

Supporting Information

Organaluminum Hydrides Catalyzed Hydroboration of Carbonates, Esters, Carboxylic Acids, and Carbon Dioxide

Ben Yan,[†] Sayan Dutta,[§] Xiaoli Ma,^{*,†} Congjian Ni,[†] Debasis Koley,^{*,§} Zhi Yang,^{*,†} and
Herbert W. Roesky^{*,‡}

[†]School of Chemistry and Chemical Engineering, Beijing Institute of Technology,
Beijing 100081, P. R. China

[§]Department of Chemical Sciences, Indian Institute of Science Education and Research
(IISER) Kolkata, Mohanpur 741 246, India

[‡]Institut für Anorganische Chemie, Georg-August-Universität Göttingen 37077,
Germany

Table of Contents

General Information.....	2
Method for preparation of LAIH2:	2
Method for preparation of L'AlH2:.....	2
Table S1. Optimization of Al-Catalyzed Hydroboration of Ethylacetate ^a	2
Table S2. Optimization of Al-Catalyzed Hydroboration of Benzoic Acid ^a	3
General Procedure for Hydroboration of Carbonates.	4
General Procedure for Hydroboration of Esters.	6
General Procedure for Hydroboration of carboxylic acids.	9
General Procedure for Hydroboration of CO ₂	12
Mechanism Experiment	13
¹ H, ¹³ C and ¹¹ B NMR Spectra of Hydroboration Products of Carbonates.....	14
¹ H, ¹³ C and ¹¹ B NMR Spectra of Hydroboration Products of Esters.....	37
¹ H, ¹³ C and ¹¹ B NMR Spectra of Hydroboration Products of Carboxylic Acids.	60
¹ H, ¹³ C and ¹¹ B NMR Spectra of Hydroboration Products of CO ₂	87
References.....	171

General Information.

All operations during the experiment were performed in a pure N₂ atmosphere using Schlenk technics or inside a Mbraun MB 150-GI glove box. Commercially available chemicals were purchased from J&K chemical reagents company or Aldrich reagents company, and stored and used according to the instructions. The NMR spectra were provided using the Bruker Ascend II 400 spectrometer.

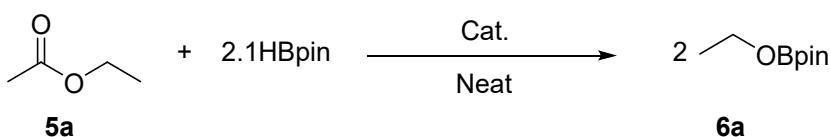
Method for preparation of LAlH₂:

LH (L = HC(CMeNAr)₂, Ar = 2,6 - iPr₂C₆H₃) (0.418g, 1 mmol) in toluene (10 mL) was added under cooling with an ice bath to a solution of AlH₃·NMe₃ (0.089 g, 1 mmol) in toluene (2 mL) under nitrogen atmosphere, and the reaction mixture was stirred for additional 24 h, concentrated to 5 mL and stored overnight at -30 °C. The crude product was crystallized from toluene to afford colorless crystals of **1** and dried in vacuo.

Method for preparation of L'AlH₂:

A solution of LH (L' = HC(CMeNAr)₂, Ar = 2,6 - Et₂C₆H₃) (0.362g, 1 mmol) in toluene (10 mL) was added under cooling with an ice bath to a solution of AlH₃·NMe₃ (0.089 g, 1 mmol) in toluene (2 mL) under nitrogen atmosphere, and the reaction mixture was stirred for additional 24 h, concentrated to 5 mL and stored overnight at -30 °C. The crude product was crystallized from toluene to afford colorless crystals of **2** and dried in vacuo.^[S1]

Table S1. Optimization of Al-Catalyzed Hydroboration of Ethylacetate^a

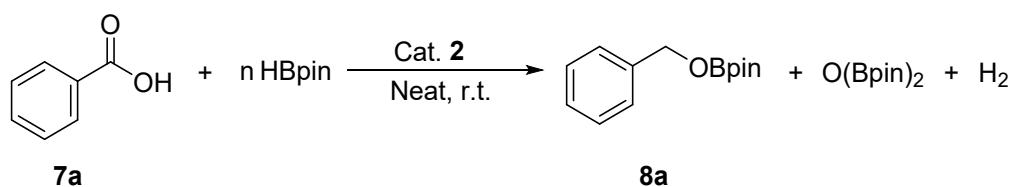


Entry	Cat. 2(mol %)	T (°C)	t (h)	Yield (%) ^b
-------	---------------	--------	-------	------------------------

1	-	23	8	0
2	-	60	8	0
3	5	23	8	21
4	5	40	8	35
5	5	60	8	55
6	5	60	10	83
7	5	60	12	99

^aEthylacetate (**5a**) (1 mmol), HBpin (2.1 equiv), **2** (5 mol %). ^bThe reaction was monitored by ¹H NMR spectroscopy.

Table S2. Optimization of Al-Catalyzed Hydroboration of Benzoic Acid^a



Entry	n	Cat. 2 (mol %)	t (h)	Yield (%) ^b
1	3.1	2	1	57
2	3.3	2	1	63
3	3.1	2	2	91
4	3.3	2	2	99
5	3.3	1	2	78
6	3.3	-	1	17
7	3.3	-	2	36

^aReaction conditions: benzoic acid (**7a**) (1 mmol) and HBpin (3.3 mmol, 3.3 equiv). ^bThe reaction was monitored by ¹H NMR spectroscopy with mesitylene as an internal standard.

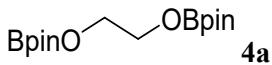
In the NMR spectra we used the following marks:

- * - MeOBPin: **¹H NMR** (400 MHz, CDCl₃) δ: 3.32 (s, 3H), 1.18 (s, 12H). **¹³C NMR** (101 MHz, CDCl₃) δ: 81.72, 51.54, 23.59.
- - EtOBPin: **¹H NMR** (400 MHz, CDCl₃) δ 3.89 (q, *J* = 7.1 Hz, 2H). 1.18 (t, *J* = 6.6Hz, 12H), 1.13 (s, 3H). **¹³C NMR** (101 MHz, CDCl₃): δ 81.54, 59.60, 23.58, 16.18.
- ▼ - Mesitylene: **¹H NMR** (400 MHz, CDCl₃) δ: 6.65 (s, 3H), 2.13 (s, 9H). **¹³C NMR**

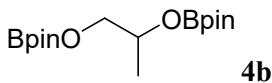
(101 MHz, CDCl₃): 136.82, 125.88, 21.13.

General Procedure for Hydroboration of Carbonates.

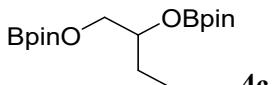
Carbonate (1.0 mmol), HBpin (3.1 mmol) and catalyst **2** (5 mol%) were placed in a 10 ml Schlenk flask equipped with a magnetic stir bar inside the glove box. The reaction mixture was stirred for 10 h at 100 °C, and then subjected to NMR analysis. The progress of the reaction was monitored by ¹H NMR, ¹³C NMR, and ¹¹B NMR spectra, respectively which indicated the progress of the reaction by the disappearance of the carbonate proton and appearance of new products and CH₃OBpin and there is no need to separate the products.



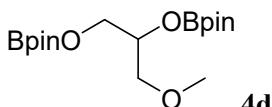
¹H NMR (400 MHz, CDCl₃): δ 3.86 (s, 4H, OCH₂), 1.18 (s, 24H, BOCMe₂). ¹³C {1H} NMR (101 MHz, CDCl₃): δ 81.74, 64.03, 51.58. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.43.



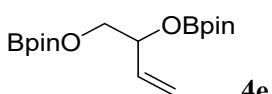
¹H NMR (400 MHz, CDCl₃): δ 4.22-4.18 (q, *J* = 6.0 Hz, 1H, CH), 3.67 (d, *J* = 5.7 Hz, 2H, OCH₂), 1.17 (s, 24H, BOCMe₂), 1.09 (d, *J* = 6.3 Hz, 3H, Me). ¹³C {1H} NMR (101 MHz, CDCl₃): δ 81.68, 81.55, 69.33, 68.13, 23.60, 23.54, 17.47. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.24.



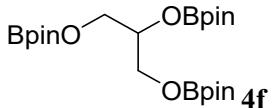
¹H NMR (400 MHz, CDCl₃): δ 4.10-4.04 (m, 1H, CH), 3.78 (dd, *J* = 14.0, 5.6 Hz, 2H, OCH₂), 1.56-1.44 (m, 2H, CH₂), 1.26 (s, 24H, BOCMe₂), 0.92 (t, *J* = 7.5 Hz, 3H, Me). ¹³C {1H} NMR (101 MHz, CDCl₃): δ 82.77, 82.55, 75.39, 67.72, 25.28, 24.62, 24.56, 9.48. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.24.



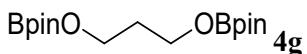
¹H NMR (400 MHz, CDCl₃): δ 4.31 (s, 1H, CH), 3.95-3.82 (m, 2H, OCH₂), 3.49-3.44 (m, 2H, CH₂), 3.36 (d, *J* = 11.1 Hz, CH₃), 1.26 (s, 24H, BOCMe₂). ¹³C {1H} NMR (101 MHz, CDCl₃): δ 82.71, 82.66, 72.81, 65.42, 59.02, 52.49, 24.55, 24.48. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.31.



¹H NMR (400 MHz, CDCl₃): δ 5.78-5.69 (m, 1H, CH=CH₂), 5.28-5.24 (m, 1H, CH=CH₂), 5.09-5.07 (m, 1H, CH=CH₂), 4.45 (q, *J* = 4.1 Hz, 1H, CH), 3.51 (d, 2H, OCH₂), 1.17 (s, 24H, BOCMe₂). ¹³C {1H} NMR (101 MHz, CDCl₃): δ 134.44, 115.37, 81.70, 81.68, 73.85, 66.84, 23.61, 23.55. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.19.



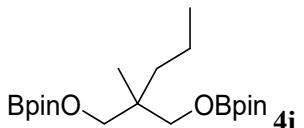
¹H NMR (400 MHz, CDCl₃): δ 4.18 (d, *J* = 4.6 Hz, 1H, CH), 3.83 (d, *J* = 4.5 Hz, 2H, OCH₂), 3.75 (d, *J* = 6.3 Hz, 2H, CH₂), 1.17 (s, 36H, BOCMe₂). ¹³C {1H} NMR (101 MHz, CDCl₃): δ 82.73, 82.69, 73.62, 65.06, 24.54, 24.52. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.37.



¹H NMR (400 MHz, CDCl₃): δ 3.93 (m, 4H, OCH₂), 1.85-1.84 (m, 2H, CH₂), 1.25 (s, 24H, BOCMe₂). ¹³C {1H} NMR (101 MHz, CDCl₃): δ 82.66, 82.58, 61.46, 33.23, 24.54. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.20.



¹H NMR (400 MHz, CDCl₃): δ 3.56 (s, 4H, OCH₂), 1.17 (s, 24H, BOCMe₂), 0.80 (s, 6H, Me). ¹³C {1H} NMR (101 MHz, CDCl₃): δ 81.74, 81.59, 69.28, 35.65, 23.60, 19.82. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.37.



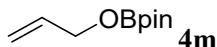
¹H NMR (400 MHz, CDCl₃): δ 3.66 (d, *J* = 4.0 Hz, 4H, OCH₂), 1.27 (s, 4H, CH₂), 1.26-1.24 (24H, BOCMe₂, CH₂), 0.88 (d, *J* = 6.3 Hz, 3H, CH₂Me), 0.83 (s, 3H, CMe). ¹³C {1H} NMR (101 MHz, CDCl₃): δ 81.73, 81.56, 68.78, 38.05, 34.97, 23.59, 17.28, 15.38, 13.90. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.24.



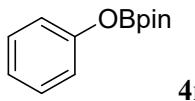
¹H NMR (400 MHz, CDCl₃): δ 3.52 (s, 3H, Me), 1.18 (s, 12H, BOCMe₂). {1H} NMR (101 MHz, CDCl₃): δ 81.72, 51.54, 23.59. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.22.



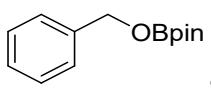
¹H NMR (400 MHz, CDCl₃): δ 3.82 (q, *J* = 7.0 Hz, 2H, OCH₂), 1.17 (s, 12H, BOCMe₂), 1.16 (t, *J* = 7.0 Hz, 3H, Me). {1H} NMR (101 MHz, CDCl₃): δ 81.72, 81.55, 59.50, 23.57, 16.18. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.11.



¹H NMR (400 MHz, CDCl₃): δ 5.82 (d, *J* = 10.5 Hz, 1H, CH=CH₂), 5.20 (d, *J* = 18.9 Hz, 2H, CH=CH₂), 5.04 (d, *J* = 12.0 Hz, 2H, CH₂), 4.29 (d, *J* = 4.8 Hz, 3H, OCH₃), 1.18 (s, 24H, BOCMe₂). {1H} NMR (101 MHz, CDCl₃): δ 135.35, 114.91, 82.76, 65.46, 24.56, 24.53. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.32.



¹H NMR (400 MHz, CDCl₃): δ 7.18-7.14 (m, 2H, Ar-H), 7.00-6.91 (m, 3H, Ar-H), 1.15 (s, 12H, BOCMe₂). {1H} NMR (101 MHz, CDCl₃): δ 152.44, 128.23, 122.00, 118.46, 82.41, 81.67, 23.56. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.25.



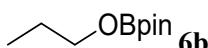
¹H NMR (400 MHz, CDCl₃): δ 7.29-7.17 (m, 5H, Ar-H), 4.84 (s, 2H, OCH₂), 1.17 (s, 12H, BOCMe₂). {1H} NMR (101 MHz, CDCl₃): δ 138.20, 127.24, 126.33, 126.68, 81.91, 65.63, 23.58. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.35.

General Procedure for Hydroboration of Esters.

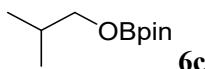
Ester (1.0 mmol), HBpin (2.1 mmol) and catalyst **2** (5 mol%) were placed in a 10 ml Schlenk flask equipped with a magnetic stir bar inside the glove box. The reaction mixture was stirred for 12 h at 60 °C. The progress of the reaction was monitored by ¹H NMR, ¹³C NMR, and ¹¹B NMR, which indicated the completion of the reaction by the disappearance of the ester proton and appearance of new products and there is no need to separate the products.



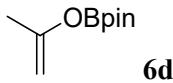
¹H NMR (400 MHz, CDCl₃): δ 3.89 (q, *J* = 7.1 Hz, 2H, BOCMe₂), 1.18 (t, *J* = 6.6 Hz, 12H, BOCMe₂), 1.13 (s, 3H, MeCH₂OBpin). ¹³C NMR (101 MHz, CDCl₃): δ 81.54, 59.60, 23.58, 16.18. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.13.



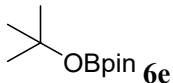
¹H NMR (400 MHz, CDCl₃): δ 3.76-3.67 (m, 2H, MeCH₂CH₂), 1.52 (q, *J* = 7.4 Hz, 2H, MeCH₂CH₂), 1.19-1.16 (m, 12H, BOCMe₂), 0.84 (t, 3H, *J* = 8 Hz, MeCH₂CH₂). ¹³C NMR (101 MHz, CDCl₃): δ 81.56, 65.54, 23.65, 23.57, 9.07. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.24.



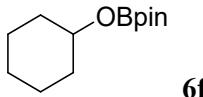
¹H NMR (400 MHz, CDCl₃): δ 3.54 (d, *J* = 6.5 Hz, 2H, CH₂OBpin), 1.74 (s, 1H, CHMe₂), 1.18 (s, 12H, BOCMe₂), 0.82 (d, *J* = 6.8 Hz, 6H, CHMe₂). ¹³C NMR (101 MHz, CDCl₃) δ 81.56, 70.35, 28.80, 23.56, 17.73. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.05.



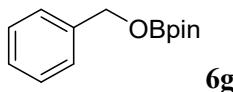
¹H NMR (400 MHz, CDCl₃): δ 4.89 (s, 1H, C=CH₂), 4.75 (s, 1H, C=CH₂), 4.17 (s, 2H, CH₂OBpin), 1.64 (s, 3H, MeC=CH₂), 1.18 (s, 12H, BOCMe₂). ¹³C NMR (101 MHz, CDCl₃) δ 141.63, 109.00, 81.74, 67.24, 23.56. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.21.



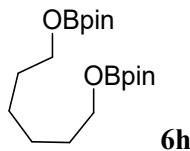
¹H NMR (400 MHz, CDCl₃): δ 1.26 (s, 9H, (CH₃)₃COBpin), 1.18 (s, 12H, BOCMe₂). ¹³C NMR (101 MHz, CDCl₃) δ 81.54, 80.95, 72.81, 28.93, 23.51. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.29.



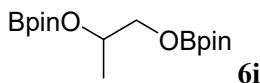
¹H NMR (400 MHz, CDCl₃): δ 3.92 (dt, *J* = 9.0, 4.7 Hz, 1H, CyOBpin), 1.84-1.71 (m, 2H, CyOBpin), 1.69-1.60 (m, 2H, CyOBpin), 1.49-1.38 (m, 2H, CyOBpin), 1.30 (dd, *J* = 19.9, 10.0 Hz, 4H, CyOBpin), 1.18 (s, 12H, BOCMe₂). ¹³C NMR (101 MHz, CDCl₃) δ 81.55, 81.38, 71.55, 33.23, 24.44, 23.58, 23.55, 22.78. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.01.



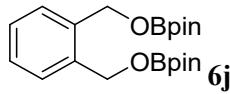
¹H NMR (400 MHz, CDCl₃): δ 7.25 (s, 3H, Ar-H), 7.17 (dd, *J* = 8.6, 4.3 Hz, 1H, Ar-H), 4.85 (s, 2H, OCH₂), 1.18 (d, *J* = 1.4 Hz, 12H, BOCMe₂). ¹³C NMR (101 MHz, CDCl₃) δ 138.22, 127.24, 126.32, 125.68, 81.87, 65.63, 23.51. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.42.



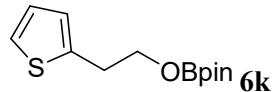
¹H NMR (400 MHz, CDCl₃): δ 3.81-3.69 (m, 4H, pinBOCH₂CH₂CH₂CH₂CH₂OBpin), 1.49 (s, 4H, pinBOCH₂CH₂CH₂CH₂CH₂OBpin), 1.29 (s, 4H pinBOCH₂CH₂CH₂CH₂CH₂OBpin), 1.24-1.11 (m, 24H, BOCMe₂). ¹³C NMR (101 MHz, CDCl₃) δ 82.53, 64.80, 31.38, 25.26, 24.56. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.03.



¹H NMR (400 MHz, CDCl₃): δ 4.21 (q, *J* = 6.0 Hz, 1H, MeCH), 3.67 (d, *J* = 5.7 Hz, 2H, CH₂OBpin), 1.21-1.16 (m, 24H, BOC*Me*₂), 1.10 (d, *J* = 6.4 Hz, 3H, *Me*CH). ¹³C NMR (101 MHz, CDCl₃) δ 82.52, 82.39, 70.19, 69.00, 24.52, 24.45, 18.34. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.36.

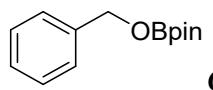


¹H NMR (400 MHz, CDCl₃): δ 7.37 (dd, *J* = 5.5, 3.5 Hz, 2H, Ar-*H*), 7.19 (dd, *J* = 5.7, 3.4 Hz, 2H, Ar-*H*), 4.91 (s, 4H, CH₂OBpin), 1.19 (d, *J* = 3.6 Hz, 24H, BOC*Me*₂). ¹³C NMR (101 MHz, CDCl₃) δ 136.42, 127.49, 127.22, 82.96, 64.09, 24.63. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.39.

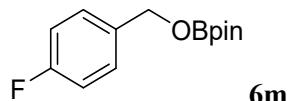


¹H NMR (400 MHz, CDCl₃): δ 6.84-6.79 (m, 1H, C₄H₃S), 6.77 (d, *J* = 2.7 Hz, 1H, C₄H₃S), 3.98 (t, *J* = 6.7 Hz, 1H, C₄H₃S), 3.81 (q, *J* = 7.0 Hz, 2H, CH₂CH₂OBpin), 3.00 (t, *J* = 6.7 Hz, 2H, CH₂CH₂OBpin), 1.17 (s, 12H, BOC*Me*₂). ¹³C NMR (101 MHz, CDCl₃) δ 139.48, 125.68, 124.38, 122.61, 81.70, 81.51, 64.36, 23.57, 23.54.

¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.06.

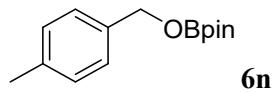


¹H NMR (400 MHz, CDCl₃): δ 7.24 (d, *J* = 6.9 Hz, 4H, Ar-*H*), 7.17 (d, *J* = 8.5 Hz, 1H, Ar-*H*), 4.83 (s, 2H, CH₂OBpin), 1.16 (d, *J* = 3.9 Hz, 12H, BOC*Me*₂). ¹³C NMR (101 MHz, CDCl₃) δ 138.22, 127.24, 126.32, 125.68, 81.87, 81.67, 65.63, 23.57, 23.51. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.30.

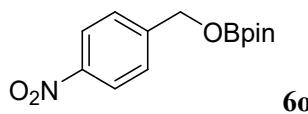


¹H NMR (400 MHz, CDCl₃): δ 7.36-7.11 (m, 2H, Ar-*H*), 6.92 (d, *J* = 17.1 Hz, 2H, Ar-*H*), 4.79 (s, 2H, CH₂OBpin), 1.17 (s, 12H, BOC*Me*₂). ¹³C NMR (101 MHz, CDCl₃) δ 162.40, 159.97, 133.99, 131.14, 127.65, 114.17, 81.98, 81.72, 65.02, 23.58.

¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.28.



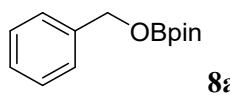
¹H NMR (400 MHz, CDCl₃): δ 7.13 (d, *J* = 7.9 Hz, 2H, Ar-*H*), 7.03 (d, *J* = 7.9 Hz, 2H, Ar-*H*), 4.78 (s, 2H, CH₂OBpin), 2.23 (s, 3H, Ar-CH₃), 1.15 (d, *J* = 2.7 Hz, 12H, BOC*Me*₂). ¹³C NMR (101 MHz, CDCl₃) δ 135.88, 135.26, 127.90, 125.82, 81.79, 81.66, 65.53, 23.57, 23.50, 20.06. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.42.



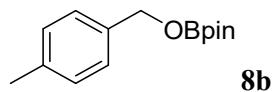
¹H NMR (400 MHz, CDCl₃): δ 8.11 (d, *J* = 8.8 Hz, 2H, Ar-*H*), 7.43 (d, *J* = 8.8 Hz, 2H, Ar-*H*), 4.95 (s, 2H, CH₂OBpin), 1.22-1.11 (m, 12H, BOCMe₂). ¹³C NMR (101 MHz, CDCl₃) δ 146.24, 129.70, 125.85, 122.56, 82.35, 81.73, 64.53, 23.58, 23.52. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.28.

General Procedure for Hydroboration of carboxylic acids.

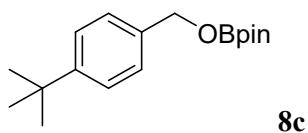
Carboxylic acid (1.0 mmol), HBpin (3.3 mmol), mesitylene (1.0 mmol) and catalyst **2** (2 mol%) were placed in a 10 ml Schlenk flask equipped with a magnetic stir bar inside the glove box. After the reaction was completed, the aliquot of the crude reaction mixture was analyzed by NMR spectroscopy and there is no need to separate the products.



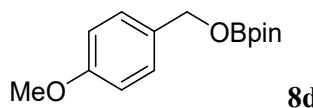
¹H NMR (400 MHz, CDCl₃): δ 7.24-7.13 (m, 5H, Ar-*H*), 4.83 (s, 2H, OCH₂), 1.16 (s, 36H, CH₃, OBpin & pinBOBPin). {1H} NMR (101 MHz, CDCl₃): δ 138.18, 127.24, 125.87, 125.70, 82.03, 81.97, 65.63, 23.52, 23.58. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.35.



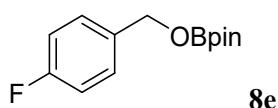
¹H NMR (400 MHz, CDCl₃): δ 7.15 (d, *J* = 7.7 Hz, 2H, Ar-*H*), 7.05 (d, *J* = 7.8 Hz, 2H, Ar-*H*), 4.80 (s, 2H, OCH₂), 2.25 (s, 3H, CH₃), 1.18 (s, 36H, CH₃, OBpin & pinBOBPin). {1H} NMR (101 MHz, CDCl₃): δ 136.69, 136.29, 128.97, 126.93, 83.27, 82.90, 66.61, 24.57, 23.58, 21.15. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 22.31.



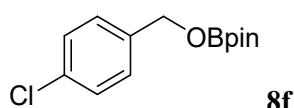
¹H NMR (400 MHz, CDCl₃): δ 7.26 (d, *J* = 8.3 Hz, 2H, Ar-*H*), 7.19 (d, *J* = 8.2 Hz, 2H, Ar-*H*), 4.81 (s, 2H, OCH₂), 1.22 (s, 9H, C(CH₃)₃), 1.15 (s, 36H, OBpin & pinBOBPin). ¹³C NMR (101 MHz, CDCl₃) δ 149.23, 135.26, 125.87, 124.14, 82.00, 81.81, 65.47, 33.44, 30.33, 23.58, 23.51. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 21.14.



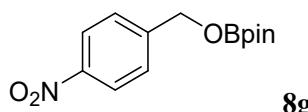
¹H NMR (400 MHz, CDCl₃): δ 7.14 (d, *J* = 8.5 Hz, 2H, Ar-*H*), 6.73 (d, *J* = 8.5 Hz, 2H, Ar-*H*), 4.72 (s, 2H, OCH₂), 3.63 (s, 3H, OCH₃), 1.12 (s, 36H, OBpin & pinBOBPin).
¹³C NMR (101 MHz, CDCl₃) δ 158.08, 130.42, 127.46, 112.63, 81.92, 81.71, 65.38, 54.02, 23.81, 23.55. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 21.23.



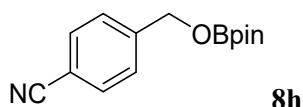
¹H NMR (400 MHz, CDCl₃): δ 7.23-7.15 (m, 2H, Ar-*H*), 6.88 (d, *J* = 8.7 Hz, 2H, Ar-*H*), 4.75 (s, 2H, OCH₂), 1.14 (s, 36H, CH₃, OBpin & pinBOBpin). ¹³C NMR (101 MHz, CDCl₃) δ 162.38, 159.95, 127.58, 114.14, 81.99, 81.93, 64.96, 23.51, 23.45. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 21.24.



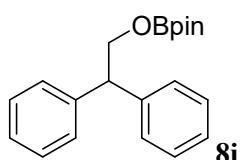
¹H NMR (400 MHz, CDCl₃): δ 7.20 (d, *J* = 1.9 Hz, 4H, Ar-*H*), 4.80 (s, 2H, OCH₂), 1.18 (s, 36H, CH₃, OBpin & pinBOBpin). ¹³C NMR (101 MHz, CDCl₃) δ 136.71, 132.08, 127.40, 127.07, 82.22, 82.04, 64.91, 23.86, 23.58. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 21.15.



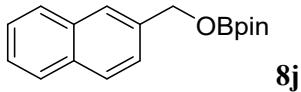
¹H NMR (400 MHz, CDCl₃): δ 8.11 (d, *J* = 8.6 Hz, 2H, Ar-*H*), 7.42 (d, *J* = 8.5 Hz, 2H, Ar-*H*), 4.94 (s, 2H, OCH₂), 1.19 (s, 36H, CH₃, OBpin & pinBOBpin). ¹³C NMR (101 MHz, CDCl₃) δ 147.27, 146.63, 126.91, 123.59, 83.37, 83.26, 65.56, 24.89, 24.55. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 21.12.



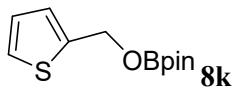
¹H NMR (400 MHz, CDCl₃): 8.11 (d, *J* = 8.6 Hz, 2H, Ar-*H*), 7.42 (d, *J* = 8.5 Hz, 2H, Ar-*H*), 4.94 (s, 2H, OCH₂), 1.19 (s, 36H, CH₃, OBpin & pinBOBpin). ¹³C NMR (101 MHz, CDCl₃) δ 147.27, 146.63, 126.91, 126.87, 123.59, 83.37, 83.08, 65.56, 24.89, 24.62. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 21.12.



¹H NMR (400 MHz, CDCl₃): δ 7.16 (d, *J* = 3.8 Hz, 8H, Ar-*H*), 7.09 (d, *J* = 4.7 Hz, 2H, Ar-*H*), 4.32 (d, *J* = 7.2 Hz, 2H, OCH₂), 4.14 (t, *J* = 7.1 Hz, 1H, CH), 1.17 (s, 24H, CH₃, CH₃, pinBOBpin), 1.05 (s, 12H, CH₃, OBpin). ¹³C NMR (101 MHz, CDCl₃) ¹³C NMR (101 MHz, CDCl₃) δ 140.70, 127.44, 127.32, 125.42, 82.01, 81.62, 66.76, 51.49, 23.85, 23.46. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 21.21.



¹H NMR (400 MHz, CDCl₃): δ 7.71 (d, *J* = 4.0 Hz, 4H, Ar-*H*), 7.42-7.25 (m, 3H, Ar-*H*), 4.99 (s, 2H, OCH₂), 1.19 (s, 36H, CH₃, OBpin & pinBOBpin). ¹³C NMR (101 MHz, CDCl₃) δ 135.68, 132.31, 131.80, 126.94, 126.85, 126.62, 124.97, 124.67, 124.10, 123.81, 82.19, 81.96, 65.70, 23.58, 23.50. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 21.20.



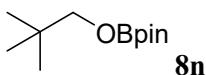
¹H NMR (400 MHz, CDCl₃): δ 7.16 (dd, *J* = 5.1, 1.0 Hz, 1H, Ar-*H*), 6.93 (d, *J* = 2.9 Hz, 1H, Ar-*H*), 6.86 (dd, *J* = 5.0, 3.5 Hz, 1H, Ar-*H*), 4.96 (s, 2H, OCH₂), 1.18 (s, 36H, CH₃, OBpin & pinBOBpin). ¹³C NMR (101 MHz, CDCl₃) δ 140.97, 125.88, 124.84, 124.47, 82.23, 82.08, 60.60, 23.86, 23.59. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 21.15.



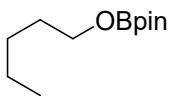
¹H NMR (400 MHz, CDCl₃): δ 3.51 (s, 3H, CH₃), 1.17 (s, 36H, CH₃, OBpin & pinBOBpin). ¹³C NMR (101 MHz, CDCl₃). ¹³C NMR (101 MHz, CDCl₃) δ 82.03, 81.70, 51.52, 23.57, 23.51. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 21.15.



¹H NMR (400 MHz, CDCl₃): δ 3.78 (q, *J* = 7.0 Hz, 2H, OCH₂), 1.13 (s, 36H, CH₃, OBpin & pinBOBpin), 1.09 (d, *J* = 7.0 Hz, 3H, CH₃). ¹³C NMR (101 MHz, CDCl₃) δ 81.87, 81.39, 59.46, 23.54, 23.49, 16.20. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 21.18.

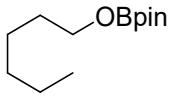


¹H NMR (400 MHz, CDCl₃): δ 3.44 (s, 2H, OCH₂), 1.18 (s, 36H, CH₃, OBpin & pinBOBpin), 0.82 (s, 9H, C(CH₃)₃). ¹³C NMR (101 MHz, CDCl₃) δ 82.23, 82.06, 73.89, 31.31, 24.98, 23.87, 23.53. ¹¹B {1H} NMR (128 MHz, CDCl₃): δ 21.14.

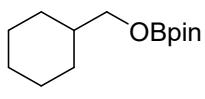


¹H NMR (400 MHz, CDCl₃): δ 3.71 (t, *J* = 6.5 Hz, 2H, OCH₂), 1.44 (s, 2H, CH₂), 1.29-1.19 (m,

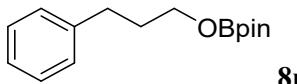
4H, CH_2), 1.18 (s, 36H, CH_3 , OBpin & pinBOBpin), 0.90-0.65 (m, 3H, CH_3). ^{13}C NMR (101 MHz, $CDCl_3$) δ 82.03, 81.78, 81.31, 63.72, 30.25, 26.86, 23.82, 23.53, 23.48, 21.40, 13.01. ^{11}B {1H} NMR (128 MHz, $CDCl_3$): δ 21.19.



1H NMR (400 MHz, $CDCl_3$): δ 3.71 (t, $J = 6.5$ Hz, 2H, OCH_2), 1.51-1.34 (m, 2H, CH_2), 1.30-1.18 (m, 6H, CH_2), 1.12 (s, 36H, CH_3 , OBpin & pinBOBpin), 0.79 (t, $J = 6.8$ Hz, 3H, CH_3). ^{13}C NMR (101 MHz, $CDCl_3$) δ 82.04, 81.81, 63.76, 30.58, 30.52, 24.36, 23.83, 23.53, 23.48, 21.67, 13.01. ^{11}B {1H} NMR (128 MHz, $CDCl_3$): δ 21.25.



1H NMR (400 MHz, $CDCl_3$): δ 3.71-3.44 (m, 2H, OCH_2), 1.70-1.27 (m, 8H, CH_2), 1.15 (s, 36H, CH_3 , OBpin & pinBOBpin), 1.10-0.89 (m, 2H, CH_2), 0.86-0.81 (m, 2H, CH_2). ^{13}C NMR (101 MHz, $CDCl_3$) δ 82.94, 82.44, 70.29, 39.35, 29.34, 26.55, 25.79, 24.85, 24.51. ^{11}B {1H} NMR (128 MHz, $CDCl_3$): δ 21.18.



1H NMR (400 MHz, $CDCl_3$): δ 7.16 (t, $J = 7.4$ Hz, 2H, Ar-H), 7.10-7.05 (m, 3H, Ar-H), 3.77 (t, $J = 6.3$ Hz, 2H, OCH_2), 2.65-2.49 (m, 2H, CH_2), 1.87-1.65 (m, 2H, CH_2), 1.14 (s, 36H, CH_3 , OBpin & pinBOBpin). ^{13}C NMR (101 MHz, $CDCl_3$) δ 140.79, 127.44, 127.28, 124.73, 81.97, 81.59, 63.07, 32.12, 30.85, 23.50. ^{11}B {1H} NMR (128 MHz, $CDCl_3$): δ 21.21.

General Procedure for Hydroboration of CO₂.

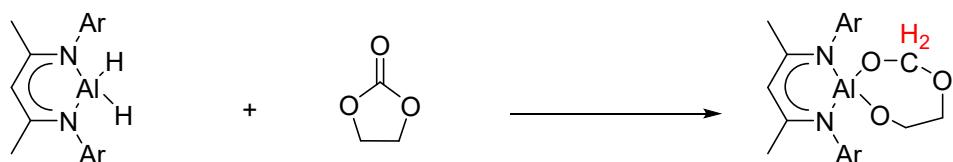
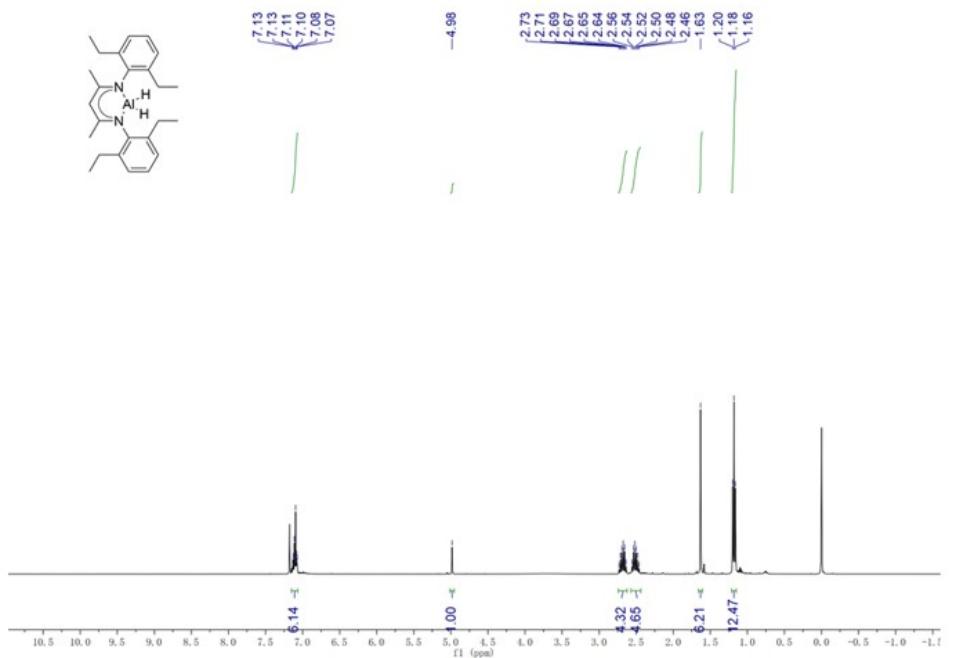
In a glove box, an oven-dried 10 ml Schlenk flask charged with mesitylene (0.50 mmol), HBpin (0.50 mmol) and catalyst **1** (10% mmol) was evacuated and refilled with CO₂ gas (1 atm) for three cycles. The resulting mixture was stirring at 100 °C for 48 h, and then subjected to NMR analysis.

Mechanism Experiment

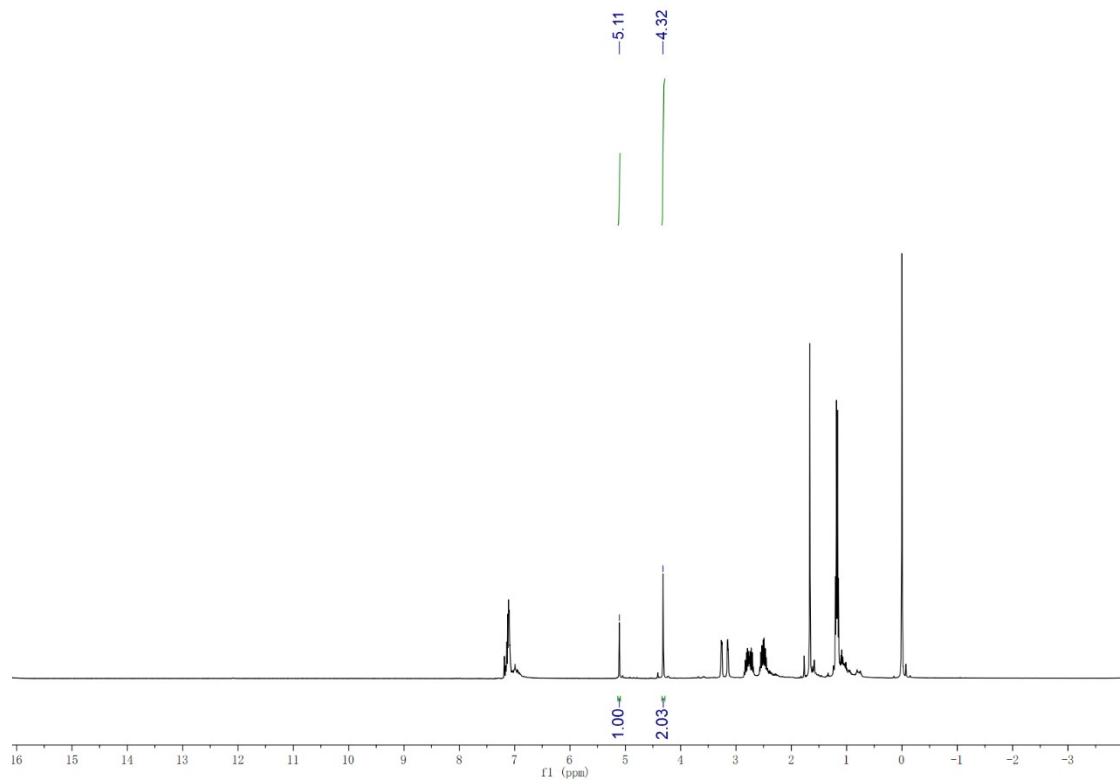
The stoichiometric reaction of **2** with ethylene carbonate (1:1) was performed at room temperature for 24 h under nitrogen atmosphere, solvent toluene was removed in vacuo resulting in a solid containing a mixture of products and then subjected to NMR

analysis.

Scheme S1. ^1H NMR (400 MHz, CDCl_3 , 298 K). Top spectrum, starting material of **2**, bottom spectrum of the crude product from the reaction of **2** with ethylene carbonate.



$\text{Ar} = 2,6\text{-Et}_2\text{C}_6\text{H}_3$



¹H, ¹³C and ¹¹B NMR Spectra of Hydroboration Products of Carbonates.

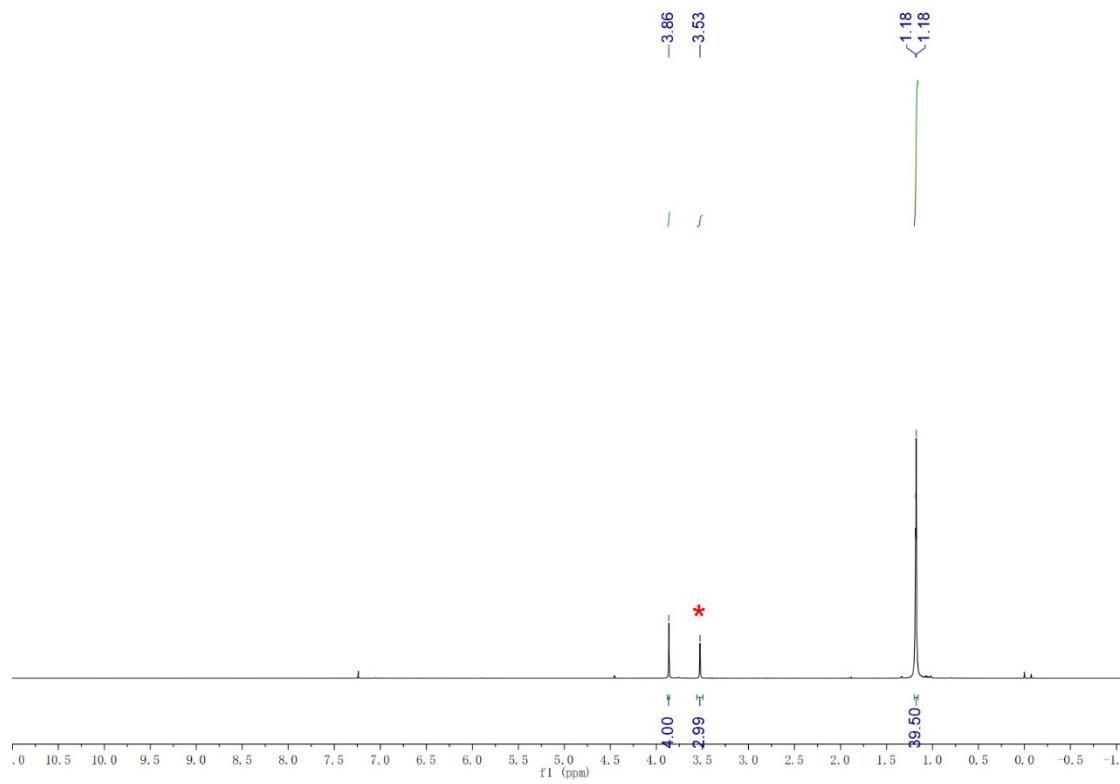


Figure S1.1.1 ^1H NMR spectrum of compound **4a** in CDCl_3

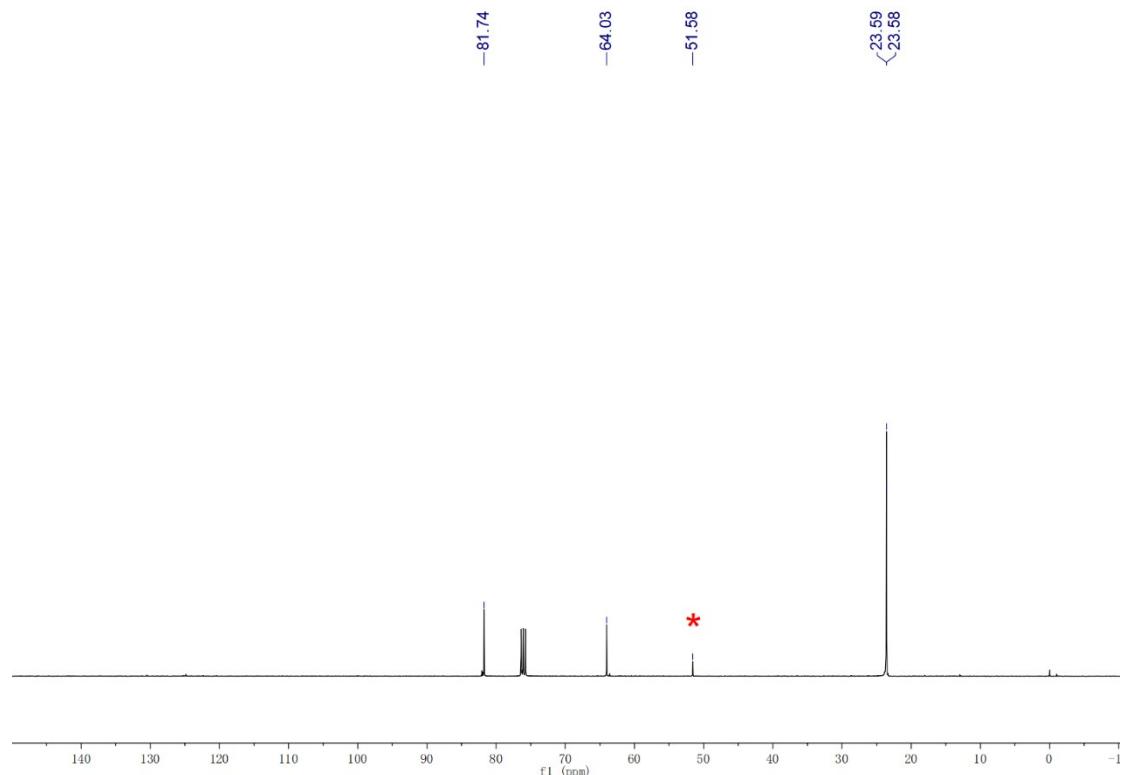


Figure S1.1.2 ^{13}C NMR spectrum of compound **4a** in CDCl_3

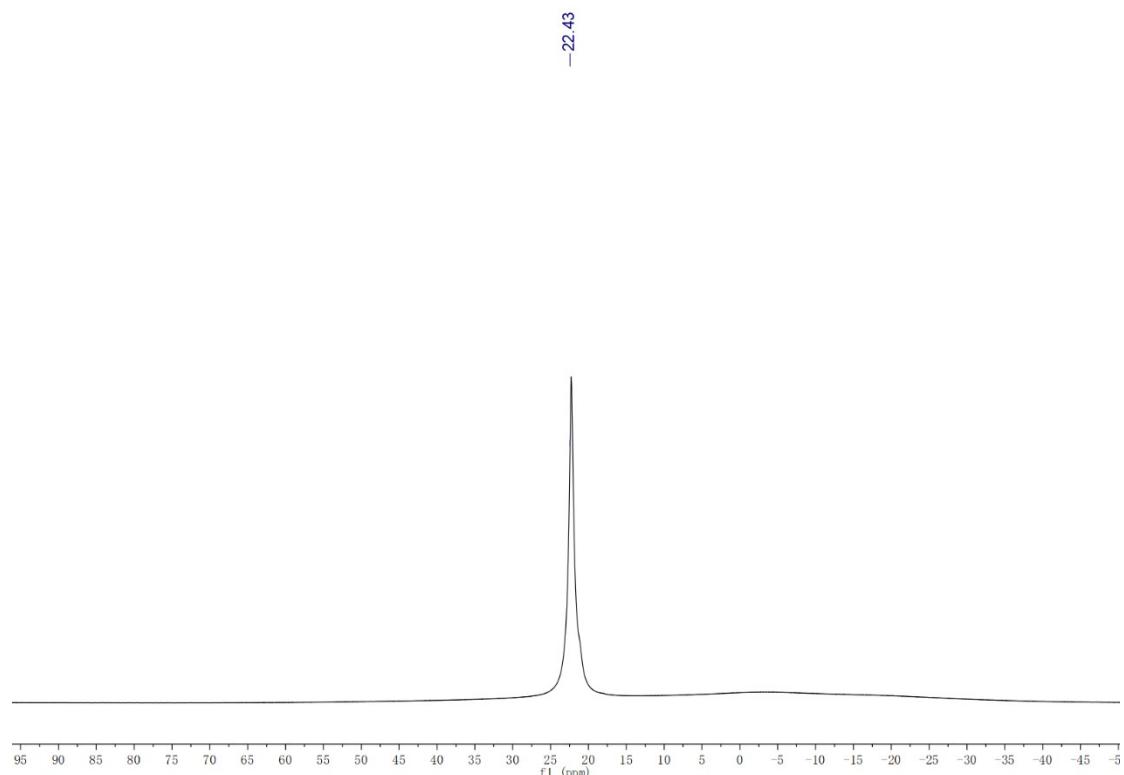


Figure S1.1.3 ^{11}B NMR spectrum of compound **4a** in CDCl_3

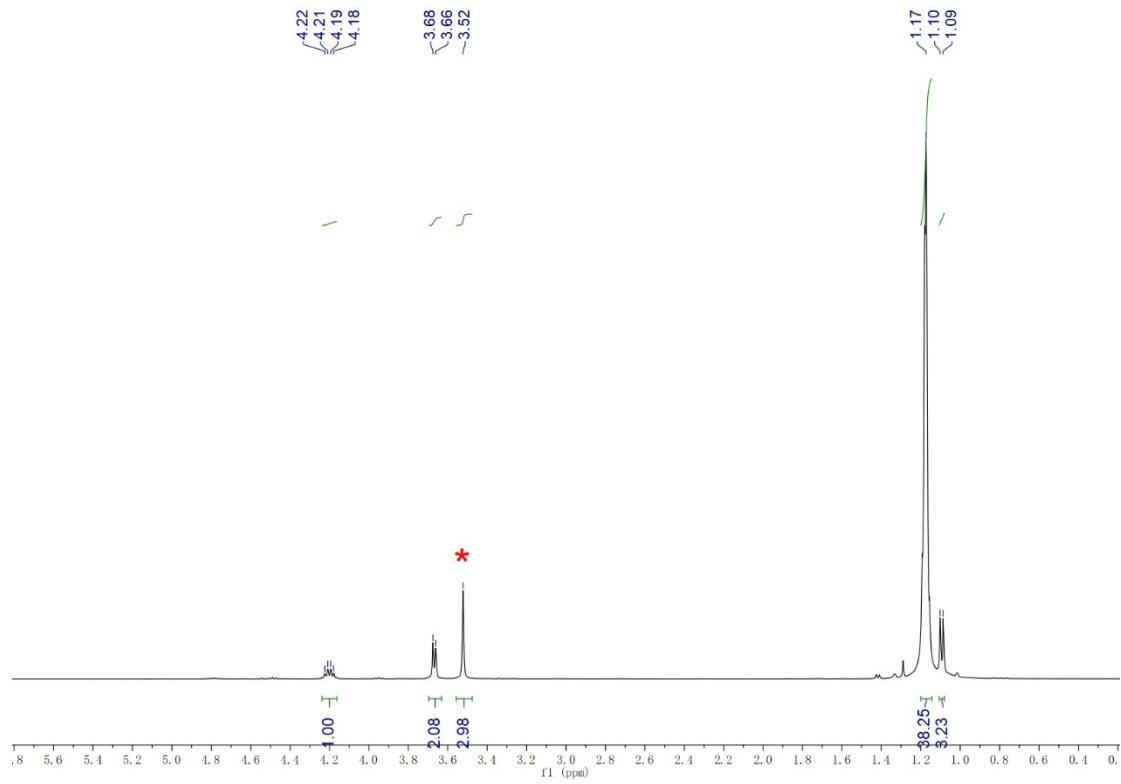


Figure S1.2.1 ^1H NMR spectrum of compound **4b** in CDCl_3

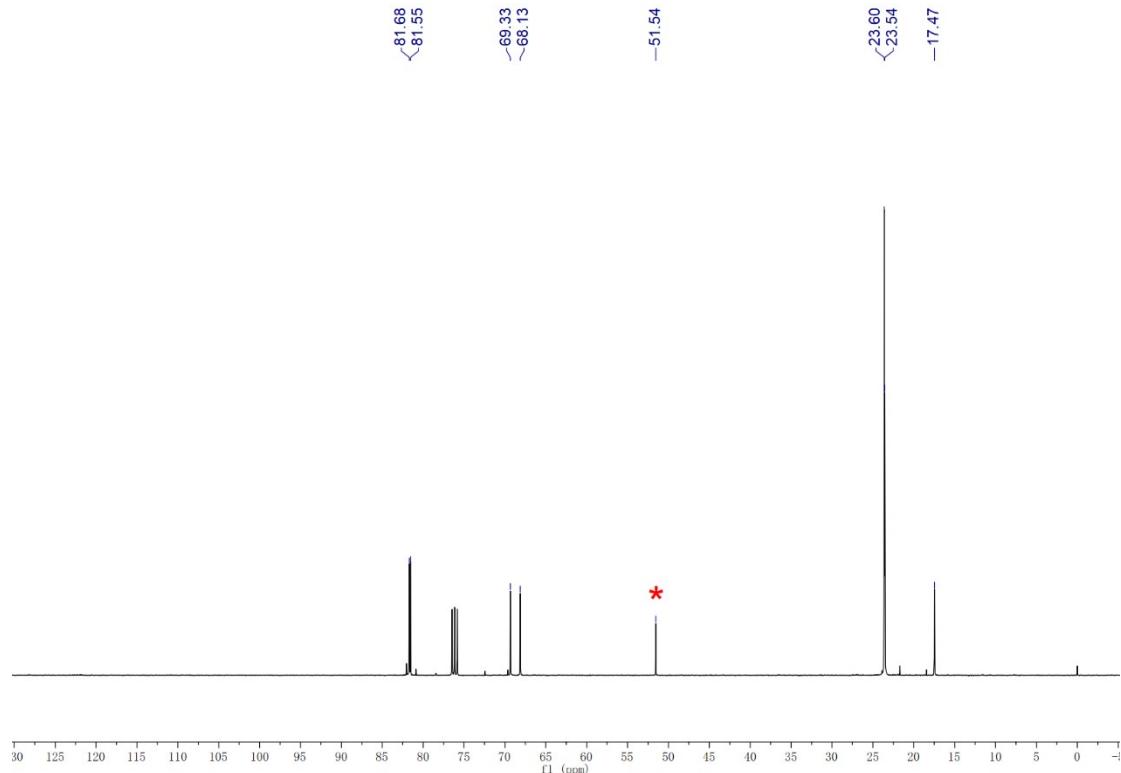


Figure S1.2.2 ^{13}C NMR spectrum of compound **4b** in CDCl_3

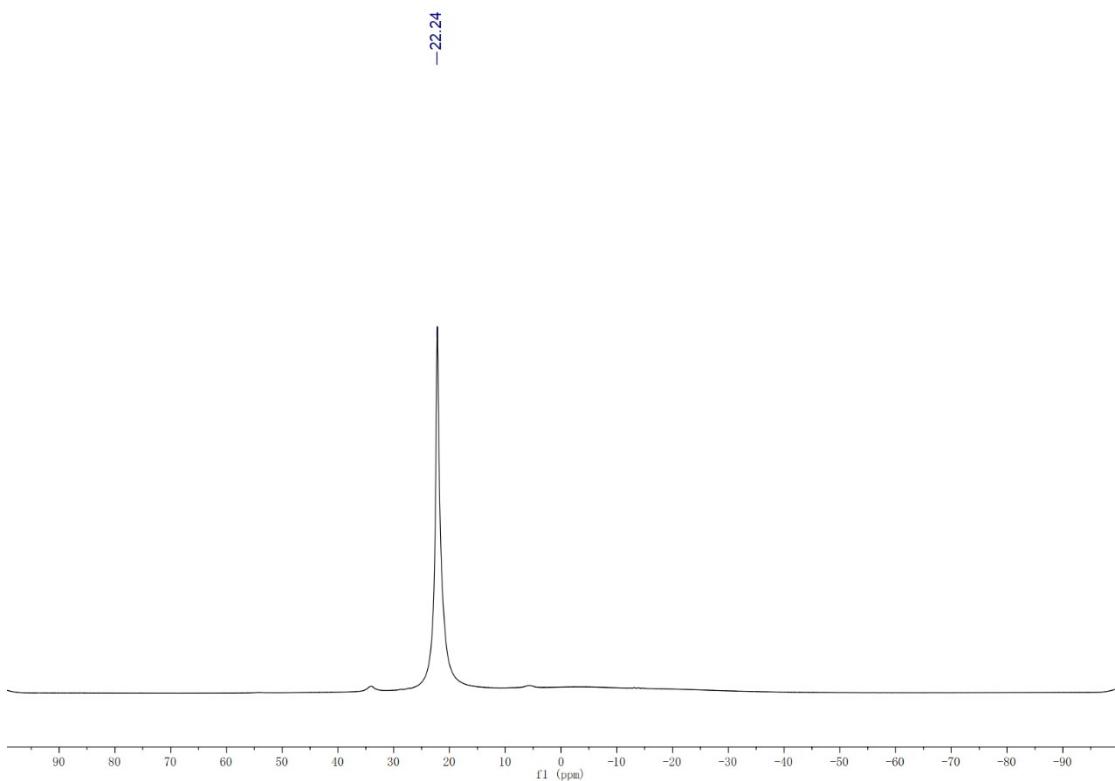


Figure S1.2.3 ¹¹B NMR spectrum of compound **4b** in CDCl_3

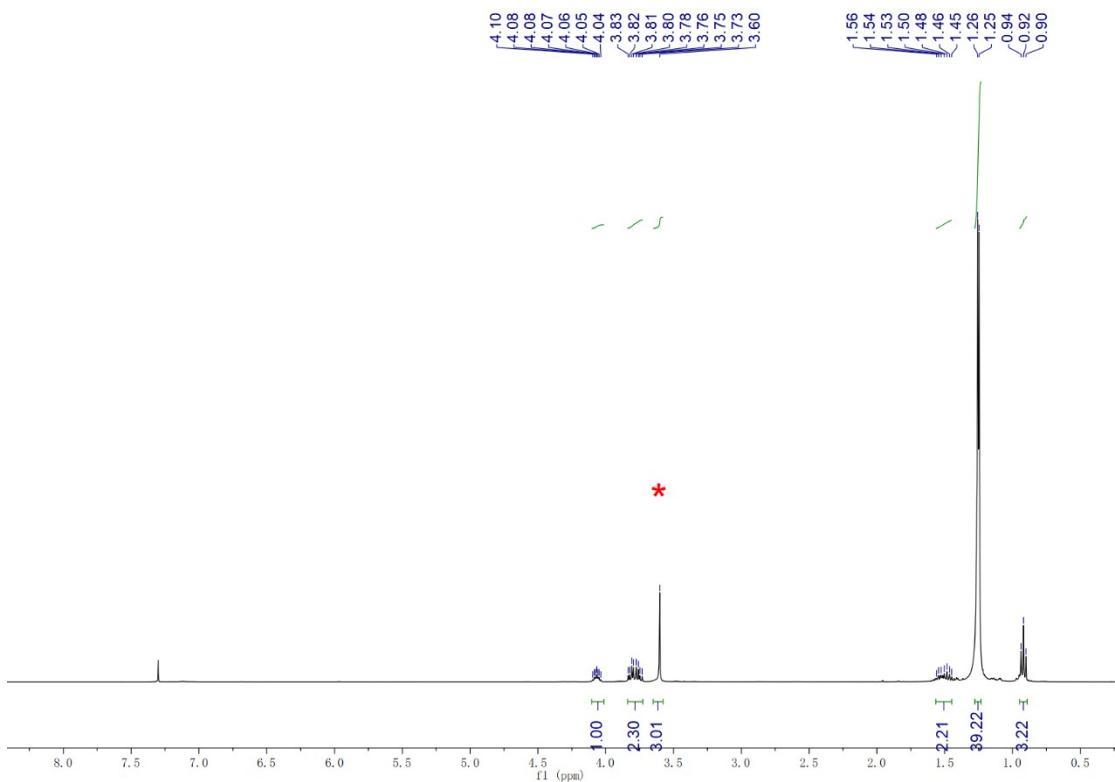


Figure S1.3.1 ¹H NMR spectrum of compound **4c** in CDCl_3

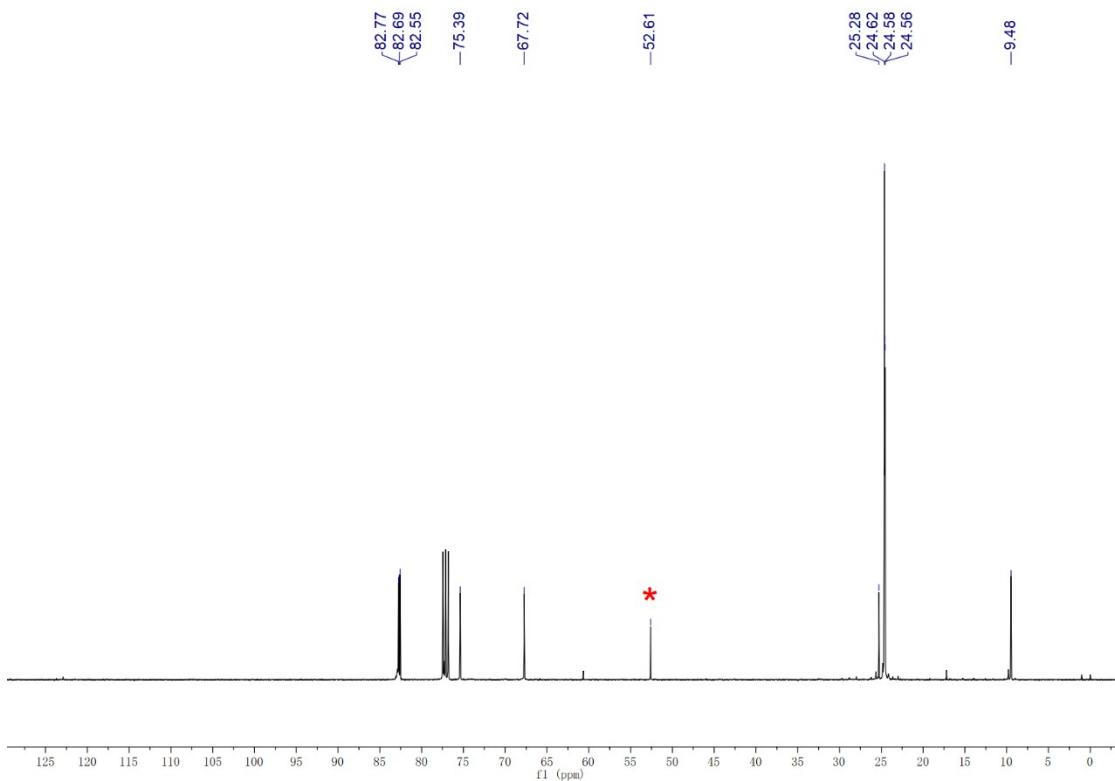


Figure S1.3.2 ^{13}C NMR spectrum of compound **4c** in CDCl_3

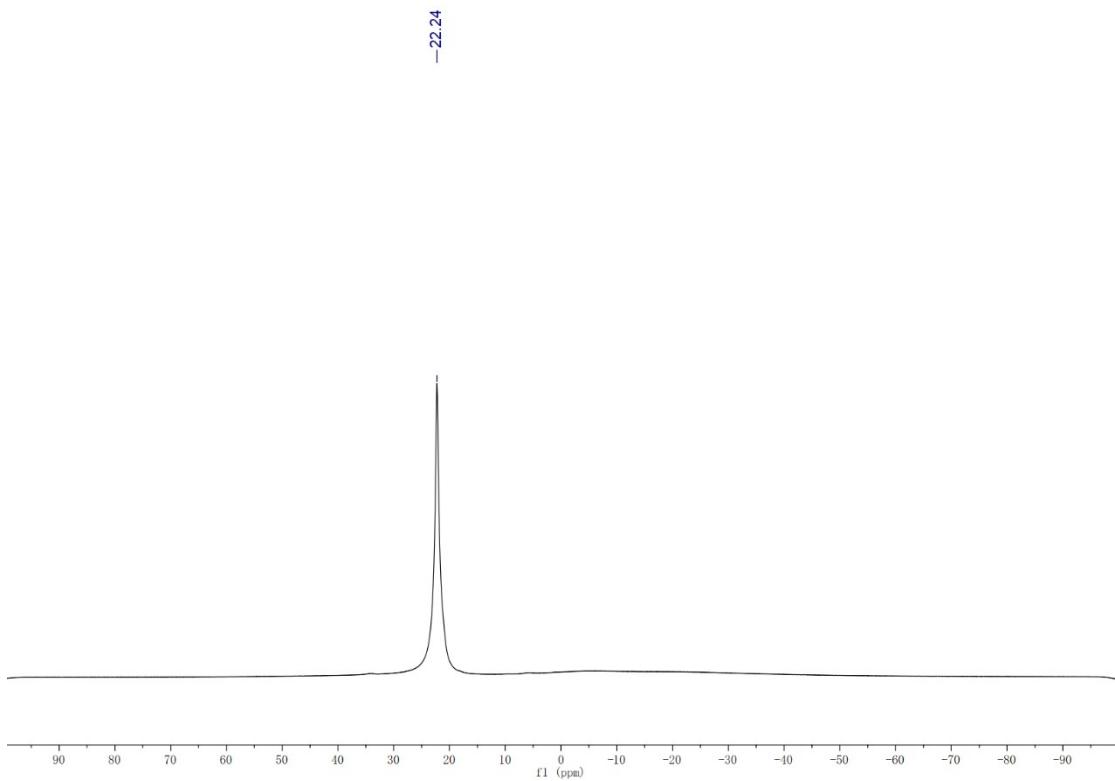
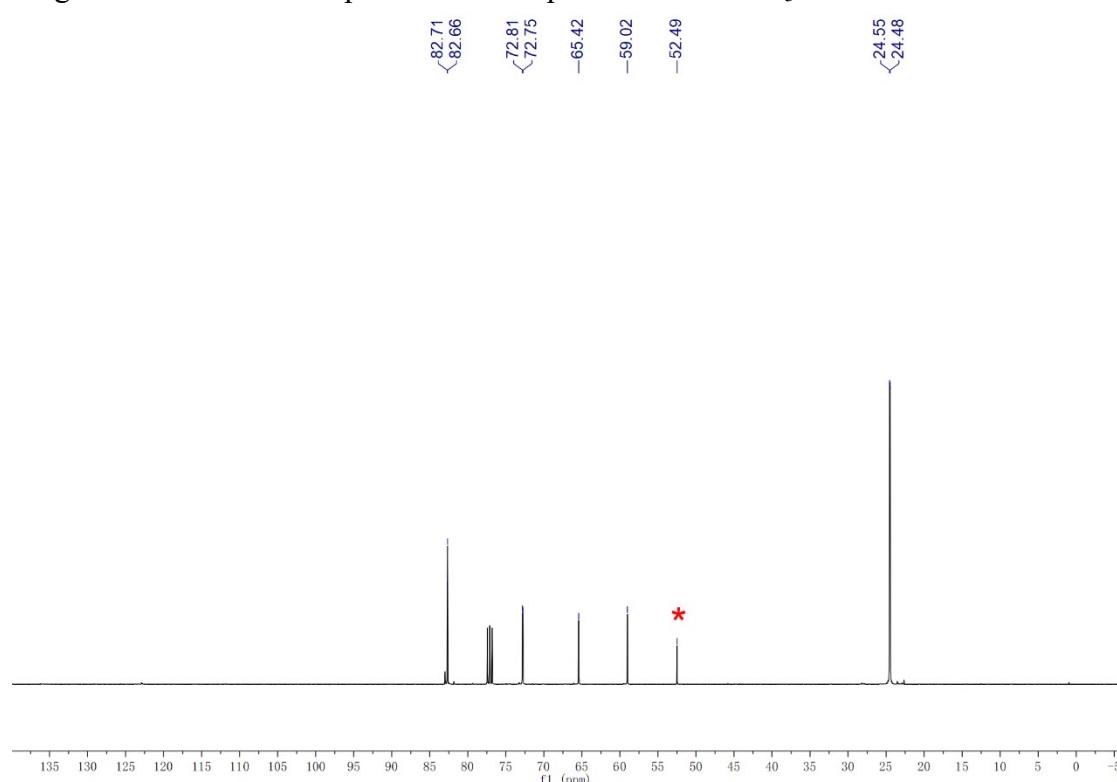
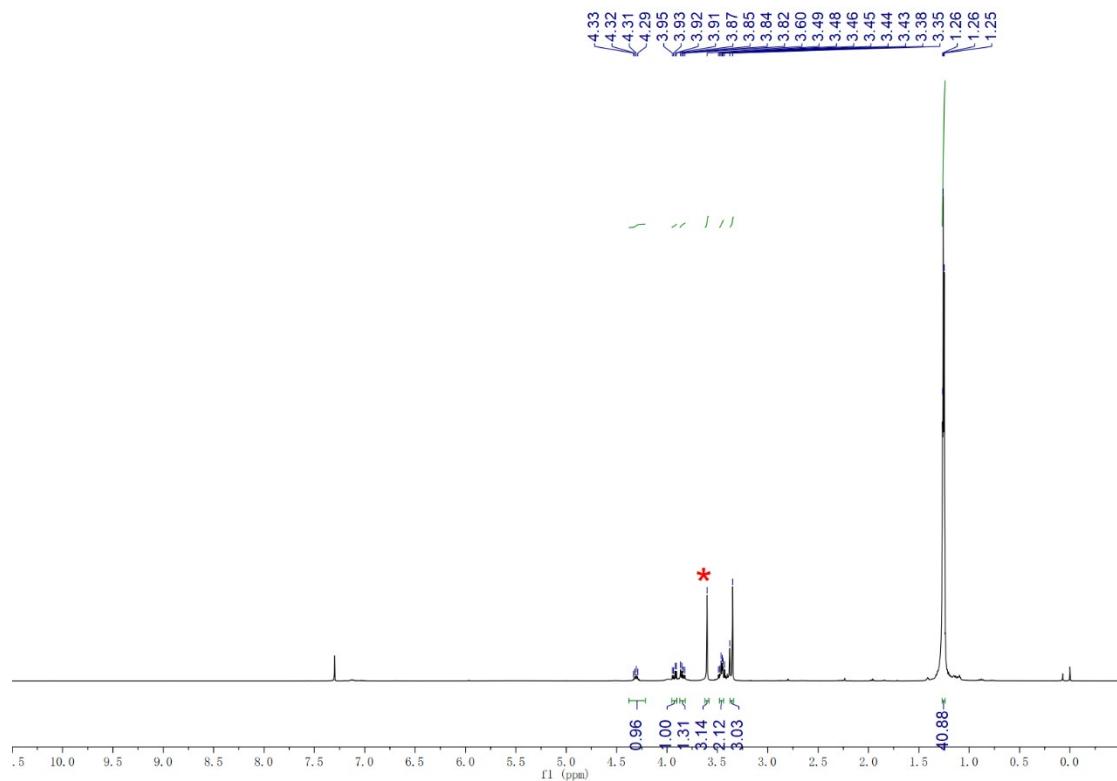


Figure S1.3.3 ^{11}B NMR spectrum of compound **4c** in CDCl_3



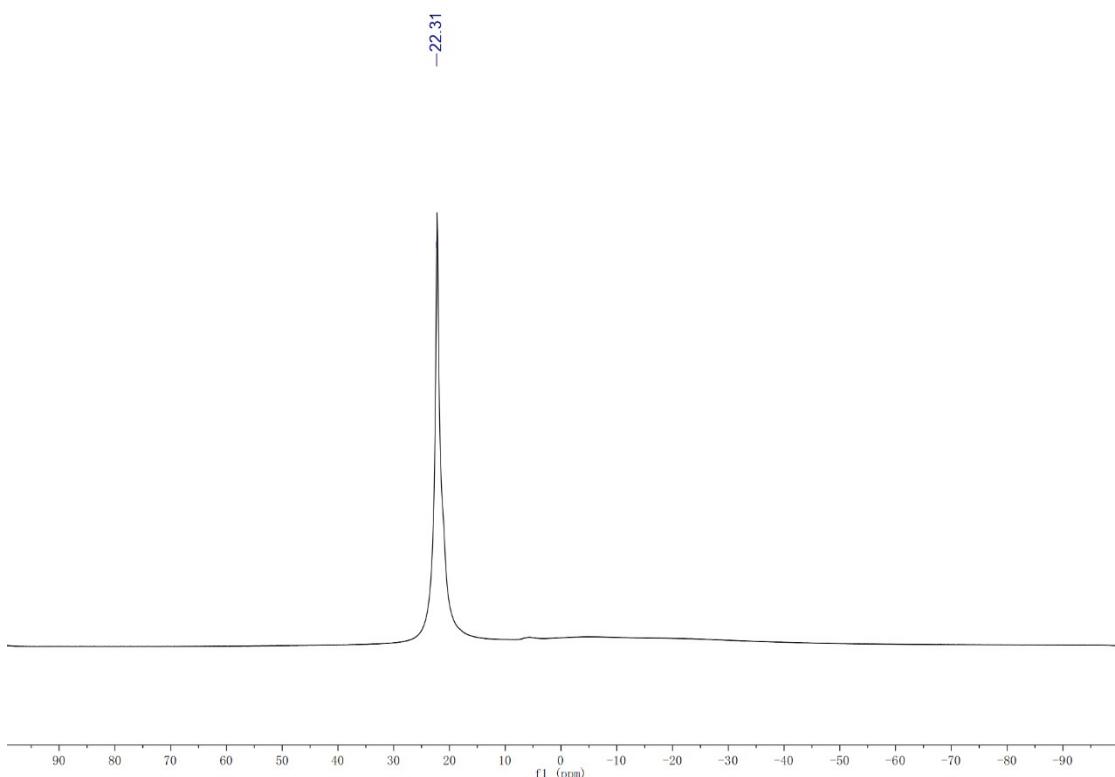


Figure S1.4.3 ¹¹B NMR spectrum of compound **4d** in CDCl₃

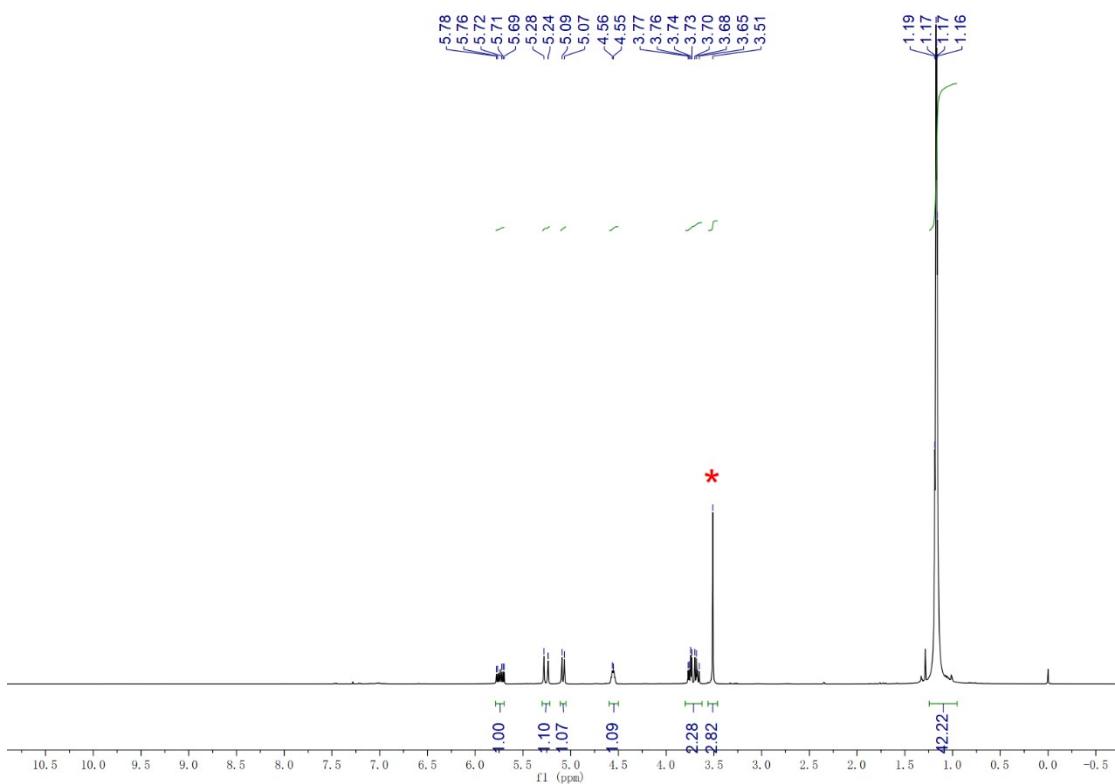


Figure S1.5.1 ¹H NMR spectrum of compound **4e** in CDCl₃

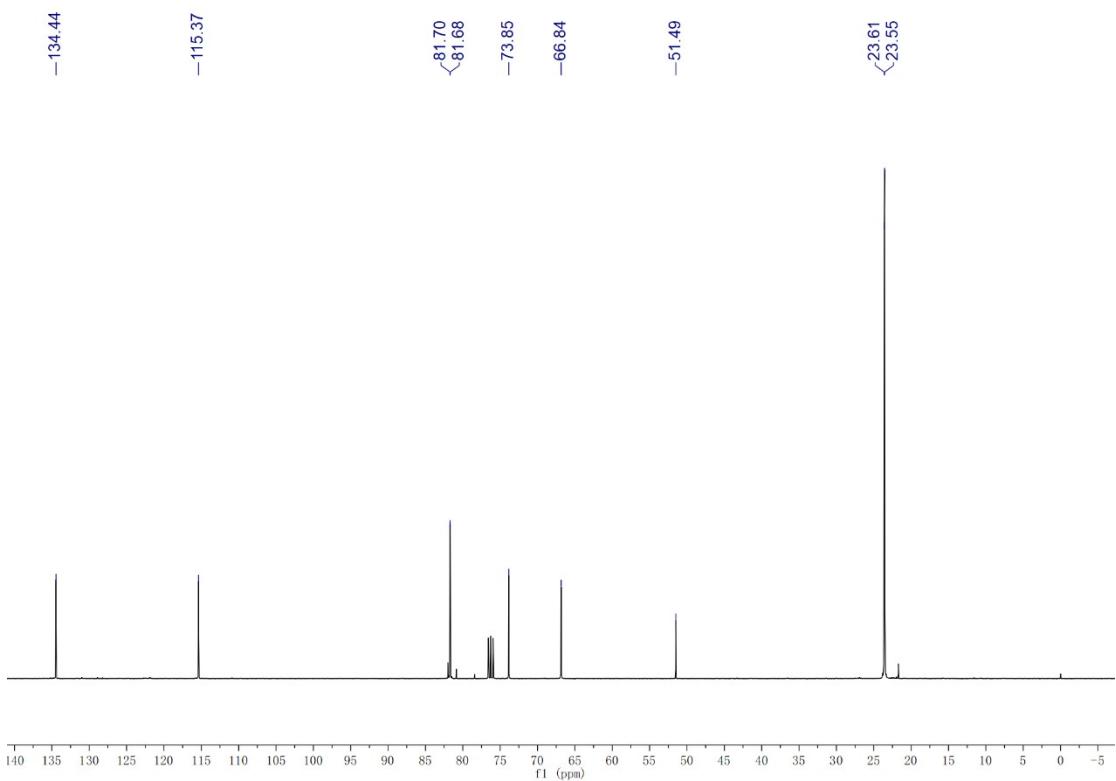


Figure S1.5.2 ^{13}C NMR spectrum of compound **4e** in CDCl_3

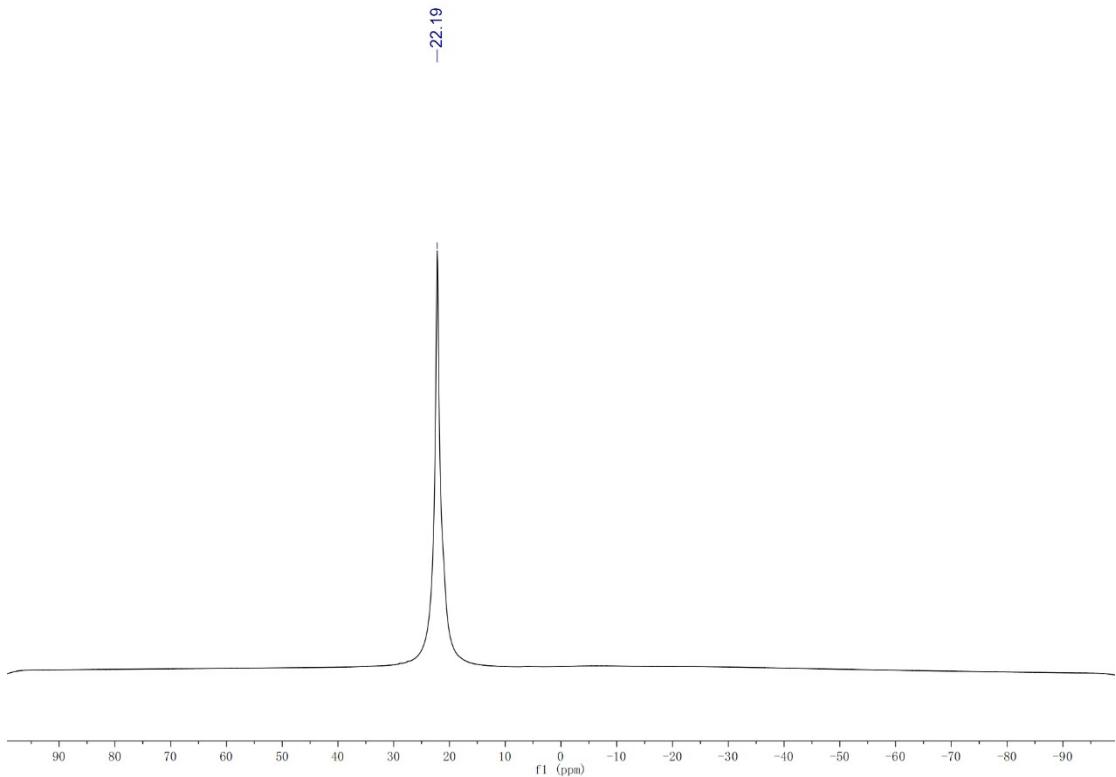


Figure S1.5.3 ^{11}B NMR spectrum of compound **4e** in CDCl_3

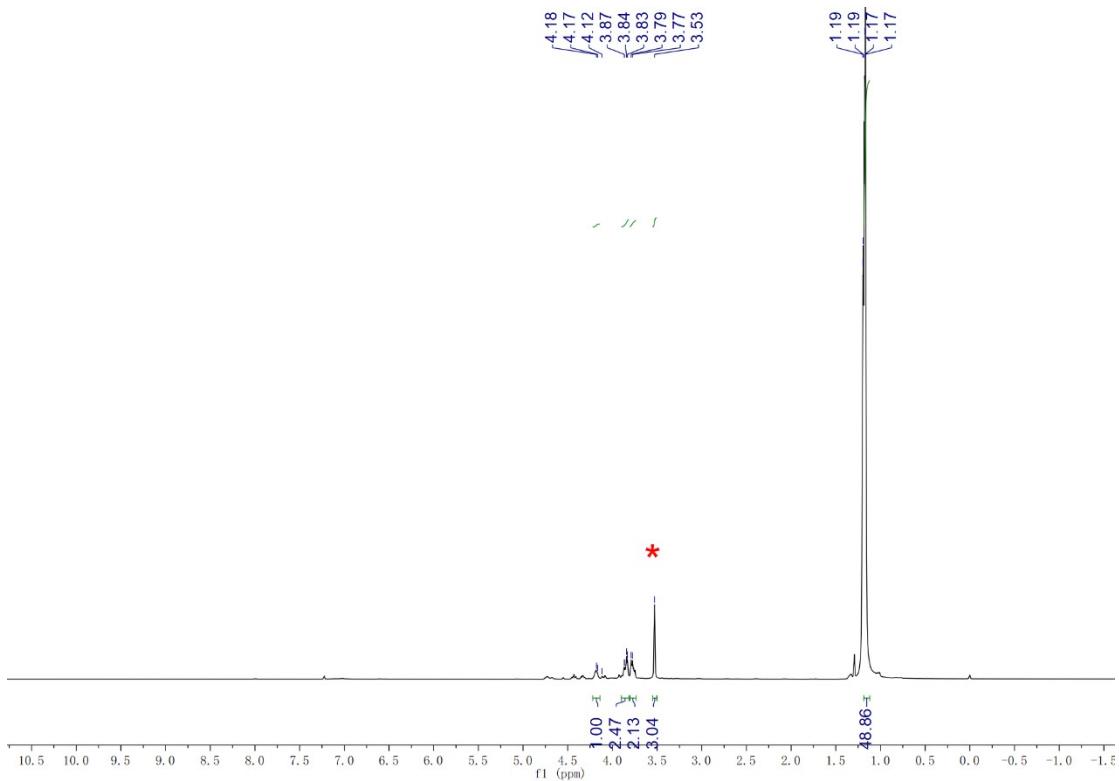


Figure S1.6.1 ^1H NMR spectrum of compound **4f** in CDCl_3

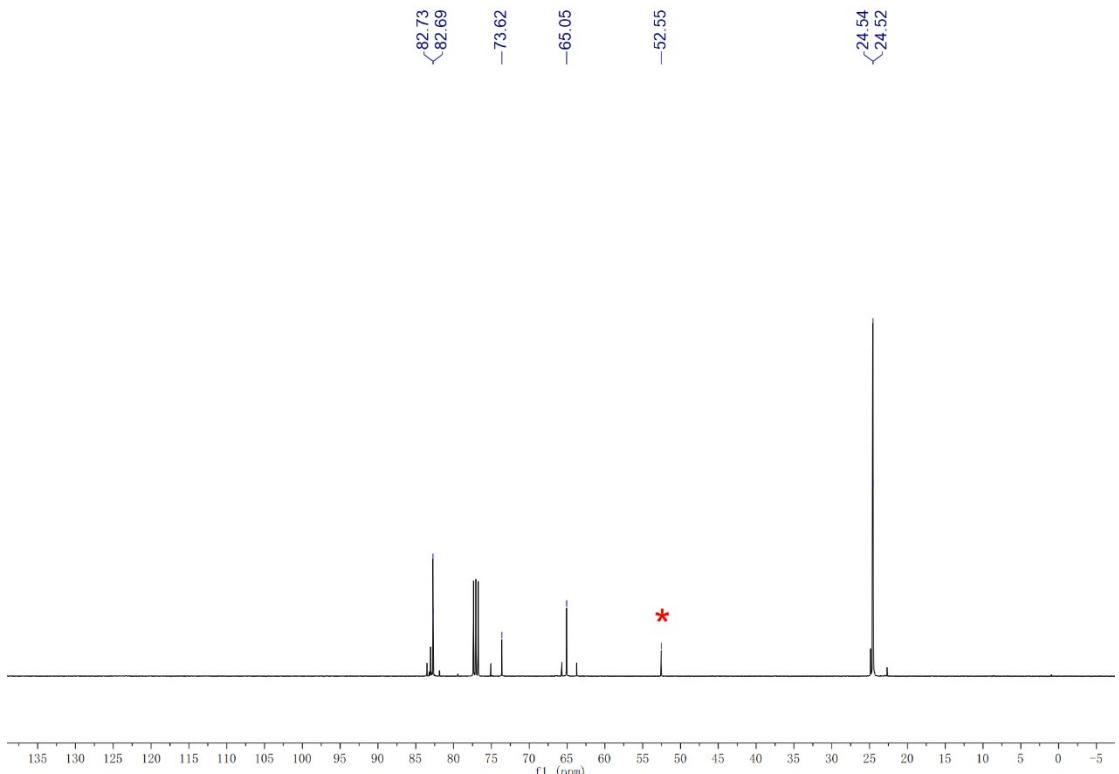


Figure S1.6.2 ^{13}C NMR spectrum of compound **4f** in CDCl_3

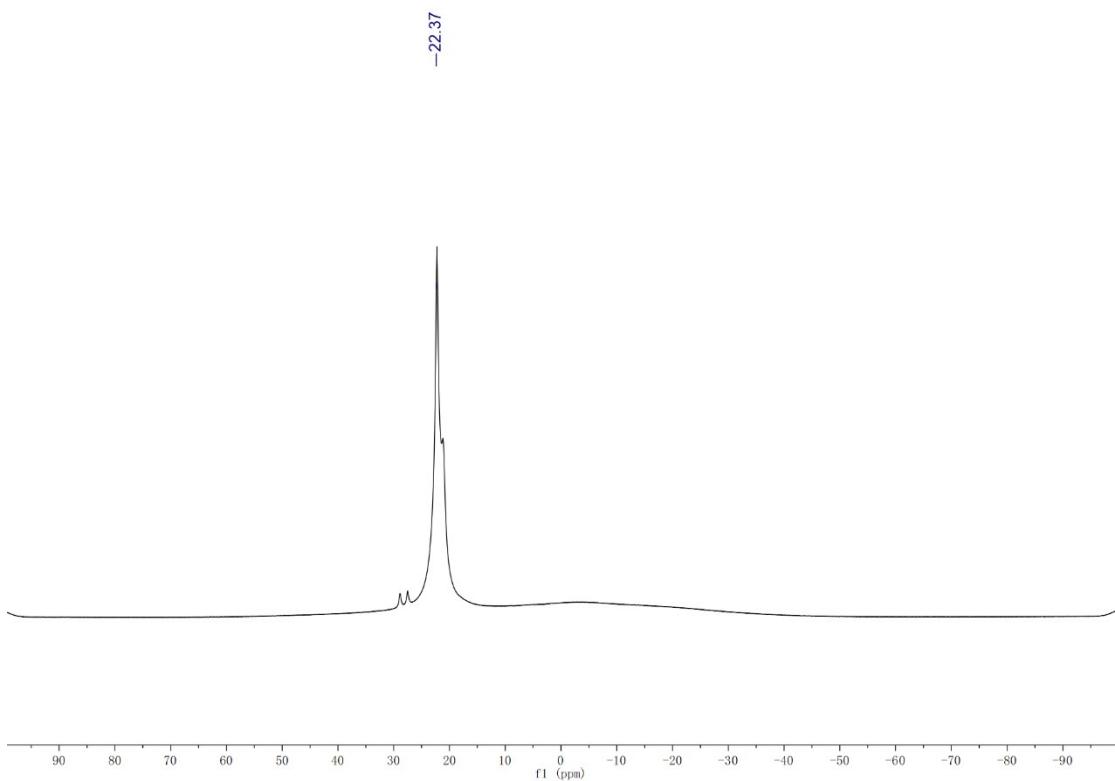


Figure S1.6.3 ¹¹B NMR spectrum of compound **4f** in CDCl_3

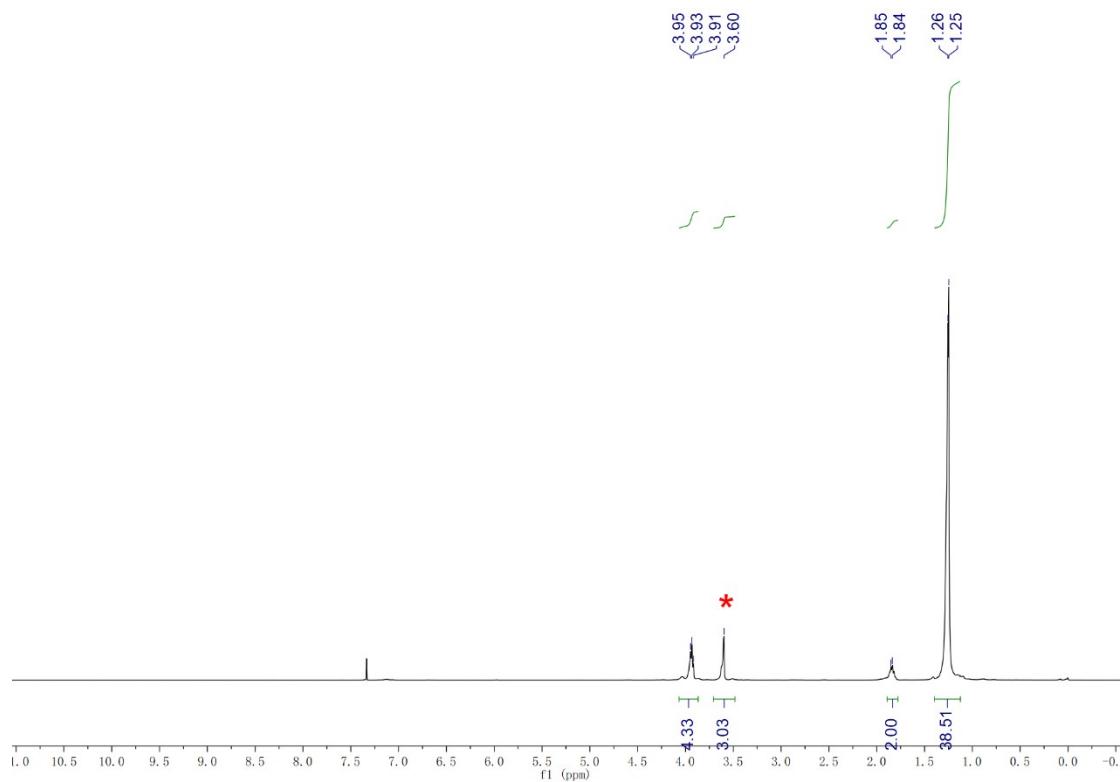


Figure S1.7.1 ¹H NMR spectrum of compound **4g** in CDCl_3

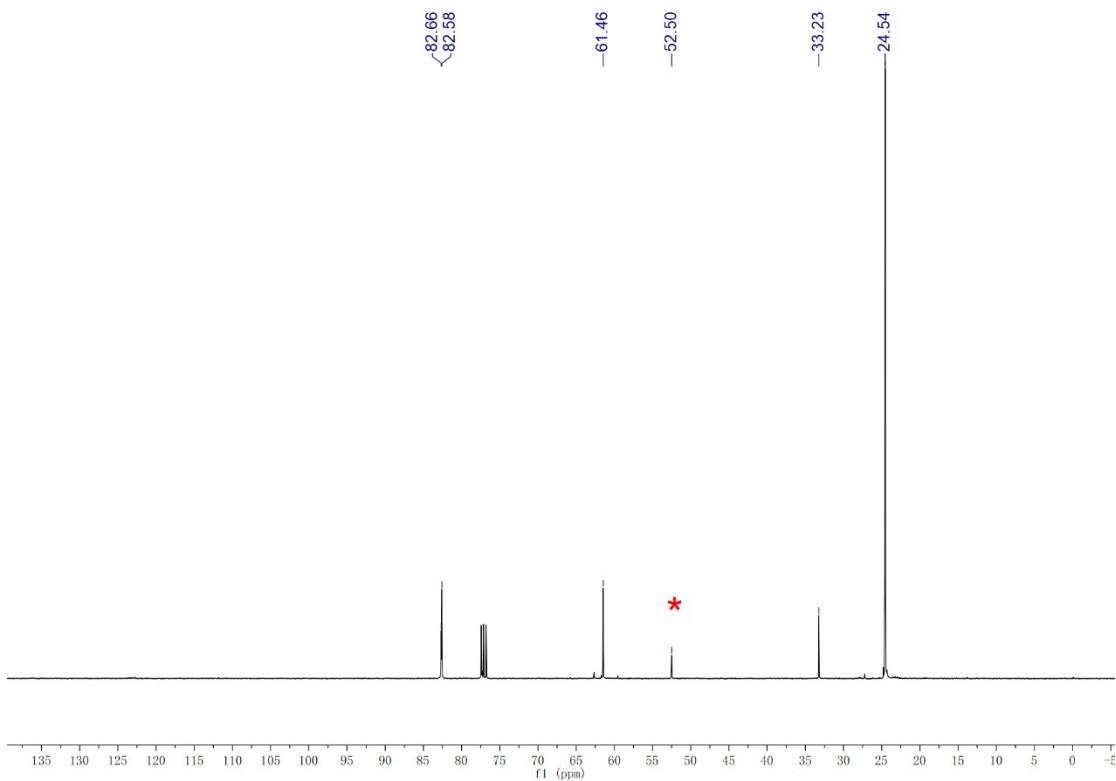


Figure S1.7.2 ^{13}C NMR spectrum of compound **4g** in CDCl_3

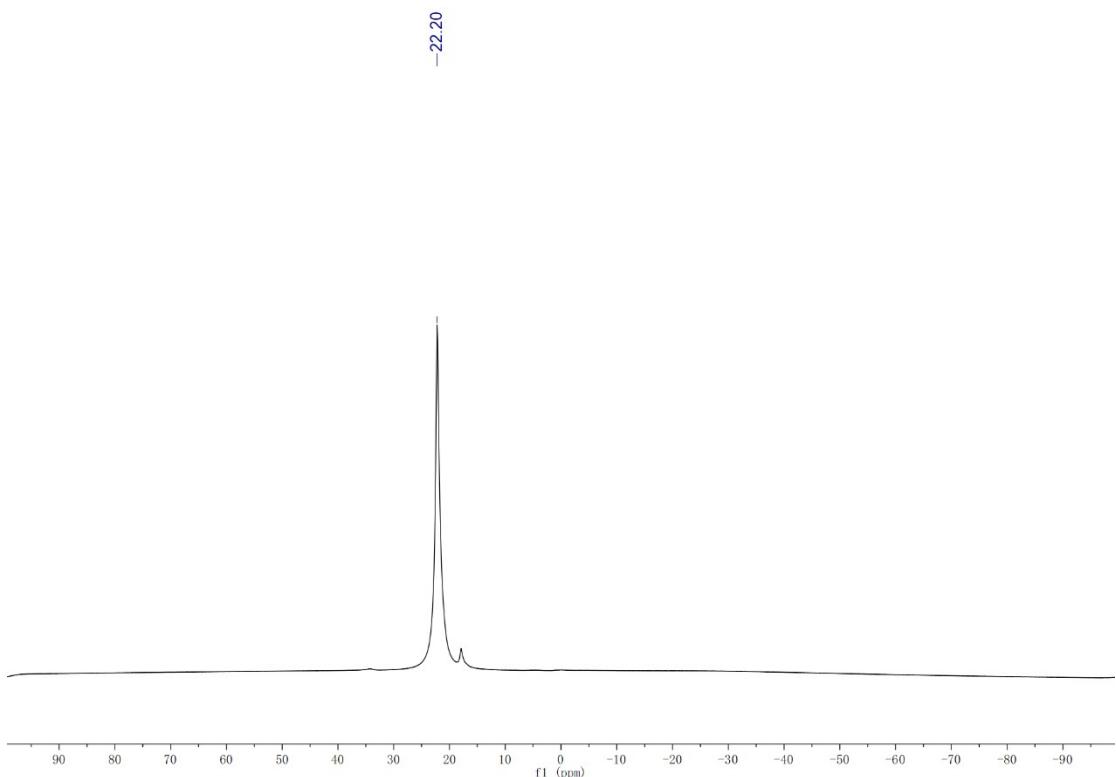


Figure S1.7.3 ^{11}B NMR spectrum of compound **4g** in CDCl_3

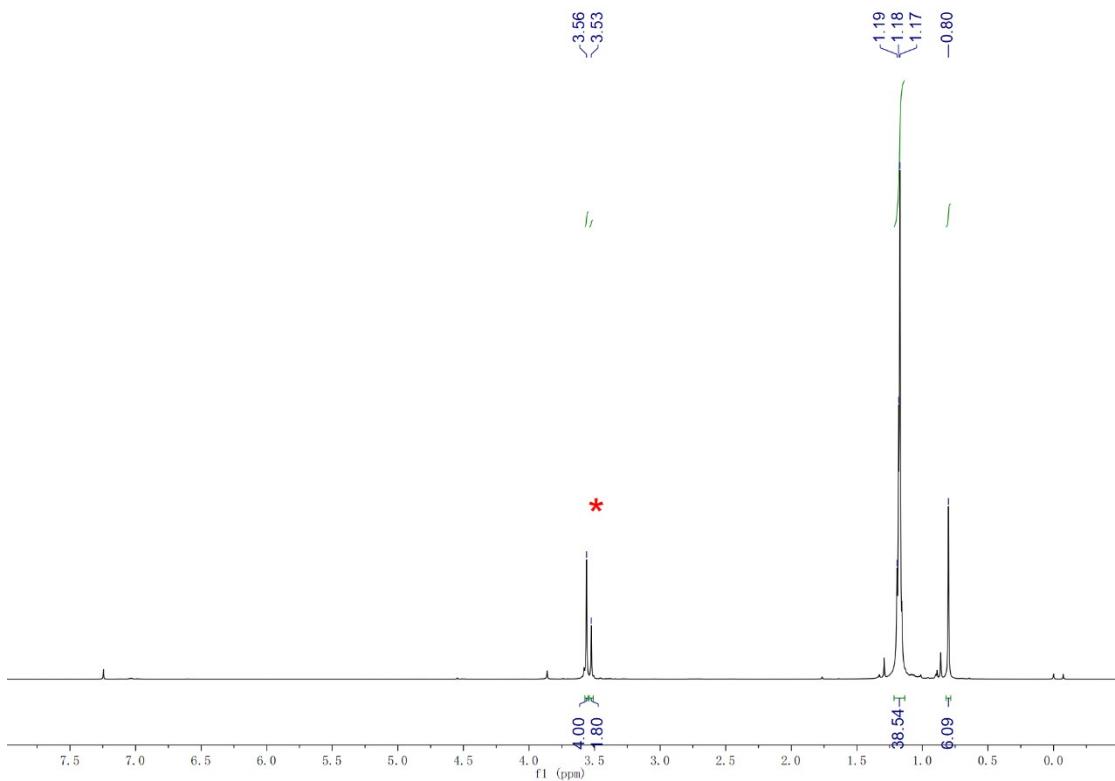


Figure S1.8.1 ^1H NMR spectrum of compound **4h** in CDCl_3

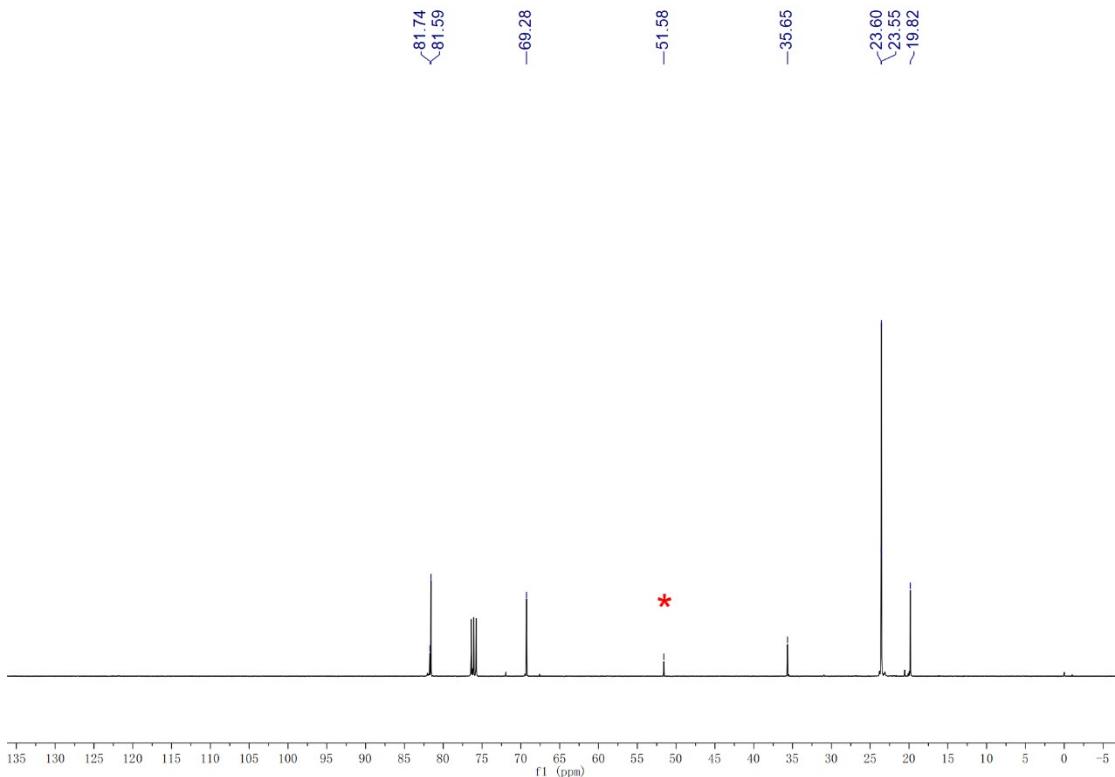


Figure S1.8.2 ^{13}C NMR spectrum of compound **4h** in CDCl_3

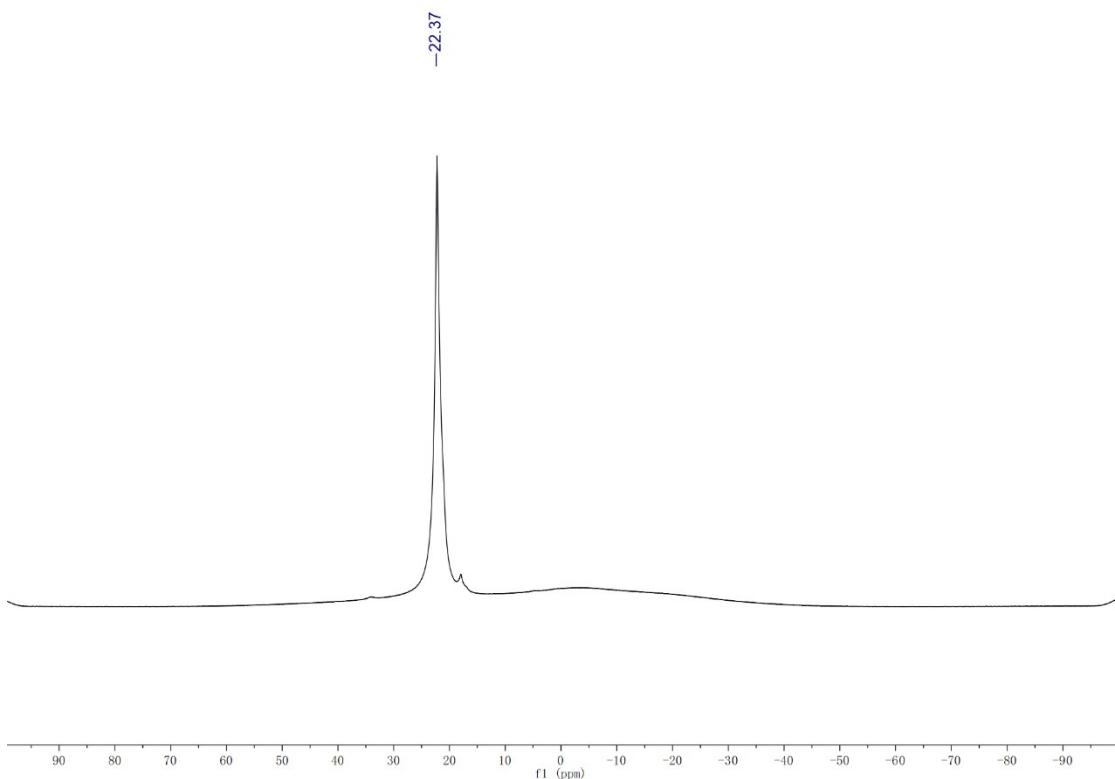


Figure S1.8.3 ¹¹B NMR spectrum of compound **4h** in CDCl_3

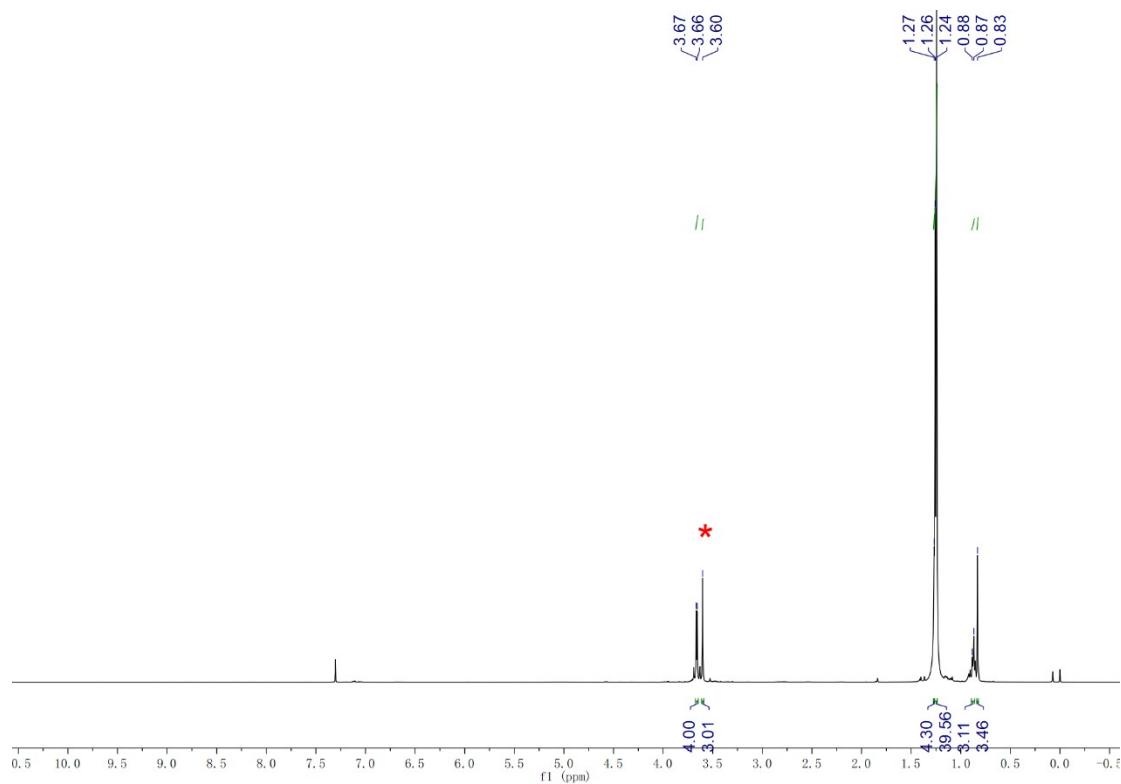


Figure S1.9.1 ¹H NMR spectrum of compound **4i** in CDCl_3

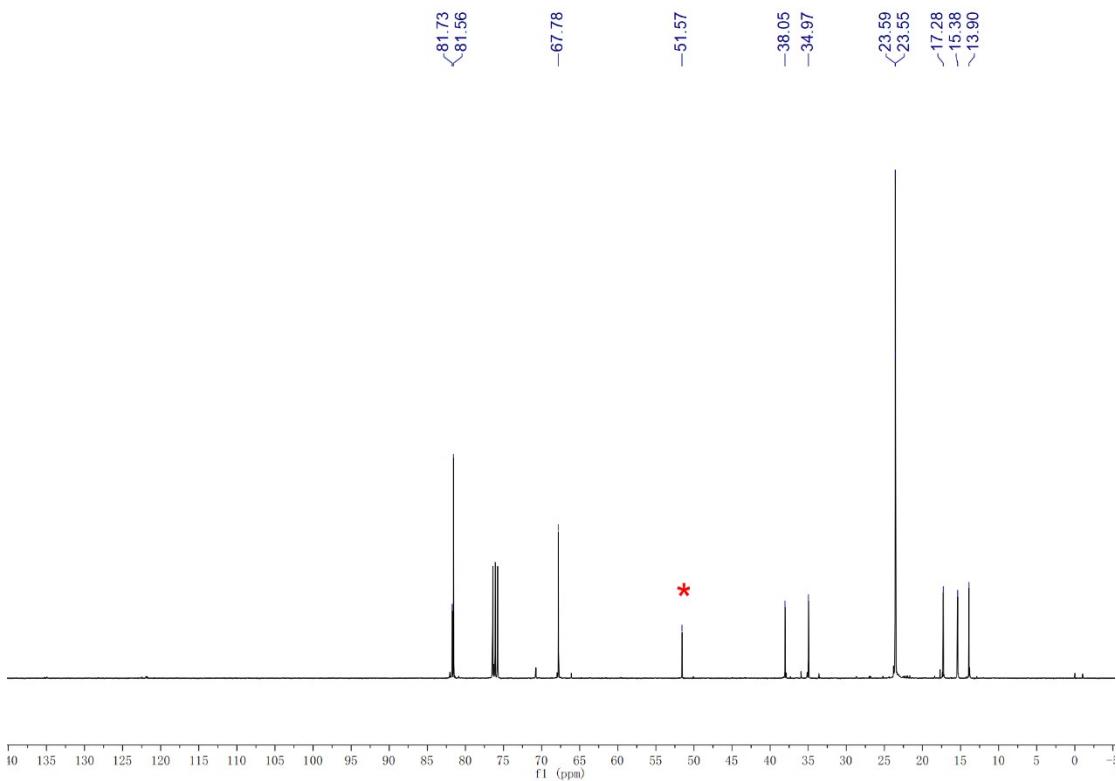


Figure S1.9.2 ^{13}C NMR spectrum of compound **4i** in CDCl_3

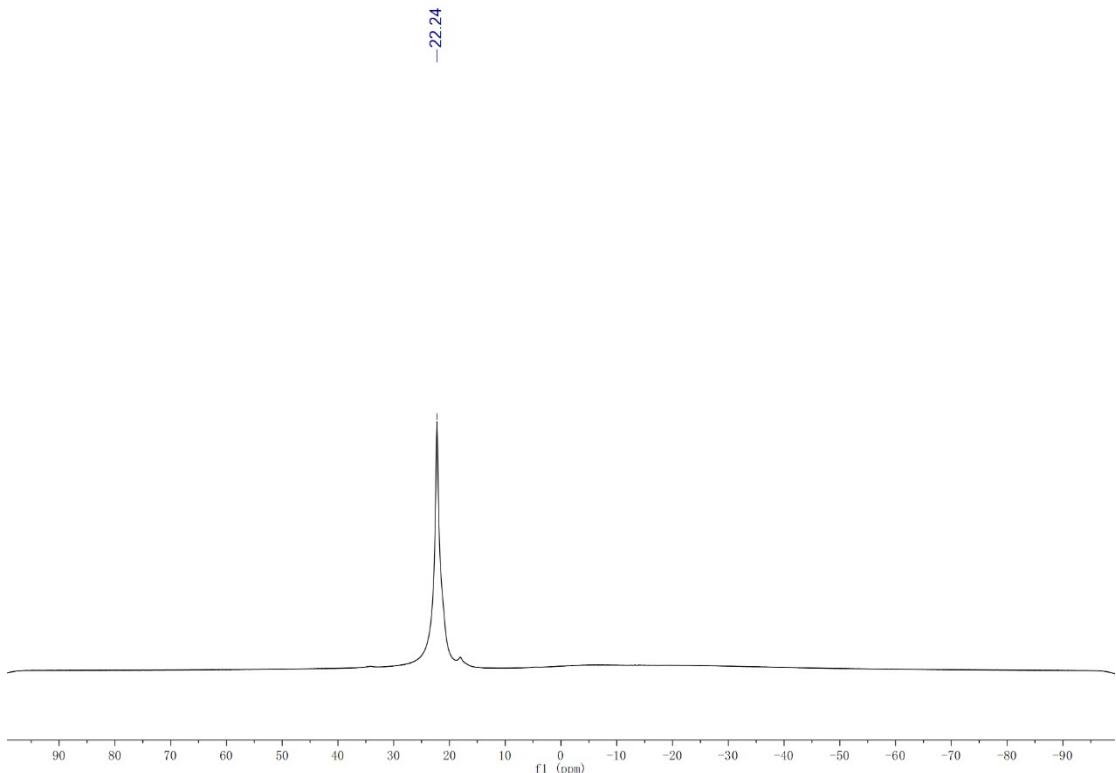


Figure S1.9.3 ^{11}B NMR spectrum of compound **4i** in CDCl_3

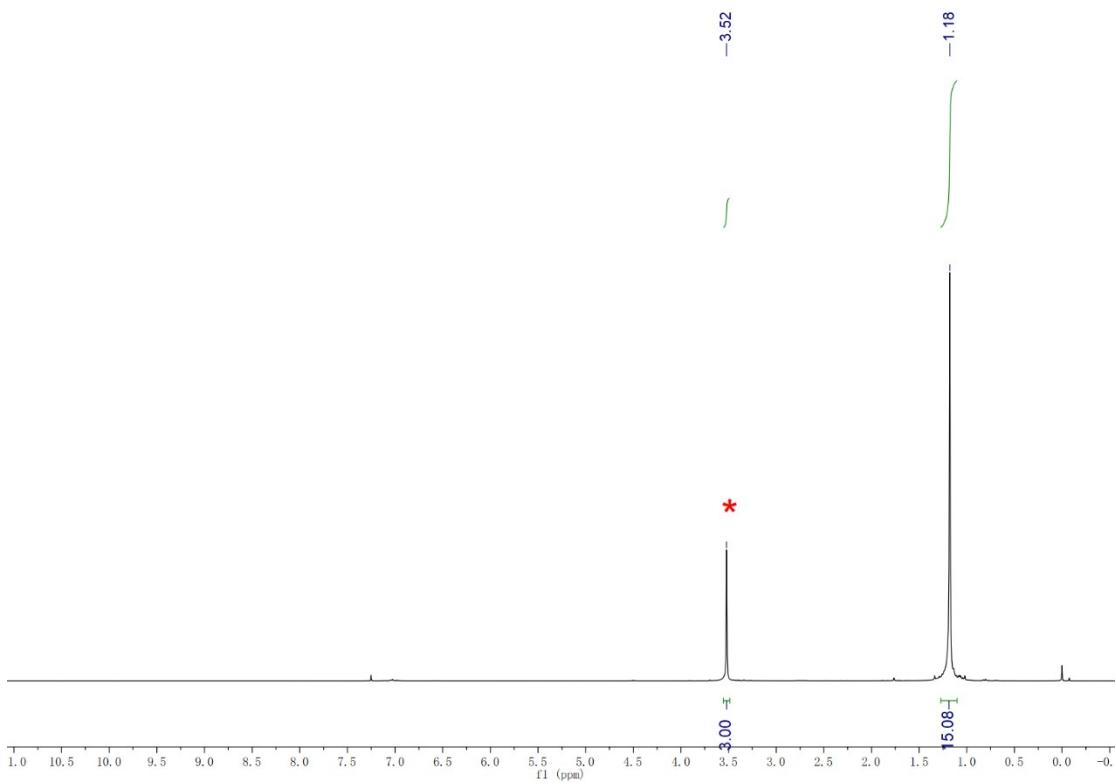


Figure S1.10.1 ^1H NMR spectrum of compound **4j** in CDCl_3

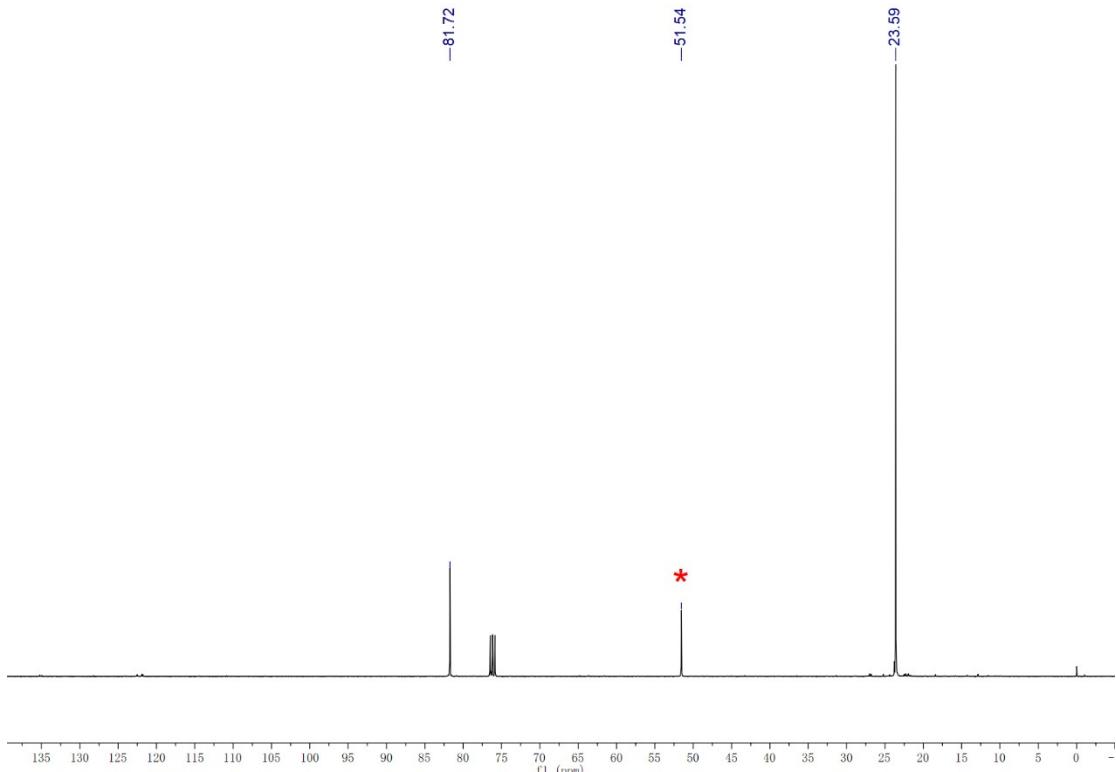


Figure S1.10.2 ^{13}C NMR spectrum of compound **4j** in CDCl_3

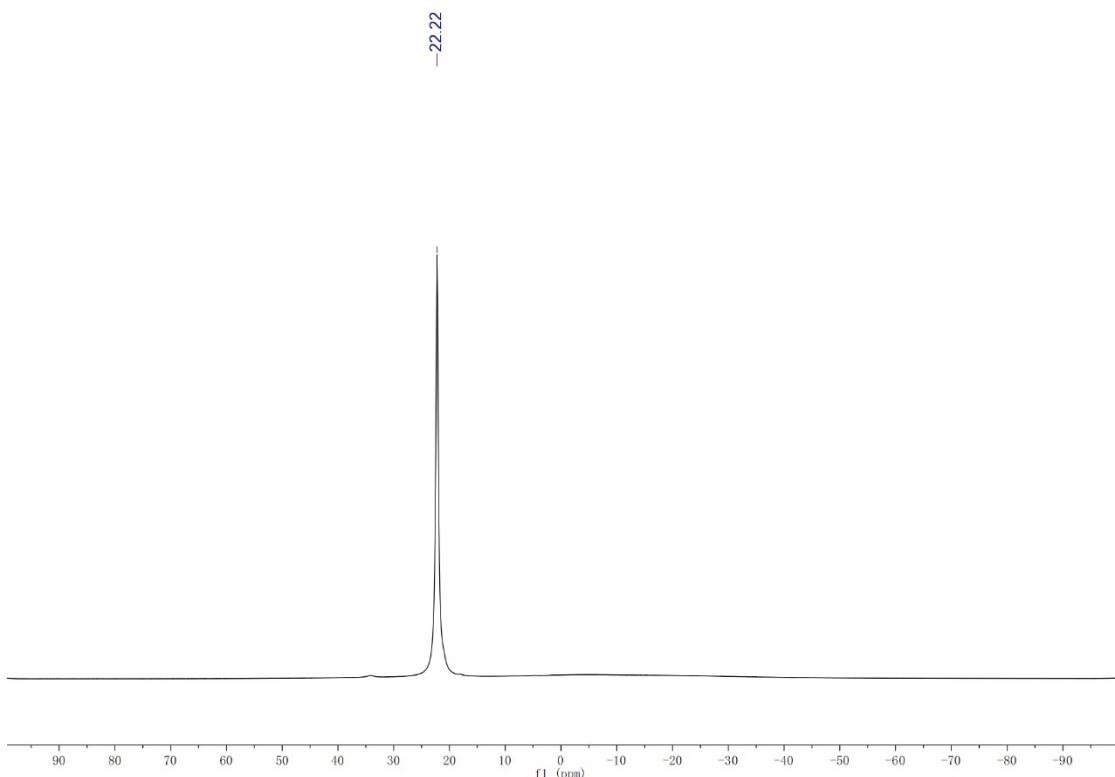


Figure S1.10.3 ¹¹B NMR spectrum of compound **4j** in CDCl₃

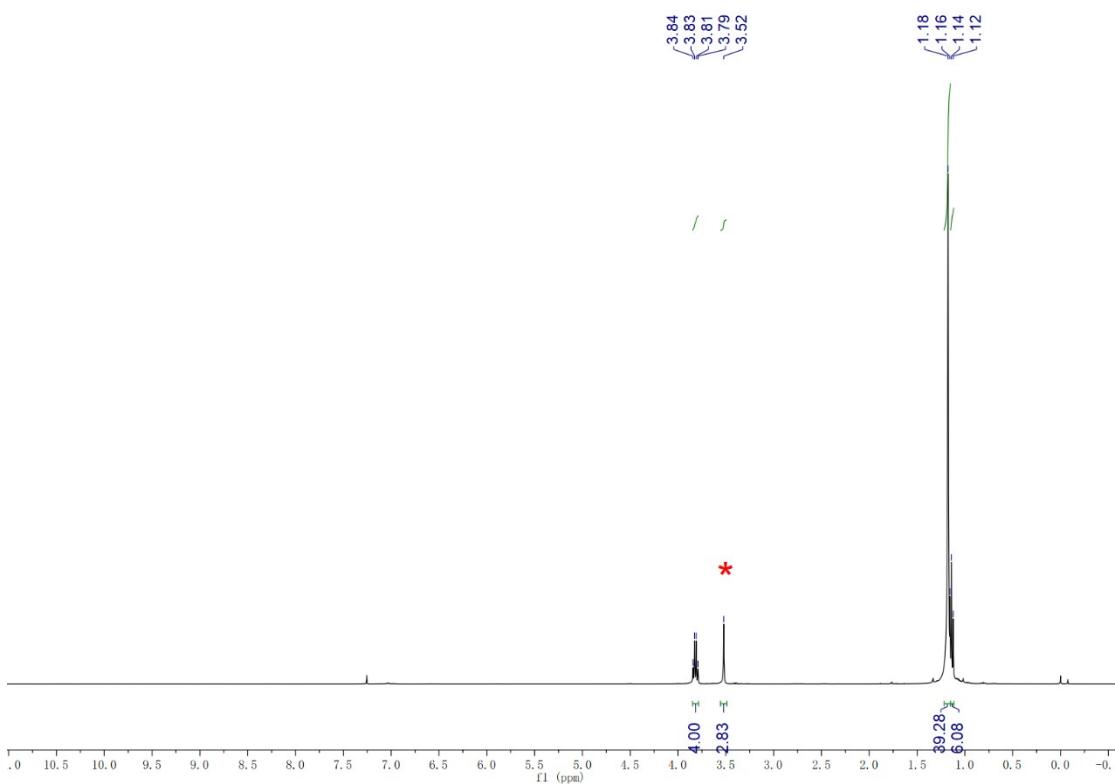


Figure S1.11.1 ¹H NMR spectrum of compound **4k** in CDCl₃

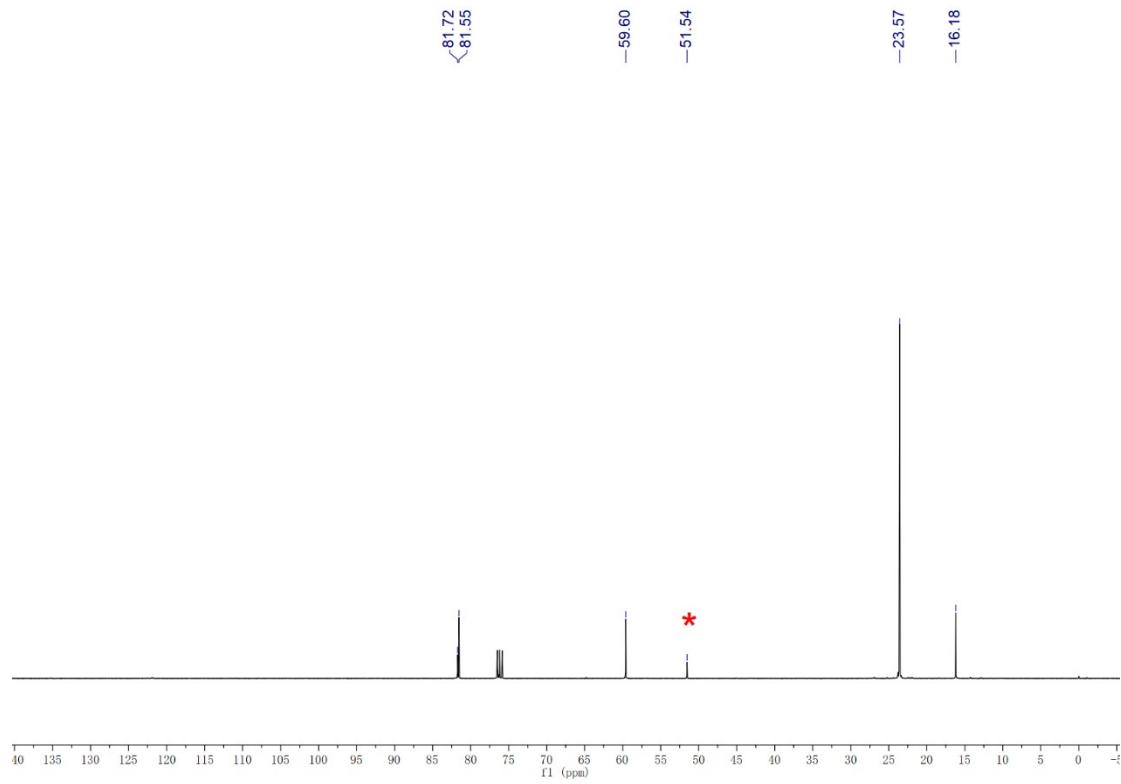


Figure S1.11.2 ^{13}C NMR spectrum of compound **4k** in CDCl_3

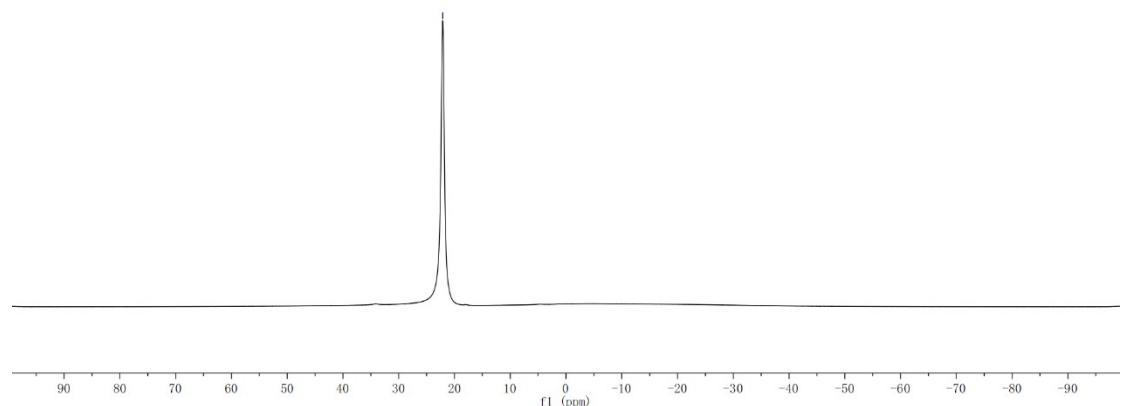


Figure S1.11.3 ^{11}B NMR spectrum of compound **4k** in CDCl_3

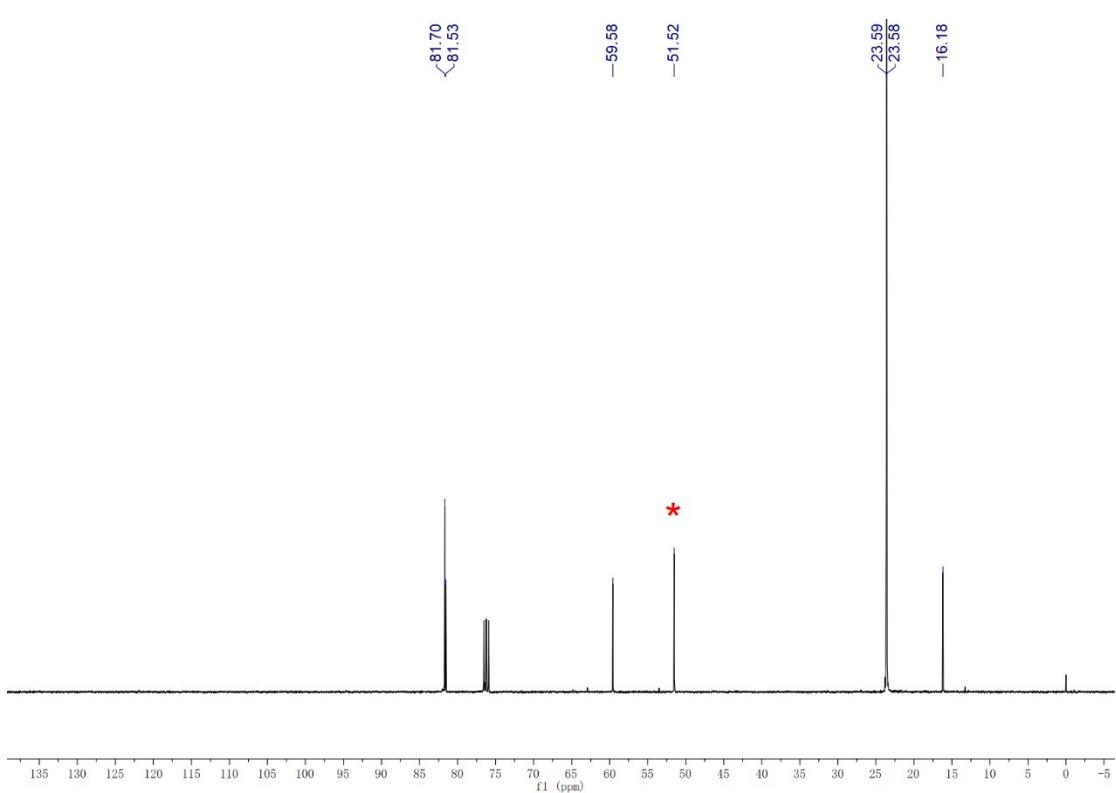
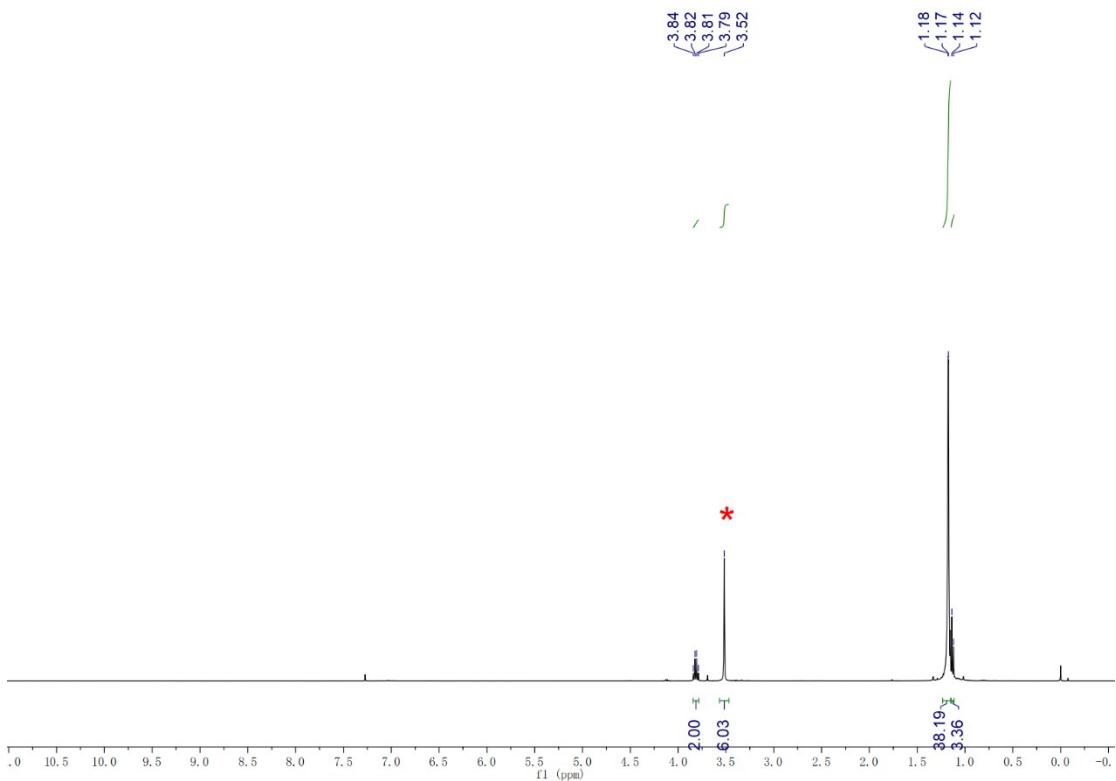




Figure S1.12.3 ^{11}B NMR spectrum of compound **4l** in CDCl_3

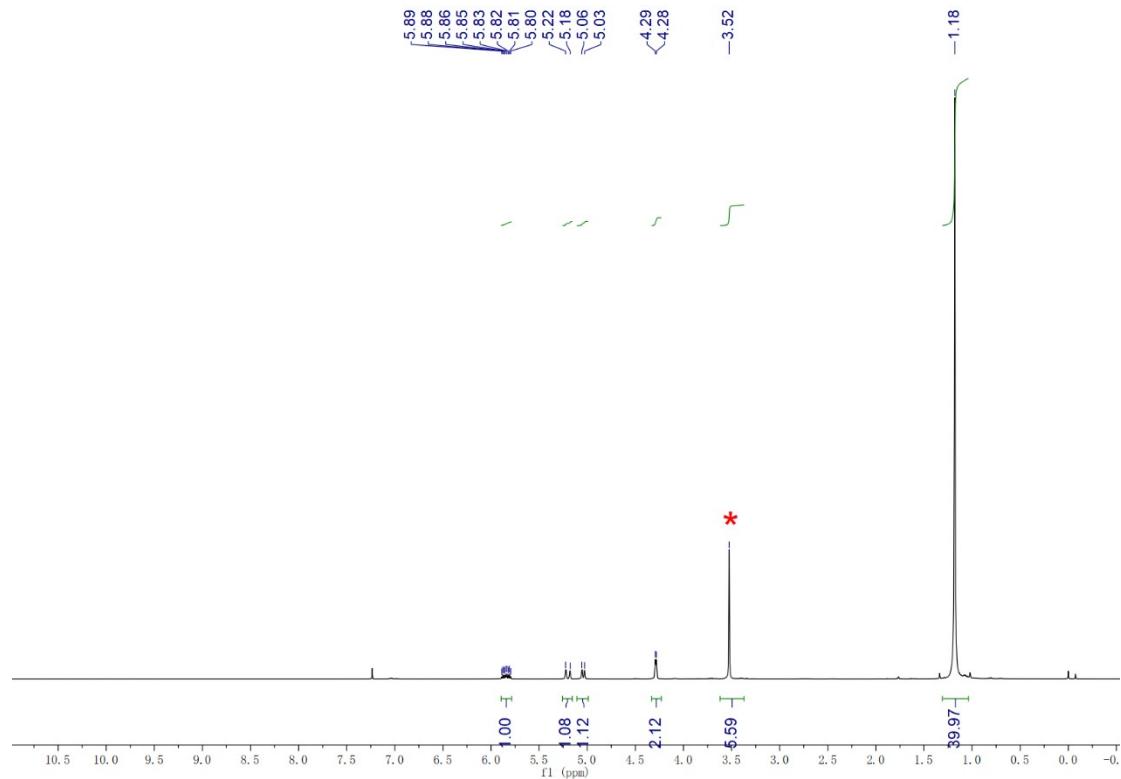


Figure S1.13.1 ^1H NMR spectrum of compound **4m** in CDCl_3

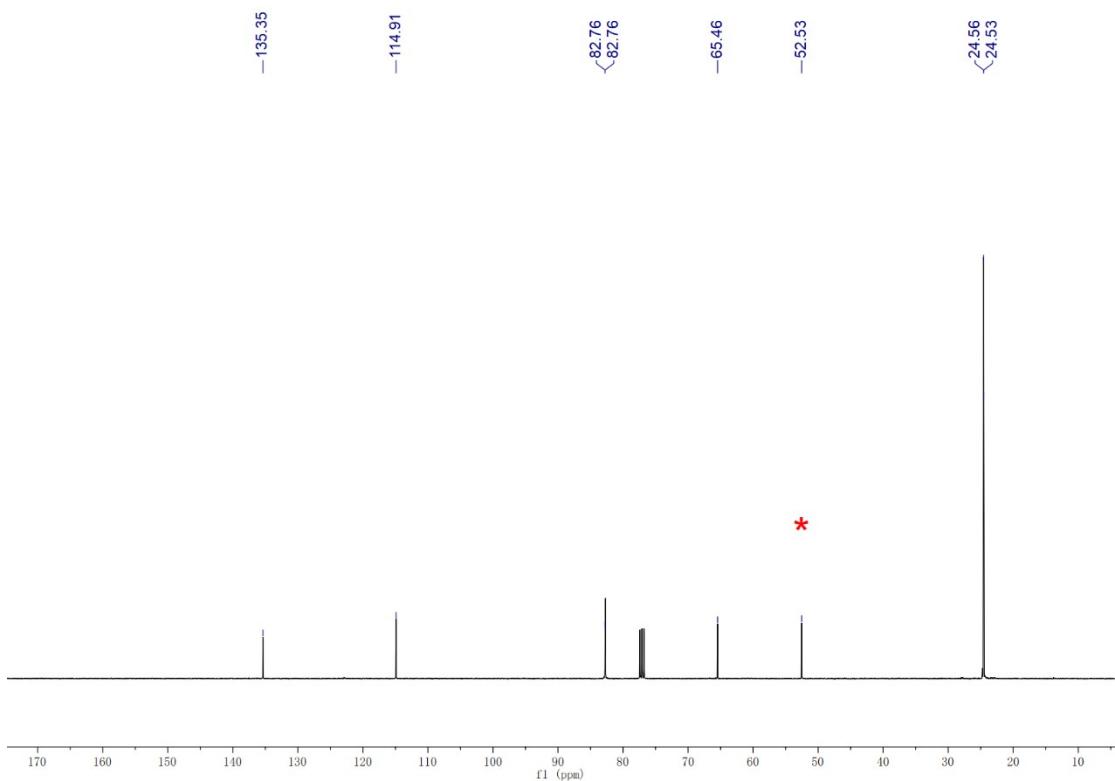


Figure S1.13.2 ^{13}C NMR spectrum of compound **4m** in CDCl_3

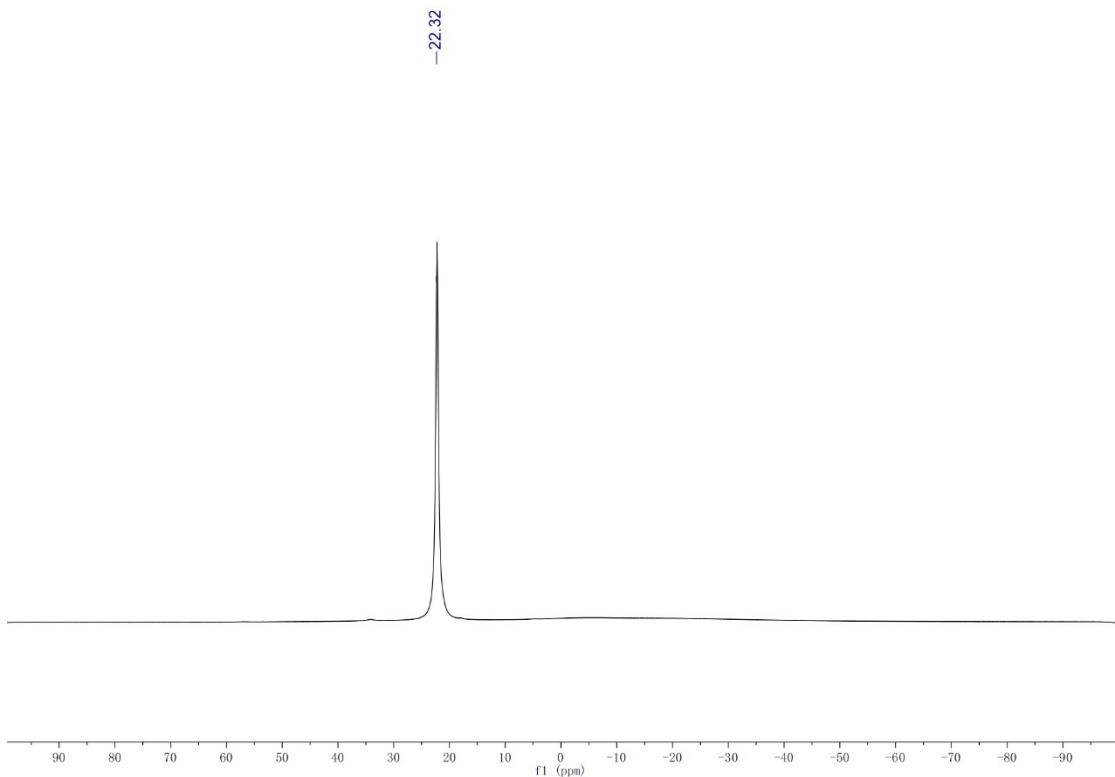
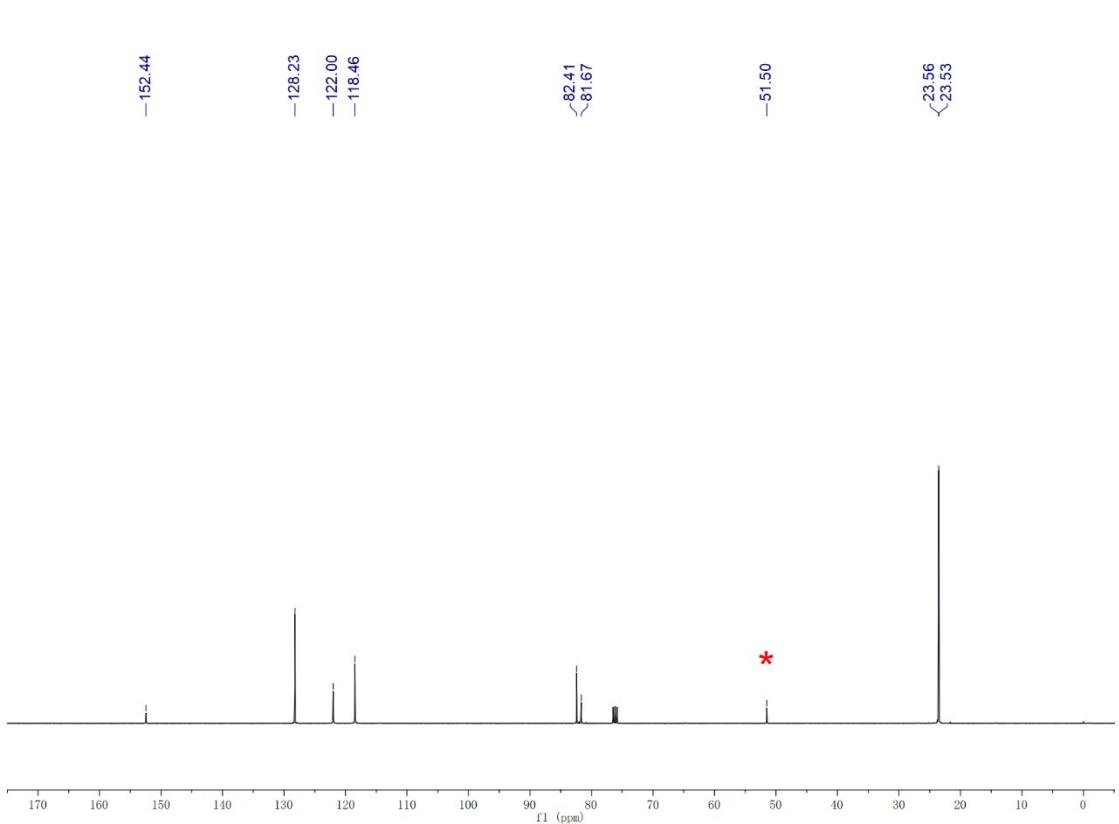
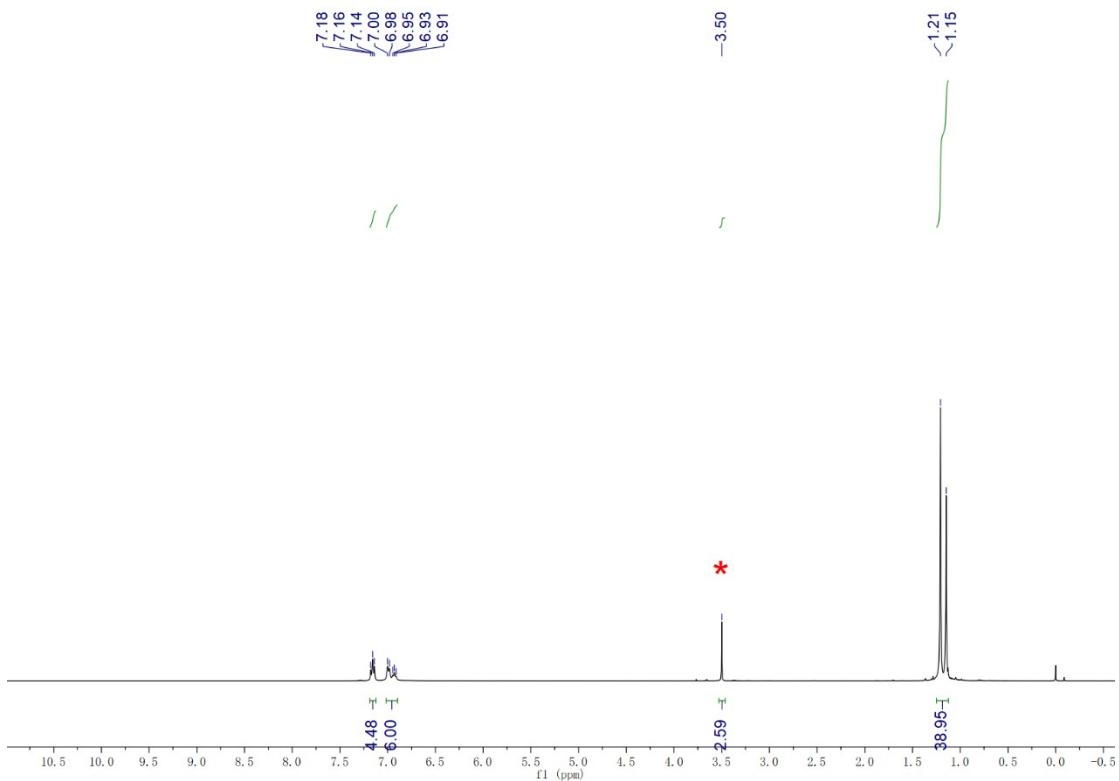


Figure S1.14.3 ^{11}B NMR spectrum of compound **4m** in CDCl_3



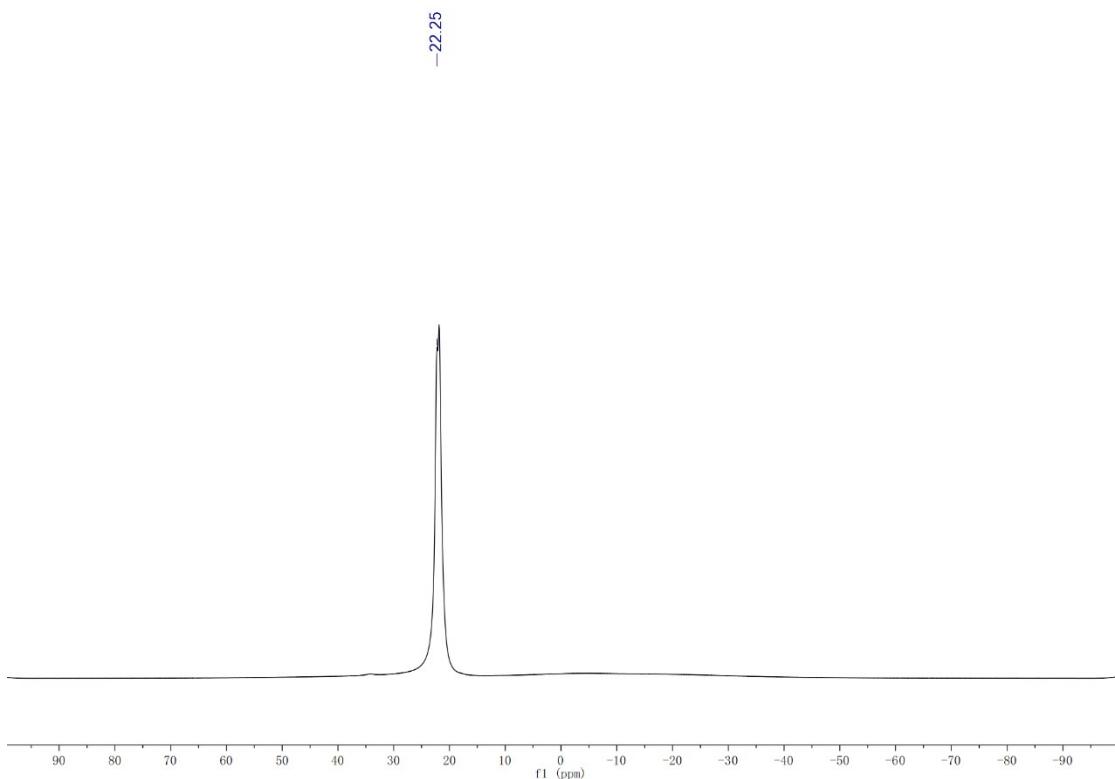


Figure S1.14.3 ¹¹B NMR spectrum of compound **4n** in CDCl₃

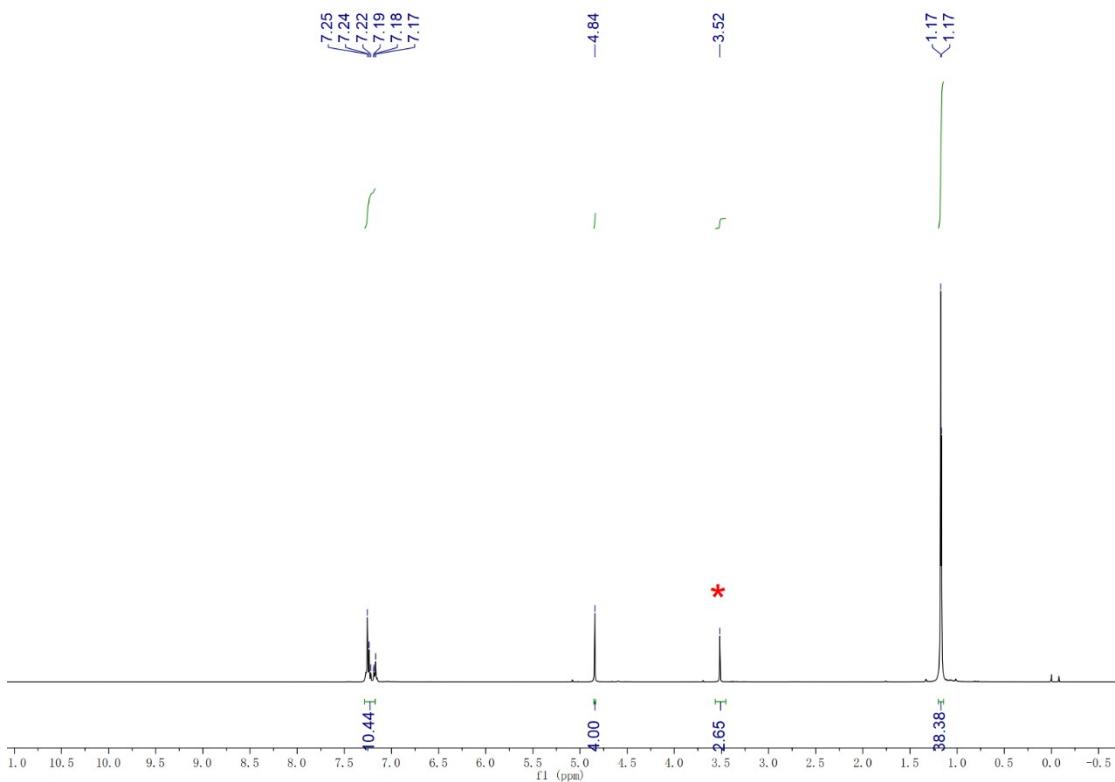


Figure S1.15.1 ¹H NMR spectrum of compound **4o** in CDCl₃

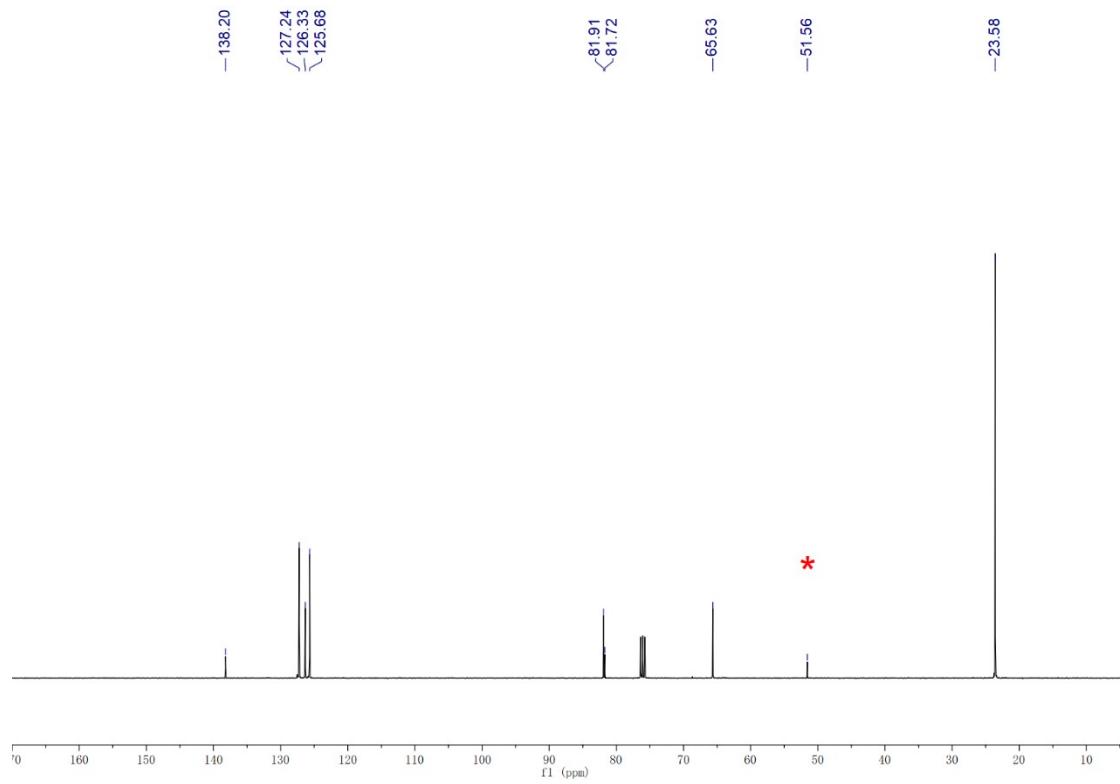


Figure S1.15.2 ^{13}C NMR spectrum of compound **4o** in CDCl_3

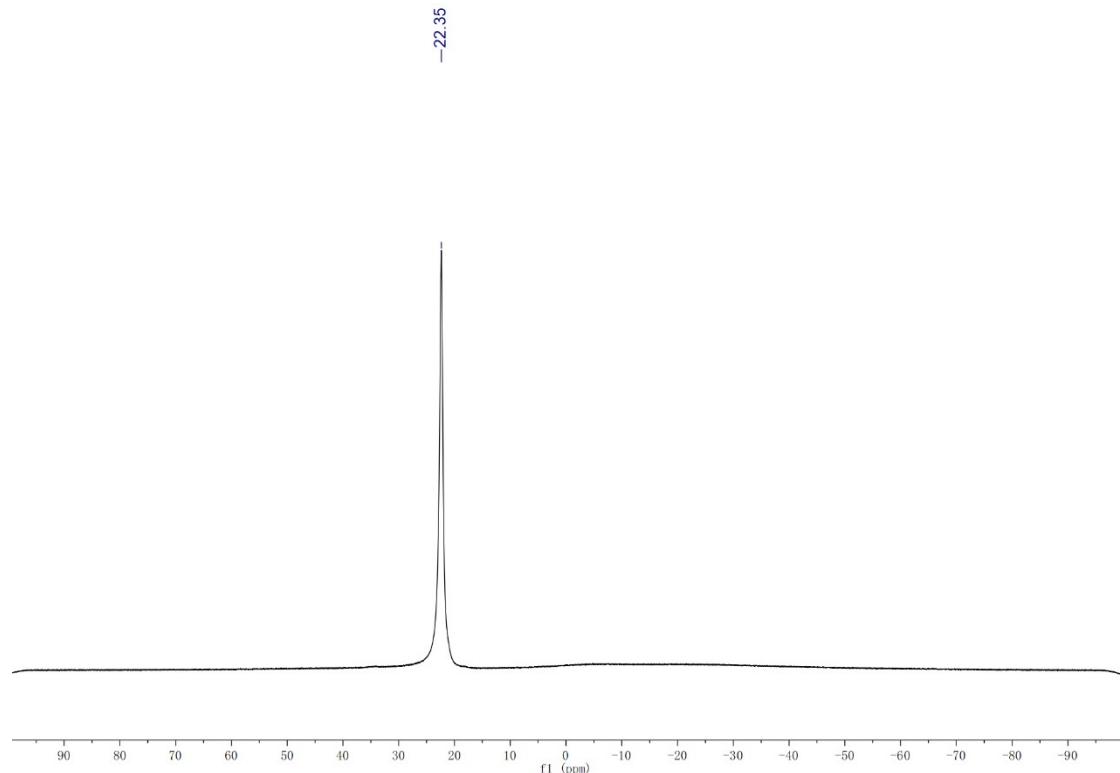


Figure S1.15.3 ^{11}B NMR spectrum of compound **4o** in CDCl_3

¹H, ¹³C and ¹¹B NMR Spectra of Hydroboration Products of Esters.

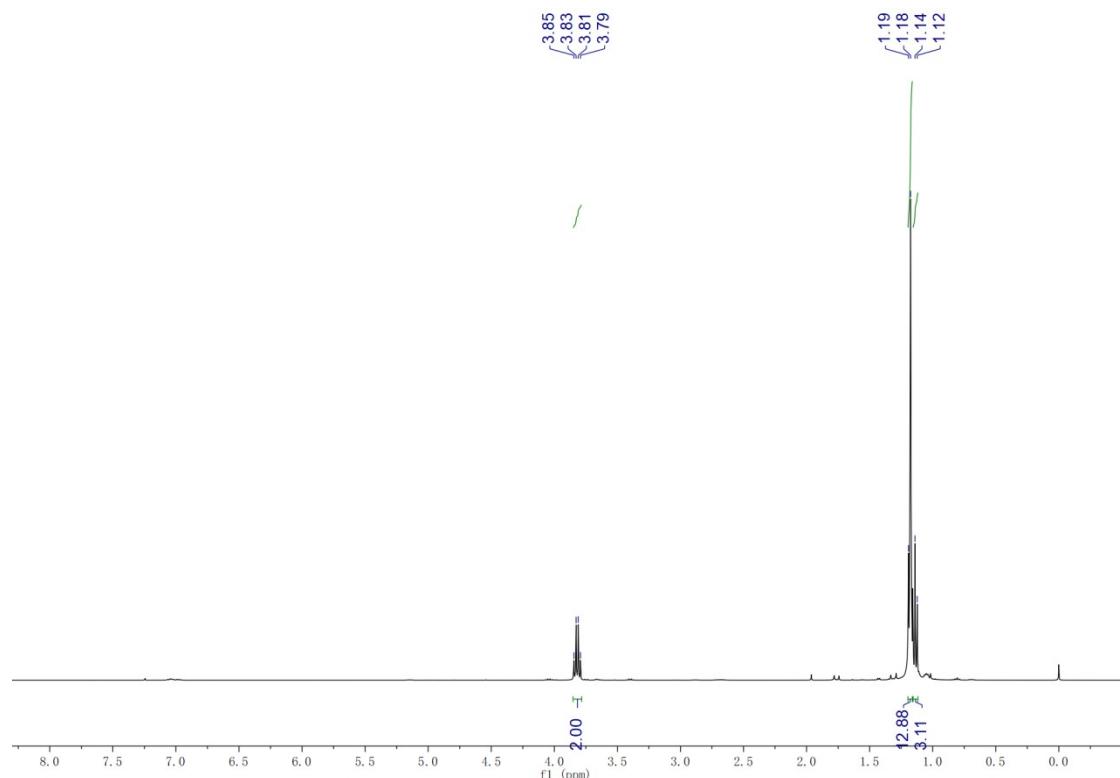


Figure S2.1.1 ¹H NMR spectrum of compound **6a** in CDCl_3

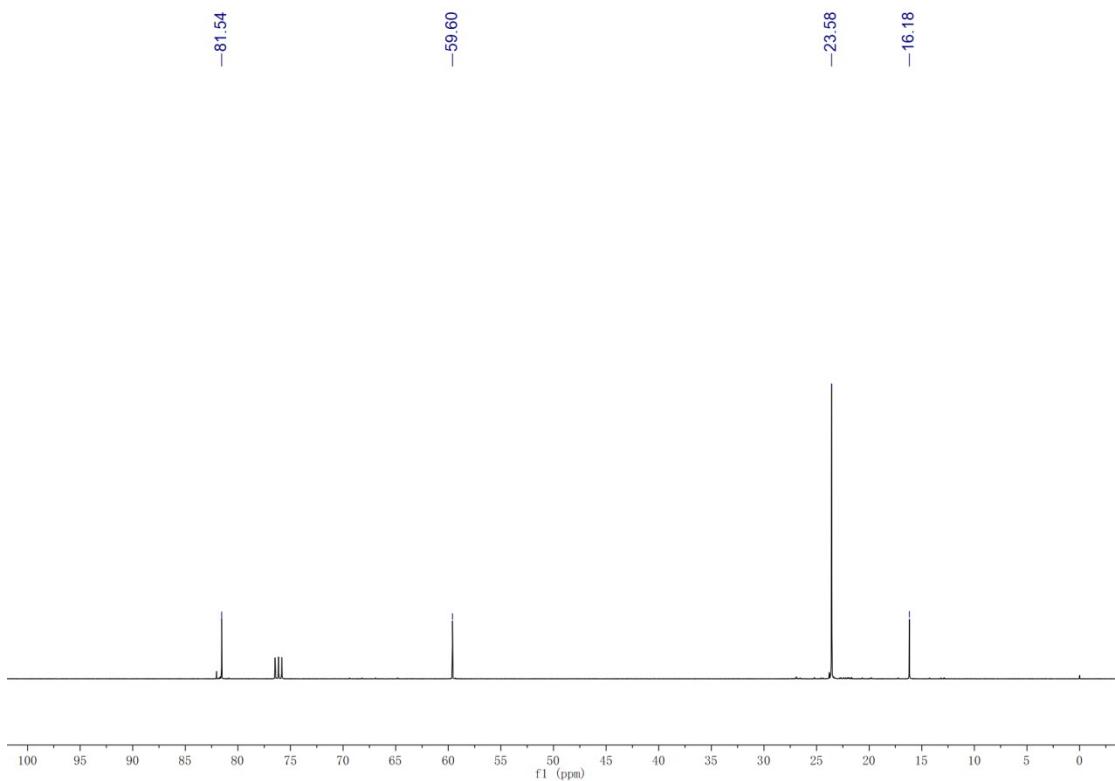


Figure S2.1.2 ^{13}C NMR spectrum of compound **6a** in CDCl_3

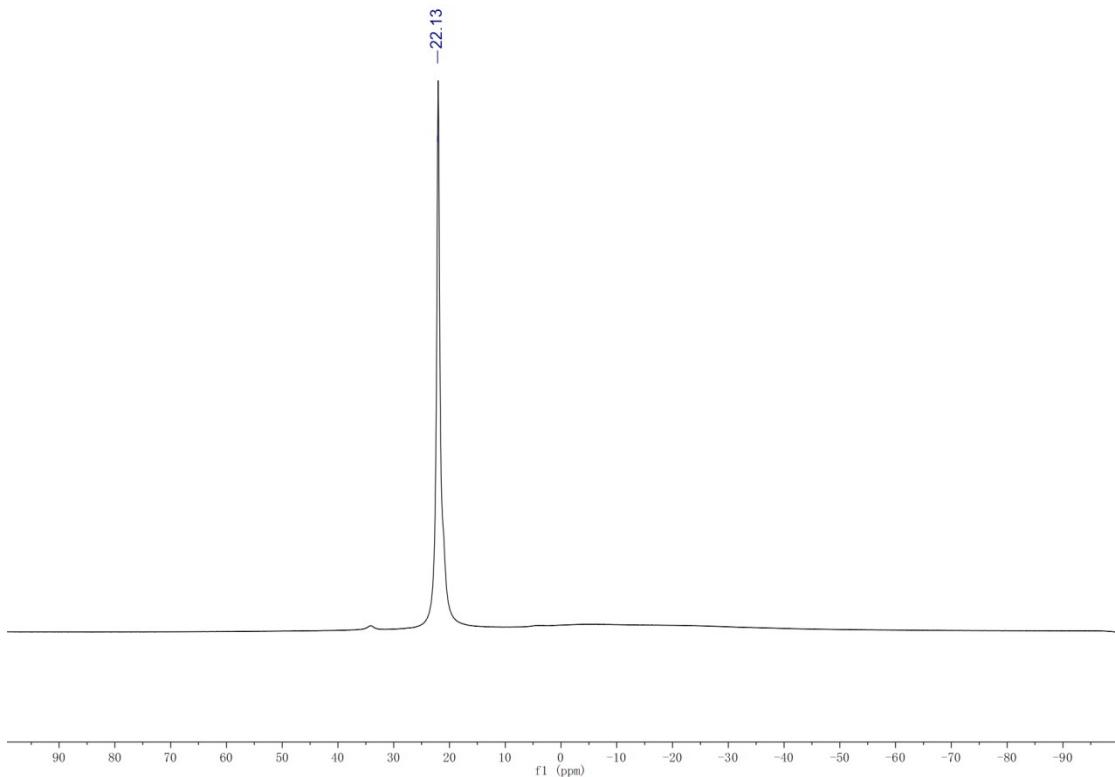


Figure S2.1.3 ^{11}B NMR spectrum of compound **6a** in CDCl_3

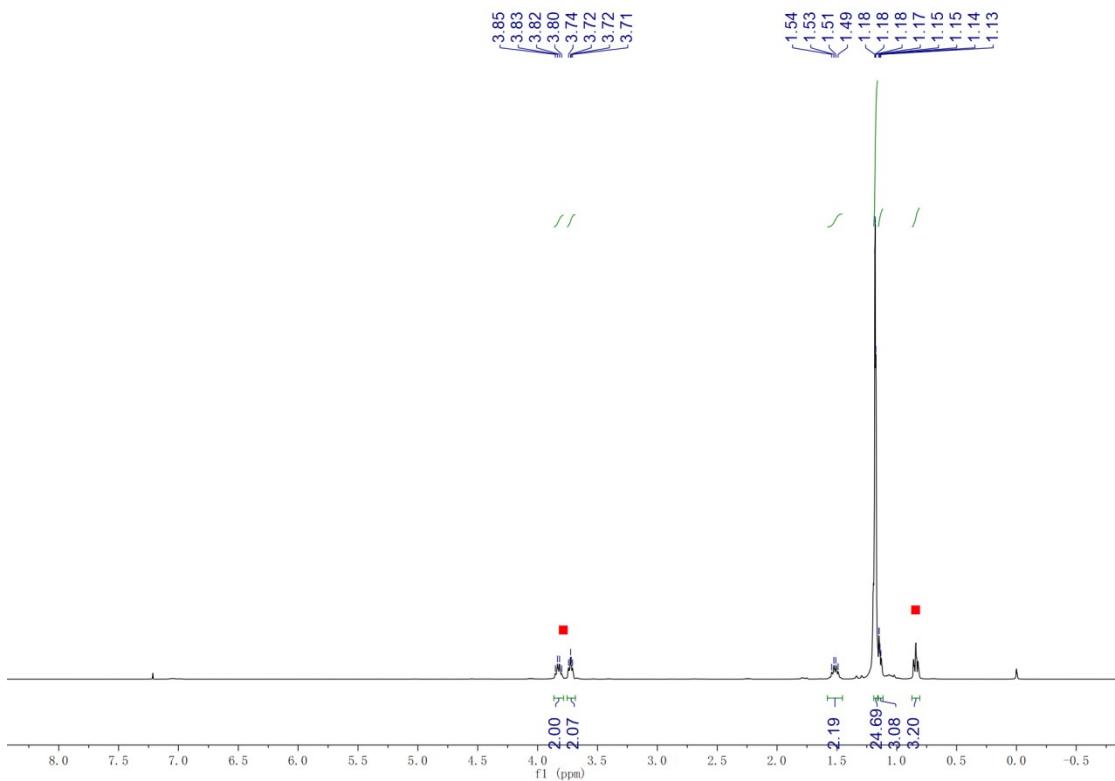


Figure S2.2.1 ^1H NMR spectrum of compound **6b** in CDCl_3

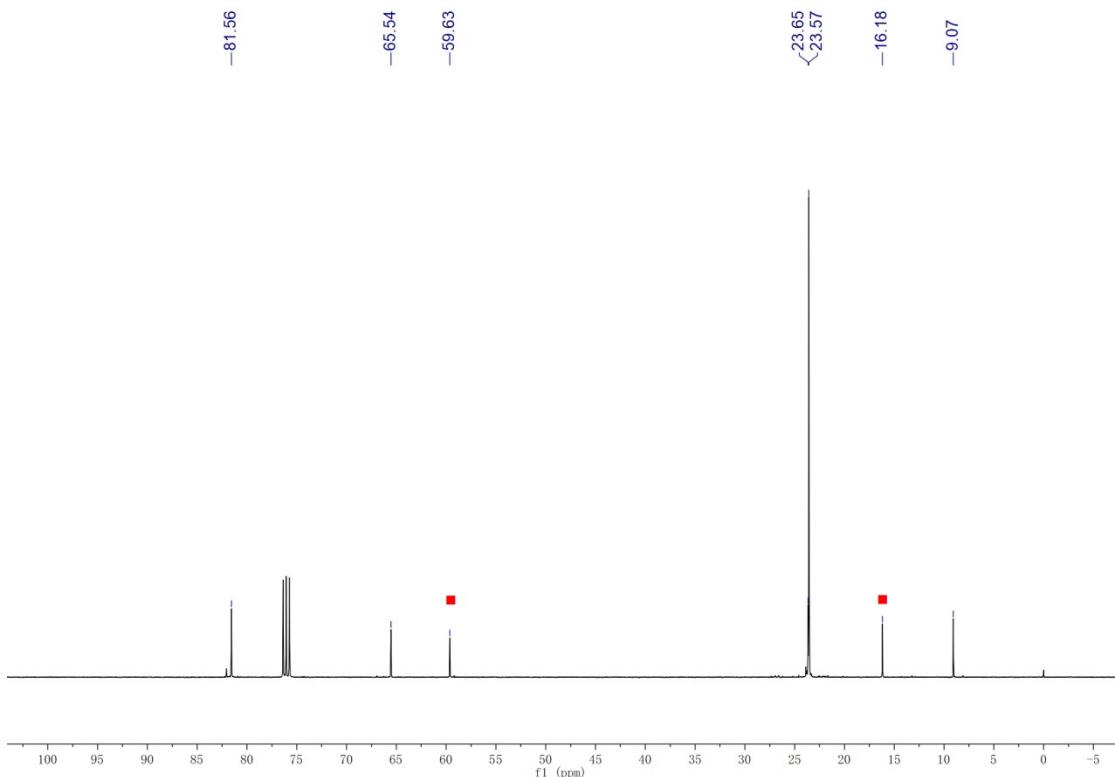


Figure S2.2.2 ^{13}C NMR spectrum of compound **6b** in CDCl_3

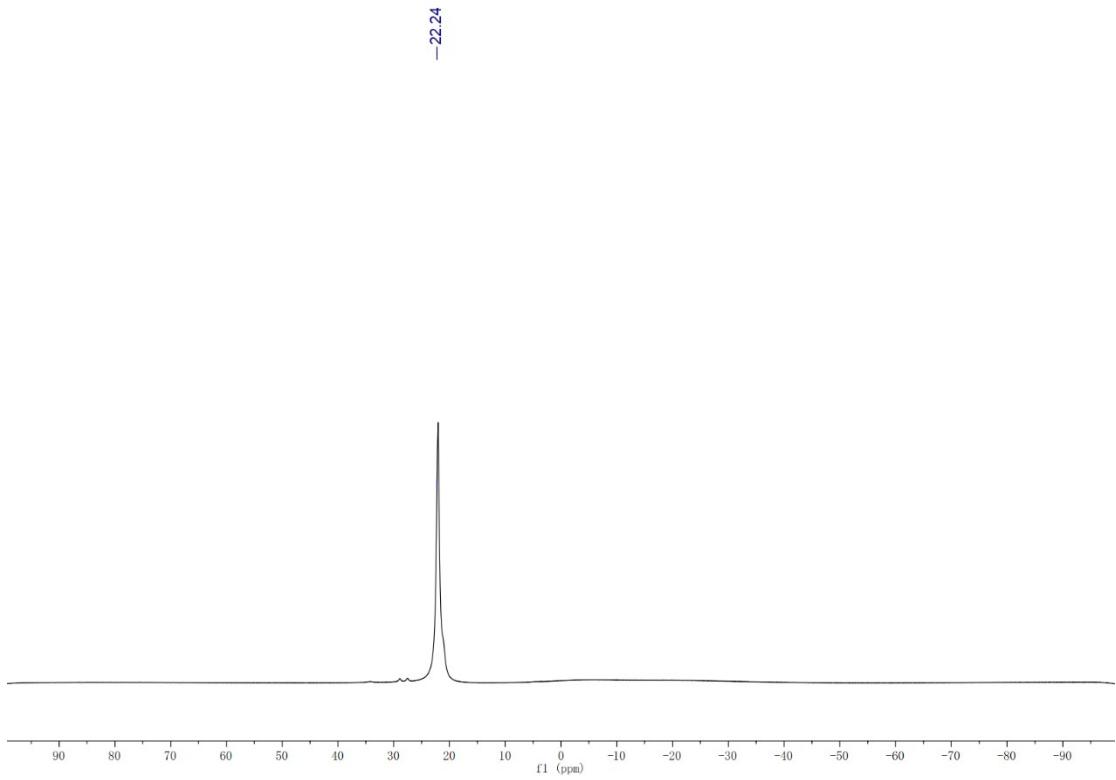


Figure S2.2.3 ¹¹B NMR spectrum of compound **6b** in CDCl₃

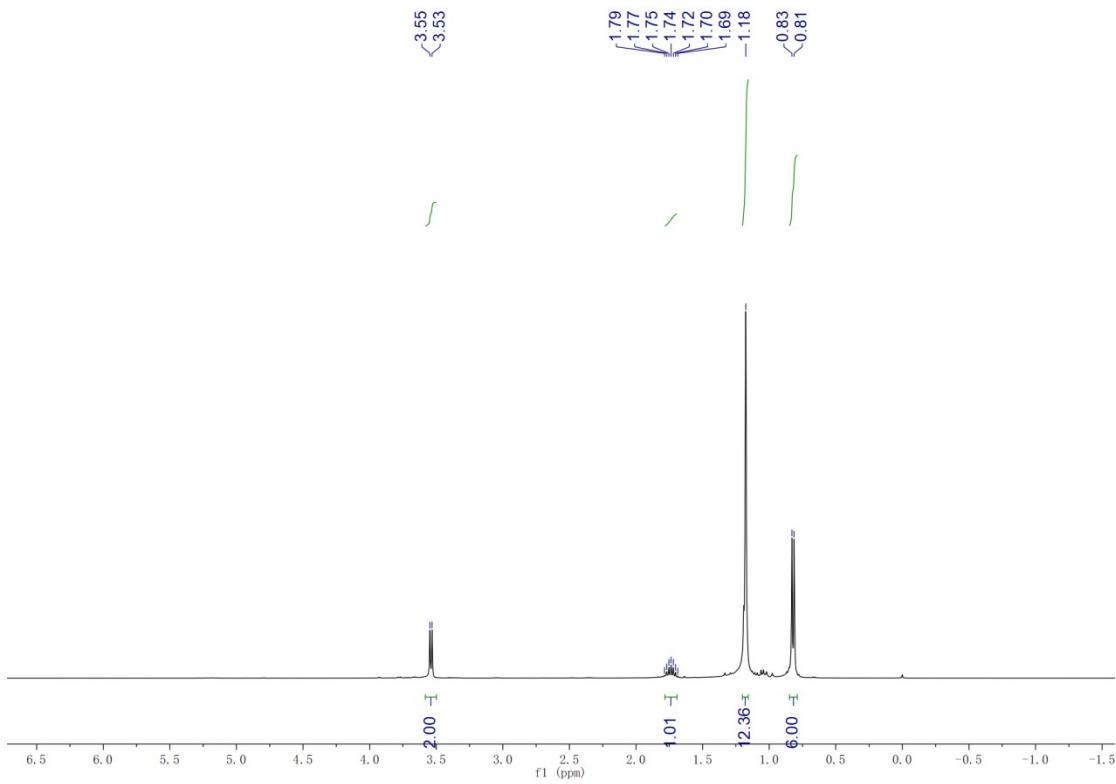


Figure S2.3.1 ¹H NMR spectrum of compound **6c** in CDCl₃

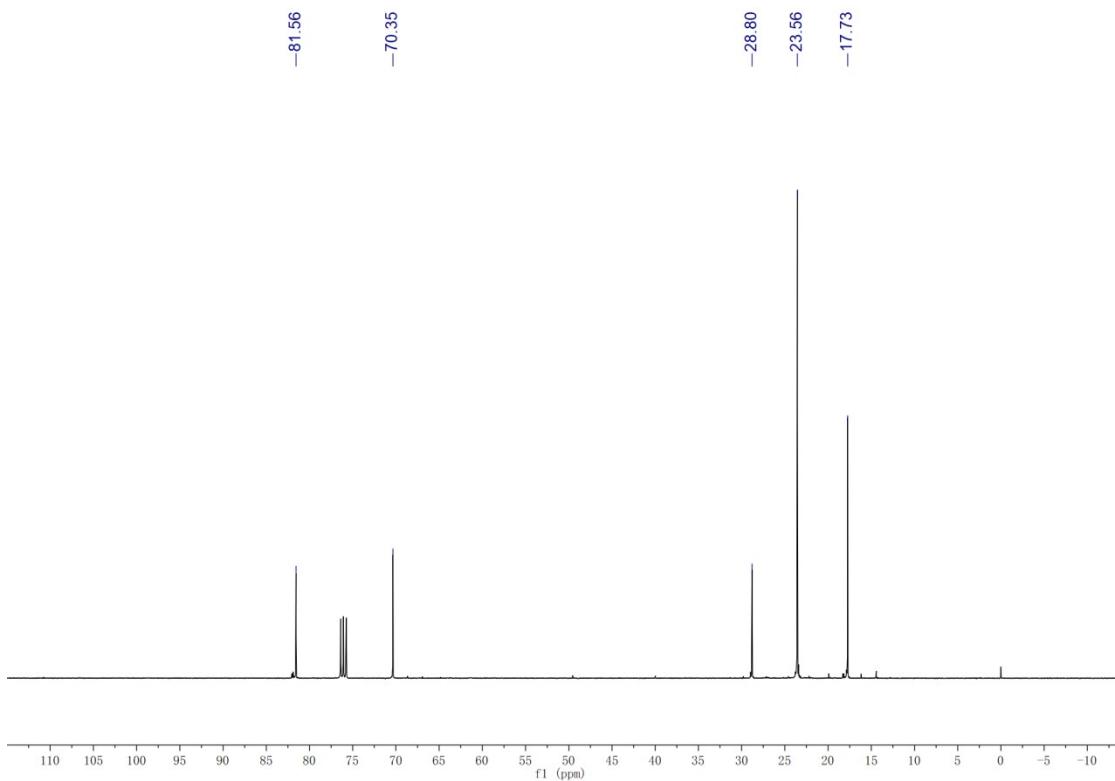


Figure S2.3.2 ^{13}C NMR spectrum of compound **6c** in CDCl_3

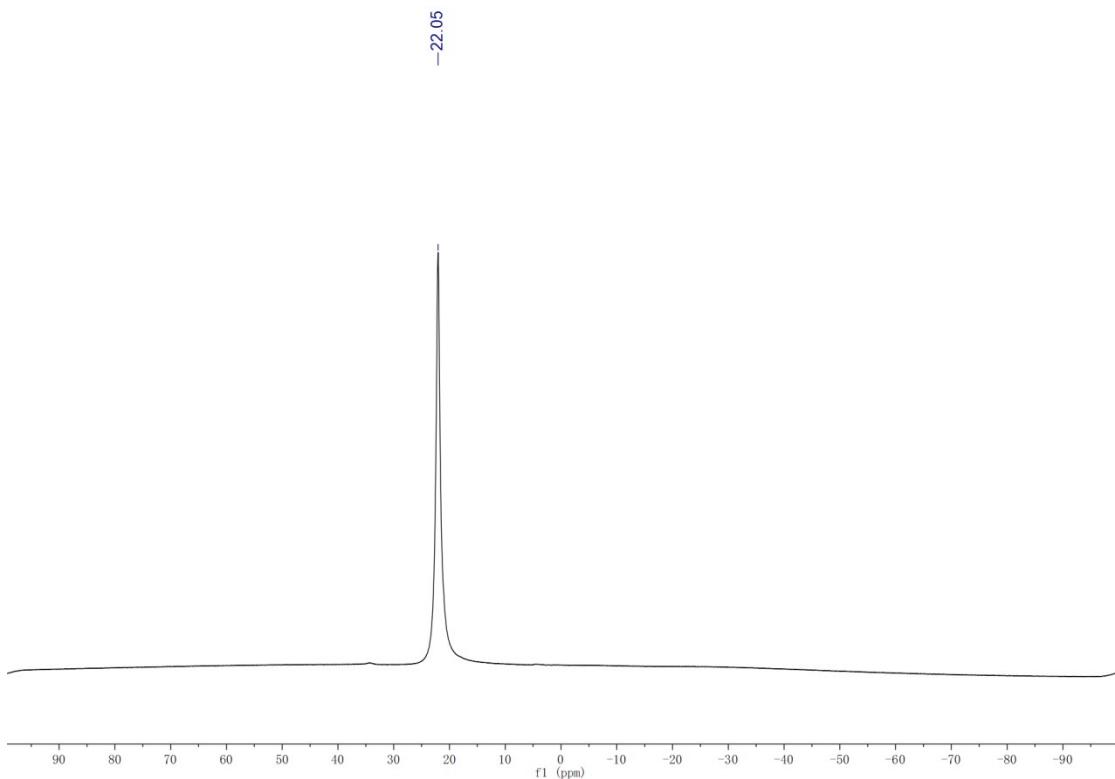
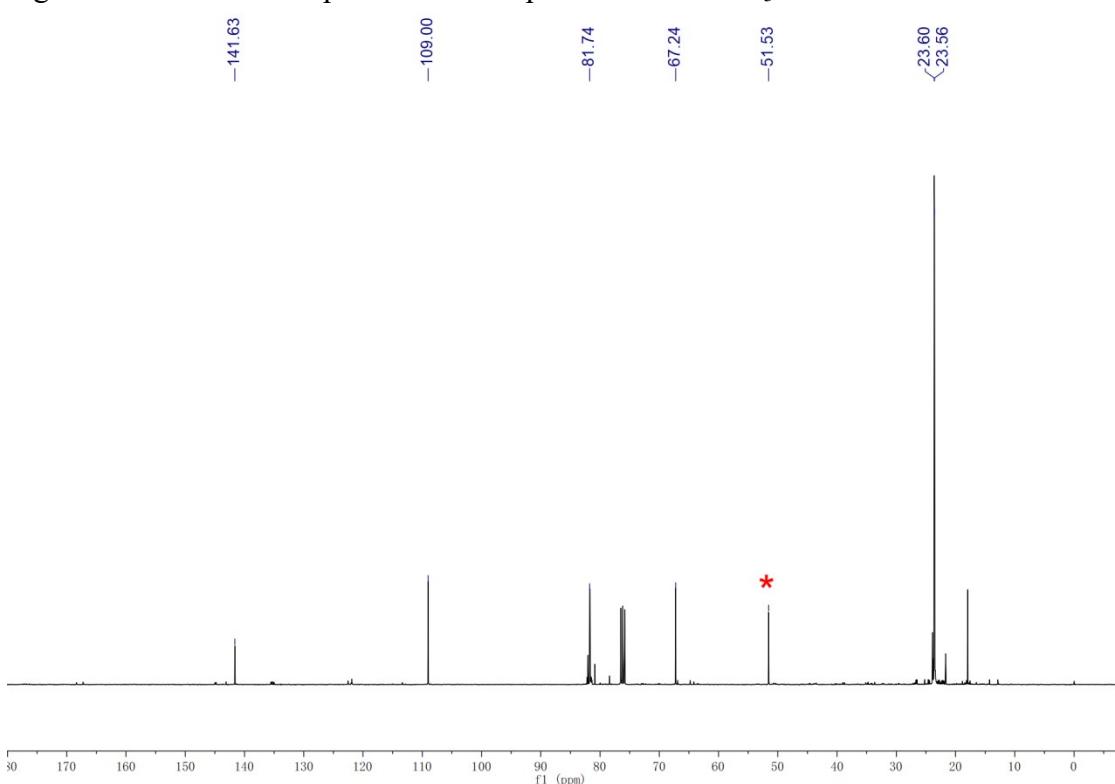
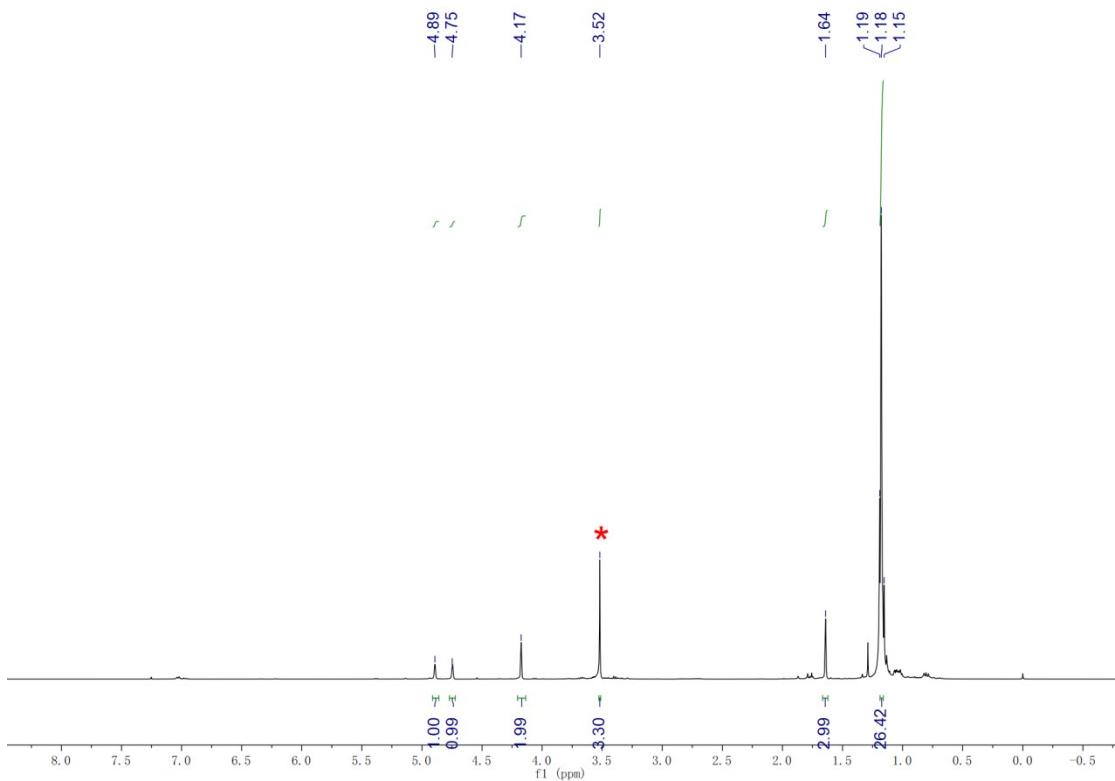


Figure S2.3.3 ^{11}B NMR spectrum of compound **6c** in CDCl_3



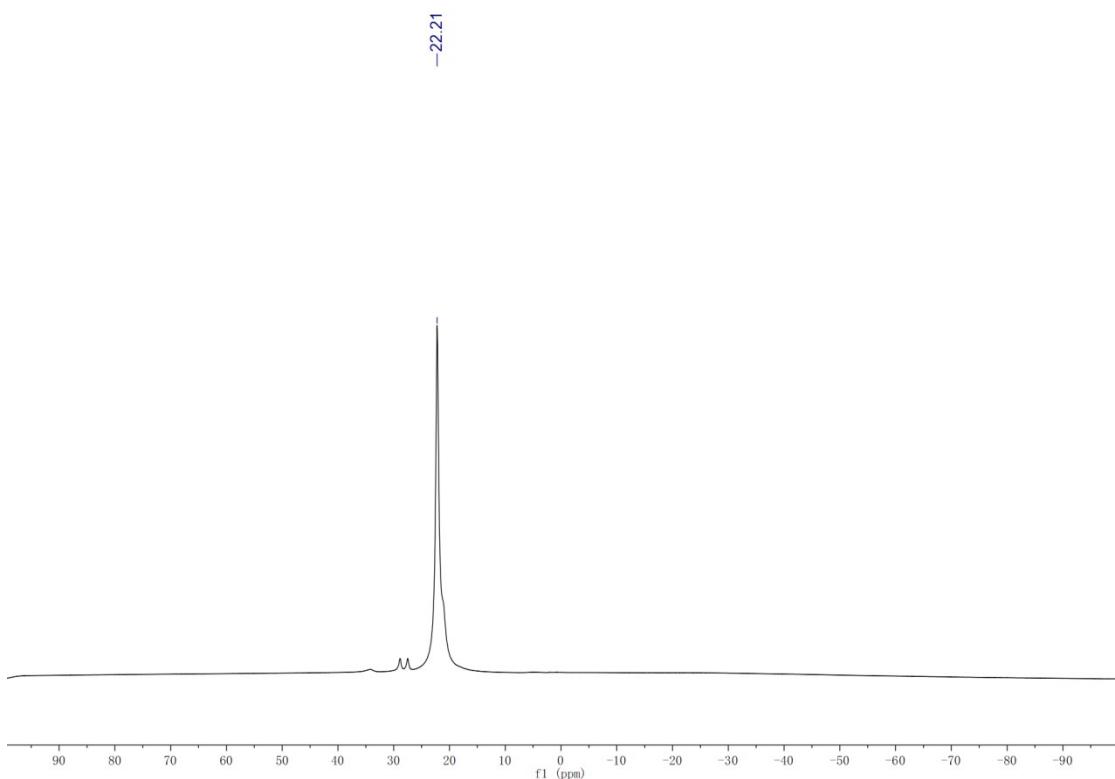


Figure S2.4.3 ^{11}B NMR spectrum of compound **6d** in CDCl_3

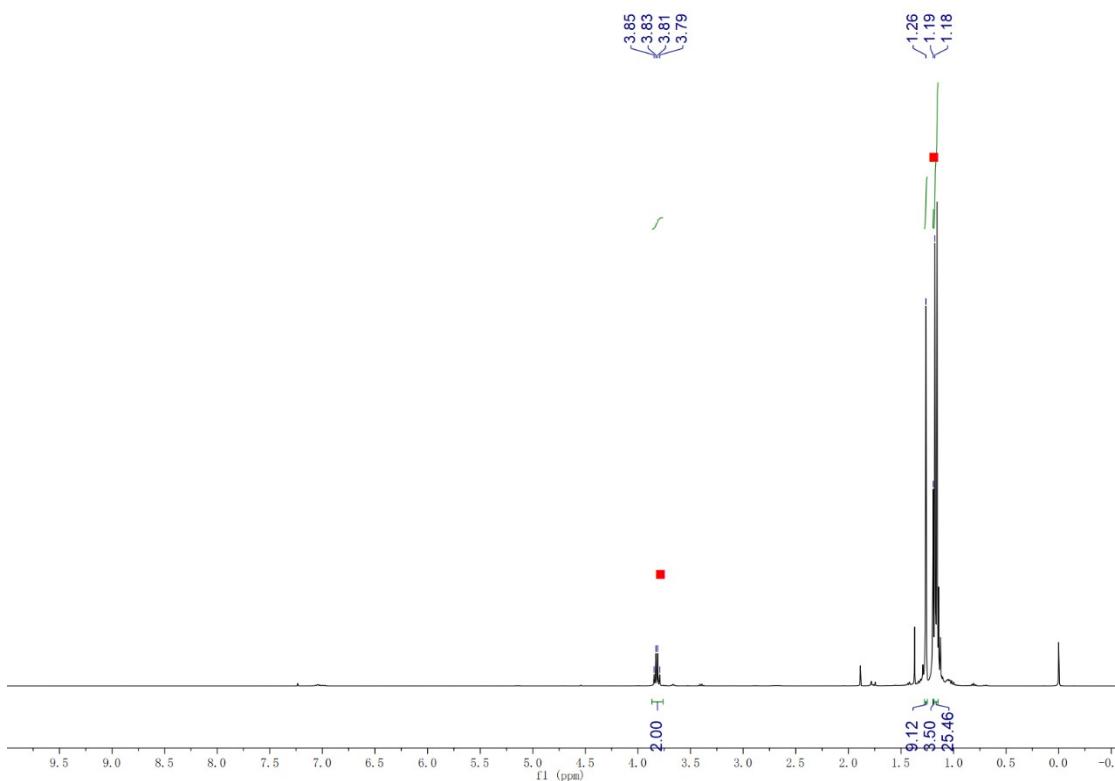


Figure S2.5.1 ^1H NMR spectrum of compound **6e** in CDCl_3

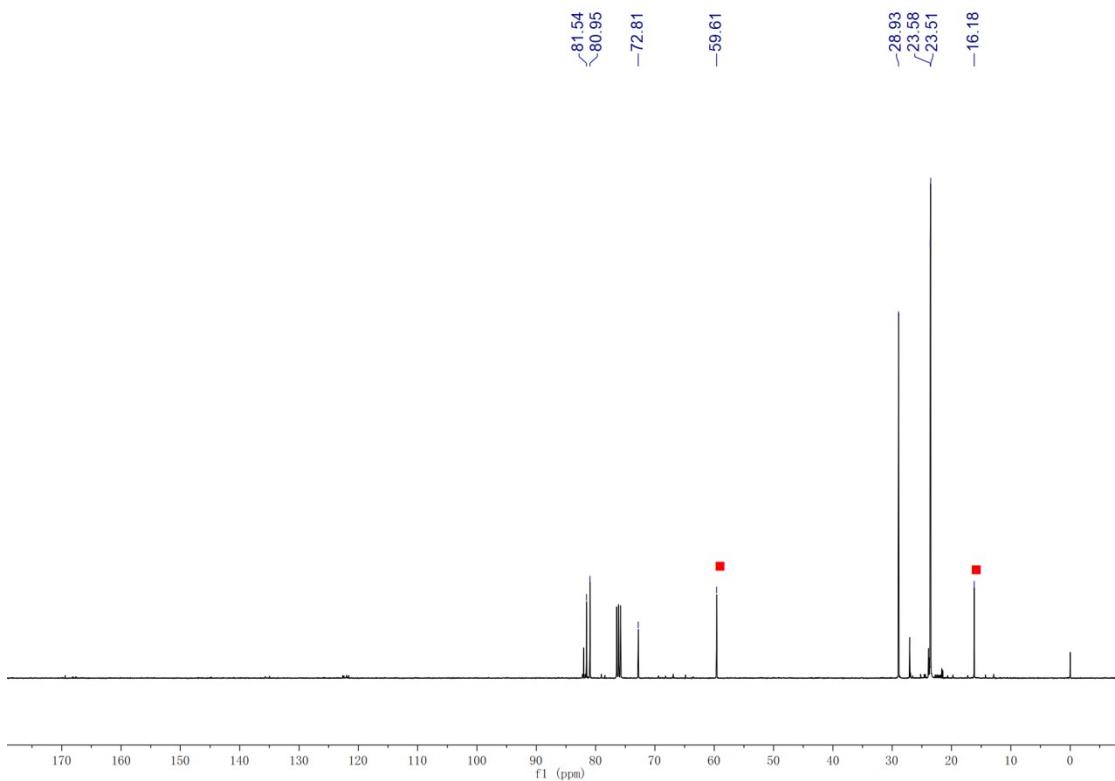


Figure S2.5.2 ^{13}C NMR spectrum of compound **6e** in CDCl_3

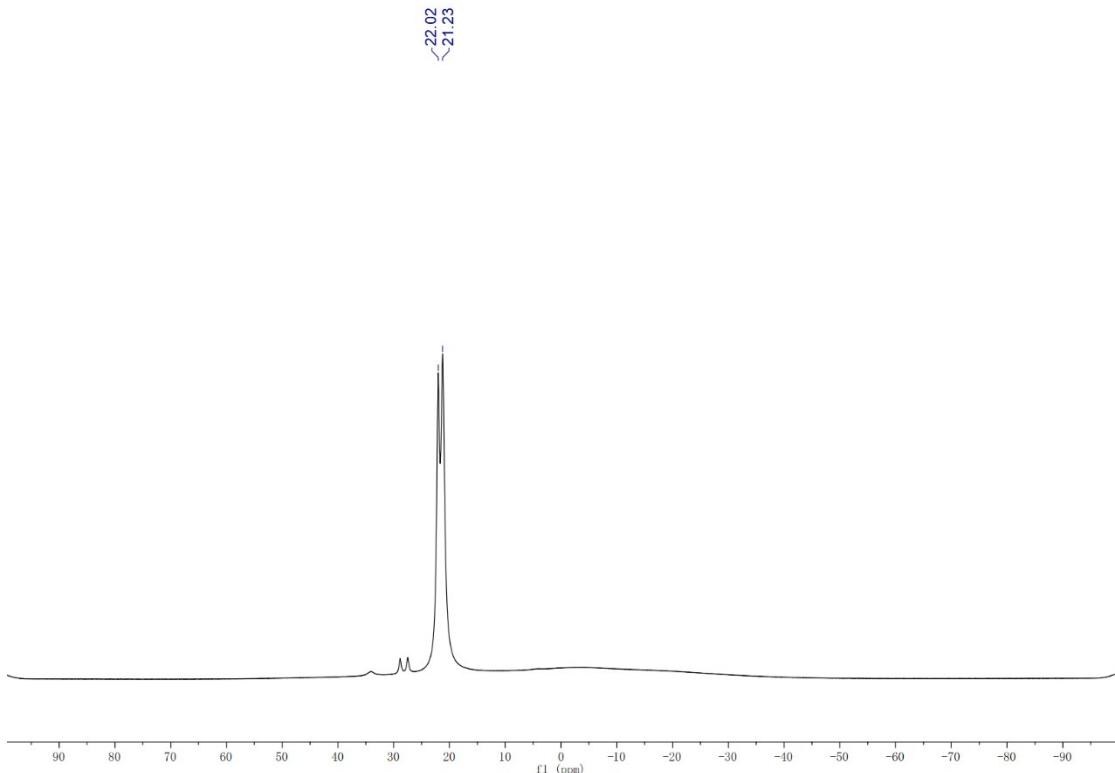


Figure S2.5.3 ^{11}B NMR spectrum of compound **6e** in CDCl_3

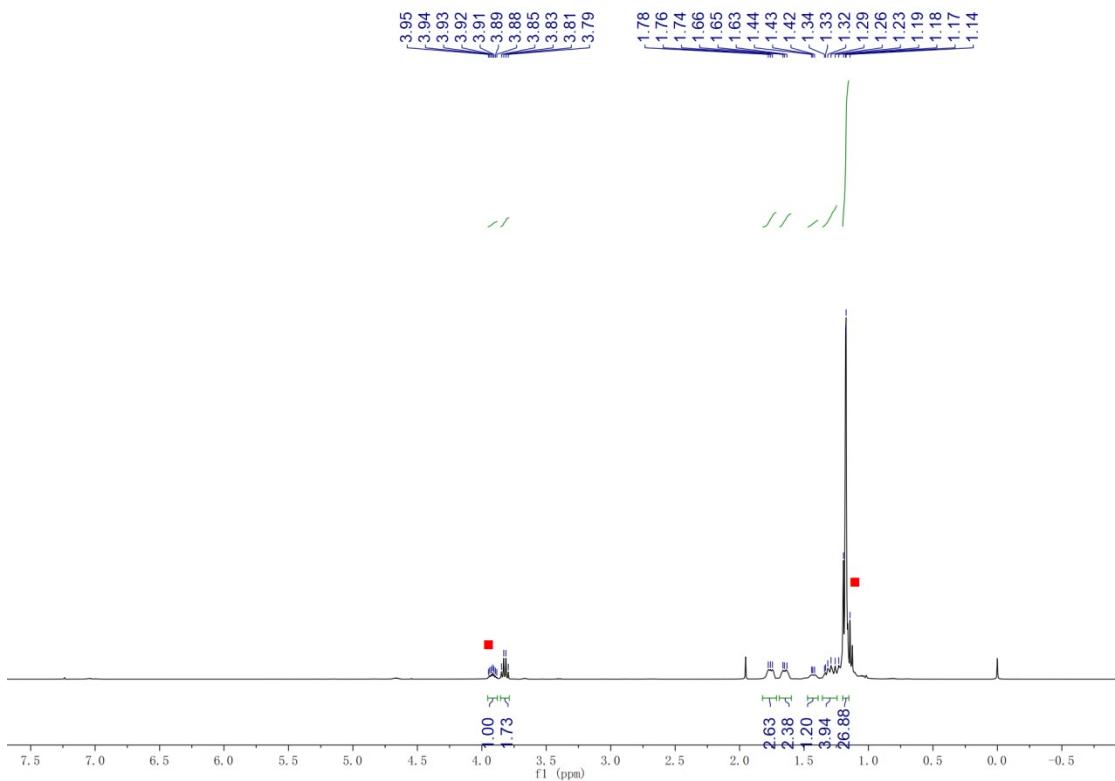


Figure S2.6.1 ^1H NMR spectrum of compound **6f** in CDCl_3

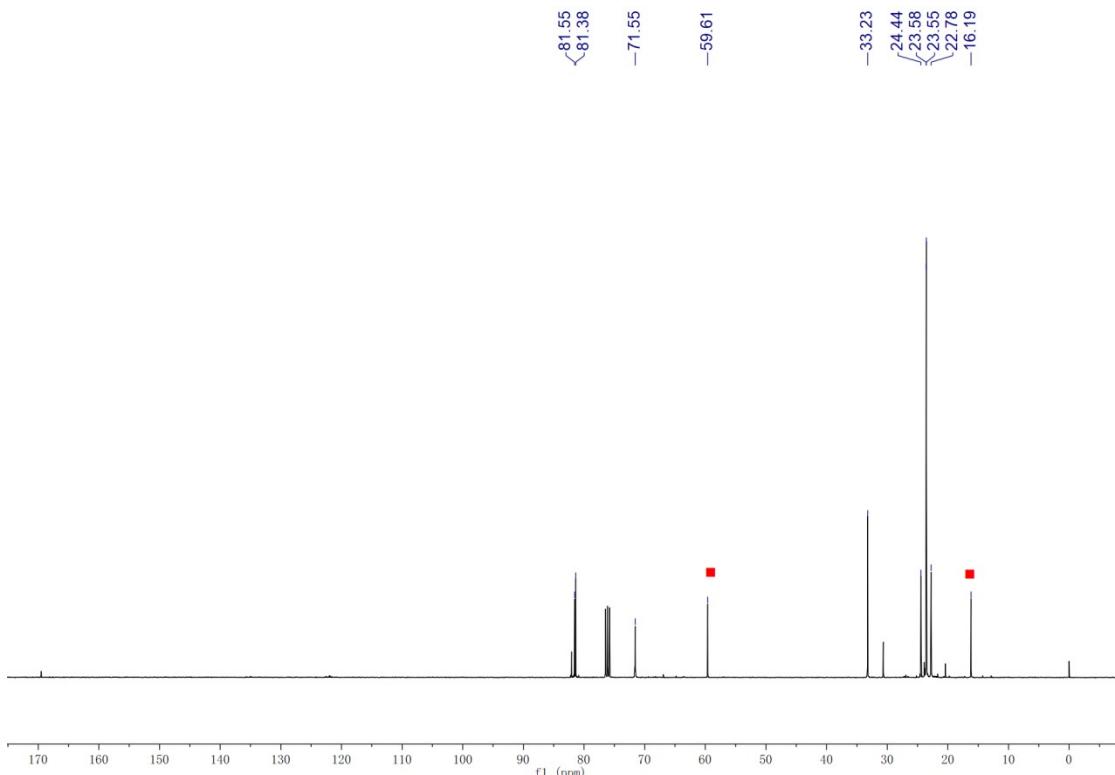


Figure S2.6.2 ^{13}C NMR spectrum of compound **6f** in CDCl_3

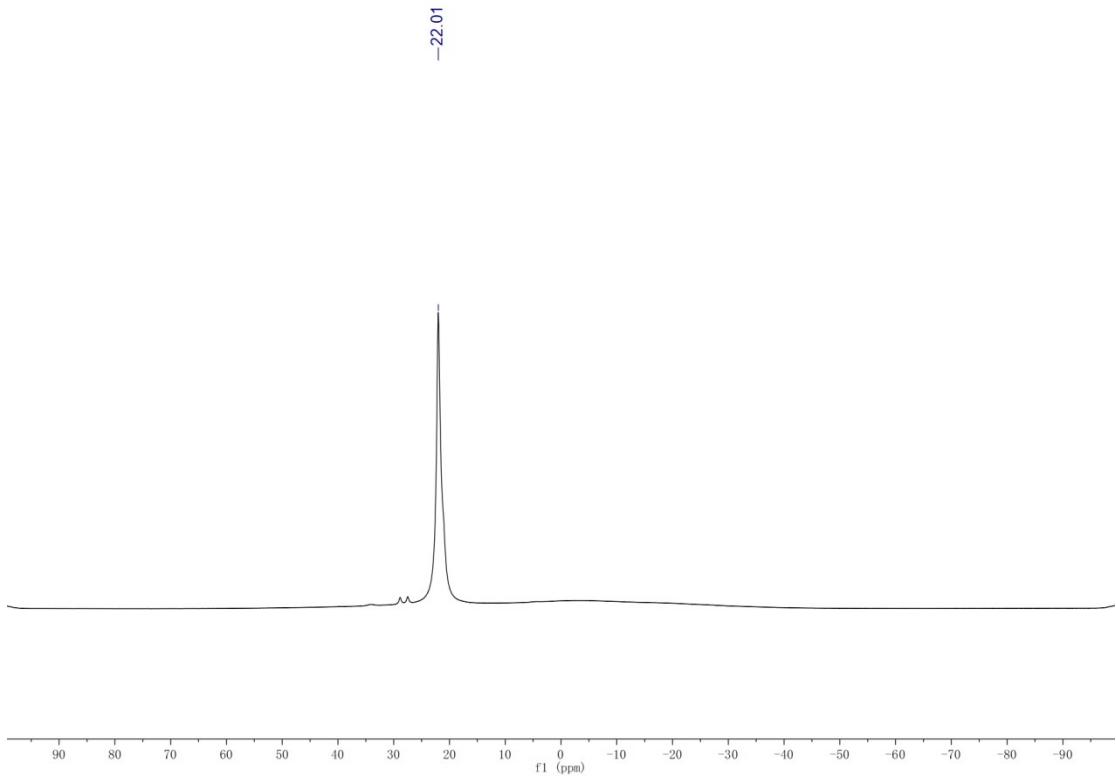


Figure S2.6.3 ¹¹B NMR spectrum of compound **6f** in CDCl_3

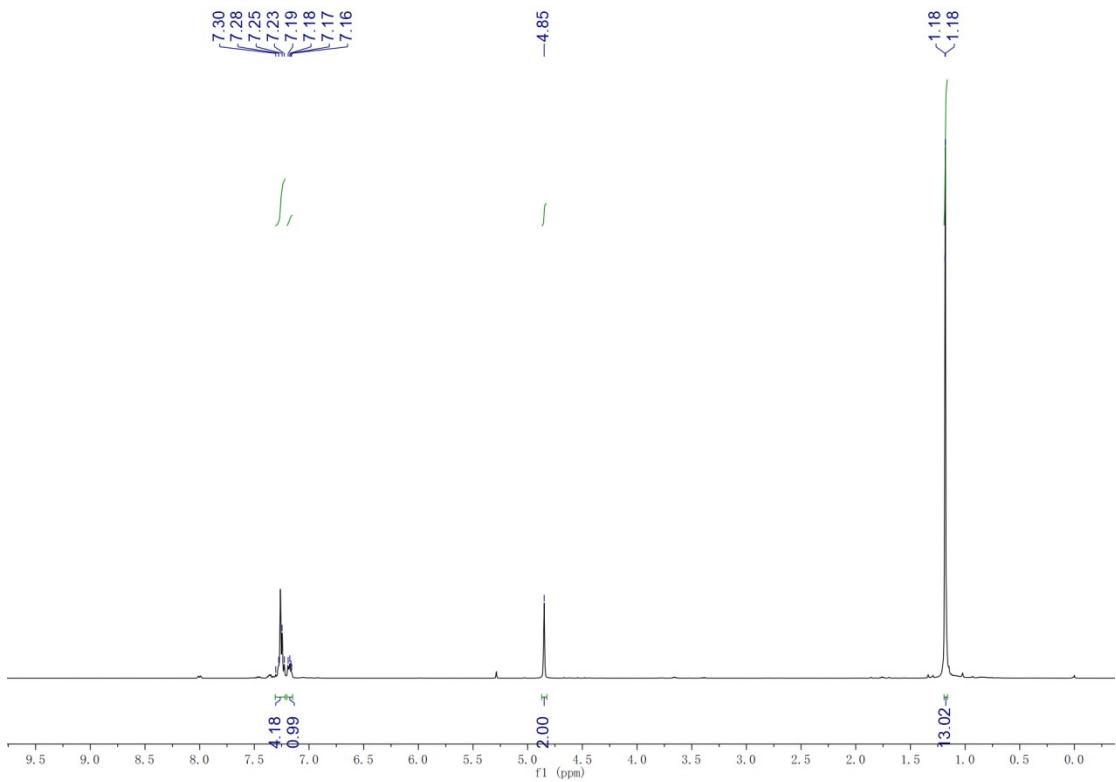


Figure S2.7.1 ¹H NMR spectrum of compound **6g** in CDCl_3

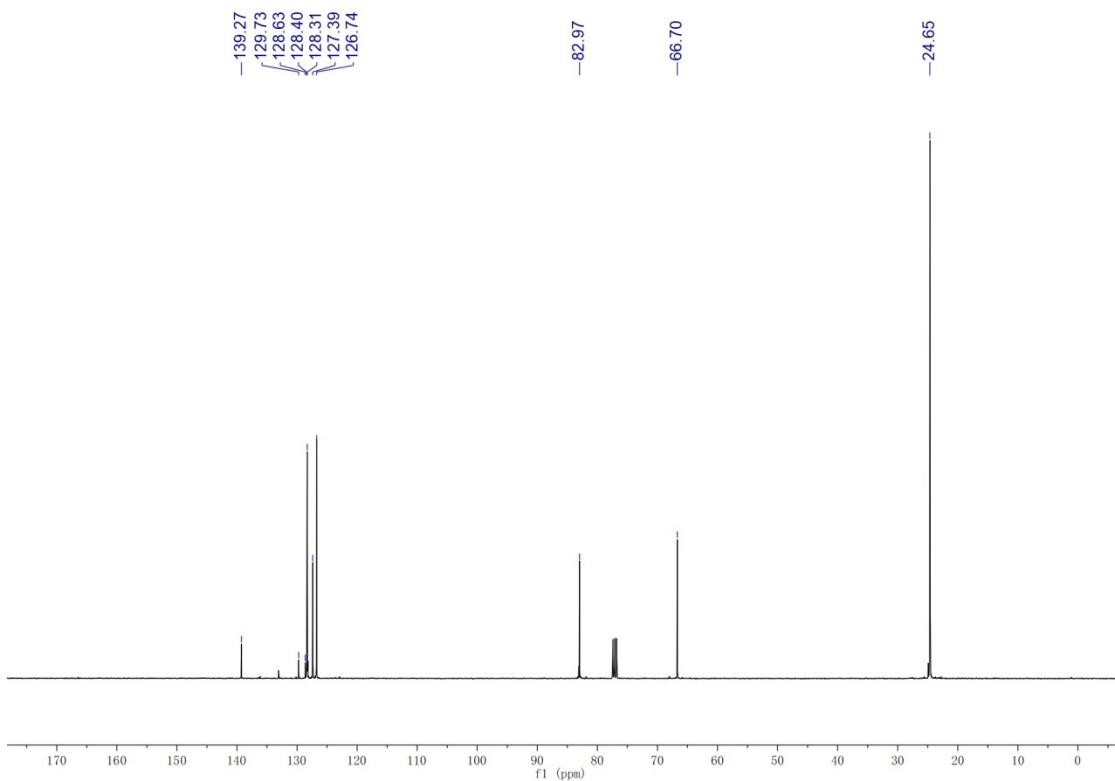


Figure S2.7.2 ^{13}C NMR spectrum of compound **6g** in CDCl_3

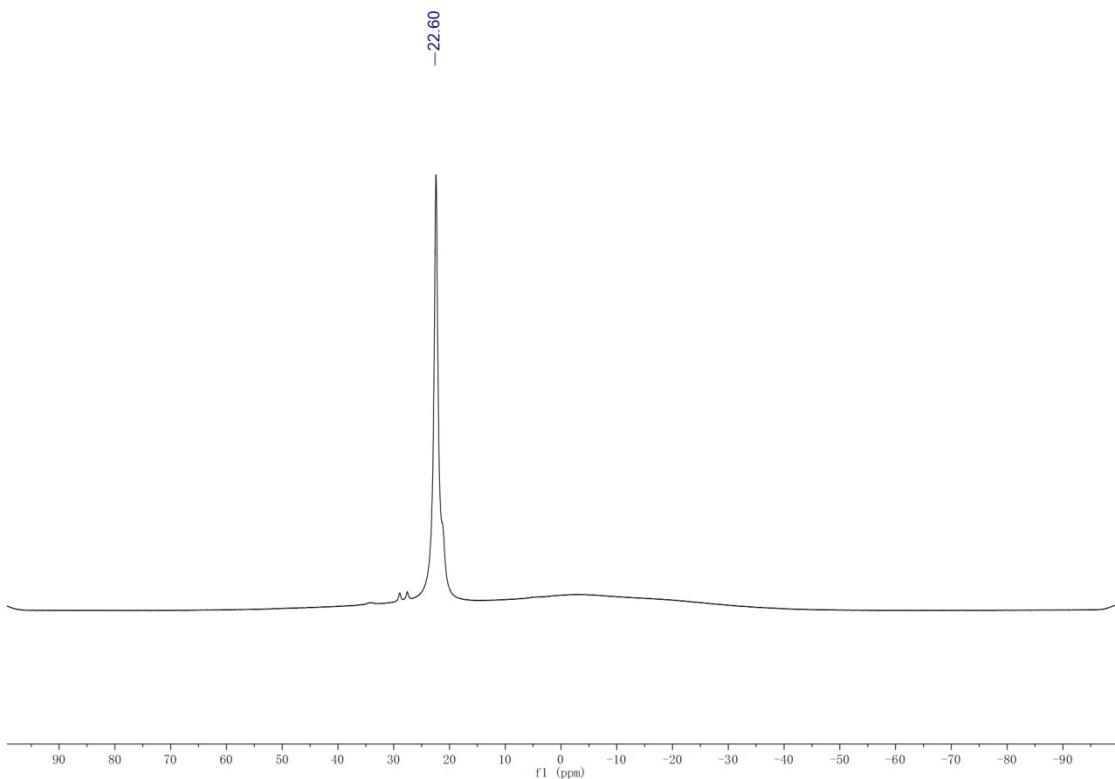


Figure S2.7.3 ^{11}B NMR spectrum of compound **6g** in CDCl_3

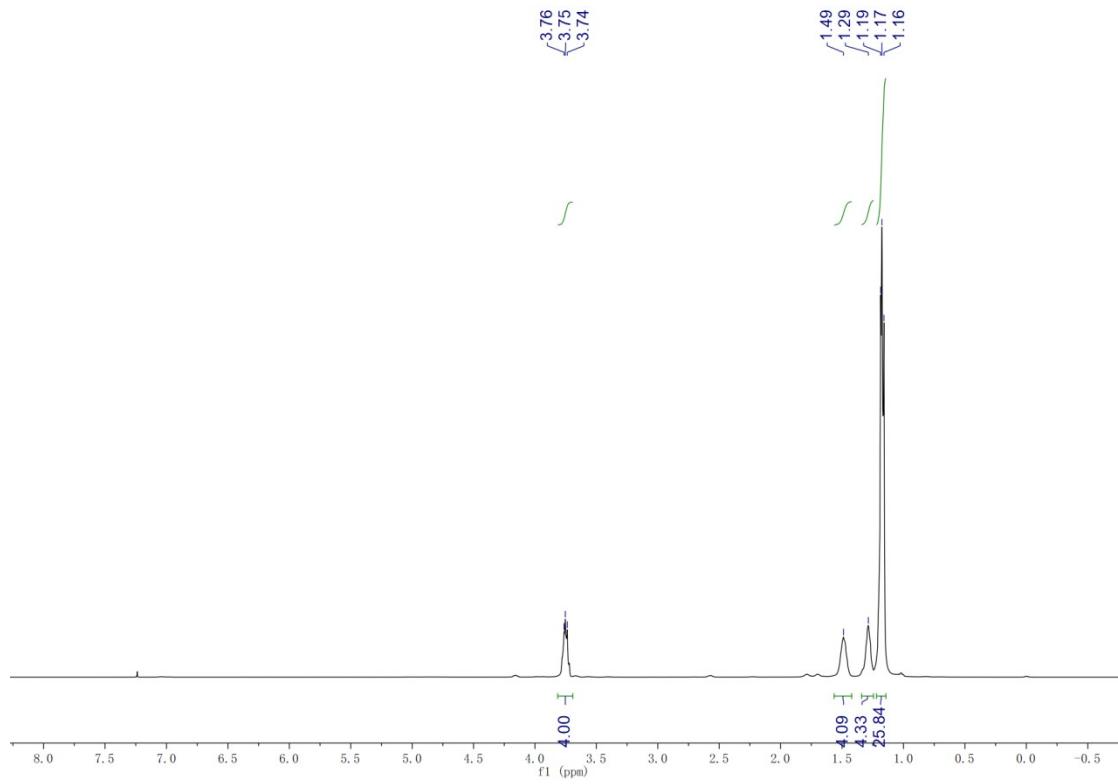


Figure S2.8.1 ^1H NMR spectrum of compound **6h** in CDCl_3

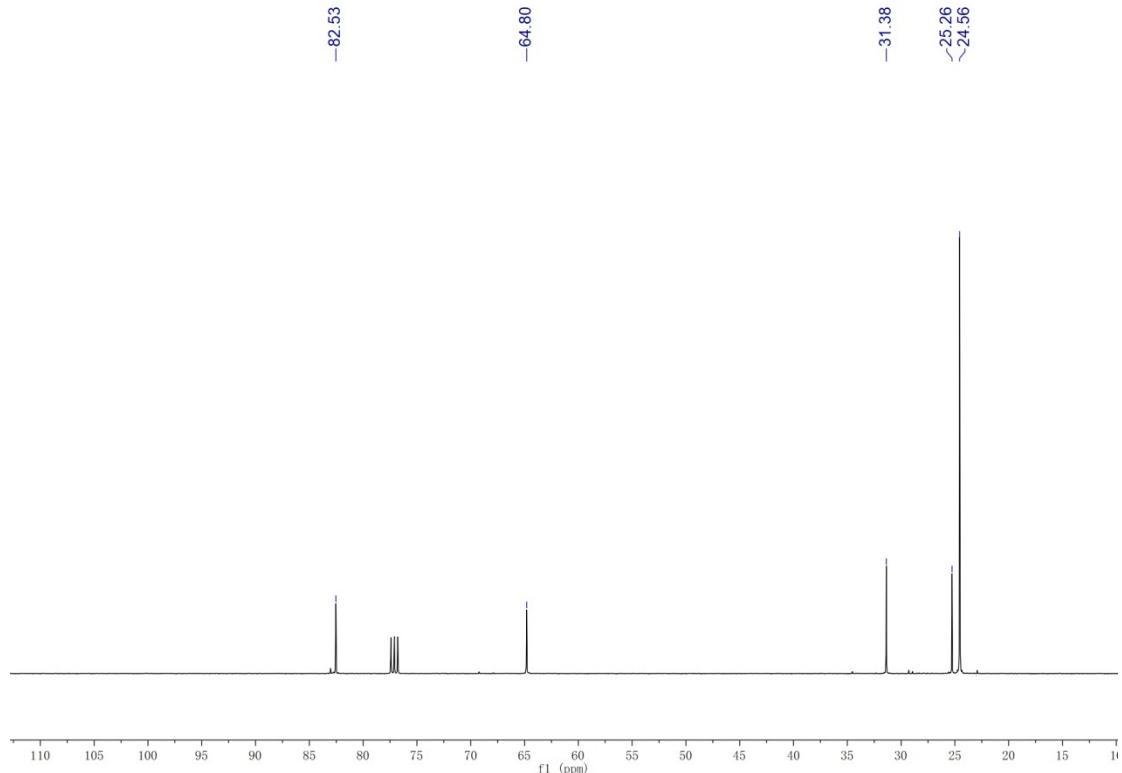


Figure S2.8.2 ^{13}C NMR spectrum of compound **6h** in CDCl_3

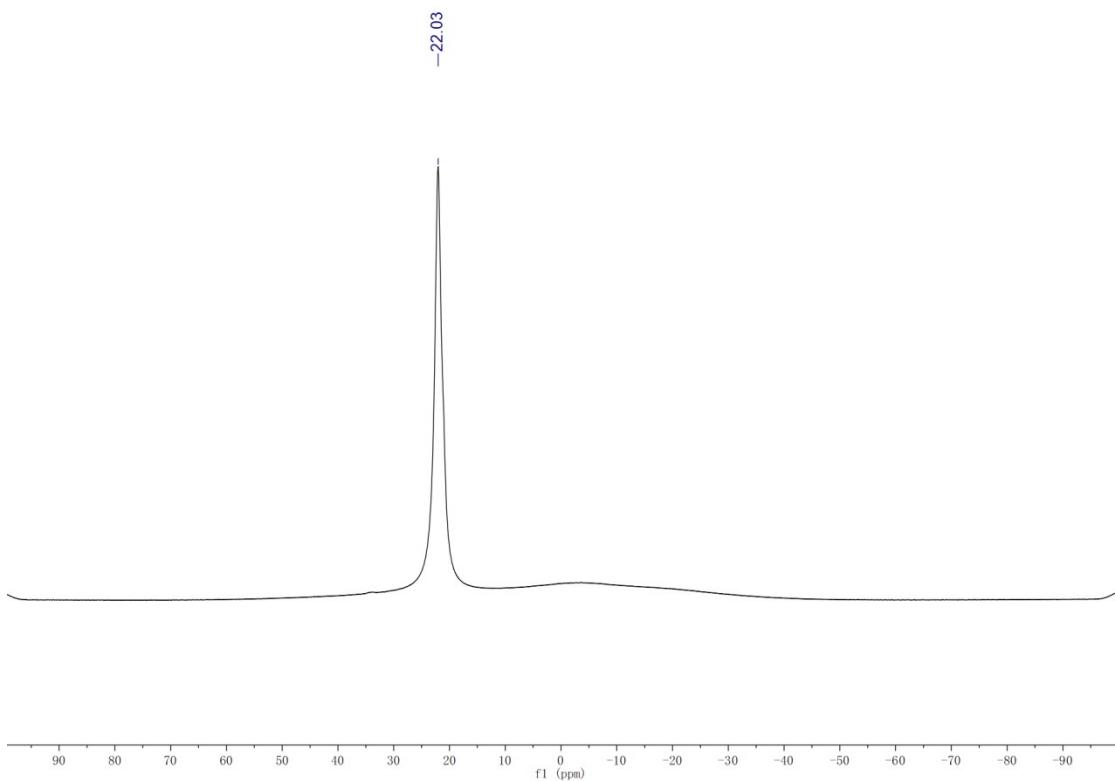


Figure S2.8.3 ¹¹B NMR spectrum of compound **6h** in CDCl₃

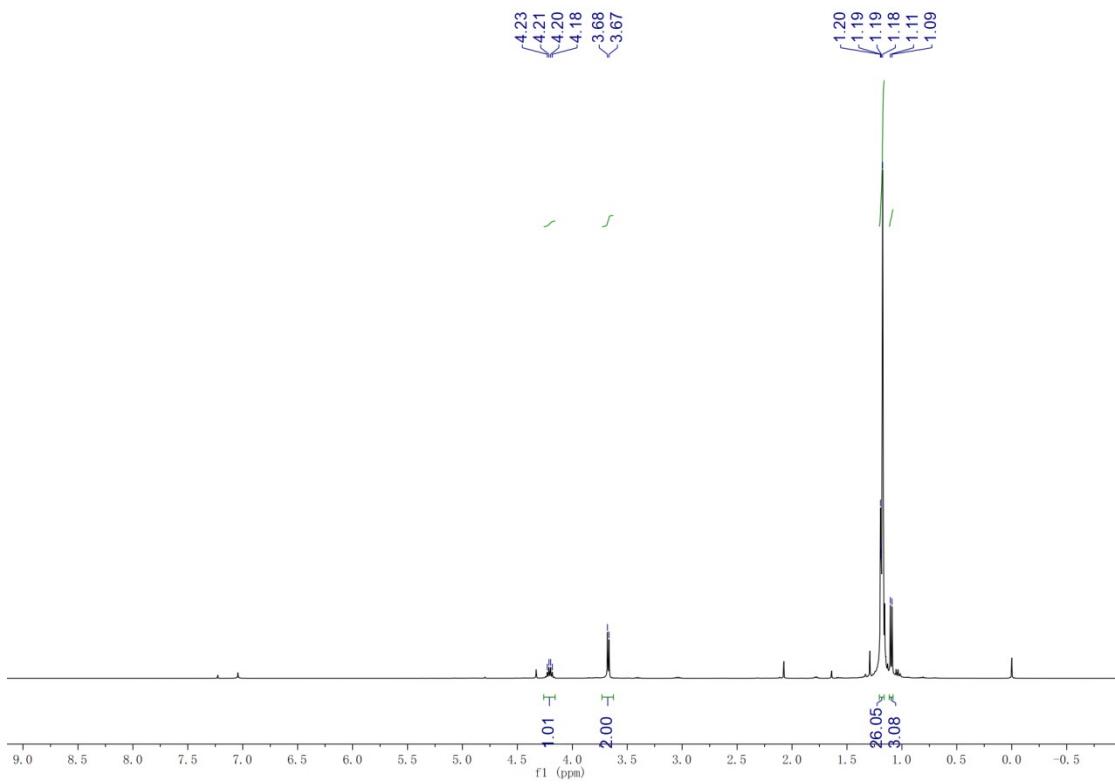


Figure S2.9.1 ¹H NMR spectrum of compound **6i** in CDCl₃

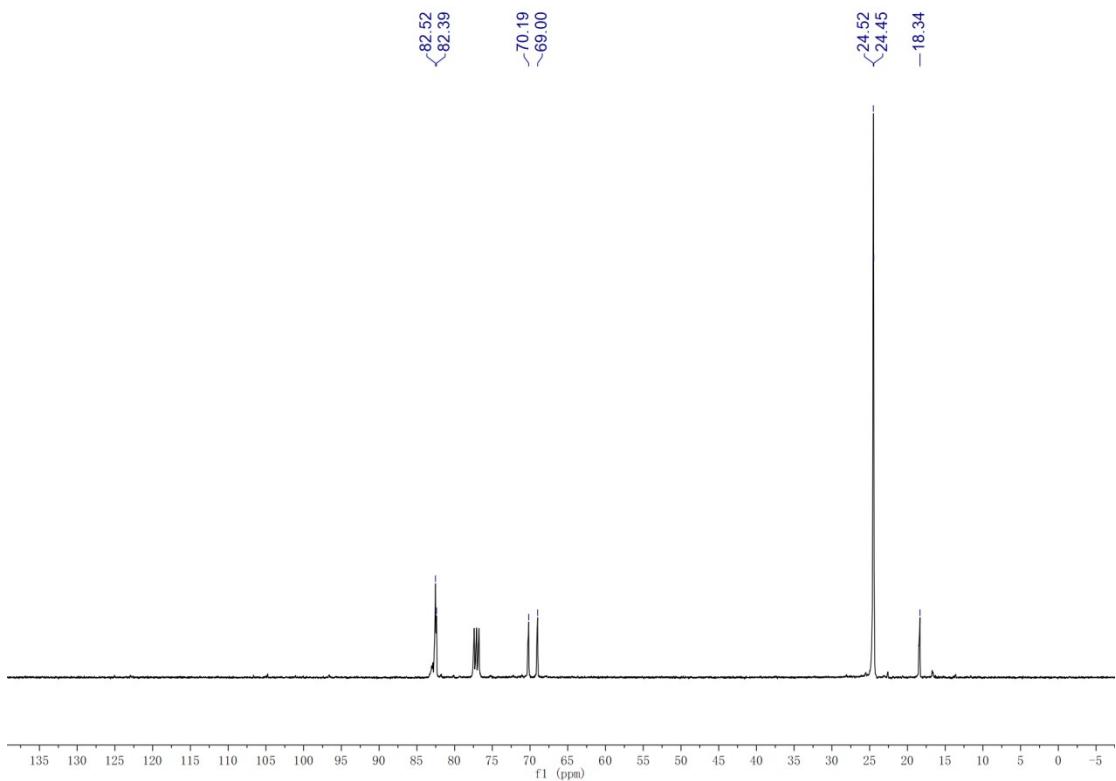


Figure S2.9.2 ^{13}C NMR spectrum of compound **6i** in CDCl_3

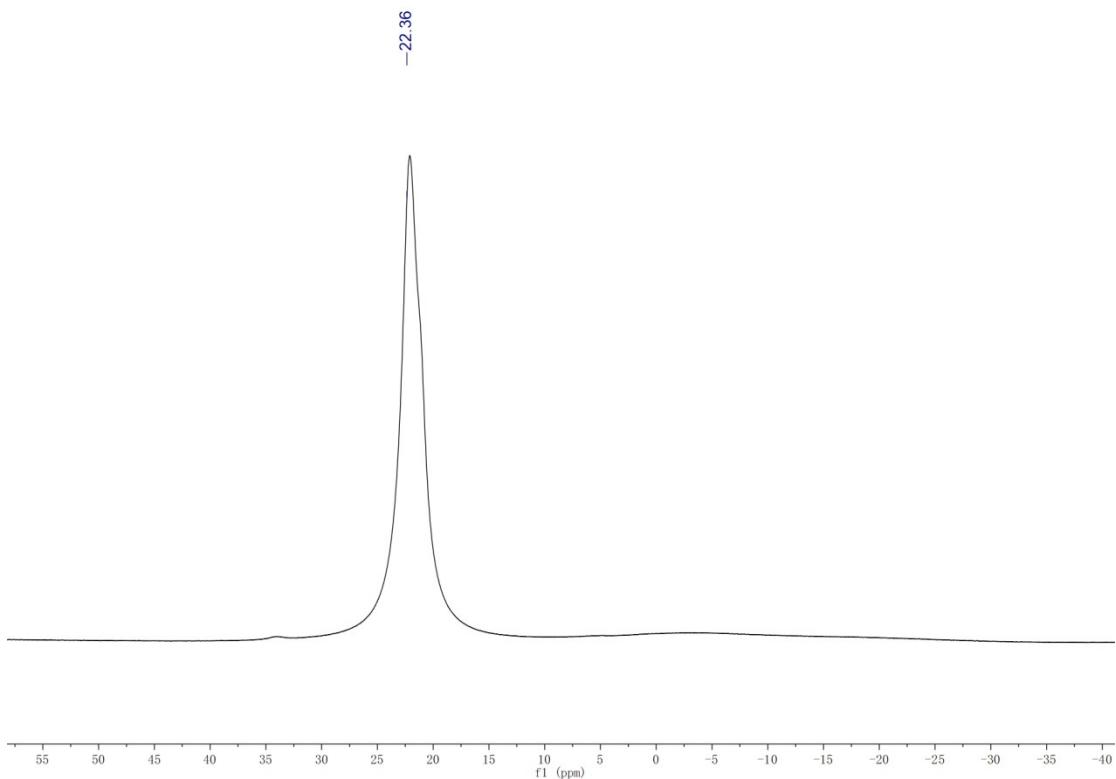


Figure S2.9.3 ^{11}B NMR spectrum of compound **6i** in CDCl_3

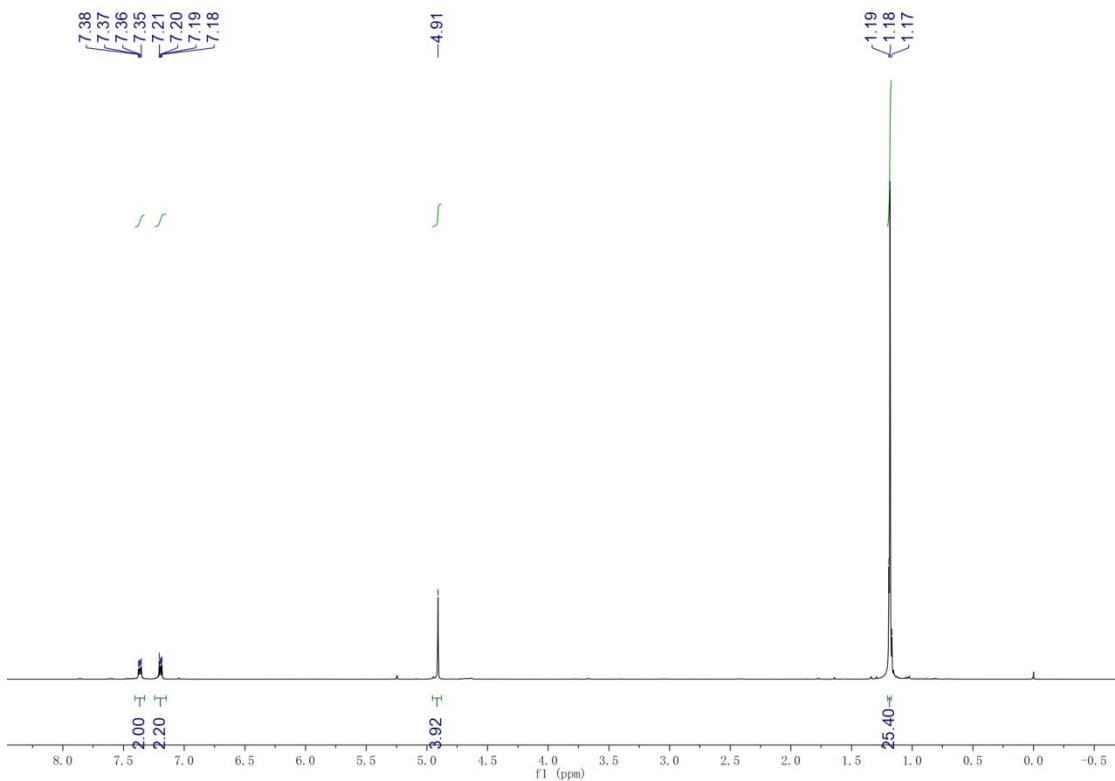


Figure S2.10.1 ^1H NMR spectrum of compound **6j** in CDCl_3

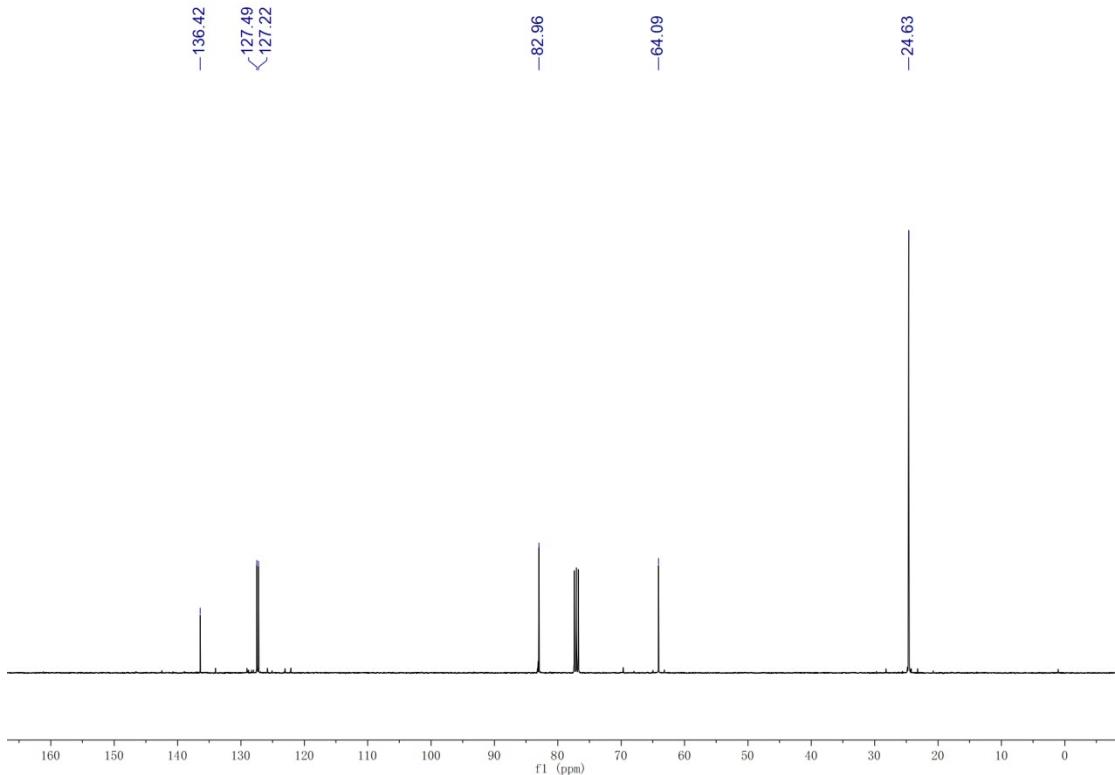


Figure S2.10.2 ^{13}C NMR spectrum of compound **6j** in CDCl_3

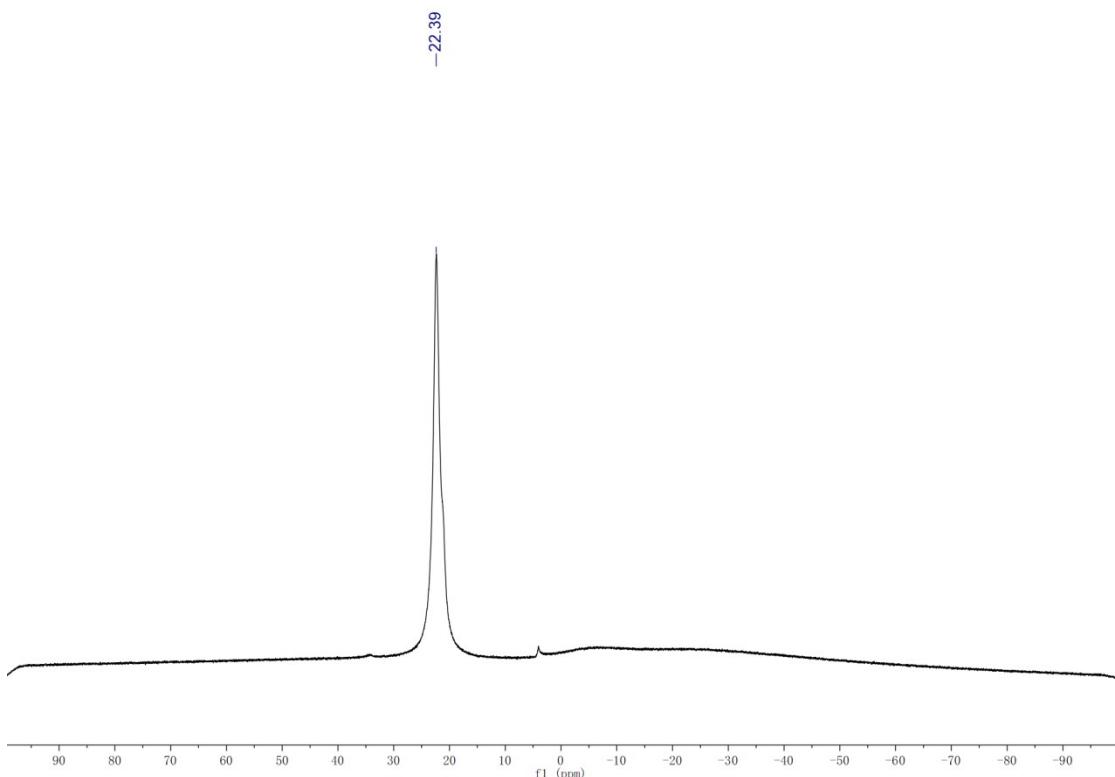


Figure S2.10.3 ¹¹B NMR spectrum of compound **6j** in CDCl₃

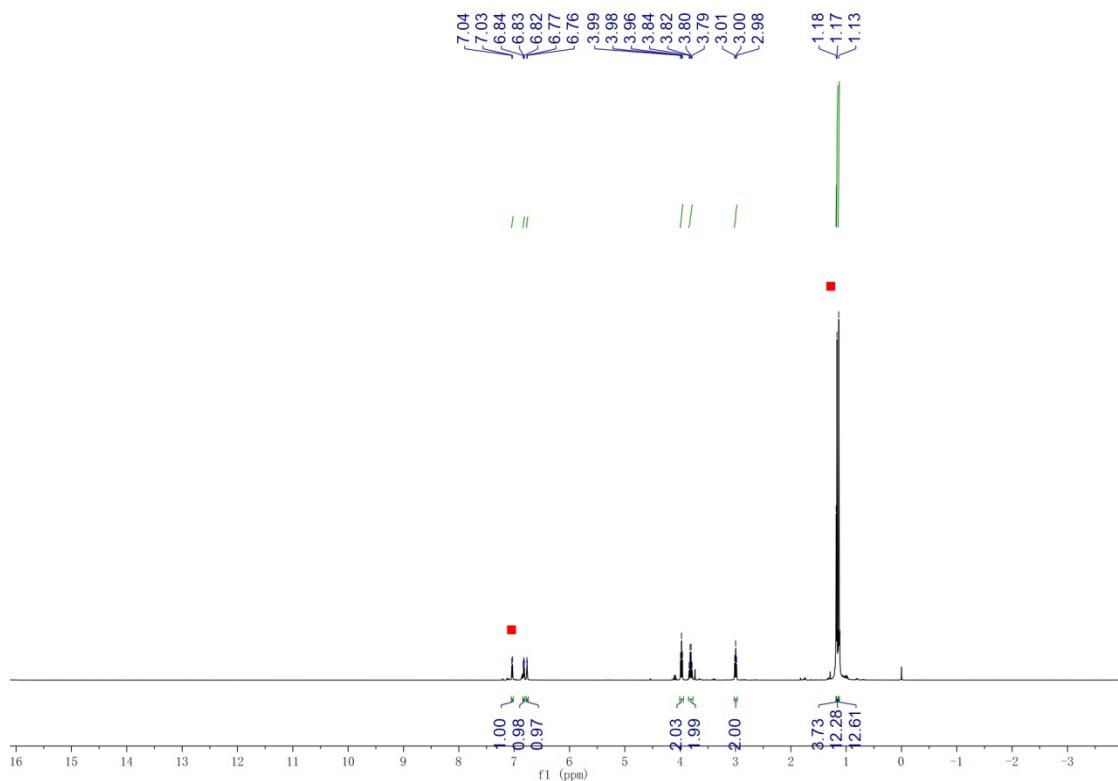


Figure S2.11.1 ¹H NMR spectrum of compound **6k** in CDCl₃

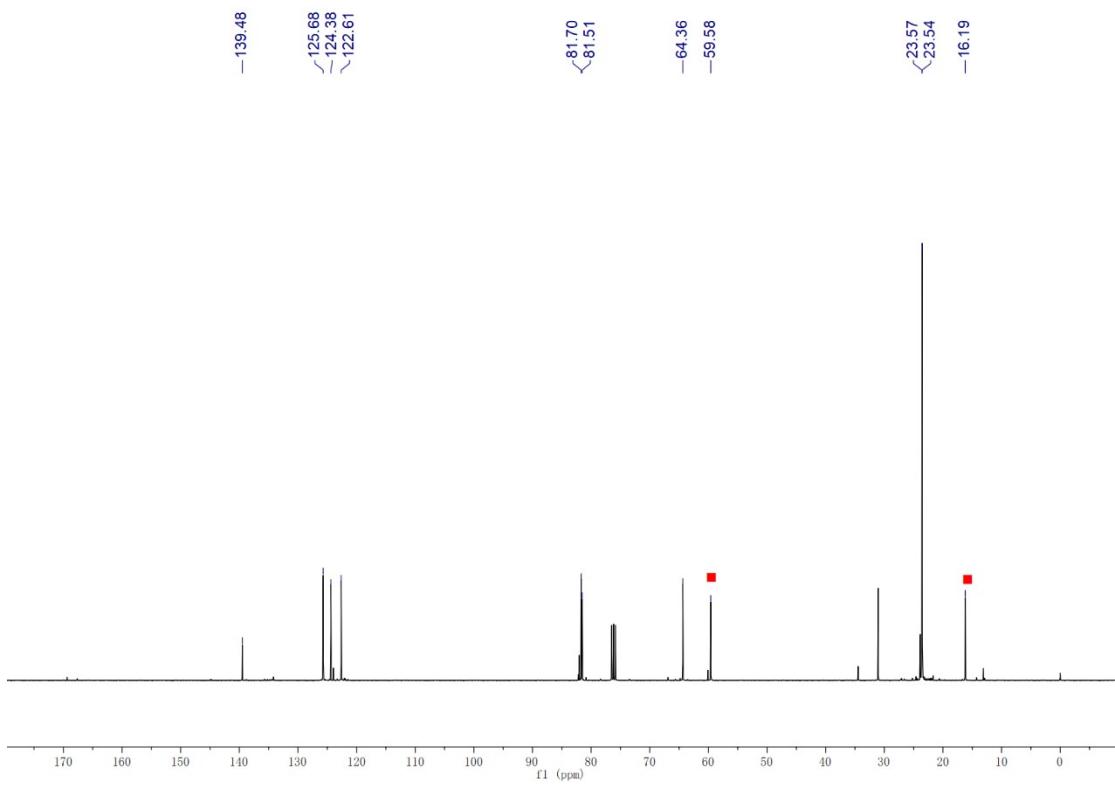


Figure S2.11.2 ^{13}C NMR spectrum of compound **6k** in CDCl_3

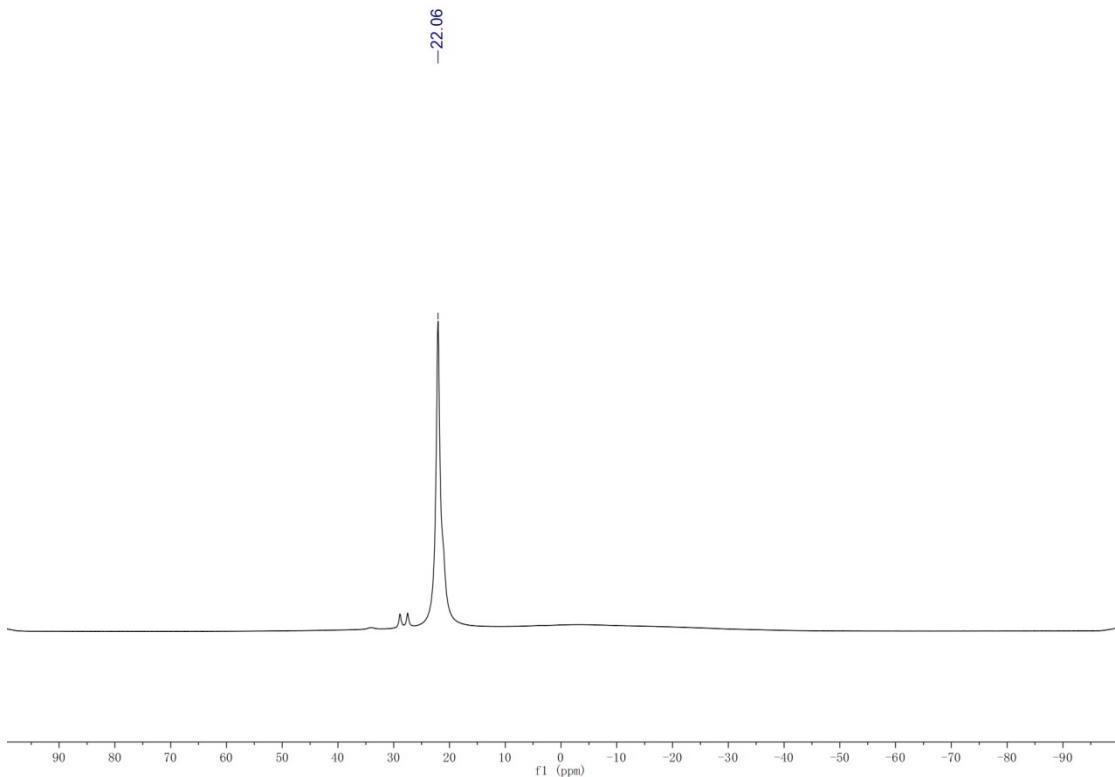


Figure S2.11.3 ^{11}B NMR spectrum of compound **6k** in CDCl_3

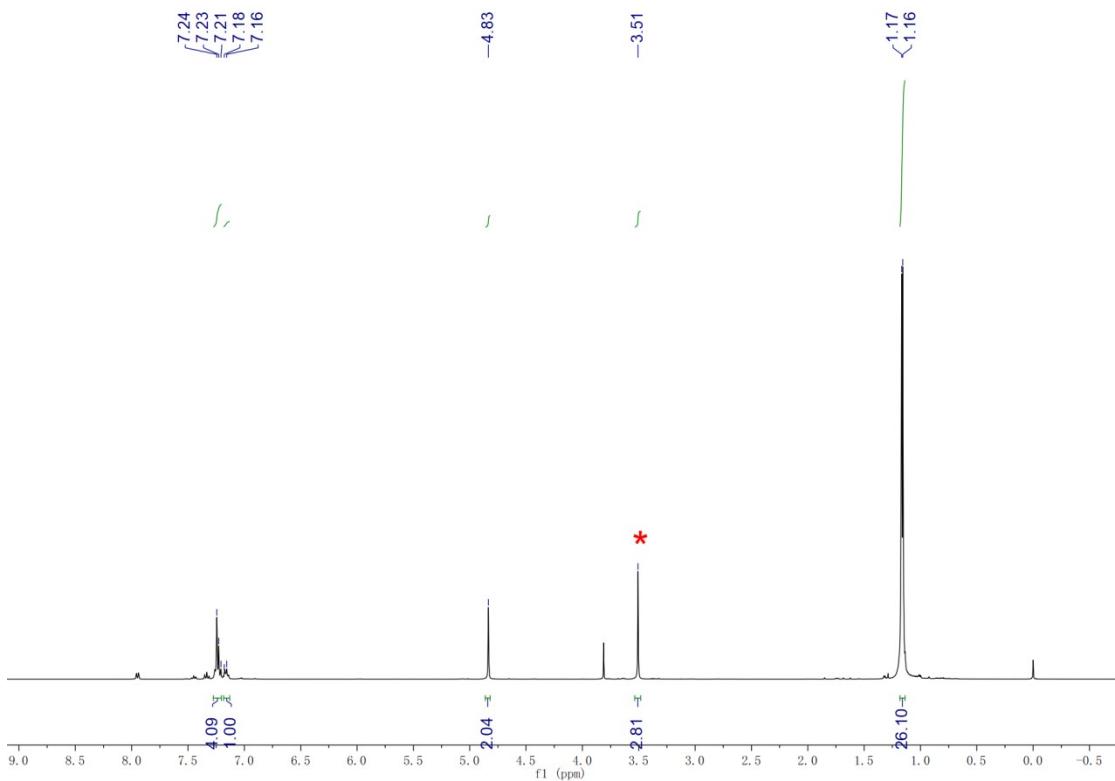


Figure S2.12.1 ^1H NMR spectrum of compound **6l** in CDCl_3

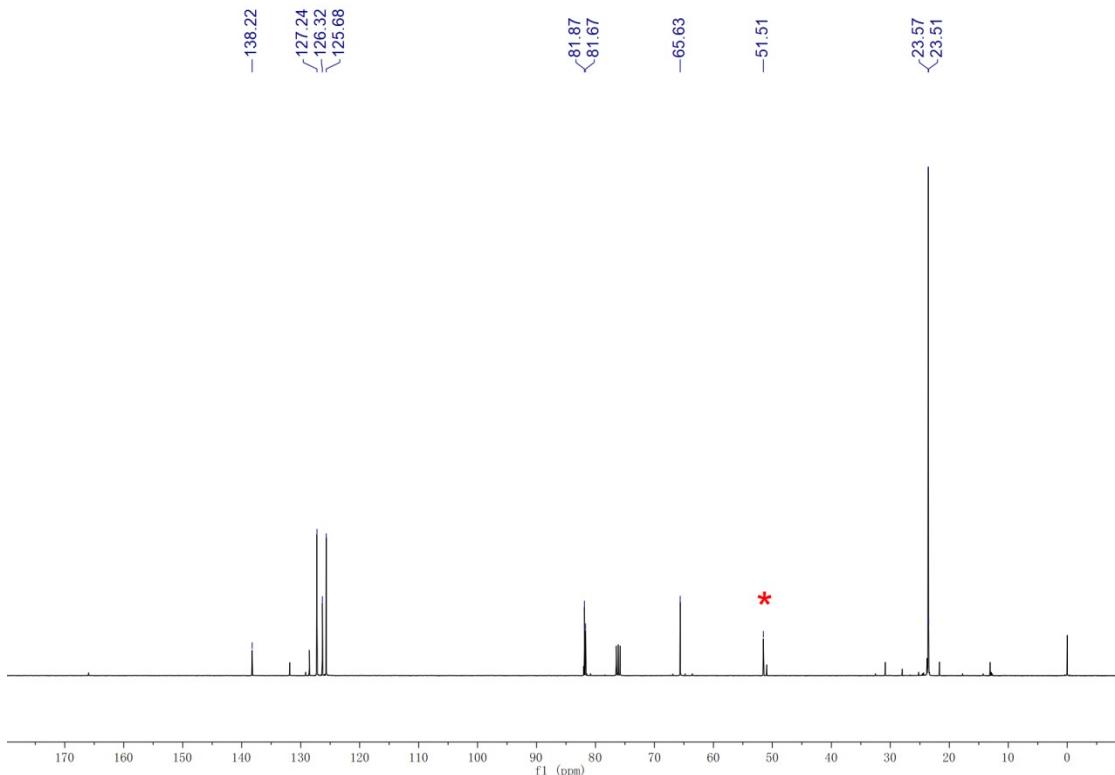


Figure S2.12.2 ^{13}C NMR spectrum of compound **6l** in CDCl_3

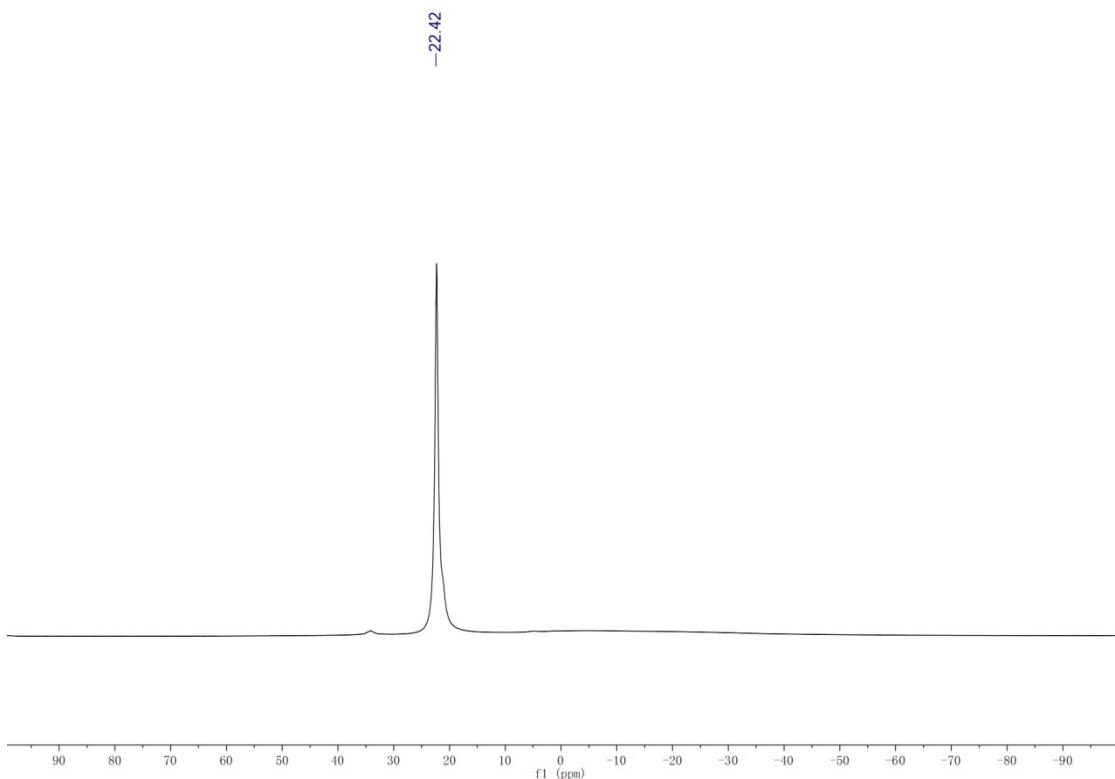


Figure S2.12.3 ^{11}B NMR spectrum of compound **6l** in CDCl_3

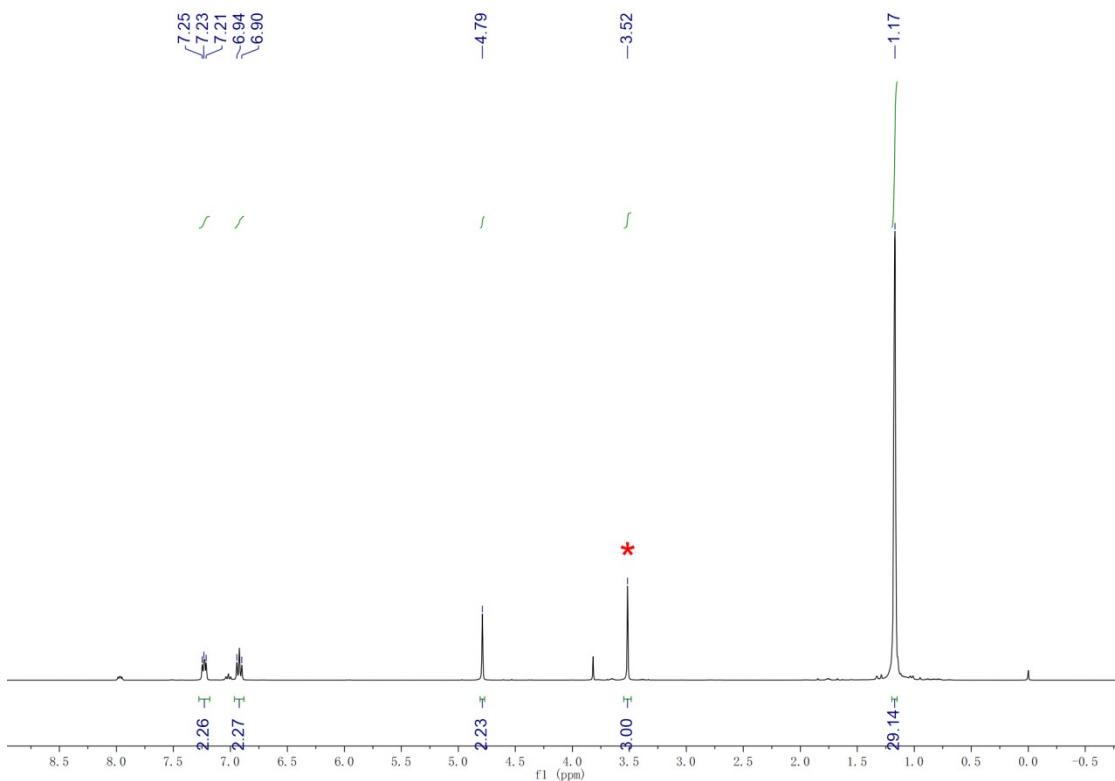


Figure S2.13.1 ^1H NMR spectrum of compound **6m** in CDCl_3

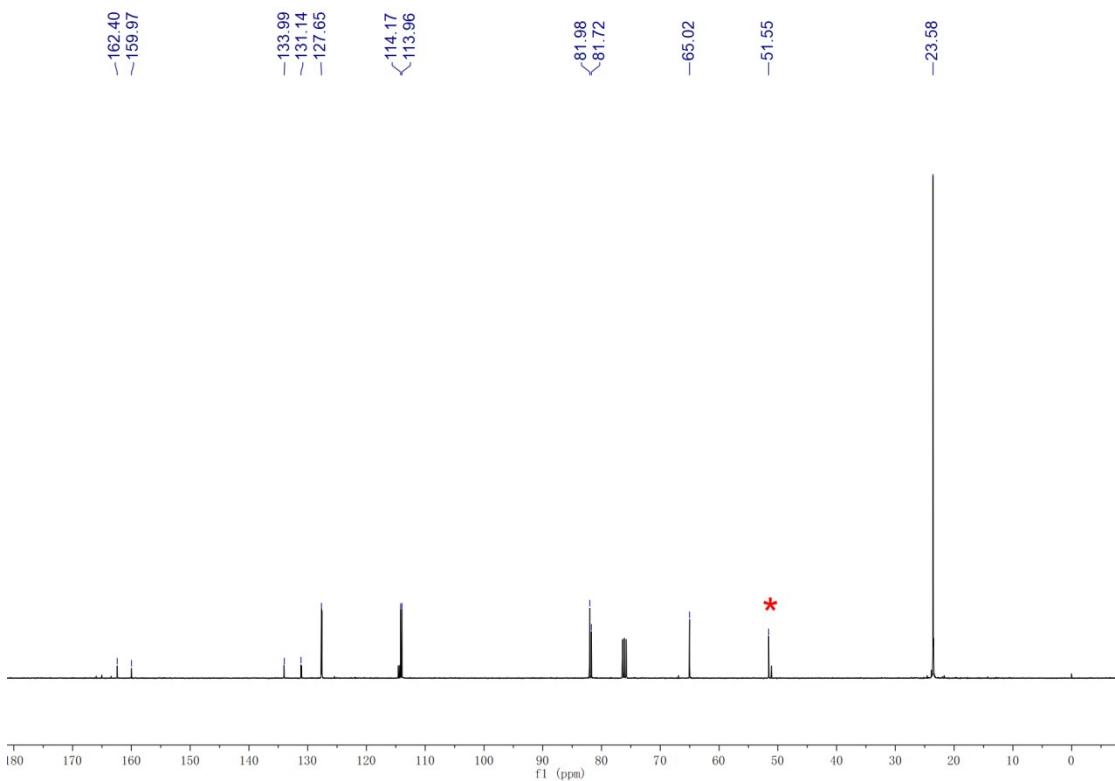


Figure S2.13.2 ^{13}C NMR spectrum of compound **6m** in CDCl_3

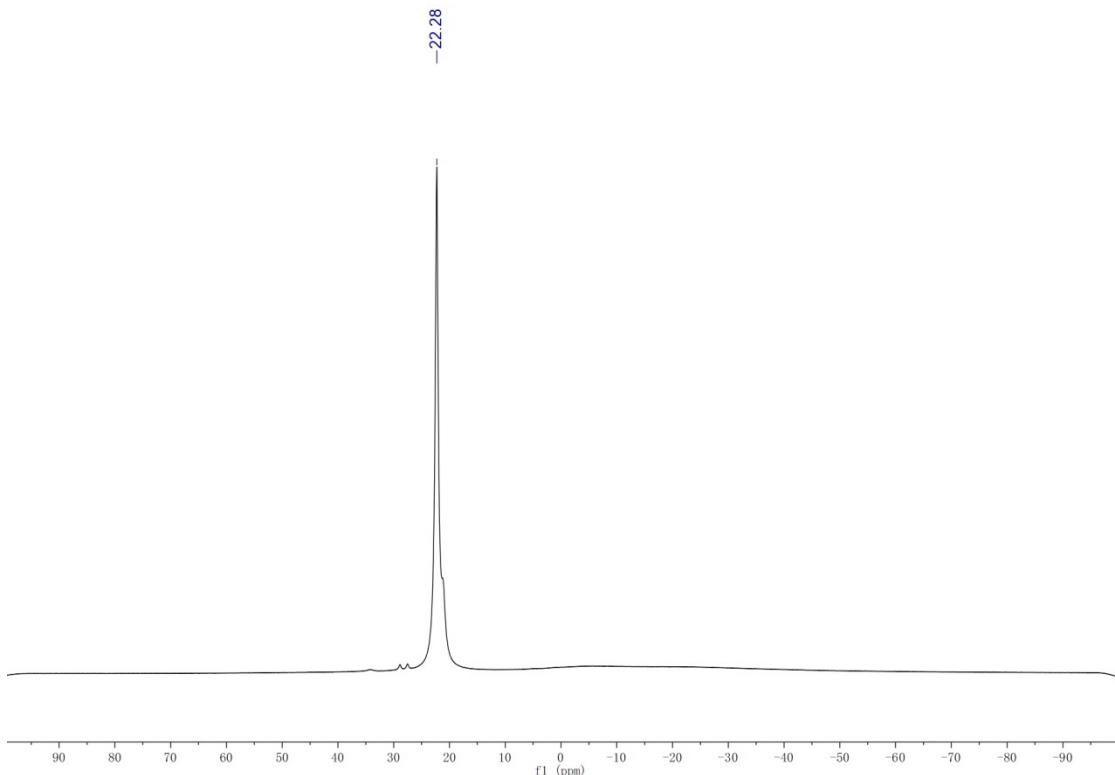


Figure S2.13.3 ^{11}B NMR spectrum of compound **6m** in CDCl_3

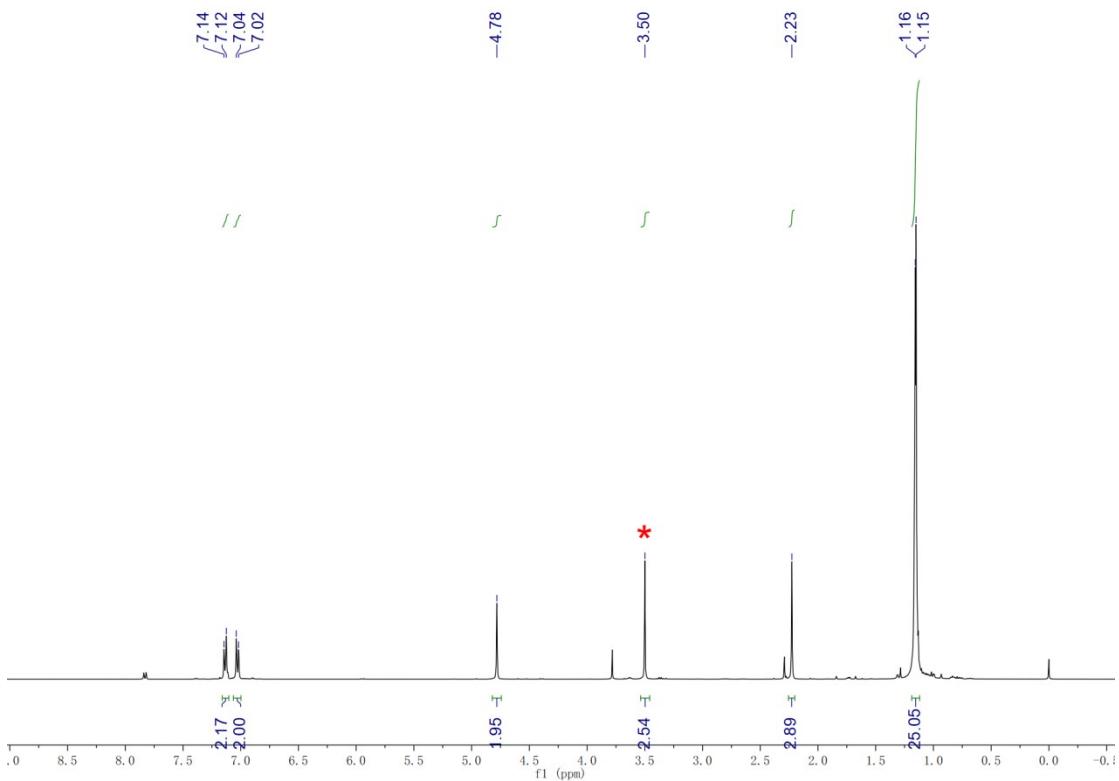


Figure S2.14.1 ^1H NMR spectrum of compound **6n** in CDCl_3

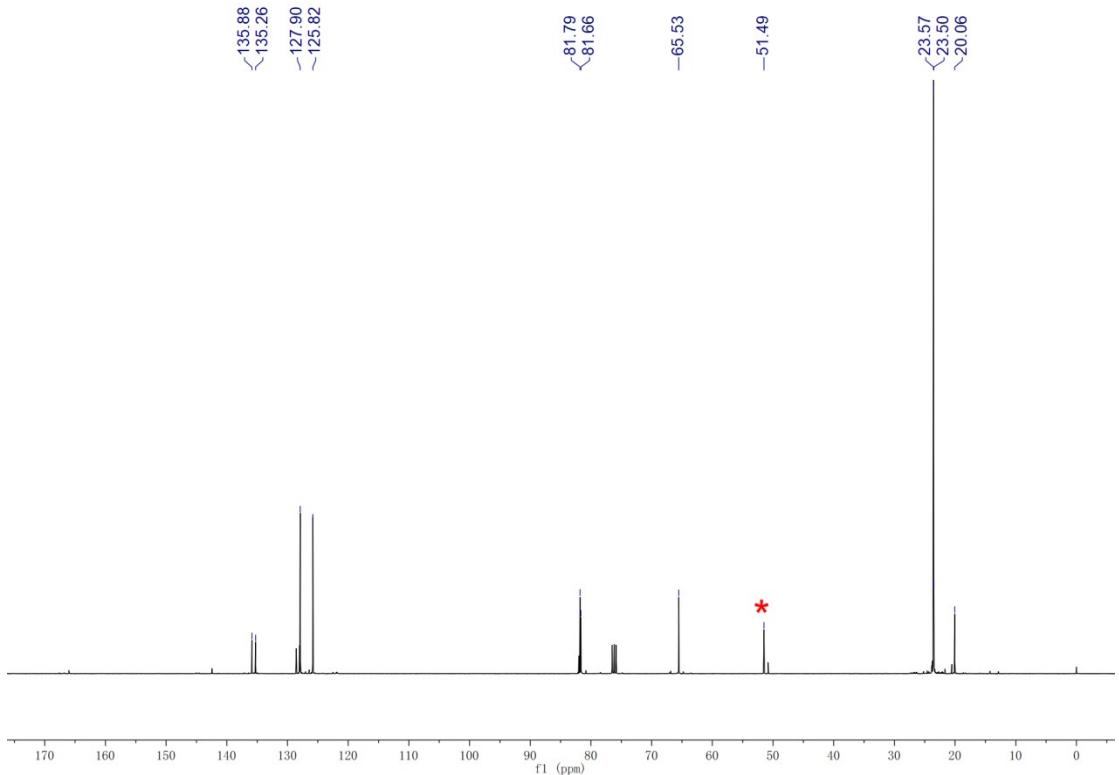


Figure S2.14.2 ^{13}C NMR spectrum of compound **6n** in CDCl_3



Figure S2.14.3 ^{11}B NMR spectrum of compound **6n** in CDCl_3

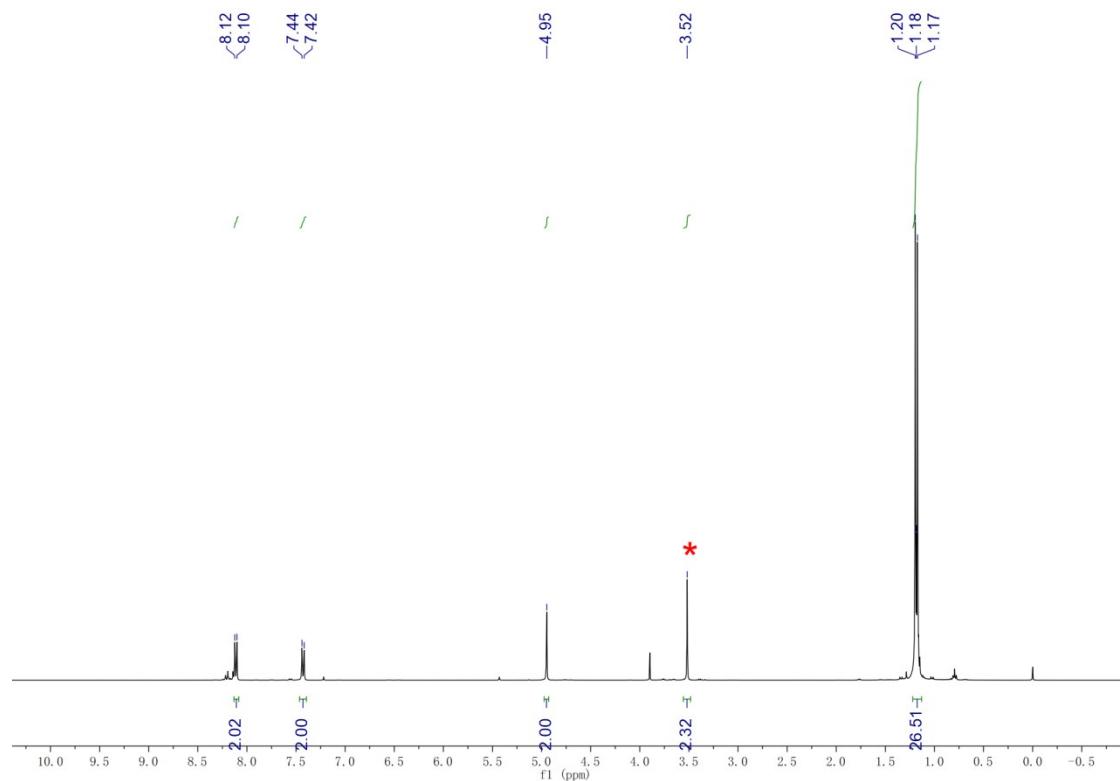


Figure S2.15.1 ^1H NMR spectrum of compound **6o** in CDCl_3

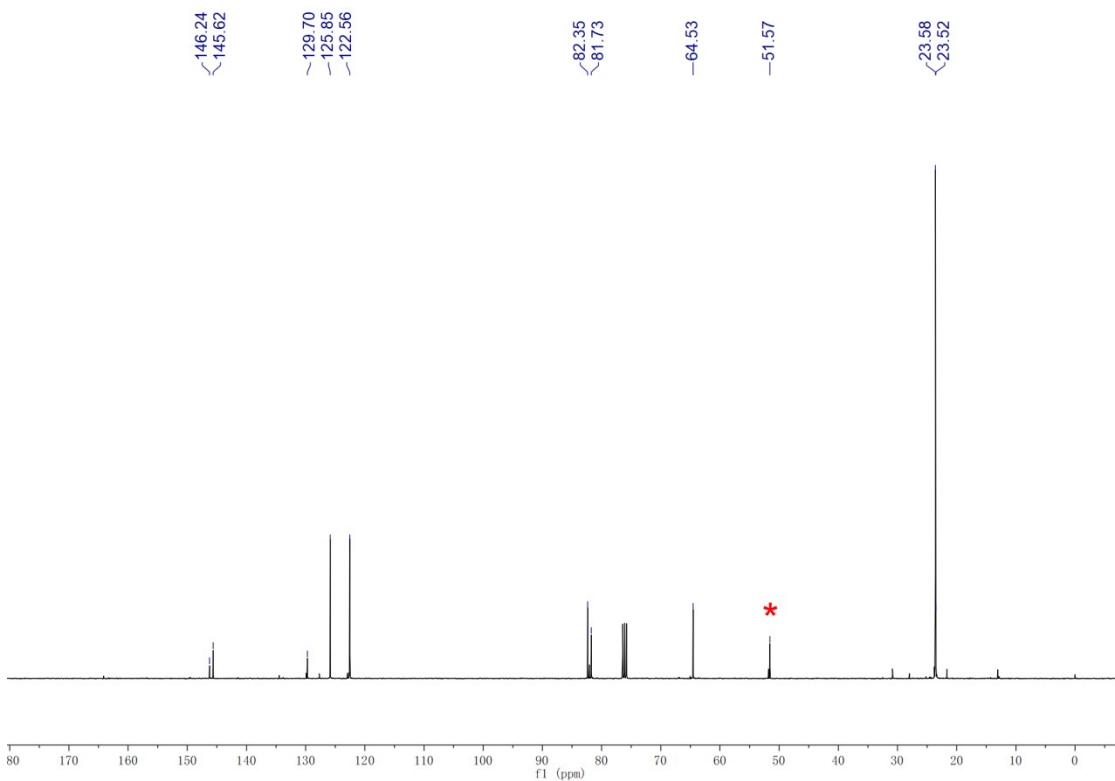


Figure S2.15.2 ^{13}C NMR spectrum of compound **6o** in CDCl_3

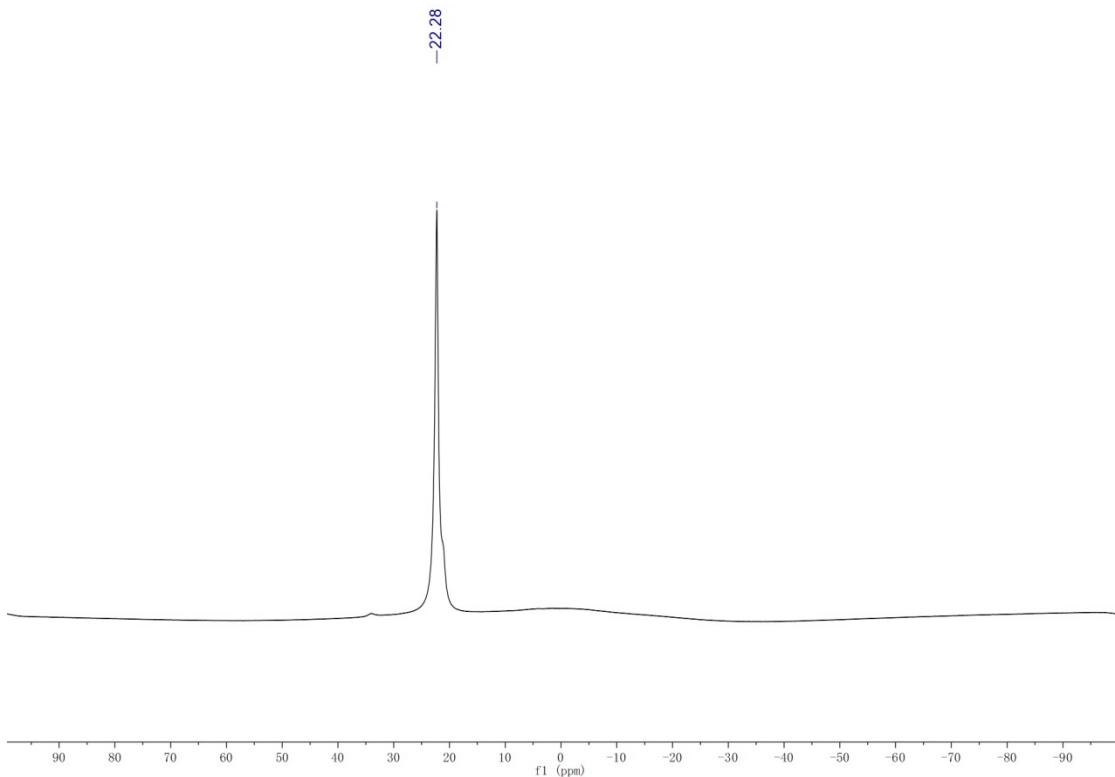
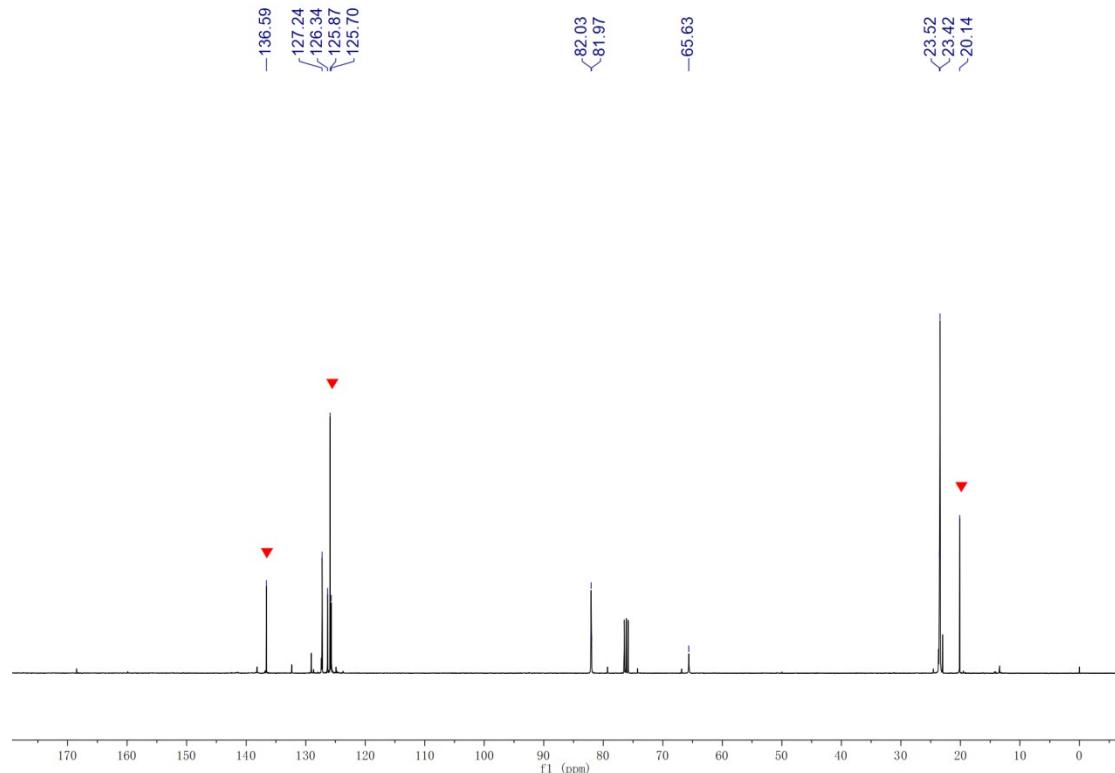
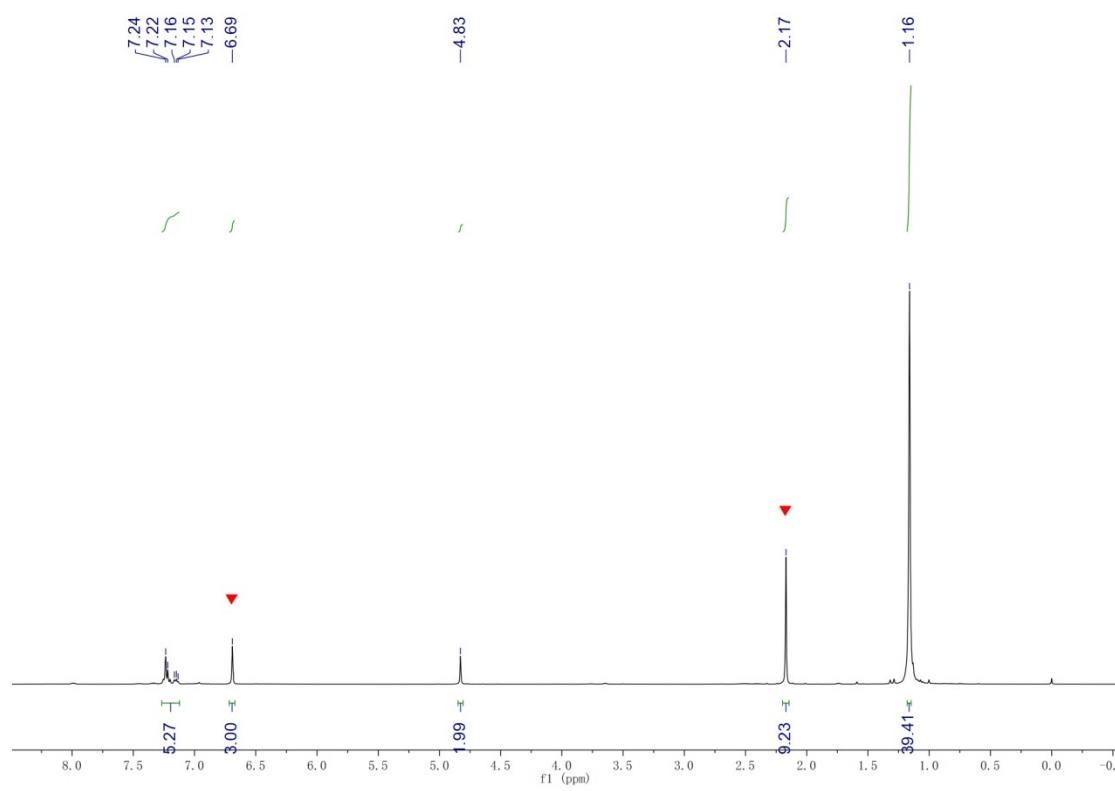


Figure S2.15.3 ^{11}B NMR spectrum of compound **6o** in CDCl_3

^1H , ^{13}C and ^{11}B NMR Spectra of Hydroboration Products of Carboxylic Acids.



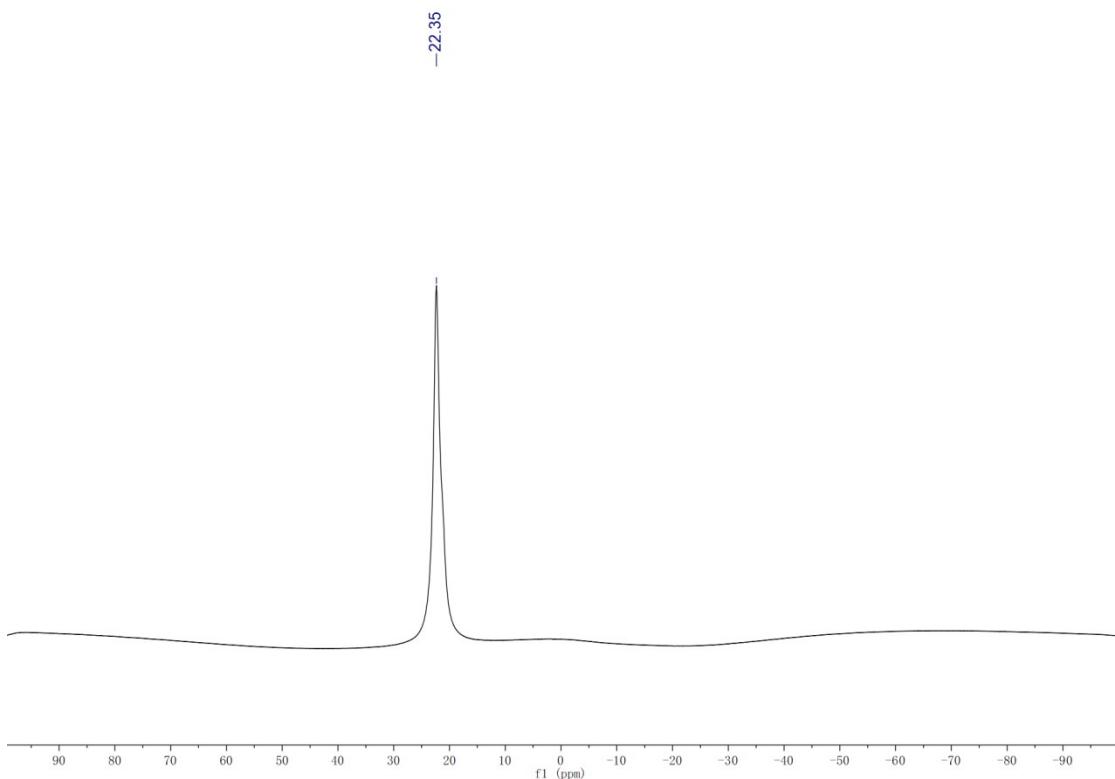


Figure S3.1.3 ¹¹B NMR spectrum of compound **8a** in CDCl_3

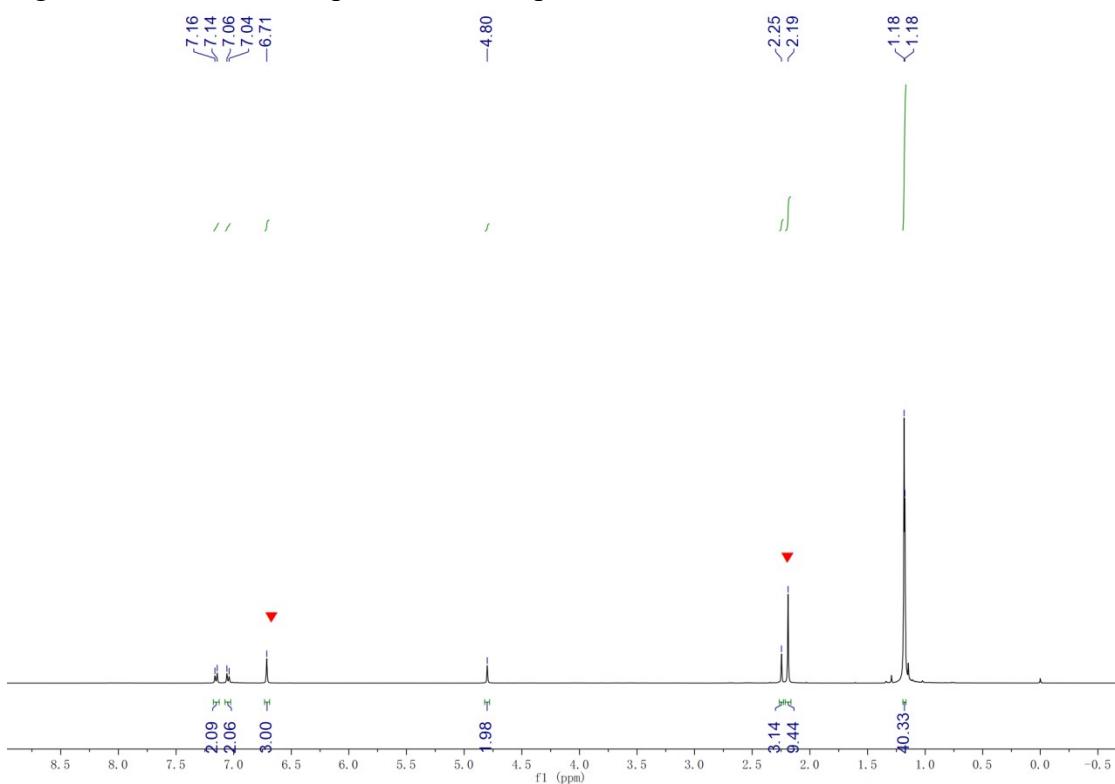
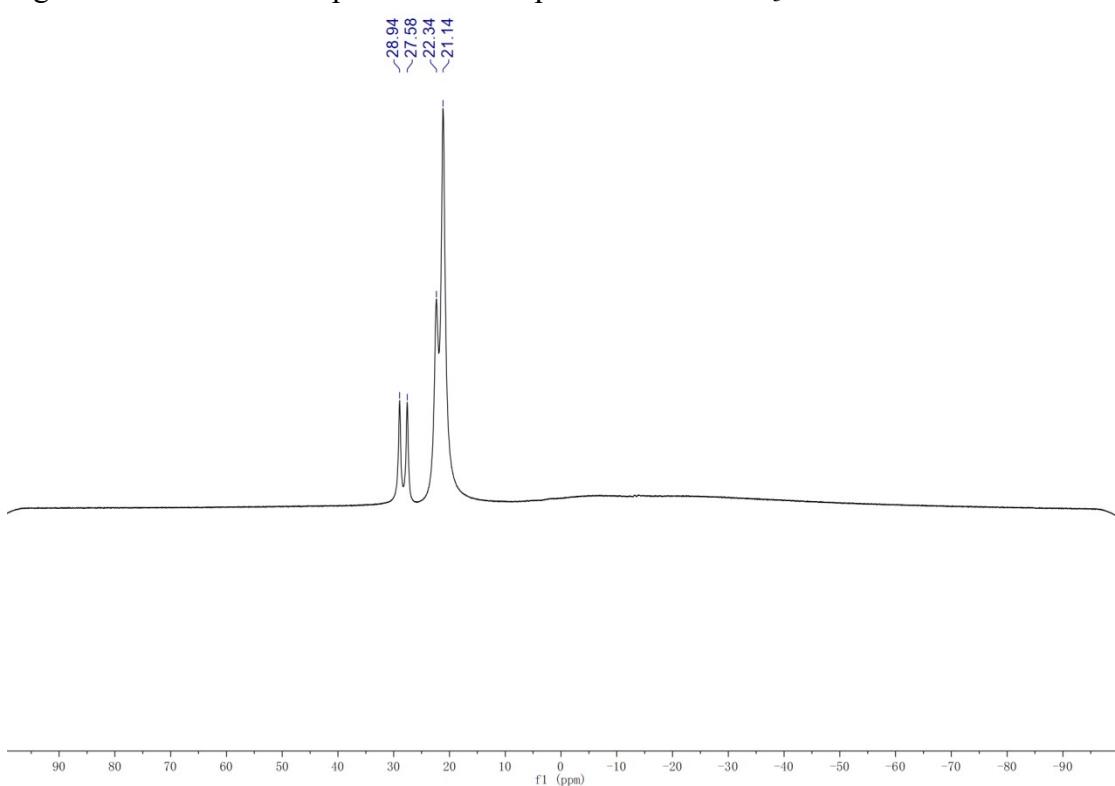
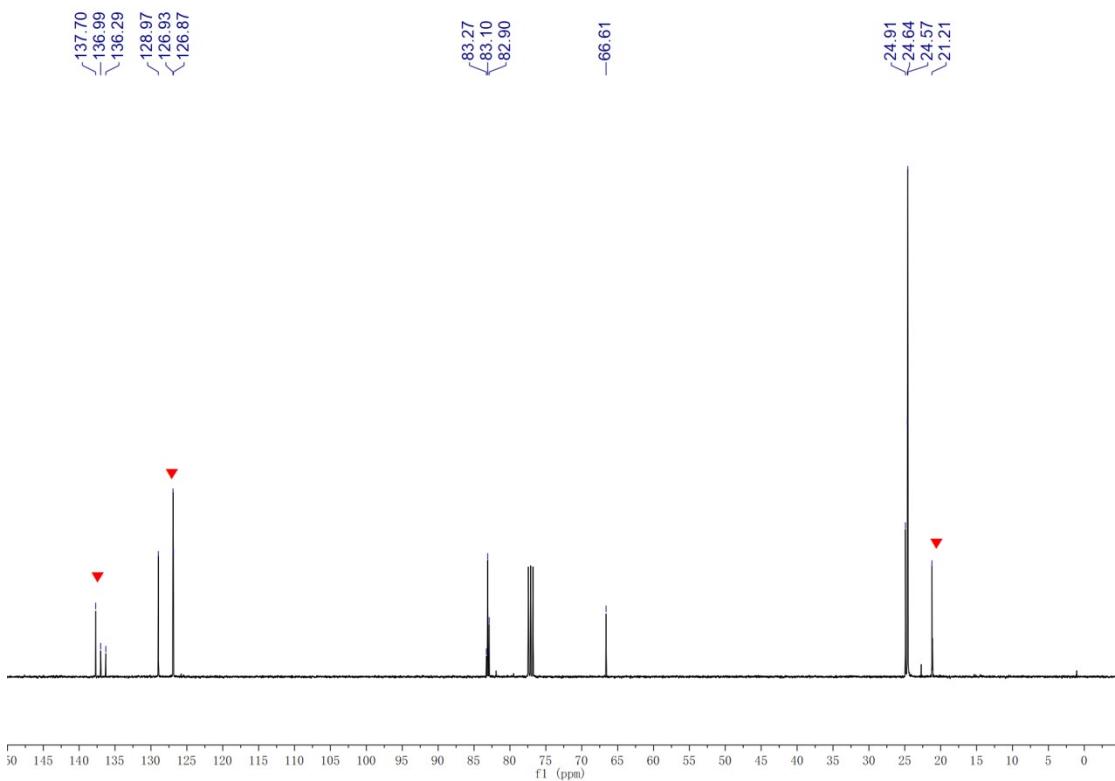


Figure S3.2.1 ¹H NMR spectrum of compound **8b** in CDCl_3



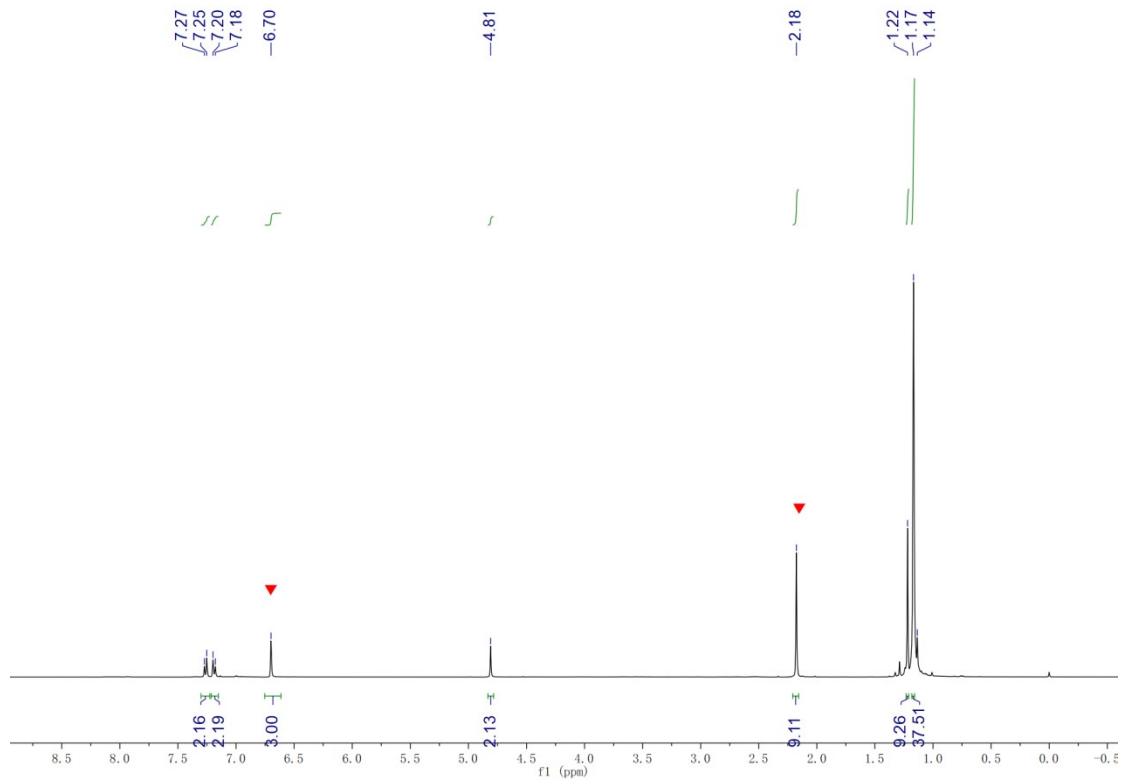


Figure S3.3.1 ^1H NMR spectrum of compound **8c** in CDCl_3

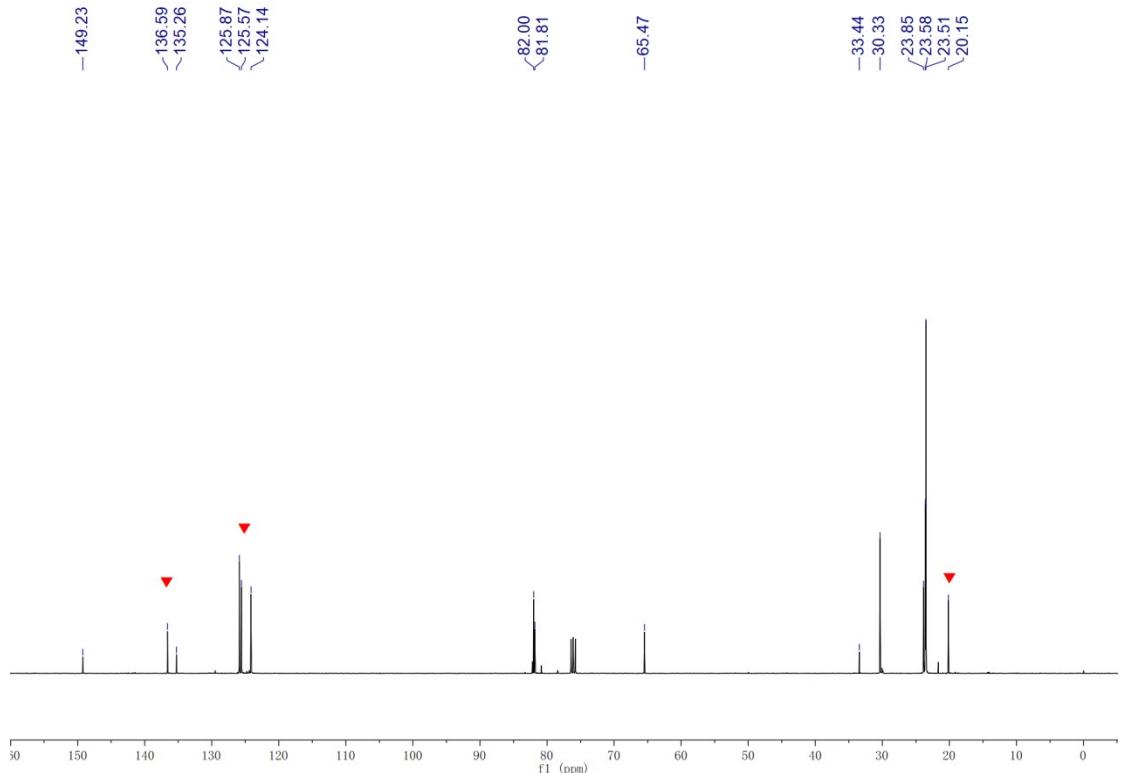


Figure S3.3.2 ^{13}C NMR spectrum of compound **8c** in CDCl_3

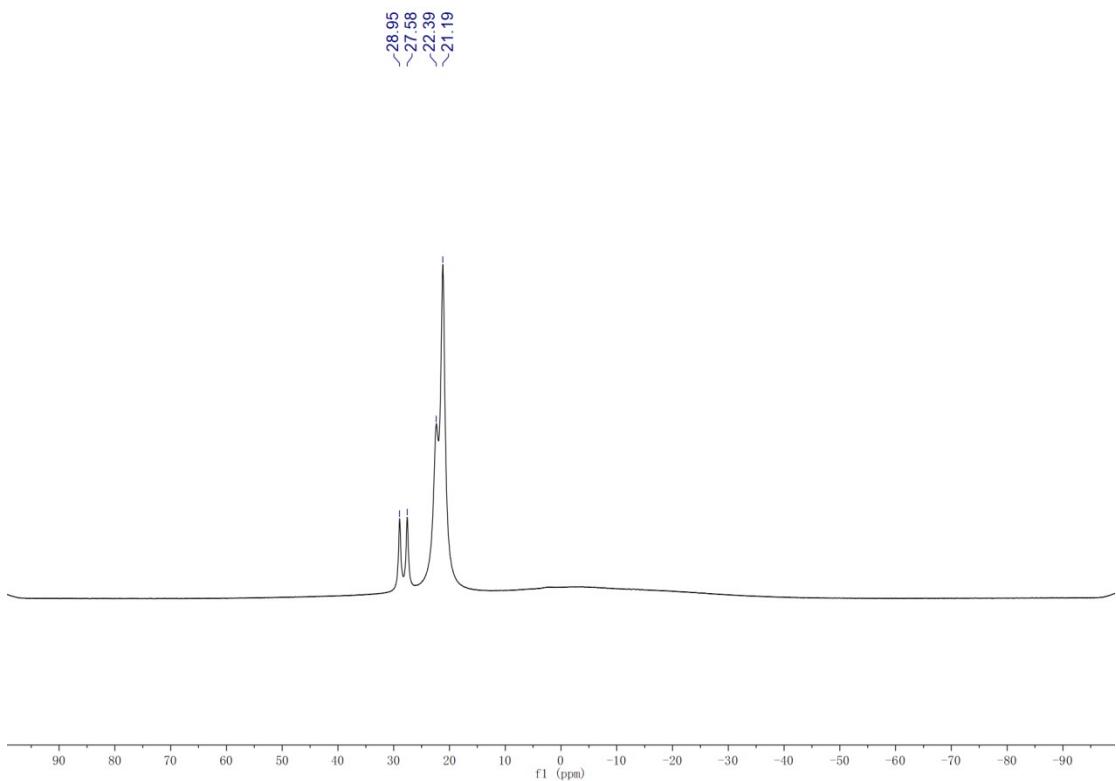


Figure S3.3.3 ^{11}B NMR spectrum of compound **8c** in CDCl_3

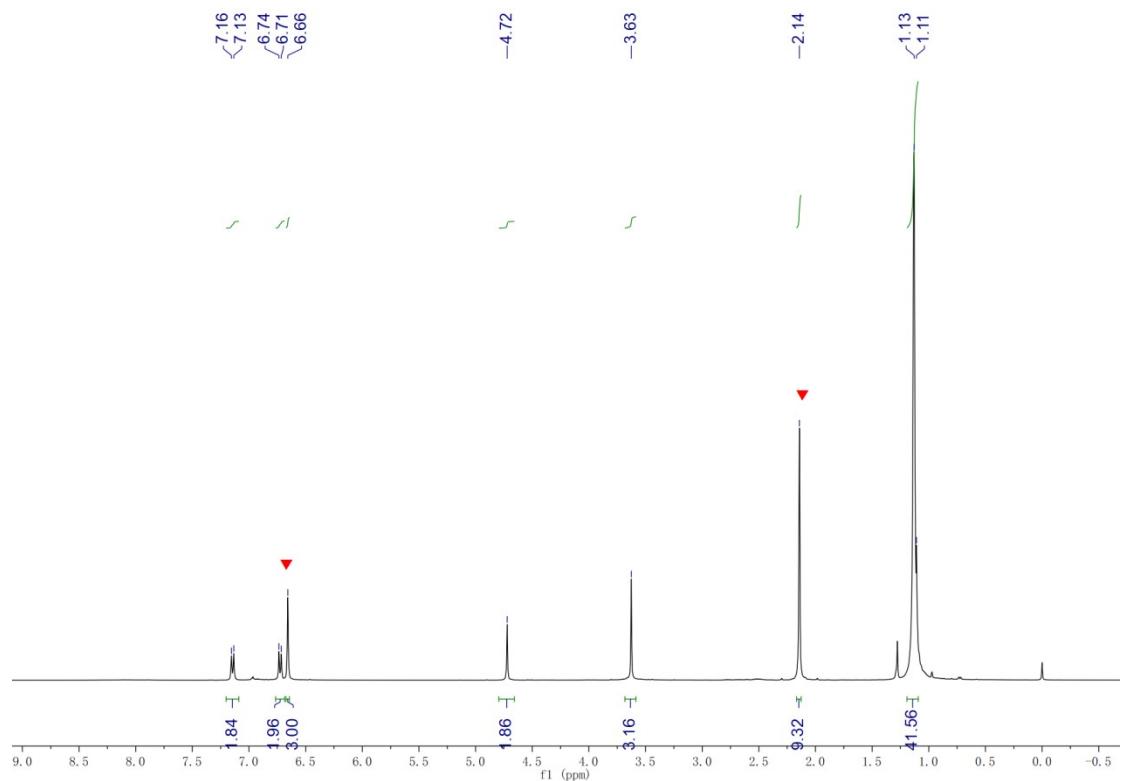


Figure S3.4.1 ^1H NMR spectrum of compound **8d** in CDCl_3

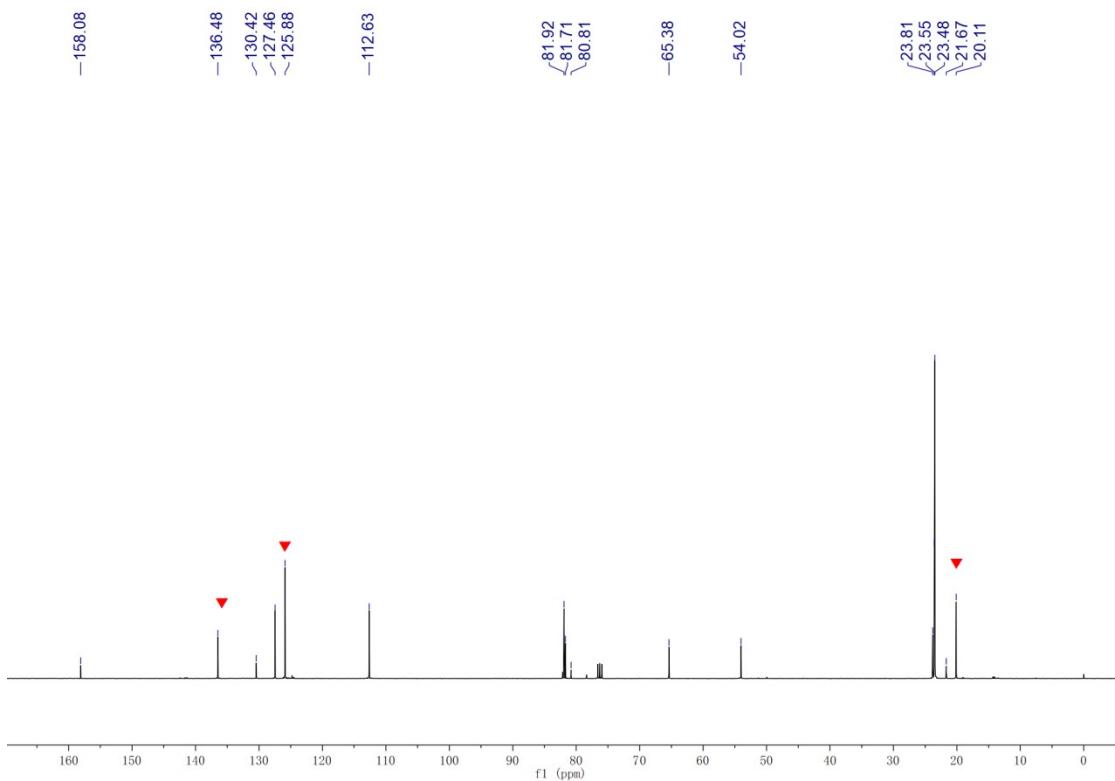


Figure S3.4.2 ^{13}C NMR spectrum of compound **8d** in CDCl_3

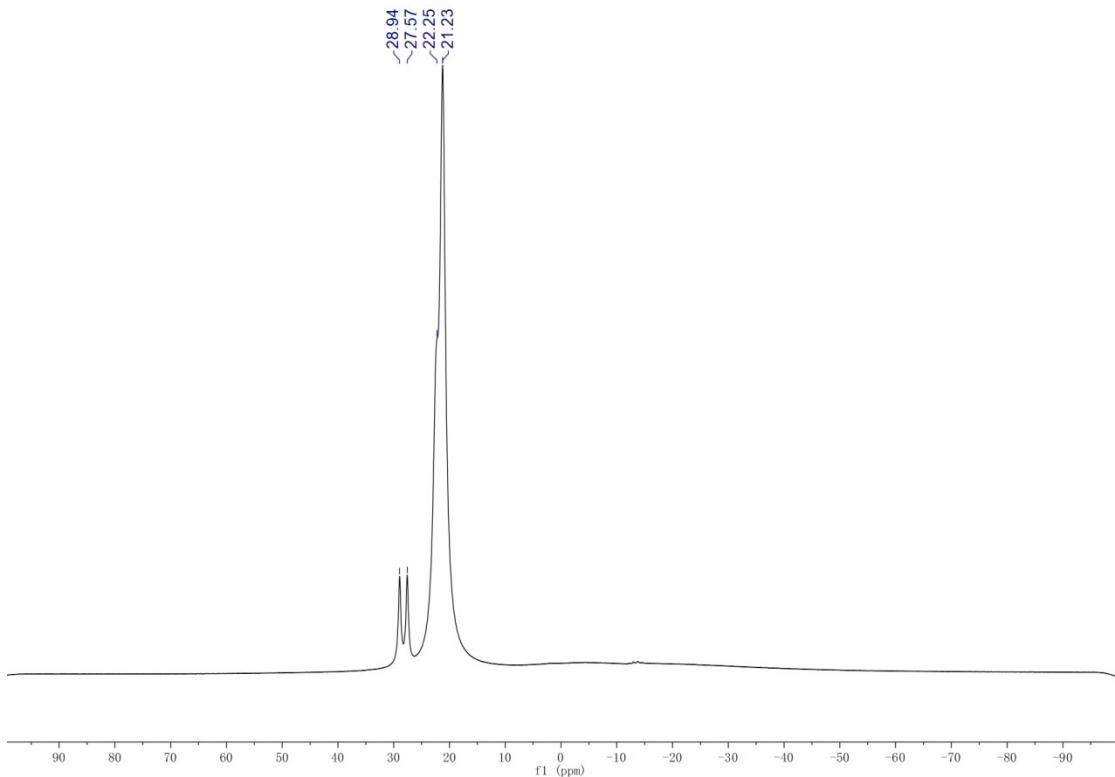


Figure S3.4.3 ^{11}B NMR spectrum of compound **8d** in CDCl_3

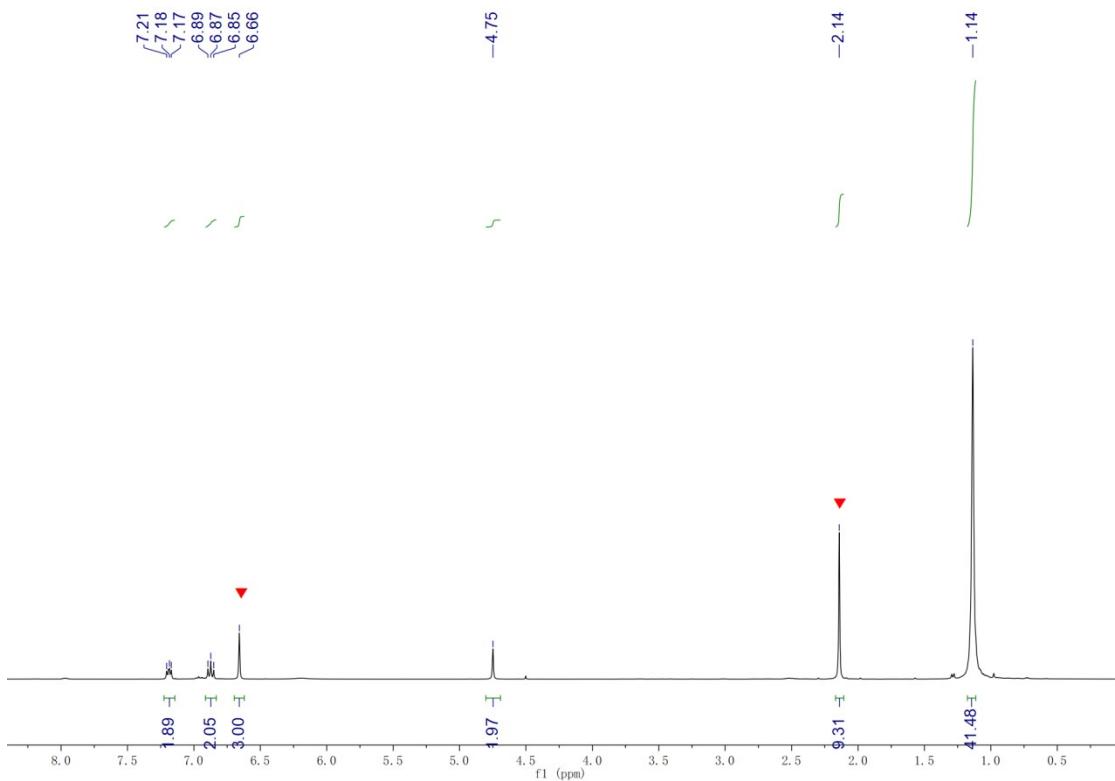


Figure S3.5.1 ^1H NMR spectrum of compound **8e** in CDCl_3

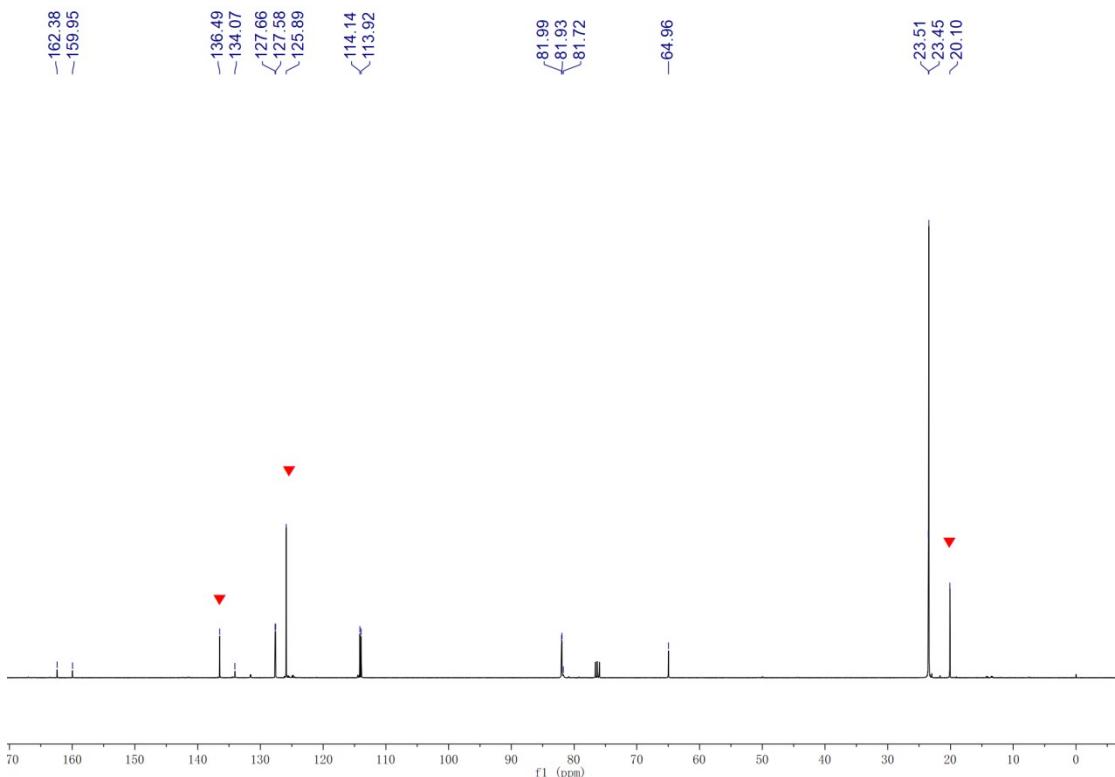


Figure S3.5.2 ^{13}C NMR spectrum of compound **8e** in CDCl_3

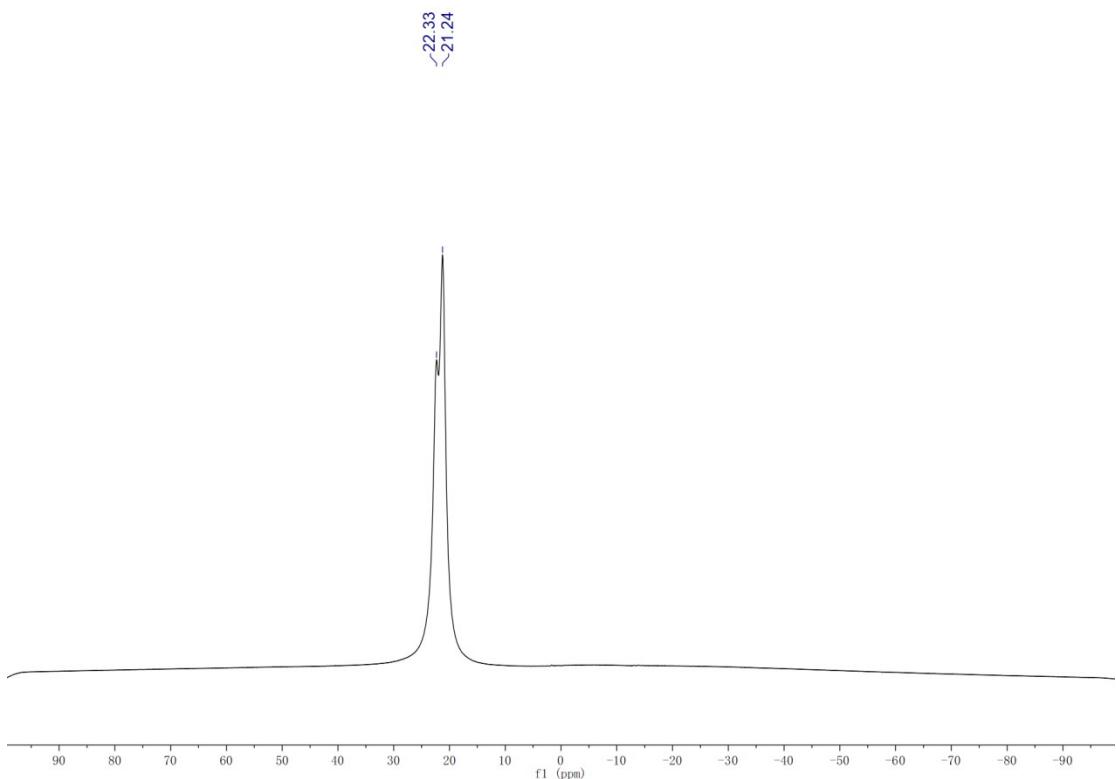


Figure S3.5.3 ¹¹B NMR spectrum of compound **8e** in CDCl_3

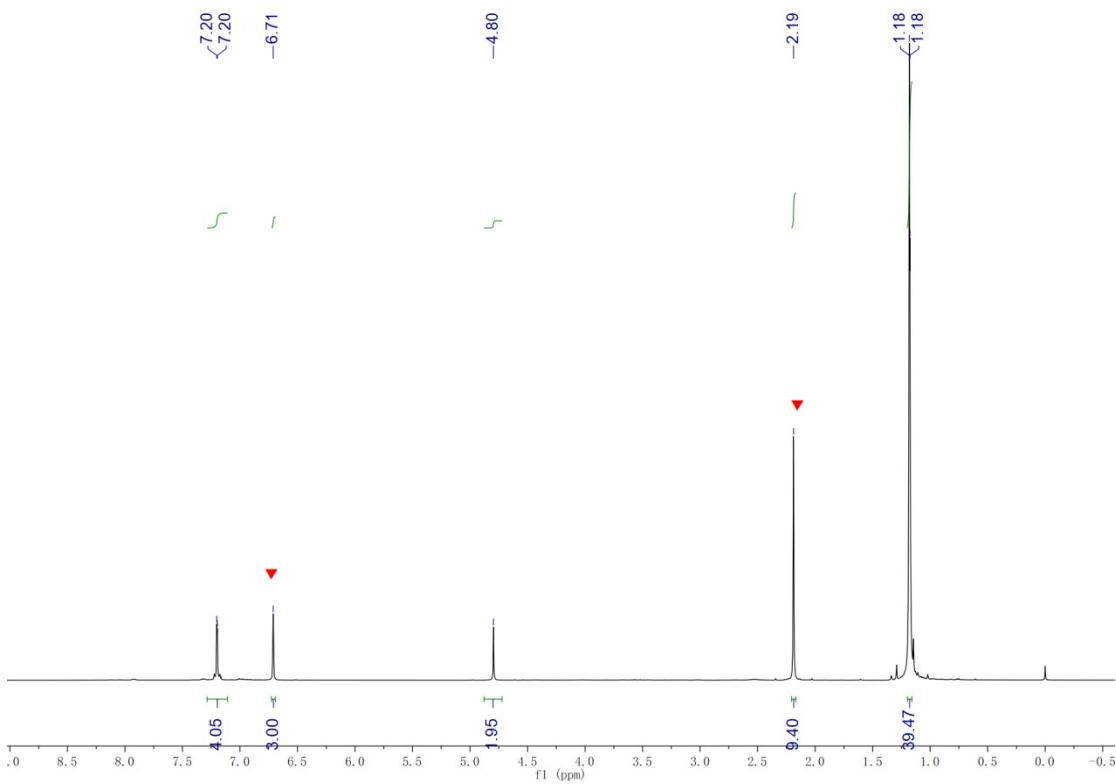


Figure S3.6.1 ¹H NMR spectrum of compound **8f** in CDCl_3

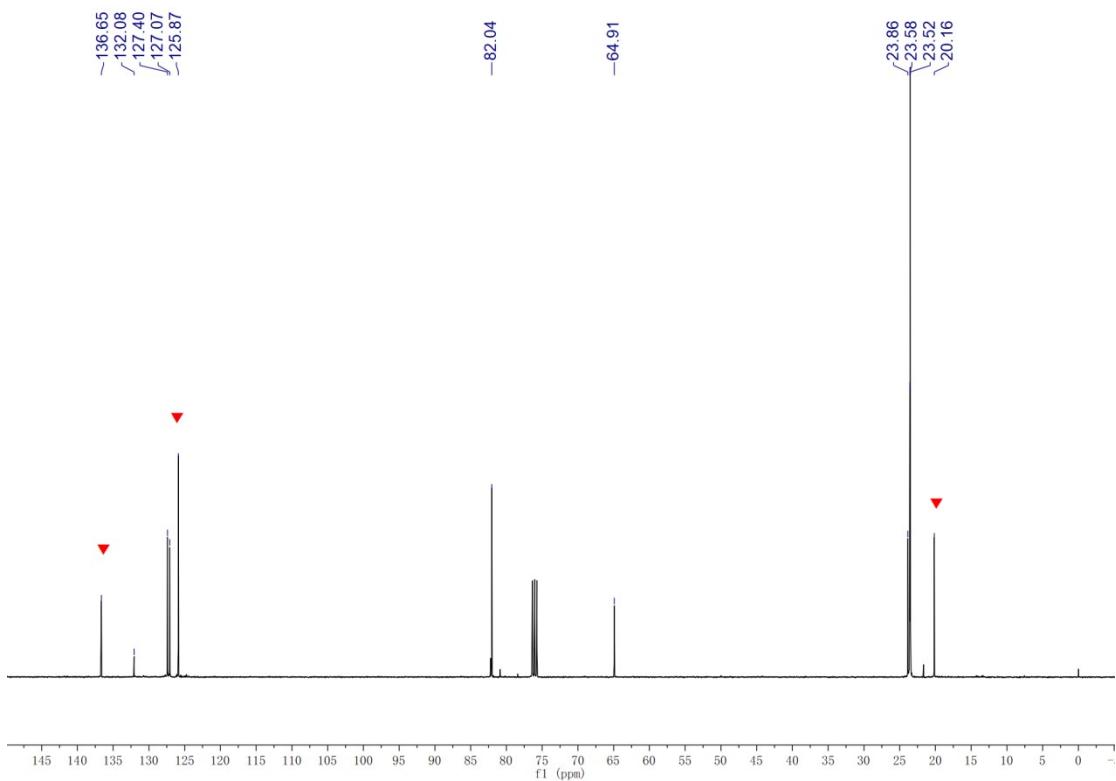


Figure S3.6.2 ^{13}C NMR spectrum of compound **8f** in CDCl_3

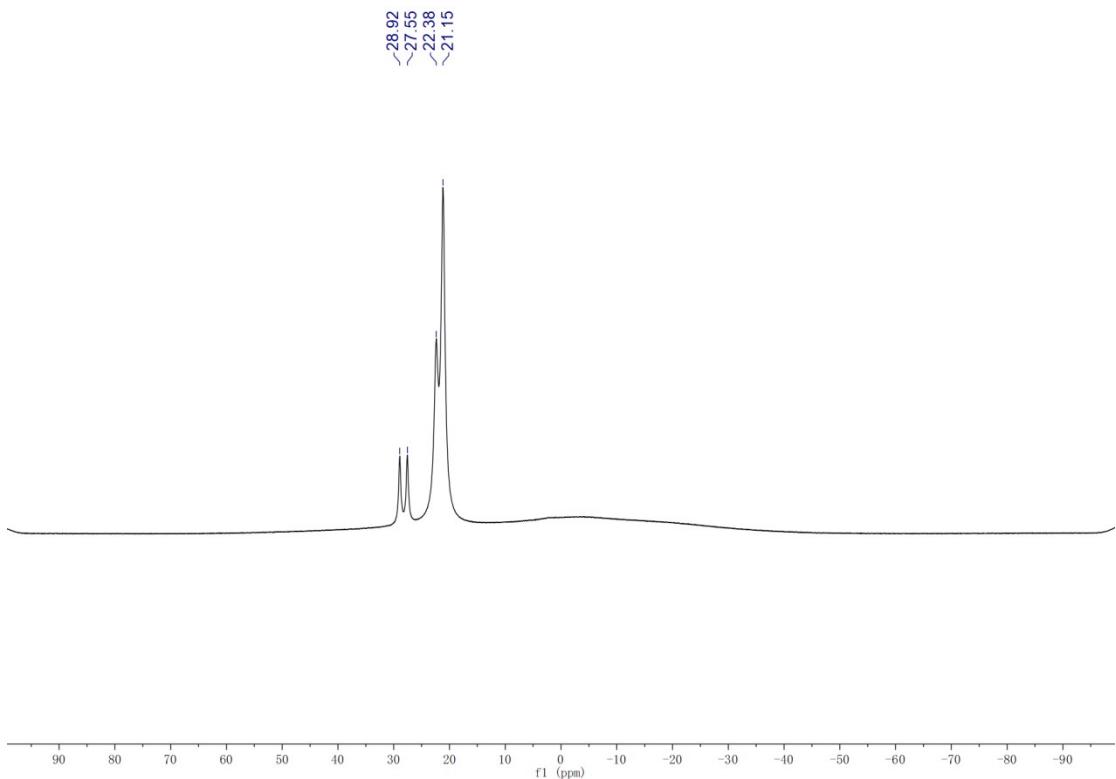


Figure S3.6.3 ^{11}B NMR spectrum of compound **8f** in CDCl_3

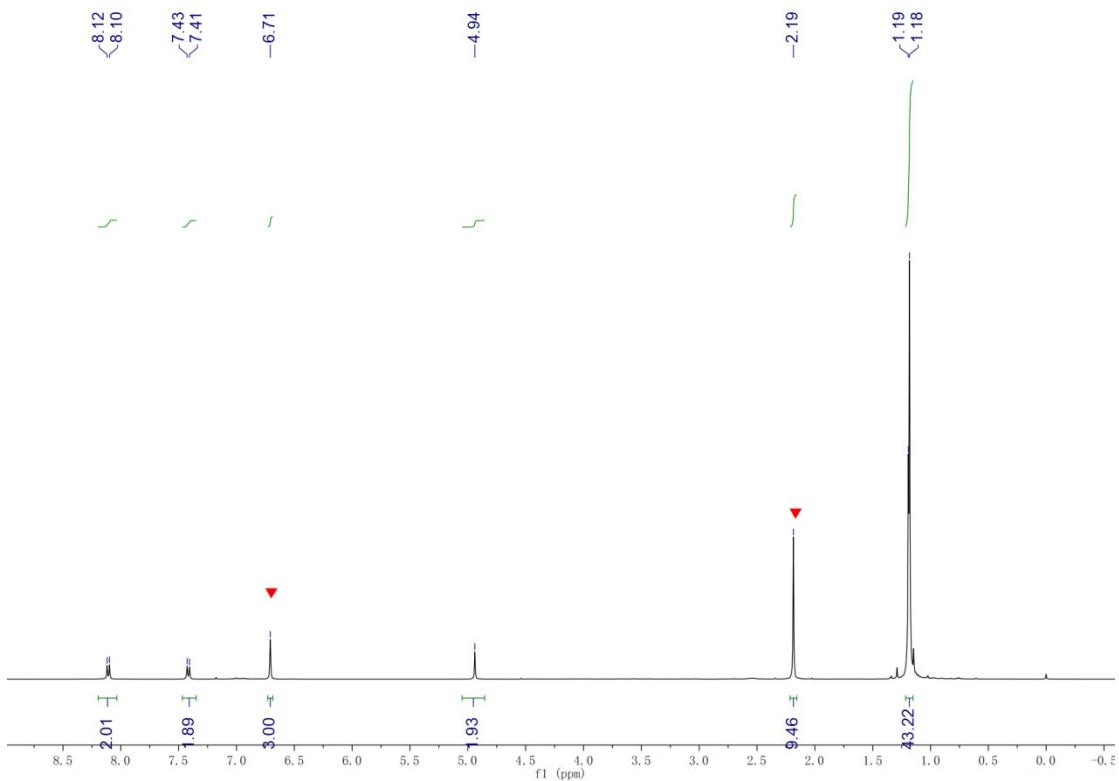


Figure S3.7.1 ^1H NMR spectrum of compound **8g** in CDCl_3

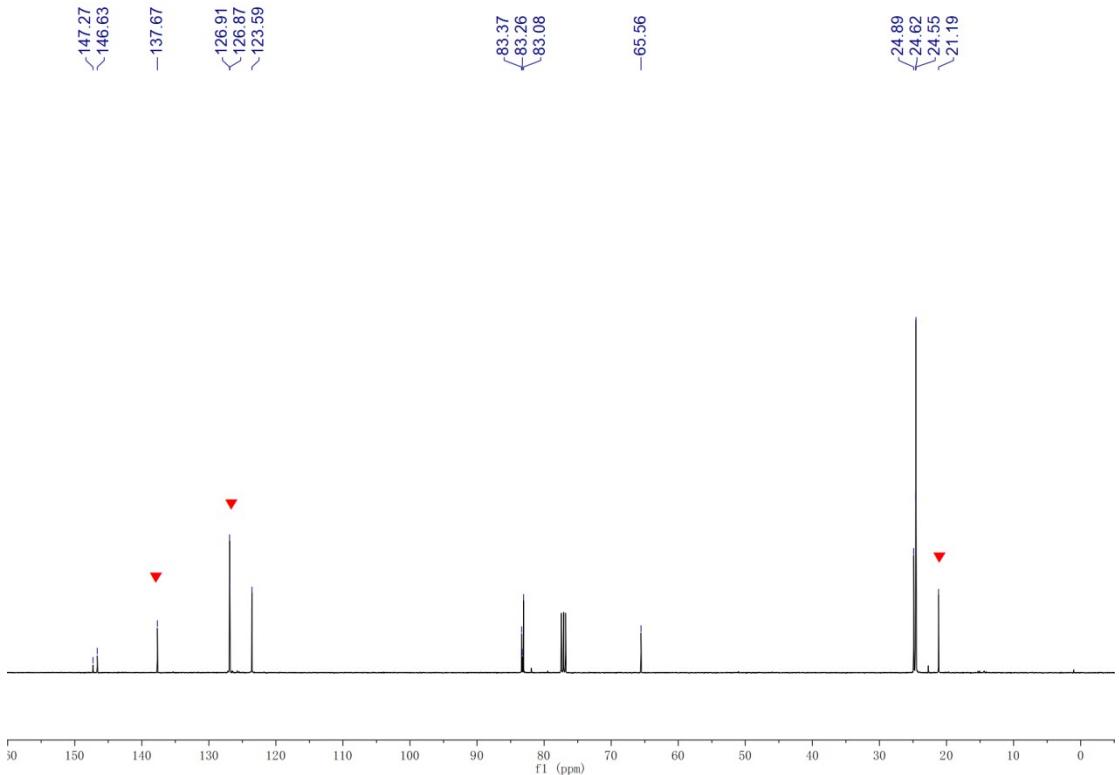


Figure S3.7.2 ^{13}C NMR spectrum of compound **8g** in CDCl_3

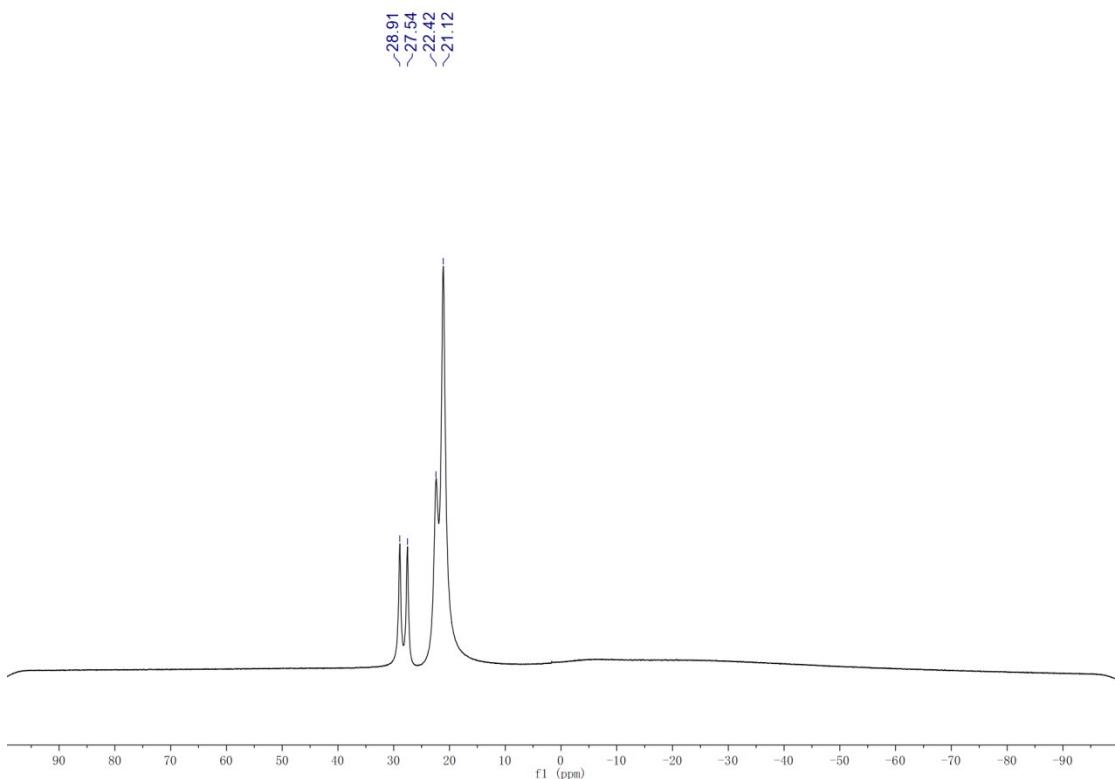


Figure S3.7.3 ¹¹B NMR spectrum of compound **8g** in CDCl_3

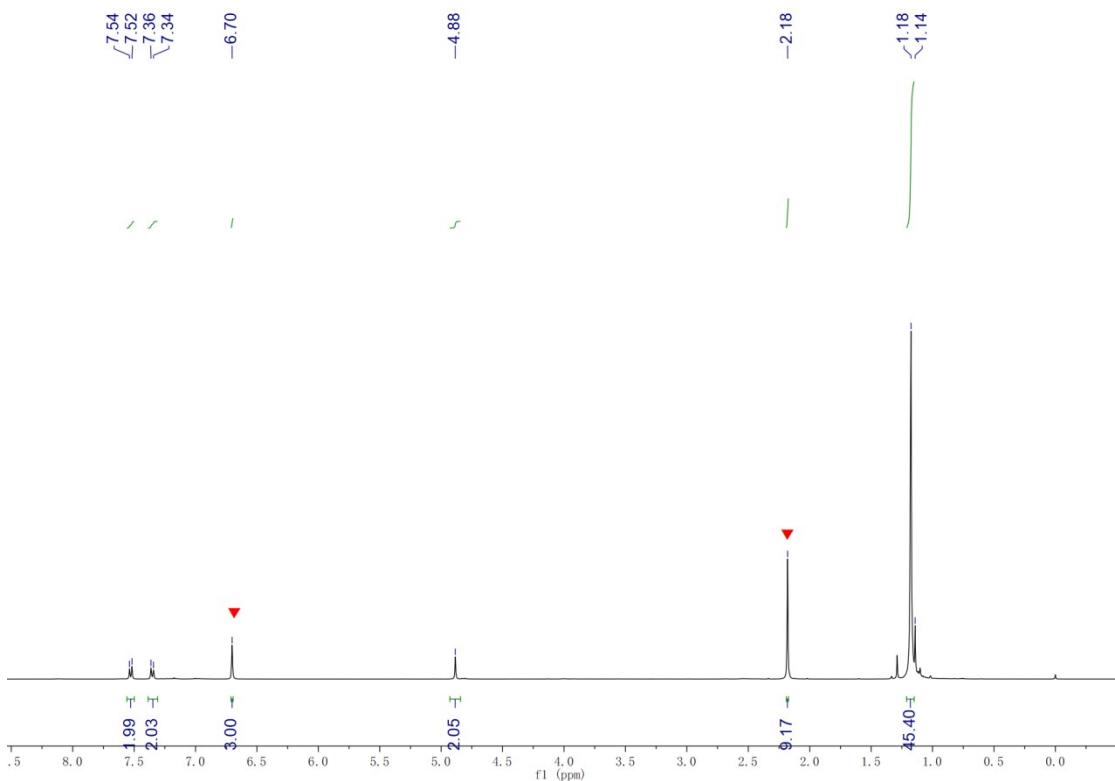


Figure S3.8.1 ¹H NMR spectrum of compound **8h** in CDCl_3

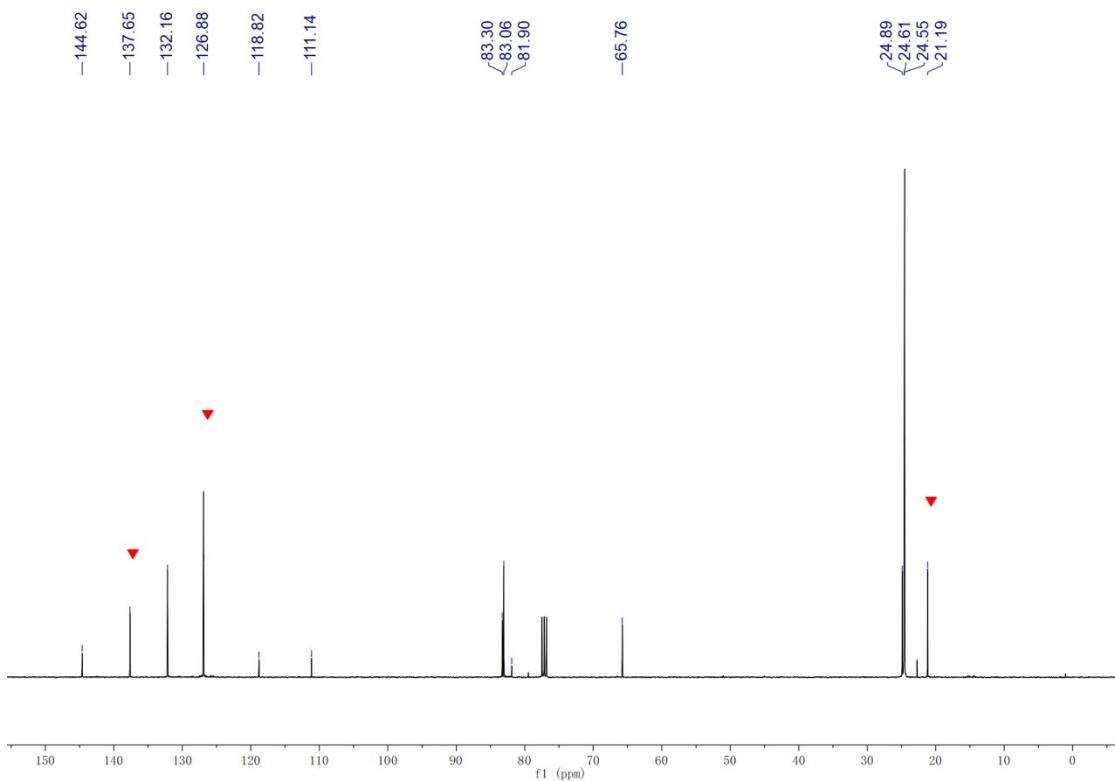


Figure S3.8.2 ^{13}C NMR spectrum of compound **8h** in CDCl_3

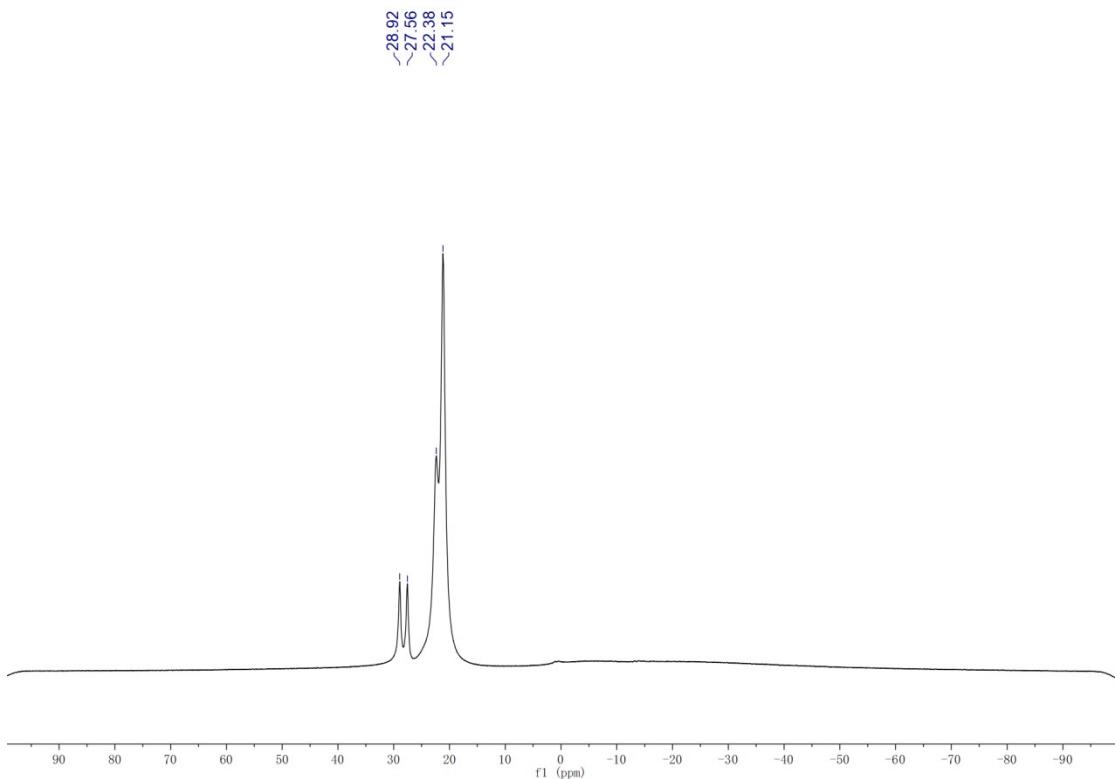


Figure S3.8.3 ^{11}B NMR spectrum of compound **8h** in CDCl_3

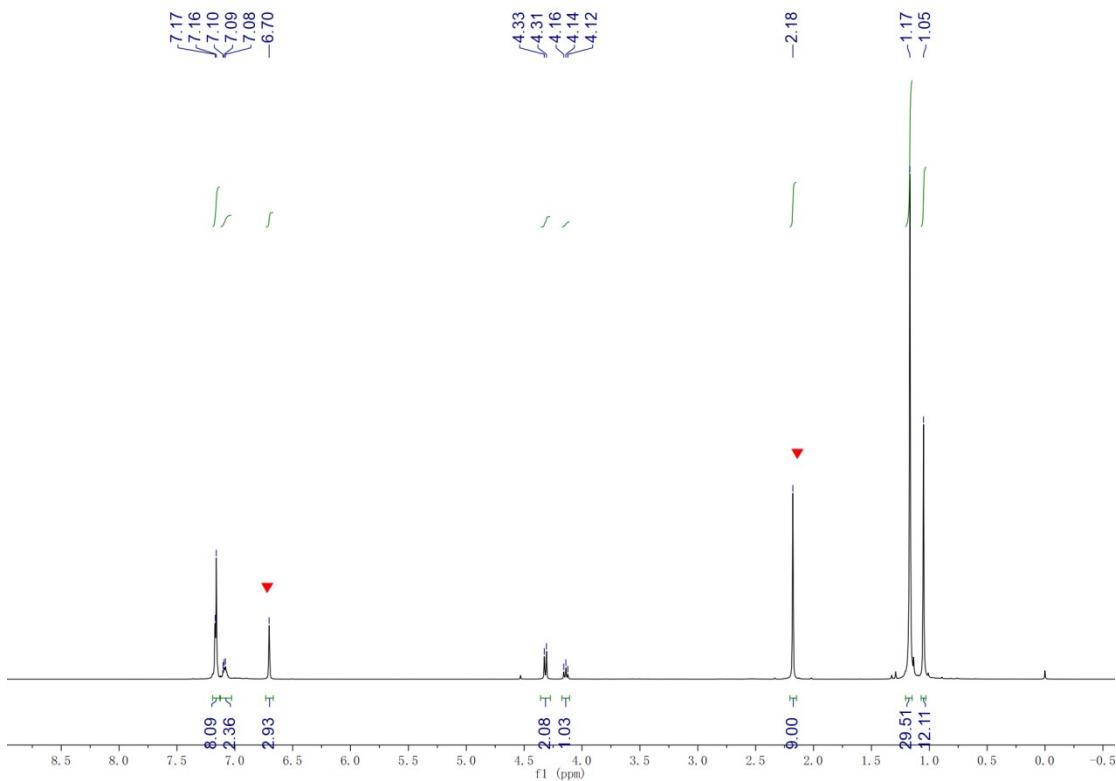


Figure S3.9.1 ^1H NMR spectrum of compound **8i** in CDCl_3

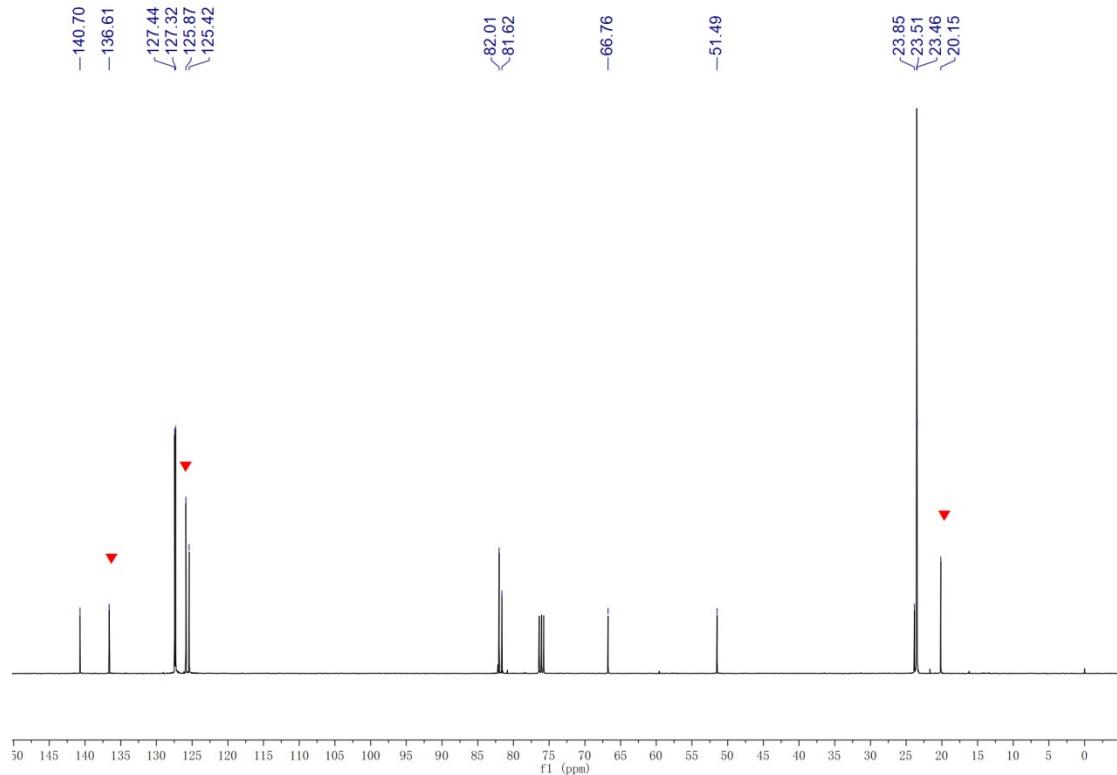


Figure S3.9.2 ^{13}C NMR spectrum of compound **8i** in CDCl_3

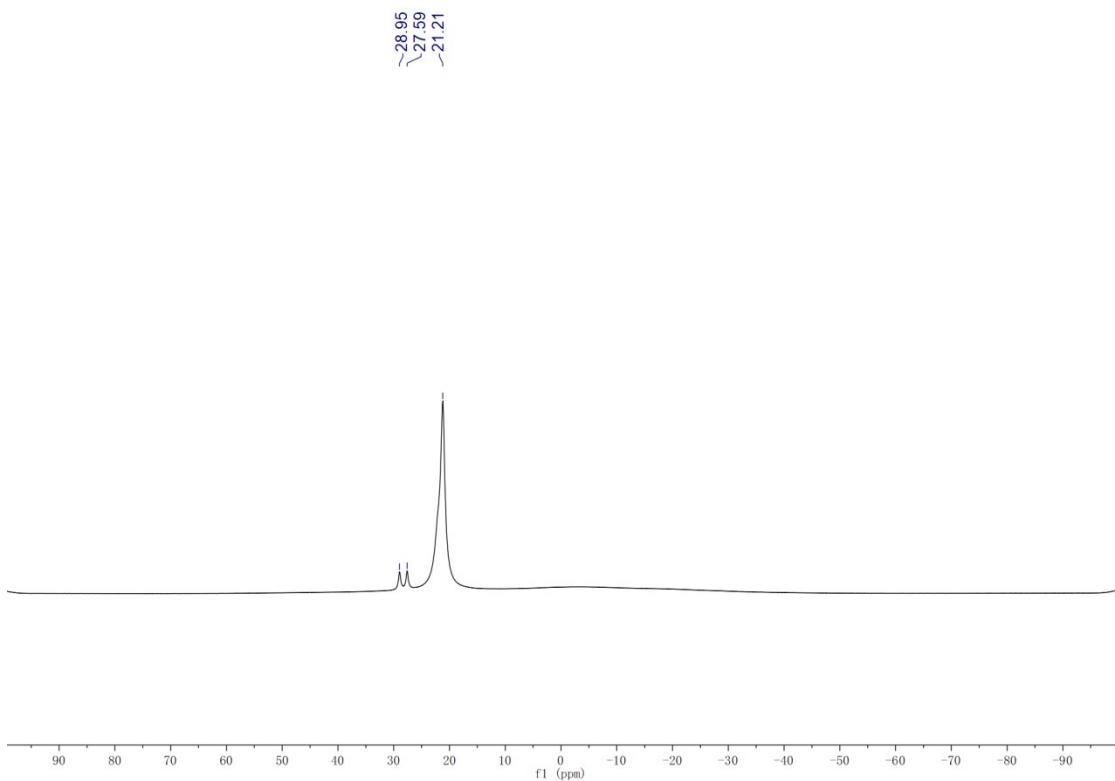


Figure S3.9.3 ^{11}B NMR spectrum of compound **8i** in CDCl_3

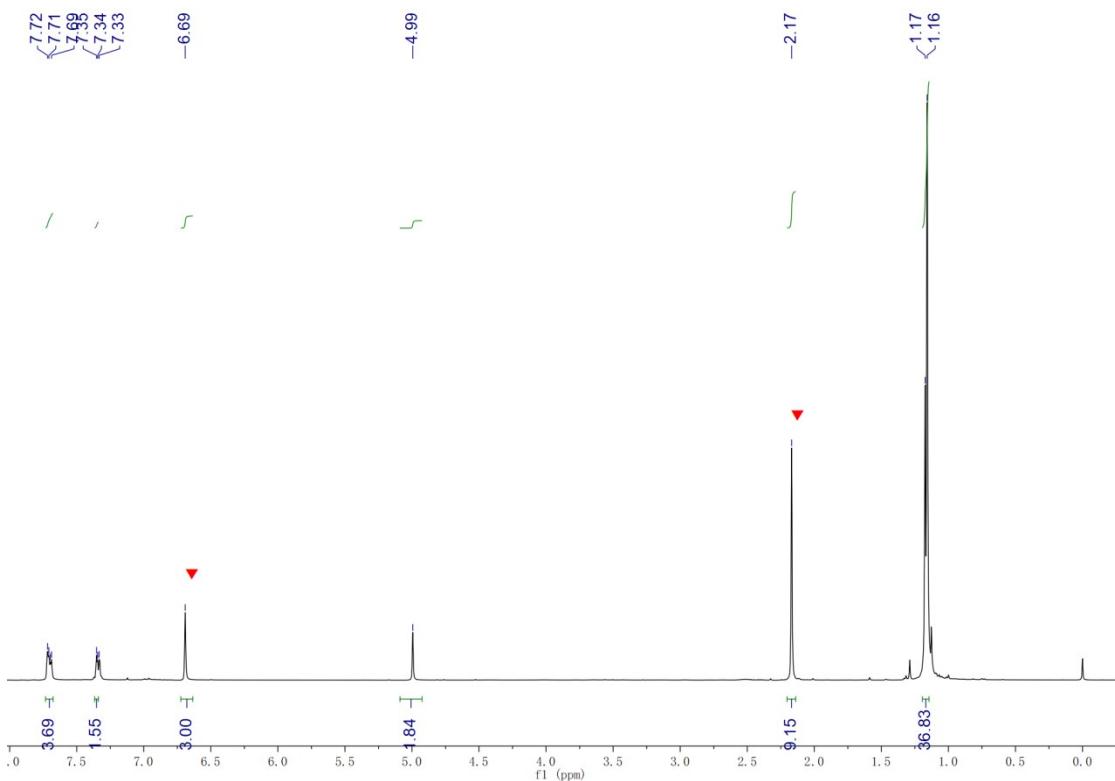


Figure S3.10.1 ^1H NMR spectrum of compound **8j** in CDCl_3

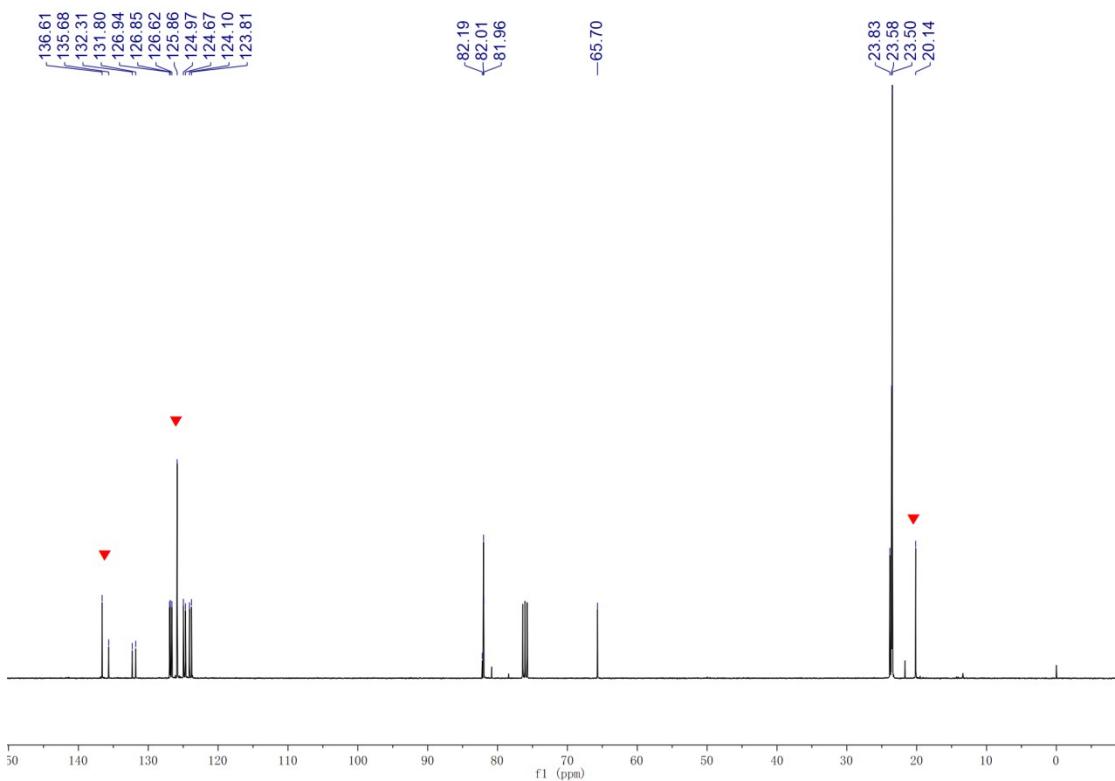


Figure S3.10.2 ^{13}C NMR spectrum of compound **8j** in CDCl_3

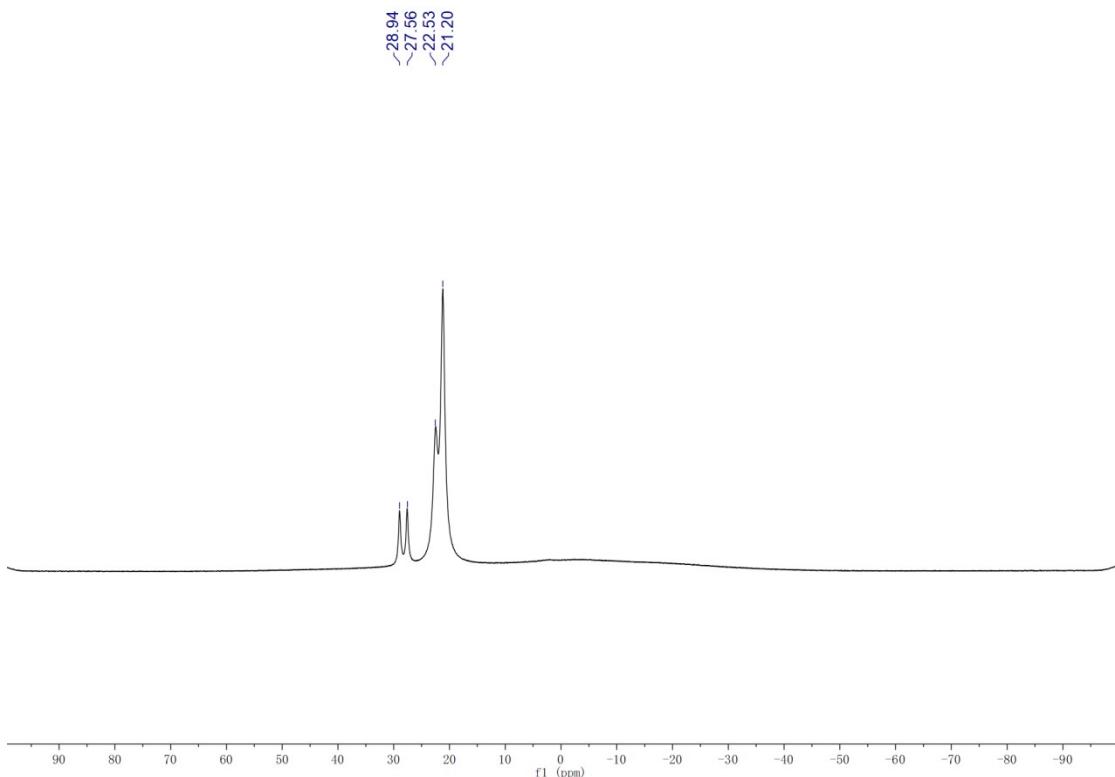


Figure S3.10.3 ^{11}B NMR spectrum of compound **8j** in CDCl_3

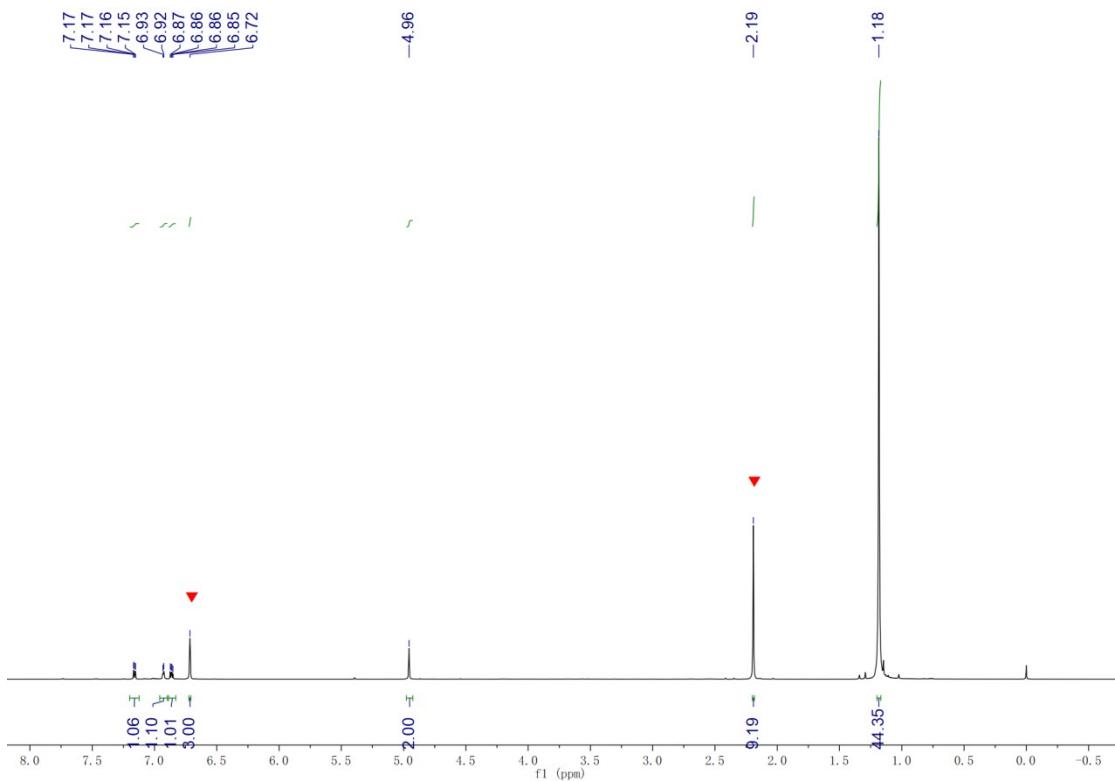


Figure S3.11.1 ^1H NMR spectrum of compound **8k** in CDCl_3

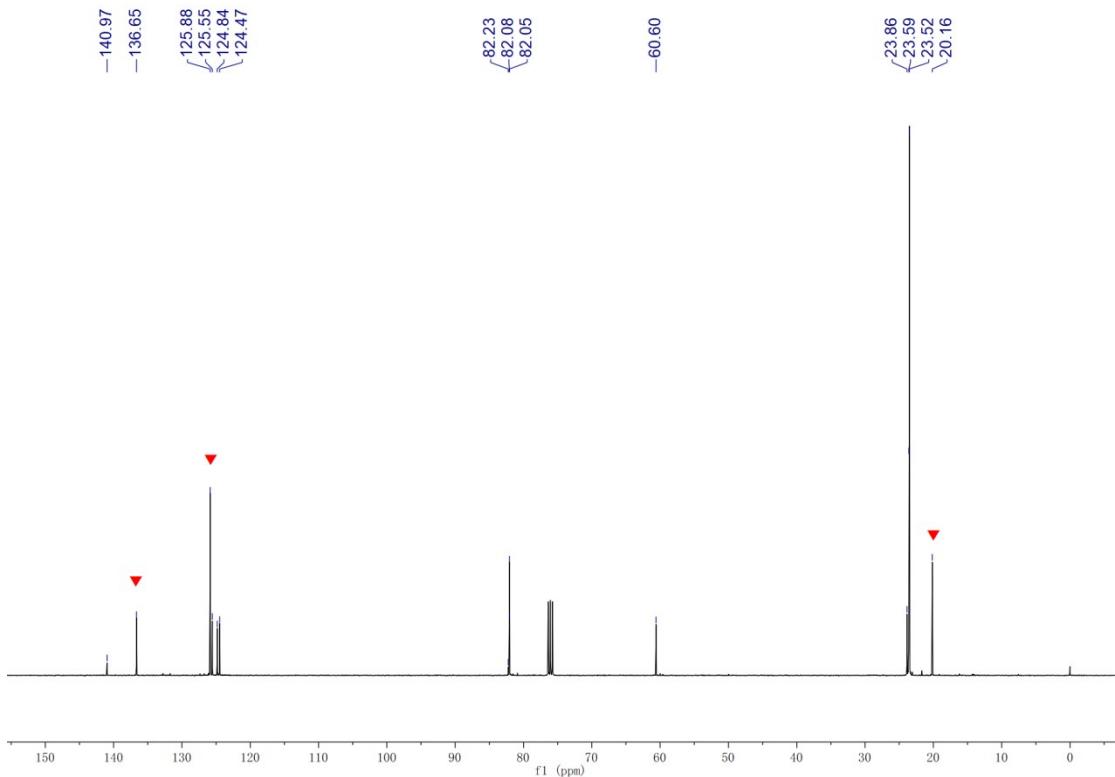


Figure S3.11.2 ^{13}C NMR spectrum of compound **8k** in CDCl_3

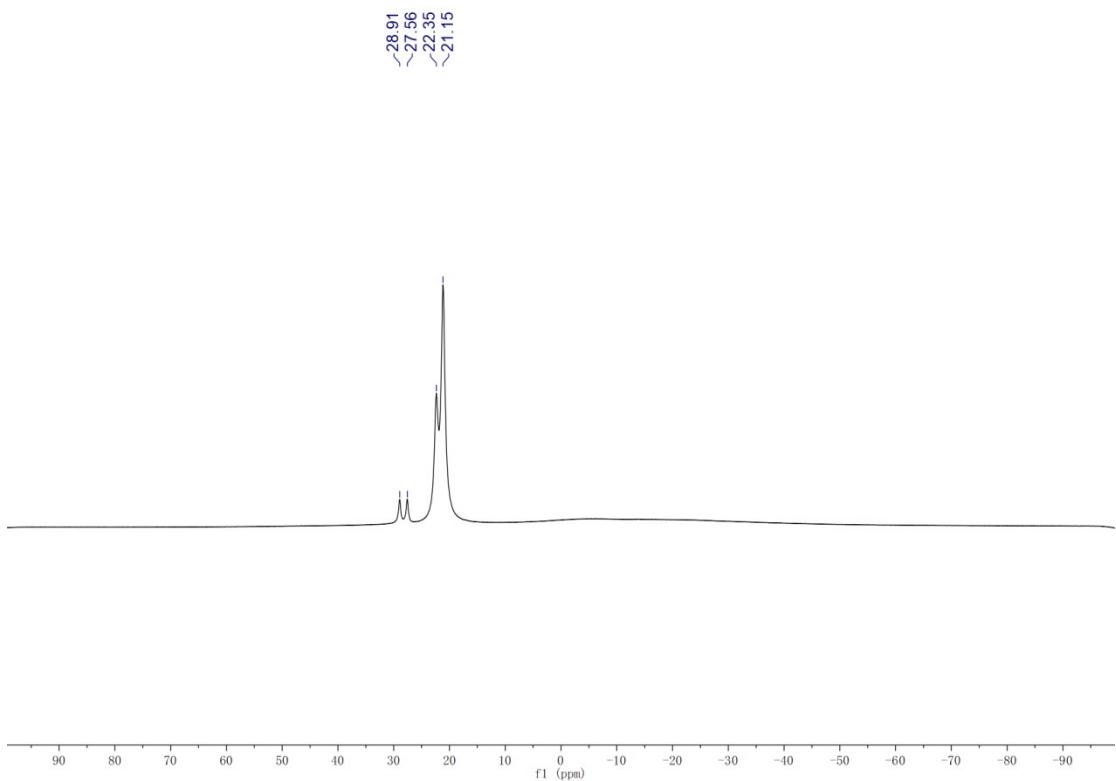


Figure S3.11.3 ¹¹B NMR spectrum of compound **8k** in CDCl_3

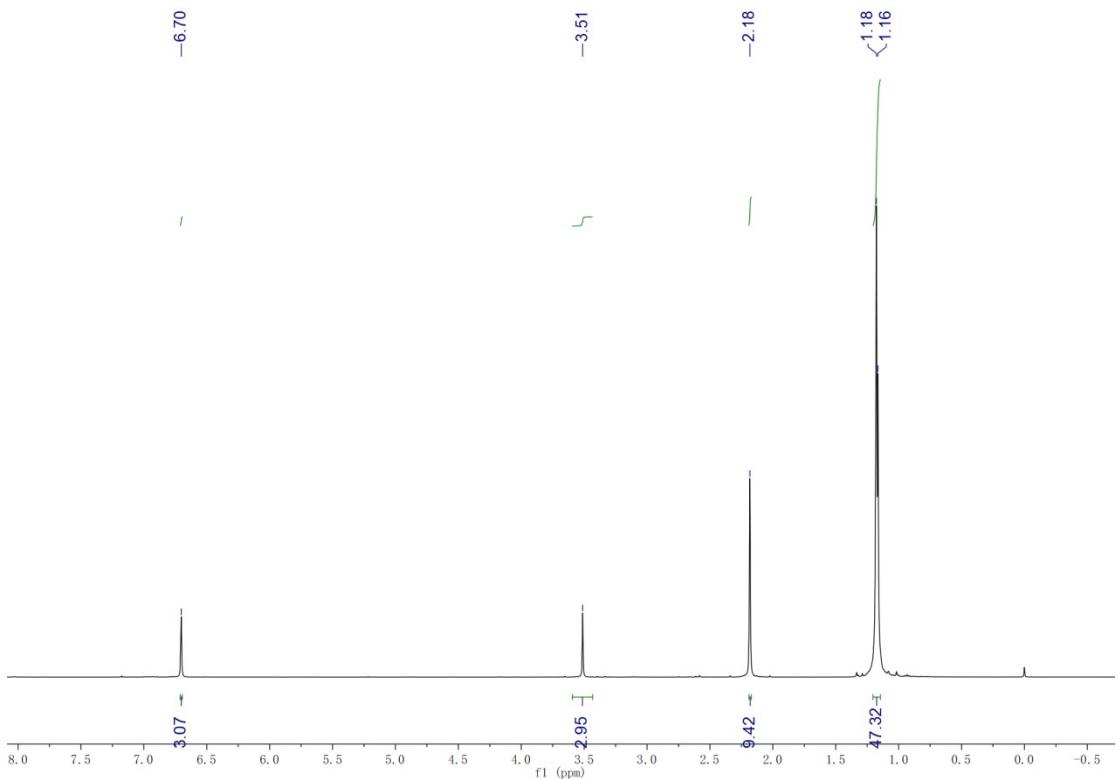


Figure S3.12.1 ¹H NMR spectrum of compound **8l** in CDCl_3

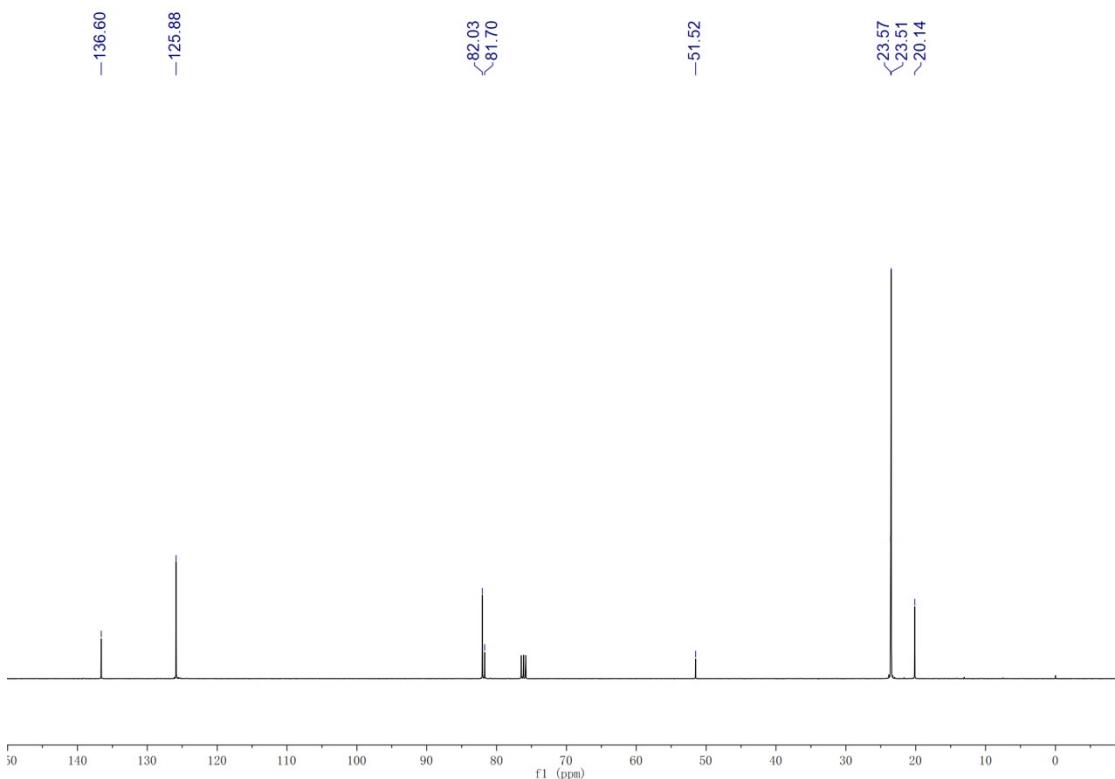


Figure S3.12.2 ^{13}C NMR spectrum of compound **8l** in CDCl_3

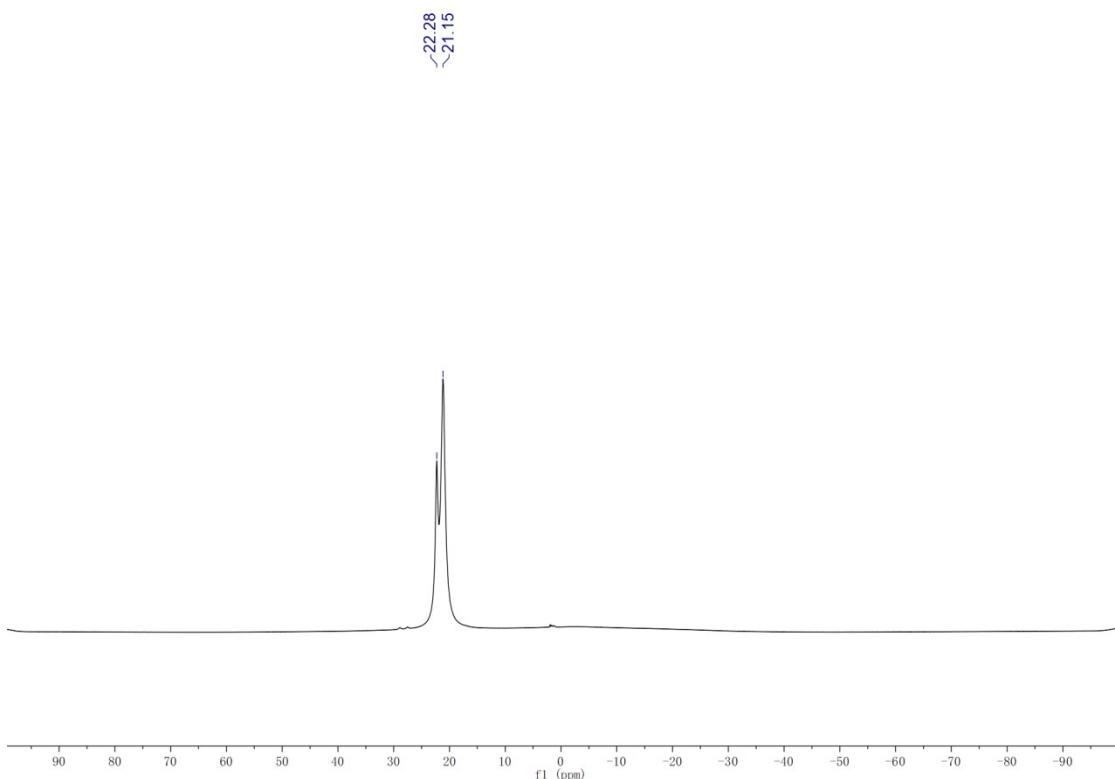


Figure S3.12.3 ^{11}B NMR spectrum of compound **8l** in CDCl_3

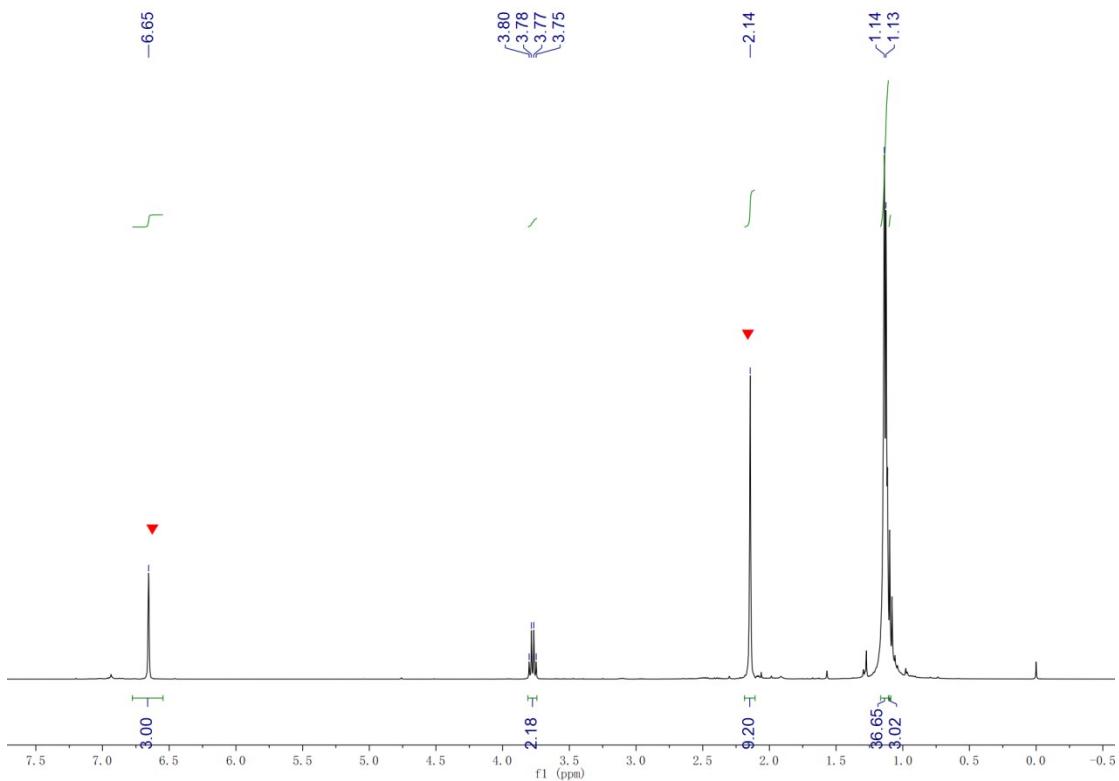


Figure S3.13.1 ^1H NMR spectrum of compound **8m** in CDCl_3

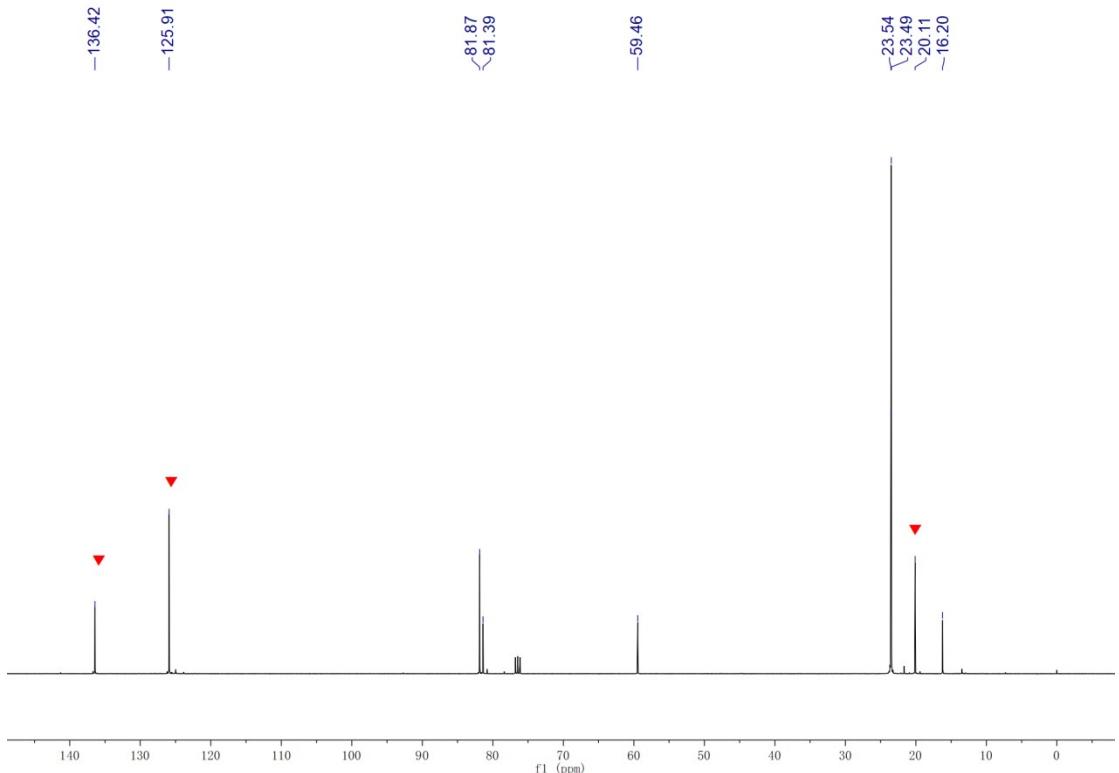


Figure S3.13.2 ^{13}C NMR spectrum of compound **8m** in CDCl_3

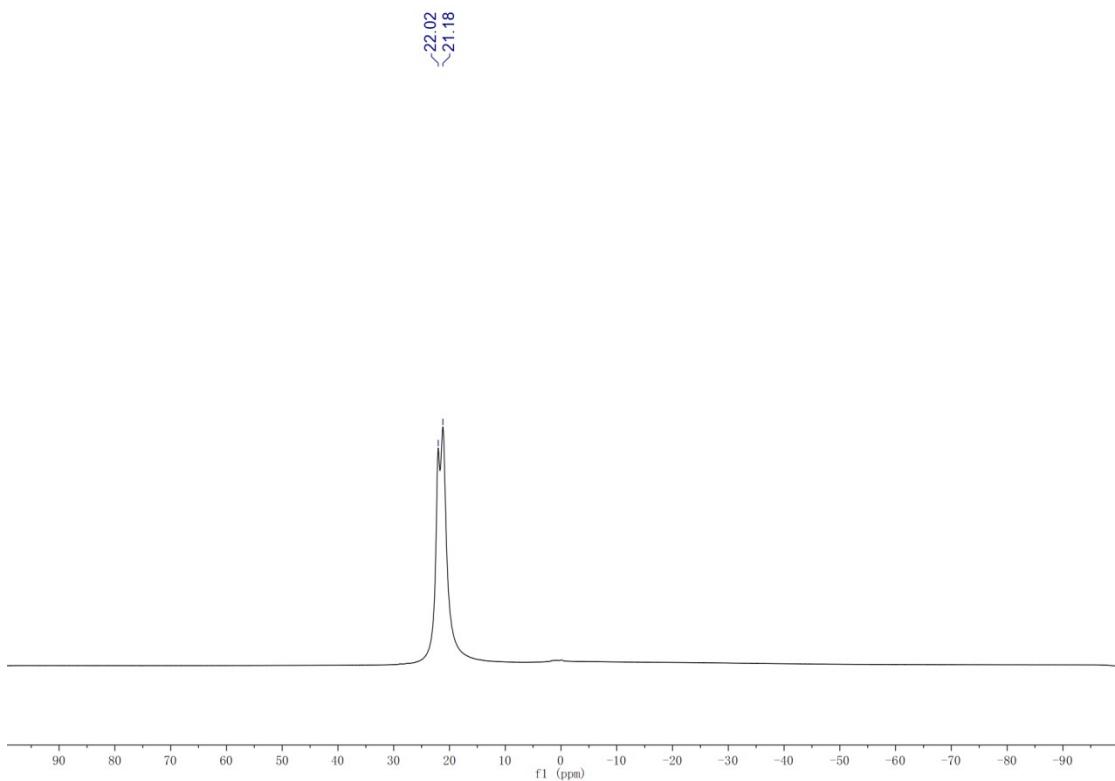


Figure S3.13.3 ^{11}B NMR spectrum of compound **8m** in CDCl_3

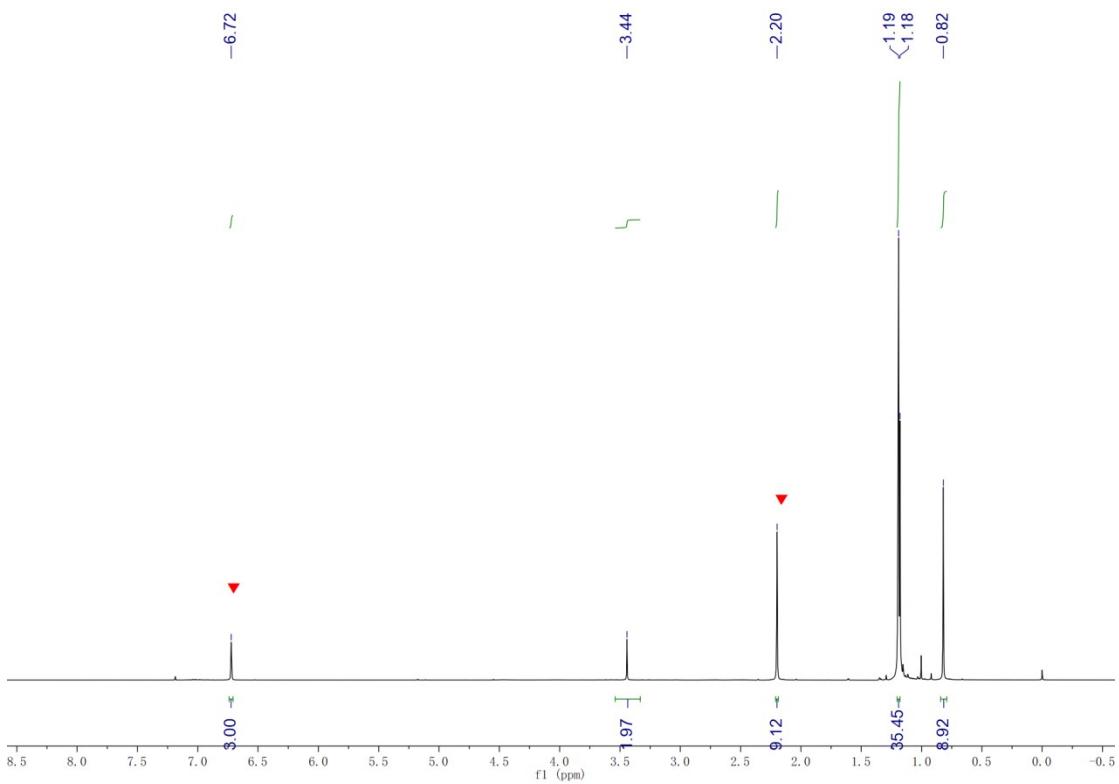
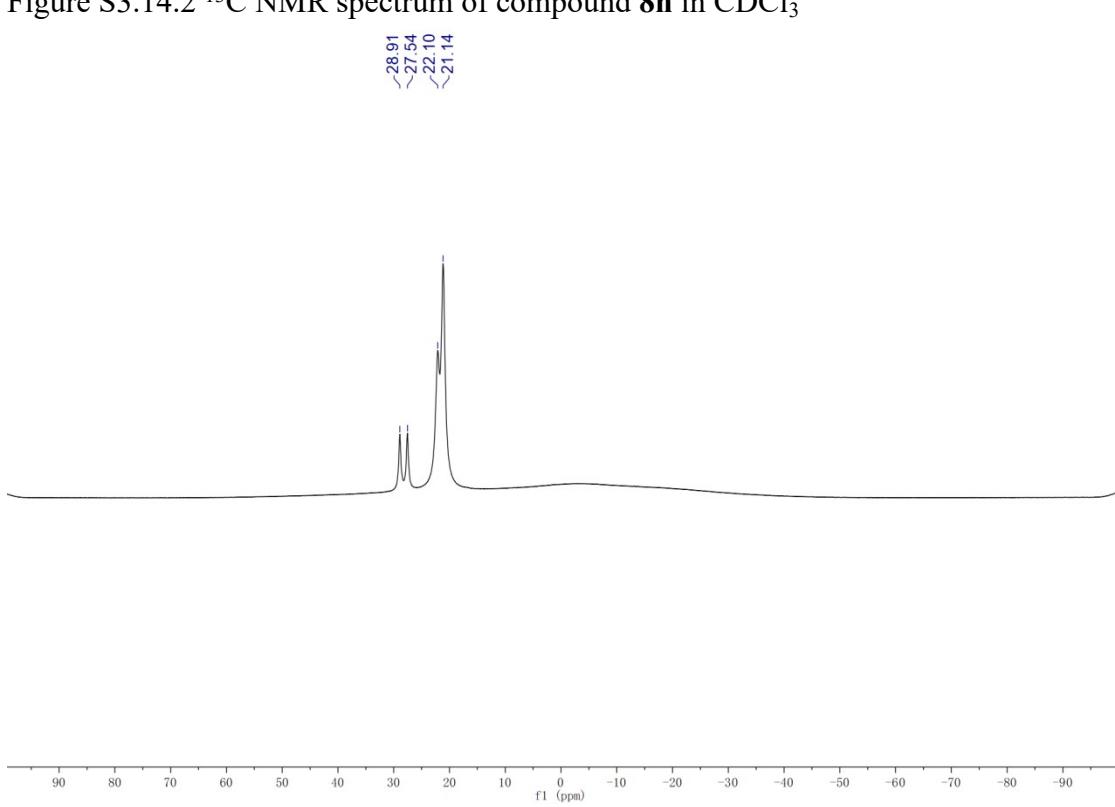
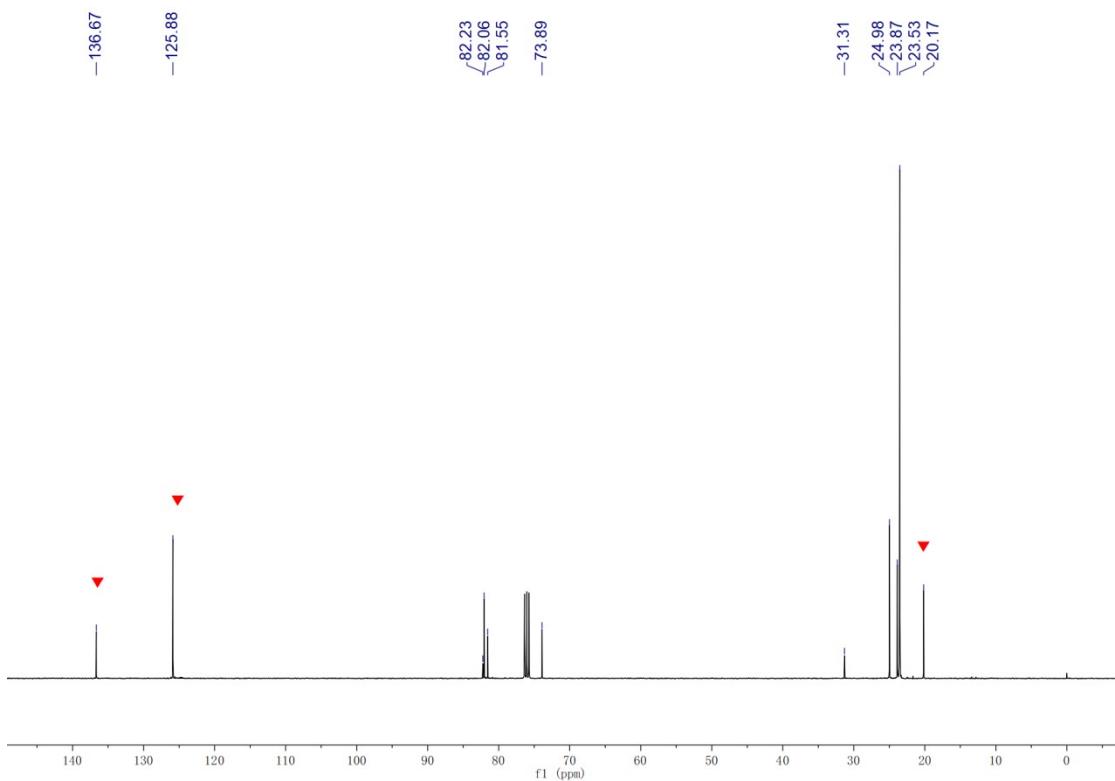


Figure S3.14.1 ^1H NMR spectrum of compound **8n** in CDCl_3



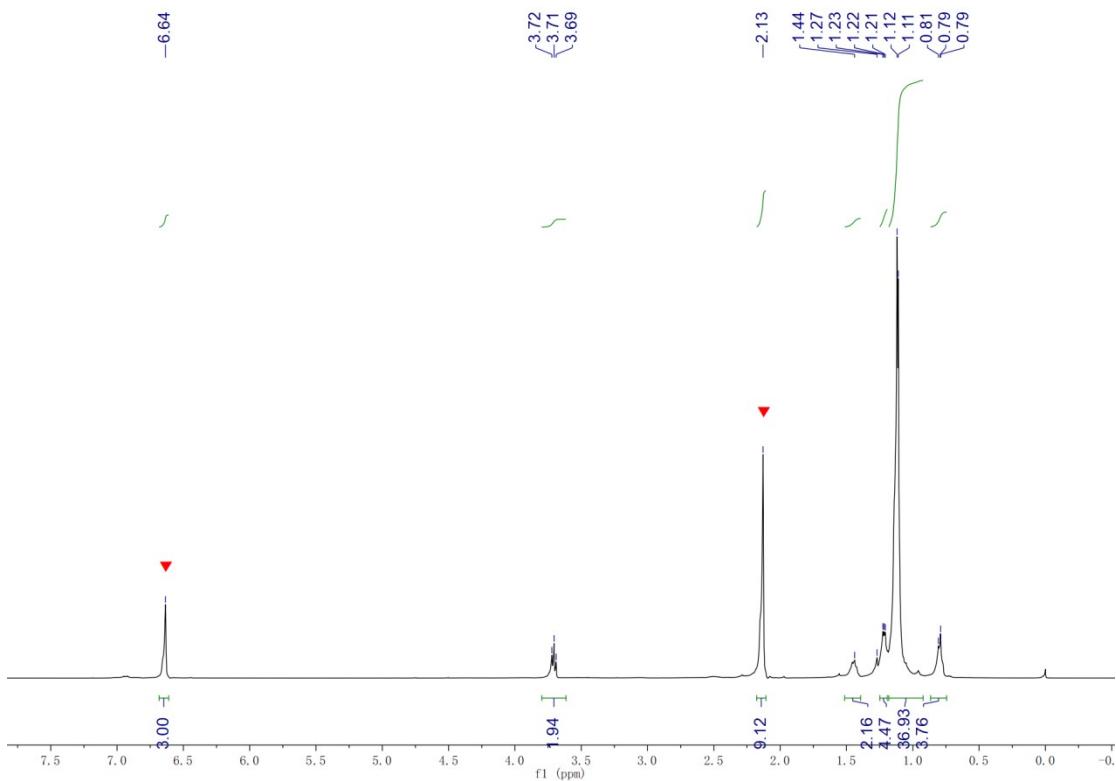


Figure S3.15.1 ^1H NMR spectrum of compound **8o** in CDCl_3

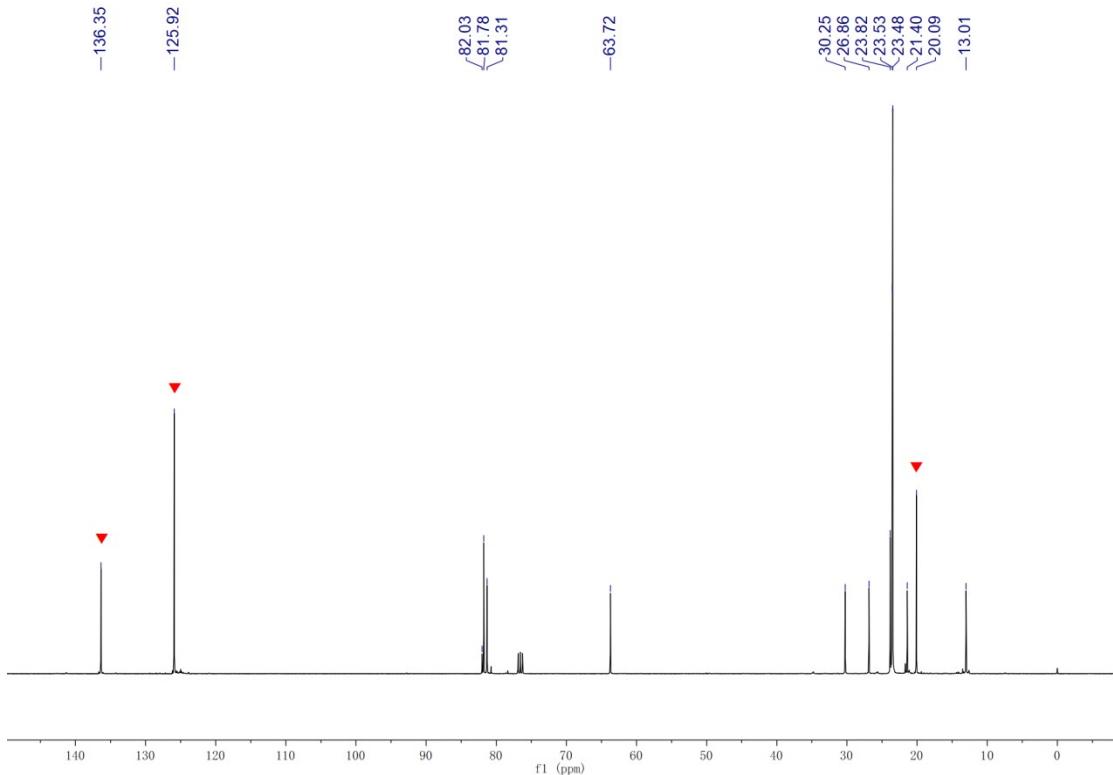


Figure S3.15.2 ^{13}C NMR spectrum of compound **8o** in CDCl_3

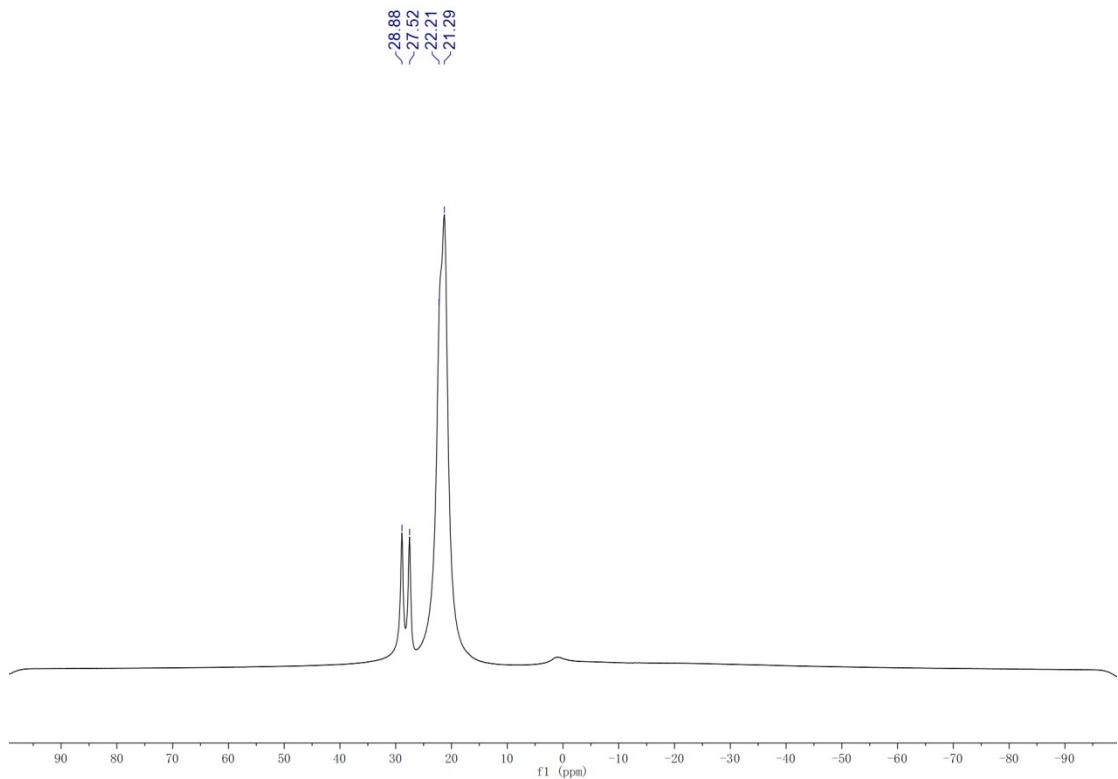


Figure S3.15.3 ¹¹B NMR spectrum of compound **8o** in CDCl_3

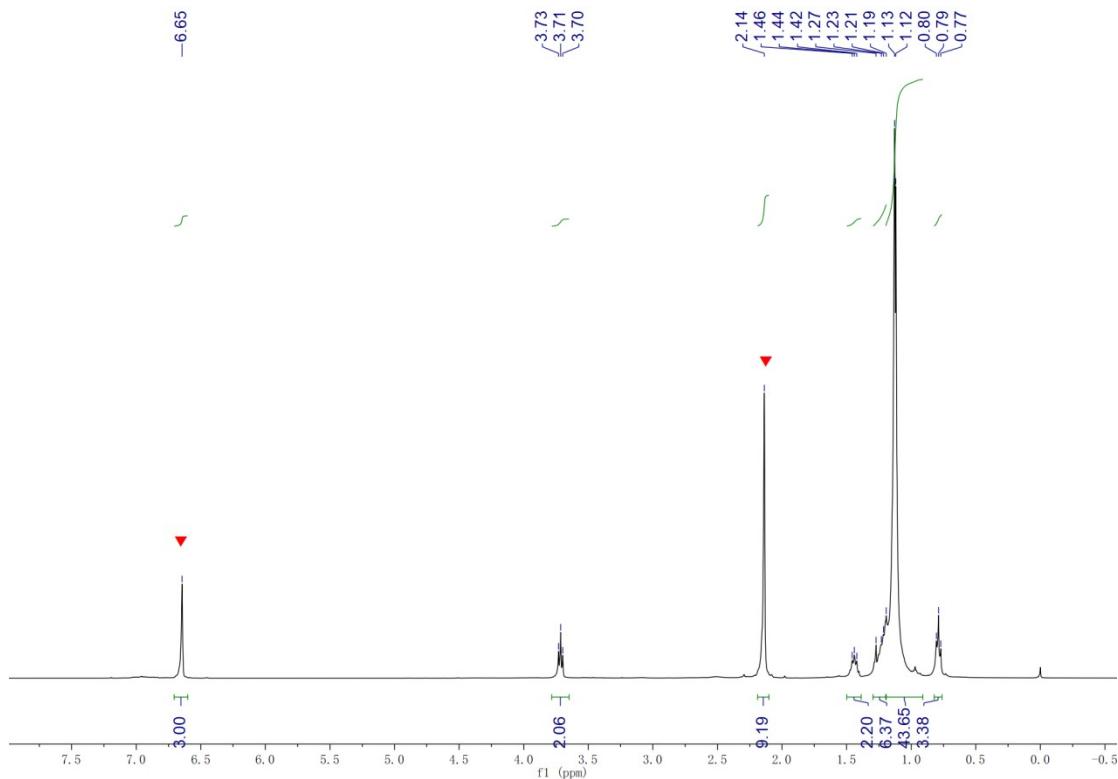


Figure S3.16.1 ¹H NMR spectrum of compound **8p** in CDCl_3

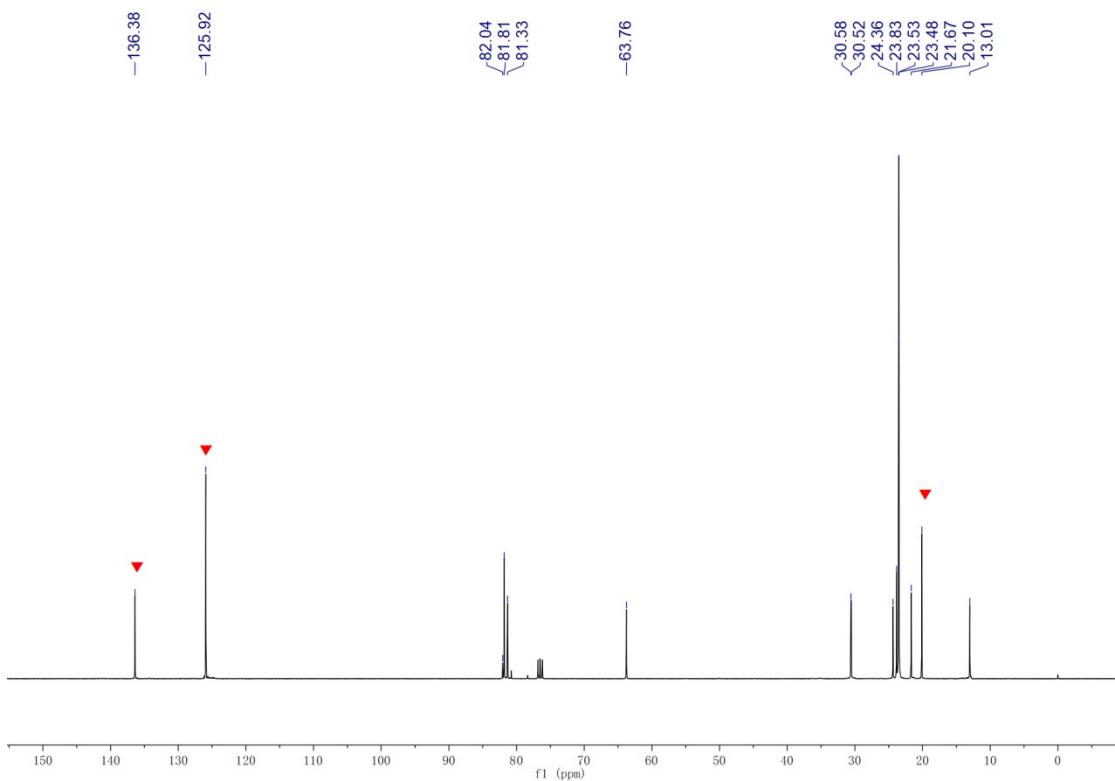


Figure S3.16.2 ¹³C NMR spectrum of compound **8p** in CDCl_3

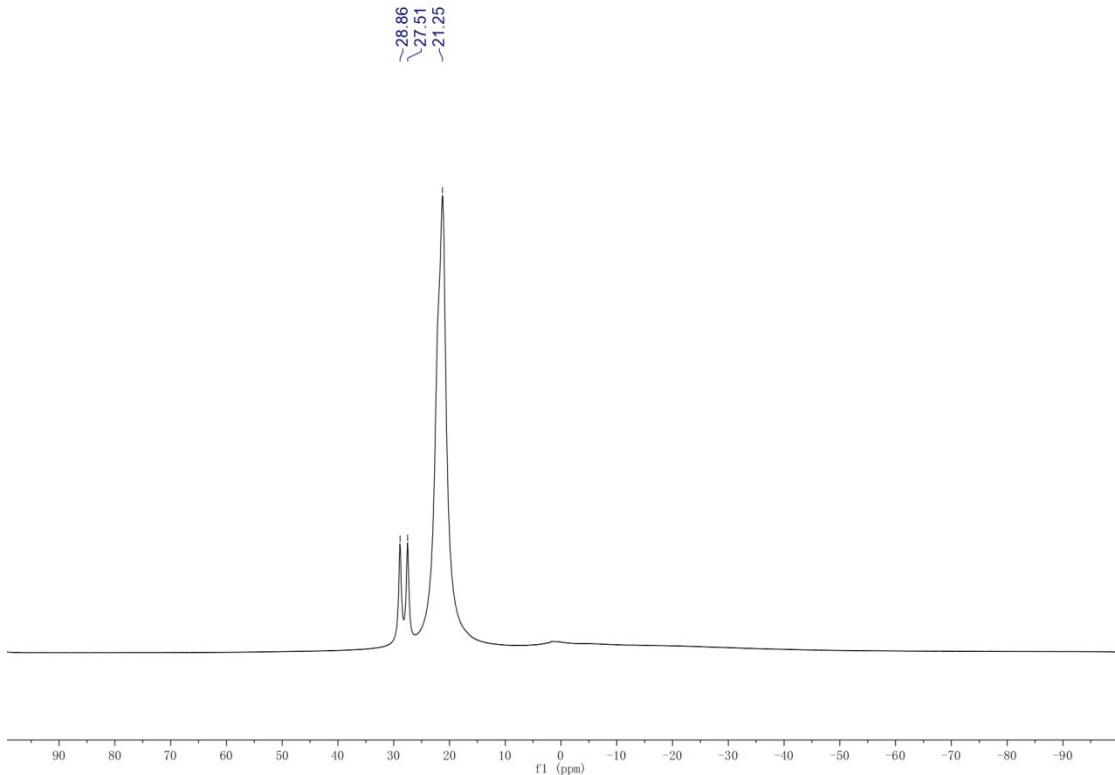


Figure S3.16.3 ¹¹B NMR spectrum of compound **8p** in CDCl_3

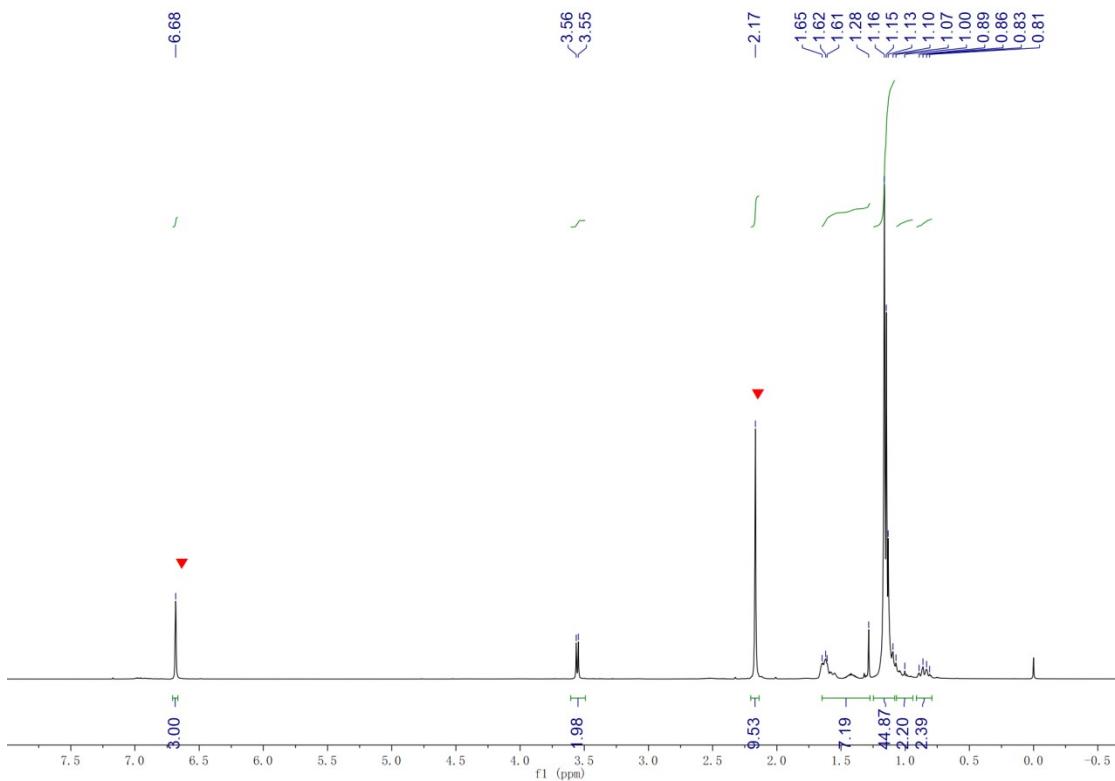


Figure S3.17.1 ^1H NMR spectrum of compound **8q** in CDCl_3

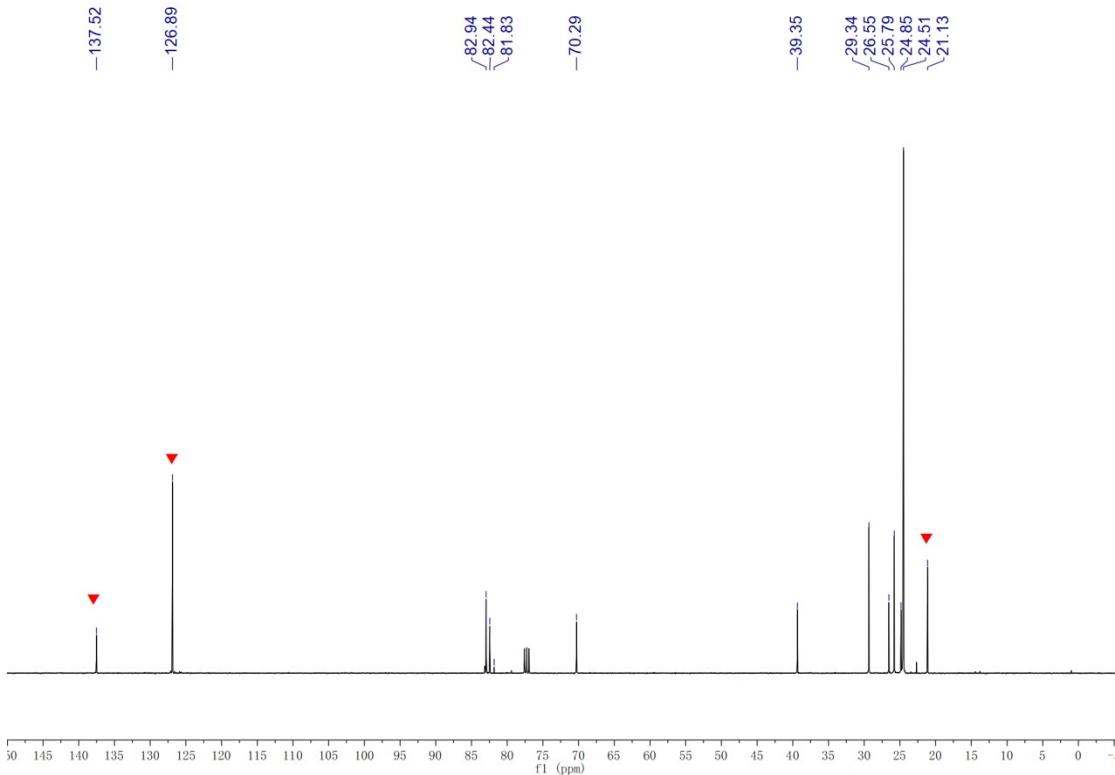


Figure S3.17.2 ^{13}C NMR spectrum of compound **8q** in CDCl_3

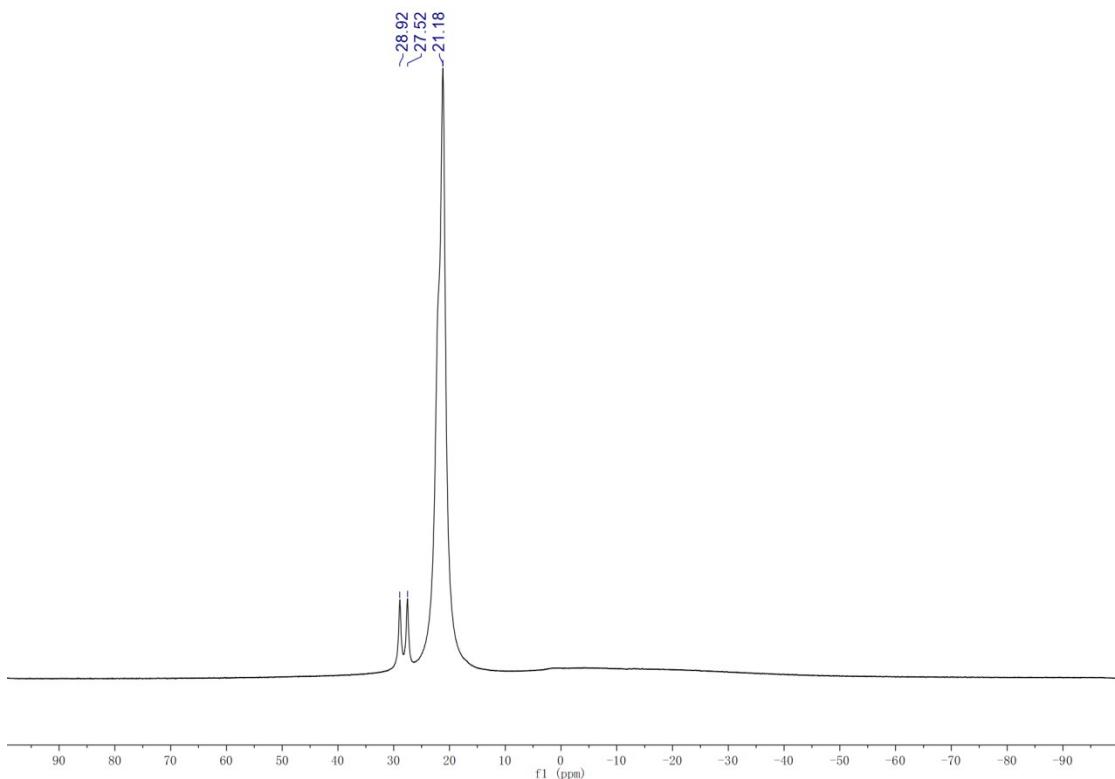


Figure S3.17.3 ^{11}B NMR spectrum of compound **8q** in CDCl_3

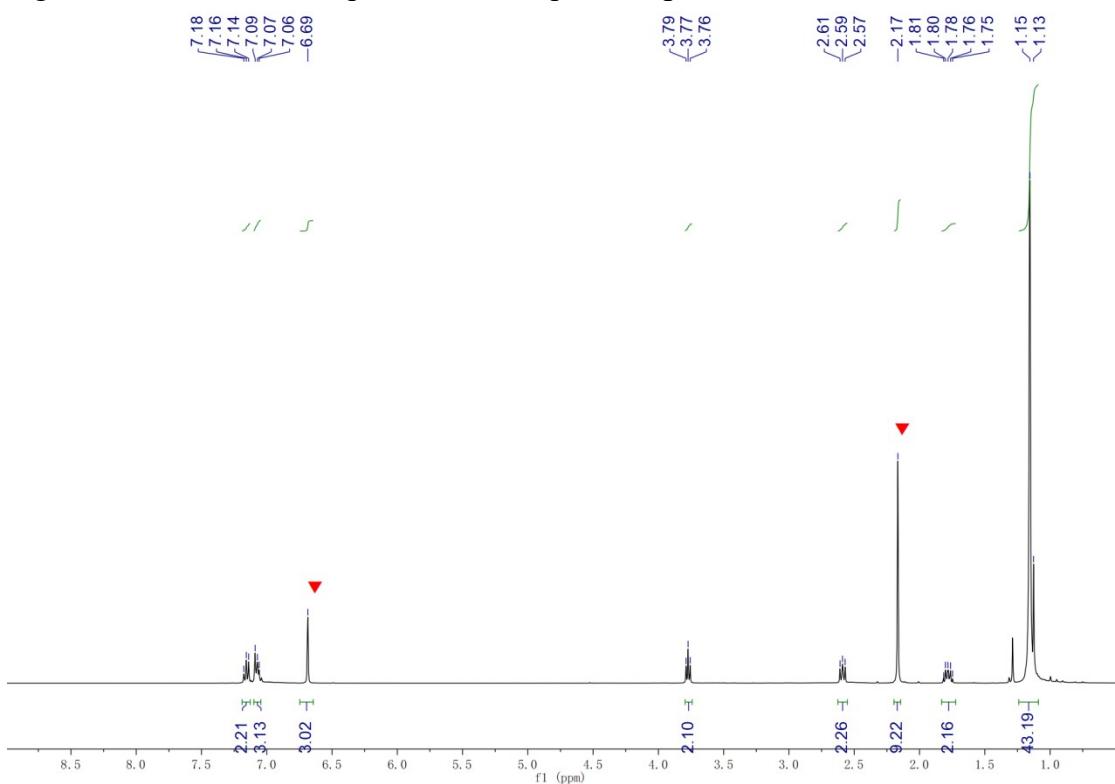


Figure S3.18.1 ^1H NMR spectrum of compound **8r** in CDCl_3

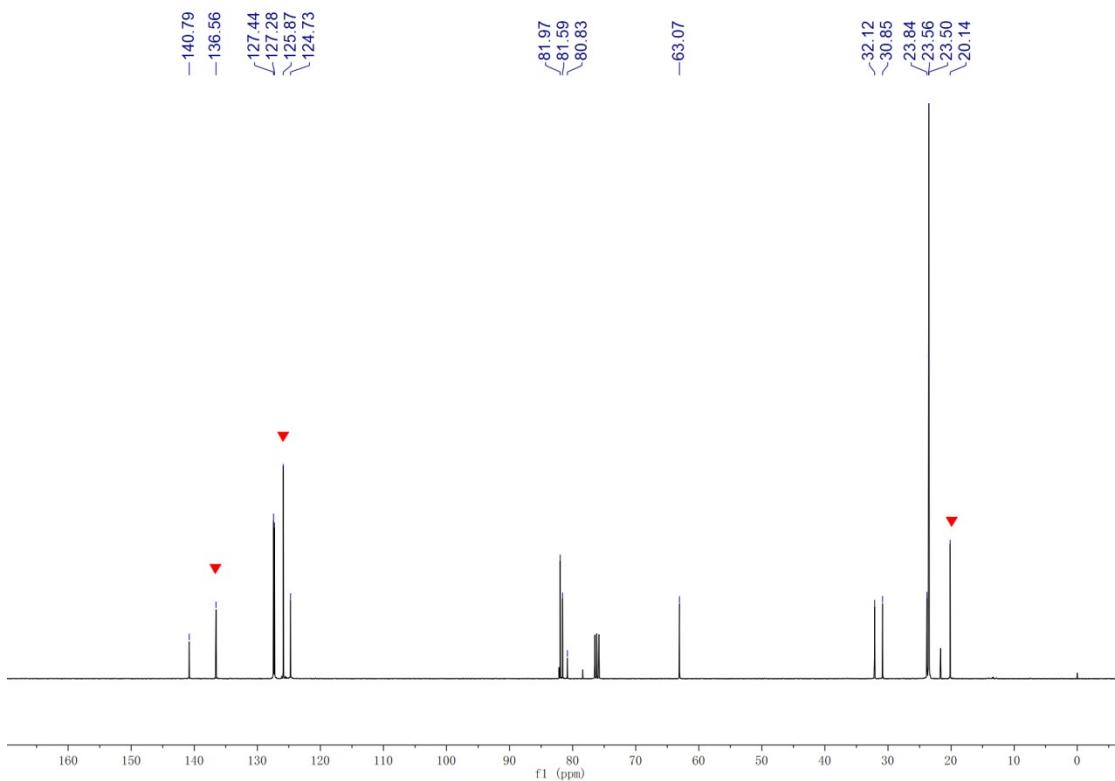


Figure S3.18.2 ^{13}C NMR spectrum of compound **8r** in CDCl_3

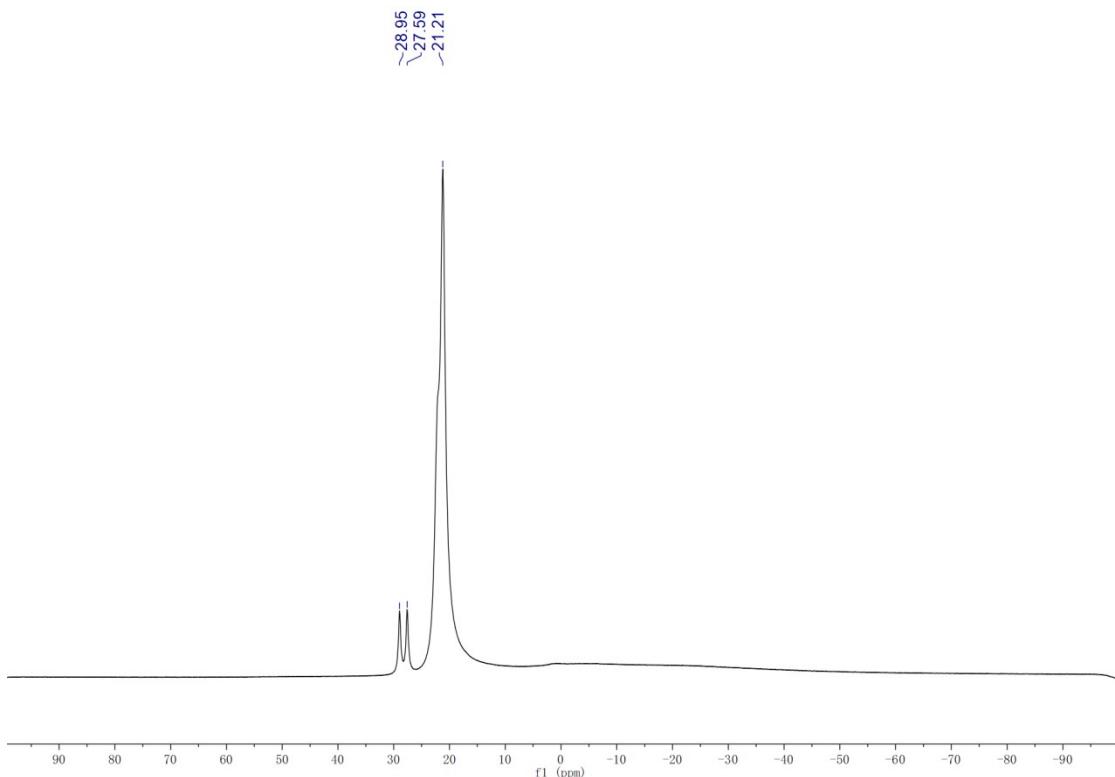


Figure S3.18.3 ^{11}B NMR spectrum of compound **8r** in CDCl_3

¹H, ¹³C and ¹¹B NMR Spectra of Hydroboration Products of CO₂.

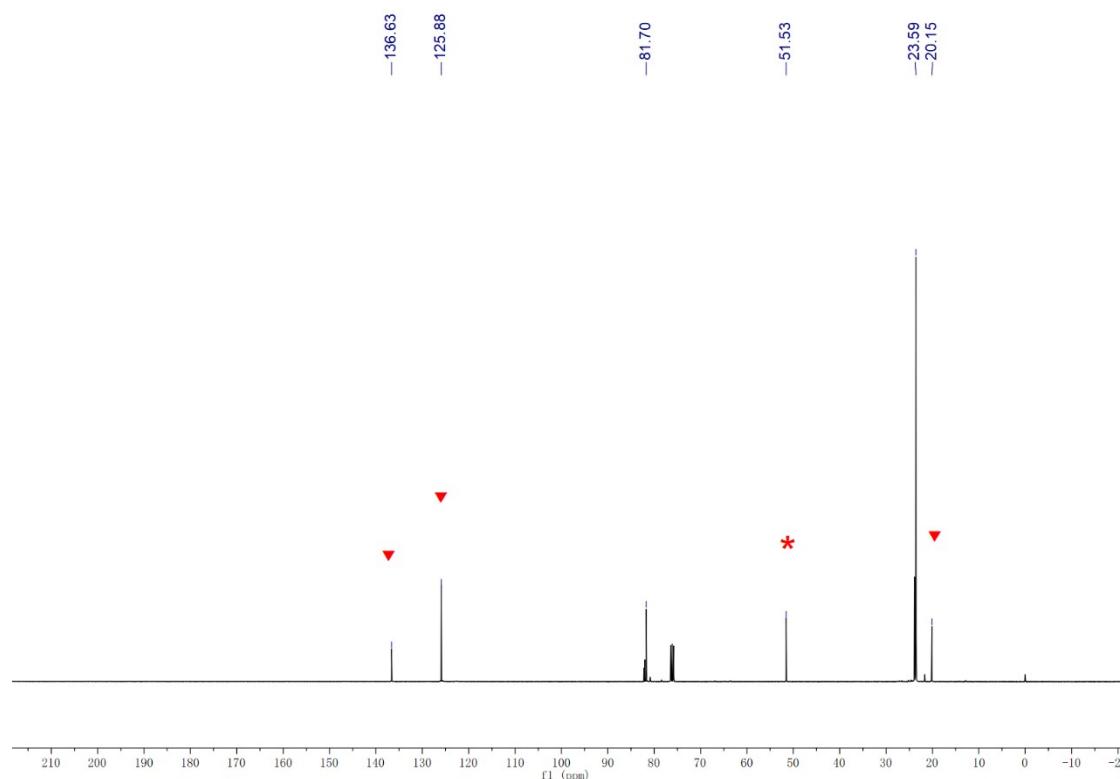
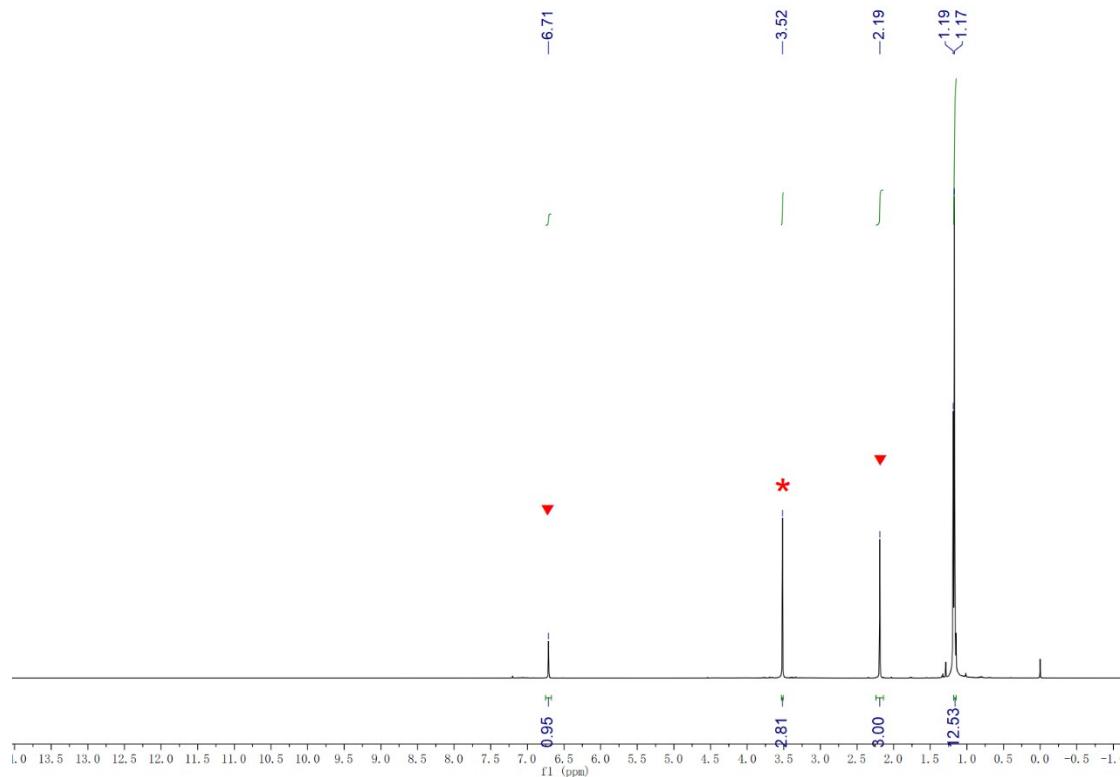


Figure S4.1.2 ^{13}C NMR spectrum NMR of **4j** in CDCl_3

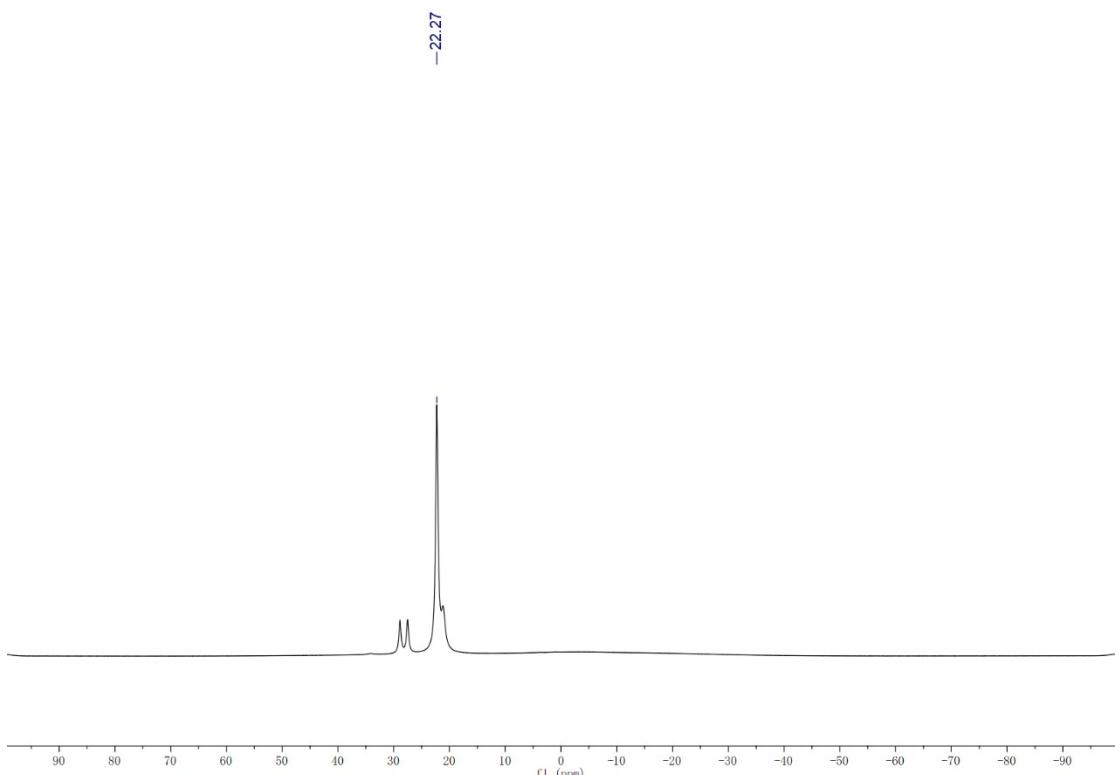


Figure S4.1.3 ^{11}B NMR spectrum of compound **4j** in CDCl_3

DFT Calculations

Computational Details

All computations reported in this article were performed employing a DFT method implemented in the Gaussian 09 suite of programs.^[S2] Geometry optimizations were carried out using gradient-corrected BP86 functional^[S3,S4] in conjunction with Ahlrichs' split valence plus polarization basis set (def2-SVP)^[S5,S6] for all the atoms. BP86 is composed of Becke's 1988 exchange and Perdew's 1986 correlation functionals. No symmetry constraints were imposed during structural optimizations. The frequency analyses were executed on the optimized geometries at the same level to ascertain the nature of stationary points and also to obtain the thermochemical energy values. The stationary points were characterized as either real minimum (no imaginary frequency) or transition state which is the first-order saddle point (one imaginary frequency) on the potential energy surface. The transition states were searched using the linear synchronous transit (LST) method,^[S7] and subsequent optimizations were performed

by utilizing the default Berny algorithm, implemented in the Gaussian 09 code. Intrinsic reaction coordinate (IRC) calculations were enforced to ensure that the transition state connects the corresponding real minima.^[S8,S9] Furthermore, to improve the accuracy of the energies obtained at the R-BP86/def2-SVP level, single-point calculations were performed on the optimized geometries employing the triple- ζ valence plus polarization basis set (def2-TZVP)^[S5,S6] for all the atoms. Tight wave function convergence criteria and “ultrafine” (99,950) grid were used in numerical integration during single-point calculations. Additionally, to incorporate the London dispersion effects, we used Grimme's D3 empirical corrections.^[S10] All the energy values (ΔG_L) reported in this article were obtained at the R-BP86-D3/def2-TZVP//R-BP86/def2-SVP level.

Moreover, to enrich our understanding towards the origin of activation barriers, distortion–interaction analysis was performed on the optimized geometries of selected transition states.^[S11,S12] The distortion–interaction model allows for partitioning the activation barrier of a transition state ($\Delta^\ddagger E$) into two physically meaningful terms:

$$\Delta^\ddagger E = \Delta^\ddagger E_{\text{dist}} + \Delta^\ddagger E_{\text{int}} \quad (\text{Eq. 1})$$

In *Eq. 1*, the destabilizing distortion energy term $\Delta^\ddagger E_{\text{dist}}$ accounts for the energy required to promote the reactants from their equilibrium geometries to the geometries in the transition state. In contrast, the stabilizing interaction energy term $\Delta^\ddagger E_{\text{int}}$ corresponds to the energy change upon interaction of the two distorted fragments. Optimized geometries were rendered using CYLview^[S13] visualization software.

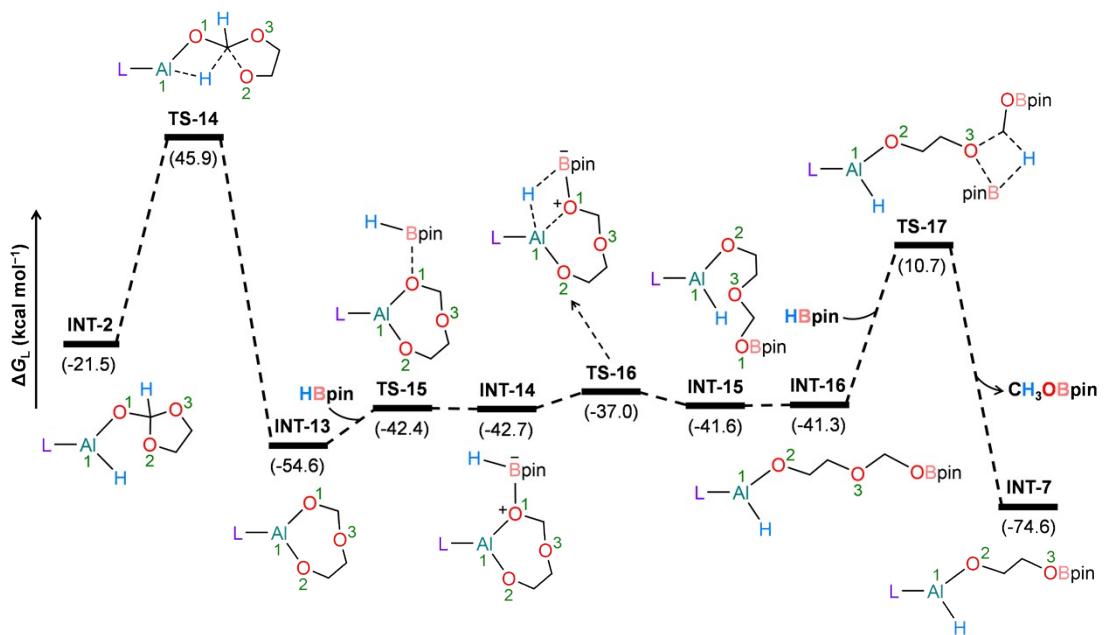


Figure S5. Energy profile for the formation of the intermediate **INT-7** and **CH₃OBpin** following unfavorable pathway. L = HC(CMeNAr)₂, Ar = 2,6 - Et₂C₆H₃.

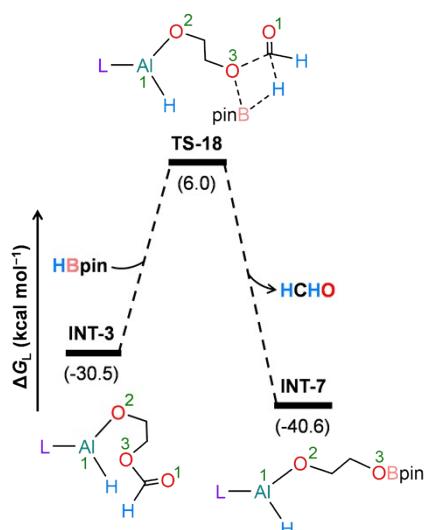


Figure S6. Energy profile for the formation of the intermediate **INT-7** and formaldehyde following unfavorable pathway. L = HC(CMeNAr)₂, Ar = 2,6 - Et₂C₆H₃.

Table S3. Distortion–interaction analysis of the transition state **TS-8**.^[a]

$\Delta^{\ddagger}E$	$\Delta^{\ddagger}E_{\text{dist}}$	$\Delta^{\ddagger}E_{\text{dist}}-\text{INT-3}^{[b]}$	$\Delta^{\ddagger}E_{\text{dist}}-\mathbf{2}^{[b]}$	$\Delta^{\ddagger}E_{\text{int}}$
12.7	36.3	27.7	8.6	-23.6

^[a]Energy values are given in kcal mol⁻¹. ^[b] $\Delta^{\ddagger}E_{\text{dist}}-\text{INT-3}$ and $\Delta^{\ddagger}E_{\text{dist}}-\mathbf{2}$ are distortion

energies of the **INT-3** and catalyst (**2**) fragments, respectively.

Table S4. Distortion–interaction analysis of the transition state **TS-18**.^[a]

$\Delta^{\ddagger}E$	$\Delta^{\ddagger}E_{\text{dist}}$	$\Delta^{\ddagger}E_{\text{dist}}\text{-INT-3}^{[b]}$	$\Delta^{\ddagger}E_{\text{dist}}\text{-HBpin}^{[b]}$	$\Delta^{\ddagger}E_{\text{int}}$
22.6	50.5	22.7	27.8	-27.9

^[a]Energy values are given in kcal mol⁻¹. ^[b] $\Delta^{\ddagger}E_{\text{dist}}\text{-INT-3}$ and $\Delta^{\ddagger}E_{\text{dist}}\text{-HBpin}$ are distortion energies of the **INT-3** and pinacolborane (**HBpin**) fragments, respectively.

Table S5. Absolute energies (in hartree) of the optimized geometries. E_e = Electronic energy at the R-BP86/def2-SVP level, G_{298} = Gibbs free energy at the R-BP86/def2-SVP level, and E^L = Electronic energy at the R-BP86-D3/def2-TZVP//R-BP86/def2-SVP level at 298 K.

Species	E_e	G_{298}	E^L	No. of imaginary frequency
3a	-342.1561788	-342.11215	-342.5564047	0
2	-1324.899002	-1324.439135	-1326.218975	0
HBpin	-411.5507017	-411.400246	-412.031617	0
4a	-1050.909046	-1050.55018	-1052.136061	0
CH₃OBpin	-526.0486084	-525.869773	-526.6633053	0
HCHO	-114.4165947	-114.412687	-114.5528376	0
INT-1	-1667.103246	-1666.575679	-1668.833084	0
INT-2	-1667.104076	-1666.574595	-1668.835191	0
INT-3	-1667.112781	-1666.586744	-1668.846007	0
INT-4	-1552.705351	-1552.198718	-1554.300882	0
INT-5	-1964.255127	-1963.576647	-1966.34447	0
INT-6	-1964.262757	-1963.589797	-1966.34233	0
INT-7	-1964.264152	-1963.592807	-1966.339563	0
INT-8	-2375.806976	-2374.963255	-2378.379093	0
INT-9	-2877.618125	-2876.636057	-2880.544391	0
INT-10	-3289.160672	-3288.002453	-3292.588431	0
INT-11	-1439.403552	-1438.913046	-1440.863673	0
INT-12	-1850.947852	-1850.284246	-1852.904334	0
INT-13	-1667.162048	-1666.625917	-1668.89461	0
INT-14	-2078.699904	-2077.99118	-2080.929407	0
INT-15	-2078.704241	-2078.002329	-2080.920785	0
INT-16	-2078.706123	-2078.007449	-2080.917125	0
TS-1	-1667.036911	-1666.511016	-1668.767348	1
TS-2	-1667.084377	-1666.553598	-1668.819722	1

TS-3	-1667.079884	-1666.548587	-1668.815637	1
TS-4	-1964.250025	-1963.570157	-1966.343602	1
TS-5	-1964.247194	-1963.568976	-1966.334864	1
TS-6	-2375.803244	-2374.958764	-2378.379493	1
TS-7	-2375.78778	-2374.943732	-2378.360658	1
TS-8	-2991.96978	-2990.962803	-2995.044785	1
TS-9	-3289.157426	-3288.000586	-3292.588217	1
TS-10	-3289.150185	-3287.994036	-3292.575942	1
TS-11	-1439.305874	-1438.820701	-1440.771491	1
TS-12	-1850.944701	-1850.281245	-1852.904641	1
TS-13	-1850.93714	-1850.275487	-1852.891451	1
TS-14	-1666.98463	-1666.461009	-1668.721887	1
TS-15	-2078.699119	-2077.989379	-2080.930022	1
TS-16	-2078.69122	-2077.983197	-2080.919635	1
TS-17	-2490.178292	-2489.309632	-2492.88541	1
TS-18	-2078.618548	-2077.919978	-2080.841583	1

Table S6. Cartesian coordinates (Å) of the optimized geometries at the R-BP86/def2-SVP level.

HBpin			
H	-0.00061600	3.16340700	-0.00024600
B	-0.00017500	1.95414200	-0.00025700
O	-1.09415900	1.20770100	-0.36256100
O	1.09392100	1.20806700	0.36208400
C	-0.79486200	-0.19061800	-0.04567000
C	0.79490800	-0.19038700	0.04580200
C	-1.48402100	-0.49254200	1.29540500
C	-1.37896400	-1.07409600	-1.15084700
C	1.37940100	-1.07340200	1.15117200
C	1.48391200	-0.49277300	-1.29523300
H	-2.56500100	-0.26528100	1.20234900
H	-1.37605800	-1.55770400	1.58378500
H	-1.07536900	0.13599900	2.11201500
H	-1.11916200	-2.14005900	-0.98474100
H	-2.48442300	-0.98831000	-1.15178400
H	-1.01646900	-0.77405200	-2.15211300
H	1.11978300	-2.13944700	0.98541000
H	2.48484300	-0.98735300	1.15177700
H	1.01716300	-0.77311900	2.15244300
H	1.37645900	-1.55819200	-1.58279800
H	1.07459300	0.13496200	-2.11212700
H	2.56478600	-0.26479600	-1.20264600

	2		
N	1.44875300	-0.00006800	0.43976800
C	3.40481100	-1.24347000	-0.41989700
Al	-0.00003600	-0.00005200	-0.86880500
C	4.68300100	-1.21597500	-1.01491300
H	5.18971800	-2.16163300	-1.25820900
C	1.27465200	-0.00015100	1.77623000
C	0.00001600	-0.00015500	2.39428300
H	0.00003300	-0.00028900	3.49239600
C	2.77969300	-0.00001500	-0.11982600
C	4.68293300	1.21613600	-1.01479600
H	5.18959600	2.16184300	-1.25801000
C	5.31744800	0.00011200	-1.30782600
H	6.31501300	0.00016400	-1.77559200
C	3.40474600	1.24350500	-0.41976300
C	2.49323500	-0.00020400	2.67723400
H	3.13159400	-0.88657200	2.48167700
H	2.20302300	-0.00023500	3.74407400
H	3.13159200	0.88619500	2.48175800
N	-1.44878500	-0.00005400	0.43981400
C	-3.40488600	-1.24342600	-0.41979200
C	-4.68307300	-1.21591000	-1.01481400
H	-5.18981100	-2.16156000	-1.25810000
C	-1.27464200	-0.00013800	1.77627200
C	-2.77973700	0.00002000	-0.11974700
C	-4.68292800	1.21620100	-1.01477800
H	-5.18954900	2.16191700	-1.25805000
C	-5.31748400	0.00018700	-1.30776200
H	-6.31504400	0.00025500	-1.77554100
C	-3.40474200	1.24354900	-0.41974100
C	-2.49318900	-0.00017600	2.67732700
H	-3.13158200	-0.88652100	2.48178000
H	-2.20293100	-0.00023700	3.74415500
H	-3.13152700	0.88624700	2.48189900
H	-0.00006500	1.36825100	-1.71967300
H	-0.00005500	-1.36829800	-1.71975800
C	-2.68796300	-2.54789200	-0.10276800
C	-3.41390800	-3.83802900	-0.49612100
H	-2.45596900	-2.57697300	0.98645200
H	-1.69066900	-2.51785800	-0.59707700
H	-2.79873900	-4.72170500	-0.22983900
H	-4.38990300	-3.94627200	0.02264700
H	-3.60561300	-3.88694600	-1.58847300
C	-2.68764300	2.54791600	-0.10269800

C	-3.41337200	3.83816500	-0.49608000
H	-1.69033200	2.51773100	-0.59696300
H	-2.45568700	2.57696400	0.98653100
H	-2.79805800	4.72174600	-0.22981900
H	-3.60506400	3.88709500	-1.58843500
H	-4.38935300	3.94657600	0.02267800
C	2.68772000	2.54788900	-0.10262100
C	3.41359500	3.83813100	-0.49575500
H	2.45564600	2.57681100	0.98658600
H	1.69045800	2.51784800	-0.59699600
H	2.79833600	4.72172700	-0.22941600
H	4.38954500	3.94637500	0.02309600
H	3.60537700	3.88721100	-1.58808800
C	2.68787100	-2.54792500	-0.10287400
C	3.41387000	-3.83807300	-0.49608800
H	1.69062700	-2.51792200	-0.59728700
H	2.45576400	-2.57695300	0.98632300
H	2.79870000	-4.72174300	-0.22978900
H	3.60565100	-3.88706600	-1.58842400
H	4.38983300	-3.94625700	0.02275400
3a			
C	1.30240500	0.76100400	-0.11758200
C	1.30246400	-0.76097700	0.11760700
H	1.94600400	1.32166400	0.58846600
H	1.58546600	1.03181500	-1.15897000
H	1.58544900	-1.03181600	1.15900300
H	1.94611400	-1.32158900	-0.58843500
O	-0.06852700	-1.11887300	-0.10671800
O	-0.06860100	1.11888900	0.10668200
C	-0.85744600	-0.00000500	-0.00000800
O	-2.05631700	-0.00004200	0.00001600
4a			
O	-1.42663100	-0.98178200	-0.16245100
O	1.51953400	1.04306800	0.67918600
C	-0.35038700	-0.07496400	-0.39584200
C	0.43956200	0.13764200	0.90101500
H	-0.71523000	0.90225400	-0.77926500
H	0.31721800	-0.52710500	-1.16129900
H	0.80158800	-0.84229500	1.28126400
H	-0.22486500	0.58879000	1.66922200
B	2.76378400	0.57358200	0.37068800
O	3.83455700	1.42682300	0.18605000
O	3.07893500	-0.76747500	0.21657000
C	4.92381500	0.62023300	-0.34882900

C	4.53381700	-0.84733200	0.13438100
C	4.89191700	0.77680400	-1.87898900
C	6.24569300	1.15203700	0.21043400
C	4.90841900	-1.96924600	-0.83666000
C	5.04643600	-1.17119500	1.54788300
H	4.94941900	1.85518300	-2.12924800
H	5.74267400	0.25974200	-2.36729600
H	3.94866300	0.37960300	-2.30583100
H	7.09748900	0.51832700	-0.11252800
H	6.42309400	2.17995800	-0.16576000
H	6.23471700	1.19542700	1.31592900
H	6.00686000	-2.01193700	-0.98812300
H	4.58296700	-2.94586000	-0.42418300
H	4.42023400	-1.83921400	-1.82099100
H	6.14401500	-1.32778900	1.56450900
H	4.79741300	-0.36072000	2.26258500
H	4.55780500	-2.10086500	1.90298500
B	-2.71701200	-0.54011600	-0.11077800
O	-3.76170700	-1.39455600	0.18537100
O	-3.11023000	0.76735800	-0.35067800
C	-4.99033900	-0.66313400	-0.09417300
C	-4.51879700	0.85472800	0.01845300
C	-5.43216500	-1.04996200	-1.51629800
C	-6.05290800	-1.08480300	0.92375500
C	-5.21714500	1.82214200	-0.93990500
C	-4.57400500	1.39584300	1.45716500
H	-5.52785500	-2.15289800	-1.57311100
H	-6.41001700	-0.60093500	-1.78428100
H	-4.68292500	-0.73550900	-2.27096600
H	-6.98353500	-0.49428600	0.79449900
H	-6.30464700	-2.15493400	0.77862400
H	-5.69565200	-0.96110100	1.96357400
H	-6.30854300	1.85682400	-0.74245400
H	-4.81281900	2.84527200	-0.79989000
H	-5.05741600	1.53776500	-1.99713400
H	-5.61593900	1.56982400	1.79419100
H	-4.08816200	0.69819400	2.16918800
H	-4.02956600	2.36070500	1.49952000
CH₃OBpin			
O	2.50323500	-0.71789600	0.18897100
B	1.18409700	-0.38975400	0.10418000
O	0.19138900	-1.28948500	0.44621500
O	0.70293000	0.84106400	-0.31964100
C	-1.06957500	-0.70437500	0.01367400

C	-0.72700300	0.85056100	-0.03329000
C	-1.38800200	-1.28986400	-1.37331200
C	-2.15931800	-1.09398900	1.01567400
C	-1.44202300	1.63796800	-1.13372600
C	-0.91025700	1.54667700	1.32621300
H	-1.39113900	-2.39608400	-1.30174900
H	-2.37958800	-0.96174700	-1.74589400
H	-0.61955500	-1.00078500	-2.11880300
H	-3.12332200	-0.60443500	0.76550200
H	-2.31636800	-2.19135400	0.98785100
H	-1.88016800	-0.82042500	2.05077600
H	-2.54257700	1.60097600	-0.99660700
H	-1.12991000	2.70160100	-1.09703100
H	-1.19737100	1.24888500	-2.14017800
H	-1.98074900	1.66868600	1.58830400
H	-0.41317600	0.97943300	2.13913400
H	-0.44737500	2.55313100	1.28016900
C	3.51547700	0.23104100	-0.12220900
H	4.28578300	0.21317300	0.67762200
H	4.00901000	-0.04088600	-1.08091600
H	3.10979000	1.26102600	-0.21157700
HCHO			
C	-0.52829900	-0.00000600	0.00000000
O	0.68134100	-0.00001700	0.00000000
H	-1.14032600	0.95312700	0.00000100
H	-1.14060800	-0.95295600	0.00000100
INT-1			
N	-1.40777000	-0.82059100	0.69337500
C	-3.52472000	0.43037800	0.36405700
Al	0.01758200	-0.15182700	-0.42270900
C	-4.80374100	0.48807700	-0.22841900
H	-5.43156400	1.37796900	-0.07453600
C	-1.22251700	-1.35346300	1.92024500
C	0.05626600	-1.54265200	2.49740200
H	0.06803100	-1.97355900	3.50737100
C	-2.74242500	-0.73712100	0.13907000
C	-4.49791100	-1.70416200	-1.23492200
H	-4.88714700	-2.52000200	-1.86181500
C	-5.28701700	-0.56543700	-1.01743300
H	-6.28783000	-0.49588700	-1.47298600
C	-3.21277400	-1.81319500	-0.66555000
C	-2.42932100	-1.80026100	2.71899600
H	-3.14235500	-0.96355300	2.86739900
H	-2.13089800	-2.19561500	3.70740200

H	-2.99084000	-2.58860100	2.17572800
N	1.47691300	-0.76504500	0.68340100
C	3.53787200	0.57030600	0.33133400
C	4.80482600	0.68203300	-0.27918500
H	5.39616900	1.59793900	-0.13372000
C	1.32268300	-1.30435500	1.91137100
C	2.80131100	-0.62851500	0.11587400
C	4.57808100	-1.52222400	-1.28037800
H	4.99319800	-2.32171000	-1.91171800
C	5.32132100	-0.35089200	-1.07434000
H	6.31201600	-0.23968900	-1.54353900
C	3.30600900	-1.68460300	-0.69461500
C	2.55205700	-1.70441400	2.70036800
H	3.23501000	-0.84167100	2.84075800
H	2.27724400	-2.10823400	3.69220200
H	3.13731100	-2.47296800	2.15375700
H	0.03258900	-0.76546600	-1.90104400
C	2.95667700	1.68410300	1.18919800
C	3.81020600	2.94798600	1.32667600
H	2.73283600	1.27929900	2.20296100
H	1.96583200	1.95891000	0.76598600
H	3.29535100	3.68781400	1.97327900
H	4.80297300	2.74591500	1.78246200
H	3.97632000	3.43195800	0.34201600
C	2.47212900	-2.93918900	-0.91241200
C	3.09628900	-4.03017500	-1.78807800
H	1.49643300	-2.62914500	-1.35104000
H	2.20531900	-3.37313600	0.07795000
H	2.40561000	-4.89331600	-1.87877300
H	3.30564900	-3.66638600	-2.81568000
H	4.04950700	-4.41170700	-1.36503200
C	-2.33006200	-3.03196100	-0.89447000
C	-2.91761900	-4.14622600	-1.76613800
H	-2.03544100	-3.45632500	0.09220000
H	-1.37248100	-2.68145000	-1.34243200
H	-2.19243500	-4.97945500	-1.86679000
H	-3.84924600	-4.56837700	-1.33369200
H	-3.15347600	-3.78905700	-2.79031400
C	-2.97671900	1.56993100	1.20951100
C	-3.89807500	2.77931300	1.39310800
H	-2.02136500	1.90574700	0.74920400
H	-2.68882700	1.17248200	2.20964200
H	-3.40505500	3.54236000	2.02983800
H	-4.13127600	3.26187200	0.42121900

H	-4.86002900	2.51367600	1.88137700
O	-0.01990800	1.62445500	-0.42014100
C	-0.00219800	2.53793500	-1.43790500
O	1.02409800	3.51636600	-1.26760400
O	-1.24346300	3.25770000	-1.45923200
C	0.41377400	4.66610700	-0.68164800
C	-0.97199300	4.65059900	-1.33173100
H	0.34412700	4.57218100	0.42869700
H	1.02396500	5.55779300	-0.93092600
H	-1.76219800	5.12319400	-0.71137900
H	-0.95676800	5.14950700	-2.33166900
H	0.17090000	2.05416900	-2.43068100
INT-2			
N	1.27712900	0.80670800	-0.84973800
C	3.16653300	1.59120500	0.53017700
Al	-0.07485600	-0.01544600	0.26759200
C	4.47246200	1.38601700	1.02040900
H	4.90666300	2.10521600	1.73068400
C	1.02022800	1.49915000	-1.97747600
C	-0.29216300	1.74317500	-2.45019300
H	-0.36748300	2.31971300	-3.38172700
C	2.63827100	0.64059700	-0.39019700
C	4.68722600	-0.65562100	-0.28329000
H	5.28701900	-1.52740100	-0.58366800
C	5.22603100	0.27296200	0.61860000
H	6.24308300	0.12605100	1.01634300
C	3.38769900	-0.49522000	-0.80917700
C	2.17641400	2.06595700	-2.77507400
H	2.77536100	2.76782600	-2.15825200
H	1.81921000	2.60078700	-3.67436000
H	2.87307100	1.26231300	-3.09060900
N	-1.60200500	0.64594000	-0.71529000
C	-3.46230300	1.18467800	0.81780500
C	-4.70894800	0.83298700	1.37486500
H	-5.16739200	1.48118100	2.13631200
C	-1.51969600	1.36471800	-1.85636100
C	-2.89991600	0.32139700	-0.16397800
C	-4.79994900	-1.17866200	0.01183700
H	-5.32922100	-2.09614000	-0.28507000
C	-5.37268800	-0.33591000	0.97532000
H	-6.34467600	-0.59608500	1.42418100
C	-3.55488900	-0.87342200	-0.57621400
C	-2.79698400	1.81296700	-2.53658500
H	-3.40590900	2.44286600	-1.85521600

H	-2.57981500	2.39010800	-3.45419900
H	-3.43467500	0.94519100	-2.80300000
C	-2.71630500	2.44313300	1.23799100
C	-3.39546100	3.31771300	2.29643300
H	-2.50837900	3.05835500	0.33303400
H	-1.70920600	2.13832500	1.60266000
H	-2.76589400	4.20118400	2.52762500
H	-4.38339600	3.69474100	1.95723100
H	-3.55361500	2.76764900	3.24757100
C	-2.90876900	-1.77981200	-1.61376700
C	-3.65564000	-3.07592400	-1.94418100
H	-1.87967100	-2.01690900	-1.26297900
H	-2.75522200	-1.20113900	-2.55368600
H	-3.08933400	-3.66354200	-2.69543900
H	-3.78060400	-3.71959800	-1.04824900
H	-4.66565000	-2.88730600	-2.36625100
C	2.79224800	-1.48655000	-1.79744300
C	3.56734000	-2.79259200	-1.99556700
H	2.66870200	-0.97792200	-2.78259400
H	1.76093200	-1.72486700	-1.46115700
H	3.03418100	-3.44687200	-2.71544300
H	4.59031300	-2.63020100	-2.39673300
H	3.65080100	-3.35028600	-1.04012100
C	2.32268600	2.78345500	0.95824500
C	2.96723800	3.75447600	1.95231300
H	1.37244400	2.39250500	1.38719100
H	2.00604900	3.34638800	0.05088700
H	2.26548500	4.57822000	2.19578600
H	3.23173600	3.25395700	2.90727000
H	3.89220100	4.21659500	1.54723300
O	0.02363600	-1.77694600	0.03795200
C	0.19303500	-2.81984900	0.91151900
O	1.55907800	-3.10262500	1.19903500
O	-0.43384900	-2.54531300	2.16987900
C	1.87487200	-2.39874700	2.40275900
C	0.56345200	-2.50438200	3.19186400
H	2.73817800	-2.89790900	2.88639500
H	2.14703400	-1.33559200	2.19743600
H	0.52594100	-3.43516600	3.80727500
H	0.37932900	-1.62976100	3.85116200
H	0.01771700	0.51716500	1.77353700
H	-0.24111400	-3.74566700	0.46670900
INT-3			
N	-1.08066200	-0.66783800	-1.04390500

C	-3.08112800	-1.56145300	0.09538300
Al	0.17804900	0.08591800	0.22325300
C	-4.43510100	-1.40470900	0.45835100
H	-4.92794300	-2.17622000	1.06843300
C	-0.72936300	-1.28294100	-2.19386500
C	0.61481000	-1.48731100	-2.58548100
H	0.76239000	-2.00110100	-3.54466400
C	-2.47939800	-0.54528300	-0.69868400
C	-4.55049800	0.72033700	-0.72023900
H	-5.13302800	1.60297800	-1.02321400
C	-5.16437300	-0.27652800	0.05269300
H	-6.22166600	-0.17200600	0.34485000
C	-3.19941200	0.61106800	-1.10920000
C	-1.81576700	-1.80154300	-3.11394200
H	-2.45075900	-2.54909300	-2.59470900
H	-1.38437100	-2.26994600	-4.01770600
H	-2.49796700	-0.98431600	-3.42631100
N	1.78138000	-0.49547900	-0.69680600
C	3.53735000	-1.11166900	0.92830900
C	4.73174500	-0.77830700	1.60004100
H	5.14640700	-1.47028800	2.34791700
C	1.79331000	-1.13768500	-1.88307900
C	3.02973700	-0.19173900	-0.03199900
C	4.88171800	1.32227400	0.38428300
H	5.41412700	2.26463600	0.18724300
C	5.39866000	0.42554500	1.33079300
H	6.32975500	0.66930400	1.86711700
C	3.68954700	1.03824000	-0.31412800
C	3.12154200	-1.52687200	-2.49915100
H	3.69165900	-2.19226600	-1.81801800
H	2.97799700	-2.04623800	-3.46453400
H	3.76221700	-0.63639500	-2.66469600
C	2.79186900	-2.40970300	1.20403800
C	3.40956600	-3.34294300	2.24987200
H	2.66817100	-2.96418000	0.24591400
H	1.75329900	-2.14874200	1.50914800
H	2.78492500	-4.25138300	2.37144100
H	4.42889900	-3.67787200	1.96339300
H	3.48173500	-2.85770800	3.24566600
C	3.10165900	2.00238000	-1.33353100
C	3.85833400	3.31790500	-1.54204800
H	2.05124200	2.21117700	-1.02842200
H	3.00867600	1.47962000	-2.31305200
H	3.33683900	3.94515000	-2.29376500

H	3.92189000	3.91183000	-0.60600800
H	4.89487300	3.15768800	-1.90799800
C	-2.50615500	1.68308300	-1.93632500
C	-3.32864600	2.93636400	-2.25161900
H	-2.15598700	1.22923600	-2.89215000
H	-1.56867100	1.96766700	-1.40789500
H	-2.72160000	3.65706900	-2.83677500
H	-4.23594000	2.70807000	-2.85031000
H	-3.65792200	3.45508900	-1.32688800
C	-2.26271200	-2.76874400	0.53040400
C	-2.98481800	-3.80815800	1.39327800
H	-1.36587900	-2.39478700	1.07415000
H	-1.84840500	-3.26885600	-0.37452900
H	-2.29546200	-4.63677600	1.65462500
H	-3.35134500	-3.37242400	2.34618400
H	-3.85612900	-4.25537100	0.86977700
O	-2.48137300	1.47406700	4.25512700
C	-2.75819300	1.30979900	3.08644600
O	-2.04591500	1.76896900	2.03422700
O	0.16732800	1.84647200	0.17706000
C	-0.82293300	2.48292700	2.34272400
C	-0.18691700	2.90179600	1.02286500
H	-1.05895500	3.36971700	2.97107400
H	-0.15686500	1.81541200	2.93064800
H	-0.89887700	3.58620200	0.49697000
H	0.70947900	3.52093800	1.27841100
H	0.04609500	-0.56874200	1.67953700
H	-3.64949600	0.75638000	2.69340500
INT-4			
N	1.43731700	-0.00714700	0.78157100
C	3.39811800	-1.23942800	-0.08707400
A1	0.00002900	-0.00004600	-0.46919400
C	4.69333300	-1.20180900	-0.64415400
H	5.20907900	-2.14376800	-0.88277000
C	1.27296400	-0.00478600	2.12315500
C	0.00019300	-0.00007100	2.74286700
H	0.00032500	-0.00020800	3.84098700
C	2.76995600	0.00025100	0.21578400
C	4.67826500	1.23109000	-0.63882000
H	5.18202100	2.18058800	-0.87314300
C	5.33115500	0.01919100	-0.90849500
H	6.34383000	0.02639700	-1.34267700
C	3.38322900	1.24929000	-0.08047700
C	2.49710700	-0.00666500	3.01265000

H	3.13432500	-0.89144700	2.80626900
H	2.21577400	-0.01013500	4.08177200
H	3.13261900	0.88075900	2.81224100
N	-1.43710500	0.00739400	0.78178100
C	-3.38302300	-1.24914900	-0.08019100
C	-4.67807200	-1.23096500	-0.63852000
H	-5.18178000	-2.18047400	-0.87291100
C	-1.27267600	0.00473100	2.12336000
C	-2.76977300	-0.00010700	0.21605800
C	-4.69322900	1.20193200	-0.64377900
H	-5.20901900	2.14388300	-0.88231900
C	-5.33101500	-0.01909200	-0.90814600
H	-6.34368400	-0.02634800	-1.34233900
C	-3.39798900	1.23956100	-0.08677200
C	-2.49670000	0.00634500	3.01298500
H	-3.13175600	-0.88150000	2.81296700
H	-2.21523100	0.01027500	4.08207300
H	-3.13439700	0.89071400	2.80638000
C	-2.62358800	-2.54451200	0.16634200
C	-3.37653800	-3.84375400	-0.13547700
H	-2.26701900	-2.56447500	1.22100000
H	-1.69426400	-2.50036000	-0.44887200
H	-2.73175000	-4.71983800	0.08112800
H	-4.29749700	-3.94894200	0.47669800
H	-3.67237100	-3.91220700	-1.20321900
C	-2.65517400	2.54576100	0.15021400
C	-3.43939400	3.83376400	-0.11943100
H	-1.74431900	2.52337900	-0.49294600
H	-2.26912400	2.56311700	1.19419800
H	-2.80724300	4.71965400	0.09465000
H	-3.75867700	3.91005800	-1.17986100
H	-4.34934400	3.91310400	0.51283700
C	2.62381300	2.54465200	0.16613500
C	3.37680000	3.84389300	-0.13560000
H	2.26722100	2.56455800	1.22078100
H	1.69451800	2.50055100	-0.44912300
H	2.73204000	4.71998800	0.08103900
H	4.29774700	3.94902800	0.47660800
H	3.67266900	3.91238900	-1.20332900
C	2.65529400	-2.54562300	0.14984300
C	3.43966500	-3.83360800	-0.11944000
H	1.74460200	-2.52335400	-0.49356400
H	2.26889300	-2.56288600	1.19369400
H	2.80753600	-4.71951600	0.09462300

H	3.75917600	-3.91004400	-1.17979300
H	4.34949200	-3.91275500	0.51302900
O	0.03469100	-1.31951400	-1.65213400
O	-0.03515900	1.31918800	-1.65232600
C	-0.20941600	-0.75207600	-2.93730600
C	0.20723600	0.75159200	-2.93769500
H	0.35600900	-1.30718400	-3.72282200
H	-1.29546600	-0.84053400	-3.19260000
H	1.29294100	0.84003200	-3.19447200
H	-0.35924700	1.30652300	-3.72257900
INT-5			
N	1.97323800	0.08838600	0.83227300
C	2.82292800	-2.23590000	0.53532800
Al	0.51558900	0.59211600	-0.27605300
C	3.76234000	-3.09665100	-0.07654600
H	3.68309900	-4.18151000	0.09530500
C	2.15693300	0.60114500	2.07086500
C	1.30542000	1.58055400	2.63510800
H	1.56050500	1.90339700	3.65301000
C	2.94397000	-0.84216700	0.28136300
C	4.89237900	-1.21984100	-1.12389200
H	5.70191800	-0.84021700	-1.76454300
C	4.78199700	-2.60084500	-0.89661200
H	5.50003800	-3.29384300	-1.36379000
C	3.98008800	-0.31503600	-0.54687500
C	3.33534600	0.12888400	2.89153800
H	3.26304000	-0.95978800	3.09255000
H	3.39267000	0.66632400	3.85571100
H	4.28585200	0.27673700	2.33834400
N	-0.25006700	1.95964600	0.79489600
C	-2.67753400	2.43037700	0.48890200
C	-3.67545900	3.23454100	-0.10585400
H	-4.73437400	2.99768800	0.07720600
C	0.21088300	2.24791700	2.03680600
C	-1.31956400	2.76610000	0.22812700
C	-1.99982500	4.63987900	-1.16248500
H	-1.75259400	5.50018200	-1.80170400
C	-3.34518300	4.32237200	-0.92304000
H	-4.14305800	4.93229000	-1.37639300
C	-0.96191700	3.87308000	-0.59655500
C	-0.45282000	3.35560100	2.82389600
H	-1.52619800	3.13335900	2.99373600
H	0.04150500	3.50145900	3.80170900
H	-0.42339600	4.31051600	2.25923700

C	-3.05801100	1.24095400	1.35484000
C	-4.36075700	1.38925000	2.15528700
H	-2.22568500	1.00567000	2.04886300
H	-3.13454300	0.33859200	0.70232100
H	-4.50717900	0.50655500	2.81103400
H	-4.35647800	2.29378700	2.80124300
H	-5.25569400	1.45268100	1.50194700
C	0.50175700	4.19482700	-0.85907400
C	0.78930600	5.50174600	-1.60562600
H	0.92882300	3.34063600	-1.43318900
H	1.05124300	4.19857900	0.10890600
H	1.88343000	5.64761700	-1.71520600
H	0.35803100	5.50011200	-2.62846800
H	0.38612600	6.38868000	-1.07206000
C	4.07270900	1.18338300	-0.79677000
C	5.28803700	1.66822100	-1.59357200
H	4.04101900	1.71506700	0.18087300
H	3.13945100	1.49036200	-1.32268200
H	5.26248100	2.77220300	-1.69756200
H	6.24738400	1.40213400	-1.10104100
H	5.30799900	1.24486200	-2.61955200
C	1.72670400	-2.81279300	1.41531400
C	2.19511600	-3.86884000	2.43136200
H	0.93868400	-3.25365900	0.76269100
H	1.20647400	-1.99342400	1.94903500
H	1.34061900	-4.20752400	3.05257800
H	2.61543900	-4.77188400	1.94194200
H	2.97612100	-3.47368400	3.11668700
O	0.91979200	1.12652400	-1.91491400
C	-0.63269100	-0.67433700	-2.38947900
C	0.57650400	0.14892500	-2.88363600
H	-0.65310000	-1.68833400	-2.83621100
H	-1.60109500	-0.16947600	-2.59224500
H	1.44197600	-0.53336800	-3.07184800
H	0.32247600	0.63103400	-3.85603100
O	-0.47760400	-0.79518300	-0.95108700
B	-1.39259200	-1.71801800	-0.02415700
O	-2.77382800	-1.52557100	-0.42409200
O	-1.09448800	-3.12337300	-0.19283100
H	-1.04531200	-1.24757300	1.08599200
C	-3.43751400	-2.79458500	-0.32570000
C	-2.26317300	-3.82324100	-0.65253000
C	-3.97788700	-2.95729900	1.11188500
C	-4.60904400	-2.82034100	-1.31611700

C	-2.35922700	-5.16137900	0.09724500
C	-2.12214900	-4.10913600	-2.16200000
H	-4.64637500	-2.10230000	1.34144300
H	-4.56076700	-3.89258700	1.24101100
H	-3.15341800	-2.95237300	1.85295400
H	-5.09763200	-3.81706200	-1.33766000
H	-5.37255200	-2.07423200	-1.01322200
H	-4.28072100	-2.56548200	-2.34188200
H	-3.29888100	-5.69929300	-0.14989000
H	-1.50959600	-5.81408800	-0.19248100
H	-2.31141600	-5.01599400	1.19320300
H	-2.92852600	-4.77086200	-2.54144000
H	-2.13915300	-3.17473400	-2.75689300
H	-1.14948900	-4.61222400	-2.33985300
INT-6			
N	-0.91010000	1.97508500	0.83895000
C	1.36984500	2.86952000	1.18859900
Al	-0.82561400	0.21546500	0.02242900
C	2.39135100	3.75475300	0.78675500
H	3.35374000	3.75041500	1.31905800
C	-1.90221100	2.38957500	1.65413300
C	-3.03008600	1.59504900	1.97189300
H	-3.76053900	2.05008500	2.65402900
C	0.14207500	2.89762300	0.47285800
C	0.98877800	4.64001700	-0.99137100
H	0.86026900	5.32720600	-1.84092600
C	2.20252500	4.63471200	-0.28806000
H	3.01389100	5.31711600	-0.58813900
C	-0.06248400	3.77177200	-0.63252400
C	-1.82435400	3.77388000	2.26607500
H	-0.86854500	3.91072700	2.81249800
H	-2.66455400	3.95010500	2.96293000
H	-1.84447900	4.55941700	1.48256900
N	-2.55294200	-0.40051800	0.66451800
C	-2.55089100	-2.84472100	1.03069500
C	-2.91470100	-4.13246700	0.58504700
H	-2.61943500	-5.01472700	1.17219200
C	-3.35353000	0.30320000	1.49190800
C	-2.94948600	-1.72624700	0.24492800
C	-4.02537900	-3.19368900	-1.36354800
H	-4.59480100	-3.34603300	-2.29250000
C	-3.64607300	-4.30657800	-0.59882200
H	-3.92016600	-5.32080200	-0.93104700
C	-3.68473700	-1.88473100	-0.96356100

C	-4.66928400	-0.30218300	1.93780400
H	-4.50988700	-1.27106200	2.45433600
H	-5.21273600	0.37905300	2.61824700
H	-5.31708800	-0.52391200	1.06434300
C	-1.75354100	-2.62941200	2.30924800
C	-1.34987200	-3.88864500	3.08237400
H	-2.32856200	-1.95624700	2.98523500
H	-0.84310700	-2.04444500	2.04775500
H	-0.76965900	-3.61479400	3.98725500
H	-2.23058100	-4.47529000	3.41954400
H	-0.71161000	-4.56172800	2.47242400
C	-4.06486700	-0.66307300	-1.78554300
C	-4.86904100	-0.92418700	-3.06277200
H	-3.12043300	-0.12648300	-2.03277800
H	-4.62866200	0.04635500	-1.13775200
H	-5.08790600	0.03201300	-3.58081900
H	-4.31257500	-1.56469700	-3.77905400
H	-5.84220700	-1.41904000	-2.85697300
C	-1.37778600	3.73459100	-1.39747900
C	-1.48394400	4.65737000	-2.61573600
H	-2.21363400	3.96476300	-0.69772000
H	-1.55584400	2.67942500	-1.70431300
H	-2.47198300	4.53567600	-3.10514500
H	-1.38030000	5.72931700	-2.34372000
H	-0.70871100	4.42854300	-3.37689800
C	1.54899400	1.89984700	2.34714400
C	2.92928900	1.88454700	3.00946000
H	1.31222300	0.87760800	1.97664000
H	0.76868700	2.10798200	3.11532900
H	2.95187000	1.14268900	3.83398900
H	3.71623600	1.59871300	2.28174000
H	3.20026200	2.86978000	3.44479600
O	-0.92692300	0.36689500	-1.72450100
C	1.15534300	-0.50563900	-2.72347800
C	-0.07611000	0.38703600	-2.83538300
H	1.67457900	-0.52723600	-3.71055500
H	0.85633100	-1.54838700	-2.47492700
H	0.27467600	1.42886900	-3.04595900
H	-0.63841700	0.05162400	-3.74201200
O	2.04355100	0.01031200	-1.72564600
B	2.96060100	-0.81086800	-1.13941700
O	3.16945200	-2.13257000	-1.50534900
O	3.79665400	-0.37643300	-0.12298400
H	0.32494400	-0.73029200	0.61306100

C	4.06342500	-2.70787200	-0.50913100
C	4.79693200	-1.41754700	0.06767000
C	3.17974400	-3.41334600	0.53372000
C	4.98212100	-3.71857500	-1.20009300
C	5.15366000	-1.49637900	1.55417800
C	6.03355700	-1.01232600	-0.75398300
H	2.54061600	-4.15688700	0.01627500
H	3.78294700	-3.94474400	1.29767000
H	2.51141200	-2.69171600	1.04546000
H	5.73238500	-4.12353900	-0.48966700
H	4.38159600	-4.56889400	-1.58260700
H	5.51468400	-3.26817900	-2.05911200
H	5.84755300	-2.34005800	1.75048900
H	5.65904500	-0.56112900	1.87008500
H	4.25307200	-1.62436900	2.18375600
H	6.88152600	-1.71050600	-0.60099700
H	5.80254000	-0.97268200	-1.83785200
H	6.35517700	0.00083300	-0.43919400
INT-7			
Al	-1.30348200	0.12873200	0.20046700
N	-1.93015700	1.93702100	-0.08422200
N	-3.03225100	-0.72564800	0.01287200
O	-0.23144400	-0.34401900	-1.11946200
O	3.28100300	-1.15322100	-1.80174200
C	-3.21421300	2.27294600	-0.33484700
C	-0.91991100	2.97029100	-0.02164500
C	-4.18486000	-0.07869400	-0.25665600
C	-3.03056500	-2.16411900	0.16052700
C	0.95808700	-1.09758700	-1.05924700
C	2.11725900	-0.32660500	-1.70630000
C	-4.26275000	1.32603700	-0.41439500
C	-3.56772800	3.73235200	-0.53529300
C	-0.59817000	3.54279900	1.24077100
C	-0.23859900	3.34814000	-1.21319100
C	-5.46521500	-0.87666900	-0.39269900
C	-3.18546900	-2.72181200	1.46079100
C	-2.81623900	-2.98056100	-0.98614900
H	0.83721800	-2.06494900	-1.60528700
H	1.24333700	-1.35404700	-0.00835400
H	2.32863400	0.59873300	-1.12669000
H	1.82824200	-0.03532800	-2.73915600
H	-5.26125800	1.73146200	-0.62517800
H	-3.28250400	4.33412500	0.35237800
H	-4.65050900	3.85991600	-0.71861100

H	-3.00810400	4.16423500	-1.39054700
C	0.41775800	4.51995600	1.28580300
C	-1.34241500	3.09283700	2.48996000
C	0.76823200	4.33090000	-1.11355100
C	-0.59548000	2.68566600	-2.53524700
H	-5.66997000	-1.45813000	0.52997500
H	-6.32854400	-0.21683500	-0.59675200
H	-5.38425900	-1.62066600	-1.21198500
C	-3.13732200	-4.12525600	1.59006100
C	-3.39149000	-1.80627200	2.65915900
C	-2.77767400	-4.37846800	-0.80202900
C	-2.62379900	-2.33895000	-2.35231800
H	0.68787300	4.97996400	2.24787200
C	1.09294100	4.91236200	0.12096500
C	-0.92515000	3.75287900	3.80776700
H	-1.22796500	1.98868400	2.57774100
H	-2.43466700	3.24611400	2.33383100
H	1.31194700	4.64402100	-2.01719800
C	0.19832900	3.14409100	-3.76236700
H	-1.68264500	2.82964000	-2.73078900
H	-0.47782300	1.58635800	-2.39952900
H	-3.25413000	-4.58459300	2.58279500
C	-2.93802200	-4.94611600	0.47048100
C	-3.53005600	-2.48879800	4.02345900
H	-4.28659900	-1.16878700	2.47678300
H	-2.54174200	-1.08734800	2.69012300
H	-2.61409700	-5.03526400	-1.66923600
C	-2.38136100	-3.29388300	-3.52528400
H	-1.77784700	-1.61866400	-2.26892500
H	-3.50922500	-1.70207000	-2.57955600
H	1.88488100	5.67639900	0.17649000
H	-1.52550200	3.34785600	4.64788000
H	0.14274800	3.56349700	4.04451000
H	-1.07694200	4.85288100	3.79253200
H	-0.14038900	2.59558600	-4.66499200
H	0.07208100	4.22849100	-3.96758600
H	1.28523800	2.94822200	-3.64835300
H	-2.90148400	-6.04060100	0.59184900
H	-3.66776400	-1.73021800	4.82086700
H	-4.40369200	-3.17319800	4.06343900
H	-2.62700400	-3.07986900	4.28316600
H	-2.24738500	-2.72006300	-4.46496700
H	-1.46468900	-3.90312200	-3.38027500
H	-3.22923400	-3.99401200	-3.68327600

H	-0.64751300	-0.11175500	1.64495900
B	4.25635900	-1.09885600	-0.85277200
O	5.39529100	-1.88123600	-0.93859100
O	4.22654500	-0.27820200	0.26566200
C	6.09086000	-1.74782300	0.33266100
C	5.54704900	-0.35255200	0.87632600
C	5.66512600	-2.93910600	1.20884400
C	7.59890800	-1.79484100	0.07271500
C	5.38936100	-0.26717600	2.39648300
C	6.35297500	0.85009000	0.35565500
H	5.87881600	-3.87924600	0.66161500
H	6.21346300	-2.96380800	2.17246000
H	4.57771200	-2.91211900	1.42431000
H	8.16974400	-1.62116300	1.00848500
H	7.87899700	-2.79438600	-0.31752800
H	7.90854700	-1.04223400	-0.67694700
H	6.36673200	-0.39919700	2.90536700
H	4.99065100	0.72933900	2.67560500
H	4.68473200	-1.03021300	2.77773600
H	7.35175100	0.91827000	0.83271300
H	6.49218200	0.79557600	-0.74315500
H	5.79471200	1.78074900	0.58244600
INT-8			
Al	-1.07897100	-0.73991800	0.03816800
N	-1.60303000	-1.27031400	1.81237000
N	-2.77365600	-0.98202600	-0.83775500
O	-0.32067900	0.93457900	-0.14931400
O	3.26757800	1.62919600	-0.62579800
C	-2.89882200	-1.44004100	2.16388800
C	-0.55631700	-1.59699900	2.76496000
C	-3.92468900	-1.17051400	-0.15282100
C	-2.78254900	-1.07004900	-2.28731200
C	0.91962700	1.14636000	-0.86679700
C	2.10786800	1.20581200	0.09663700
C	-3.97557400	-1.30235400	1.25543100
C	-3.23030200	-1.85719100	3.58102300
C	0.01886800	-2.90060500	2.70905700
C	-0.11638000	-0.62673500	3.71029400
C	-5.22364900	-1.30880600	-0.91758400
C	-2.50762000	-2.33617900	-2.88240600
C	-3.03884800	0.08637200	-3.07699800
H	0.82142500	2.09699200	-1.42500900
H	1.04774300	0.31904800	-1.59586200
H	2.27170700	0.21454600	0.57337900

H	1.88816800	1.95377500	0.88501500
H	-4.97839900	-1.42708700	1.68495800
H	-2.76252300	-2.83592900	3.81726600
H	-4.32288700	-1.94408000	3.72490900
H	-2.82643200	-1.13657400	4.32026300
C	1.07022500	-3.20592400	3.59635300
C	-0.51296000	-3.92908400	1.72167500
C	0.93657500	-0.98989700	4.57926300
C	-0.75399400	0.74945200	3.79397100
H	-5.18541500	-2.18487300	-1.59835600
H	-6.08013500	-1.43275400	-0.22974500
H	-5.40474700	-0.42536000	-1.56271700
C	-2.47031400	-2.41930300	-4.28872200
C	-2.27299200	-3.55717000	-2.00507200
C	-2.99604500	-0.05629300	-4.48161600
C	-3.34523200	1.42807700	-2.43581900
H	1.53289400	-4.20336500	3.56916600
C	1.53123200	-2.25649500	4.51949100
C	0.10589900	-5.32869500	1.79227700
H	-0.37808500	-3.52093800	0.69464800
H	-1.61639600	-4.00982200	1.84741200
H	1.29637000	-0.26048800	5.31998500
C	-0.61210500	1.47187100	5.14062800
H	-1.82969200	0.67281100	3.53160400
H	-0.34179900	1.40828200	2.99526300
H	-2.25635000	-3.38409800	-4.77160800
C	-2.70788700	-1.28811600	-5.08285300
C	-2.05155200	-4.88812700	-2.73061900
H	-3.12777500	-3.66325500	-1.29938800
H	-1.39685200	-3.34643300	-1.35110400
H	-3.19369000	0.82043500	-5.11605400
C	-4.08815300	2.44398500	-3.31246500
H	-2.40280800	1.90104100	-2.07956100
H	-3.91759200	1.26571000	-1.49850300
H	2.35525100	-2.51052000	5.20541000
H	-0.36424700	-5.99548900	1.04089700
H	1.19529700	-5.31161700	1.58014400
H	-0.03608100	-5.79896800	2.78816800
H	-1.18110500	2.42371800	5.12135500
H	-0.99730600	0.86489400	5.98826300
H	0.44149500	1.73529500	5.37031600
H	-2.67507000	-1.37023100	-6.18112700
H	-1.90218400	-5.70632700	-1.99681100
H	-2.91848600	-5.16696400	-3.36600100

H	-1.15243600	-4.86146500	-3.38099200
H	-4.30953200	3.35573900	-2.72192700
H	-3.48506200	2.76855600	-4.18619800
H	-5.05038300	2.04478400	-3.69976100
H	0.05525600	-1.68097300	-0.57866600
B	4.28857100	0.76737900	-0.89904000
O	5.42943000	1.18611200	-1.55888200
O	4.29998000	-0.57605400	-0.55694800
C	6.18633300	-0.01373200	-1.88684500
C	5.65066000	-1.06125200	-0.81233100
C	5.82181300	-0.39732500	-3.33170900
C	7.67972600	0.30709600	-1.78513600
C	5.56649800	-2.50781600	-1.30514100
C	6.41237100	-0.99572800	0.52253000
H	6.02098100	0.47006800	-3.99267400
H	6.41836300	-1.25799000	-3.69660800
H	4.74641600	-0.65238100	-3.42208200
H	8.29414100	-0.60157500	-1.95365000
H	7.95433000	1.05318600	-2.55822400
H	7.94027700	0.73388900	-0.79814500
H	6.56948200	-2.88959900	-1.58757200
H	5.16959300	-3.15561200	-0.49725600
H	4.89181600	-2.60439400	-2.17668300
H	7.43216600	-1.42326200	0.43932500
H	6.49859400	0.04831800	0.88610800
H	5.85269100	-1.57590400	1.28364100
B	-1.14420800	2.18993000	0.41887200
O	-0.32907300	2.87042800	1.41191500
O	-1.41148000	3.15751000	-0.62306900
H	-2.14967000	1.56716600	0.83353500
C	-0.61137900	4.27534500	1.31025300
C	-0.90378500	4.45308800	-0.24800800
C	-1.84540700	4.59285900	2.18312800
C	0.59576200	5.06601600	1.83074500
C	-1.97169900	5.50845300	-0.57740800
C	0.36646600	4.76181600	-1.06574600
H	-1.63767000	4.27108600	3.22415300
H	-2.08310300	5.67638900	2.19965100
H	-2.74069000	4.04218000	1.83114400
H	0.44650000	6.15818800	1.69915200
H	0.73245600	4.87103900	2.91449000
H	1.53089200	4.77546300	1.31511200
H	-1.67132200	6.51552900	-0.21844900
H	-2.10996900	5.56958300	-1.67683100

H	-2.94994700	5.24990400	-0.12936000
H	0.71403700	5.80477500	-0.91343800
H	1.20475500	4.08442900	-0.81049700
H	0.13829600	4.63307100	-2.14393600
INT-9			
Al	-3.35096100	0.24038000	0.18939600
N	-4.11298100	1.84104800	-0.59055300
N	-4.66104400	-0.98831400	-0.54232400
O	-1.76381900	-0.07522100	-0.50455900
O	1.76323100	0.07191200	0.50157400
C	-5.19230900	1.86206400	-1.40146800
C	-3.43994300	3.07864400	-0.26389400
C	-5.67192800	-0.63700700	-1.36340100
C	-4.48215500	-2.37478400	-0.17398800
C	-0.57726100	-0.48800900	0.14244800
C	0.57691700	0.48481600	-0.14577400
C	-5.91417900	0.69947800	-1.76222700
C	-5.67354200	3.18841100	-1.95342100
C	-3.82271300	3.77828400	0.91485000
C	-2.38022000	3.53502300	-1.09783000
C	-6.60613700	-1.70946300	-1.88533700
C	-5.09287900	-2.85233400	1.01966600
C	-3.65535900	-3.20822300	-0.97978200
H	-0.27823500	-1.50470300	-0.21328500
H	-0.70754100	-0.56264500	1.25113600
H	0.27782600	1.50157500	0.20975100
H	0.70751100	0.55934000	-1.25443300
H	-6.77143400	0.85402800	-2.43089000
H	-5.92168200	3.89248700	-1.13233700
H	-6.56736400	3.05576400	-2.59051600
H	-4.87971900	3.68239200	-2.55090600
C	-3.12869900	4.96266500	1.23778600
C	-4.94865000	3.23862300	1.78531700
C	-1.71874500	4.72555300	-0.73032700
C	-1.98456100	2.73674200	-2.33048000
H	-7.09358700	-2.25210300	-1.04905200
H	-7.39022600	-1.27649400	-2.53355300
H	-6.04833100	-2.47486600	-2.46354900
C	-4.87350500	-4.19648700	1.38537200
C	-5.94835300	-1.91508100	1.86010900
C	-3.46902500	-4.54503700	-0.56967300
C	-2.99521400	-2.64611100	-2.22975900
H	-3.40316200	5.52506200	2.14257100
C	-2.08895900	5.43371000	0.42264100

C	-5.29014900	4.04942000	3.03930800
H	-4.68449800	2.19747000	2.07902700
H	-5.86484500	3.12602700	1.16188100
H	-0.89515700	5.10236500	-1.35458000
C	-0.82457600	3.29578700	-3.15971800
H	-2.87760400	2.61710200	-2.98565200
H	-1.74259400	1.70248700	-1.99408500
H	-5.33375700	-4.59317000	2.30248600
C	-4.07215300	-5.03595000	0.59765100
C	-6.55503700	-2.50528400	3.13678800
H	-6.76454400	-1.50297400	1.22388100
H	-5.32724500	-1.02858100	2.12145100
H	-2.83601800	-5.21280900	-1.17260600
C	-2.10127600	-3.60770400	-3.01881700
H	-2.40984000	-1.74815700	-1.92494200
H	-3.78570400	-2.24636300	-2.90568500
H	-1.55830900	6.36130000	0.69126300
H	-6.11665200	3.56445100	3.59792500
H	-4.42498400	4.12502100	3.73078500
H	-5.61703300	5.08226700	2.79487300
H	-0.62160900	2.63518100	-4.02724800
H	-1.03932500	4.31015500	-3.55886500
H	0.11333100	3.35677200	-2.56917900
H	-3.91163600	-6.08333500	0.90002900
H	-7.15004100	-1.73665300	3.67113300
H	-7.23247200	-3.35909200	2.92361300
H	-5.77290100	-2.86323000	3.83859400
H	-1.66819200	-3.09096300	-3.89950200
H	-1.25205700	-3.97807700	-2.40744000
H	-2.65859900	-4.49217700	-3.39509500
H	-3.34744600	0.25646700	1.79493500
Al	3.35194700	-0.23953000	-0.19059700
N	4.65919900	0.98842000	0.54744400
N	4.11452600	-1.84176800	0.58559000
H	3.35125000	-0.25050500	-1.79619300
C	5.66932300	0.63562300	1.36881800
C	4.47908900	2.37595300	0.18369600
C	5.19272900	-1.86414800	1.39797400
C	3.44322000	-3.07908500	0.25434500
C	5.91274300	-0.70189300	1.76346700
C	6.60125900	1.70752300	1.89593500
C	5.09123400	2.85859000	-1.00718300
C	3.64982100	3.20541100	0.99104800
C	5.67464100	-3.19167700	1.94647500

C	3.82828000	-3.77478400	-0.92598700
C	2.38295300	-3.53913500	1.08556300
H	6.76926300	-0.85759200	2.43280600
H	7.08891000	2.25411900	1.06235600
H	7.38518500	1.27330700	2.54351400
H	6.04152400	2.46984900	2.47635500
C	4.87076700	4.20378200	-1.36838600
C	5.94929700	1.92549100	-1.84961400
C	3.46247900	4.54346400	0.58547000
C	2.98822200	2.63792300	2.23782500
H	5.92413000	-3.89316100	1.12359000
H	6.56775400	-3.06008900	2.58478400
H	4.88071600	-3.68807800	2.54182500
C	3.13602700	-4.95898100	-1.25333300
C	4.95475700	-3.23127300	-1.79336000
C	1.72332300	-4.72933400	0.71368900
C	1.98474400	-2.74497700	2.32005000
H	5.33209200	4.60437700	-2.28325900
C	4.06700100	5.03937200	-0.57901000
C	6.55777600	2.52126400	-3.12284800
H	5.32962000	1.03935500	-2.11555700
H	6.76472100	1.51176400	-1.21346200
H	2.82754200	5.20822000	1.18970200
C	2.09159100	3.59548100	3.02873500
H	3.77804700	2.23679500	2.91371300
H	2.40459000	1.74029600	1.92872400
H	3.41227200	-5.51836400	-2.15944300
C	2.09580700	-5.43364600	-0.44090600
C	5.29867300	-4.03785900	-3.04940300
H	5.87004300	-3.11964700	-1.16841000
H	4.68991100	-2.18948400	-2.08417800
H	0.89941300	-5.10896400	1.33580800
C	0.82425900	-3.30780900	3.14603800
H	1.74204300	-1.71001700	1.98637500
H	2.87676100	-2.62625500	2.97678200
H	3.90567700	6.08764200	-0.87787500
H	7.15472700	1.75537400	-3.65895300
H	5.77660800	2.88097600	-3.82483100
H	7.23378000	3.37504600	-2.90507300
H	1.65761900	3.07499500	3.90677200
H	2.64706900	4.47932600	3.40919400
H	1.24298900	3.96693500	2.41715600
H	1.56658700	-6.36105600	-0.71295000
H	6.12533300	-3.55028900	-3.60551900

H	5.62638200	-5.07109300	-2.80772700
H	4.43443600	-4.11228100	-3.74216900
H	0.61935700	-2.65001100	4.01524300
H	-0.11277600	-3.36812600	2.55404500
H	1.03964100	-4.32310700	3.54247400
INT-10			
Al	3.55910100	-0.01341800	-0.20946500
N	4.41148800	-1.46546000	-1.16520400
N	4.59338400	1.40749500	-1.02618900
O	1.86392100	0.08849700	-0.68771800
O	-1.54394800	-0.52513700	0.59252200
C	5.38714300	-1.31078300	-2.08614100
C	3.93429800	-2.79333400	-0.84768800
C	5.54111300	1.22646300	-1.96903300
C	4.28485400	2.74298000	-0.56570300
C	0.71591600	0.33817100	0.09237400
C	-0.29092700	-0.80348600	-0.08849400
C	5.90848300	-0.04947700	-2.45961100
C	5.97029500	-2.53860200	-2.75519000
C	4.51943600	-3.49160700	0.24548700
C	2.86023400	-3.34366000	-1.60286700
C	6.26173500	2.43362100	-2.53327800
C	4.97022200	3.25201200	0.57318600
C	3.26949700	3.48963800	-1.22751100
H	0.22856100	1.29027400	-0.23420000
H	0.94891000	0.44991800	1.17766600
H	0.09185200	-1.76136100	0.31575300
H	-0.50245500	-0.94023800	-1.17018500
H	6.69821400	-0.06240600	-3.22248800
H	6.39347800	-3.23564000	-2.00252700
H	6.76571700	-2.26325700	-3.47201400
H	5.18655600	-3.10951500	-3.29450400
C	4.01267300	-4.76879900	0.56332700
C	5.65579300	-2.85392400	1.03216500
C	2.39101200	-4.62454600	-1.24426200
C	2.24835000	-2.54813400	-2.74608300
H	6.76855800	3.00509500	-1.72836000
H	7.01461200	2.13465800	-3.28573000
H	5.54622000	3.13825800	-3.00529400
C	4.62857100	4.54143500	1.03051100
C	6.03346300	2.40612200	1.25915900
C	2.96626600	4.77414300	-0.73002700
C	2.54257700	2.89272800	-2.42348700
H	4.44540100	-5.33249700	1.40302600

C	2.96035200	-5.33101000	-0.17425600
C	6.23023600	-3.67650600	2.18959600
H	5.29648400	-1.87334000	1.41861000
H	6.47734400	-2.58921600	0.32811100
H	1.56129100	-5.07564800	-1.80825600
C	1.09033800	-3.21387600	-3.49561900
H	3.04969700	-2.28586400	-3.47405900
H	1.91660300	-1.56912300	-2.33105600
H	5.14193200	4.96122300	1.90828900
C	3.63889200	5.29648300	0.38434500
C	6.70605400	3.02180100	2.48993500
H	6.81487900	2.13350000	0.51347500
H	5.56775200	1.43436500	1.53957200
H	2.18451200	5.37371800	-1.21903300
C	1.45702300	3.76320600	-3.06401200
H	2.10658900	1.91909400	-2.10233100
H	3.29290100	2.61679500	-3.19953300
H	2.57652500	-6.32919600	0.09044900
H	7.04563600	-3.11683100	2.69175400
H	5.46195800	-3.89996400	2.95899300
H	6.65471700	-4.64368000	1.84647100
H	0.72151500	-2.54683400	-4.30132800
H	1.38973300	-4.17249800	-3.97050700
H	0.22992500	-3.42445600	-2.82660800
H	3.38459100	6.30149400	0.75761800
H	7.45351900	2.31921300	2.91178200
H	7.23862100	3.96605500	2.24893200
H	5.97280100	3.24427600	3.29316800
H	0.99201600	3.22791100	-3.91687600
H	0.64498400	4.00507200	-2.34707600
H	1.86062800	4.72181700	-3.45455700
H	3.76209200	-0.07672600	1.37969300
Al	-2.92401900	0.40000300	-0.20742500
N	-4.56033600	-0.57982200	-0.49919400
N	-3.65681800	1.86586800	0.80382900
H	-2.28179700	0.87919500	-1.59108700
C	-5.67960300	-0.33075300	0.21759200
C	-4.60860200	-1.53986600	-1.58766400
C	-4.88557500	1.80018400	1.36676000
C	-2.90909900	3.10834900	0.88032400
C	-5.77930900	0.72231400	1.15909900
C	-6.91902900	-1.16415800	-0.03183200
C	-4.89356300	-1.05687800	-2.89821700
C	-4.35913100	-2.92032700	-1.34127100

C	-5.37288400	2.95803800	2.21212600
C	-3.07373900	4.05672100	-0.17050100
C	-2.03021500	3.35213900	1.97343200
H	-6.72978900	0.78191700	1.70587100
H	-7.27483600	-1.02779900	-1.07477800
H	-7.73517900	-0.87994400	0.65761300
H	-6.70949900	-2.24647000	0.08363100
C	-4.89879600	-1.97754100	-3.96543700
C	-5.18977800	0.41843500	-3.12026900
C	-4.38272200	-3.79949400	-2.44658300
C	-4.08353800	-3.43363200	0.06056000
H	-5.45020600	3.88216400	1.60161200
H	-6.36499100	2.74157800	2.64929100
H	-4.66005200	3.18723500	3.02969100
C	-2.33002900	5.25297100	-0.11497900
C	-4.03726400	3.76997600	-1.31219800
C	-1.31335400	4.56874100	1.98167800
C	-1.87179800	2.33830700	3.09123000
H	-5.11244300	-1.62678500	-4.98579600
C	-4.64016100	-3.33744600	-3.74365800
C	-5.57698500	0.83226600	-4.54352800
H	-4.29412400	0.99749800	-2.80088900
H	-5.99150100	0.73524200	-2.41575000
H	-4.19662000	-4.87129200	-2.28375400
C	-4.23384800	-4.94522200	0.26851200
H	-4.73847200	-2.89964000	0.78155100
H	-3.06029600	-3.13786800	0.38413200
H	-2.44060600	6.00026200	-0.91453200
C	-1.45469600	5.50673600	0.95086700
C	-4.20719100	4.87596700	-2.35848000
H	-5.03375100	3.51183200	-0.88800600
H	-3.70068400	2.83617800	-1.81640800
H	-0.62910400	4.78291300	2.81565500
C	-1.19641700	2.83513700	4.37373900
H	-1.30514200	1.45517600	2.72321700
H	-2.86576500	1.91069900	3.34333300
H	-4.64774600	-4.04442500	-4.58879100
H	-5.78409000	1.92117000	-4.58487900
H	-4.76552800	0.62474700	-5.27194300
H	-6.48933800	0.30735900	-4.89747700
H	-4.07201400	-5.19553900	1.33653500
H	-5.24252800	-5.31451700	-0.01687000
H	-3.48727700	-5.52640700	-0.31245300
H	-0.88176000	6.44736500	0.98069100

H	-4.93719800	4.56441600	-3.13329900
H	-4.58235500	5.82023400	-1.91040300
H	-3.25398900	5.10596700	-2.87861900
H	-1.17606300	2.01753500	5.12175800
H	-0.14283600	3.14044200	4.20223200
H	-1.72811800	3.70019200	4.82572400
B	-1.88280900	-1.17817700	2.02117200
O	-1.65254600	-2.60531100	1.92150800
O	-1.02089100	-0.69065700	3.07646700
H	-3.07240700	-0.78674500	2.10654000
C	-1.14501500	-3.05681100	3.18558900
C	-0.32966700	-1.78681400	3.70305800
C	-2.34369300	-3.40206600	4.09680500
C	-0.29740500	-4.31545100	2.96090500
C	-0.37252100	-1.58436000	5.22659900
C	1.14173600	-1.78890400	3.24588300
H	-2.97305200	-4.15917400	3.58551700
H	-2.02597300	-3.82176000	5.07354600
H	-2.97470200	-2.51041800	4.28558300
H	0.18303400	-4.64973300	3.90436900
H	-0.94325900	-5.14184400	2.59812900
H	0.49186400	-4.14760400	2.20361500
H	0.06615000	-2.45175000	5.76403700
H	0.21778300	-0.68509300	5.49950400
H	-1.40720700	-1.43014500	5.58768800
H	1.74363200	-2.55145400	3.78257300
H	1.23911600	-1.98058600	2.15950200
H	1.58749600	-0.79490000	3.45274000
INT-11			
N	1.44099600	0.17216300	0.59263600
C	3.43279900	-1.12548700	-0.10184800
A1	0.00007100	-0.01192900	-0.68732700
C	4.71771300	-1.13561100	-0.68378200
H	5.25156500	-2.09020700	-0.80230000
C	1.27265900	0.30982900	1.92466000
C	0.00001100	0.36953500	2.54142700
H	-0.00000600	0.48292100	3.63368800
C	2.77525500	0.12982600	0.03664900
C	4.65653600	1.27664400	-0.98735400
H	5.14194300	2.19811800	-1.34152700
C	5.32503700	0.05093300	-1.12029200
H	6.32841700	0.01935100	-1.57446900
C	3.37135200	1.34239800	-0.41053200
C	2.49369500	0.41611600	2.81501200

H	3.13495000	-0.48441600	2.71953400
H	2.20641100	0.53675200	3.87581000
H	3.12766100	1.27663500	2.51659200
N	-1.44099900	0.17208900	0.59263700
C	-3.43283500	-1.12547500	-0.10189300
C	-4.71774800	-1.13553900	-0.68383200
H	-5.25161200	-2.09011900	-0.80242600
C	-1.27265100	0.30976900	1.92463700
C	-2.77527100	0.12981600	0.03669000
C	-4.65653000	1.27673800	-0.98722300
H	-5.14192000	2.19824400	-1.34133600
C	-5.32505700	0.05104900	-1.12024200
H	-6.32844000	0.01952100	-1.57441600
C	-3.37134100	1.34243000	-0.41040500
C	-2.49366300	0.41607800	2.81503200
H	-3.13491200	-0.48446200	2.71958600
H	-2.20634500	0.53673200	3.87581700
H	-3.12765400	1.27658200	2.51662000
H	-0.00008700	1.13351900	-1.81227600
C	-2.74236300	-2.40109700	0.35666400
C	-3.52028500	-3.70563300	0.15812600
H	-2.47324900	-2.29919500	1.43293300
H	-1.76221600	-2.45885800	-0.17076200
H	-2.92176100	-4.56709400	0.51870400
H	-4.48182300	-3.71487000	0.71452000
H	-3.75023500	-3.89175500	-0.91205100
C	-2.61787700	2.65667600	-0.26298500
C	-3.32860100	3.91219900	-0.77768900
H	-1.63804000	2.54836400	-0.78089000
H	-2.34985700	2.80110500	0.80846400
H	-2.68957200	4.80590900	-0.62539000
H	-3.54934900	3.84620600	-1.86361200
H	-4.28784500	4.09716500	-0.24958400
C	2.61794000	2.65668000	-0.26315200
C	3.32867700	3.91214200	-0.77798700
H	2.35000600	2.80118600	0.80831000
H	1.63806400	2.54837900	-0.78098100
H	2.68967800	4.80588100	-0.62573200
H	4.28794800	4.09712800	-0.24993900
H	3.54937500	3.84605000	-1.86391500
C	2.74230900	-2.40106500	0.35679700
C	3.52028000	-3.70560900	0.15852200
H	1.76222800	-2.45891400	-0.17074800
H	2.47304700	-2.29903000	1.43301500

H	2.92175400	-4.56702900	0.51919600
H	3.75030600	-3.89190300	-0.91160800
H	4.48177900	-3.71472700	0.71498500
O	0.00001800	-1.63924200	-1.35732200
C	-0.00014800	-2.06042500	-2.69919100
H	-0.00032000	-1.21091000	-3.42506200
H	0.89750800	-2.68520400	-2.92348300
H	-0.89779900	-2.68531400	-2.92321000
INT-12			
N	-1.34358500	1.32948700	0.64379700
C	-0.74584000	3.67253800	0.02892000
A1	-0.71671800	-0.05448800	-0.53338100
C	-1.13948800	4.88869000	-0.57158200
H	-0.42496400	5.72415800	-0.61031300
C	-1.55634000	1.11158400	1.96244100
C	-1.44736800	-0.16430000	2.56535200
H	-1.61565400	-0.19313800	3.65008400
C	-1.69778000	2.61489700	0.06766000
C	-3.34668000	4.00316000	-1.06271000
H	-4.35144300	4.14627400	-1.48665400
C	-2.41915500	5.05333200	-1.11726100
H	-2.69933100	6.01103600	-1.58452500
C	-3.00926000	2.77046900	-0.46847700
C	-1.99230800	2.26597000	2.83922400
H	-1.27727200	3.11088600	2.77505900
H	-2.08428600	1.95179600	3.89512500
H	-2.97215300	2.66449900	2.50211300
N	-1.03861000	-1.56446100	0.61475000
C	0.06797400	-3.71690700	0.00537700
C	-0.03114100	-4.97152300	-0.63642300
H	0.84595300	-5.63536500	-0.65426200
C	-1.30054000	-1.42326200	1.93433100
C	-1.08746700	-2.88458100	0.01107500
C	-2.35243900	-4.56277000	-1.21808500
H	-3.28494100	-4.90601500	-1.68961700
C	-1.21948500	-5.38854300	-1.24885100
H	-1.26706200	-6.36990200	-1.74753000
C	-2.31233600	-3.30353200	-0.58690300
C	-1.50695900	-2.66006100	2.78236200
H	-0.62716600	-3.33299200	2.73423300
H	-1.69656400	-2.39237800	3.83802100
H	-2.36816000	-3.25098500	2.40605100
H	-1.55629500	-0.13153700	-1.89165000
C	1.36469500	-3.28089200	0.66460200

C	2.30962100	-4.41001700	1.09732800
H	1.13472000	-2.63987500	1.54082800
H	1.92333600	-2.59430500	-0.01171300
H	3.18127900	-3.98693200	1.63690600
H	1.81375500	-5.13940800	1.77362000
H	2.71460400	-4.97774300	0.23363100
C	-3.53878600	-2.40523600	-0.52550200
C	-4.83262000	-2.97227900	-1.11819100
H	-3.28935200	-1.44935900	-1.03916400
H	-3.71830600	-2.11347800	0.53391100
H	-5.65951200	-2.24148300	-1.00686000
H	-4.73182100	-3.19149800	-2.20161000
H	-5.14786700	-3.90944000	-0.61283400
C	-4.00786500	1.62547100	-0.38653900
C	-5.41241000	1.90244700	-0.93187900
H	-4.08634900	1.28981000	0.67222700
H	-3.57267600	0.75213500	-0.92277200
H	-6.05530000	1.00649600	-0.81282500
H	-5.90953900	2.74010500	-0.39878100
H	-5.39569500	2.15411600	-2.01281400
C	0.64481900	3.49784200	0.61139500
C	1.43369100	4.78215100	0.88991700
H	1.25754700	2.85442900	-0.05810300
H	0.57992800	2.89964600	1.54508900
H	2.40668000	4.52666900	1.35536500
H	1.66084800	5.34668000	-0.03879500
H	0.89506100	5.46990600	1.57693600
O	1.01032200	0.15117800	-1.14830600
C	1.35016200	0.18847600	-2.54893300
H	0.43871300	-0.01476900	-3.14435300
H	1.74968100	1.18916200	-2.80744100
H	2.11817800	-0.58390200	-2.74842900
B	2.19373900	0.21262800	-0.06191200
O	3.13514800	-0.84139600	-0.38788700
O	2.92638600	1.45929900	-0.13484500
H	1.49845100	0.07944400	0.97059200
C	4.45664600	-0.35228200	-0.11811500
C	4.31516800	1.20989300	-0.41355000
C	4.79390600	-0.64538200	1.36040100
C	5.45404000	-1.08824600	-1.02234100
C	5.16588900	2.10840200	0.49889900
C	4.61354200	1.57542600	-1.88204700
H	4.69126900	-1.73527900	1.53942400
H	5.82984200	-0.34944500	1.62539700

H	4.09355600	-0.12329500	2.04284600
H	6.48044700	-0.68174000	-0.90527200
H	5.48221400	-2.16406200	-0.75202300
H	5.16722200	-1.01756500	-2.08907500
H	6.24880500	1.88553800	0.39398400
H	5.01215700	3.17257000	0.22392300
H	4.88127000	1.99179200	1.56180800
H	5.69837100	1.52708000	-2.11170800
H	4.08337300	0.90935100	-2.58947600
H	4.27027800	2.61406900	-2.06793600
INT-13			
N	1.41635700	-0.02336100	0.97865400
C	3.40262200	-1.23888600	0.14166200
Al	-0.01134600	-0.00105800	-0.30531500
C	4.70067100	-1.19067000	-0.40775800
H	5.22169300	-2.12803300	-0.65282200
C	1.23043300	-0.04061300	2.31641100
C	-0.04983600	-0.04481700	2.91957900
H	-0.06280200	-0.05913000	4.01748300
C	2.76211000	-0.00511000	0.44473200
C	4.68469100	1.24097800	-0.35757200
H	5.19340800	2.19456100	-0.56284900
C	5.33665500	0.03492300	-0.65331000
H	6.34992000	0.05044000	-1.08584400
C	3.38647200	1.24880500	0.19361400
C	2.43952500	-0.05613900	3.22811300
H	3.07964300	-0.93898000	3.02292800
H	2.13781800	-0.07458400	4.29154600
H	3.07978400	0.83327700	3.05422100
N	-1.47033300	-0.01465000	0.94433500
C	-3.43436000	-1.25129900	0.08576200
C	-4.71956600	-1.21847200	-0.49487800
H	-5.23154500	-2.16246700	-0.73362000
C	-1.31528900	-0.03123600	2.28654200
C	-2.80462400	-0.00926600	0.38105400
C	-4.71586300	1.21333800	-0.48368800
H	-5.22514200	2.16105400	-0.71337200
C	-5.35509600	-0.00028100	-0.77614500
H	-6.35874500	0.00330800	-1.23096900
C	-3.43031600	1.23727500	0.09670400
C	-2.54513600	-0.03459900	3.17018800
H	-3.18510400	-0.91576900	2.95762800
H	-2.26817400	-0.04606900	4.24042600
H	-3.17637700	0.85671100	2.97413200

C	-2.71790000	-2.55946200	0.38677000
C	-3.47508900	-3.84583600	0.04254400
H	-2.44003700	-2.57900400	1.46532600
H	-1.74466300	-2.53985600	-0.15379100
H	-2.86086800	-4.73289300	0.30002200
H	-4.43326000	-3.93427900	0.59754500
H	-3.70791700	-3.91204400	-1.04107100
C	-2.70827700	2.53987500	0.40646500
C	-3.46655100	3.83198100	0.08731700
H	-1.74105800	2.52221100	-0.14598500
H	-2.41765500	2.54451600	1.48178400
H	-2.84845300	4.71446500	0.35122200
H	-3.70943300	3.91392700	-0.99304400
H	-4.41952700	3.91428300	0.65226600
C	2.64835900	2.54163000	0.50937300
C	3.38240700	3.84413800	0.17622400
H	2.37430500	2.54603600	1.58937700
H	1.67186800	2.51077100	-0.02526700
H	2.75052600	4.71800500	0.43600300
H	4.33576300	3.94721800	0.73688600
H	3.61967400	3.92020900	-0.90571500
C	2.68112400	-2.55322600	0.40029200
C	3.44249300	-3.83152500	0.03605700
H	1.71432300	-2.51865800	-0.15168900
H	2.38743400	-2.59843800	1.47405600
H	2.82259500	-4.72408800	0.25856900
H	3.69595400	-3.86851600	-1.04421400
H	4.38974100	-3.93612100	0.60675400
O	-0.03353200	-1.46429700	-1.28324600
C	0.10063400	-1.63419600	-2.65951600
O	0.69436200	-0.54098000	-3.33444600
O	-0.04635400	1.48048900	-1.24227300
C	-0.14162400	0.59669400	-3.54449600
C	0.19659100	1.75229100	-2.59839700
H	0.01090300	0.94189100	-4.59397600
H	-1.21809000	0.31761500	-3.43273400
H	1.26954200	2.02469200	-2.75830500
H	-0.40811600	2.63699600	-2.91785300
H	0.77511100	-2.49693200	-2.86678200
H	-0.90509100	-1.84594300	-3.11223900
INT-14			
H	1.61718600	0.02377200	-1.33331000
B	2.25965300	0.18528500	-0.27665000
O	3.04207300	-0.95973800	0.10773500

O	3.10225000	1.35043200	-0.13744000
C	4.34169400	-0.54730000	0.56867900
C	4.47197500	0.91875600	-0.04521600
C	4.36434300	-0.58009100	2.11073900
C	5.38527600	-1.54523800	0.04182500
C	5.24881800	1.91000700	0.83067500
C	5.06354200	0.91925800	-1.47072600
H	4.07273600	-1.59649600	2.44523000
H	5.37346300	-0.35953800	2.51704100
H	3.64121100	0.12549900	2.56217900
H	6.41717600	-1.21977500	0.29165300
H	5.22221600	-2.53799600	0.50981100
H	5.31034400	-1.67338800	-1.05465000
H	6.30045500	1.58261000	0.96976300
H	5.26514500	2.90785500	0.34555300
H	4.78630400	2.02646200	1.82986500
H	6.14417500	0.66810000	-1.48270600
H	4.52776900	0.20227300	-2.12475400
H	4.93870000	1.93178900	-1.90600300
O	0.96386200	0.43017800	0.73010000
Al	-0.71214500	-0.04345300	0.15832400
C	1.13780300	1.15044700	1.98053700
N	-1.08417000	-1.54149200	-0.97574200
N	-1.40721000	1.34971700	-0.94679300
O	-1.58729900	-0.20552100	1.66790600
O	1.04834500	0.34519600	3.11078700
H	2.16031400	1.56696700	1.92189900
H	0.38468500	1.97212700	2.01026000
C	-1.51066300	-1.38812900	-2.25312500
C	-1.09013700	-2.87703900	-0.39673200
C	-1.78256700	1.14469200	-2.22960100
C	-1.47363400	2.68302300	-0.37787200
C	-1.18834600	-0.73083600	2.91341200
C	-0.25286600	0.19982300	3.68568700
C	-1.77140900	-0.12967300	-2.84389300
C	-1.77063100	-2.61999500	-3.09307000
C	0.06749500	-3.70026500	-0.47684600
C	-2.28701400	-3.32495200	0.23863400
C	-2.26125500	2.32002700	-3.05220400
C	-0.39958400	3.59578400	-0.57541900
C	-2.61245600	3.02430200	0.41172900
H	-0.69313900	-1.72642200	2.80412200
H	-2.09251500	-0.89227400	3.54958500
H	-0.08691400	-0.20769500	4.70599900

H	-0.73603500	1.20264200	3.78683200
H	-2.08307100	-0.15314800	-3.89639600
H	-0.87275000	-3.26911200	-3.13676000
H	-2.06636100	-2.34401300	-4.12185200
H	-2.57668000	-3.23877600	-2.64655200
C	0.01160200	-4.97175700	0.13739300
C	1.31921200	-3.24198800	-1.20260200
C	-2.28380900	-4.60106100	0.83675400
C	-3.52789000	-2.44359900	0.25225200
H	-1.44965700	3.06341900	-3.19095200
H	-2.61535400	1.99326300	-4.04701900
H	-3.08366400	2.85467500	-2.53356800
C	-0.47898100	4.85155900	0.06870900
C	0.80771800	3.26333800	-1.43770100
C	-2.64147500	4.29377200	1.02166100
C	-3.75123000	2.02967300	0.57789700
H	0.89348900	-5.62797900	0.09221900
C	-1.14168000	-5.41457000	0.79610800
C	2.21543200	-4.35555700	-1.76218900
H	1.93063600	-2.60393900	-0.52307900
H	1.03351800	-2.55226900	-2.02400900
H	-3.19130900	-4.96802900	1.33836000
C	-4.78675300	-3.04632300	0.88434400
H	-3.76072000	-2.13322500	-0.79160600
H	-3.26120400	-1.49962700	0.77753100
H	0.34647000	5.56972900	-0.05782400
C	-1.57930800	5.19783900	0.86133800
C	1.21610500	4.36509700	-2.43154000
H	0.62743700	2.32021300	-1.98896300
H	1.67662300	3.02582900	-0.78435100
H	-3.50843100	4.58194100	1.63432000
C	-4.99389000	2.53415000	1.31845600
H	-3.34037200	1.13778400	1.10367000
H	-4.04951900	1.65661400	-0.42767200
H	-1.15695900	-6.40842700	1.27169900
H	3.05183300	-3.91212100	-2.33986500
H	2.67474500	-4.97195900	-0.96134700
H	1.66274900	-5.04409600	-2.43752200
H	-5.62741300	-2.32484900	0.82718100
H	-5.11265700	-3.97602100	0.37140500
H	-4.63771100	-3.29030600	1.95710400
H	-1.61558500	6.18224300	1.35498300
H	2.07921400	4.02851300	-3.04177000
H	0.39075800	4.62745200	-3.12836600

H	1.52451900	5.30217400	-1.92317300
H	-5.76559100	1.73843000	1.35920700
H	-4.76607400	2.82061500	2.36664500
H	-5.45138300	3.41595200	0.82149800
INT-15			
B	4.02088000	-0.19472600	-0.05951300
O	4.50134600	0.54028600	-1.12584100
O	4.64830200	0.09064100	1.14523200
C	5.69772200	1.22686900	-0.65927500
C	5.47515900	1.27152300	0.91738800
C	6.90314600	0.36359100	-1.07090600
C	5.77150300	2.59666000	-1.33884700
C	6.74982300	1.14516300	1.75498300
C	4.65560100	2.49057900	1.37298100
H	6.86470200	0.19518400	-2.16589600
H	7.86766700	0.85347100	-0.82715300
H	6.87760300	-0.62779800	-0.57461000
H	6.62981800	3.18575700	-0.95438900
H	5.91062600	2.46346800	-2.43087700
H	4.84356900	3.17959000	-1.18672700
H	7.44282400	1.98763500	1.55158100
H	6.49313100	1.16853200	2.83366000
H	7.27963800	0.19481800	1.55421000
H	5.23858800	3.43100400	1.30109900
H	3.73218600	2.60408600	0.76969800
H	4.35678600	2.34914900	2.43121400
O	3.03107800	-1.12331100	-0.21860700
Al	-1.27133300	-0.00841500	0.01432700
C	2.51934800	-1.86325300	0.89023700
N	-2.03951600	-1.68895400	-0.59112900
N	-2.79913400	1.10150500	-0.45520600
O	-1.14798600	0.05795400	1.77284400
O	1.27764800	-1.40444300	1.32885500
H	2.34690800	-2.89873800	0.53476000
H	3.26406600	-1.84729900	1.72332100
C	-3.27236300	-1.81014500	-1.13045900
C	-1.23274300	-2.87729200	-0.42059400
C	-3.93941100	0.64438800	-1.00958500
C	-2.64779700	2.51571000	-0.19596900
C	-0.10222300	-0.01695900	2.69998800
C	1.28290000	-0.19021200	2.08112400
C	-4.15353300	-0.71968500	-1.32157400
C	-3.75314100	-3.17887300	-1.57040500
C	-0.30388100	-3.23280000	-1.43641200

C	-1.35566300	-3.62904000	0.78066900
C	-5.05038500	1.62291000	-1.33312000
C	-2.04928600	3.33678400	-1.19325000
C	-3.05453300	3.04267900	1.06272000
H	-0.27343900	-0.87593600	3.39686800
H	-0.07274000	0.90470600	3.33397100
H	2.05754500	-0.23348000	2.88547900
H	1.52153200	0.67656100	1.42064200
H	-5.12456300	-0.96187000	-1.77354900
H	-3.06125300	-3.61944900	-2.31773600
H	-4.76543100	-3.12299100	-2.01154500
H	-3.77511300	-3.88896000	-0.71820000
C	0.48074300	-4.38883200	-1.24124600
C	-0.17495000	-2.36837000	-2.68175000
C	-0.54890300	-4.77576900	0.92843100
C	-2.32493500	-3.17524500	1.86171600
H	-4.69788300	2.40250300	-2.03993200
H	-5.92071900	1.10698900	-1.77905300
H	-5.38334300	2.16274800	-0.42275200
C	-1.87211300	4.70648300	-0.90708100
C	-1.62021900	2.72803300	-2.52045900
C	-2.85661300	4.41940700	1.29758600
C	-3.66923800	2.12459000	2.10771400
H	1.20442000	-4.69045900	-2.01300100
C	0.35519500	-5.15774200	-0.07435600
C	0.91710300	-2.76949600	-3.67763900
H	0.00144400	-1.32086300	-2.35003800
H	-1.15961400	-2.33599500	-3.20293400
H	-0.62409600	-5.37891700	1.84555600
C	-2.32828700	-3.99065400	3.15853700
H	-3.35679800	-3.16042300	1.44111100
H	-2.10464200	-2.10695000	2.08527700
H	-1.41183200	5.36384400	-1.65965800
C	-2.27241500	5.24394800	0.32484700
C	-0.97694700	3.68074300	-3.53268500
H	-2.50009900	2.23365000	-2.99185700
H	-0.91846200	1.89239300	-2.29947100
H	-3.16222100	4.85449500	2.26082600
C	-4.05995500	2.77316100	3.43920600
H	-2.94652800	1.29559700	2.28427300
H	-4.56466500	1.62726700	1.66943700
H	0.97455200	-6.05950700	0.05877800
H	0.93249400	-2.06559700	-4.53467200
H	1.92222300	-2.73959300	-3.20828500

H	0.75991200	-3.78885300	-4.08990300
H	-3.05192200	-3.56086400	3.88114900
H	-2.61897900	-5.04969100	2.99146600
H	-1.33189700	-3.98968200	3.64841600
H	-2.12500600	6.31651000	0.53021300
H	-0.69957400	3.13093200	-4.45520600
H	-1.66139600	4.50335400	-3.83017900
H	-0.04931800	4.14221000	-3.13383800
H	-4.48861900	2.01355100	4.12469500
H	-3.18414600	3.22180100	3.95381000
H	-4.82110600	3.57290300	3.31493500
H	0.01129700	0.46223800	-0.81427800
INT-16			
B	-5.56636900	0.47355700	-0.35586900
O	-6.26604000	0.51498800	0.83479300
O	-6.12334400	-0.36684900	-1.30568800
C	-7.25536600	-0.55294300	0.77491700
C	-7.42655400	-0.77387000	-0.79352600
C	-6.64580400	-1.77176600	1.48896000
C	-8.52000300	-0.08981100	1.50247600
C	-7.68859000	-2.22077600	-1.21825200
C	-8.47062500	0.16444200	-1.42256700
H	-6.34958400	-1.47363800	2.51477900
H	-7.36576600	-2.61179400	1.56416700
H	-5.73765300	-2.13268800	0.96503900
H	-9.32748800	-0.84623400	1.41662000
H	-8.29926800	0.05296700	2.57979900
H	-8.89224000	0.87323900	1.10468500
H	-8.63614400	-2.59744900	-0.78039700
H	-7.77712800	-2.27653100	-2.32230500
H	-6.86431500	-2.89223900	-0.91219700
H	-9.50552300	-0.12373400	-1.14770600
H	-8.30584100	1.21639700	-1.11280900
H	-8.37842800	0.11571300	-2.52637600
O	-4.44129300	1.22815100	-0.55080300
Al	2.22877300	0.02373700	-0.39523200
C	-3.69271800	1.08931800	-1.76130600
N	2.86252800	1.56462700	0.58954000
N	3.36854200	-1.27162700	0.48379500
O	0.53717000	-0.28437600	-0.00238700
O	-2.68243400	0.13846500	-1.65486600
C	3.80214400	1.52296100	1.55820900
C	2.25073500	2.82696900	0.23732900
C	4.24523200	-0.98183700	1.46784600

C	3.22100900	-2.63693500	0.03048800
C	-0.53212100	-0.58066100	-0.87100900
C	-1.59477100	0.51903400	-0.80912600
C	4.44535100	0.32904000	1.96310900
C	4.20488800	2.80924400	2.24968400
C	2.80726200	3.58658700	-0.82980600
C	1.07880800	3.24796400	0.92774800
C	5.06611200	-2.09958200	2.07732300
C	4.00192500	-3.08295600	-1.07262700
C	2.26067800	-3.47890400	0.65983100
H	-1.01211500	-1.54608300	-0.58044000
H	-0.20171700	-0.69646400	-1.93277100
H	-1.16048800	1.49250400	-1.14809100
H	-1.93775900	0.65298600	0.24251200
H	5.19185600	0.43244800	2.76177800
H	4.57953700	3.55262700	1.51589600
H	4.99103300	2.62789700	3.00560100
H	3.33400200	3.28288200	2.74813500
C	2.17022800	4.79295300	-1.18739200
C	4.05245700	3.08636300	-1.54844800
C	0.48065700	4.46234300	0.53087000
C	0.50222100	2.38946800	2.04352200
H	5.66423600	-2.62079800	1.30150100
H	5.75034200	-1.71509500	2.85601800
H	4.41073900	-2.87258300	2.52934900
C	3.81381800	-4.40473900	-1.52677500
C	4.99998700	-2.13804400	-1.72672800
C	2.11289200	-4.79250100	0.16781700
C	1.42311200	-2.94801500	1.81364700
H	2.57819000	5.40119100	-2.00823000
C	1.01977300	5.22806000	-0.51349900
C	4.58322000	3.96469700	-2.68562900
H	3.83597000	2.06659500	-1.93997300
H	4.86188800	2.92858000	-0.79962200
H	-0.42640300	4.81306000	1.04505700
C	-0.77583200	2.90772100	2.71020900
H	1.28368200	2.23651600	2.82267800
H	0.32185800	1.37369200	1.62366600
H	4.40354000	-4.77687500	-2.37758600
C	2.88112200	-5.25250500	-0.91175500
C	5.78874900	-2.69511400	-2.91580000
H	5.71358700	-1.77415100	-0.95263700
H	4.44803100	-1.22478800	-2.04494900
H	1.37951700	-5.46688500	0.63430000

C	0.40576400	-3.91934700	2.42019400
H	0.90323400	-2.03012500	1.45493100
H	2.10401100	-2.58626100	2.61778600
H	0.53484800	6.17237600	-0.80868400
H	5.48515900	3.50445800	-3.13832900
H	3.83474400	4.08859800	-3.49602700
H	4.86972500	4.97828600	-2.33376800
H	-1.10587100	2.20553400	3.50276200
H	-0.63203100	3.90056600	3.18723700
H	-1.61278300	2.99928700	1.98659800
H	2.74713700	-6.28160500	-1.28186900
H	6.47739300	-1.92326200	-3.31613000
H	6.40519200	-3.57510600	-2.63497000
H	5.12038100	-3.00336700	-3.74678600
H	-0.15033100	-3.42651700	3.24369800
H	-0.34400800	-4.25319600	1.67251600
H	0.88680000	-4.82728100	2.84253300
H	2.48764700	0.11814300	-1.97646600
H	-3.27393800	2.10199100	-1.97669500
H	-4.35415900	0.75463500	-2.58779300
TS-1			
N	-1.42482100	-0.80967700	0.60557600
C	-3.40098500	0.67432000	0.76648300
Al	0.04182600	-0.24174200	-0.59459500
C	-4.72533300	0.96549700	0.38194600
H	-5.22646000	1.85786600	0.78597200
C	-1.27228000	-1.56378300	1.72301200
C	-0.02676000	-1.95498700	2.25885200
H	-0.06623700	-2.56914800	3.16825300
C	-2.78505300	-0.48646100	0.22512000
C	-4.78448300	-0.99265900	-1.05670900
H	-5.33145200	-1.62642300	-1.77060300
C	-5.41358200	0.13922900	-0.51894300
H	-6.44769700	0.38426800	-0.81012600
C	-3.46165400	-1.32688700	-0.69902600
C	-2.50661900	-2.03714600	2.46968600
H	-3.11199200	-1.18167000	2.83324200
H	-2.22663700	-2.66553900	3.33539800
H	-3.17562700	-2.62120700	1.80492500
N	1.46106200	-0.89897800	0.67380600
C	3.37502700	0.65789900	0.80487200
C	4.67620100	1.00906300	0.38956100
H	5.13878300	1.93280900	0.76875000
C	1.26552300	-1.61881100	1.78958300

C	2.80693700	-0.54632600	0.29781100
C	4.82236500	-0.98767700	-0.98839700
H	5.39706400	-1.61742700	-1.68381800
C	5.39396800	0.19635800	-0.50065100
H	6.40896000	0.48774400	-0.81552700
C	3.52521700	-1.38465100	-0.60129200
C	2.45490500	-2.09911100	2.59952300
H	3.05452000	-1.24332600	2.97343800
H	2.13016700	-2.70629400	3.46499600
H	3.14291000	-2.70582400	1.97547000
H	0.25864100	-1.14756200	-1.90076600
C	2.57355900	1.52577500	1.76339000
C	3.25363500	2.80486000	2.26136800
H	2.26623800	0.91327600	2.64071600
H	1.61490900	1.78290700	1.25735500
H	2.57985900	3.35917900	2.94654000
H	4.18996200	2.59235700	2.81947800
H	3.51396200	3.49014000	1.42683500
C	2.89338200	-2.67391900	-1.10511600
C	3.70441500	-3.47890800	-2.12479300
H	1.89873300	-2.41886800	-1.53398300
H	2.65994600	-3.32325400	-0.22992400
H	3.14250100	-4.38415400	-2.43332800
H	3.91087000	-2.89058300	-3.04357700
H	4.67982800	-3.81953400	-1.71670500
C	-2.75402900	-2.54658400	-1.27150500
C	-3.53864500	-3.37337700	-2.29470400
H	-2.43933200	-3.20801400	-0.43150700
H	-1.79461500	-2.21084400	-1.72632200
H	-2.92498200	-4.22516600	-2.65294600
H	-4.47294100	-3.79538600	-1.86718200
H	-3.81799300	-2.77072700	-3.18427400
C	-2.61805500	1.57444000	1.70961100
C	-3.36374700	2.78974500	2.27001500
H	-1.71157800	1.92453400	1.16723100
H	-2.22272000	0.96688300	2.55457200
H	-2.70244800	3.37089300	2.94518300
H	-3.69711700	3.47635700	1.46402500
H	-4.26098200	2.49754200	2.85583500
O	-1.26188800	1.08452700	-1.50026200
C	-0.42342800	2.00909000	-1.58319100
O	-0.52007000	3.14298600	-0.81541300
O	0.24580000	2.28228300	-2.74019400
C	0.31418900	4.17030200	-1.38158000

C	1.07522300	3.42676900	-2.49941500
H	-0.34094600	4.98235900	-1.76430500
H	0.98150900	4.58032100	-0.59727900
H	1.16974200	3.99971500	-3.44145900
H	2.07914000	3.08358000	-2.16666300
H	0.88596800	1.24069200	-0.70997000
TS-2			
N	-1.48256500	-0.37268800	-0.84988600
C	-3.63317300	-1.16690100	0.09160600
Al	-0.03927600	-0.53729300	0.49226500
C	-4.93855300	-0.86806800	0.53143700
H	-5.58333800	-1.67531600	0.90978800
C	-1.33140400	-0.58091600	-2.18202900
C	-0.08242300	-0.71552400	-2.81926700
H	-0.10889500	-0.89813600	-3.90167900
C	-2.82838200	-0.10058700	-0.39050700
C	-4.61429600	1.49040800	0.03926000
H	-5.00679700	2.51838700	0.03361400
C	-5.42787300	0.44638800	0.50376200
H	-6.45025600	0.66035700	0.85434200
C	-3.30291600	1.23863900	-0.41407900
C	-2.56104900	-0.65548600	-3.06849700
H	-3.28090400	-1.41204200	-2.69527000
H	-2.28153700	-0.90753700	-4.10837100
H	-3.11018100	0.30874100	-3.07626600
N	1.39310800	-0.34135200	-0.93179700
C	3.56180500	-1.20997400	-0.10548300
C	4.86081600	-0.94286000	0.37842200
H	5.50823800	-1.77885700	0.68245900
C	1.20019400	-0.53070400	-2.24811700
C	2.74566700	-0.10437700	-0.48432800
C	4.53712900	1.44546400	0.07113800
H	4.93230700	2.47012900	0.13819000
C	5.34462100	0.37015800	0.47070500
H	6.36185800	0.55684300	0.85084700
C	3.22919200	1.23379800	-0.41183300
C	2.38285300	-0.51930000	-3.19936800
H	3.15605000	-1.25385300	-2.89595500
H	2.06247200	-0.74464600	-4.23351700
H	2.88280900	0.47172800	-3.19539300
C	3.04122500	-2.63335600	-0.25176300
C	3.93672100	-3.74879900	0.29639800
H	2.84055700	-2.82880900	-1.33078000
H	2.03905600	-2.68605600	0.22739300

H	3.44775500	-4.73473200	0.15790700
H	4.92093100	-3.79529800	-0.21629600
H	4.13017600	-3.62682800	1.38319300
C	2.33419600	2.38889300	-0.83454200
C	2.96077600	3.78665100	-0.80446200
H	1.44080600	2.36417300	-0.17260000
H	1.93940800	2.18703500	-1.85530700
H	2.22565200	4.54531200	-1.14306900
H	3.28273500	4.07724300	0.21761000
H	3.84690600	3.86456500	-1.46965400
C	-2.39207000	2.35409800	-0.90939000
C	-2.94523600	3.78006100	-0.81878800
H	-2.09918800	2.14591200	-1.96385900
H	-1.42905000	2.29509000	-0.35273100
H	-2.19578000	4.51048600	-1.18645400
H	-3.86132400	3.91050700	-1.43232900
H	-3.19975000	4.06114500	0.22475700
C	-3.06583700	-2.57716200	0.13522400
C	-3.98768100	-3.66735300	0.69018600
H	-2.12503800	-2.55441800	0.73066000
H	-2.73257900	-2.86534500	-0.88806400
H	-3.47116600	-4.64892600	0.68278500
H	-4.28716300	-3.45970200	1.73879100
H	-4.91592700	-3.77707400	0.09021000
O	-1.34506800	-0.08848500	1.91087800
C	-0.84428300	0.94992300	2.46664800
O	-0.33326100	0.93439600	3.73103900
O	0.77966500	0.88734200	1.56057900
C	0.80081700	0.05032700	3.77793600
C	1.67934600	0.55936400	2.61417900
H	1.27131000	0.16053300	4.77363400
H	0.48826400	-1.00532500	3.62100500
H	2.23915300	1.47306700	2.91387400
H	2.40820600	-0.21469800	2.29108900
H	0.32705200	-1.99851700	1.06306000
H	-1.24782900	1.96509800	2.23807000
TS-3			
N	1.30062500	-0.03226300	0.87592100
C	3.48146700	-1.02407700	0.20490600
A1	-0.10852600	-0.08662100	-0.45509200
C	4.79625000	-0.81944500	-0.26508600
H	5.44714800	-1.68809000	-0.44375000
C	1.07382300	0.02022800	2.21366100
C	-0.21006600	0.05376500	2.79821800

H	-0.23493300	0.08398200	3.89548800
C	2.67033200	0.12304100	0.42322300
C	4.47886600	1.59068500	-0.27246400
H	4.88220600	2.59774000	-0.45563300
C	5.28840300	0.47013700	-0.51031600
H	6.31676400	0.60427600	-0.88274700
C	3.15983800	1.44275700	0.20457900
C	2.25915700	0.06457100	3.15778900
H	2.93893400	-0.79457900	2.98545200
H	1.92550800	0.05154000	4.21170600
H	2.87008200	0.97575200	2.99177900
N	-1.60102800	0.05741400	0.81163400
C	-3.57276400	-1.24481600	0.07342500
C	-4.84621000	-1.26396000	-0.53340800
H	-5.36446800	-2.22356800	-0.67668600
C	-1.46893900	0.09219600	2.15027600
C	-2.92868400	0.01644600	0.23649600
C	-4.82208000	1.15418600	-0.77422400
H	-5.32224000	2.07705000	-1.10343400
C	-5.46462200	-0.07874300	-0.95603400
H	-6.45920900	-0.11626500	-1.42881300
C	-3.54628200	1.23075700	-0.17755400
C	-2.70477200	0.18915000	3.02181500
H	-3.37939100	-0.67666900	2.86163100
H	-2.43524800	0.23520400	4.09312300
H	-3.29697800	1.09117800	2.76297400
C	-2.90203100	-2.52411600	0.55687500
C	-3.65455400	-3.83248000	0.29501400
H	-2.69893300	-2.43666200	1.64864000
H	-1.89164000	-2.58133100	0.09345600
H	-3.06839300	-4.69359400	0.67558000
H	-4.64442600	-3.85734300	0.79788600
H	-3.82289500	-4.00261900	-0.78898500
C	-2.83298100	2.55794700	0.02715400
C	-3.60503300	3.81656400	-0.38078800
H	-1.87135000	2.50687600	-0.53156900
H	-2.53499000	2.64263700	1.09703800
H	-2.99663300	4.72180700	-0.17808100
H	-3.84602800	3.82195000	-1.46472600
H	-4.56024000	3.92810300	0.17556900
C	2.27625000	2.64638800	0.50886000
C	2.85860700	4.02288000	0.17124900
H	2.00806900	2.62719800	1.59045400
H	1.30200300	2.51455500	-0.01250700

H	2.12778700	4.81996300	0.41784800
H	3.78724800	4.23884600	0.74059500
H	3.09867400	4.11828800	-0.90879100
C	2.93710300	-2.41736800	0.46999800
C	3.96556000	-3.55397400	0.49764300
H	2.17643800	-2.65218900	-0.31026400
H	2.37232000	-2.40869400	1.42807600
H	3.46718500	-4.51251500	0.74833800
H	4.45434900	-3.69544700	-0.48876400
H	4.76517500	-3.38254800	1.24998900
O	0.84168800	-3.06375300	-1.99526800
C	0.32343100	-1.99928100	-2.25595100
O	1.12456700	-0.72507100	-2.09811200
O	-0.25428300	1.38268800	-1.45930400
C	0.97620000	0.22063100	-3.17418900
C	0.62010000	1.57749400	-2.53983800
H	1.91296700	0.25683300	-3.77203100
H	0.14682200	-0.12339300	-3.83678000
H	1.56109800	2.08451500	-2.20989200
H	0.15747100	2.23283100	-3.31563400
H	-0.67743500	-1.54999900	-1.09289100
H	-0.43314700	-1.82589900	-3.06684100
TS-4			
N	-0.07953300	-1.97385900	0.67358900
C	-2.48380900	-1.85349000	1.22691000
Al	0.71068000	-0.52328000	-0.27718100
C	-3.81459700	-2.18651000	0.90161800
H	-4.63364200	-1.82720500	1.54147200
C	0.60810400	-2.72455200	1.57072400
C	1.91961100	-2.42101500	2.00007800
H	2.35113100	-3.10666300	2.74111500
C	-1.45349800	-2.33232700	0.37108300
C	-3.07835900	-3.42870800	-1.05652800
H	-3.32610300	-4.04134000	-1.93584500
C	-4.11024300	-2.96220700	-0.22890100
H	-5.15759200	-3.20821600	-0.46711100
C	-1.72862100	-3.12825900	-0.77609100
C	-0.04523700	-3.96529000	2.14137800
H	-0.97364500	-3.71673300	2.69442600
H	0.64275900	-4.49763900	2.82343400
H	-0.34900100	-4.65547300	1.32727800
N	2.36993600	-0.43830000	0.67114200
C	3.24064800	1.86056400	0.94935700
C	4.12857600	2.87295000	0.52968400

H	4.10788600	3.85298300	1.02848600
C	2.74579200	-1.34366100	1.60057500
C	3.29567100	0.60725800	0.27918100
C	5.07110400	1.40763100	-1.16737200
H	5.78595400	1.24910900	-1.98827400
C	5.03529200	2.64944200	-0.51641500
H	5.72040100	3.45333800	-0.83008200
C	4.20372700	0.36100800	-0.78970500
C	4.10943200	-1.21925600	2.24415200
H	4.22126300	-0.23434000	2.74256400
H	4.27319200	-2.01782000	2.99080400
H	4.91466700	-1.27022300	1.48245800
C	2.23937600	2.08030100	2.07196100
C	2.27858400	3.44551900	2.76456200
H	2.36748300	1.27826100	2.83393300
H	1.21913500	1.91606300	1.65818600
H	1.50833900	3.49102700	3.56090600
H	3.26238700	3.64945900	3.23832500
H	2.06359600	4.27256400	2.05648300
C	4.21013500	-0.98487600	-1.49927600
C	5.26741400	-1.17379000	-2.59168000
H	3.19362400	-1.13816700	-1.93037200
H	4.32196500	-1.79384900	-0.74198500
H	5.18420400	-2.18802600	-3.03287600
H	5.14122400	-0.44646300	-3.42090900
H	6.30241400	-1.06426400	-2.20325200
C	-0.59153800	-3.64042400	-1.64851200
C	-0.98928800	-4.52177400	-2.83669300
H	0.12503800	-4.20070600	-1.00440900
H	-0.00822600	-2.76424400	-2.01523000
H	-0.08577600	-4.83883500	-3.39644900
H	-1.52499000	-5.44241600	-2.52140200
H	-1.64356100	-3.98060100	-3.55207300
C	-2.13873000	-1.01639200	2.44868400
C	-3.31919800	-0.52227700	3.28779000
H	-1.55452500	-0.13589100	2.10615800
H	-1.44181700	-1.59177900	3.09987700
H	-2.95242900	0.07216500	4.14932400
H	-3.97881800	0.13692100	2.68891300
H	-3.92806400	-1.35713300	3.69563900
O	0.97409300	-0.76915300	-2.01682000
C	0.26723100	1.53031700	-1.80764600
C	0.39833700	0.31169000	-2.74243000
H	-0.46844600	2.27818100	-2.16868400

H	1.25002300	2.04992400	-1.71089000
H	-0.60712400	0.01831000	-3.13478000
H	1.03014200	0.57462900	-3.62330300
O	-0.14886000	1.05600100	-0.50669000
B	-1.48456800	2.13146300	0.49256700
O	-1.59412400	3.27749200	-0.31975900
O	-2.69696200	1.41688600	0.50963100
H	-0.80697800	2.12073900	1.50823600
C	-2.98452500	3.43586600	-0.69255200
C	-3.57484100	1.96939900	-0.50153100
C	-3.59690500	4.46209800	0.28137900
C	-3.06453500	3.97878400	-2.12424100
C	-5.01347400	1.92640700	0.03094800
C	-3.47937000	1.09517400	-1.76537600
H	-2.99630400	5.39329400	0.23882400
H	-4.64706700	4.71256300	0.02597300
H	-3.56611400	4.08868000	1.32467100
H	-4.11989600	4.08404200	-2.45219900
H	-2.59153100	4.98113400	-2.17059800
H	-2.54102200	3.32398700	-2.84702200
H	-5.71467400	2.42657100	-0.66959000
H	-5.33838700	0.87131700	0.13897900
H	-5.09867200	2.41187800	1.02170500
H	-4.21152200	1.40495700	-2.53958600
H	-2.46636500	1.12593100	-2.20956700
H	-3.69013900	0.04301900	-1.48588000
TS-5			
N	-1.42316000	-1.32425300	0.86014300
C	-3.46643600	0.07933400	0.96977200
Al	0.03891300	-0.59046100	-0.20812800
C	-4.77370400	0.33619100	0.50676500
H	-5.32435500	1.20714700	0.89202300
C	-1.24678500	-2.20377400	1.87785400
C	0.00779300	-2.69991300	2.29145400
H	-0.01208000	-3.40976100	3.12891200
C	-2.78430500	-1.05194300	0.44562400
C	-4.70606500	-1.62738000	-0.92509400
H	-5.20367700	-2.28399500	-1.65439000
C	-5.38461700	-0.50044500	-0.43842800
H	-6.40380100	-0.27711100	-0.79287800
C	-3.39977000	-1.93274400	-0.48898300
C	-2.46251100	-2.70991500	2.63187200
H	-3.06335300	-1.86679300	3.02967300
H	-2.16178900	-3.36173500	3.47278800

H	-3.14172700	-3.28295100	1.96798500
N	1.47869800	-1.55177600	0.74071900
C	3.50846600	-0.18147100	1.04945100
C	4.81189200	0.16148600	0.63434500
H	5.35424600	0.96597700	1.15291500
C	1.28730200	-2.41209800	1.75629100
C	2.83334600	-1.22541000	0.35237700
C	4.75858100	-1.54688700	-1.09301100
H	5.26025300	-2.07276700	-1.91886600
C	5.42976200	-0.50913000	-0.43113100
H	6.44713900	-0.22420900	-0.74417000
C	3.45388300	-1.93113500	-0.71723900
C	2.47788600	-3.11639100	2.37737700
H	3.19469300	-2.39008100	2.81253800
H	2.15778400	-3.81637100	3.17124100
H	3.04387400	-3.68212600	1.60880600
C	2.82980900	0.52182100	2.21717200
C	3.65712100	1.58158900	2.95189700
H	2.49183800	-0.24127300	2.95351100
H	1.88249500	0.97244700	1.84298200
H	3.06994300	2.01786300	3.78589100
H	4.58629500	1.15706900	3.38756800
H	3.95305300	2.41779700	2.28452300
C	2.72047300	-3.06827700	-1.40990200
C	3.47818200	-3.78452500	-2.53191800
H	1.75953600	-2.66061700	-1.79783900
H	2.41631200	-3.81501200	-0.64062300
H	2.85163800	-4.59324500	-2.96117600
H	3.73507800	-3.09458300	-3.36339300
H	4.42324900	-4.25069400	-2.17936300
C	-2.66489100	-3.18006900	-0.96405300
C	-3.33886900	-3.98504600	-2.08035500
H	-2.50555100	-3.85253000	-0.08925300
H	-1.63549700	-2.89347400	-1.27249900
H	-2.70612900	-4.85032300	-2.36541200
H	-4.32747800	-4.38726900	-1.77350400
H	-3.49552100	-3.37436300	-2.99464600
C	-2.79270300	0.95967800	2.01013900
C	-3.65833200	2.06205700	2.62797500
H	-1.89985300	1.43483900	1.54847800
H	-2.38939600	0.31136000	2.82006200
H	-3.08042700	2.61940100	3.39343100
H	-3.98772600	2.79963400	1.86679600
H	-4.56674300	1.65862700	3.12433300

O	0.11630700	-1.33074000	-1.83075900
C	-0.93949000	0.60532100	-2.80704700
C	-0.71086600	-0.90992400	-2.88489100
H	-1.84707400	0.91619300	-3.36971900
H	-0.06479300	1.16041000	-3.20180500
H	-1.69760800	-1.43559200	-2.85166100
H	-0.25137500	-1.15639900	-3.87172600
O	-1.11150500	0.93076800	-1.40869000
B	-0.34028400	2.01342600	-0.87123100
O	0.58154800	2.68038900	-1.67810200
O	-0.87117500	2.84692100	0.12272800
H	0.58626300	0.93764000	0.13582600
C	0.91689100	3.93060600	-1.01968100
C	-0.37047200	4.19120500	-0.11619100
C	2.19821500	3.70232900	-0.20066800
C	1.17014200	4.98959900	-2.09784300
C	-0.08109100	4.86049800	1.23082800
C	-1.47903300	4.95979300	-0.85828700
H	2.98882900	3.31420000	-0.87358100
H	2.56338200	4.64041800	0.26453800
H	2.03717000	2.94975300	0.59518900
H	1.34808400	5.98575800	-1.64219700
H	2.07204700	4.71678500	-2.68270300
H	0.32105600	5.06919700	-2.80281000
H	0.36924200	5.86472800	1.08708800
H	-1.02663300	4.99037000	1.79577400
H	0.60361600	4.25203200	1.85115900
H	-1.21444800	6.02577000	-1.01353700
H	-1.69480700	4.50280600	-1.84483200
H	-2.40871500	4.91725300	-0.25591200
TS-6			
Al	1.22691500	-0.51366600	0.08058300
N	1.98301100	-1.07454500	-1.60599900
N	2.88573900	-0.00850000	0.93414400
O	0.05150700	0.86172800	-0.06742900
O	-3.61405200	0.84193300	0.17304200
C	3.21578100	-0.68458300	-2.00372800
C	1.23249400	-2.00236000	-2.43183100
C	4.00552400	0.25719600	0.22516200
C	2.93672000	0.02301700	2.38390900
C	-1.21725300	0.81350100	0.58846800
C	-2.34375600	0.54675300	-0.41823200
C	4.10992600	0.02801800	-1.16860900
C	3.70400400	-1.07053700	-3.38430600

C	1.40668200	-3.39899500	-2.21309900
C	0.32738400	-1.51226400	-3.41430900
C	5.23492300	0.76832700	0.94658500
C	3.28984300	-1.17085800	3.07584700
C	2.60789200	1.21729800	3.08406900
H	-1.39947500	1.78749500	1.09070700
H	-1.22200800	0.02590700	1.37721800
H	-2.30513500	-0.50655900	-0.77353100
H	-2.20664400	1.22079400	-1.28789000
H	5.05885400	0.32915900	-1.63217100
H	3.80377300	-2.17311400	-3.46936600
H	4.68675800	-0.61283400	-3.60138100
H	2.98144400	-0.76443300	-4.16744000
C	0.65775500	-4.29778500	-2.99974500
C	2.37426100	-3.88776800	-1.14663900
C	-0.39783800	-2.45386800	-4.17554500
C	0.15858600	-0.01892700	-3.62423700
H	5.61819500	0.00493100	1.65589400
H	6.04096900	1.01841300	0.23231800
H	4.99971500	1.66498200	1.55487500
C	3.31136100	-1.14560600	4.48527100
C	3.62107800	-2.43344700	2.29558800
C	2.64524400	1.18960500	4.49468800
C	2.23161200	2.47421200	2.32191000
H	0.77476600	-5.38094500	-2.84820300
C	-0.23723000	-3.83116000	-3.97282800
C	2.53858000	-5.40507300	-1.01483000
H	2.04182800	-3.46818100	-0.17031000
H	3.37193000	-3.42533900	-1.32067300
H	-1.10200800	-2.09894900	-4.94234800
C	-0.80300400	0.41619400	-4.73206100
H	1.15570400	0.43990900	-3.80834100
H	-0.16292900	0.44550600	-2.66900100
H	3.58036200	-2.05555800	5.04163000
C	2.99196500	0.02349500	5.19023400
C	4.05040200	-3.65299800	3.11719600
H	4.40979300	-2.20166200	1.54490600
H	2.72830200	-2.69784100	1.68495100
H	2.39751900	2.10132100	5.05790500
C	1.95763700	3.72893000	3.15372600
H	1.34540500	2.26395200	1.68731000
H	3.02646500	2.70125200	1.57684700
H	-0.81514600	-4.54804300	-4.57791100
H	3.26890000	-5.64566600	-0.21546500

H	1.58364200	-5.90463400	-0.74921400
H	2.91072400	-5.86742000	-1.95337700
H	-0.84840100	1.52258400	-4.76427500
H	-0.48696800	0.05721900	-5.73485600
H	-1.83608900	0.05012600	-4.55341500
H	3.01289900	0.02482600	6.29186200
H	4.27455800	-4.50897000	2.44836700
H	4.96412200	-3.45192500	3.71535600
H	3.25531200	-3.98262100	3.81804900
H	1.68880900	4.56346100	2.47661100
H	1.10975900	3.58640600	3.85671900
H	2.84010200	4.04417200	3.75062000
H	0.49847800	-1.70992900	0.85279000
B	-4.38576200	-0.14699000	0.70853600
O	-5.62568000	0.12001900	1.26022500
O	-4.02796100	-1.48542900	0.75463600
C	-6.05294100	-1.09785200	1.93481600
C	-5.21219400	-2.22143400	1.18006300
C	-5.66523300	-0.95316700	3.41685600
C	-7.57192100	-1.22683100	1.79536100
C	-4.76995000	-3.39648600	2.05540100
C	-5.90417700	-2.73609100	-0.09381300
H	-6.11641200	-0.02209600	3.81499300
H	-6.02842800	-1.80518900	4.02667700
H	-4.56588000	-0.87703800	3.54044200
H	-7.93159700	-2.18155000	2.23205200
H	-8.06806600	-0.39559500	2.33633600
H	-7.89134700	-1.17791500	0.73716300
H	-5.64746300	-3.93815300	2.46543200
H	-4.17894600	-4.11260400	1.44905400
H	-4.13376400	-3.06303400	2.89690200
H	-6.77756400	-3.37824700	0.13965500
H	-6.24678100	-1.89730900	-0.73319000
H	-5.17804000	-3.33570000	-0.67889400
B	0.63184900	2.55536500	-1.01642900
O	-0.30424600	2.73094100	-2.05921600
O	0.55227100	3.62617900	-0.11063500
H	1.71266000	2.01949800	-1.21198400
C	-0.76282600	4.10447400	-2.03911600
C	-0.47196700	4.56271100	-0.53683600
C	0.07722400	4.87331700	-3.07887800
C	-2.24089700	4.14892700	-2.44640300
C	0.10925400	5.97925100	-0.40729700
C	-1.69306200	4.44552400	0.39210900

H	-0.04214700	4.38396800	-4.06674400
H	-0.24052900	5.93141800	-3.17703600
H	1.15516400	4.85195700	-2.82158400
H	-2.63305600	5.18642000	-2.40540100
H	-2.35193600	3.78685900	-3.48900100
H	-2.87304200	3.51332300	-1.79796500
H	-0.59086800	6.73994500	-0.81104600
H	0.28139600	6.21440200	0.66314900
H	1.07805000	6.07478800	-0.93283100
H	-2.43701000	5.24159300	0.18349800
H	-2.20850200	3.47111100	0.30180900
H	-1.35777500	4.55953400	1.44314700
TS-7			
Al	2.19148200	0.11010300	0.15378600
N	1.82612700	-1.04686200	-1.35147500
C	2.08189000	-3.50398000	-0.99063400
C	2.87678200	-4.66012600	-1.15015800
H	2.51044600	-5.62226000	-0.76283300
C	4.12111000	-4.60764800	-1.79129500
H	4.72434400	-5.52335900	-1.89893700
C	4.59673900	-3.39120400	-2.30074000
H	5.57264000	-3.36173400	-2.80727800
C	3.84123800	-2.20827100	-2.17364000
C	2.58281900	-2.27593300	-1.50759400
C	0.96384600	-0.67217400	-2.32377800
C	0.37048400	0.61276000	-2.38847100
H	-0.35153300	0.76170600	-3.20235600
C	0.73645300	-3.56811200	-0.28841800
H	0.01706700	-2.91765000	-0.82940600
H	0.82954700	-3.09625200	0.71598200
C	0.12668100	-4.96475200	-0.11761800
H	0.01146800	-5.49640800	-1.08659500
H	-0.87800400	-4.88637600	0.34538000
H	0.73651700	-5.61060600	0.54822100
H	3.55903500	-0.44526900	-3.38576000
H	4.41419000	-0.16895500	-1.87239900
C	5.67597400	-0.91201000	-3.47539900
H	5.64228300	-1.58087200	-4.36124400
H	6.50928500	-1.25415900	-2.82688100
H	5.93710100	0.10338100	-3.83747200
C	0.65311100	-1.64118100	-3.44594400
H	-0.12327900	-1.23424400	-4.11983400
H	0.31490000	-2.62079400	-3.05218400
H	1.56442000	-1.84848100	-4.04552400

N	1.54543800	1.76222200	-0.59227600
C	3.20089900	3.58533800	-0.44977600
C	3.66116900	4.76141300	0.17240900
H	4.59973100	5.22440300	-0.16619800
C	2.94180600	5.35088100	1.22412000
H	3.32175800	6.26612200	1.70571300
C	1.74274900	4.77541000	1.65802700
H	1.18291700	5.24383000	2.48291700
C	1.23138300	3.59898500	1.06456100
C	1.98014500	3.00657700	0.01089700
C	0.70192700	1.77373000	-1.64664100
C	3.97011900	2.92899300	-1.58569800
H	3.28106100	2.77500600	-2.44646400
H	4.24221900	1.89898800	-1.26163600
C	5.22872500	3.65578300	-2.06933900
H	5.70003900	3.09663100	-2.90326000
H	5.98871300	3.74938900	-1.26577400
H	5.00366800	4.67783200	-2.44080600
C	-0.07488100	3.00437200	1.56229700
H	-0.39475300	2.19096900	0.88259600
H	0.10838300	2.48380200	2.52836500
C	-1.22198300	4.01380100	1.74053100
H	-0.99514200	4.78559700	2.50522600
H	-2.14480500	3.49316900	2.06965400
H	-1.45525700	4.54859400	0.79455100
C	0.10453000	3.09013500	-2.09401000
H	-0.49374500	3.54769600	-1.27957000
H	-0.54255400	2.95622300	-2.98011700
H	0.90190100	3.82204100	-2.33973400
C	4.34117800	-0.88187000	-2.72448800
H	3.77466900	0.10531000	0.41941600
H	1.62824900	-0.07674800	1.72430900
B	0.33140600	-0.60461800	2.11283200
O	-0.03562200	0.19348100	3.24024900
O	0.54599900	-1.94690500	2.54891100
C	0.80280600	-1.91324400	3.97010700
C	-0.02302600	-0.62846500	4.43023200
C	-1.48659400	-0.95430700	4.78485700
H	-1.57082100	-1.51868600	5.73634600
H	-2.04785300	-0.00454600	4.89931300
H	-1.97653800	-1.54407500	3.98430500
C	0.61848800	0.16327900	5.57726700
H	0.71286500	-0.45892400	6.49192800
H	1.62138100	0.54132500	5.30211700

H	-0.01553000	1.03867000	5.82751700
C	2.32204900	-1.76076900	4.18525200
H	2.84230900	-2.58632300	3.65824600
H	2.70208200	-0.80518800	3.77247900
H	2.59616000	-1.80973600	5.25883900
C	0.32739900	-3.23498200	4.58430100
H	-0.72337300	-3.45518000	4.31612800
H	0.95498900	-4.06933400	4.20923000
H	0.41471300	-3.21610800	5.69063000
O	-0.31863300	-0.41123900	0.84041400
C	-1.61929600	-0.95021500	0.64138200
C	-2.71100800	0.05316500	1.03891700
H	-1.75655500	-1.89076400	1.22156900
H	-1.72956400	-1.20018400	-0.43758000
O	-3.99828600	-0.56094900	0.92353100
H	-2.64462300	0.96279100	0.40372000
H	-2.56451100	0.35184000	2.09759400
B	-4.84362600	-0.25078900	-0.09768200
O	-6.10525200	-0.81160300	-0.18720500
O	-4.55221300	0.63423800	-1.12776200
C	-6.63541600	-0.44736000	-1.49232200
C	-5.79965300	0.86140000	-1.84740400
C	-6.34384800	-1.62134000	-2.44355500
C	-8.14580500	-0.23253900	-1.36487500
C	-5.48345600	1.04268500	-3.33395000
C	-6.42362200	2.14552800	-1.27462700
H	-6.77463700	-2.54664700	-2.01105500
H	-6.78983000	-1.46504200	-3.44677600
H	-5.25302600	-1.78025300	-2.56473400
H	-8.57982400	0.12214000	-2.32269700
H	-8.63762200	-1.19083200	-1.10136600
H	-8.38946600	0.49948700	-0.57182500
H	-6.41534900	1.13739300	-3.92892000
H	-4.89060000	1.96843300	-3.48120300
H	-4.89391900	0.19560400	-3.73299000
H	-7.34309600	2.43927700	-1.82039100
H	-6.67631100	2.02599500	-0.20158400
H	-5.68946500	2.97182200	-1.36143400
TS-8			
Al	-3.26572700	-0.17378900	0.19437300
C	1.69066900	0.78675100	-2.63523600
N	-4.51866900	1.02769700	-0.66510000
N	-4.55001600	-1.56816000	0.59864100
O	-2.14038600	-0.78703500	-1.00072900

O	1.41434200	0.19495900	-1.28068300
C	-5.80021800	0.71525400	-0.94819900
C	-4.00974600	2.33760800	-1.01069900
C	-5.83456800	-1.56571200	0.18250100
C	-4.04293900	-2.68352100	1.36497000
C	-0.77240400	-0.91606100	-1.26976500
C	0.05307400	0.30908900	-0.84022200
C	-6.40346300	-0.50721400	-0.56392900
C	-6.65712300	1.71844900	-1.69274900
C	-4.12435900	3.38179500	-0.04851000
C	-3.37063500	2.54084800	-2.26634700
C	-6.72916600	-2.73464600	0.54204600
C	-4.05533500	-2.60383700	2.78615100
C	-3.49306100	-3.80628800	0.68243800
H	-0.62573300	-1.06036800	-2.36874100
H	-0.34814000	-1.82564800	-0.77623700
H	0.07175300	0.39862000	0.26637100
H	-0.39446700	1.23728400	-1.25889800
H	-7.45447500	-0.63570500	-0.85503700
H	-6.74330000	2.66678600	-1.12276800
H	-7.67266500	1.32076500	-1.87415600
H	-6.19808600	1.98643800	-2.66647500
C	-3.60781000	4.65034300	-0.38023900
C	-4.78600100	3.10573700	1.29437000
C	-2.86130100	3.82755300	-2.54388000
C	-3.25960300	1.40336300	-3.27172800
H	-6.79451700	-2.85523700	1.64350600
H	-7.74972000	-2.59536800	0.14028500
H	-6.32015100	-3.68945400	0.15247200
C	-3.51114200	-3.68029900	3.51689300
C	-4.64542500	-1.37927700	3.47046000
C	-2.96133800	-4.85611100	1.46038700
C	-3.48887800	-3.84551800	-0.83855500
H	-3.68691700	5.47697600	0.34130600
C	-2.98513800	4.87284300	-1.61778000
C	-4.85521400	4.28052200	2.27504600
H	-4.24638300	2.25679100	1.77227600
H	-5.81443700	2.71556700	1.11947100
H	-2.35318700	4.01138600	-3.50166000
C	-2.31243400	1.63720200	-4.45507600
H	-4.28039700	1.16925900	-3.65742800
H	-2.94921100	0.48831800	-2.72145600
H	-3.50951300	-3.64591300	4.61651000
C	-2.96991300	-4.79610200	2.86174500

C	-4.62998700	-1.37901200	5.00214200
H	-5.69114400	-1.23773400	3.11441400
H	-4.10209800	-0.48293800	3.09439100
H	-2.53096000	-5.73679400	0.96070400
C	-2.79913300	-5.04989000	-1.48681600
H	-3.02539600	-2.90005200	-1.20016500
H	-4.54086700	-3.79411500	-1.20242600
H	-2.58440600	5.87018400	-1.85922800
H	-5.34788300	3.96688100	3.21809900
H	-3.84555900	4.65852200	2.53971400
H	-5.43678400	5.13351400	1.86599000
H	-2.28643300	0.73658200	-5.10270900
H	-2.63365900	2.48571400	-5.09588800
H	-1.27333000	1.83615400	-4.11657100
H	-2.54877700	-5.62739200	3.44979500
H	-5.08119200	-0.44358200	5.39152800
H	-5.20738600	-2.22702000	5.42732200
H	-3.59755700	-1.43928100	5.40589500
H	-2.83892300	-4.96504800	-2.59202000
H	-1.72848300	-5.11673600	-1.20009700
H	-3.28024100	-6.01294900	-1.21298300
H	-2.60967000	0.45783600	1.51560100
Al	3.81743400	0.45345300	-0.83332800
N	3.32118300	1.37566100	0.78251400
N	3.72252200	-1.36533900	-0.18953300
C	2.62621700	0.73122200	1.74507700
C	3.76963200	2.73739600	0.99899400
C	2.96777700	-1.65565500	0.89367200
C	4.47307800	-2.41448700	-0.84931100
C	2.38278300	-0.66660900	1.72428000
C	2.12008900	1.51553600	2.93728700
C	5.00815000	2.94038600	1.67364300
C	3.00346800	3.82998200	0.50501300
C	2.76237600	-3.10540700	1.27944700
C	5.80859000	-2.66365000	-0.40875600
C	3.90477500	-3.15547500	-1.92144700
H	1.75582400	-1.04798300	2.54147200
H	1.47835300	0.88943300	3.58419400
H	1.54702500	2.40749000	2.61243700
H	2.96760900	1.89593500	3.54537000
C	5.46516900	4.26178300	1.84980600
C	5.81045100	1.74740100	2.16940700
C	3.50781400	5.13319600	0.70767100
C	1.68111900	3.59776300	-0.20424900

H	2.30109300	-3.67444500	0.44657200
H	3.73389500	-3.59888200	1.49157400
H	2.11734600	-3.19499700	2.17268800
C	6.55309800	-3.66833300	-1.05489800
C	6.39584300	-1.84481500	0.72901600
C	4.69485600	-4.15443800	-2.53437700
C	2.47811300	-2.92789600	-2.39708500
H	6.41911600	4.44353000	2.36631000
C	4.72299900	5.35018600	1.36981200
C	7.11441900	2.06000900	2.91004300
H	6.03165200	1.10104900	1.29071500
H	5.16456800	1.11577300	2.82019200
H	2.93334900	5.99495000	0.33802400
C	0.84739500	4.84494000	-0.51308400
H	1.07004600	2.89233600	0.40110900
H	1.84362800	3.05154700	-1.16194700
H	7.58334900	-3.87479900	-0.72955900
C	6.00210500	-4.41270100	-2.10996500
C	7.81436900	-2.21085400	1.17566600
H	5.70968700	-1.89556700	1.60419600
H	6.37006500	-0.77578700	0.41856200
H	4.26646100	-4.74286600	-3.36112800
C	2.31295500	-2.83536500	-3.92429400
H	2.07351500	-2.00999900	-1.92542200
H	1.84083400	-3.76270700	-2.02091900
H	5.09621800	6.37691700	1.51321800
H	7.61208400	1.12091200	3.22760000
H	7.83267700	2.61349800	2.26994300
H	6.94057100	2.66705100	3.82351000
H	-0.10441600	4.54935200	-0.99709100
H	0.59643800	5.42186900	0.40274800
H	1.37059700	5.53011500	-1.21277000
H	6.59923500	-5.19685900	-2.60220100
H	8.13617400	-1.55490400	2.01006700
H	7.88208300	-3.25976200	1.53418900
H	8.55301700	-2.08623400	0.35655500
H	1.25649900	-2.62268700	-4.18860000
H	2.94031000	-2.02435300	-4.35005200
H	2.59497900	-3.77612300	-4.44124400
H	3.09003500	0.88482600	-2.34359500
H	5.34700100	0.80006300	-1.20011300
O	1.16072500	1.85500000	-2.94644700
H	1.80429800	-0.05586400	-3.36841500

TS-9

Al	3.52397000	0.16771500	-0.26307100
N	4.47403600	-1.22532200	-1.21386900
N	4.45766300	1.65482300	-1.08531400
O	1.82702300	0.14640300	-0.73670500
O	-1.52030700	-0.51805000	0.66930600
C	5.43592500	-1.00539100	-2.13653700
C	4.09404800	-2.58333000	-0.89268600
C	5.41575200	1.53687300	-2.02711700
C	4.04535000	2.96704200	-0.63957300
C	0.66497100	0.41224300	0.01809900
C	-0.29129700	-0.78937300	-0.01721300
C	5.87108100	0.28733200	-2.51229500
C	6.09809400	-2.19162300	-2.80734500
C	4.73718800	-3.23885600	0.19442000
C	3.05634600	-3.20911600	-1.63981100
C	6.04946000	2.78906600	-2.59740400
C	4.68180700	3.53801100	0.49827700
C	2.97923600	3.62693200	-1.31422500
H	0.12798300	1.29655000	-0.40617900
H	0.89676200	0.66241100	1.08212800
H	0.17957800	-1.67897800	0.45668900
H	-0.48188400	-1.05386600	-1.08417600
H	6.65985600	0.32609000	-3.27527900
H	6.56772000	-2.86052800	-2.05674500
H	6.87211000	-1.86359700	-3.52541400
H	5.35237900	-2.81198700	-3.34608100
C	4.32852000	-4.55065200	0.51299800
C	5.82987800	-2.52078700	0.97380000
C	2.68635900	-4.52218700	-1.28135200
C	2.37608300	-2.45715200	-2.77344500
H	6.50823700	3.40231800	-1.79445900
H	6.82636000	2.54035500	-3.34370500
H	5.28698600	3.43564100	-3.07891800
C	4.23797400	4.80086600	0.94184300
C	5.80364000	2.78385300	1.19794400
C	2.57294000	4.88754500	-0.82926100
C	2.30968900	2.96676300	-2.51049200
H	4.80874700	-5.08301000	1.34736600
C	3.31525100	-5.18759500	-0.21853300
C	6.46831700	-3.29877900	2.12857400
H	5.40433900	-1.56730300	1.36076500
H	6.62674100	-2.19948700	0.26496200
H	1.88816300	-5.03195500	-1.84087400
C	1.27514200	-3.20991500	-3.52631300

H	3.15031700	-2.12130100	-3.50042500
H	1.96449900	-1.51384000	-2.34681700
H	4.71207000	5.26739200	1.81810700
C	3.19577400	5.47039400	0.28402600
C	6.42263300	3.46404400	2.42293000
H	6.60649100	2.56267500	0.45808000
H	5.41238600	1.78281000	1.48894200
H	1.74938100	5.41984000	-1.32741700
C	1.15739700	3.74078100	-3.15828600
H	1.95575400	1.96104200	-2.18768000
H	3.08372100	2.75251600	-3.28279900
H	3.00922400	-6.21257200	0.04537500
H	7.24376300	-2.68134100	2.62630800
H	5.72235200	-3.57719200	2.90209500
H	6.95982200	-4.23294300	1.78352900
H	0.85203500	-2.56951000	-4.32684400
H	1.65010700	-4.13842200	-4.00753000
H	0.43502200	-3.49209900	-2.85794500
H	2.86096500	6.45535300	0.64703400
H	7.22057400	2.82620300	2.85511500
H	6.88167700	4.44355700	2.17165200
H	5.67183000	3.63914700	3.22168100
H	0.74026000	3.16386300	-4.00866500
H	0.32621700	3.91812000	-2.44459800
H	1.48095400	4.72737300	-3.55359800
H	3.73622600	0.12378700	1.32705000
Al	-2.88738400	0.27492500	-0.21857600
N	-4.42440800	-0.86845100	-0.50977600
N	-3.78671300	1.61446300	0.84287200
H	-2.34842100	0.84906300	-1.61198600
C	-5.51229500	-0.82077300	0.29095400
C	-4.42889300	-1.75316000	-1.65898300
C	-4.95247400	1.35931000	1.47904400
C	-3.22247200	2.94946200	0.90635300
C	-5.69614900	0.16979400	1.28627400
C	-6.62264200	-1.83175500	0.09357900
C	-4.95154500	-1.26282800	-2.89005800
C	-3.89443200	-3.06755100	-1.55173800
C	-5.53408600	2.40738200	2.40467800
C	-3.62654900	3.90375200	-0.07078600
C	-2.26740700	3.27294500	1.91012500
H	-6.59829300	0.06528800	1.90377000
H	-7.09667300	-1.70474000	-0.90236100
H	-7.40319000	-1.72278300	0.86908800

H	-6.22998200	-2.86841000	0.11894900
C	-4.93443600	-2.11595700	-4.01224100
C	-5.49962800	0.15303100	-2.97272000
C	-3.90274600	-3.88246500	-2.70428100
C	-3.33602100	-3.56360200	-0.23080500
H	-5.80446900	3.32393400	1.83945300
H	-6.43994600	2.03005100	2.91408100
H	-4.79433100	2.72198200	3.16839300
C	-3.06097800	5.19421800	-0.01941500
C	-4.63557700	3.51681000	-1.14067000
C	-1.73060900	4.57824500	1.91704200
C	-1.85139300	2.23370300	2.93360500
H	-5.33212700	-1.75845100	-4.97349600
C	-4.41550200	-3.41530000	-3.92196300
C	-6.08896500	0.58174300	-4.32009400
H	-4.67768600	0.84952500	-2.69184100
H	-6.26491500	0.29482000	-2.17672700
H	-3.49978900	-4.90418100	-2.64423200
C	-2.88158300	-5.02391300	-0.18038800
H	-4.08623700	-3.38864700	0.57174900
H	-2.48692500	-2.91665900	0.07437100
H	-3.35887600	5.94880200	-0.76234000
C	-2.12132700	5.53024500	0.96579000
C	-5.05893200	4.62136400	-2.11401500
H	-5.54142100	3.09308500	-0.65165600
H	-4.20853000	2.66404700	-1.71537000
H	-0.99108200	4.85189400	2.68374600
C	-0.87931800	2.69091100	4.02315000
H	-1.41688700	1.35936300	2.40419100
H	-2.76029400	1.80928000	3.41481200
H	-4.41029400	-4.06884200	-4.80907300
H	-6.46240600	1.62464400	-4.26323000
H	-5.33467500	0.54634100	-5.13367500
H	-6.94291500	-0.05942700	-4.62486900
H	-2.49135300	-5.25089800	0.83124700
H	-3.70841000	-5.73394300	-0.39668500
H	-2.06279600	-5.23118200	-0.90133600
H	-1.68937800	6.54360900	0.99124100
H	-5.79897200	4.23094000	-2.84218700
H	-5.53036800	5.47990700	-1.59069200
H	-4.19953600	5.01367500	-2.69679400
H	-0.66673600	1.84084600	4.70115200
H	0.09022600	3.03118300	3.60194500
H	-1.28995600	3.52081000	4.63750600

B	-1.98010800	-1.43387400	2.42769100
O	-1.50826900	-2.74609100	2.21925400
O	-1.29872800	-0.83337700	3.49832900
H	-3.14510100	-1.12096000	2.23724700
C	-0.70970100	-3.13015600	3.36488900
C	-0.25910600	-1.72701200	3.97181600
C	-1.63177000	-3.92582000	4.31077100
C	0.44192100	-4.02683200	2.89783000
C	-0.25027000	-1.67122500	5.50635800
C	1.09999600	-1.23973500	3.44389000
H	-2.05739700	-4.78607700	3.75522200
H	-1.08866300	-4.31978700	5.19414900
H	-2.47688900	-3.30255600	4.66610000
H	1.10684600	-4.29367400	3.74567000
H	0.03603400	-4.96931400	2.47655700
H	1.05377100	-3.54397500	2.11297600
H	0.45927600	-2.41225800	5.93027400
H	0.07380300	-0.66449300	5.84136700
H	-1.25508800	-1.85966200	5.92944000
H	1.94023200	-1.82718400	3.86709800
H	1.16410900	-1.29796200	2.34142500
H	1.24408400	-0.17967200	3.73458500
TS-10			
Al	3.74280500	-0.60592800	0.04001000
N	4.06927600	-2.16186500	-1.06515300
N	5.40174000	0.29939700	-0.38407700
O	2.36509200	0.32024400	-0.56214200
O	-1.19277700	0.63848700	0.36951300
C	5.15911700	-2.33938400	-1.84158700
C	3.04431800	-3.18211300	-1.02760400
C	6.33653300	-0.16584000	-1.23971600
C	5.60522700	1.56957100	0.27635400
C	1.25692100	0.79455100	0.17460100
C	-0.03664700	0.17253200	-0.36580900
C	6.21446000	-1.39968400	-1.92162500
C	5.28013900	-3.60564800	-2.66428400
C	3.11713600	-4.19241100	-0.02808600
C	1.96635400	-3.11839900	-1.95473500
C	7.58574800	0.65505300	-1.48603700
C	6.21905900	1.58759300	1.56021800
C	5.14023200	2.76008600	-0.35039600
H	1.18244500	1.90461100	0.09774600
H	1.34655800	0.54834900	1.26233300
H	0.01930100	-0.93575800	-0.31897900

H	-0.18891000	0.46943500	-1.42238600
H	7.04436800	-1.66411200	-2.59031200
H	5.25327200	-4.50426300	-2.01370100
H	6.22004000	-3.61612700	-3.24637500
H	4.42543700	-3.70885600	-3.36416400
C	2.08598300	-5.15318600	0.01851700
C	4.28248400	-4.20880000	0.95105500
C	0.95905900	-4.10142500	-1.86292100
C	1.92249000	-2.00896000	-2.99490400
H	8.13181300	0.83945200	-0.53774400
H	8.26509300	0.14649200	-2.19471400
H	7.33127000	1.65578100	-1.89225900
C	6.37287700	2.83286600	2.20404500
C	6.68380400	0.28560700	2.19696800
C	5.32141700	3.97964200	0.33461000
C	4.45905700	2.68740100	-1.70855500
H	2.11539000	-5.94668400	0.77990600
C	1.01766900	-5.10891100	-0.88909700
C	4.28520200	-5.33451400	1.98993900
H	4.30551700	-3.22495200	1.47222900
H	5.23651900	-4.23982000	0.37699900
H	0.10950400	-4.07403100	-2.56085600
C	0.70384400	-1.99631300	-3.92268800
H	2.85003000	-2.05509300	-3.61079500
H	1.99318700	-1.03793700	-2.45401400
H	6.84367200	2.87748400	3.19729200
C	5.93139300	4.01760900	1.59709200
C	7.32522000	0.39471300	3.58369500
H	7.39368700	-0.22151800	1.50435400
H	5.80885400	-0.40125500	2.24755900
H	4.97446600	4.91685200	-0.12526000
C	4.03745800	4.02209700	-2.32984800
H	3.57280300	2.01976500	-1.60326300
H	5.12754700	2.15117900	-2.41966800
H	0.21752600	-5.86409200	-0.83260000
H	5.17318000	-5.24802300	2.64902000
H	3.38680200	-5.29876600	2.64091300
H	4.31922200	-6.33940700	1.51844400
H	0.77429000	-1.14922400	-4.63527300
H	0.62085100	-2.92677800	-4.52380300
H	-0.24332800	-1.87284200	-3.35699300
H	6.05983000	4.98105600	2.11602700
H	7.61873700	-0.60956800	3.95189200
H	8.24003700	1.02424500	3.57459300

H	6.62607500	0.82770800	4.32940800
H	3.56436100	3.85200500	-3.31852800
H	3.29569700	4.55476900	-1.69893700
H	4.89863400	4.70586600	-2.48797800
H	3.60329800	-0.95398500	1.60155200
Al	-3.28538000	0.39207700	-0.44025600
N	-5.23831700	0.03105000	-0.74726400
N	-3.44349400	2.30984300	-0.88230700
H	-2.59798900	-0.51130200	-1.58347100
C	-6.14378900	0.90654600	-1.20390400
C	-5.65321900	-1.30927000	-0.41954800
C	-4.57787800	2.90711100	-1.32895000
C	-2.25978900	3.13833500	-0.80942100
C	-5.81946800	2.25631900	-1.48958500
C	-7.57771300	0.46525600	-1.42818300
C	-5.54589600	-2.33565300	-1.40077100
C	-6.12349600	-1.58465700	0.89687500
C	-4.53974500	4.38175700	-1.68983500
C	-1.40490200	3.21480500	-1.94291000
C	-1.97834100	3.84954200	0.38893800
H	-6.64132200	2.87948000	-1.86632300
H	-8.19195800	1.29040500	-1.83427000
H	-8.03908100	0.11301600	-0.48238600
H	-7.62372500	-0.39296200	-2.12989500
C	-5.90663400	-3.64837000	-1.03190300
C	-5.06781000	-1.99445100	-2.80425300
C	-6.47414000	-2.91316700	1.21438600
C	-6.24017900	-0.45566400	1.91054100
H	-3.79045800	4.58406500	-2.48241500
H	-5.52961200	4.72697100	-2.04122200
H	-4.23632600	4.99984200	-0.82004900
C	-0.25595800	4.02863700	-1.85591500
C	-1.75466800	2.44228600	-3.20776700
C	-0.82021800	4.65264800	0.42612400
C	-2.91115400	3.72165100	1.58267300
H	-5.82986600	-4.46020500	-1.77055300
C	-6.36365600	-3.93708500	0.26208000
C	-4.92367100	-3.16609100	-3.78006000
H	-4.09551300	-1.46142900	-2.70993200
H	-5.75813400	-1.23773600	-3.24325000
H	-6.83865800	-3.15310400	2.22440400
C	-6.75777600	-0.83600000	3.30124800
H	-6.89180700	0.34294800	1.48919400
H	-5.23953000	0.02568600	1.99718400

H	0.42376200	4.10740000	-2.71731700
C	0.03278500	4.74360800	-0.68393400
C	-0.75151600	2.53371900	-4.36186400
H	-2.75440400	2.77702200	-3.56845500
H	-1.91375300	1.37414000	-2.93595400
H	-0.57735400	5.21443600	1.34027700
C	-2.57836700	4.58926000	2.80014600
H	-2.91911700	2.65525300	1.89980800
H	-3.95345200	3.93168600	1.25342500
H	-6.63809600	-4.96987700	0.53082800
H	-4.55694000	-2.80518400	-4.76287100
H	-4.19650300	-3.92087200	-3.41336600
H	-5.88761900	-3.68816900	-3.95945100
H	-6.80129100	0.05974100	3.95418900
H	-7.78021200	-1.26839000	3.26467700
H	-6.09962800	-1.57734700	3.80127500
H	0.93160200	5.37902800	-0.63468100
H	-1.09851700	1.92638300	-5.22275200
H	-0.62268100	3.57580300	-4.72360400
H	0.25009600	2.15388600	-4.07007700
H	-3.33016400	4.43209900	3.60055400
H	-1.58701800	4.33117500	3.22706800
H	-2.57235300	5.67345100	2.55757200
B	-1.46742700	0.03927200	1.62972900
O	-1.05434800	-1.25616200	1.89878900
O	-1.68703900	0.79262500	2.78293100
H	-3.27199300	-0.08242200	1.13094800
C	-1.29637700	-1.51050000	3.30890400
C	-1.33759700	-0.03559200	3.92759900
C	-2.63554000	-2.25933300	3.41657200
C	-0.16125800	-2.39320200	3.83870700
C	-2.39210600	0.16525500	5.02129700
C	0.03336000	0.45215400	4.42839600
H	-2.57743400	-3.18258000	2.80595100
H	-2.86505900	-2.54698000	4.46270100
H	-3.47130900	-1.65146100	3.01868100
H	-0.26209400	-2.55748200	4.93163100
H	-0.19849400	-3.38206000	3.33857300
H	0.83184600	-1.95048200	3.63461700
H	-2.19312600	-0.49363400	5.89198100
H	-2.36551300	1.21548400	5.37685300
H	-3.41290000	-0.04110100	4.64828500
H	0.35197700	-0.07883400	5.34852700
H	0.81826300	0.31919200	3.65727800

H	-0.03389900	1.53470000	4.65825900
TS-11			
N	1.32802100	0.22208500	0.56815700
C	3.20130500	-1.28882400	0.01768900
Al	-0.11032100	0.44183800	-0.74145600
C	4.53070900	-1.45709400	-0.42574500
H	4.95173500	-2.46959400	-0.51573100
C	1.12221800	0.24278700	1.91147300
C	-0.14760400	0.24842900	2.52738100
H	-0.14749800	0.27966000	3.62497900
C	2.69119300	0.03503100	0.11643400
C	4.80203000	0.94845500	-0.65536700
H	5.43387800	1.80697300	-0.92729100
C	5.32525000	-0.34986600	-0.75503100
H	6.36133000	-0.50004100	-1.09845100
C	3.47862300	1.16740600	-0.22547600
C	2.32516000	0.25163600	2.83652100
H	2.91692400	-0.68192900	2.74114800
H	2.00994900	0.35999100	3.89074500
H	3.01828500	1.07885200	2.58068400
N	-1.56550500	0.14550800	0.57444900
C	-3.33619200	-1.31282300	-0.34071800
C	-4.60000300	-1.43829700	-0.95305000
H	-4.97649800	-2.43563600	-1.22484300
C	-1.41792600	0.14141800	1.90782300
C	-2.87867900	-0.00719100	-0.00385200
C	-4.92075300	0.97040900	-0.88594200
H	-5.54723900	1.84743300	-1.10617100
C	-5.38550400	-0.30863200	-1.22439900
H	-6.36909700	-0.42611500	-1.70674700
C	-3.66399900	1.15057200	-0.27147900
C	-2.63338600	0.00034200	2.80183100
H	-3.14229700	-0.96941800	2.62062000
H	-2.35441100	0.05709800	3.87035300
H	-3.38509200	0.78646400	2.58450500
H	-0.48677200	1.84497900	-1.39590500
C	-2.46438100	-2.52206800	-0.03553000
C	-3.01473200	-3.88661900	-0.46115900
H	-2.24276100	-2.54169900	1.05592800
H	-1.47344300	-2.35400500	-0.51530800
H	-2.29708500	-4.69090500	-0.19935200
H	-3.97588000	-4.12600200	0.04092500
H	-3.18580400	-3.93987400	-1.55677600
C	-3.14429700	2.52966000	0.10783800

C	-4.02581300	3.72127600	-0.27806800
H	-2.13618800	2.64859300	-0.34828900
H	-2.95798200	2.55556500	1.20617700
H	-3.54352800	4.67107100	0.03102200
H	-4.18765600	3.77564400	-1.37504600
H	-5.02350400	3.68414400	0.20861400
C	2.87371800	2.55832300	-0.13766800
C	3.79343000	3.72776500	-0.50167600
H	2.46868500	2.71342500	0.88829200
H	1.97930700	2.57577100	-0.79966200
H	3.24992700	4.68953900	-0.40258600
H	4.68592000	3.78146000	0.15737800
H	4.15090900	3.65892700	-1.55020900
C	2.32476800	-2.47649200	0.39867100
C	2.89067700	-3.86733400	0.09273100
H	1.33606900	-2.36135500	-0.09890700
H	2.08493300	-2.41777300	1.48558500
H	2.16119200	-4.65259800	0.37830400
H	3.11239100	-3.99489200	-0.98777500
H	3.82746700	-4.07059200	0.65263700
O	1.47888900	0.63455900	-2.46348300
C	1.12666500	-0.52852200	-2.75429600
H	-0.31982000	-0.89020300	-1.72830600
H	0.52463900	-0.75442300	-3.67765000
H	1.62960500	-1.43052100	-2.30795700
TS-12			
N	-1.13126300	1.48958800	0.56109700
C	-0.27927300	3.69880500	-0.20604800
A1	-0.71010400	0.02333000	-0.61960500
C	-0.55106400	4.95033600	-0.79908700
H	0.27173900	5.66419200	-0.95187900
C	-1.26211800	1.31939200	1.89623100
C	-1.26969200	0.04622400	2.51642500
H	-1.32885800	0.04964400	3.61302100
C	-1.36528900	2.79888800	-0.01842000
C	-2.90722400	4.40011500	-1.00788400
H	-3.92105400	4.68414000	-1.32629000
C	-1.84870900	5.30003100	-1.19637500
H	-2.03742400	6.28221900	-1.65867300
C	-2.68916500	3.13746100	-0.41979700
C	-1.46633200	2.53234100	2.77935300
H	-0.67391100	3.28944600	2.61122000
H	-1.47450900	2.25017000	3.84832200
H	-2.42828500	3.03277900	2.54059000

N	-1.25945500	-1.40473600	0.56244000
C	-0.63583900	-3.68267400	-0.22992800
C	-1.03980500	-4.90095500	-0.81709100
H	-0.29257100	-5.68924700	-0.99038200
C	-1.36925600	-1.22391300	1.89787400
C	-1.62642200	-2.68425000	-0.01430300
C	-3.33710400	-4.12900700	-0.96814800
H	-4.38063500	-4.31415200	-1.26253200
C	-2.37381200	-5.12480800	-1.18316600
H	-2.66584900	-6.08314500	-1.64175700
C	-2.98598200	-2.89515900	-0.38368700
C	-1.66667000	-2.41546100	2.78384800
H	-0.94228000	-3.23616900	2.60731100
H	-1.63965400	-2.13402200	3.85275000
H	-2.66959900	-2.83373000	2.55604100
H	-1.57574000	0.03181800	-1.96526300
C	0.80778100	-3.43006300	0.16477500
C	1.79041700	-4.58470300	-0.04200300
H	0.84372200	-3.10786000	1.22934500
H	1.18383200	-2.54012000	-0.38172700
H	2.80393400	-4.26247800	0.26796700
H	1.52003300	-5.48431200	0.55122300
H	1.85447200	-4.89092000	-1.10756400
C	-4.01523000	-1.79915000	-0.15553000
C	-5.45997900	-2.12464600	-0.54709900
H	-3.67785500	-0.89631800	-0.71287600
H	-3.98725900	-1.48908300	0.91339600
H	-6.12116800	-1.25978300	-0.33475200
H	-5.55521500	-2.35429300	-1.62886000
H	-5.85966500	-2.99308300	0.01783900
C	-3.82240600	2.14284500	-0.22209800
C	-5.22336200	2.61200900	-0.62681600
H	-3.83871200	1.81547800	0.84177000
H	-3.56569000	1.22035200	-0.79070600
H	-5.96837600	1.81351600	-0.43297800
H	-5.54331400	3.50929200	-0.05619600
H	-5.28204900	2.86143100	-1.70678800
C	1.12166700	3.30661600	0.22398500
C	2.21414400	4.36504500	0.05836900
H	1.42215900	2.38447100	-0.31741300
H	1.09924300	2.97630300	1.28622500
H	3.17821400	3.95345300	0.41714700
H	2.35247800	4.66167900	-1.00299200
H	2.00248600	5.28791300	0.63972600

O	1.04741800	-0.01596700	-1.05797700
C	1.45796100	-0.21845500	-2.40751700
H	0.61738600	-0.57939800	-3.04140600
H	1.83774500	0.72687300	-2.85657400
H	2.26910800	-0.97816000	-2.43341100
B	2.43761600	-0.18422700	0.41752300
O	3.18483000	-1.29690300	-0.02059400
O	3.24833200	0.96182000	0.46273800
H	1.52841700	-0.28205400	1.22549100
C	4.58902100	-0.94344200	-0.00925100
C	4.56039400	0.65115300	-0.06768600
C	5.18005800	-1.48711000	1.30669000
C	5.28509000	-1.61610000	-1.19831500
C	5.60670500	1.33802800	0.82219800
C	4.66811300	1.21874300	-1.49414000
H	4.99837100	-2.57991600	1.35617800
H	6.27342100	-1.31518300	1.37962500
H	4.69107100	-1.02423200	2.18713800
H	6.35662700	-1.33069900	-1.24732200
H	5.23234400	-2.71858300	-1.08827900
H	4.80889900	-1.34978900	-2.16107300
H	6.63730900	1.05735400	0.52023100
H	5.51475800	2.43926300	0.72477000
H	5.46786300	1.08227200	1.88951400
H	5.68886000	1.09405900	-1.91041800
H	3.95009900	0.73861700	-2.18421700
H	4.43901500	2.30344800	-1.46751500
TS-13			
N	-1.81589500	-1.29812700	0.65547600
C	-3.66862300	0.33577200	0.78484100
Al	-0.20885700	-0.51137000	-0.25699600
C	-4.87595200	0.83279900	0.25167700
H	-5.35045000	1.71378100	0.70909500
C	-1.79970600	-2.20284100	1.64362800
C	-0.59629400	-2.74957300	2.15730000
H	-0.70765800	-3.47354200	2.97536600
C	-3.07945700	-0.80465100	0.16704000
C	-4.89640500	-0.90577000	-1.44603800
H	-5.38615900	-1.37825200	-2.31050200
C	-5.48326100	0.22247700	-0.85532100
H	-6.42394200	0.62900800	-1.26024700
C	-3.69066500	-1.44309700	-0.94984600
C	-3.10469800	-2.70173800	2.23482600
H	-3.71656300	-1.86439500	2.62818100

H	-2.92392600	-3.42493500	3.05171500
H	-3.72401100	-3.19480600	1.45669600
N	1.06249300	-1.66620000	0.71545700
C	3.36334800	-0.76661200	0.92874300
C	4.70365100	-0.77760900	0.49077200
H	5.43217200	-0.09732300	0.95652100
C	0.72187400	-2.52972200	1.70561300
C	2.44828500	-1.65681700	0.30238200
C	4.20914300	-2.50972600	-1.14272000
H	4.55200500	-3.18054900	-1.94473000
C	5.12509100	-1.63973800	-0.53298300
H	6.17750100	-1.63242000	-0.85951600
C	2.85649900	-2.53486900	-0.74036300
C	1.81085200	-3.35213500	2.37132500
H	2.60936900	-2.70650500	2.78989100
H	1.39346800	-3.97500300	3.18393500
H	2.31070800	-4.01860900	1.63805900
H	-0.48993900	-0.92635600	-1.78744900
C	2.88106700	0.16360400	2.03005900
C	3.93754400	1.07323400	2.66384900
H	2.39074700	-0.44165500	2.82566000
H	2.06810600	0.79934300	1.61617100
H	3.47859800	1.69750000	3.45751800
H	4.76596500	0.49892000	3.13077800
H	4.37985800	1.76599500	1.91826300
C	1.83937300	-3.46765800	-1.38414000
C	2.35170300	-4.35587200	-2.52228600
H	0.98534700	-2.85247300	-1.74855900
H	1.39068700	-4.11132500	-0.59345300
H	1.52916400	-4.98459800	-2.92028000
H	2.74853700	-3.75781800	-3.36958300
H	3.15962900	-5.04086700	-2.18858100
C	-3.04475800	-2.67537000	-1.56435000
C	-3.74954200	-3.28074500	-2.78201400
H	-2.94003700	-3.45619600	-0.77652600
H	-1.99871600	-2.40545600	-1.83241600
H	-3.18974000	-4.16470300	-3.15069000
H	-4.78170800	-3.61808200	-2.54814100
H	-3.81450900	-2.55805400	-3.62241100
C	-2.99989600	0.97467500	1.99322500
C	-3.68469000	2.21458300	2.57626900
H	-1.95105700	1.21763800	1.71083000
H	-2.89584000	0.20976700	2.79593600
H	-3.10952400	2.60100900	3.44245300

H	-3.75624800	3.03713200	1.83385900
H	-4.71359000	1.99704100	2.93350400
O	1.45732500	0.72789700	-1.11718800
C	1.96081600	0.53839000	-2.44948200
H	2.70829100	1.32101400	-2.69574400
H	2.45838300	-0.44979100	-2.47596500
H	1.13801700	0.56188600	-3.19349800
B	0.93111900	1.99998300	-0.77817900
O	1.48631500	2.76183800	0.24423900
O	0.19842500	2.75182000	-1.68322700
H	-0.40053000	1.04037300	0.25363300
C	0.83483600	4.06336000	0.20852600
C	0.32567500	4.15108400	-1.30379200
C	-0.31171200	4.04435700	1.23283200
C	1.86588300	5.12698000	0.59934000
C	-1.03297400	4.83416100	-1.48582300
C	1.36132400	4.77633800	-2.25481200
H	0.10069300	3.78084500	2.22769000
H	-0.80747000	5.03286300	1.31341900
H	-1.07236400	3.28390600	0.97054000
H	1.43822300	6.14688300	0.50760800
H	2.17090400	4.97980000	1.65529800
H	2.77622500	5.06692300	-0.02658300
H	-0.99720200	5.88964500	-1.14482600
H	-1.31037300	4.83120500	-2.55951800
H	-1.83207000	4.30777200	-0.93114300
H	1.46911500	5.86796500	-2.09185600
H	2.35754200	4.30465800	-2.13474400
H	1.03123800	4.61295200	-3.30059100
TS-14			
N	1.40868700	-0.86031000	0.74637500
C	3.39255900	-1.36213000	-0.63582400
A1	-0.01298900	-0.00286500	-0.14942900
C	4.68757800	-1.00567400	-1.06239400
H	5.21690400	-1.64134700	-1.78730500
C	1.21199100	-1.62806700	1.84601800
C	-0.07198100	-1.93485700	2.35654000
H	-0.08874000	-2.55236300	3.26430600
C	2.74647000	-0.51690900	0.30779100
C	4.63556000	0.99963400	0.31481100
H	5.12683600	1.92037700	0.66216300
C	5.30707600	0.15813300	-0.58329500
H	6.32059800	0.42037400	-0.92636600
C	3.33690100	0.69218800	0.77376200

C	2.42031900	-2.16200800	2.58114600
H	3.06634300	-2.75900600	1.90512500
H	2.12200400	-2.78990900	3.44051200
H	3.05227600	-1.32695000	2.94925200
N	-1.48270400	-0.77480800	0.75259400
C	-3.46523000	-1.33747500	-0.60004100
C	-4.73455700	-0.98082200	-1.09497700
H	-5.28014700	-1.67536000	-1.75048100
C	-1.33932400	-1.53250300	1.86120500
C	-2.79517200	-0.41314300	0.25204500
C	-4.61035500	1.17334700	0.02797100
H	-5.06173500	2.15150800	0.25059600
C	-5.30711300	0.25985700	-0.77272500
H	-6.30258000	0.52248900	-1.16526100
C	-3.33146500	0.87288600	0.55154700
C	-2.57337200	-1.94750800	2.62872200
H	-3.13272100	-1.04879400	2.96329400
H	-3.27335500	-2.52197500	1.98839100
H	-2.31142100	-2.55778600	3.51234200
H	0.00947300	1.65249200	-0.28177600
C	-2.78545400	-2.64296200	-0.99218100
C	-3.57836100	-3.57397100	-1.91514100
H	-2.49554200	-3.20404500	-0.07547600
H	-1.81762500	-2.38376300	-1.47937400
H	-2.98926000	-4.48648100	-2.13973400
H	-4.53461300	-3.90099700	-1.45530800
H	-3.81848600	-3.08951200	-2.88426200
C	-2.54443900	1.90433000	1.34076700
C	-3.37012200	2.98245800	2.05560000
H	-1.83363900	2.43529400	0.64067000
H	-1.89920900	1.38466200	2.08185800
H	-2.69770500	3.63722600	2.64566100
H	-3.89841500	3.64440100	1.33857000
H	-4.12853200	2.55357800	2.74624300
C	2.57109400	1.63220100	1.69598600
C	3.39049900	2.74078200	2.36654900
H	2.05381200	1.03460600	2.47862500
H	1.74675300	2.10951100	1.10930400
H	2.74345200	3.33300100	3.04450100
H	4.23224200	2.33558600	2.96774500
H	3.81285300	3.45106800	1.62606300
C	2.66589900	-2.58272500	-1.18376500
C	3.45286300	-3.46290300	-2.15990200
H	1.73707200	-2.22411600	-1.68432100

H	2.30503200	-3.20794900	-0.33638800
H	2.83155600	-4.31920900	-2.49249700
H	3.75552400	-2.90351500	-3.06929200
H	4.37245500	-3.87889900	-1.69705600
O	-0.13027300	-0.04717300	-1.97372500
C	-0.17453700	1.28870200	-1.96973700
O	0.84513600	1.91615200	-2.50752400
O	-0.38943500	3.48333000	-0.40124200
C	0.89137000	3.39865000	-2.45115900
C	-0.25051100	4.02704900	-1.62046300
H	1.87236700	3.59546700	-1.97155800
H	0.92341600	3.74247600	-3.50996400
H	0.01333800	5.14080200	-1.66404500
H	-1.18422700	3.97824700	-2.28808200
H	-1.15191400	1.81404600	-1.96007400
TS-15			
H	1.75756600	-0.10546800	1.57756400
B	2.49936600	-0.04484100	0.60406700
O	3.15678700	1.18166800	0.37570100
O	3.34836800	-1.11994800	0.24124900
C	4.38920600	0.94712700	-0.34601300
C	4.66672900	-0.59707500	-0.05263000
C	4.16270800	1.27674400	-1.83381800
C	5.45850100	1.89575700	0.21599600
C	5.26318900	-1.37132900	-1.23454100
C	5.53051100	-0.83024800	1.20260500
H	3.83425900	2.33333100	-1.91354600
H	5.09460700	1.16621300	-2.42600800
H	3.37034500	0.65931400	-2.29751800
H	6.44962400	1.70088200	-0.24450400
H	5.18069400	2.94514800	-0.01169200
H	5.55399800	1.80278700	1.31430600
H	6.26802000	-0.98067000	-1.49883100
H	5.37520900	-2.44134700	-0.96365300
H	4.62297000	-1.31220700	-2.13569200
H	6.58507400	-0.52044200	1.05311700
H	5.12229500	-0.28333300	2.07600500
H	5.51821500	-1.91203800	1.44648800
O	1.03304900	-0.25874600	-0.63217000
Al	-0.69866000	0.00324300	-0.16714300
C	1.27874100	-0.99014100	-1.83925100
N	-1.21957700	1.44511200	0.98133300
N	-1.29971000	-1.45777000	0.91791500
O	-1.57095600	0.11204000	-1.68423700

O	1.17505600	-0.21548600	-3.00525200
H	2.32333400	-1.34994400	-1.76614300
H	0.58718100	-1.86618300	-1.89938300
C	-1.60439600	1.24352700	2.26525100
C	-1.40883300	2.76525900	0.40087100
C	-1.66531500	-1.30143800	2.20955500
C	-1.29733000	-2.78121500	0.32291200
C	-1.16001800	0.66022900	-2.91664100
C	-0.10670700	-0.18643500	-3.63435100
C	-1.73503800	-0.03888100	2.84669800
C	-1.97158500	2.43826100	3.11934100
C	-0.34439100	3.70806400	0.41120000
C	-2.67766700	3.07424200	-0.17109300
C	-2.04853100	-2.52015100	3.01959800
C	-0.16999900	-3.63523000	0.48218300
C	-2.42695100	-3.17248600	-0.45701200
H	-0.76409100	1.69845800	-2.79600800
H	-2.04352800	0.73340900	-3.59671100
H	0.06539200	0.22860600	-4.65104700
H	-0.49613700	-1.22826400	-3.74903700
H	-2.02045700	-0.05541800	3.90683600
H	-1.16907800	3.20296100	3.10527200
H	-2.16390200	2.13426300	4.16478400
H	-2.88140600	2.93795800	2.72558500
C	-0.57309100	4.96858200	-0.18253900
C	0.98707900	3.36104600	1.04919400
C	-2.85116100	4.34717000	-0.75204500
C	-3.79811300	2.04488000	-0.15767000
H	-1.18906800	-3.21314500	3.12597700
H	-2.40031900	-2.23510300	4.02797200
H	-2.84739600	-3.09611900	2.50827400
C	-0.18903100	-4.88171800	-0.18401800
C	1.03519600	-3.25217800	1.32675600
C	-2.39535800	-4.43067300	-1.08938700
C	-3.61845800	-2.23759500	-0.59487300
H	0.23334500	5.71652500	-0.18575300
C	-1.80860200	5.28514700	-0.76237100
C	1.97591300	4.51448000	1.24277200
H	1.49313800	2.57166000	0.45138200
H	0.80309700	2.86987800	2.02997000
H	-3.81906700	4.61034700	-1.20355200
C	-5.14842500	2.49750100	-0.72250900
H	-3.94475600	1.67908700	0.88360400
H	-3.43418600	1.15842200	-0.72393500

H	0.67915700	-5.55265300	-0.08612700
C	-1.28214000	-5.27677700	-0.96332700
C	1.50055900	-4.33420800	2.31749800
H	0.82630800	-2.31508400	1.87704000
H	1.88502600	-2.98835000	0.65953000
H	-3.25481300	-4.75535900	-1.69429700
C	-4.84631800	-2.80032600	-1.31794600
H	-3.26140100	-1.32351600	-1.12227000
H	-3.91732000	-1.88626000	0.41813400
H	-1.96362800	6.27456000	-1.22193600
H	2.89449600	4.13700500	1.73457800
H	2.28789100	4.96316900	0.27617900
H	1.55991200	5.32974800	1.87303500
H	-5.88926300	1.67496500	-0.65146500
H	-5.56533800	3.36733000	-0.17177500
H	-5.07708600	2.78159100	-1.79331000
H	-1.27181900	-6.25271900	-1.47464500
H	2.36177000	-3.96444100	2.91091800
H	0.69711100	-4.62155200	3.02971900
H	1.83116000	-5.26253100	1.80704700
H	-5.65937300	-2.04607300	-1.33730400
H	-4.62323100	-3.06508900	-2.37280300
H	-5.24745700	-3.70934800	-0.82126300
TS-16			
H	0.34793900	1.10074700	-0.50831300
B	-1.11649800	1.97521600	0.51772900
O	-0.38779300	2.77616300	1.37666400
O	-1.78875700	2.68901100	-0.46361500
C	-0.65984200	4.16389800	1.02979900
C	-1.26290600	4.04908400	-0.44543600
C	-1.67435300	4.68504700	2.06245800
C	0.64565500	4.95837100	1.12884700
C	-2.41390800	5.01479500	-0.74314000
C	-0.19725100	4.14631100	-1.54885700
H	-1.25934700	4.53151900	3.07859800
H	-1.88448900	5.76571000	1.92896800
H	-2.63258800	4.13069600	2.00511400
H	0.49703900	6.01030600	0.80813300
H	0.99579300	4.96846700	2.18091000
H	1.44580100	4.50795000	0.51210800
H	-2.07668800	6.06897000	-0.66355000
H	-2.77986700	4.85190000	-1.77718400
H	-3.26667300	4.86399500	-0.05459700
H	0.20828800	5.17417900	-1.63902700

H	0.64111500	3.44746200	-1.36204400
H	-0.65803700	3.86957900	-2.51859600
O	-1.48024500	0.63381300	0.81638500
Al	0.26860800	-0.46354000	-0.03332100
C	-2.32024200	0.36332900	1.96951800
N	1.97290400	-1.06330100	-0.89859900
N	-0.84967300	-1.71914200	-1.03913100
O	0.55680400	-1.02354400	1.62480400
O	-1.70247000	0.59397100	3.18612000
H	-3.20045000	1.03756300	1.92165600
H	-2.63774600	-0.69570800	1.84555500
C	2.06752900	-1.92921500	-1.91761300
C	3.18402700	-0.47520000	-0.37367000
C	-0.40251800	-2.51276600	-2.04810000
C	-2.23707000	-1.87386900	-0.65976300
C	0.58683900	-0.38262600	2.87213600
C	-0.75323000	-0.38852300	3.61866800
C	0.93722400	-2.57673100	-2.47841300
C	3.42558800	-2.26608500	-2.50372300
C	3.65571900	0.75102100	-0.92426200
C	3.87208600	-1.12394400	0.69228100
C	-1.38769200	-3.42003600	-2.76268300
C	-3.22410900	-1.04870400	-1.26592300
C	-2.57616600	-2.84835200	0.32125600
H	0.93469400	0.67671300	2.80244800
H	1.31714300	-0.91311700	3.53458000
H	-0.57137400	-0.15416900	4.68935800
H	-1.20543700	-1.40911000	3.55801800
H	1.13887600	-3.25437000	-3.31854300
H	3.33048600	-2.96204100	-3.35785700
H	4.08015000	-2.73328400	-1.73882400
H	3.95512200	-1.35281300	-2.84376800
C	4.81063700	1.33429600	-0.36216700
C	2.93392900	1.38355200	-2.10539000
C	5.02287100	-0.49938100	1.21689900
C	3.36636600	-2.45454000	1.22662400
H	-2.24666200	-2.84808200	-3.16860900
H	-0.89460900	-3.95965800	-3.59224200
H	-1.82033700	-4.16762100	-2.06588600
C	-4.56545800	-1.21286900	-0.86155000
C	-2.81583900	-0.02888900	-2.31671800
C	-3.93338200	-2.97829000	0.68751600
C	-1.48485500	-3.70574400	0.94588900
H	5.19160600	2.28401900	-0.76625600

C	5.48519900	0.72054600	0.70266700
C	3.49330500	2.71532700	-2.61489300
H	1.86405300	1.50357400	-1.82435000
H	2.91494900	0.65481900	-2.94763400
H	5.56918600	-0.97730500	2.04374100
C	4.16350400	-3.07596000	2.37769400
H	3.31805600	-3.18325800	0.38520200
H	2.30552400	-2.30081200	1.52744300
H	-5.34881800	-0.58440200	-1.31083100
C	-4.91878700	-2.16756200	0.10442400
C	-3.94175200	0.81498900	-2.92082900
H	-2.26975200	-0.55392000	-3.13294000
H	-2.06305800	0.65351700	-1.86616700
H	-4.22426800	-3.72395800	1.44249800
C	-1.93179200	-4.69792500	2.02412300
H	-0.70931900	-3.02159200	1.35963500
H	-0.95714400	-4.26154800	0.13746400
H	6.38342700	1.19371300	1.13108500
H	2.88869200	3.08615400	-3.46778100
H	3.47436400	3.50070800	-1.83010600
H	4.54193200	2.62330200	-2.96911700
H	3.70217200	-4.03541000	2.69005600
H	5.21675900	-3.29264600	2.09779200
H	4.18471700	-2.41655100	3.27103300
H	-5.97281300	-2.28120100	0.40503200
H	-3.53144400	1.51404800	-3.67784800
H	-4.71226200	0.19430700	-3.42586100
H	-4.44940500	1.43040100	-2.14955900
H	-1.05908200	-5.26169700	2.41262000
H	-2.40390700	-4.18617100	2.88957900
H	-2.66058500	-5.44229400	1.63862500
TS-17			
B	4.68149000	-1.20644400	-0.95236600
O	4.60808900	-1.96889300	0.17584600
O	5.87612800	-0.59750800	-1.20272000
C	5.81405400	-1.63125900	0.95170200
C	6.80635700	-1.08543600	-0.17410700
C	5.38788100	-0.54926300	1.95392700
C	6.29282400	-2.89063100	1.67337200
C	7.68954400	0.08343500	0.26295800
C	7.64828800	-2.18785500	-0.83337700
H	4.57603500	-0.95165600	2.59223900
H	6.22747700	-0.24854000	2.61219700
H	4.99450800	0.34532800	1.42922400

H	7.23849100	-2.69266100	2.21865300
H	5.53239500	-3.20616900	2.41553800
H	6.45697100	-3.73291400	0.97492300
H	8.34954800	-0.21452300	1.10343800
H	8.33441200	0.40096000	-0.58119900
H	7.08265400	0.95381700	0.57430200
H	8.43434400	-2.56513400	-0.14889800
H	7.02155100	-3.04500200	-1.15286200
H	8.14441000	-1.77304200	-1.73373000
O	3.57736800	-1.10509900	-1.82193400
A1	-2.80672500	-0.47742800	-0.35948400
C	3.54079500	-0.15776200	-2.74235900
N	-2.83923900	-2.15951800	0.60164100
N	-4.31470700	0.31523300	0.56449400
O	-1.33104300	0.41450700	0.00890000
O	1.83330900	0.91952900	-1.79330000
C	-3.69620100	-2.45841600	1.60087200
C	-1.85120900	-3.13067200	0.18785600
C	-4.99575300	-0.27066100	1.57096100
C	-4.68716000	1.64056000	0.12132700
C	-0.43670400	1.03668900	-0.89074200
C	0.95816000	0.38313000	-0.81581300
C	-4.69873100	-1.56811400	2.05343900
C	-3.60042900	-3.81268200	2.27325500
C	-2.16616000	-4.02091200	-0.87707900
C	-0.57262300	-3.13178200	0.81414500
C	-6.14239000	0.47737300	2.21970300
C	-5.61117100	1.77105700	-0.95318700
C	-4.07930100	2.77441400	0.73096600
H	-0.33166000	2.11997600	-0.64853600
H	-0.78838000	0.97842600	-1.94998500
H	0.84740400	-0.70668900	-1.02451100
H	1.38208200	0.49053800	0.20816700
H	-5.32940100	-1.93161300	2.87564200
H	-3.73678600	-4.63072300	1.53580600
H	-4.36205100	-3.91991400	3.06753900
H	-2.59586400	-3.96605800	2.71868200
C	-1.17252300	-4.92883500	-1.29796600
C	-3.54096100	-3.96845100	-1.52816800
C	0.38688700	-4.05765300	0.35338700
C	-0.27232500	-2.14498300	1.93196800
H	-6.91752000	0.74065600	1.47046700
H	-6.61105200	-0.12445400	3.02008000
H	-5.79581000	1.43855500	2.65237300

C	-5.93035600	3.07024400	-1.39906400
C	-6.21683900	0.52713000	-1.58772000
C	-4.43387100	4.05135800	0.24806400
C	-3.07099300	2.58529900	1.85414500
H	-1.38790400	-5.62916500	-2.11859200
C	0.09086500	-4.94803200	-0.68924000
C	-3.79416300	-4.95924100	-2.66862800
H	-3.70466300	-2.93064800	-1.89725300
H	-4.31824800	-4.10851500	-0.74272000
H	1.38661900	-4.07583300	0.81166400
C	1.12619900	-2.22688700	2.55138700
H	-1.03487100	-2.26600800	2.73491500
H	-0.44905200	-1.12024300	1.53181300
H	-6.64096800	3.20187100	-2.22843800
C	-5.34993000	4.19956800	-0.80354500
C	-7.19825100	0.75842900	-2.74086000
H	-6.71807300	-0.07487600	-0.79581900
H	-5.38054600	-0.11906900	-1.93856900
H	-3.98011900	4.94654500	0.69848400
C	-2.46682500	3.86142000	2.44783500
H	-2.26017800	1.92513500	1.46851100
H	-3.54633900	1.99446900	2.67034100
H	0.85617400	-5.66111300	-1.03560300
H	-4.82028300	-4.83038000	-3.06962300
H	-3.08930400	-4.80672700	-3.51259500
H	-3.69848300	-6.01462700	-2.33635900
H	1.23404300	-1.46441600	3.34993900
H	1.32469900	-3.21869700	3.01144200
H	1.92343500	-2.03702300	1.80268600
H	-5.60935700	5.20657800	-1.16768900
H	-7.57222800	-0.21127100	-3.12840400
H	-8.08222500	1.35252500	-2.42625400
H	-6.72004600	1.29020900	-3.58986300
H	-1.74691600	3.60605400	3.25198500
H	-1.91239000	4.44892200	1.68635400
H	-3.23683500	4.52792500	2.89186900
H	-3.05639200	-0.65154500	-1.93543000
B	2.75948600	2.05322700	-1.47771500
O	2.09279600	3.33166000	-1.44639500
O	3.51075700	1.93011600	-0.22595900
H	3.56078100	1.91542500	-2.48676900
C	2.80349800	4.17660400	-0.53363600
C	3.35533700	3.13756600	0.54227200
C	3.93463500	4.88472700	-1.31320800

C	1.83647800	5.22973400	0.02395800
C	4.70953900	3.52936300	1.15420600
C	2.34562100	2.86924900	1.67707400
H	3.48833500	5.40649600	-2.18406600
H	4.46949900	5.63432000	-0.69396300
H	4.67149100	4.15312700	-1.70090100
H	2.32648500	5.85969200	0.79602000
H	1.49902100	5.89545500	-0.79684100
H	0.93674100	4.76155000	0.46682400
H	4.65236700	4.51339000	1.66605800
H	5.01601100	2.77794100	1.91192700
H	5.50296700	3.57960500	0.38400000
H	2.25063700	3.73320000	2.36774100
H	1.34084900	2.63130000	1.27507400
H	2.69065100	1.99534100	2.26724000
H	2.75448900	-0.24769800	-3.50190100
H	4.49474000	0.33281800	-2.98203300
TS-18			
N	-1.40914500	1.86129600	-0.75046500
C	-0.27169300	3.61613100	0.56326200
Al	-1.52135700	0.19394700	0.22614600
C	0.88316500	4.38986700	0.80298300
H	0.88468600	5.12670300	1.61957100
C	-2.34923100	2.30195400	-1.61483300
C	-3.54883100	1.60039000	-1.88332700
H	-4.22953700	2.07306100	-2.60372500
C	-0.23727100	2.67331700	-0.50384200
C	2.05690900	3.28036300	-1.01789800
H	2.97264900	3.14997500	-1.61257800
C	2.03468000	4.22840600	0.01715100
H	2.92788400	4.84089900	0.21956300
C	0.92729800	2.48216100	-1.30049400
C	-2.13092200	3.61809200	-2.33246200
H	-2.01551000	4.45109800	-1.60842700
H	-2.97488500	3.84970200	-3.00793200
H	-1.19407300	3.59574100	-2.92646800
N	-3.26268100	-0.33184000	-0.43776100
C	-4.48319800	-1.60933200	1.29076700
C	-4.91648600	-2.85591800	1.78813400
H	-5.47605600	-2.89907600	2.73422500
C	-3.98645300	0.37232400	-1.33256500
C	-3.76205700	-1.59260400	0.06372800
C	-3.92577500	-4.00933700	-0.11005300
H	-3.71473300	-4.95037800	-0.63940100

C	-4.64194700	-4.04405400	1.09554700
H	-4.98696000	-5.00842000	1.50161900
C	-3.46894900	-2.78935400	-0.65093100
C	-5.33781000	-0.15552900	-1.76836400
H	-6.00691200	-0.29508400	-0.89406800
H	-5.82506600	0.53330000	-2.48277000
H	-5.24341900	-1.15315500	-2.24464200
C	-4.76437800	-0.30539600	2.02364700
C	-5.55393300	-0.41399600	3.33167600
H	-5.29424200	0.38825200	1.33171800
H	-3.78871600	0.19345100	2.22150500
H	-5.69797200	0.59100100	3.77813000
H	-6.56115300	-0.85590000	3.17835700
H	-5.02416600	-1.03497800	4.08399100
C	-2.68052200	-2.72688200	-1.95132100
C	-2.34921300	-4.06874100	-2.61204400
H	-1.74313900	-2.16060900	-1.75173700
H	-3.23676700	-2.09388800	-2.68031600
H	-1.76087100	-3.90514000	-3.53796600
H	-1.74261900	-4.71895900	-1.94716700
H	-3.26024300	-4.63690700	-2.89645500
C	0.93576700	1.43937900	-2.40688600
C	2.26688800	1.24089000	-3.13882800
H	0.13850700	1.69279000	-3.14376200
H	0.60893200	0.47549000	-1.95629400
H	2.15814600	0.45728400	-3.91677900
H	2.61083600	2.16445500	-3.65186000
H	3.06585300	0.91117400	-2.44196600
C	-1.52930300	3.76229400	1.40772000
C	-1.46543400	4.77288400	2.55695800
H	-1.78493500	2.75761500	1.81358900
H	-2.38421800	4.01776700	0.74074300
H	-2.42760300	4.78840100	3.10838200
H	-0.67065800	4.51556900	3.28777000
H	-1.27380700	5.80605400	2.19771700
O	2.02694600	0.82200800	3.01420000
C	2.38711000	0.96241300	1.88246500
O	2.29844700	-0.29967900	0.86526900
O	-0.30067900	-0.91579300	-0.38308600
C	1.46721400	-1.42530800	1.26833100
C	0.58330700	-1.88021500	0.10922600
H	2.13930900	-2.24417900	1.59871500
H	0.87055400	-1.07975100	2.13796900
H	1.24274500	-2.22552900	-0.72276500

H	0.04410000	-2.79122900	0.47737500
H	-1.49871000	0.40221800	1.81491600
B	3.86320800	-0.36998800	0.85473800
O	4.35048900	-1.54116500	1.48796500
O	4.47468900	-0.19001600	-0.41610700
H	3.97045300	0.72852700	1.59540000
C	5.60033800	-1.86677400	0.83458300
C	5.36108800	-1.31550700	-0.64092100
C	6.73384900	-1.12678000	1.57122400
C	5.81907100	-3.38014900	0.93070000
C	6.62430700	-0.81309200	-1.34890200
C	4.62435600	-2.32641700	-1.53973300
H	6.69633300	-1.39765900	2.64576800
H	7.73462000	-1.39923700	1.17819900
H	6.61514600	-0.02712300	1.49465300
H	6.72517300	-3.68826200	0.36862400
H	5.96079600	-3.67085800	1.99169800
H	4.95148100	-3.94458000	0.53900900
H	7.37051700	-1.62721000	-1.46296900
H	6.36546900	-0.44528100	-2.36297800
H	7.09366100	0.02337000	-0.79714200
H	5.27405600	-3.17698000	-1.83254800
H	3.72445400	-2.73141000	-1.03441100
H	4.29222000	-1.81125800	-2.46357600
H	2.33200500	1.84585300	1.21133900

References

- [S1] W. Liu, Y. Ding, D. Jin, Q. Shen, B. Yan, X. Ma and Z. Yang, *Green Chem.*, 2019, **21**, 3812–3815.
- [S2] M. J. Frisch, G. W. Trucks, H. B. Schlegel, G. E. Scuseria, M. A. Robb, J. R. Cheeseman, G. Scalmani, V. Barone, B. Mennucci, G. A. Petersson, G. H. Nakatsuji, M. Caricato, X. Li, H. P. Hratchian, A. F. Izmaylov, J. Bloino, G. Zheng, J. L. Sonnenberg, M. Hada, M. Ehara, K. Toyota, R. Fukuda, J. Hasegawa, M. Ishida, T. Nakajima, Y. Honda, O. Kitao, H. Nakai, T. Vreven, J. A. Montgomery, Jr., J. E. Peralta, F. Ogliaro, M. Bearpark, J. J. Heyd, E. Brothers, K. N. Kudin, V. N. Staroverov, R. Kobayashi, J. Normand, K. Raghavachari, A. Rendell, J. C. Burant, S. S. Iyengar, J. Tomasi, M. Cossi, N. Rega, J. M. Millam, M. Klene, J. E. Knox, J. B. Cross, V. Bakken, C. Adamo, J. Jaramillo, R. Gomperts, R. E. Stratmann, O. Yazyev, A. J. Austin, R. Cammi, C. Pomelli, J. W. Ochterski, R. L. Martin, K. Morokuma, V. G. Zakrzewski, G. A. Voth, P. Salvador, J. J. Dannenberg, S. Dapprich, A. D. Daniels, O. Farkas, J. B.

- Foresman, J. V. Ortiz, J. Cioslowski and D. J. Fox, *Gaussian 09, Revision D.01*; Gaussian, Inc., Wallingford, CT, 2013.
- [S3] A. D. Becke, *Phys. Rev. A: At., Mol., Opt. Phys.*, 1988, **38**, 3098–3100.
- [S4] J. P. Perdew, *Phys. Rev. B: Condens. Matter Mater. Phys.*, 1986, **33**, 8822–8824.
- [S5] F. Weigend and R. Ahlrichs, *Phys. Chem. Chem. Phys.*, 2005, **7**, 3297–3305.
- [S6] F. Weigend, *Phys. Chem. Chem. Phys.*, 2006, **8**, 1057–1065.
- [S7] T. A. Halgren and W. N. Lipscomb, *Chem. Phys. Lett.*, 1977, **49**, 225–232.
- [S8] H. P. Hratchian and H. B. Schlegel, *J. Chem. Phys.*, 2004, **120**, 9918–9924.
- [S9] K. Fukui, *Acc. Chem. Res.*, 1981, **14**, 363–368.
- [S10] S. Grimme, J. Antony, S. Ehrlich and H. Krieg, *J. Chem. Phys.*, 2010, **132**, 154104–154122.
- [S11] K. Kitaura and K. Morokuma, *Int. J. Quantum Chem.*, 1976, **10**, 325–340.
- [S12] F. M. Bickelhaupt and K. N. Houk, *Angew. Chem. Int. Ed.*, 2017, **56**, 10070–10086.
- [S13] C. Y. Legault, *CYLview, 1.0b*; Université de Sherbrooke, 2009, <http://www.cylview.org>.