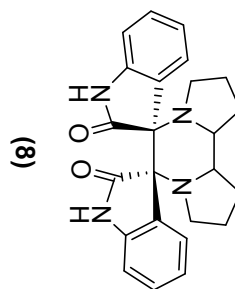
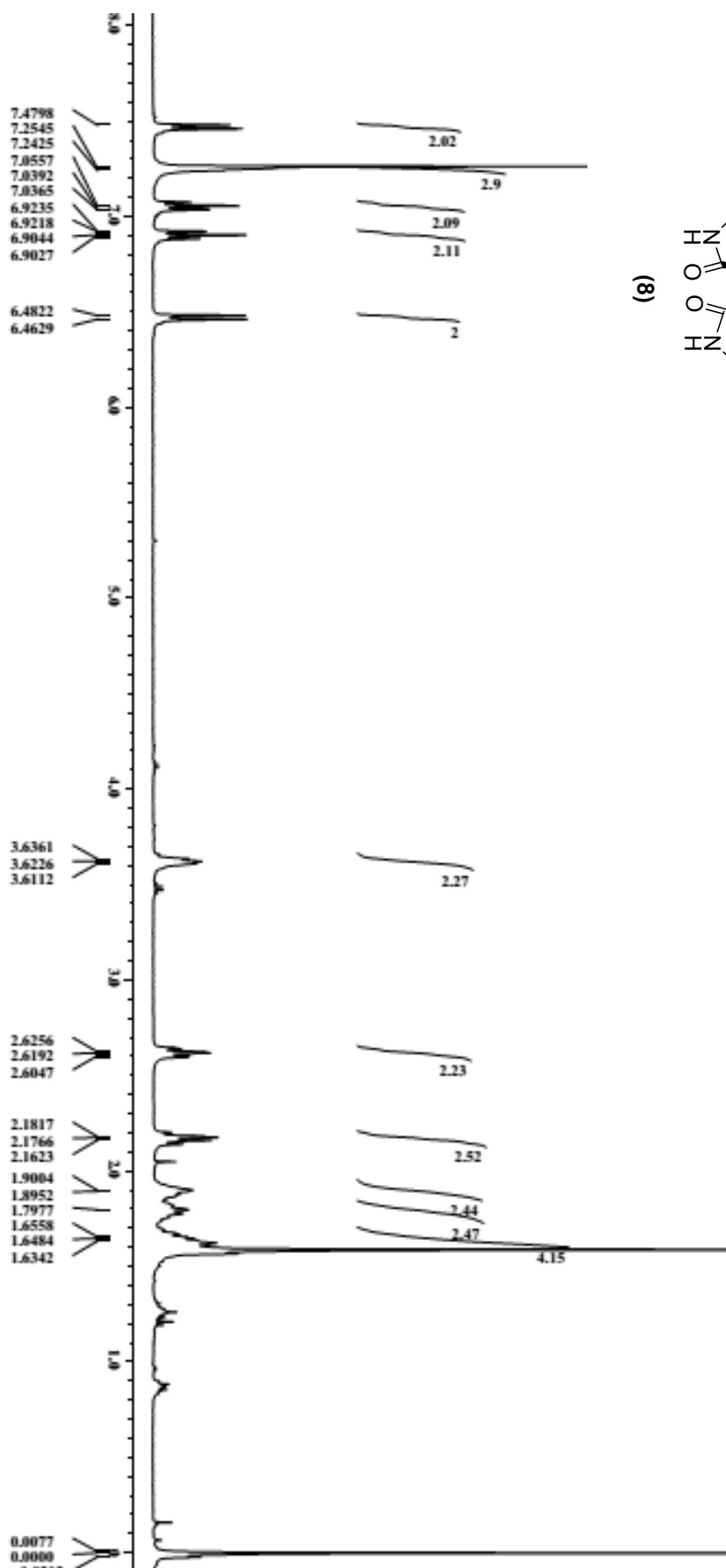
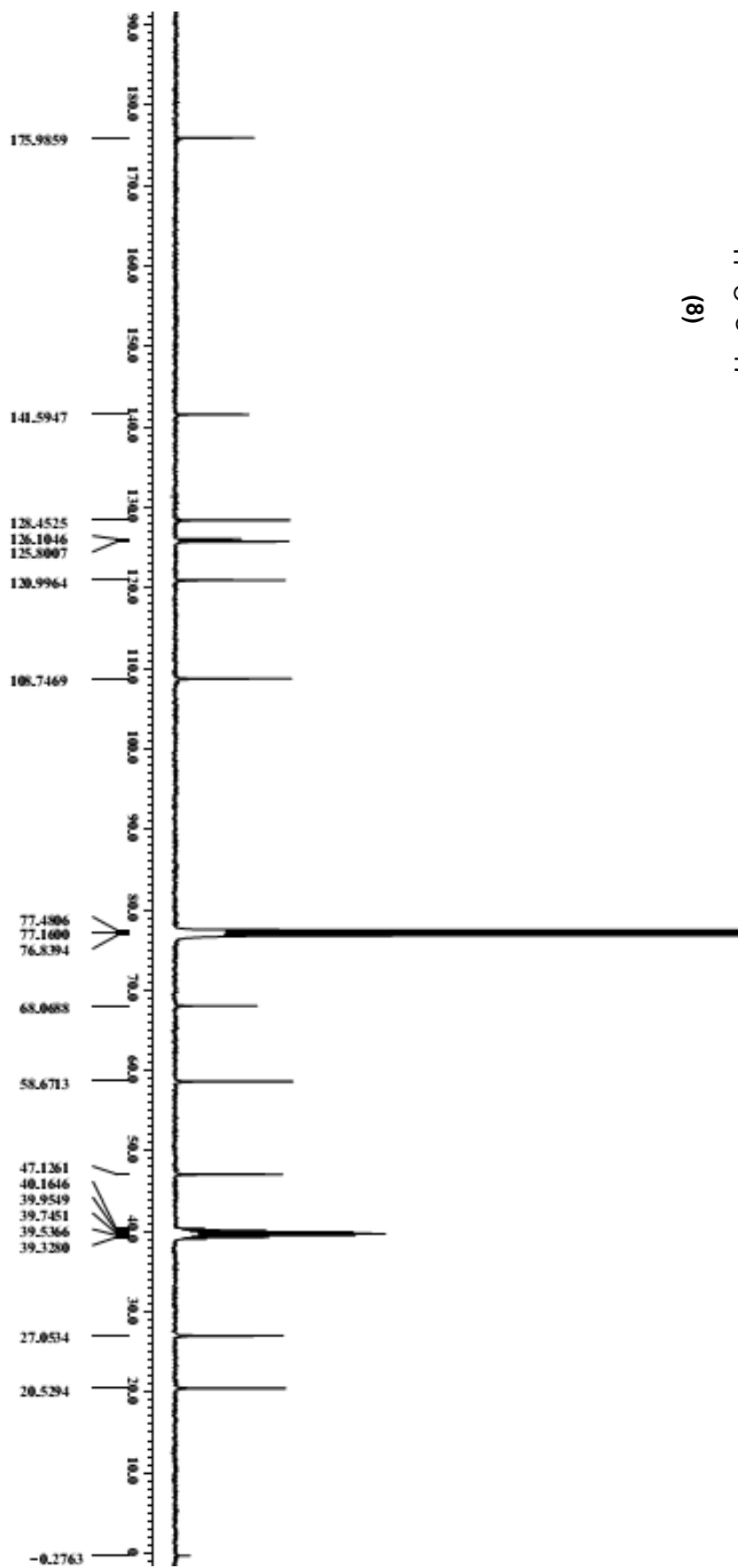
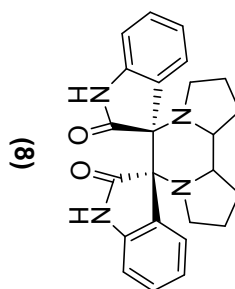


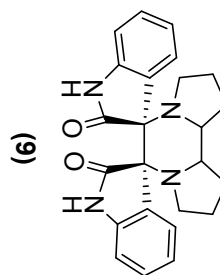
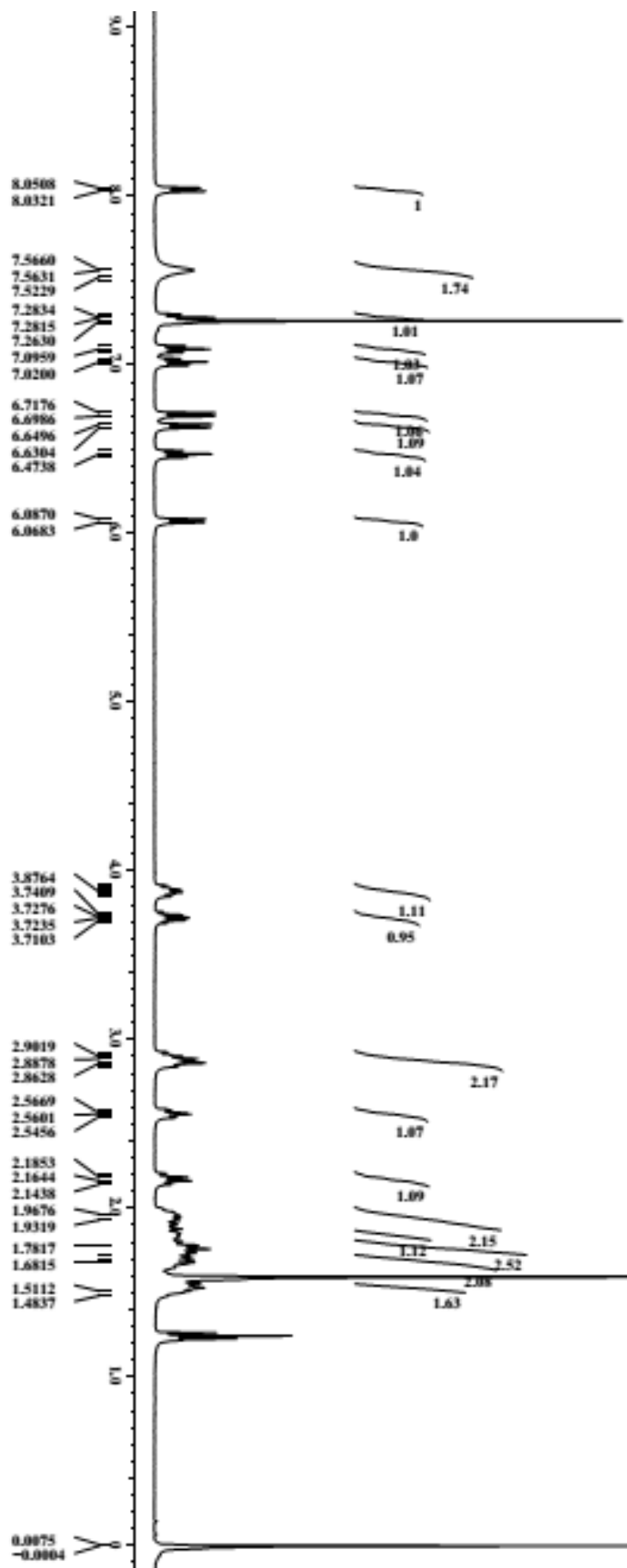
Supporting Information

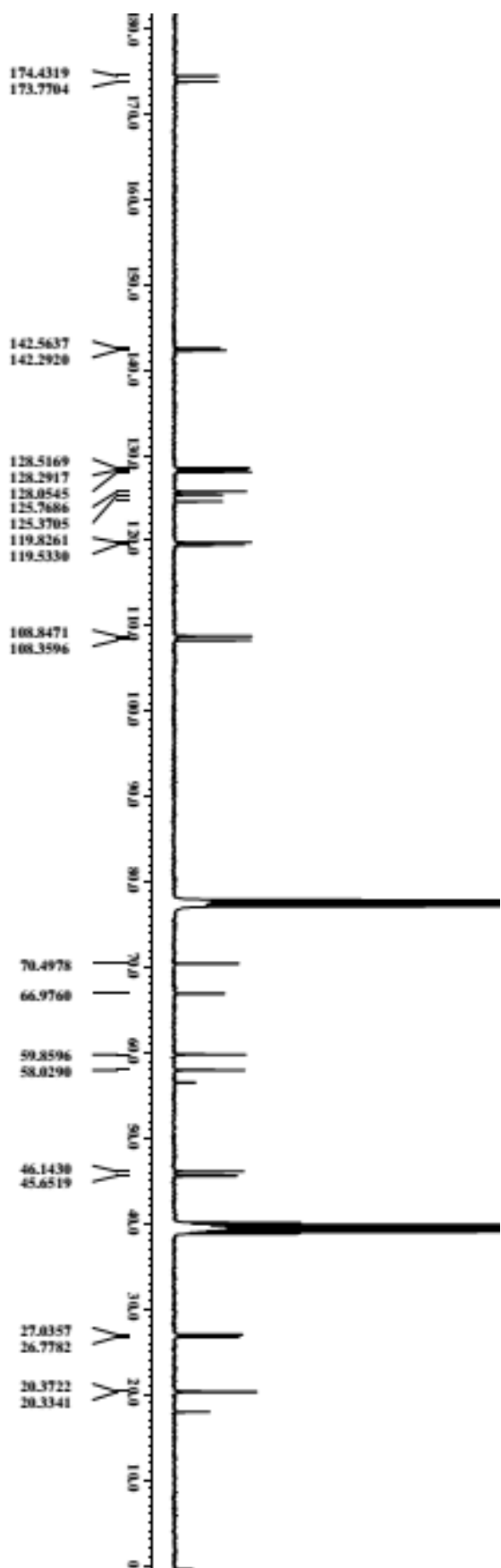
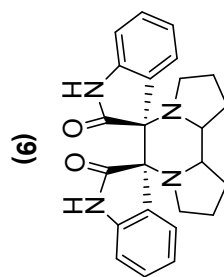
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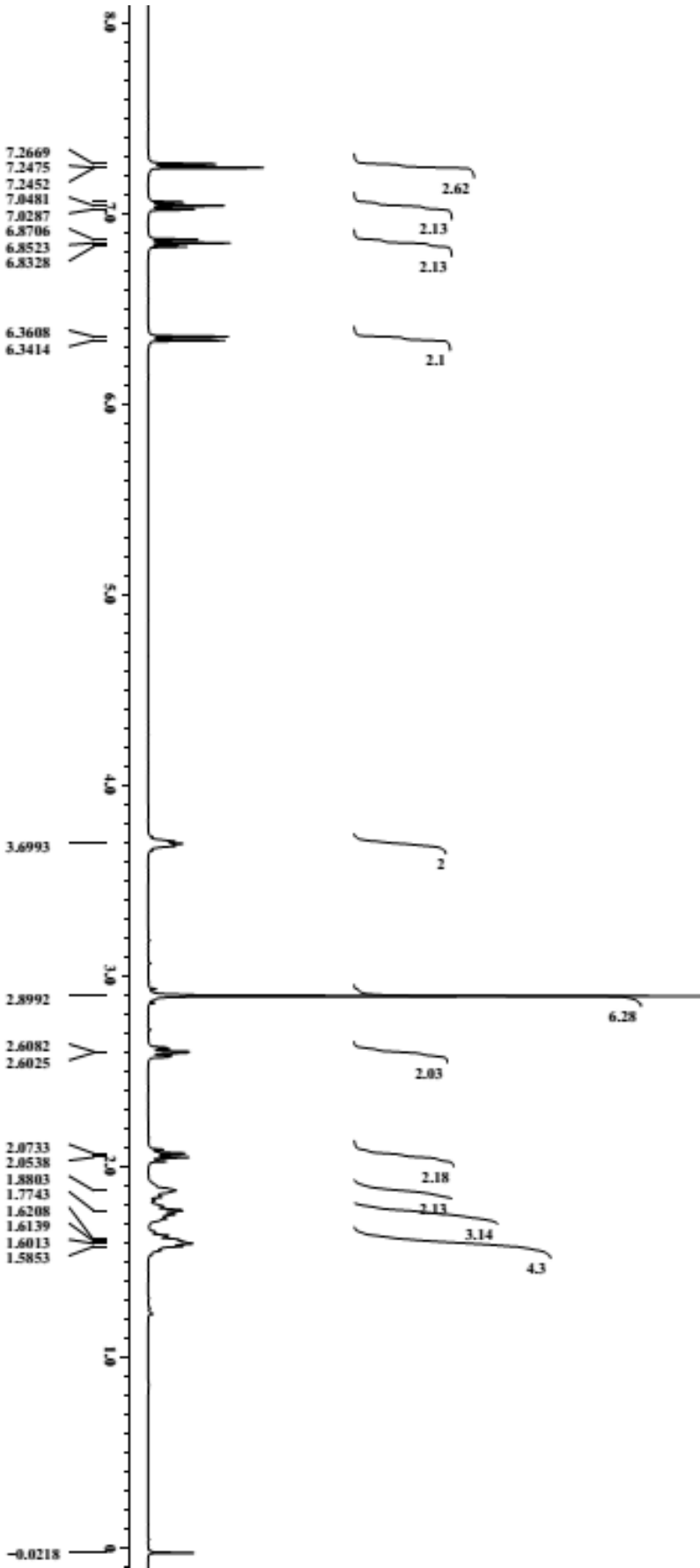
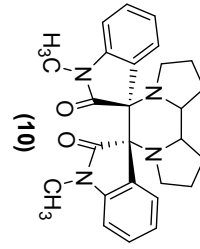
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¹³ C NMR of 8	3	¹ H NMR of 15	16
¹ H NMR of 9	4	¹³ C NMR of 15	17
¹³ C NMR of 9	5	¹ H NMR of 16	18
¹ H NMR of 10	6	¹³ C NMR of 16	19
¹³ C NMR of 10	7	¹ H NMR of 17	20
¹ H NMR of 11	8	¹³ C NMR of 17	21
¹³ C NMR of 11	9	¹ H NMR of 18	22
¹ H NMR of 12	10	¹³ C NMR of 18	23
¹³ C NMR of 12	11		
¹ H NMR of 13	12	X-Ray Data	24
¹³ C NMR of 13	13		
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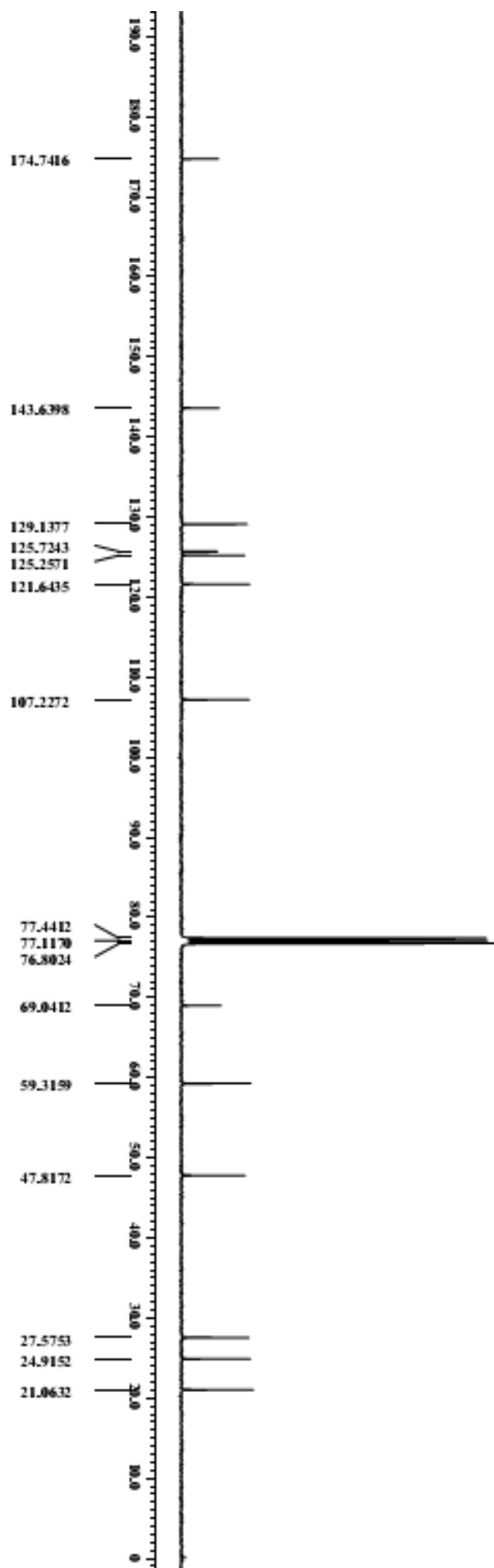
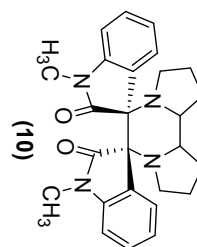


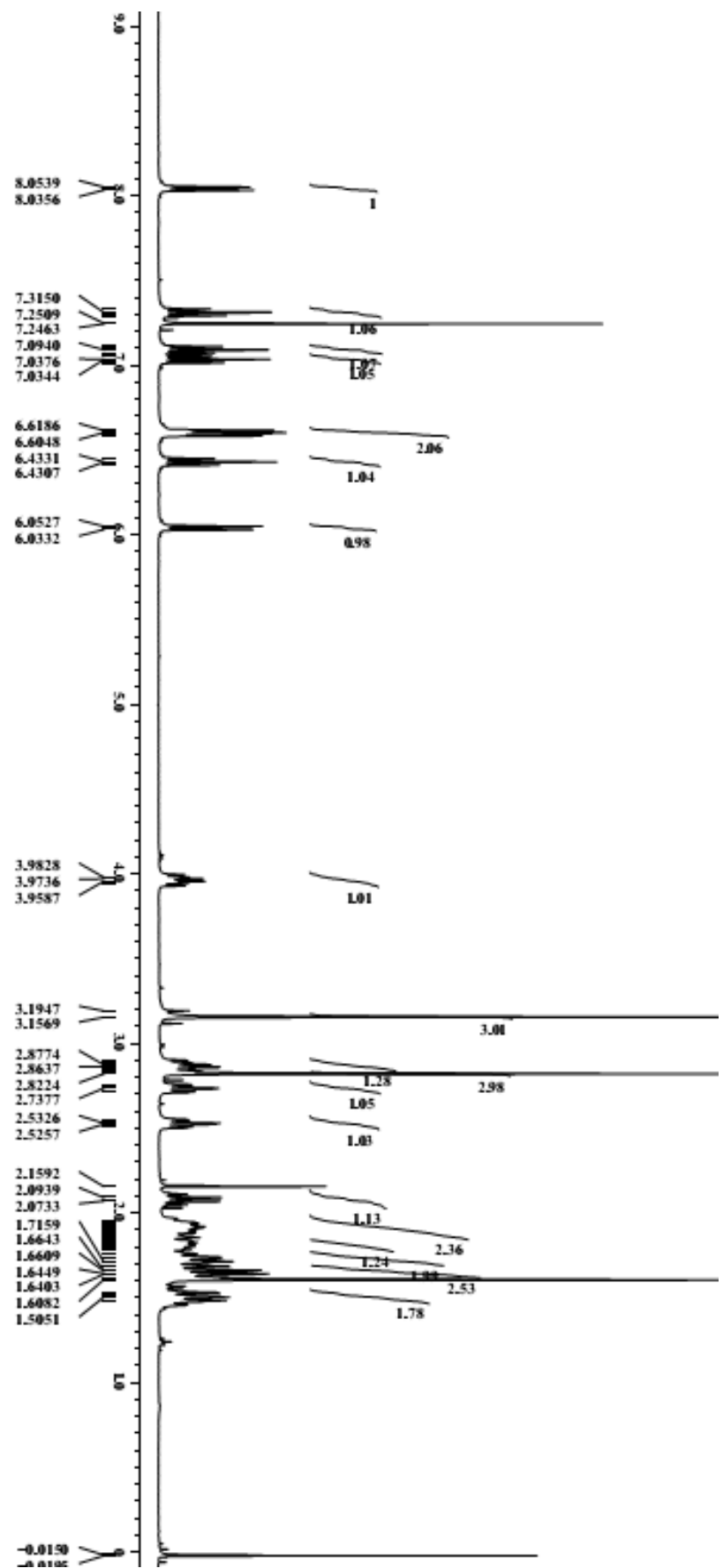
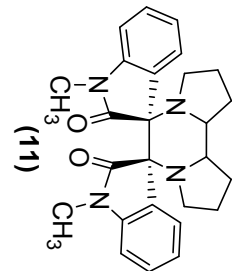


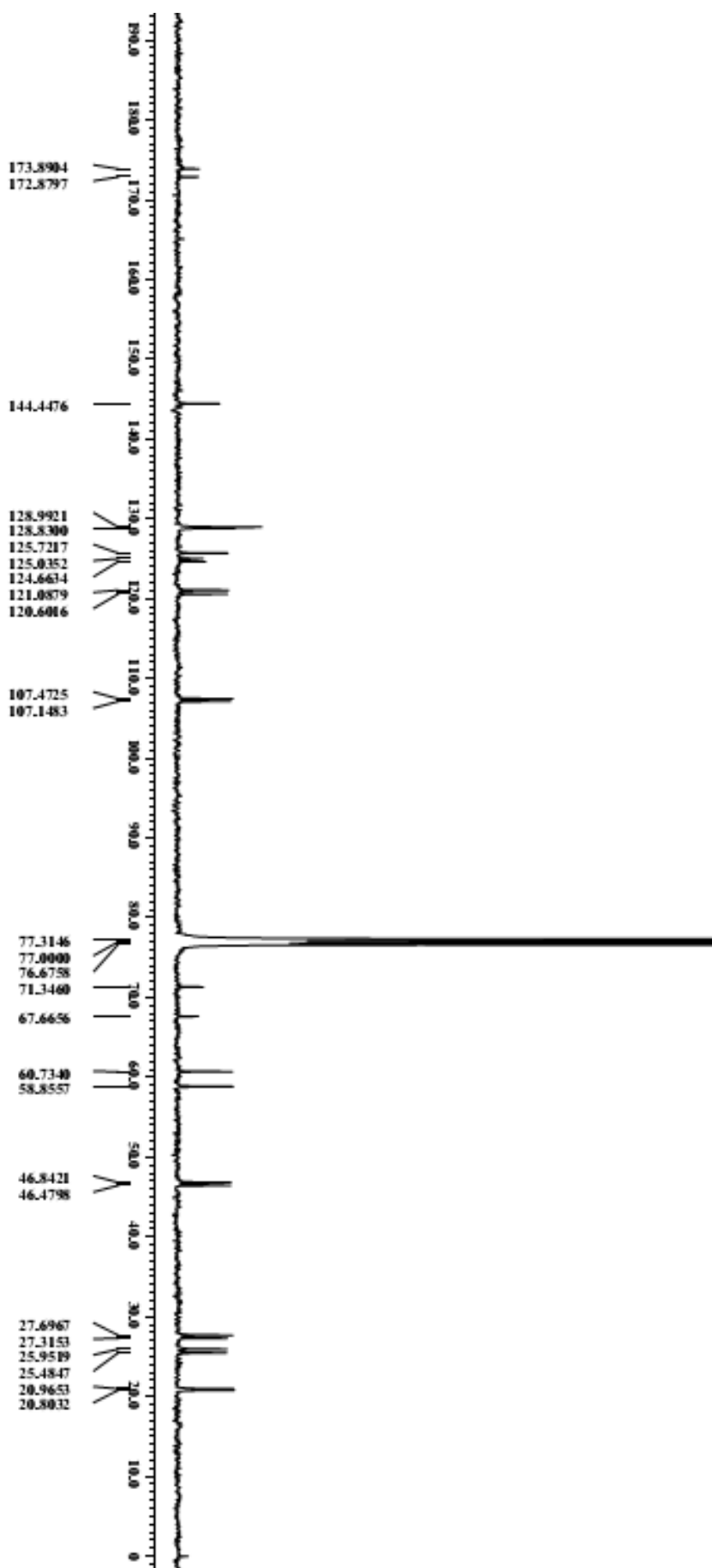
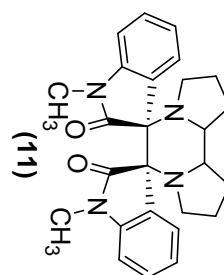


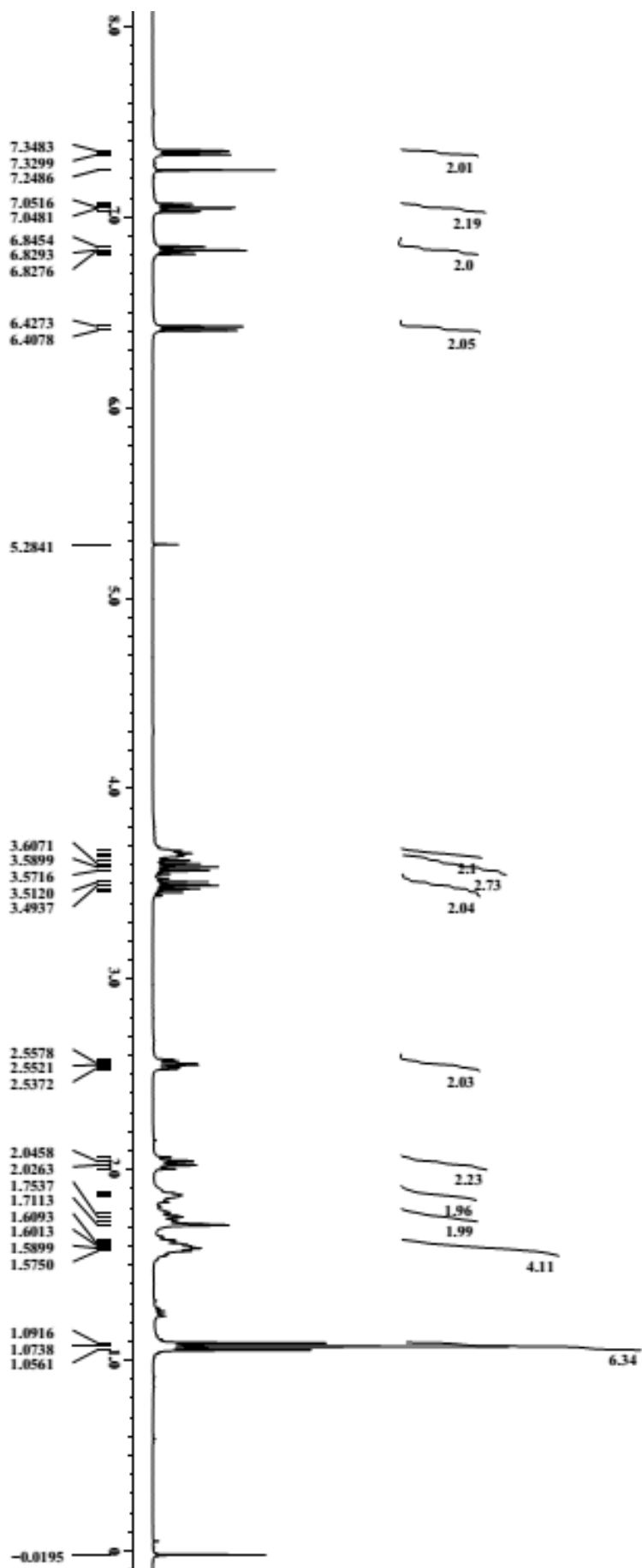
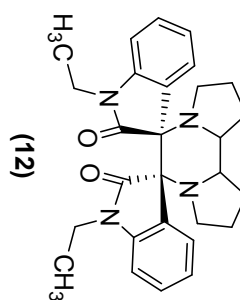


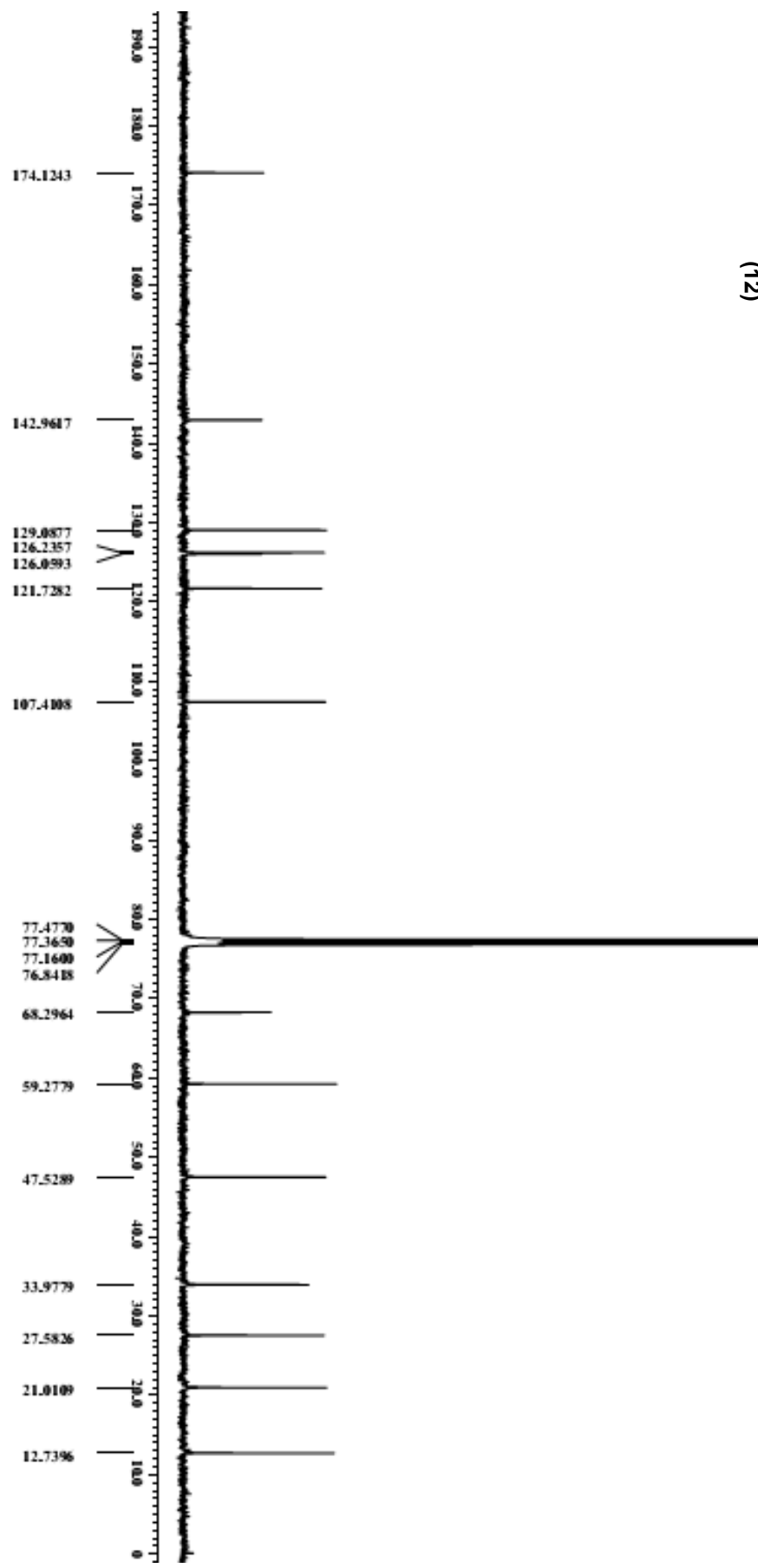
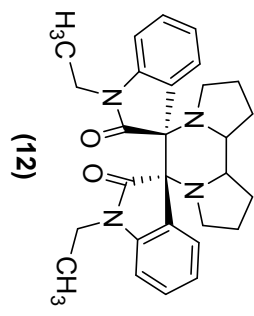


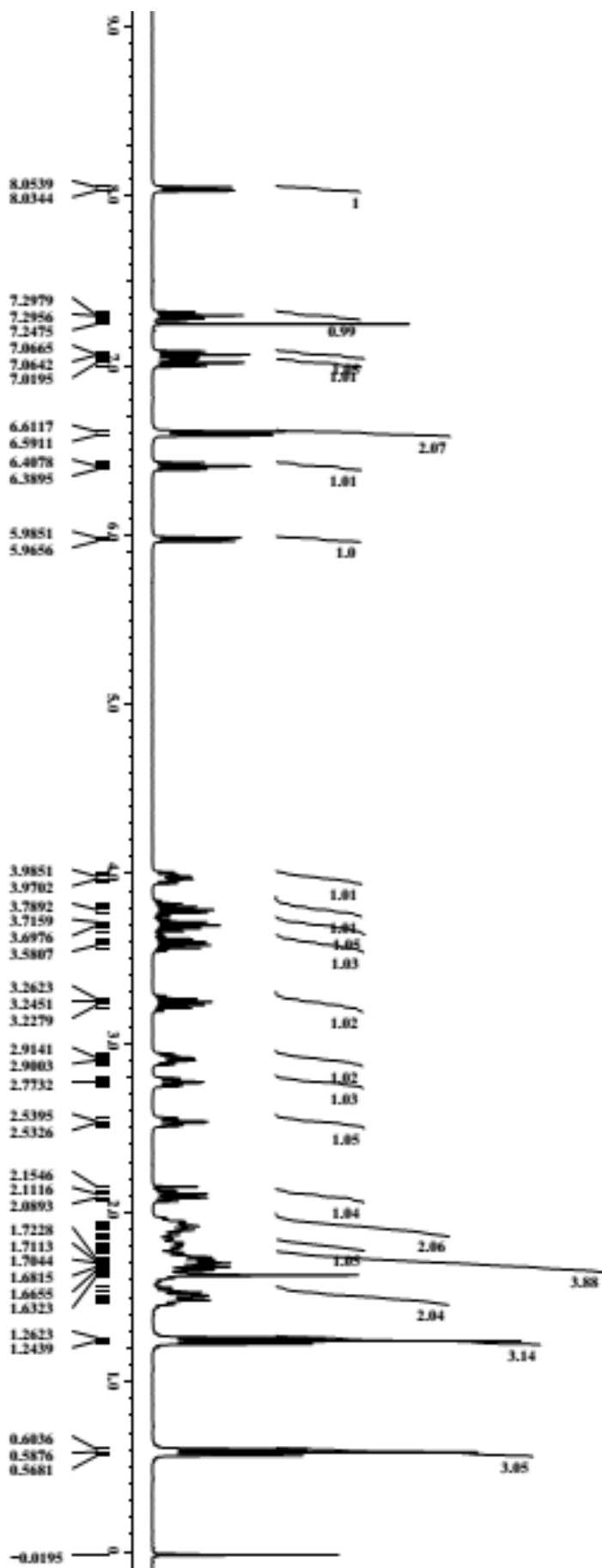
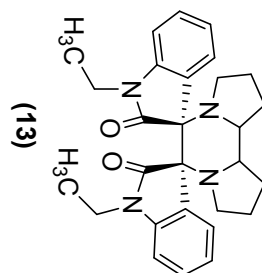


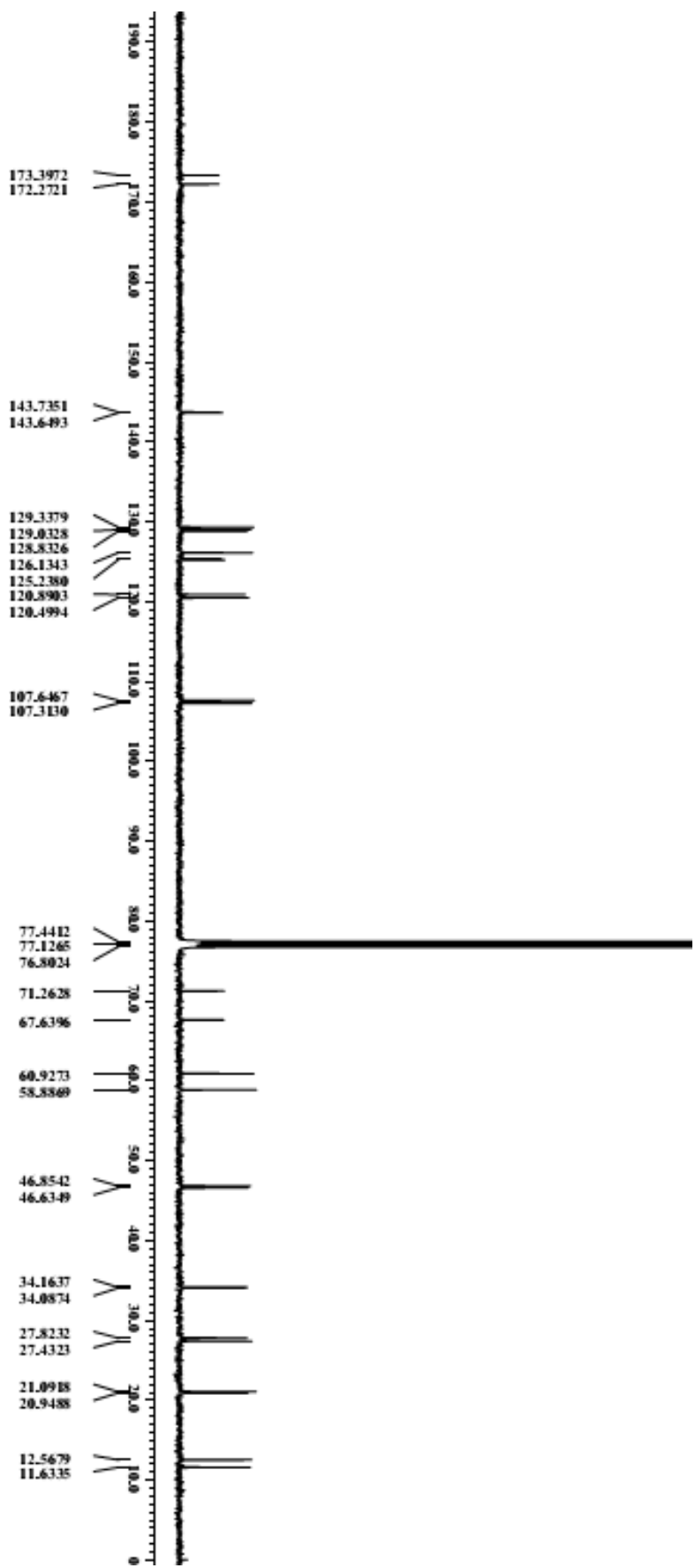
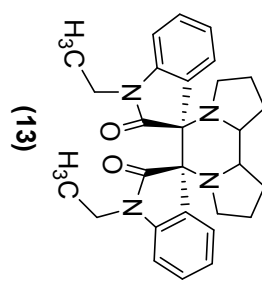


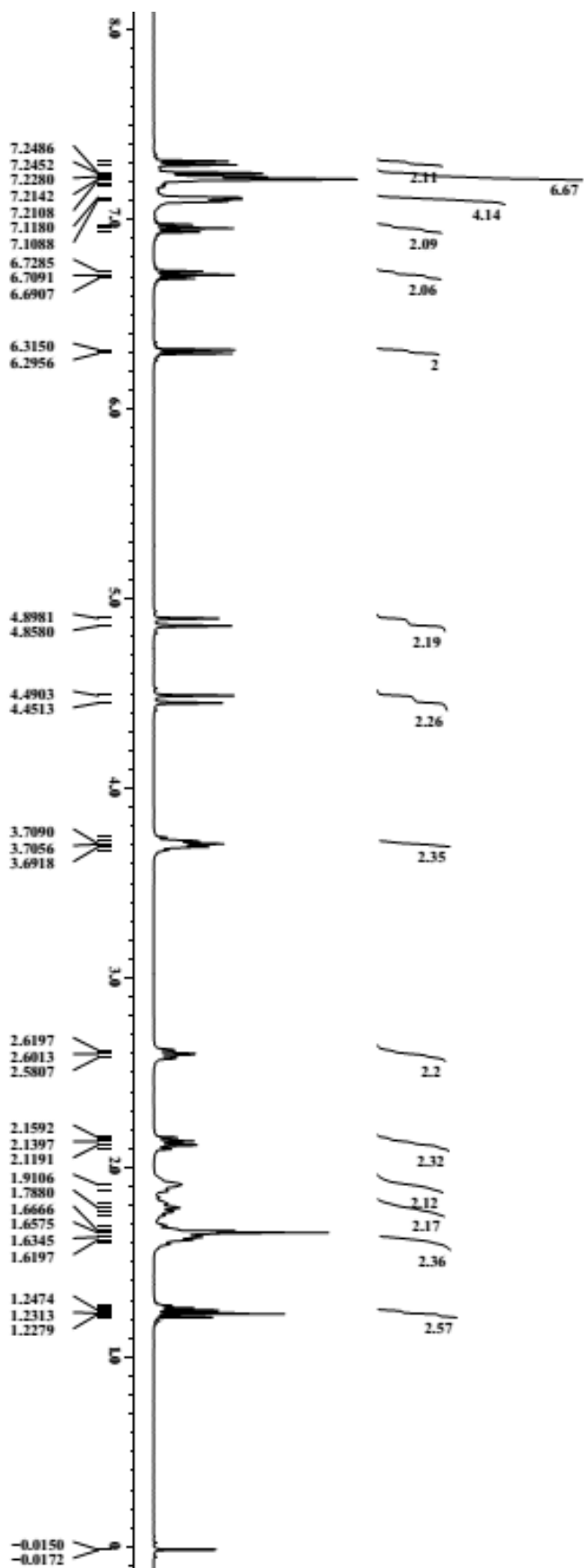
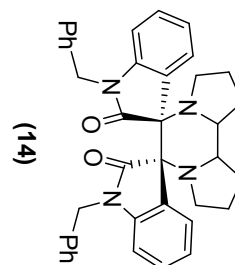


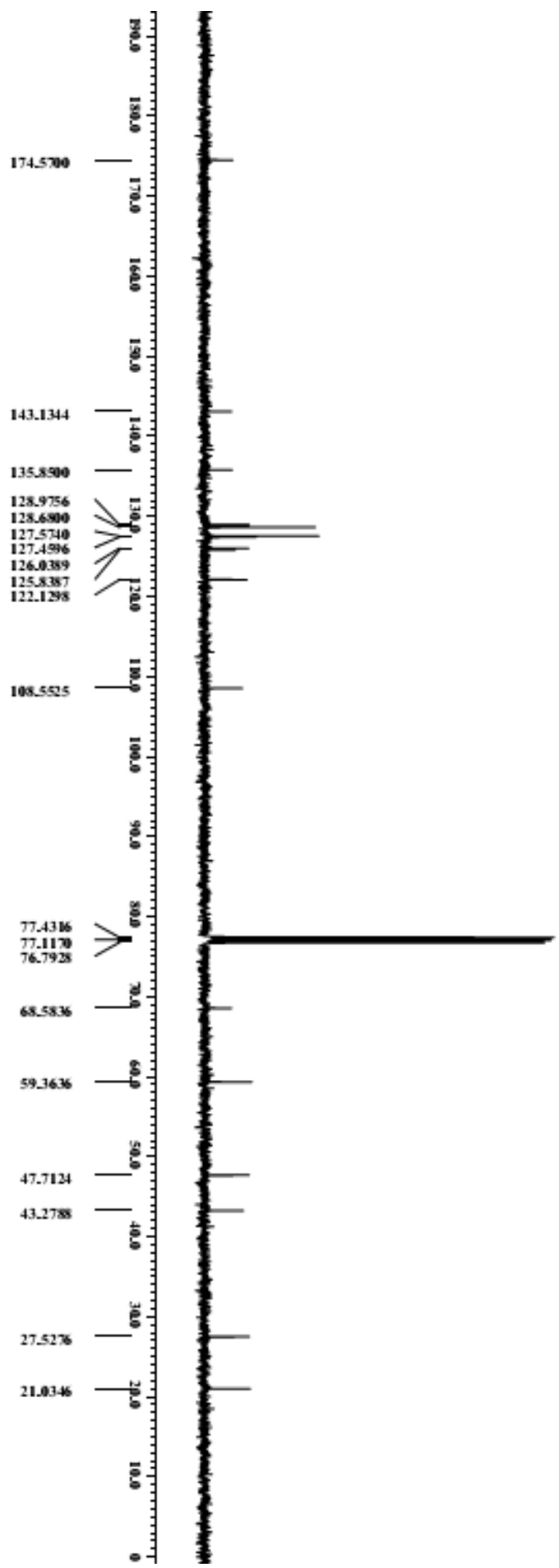
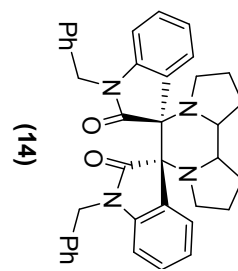


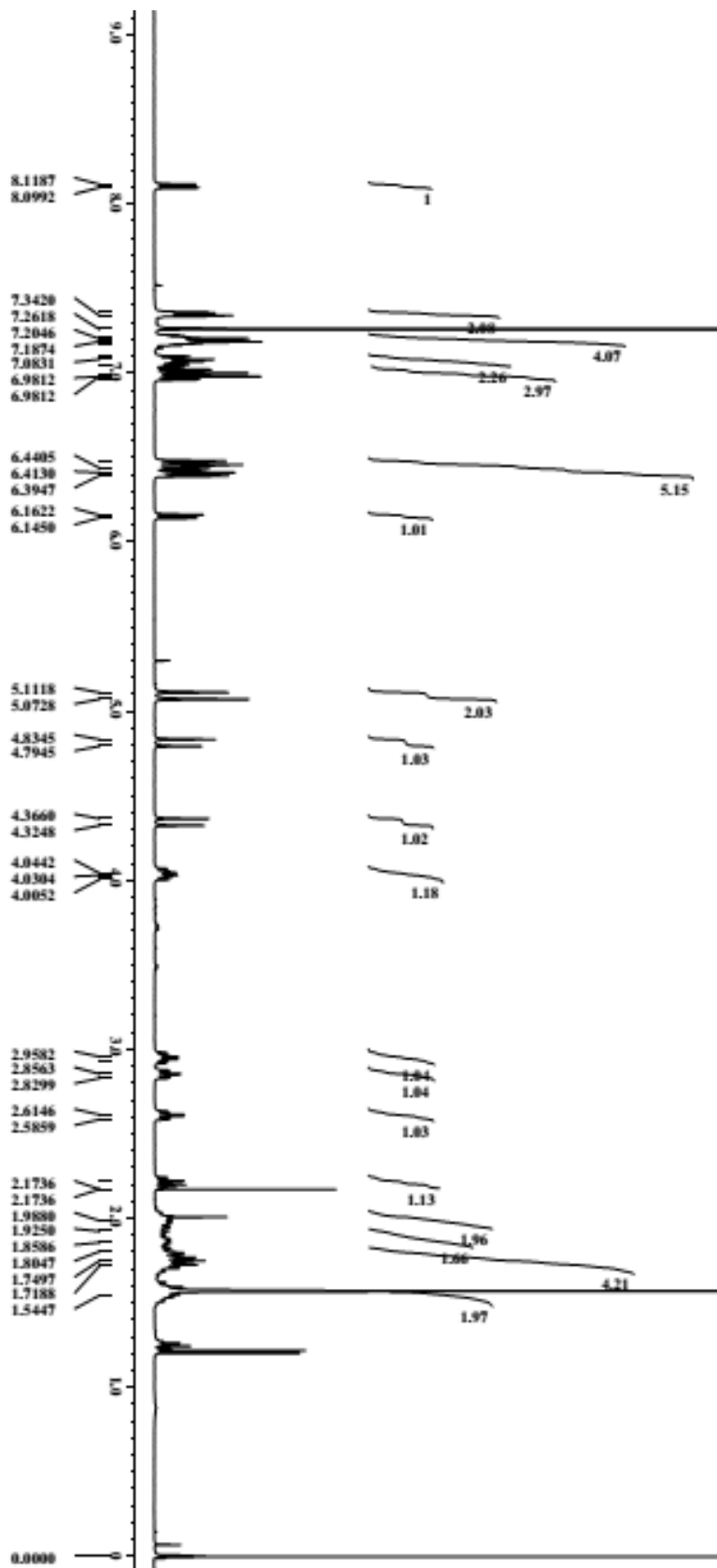
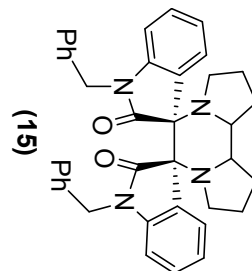


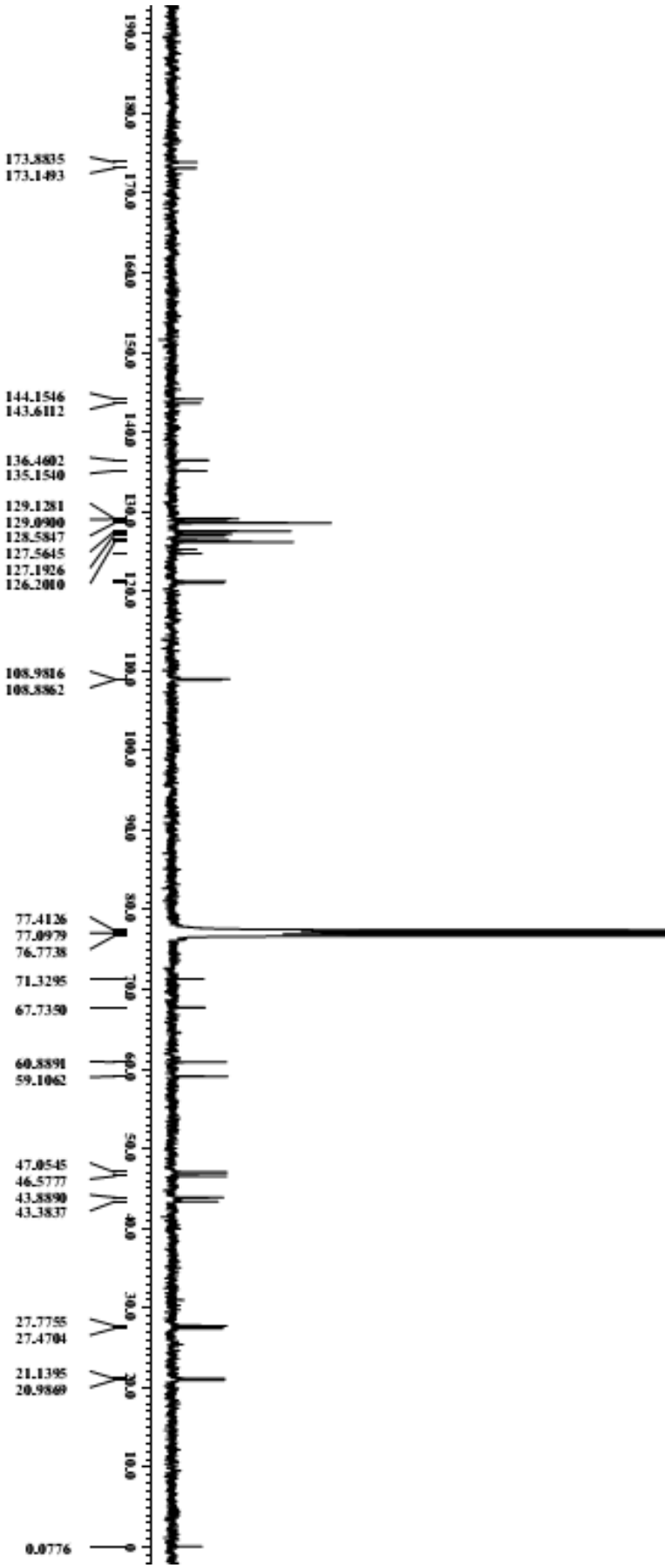
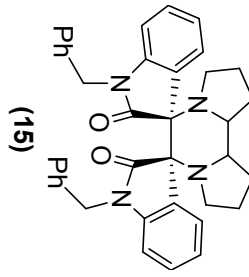


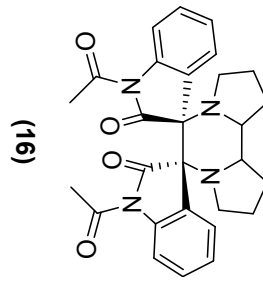
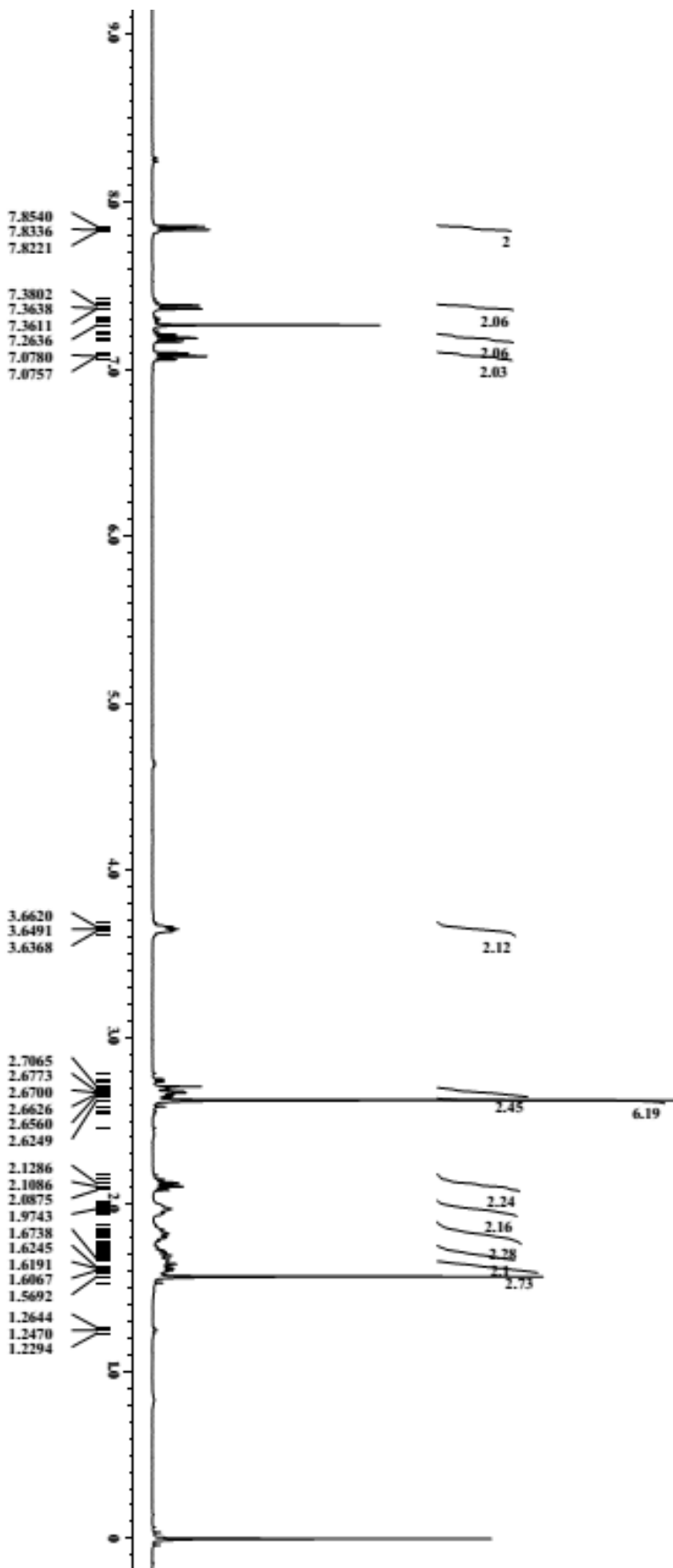


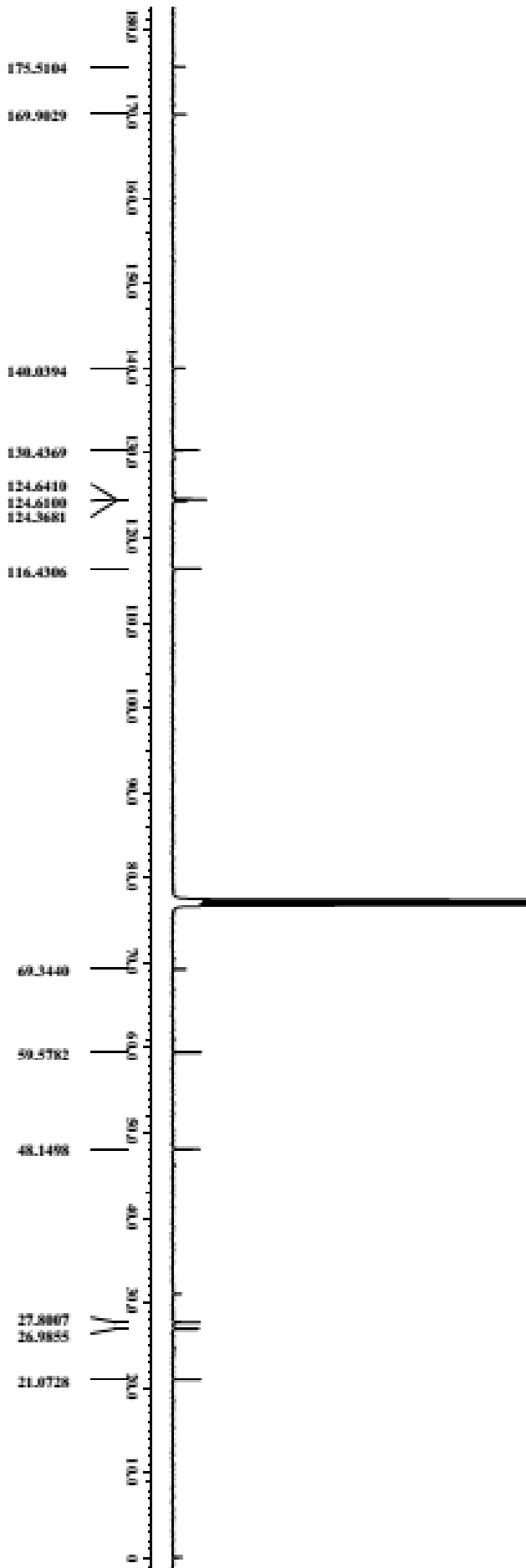
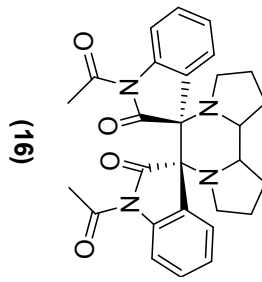


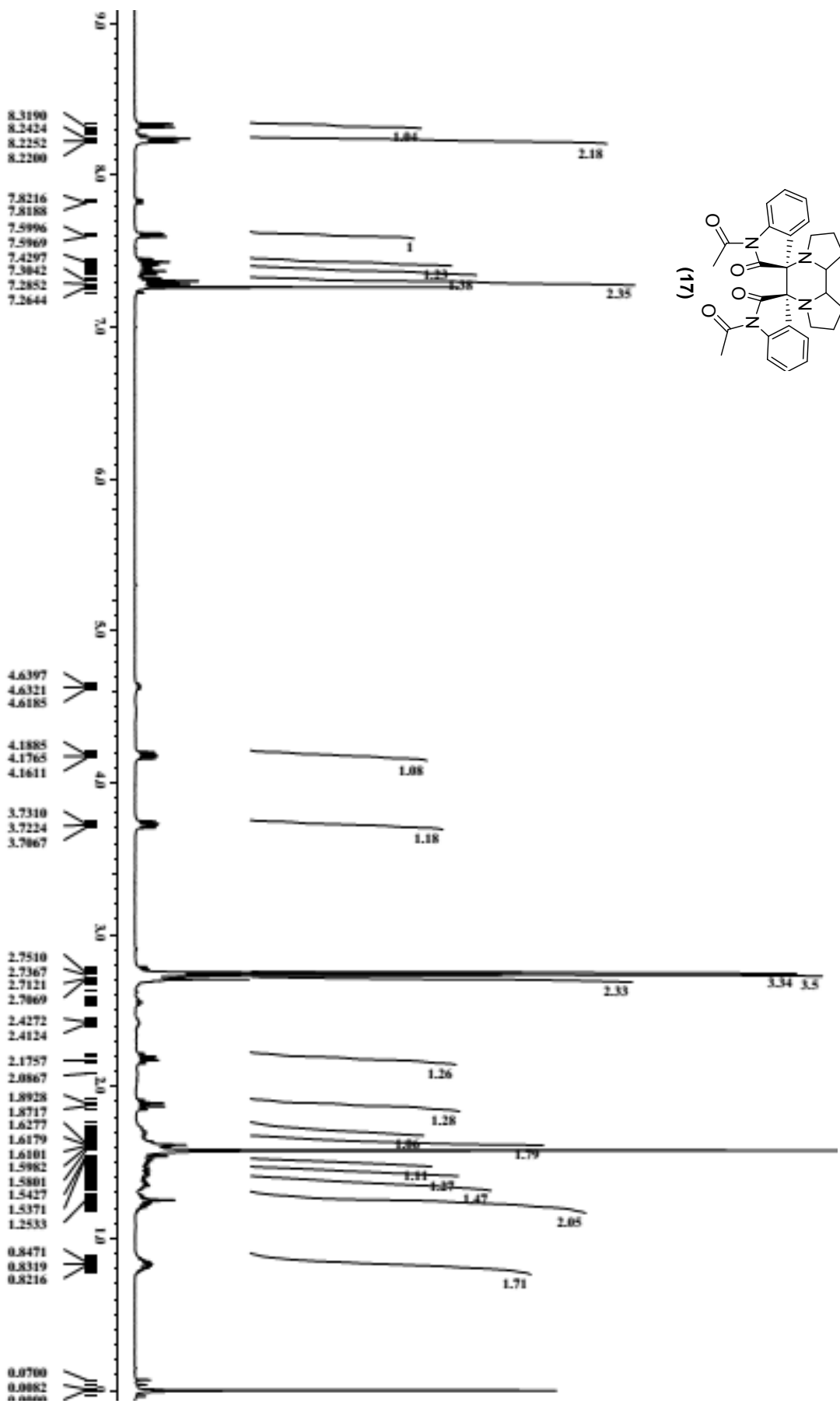


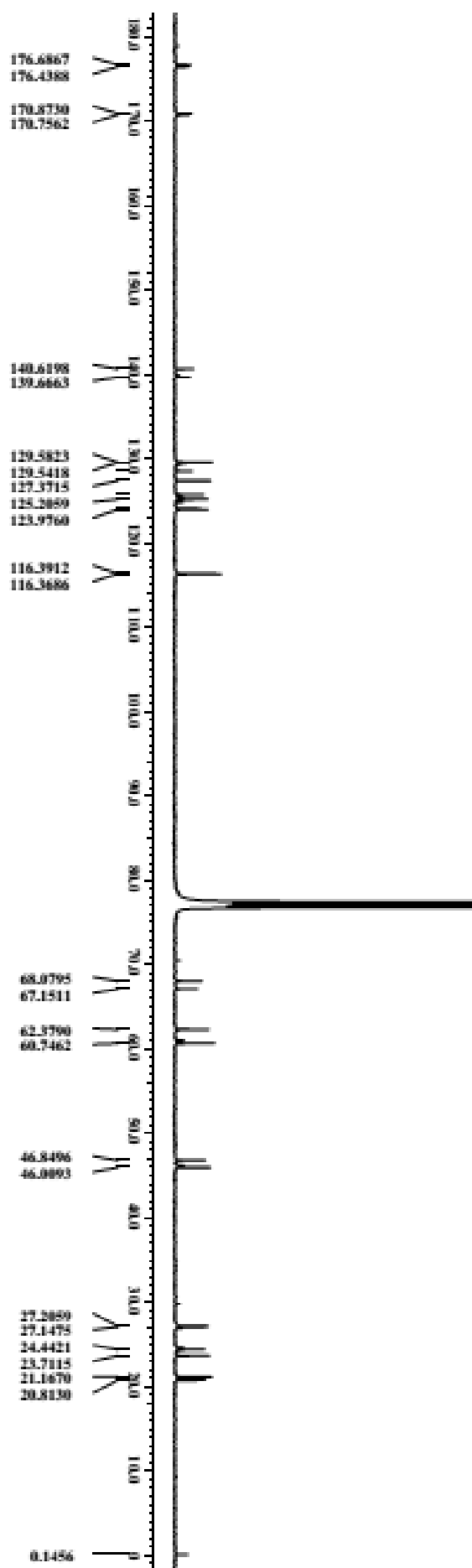
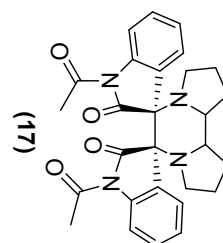


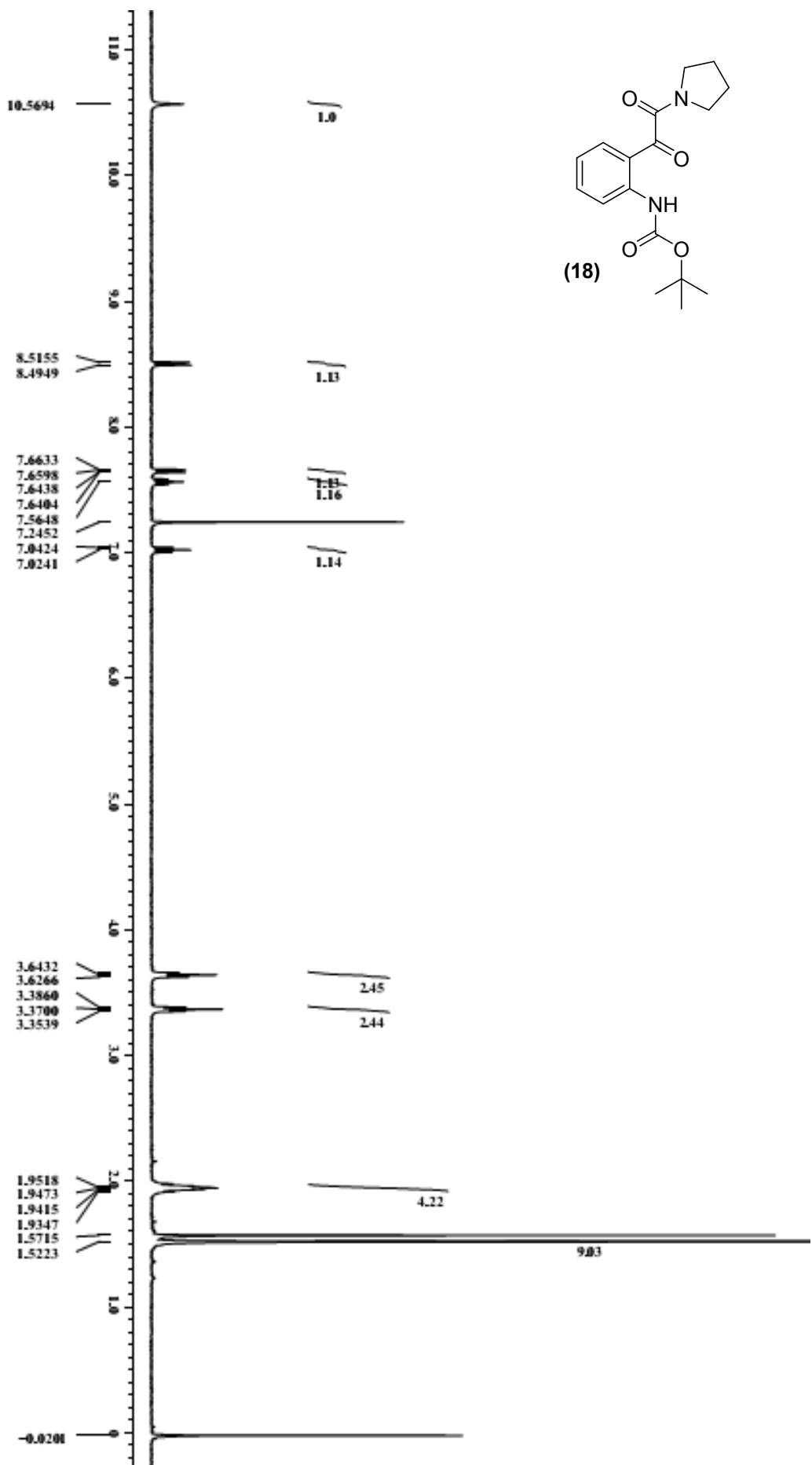


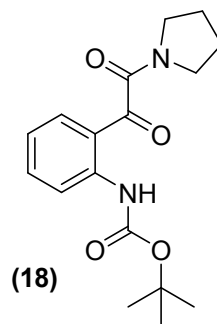
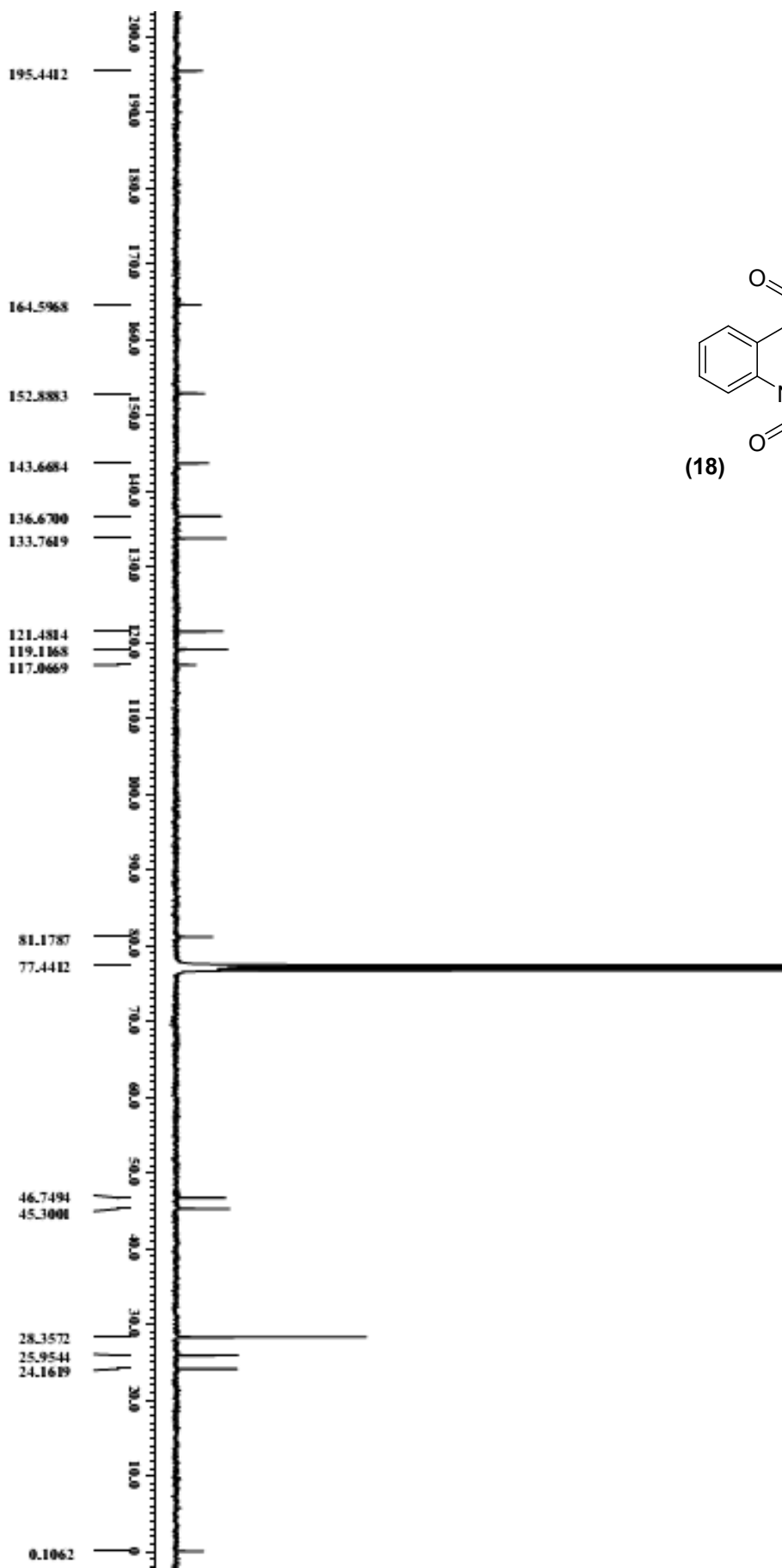








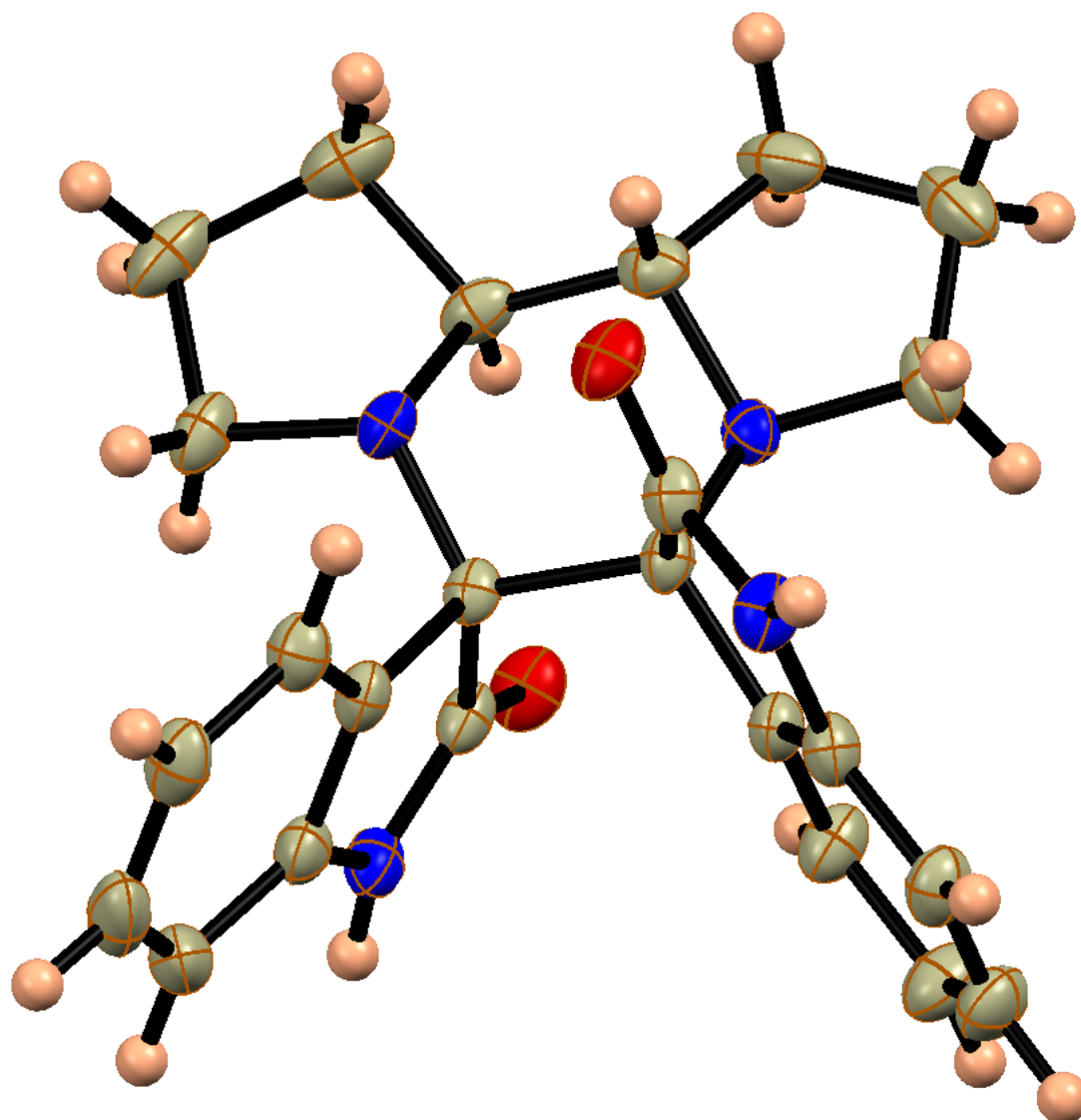




X-ray Crystallography

X-ray single crystal structural data of compounds **8**, **9** and **18** were collected on a Bruker D8 Venture PHOTON 100 CMOS diffractometer equipped with a INCOATEC micro-focus source 1 μ s with graphite monochromated Mo K α radiation ($\lambda = 0.71073$ Å) operating at 50 kV and 30 mA. The program SAINTⁱ was used for integration of diffraction profiles and absorption correction was made with SADABSⁱⁱ program. Both the structures were solved by SIR 92ⁱⁱⁱ and refined by full matrix least square method using SHELXL-97^{iv} and WinGX system, Ver 1.70.01.^v All the non hydrogen atoms were located from the difference Fourier map and refined anisotropically. Due to disordered guest molecules in **8** and **9**, the PLATON/SQUEEZE route was used to calculate the diffraction contribution from the guest molecules and thereby to generate a set of guest-free diffraction intensities.^{vi} All the hydrogen atoms except the ones on quaternary carbons and the nitrogen atoms were fixed by HFIX and placed in ideal positions and included in the refinement process using riding model with isotropic thermal parameters. All the crystallographic and structure refinement data of **8** and **9** are summarized in Table 1. Selected bond lengths and angles are given in Table 2. The crystallographic and structure refinement data of **18** is summarized in Table 3 and selected bond lengths and angles are given in Table 4.

ORTEP Diagram of (3R,7'S) -1,1'',2,2''-tetrahydrodispiro[indole-3,8'-[6,9]diazatricyclo[7.3.0.0^{2,6}]dodecane-7',3''-indole]-2,2''-dione (8).



ORTEP Diagram of (3*R*,7'*R*) -1,1'',2,2''-tetrahydrodispiro[indole-3,8'-[6,9]diazatricyclo[7.3.0.0^{2,6}]dodecane-7',3''-indole]-2,2''-dione (9).

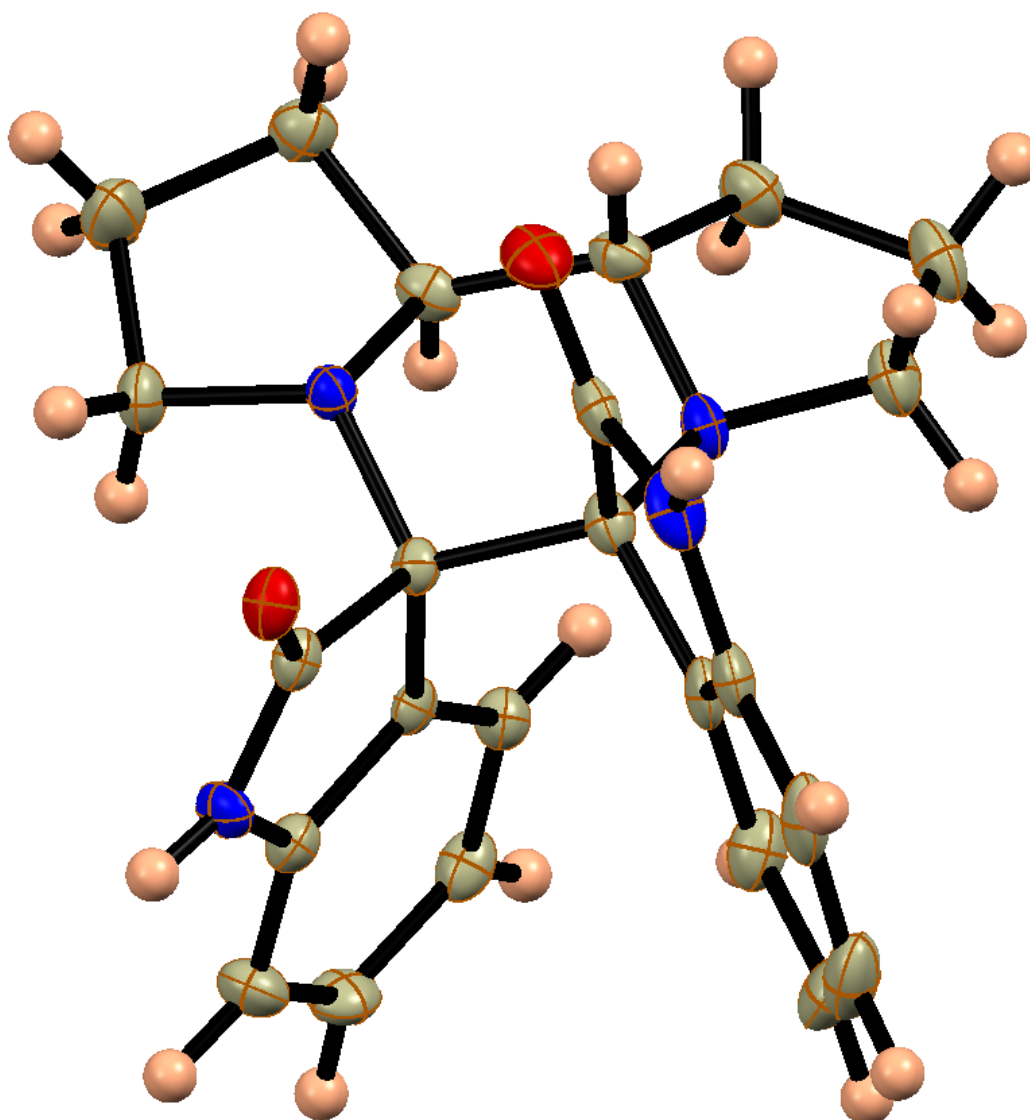


Table 1 : Crystal and structure refinement data for **8** and **9**

Parameters	8	9
Empirical formula	C ₂₄ H ₂₄ N ₄ O ₂	C ₂₄ H ₂₄ N ₄ O ₂
Formula Weight	400.47	400.47
Crystal system	Trigonal	Orthorhombic
Space group	R-3(No.148)	Pbcn(No.60)
a (Å)	32.703(2)	27.5591(13)
b (Å)	32.703(2)	9.5215(5)
c (Å)	20.7189(14)	15.8189(7)
α (°)	90	90
β (°)	90	90
γ (°)	120	90
V(Å ³)	19190(2)	4150.9(3)
Z	36	8
D _c (g cm ⁻³)	1.247	1.282

$\mu(\text{mm}^{-1})$	0.081	0.084
F(000)	7632	1696
T(K)	100	100
$\lambda(\text{Mo K}\alpha)(\text{\AA})$	0.71073	0.71073
Crystal size(mm)	0.28 x 0.32 x 0.40	0.29 x 0.32 x 0.34
$\Theta_{\min}(\text{\textcircled{C}})$	2.4	2.3
$\Theta_{\max}(\text{\textcircled{C}})$	28.4	25.0
Total data	139193	18774
Unique data	10651	3635
R_{int}	0.053	0.059
Data[$I > 2\sigma(I)$]	8959	2790
R^a	0.0542	0.0561
R_w^b	0.2133	0.1671
S	0.90	1.05

Table 2 : Selected bond lengths (\AA) and angles ($\text{\textcircled{C}}$) in **8** and **9**

Compound 8				Compound 9			
O1-C16	1.222(2)	C1-C2	1.532(3)	O1-C16	1.219(3)	C13-C14	1.391(3)
O2-C24	1.221(2)	C2-C3	1.526(3)	O2-C24	1.218(3)	C14-C15	1.373(3)
O3-C16A	1.2232(18)	C3-C4	1.518(3)	N1-C1	1.469(3)	C17-C18	1.521(3)
O4-C24A	1.2293(18)	C4-C5	1.503(2)	N1-C4	1.471(3)	C17-C24	1.575(3)
N1-C4	1.476(2)	C5-C6	1.522(3)	N1-C9	1.470(3)	C18-C23	1.401(3)
N1-C1	1.474(2)	C6-C7	1.530(3)	N2-C5	1.468(3)	C18-C19	1.381(3)
N1-C9	1.458(2)	C7-C8	1.537(3)	N2-C8	1.464(3)	C19-C20	1.390(4)
N2-C8	1.468(2)	C9-C17	1.572(2)	N2-C17	1.461(3)	C20-C21	1.390(4)
N2-C5	1.469(2)	C9-C16	1.561(2)	N3-C23	1.400(3)	C21-C22	1.378(4)
N2-C17	1.455(2)	C9-C10	1.530(2)	N3-C24	1.356(3)	C22-C23	1.380(4)
N3-C16	1.351(2)	C10-C15	1.391(2)	N4-C15	1.407(3)	C1-H1A	0.9700
N3-C15	1.406(3)	C10-C11	1.383(3)	N4-C16	1.343(3)	C1-H1B	0.9700
N4-C23	1.404(3)	C11-C12	1.392(3)	N3-H3	0.8600	C2-H2A	0.9700
N4-C24	1.351(2)	C12-C13	1.380(2)	N4-H4	0.79(3)	C2-H2B	0.9700
N3-H3	0.93(3)	C13-C14	1.390(3)	C1-C2	1.527(4)	C3-H3A	0.9700
N4-H4B	0.91(2)	C14-C15	1.384(3)	C2-C3	1.537(4)	C3-H3B	0.9700
N5-C1A	1.462(3)	C17-C18	1.530(2)	C3-C4	1.523(3)	C4-H4A	0.9800
N5-C4A	1.480(2)	C17-C24	1.566(2)	C4-C5	1.509(3)	C5-H5	0.96(3)
N5-C9A	1.445(2)	C18-C23	1.390(2)	C5-C6	1.525(3)	C6-H6A	0.9700
N6-C8A	1.466(3)	C18-C19	1.385(3)	C6-C7	1.547(4)	C6-H6B	0.9700
N6-C17A	1.4522(19)	C19-C20	1.390(3)	C7-C8	1.526(4)	C7-H7A	0.9700
N6-C5A	1.476(2)	C20-C21	1.392(3)	C9-C16	1.548(3)	C7-H7B	0.9700
N7-C15A	1.4018(19)	C21-C22	1.385(3)	C9-C10	1.525(3)	C8-H8A	0.9700
N7-C16A	1.349(2)	C22-C23	1.385(2)	C9-C17	1.566(3)	C8-H8B	0.9700
N8-C24A	1.347(2)	C1-H1B	0.9700	C10-C11	1.387(3)	C11-H11	0.9300
N8-C23A	1.4055(19)	C1-H1A	0.9700	C10-C15	1.396(3)	C12-H12	0.9300
N7-H7	0.92(3)	C2-H2A	0.9700	C11-C12	1.389(3)	C13-H13	0.9300
N8-H8	0.89(2)	C2-H2B	0.9700	C12-C13	1.376(3)	C14-H14	0.9300
C1-N1-C4	105.86(13)	C3-C4-C5	118.04(15)	C1-N1-C4	105.29(17)	N1-C9-C16	107.71(16)
C1-N1-C9	116.29(13)	N1-C4-C5	107.82(14)	C1-N1-C9	117.16(16)	C10-C9-C16	101.45(16)
C4-N1-C9	115.51(14)	N2-C5-C4	107.22(13)	C4-N1-C9	113.53(17)	C9-C10-C11	133.28(19)
C5-N2-C8	106.87(12)	C4-C5-C6	117.09(16)	C5-N2-C8	104.19(18)	C11-C10-C15	118.59(19)
C5-N2-C17	115.64(14)	N2-C5-C6	101.34(16)	C5-N2-C17	115.20(17)	C9-C10-C15	108.12(18)
C8-N2-C17	116.44(13)	C5-C6-C7	103.74(16)	C8-N2-C17	117.73(18)	C10-C11-C12	119.0(2)
C15-N3-C16	112.01(14)	C6-C7-C8	105.59(16)	C23-N3-C24	112.5(2)	C11-C12-C13	121.0(2)
C23-N4-C24	111.75(15)	N2-C8-C7	104.18(15)	C15-N4-C16	112.0(2)	C12-C13-C14	121.2(2)
C15-N3-H3	121(2)	N1-C9-C10	110.72(14)	C23-N3-H3	124.00	C13-C14-C15	117.1(2)
C16-N3-H3	126.7(19)	C16-C9-C17	109.75(14)	C24-N3-H3	124.00	N4-C15-C14	127.3(2)
C24-N4-H4B	124.4(14)	N1-C9-C16	111.48(13)	C16-N4-H4	127(2)	C10-C15-C14	123.2(2)
C23-N4-H4B	123.6(14)	C10-C9-C16	101.00(12)	C15-N4-H4	121(2)	N4-C15-C10	109.58(18)
C4A-N5-C9A	114.87(14)	C10-C9-C17	113.36(12)	N1-C1-C2	103.81(18)	O1-C16-N4	126.3(2)
C1A-N5-C4A	105.49(14)	N1-C9-C17	110.24(12)	C1-C2-C3	105.7(2)	O1-C16-C9	125.38(19)
C1A-N5-C9A	116.10(13)	C9-C10-C11	131.77(14)	C2-C3-C4	103.00(18)	N4-C16-C9	108.31(18)
C8A-N6-C17A	115.87(14)	C9-C10-C15	108.78(15)	N1-C4-C3	100.95(17)	N2-C17-C18	114.12(17)
C5A-N6-C8A	105.44(15)	C11-C10-C15	119.31(16)	N1-C4-C5	109.25(18)	N2-C17-C24	113.10(17)
C5A-N6-C17A	114.97(14)	C10-C11-C12	118.81(16)	C3-C4-C5	118.02(17)	C9-C17-C18	111.19(16)
C15A-N7-C16A	112.03(13)	C11-C12-C13	120.8(2)	C4-C5-C6	116.2(2)	N2-C17-C9	105.95(17)
C23A-N8-C24A	112.22(12)	C12-C13-C14	121.41(19)	N2-C5-C4	109.84(17)	C9-C17-C24	110.97(17)

C16A-N7-H7	120.5(16)	C13-C14-C15	116.86(16)	N2 -C5-C6	101.16(18)	C18-C17-C24	101.66(18)
C15A-N7-H7	127.5(16)	C10-C15-C14	122.79(17)	C5 -C6-C7	103.6(2)	C19-C18-C23	118.9(2)
C23A-N8-H8	120.6(16)	N3-C15-C14	127.31(15)	C6 -C7-C8	105.13(19)	C17-C18-C19	132.7(2)
C24A-N8-H8	127.0(15)	N3-C15-C10	109.87(14)	N2-C8-C7	102.63(18)	C17-C18 -C23	108.38(19)
N1-C1-C2	104.07(16)	O1-C16-C9	126.07(13)	C10-C9-C17	114.40(17)	C18-C19-C20	119.4(2)
C1-C2-C3	106.04(15)	O1-C16-N3	125.51(15)	C16-C9-C17	111.52(17)	C19-C20-C21	120.3(3)
C2-C3-C4	102.55(17)	N3-C16-C9	108.34(15)	N1-C9-C17	107.15(16)	C20-C21-C22	121.3(3)
N1-C4-C3	101.24(17)	C9-C17-C18	114.57(12)	N1-C9-C10	114.41(17)	C21-C22-C23	117.6(2)

ORTEP Diagram of tert-butyl 2-(2-oxo-2-(pyrrolidin-1-yl)acetyl)phenylcarbamate (18).

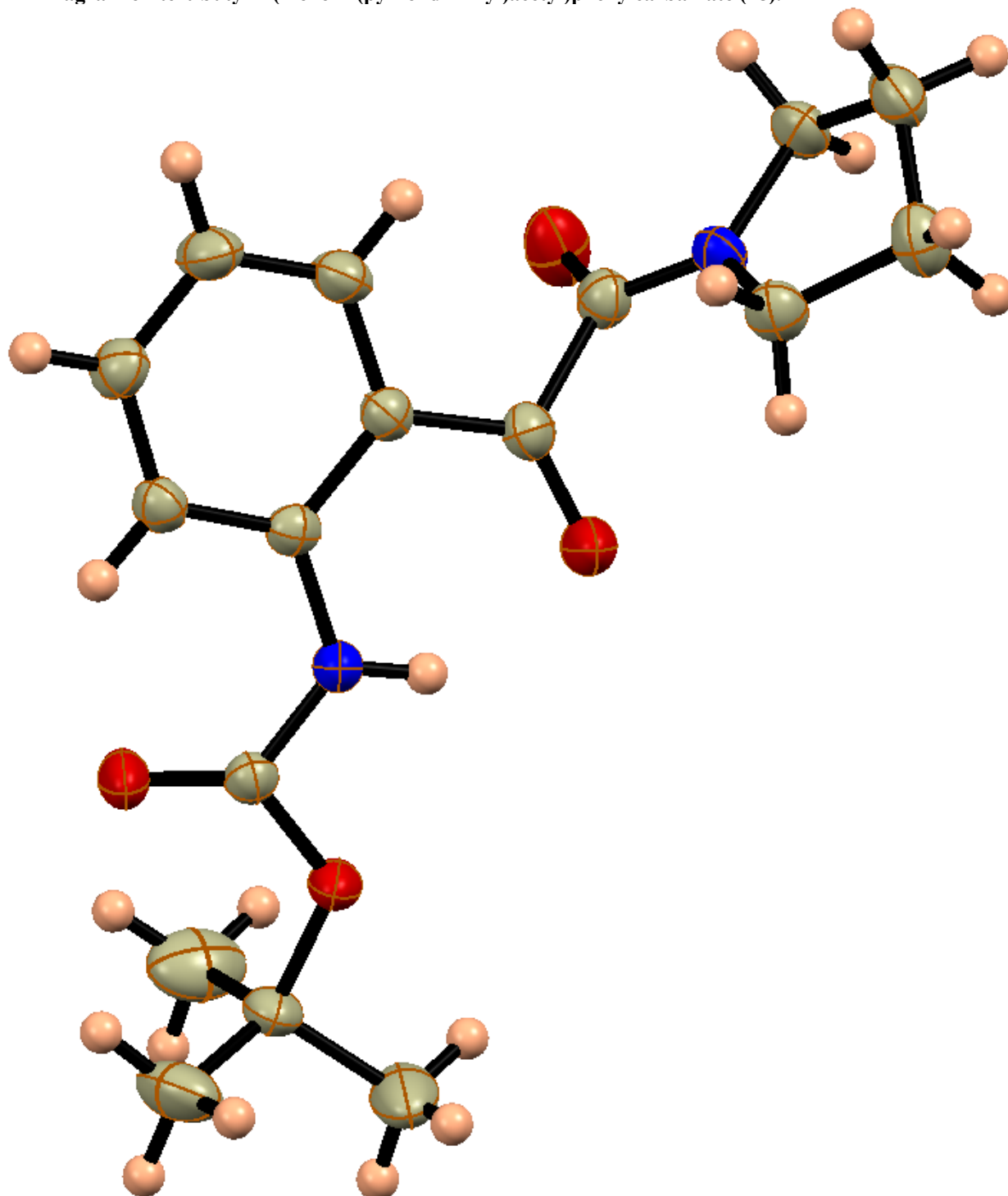


Table 3 : Crystal and structure refinement data for **18**.

Parameters	18
Empirical formula	C ₁₇ H ₂₂ N ₂ O ₄
Formula Weight	318.37
Crystal system	Monoclinic
Space group	C2/c
a (Å)	32.0681(13)
b (Å)	11.0308(4)
c (Å)	9.7494(3)
α (°)	90
β (°)	104.548(2)
γ (°)	90
V(A ³)	3338.2(2)
Z	8
D _c (g cm ⁻³)	1.267
μ(mm ⁻¹)	0.091
F(000)	1360
T(K)	293
λ(Mo K _α)(Å)	0.71073
Crystal size(mm)	0.00 x 0.00 x 0.00
Θ _{min} (°)	2.6
Θ _{max} (°)	24.0
Total data	28888
Unique data	2625
R _{int}	0.029
Data[I>2σ(I)]	2334
R ^a	0.0319
R _w ^b	0.0853
S	1.08

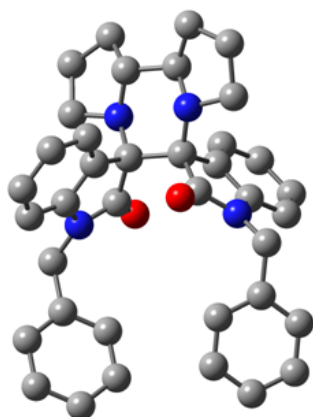
Table 4 : Selected bond lengths (Å) and angles (°) in **18**.

Compound 18			
O1-C13	1.1982(17)	C14-C17	
1.502(2)			
O2-C13	1.3390(16)	C14-C15	1.510(3)
O2-C14	1.4803(17)	C3-H3	0.9300
O3-C7	1.2275(18)	C4-H4	0.9300
O4-C8	1.2277(18)	C5-H5	0.9300
N1-C13	1.3740(18)	C9-H9A	0.9700
N2 -C8	1.3258(18)	C9-H9B	0.9700
N2 -C9	1.4721(18)	C10-H10A	0.9700
N2 -C12	1.4684(19)	C10-H10B	0.9700
N1 -H1A	0.86(2)	C11-H11A	0.9700
C1 -C6	1.401(2)	C11-H11B	0.9700
C1 -C7	1.4644(19)	C12-H12A	0.9700
C1 -C2	1.4132(19)	C12-H12B	0.9700
C2-C3	1.3894(19)	C15-H15A	0.9600
C3-C4	1.378(2)	C15-H15B	0.9600
C4-C5	1.382(2)	C15 -H15C	0.9600
C5-C6	1.369(2)	C16-H16A	0.9600
C7-C8	1.530(2)	C16-H16B	0.9600
C9-C10	1.517(2)	C16-H16C	0.9600
C10-C11	1.519(2)	C17-H17A	0.9600
C11-C12	1.516(2)	C17-H17B	0.9600
C14-C16	1.502(2)	C17-H17C	0.9600
C13-O2-C14	120.42(11)	O1-C13-O2	126.60(13)
C2-N1-C13	126.25(12)	O2-C13-N1	107.54(11)
C8-N2-C9	126.41(12)	O2-C14-C16	110.34(12)
C8-N2-C12	121.20(12)	O2-C14-C17	109.33(12)
C9-N2-C12	112.24(12)	C15-C14-C17	110.63(15)
C13-N1-H1A	116.7(11)	C1-C14-C17	113.20(15)

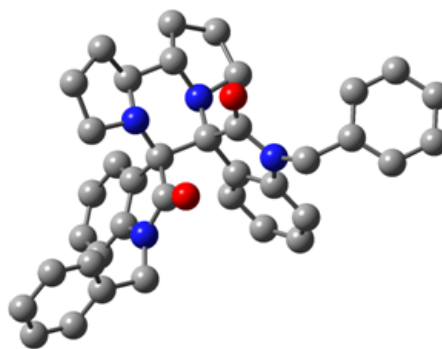
C2-N1-H1A	115.1(11)	C15-C14-C16	110.98(15)
C6-C1-C7	118.64(13)	O2-C14-C15	101.76(13)
C2-C1-C7	122.54(12)	C2-C3-H3	120.00
C2-C1-C6	118.82(13)	C4-C3-H3	120.00
N1-C2-C1	118.80(12)	C3-C4-H4	119.00
N1-C2-C3	122.17(12)	C5-C4-H4	119.00
C1-C2-C3	119.04(12)	C4-C5-H5	121.00
C2-C3-C4	120.37(13)	C6-C5-H5	120.00
C3-C4-C5	121.24(15)	C1-C6-H6	119.00
C4-C5-C6	119.10(14)	C5-C6-H6	119.00
C1-C6-C5	121.44(14)	N2-C9-H9A	111.00
O3-C7-C1	124.74(13)	N2-C9-H9B	111.00
O3-C7-C8	116.91(12)	C10-C9-H9A	111.00
C1-C7-C8	118.13(12)	C10-C9-H9B	111.00
O4-C8-N2	124.92(13)	H9A-C9-H9B	109.00
N2-C8-C7	117.60(12)	C9-C10-H10A	111.00
O4-C8-C7	117.32(13)	C9-C10-H10B	111.00
N2-C9-C10	102.49(12)	C11-C10-H10A	111.00
C9-C10-C11	103.72(13)	C11-C10-H10B	111.00
C10-C11-C12	103.68(13)	H10A-C10-H10B	109.00
N2-C12-C11	103.32(12)	C10-C11-H11A	111.00
O1-C13-N1	125.86(13)	C10-C11-H11B	111.00
C12-C11-H11A	111.00	H15B-C15-H15C	109.00
C12-C11-H11B	111.00	C14-C16-H16A	109.00
H11A-C11-H11B	109.00	C14-C16-H16B	110.00
N2-C12-H12A	111.00	C14-C16-H16C	109.00
N2-C12-H12B	111.00	H16A-C16-H16B	110.00
C11-C12-H12A	111.00	H16A-C16-H16C	109.00
C11-C12-H12B	111.00	H16B-C16-H16C	109.00
H12A-C12-H12B	109.00	C14-C17-H17A	109.00
C14-C15-H15A	109.00	C14-C17-H17B	109.00
C14-C15-H15B	110.00	C14-C17-H17C	109.00
C14-C15-H15C	110.00	H17A-C17-H17B	109.00
H15A-C15-H15B	109.00	H17A-C17-H17C	110.00
H15A-C15-H15C	109.00	H17B-C17-H17C	109.00

Computational Data

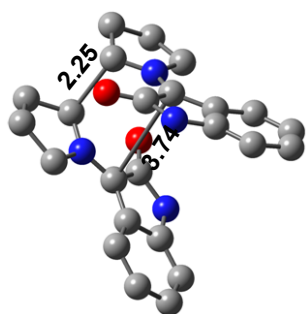
The geometries listed below were optimized at the B3LYP/6-31G(d,p) level in the gas phase. Cartesian coordinates of all optimized geometries with their corresponding Codes (as in text). Cartesian coordinates of all Reactants and Products.



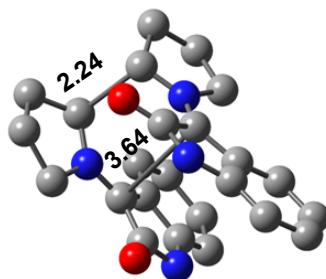
14



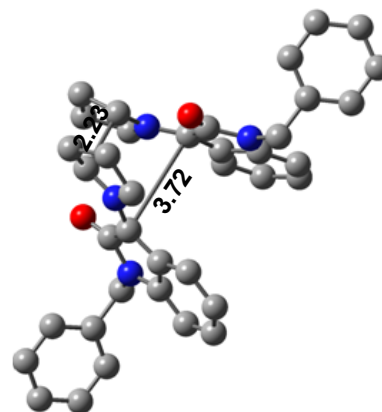
15



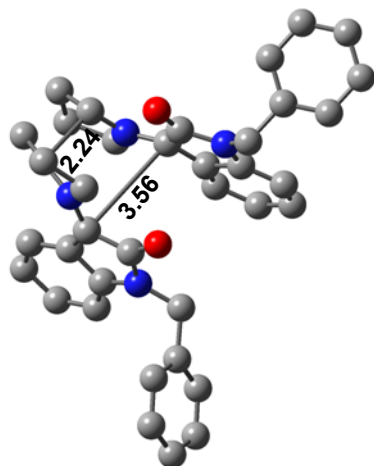
23 (TS)



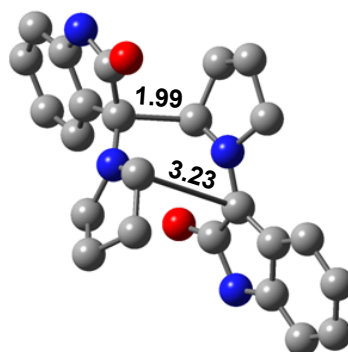
24 (TS)



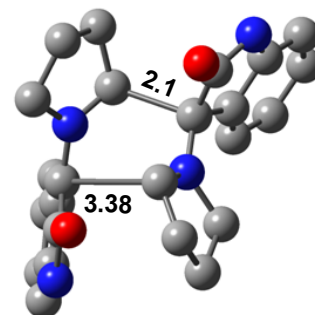
27 (TS)



28 (TS)

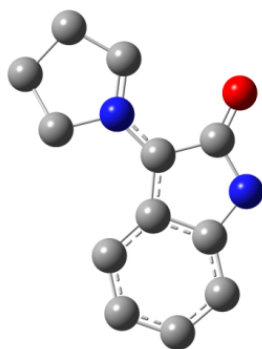


25 (TS)



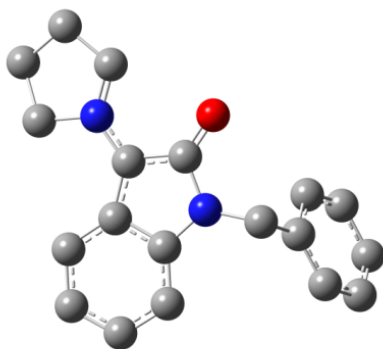
26 (TS)

AMY of R = H



C	-3.37099800	0.36368300	0.04867800
C	-2.01911100	0.67805300	0.03399900
C	-0.99882500	-0.32203400	-0.01867200
C	-1.40476900	-1.66481000	-0.07474300
C	-2.76606200	-1.98295100	-0.05854000
C	-3.74154200	-0.98484500	0.00558600
H	-4.12076200	1.14872700	0.09048400
H	-0.68320100	-2.47086000	-0.14187300
H	-3.06520100	-3.02613500	-0.10069500
H	-4.79358400	-1.25254200	0.01694000
C	0.25068100	0.40302700	-0.02246300
C	-0.02200200	1.82759200	0.01193700
O	0.75927500	2.78913000	0.01337800
C	1.83660700	-1.52018000	-0.01867900
C	2.66031600	0.64914600	-0.09046400
C	3.34211700	-1.59834700	0.27287600
H	1.56042500	-1.93061100	-0.99487600
H	1.21914300	-1.99375500	0.74455900
C	3.88153000	-0.20815300	-0.13481900
H	3.50415400	-1.76314900	1.34162600
H	3.81871400	-2.41889500	-0.26744300
H	4.66964200	0.15167000	0.53599900
H	4.31891000	-0.21823200	-1.14552900
N	1.54477400	-0.05908200	-0.03676300
H	2.58555400	1.72724100	-0.13491700
N	-1.41462200	1.92704100	0.05626700
H	-1.88669500	2.81669300	0.08399300

AMY of R = Bn



C	0.98983700	2.49478400	-0.36528000
C	0.21489200	1.34485800	-0.44783400
C	-1.14981400	1.31312000	-0.02316300

C	-1.71244900	2.50113100	0.46709100
C	-0.93397200	3.65980600	0.54609900
C	0.40229100	3.65990400	0.14007900
H	2.02966700	2.48616200	-0.67398300
H	-2.74946200	2.54832200	0.77935000
H	-1.38118100	4.57207200	0.92986400
H	0.99281300	4.56785800	0.21471600
C	-1.59508800	-0.03891600	-0.26455600
C	-0.50822200	-0.79610300	-0.84447400
O	-0.46470000	-1.98815300	-1.19590200
C	-3.91146000	0.12481800	0.64166900
C	-3.18093800	-1.87174400	-0.29066300
C	-4.93391500	-0.95432600	1.02579700
H	-4.29442700	0.84825100	-0.08469200
H	-3.50954000	0.66964100	1.49584300
C	-4.59441200	-2.14674800	0.10267200
H	-4.79503600	-1.24033000	2.07199400
H	-5.96055300	-0.60089700	0.90985600
H	-4.70783500	-3.11412200	0.60457100
H	-5.24962200	-2.18080300	-0.78191000
N	-2.80658600	-0.63540500	-0.00835900
H	-2.47721300	-2.52355600	-0.79014600
N	0.57100800	0.09119600	-0.93657500
C	1.85041200	-0.29712000	-1.50829800
H	1.63763200	-1.18124900	-2.11721400
C	2.91969100	-0.62517900	-0.48045500
C	4.11777400	0.09267000	-0.42951500
C	2.72024500	-1.67899600	0.42276200
C	5.10187000	-0.22764600	0.50905800
H	4.28631000	0.90675000	-1.13096300
C	3.69928000	-1.99795900	1.36137700
H	1.79558500	-2.24739600	0.37356900
C	4.89316200	-1.27232100	1.40825100
H	6.02722200	0.34076700	0.53764400
H	3.53456200	-2.81769000	2.05512800
H	5.65562400	-1.52289500	2.14022200
H	2.19700200	0.49960300	-2.17578400

Trans (8)

C	3.84541400	-2.06345900	0.12965900
C	2.57377300	-1.61948900	0.46826100
C	1.97674000	-0.49714100	-0.12642500
C	2.67113000	0.17810500	-1.12420600
C	3.95833700	-0.24767400	-1.47899100
C	4.53925100	-1.35118700	-0.85477700
H	4.28249300	-2.93653200	0.60496200
H	2.20012100	0.99630400	-1.65279800
H	4.50028200	0.27898000	-2.25835400
H	5.53606400	-1.67351500	-1.14118200
C	0.59997400	-0.26945800	0.51424400
C	0.51169200	-1.47779700	1.51607000
O	-0.38718500	-1.74082000	2.28961300
C	-0.59973800	-0.26967000	-0.51421900
C	0.54293000	2.21573500	0.53219700
H	1.52481000	2.31058600	0.03439500
C	-0.54318000	2.21557200	-0.53258800
H	-1.52510600	2.31042200	-0.03487900
C	-1.97648000	-0.49753100	0.12650700
C	-0.51123100	-1.47811200	-1.51586600
C	-2.57329500	-1.62004800	-0.46805600
O	0.38769000	-1.74104100	-2.28939200
N	-1.68799900	-2.18220500	-1.39801000

H	-1.87476700	-2.99163400	-1.97110800
N	-0.46414200	0.96570000	-1.30267500
N	0.46408300	0.96601200	1.30246800
C	-3.84488200	-2.06418400	-0.12945800
H	-4.28178700	-2.93741600	-0.60463000
C	-2.67103600	0.17775000	1.12415200
H	-2.20018200	0.99609500	1.65265700
C	-3.95820100	-0.24817600	1.47891200
H	-4.50027900	0.27851100	2.25816200
C	-4.53889900	-1.35187300	0.85482100
H	-5.53567200	-1.67433000	1.14122000
C	-0.43912300	3.28457100	-1.63178700
H	-0.94774800	4.20910500	-1.34503400
H	0.61184600	3.52939600	-1.81731700
C	-1.35269700	1.15358300	-2.45516400
H	-2.41440300	1.03222200	-2.17955000
H	-1.11733300	0.42909000	-3.23911900
C	-1.07252500	2.61210100	-2.88311300
H	-0.38062000	2.64260000	-3.72860400
H	-1.99315100	3.11097000	-3.19742000
C	0.43878900	3.28512300	1.63112700
H	0.94859800	4.20904600	1.34450900
H	-0.61209000	3.53111100	1.81560300
C	1.07045100	2.61251600	2.88326600
H	1.99010700	3.11186300	3.19962400
H	0.37687300	2.64189800	3.72742000
C	1.35225600	1.15440200	2.45513000
H	1.11742300	0.42958900	3.23893300
H	2.41414300	1.03418500	2.17968500
N	1.68864100	-2.18161400	1.39838800
H	1.87556700	-2.99086500	1.97168800

Cis (9)

C	-1.92887600	-1.56817800	0.73527700
H	-2.06059300	-2.31289300	-0.06217800
N	-1.78130700	0.28611700	-0.83894300
N	-0.48658600	-1.35134000	0.99974200
C	-0.36782200	0.52801400	-0.56141300
C	-0.37759200	1.84182900	1.77407400
C	-0.03239600	3.04342000	2.41136100
C	0.60290700	4.06392200	1.70369200
C	0.91454200	3.91003900	0.34793000
H	-0.82932600	1.03375700	2.33540300
H	-0.25756500	3.17541600	3.46511100
H	0.86615000	4.98937200	2.20733500
H	1.41873000	4.69749500	-0.20420300
C	2.46371800	-0.06311900	1.16665400
C	3.86522400	-0.10249500	1.18940200
C	4.56772400	-0.79666800	0.20385500
C	3.89456600	-1.48025900	-0.81452800
H	1.92033300	0.47220200	1.93574200
H	4.40423700	0.41001000	1.97993400
H	5.65345700	-0.81746700	0.22799300
H	4.43903800	-2.03522000	-1.57231700
C	-2.41518400	-2.14469100	2.07276200
C	-0.03405600	-2.58983500	1.64591700
C	-1.18172400	-2.91220300	2.62963100
H	-2.70309800	-1.33511600	2.75238500
H	-3.28819300	-2.78929900	1.93915500
H	0.08272500	-3.41224400	0.91835400
H	0.92894000	-2.44024000	2.13984200
H	-1.35624300	-3.98996500	2.68587800

H	-0.93646100	-2.56994100	3.63868400
C	-3.96404400	-0.37225600	-0.35044500
C	-4.02591200	0.81177100	-1.35552200
C	-2.58326400	1.36943500	-1.41014100
H	-4.75203100	-0.32690700	0.40665600
H	-4.05707600	-1.32524600	-0.87958500
H	-4.34903300	0.46565600	-2.34020900
H	-4.72836900	1.58601700	-1.03465300
H	-2.25308900	1.58996700	-2.42940400
H	-2.51102700	2.29879800	-0.81763200
C	-2.56335300	-0.26695000	0.27196200
C	0.29723900	-1.86205900	-1.36121100
C	2.50424900	-1.43683700	-0.81630900
C	1.77844800	-0.71996300	0.15195200
O	-0.63961000	-2.43207700	-1.88112300
C	0.28521300	-0.85147300	-0.13945700
C	-0.08519700	1.67262600	0.42406800
C	0.56247300	2.71309300	-0.26352900
O	0.38671800	0.50402200	-2.94271700
N	1.62424200	-2.07961900	-1.68376500
N	0.77962800	2.33074000	-1.59227100
H	-2.60281500	0.43908600	1.12342000
H	1.88775800	-2.68567800	-2.44642000
H	1.26305800	2.87804400	-2.28893300
C	0.30508200	1.06743000	-1.86981100

Trans (14)

C	0.26832300	3.60963900	-1.52132500
C	-0.14321300	2.59297400	-0.66721000
C	-1.19076200	1.71647200	-0.99108200
C	-1.82735400	1.84957800	-2.21941200
C	-1.43520600	2.87470000	-3.09088500
C	-0.40356700	3.74505800	-2.74185700
H	1.09607100	4.26182400	-1.26611800
H	-2.58960400	1.13849600	-2.51018700
H	-1.92896000	2.97922800	-4.05204800
H	-0.10182300	4.53042300	-3.42878500
C	-1.42084500	0.76532600	0.18647600
C	-0.25480500	1.17839000	1.14959600
O	0.00569700	0.70725400	2.24260800
C	-1.41987100	-0.76550800	-0.18638700
C	-3.91230400	0.72705800	0.21411000
H	-3.99556900	1.36080200	-0.68763200
C	-3.91151000	-0.72999800	-0.21454400
H	-3.99468700	-1.36386800	0.68713300
C	-1.18877700	-1.71649600	0.99109400
C	-0.25327200	-1.17715300	-1.14949300
C	-0.14063000	-2.59215600	0.66691100
O	0.00708900	-0.70534300	-2.24223800
N	0.39208500	-2.26330300	-0.59430700
N	-2.66688400	-1.01135500	-0.94368300
N	-2.66818000	1.00951900	0.94370000
C	0.27185000	-3.60861600	1.52082100
H	1.10011700	-4.26005900	1.26540000
C	-1.82510700	-1.85029300	2.21948500
H	-2.58789600	-1.13986300	2.51043100
C	-1.43202100	-2.87523700	3.09074700
H	-1.92554400	-2.98029100	4.05197100
C	-0.39975000	-3.74473700	2.74143500
H	-0.09728100	-4.52995800	3.42820900
C	-4.98879800	-1.15189100	-1.22519600
H	-5.90958000	-1.46633900	-0.72630300
H	-5.23735300	-0.30975400	-1.87931800

C	-2.85600200	-2.33231700	-1.55695000
H	-2.71291800	-3.14854600	-0.82872600
H	-2.14746400	-2.47655100	-2.37685100
C	-4.32404300	-2.29668800	-2.03953600
H	-4.37761500	-2.09001100	-3.11148100
H	-4.81302700	-3.25976100	-1.86993100
C	-4.99069800	1.14805600	1.22410900
H	-5.91052200	1.46385800	0.72431200
H	-5.24088000	0.30510100	1.87654700
C	-4.32647300	2.29122100	2.04128200
H	-4.81680800	3.25427900	1.87555600
H	-4.37842700	2.08081300	3.11258200
C	-2.85907400	2.33000100	1.55734800
H	-2.15012500	2.47544200	2.37664200
H	-2.71823200	3.14661600	0.82907800
N	0.38977000	2.26481200	0.59408700
C	1.32943300	-3.07653600	-1.36435500
H	1.07059400	-4.12917900	-1.20693200
H	1.13291700	-2.83005700	-2.41218200
C	2.79733800	-2.84789200	-1.05735700
C	3.59231200	-3.87990200	-0.54915600
C	3.38753800	-1.60746300	-1.33422800
C	4.95527200	-3.68187300	-0.31776100
H	3.14643300	-4.85028900	-0.34267700
C	4.74826100	-1.40891700	-1.10708900
H	2.77620400	-0.80600400	-1.73933900
C	5.53586800	-2.44537700	-0.59776500
H	5.56027900	-4.49311100	0.07686700
H	5.19333100	-0.44407400	-1.32906700
H	6.59706400	-2.29000100	-0.42529700
C	1.32700400	3.07867400	1.36363400
H	1.06821400	4.13115900	1.20524400
H	1.13028800	2.83314400	2.41166400
C	2.79497500	2.84979000	1.05708600
C	3.58980800	3.88114500	0.54733000
C	3.38536700	1.60989300	1.33593200
C	4.95282300	3.68300100	0.31636700
H	3.14377700	4.85113500	0.33932100
C	4.74614600	1.41123800	1.10922500
H	2.77411600	0.80895800	1.74219000
C	5.53361500	2.44704900	0.59837100
H	5.55772400	4.49373200	-0.07945900
H	5.19138800	0.44682300	1.33273200
H	6.59486300	2.29160600	0.42627900

Cis (15)

C	-0.95531200	3.08681200	-0.74355000
H	-1.54875600	2.72737400	-1.59580600
N	0.93935300	1.64098300	-1.26732600
N	-1.18156300	2.22074500	0.43747200
C	0.74025000	0.80237900	-0.08724500
C	1.74925600	2.25718800	1.91468600
C	2.72968100	2.29934000	2.91774500
C	3.59644600	1.22339500	3.10327600
C	3.50265600	0.07787500	2.30375500
H	1.04872200	3.07427200	1.79799400
H	2.81008700	3.17572600	3.55339900
H	4.35580200	1.26741600	3.87849600
H	4.18114100	-0.75522200	2.44688600
C	-0.81425500	0.07662100	2.80954700
C	-1.23671200	-0.90446100	3.71826100
C	-1.97446200	-2.00221100	3.27618800
C	-2.32272000	-2.14320900	1.92787700

H	-0.24473400	0.93126700	3.15430000
H	-0.98973400	-0.80439600	4.77051000
H	-2.29844000	-2.75660500	3.98741600
H	-2.92707200	-2.97852300	1.59381700
C	-1.50425900	4.43862200	-0.25996800
C	-2.55282700	2.52082700	0.86578400
C	-2.61864400	4.06004900	0.75854800
H	-0.71420700	5.01661900	0.23166200
H	-1.88183600	5.03900600	-1.09219700
H	-3.30209800	2.06109100	0.19720200
H	-2.73479100	2.14907600	1.87669300
H	-3.60896900	4.38924200	0.43281800
H	-2.42526700	4.52215800	1.73042400
C	0.86983700	3.60611400	-2.51919400
C	2.12846300	2.80056100	-2.94665500
C	2.26389400	1.67694000	-1.89094000
H	1.04787200	4.68467200	-2.48454500
H	0.04509300	3.42040300	-3.21352600
H	1.99807800	2.38355800	-3.94821500
H	3.02721700	3.42324200	-2.96654200
H	2.50531500	0.70649000	-2.33358500
H	3.05934700	1.92821400	-1.16758500
C	0.51215200	3.03884000	-1.13724200
C	-1.63130300	0.09248600	-0.87207300
C	-1.89866800	-1.15873000	1.03998200
C	-1.13326800	-0.05762400	1.46462700
O	-1.85511700	0.47959200	-2.00504800
C	-0.80658500	0.81805800	0.26097600
C	1.64623500	1.13152200	1.10426800
C	2.52170900	0.05322700	1.31861400
O	0.75224700	-1.37417900	-1.30365400
N	-2.16407500	-1.06553000	-0.33035900
N	2.22515800	-0.99195000	0.42618100
H	1.10891400	3.56825900	-0.36982200
C	1.19834100	-0.65109600	-0.42820000
C	2.85476700	-2.30935600	0.40066800
H	2.98548500	-2.64810900	1.43341800
H	2.12890600	-2.96832200	-0.08378700
C	-2.87329600	-2.04770600	-1.14035900
H	-2.49166500	-3.04347400	-0.89071800
H	-2.58800300	-1.82775300	-2.17289500
C	-4.38395700	-2.00726200	-0.99317700
C	-5.09546300	-3.13183100	-0.56492400
C	-5.09023900	-0.83908500	-1.31335400
C	-6.48715400	-3.09429400	-0.44875200
H	-4.55886300	-4.04725100	-0.32528800
C	-6.47799500	-0.79858300	-1.19479500
H	-4.54182700	0.03000300	-1.66582500
C	-7.18093900	-1.92599400	-0.76060500
H	-7.02553700	-3.97620300	-0.11349500
H	-7.01436300	0.11171700	-1.44744100
H	-8.26277300	-1.89293400	-0.66975000
C	4.17679900	-2.35017500	-0.34483100
C	5.37404600	-2.62139900	0.32394100
C	4.20628100	-2.13167600	-1.72982600
C	6.58492300	-2.66363300	-0.37115600
H	5.36124100	-2.80880800	1.39522700
C	5.41395300	-2.17003900	-2.42417500
H	3.27485800	-1.94382700	-2.25661200
C	6.60717400	-2.43415600	-1.74617800
H	7.50722800	-2.87500100	0.16216800
H	5.42437700	-2.00103700	-3.49709500
H	7.54726500	-2.46538100	-2.28913900

Trans (19)

C	-5.05235400	1.07207300	-0.90860700
C	-4.95872400	-0.06188500	-0.09161400
C	-3.68823000	-0.48452400	0.27716800
C	-2.52137000	0.17677800	-0.14448400
C	-2.63371000	1.31613400	-0.93543600
C	-3.90916600	1.75666800	-1.32117800
H	-6.03302000	1.42492600	-1.21410800
H	-5.84882700	-0.58490000	0.24518000
H	-1.74870500	1.87151100	-1.22544500
H	-4.00469100	2.64287400	-1.94066700
C	-1.30989000	-0.55724600	0.42824800
C	-1.97768900	-1.67879400	1.28139700
N	-3.34051200	-1.56327200	1.10685400
H	-3.99239600	-2.17916100	1.57008500
O	-1.41136700	-2.50415700	1.97171700
N	-0.41398900	-1.20554500	-0.54069900
C	-0.40017900	0.29028300	1.34766200
H	0.22603300	-0.43418900	1.89094600
C	0.40013700	-0.29029300	-1.34752100
H	-0.22614400	0.43417000	-1.89073600
N	0.41402900	1.20548700	0.54085900
C	1.30988500	0.55724000	-0.42812400
C	1.97761000	1.67880500	-1.28131800
C	2.52142700	-0.17677900	0.14449800
C	3.68825000	0.48444900	-0.27736100
C	2.63383200	-1.31606200	0.93554400
H	1.74884300	-1.87137800	1.22572100
C	4.95878000	0.06179500	0.09128100
H	5.84885300	0.58476200	-0.24566700
C	3.90932400	-1.75661600	1.32114300
H	4.00490400	-2.64277100	1.94069600
C	5.05248100	-1.07209400	0.90836100
H	6.03317500	-1.42495800	1.21376100
O	1.41121400	2.50424900	-1.97148300
N	3.34046000	1.56317300	-1.10705000
H	3.99230800	2.17903900	-1.57036100
C	-1.08415700	1.22012500	2.37369300
H	-2.10433000	1.46291100	2.06812100
H	-1.13536600	0.73350300	3.35117200
C	-0.20209500	2.49991600	2.39623200
H	-0.75644800	3.34827900	1.98652800
H	0.12146700	2.77071100	3.40469400
C	0.99156500	2.16393000	1.48637300
H	1.38221400	3.03756300	0.95614900
H	1.81419300	1.72089100	2.07452700
C	1.08408900	-1.22005800	-2.37363400
H	2.10423600	-1.46293700	-2.06804200
H	1.13536100	-0.73333200	-3.35105200
C	0.20197100	-2.49980200	-2.39633100
H	0.75634900	-3.34833400	-1.98701400
H	-0.12184000	-2.77030100	-3.40480000
C	-0.99154700	-2.16400400	-1.48618700
H	-1.38199700	-3.03771800	-0.95595000
H	-1.81430700	-1.72102600	-2.07418400

Cis (20)

C	-0.53771000	-0.55247200	-1.10059500
H	-0.34408200	0.44077800	-1.54682000
N	-0.50991700	0.36045100	1.14206300
N	0.71207600	-1.23650800	-0.78035400
C	0.70577500	-0.41509300	1.47064500

C	-2.64376700	1.90119400	-0.68722200
C	-3.89115100	2.47363000	-0.97694200
C	-5.06318000	1.74244100	-0.77863300
C	-5.02485000	0.43199500	-0.28589300
H	-1.73106500	2.47121500	-0.83244000
H	-3.94477700	3.48989900	-1.35423700
H	-6.02443200	2.19359700	-1.00632500
H	-5.93819600	-0.13367600	-0.12911800
C	1.86782000	1.94350100	-0.62224700
C	2.79603300	2.91732800	-1.02106700
C	4.16012300	2.62797200	-1.03901500
C	4.63395300	1.36929000	-0.64858600
H	0.81213100	2.17981600	-0.56898600
H	2.44905400	3.90437100	-1.31076800
H	4.87021500	3.38893800	-1.34925800
H	5.69713400	1.14820200	-0.64416600
C	-1.15121300	-1.45834400	-2.18589600
C	1.29622300	-1.63003900	-2.06312900
C	0.07740300	-2.10699900	-2.88206600
H	-1.77491200	-2.23271600	-1.73299300
H	-1.77732200	-0.88479600	-2.87366300
H	1.79042700	-0.78275500	-2.57107000
H	2.04195300	-2.41663000	-1.91415700
H	0.16582500	-1.80624100	-3.92950300
H	-0.00226400	-3.19639000	-2.85934600
C	-1.08045100	0.75419300	2.43494300
C	0.15682400	1.23098600	3.21006600
C	1.31571100	0.35104500	2.66598300
H	-1.55262700	-0.09812400	2.95556400
H	-1.83684800	1.53258700	2.30248300
H	0.34690400	2.28545100	2.99061700
H	0.02349900	1.13498200	4.29078900
H	2.15980900	0.97323500	2.35779900
H	1.68129600	-0.35641000	3.41448300
C	-1.39803400	-0.26974300	0.16336000
C	2.76125700	-1.54763100	0.52918400
C	3.69751000	0.41946300	-0.25915800
C	2.31497000	0.67927700	-0.25463200
O	2.69130200	-2.67012900	0.98403500
C	1.57638600	-0.57965200	0.20672600
C	-2.58965300	0.60384400	-0.20042600
C	-3.77878000	-0.11518400	-0.00231800
O	-1.61450800	-2.53861200	1.22777500
N	3.92809600	-0.88456100	0.19762800
N	-3.47298400	-1.38373600	0.50234000
H	4.83498100	-1.30632200	0.33306600
H	-4.14710400	-2.06278100	0.82550500
C	-2.11142500	-1.56247400	0.70208700
H	0.44650300	-1.43698800	1.77532500

Cartesian coordinates of all Transition states.

TS (23) of Trans isomer (8)

C	-2.59956400	1.12457400	0.01081800
H	-2.76197100	1.14588700	1.08046000
N	-1.40487200	-1.59340800	0.41152700
N	-1.40638400	1.59239900	-0.41155100
C	-0.29712100	-1.83261300	-0.36434500
C	1.64529800	-2.63971200	1.23790900
C	2.96740700	-3.08772800	1.22200200
C	3.67611800	-3.21426300	0.02269900
C	3.07081300	-2.88890500	-1.19550500
H	1.13409300	-2.54812000	2.18818500
H	3.45166700	-3.33914400	2.16091100

H	4.70364500	-3.56442500	0.03361300
H	3.61302300	-2.97930200	-2.13240900
C	1.64308400	2.64068900	-1.23789500
C	2.96485900	3.08968800	-1.22200500
C	3.67339800	3.21700800	-0.02268300
C	3.06826600	2.89144500	1.19555200
H	1.13200500	2.54849600	-2.18818000
H	3.44899500	3.34125500	-2.16093800
H	4.70066400	3.56793500	-0.03360600
H	3.61036300	2.98242400	2.13246600
C	-3.65445200	1.42862400	-1.01976200
C	-1.41422600	1.88185700	-1.86780300
C	-2.84224700	1.54313100	-2.32684000
H	-4.43552900	0.66400100	-1.07396500
H	-4.15426000	2.37549400	-0.76880000
H	-1.14552600	2.93361300	-2.00277000
H	-0.67648800	1.24891800	-2.36599400
H	-3.24212400	2.30220300	-3.00274400
H	-2.82240500	0.58616400	-2.84948800
C	-3.65311000	-1.43187000	1.01962400
C	-2.84083300	-1.54536400	2.32673500
C	-1.41254500	-1.88296700	1.86775200
H	-4.15189200	-2.37930000	0.76873000
H	-4.43500900	-0.66808100	1.07374600
H	-2.82181400	-0.58824500	2.84913900
H	-3.24004400	-2.30461200	3.00283500
H	-0.67524600	-1.24957600	2.36602000
H	-1.14311400	-2.93455300	2.00262300
C	-2.59850100	-1.12681800	-0.01095000
C	-0.31421500	1.66157400	1.80661000
C	1.75497000	2.44428400	1.17724200
C	1.00360900	2.31011500	-0.03022900
O	-1.20873200	1.24139800	2.56554600
C	-0.29886100	1.83252000	0.36438600
C	1.00565200	-2.30934500	0.03027600
C	1.75718700	-2.44272700	-1.17717600
O	-1.20743600	-1.24200400	-2.56541000
N	0.94831000	2.06273300	2.23898700
N	0.95029000	-2.06165500	-2.23892100
H	-2.76079200	-1.14829600	-1.08060800
H	1.21651700	2.02734700	3.20942700
H	1.21857100	-2.02581800	-3.20932500
C	-0.31255200	-1.66151600	-1.80653000

TS (24) of Cis Isomer (9)

C	0.11032600	2.08708300	1.47560100
H	-0.49049500	2.89650000	1.08049800
N	1.14636600	1.33582700	-1.17671000
N	-0.48118200	0.86725100	1.47614700
C	1.35264200	-0.01818700	-1.21727900
C	3.49658000	-0.54563000	0.22535100
C	4.29340600	-1.60419400	0.67257600
C	3.97369200	-2.92864100	0.35928100
C	2.85411300	-3.22341500	-0.42904900
H	3.79382800	0.47102600	0.46080400
H	5.17453800	-1.38998100	1.27010900
H	4.59927200	-3.73787700	0.72311000
H	2.61033100	-4.24903000	-0.69097800
C	-1.96007100	-2.08733500	1.10014900
C	-2.84227700	-3.12408400	0.78780800
C	-4.01804000	-2.88192400	0.07090200
C	-4.33859800	-1.58693700	-0.35107400
H	-1.05680700	-2.31699600	1.65171100

H	-2.60651500	-4.13437400	1.10891000
H	-4.69033000	-3.70204900	-0.16168500
H	-5.24802500	-1.38972100	-0.91108900
C	0.99381000	2.21073000	2.68890100
C	0.19456500	-0.07315500	2.40836000
C	1.35064200	0.74417300	3.00893600
H	1.87652400	2.83591700	2.51798400
H	0.43398400	2.67422600	3.51391700
H	-0.54258400	-0.39541100	3.15057200
H	0.54869700	-0.94840800	1.86116400
H	1.46166500	0.56119100	4.07984600
H	2.28836800	0.46010300	2.52509700
C	1.44904000	3.61201700	-0.72210400
C	0.33137900	3.49967400	-1.77978900
C	0.42640500	2.05149600	-2.27807700
H	2.40108700	3.93490100	-1.16882700
H	1.21354500	4.32245100	0.07634700
H	-0.64319100	3.65564500	-1.31370400
H	0.45153500	4.21632900	-2.59540300
H	-0.52812200	1.56370400	-2.46256600
H	1.04130300	1.94345300	-3.17864900
C	1.56485900	2.19524700	-0.22604400
C	-2.45663900	1.50194500	0.12773700
C	-3.46135500	-0.55934000	-0.03907300
C	-2.25407400	-0.77551800	0.69191000
O	-2.29767300	2.72509000	-0.02260800
C	-1.62214600	0.51609600	0.80401500
C	2.35635200	-0.80815400	-0.55454200
C	2.06684700	-2.17209100	-0.87785900
O	-0.56354700	-0.67533300	-2.59964700
N	-3.55952600	0.79139700	-0.33765700
N	0.94735200	-2.20041300	-1.69131900
H	2.36236000	1.87766100	0.42968700
H	-4.26933200	1.22402900	-0.90703100
H	0.47534700	-3.02342400	-2.03069000
C	0.44882600	-0.91424900	-1.93735500

TS (27) of Trans isomer (14)

C	-0.80390600	3.03530800	0.78543500
H	-1.57748200	3.18994400	0.04505400
N	0.82853900	1.84418500	-1.42065200
N	-0.82821200	1.84461200	1.42065000
C	1.53849200	0.72906200	-1.04777900
C	0.95473400	-1.19827000	-2.75562400
C	1.26914000	-2.52189000	-3.06957900
C	2.20705900	-3.23902000	-2.32081700
C	2.85105200	-2.64405600	-1.23071400
H	0.22006600	-0.67716300	-3.35664900
H	0.77482200	-2.99778200	-3.91128400
H	2.44215300	-4.26539300	-2.58527100
H	3.58922200	-3.19134500	-0.65461200
C	-0.95489700	-1.19741700	2.75654500
C	-1.26960400	-2.52084700	3.07100200
C	-2.20779500	-3.23800100	2.32260400
C	-2.85176600	-2.64325000	1.23237400
H	-0.21998900	-0.67630600	3.35727300
H	-0.77529900	-2.99657000	3.91281000
H	-2.44311900	-4.26422200	2.58744400
H	-3.59015000	-3.19054200	0.65654600
C	-0.29621500	4.09821700	1.72350600
C	-0.00187400	1.86424600	2.65415600
C	0.55335400	3.29602000	2.73141200
H	0.27746200	4.88010400	1.21641000

H	-1.14524700	4.59593700	2.21417200
H	-0.64728600	1.59564400	3.49544200
H	0.80239400	1.13133700	2.56067100
H	0.49384400	3.70027300	3.74428100
H	1.59977000	3.28225100	2.42394800
C	0.29693300	4.09778900	-1.72410600
C	-0.55280500	3.29545400	-2.73175900
C	0.00225300	1.86363900	-2.65418300
H	1.14603200	4.59523500	-2.21493500
H	-0.27661000	4.87990600	-1.21721100
H	-1.59919800	3.28187500	-2.42420500
H	-0.49334200	3.69945500	-3.74473100
H	-0.80209800	1.13083600	-2.56058100
H	0.64769300	1.59480600	-3.49537600
C	0.80450000	3.03505700	-0.78576500
C	-2.43762400	0.72754200	-0.08747300
C	-2.53236400	-1.32944500	0.91614800
C	-1.58578200	-0.56997600	1.66936900
O	-2.69263100	1.62370500	-0.92112700
C	-1.53834300	0.72947300	1.04807600
C	1.58565200	-0.57061400	-1.66859400
C	2.53196000	-1.33005600	-0.91499200
O	2.69313500	1.62393200	0.92089200
N	-3.02104900	-0.54215900	-0.12176500
N	3.02069800	-0.54253100	0.12271700
H	1.57812100	3.18971400	-0.04543300
C	2.43777100	0.72737500	0.08776500
C	-3.94955500	-0.95051300	-1.16288500
H	-3.65776000	-1.94036700	-1.53076500
H	-3.80747000	-0.23129600	-1.97538400
C	-5.40605700	-0.95916200	-0.73161200
C	-6.17298900	-2.12501800	-0.80847500
C	-6.00786400	0.22041300	-0.27178400
C	-7.51749000	-2.12070600	-0.42880200
H	-5.71749000	-3.04400800	-1.17067800
C	-7.34768700	0.22618000	0.11039100
H	-5.41755400	1.13136200	-0.22511600
C	-8.10673600	-0.94509700	0.03403400
H	-8.09996400	-3.03546100	-0.49195900
H	-7.80374700	1.14644600	0.46454700
H	-9.15112200	-0.93867800	0.33236500
C	3.94989400	-0.95035300	1.16342800
H	3.65837400	-1.94003500	1.53198200
H	3.80830100	-0.23074800	1.97566800
C	5.40611300	-0.95917400	0.73120700
C	6.00771700	0.22031500	0.27089100
C	6.17299400	-2.12509000	0.80765200
C	7.34728100	0.22593100	-0.11218900
H	5.41746700	1.13132100	0.22457000
C	7.51723900	-2.12093100	0.42707300
H	5.71765500	-3.04400600	1.17024700
C	8.10627500	-0.94541000	-0.03625500
H	7.80319000	1.14612900	-0.46671500
H	8.09967600	-3.03573100	0.48991200
H	9.15046100	-0.93910600	-0.33528700

TS (28) of Cis isomer (15)

C	-1.01115200	3.27774600	0.47579600
H	-1.81138800	3.25680300	-0.25299600
N	0.82398900	2.29556500	-1.54817400
N	-0.82348600	2.12605500	1.16787600
C	1.64896100	1.39658700	-0.93142600
C	3.41089700	2.75358500	0.47771700

C	4.47809000	2.58676200	1.36619500
C	4.87576200	1.31206900	1.77902500
C	4.22533600	0.16813500	1.29787600
H	3.14692900	3.75457500	0.15171700
H	5.00468500	3.46194500	1.73515900
H	5.70358500	1.20187900	2.47279800
H	4.55217700	-0.82308300	1.59255100
C	-0.45432900	-0.80993500	2.69180800
C	-0.54810800	-2.14617900	3.08779600
C	-1.37318400	-3.04507300	2.40407600
C	-2.12512500	-2.62368800	1.30257300
H	0.19793000	-0.14623500	3.24586400
H	0.02693900	-2.48624600	3.94405500
H	-1.43776400	-4.07832000	2.73124400
C	-0.71529100	4.44717600	1.37974100
C	-0.03340800	2.35342300	2.40579900
C	0.29600500	3.85415700	2.38153700
H	-0.32688000	5.32102900	0.84734200
H	-1.63520700	4.76904600	1.88947400
H	-0.65520100	2.06254700	3.25819400
H	0.86159200	1.72802800	2.39172500
H	0.22121500	4.30208500	3.37476000
H	1.32092500	3.99799100	2.02923500
C	-0.17182000	4.32612900	-2.20976700
C	-0.23973300	3.32197000	-3.38791100
C	-0.01003400	1.95320200	-2.73524700
H	0.37438900	5.23832400	-2.47460800
H	-1.17178400	4.64109600	-1.88843200
H	-1.19556900	3.35712400	-3.91526800
H	0.55368200	3.53848900	-4.11028100
H	-0.94904600	1.51041900	-2.38936700
H	0.51875700	1.22948200	-3.35179900
C	0.53751300	3.54433700	-1.12639300
C	-2.27870900	0.68141200	-0.21232900
C	-2.02746900	-1.29607500	0.90554400
C	-1.19591400	-0.35483900	1.58812900
O	-2.68553200	1.48172900	-1.08066900
C	-1.36676800	0.89543400	0.89218800
C	2.72707100	1.62739600	-0.00905800
C	3.16750600	0.33337800	0.41291900
O	0.55574600	-0.65825700	-1.65667400
N	-2.66342900	-0.65967100	-0.15152300
N	2.39143000	-0.63748800	-0.21068500
H	1.21439800	4.01076200	-0.42675500
C	1.42802700	-0.03718600	-1.03929300
C	2.38929800	-2.06237000	0.07105900
H	1.48254000	-2.44190600	-0.41162400
H	-2.77777700	-3.31336900	0.77868800
C	-3.47524600	-1.28662200	-1.18217300
H	-3.45015400	-0.59584200	-2.03007600
H	2.27473000	-2.21946200	1.15005900
H	-2.99264800	-2.21909600	-1.49355800
C	3.61170100	-2.80501300	-0.43981700
C	4.29366800	-3.70291000	0.38772300
C	4.05442300	-2.63237500	-1.75770100
C	5.39601100	-4.41702400	-0.08746000
H	3.95845200	-3.84590300	1.41254500
C	5.15616300	-3.34077400	-2.23357000
H	3.52952800	-1.93817800	-2.40772000
C	5.83122100	-4.23614800	-1.39974500
H	5.91541200	-5.10891800	0.56958800
H	5.48862400	-3.19613400	-3.25768800
H	6.69040800	-4.78685100	-1.77155800

C	-4.91292300	-1.54450900	-0.76645900
C	-5.73166700	-0.47513500	-0.37757900
C	-5.44968400	-2.83488000	-0.78553900
C	-7.05636600	-0.69761700	-0.00781400
H	-5.32037400	0.53059700	-0.37539700
C	-6.77854700	-3.06026100	-0.41748300
H	-4.82570200	-3.67080600	-1.09374800
C	-7.58384000	-1.99205300	-0.02521500
H	-7.68139500	0.13943700	0.29064100
H	-7.18057900	-4.06932600	-0.43519300
H	-8.61668900	-2.16436600	0.26357100

TS (25) of Trans isomer (19)

C	0.10697400	0.57407600	1.99359200
H	0.05307100	1.64647900	1.88957000
N	0.72925500	0.95030600	-0.73798300
N	-0.79801000	-0.18629600	1.42376700
C	-0.57626500	0.68792300	-1.08843100
C	3.98922500	1.24490600	-0.09437500
C	5.35952400	1.03914300	0.07906300
C	5.93647800	-0.22449400	-0.09324100
C	5.13728700	-1.31908600	-0.44045700
H	3.58936200	2.24234100	0.04899000
H	5.98794000	1.88221300	0.35326300
H	7.00503900	-0.35940900	0.04377600
H	5.56916100	-2.30778300	-0.57313900
C	-2.82666500	-1.84062100	-0.62653600
C	-4.03217500	-2.35624500	-1.11880300
C	-5.21240300	-1.61216700	-1.05177300
C	-5.22077400	-0.32371800	-0.50409100
H	-1.90196400	-2.39751900	-0.73497900
H	-4.04319600	-3.34273000	-1.57136800
H	-6.13617300	-2.02822700	-1.44234300
H	-6.13124600	0.26703500	-0.47236900
C	1.13182500	-0.23017100	2.70943300
C	-0.56958800	-1.63558700	1.68592500
C	0.46068900	-1.61771100	2.82813500
H	2.02287600	-0.27005300	2.06102700
H	1.43721800	0.20403600	3.66530800
H	-1.52124300	-2.09784100	1.95425200
H	-0.19443800	-2.09001600	0.75997300
H	-0.04258500	-1.70907800	3.79562700
H	1.17531700	-2.43751400	2.73851100
C	1.07235800	2.38090700	-0.92579100
C	-0.26547400	3.06083100	-1.24495900
C	-1.11697700	1.90899700	-1.80919300
H	1.78514100	2.45235800	-1.75575300
H	1.55235000	2.79256500	-0.03522600
H	-0.71974600	3.45717600	-0.33491300
H	-0.14028800	3.88348900	-1.95302100
H	-2.19204300	2.05485800	-1.68252800
H	-0.93121400	1.77983600	-2.88378400
C	1.75320700	-0.02800500	-0.72162900
C	-2.43564400	1.55394100	0.93323200
C	-4.02327900	0.17083900	-0.00606900
C	-2.82661800	-0.57757500	-0.03230300
O	-1.96107500	2.51440800	1.53402400
C	-1.73683200	0.29365700	0.47768600
C	3.15403200	0.16711100	-0.45194900
C	3.77379100	-1.11731300	-0.60885700
O	0.46357000	-2.05704900	-1.23042200
N	-3.75874700	1.42418700	0.55794900

N	2.78106800	-2.02620900	-0.91944400
H	-4.44000600	2.14091400	0.75824600
H	2.90540600	-3.00364700	-1.12830400
C	1.52317500	-1.40882400	-1.00187600
H	-0.71887100	-0.29716600	-1.52004700

TS (26) of Trans isomer (20)

C	0.50532200	-0.00889300	1.61070300
H	0.39398900	1.04704300	1.38775800
N	0.74403000	-1.03317400	-1.09192700
N	-0.61912500	-0.75761400	1.58914900
C	0.48359100	-2.32122100	-0.97721200
C	1.18518900	2.25329700	-0.87042300
C	1.82457000	3.49628200	-0.96488400
C	3.18156500	3.62653600	-0.66282500
C	3.93355300	2.52044200	-0.24769000
H	0.11944700	2.17886200	-1.06417900
H	1.25208000	4.36856300	-1.26410300
H	3.66086800	4.59798300	-0.73559600
H	4.98372200	2.62240200	0.00940300
C	-2.49935600	1.97160600	1.26781300
C	-3.46490700	2.91361700	0.90749700
C	-4.45565600	2.61206100	-0.03689700
C	-4.49945600	1.35361100	-0.64730000
H	-1.75176300	2.21807500	2.01706700
H	-3.44984900	3.89594600	1.37153400
H	-5.19686800	3.36037300	-0.30096100
H	-5.26616800	1.11523500	-1.37998300
C	1.34353900	-0.45841700	2.79013000
C	-0.53183900	-1.95160700	2.46114000
C	0.92487000	-1.93620700	2.95191300
H	2.41564600	-0.31958800	2.64338200
H	1.05431900	0.13464600	3.66878000
H	-1.24886400	-1.82475300	3.28229100
H	-0.81397000	-2.84241600	1.89625000
H	1.01706500	-2.29167200	3.98081000
H	1.55855000	-2.56110700	2.31743200
C	0.37555500	-0.52589500	-2.44784700
C	-0.38030400	-1.70367200	-3.08194500
C	0.11143200	-2.93029700	-2.28876400
H	1.29910600	-0.26979700	-2.97743800
H	-0.23011700	0.37488400	-2.35682000
H	-1.45352000	-1.58213400	-2.92517700
H	-0.18716200	-1.77731400	-4.15427500
H	-0.63681900	-3.71369400	-2.18095900
H	1.01682600	-3.36579100	-2.74016400
C	1.56028200	-0.26887400	-0.19480100
C	-2.25152200	-1.47824000	-0.08633600
C	-3.53335300	0.41759200	-0.29695000
C	-2.52150700	0.69988100	0.67380200
O	-1.80268400	-2.62992600	-0.34975400
C	-1.74828700	-0.50145000	0.80149000
C	1.92704000	1.12724000	-0.50708500
C	3.29353400	1.29064600	-0.17515800
O	3.05698700	-2.14310400	0.33879100
N	-3.33258700	-0.87620200	-0.75911700
N	3.80393900	0.05557800	0.23236700
H	-3.97656500	-1.40374200	-1.32714100
H	4.76920400	-0.14549700	0.44581400
C	2.84610700	-0.94688700	0.15190100
H	0.80285400	-2.85930200	-0.10096400

Calculated Frequencies of all transition States.

TS (23) (for trans)

-273.5210	16.7812	21.5171	28.0202	55.0594	71.3282
97.9190	118.1272	123.9245	139.8885	148.2703	148.7163
156.1275	158.7393	171.8830	176.3821	211.8504	221.6071
272.5999	287.7428	299.9343	314.7284	331.3894	336.4687
338.9177	361.1117	396.4641	411.6133	415.8223	417.8035
470.8184	473.8001	507.1494	509.5714	515.9536	526.8122
578.5450	581.3021	622.3221	622.8769	637.6779	638.5226
663.1618	671.7099	695.2484	696.8119	728.9153	729.0120
746.6238	746.9468	751.5886	752.7519	817.9322	827.2309
842.9429	844.8930	850.5322	852.1674	882.4455	883.0278
895.6141	903.4801	905.2828	912.7336	915.8827	928.3867
938.4933	956.1333	956.1458	958.2024	975.1021	977.5283
985.6954	994.5759	1032.3830	1032.8356	1058.0291	1060.0490
1067.6578	1072.2739	1086.9689	1102.9358	1129.2737	1131.8491
1183.6443	1183.7320	1191.1707	1192.4562	1210.9224	1214.3954
1223.7666	1229.7361	1242.6614	1247.2079	1262.6394	1263.1457
1270.9050	1272.9742	1299.5211	1311.5820	1326.6063	1331.2663
1334.1369	1335.7998	1345.9760	1346.2720	1361.0047	1362.6994
1390.8367	1392.0503	1419.9580	1430.4639	1432.1847	1437.9124
1492.7138	1500.3889	1502.2064	1504.2917	1506.9852	1507.6967
1517.0221	1520.1472	1524.2331	1526.0590	1535.9515	1567.0573
1624.8889	1627.2878	1664.4510	1665.2656	1701.0962	1707.3128
3016.7644	3016.9777	3072.6777	3072.7755	3084.3024	3088.1395
3097.6271	3097.8575	3130.5217	3130.5943	3155.4144	3155.4816

TS (24) (for cis)

-286.0436	20.3669	23.4788	29.8478	44.1424	61.4491
97.6694	112.7431	119.8562	128.9163	130.8805	142.0166
151.8457	154.9380	167.2829	188.2210	225.5370	245.8322
272.0277	286.9929	294.8717	311.4067	322.6216	331.2808
351.0681	377.6563	391.1838	408.0607	417.1049	421.0339
464.9449	474.2467	508.1094	508.6899	511.2081	531.6222
578.1283	583.2407	622.5121	624.4704	637.7146	640.4726
646.9815	664.7954	694.2998	696.4998	726.2915	726.9480
744.6522	747.2015	749.6864	752.8111	809.1365	817.8457
843.7687	847.7392	852.0564	854.7866	874.6349	883.5975
884.6419	898.2772	902.1890	903.9847	913.0640	921.1748
928.7335	942.2643	952.4981	954.4391	958.5867	980.6338
983.7854	988.9196	1030.2015	1031.5053	1051.8488	1058.1888
1068.2771	1077.9380	1087.2116	1105.2137	1124.4268	1129.6701
1178.2377	1182.7253	1186.6986	1188.2940	1200.9188	1212.3783
1219.1183	1225.8449	1237.9980	1243.5176	1254.4496	1257.2322
1262.4331	1272.5065	1294.6101	1305.4315	1321.6868	1328.4007
1329.7757	1334.1538	1344.1224	1348.1127	1361.4216	1367.1126
1386.4181	1389.6377	1420.5167	1430.0902	1432.8467	1449.7681
1494.7514	1500.9932	1504.3210	1508.1953	1511.5768	1515.4544
1517.4598	1520.7299	1530.5657	1532.1613	1534.5956	1569.6392
1620.7706	1627.7679	1660.5521	1665.0911	1714.4372	1748.4163
3013.4217	3020.0511	3063.5061	3070.4840	3079.5266	3089.3201

TS (25) (for trans)

-290.6099	25.8048	32.9729	61.4618	67.3016	84.2856
93.2674	109.6014	131.4012	138.8484	145.3183	149.1035
153.9191	172.4875	188.5140	223.5047	236.9043	246.4561
277.3956	287.9294	300.3394	309.6289	323.6427	339.1967
349.8144	373.4382	397.6496	403.9914	424.8494	448.6477
465.4622	499.1369	502.0293	512.6868	519.1287	539.5461
578.0621	585.3727	613.3778	624.1219	632.3814	642.9948
653.2232	656.7136	691.2690	693.7781	715.8605	737.6346
740.9942	752.0213	766.2560	772.5832	791.0854	823.0191
823.9062	830.9562	850.6854	869.6039	872.6486	878.2660

887.3782	888.7148	902.2919	918.4282	928.5594	933.0503
939.6111	943.8857	951.8523	969.6851	971.1658	987.7394
988.8934	1014.3139	1023.1774	1051.4096	1054.9577	1057.9329
1066.6231	1089.0344	1095.6984	1124.7757	1130.8040	1169.8260
1180.1052	1182.3572	1185.2723	1191.8124	1196.8836	1205.0358
1222.5514	1237.0706	1238.9556	1244.6431	1256.1047	1260.8227
1266.5594	1274.9706	1300.2421	1315.5664	1322.1589	1326.0838
1333.9482	1337.2754	1350.1994	1353.0229	1355.3411	1362.6640
1365.7297	1387.2741	1398.2609	1408.1383	1424.2611	1428.9370
1471.4248	1474.0178	1504.8630	1509.1536	1512.0921	1513.5836
1514.8074	1519.8905	1522.0352	1539.0961	1546.3792	1611.5261
1617.3858	1638.1604	1647.0370	1669.6579	1674.7843	1769.9676
2997.5281	3026.4856	3038.7291	3051.3761	3075.4339	3092.1760
3108.9228	3109.6062	3119.5025	3130.4244	3142.4183	3144.9504
3170.4962	3177.3011	3185.3225	3191.4746	3196.5900	3198.1793
3206.9900	3212.3168	3216.4754	3293.8235	3659.9442	3678.5951

TS (26) (for cis)

-231.5941	19.9462	30.1330	62.1285	68.6062	79.5589
95.1030	100.0289	113.6564	129.1048	139.1856	147.7944
164.3472	179.3983	202.0890	212.4311	230.4641	241.7138
269.9468	283.1305	298.4135	309.7850	313.9195	328.9554
374.0125	387.5933	392.2146	410.3033	431.6060	444.3789
461.9929	482.7149	490.5809	504.9329	519.7999	533.5732
583.8449	586.3183	615.3485	624.2073	632.1056	641.1121
649.0888	656.6078	692.5378	699.4762	727.8051	746.7738
750.8295	754.0461	764.3830	779.5150	802.8107	830.5053
843.7090	844.7547	860.4908	863.5256	867.9558	876.0761
887.1504	895.5841	897.6589	904.2351	922.2020	931.4082
937.8647	947.7327	949.9896	956.8417	968.3337	973.1343
979.3994	1008.6567	1024.2953	1041.8110	1050.8702	1053.6240
1061.3741	1078.1605	1091.5072	1120.0879	1129.2965	1135.4179
1173.8007	1174.0052	1181.0379	1186.5944	1195.5227	1201.7098
1215.2862	1232.7127	1237.7813	1239.7150	1252.0060	1253.4633
1261.7391	1263.6892	1306.6245	1312.4463	1320.9267	1323.2166
1328.8128	1335.6960	1338.4346	1341.9311	1343.7581	1357.0036
1359.0476	1378.1751	1387.1507	1417.4176	1426.8556	1457.0360
1479.2224	1494.4633	1501.8624	1504.1544	1509.2236	1517.6774
1518.9043	1521.1165	1522.2917	1532.7137	1547.1296	1593.2116
1623.8350	1636.2508	1642.0312	1667.5758	1669.1077	1768.4865
3004.5464	3032.3654	3039.7570	3072.7700	3086.4842	3096.5233
3124.0405	3133.6936	3139.8745	3145.5389	3160.1502	3165.4259
3168.8718	3175.3077	3184.2507	3185.6093	3188.8830	3192.3603
3200.6433	3201.0611	3211.2913	3320.3881	3659.9485	3669.5449

TS (27) (for trans)

-277.6864	8.8356	12.6617	14.2170	15.0002	20.7821
30.9645	31.4815	37.8156	38.2811	54.1966	60.0013
101.4811	113.4659	123.2104	136.2918	137.8538	143.1656
151.3424	156.2323	160.0322	162.1721	171.2017	177.4997
183.8958	185.5575	219.1516	232.5365	238.8035	242.4850
301.6907	308.4649	308.6893	321.1103	339.2621	342.1055
347.7540	356.9221	364.0044	376.4196	414.8756	416.9249
416.9362	421.7709	454.0897	457.7440	473.8914	473.9790
507.4023	508.9362	515.3823	523.2488	564.5789	566.0068
575.8024	579.4680	627.5242	628.6109	634.8278	635.1135
660.1960	662.3231	681.0128	681.2891	702.3794	705.5646
715.9919	716.0468	727.3290	728.2356	745.2537	745.3887
747.7925	750.1321	751.5214	753.1671	794.2613	799.3131
826.6938	827.0424	833.4646	843.7648	849.0589	850.2507
855.8407	858.0883	865.5091	865.5165	897.5994	903.5562
907.3500	915.7544	915.9689	923.6523	924.7083	931.0464
933.8217	939.7808	952.3635	956.5712	956.7710	964.0009

977.4234	977.5680	977.5772	995.0039	1000.9942	1001.0662
1010.1047	1010.6229	1017.0617	1017.0876	1041.2622	1041.4473
1055.0978	1055.8634	1057.1694	1061.3641	1070.2498	1070.5881
1084.2039	1099.9092	1101.9569	1105.8383	1119.8816	1121.1577
1141.9237	1144.2784	1185.6271	1185.9578	1186.9881	1186.9977
1191.1317	1192.7951	1202.9692	1208.2137	1208.3009	1210.3568
1223.2826	1224.4232	1233.2997	1235.0554	1248.3962	1252.4063
1262.1117	1262.3630	1299.6003	1304.8392	1312.3532	1315.1794
1326.9415	1333.3223	1340.9158	1341.4166	1348.5531	1350.4681
1363.7090	1363.7112	1366.7193	1369.1260	1375.3487	1376.1594
1387.1161	1387.7773	1394.2462	1396.6298	1424.3569	1428.5809
1430.9236	1442.3797	1480.9302	1484.0346	1494.8155	1497.6599
1497.7841	1501.1565	1504.2169	1505.3214	1508.1659	1509.4493
1513.0444	1515.6234	1524.0025	1525.9721	1530.8603	1540.1724
1540.4685	1566.2320	1626.0946	1627.7952	1643.1945	1643.2373
1654.2611	1657.3791	1663.1223	1663.1682	1671.0664	1675.8974
3016.9996	3017.1420	3052.2383	3052.2808	3073.3332	3073.4317
3087.3174	3090.4707	3098.1793	3098.4368	3106.5477	3106.5697
3131.9462	3132.0132	3154.8200	3154.8842	3166.7627	3166.7745
3178.0796	3178.0812	3181.9828	3182.0477	3188.0594	3188.0628
3196.8988	3196.9068	3197.1836	3197.1917	3205.2693	3205.3036
3212.3766	3212.4927	3226.0671	3226.0821	3237.9724	3238.9766

TS (28) (for Cis)

-295.4323	8.9909	11.2650	17.8819	19.1680	23.1030
28.9370	38.9192	40.8738	44.5151	48.9849	55.7018
88.8682	100.7769	113.7060	119.5800	132.3747	139.9055
145.9182	157.8358	162.1372	165.1496	177.3232	180.3322
192.0472	204.0297	227.2275	235.0843	242.3340	257.5340
288.7489	308.1762	309.9559	319.6149	330.3257	336.4764
346.3110	355.6514	365.5902	392.6816	412.6333	416.6799
417.7141	419.9239	455.4356	460.3561	472.8326	474.4871
508.5691	510.1703	521.8926	536.8391	565.2871	566.9700
577.1185	584.3143	623.1615	628.3982	634.3423	635.1011
644.3598	650.9261	682.3207	685.5118	704.0929	709.5389
714.0504	717.1718	727.9215	731.6763	744.3824	744.7837
748.1113	750.2585	752.0151	752.9833	788.4298	796.4878
817.7019	826.9705	831.0224	841.0884	846.6216	850.7069
858.5948	861.3918	865.2126	866.3496	876.6032	898.1128
903.2815	908.4208	914.6942	919.4502	923.1819	924.4463
931.2548	936.7943	945.7546	954.0607	956.4482	961.0522
963.7374	972.4922	978.0468	982.5677	994.9751	998.0171
1000.5296	1011.4327	1016.6137	1017.1726	1040.7180	1042.2571
1053.0757	1055.0118	1056.0332	1057.1905	1068.8097	1071.7751
1089.4127	1100.7467	1105.3091	1108.2467	1119.0488	1121.5148
1142.6424	1144.6236	1184.4823	1186.2935	1186.5883	1186.7748
1189.4371	1196.6612	1206.3408	1206.8337	1208.4479	1210.3014
1221.8892	1225.3490	1230.0542	1232.5977	1244.9074	1248.7055
1262.2751	1269.4182	1292.5641	1304.1203	1311.5591	1316.3837
1324.3255	1327.7638	1336.6009	1341.0440	1347.4911	1348.9644
1362.4597	1363.8510	1366.6079	1369.9232	1373.3435	1376.9330
1384.3147	1387.6167	1393.8381	1396.9397	1426.0971	1429.8932
1436.0376	1445.8328	1482.6708	1484.6073	1494.5700	1496.6240
1497.4058	1500.0765	1504.5549	1507.8086	1510.0354	1511.8960
1514.8995	1515.5261	1522.6223	1524.8762	1534.0139	1540.1734
1540.4434	1568.4767	1622.5072	1625.3369	1642.8123	1642.9761
1650.8701	1654.5489	1662.9044	1663.3348	1675.6494	1724.5365
3016.1170	3045.2964	3046.2068	3058.8041	3066.1165	3070.4942
3079.3337	3081.6127	3082.9233	3091.1078	3099.1682	3112.2682
3125.6529	3129.8772	3138.7131	3167.6443	3168.1547	3177.4362
3178.5300	3179.3201	3179.4435	3181.0635	3187.3750	3188.0799
3191.7867	3195.8862	3197.0114	3197.0952	3202.6182	3204.7466

3205.7546 3214.1158 3215.2407 3226.6628 3228.8958 3262.6154

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