



wwPDB EM Validation Summary Report ⓘ

Nov 21, 2022 – 01:12 AM EST

PDB ID : 7SBT
EMDB ID : EMD-24988
Title : One RBD-up 2 of pre-fusion SARS-CoV-2 Gamma variant spike protein
Authors : Zhang, J.; Xiao, T.S.; Cai, Y.F.; Peng, H.Q.; Volloch, S.R.; Chen, B.
Deposited on : 2021-09-25
Resolution : 3.50 Å (reported)
Based on initial model : 7KRR

This is a wwPDB EM Validation Summary Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.3

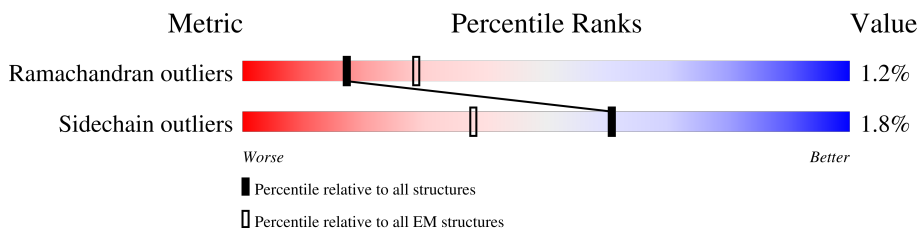
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.50 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$.

Mol	Chain	Length	Quality of chain
1	A	1310	82% (Green), 16% (Grey), 2% (Yellow), 0% (Orange), 0% (Red)
1	B	1310	82% (Green), 16% (Grey), 2% (Yellow), 0% (Orange), 0% (Red)
1	C	1310	82% (Green), 16% (Grey), 2% (Yellow), 0% (Orange), 0% (Red)
2	D	2	100% (Yellow)
2	E	2	100% (Yellow)
2	F	2	100% (Yellow)
2	G	2	100% (Yellow)
2	L	2	100% (Yellow)
2	M	2	50% (Green), 50% (Yellow)
2	N	2	50% (Green), 50% (Yellow)

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Mol	Chain	Length	Quality of chain
2	O	2	50% 50%
2	P	2	100%
2	Q	2	100%
2	V	2	100%
2	W	2	50% 50%
2	X	2	50% 50%
2	Y	2	100%
2	Z	2	50% 50%
2	a	2	100%
2	b	2	100%
3	H	3	100%
3	R	3	100%
3	c	3	33% 67%
4	I	3	100%
4	J	3	100%
4	K	3	100%
4	S	3	100%
4	T	3	100%
4	U	3	33% 67%
4	d	3	100%
4	e	3	100%
4	f	3	33% 67%

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 27151 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Spike glycoprotein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1104	8627	5511	1431	1646	39	0	0
1	B	1096	8582	5484	1426	1634	38	0	0
1	C	1100	8609	5500	1430	1640	39	0	0

There are 147 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	18	PHE	LEU	variant	UNP P0DTC2
A	20	ASN	THR	variant	UNP P0DTC2
A	26	SER	PRO	variant	UNP P0DTC2
A	138	TYR	ASP	variant	UNP P0DTC2
A	190	SER	ARG	variant	UNP P0DTC2
A	417	THR	LYS	variant	UNP P0DTC2
A	484	LYS	GLU	variant	UNP P0DTC2
A	501	TYR	ASN	variant	UNP P0DTC2
A	614	GLY	ASP	variant	UNP P0DTC2
A	655	TYR	HIS	variant	UNP P0DTC2
A	1027	ILE	THR	variant	UNP P0DTC2
A	1176	PHE	VAL	variant	UNP P0DTC2
A	1274	LEU	-	expression tag	UNP P0DTC2
A	1275	GLU	-	expression tag	UNP P0DTC2
A	1276	SER	-	expression tag	UNP P0DTC2
A	1277	GLY	-	expression tag	UNP P0DTC2
A	1278	GLY	-	expression tag	UNP P0DTC2
A	1279	GLY	-	expression tag	UNP P0DTC2
A	1280	SER	-	expression tag	UNP P0DTC2
A	1281	ALA	-	expression tag	UNP P0DTC2
A	1282	TRP	-	expression tag	UNP P0DTC2
A	1283	SER	-	expression tag	UNP P0DTC2
A	1284	HIS	-	expression tag	UNP P0DTC2
A	1285	PRO	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1286	GLN	-	expression tag	UNP P0DTC2
A	1287	PHE	-	expression tag	UNP P0DTC2
A	1288	GLU	-	expression tag	UNP P0DTC2
A	1289	LYS	-	expression tag	UNP P0DTC2
A	1290	GLY	-	expression tag	UNP P0DTC2
A	1291	GLY	-	expression tag	UNP P0DTC2
A	1292	GLY	-	expression tag	UNP P0DTC2
A	1293	SER	-	expression tag	UNP P0DTC2
A	1294	GLY	-	expression tag	UNP P0DTC2
A	1295	GLY	-	expression tag	UNP P0DTC2
A	1296	GLY	-	expression tag	UNP P0DTC2
A	1297	SER	-	expression tag	UNP P0DTC2
A	1298	GLY	-	expression tag	UNP P0DTC2
A	1299	GLY	-	expression tag	UNP P0DTC2
A	1300	SER	-	expression tag	UNP P0DTC2
A	1301	SER	-	expression tag	UNP P0DTC2
A	1302	ALA	-	expression tag	UNP P0DTC2
A	1303	TRP	-	expression tag	UNP P0DTC2
A	1304	SER	-	expression tag	UNP P0DTC2
A	1305	HIS	-	expression tag	UNP P0DTC2
A	1306	PRO	-	expression tag	UNP P0DTC2
A	1307	GLN	-	expression tag	UNP P0DTC2
A	1308	PHE	-	expression tag	UNP P0DTC2
A	1309	GLU	-	expression tag	UNP P0DTC2
A	1310	LYS	-	expression tag	UNP P0DTC2
B	18	PHE	LEU	variant	UNP P0DTC2
B	20	ASN	THR	variant	UNP P0DTC2
B	26	SER	PRO	variant	UNP P0DTC2
B	138	TYR	ASP	variant	UNP P0DTC2
B	190	SER	ARG	variant	UNP P0DTC2
B	417	THR	LYS	variant	UNP P0DTC2
B	484	LYS	GLU	variant	UNP P0DTC2
B	501	TYR	ASN	variant	UNP P0DTC2
B	614	GLY	ASP	variant	UNP P0DTC2
B	655	TYR	HIS	variant	UNP P0DTC2
B	1027	ILE	THR	variant	UNP P0DTC2
B	1176	PHE	VAL	variant	UNP P0DTC2
B	1274	LEU	-	expression tag	UNP P0DTC2
B	1275	GLU	-	expression tag	UNP P0DTC2
B	1276	SER	-	expression tag	UNP P0DTC2
B	1277	GLY	-	expression tag	UNP P0DTC2
B	1278	GLY	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1279	GLY	-	expression tag	UNP P0DTC2
B	1280	SER	-	expression tag	UNP P0DTC2
B	1281	ALA	-	expression tag	UNP P0DTC2
B	1282	TRP	-	expression tag	UNP P0DTC2
B	1283	SER	-	expression tag	UNP P0DTC2
B	1284	HIS	-	expression tag	UNP P0DTC2
B	1285	PRO	-	expression tag	UNP P0DTC2
B	1286	GLN	-	expression tag	UNP P0DTC2
B	1287	PHE	-	expression tag	UNP P0DTC2
B	1288	GLU	-	expression tag	UNP P0DTC2
B	1289	LYS	-	expression tag	UNP P0DTC2
B	1290	GLY	-	expression tag	UNP P0DTC2
B	1291	GLY	-	expression tag	UNP P0DTC2
B	1292	GLY	-	expression tag	UNP P0DTC2
B	1293	SER	-	expression tag	UNP P0DTC2
B	1294	GLY	-	expression tag	UNP P0DTC2
B	1295	GLY	-	expression tag	UNP P0DTC2
B	1296	GLY	-	expression tag	UNP P0DTC2
B	1297	SER	-	expression tag	UNP P0DTC2
B	1298	GLY	-	expression tag	UNP P0DTC2
B	1299	GLY	-	expression tag	UNP P0DTC2
B	1300	SER	-	expression tag	UNP P0DTC2
B	1301	SER	-	expression tag	UNP P0DTC2
B	1302	ALA	-	expression tag	UNP P0DTC2
B	1303	TRP	-	expression tag	UNP P0DTC2
B	1304	SER	-	expression tag	UNP P0DTC2
B	1305	HIS	-	expression tag	UNP P0DTC2
B	1306	PRO	-	expression tag	UNP P0DTC2
B	1307	GLN	-	expression tag	UNP P0DTC2
B	1308	PHE	-	expression tag	UNP P0DTC2
B	1309	GLU	-	expression tag	UNP P0DTC2
B	1310	LYS	-	expression tag	UNP P0DTC2
C	18	PHE	LEU	variant	UNP P0DTC2
C	20	ASN	THR	variant	UNP P0DTC2
C	26	SER	PRO	variant	UNP P0DTC2
C	138	TYR	ASP	variant	UNP P0DTC2
C	190	SER	ARG	variant	UNP P0DTC2
C	417	THR	LYS	variant	UNP P0DTC2
C	484	LYS	GLU	variant	UNP P0DTC2
C	501	TYR	ASN	variant	UNP P0DTC2
C	614	GLY	ASP	variant	UNP P0DTC2
C	655	TYR	HIS	variant	UNP P0DTC2

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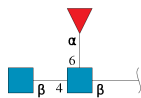
Chain	Residue	Modelled	Actual	Comment	Reference
C	1027	ILE	THR	variant	UNP P0DTC2
C	1176	PHE	VAL	variant	UNP P0DTC2
C	1274	LEU	-	expression tag	UNP P0DTC2
C	1275	GLU	-	expression tag	UNP P0DTC2
C	1276	SER	-	expression tag	UNP P0DTC2
C	1277	GLY	-	expression tag	UNP P0DTC2
C	1278	GLY	-	expression tag	UNP P0DTC2
C	1279	GLY	-	expression tag	UNP P0DTC2
C	1280	SER	-	expression tag	UNP P0DTC2
C	1281	ALA	-	expression tag	UNP P0DTC2
C	1282	TRP	-	expression tag	UNP P0DTC2
C	1283	SER	-	expression tag	UNP P0DTC2
C	1284	HIS	-	expression tag	UNP P0DTC2
C	1285	PRO	-	expression tag	UNP P0DTC2
C	1286	GLN	-	expression tag	UNP P0DTC2
C	1287	PHE	-	expression tag	UNP P0DTC2
C	1288	GLU	-	expression tag	UNP P0DTC2
C	1289	LYS	-	expression tag	UNP P0DTC2
C	1290	GLY	-	expression tag	UNP P0DTC2
C	1291	GLY	-	expression tag	UNP P0DTC2
C	1292	GLY	-	expression tag	UNP P0DTC2
C	1293	SER	-	expression tag	UNP P0DTC2
C	1294	GLY	-	expression tag	UNP P0DTC2
C	1295	GLY	-	expression tag	UNP P0DTC2
C	1296	GLY	-	expression tag	UNP P0DTC2
C	1297	SER	-	expression tag	UNP P0DTC2
C	1298	GLY	-	expression tag	UNP P0DTC2
C	1299	GLY	-	expression tag	UNP P0DTC2
C	1300	SER	-	expression tag	UNP P0DTC2
C	1301	SER	-	expression tag	UNP P0DTC2
C	1302	ALA	-	expression tag	UNP P0DTC2
C	1303	TRP	-	expression tag	UNP P0DTC2
C	1304	SER	-	expression tag	UNP P0DTC2
C	1305	HIS	-	expression tag	UNP P0DTC2
C	1306	PRO	-	expression tag	UNP P0DTC2
C	1307	GLN	-	expression tag	UNP P0DTC2
C	1308	PHE	-	expression tag	UNP P0DTC2
C	1309	GLU	-	expression tag	UNP P0DTC2
C	1310	LYS	-	expression tag	UNP P0DTC2

- Molecule 2 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	D	2	28	16	2	10	0	0
2	E	2	28	16	2	10	0	0
2	F	2	28	16	2	10	0	0
2	G	2	28	16	2	10	0	0
2	L	2	28	16	2	10	0	0
2	M	2	28	16	2	10	0	0
2	N	2	28	16	2	10	0	0
2	O	2	28	16	2	10	0	0
2	P	2	28	16	2	10	0	0
2	Q	2	28	16	2	10	0	0
2	V	2	28	16	2	10	0	0
2	W	2	28	16	2	10	0	0
2	X	2	28	16	2	10	0	0
2	Y	2	28	16	2	10	0	0
2	Z	2	28	16	2	10	0	0
2	a	2	28	16	2	10	0	0
2	b	2	28	16	2	10	0	0

- Molecule 3 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.



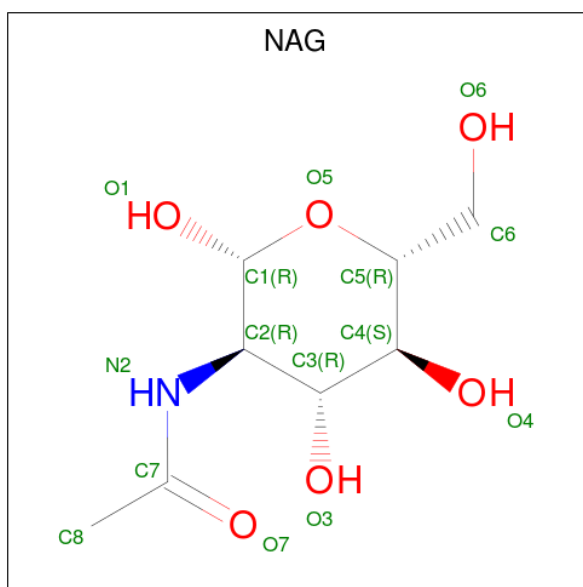
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
3	H	3	38	22	2	14	0	0
3	R	3	38	22	2	14	0	0
3	c	3	38	22	2	14	0	0

- Molecule 4 is an oligosaccharide called alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
4	I	3	39	22	2	15	0	0
4	J	3	39	22	2	15	0	0
4	K	3	39	22	2	15	0	0
4	S	3	39	22	2	15	0	0
4	T	3	39	22	2	15	0	0
4	U	3	39	22	2	15	0	0
4	d	3	39	22	2	15	0	0
4	e	3	39	22	2	15	0	0
4	f	3	39	22	2	15	0	0

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
5	A	1	154	88	11	55	0
5	A	1	154	88	11	55	0
5	A	1	154	88	11	55	0
5	A	1	154	88	11	55	0
5	A	1	154	88	11	55	0
5	A	1	154	88	11	55	0
5	A	1	154	88	11	55	0
5	A	1	154	88	11	55	0
5	A	1	154	88	11	55	0
5	A	1	154	88	11	55	0
5	A	1	154	88	11	55	0
5	B	1	126	72	9	45	0
5	B	1	126	72	9	45	0
5	B	1	126	72	9	45	0

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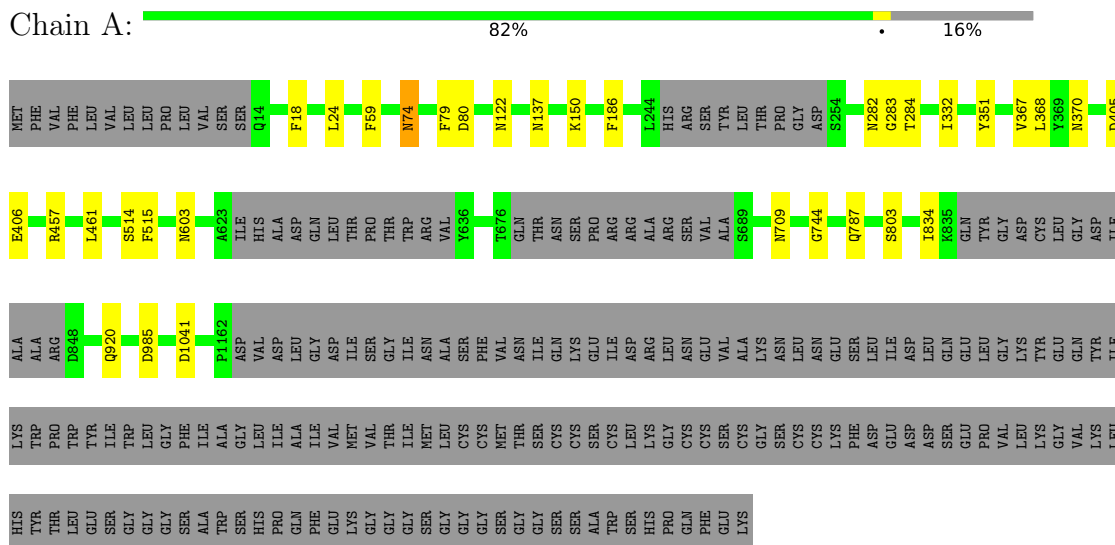
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Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
5	B	1	Total 126	C 72	N 9	O 45	0
5	B	1	Total 126	C 72	N 9	O 45	0
5	B	1	Total 126	C 72	N 9	O 45	0
5	B	1	Total 126	C 72	N 9	O 45	0
5	B	1	Total 126	C 72	N 9	O 45	0
5	B	1	Total 126	C 72	N 9	O 45	0
5	B	1	Total 126	C 72	N 9	O 45	0
5	C	1	Total 112	C 64	N 8	O 40	0
5	C	1	Total 112	C 64	N 8	O 40	0
5	C	1	Total 112	C 64	N 8	O 40	0
5	C	1	Total 112	C 64	N 8	O 40	0
5	C	1	Total 112	C 64	N 8	O 40	0
5	C	1	Total 112	C 64	N 8	O 40	0
5	C	1	Total 112	C 64	N 8	O 40	0
5	C	1	Total 112	C 64	N 8	O 40	0
5	C	1	Total 112	C 64	N 8	O 40	0

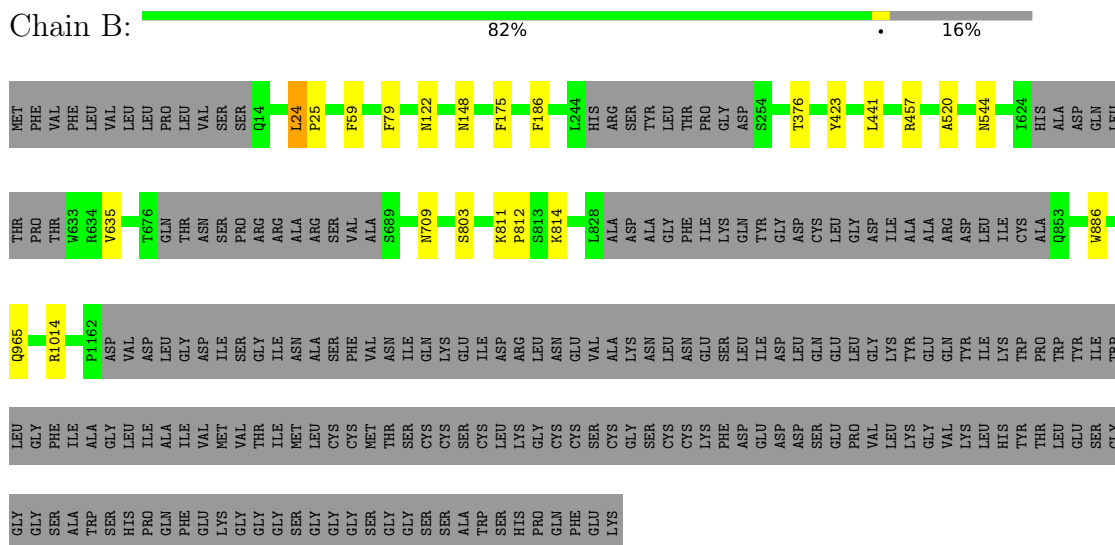
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.


- Molecule 1: Spike glycoprotein

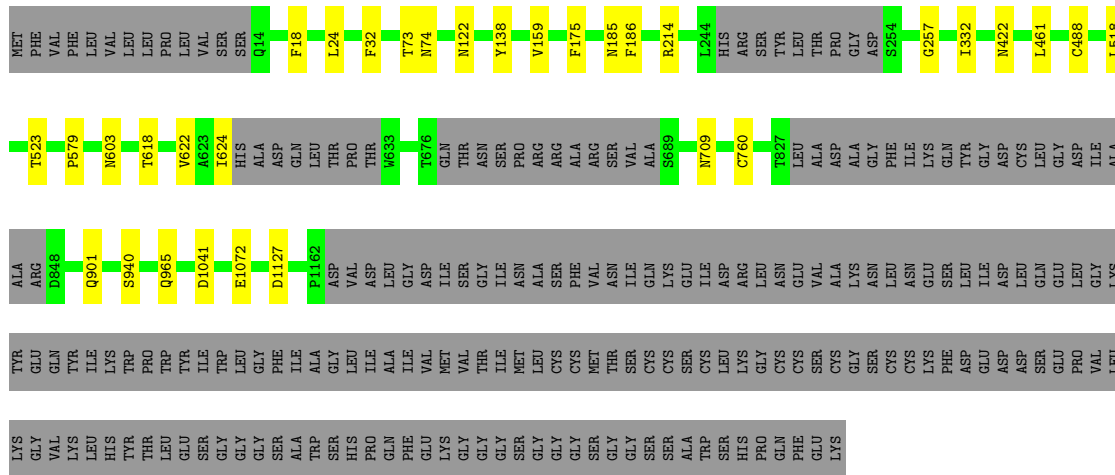


- Molecule 1: Spike glycoprotein



- Molecule 1: Spike glycoprotein

Chain C:  82% 16%



- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D:  100%

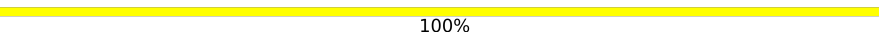
MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain E:  100%

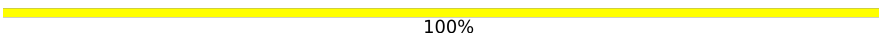
MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain F:  100%


MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:  100%

MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain L:  100%

MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain M:  50% 50%

MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain N:  50% 50%


MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain O:  50% 50%


MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain P:  100%

MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Q:  100%

MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain V:  100%

MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain W:  50% 50%

MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain X:  50% 50%

MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Y:  100%

MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Z:  50% 50%

MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain a:  100%

MAG1
MAG2

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain b:  100%

MAG1
MAG2

- Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain H:  100%

MAG1
MAG2
FUC3

- Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain R: 100%

MAG1
MAG2
FUC3

- Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain c: 33% 67%

MAG1
MAG2
FUC3

- Molecule 4: alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain I: 100%

MAG1
MAG2
MAN3

- Molecule 4: alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain J: 100%

MAG1
MAG2
MAN3

- Molecule 4: alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain K: 100%


MAG1
MAG2
MAN3

- Molecule 4: alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain S: 100%



MAG1
MAG2
MAN3

- Molecule 4: alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain T:  100%

MAG1
MAG2
MAN3

- Molecule 4: alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain U:  33%  67%


MAG1
MAG2
MAN3

- Molecule 4: alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain d:  100%

MAG1
MAG2
MAN3

- Molecule 4: alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain e:  100%

MAG1
MAG2
MAN3

- Molecule 4: alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain f:  33%  67%

MAG1
MAG2
MAN3

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	36346	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	54.72	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: FUC, NAG, MAN

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.64	1/8827 (0.0%)	0.91	0/12007
1	B	0.64	0/8783	0.93	0/11949
1	C	0.65	0/8810	0.93	0/11986
All	All	0.64	1/26420 (0.0%)	0.92	0/35942

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	18	PHE	C-N	-5.20	1.22	1.34

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	1094/1310 (84%)	1004 (92%)	74 (7%)	16 (2%)	10	45
1	B	1086/1310 (83%)	988 (91%)	86 (8%)	12 (1%)	14	52
1	C	1090/1310 (83%)	995 (91%)	85 (8%)	10 (1%)	17	56
All	All	3270/3930 (83%)	2987 (91%)	245 (8%)	38 (1%)	17	50

5 of 38 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	24	LEU
1	A	920	GLN
1	B	148	ASN
1	B	520	ALA
1	B	635	VAL

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	962/1135 (85%)	945 (98%)	17 (2%)	59	81
1	B	958/1135 (84%)	946 (99%)	12 (1%)	69	86
1	C	961/1135 (85%)	939 (98%)	22 (2%)	50	77
All	All	2881/3405 (85%)	2830 (98%)	51 (2%)	61	81

5 of 51 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	1014	ARG
1	C	185	ASN
1	C	1072	GLU
1	C	18	PHE
1	C	122	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 11 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	564	GLN
1	C	580	GLN
1	C	957	GLN
1	C	613	GLN
1	B	23	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

70 monosaccharides are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z > 2$	Counts	RMSZ	# $ Z > 2$
2	NAG	D	1	1,2	14,14,15	1.27	1 (7%)	17,19,21	1.17	2 (11%)
2	NAG	D	2	2	14,14,15	1.10	1 (7%)	17,19,21	0.85	1 (5%)
2	NAG	E	1	1,2	14,14,15	1.19	1 (7%)	17,19,21	1.11	2 (11%)
2	NAG	E	2	2	14,14,15	1.27	2 (14%)	17,19,21	0.94	0
2	NAG	F	1	1,2	14,14,15	1.23	2 (14%)	17,19,21	1.06	2 (11%)
2	NAG	F	2	2	14,14,15	1.24	2 (14%)	17,19,21	0.94	0
2	NAG	G	1	1,2	14,14,15	1.19	1 (7%)	17,19,21	0.93	0
2	NAG	G	2	2	14,14,15	1.19	1 (7%)	17,19,21	0.75	0
3	NAG	H	1	1,3	14,14,15	1.26	2 (14%)	17,19,21	1.10	2 (11%)
3	NAG	H	2	3	14,14,15	1.23	2 (14%)	17,19,21	1.21	1 (5%)
3	FUC	H	3	3	10,10,11	1.81	2 (20%)	14,14,16	1.32	2 (14%)
4	NAG	I	1	1,4	14,14,15	1.33	2 (14%)	17,19,21	1.24	3 (17%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	NAG	I	2	4	14,14,15	1.50	4 (28%)	17,19,21	0.99	1 (5%)
4	MAN	I	3	4	11,11,12	1.46	2 (18%)	15,15,17	0.91	1 (6%)
4	NAG	J	1	1,4	14,14,15	1.13	1 (7%)	17,19,21	0.68	0
4	NAG	J	2	4	14,14,15	1.21	2 (14%)	17,19,21	1.06	1 (5%)
4	MAN	J	3	4	11,11,12	1.42	2 (18%)	15,15,17	1.04	1 (6%)
4	NAG	K	1	1,4	14,14,15	1.31	3 (21%)	17,19,21	2.14	3 (17%)
4	NAG	K	2	4	14,14,15	1.74	4 (28%)	17,19,21	1.86	2 (11%)
4	MAN	K	3	4	11,11,12	1.43	2 (18%)	15,15,17	1.17	2 (13%)
2	NAG	L	1	1,2	14,14,15	1.33	2 (14%)	17,19,21	0.84	1 (5%)
2	NAG	L	2	2	14,14,15	1.27	2 (14%)	17,19,21	0.85	1 (5%)
2	NAG	M	1	1,2	14,14,15	0.24	0	17,19,21	0.50	0
2	NAG	M	2	2	14,14,15	1.12	1 (7%)	17,19,21	1.26	1 (5%)
2	NAG	N	1	1,2	14,14,15	0.28	0	17,19,21	0.44	0
2	NAG	N	2	2	14,14,15	1.15	1 (7%)	17,19,21	0.98	1 (5%)
2	NAG	O	1	1,2	14,14,15	0.27	0	17,19,21	0.44	0
2	NAG	O	2	2	14,14,15	1.13	1 (7%)	17,19,21	1.17	1 (5%)
2	NAG	P	1	1,2	14,14,15	1.06	1 (7%)	17,19,21	0.99	1 (5%)
2	NAG	P	2	2	14,14,15	1.18	1 (7%)	17,19,21	0.97	1 (5%)
2	NAG	Q	1	1,2	14,14,15	1.15	1 (7%)	17,19,21	1.07	0
2	NAG	Q	2	2	14,14,15	1.46	2 (14%)	17,19,21	0.76	0
3	NAG	R	1	1,3	14,14,15	0.25	0	17,19,21	0.89	1 (5%)
3	NAG	R	2	3	14,14,15	1.05	1 (7%)	17,19,21	0.95	1 (5%)
3	FUC	R	3	3	10,10,11	1.49	2 (20%)	14,14,16	1.64	3 (21%)
4	NAG	S	1	1,4	14,14,15	1.12	1 (7%)	17,19,21	1.11	2 (11%)
4	NAG	S	2	4	14,14,15	1.25	2 (14%)	17,19,21	0.73	0
4	MAN	S	3	4	11,11,12	1.27	2 (18%)	15,15,17	1.00	0
4	NAG	T	1	1,4	14,14,15	1.49	2 (14%)	17,19,21	1.04	1 (5%)
4	NAG	T	2	4	14,14,15	1.27	2 (14%)	17,19,21	1.57	2 (11%)
4	MAN	T	3	4	11,11,12	1.55	2 (18%)	15,15,17	1.07	2 (13%)
4	NAG	U	1	1,4	14,14,15	0.23	0	17,19,21	0.48	0
4	NAG	U	2	4	14,14,15	1.17	2 (14%)	17,19,21	1.23	3 (17%)
4	MAN	U	3	4	11,11,12	1.45	2 (18%)	15,15,17	1.01	1 (6%)
2	NAG	V	1	1,2	14,14,15	1.32	2 (14%)	17,19,21	0.84	1 (5%)
2	NAG	V	2	2	14,14,15	1.27	2 (14%)	17,19,21	0.85	1 (5%)
2	NAG	W	1	1,2	14,14,15	0.32	0	17,19,21	0.56	0
2	NAG	W	2	2	14,14,15	1.00	1 (7%)	17,19,21	0.82	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	NAG	X	1	1,2	14,14,15	0.28	0	17,19,21	0.55	0
2	NAG	X	2	2	14,14,15	1.01	1 (7%)	17,19,21	1.22	1 (5%)
2	NAG	Y	1	1,2	14,14,15	1.31	2 (14%)	17,19,21	1.50	3 (17%)
2	NAG	Y	2	2	14,14,15	1.26	2 (14%)	17,19,21	0.97	1 (5%)
2	NAG	Z	1	1,2	14,14,15	0.20	0	17,19,21	0.43	0
2	NAG	Z	2	2	14,14,15	1.05	1 (7%)	17,19,21	0.79	0
2	NAG	a	1	1,2	14,14,15	1.20	2 (14%)	17,19,21	0.74	0
2	NAG	a	2	2	14,14,15	1.33	2 (14%)	17,19,21	1.07	1 (5%)
2	NAG	b	1	1,2	14,14,15	0.97	1 (7%)	17,19,21	0.97	1 (5%)
2	NAG	b	2	2	14,14,15	1.15	1 (7%)	17,19,21	0.90	1 (5%)
3	NAG	c	1	1,3	14,14,15	0.20	0	17,19,21	0.82	1 (5%)
3	NAG	c	2	3	14,14,15	0.28	0	17,19,21	0.59	0
3	FUC	c	3	3	10,10,11	1.58	2 (20%)	14,14,16	1.43	2 (14%)
4	NAG	d	1	1,4	14,14,15	1.18	2 (14%)	17,19,21	1.06	1 (5%)
4	NAG	d	2	4	14,14,15	1.41	2 (14%)	17,19,21	0.93	1 (5%)
4	MAN	d	3	4	11,11,12	1.48	2 (18%)	15,15,17	0.88	1 (6%)
4	NAG	e	1	1,4	14,14,15	1.11	1 (7%)	17,19,21	0.97	0
4	NAG	e	2	4	14,14,15	1.31	2 (14%)	17,19,21	0.70	0
4	MAN	e	3	4	11,11,12	1.57	2 (18%)	15,15,17	1.09	2 (13%)
4	NAG	f	1	1,4	14,14,15	0.24	0	17,19,21	0.49	0
4	NAG	f	2	4	14,14,15	1.22	2 (14%)	17,19,21	1.01	1 (5%)
4	MAN	f	3	4	11,11,12	1.43	2 (18%)	15,15,17	1.02	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	D	1	1,2	-	2/6/23/26	0/1/1/1
2	NAG	D	2	2	-	0/6/23/26	0/1/1/1
2	NAG	E	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	E	2	2	-	0/6/23/26	0/1/1/1
2	NAG	F	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	F	2	2	-	0/6/23/26	0/1/1/1
2	NAG	G	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	G	2	2	-	0/6/23/26	0/1/1/1
3	NAG	H	1	1,3	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	H	2	3	-	0/6/23/26	0/1/1/1
3	FUC	H	3	3	-	-	0/1/1/1
4	NAG	I	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	I	2	4	-	0/6/23/26	0/1/1/1
4	MAN	I	3	4	-	1/2/19/22	0/1/1/1
4	NAG	J	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	J	2	4	-	0/6/23/26	0/1/1/1
4	MAN	J	3	4	-	0/2/19/22	0/1/1/1
4	NAG	K	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	K	2	4	-	4/6/23/26	0/1/1/1
4	MAN	K	3	4	-	0/2/19/22	0/1/1/1
2	NAG	L	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	L	2	2	-	0/6/23/26	0/1/1/1
2	NAG	M	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	M	2	2	-	0/6/23/26	0/1/1/1
2	NAG	N	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	N	2	2	-	0/6/23/26	0/1/1/1
2	NAG	O	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	O	2	2	-	0/6/23/26	0/1/1/1
2	NAG	P	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	P	2	2	-	0/6/23/26	0/1/1/1
2	NAG	Q	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	Q	2	2	-	0/6/23/26	0/1/1/1
3	NAG	R	1	1,3	-	2/6/23/26	0/1/1/1
3	NAG	R	2	3	-	0/6/23/26	0/1/1/1
3	FUC	R	3	3	-	-	0/1/1/1
4	NAG	S	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	S	2	4	-	0/6/23/26	0/1/1/1
4	MAN	S	3	4	-	2/2/19/22	0/1/1/1
4	NAG	T	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	T	2	4	-	0/6/23/26	0/1/1/1
4	MAN	T	3	4	-	0/2/19/22	1/1/1/1
4	NAG	U	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	U	2	4	-	2/6/23/26	0/1/1/1
4	MAN	U	3	4	-	0/2/19/22	1/1/1/1
2	NAG	V	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	V	2	2	-	0/6/23/26	0/1/1/1
2	NAG	W	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	W	2	2	-	0/6/23/26	0/1/1/1
2	NAG	X	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	X	2	2	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	Y	1	1,2	-	2/6/23/26	0/1/1/1
2	NAG	Y	2	2	-	0/6/23/26	0/1/1/1
2	NAG	Z	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	Z	2	2	-	0/6/23/26	0/1/1/1
2	NAG	a	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	a	2	2	-	0/6/23/26	0/1/1/1
2	NAG	b	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	b	2	2	-	0/6/23/26	0/1/1/1
3	NAG	c	1	1,3	-	2/6/23/26	0/1/1/1
3	NAG	c	2	3	-	0/6/23/26	0/1/1/1
3	FUC	c	3	3	-	-	0/1/1/1
4	NAG	d	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	d	2	4	-	0/6/23/26	0/1/1/1
4	MAN	d	3	4	-	1/2/19/22	0/1/1/1
4	NAG	e	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	e	2	4	-	0/6/23/26	0/1/1/1
4	MAN	e	3	4	-	0/2/19/22	1/1/1/1
4	NAG	f	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	f	2	4	-	0/6/23/26	0/1/1/1
4	MAN	f	3	4	-	0/2/19/22	0/1/1/1

The worst 5 of 103 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	1	NAG	O5-C1	-4.65	1.36	1.43
4	T	1	NAG	O5-C5	3.76	1.51	1.43
4	T	3	MAN	O5-C5	3.35	1.50	1.43
4	e	3	MAN	O5-C5	3.33	1.50	1.43
4	K	2	NAG	O5-C1	3.26	1.48	1.43

The worst 5 of 68 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	K	1	NAG	C1-O5-C5	7.28	122.06	112.19
4	K	2	NAG	C4-C3-C2	5.32	118.82	111.02
2	M	2	NAG	C1-O5-C5	4.55	118.35	112.19
4	K	2	NAG	O5-C5-C6	4.39	114.08	107.20
2	O	2	NAG	C1-O5-C5	4.19	117.87	112.19

There are no chirality outliers.

5 of 26 torsion outliers are listed below:

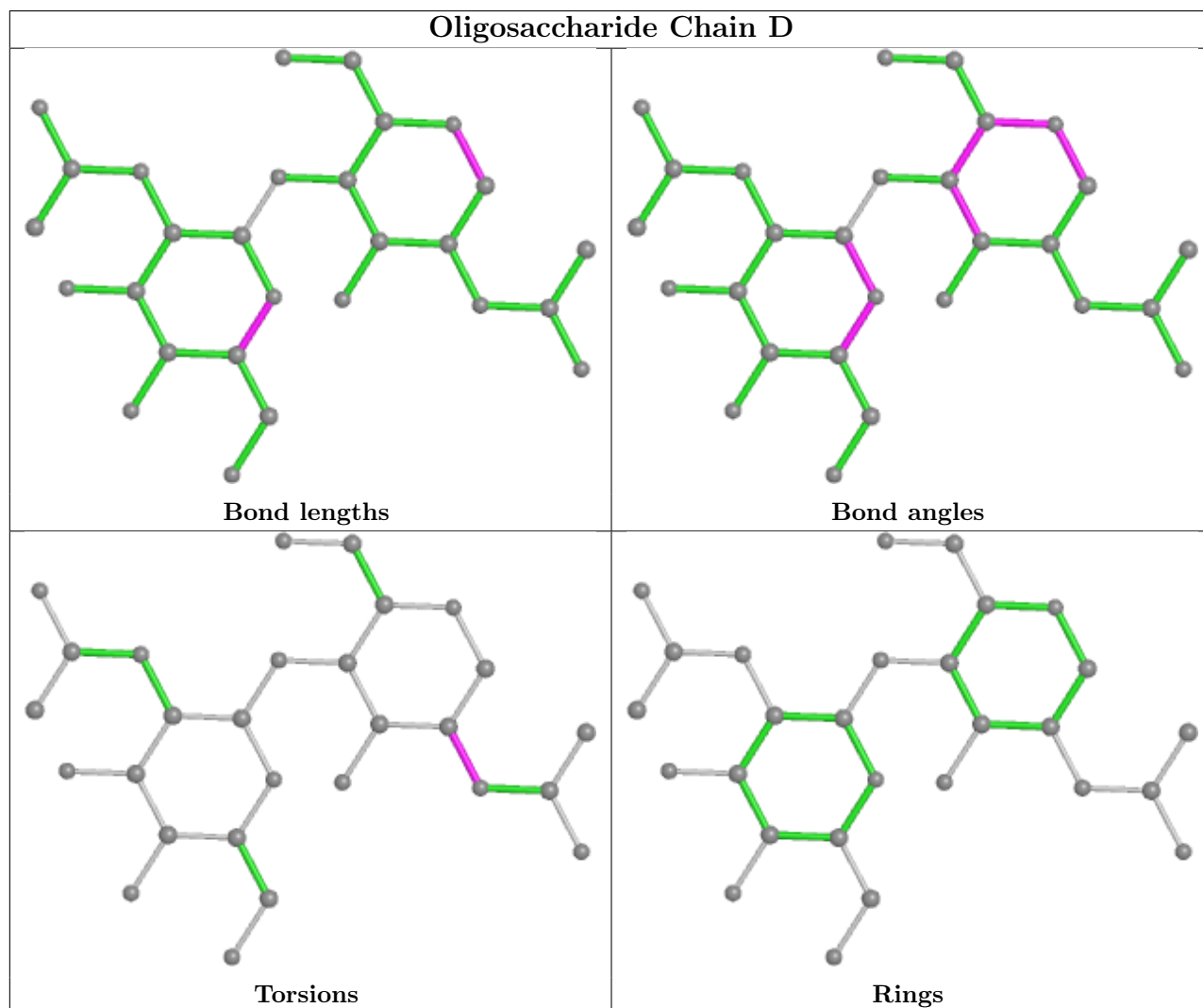
Mol	Chain	Res	Type	Atoms
3	H	1	NAG	O5-C5-C6-O6
3	R	1	NAG	O5-C5-C6-O6
4	U	2	NAG	C8-C7-N2-C2
3	H	1	NAG	C4-C5-C6-O6
3	c	1	NAG	O5-C5-C6-O6

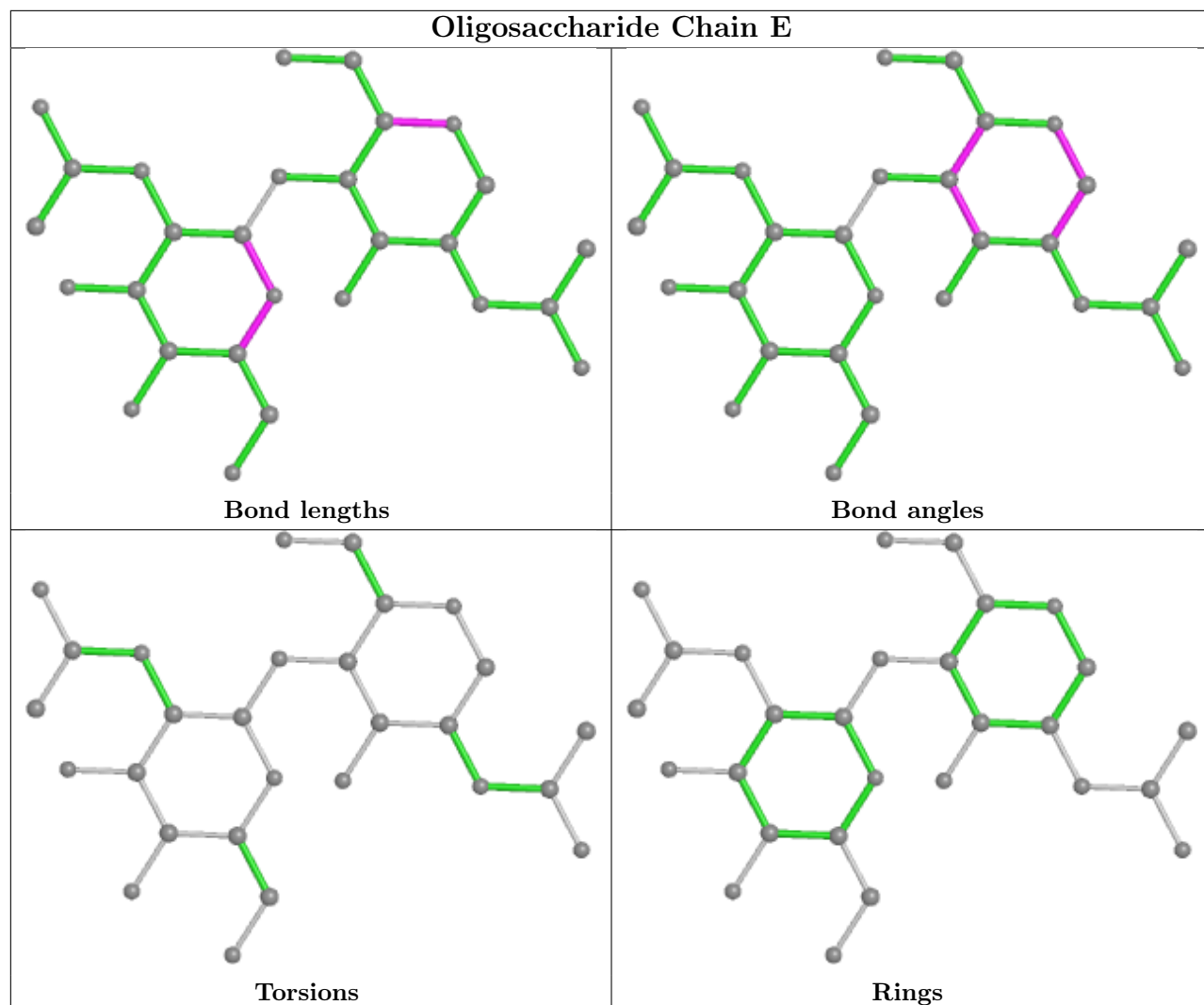
All (3) ring outliers are listed below:

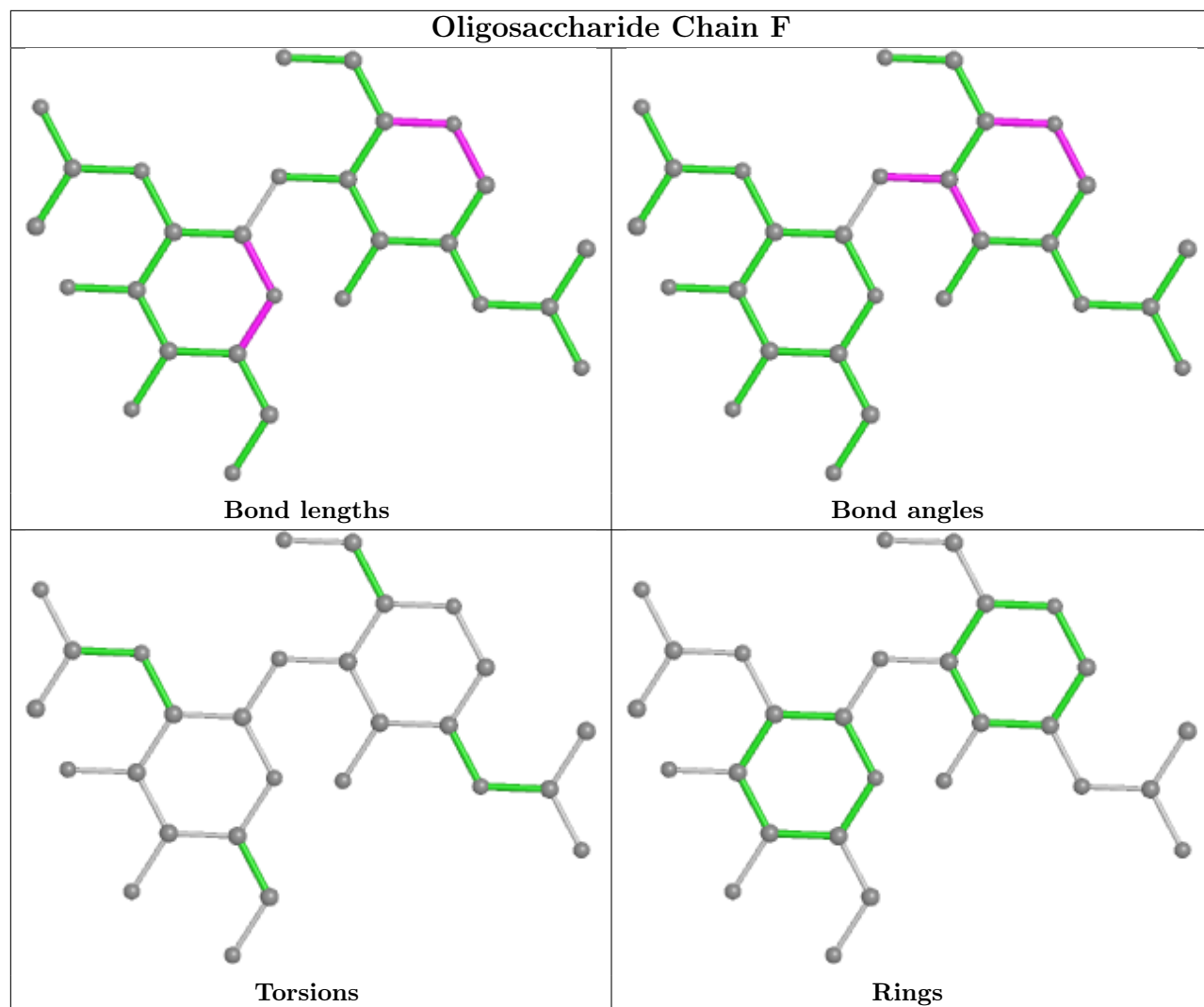
Mol	Chain	Res	Type	Atoms
4	U	3	MAN	C1-C2-C3-C4-C5-O5
4	T	3	MAN	C1-C2-C3-C4-C5-O5
4	e	3	MAN	C1-C2-C3-C4-C5-O5

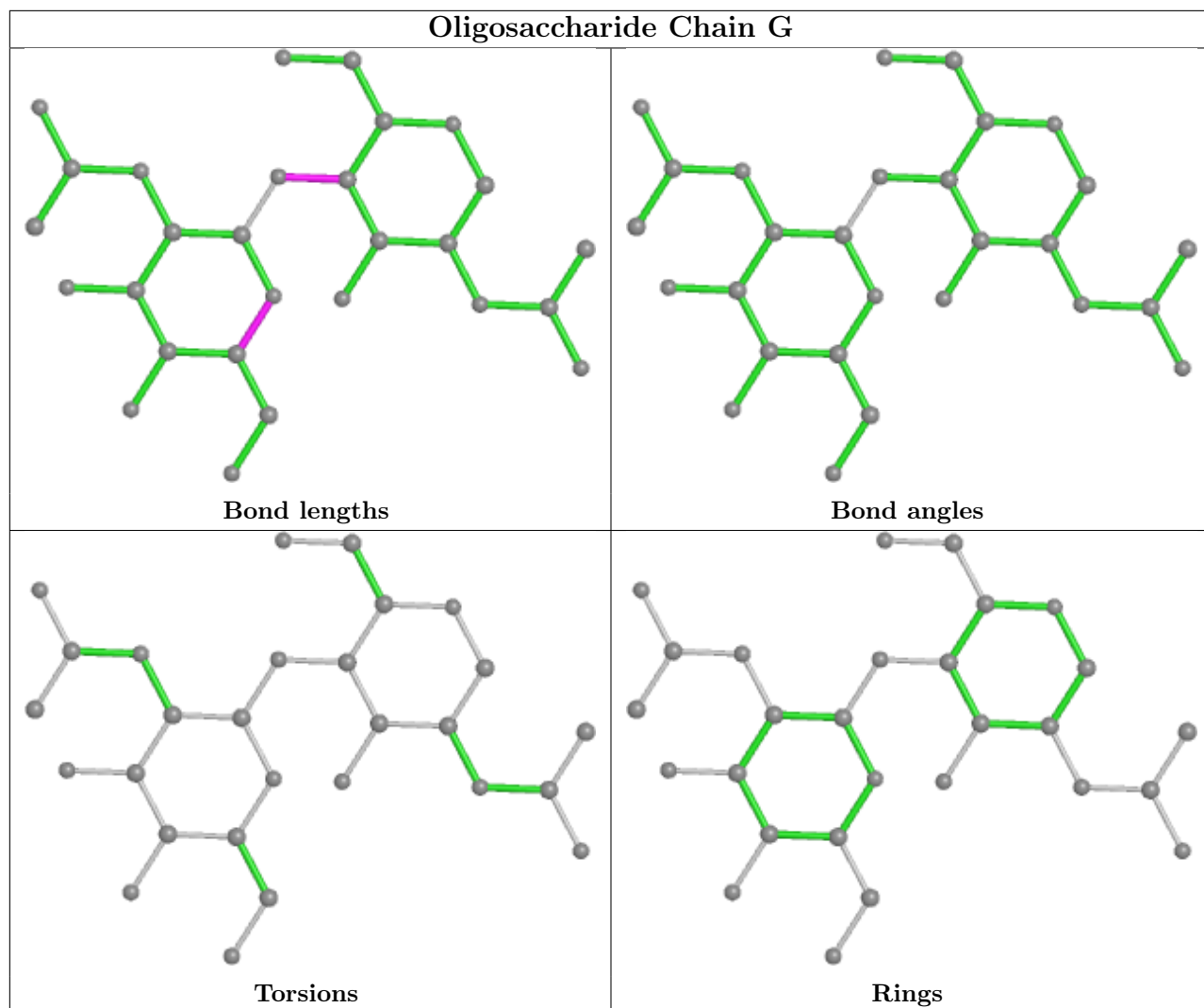
No monomer is involved in short contacts.

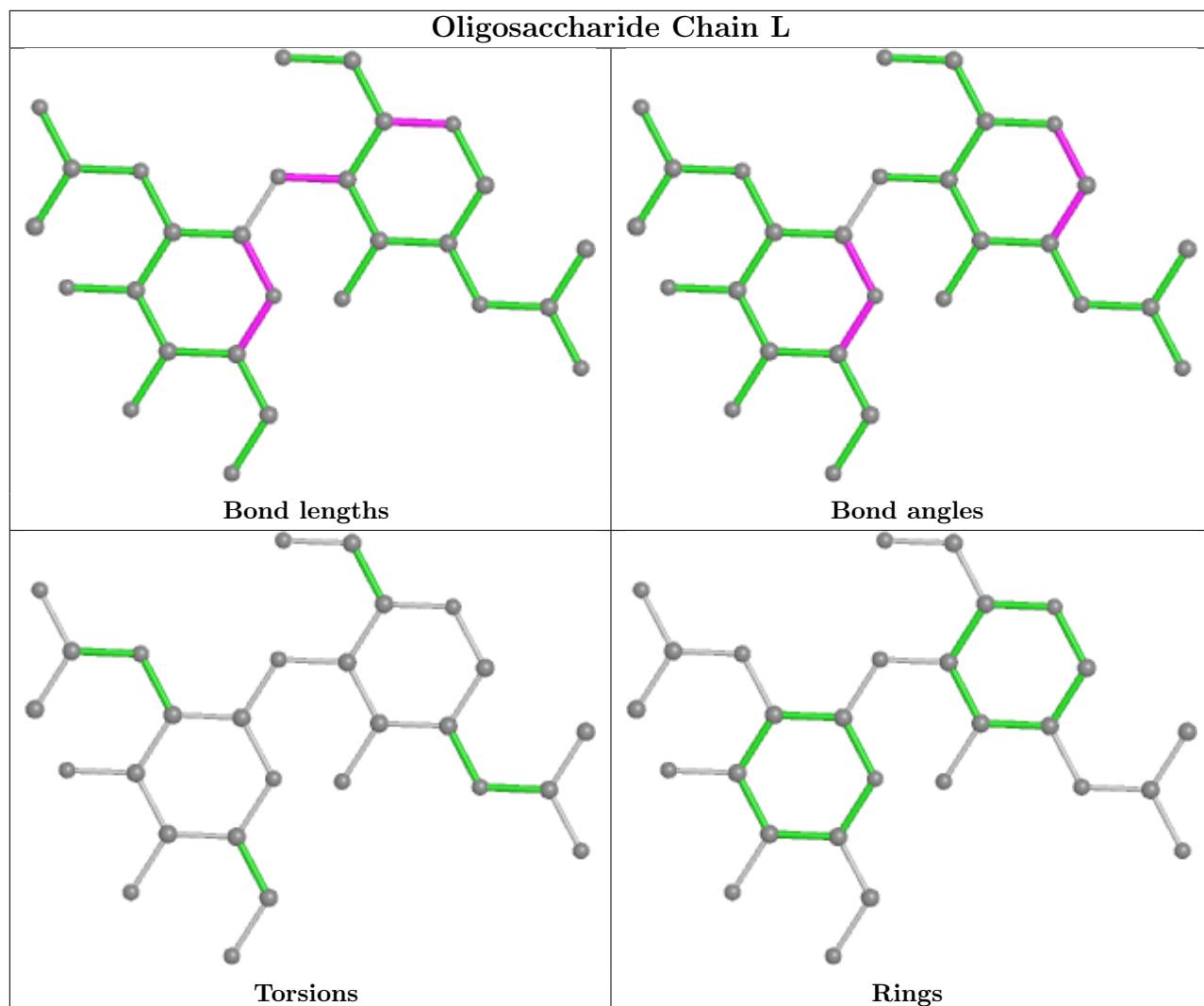
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

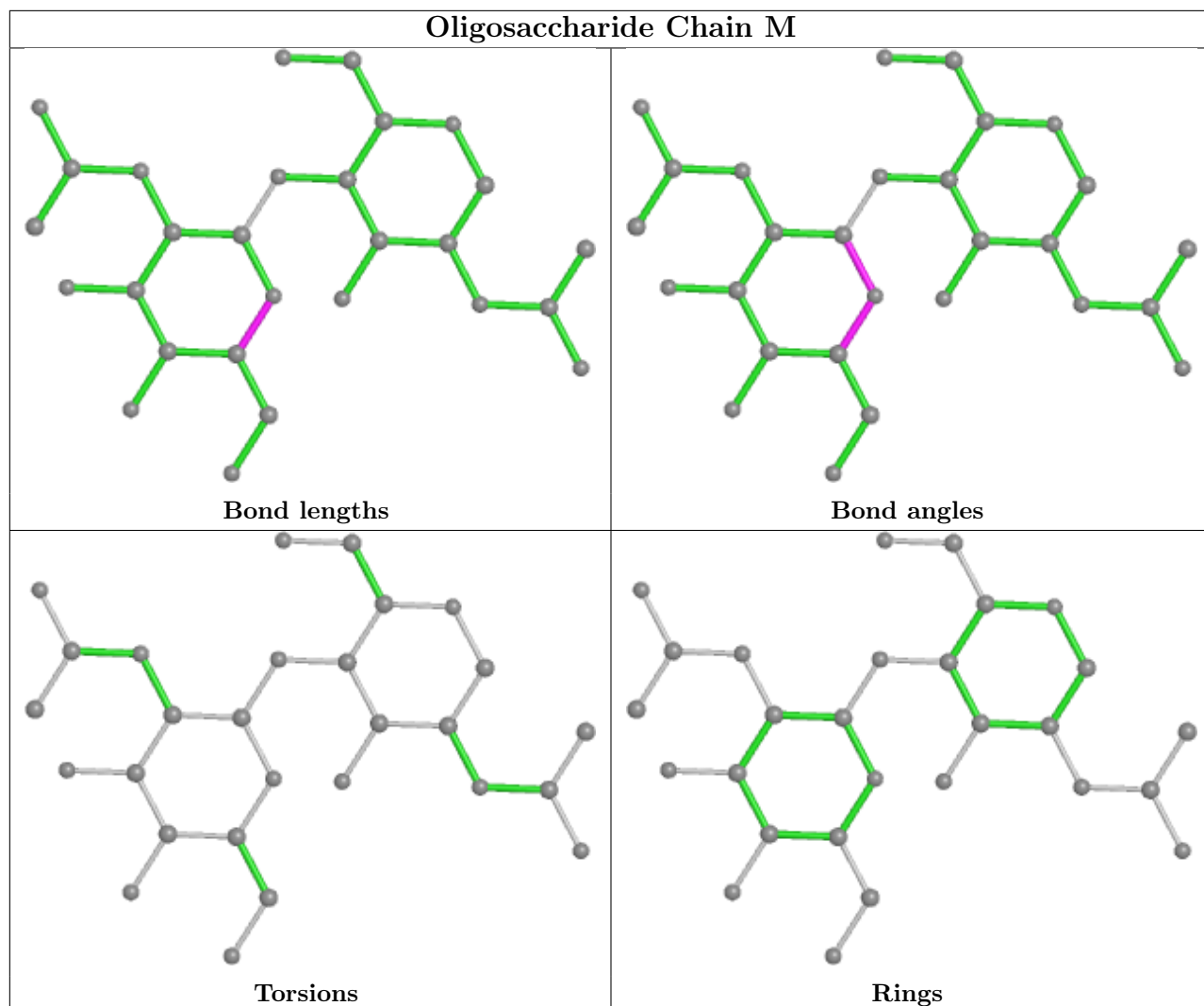


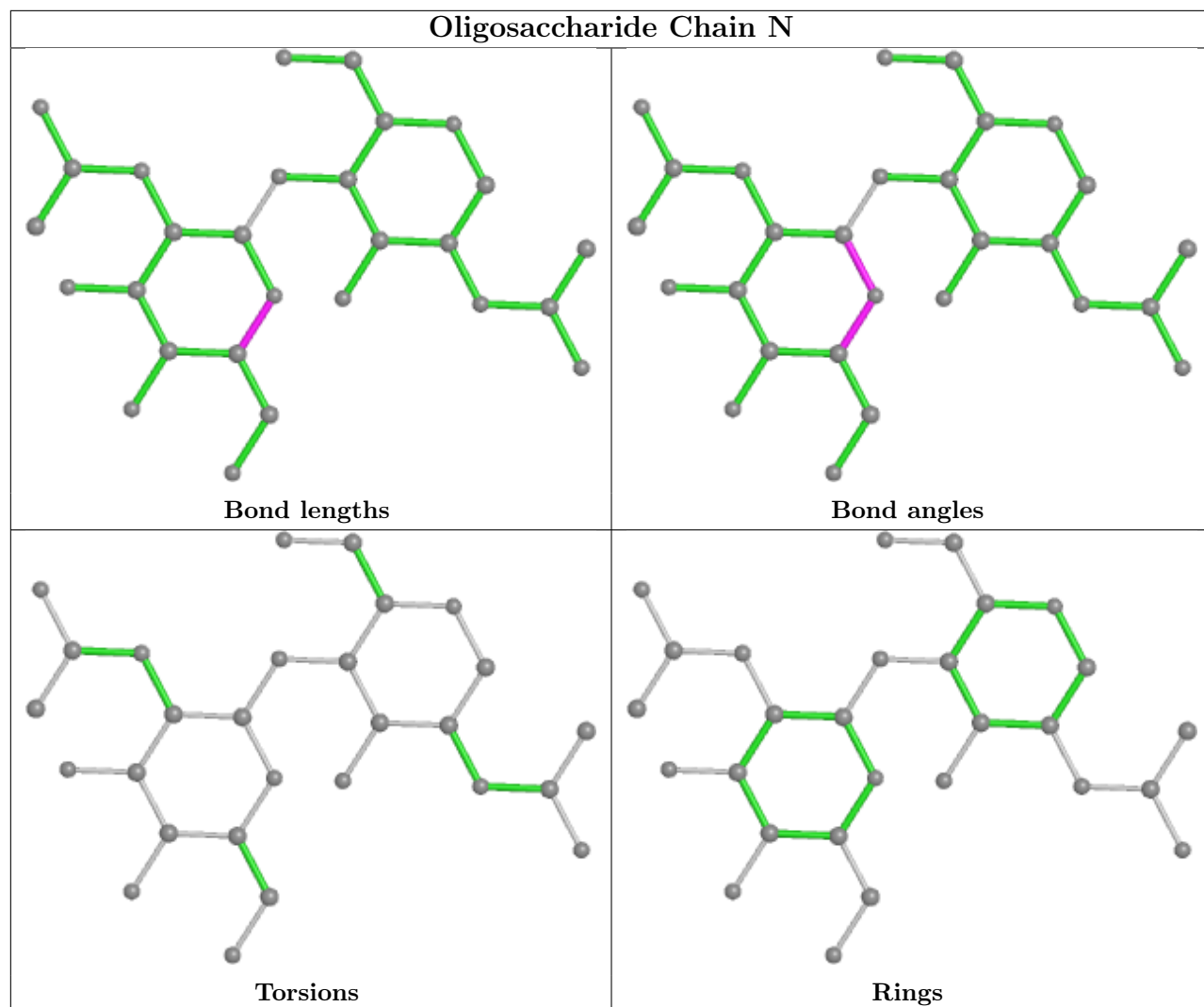


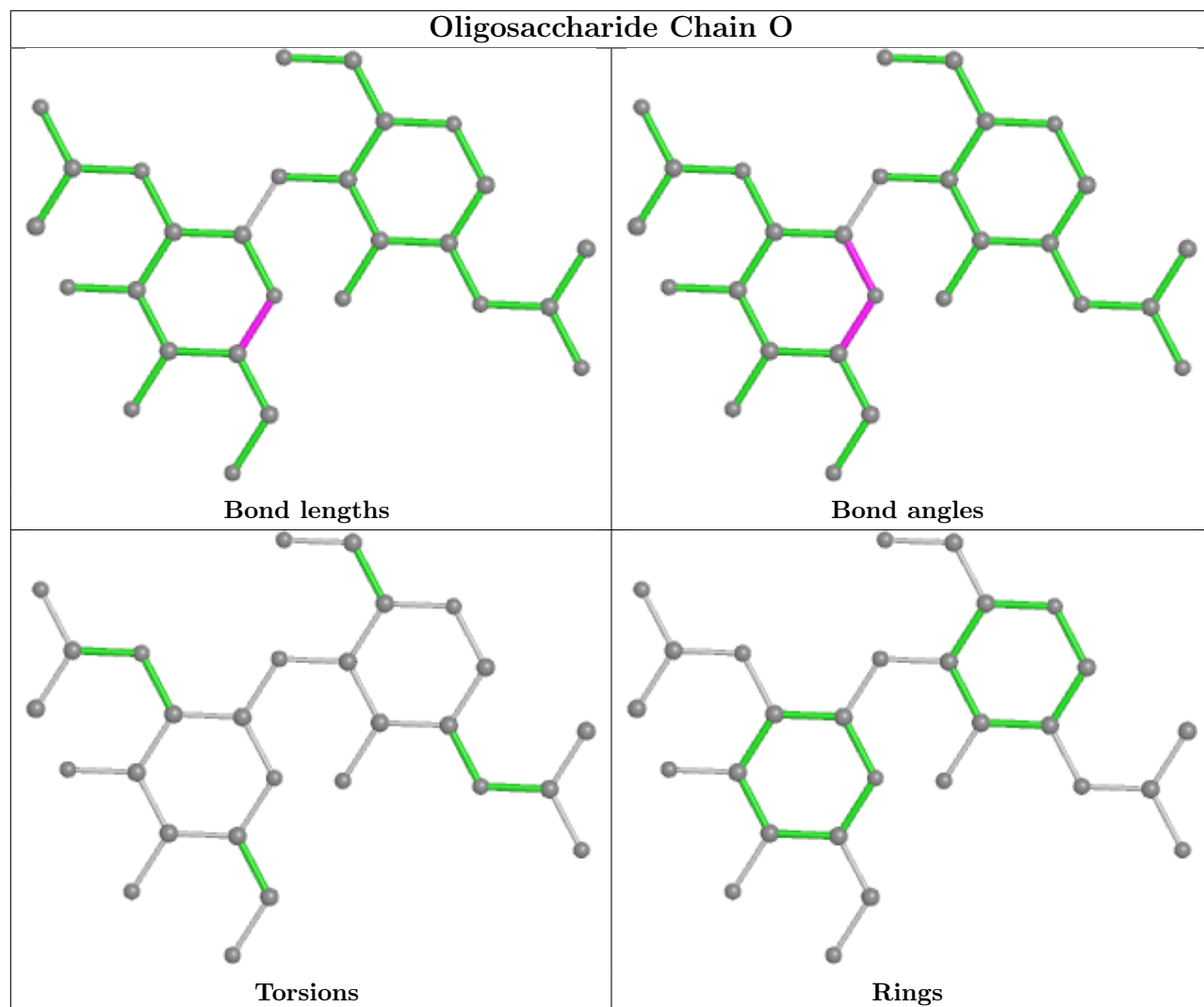


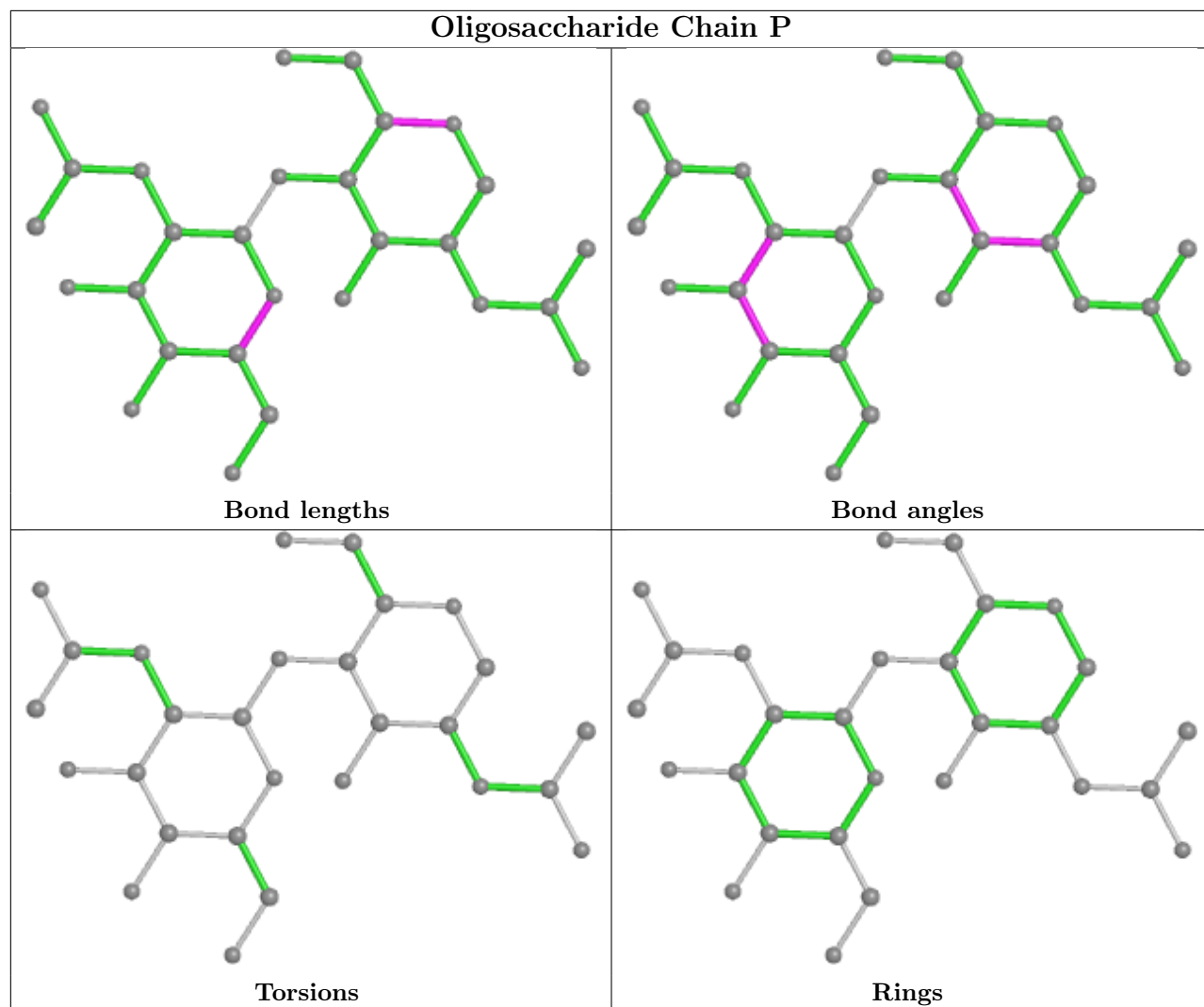


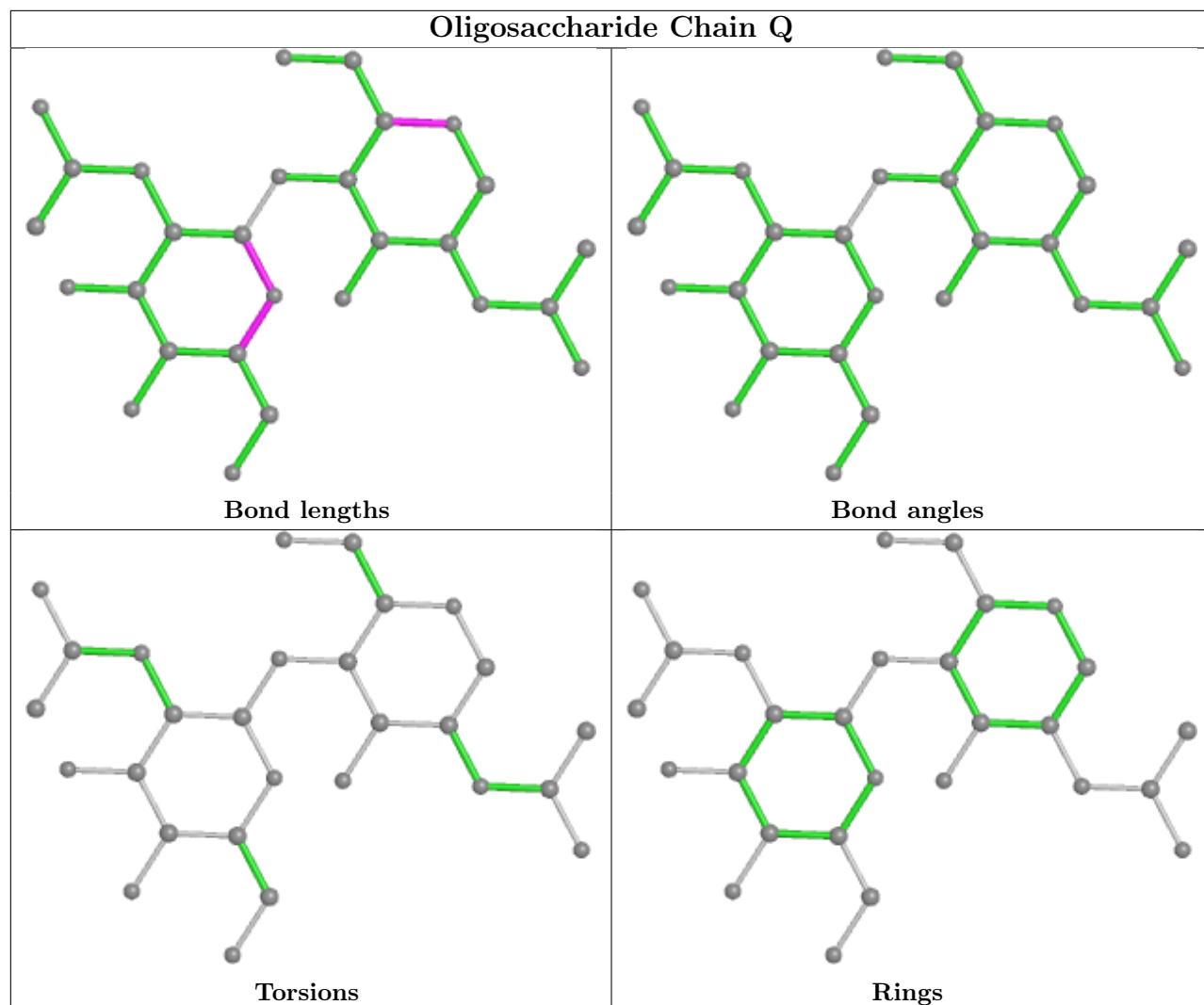


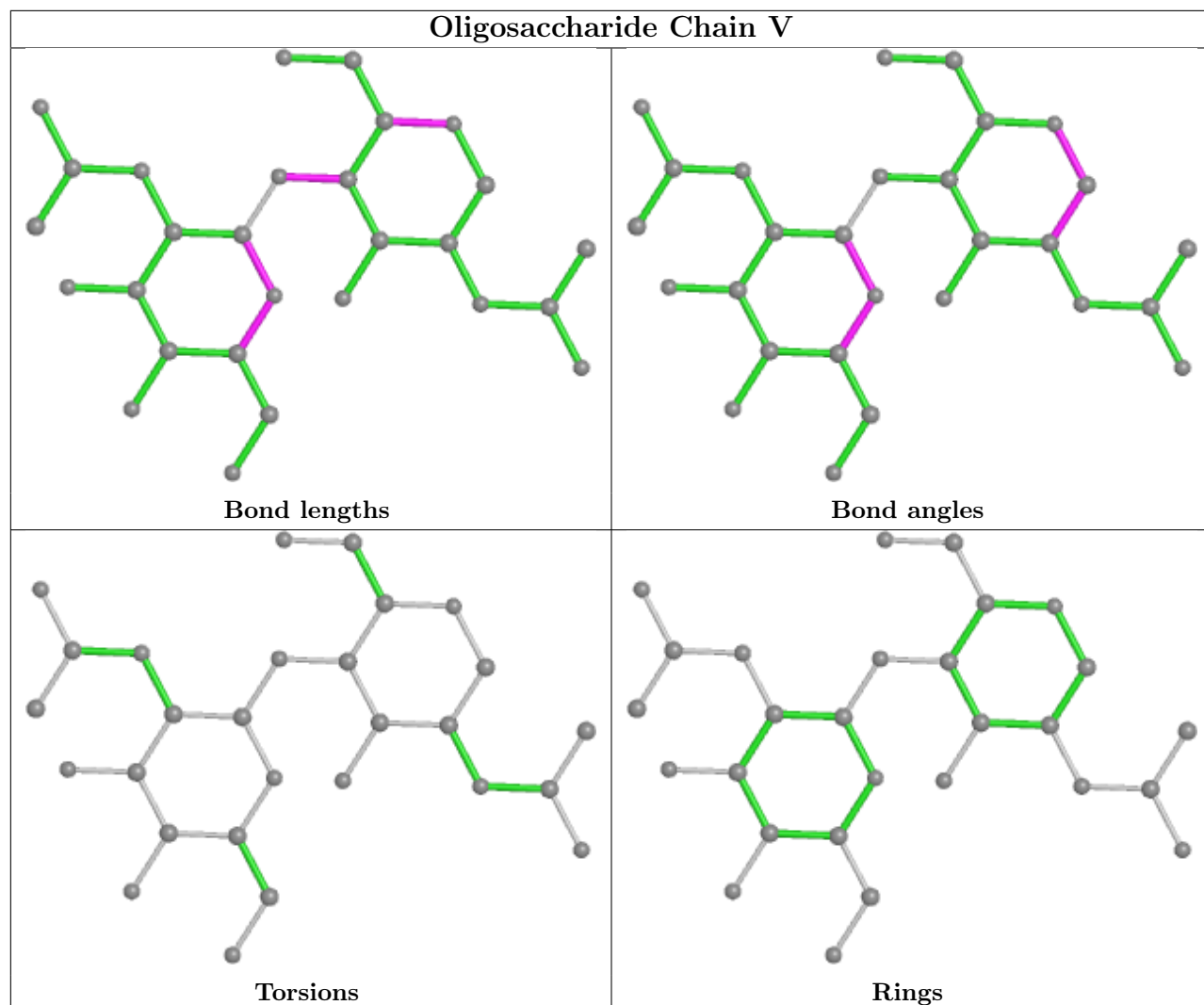


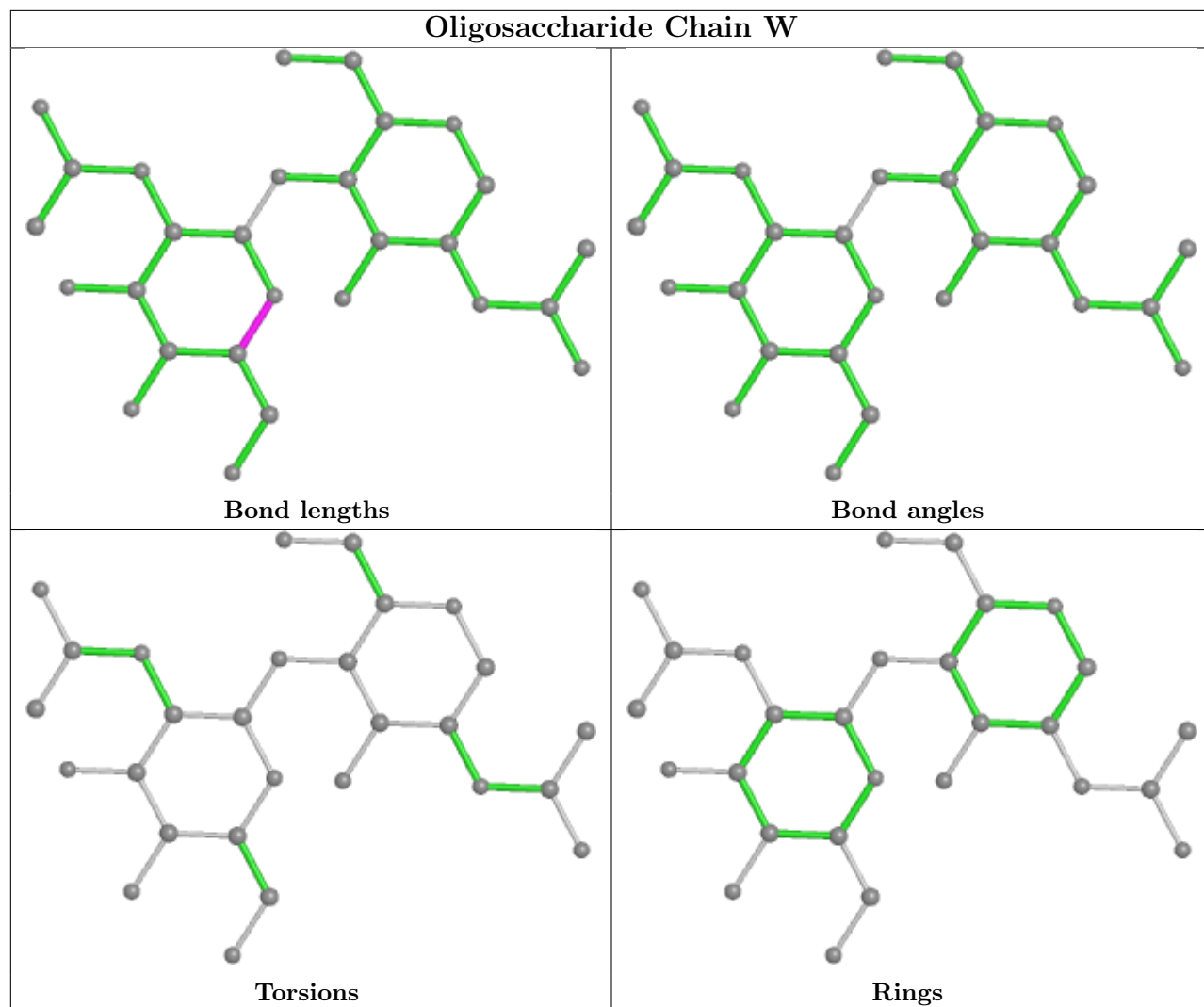


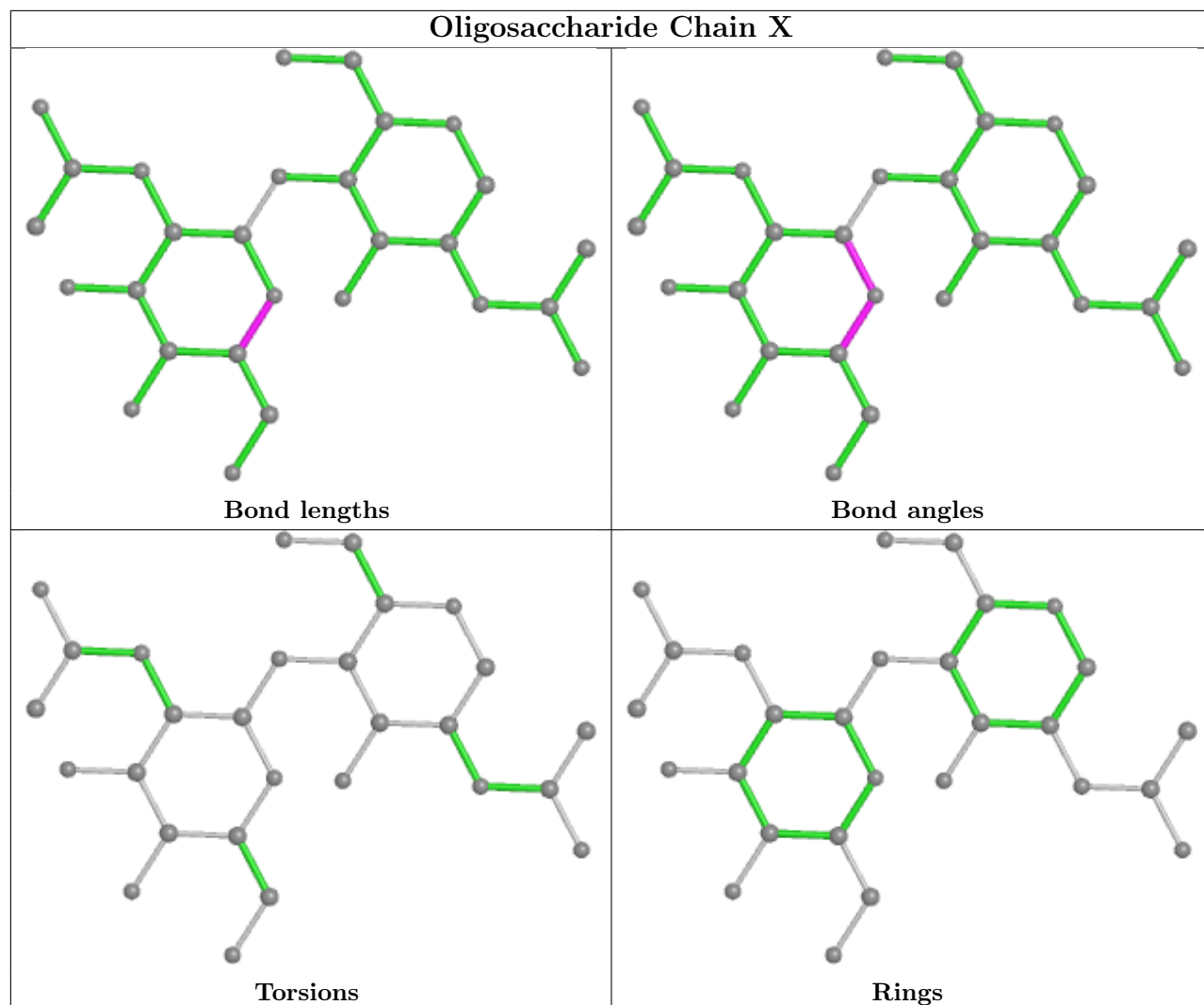


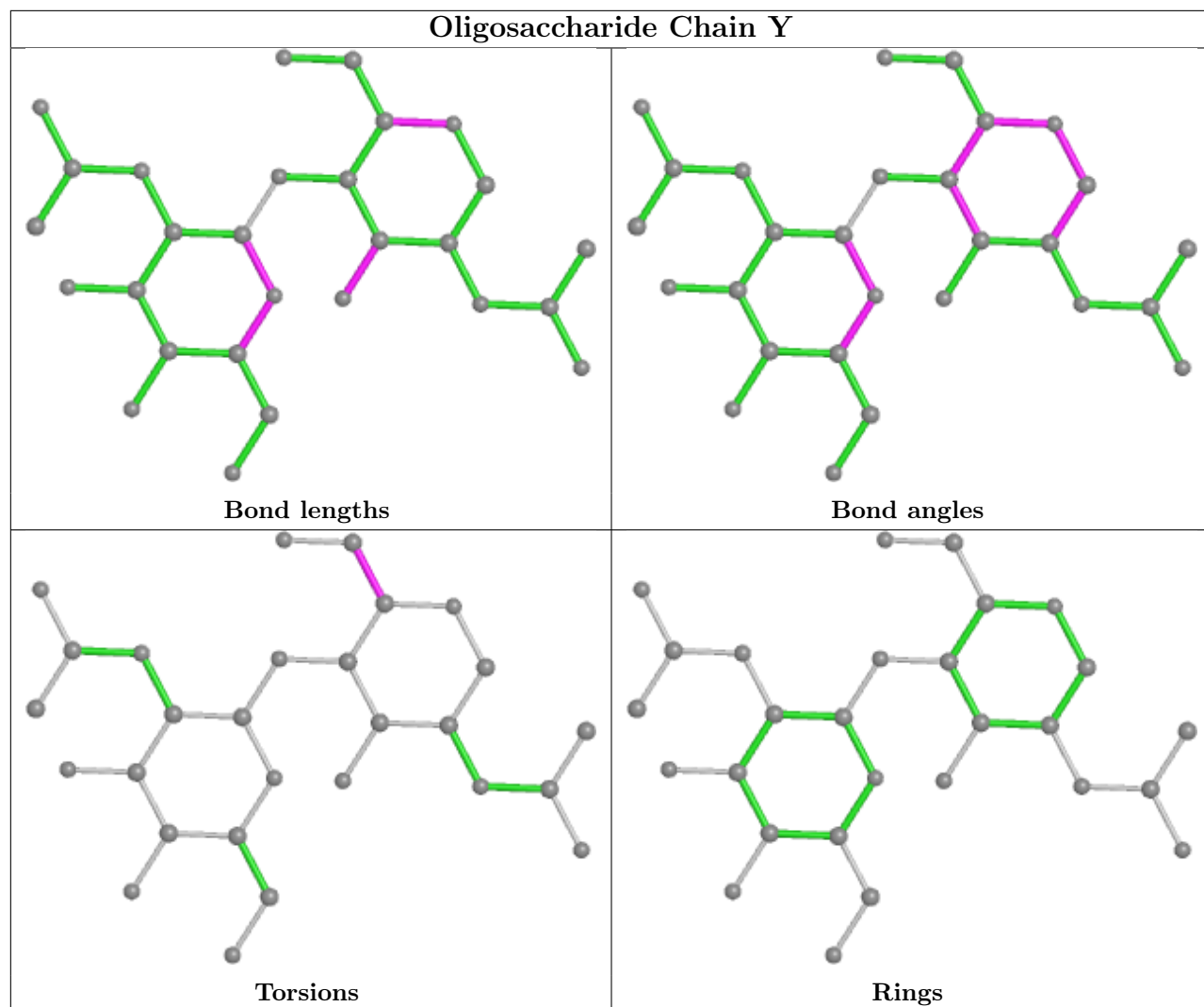


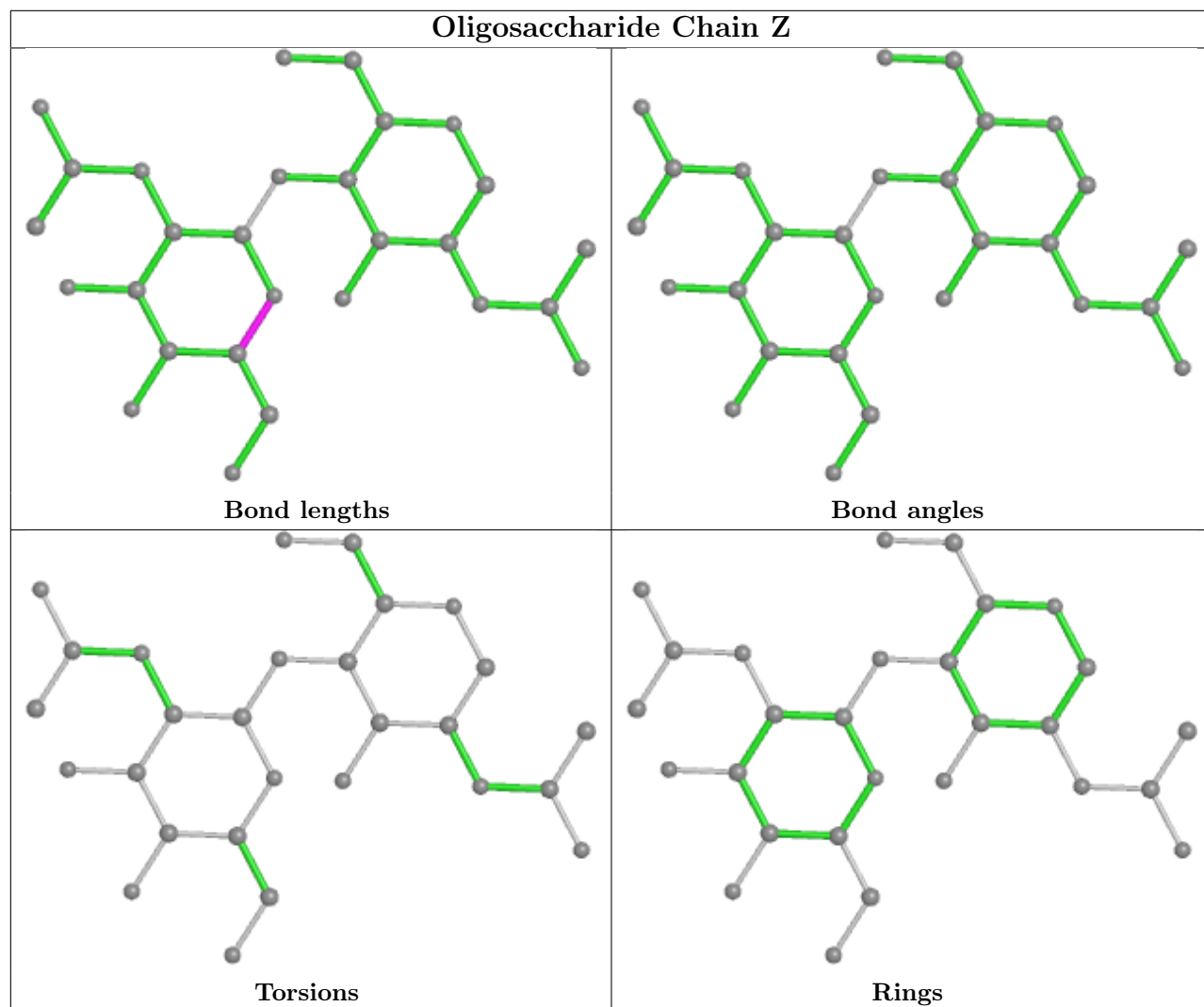


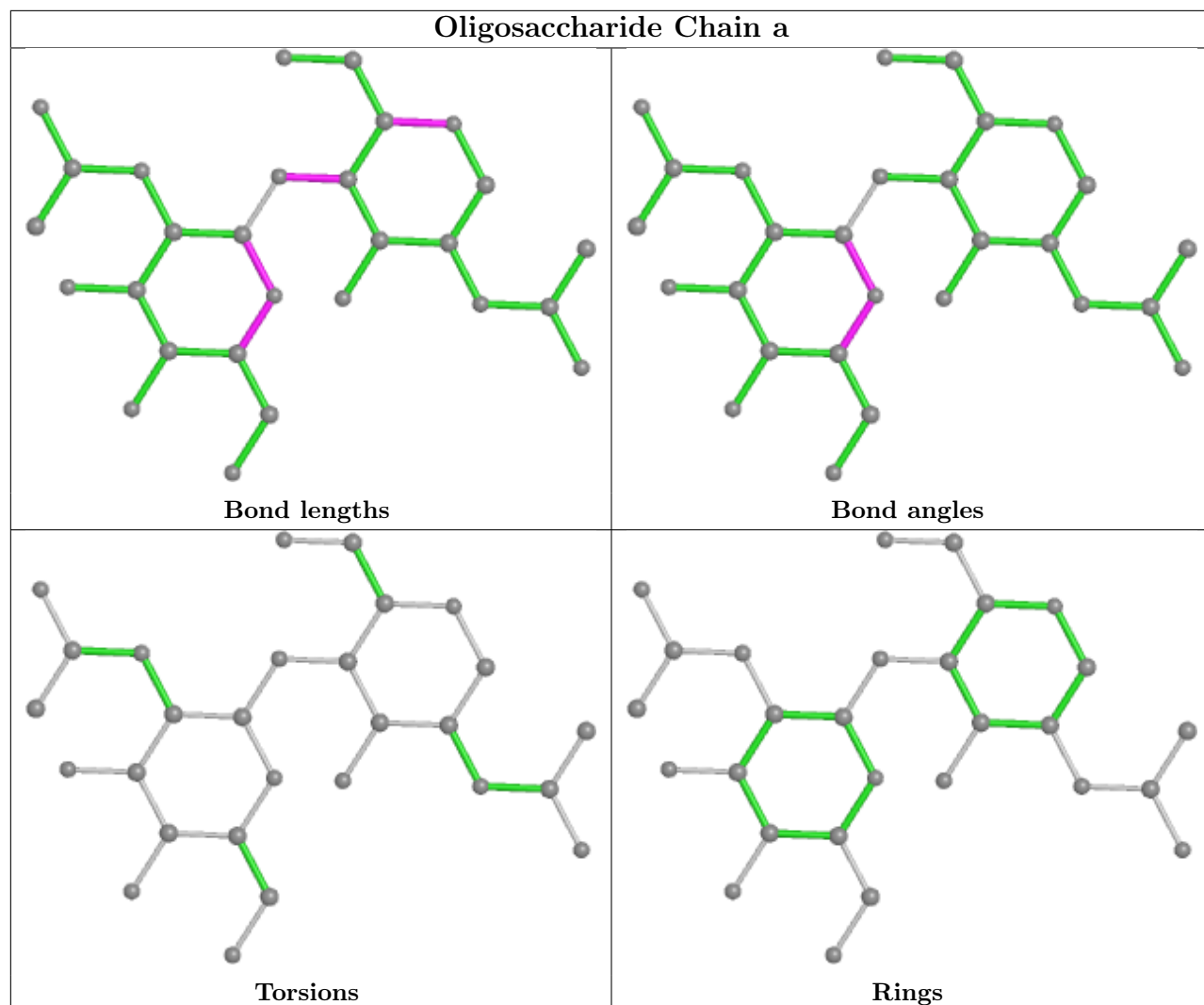


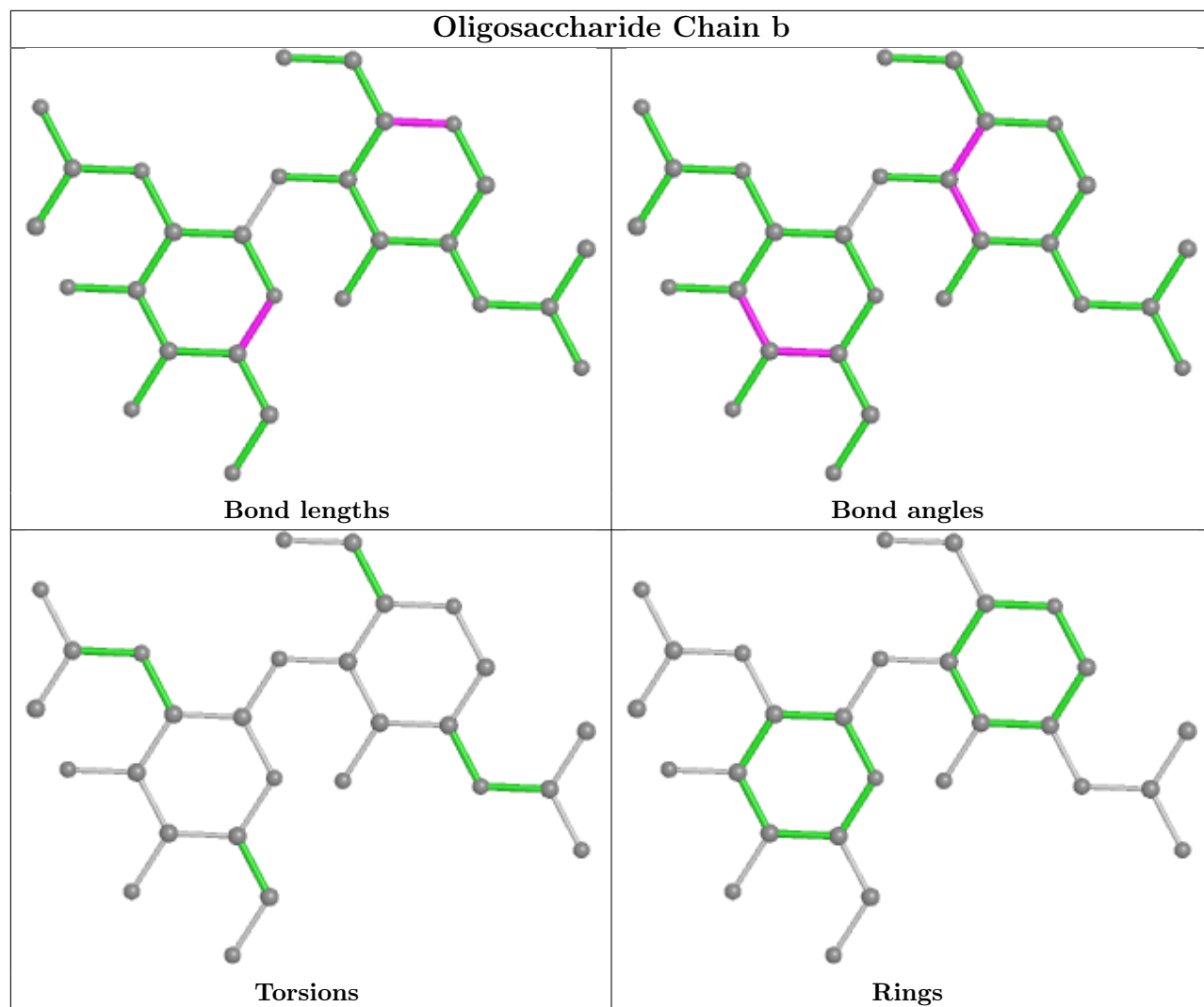


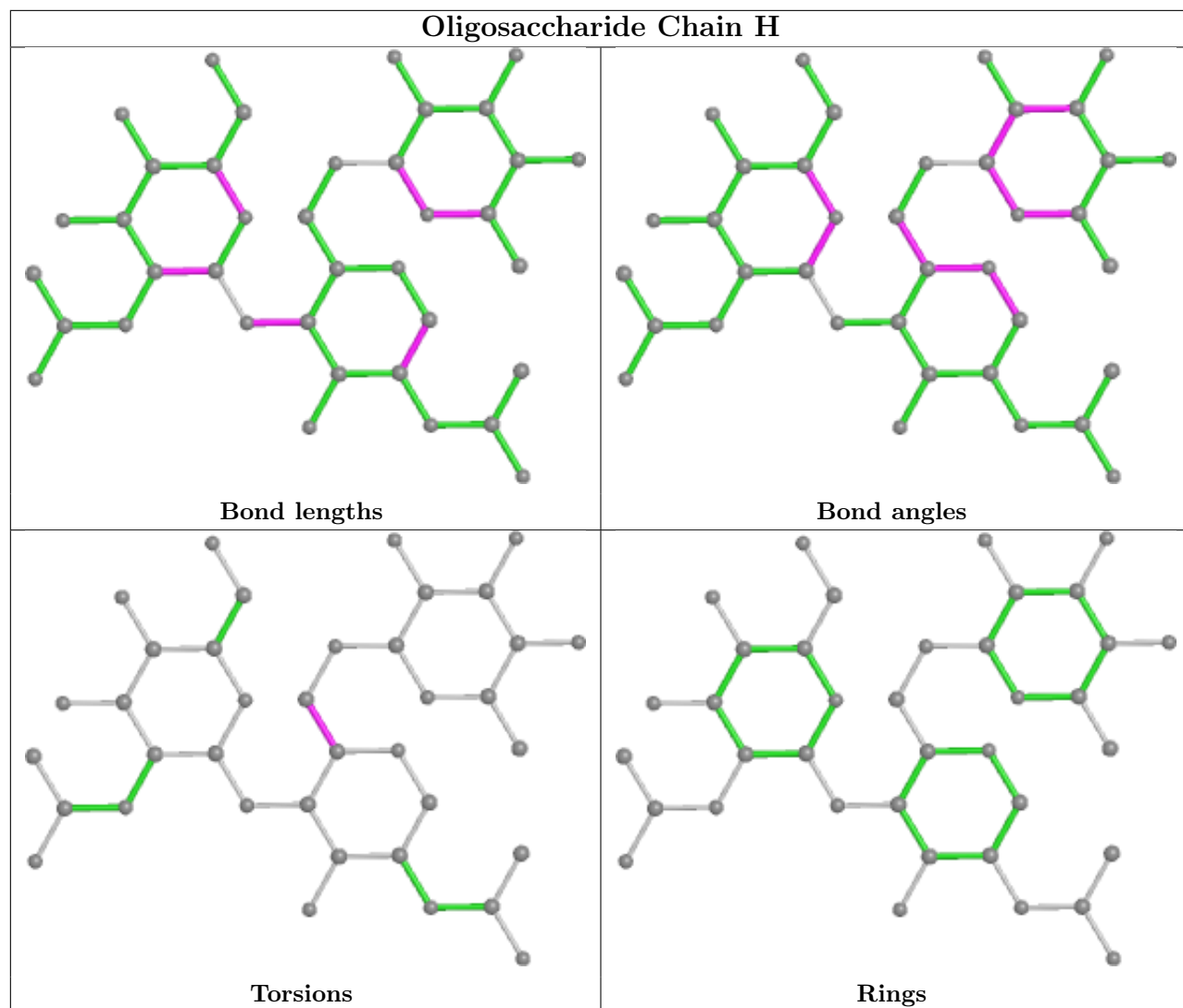


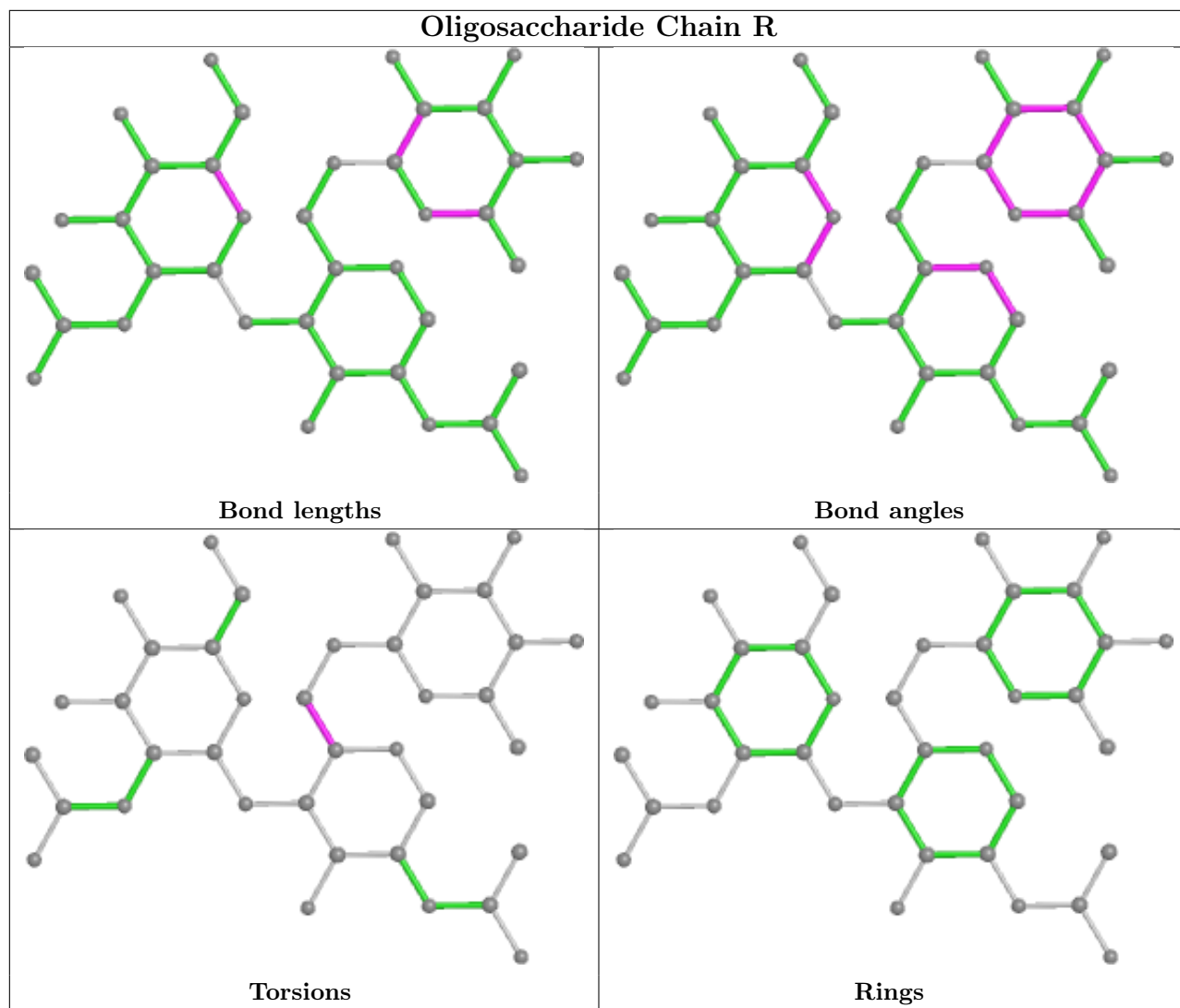


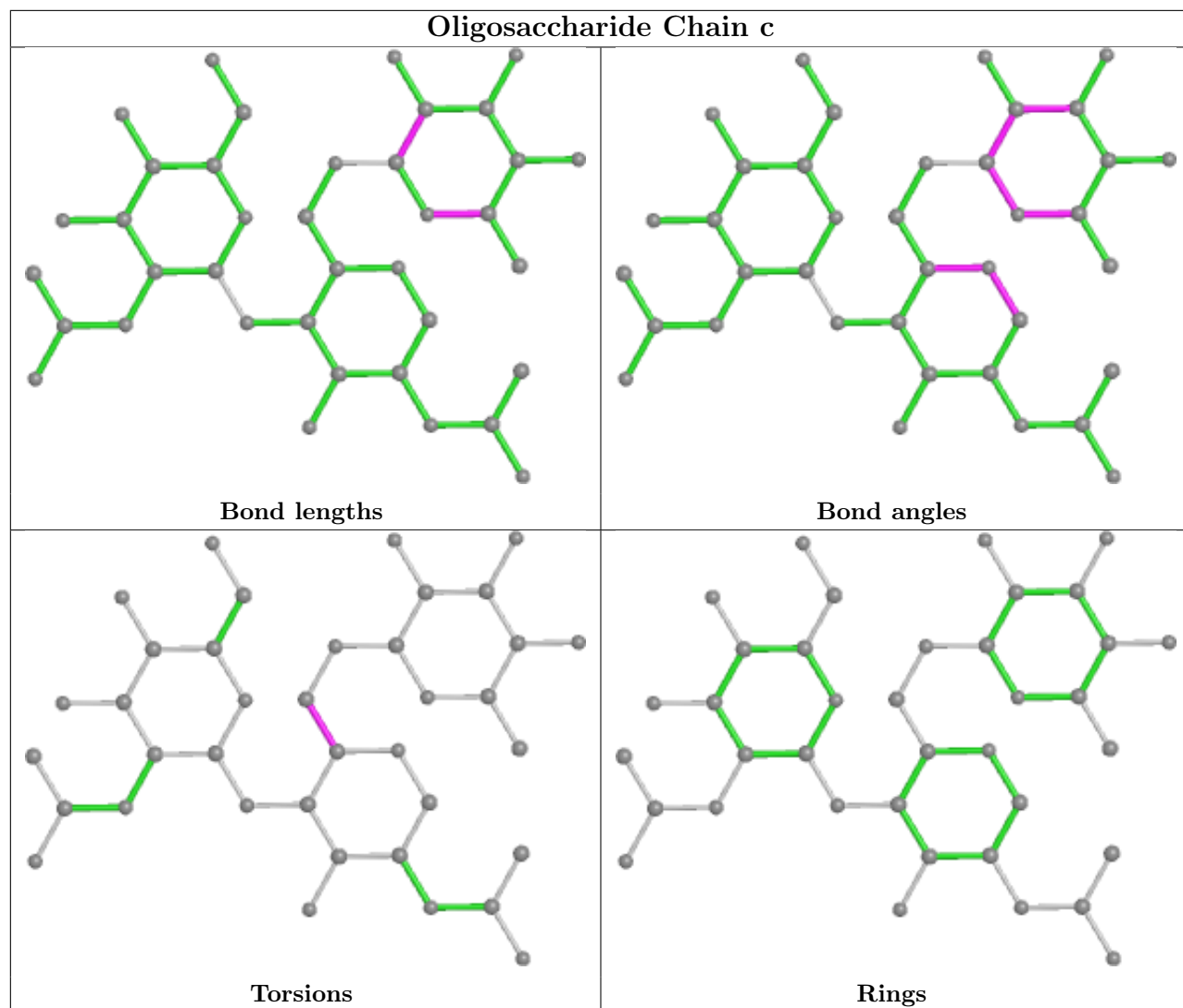


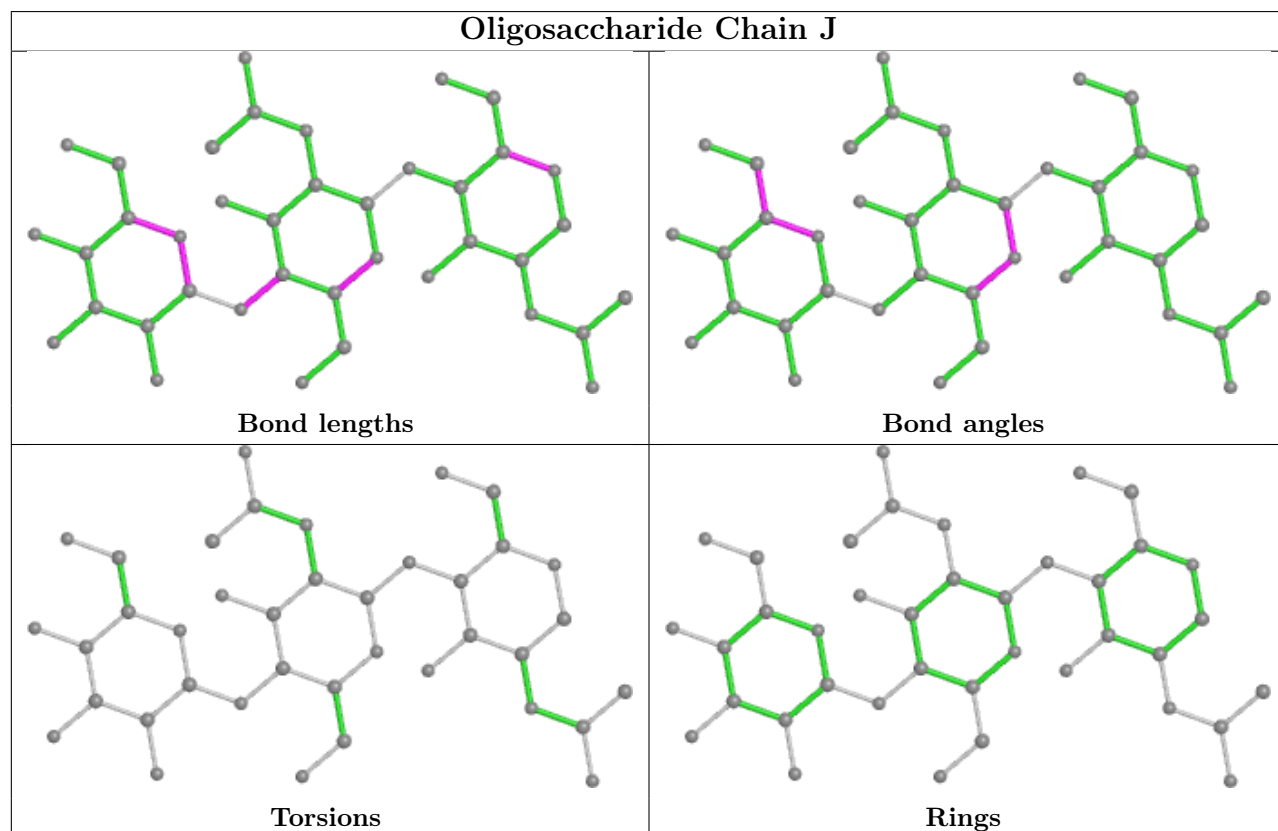
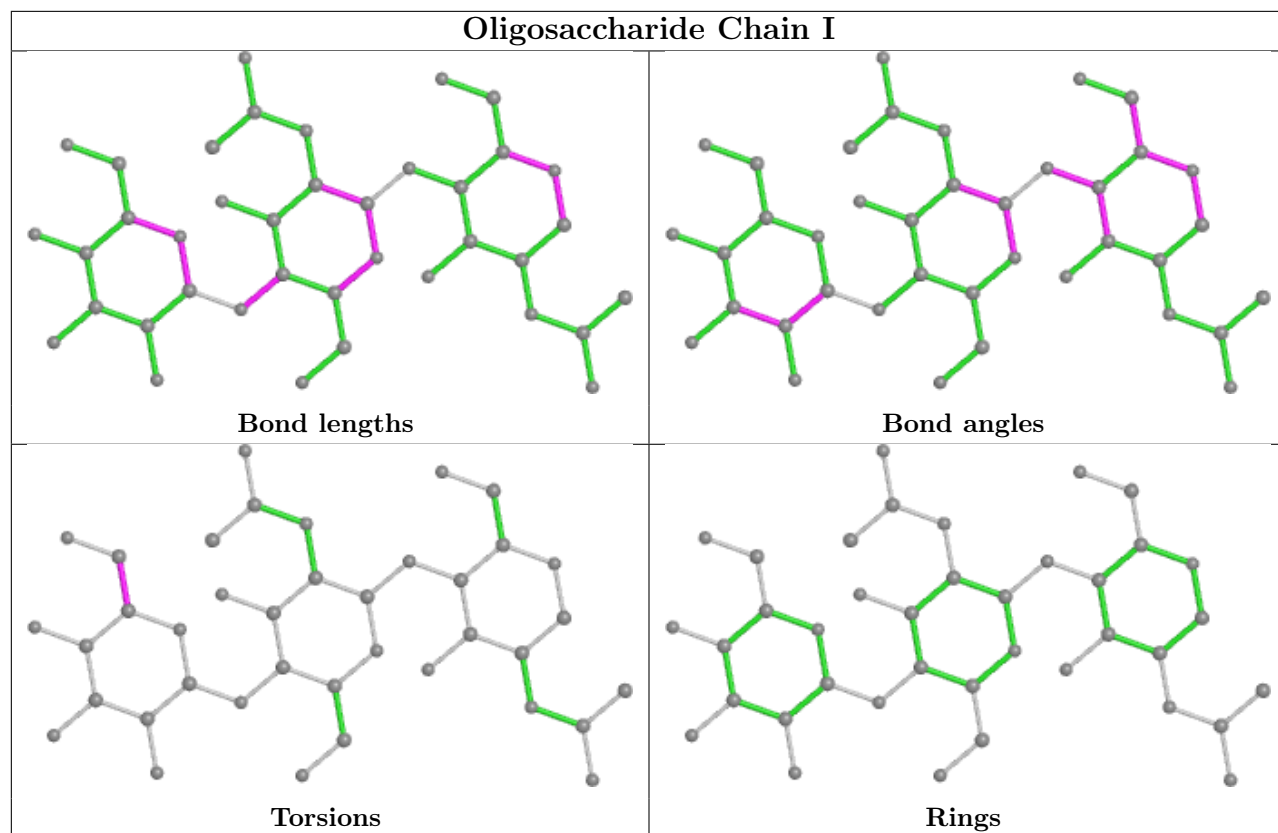


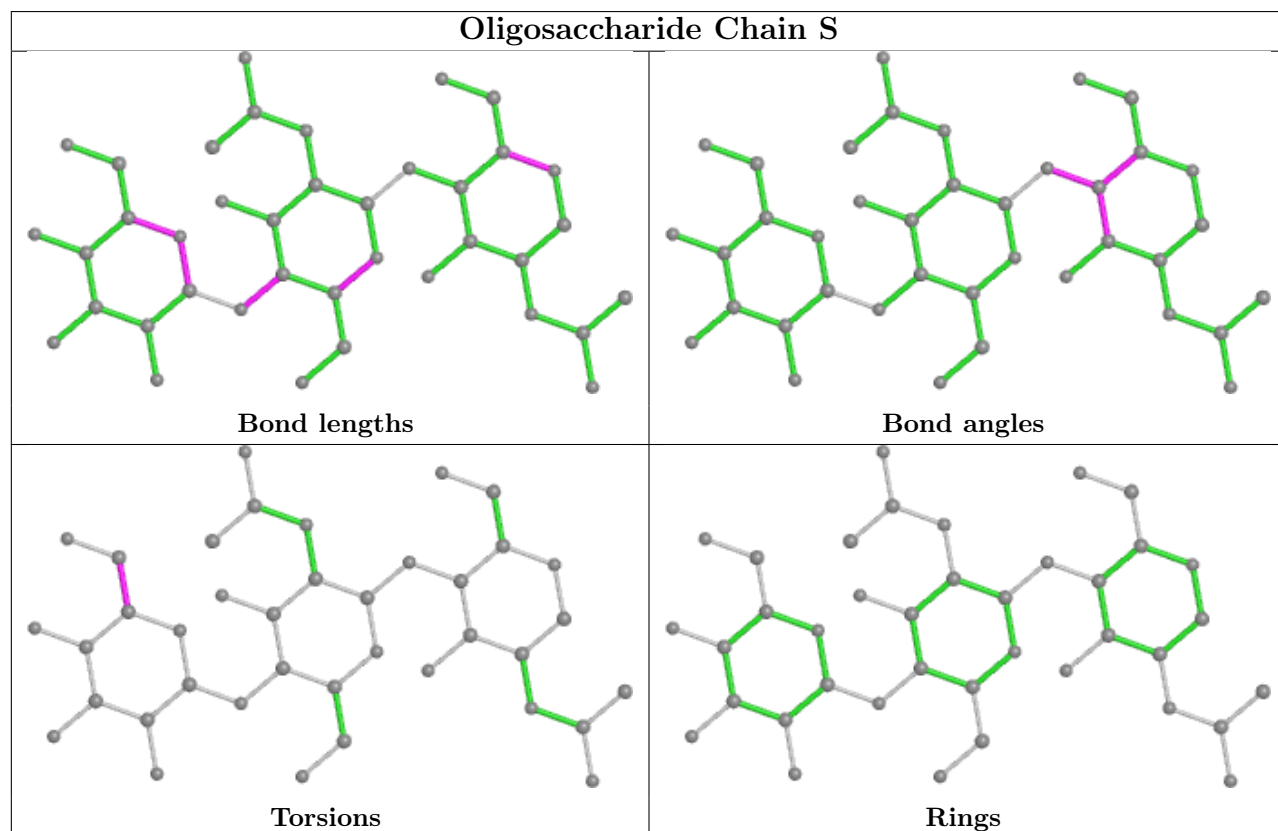
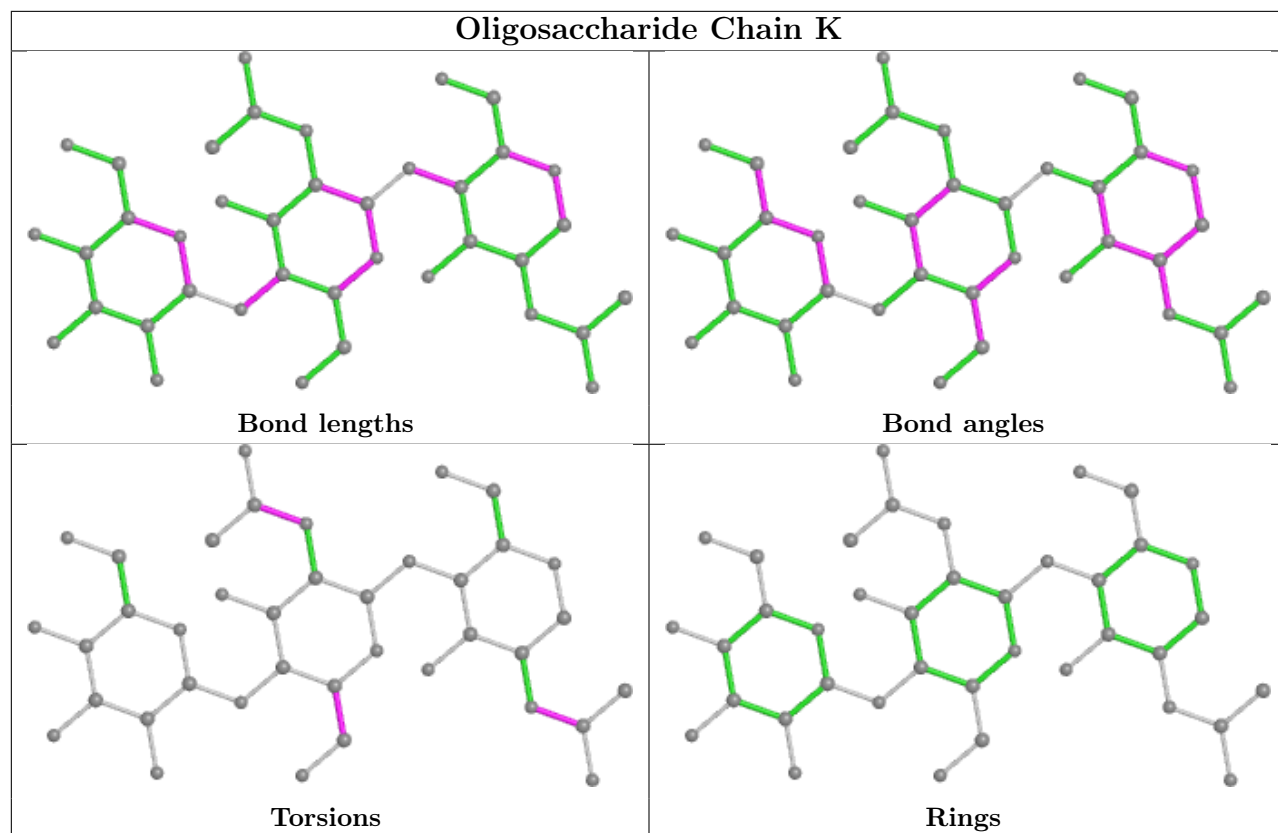


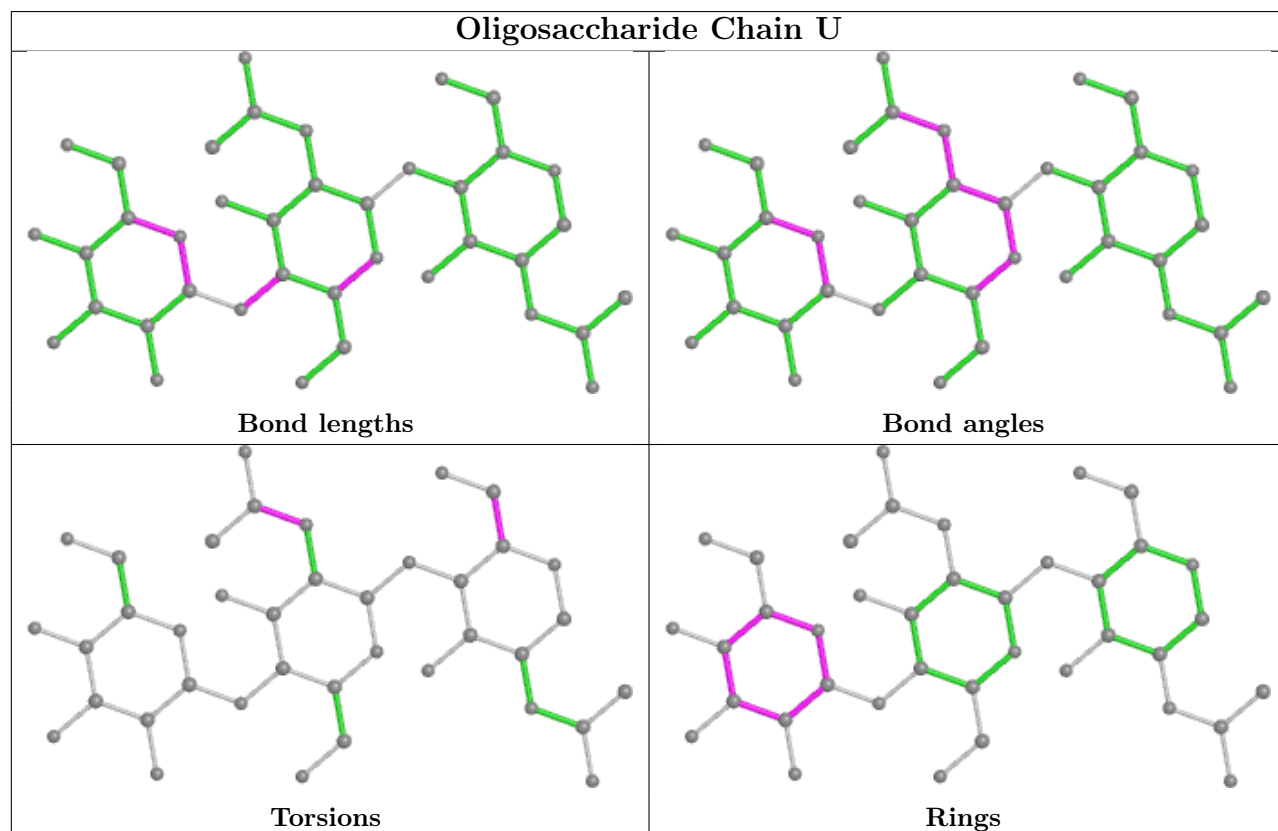
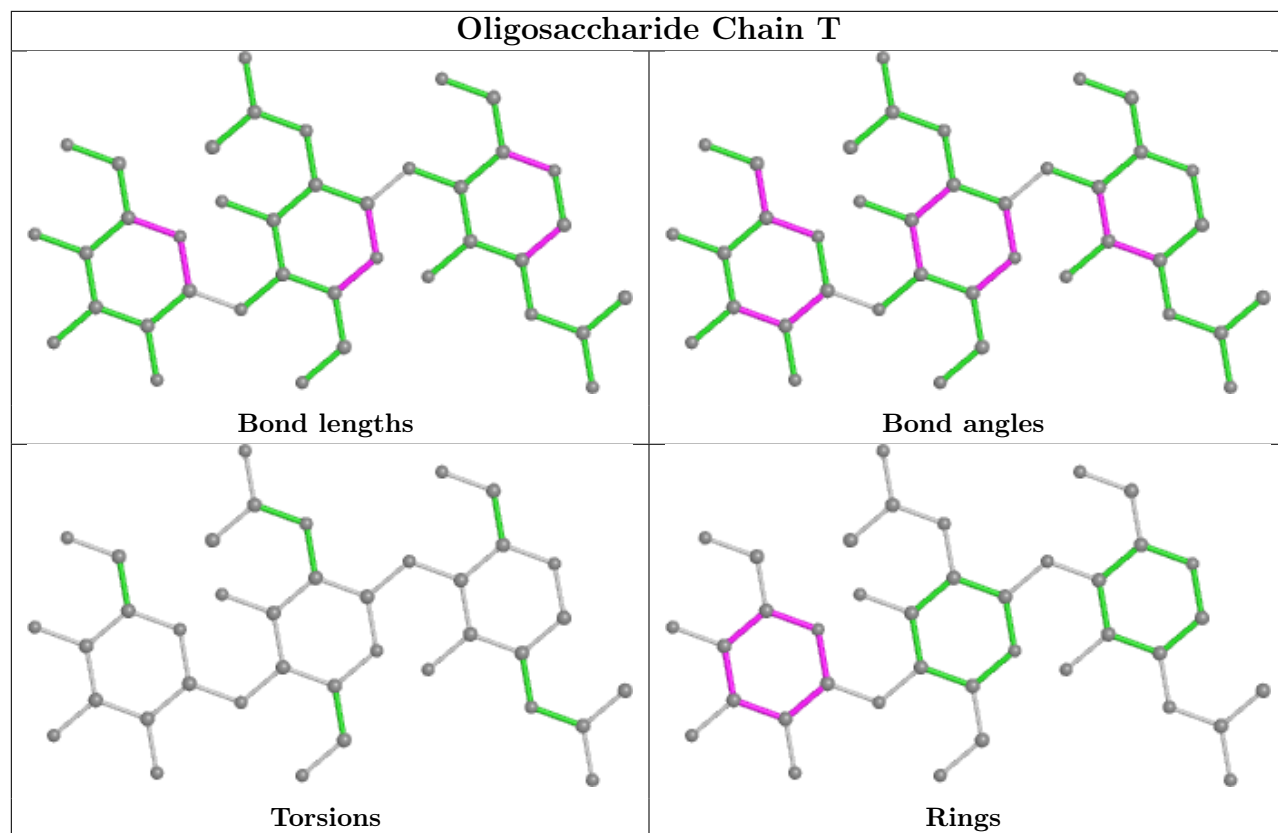


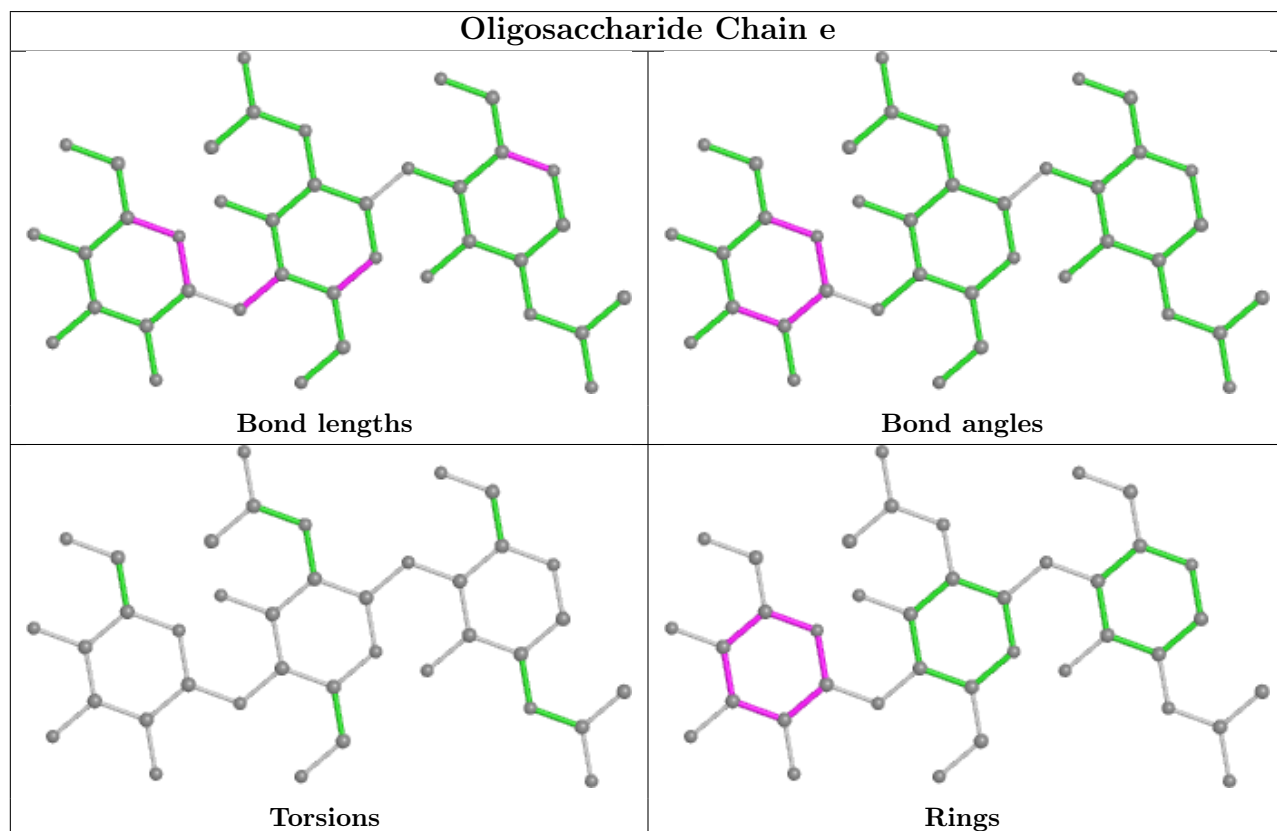
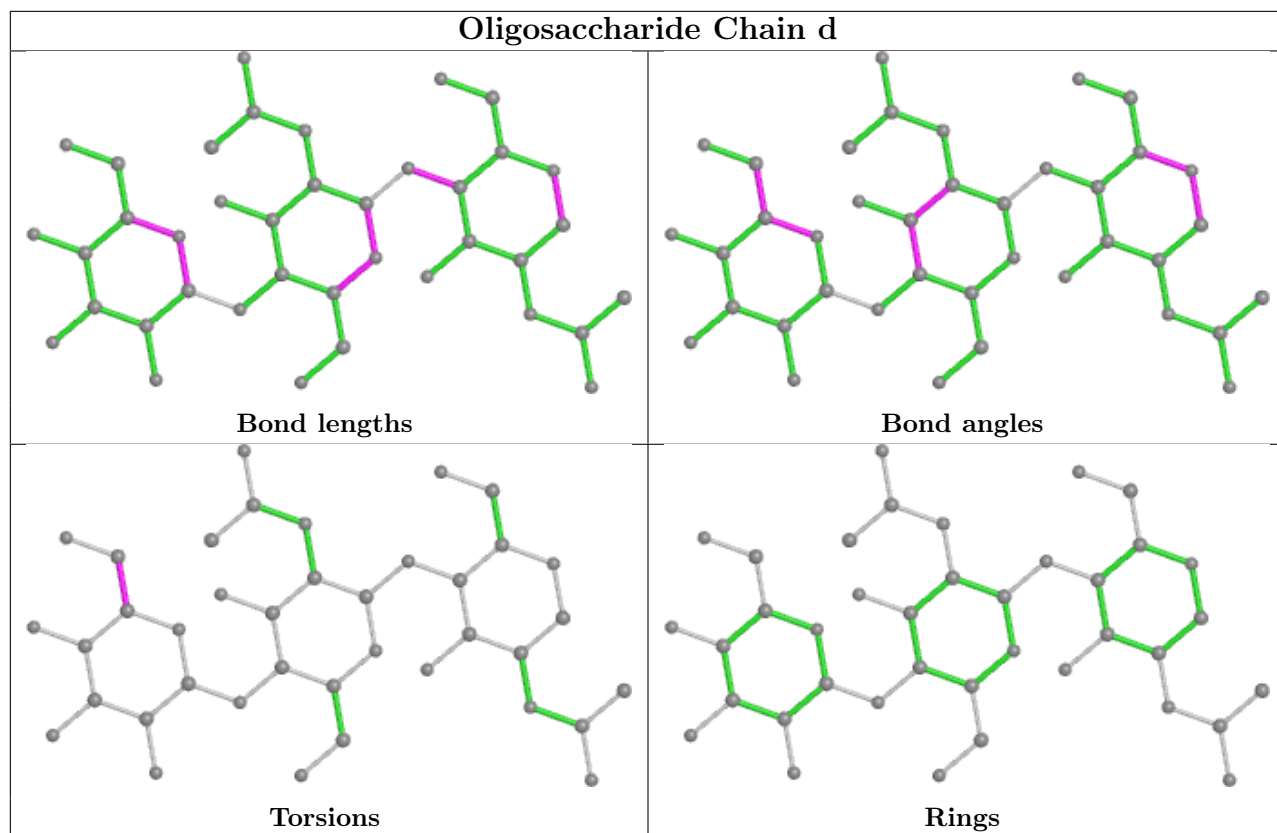


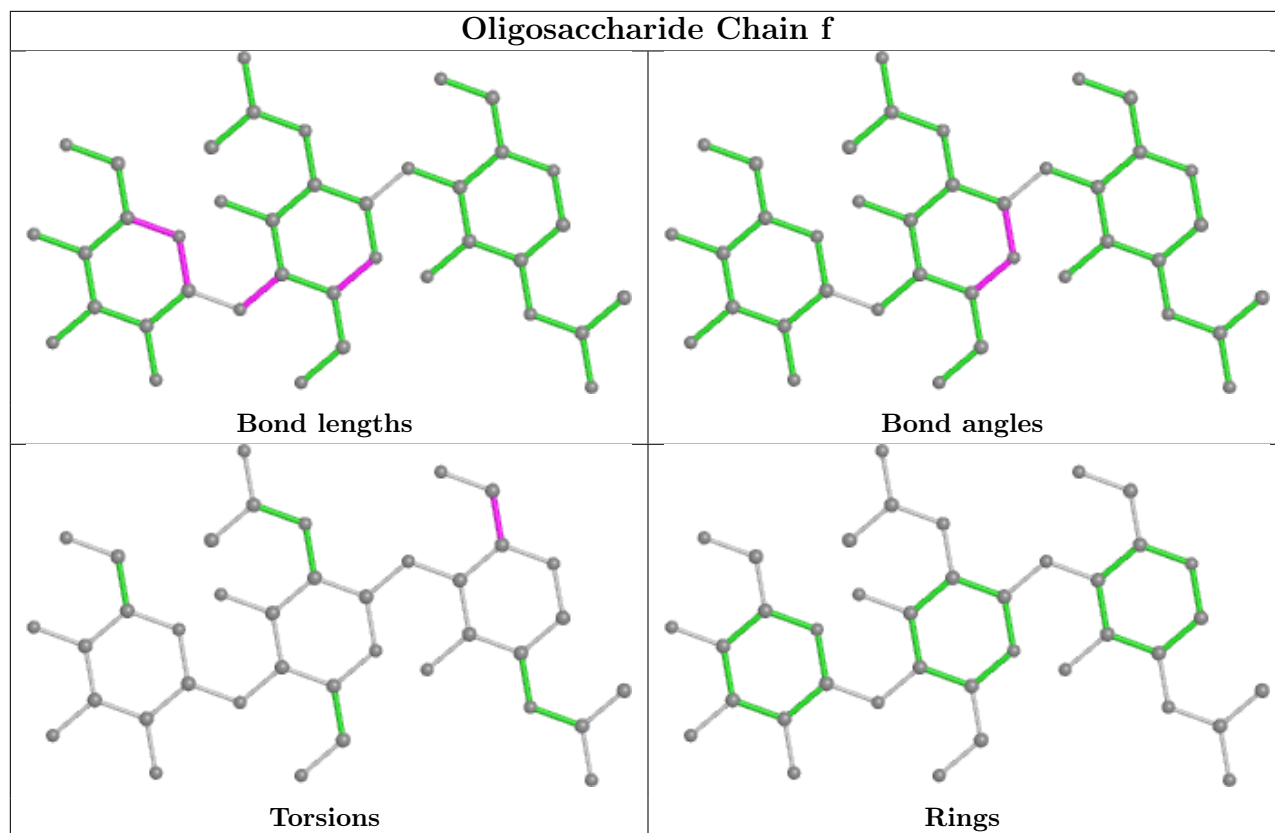












5.6 Ligand geometry [i](#)

28 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z > 2$	Counts	RMSZ	# $ Z > 2$
5	NAG	C	1402	1	14,14,15	1.28	2 (14%)	17,19,21	0.62	0
5	NAG	A	1405	1	14,14,15	1.14	1 (7%)	17,19,21	0.81	0
5	NAG	B	1405	1	14,14,15	1.16	1 (7%)	17,19,21	0.85	0
5	NAG	A	1401	1	14,14,15	1.30	2 (14%)	17,19,21	0.95	1 (5%)
5	NAG	A	1407	1	14,14,15	0.30	0	17,19,21	0.43	0
5	NAG	C	1403	1	14,14,15	1.17	1 (7%)	17,19,21	1.11	1 (5%)
5	NAG	B	1409	1	14,14,15	1.25	1 (7%)	17,19,21	0.68	0
5	NAG	A	1409	1	14,14,15	0.28	0	17,19,21	0.38	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	NAG	B	1403	1	14,14,15	1.12	1 (7%)	17,19,21	0.95	1 (5%)
5	NAG	A	1402	1	14,14,15	1.29	1 (7%)	17,19,21	1.47	4 (23%)
5	NAG	A	1404	1	14,14,15	1.01	1 (7%)	17,19,21	1.02	1 (5%)
5	NAG	B	1407	1	14,14,15	0.21	0	17,19,21	0.43	0
5	NAG	A	1406	1	14,14,15	0.35	0	17,19,21	0.44	0
5	NAG	B	1404	1	14,14,15	1.20	1 (7%)	17,19,21	1.11	1 (5%)
5	NAG	B	1408	1	14,14,15	1.21	2 (14%)	17,19,21	0.90	1 (5%)
5	NAG	A	1408	1	14,14,15	1.07	0	17,19,21	0.69	0
5	NAG	C	1408	1	14,14,15	1.27	1 (7%)	17,19,21	0.84	1 (5%)
5	NAG	A	1411	1	14,14,15	0.28	0	17,19,21	0.40	0
5	NAG	C	1405	1	14,14,15	0.22	0	17,19,21	0.42	0
5	NAG	C	1407	1	14,14,15	1.48	2 (14%)	17,19,21	0.67	0
5	NAG	C	1404	1	14,14,15	1.56	2 (14%)	17,19,21	0.67	0
5	NAG	A	1410	1	14,14,15	1.10	1 (7%)	17,19,21	1.16	2 (11%)
5	NAG	A	1403	1	14,14,15	0.50	0	17,19,21	0.62	1 (5%)
5	NAG	C	1406	1	14,14,15	1.02	1 (7%)	17,19,21	0.76	0
5	NAG	C	1401	1	14,14,15	0.60	0	17,19,21	0.43	0
5	NAG	B	1406	1	14,14,15	1.15	1 (7%)	17,19,21	1.16	2 (11%)
5	NAG	B	1401	1	14,14,15	1.32	1 (7%)	17,19,21	1.46	3 (17%)
5	NAG	B	1402	1	14,14,15	0.49	0	17,19,21	0.68	1 (5%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	C	1402	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1405	1	-	0/6/23/26	0/1/1/1
5	NAG	B	1405	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1401	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1407	1	-	0/6/23/26	0/1/1/1
5	NAG	C	1403	1	-	3/6/23/26	0/1/1/1
5	NAG	B	1409	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1409	1	-	0/6/23/26	0/1/1/1
5	NAG	B	1403	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1402	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1404	1	-	0/6/23/26	0/1/1/1
5	NAG	B	1407	1	-	1/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	A	1406	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1404	1	-	3/6/23/26	0/1/1/1
5	NAG	B	1408	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1408	1	-	0/6/23/26	0/1/1/1
5	NAG	C	1408	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1411	1	-	0/6/23/26	0/1/1/1
5	NAG	C	1405	1	-	0/6/23/26	0/1/1/1
5	NAG	C	1407	1	-	0/6/23/26	0/1/1/1
5	NAG	C	1404	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1410	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1403	1	-	2/6/23/26	0/1/1/1
5	NAG	C	1406	1	-	0/6/23/26	0/1/1/1
5	NAG	C	1401	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1406	1	-	0/6/23/26	0/1/1/1
5	NAG	B	1401	1	-	1/6/23/26	0/1/1/1
5	NAG	B	1402	1	-	2/6/23/26	0/1/1/1

The worst 5 of 23 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	1404	NAG	O5-C1	-4.40	1.36	1.43
5	C	1403	NAG	O5-C1	-4.31	1.36	1.43
5	C	1404	NAG	C1-C2	4.24	1.58	1.52
5	B	1401	NAG	O5-C5	3.71	1.51	1.43
5	A	1405	NAG	O5-C5	3.16	1.49	1.43

The worst 5 of 20 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	1401	NAG	C1-O5-C5	4.15	117.82	112.19
5	A	1410	NAG	C1-O5-C5	3.44	116.85	112.19
5	B	1406	NAG	C3-C4-C5	3.03	115.64	110.24
5	B	1408	NAG	C1-O5-C5	3.02	116.29	112.19
5	A	1404	NAG	C1-O5-C5	2.98	116.23	112.19

There are no chirality outliers.

5 of 18 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	C	1401	NAG	O5-C5-C6-O6

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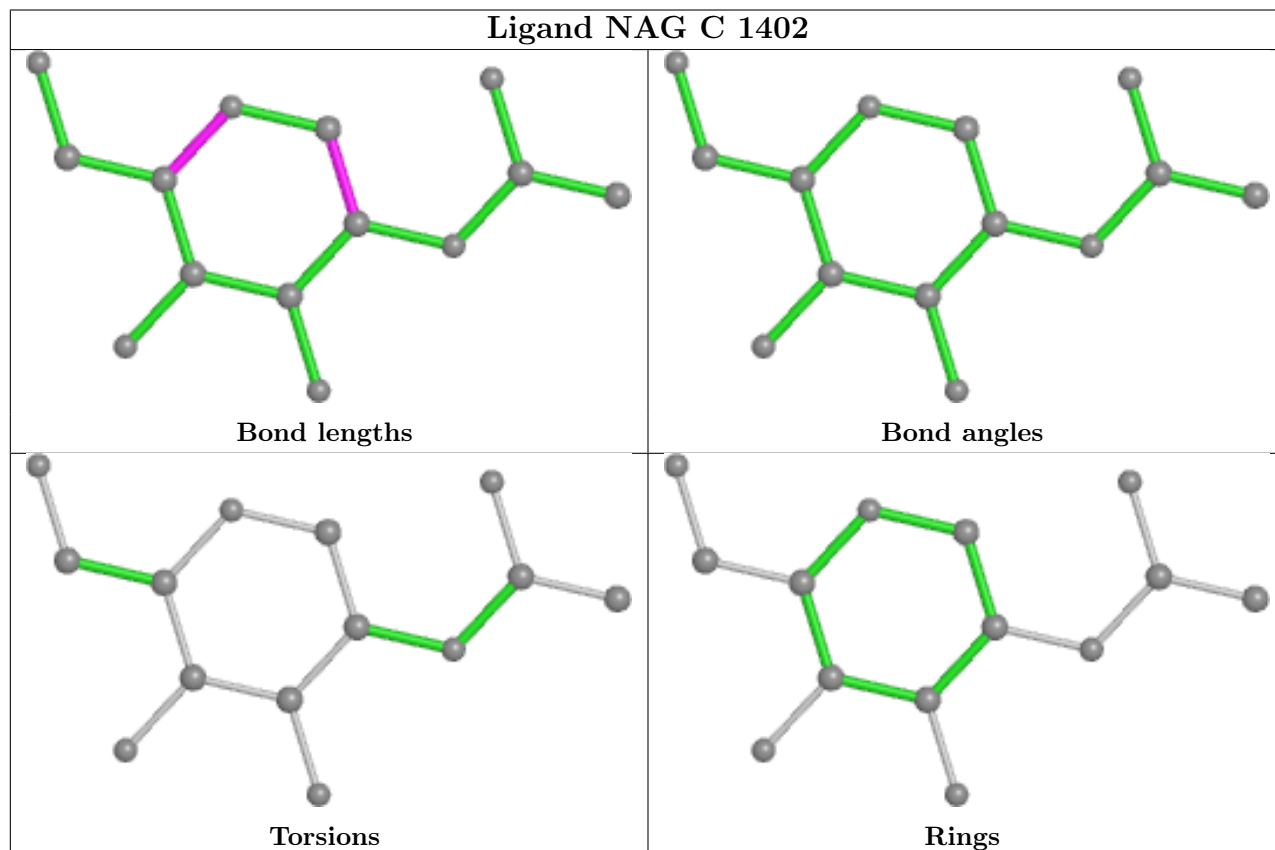
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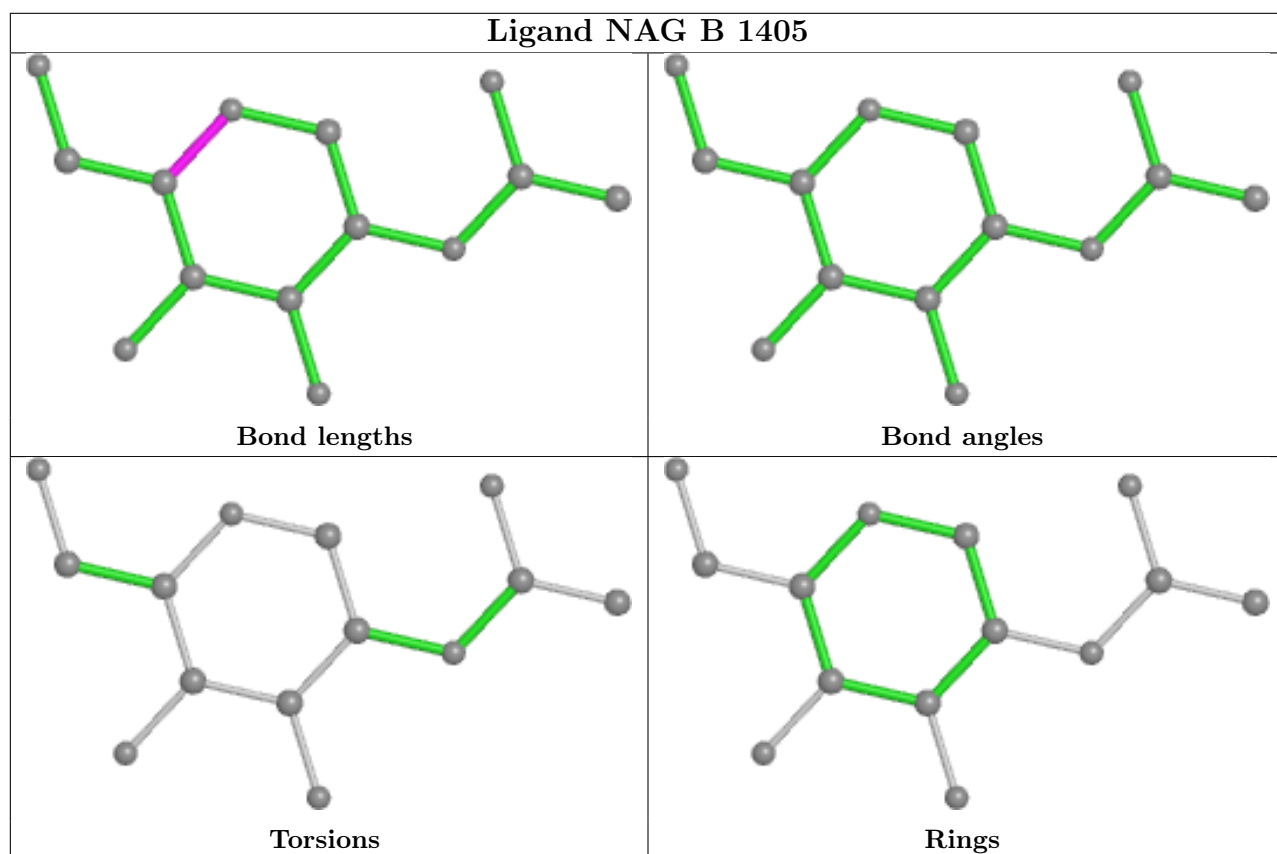
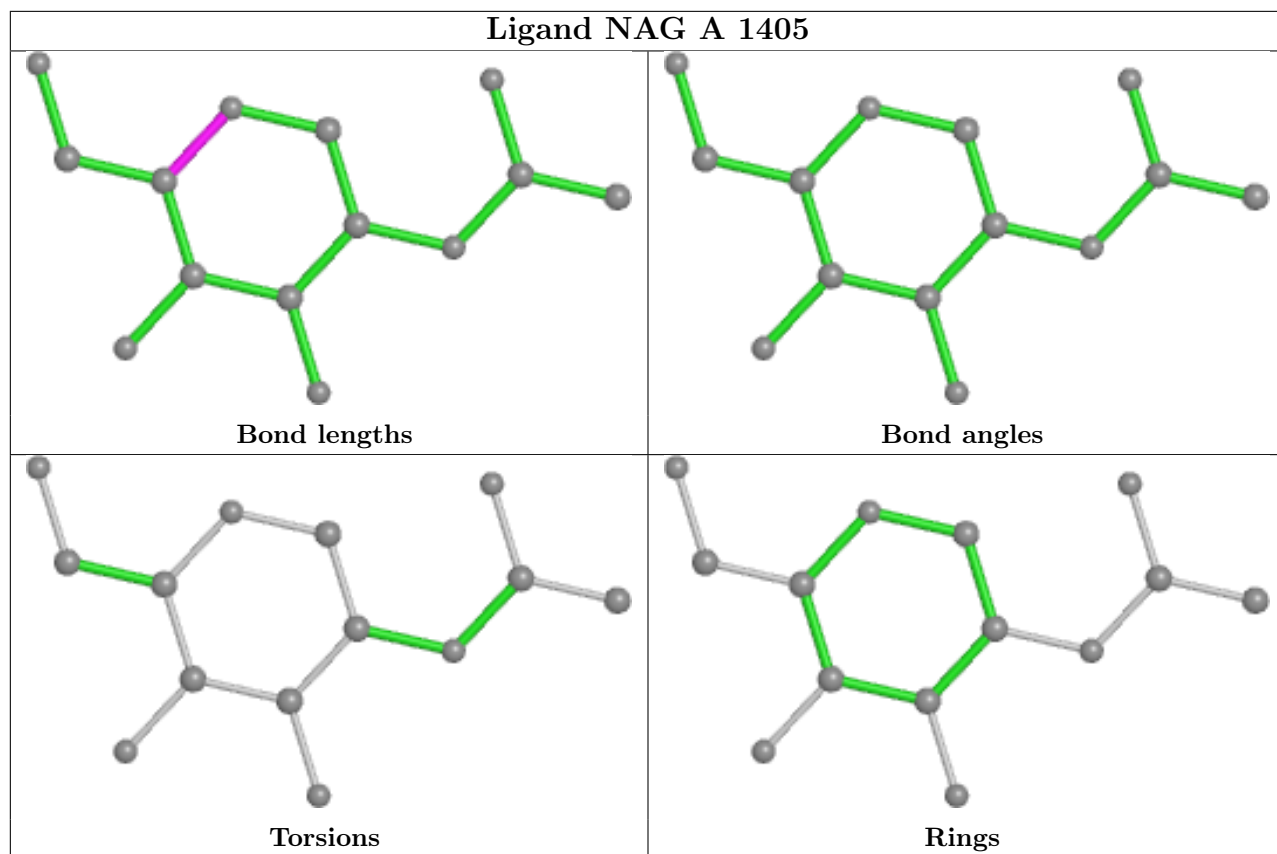
Mol	Chain	Res	Type	Atoms
5	C	1401	NAG	C4-C5-C6-O6
5	B	1401	NAG	C1-C2-N2-C7
5	A	1403	NAG	O5-C5-C6-O6
5	A	1402	NAG	C8-C7-N2-C2

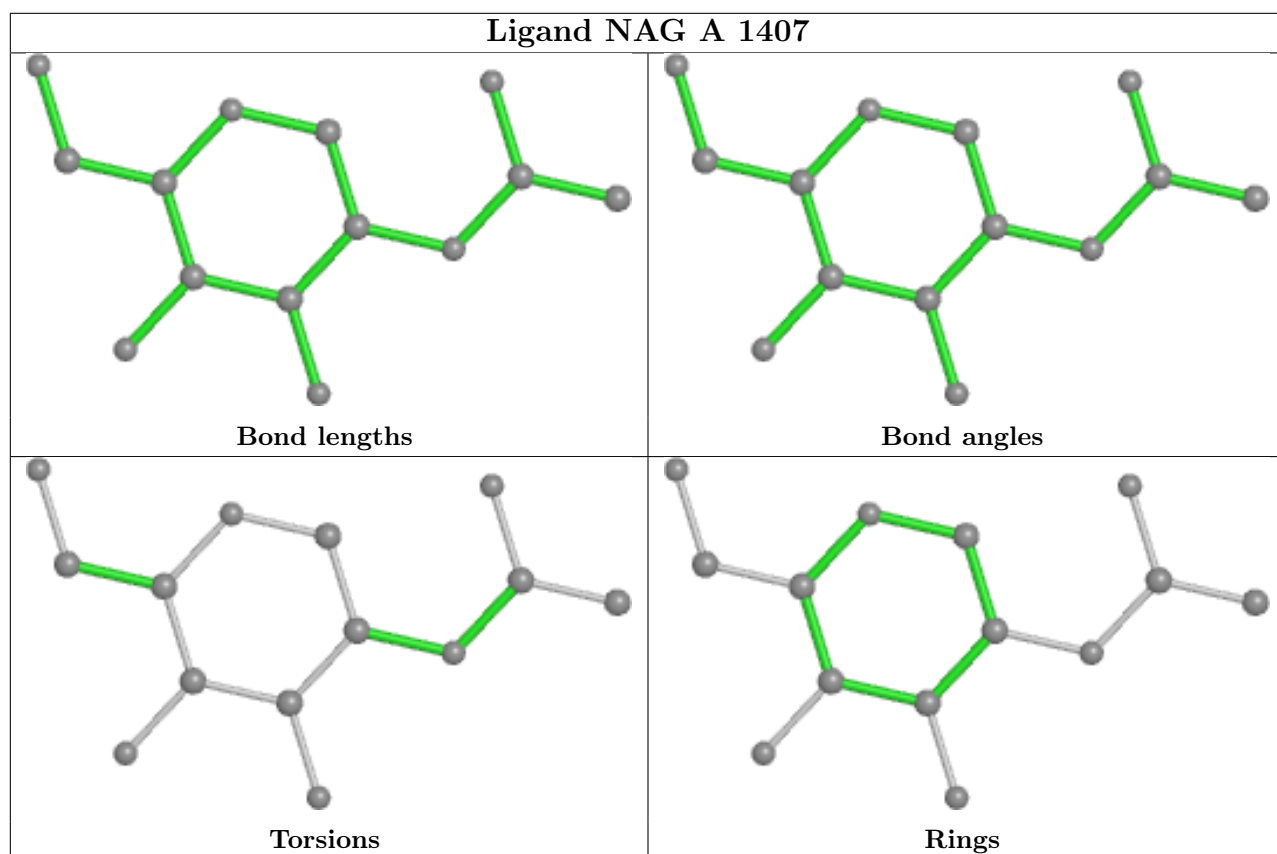
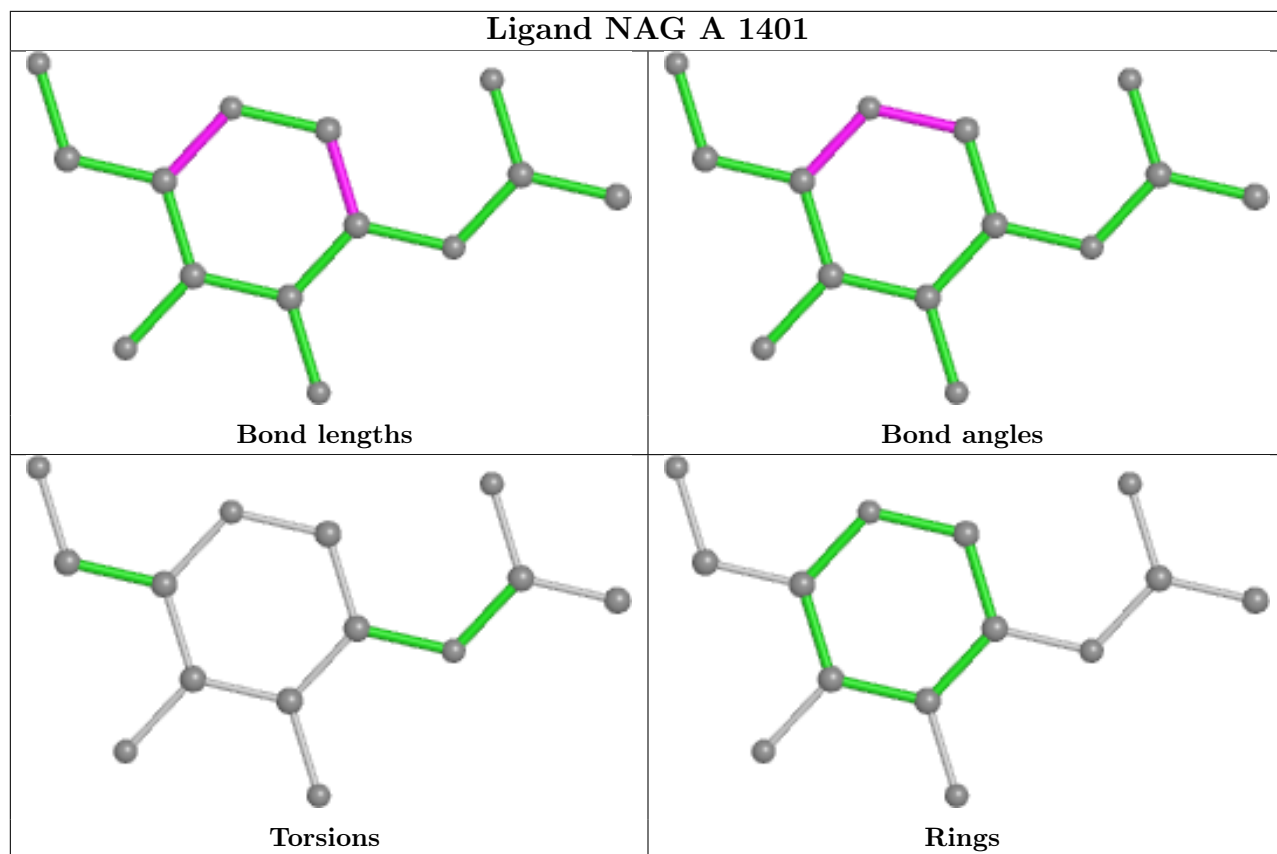
There are no ring outliers.

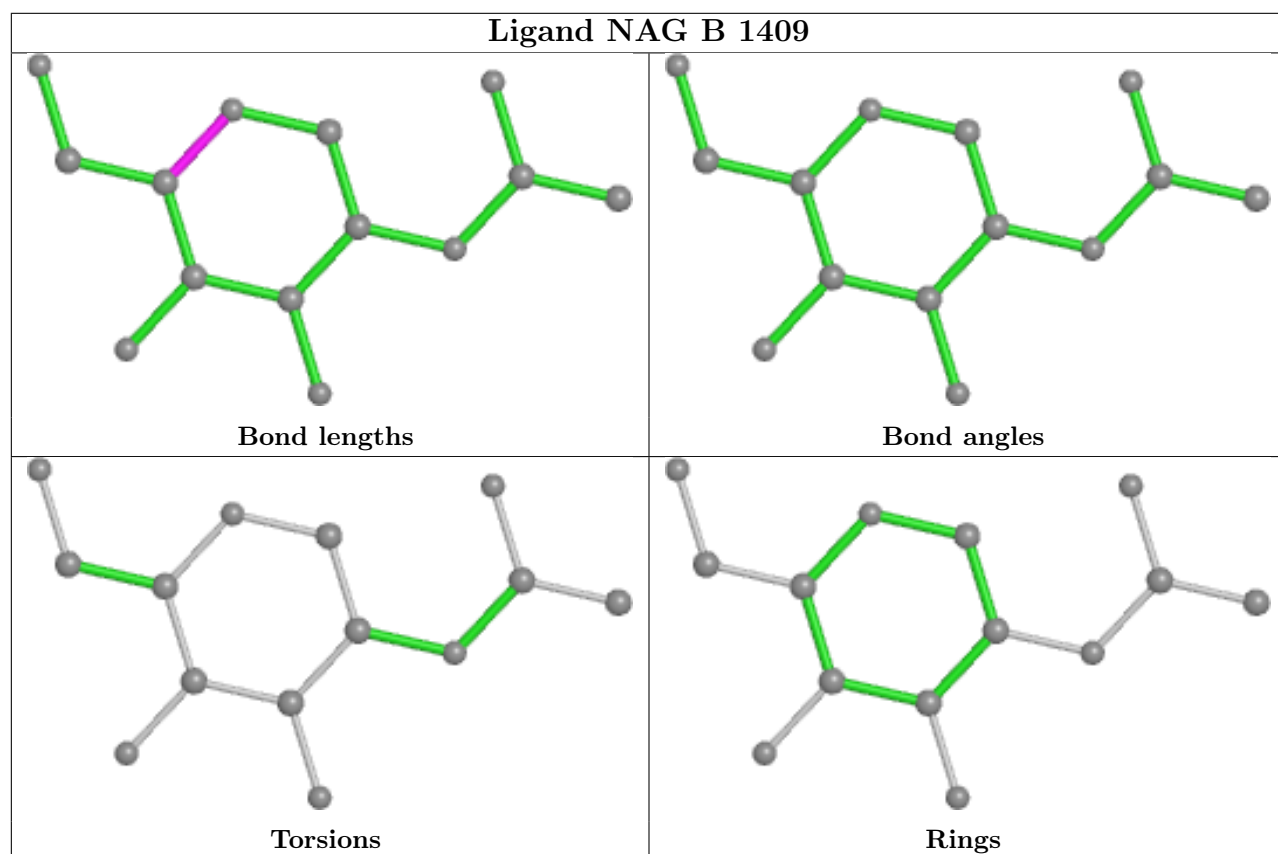
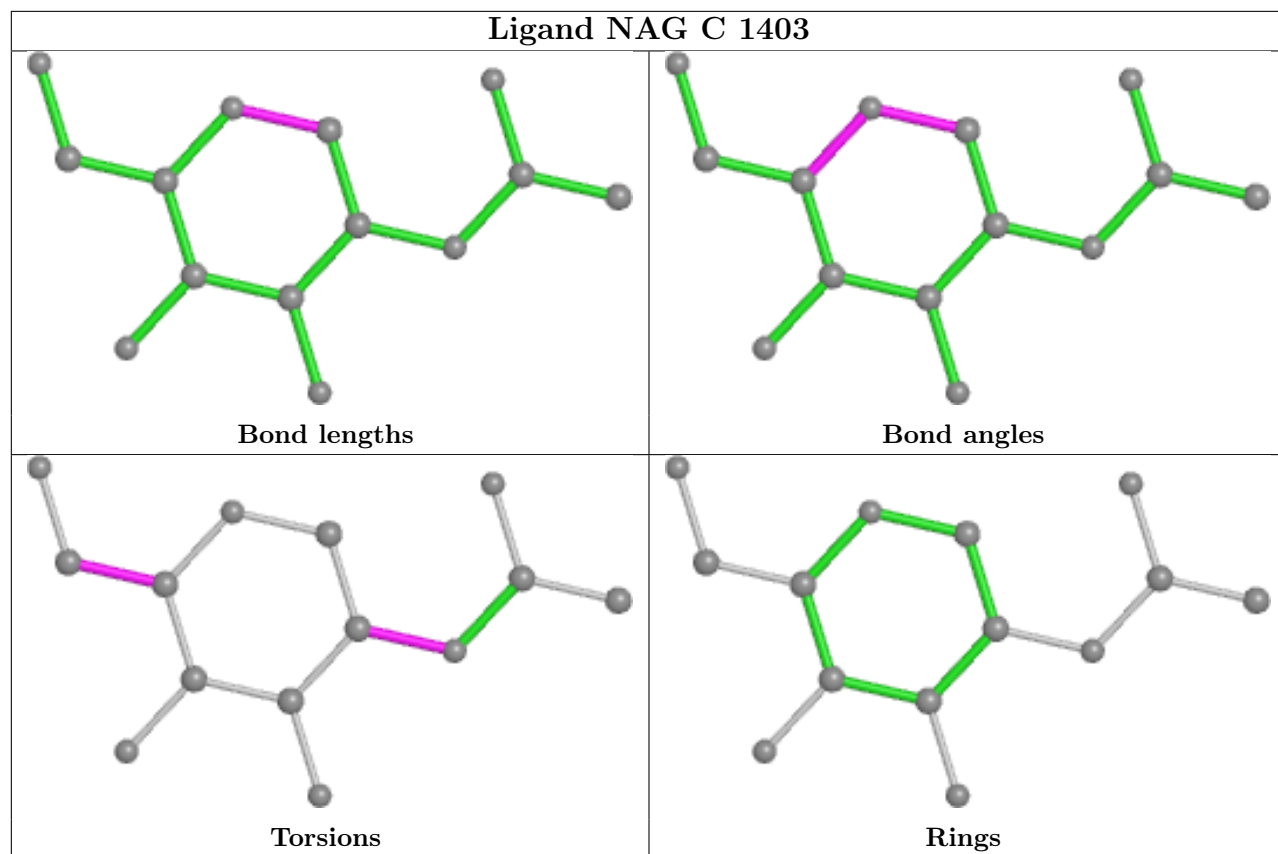
No monomer is involved in short contacts.

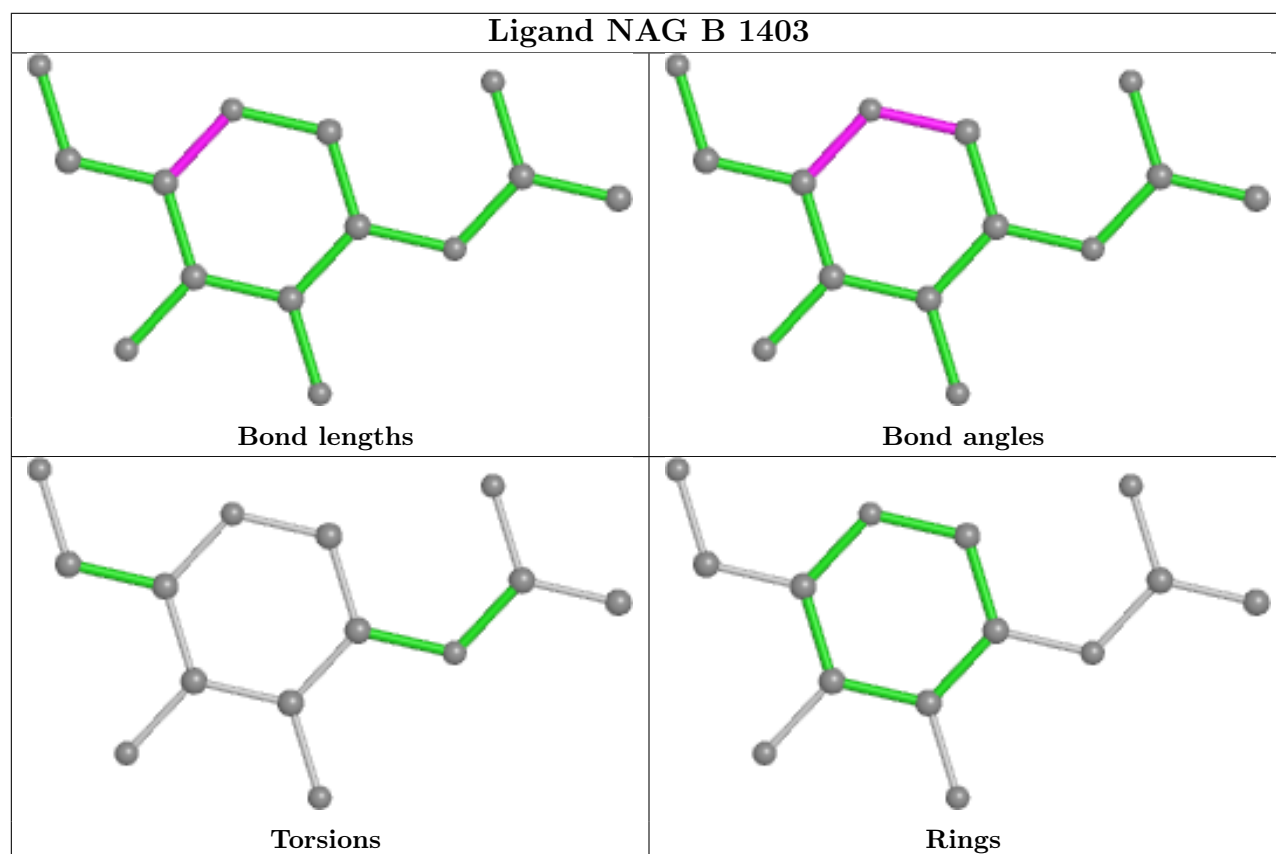
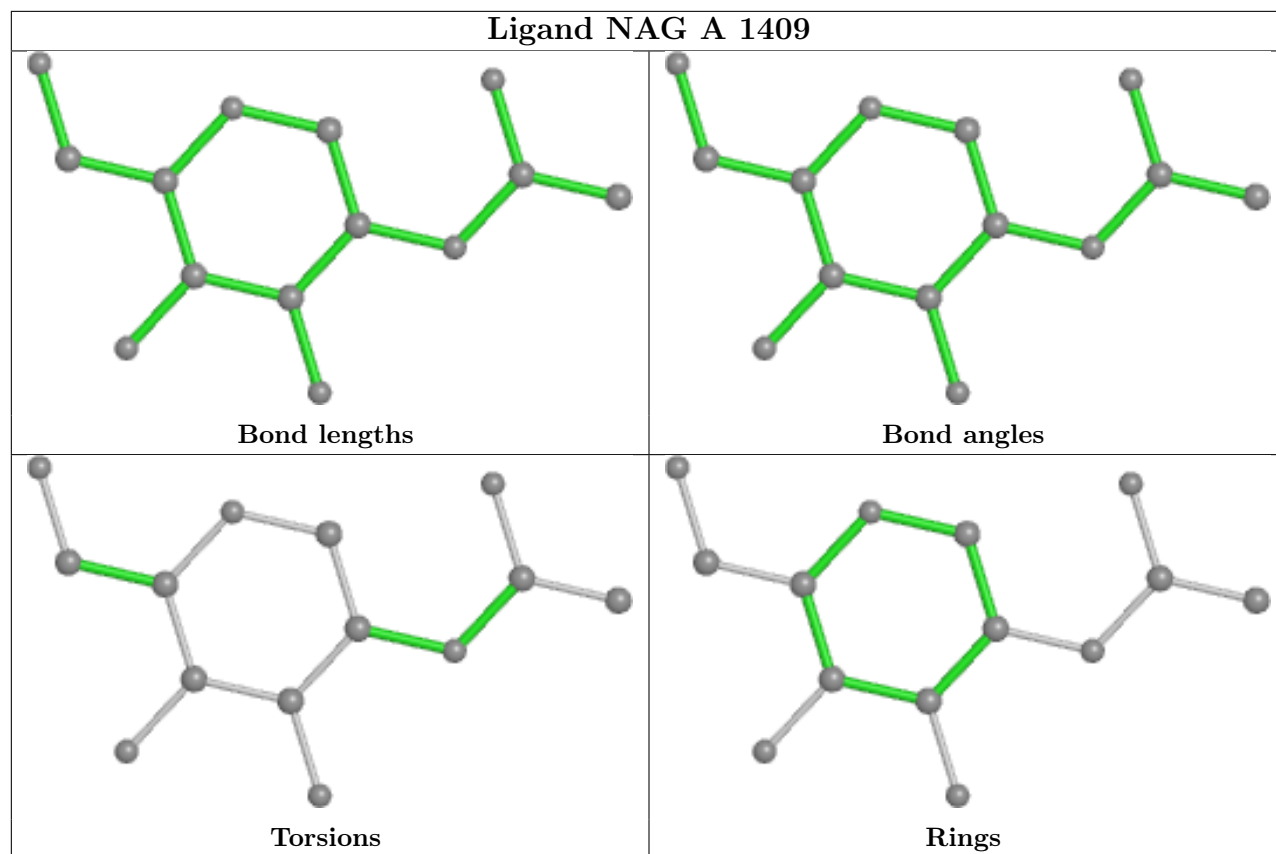
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

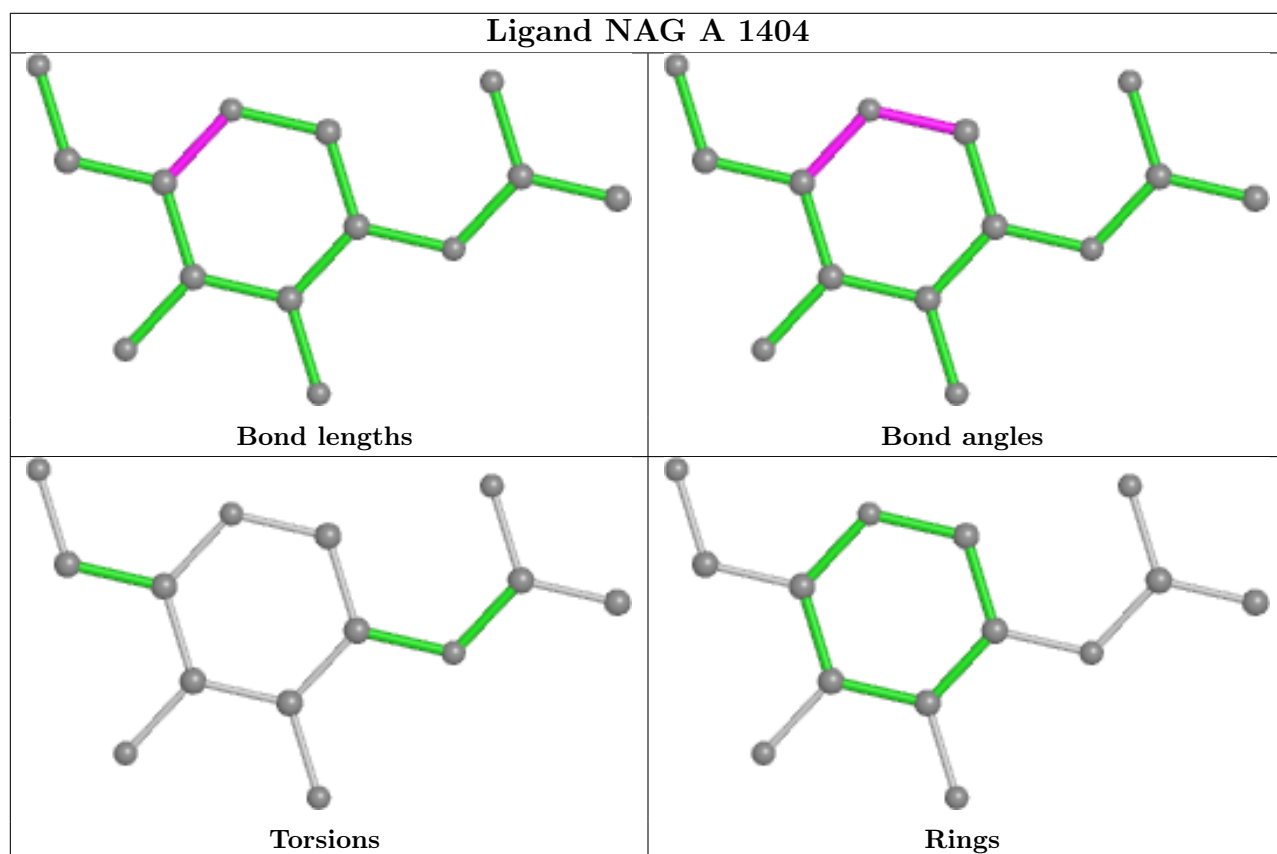
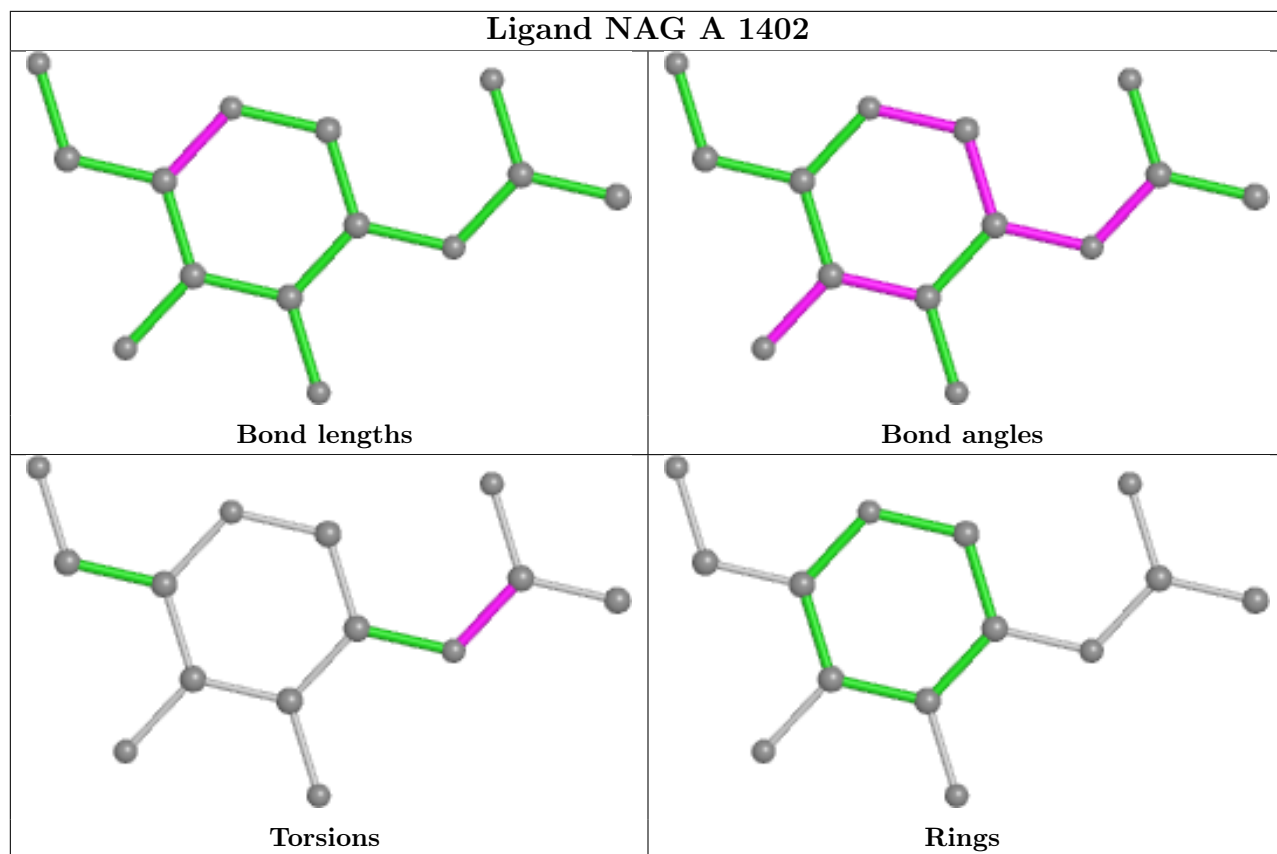


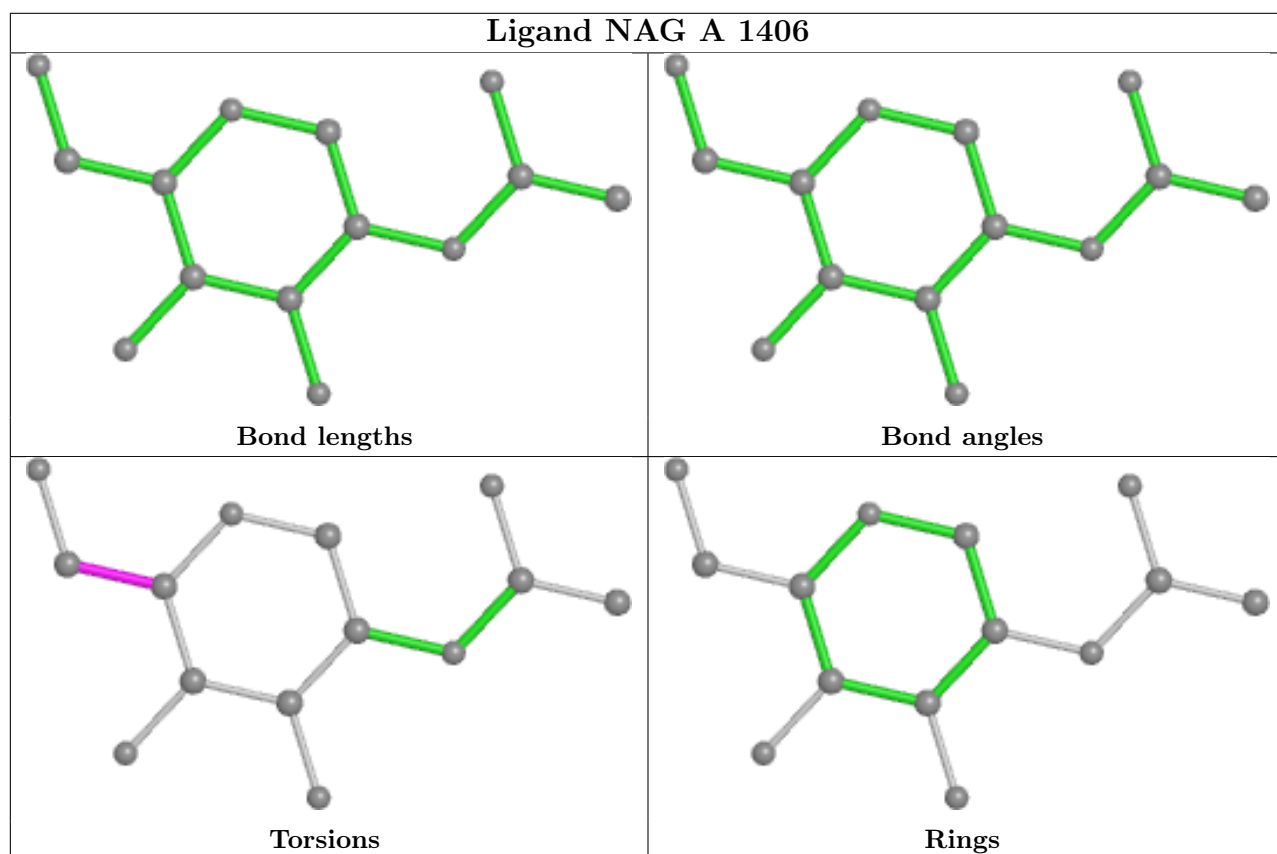
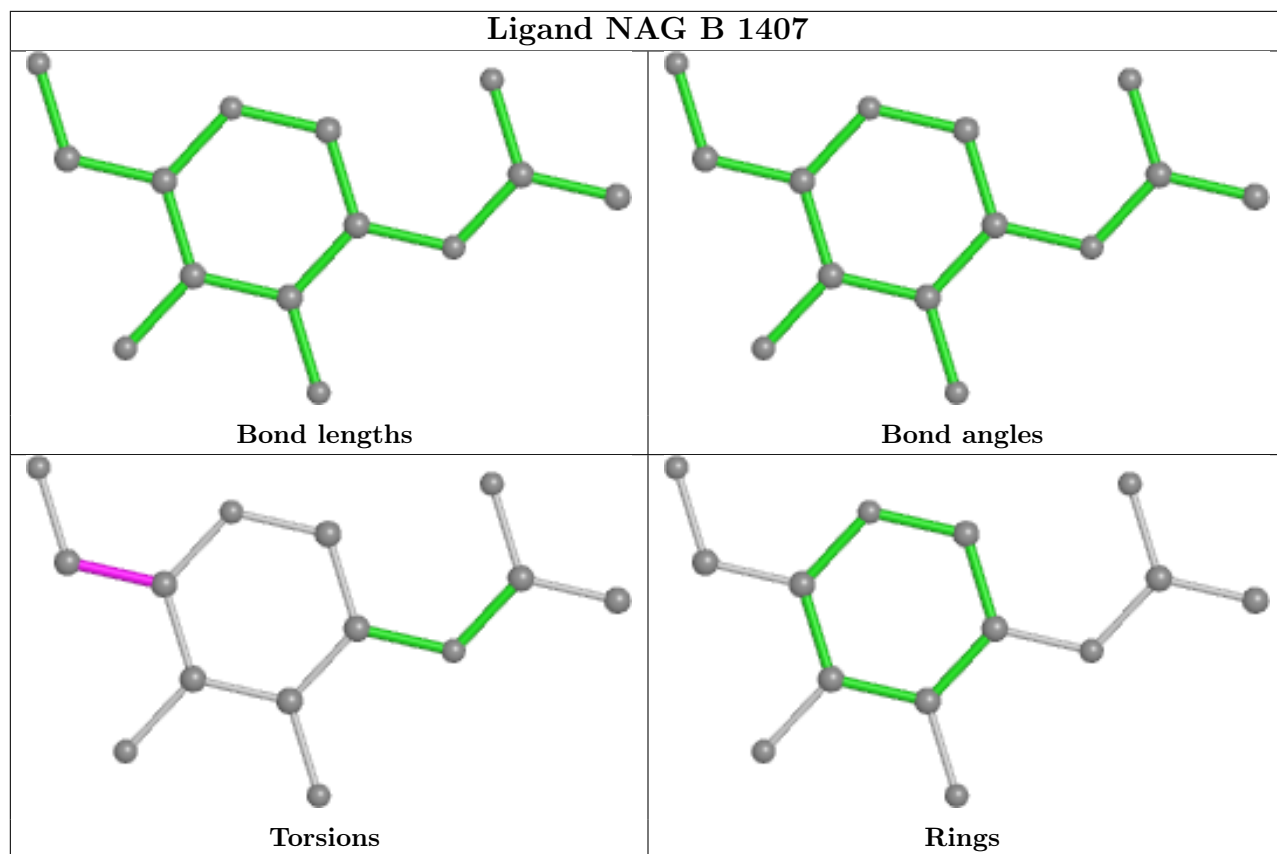


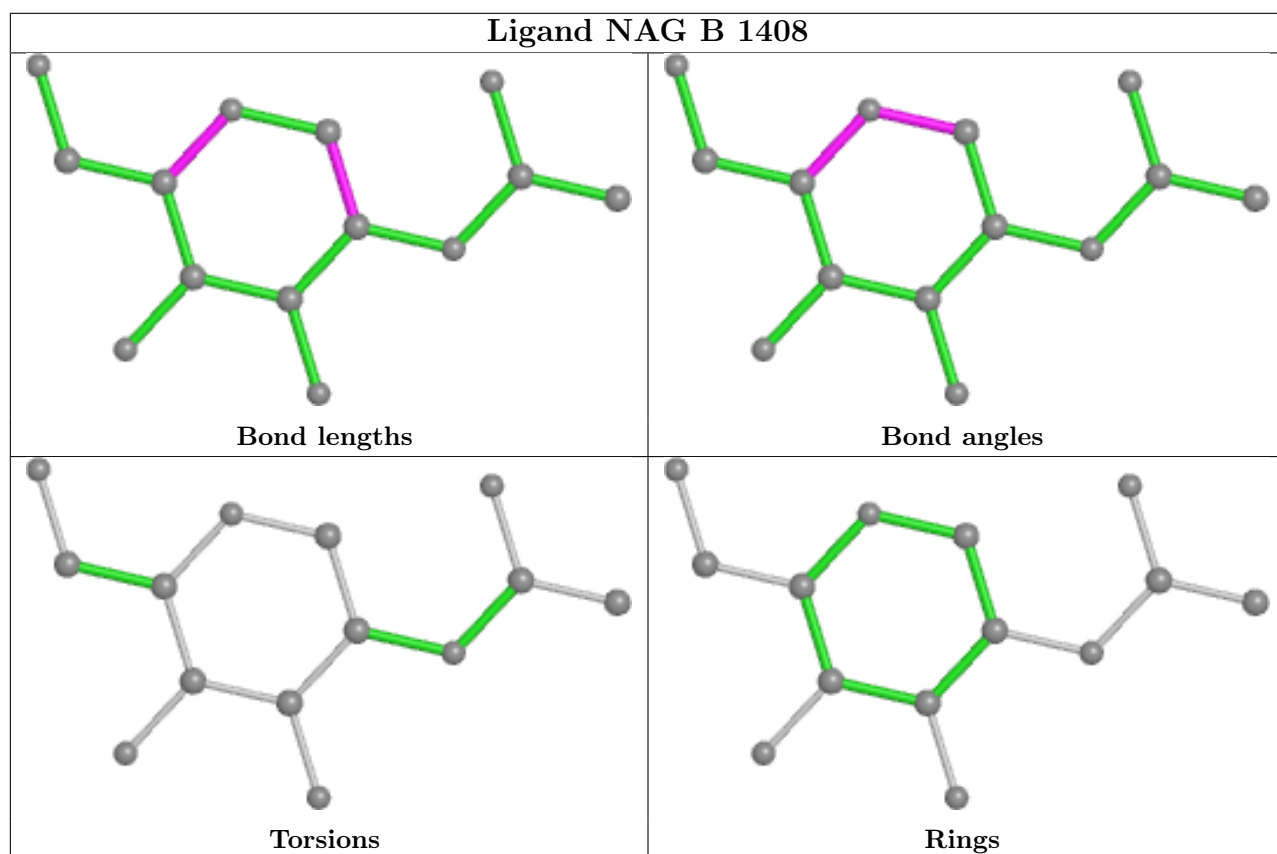
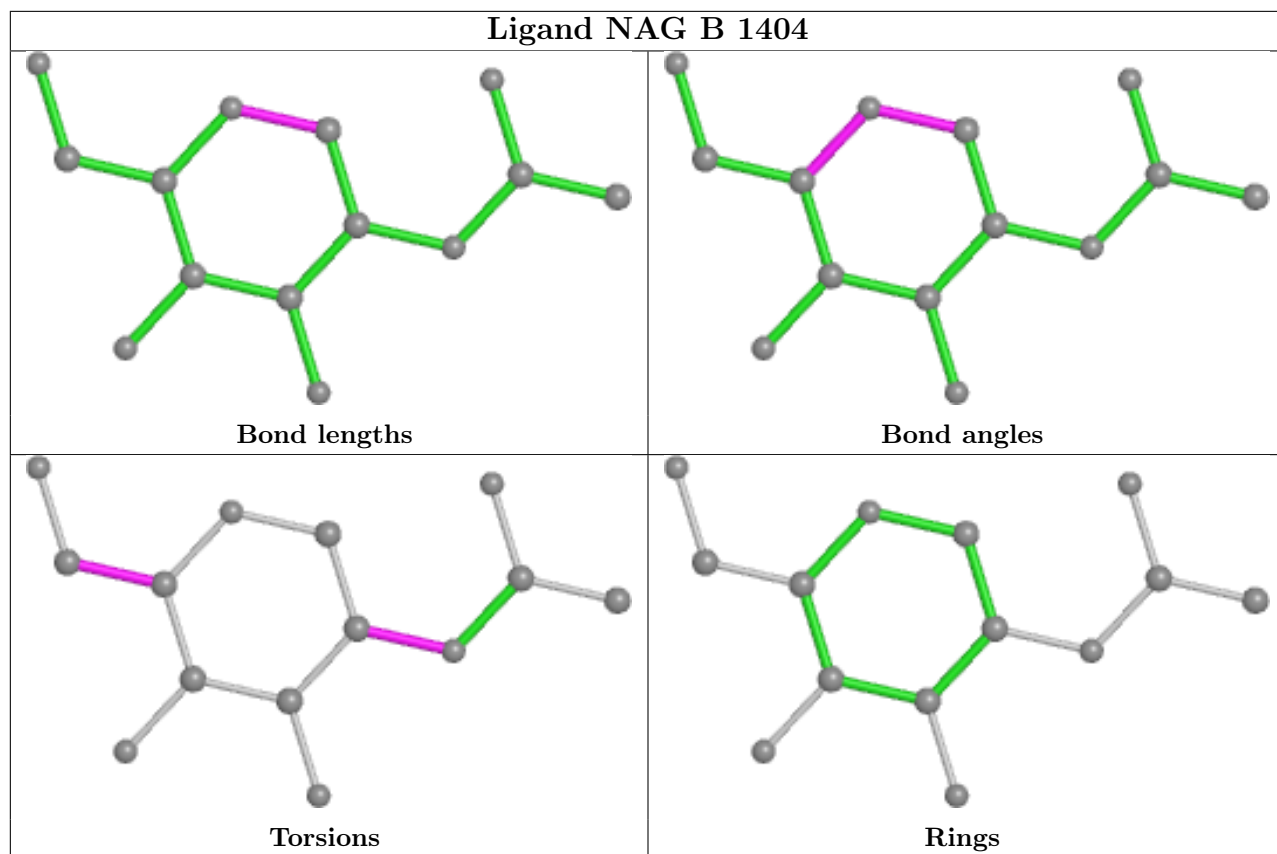


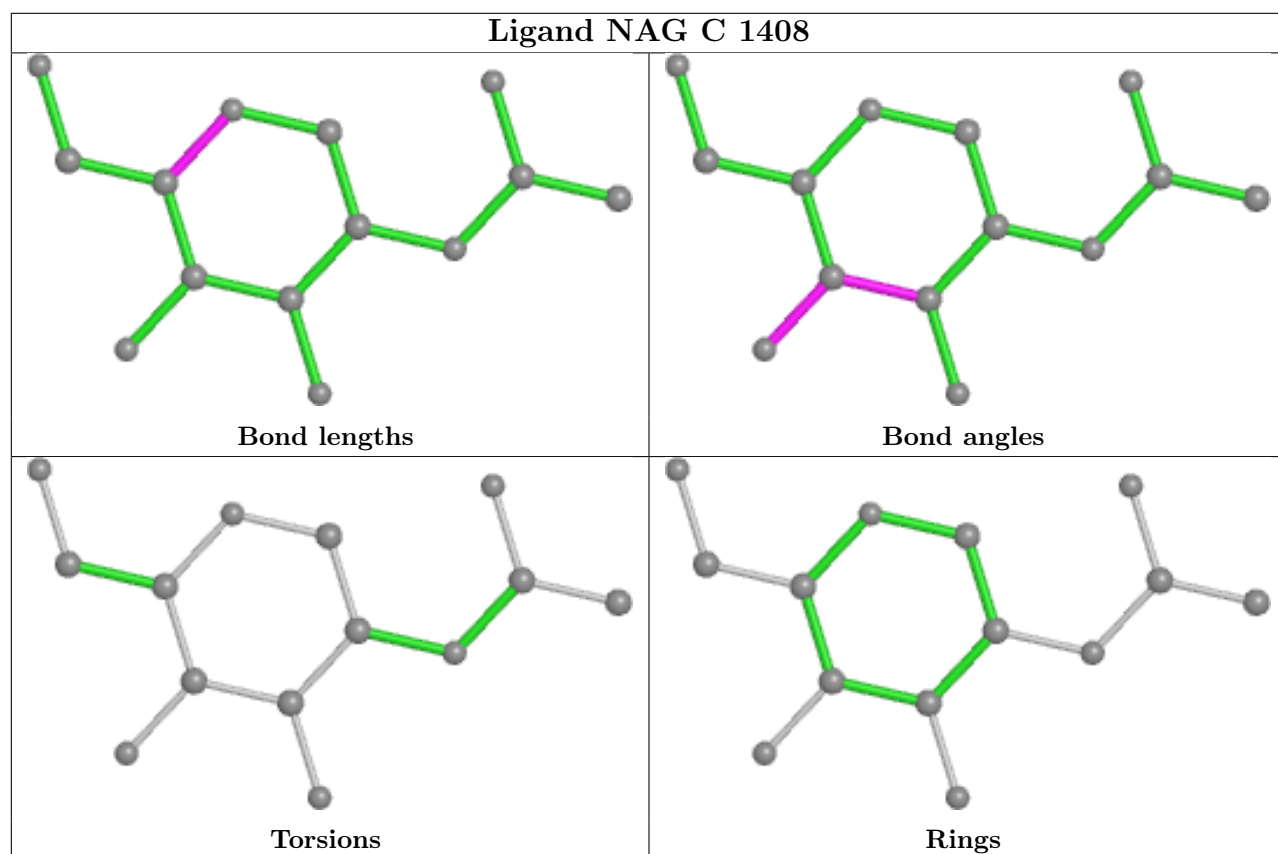
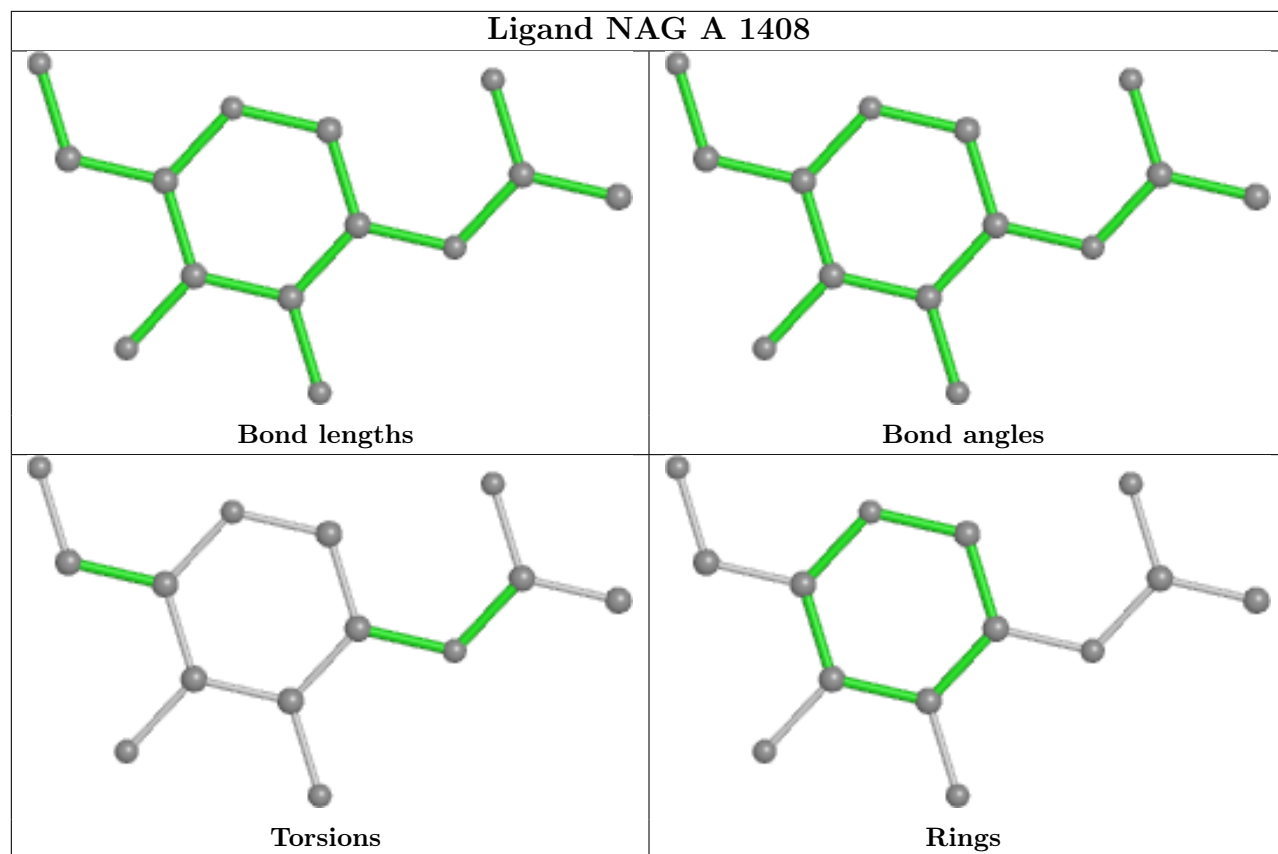


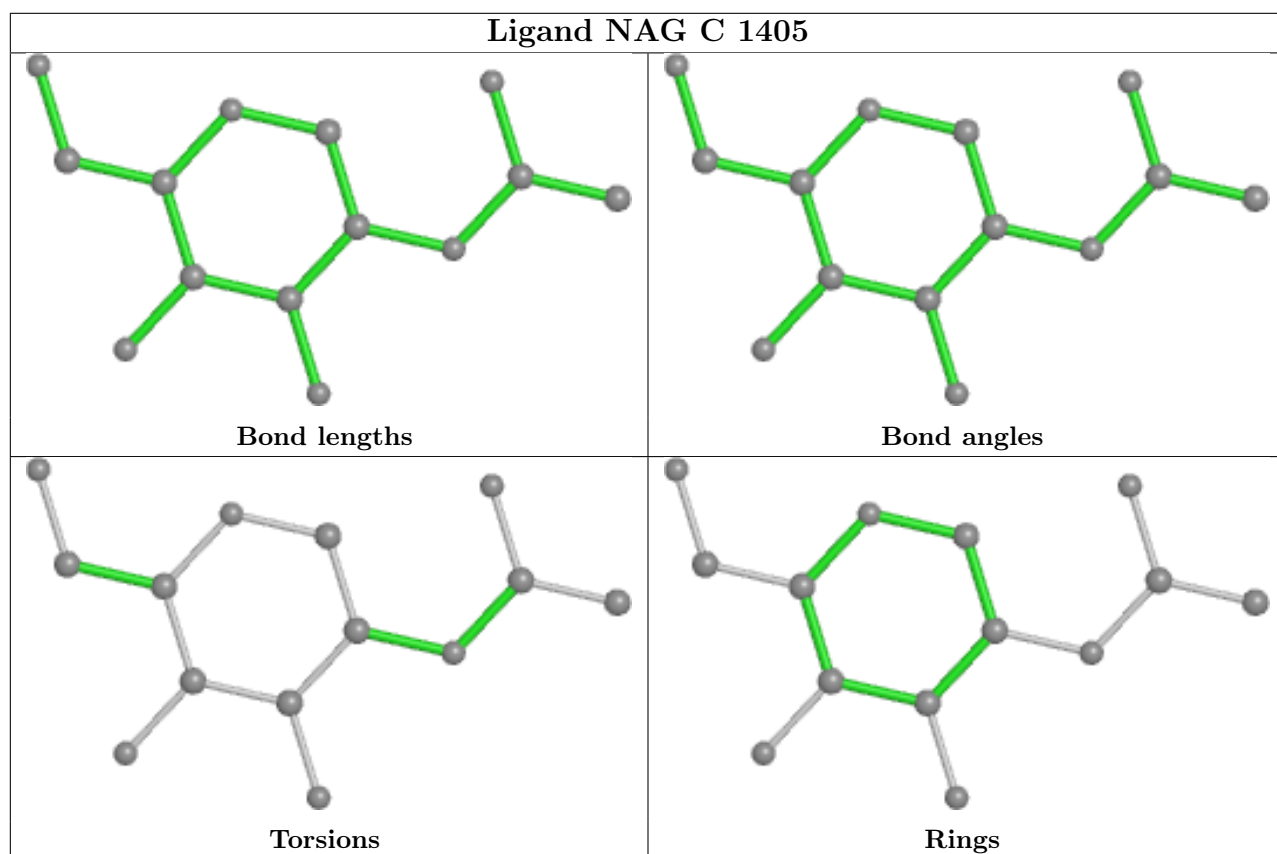
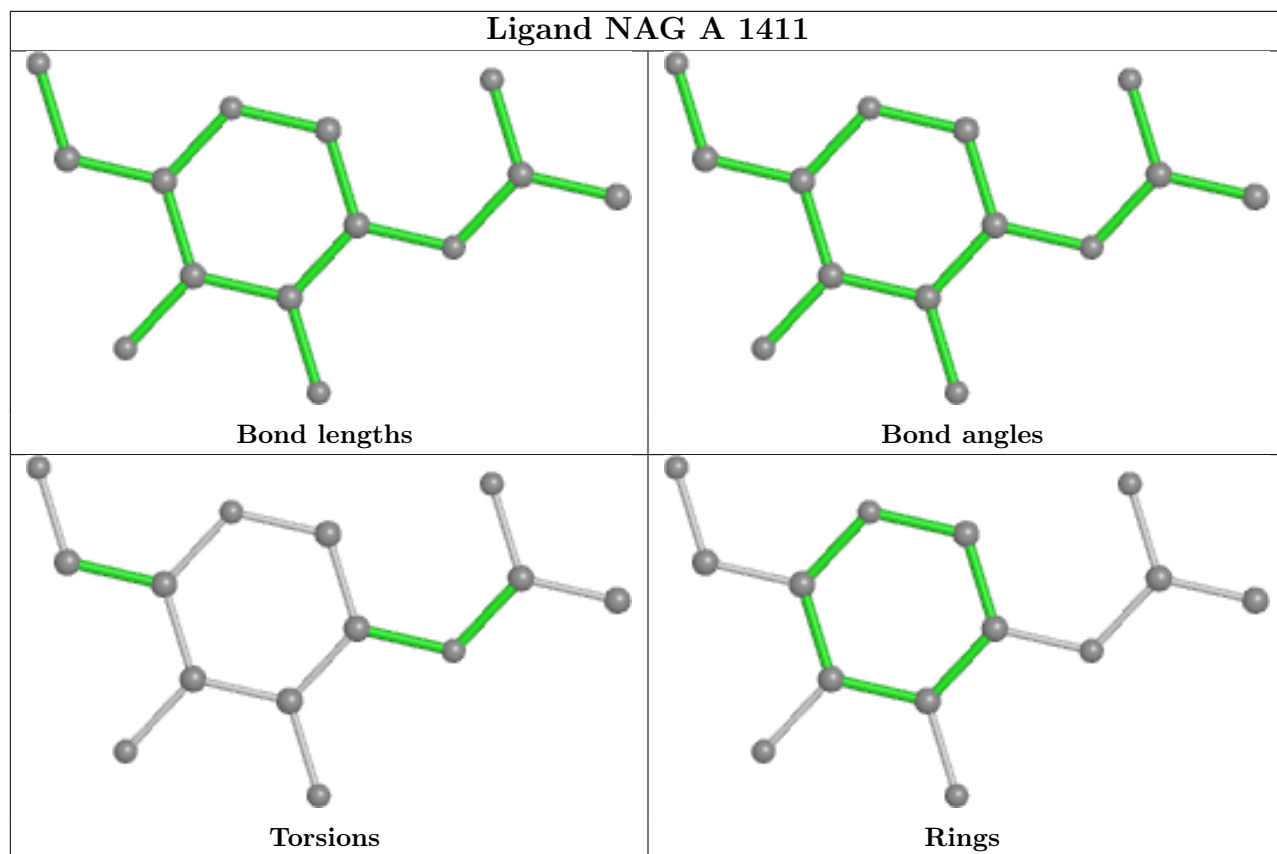


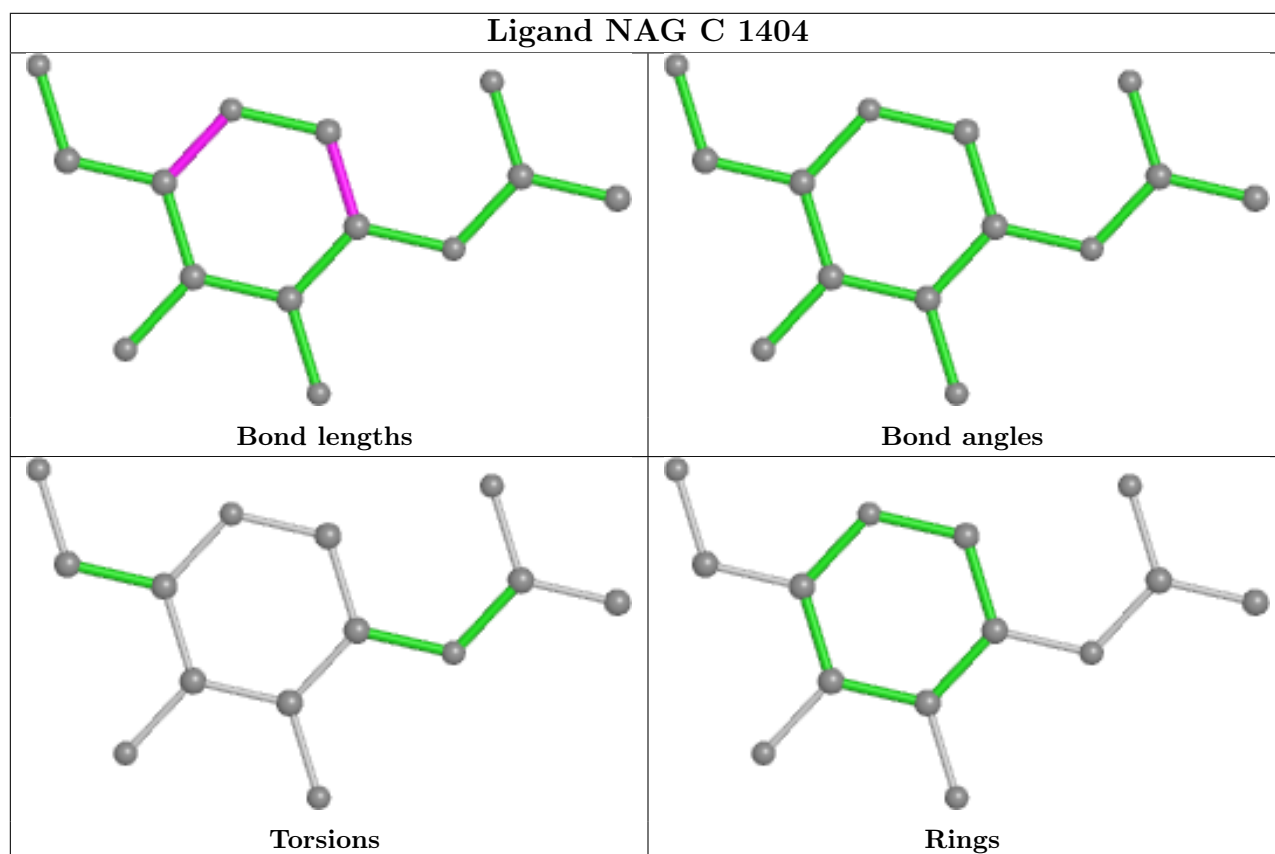
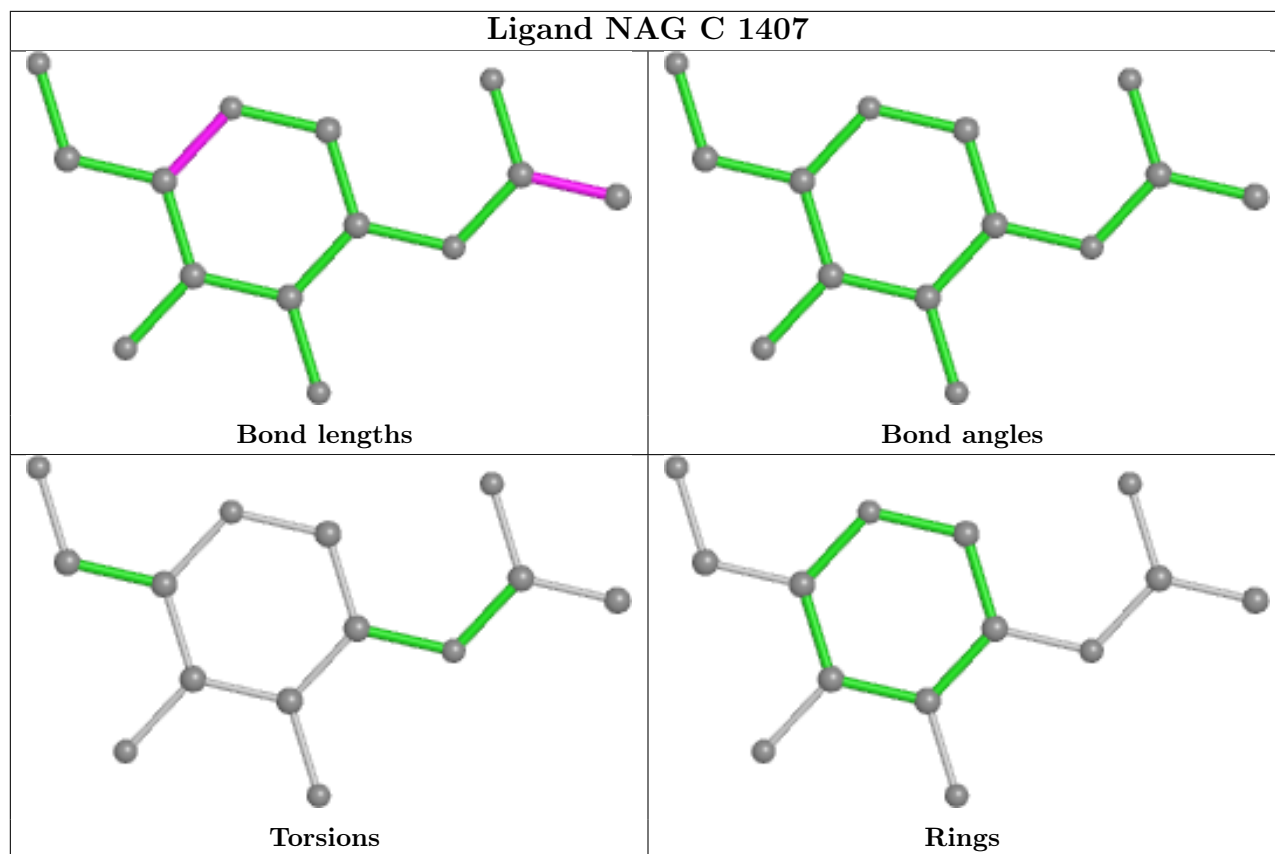


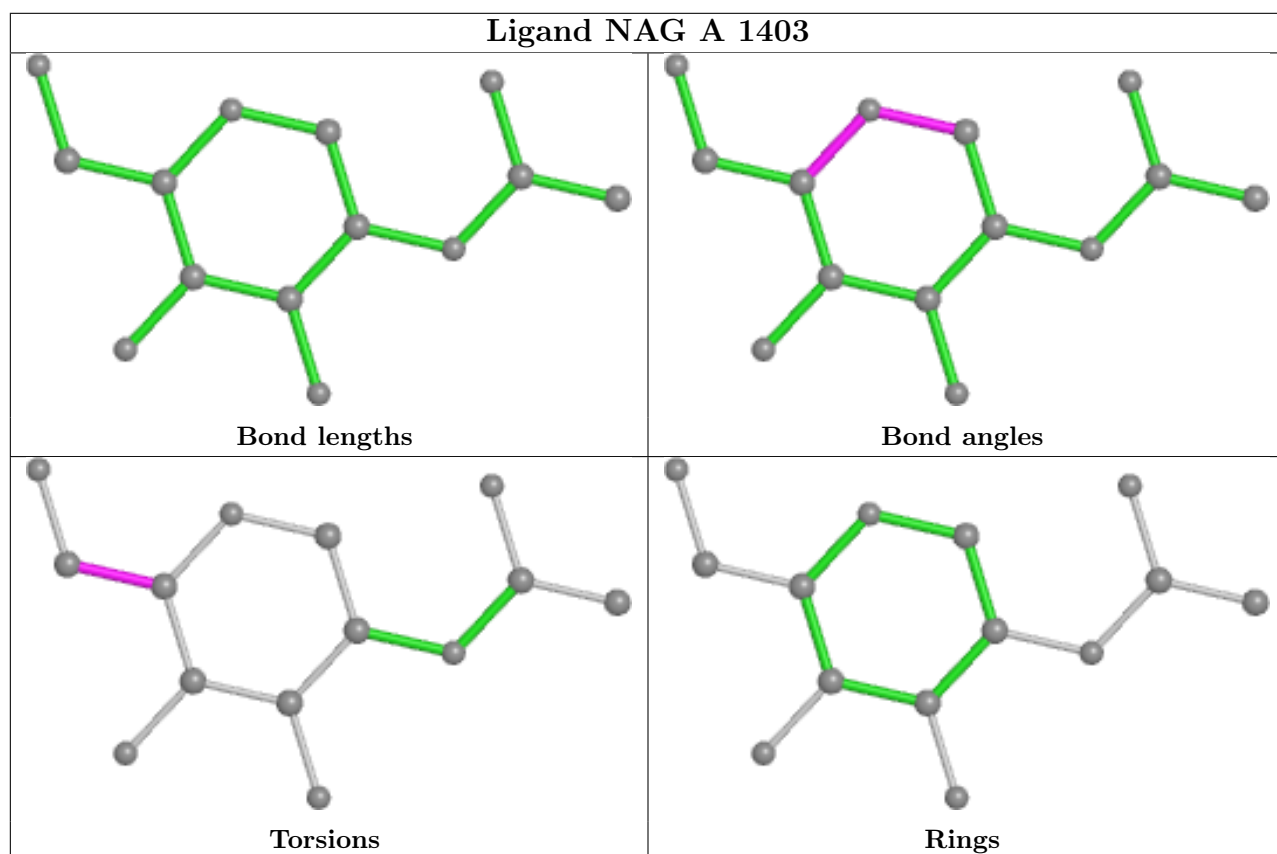
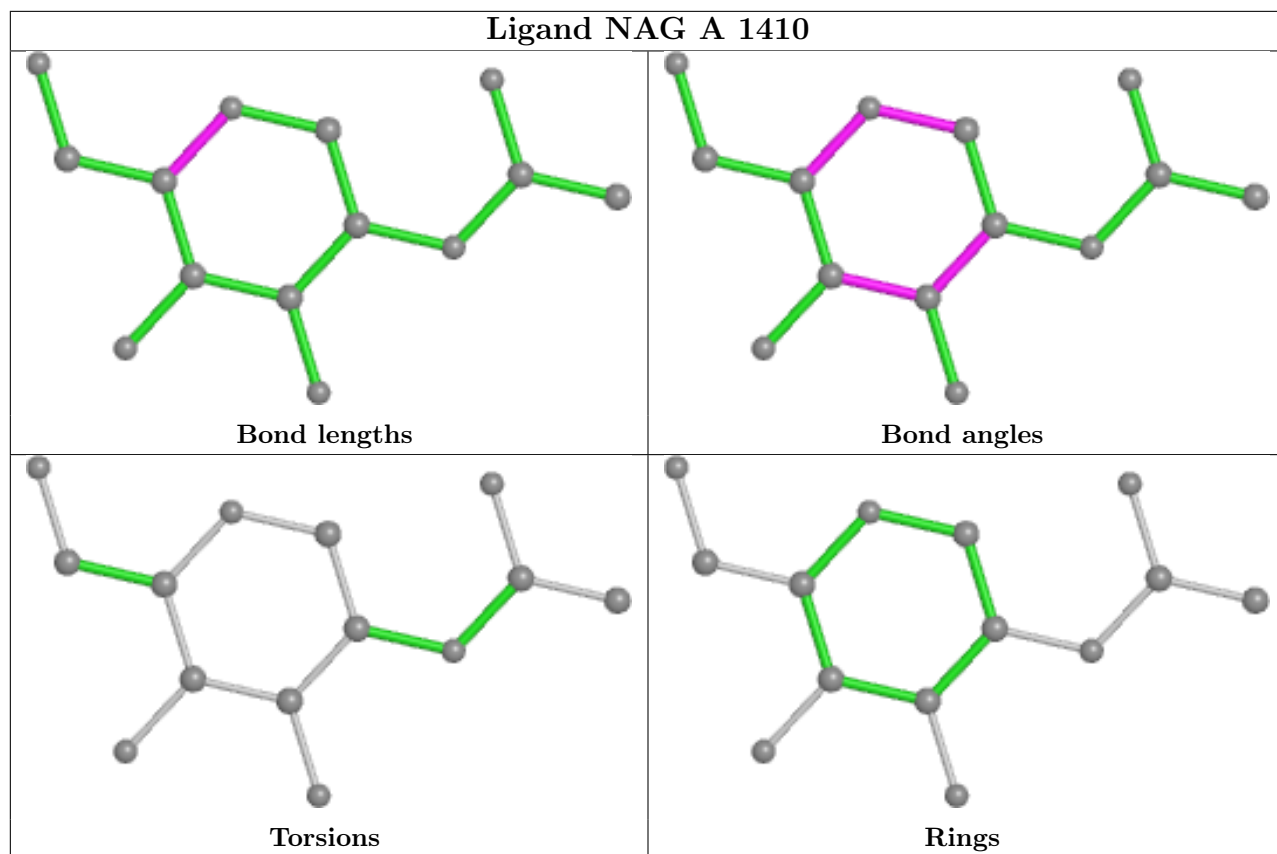


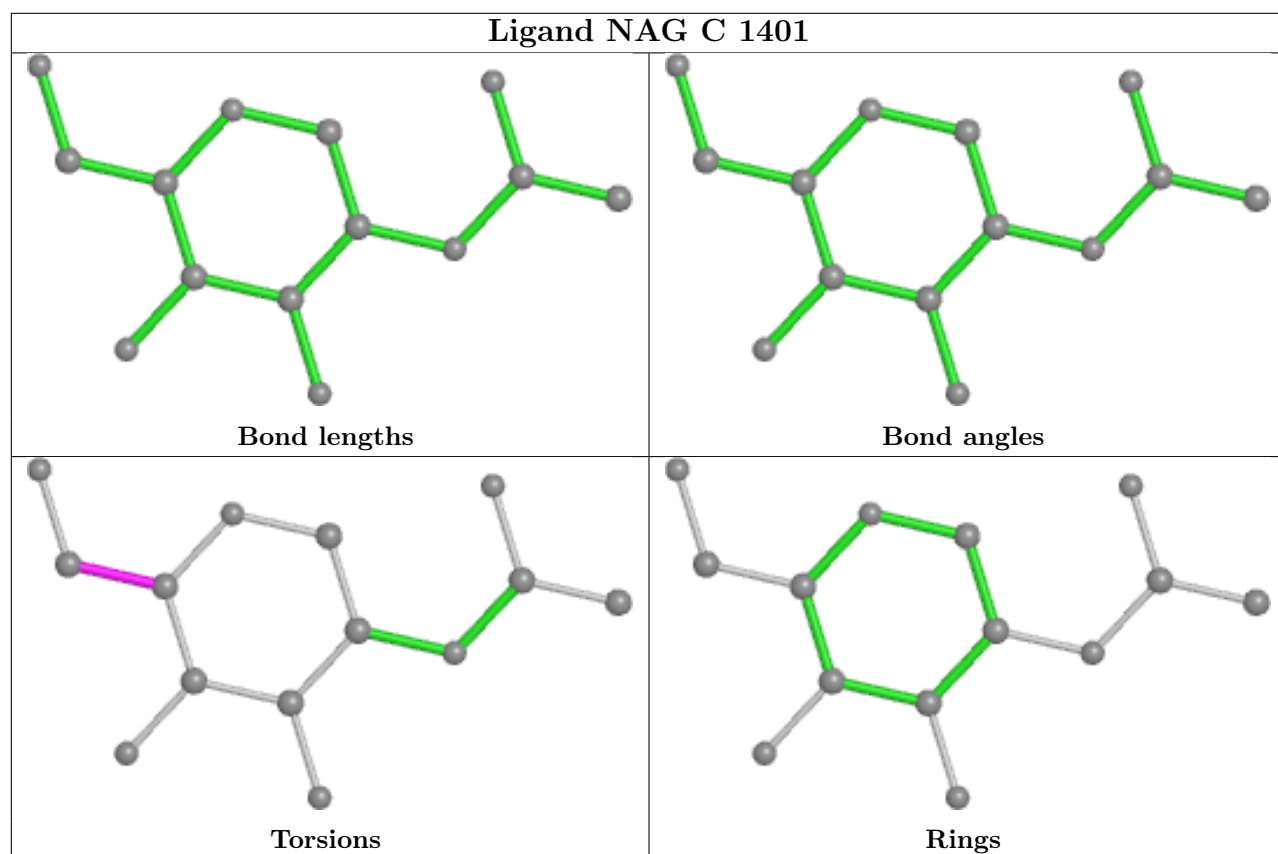
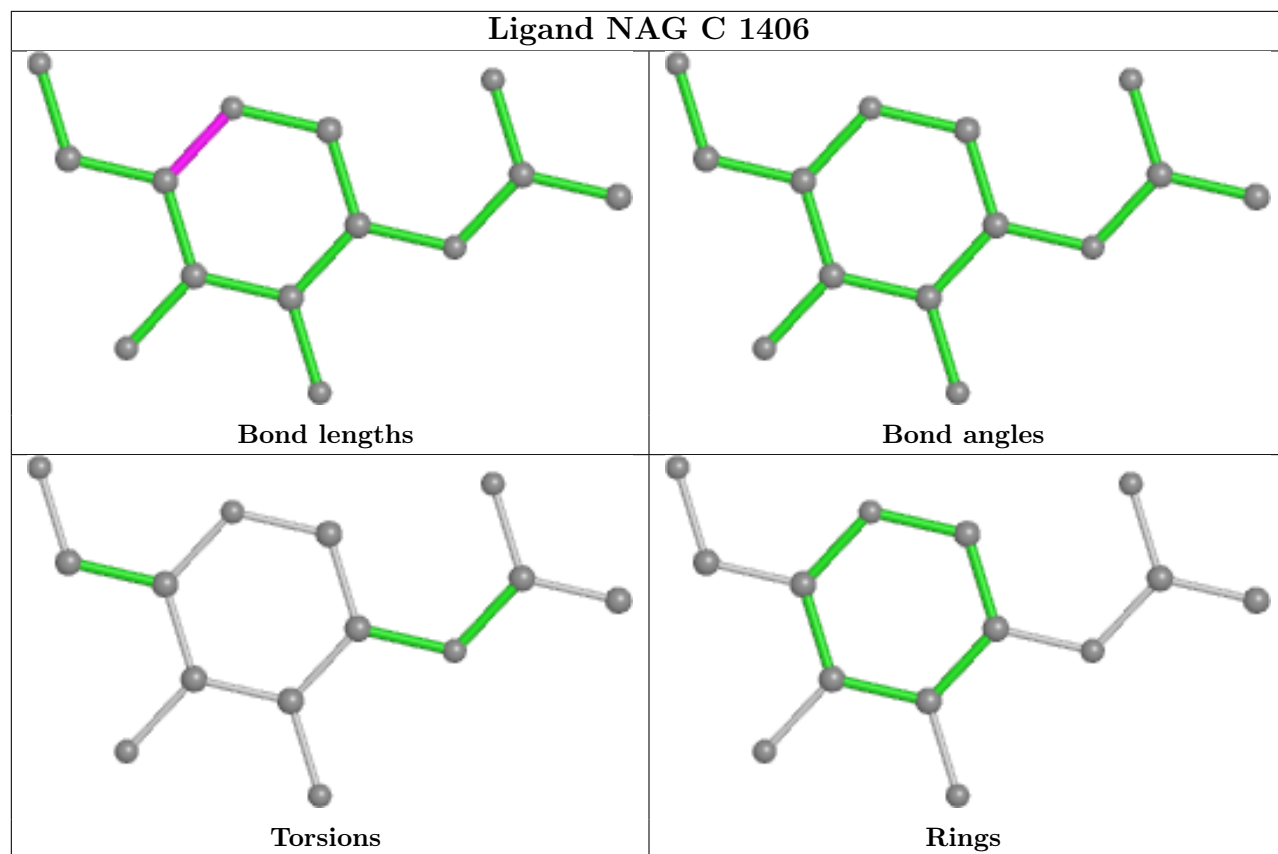


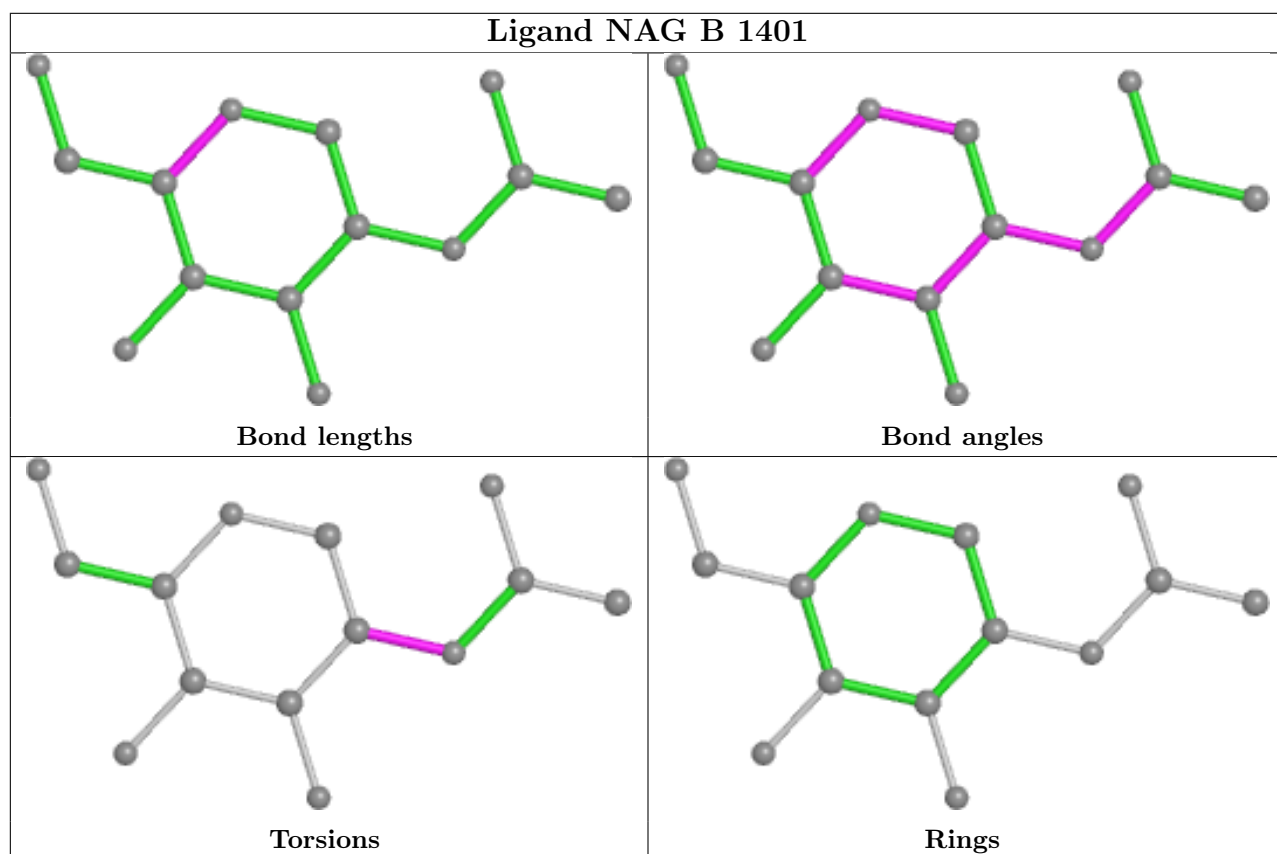
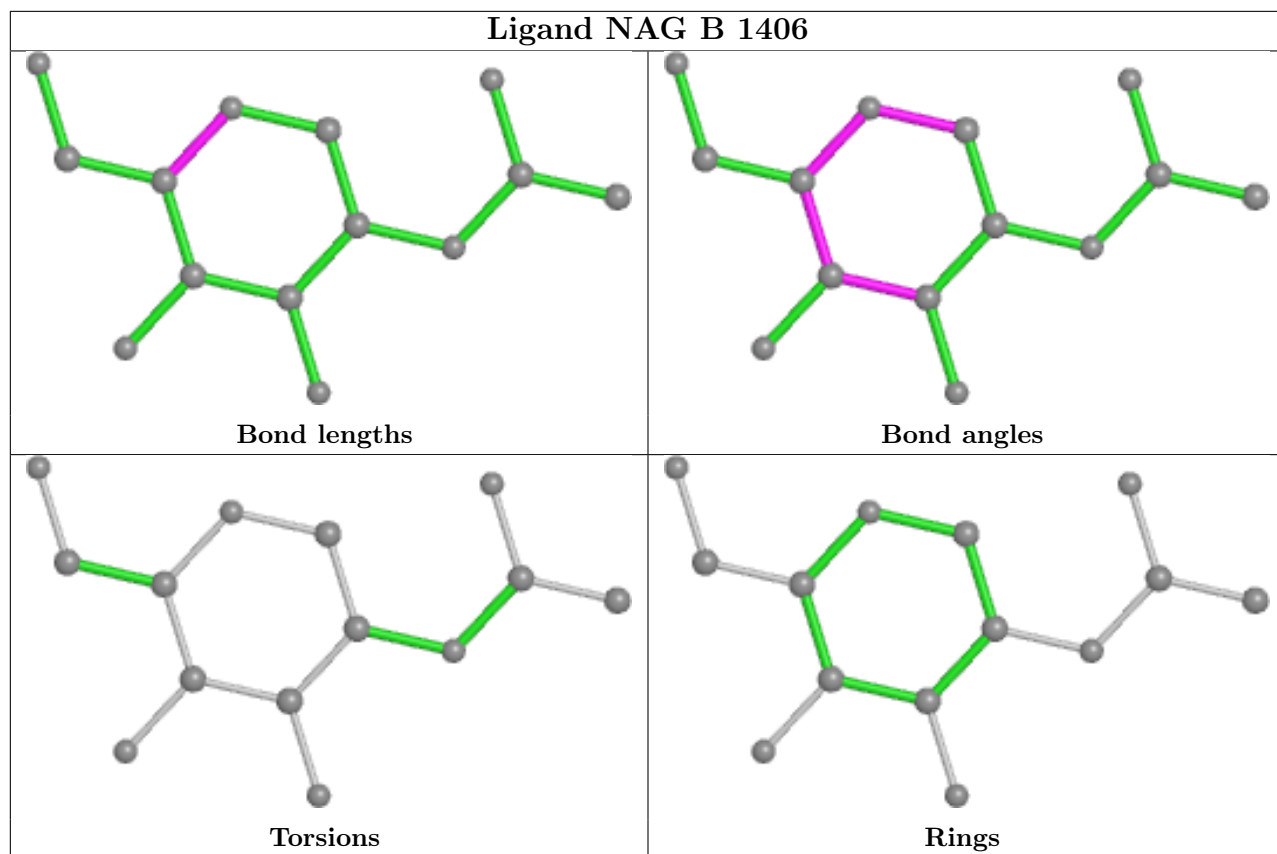


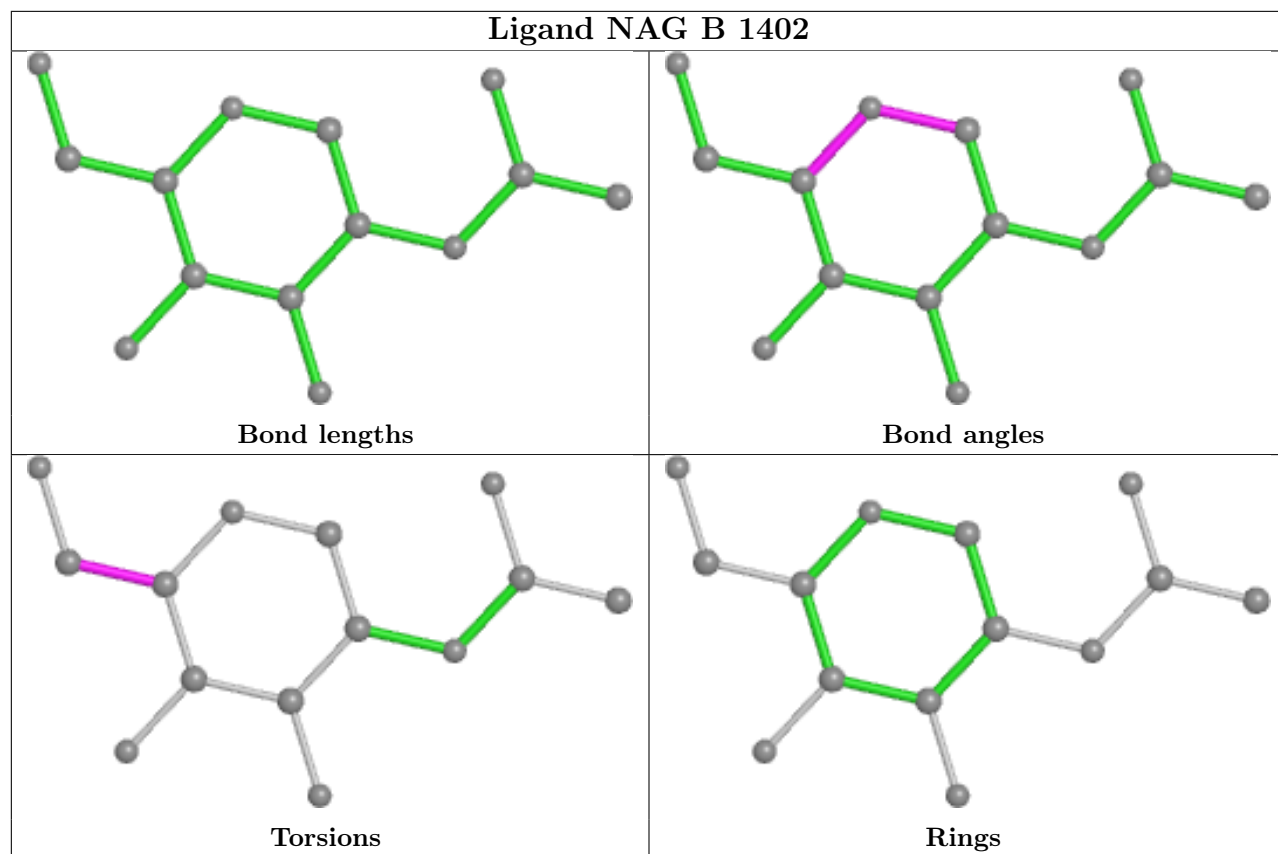












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Map visualisation

This section contains visualisations of the EMDB entry EMD-24988. These allow visual inspection of the internal detail of the map and identification of artifacts.

No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

This section was not generated.

6.2 Central slices

This section was not generated.

6.3 Largest variance slices

This section was not generated.

6.4 Orthogonal surface views

This section was not generated.

6.5 Mask visualisation

This section was not generated. No masks/segmentation were deposited.

7 Map analysis

This section contains the results of statistical analysis of the map.

7.1 Map-value distribution

This section was not generated.

7.2 Volume estimate versus contour level

This section was not generated.

7.3 Rotationally averaged power spectrum

This section was not generated. The rotationally averaged power spectrum had issues being displayed.

8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

9 Map-model fit

This section was not generated.