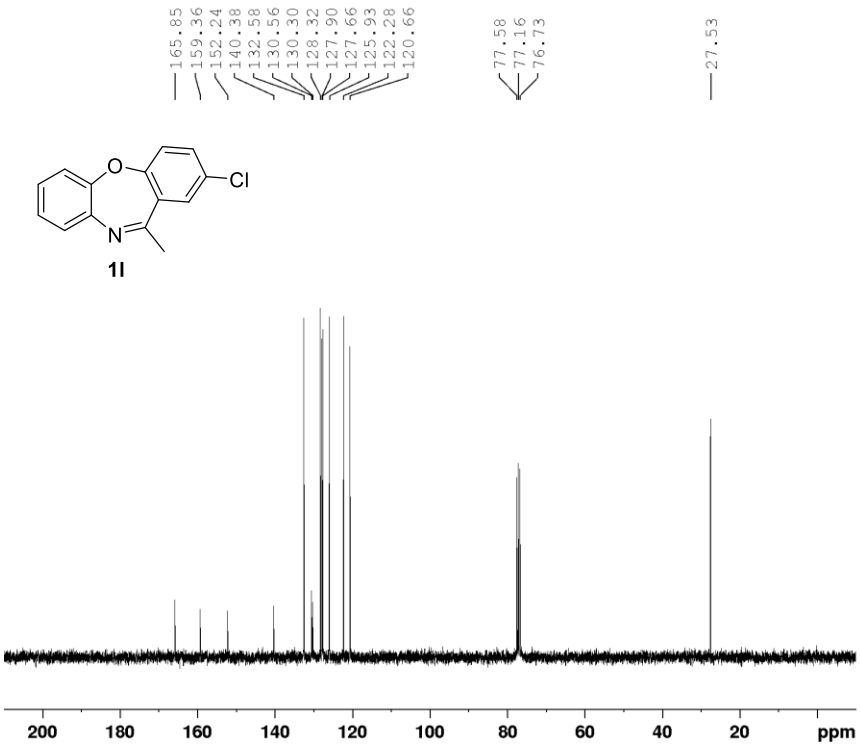
F2 - Processing parameters
SI                   32768
SF            75.4677398 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   23
PROCNO                   1

F2 - Acquisition Parameters
Date_              20220908
Time                 15.50 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG               zg30
TD                   65536
SOLVENT              CDC13
NS                      16
DS                       2
SWH               6009.615 Hz
FIDRES               0.183399 Hz
AQ                5.4525952 sec
RG                   186.23
DW                   83.200 usec
DE                    6.50 usec
TE                   299.9 K
D1             1.00000000 sec
TD0                      1
SFO1          300.1318534 MHz
NUC1                    1H
P1                    8.00 usec
PLW1          18.00000000 W

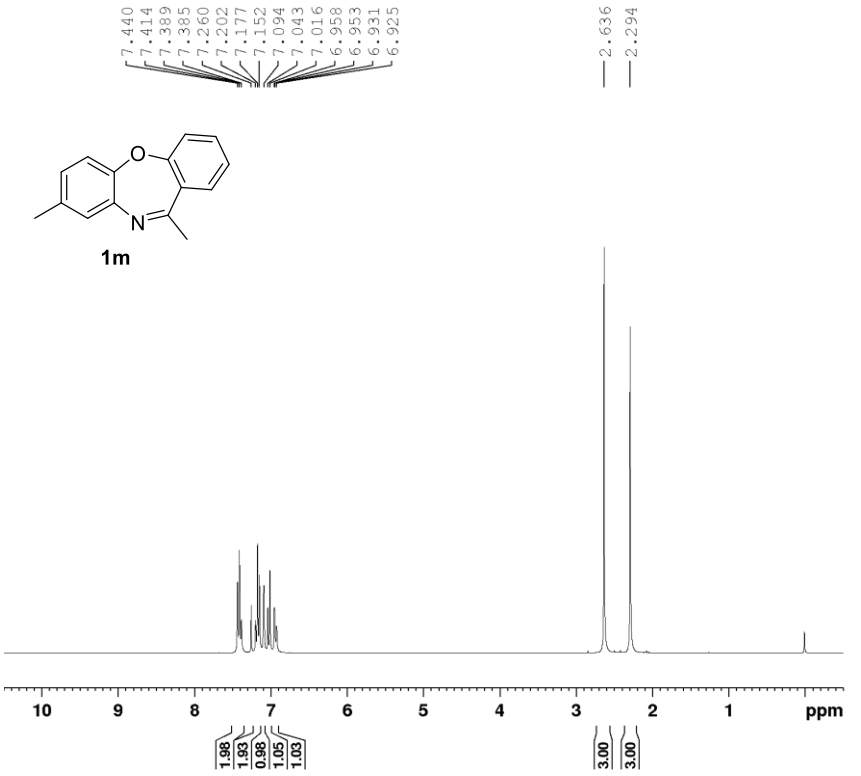
F2 - Processing parameters
SI                   65536
SF            300.1300091 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                   24
PROCNO                   1

F2 - Acquisition Parameters
Date_              20220909
Time                 13.44 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG            zgpg30
TD                   65536
SOLVENT              CDC13
NS                     162
DS                       4
SWH              18028.846 Hz
FIDRES               0.550197 Hz
AQ                1.8175317 sec
RG                   209.09
DW                   27.733 usec
DE                    6.50 usec
TE                   300.6 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                      1
SFO1          75.4752949 MHz
NUC1                   13C
P1                   11.00 usec
PLW1         195.00000000 W
SFO2          300.1312005 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2                90.00 usec
PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

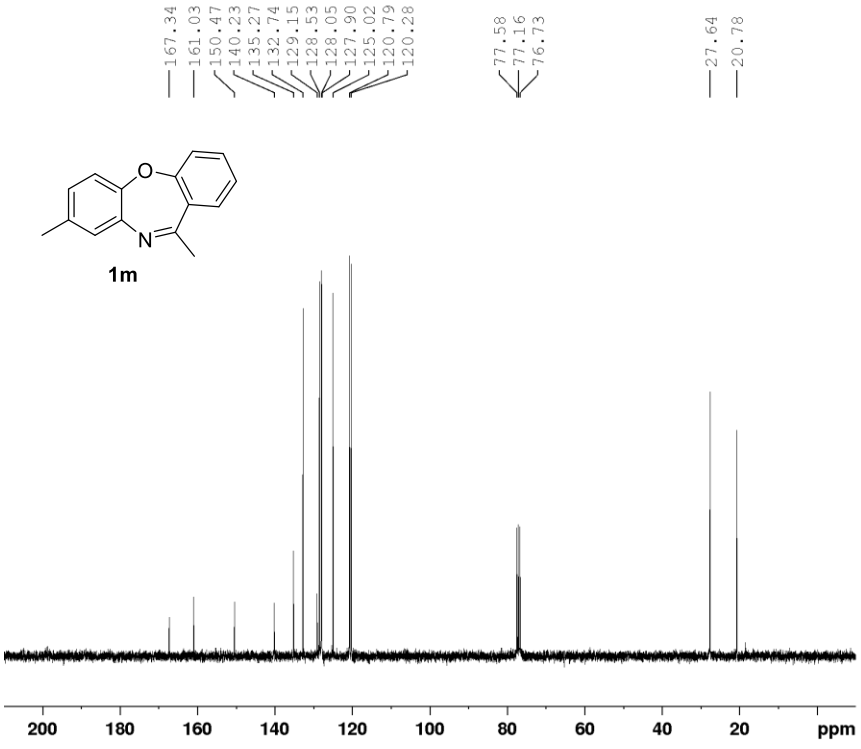
F2 - Processing parameters
SI                   32768
SF            75.4677404 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   25
PROCNO                   1

F2 - Acquisition Parameters
Date_           20220908
Time                15.25 h
INSTRUM              spect
PROBHD    5 mm DUL 13C-1
PULPROG              zg30
TD                  65536
SOLVENT             CDC13
NS                     16
DS                      2
SWH              6009.615 Hz
FIDRES           0.183399 Hz
AQ               5.4525952 sec
RG                  142.81
DW                  83.200 usec
DE                    6.50 usec
TE                  299.9 K
D1              1.00000000 sec
TD0                     1
SFO1          300.1318534 MHz
NUC1                   1H
P1                    8.00 usec
PLW1           18.00000000 W

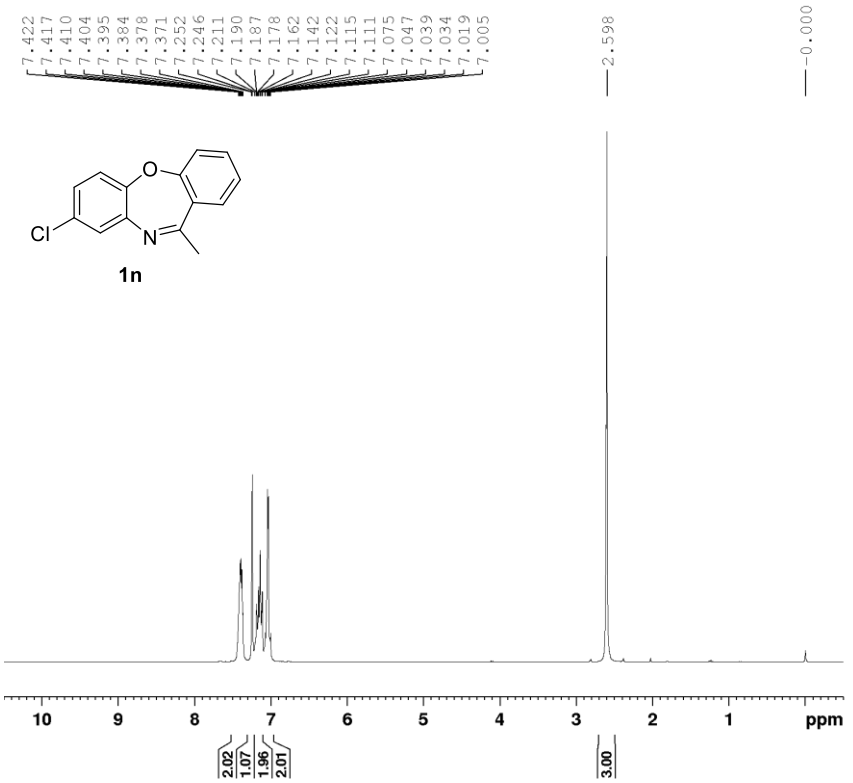
F2 - Processing parameters
SI                  65536
SF            300.1300072 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                   26
PROCNO                   1

F2 - Acquisition Parameters
Date_           20220909
Time                13.28 h
INSTRUM              spect
PROBHD    5 mm DUL 13C-1
PULPROG            zgpg30
TD                  65536
SOLVENT             CDC13
NS                    156
DS                      4
SWH             18028.846 Hz
FIDRES           0.550197 Hz
AQ               1.8175317 sec
RG                  209.09
DW                  27.733 usec
DE                    6.50 usec
TE                  300.1 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                     1
SFO1          75.4752949 MHz
NUC1                   13C
P1                   11.00 usec
PLW1         195.00000000 W
SFO2          300.1312005 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2                90.00 usec
PLW2         14.00000000 W
PLW12         0.17284000 W
PLW13         0.14000000 W

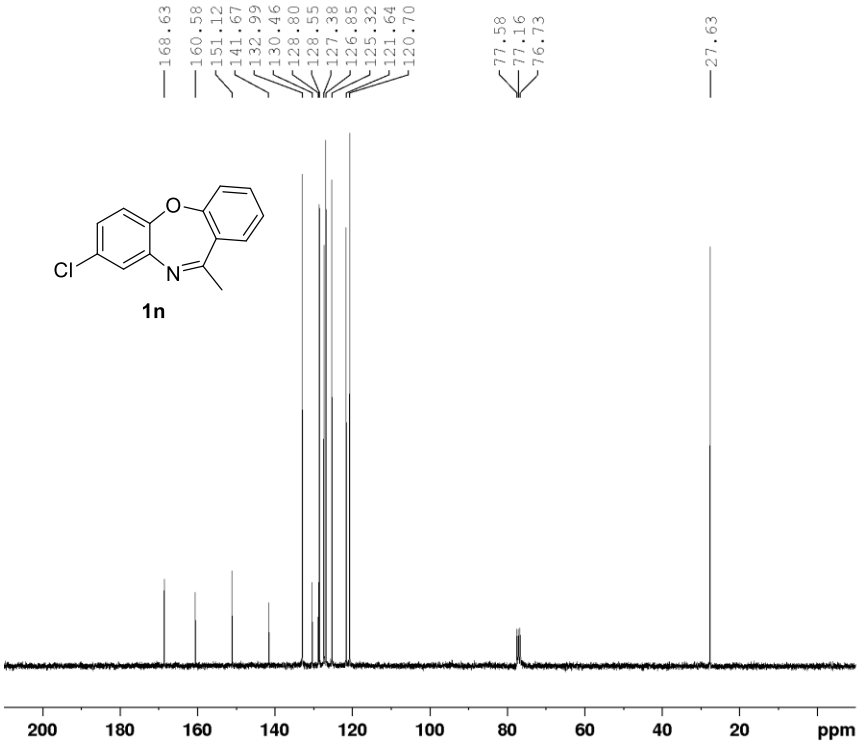
F2 - Processing parameters
SI                  32768
SF            75.4677430 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   27
PROCNO                   1

F2 - Acquisition Parameters
Date_              20220916
Time                  1.26 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG               zg30
TD                   65536
SOLVENT              CDC13
NS                      16
DS                       2
SWH             6009.615 Hz
FIDRES          0.183399 Hz
AQ              5.4525952 sec
RG                   93.25
DW                 83.200 usec
DE                  6.50 usec
TE                 298.3 K
D1              1.00000000 sec
TD0                      1
SFO1          300.1318534 MHz
NUC1                    1H
P1                   8.00 usec
PLW1          18.00000000 W

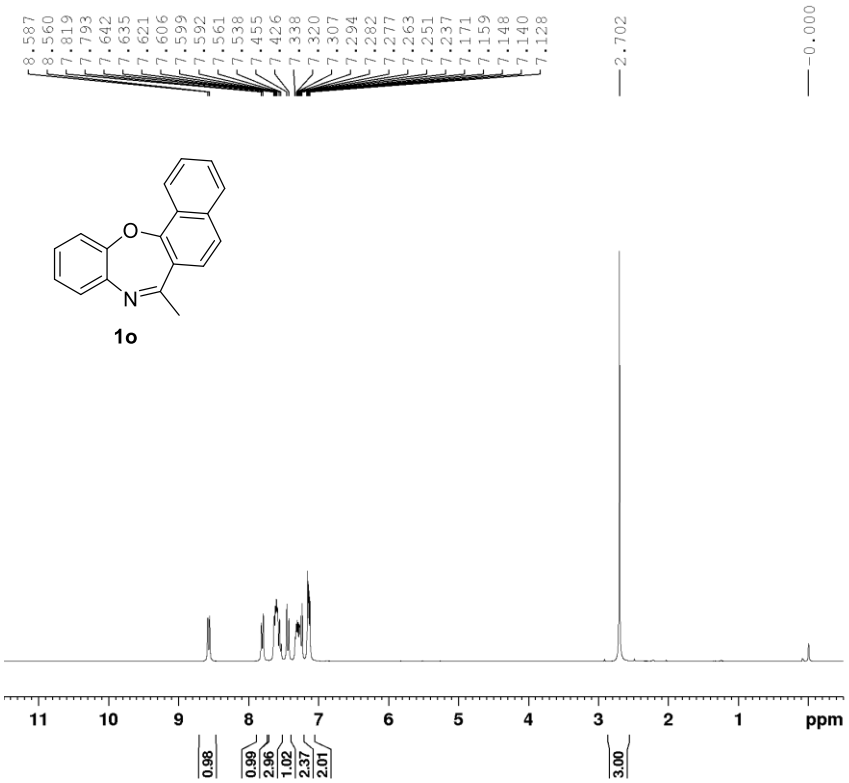
F2 - Processing parameters
SI                   65536
SF            300.1300113 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                   28
PROCNO                   1

F2 - Acquisition Parameters
Date_              20220916
Time                  1.37 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG           zgpg30
TD                   65536
SOLVENT              CDC13
NS                     181
DS                       4
SWH            18028.846 Hz
FIDRES          0.550197 Hz
AQ              1.8175317 sec
RG                  209.09
DW                 27.733 usec
DE                  6.50 usec
TE                 298.5 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                      1
SFO1          75.4752949 MHz
NUC1                    13C
P1                  11.00 usec
PLW1         195.00000000 W
SFO2          300.1312005 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2               90.00 usec
PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

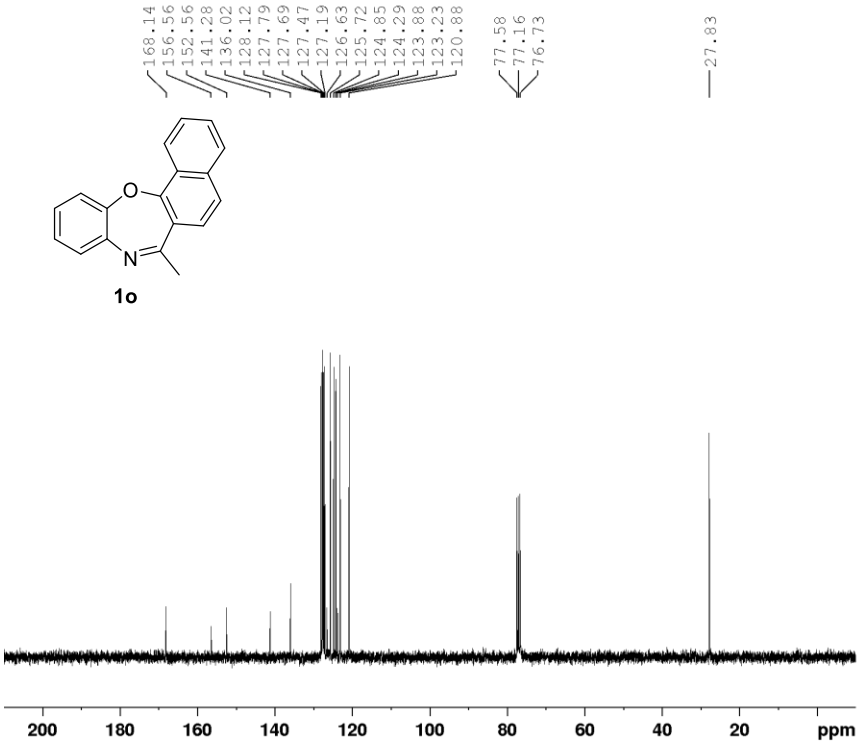
F2 - Processing parameters
SI                   32768
SF            75.4677509 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   29
PROCNO                   1

F2 - Acquisition Parameters
Date_              20220908
Time                 15.45 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG               zg30
TD                   65536
SOLVENT              CDC13
NS                      16
DS                       2
SWH               6009.615 Hz
FIDRES               0.183399 Hz
AQ                5.4525952 sec
RG                    166.41
DW                   83.200 usec
DE                    6.50 usec
TE                   299.9 K
D1             1.00000000 sec
TD0                      1
SFO1          300.1318534 MHz
NUC1                    1H
P1                    8.00 usec
PLW1          18.00000000 W

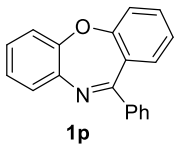
F2 - Processing parameters
SI                   65536
SF            300.1300141 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```



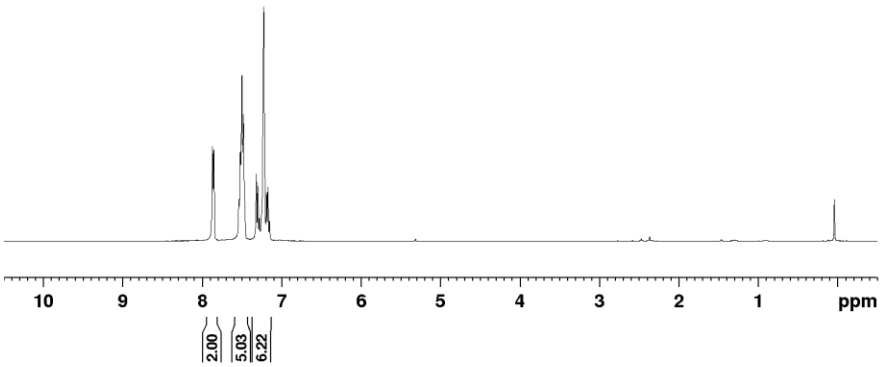

```
Current Data Parameters
NAME                  500M
EXPNO                   30
PROCNO                   1

F2 - Acquisition Parameters
Date_              20220909
Time                 13.53 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG           zgpg30
TD                   65536
SOLVENT              CDC13
NS                     183
DS                       4
SWH              18028.846 Hz
FIDRES               0.550197 Hz
AQ                1.8175317 sec
RG                    209.09
DW                   27.733 usec
DE                    6.50 usec
TE                   300.4 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                      1
SFO1          75.4752949 MHz
NUC1                    13C
P1                   11.00 usec
PLW1         195.00000000 W
SFO2         300.1312005 MHz
NUC2                    1H
CPDPRG[2          waltz16
PCPD2                90.00 usec
PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

F2 - Processing parameters
SI                   32768
SF            75.4677413 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```



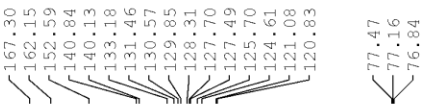
1p

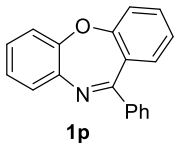



```
Current Data Parameters
NAME                  500M
EXPNO                   65
PROCNO                   1

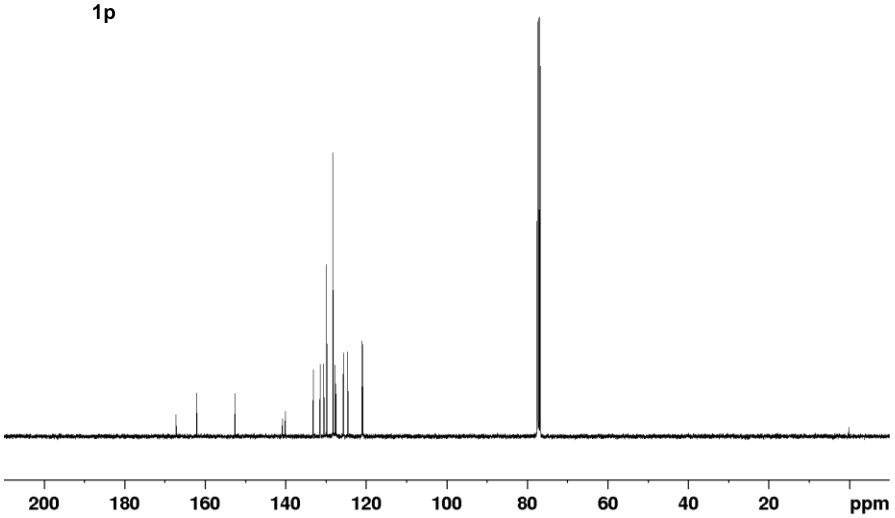
F2 - Acquisition Parameters
Date_           20230301
Time                 20.45 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT              CDC13
NS                      16
DS                       0
SWH               8012.820 Hz
FIDRES               0.489064 Hz
AQ                2.0447233 sec
RG                    206.33
DW                   62.400 usec
DE                    6.50 usec
TE                   298.4 K
D1              2.00000000 sec
TD0                      1
SFO1           400.2424716 MHz
NUC1                    1H
P1                   14.30 usec
PLW1           12.00000000 W

F2 - Processing parameters
SI                    65536
SF              400.2400000 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```





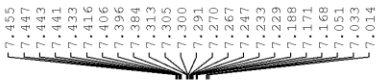
1p

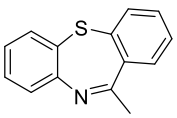



```
Current Data Parameters
NAME                  500M
EXPNO                   66
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230301
Time                 21.44 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG            zgpg30
TD                  65536
SOLVENT              CDC13
NS                    1024
DS                       4
SWH              24038.461 Hz
FIDRES               0.733596 Hz
AQ                1.3631488 sec
RG                    206.33
DW                   20.800 usec
DE                    6.50 usec
TE                   299.2 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                      1
SFO1           100.6504916 MHz
NUC1                   13C
P1                   10.00 usec
PLW1           54.00000000 W
SFO2           400.2416010 MHz
NUC2                    1H
CPDPRG[2          waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                    32768
SF              100.6404180 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```



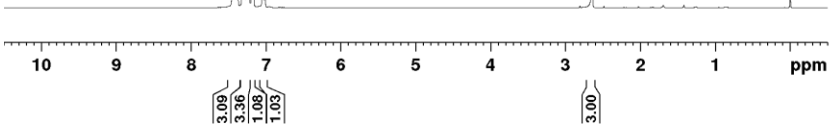


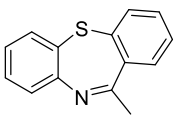
3a

```
Current Data Parameters
NAME      2022-11-05-YZQ-S-Me-Sub
EXPNO                           1
PROCNO                          1

F2 - Acquisition Parameters
Date_              20221105
Time                 20.36 h
INSTRUM                spect
PROBHD   5 mm PABBO BB/
PULPROG                zg30
TD                    32768
SOLVENT               CDCl3
NS                       16
DS                        0
SWH                8012.820 Hz
FIDRES                0.489064 Hz
AQ                 2.0447233 sec
RG                     102.73
DW                    62.400 usec
DE                     6.50 usec
TE                    299.0 K
D1                 2.00000000 sec
TD0                       1
SFO1             400.2424716 MHz
NUC1                     1H
P1                    14.30 usec
PLW1              12.00000000 W

F2 - Processing parameters
SI                    65536
SF               400.2400151 MHz
WDW                      EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```



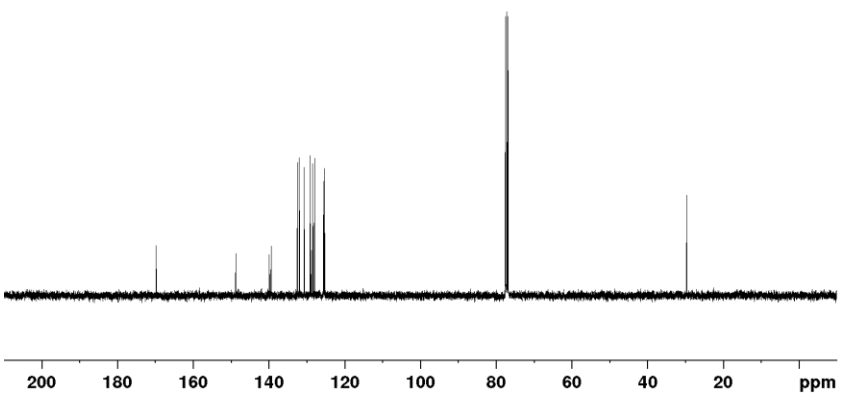


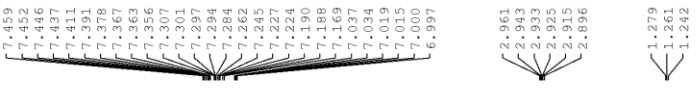
3a

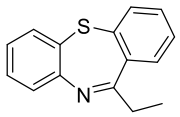
```
Current Data Parameters
NAME      2022-11-05-YZQ-S-Me-Sub
EXPNO                           2
PROCNO                          1

F2 - Acquisition Parameters
Date_              20221105
Time                 20.40 h
INSTRUM                spect
PROBHD   5 mm PABBO BB/
PULPROG              zgpg30
TD                    65536
SOLVENT               CDCl3
NS                       64
DS                        4
SWH               24038.461 Hz
FIDRES                0.733596 Hz
AQ                 1.3631488 sec
RG                     206.33
DW                    20.800 usec
DE                     6.50 usec
TE                    299.6 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                       1
SFO1             100.6504916 MHz
NUC1                     13C
P1                    10.00 usec
PLW1              54.00000000 W
SFO2             400.2416010 MHz
NUC2                     1H
CPDPRG[2             waltz16
PCPD2                 90.00 usec
PLW2              12.00000000 W
PLW12              0.30294999 W
PLW13              0.24539000 W

F2 - Processing parameters
SI                    32768
SF               100.6404188 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```





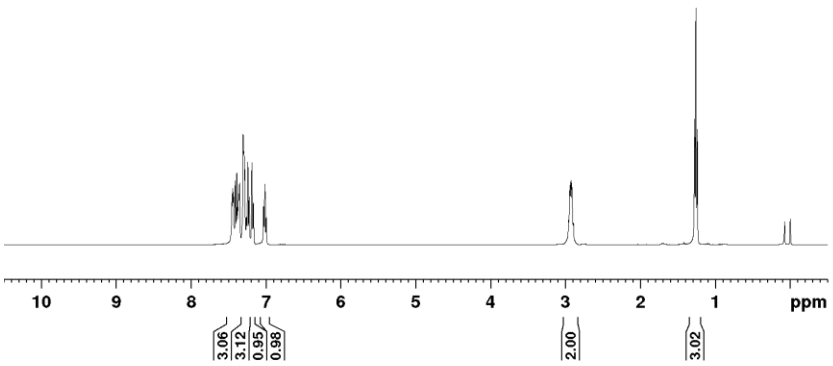


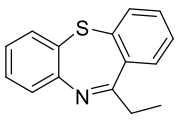
3b

```
Current Data Parameters
NAME      2022-11-05-YZQ-S-Et-Sub
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_              20221105
Time                 20.44 h
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      0
SWH               8012.820 Hz
FIDRES               0.489064 Hz
AQ                2.0447233 sec
RG                     92.09
DW                    62.400 usec
DE                     6.50 usec
TE                   299.0 K
D1                2.00000000 sec
TD0                     1
SFO1            400.2424716 MHz
NUC1                   1H
P1                    14.30 usec
PLW1           12.00000000 W

F2 - Processing parameters
SI                    65536
SF              400.2400156 MHz
WDW                    EM
SSB                     0
LB                    0.30 Hz
GB                      0
PC                    1.00
```



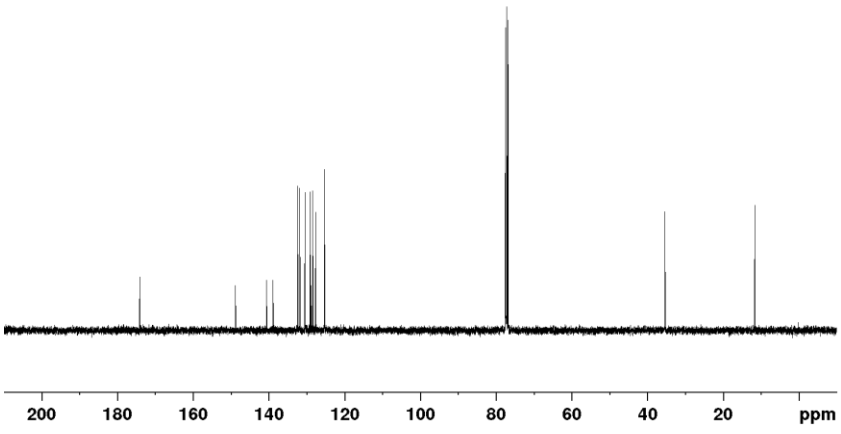


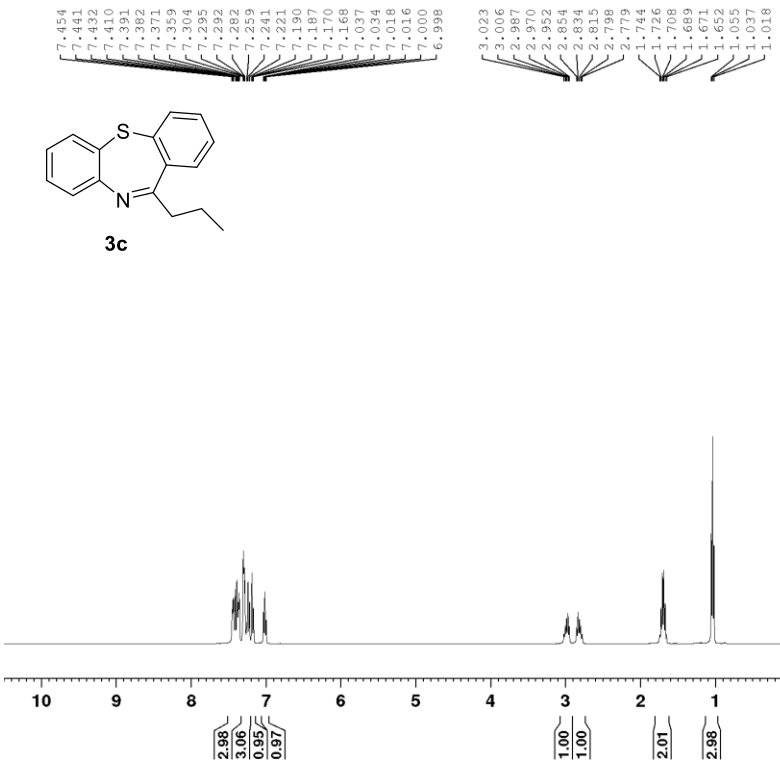
3b

```
Current Data Parameters
NAME      2022-11-05-YZQ-S-Et-Sub
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_              20221105
Time                 20.45 h
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                    100
DS                      4
SWH              24038.461 Hz
FIDRES               0.733596 Hz
AQ                1.3631488 sec
RG                    206.33
DW                    20.800 usec
DE                     6.50 usec
TE                   299.5 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                     1
SFO1            100.6504916 MHz
NUC1                   13C
P1                    10.00 usec
PLW1           54.00000000 W
SFO2            400.2416010 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2                 90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                    32768
SF              100.6404179 MHz
WDW                    EM
SSB                     0
LB                    1.00 Hz
GB                      0
PC                    1.40
```

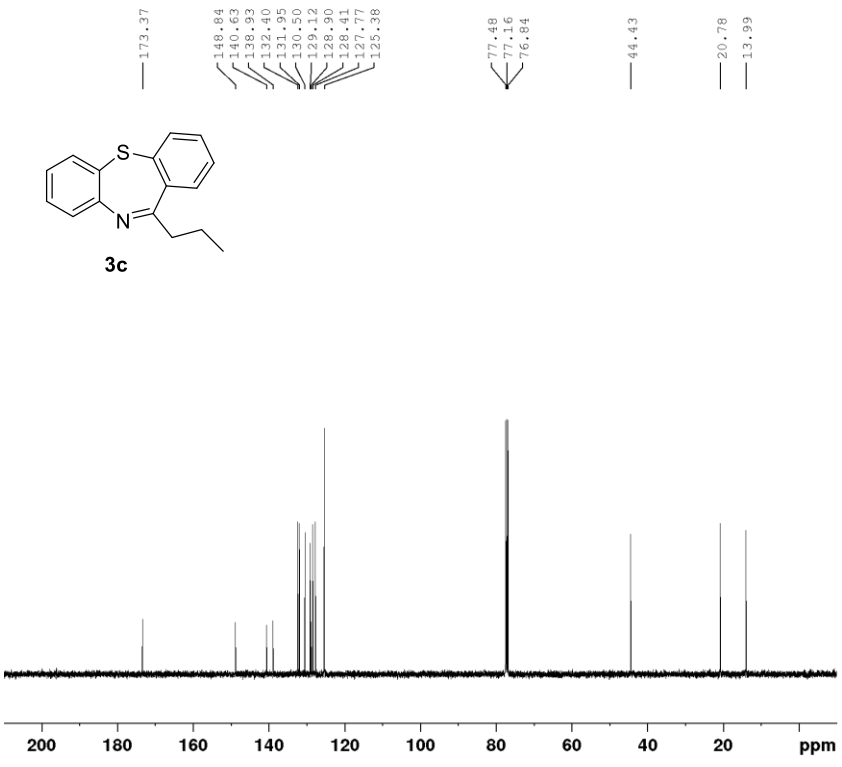





```
Current Data Parameters
NAME      2022-11-05-YZQ-S-n-Pr-Sub
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_           20221105
Time              20.54 h
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    0
SWH            8012.820 Hz
FIDRES         0.489064 Hz
AQ             2.0447233 sec
RG                80.72
DW               62.400 usec
DE                6.50 usec
TE               299.1 K
D1             2.00000000 sec
TD0                   1
SFO1         400.2424716 MHz
NUC1                 1H
P1                14.30 usec
PLW1         12.00000000 W

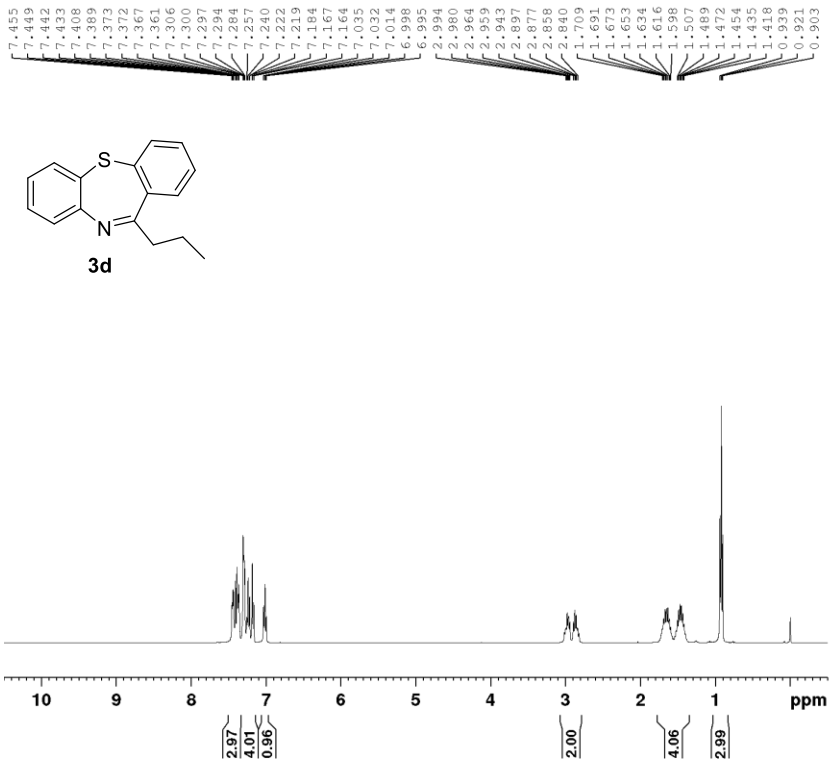
F2 - Processing parameters
SI                65536
SF           400.2400159 MHz
WDW                  EM
SSB                   0
LB                 0.10 Hz
GB                    0
PC                 1.00
```




```
Current Data Parameters
NAME      2022-11-05-YZQ-S-n-Pr-Sub
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_           20221105
Time              20.59 h
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  100
DS                    4
SWH           24038.461 Hz
FIDRES         0.733596 Hz
AQ             1.3631488 sec
RG                206.33
DW               20.800 usec
DE                6.50 usec
TE               299.7 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                   1
SFO1         100.6504916 MHz
NUC1                 13C
P1               10.00 usec
PLW1         54.00000000 W
SFO2         400.2416010 MHz
NUC2                 1H
CPDPRG[2          waltz16
PCPD2             90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

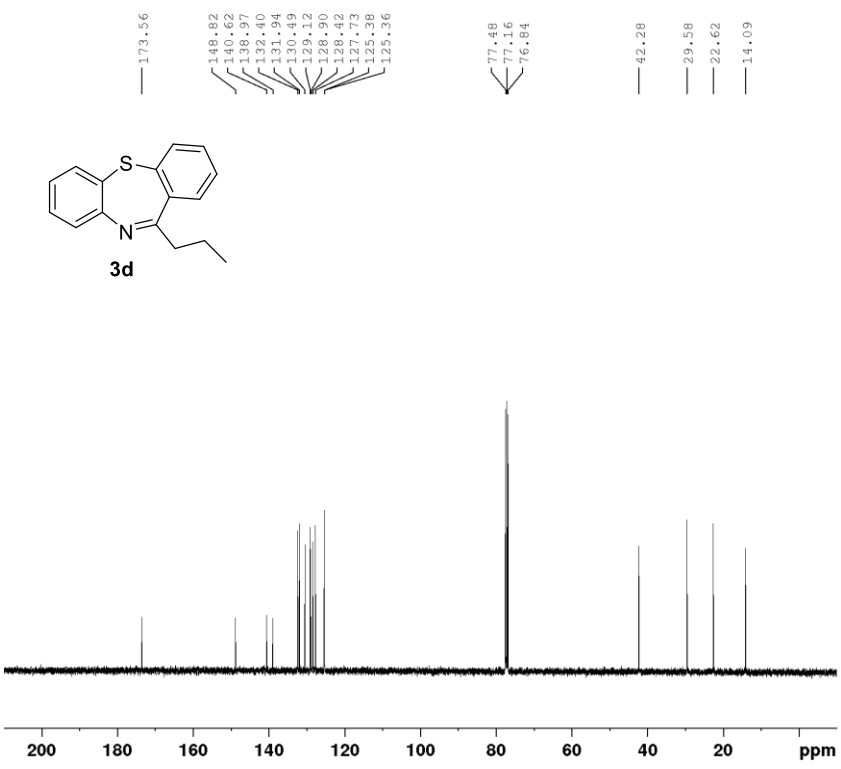
F2 - Processing parameters
SI                32768
SF           100.6404185 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```




```
Current Data Parameters
NAME      2022-11-05-YZQ-S-n-Bu-Sub
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_           20221105
Time              21.04 h
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    0
SWH            8012.820 Hz
FIDRES         0.489064 Hz
AQ             2.0447233 sec
RG                80.72
DW              62.400 usec
DE               6.50 usec
TE              299.1 K
D1           2.00000000 sec
TD0                   1
SFO1         400.2424716 MHz
NUC1                 1H
P1                14.30 usec
PLW1         12.00000000 W

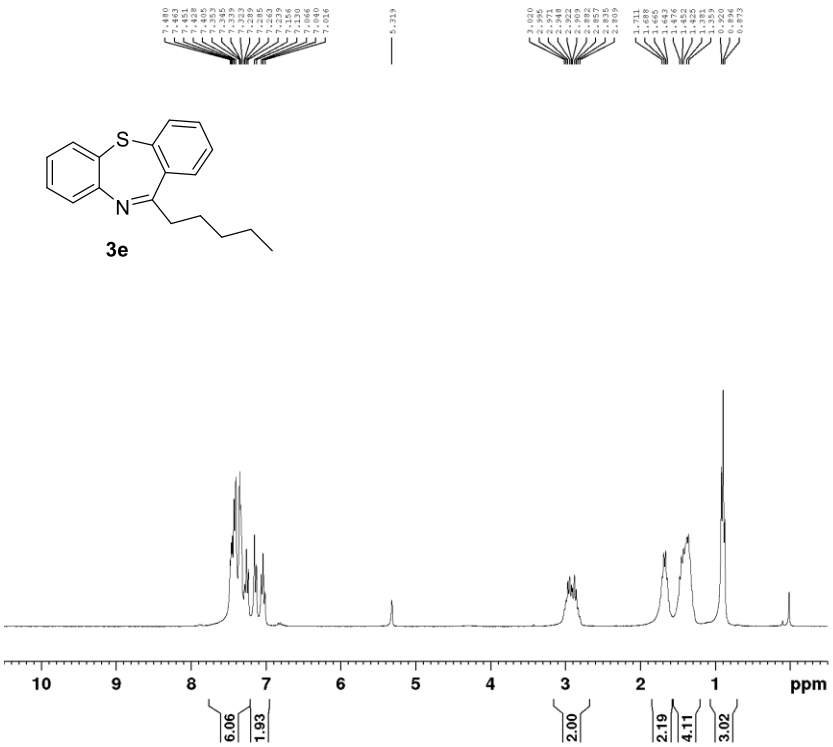
F2 - Processing parameters
SI                65536
SF           400.2400157 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```




```
Current Data Parameters
NAME      2022-11-05-YZQ-S-n-Bu-Sub
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_           20221105
Time              21.05 h
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  100
DS                    4
SWH           24038.461 Hz
FIDRES         0.733596 Hz
AQ             1.3631488 sec
RG                206.33
DW              20.800 usec
DE               6.50 usec
TE              299.5 K
D1           2.00000000 sec
d11          0.03000000 sec
DELTA        1.89999998 sec
TD0                   1
SFO1         100.6504916 MHz
NUC1                 13C
P1                10.00 usec
PLW1         54.00000000 W
SFO2         400.2416010 MHz
NUC2                 1H
CPDPRG[2         waltz16
PCPD2             90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

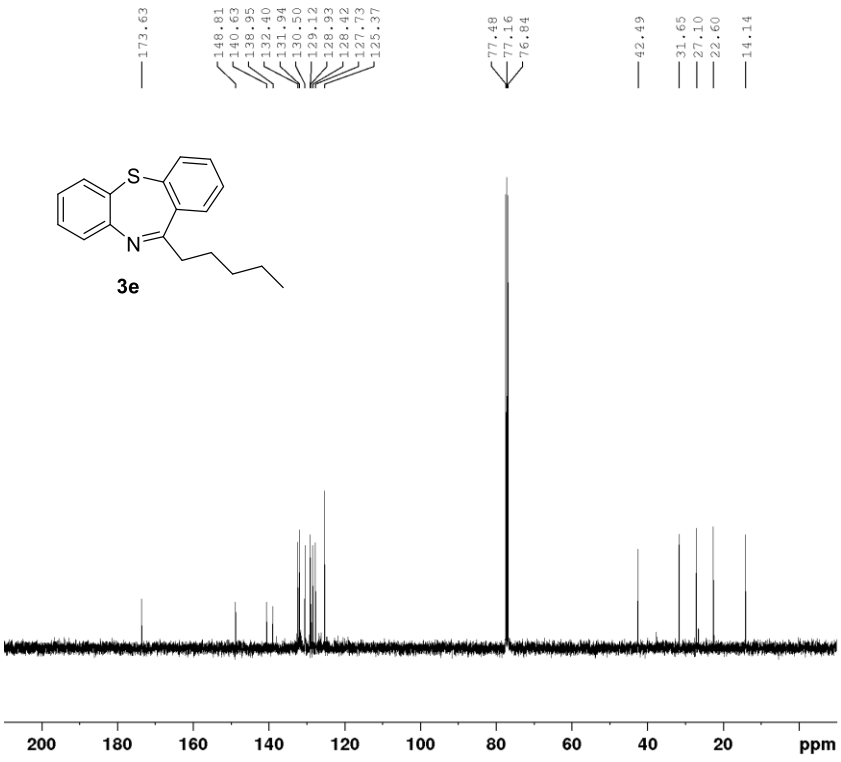
F2 - Processing parameters
SI                32768
SF           100.6404180 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```




```
Current Data Parameters
NAME      2022-11-11-YZQ-S-Pentyl-Sub
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_           20221111
Time              21.32 h
INSTRUM            spect
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                 65536
SOLVENT           CD2Cl2
NS                    12
DS                     2
SWH             6009.615 Hz
FIDRES          0.183399 Hz
AQ              5.4525952 sec
RG                186.23
DW                83.200 usec
DE                 6.50 usec
TE                298.2 K
D1             1.00000000 sec
TD0                    1
SFO1          300.1318534 MHz
NUC1                  1H
P1                 8.00 usec
PLW1          18.00000000 W

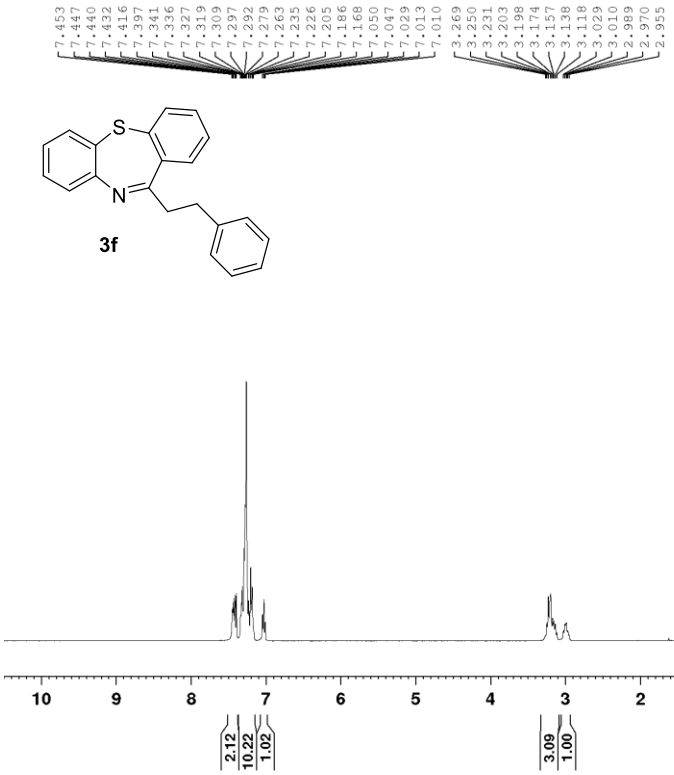
F2 - Processing parameters
SI                 65536
SF            300.1300119 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```




```
Current Data Parameters
NAME      2022-11-05-YZQ-S-n-Pent-Sub
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_           20221105
Time              21.24 h
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                    64
DS                     4
SWH            24038.461 Hz
FIDRES          0.733596 Hz
AQ              1.3631488 sec
RG                206.33
DW                20.800 usec
DE                 6.50 usec
TE                299.6 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                    1
SFO1          100.6504916 MHz
NUC1                  13C
P1                10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

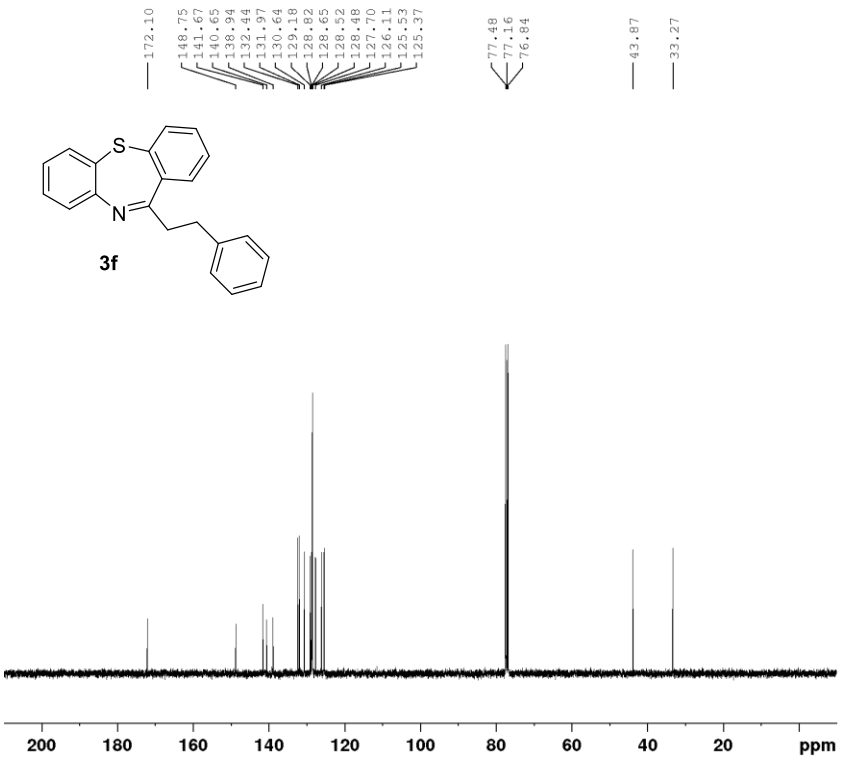
F2 - Processing parameters
SI                 32768
SF            100.6404173 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```




```
Current Data Parameters
NAME      2022-11-05-YZQ-S-CH2CH2Ph-Sub
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_              20221105
Time                 21.30 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT             CDCl3
NS                    16
DS                     0
SWH               8012.820 Hz
FIDRES            0.489064 Hz
AQ                2.0447233 sec
RG                   92.09
DW                  62.400 usec
DE                   6.50 usec
TE                  299.1 K
D1                2.00000000 sec
TD0                    1
SFO1            400.2424716 MHz
NUC1                  1H
P1                  14.30 usec
PLW1           12.00000000 W

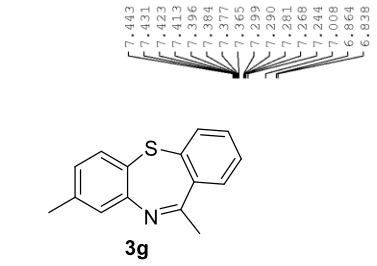
F2 - Processing parameters
SI                 65536
SF              400.2400231 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

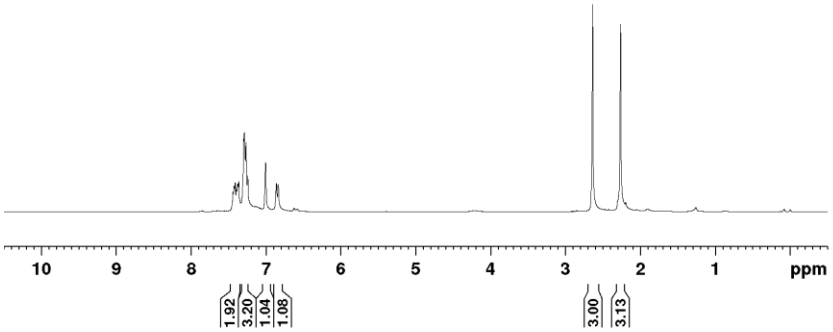



```
Current Data Parameters
NAME      2022-11-05-YZQ-S-CH2CH2Ph-Sub
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_              20221105
Time                 21.34 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT             CDCl3
NS                   100
DS                     4
SWH              24038.461 Hz
FIDRES            0.733596 Hz
AQ                1.3631488 sec
RG                   206.33
DW                  20.800 usec
DE                   6.50 usec
TE                  299.7 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                    1
SFO1            100.6504916 MHz
NUC1                  13C
P1                  10.00 usec
PLW1           54.00000000 W
SFO2            400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2               90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                 32768
SF              100.6404198 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

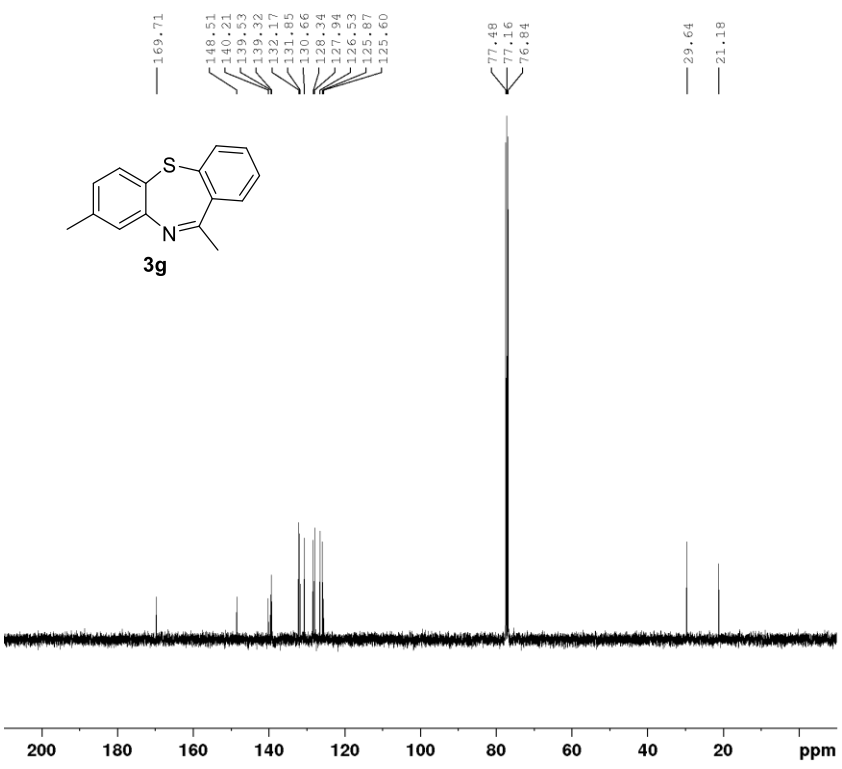





```
Current Data Parameters
NAME      2022-10-27-YZQ-S-P-Me-left-Sul
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_           20221029
Time              11.33 h
INSTRUM             spect
PROBHD    5 mm DUL 13C-1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             6009.615 Hz
FIDRES             0.183399 Hz
AQ              5.4525952 sec
RG                 142.81
DW                 83.200 usec
DE                  6.50 usec
TE                298.2 K
D1             1.00000000 sec
TD0                    1
SFO1          300.1318534 MHz
NUC1                  1H
P1                 8.00 usec
PLW1          18.00000000 W

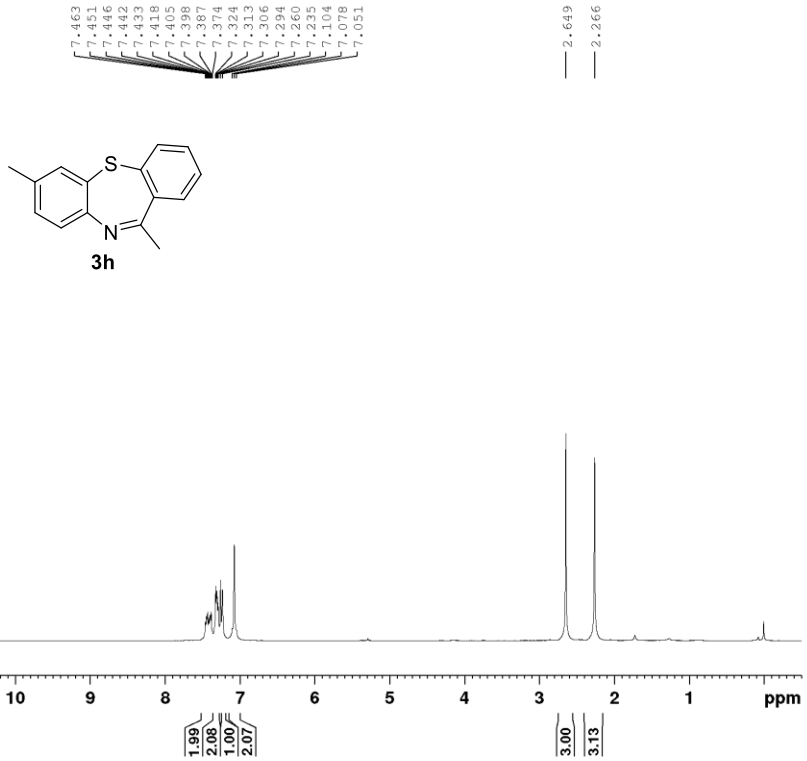
F2 - Processing parameters
SI                 65536
SF            300.1300120 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```




```
Current Data Parameters
NAME      2022-10-27-YZQ-S-P-Me-left-Sub
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_           20221027
Time              16.51 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   128
DS                     4
SWH            24038.461 Hz
FIDRES             0.733596 Hz
AQ              1.3631488 sec
RG                 206.33
DW                 20.800 usec
DE                  6.50 usec
TE                299.0 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                    1
SFO1          100.6504916 MHz
NUC1                  13C
P1                 10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

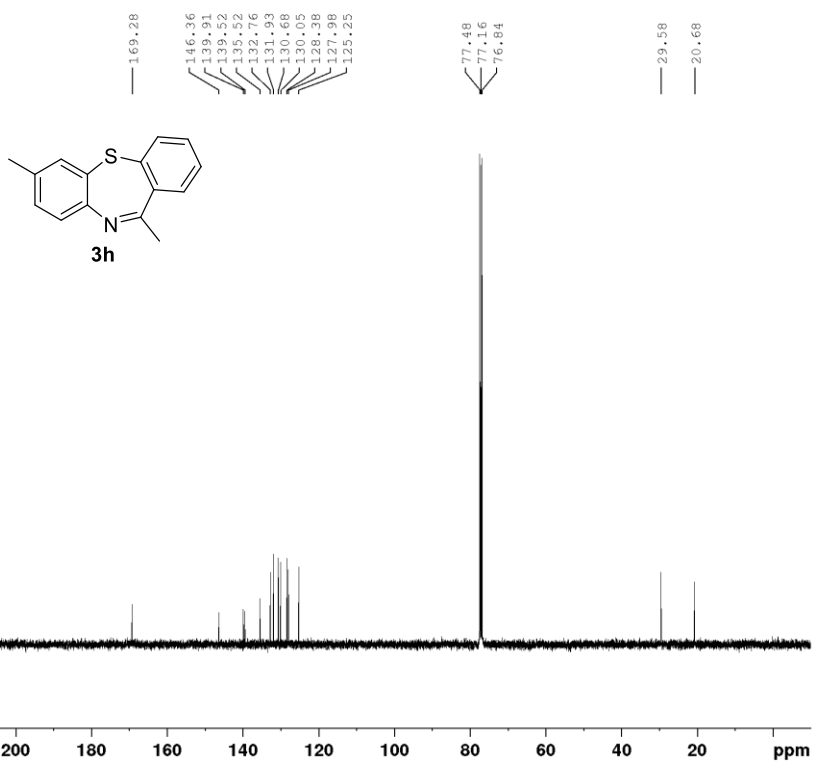
F2 - Processing parameters
SI                 32768
SF            100.6404171 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```




```
Current Data Parameters
NAME      2022-10-28-YZQ-S-Left-M-CH3-Sub
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_           20221028
Time              13.40 h
INSTRUM             spect
PROBHD    5 mm DUL 13C-1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             6009.615 Hz
FIDRES          0.183399 Hz
AQ              5.4525952 sec
RG                 209.09
DW                 83.200 usec
DE                  6.50 usec
TE                298.3 K
D1             1.00000000 sec
TD0                    1
SFO1          300.1318534 MHz
NUC1                  1H
P1                 8.00 usec
PLW1          18.00000000 W

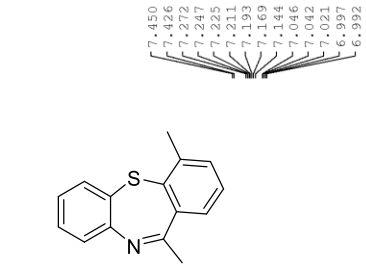
F2 - Processing parameters
SI                 65536
SF            300.1300071 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```



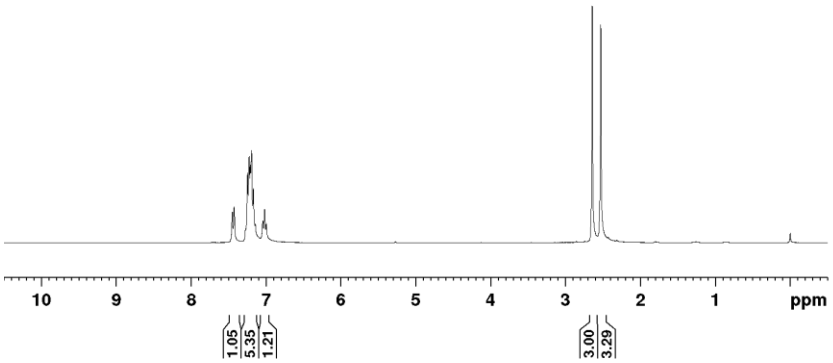

```
Current Data Parameters
NAME      2022-10-28-YZQ-S-Left-M-CH3-Sub
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_           20221028
Time              15.57 h
INSTRUM             spect
PROBHD  5 mm PABBO BB/
PULPROG          zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   200
DS                     4
SWH            24038.461 Hz
FIDRES          0.733596 Hz
AQ              1.3631488 sec
RG                 206.33
DW                 20.800 usec
DE                  6.50 usec
TE                299.9 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                    1
SFO1          100.6504916 MHz
NUC1                  13C
P1                10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2             90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                 32768
SF            100.6404160 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```



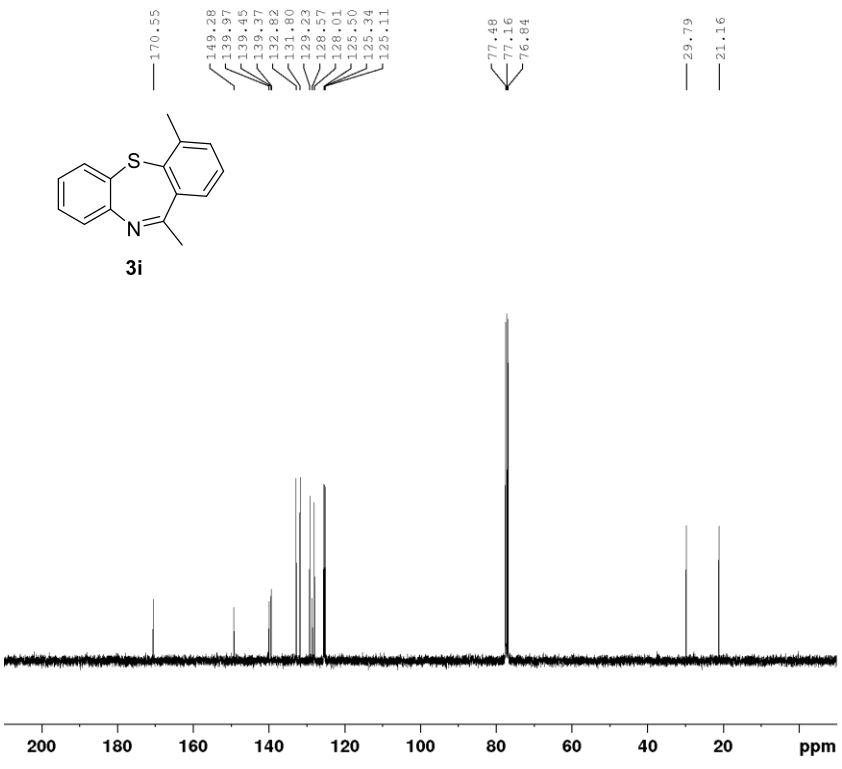
3i




```
Current Data Parameters
NAME      2022-10-27-YZQ-S-O-Me-(right)-Sub
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_              20221027
Time                 14.01 h
INSTRUM              spect
PROBHD    5 mm DUL 13C-1
PULPROG              zg30
TD                  65536
SOLVENT              CDCl3
NS                       8
DS                       2
SWH               6009.615 Hz
FIDRES               0.183399 Hz
AQ                5.4525952 sec
RG                   186.23
DW                  83.200 usec
DE                   6.50 usec
TE                  298.2 K
D1             1.00000000 sec
TD0                      1
SFO1           300.1318534 MHz
NUC1                    1H
P1                   8.00 usec
PLW1          18.00000000 W

F2 - Processing parameters
SI                  65536
SF             300.1300113 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

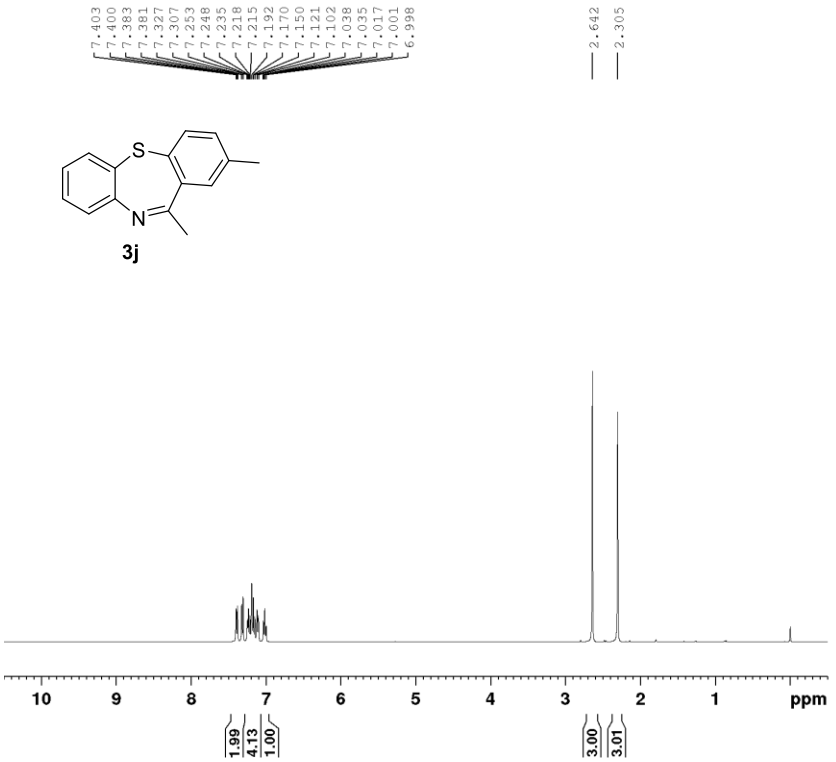


3i


```
Current Data Parameters
NAME      2022-10-27-YZQ-S-O-Me-(right)-Sub
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_              20221027
Time                 16.38 h
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG            zgpg30
TD                  65536
SOLVENT              CDCl3
NS                      64
DS                       4
SWH              24038.461 Hz
FIDRES               0.733596 Hz
AQ                1.36314880 sec
RG                   206.33
DW                  20.800 usec
DE                   6.50 usec
TE                  298.9 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                      1
SFO1           100.6504916 MHz
NUC1                    13C
P1                  10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                    1H
CPDPRG[2          waltz16
PCPD2               90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

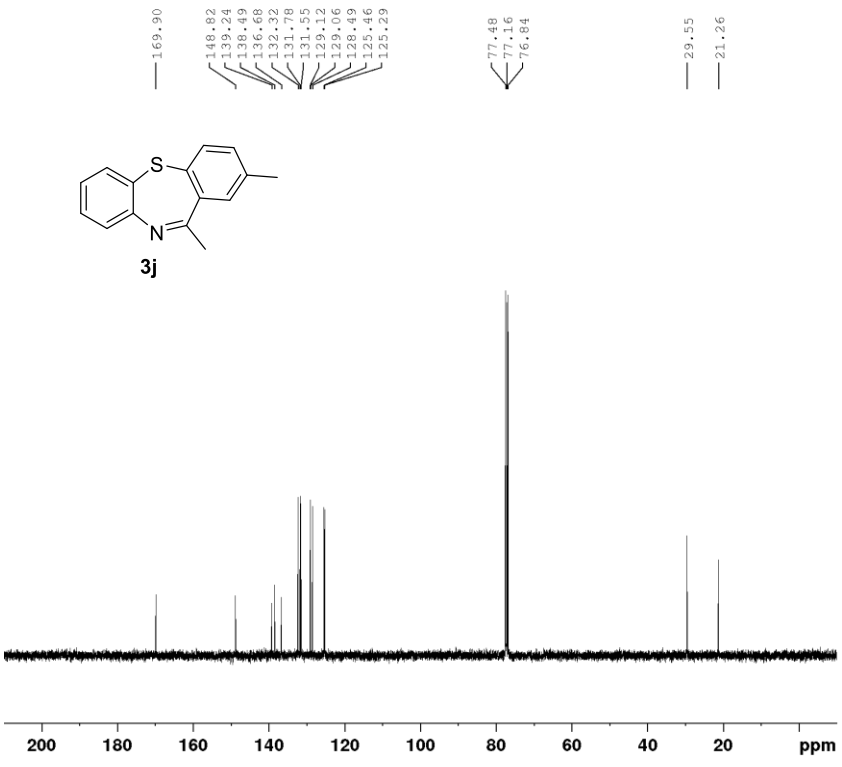
F2 - Processing parameters
SI                  32768
SF             100.6404185 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME      2022-11-05-YZQ-S-P-Me-right-Sub
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_              20221105
Time                 21.40 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     0
SWH             8012.820 Hz
FIDRES             0.489064 Hz
AQ              2.0447233 sec
RG                  92.09
DW                 62.400 usec
DE                  6.50 usec
TE                 299.1 K
D1              2.00000000 sec
TD0                    1
SFO1           400.2424716 MHz
NUC1                  1H
P1                 14.30 usec
PLW1           12.00000000 W

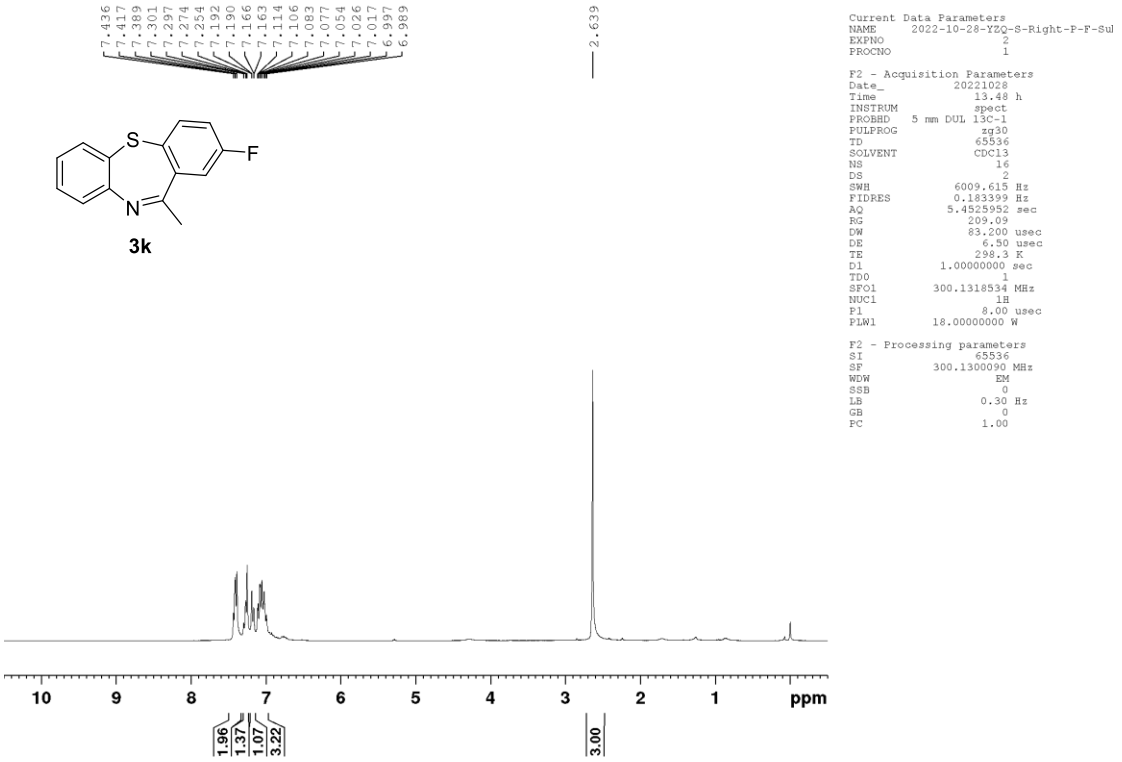
F2 - Processing parameters
SI                 65536
SF             400.2400148 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```




```
Current Data Parameters
NAME      2022-11-05-YZQ-S-P-Me-right-Sub
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_              20221105
Time                 21.41 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                    64
DS                     4
SWH            24038.461 Hz
FIDRES             0.733596 Hz
AQ              1.3631488 sec
RG                  206.33
DW                 20.800 usec
DE                  6.50 usec
TE                 299.4 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                    1
SFO1           100.6504916 MHz
NUC1                  13C
P1                 10.00 usec
PLW1           54.00000000 W
SFO2           400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

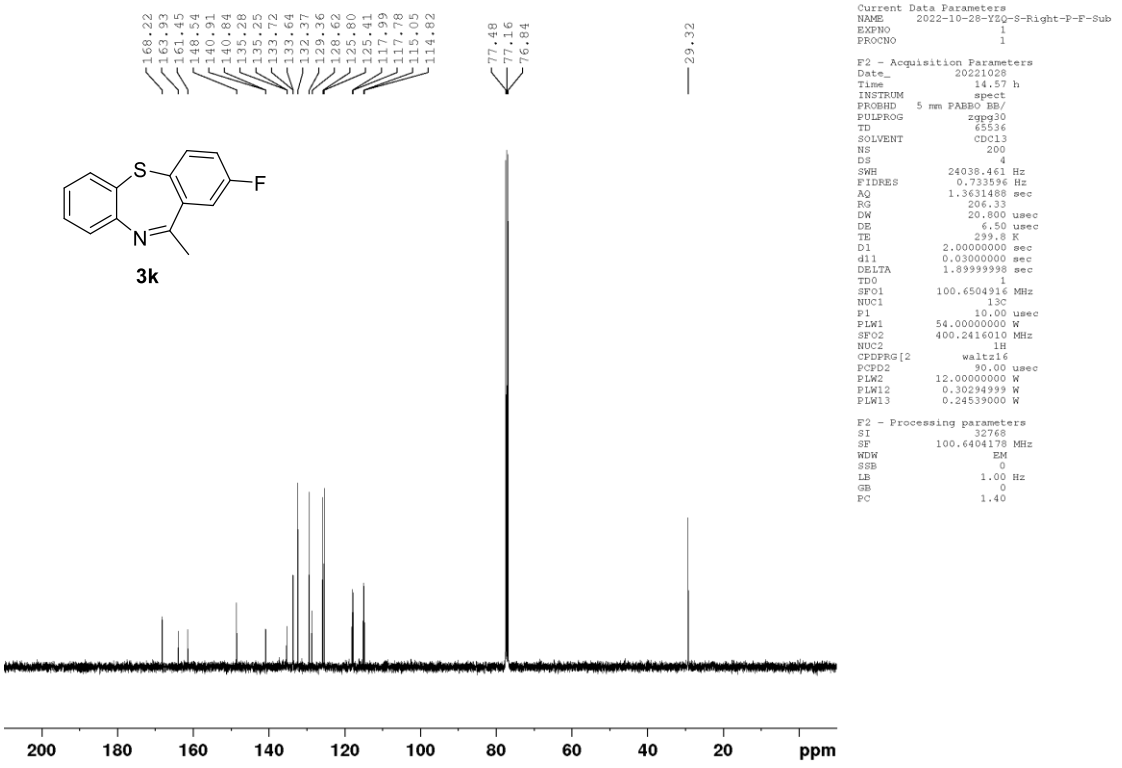
F2 - Processing parameters
SI                 32768
SF             100.6404184 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```




```
Current Data Parameters
NAME      2022-10-28-YZQ-S-Right-P-F-Sul
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_           20221028
Time              13.48 h
INSTRUM             spect
PROBHD    5 mm DUL 13C-1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             6009.615 Hz
FIDRES          0.183399 Hz
AQ              5.4525952 sec
RG                 209.09
DW                83.200 usec
DE                 6.50 usec
TE                298.3 K
D1             1.00000000 sec
TD0                    1
SFO1         300.1318534 MHz
NUC1                  1H
P1                 8.00 usec
PLW1         18.00000000 W

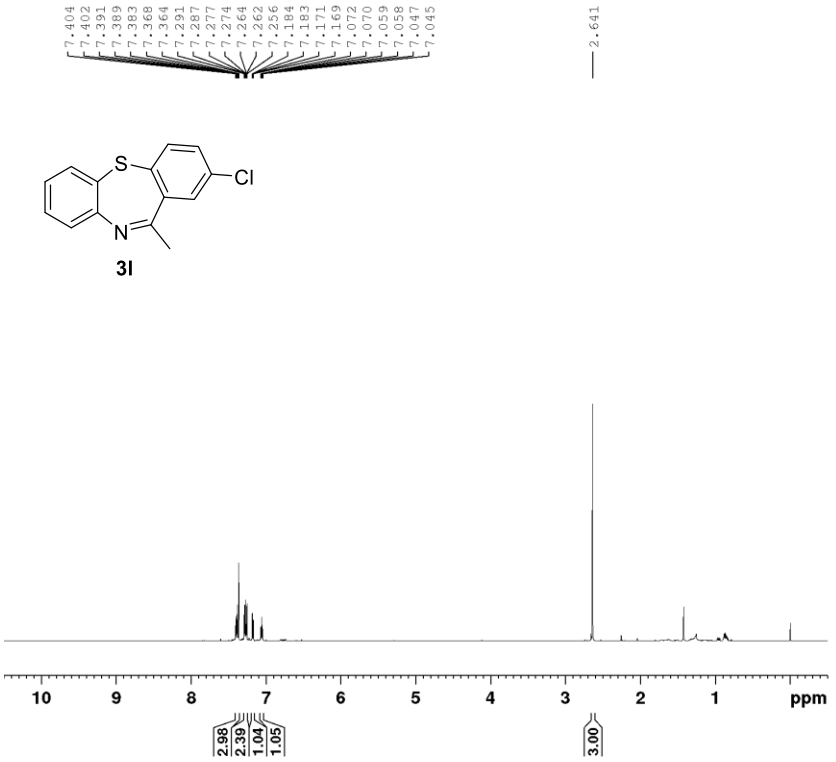
F2 - Processing parameters
SI                 65536
SF           300.1300090 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```




```
Current Data Parameters
NAME      2022-10-28-YZQ-S-Right-P-F-Sub
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_           20221028
Time              14.57 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   200
DS                     4
SWH            24038.461 Hz
FIDRES          0.733596 Hz
AQ              1.3631488 sec
RG                 206.33
DW                20.800 usec
DE                 6.50 usec
TE                299.8 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                    1
SFO1         100.6504916 MHz
NUC1                  13C
P1                10.00 usec
PLW1         54.00000000 W
SFO2         400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2             90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                 32768
SF           100.6404178 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

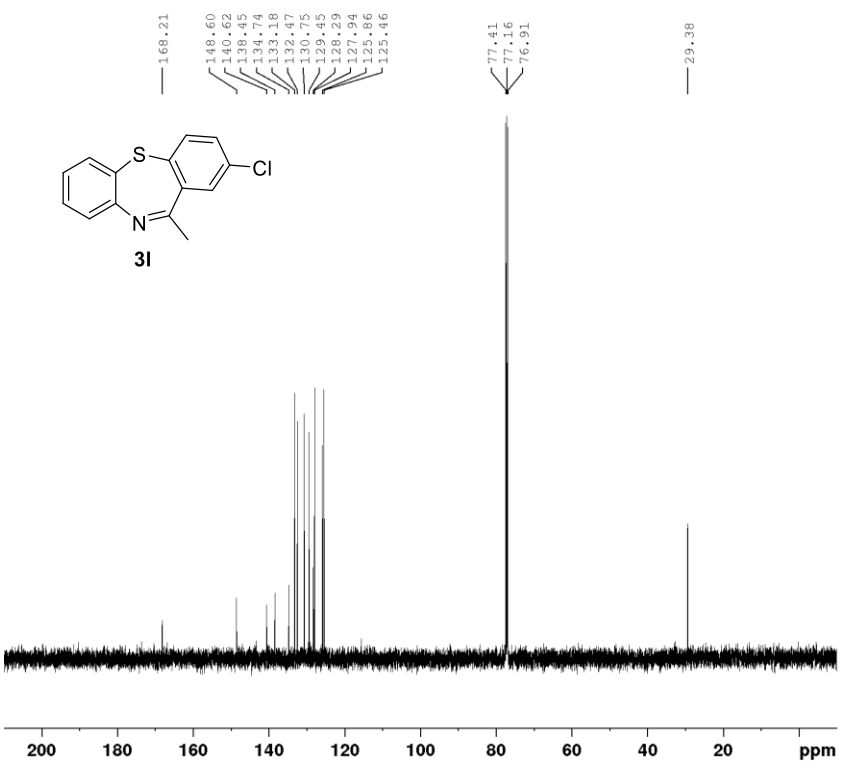



```
Current Data Parameters
NAME      2022-10-27-YZQ-S-P-Cl-right-Sub
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20221024
Time              22.59
INSTRUM           spect
PROBHD    5 mm PABBO BB/
PULPROG           zg30
TD               65536
SOLVENT          CDCl3
NS                   8
DS                   0
SWH           9615.385 Hz
FIDRES        0.146719 Hz
AQ            3.4078720 sec
RG                69.87
DW               52.000 usec
DE                6.50 usec
TE               298.0 K
D1            1.00000000 sec
TD0                  1

======== CHANNEL f1 ========
SFO1        600.1739011 MHz
NUC1                1H
P1                9.96 usec
PLW1        28.00000000 W

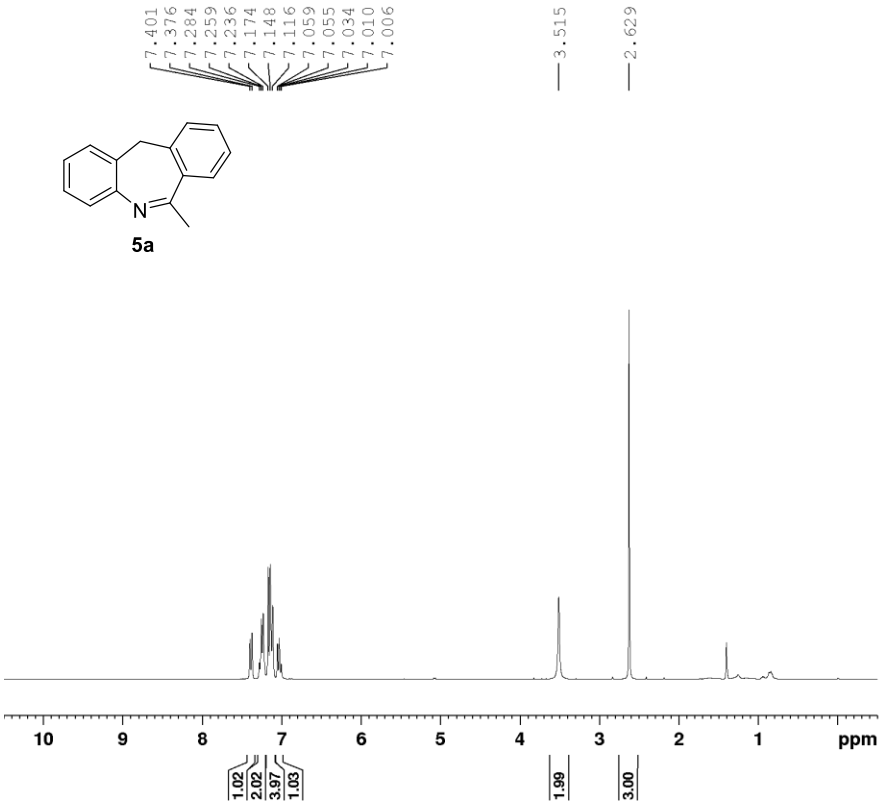
F2 - Processing parameters
SI                65536
SF          600.1700170 MHz
WDW                 EM
SSB                  0
LB                0.30 Hz
GB                   0
PC                1.00
```




```
Current Data Parameters
NAME      2022-10-27-YZQ-S-P-Cl-right-Sub
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20221027
Time              12.54 h
INSTRUM           spect
PROBHD    5 mm PADUL 13C
PULPROG          zgpg30
TD               65536
SOLVENT          CDCl3
NS                 128
DS                   4
SWH          29761.904 Hz
FIDRES        0.908261 Hz
AQ            1.1010048 sec
RG                192.89
DW               16.800 usec
DE                6.50 usec
TE                   0 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
TD0                  1
SFO1        125.7703637 MHz
NUC1               13C
P1               10.00 usec
PLW1         80.00000000 W
SFO2        500.1320005 MHz
NUC2               1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2         20.00000000 W
PLW12         0.39903000 W
PLW13         0.25538000 W

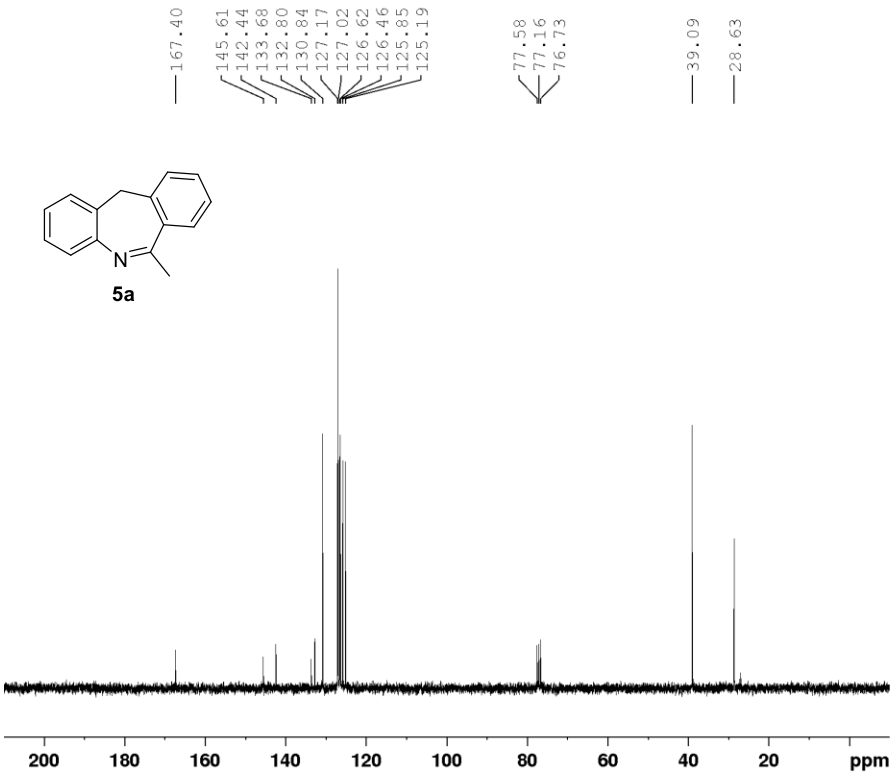
F2 - Processing parameters
SI                32768
SF          125.7577688 MHz
WDW                 EM
SSB                  0
LB                1.00 Hz
GB                   0
PC                1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  106
PROCNO                   1

F2 - Acquisition Parameters
Date_           20210725
Time                17.57 h
INSTRUM             spect
PROBHD    5 mm DUL 13C-1
PULPROG              zg30
TD                  65536
SOLVENT             CDC13
NS                     16
DS                      2
SWH              6009.615 Hz
FIDRES           0.183399 Hz
AQ               5.4525952 sec
RG                  32.14
DW                83.200 usec
DE                 6.50 usec
TE                 301.7 K
D1              1.00000000 sec
TD0                     1
SFO1          300.1318534 MHz
NUC1                   1H
P1                  8.00 usec
PLW1          18.00000000 W

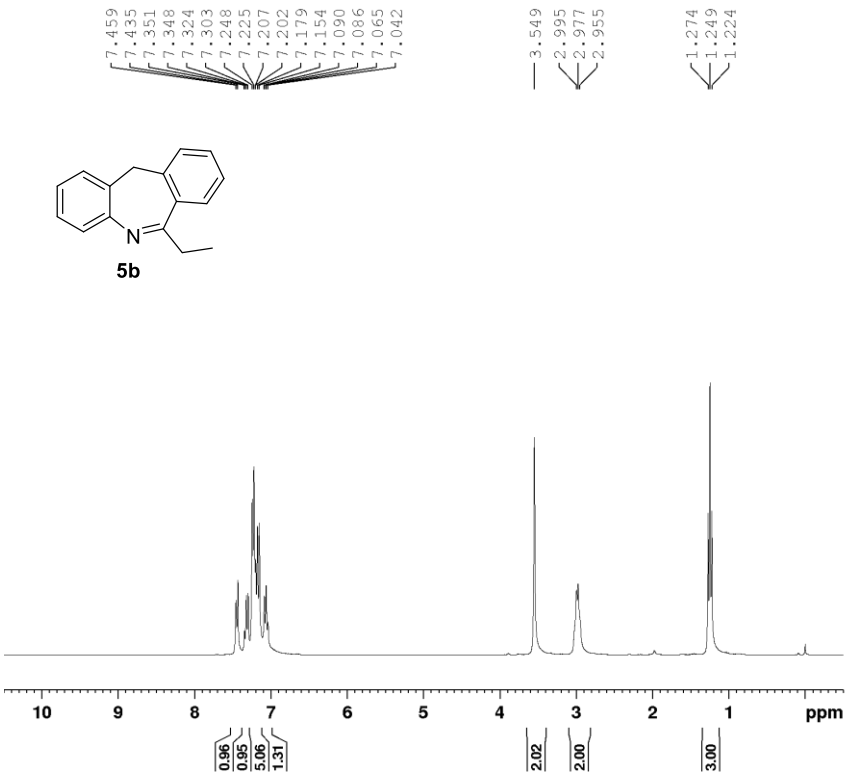
F2 - Processing parameters
SI                  65536
SF            300.1300402 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  107
PROCNO                   1

F2 - Acquisition Parameters
Date_           20210726
Time                 8.56 h
INSTRUM             spect
PROBHD    5 mm DUL 13C-1
PULPROG           zgpg30
TD                  65536
SOLVENT             CDC13
NS                     22
DS                      4
SWH             18028.846 Hz
FIDRES           0.550197 Hz
AQ               1.8175317 sec
RG                  209.09
DW                27.733 usec
DE                 6.50 usec
TE                 301.6 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                     1
SFO1          75.4752949 MHz
NUC1                  13C
P1                 11.00 usec
PLW1        195.00000000 W
SFO2          300.1312005 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2         14.00000000 W
PLW12         0.17284000 W
PLW13         0.14000000 W

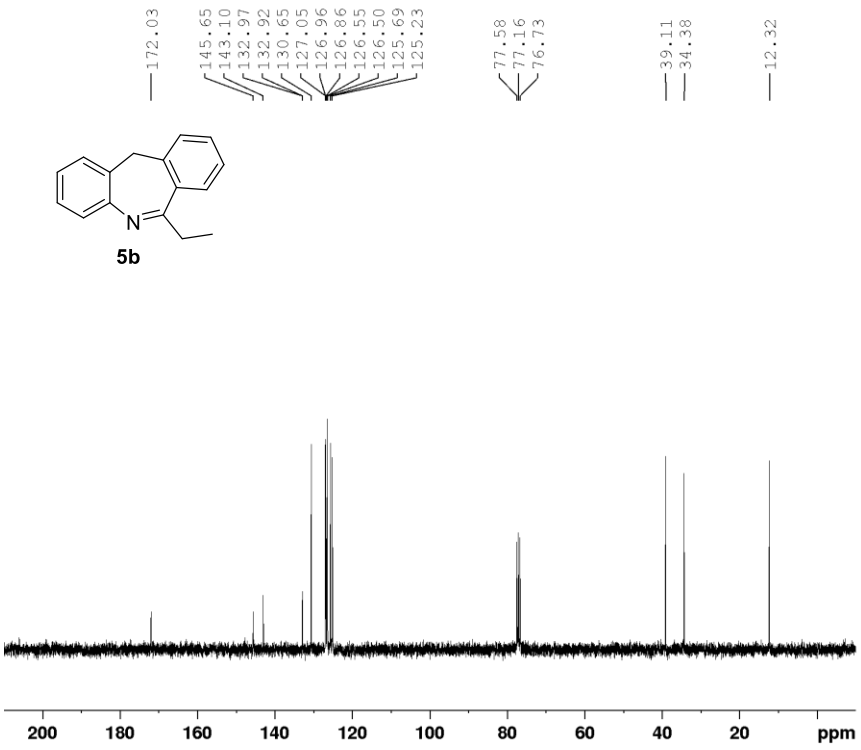
F2 - Processing parameters
SI                  32768
SF            75.4677459 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  108
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221028
Time                13.57 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             6009.615 Hz
FIDRES          0.183399 Hz
AQ             5.4525952 sec
RG                 117.72
DW                 83.200 usec
DE                   6.50 usec
TE                 298.3 K
D1             1.00000000 sec
TD0                     1
SFO1         300.1318534 MHz
NUC1                   1H
P1                   8.00 usec
PLW1         18.00000000 W

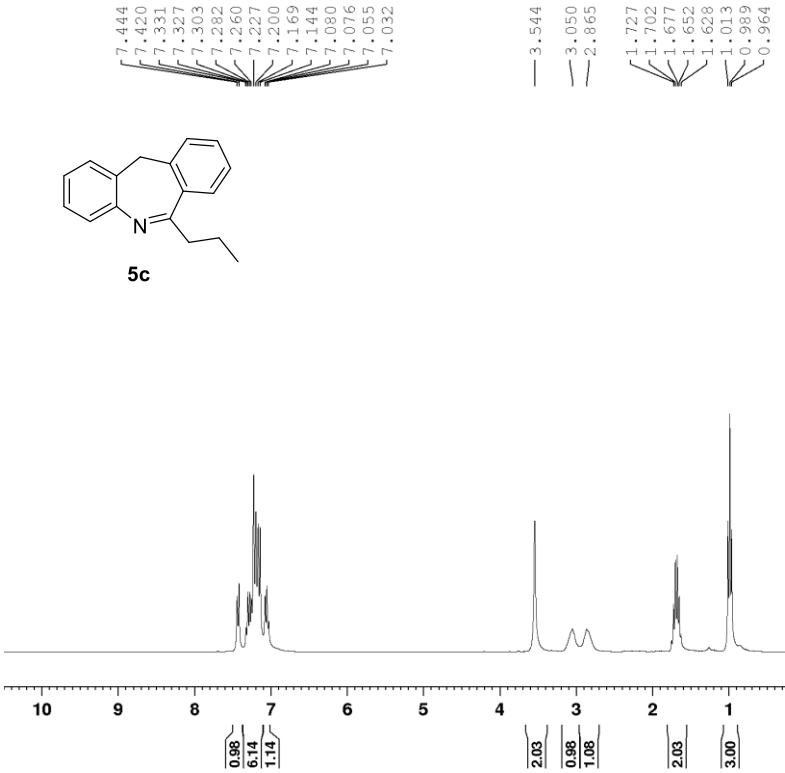
F2 - Processing parameters
SI                  65536
SF           300.1300195 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  109
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221025
Time                 8.42 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                     82
DS                      4
SWH            18028.846 Hz
FIDRES          0.550197 Hz
AQ             1.8175317 sec
RG                 209.09
DW                 27.733 usec
DE                   6.50 usec
TE                 298.3 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                     1
SFO1          75.4752949 MHz
NUC1                   13C
P1                  11.00 usec
PLW1        195.00000000 W
SFO2         300.1312005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                90.00 usec
PLW2         14.00000000 W
PLW12         0.17284000 W
PLW13         0.14000000 W

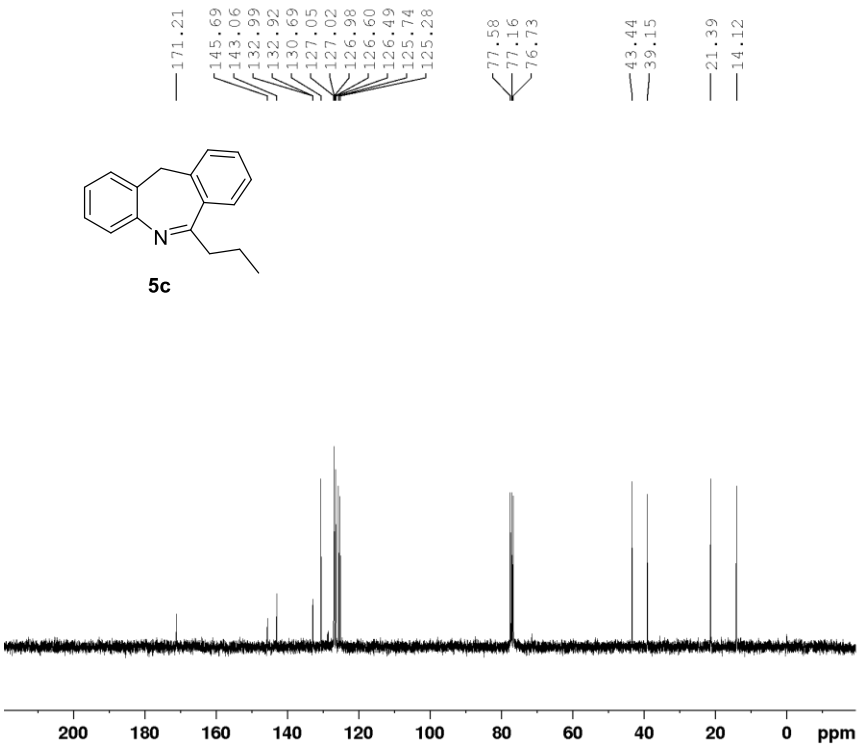
F2 - Processing parameters
SI                  32768
SF           75.4677429 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  110
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221028
Time                14.01 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG              zg30
TD                  65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH              6009.615 Hz
FIDRES           0.183399 Hz
AQ               5.4525952 sec
RG                    66.2
DW                 83.200 usec
DE                  6.50 usec
TE                 298.3 K
D1              1.00000000 sec
TD0                      1
SFO1          300.1318534 MHz
NUC1                    1H
P1                   8.00 usec
PLW1           18.00000000 W

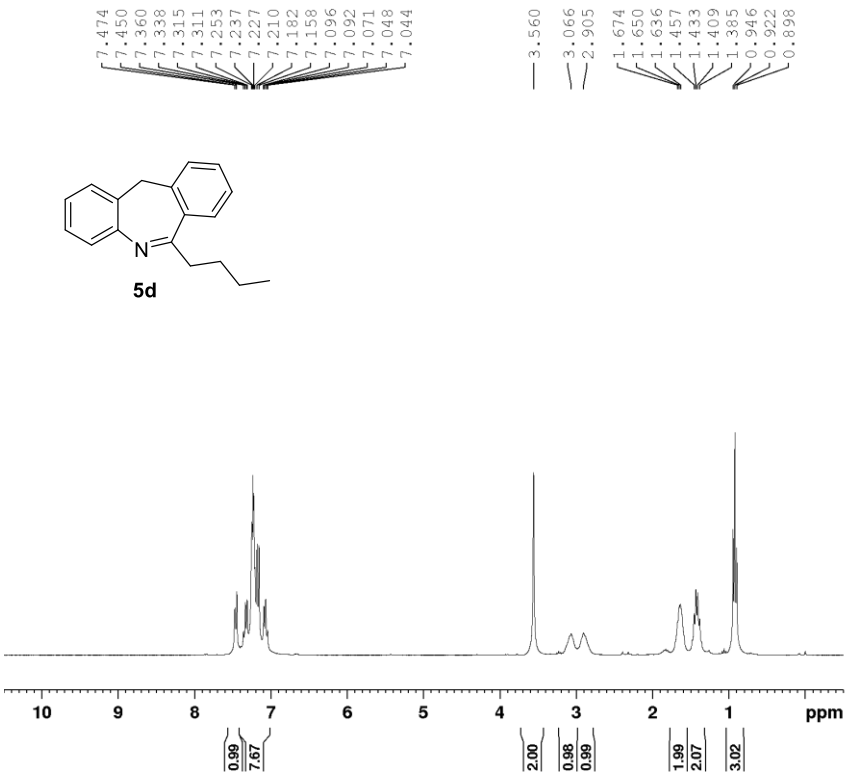
F2 - Processing parameters
SI                   65536
SF            300.1300271 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  111
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221025
Time                 8.52 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG            zgpg30
TD                  65536
SOLVENT              CDCl3
NS                     152
DS                       4
SWH             18028.846 Hz
FIDRES           0.550197 Hz
AQ               1.8175317 sec
RG                   209.09
DW                 27.733 usec
DE                  6.50 usec
TE                 298.3 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                      1
SFO1          75.4752949 MHz
NUC1                   13C
P1                  11.00 usec
PLW1          195.00000000 W
SFO2          300.1312005 MHz
NUC2                    1H
CPDPRG[2           waltz16
PCPD2               90.00 usec
PLW2           14.00000000 W
PLW12           0.17284000 W
PLW13           0.14000000 W

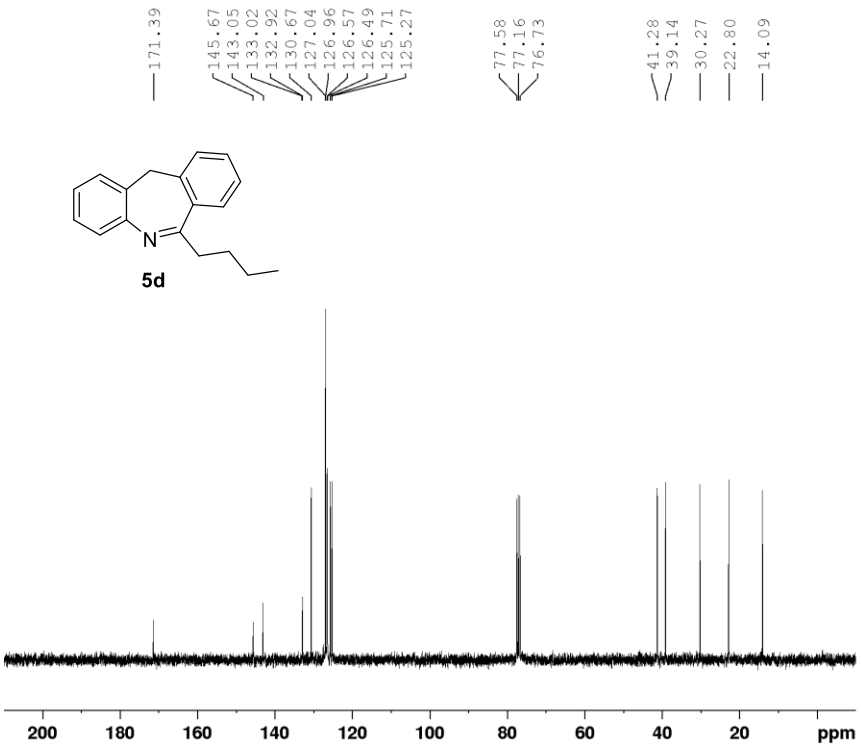
F2 - Processing parameters
SI                   32768
SF            75.4677412 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  112
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time                11.15 h
INSTRUM             spect
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                 65536
SOLVENT             CDCl3
NS                    16
DS                     2
SWH              6009.615 Hz
FIDRES           0.183399 Hz
AQ               5.4525952 sec
RG                 126.88
DW                 83.200 usec
DE                  6.50 usec
TE                     0 K
D1            1.00000000 sec
TD0                    1
SFO1         300.1318534 MHz
NUC1                  1H
P1                 8.00 usec
PLW1         18.00000000 W

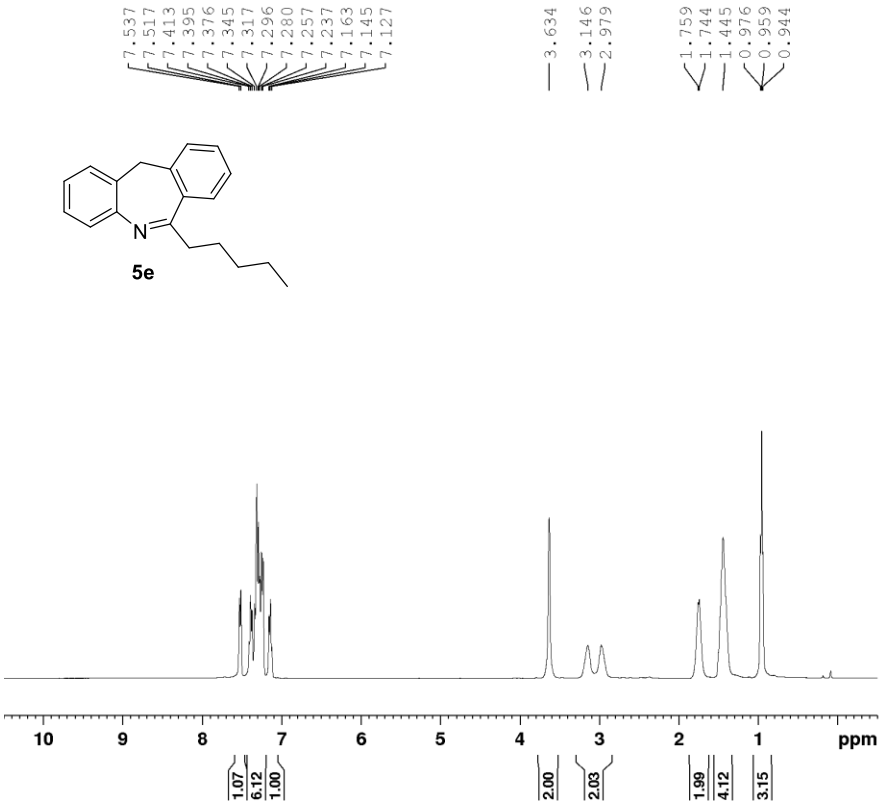
F2 - Processing parameters
SI                 65536
SF           300.1300140 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  113
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time                11.19 h
INSTRUM             spect
PROBHD   5 mm DUL 13C-1
PULPROG           zgpg30
TD                 65536
SOLVENT             CDCl3
NS                   124
DS                     4
SWH             18028.846 Hz
FIDRES           0.550197 Hz
AQ               1.8175317 sec
RG                 209.09
DW                 27.733 usec
DE                  6.50 usec
TE                     0 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
TD0                    1
SFO1         75.4752949 MHz
NUC1                  13C
P1                 11.00 usec
PLW1        195.00000000 W
SFO2         300.1312005 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2         14.00000000 W
PLW12         0.17284000 W
PLW13         0.14000000 W

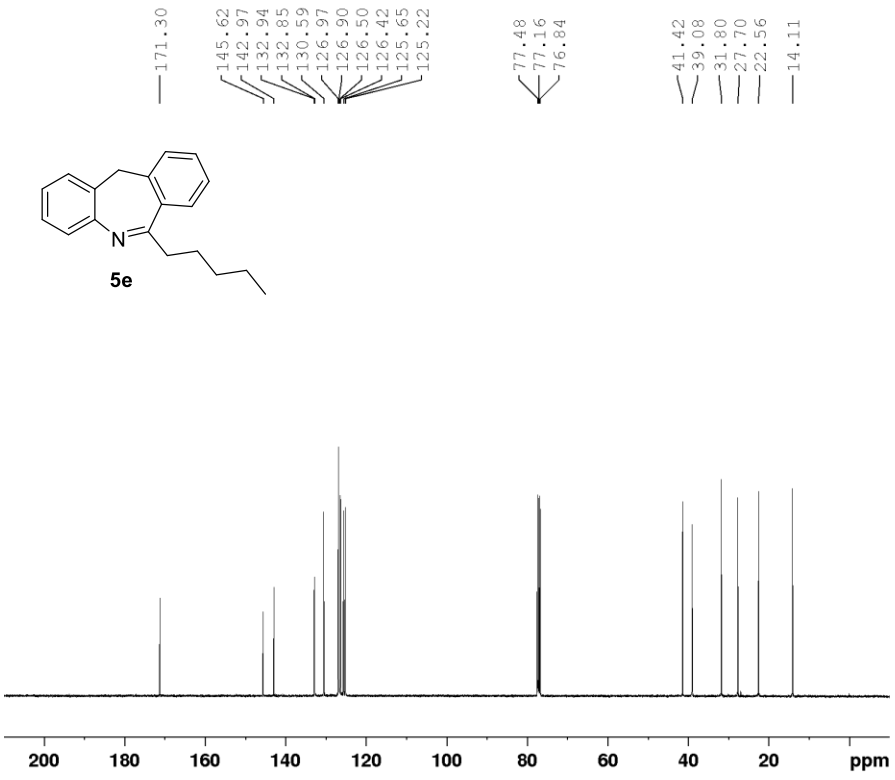
F2 - Processing parameters
SI                 32768
SF           75.4677419 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  141
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230207
Time                13.40 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDC13
NS                     16
DS                      0
SWH              8012.820 Hz
FIDRES           0.489064 Hz
AQ               2.0447233 sec
RG                  31.63
DW                62.400 usec
DE                 6.50 usec
TE                298.0 K
D1             2.00000000 sec
TD0                     1
SFO1          400.2424716 MHz
NUC1                   1H
P1                 14.30 usec
PLW1          12.00000000 W

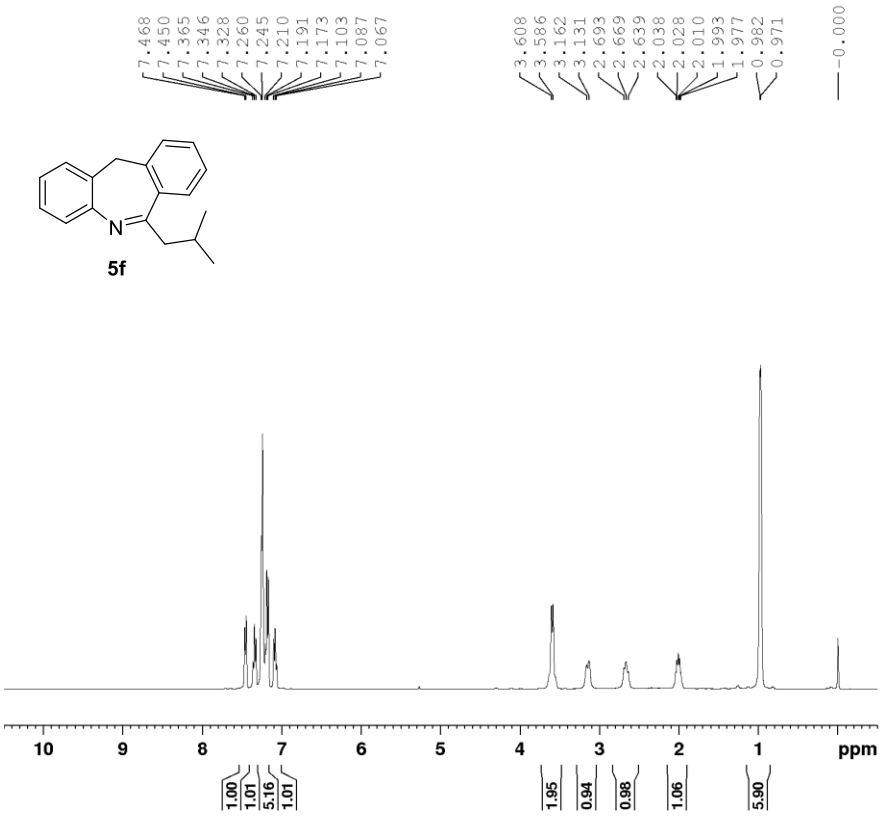
F2 - Processing parameters
SI                  65536
SF            400.2400000 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  142
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230207
Time                14.39 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG           zgpg30
TD                  65536
SOLVENT             CDC13
NS                   1024
DS                      4
SWH             24038.461 Hz
FIDRES           0.733596 Hz
AQ               1.3631488 sec
RG                  206.33
DW                 20.800 usec
DE                  6.50 usec
TE                298.0 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                     1
SFO1          100.6504916 MHz
NUC1                   13C
P1                 10.00 usec
PLW1           54.00000000 W
SFO2          400.2416010 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

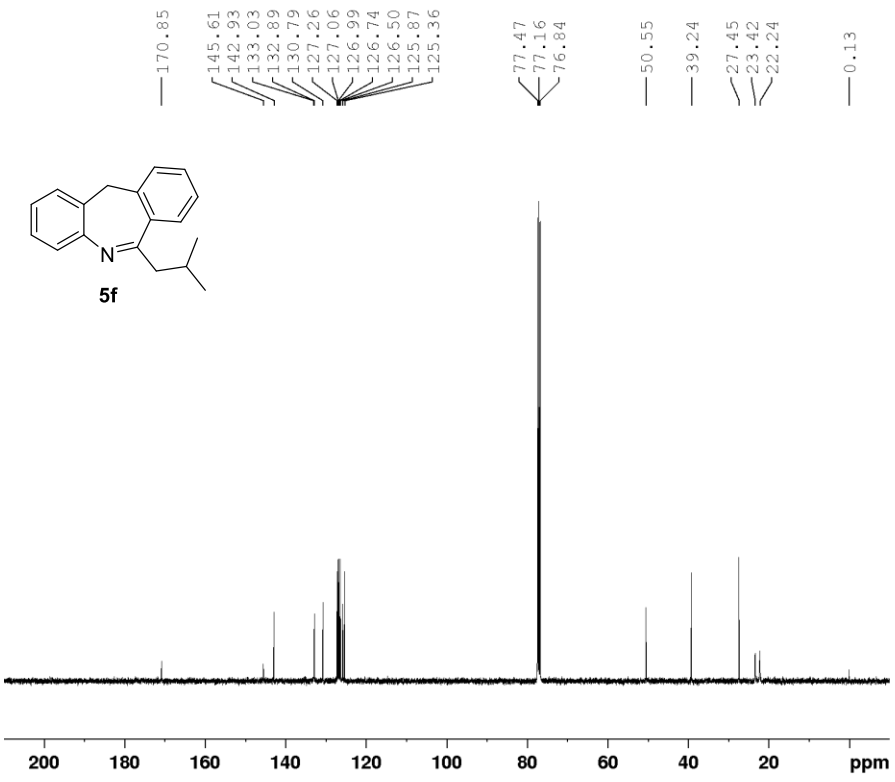
F2 - Processing parameters
SI                  32768
SF            100.6404301 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  145
PROCNO                   1

F2 - Acquisition Parameters
Date_              20230217
Time                 18.48 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      0
SWH                8012.820 Hz
FIDRES             0.489064 Hz
AQ                 2.0447233 sec
RG                    92.09
DW                  62.400 usec
DE                   6.50 usec
TE                  296.1 K
D1                 2.00000000 sec
TD0                     1
SFO1            400.2424716 MHz
NUC1                    1H
P1                  14.30 usec
PLW1           12.00000000 W

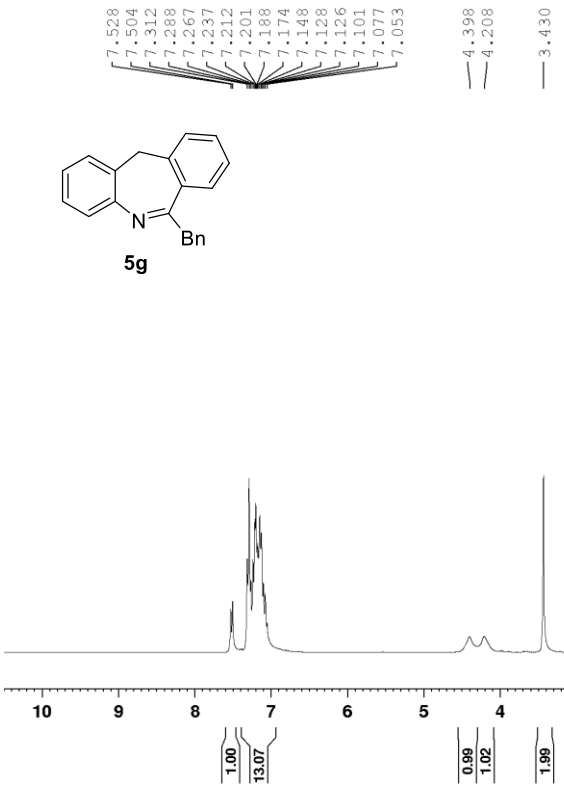
F2 - Processing parameters
SI                    65536
SF              400.2400162 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  146
PROCNO                   1

F2 - Acquisition Parameters
Date_              20230217
Time                 19.47 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                   1024
DS                      4
SWH               24038.461 Hz
FIDRES             0.733596 Hz
AQ                 1.3631488 sec
RG                   206.33
DW                  20.800 usec
DE                   6.50 usec
TE                  297.6 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                     1
SFO1            100.6504916 MHz
NUC1                    13C
P1                  10.00 usec
PLW1           54.00000000 W
SFO2            400.2416010 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2               90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

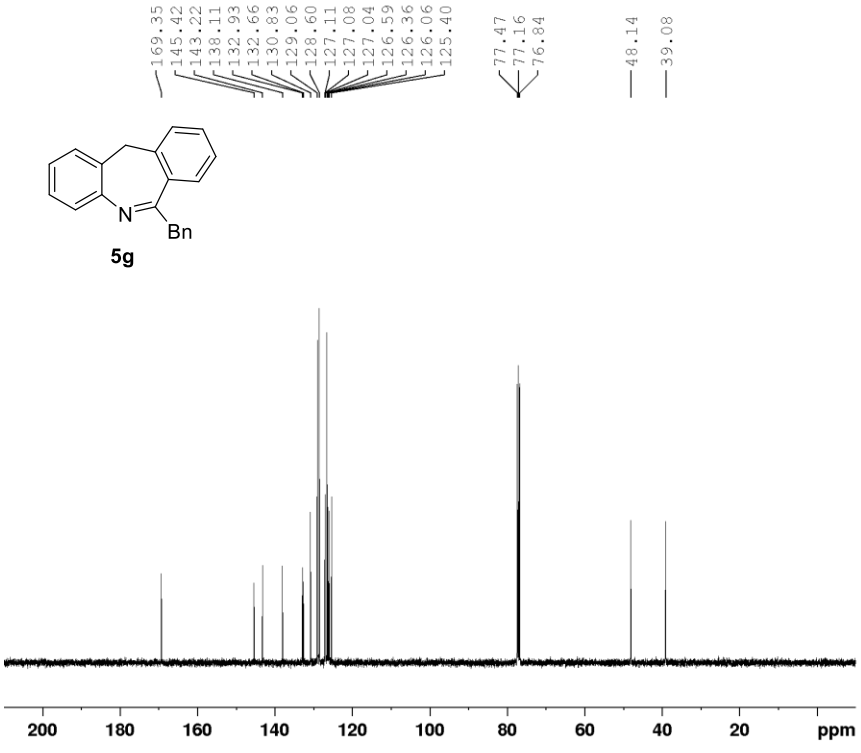
F2 - Processing parameters
SI                    32768
SF              100.6404176 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  114
PROCNO                   1

F2 - Acquisition Parameters
Date_              20221028
Time                 14.04 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG              zg30
TD                  65536
SOLVENT              CDC13
NS                      16
DS                       2
SWH               6009.615 Hz
FIDRES            0.183399 Hz
AQ                5.4525952 sec
RG                   117.72
DW                   83.200 usec
DE                    6.50 usec
TE                   298.2 K
D1                1.00000000 sec
TD0                      1
SFO1           300.1318534 MHz
NUC1                    1H
P1                    8.00 usec
PLW1          18.00000000 W

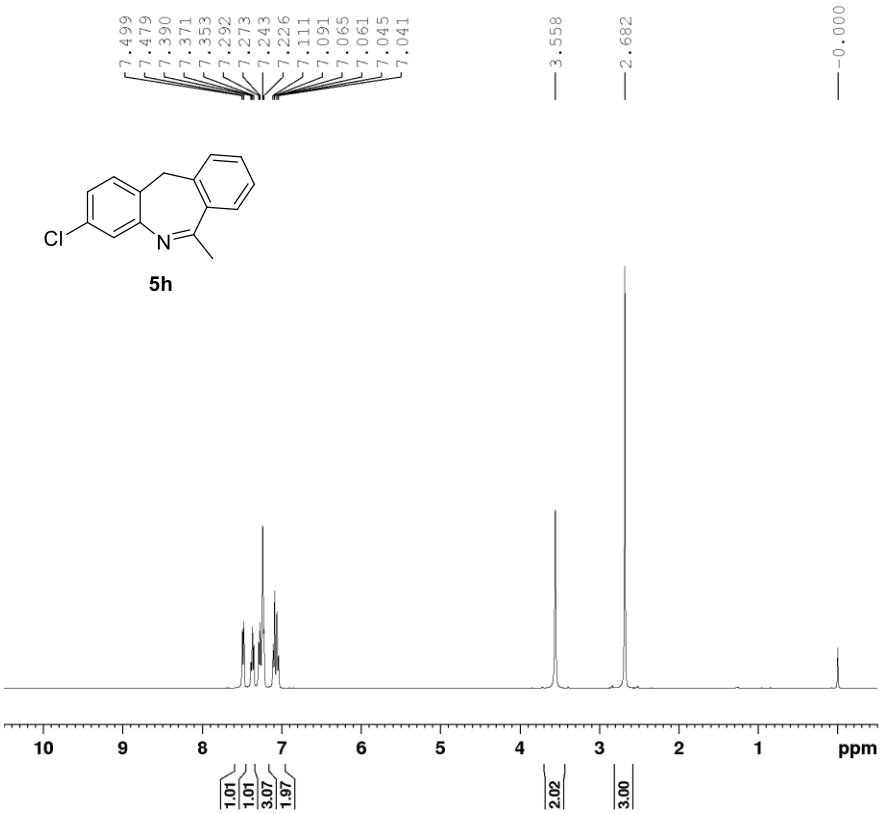
F2 - Processing parameters
SI                  65536
SF             300.1300250 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  117
PROCNO                   1

F2 - Acquisition Parameters
Date_              20221028
Time                 15.25 h
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG            zgpg30
TD                  65536
SOLVENT              CDC13
NS                     200
DS                       4
SWH              24038.461 Hz
FIDRES            0.733596 Hz
AQ                1.3631488 sec
RG                   206.33
DW                   20.800 usec
DE                    6.50 usec
TE                   299.9 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                      1
SFO1           100.6504916 MHz
NUC1                    13C
P1                   10.00 usec
PLW1          54.00000000 W
SFO2           400.2416010 MHz
NUC2                    1H
CPDPRG[2             waltz16
PCPD2                90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

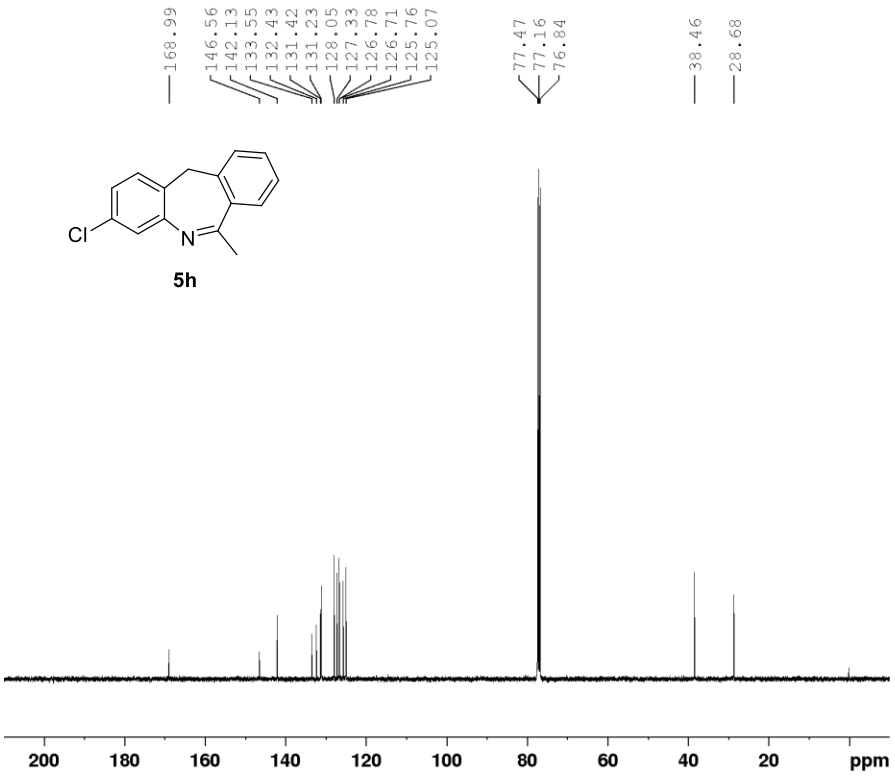
F2 - Processing parameters
SI                  32768
SF             100.6404234 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  157
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230222
Time                3.36 h
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDC13
NS                    16
DS                     0
SWH              8012.820 Hz
FIDRES           0.489064 Hz
AQ               2.0447233 sec
RG                206.33
DW                62.400 usec
DE                 6.50 usec
TE                298.0 K
D1              2.00000000 sec
TD0                    1
SFO1          400.2424716 MHz
NUC1                  1H
P1                 14.30 usec
PLW1          12.00000000 W

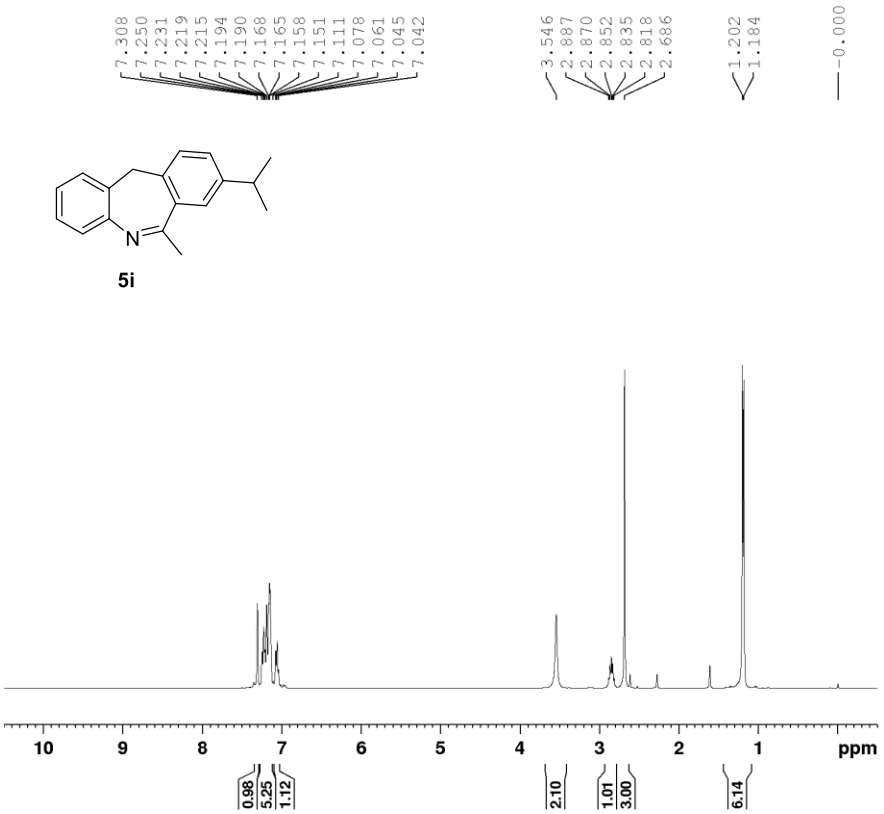
F2 - Processing parameters
SI                 65536
SF            400.2400136 MHz
WDW                   EM
SSB                    0
LB                 0.30 Hz
GB                     0
PC                  1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  158
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230222
Time                4.35 h
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT            CDC13
NS                  1024
DS                     4
SWH             24038.461 Hz
FIDRES           0.733596 Hz
AQ               1.3631488 sec
RG                206.33
DW                20.800 usec
DE                 6.50 usec
TE                298.5 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                    1
SFO1          100.6504916 MHz
NUC1                  13C
P1                 10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

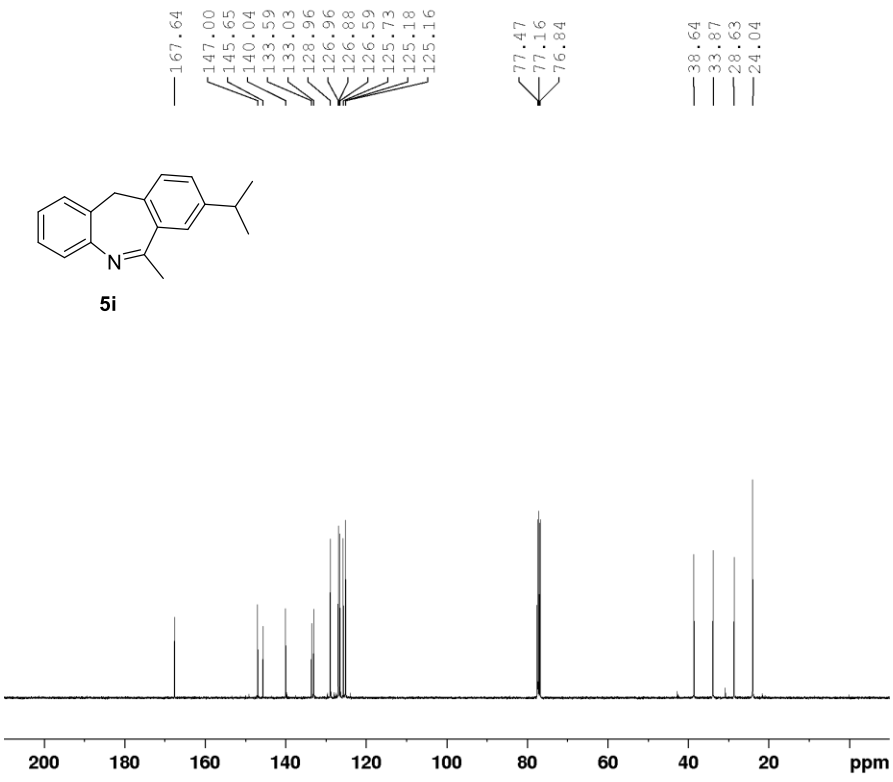
F2 - Processing parameters
SI                 32768
SF            100.6404176 MHz
WDW                   EM
SSB                    0
LB                 1.00 Hz
GB                     0
PC                  1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  153
PROCNO                   1

F2 - Acquisition Parameters
Date_              20230216
Time                  1.55 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG               zg30
TD                   32768
SOLVENT              CDC13
NS                      16
DS                       0
SWH                8012.820 Hz
FIDRES             0.489064 Hz
AQ                 2.0447233 sec
RG                     34.76
DW                  62.400 usec
DE                   6.50 usec
TE                   298.6 K
D1                2.00000000 sec
TD0                      1
SFO1           400.2424716 MHz
NUC1                    1H
P1                   14.30 usec
PLW1           12.00000000 W

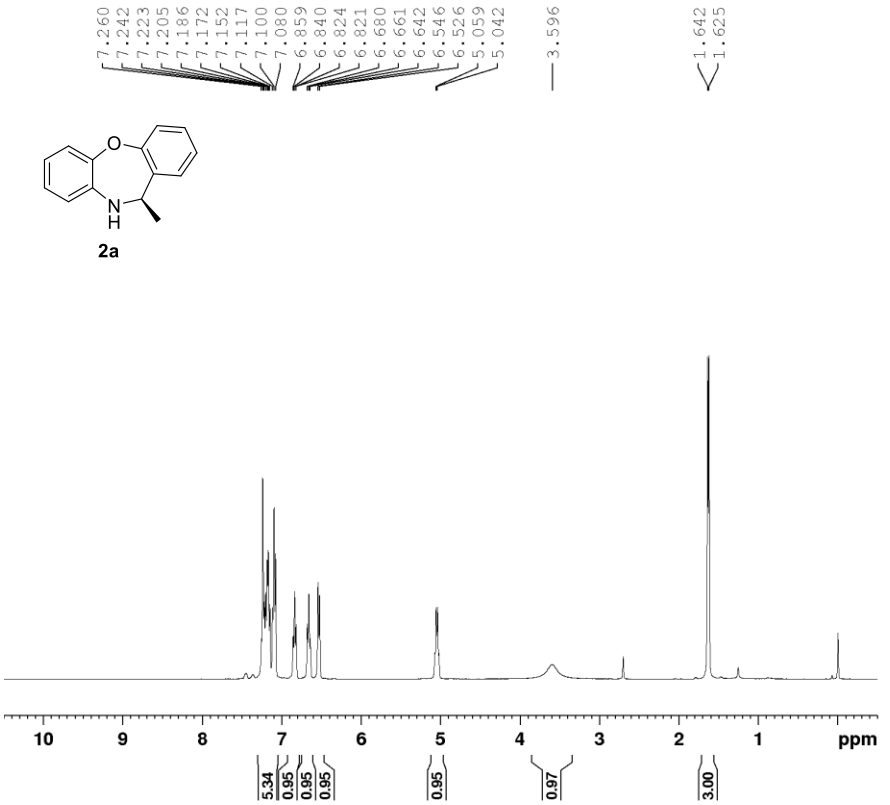
F2 - Processing parameters
SI                    65536
SF               400.2400383 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  154
PROCNO                   1

F2 - Acquisition Parameters
Date_              20230216
Time                  2.54 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG            zgpg30
TD                   65536
SOLVENT              CDC13
NS                    1024
DS                       4
SWH               24038.461 Hz
FIDRES             0.733596 Hz
AQ                 1.3631488 sec
RG                    206.33
DW                  20.800 usec
DE                   6.50 usec
TE                   299.5 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                      1
SFO1           100.6504916 MHz
NUC1                   13C
P1                   10.00 usec
PLW1           54.00000000 W
SFO2           400.2416010 MHz
NUC2                    1H
CPDPRG[2          waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

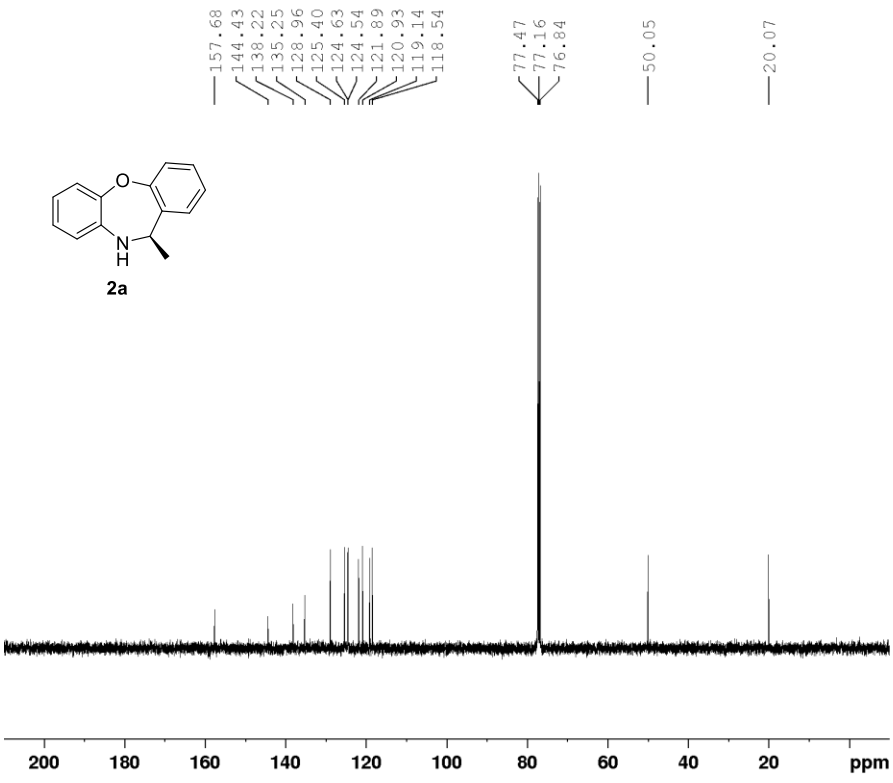
F2 - Processing parameters
SI                    32768
SF               100.6404308 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   31
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230202
Time                10.14 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDC13
NS                     16
DS                      0
SWH              8012.820 Hz
FIDRES           0.489064 Hz
AQ               2.0447233 sec
RG                  102.73
DW                 62.400 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
TD0                     1
SFO1           400.2424716 MHz
NUC1                   1H
P1                  14.30 usec
PLW1           12.00000000 W

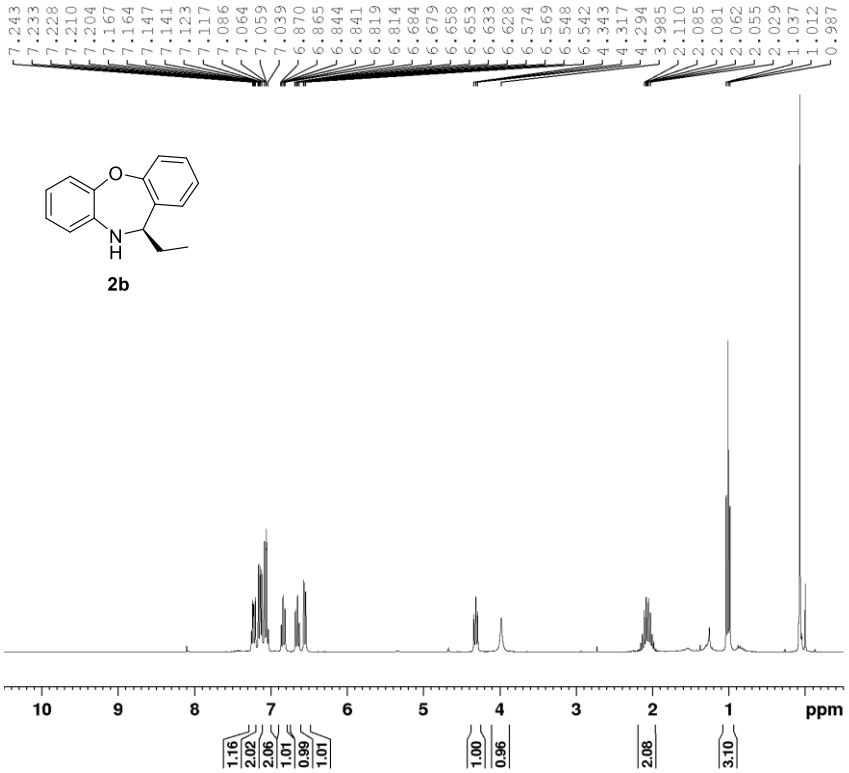
F2 - Processing parameters
SI                  65536
SF             400.2400174 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                   32
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230202
Time                10.15 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG           zgpg30
TD                  65536
SOLVENT             CDC13
NS                    155
DS                      4
SWH             24038.461 Hz
FIDRES           0.733596 Hz
AQ               1.3631488 sec
RG                  206.33
DW                 20.800 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                     1
SFO1           100.6504916 MHz
NUC1                   13C
P1                  10.00 usec
PLW1           54.00000000 W
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2         waltz16
PCPD2               90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

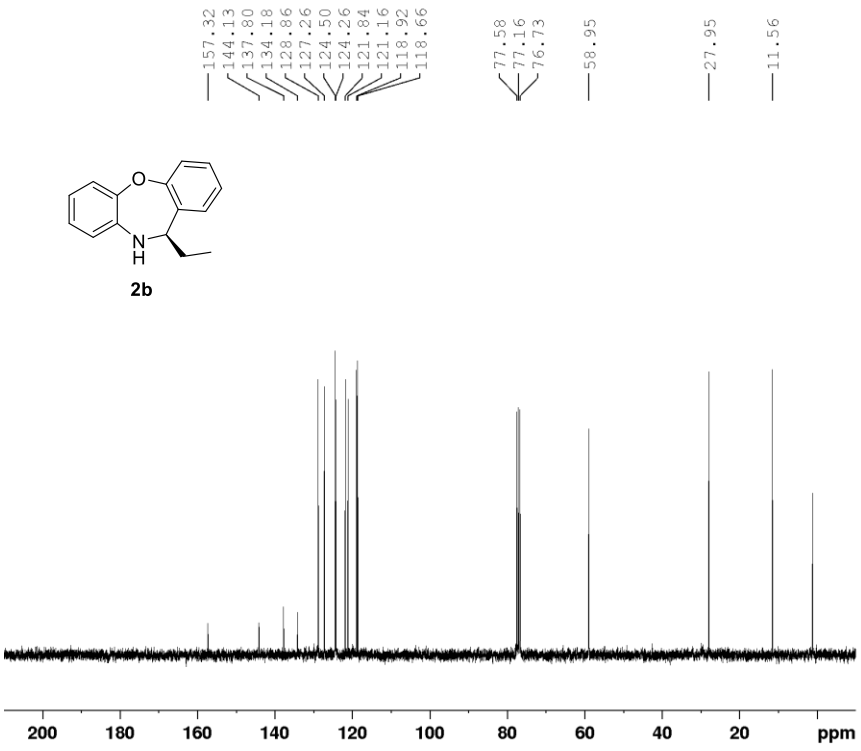
F2 - Processing parameters
SI                  32768
SF             100.6404168 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   33
PROCNO                   1

F2 - Acquisition Parameters
Date_           20211118
Time                 0.50 h
INSTRUM             spect
PROBHD   5 mm DUL 13C-1
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             6009.615 Hz
FIDRES          0.183399 Hz
AQ              5.4525952 sec
RG                 209.09
DW                83.200 usec
DE                 6.50 usec
TE                298.7 K
D1             1.00000000 sec
TD0                     1
SFO1         300.1318534 MHz
NUC1                   1H
P1                 8.00 usec
PLW1          18.00000000 W

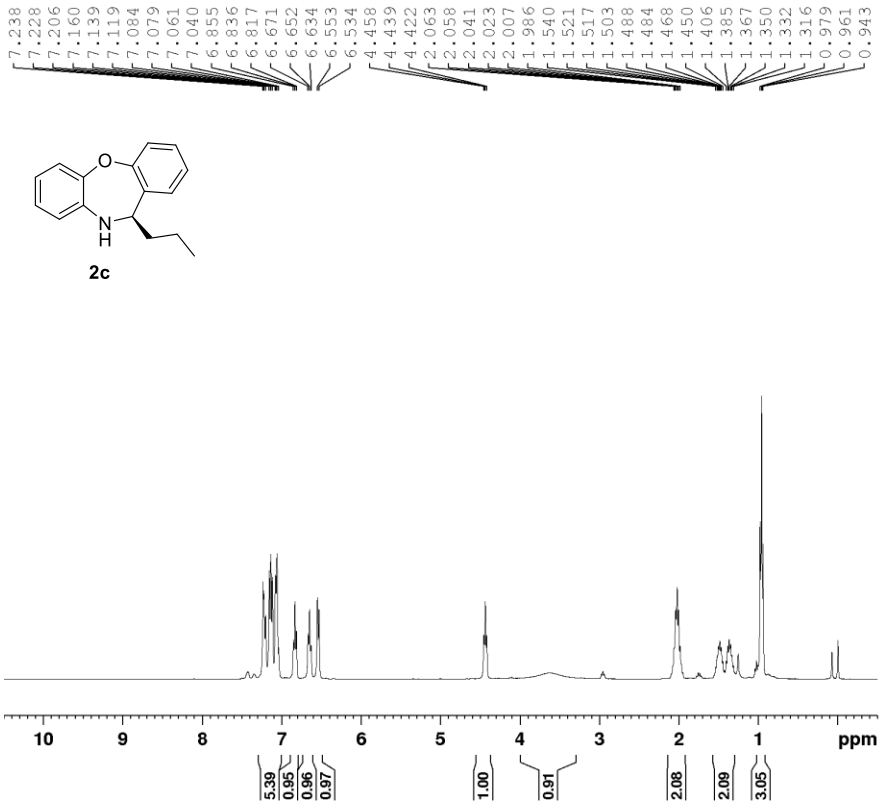
F2 - Processing parameters
SI                  65536
SF           300.1300125 MHz
WDW                    EM
SSB                     0
LB                 0.30 Hz
GB                      0
PC                 1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                   34
PROCNO                   1

F2 - Acquisition Parameters
Date_           20211118
Time                 1.13 h
INSTRUM             spect
PROBHD   5 mm DUL 13C-1
PULPROG           zgpg30
TD                  65536
SOLVENT             CDCl3
NS                    256
DS                      4
SWH            18028.846 Hz
FIDRES          0.550197 Hz
AQ              1.8175317 sec
RG                 209.09
DW                27.733 usec
DE                 6.50 usec
TE                299.3 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                     1
SFO1          75.4752949 MHz
NUC1                   13C
P1                11.00 usec
PLW1         195.00000000 W
SFO2         300.1312005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2             90.00 usec
PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

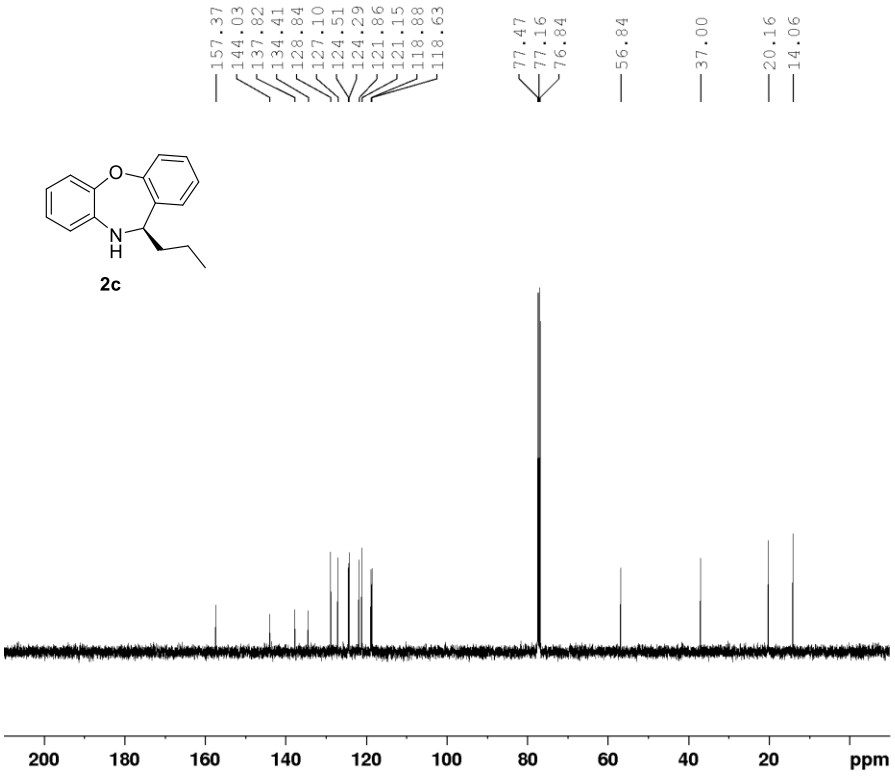
F2 - Processing parameters
SI                  32768
SF           75.4677396 MHz
WDW                    EM
SSB                     0
LB                 1.00 Hz
GB                      0
PC                 1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   35
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230202
Time                10.27 h
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDC13
NS                     16
DS                      0
SWH              8012.820 Hz
FIDRES           0.489064 Hz
AQ               2.0447233 sec
RG                  80.72
DW                 62.400 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
TD0                     1
SFO1           400.2424716 MHz
NUC1                   1H
P1                  14.30 usec
PLW1           12.00000000 W

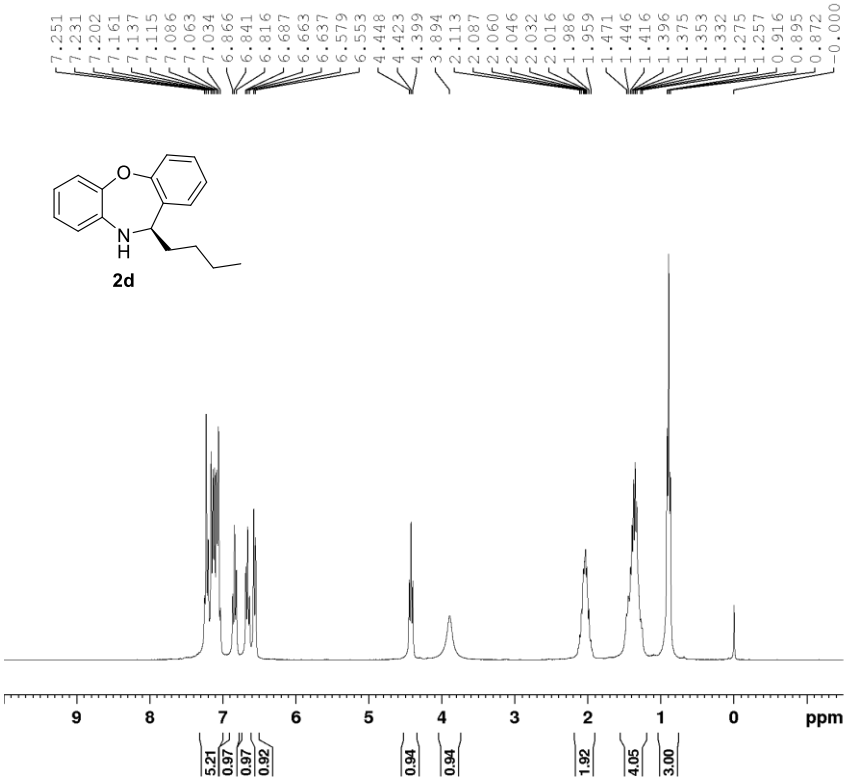
F2 - Processing parameters
SI                  65536
SF             400.2400191 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                   36
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230202
Time                10.30 h
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG            zgpg30
TD                  65536
SOLVENT             CDC13
NS                    105
DS                      4
SWH             24038.461 Hz
FIDRES           0.733596 Hz
AQ               1.3631488 sec
RG                  206.33
DW                 20.800 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                     1
SFO1           100.6504916 MHz
NUC1                   13C
P1                  10.00 usec
PLW1           54.00000000 W
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2            waltz16
PCPD2               90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

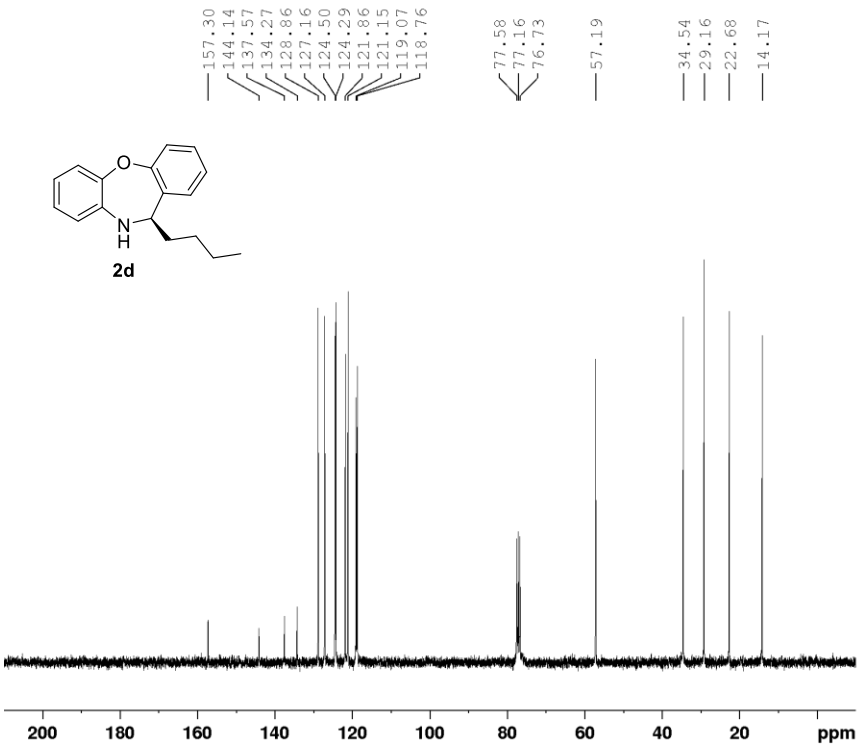
F2 - Processing parameters
SI                  32768
SF             100.6404172 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   37
PROCNO                   1

F2 - Acquisition Parameters
Date_              20220123
Time                  1.44 h
INSTRUM              spect
PROBHD    5 mm DUL 13C-1
PULPROG               zg30
TD                   65536
SOLVENT              CDC13
NS                      16
DS                       2
SWH               6009.615 Hz
FIDRES               0.183399 Hz
AQ                5.4525952 sec
RG                   142.81
DW                   83.200 usec
DE                    6.50 usec
TE                   296.4 K
D1             1.00000000 sec
TD0                      1
SFO1          300.1318534 MHz
NUC1                    1H
P1                    8.00 usec
PLW1          18.00000000 W

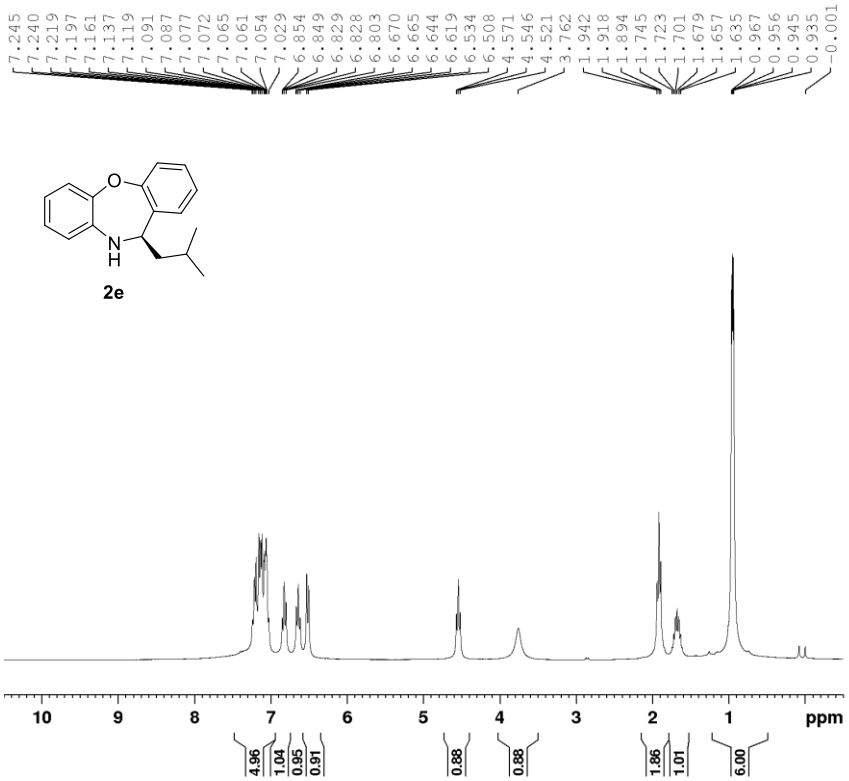
F2 - Processing parameters
SI                   65536
SF            300.1300162 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                   38
PROCNO                   1

F2 - Acquisition Parameters
Date_              20220123
Time                  1.53 h
INSTRUM              spect
PROBHD    5 mm DUL 13C-1
PULPROG           zgpg30
TD                   65536
SOLVENT              CDC13
NS                     435
DS                       4
SWH              18028.846 Hz
FIDRES               0.550197 Hz
AQ                1.8175317 sec
RG                   209.09
DW                   27.733 usec
DE                    6.50 usec
TE                   296.7 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                      1
SFO1          75.4752949 MHz
NUC1                   13C
P1                   11.00 usec
PLW1         195.00000000 W
SFO2         300.1312005 MHz
NUC2                    1H
CPDPRG[2          waltz16
PCPD2                90.00 usec
PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

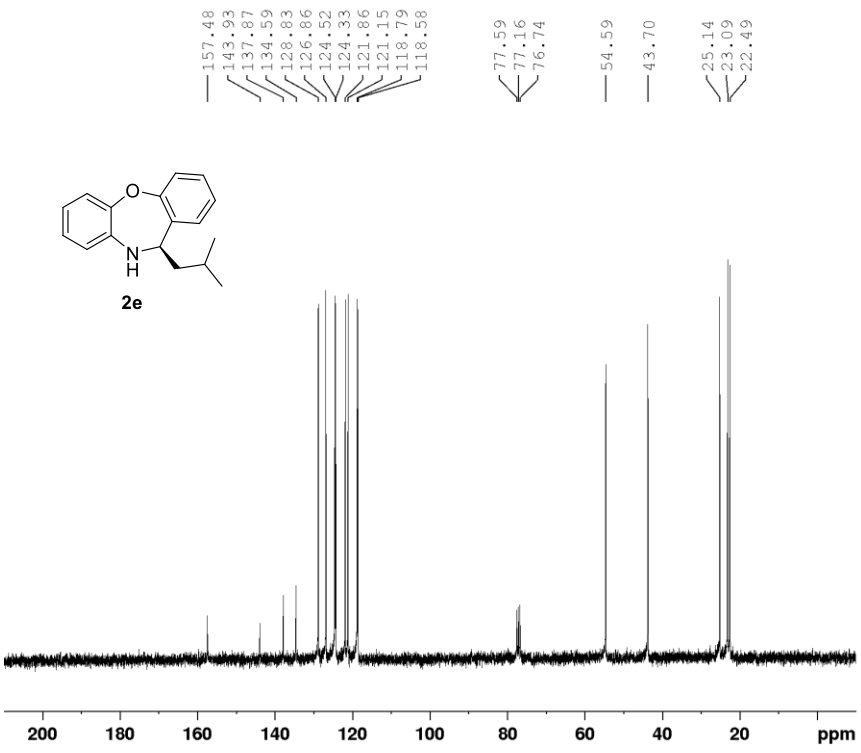
F2 - Processing parameters
SI                   32768
SF            75.4677415 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  246
PROCNO                   1

F2 - Acquisition Parameters
Date_              20220114
Time                 22.31 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG               zg30
TD                   65536
SOLVENT              CDC13
NS                      16
DS                       2
SWH               6009.615 Hz
FIDRES               0.183399 Hz
AQ                5.4525952 sec
RG                     82.09
DW                   83.200 usec
DE                    6.50 usec
TE                   296.7 K
D1             1.00000000 sec
TD0                      1
SFO1          300.1318534 MHz
NUC1                    1H
P1                    8.00 usec
PLW1          18.00000000 W

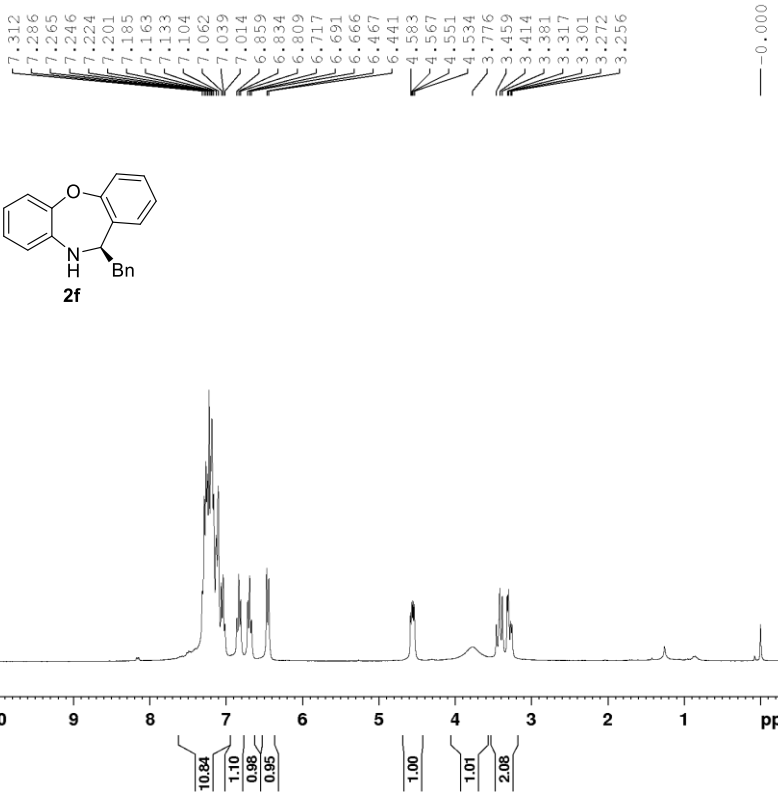
F2 - Processing parameters
SI                   65536
SF            300.1300260 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  248
PROCNO                   1

F2 - Acquisition Parameters
Date_              20220114
Time                 23.40 h
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG            zgpg30
TD                   65536
SOLVENT              CDC13
NS                     114
DS                       4
SWH              18028.846 Hz
FIDRES               0.550197 Hz
AQ                1.8175317 sec
RG                   209.09
DW                   27.733 usec
DE                    6.50 usec
TE                   297.1 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                      1
SFO1          75.4752949 MHz
NUC1                    13C
P1                   11.00 usec
PLW1         195.00000000 W
SFO2         300.1312005 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2                90.00 usec
PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

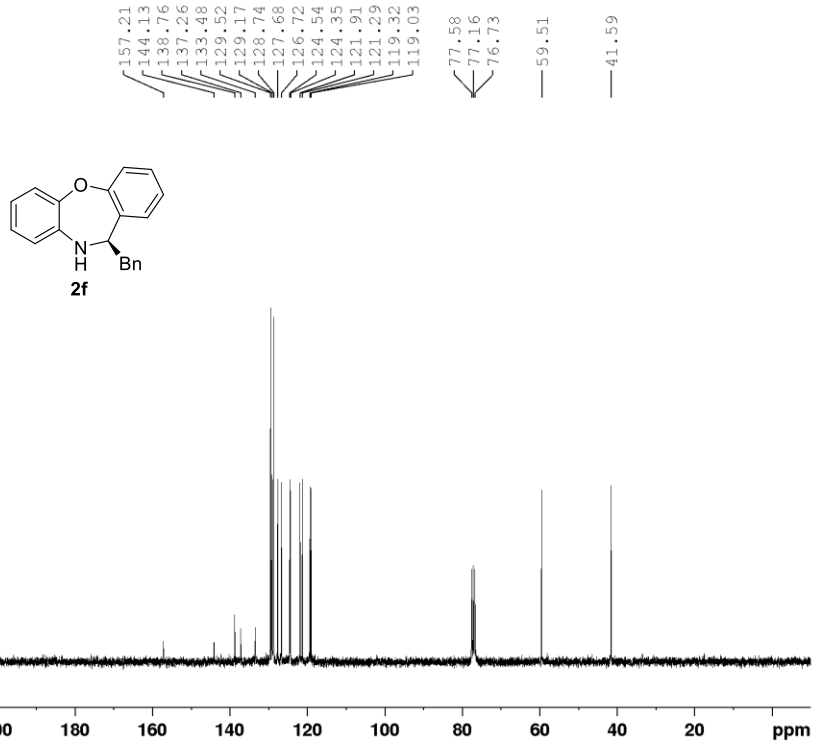
F2 - Processing parameters
SI                   32768
SF            75.4677453 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   41
PROCNO                   1

F2 - Acquisition Parameters
Date_           20220114
Time              18.31 h
INSTRUM             spect
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                 65536
SOLVENT             CDC13
NS                     16
DS                      2
SWH             6009.615 Hz
FIDRES          0.183399 Hz
AQ              5.4525952 sec
RG                 166.41
DW                 83.200 usec
DE                   6.50 usec
TE                 296.5 K
D1              1.00000000 sec
TD0                     1
SFO1         300.1318534 MHz
NUC1                   1H
P1                   8.00 usec
PLW1          18.00000000 W

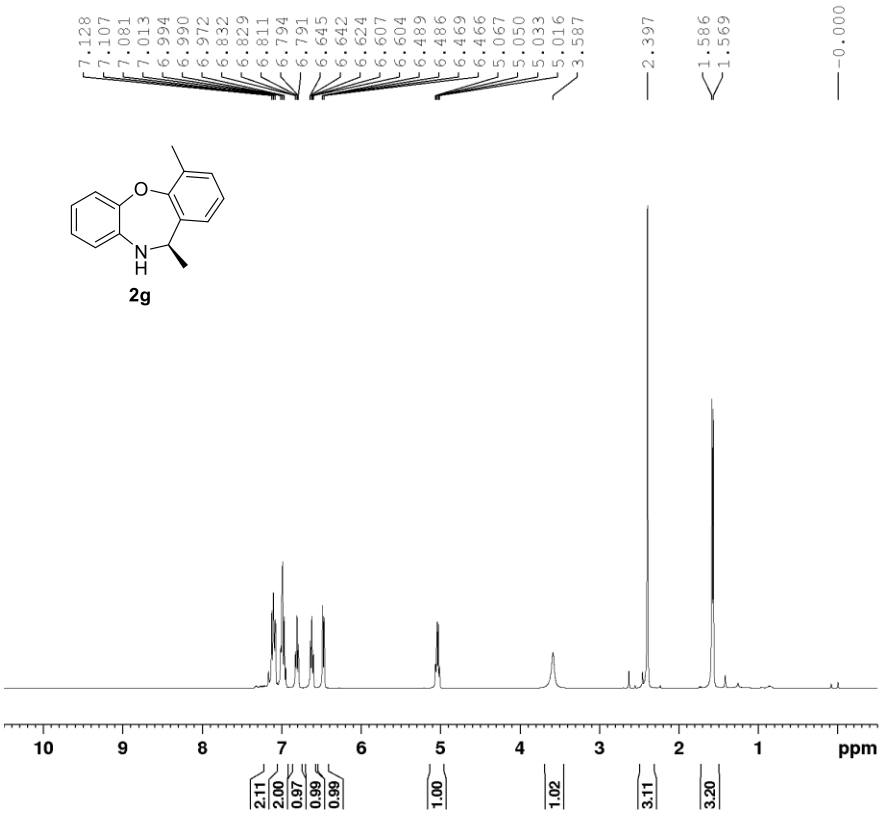
F2 - Processing parameters
SI                  65536
SF           300.1300188 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                   42
PROCNO                   1

F2 - Acquisition Parameters
Date_           20220114
Time              18.46 h
INSTRUM             spect
PROBHD   5 mm DUL 13C-1
PULPROG           zgpg30
TD                 65536
SOLVENT             CDC13
NS                    200
DS                      4
SWH            18028.846 Hz
FIDRES          0.550197 Hz
AQ              1.8175317 sec
RG                 209.09
DW                 27.733 usec
DE                   6.50 usec
TE                 296.5 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                     1
SFO1         75.4752949 MHz
NUC1                   13C
P1                  11.00 usec
PLW1         195.00000000 W
SFO2         300.1312005 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2                90.00 usec
PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

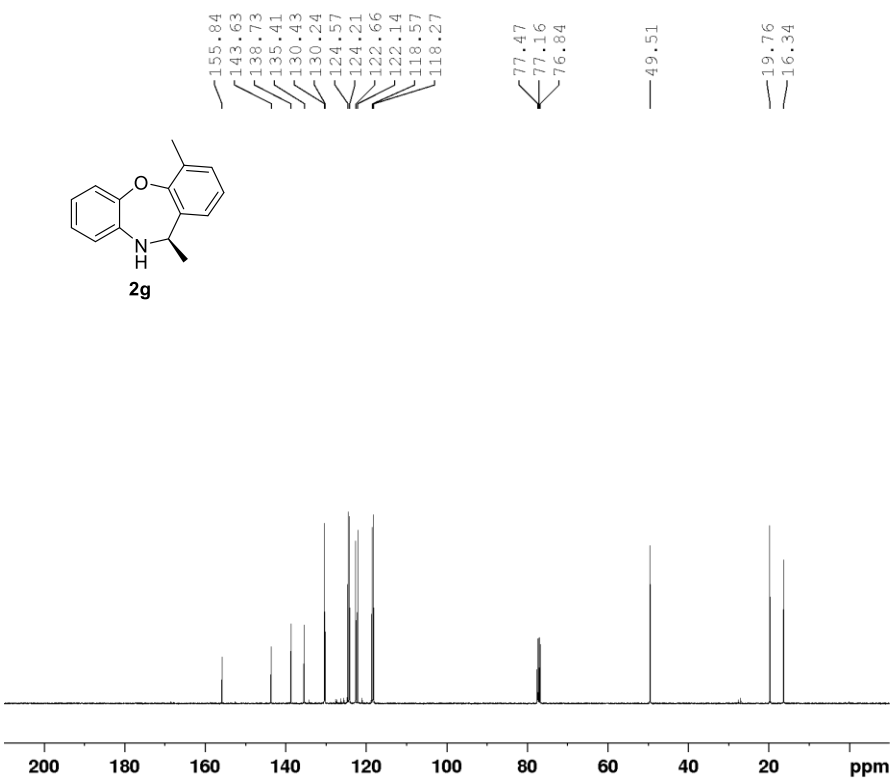
F2 - Processing parameters
SI                  32768
SF           75.4677424 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   43
PROCNO                   1

F2 - Acquisition Parameters
Date_              20230205
Time                 16.43 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDC13
NS                     16
DS                      0
SWH               8012.820 Hz
FIDRES            0.489064 Hz
AQ                2.0447233 sec
RG                    43.5
DW                  62.400 usec
DE                   6.50 usec
TE                  298.4 K
D1              2.00000000 sec
TD0                     1
SFO1           400.2424716 MHz
NUC1                   1H
P1                  14.30 usec
PLW1           12.00000000 W

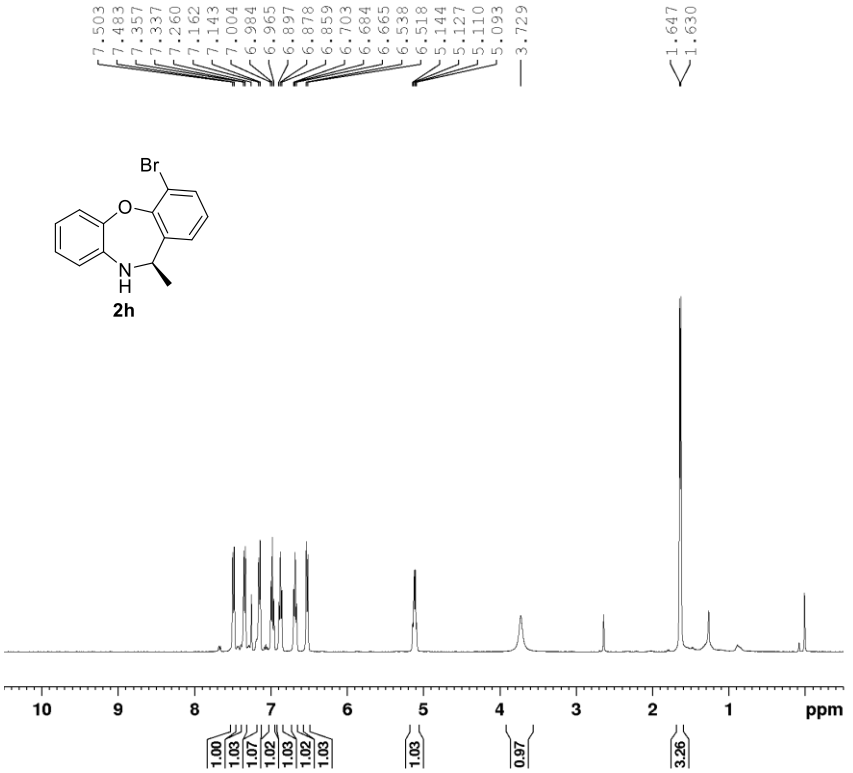
F2 - Processing parameters
SI                  65536
SF             400.2400457 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                   44
PROCNO                   1

F2 - Acquisition Parameters
Date_              20230205
Time                 17.42 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG            zgpg30
TD                  65536
SOLVENT             CDC13
NS                   1024
DS                      4
SWH              24038.461 Hz
FIDRES            0.733596 Hz
AQ                1.3631488 sec
RG                   206.33
DW                  20.800 usec
DE                   6.50 usec
TE                  298.7 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                     1
SFO1           100.6504916 MHz
NUC1                   13C
P1                  10.00 usec
PLW1           54.00000000 W
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2               90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

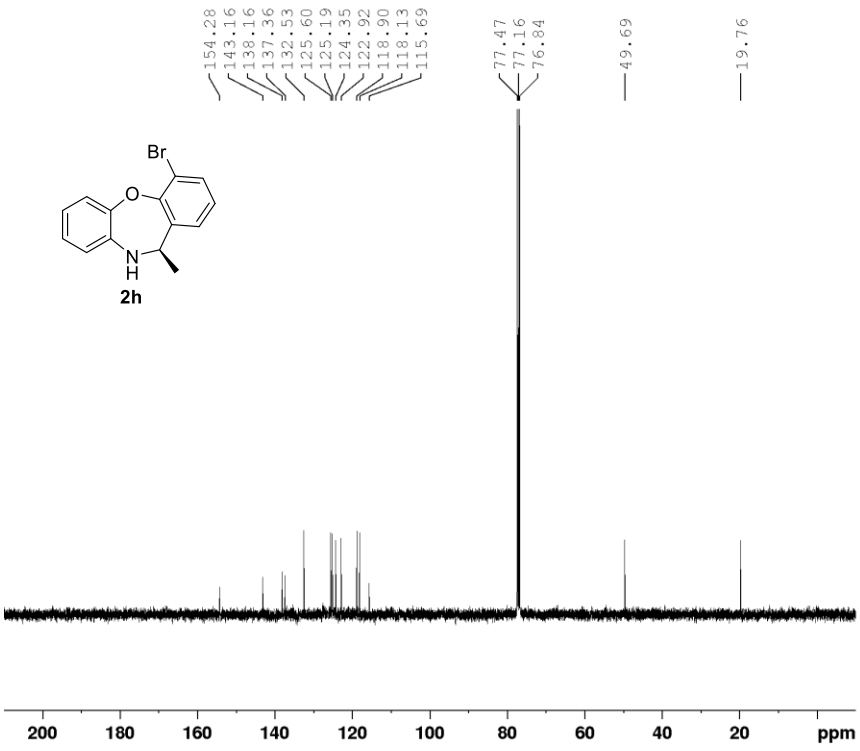
F2 - Processing parameters
SI                  32768
SF             100.6404275 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   45
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time              20.58 h
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     0
SWH             8012.820 Hz
FIDRES          0.489064 Hz
AQ              2.0447233 sec
RG                206.33
DW                62.400 usec
DE                 6.50 usec
TE                298.0 K
D1              2.00000000 sec
TD0                    1
SFO1          400.2424716 MHz
NUC1                  1H
P1                 14.30 usec
PLW1           12.00000000 W

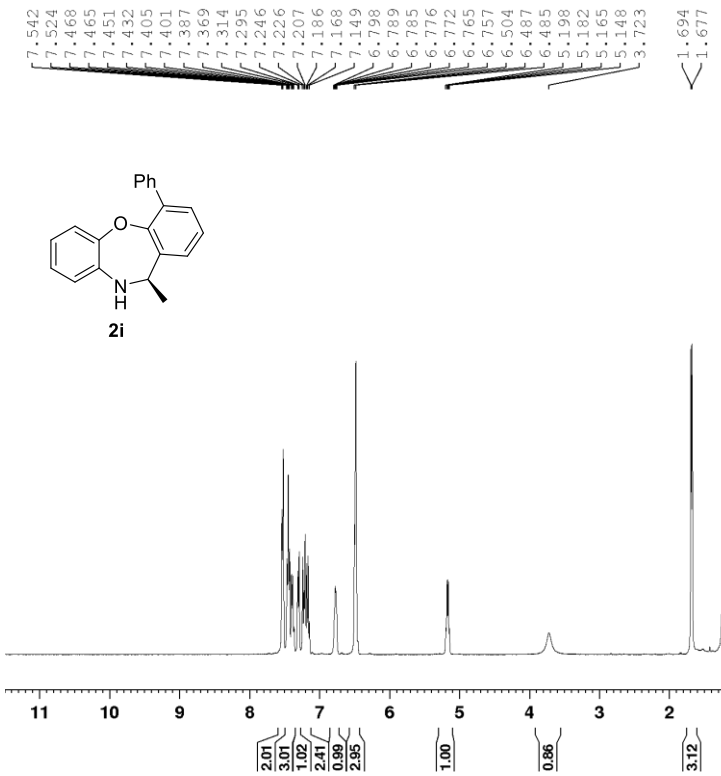
F2 - Processing parameters
SI                 65536
SF            400.2400102 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  262
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time              21.00 h
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   165
DS                     4
SWH            24038.461 Hz
FIDRES          0.733596 Hz
AQ              1.3631488 sec
RG                206.33
DW                20.800 usec
DE                 6.50 usec
TE                298.0 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                    1
SFO1          100.6504916 MHz
NUC1                  13C
P1                 10.00 usec
PLW1           54.00000000 W
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

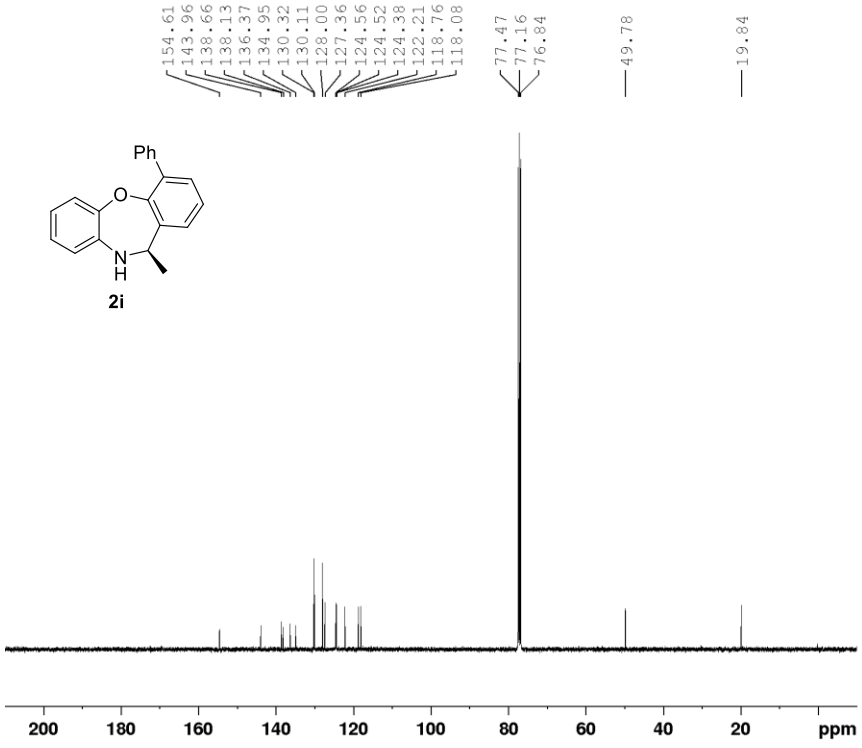
F2 - Processing parameters
SI                 32768
SF            100.6404166 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   47
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time              21.11 h
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             8012.820 Hz
FIDRES          0.489064 Hz
AQ              2.0447233 sec
RG                206.33
DW                62.400 usec
DE                 6.50 usec
TE                298.0 K
D1              2.00000000 sec
TD0                     1
SFO1          400.2424716 MHz
NUC1                   1H
P1                 14.30 usec
PLW1           12.00000000 W

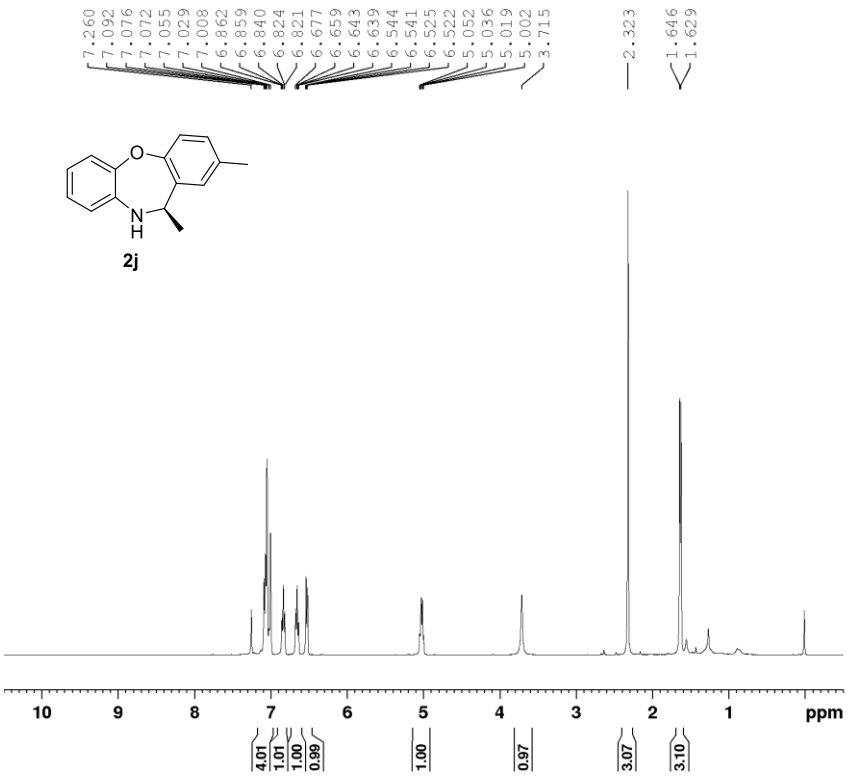
F2 - Processing parameters
SI                  65536
SF            400.2400155 MHz
WDW                    EM
SSB                     0
LB                 0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  264
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time              21.13 h
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT             CDCl3
NS                   1024
DS                      4
SWH            24038.461 Hz
FIDRES          0.733596 Hz
AQ              1.3631488 sec
RG                206.33
DW                20.800 usec
DE                 6.50 usec
TE                298.0 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                     1
SFO1          100.6504916 MHz
NUC1                  13C
P1                 10.00 usec
PLW1           54.00000000 W
SFO2          400.2416010 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2              90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

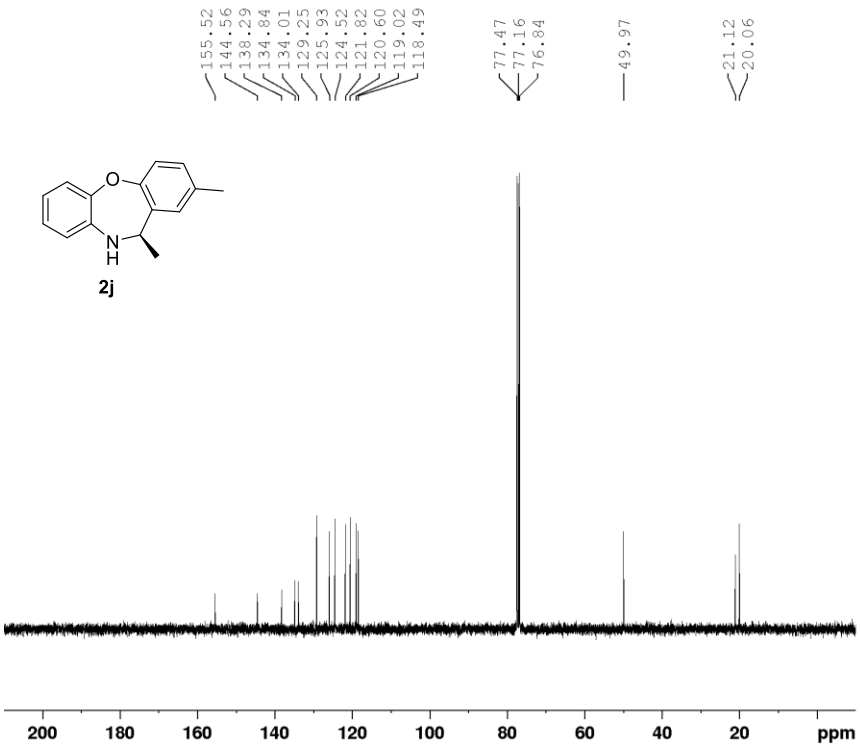
F2 - Processing parameters
SI                  32768
SF            100.6404161 MHz
WDW                    EM
SSB                     0
LB                 1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  249
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time                19.00 h
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT              CDC13
NS                      16
DS                       0
SWH              8012.820 Hz
FIDRES           0.489064 Hz
AQ               2.0447233 sec
RG                  206.33
DW                  62.400 usec
DE                   6.50 usec
TE                  298.0 K
D1               2.00000000 sec
TD0                      1
SFO1           400.2424716 MHz
NUC1                    1H
P1                   14.30 usec
PLW1           12.00000000 W

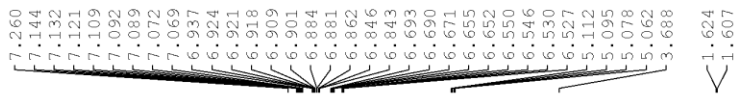
F2 - Processing parameters
SI                    65536
SF             400.2400101 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```

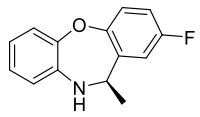



```
Current Data Parameters
NAME                  500M
EXPNO                  250
PROCNO                   1

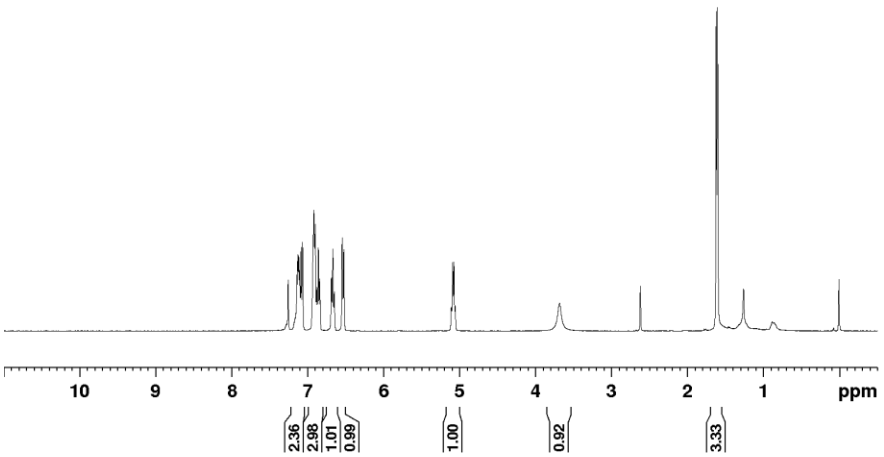
F2 - Acquisition Parameters
Date_           20221115
Time                19.03 h
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG            zgpg30
TD                  65536
SOLVENT              CDC13
NS                     102
DS                       4
SWH             24038.461 Hz
FIDRES           0.733596 Hz
AQ               1.3631488 sec
RG                  206.33
DW                  20.800 usec
DE                   6.50 usec
TE                  298.0 K
D1               2.00000000 sec
d11              0.03000000 sec
DELTA            1.89999998 sec
TD0                      1
SFO1           100.6504916 MHz
NUC1                   13C
P1                   10.00 usec
PLW1           54.00000000 W
SFO2           400.2416010 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                    32768
SF             100.6404280 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```





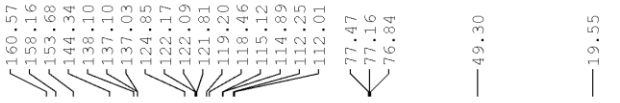
2k

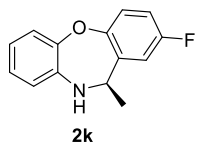



```
Current Data Parameters
NAME                  500M
EXPNO                   51
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time              19.11 h
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDC13
NS                    16
DS                     0
SWH             8012.820 Hz
FIDRES             0.489064 Hz
AQ              2.0447233 sec
RG                  206.33
DW                 62.400 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
TD0                    1
SFO1          400.2424716 MHz
NUC1                  1H
P1                 14.30 usec
PLW1          12.00000000 W

F2 - Processing parameters
SI                 65536
SF            400.2400101 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```



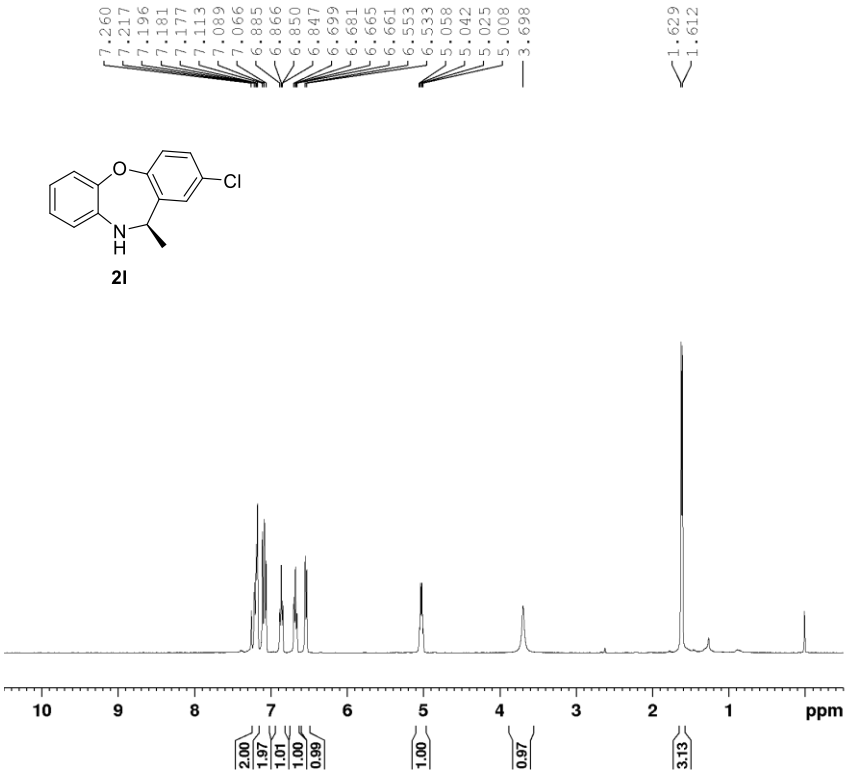


2k


```
Current Data Parameters
NAME                  500M
EXPNO                  252
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time              19.12 h
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT            CDC13
NS                   205
DS                     4
SWH            24038.461 Hz
FIDRES             0.733596 Hz
AQ              1.3631488 sec
RG                  206.33
DW                 20.800 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                    1
SFO1          100.6504916 MHz
NUC1                  13C
P1                 10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

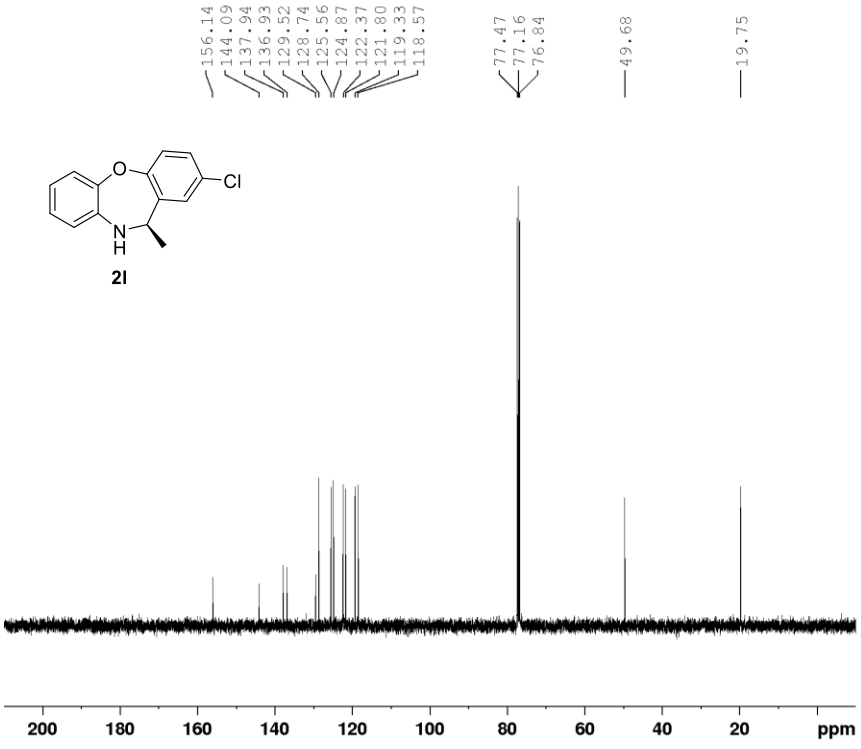
F2 - Processing parameters
SI                 32768
SF            100.6404151 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  253
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time                19.32 h
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      0
SWH              8012.820 Hz
FIDRES           0.489064 Hz
AQ               2.0447233 sec
RG                  206.33
DW                  62.400 usec
DE                    6.50 usec
TE                  298.0 K
D1               2.00000000 sec
TD0                     1
SFO1           400.2424716 MHz
NUC1                   1H
P1                  14.30 usec
PLW1           12.00000000 W

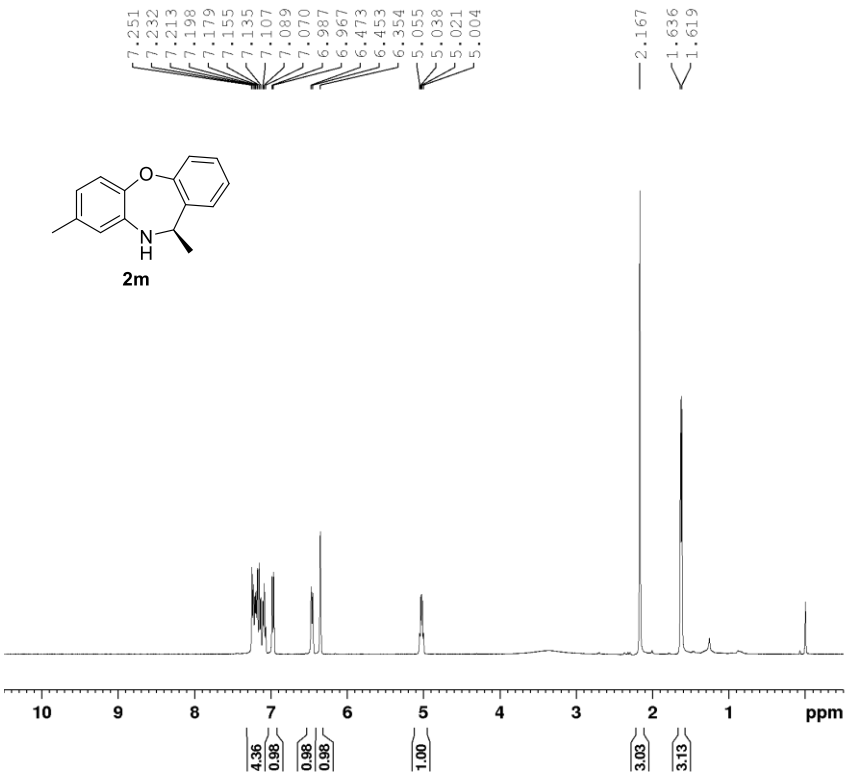
F2 - Processing parameters
SI                  65536
SF             400.2400100 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  254
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time                19.27 h
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                     86
DS                      4
SWH             24038.461 Hz
FIDRES           0.733596 Hz
AQ               1.3631488 sec
RG                  206.33
DW                  20.800 usec
DE                    6.50 usec
TE                  298.0 K
D1               2.00000000 sec
d11              0.03000000 sec
DELTA            1.89999998 sec
TD0                     1
SFO1           100.6504916 MHz
NUC1                   13C
P1                  10.00 usec
PLW1           54.00000000 W
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2            waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

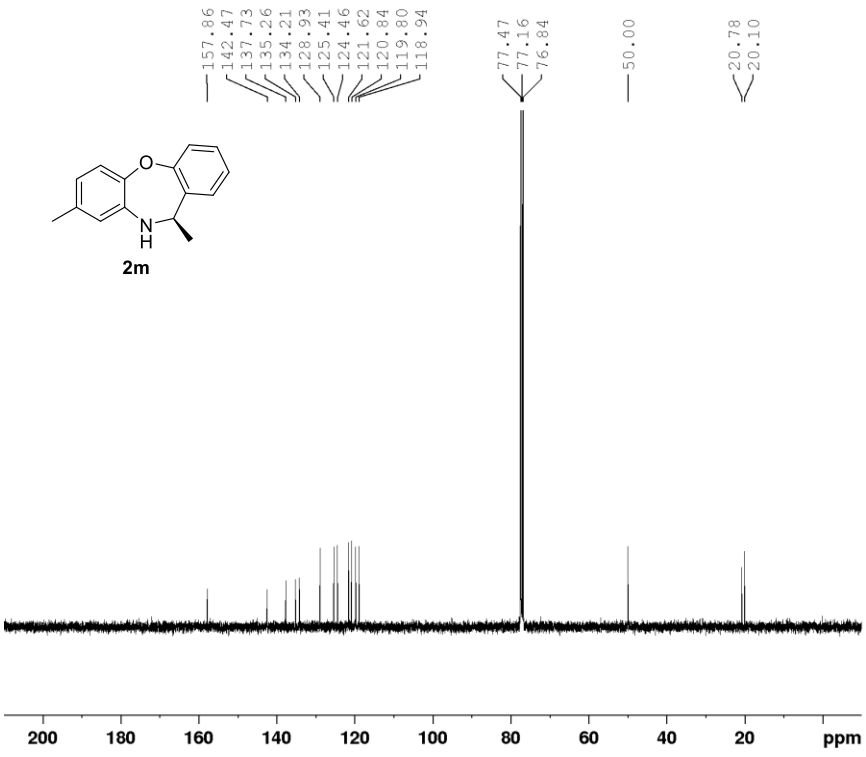
F2 - Processing parameters
SI                  32768
SF             100.6404161 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   61
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221116
Time              12.31 h
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    12
DS                     0
SWH             8012.820 Hz
FIDRES          0.489064 Hz
AQ              2.0447233 sec
RG                206.33
DW                62.400 usec
DE                 6.50 usec
TE                298.0 K
D1             2.00000000 sec
TD0                    1
SFO1         400.2424716 MHz
NUC1                  1H
P1                 14.30 usec
PLW1          12.00000000 W

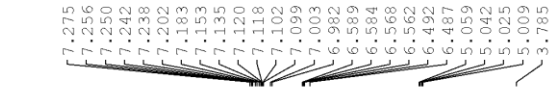
F2 - Processing parameters
SI                 65536
SF           400.2400138 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

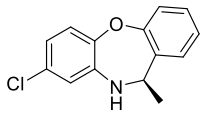



```
Current Data Parameters
NAME                  500M
EXPNO                   62
PROCNO                   1

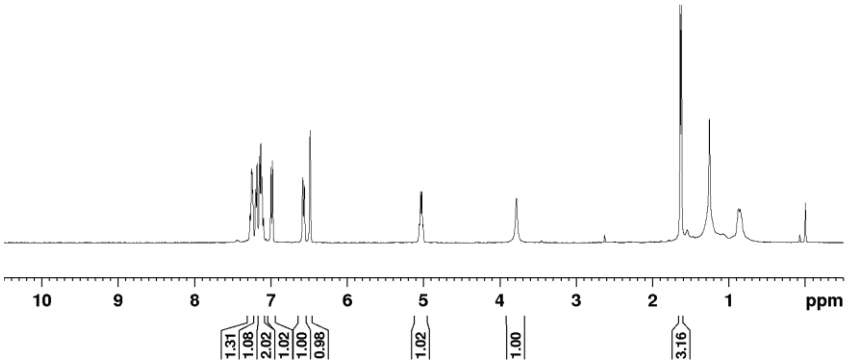
F2 - Acquisition Parameters
Date_           20221116
Time              13.08 h
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   457
DS                     4
SWH            24038.461 Hz
FIDRES          0.733596 Hz
AQ              1.3631488 sec
RG                206.33
DW                20.800 usec
DE                 6.50 usec
TE                298.0 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                    1
SFO1         100.6504916 MHz
NUC1                  13C
P1                 10.00 usec
PLW1          54.00000000 W
SFO2         400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                 32768
SF           100.6404151 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```





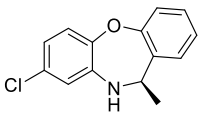
2n



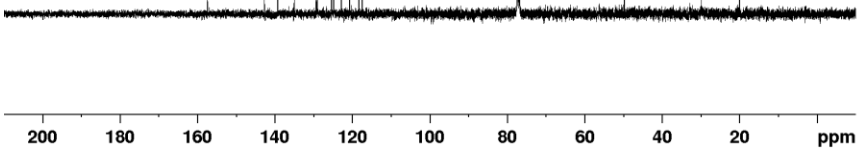

```
Current Data Parameters
NAME                  500M
EXPNO                   63
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221116
Time                12.17 h
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      0
SWH              8012.820 Hz
FIDRES           0.489064 Hz
AQ               2.0447233 sec
RG                 206.33
DW                 62.400 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
TD0                     1
SFO1          400.2424716 MHz
NUC1                   1H
P1                  14.30 usec
PLW1          12.00000000 W

F2 - Processing parameters
SI                  65536
SF            400.2400142 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```



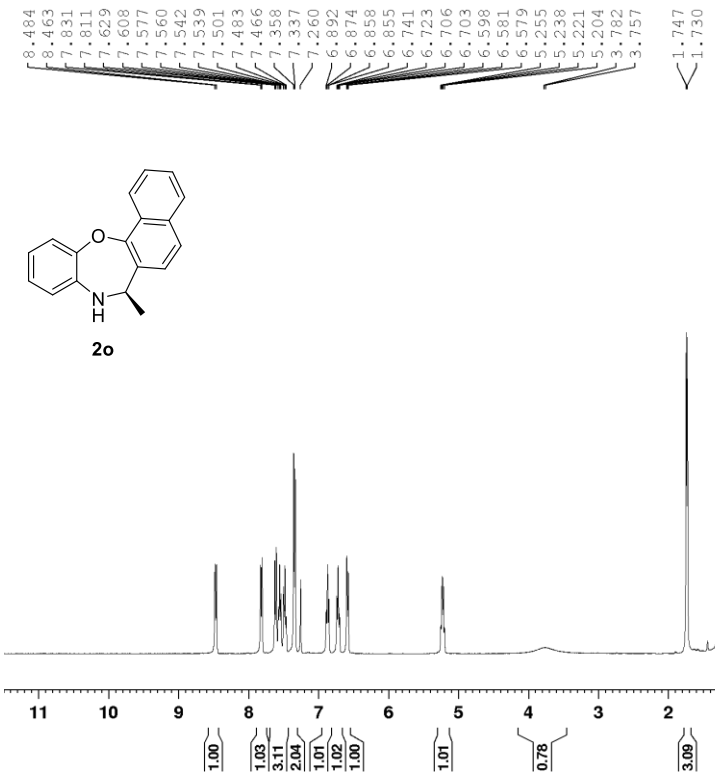
2n




```
Current Data Parameters
NAME                  500M
EXPNO                   64
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221116
Time                12.21 h
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                  65536
SOLVENT             CDCl3
NS                    169
DS                      4
SWH             24038.461 Hz
FIDRES           0.733596 Hz
AQ               1.3631488 sec
RG                 206.33
DW                 20.800 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                     1
SFO1          100.6504916 MHz
NUC1                   13C
P1                  10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                   1H
CPDPRG[2         waltz16
PCPD2               90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

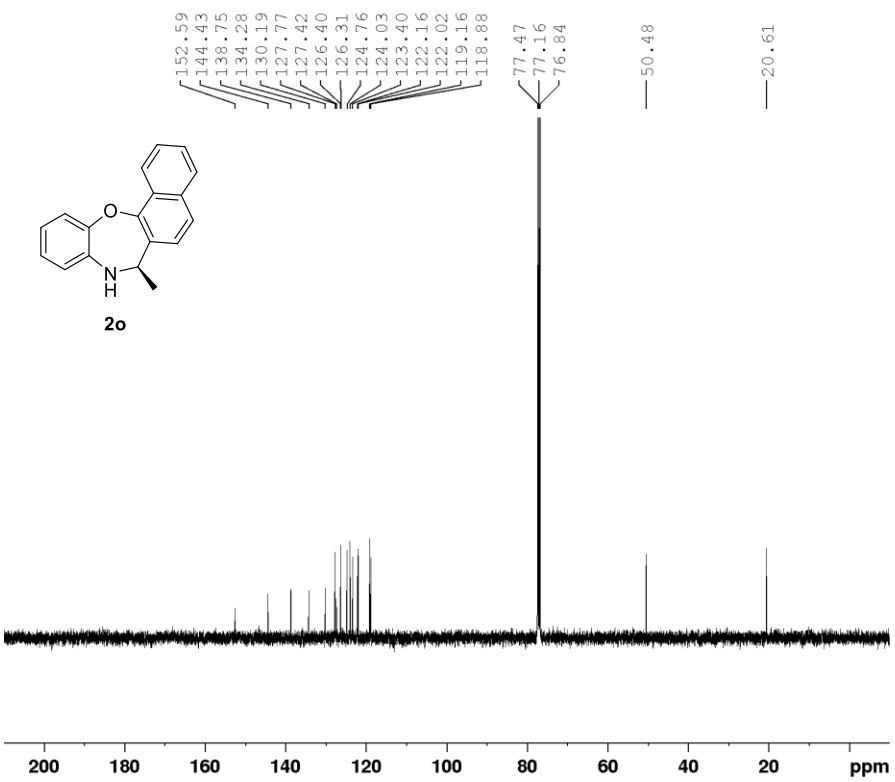
F2 - Processing parameters
SI                  32768
SF            100.6404161 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                   59
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time              20.43 h
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     0
SWH             8012.820 Hz
FIDRES          0.489064 Hz
AQ             2.0447233 sec
RG                206.33
DW                62.400 usec
DE                 6.50 usec
TE                298.0 K
D1             2.00000000 sec
TD0                    1
SFO1         400.2424716 MHz
NUC1                  1H
P1                14.30 usec
PLW1         12.00000000 W

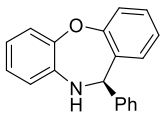
F2 - Processing parameters
SI                 65536
SF           400.2400097 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```



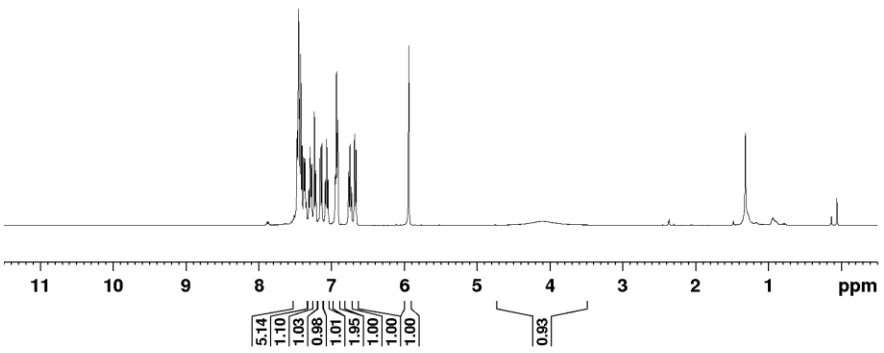

```
Current Data Parameters
NAME                  500M
EXPNO                   60
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time              20.44 h
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   197
DS                     4
SWH            24038.461 Hz
FIDRES          0.733596 Hz
AQ             1.3631488 sec
RG                206.33
DW                20.800 usec
DE                 6.50 usec
TE                298.1 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                    1
SFO1         100.6504916 MHz
NUC1                 13C
P1                10.00 usec
PLW1         54.00000000 W
SFO2         400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2             90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                 32768
SF           100.6404168 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```



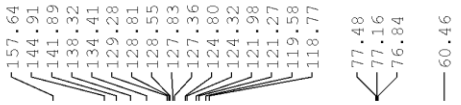
2p

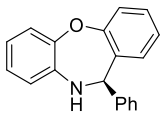



```
Current Data Parameters
NAME                  500M
EXPNO                   67
PROCNO                   1

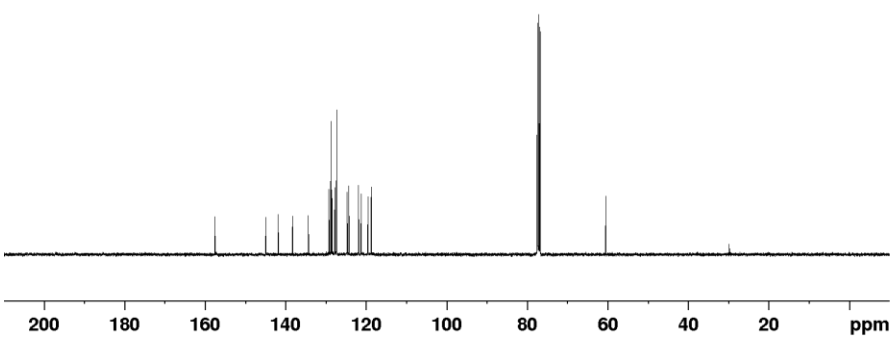
F2 - Acquisition Parameters
Date_              20230306
Time                  5.27 h
INSTRUM               spect
PROBHD    5 mm PABBO BB/
PULPROG                zg30
TD                    32768
SOLVENT               CDC13
NS                       16
DS                        0
SWH                8012.820 Hz
FIDRES            0.489064 Hz
AQ                2.0447233 sec
RG                   162.77
DW                   62.400 usec
DE                    6.50 usec
TE                   300.9 K
D1              2.00000000 sec
TD0                      1
SFO1           400.2424716 MHz
NUC1                    1H
P1                   14.30 usec
PLW1           12.00000000 W

F2 - Processing parameters
SI                    65536
SF              400.2400000 MHz
WDW                      EM
SSB                       0
LB                    0.30 Hz
GB                        0
PC                    1.00
```





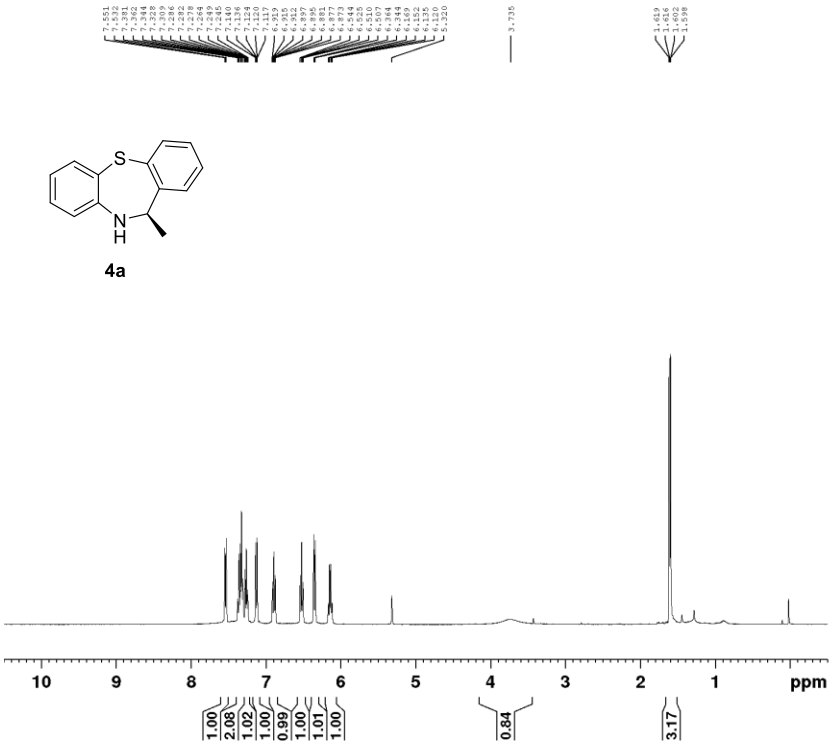
2p




```
Current Data Parameters
NAME                  500M
EXPNO                   68
PROCNO                   1

F2 - Acquisition Parameters
Date_              20230306
Time                  6.26 h
INSTRUM               spect
PROBHD    5 mm PABBO BB/
PULPROG             zgpg30
TD                    65536
SOLVENT               CDC13
NS                     1024
DS                        4
SWH               24038.461 Hz
FIDRES            0.733596 Hz
AQ                1.3631488 sec
RG                   206.33
DW                   20.800 usec
DE                    6.50 usec
TE                   301.5 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                      1
SFO1           100.6504916 MHz
NUC1                   13C
P1                   10.00 usec
PLW1           54.00000000 W
SFO2           400.2416010 MHz
NUC2                    1H
CPDPRG[2         waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

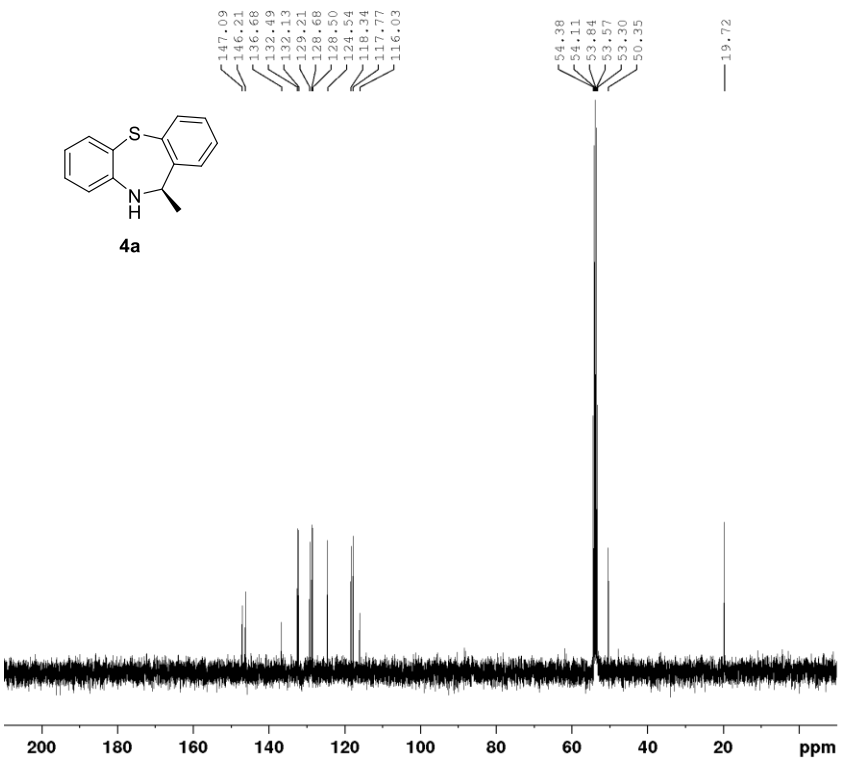
F2 - Processing parameters
SI                    32768
SF             100.6404168 MHz
WDW                      EM
SSB                       0
LB                    1.00 Hz
GB                        0
PC                    1.40
```



Current Data Parameters
NAME 2022-11-12-YZQ-S-Me-QH-Pro
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20221112
Time 1.02 h
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 32768
SOLVENT CD2Cl2
NS 4
DS 0
SWH 8012.820 Hz
FIDRES 0.489064 Hz
AQ 2.0447233 sec
RG 162.77
DW 62.400 usec
DE 6.50 usec
TE 299.8 K
D1 2.00000000 sec
TD0 1
SFO1 400.2424716 MHz
NUC1 1H
P1 14.30 usec
PLW1 12.00000000 W

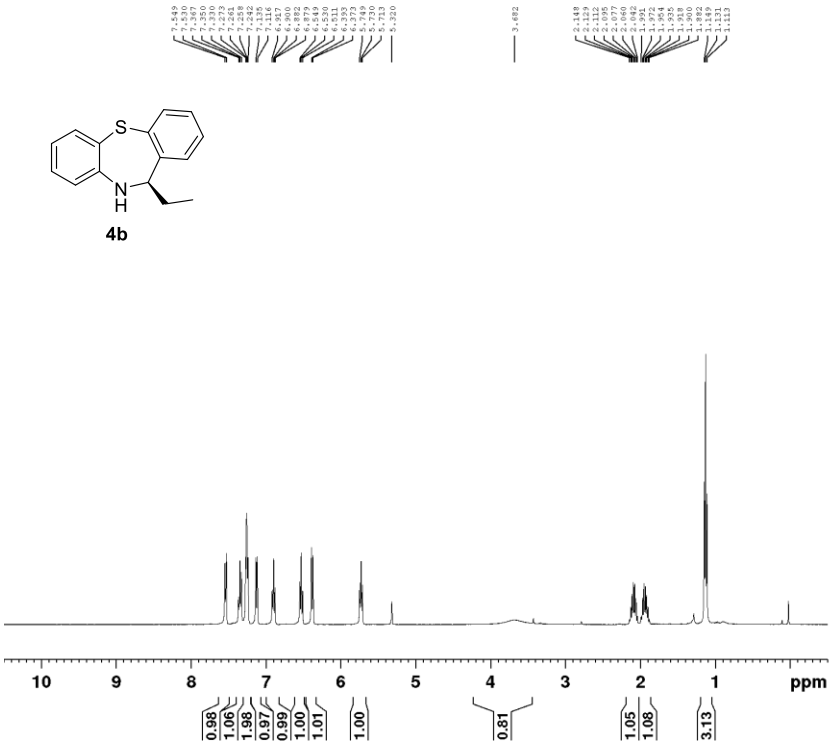
F2 - Processing parameters
SI 65536
SF 400.2400159 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



Current Data Parameters
NAME 2022-11-12-YZQ-S-Me-QH-Pro
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20221112
Time 1.06 h
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 65536
SOLVENT CD2Cl2
NS 64
DS 4
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 1.3631488 sec
RG 206.33
DW 20.800 usec
DE 6.50 usec
TE 300.4 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
SFO1 100.6504916 MHz
NUC1 13C
P1 10.00 usec
PLW1 54.00000000 W
SFO2 400.2416010 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.30294999 W
PLW13 0.24539000 W

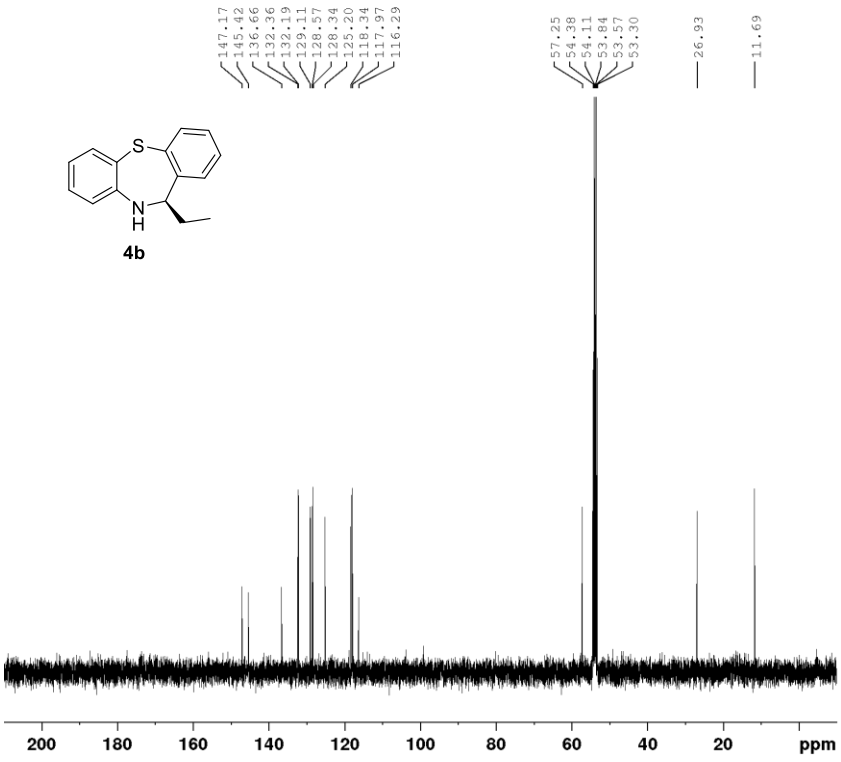
F2 - Processing parameters
SI 32768
SF 100.6403867 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40




```
Current Data Parameters
NAME      2022-11-12-YZQ-S-Et-QH-Pro
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_          20221112
Time               1.54 h
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                32768
SOLVENT           CD2Cl2
NS                    4
DS                    0
SWH             8012.820 Hz
FIDRES          0.489064 Hz
AQ             2.0447233 sec
RG                102.73
DW                62.400 usec
DE                 6.50 usec
TE                299.8 K
D1             2.00000000 sec
TD0                   1
SFO1          400.2424716 MHz
NUC1                  1H
P1                14.30 usec
PLW1          12.00000000 W

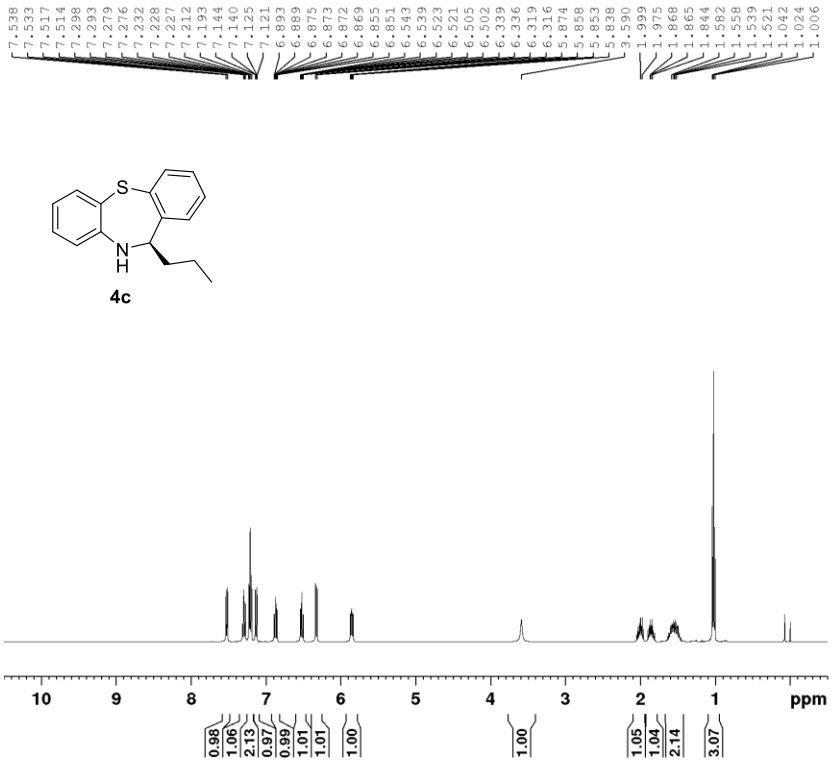
F2 - Processing parameters
SI                65536
SF            400.2400154 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```




```
Current Data Parameters
NAME      2022-11-12-YZQ-S-Et-QH-Pro
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_          20221112
Time               1.56 h
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG          zgpg30
TD                65536
SOLVENT           CD2Cl2
NS                   64
DS                    4
SWH            24038.461 Hz
FIDRES          0.733596 Hz
AQ             1.3631488 sec
RG                206.33
DW                20.800 usec
DE                 6.50 usec
TE                300.3 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                   1
SFO1          100.6504916 MHz
NUC1                 13C
P1                10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2             90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

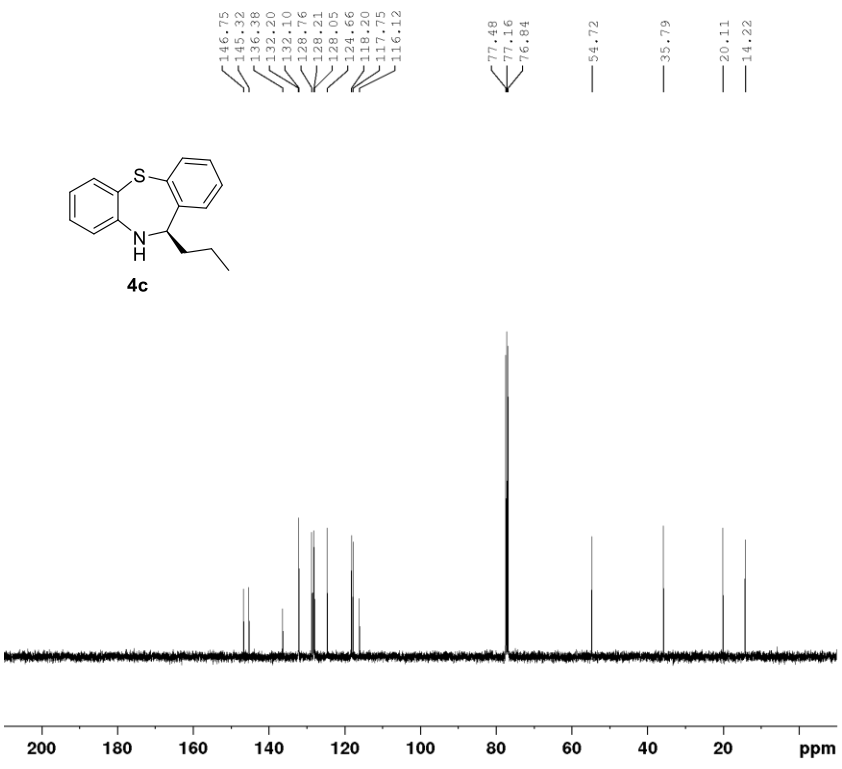
F2 - Processing parameters
SI                32768
SF            100.6403867 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```




```
Current Data Parameters
NAME       2022-11-01-YZQ-S-n-Prop-QH-Pr
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_            20221101
Time                21.20 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                      8
DS                      0
SWH              8012.820 Hz
FIDRES           0.489064 Hz
AQ               2.0447233 sec
RG                   73.9
DW                62.400 usec
DE                 6.50 usec
TE                298.0 K
D1             2.00000000 sec
TD0                     1
SFO1          400.2424716 MHz
NUC1                   1H
P1                 14.30 usec
PLW1          12.00000000 W

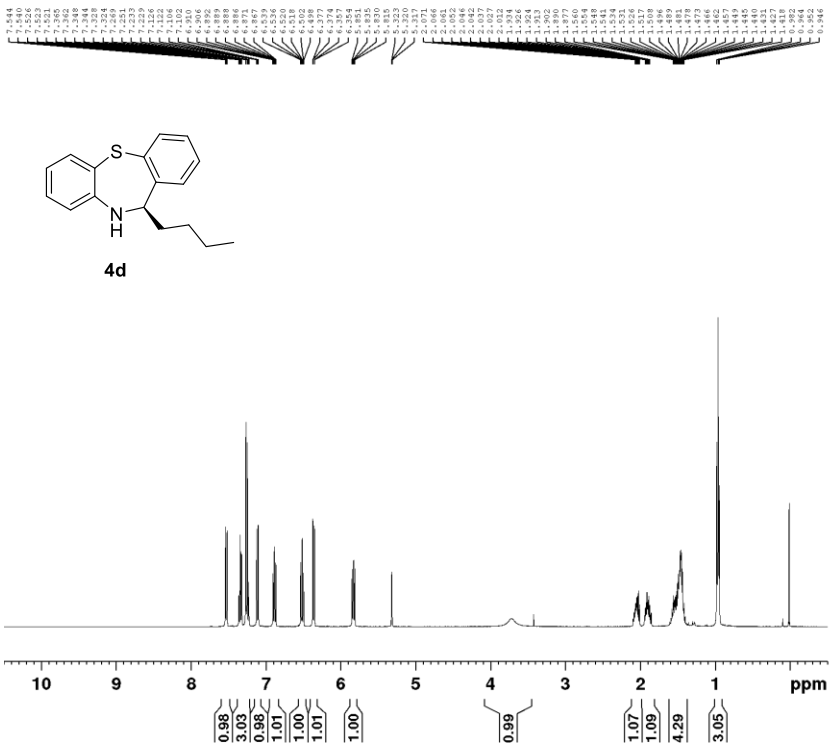
F2 - Processing parameters
SI                  65536
SF            400.2400231 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME       2022-11-01-YZQ-S-n-Prop-QH-Pro
EXPNO                   2
PROCNO                  1

F2 - Acquisition Parameters
Date_            20221101
Time                21.24 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG           zgpg30
TD                  65536
SOLVENT             CDCl3
NS                     80
DS                      4
SWH             24038.461 Hz
FIDRES           0.733596 Hz
AQ               1.3631488 sec
RG                  206.33
DW                20.800 usec
DE                 6.50 usec
TE                298.0 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                     1
SFO1          100.6504916 MHz
NUC1                   13C
P1                10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2             90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

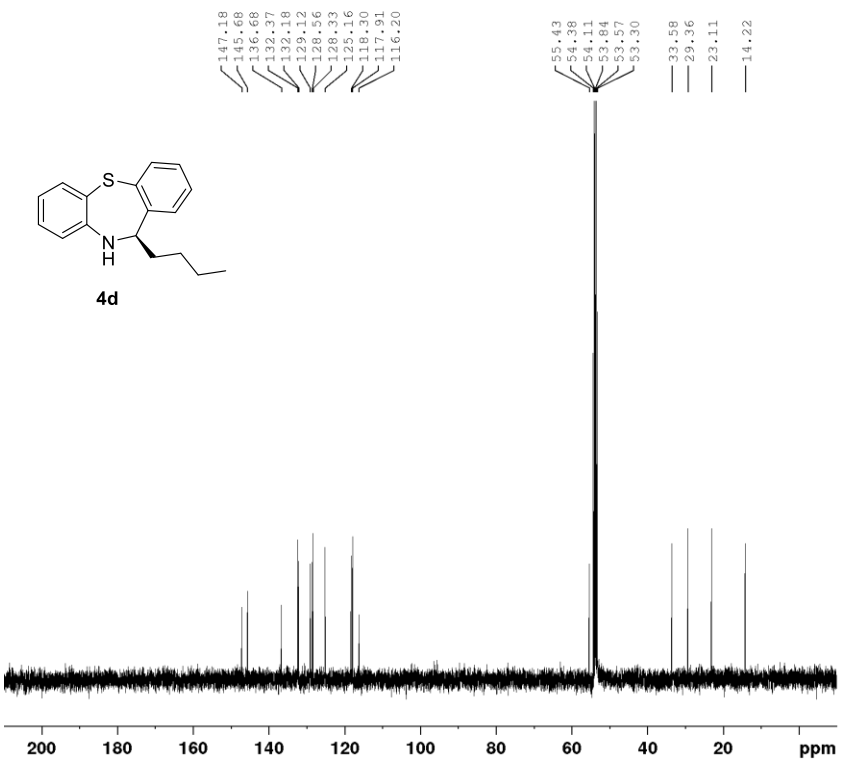
F2 - Processing parameters
SI                  32768
SF            100.6404201 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME      2022-11-12-YZQ-S-n-Bu-QH-pro
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_          20221112
Time               1.43 h
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                32768
SOLVENT           CD2Cl2
NS                    4
DS                    0
SWH            8012.820 Hz
FIDRES        0.489064 Hz
AQ            2.0447233 sec
RG               206.33
DW              62.400 usec
DE               6.50 usec
TE              299.9 K
D1            2.00000000 sec
TD0                   1
SFO1        400.2424716 MHz
NUC1                1H
P1                14.30 usec
PLW1         12.00000000 W

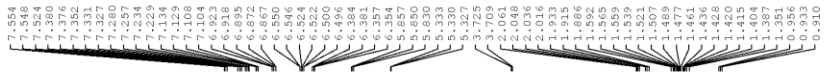
F2 - Processing parameters
SI                65536
SF            400.2400153 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```

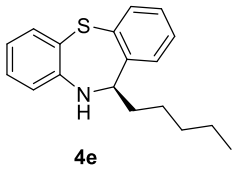



```
Current Data Parameters
NAME      2022-11-12-YZQ-S-n-Bu-QH-pro
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_          20221112
Time               1.46 h
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG          zgpg30
TD                65536
SOLVENT           CD2Cl2
NS                  128
DS                    4
SWH           24038.461 Hz
FIDRES        0.733596 Hz
AQ            1.3631488 sec
RG               206.33
DW              20.800 usec
DE               6.50 usec
TE              300.4 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
TD0                   1
SFO1        100.6504916 MHz
NUC1                13C
P1                10.00 usec
PLW1         54.00000000 W
SFO2        400.2416010 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                32768
SF            100.6403853 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```



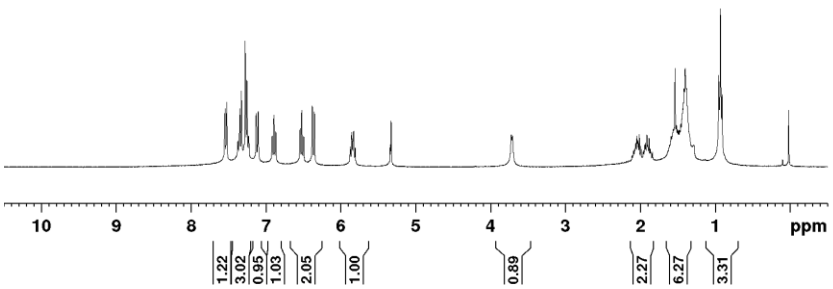


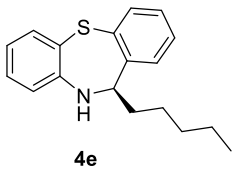
4e

```
Current Data Parameters
NAME      2022-10-28-YZQ-S-n-Pentyl-QH-Pro
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_              20221028
Time                 13.20 h
INSTRUM              spect
PROBHD    5 mm DUL 13C-1
PULPROG              zg30
TD                  65536
SOLVENT           CD2Cl2
NS                    12
DS                     2
SWH             6009.615 Hz
FIDRES          0.183399 Hz
AQ              5.4525952 sec
RG                 209.09
DW                83.200 usec
DE                 6.50 usec
TE                298.2 K
D1             1.00000000 sec
TD0                    1
SFO1          300.1318534 MHz
NUC1                  1H
P1                 8.00 usec
PLW1          18.00000000 W

F2 - Processing parameters
SI                  65536
SF            300.1300086 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```



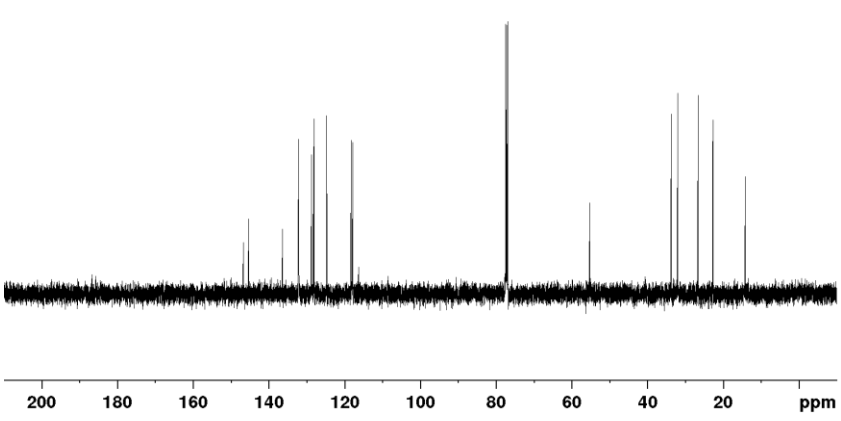


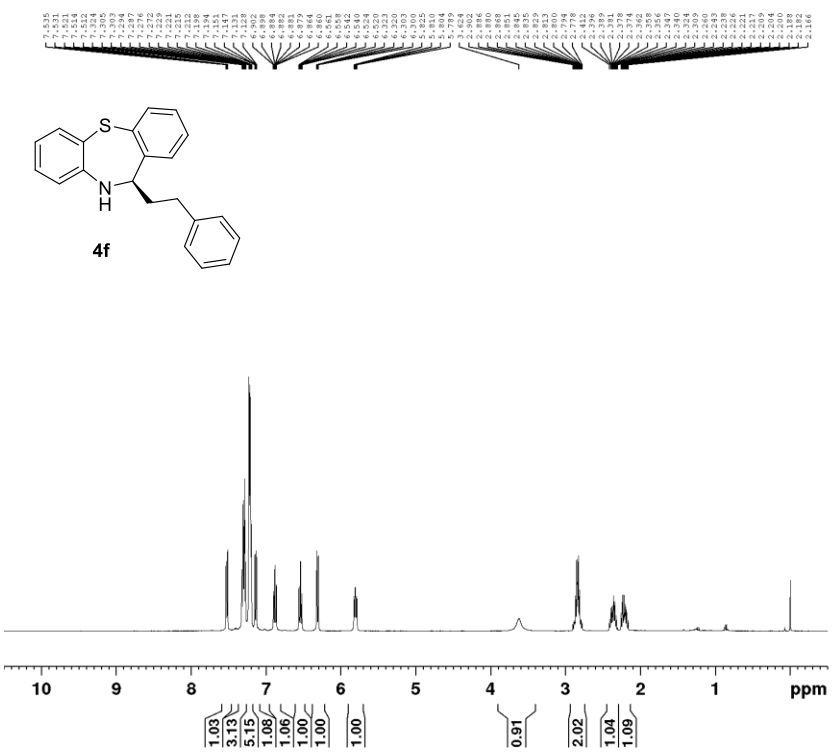
4e

```
Current Data Parameters
NAME      2022-10-28-YZQ-S-n-Pentyl-QH-Pro
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_              20221028
Time                  0.45 h
INSTRUM              spect
PROBHD    5 mm PADUL 13C
PULPROG           zgpg30
TD                  65536
SOLVENT           CDCl3
NS                    36
DS                     4
SWH            29761.904 Hz
FIDRES          0.908261 Hz
AQ              1.1010048 sec
RG                 192.89
DW                16.800 usec
DE                 6.50 usec
TE                    0 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                    1
SFO1          125.7703637 MHz
NUC1                 13C
P1                10.00 usec
PLW1          80.00000000 W
SFO2          500.1320005 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2             80.00 usec
PLW2          20.00000000 W
PLW12          0.39903000 W
PLW13          0.25538000 W

F2 - Processing parameters
SI                  32768
SF            125.7577718 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

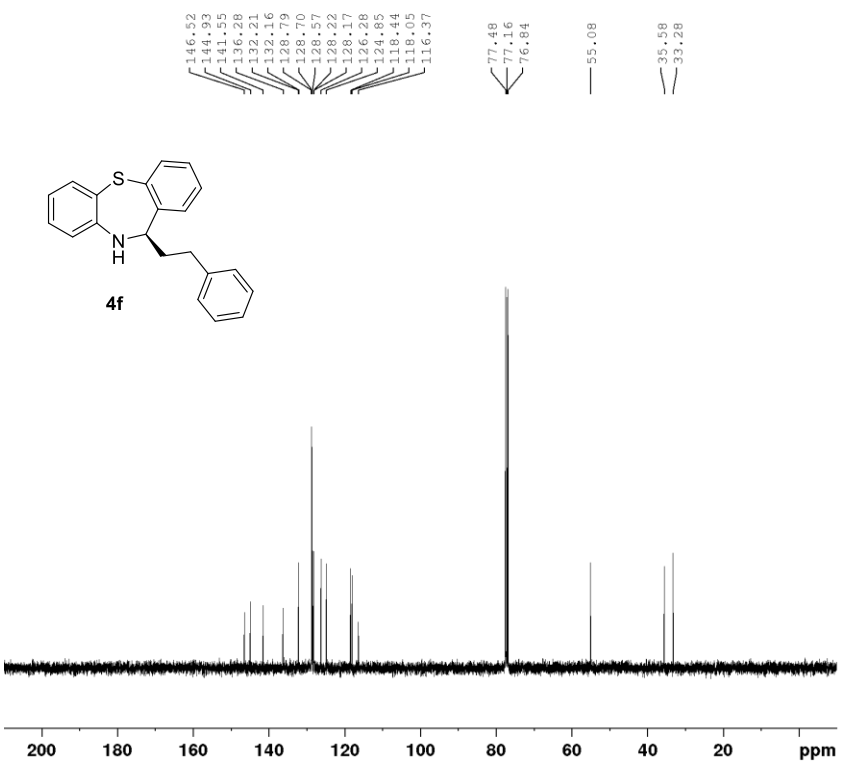





```
Current Data Parameters
NAME      2022-11-01-YZQ-S-CH2-CH2-Ph-QH-Pro
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_           20221101
Time              21.30 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                     8
DS                     0
SWH             8012.820 Hz
FIDRES          0.489064 Hz
AQ              2.0447233 sec
RG                  73.9
DW                62.400 usec
DE                 6.50 usec
TE                298.0 K
D1             2.00000000 sec
TD0                    1
SFO1          400.2424716 MHz
NUC1                  1H
P1                 14.30 usec
PLW1          12.00000000 W

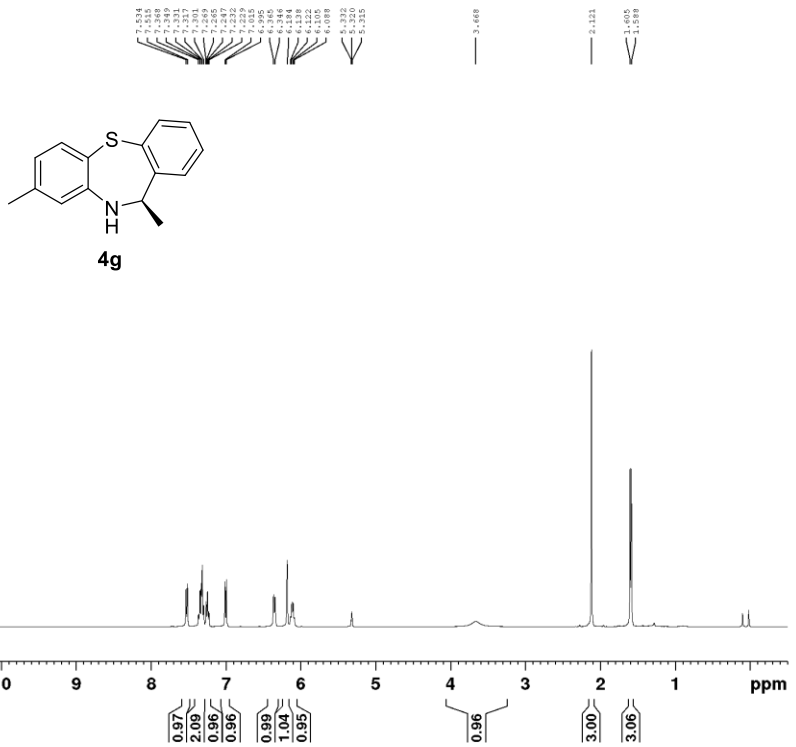
F2 - Processing parameters
SI                 65536
SF            400.2400274 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```




```
Current Data Parameters
NAME      2022-11-01-YZQ-S-CH2-CH2-Ph-QH-Pro
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_           20221101
Time              21.32 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                    64
DS                     4
SWH            24038.461 Hz
FIDRES          0.733596 Hz
AQ              1.36314888 sec
RG                 206.33
DW                20.800 usec
DE                 6.50 usec
TE                298.0 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                    1
SFO1          100.6504916 MHz
NUC1                  13C
P1                10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2             90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

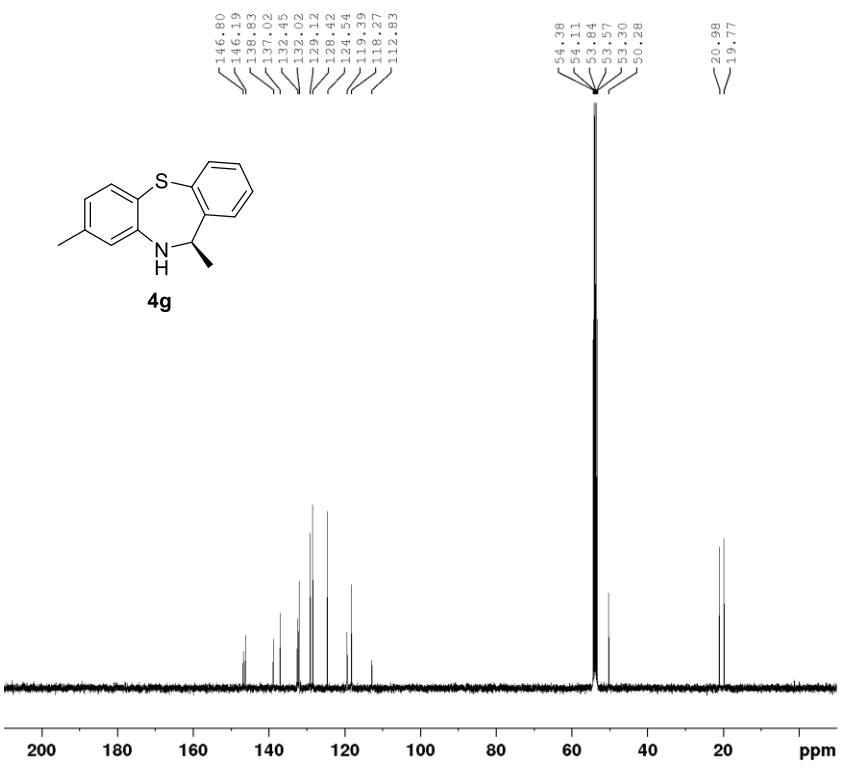
F2 - Processing parameters
SI                 32768
SF            100.6404213 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```




```
Current Data Parameters
NAME      2022-11-04-YZQ-S-P-Me-left-QH-Pro
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_              20221104
Time                 23.15 h
INSTRUM              spect
PROBHD     5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT            CD2Cl2
NS                     16
DS                      0
SWH                8012.820 Hz
FIDRES                0.489064 Hz
AQ                 2.0447233 sec
RG                   102.73
DW                    62.400 usec
DE                     6.50 usec
TE                   298.8 K
D1                 2.00000000 sec
TD0                     1
SFO1               400.2424716 MHz
NUC1                    1H
P1                    14.30 usec
PLW1              12.00000000 W

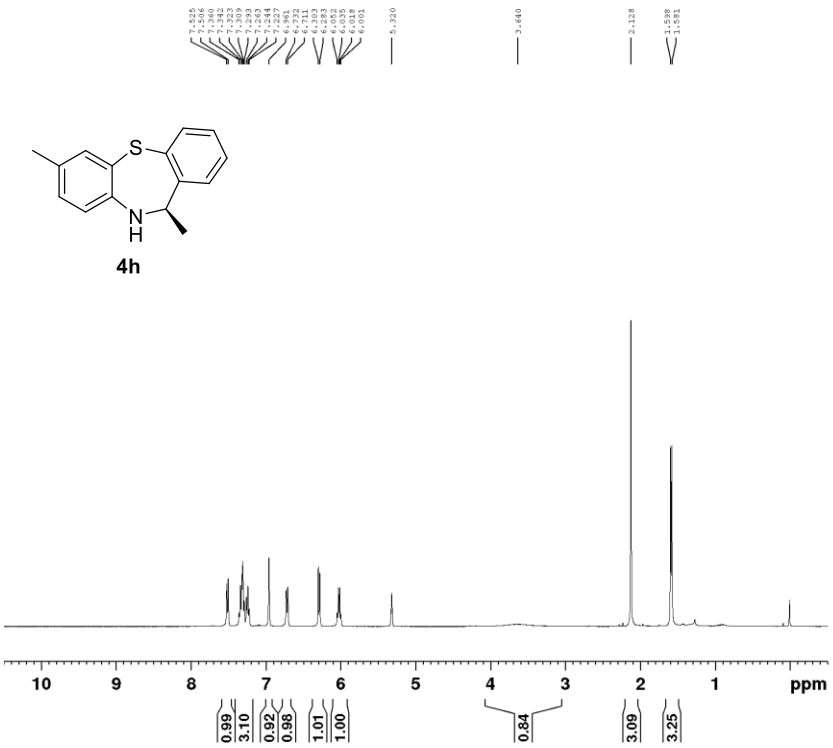
F2 - Processing parameters
SI                     65536
SF                 400.2400158 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME      2022-11-04-YZQ-S-P-Me-left-QH-Pro
EXPNO                 3
PROCNO                1

F2 - Acquisition Parameters
Date_              20221105
Time                  0.14 h
INSTRUM              spect
PROBHD     5 mm PABBO BB/
PULPROG           zgpg30
TD                  65536
SOLVENT            CD2Cl2
NS                   1024
DS                      4
SWH               24038.461 Hz
FIDRES                0.733596 Hz
AQ                 1.3631488 sec
RG                   206.33
DW                    20.800 usec
DE                     6.50 usec
TE                   299.4 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                     1
SFO1               100.6504916 MHz
NUC1                    13C
P1                    10.00 usec
PLW1              54.00000000 W
SFO2               400.2416010 MHz
NUC2                    1H
CPDPRG[2          waltz16
PCPD2                 90.00 usec
PLW2              12.00000000 W
PLW12              0.30294999 W
PLW13              0.24539000 W

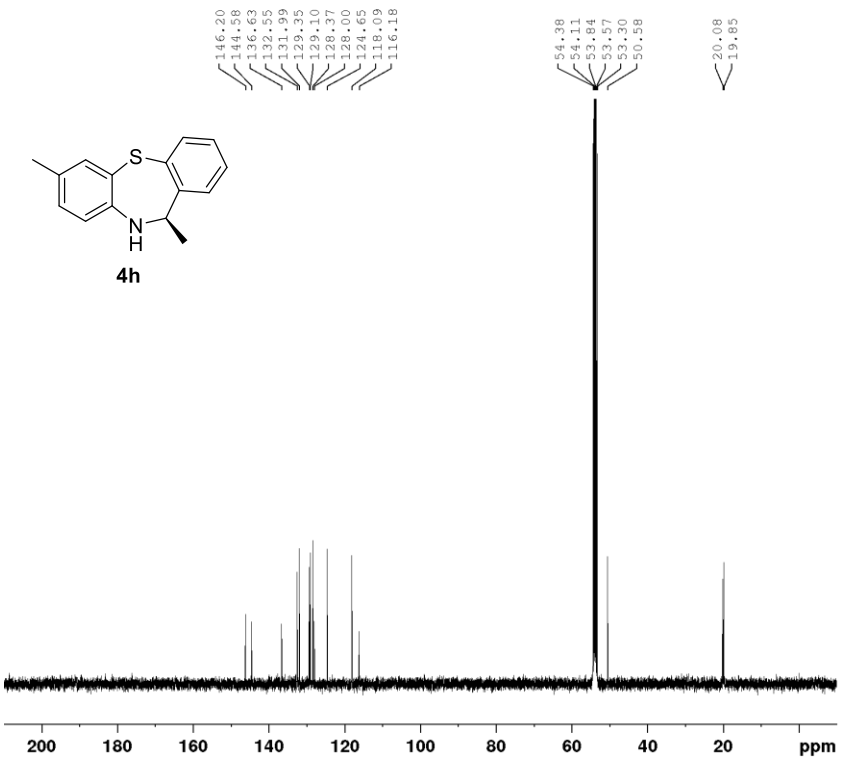
F2 - Processing parameters
SI                     32768
SF                 100.6403868 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```




```
Current Data Parameters
NAME      2022-11-08-YZQ-S-M-Me-Left-QH-Pro
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_              20221109
Time                  0.48 h
INSTRUM               spect
PROBHD    5 mm PABBO BB/
PULPROG               zg30
TD                   32768
SOLVENT           CD2Cl2
NS                      16
DS                       0
SWH                8012.820 Hz
FIDRES                0.489064 Hz
AQ                 2.0447233 sec
RG                    206.33
DW                   62.400 usec
DE                    6.50 usec
TE                   299.0 K
D1                 2.00000000 sec
TD0                      1
SFO1              400.2424716 MHz
NUC1                     1H
P1                   14.30 usec
PLW1              12.00000000 W

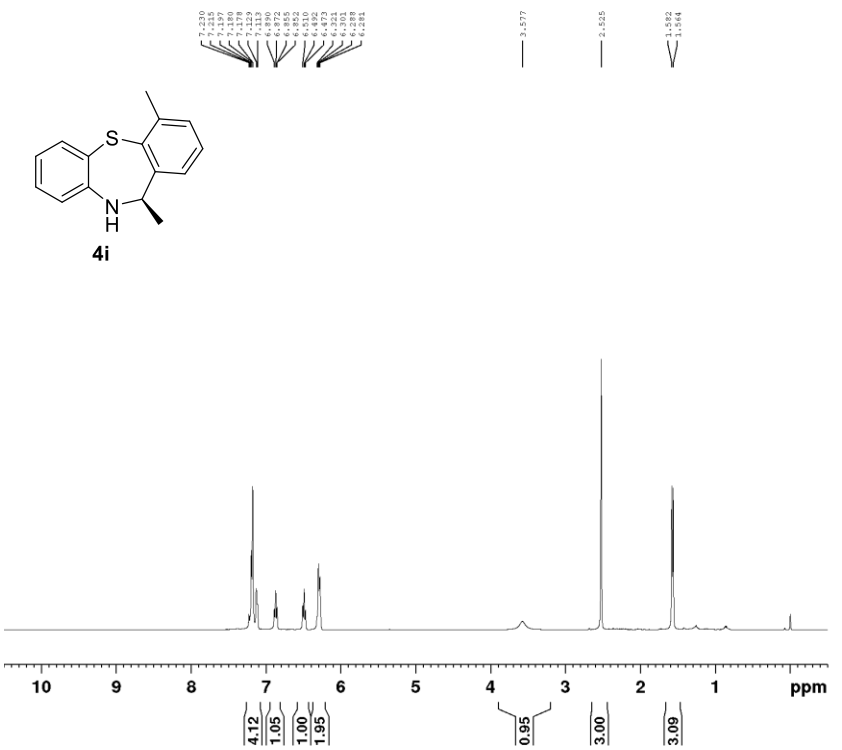
F2 - Processing parameters
SI                       65536
SF                400.2400157 MHz
WDW                      EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME      2022-11-08-YZQ-S-M-Me-Left-QH-Pro
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_              20221109
Time                  1.47 h
INSTRUM               spect
PROBHD    5 mm PABBO BB/
PULPROG             zgpg30
TD                   65536
SOLVENT           CD2Cl2
NS                    1024
DS                       4
SWH               24038.461 Hz
FIDRES                0.733596 Hz
AQ                 1.3631488 sec
RG                    206.33
DW                   20.800 usec
DE                    6.50 usec
TE                   299.9 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                      1
SFO1              100.6504916 MHz
NUC1                    13C
P1                   10.00 usec
PLW1              54.00000000 W
SFO2              400.2416010 MHz
NUC2                     1H
CPDPRG[2            waltz16
PCPD2                90.00 usec
PLW2              12.00000000 W
PLW12              0.30294999 W
PLW13              0.24539000 W

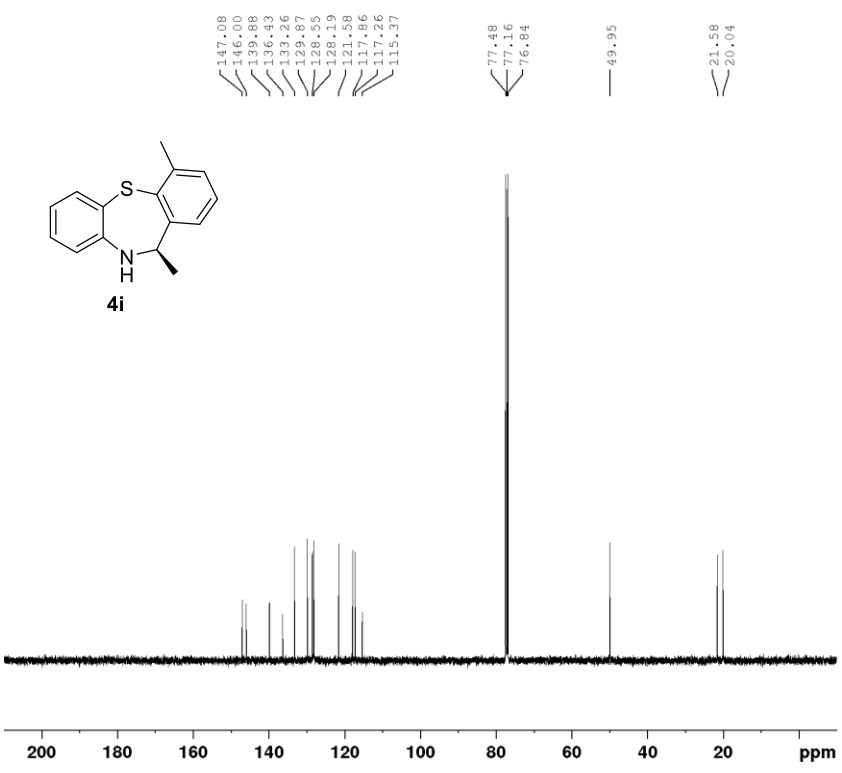
F2 - Processing parameters
SI                       32768
SF                100.6403858 MHz
WDW                      EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```




```
Current Data Parameters
NAME      2022-10-29-YZQ-S-O-Me-right-QH-Pro
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_              20221029
Time                 20.34 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT              CDCl3
NS                      16
DS                       0
SWH                8012.820 Hz
FIDRES             0.489064 Hz
AQ                 2.0447233 sec
RG                    92.09
DW                  62.400 usec
DE                   6.50 usec
TE                  298.0 K
D1                 2.00000000 sec
TD0                      1
SFO1            400.2424716 MHz
NUC1                    1H
P1                   14.30 usec
PLW1            12.00000000 W

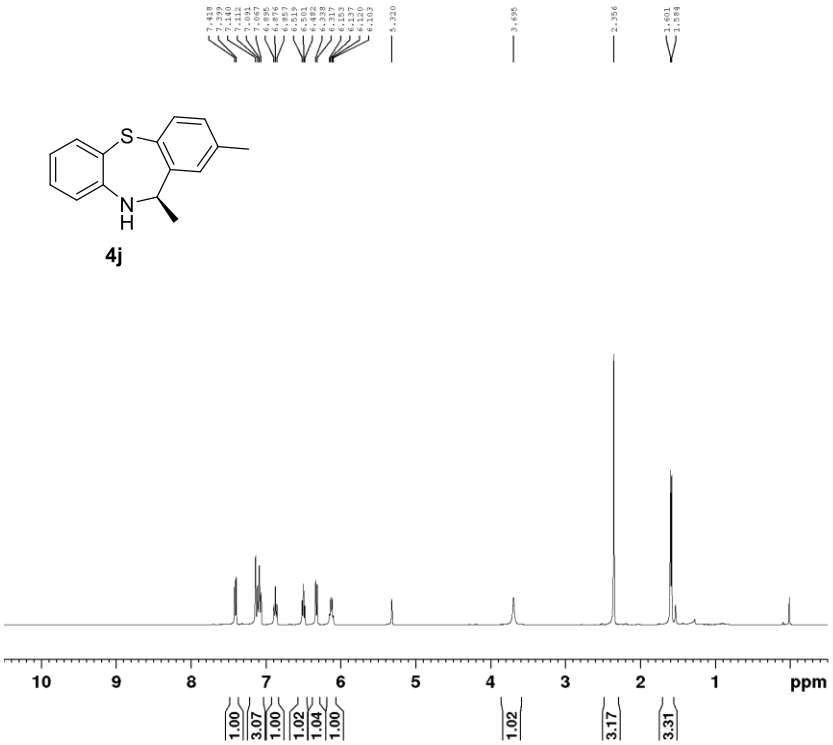
F2 - Processing parameters
SI                    65536
SF              400.2400219 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME      2022-10-29-YZQ-S-O-Me-right-QH-Pro
EXPNO                 3
PROCNO                1

F2 - Acquisition Parameters
Date_              20221029
Time                 20.57 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG           zgpg30
TD                  65536
SOLVENT              CDCl3
NS                     256
DS                       4
SWH               24038.461 Hz
FIDRES             0.733596 Hz
AQ                 1.3631488 sec
RG                    206.33
DW                  20.800 usec
DE                   6.50 usec
TE                  298.0 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                      1
SFO1            100.6504916 MHz
NUC1                    13C
P1                   10.00 usec
PLW1            54.00000000 W
SFO2            400.2416010 MHz
NUC2                    1H
CPDPRG[2             waltz16
PCPD2                90.00 usec
PLW2            12.00000000 W
PLW12            0.30294999 W
PLW13            0.24539000 W

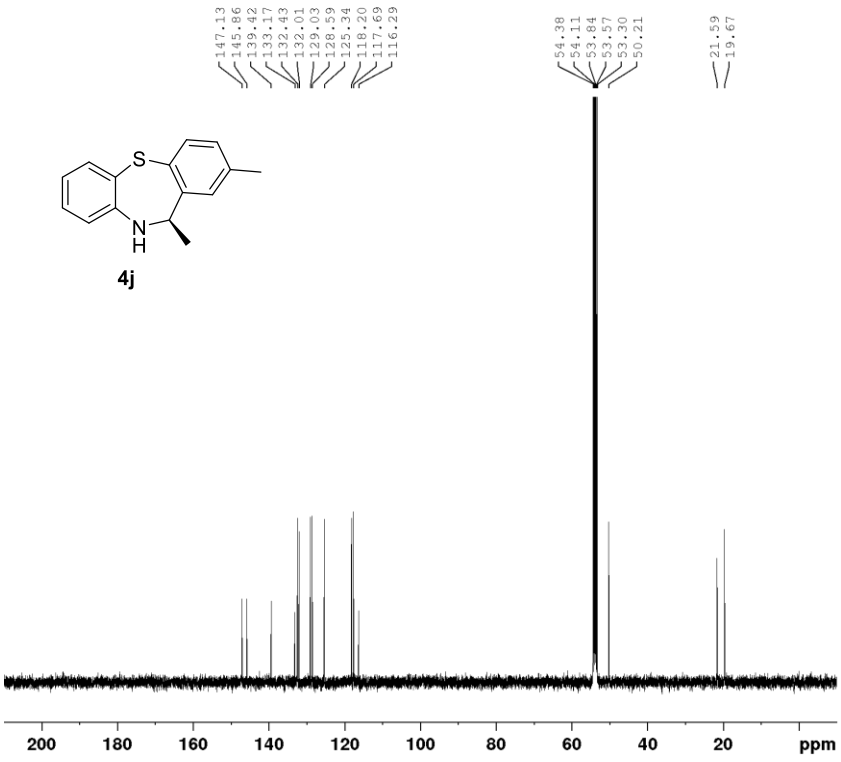
F2 - Processing parameters
SI                    32768
SF              100.6404191 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```




```
Current Data Parameters
NAME      2022-11-08-YZQ-S-P-Me-Right-QH-Pro
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_           20221109
Time              1.51 h
INSTRUM            spect
PROBHD    5 mm PABBO BB/
PULPROG            zg30
TD                32768
SOLVENT           CD2Cl2
NS                   16
DS                    0
SWH            8012.820 Hz
FIDRES         0.489064 Hz
AQ             2.0447233 sec
RG                206.33
DW                62.400 usec
DE                 6.50 usec
TE                299.2 K
D1             2.00000000 sec
TD0                   1
SFO1         400.2424716 MHz
NUC1                 1H
P1                14.30 usec
PLW1         12.00000000 W

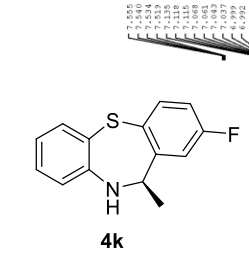
F2 - Processing parameters
SI                65536
SF           400.2400155 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```




```
Current Data Parameters
NAME      2022-11-08-YZQ-S-P-Me-Right-QH-Pro
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_           20221109
Time              2.50 h
INSTRUM            spect
PROBHD    5 mm PABBO BB/
PULPROG          zgpg30
TD                65536
SOLVENT           CD2Cl2
NS                 1024
DS                    4
SWH           24038.461 Hz
FIDRES         0.733596 Hz
AQ             1.3631488 sec
RG                206.33
DW                20.800 usec
DE                 6.50 usec
TE                299.6 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                   1
SFO1         100.6504916 MHz
NUC1                 13C
P1                10.00 usec
PLW1         54.00000000 W
SFO2         400.2416010 MHz
NUC2                 1H
CPDPRG[2         waltz16
PCPD2             90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                32768
SF           100.6403860 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```

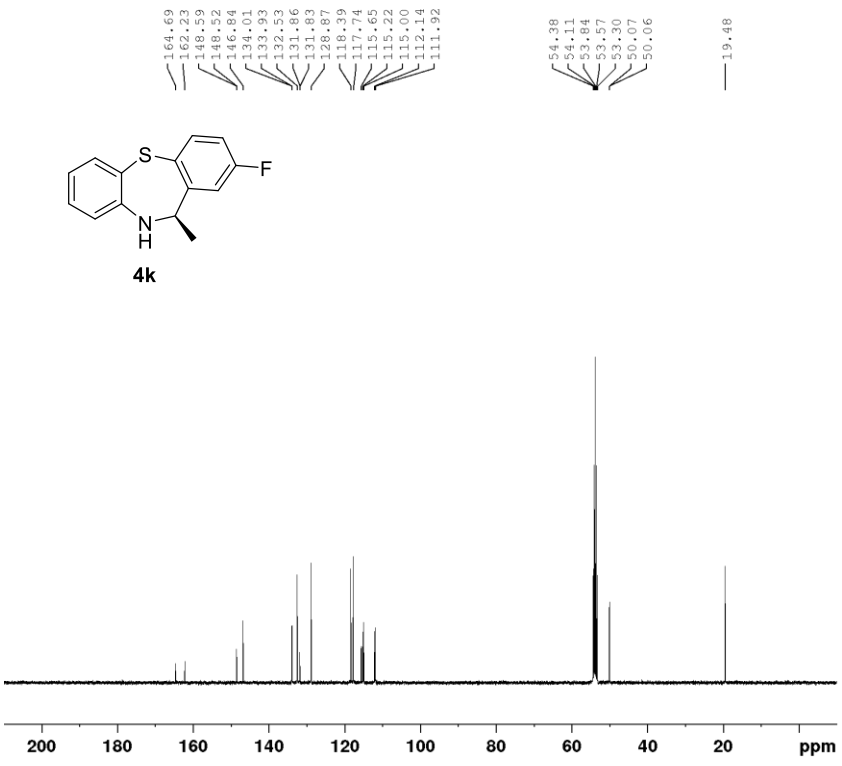


4k


```
Current Data Parameters
NAME      2022-11-04-YZQ-S-P-F-right-QH-Pro
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_              20221104
Time                 21.20 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CD2Cl2
NS                      8
DS                      0
SWH               8012.820 Hz
FIDRES               0.489064 Hz
AQ                2.0447233 sec
RG                   80.72
DW                  62.400 usec
DE                   6.50 usec
TE                 298.5 K
D1                2.00000000 sec
TD0                     1
SFO1            400.2424716 MHz
NUC1                   1H
P1                  14.30 usec
PLW1           12.00000000 W

F2 - Processing parameters
SI                    65536
SF              400.2400161 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

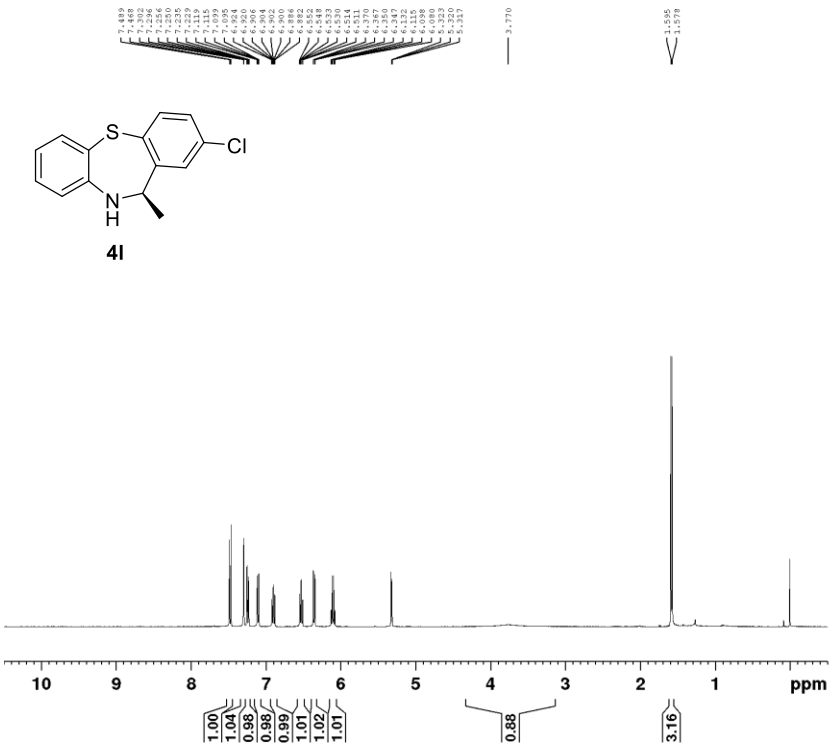


4k

```
Current Data Parameters
NAME      2022-11-04-YZQ-S-P-F-right-QH-Pro
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_              20221104
Time                 21.21 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG              zgpg30
TD                  65536
SOLVENT             CD2Cl2
NS                   1024
DS                      4
SWH              24038.461 Hz
FIDRES               0.733596 Hz
AQ                1.3631488 sec
RG                   206.33
DW                  20.800 usec
DE                   6.50 usec
TE                 298.7 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                     1
SFO1            100.6504916 MHz
NUC1                   13C
P1                  10.00 usec
PLW1           54.00000000 W
SFO2            400.2416010 MHz
NUC2                   1H
CPDPRG[2             waltz16
PCPD2               90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

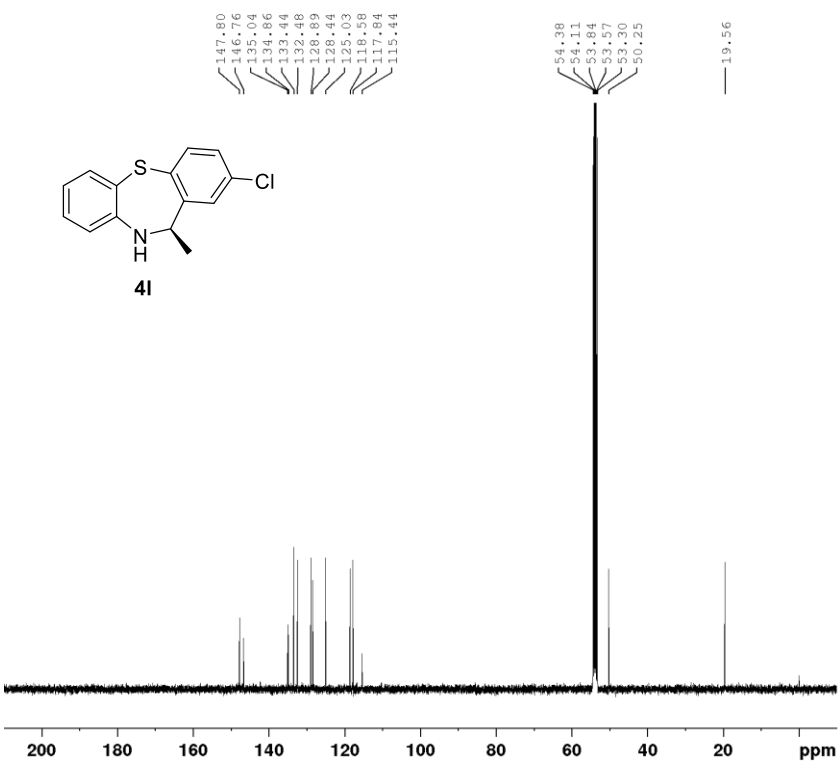
F2 - Processing parameters
SI                    32768
SF              100.6403880 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME      2022-11-04-YZQ-S-P-Cl-right-QH-Pro
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_              20221104
Time                 15.35 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CD2Cl2
NS                     12
DS                      0
SWH                8012.820 Hz
FIDRES             0.489064 Hz
AQ                 2.0447233 sec
RG                   206.33
DW                  62.400 usec
DE                   6.50 usec
TE                  298.0 K
D1                2.00000000 sec
TD0                     1
SFO1            400.2424716 MHz
NUC1                   1H
P1                  14.30 usec
PLW1           12.00000000 W

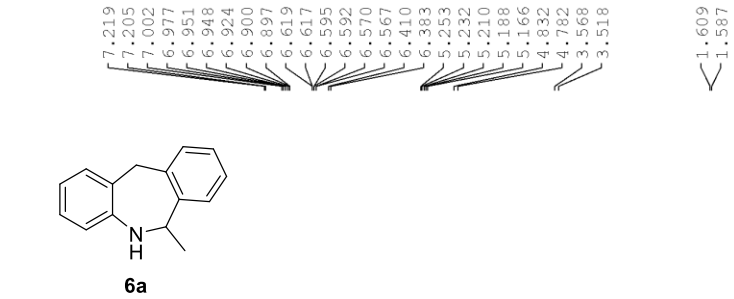
F2 - Processing parameters
SI                    65536
SF              400.2400154 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```



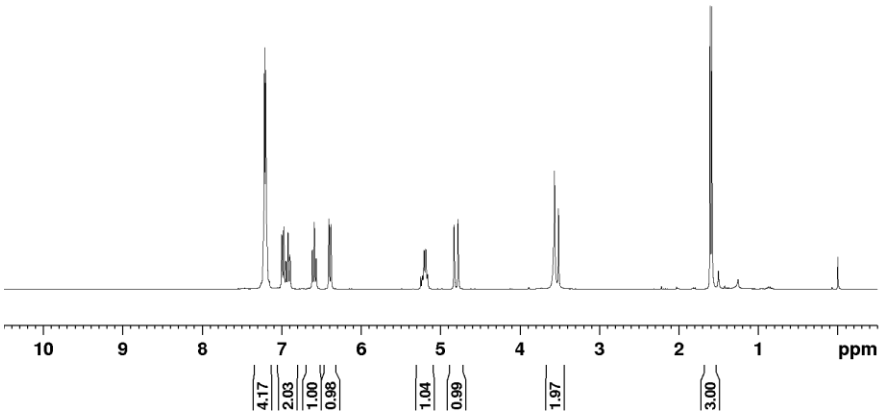

```
Current Data Parameters
NAME      2022-11-04-YZQ-S-P-Cl-right-QH-Pro
EXPNO                 3
PROCNO                1

F2 - Acquisition Parameters
Date_              20221104
Time                 18.32 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG            zgpg30
TD                  65536
SOLVENT             CD2Cl2
NS                   2048
DS                      4
SWH               24038.461 Hz
FIDRES             0.733596 Hz
AQ                 1.36314888 sec
RG                   206.33
DW                  20.800 usec
DE                   6.50 usec
TE                  299.0 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                     1
SFO1            100.6504916 MHz
NUC1                   13C
P1                  10.00 usec
PLW1           54.00000000 W
SFO2            400.2416010 MHz
NUC2                   1H
CPDPRG[2            waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                    32768
SF              100.6403867 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```



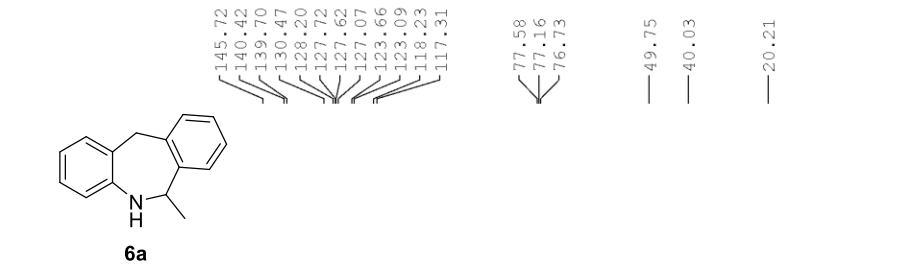
6a



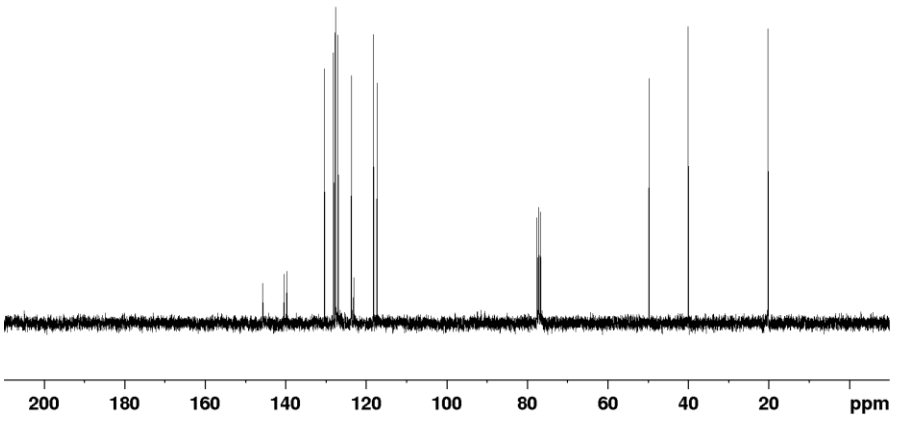

```
Current Data Parameters
NAME                  500M
EXPNO                  131
PROCNO                   1

F2 - Acquisition Parameters
Date_           20210727
Time                17.10 h
INSTRUM              spect
PROBHD    5 mm DUL 13C-1
PULPROG               zg30
TD                   65536
SOLVENT              CDC13
NS                      16
DS                       2
SWH               6009.615 Hz
FIDRES            0.183399 Hz
AQ                5.4525952 sec
RG                   186.23
DW                  83.200 usec
DE                   6.50 usec
TE                  301.6 K
D1             1.00000000 sec
TD0                      1
SFO1          300.1318534 MHz
NUC1                    1H
P1                   8.00 usec
PLW1          18.00000000 W

F2 - Processing parameters
SI                   65536
SF            300.1300211 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```



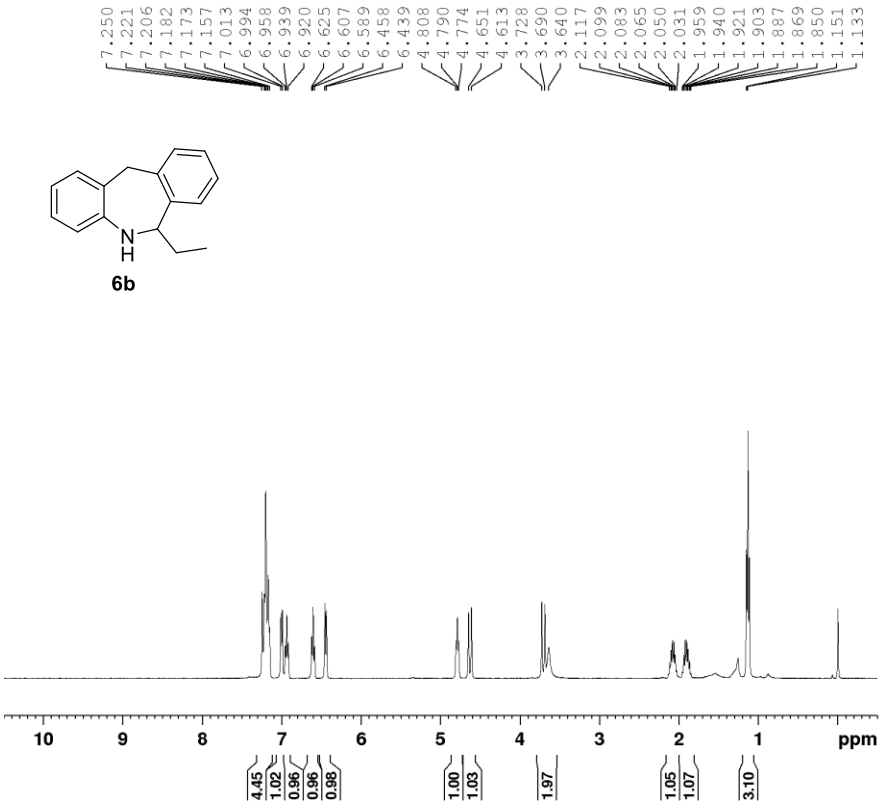
6a




```
Current Data Parameters
NAME                  500M
EXPNO                  132
PROCNO                   1

F2 - Acquisition Parameters
Date_           20210727
Time                17.13 h
INSTRUM              spect
PROBHD    5 mm DUL 13C-1
PULPROG            zgpg30
TD                   65536
SOLVENT              CDC13
NS                      63
DS                       4
SWH              18028.846 Hz
FIDRES            0.550197 Hz
AQ                1.8175317 sec
RG                   209.09
DW                  27.733 usec
DE                   6.50 usec
TE                  301.7 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                      1
SFO1          75.4752949 MHz
NUC1                   13C
P1                  11.00 usec
PLW1         195.00000000 W
SFO2         300.1312005 MHz
NUC2                    1H
CPDPRG[2          waltz16
PCPD2                90.00 usec
PLW2          14.00000000 W
PLW12          0.17284000 W
PLW13          0.14000000 W

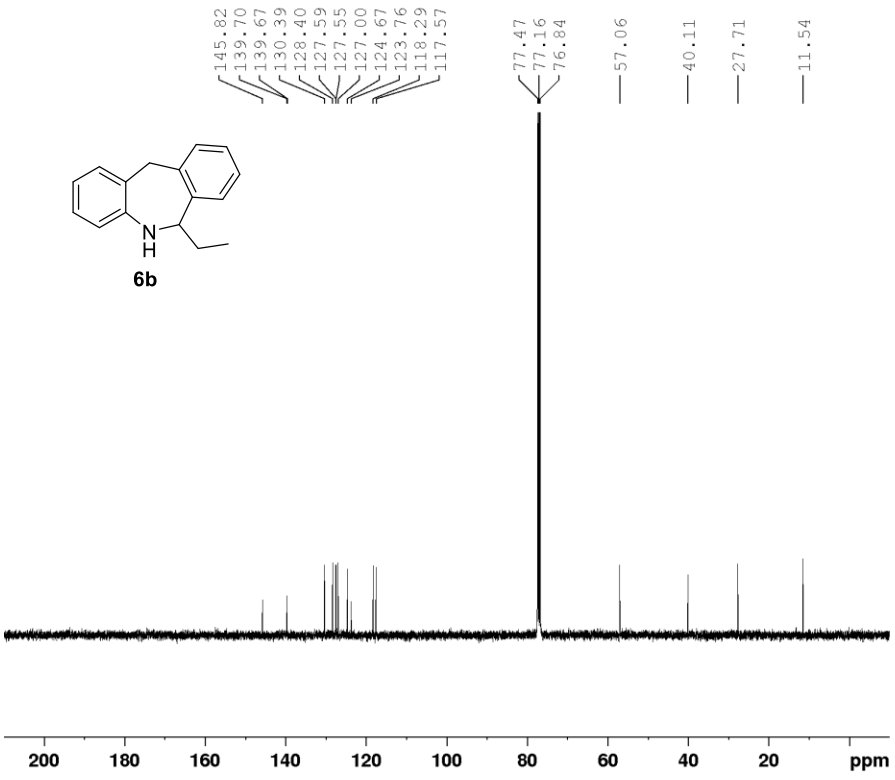
F2 - Processing parameters
SI                   32768
SF            75.4677420 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  133
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time                16.55 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDC13
NS                     16
DS                      0
SWH              8012.820 Hz
FIDRES           0.489064 Hz
AQ               2.0447233 sec
RG                  206.33
DW                 62.400 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
TD0                     1
SFO1          400.2424716 MHz
NUC1                   1H
P1                 14.30 usec
PLW1          12.00000000 W

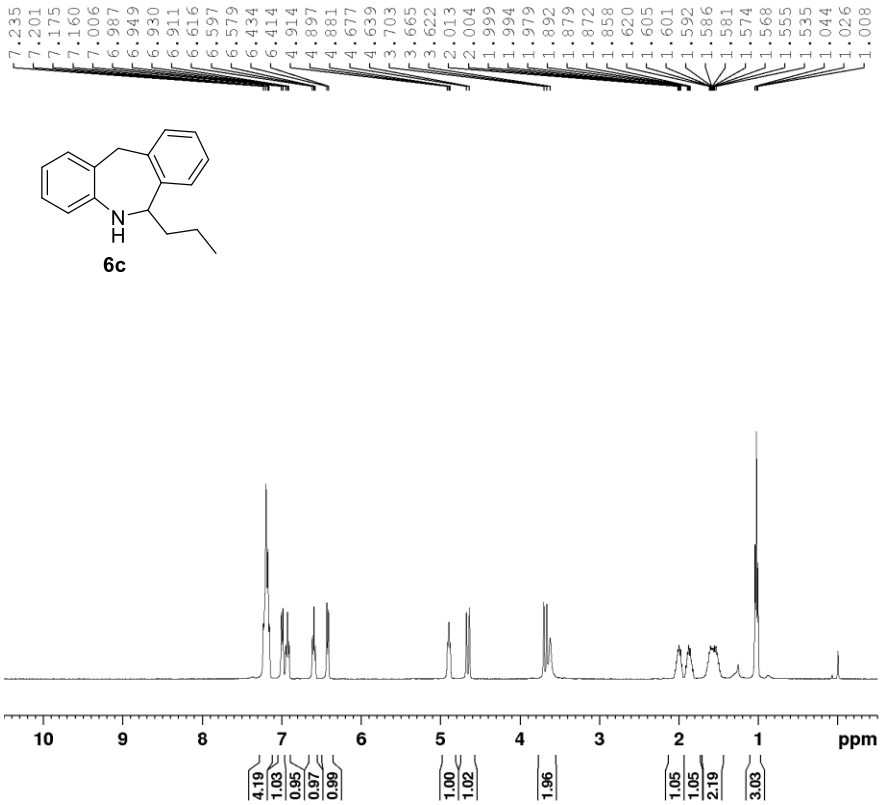
F2 - Processing parameters
SI                  65536
SF            400.2400139 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  134
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221116
Time                 0.14 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG           zgpg30
TD                  65536
SOLVENT             CDC13
NS                   1024
DS                      4
SWH             24038.461 Hz
FIDRES           0.733596 Hz
AQ               1.3631488 sec
RG                  206.33
DW                 20.800 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                     1
SFO1          100.6504916 MHz
NUC1                  13C
P1                 10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

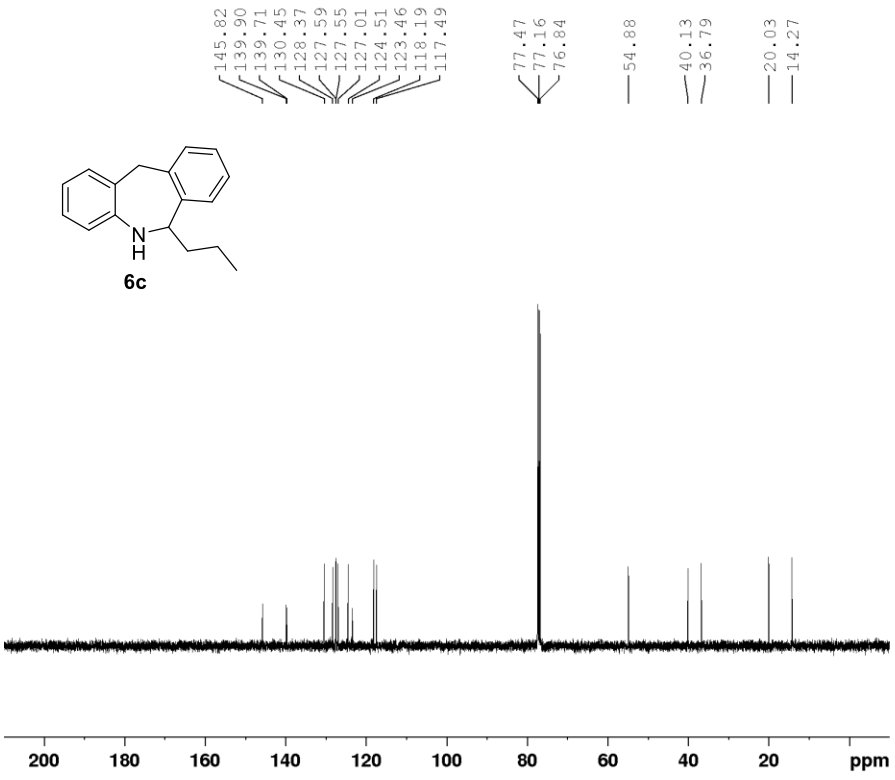
F2 - Processing parameters
SI                  32768
SF            100.6404149 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  135
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time                16.47 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDC13
NS                     9
DS                     0
SWH             8012.820 Hz
FIDRES             0.489064 Hz
AQ              2.0447233 sec
RG                 102.73
DW                 62.400 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
TD0                    1
SFO1          400.2424716 MHz
NUC1                   1H
P1                  14.30 usec
PLW1          12.00000000 W

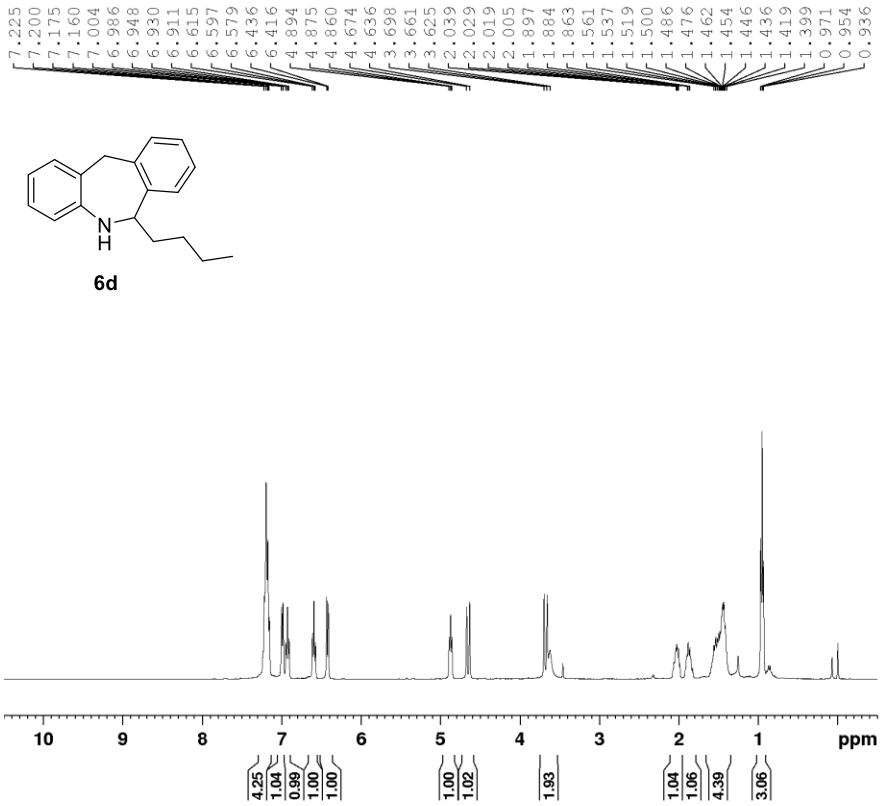
F2 - Processing parameters
SI                 65536
SF            400.2400201 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  136
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221115
Time                16.49 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT            CDC13
NS                    65
DS                     4
SWH            24038.461 Hz
FIDRES             0.733596 Hz
AQ              1.3631488 sec
RG                 206.33
DW                 20.800 usec
DE                  6.50 usec
TE                 298.1 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                    1
SFO1          100.6504916 MHz
NUC1                  13C
P1                  10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2               90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

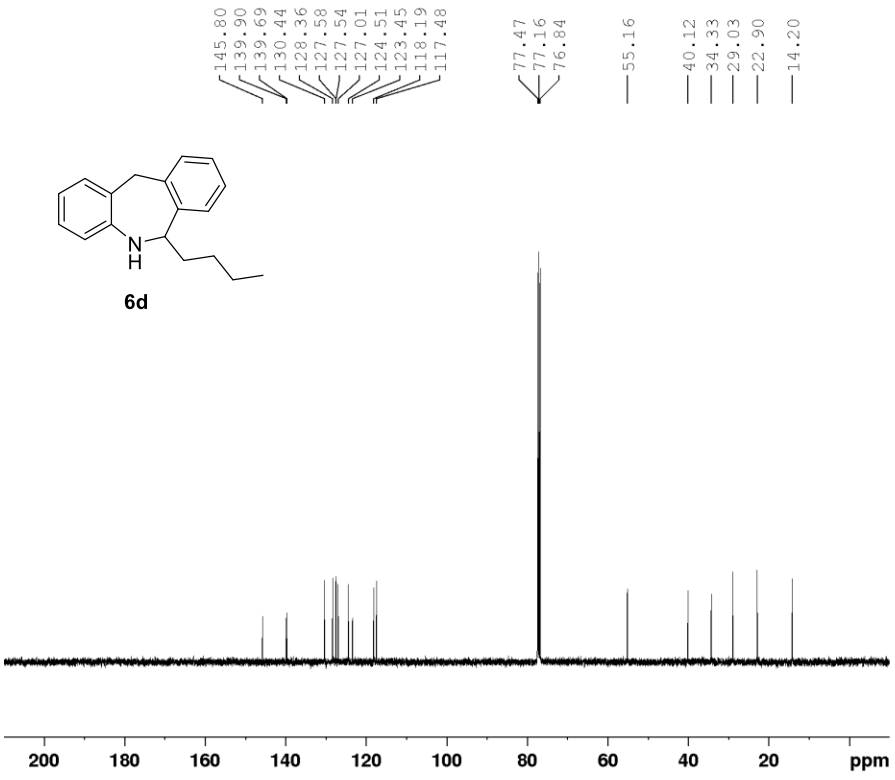
F2 - Processing parameters
SI                 32768
SF            100.6404172 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  137
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221029
Time                20.18 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDC13
NS                    16
DS                     0
SWH             8012.820 Hz
FIDRES             0.489064 Hz
AQ              2.0447233 sec
RG                 80.72
DW                62.400 usec
DE                 6.50 usec
TE                298.0 K
D1             2.00000000 sec
TD0                    1
SFO1          400.2424716 MHz
NUC1                  1H
P1                 14.30 usec
PLW1          12.00000000 W

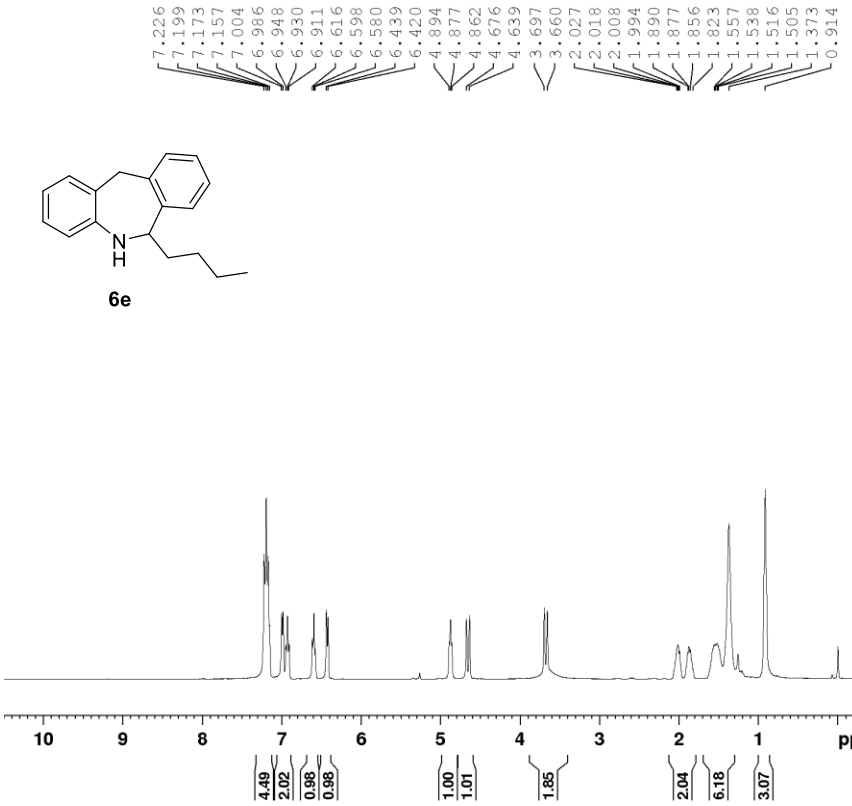
F2 - Processing parameters
SI                 65536
SF            400.2400235 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  138
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221029
Time                20.30 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT            CDC13
NS                   200
DS                     4
SWH            24038.461 Hz
FIDRES             0.733596 Hz
AQ              1.3631488 sec
RG                 206.33
DW                20.800 usec
DE                 6.50 usec
TE                298.0 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                    1
SFO1          100.6504916 MHz
NUC1                  13C
P1                 10.00 usec
PLW1           54.00000000 W
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

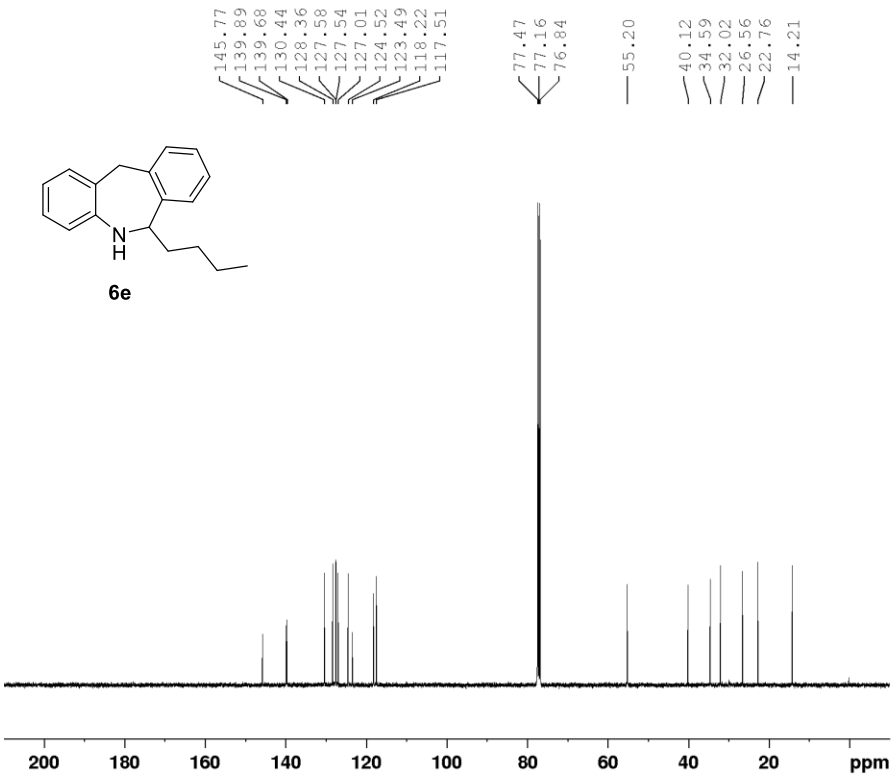
F2 - Processing parameters
SI                 32768
SF            100.6404190 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  143
PROCNO                   1

F2 - Acquisition Parameters
Date_            20230209
Time                1.38 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDC13
NS                     16
DS                      0
SWH              8012.820 Hz
FIDRES           0.489064 Hz
AQ               2.0447233 sec
RG                   73.9
DW                 62.400 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
TD0                     1
SFO1           400.2424716 MHz
NUC1                   1H
P1                  14.30 usec
PLW1           12.00000000 W

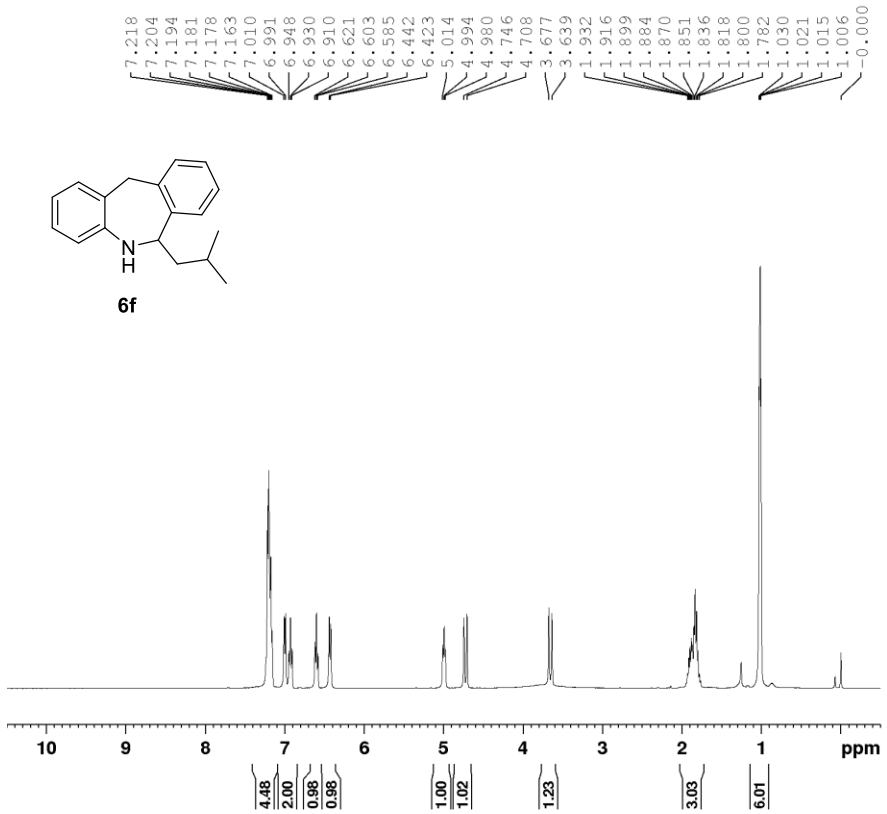
F2 - Processing parameters
SI                  65536
SF             400.2400233 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  144
PROCNO                   1

F2 - Acquisition Parameters
Date_            20230209
Time                2.37 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG           zgpg30
TD                  65536
SOLVENT             CDC13
NS                   1024
DS                      4
SWH             24038.461 Hz
FIDRES           0.733596 Hz
AQ               1.3631488 sec
RG                  206.33
DW                 20.800 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                     1
SFO1           100.6504916 MHz
NUC1                   13C
P1                  10.00 usec
PLW1           54.00000000 W
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2               90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

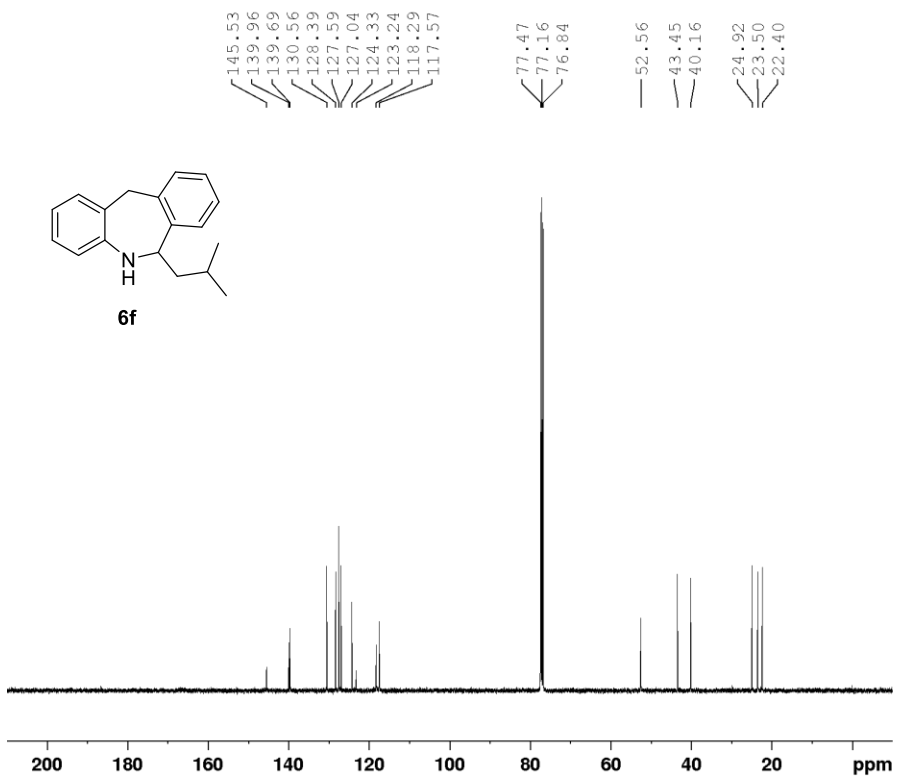
F2 - Processing parameters
SI                  32768
SF             100.6404186 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  147
PROCNO                   1

F2 - Acquisition Parameters
Date_              20230222
Time                  2.33 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG               zg30
TD                   32768
SOLVENT              CDC13
NS                      16
DS                       0
SWH                8012.820 Hz
FIDRES                0.489064 Hz
AQ                 2.0447233 sec
RG                    80.72
DW                    62.400 usec
DE                     6.50 usec
TE                   298.0 K
D1                 2.00000000 sec
TD0                      1
SFO1             400.2424716 MHz
NUC1                    1H
P1                    14.30 usec
PLW1              12.00000000 W

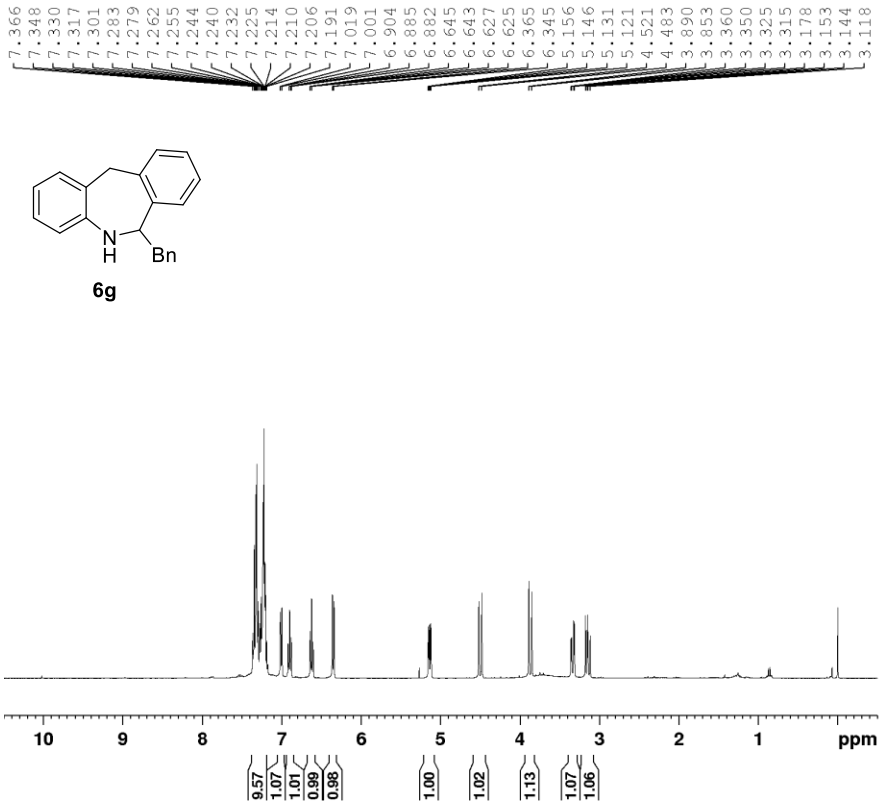
F2 - Processing parameters
SI                    65536
SF               400.2400265 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME                  500M
EXPNO                  148
PROCNO                   1

F2 - Acquisition Parameters
Date_              20230222
Time                  3.32 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG            zgpg30
TD                   65536
SOLVENT              CDC13
NS                    1024
DS                       4
SWH               24038.461 Hz
FIDRES                0.733596 Hz
AQ                 1.3631488 sec
RG                   206.33
DW                    20.800 usec
DE                     6.50 usec
TE                   298.4 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                      1
SFO1             100.6504916 MHz
NUC1                    13C
P1                    10.00 usec
PLW1              54.00000000 W
SFO2             400.2416010 MHz
NUC2                    1H
CPDPRG[2             waltz16
PCPD2                 90.00 usec
PLW2              12.00000000 W
PLW12              0.30294999 W
PLW13              0.24539000 W

F2 - Processing parameters
SI                    32768
SF               100.6404198 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```

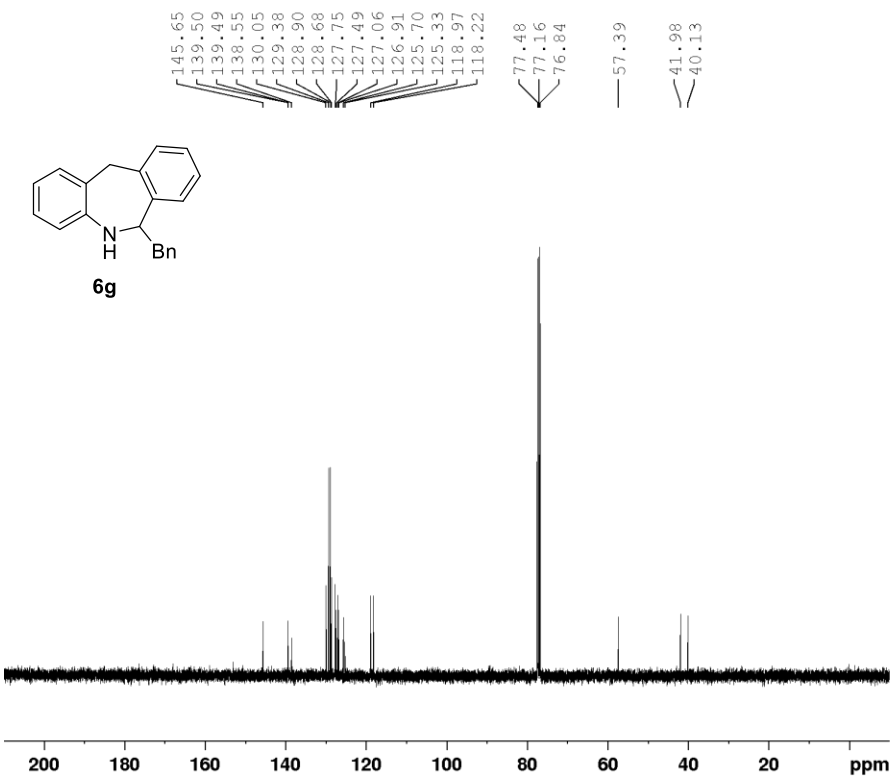


6g

```
Current Data Parameters
NAME                  500M
EXPNO                  139
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221030
Time                17.55 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDC13
NS                      8
DS                      0
SWH              8012.820 Hz
FIDRES           0.489064 Hz
AQ               2.0447233 sec
RG                 162.77
DW                 62.400 usec
DE                  6.50 usec
TE                 298.0 K
D1              2.00000000 sec
TD0                     1
SFO1          400.2424716 MHz
NUC1                   1H
P1                  14.30 usec
PLW1          12.00000000 W

F2 - Processing parameters
SI                  65536
SF            400.2400211 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

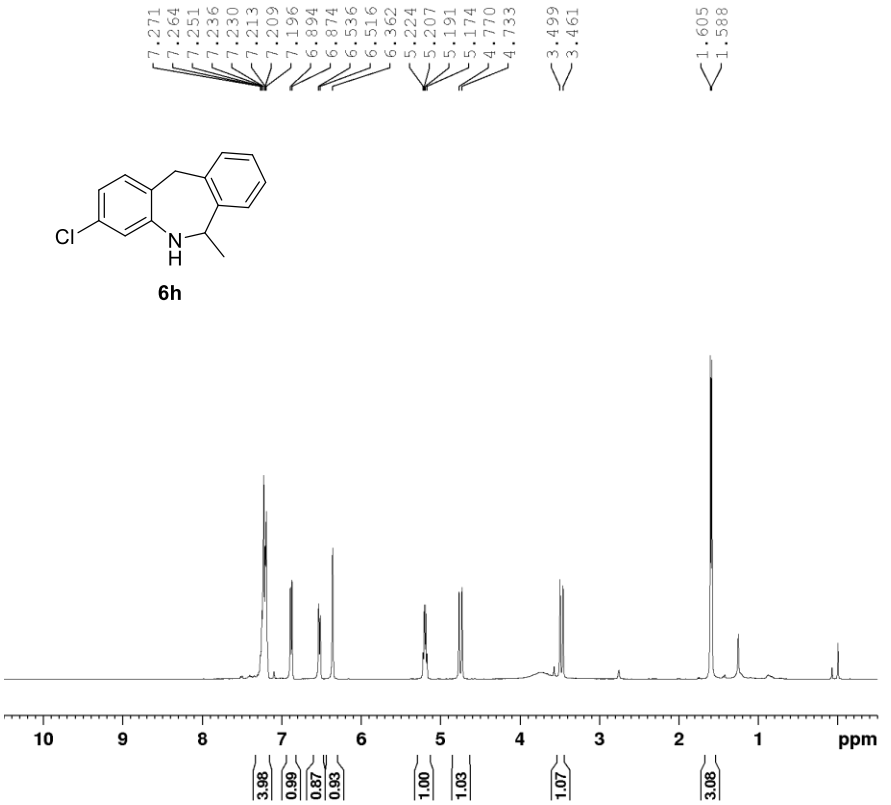


6g

```
Current Data Parameters
NAME                  500M
EXPNO                  140
PROCNO                   1

F2 - Acquisition Parameters
Date_           20221030
Time                17.58 h
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG            zgpg30
TD                  65536
SOLVENT             CDC13
NS                    128
DS                      4
SWH             24038.461 Hz
FIDRES           0.733596 Hz
AQ               1.3631488 sec
RG                  206.33
DW                  20.800 usec
DE                   6.50 usec
TE                  298.0 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                     1
SFO1          100.6504916 MHz
NUC1                   13C
P1                  10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2               90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                  32768
SF            100.6404177 MHz
WDW                    EM
SSB                     0
LB                   0.40 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  500M
EXPNO                  159
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230223
Time                5.04 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     0
SWH             8012.820 Hz
FIDRES          0.489064 Hz
AQ             2.0447233 sec
RG                140.59
DW                62.400 usec
DE                 6.50 usec
TE                298.0 K
D1            2.00000000 sec
TD0                    1
SFO1         400.2424716 MHz
NUC1                  1H
P1                 14.30 usec
PLW1         12.00000000 W

F2 - Processing parameters
SI                 65536
SF            400.2400221 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
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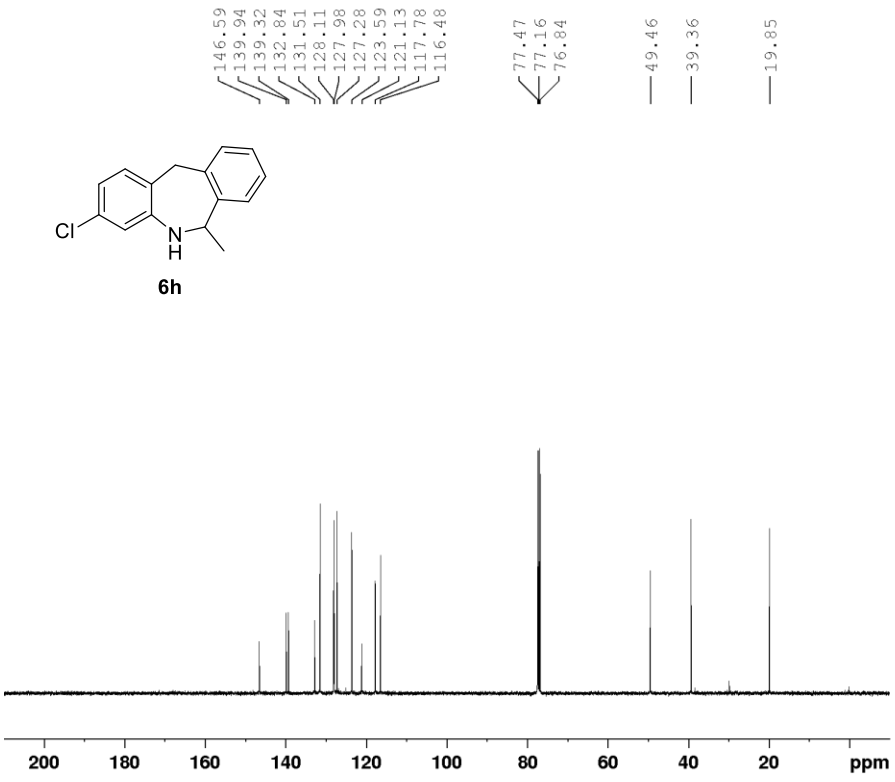


```
Current Data Parameters
NAME                  500M
EXPNO                  160
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230223
Time                6.03 h
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG          zgpg30
TD                 65536
SOLVENT            CDCl3
NS                  1024
DS                     4
SWH            24038.461 Hz
FIDRES          0.733596 Hz
AQ             1.3631488 sec
RG                206.33
DW                20.800 usec
DE                 6.50 usec
TE                298.3 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
TD0                    1
SFO1         100.6504916 MHz
NUC1                  13C
P1                 10.00 usec
PLW1         54.00000000 W
SFO2         400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                 32768
SF           100.6404180 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
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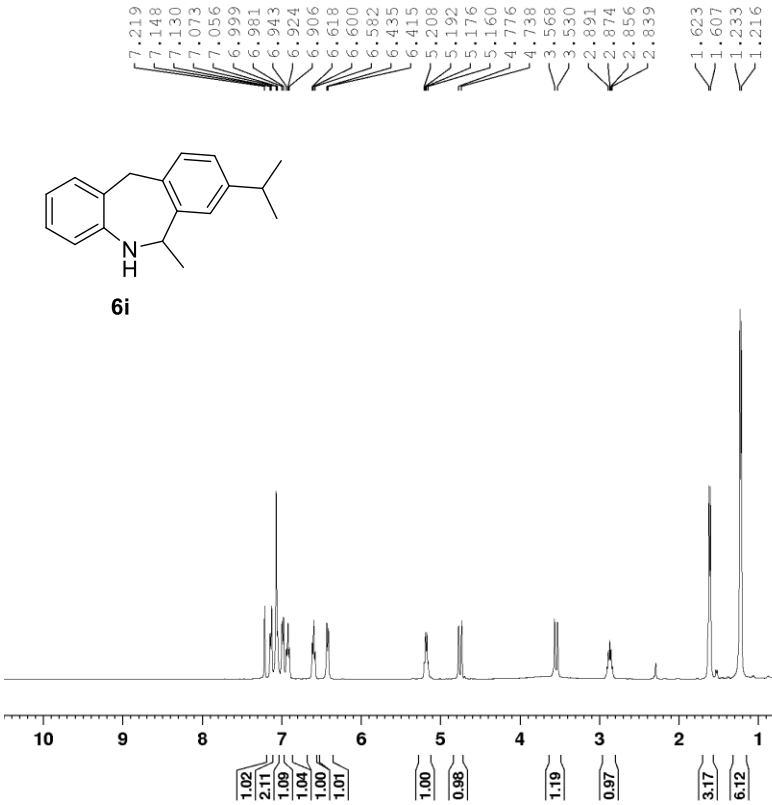


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Current Data Parameters
NAME                  500M
EXPNO                  155
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230218
Time                2.21 h
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     0
SWH             8012.820 Hz
FIDRES             0.489064 Hz
AQ              2.0447233 sec
RG                 80.72
DW                62.400 usec
DE                 6.50 usec
TE                296.8 K
D1             2.00000000 sec
TD0                    1
SFO1          400.2424716 MHz
NUC1                  1H
P1                 14.30 usec
PLW1          12.00000000 W

F2 - Processing parameters
SI                 65536
SF            400.2400264 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```
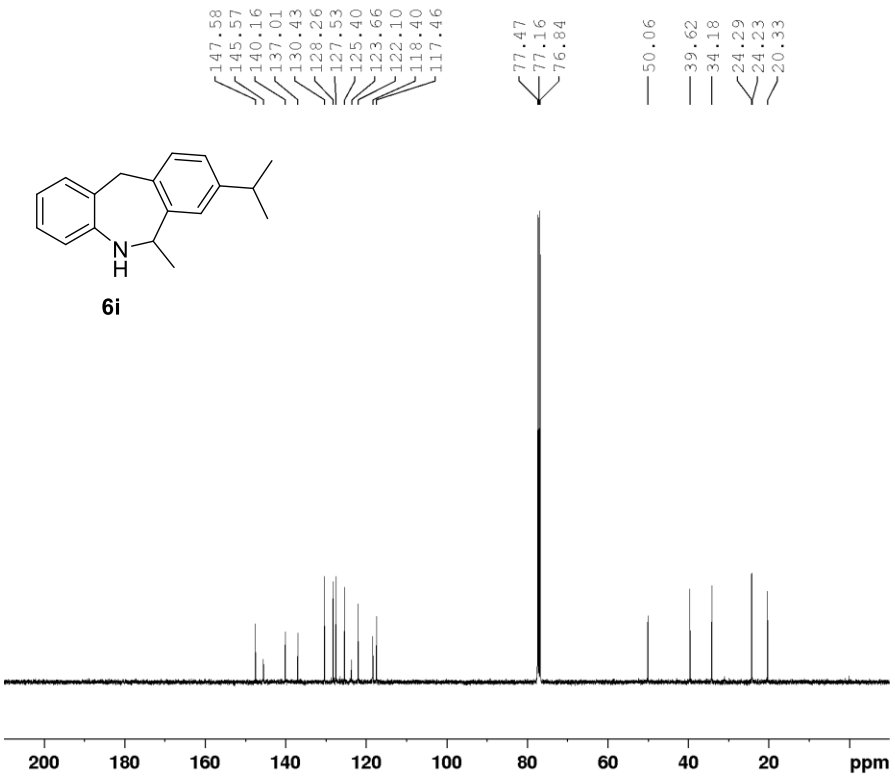
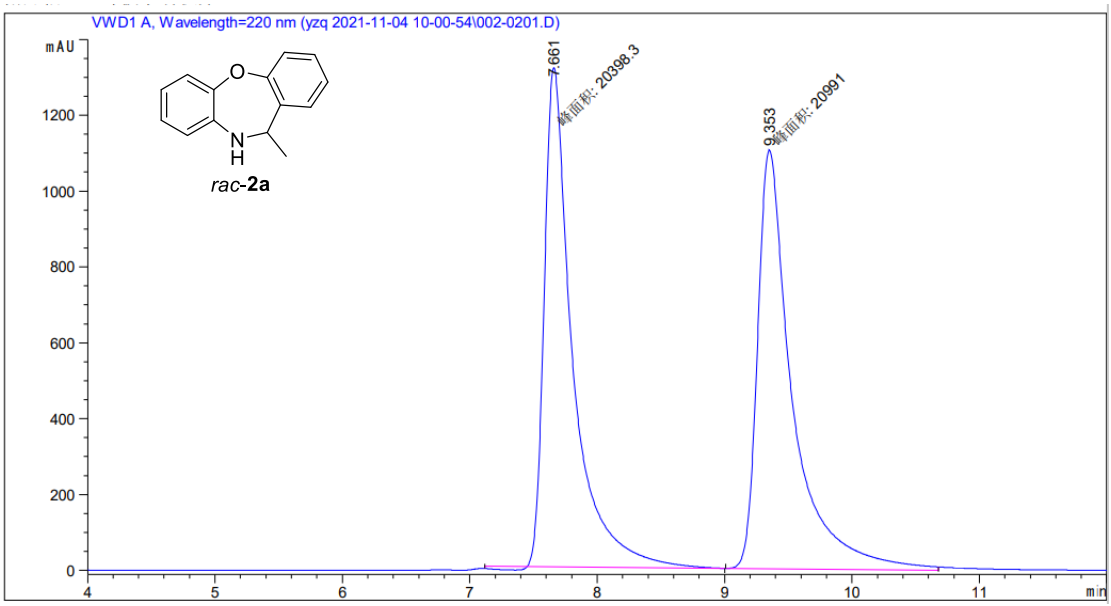
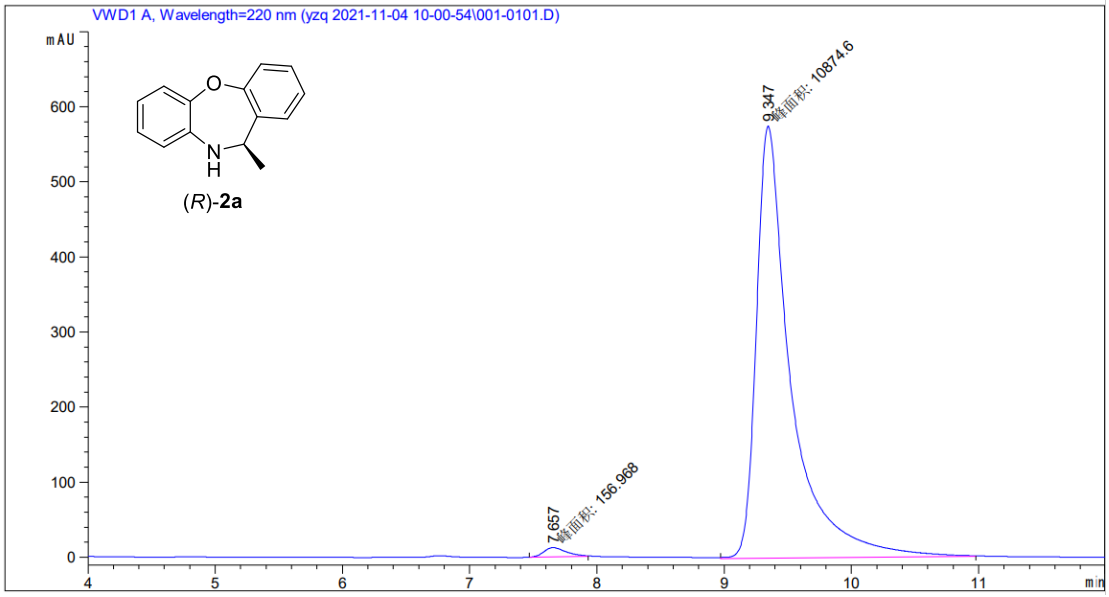




```
Current Data Parameters
NAME                  500M
EXPNO                  156
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230218
Time                3.20 h
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                  1024
DS                     4
SWH            24038.461 Hz
FIDRES             0.733596 Hz
AQ              1.3631488 sec
RG                206.33
DW                20.800 usec
DE                 6.50 usec
TE                298.0 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                    1
SFO1          100.6504916 MHz
NUC1                  13C
P1                 10.00 usec
PLW1          54.00000000 W
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                 32768
SF            100.6404195 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

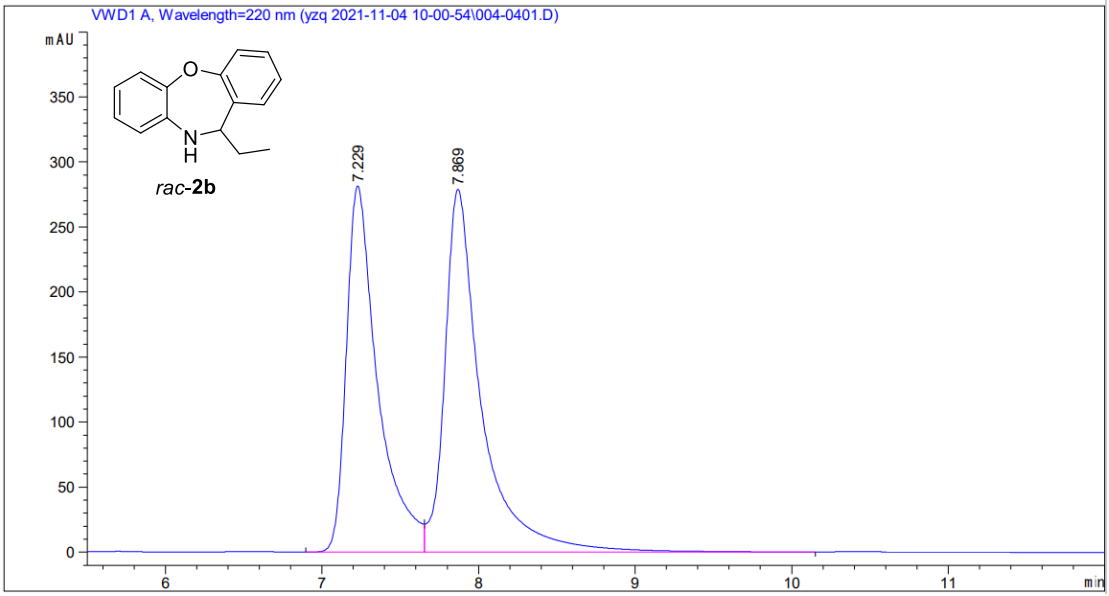
7. Copy of HPLC spectra



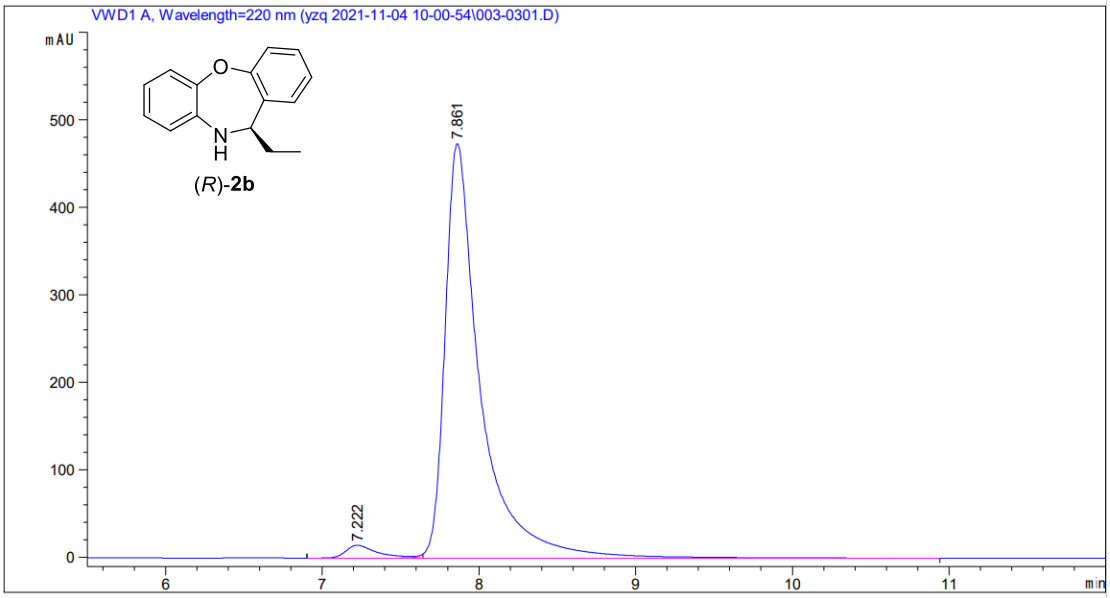
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	7.661	MM	0.2584	2.03983e4	1315.81738	49.2839
2	9.353	MM	0.3169	2.09910e4	1104.11499	50.7161



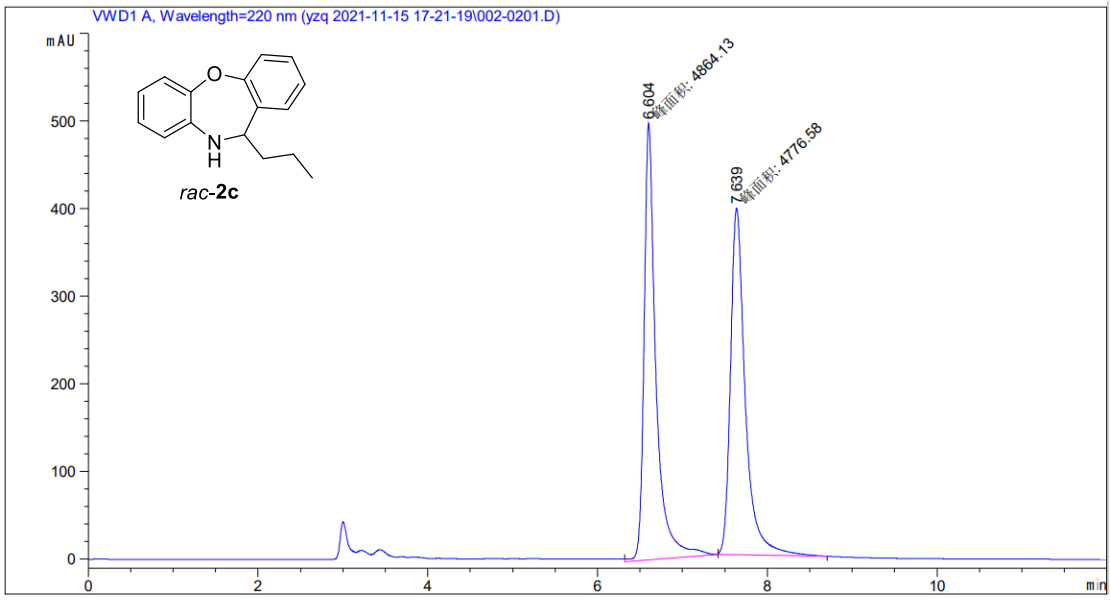
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	7.657	MM	0.2086	156.96762	12.54206	1.4229
2	9.347	MM	0.3151	1.08746e4	575.18481	98.5771



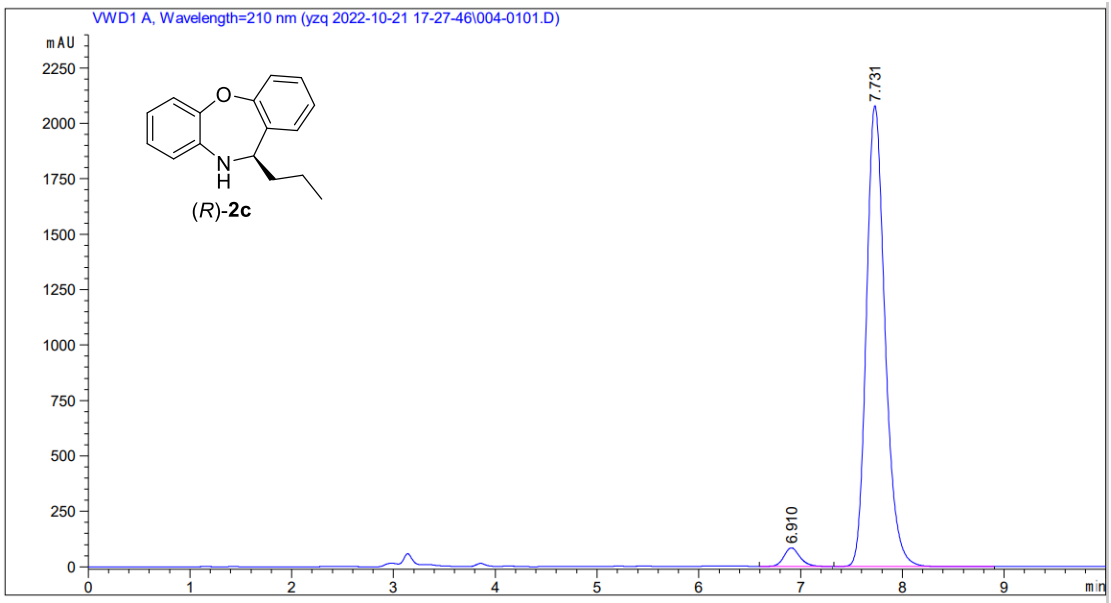
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	7.229	BV	0.2027	3923.12793	281.36957	46.3995
2	7.869	VB	0.2316	4531.97461	278.86414	53.6005



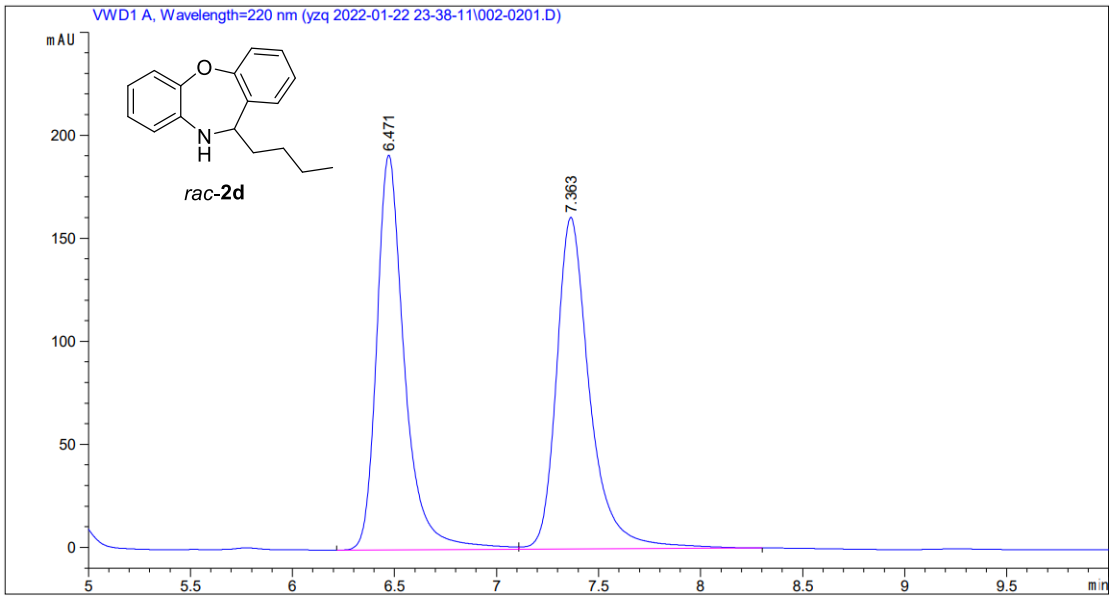
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	7.222	BV E	0.2013	201.87910	14.60347	2.6407
2	7.861	VB R	0.2264	7443.03809	473.38141	97.3593



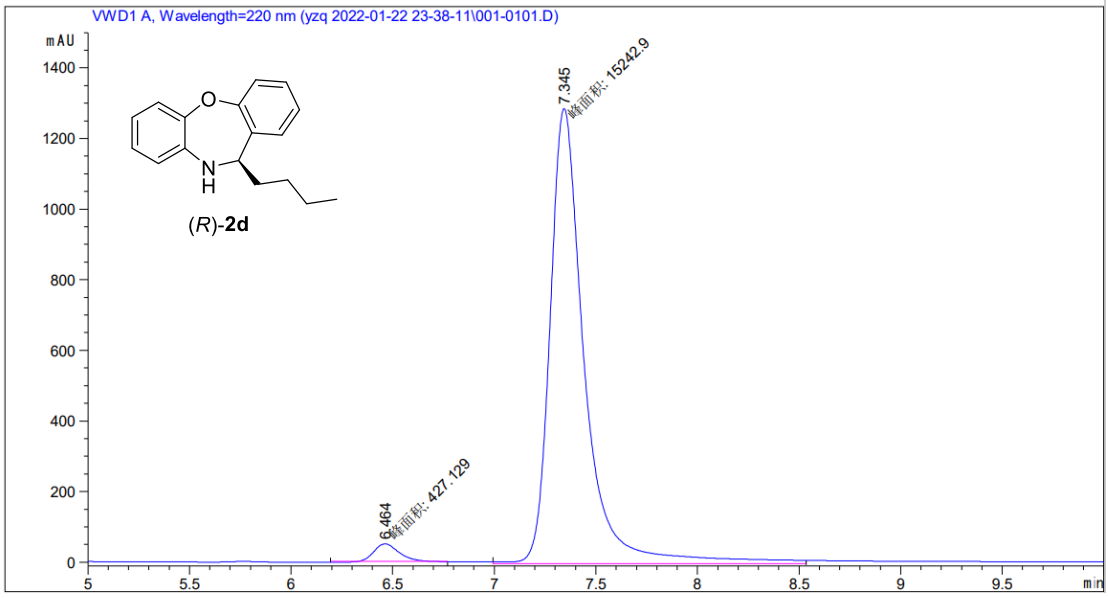
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.604	MM	0.1627	4864.12891	498.13934	50.4540
2	7.639	MM	0.2014	4776.58398	395.33887	49.5460



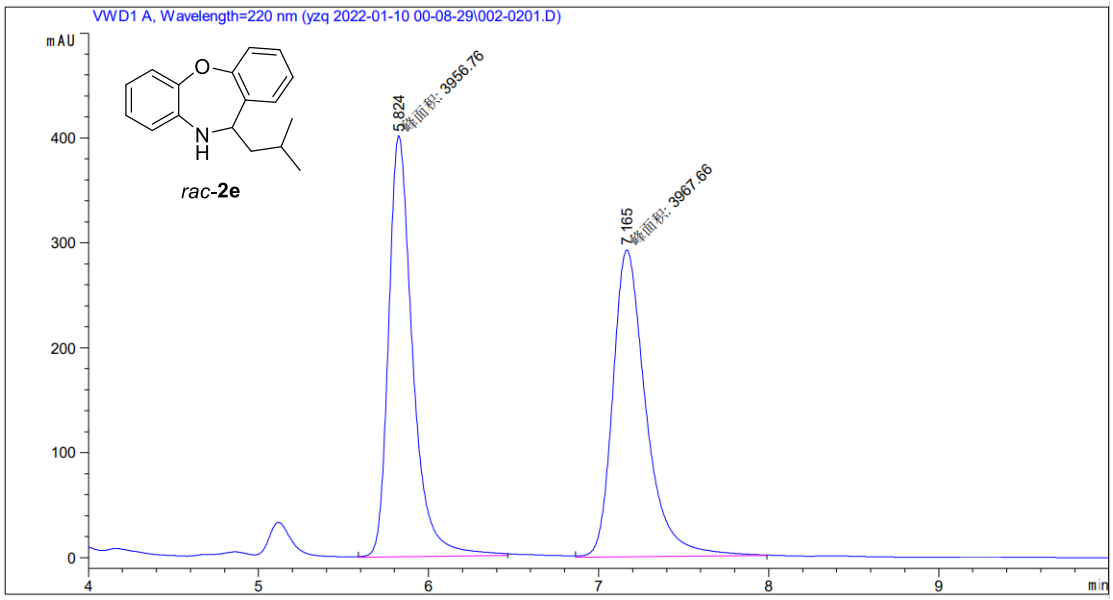
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.910	BB	0.1654	903.76801	83.44752	3.3162
2	7.731	BB	0.1949	2.63490e4	2078.16821	96.6838



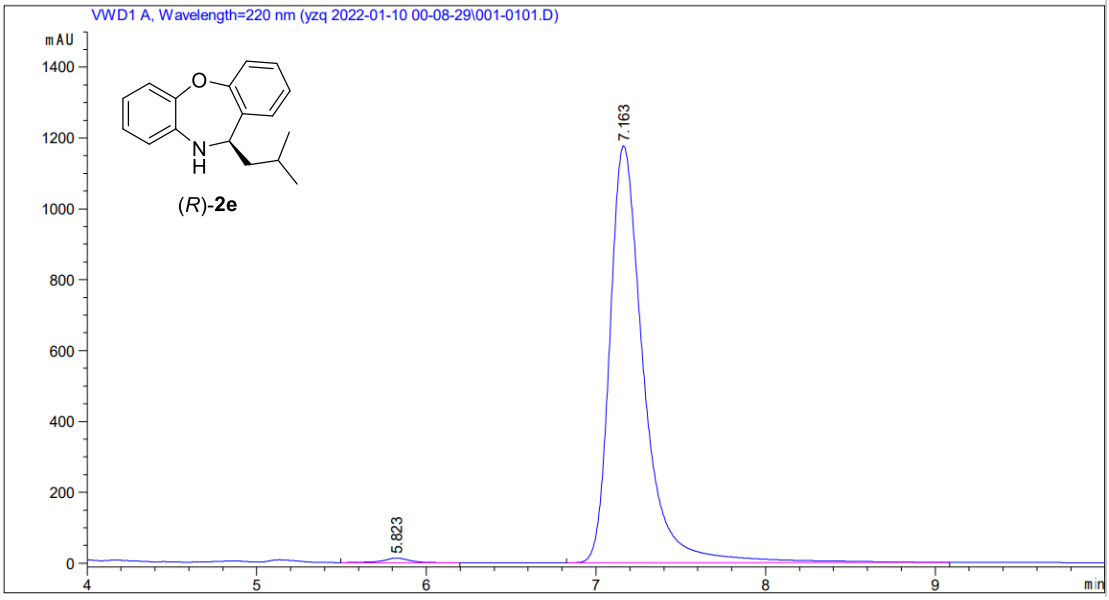
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.471	BV	0.1417	1818.55579	191.59535	49.8358
2	7.363	VB	0.1697	1830.53894	160.92191	50.1642



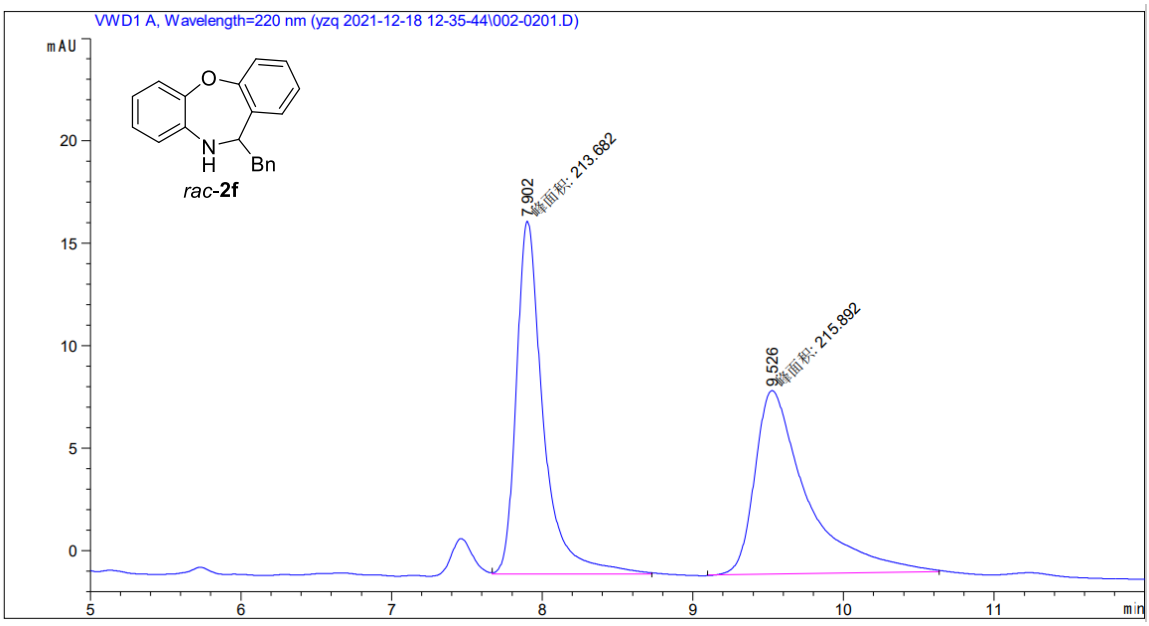
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.464	MM	0.1429	427.12881	49.81016	2.7258
2	7.345	MM	0.1971	1.52429e4	1289.13086	97.2742



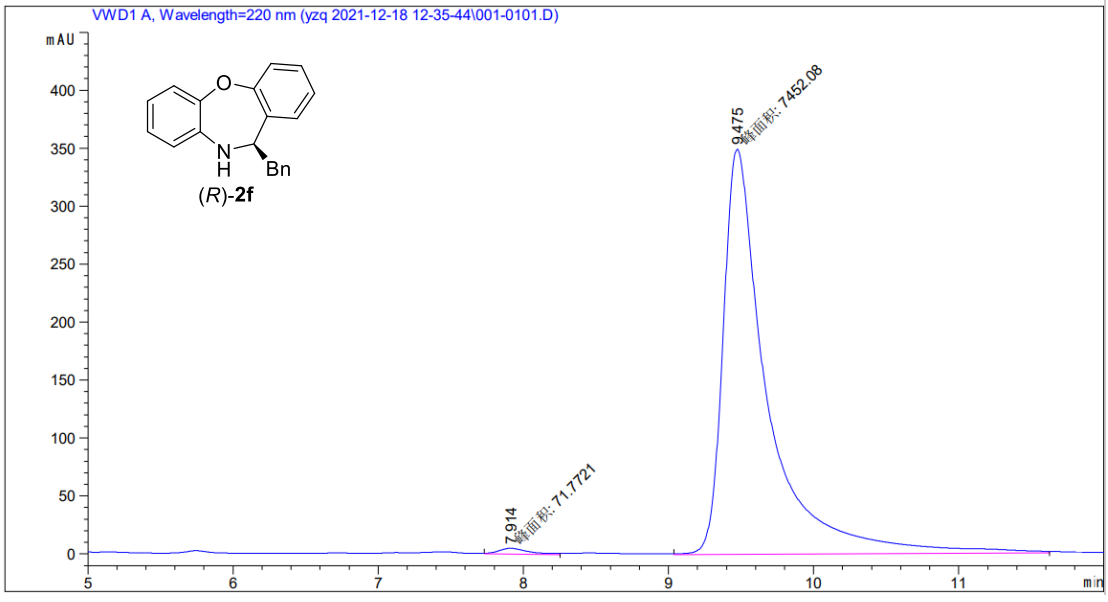
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	5.824	MM	0.1642	3956.76465	401.62625	49.9313
2	7.165	MM	0.2260	3967.65991	292.63208	50.0687



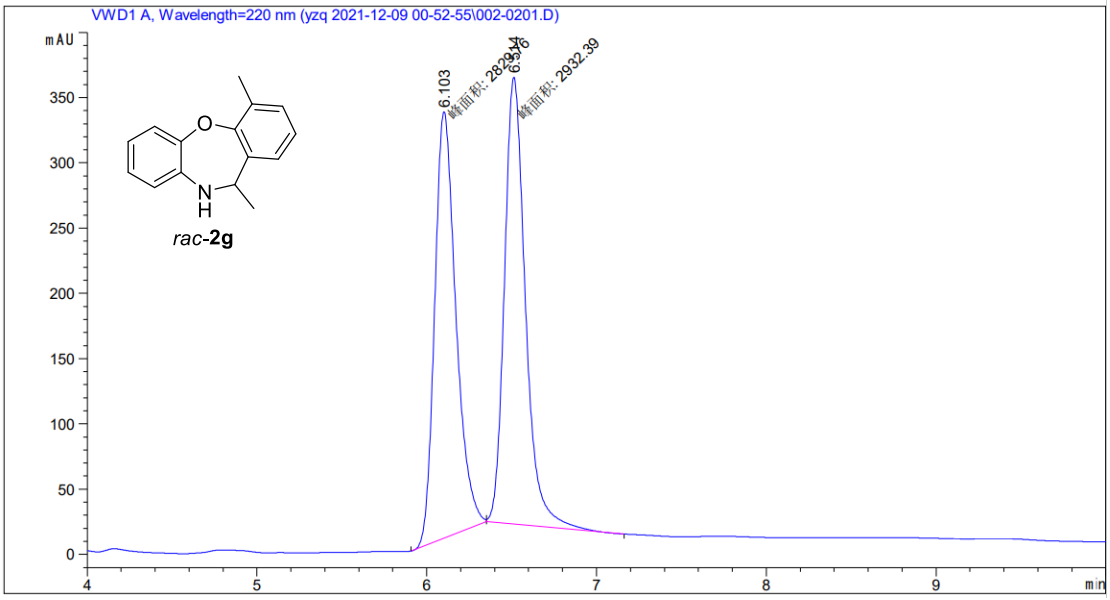
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	5.823	BB	0.1600	143.69049	13.20373	0.8766
2	7.163	BB	0.2080	1.62489e4	1177.11914	99.1234



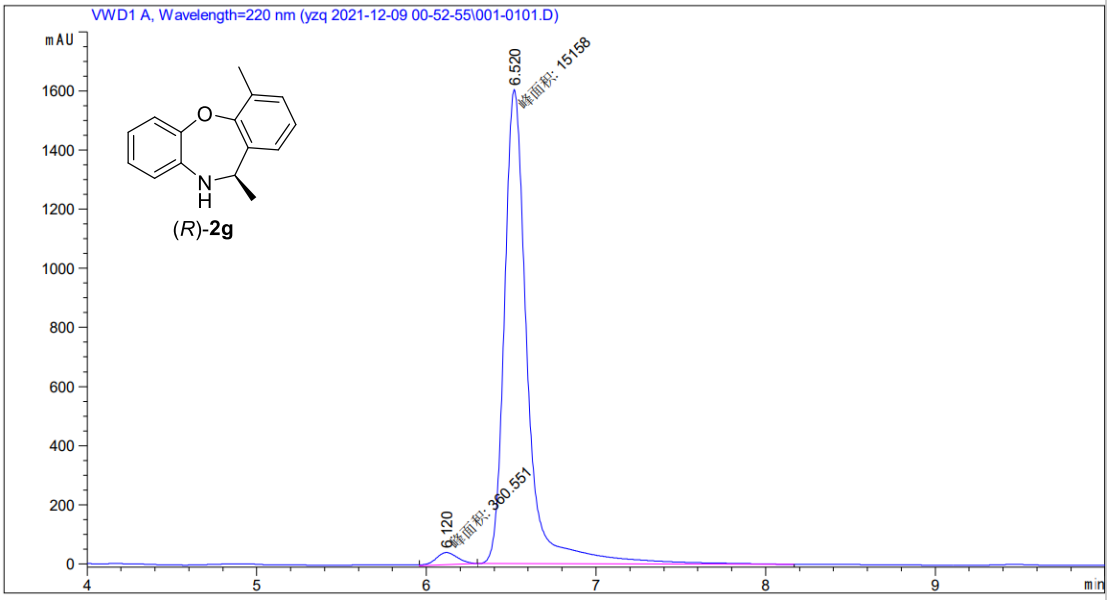
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	7.902	MM	0.2069	213.68236	17.21046	49.7428
2	9.526	MM	0.4017	215.89204	8.95787	50.2572



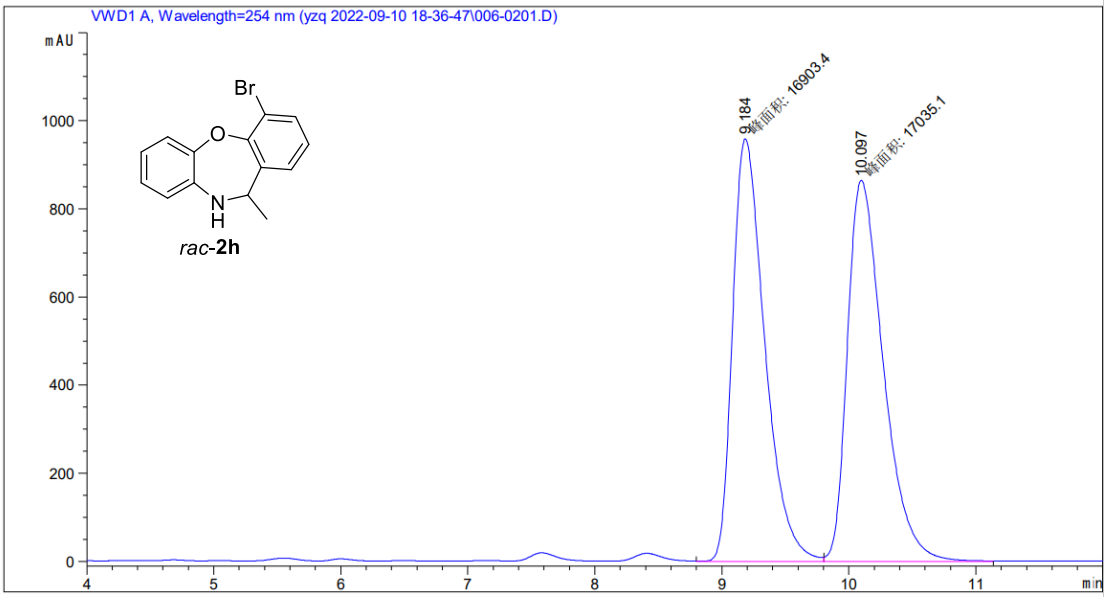
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	7.914	MM	0.2415	71.77213	4.95351	0.9539
2	9.475	MM	0.3554	7452.07764	349.43829	99.0461



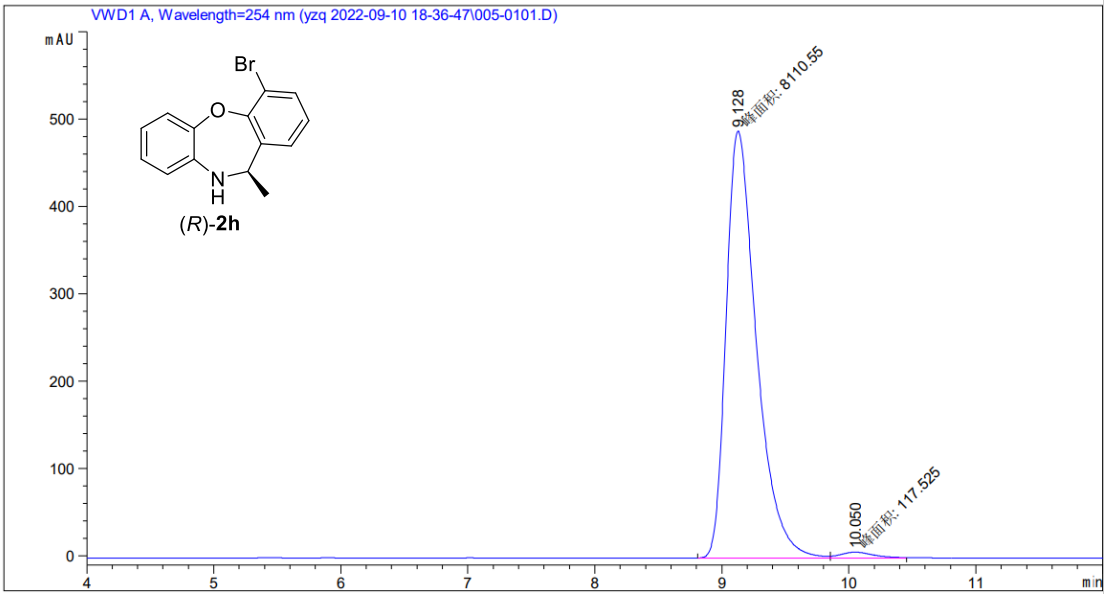
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.103	MM	0.1443	2829.76099	326.81302	49.1095
2	6.514	MM	0.1428	2932.38916	342.15329	50.8905



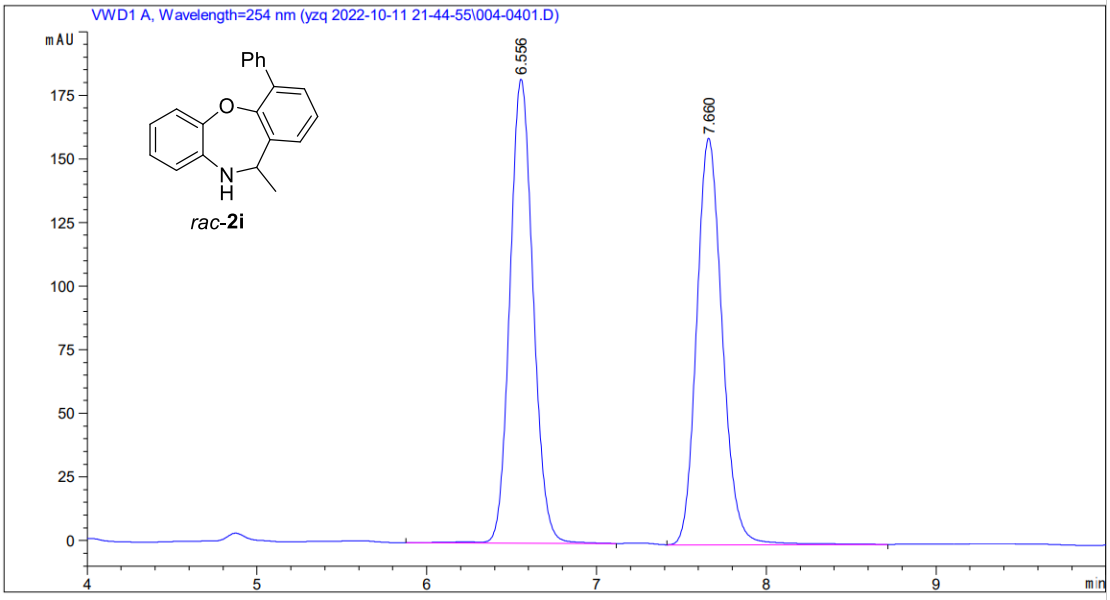
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.120	MM	0.1463	360.55060	41.06944	2.3234
2	6.520	MM	0.1576	1.51580e4	1603.35693	97.6766



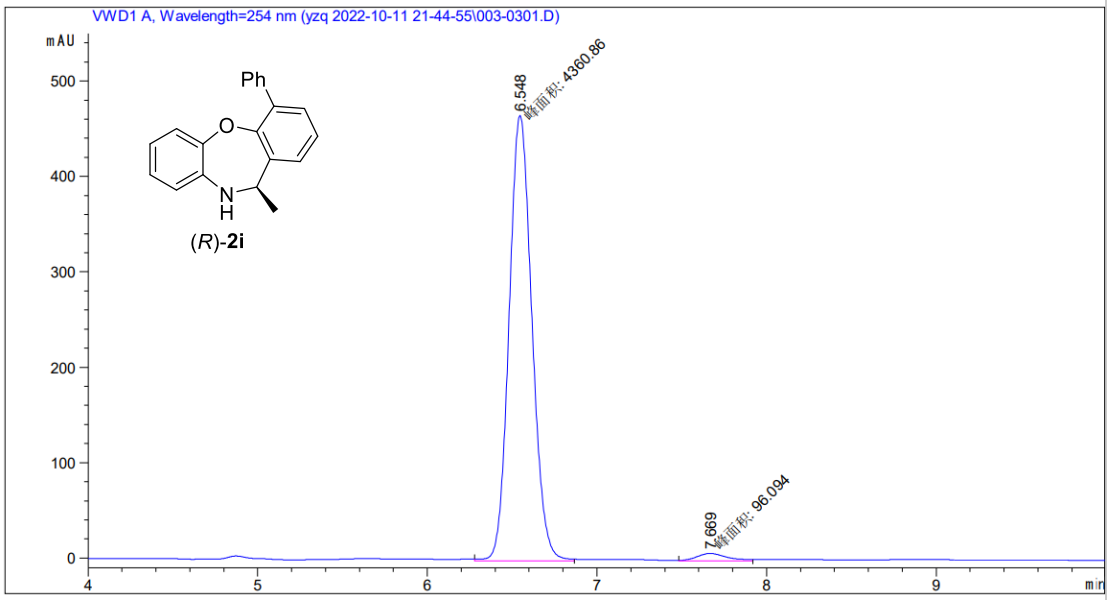
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	9.184	MM	0.2937	1.69034e4	959.37061	49.8060
2	10.097	MM	0.3283	1.70351e4	864.69208	50.1940



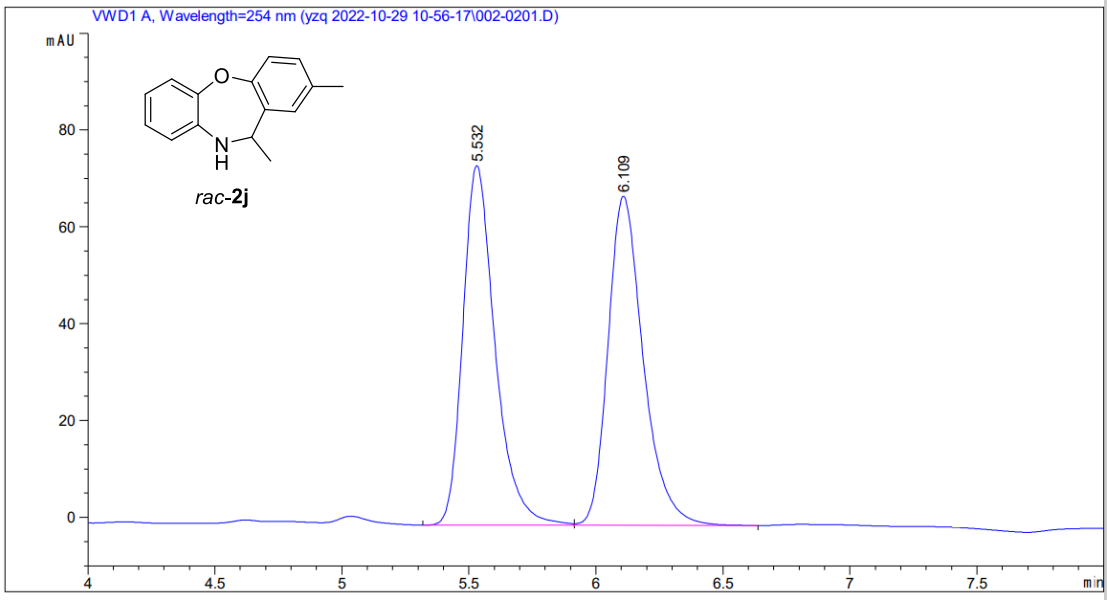
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	9.128	MM	0.2767	8110.55078	488.48135	98.5717
2	10.050	MM	0.2971	117.52460	6.59289	1.4283



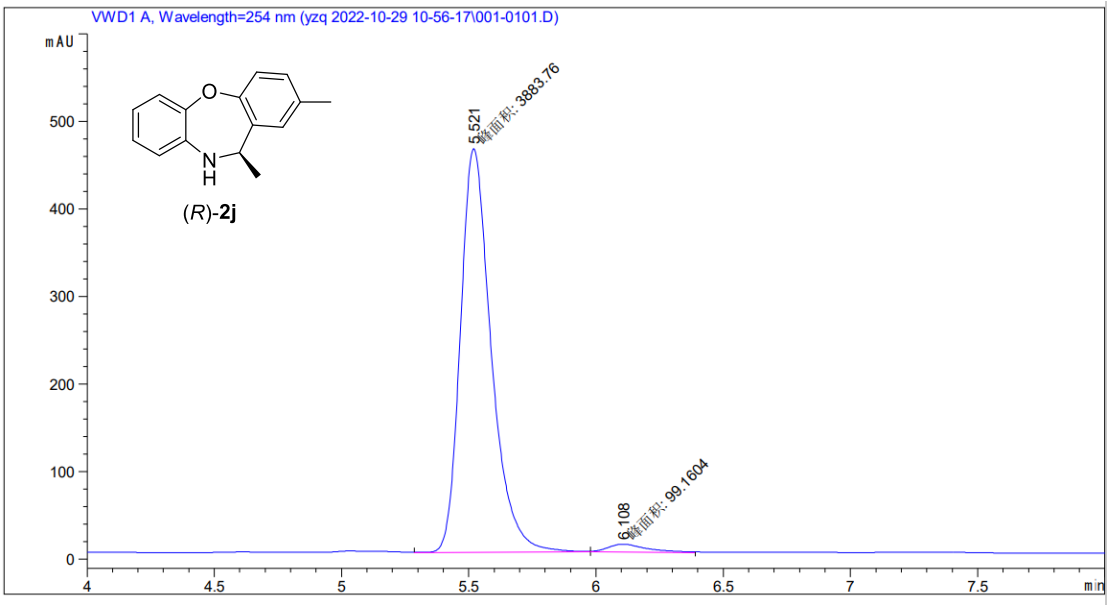
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.556	VB R	0.1480	1735.50037	182.43024	50.8752
2	7.660	BB	0.1624	1675.78918	159.72038	49.1248



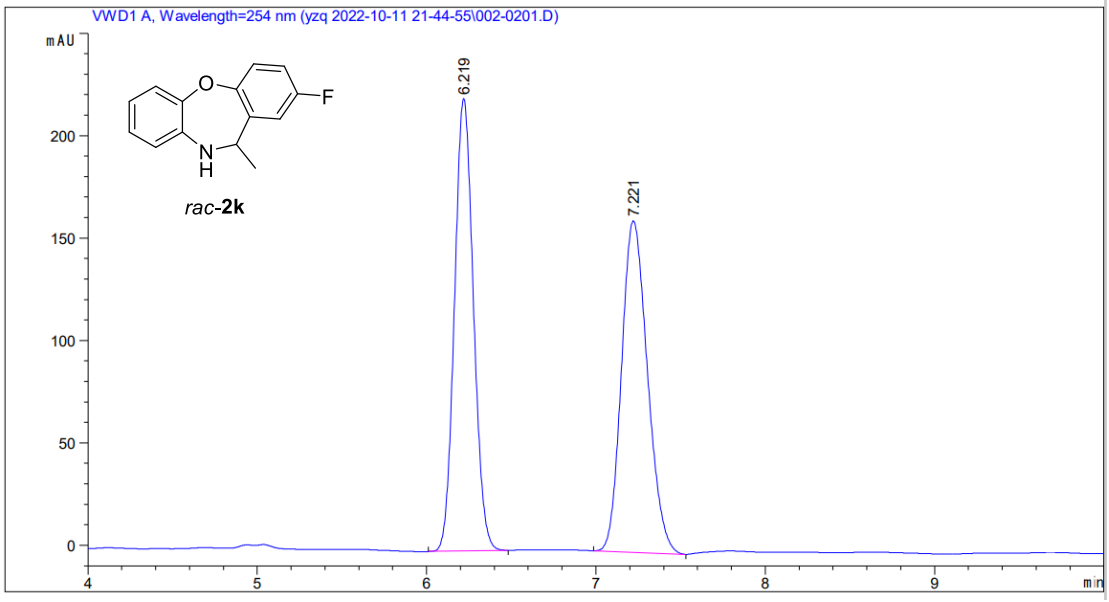
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.548	MM	0.1557	4360.86035	466.79453	97.8440
2	7.669	MM	0.2075	96.09402	7.71751	2.1560



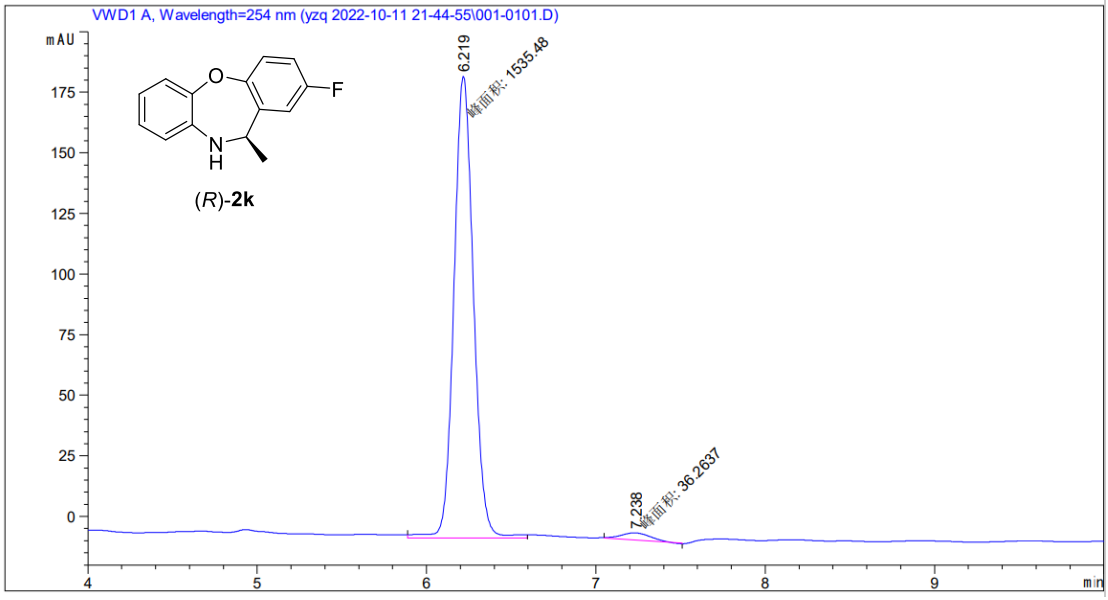
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	5.532	BV	0.1341	656.26013	74.26038	49.9608
2	6.109	VB	0.1468	657.28894	67.97305	50.0392



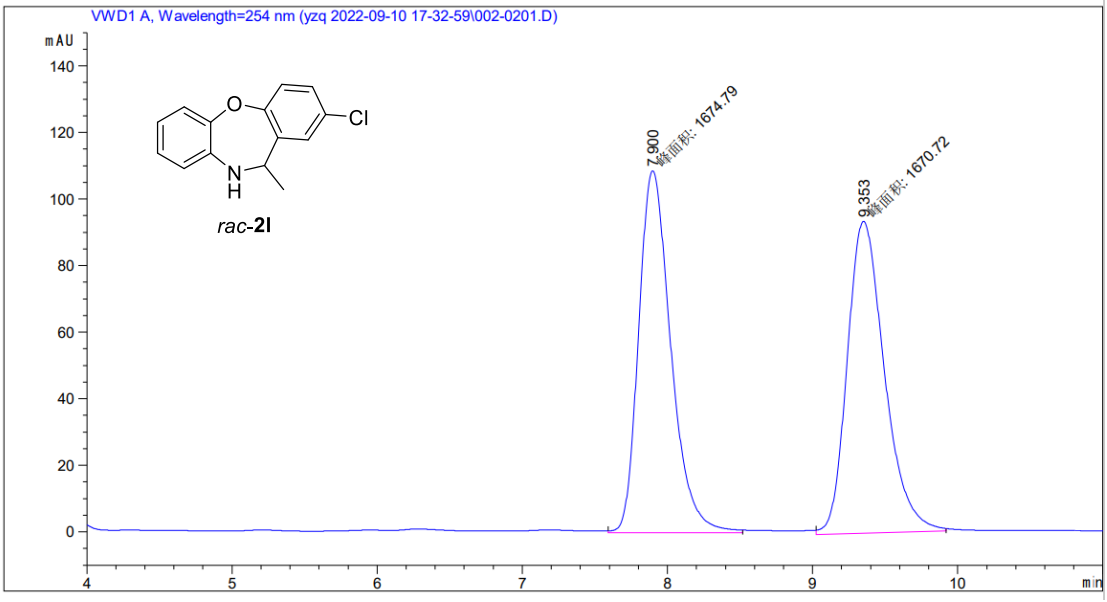
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	5.521	MM	0.1404	3883.76074	461.14517	97.5104
2	6.108	MM	0.1807	99.16038	9.14580	2.4896



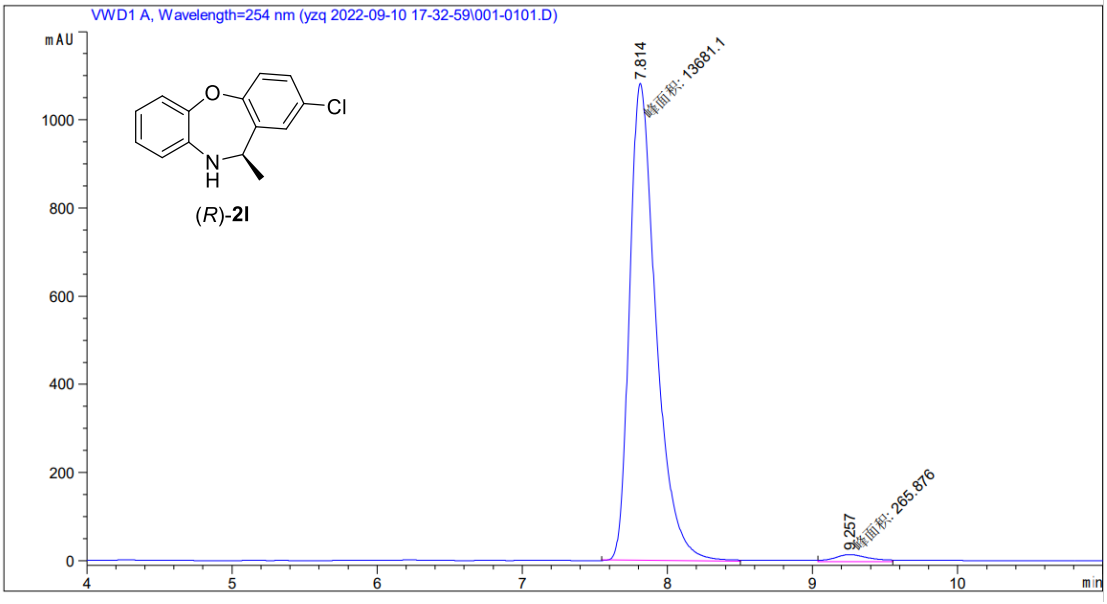
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.219	BB	0.1205	1712.26758	220.83284	49.8881
2	7.221	BB	0.1650	1719.95007	161.82474	50.1119



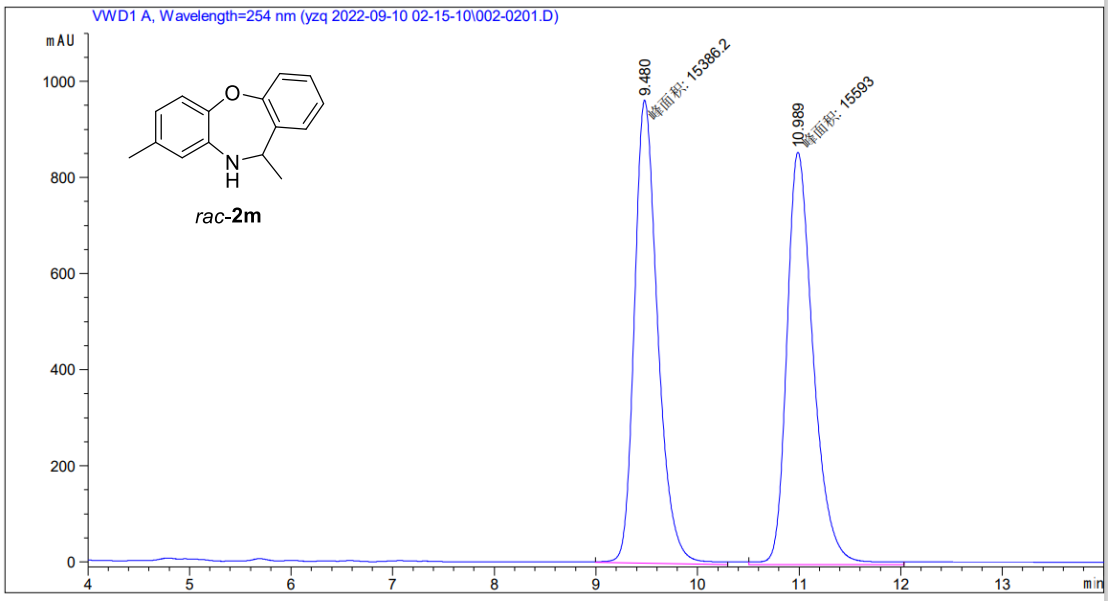
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.219	MM	0.1343	1535.47925	190.55466	97.6928
2	7.238	MM	0.2002	36.26373	3.01918	2.3072



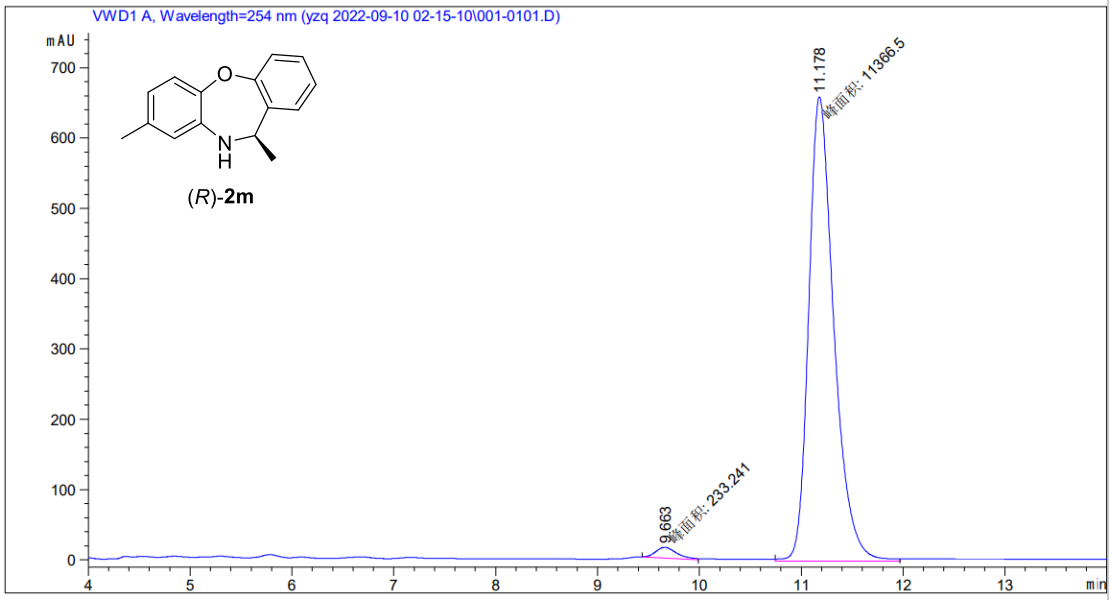
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	7.900	MM	0.2569	1674.78992	108.65009	50.0609
2	9.353	MM	0.2971	1670.71606	93.71886	49.9391



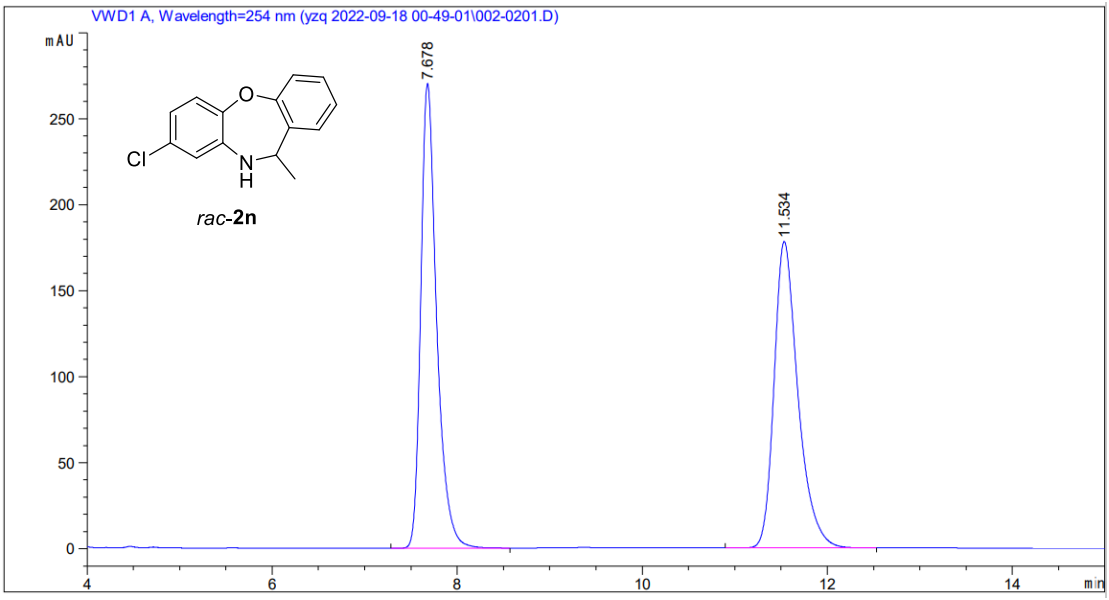
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	7.814	MM	0.2109	1.36811e4	1081.13208	98.0937
2	9.257	MM	0.2785	265.87637	15.91228	1.9063



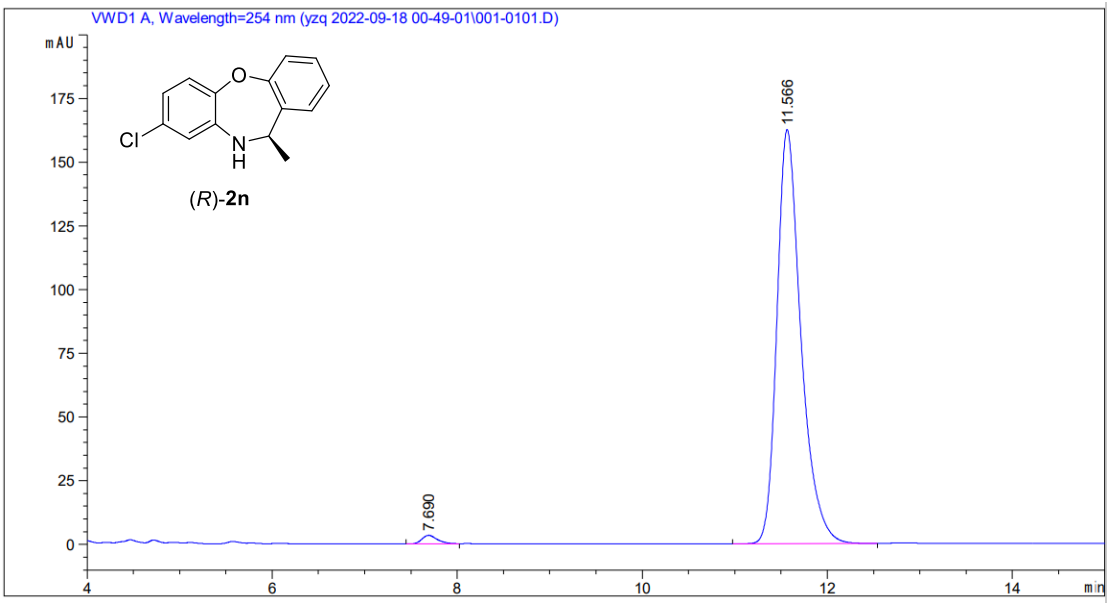
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	9.480	MM	0.2661	1.53862e4	963.64459	49.6661
2	10.989	MM	0.3030	1.55930e4	857.83191	50.3339



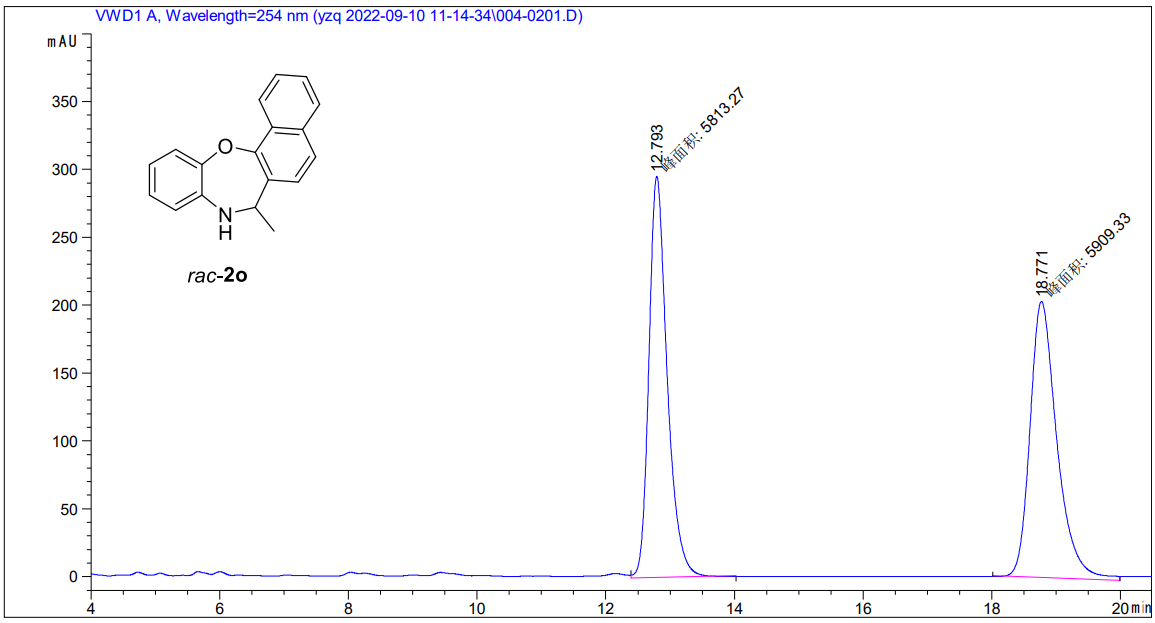
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	9.663	MM	0.2493	233.24057	15.59130	2.0107
2	11.178	MM	0.2868	1.13665e4	660.55127	97.9893



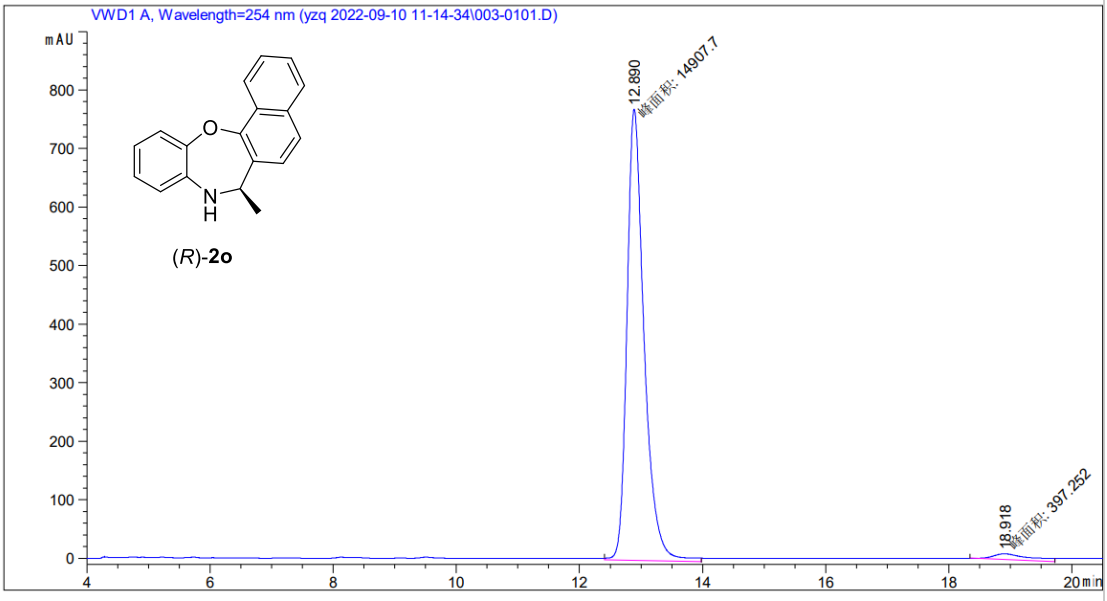
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	7.678	BB	0.1777	3211.87427	270.16354	50.0868
2	11.534	BB	0.2695	3200.73779	178.20679	49.9132



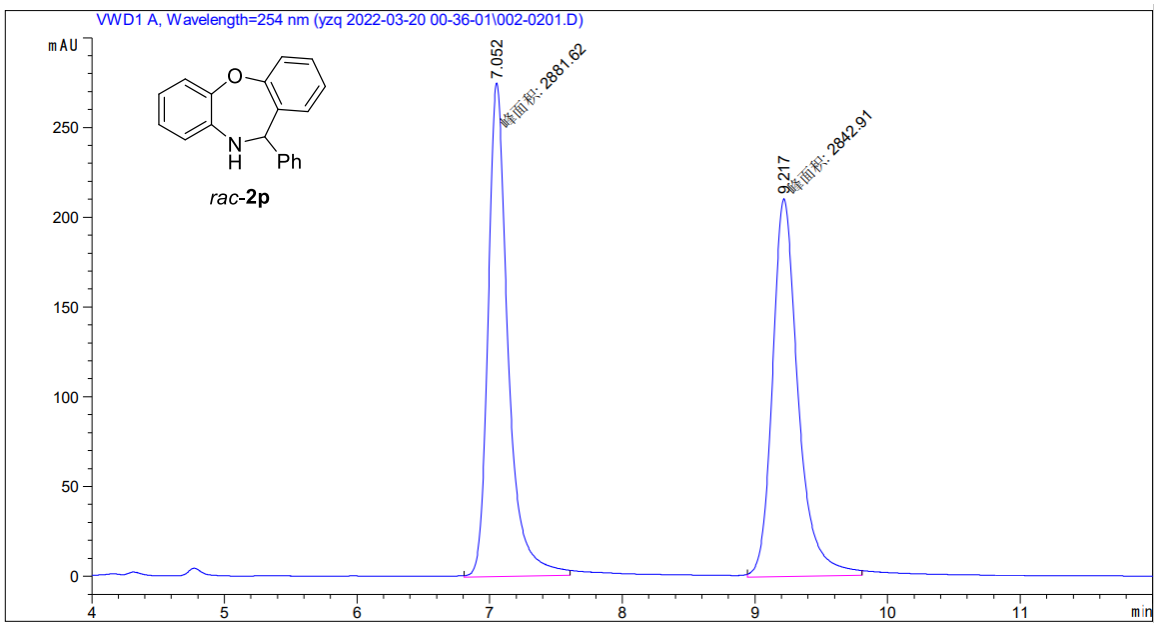
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	7.690	BB	0.1735	38.71240	3.35792	1.3029
2	11.566	BB	0.2716	2932.63623	162.49332	98.6971



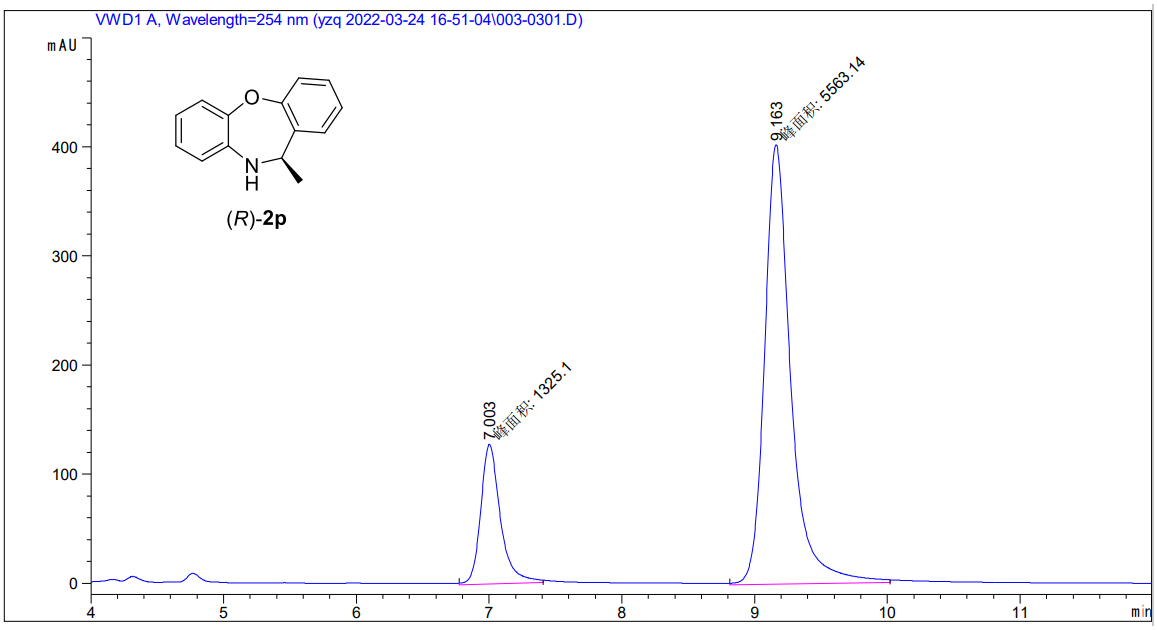
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	12.793	MM	0.3279	5813.26709	295.52185	49.5903
2	18.771	MM	0.4845	5909.32764	203.26321	50.4097



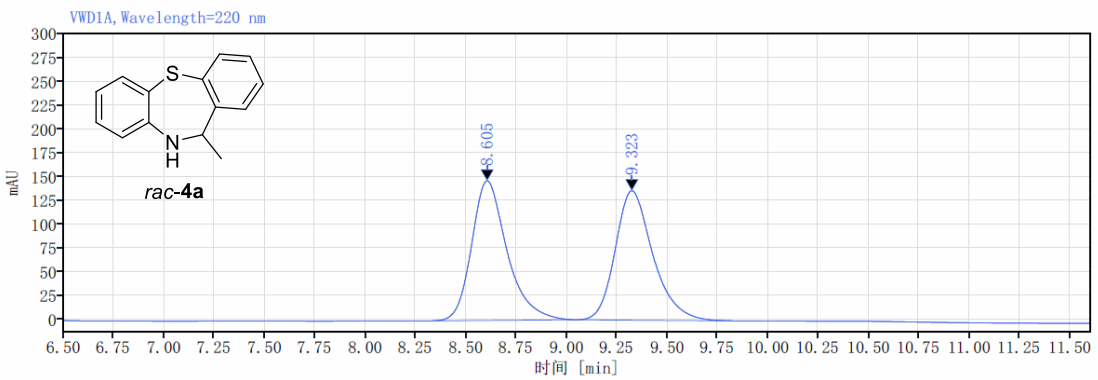
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	12.890	MM	0.3226	1.49077e4	770.06824	97.4044
2	18.918	MM	0.6986	397.25153	9.47770	2.5956



峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	7.052	MM	0.1747	2881.61548	274.93240	50.3381
2	9.217	MM	0.2250	2842.91040	210.57024	49.6619

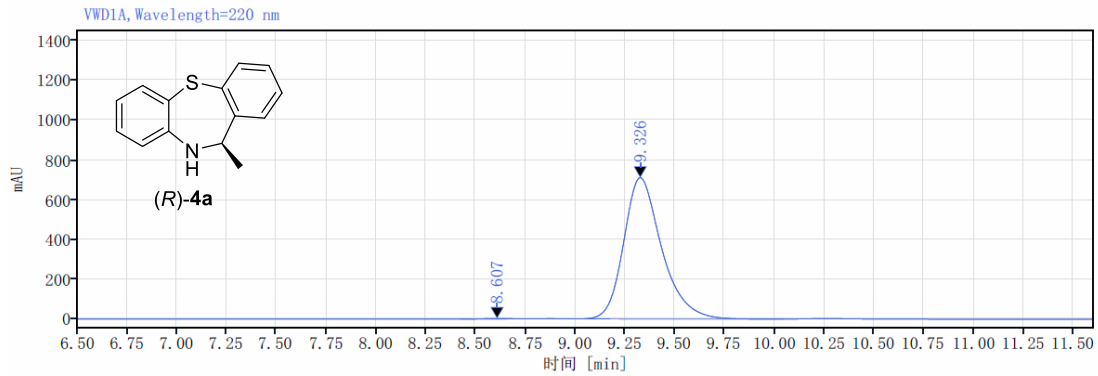


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	7.003	MM	0.1726	1325.10217	127.97246	19.2372
2	9.163	MM	0.2303	5563.14063	402.68359	80.7628



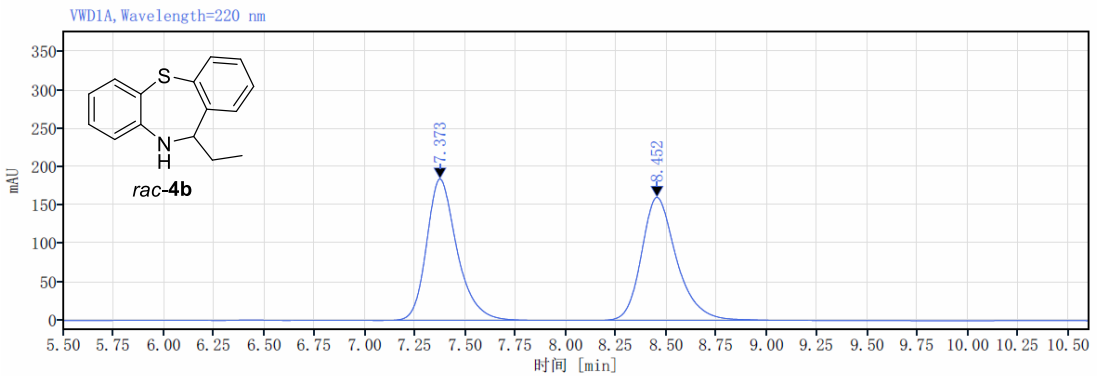
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
8.605	MM m	0.83	1787.60	146.32	50.31
9.323	MM m	0.90	1765.74	135.72	49.69
		总和	3553.35		



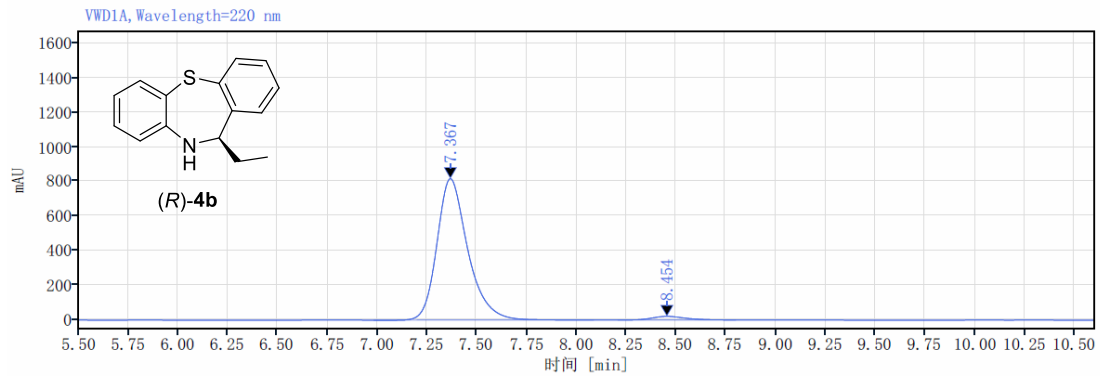
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
8.607	MM m	0.34	22.50	2.47	0.24
9.326	MM m	1.06	9430.28	711.50	99.76
		总和	9452.77		



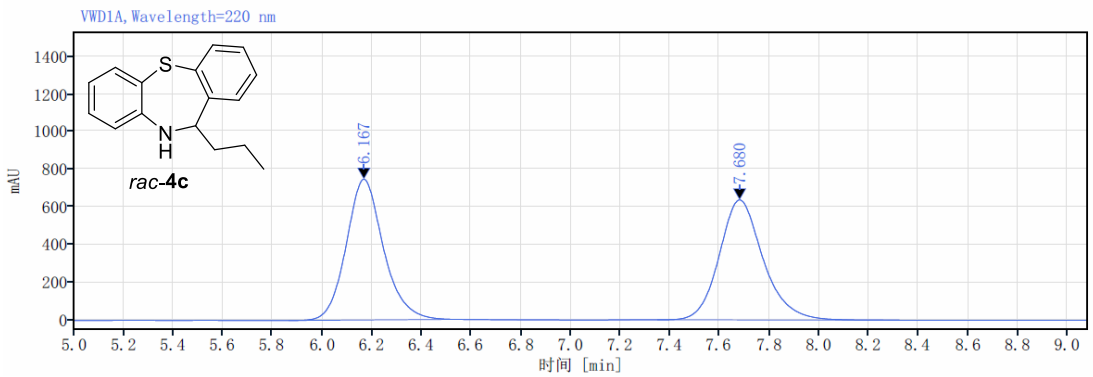
信号: VWD1A, Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
7.373	MM m	0.90	1942.98	184.50	49.92
8.452	MM m	1.13	1949.37	160.47	50.08
		总和	3892.36		



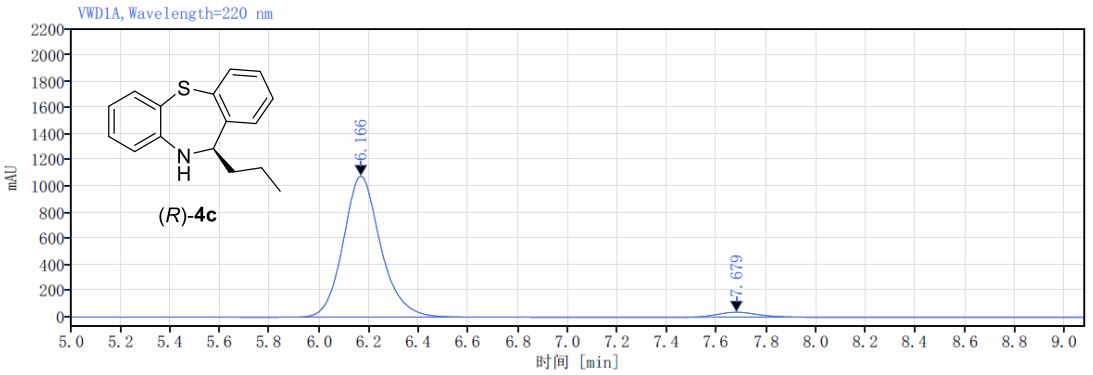
信号: VWD1A, Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
7.367	MM m	1.10	8795.64	817.10	97.26
8.454	MM m	0.59	247.92	21.19	2.74
		总和	9043.56		



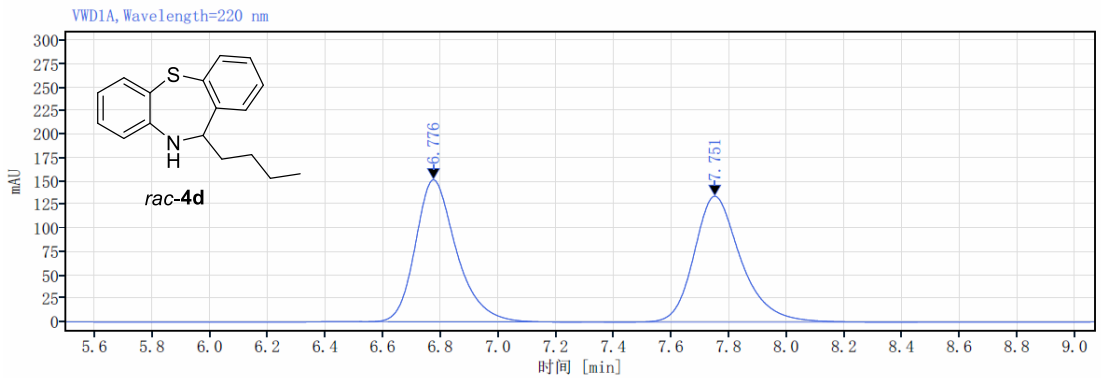
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
6.167	MM m	0.67	7770.11	745.23	49.86
7.680	MM m	1.03	7813.31	635.68	50.14
		总和	15583.42		



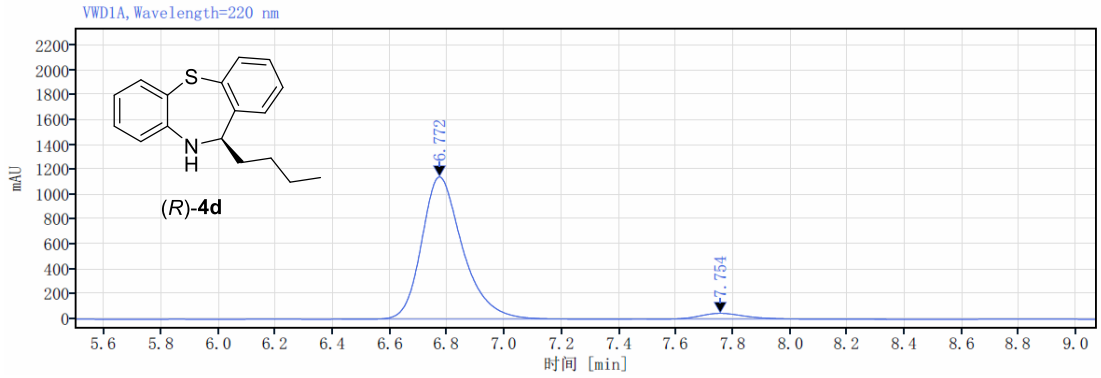
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
6.166	MM m	0.85	11324.71	1079.29	96.28
7.679	MM m	0.45	438.04	38.92	3.72
		总和	11762.75		



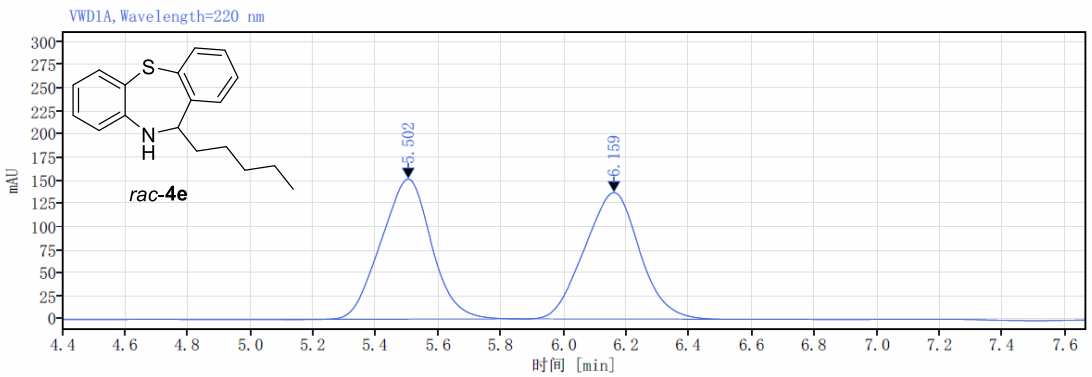
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
6.776	MM m	0.77	1497.09	151.66	49.69
7.751	MM m	1.09	1515.85	134.38	50.31
		总和	3012.93		



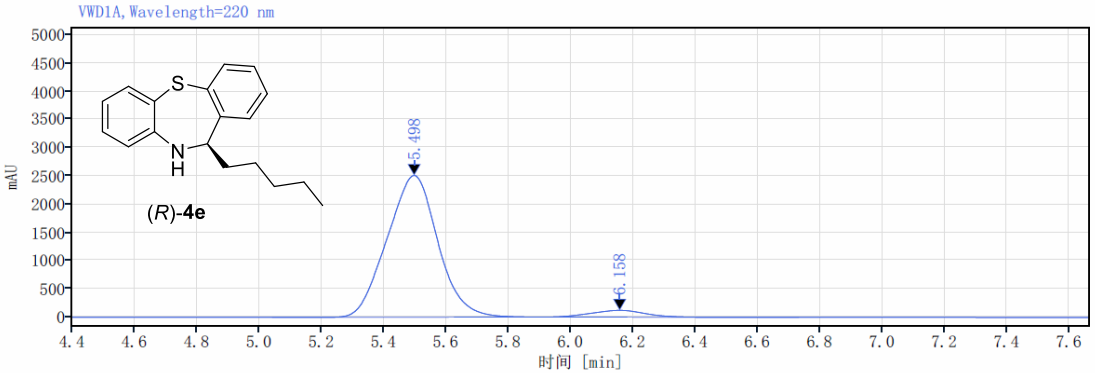
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
6.772	MM m	1.01	11417.29	1143.13	95.49
7.754	MM m	0.84	539.56	47.05	4.51
		总和	11956.85		



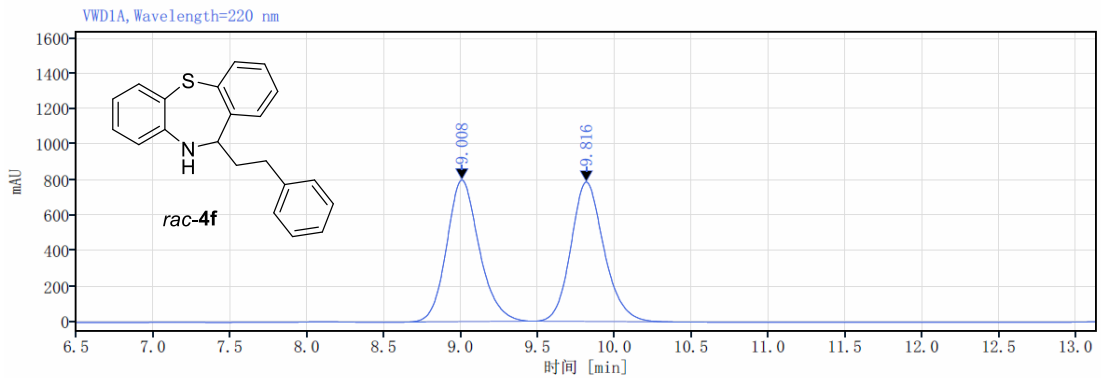
信号: VWD1A, Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
5.502	MM m	0.75	1702.73	151.64	50.39
6.159	MM m	0.78	1676.67	136.88	49.61
		总和	3379.41		



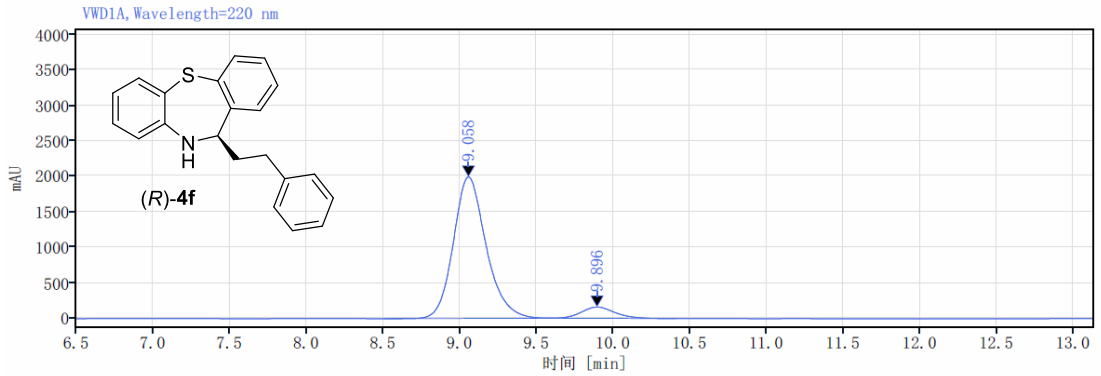
信号: VWD1A, Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
5.498	MM m	0.86	28379.11	2509.57	95.18
6.158	MM m	0.83	1436.04	120.51	4.82
		总和	29815.15		



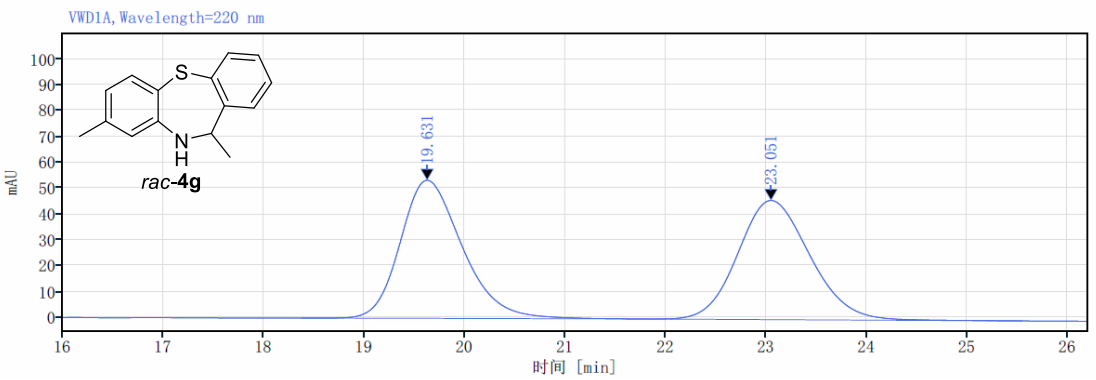
信号: VWD1A, Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
9.008	MM m	0.80	11732.21	799.54	49.96
9.816	MM m	0.98	11748.67	786.66	50.04
		总和	23480.88		



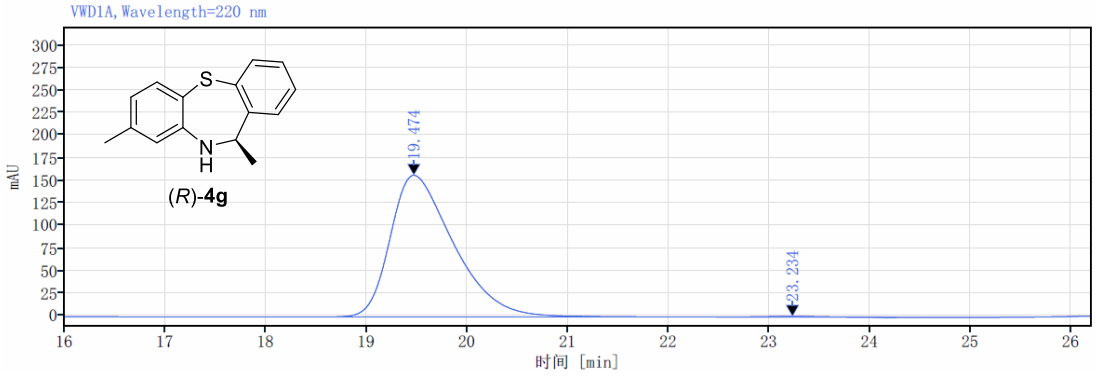
信号: VWD1A, Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
9.058	MM m	1.09	29551.95	1994.70	92.46
9.896	MM m	0.82	2409.56	159.24	7.54
		总和	31961.51		



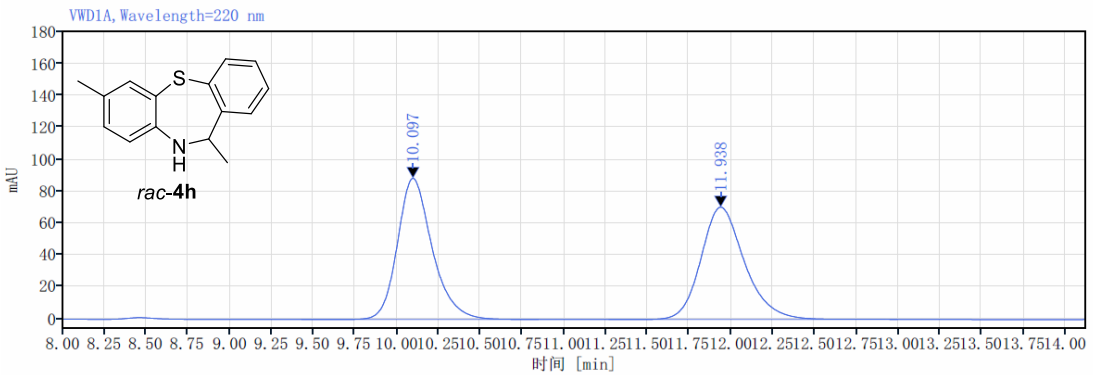
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
19.631	MM m	3.26	2282.56	53.31	49.91
23.051	MM m	3.91	2290.77	46.00	50.09
		总和	4573.33		



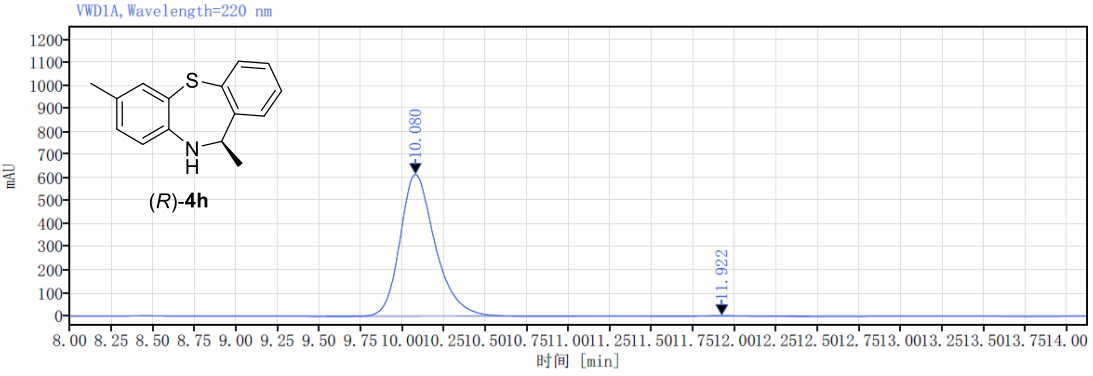
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
19.474	MM m	3.98	6865.43	157.02	99.44
23.234	MM m	2.02	38.64	0.83	0.56
		总和	6904.07		



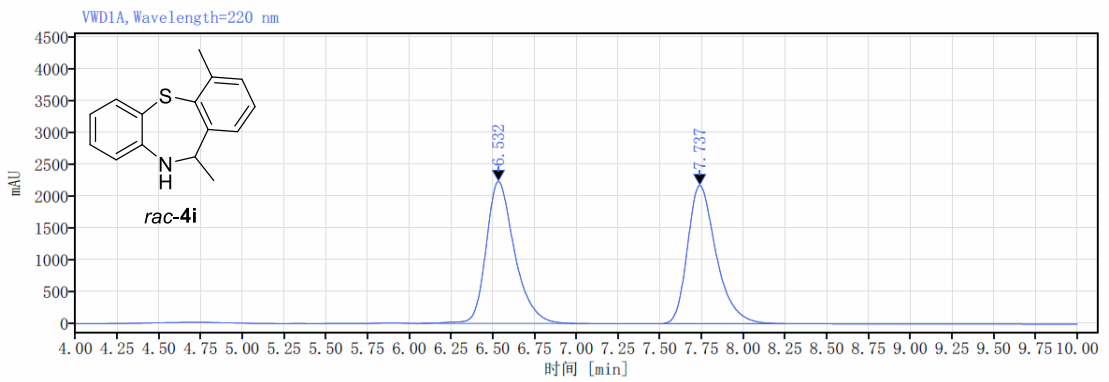
信号: VWD1A, Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
10.097	MM m	1.42	1277.72	88.44	50.06
11.938	MM m	1.73	1274.80	70.35	49.94
		总和	2552.52		



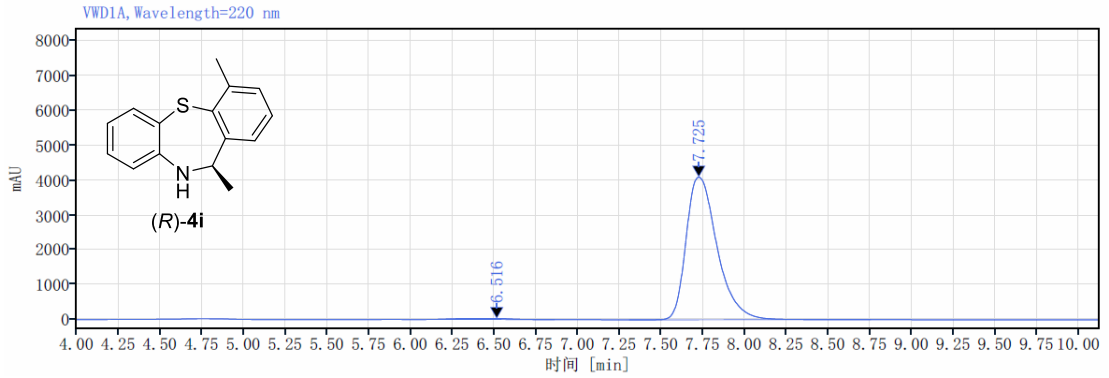
信号: VWD1A, Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
10.080	MM m	1.50	9074.34	615.58	99.51
11.922	MM m	0.97	44.27	2.46	0.49
		总和	9118.61		



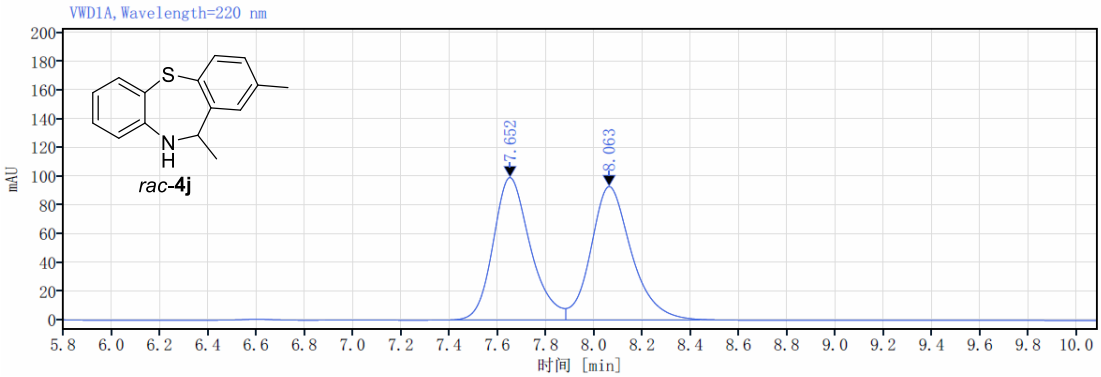
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
6.532	MM m	1.03	26507.74	2234.98	50.43
7.737	MM m	1.13	26054.62	2177.64	49.57
		总和	52562.35		



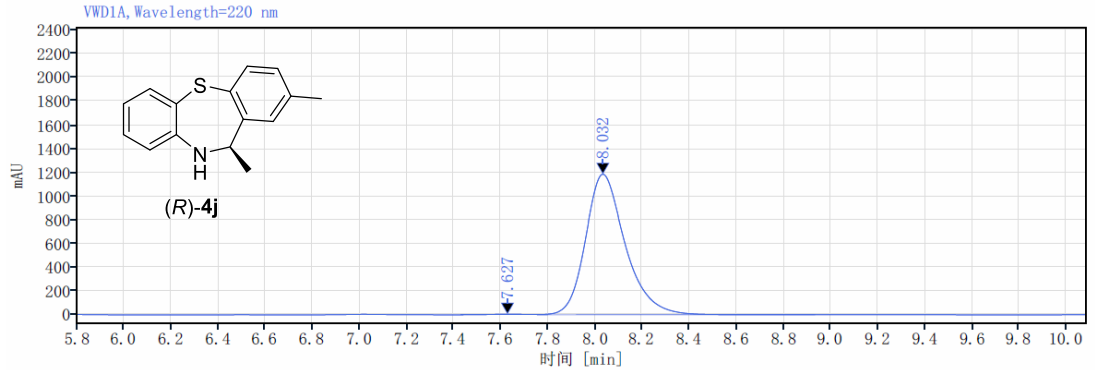
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
6.516	MM m	0.73	546.81	24.88	1.03
7.725	MM m	1.44	52777.68	4094.50	98.97
		总和	53324.49		



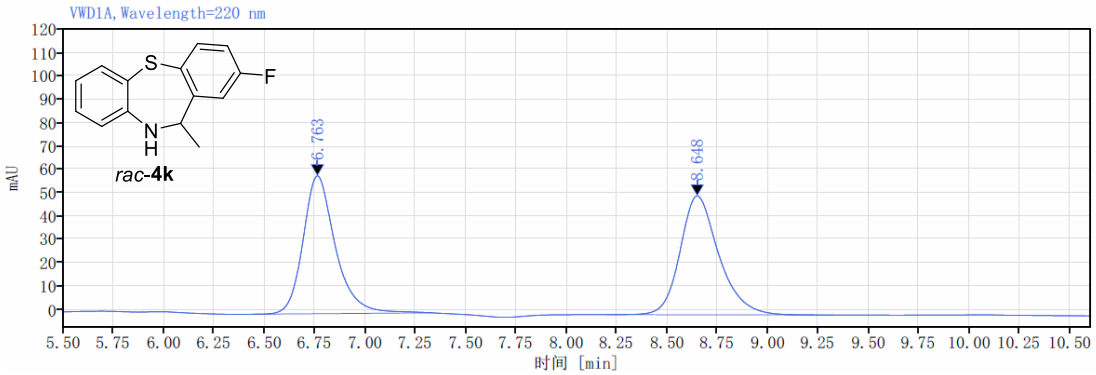
信号: VWD1A, Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
7.652	MM m	0.54	1062.70	99.07	49.49
8.063	MM m	0.61	1084.51	92.75	50.51
		总和	2147.21		



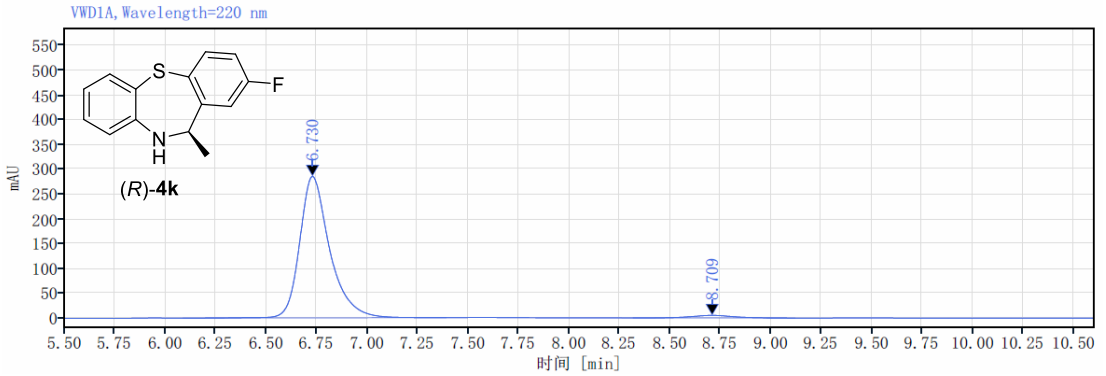
信号: VWD1A, Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
7.627	MM m	0.32	55.03	5.66	0.39
8.032	MM m	1.18	13916.96	1187.39	99.61
		总和	13971.99		



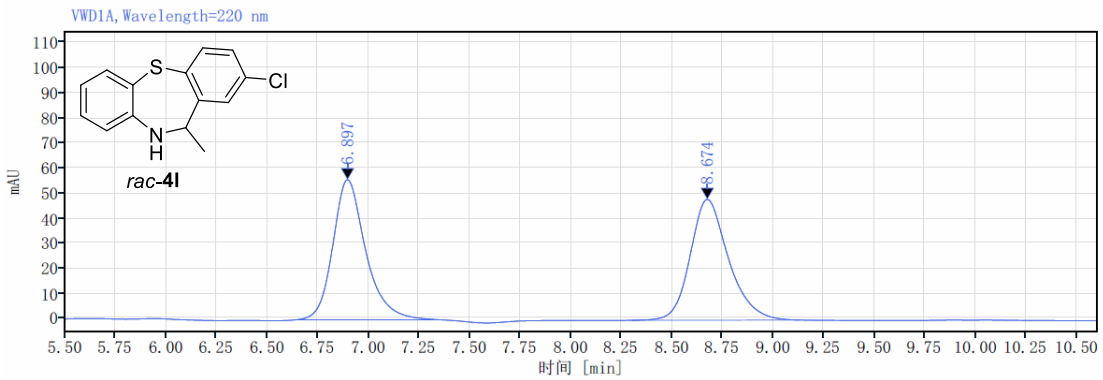
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
6.763	MM m	0.96	659.93	59.15	49.13
8.648	MM m	1.12	683.23	50.99	50.87
		总和	1343.16		



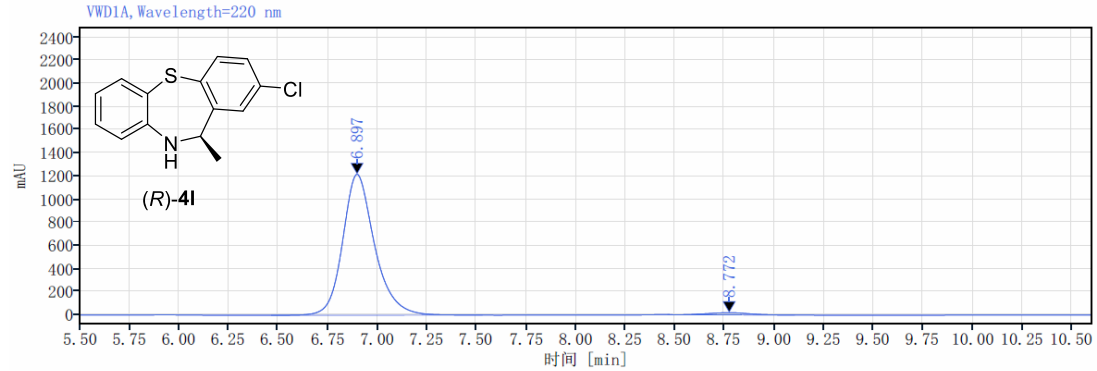
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
6.730	MM m	1.30	2947.21	285.28	97.44
8.709	MM m	0.80	77.49	5.30	2.56
		总和	3024.70		



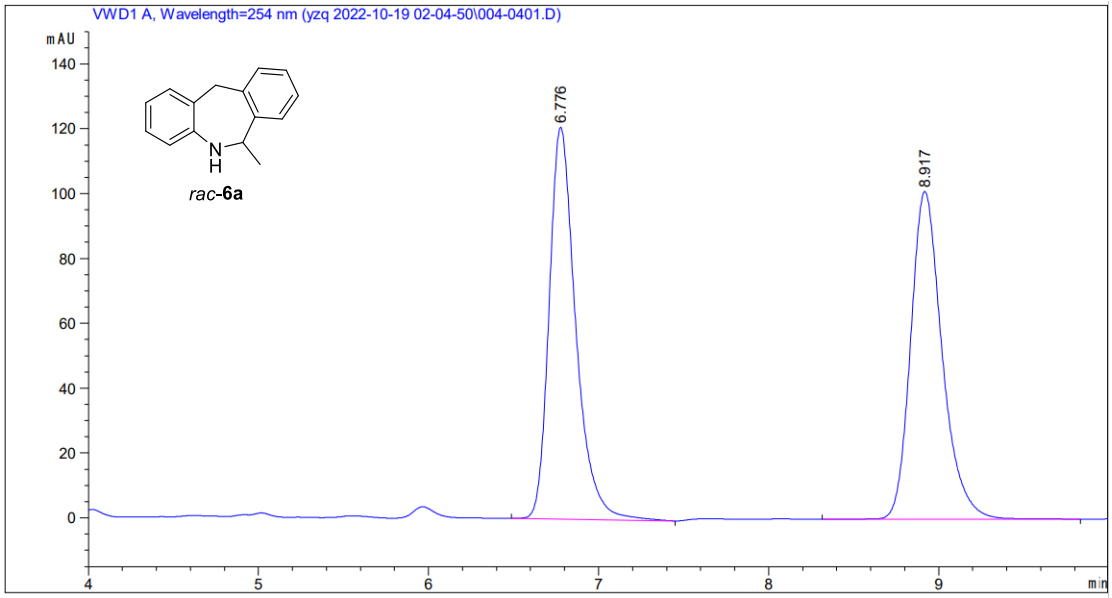
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
6.897	MM m	0.67	625.58	55.68	49.68
8.674	MM m	0.83	633.53	48.13	50.32
		总和	1259.10		

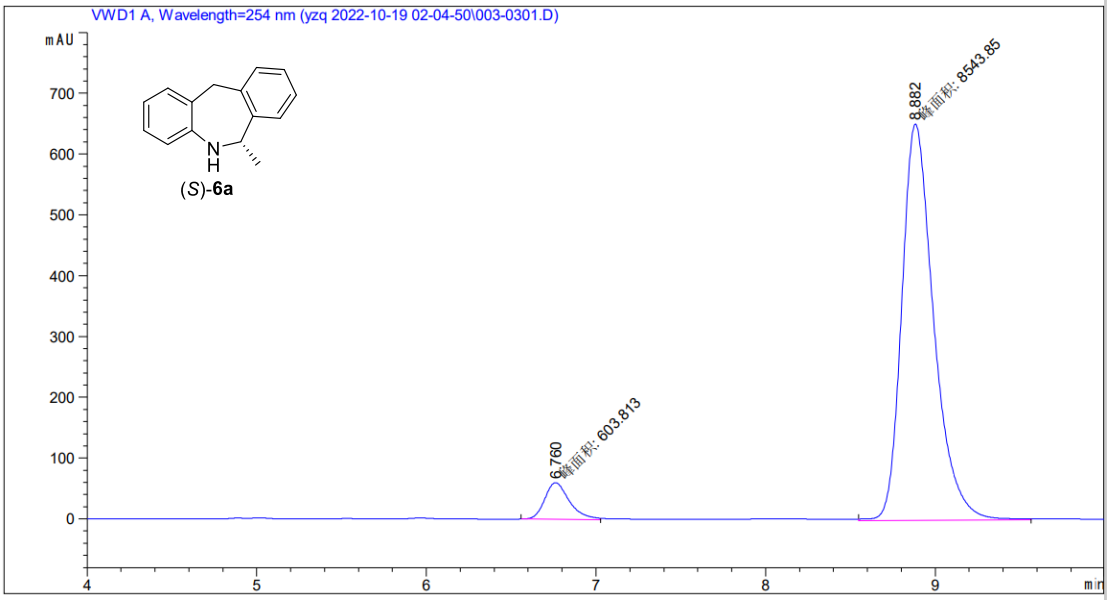


信号: VWD1A,Wavelength=220 nm

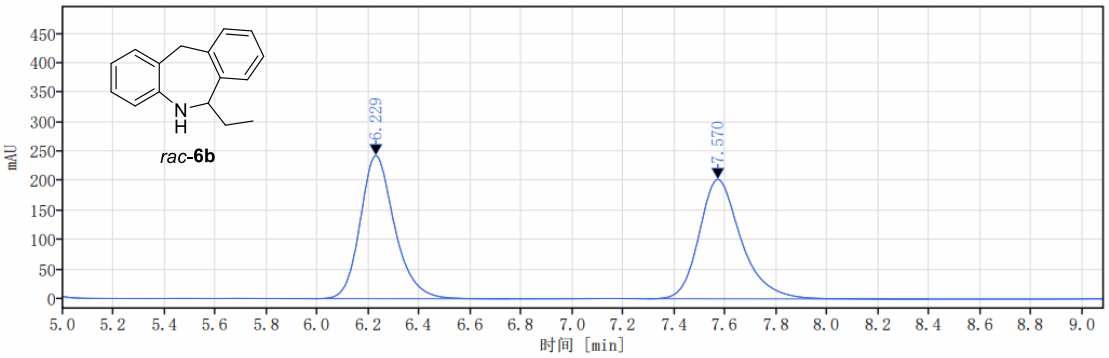
保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
6.897	MM m	1.07	13633.63	1216.81	98.04
8.772	MM m	0.64	272.32	19.29	1.96
		总和	13905.95		



峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.776	BB	0.1647	1312.09070	120.80309	50.2006
2	8.917	BB	0.1952	1301.60254	101.07877	49.7994

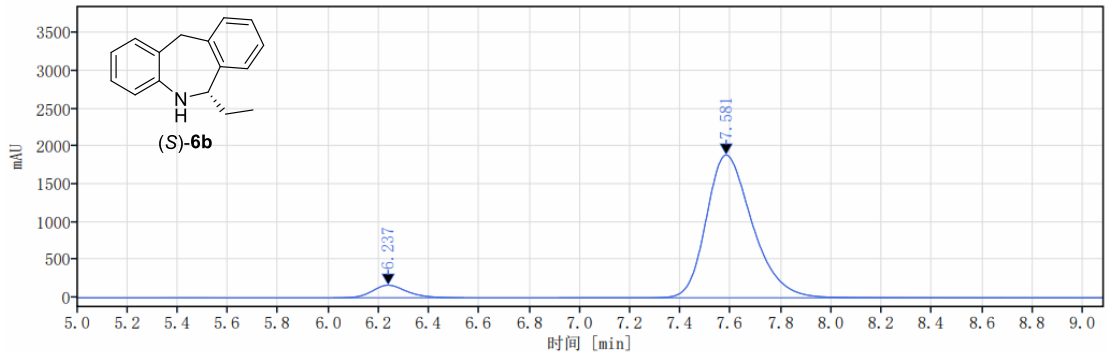


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.760	MM	0.1678	603.81342	59.95949	6.6007
2	8.882	MM	0.2185	8543.84766	651.67072	93.3993



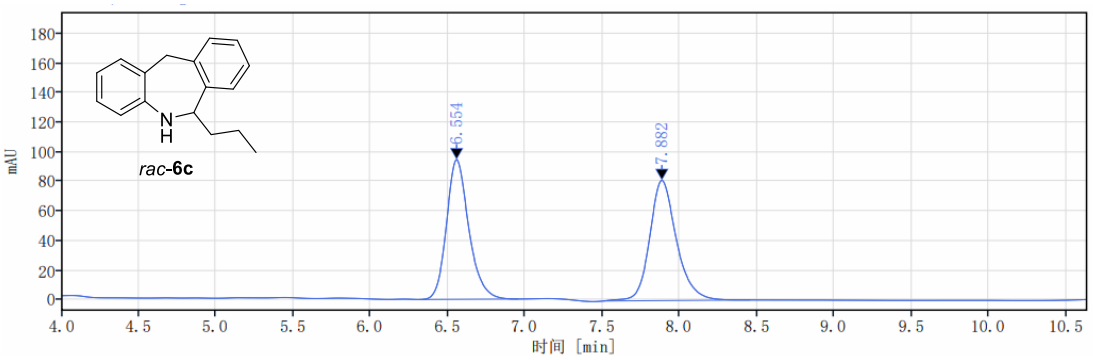
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
6.229	MM m	0.78	2270.95	242.56	49.46
7.570	MM m	1.11	2320.49	202.48	50.54
		总和	**4591.43**		



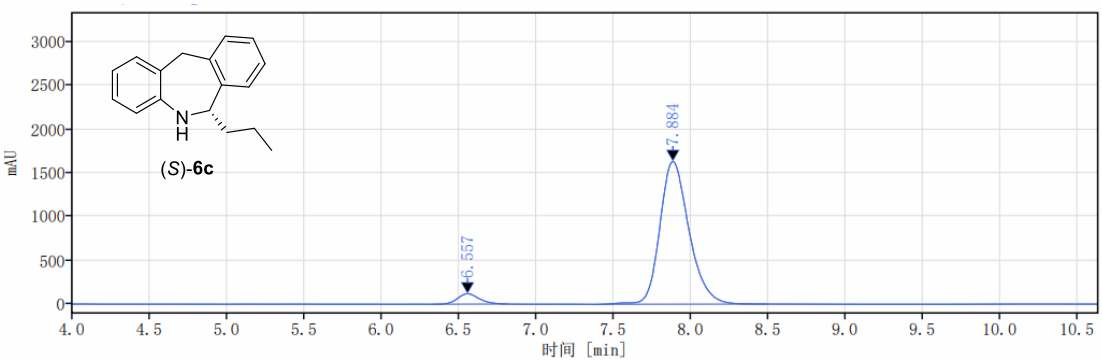
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
6.237	MM m	0.52	1600.81	167.31	6.21
7.581	MM m	2.51	24190.00	1891.09	93.79
		总和	**25790.81**		



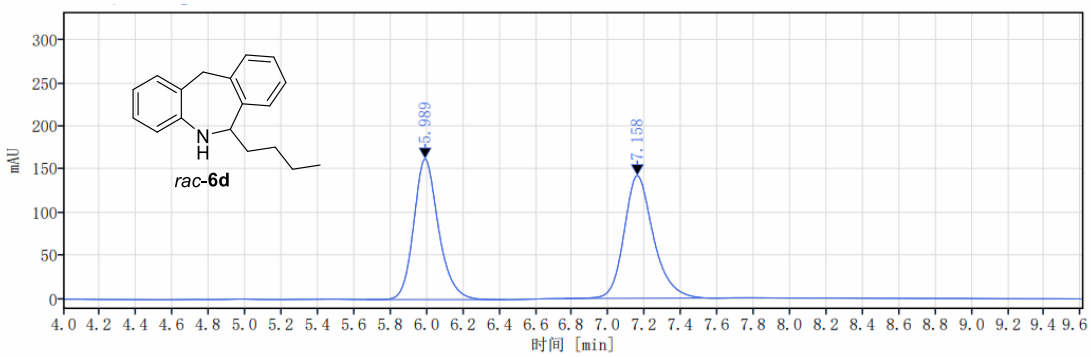
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
6.554	BB	0.64	946.60	94.36	49.19
7.882	MM m	0.95	977.67	81.23	50.81
		总和	1924.27		



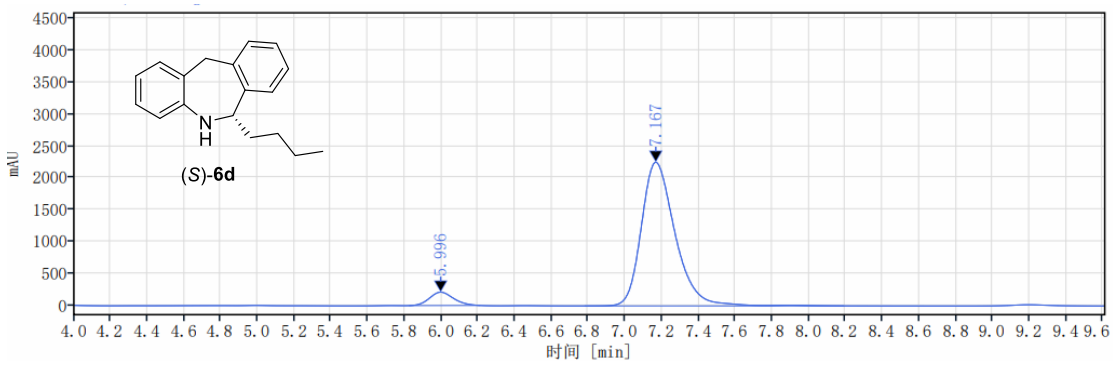
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
6.557	MM m	0.48	1167.79	119.44	5.16
7.884	MM m	1.09	21443.56	1635.35	94.84
		总和	22611.35		



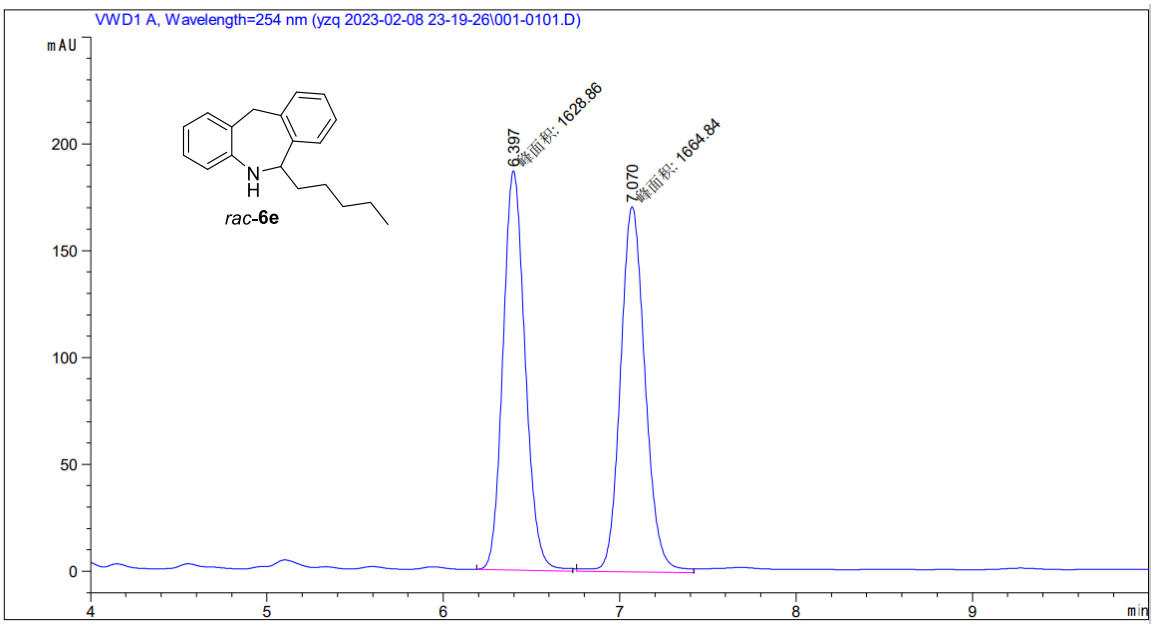
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
5.989	MM m	0.77	1551.51	163.24	49.33
7.158	MM m	0.95	1593.52	142.19	50.67
		总和	3145.04		

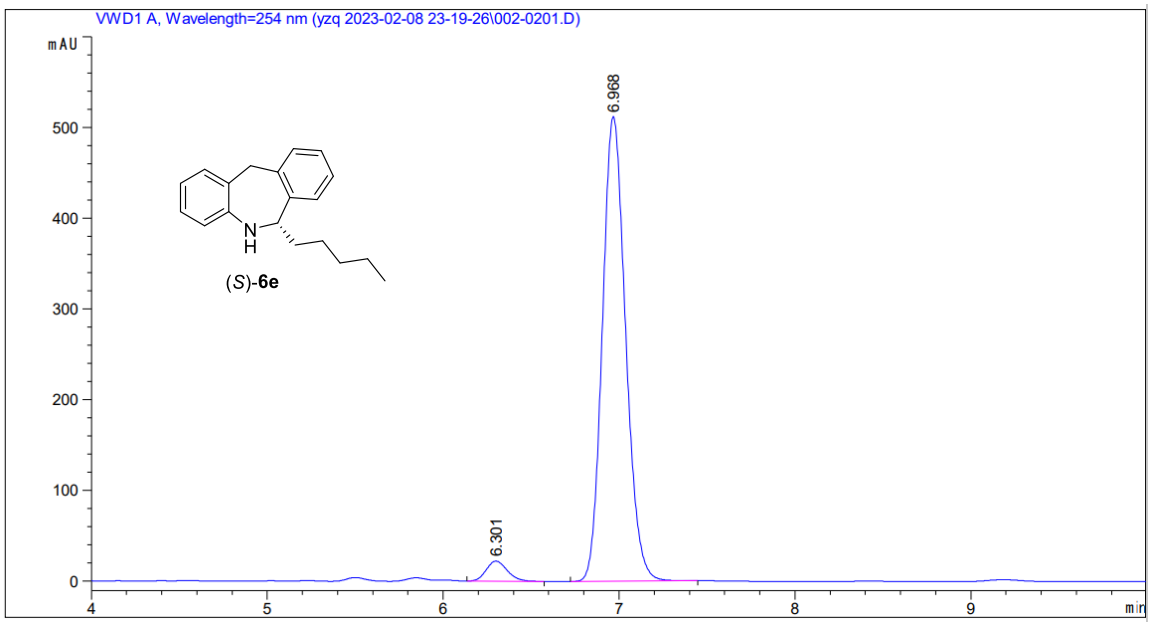


信号: VWD1A,Wavelength=220 nm

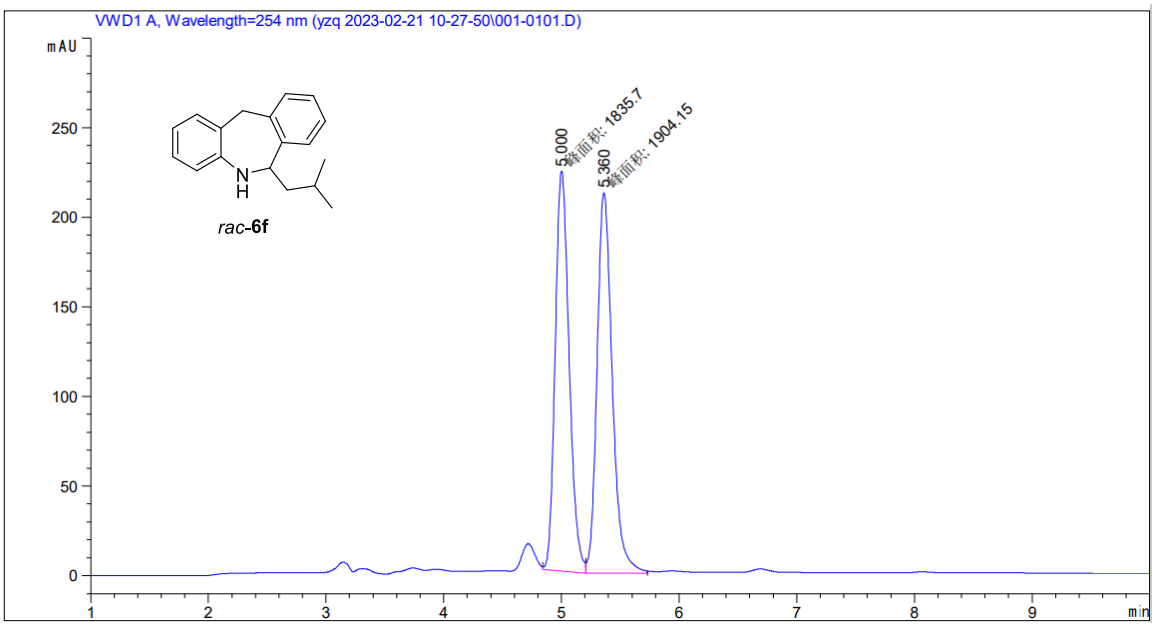
保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
5.996	MM m	0.39	1903.51	209.31	6.22
7.167	MM m	1.41	28676.92	2247.64	93.78
		总和	30580.43		



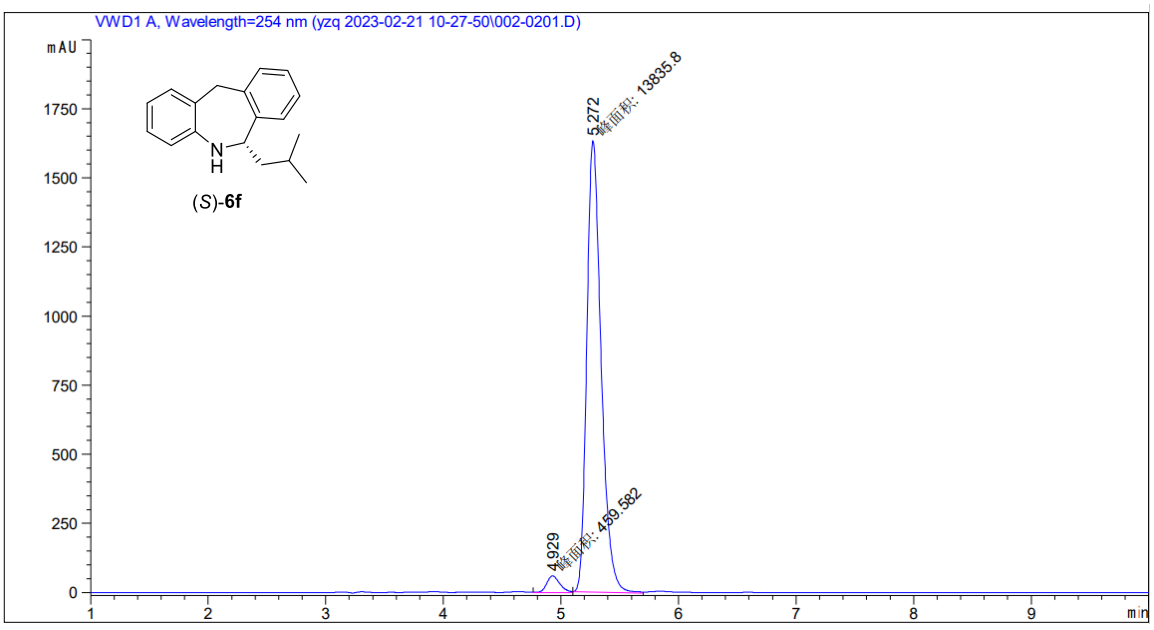
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.397	MM	0.1453	1628.86328	186.80881	49.4538
2	7.070	MM	0.1623	1664.84094	170.94958	50.5462



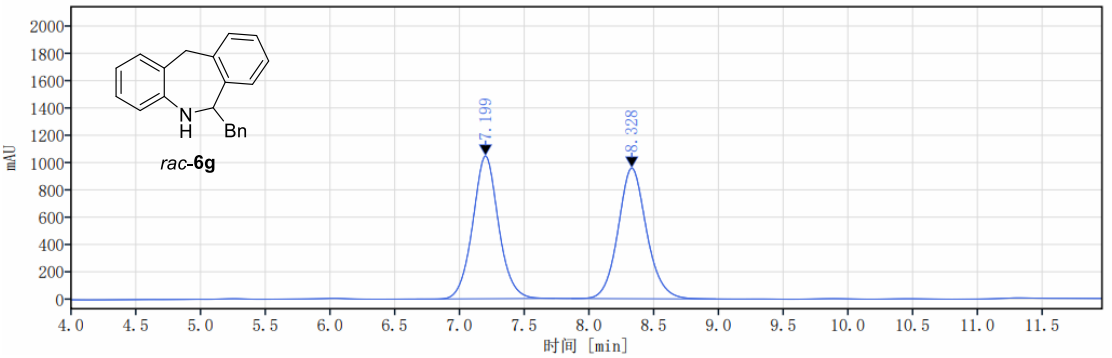
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.301	BB	0.1279	184.13351	22.16995	3.7789
2	6.968	BB	0.1418	4688.52637	511.98151	96.2211



峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	5.000	MM	0.1371	1835.70276	223.13763	49.0849
2	5.360	MM	0.1495	1904.15332	212.34982	50.9151

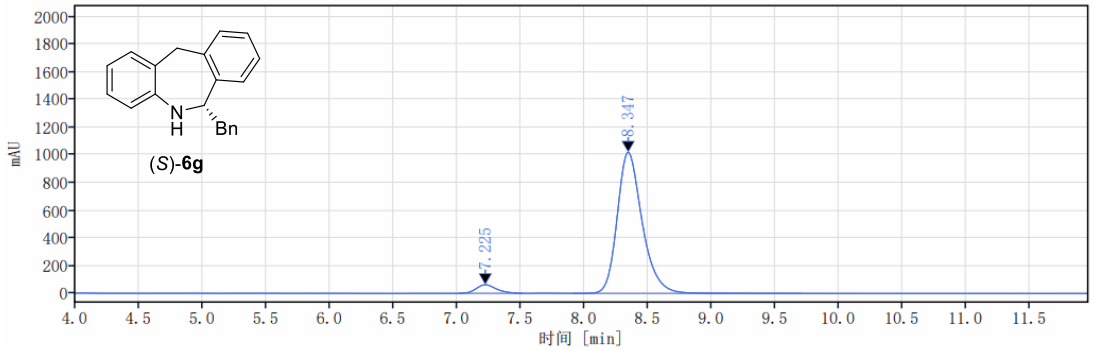


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	4.929	MM	0.1278	459.58212	59.93166	3.2149
2	5.272	MM	0.1412	1.38358e4	1633.07397	96.7851



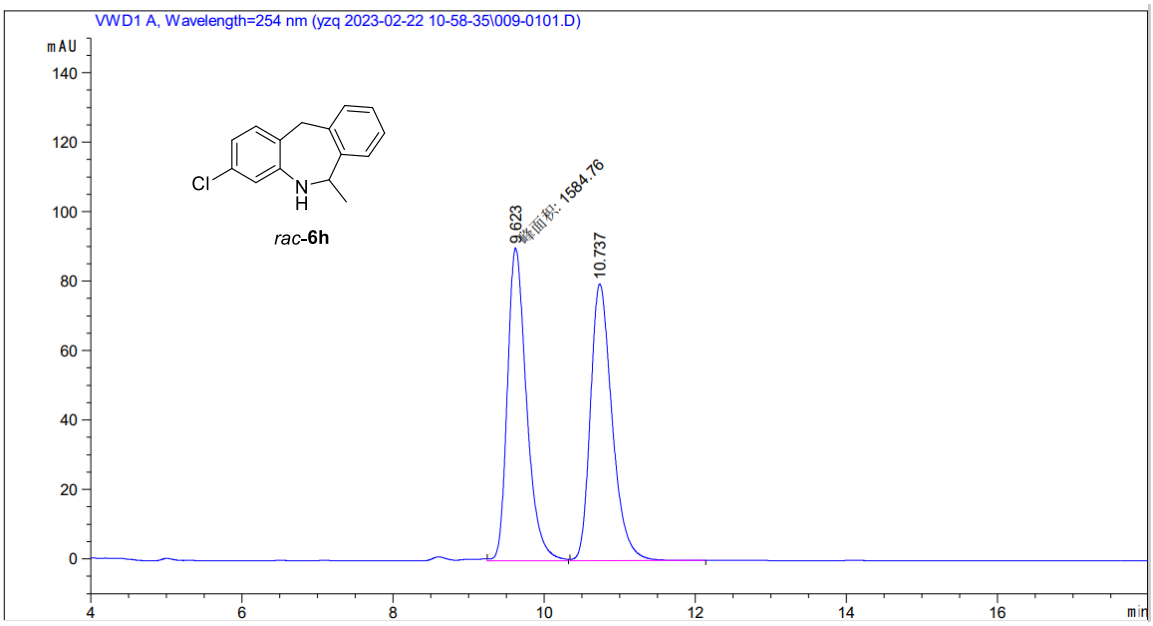
信号: VWD1A,Wavelength=220 nm

保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
7.199	MM m	1.07	14528.85	1046.43	49.77
8.328	MM m	1.12	14664.29	957.81	50.23
		总和	**29193.14**		

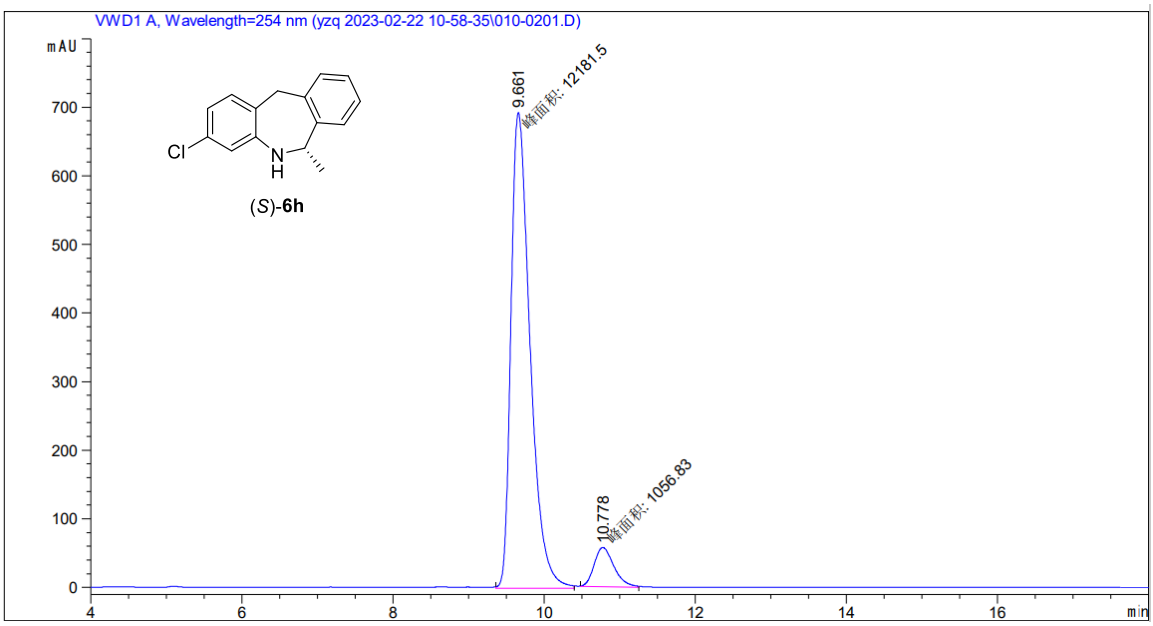


信号: VWD1A,Wavelength=220 nm

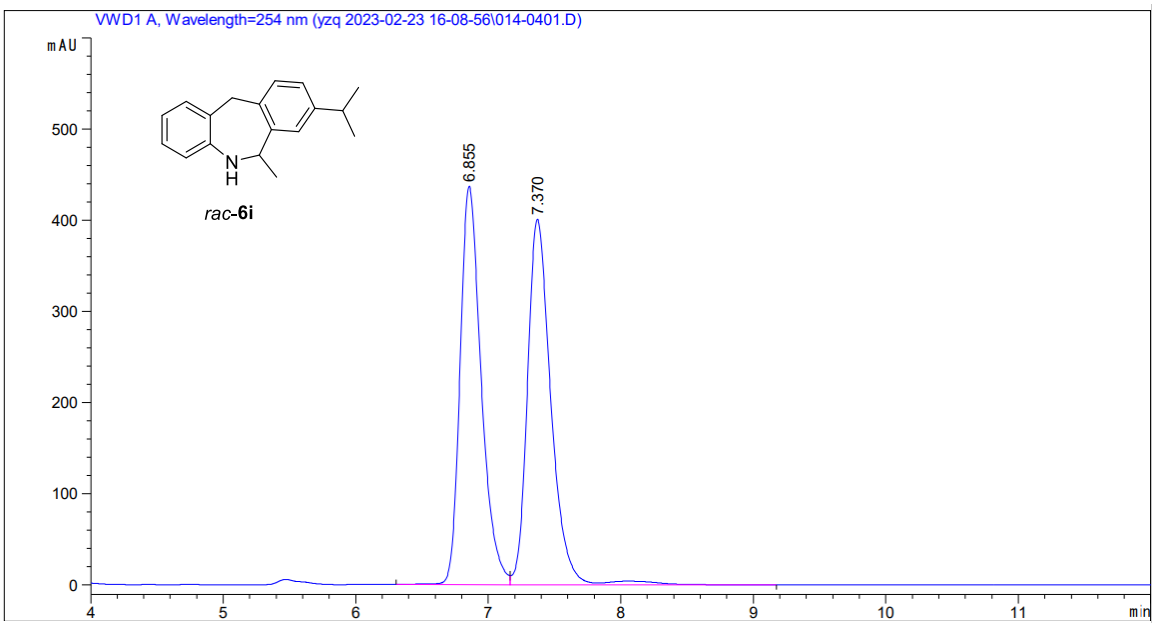
保留时间 [min]	类型	峰宽 [min]	峰面积	峰高	峰面积%
7.225	MM m	0.51	689.75	62.38	4.72
8.347	MM m	1.80	13930.67	1021.18	95.28
		总和	**14620.42**		



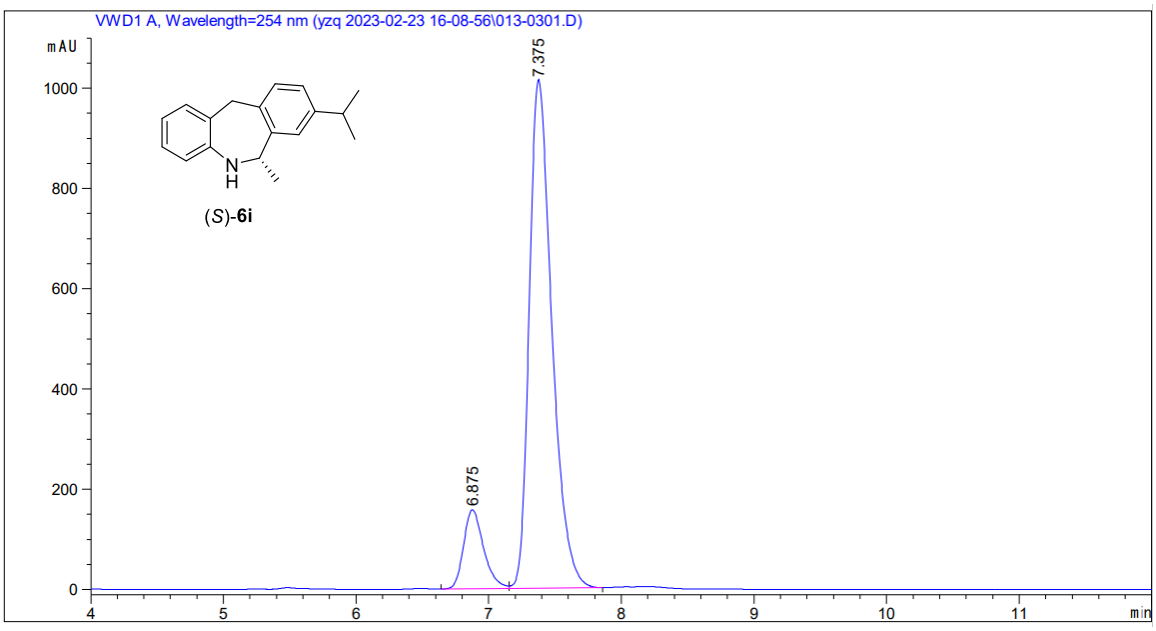
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	9.623	MM	0.2936	1584.75745	89.95203	49.9335
2	10.737	VB	0.3056	1588.97620	79.70918	50.0665



峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	9.661	MM	0.2926	1.21815e4	693.95624	92.0169
2	10.778	MM	0.3065	1056.82703	57.46886	7.9831



峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.855	BV	0.1683	4839.42090	436.70612	49.3037
2	7.370	VV R	0.1857	4976.10547	400.64288	50.6963



峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	6.875	BV	0.1596	1655.15869	157.55090	12.1165
2	7.375	VB	0.1801	1.20052e4	1014.30573	87.8835