Electronic supporting information

Novel enantiopure δ-thiolactones: synthesis, structural characterization, and reactivity studies

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I. Crystal structure of δ -thiolactones 1a and 1b

The crystals were obtained using vapor diffusion crystallization method. A mixture of miscible solvents was used. The compound was dissolved in the smallest amount of the most soluble solvent. Then a quantity of precipitating solvent was added, but in such quantities as to allow its dissolution. For 10 mg of compound a final volume of 4-5mL was used. The final solution was filtered into a vial and left for 7-10 days, under slow evaporation conditions.

The X-ray intensity data were measured at room temperature, 298 (2) K, using CuKα (λ = 1.54184 Å) for **1a**, and MoKα radiation (λ = 0.71073 Å) for **1c**, using a Bruker D8 Venture diffractometer. The frames were integrated with the Bruker SAINT software package using a narrow-frame algorithm and scaling and absorption correction using Multi-scan SADABS (BrukerSAINT and SADABS, Bruker AXS Inc., 2018). The crystal structures were solved by Direct Methods [1], and then completed by a difference Fourier map, refined using the program SHELX2018/3 [2] and the molecular and supramolecular graphics were carried out using the software Mercury [3]. Crystallographic data for the structures have been deposited in the Cambridge Crystallographic Data Center (CCDC) with deposition numbers - **1a** CCDC: 2387412, **1c**: 2387413. Crystal data, data collection, and structure refinement details are summarized in Table S1.

Table S1. Crystallographic data of δ-thiolactones 1a and 1c.

Crystal Data	**Compound 1a**	**Compound 1c**
Chemical Formula	$C_7H_9NOS_3$	$C_7H_9NOS_3$
M_r	219.33	219.33
Crystalline system, space group	Monoclinic, $P2_1$	Orthorhombic, $P2_12_12_1$
a, b, c (Å)	11.4682 (5), 5.3017 (3), 15.1947 (7)	5.2493 (7), 12.0624 (18), 14.1479 (16)
α, β, γ (°)	90, 91.900 (2), 90	90, 90, 90
Volume, (Å^3)	923.34 (8)	895.8 (2)
ρ, kg m^{-3}	1.578	1.626
Z	4	4
Temperature, (K)	298(2)	298(2)
Radiation type	Cu K_α	Mo K_α
μ (mm^{-1})	6.94	0.77
Theta range for data collection	2.910°<2θ< 72.310°	2.880°<2θ< 26.601°
Index range	-14<=h<=14, -6<=k<=5, -18<=l<=17	-6<=h<=6, -15<=k<=15, -17<=l<=17
Data collection		
Diffractometer	Bruker D8 Venture	Bruker D8 Venture
Absorption correction	Multi-Scan *SADABS2016*/2 (Bruker,2016/2)	Multi-Scan *SADABS2016*/2 (Bruker,2016/2)
Tmin, Tmax	0.421, 0.754	0.814, 0.941

No. of measured, independent and observed reflections [I>2σ(I)]	15886, 3542, 3270	29567, 1863, 1775
R_{int}	0.049	0.040
$(\sin \theta/\lambda)_{max}$ (Å^{-1})	0.618	0.630
Refinement		
R[$F^2 > 2\sigma(F^2)$], wR(F^2), S	0.039, 0.105, 1.06	0.038, 0.088, 1.25
No. of reflections	3542	1863
Refined parameters	217	109
No. of restraints	1	0
H-atoms treatment	H-atom parameters constrained	H-atom parameters constrained
$\Delta\rho_{max}$, $\Delta\rho_{min}$ (e Å^{-3})	0.42, −0.30	0.36, −0.27
Absolute structure	0.070 (12)	0.01 (4)
Absolute structure	Flack x determined using 1279 quotients [(I+)-(I-)]/[(I+)+(I-)] (Parsons, Flack and Wagner, Acta Cryst. B69 (2013) 249-259).	

II. NMR prediction methods

The conformational search for all the stereoisomers **1a-c** was performed through the LowMD method in MOE with chloroform as the implicit solvent (Born model, e=4.81). The initial optimization was made to the conformer with the lowest energy in MOE using the AMBER12:EHT force field, followed by the AM1 semi-empirical method. Quantum
calculations were performed using Gaussian09. For optimization, the B3LYP method was used with a theory level of 6-311+g(d'; p') and chloroform as the solvent, modeled with SDM. Vibrational frequencies were calculated to check for the absence of imaginary values and confirm the reaching of a minimum. 1 H and 13 C NMR predictions were subsequently performed using the GIAO method with the same solvent model. The shifts for all the isomers 1a-d were calculated using TMS 1 H and 13 C shielding as the reference and compared with the experimental data.

Table S2: Optimized coordinates of 1a-d for NMR calculations

• ***1a***				• ***1b***			
0 1				*0 1*			
H	*-1.84600500*	*0.37651900*	*1.59721500*	*H*	*1.82168800*	*0.52515000*	*1.45283700*
C	*-1.63896700*	*0.40683500*	*0.52917300*	*C*	*1.64210100*	*0.51550000*	*0.36814700*
C	*-2.57380900*	*-0.55305000*	*-0.20404700*	*S*	*1.60889200*	*2.28155400*	*-0.20356900*
H	*-2.68189800*	*-0.29955500*	*-1.25707800*	*C*	*-0.25041500*	*2.30622800*	*-0.21824300*
H	*-3.55501100*	*-0.61996200*	*0.25977600*	*H*	*-0.60813500*	*3.17918100*	*0.32317200*
S	*-1.72382000*	*-2.18241000*	*-0.04702300*	*H*	*-0.59514700*	*2.34628300*	*-1.25063900*
S	*-1.74950400*	*2.18009000*	*-0.01665800*	*C*	*-0.67731900*	*0.98925100*	*0.45516900*
C	*0.08199300*	*2.35319600*	*0.10483700*	*C*	*-2.11274300*	*0.59930600*	*0.11910100*
H	*0.40405800*	*3.16303800*	*-0.54298300*	*O*	*-3.00899300*	*1.41064100*	*0.15384000*
H	*0.37581800*	*2.56446500*	*1.13107400*	*H*	*-0.67565200*	*1.12593900*	*1.55299500*

C	*0.58263300*	*0.99358200*	*-0.36470300*
H	*0.48984200*	*0.94295200*	*-1.46296600*
N	*-0.24641700*	*-0.01530700*	*0.28525700*
C	*-0.12016900*	*-1.32259800*	*-0.35571800*
H	*-0.00078400*	*-1.21792900*	*-1.44132100*
C	*1.08338600*	*-2.03686600*	*0.22708300*
H	*0.93381000*	*-2.24903400*	*1.28279100*
H	*1.31460800*	*-2.95592100*	*-0.30968700*
S	*2.61302600*	*-0.98477700*	*0.08380800*
C	*2.06175600*	*0.72817400*	*-0.09032200*
O	*2.89928800*	*1.59756200*	*-0.08168400*

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2 3 1.0 7 1.0 13 1.0
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6 14 1.0
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9
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11 12 1.0 13 1.0 20 1.0
12
13 14 1.0
14 15 1.0 16 1.0
15
16 17 1.0 18 1.0 19 1.0
17
18
19 20 1.0
20 21 2.0
21

N	*0.32124500*	*0.02414300*	*0.03277900*
C	*0.16854200*	*-1.36156700*	*0.43070200*
C	*-0.92621400*	*-2.00672700*	*-0.39506600*
H	*-1.12443000*	*-3.03041300*	*-0.07397800*
H	*-0.66397300*	*-1.99945400*	*-1.45203800*
S	*-2.54003600*	*-1.11632500*	*-0.19477600*
H	*-0.03088900*	*-1.47912300*	*1.50472300*
S	*1.85482800*	*-2.10185700*	*0.08838100*
C	*2.60278500*	*-0.44644400*	*-0.30702400*
H	*3.60820100*	*-0.41096200*	*0.11074300*
H	*2.63218300*	*-0.29796900*	*-1.38528400*

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18 19 1.0
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- **1c**

0 1

H	*-2.10723600*	*0.14150600*	*1.54180000*
C	*-1.69160600*	*0.31041400*	*0.54710100*
S	*-1.85751400*	*2.10048900*	*0.12851800*
C	*-0.05728700*	*2.27524400*	*-0.22571900*
H	*0.07804000*	*2.87559900*	*-1.12338400*
H	*0.42743200*	*2.76855100*	*0.61488800*
C	*0.47334300*	*0.85479200*	*-0.40966600*
C	*1.98548000*	*0.80100500*	*-0.14931800*
O	*2.69627800*	*1.77719800*	*-0.15399800*
H	*0.31985400*	*0.53329700*	*-1.45255400*
N	*-0.25640800*	*0.01699900*	*0.56116400*
C	*-0.03360500*	*-1.41941400*	*0.54672300*
C	*1.19891800*	*-1.83644500*	*-0.24333900*
H	*1.02748700*	*-1.77010700*	*-1.31783200*
H	*1.46843100*	*-2.86586400*	*-0.00742200*
S	*2.67448500*	*-0.81933100*	*0.17193400*
H	*0.02379900*	*-1.78910100*	*1.57021300*
S	*-1.58490000*	*-2.24728900*	*-0.19805200*
C	*-2.38263500*	*-0.61735500*	*-0.46579100*
H	*-2.23003700*	*-0.28014600*	*-1.49098900*
H	*-3.45190200*	*-0.70166100*	*-0.26923400*

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8 9 2.0 16 1.0
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- **1d**

0 1

H	*1.63530800*	*1.12043100*	*1.77470700*
C	*1.55168000*	*0.60731200*	*0.81750100*
S	*1.59613800*	*1.98003000*	*-0.51513900*
C	*-0.24146500*	*2.00530900*	*-0.61426600*
H	*-0.55893000*	*1.66780300*	*-1.60150700*
H	*-0.61843700*	*3.01203800*	*-0.44590000*
C	*-0.73112100*	*1.04026800*	*0.51550700*
C	*-2.15551200*	*0.56467800*	*0.24839600*
O	*-3.07647800*	*1.35010100*	*0.27652100*
H	*-0.78964100*	*1.61019500*	*1.44653900*
N	*0.26013500*	*-0.01643400*	*0.70659600*
C	*0.24240700*	*-1.02402300*	*-0.36517000*
C	*-0.88103400*	*-2.00475700*	*-0.10526000*
H	*-0.76397700*	*-2.48182000*	*0.86715000*
H	*-0.93598500*	*-2.76604500*	*-0.88463500*
S	*-2.51781700*	*-1.14114400*	*-0.15557600*
H	*0.12218900*	*-0.57017100*	*-1.35500200*
S	*1.90389900*	*-1.82704200*	*-0.31633700*
C	*2.63777000*	*-0.45003500*	*0.67194900*
H	*2.92340100*	*-0.83270200*	*1.65207500*
H	*3.52508400*	*-0.06752000*	*0.16913200*

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10 *11 12 1.0* *12 13 1.0 17 1.0* *13 14 1.0 15 1.0 16 1.0* *14* *15* *16* *17* *18 19 1.0* *19 20 1.0 21 1.0* *20* *21*	*11 12 1.0* *12 13 1.0 17 1.0 18 1.0* *13 14 1.0 15 1.0 16 1.0* *14* *15* *16* *17* *18 19 1.0* *19 20 1.0 21 1.0* *20* *21*

III. HTE analytical-scale screening for δ-thiolactone preparation 1a-c

Three stock solutions of **2** (100 mg, 0.36 mmol) were prepared in the corresponding solvent DCM, DEC and MeCN (5 mL).
Reactions were performed in 1.5 mL Eppendorf tubes. For each case, in a tube containing 0.05 mmol of the coupling reagent, a stock solution of **2** in the corresponding solvent (0.5 mL, 0.042 mmol) was added. In the case of HATU and COMU, DIPEA (0.084 mmol, 15 μL) was additionally added, and in the case of EDCI and DIC, catalytic amount of 4-DMAP was additionally added. The fifteen different reactions were conducted simultaneously in a digital Thermo Shaker with the appropriate module, at 25° C and 300 rpm, for 24 hours.

For the HPLC analysis, aliquots of 10 μL were dissolved in 1 mL HPLC grade MeCN and filtered through 0.22 μm PVDF filters. The yield was calculated as conversion percentage of L-2, calculated from the corresponding calibration curve, and verified from the quantification of 1a and 1c from the corresponding calibration curves.

Table S3: Analytical-scale screening for δ-thiolactone **1a-c** preparation.

Entry	Solvent	Coupling agent (eq.)		Aditives (eq)		1a-c Yield (%)
1		CDI	(1.0)	-		0
2		COMU	(1.2)	DIPEA	(2)	0
3	DEC	HATU	(1.2)	DIPEA	(2)	0
4		EDCI	(1.2)	4-DMAP	(0.1)	10
5		DIC	(1.2)	4-DMAP	(0.1)	28
6		CDI	(1.0)	-		0
7		COMU	(1.2)	DIPEA	(2)	16
8	ACN	HATU	(1.2)	DIPEA	(2)	14
9		EDCI	(1.2)	4-DMAP	(0.1)	15
10		DIC	(1.2)	4-DMAP	(0.1)	25
11		CDI	(1.0)	-		0
12		COMU	(1.2)	DIPEA	(2)	40
13	DCM	HATU	(1.2)	DIPEA	(2)	5
14		EDCI	(1.2)	4-DMAP	(0.1)	80
15		DIC	(1.2)	4-DMAP	(0.1)	30

The High Perfomance Liquid Chromathograpy was conducted in an Agilent series 1200, equipped with automatic injector (inj. vol 5 µL), quaternary pumps and diode array detector. A Kinetex NUCLEOSIL ® octadecylsilane column was used, 5 µm p.d., 4.6x150 mm, with column oven termostatized at 25 °C. Monitored wavelengths were 210 and 250 nm. Elution was performed in isocratic mode with a mixture 65:35 of 0.1% formic acid and MeCN. The data was collected and analyzed using OpenLab software. Calibration curves for **L-2**, **1a** and **1c** were obtained with 25, 50, 75, 125 and 250 µg/mL standars (Fig S1-3), prepared from a 500 µg/mL stock solution in MeCN. In each case, the 250 µg/mL standard was injected five times to evaluate system precision, obtaining RSD values of 1.31 for L-2, 1.07 for 1a and 0.09 for 1c. System aptitude was evaluated injecting a solution of L-2, 1a and 1c at 200 µg/mL. For an elution order consisting of L-2 (rt: 3.38 min), 1c (rt:5.87 min), 1a (rt: 7.85 min), selectivity indexes of 1.29 and 1.45 were obtained.

Figure S1: Calibration curve obtained for L-2, in a range of 25-250 µg/mL, at a monitoring wavelength of 210 nm.

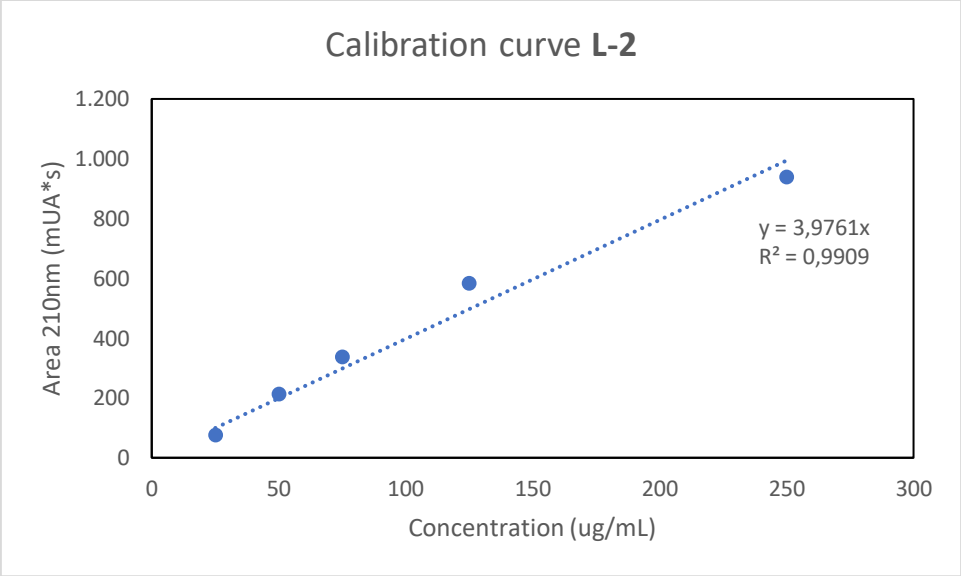


Figure S2: Calibration curve obtained for 1a, in a range of 25-250 µg/mL, at a monitoring wavelength of 250 nm.

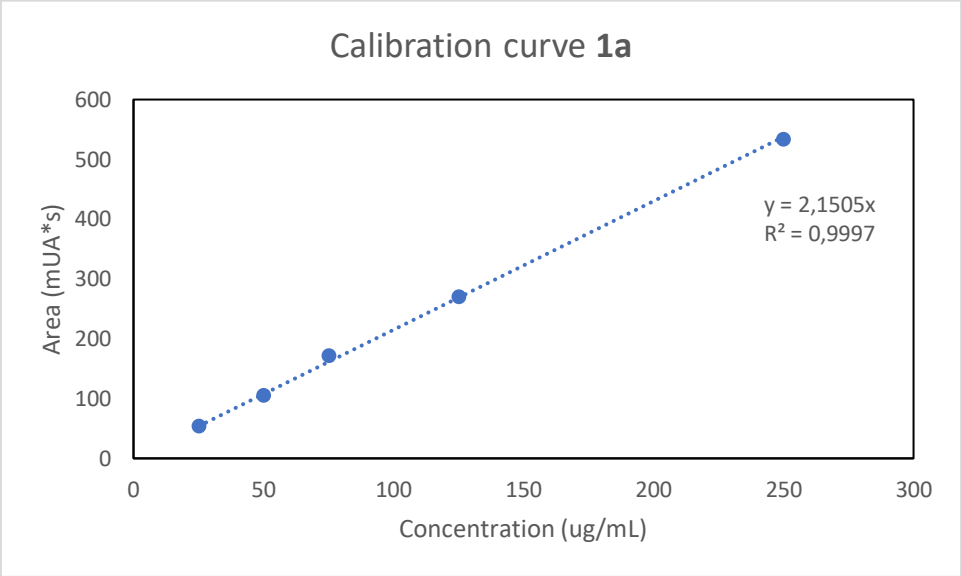
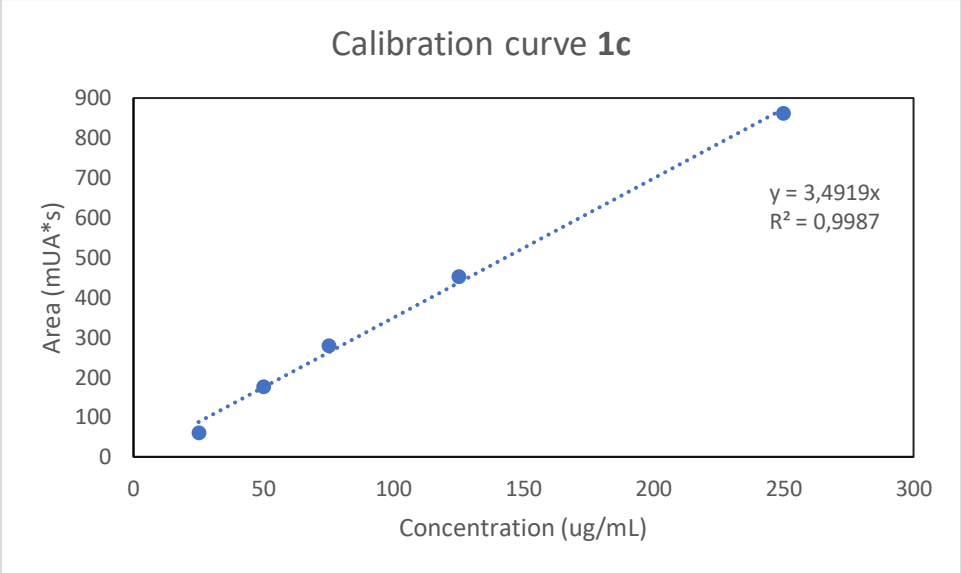


Figure S3: Calibration curve obtained for 1c, in a range of 25-250 µg/mL, at a monitoring wavelength of 250 nm.



IV. NMR Spectra of δ-thiolactones 1a-c and 4a, 4c

Figure S4: ^{1}H-NMR of **1a** in $CDCl_3$ (400 MHz)

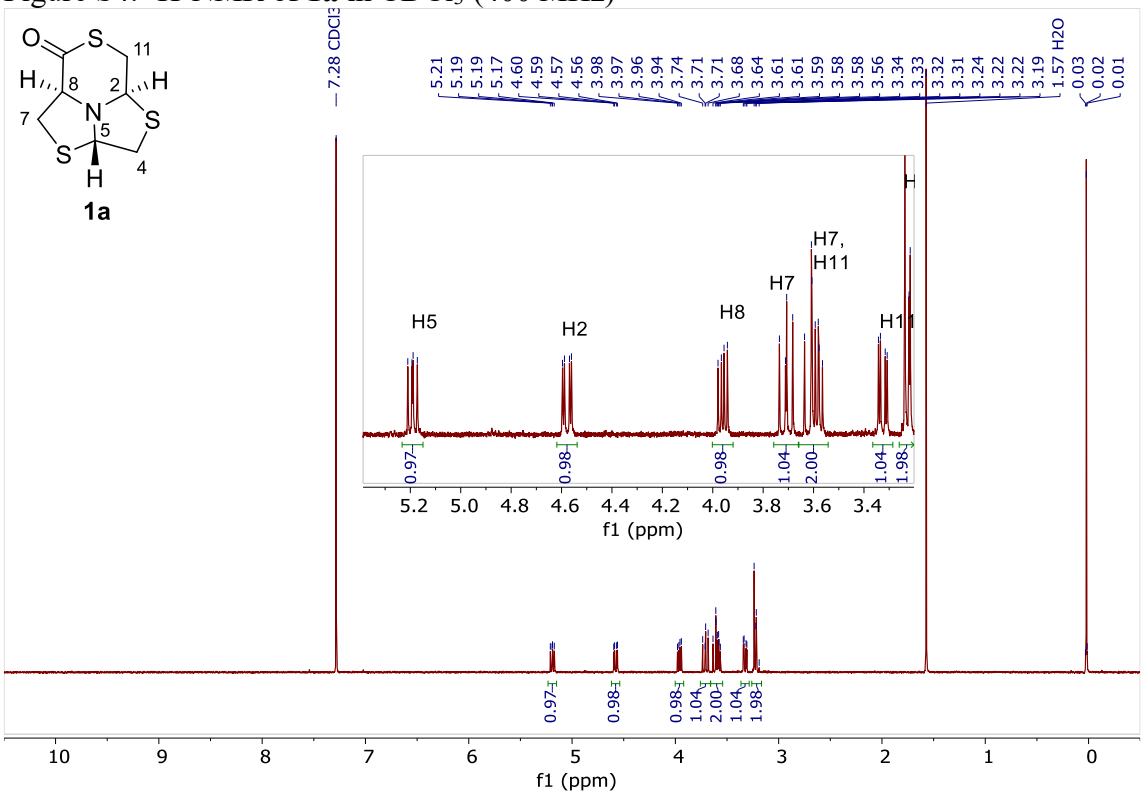


Figure S5: ^{13}C-NMR of **1a** in $CDCl_3$ (101 MHz)

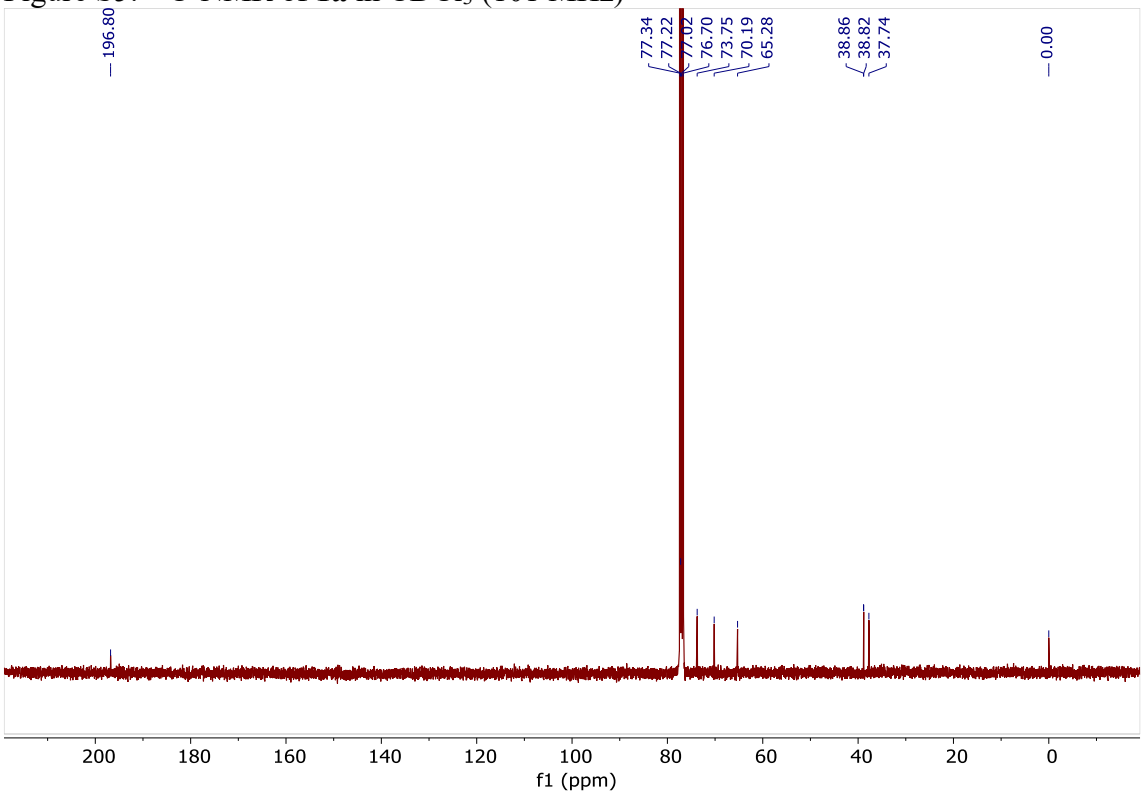


Figure S6: ^{1}H-NMR of **1b** in $CDCl_3$ (400 MHz)

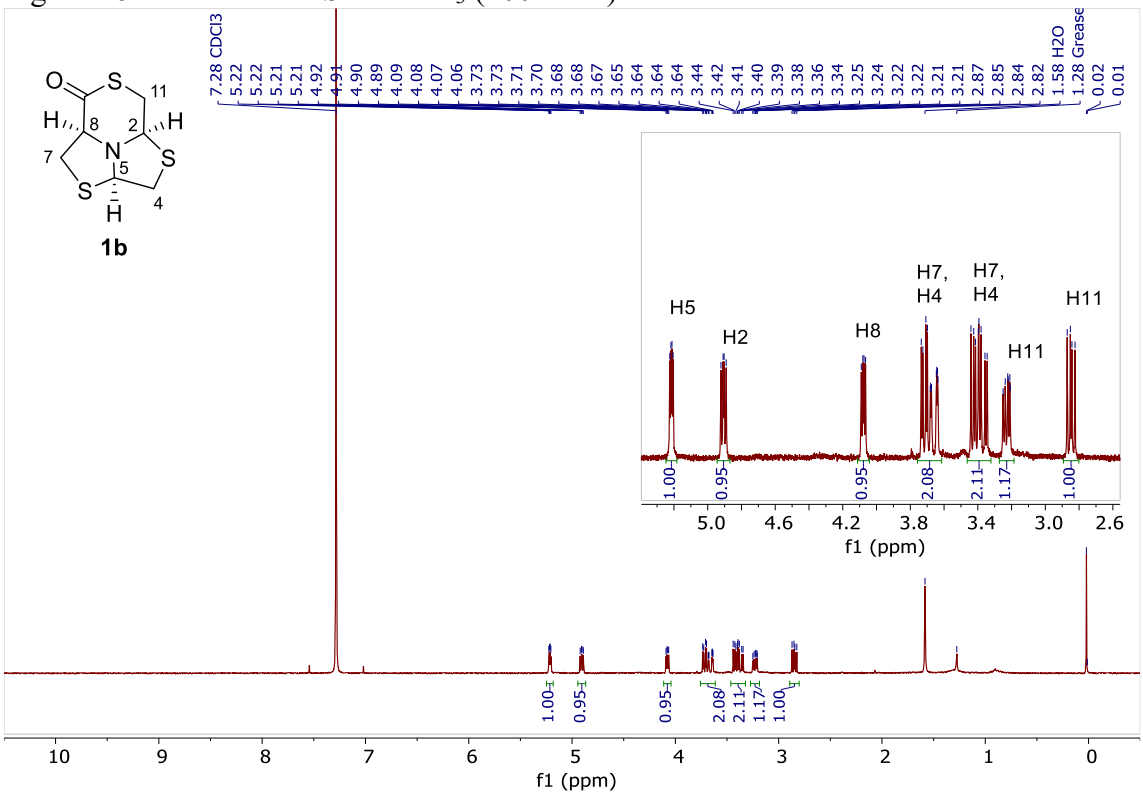


Figure S7: ^{13}C-NMR of **1b** in $CDCl_3$ (101 MHz)

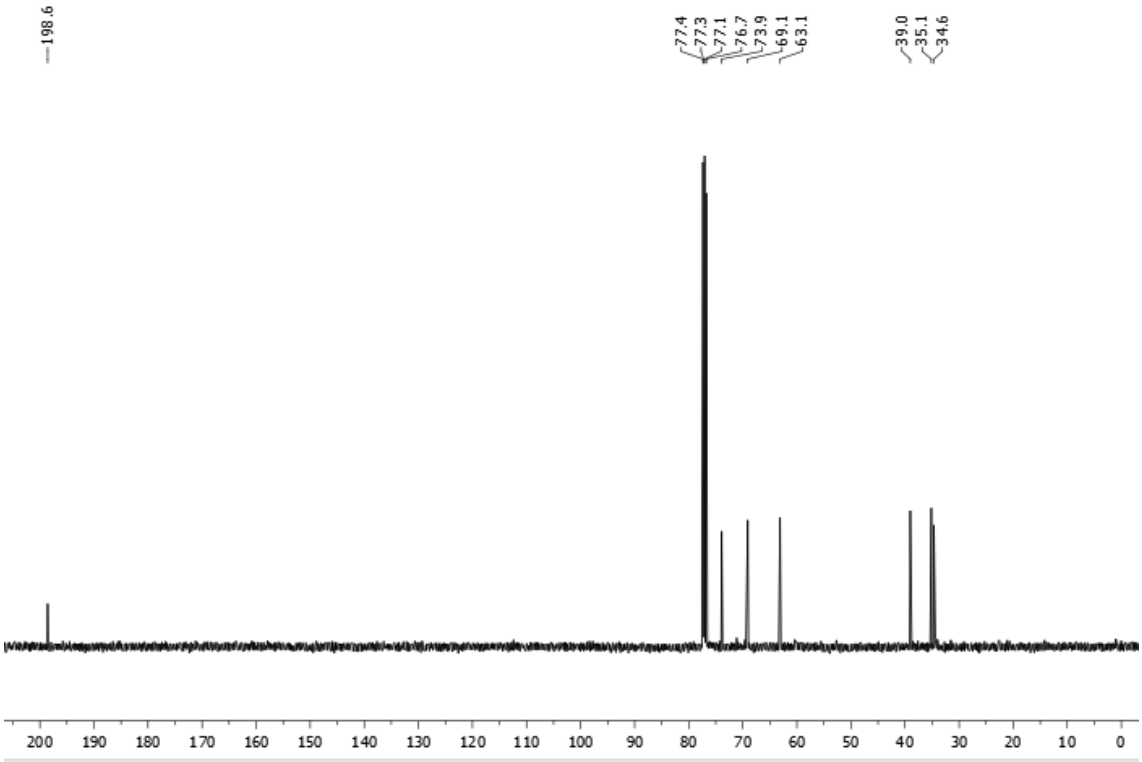


Figure S8: ^{1}H-NMR of **1c** in $CDCl_3$ (400 MHz)

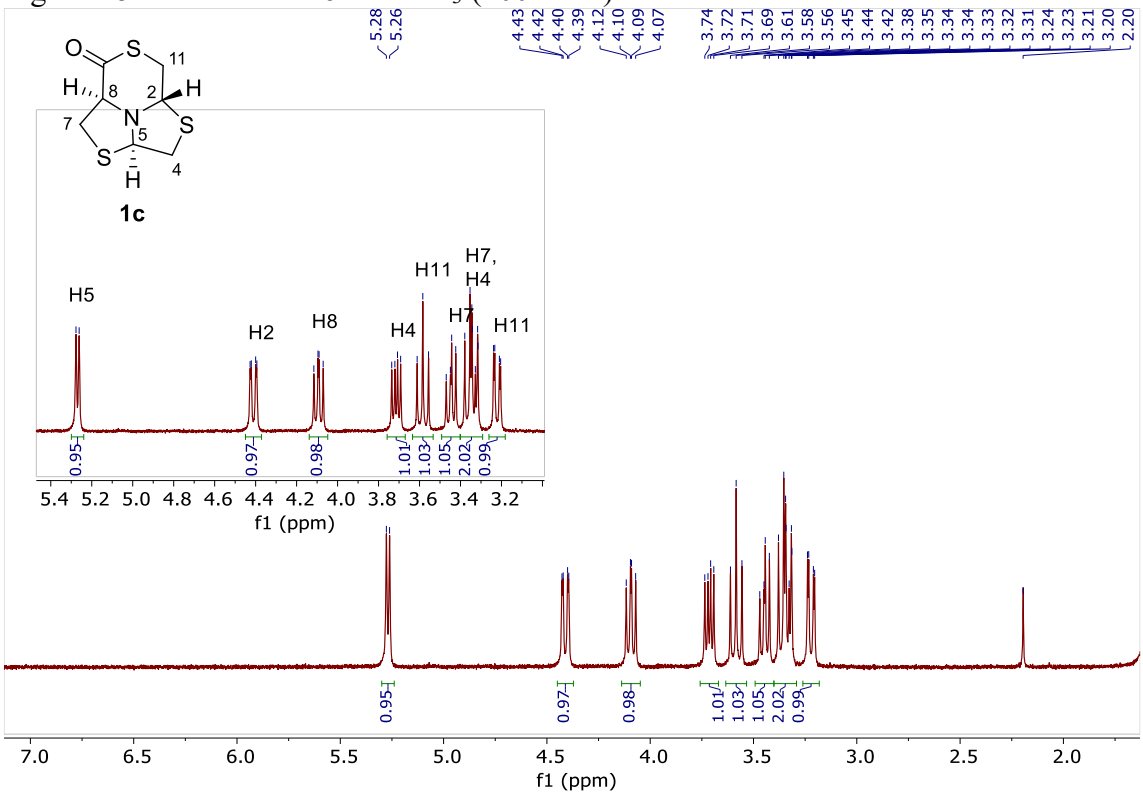


Figure S9: ^{13}C-NMR of **1c** in $CDCl_3$ (101 MHz)

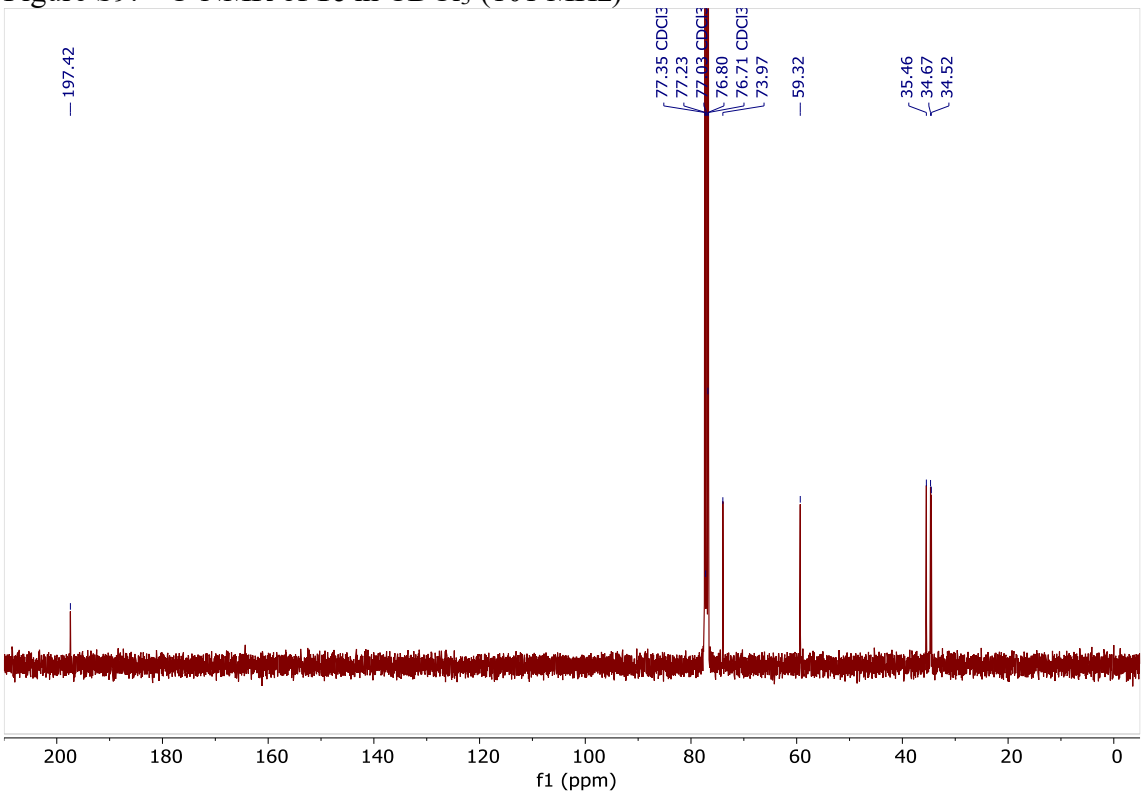


Figure S10: ^{1}H-NMR of **4a** in $CDCl_3$ (400 MHz)

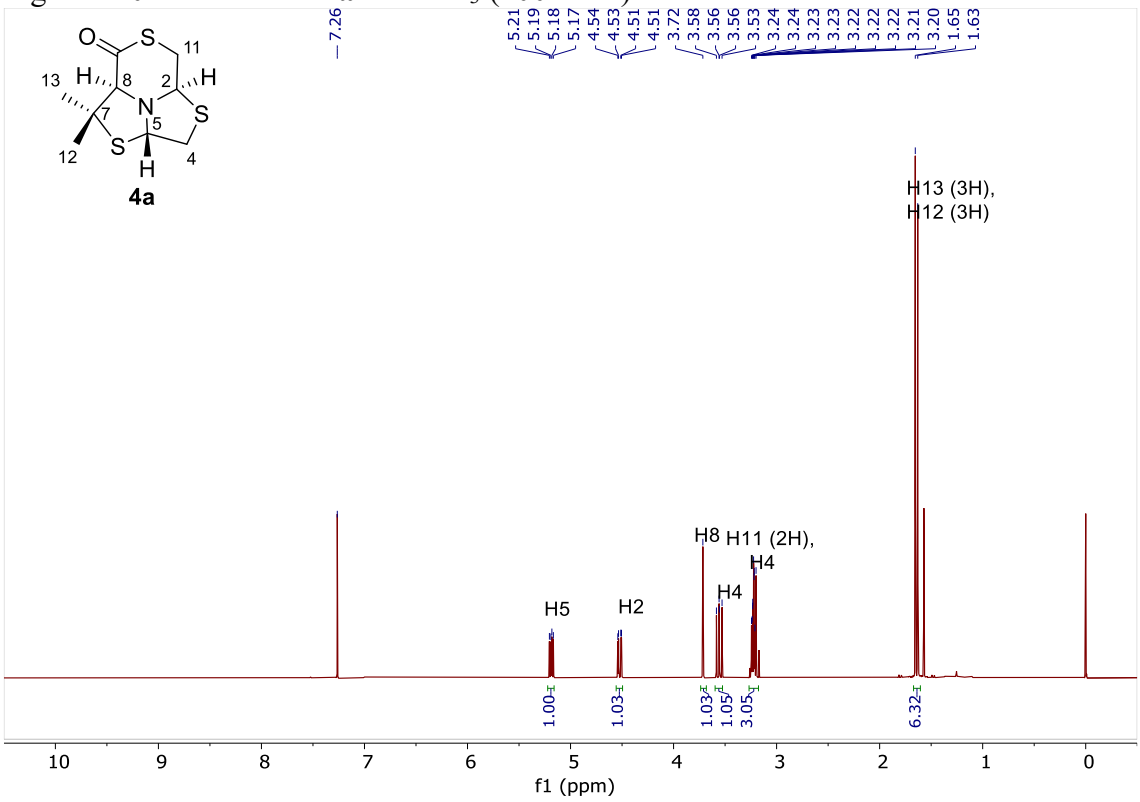


Figure S11: ^{13}C-NMR of **4a** in $CDCl_3$ (101 MHz)

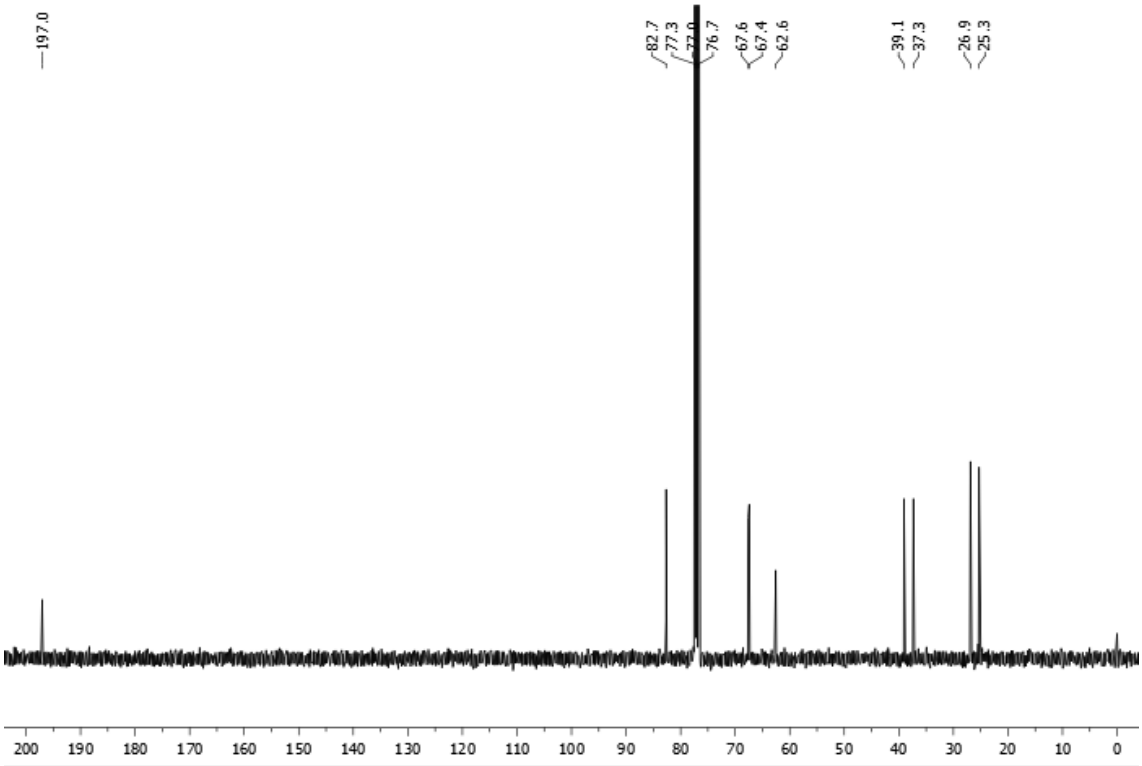


Figure S12: ^{1}H-NMR of **4c** in $CDCl_3$ (400 MHz)

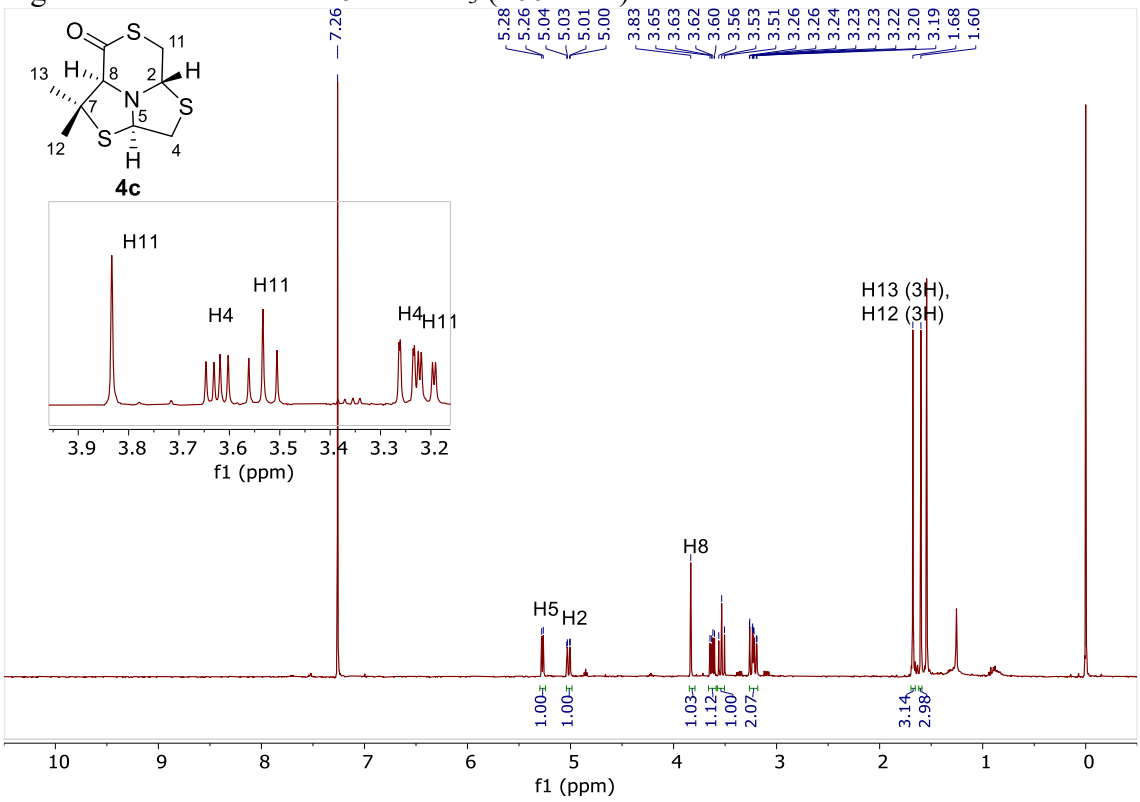
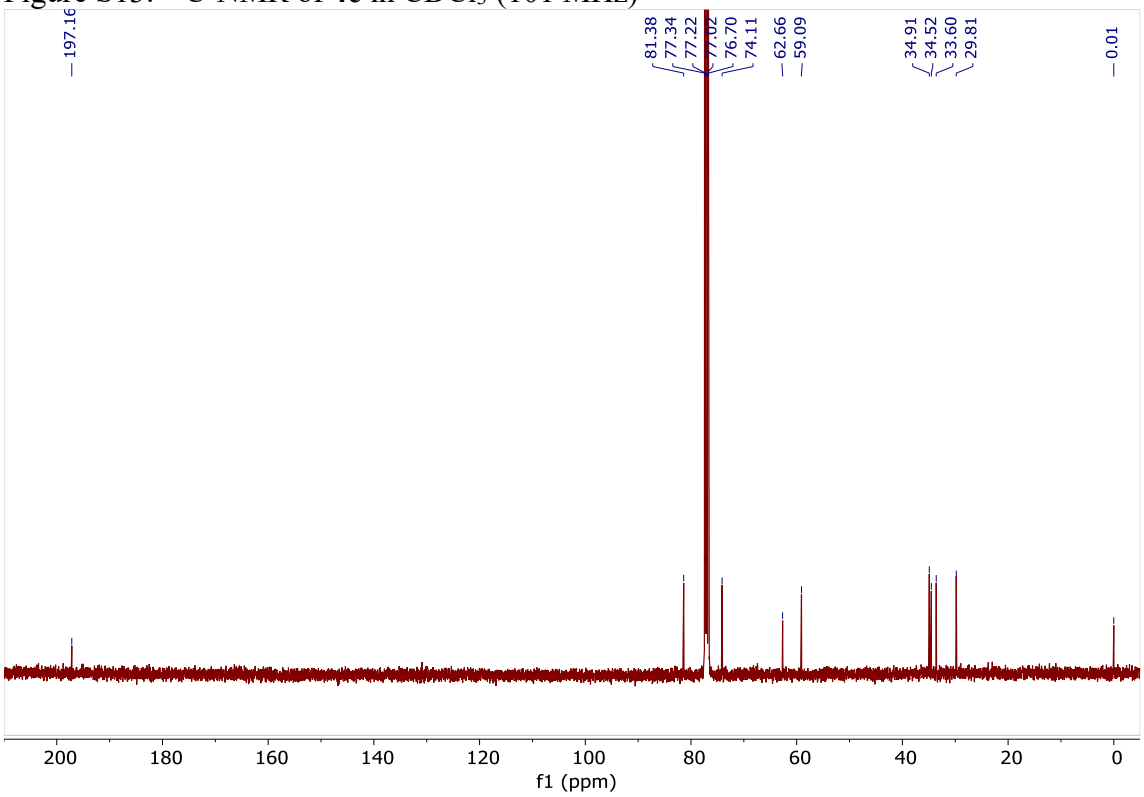
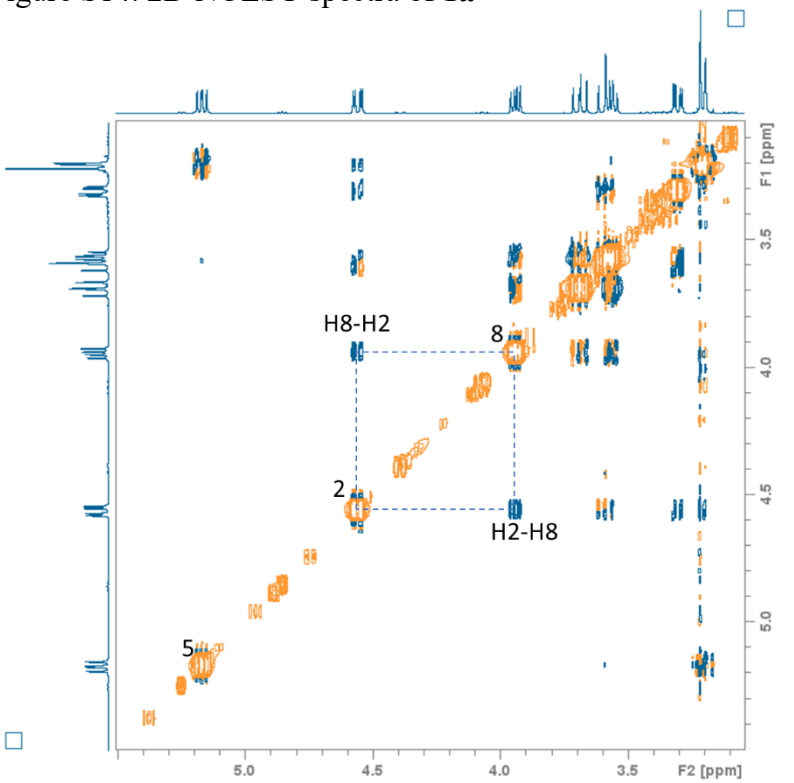


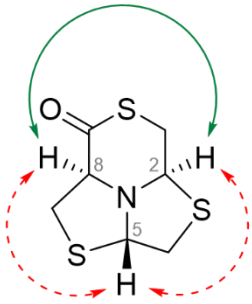
Figure S13: ^{13}C-NMR of **4c** in $CDCl_3$ (101 MHz)



V. 2D NOESY experiments of δ-thiolactones 1a-c and 4a and 4c

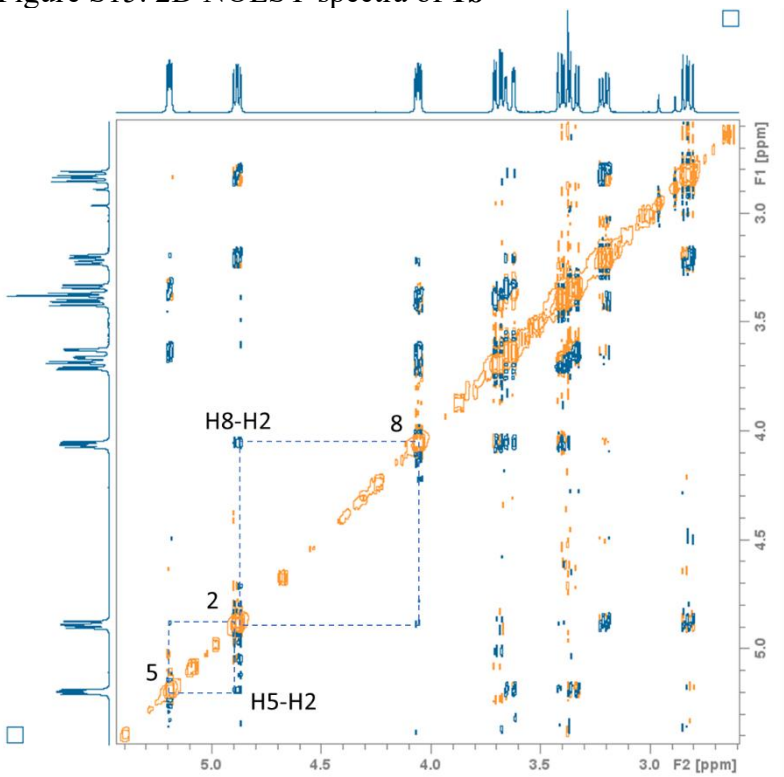
Figure S14: 2D NOESY spectra of **1a**

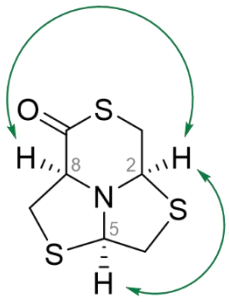




1a
(*2R,5S,8R*)

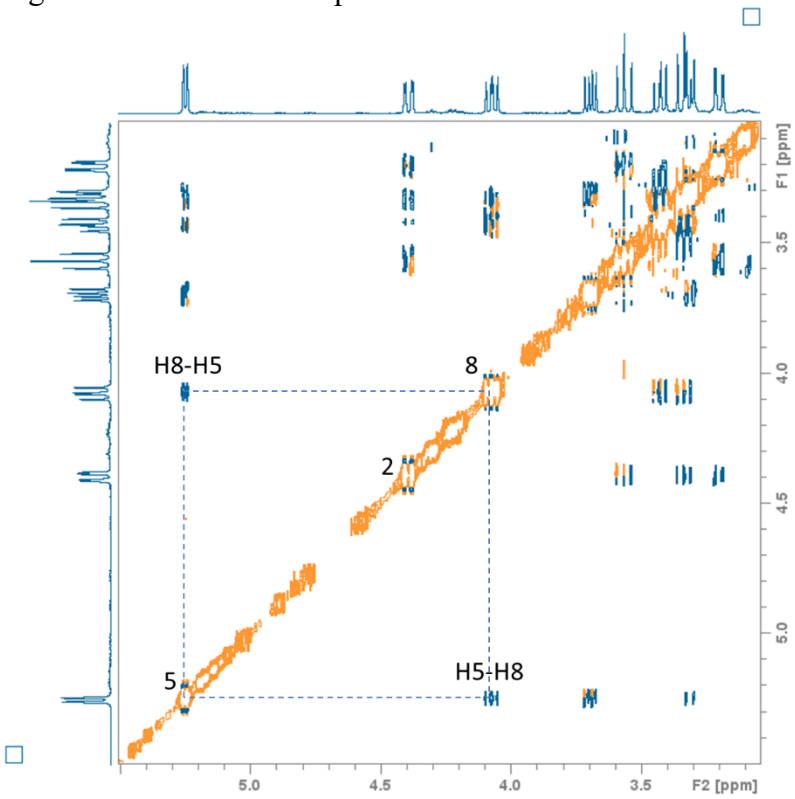
Figure S15: 2D NOESY spectra of **1b**

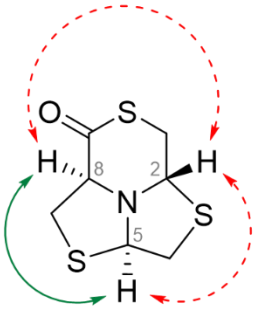




1b
(*2R,5R,8R*)

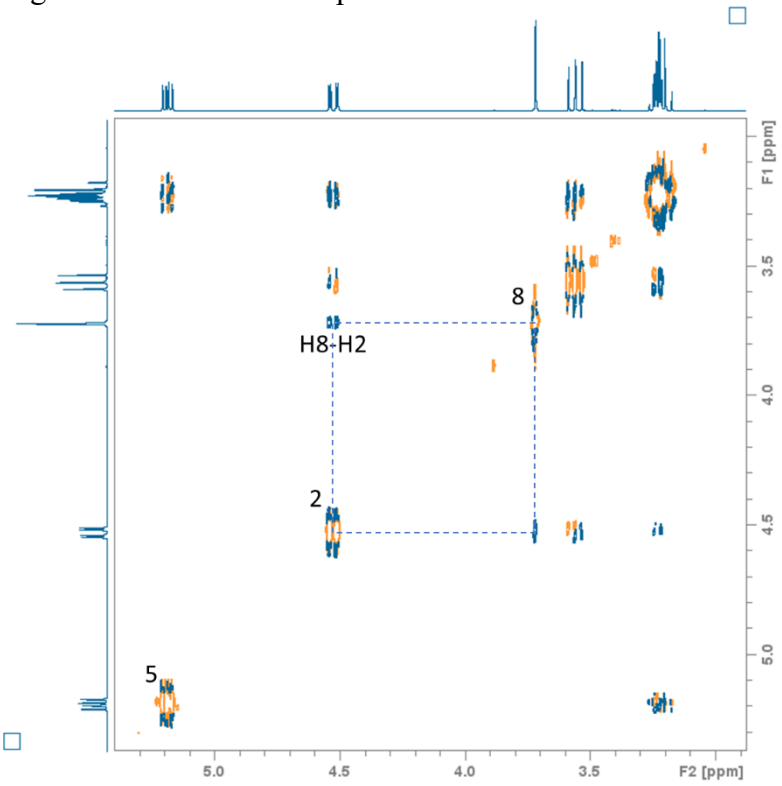
Figure S16: 2D NOESY spectra of **1c**

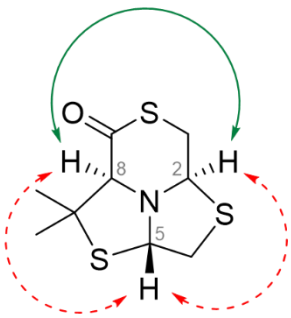




1c
(*2S,5R,8R*)

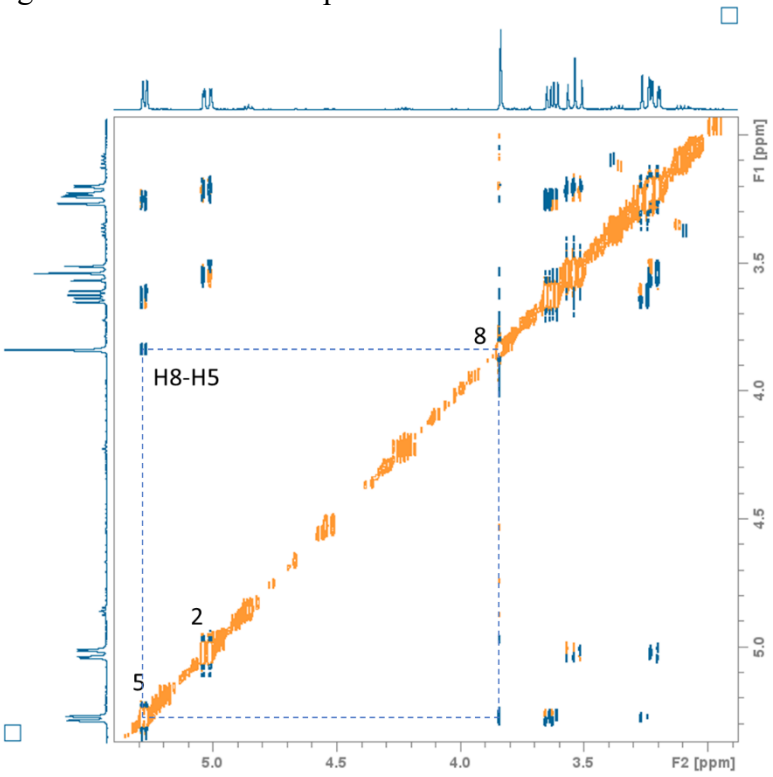
Figure S17: 2D NOESY spectra of **4a**

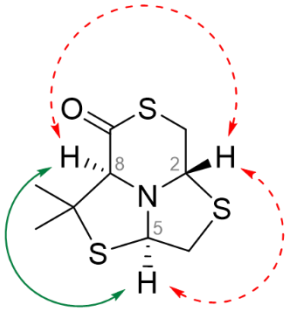




4a
(*2R,5S,8R*)

Figure S18: 2D NOESY spectra of **4c**





4c
(*2S,5R,8R*)

VI. Isomerization studies of δ–thiolactones 1

Figure S19: ^{1}H-NMR of time samples of isomerization reaction from **1a** to **1c** under DIPEA and microwave conditions.

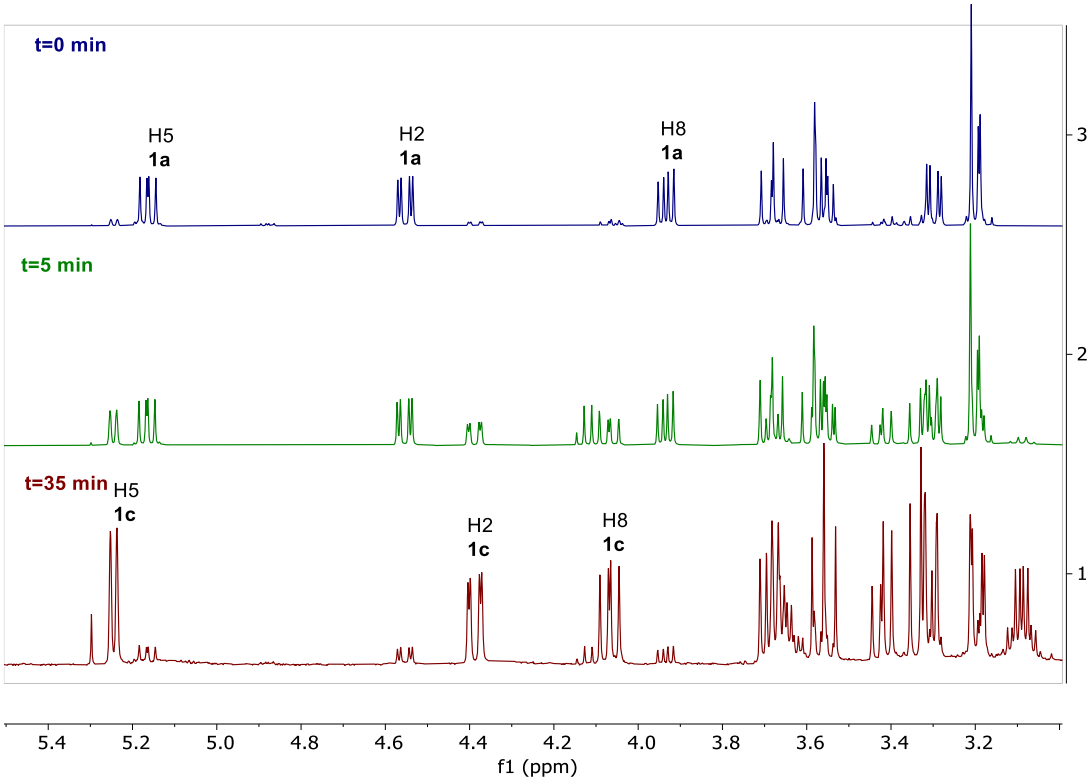
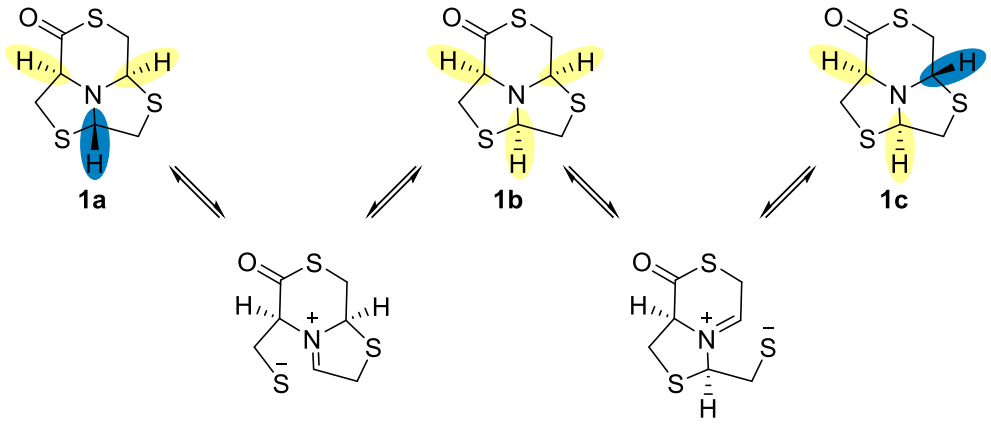


Figure S20: Proposed mechanism for the interconversion of thiolactone 1a to 1c though thiazolidine's ring opening and closing.



VII. NMR Spectra of δ-thiolactones opening products 5a-d, 6a-d, 8a, 9a-b and 10a-b

Figure S21: ^{1}H-NMR of **5a** in $CDCl_3$ (400 MHz)

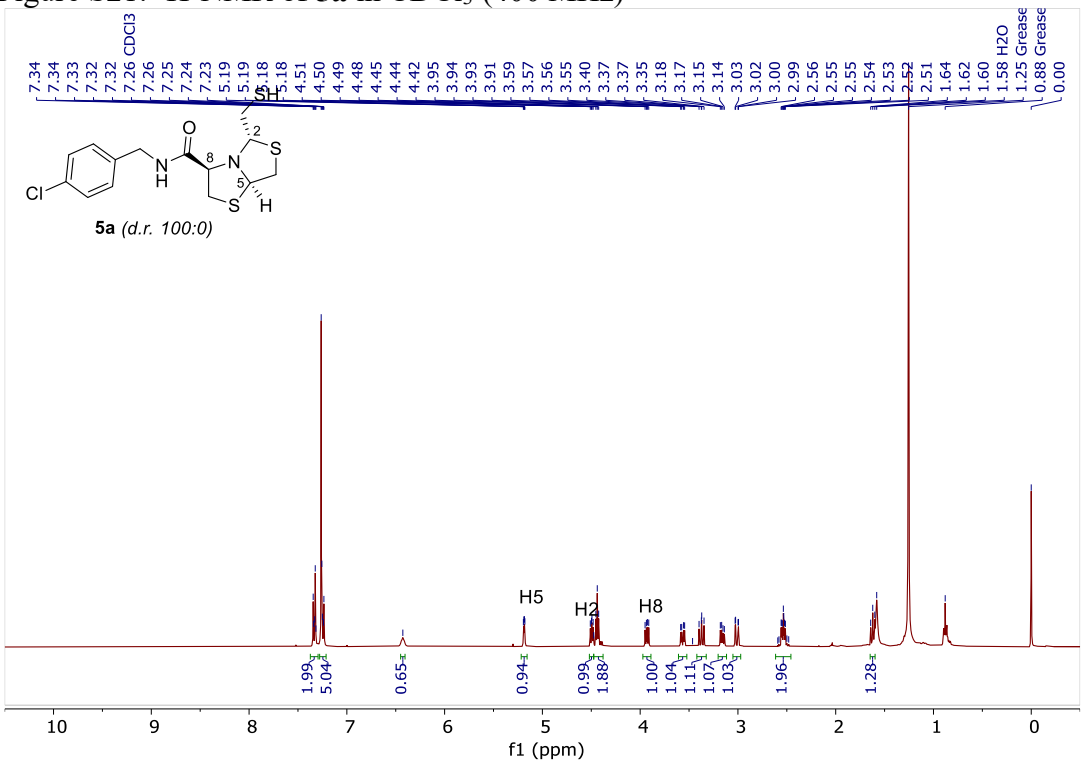


Figure S22: 13C-NMR of 5a in CDCl3 (101 MHz)

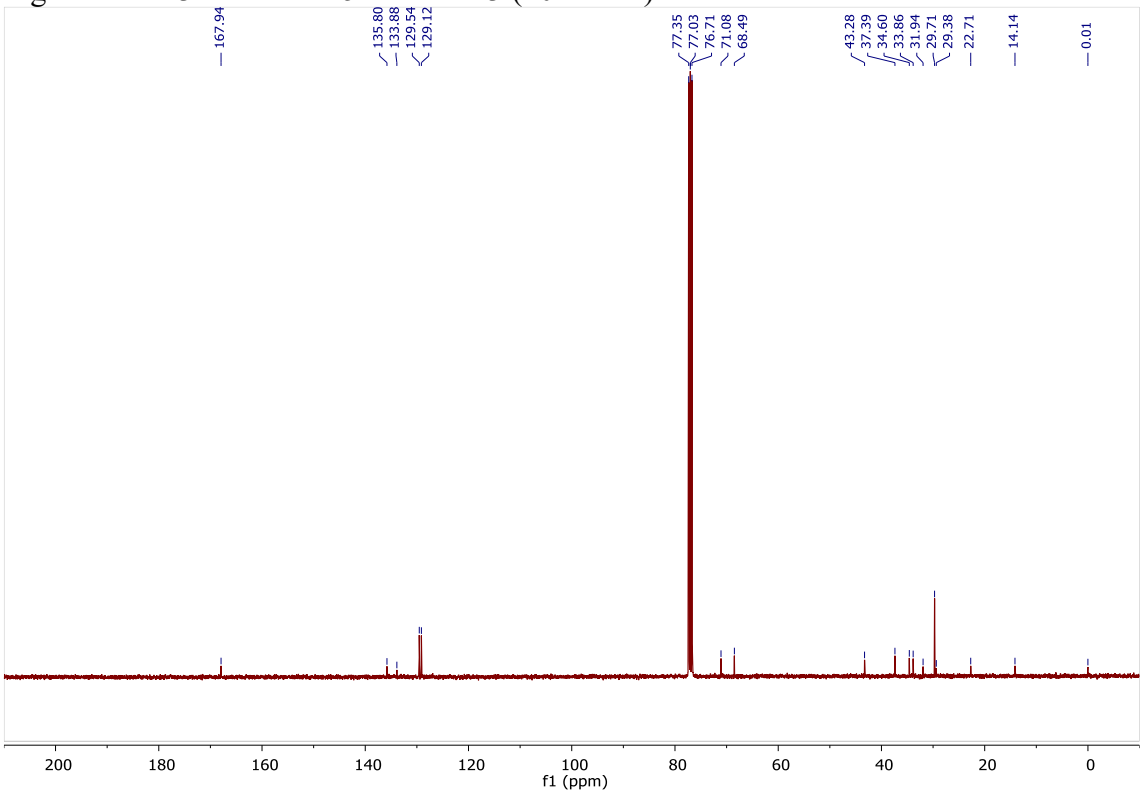


Figure S23: 2D NOESY NMR of **5a** in $CDCl_3$

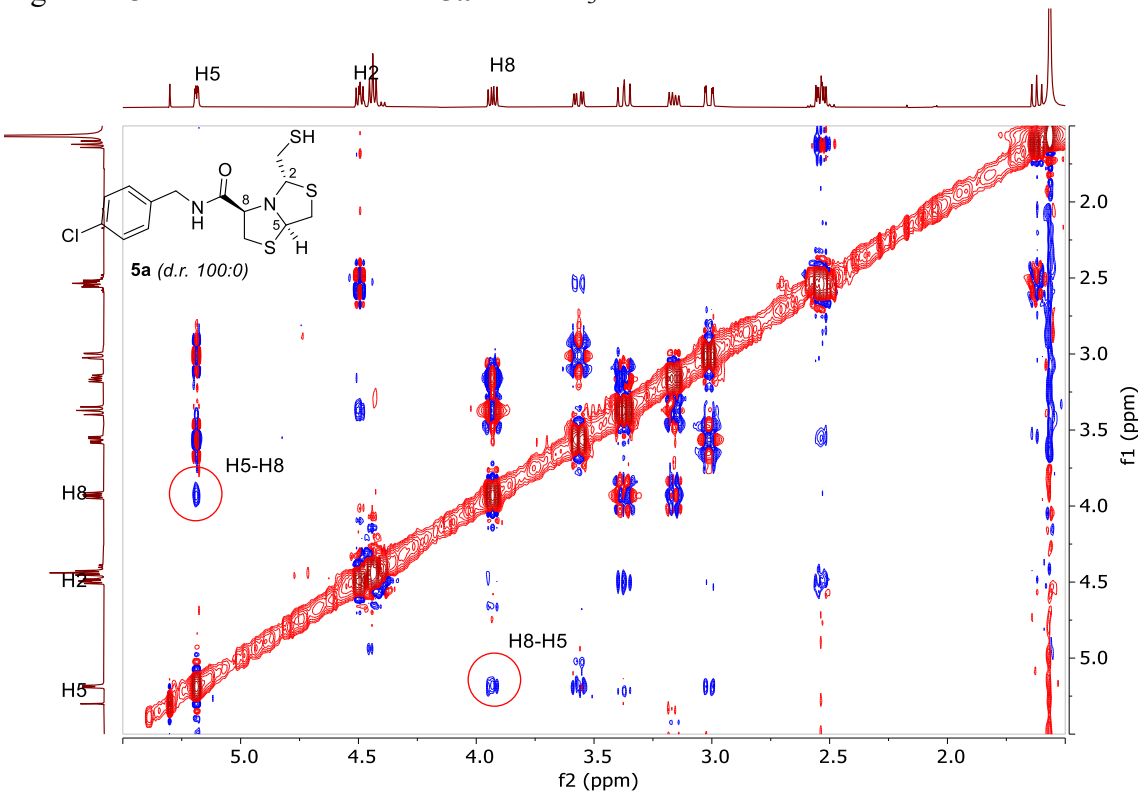


Figure S24: 1H-NMR of 5b in CDCl3 (400 MHz)

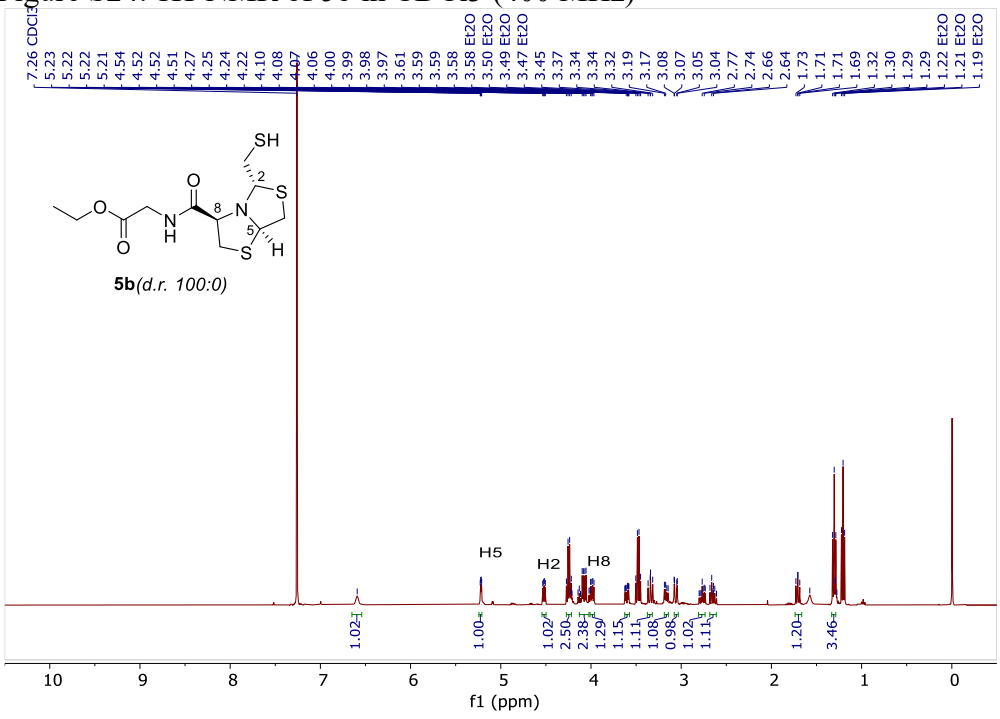


Figure S25: ^{13}C-NMR of **5b** in $CDCl_3$ (400 MHz) (the appearance of a second diastereomer could be observed)

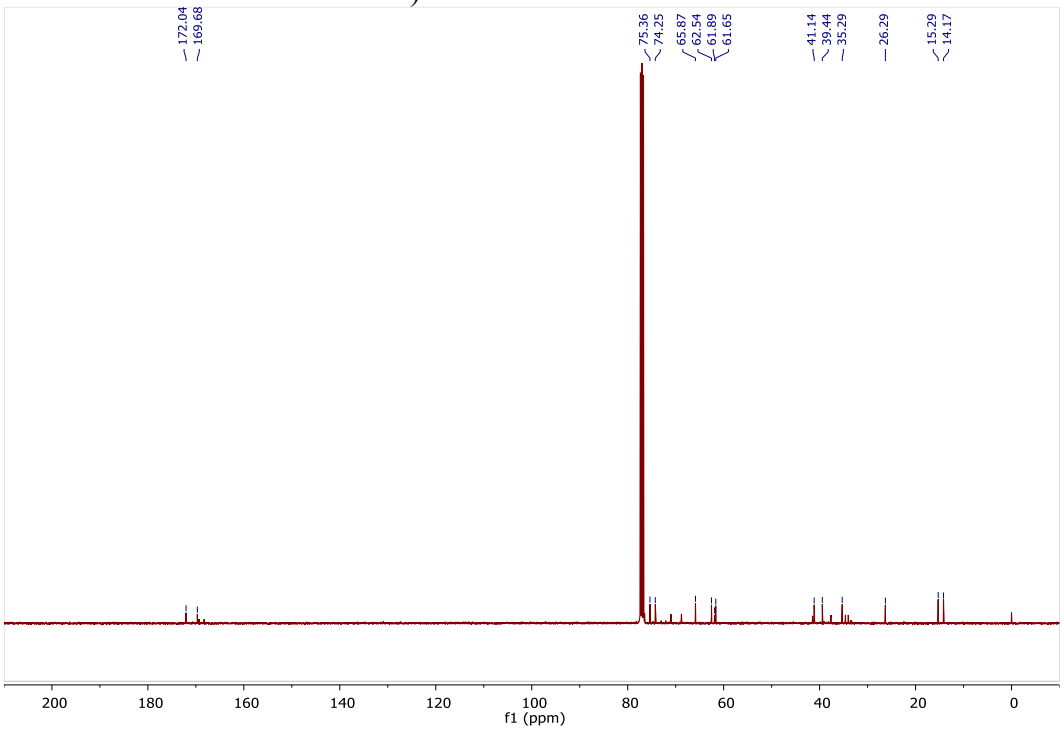


Figure S26: ^{1}H-NMR of **5b** in $CDCl_3$ after 24 h and removal of trace solvent (400 MHz)

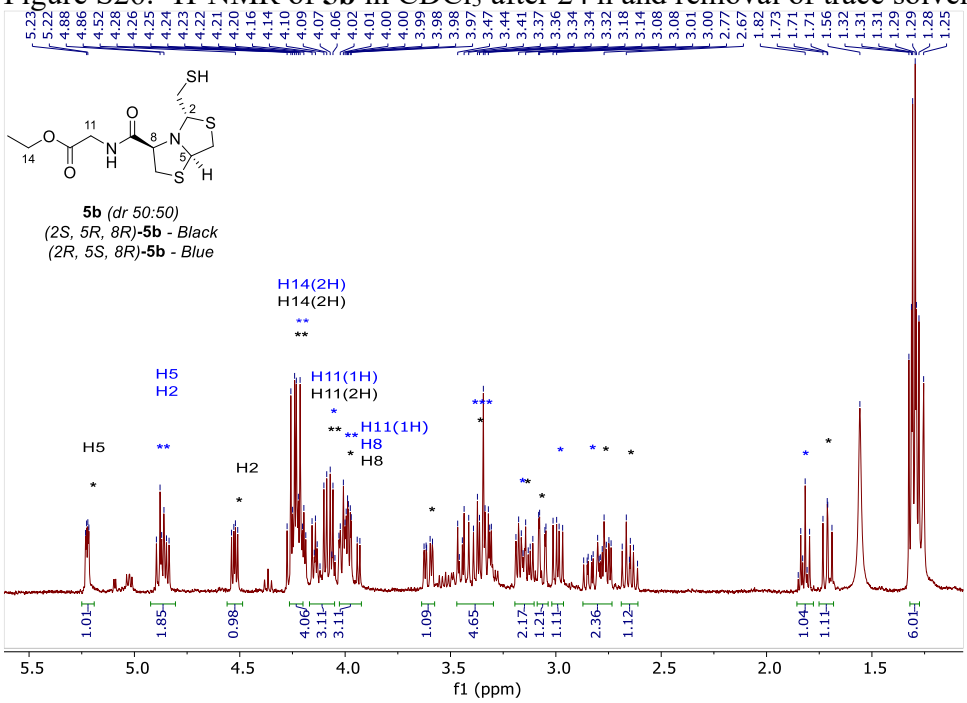


Figure S27: HSQC of diasteromers of 5b in CDCl3 (after 24 h)

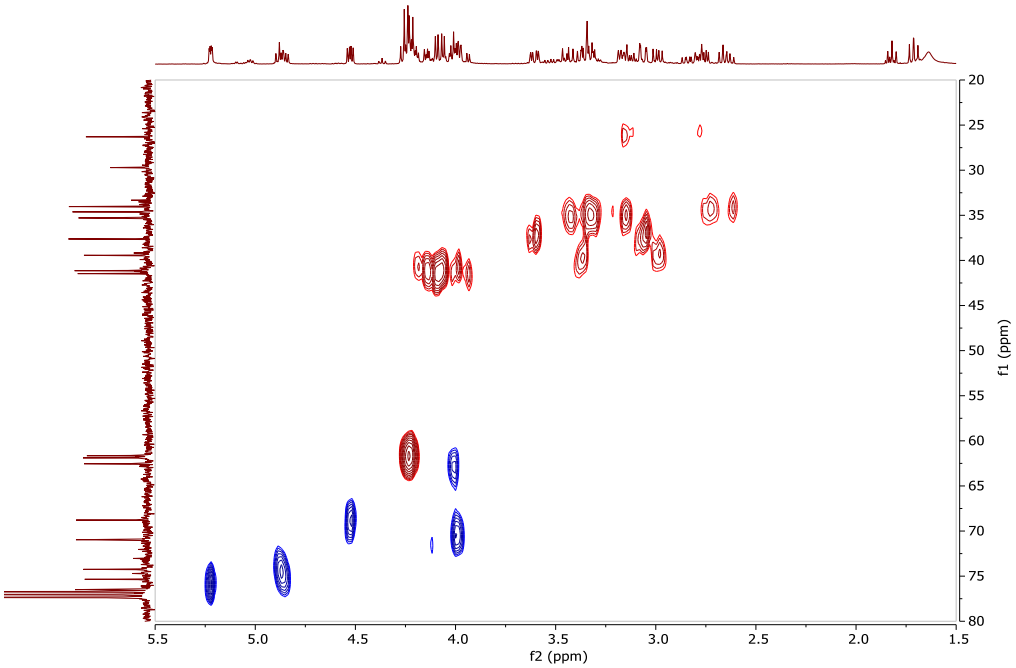


Figure S28: ^{13}C-NMR of diasteromers of **5b** in $CDCl_3$ after 24 h (400 MHz)

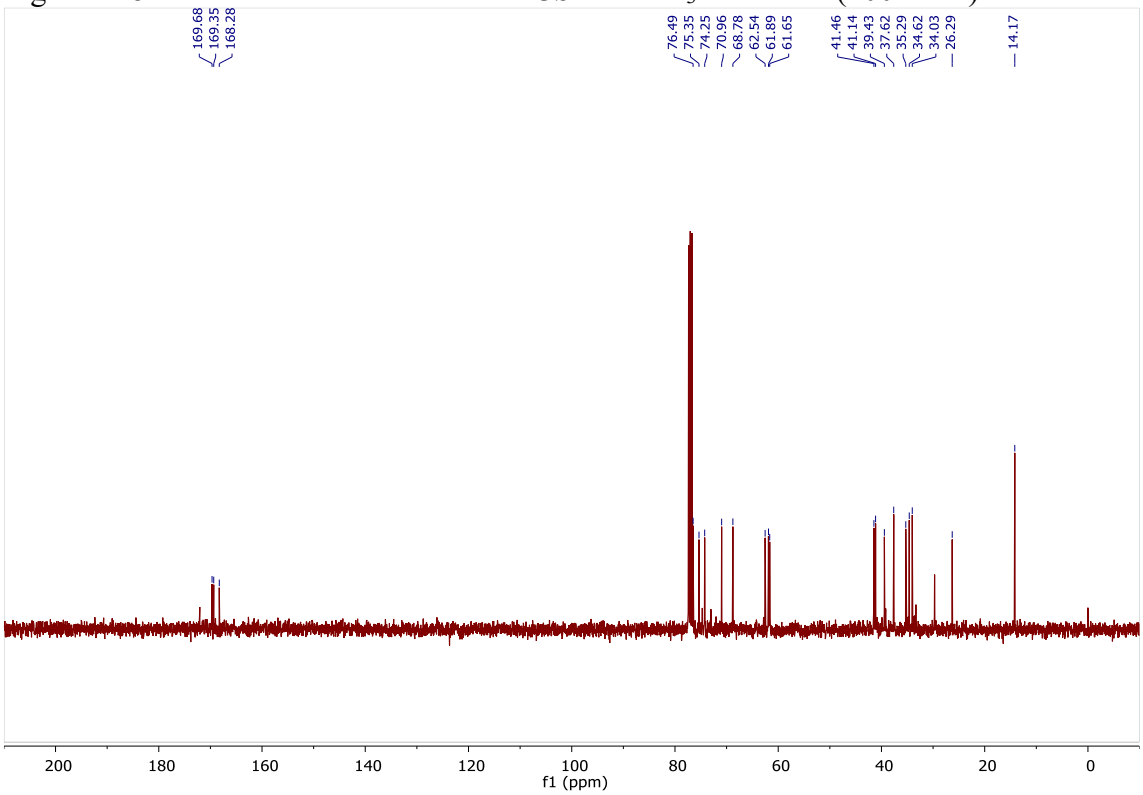


Figure S29: ^{1}H-NMR of **5c** in $CDCl_3$ (400 MHz)

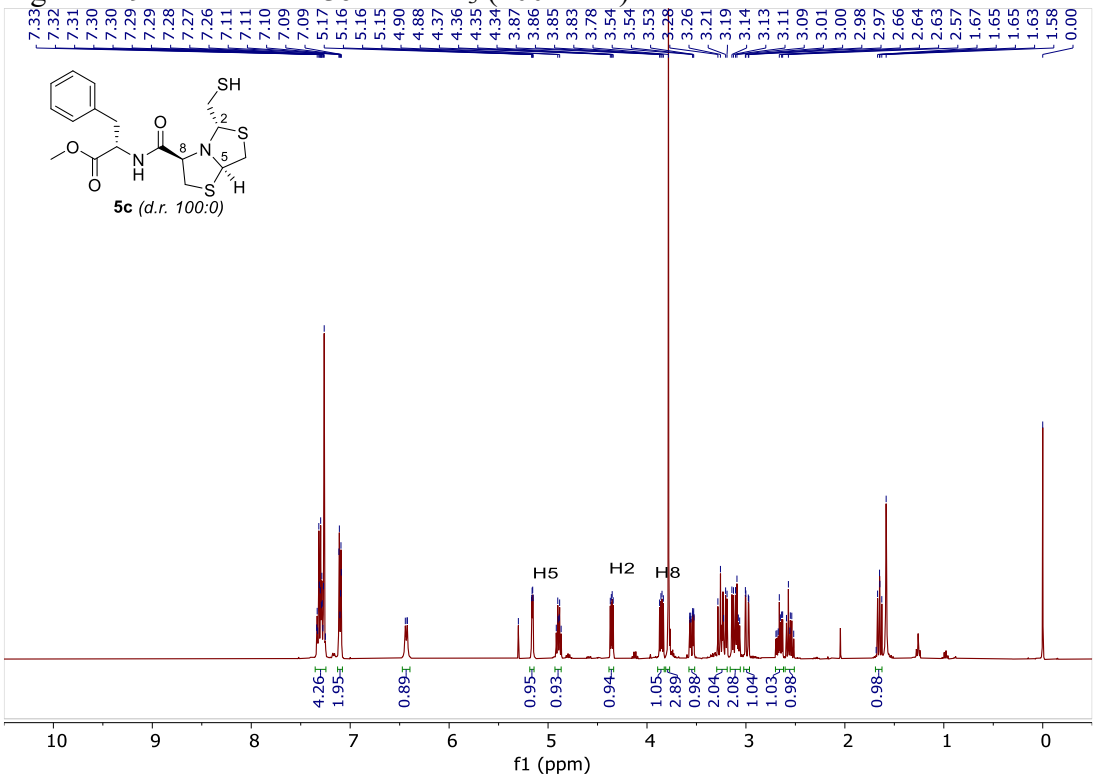


Figure S30: 13C-NMR of 5c in CDCl3 (400 MHz)

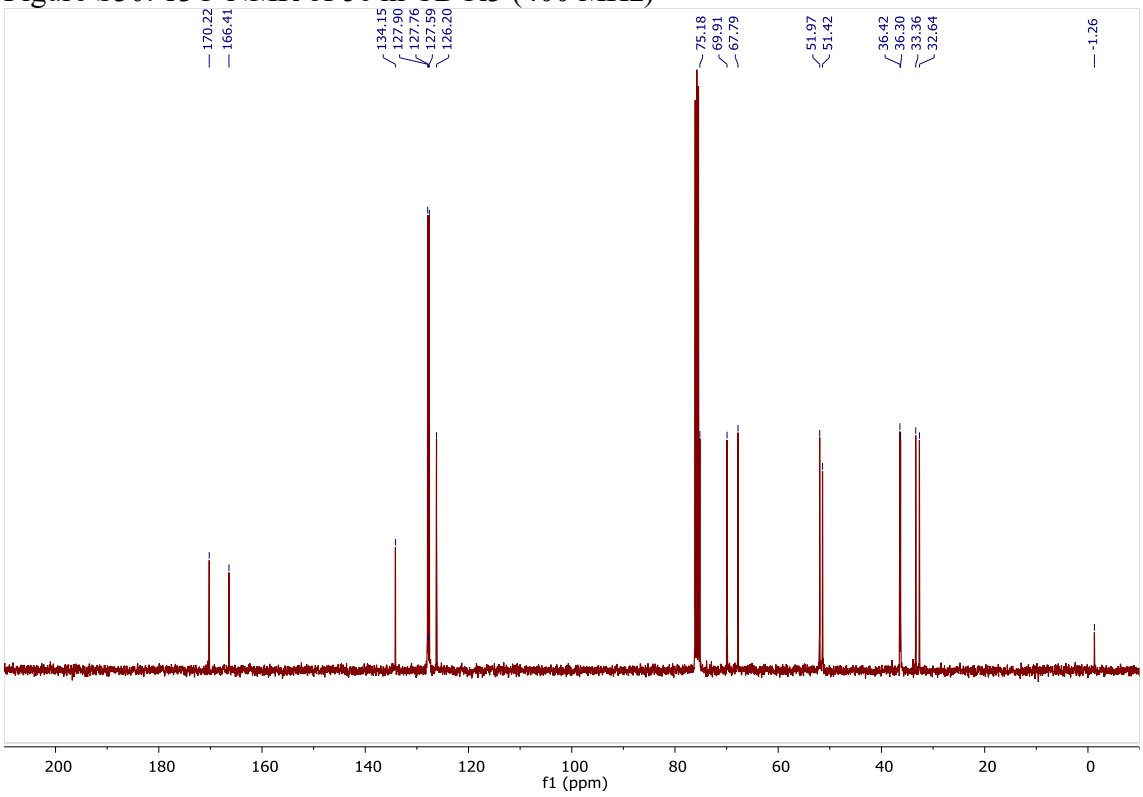


Figure S31: 2D NOESY NMR of **5c** in $CDCl_3$

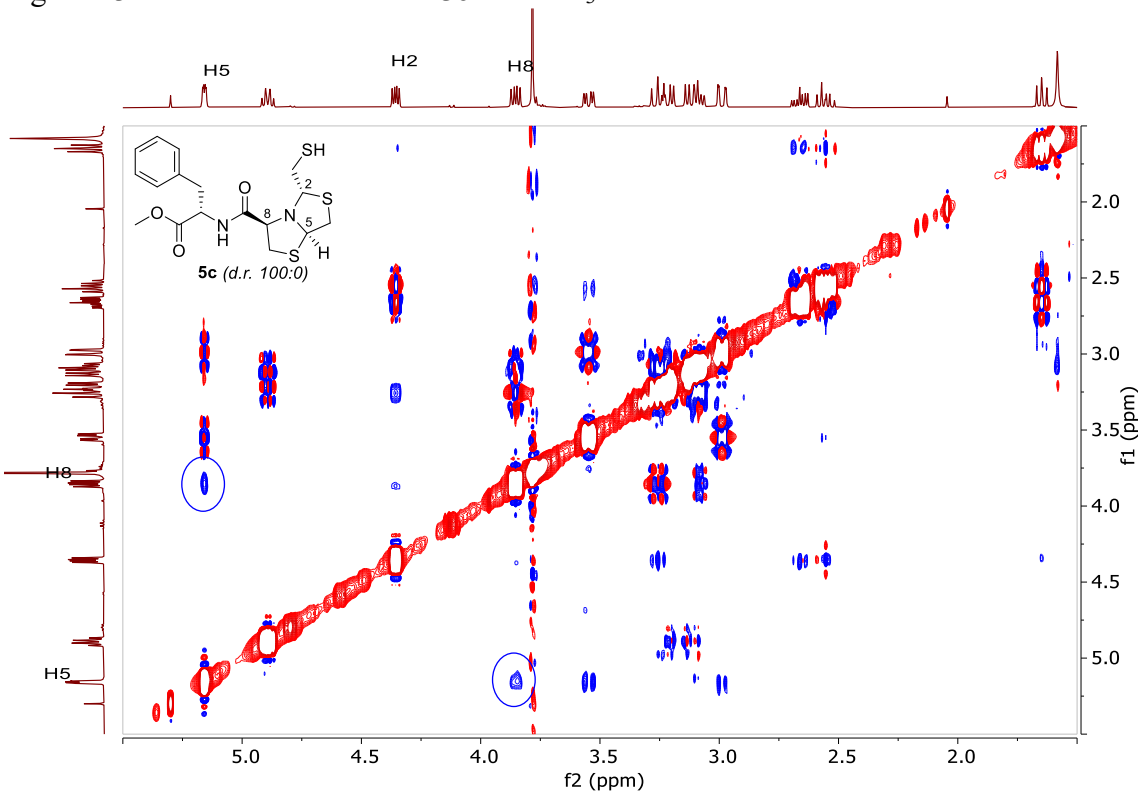


Figure S32: ^{1}H-NMR of **5d** in $CDCl_3$ (400 MHz)

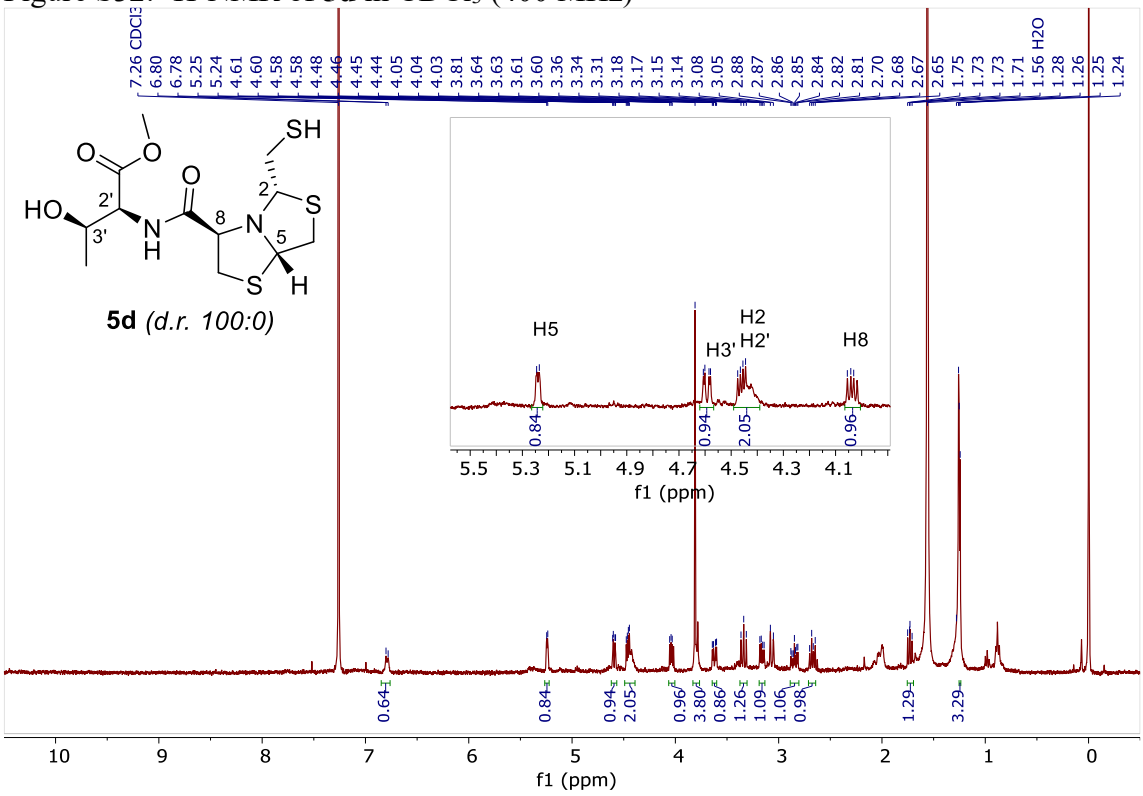


Figure S33: ^{13}C-NMR of **5d** in $CDCl_3$ (400 MHz)

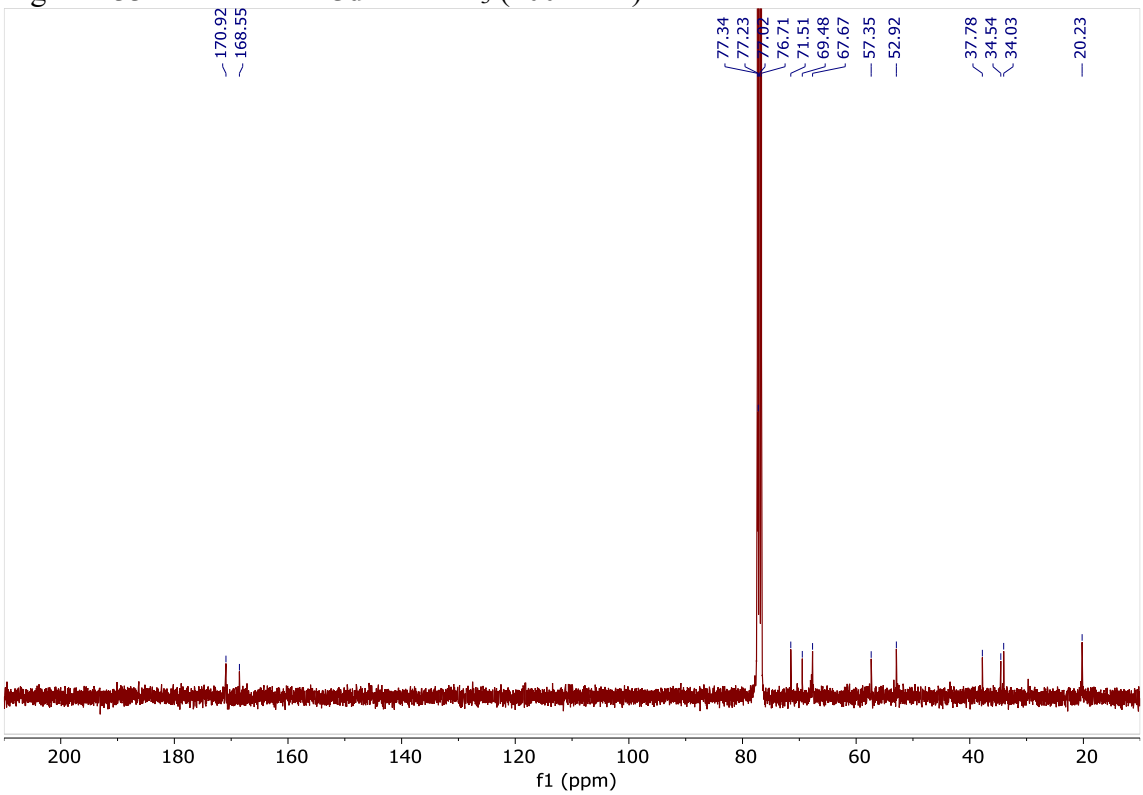


Figure S34: ^{1}H-NMR of **6a** in $CDCl_3$ (400 MHz)

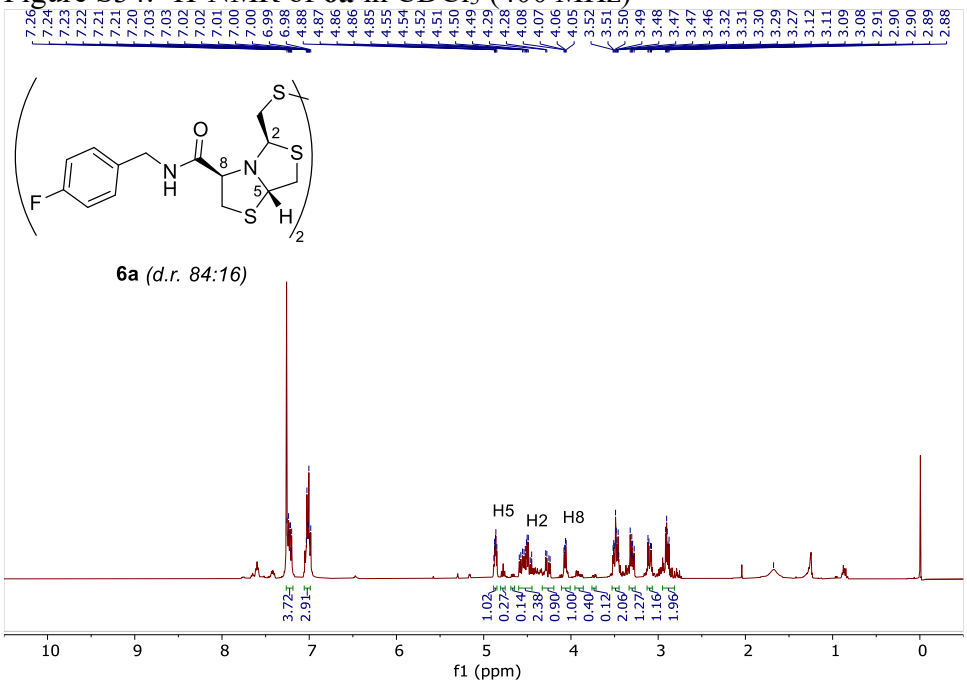


Figure S35: ^{13}C-NMR of **6a** in $CDCl_3$ (101 MHz)

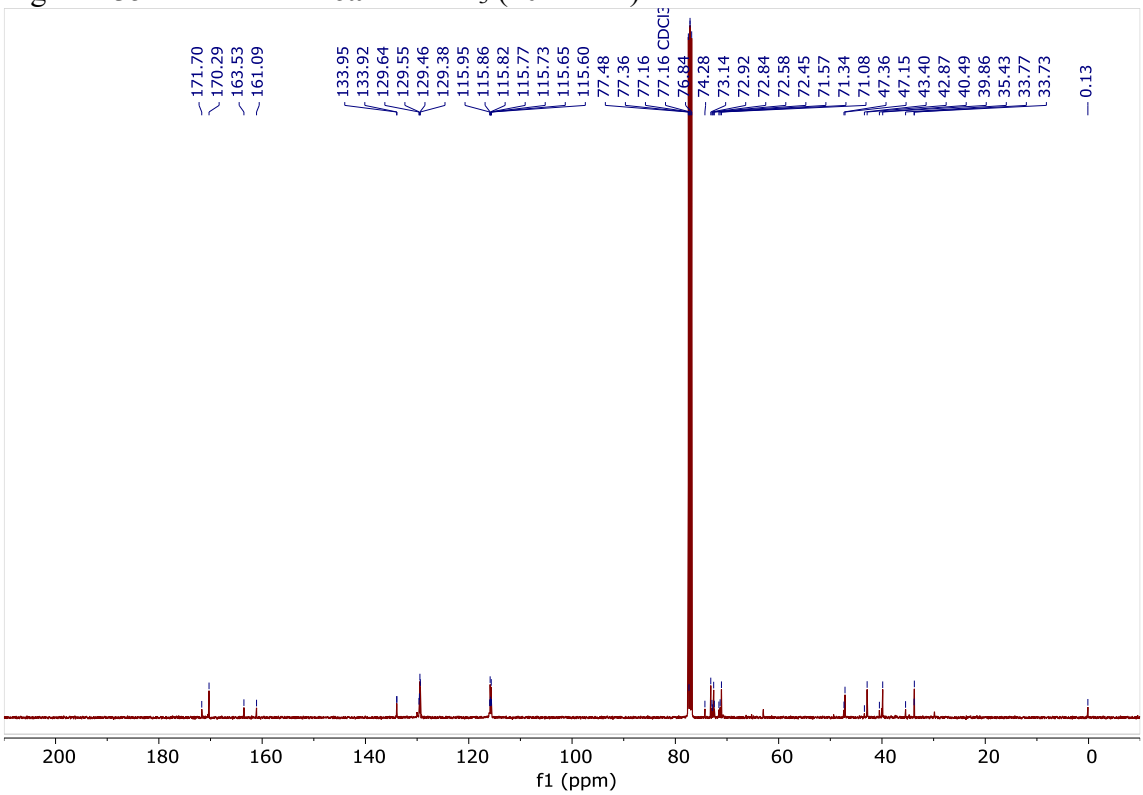


Figure S36: 1D NOESY NMR of **6a** in $CDCl_3$

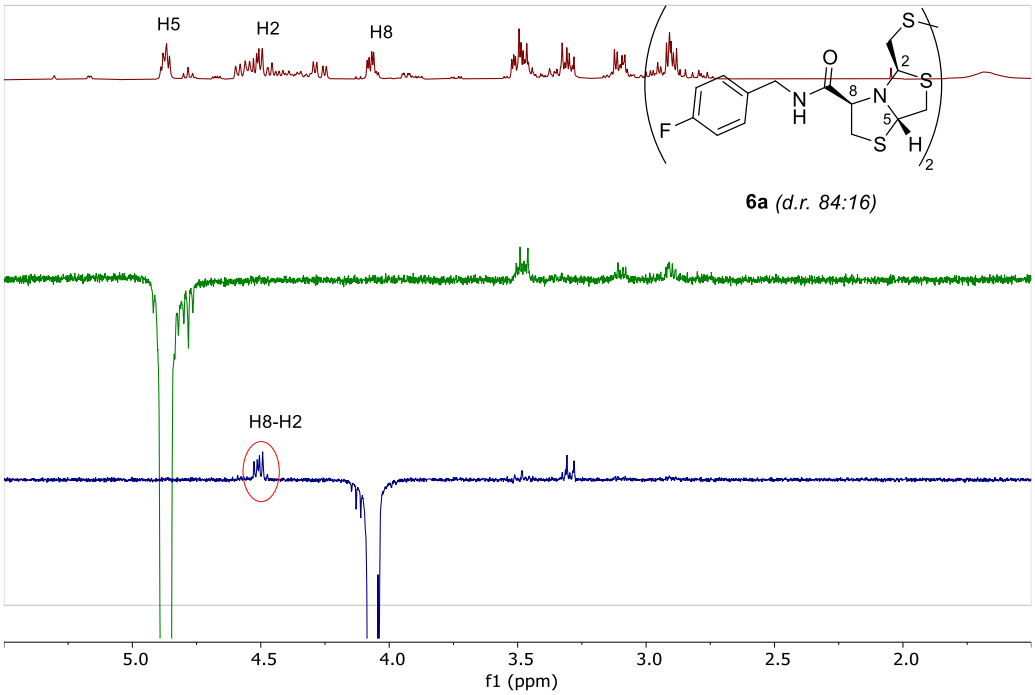


Figure S37: ^{1}H-NMR of **6b** in $CDCl_3$ (400 MHz)

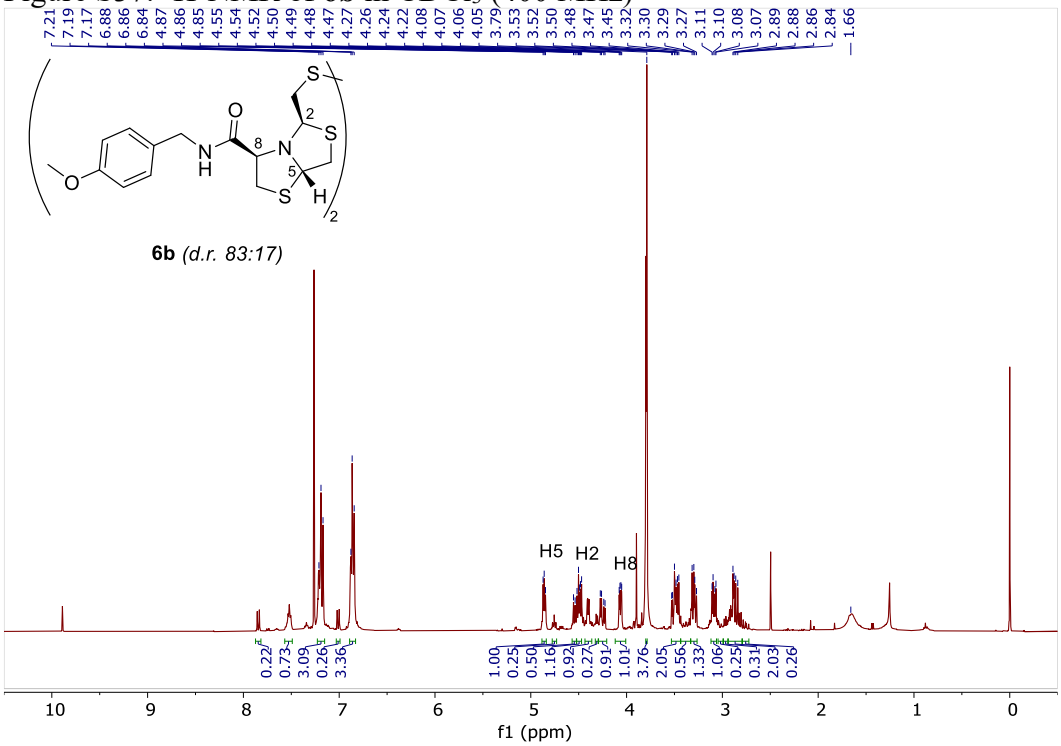


Figure S38: ^{13}C-NMR of **6b** in $CDCl_3$ (101 MHz)

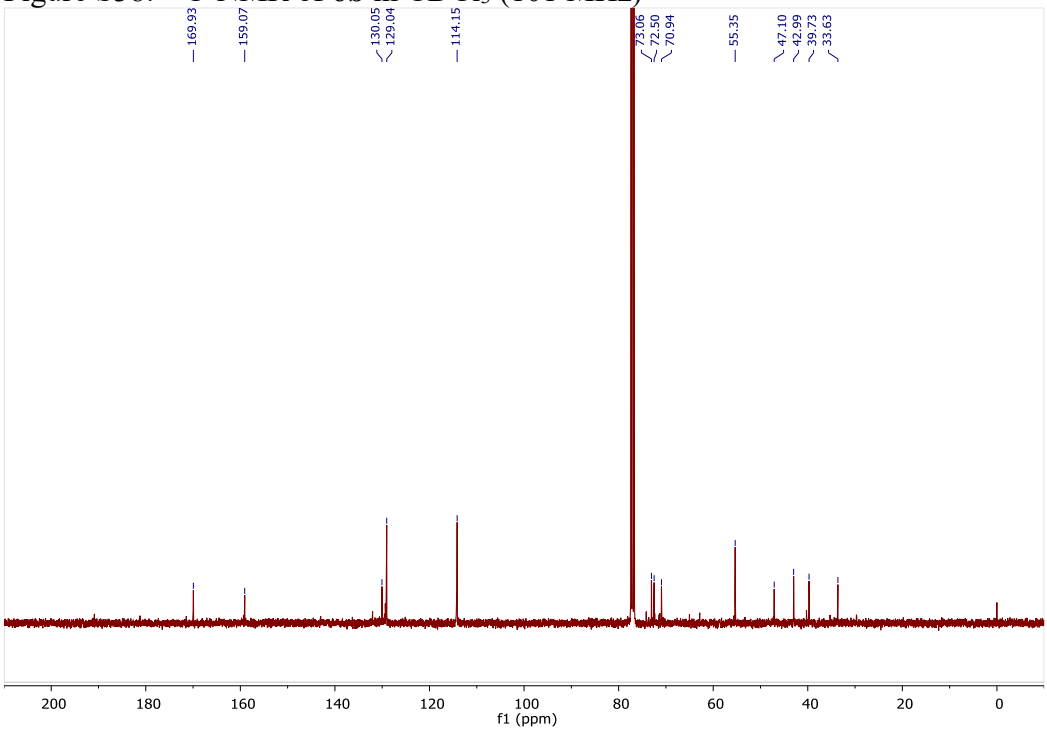


Figure S39: 1D NOESY NMR of **6b** in $CDCl_3$

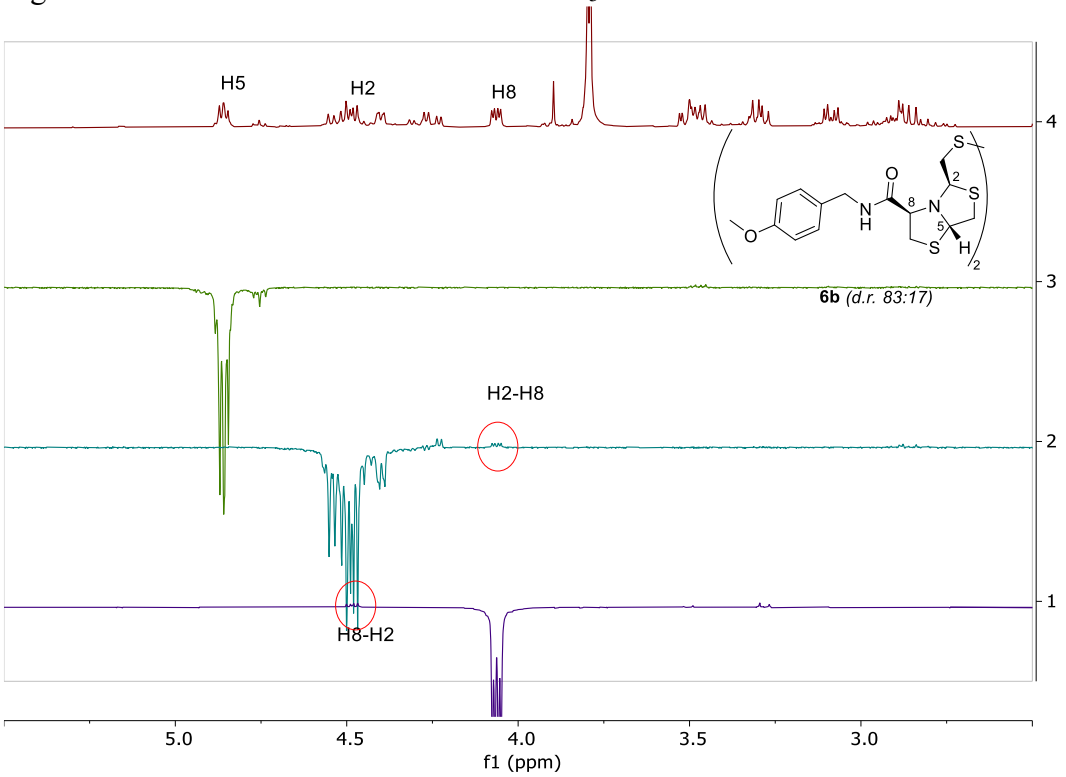


Figure S40: ^{1}H-NMR of **6c** in $CDCl_3$ (400 MHz)

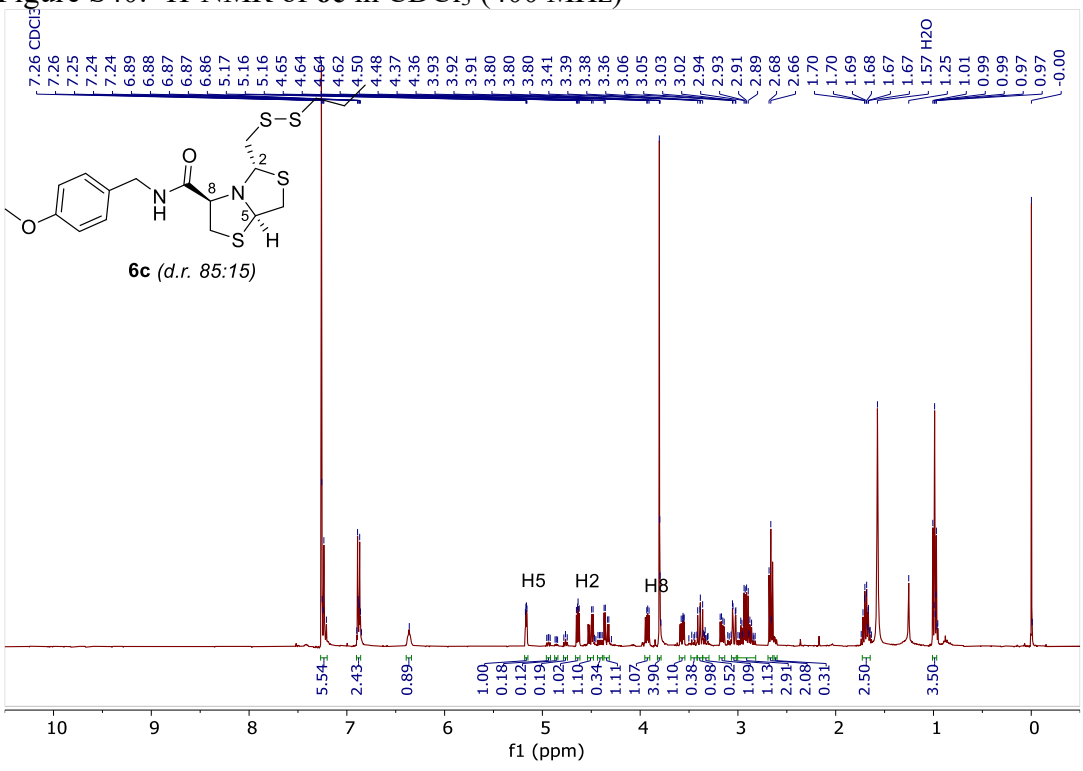


Figure S41: ^{13}C-NMR of **6c** in $CDCl_3$ (101 MHz)

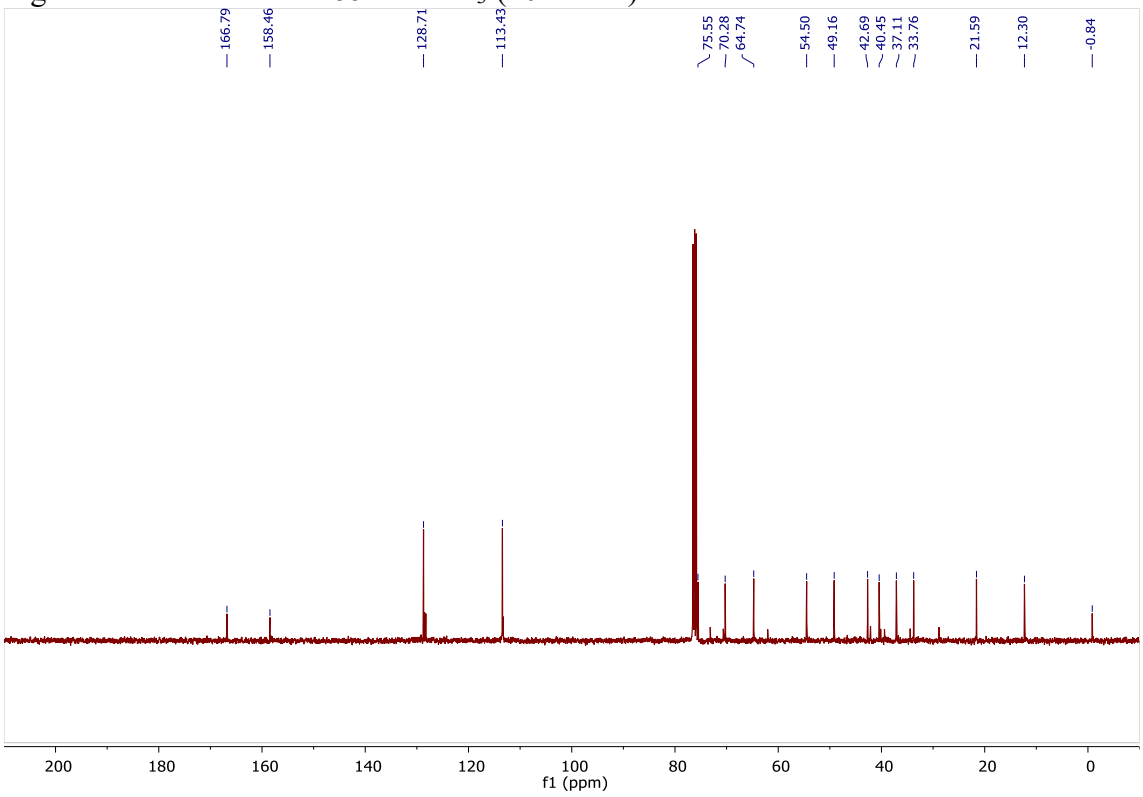


Figure S42: 1D NOESY NMR of **6c** in $CDCl_3$

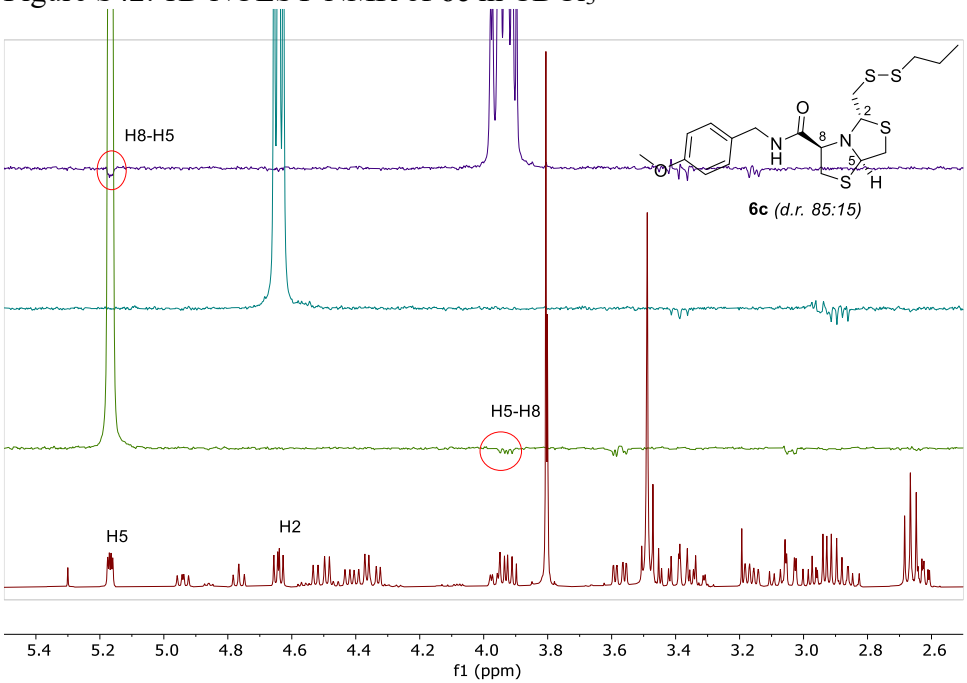


Figure S43: ^{1}H-NMR of **6d** idn $CDCl_3$ (400 MHz)

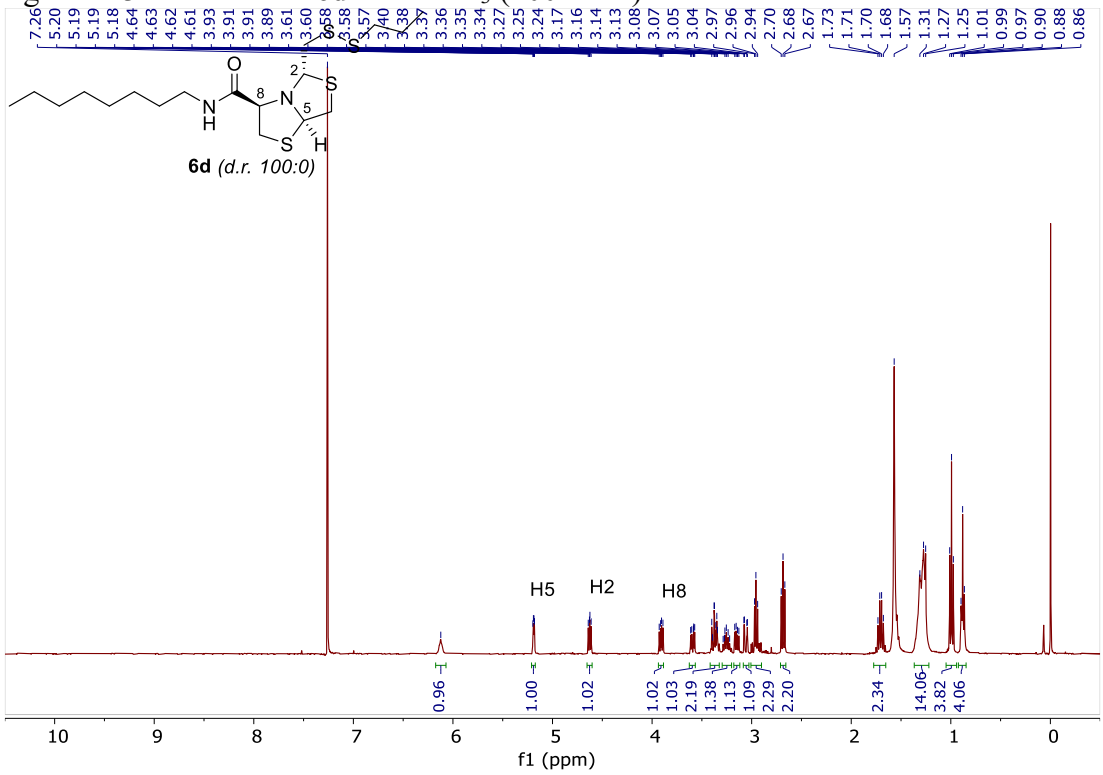


Figure S44: ^{13}C-NMR of **6d** in $CDCl_3$ (101 MHz)

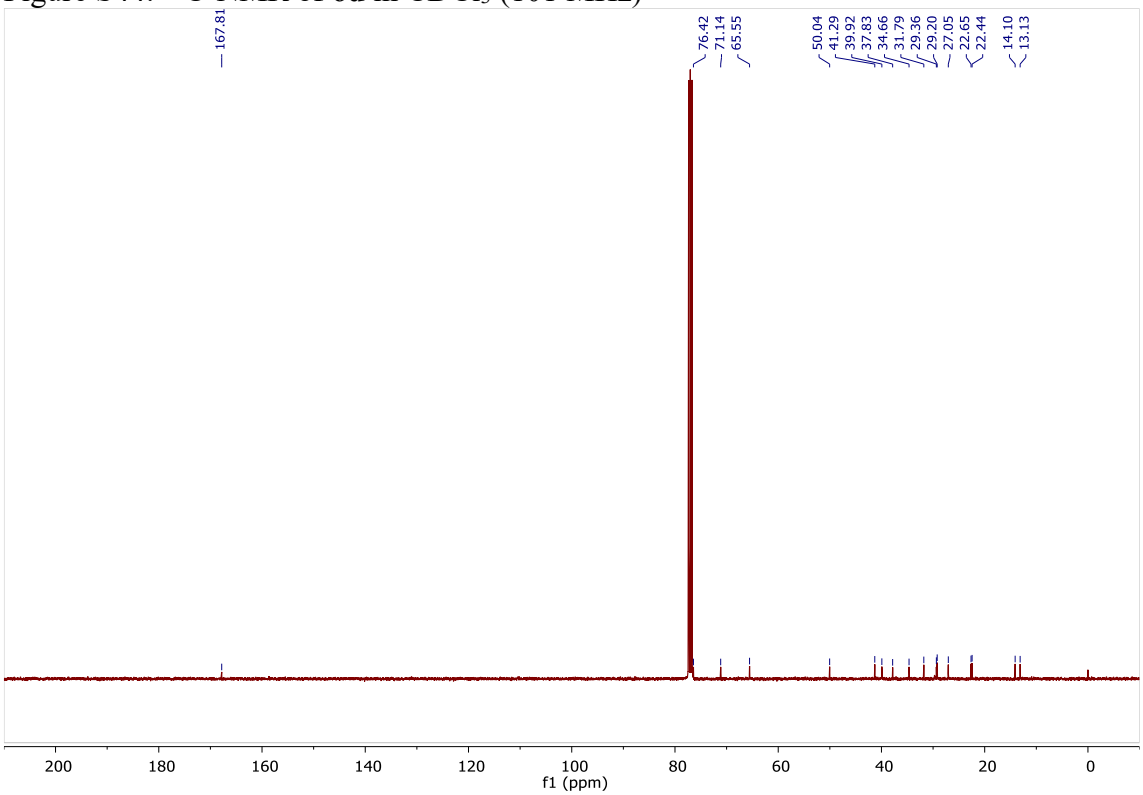


Figure S45: 2D NOESY NMR of **6d** in $CDCl_3$

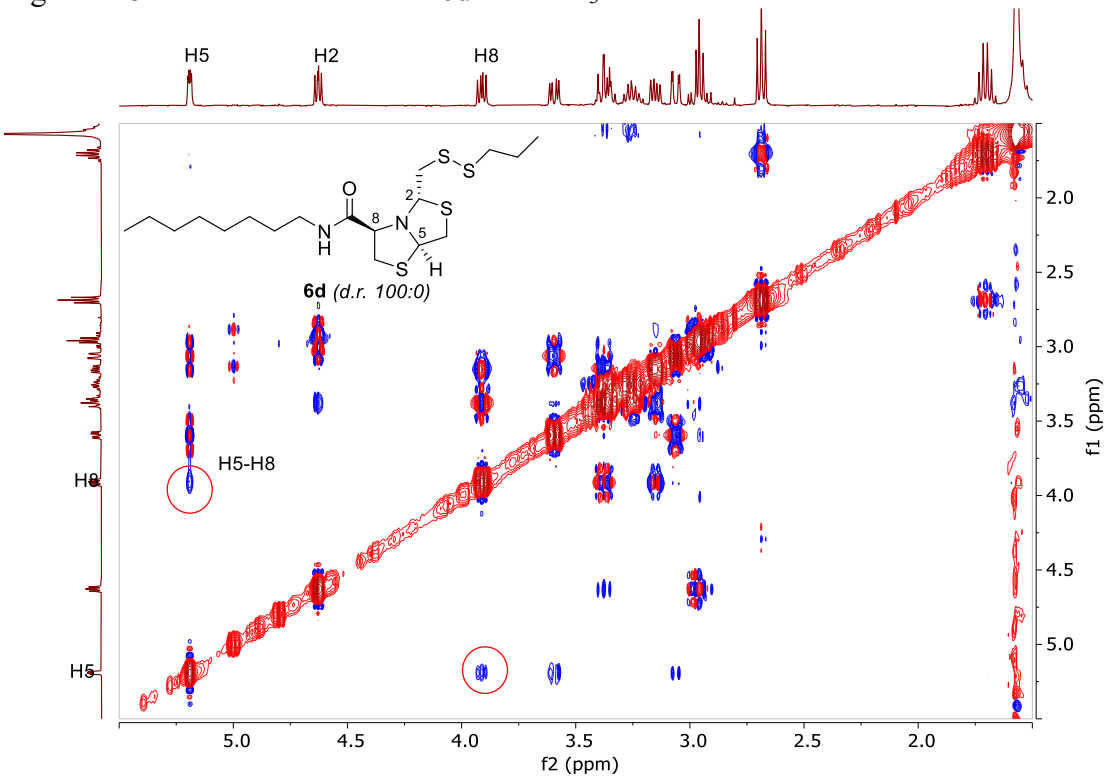


Figure S46: ^{1}H-NMR of **6e** in $CDCl_3$ (400 MHz)

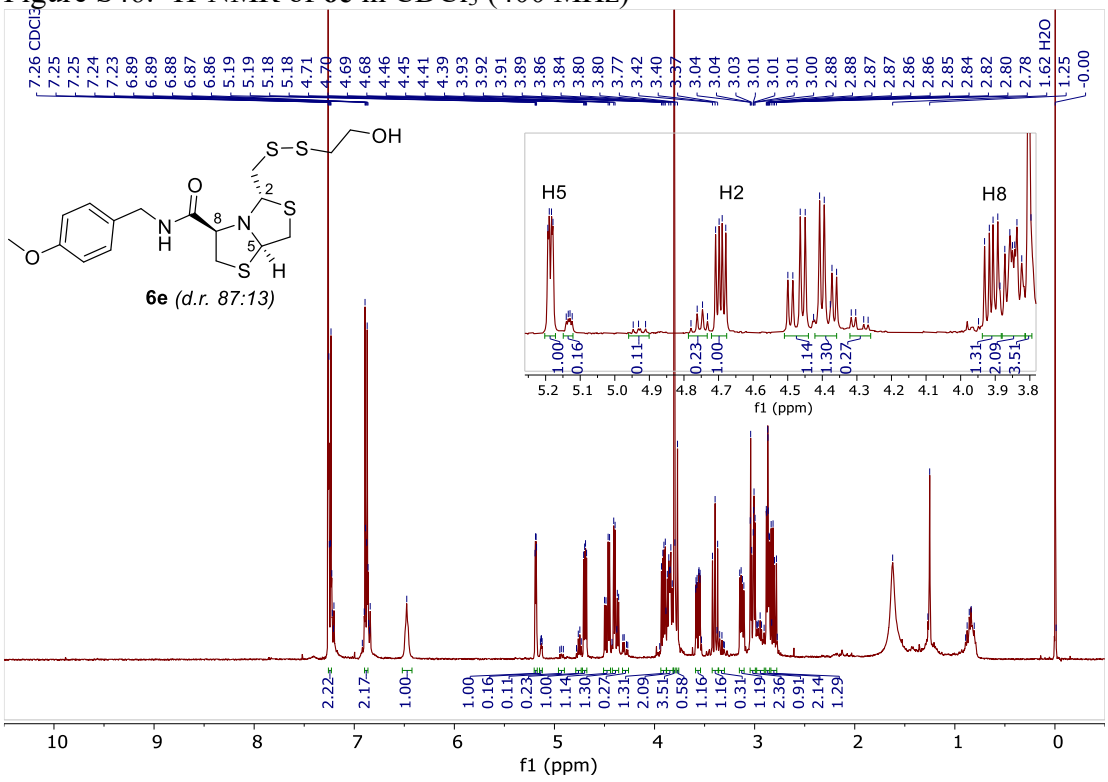


Figure S47: ^{13}C-NMR of **6e** in $CDCl_3$ (101 MHz)

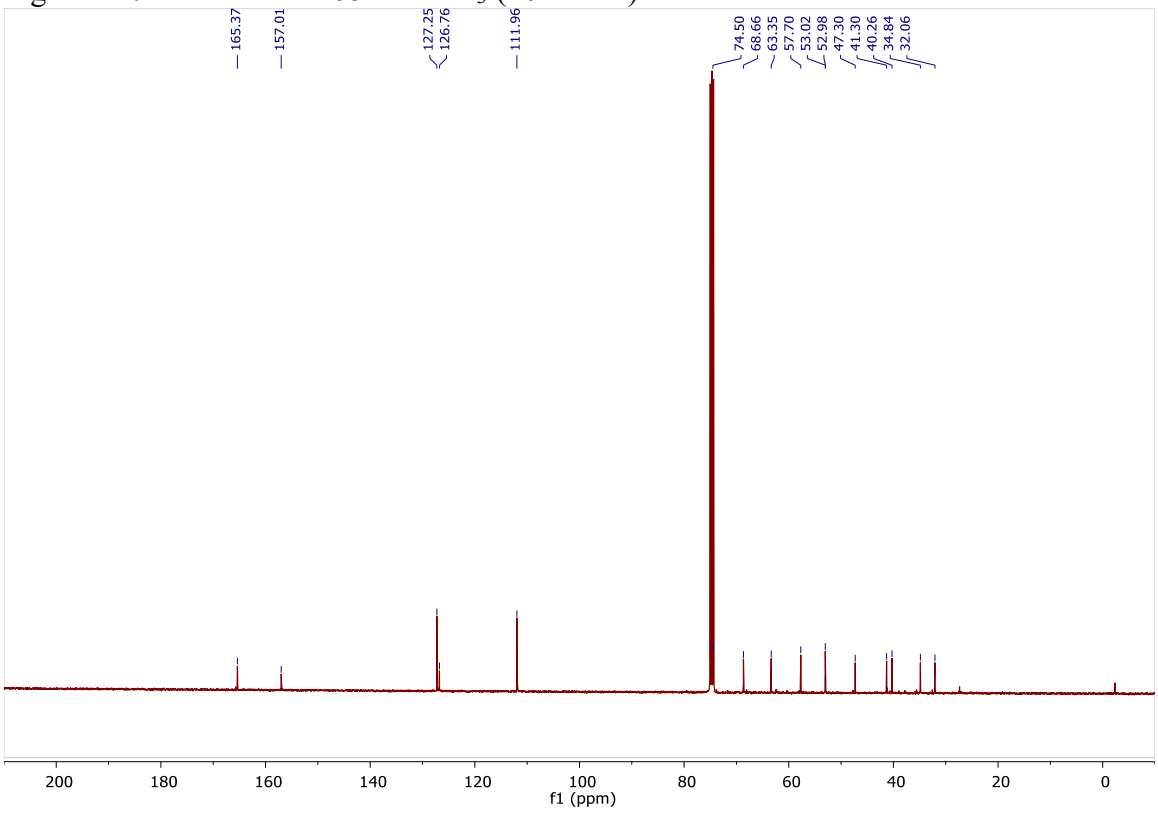


Figure S48: 2D NOESY NMR of **6e** in $CDCl_3$

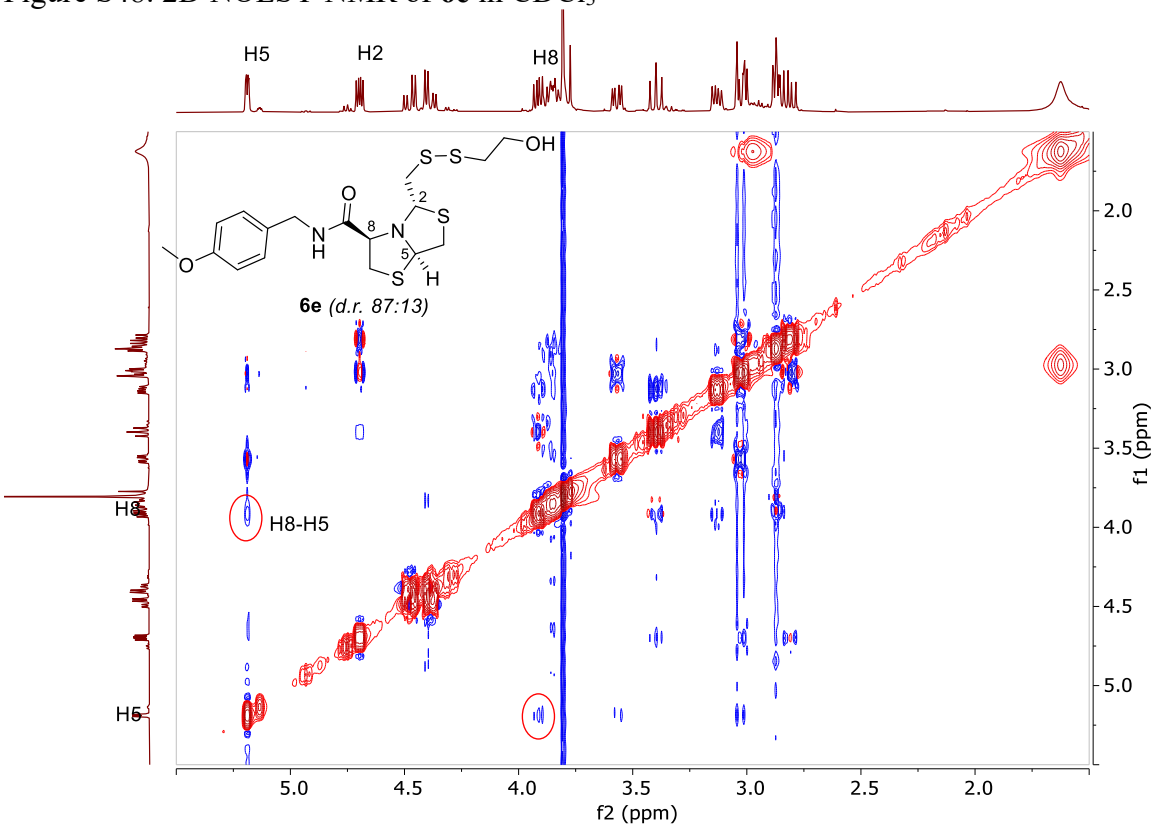


Figure S49: ^{1}H-NMR of **8a** in $CDCl_3$ (400 MHz)

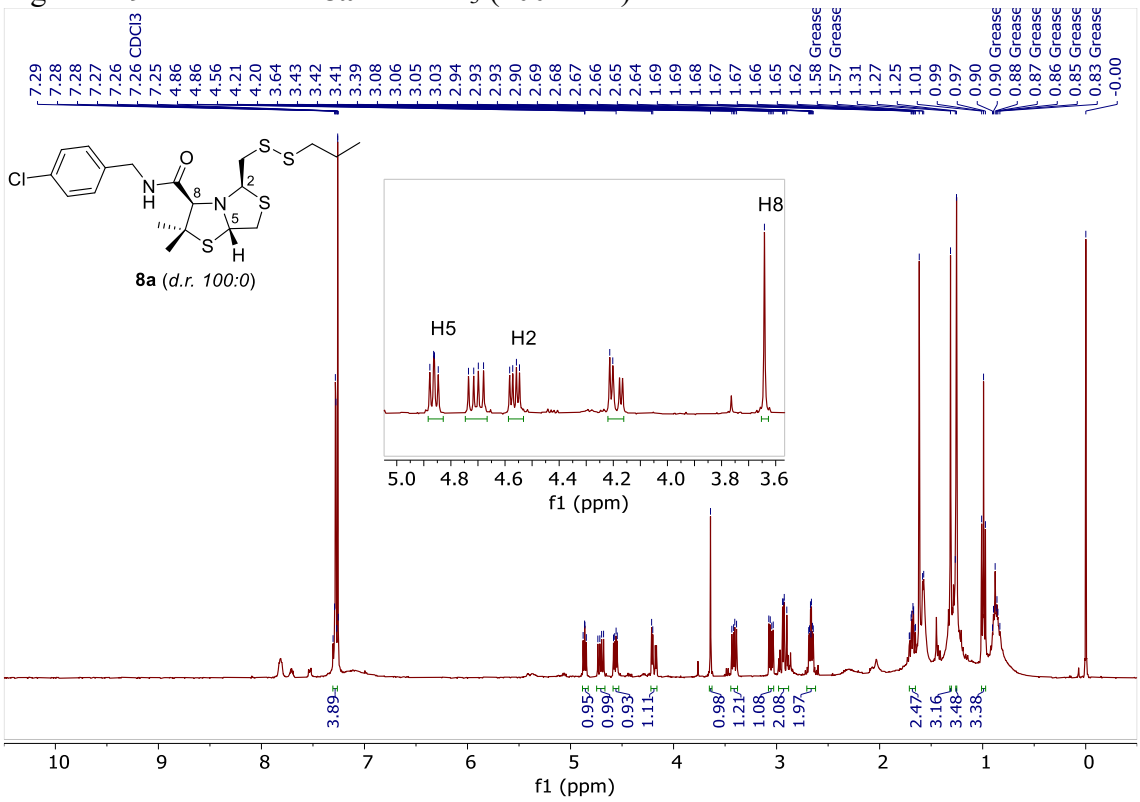


Figure S50: ^{13}C-NMR of **8a** in $CDCl_3$ (101 MHz)

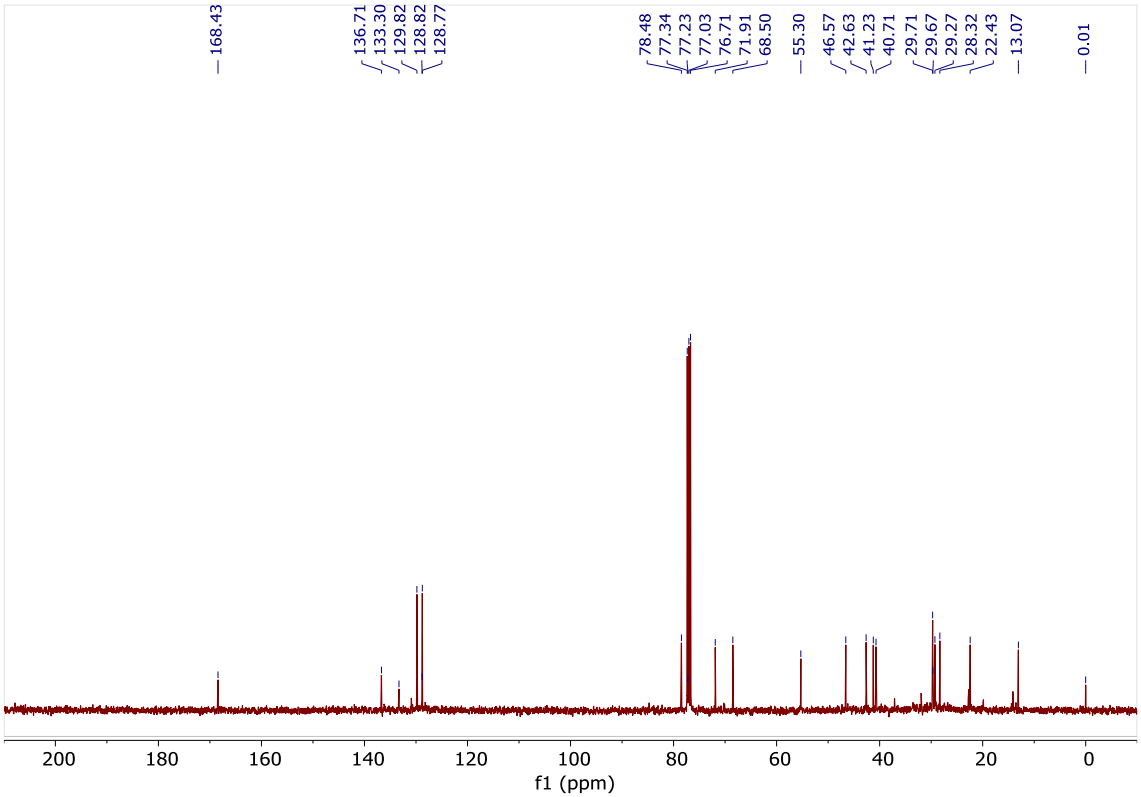


Figure S51: 2D NOESY NMR of **8a** in $CDCl_3$

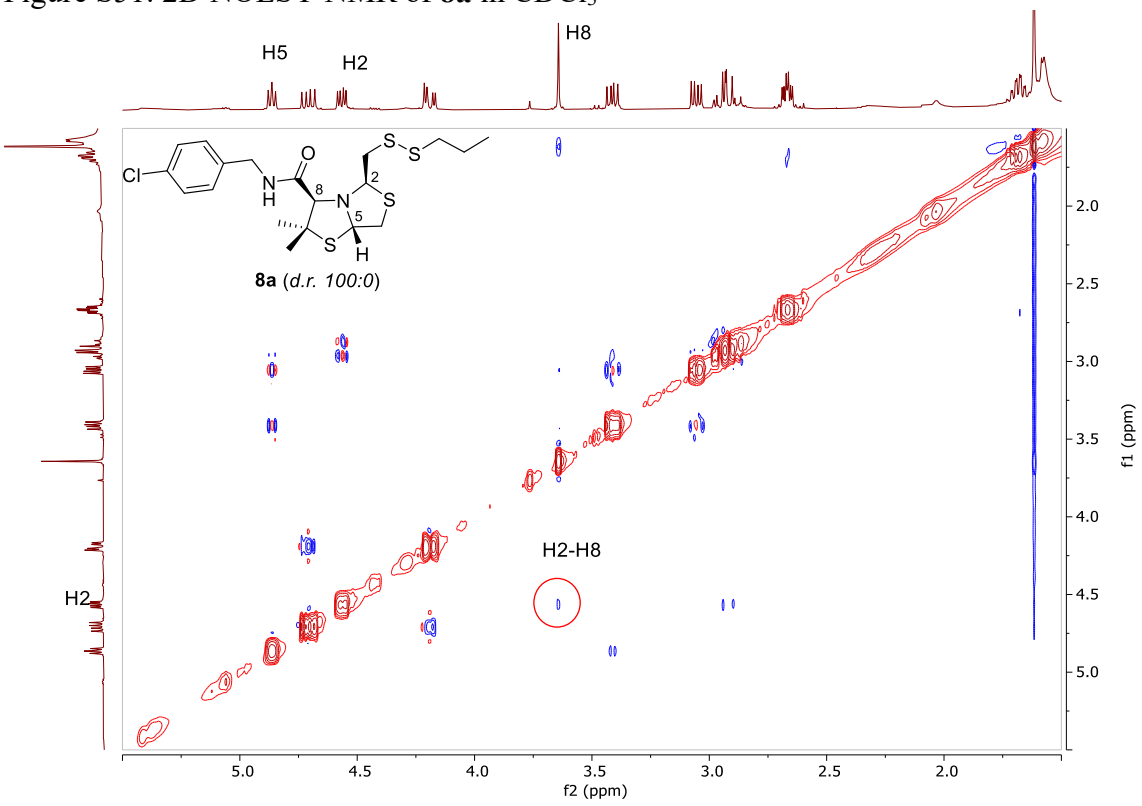


Figure S52: ^{1}H-NMR of **9a** in $CDCl_3$ (400 MHz)

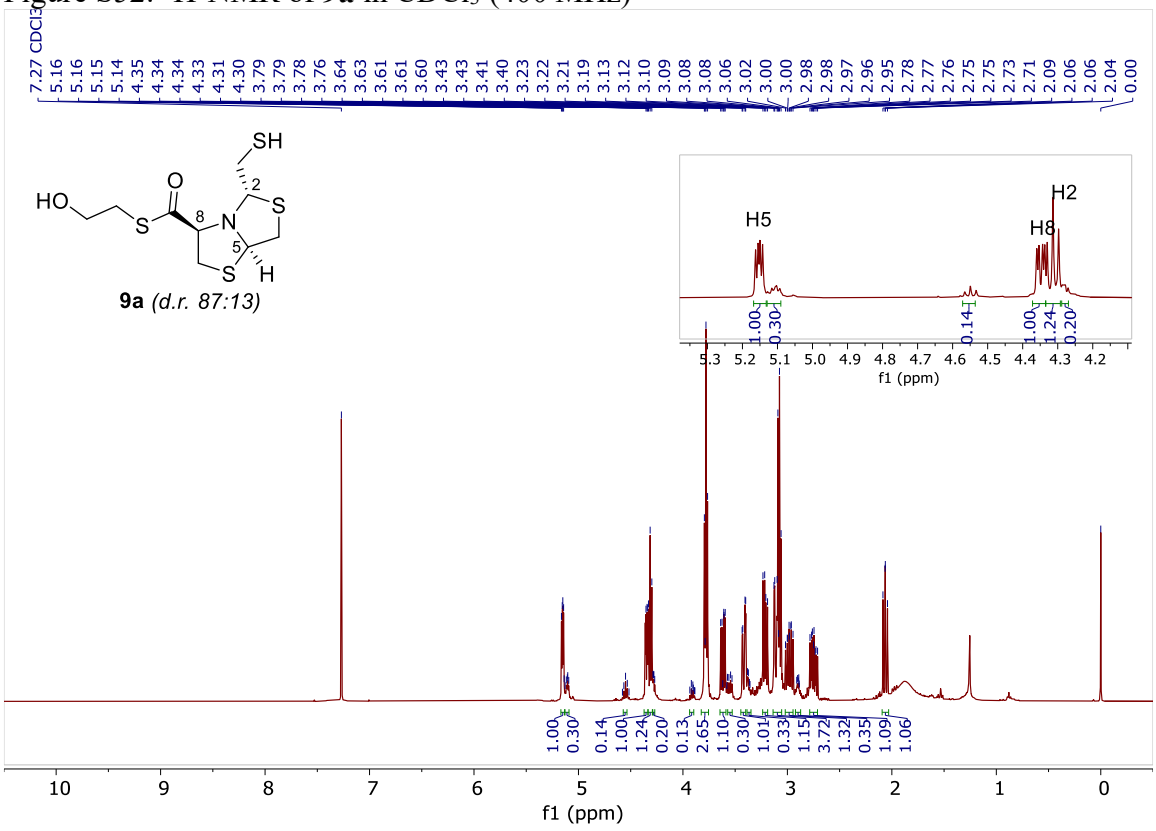


Figure S53: ^{13}C-NMR of **9a** in $CDCl_3$ (101 MHz)

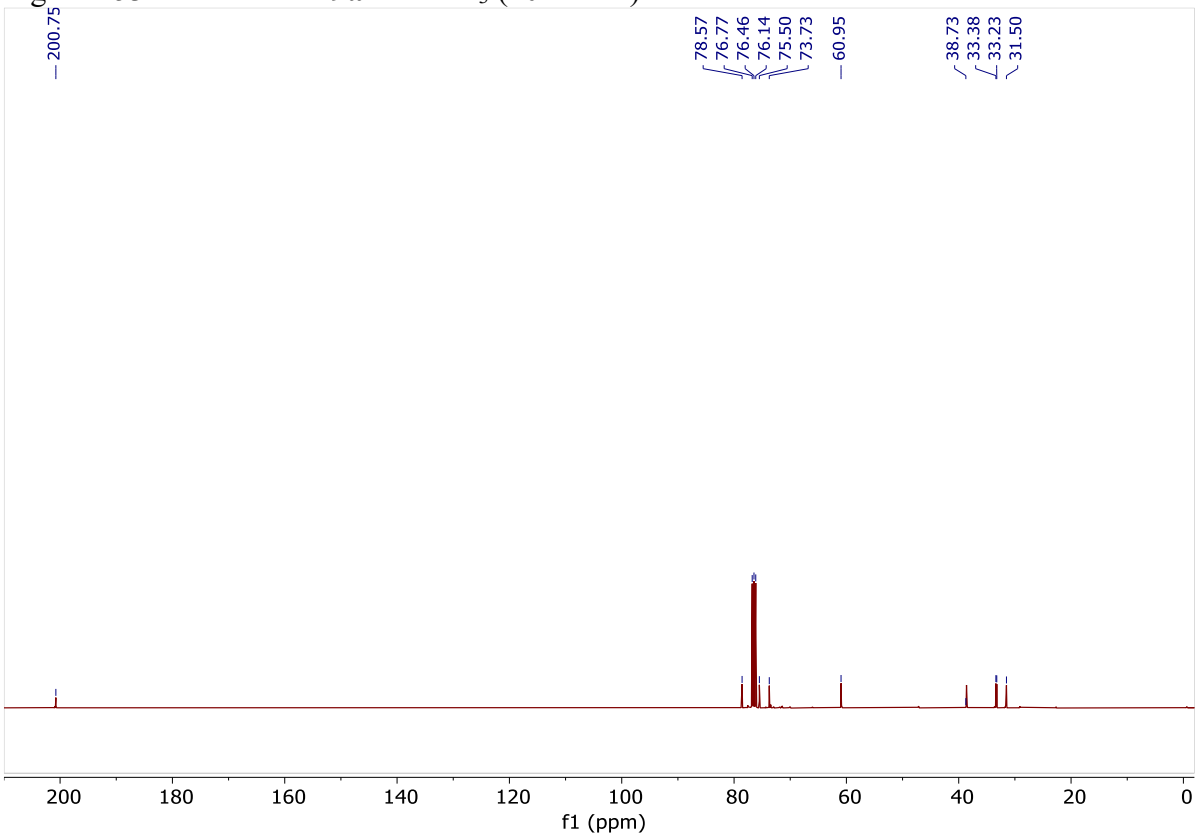


Figure S54: 2D NOESY NMR of **9a** in $CDCl_3$

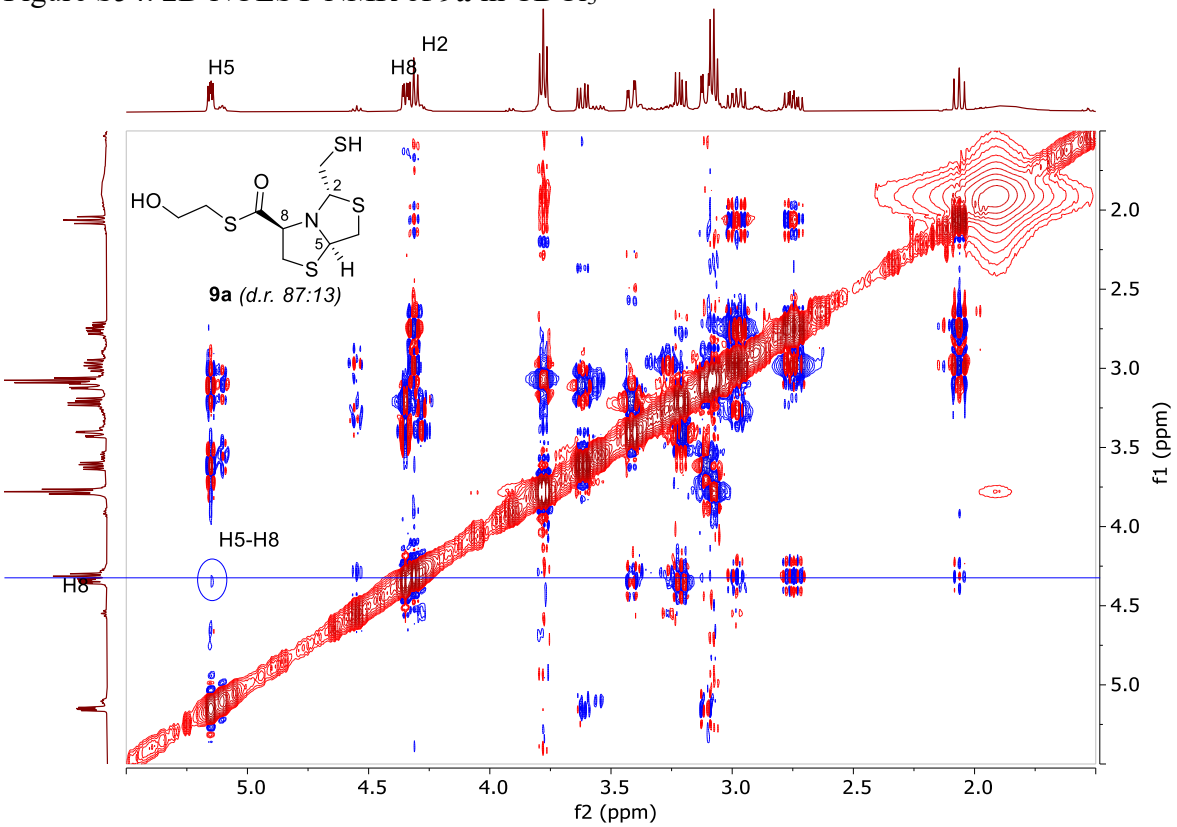


Figure S55: ^{1}H-NMR of **9b** in $CDCl_3$ (400 MHz)

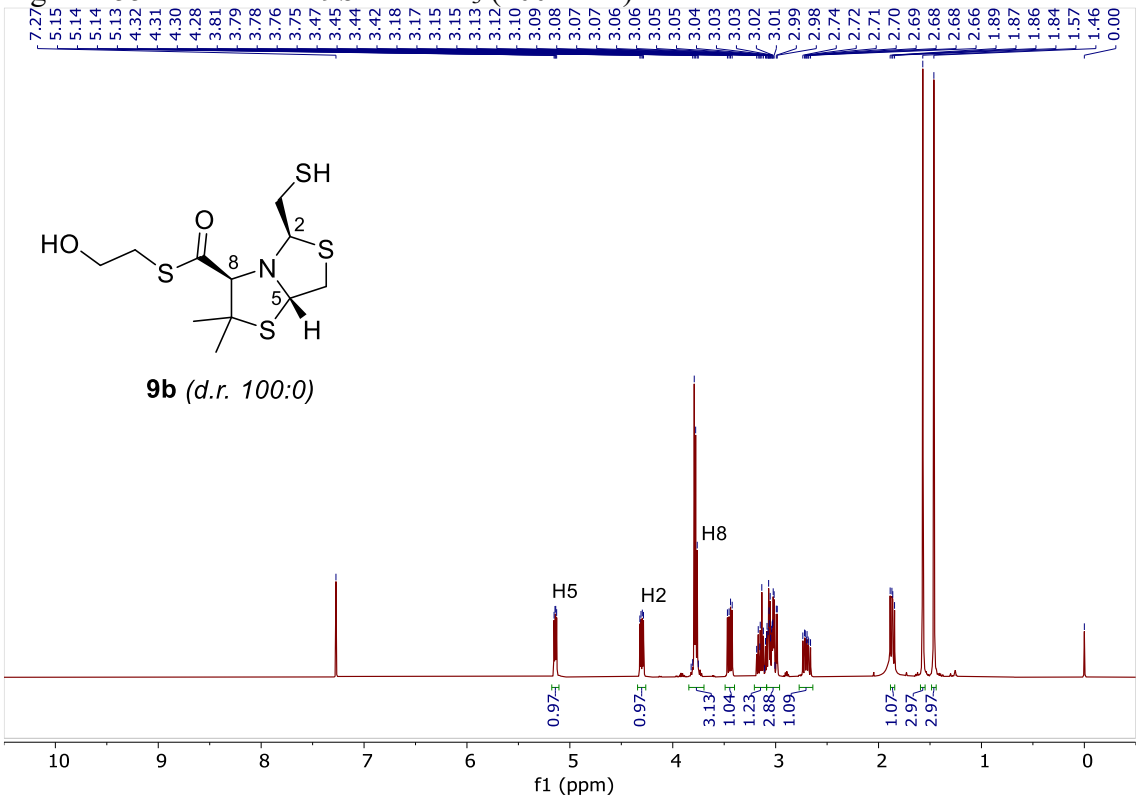


Figure S56: ^{13}C-NMR of **9b** in $CDCl_3$ (101 MHz)

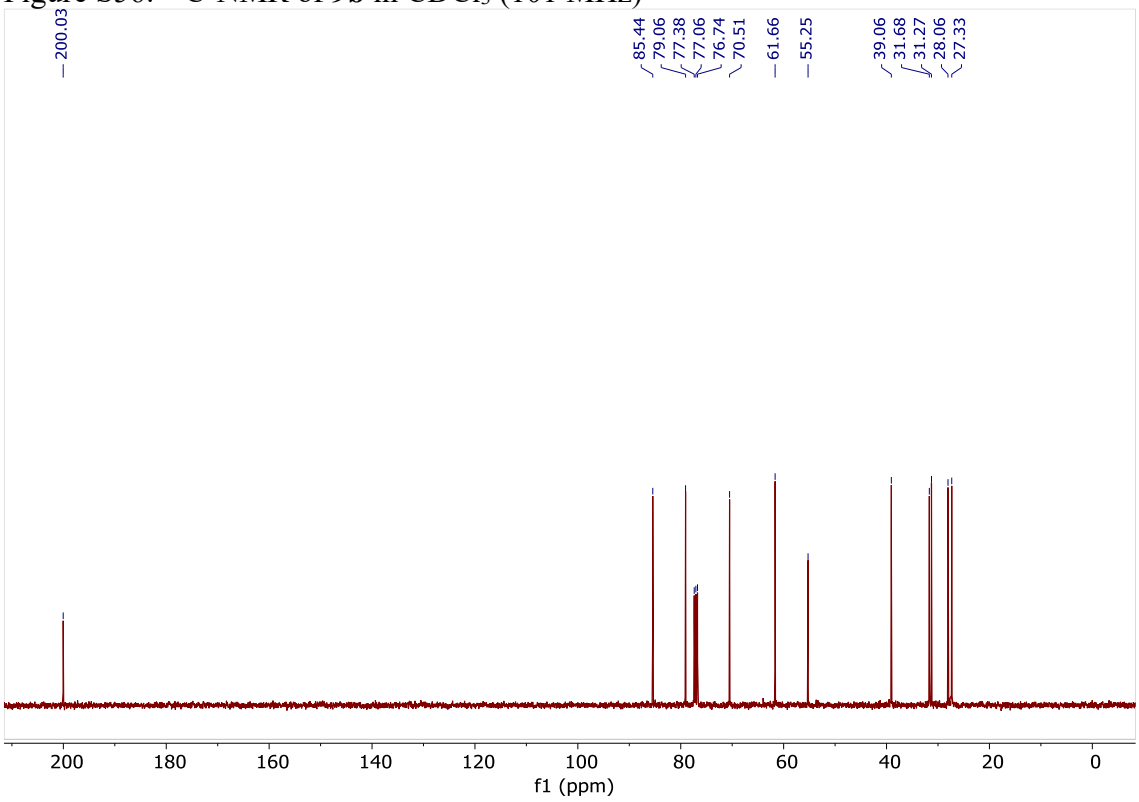


Figure S57: 2D NOESY NMR of **9b** in $CDCl_3$

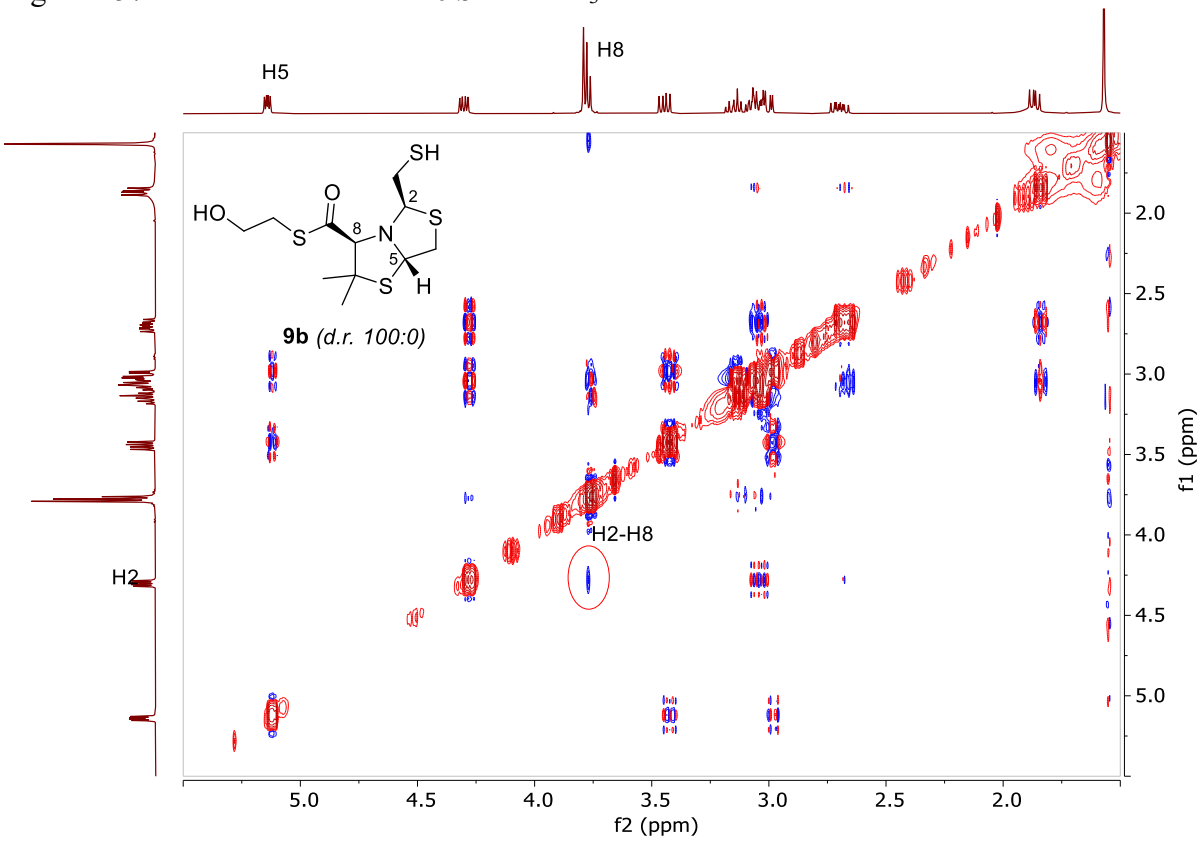


Figure S58: ^{1}H-NMR of *3'S*-**10a** in $CDCl_3$ (400 MHz)

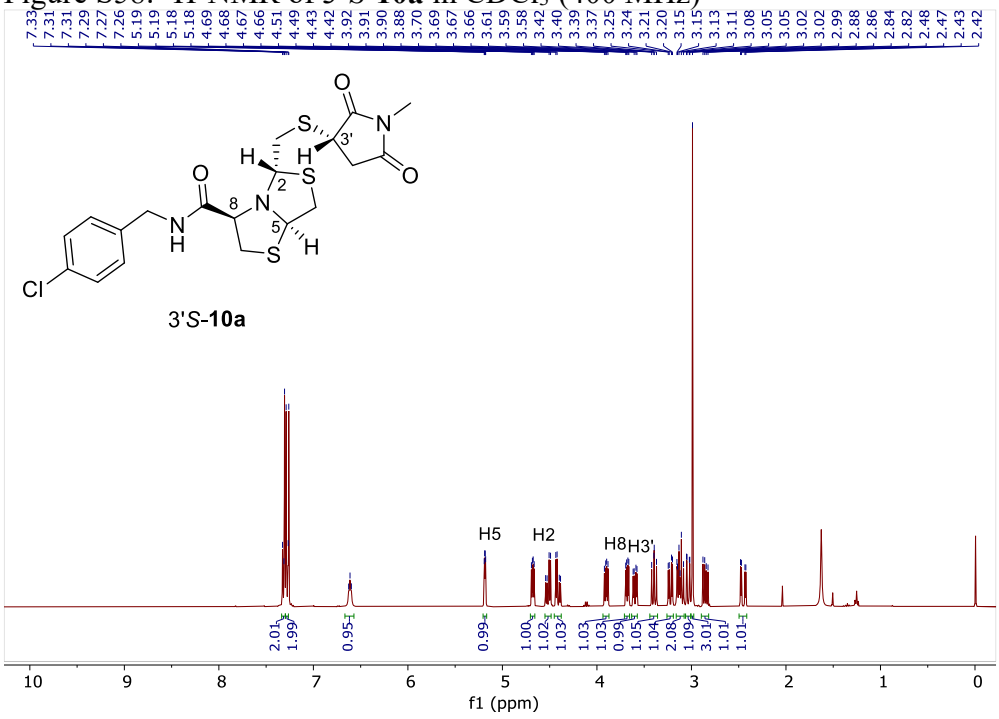


Figure S59: ^{13}C-NMR of *3'S*-**10a** in $CDCl_3$ (101 MHz)

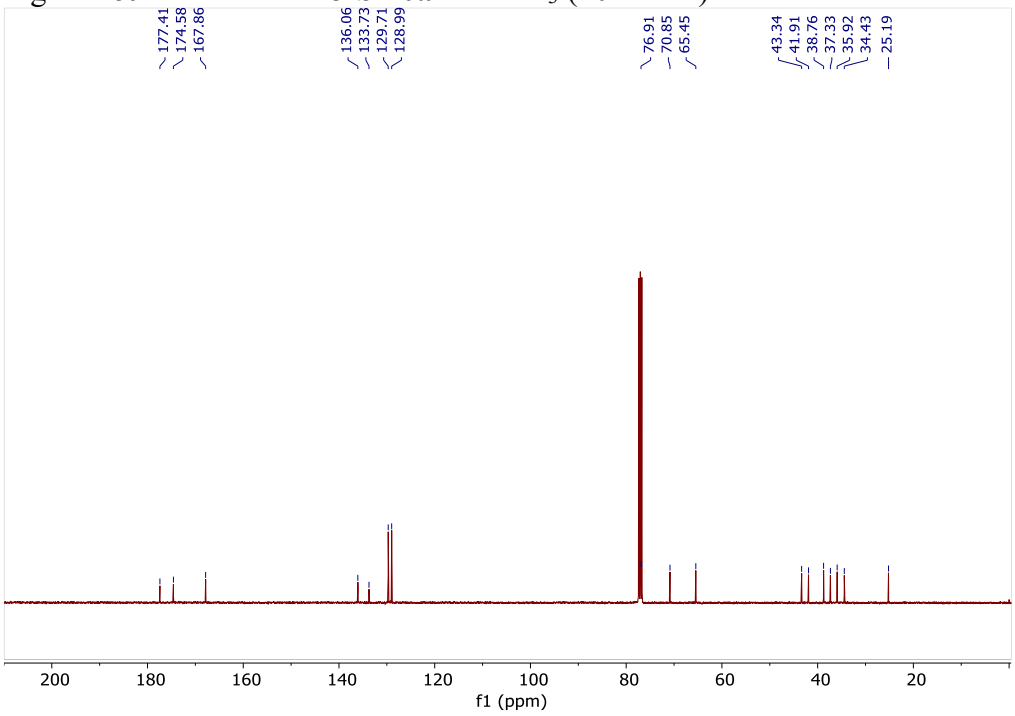


Figure S60: 2D NOESY NMR of *3'S*-**10a** in $CDCl_3$

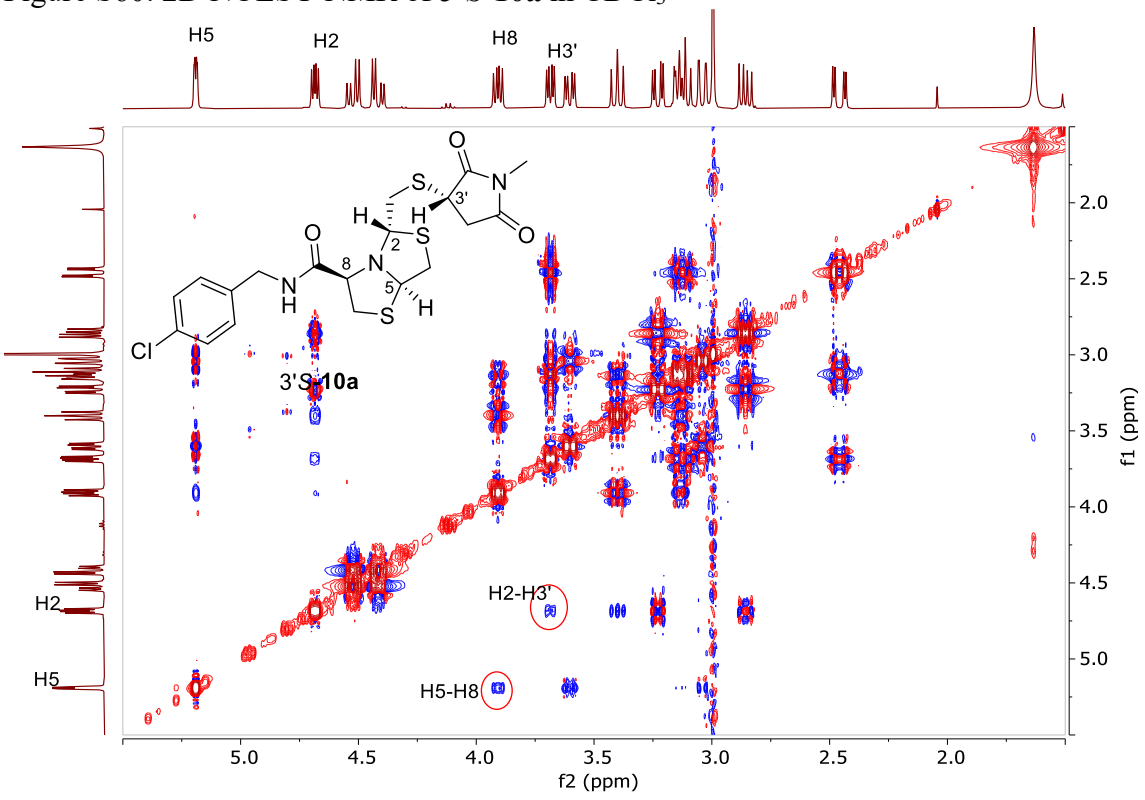


Figure S61: ^{1}H-NMR of *3'S*-**10b** in $CDCl_3$ (400 MHz)

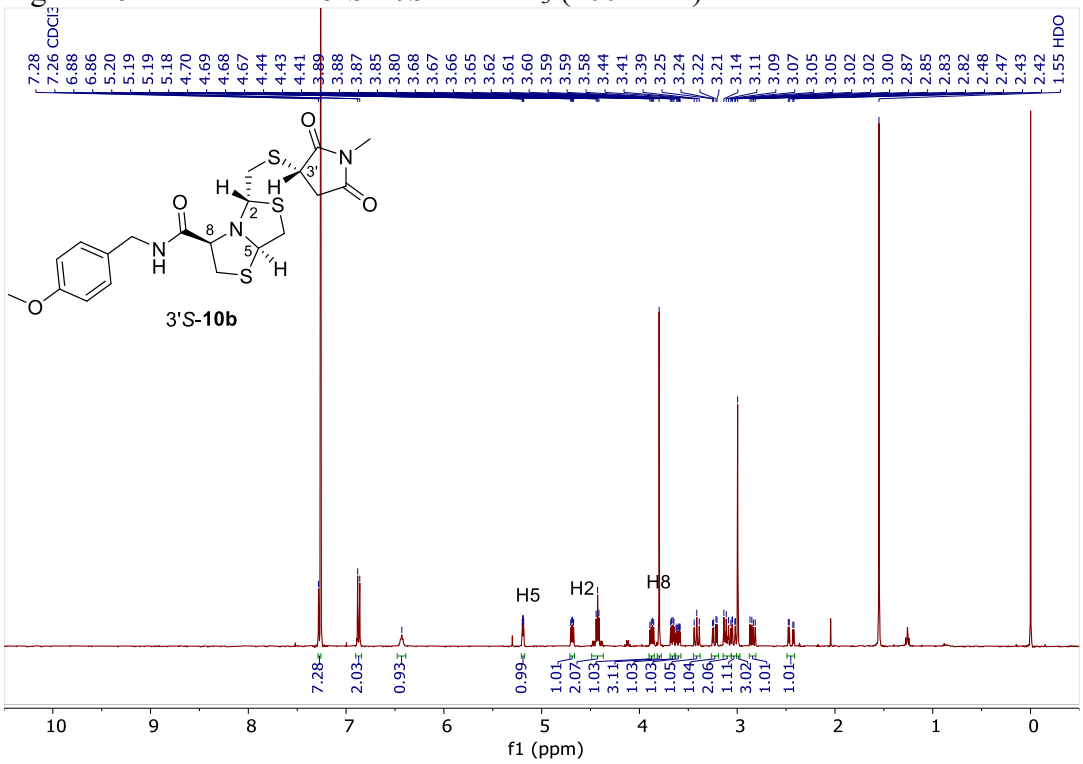


Figure S62: ^{13}C-NMR of *3'S*-**10b** in $CDCl_3$ (101 MHz)

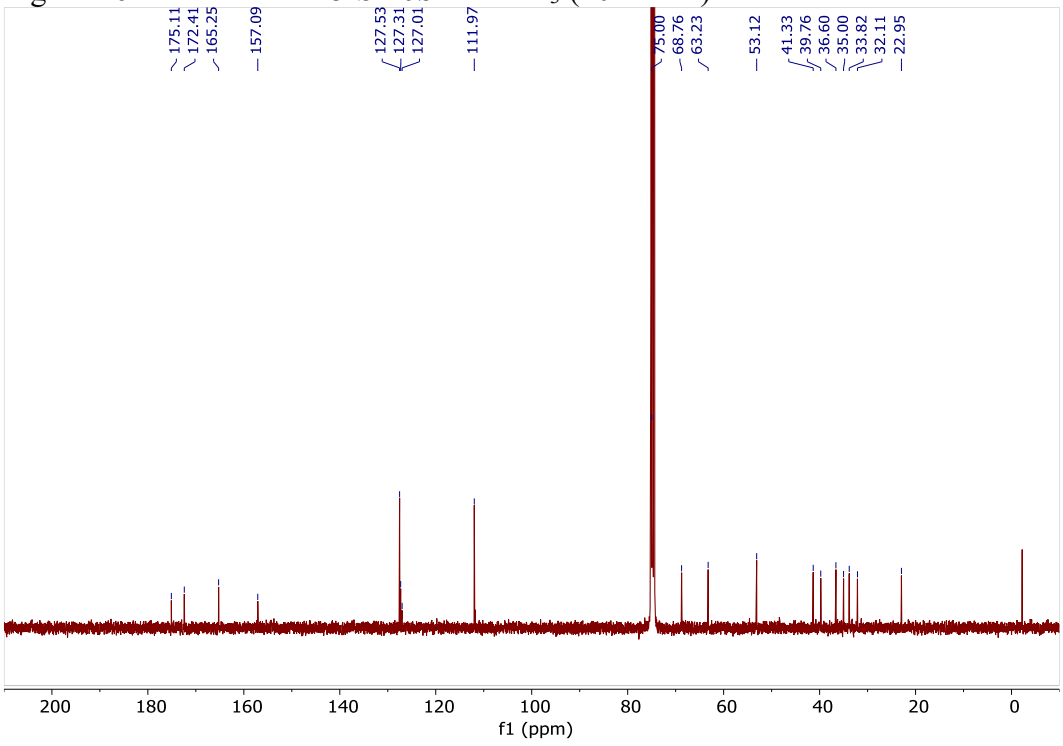
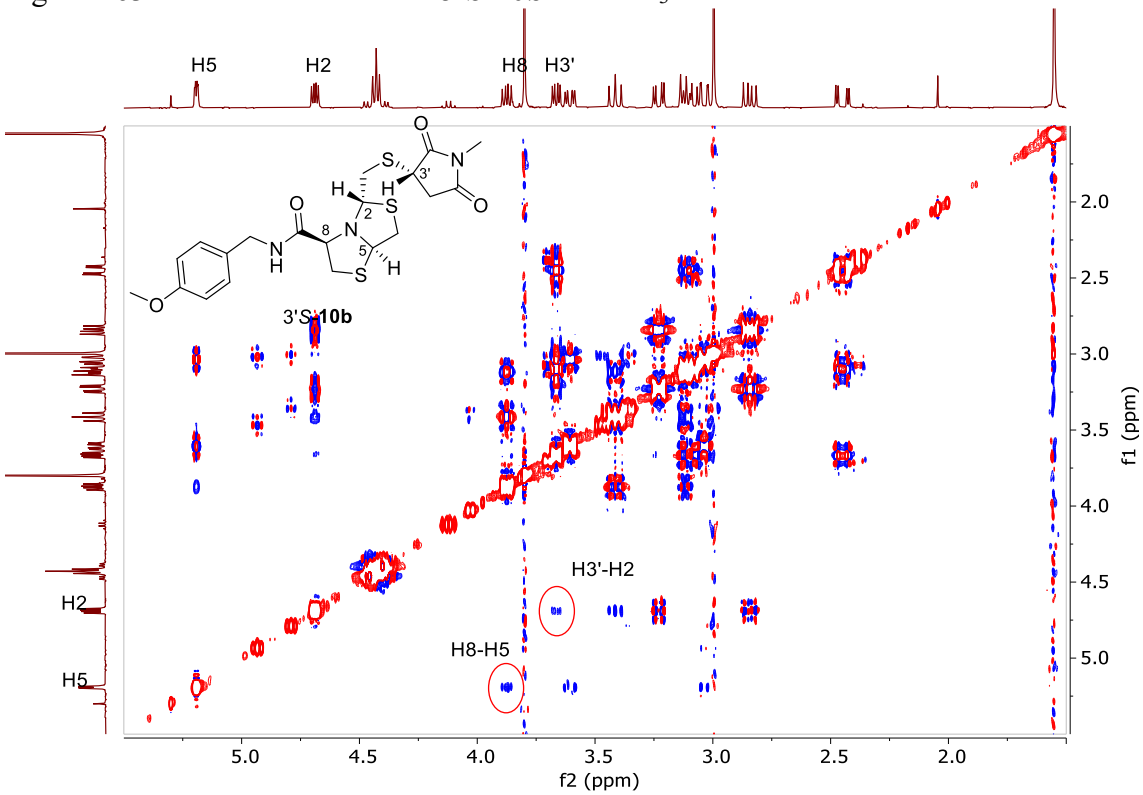


Figure S63: 2D NOESY NMR of *3'S*-**10b** in $CDCl_3$



VIII. Opening of δ-thiolactones with dithiothreitol (DTT)

Condition TA-E: To a stirred solution of **1c** (40 mg, 0.18 mmol) dissolved in MeCN (1 mL) was added dithiothreitol (55 mg, 0.36 mmol) and dropwise a solution of L-Thr-OMe (39 mg, 0.22 mmol) in MeCN (0.5 mL). The reaction mixture was stirred for 24 h at rt, and the solvent evaporated under vacuum. The crude was extracted with HCl (5% aq. 10 mL) and AcOEt (3x15 mL), the organic layer was dried over Na_2SO_4 and concentrated under vacuum. The crude was purified by column chromatography (n-Hex:AcOEt 40:60) to give a mixture of **5d** distereomers (16 mg, 0.04 mmol, 22%, dr(58:24:18)) as an oil.

Figure S64: ^{1}H-NMR of **5d** distereomers in $CDCl_3$ (8.5 - 3.5 ppm, 400 MHz)

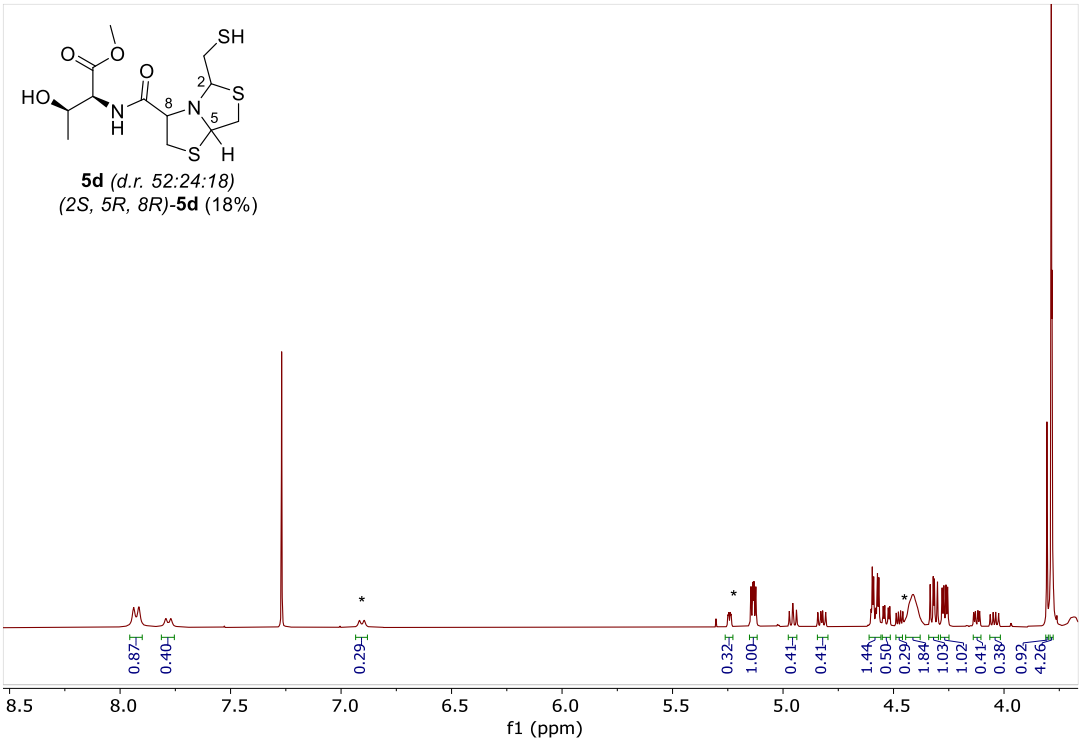
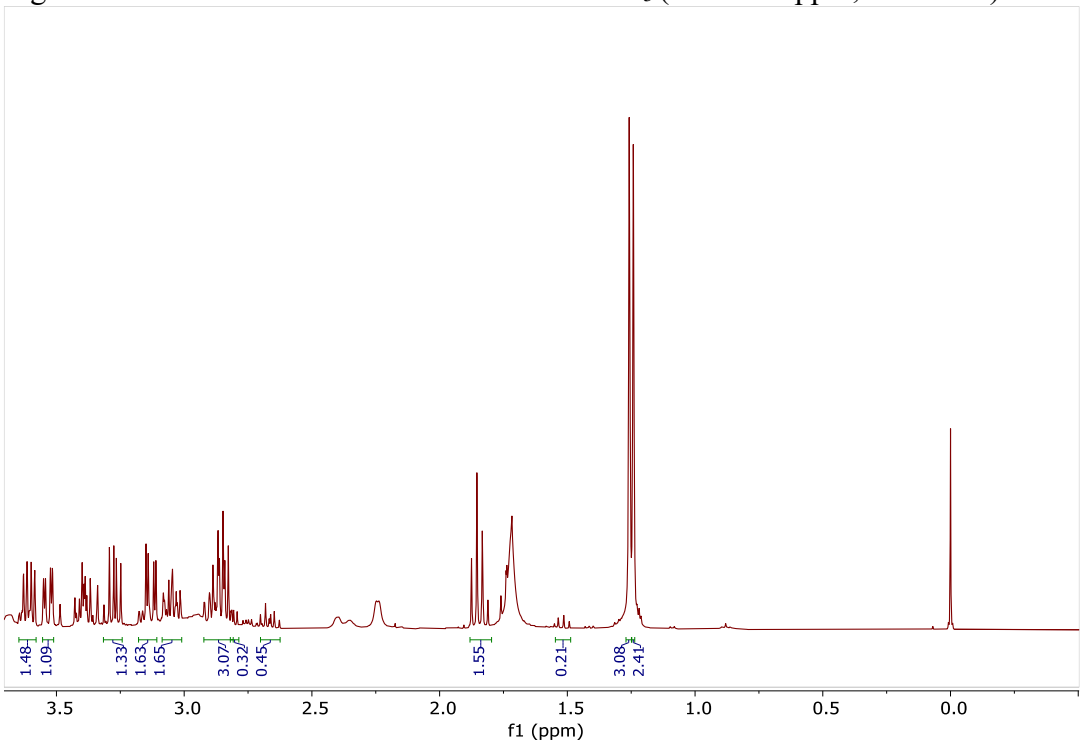
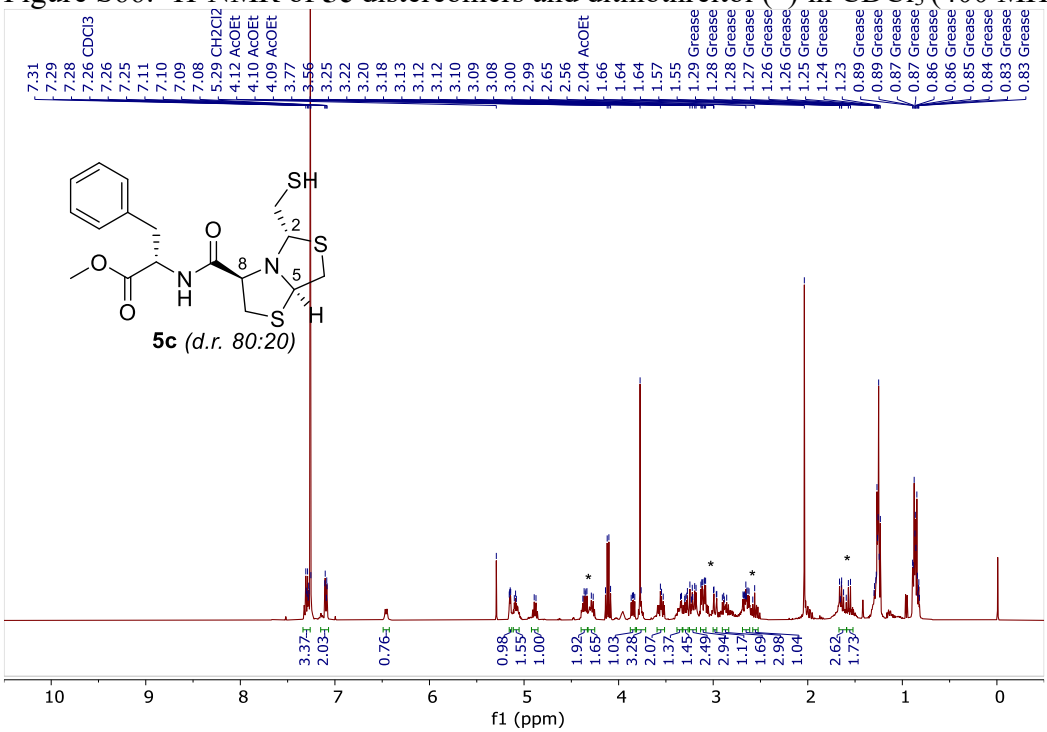


Figure S65: ^{1}H-NMR of **5d** distereomers in $CDCl_3$ (4.0 - -0.5 ppm, 400 MHz)



Condition TA-E: To a stirred solution of **1a** (40 mg, 0.18 mmol) dissolved in MeCN (1 mL) was added dithiothreitol (55 mg, 0.36 mmol) and dropwise a solution of L-Phe-OMe (39 mg, 0.22 mmol) in MeCN (0.5 mL). The reaction mixture was stirred for 5 h at rt, and the solvent evaporated under vacuum. The crude was extracted with HCl (5% aq. 10 mL) and AcOEt (3x15 mL), the organic layer was dried over Na_2SO_4 and concentrated under vacuum. The crude was purified by column chromatography (n-Hex:AcOEt 60:40) to give a irresolvable mixture of **5c** distereomers (40 mg, 0.10 mmol, 55%, dr(80:20)) and dithiothreitol.

Figure S66: ^{1}H-NMR of **5c** distereomers and dithiothreitol (*) in $CDCl_3$ (400 MHz)



IX. References

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