Supplementary Data

An efficient enantiospecific synthesis of neuroactive glutamate analogs

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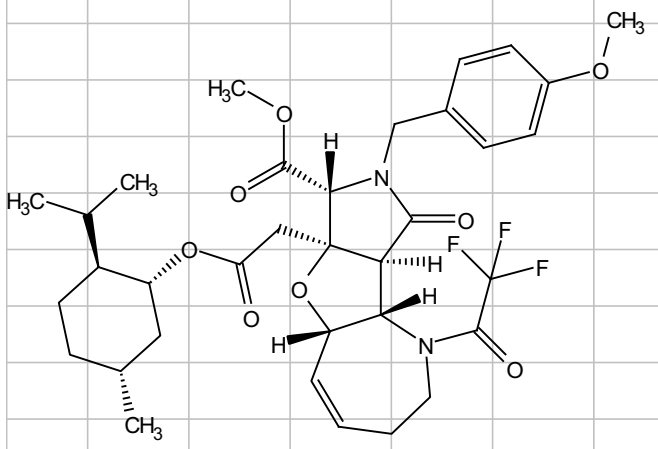
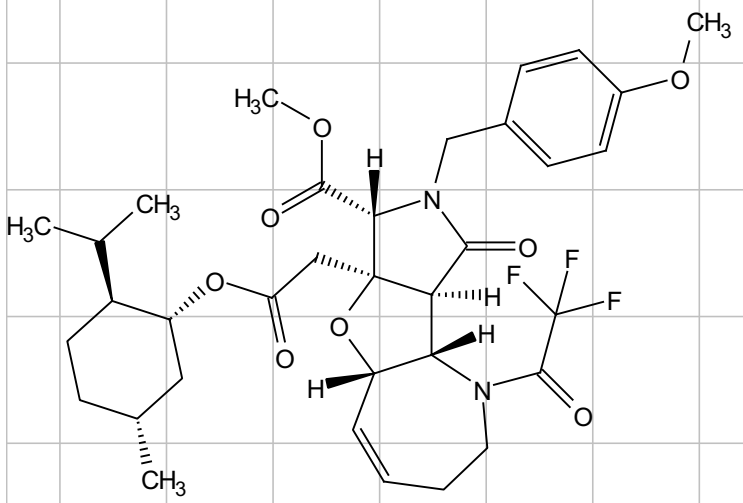
Contents:

ST-I-98-2.40.fid
1H ST-I-98-2
^{1}H NMR (400 MHz, $CDCl_3$)



5n (2*R*)

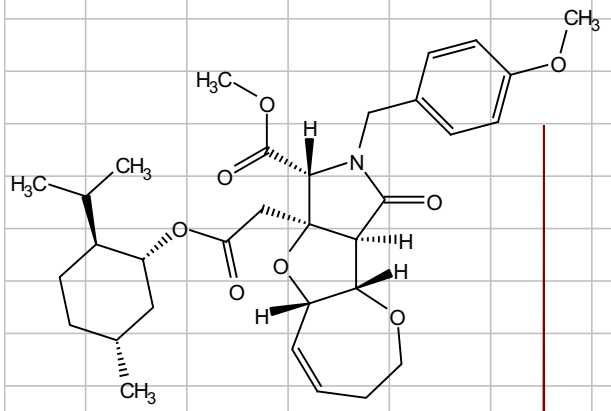
ST-I-98-2.41.fid
1H ST-I-98-2
^{13}C NMR (100 MHz, $CDCl_3$)



5n (2*R*)

f1 (ppm)

HI-I-127-1.1.fid
1H HI-I-127-1
^{1}H NMR (400 MHz, $CDCl_3$)

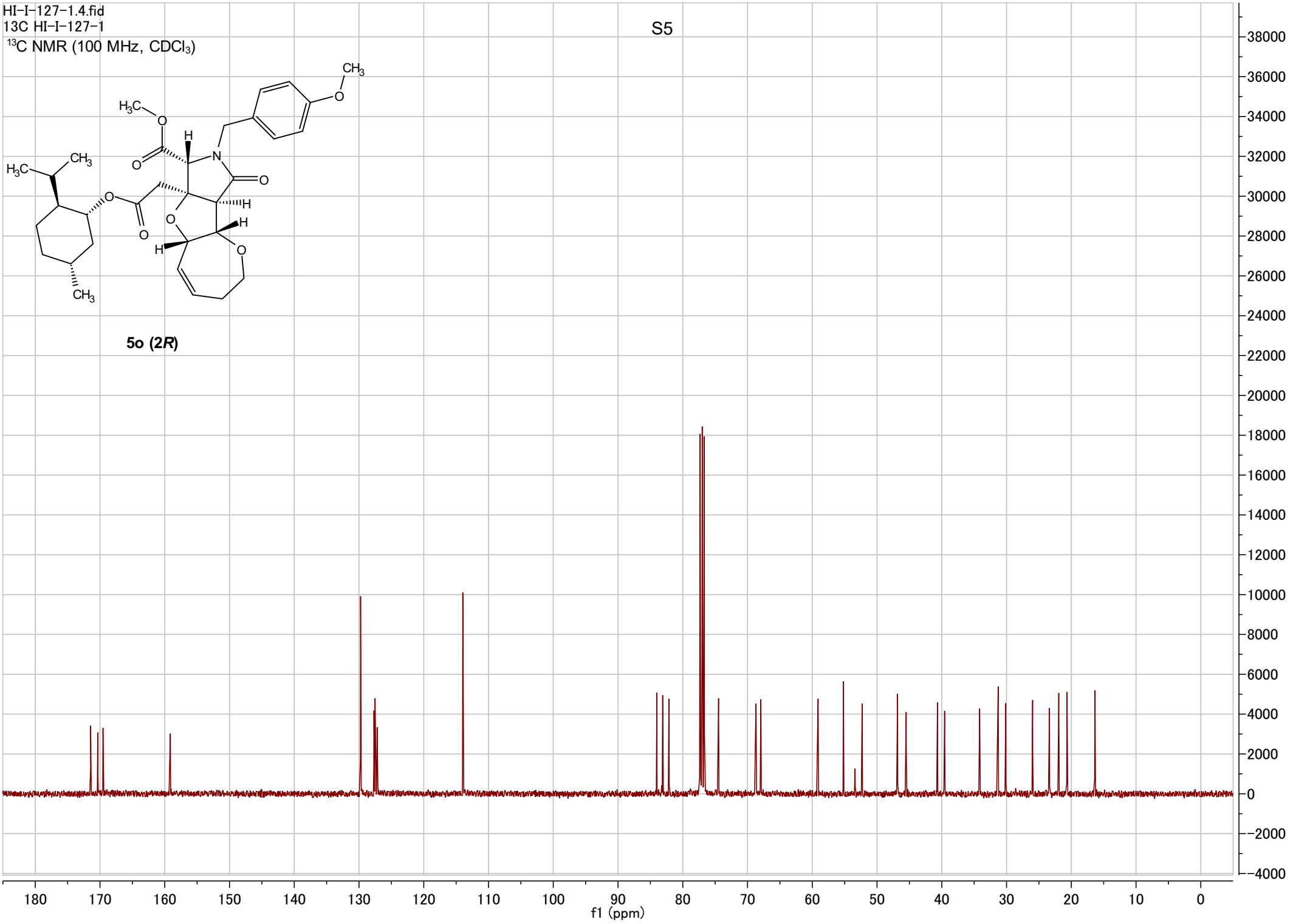


5o (2*R*)

f1 (ppm)

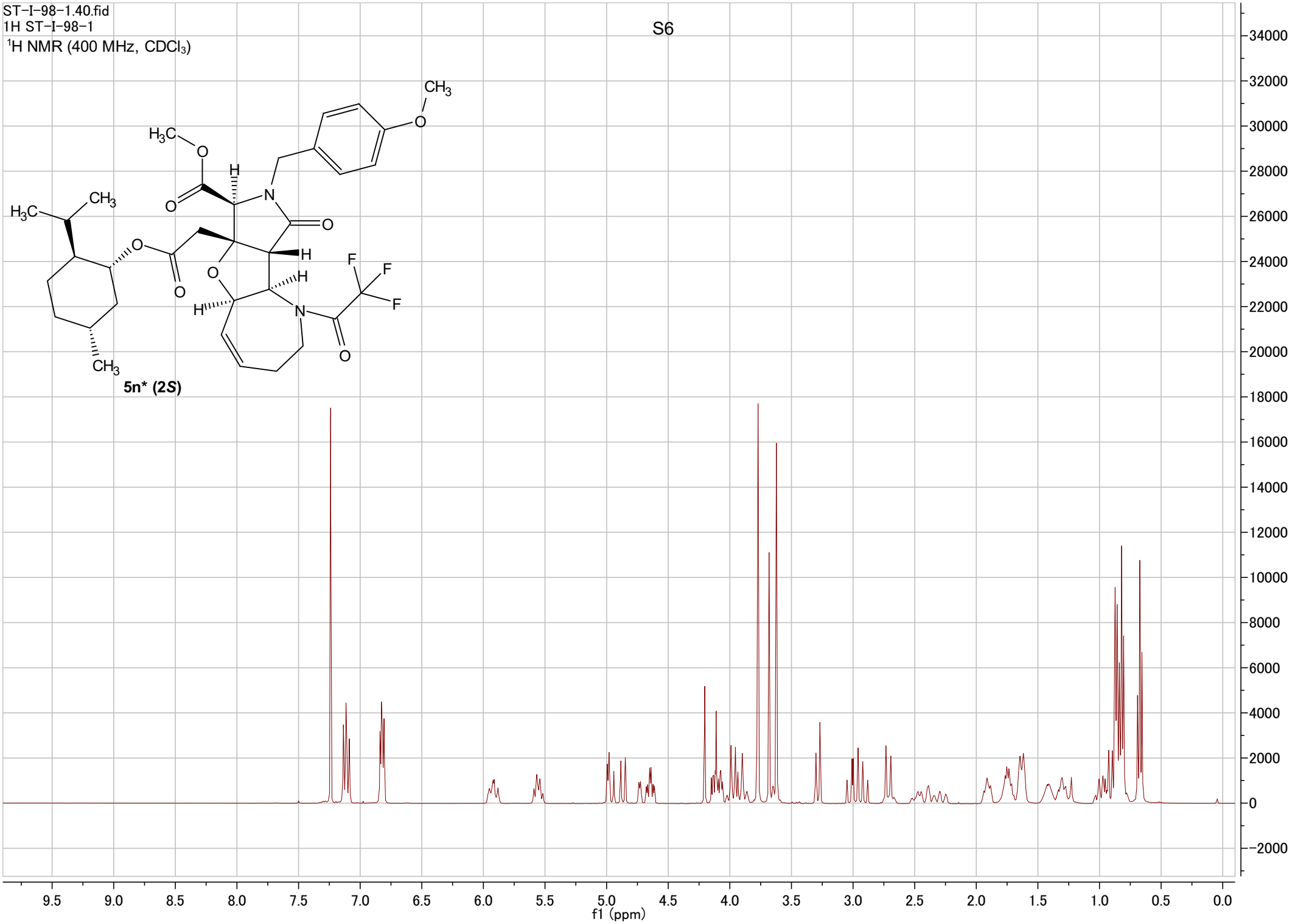
HI-I-127-1.4.fid
13C HI-I-127-1
^{13}C NMR (100 MHz, $CDCl_3$)

5o (2*R*)

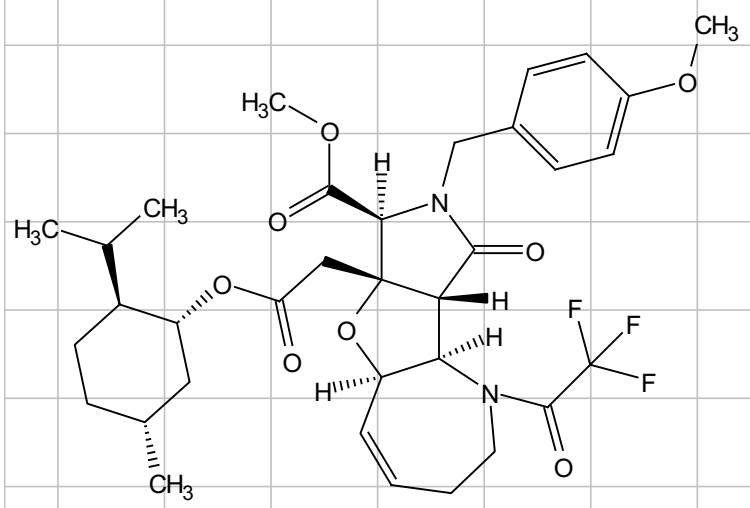


ST-I-98-1.40.fid
1H ST-I-98-1
^{1}H NMR (400 MHz, $CDCl_3$)

5n* (2*S*)



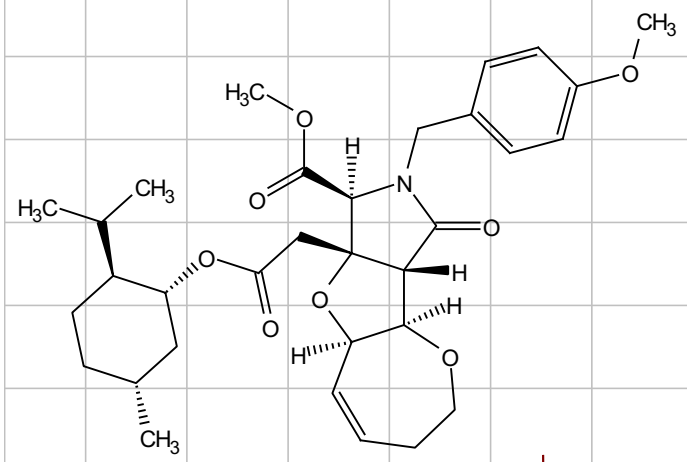
ST-I-98-1.41.fid
13C ST-I-98-1
^{13}C NMR (100 MHz, $CDCl_3$)



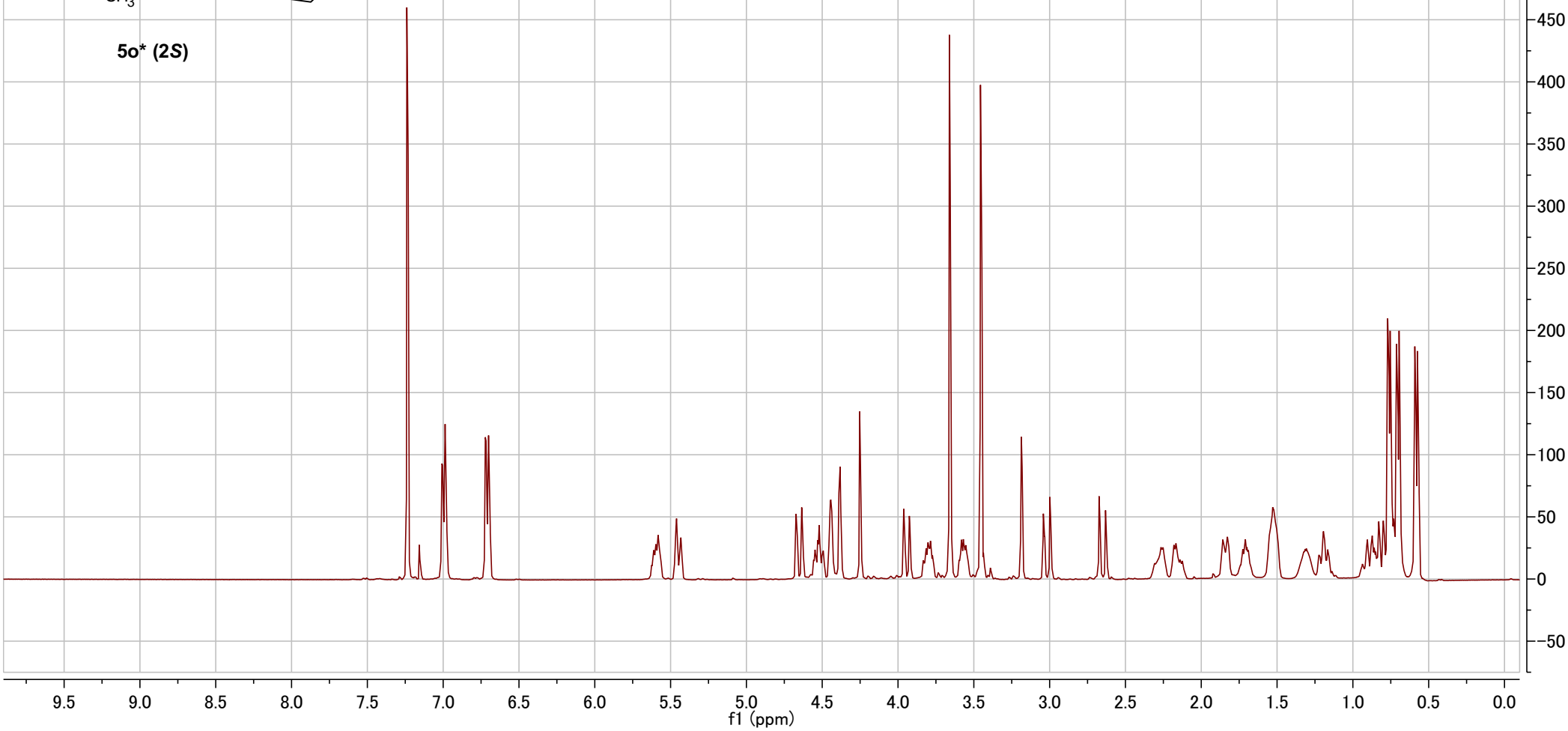
5n* (2*S*)

f1 (ppm)

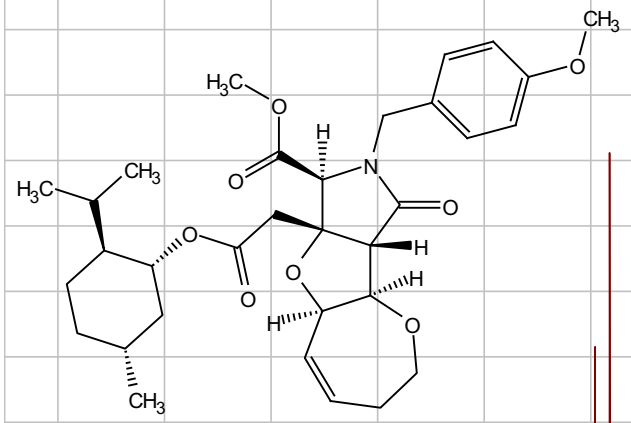
HI-I-127-2;.1.fid
1H HI-I-127-2
^{1}H NMR (400 MHz, $CDCl_3$)



5o* (2*S*)

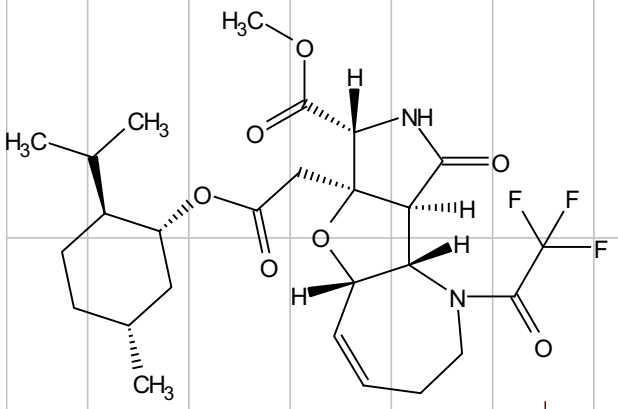


HI-I-127-2;.4.fid
13C HI-I-127-2
^{13}C NMR (100 MHz, $CDCl_3$)



5o* (2*S*)

ST-I-103-2.30.fid
1H ST-I-103-2
^{1}H NMR (400 MHz, $CDCl_3$)



6n (2*R*)

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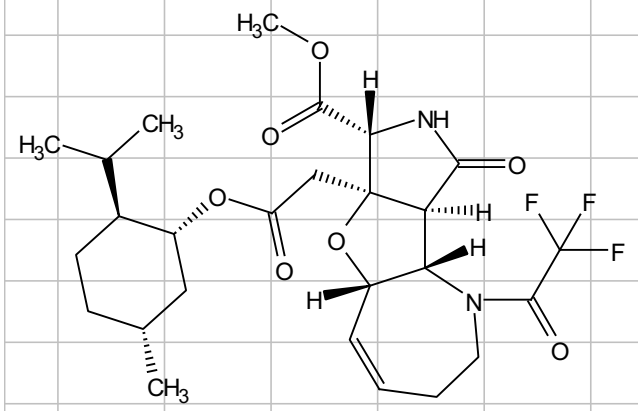
13C ST-I-103-2
^{13}C NMR (100 MHz, $CDCl_3$)

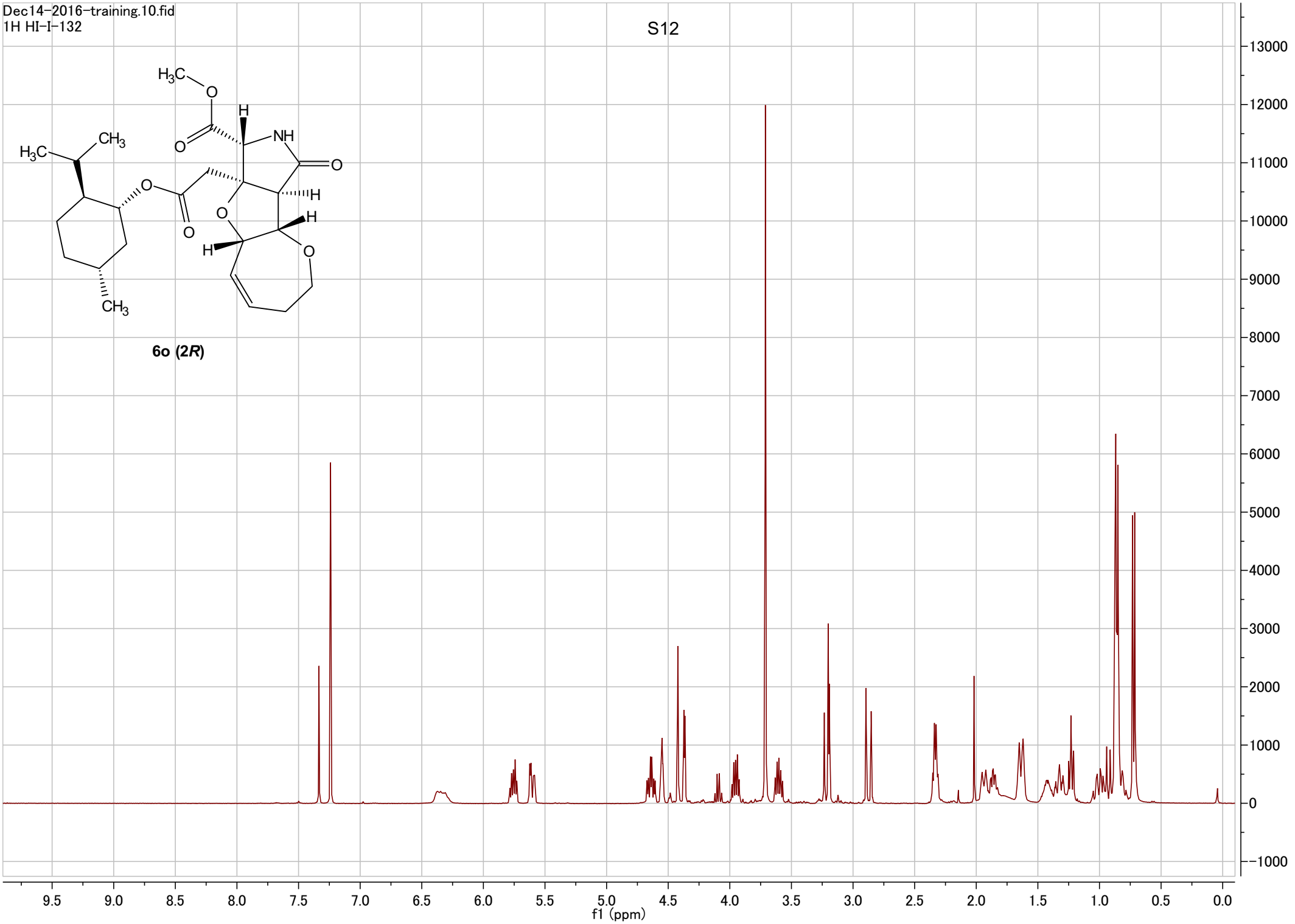


6n (2*R*)

f1 (ppm)

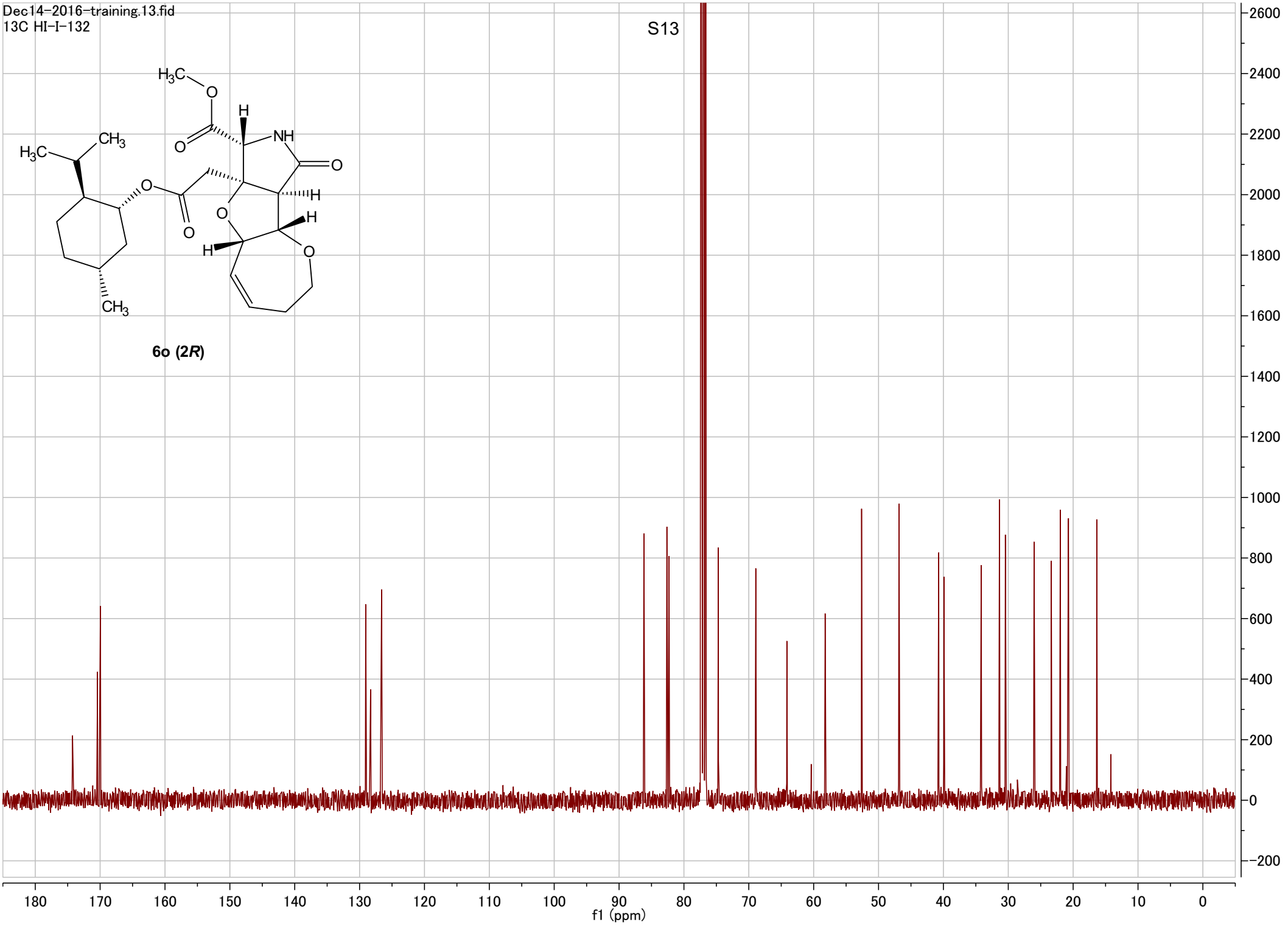
Dec14-2016-training.10.fid
1H HI-I-132

6o (2*R*)

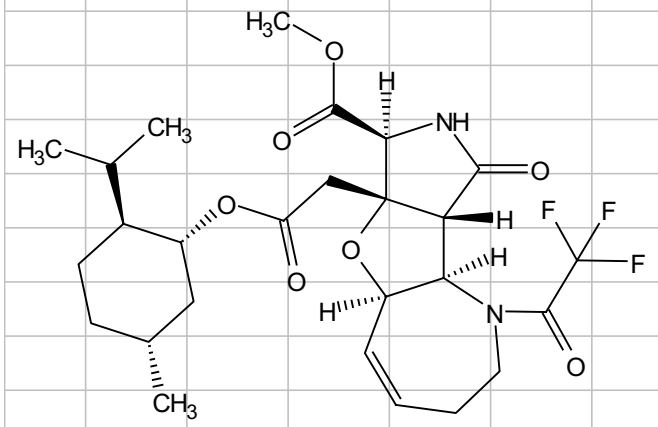


Dec14-2016-training.13.fid
13C HI-I-132

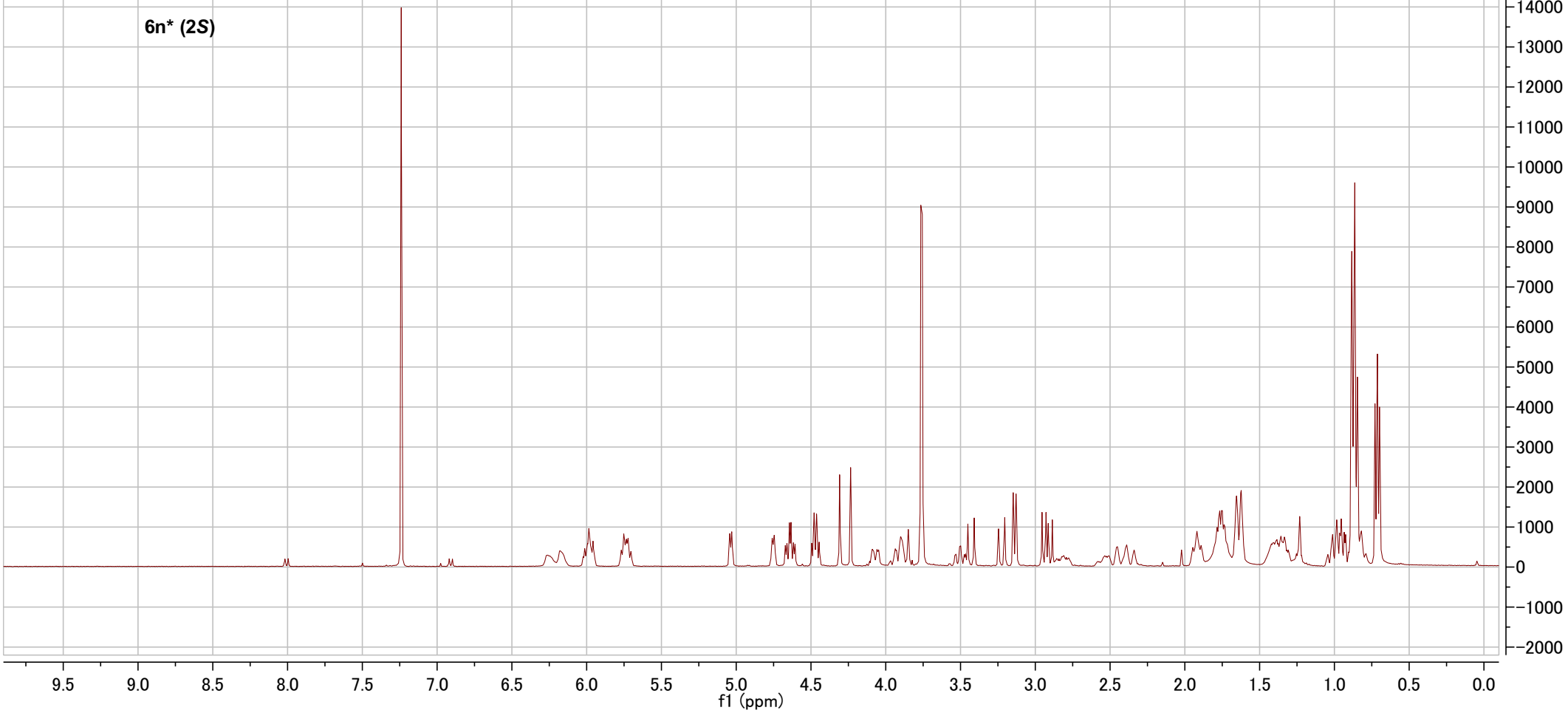
6o (2*R*)



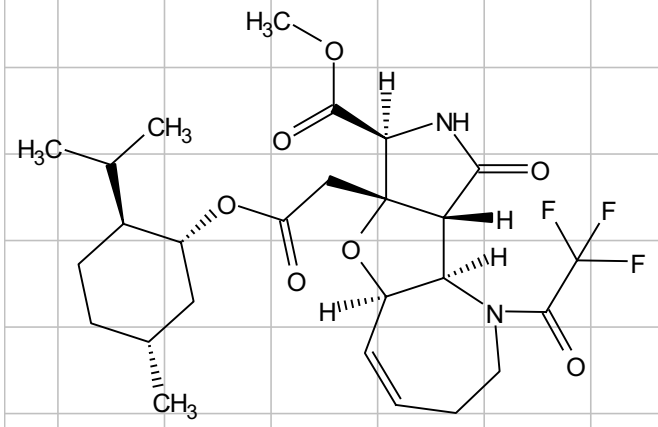
ST-I-102-1.30.fid
1H ST-I-102-1
^{1}H NMR (400 MHz, $CDCl_3$)



6n* (2*S*)



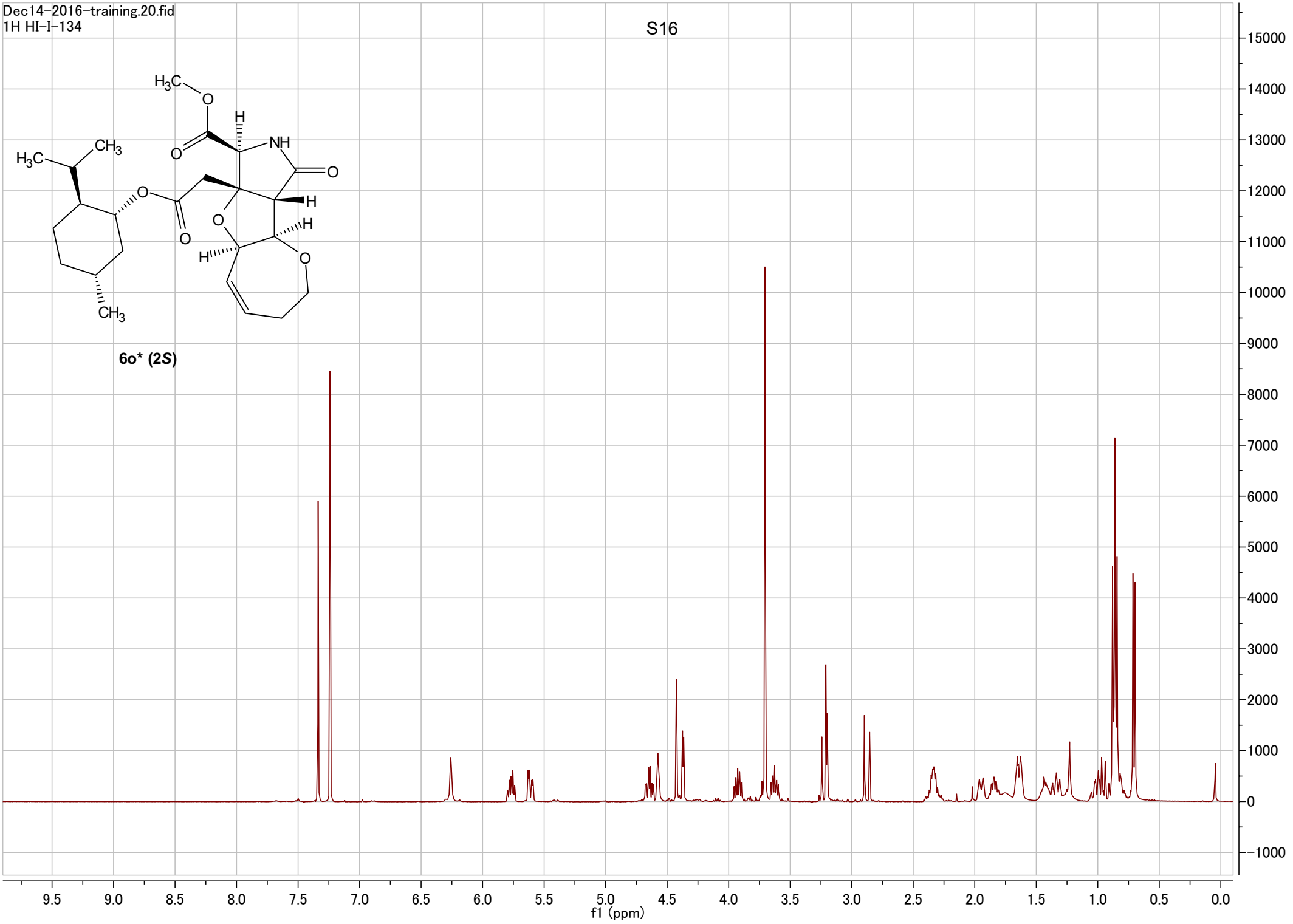
ST-I-102-1.33.fid
13C ST-I-102-1
^{13}C NMR (100 MHz, $CDCl_3$)



6n* (2*S*)

Dec14-2016-training.20.fid
1H HI-I-134

6o* (2*S*)



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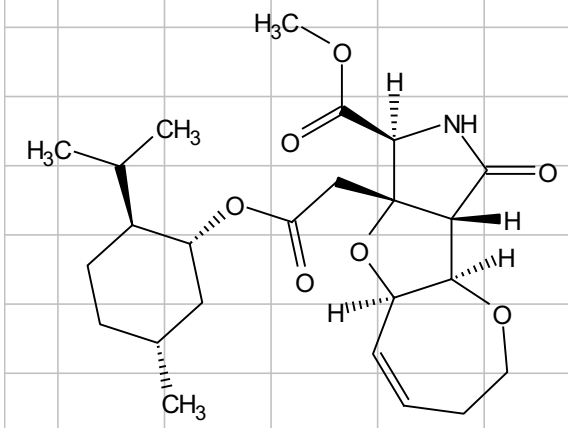
13C HI-I-134

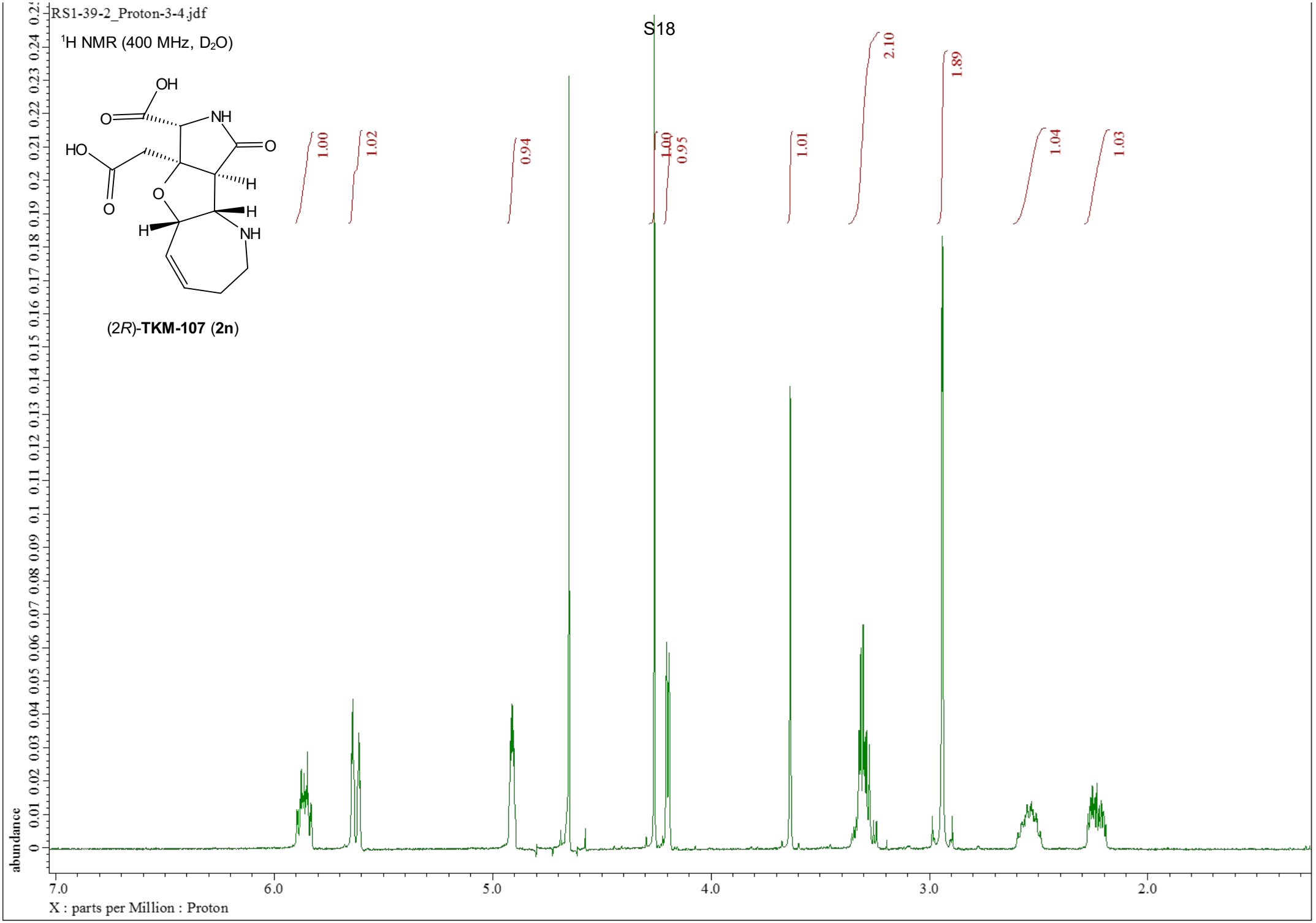


6o* (2*S*)

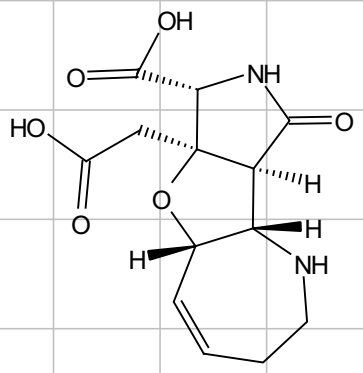
RS1-39-2_Proton-3-4.jdf

^{1}H NMR (400 MHz, D_2O)

(2*R*)-**TKM-107** (**2n**)



ST-I-107-1.23.fid
13C ST-I-107-1
^{13}C NMR (100 MHz, D_2O)

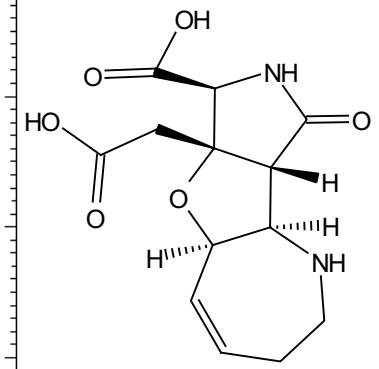


(2*R*)-**TKM-107** (**2n**)

f1 (ppm)

RS1-40-1_Proton-3-4.jdf

^{1}H NMR (400 MHz, D_2O)



(2*S*)-**TKM-107** (**2n***)

1.00 0.98 0.92 0.95 0.93 0.96 2.05 1.78 0.95 0.95

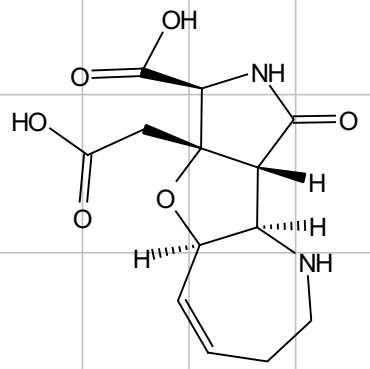
abundance

0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1

6.4 6.3 6.2 6.1 6.0 5.9 5.8 5.7 5.6 5.5 5.4 5.3 5.2 5.1 5.0 4.9 4.8 4.7 4.6 4.5 4.4 4.3 4.2 4.1 4.0 3.9 3.8 3.7 3.6 3.5 3.4 3.3 3.2 3.1 3.0 2.9 2.8 2.7 2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 1.6

X : parts per Million : Proton

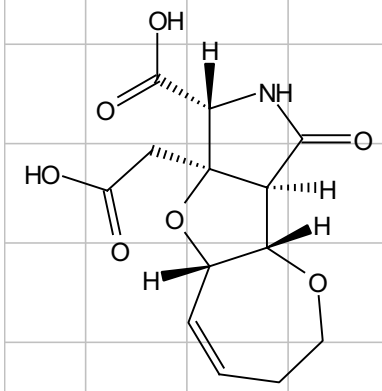
ST-I-109-1.40.fid
13C ST-I-109-1
^{13}C NMR (100 MHz, D_2O)



(2*S*)-**TKM-107** (**2n***)

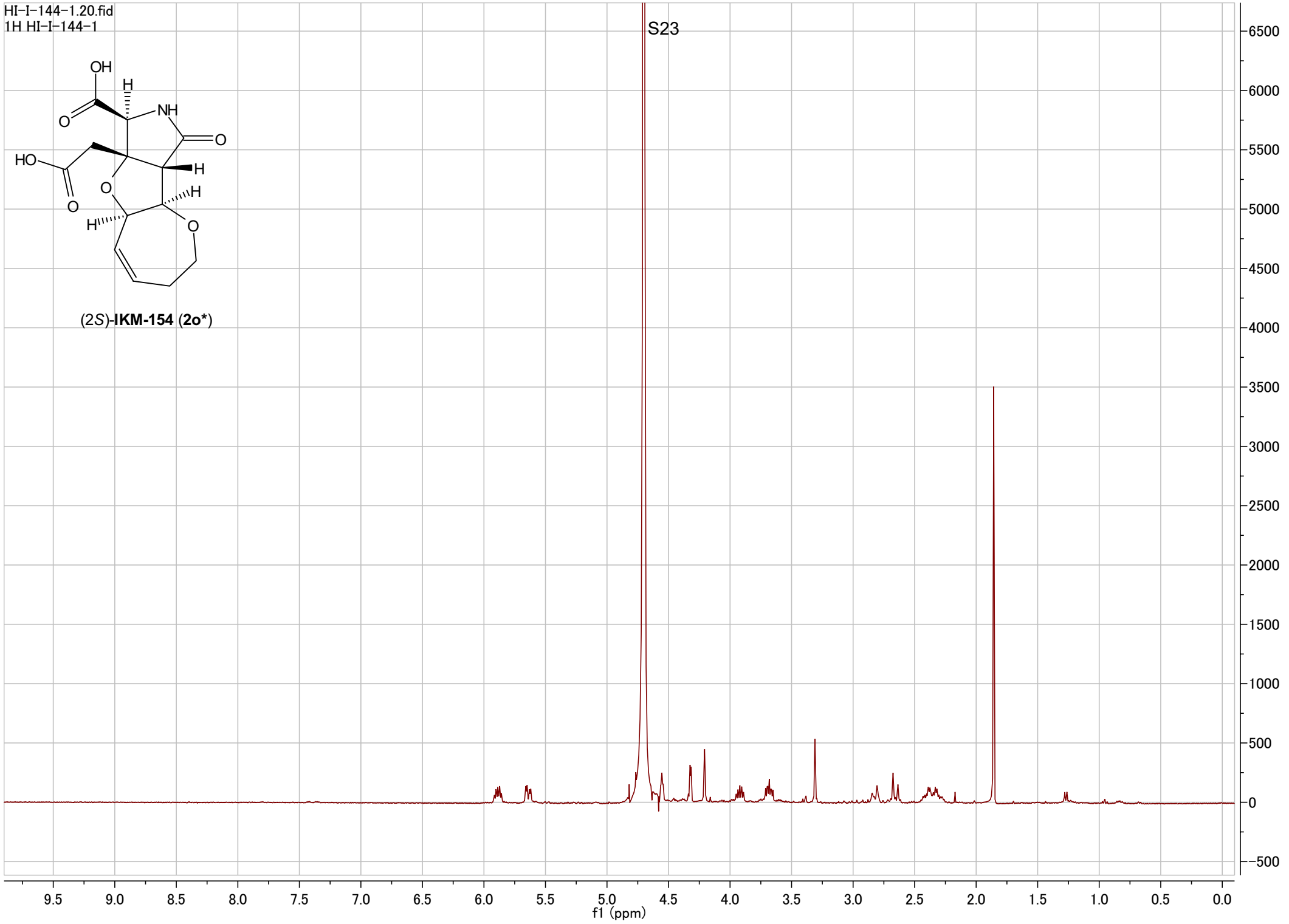
HI-I-145-1.10.fid
HI-I-145-1

S22



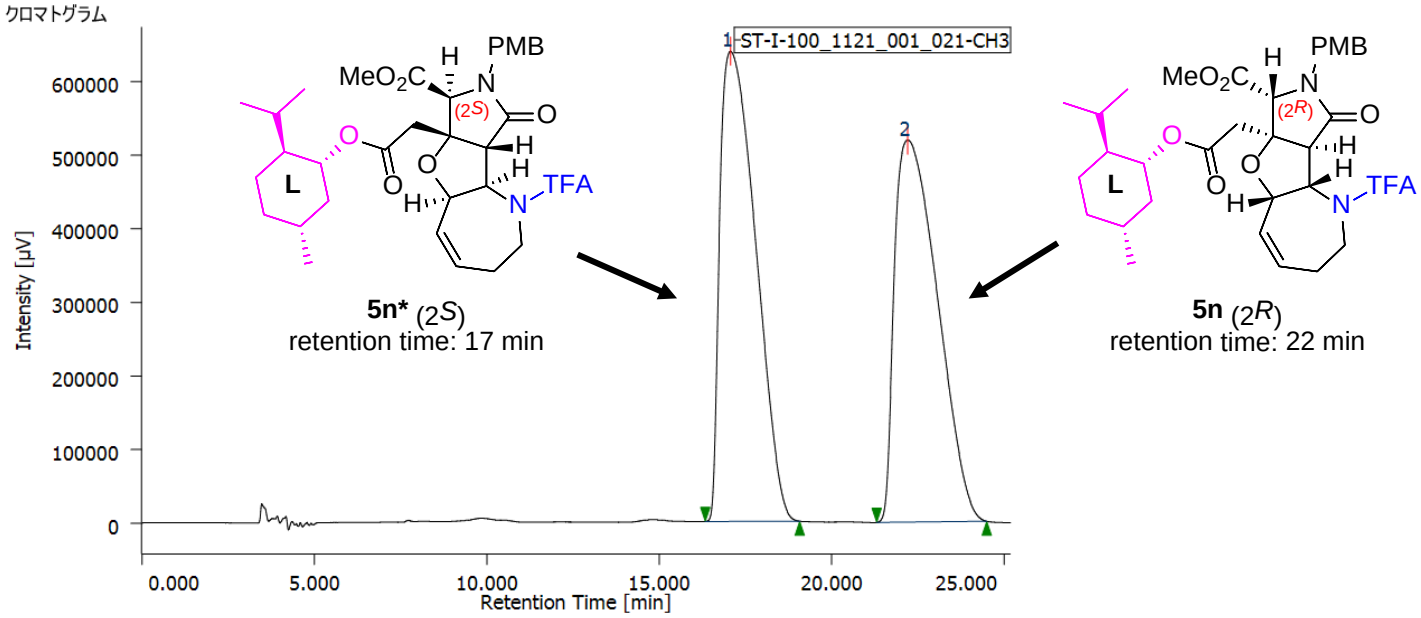
(2*R*)-**IKM-154** (**2o**)

f1 (ppm)


HI-I-144-1.20.fid
1H HI-I-144-1
S23
OH
H
NH
O
O
HO
O
O
H
H
H
O
(2S)-IKM-154 (2o*)
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

Chiral HPLC profiles for separation of menthyl ester diastereomers **5n*** and **5n**

ST−I−100



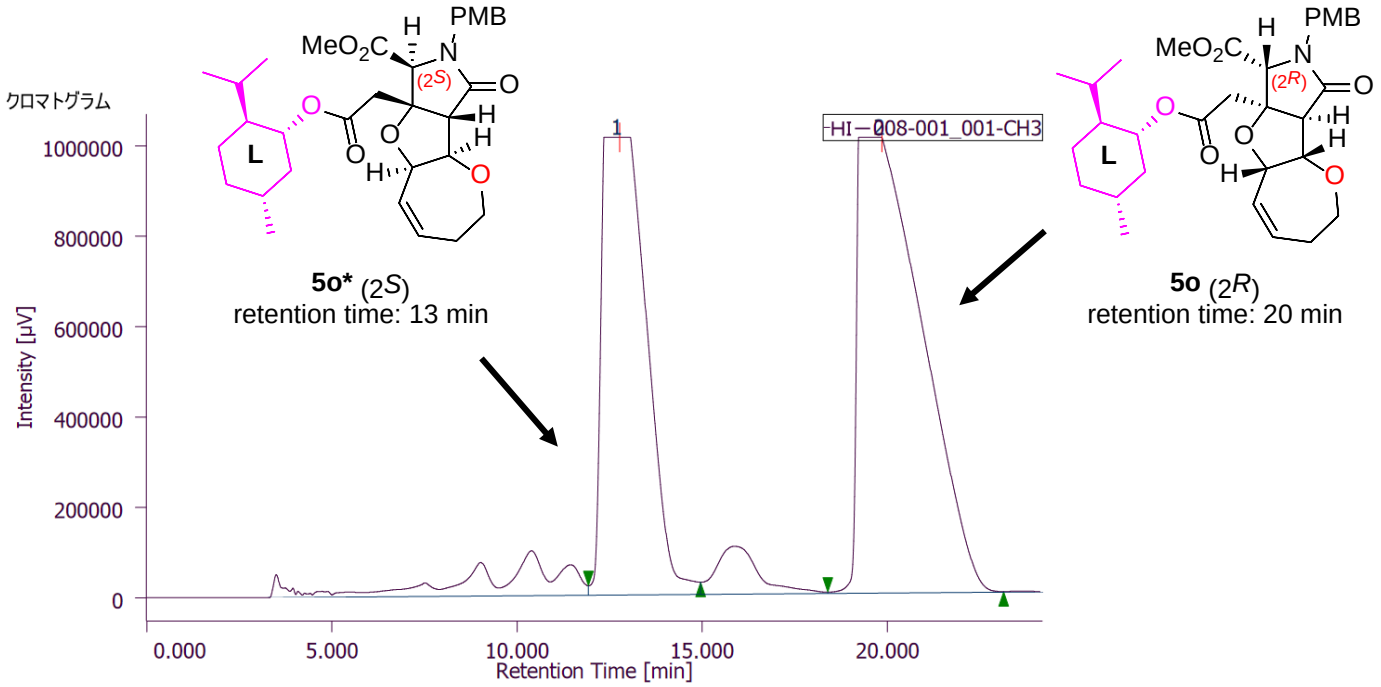
ピーク情報

#	ピーク名	CH	tR [min]	面積 [μV·sec]	高さ [μV]	面積%	高さ%	定量値	NTP	分離度	シンメトリー係数	警告
1	ST−I−100−1	3	17.058	46013759	638496	50.596	55.174	N/A	1124	2.302	1.967	
2	ST−I−100−2	3	22.192	44930426	518740	49.404	44.826	N/A	1329	N/A	1.903	

Conditions:

4.6 × 250 mm CHIRALPAK IC column, EtOH/hexane = 1/9, 1 mL/min, 40 ˚C, t_R 17, 22 min

Chiral HPLC profiles for separation of menthyl ester diastereomers **5o*** and **5o**



ピーク情報

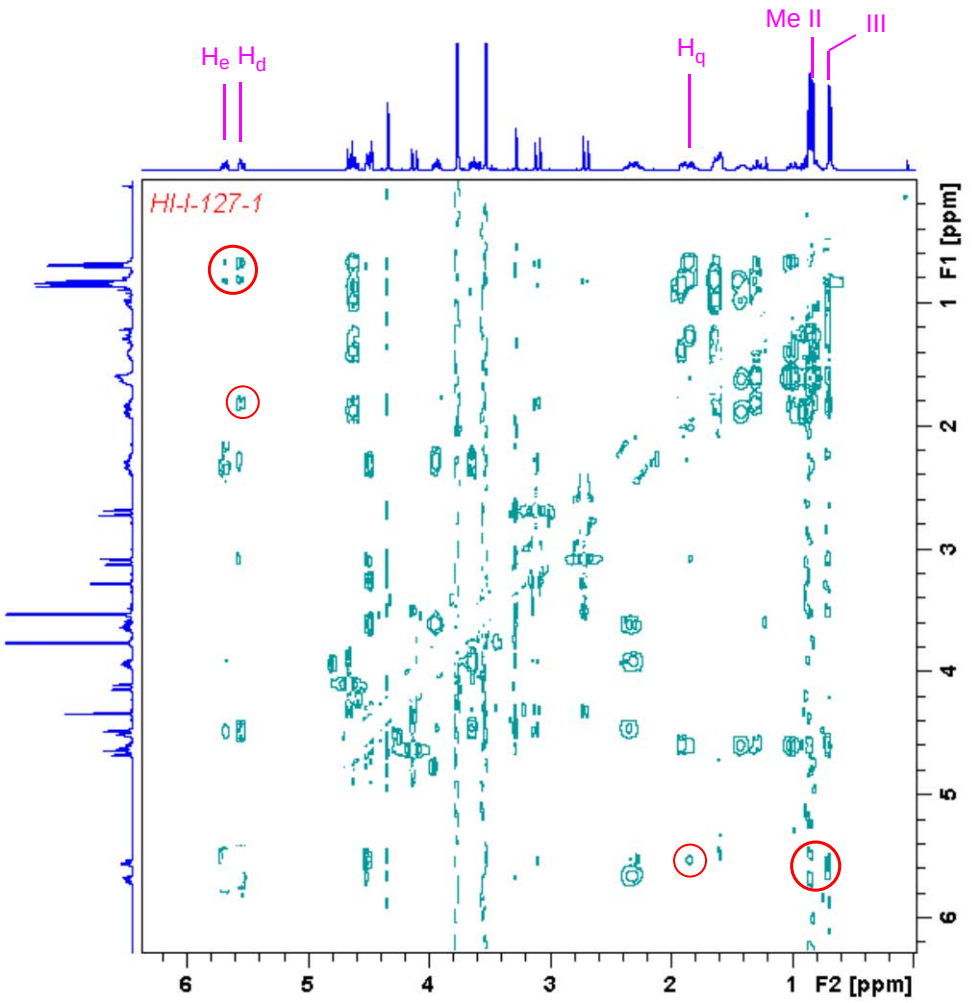
#	ピーク名	CH	tR [min]	面積 [μV·sec]	高さ [μV]	面積%	高さ%	定量値	NTP	分離度	シンメトリー係数	警告
1	Unknown	3	12.767	85314829	1011807	41.176	50.106	N/A	497	2.504	1.586	
2	Unknown	3	19.842	121881247	1007506	58.824	49.894	N/A	553	N/A	2.059	

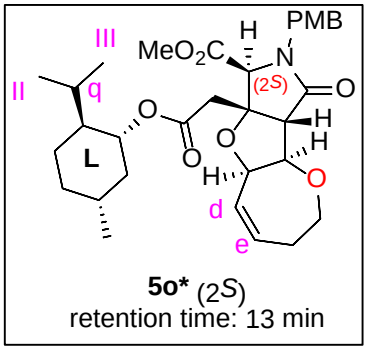
Conditions:

4.6 × 250 mm CHIRALPAK IC column, EtOH/hexane = 1/9, 1 mL/min, 40 ˚C, t_R 13, 20 min

NOESY spectrum of menthyl ester diastereomer **5o***

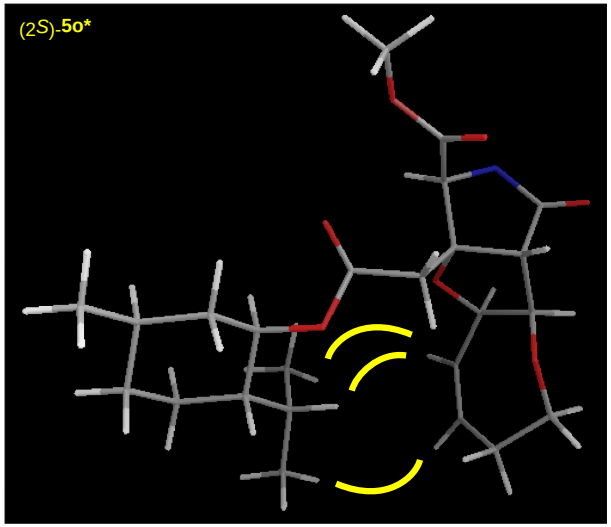
Fig. A NOESY (400 MHz, $CDCl_3$, 500 ms)





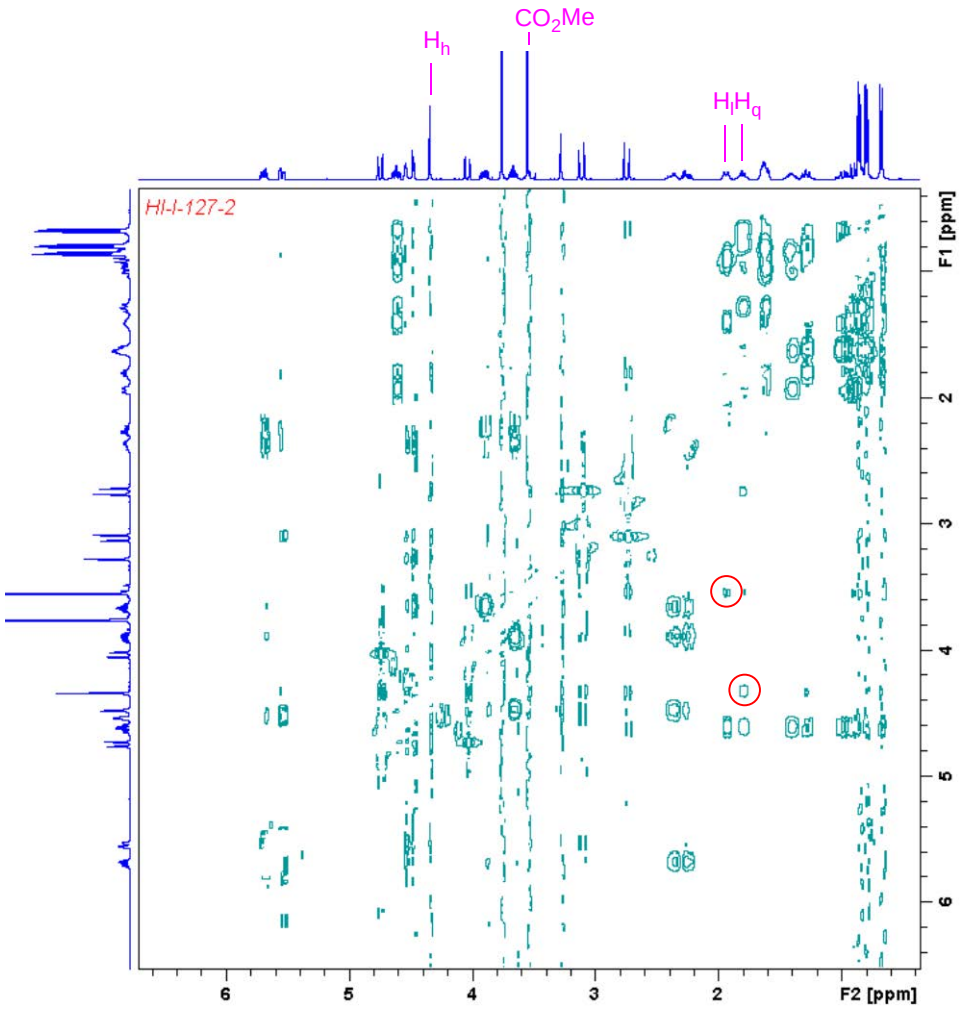
5o* (2*S*)
retention time: 13 min

Fig. B
The most stable conformer for (2*S*)-**5o***, optimized by MM2 calculation (CONFLEX).
Yellow lines denote NOEs observed.



NOESY spectrum of menthyl ester diastereomer **5o**

Fig. C NOESY (400 MHz, $CDCl_3$, 500 ms)



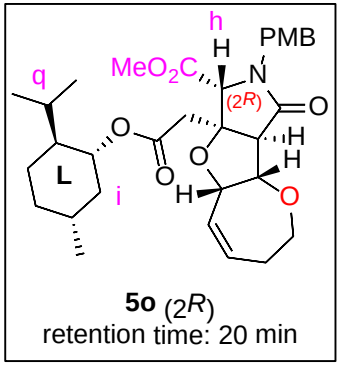
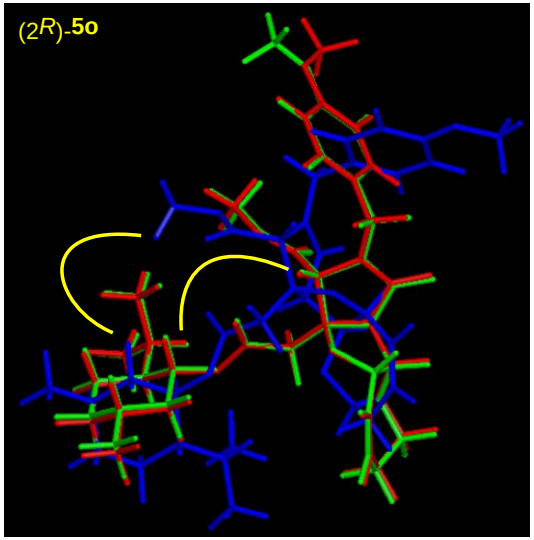


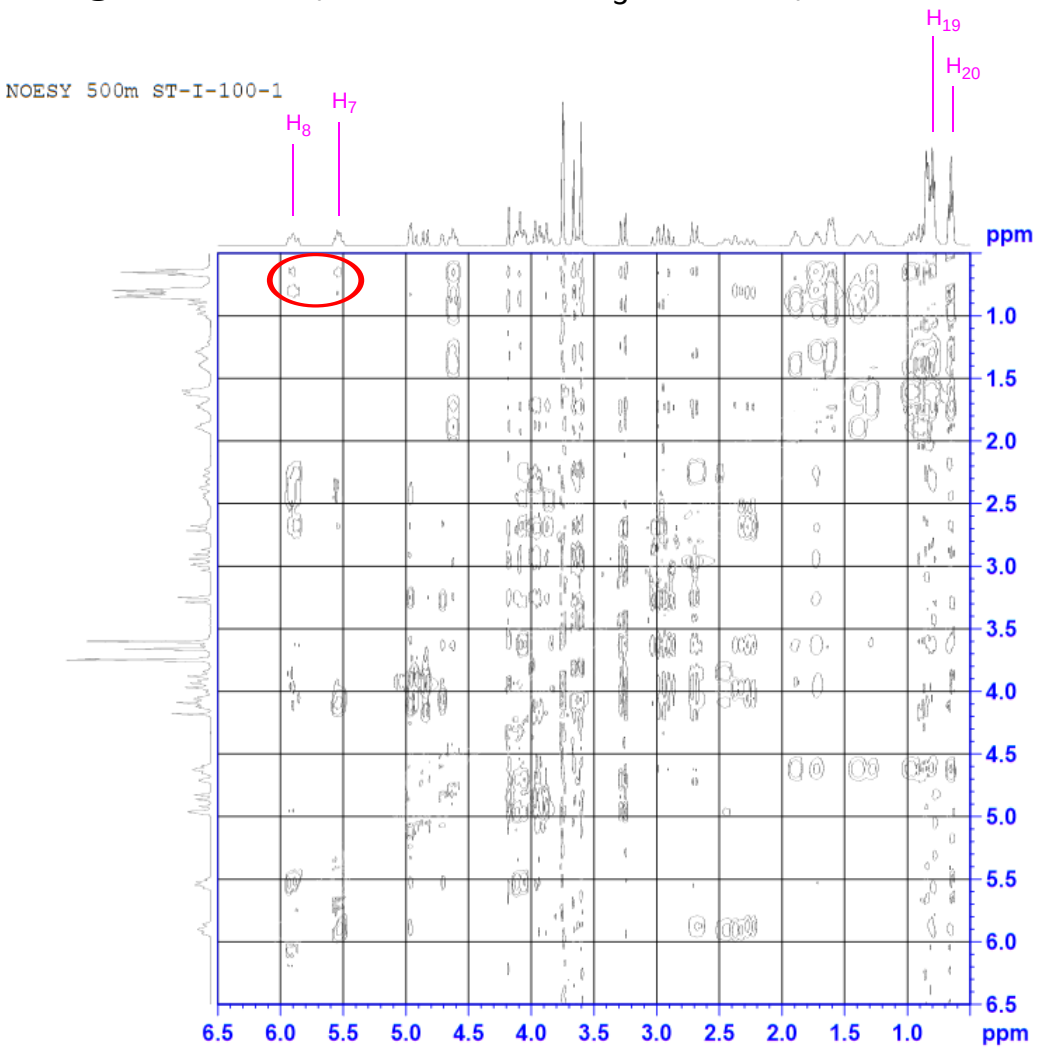
Fig. D

The top three stable conformers for (2*R*)-**5o**, optimized by MM2 calculation (CONFLEX).
Yellow lines denote NOEs observed.



NOESY spectrum of menthyl ester diastereomer **5n***

Fig. E NOESY (400 MHz, $CDCl_3$, 500 ms)



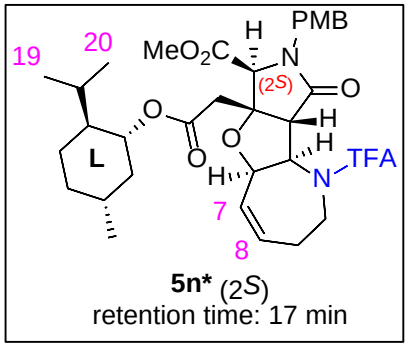
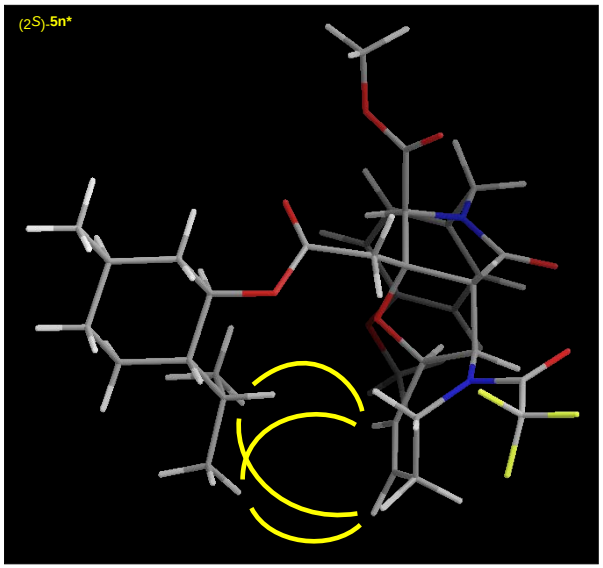


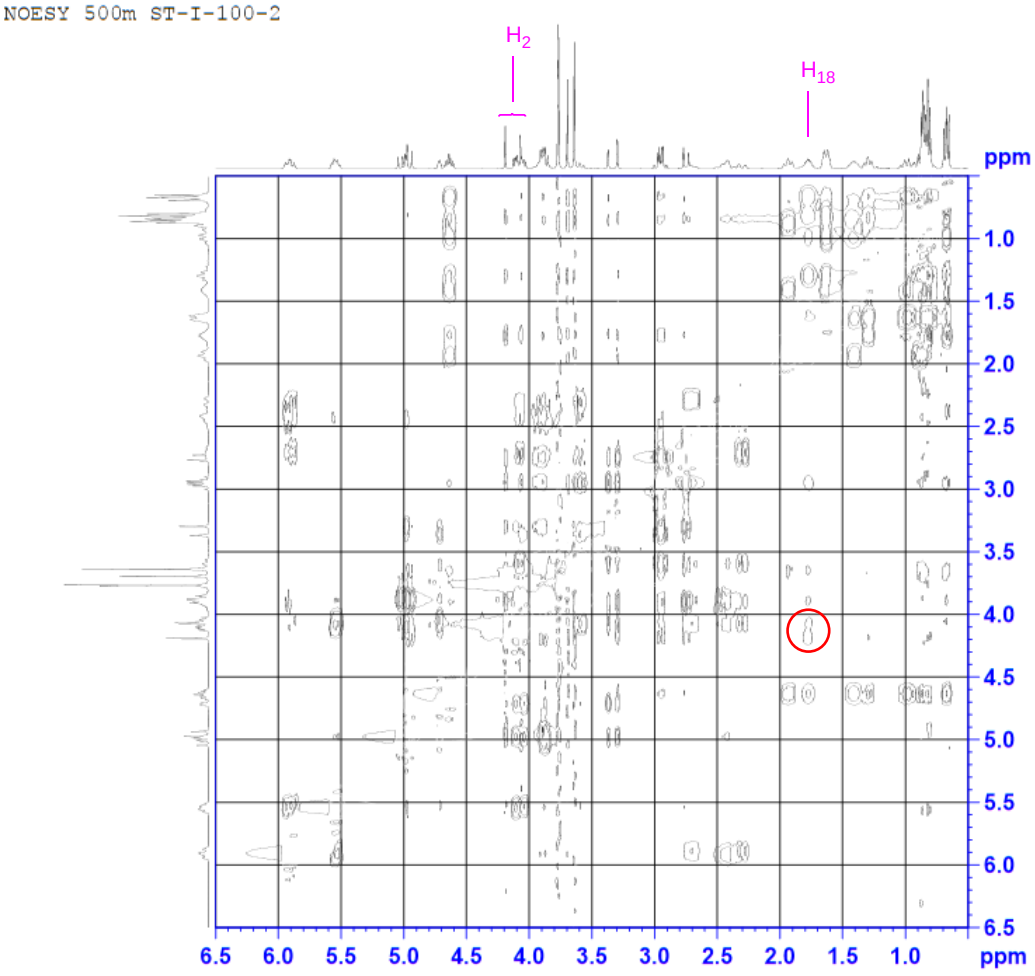
Fig. F

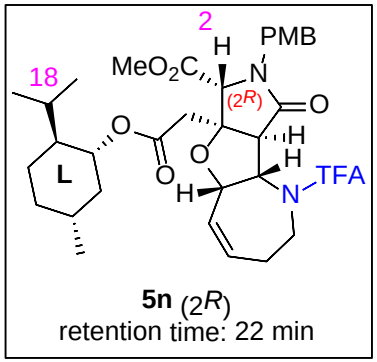
The most stable conformer for (2*S*)-**5n***, optimized by MM2 calculation (CONFLEX).
Yellow lines denote NOEs observed.



NOESY spectrum of menthyl ester diastereomer **5n**

Fig. G NOESY (400 MHz, $CDCl_3$, 500 ms)





5n (2*R*)
retention time: 22 min

Fig. H
The most stable conformer for (2*R*)-**5n**, optimized by MM2 calculation (CONFLEX).
Yellow line denotes NOE observed.