Supporting Information

Highly Stereoselective Synthesis of Fused Cyclopropane-γ-Lactams via Biocatalytic Iron-Catalyzed Intramolecular Cyclopropanation

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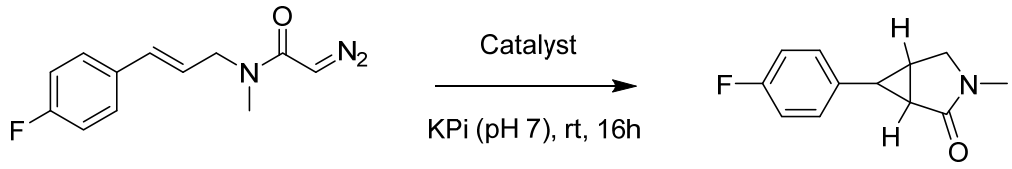
Table of Contents

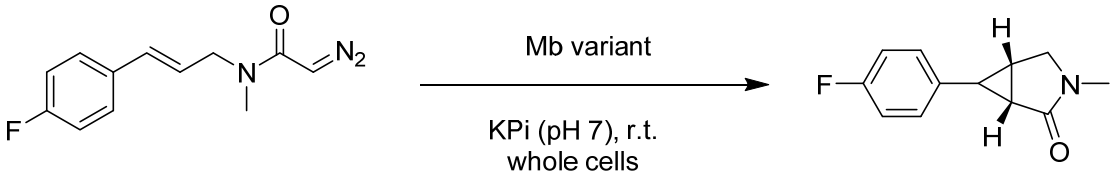
Table S1. Activity of hemin and hemoproteins in the intramolecular cyclopropanation of (*E*)-2-diazo-*N*-(3-(4-fluorophenyl)allyl)-*N*-methylacetamide (**1a**). Reaction conditions: 20 μM catalyst, 2.5 mM **1a**, 10 mM $Na_2S_2O_4$, in KPi buffer (50 mM, pH 7), room temperature, 16 hours, in anaerobic chamber.



1a **2a**

Entry	Catalyst	Yield (GC)	TON	% *ee* (1R, 5S, 6S)
1	Hemin	17%	21	0
2	Mb	13%	16	2
3	Catalase	1%	1	1
4	Cytochrome *c* (equine heart)	1%	1	4
5	Cytochrome *c* (*Hydrogenobacter thermophilus*)	0.5%	0.6	9
6	$P450_{BM3}$	0.3%	0.4	5

Table S2. Activity and selectivity of viable Mb variants from the Mb(H64V)-based mutability landscape library in the intramolecular cyclopropanation of (*E*)-2-diazo-*N*-(3-(4-fluorophenyl)allyl)-*N*-methylacetamide (**1a**). Reaction conditions: 1 mM **1a**, Mb-expressing *E. coli* cells (C41(DE3)) at the cell density (OD_{600} = 40), in KPi buffer (50 mM, pH 7), room temperature, 16 hours, in anaerobic chamber.

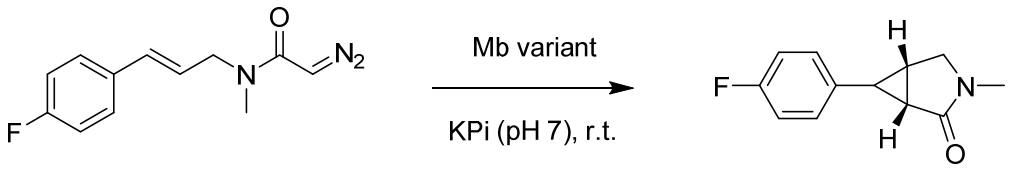


1a **2a**

No	Catalyst	Yield	*e.e.*
1	H64V	62%	5%
2	H64V/F43W	54%	12%
3	H64V/F43Q	55%	15%
4	H64V/F43C	52%	27%
5	H64V/F43G	51%	4%
6	H64V/F43M	48%	31%
7	H64V/F43I	44%	5%
8	H64V/F43T	46%	16%
9	H64V/F43Y	60%	7%
10	H64V/F43D	50%	57%
11	H64V/F43A	52%	13%
12	H64V/F43S	46%	14%
13	H64V/I107N	49%	4%
14	H64V/I107K	55%	2%
15	H64V/I107E	62%	2%
16	H64V/I107D	56%	0%
17	H64V/I107V	62%	20%
18	H64V/I107S	71%	46%

19	H64V/I107H	52%	0%
20	H64V/I107Y	46%	6%
21	H64V/I107W	55%	4%
22	H64V/I107T	59%	27%
23	H64V/I107P	69%	71%
24	H64V/I107L	52%	4%
25	H64V/V68F	68%	9%
26	H64V/V68D	47%	7%
27	H64V/V68T	30%	28%
28	H64V/V68S	72%	79%
29	H64V/V68W	59%	7%
30	H64V/V68E	54%	8%
31	H64V/V68N	64%	42%
32	H64V/V68R	43%	7%
33	H64V/V68C	64%	32%
34	H64V/V68G	61%	80%
35	H64V/V68A	80%	80%
36	H64V/L29P	50%	6%
37	H64V/L29M	52%	5%
38	H64V/L29S	58%	55%
39	H64V/L29A	73%	48%
40	H64V/L29Y	65%	48%
41	H64V/L29F	57%	9%
42	H64V/L29N	55%	4%
43	H64V/L29H	52%	3%
44	H64V/L29T	80%	47%
45	H64V/L29G	80%	41%
46	H64V/L29Q	46%	10%
47	H64V/L29C	63%	33%

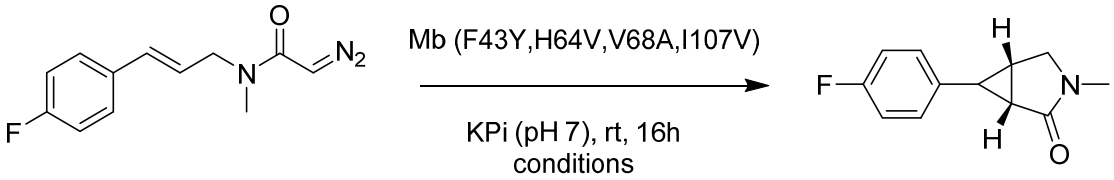
Table S3. Activity and selectivity of representative Mb variants from the third and fourth rounds of catalyst evolution via site-saturation mutagenesis (Figure 2). Reaction conditions: 2.5 mM **1a**, 20 μM purified protein in 0.5 mL KPi buffer (50 mM, pH 7), room temperature, 16 hours in anaerobic chamber.



1a **2a**

Catalyst	Yield (GC)	TON	*e.e.* (1*R*,5*S*,6*S*)
WT	13%	16	2%
H64V	22%	28	5%
H64V/V68A	59%	74	82%
H64V/V68G	57%	72	81%
F43L/H64V/V68A	73%	91	91%
F43R/H64V/V68A	75%	94	91%
F43Y/H64V/V68A	91%	114	92%
F43M/H64V/V68A	80%	100	92%
F43Y/H64V/V68A/I107L	99%	124	98%
F43Y/H64V/V68A/I107T	93%	116	99%
F43Y/H64V/V68A/I107V	>99%	125	99%

Table S4. Optimization studies for Mb(F43Y,H64V,V68A,I107V)-catalyzed intramolecular cyclopropanation of **1a** using purified protein and Mb-expressing *E. coli* cells (C41(DE3)). Reaction conditions: 1-10 mM **1a**, 20 μM purified protein or Mb-expressing *E. coli* cells (C41(DE3)) at the indicated cell density (OD_{600}) in 0.5 mL KPi buffer (50 mM, pH 7), room temperature, 16 hours in anaerobic chamber. Mb-free cells produce a background conversion of ~10% (0% ee) likely due to free hemin in the cell.

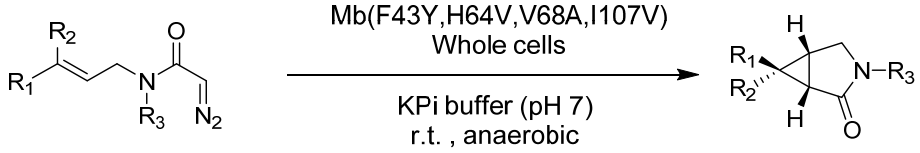


1a **2a**

No	Catalyst	Protein/cell conc.	[1a] (mM)	Yield (GC)	TON	*e.e.* (1*R*,5*S*,6*S*)
1	Purified protein	20 μM	1	>99%	50	99%
2	Purified protein	20 μM	2.5	>99%	125	99%
3	Purified protein	20 μM	5	94%	236	98%
4	Purified protein	20 μM	10	88%	439	91%
5	Whole cells	OD = 20	1	>99%	97	98%
6	Whole cells	OD = 20	2.5	>99%	242	98%
7	Whole cells	OD = 20	5	91%	441	97%
8	Whole cells	OD = 20	10	78%	755	88%
9	Whole cells	OD = 40	1	>99%	48	>99%
10	Whole cells	OD = 40	2.5	>99%	121	>99%
11	Whole cells	OD = 40	5	>99%	242	>99%
12	Whole cells	OD = 40	10	93%	450	94%

13	Whole cells	OD = 60	1	>99%	32	>99%
14	Whole cells	OD = 60	2.5	>99%	81	>99%
15	Whole cells	OD = 60	5	>99%	162	>99%
16	Whole cells	OD = 60	10	94%	322	95%

Table S5. Mb(F43Y,H64V,V68A,I107V)-catalyzed cyclization of allyl α-diazoacetamides containing unactivated olefinic groups. Reaction conditions: 5 mM allyl α-diazoacetamide, Mb (F43Y,H64V,V68A,I107V)-expressing *E. coli* (OD_{600} = 40) in KPi buffer (50 mM, pH 7), 40 mL-scale, r.t., 16 h.



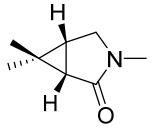
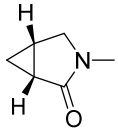
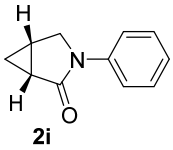
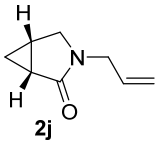
Entry	Product	Yield (GC)	*e.e.*
1	 **2g**	51%	90%
2	 **2h**	99 %	28%
3	 **2i**	23 %	67%
4	 **2j**	53 %	65%

Figure S1. Crystal structure of sperm whale myoglobin (Mb). The amino acid residues lining the distal heme pocket are highlighted as stick models in light blue. The heme group (yellow) and the heme-coordinating proximal histidine (green) are shown as stick models.

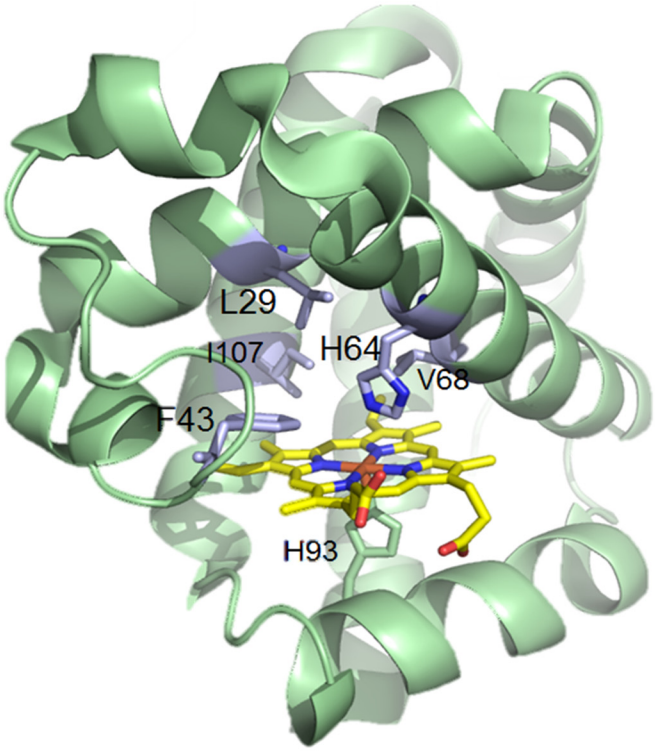


Figure S2 Time-course analysis of Mb(F43Y,H64V,V68A,I107V)-catalyzed intramolecular cyclopropanation of (*E*)-2-diazo-*N*-(3-(4-fluorophenyl)allyl)-*N*-methylacetamide (**1a**) Conversion was determined by gas chromatography using calibration curves with isolated **2a**. Reaction conditions: Mb(F43Y,H64V,V68A,I107V) expressing C41(DE3) *E. coli* cells at OD_{600} = 40, 5 mM **1a** in oxygen-free potassium phosphate buffer (50 mM, pH 7.0). The experiments were performed in duplicates.

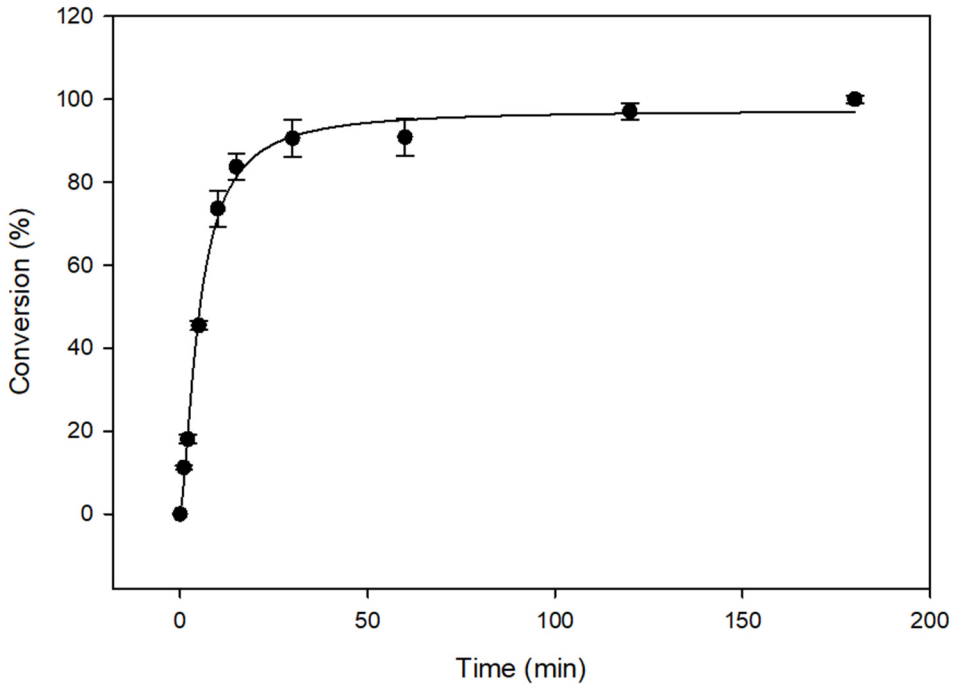
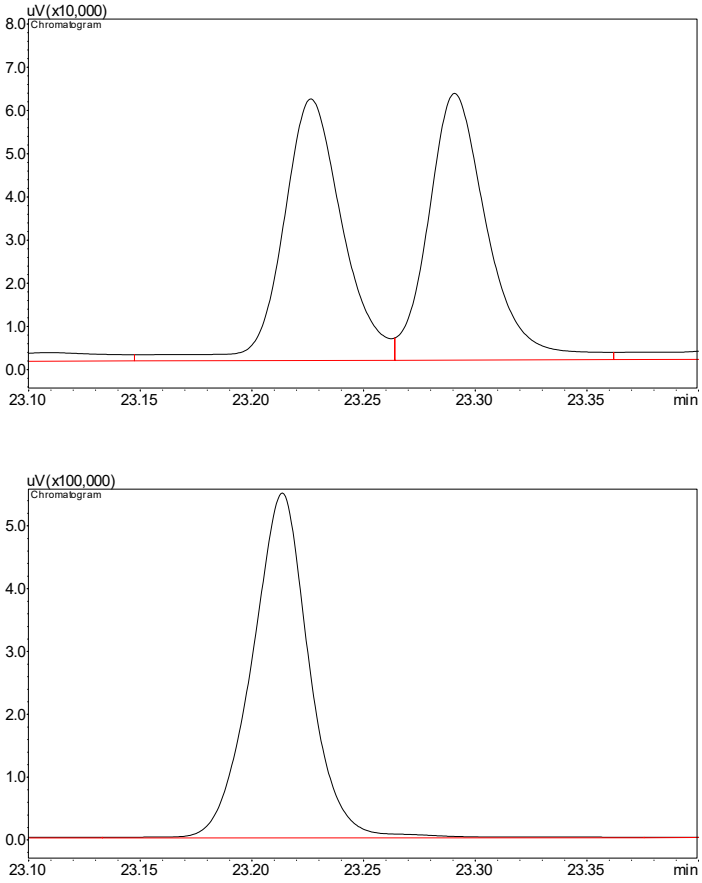
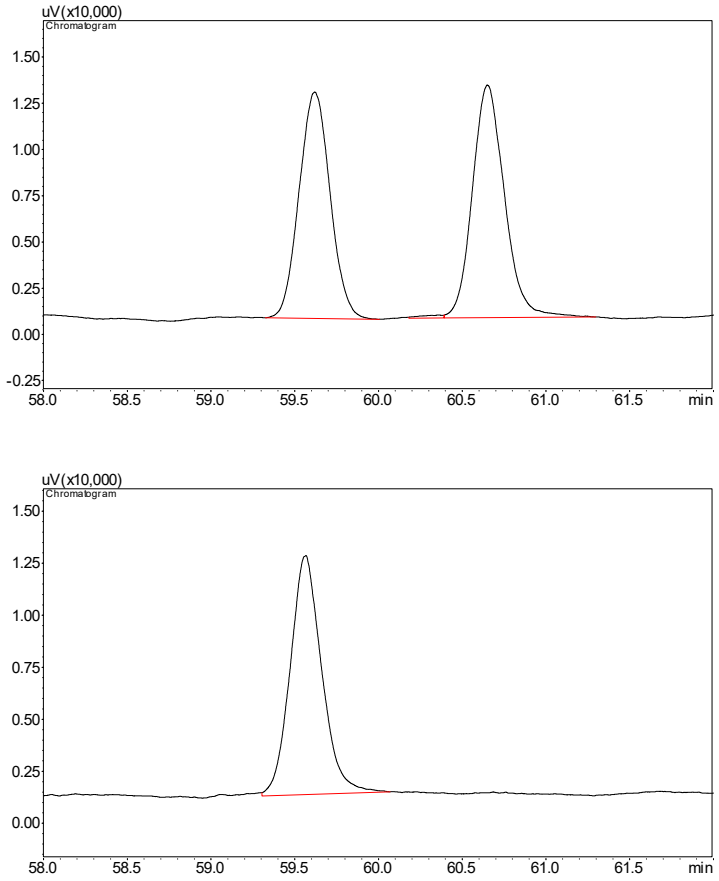


Figure S3. GC and SFC analysis for the determination of an enantiomeric excess in the Mb-catalyzed intramolecular cyclopropanation reactions. The reference racemic samples were prepared as described in the experimental procedures.

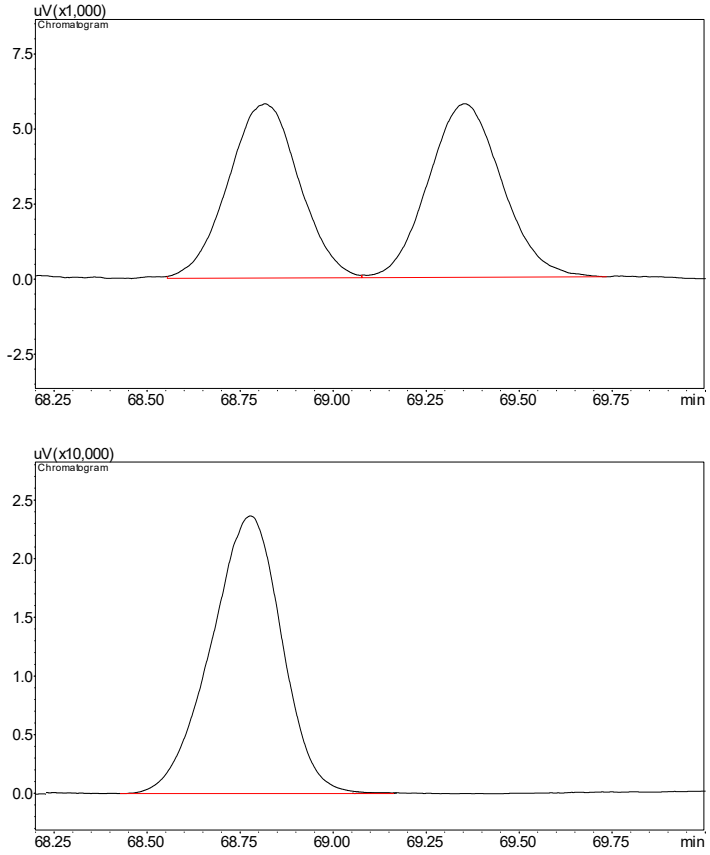
- Chiral GC analysis of racemic **2a** (*top*) and enzymatically produced **2a** product by Mb (F43Y,H64V,V68A,I107V) variant (*bottom*):



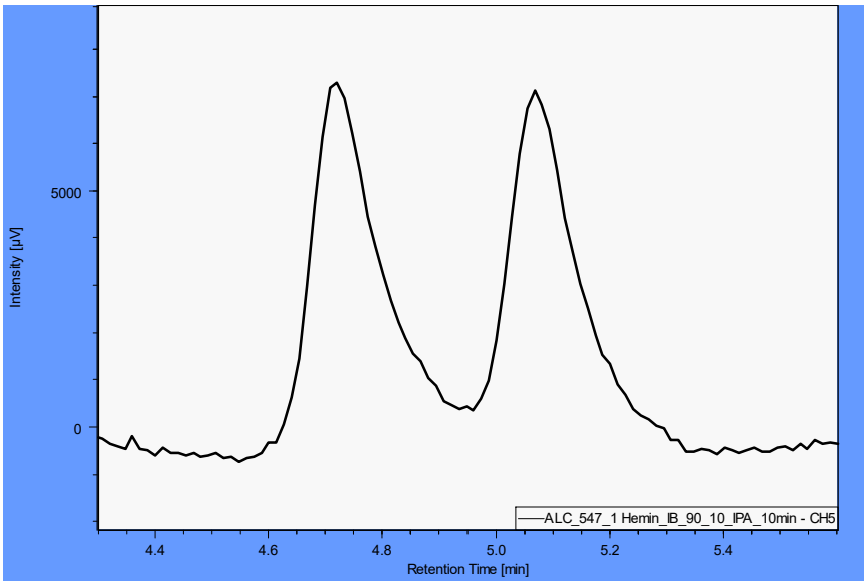
- Chiral GC analysis of racemic **2b** (*top*) and enzymatically produced **2b** product by Mb (F43Y,H64V,V68A,I107V) variant (*bottom*):

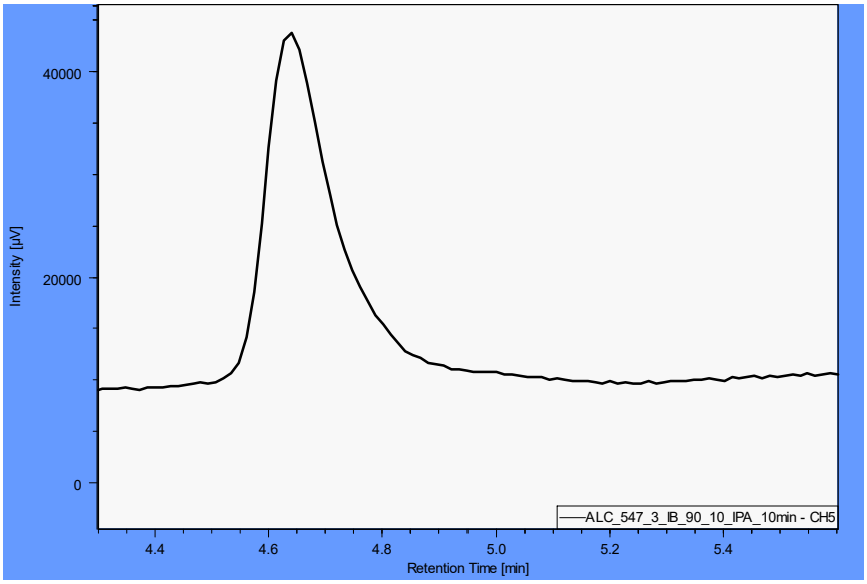


- Chiral GC analysis of racemic **2c** (*top*) and enzymatically produced **2c** product by Mb (F43Y,H64V,V68A,I107V) variant (*bottom*):

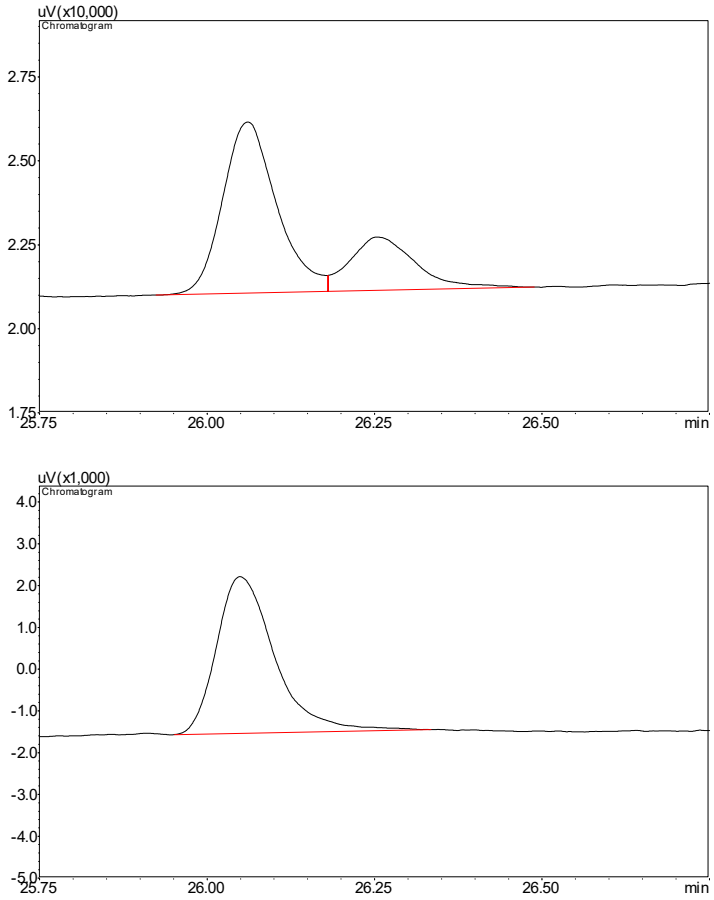


- Chiral SFC analysis of racemic **2d** (*top*) and enzymatically produced **2d** product by Mb (F43Y,H64V,V68A,I107V) variant (*bottom*):

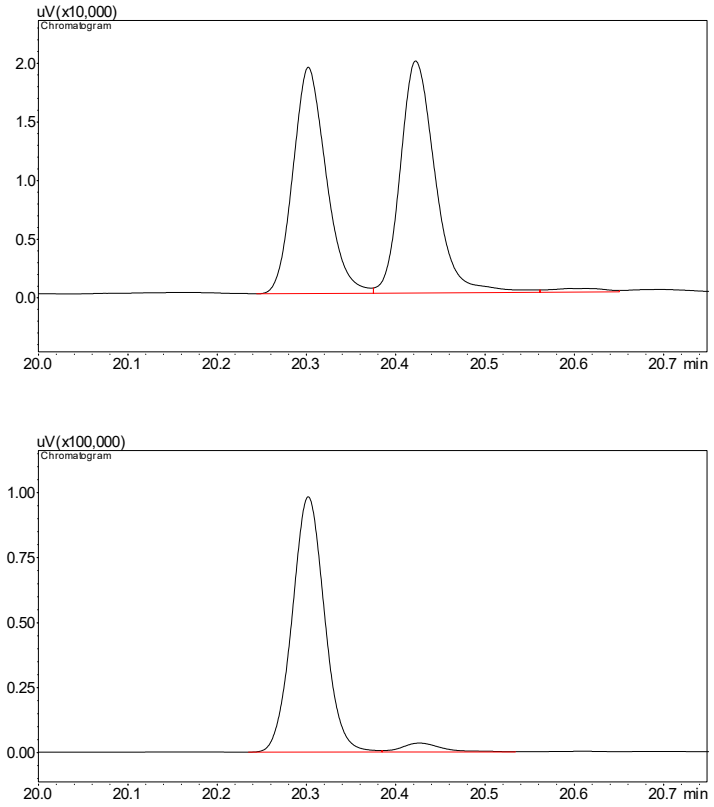




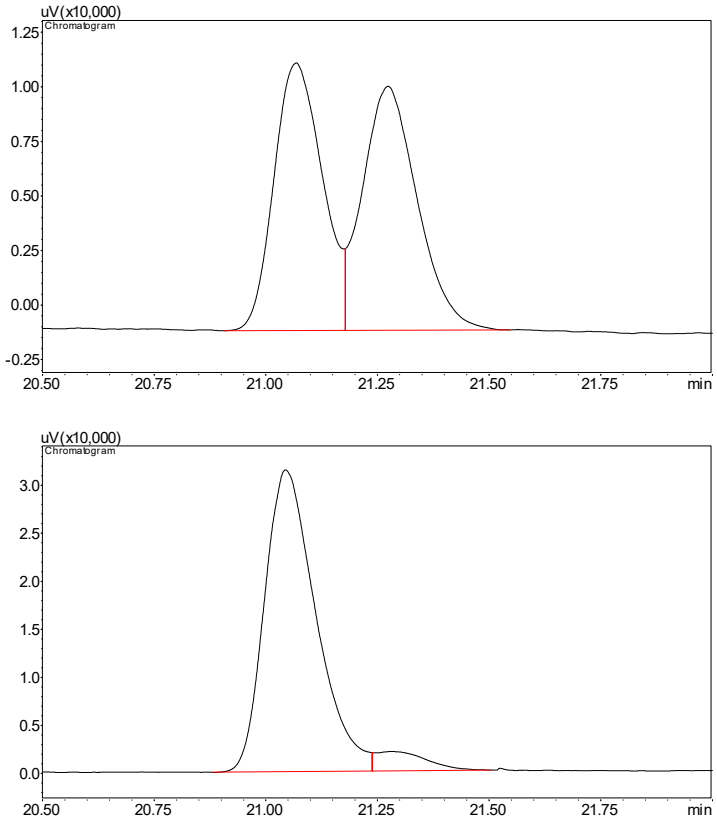
- Chiral GC analysis of racemic (Mb-H64V catalyzed whole-cell reaction) **2e** (*top*) and enzymatically produced **2e** product by Mb (F43Y,H64V,V68A,I107V) variant (*bottom*):



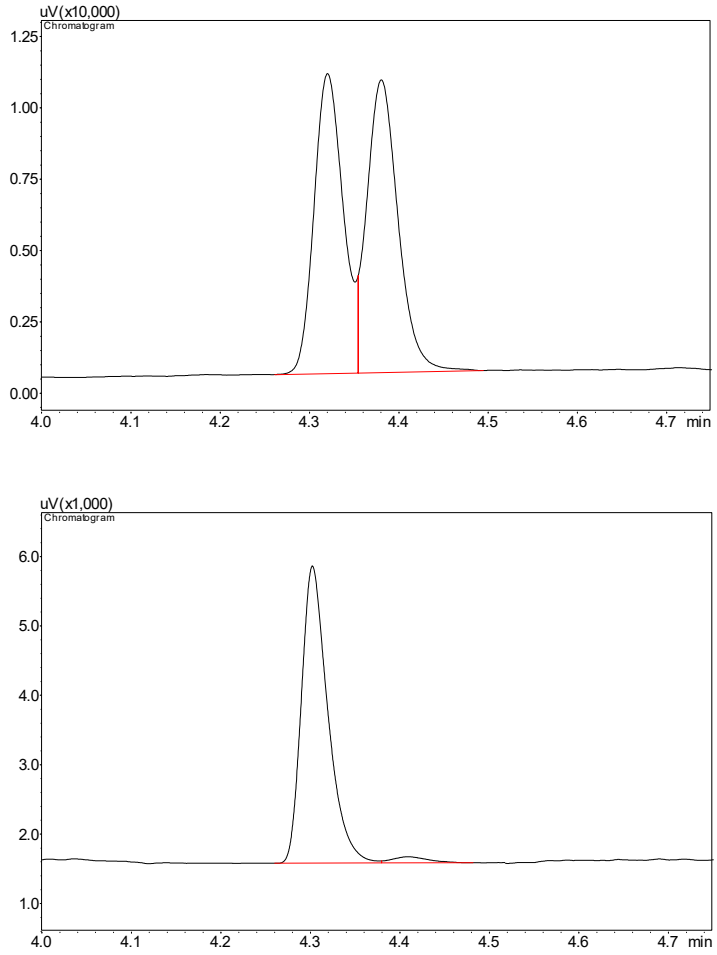
- Chiral GC analysis of racemic **2f** (*top*) and enzymatically produced **2f** product by Mb (F43Y,H64V,V68A,I107V) variant (*bottom*):



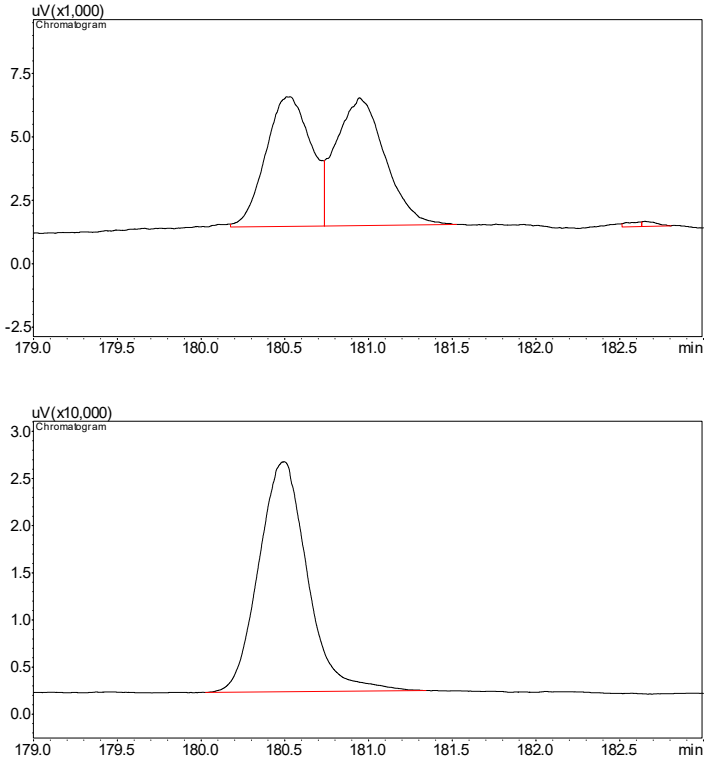
- Chiral GC analysis of racemic **2g** (*top*) and enzymatically produced **2g** product by Mb (F43Y,H64V,V68A,I107V) variant (*bottom*):



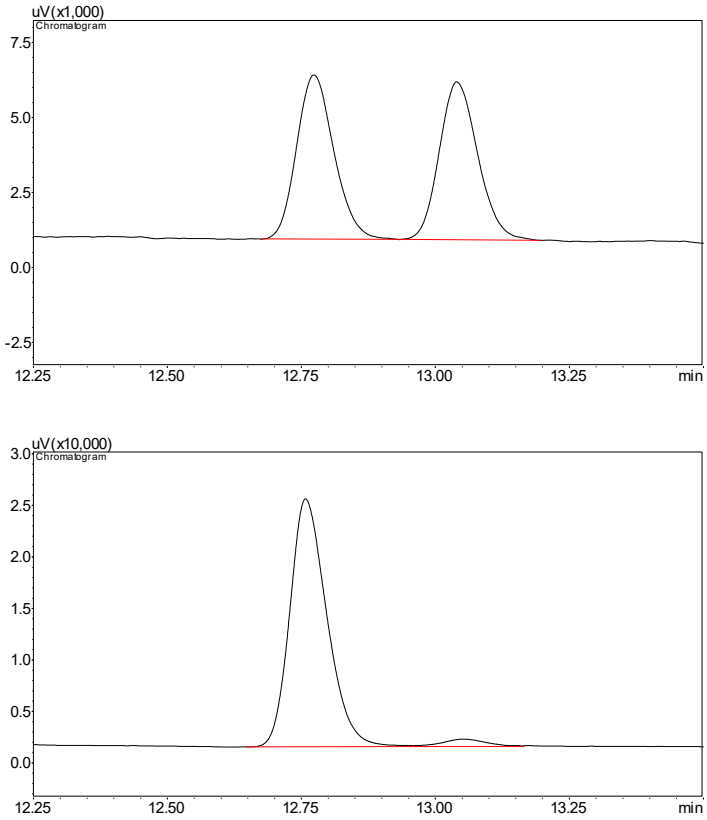
- Chiral GC analysis of racemic **2h** (*top*) and enzymatically produced **2h** product by Mb (H64V,V68G) variant (*bottom*):



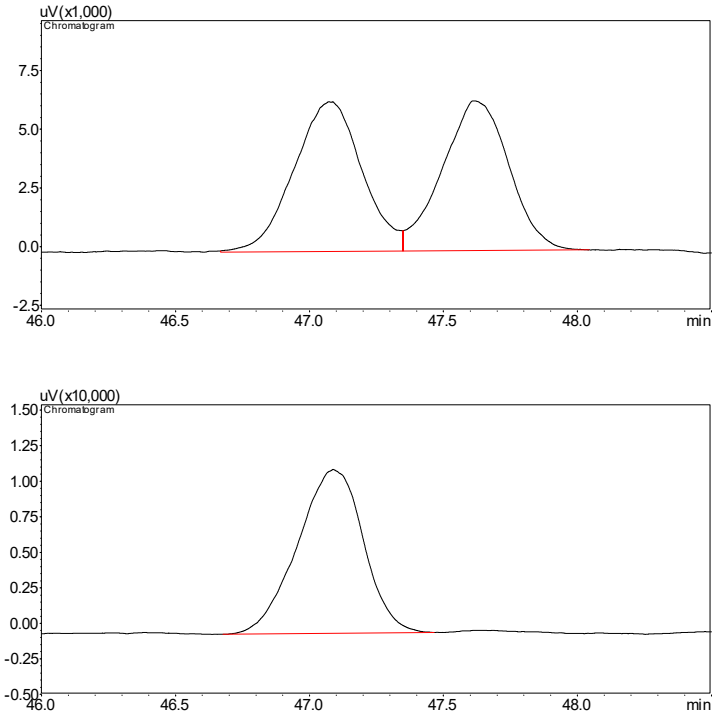
- Chiral GC analysis of racemic **2i** (*top*) and enzymatically produced **2i** product by Mb (H64V,V68G) variant (*bottom*):



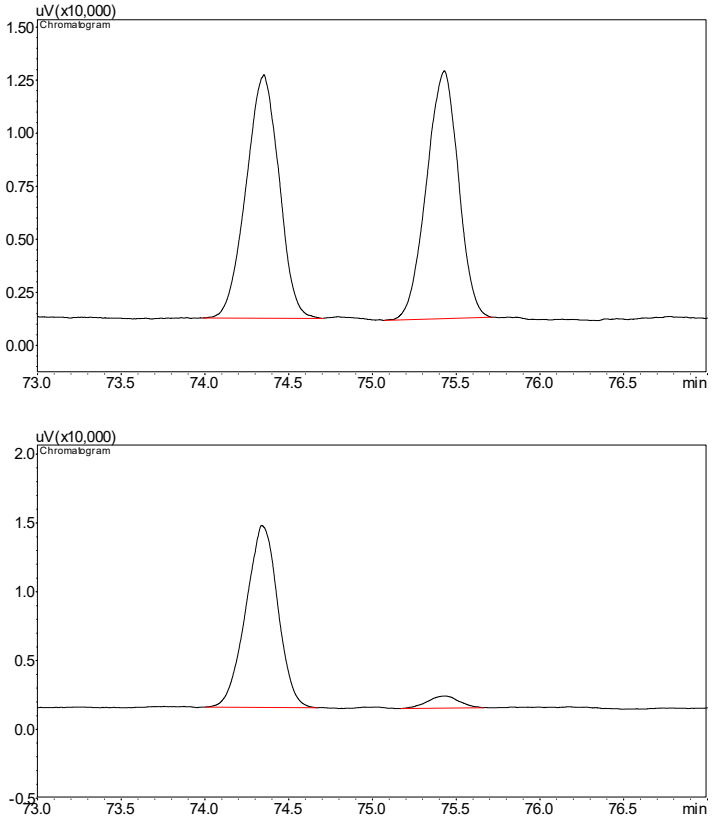
- Chiral GC analysis of racemic **2j** (*top*) and enzymatically produced **2j** product by Mb (H64V,V68G) variant (*bottom*):



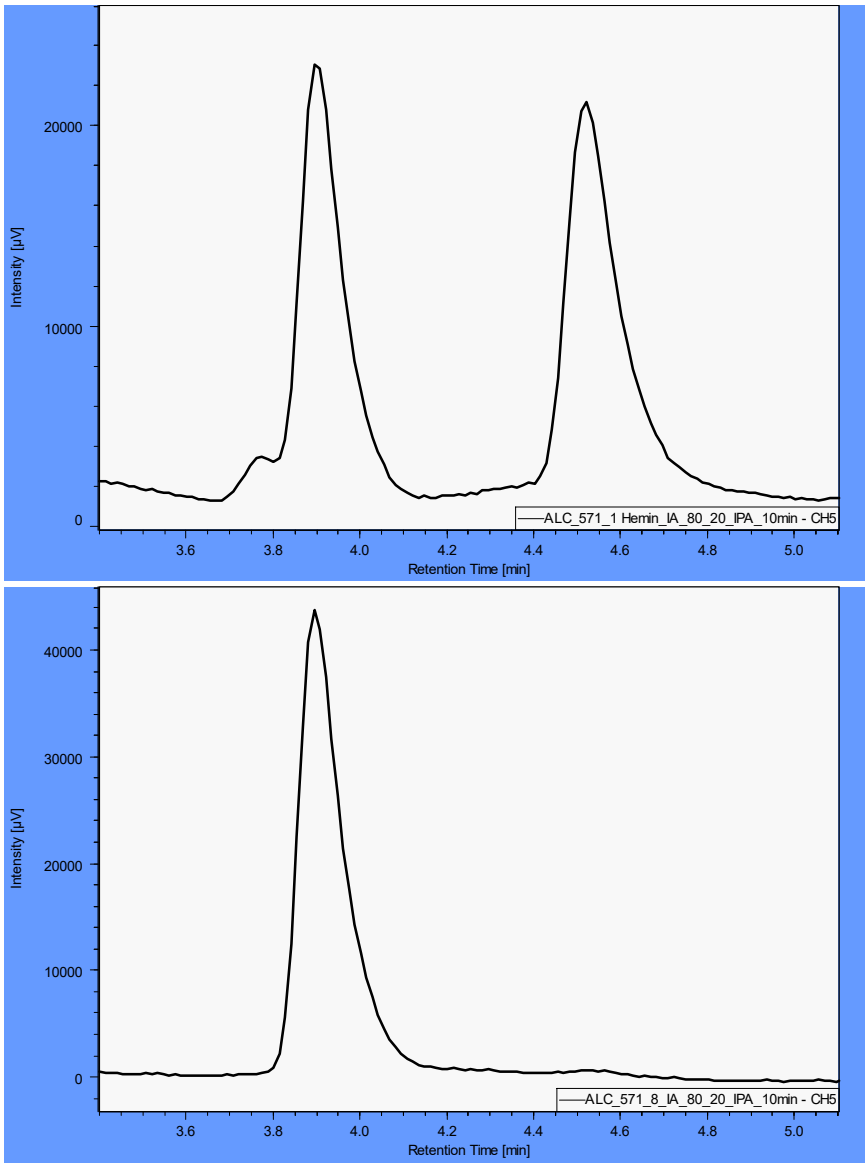
- Chiral GC analysis of racemic **2k** (*top*) and enzymatically produced **2k** product by Mb (F43Y,H64V,V68A,I107V) variant (*bottom*):



- Chiral GC analysis of racemic **2l** (*top*), enzymatically produced **2l** product by Mb (F43Y,H64V,V68A,I107V) variant (*bottom*):



➢ Chiral SFC analysis of racemic **2m** (*top*), enzymatically produced **2m** product by Mb (F43Y,H64V,V68A,I107V) variant (*bottom*):



➢ Chiral SFC analysis of racemic **2n** (*top*), enzymatically produced **2n** product by Mb (F43Y,H64V,V68A,I107V) variant (*bottom*):

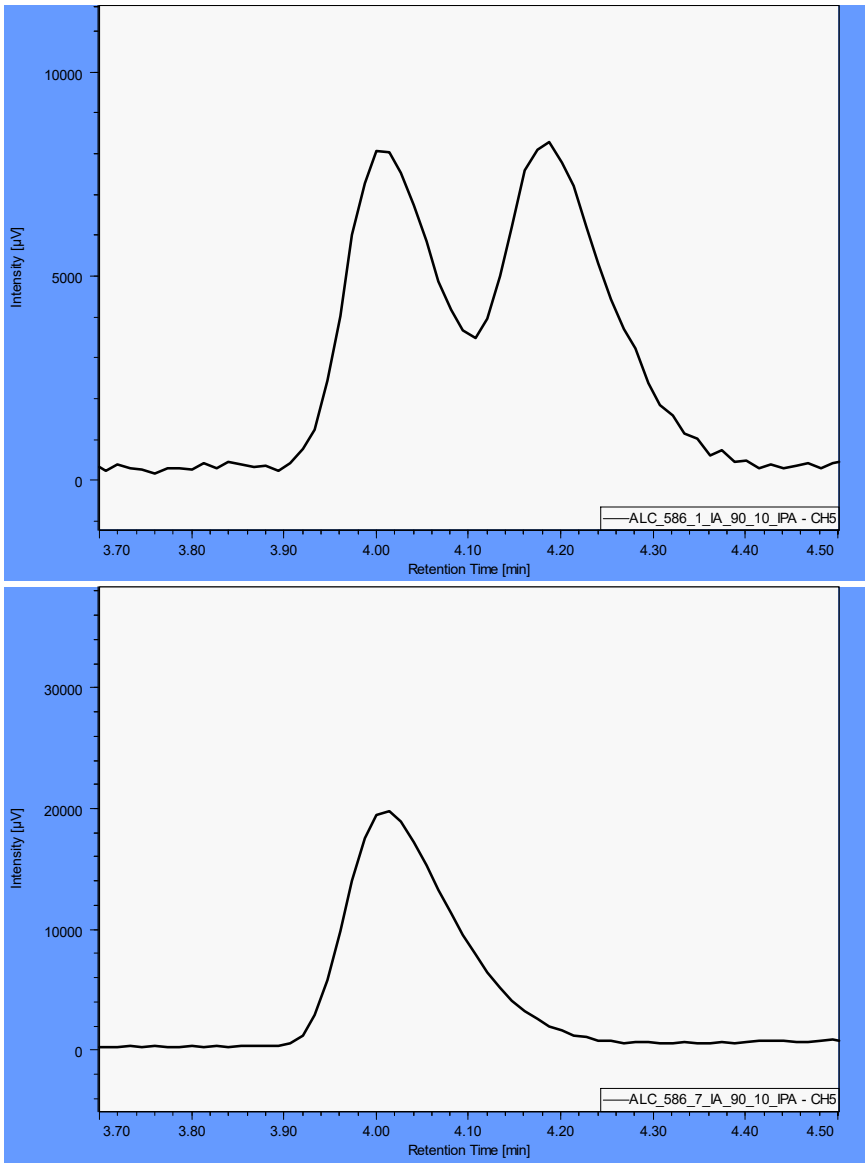


Figure S4. Anisotropic displacement ellipsoid plot of (1R,5S,6S)-3-methyl-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one **(2b)** with ellipsoids drawn at the 50% probability level. Hydrogen atoms are represented here as spheres of arbitrary radius.

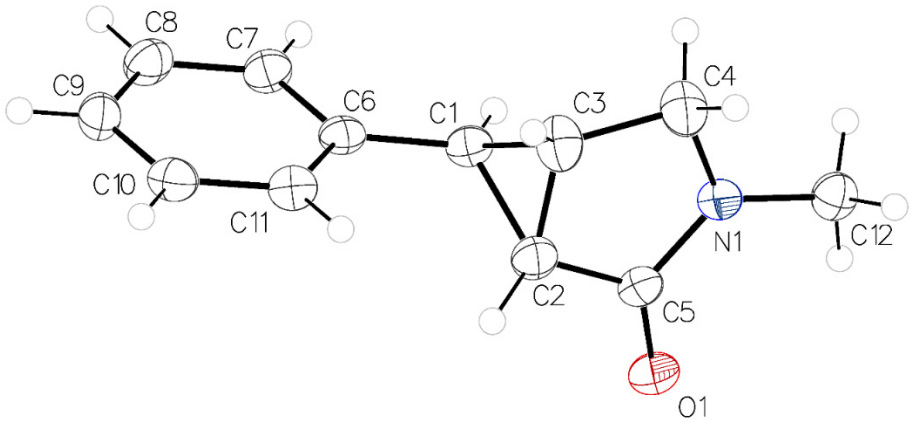
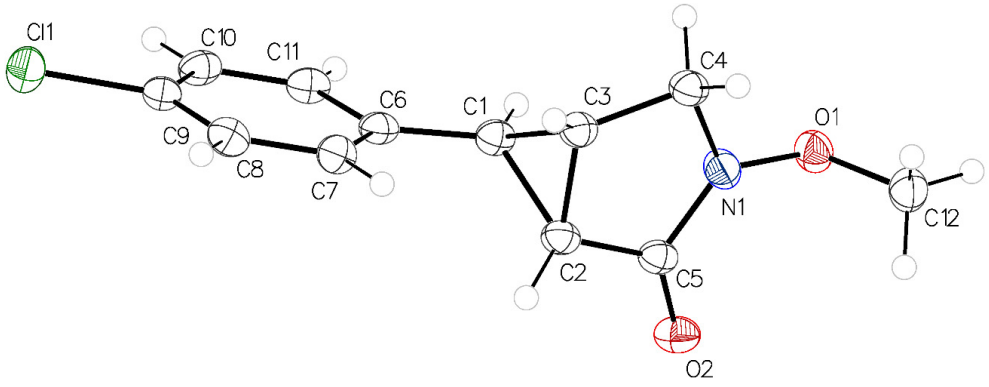


Figure S5. Anisotropic displacement ellipsoid plot of (1R,5S,6S)-6-(4-chlorophenyl)-3-methoxy-3-azabicyclo[3.1.0]hexan-2-one **2k)** with ellipsoids drawn at the 50% probability level. Hydrogen atoms are represented here as spheres of arbitrary radius.



Experimental Procedures

General Information

All chemicals and reagents were purchased from commercial suppliers (Sigma-Aldrich, AK Scientific, Alfa Aesar, TCI, Acros) and used without any further purification, unless otherwise stated. ^{1}H, and ^{13}C NMR spectra were measured on a Bruker DPX-500 instrument (operating at 500 MHz for ^{1}H and 125 MHz for ^{13}C). Tetramethylsilane (TMS) served as the internal standard (0 ppm) for ^{1}H NMR and $CDCl_3$ was used as the internal standard (77.0 ppm) for ^{13}C NMR. Flash column chromatography purification was carried out using AMD Silica Gel 60 Å 230-400 mesh or Alumina, (Fisher adsorption) 80-200 mesh. Thin Layer Chromatography (TLC) was carried out using Merck Millipore TLC silica gel 60 F254 glass plates.

Protein Expression

Cloning procedures of the Mb variants investigated in this work were described previously.[1, 2] The oligonucleotides used for site saturation mutagenesis are shown in **Table S6**. The Mb variants were expressed in *E. coli* BL21(DE3) or C41(DE3) cells as follows. After transformation, cells were grown in TB medium (ampicillin, 100 mg L^{-1}) at 37 °C (200 rpm) until OD_{600} reached 0.6. Cells were then induced with 0.25 mM isopropyl-β-D-1-thiogalactopyranoside (IPTG) and 0.3 mM δ-aminolevulinic acid (ALA). After induction, cultures were shaken at 180 rpm and 27 °C and harvested after 20 h by centrifugation at 4,000 rpm at 4 °C. Myoglobin concentration was determined after cell lysis by sonication, followed by CO-binding assay using an extinction coefficient ε_{424} = 187 $mM^{-1}cm^{-1}$.[5,6]

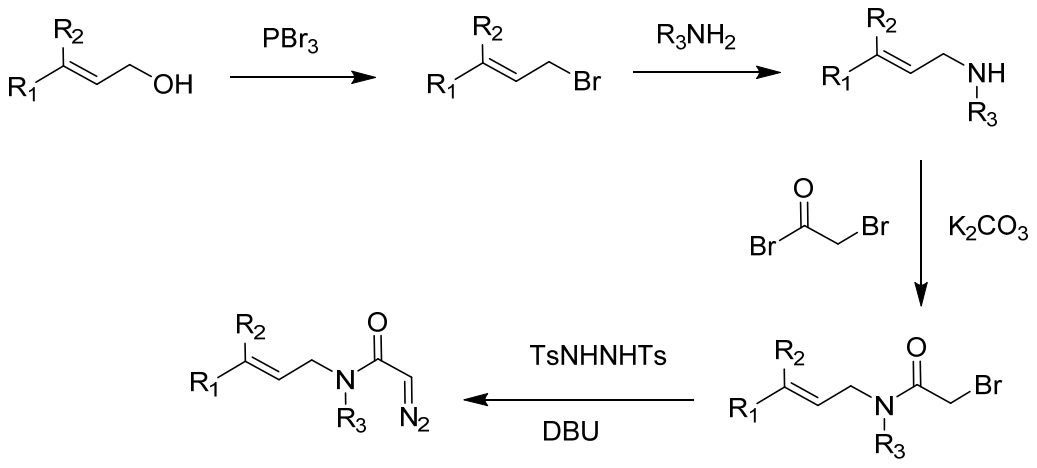
Table S6. Oligonucleotide used for site saturation mutagenesis

Oligonucleotide	**sequence (5' – 3')**
XhoI Rev	GGCTTTGTTAGCAGCCGGAT
L29NNK Fwd	GTCACGGTCAGGACATCNNKATCCGTCTGTTC
F43NNK Fwd	CAC CCG GAAACCCTG GAAAAANNKGACCGTTTC
H64NNK Fwd	GAAGGCTTCTGAAGACCTGAAAAAANNKGGTGTTACCG
V68NNK Fwd	CCTGAAAAAACACGGTGTTACCNNKCTGACCGCT
I107NNK Fwd	CCCGATCAAATACCTGGAGTTCNNKTCTGAAGCTATC

Synthetic Procedures:

Synthesis of trans-allylic diazo acetamides:

All diazo-compounds were synthesized by following reported procedures.[3, 4] The allylic alcohols were synthesized according to a published procedure[3] and then used for the synthesis of diazo acetamides.



General Procedure A: Synthesis of trans-allylic bromide from trans-allylic alcohol:

A solution of trans-allylic alcohol (1.0 equiv.) in DCM was added PBr_3 (0.5 equiv.) at 0 °C. The reaction mixture was stirred at room temperature for 2 h, subsequently quenched by the addition of saturated aqueous $NaHCO_3$ solution and diluted with DCM. The aqueous phase was separated and extracted with DCM. The combined organic layers were washed with brine, dried over $MgSO_4$ and concentrated in vacuo and obtained product was used in the next step without any further purification.

General Procedure B: Synthesis of trans-allylic amines from trans-allylic bromide by using methyl amine:

To a solution of methyl amine in EtOH (3 eq), trans-allylic bromide (3 mmol in 2 mL EtOH) was added slowly over 10 minutes at 0 °C and stirred at room temperature until the reaction was completed (6-12 h). After the evaporation of the solvent, residue was washed with

in diethyl ether (4 X). Crude product was dissolved in water (20 mL) and made basic by using 1 M NaOH. The reaction mixture was extracted with diethyl ether (3X). The organic phase was dried over $MgSO_4$. The solvent was removed in vacuo and the obtained product was used in the next step without any future purification.

General Procedure C: Synthesis of trans-allylic amines from trans-allylic bromide by using amine:

To a solution of amine (1.1 eq) in 10 mL EtOH, trans-allylic bromide (3 mmol) was added slowly at 0 °C and stirred at room temperature until the reaction was completed (6-12 h). After the evaporation of the solvent, residue was washed with in diethyl ether (4 X). Crude product was dissolved in water (20 mL) and made basic by using 1 M NaOH. The reaction mixture was extracted with diethyl ether (3X). The organic phase was dried over $MgSO_4$. The solvent was removed in vacuo and the obtained product was used in the next step without any future purification.

General Procedure D: Synthesis of trans-allylic amines from trans-allylic bromide by using Methoxyamine hydrochloride:

To a solution of *trans*-allylic bromide (3 mmol) and K_2CO_3 (2.08 g, 15 mmol) in CH_3CN (15.0 mL) and DMF (3 mL), Methoxylamine hydrochloride (1.25 g, 15 mmol.) was added slowly at 0 °C and stirred at room temperature until the reaction was completed. The reaction mixture was quenched with H_2O and extracted with DCM three times. The organic phase was washed with brine and dried over $MgSO_4$. The solvent was removed in vacuo and the obtained product was used in the next step without any future purification.

General Procedure E: Synthesis of trans-allylic diazoacetamides from trans-allylic amines:

To a solution of *trans*-allylic amine (3 mmol) and K_2CO_3 (2.08 g, 15 mmol) in DCM (15.0 mL), bromoacetyl bromide (780 µl, 9 mmol) was added slowly at 0 °C and stirred for 30 min. The reaction mixture was quenched with H_2O and extracted with DCM three times. The organic phase was washed with brine and dried over $MgSO_4$. The solvent was removed in vacuo and the obtained bromoacetate residue was used in the next step without any future purification. To the solution of the resulting bromoacetate and N',N-ditosylhydrazine (2.04 g, 6.0 mmol) in

THF (15.0 mL), DBU (2.28 mL, 15 mmol) was added dropwise at 0 °C and stirred for 30 min. Reaction was quenched by aqueous saturated solution of $NaHCO_3$. Reaction mixture was extracted with Et_2O three times. The organic phase was washed with brine, dried over $MgSO_4$ and evaporated to give crude diazo acetamide. The crude product was purified by column chromatography on silica gel with ethyl acetate/hexanes to afford the desired *trans*-allylic diazo acetamide product.

General procedure F: Preparative-scale biocatalytic intramolecular cyclopropanation reactions using whole cells:

These reactions were carried out on a 40 mL-scale using 39 mL of Mb(F43Y,H64V,V68A,I107V) (otherwise mentioned) expressing *E. coli* cells, 5 mM of allylic diazo acetamide. In a typical procedure, freshly prepared allylic diazo acetamide (0.2 mmol in 1 mL of ethanol) was added slowly to a 125 mL Erlenmeyer flask containing a suspension of Mb-expressing cells (OD_{600} = 40 in KPi, pH 7) under argon pressure, equipped with a magnetic stir bar and sealed with a rubber septum. Reaction mixture stirred at room temperature for 3-5 hours. The reaction mixtures were extracted with diethyl ether (20 mL x 3) and the combined organic layers were dried over $MgSO_4$ and concentrated under reduced pressure. The TON for the whole-cell reactions were calculated based on Mb concentration in the reaction mixture as measured via UV-vis spectroscopy using the CO-binding assay (ε_{424} = 187 $mM^{-1}cm^{-1}$) after cell lysis. The crude product was purified by flash column chromatography using silica gel and ethyl acetate/hexanes as the eluent to isolate the intramolecular cyclopropanation product. The purified product was characterized by NMR, GC-MS, and chiral SFC or GC for stereoselectivity determination and they were used as authentic standards for the construction of the calibration curves (TON and % conversion determination).

General Procedure G: Synthesis of racemic standards by using Hemin

Under standard reaction conditions, 500 μL scale reactions were carried out using 20 μM hemin (except 20 μM Mb-WT variant for **2h**), 5 mM allylic diazoacetate, and 10 mM sodium dithionite. In a typical procedure, a solution containing hemin in potassium phosphate buffer (50 mM, pH 7.0) with sodium dithionite was prepared in an anaerobic chamber. Reactions were

initiated by addition of 10 μL of diazoacetate from 0.5 M stock solutions, and the reaction mixtures were stirred in the chamber for 12 h at room temperature. Reaction mixtures were extracted by using DCM and used for analysis.

Reaction Analysis

The reactions were analyzed by adding 25 μL of internal standard (benzodioxole, 50 mM in methanol) to a 500 μL aliquot of the reaction mixture, followed by extraction with 500 μL dichloromethane (DCM) and centrifugation at 14,000 rpm. The organic layer was collected and analyzed by SFC or GC-FID. The TON for the whole-cell reactions were calculated based on Mb concentration in the reaction mixture as measured via UV-vis using the CO-binding assay (ε_{424} = 187 $mM^{-1}cm^{-1}$) after cell lysis. Calibration curves of the different intramolecular cyclopropane products were constructed using authentic standards from the whole cell reactions (procedure F). Enantioselectivity was determined by using SFC or GC-FID using a chiral column as described below.

Analytical Methods

Gas chromatography (GC) analysis were carried out using a Shimadzu GC-2010 gas chromatograph equipped with a FID detector, and a Cyclosil-B column (30 m x 0.25 mm x 0.25 μm film). The following GC methods were used for TON analysis and stereoisomer separation (% *ee* analysis)**,** 1 μL injection, injector temp.: 200 ºC, detector temp: 300 ºC.

Gradient for method A: column temperature set at 140 ºC for 3 min, then to 160 ºC at 1.8 ºC/min, then to 165 ºC at 1.0 ºC/min, then to 245 at 25 ºC/min, then 245 ºC for 6 min. Total run time was 28 min.

Gradient for method B: column temperature set at 130ºC for 2 min, then to 150 ºC at 0.8 ºC/min, then to 180 ºC at 0.6 ºC/min, then 245 °C at 25 ºC/min, 245 ºC hold for 3 min. Total run time was 82 min.

Gradient for method C: column temperature set at 120ºC for 3 min, then to 150 ºC at 0.8 ºC/min, then to 245 °C at 25 ºC/min, 245 ºC hold for 2 min. Total run time was 46 min.

Gradient for method D: column temperature set at 70ºC for 3 min, then to 160 ºC at 0.45 ºC/min, then to 240 °C at 25 ºC/min. Total run time was 206 min.

Gradient for method E: column temperature set at 180ºC, then to 192 ºC at 0.2 ºC/min, then to 245 °C at 25 ºC/min, 245 ºC hold for 3 min. Total run time was 65 min.

Gradient for method F: column temperature set at 160ºC for 3 min, then to 245 ºC at 2 ºC/min, 245 ºC hold for 3 min. Total run time was 48.5 min.

Gradient for method G: column temperature set at 100ºC for 3 min, then to 140 ºC at 0.4 ºC/min then to 245 ºC at 25 ºC/min, 245 ºC hold for 2 min. Total run time was 109 min.

Table S7. Enantiomer resolution via chiral GC analysis.

Product	**Method**	**t_R for 1st isomer (min)**	**t_R for 2nd isomer (min)**
2a	A	23.22	23.29
2b	B	59.61	60.70
2c	B	68.83	69.38
2e	F	26.09	26.29
2f	A	20.30	20.45
2g	G	21.07	21.31
2h	A	4.32	4.41
2i	D	180.55	181.08
2j	B	12.82	13.07
2k	E	47.15	47.66
2l	C	74.39	75.49

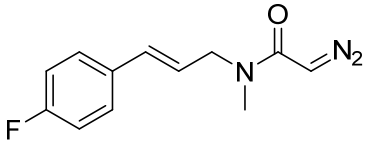
Enantiomer resolution for compounds **2d, 2m, 2n** were performed by Supercritical Fluid Chromatography (SFC) using a JASCO Analytical and Semi-Preparative SFC instrument equipped with a column oven (35 °C), photodiode array detector, a backpressure regulator (12.0 MPa), a carbon dioxide pump and a sample injection volume of 3 μL. Daicel Chiralpak IA, IB IC or IF column (0.46 cm ID × 25 cm L) were used for separation of the enantiomers and % *ee* determination. All samples were eluted using an isocratic solvent system with the indicated modifier in liquid CO_2 at an elution rate of 4 mL/min and detected at λ = 220 nm. Total run time was 10.2 min.

Table S8. Enantiomer resolution via chiral SFC analysis.

Product	Column	Modifier Solvent	t_R for 1st enantiomer (min)	t_R for 2nd enantiomer (min)
2d	IB	IPA (10%)	4.67	5.10
2m	IA	IPA (20%)	3.92	4.55
2n	IA	IPA (10%)	4.02	4.19

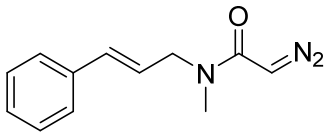
Compound Characterization Data

(E)-2-diazo-N-(3-(4-fluorophenyl)allyl)-N-methylacetamide (1a):



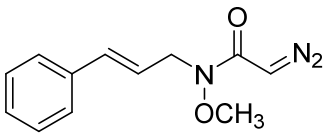
(E)-2-diazo-N-(3-(4-fluorophenyl)allyl)-N-methylacetamide (**1a**) was prepared according to the general procedure for the synthesis of *trans*-allylic diazo acetamide. Reaction mixture was purified by silica gel column chromatography with 30% EtOAc/hexanes as an eluent to give the desired product as pale-yellow liquid in 48% yield (yield of step E). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.13 – 7.07 (m, 4H), 5.78 (dd, *J* = 8.8, 1.6 Hz, 1H), 5.58 (dd, *J* = 4.3, 2.2 Hz, 1H), 3.73 (dd, *J* = 10.5, 8.4 Hz, 1H), 3.24 (dd, *J* = 10.6, 2.6 Hz, 1H), 2.86 (s, 3H), 2.77 – 2.68 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 166.5, 162.4, 133.7, 129.40 (d, *J* = 8.3 Hz), 116.95 (d, *J* = 21.7 Hz), 101.8, 97.3, 54.4, 37.1, 30.5. ^{19}F NMR (376 MHz, CDCl3): δ -113.2.

N-cinnamyl-2-diazo-N-methylacetamide (1b):



N-cinnamyl-2-diazo-N-methylacetamide (**1b**) was prepared according to the general procedure for the synthesis of *trans*-allylic diazo acetamide. Reaction mixture was purified by silica gel column chromatography with 30% EtOAc/hexanes as an eluent to give the desired product as pale-yellow liquid in 74% yield (yield of step E). (mixture of rotamers 90:10), major rotamer: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.46 – 7.22 (m, 5H), 6.51 (d, *J* = 15.7 Hz, 1H), 6.15 (d, *J* = 15.6 Hz, 1H), 5.04 (s, 1H), 4.08 (br s, 2H), 2.94 (br s, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 164.0, 134.5, 130.5, 127.4, 126.8, 126.0, 124.6, 51.9, 44.6, 32.3.

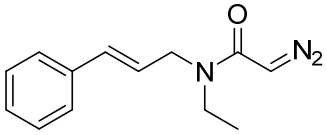
N-cinnamyl-2-diazo-N-methoxyacetamide (1c):



N-cinnamyl-2-diazo-N-methoxyacetamide (**1c**) was prepared according to the general procedure for the synthesis of *trans*-allylic diazo acetamide. Reaction mixture was purified by silica gel column chromatography with 20% EtOAc/hexanes as an eluent to give the desired product as pale-yellow liquid 71% yield (yield of step E). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.36 (d, *J* = 7.4 Hz, 2H), 7.29 (t, *J* = 7.5 Hz, 2H), 7.22 (t, *J* = 7.2 Hz, 1H), 6.58 (d, *J* = 15.8 Hz, 1H), 6.22 (dt, *J* =

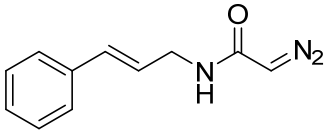
15.7, 6.6 Hz, 1H), 5.34 (s, 1H), 4.35 (d, *J* = 6.5 Hz, 2H), 3.67 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 169.3, 137.2, 134.6, 129.3, 128.6, 127.2, 124.2, 63.4, 49.9, 47.5.

N-cinnamyl-2-diazo-N-ethylacetamide (1d):



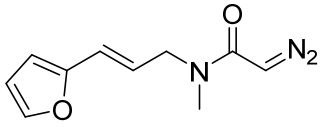
N-cinnamyl-2-diazo-N-ethylacetamide (**1d**) was prepared according to the general procedure for the synthesis of *trans*-allylic diazo acetamide. Reaction mixture was purified by silica gel column chromatography with 20% EtOAc/hexanes as an eluent to give the desired product as pale-yellow liquid in 80% yield (yield of step E). (mixture of rotamers 80:20), major rotamer: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.47 – 7.24 (m, 5H), 6.48 (d, *J* = 15.7 Hz, 1H), 6.30 – 6.03 (m, 1H), 4.98 (s, 1H), 4.03 (br s, 2H), 3.34 (br s, 2H), 1.16 (br s, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 163.6, 135.3, 134.5, 127.4, 126.8, 126.0, 124.5, 49.1, 44.8, 39.8, 11.8.

N-cinnamyl-2-diazoacetamide (1e):



N-cinnamyl-2-diazoacetamide (1e) was prepared according to the general procedure for the synthesis of *trans*-allylic diazo acetamide. Reaction mixture was purified by silica gel column chromatography with 90% EtOAc/hexanes as an eluent to give the desired product as yellow solid in 35% yield (yield of step E). ^{1}H NMR (500 MHz, MeOD) δ 7.67 (d, *J* = 8.1 Hz, 1H), 7.35 (d, *J* = 7.5 Hz, 2H), 7.27 (t, *J* = 7.4 Hz, 2H), 7.18 (t, *J* = 7.2 Hz, 1H), 6.50 (d, *J* = 15.8 Hz, 1H), 6.19 (dt, *J* = 15.8, 5.9 Hz, 1H), 5.14 (s, 1H), 3.96 (d, *J* = 5.7 Hz, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 171.8, 137.6, 132.1, 128.9, 127.9, 126.7, 126.2, 70.4, 41.1.

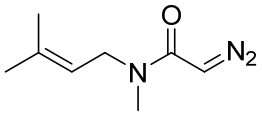
(E)-2-diazo-N-(3-(furan-2-yl)allyl)-N-methylacetamide (1f):



(E)-2-diazo-N-(3-(furan-2-yl)allyl)-N-methylacetamide **(1f)** was prepared according to the general procedure for the synthesis of *trans*-allylic diazo acetamide. Reaction mixture was purified by silica gel column chromatography with 50% EtOAc/hexanes as an eluent to give the desired product as pale-yellow liquid in 44% yield (yield of step E). (mixture of rotamers 60:40), major rotamer: ^{1}H

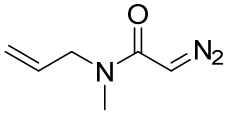
NMR (500 MHz, $CDCl_3$) δ 7.34 (s, 1H), 6.39 (d, J = 17.4 Hz, 1H), 6.35 – 6.18 (m, 2H), 6.06 (d, J = 15.6 Hz, 1H), 4.98 (s, 1H), 4.04 (br s, 2H), 2.92 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 166.7, 142.9, 139.9, 130.2, 112.1, 111.6, 109.5, 54.2, 47.2, 33.6.

2-diazo-N-methyl-N-(3-methylbut-2-en-1-yl)acetamide (1g):



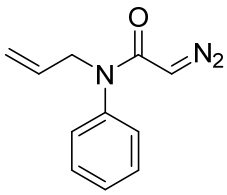
2-diazo-N-methyl-N-(3-methylbut-2-en-1-yl)acetamide **(1g)** was prepared according to the general procedure for the synthesis of *trans*-allylic diazo acetamide. Reaction mixture was purified by silica gel column chromatography with 30% EtOAc/hexanes as an eluent to give the desired product as pale-yellow liquid in 43% yield (yield of step E). ^1H NMR (500 MHz, $CDCl_3$) δ 5.11 (t, J = 5.9 Hz, 1H), 4.93 (s, 1H), 3.86 (br s, 2H), 2.84 (s, 3H), 1.74 (s, 3H), 1.69 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 166.2, 136.9, 120.3, 48.6, 47.0, 34.5, 26.4, 18.6.

N-allyl-2-diazo-N-methylacetamide (1h):



N-allyl-2-diazo-N-methylacetamide (**1h**) was prepared according to the general procedure for the synthesis of *trans*-allylic diazo acetamide. Reaction mixture was purified by silica gel column chromatography with 30% EtOAc/hexanes as an eluent to give the desired product as pale-yellow liquid in 43% yield (yield of step E). (mixture of rotamers 80:20), major rotamer: ^1H NMR (500 MHz, $CDCl_3$) δ 5.86 – 5.70 (m, 1H), 5.20 (d, J = 11.3 Hz, 2H), 4.97 (s, 1H), 3.90 (br s, 2H), 2.89 (br s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 166.6, 133.4, 117.8, 55.3, 47.0, 34.8.

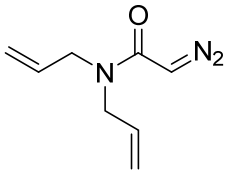
N-allyl-2-diazo-N-phenylacetamide (1i):



N-allyl-2-diazo-N-phenylacetamide **(1i)** was prepared according to the general procedure for the synthesis of *trans*-allylic diazo acetamide. Reaction mixture was purified by silica gel column chromatography with 20% EtOAc/hexanes as an eluent to give the desired product as pale-yellow liquid

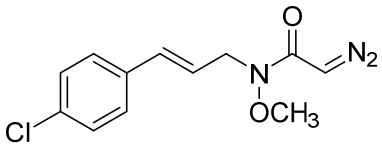
in 85% yield (yield of step E). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.37 (t, *J* = 7.5 Hz, 2H), 7.31 (t, *J* = 6.9 Hz, 1H), 7.15 (d, *J* = 7.2 Hz, 2H), 5.94 – 5.78 (m, 1H), 5.12 – 5.06 (m, 2H), 4.43 (s, 1H), 4.31 (d, *J* = 6.2 Hz, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 166.3, 142.3, 134.1, 130.4, 129.1, 128.8, 118.6, 52.8, 48.1.

N,N-diallyl-2-diazoacetamide (1j):



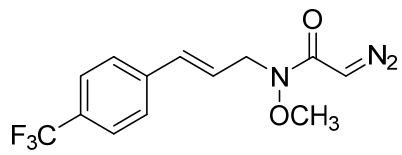
N,N-diallyl-2-diazoacetamide **(1j)** was prepared according to the general procedure for the synthesis of *trans*-allylic diazo acetamide. Reaction mixture was purified by silica gel column chromatography with 30% EtOAc/hexanes as an eluent to give the desired product as pale-yellow liquid in 69% yield (yield of step E). (mixture of rotamers 85:15), Major rotamer: ^{1}H NMR (500 MHz, $CDCl_3$) δ 5.79 – 5.66 (m, 2H), 5.15 (d, *J* = 10.9 Hz, 4H), 4.90 (br s, 1H), 3.82 (br s, 4H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 166.7, 132.1, 119.6, 52.6, 49.5.

(E)-N-(3-(4-chlorophenyl)allyl)-2-diazo-N-methoxyacetamide (1k):



(E)-N-(3-(4-chlorophenyl)allyl)-2-diazo-N-methoxyacetamide **(1k)** was prepared according to the general procedure for the synthesis of *trans*-allylic diazo acetamide. Reaction mixture was purified by silica gel column chromatography with 20% EtOAc/hexanes as an eluent to give the desired product as pale-yellow liquid in 76% yield (yield of step E). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.25 (d, *J* = 6.3 Hz, 4H), 6.51 (d, *J* = 15.8 Hz, 1H), 6.18 (dt, *J* = 15.8, 6.5 Hz, 1H), 5.33 (s, 1H), 4.33 (dd, *J* = 6.5, 1.2 Hz, 2H), 3.66 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 169.4, 135.7, 134.2, 133.3, 129.5, 128.4, 125.0, 63.3, 49.6, 47.45.

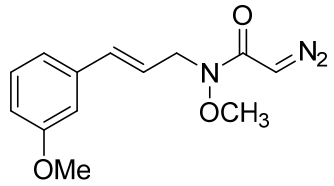
(E)-2-diazo-N-methoxy-N-(3-(4-(trifluoromethyl)phenyl)allyl)acetamide (1l):



(E)-2-diazo-N-methoxy-N-(3-(4-(trifluoromethyl)phenyl)allyl)acetamide **(1l)** was prepared according to the general procedure for the synthesis of *trans*-allylic diazo acetamide. Reaction mixture was purified by

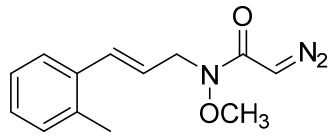
silica gel column chromatography with 20% EtOAc/hexanes as an eluent to give the desired product as pale-yellow liquid in 78% yield (yield of step E). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.56 (d, *J* = 8.1 Hz, 2H), 7.47 (d, *J* = 8.1 Hz, 2H), 6.62 (d, *J* = 15.9 Hz, 1H), 6.33 (dt, *J* = 15.8, 6.4 Hz, 1H), 5.38 (s, 1H), 4.39 (d, *J* = 6.3 Hz, 2H), 3.70 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 169.4, 140.6, 133.1, 127.4, 127.1, 126.3, 126.2, 126.1 63.3, 49.6, 47.5. ^{19}F NMR (376 MHz, CDCl3): δ -62.7.

(E)-2-diazo-N-methoxy-N-(3-(3-methoxyphenyl)allyl)acetamide (1m):



(E)-2-diazo-N-methoxy-N-(3-(3-methoxyphenyl)allyl)acetamide (**1m**) was prepared according to the general procedure for the synthesis of *trans*-allylic diazo acetamide. Reaction mixture was purified by silica gel column chromatography with 20% EtOAc/hexanes as an eluent to give the desired product as pale-yellow liquid in 62% yield (yield of step E). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.20 (t, *J* = 7.9 Hz, 1H), 6.95 (d, *J* = 7.6 Hz, 1H), 6.89 (s, 1H), 6.78 (dd, *J* = 8.2, 2.1 Hz, 1H), 6.55 (d, *J* = 15.8 Hz, 1H), 6.21 (dt, *J* = 15.8, 6.6 Hz, 1H), 5.34 (s, 1H), 4.34 (d, *J* = 6.3 Hz, 2H), 3.79 (s, 3H), 3.67 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 169.4, 160.5, 138.6, 134.5, 130.3, 124.6, 119.9, 114.4, 112.4, 63.4, 56.0, 49.8, 47.5.

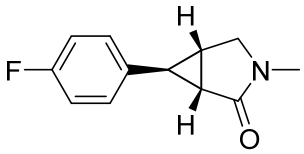
(E)-2-diazo-N-methoxy-N-(3-(o-tolyl)allyl)acetamide (1n):



(E)-2-diazo-N-methoxy-N-(3-(o-tolyl)allyl)acetamide **(1n)** was prepared according to the general procedure for the synthesis of *trans*-allylic diazo acetamide. Reaction mixture was purified by silica gel column chromatography with 20% EtOAc/hexanes as an eluent to give the desired product as pale-yellow liquid in 65% yield (yield of step E). (mixture of rotamers 90:10) ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.48 – 7.37 (m, 1H), 7.18 – 7.09 (m, 3H), 6.79 (d, *J* = 15.7 Hz, 1H), 6.10 (dt, *J* = 15.7, 6.6 Hz, 1H), 5.34 (s, 1H), 4.37 (dd, *J* = 6.6, 1.1 Hz, 2H), 3.68 (s, 3H), 2.33 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 169.4, 136.3, 136.2, 132.5, 131.0, 128.5, 126.9, 126.5, 125.6, 63.5, 50.2, 47.4, 20.5.

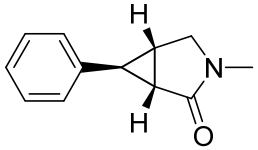
Characterization data for intramolecular cyclopropanation products prepared by enzymatic reactions on preparative scale.

(1R,5S,6S)-6-(4-fluorophenyl)-3-methyl-3-azabicyclo[3.1.0]hexan-2-one (2a):



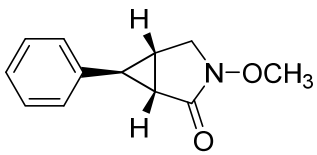
(1R,5S,6S)-6-(4-fluorophenyl)-3-methyl-3-azabicyclo[3.1.0]hexan-2-one **(2a)** was prepared according to the general **Procedure F** with *E. coli* cells expressing Mb(F43Y,H64V,V68A,I107V) to afford the product as a white solid, 36.9 mg, 90% yield. GC-MS m/z (% relative intensity): 207(1.8), 205(0.5), 174(27.0), 173(12.0), 130(67.4), 129(100), 115(86.6), 91(15.6), 77(13.7); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.07 – 6.92 (m, 4H), 3.66 (dd, *J* = 10.6, 5.8 Hz, 1H), 3.49 (dd, *J* = 10.5, 10.5 Hz, 1H), 2.82 (s, 3H), 2.21 (dd, *J* = 6.3, 6.3 Hz, 1H), 2.11 (dd, *J* = 9.0, 5.4 Hz, 1H), 2.08 – 2.03 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 174.2, 162.32 (d, *J* = 245.0 Hz), 135.43 (d, *J* = 3.0 Hz), 128.13 (d, *J* = 8.0 Hz), 116.11 (d, *J* = 21.5 Hz), 52.5, 31.3, 30.1, 30.0, 22.1. ^{19}F NMR (376 MHz, CDCl3): δ -116.4.

(1R,5S,6S)-3-methyl-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one (2b):



(1R,5S,6S)-3-methyl-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one **(2b)** was prepared according to the general **Procedure F** with *E. coli* cells expressing Mb(F43Y,H64V,V68A,I107V) to afford the product as a white solid, 30.7 mg, 82% yield. GC-MS m/z (% relative intensity): 188(1.2), 187(9.3), 186(5.9), 130(100), 129(53.7), 116(12.7), 115(42.5), 77(5.7); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.26 – 7.21 (m, 2H), 7.17 (t, *J* = 7.3 Hz, 1H), 7.01 (d, *J* = 7.5 Hz, 2H), 3.62 (dd, *J* = 10.6, 5.8 Hz, 1H), 3.45 (dd, *J* = 10.5, 10.5 Hz, 1H), 2.78 (s, 3H), 2.20 (dd, *J* = 6.2, 6.2 Hz, 1H), 2.11 (dd, *J* = 9.6, 5.9 Hz, 1H), 2.05 – 2.00 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 174.3, 139.9, 129.3, 127.3, 126.6, 52.6, 31.4, 30.7, 30.1, 22.3.

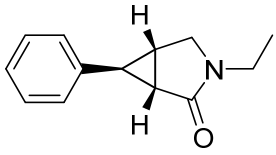
(1R,5S,6S)-3-methoxy-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one (2c):



(1R,5S,6S)-3-methoxy-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one **(2c)** was prepared according to the general **Procedure F** with *E. coli* cells expressing Mb(F43Y,H64V,V68A,I107V) to afford the product as a

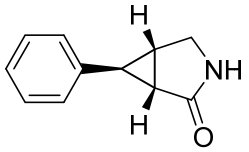
white solid, 36.2 mg, 89% yield. GC-MS m/z (% relative intensity): 203(13.1), 172(22.2), 144(66.7), 130(76.5), 116(83.2), 115(100), 91(11.0), 77(12.7); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.25 (t, *J* = 7.4 Hz, 2H), 7.18 (t, *J* = 7.3 Hz, 1H), 7.01 (d, *J* = 7.3 Hz, 2H), 3.84 (dd, *J* = 9.5, 5.6 Hz, 1H), 3.73 (s, 3H), 3.62 (dd, *J* = 9.4, 9.4 Hz, 1H), 2.13 (dd, *J* = 6.1, 6.1 Hz, 1H), 2.11 – 2.03 (m, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 169.9, 138.9, 129.4, 127.6, 126.7, 62.9, 48.5, 30.8, 27.6, 19.5.

(1R,5S,6S)-3-ethyl-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one (2d):



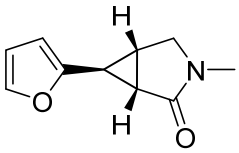
(1R,5S,6S)-3-ethyl-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one **(2d)** was prepared according to the general **Procedure F** with *E. coli* cells expressing Mb(F43Y,H64V,V68A,I107V) to afford the product as a white solid, 33 mg, 82% yield. GC-MS m/z (% relative intensity): 201(3.87), 130(100), 129(52.3), 115(35.5), 77(4.7); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.24 (t, *J* = 7.4 Hz, 2H), 7.17 (t, *J* = 7.2 Hz, 1H), 7.01 (d, *J* = 7.1 Hz, 2H), 3.63 (dd, *J* = 10.5, 5.9 Hz, 1H), 3.45 (dd, *J* = 10.4, 10.4 Hz, 1H), 3.26 (m, 2H), 2.21 (dd, *J* = 5.7, 5.7 Hz, 1H), 2.10 (dd, *J* = 9.5, 5.9 Hz, 1H), 2.02 – 1.94 (m, 1H), 1.08 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 173.9, 139.9, 129.2, 127.2, 126.6, 49.7, 37.6, 31.7, 30.6, 22.2, 13.5.

(1R,5S,6S)-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one (2e):



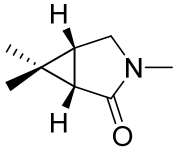
(1R,5S,6S)-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one **(2e)** was prepared according to the general **Procedure F** with *E. coli* cells expressing Mb(F43Y,H64V,V68A,I107V) to afford the product as a white solid, 8 mg, 23% yield. GC-MS m/z (% relative intensity): 174(1.3), 173(10.8), 172(7.4), 153(9.3), 130(100), 115(48.7), 91(9.0); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.29 (t, *J* = 7.4 Hz, 2H), 7.21 (t, *J* = 7.0 Hz, 1H), 7.05 (d, *J* = 7.4 Hz, 2H), 5.35 (s, 1H), 3.66 (dd, *J* = 10.3, 5.8 Hz, 1H), 3.54 (dd, *J* = 10.3, 10.3 Hz, 1H), 2.25 (dd, *J* = 5.2, 5.2 Hz, 1H), 2.17 – 2.13 (m, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 166.6, 139.8, 129.3, 127.3, 126.6, 70.4, 45.2, 30.3, 25.1.

(1R,5S,6S)-6-(furan-2-yl)-3-methyl-3-azabicyclo[3.1.0]hexan-2-one (2f):



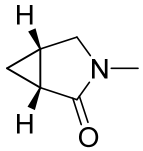
(1R,5S,6S)-6-(furan-2-yl)-3-methyl-3-azabicyclo[3.1.0]hexan-2-one **(2f)** was prepared according to the general **Procedure F** with *E. coli* cells expressing Mb(F43Y,H64V,V68A,I107V) to afford the product as a white solid, 24.8 mg, 70% yield. GC-MS m/z (% relative intensity): 178(3.7), 177(31.4), 121(13.0), 120(100), 106(11.7), 91(67.1), 65(8.4); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.25 (d, *J* = 0.9 Hz, 1H), 6.28 (dd, *J* = 3.1, 1.8 Hz, 1H), 6.05 (d, *J* = 3.1 Hz, 1H), 3.63 (dd, *J* = 10.6, 5.7 Hz, 1H), 3.45 (dd, *J* = 10.6, 10,6 Hz, 1H), 2.79 (s, 3H), 2.32 – 2.20 (m, 2H), 2.11 – 2.02 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 173.9, 152.7, 142.0, 111.2, 106.1, 52.1, 30.0, 29.1, 24.0, 19.9.

(1S,5R)-3,6,6-trimethyl-3-azabicyclo[3.1.0]hexan-2-one (2g):



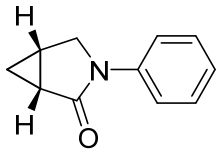
(1S,5R)-3,6,6-trimethyl-3-azabicyclo[3.1.0]hexan-2-one **(2g)** was prepared according to the general **Procedure F** with *E. coli* cells expressing Mb(H64V, V68G) to afford the product as a white solid, 13 mg, 45% yield. GC-MS m/z (% relative intensity): 140(6.3), 139(67.8), 138(7.0), 124(15.4), 111(11.4), 98(49.3), 82(62.3), 67(100); ^{1}H NMR (500 MHz, $CDCl_3$) δ 3.52 (dd, *J* = 10.8, 6.6 Hz, 1H), 3.10 (d, *J* = 11.0 Hz, 1H), 2.73 (s, 3H), 1.80 (d, *J* = 6.5 Hz, 1H), 1.59 (dd, *J* = 6.6, 6.6 Hz, 1H), 1.11 (s, 3H), 0.99 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 173.7, 49.0, 33.9, 29.4, 26.4, 24.8, 22.4, 14.5.

(1R,5S)-3-methyl-3-azabicyclo[3.1.0]hexan-2-one (2h):



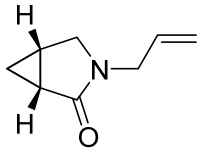
(1R,5S)-3-methyl-3-azabicyclo[3.1.0]hexan-2-one **(2h)** was prepared according to the general **Procedure F** with *E. coli* cells expressing Mb(H64V,V68G) to afford the product as a green solid, 15.8 mg, 71% yield. GC-MS m/z (% relative intensity): 112(6.9), 111(100), 110(31.4), 83(13.6), 82(23.5), 68(24.8), 55(22.8); ^{1}H NMR (500 MHz, $CDCl_3$) δ 3.52 (dd, *J* = 10.3, 5.9 Hz, 1H), 3.28 (dd, *J* = 10.5, 10.5 Hz, 1H), 2.74 (s, 3H), 1.95 – 1.87 (m, 1H), 1.87 – 1.79 (m, 1H), 1.08 (ddd, *J* = 8.0, 8.0, 4.8 Hz, 2H), 0.59 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 169.0, 52.1, 30.0, 20.9, 13.5, 12.5.

(1R,5S)-3-phenyl-3-azabicyclo[3.1.0]hexan-2-one (2i):



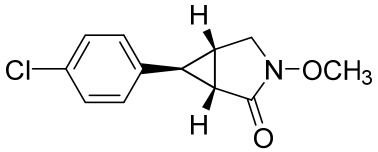
(1R,5S)-3-phenyl-3-azabicyclo[3.1.0]hexan-2-one **(2i)** was prepared according to the general **Procedure F** with *E. coli* cells expressing Mb(H64V,V68G) to afford the product as a white liquid, 28.8 mg, 83% yield. GC-MS m/z (% relative intensity): 174(12.4), 173(100), 172(19.5), 144(25.0), 119(13.3), 104(27.2), 77(26.8); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.49 (d, *J* = 8.0 Hz, 2H), 7.30 (t, *J* = 7.9 Hz, 2H), 7.08 (t, *J* = 7.3 Hz, 1H), 4.02 (dd, *J* = 10.0, 5.9 Hz, 1H), 3.71 (dd, *J* = 10.0, 10.0 Hz, 1H), 2.12 – 2.03 (m, 1H), 2.01 – 1.90 (m, 1H), 1.17 (ddd, *J* = 8.0, 8.0, 4.9 Hz, 8H), 0.76 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 175.1, 140.1, 129.6, 125.0, 120.5, 51.1, 22.5, 13.4, 12.1.

(1R,5S)-3-allyl-3-azabicyclo[3.1.0]hexan-2-one (2j):



(1R,5S)-3-allyl-3-azabicyclo[3.1.0]hexan-2-one **(2j)** was prepared according to the general **Procedure F** with *E. coli* cells expressing Mb(H64V,V68G) to afford the product as a white solid, 11.8 mg, 43% yield. GC-MS m/z (% relative intensity): 138(9.0), 137(100), 136(75.2), 122(25.8), 110(31.1), 96(15.1), 94(41.8), 68(29.9); ^{1}H NMR (500 MHz, $CDCl_3$) δ 5.76 – 5.58 (m, 1H), 5.13 (d, *J* = 16.0 Hz, 2H), 3.77 (qd, *J* = 15.3, 5.9 Hz, 2H), 3.48 (dd, *J* = 10.3, 5.9 Hz, 1H), 3.26 (dd, *J* = 10.3, 10.3 Hz, 1H), 1.99 – 1.90 (m, 1H), 1.88 – 1.77 (m, 1H), 1.10 (ddd, *J* = 8.0, 8.0, 4.9 Hz, 1H), 0.60 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 175.6, 133.5, 118.5, 49.5, 45.5, 21.0, 13.5, 12.6.

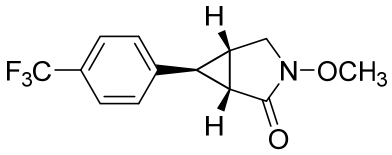
(1R,5S,6S)-6-(4-chlorophenyl)-3-methoxy-3-azabicyclo[3.1.0]hexan-2-one (2k):



(1R,5S,6S)-6-(4-chlorophenyl)-3-methoxy-3-azabicyclo[3.1.0]hexan-2-one (**2k)** was prepared according to the general **Procedure F** with *E. coli* cells expressing Mb(F43Y,H64V,V68A,I107V) to afford the product as a white solid, 32.8 mg, 69% yield. GC-MS m/z (% relative intensity): 239(3.4), 237(9.9), 180(17.1), 178(53.1), 164(38.7), 129(44.7), 115(100), 89(9.9); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.23 (d, *J* = 8.5 Hz, 2H), 6.95 (d, *J* = 8.4 Hz, 2H), 3.85 (dd, *J* = 9.6, 5.4 Hz, 1H), 3.74 (s, 3H), 3.63 (dd, *J* =

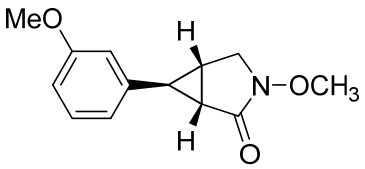
10.3, 10.3 Hz, 1H), 2.12 (dd, *J* = 6.4, 6.4 Hz, 1H), 2.09 – 2.01 (m, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 169.5, 137.4, 133.4, 129.5, 128.1, 63.0, 48.4, 30.2, 27.7, 19.6.

(1R,5S,6S)-3-methoxy-6-(4-(trifluoromethyl)phenyl)-3-azabicyclo[3.1.0]hexan-2-one (2l):



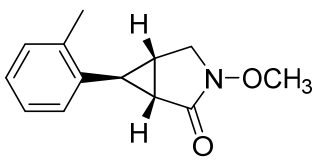
(1R,5S,6S)-3-methoxy-6-(4-(trifluoromethyl)phenyl)-3-azabicyclo[3.1.0]hexan-2-one **(2l)** was prepared according to the general **Procedure F** with *E. coli* cells expressing Mb(F43Y,H64V,V68A,I107V) to afford the product as a white solid, 36.3 mg, 67% yield. GC-MS m/z (% relative intensity): 271(12.2), 241(26.8), 212(58.3), 198(45.8), 184(44.2), 129(52.0), 115(100), 68(32.0); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.52 (d, *J* = 7.9 Hz, 2H), 7.12 (d, *J* = 7.9 Hz, 2H), 3.88 (dd, *J* = 9.6, 5.8 Hz, 1H), 3.75 (s, 3H), 3.66 (dd, *J* = 9.7, 9.7 Hz, 1H), 2.20 (dd, *J* = 6.2, 6.2 Hz, 1H), 2.17 – 2.08 (m, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 169.3, 143.1, 129.13 (d, *J* = 30.0 Hz), 127.0, 126.33 (d, *J* = 3.7 Hz), 63.0, 48.4, 30.3, 28.0, 20.0. ^{19}F NMR (376 MHz, CDCl3): δ -62.7.

(1R,5S,6S)-3-methoxy-6-(3-methoxyphenyl)-3-azabicyclo[3.1.0]hexan-2-one (2m):



(1R,5S,6S)-3-methoxy-6-(3-methoxyphenyl)-3-azabicyclo[3.1.0]hexan-2-one (**2l)** was prepared according to the general **Procedure F** with *E. coli* cells expressing Mb(F43Y,H64V,V68A,I107V) to afford the product as a white solid, 42 mg, 90% yield. GC-MS m/z (% relative intensity): 234(7.4), 233(49.1), 202(52,7), 174(88.6), 146(100), 131(95.4), 115(53.7), 103(60.6), 77(36.1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.20 (t, *J* = 7.9 Hz, 1H), 6.76 (dd, *J* = 8.2, 2.0 Hz, 1H), 6.64 (d, *J* = 7.7 Hz, 1H), 6.60 (s, 1H), 3.87 (dd, *J* = 9.6, 5.6 Hz, 1H), 3.79 (s, 3H), 3.77 (s, 3H), 3.66 (dd, *J* = 9.4, 9.4 Hz, 1H), 2.15 (dd, *J* = 6.4, 6.4 Hz, 1H), 2.14 – 2.08 (m, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 169.8, 160.5, 140.5, 130.4, 119.0, 112.8, 112.8, 62.9, 56.0, 48.5, 30.8, 27.6, 19.5.

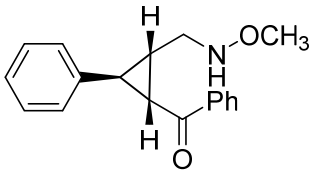
(1R,5S,6S)-3-methoxy-6-(o-tolyl)-3-azabicyclo[3.1.0]hexan-2-one (2n):



(1R,5S,6S)-3-methoxy-6-(o-tolyl)-3-azabicyclo[3.1.0]hexan-2-one **(2n)** was prepared according to the general **Procedure F** with *E. coli*

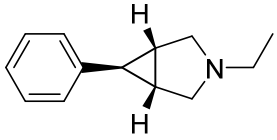
cells expressing Mb(F43Y,H64V,V68A,I107V) to afford the product as a white solid, 35.2 mg, 81% yield. GC-MS m/z (% relative intensity): 217(4.4), 158(100), 157(16.9), 143(15.1), 130(24.6), 129(58.5), 115(41.4); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.18 – 7.06 (m, 3H), 6.94 (d, *J* = 7.2 Hz, 1H), 3.89 (dd, *J* = 9.4, 5.9 Hz, 1H), 3.76 (s, 3H), 3.65 (dd, *J* = 9.4, 9.4 Hz, 1H), 2.40 (s, 3H), 2.15 (dd, *J* = 6.7, 6.7 Hz, 1H), 2.11 – 2.01 (m, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 170.2, 138.5, 136.3, 130.9, 127.9, 126.8, 126.4, 62.9, 48.5, 29.2, 25.9, 20.4, 17.8.

((1R,2S,3S)-2-((methoxyamino)methyl)-3-phenylcyclopropyl)(phenyl)methanone (3):



((1R,2S,3S)-2-((methoxyamino)methyl)-3-phenylcyclopropyl) (phenyl)methanone **(3)** was prepared according to a modified version of a reported procedure.[5] To a solution of (1R,5S,6S)-3-methoxy-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one (**2c**) (30 mg, 1 equiv) in 2 ml THF, of phenyl magnesium bromide (1.5 equiv.) was added at 0 °C over 10 min. and the reaction mixture was stirred for 6 h at room temperature. After the reaction was finished, the THF was removed under reduced pressure and the residue was further purified by silica-gel chromatography using 20% EtOAc/hexanes as eluent to afford the product as a white solid, 35 mg, 83% yield. GC-MS m/z (% relative intensity): 281(0.5), 203(13.6), 173(13.6), 172(22.4), 144(64.3), 130(73.1), 115(100), 91(11.5), 77(13.3); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.00 (d, *J* = 7.5 Hz, 2H), 7.54 (t, *J* = 7.4 Hz, 1H), 7.45 (t, *J* = 7.6 Hz, 2H), 7.32 – 7.26 (m, 2H), 7.23 – 7.13 (m, 3H), 5.51 (s, 1H), 3.35 (s, 3H), 3.33 (dd, *J* = 13.8, 5.6 Hz, 1H), 3.17 (dd, *J* = 13.8, 8.3 Hz, 1H), 3.05 (dd, *J* = 9.0, 5.1 Hz, 1H), 2.96 – 2.88 (m, 1H), 2.36 – 2.27 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 198.0, 140.8, 139.1, 133.6, 129.3, 129.3, 128.9, 127.3, 127.2, 62.4, 49.0, 34.0, 32.9, 31.8.

(1R,5S,6S)-3-ethyl-6-phenyl-3-azabicyclo[3.1.0]hexane (4):



(1R,5S,6S)-3-ethyl-6-phenyl-3-azabicyclo[3.1.0]hexane (**4**) was was prepared according to a reported procedure.1 (1R,5S,6S)-3-ethyl-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one (**2d**) (30 mg, 0.15 mmol) in dry THF was added dropwise to a suspension of LiAlH4 (1 equiv) in dry THF at 0 °C. The resulting mixture was stirred for 6h at room temperature and then quenched

with aqueous diethyl ether and stirred for 1 h at room temperature. After filtration through a pad of Celite, the filtrate was dried over $MgSO_4$ and concentrated to give a residue, which was further purified by silica-gel chromatography using 10% MeOH/DCM as eluent to afford the product as a white solid, 23 mg, 82% yield. GC-MS m/z (% relative intensity): 188(14.2), 187(100), 172(93.7), 158(20.5), 130(59.2), 115(87.0), 91(78.7); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.24 (m, 2H), 7.13 (t, *J* = 7.4 Hz, 1H), 7.04 (d, *J* = 7.5 Hz, 2H), 3.23 (d, *J* = 9.0 Hz, 2H), 2.53 (dd, *J* = 14.4, 7.2 Hz, 2H), 2.44 (d, *J* = 8.8 Hz, 2 H), 2.30 – 2.24 (m, 1H), 1.71 – 1.65 (m, 1H), 1.27 – 1.25 (m, *J* = 1.0 Hz, 1H), 1.10 (t, *J* = 7.0 Hz, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 143.6, 129.2, 129.1, 129.0, 126.3, 126.0, 56.1, 50.3, 30.4, 28.2, 25.1, 14.6.

X-ray crystallographic analyses

X-ray crystal diffraction data were collected using a XtaLab Synergy-S Dualflex diffractometer equipped with a HyPix-6000HE HPC area detector for data collection at 100.00(10) K. A preliminary set of cell constants and an orientation matrix were calculated from reflections harvested from a sampling of reciprocal space. The full data collection was carried out using a PhotonJet (Cu) X-ray Source with frame times of 0.05 and 0.06 seconds and a detector distance of 31.2 mm. Series of frames were collected in 0.50º steps in ω at different 2θ, κ, and ϕ settings. The intensity data were scaled and corrected for absorption, and final cell constants were calculated from the xyz centroids of strong reflections from the actual data collections after integration. Space groups were determined based on systematic absences and intensity statistics.

Structures were solved using SHELXT(Sheldrick, G. M. *SHELXT*, version 2014/5; University of Göttingen: Göttingen, Germany)and refined using SHELXL (against F^2) (Sheldrick, G. M. *SHELXL-2016/6*;*Acta Crystallogr.* **2015**, *C71*, 3-8.).All non-hydrogen atoms were refined with anisotropic displacement parameters. All hydrogen atoms were placed in ideal positions and refined as riding atoms with relative isotropic displacement parameters.Absolute configurations for **2b**, and **2k** were determined by anomalous dispersion effects (Parsons, S; Flack, H. D.; Wagner, T. *Acta Crystallogr.* **2013**, *B69*, 249-259). See **Figure S4-S5** and **Table S9-S10** for additional crystal data and structure refinement information. The crystallographic data and coordinates for compounds 2b, 2k were deposited in the Cambridge Crystallographic Data Centre (CCDC) under entries 1962324 through 1962325.

Table S9. Crystal data and structure refinement for (1R,5S,6S)-3-methyl-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one **(2b)**. Cambridge Crystallographic Data Centre (CCDC) entry: 1962325.

Identification code	**2b**	
Empirical formula	C12 H13 N O	
Formula weight	187.23	
Temperature	100.00(10) K	
Wavelength	1.54184 Å	
Crystal system	monoclinic	
Space group	$P2_1$	
Unit cell dimensions	a = 5.6803(2) Å	α = 90°
	b = 9.2798(3) Å	β = 90.739(3)°
	c = 9.3092(3) Å	γ = 90°
Volume	490.67(3) Å^3	
Z	2	
Density (calculated)	1.267 Mg/m^3	
Absorption coefficient	0.638 mm^{-1}	
F(000)	200	
Crystal color, morphology	colourless, needle	
Crystal size	0.145 x 0.066 x 0.035 mm^3	
Theta range for data collection	4.751 to 77.848°	
Index ranges	$-6 \le h \le 7$, $-11 \le k \le 11$, $-11 \le l \le 11$	
Reflections collected	7207	
Independent reflections	2033 [R(int) = 0.0666]	
Observed reflections	1854	
Completeness to theta = 74.504°	99.9%	
Absorption correction	Multi-scan	
Max. and min. transmission	1.00000 and 0.61067	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	2033 / 1 / 128	
Goodness-of-fit on F^2	1.057	
Final R indices [I>2sigma(I)]	$R1$ = 0.0438, $wR2$ = 0.1144	
R indices (all data)	$R1$ = 0.0482, $wR2$ = 0.1183	
Absolute structure parameter	-0.3(3)	
Largest diff. peak and hole	0.156 and -0.220 e.Å^{-3}	

Table S10. Crystal data and structure refinement for (1R,5S,6S)-6-(4-chlorophenyl)-3-methoxy-3-azabicyclo[3.1.0]hexan-2-one **2k)**. Cambridge Crystallographic Data Centre (CCDC) entry: 1962324.

Identification code	**2k**	
Empirical formula	C12 H12 Cl N O2	
Formula weight	237.68	
Temperature	100.00(10) K	
Wavelength	1.54184 Å	
Crystal system	orthorhombic	
Space group	$P2_12_12_1$	
Unit cell dimensions	a = 8.2690(2) Å	α = 90°
	b = 9.9012(2) Å	β = 90°
	c = 13.5986(2) Å	γ = 90°
Volume	1113.36(4) Å^3	
Z	4	
Density (calculated)	1.418 Mg/m^3	
Absorption coefficient	2.913 mm^{-1}	
F(000)	496	
Crystal color, morphology	colourless, block	
Crystal size	0.248 x 0.204 x 0.113 mm^3	
Theta range for data collection	5.527 to 78.818°	
Index ranges	$-9 \le h \le 10$, $-12 \le k \le 12$, $-17 \le l \le 17$	
Reflections collected	11869	
Independent reflections	2356 [R(int) = 0.0428]	
Observed reflections	2306	
Completeness to theta = 74.504°	100.0%	
Absorption correction	Multi-scan	
Max. and min. transmission	1.00000 and 0.74976	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	2356 / 0 / 146	
Goodness-of-fit on F^2	1.107	
Final R indices [I>2sigma(I)]	$R1$ = 0.0296, $wR2$ = 0.0702	
R indices (all data)	$R1$ = 0.0306, $wR2$ = 0.0721	
Absolute structure parameter	-0.008(8)	
Largest diff. peak and hole	0.167 and -0.239 e.Å^{-3}	

References:

(1) Bordeaux, M., Tyagi, V., and Fasan, R. Highly diastereoselective and enantioselective olefin cyclopropanation using engineered myoglobin-based catalysts, *Angew. Chem. Int. Ed.* **2015**, *54*, 1744–1748.

(2) Bajaj, P., Sreenilayam, G., Tyagi, V., and Fasan, R. Gram-scale synthesis of chiral cyclopropane containing drugs and drug precursors with engineered myoglobin catalysts featuring complementary stereoselectivity, *Angew. Chem. Int. Ed.* **2016**, *55*, 16110–16114.

(3) Chandgude, A., Ren, X., and Fasan, R. Stereodivergent intramolecular cyclopropanation enabled by engineered carbene transferases *J. Am. Chem. Soc.* **2019**, *141*, 9145-9150.

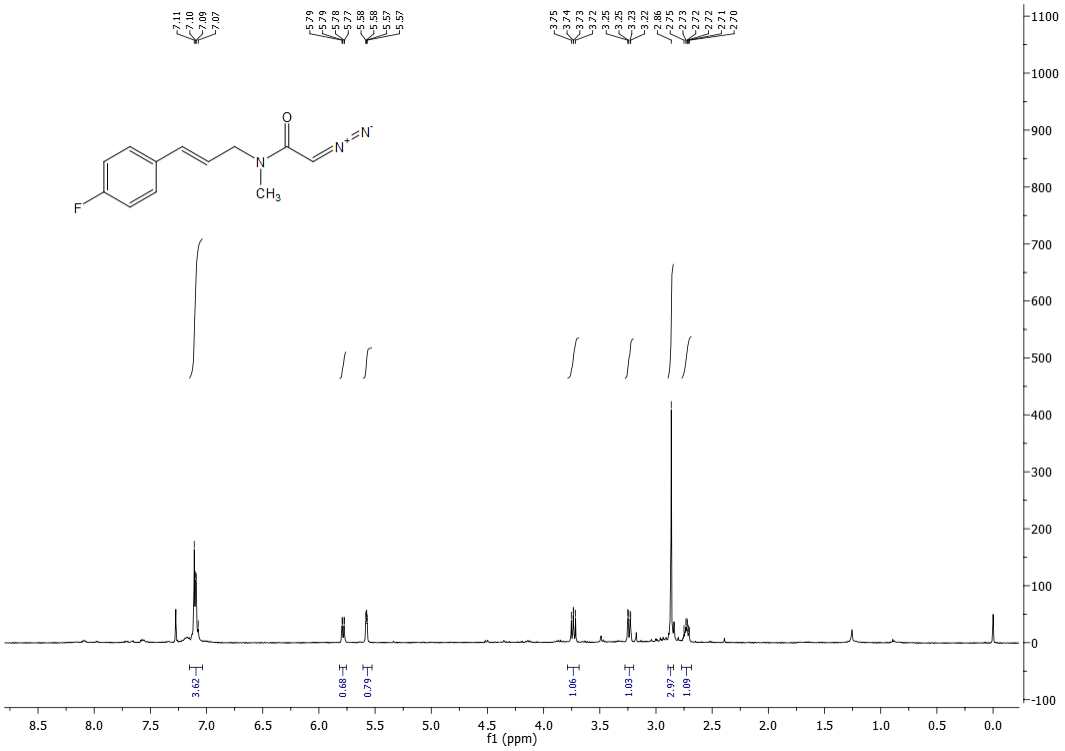
(4) Mandour, H. S. A., Chanthamath, S., Shibatomi, K., Iwasa, S., Inter- and intramolecular cyclopropanations of diazo weinrebamides catalyzed by ruthenium(ii)-amm-pheox, *Adv. Synth. Catal.* **2017**, *359*, 1742–1746.

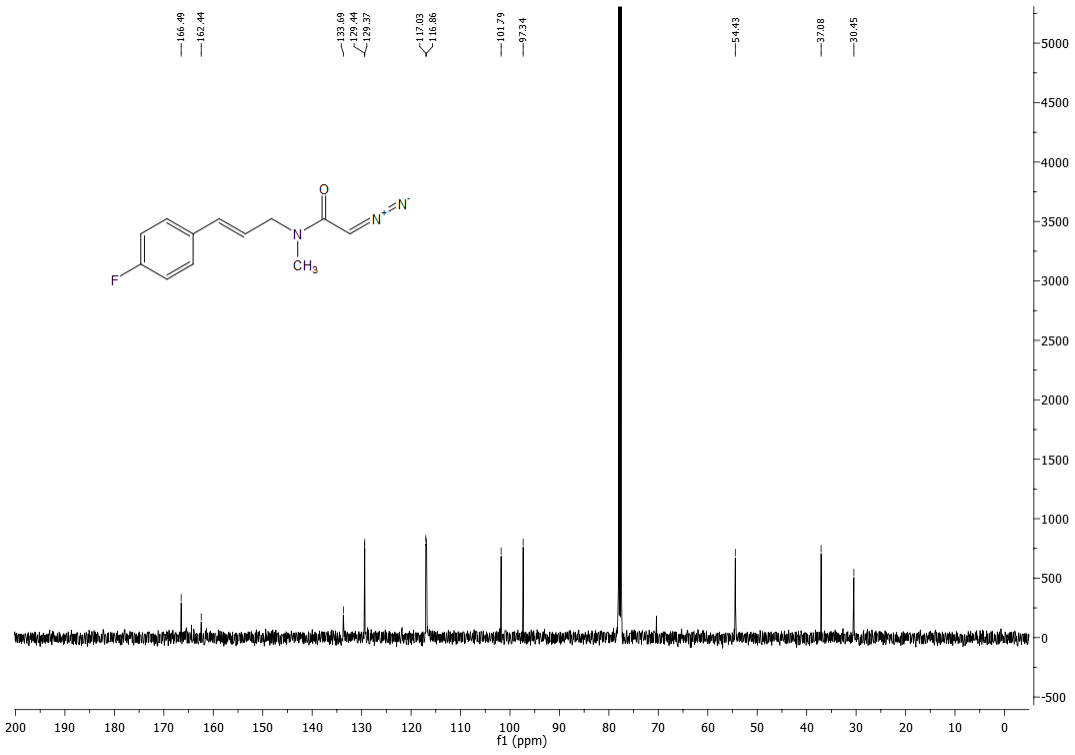
(5) Culbertson, D.S. and Olson, J.S. The role of heme in the unfolding and assembly of myoglobin, *Biochemistry* **2010**; *49* (29), 6052–6063

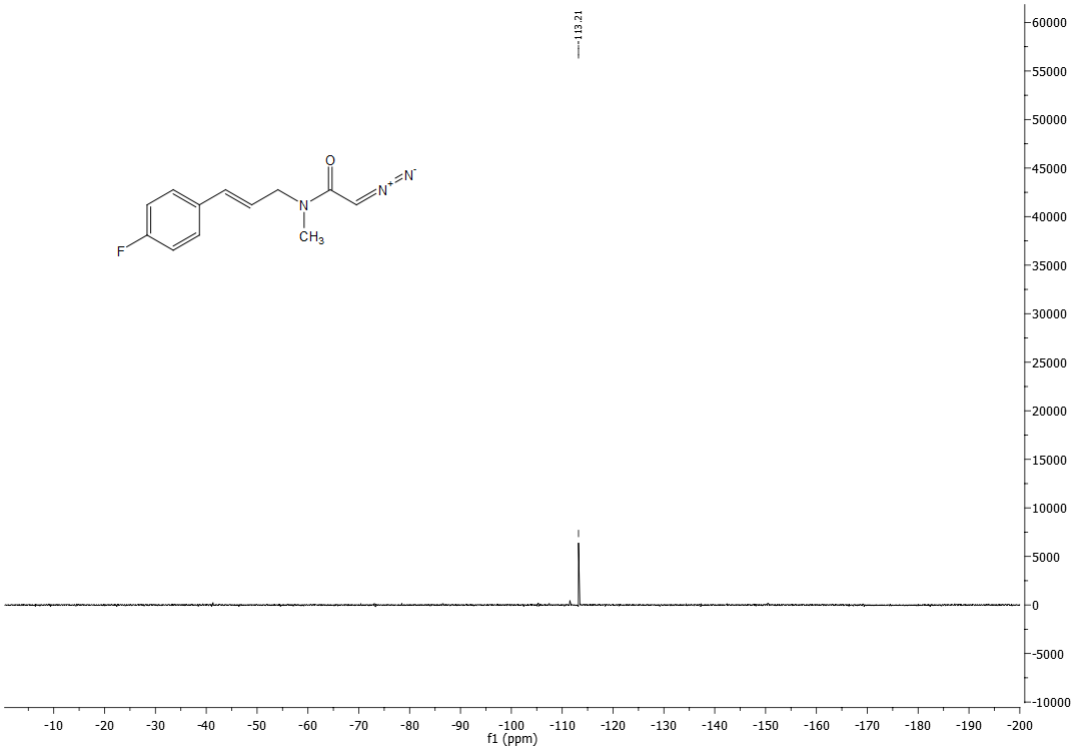
(6) Antonini, E.; Brunori, M. Hemoglobin and myoglobin in their reactions with ligands. **1971**, North-Holland Pub. Co, Amsterdam.

NMR Spectra

(E)-2-diazo-N-(3-(4-fluorophenyl)allyl)-N-methylacetamide (1a): 500 MHz ^{1}H spectrum, 126 MHz ^{13}C spectrum and 376 MHz ^{19}F spectrum in $CDCl_3$ solvent

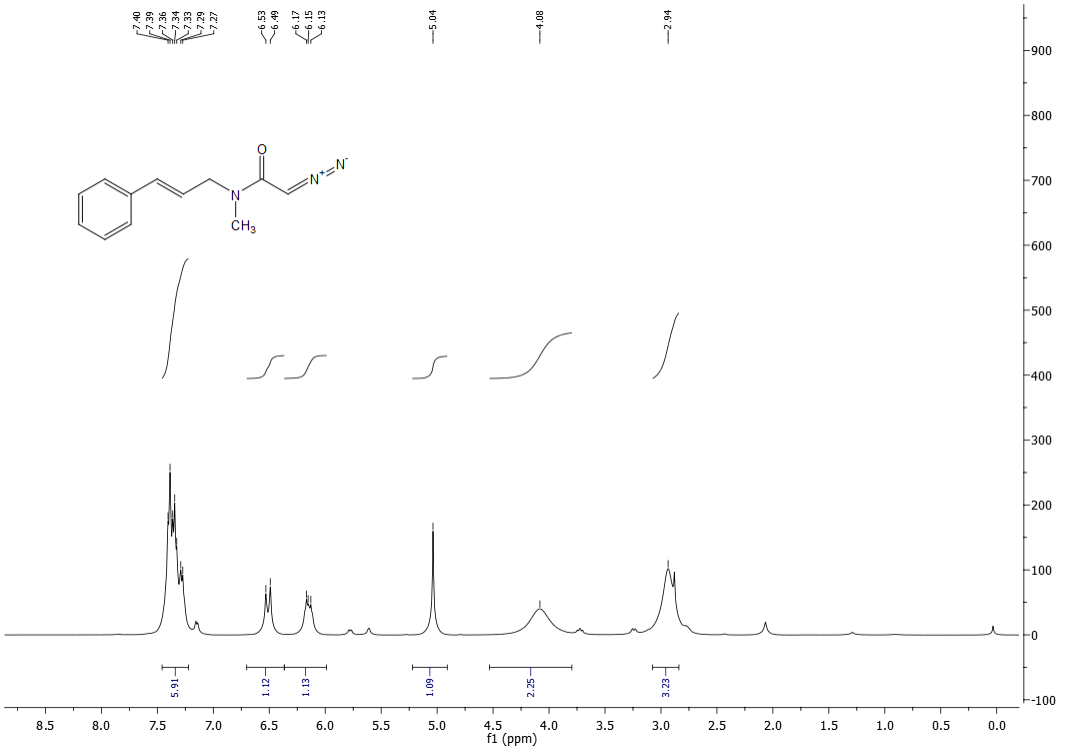


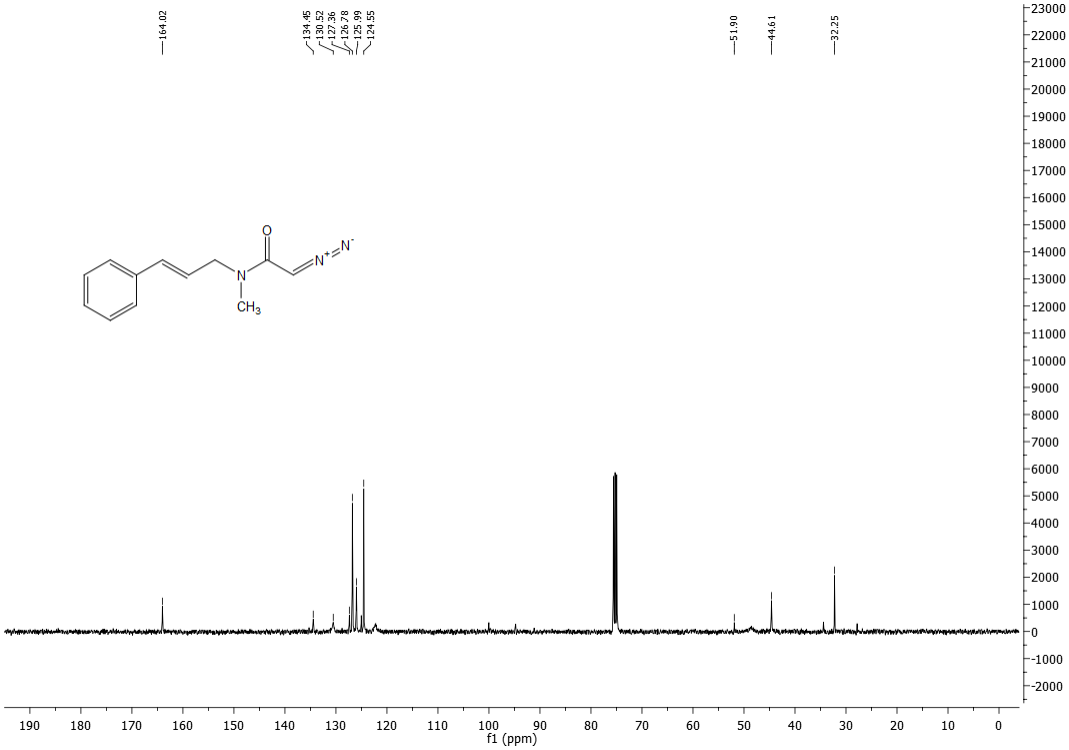



-113.21
O
N
CH3
F
N+
N-
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
-5000
-10000
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
f1 (ppm)

N-cinnamyl-2-diazo-N-methylacetamide (1b): rotamer mixture 90:10

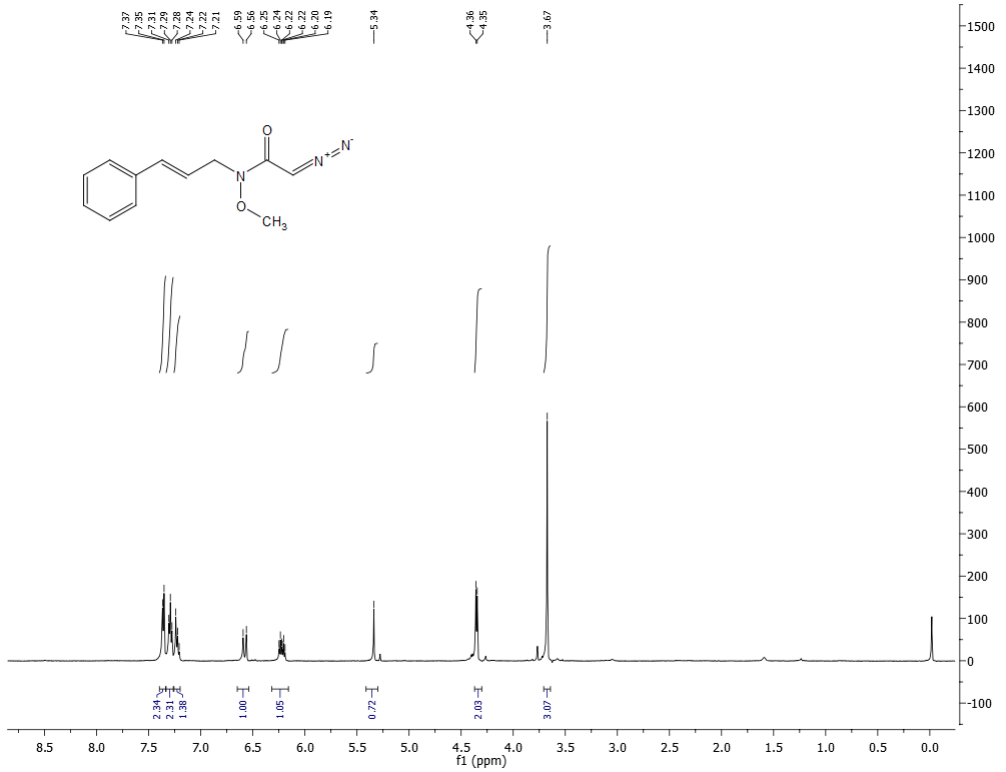
400 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent

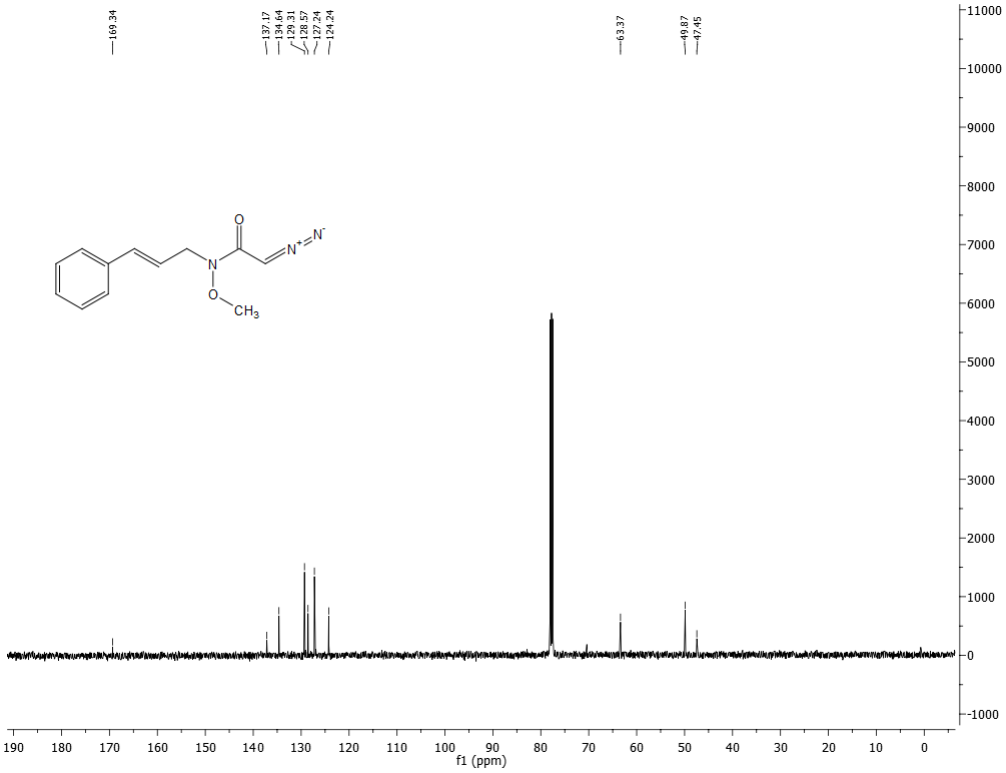




N-cinnamyl-2-diazo-N-methoxyacetamide (1c):

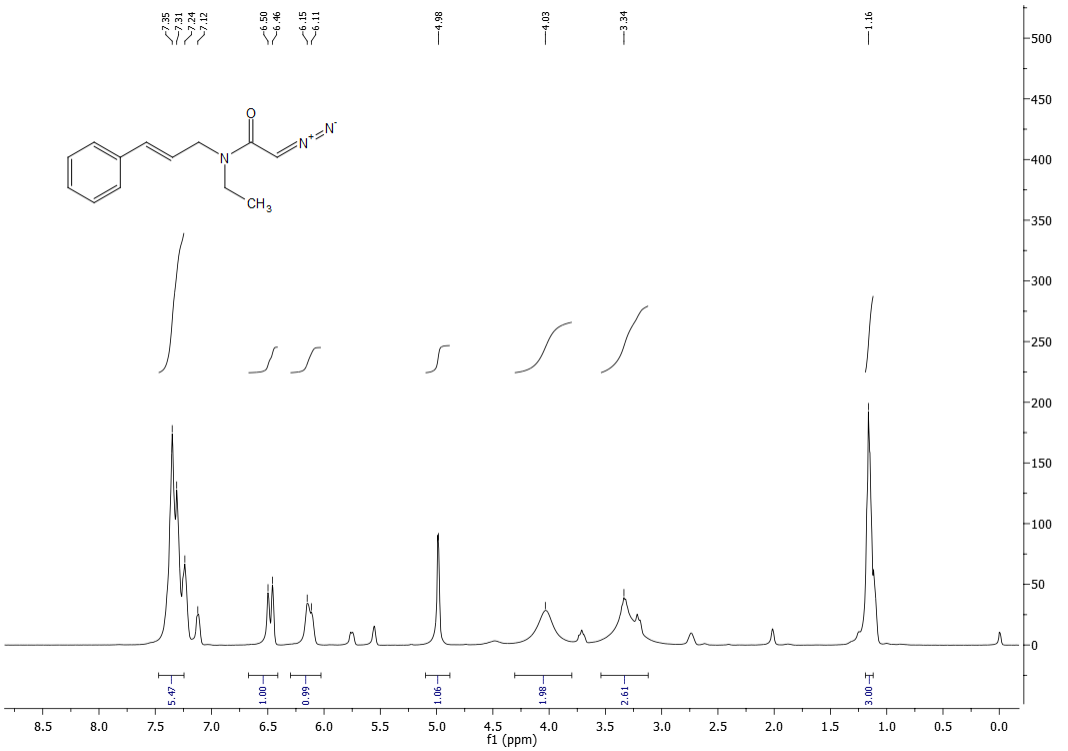
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent

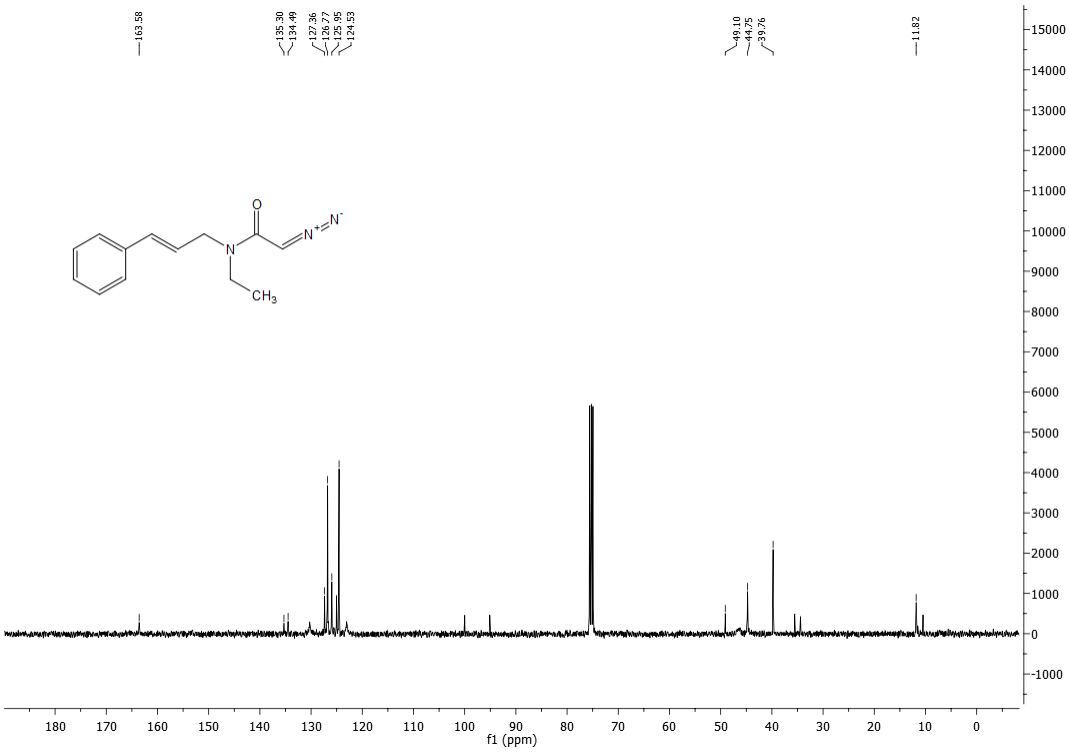




N-cinnamyl-2-diazo-N-ethylacetamide (1d): Rotamer mixture 80:20

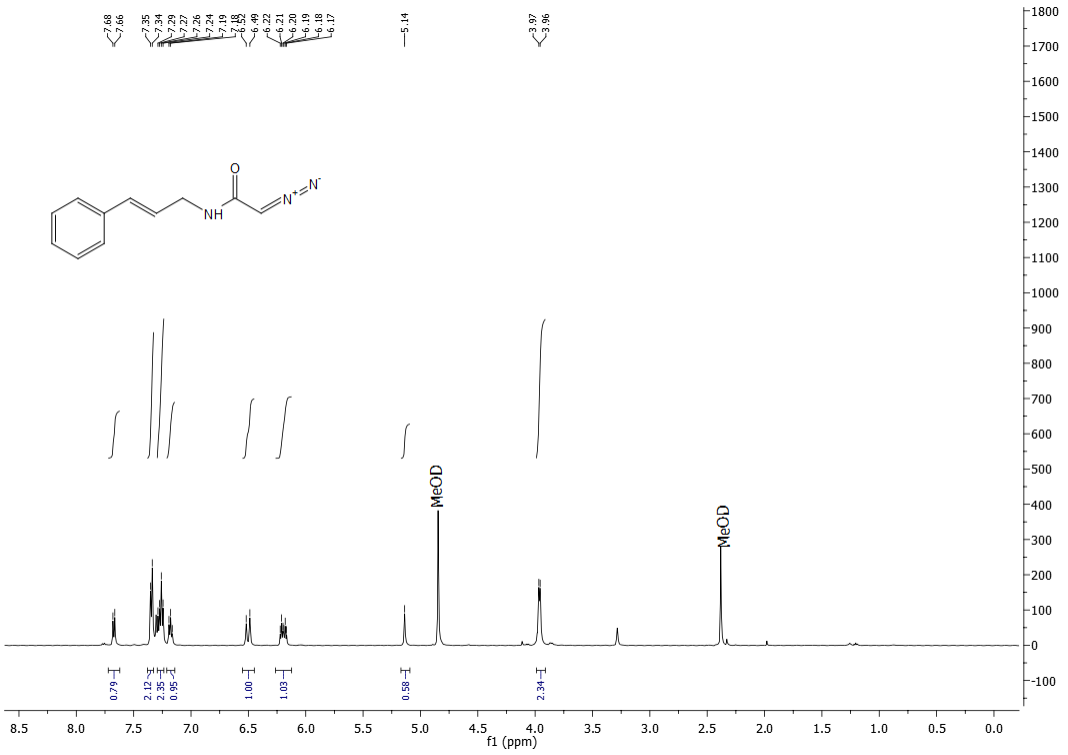
400 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent

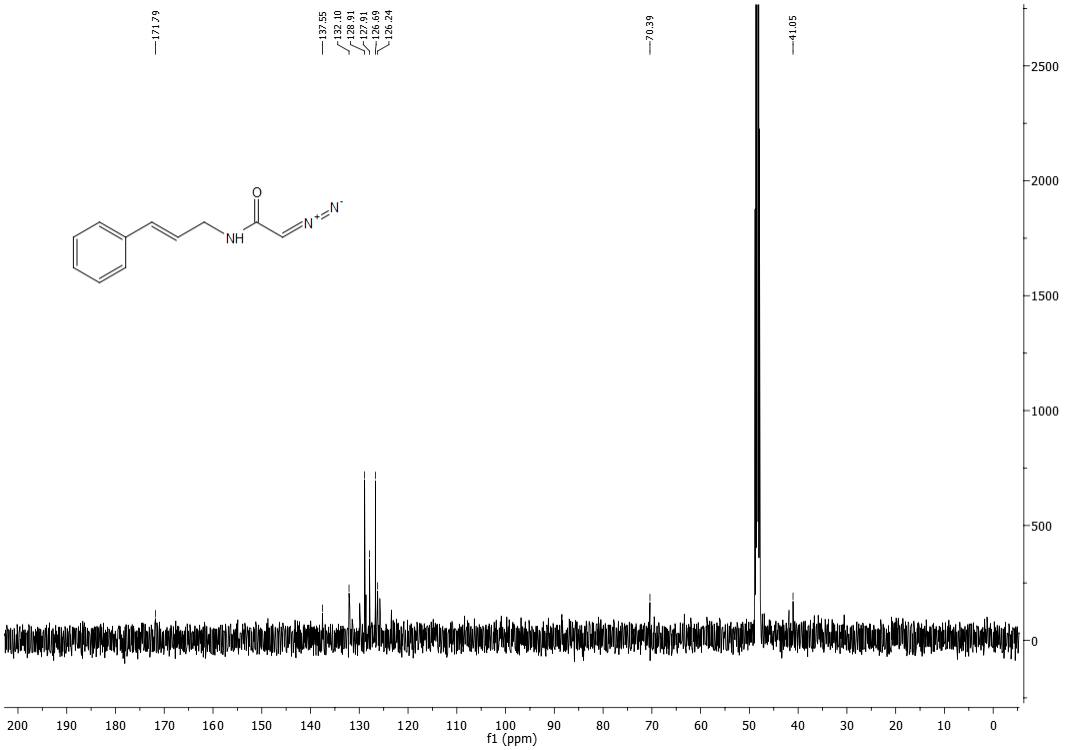




N-cinnamyl-2-diazoacetamide (1e):

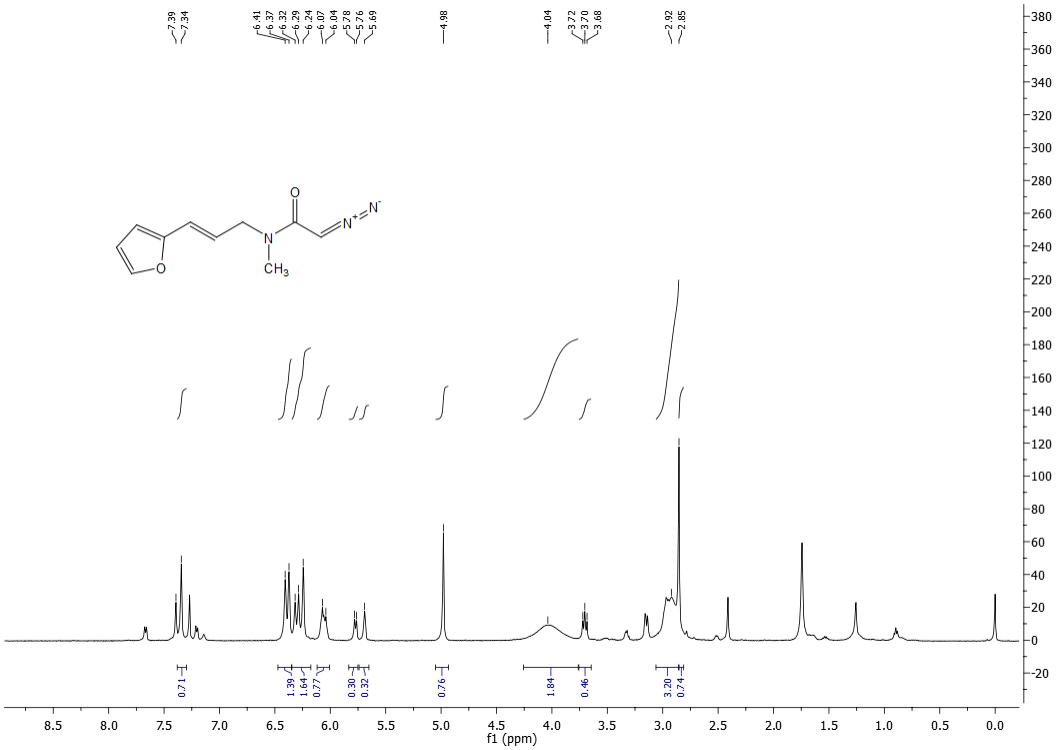
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in MeOD solvent

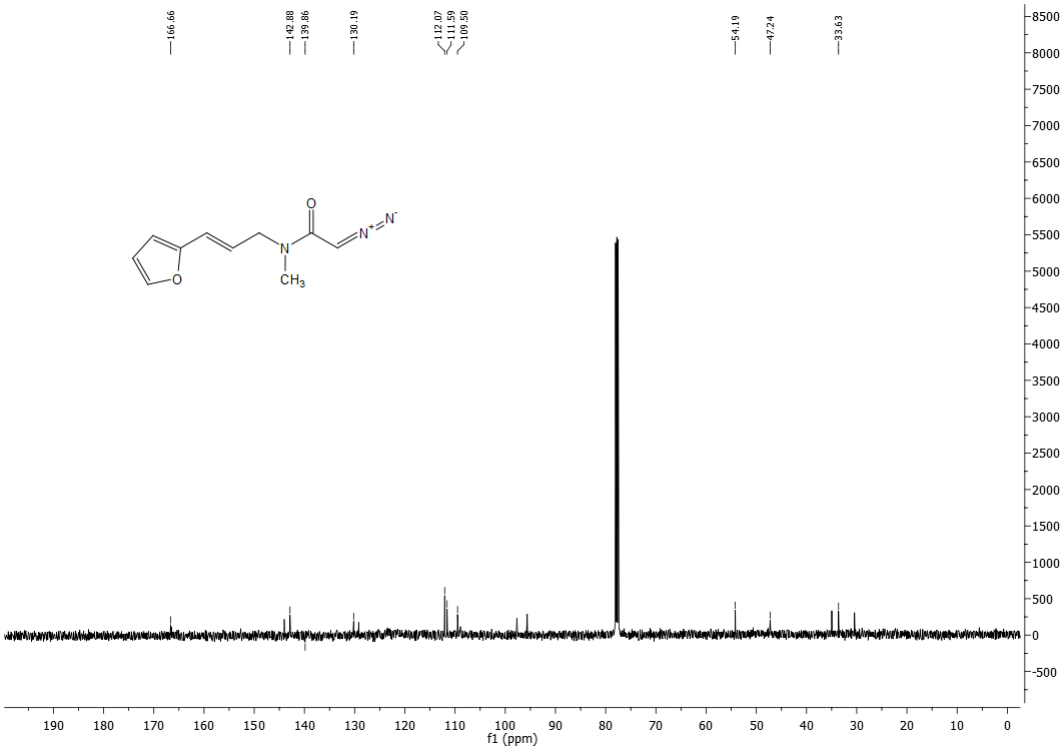




(E)-2-diazo-N-(3-(furan-2-yl)allyl)-N-methylacetamide (1f): mixture of rotamers 60:40

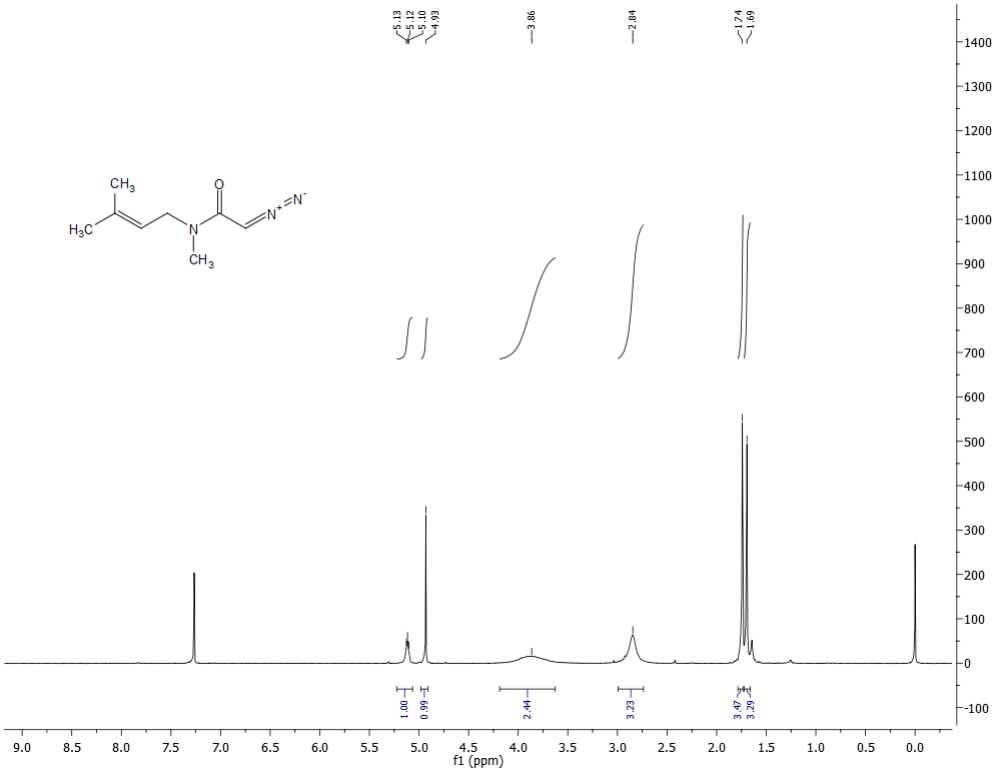
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent

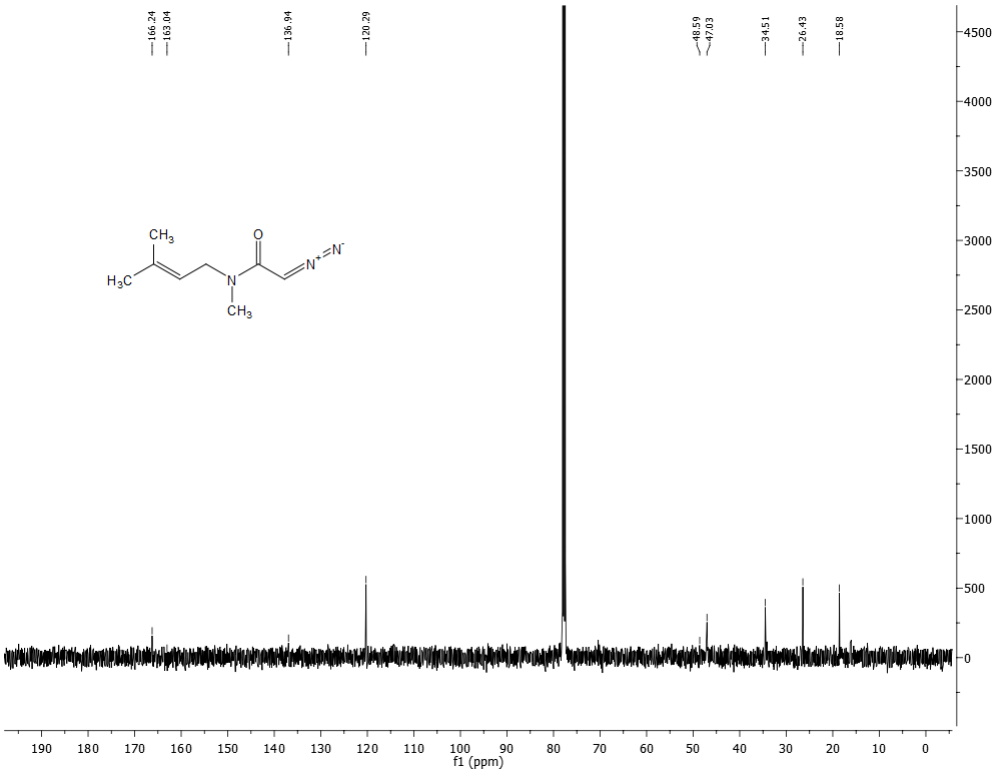




2-diazo-N-methyl-N-(3-methylbut-2-en-1-yl)acetamide (1g):

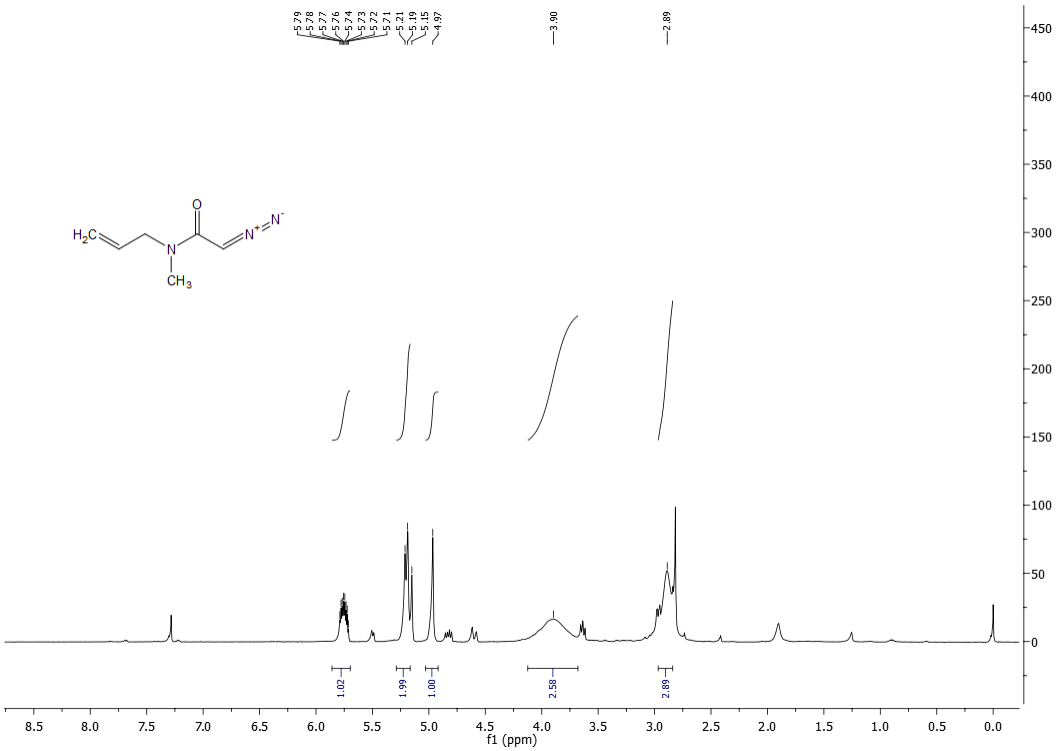
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent

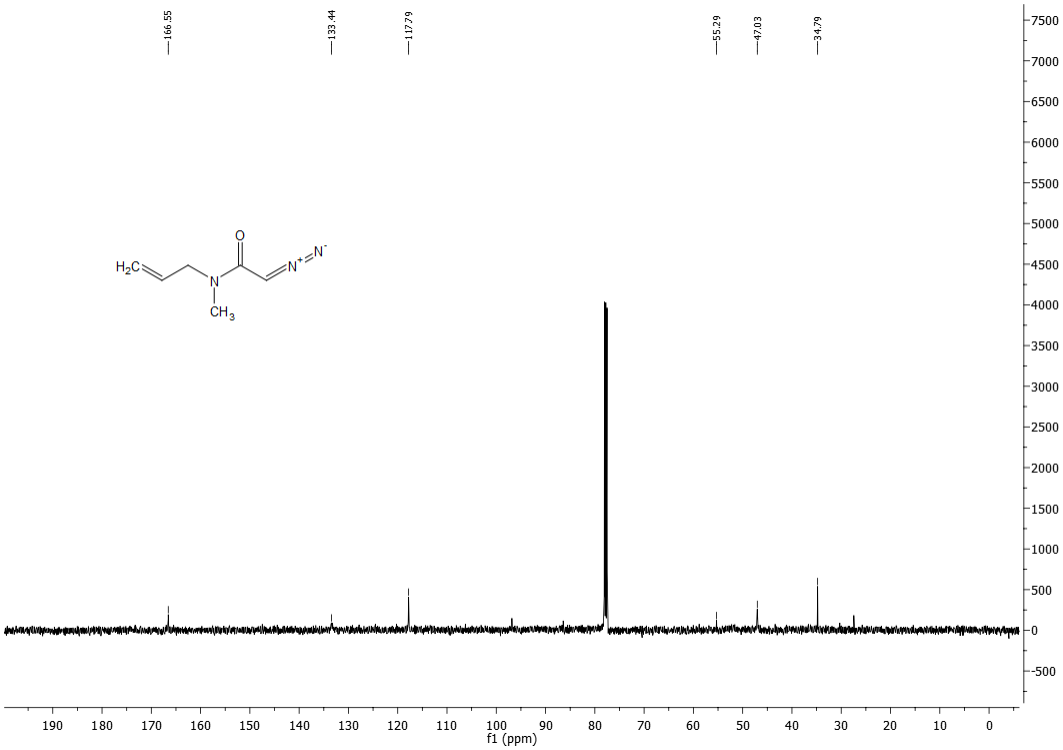




N-allyl-2-diazo-N-methylacetamide (1h): mixture of rotamers 80:20

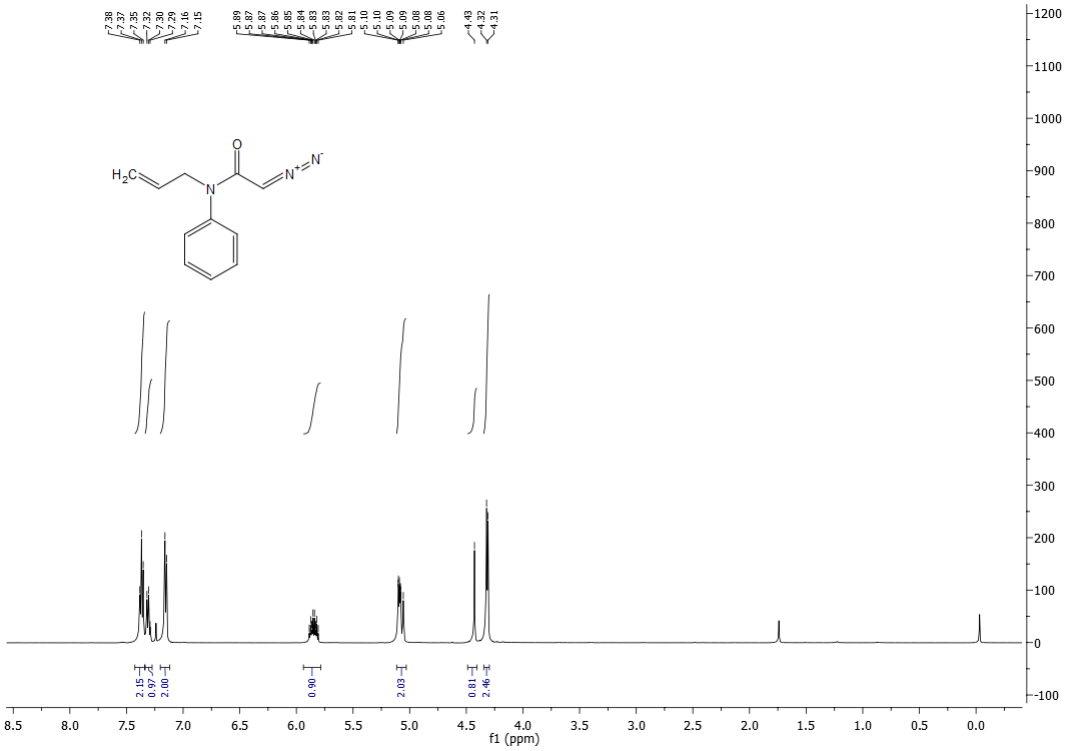
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent

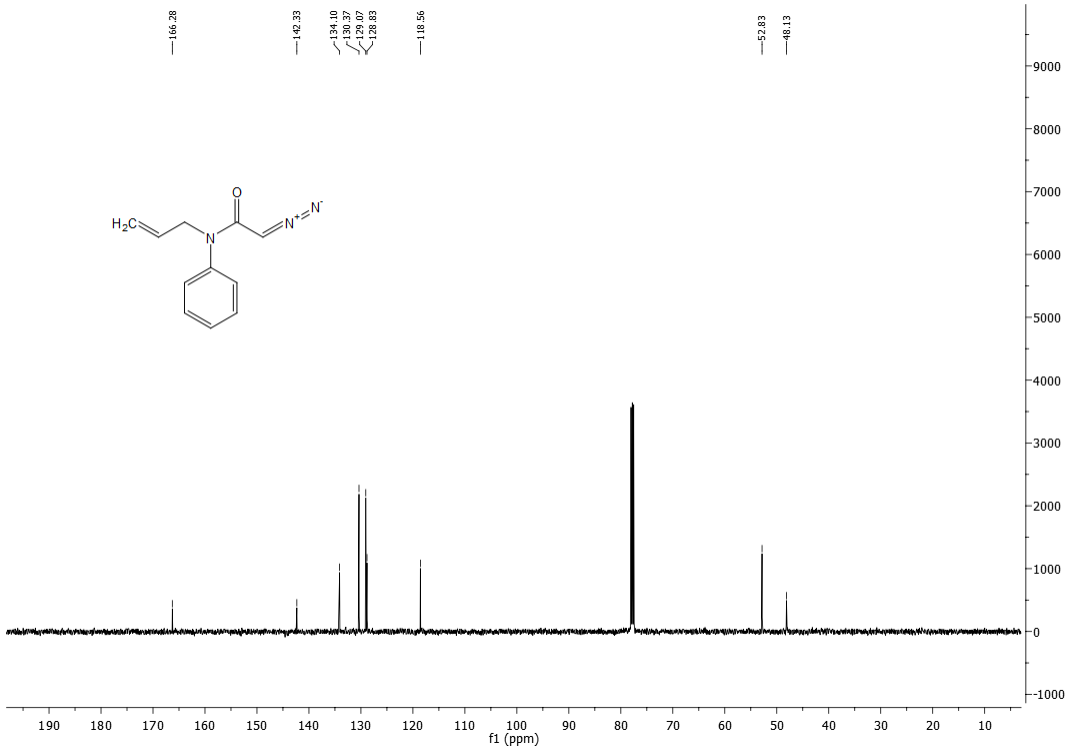




N-allyl-2-diazo-N-phenylacetamide (1i):

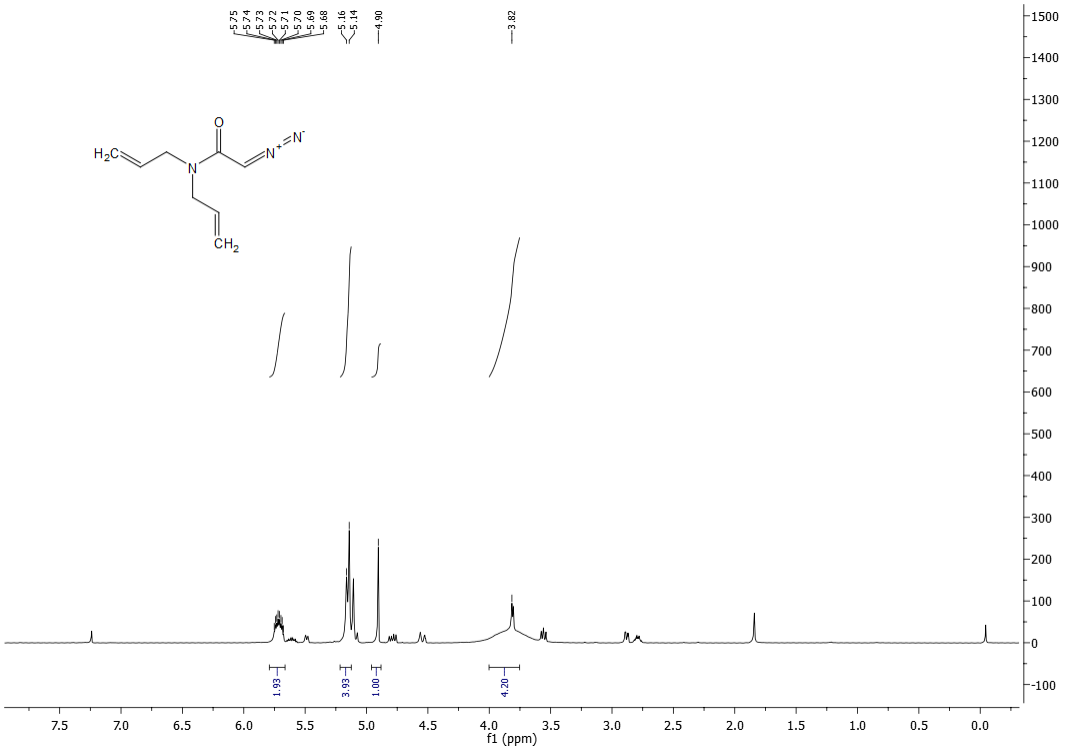
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent

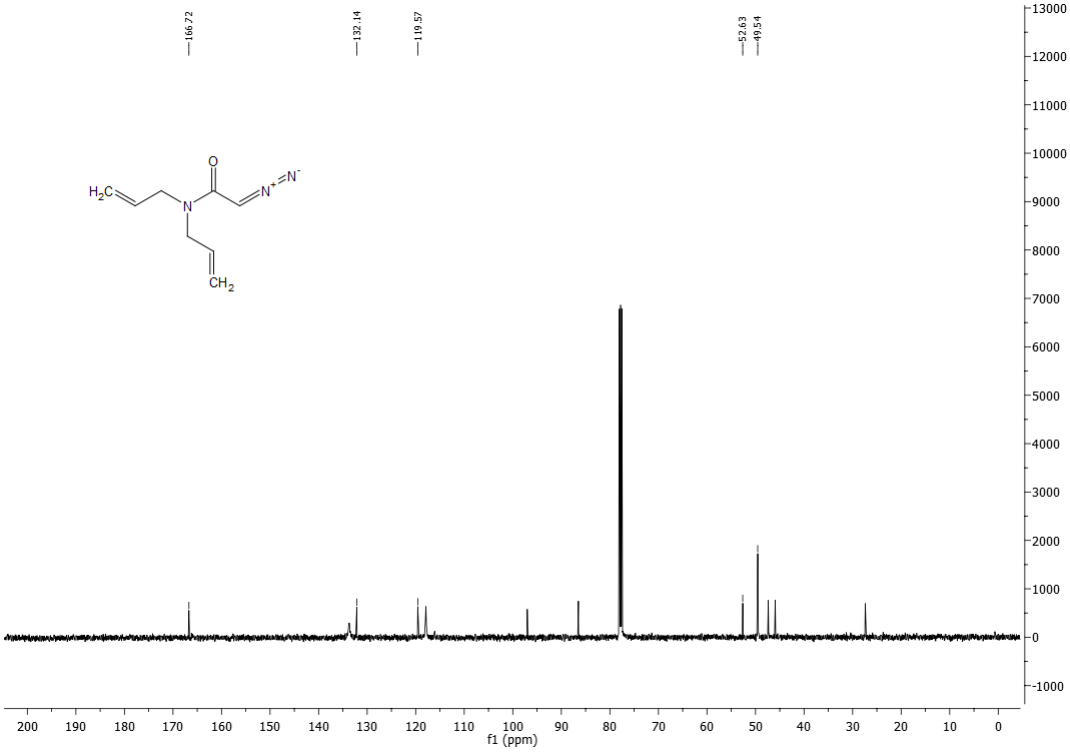




N,N-diallyl-2-diazoacetamide (1j): mixture of rotamers 85:15

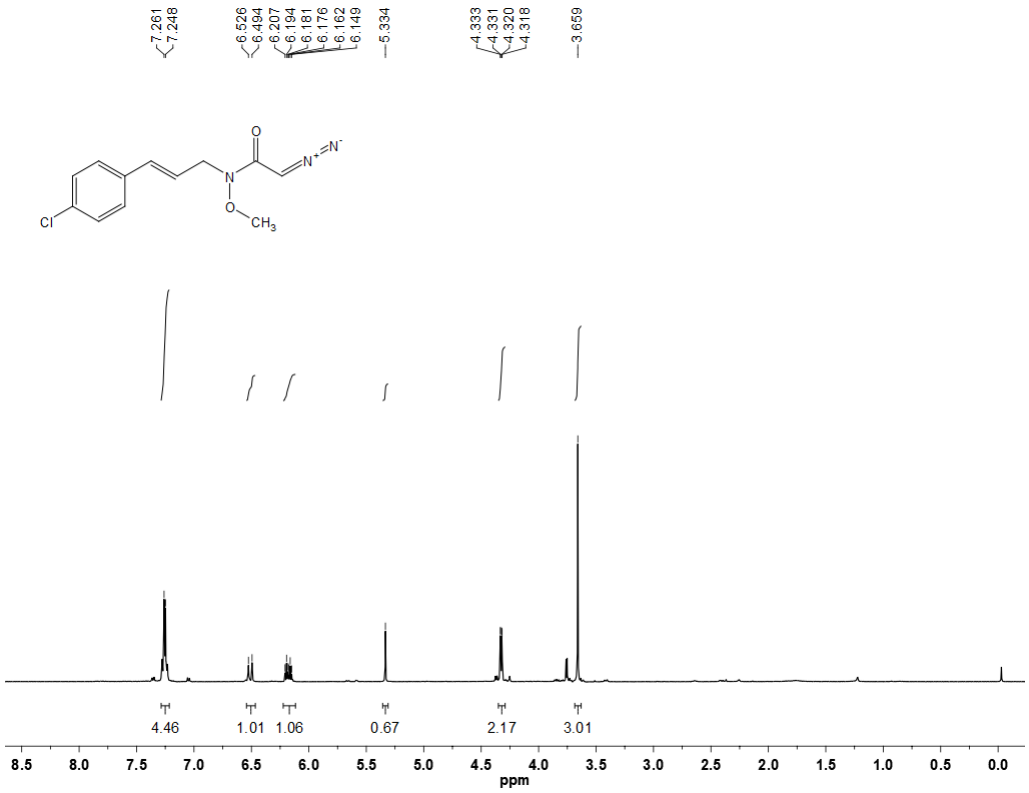
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent

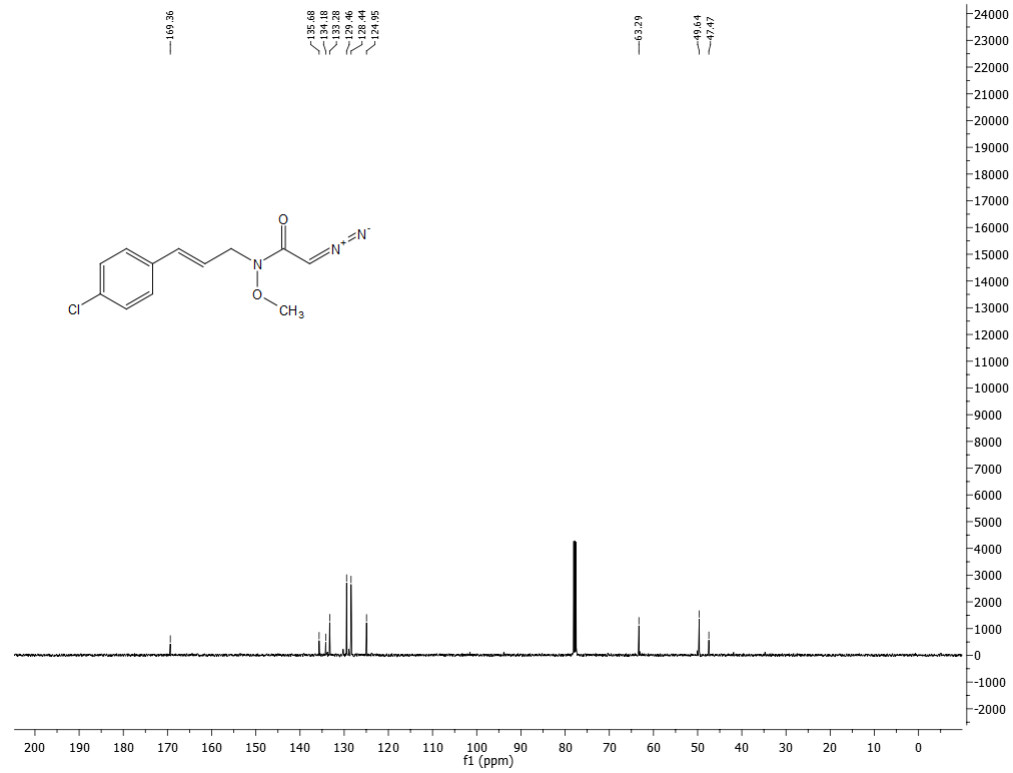




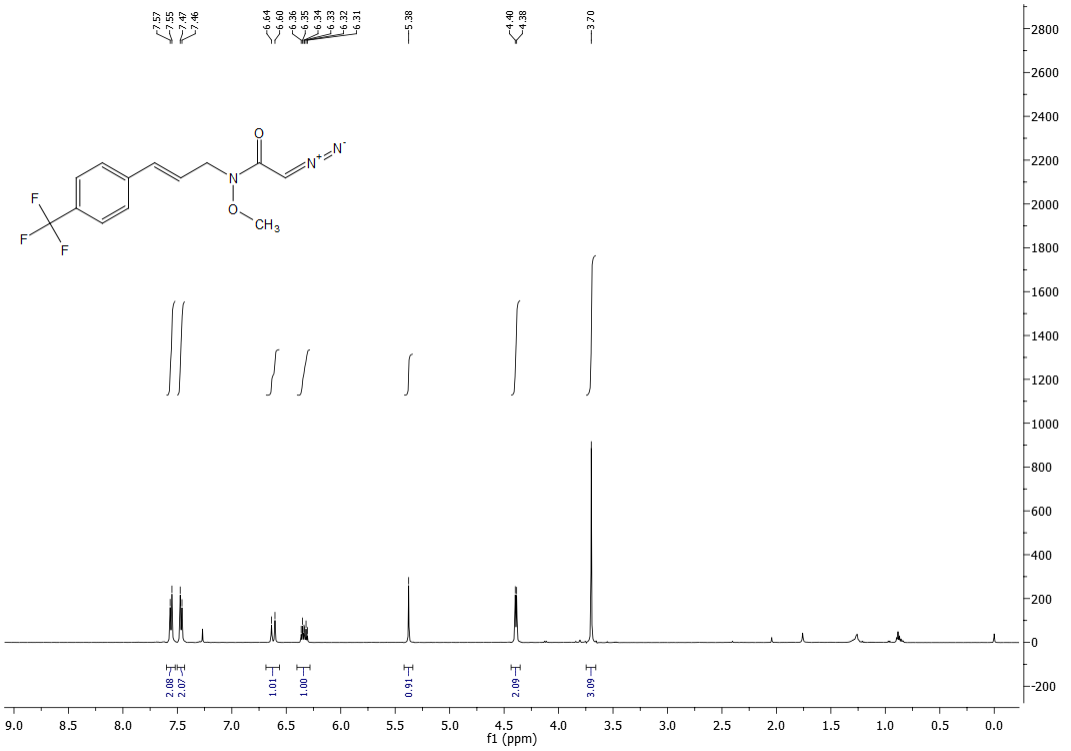
(E)-N-(3-(4-chlorophenyl)allyl)-2-diazo-N-methoxyacetamide (1k):

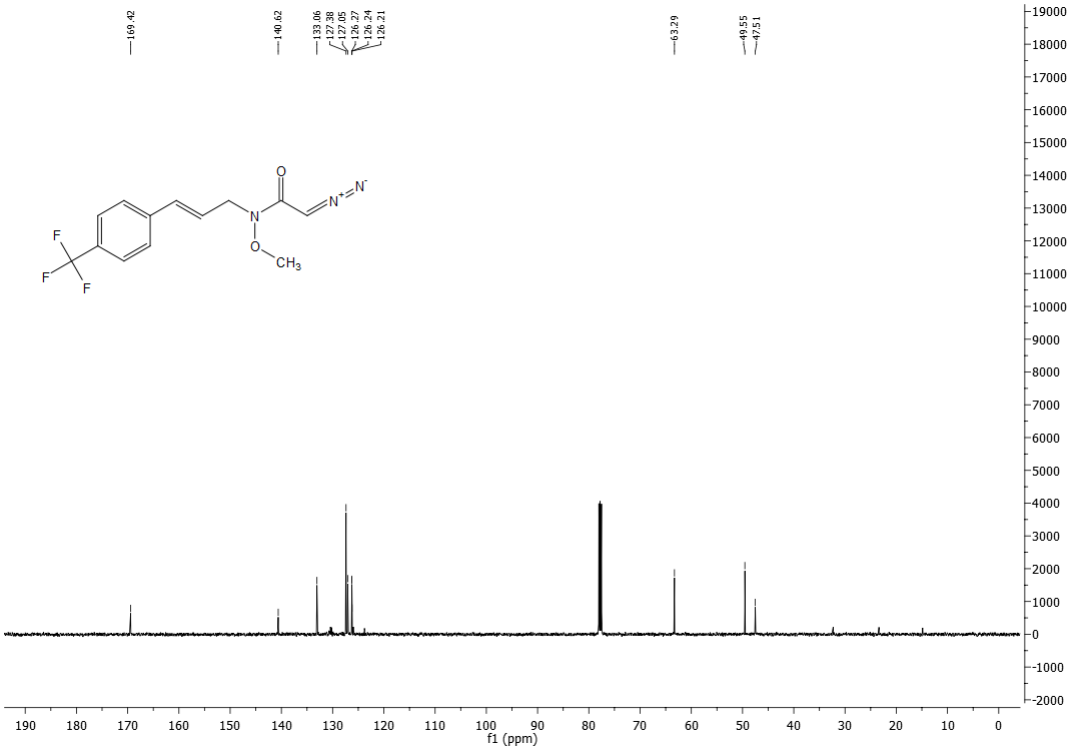
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent

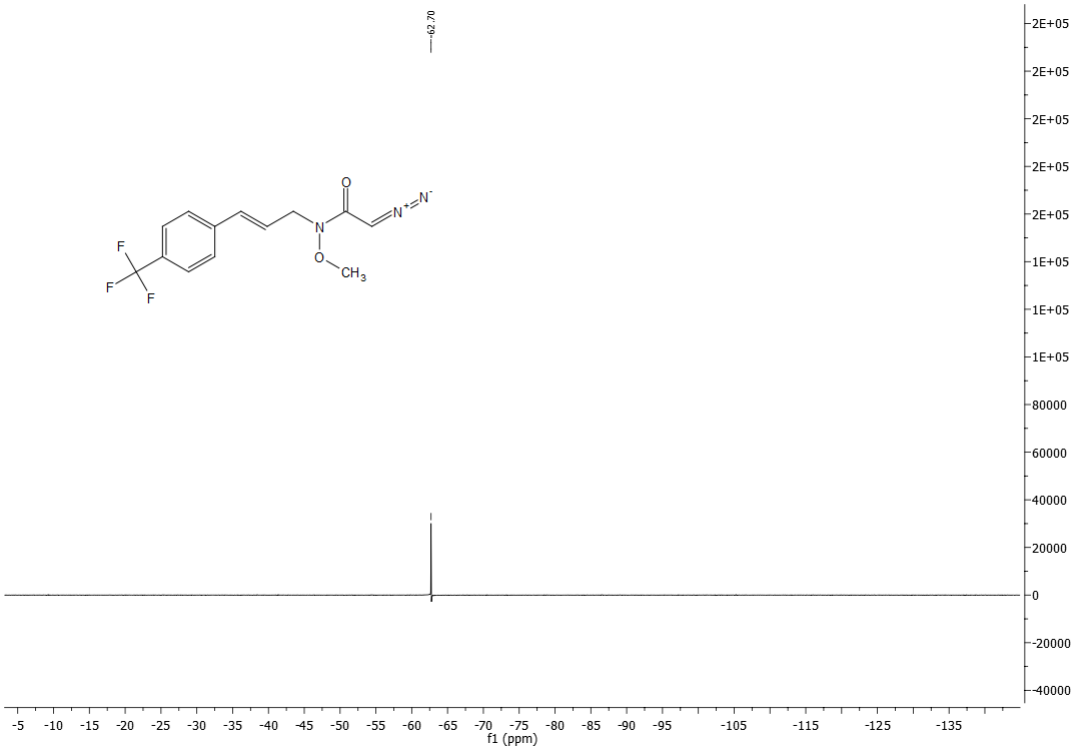




(E)-2-diazo-N-methoxy-N-(3-(4-(trifluoromethyl)phenyl)allyl)acetamide (1l): 500 MHz ^{1}H spectrum, 126 MHz ^{13}C spectrum and 376 MHz ^{19}F spectrum in $CDCl_3$ solvent

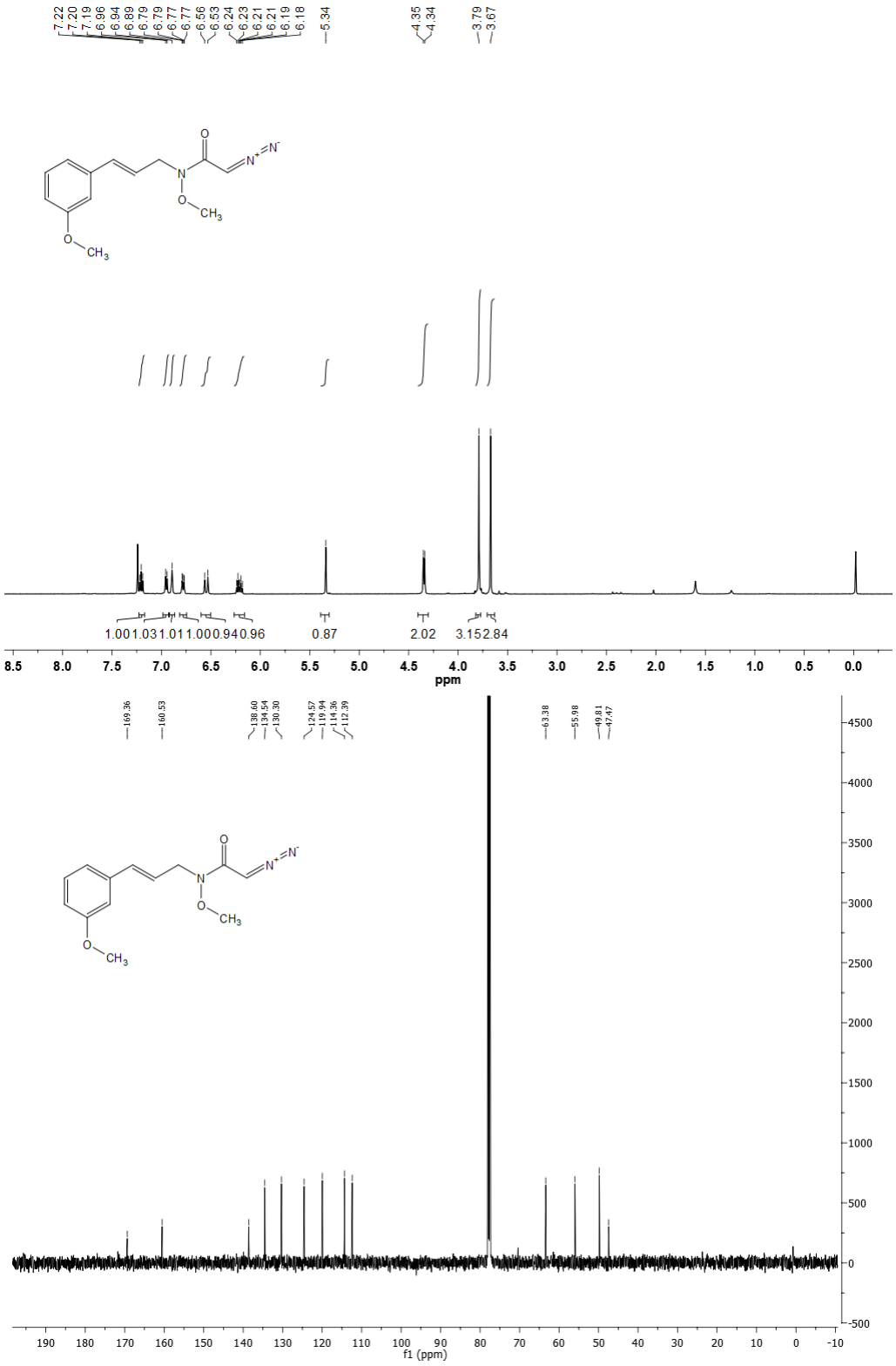





-62.70
F
F
F
O
N
O
CH3
N+
N-
2E+05
2E+05
2E+05
2E+05
2E+05
1E+05
1E+05
1E+05
80000
60000
40000
20000
0
-20000
-40000
-5 -10 -15 -20 -25 -30 -35 -40 -45 -50 -55 -60 -65 -70 -75 -80 -85 -90 -95 -105 -115 -125 -135
f1 (ppm)

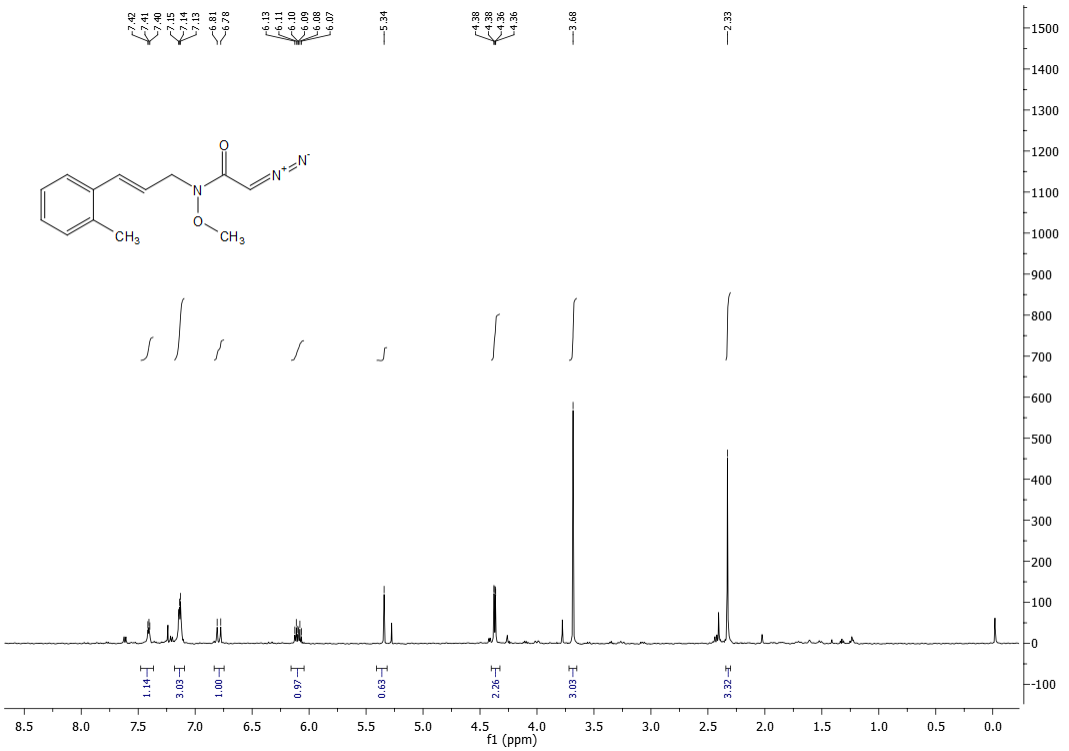
(E)-2-diazo-N-methoxy-N-(3-(3-methoxyphenyl)allyl)acetamide (1m):

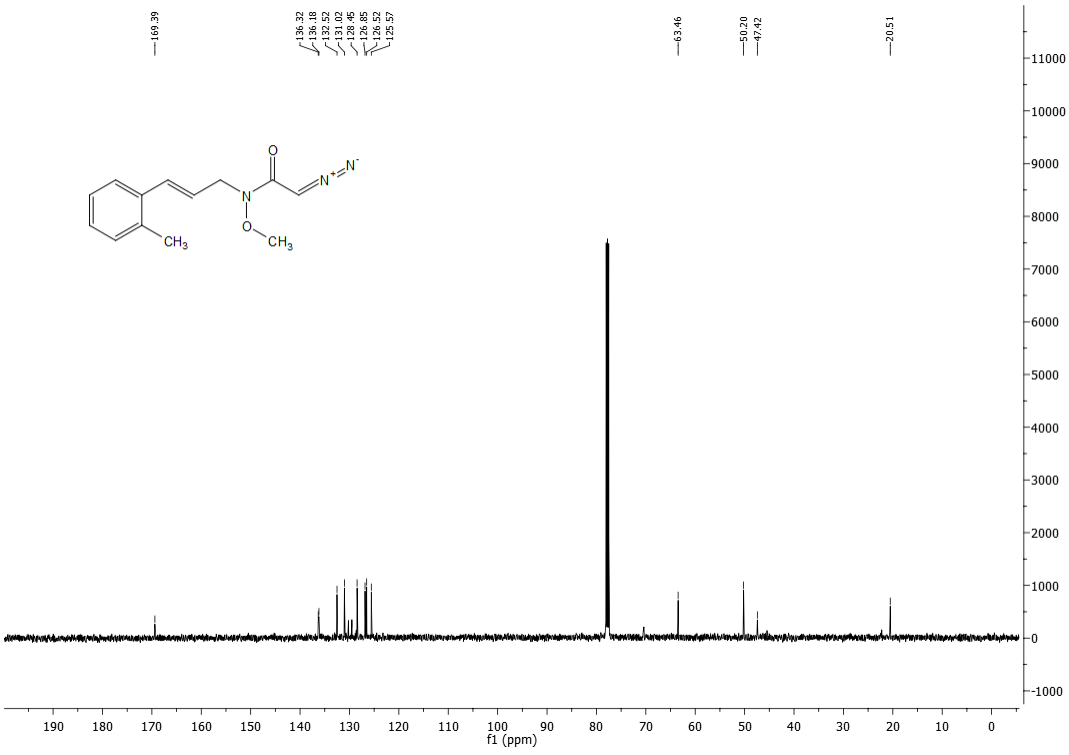
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent



(E)-2-diazo-N-methoxy-N-(3-(o-tolyl)allyl)acetamide (1n):

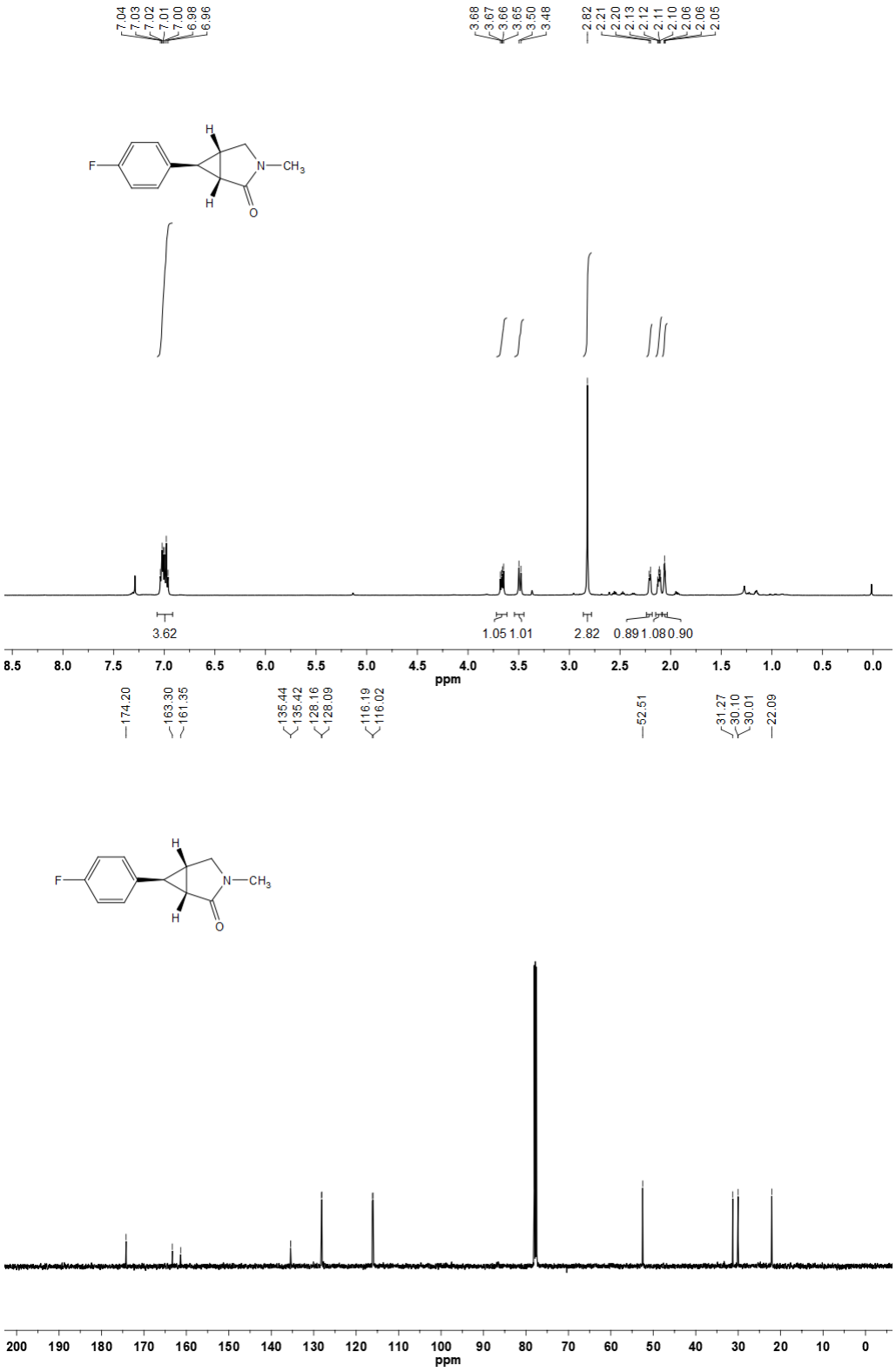
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent

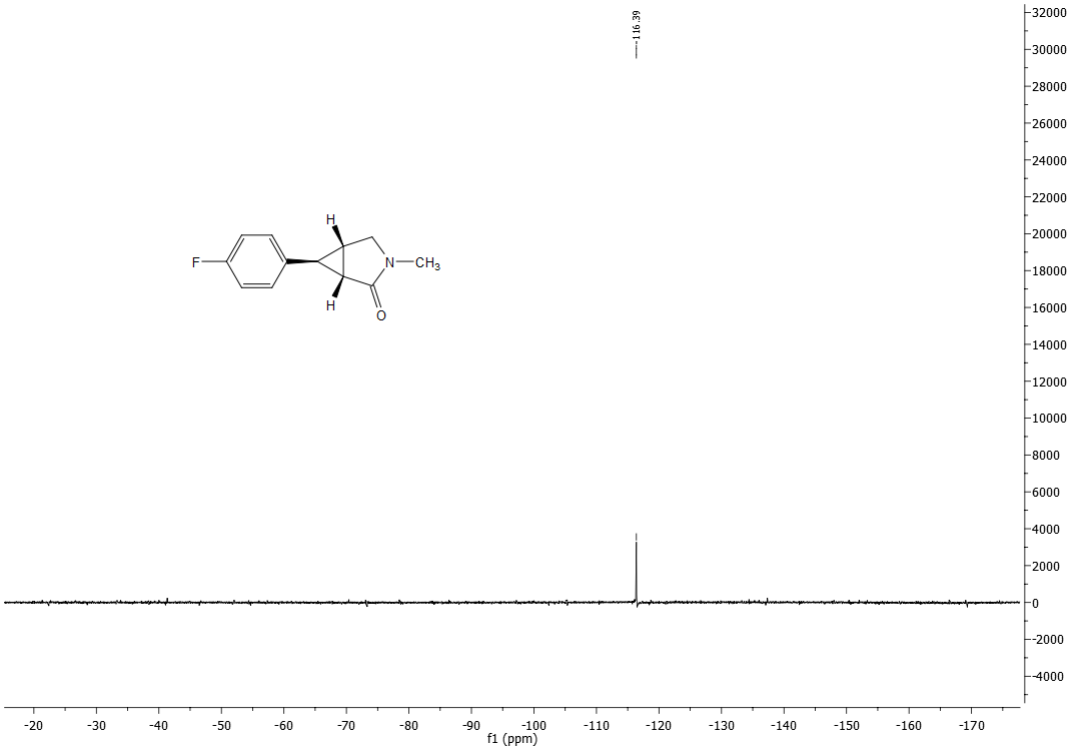




(1R,5S,6S)-6-(4-fluorophenyl)-3-methyl-3-azabicyclo[3.1.0]hexan-2-one (2a):

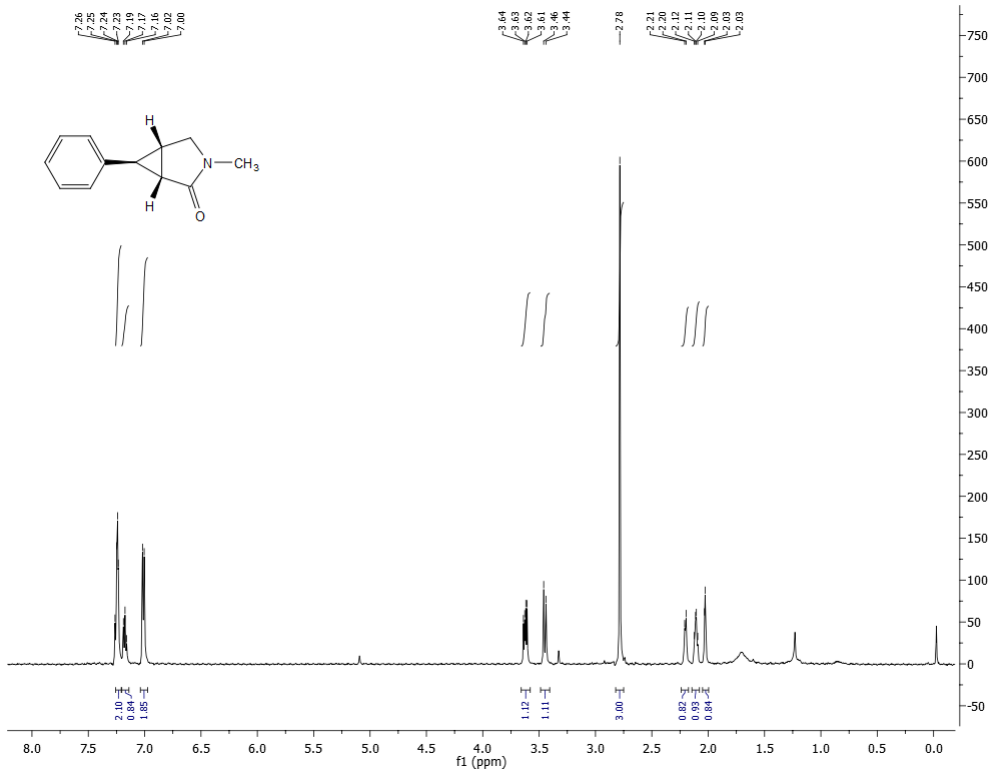
500 MHz ^{1}H spectrum, 126 MHz ^{13}C spectrum and 376 MHz ^{19}F spectrum in $CDCl_3$ solvent

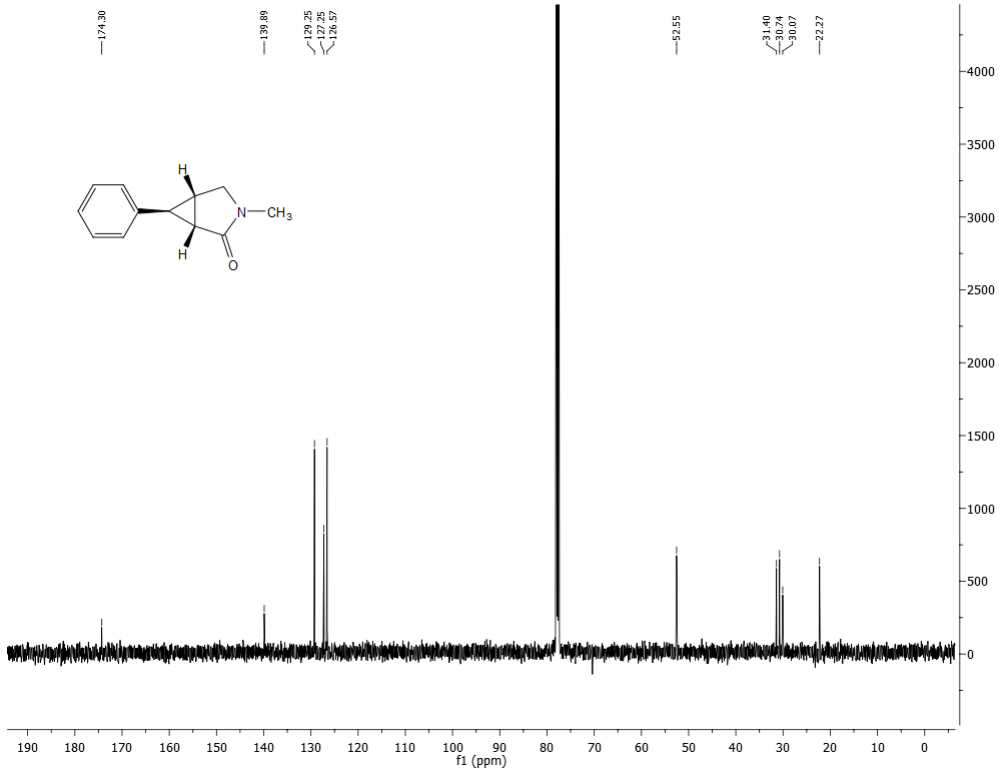



-116.39
F
H
N
CH3
H
O
32000
30000
28000
26000
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
-2000
-4000
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
f1 (ppm)

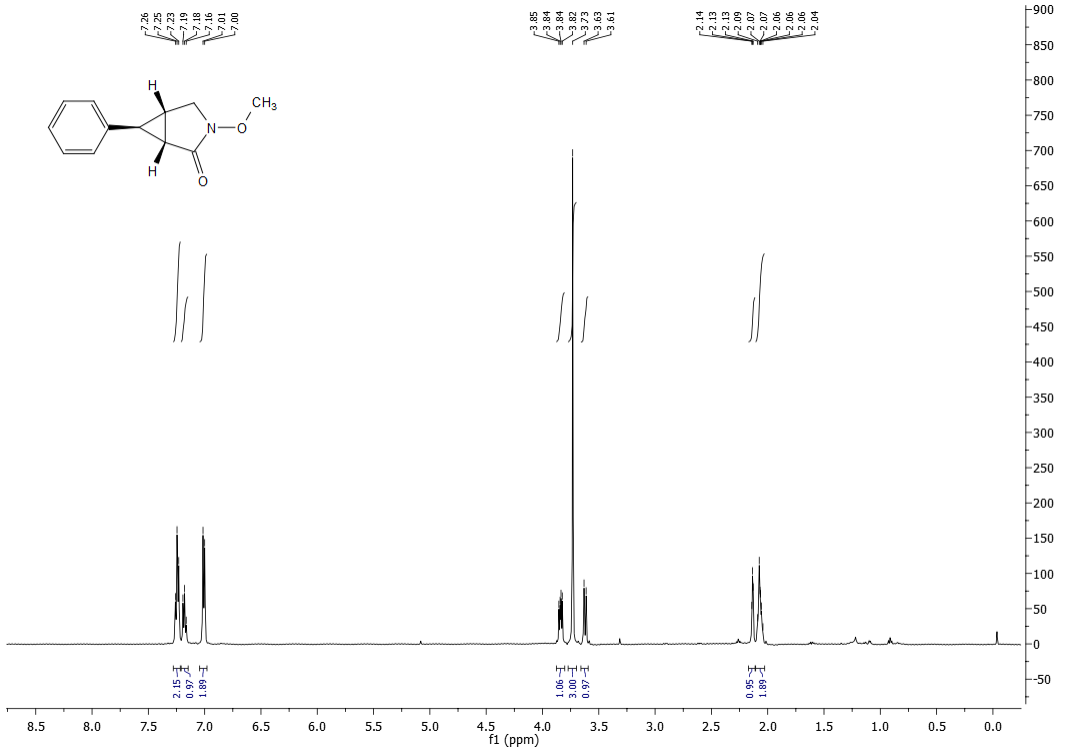
(1R,5S,6S)-3-methyl-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one (2b):

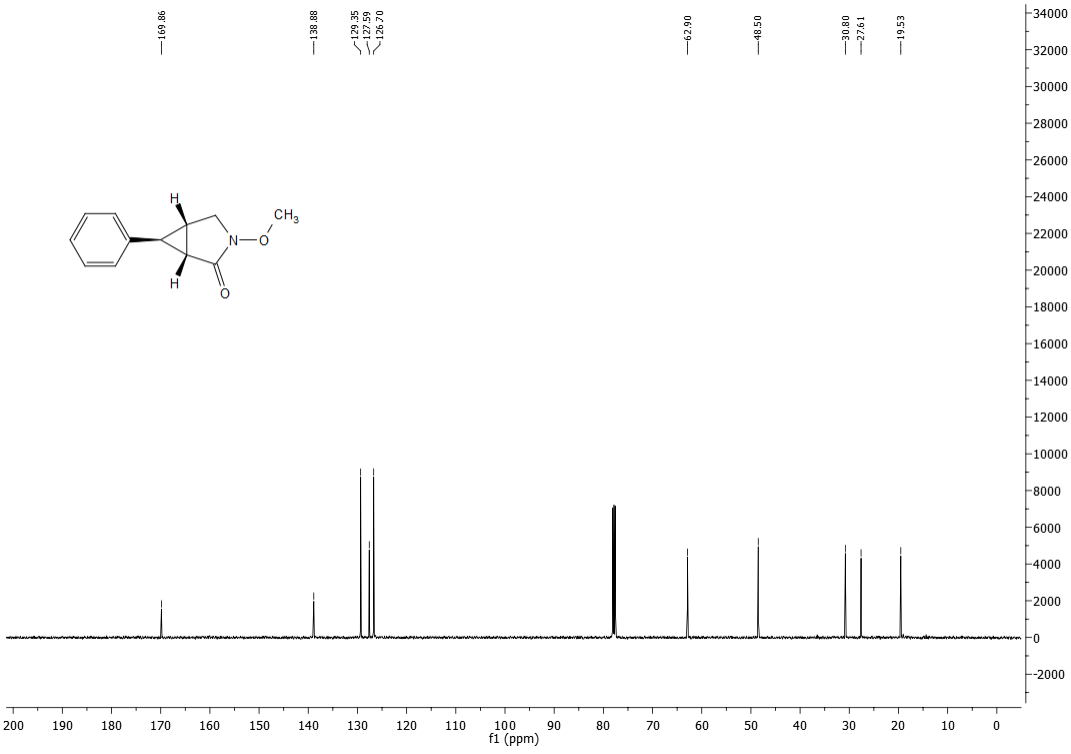
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent





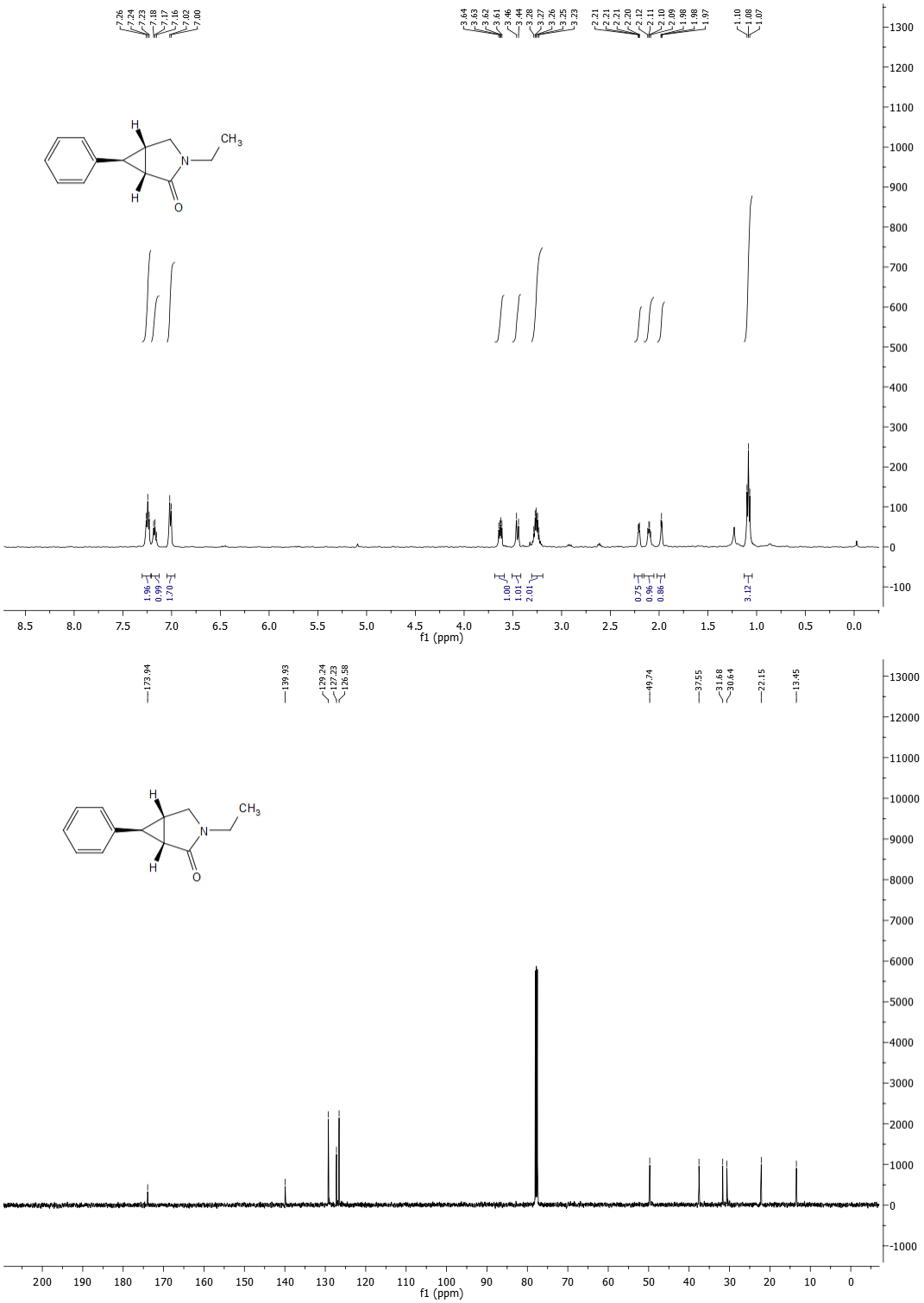
(1R,5S,6S)-3-methoxy-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one (2c):
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent





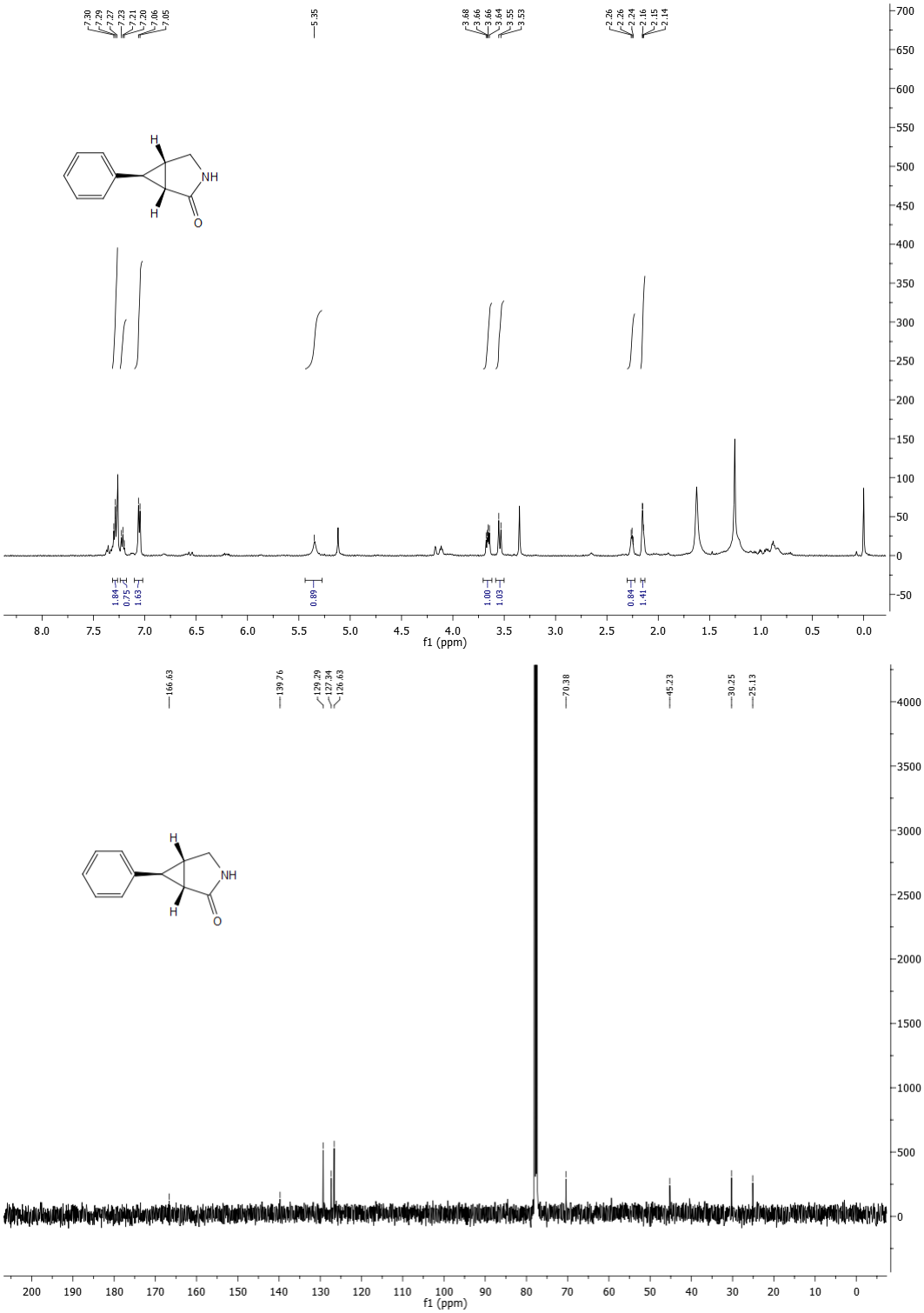
(1R,5S,6S)-3-ethyl-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one (2d):

500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent



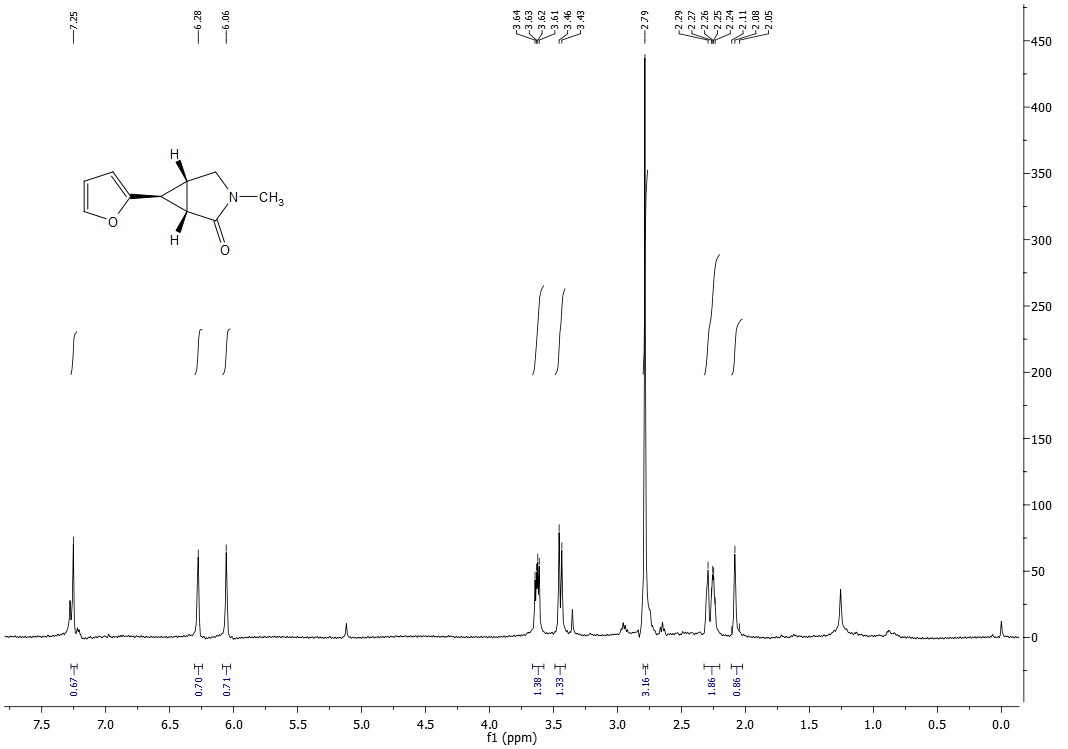
(1R,5S,6S)-6-phenyl-3-azabicyclo[3.1.0]hexan-2-one (2e):

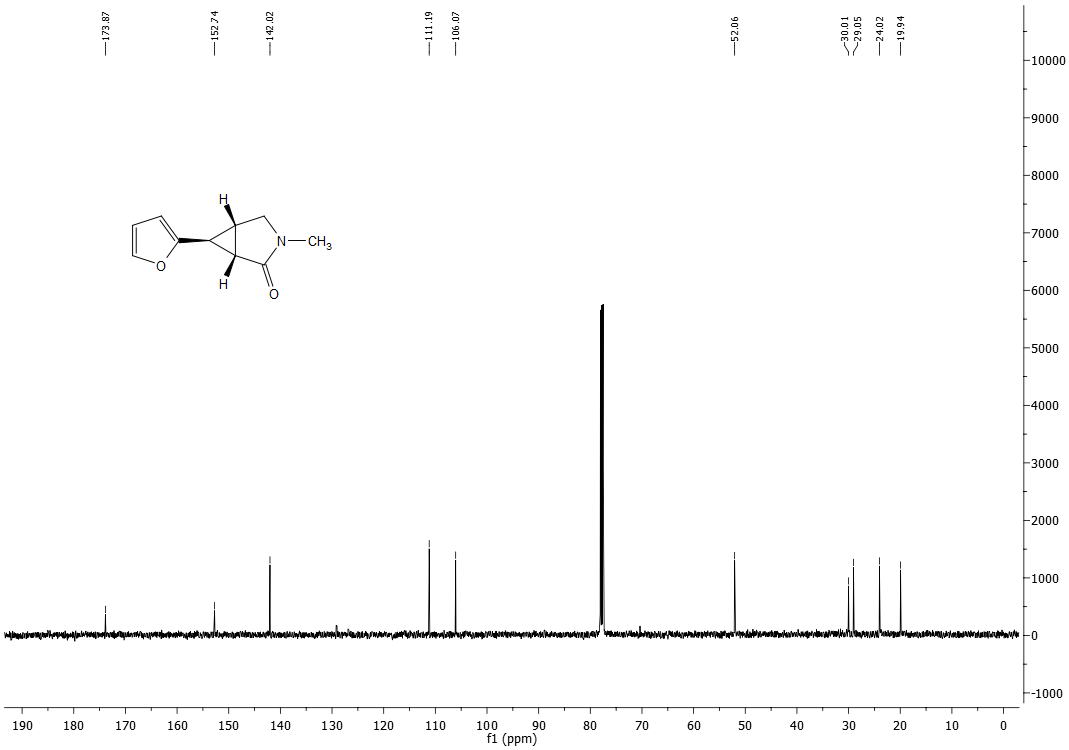
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent



(1R,5S,6S)-6-(furan-2-yl)-3-methyl-3-azabicyclo[3.1.0]hexan-2-one (2f):

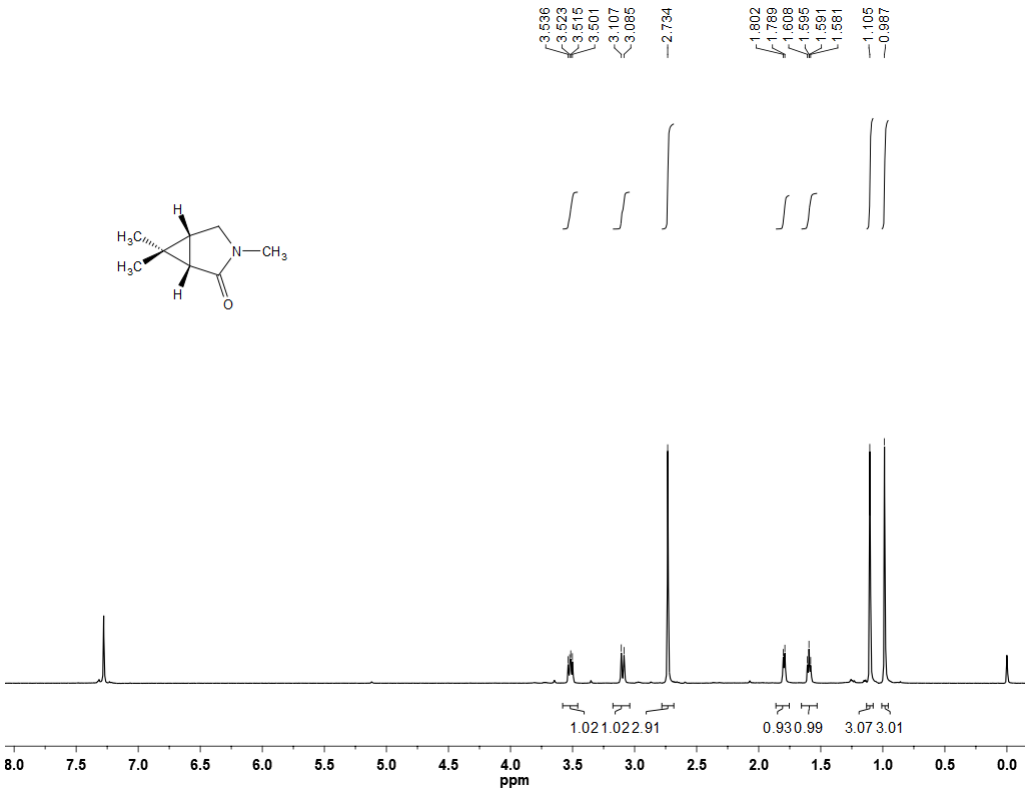
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent

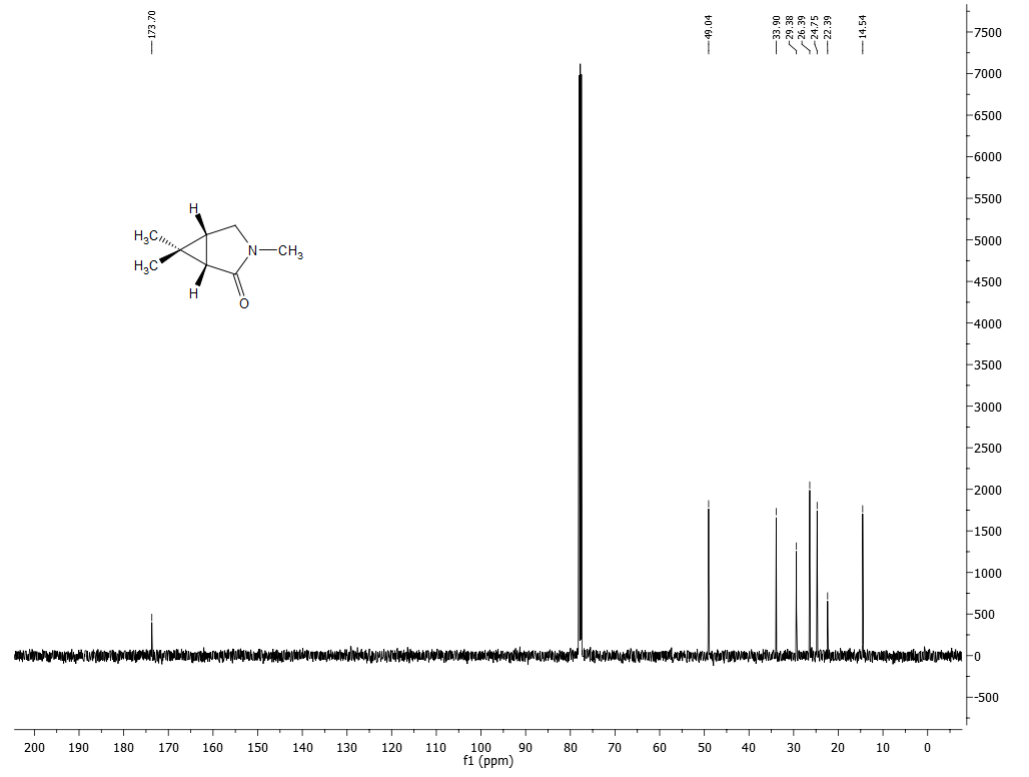




(1S,5R)-3,6,6-trimethyl-3-azabicyclo[3.1.0]hexan-2-one (2g):

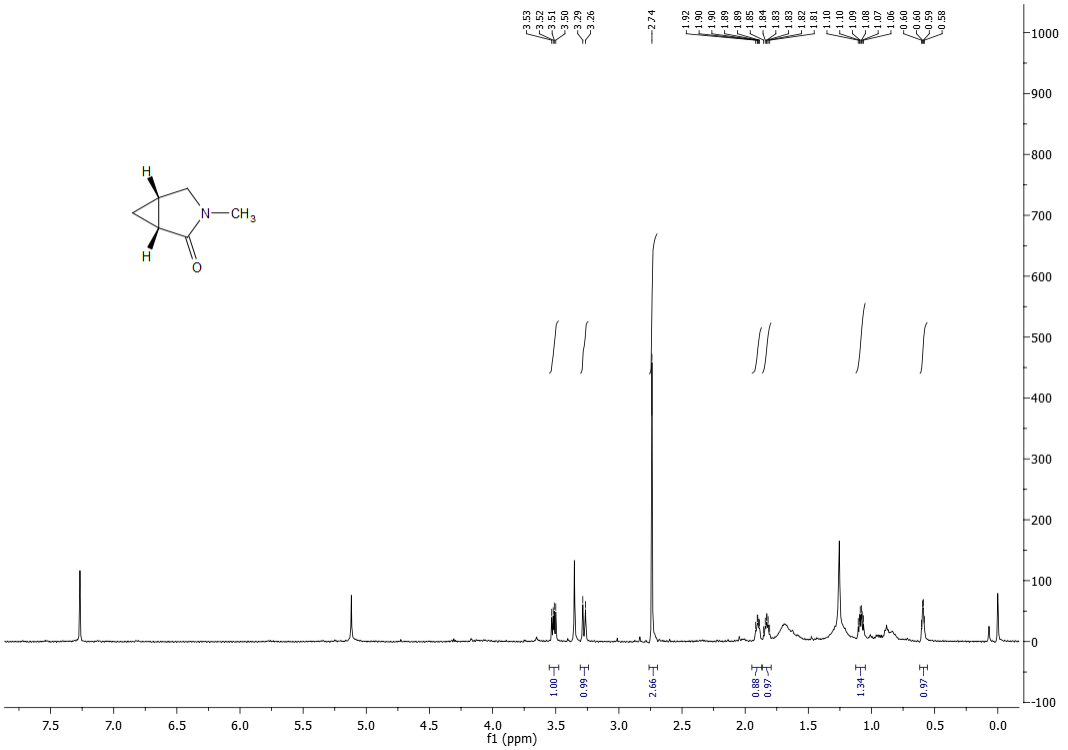
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent

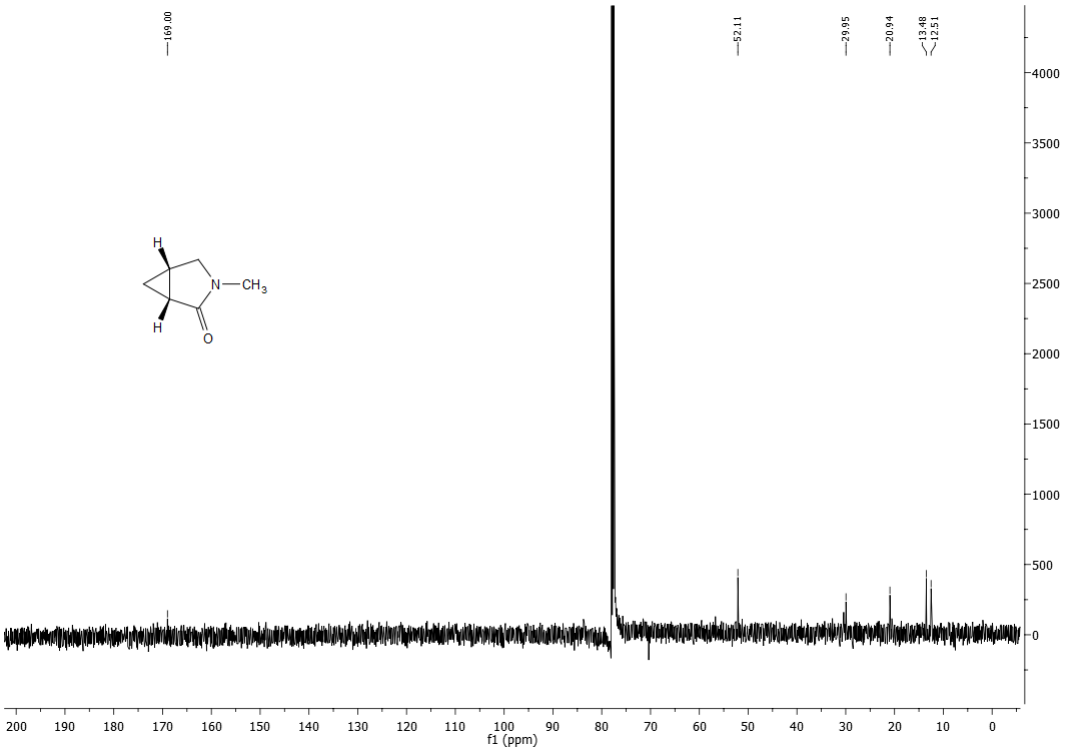




(1R,5S)-3-methyl-3-azabicyclo[3.1.0]hexan-2-one (2h):

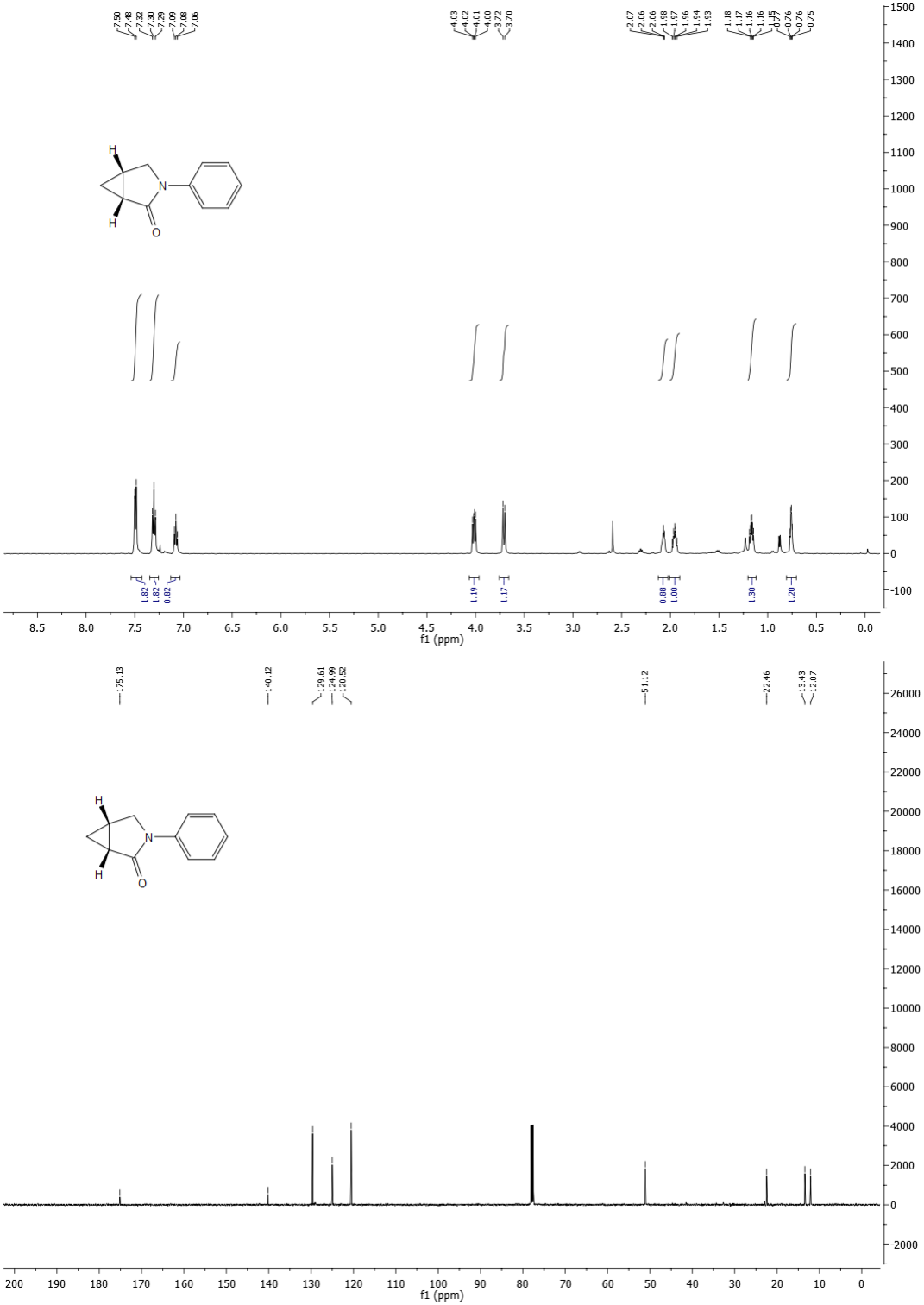
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent





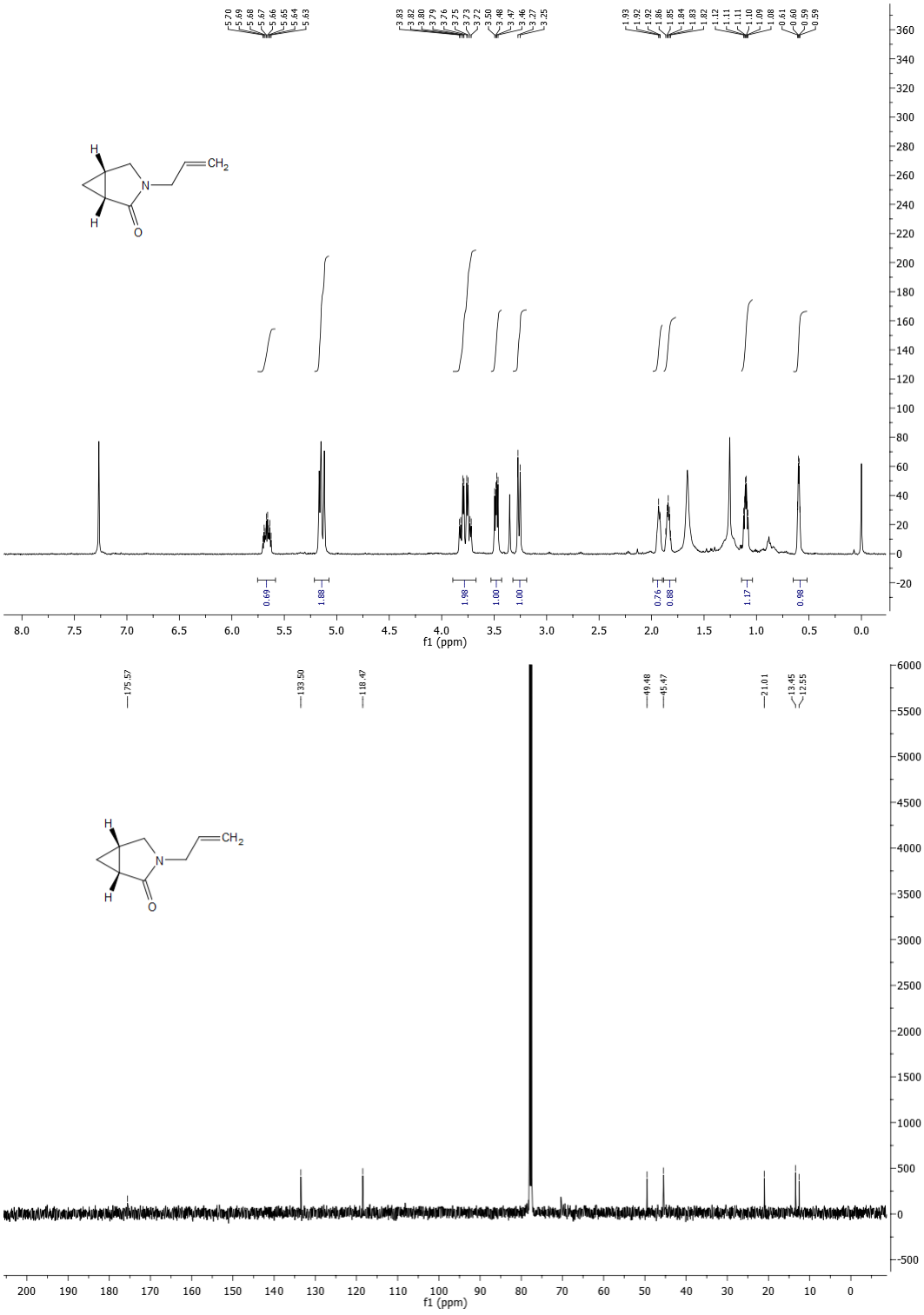
(1R,5S)-3-phenyl-3-azabicyclo[3.1.0]hexan-2-one (2i):

500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent

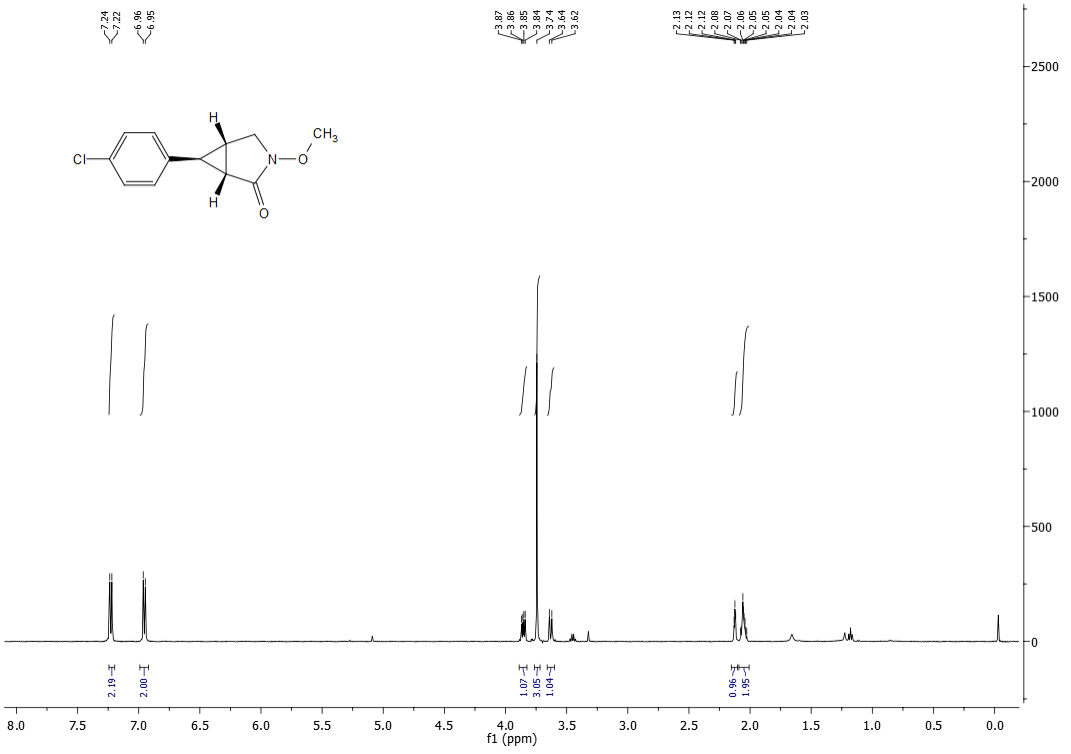


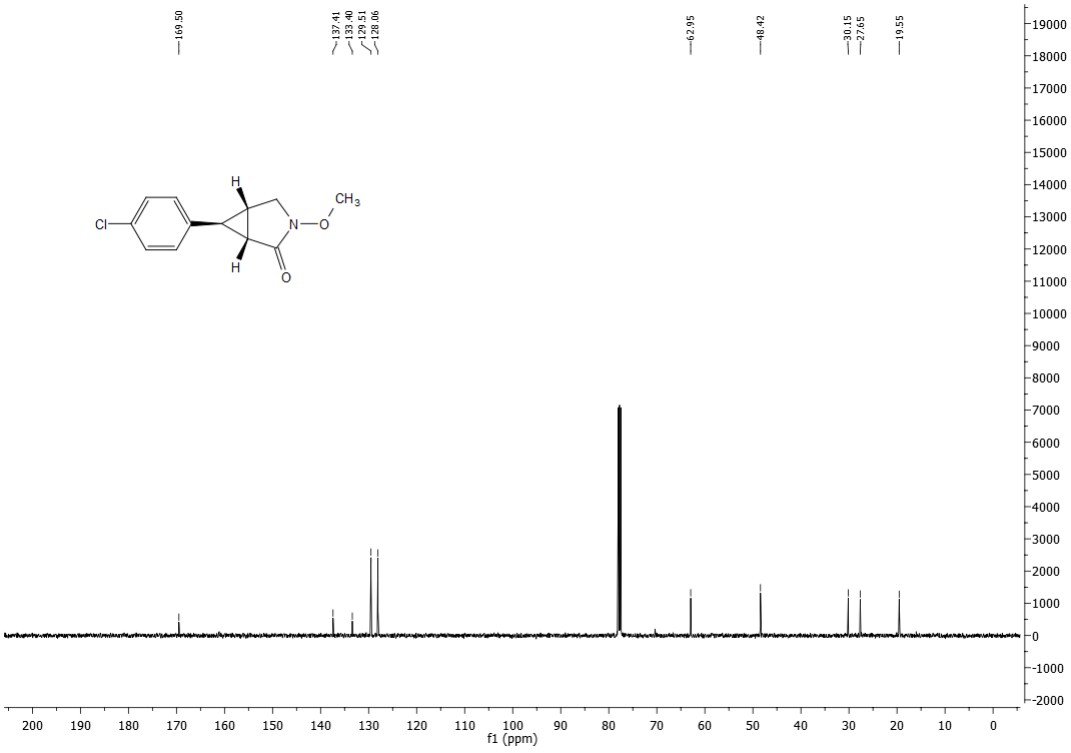
(1R,5S)-3-allyl-3-azabicyclo[3.1.0]hexan-2-one (2j):

500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent

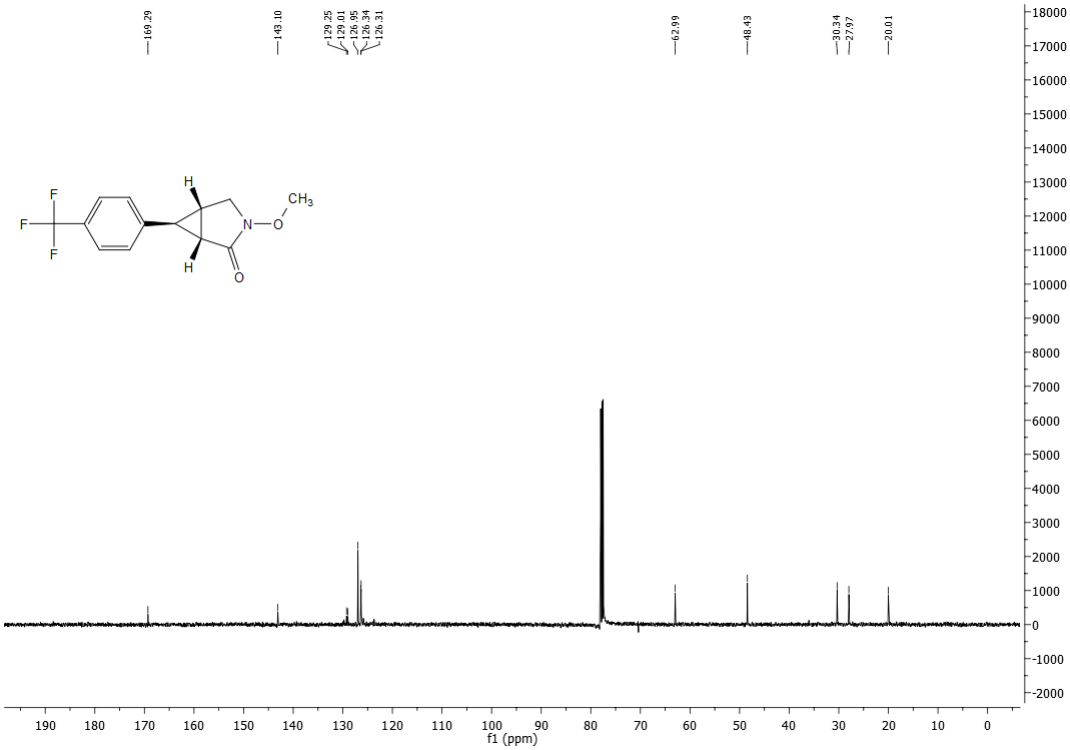


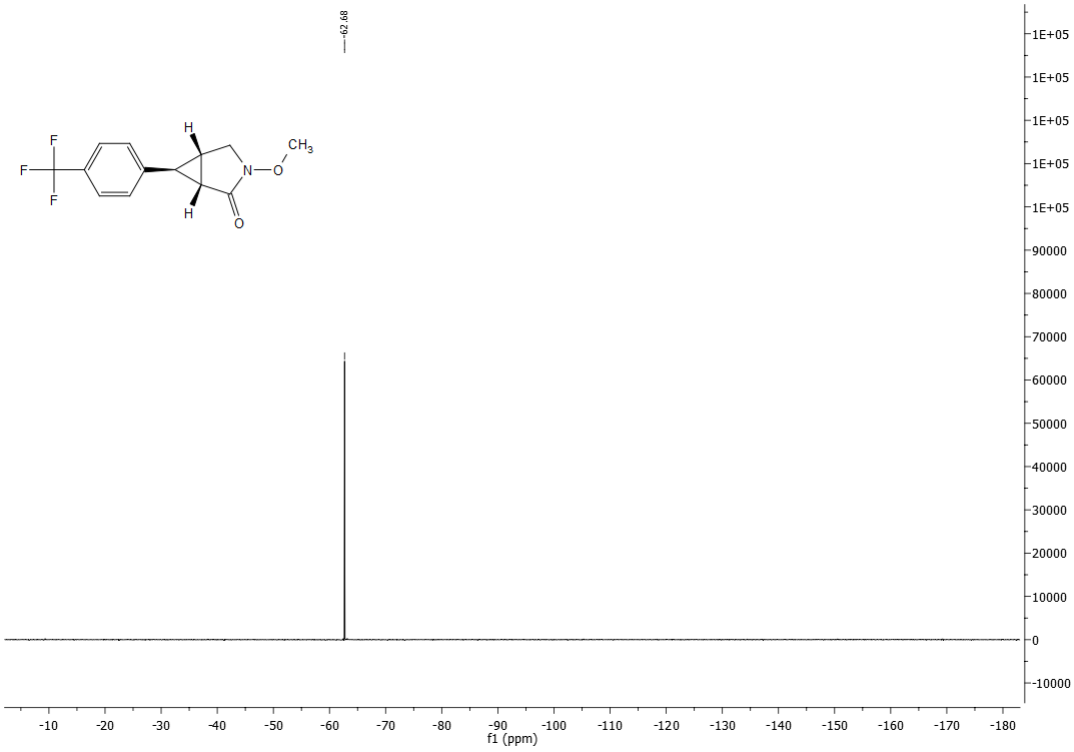
(1R,5S,6S)-6-(4-chlorophenyl)-3-methoxy-3-azabicyclo[3.1.0]hexan-2-one (2k):
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent





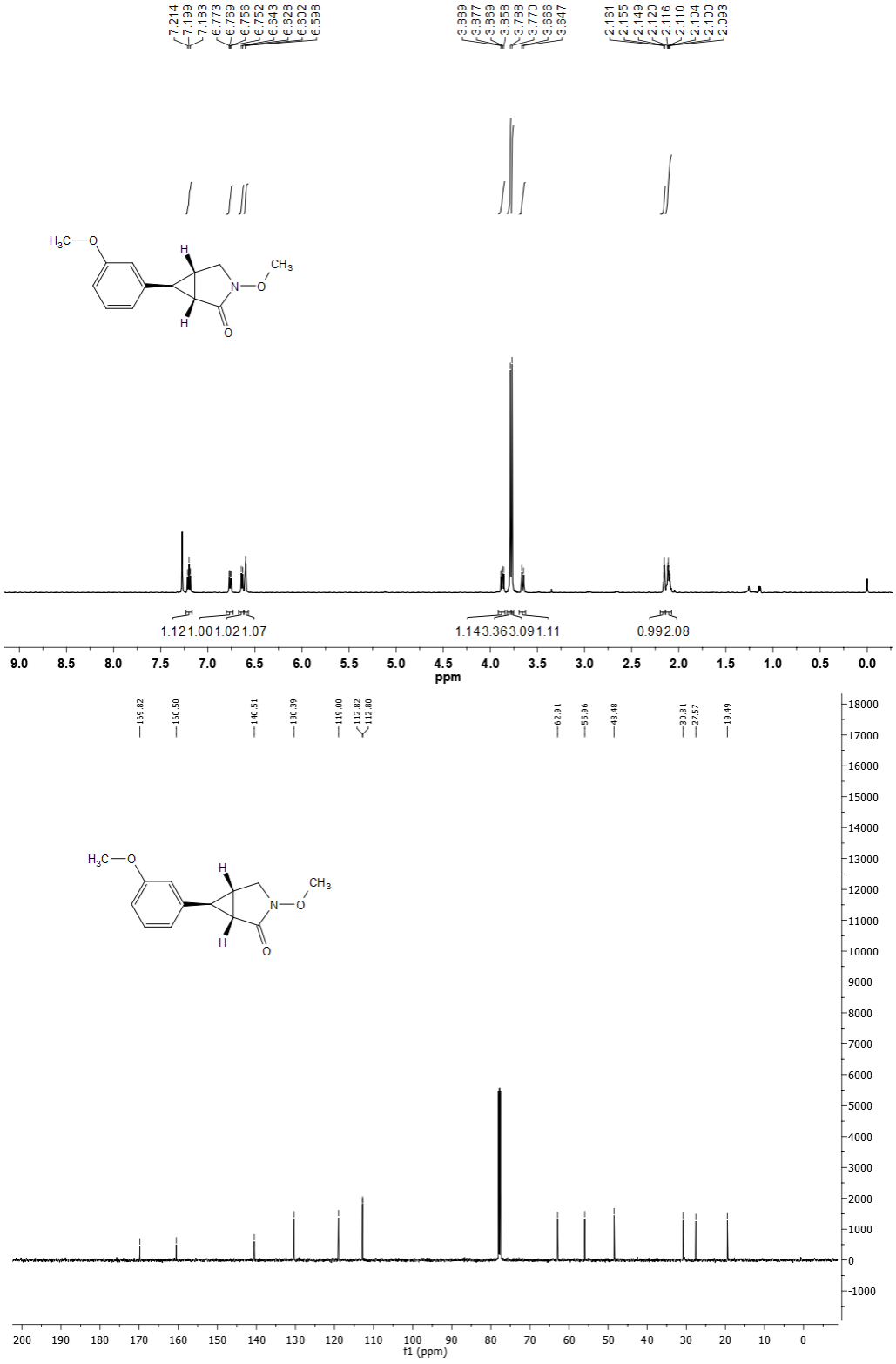
(1R,5S,6S)-3-methoxy-6-(4-(trifluoromethyl)phenyl)-3-azabicyclo[3.1.0]hexan-2-one (2l):
500 MHz ^{1}H spectrum, 126 MHz ^{13}C spectrum and 376 MHz ^{19}F spectrum in $CDCl_3$ solvent




-62.68
F
F
F
H
H
N
O
CH3
O
1E+05
1E+05
1E+05
1E+05
1E+05
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
-10000
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
f1 (ppm)

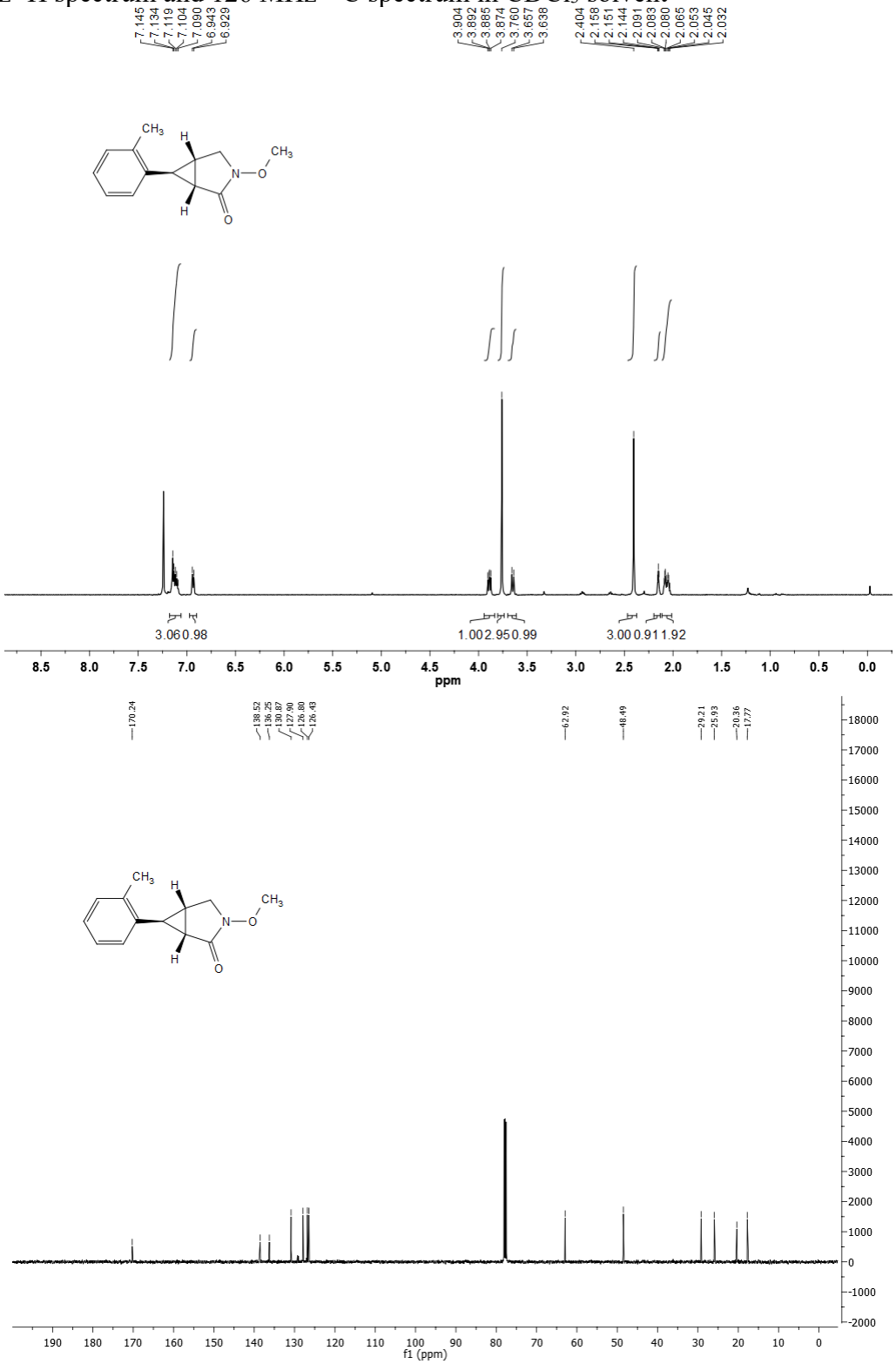
(1R,5S,6S)-3-methoxy-6-(3-methoxyphenyl)-3-azabicyclo[3.1.0]hexan-2-one (2m):

500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent



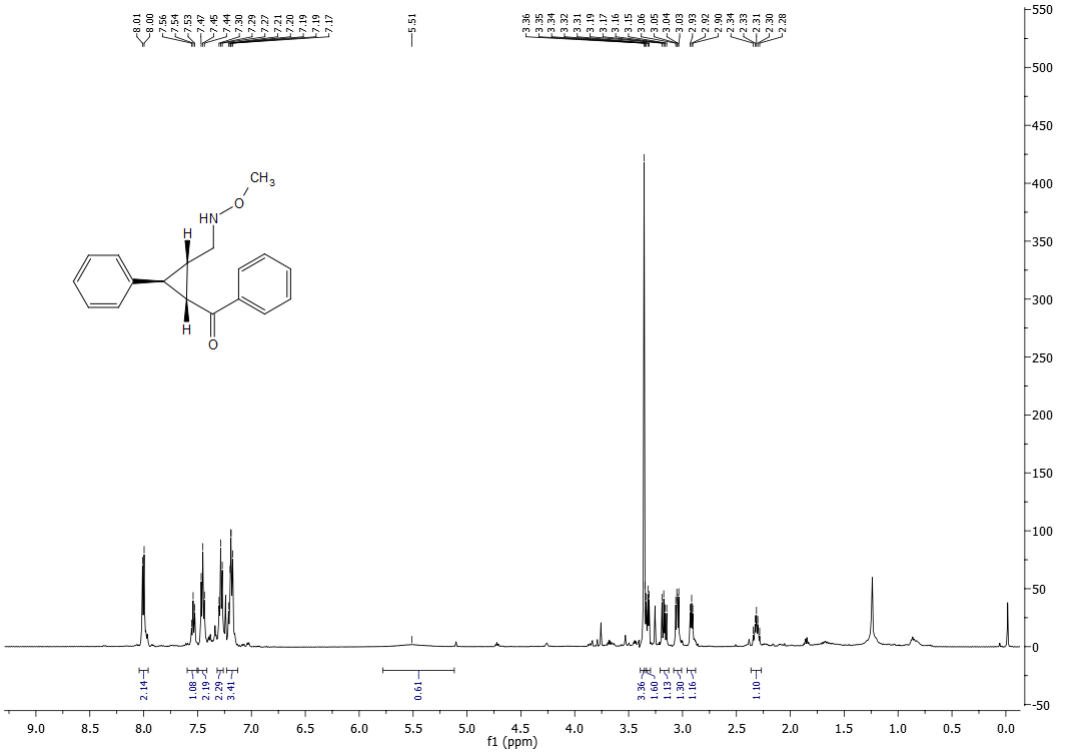
(1R,5S,6S)-3-methoxy-6-(o-tolyl)-3-azabicyclo[3.1.0]hexan-2-one (2n):

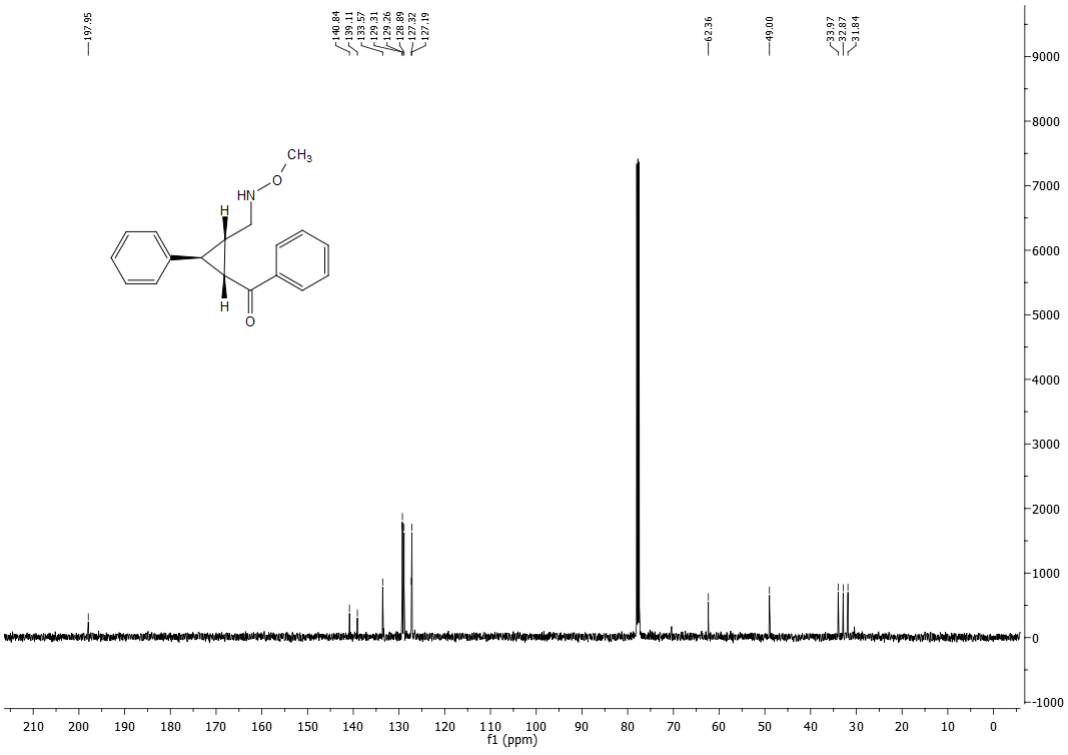
500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent



((1R,2S,3S)-2-((methoxyamino)methyl)-3-phenylcyclopropyl)(phenyl)methanone (3):

500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent





(1R,5S,6S)-3-ethyl-6-phenyl-3-azabicyclo[3.1.0]hexane (4):

500 MHz ^{1}H spectrum and 126 MHz ^{13}C spectrum in $CDCl_3$ solvent