



## Full wwPDB EM Validation Report ⓘ

Nov 21, 2022 – 06:24 AM EST

PDB ID : 7MW6  
EMDB ID : EMD-24064  
Title : Structure of the SARS-CoV-2 Spike trimer with three RBDs up in complex with the Fab fragment of human neutralizing antibody clone 2  
Authors : Hu, Y.; Xiong, Y.  
Deposited on : 2021-05-15  
Resolution : 3.22 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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>.

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

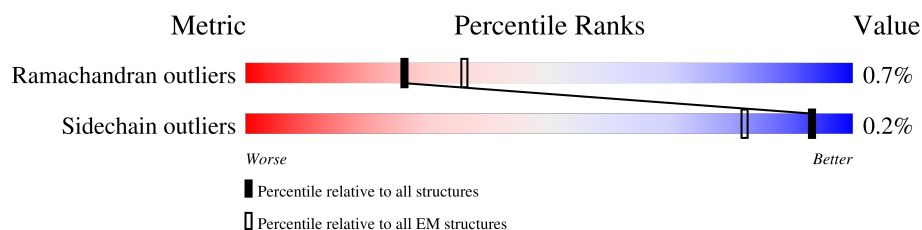
EMDB validation analysis : 0.0.1.dev43  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.31.3

# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:  
*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.22 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.





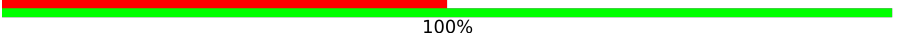




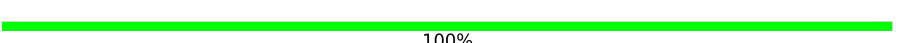



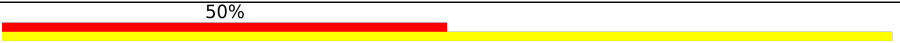

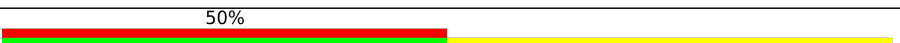

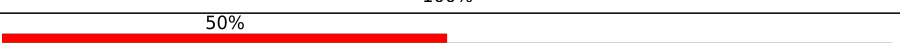

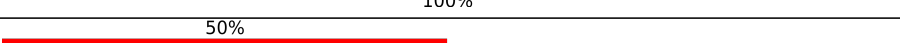
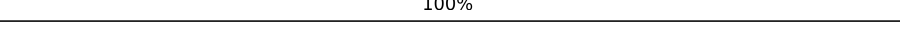
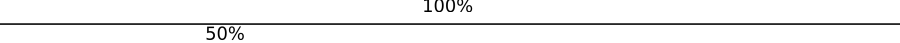

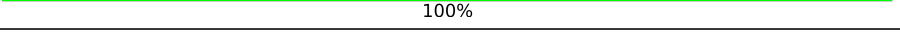

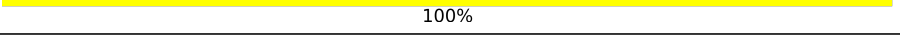
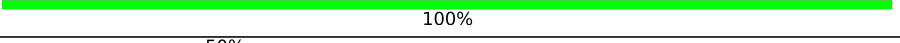
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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  $\geq 3$ , 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  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	1288	
1	B	1288	
1	C	1288	
2	E	265	
2	G	265	
2	L	265	
3	D	263	
3	F	263	
3	H	263	

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

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Mol	Chain	Length	Quality of chain
4	i	2	 100%
4	k	2	 50% 50%
4	l	2	 50% 100%
4	m	2	 100%
4	n	2	 50% 50%
4	o	2	 50% 50%
5	j	2	 100%
5	p	2	 50% 50%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
6	NAG	A	1302	X	-	-	-
6	NAG	B	1302	X	-	-	-
6	NAG	B	1305	X	-	-	-
6	NAG	B	1306	X	-	-	-
6	NAG	C	1302	X	-	-	-

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 35247 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
1	A	1058	Total	C	N	O	S	1	0
			8166	5227	1365	1536	38		
1	C	1058	Total	C	N	O	S	1	0
			8162	5224	1364	1536	38		
1	B	1058	Total	C	N	O	S	1	0
			8170	5230	1366	1536	38		

There are 255 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	682	GLY	ARG	conflict	UNP P0DTC2
A	683	SER	ARG	conflict	UNP P0DTC2
A	685	SER	ARG	conflict	UNP P0DTC2
A	986	PRO	LYS	conflict	UNP P0DTC2
A	987	PRO	VAL	conflict	UNP P0DTC2
A	1209	GLY	-	expression tag	UNP P0DTC2
A	1210	SER	-	expression tag	UNP P0DTC2
A	1211	GLY	-	expression tag	UNP P0DTC2
A	1212	TYR	-	expression tag	UNP P0DTC2
A	1213	ILE	-	expression tag	UNP P0DTC2
A	1214	PRO	-	expression tag	UNP P0DTC2
A	1215	GLU	-	expression tag	UNP P0DTC2
A	1216	ALA	-	expression tag	UNP P0DTC2
A	1217	PRO	-	expression tag	UNP P0DTC2
A	1218	ARG	-	expression tag	UNP P0DTC2
A	1219	ASP	-	expression tag	UNP P0DTC2
A	1220	GLY	-	expression tag	UNP P0DTC2
A	1221	GLN	-	expression tag	UNP P0DTC2
A	1222	ALA	-	expression tag	UNP P0DTC2
A	1223	TYR	-	expression tag	UNP P0DTC2
A	1224	VAL	-	expression tag	UNP P0DTC2
A	1225	ARG	-	expression tag	UNP P0DTC2
A	1226	LYS	-	expression tag	UNP P0DTC2
A	1227	ASP	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1228	GLY	-	expression tag	UNP P0DTC2
A	1229	GLU	-	expression tag	UNP P0DTC2
A	1230	TRP	-	expression tag	UNP P0DTC2
A	1231	VAL	-	expression tag	UNP P0DTC2
A	1232	LEU	-	expression tag	UNP P0DTC2
A	1233	LEU	-	expression tag	UNP P0DTC2
A	1234	SER	-	expression tag	UNP P0DTC2
A	1235	THR	-	expression tag	UNP P0DTC2
A	1236	PHE	-	expression tag	UNP P0DTC2
A	1237	LEU	-	expression tag	UNP P0DTC2
A	1238	GLY	-	expression tag	UNP P0DTC2
A	1239	ARG	-	expression tag	UNP P0DTC2
A	1240	SER	-	expression tag	UNP P0DTC2
A	1241	LEU	-	expression tag	UNP P0DTC2
A	1242	GLU	-	expression tag	UNP P0DTC2
A	1243	VAL	-	expression tag	UNP P0DTC2
A	1244	LEU	-	expression tag	UNP P0DTC2
A	1245	PHE	-	expression tag	UNP P0DTC2
A	1246	GLN	-	expression tag	UNP P0DTC2
A	1247	GLY	-	expression tag	UNP P0DTC2
A	1248	PRO	-	expression tag	UNP P0DTC2
A	1249	GLY	-	expression tag	UNP P0DTC2
A	1250	HIS	-	expression tag	UNP P0DTC2
A	1251	HIS	-	expression tag	UNP P0DTC2
A	1252	HIS	-	expression tag	UNP P0DTC2
A	1253	HIS	-	expression tag	UNP P0DTC2
A	1254	HIS	-	expression tag	UNP P0DTC2
A	1255	HIS	-	expression tag	UNP P0DTC2
A	1256	HIS	-	expression tag	UNP P0DTC2
A	1257	HIS	-	expression tag	UNP P0DTC2
A	1258	SER	-	expression tag	UNP P0DTC2
A	1259	ALA	-	expression tag	UNP P0DTC2
A	1260	TRP	-	expression tag	UNP P0DTC2
A	1261	SER	-	expression tag	UNP P0DTC2
A	1262	HIS	-	expression tag	UNP P0DTC2
A	1263	PRO	-	expression tag	UNP P0DTC2
A	1264	GLN	-	expression tag	UNP P0DTC2
A	1265	PHE	-	expression tag	UNP P0DTC2
A	1266	GLU	-	expression tag	UNP P0DTC2
A	1267	LYS	-	expression tag	UNP P0DTC2
A	1268	GLY	-	expression tag	UNP P0DTC2
A	1269	GLY	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1270	GLY	-	expression tag	UNP P0DTC2
A	1271	SER	-	expression tag	UNP P0DTC2
A	1272	GLY	-	expression tag	UNP P0DTC2
A	1273	GLY	-	expression tag	UNP P0DTC2
A	1274	GLY	-	expression tag	UNP P0DTC2
A	1275	GLY	-	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	SER	-	expression tag	UNP P0DTC2
A	1280	ALA	-	expression tag	UNP P0DTC2
A	1281	TRP	-	expression tag	UNP P0DTC2
A	1282	SER	-	expression tag	UNP P0DTC2
A	1283	HIS	-	expression tag	UNP P0DTC2
A	1284	PRO	-	expression tag	UNP P0DTC2
A	1285	GLN	-	expression tag	UNP P0DTC2
A	1286	PHE	-	expression tag	UNP P0DTC2
A	1287	GLU	-	expression tag	UNP P0DTC2
A	1288	LYS	-	expression tag	UNP P0DTC2
C	682	GLY	ARG	conflict	UNP P0DTC2
C	683	SER	ARG	conflict	UNP P0DTC2
C	685	SER	ARG	conflict	UNP P0DTC2
C	986	PRO	LYS	conflict	UNP P0DTC2
C	987	PRO	VAL	conflict	UNP P0DTC2
C	1209	GLY	-	expression tag	UNP P0DTC2
C	1210	SER	-	expression tag	UNP P0DTC2
C	1211	GLY	-	expression tag	UNP P0DTC2
C	1212	TYR	-	expression tag	UNP P0DTC2
C	1213	ILE	-	expression tag	UNP P0DTC2
C	1214	PRO	-	expression tag	UNP P0DTC2
C	1215	GLU	-	expression tag	UNP P0DTC2
C	1216	ALA	-	expression tag	UNP P0DTC2
C	1217	PRO	-	expression tag	UNP P0DTC2
C	1218	ARG	-	expression tag	UNP P0DTC2
C	1219	ASP	-	expression tag	UNP P0DTC2
C	1220	GLY	-	expression tag	UNP P0DTC2
C	1221	GLN	-	expression tag	UNP P0DTC2
C	1222	ALA	-	expression tag	UNP P0DTC2
C	1223	TYR	-	expression tag	UNP P0DTC2
C	1224	VAL	-	expression tag	UNP P0DTC2
C	1225	ARG	-	expression tag	UNP P0DTC2
C	1226	LYS	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
C	1227	ASP	-	expression tag	UNP P0DTC2
C	1228	GLY	-	expression tag	UNP P0DTC2
C	1229	GLU	-	expression tag	UNP P0DTC2
C	1230	TRP	-	expression tag	UNP P0DTC2
C	1231	VAL	-	expression tag	UNP P0DTC2
C	1232	LEU	-	expression tag	UNP P0DTC2
C	1233	LEU	-	expression tag	UNP P0DTC2
C	1234	SER	-	expression tag	UNP P0DTC2
C	1235	THR	-	expression tag	UNP P0DTC2
C	1236	PHE	-	expression tag	UNP P0DTC2
C	1237	LEU	-	expression tag	UNP P0DTC2
C	1238	GLY	-	expression tag	UNP P0DTC2
C	1239	ARG	-	expression tag	UNP P0DTC2
C	1240	SER	-	expression tag	UNP P0DTC2
C	1241	LEU	-	expression tag	UNP P0DTC2
C	1242	GLU	-	expression tag	UNP P0DTC2
C	1243	VAL	-	expression tag	UNP P0DTC2
C	1244	LEU	-	expression tag	UNP P0DTC2
C	1245	PHE	-	expression tag	UNP P0DTC2
C	1246	GLN	-	expression tag	UNP P0DTC2
C	1247	GLY	-	expression tag	UNP P0DTC2
C	1248	PRO	-	expression tag	UNP P0DTC2
C	1249	GLY	-	expression tag	UNP P0DTC2
C	1250	HIS	-	expression tag	UNP P0DTC2
C	1251	HIS	-	expression tag	UNP P0DTC2
C	1252	HIS	-	expression tag	UNP P0DTC2
C	1253	HIS	-	expression tag	UNP P0DTC2
C	1254	HIS	-	expression tag	UNP P0DTC2
C	1255	HIS	-	expression tag	UNP P0DTC2
C	1256	HIS	-	expression tag	UNP P0DTC2
C	1257	HIS	-	expression tag	UNP P0DTC2
C	1258	SER	-	expression tag	UNP P0DTC2
C	1259	ALA	-	expression tag	UNP P0DTC2
C	1260	TRP	-	expression tag	UNP P0DTC2
C	1261	SER	-	expression tag	UNP P0DTC2
C	1262	HIS	-	expression tag	UNP P0DTC2
C	1263	PRO	-	expression tag	UNP P0DTC2
C	1264	GLN	-	expression tag	UNP P0DTC2
C	1265	PHE	-	expression tag	UNP P0DTC2
C	1266	GLU	-	expression tag	UNP P0DTC2
C	1267	LYS	-	expression tag	UNP P0DTC2
C	1268	GLY	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
C	1269	GLY	-	expression tag	UNP P0DTC2
C	1270	GLY	-	expression tag	UNP P0DTC2
C	1271	SER	-	expression tag	UNP P0DTC2
C	1272	GLY	-	expression tag	UNP P0DTC2
C	1273	GLY	-	expression tag	UNP P0DTC2
C	1274	GLY	-	expression tag	UNP P0DTC2
C	1275	GLY	-	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	SER	-	expression tag	UNP P0DTC2
C	1280	ALA	-	expression tag	UNP P0DTC2
C	1281	TRP	-	expression tag	UNP P0DTC2
C	1282	SER	-	expression tag	UNP P0DTC2
C	1283	HIS	-	expression tag	UNP P0DTC2
C	1284	PRO	-	expression tag	UNP P0DTC2
C	1285	GLN	-	expression tag	UNP P0DTC2
C	1286	PHE	-	expression tag	UNP P0DTC2
C	1287	GLU	-	expression tag	UNP P0DTC2
C	1288	LYS	-	expression tag	UNP P0DTC2
B	682	GLY	ARG	conflict	UNP P0DTC2
B	683	SER	ARG	conflict	UNP P0DTC2
B	685	SER	ARG	conflict	UNP P0DTC2
B	986	PRO	LYS	conflict	UNP P0DTC2
B	987	PRO	VAL	conflict	UNP P0DTC2
B	1209	GLY	-	expression tag	UNP P0DTC2
B	1210	SER	-	expression tag	UNP P0DTC2
B	1211	GLY	-	expression tag	UNP P0DTC2
B	1212	TYR	-	expression tag	UNP P0DTC2
B	1213	ILE	-	expression tag	UNP P0DTC2
B	1214	PRO	-	expression tag	UNP P0DTC2
B	1215	GLU	-	expression tag	UNP P0DTC2
B	1216	ALA	-	expression tag	UNP P0DTC2
B	1217	PRO	-	expression tag	UNP P0DTC2
B	1218	ARG	-	expression tag	UNP P0DTC2
B	1219	ASP	-	expression tag	UNP P0DTC2
B	1220	GLY	-	expression tag	UNP P0DTC2
B	1221	GLN	-	expression tag	UNP P0DTC2
B	1222	ALA	-	expression tag	UNP P0DTC2
B	1223	TYR	-	expression tag	UNP P0DTC2
B	1224	VAL	-	expression tag	UNP P0DTC2
B	1225	ARG	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1226	LYS	-	expression tag	UNP P0DTC2
B	1227	ASP	-	expression tag	UNP P0DTC2
B	1228	GLY	-	expression tag	UNP P0DTC2
B	1229	GLU	-	expression tag	UNP P0DTC2
B	1230	TRP	-	expression tag	UNP P0DTC2
B	1231	VAL	-	expression tag	UNP P0DTC2
B	1232	LEU	-	expression tag	UNP P0DTC2
B	1233	LEU	-	expression tag	UNP P0DTC2
B	1234	SER	-	expression tag	UNP P0DTC2
B	1235	THR	-	expression tag	UNP P0DTC2
B	1236	PHE	-	expression tag	UNP P0DTC2
B	1237	LEU	-	expression tag	UNP P0DTC2
B	1238	GLY	-	expression tag	UNP P0DTC2
B	1239	ARG	-	expression tag	UNP P0DTC2
B	1240	SER	-	expression tag	UNP P0DTC2
B	1241	LEU	-	expression tag	UNP P0DTC2
B	1242	GLU	-	expression tag	UNP P0DTC2
B	1243	VAL	-	expression tag	UNP P0DTC2
B	1244	LEU	-	expression tag	UNP P0DTC2
B	1245	PHE	-	expression tag	UNP P0DTC2
B	1246	GLN	-	expression tag	UNP P0DTC2
B	1247	GLY	-	expression tag	UNP P0DTC2
B	1248	PRO	-	expression tag	UNP P0DTC2
B	1249	GLY	-	expression tag	UNP P0DTC2
B	1250	HIS	-	expression tag	UNP P0DTC2
B	1251	HIS	-	expression tag	UNP P0DTC2
B	1252	HIS	-	expression tag	UNP P0DTC2
B	1253	HIS	-	expression tag	UNP P0DTC2
B	1254	HIS	-	expression tag	UNP P0DTC2
B	1255	HIS	-	expression tag	UNP P0DTC2
B	1256	HIS	-	expression tag	UNP P0DTC2
B	1257	HIS	-	expression tag	UNP P0DTC2
B	1258	SER	-	expression tag	UNP P0DTC2
B	1259	ALA	-	expression tag	UNP P0DTC2
B	1260	TRP	-	expression tag	UNP P0DTC2
B	1261	SER	-	expression tag	UNP P0DTC2
B	1262	HIS	-	expression tag	UNP P0DTC2
B	1263	PRO	-	expression tag	UNP P0DTC2
B	1264	GLN	-	expression tag	UNP P0DTC2
B	1265	PHE	-	expression tag	UNP P0DTC2
B	1266	GLU	-	expression tag	UNP P0DTC2
B	1267	LYS	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1268	GLY	-	expression tag	UNP P0DTC2
B	1269	GLY	-	expression tag	UNP P0DTC2
B	1270	GLY	-	expression tag	UNP P0DTC2
B	1271	SER	-	expression tag	UNP P0DTC2
B	1272	GLY	-	expression tag	UNP P0DTC2
B	1273	GLY	-	expression tag	UNP P0DTC2
B	1274	GLY	-	expression tag	UNP P0DTC2
B	1275	GLY	-	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
B	1279	SER	-	expression tag	UNP P0DTC2
B	1280	ALA	-	expression tag	UNP P0DTC2
B	1281	TRP	-	expression tag	UNP P0DTC2
B	1282	SER	-	expression tag	UNP P0DTC2
B	1283	HIS	-	expression tag	UNP P0DTC2
B	1284	PRO	-	expression tag	UNP P0DTC2
B	1285	GLN	-	expression tag	UNP P0DTC2
B	1286	PHE	-	expression tag	UNP P0DTC2
B	1287	GLU	-	expression tag	UNP P0DTC2
B	1288	LYS	-	expression tag	UNP P0DTC2

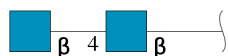
- Molecule 2 is a protein called Fab of antibody clone 2, light chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	E	215	Total	C	N	O	S	0	0
			1640	1029	279	326	6		
2	L	215	Total	C	N	O	S	0	0
			1640	1029	279	326	6		
2	G	215	Total	C	N	O	S	0	0
			1640	1029	279	326	6		

- Molecule 3 is a protein called Fab of antibody clone 2, heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	D	209	Total	C	N	O	S	0	0
			1537	966	253	311	7		
3	H	209	Total	C	N	O	S	0	0
			1537	966	253	311	7		
3	F	209	Total	C	N	O	S	0	0
			1537	966	253	311	7		

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



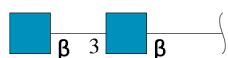
Mol	Chain	Residues	Atoms				AltConf	Trace
4	I	2	Total	C	N	O	0	0
			28	16	2	10		
4	J	2	Total	C	N	O	0	0
			28	16	2	10		
4	K	2	Total	C	N	O	0	0
			28	16	2	10		
4	M	2	Total	C	N	O	0	0
			28	16	2	10		
4	N	2	Total	C	N	O	0	0
			28	16	2	10		
4	O	2	Total	C	N	O	0	0
			28	16	2	10		
4	P	2	Total	C	N	O	0	0
			28	16	2	10		
4	Q	2	Total	C	N	O	0	0
			28	16	2	10		
4	R	2	Total	C	N	O	0	0
			28	16	2	10		
4	S	2	Total	C	N	O	0	0
			28	16	2	10		
4	T	2	Total	C	N	O	0	0
			28	16	2	10		
4	U	2	Total	C	N	O	0	0
			28	16	2	10		
4	V	2	Total	C	N	O	0	0
			28	16	2	10		
4	W	2	Total	C	N	O	0	0
			28	16	2	10		
4	X	2	Total	C	N	O	0	0
			28	16	2	10		
4	Y	2	Total	C	N	O	0	0
			28	16	2	10		
4	Z	2	Total	C	N	O	0	0
			28	16	2	10		
4	a	2	Total	C	N	O	0	0
			28	16	2	10		

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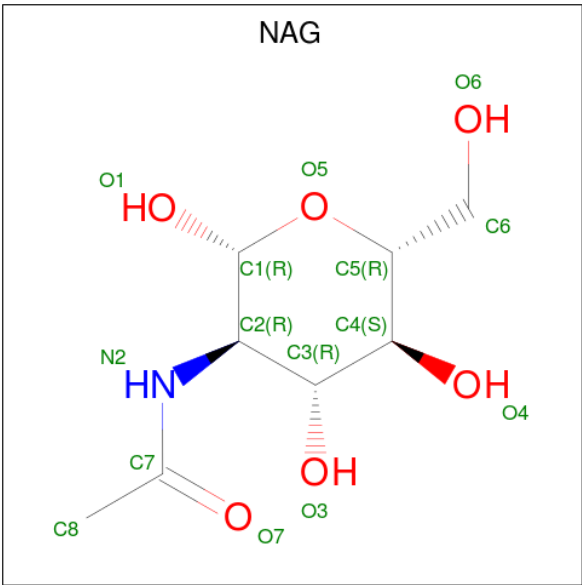
Mol	Chain	Residues	Atoms				AltConf	Trace
4	b	2	Total	C	N	O	0	0
			28	16	2	10		
4	c	2	Total	C	N	O	0	0
			28	16	2	10		
4	d	2	Total	C	N	O	0	0
			28	16	2	10		
4	e	2	Total	C	N	O	0	0
			28	16	2	10		
4	f	2	Total	C	N	O	0	0
			28	16	2	10		
4	g	2	Total	C	N	O	0	0
			28	16	2	10		
4	h	2	Total	C	N	O	0	0
			28	16	2	10		
4	i	2	Total	C	N	O	0	0
			28	16	2	10		
4	k	2	Total	C	N	O	0	0
			28	16	2	10		
4	l	2	Total	C	N	O	0	0
			28	16	2	10		
4	m	2	Total	C	N	O	0	0
			28	16	2	10		
4	n	2	Total	C	N	O	0	0
			28	16	2	10		
4	o	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 5 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				AltConf	Trace
5	j	2	Total	C	N	O	0	0
			28	16	2	10		
5	p	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 6 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C<sub>8</sub>H<sub>15</sub>NO<sub>6</sub>) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf
6	A	1	Total	C	N	O	0
			98	56	7	35	
6	A	1	Total	C	N	O	0
			98	56	7	35	
6	A	1	Total	C	N	O	0
			98	56	7	35	
6	A	1	Total	C	N	O	0
			98	56	7	35	
6	A	1	Total	C	N	O	0
			98	56	7	35	
6	A	1	Total	C	N	O	0
			98	56	7	35	
6	C	1	Total	C	N	O	0
			98	56	7	35	
6	C	1	Total	C	N	O	0
			98	56	7	35	
6	C	1	Total	C	N	O	0
			98	56	7	35	
6	C	1	Total	C	N	O	0
			98	56	7	35	
6	C	1	Total	C	N	O	0
			98	56	7	35	
6	C	1	Total	C	N	O	0
			98	56	7	35	

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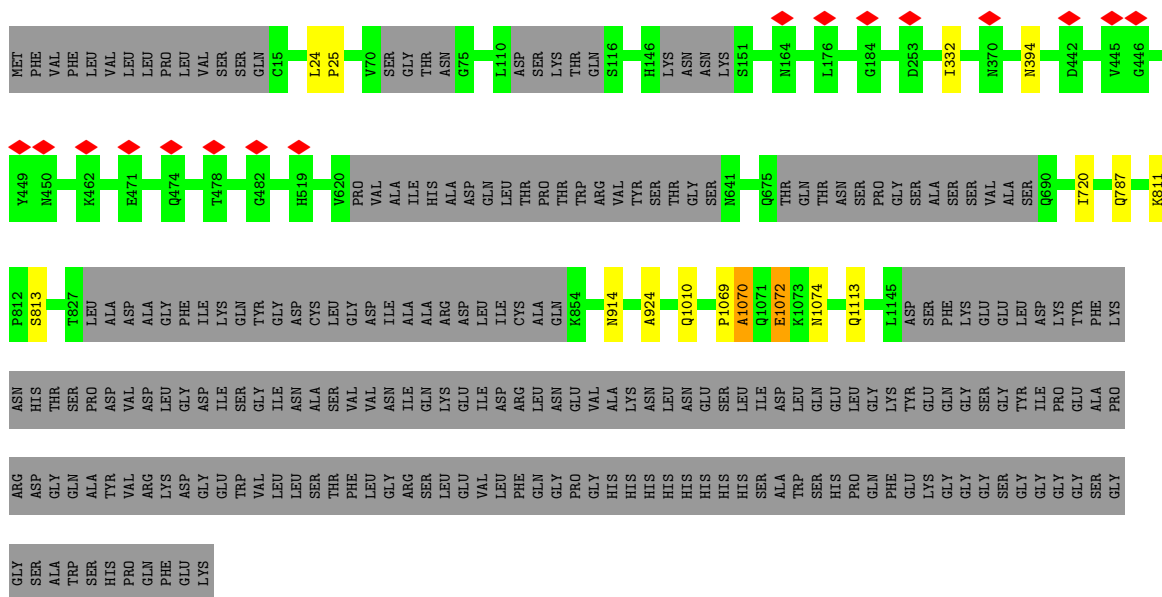
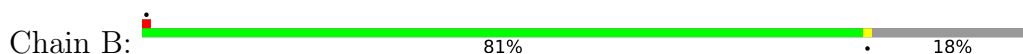
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Mol	Chain	Residues	Atoms				AltConf
6	B	1	Total	C	N	O	0
			98	56	7	35	
6	B	1	Total	C	N	O	0
			98	56	7	35	
6	B	1	Total	C	N	O	0
			98	56	7	35	
6	B	1	Total	C	N	O	0
			98	56	7	35	
6	B	1	Total	C	N	O	0
			98	56	7	35	
6	B	1	Total	C	N	O	0
			98	56	7	35	

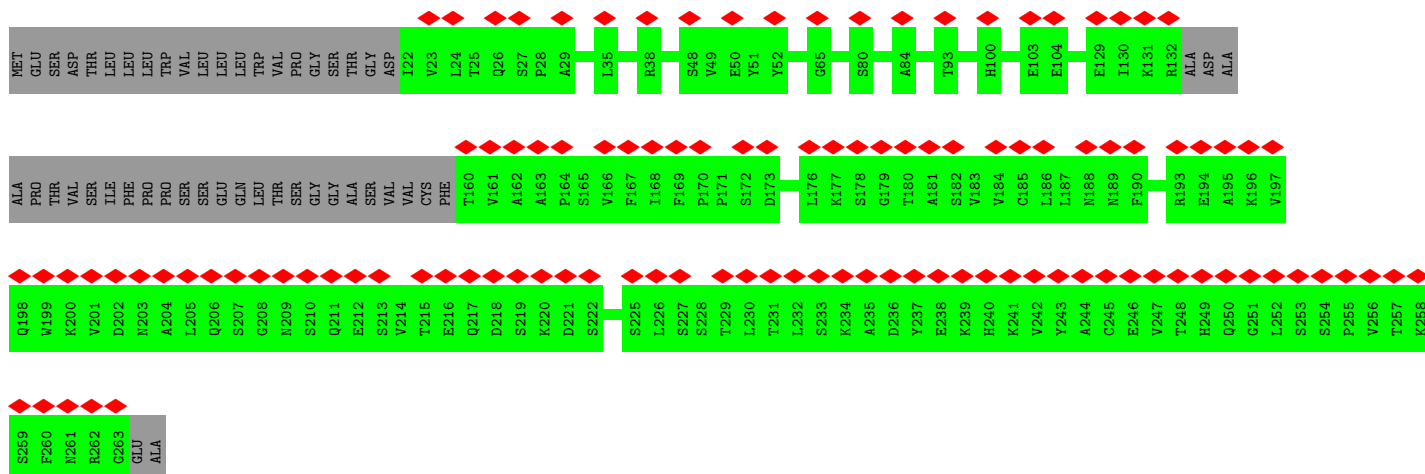
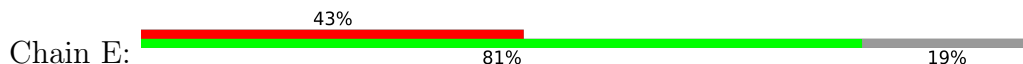




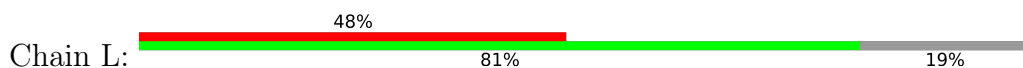
- Molecule 1: Spike glycoprotein



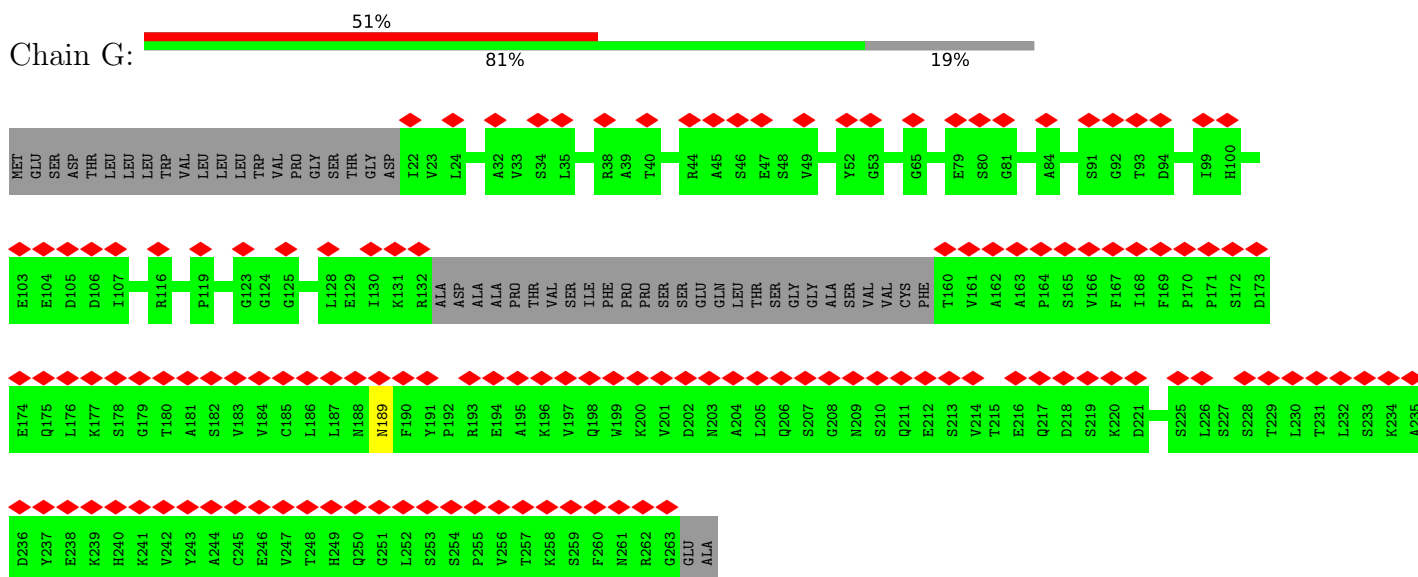
- Molecule 2: Fab of antibody clone 2, light chain



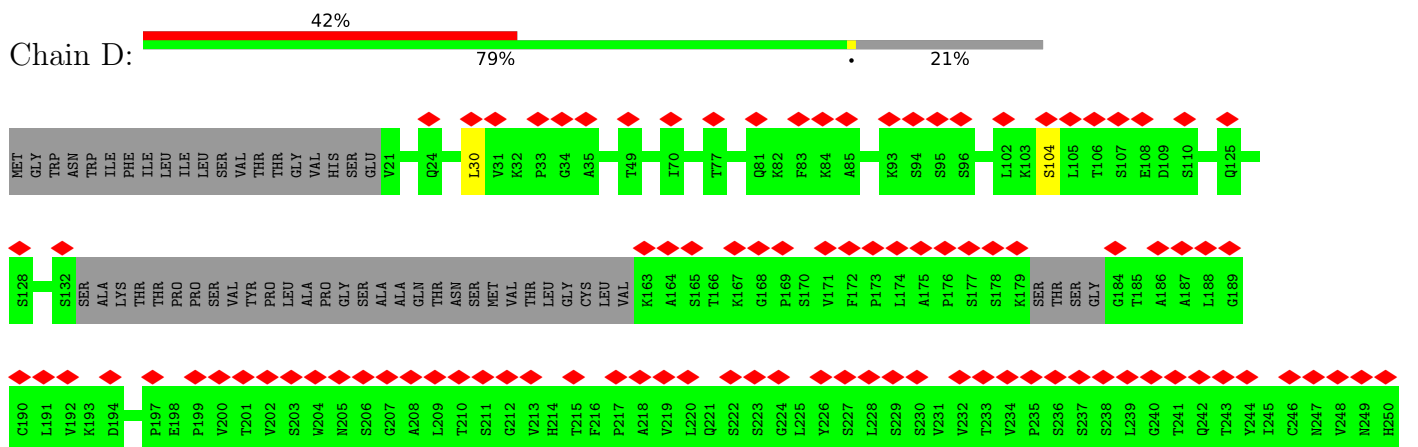
- Molecule 2: Fab of antibody clone 2, light chain

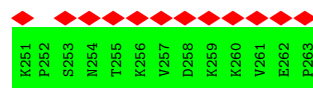


- Molecule 2: Fab of antibody clone 2, light chain

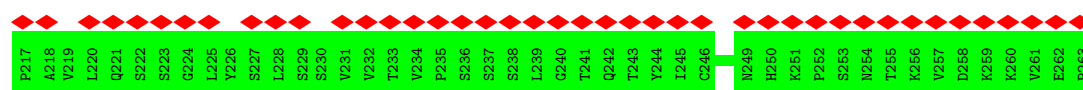
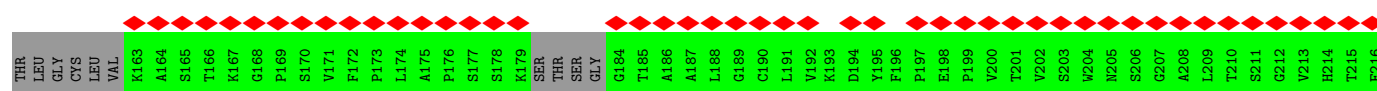
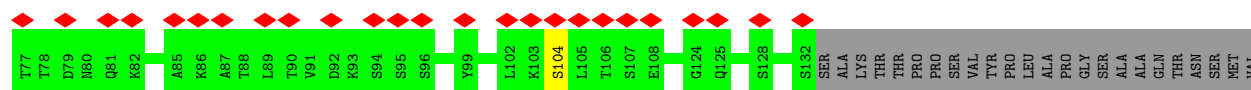
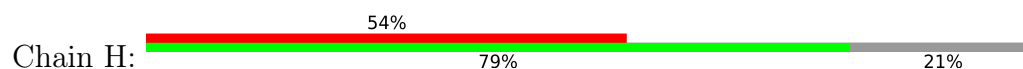


- Molecule 3: Fab of antibody clone 2, heavy chain

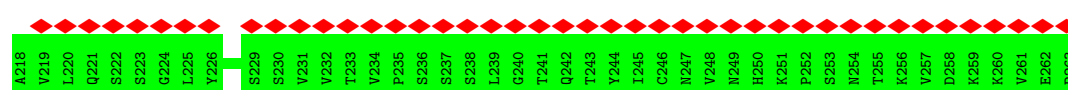
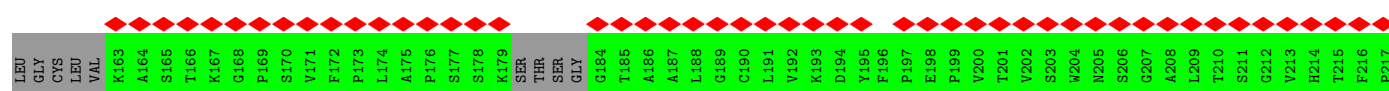
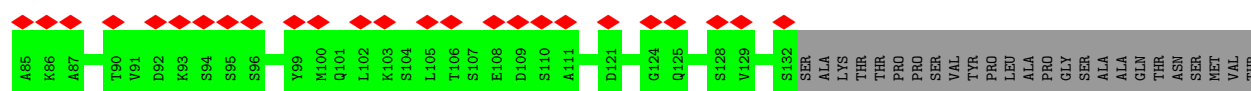
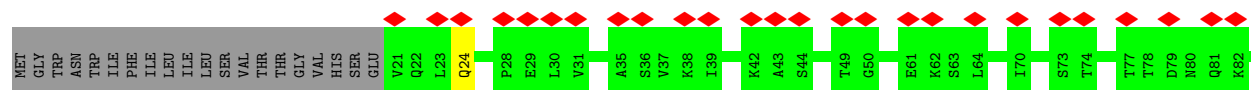
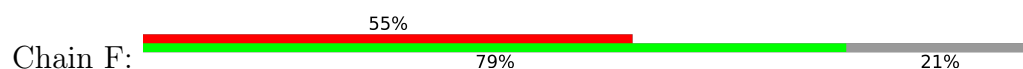




- Molecule 3: Fab of antibody clone 2, heavy chain



- Molecule 3: Fab of antibody clone 2, heavy chain



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



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



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



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



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



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



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



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

Chain Q:  100%



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

Chain R:  50%  
 50%



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

Chain S:  50%  
 50%



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

Chain T:  50%  
 50%



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

Chain U:  50%  
 100%



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

Chain V:  50%  
 50%



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

Chain W: 



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

Chain X: 



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

Chain Y: 



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

Chain Z: 



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

Chain a: 



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

Chain b: 



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



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



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



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



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



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



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

Chain i:  100%



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

Chain k:  50% 50%



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

Chain l:  50% 100%



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

Chain m:  100%



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

Chain n:  50% 50% 50%



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

Chain o:  50% 50% 50%





- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	181380	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	66.5	Depositor
Minimum defocus (nm)	700	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.210	Depositor
Minimum map value	0.000	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.025	Depositor
Map size ( $\text{\AA}$ )	410.112, 410.112, 410.112	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.068, 1.068, 1.068	Depositor

## 5 Model quality

### 5.1 Standard geometry

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

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	0.28	0/8357	0.50	1/11387 (0.0%)
1	B	0.28	0/8361	0.53	2/11391 (0.0%)
1	C	0.28	0/8353	0.51	3/11383 (0.0%)
2	E	0.26	0/1676	0.51	0/2276
2	G	0.27	0/1676	0.52	0/2276
2	L	0.27	0/1676	0.50	0/2276
3	D	0.26	0/1572	0.53	1/2142 (0.0%)
3	F	0.26	0/1572	0.52	0/2142
3	H	0.26	0/1572	0.53	0/2142
All	All	0.28	0/34815	0.52	7/47415 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	3
1	C	0	2
All	All	0	6

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	24	LEU	C-N-CD	-17.71	81.63	120.60
1	A	24	LEU	C-N-CD	-8.20	102.55	120.60
1	C	24	LEU	C-N-CD	-6.02	107.35	120.60
1	B	1072	GLU	N-CA-C	5.37	125.51	111.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	30	LEU	CA-CB-CG	5.29	127.47	115.30
1	C	252	GLY	C-N-CA	5.23	134.78	121.70
1	C	253	ASP	CB-CG-OD1	5.09	122.88	118.30

There are no chirality outliers.

All (6) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	811	LYS	Peptide
1	B	1069	PRO	Peptide
1	B	1070	ALA	Peptide
1	B	811	LYS	Peptide
1	C	1070	ALA	Peptide
1	C	811	LYS	Peptide

## 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	1045/1288 (81%)	985 (94%)	53 (5%)	7 (1%)	22	60
1	B	1045/1288 (81%)	985 (94%)	50 (5%)	10 (1%)	15	52
1	C	1045/1288 (81%)	975 (93%)	60 (6%)	10 (1%)	15	52
2	E	213/265 (80%)	204 (96%)	9 (4%)	0	100	100
2	G	213/265 (80%)	201 (94%)	11 (5%)	1 (0%)	29	66
2	L	213/265 (80%)	204 (96%)	9 (4%)	0	100	100
3	D	205/263 (78%)	193 (94%)	11 (5%)	1 (0%)	29	66

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	F	205/263 (78%)	194 (95%)	11 (5%)	0	100	100
3	H	205/263 (78%)	195 (95%)	9 (4%)	1 (0%)	29	66
All	All	4389/5448 (81%)	4136 (94%)	223 (5%)	30 (1%)	26	60

All (30) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	25	PRO
1	A	924	ALA
1	A	1070	ALA
1	C	25	PRO
1	C	529	LYS
1	C	914	ASN
1	C	924	ALA
1	C	1070	ALA
1	C	1113	GLN
1	B	25	PRO
1	B	924	ALA
1	B	1070	ALA
1	A	914	ASN
1	A	1113	GLN
1	B	914	ASN
1	B	1072	GLU
1	B	1113	GLN
1	B	813	SER
3	D	104	SER
3	H	104	SER
1	C	813	SER
1	C	787	GLN
2	G	189	ASN
1	A	720	ILE
1	A	787	GLN
1	C	720	ILE
1	B	720	ILE
1	B	787	GLN
1	C	332	ILE
1	B	332	ILE

### 5.3.2 Protein sidechains ⓘ

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	891/1113 (80%)	889 (100%)	2 (0%)	93	97
1	B	892/1113 (80%)	888 (100%)	4 (0%)	91	95
1	C	890/1113 (80%)	888 (100%)	2 (0%)	93	97
2	E	184/227 (81%)	184 (100%)	0	100	100
2	G	184/227 (81%)	184 (100%)	0	100	100
2	L	184/227 (81%)	184 (100%)	0	100	100
3	D	174/224 (78%)	174 (100%)	0	100	100
3	F	174/224 (78%)	173 (99%)	1 (1%)	86	93
3	H	174/224 (78%)	174 (100%)	0	100	100
All	All	3747/4692 (80%)	3738 (100%)	9 (0%)	93	97

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1010[A]	GLN
1	A	1010[B]	GLN
1	C	1010[A]	GLN
1	C	1010[B]	GLN
1	B	394	ASN
1	B	1010[A]	GLN
1	B	1010[B]	GLN
1	B	1074	ASN
3	F	24	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (16) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	146	HIS
1	A	370	ASN
1	A	394	ASN
1	A	501	ASN

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Mol	Chain	Res	Type
1	A	901	GLN
2	E	198	GLN
2	L	26	GLN
3	H	24	GLN
3	H	71	ASN
1	C	501	ASN
1	B	901	GLN
2	G	175	GLN
2	G	217	GLN
2	G	249	HIS
3	F	24	GLN
3	F	125	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](#)

66 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	$\# Z  > 2$
4	NAG	I	1	1,4	14,14,15	0.84	1 (7%)	17,19,21	1.25	1 (5%)
4	NAG	I	2	4	14,14,15	0.24	0	17,19,21	0.48	0
4	NAG	J	1	1,4	14,14,15	0.82	1 (7%)	17,19,21	1.38	1 (5%)
4	NAG	J	2	4	14,14,15	0.20	0	17,19,21	0.44	0
4	NAG	K	1	1,4	14,14,15	0.48	0	17,19,21	0.53	0
4	NAG	K	2	4	14,14,15	0.25	0	17,19,21	0.45	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	NAG	M	1	1,4	14,14,15	1.45	1 (7%)	17,19,21	1.41	2 (11%)
4	NAG	M	2	4	14,14,15	0.24	0	17,19,21	0.52	0
4	NAG	N	1	1,4	14,14,15	0.78	1 (7%)	17,19,21	0.77	1 (5%)
4	NAG	N	2	4	14,14,15	0.30	0	17,19,21	0.40	0
4	NAG	O	1	1,4	14,14,15	0.39	0	17,19,21	0.65	1 (5%)
4	NAG	O	2	4	14,14,15	0.23	0	17,19,21	0.37	0
4	NAG	P	1	1,4	14,14,15	0.23	0	17,19,21	0.41	0
4	NAG	P	2	4	14,14,15	0.25	0	17,19,21	0.53	0
4	NAG	Q	1	1,4	14,14,15	0.24	0	17,19,21	0.46	0
4	NAG	Q	2	4	14,14,15	0.20	0	17,19,21	0.42	0
4	NAG	R	1	1,4	14,14,15	0.40	0	17,19,21	1.26	1 (5%)
4	NAG	R	2	4	14,14,15	0.21	0	17,19,21	0.46	0
4	NAG	S	1	1,4	14,14,15	0.70	1 (7%)	17,19,21	0.93	1 (5%)
4	NAG	S	2	4	14,14,15	0.24	0	17,19,21	0.38	0
4	NAG	T	1	1,4	14,14,15	0.72	1 (7%)	17,19,21	0.72	0
4	NAG	T	2	4	14,14,15	0.26	0	17,19,21	0.36	0
4	NAG	U	1	1,4	14,14,15	0.97	1 (7%)	17,19,21	1.22	1 (5%)
4	NAG	U	2	4	14,14,15	1.01	1 (7%)	17,19,21	1.26	1 (5%)
4	NAG	V	1	1,4	14,14,15	0.60	1 (7%)	17,19,21	0.64	0
4	NAG	V	2	4	14,14,15	0.22	0	17,19,21	0.39	0
4	NAG	W	1	1,4	14,14,15	0.74	1 (7%)	17,19,21	0.70	0
4	NAG	W	2	4	14,14,15	0.33	0	17,19,21	0.52	0
4	NAG	X	1	1,4	14,14,15	0.26	0	17,19,21	0.45	0
4	NAG	X	2	4	14,14,15	0.24	0	17,19,21	0.41	0
4	NAG	Y	1	1,4	14,14,15	0.63	1 (7%)	17,19,21	0.58	0
4	NAG	Y	2	4	14,14,15	0.28	0	17,19,21	0.41	0
4	NAG	Z	1	1,4	14,14,15	0.34	0	17,19,21	0.53	0
4	NAG	Z	2	4	14,14,15	0.29	0	17,19,21	0.49	0
4	NAG	a	1	1,4	14,14,15	0.25	0	17,19,21	0.42	0
4	NAG	a	2	4	14,14,15	0.24	0	17,19,21	0.53	0
4	NAG	b	1	1,4	14,14,15	0.22	0	17,19,21	0.47	0
4	NAG	b	2	4	14,14,15	0.20	0	17,19,21	0.41	0
4	NAG	c	1	1,4	14,14,15	0.39	0	17,19,21	1.26	1 (5%)
4	NAG	c	2	4	14,14,15	0.21	0	17,19,21	0.46	0
4	NAG	d	1	1,4	14,14,15	0.43	0	17,19,21	0.51	0
4	NAG	d	2	4	14,14,15	0.33	0	17,19,21	0.40	0
4	NAG	e	1	1,4	14,14,15	0.75	1 (7%)	17,19,21	0.84	0
4	NAG	e	2	4	14,14,15	0.35	0	17,19,21	0.37	0
4	NAG	f	1	1,4	14,14,15	1.03	1 (7%)	17,19,21	0.90	1 (5%)



Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	NAG	f	2	4	14,14,15	0.94	1 (7%)	17,19,21	1.25	1 (5%)
4	NAG	g	1	1,4	14,14,15	0.28	0	17,19,21	0.54	0
4	NAG	g	2	4	14,14,15	0.22	0	17,19,21	0.36	0
4	NAG	h	1	1,4	14,14,15	1.07	1 (7%)	17,19,21	1.04	2 (11%)
4	NAG	h	2	4	14,14,15	0.27	0	17,19,21	0.55	0
4	NAG	i	1	1,4	14,14,15	0.42	0	17,19,21	0.56	0
4	NAG	i	2	4	14,14,15	0.36	0	17,19,21	0.39	0
5	NAG	j	1	1,5	14,14,15	0.57	0	17,19,21	0.46	0
5	NAG	j	2	5	14,14,15	0.42	0	17,19,21	0.40	0
4	NAG	k	1	1,4	14,14,15	0.38	0	17,19,21	0.64	1 (5%)
4	NAG	k	2	4	14,14,15	0.24	0	17,19,21	0.36	0
4	NAG	l	1	1,4	14,14,15	0.28	0	17,19,21	0.42	0
4	NAG	l	2	4	14,14,15	0.25	0	17,19,21	0.54	0
4	NAG	m	1	1,4	14,14,15	0.26	0	17,19,21	0.45	0
4	NAG	m	2	4	14,14,15	0.19	0	17,19,21	0.41	0
4	NAG	n	1	1,4	14,14,15	0.41	0	17,19,21	1.27	1 (5%)
4	NAG	n	2	4	14,14,15	0.21	0	17,19,21	0.46	0
4	NAG	o	1	1,4	14,14,15	0.60	0	17,19,21	1.20	1 (5%)
4	NAG	o	2	4	14,14,15	0.24	0	17,19,21	0.46	0
5	NAG	p	1	1,5	14,14,15	0.72	1 (7%)	17,19,21	0.67	1 (5%)
5	NAG	p	2	5	14,14,15	0.45	0	17,19,21	0.38	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
4	NAG	I	1	1,4	-	4/6/23/26	0/1/1/1
4	NAG	I	2	4	-	0/6/23/26	0/1/1/1
4	NAG	J	1	1,4	-	4/6/23/26	0/1/1/1
4	NAG	J	2	4	-	0/6/23/26	0/1/1/1
4	NAG	K	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	K	2	4	-	0/6/23/26	0/1/1/1
4	NAG	M	1	1,4	-	4/6/23/26	0/1/1/1
4	NAG	M	2	4	-	0/6/23/26	0/1/1/1
4	NAG	N	1	1,4	-	4/6/23/26	0/1/1/1
4	NAG	N	2	4	-	2/6/23/26	0/1/1/1
4	NAG	O	1	1,4	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	O	2	4	-	4/6/23/26	0/1/1/1
4	NAG	P	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	P	2	4	-	3/6/23/26	0/1/1/1
4	NAG	Q	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	Q	2	4	-	2/6/23/26	0/1/1/1
4	NAG	R	1	1,4	-	5/6/23/26	0/1/1/1
4	NAG	R	2	4	-	2/6/23/26	0/1/1/1
4	NAG	S	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	S	2	4	-	4/6/23/26	0/1/1/1
4	NAG	T	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	T	2	4	-	0/6/23/26	0/1/1/1
4	NAG	U	1	1,4	-	4/6/23/26	0/1/1/1
4	NAG	U	2	4	-	2/6/23/26	0/1/1/1
4	NAG	V	1	1,4	-	4/6/23/26	0/1/1/1
4	NAG	V	2	4	-	0/6/23/26	0/1/1/1
4	NAG	W	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	W	2	4	-	0/6/23/26	0/1/1/1
4	NAG	X	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	X	2	4	-	0/6/23/26	0/1/1/1
4	NAG	Y	1	1,4	-	4/6/23/26	0/1/1/1
4	NAG	Y	2	4	-	2/6/23/26	0/1/1/1
4	NAG	Z	1	1,4	-	4/6/23/26	0/1/1/1
4	NAG	Z	2	4	-	4/6/23/26	0/1/1/1
4	NAG	a	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	a	2	4	-	3/6/23/26	0/1/1/1
4	NAG	b	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	b	2	4	-	2/6/23/26	0/1/1/1
4	NAG	c	1	1,4	-	3/6/23/26	0/1/1/1
4	NAG	c	2	4	-	2/6/23/26	0/1/1/1
4	NAG	d	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	d	2	4	-	2/6/23/26	0/1/1/1
4	NAG	e	1	1,4	-	1/6/23/26	0/1/1/1
4	NAG	e	2	4	-	2/6/23/26	0/1/1/1
4	NAG	f	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	f	2	4	-	1/6/23/26	0/1/1/1
4	NAG	g	1	1,4	-	3/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	g	2	4	-	2/6/23/26	0/1/1/1
4	NAG	h	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	h	2	4	-	0/6/23/26	0/1/1/1
4	NAG	i	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	i	2	4	-	2/6/23/26	0/1/1/1
5	NAG	j	1	1,5	-	4/6/23/26	0/1/1/1
5	NAG	j	2	5	-	4/6/23/26	0/1/1/1
4	NAG	k	1	1,4	-	4/6/23/26	0/1/1/1
4	NAG	k	2	4	-	3/6/23/26	0/1/1/1
4	NAG	l	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	l	2	4	-	3/6/23/26	0/1/1/1
4	NAG	m	1	1,4	-	1/6/23/26	0/1/1/1
4	NAG	m	2	4	-	1/6/23/26	0/1/1/1
4	NAG	n	1	1,4	-	3/6/23/26	0/1/1/1
4	NAG	n	2	4	-	2/6/23/26	0/1/1/1
4	NAG	o	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	o	2	4	-	4/6/23/26	0/1/1/1
5	NAG	p	1	1,5	-	2/6/23/26	0/1/1/1
5	NAG	p	2	5	-	0/6/23/26	0/1/1/1

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	M	1	NAG	O5-C1	-5.16	1.35	1.43
4	U	2	NAG	O5-C1	3.62	1.49	1.43
4	f	1	NAG	O5-C1	-3.59	1.38	1.43
4	U	1	NAG	O5-C1	3.42	1.49	1.43
4	h	1	NAG	O5-C1	-3.38	1.38	1.43
4	f	2	NAG	O5-C1	3.33	1.49	1.43
4	I	1	NAG	O5-C1	3.00	1.48	1.43
4	J	1	NAG	O5-C1	2.96	1.48	1.43
4	N	1	NAG	O5-C1	-2.76	1.39	1.43
4	e	1	NAG	O5-C1	-2.63	1.39	1.43
4	T	1	NAG	O5-C1	-2.53	1.39	1.43
5	p	1	NAG	O5-C1	-2.48	1.39	1.43
4	Y	1	NAG	O5-C1	-2.21	1.40	1.43
4	S	1	NAG	O5-C1	2.19	1.47	1.43
4	W	1	NAG	O5-C1	-2.15	1.40	1.43
4	V	1	NAG	O5-C1	-2.11	1.40	1.43

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	J	1	NAG	C1-O5-C5	5.40	119.51	112.19
4	U	2	NAG	C1-O5-C5	4.98	118.93	112.19
4	f	2	NAG	C1-O5-C5	4.91	118.84	112.19
4	I	1	NAG	C1-O5-C5	4.87	118.79	112.19
4	U	1	NAG	C1-O5-C5	4.83	118.74	112.19
4	o	1	NAG	C1-O5-C5	4.66	118.51	112.19
4	M	1	NAG	C3-C4-C5	4.48	118.23	110.24
4	c	1	NAG	C2-N2-C7	4.35	129.10	122.90
4	n	1	NAG	C2-N2-C7	4.34	129.08	122.90
4	R	1	NAG	C2-N2-C7	4.32	129.06	122.90
4	S	1	NAG	C1-O5-C5	3.66	117.15	112.19
4	h	1	NAG	C1-O5-C5	-2.66	108.58	112.19
4	h	1	NAG	C4-C3-C2	2.47	114.64	111.02
4	f	1	NAG	C3-C4-C5	2.31	114.36	110.24
4	N	1	NAG	C3-C4-C5	2.15	114.07	110.24
5	p	1	NAG	C3-C4-C5	2.13	114.05	110.24
4	O	1	NAG	C1-O5-C5	2.09	115.02	112.19
4	M	1	NAG	C4-C3-C2	2.08	114.06	111.02
4	k	1	NAG	C1-O5-C5	2.04	114.95	112.19

There are no chirality outliers.

All (138) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	Z	2	NAG	C4-C5-C6-O6
4	d	1	NAG	C4-C5-C6-O6
4	V	1	NAG	O5-C5-C6-O6
4	P	1	NAG	O5-C5-C6-O6
4	P	2	NAG	O5-C5-C6-O6
4	R	2	NAG	O5-C5-C6-O6
4	a	2	NAG	O5-C5-C6-O6
4	b	2	NAG	O5-C5-C6-O6
4	l	1	NAG	O5-C5-C6-O6
4	l	2	NAG	O5-C5-C6-O6
4	n	2	NAG	O5-C5-C6-O6
4	Z	2	NAG	O5-C5-C6-O6
4	c	2	NAG	O5-C5-C6-O6
4	d	1	NAG	O5-C5-C6-O6
4	i	2	NAG	C4-C5-C6-O6
5	j	1	NAG	O5-C5-C6-O6
4	V	1	NAG	C4-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
4	b	2	NAG	C4-C5-C6-O6
4	l	2	NAG	C4-C5-C6-O6
5	j	1	NAG	C4-C5-C6-O6
4	U	2	NAG	O5-C5-C6-O6
4	g	2	NAG	O5-C5-C6-O6
4	i	2	NAG	O5-C5-C6-O6
4	P	1	NAG	C4-C5-C6-O6
4	P	2	NAG	C4-C5-C6-O6
4	T	1	NAG	C4-C5-C6-O6
4	a	2	NAG	C4-C5-C6-O6
4	l	1	NAG	C4-C5-C6-O6
4	J	1	NAG	O5-C5-C6-O6
4	N	1	NAG	O5-C5-C6-O6
4	a	1	NAG	O5-C5-C6-O6
4	R	2	NAG	C4-C5-C6-O6
4	n	2	NAG	C4-C5-C6-O6
4	Y	1	NAG	O5-C5-C6-O6
4	Q	2	NAG	O5-C5-C6-O6
4	e	2	NAG	C4-C5-C6-O6
4	c	2	NAG	C4-C5-C6-O6
4	J	1	NAG	C4-C5-C6-O6
4	g	2	NAG	C4-C5-C6-O6
4	I	1	NAG	C8-C7-N2-C2
4	I	1	NAG	O7-C7-N2-C2
4	J	1	NAG	C8-C7-N2-C2
4	J	1	NAG	O7-C7-N2-C2
4	M	1	NAG	C8-C7-N2-C2
4	M	1	NAG	O7-C7-N2-C2
4	N	1	NAG	C8-C7-N2-C2
4	N	1	NAG	O7-C7-N2-C2
4	N	2	NAG	C8-C7-N2-C2
4	N	2	NAG	O7-C7-N2-C2
4	O	1	NAG	C8-C7-N2-C2
4	O	1	NAG	O7-C7-N2-C2
4	O	2	NAG	C8-C7-N2-C2
4	O	2	NAG	O7-C7-N2-C2
4	R	1	NAG	C8-C7-N2-C2
4	R	1	NAG	O7-C7-N2-C2
4	S	2	NAG	C8-C7-N2-C2
4	S	2	NAG	O7-C7-N2-C2
4	U	1	NAG	C8-C7-N2-C2
4	U	1	NAG	O7-C7-N2-C2

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Mol	Chain	Res	Type	Atoms
4	V	1	NAG	C8-C7-N2-C2
4	V	1	NAG	O7-C7-N2-C2
4	X	1	NAG	C8-C7-N2-C2
4	X	1	NAG	O7-C7-N2-C2
4	Y	1	NAG	C8-C7-N2-C2
4	Y	1	NAG	O7-C7-N2-C2
4	Y	2	NAG	C8-C7-N2-C2
4	Y	2	NAG	O7-C7-N2-C2
4	Z	1	NAG	C8-C7-N2-C2
4	Z	1	NAG	O7-C7-N2-C2
4	Z	2	NAG	C8-C7-N2-C2
4	Z	2	NAG	O7-C7-N2-C2
4	c	1	NAG	C8-C7-N2-C2
4	c	1	NAG	O7-C7-N2-C2
4	d	2	NAG	C8-C7-N2-C2
4	d	2	NAG	O7-C7-N2-C2
4	g	1	NAG	C8-C7-N2-C2
4	g	1	NAG	O7-C7-N2-C2
4	k	1	NAG	C8-C7-N2-C2
4	k	1	NAG	O7-C7-N2-C2
4	k	2	NAG	C8-C7-N2-C2
4	k	2	NAG	O7-C7-N2-C2
4	n	1	NAG	C8-C7-N2-C2
4	n	1	NAG	O7-C7-N2-C2
4	o	2	NAG	C8-C7-N2-C2
4	o	2	NAG	O7-C7-N2-C2
5	j	1	NAG	C8-C7-N2-C2
5	j	1	NAG	O7-C7-N2-C2
5	j	2	NAG	C8-C7-N2-C2
5	j	2	NAG	O7-C7-N2-C2
5	p	1	NAG	C8-C7-N2-C2
5	p	1	NAG	O7-C7-N2-C2
4	I	1	NAG	C4-C5-C6-O6
4	N	1	NAG	C4-C5-C6-O6
4	S	2	NAG	O5-C5-C6-O6
5	j	2	NAG	O5-C5-C6-O6
4	a	1	NAG	C4-C5-C6-O6
4	O	2	NAG	O5-C5-C6-O6
4	T	1	NAG	O5-C5-C6-O6
4	Q	2	NAG	C4-C5-C6-O6
5	j	2	NAG	C4-C5-C6-O6
4	Y	1	NAG	C4-C5-C6-O6

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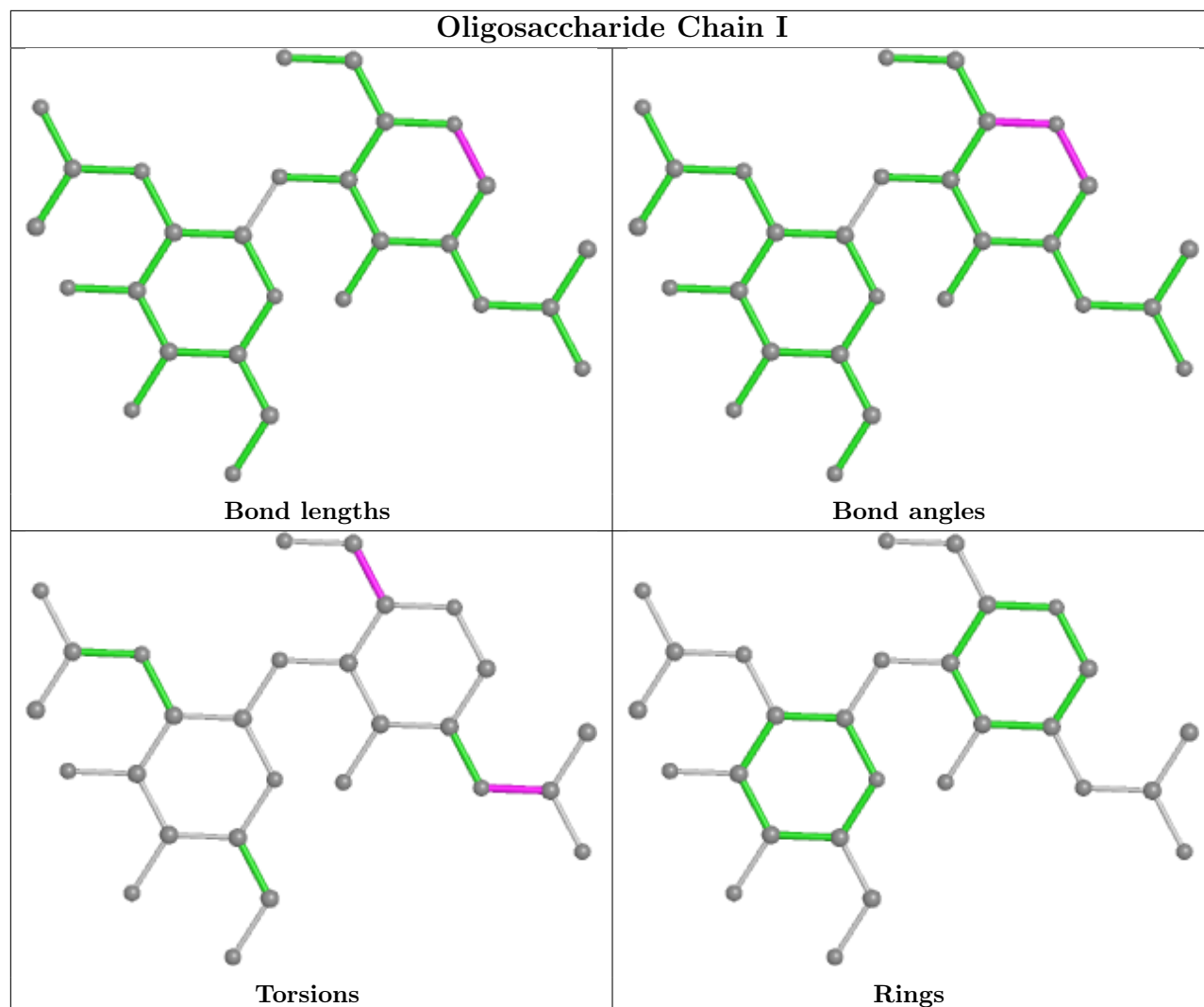
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Mol	Chain	Res	Type	Atoms
4	S	2	NAG	C4-C5-C6-O6
4	U	1	NAG	C4-C5-C6-O6
4	o	2	NAG	C4-C5-C6-O6
4	Z	1	NAG	O5-C5-C6-O6
4	I	1	NAG	O5-C5-C6-O6
4	U	2	NAG	C4-C5-C6-O6
4	e	2	NAG	O5-C5-C6-O6
4	Z	1	NAG	C4-C5-C6-O6
4	U	1	NAG	O5-C5-C6-O6
4	f	1	NAG	C4-C5-C6-O6
4	M	1	NAG	O5-C5-C6-O6
4	f	2	NAG	O5-C5-C6-O6
4	f	1	NAG	O5-C5-C6-O6
4	K	1	NAG	C4-C5-C6-O6
4	o	2	NAG	O5-C5-C6-O6
4	k	2	NAG	O5-C5-C6-O6
4	S	1	NAG	C4-C5-C6-O6
4	m	1	NAG	O5-C5-C6-O6
4	R	1	NAG	C4-C5-C6-O6
4	m	2	NAG	O5-C5-C6-O6
4	M	1	NAG	C4-C5-C6-O6
4	S	1	NAG	O5-C5-C6-O6
4	O	2	NAG	C4-C5-C6-O6
4	R	1	NAG	O5-C5-C6-O6
4	K	1	NAG	O5-C5-C6-O6
4	P	2	NAG	C3-C2-N2-C7
4	a	2	NAG	C3-C2-N2-C7
4	l	2	NAG	C3-C2-N2-C7
4	W	1	NAG	C4-C5-C6-O6
4	g	1	NAG	C4-C5-C6-O6
4	W	1	NAG	C1-C2-N2-C7
4	R	1	NAG	C3-C2-N2-C7
4	c	1	NAG	C3-C2-N2-C7
4	n	1	NAG	C3-C2-N2-C7
4	e	1	NAG	O5-C5-C6-O6
4	k	1	NAG	O5-C5-C6-O6
4	k	1	NAG	C4-C5-C6-O6

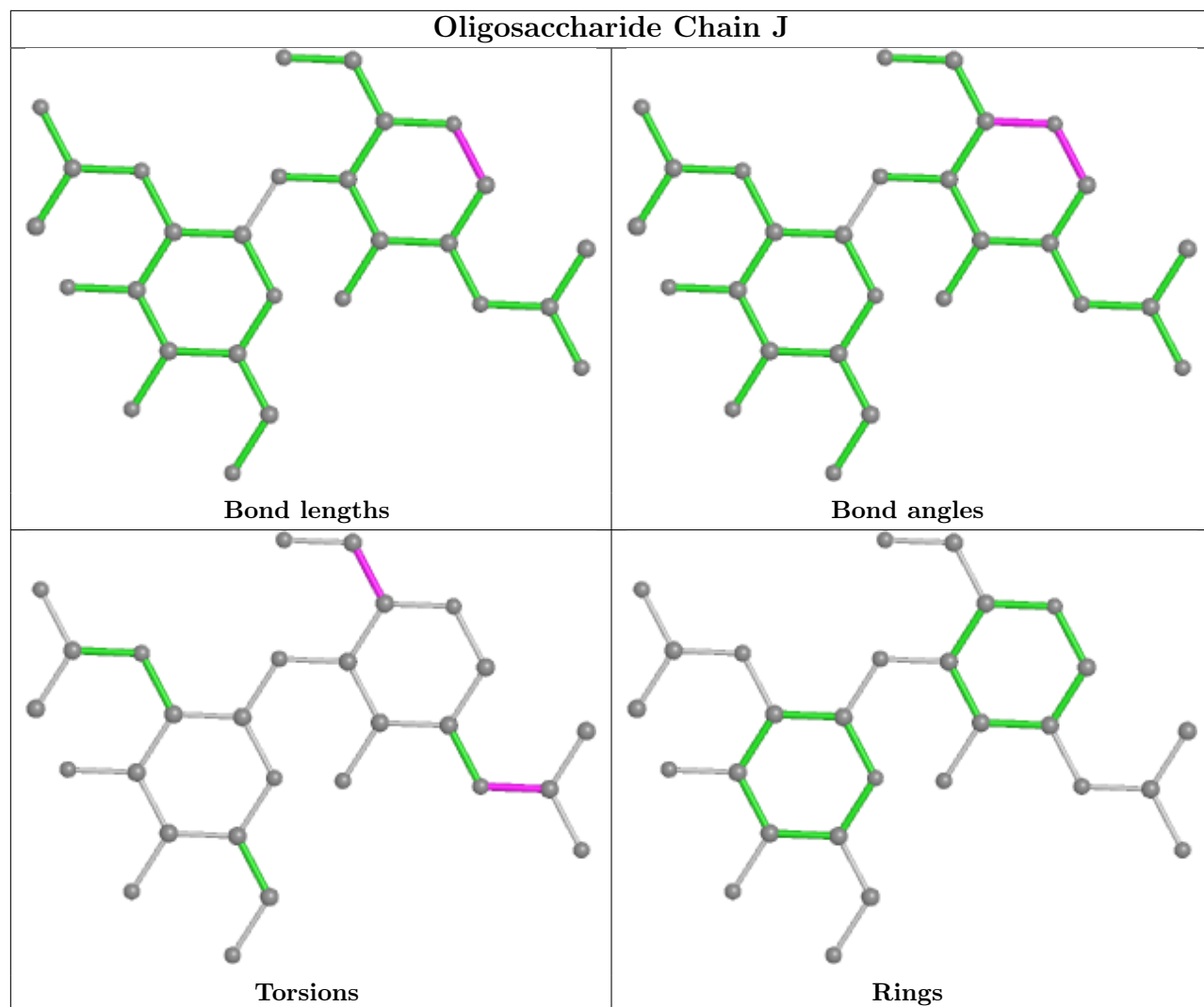
There are no ring outliers.

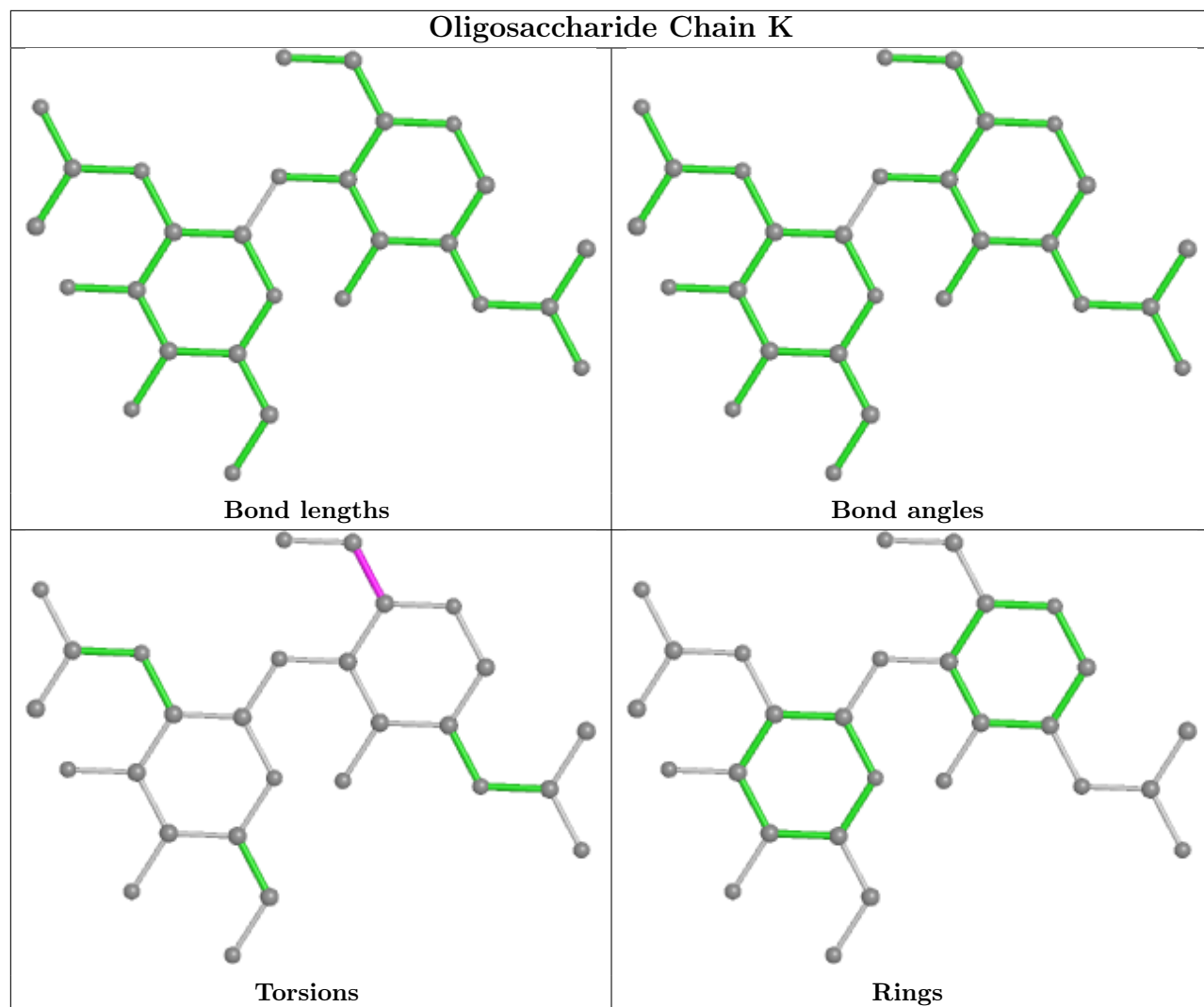
No monomer is involved in short contacts.

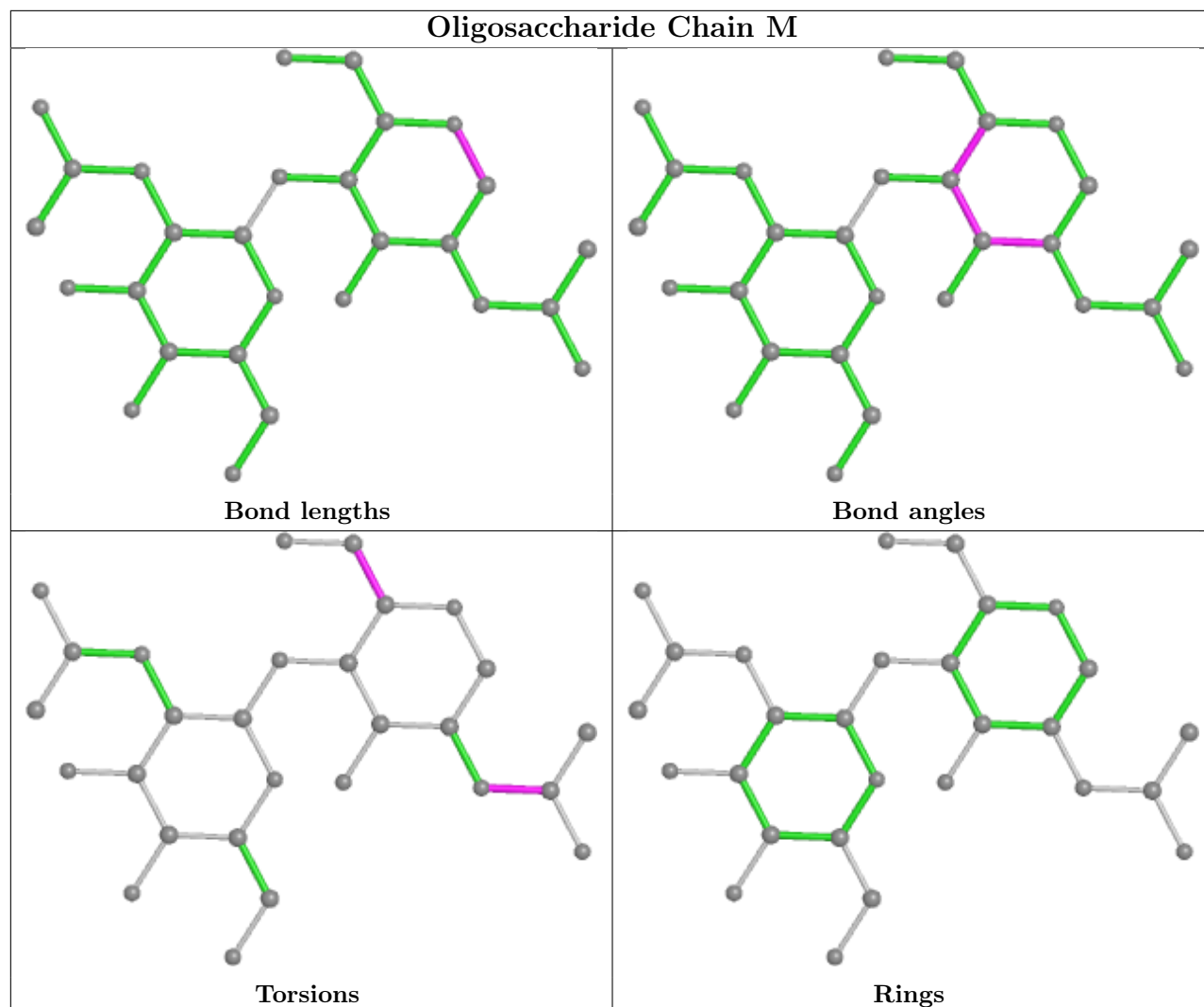
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

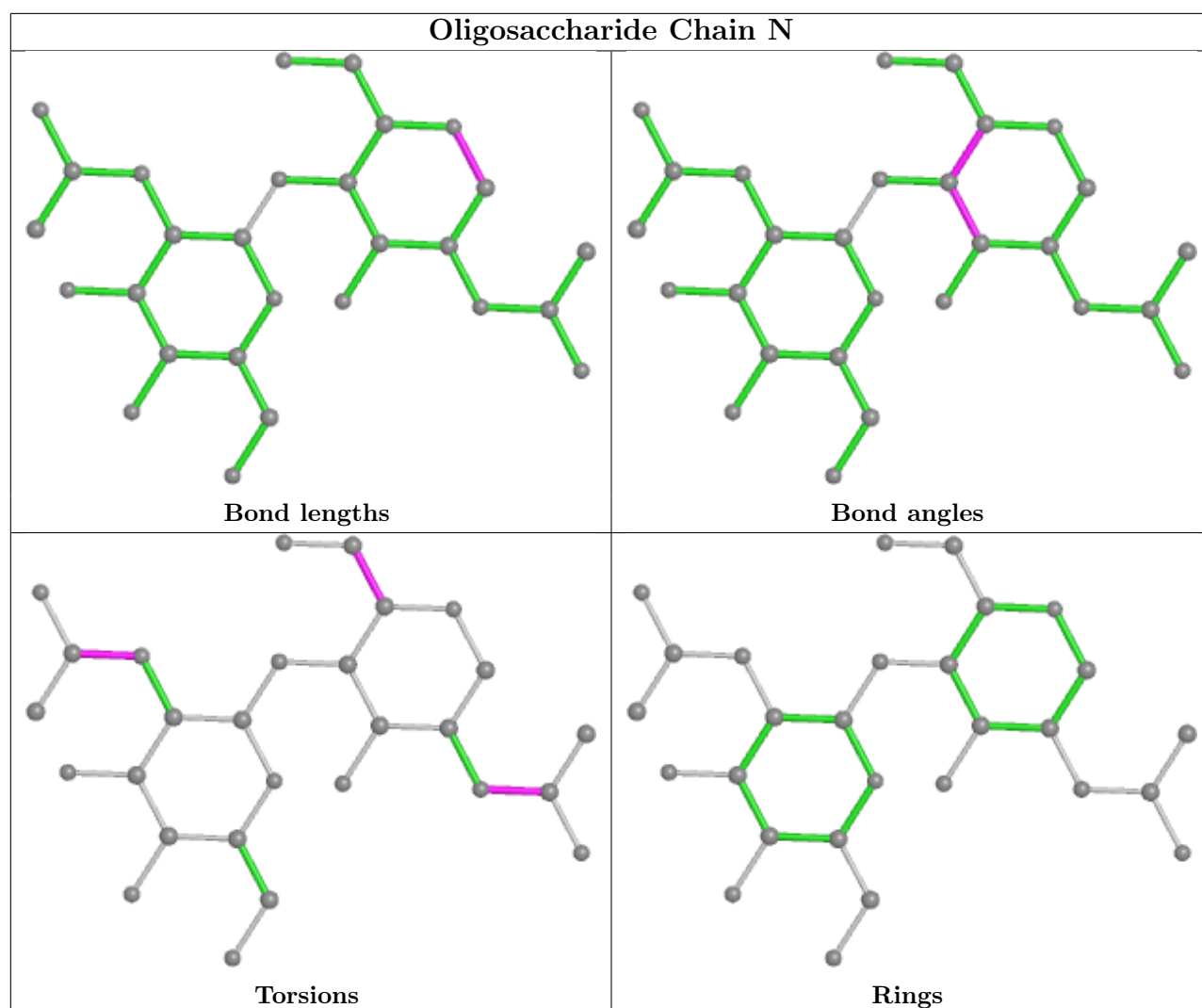


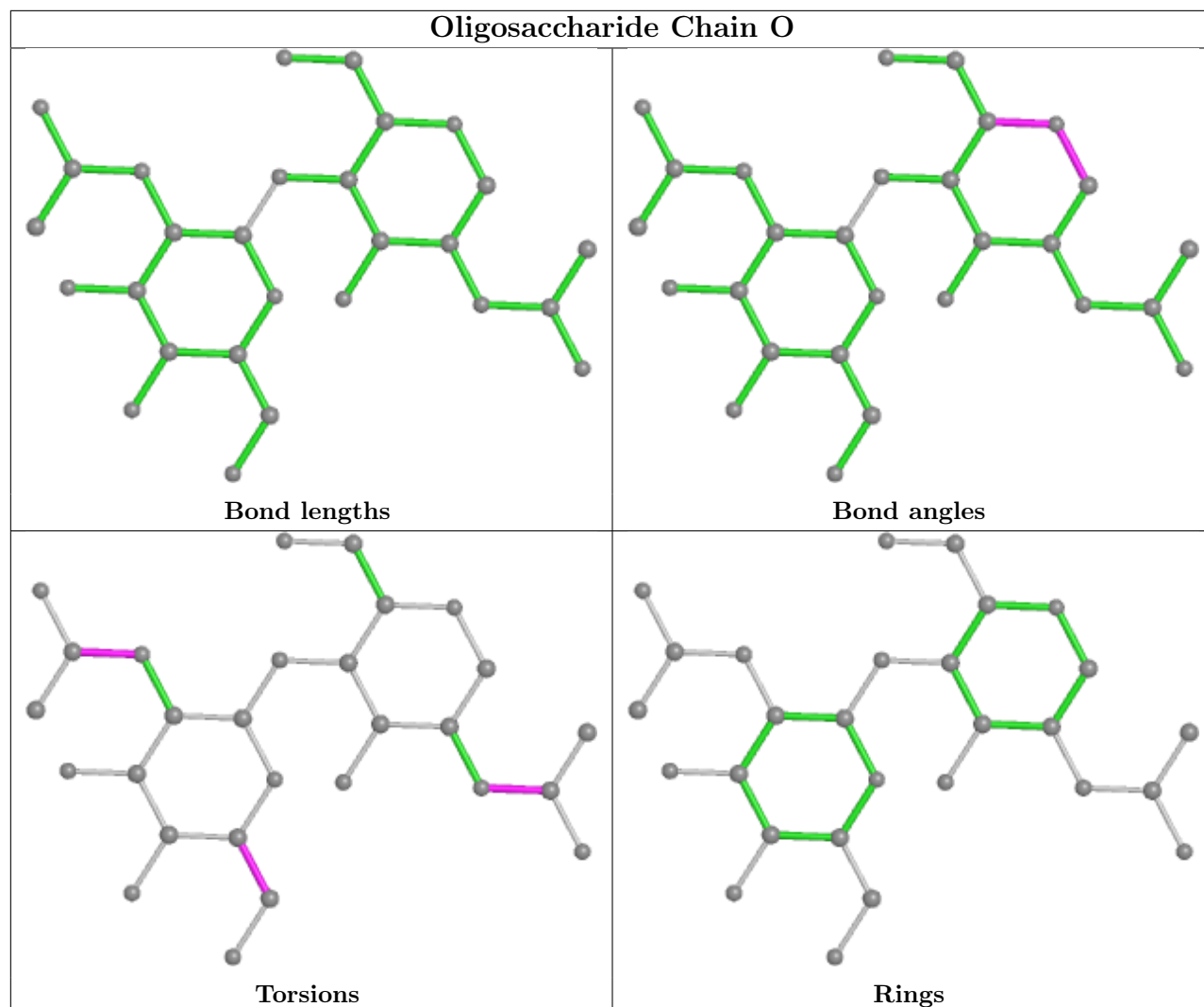


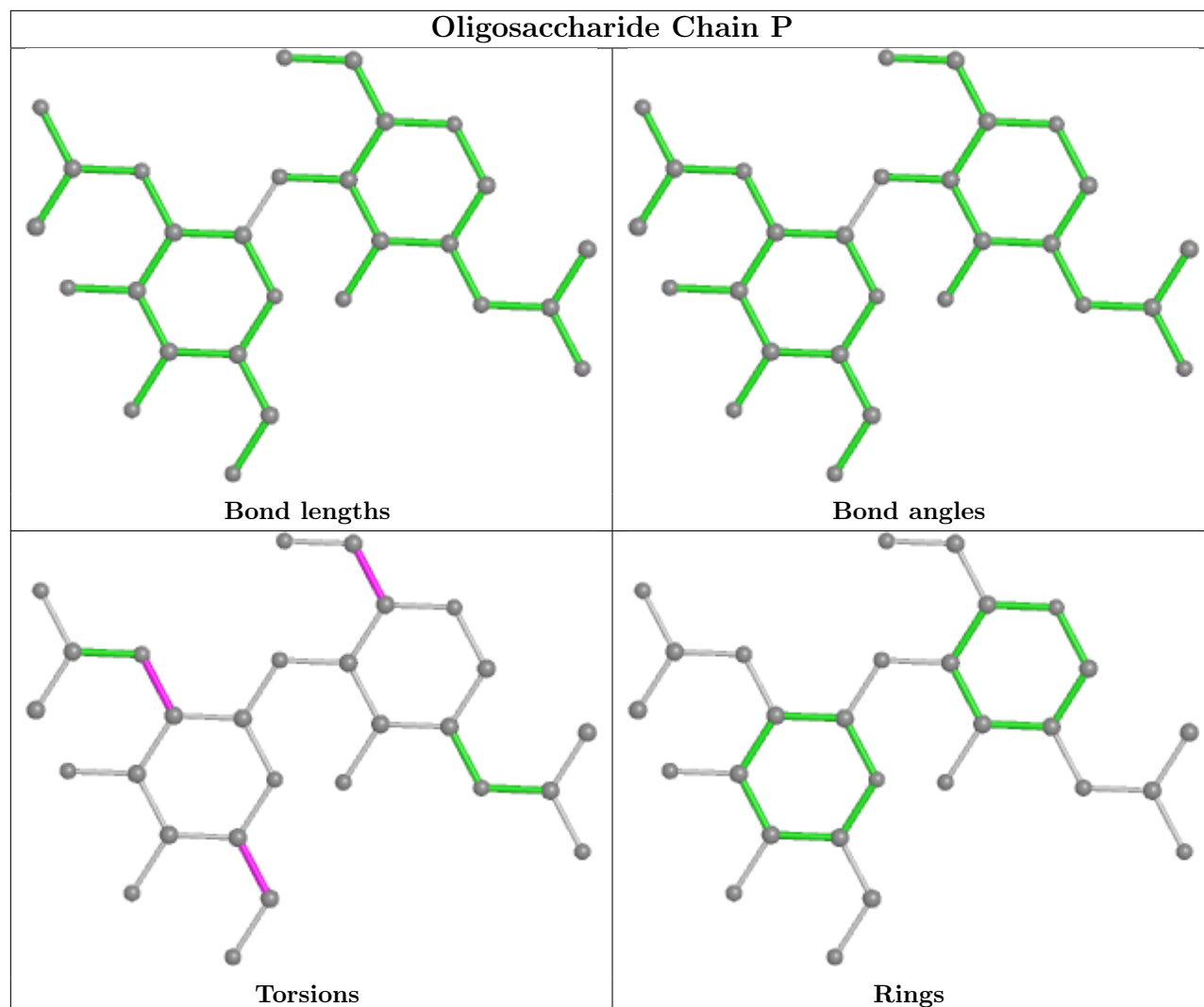


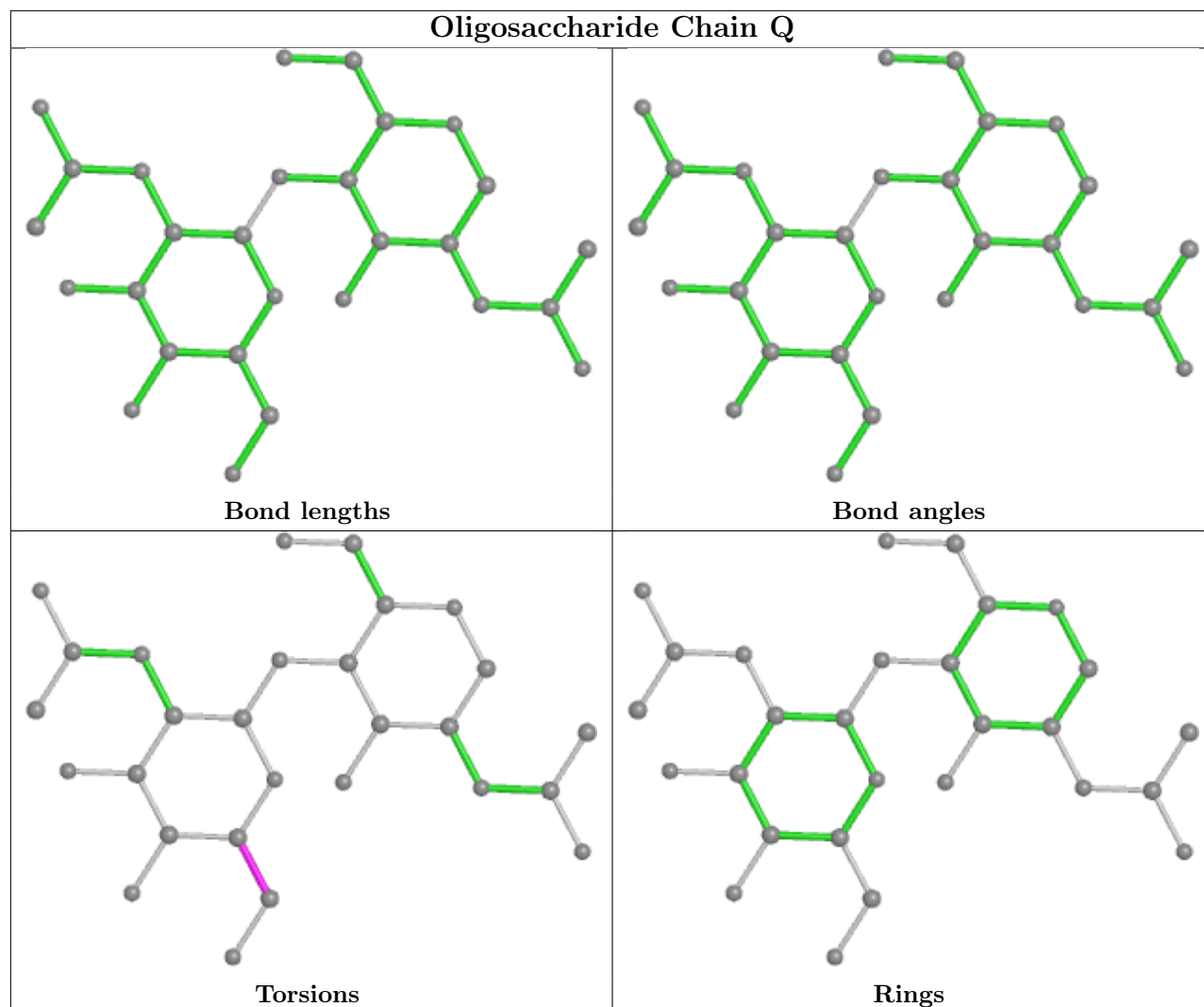


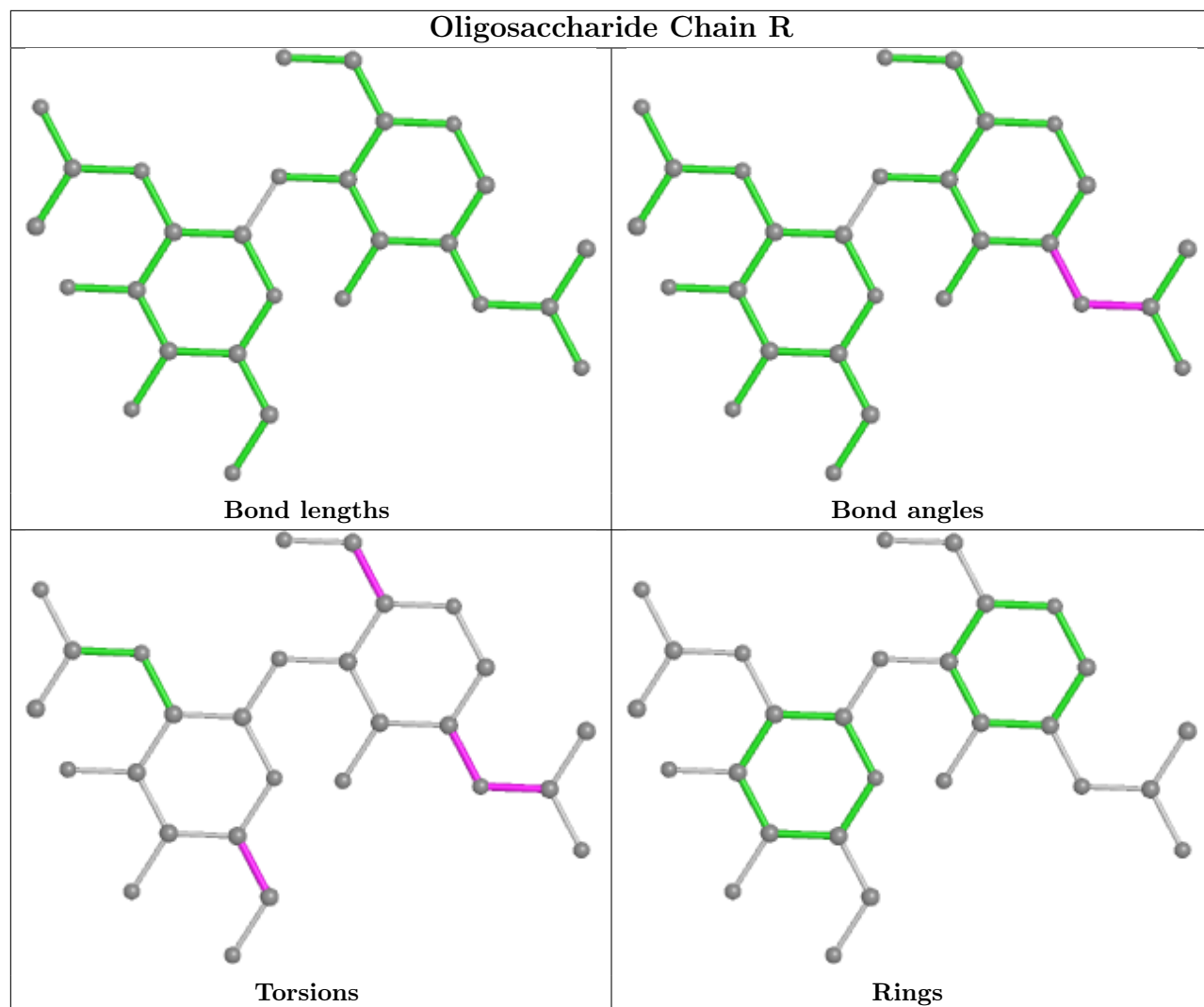




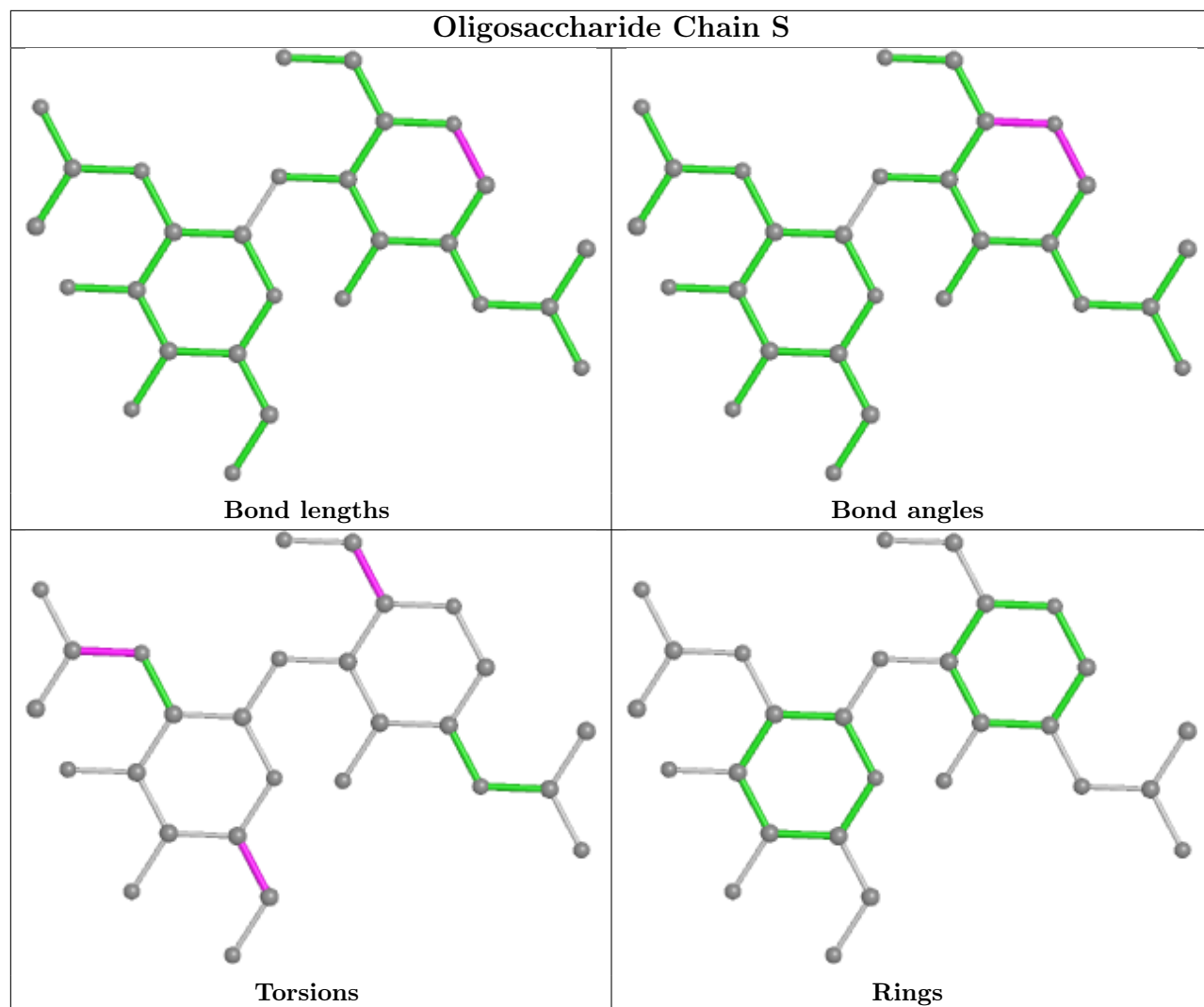


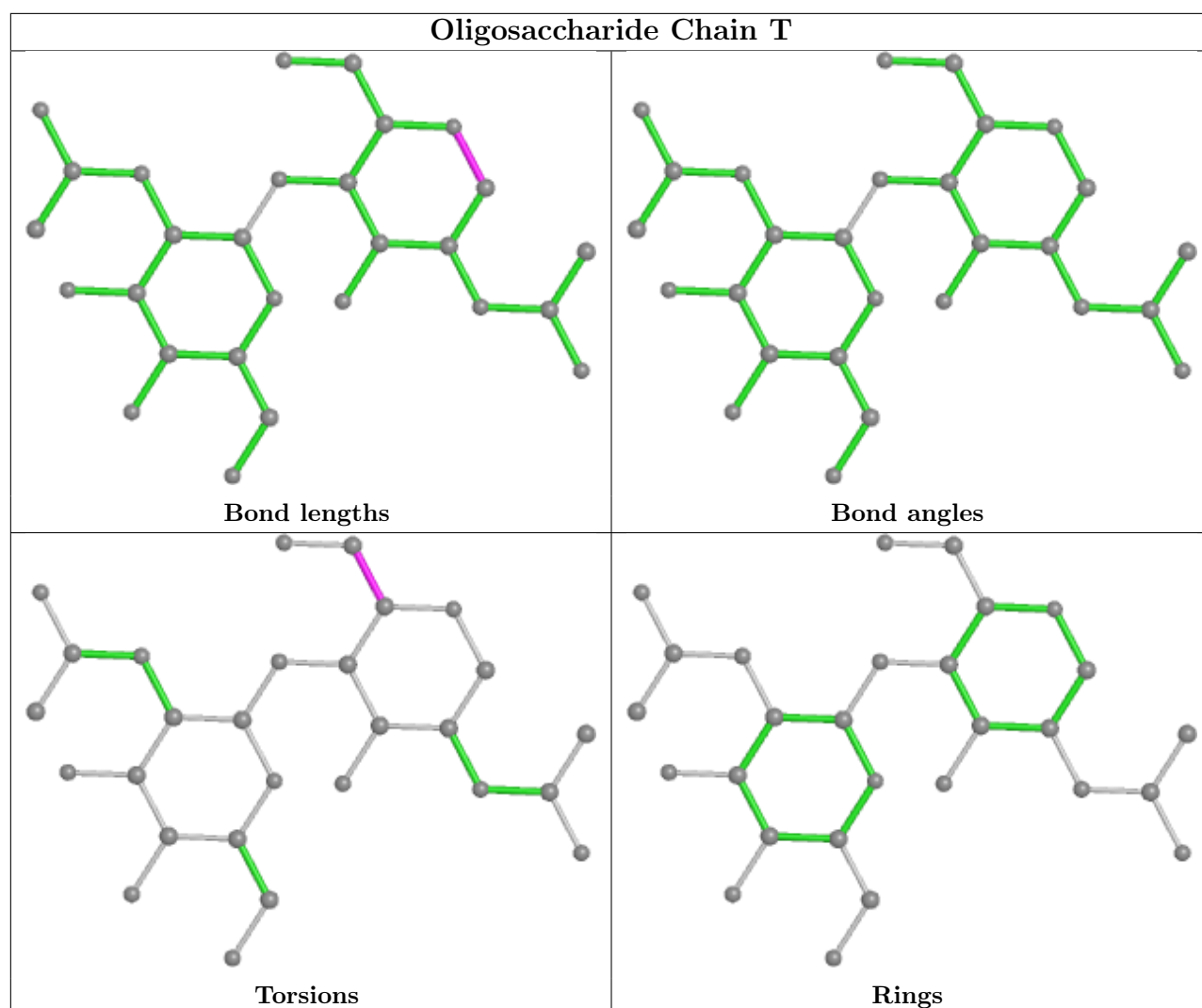


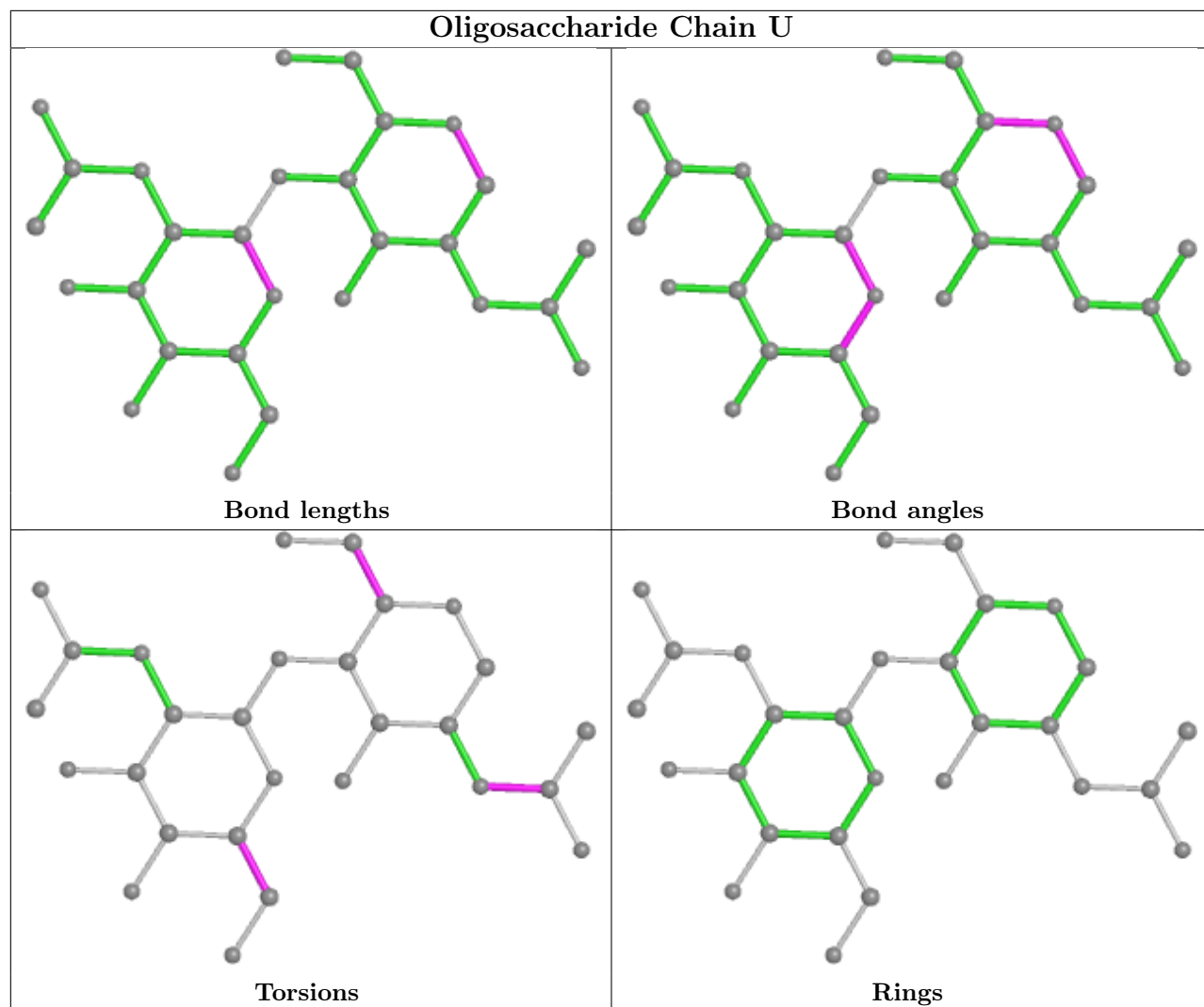


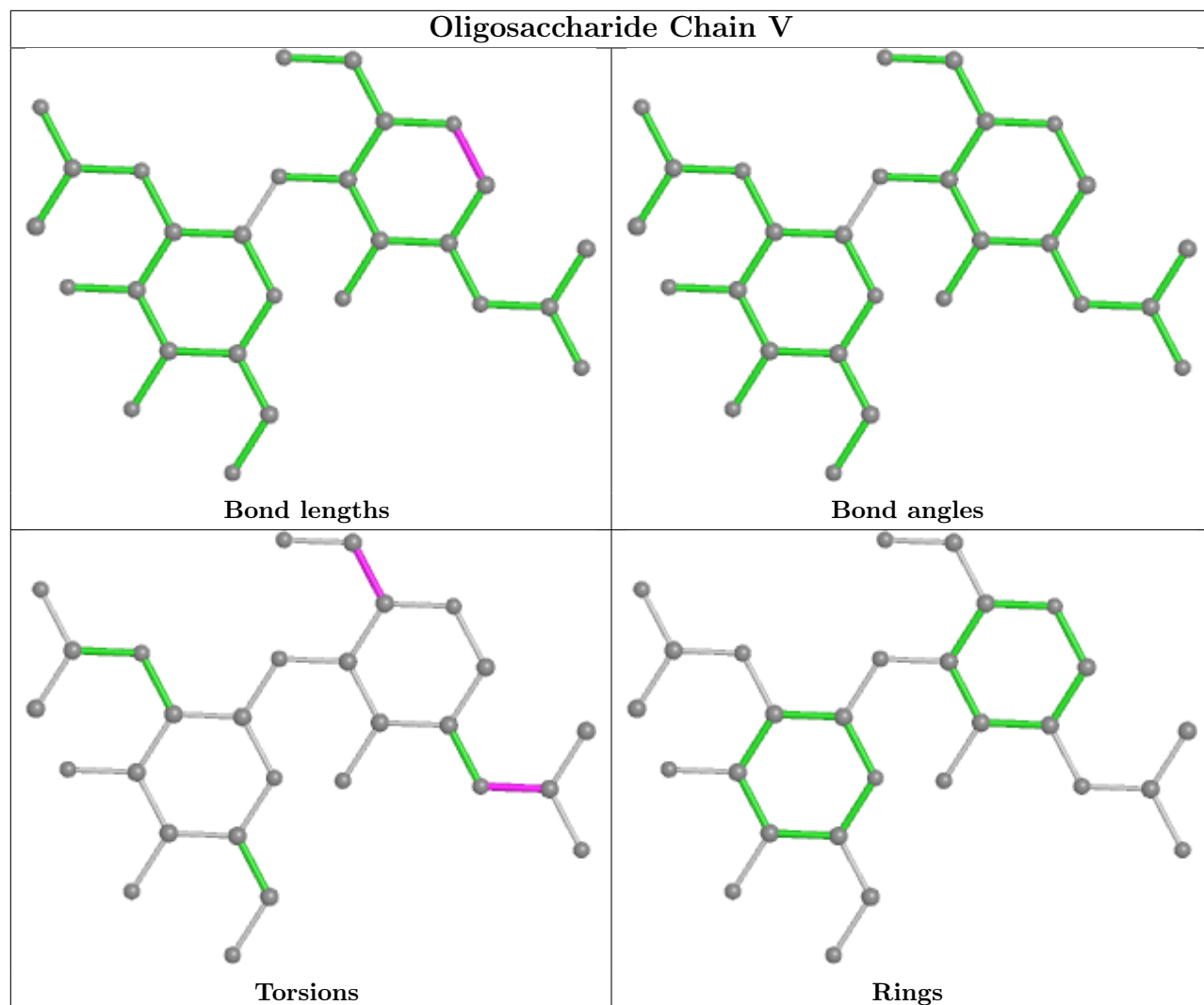


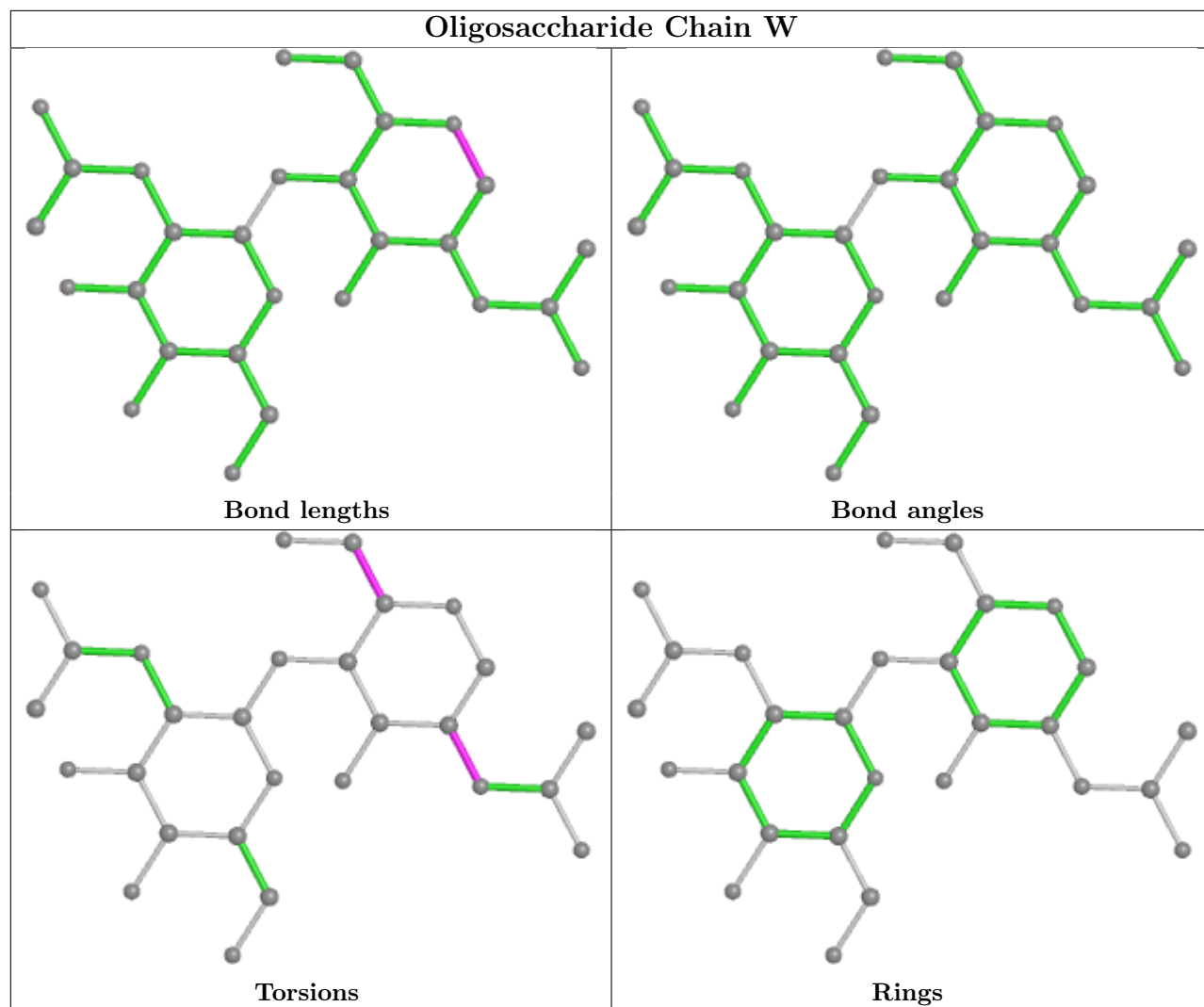


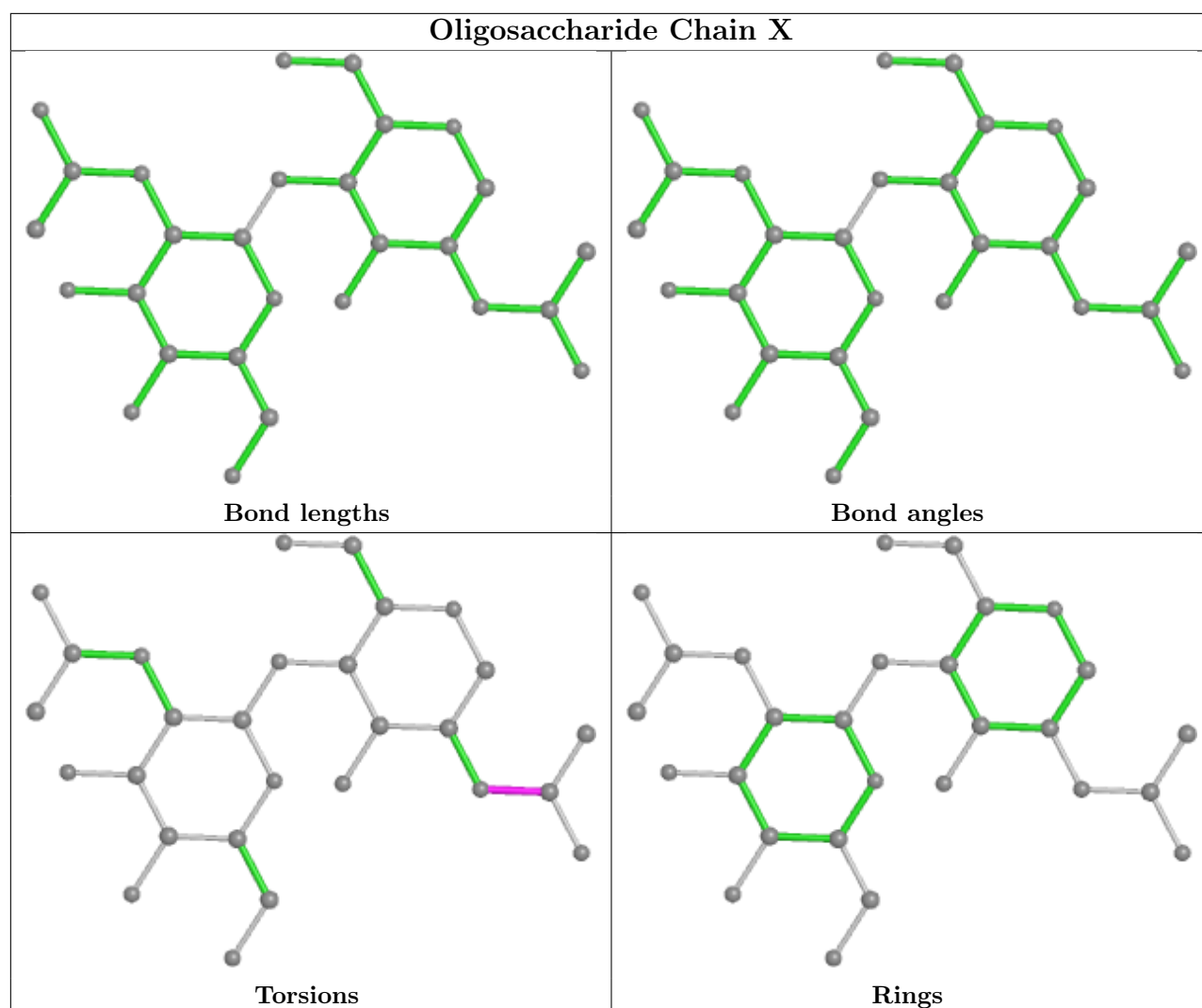


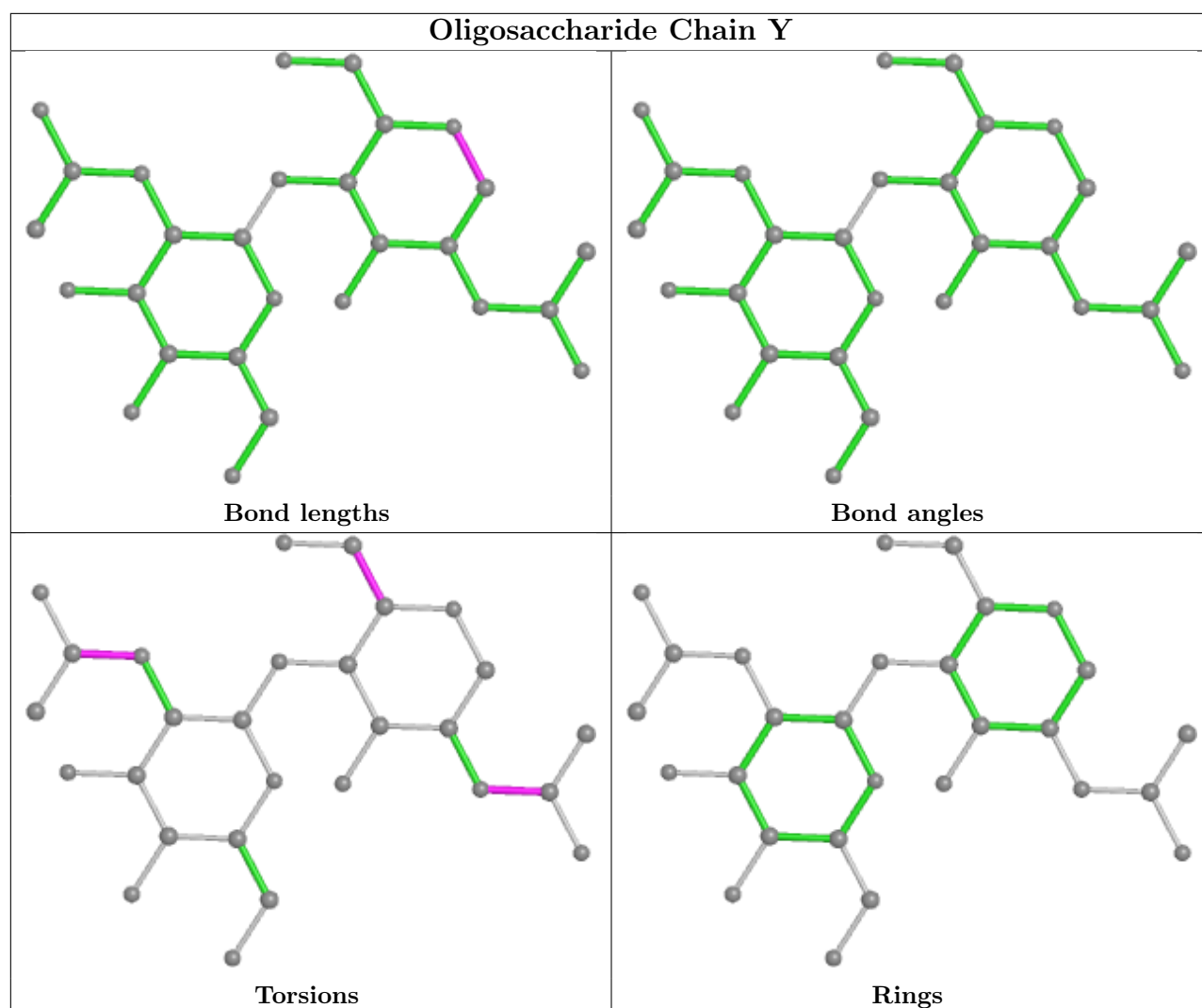


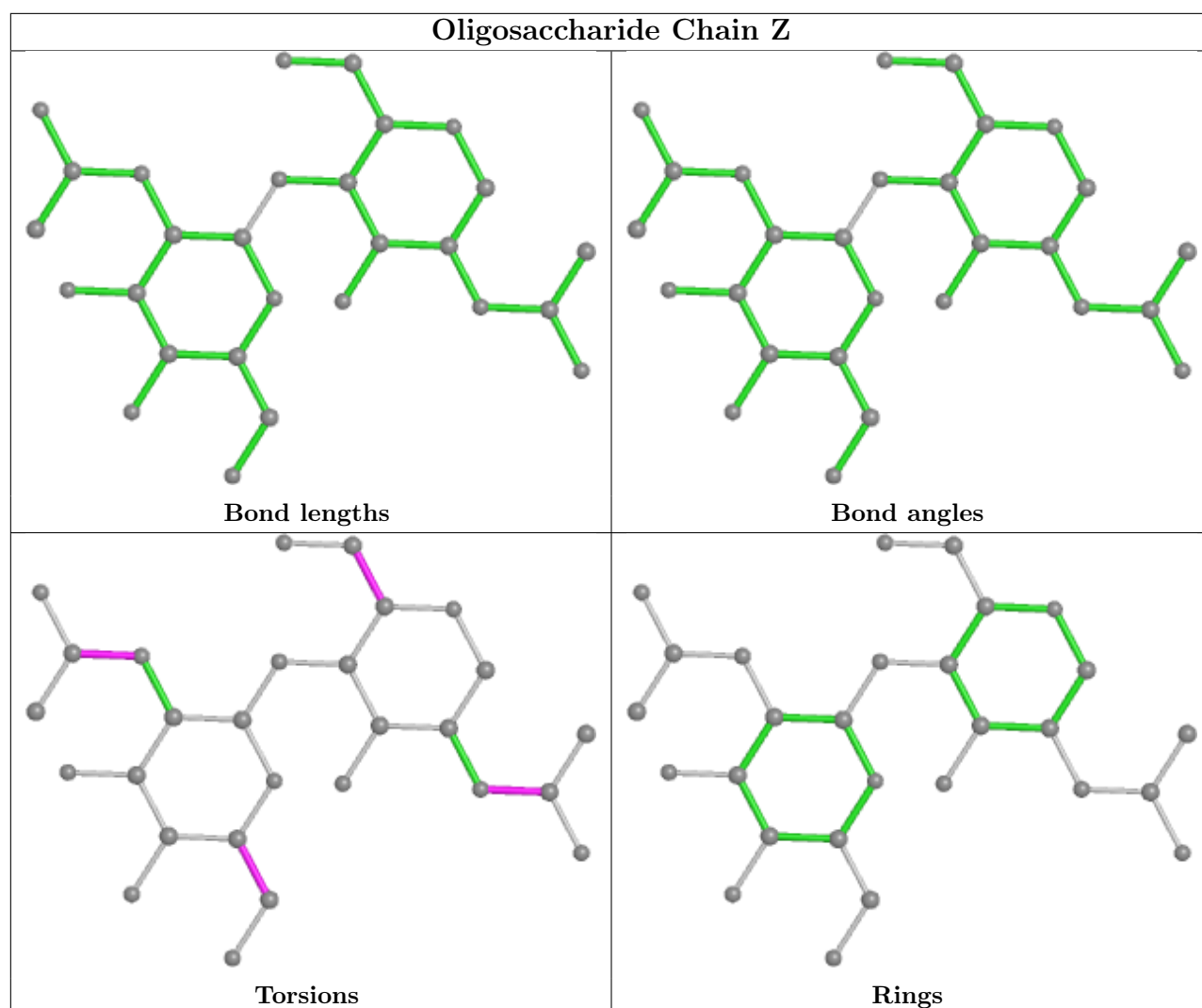




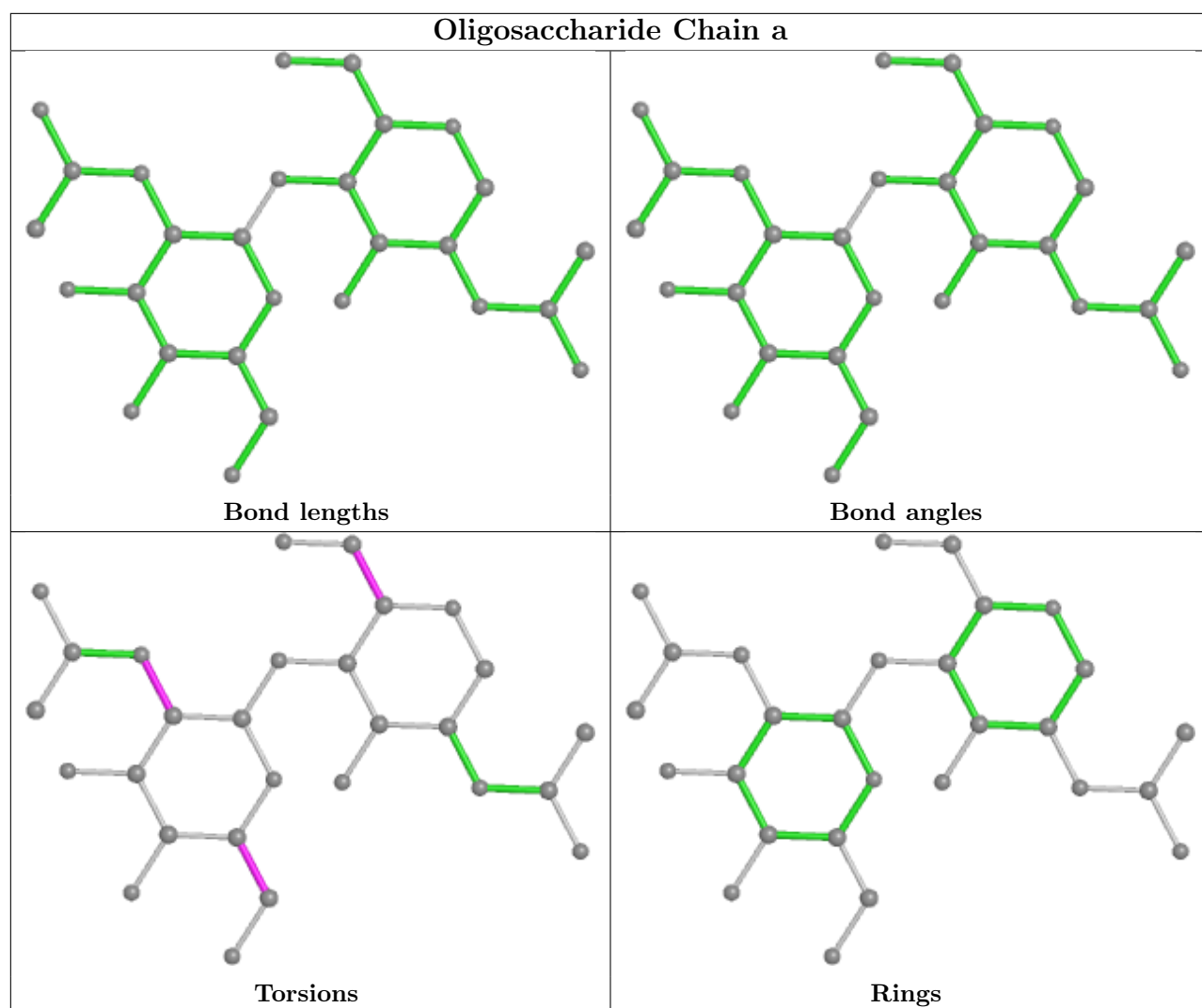


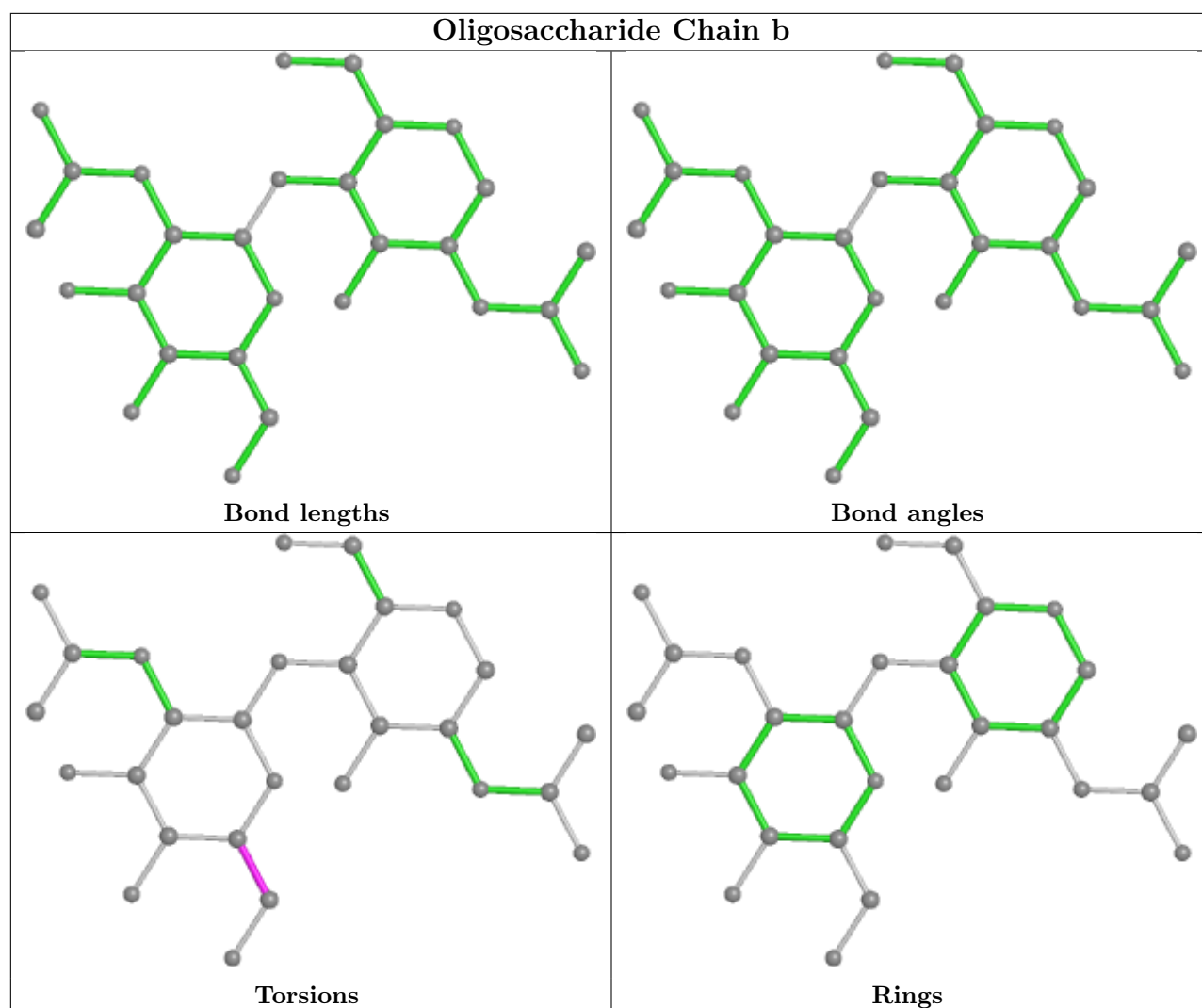


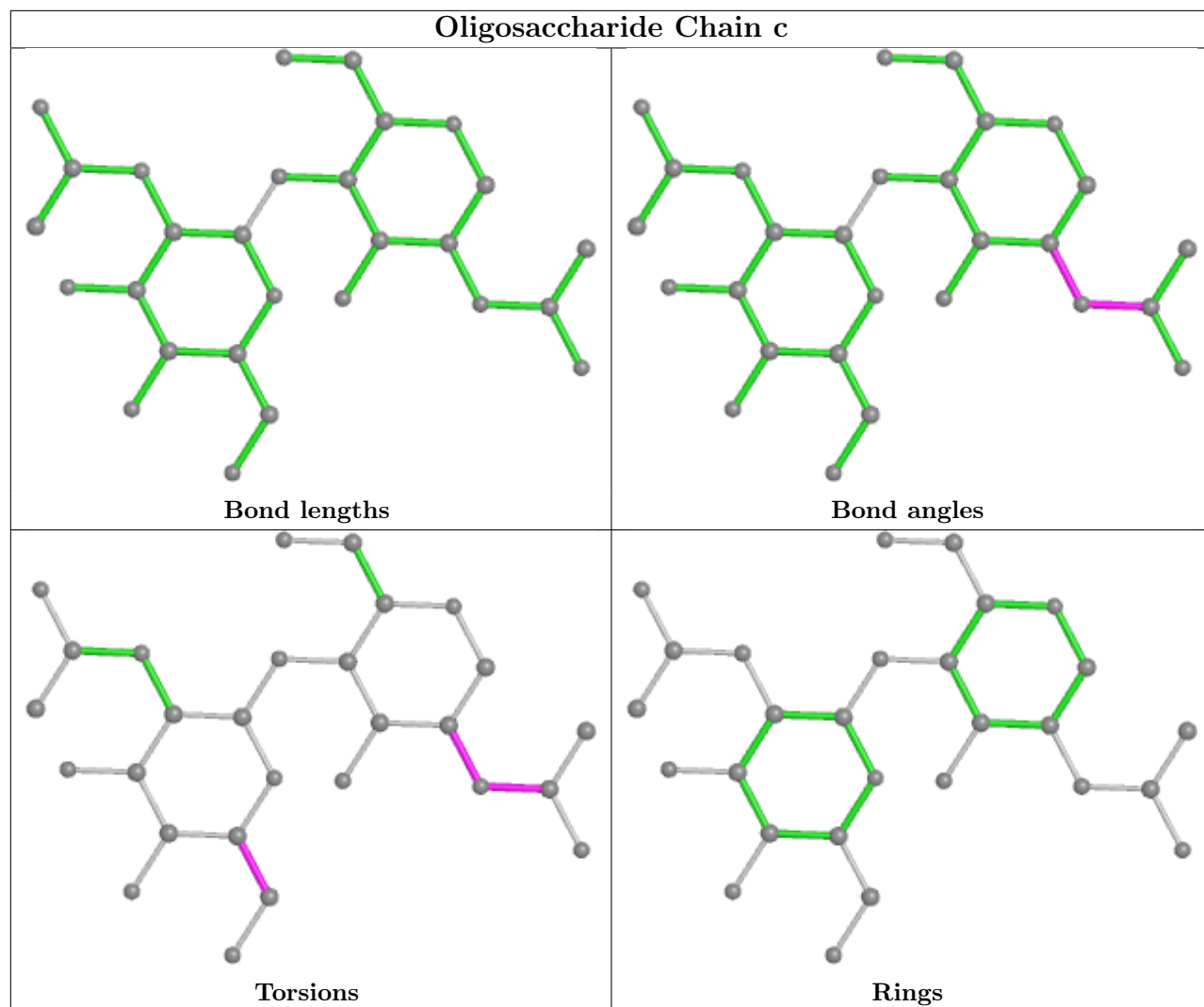


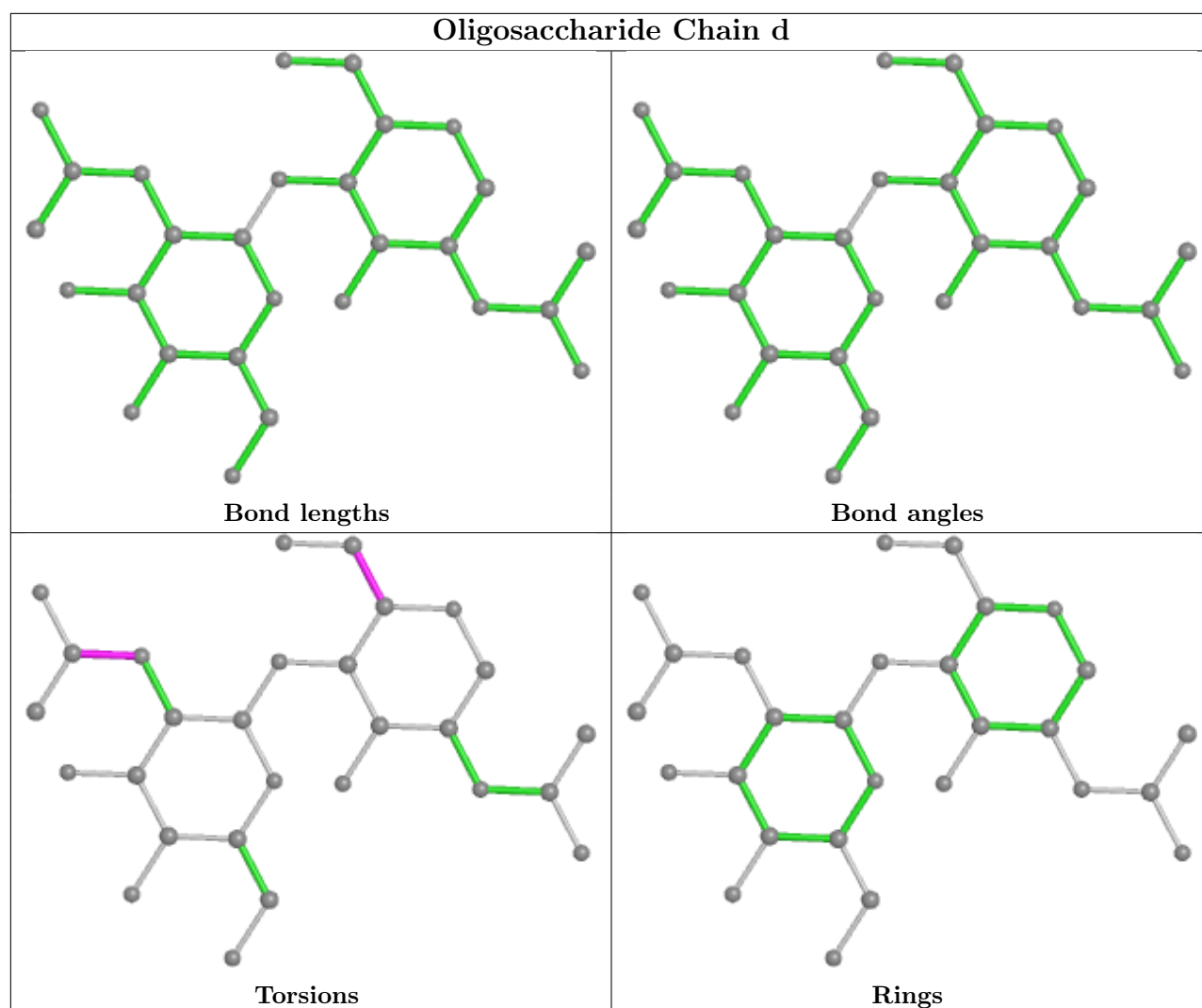


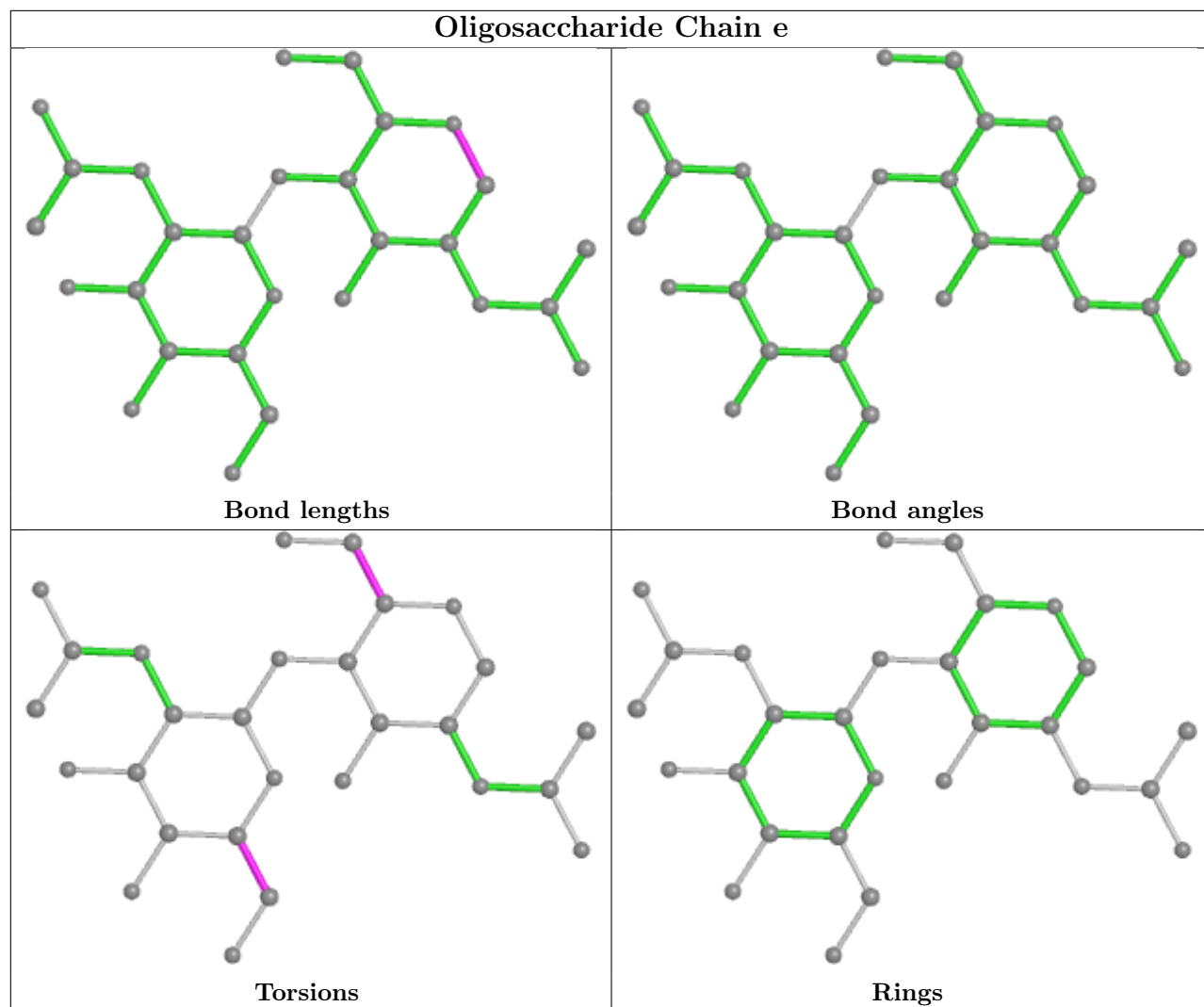


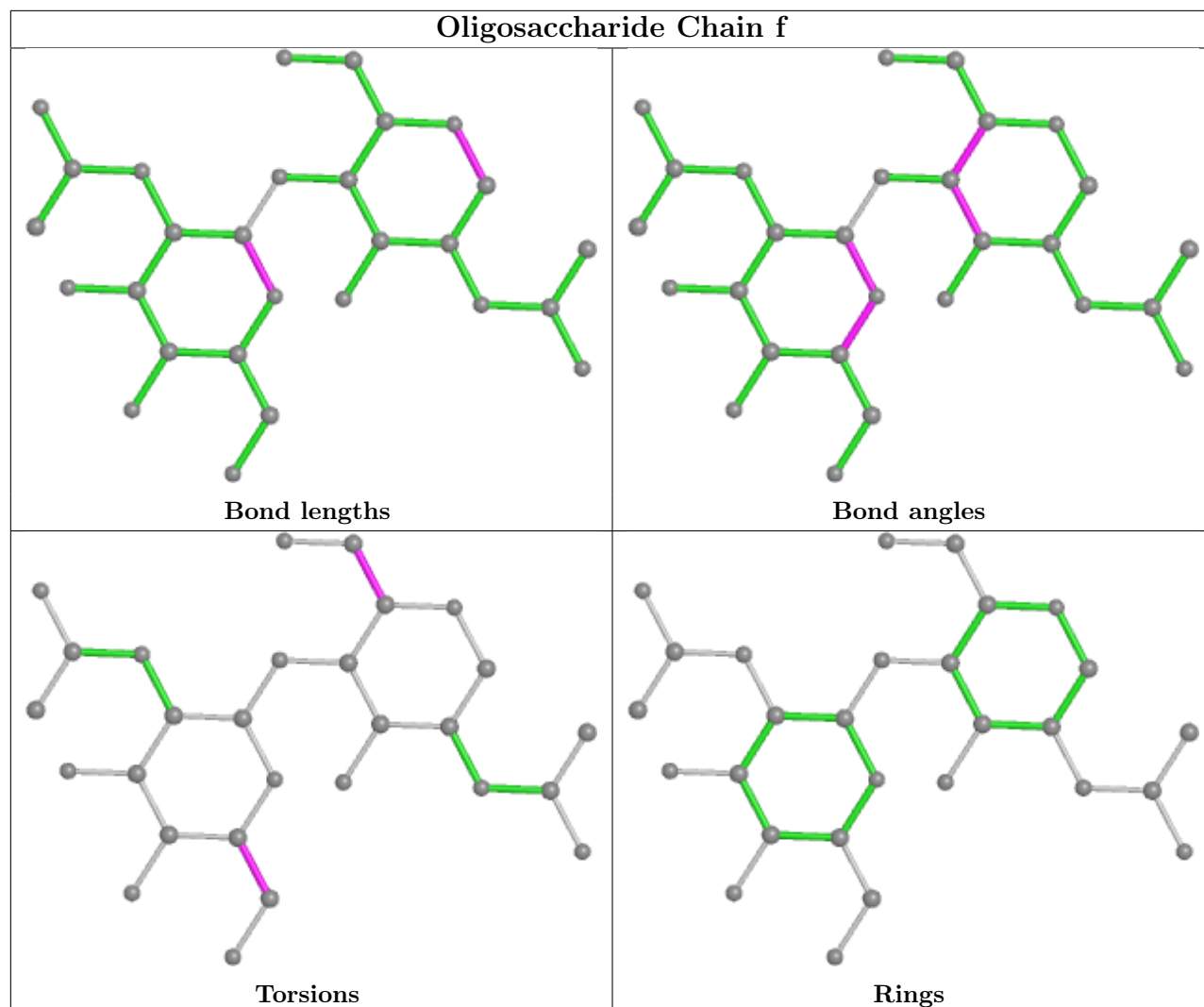


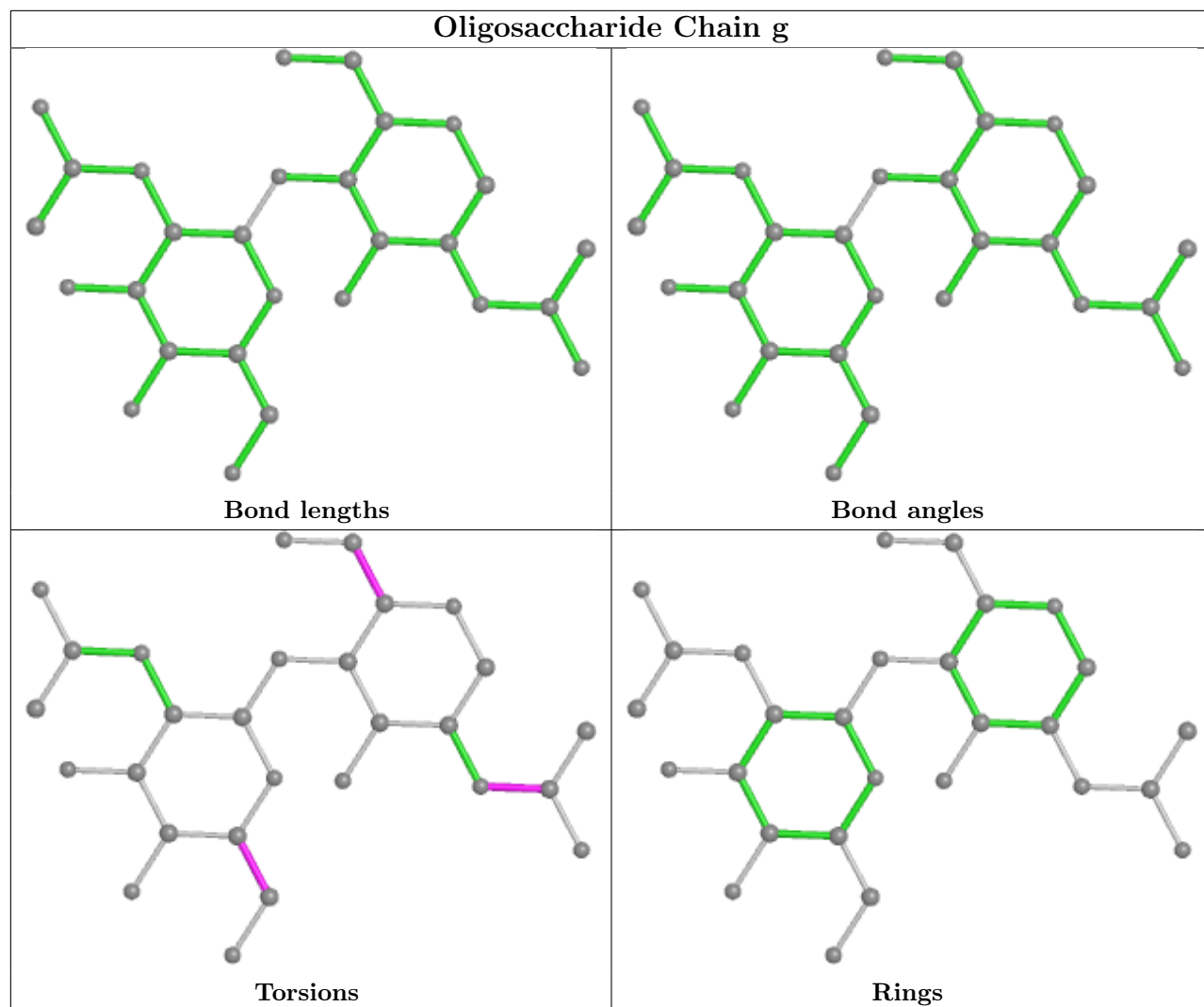


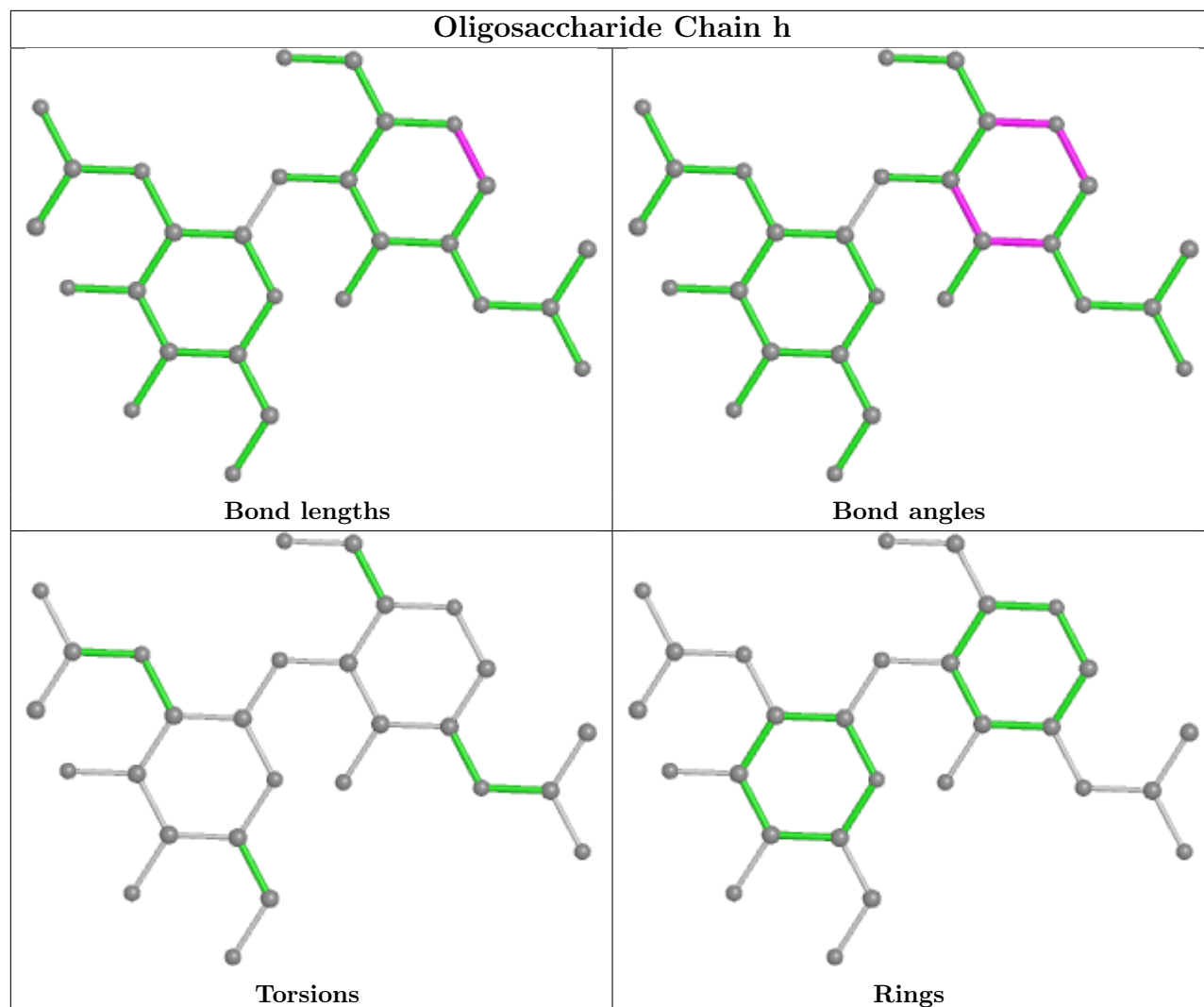




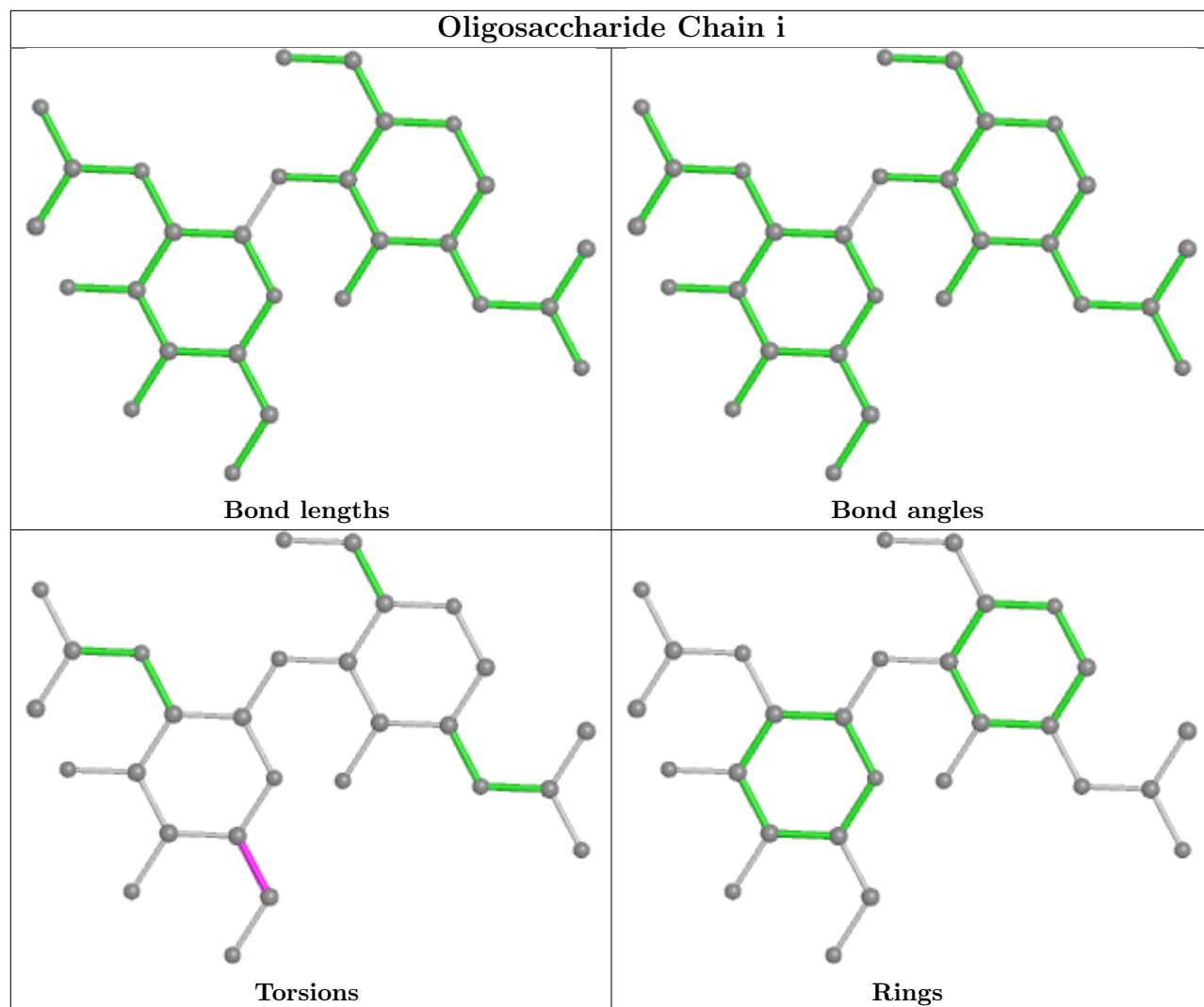


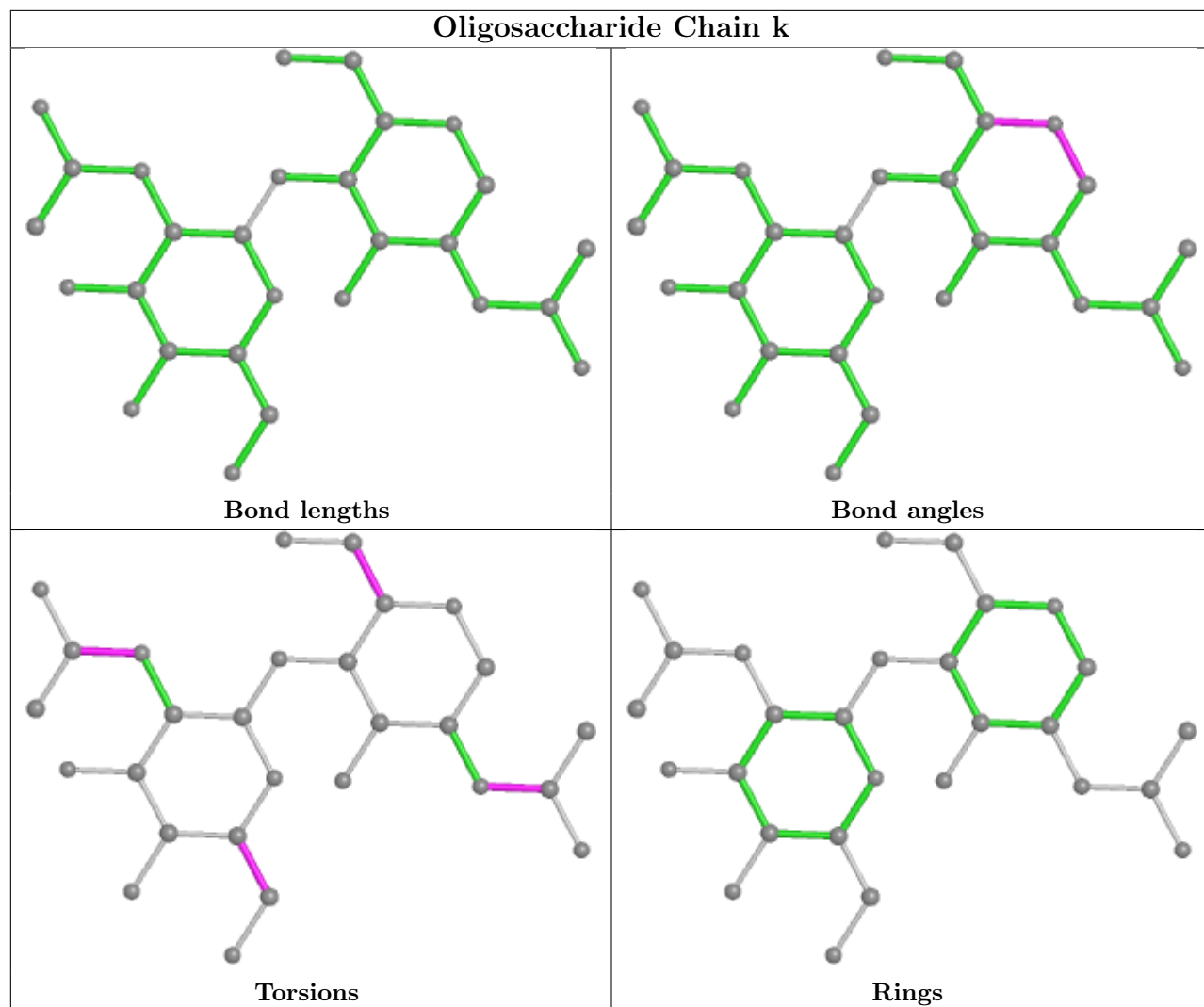


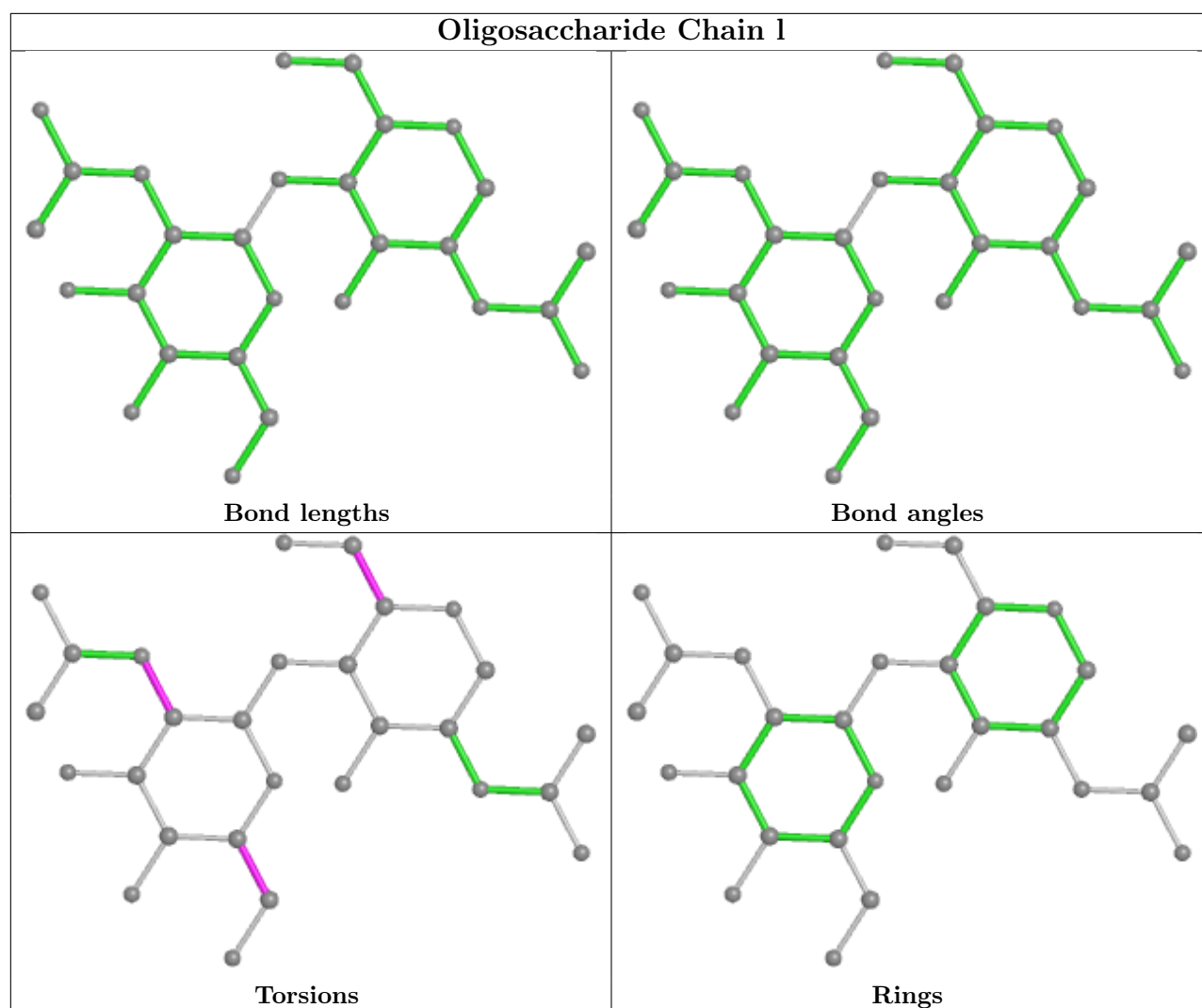


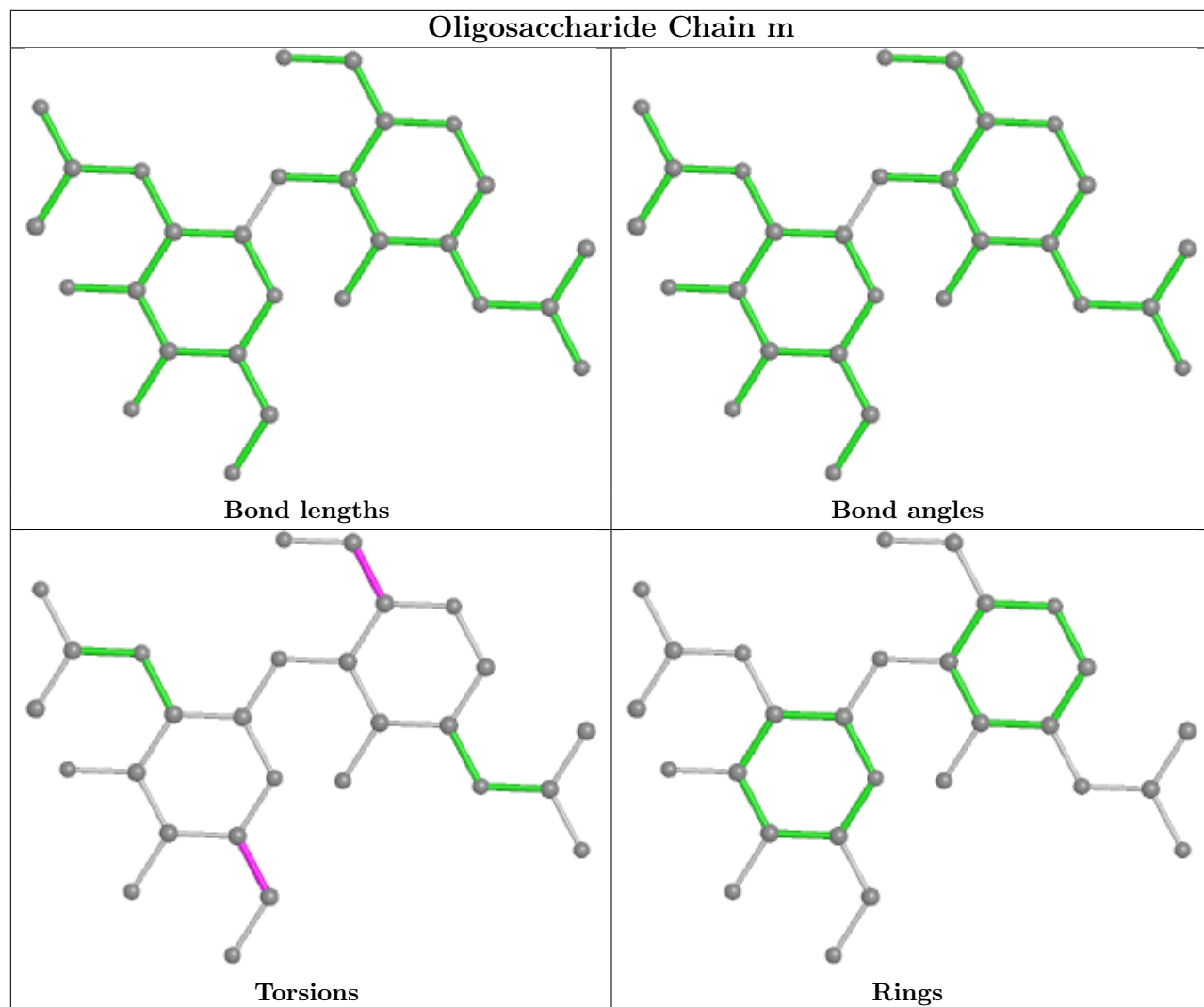


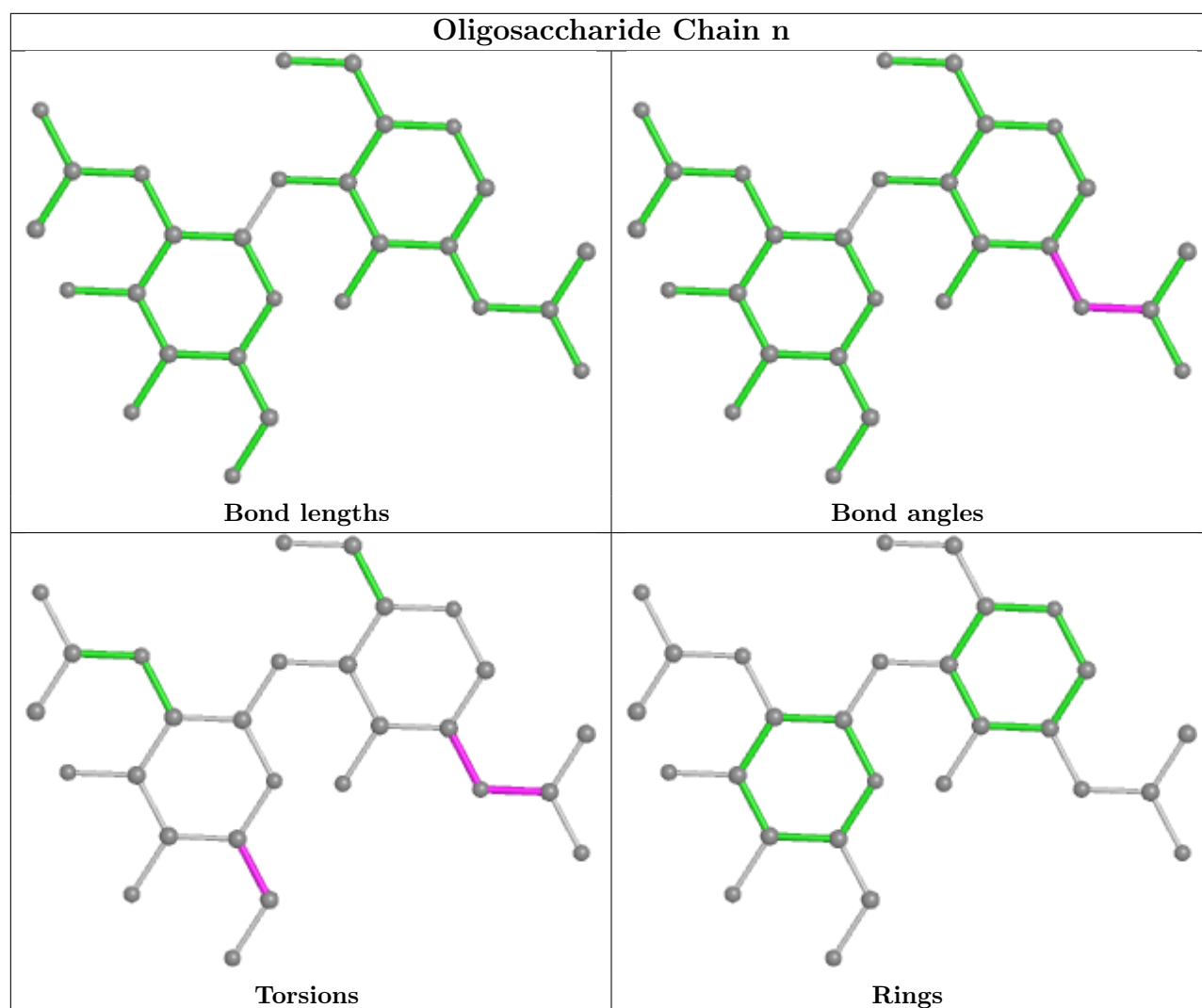


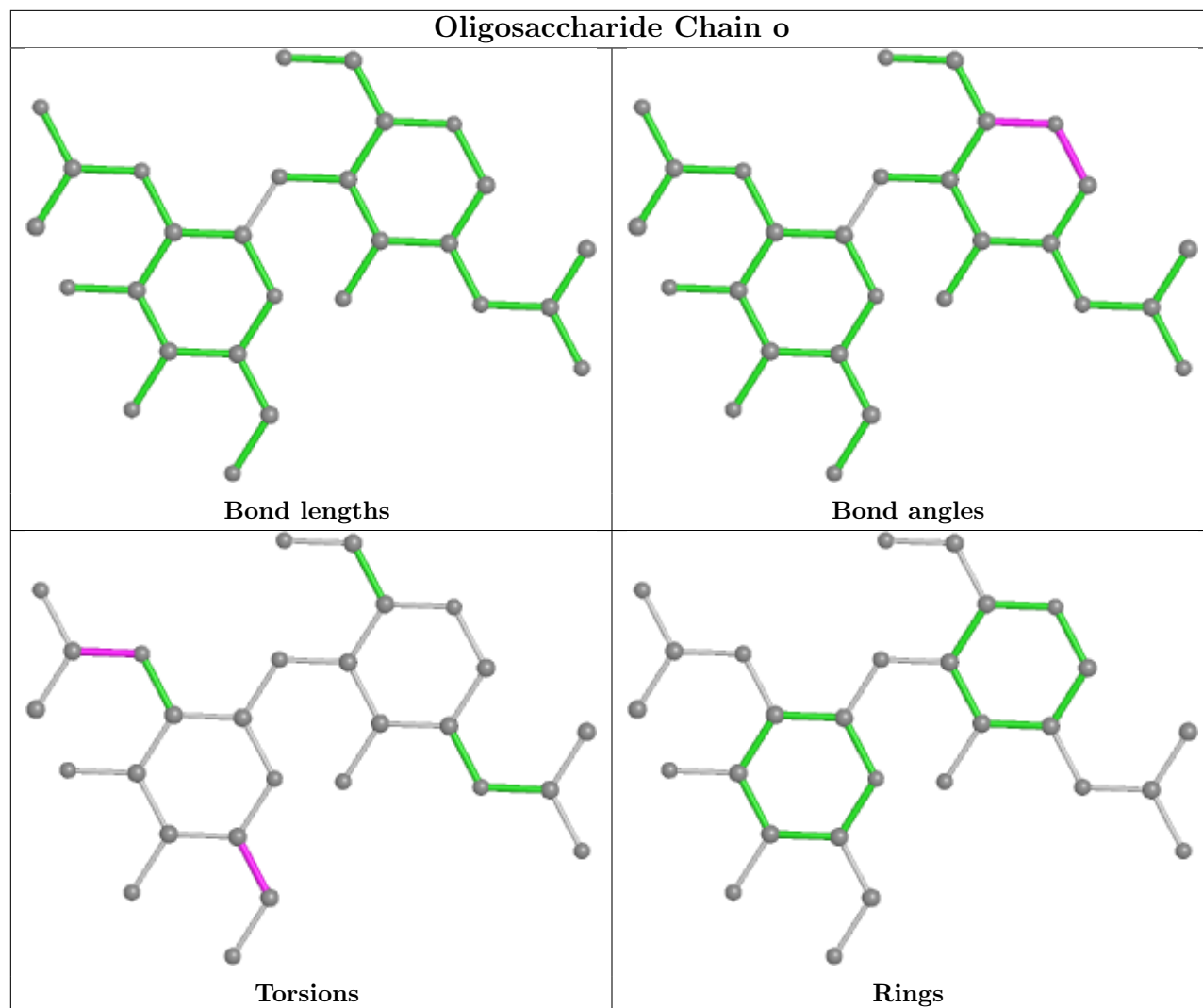


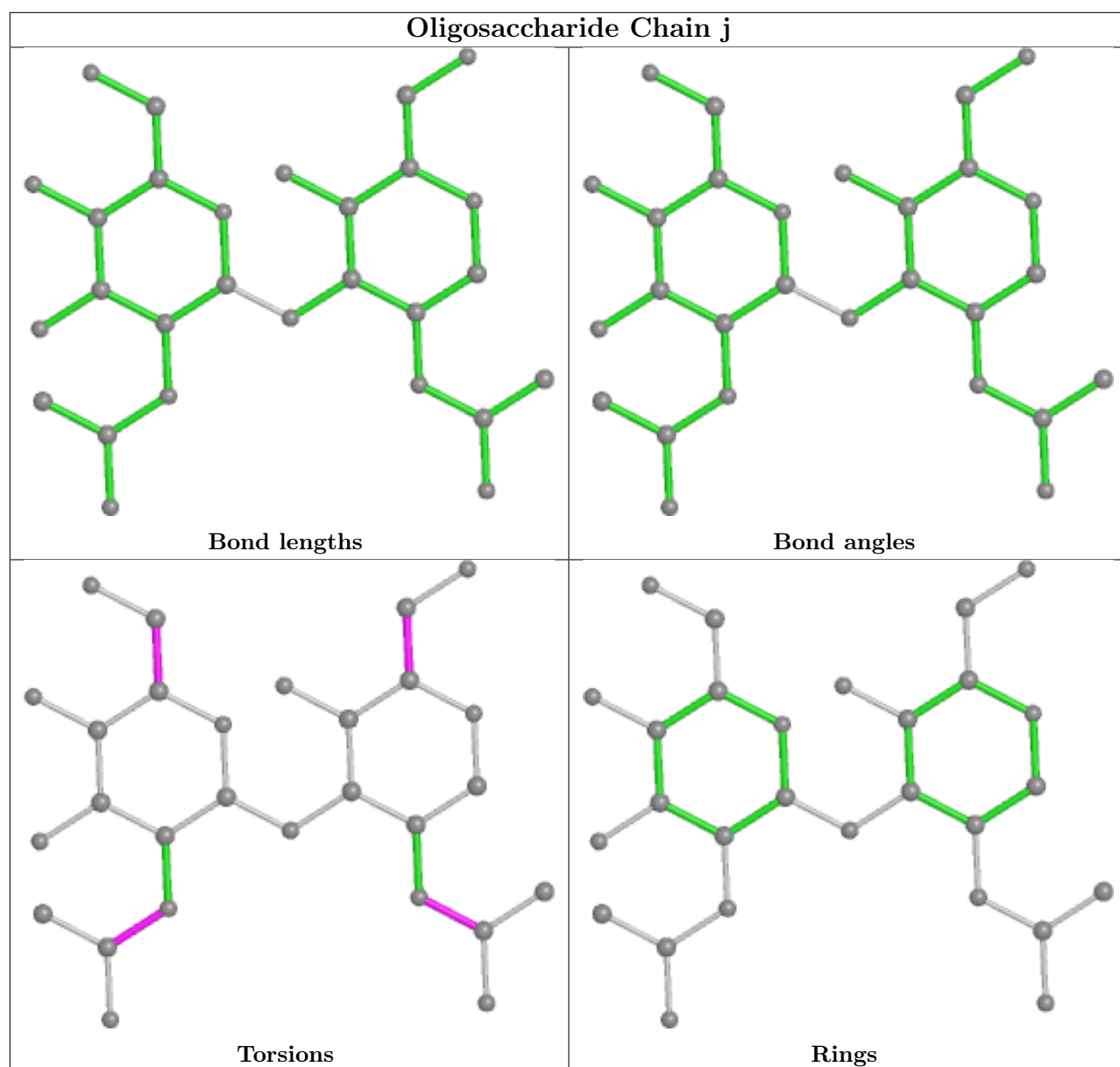


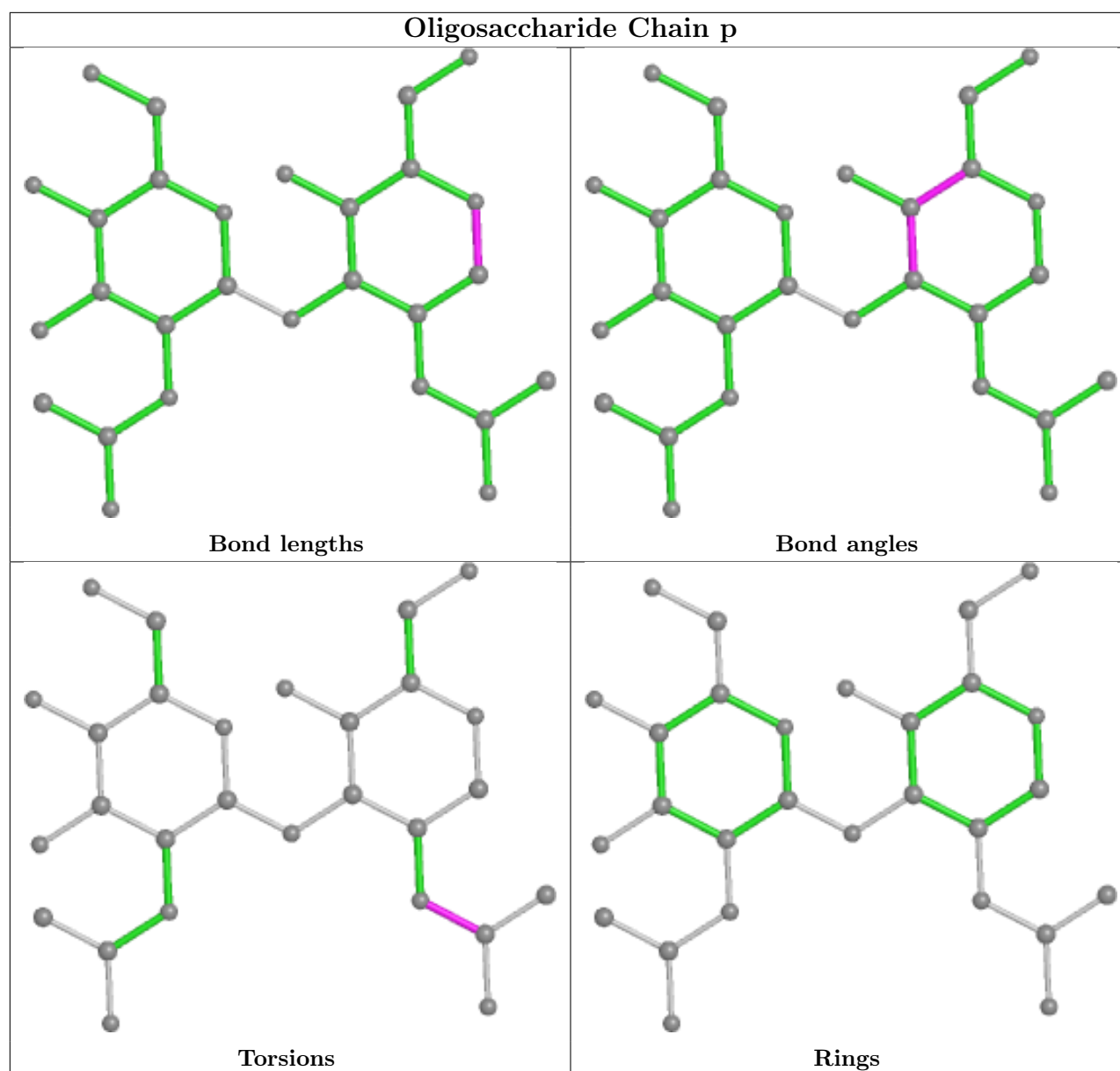












## 5.6 Ligand geometry [i](#)

21 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
6	NAG	C	1307	1	14,14,15	0.19	0	17,19,21	0.43	0
6	NAG	C	1301	1	14,14,15	0.27	0	17,19,21	0.48	0
6	NAG	A	1303	1	14,14,15	0.32	0	17,19,21	0.38	0
6	NAG	C	1303	1	14,14,15	0.32	0	17,19,21	0.41	0
6	NAG	A	1301	1	14,14,15	0.29	0	17,19,21	0.47	0
6	NAG	A	1302	1	14,14,15	0.68	1 (7%)	17,19,21	1.13	1 (5%)
6	NAG	B	1307	1	14,14,15	0.19	0	17,19,21	0.40	0
6	NAG	A	1307	1	14,14,15	0.49	0	17,19,21	0.43	0
6	NAG	B	1305	1	14,14,15	0.63	1 (7%)	17,19,21	1.56	2 (11%)
6	NAG	B	1302	1	14,14,15	0.68	1 (7%)	17,19,21	1.15	2 (11%)
6	NAG	C	1305	1	14,14,15	0.97	1 (7%)	17,19,21	1.29	2 (11%)
6	NAG	B	1303	1	14,14,15	0.30	0	17,19,21	0.38	0
6	NAG	C	1302	1	14,14,15	0.67	1 (7%)	17,19,21	1.15	1 (5%)
6	NAG	B	1304	1	14,14,15	0.37	0	17,19,21	0.39	0
6	NAG	C	1304	1	14,14,15	0.77	1 (7%)	17,19,21	0.83	1 (5%)
6	NAG	A	1306	1	14,14,15	0.87	1 (7%)	17,19,21	1.65	2 (11%)
6	NAG	B	1306	1	14,14,15	0.78	1 (7%)	17,19,21	1.22	2 (11%)
6	NAG	A	1304	1	14,14,15	1.41	1 (7%)	17,19,21	1.53	1 (5%)
6	NAG	B	1301	1	14,14,15	0.26	0	17,19,21	0.49	0
6	NAG	A	1305	1	14,14,15	0.89	1 (7%)	17,19,21	0.98	1 (5%)
6	NAG	C	1306	1	14,14,15	1.01	1 (7%)	17,19,21	1.47	2 (11%)

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
6	NAG	C	1307	1	-	4/6/23/26	0/1/1/1
6	NAG	C	1301	1	-	3/6/23/26	0/1/1/1
6	NAG	A	1303	1	-	1/6/23/26	0/1/1/1
6	NAG	C	1303	1	-	2/6/23/26	0/1/1/1
6	NAG	A	1301	1	-	3/6/23/26	0/1/1/1
6	NAG	A	1302	1	1/1/5/7	4/6/23/26	0/1/1/1
6	NAG	B	1307	1	-	0/6/23/26	0/1/1/1
6	NAG	A	1307	1	-	0/6/23/26	0/1/1/1
6	NAG	B	1305	1	1/1/5/7	5/6/23/26	0/1/1/1
6	NAG	B	1302	1	1/1/5/7	4/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	C	1305	1	-	3/6/23/26	0/1/1/1
6	NAG	B	1303	1	-	2/6/23/26	0/1/1/1
6	NAG	C	1302	1	1/1/5/7	4/6/23/26	0/1/1/1
6	NAG	B	1304	1	-	2/6/23/26	0/1/1/1
6	NAG	C	1304	1	-	2/6/23/26	0/1/1/1
6	NAG	A	1306	1	-	0/6/23/26	0/1/1/1
6	NAG	B	1306	1	1/1/5/7	0/6/23/26	0/1/1/1
6	NAG	A	1304	1	-	1/6/23/26	0/1/1/1
6	NAG	B	1301	1	-	3/6/23/26	0/1/1/1
6	NAG	A	1305	1	-	1/6/23/26	0/1/1/1
6	NAG	C	1306	1	-	0/6/23/26	0/1/1/1

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	1304	NAG	O5-C1	4.98	1.51	1.43
6	C	1306	NAG	C1-C2	3.63	1.57	1.52
6	C	1305	NAG	C1-C2	3.52	1.57	1.52
6	A	1305	NAG	C1-C2	3.24	1.57	1.52
6	A	1306	NAG	C1-C2	3.00	1.56	1.52
6	B	1306	NAG	C1-C2	2.69	1.56	1.52
6	A	1302	NAG	C1-C2	2.34	1.55	1.52
6	B	1302	NAG	C1-C2	2.32	1.55	1.52
6	C	1302	NAG	C1-C2	2.28	1.55	1.52
6	C	1304	NAG	O5-C1	2.26	1.47	1.43
6	B	1305	NAG	C1-C2	2.05	1.55	1.52

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	A	1304	NAG	C1-O5-C5	6.07	120.42	112.19
6	A	1306	NAG	O5-C1-C2	-5.39	102.78	111.29
6	B	1305	NAG	C1-O5-C5	4.51	118.31	112.19
6	C	1306	NAG	O5-C1-C2	-3.94	105.06	111.29
6	B	1306	NAG	O5-C1-C2	-3.90	105.14	111.29
6	B	1305	NAG	O5-C1-C2	-3.78	105.33	111.29
6	C	1302	NAG	O5-C1-C2	-3.76	105.35	111.29
6	A	1302	NAG	O5-C1-C2	-3.62	105.57	111.29
6	B	1302	NAG	O5-C1-C2	-3.62	105.57	111.29
6	C	1306	NAG	C1-O5-C5	3.37	116.75	112.19
6	A	1306	NAG	C1-O5-C5	3.29	116.66	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	C	1304	NAG	C1-O5-C5	3.20	116.53	112.19
6	C	1305	NAG	C1-O5-C5	3.16	116.47	112.19
6	A	1305	NAG	C1-O5-C5	2.88	116.09	112.19
6	B	1306	NAG	O5-C5-C6	2.34	110.87	107.20
6	B	1302	NAG	O5-C5-C6	2.04	110.41	107.20
6	C	1305	NAG	O5-C5-C6	2.02	110.37	107.20

All (5) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
6	A	1302	NAG	C1
6	C	1302	NAG	C1
6	B	1302	NAG	C1
6	B	1305	NAG	C1
6	B	1306	NAG	C1

All (44) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	B	1305	NAG	C3-C2-N2-C7
6	B	1305	NAG	C8-C7-N2-C2
6	B	1305	NAG	O7-C7-N2-C2
6	C	1302	NAG	C8-C7-N2-C2
6	C	1302	NAG	O7-C7-N2-C2
6	B	1302	NAG	C8-C7-N2-C2
6	B	1302	NAG	O7-C7-N2-C2
6	B	1304	NAG	C4-C5-C6-O6
6	A	1302	NAG	C8-C7-N2-C2
6	A	1302	NAG	O7-C7-N2-C2
6	C	1304	NAG	C4-C5-C6-O6
6	A	1301	NAG	O5-C5-C6-O6
6	B	1304	NAG	O5-C5-C6-O6
6	A	1301	NAG	C4-C5-C6-O6
6	C	1302	NAG	O5-C5-C6-O6
6	C	1305	NAG	C8-C7-N2-C2
6	C	1307	NAG	C8-C7-N2-C2
6	C	1307	NAG	O7-C7-N2-C2
6	A	1302	NAG	O5-C5-C6-O6
6	C	1303	NAG	O5-C5-C6-O6
6	B	1302	NAG	O5-C5-C6-O6
6	C	1304	NAG	O5-C5-C6-O6
6	C	1301	NAG	O5-C5-C6-O6

*Continued on next page...*

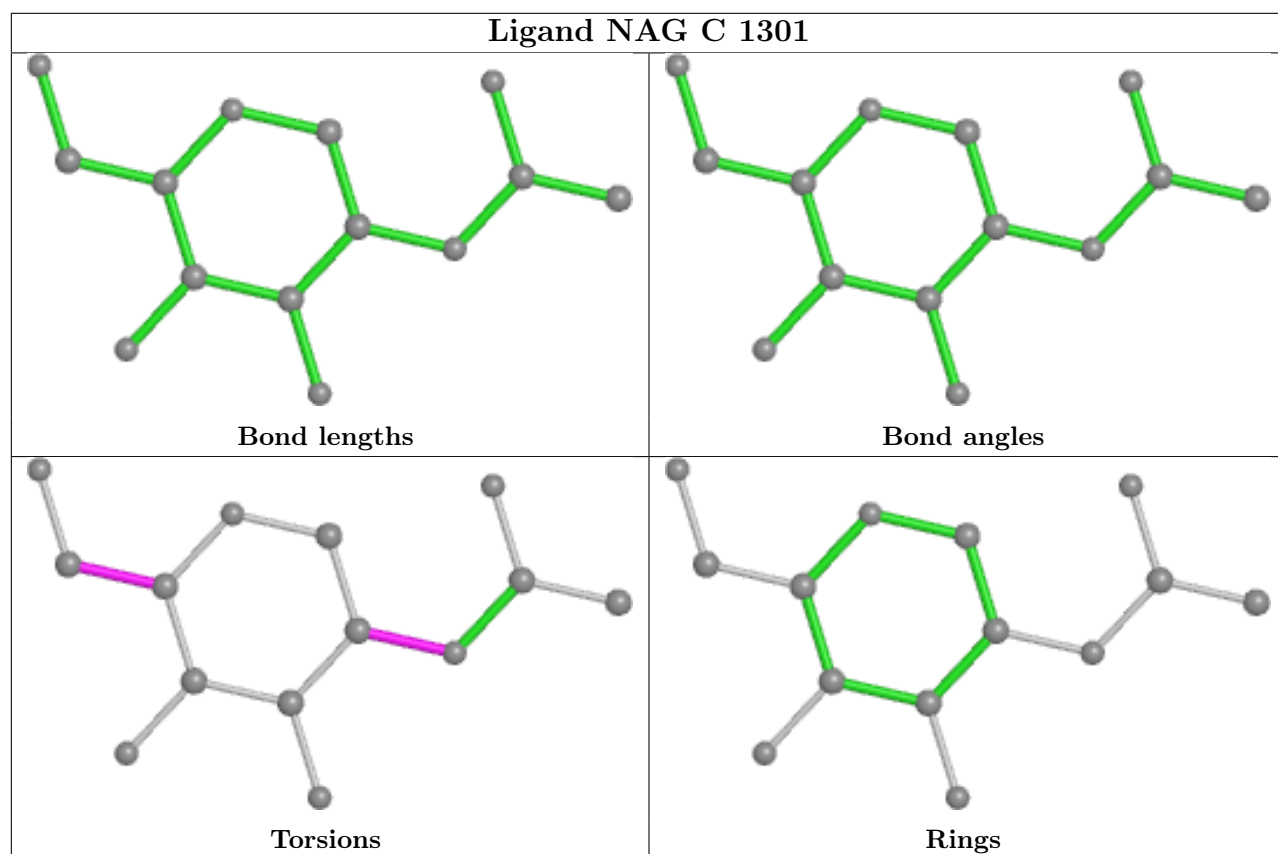
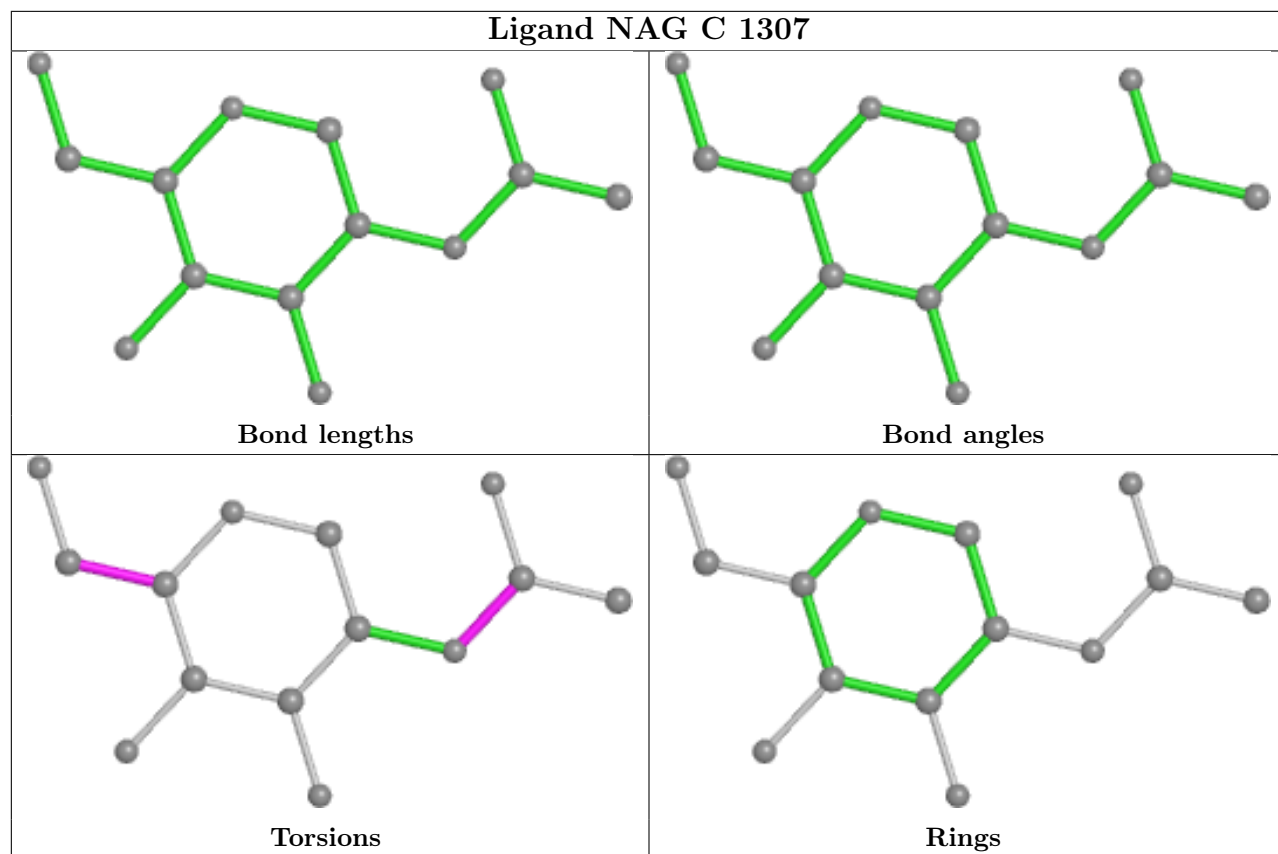
*Continued from previous page...*

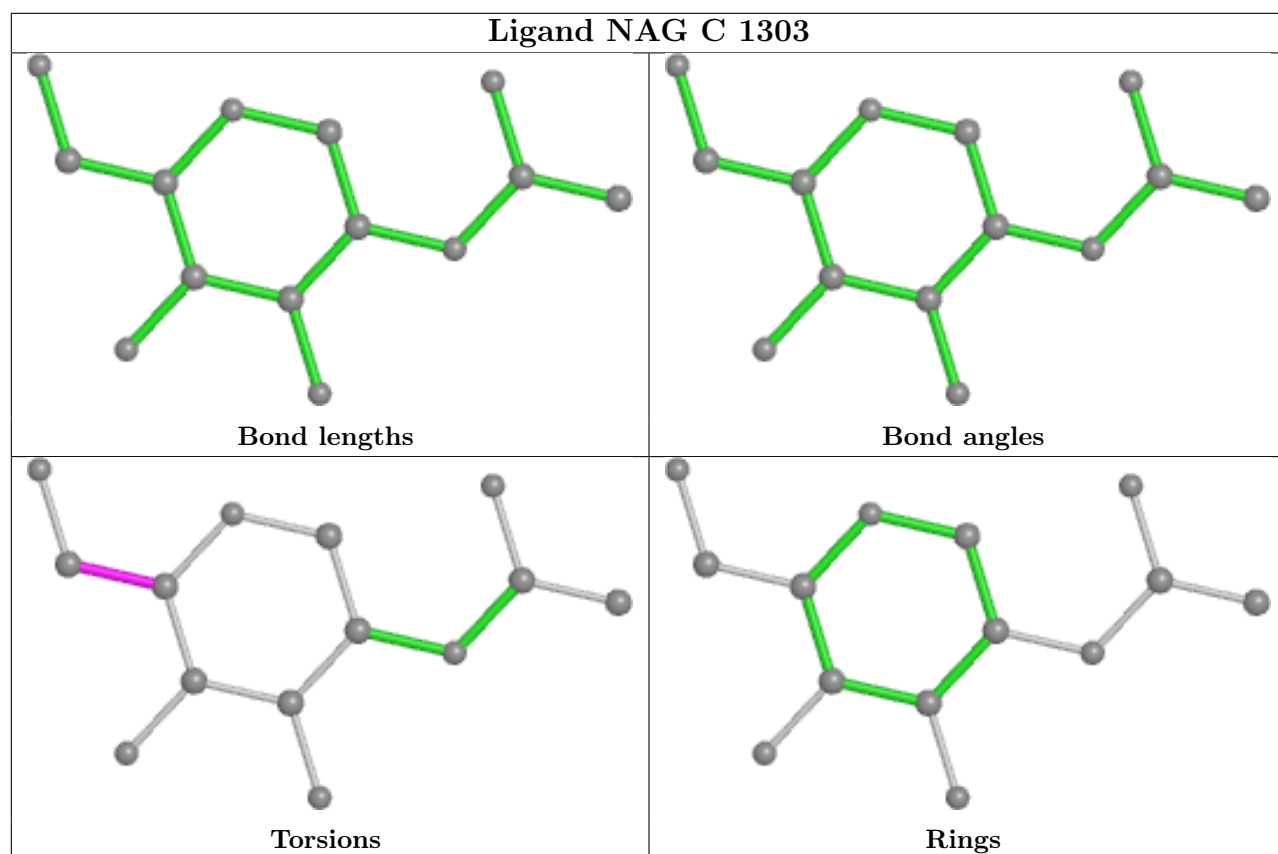
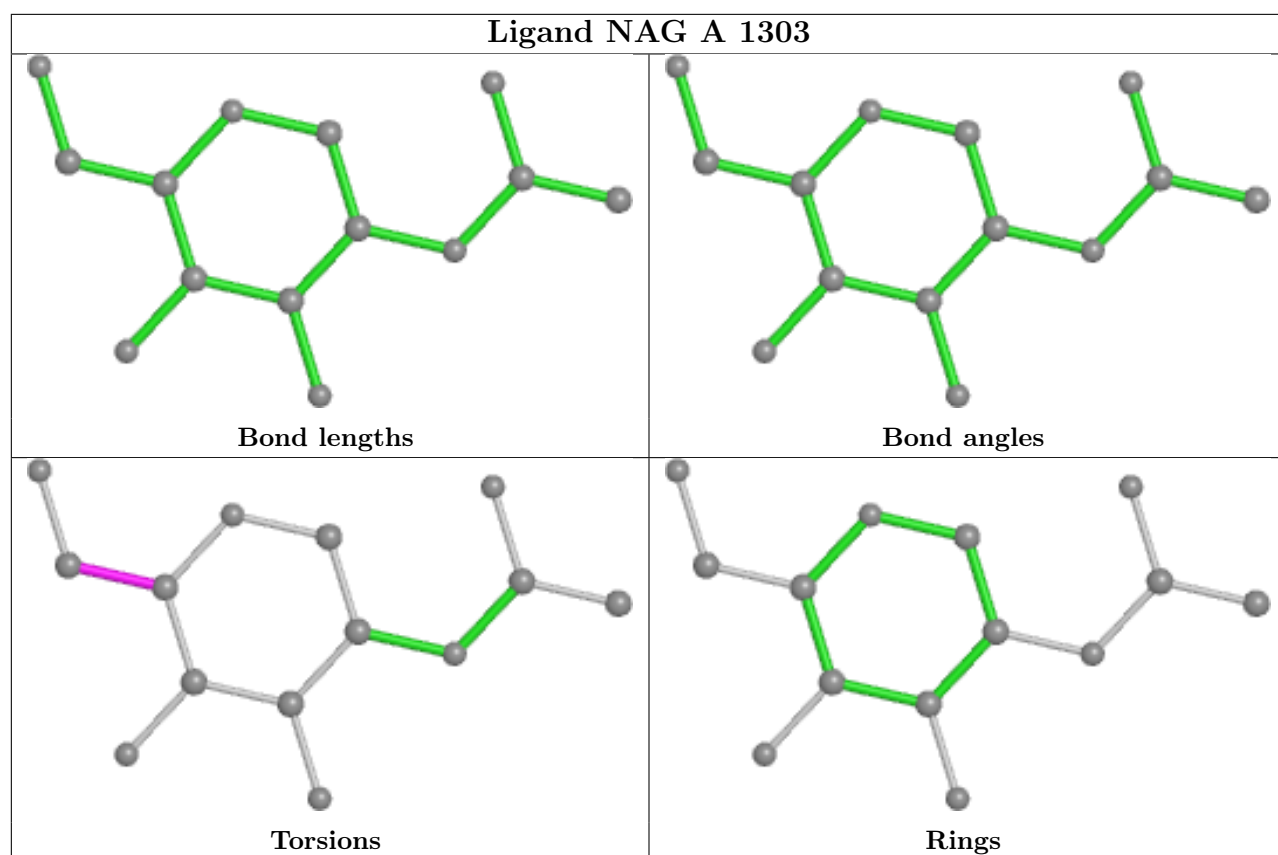
Mol	Chain	Res	Type	Atoms
6	C	1301	NAG	C4-C5-C6-O6
6	B	1303	NAG	O5-C5-C6-O6
6	C	1305	NAG	O7-C7-N2-C2
6	A	1304	NAG	O5-C5-C6-O6
6	A	1305	NAG	O5-C5-C6-O6
6	C	1303	NAG	C4-C5-C6-O6
6	C	1307	NAG	C4-C5-C6-O6
6	C	1302	NAG	C4-C5-C6-O6
6	C	1307	NAG	O5-C5-C6-O6
6	B	1301	NAG	C4-C5-C6-O6
6	A	1302	NAG	C4-C5-C6-O6
6	A	1303	NAG	O5-C5-C6-O6
6	C	1305	NAG	O5-C5-C6-O6
6	B	1301	NAG	O5-C5-C6-O6
6	B	1305	NAG	O5-C5-C6-O6
6	B	1302	NAG	C4-C5-C6-O6
6	B	1303	NAG	C4-C5-C6-O6
6	B	1305	NAG	C1-C2-N2-C7
6	A	1301	NAG	C3-C2-N2-C7
6	C	1301	NAG	C3-C2-N2-C7
6	B	1301	NAG	C3-C2-N2-C7

There are no ring outliers.

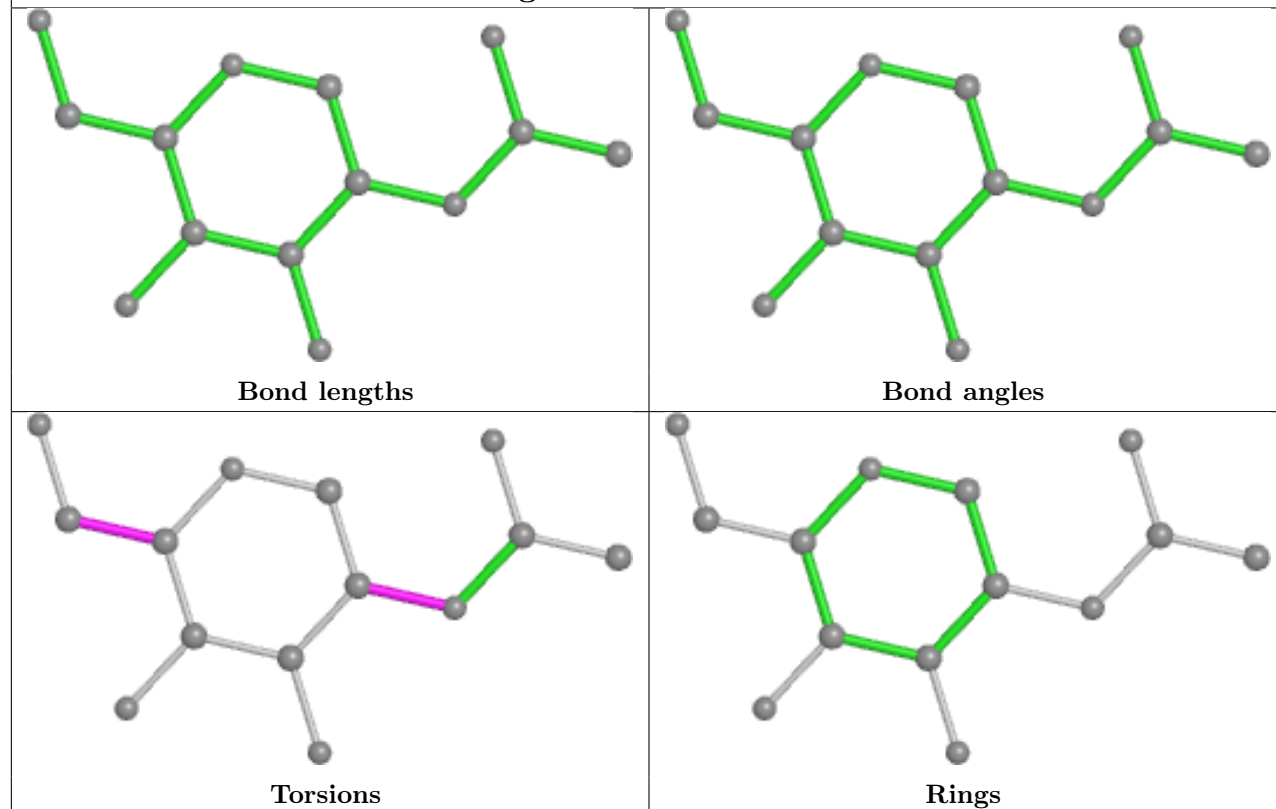
No monomer is involved in short contacts.

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.

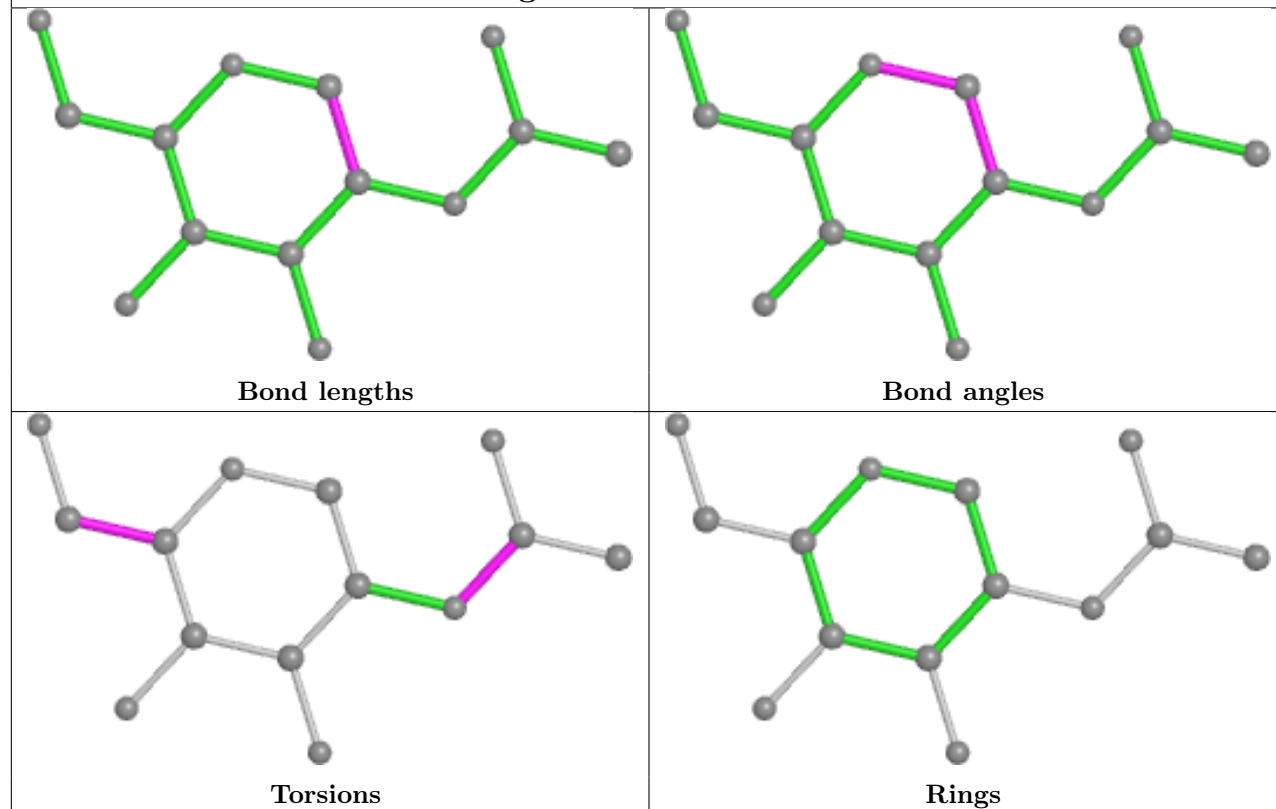




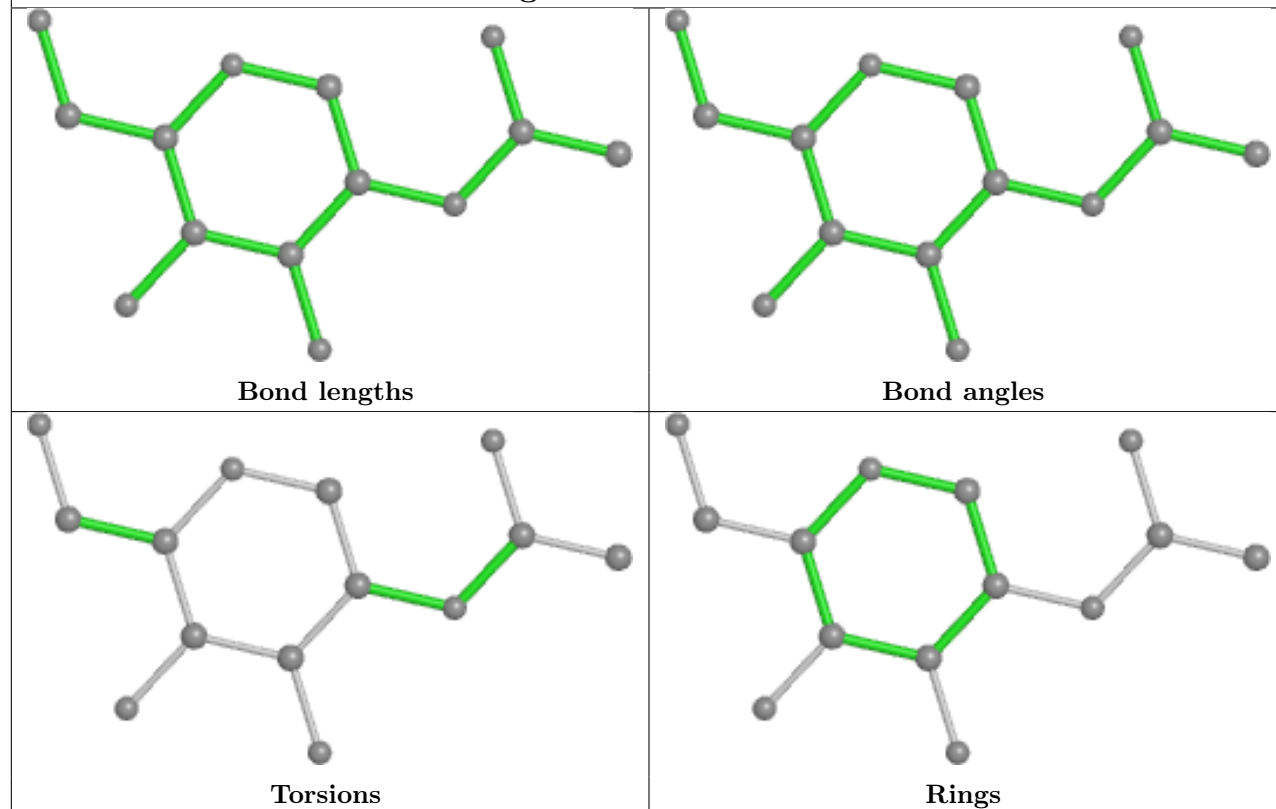
## Ligand NAG A 1301



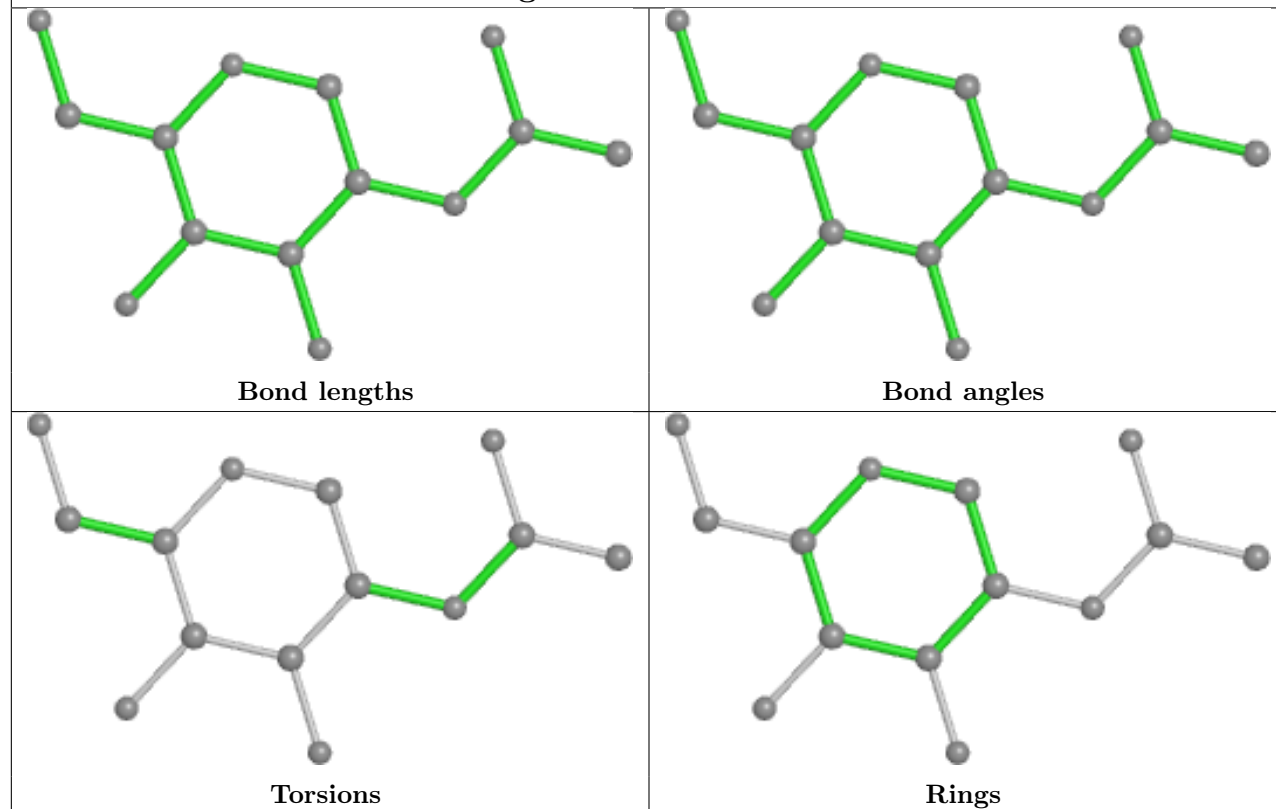
## Ligand NAG A 1302



## Ligand NAG B 1307

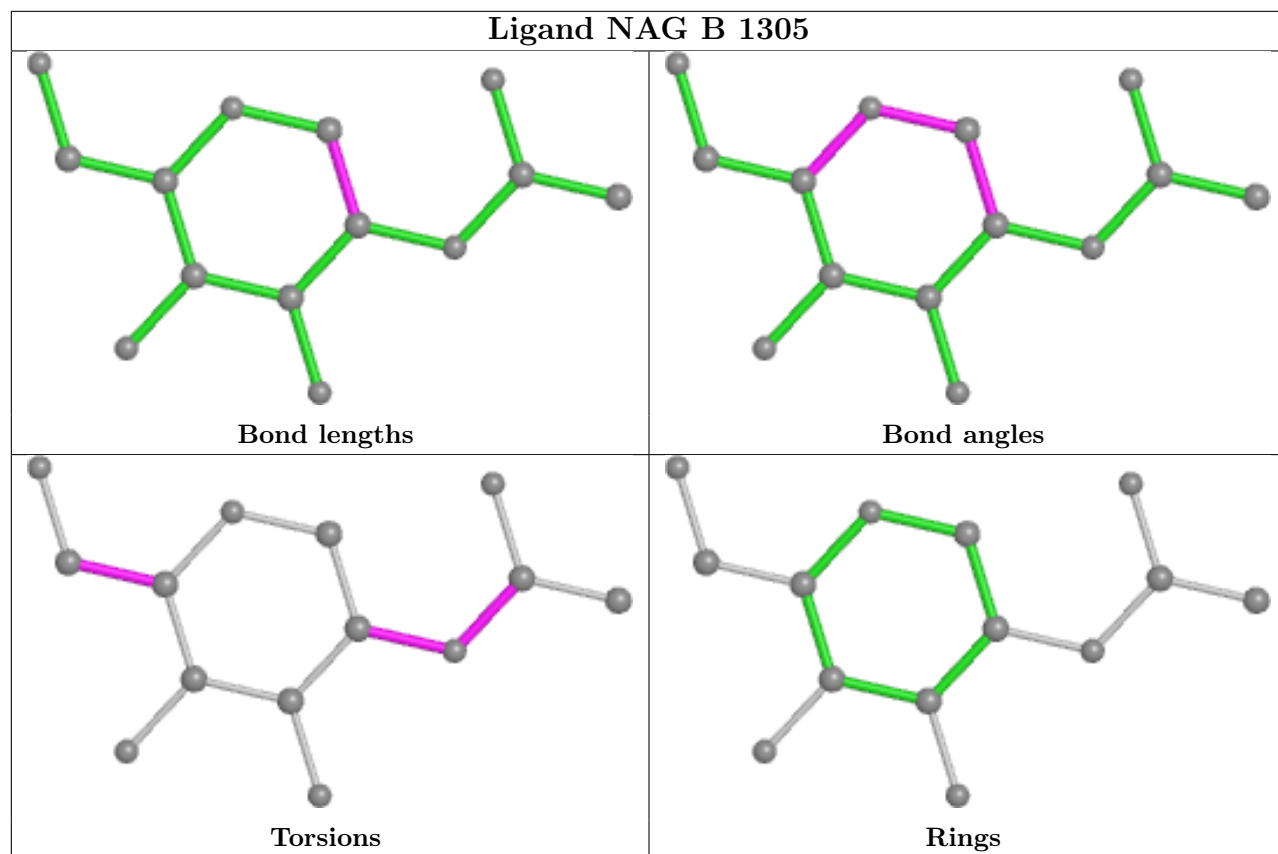


## Ligand NAG A 1307

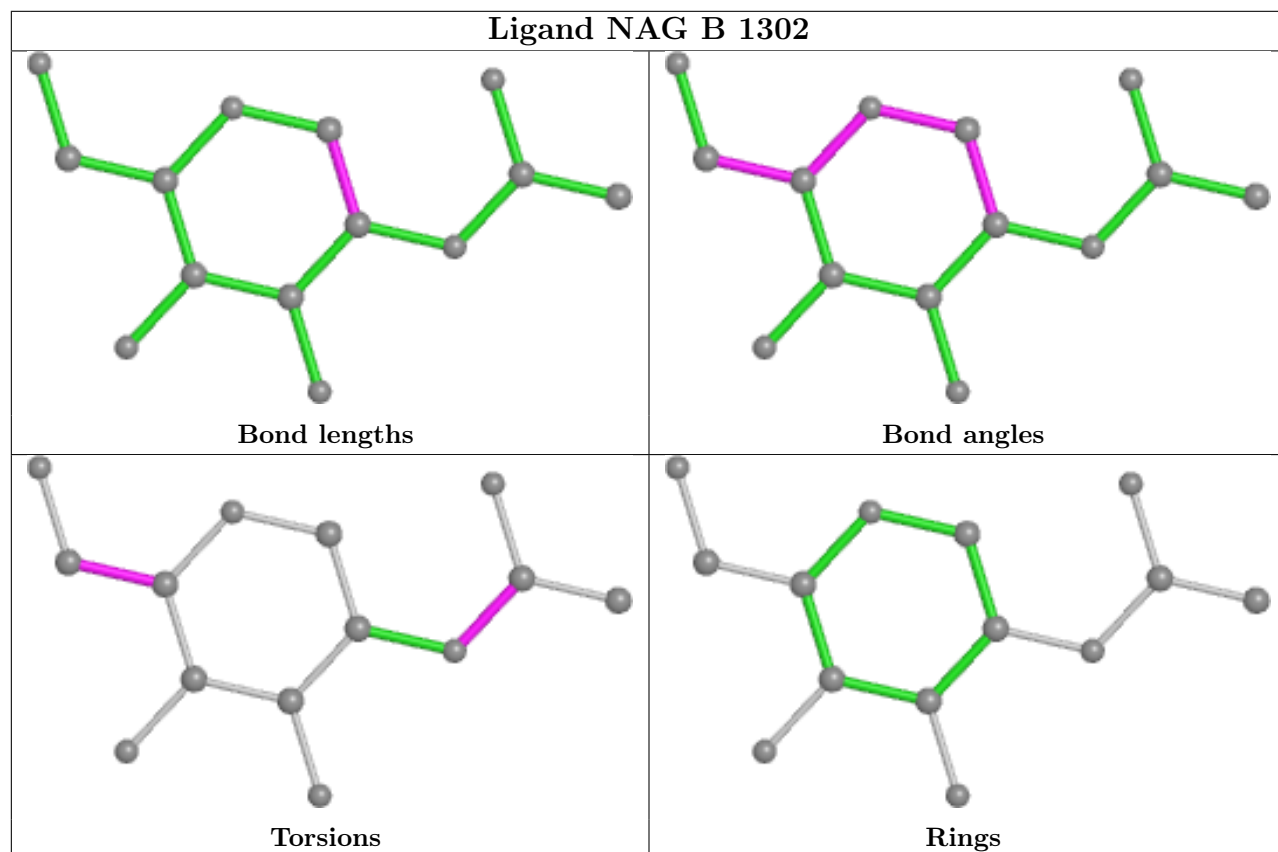


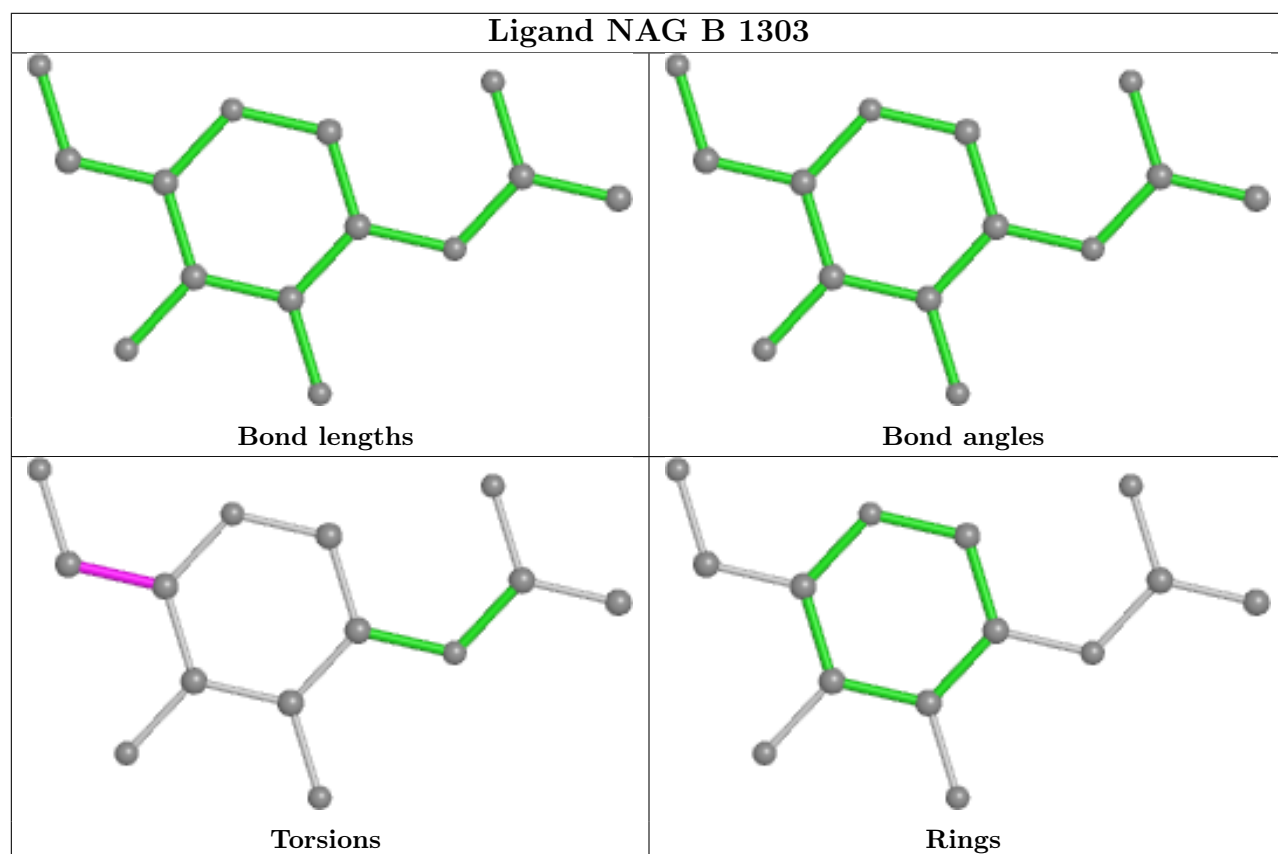
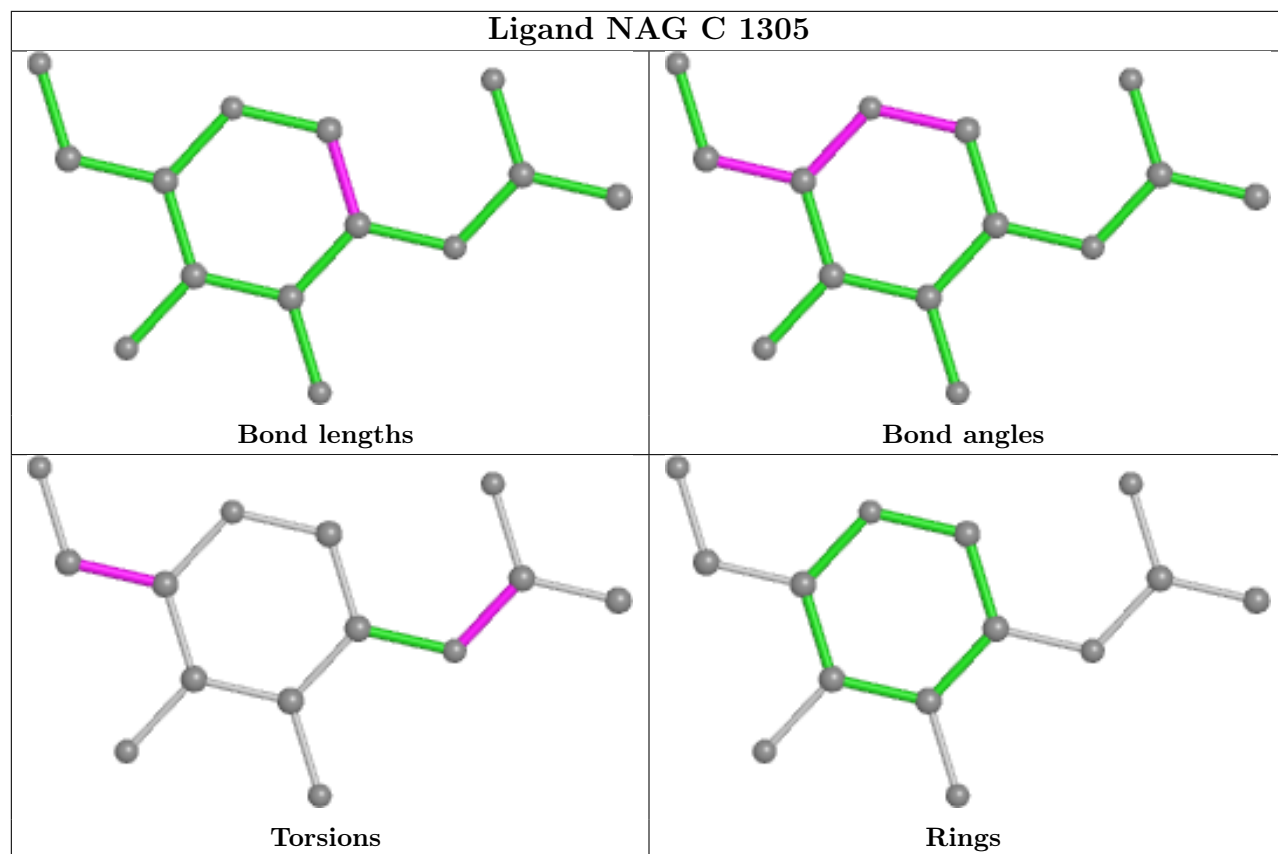


## Ligand NAG B 1305

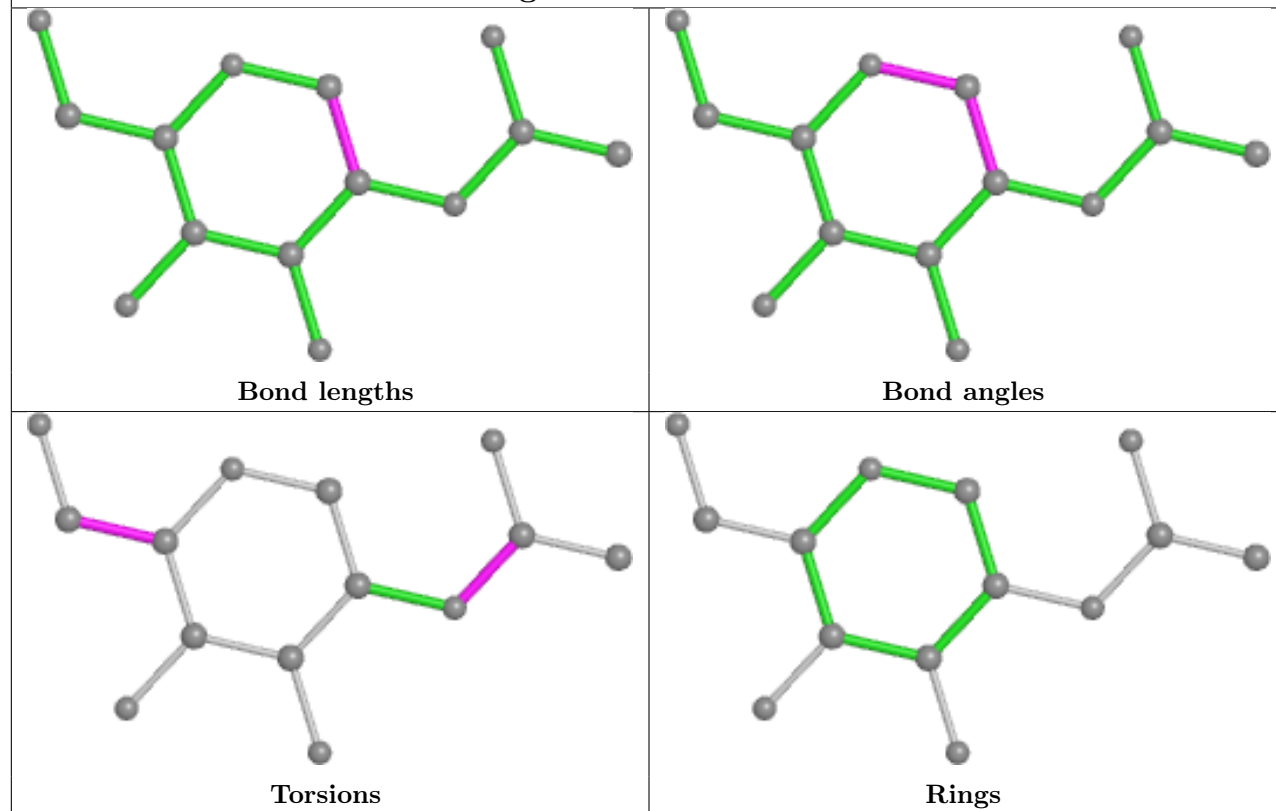


## Ligand NAG B 1302

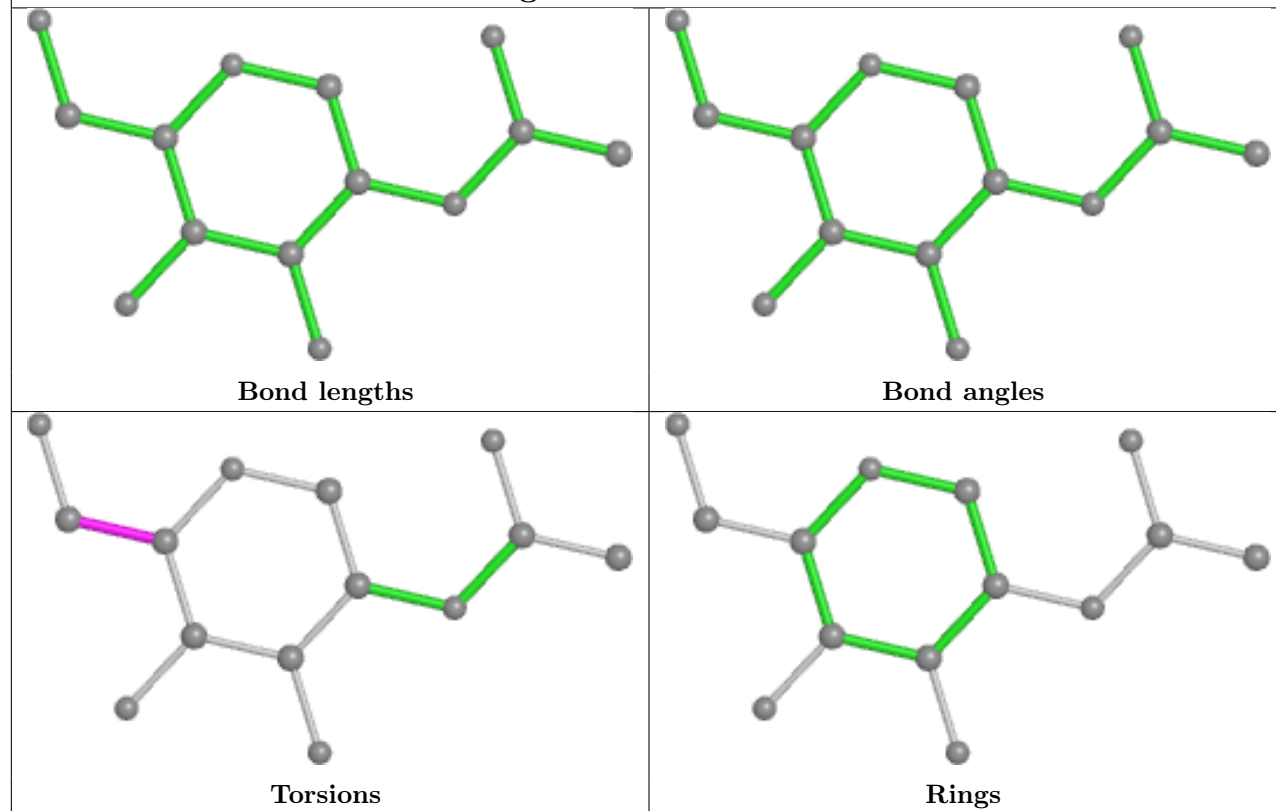




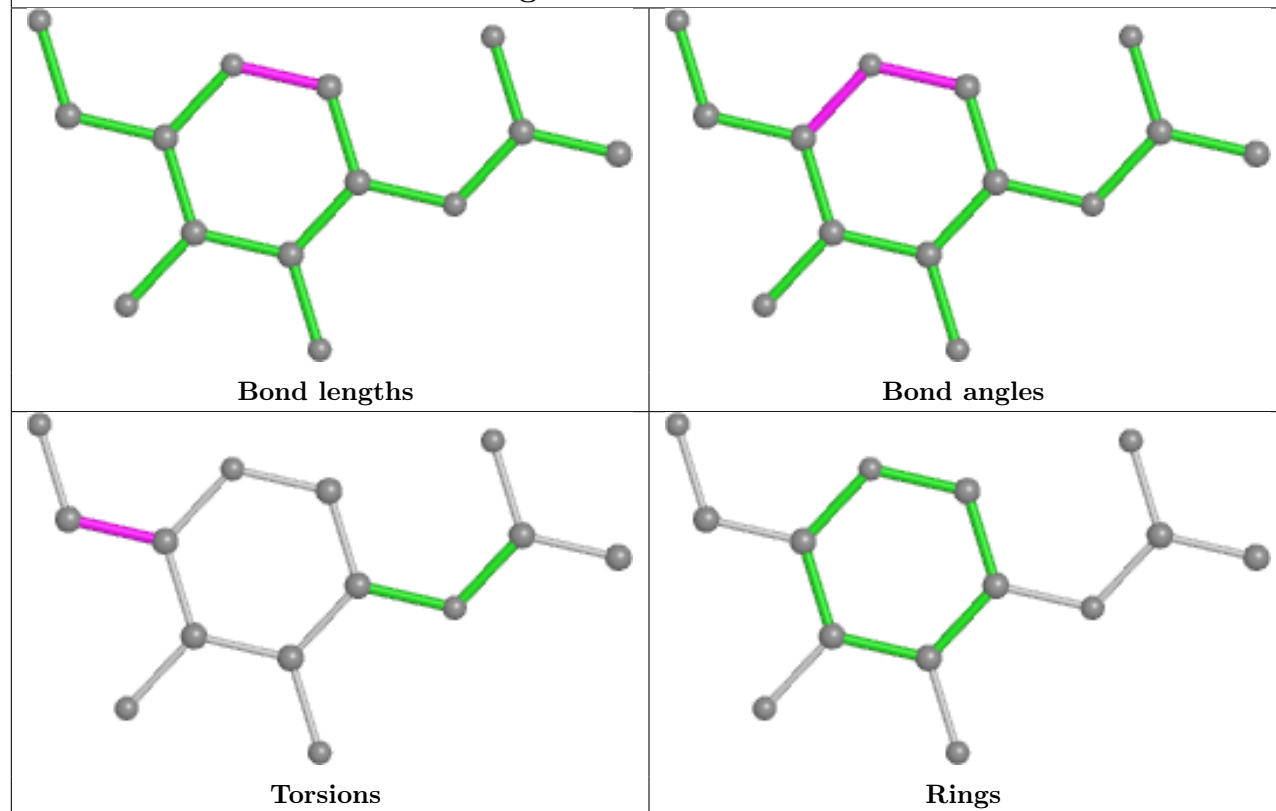
## Ligand NAG C 1302



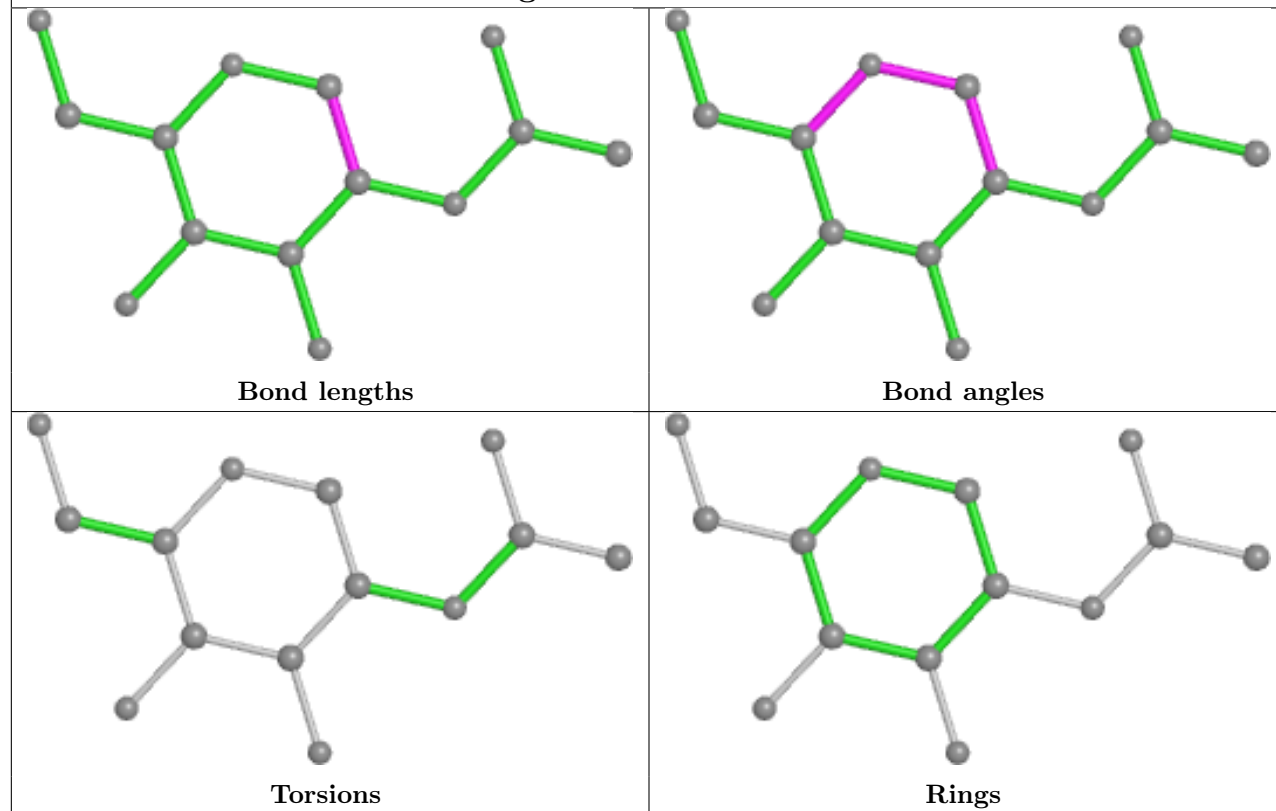
## Ligand NAG B 1304



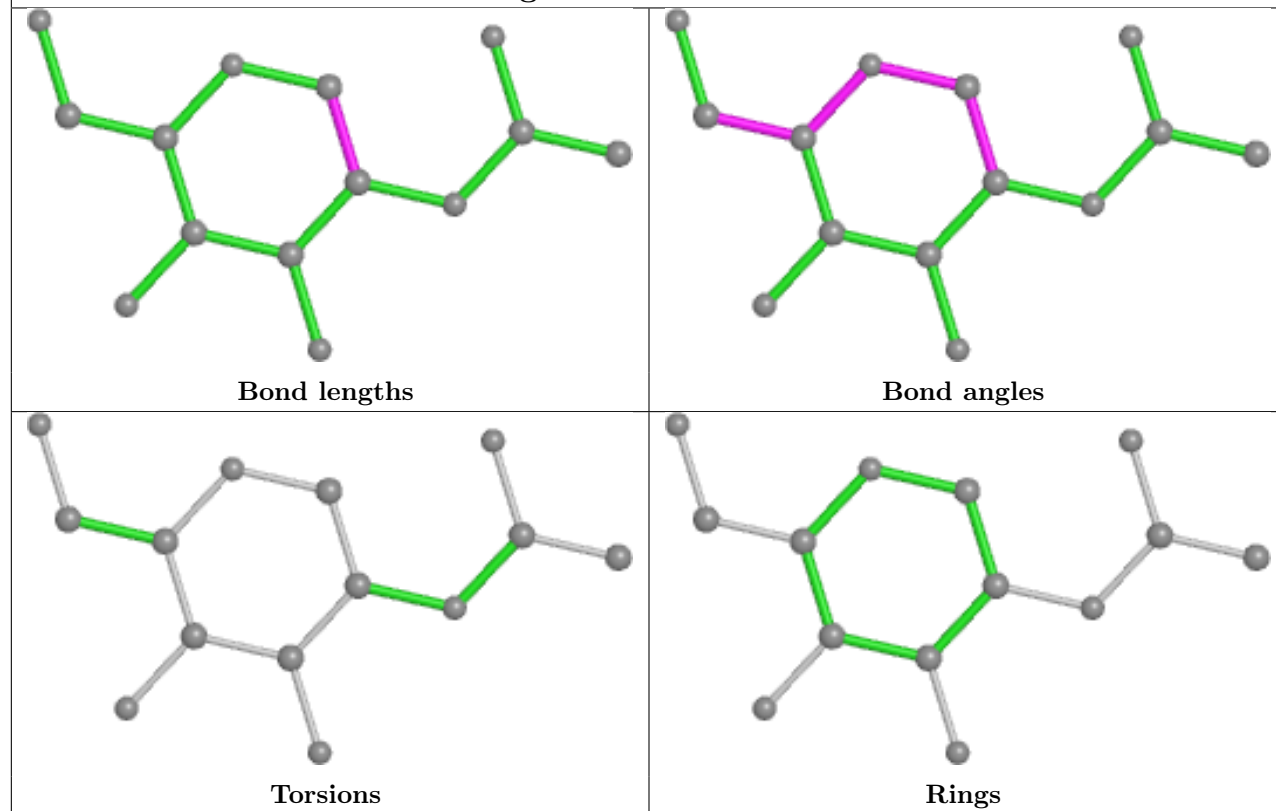
## Ligand NAG C 1304



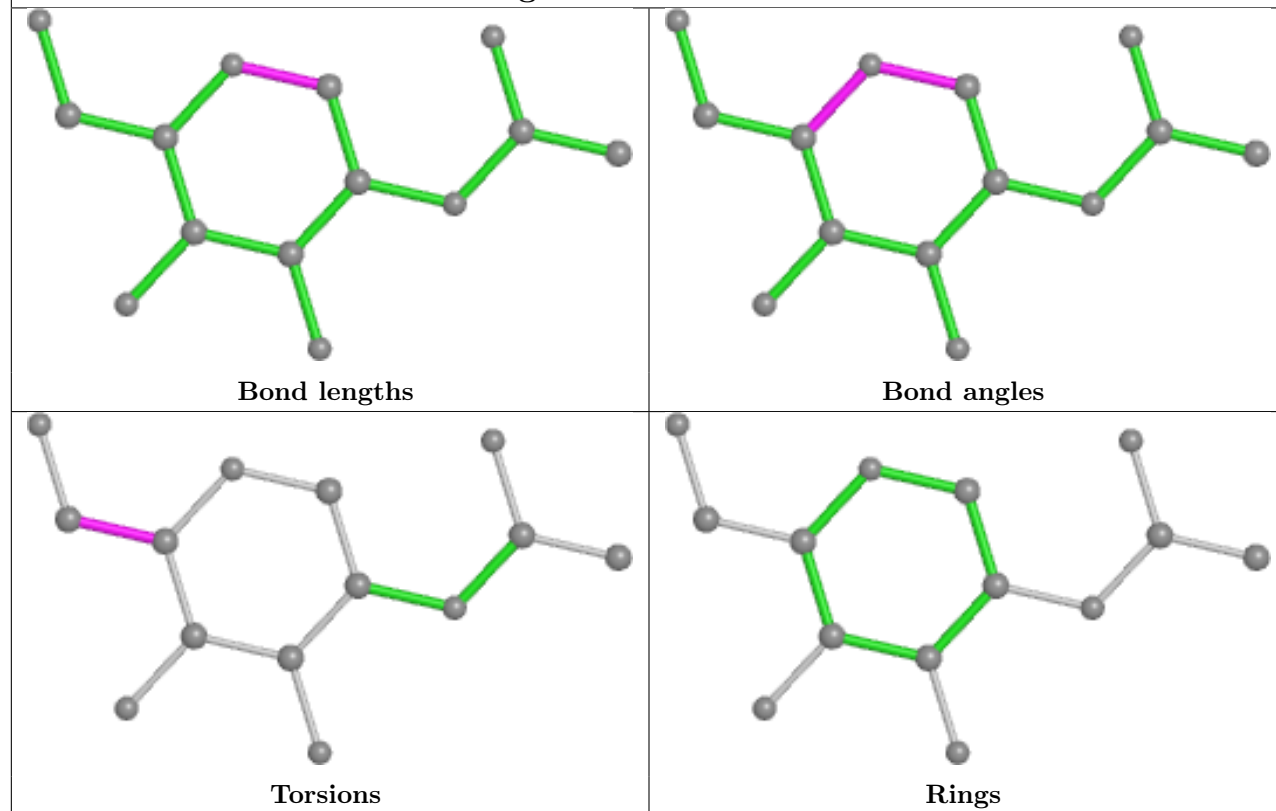
## Ligand NAG A 1306



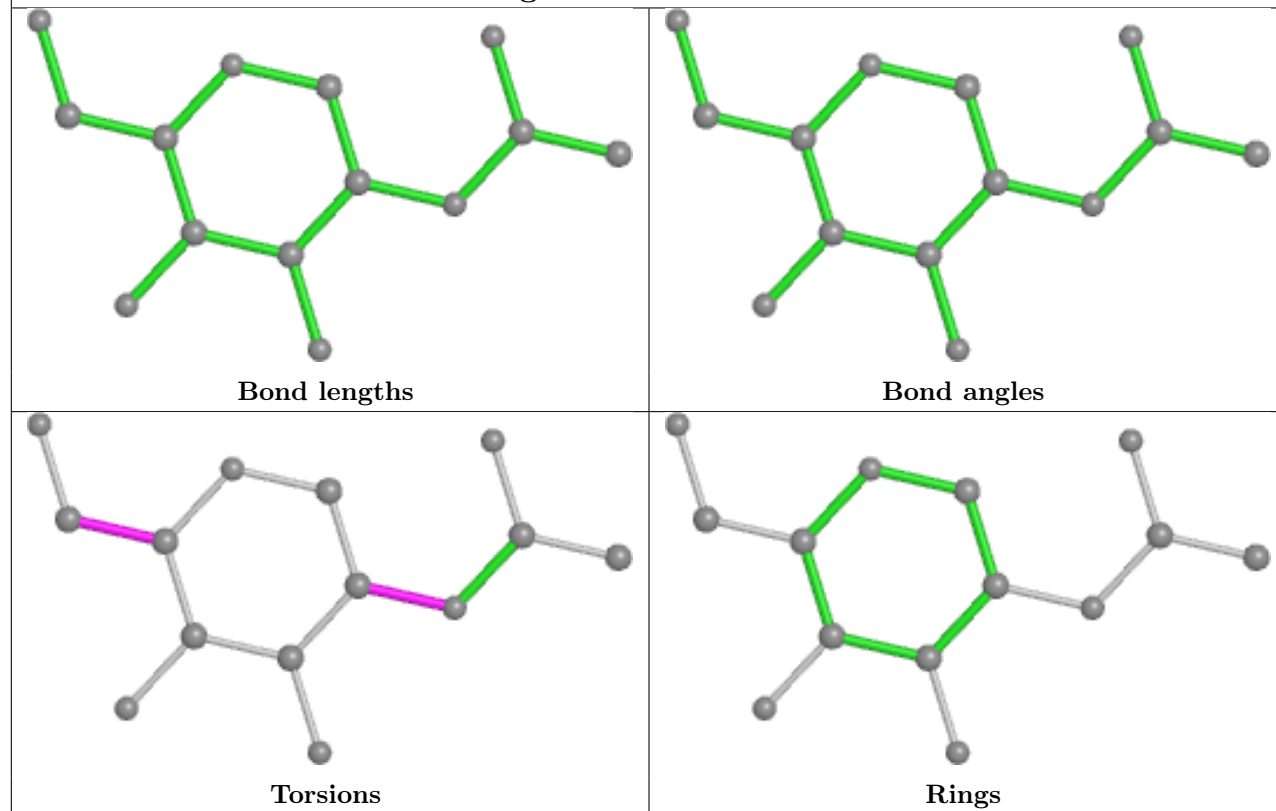
## Ligand NAG B 1306



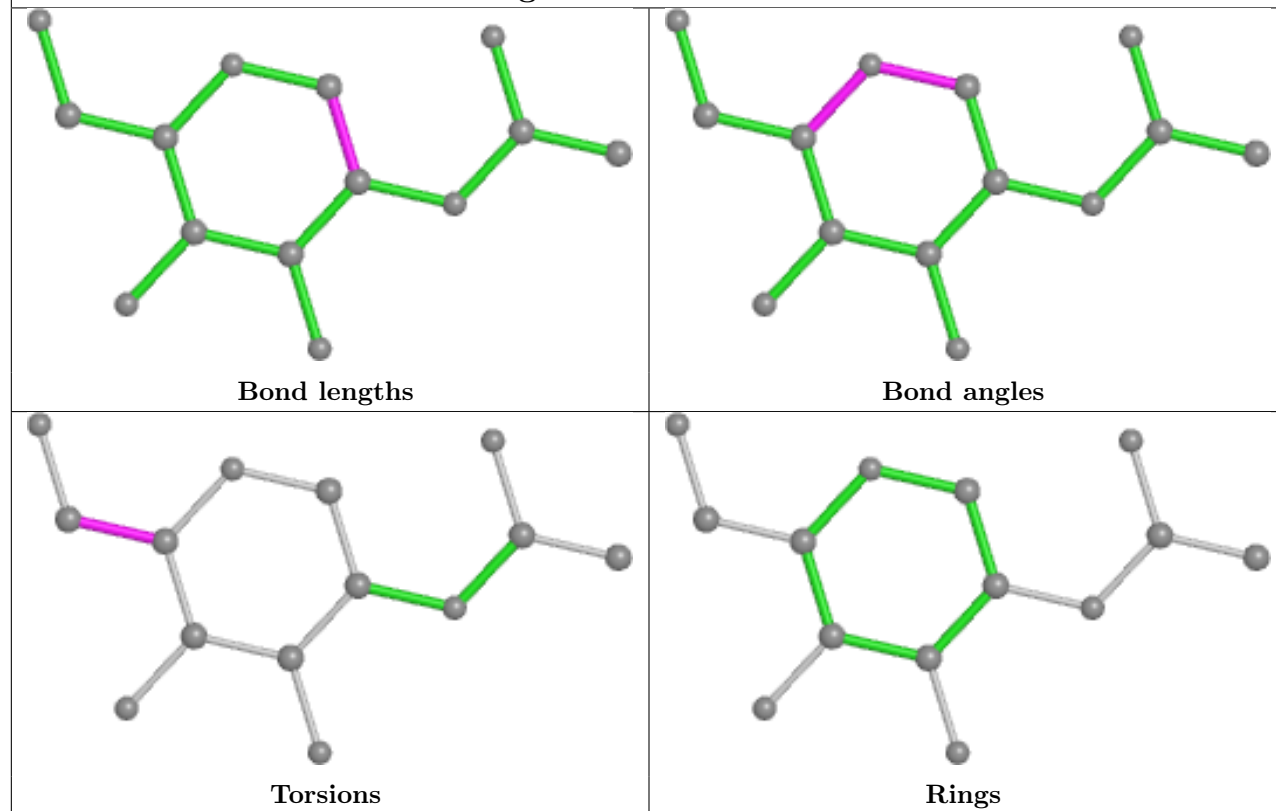
## Ligand NAG A 1304

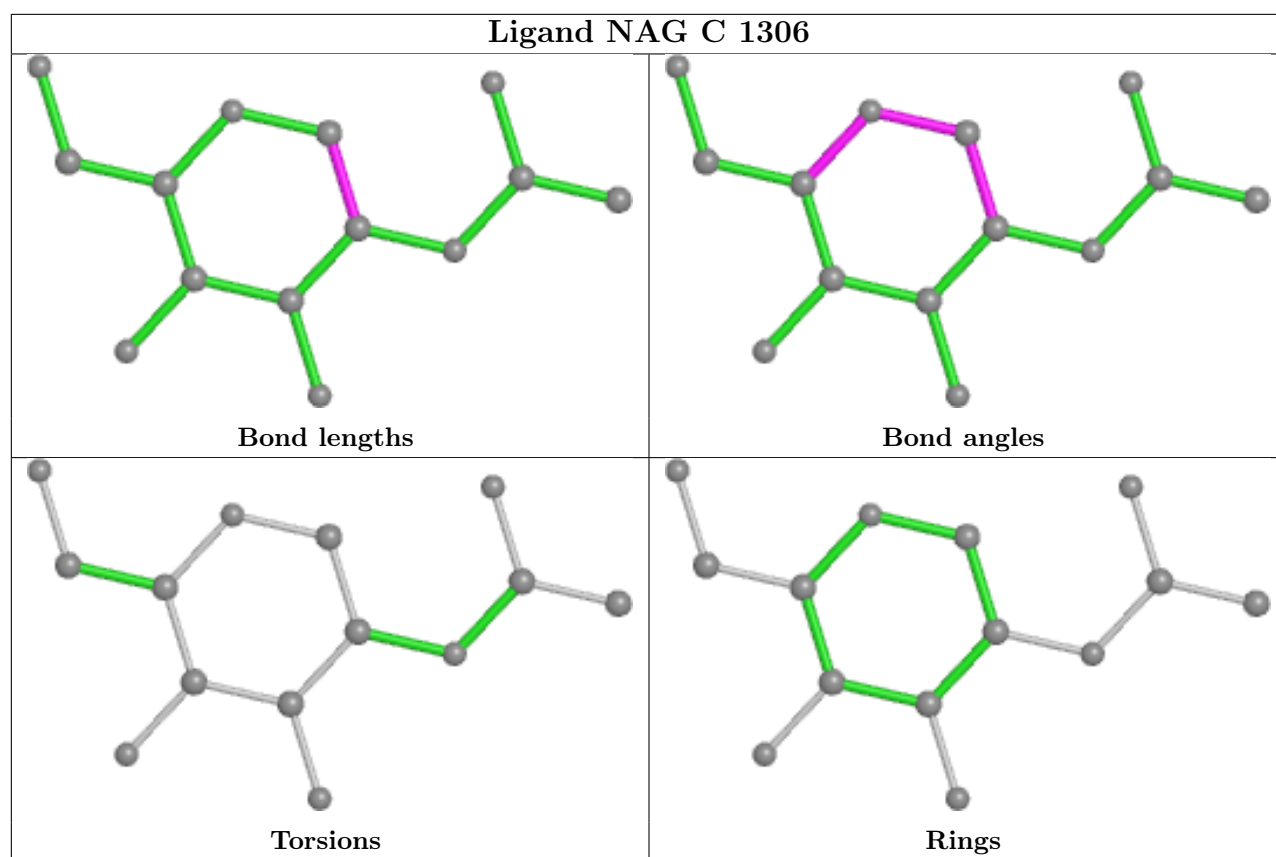


## Ligand NAG B 1301



## Ligand NAG A 1305





## 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.

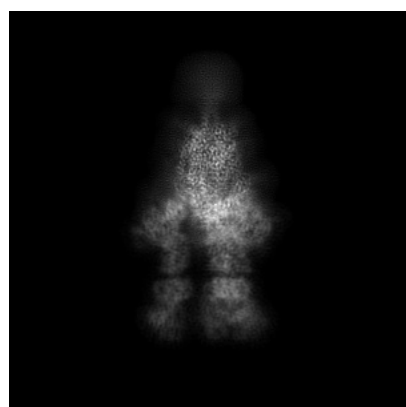
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-24064. These allow visual inspection of the internal detail of the map and identification of artifacts.

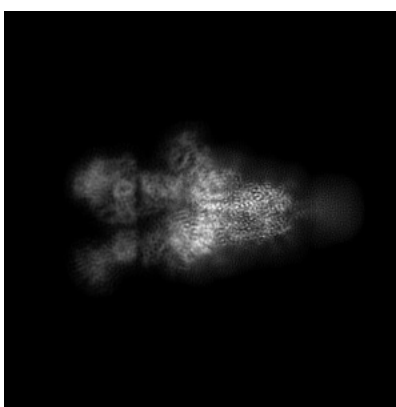
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections [i](#)

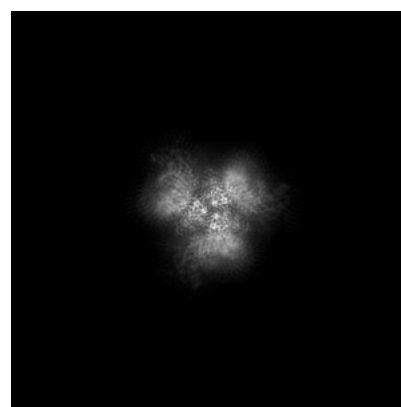
#### 6.1.1 Primary map



X



Y

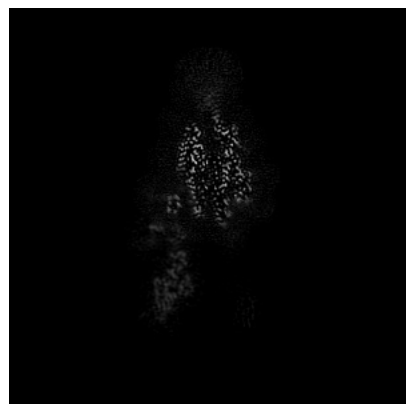


Z

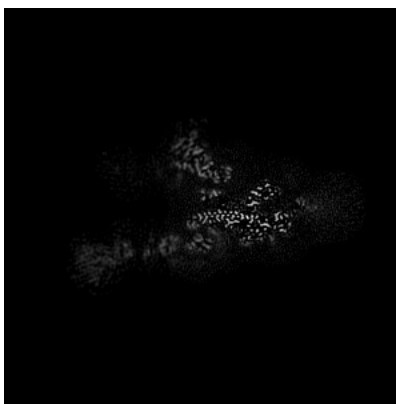
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

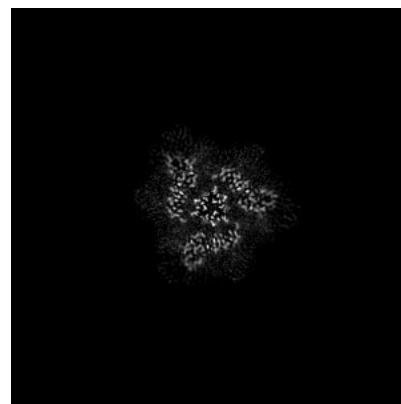
#### 6.2.1 Primary map



X Index: 192



Y Index: 192



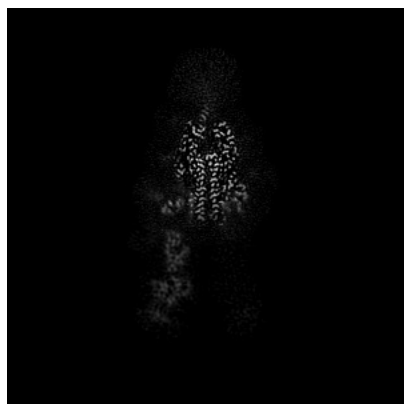
Z Index: 192



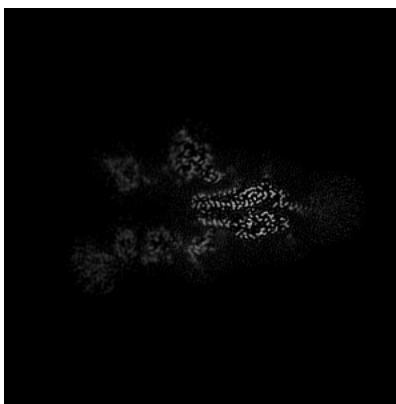
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

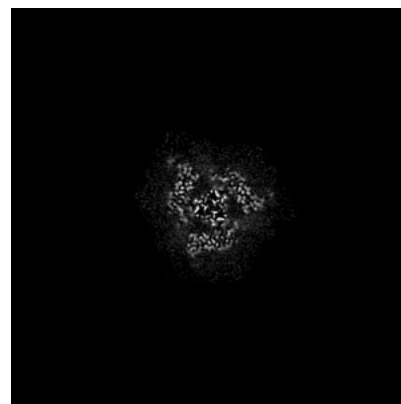
### 6.3.1 Primary map



X Index: 197



Y Index: 199

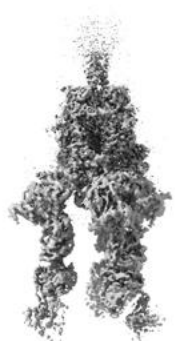


Z Index: 197

The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4 Orthogonal surface views [i](#)

### 6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.025. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

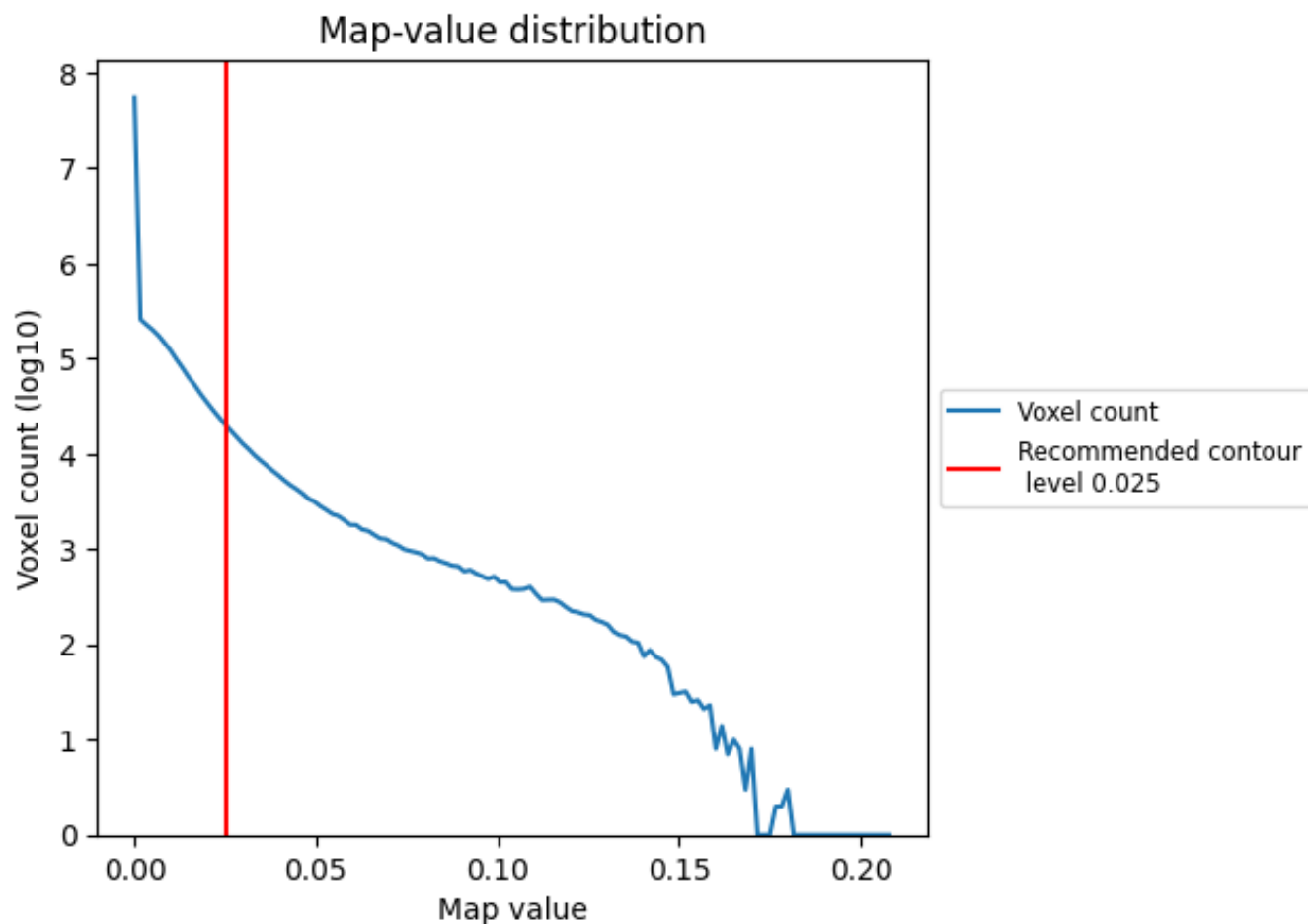
## 6.5 Mask visualisation

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

## 7 Map analysis [i](#)

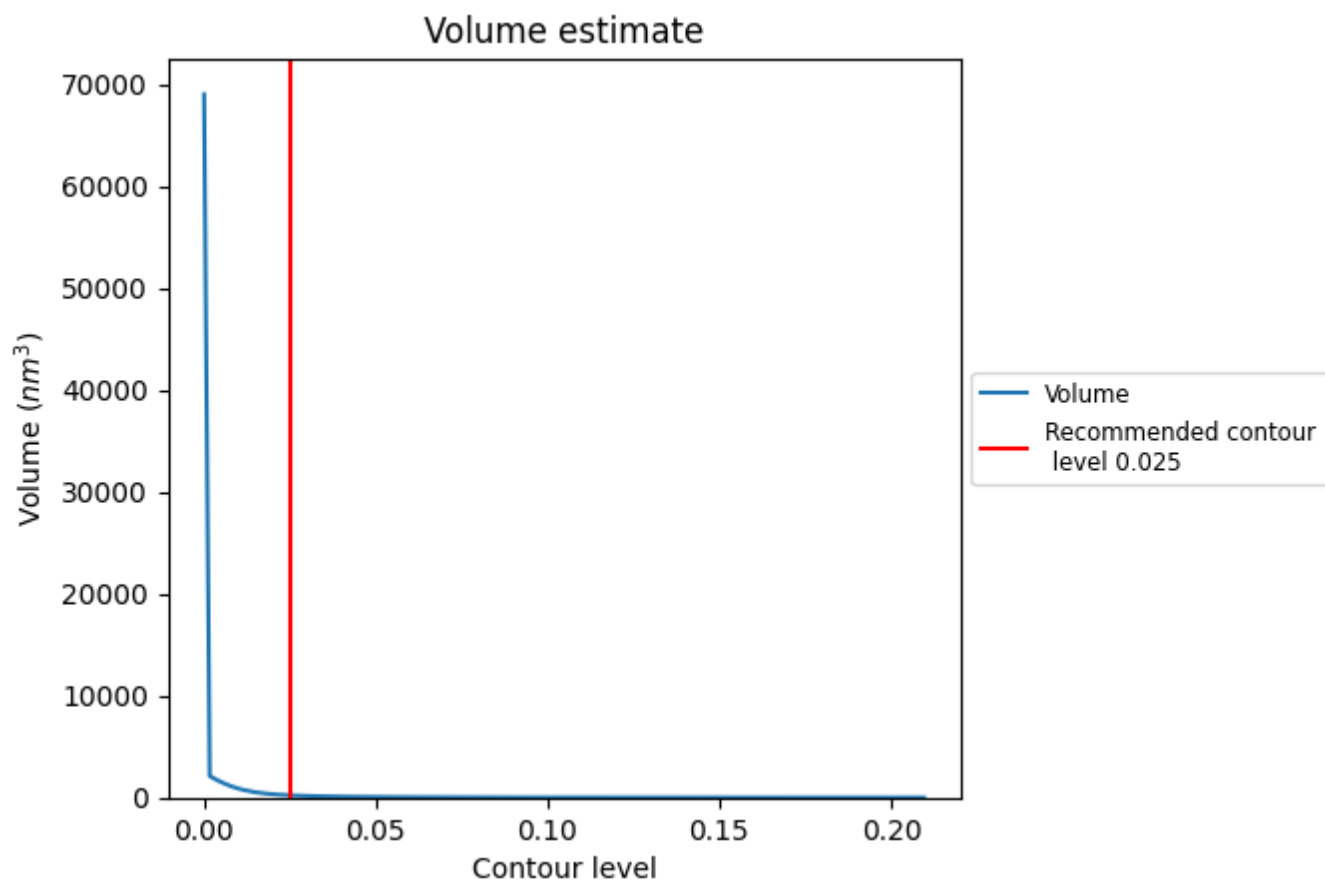
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

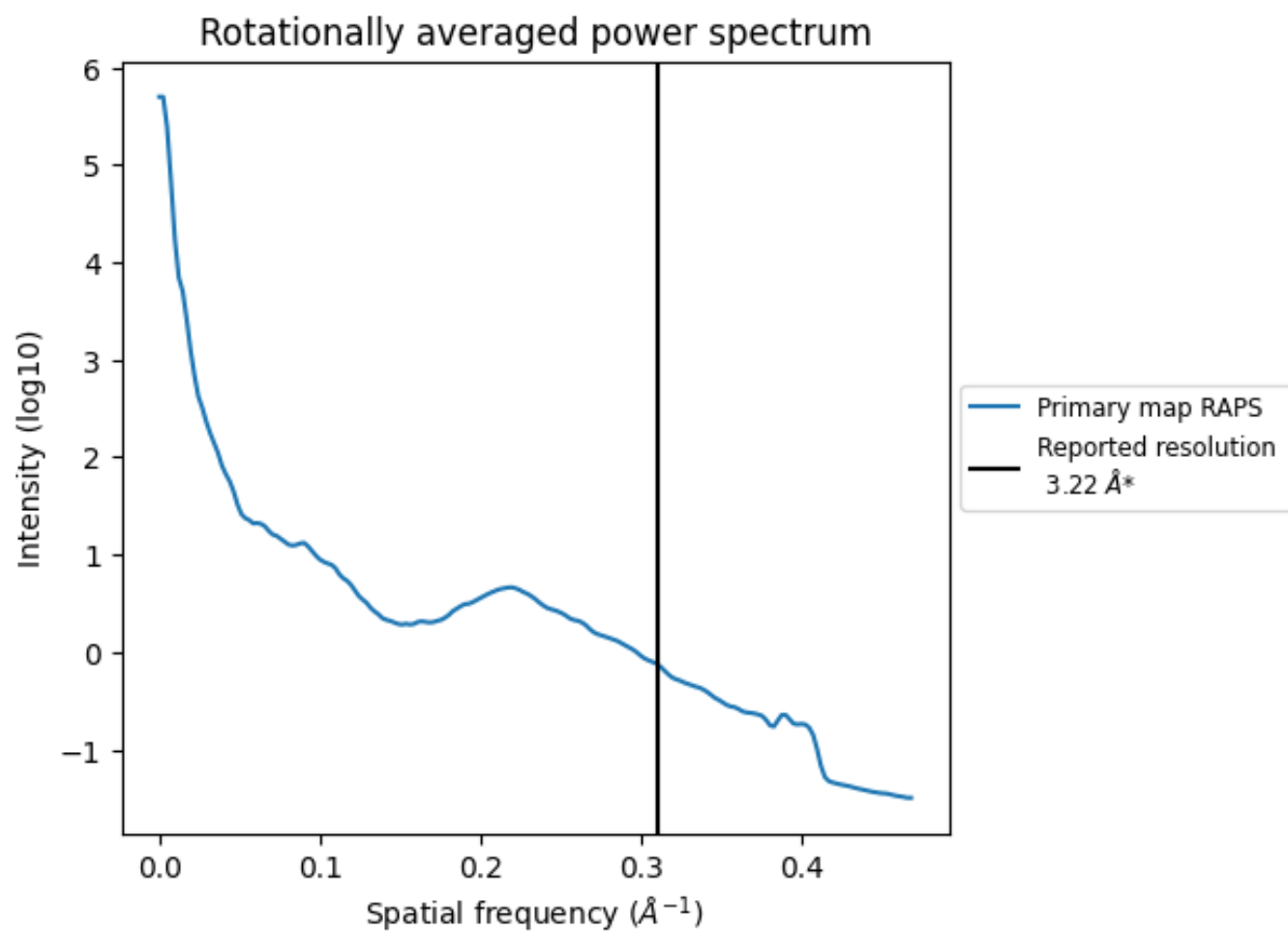
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 220 nm<sup>3</sup>; this corresponds to an approximate mass of 199 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

### 7.3 Rotationally averaged power spectrum ⓘ



\*Reported resolution corresponds to spatial frequency of 0.311 Å<sup>-1</sup>

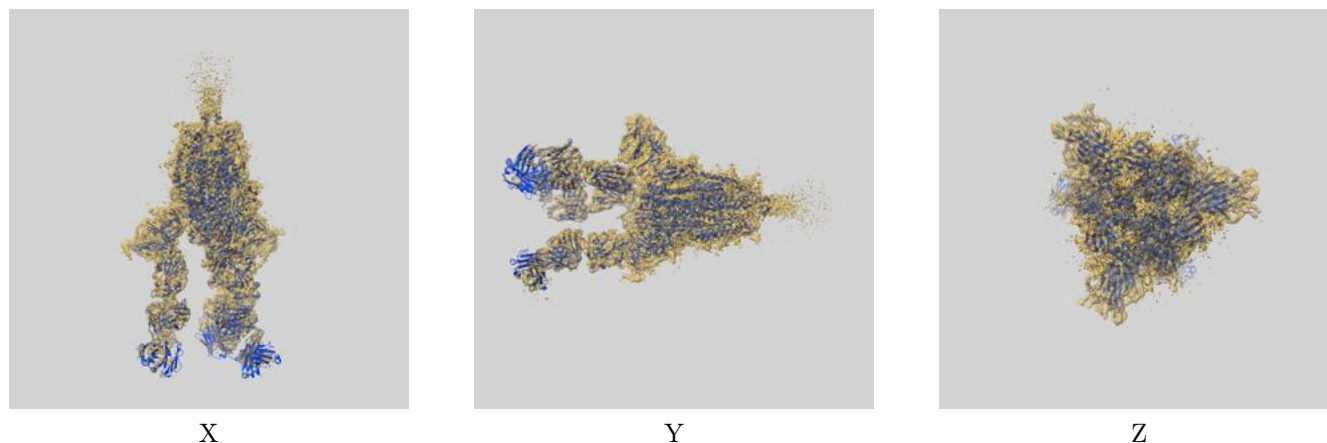
## 8 Fourier-Shell correlation

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

## 9 Map-model fit [i](#)

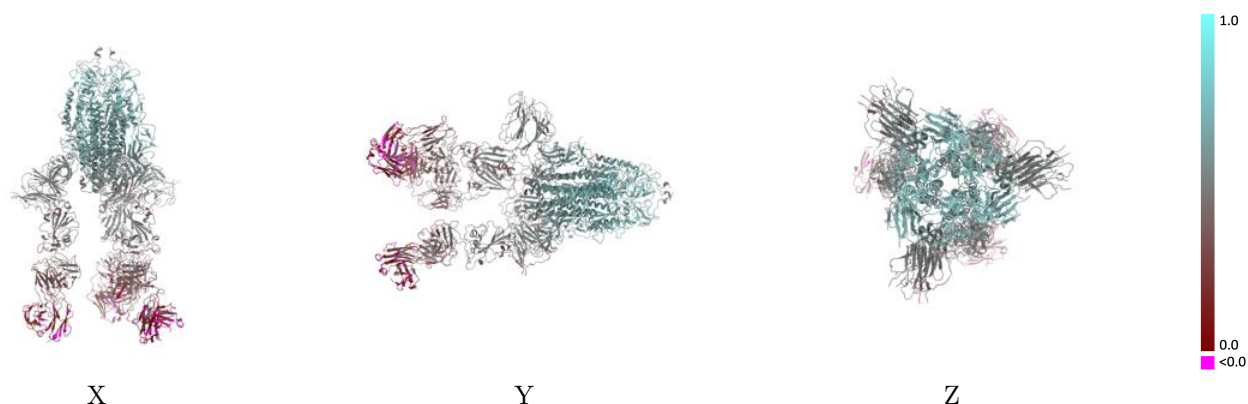
This section contains information regarding the fit between EMDB map EMD-24064 and PDB model 7MW6. Per-residue inclusion information can be found in section [3](#) on page [16](#).

### 9.1 Map-model overlay [i](#)



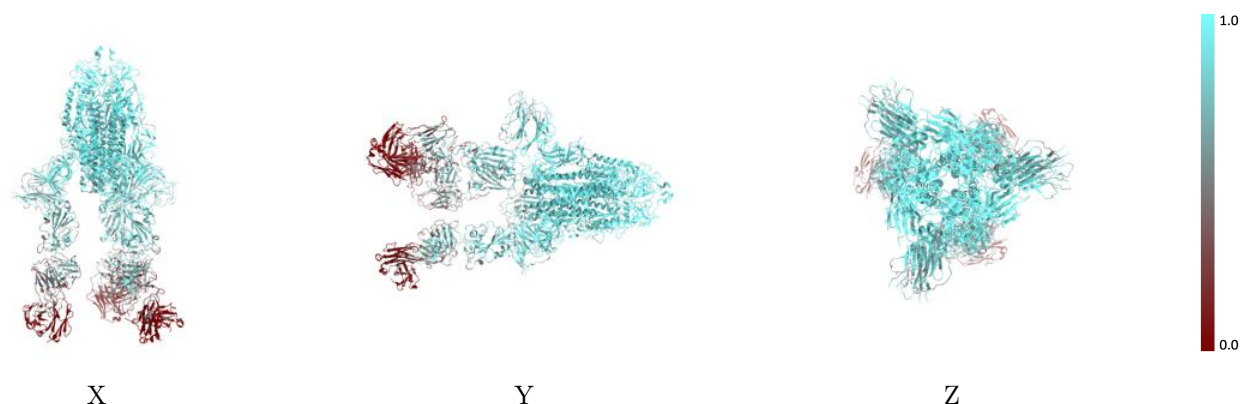
The images above show the 3D surface view of the map at the recommended contour level 0.025 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 9.2 Q-score mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

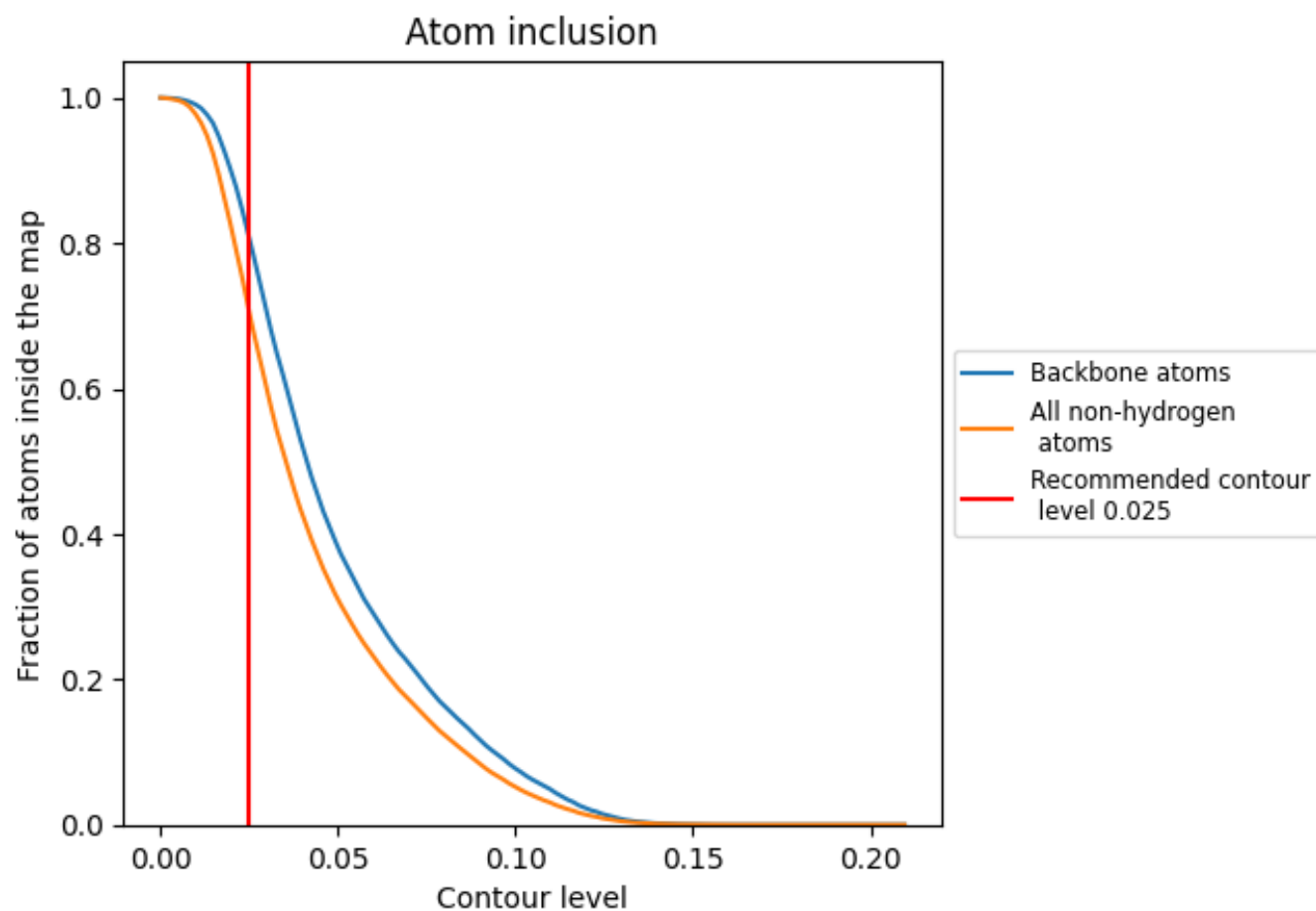
## 9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.025).









































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 81% of all backbone atoms, 70% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary ⓘ

















The table lists the average atom inclusion at the recommended contour level (0.025) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7047	 0.4660
A	 0.8584	 0.5410
B	 0.8647	 0.5480
C	 0.8470	 0.5380
D	 0.3888	 0.2840
E	 0.3678	 0.2950
F	 0.2796	 0.2550
G	 0.2960	 0.2610
H	 0.2862	 0.2590
I	 0.5714	 0.3580
J	 0.4643	 0.3110
K	 0.5000	 0.4410
L	 0.3127	 0.2790
M	 0.7500	 0.2940
N	 0.5000	 0.3490
O	 0.8214	 0.5640
P	 0.6071	 0.4190
Q	 0.8571	 0.5520
R	 0.3929	 0.4340
S	 0.4643	 0.3780
T	 0.3929	 0.3660
U	 0.5000	 0.4180
V	 0.3571	 0.3490
W	 0.4643	 0.3660
X	 0.7857	 0.3880
Y	 0.4643	 0.3200
Z	 0.6786	 0.3690
a	 0.5357	 0.4200
b	 0.9286	 0.5750
c	 0.4286	 0.4060
d	 0.3571	 0.3010
e	 0.6071	 0.3730
f	 0.6786	 0.3850
g	 0.5714	 0.3500
h	 0.5000	 0.3950



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Chain	Atom inclusion	Q-score
i	 0.7857	 0.4670
j	 0.6071	 0.3890
k	 0.8571	 0.5700
l	 0.5714	 0.4080
m	 0.8929	 0.5620
n	 0.3929	 0.4440
o	 0.3571	 0.3460
p	 0.6786	 0.3510