



Full wwPDB EM Validation Report ⓘ

Mar 8, 2026 – 04:30 PM UTC

PDB ID : 8ZY4 / pdb_00008zy4
EMDB ID : EMD-60555
Title : Sarbecovirus YN2013 Spike Trimer in a Locked Conformation
Authors : Wang, J.; Xiong, X.
Deposited on : 2024-06-16
Resolution : 2.53 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

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:

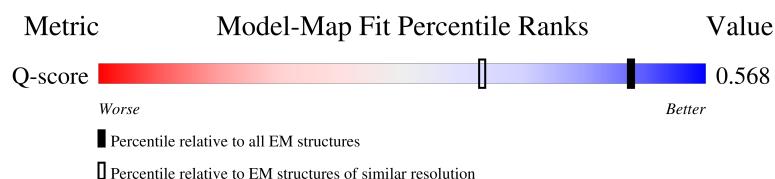
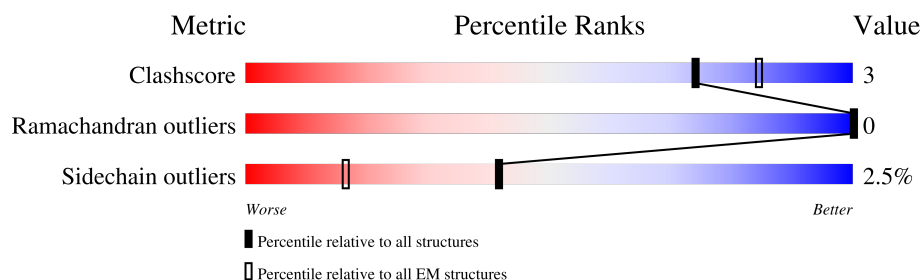
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

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 2.53 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.



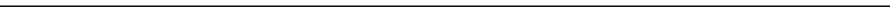
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	7309 (2.03 - 3.03)

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 $\leq 5\%$. 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	1247	
1	B	1247	
1	C	1247	
2	D	2	

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Mol	Chain	Length	Quality of chain
2	E	2	 100%
2	F	2	 100%
2	G	2	 50% 50%
2	H	2	 50% 50%
2	I	2	 50% 50%
2	J	2	 50% 50%
2	K	2	 50% 50%
2	L	2	 50% 50%
2	M	2	 50% 50%
2	N	2	 50% 50%
2	O	2	 100%
2	P	2	 100%
2	Q	2	 50% 50%
2	R	2	 50% 50%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 26181 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	1073	Total	C	N	O	S	0	0
			8344	5313	1395	1596	40		
1	B	1073	Total	C	N	O	S	0	0
			8350	5316	1398	1596	40		
1	C	1073	Total	C	N	O	S	0	0
			8350	5316	1398	1596	40		

There are 243 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	946	PRO	LYS	engineered mutation	UNP A0A0U1WJY8
A	947	PRO	VAL	engineered mutation	UNP A0A0U1WJY8
A	1169	GLY	-	expression tag	UNP A0A0U1WJY8
A	1170	SER	-	expression tag	UNP A0A0U1WJY8
A	1171	GLY	-	expression tag	UNP A0A0U1WJY8
A	1172	TYR	-	expression tag	UNP A0A0U1WJY8
A	1173	ILE	-	expression tag	UNP A0A0U1WJY8
A	1174	PRO	-	expression tag	UNP A0A0U1WJY8
A	1175	GLU	-	expression tag	UNP A0A0U1WJY8
A	1176	ALA	-	expression tag	UNP A0A0U1WJY8
A	1177	PRO	-	expression tag	UNP A0A0U1WJY8
A	1178	ARG	-	expression tag	UNP A0A0U1WJY8
A	1179	ASP	-	expression tag	UNP A0A0U1WJY8
A	1180	GLY	-	expression tag	UNP A0A0U1WJY8
A	1181	GLN	-	expression tag	UNP A0A0U1WJY8
A	1182	ALA	-	expression tag	UNP A0A0U1WJY8
A	1183	TYR	-	expression tag	UNP A0A0U1WJY8
A	1184	VAL	-	expression tag	UNP A0A0U1WJY8
A	1185	ARG	-	expression tag	UNP A0A0U1WJY8
A	1186	LYS	-	expression tag	UNP A0A0U1WJY8
A	1187	ASP	-	expression tag	UNP A0A0U1WJY8
A	1188	GLY	-	expression tag	UNP A0A0U1WJY8
A	1189	GLU	-	expression tag	UNP A0A0U1WJY8
A	1190	TRP	-	expression tag	UNP A0A0U1WJY8

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1191	VAL	-	expression tag	UNP A0A0U1WJY8
A	1192	LEU	-	expression tag	UNP A0A0U1WJY8
A	1193	LEU	-	expression tag	UNP A0A0U1WJY8
A	1194	SER	-	expression tag	UNP A0A0U1WJY8
A	1195	THR	-	expression tag	UNP A0A0U1WJY8
A	1196	PHE	-	expression tag	UNP A0A0U1WJY8
A	1197	LEU	-	expression tag	UNP A0A0U1WJY8
A	1198	LEU	-	expression tag	UNP A0A0U1WJY8
A	1199	GLU	-	expression tag	UNP A0A0U1WJY8
A	1200	VAL	-	expression tag	UNP A0A0U1WJY8
A	1201	LEU	-	expression tag	UNP A0A0U1WJY8
A	1202	PHE	-	expression tag	UNP A0A0U1WJY8
A	1203	GLN	-	expression tag	UNP A0A0U1WJY8
A	1204	GLY	-	expression tag	UNP A0A0U1WJY8
A	1205	PRO	-	expression tag	UNP A0A0U1WJY8
A	1206	GLY	-	expression tag	UNP A0A0U1WJY8
A	1207	HIS	-	expression tag	UNP A0A0U1WJY8
A	1208	HIS	-	expression tag	UNP A0A0U1WJY8
A	1209	HIS	-	expression tag	UNP A0A0U1WJY8
A	1210	HIS	-	expression tag	UNP A0A0U1WJY8
A	1211	HIS	-	expression tag	UNP A0A0U1WJY8
A	1212	HIS	-	expression tag	UNP A0A0U1WJY8
A	1213	HIS	-	expression tag	UNP A0A0U1WJY8
A	1214	HIS	-	expression tag	UNP A0A0U1WJY8
A	1215	SER	-	expression tag	UNP A0A0U1WJY8
A	1216	ALA	-	expression tag	UNP A0A0U1WJY8
A	1217	TRP	-	expression tag	UNP A0A0U1WJY8
A	1218	SER	-	expression tag	UNP A0A0U1WJY8
A	1219	HIS	-	expression tag	UNP A0A0U1WJY8
A	1220	PRO	-	expression tag	UNP A0A0U1WJY8
A	1221	GLN	-	expression tag	UNP A0A0U1WJY8
A	1222	PHE	-	expression tag	UNP A0A0U1WJY8
A	1223	GLU	-	expression tag	UNP A0A0U1WJY8
A	1224	LYS	-	expression tag	UNP A0A0U1WJY8
A	1225	GLY	-	expression tag	UNP A0A0U1WJY8
A	1226	GLY	-	expression tag	UNP A0A0U1WJY8
A	1227	GLY	-	expression tag	UNP A0A0U1WJY8
A	1228	SER	-	expression tag	UNP A0A0U1WJY8
A	1229	GLY	-	expression tag	UNP A0A0U1WJY8
A	1230	GLY	-	expression tag	UNP A0A0U1WJY8
A	1231	GLY	-	expression tag	UNP A0A0U1WJY8
A	1232	GLY	-	expression tag	UNP A0A0U1WJY8

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1233	SER	-	expression tag	UNP A0A0U1WJY8
A	1234	GLY	-	expression tag	UNP A0A0U1WJY8
A	1235	GLY	-	expression tag	UNP A0A0U1WJY8
A	1236	SER	-	expression tag	UNP A0A0U1WJY8
A	1237	ALA	-	expression tag	UNP A0A0U1WJY8
A	1238	TRP	-	expression tag	UNP A0A0U1WJY8
A	1239	SER	-	expression tag	UNP A0A0U1WJY8
A	1240	HIS	-	expression tag	UNP A0A0U1WJY8
A	1241	PRO	-	expression tag	UNP A0A0U1WJY8
A	1242	GLN	-	expression tag	UNP A0A0U1WJY8
A	1243	PHE	-	expression tag	UNP A0A0U1WJY8
A	1244	GLU	-	expression tag	UNP A0A0U1WJY8
A	1245	LYS	-	expression tag	UNP A0A0U1WJY8
A	1246	SER	-	expression tag	UNP A0A0U1WJY8
A	1247	ALA	-	expression tag	UNP A0A0U1WJY8
B	946	PRO	LYS	engineered mutation	UNP A0A0U1WJY8
B	947	PRO	VAL	engineered mutation	UNP A0A0U1WJY8
B	1169	GLY	-	expression tag	UNP A0A0U1WJY8
B	1170	SER	-	expression tag	UNP A0A0U1WJY8
B	1171	GLY	-	expression tag	UNP A0A0U1WJY8
B	1172	TYR	-	expression tag	UNP A0A0U1WJY8
B	1173	ILE	-	expression tag	UNP A0A0U1WJY8
B	1174	PRO	-	expression tag	UNP A0A0U1WJY8
B	1175	GLU	-	expression tag	UNP A0A0U1WJY8
B	1176	ALA	-	expression tag	UNP A0A0U1WJY8
B	1177	PRO	-	expression tag	UNP A0A0U1WJY8
B	1178	ARG	-	expression tag	UNP A0A0U1WJY8
B	1179	ASP	-	expression tag	UNP A0A0U1WJY8
B	1180	GLY	-	expression tag	UNP A0A0U1WJY8
B	1181	GLN	-	expression tag	UNP A0A0U1WJY8
B	1182	ALA	-	expression tag	UNP A0A0U1WJY8
B	1183	TYR	-	expression tag	UNP A0A0U1WJY8
B	1184	VAL	-	expression tag	UNP A0A0U1WJY8
B	1185	ARG	-	expression tag	UNP A0A0U1WJY8
B	1186	LYS	-	expression tag	UNP A0A0U1WJY8
B	1187	ASP	-	expression tag	UNP A0A0U1WJY8
B	1188	GLY	-	expression tag	UNP A0A0U1WJY8
B	1189	GLU	-	expression tag	UNP A0A0U1WJY8
B	1190	TRP	-	expression tag	UNP A0A0U1WJY8
B	1191	VAL	-	expression tag	UNP A0A0U1WJY8
B	1192	LEU	-	expression tag	UNP A0A0U1WJY8
B	1193	LEU	-	expression tag	UNP A0A0U1WJY8

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1194	SER	-	expression tag	UNP A0A0U1WJY8
B	1195	THR	-	expression tag	UNP A0A0U1WJY8
B	1196	PHE	-	expression tag	UNP A0A0U1WJY8
B	1197	LEU	-	expression tag	UNP A0A0U1WJY8
B	1198	LEU	-	expression tag	UNP A0A0U1WJY8
B	1199	GLU	-	expression tag	UNP A0A0U1WJY8
B	1200	VAL	-	expression tag	UNP A0A0U1WJY8
B	1201	LEU	-	expression tag	UNP A0A0U1WJY8
B	1202	PHE	-	expression tag	UNP A0A0U1WJY8
B	1203	GLN	-	expression tag	UNP A0A0U1WJY8
B	1204	GLY	-	expression tag	UNP A0A0U1WJY8
B	1205	PRO	-	expression tag	UNP A0A0U1WJY8
B	1206	GLY	-	expression tag	UNP A0A0U1WJY8
B	1207	HIS	-	expression tag	UNP A0A0U1WJY8
B	1208	HIS	-	expression tag	UNP A0A0U1WJY8
B	1209	HIS	-	expression tag	UNP A0A0U1WJY8
B	1210	HIS	-	expression tag	UNP A0A0U1WJY8
B	1211	HIS	-	expression tag	UNP A0A0U1WJY8
B	1212	HIS	-	expression tag	UNP A0A0U1WJY8
B	1213	HIS	-	expression tag	UNP A0A0U1WJY8
B	1214	HIS	-	expression tag	UNP A0A0U1WJY8
B	1215	SER	-	expression tag	UNP A0A0U1WJY8
B	1216	ALA	-	expression tag	UNP A0A0U1WJY8
B	1217	TRP	-	expression tag	UNP A0A0U1WJY8
B	1218	SER	-	expression tag	UNP A0A0U1WJY8
B	1219	HIS	-	expression tag	UNP A0A0U1WJY8
B	1220	PRO	-	expression tag	UNP A0A0U1WJY8
B	1221	GLN	-	expression tag	UNP A0A0U1WJY8
B	1222	PHE	-	expression tag	UNP A0A0U1WJY8
B	1223	GLU	-	expression tag	UNP A0A0U1WJY8
B	1224	LYS	-	expression tag	UNP A0A0U1WJY8
B	1225	GLY	-	expression tag	UNP A0A0U1WJY8
B	1226	GLY	-	expression tag	UNP A0A0U1WJY8
B	1227	GLY	-	expression tag	UNP A0A0U1WJY8
B	1228	SER	-	expression tag	UNP A0A0U1WJY8
B	1229	GLY	-	expression tag	UNP A0A0U1WJY8
B	1230	GLY	-	expression tag	UNP A0A0U1WJY8
B	1231	GLY	-	expression tag	UNP A0A0U1WJY8
B	1232	GLY	-	expression tag	UNP A0A0U1WJY8
B	1233	SER	-	expression tag	UNP A0A0U1WJY8
B	1234	GLY	-	expression tag	UNP A0A0U1WJY8
B	1235	GLY	-	expression tag	UNP A0A0U1WJY8

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1236	SER	-	expression tag	UNP A0A0U1WJY8
B	1237	ALA	-	expression tag	UNP A0A0U1WJY8
B	1238	TRP	-	expression tag	UNP A0A0U1WJY8
B	1239	SER	-	expression tag	UNP A0A0U1WJY8
B	1240	HIS	-	expression tag	UNP A0A0U1WJY8
B	1241	PRO	-	expression tag	UNP A0A0U1WJY8
B	1242	GLN	-	expression tag	UNP A0A0U1WJY8
B	1243	PHE	-	expression tag	UNP A0A0U1WJY8
B	1244	GLU	-	expression tag	UNP A0A0U1WJY8
B	1245	LYS	-	expression tag	UNP A0A0U1WJY8
B	1246	SER	-	expression tag	UNP A0A0U1WJY8
B	1247	ALA	-	expression tag	UNP A0A0U1WJY8
C	946	PRO	LYS	engineered mutation	UNP A0A0U1WJY8
C	947	PRO	VAL	engineered mutation	UNP A0A0U1WJY8
C	1169	GLY	-	expression tag	UNP A0A0U1WJY8
C	1170	SER	-	expression tag	UNP A0A0U1WJY8
C	1171	GLY	-	expression tag	UNP A0A0U1WJY8
C	1172	TYR	-	expression tag	UNP A0A0U1WJY8
C	1173	ILE	-	expression tag	UNP A0A0U1WJY8
C	1174	PRO	-	expression tag	UNP A0A0U1WJY8
C	1175	GLU	-	expression tag	UNP A0A0U1WJY8
C	1176	ALA	-	expression tag	UNP A0A0U1WJY8
C	1177	PRO	-	expression tag	UNP A0A0U1WJY8
C	1178	ARG	-	expression tag	UNP A0A0U1WJY8
C	1179	ASP	-	expression tag	UNP A0A0U1WJY8
C	1180	GLY	-	expression tag	UNP A0A0U1WJY8
C	1181	GLN	-	expression tag	UNP A0A0U1WJY8
C	1182	ALA	-	expression tag	UNP A0A0U1WJY8
C	1183	TYR	-	expression tag	UNP A0A0U1WJY8
C	1184	VAL	-	expression tag	UNP A0A0U1WJY8
C	1185	ARG	-	expression tag	UNP A0A0U1WJY8
C	1186	LYS	-	expression tag	UNP A0A0U1WJY8
C	1187	ASP	-	expression tag	UNP A0A0U1WJY8
C	1188	GLY	-	expression tag	UNP A0A0U1WJY8
C	1189	GLU	-	expression tag	UNP A0A0U1WJY8
C	1190	TRP	-	expression tag	UNP A0A0U1WJY8
C	1191	VAL	-	expression tag	UNP A0A0U1WJY8
C	1192	LEU	-	expression tag	UNP A0A0U1WJY8
C	1193	LEU	-	expression tag	UNP A0A0U1WJY8
C	1194	SER	-	expression tag	UNP A0A0U1WJY8
C	1195	THR	-	expression tag	UNP A0A0U1WJY8
C	1196	PHE	-	expression tag	UNP A0A0U1WJY8

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Chain	Residue	Modelled	Actual	Comment	Reference
C	1197	LEU	-	expression tag	UNP A0A0U1WJY8
C	1198	LEU	-	expression tag	UNP A0A0U1WJY8
C	1199	GLU	-	expression tag	UNP A0A0U1WJY8
C	1200	VAL	-	expression tag	UNP A0A0U1WJY8
C	1201	LEU	-	expression tag	UNP A0A0U1WJY8
C	1202	PHE	-	expression tag	UNP A0A0U1WJY8
C	1203	GLN	-	expression tag	UNP A0A0U1WJY8
C	1204	GLY	-	expression tag	UNP A0A0U1WJY8
C	1205	PRO	-	expression tag	UNP A0A0U1WJY8
C	1206	GLY	-	expression tag	UNP A0A0U1WJY8
C	1207	HIS	-	expression tag	UNP A0A0U1WJY8
C	1208	HIS	-	expression tag	UNP A0A0U1WJY8
C	1209	HIS	-	expression tag	UNP A0A0U1WJY8
C	1210	HIS	-	expression tag	UNP A0A0U1WJY8
C	1211	HIS	-	expression tag	UNP A0A0U1WJY8
C	1212	HIS	-	expression tag	UNP A0A0U1WJY8
C	1213	HIS	-	expression tag	UNP A0A0U1WJY8
C	1214	HIS	-	expression tag	UNP A0A0U1WJY8
C	1215	SER	-	expression tag	UNP A0A0U1WJY8
C	1216	ALA	-	expression tag	UNP A0A0U1WJY8
C	1217	TRP	-	expression tag	UNP A0A0U1WJY8
C	1218	SER	-	expression tag	UNP A0A0U1WJY8
C	1219	HIS	-	expression tag	UNP A0A0U1WJY8
C	1220	PRO	-	expression tag	UNP A0A0U1WJY8
C	1221	GLN	-	expression tag	UNP A0A0U1WJY8
C	1222	PHE	-	expression tag	UNP A0A0U1WJY8
C	1223	GLU	-	expression tag	UNP A0A0U1WJY8
C	1224	LYS	-	expression tag	UNP A0A0U1WJY8
C	1225	GLY	-	expression tag	UNP A0A0U1WJY8
C	1226	GLY	-	expression tag	UNP A0A0U1WJY8
C	1227	GLY	-	expression tag	UNP A0A0U1WJY8
C	1228	SER	-	expression tag	UNP A0A0U1WJY8
C	1229	GLY	-	expression tag	UNP A0A0U1WJY8
C	1230	GLY	-	expression tag	UNP A0A0U1WJY8
C	1231	GLY	-	expression tag	UNP A0A0U1WJY8
C	1232	GLY	-	expression tag	UNP A0A0U1WJY8
C	1233	SER	-	expression tag	UNP A0A0U1WJY8
C	1234	GLY	-	expression tag	UNP A0A0U1WJY8
C	1235	GLY	-	expression tag	UNP A0A0U1WJY8
C	1236	SER	-	expression tag	UNP A0A0U1WJY8
C	1237	ALA	-	expression tag	UNP A0A0U1WJY8
C	1238	TRP	-	expression tag	UNP A0A0U1WJY8

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Chain	Residue	Modelled	Actual	Comment	Reference
C	1239	SER	-	expression tag	UNP A0A0U1WJY8
C	1240	HIS	-	expression tag	UNP A0A0U1WJY8
C	1241	PRO	-	expression tag	UNP A0A0U1WJY8
C	1242	GLN	-	expression tag	UNP A0A0U1WJY8
C	1243	PHE	-	expression tag	UNP A0A0U1WJY8
C	1244	GLU	-	expression tag	UNP A0A0U1WJY8
C	1245	LYS	-	expression tag	UNP A0A0U1WJY8
C	1246	SER	-	expression tag	UNP A0A0U1WJY8
C	1247	ALA	-	expression tag	UNP A0A0U1WJY8

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



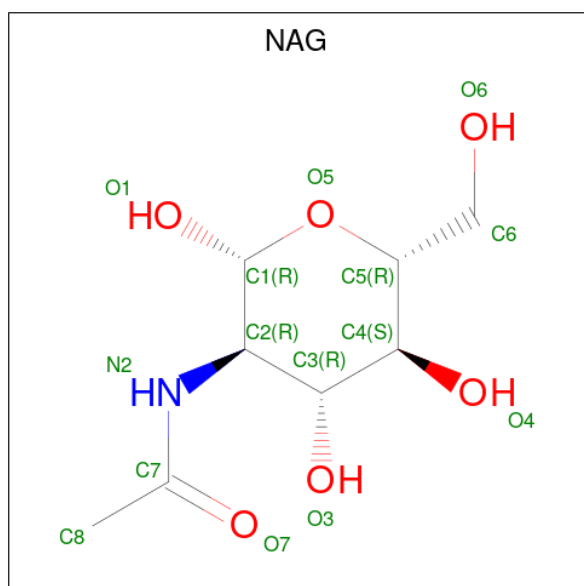
Mol	Chain	Residues	Atoms				AltConf	Trace
2	D	2	Total	C	N	O	0	0
			28	16	2	10		
2	E	2	Total	C	N	O	0	0
			28	16	2	10		
2	F	2	Total	C	N	O	0	0
			28	16	2	10		
2	G	2	Total	C	N	O	0	0
			28	16	2	10		
2	H	2	Total	C	N	O	0	0
			28	16	2	10		
2	I	2	Total	C	N	O	0	0
			28	16	2	10		
2	J	2	Total	C	N	O	0	0
			28	16	2	10		
2	K	2	Total	C	N	O	0	0
			28	16	2	10		
2	L	2	Total	C	N	O	0	0
			28	16	2	10		
2	M	2	Total	C	N	O	0	0
			28	16	2	10		
2	N	2	Total	C	N	O	0	0
			28	16	2	10		
2	O	2	Total	C	N	O	0	0
			28	16	2	10		

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Mol	Chain	Residues	Atoms				AltConf	Trace
2	P	2	Total	C	N	O	0	0
			28	16	2	10		
2	Q	2	Total	C	N	O	0	0
			28	16	2	10		
2	R	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 3 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	

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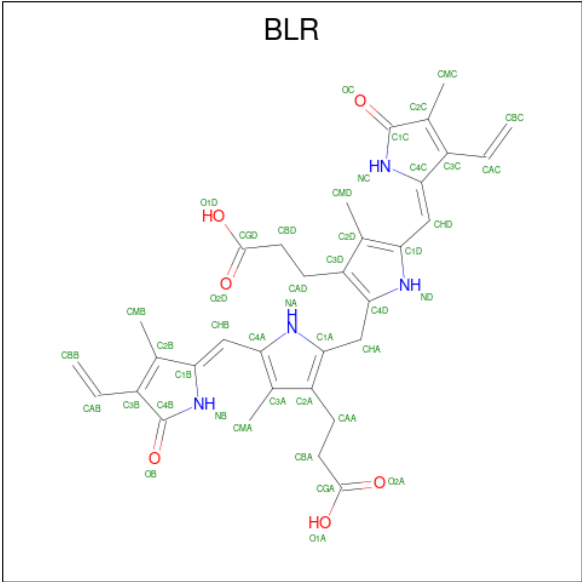
Mol	Chain	Residues	Atoms				AltConf
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	B	1	Total	C	N	O	0
			14	8	1	5	
3	B	1	Total	C	N	O	0
			14	8	1	5	
3	B	1	Total	C	N	O	0
			14	8	1	5	
3	B	1	Total	C	N	O	0
			14	8	1	5	
3	B	1	Total	C	N	O	0
			14	8	1	5	
3	B	1	Total	C	N	O	0
			14	8	1	5	
3	B	1	Total	C	N	O	0
			14	8	1	5	
3	B	1	Total	C	N	O	0
			14	8	1	5	
3	B	1	Total	C	N	O	0
			14	8	1	5	
3	B	1	Total	C	N	O	0
			14	8	1	5	
3	B	1	Total	C	N	O	0
			14	8	1	5	
3	C	1	Total	C	N	O	0
			14	8	1	5	

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Mol	Chain	Residues	Atoms				AltConf
3	C	1	Total	C	N	O	0
			14	8	1	5	
3	C	1	Total	C	N	O	0
			14	8	1	5	
3	C	1	Total	C	N	O	0
			14	8	1	5	
3	C	1	Total	C	N	O	0
			14	8	1	5	
3	C	1	Total	C	N	O	0
			14	8	1	5	
3	C	1	Total	C	N	O	0
			14	8	1	5	
3	C	1	Total	C	N	O	0
			14	8	1	5	
3	C	1	Total	C	N	O	0
			14	8	1	5	
3	C	1	Total	C	N	O	0
			14	8	1	5	
3	C	1	Total	C	N	O	0
			14	8	1	5	
3	C	1	Total	C	N	O	0
			14	8	1	5	

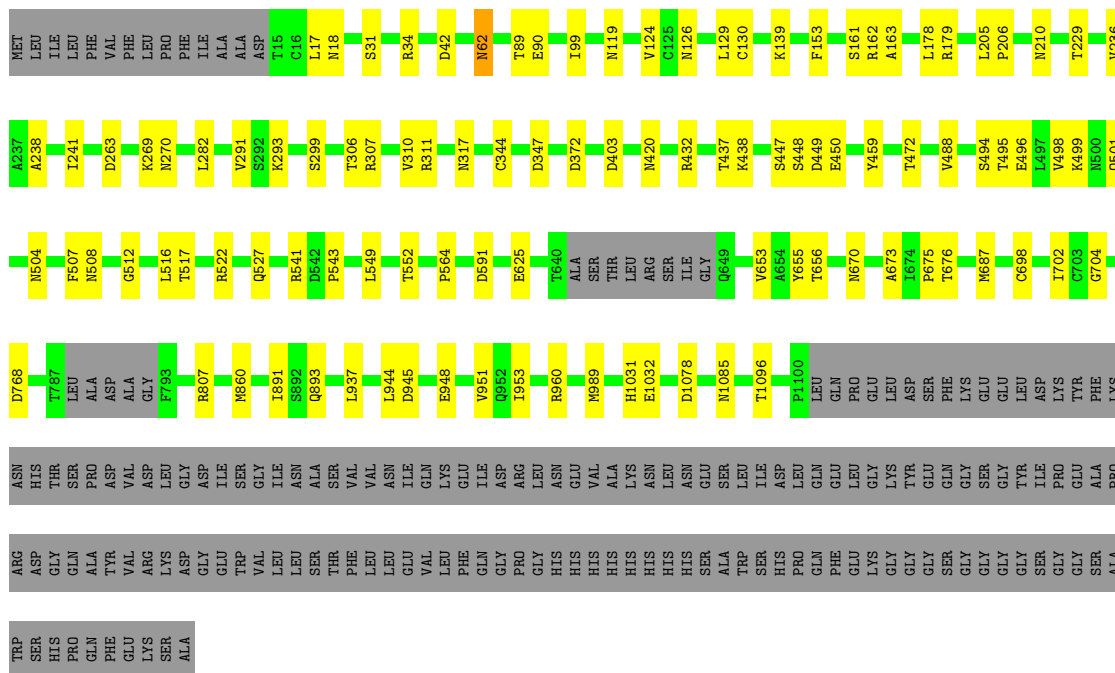
- Molecule 4 is 3-[5-[(Z)-(4-ethenyl-3-methyl-5-oxidanylidene-pyrrol-2-ylidene)methyl]-2-[[5-[(Z)-(3-ethenyl-4-methyl-5-oxidanylidene-pyrrol-2-ylidene)methyl]-3-(3-hydroxy-3-oxopropyl)-4-methyl-1H-pyrrol-2-yl]methyl]-4-methyl-1H-pyrrol-3-yl]propanoic acid (CCD ID: BLR) (formula: C₃₃H₃₆N₄O₆) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf
4	A	1	Total	C	N	O	0
			43	33	4	6	
4	B	1	Total	C	N	O	0
			43	33	4	6	
4	C	1	Total	C	N	O	0
			43	33	4	6	

- Molecule 1: Spike glycoprotein

Chain C: 78% 8% 14%

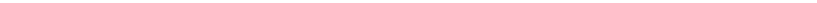


- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D: 100%



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

Chain E:  100%



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

Chain F:  100%



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

Chain G:  50% 50%



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

Chain H:  50% 50%



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

Chain I:  50% 50%



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

Chain J:  50% 50%



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

Chain K:  50% 50%



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

Chain L:  50% 50%



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

Chain M:  50% 50%



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

Chain N:  50% 50%



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

Chain O:  100%



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

Chain P:  100%



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

Chain Q:  50% 50%



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

Chain R:  50% 50%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	452110	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.974	Depositor
Minimum map value	-0.332	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.031	Depositor
Recommended contour level	0.0157	Depositor
Map size ($\text{\AA}$)	328.5, 328.5, 328.5	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	1.095, 1.095, 1.095	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: BLR, 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	0.14	0/8529	0.36	0/11607
1	B	0.15	0/8535	0.38	0/11614
1	C	0.14	0/8535	0.38	0/11614
All	All	0.14	0/25599	0.37	0/34835

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	8344	0	8128	59	0
1	B	8350	0	8139	55	0
1	C	8350	0	8139	53	0
2	D	28	0	25	0	0
2	E	28	0	25	0	0
2	F	28	0	25	0	0
2	G	28	0	25	0	0
2	H	28	0	25	0	0
2	I	28	0	25	0	0
2	J	28	0	25	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	K	28	0	25	0	0
2	L	28	0	25	0	0
2	M	28	0	25	0	0
2	N	28	0	25	0	0
2	O	28	0	25	0	0
2	P	28	0	25	0	0
2	Q	28	0	25	0	0
2	R	28	0	25	0	0
3	A	196	0	182	0	0
3	B	196	0	182	0	0
3	C	196	0	182	0	0
4	A	43	0	34	2	0
4	B	43	0	34	2	0
4	C	43	0	34	1	0
All	All	26181	0	25429	166	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

All (166) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:483:ASN:HD21	1:A:530:GLY:H	1.46	0.64
1:A:126:ASN:HB2	1:A:153:PHE:HB2	1.82	0.60
1:C:702:ILE:O	1:C:960:ARG:NH1	2.37	0.58
1:C:447:SER:OG	1:C:450:GLU:OE1	2.22	0.57
1:A:293:LYS:HG3	1:A:564:PRO:HA	1.87	0.57
1:A:307:ARG:HB2	1:A:503:VAL:HG12	1.86	0.57
1:C:311:ARG:NH1	1:C:495:THR:O	2.39	0.56
1:C:99:ILE:HD13	1:C:129:LEU:HD11	1.88	0.55
1:A:347:ASP:OD1	1:A:347:ASP:N	2.38	0.55
1:A:1051:ARG:NH1	1:A:1078:ASP:O	2.39	0.55
1:C:347:ASP:N	1:C:347:ASP:OD1	2.39	0.55
1:B:1051:ARG:NH1	1:B:1078:ASP:O	2.39	0.55
1:A:336:TRP:O	1:A:444:ARG:NH1	2.40	0.54
1:A:31:SER:HA	1:A:62:ASN:HA	1.90	0.54
1:B:347:ASP:OD1	1:B:347:ASP:N	2.39	0.53
1:C:31:SER:HA	1:C:62:ASN:HA	1.90	0.53
1:A:311:ARG:NH1	1:A:495:THR:O	2.41	0.53
1:A:702:ILE:O	1:A:960:ARG:NH1	2.42	0.53
1:C:293:LYS:HG3	1:C:564:PRO:HA	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:34:ARG:NH2	1:B:270:ASN:OD1	2.42	0.53
1:A:382:THR:HG22	1:A:475:VAL:HG22	1.91	0.52
1:A:712:LEU:HD11	1:A:950:GLU:HG2	1.89	0.52
1:C:768:ASP:OD1	1:C:768:ASP:N	2.42	0.52
1:C:139:LYS:HG3	1:C:236:VAL:HA	1.90	0.52
1:B:538:ASP:OD1	1:B:538:ASP:N	2.42	0.52
1:A:460:ASP:OD1	1:A:460:ASP:N	2.42	0.52
1:A:141:ASN:OD1	1:A:141:ASN:N	2.41	0.52
1:B:712:LEU:HD11	1:B:950:GLU:HG2	1.92	0.52
1:B:511:LYS:NZ	1:C:704:GLY:O	2.40	0.52
1:B:591:ASP:OD1	1:B:591:ASP:N	2.42	0.52
1:C:263:ASP:HB3	1:C:269:LYS:HG3	1.92	0.52
1:B:538:ASP:HA	1:B:551:ILE:HB	1.92	0.52
1:C:344:CYS:HB2	1:C:488:VAL:HG22	1.90	0.51
1:B:336:TRP:O	1:B:444:ARG:NH1	2.43	0.51
1:C:591:ASP:OD1	1:C:591:ASP:N	2.41	0.51
1:C:126:ASN:HB2	1:C:153:PHE:HB2	1.93	0.51
1:A:527:GLN:O	1:A:541:ARG:NH2	2.44	0.51
1:B:307:ARG:HH12	1:B:498:VAL:HB	1.74	0.51
1:A:768:ASP:OD2	1:A:768:ASP:N	2.44	0.50
1:C:205:LEU:HD12	1:C:206:PRO:HD2	1.93	0.50
1:A:119:ASN:ND2	1:A:161:SER:O	2.44	0.50
1:A:540:VAL:HB	1:A:551:ILE:HD11	1.93	0.50
1:C:937:LEU:HD11	1:C:953:ILE:HG12	1.93	0.50
1:B:504:ASN:HA	1:B:512:GLY:HA2	1.94	0.50
1:B:531:ARG:NH2	1:B:532:ASP:O	2.44	0.50
1:B:532:ASP:HA	1:C:807:ARG:HH12	1.77	0.50
1:A:137:VAL:HG11	1:A:168:ILE:HG21	1.94	0.49
1:B:293:LYS:HG3	1:B:564:PRO:HA	1.94	0.49
1:A:591:ASP:OD1	1:A:591:ASP:N	2.42	0.49
1:B:235:ARG:NH1	1:B:239:GLY:O	2.45	0.49
1:B:795:LYS:NZ	1:B:808:ASP:OD2	2.41	0.49
1:A:376:THR:OG1	1:A:480:GLU:O	2.31	0.49
1:A:944:LEU:HD13	1:A:948:GLU:HG3	1.93	0.49
1:B:311:ARG:NH1	1:B:495:THR:O	2.43	0.49
1:C:90:GLU:OE2	1:C:179:ARG:NH1	2.45	0.49
1:A:1071:SER:O	1:A:1071:SER:OG	2.27	0.49
1:B:31:SER:HA	1:B:62:ASN:HA	1.94	0.49
1:B:210:ASN:N	1:B:210:ASN:OD1	2.46	0.49
4:C:1315:BLR:H28	4:C:1315:BLR:H3	1.61	0.49
1:A:542:ASP:OD1	1:A:544:GLN:NE2	2.47	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:504:ASN:HA	1:C:512:GLY:HA2	1.95	0.48
1:A:199:ILE:HD12	1:A:201:ILE:HG12	1.94	0.48
4:A:1314:BLR:H28	4:A:1314:BLR:H3	1.62	0.48
4:B:1315:BLR:H28	4:B:1315:BLR:H3	1.63	0.47
1:C:507:PHE:HD1	1:C:543:PRO:HD3	1.79	0.47
1:A:785:LYS:NZ	1:A:901:THR:O	2.41	0.47
1:C:62:ASN:OD1	1:C:62:ASN:N	2.44	0.47
1:C:437:THR:OG1	1:C:438:LYS:N	2.47	0.47
1:C:944:LEU:HD13	1:C:948:GLU:HG3	1.96	0.47
1:A:34:ARG:NH2	1:A:270:ASN:OD1	2.47	0.47
1:A:210:ASN:N	1:A:210:ASN:OD1	2.46	0.46
1:A:172:SER:OG	1:A:174:ASN:O	2.34	0.46
1:C:210:ASN:OD1	1:C:210:ASN:N	2.47	0.46
1:B:684:THR:HG23	1:B:894:ILE:HD11	1.98	0.46
1:A:62:ASN:OD1	1:A:62:ASN:N	2.44	0.46
1:B:540:VAL:HB	1:B:551:ILE:HD11	1.97	0.46
1:B:205:LEU:HD12	1:B:206:PRO:HD2	1.98	0.46
1:B:746:LYS:HD3	1:B:746:LYS:HA	1.71	0.46
1:C:34:ARG:NH2	1:C:270:ASN:OD1	2.49	0.46
1:A:162:ARG:NH1	1:A:163:ALA:O	2.48	0.45
1:A:863:ALA:HB1	1:A:873:GLN:HB2	1.98	0.45
1:B:162:ARG:NH1	1:B:163:ALA:O	2.49	0.45
1:A:75:ASN:N	1:A:75:ASN:OD1	2.50	0.45
1:B:803:ASP:OD1	1:B:803:ASP:N	2.47	0.45
1:C:499:LYS:HE3	1:C:549:LEU:HD22	1.98	0.45
1:B:90:GLU:OE2	1:B:179:ARG:NH1	2.50	0.45
1:C:236:VAL:HG23	1:C:238:ALA:H	1.81	0.45
1:B:282:LEU:HD21	1:B:291:VAL:HG11	1.99	0.45
1:A:771:LYS:HA	1:A:771:LYS:HD3	1.83	0.45
1:B:215:LEU:HG	1:B:216:LEU:HD13	1.99	0.45
1:A:538:ASP:HA	1:A:551:ILE:HD12	2.00	0.44
1:B:745:VAL:HG22	1:B:747:GLN:H	1.81	0.44
1:B:893:GLN:HA	1:B:896:GLU:HG3	1.99	0.44
1:A:403:ASP:HB2	1:A:438:LYS:HB2	1.99	0.44
1:B:988:LYS:NZ	1:B:1002:PHE:O	2.50	0.44
1:C:989:MET:HE2	1:C:989:MET:HB2	1.88	0.44
1:C:307:ARG:HH12	1:C:498:VAL:HB	1.82	0.44
1:B:536:PHE:HZ	1:B:553:PRO:HD3	1.83	0.44
1:C:945:ASP:N	1:C:945:ASP:OD1	2.47	0.44
1:C:317:ASN:OD1	1:C:317:ASN:N	2.48	0.43
1:C:420:ASN:HA	1:C:472:THR:HG22	1.99	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:236:VAL:HG23	1:A:238:ALA:H	1.83	0.43
1:B:377:SER:O	1:B:377:SER:OG	2.32	0.43
1:B:168:ILE:O	1:B:234:TYR:OH	2.28	0.43
1:B:522:ARG:H	1:B:522:ARG:HG3	1.66	0.43
1:C:403:ASP:HB2	1:C:438:LYS:HG2	2.00	0.43
1:A:96:ARG:HH12	1:A:144:GLN:HE22	1.66	0.43
1:B:640:THR:OG1	1:B:650:LYS:NZ	2.49	0.43
1:C:675:PRO:HA	1:C:1032:GLU:HA	2.01	0.43
1:C:432:ARG:NH2	1:C:447:SER:O	2.48	0.43
1:A:709:CYS:O	1:A:713:LEU:N	2.51	0.43
1:B:937:LEU:HD12	1:B:937:LEU:HA	1.91	0.43
1:C:499:LYS:NZ	1:C:517:THR:OG1	2.52	0.43
1:C:625:GLU:O	1:C:655:TYR:OH	2.33	0.43
1:A:499:LYS:HG2	1:A:515:VAL:HG12	2.00	0.42
1:A:854:LEU:HB3	1:C:673:ALA:HB3	2.01	0.42
1:C:676:THR:N	1:C:1031:HIS:O	2.44	0.42
1:C:891:ILE:HD13	1:C:891:ILE:HA	1.92	0.42
1:C:282:LEU:HD21	1:C:291:VAL:HG11	2.00	0.42
1:B:687:MET:HE2	1:B:687:MET:HB3	1.80	0.42
1:A:546:LEU:HD12	1:A:546:LEU:HA	1.89	0.42
1:A:220:PHE:HB3	1:A:222:LEU:HD12	2.01	0.42
1:A:673:ALA:HB3	1:B:854:LEU:HB3	2.01	0.42
1:B:675:PRO:HA	1:B:1032:GLU:HA	2.02	0.42
1:C:162:ARG:NH1	1:C:163:ALA:O	2.53	0.42
1:A:21:ASN:O	1:A:71:THR:OG1	2.37	0.42
1:A:1087:ASP:OD1	1:A:1087:ASP:N	2.53	0.42
1:B:144:GLN:OE1	1:B:144:GLN:N	2.39	0.42
1:B:361:LYS:HB2	1:B:361:LYS:HE2	1.73	0.42
1:B:892:SER:OG	1:B:893:GLN:N	2.52	0.42
1:B:145:LEU:HD23	1:B:145:LEU:HA	1.87	0.41
1:B:318:ARG:HA	1:B:318:ARG:HD2	1.94	0.41
1:C:119:ASN:ND2	1:C:161:SER:O	2.49	0.41
1:C:307:ARG:HH21	1:C:501:GLN:HG3	1.85	0.41
1:B:497:LEU:HD13	1:B:549:LEU:HD11	2.02	0.41
1:B:961:LEU:HD12	1:B:961:LEU:HA	1.94	0.41
1:C:18:ASN:OD1	1:C:18:ASN:N	2.52	0.41
1:A:750:LYS:HE3	1:A:750:LYS:HB3	1.87	0.41
1:A:774:LYS:HE2	1:A:774:LYS:HB2	1.87	0.41
1:A:892:SER:OG	1:A:893:GLN:N	2.53	0.41
1:C:670:ASN:OD1	1:C:670:ASN:N	2.53	0.41
1:B:727:LEU:HD23	1:B:727:LEU:HA	1.92	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:321:PHE:HB3	1:B:351:LEU:HD21	2.02	0.41
1:B:718:SER:O	1:B:722:GLN:HB2	2.21	0.41
1:A:216:LEU:HD22	1:A:218:ILE:HD11	2.03	0.41
1:A:746:LYS:HD3	1:A:746:LYS:HA	1.88	0.41
1:A:865:ARG:NH1	1:A:1009:LEU:O	2.50	0.41
1:B:93:ASN:HB3	4:B:1315:BLR:H26	2.02	0.41
1:B:311:ARG:NH2	1:B:542:ASP:OD2	2.48	0.41
1:C:311:ARG:HH11	1:C:494:SER:HB3	1.86	0.41
1:C:496:GLU:HG3	1:C:498:VAL:HG23	2.02	0.41
1:A:937:LEU:HD12	1:A:937:LEU:HA	1.94	0.41
1:A:626:CYS:HB2	1:A:657:MET:HE3	2.03	0.40
1:A:687:MET:HE2	1:A:687:MET:HB3	1.86	0.40
1:B:771:LYS:HA	1:B:771:LYS:HD3	1.92	0.40
1:C:89:THR:HG22	1:C:178:LEU:HD13	2.03	0.40
1:B:863:ALA:HB1	1:B:873:GLN:HB2	2.03	0.40
1:C:687:MET:HE2	1:C:687:MET:HB3	1.90	0.40
1:B:42:ASP:OD1	1:B:42:ASP:N	2.54	0.40
1:C:527:GLN:O	1:C:541:ARG:NH2	2.53	0.40
1:A:93:ASN:HB3	4:A:1314:BLR:H26	2.04	0.40
1:A:99:ILE:HG13	1:A:112:ILE:HG22	2.02	0.40
1:A:151:ASP:OD2	1:A:152:SER:N	2.55	0.40
1:A:937:LEU:HD11	1:A:953:ILE:HG12	2.02	0.40
1:C:42:ASP:OD2	1:C:42:ASP:N	2.55	0.40
1:C:448:SER:OG	1:C:449:ASP:N	2.53	0.40

There are no symmetry-related clashes.

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	1067/1247 (86%)	1027 (96%)	40 (4%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	1067/1247 (86%)	1020 (96%)	47 (4%)	0	100	100
1	C	1067/1247 (86%)	1023 (96%)	44 (4%)	0	100	100
All	All	3201/3741 (86%)	3070 (96%)	131 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	929/1072 (87%)	904 (97%)	25 (3%)	39	65
1	B	930/1072 (87%)	910 (98%)	20 (2%)	45	71
1	C	930/1072 (87%)	906 (97%)	24 (3%)	40	66
All	All	2789/3216 (87%)	2720 (98%)	69 (2%)	42	67

All (69) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	31	SER
1	A	42	ASP
1	A	52	VAL
1	A	62	ASN
1	A	124	VAL
1	A	141	ASN
1	A	303	VAL
1	A	306	THR
1	A	310	VAL
1	A	372	ASP
1	A	459	TYR
1	A	465	VAL
1	A	478	SER
1	A	508	ASN
1	A	545	THR
1	A	698	CYS

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Mol	Chain	Res	Type
1	A	703	CYS
1	A	725	ARG
1	A	804	ILE
1	A	809	LEU
1	A	860	MET
1	A	954	ASP
1	A	1010	MET
1	A	1042	CYS
1	A	1096	THR
1	B	42	ASP
1	B	62	ASN
1	B	99	ILE
1	B	120	LEU
1	B	124	VAL
1	B	229	THR
1	B	241	ILE
1	B	264	LEU
1	B	306	THR
1	B	459	TYR
1	B	465	VAL
1	B	497	LEU
1	B	522	ARG
1	B	552	THR
1	B	656	THR
1	B	698	CYS
1	B	725	ARG
1	B	801	LEU
1	B	1042	CYS
1	B	1089	VAL
1	C	17	LEU
1	C	62	ASN
1	C	124	VAL
1	C	130	CYS
1	C	229	THR
1	C	241	ILE
1	C	299	SER
1	C	306	THR
1	C	310	VAL
1	C	372	ASP
1	C	459	TYR
1	C	508	ASN
1	C	516	LEU

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Mol	Chain	Res	Type
1	C	522	ARG
1	C	552	THR
1	C	653	VAL
1	C	656	THR
1	C	698	CYS
1	C	860	MET
1	C	893	GLN
1	C	951	VAL
1	C	1078	ASP
1	C	1085	ASN
1	C	1096	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (32) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	21	ASN
1	A	191	HIS
1	A	423	ASN
1	A	500	ASN
1	A	608	GLN
1	A	619	HIS
1	A	796	GLN
1	B	21	ASN
1	B	72	ASN
1	B	119	ASN
1	B	191	HIS
1	B	300	ASN
1	B	470	GLN
1	B	504	ASN
1	B	608	GLN
1	B	764	GLN
1	B	816	ASN
1	B	861	GLN
1	B	873	GLN
1	B	917	GLN
1	B	971	GLN
1	C	174	ASN
1	C	191	HIS
1	C	300	ASN
1	C	420	ASN
1	C	500	ASN
1	C	504	ASN

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Mol	Chain	Res	Type
1	C	639	HIS
1	C	764	GLN
1	C	796	GLN
1	C	816	ASN
1	C	861	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

30 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	0.67	0	17,19,21	1.74	4 (23%)
2	NAG	D	2	2	14,14,15	0.70	0	17,19,21	0.96	1 (5%)
2	NAG	E	1	1,2	14,14,15	0.72	0	17,19,21	0.94	0
2	NAG	E	2	2	14,14,15	0.71	0	17,19,21	0.88	0
2	NAG	F	1	1,2	14,14,15	0.74	0	17,19,21	1.02	0
2	NAG	F	2	2	14,14,15	0.71	0	17,19,21	0.87	0
2	NAG	G	1	1,2	14,14,15	0.73	0	17,19,21	1.19	1 (5%)
2	NAG	G	2	2	14,14,15	0.71	0	17,19,21	0.84	0
2	NAG	H	1	1,2	14,14,15	0.72	0	17,19,21	1.01	1 (5%)
2	NAG	H	2	2	14,14,15	0.71	0	17,19,21	0.86	0
2	NAG	I	1	1,2	14,14,15	0.74	0	17,19,21	1.08	1 (5%)
2	NAG	I	2	2	14,14,15	0.71	0	17,19,21	0.90	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	NAG	J	1	1,2	14,14,15	0.68	0	17,19,21	1.55	3 (17%)
2	NAG	J	2	2	14,14,15	0.72	0	17,19,21	0.92	0
2	NAG	K	1	1,2	14,14,15	0.75	0	17,19,21	1.01	1 (5%)
2	NAG	K	2	2	14,14,15	0.72	0	17,19,21	0.84	0
2	NAG	L	1	1,2	14,14,15	0.72	0	17,19,21	1.25	2 (11%)
2	NAG	L	2	2	14,14,15	0.69	0	17,19,21	0.83	0
2	NAG	M	1	1,2	14,14,15	0.72	0	17,19,21	1.02	1 (5%)
2	NAG	M	2	2	14,14,15	0.71	0	17,19,21	0.87	0
2	NAG	N	1	1,2	14,14,15	0.74	0	17,19,21	1.09	0
2	NAG	N	2	2	14,14,15	0.70	0	17,19,21	1.55	2 (11%)
2	NAG	O	1	1,2	14,14,15	0.69	0	17,19,21	0.91	0
2	NAG	O	2	2	14,14,15	0.72	0	17,19,21	0.89	0
2	NAG	P	1	1,2	14,14,15	0.69	0	17,19,21	0.90	0
2	NAG	P	2	2	14,14,15	0.70	0	17,19,21	0.86	0
2	NAG	Q	1	1,2	14,14,15	0.73	0	17,19,21	1.15	1 (5%)
2	NAG	Q	2	2	14,14,15	0.71	0	17,19,21	0.86	0
2	NAG	R	1	1,2	14,14,15	0.73	0	17,19,21	1.00	1 (5%)
2	NAG	R	2	2	14,14,15	0.71	0	17,19,21	0.86	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	-	1/6/23/26	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	-	2/6/23/26	0/1/1/1
2	NAG	G	2	2	-	0/6/23/26	0/1/1/1
2	NAG	H	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	H	2	2	-	1/6/23/26	0/1/1/1
2	NAG	I	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	I	2	2	-	1/6/23/26	0/1/1/1
2	NAG	J	1	1,2	-	2/6/23/26	0/1/1/1
2	NAG	J	2	2	-	0/6/23/26	0/1/1/1
2	NAG	K	1	1,2	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	K	2	2	-	0/6/23/26	0/1/1/1
2	NAG	L	1	1,2	-	3/6/23/26	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	-	3/6/23/26	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	-	2/6/23/26	0/1/1/1
2	NAG	Q	2	2	-	0/6/23/26	0/1/1/1
2	NAG	R	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	R	2	2	-	1/6/23/26	0/1/1/1

There are no bond length outliers.

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	1	NAG	C2-N2-C7	4.68	129.18	122.90
2	N	2	NAG	C2-N2-C7	4.54	128.99	122.90
2	J	1	NAG	C2-N2-C7	4.54	128.98	122.90
2	D	1	NAG	C1-O5-C5	2.98	116.18	112.19
2	G	1	NAG	C2-N2-C7	2.90	126.79	122.90
2	Q	1	NAG	C2-N2-C7	2.75	126.59	122.90
2	L	1	NAG	C2-N2-C7	2.71	126.53	122.90
2	M	1	NAG	C1-O5-C5	2.52	115.56	112.19
2	D	2	NAG	C1-O5-C5	2.46	115.48	112.19
2	H	1	NAG	C1-O5-C5	2.44	115.45	112.19
2	R	1	NAG	C1-O5-C5	2.34	115.32	112.19
2	L	1	NAG	O5-C1-C2	-2.23	107.84	111.29
2	D	1	NAG	O5-C1-C2	-2.22	107.86	111.29
2	I	1	NAG	C1-O5-C5	2.18	115.11	112.19
2	D	1	NAG	C1-C2-N2	2.10	113.74	110.43
2	J	1	NAG	O5-C1-C2	-2.06	108.10	111.29
2	J	1	NAG	O7-C7-N2	2.05	125.60	121.98
2	N	2	NAG	O7-C7-N2	2.03	125.57	121.98
2	K	1	NAG	C1-O5-C5	2.01	114.89	112.19

There are no chirality outliers.

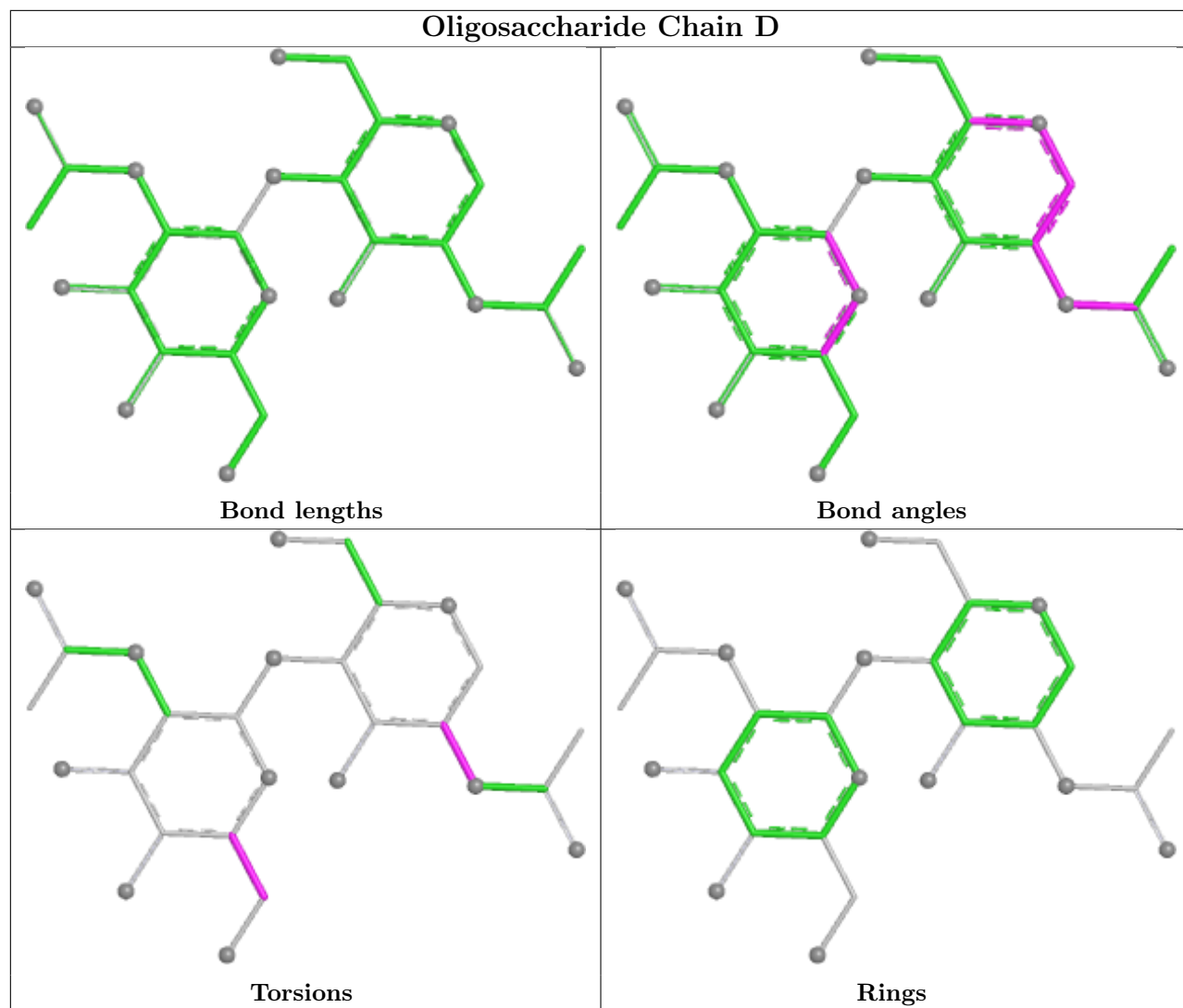
All (18) torsion outliers are listed below:

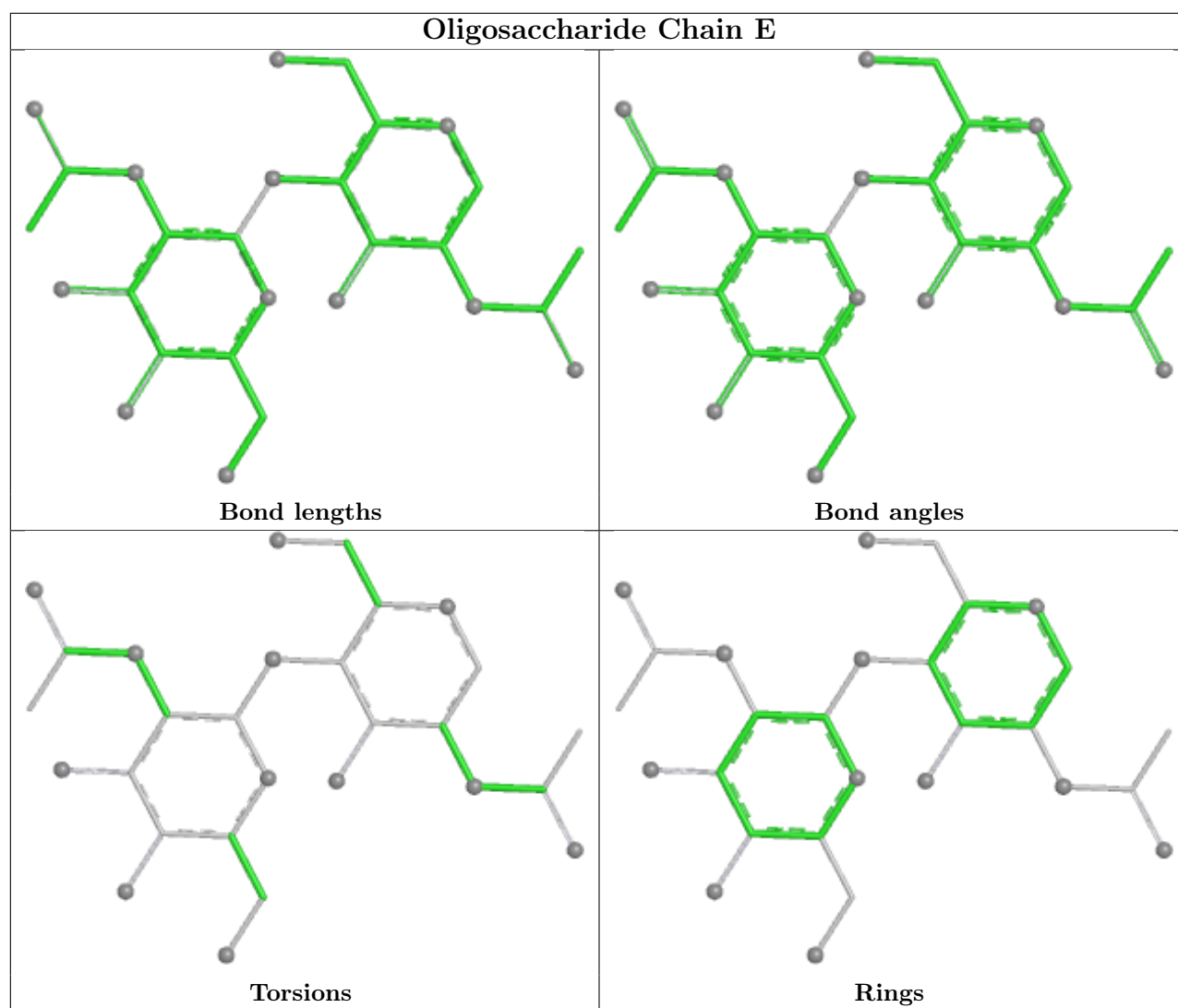
Mol	Chain	Res	Type	Atoms
2	G	1	NAG	C8-C7-N2-C2
2	G	1	NAG	O7-C7-N2-C2
2	L	1	NAG	C8-C7-N2-C2
2	L	1	NAG	O7-C7-N2-C2
2	Q	1	NAG	C8-C7-N2-C2
2	Q	1	NAG	O7-C7-N2-C2
2	D	2	NAG	O5-C5-C6-O6
2	N	2	NAG	O5-C5-C6-O6
2	R	2	NAG	O5-C5-C6-O6
2	I	2	NAG	O5-C5-C6-O6
2	H	2	NAG	O5-C5-C6-O6
2	L	1	NAG	O5-C5-C6-O6
2	J	1	NAG	C1-C2-N2-C7
2	D	1	NAG	C3-C2-N2-C7
2	N	2	NAG	C3-C2-N2-C7
2	D	1	NAG	C1-C2-N2-C7
2	N	2	NAG	C1-C2-N2-C7
2	J	1	NAG	C3-C2-N2-C7

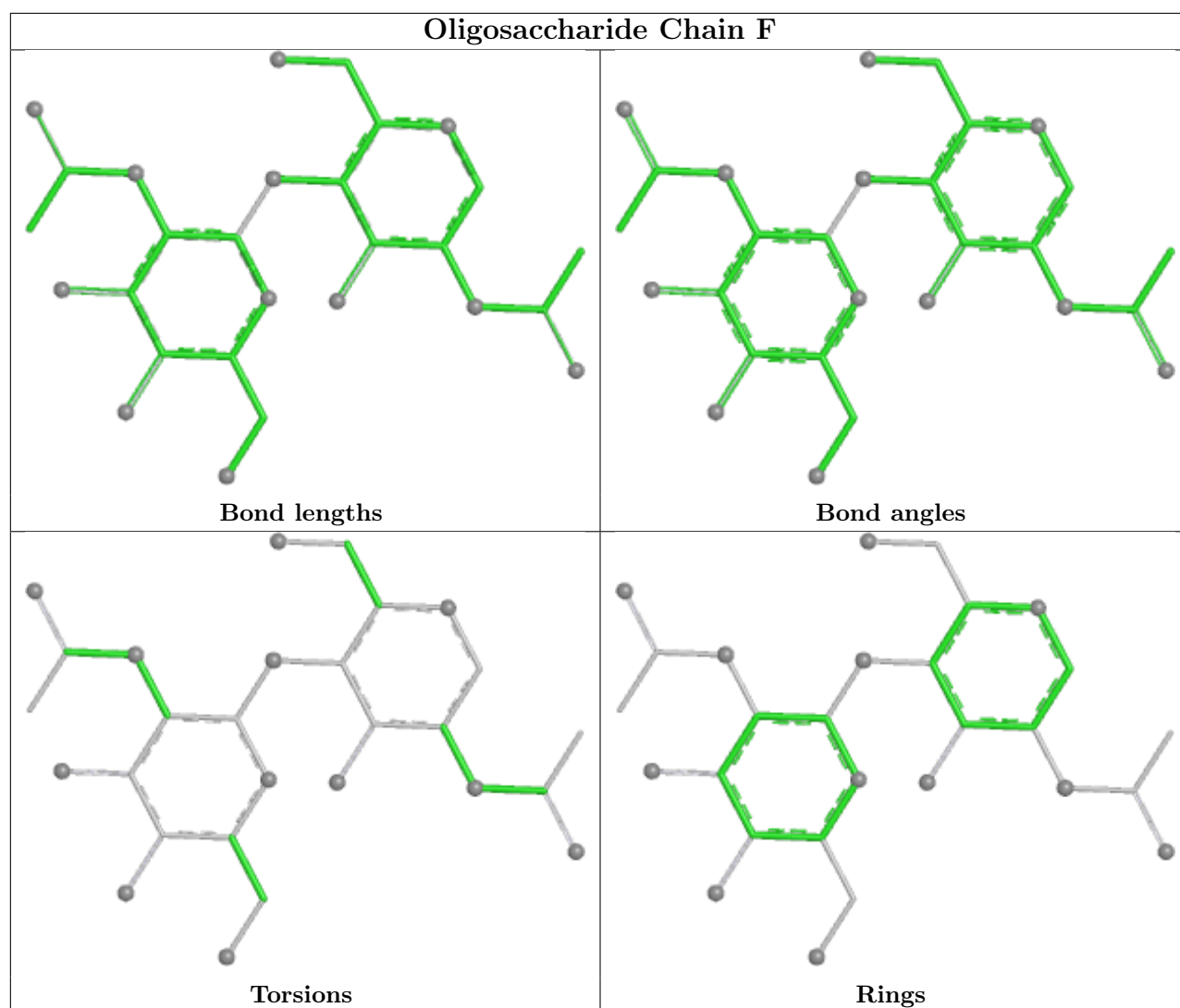
There are no ring outliers.

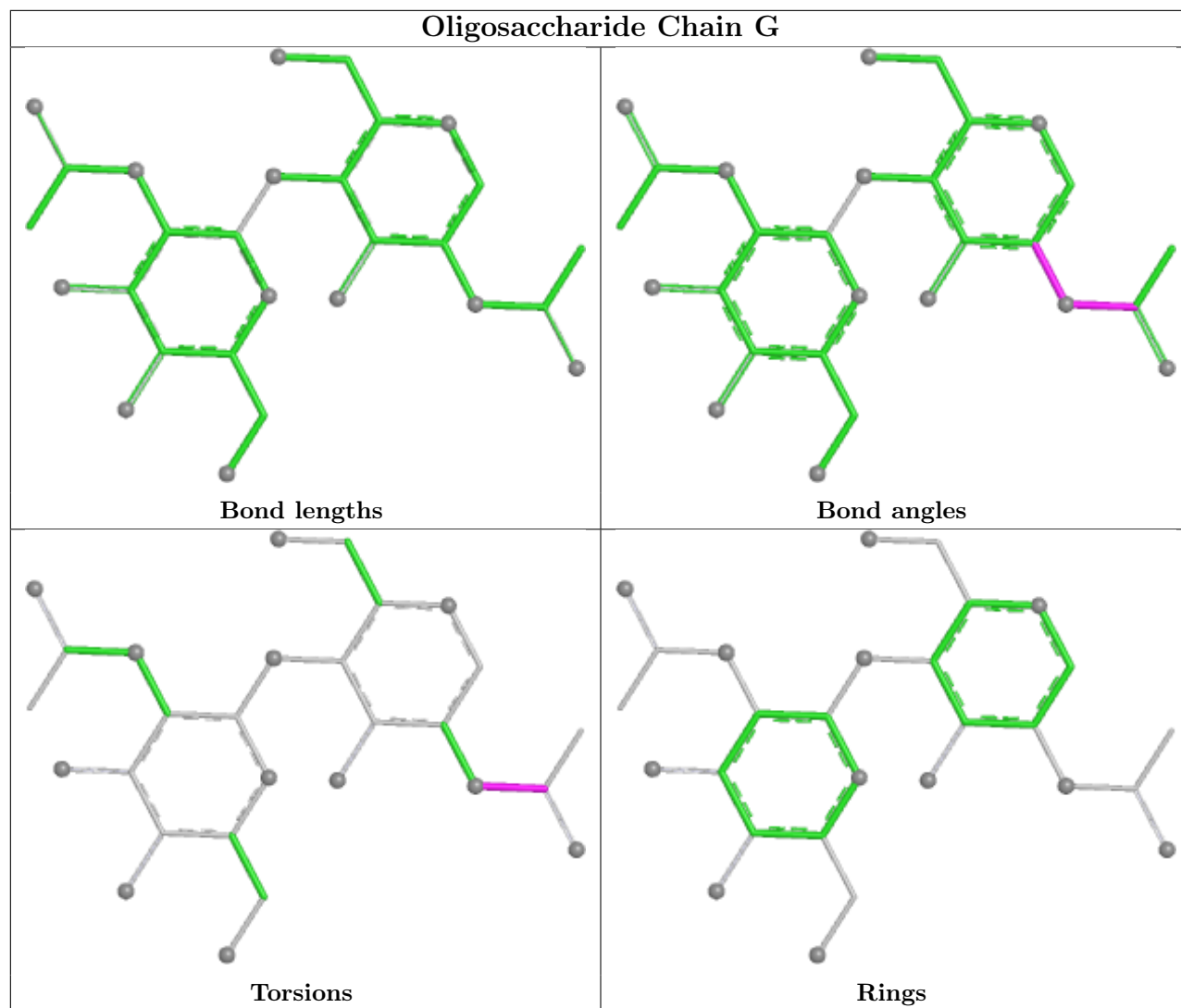
No monomer is involved in short contacts.

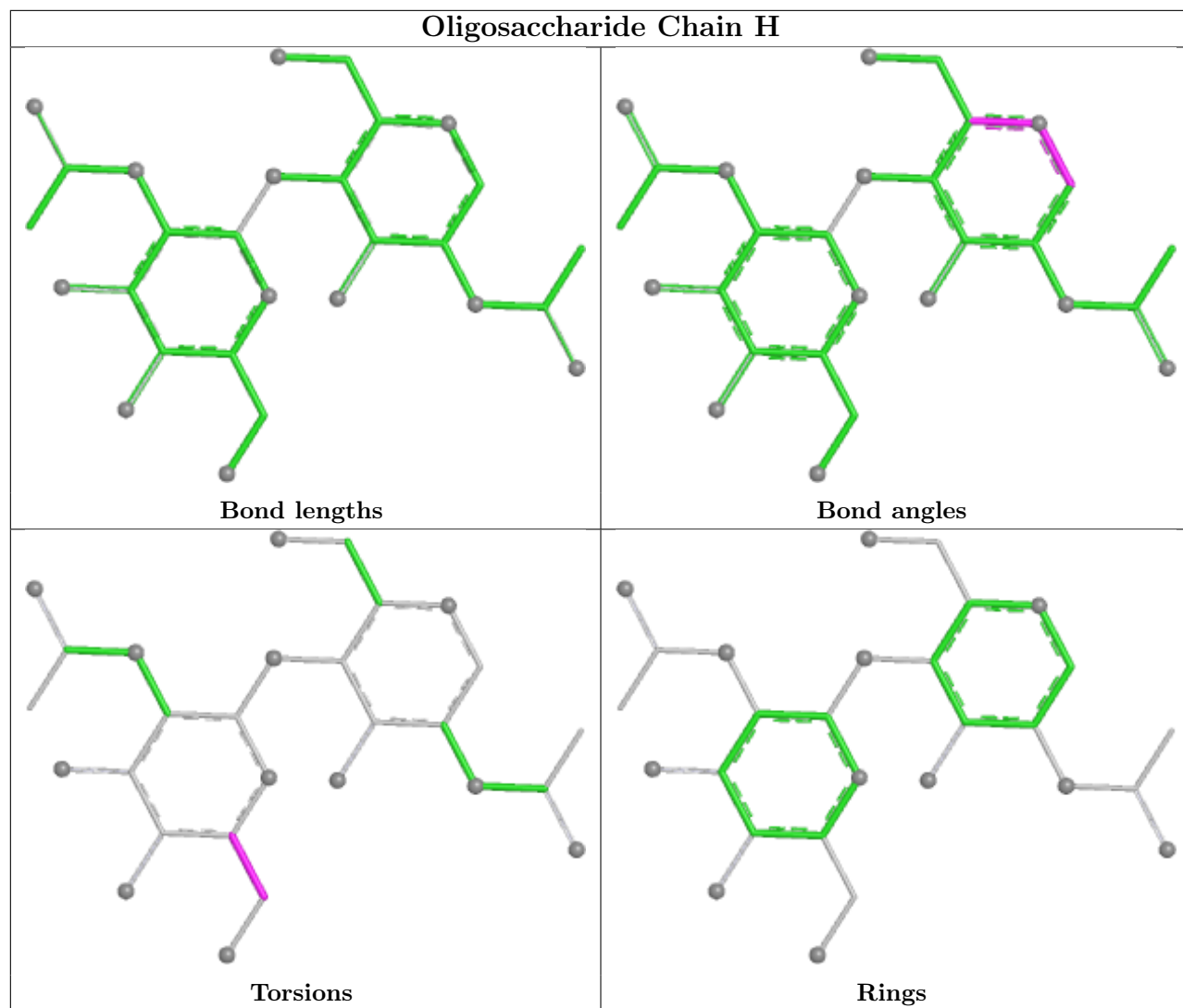
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

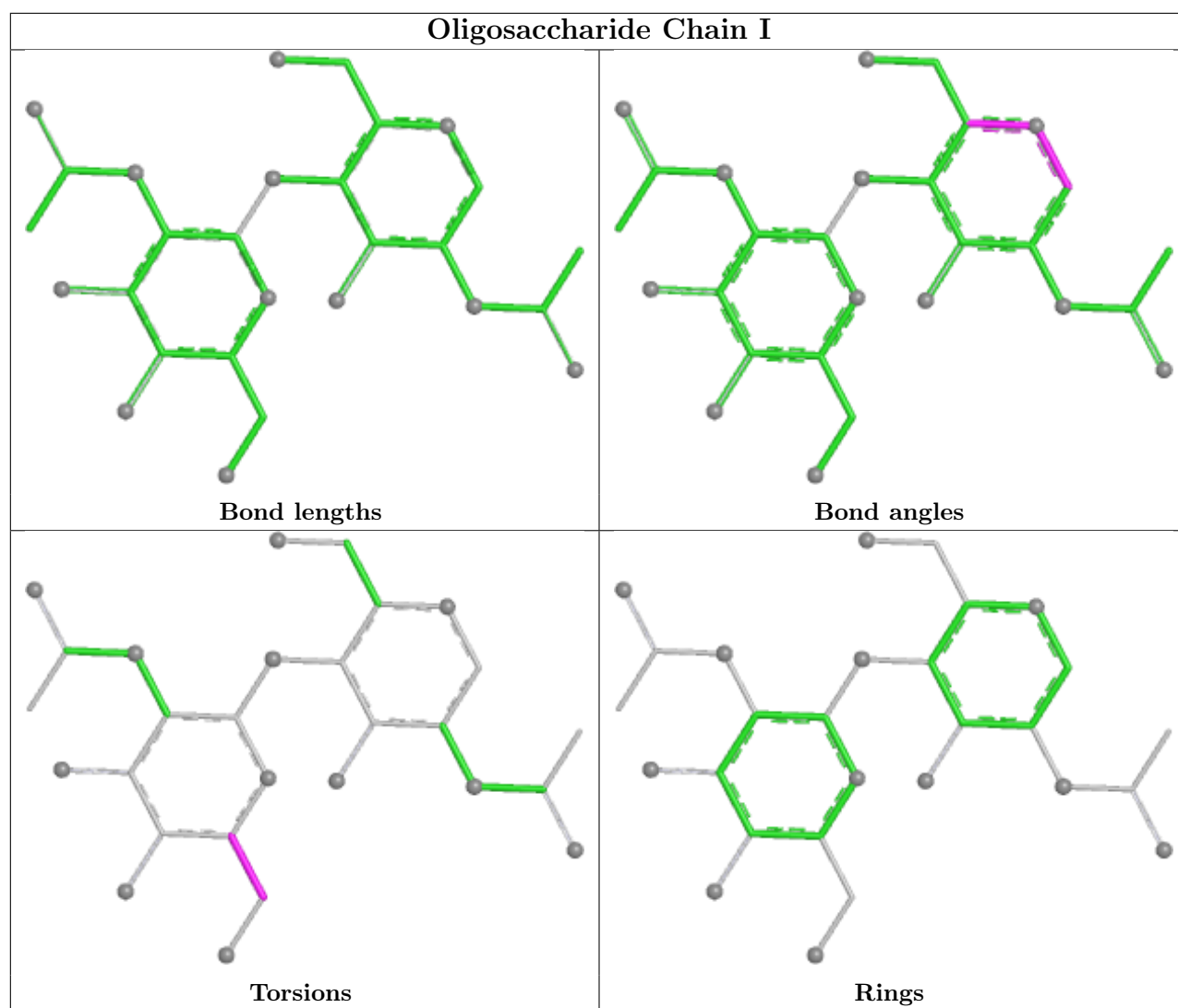


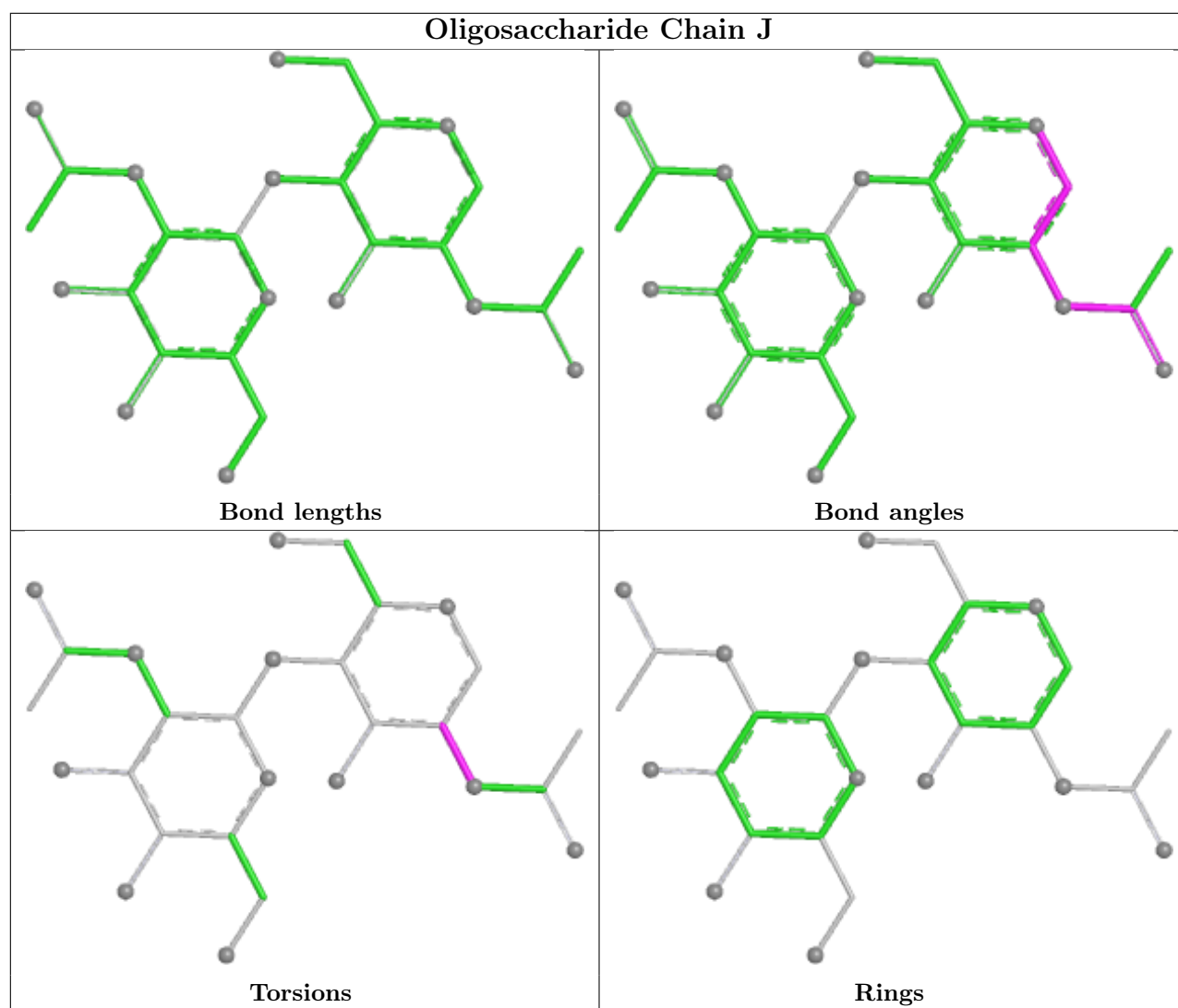


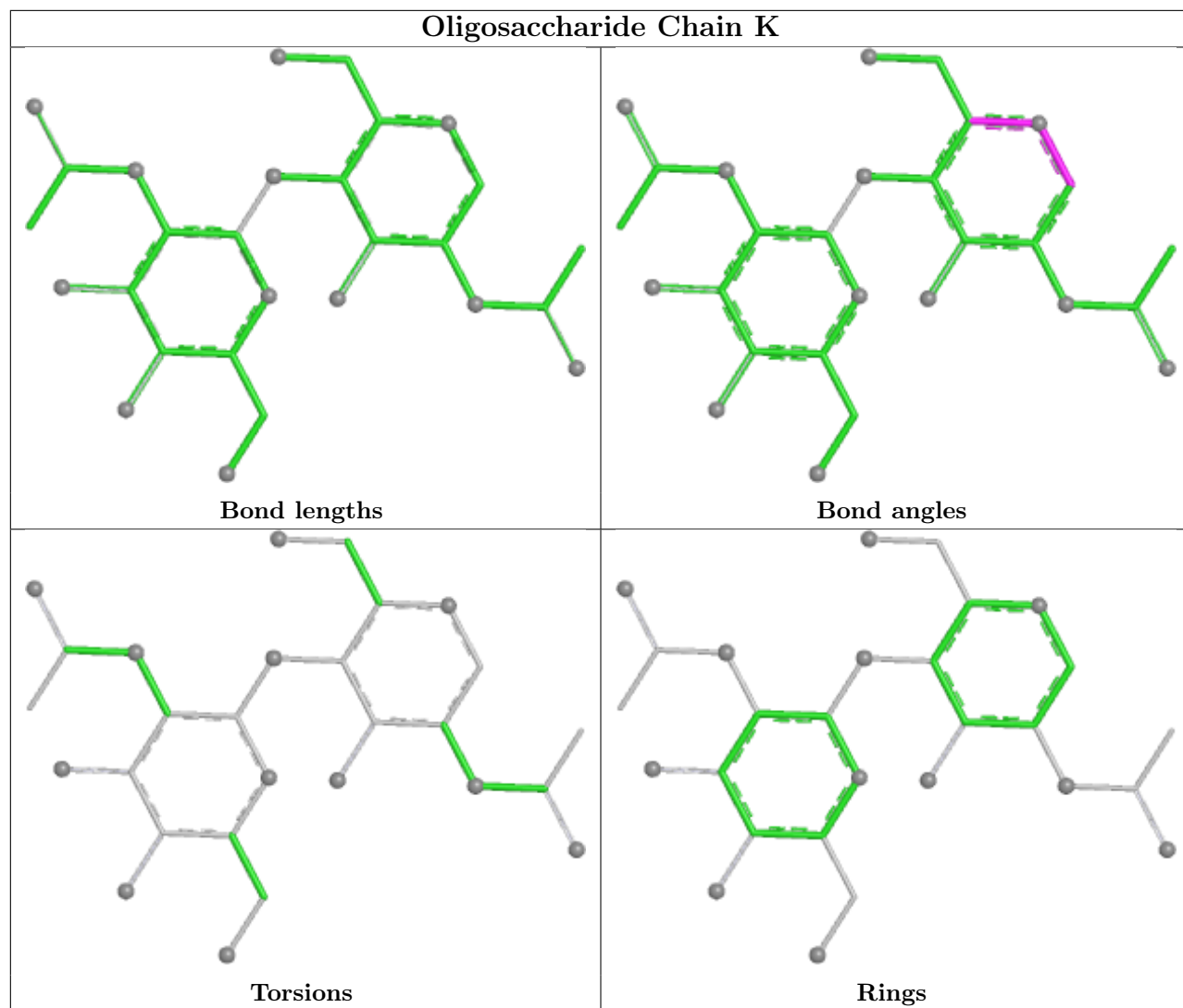


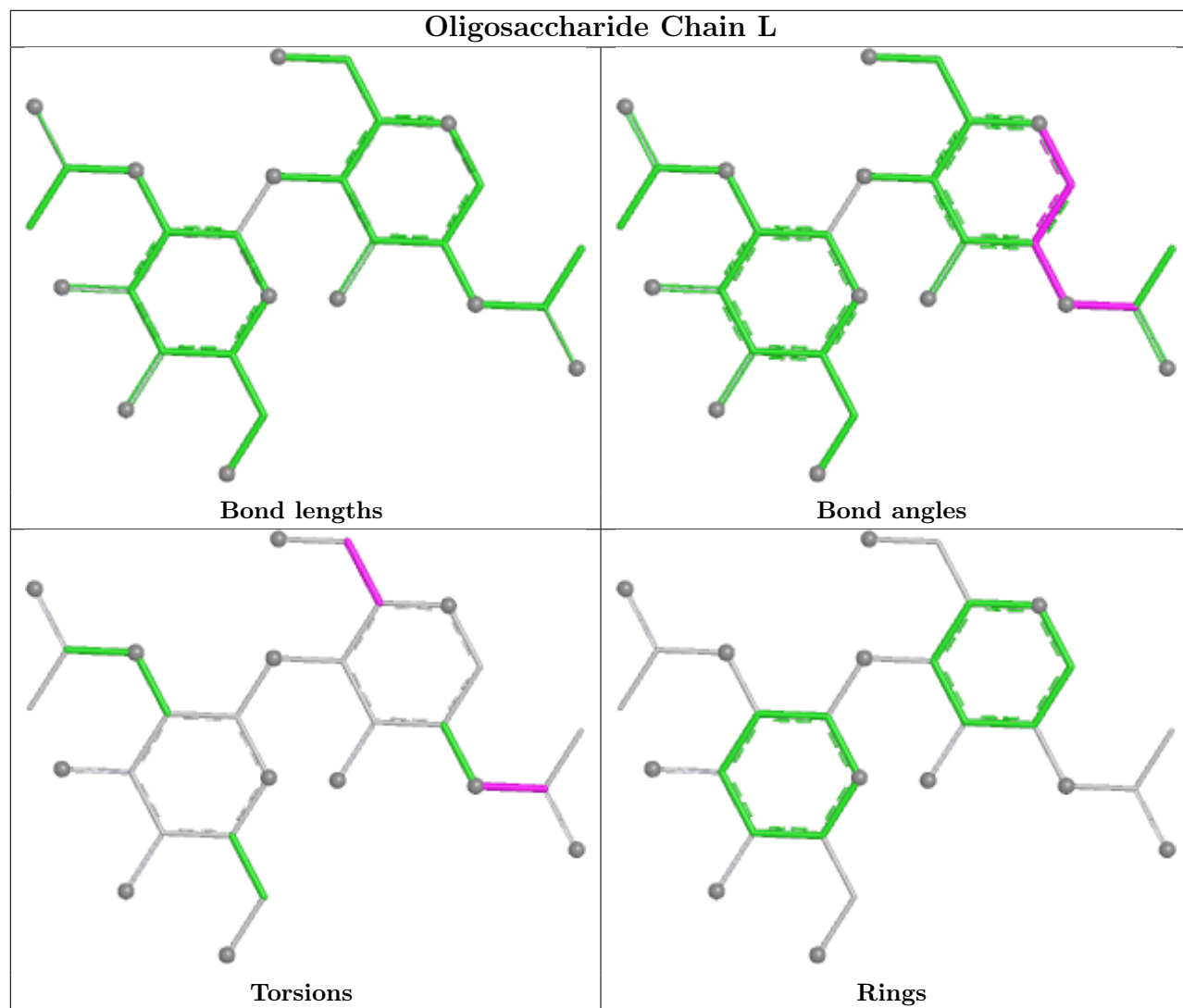


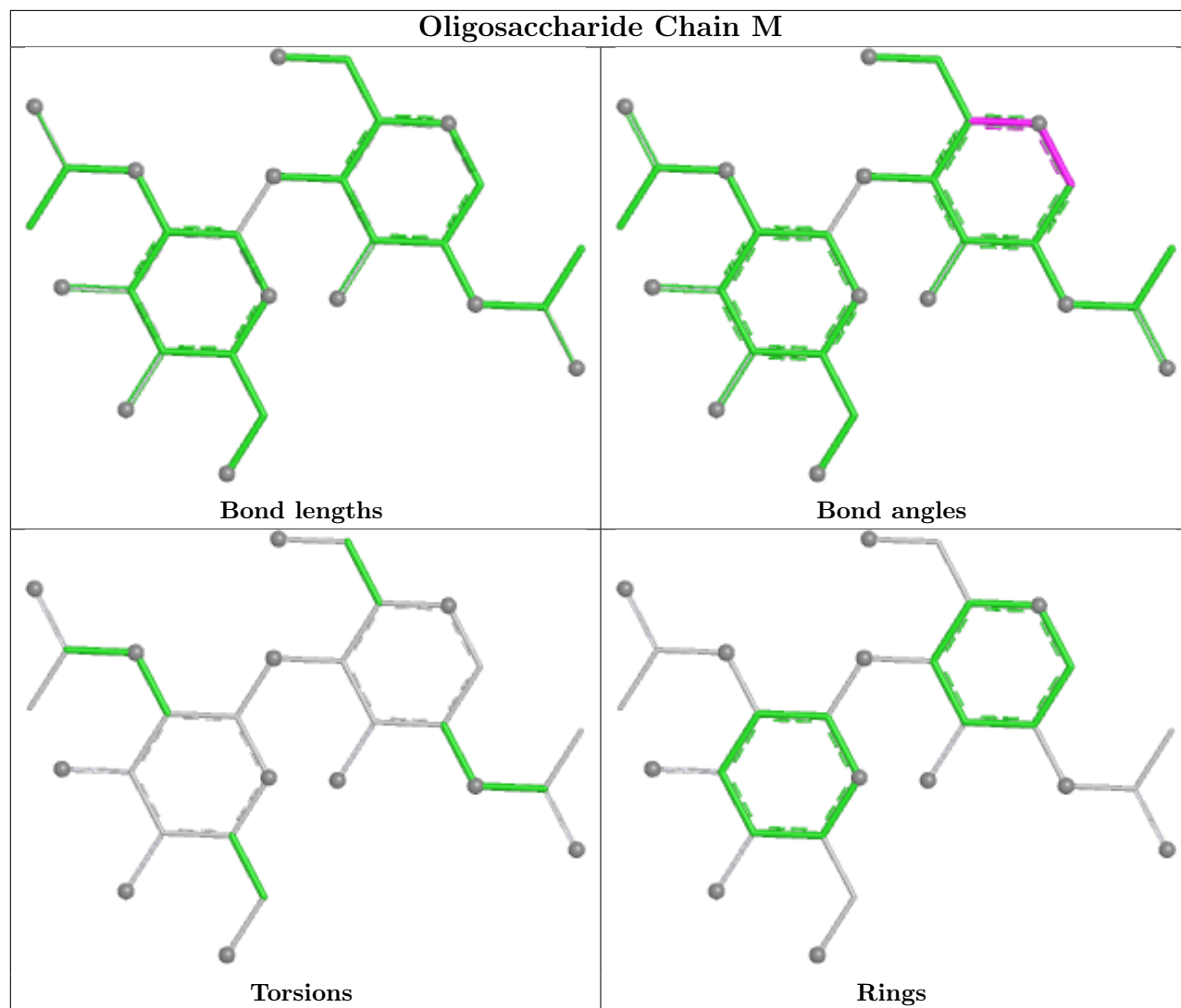


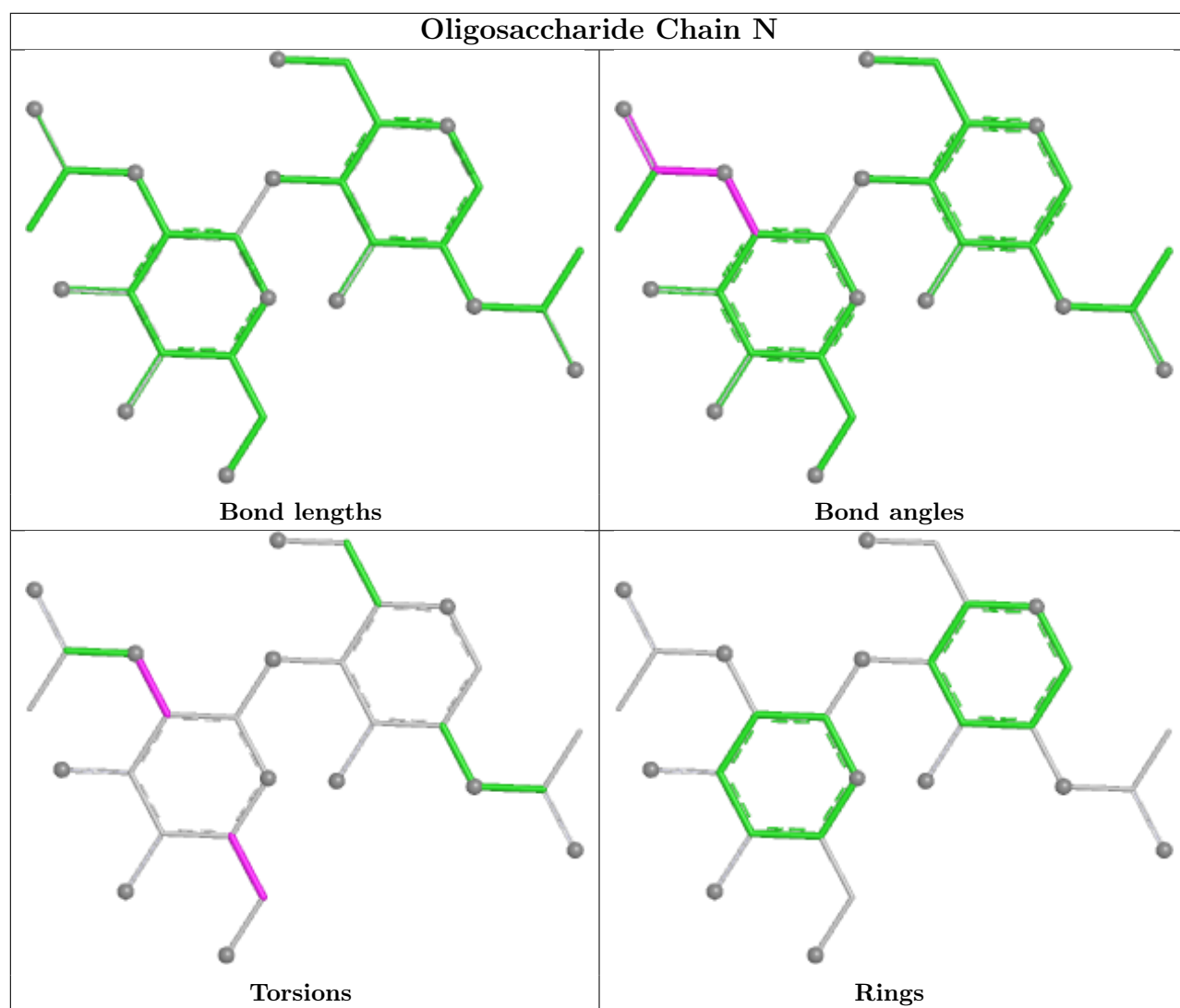


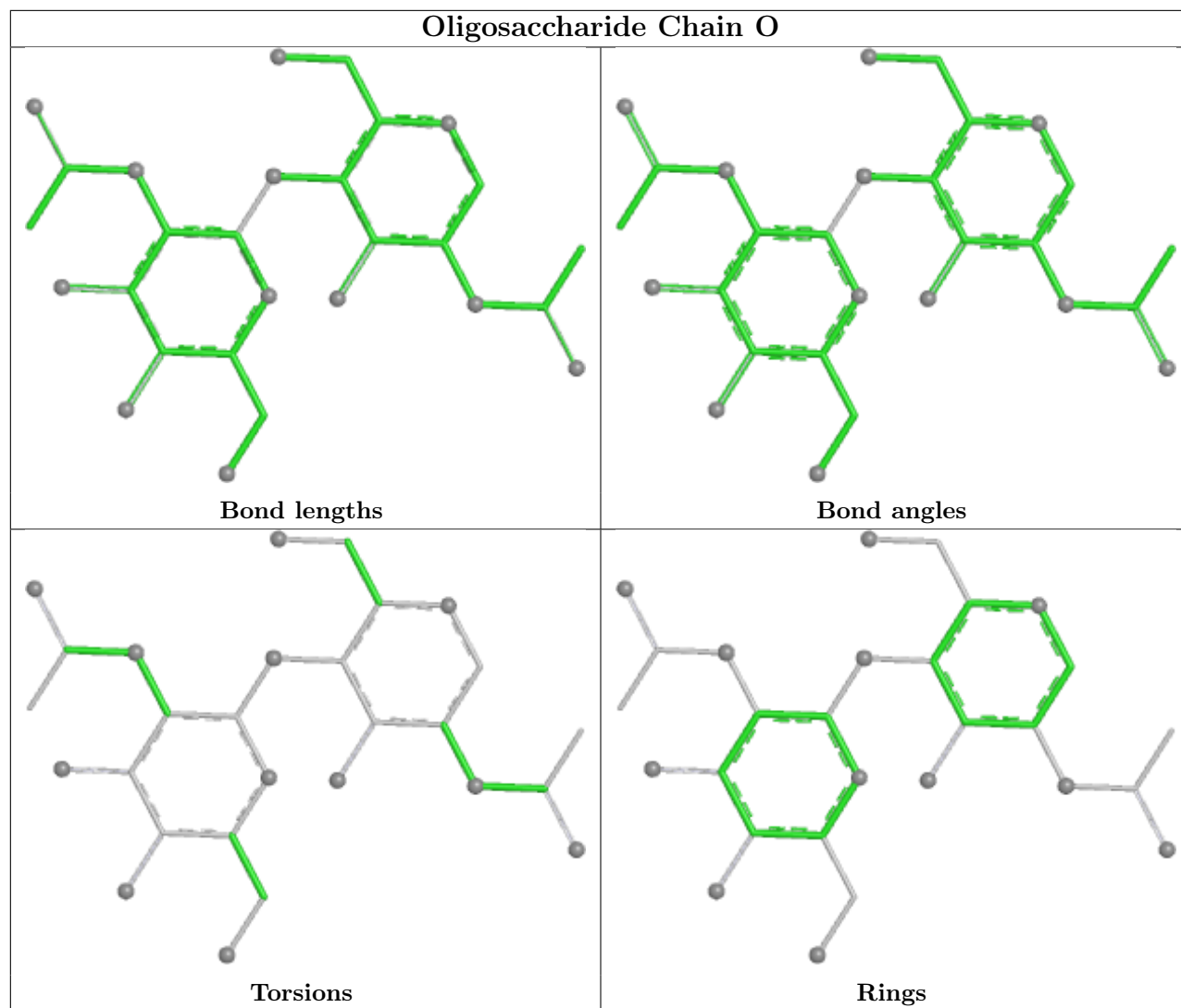


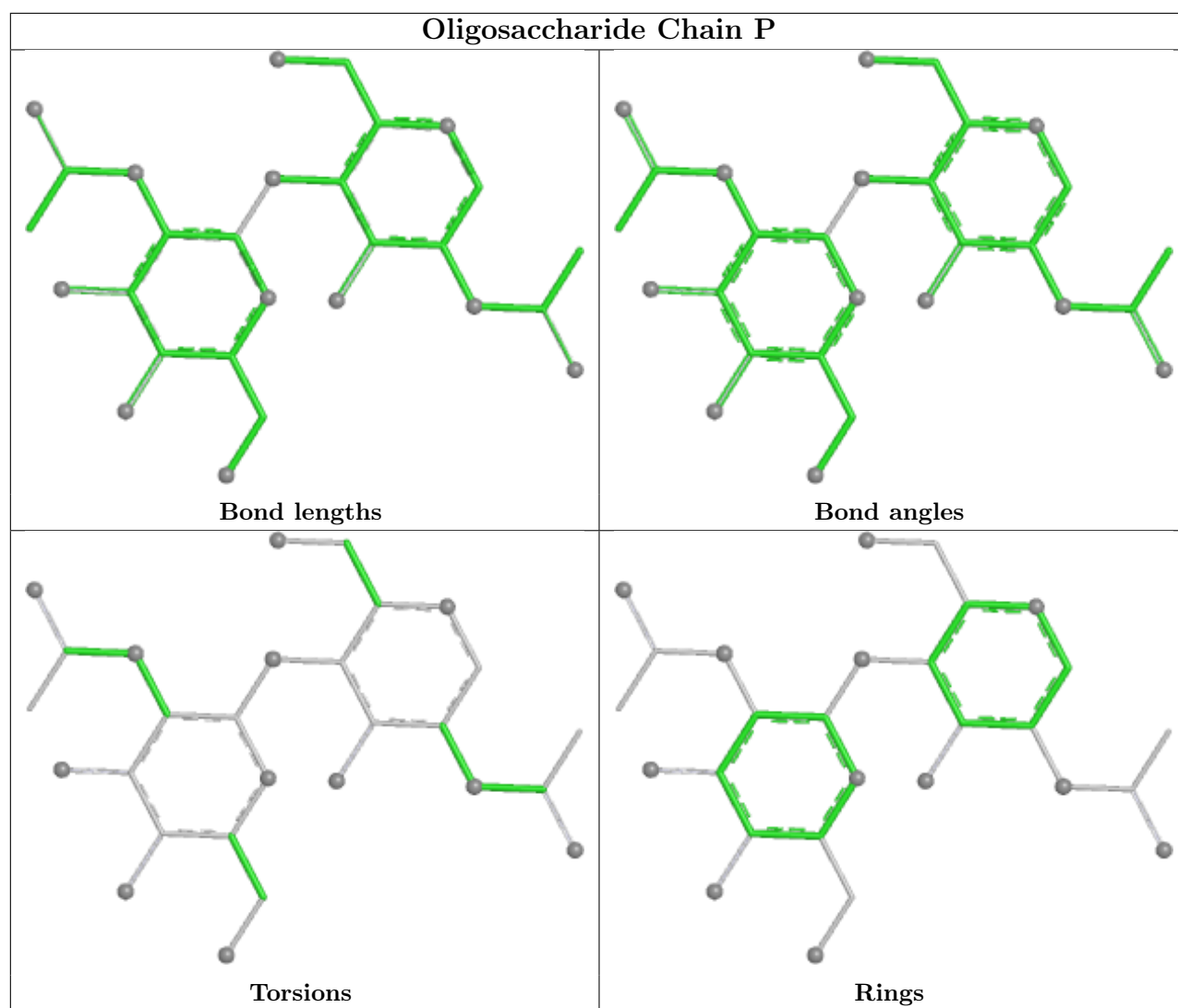


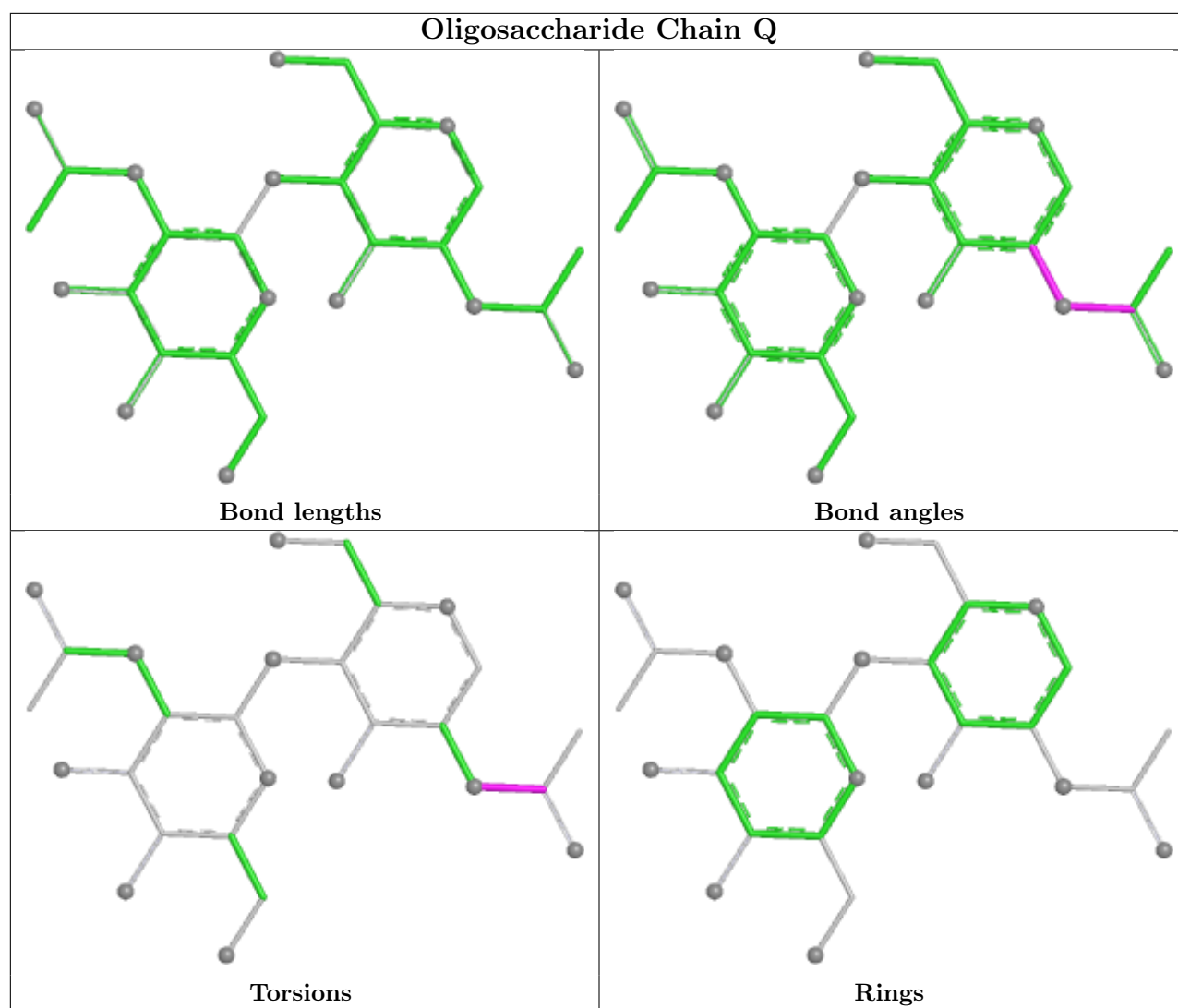


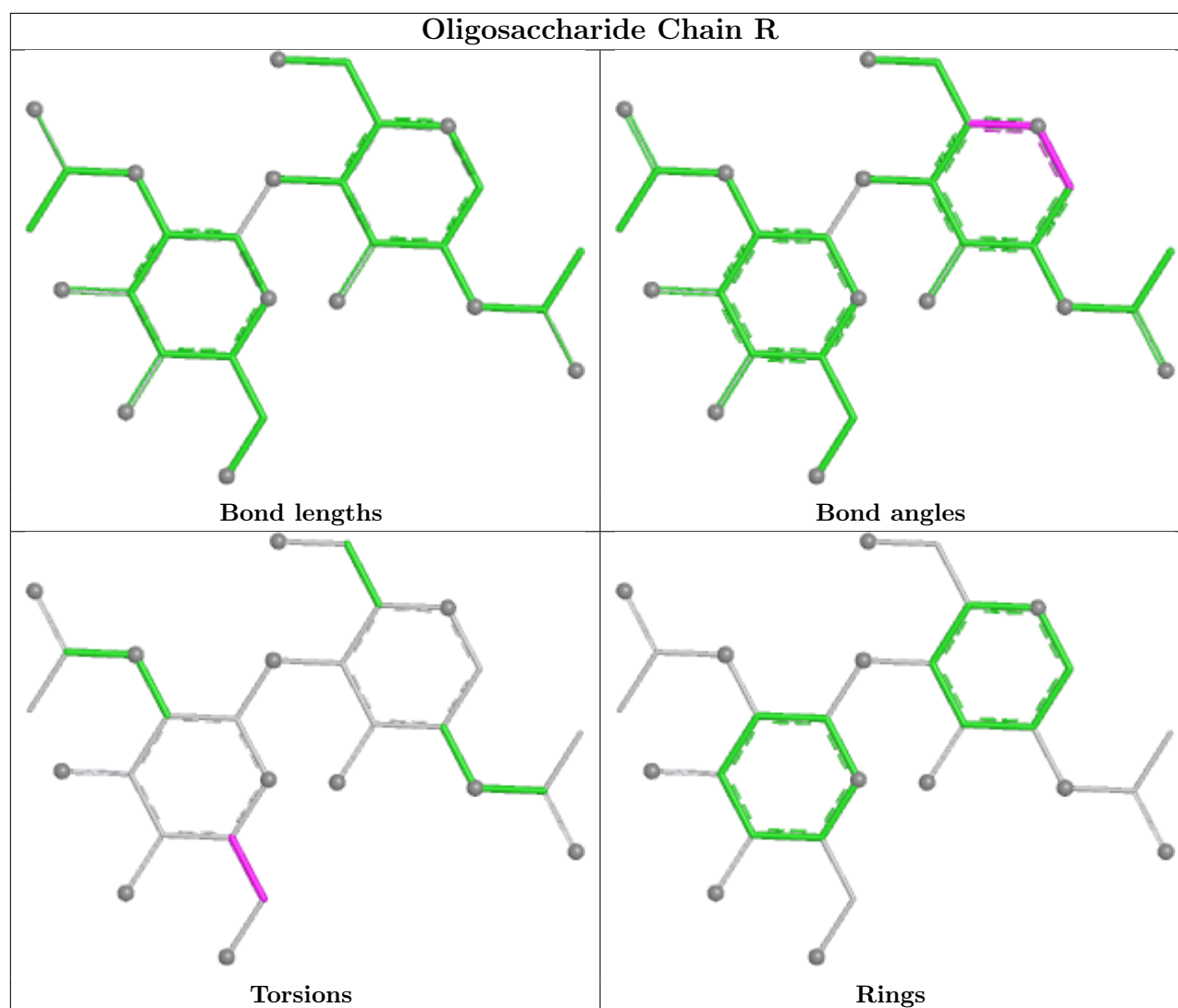












5.6 Ligand geometry [i](#)

45 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	$\# Z > 2$
3	NAG	A	1313	1	14,14,15	0.70	0	17,19,21	0.87	0
3	NAG	B	1310	1	14,14,15	0.68	0	17,19,21	1.17	1 (5%)
3	NAG	C	1306	1	14,14,15	0.72	0	17,19,21	0.95	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	NAG	A	1301	1	14,14,15	0.71	0	17,19,21	0.91	1 (5%)
3	NAG	A	1315	1	14,14,15	0.70	0	17,19,21	1.50	2 (11%)
3	NAG	B	1302	1	14,14,15	0.69	0	17,19,21	0.85	0
3	NAG	B	1309	1	14,14,15	0.72	0	17,19,21	1.50	2 (11%)
3	NAG	C	1314	1	14,14,15	0.71	0	17,19,21	0.89	1 (5%)
3	NAG	B	1301	1	14,14,15	0.73	0	17,19,21	0.91	1 (5%)
3	NAG	A	1309	1	14,14,15	0.77	0	17,19,21	0.82	0
4	BLR	B	1315	-	46,46,46	1.25	4 (8%)	66,67,67	1.00	3 (4%)
3	NAG	A	1311	1	14,14,15	0.71	0	17,19,21	0.86	0
3	NAG	C	1307	1	14,14,15	0.74	0	17,19,21	1.60	2 (11%)
3	NAG	B	1305	1	14,14,15	0.68	0	17,19,21	1.08	2 (11%)
3	NAG	B	1312	1	14,14,15	0.70	0	17,19,21	0.85	0
3	NAG	C	1302	1	14,14,15	0.68	0	17,19,21	1.05	1 (5%)
3	NAG	A	1307	1	14,14,15	0.75	0	17,19,21	1.65	2 (11%)
4	BLR	A	1314	-	46,46,46	1.25	3 (6%)	66,67,67	1.00	3 (4%)
3	NAG	B	1303	1	14,14,15	0.73	0	17,19,21	1.00	1 (5%)
3	NAG	C	1308	1	14,14,15	0.70	0	17,19,21	0.94	1 (5%)
3	NAG	C	1311	1	14,14,15	0.70	0	17,19,21	1.50	2 (11%)
3	NAG	C	1309	1	14,14,15	0.43	0	17,19,21	0.83	1 (5%)
3	NAG	A	1303	1	14,14,15	0.72	0	17,19,21	0.97	1 (5%)
3	NAG	C	1301	1	14,14,15	0.69	0	17,19,21	0.94	1 (5%)
3	NAG	A	1308	1	14,14,15	0.69	0	17,19,21	1.01	1 (5%)
3	NAG	C	1312	1	14,14,15	0.69	0	17,19,21	0.83	0
3	NAG	C	1305	1	14,14,15	0.68	0	17,19,21	1.11	2 (11%)
4	BLR	C	1315	-	46,46,46	1.24	3 (6%)	66,67,67	1.01	3 (4%)
3	NAG	B	1311	1	14,14,15	0.73	0	17,19,21	1.52	2 (11%)
3	NAG	A	1304	1	14,14,15	0.71	0	17,19,21	1.03	1 (5%)
3	NAG	A	1310	1	14,14,15	0.70	0	17,19,21	1.51	2 (11%)
3	NAG	A	1302	1	14,14,15	0.70	0	17,19,21	0.86	0
3	NAG	C	1313	1	14,14,15	0.71	0	17,19,21	0.85	0
3	NAG	B	1306	1	14,14,15	0.72	0	17,19,21	0.90	1 (5%)
3	NAG	C	1303	1	14,14,15	0.72	0	17,19,21	1.07	1 (5%)
3	NAG	A	1306	1	14,14,15	0.70	0	17,19,21	0.75	0
3	NAG	B	1314	1	14,14,15	0.69	0	17,19,21	0.88	0
3	NAG	C	1304	1	14,14,15	0.68	0	17,19,21	1.03	1 (5%)
3	NAG	A	1312	1	14,14,15	0.69	0	17,19,21	0.80	0
3	NAG	B	1304	1	14,14,15	0.67	0	17,19,21	2.57	4 (23%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	NAG	B	1313	1	14,14,15	0.70	0	17,19,21	0.82	0
3	NAG	C	1310	1	14,14,15	0.75	0	17,19,21	0.79	0
3	NAG	B	1308	1	14,14,15	0.71	0	17,19,21	0.98	1 (5%)
3	NAG	B	1307	1	14,14,15	0.73	0	17,19,21	1.06	1 (5%)
3	NAG	A	1305	1	14,14,15	0.67	0	17,19,21	1.04	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
3	NAG	A	1313	1	-	0/6/23/26	0/1/1/1
3	NAG	B	1310	1	-	0/6/23/26	0/1/1/1
3	NAG	C	1306	1	-	0/6/23/26	0/1/1/1
3	NAG	A	1301	1	-	0/6/23/26	0/1/1/1
3	NAG	A	1315	1	-	2/6/23/26	0/1/1/1
3	NAG	B	1302	1	-	0/6/23/26	0/1/1/1
3	NAG	B	1309	1	-	2/6/23/26	0/1/1/1
3	NAG	C	1314	1	-	1/6/23/26	0/1/1/1
3	NAG	B	1301	1	-	0/6/23/26	0/1/1/1
3	NAG	A	1309	1	-	0/6/23/26	0/1/1/1
4	BLR	B	1315	-	-	6/26/58/58	0/4/4/4
3	NAG	A	1311	1	-	1/6/23/26	0/1/1/1
3	NAG	C	1307	1	-	3/6/23/26	0/1/1/1
3	NAG	B	1305	1	-	3/6/23/26	0/1/1/1
3	NAG	B	1312	1	-	0/6/23/26	0/1/1/1
3	NAG	C	1302	1	-	2/6/23/26	0/1/1/1
3	NAG	A	1307	1	-	3/6/23/26	0/1/1/1
4	BLR	A	1314	-	-	8/26/58/58	0/4/4/4
3	NAG	B	1303	1	-	1/6/23/26	0/1/1/1
3	NAG	C	1308	1	-	1/6/23/26	0/1/1/1
3	NAG	C	1311	1	-	2/6/23/26	0/1/1/1
3	NAG	C	1309	1	-	0/6/23/26	0/1/1/1
3	NAG	A	1303	1	-	1/6/23/26	0/1/1/1
3	NAG	C	1301	1	-	1/6/23/26	0/1/1/1
3	NAG	A	1308	1	-	0/6/23/26	0/1/1/1
3	NAG	C	1312	1	-	0/6/23/26	0/1/1/1
3	NAG	C	1305	1	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	BLR	C	1315	-	-	4/26/58/58	0/4/4/4
3	NAG	B	1311	1	-	4/6/23/26	0/1/1/1
3	NAG	A	1304	1	-	2/6/23/26	0/1/1/1
3	NAG	A	1310	1	-	3/6/23/26	0/1/1/1
3	NAG	A	1302	1	-	1/6/23/26	0/1/1/1
3	NAG	C	1313	1	-	0/6/23/26	0/1/1/1
3	NAG	B	1306	1	-	0/6/23/26	0/1/1/1
3	NAG	C	1303	1	-	0/6/23/26	0/1/1/1
3	NAG	A	1306	1	-	0/6/23/26	0/1/1/1
3	NAG	B	1314	1	-	0/6/23/26	0/1/1/1
3	NAG	C	1304	1	-	2/6/23/26	0/1/1/1
3	NAG	A	1312	1	-	0/6/23/26	0/1/1/1
3	NAG	B	1304	1	-	2/6/23/26	0/1/1/1
3	NAG	B	1313	1	-	1/6/23/26	0/1/1/1
3	NAG	C	1310	1	-	1/6/23/26	0/1/1/1
3	NAG	B	1308	1	-	1/6/23/26	0/1/1/1
3	NAG	B	1307	1	-	2/6/23/26	0/1/1/1
3	NAG	A	1305	1	-	2/6/23/26	0/1/1/1

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	1314	BLR	C1D-ND	-3.78	1.31	1.37
4	B	1315	BLR	C1D-ND	-3.77	1.31	1.37
4	C	1315	BLR	C1D-ND	-3.71	1.31	1.37
4	B	1315	BLR	CHA-C4D	-2.98	1.37	1.49
4	C	1315	BLR	CHA-C4D	-2.94	1.38	1.49
4	A	1314	BLR	CHA-C4D	-2.93	1.38	1.49
4	A	1314	BLR	C4D-C3D	2.53	1.45	1.39
4	C	1315	BLR	C4D-C3D	2.49	1.45	1.39
4	B	1315	BLR	C4D-C3D	2.47	1.45	1.39
4	B	1315	BLR	CHD-C1D	2.00	1.44	1.40

All (50) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	1304	NAG	C1-O5-C5	8.86	124.06	112.19
3	A	1310	NAG	C2-N2-C7	4.55	129.00	122.90
3	C	1311	NAG	C2-N2-C7	4.53	128.97	122.90
3	A	1315	NAG	C2-N2-C7	4.52	128.96	122.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1307	NAG	C2-N2-C7	4.52	128.96	122.90
3	B	1311	NAG	C2-N2-C7	4.50	128.93	122.90
3	B	1309	NAG	C2-N2-C7	4.49	128.92	122.90
3	C	1307	NAG	C2-N2-C7	4.44	128.85	122.90
3	B	1310	NAG	O5-C1-C2	-3.91	105.25	111.29
3	B	1304	NAG	O5-C1-C2	3.37	116.51	111.29
4	C	1315	BLR	C4D-CHA-C1A	3.14	127.88	115.77
4	B	1315	BLR	C4D-CHA-C1A	3.11	127.77	115.77
4	A	1314	BLR	C4D-CHA-C1A	3.09	127.68	115.77
3	C	1303	NAG	C1-O5-C5	3.02	116.23	112.19
3	C	1304	NAG	C2-N2-C7	2.89	126.77	122.90
3	B	1307	NAG	C2-N2-C7	2.88	126.77	122.90
3	C	1309	NAG	O5-C1-C2	2.85	115.71	111.29
3	B	1304	NAG	C2-N2-C7	2.80	126.65	122.90
3	C	1305	NAG	C2-N2-C7	2.80	126.65	122.90
3	B	1305	NAG	C2-N2-C7	2.80	126.65	122.90
3	A	1304	NAG	C2-N2-C7	2.78	126.63	122.90
3	C	1302	NAG	C2-N2-C7	2.69	126.51	122.90
3	B	1308	NAG	C1-O5-C5	2.69	115.80	112.19
3	A	1307	NAG	O5-C1-C2	-2.69	107.13	111.29
3	A	1308	NAG	C1-O5-C5	2.69	115.79	112.19
4	A	1314	BLR	C2D-C1D-ND	2.68	111.09	107.43
4	C	1315	BLR	C2D-C1D-ND	2.68	111.08	107.43
4	B	1315	BLR	C2D-C1D-ND	2.65	111.04	107.43
3	A	1305	NAG	C2-N2-C7	2.57	126.35	122.90
3	B	1303	NAG	C1-O5-C5	2.49	115.53	112.19
3	C	1308	NAG	C1-O5-C5	2.47	115.50	112.19
3	C	1301	NAG	C1-O5-C5	2.42	115.43	112.19
3	C	1306	NAG	C1-O5-C5	2.40	115.41	112.19
4	C	1315	BLR	O2D-CGD-CBD	-2.38	115.55	123.09
4	B	1315	BLR	O2D-CGD-CBD	-2.35	115.63	123.09
4	A	1314	BLR	O2D-CGD-CBD	-2.35	115.65	123.09
3	C	1307	NAG	O5-C1-C2	-2.33	107.69	111.29
3	A	1303	NAG	C1-O5-C5	2.31	115.29	112.19
3	C	1305	NAG	C1-O5-C5	2.19	115.12	112.19
3	B	1301	NAG	C1-O5-C5	2.18	115.11	112.19
3	B	1304	NAG	C3-C4-C5	-2.18	106.29	110.23
3	A	1301	NAG	C1-O5-C5	2.17	115.09	112.19
3	B	1306	NAG	C1-O5-C5	2.12	115.03	112.19
3	B	1305	NAG	C1-O5-C5	2.11	115.02	112.19
3	B	1311	NAG	O7-C7-N2	2.09	125.68	121.98
3	C	1311	NAG	O7-C7-N2	2.08	125.66	121.98

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1310	NAG	O7-C7-N2	2.08	125.66	121.98
3	A	1315	NAG	O7-C7-N2	2.08	125.65	121.98
3	C	1314	NAG	C1-O5-C5	2.08	114.97	112.19
3	B	1309	NAG	O7-C7-N2	2.05	125.60	121.98

There are no chirality outliers.

All (64) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	1315	BLR	C2C-C3C-CAC-CBC
4	C	1315	BLR	C2C-C3C-CAC-CBC
3	A	1304	NAG	C8-C7-N2-C2
3	A	1304	NAG	O7-C7-N2-C2
3	A	1305	NAG	C8-C7-N2-C2
3	A	1305	NAG	O7-C7-N2-C2
3	B	1304	NAG	C8-C7-N2-C2
3	B	1304	NAG	O7-C7-N2-C2
3	B	1305	NAG	C8-C7-N2-C2
3	B	1305	NAG	O7-C7-N2-C2
3	B	1307	NAG	C8-C7-N2-C2
3	B	1307	NAG	O7-C7-N2-C2
3	C	1302	NAG	C8-C7-N2-C2
3	C	1302	NAG	O7-C7-N2-C2
3	C	1304	NAG	C8-C7-N2-C2
3	C	1304	NAG	O7-C7-N2-C2
3	C	1305	NAG	C8-C7-N2-C2
3	C	1305	NAG	O7-C7-N2-C2
3	B	1311	NAG	O5-C5-C6-O6
4	A	1314	BLR	C2C-C3C-CAC-CBC
3	C	1307	NAG	O5-C5-C6-O6
3	C	1308	NAG	O5-C5-C6-O6
4	A	1314	BLR	C4C-C3C-CAC-CBC
4	B	1315	BLR	C4C-C3C-CAC-CBC
4	C	1315	BLR	C4C-C3C-CAC-CBC
3	C	1301	NAG	O5-C5-C6-O6
3	C	1314	NAG	O5-C5-C6-O6
3	A	1307	NAG	O5-C5-C6-O6
3	A	1310	NAG	O5-C5-C6-O6
3	B	1308	NAG	O5-C5-C6-O6
3	B	1305	NAG	O5-C5-C6-O6
3	A	1311	NAG	O5-C5-C6-O6
3	A	1302	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
3	B	1313	NAG	O5-C5-C6-O6
3	B	1303	NAG	O5-C5-C6-O6
3	C	1310	NAG	O5-C5-C6-O6
3	A	1303	NAG	O5-C5-C6-O6
3	A	1310	NAG	C1-C2-N2-C7
3	C	1311	NAG	C1-C2-N2-C7
3	B	1311	NAG	C4-C5-C6-O6
3	A	1307	NAG	C3-C2-N2-C7
4	A	1314	BLR	ND-C1D-CHD-C4C
4	A	1314	BLR	CAA-CBA-CGA-O2A
4	C	1315	BLR	CAD-CBD-CGD-O2D
4	C	1315	BLR	CAD-CBD-CGD-O1D
4	A	1314	BLR	CAA-CBA-CGA-O1A
4	B	1315	BLR	CAA-CBA-CGA-O2A
3	A	1307	NAG	C1-C2-N2-C7
3	A	1315	NAG	C1-C2-N2-C7
3	B	1309	NAG	C1-C2-N2-C7
3	B	1311	NAG	C1-C2-N2-C7
3	C	1307	NAG	C1-C2-N2-C7
4	B	1315	BLR	CAA-CBA-CGA-O1A
3	A	1310	NAG	C3-C2-N2-C7
3	A	1315	NAG	C3-C2-N2-C7
3	B	1309	NAG	C3-C2-N2-C7
3	B	1311	NAG	C3-C2-N2-C7
3	C	1307	NAG	C3-C2-N2-C7
3	C	1311	NAG	C3-C2-N2-C7
4	A	1314	BLR	CAD-CBD-CGD-O1D
4	A	1314	BLR	CAD-CBD-CGD-O2D
4	B	1315	BLR	CAD-CBD-CGD-O1D
4	B	1315	BLR	CAD-CBD-CGD-O2D
4	A	1314	BLR	C2D-C1D-CHD-C4C

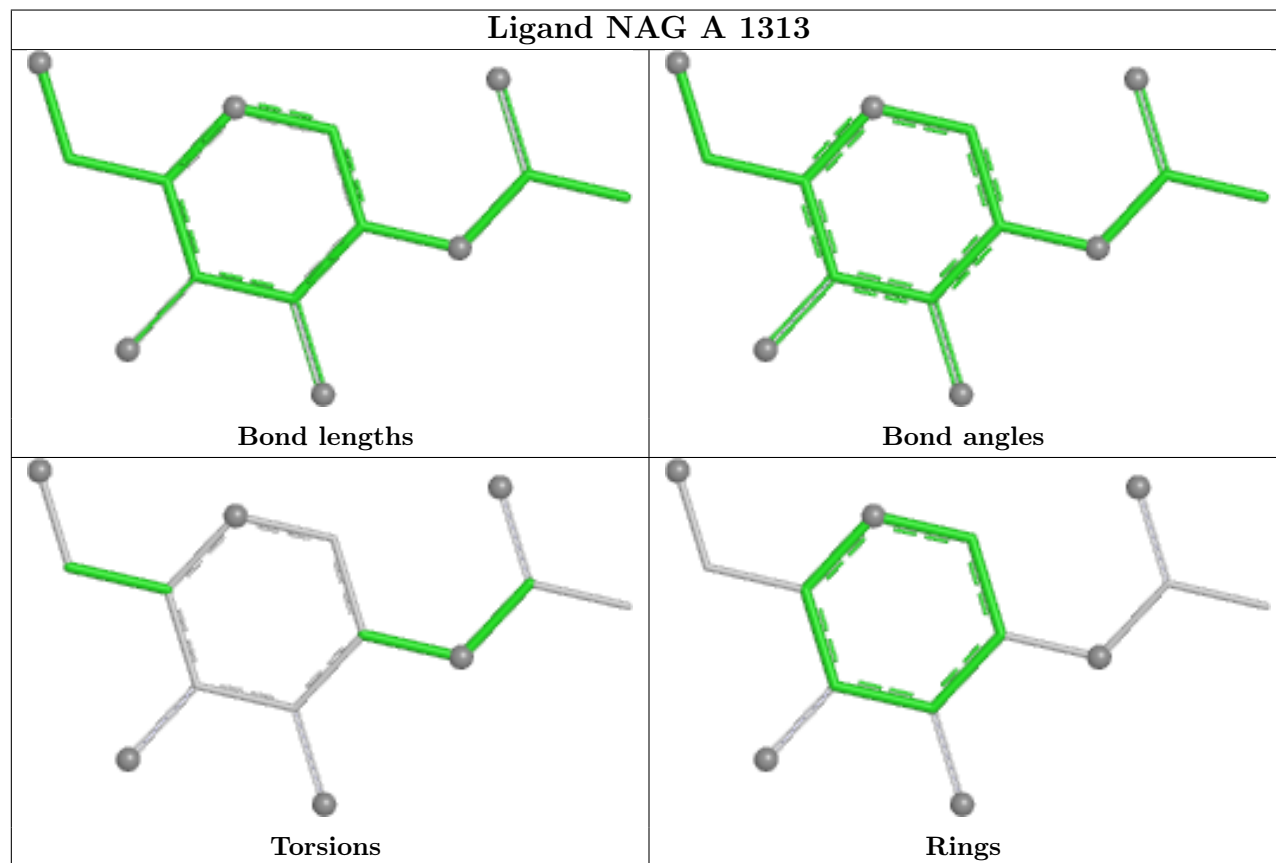
There are no ring outliers.

3 monomers are involved in 5 short contacts:

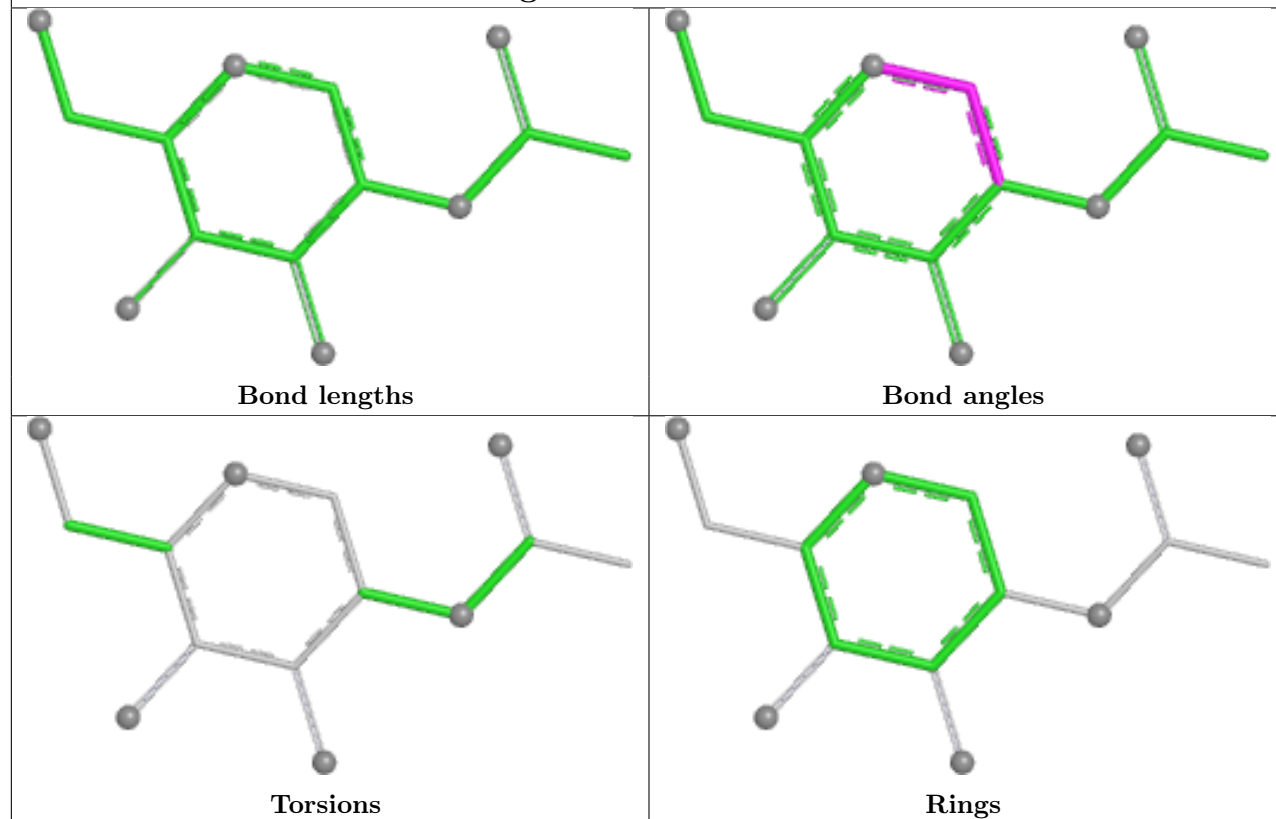
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	1315	BLR	2	0
4	A	1314	BLR	2	0
4	C	1315	BLR	1	0

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

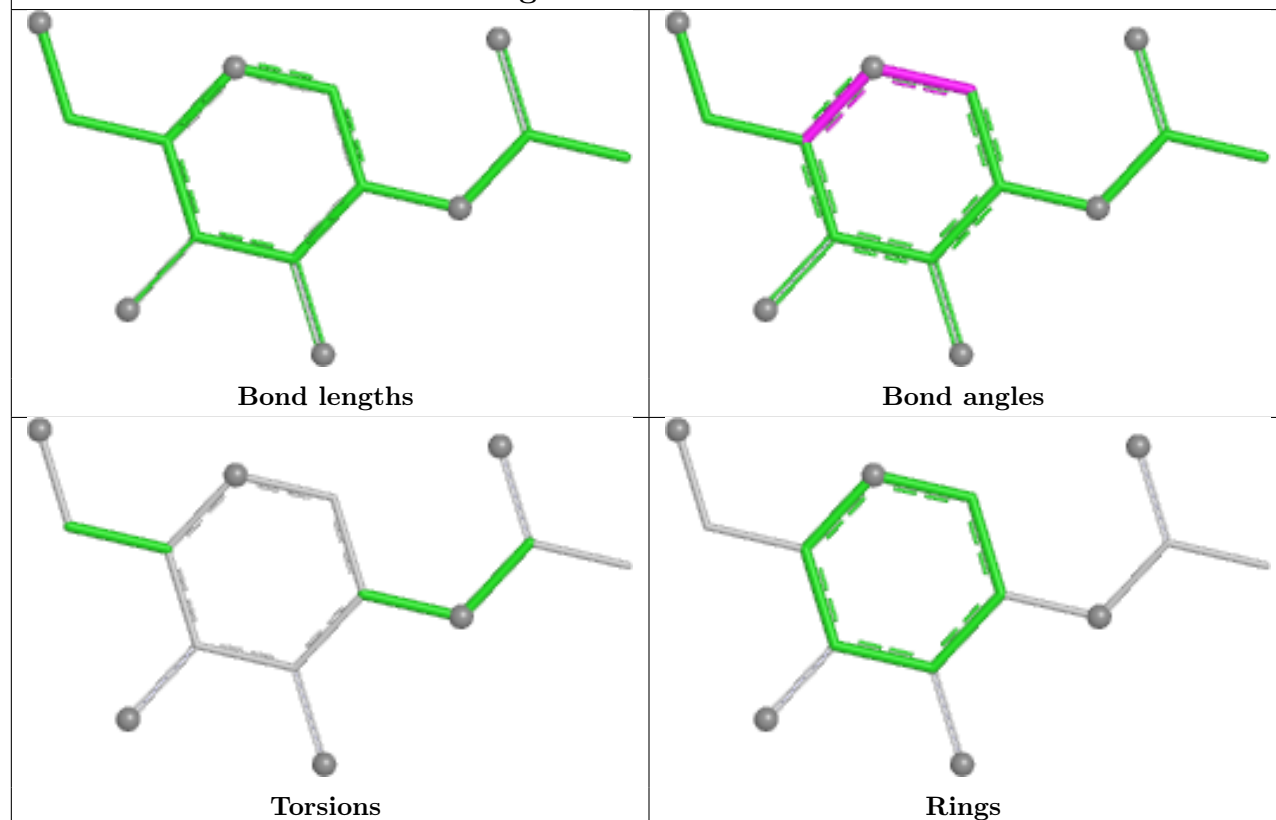
addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. 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.



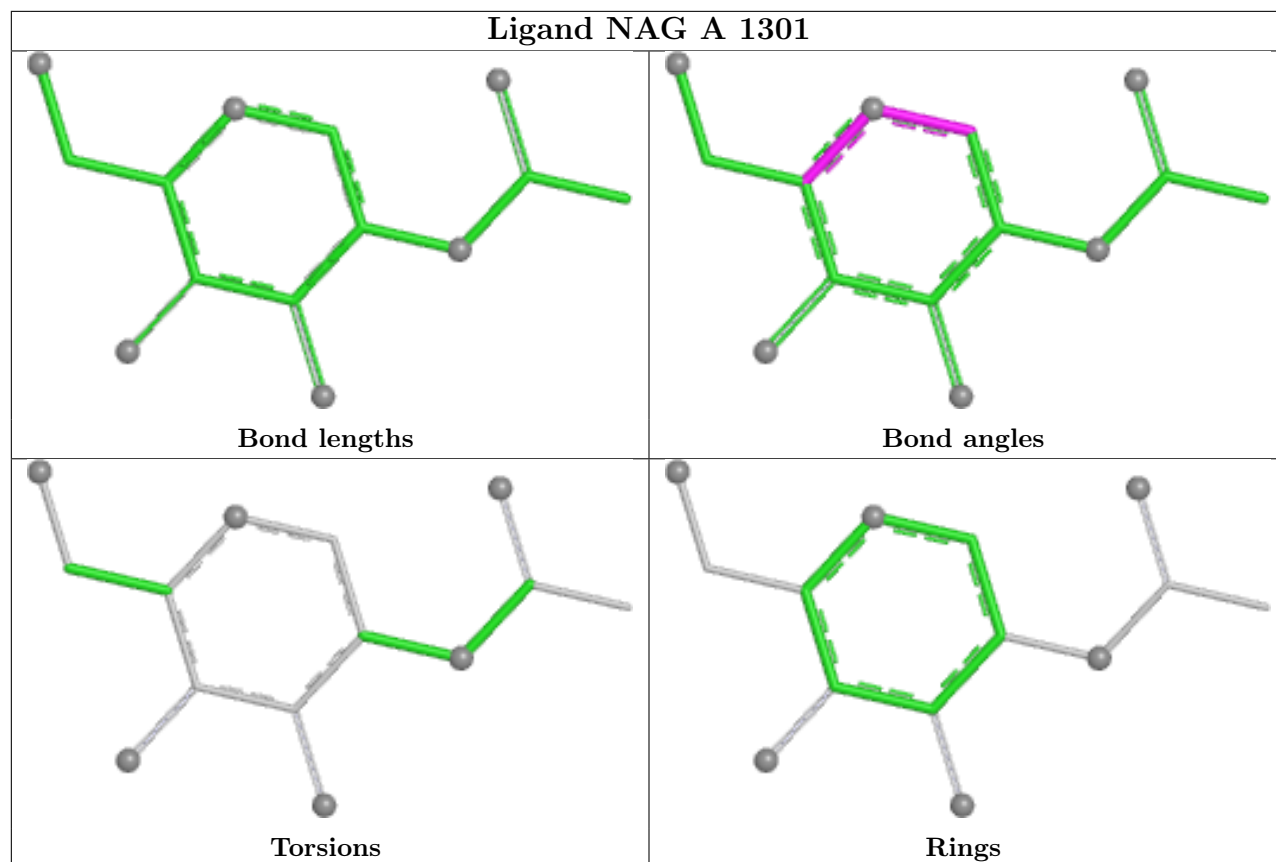
Ligand NAG B 1310



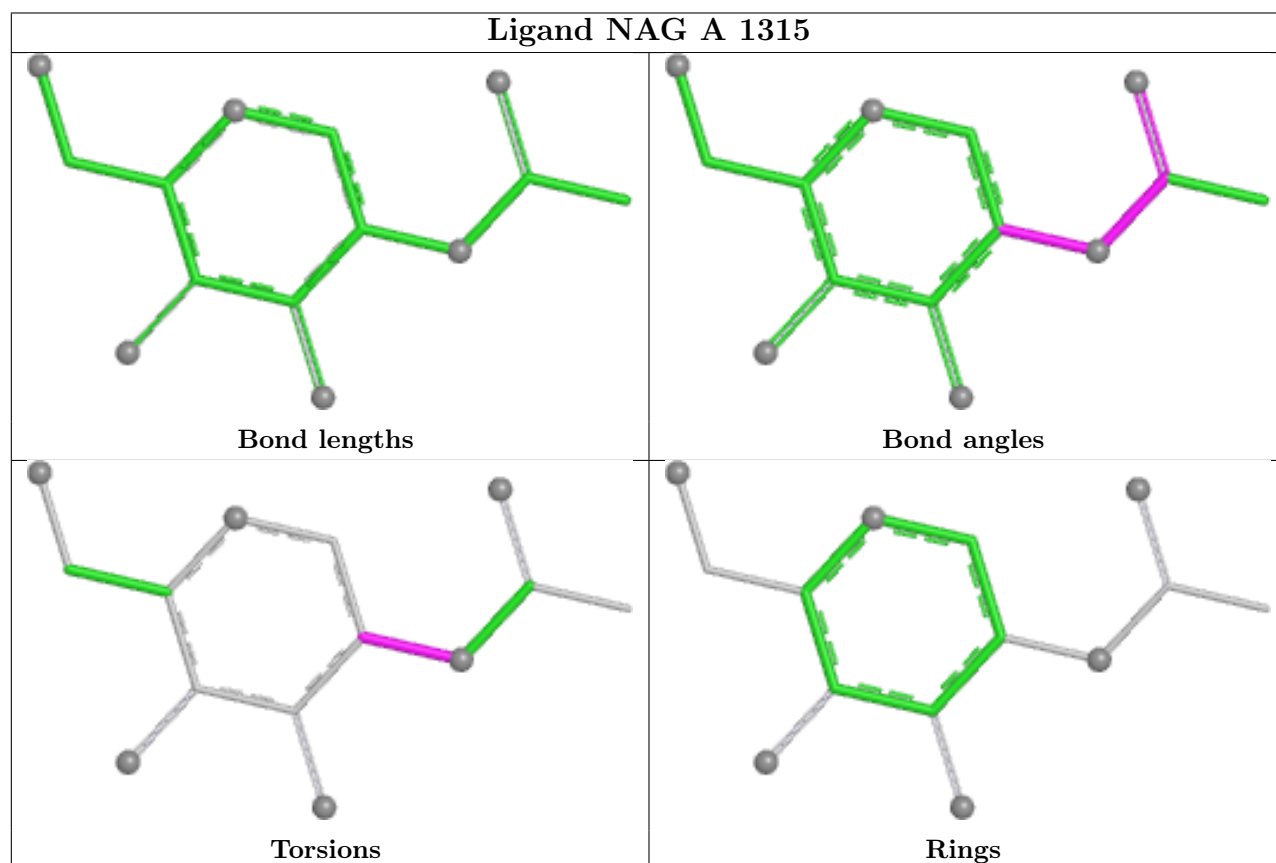
Ligand NAG C 1306



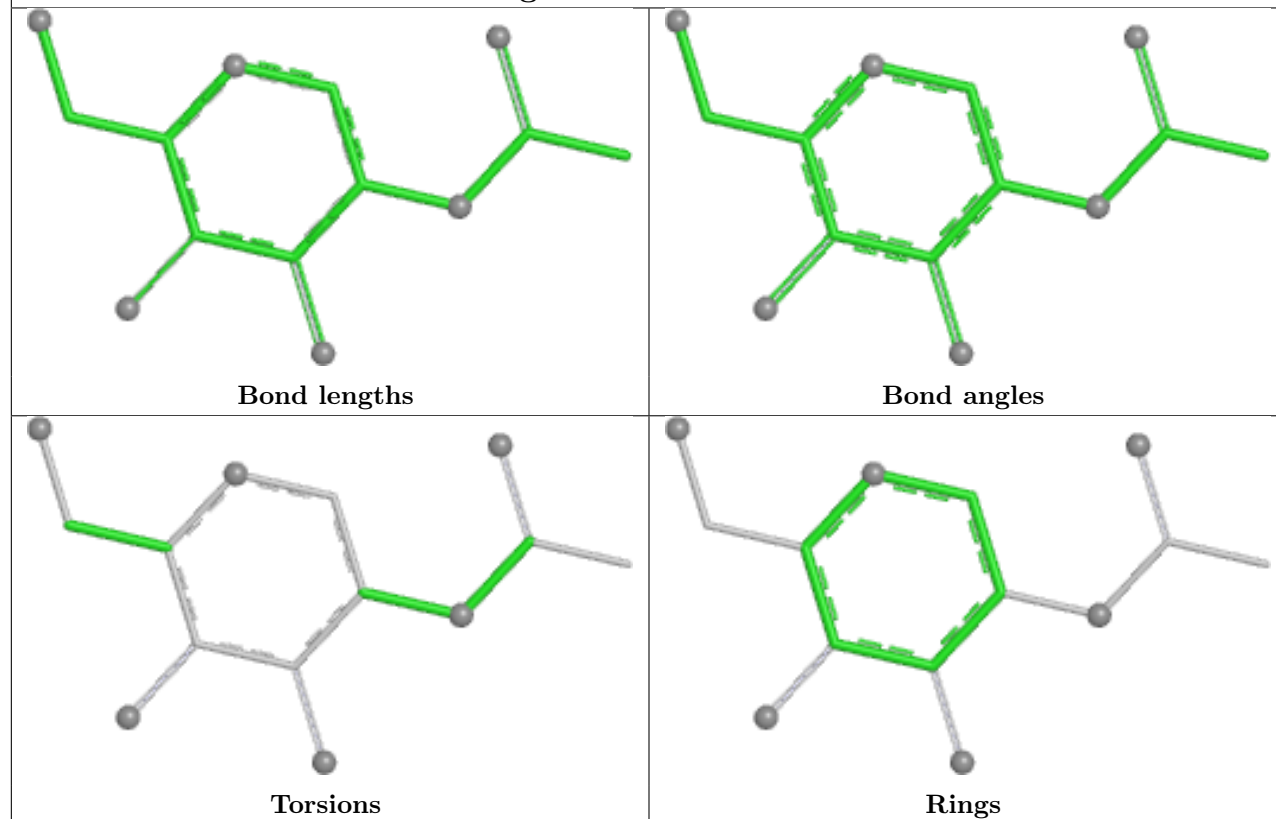
Ligand NAG A 1301



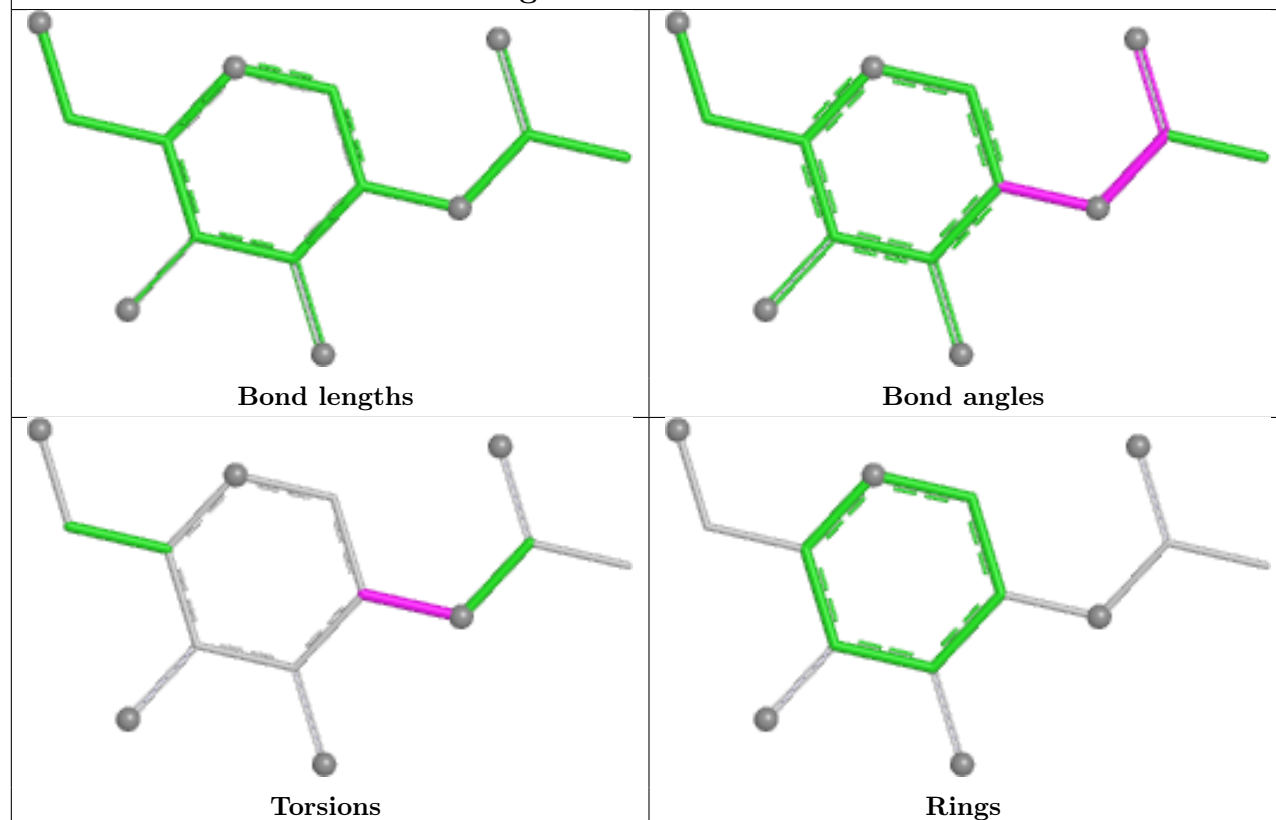
Ligand NAG A 1315



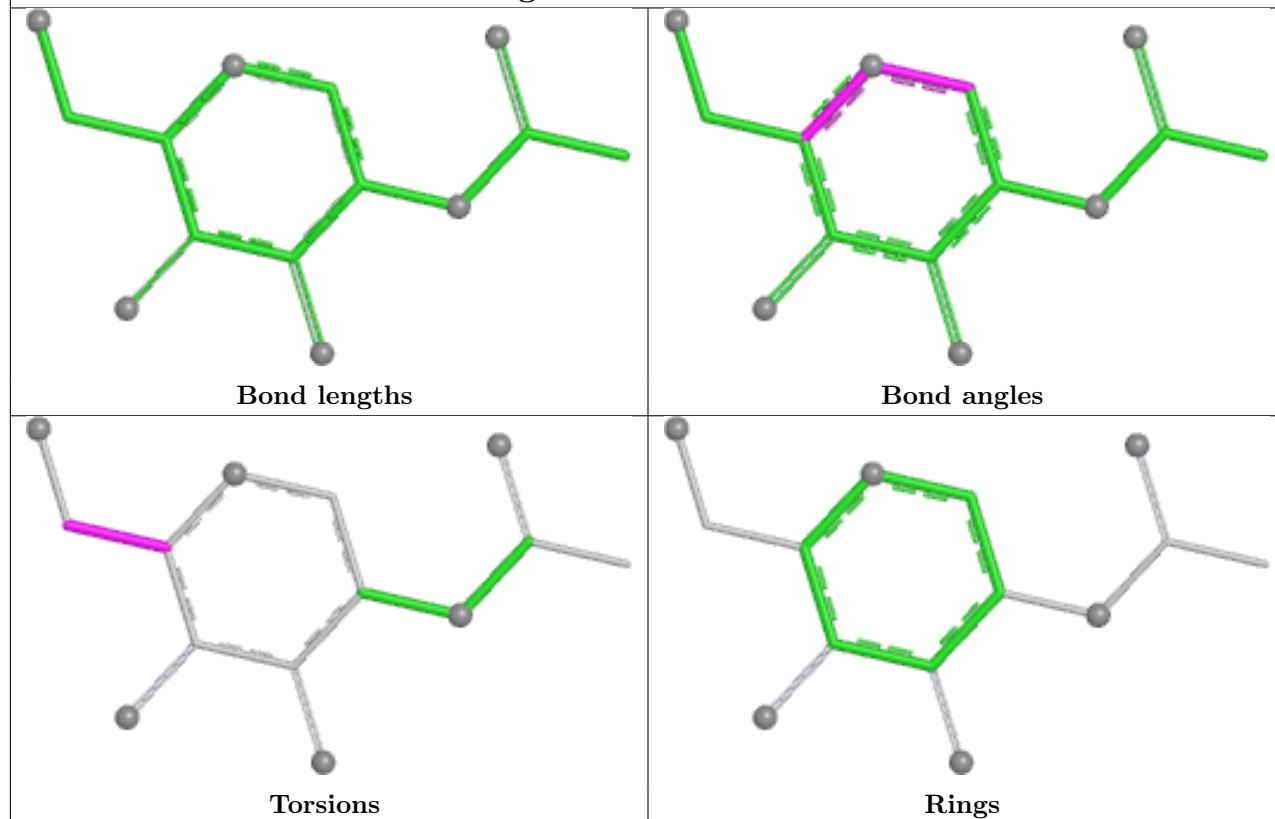
Ligand NAG B 1302



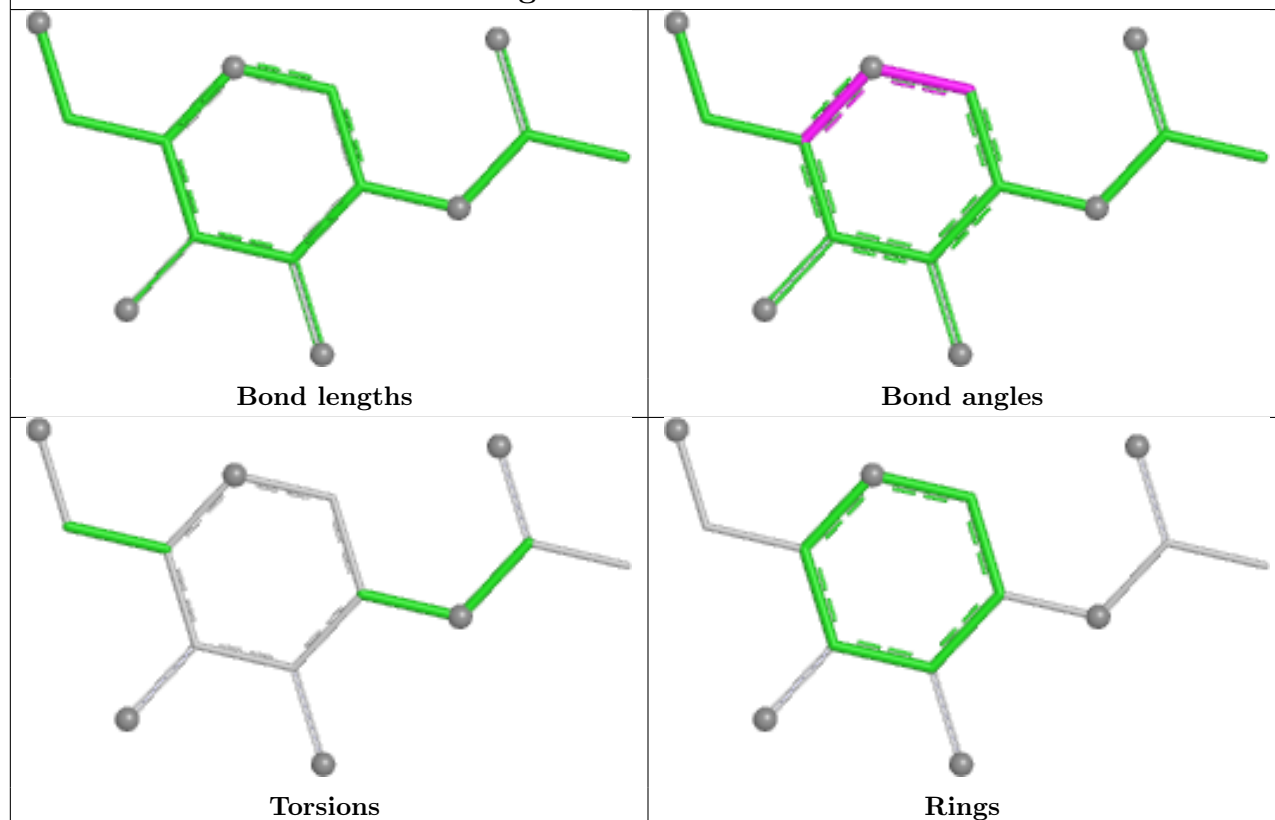
Ligand NAG B 1309



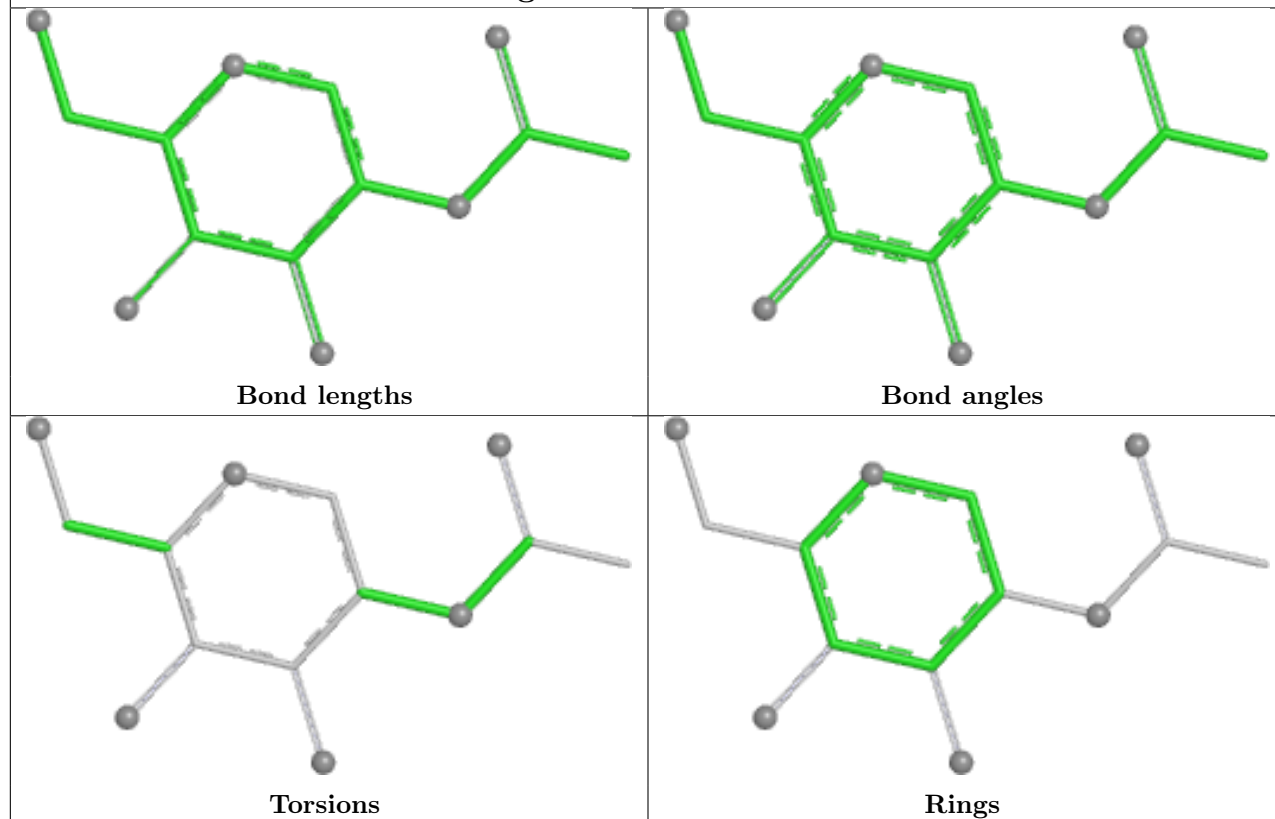
Ligand NAG C 1314



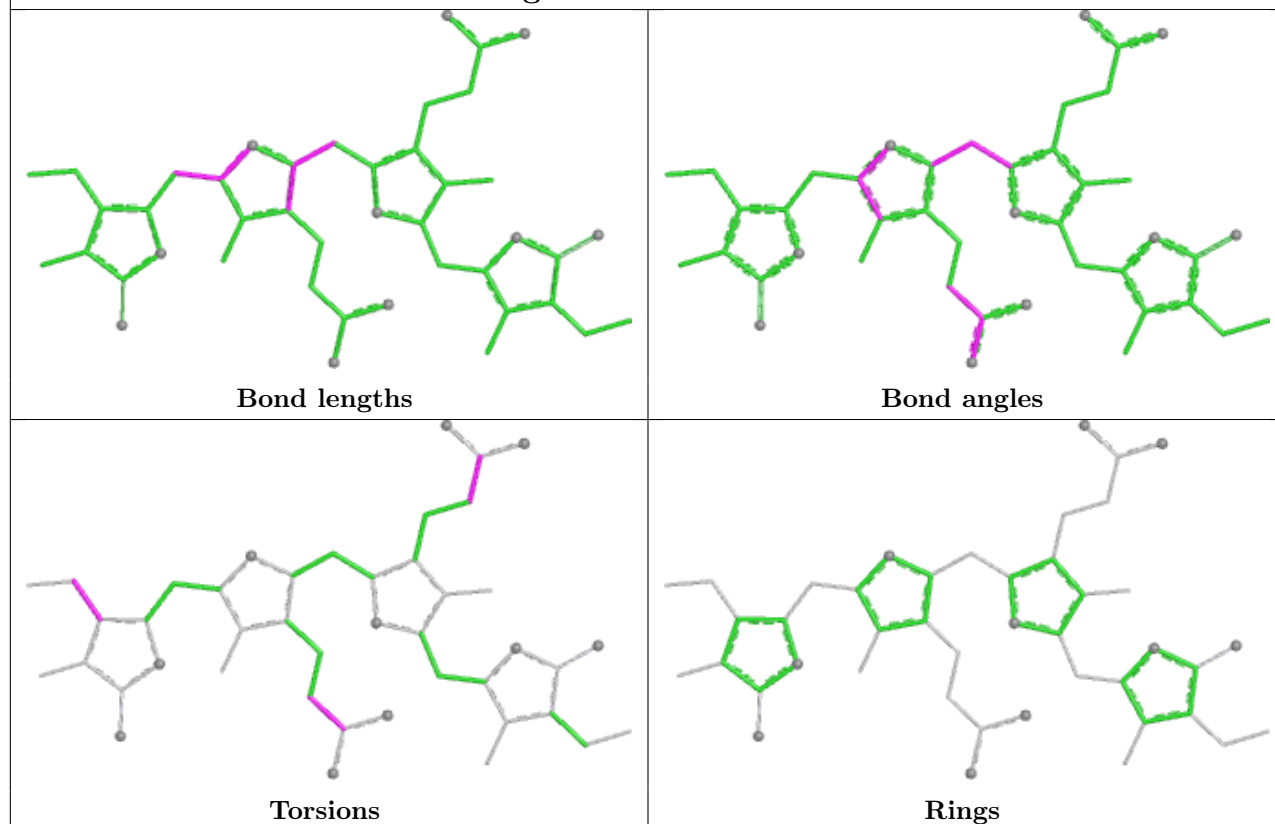
Ligand NAG B 1301



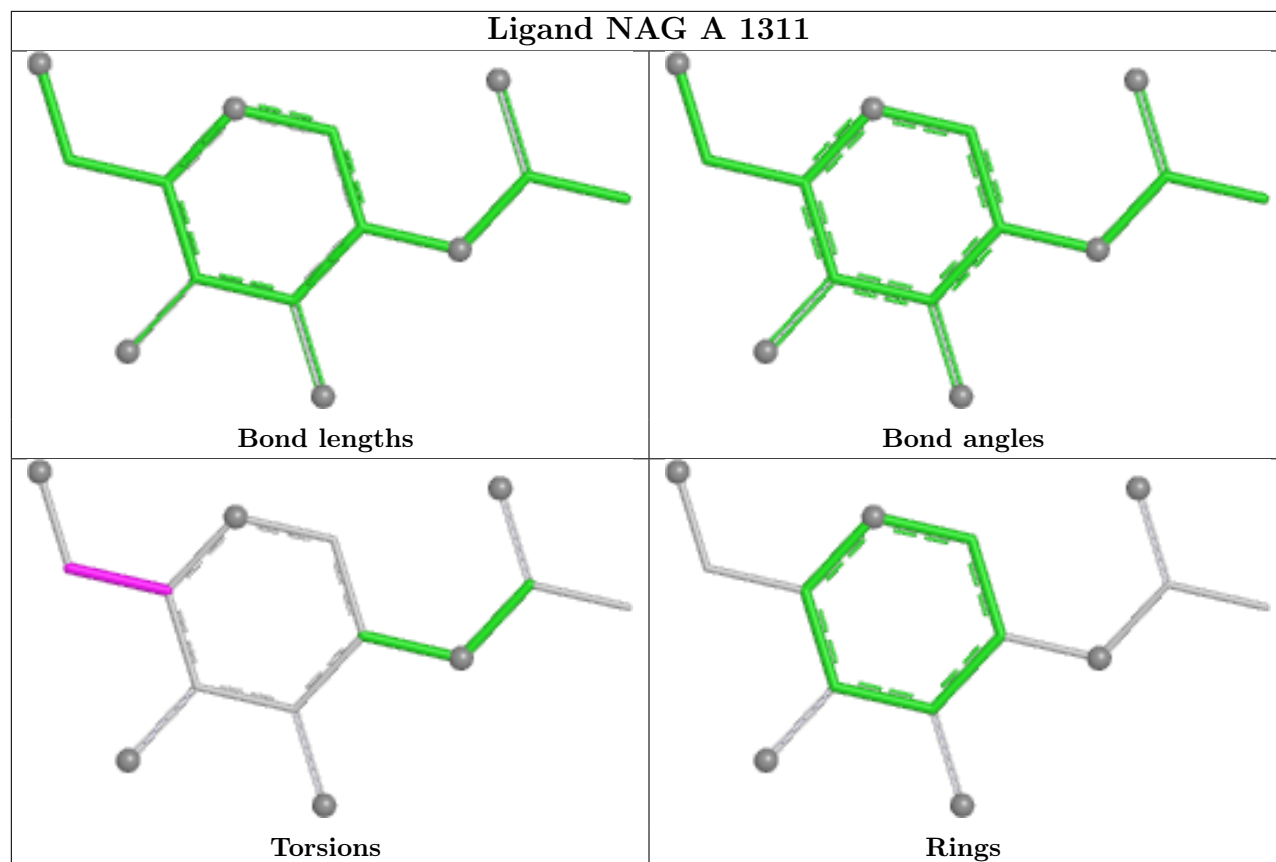
Ligand NAG A 1309



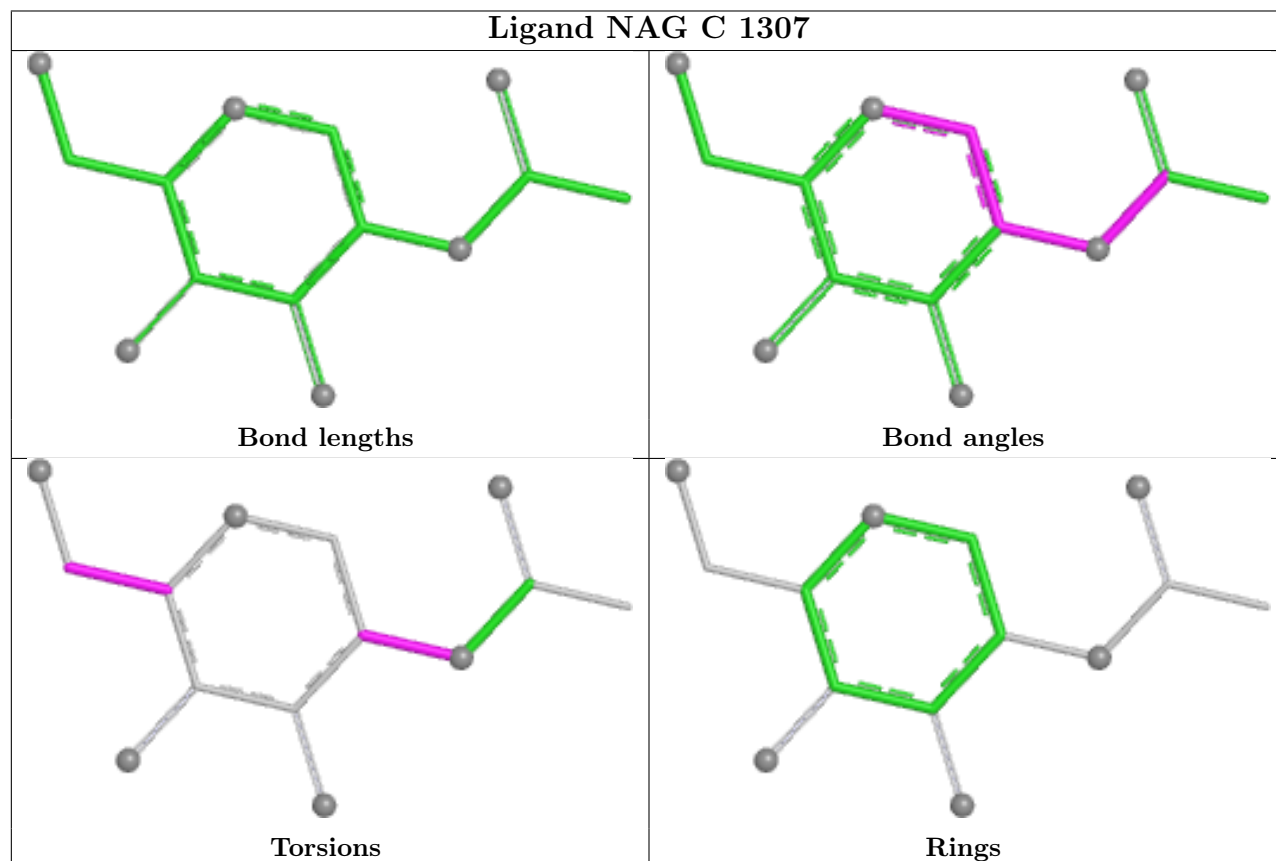
Ligand BLR B 1315



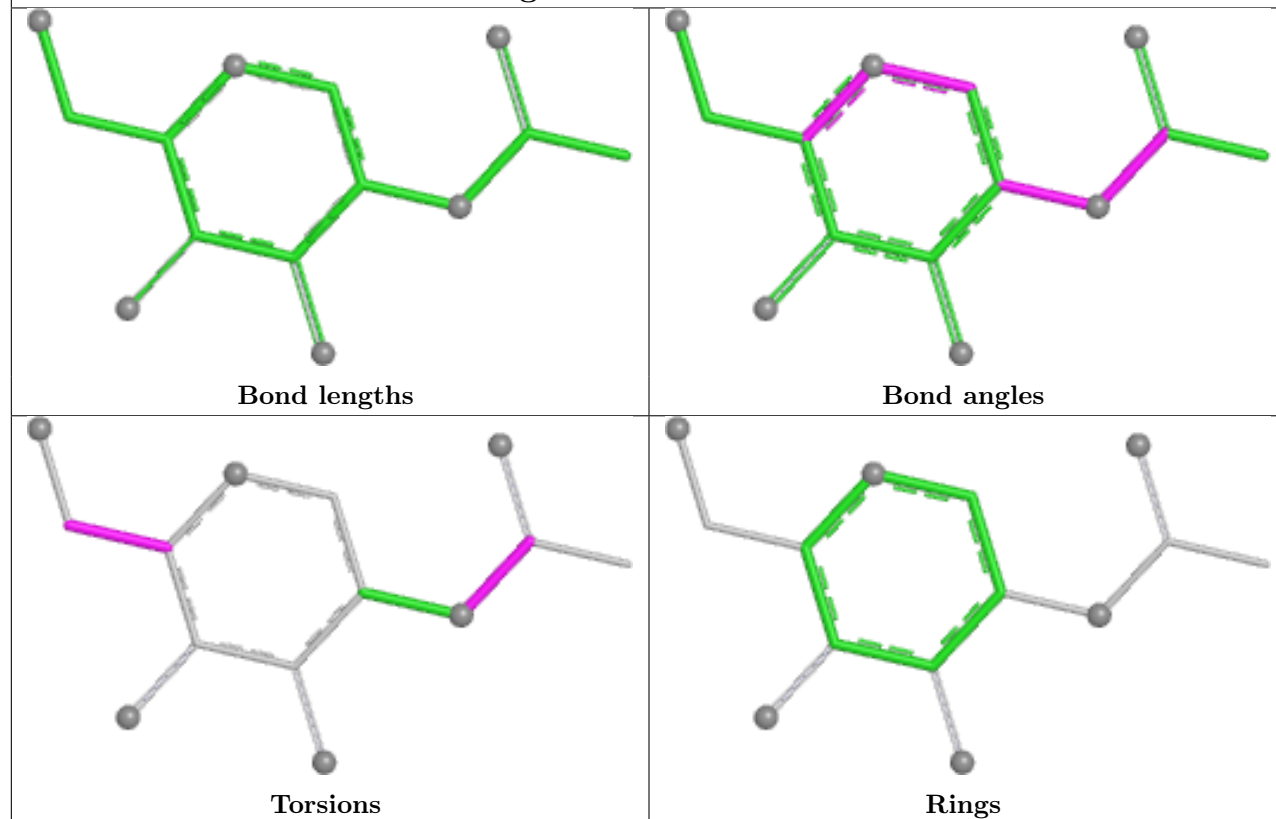
Ligand NAG A 1311



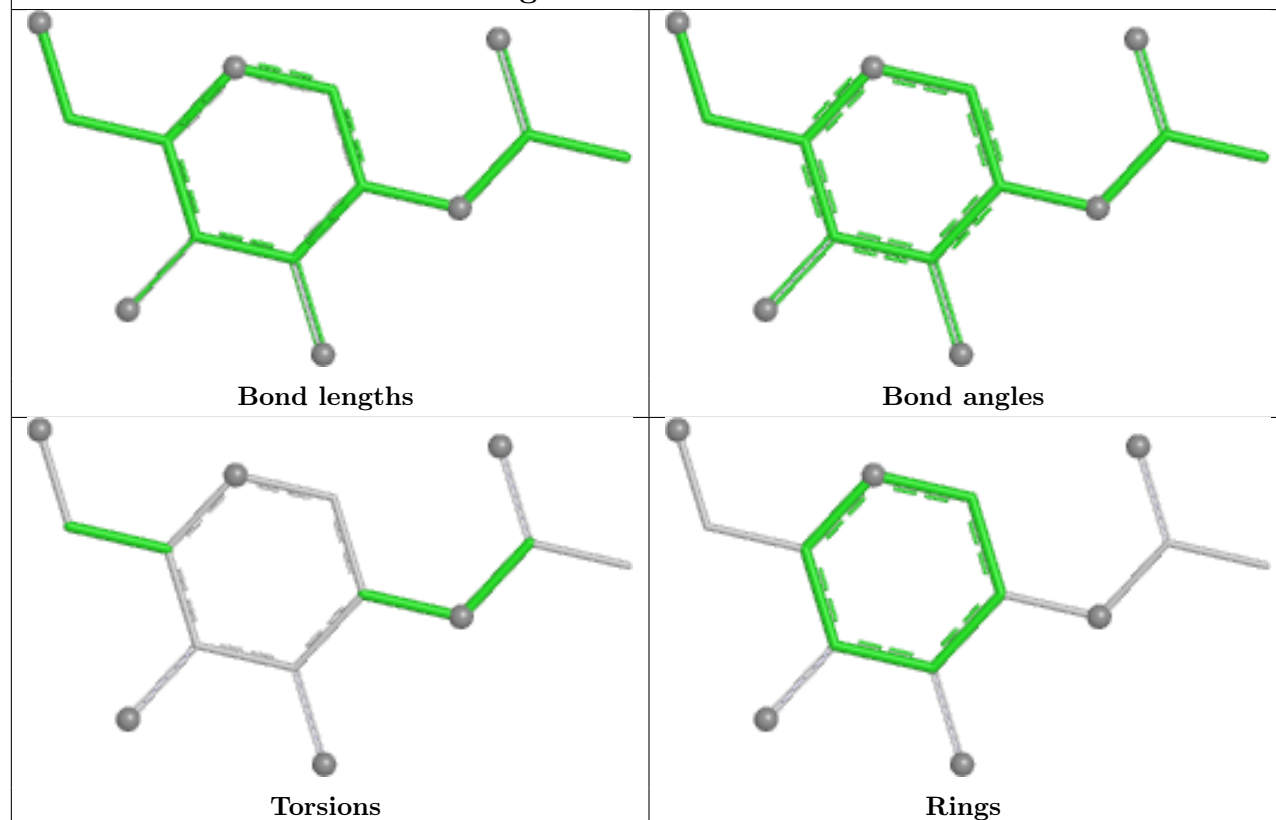
Ligand NAG C 1307



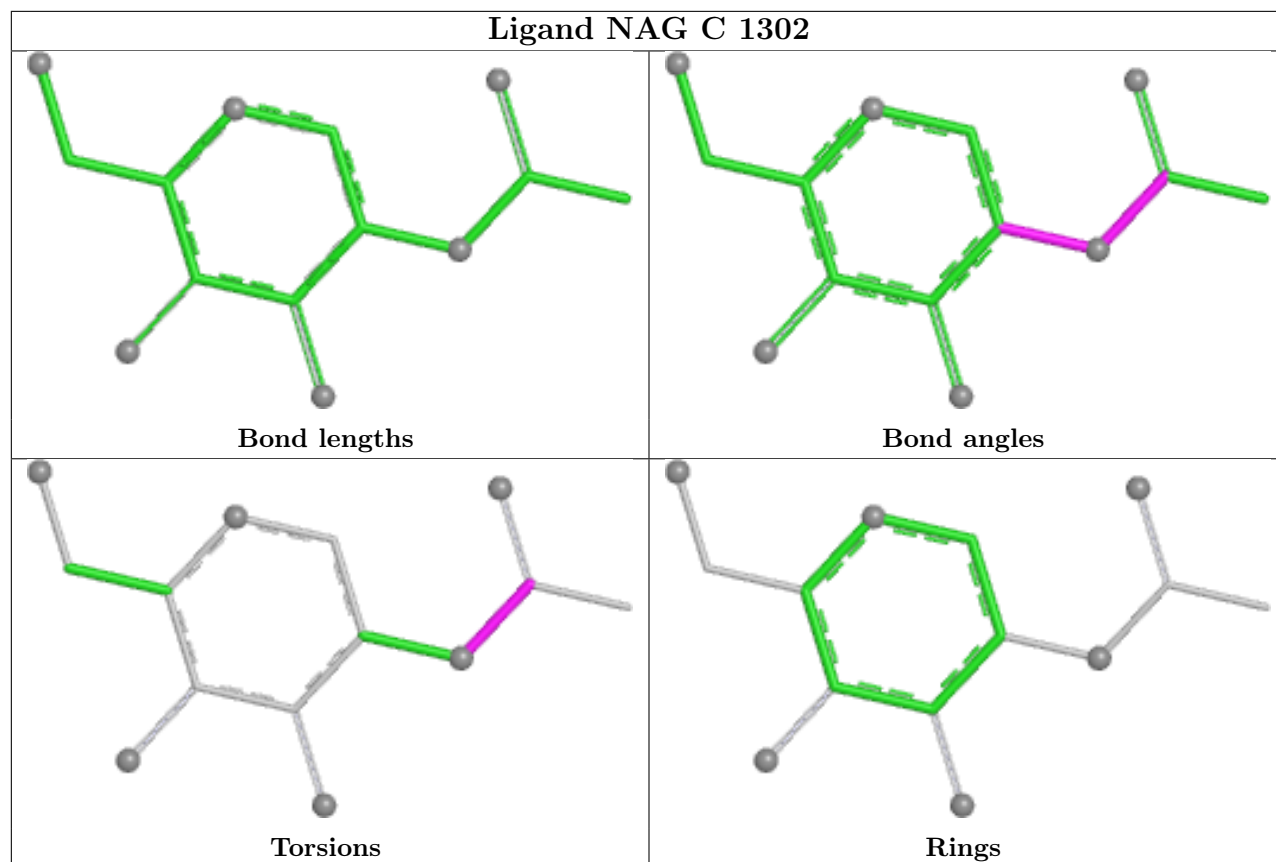
Ligand NAG B 1305



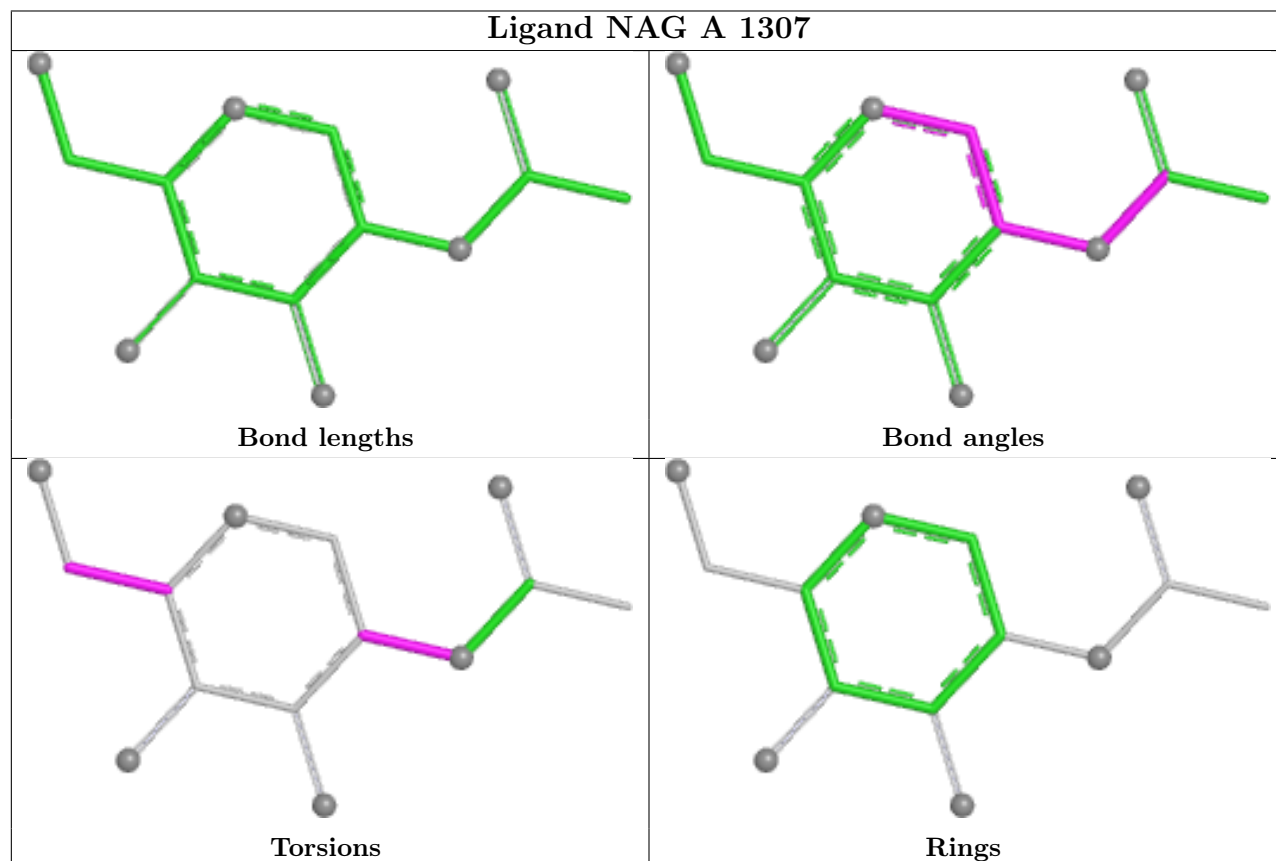
Ligand NAG B 1312



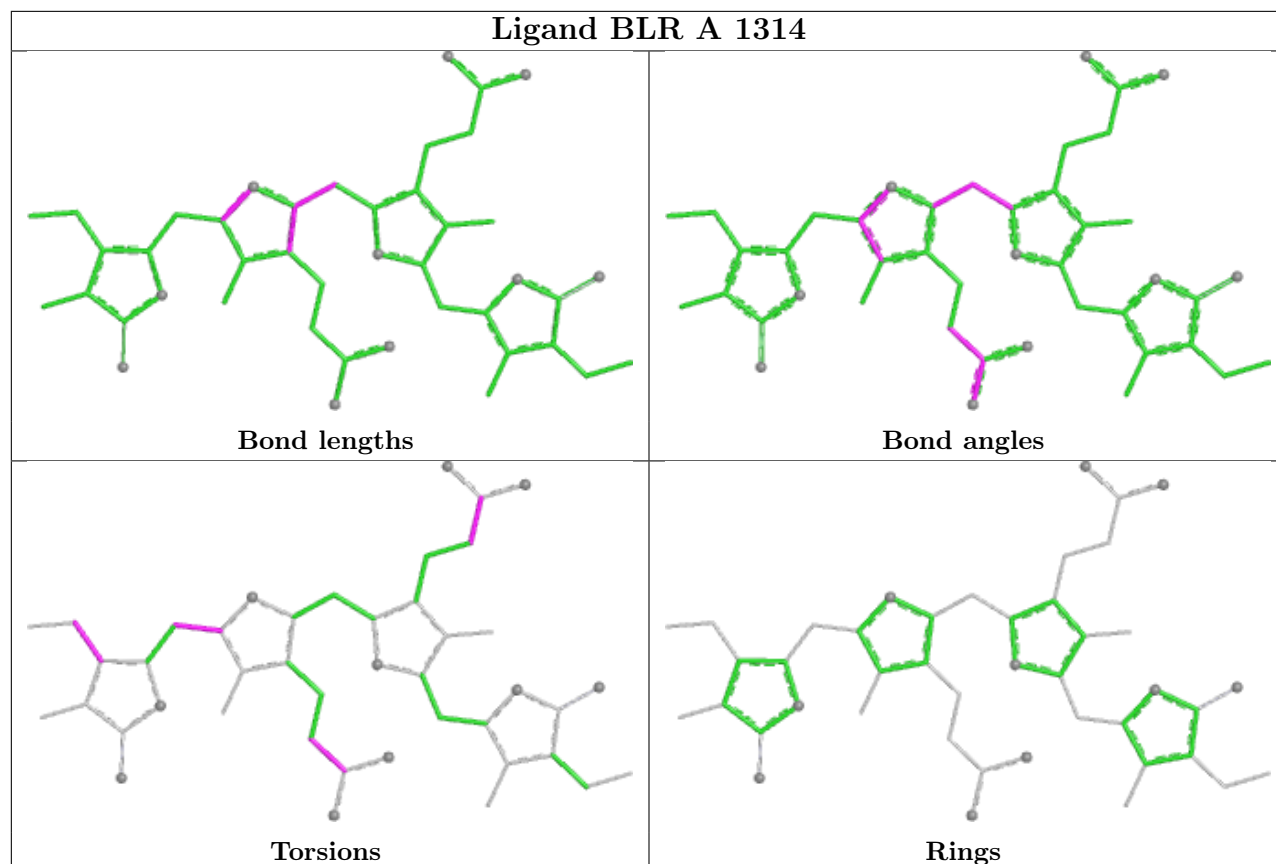
Ligand NAG C 1302



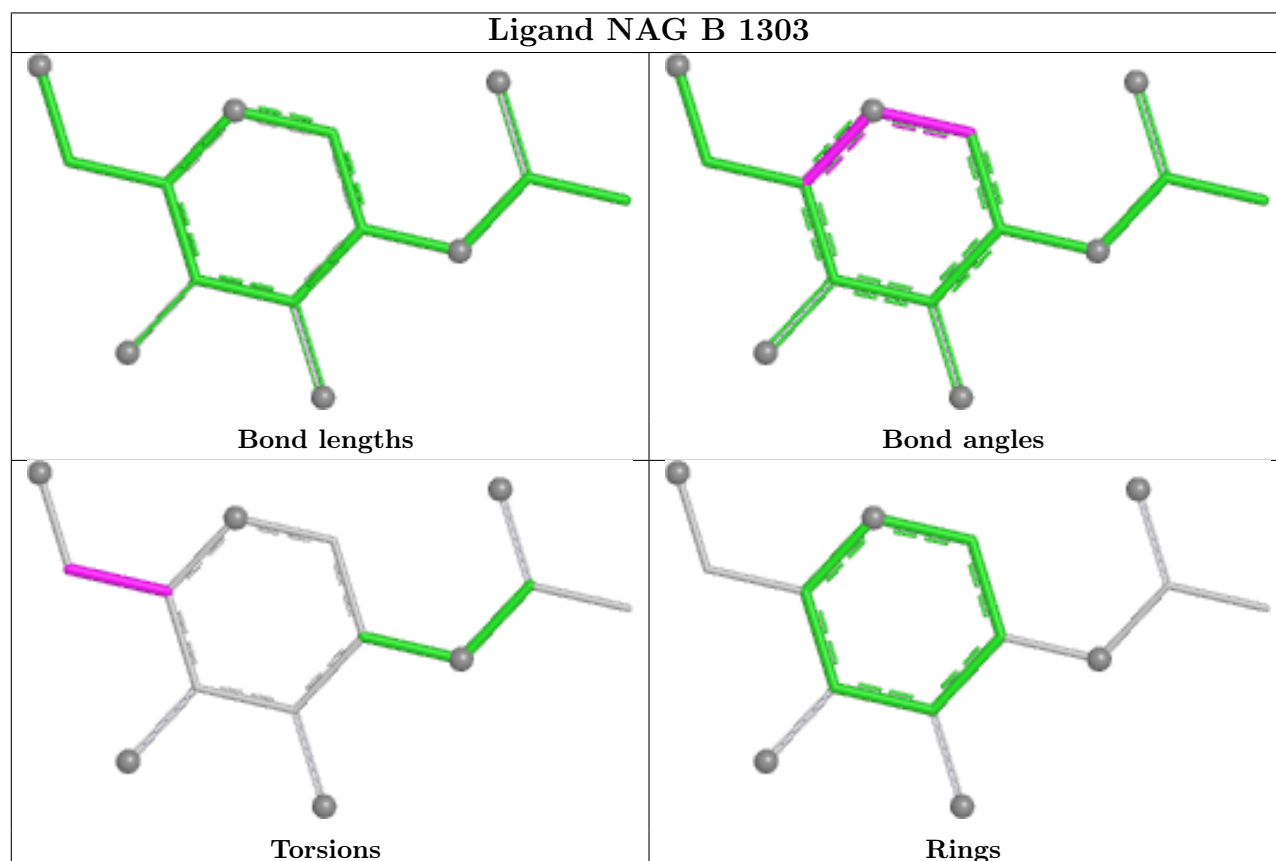
Ligand NAG A 1307



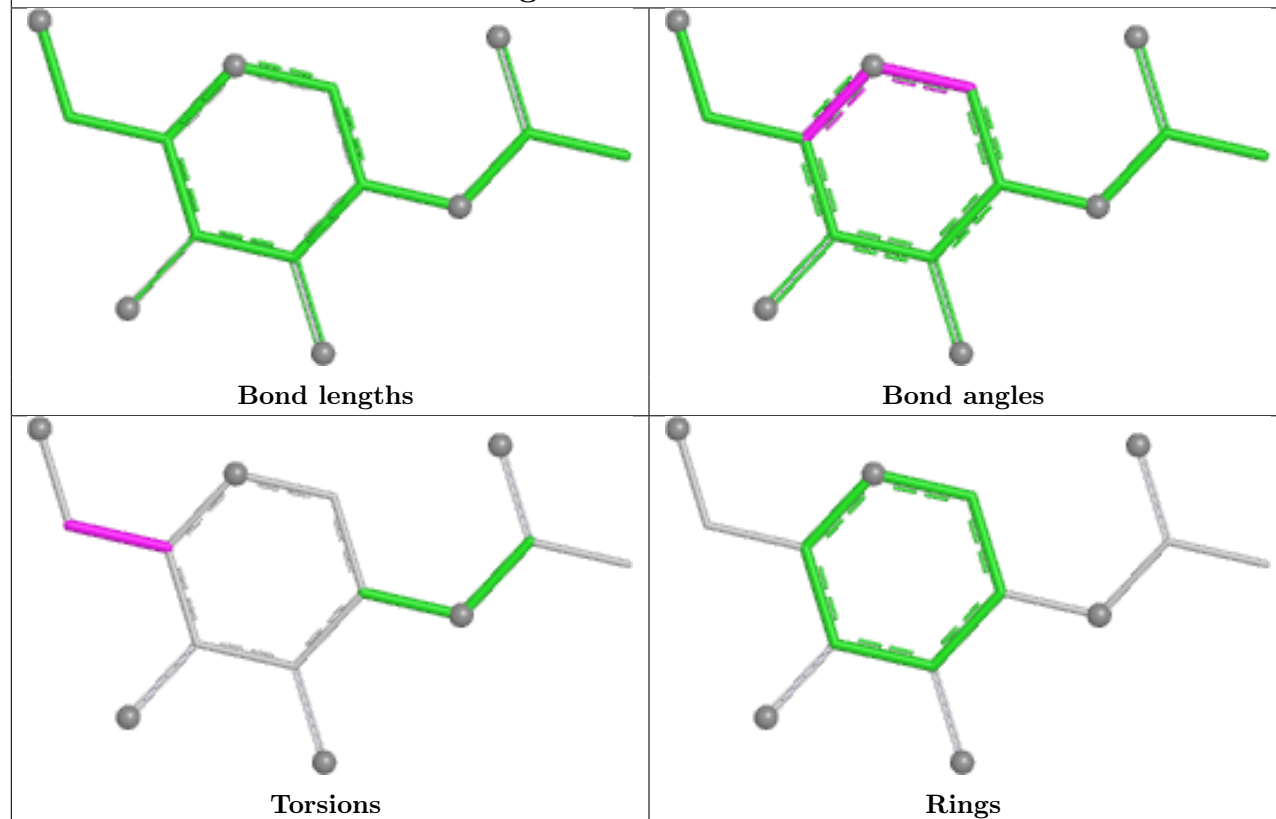
Ligand BLR A 1314



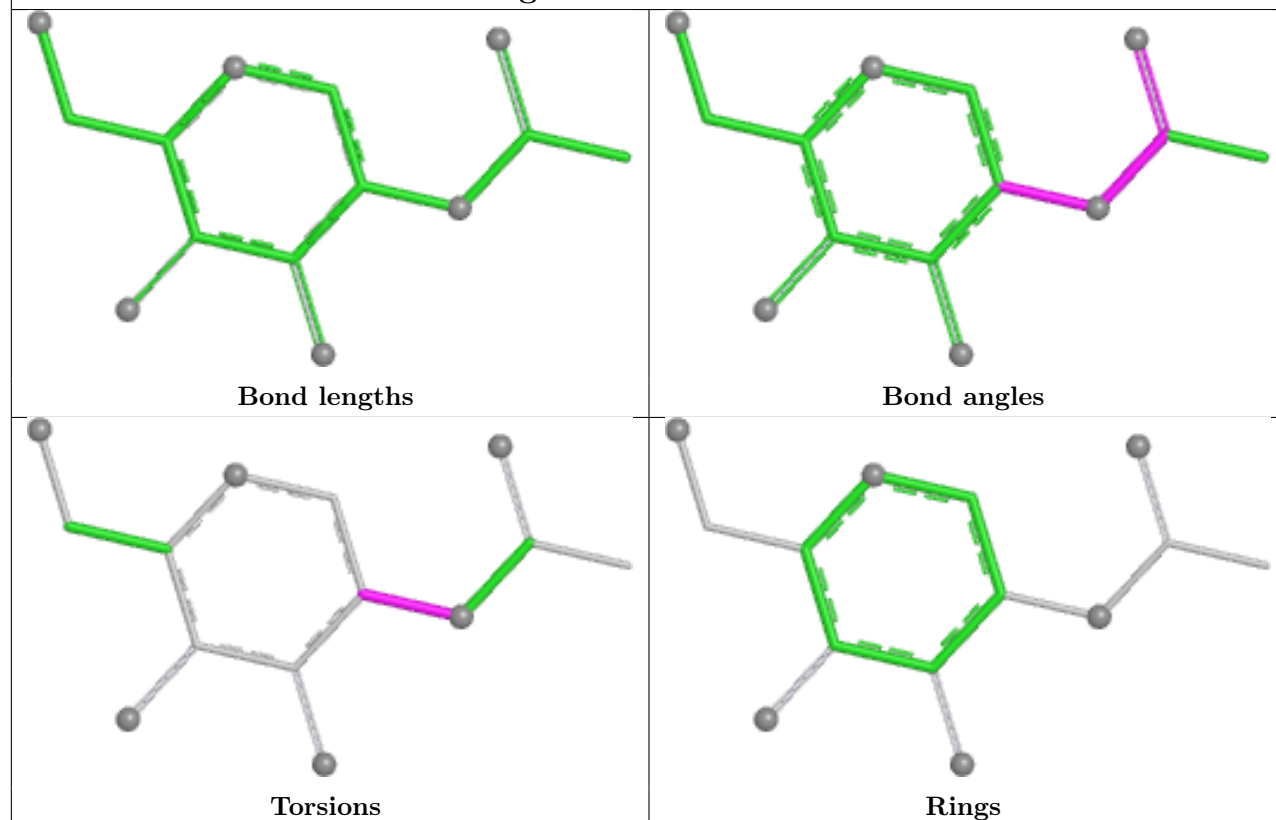
Ligand NAG B 1303



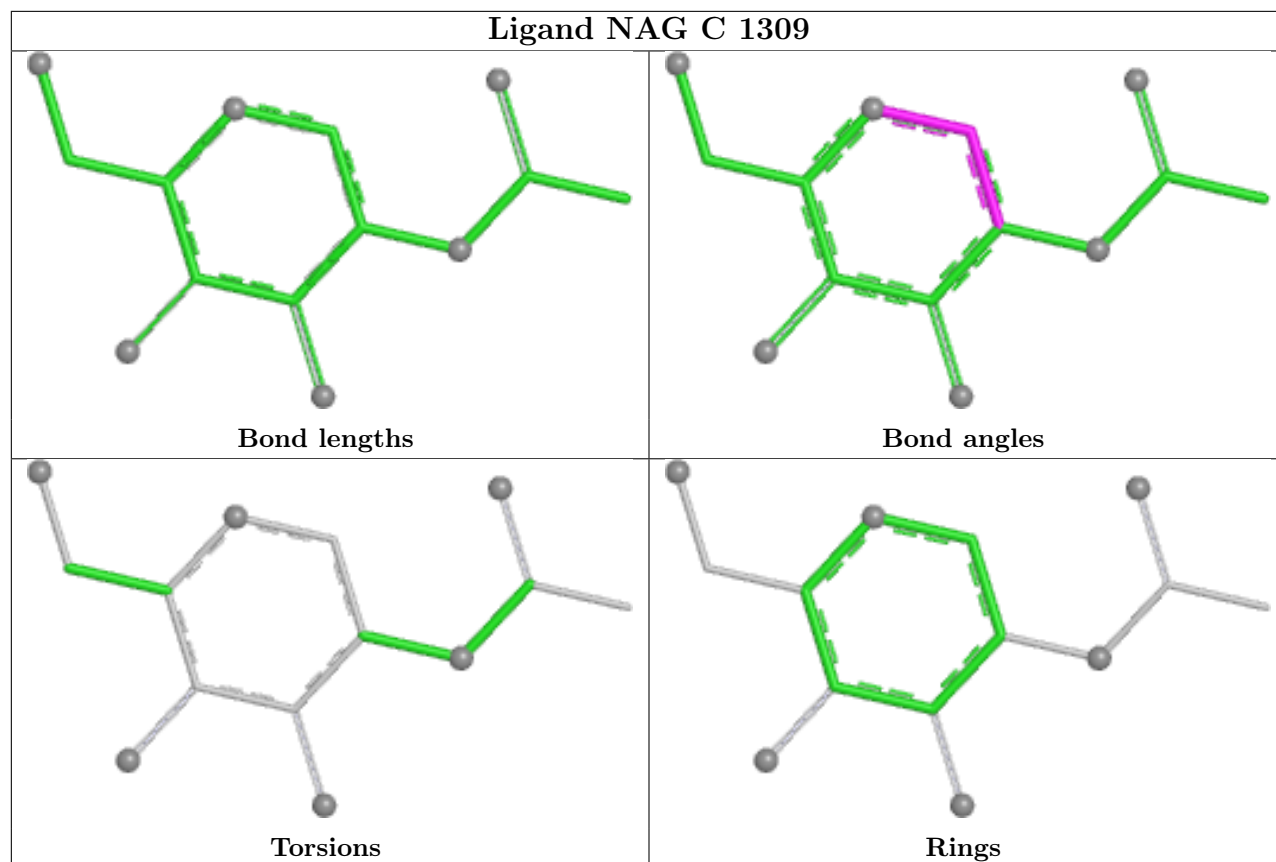
Ligand NAG C 1308



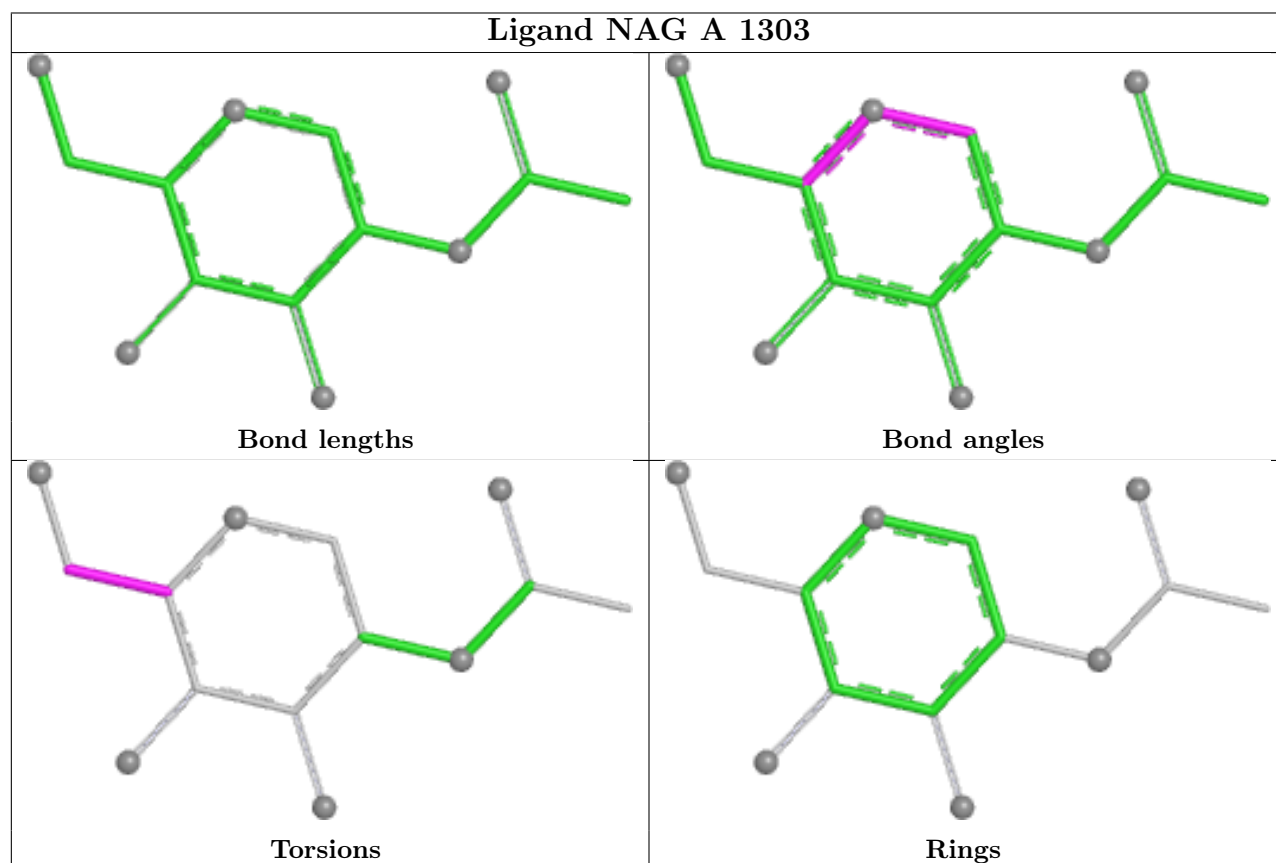
Ligand NAG C 1311



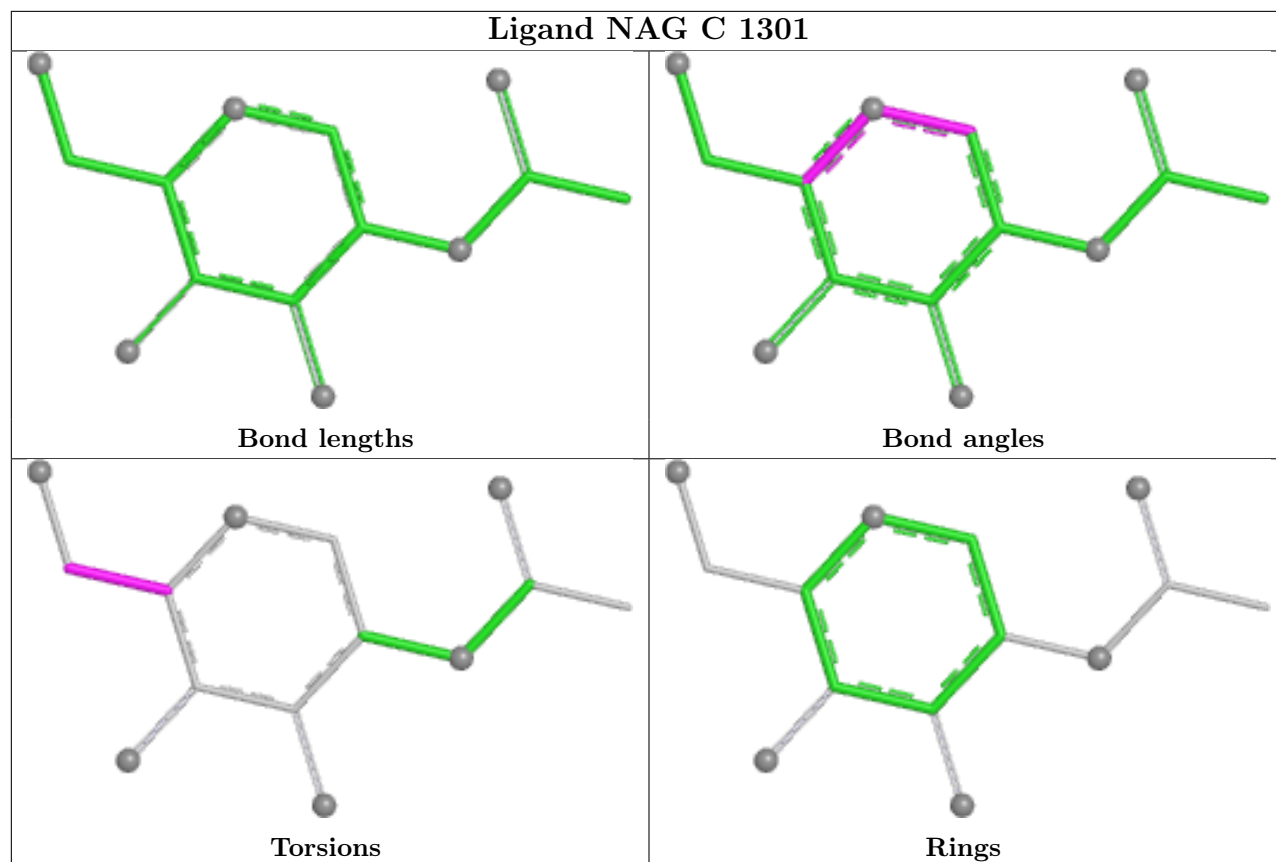
Ligand NAG C 1309



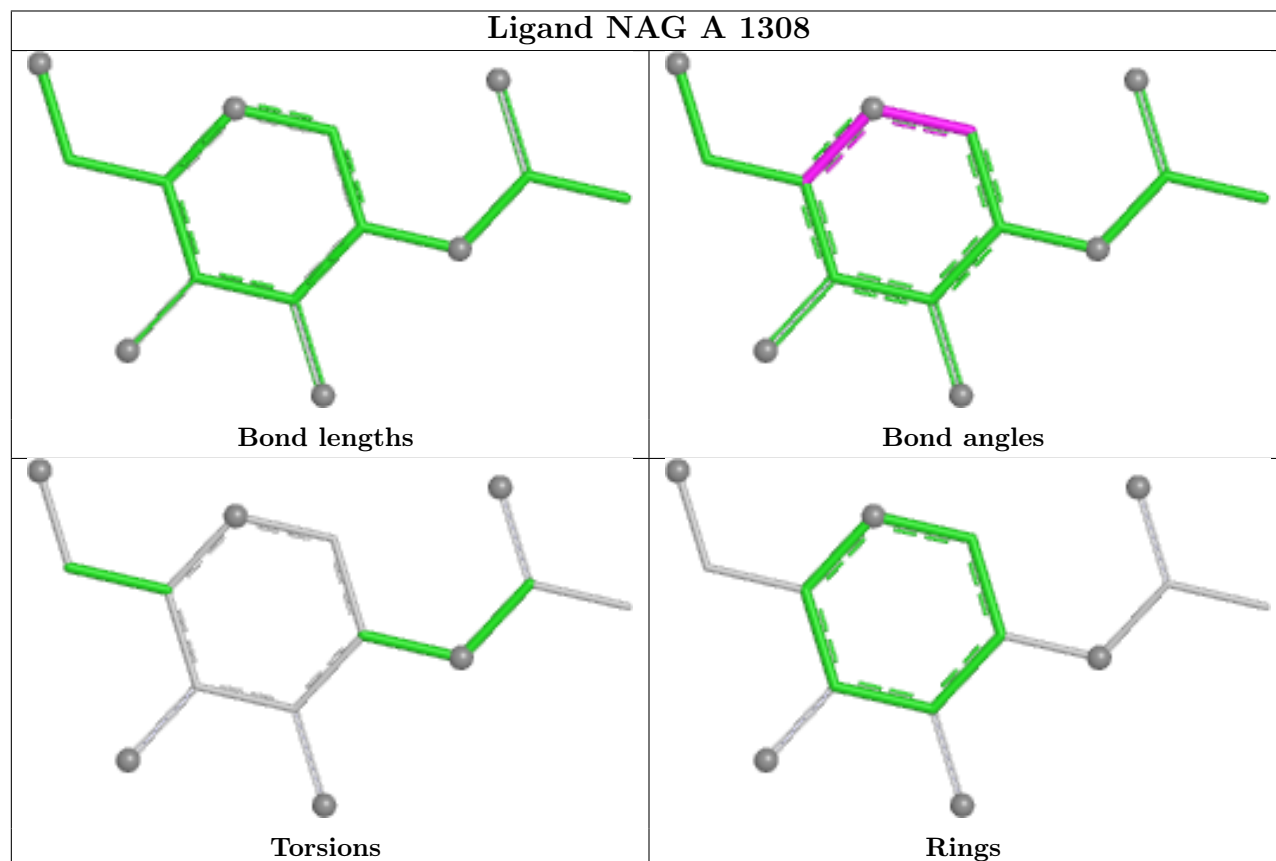
Ligand NAG A 1303



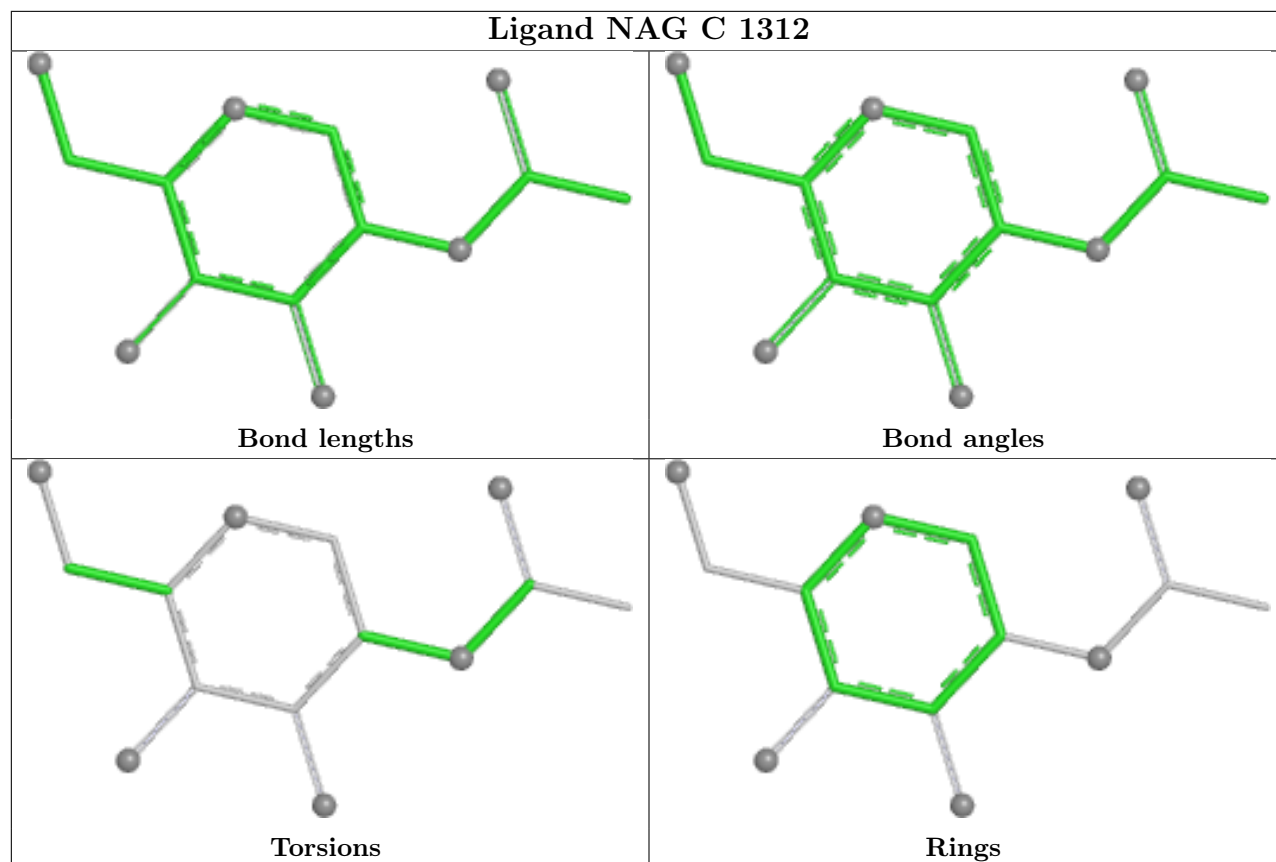
Ligand NAG C 1301



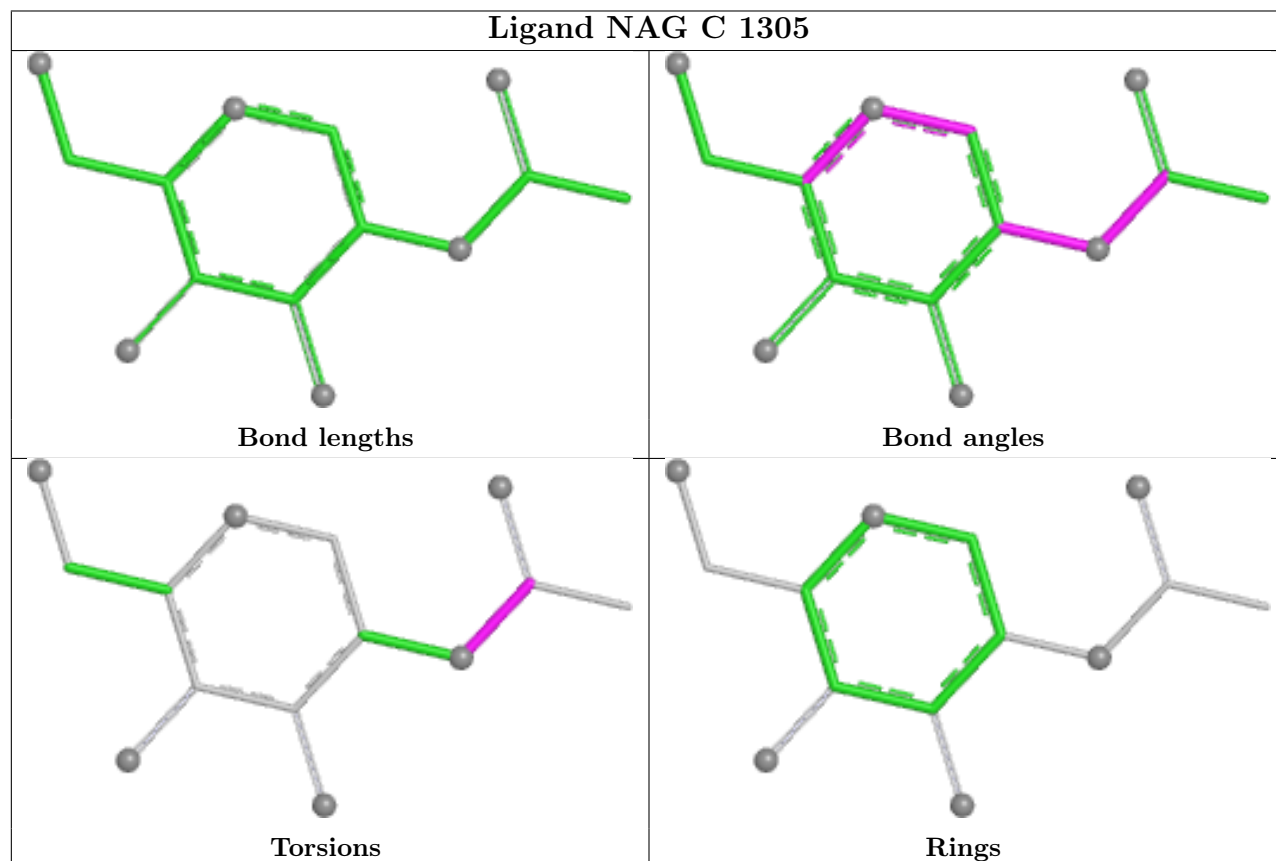
Ligand NAG A 1308



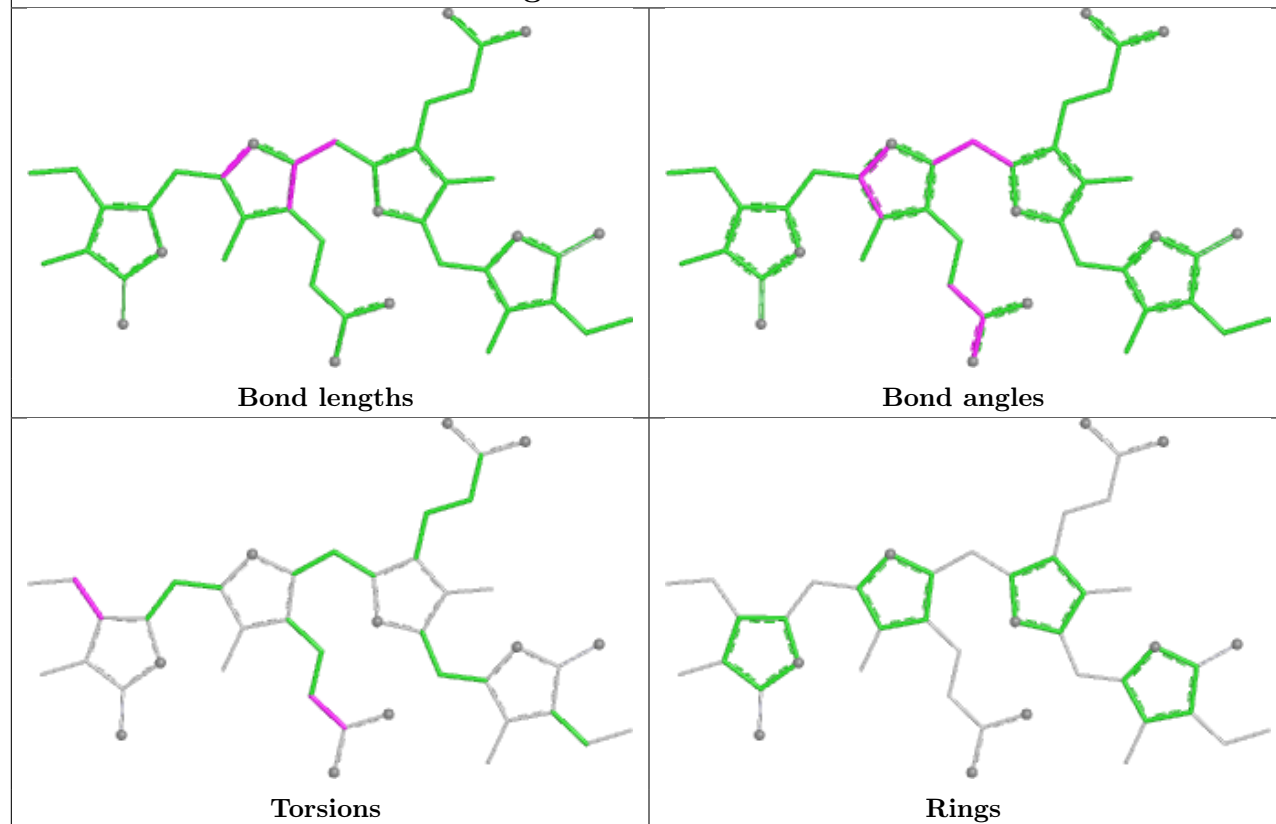
Ligand NAG C 1312



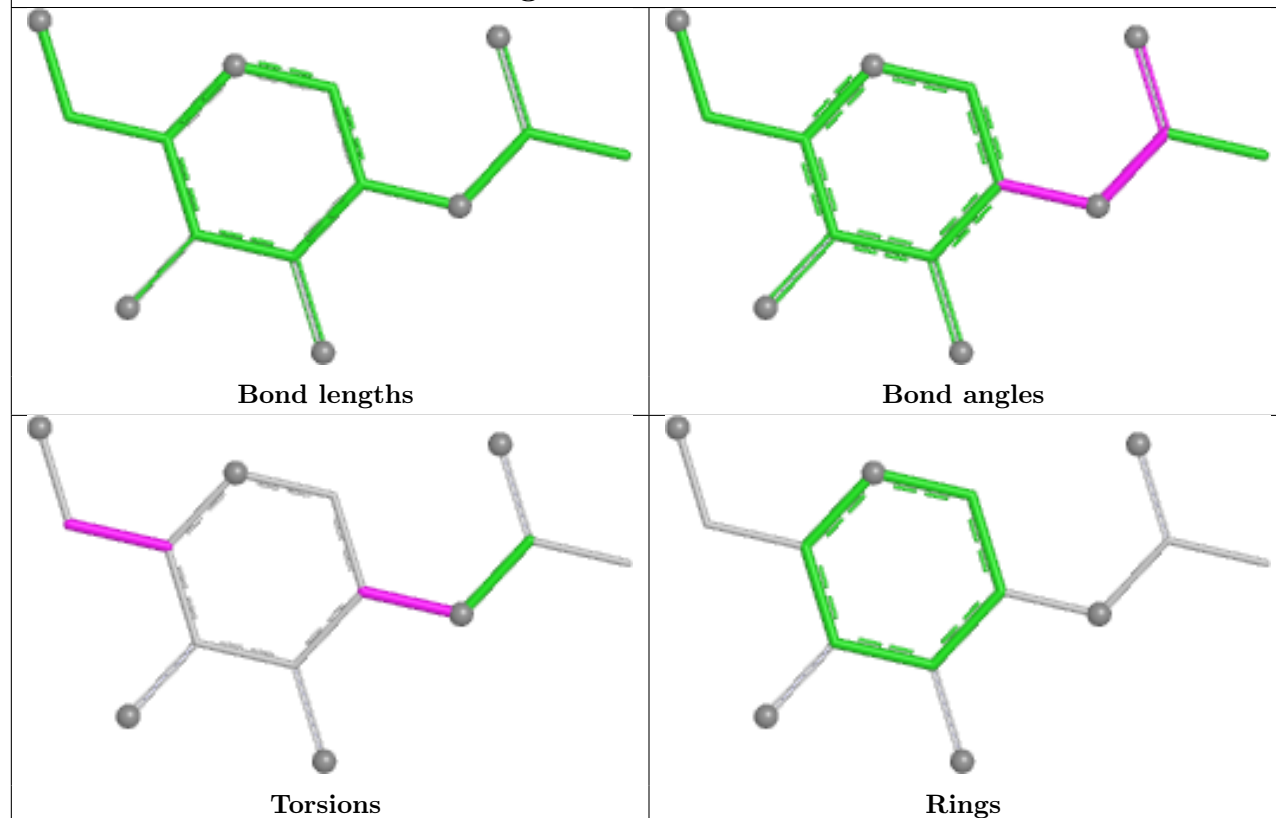
Ligand NAG C 1305



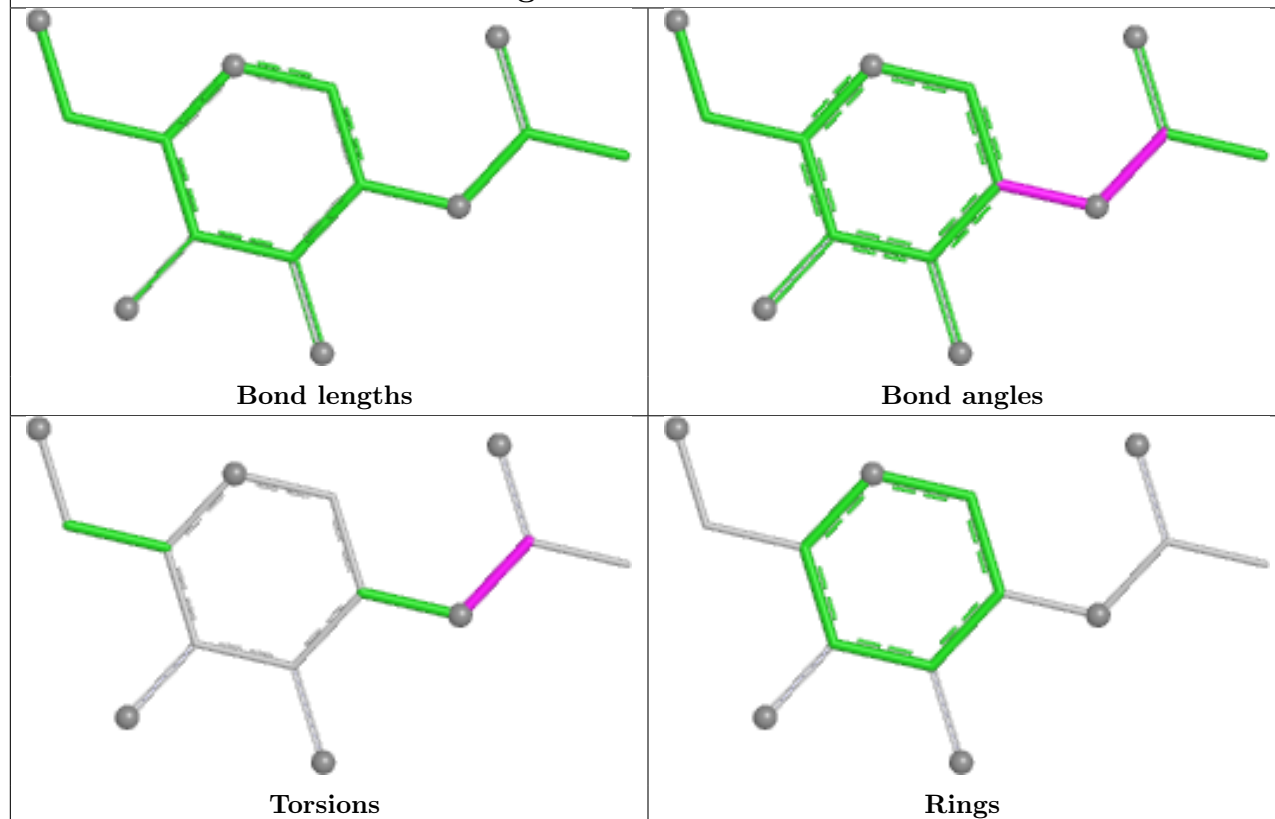
Ligand BLR C 1315



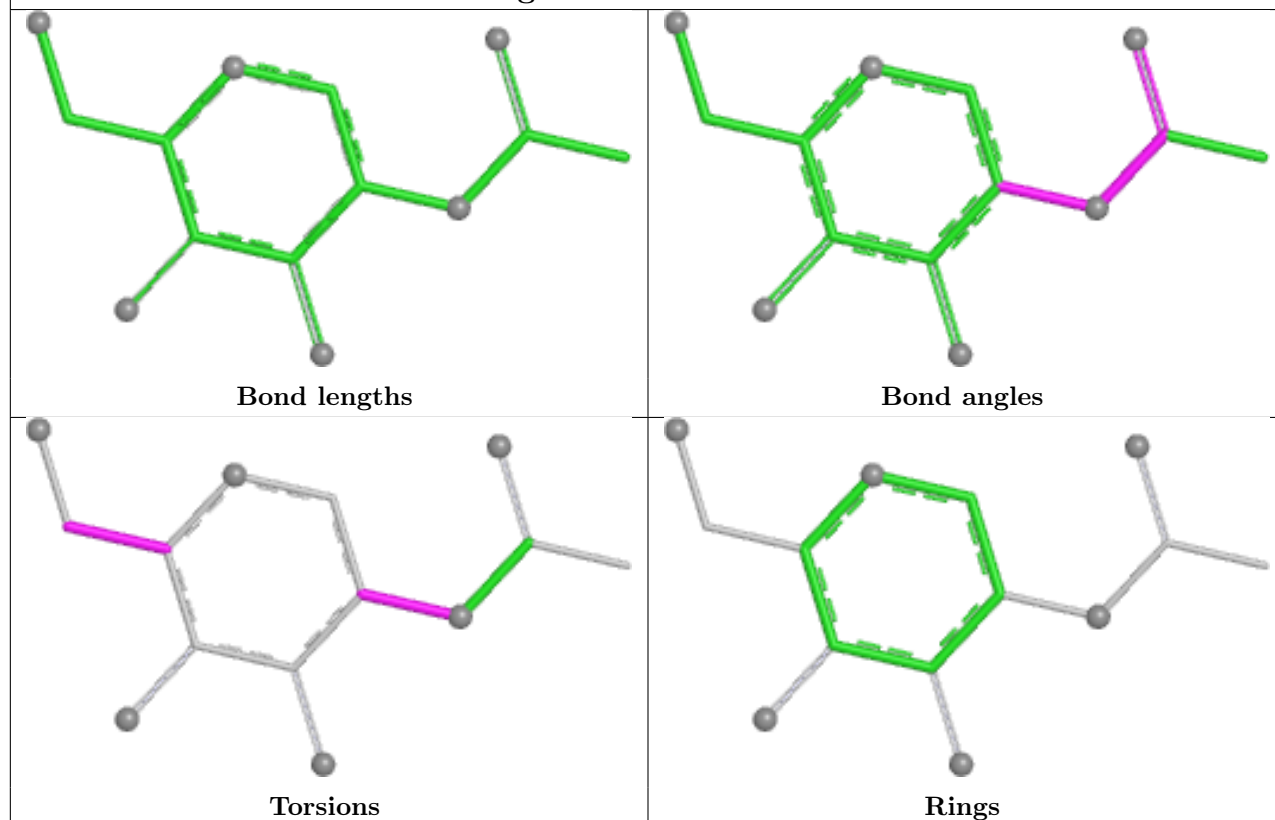
Ligand NAG B 1311



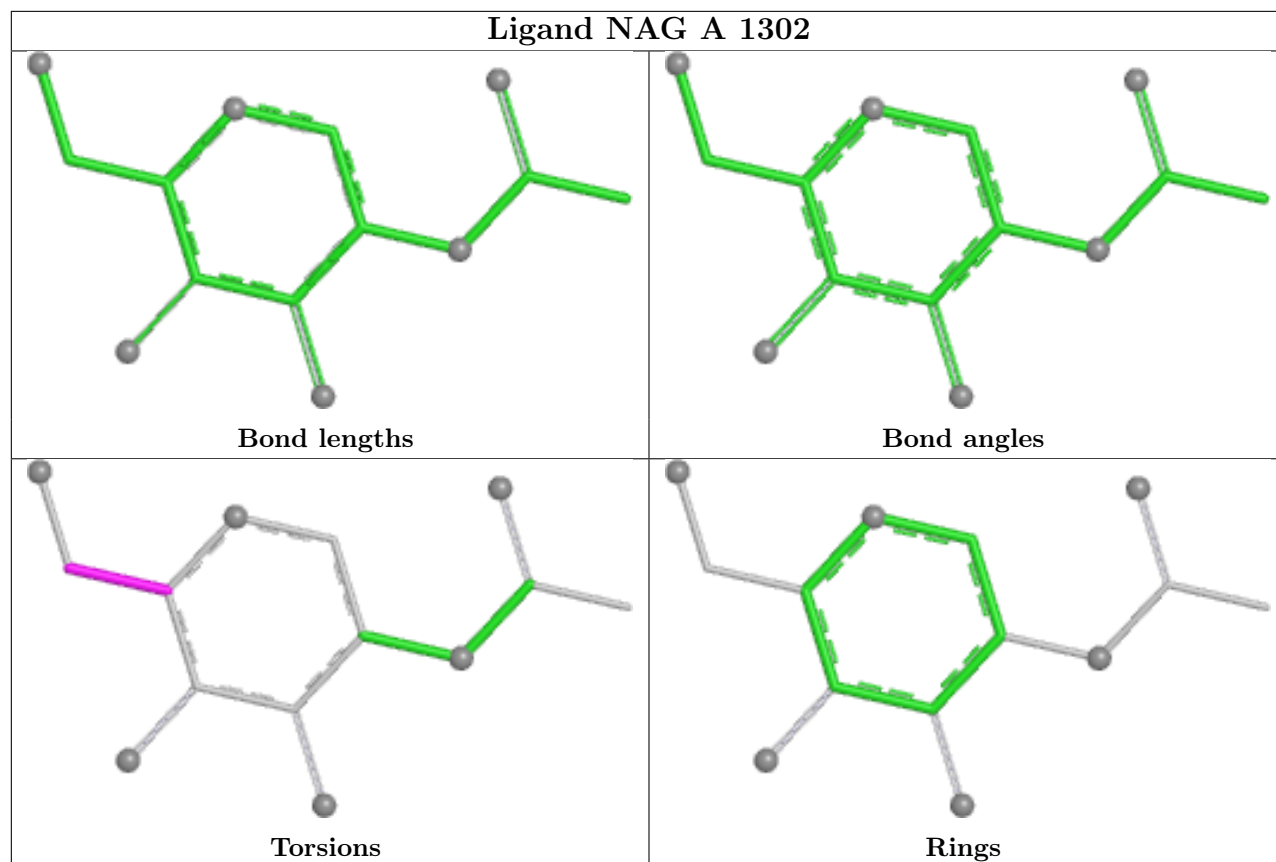
Ligand NAG A 1304



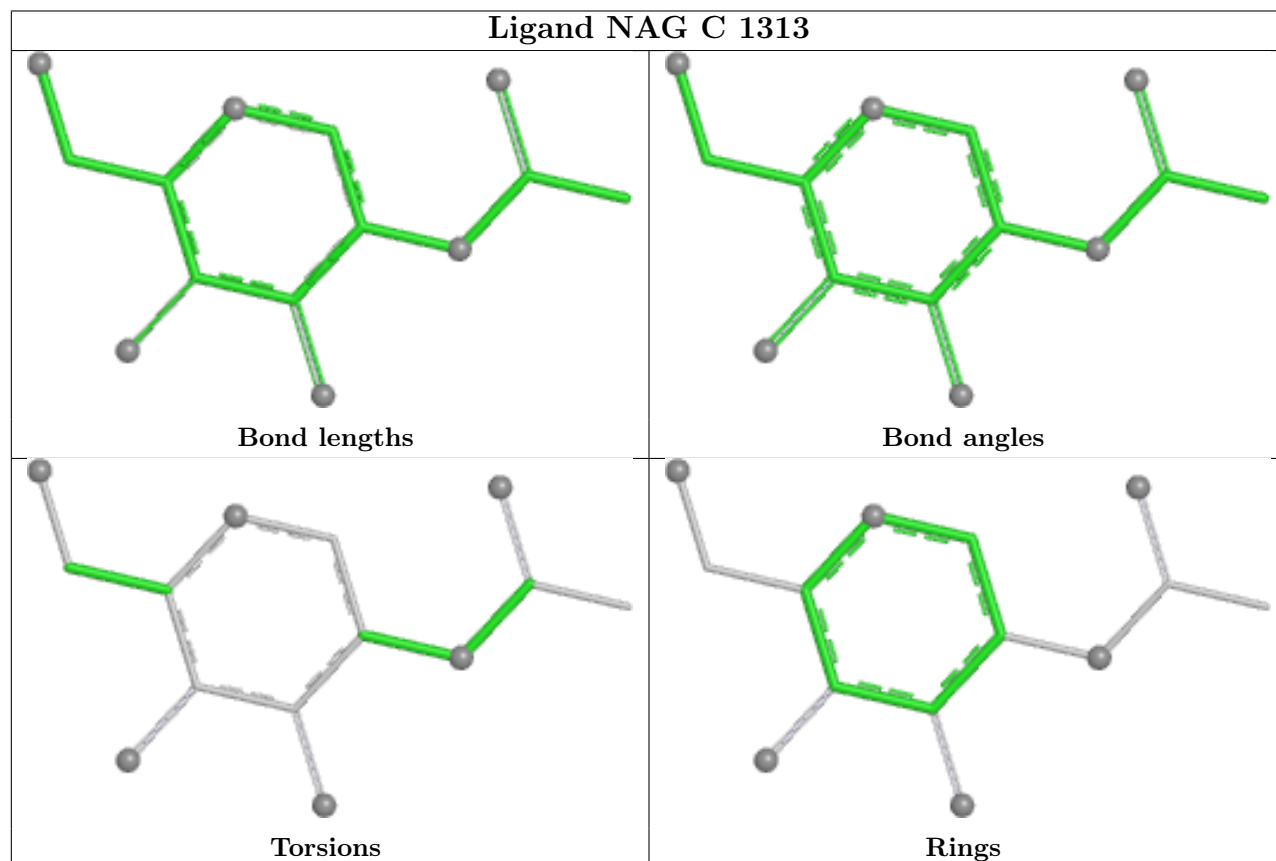
Ligand NAG A 1310



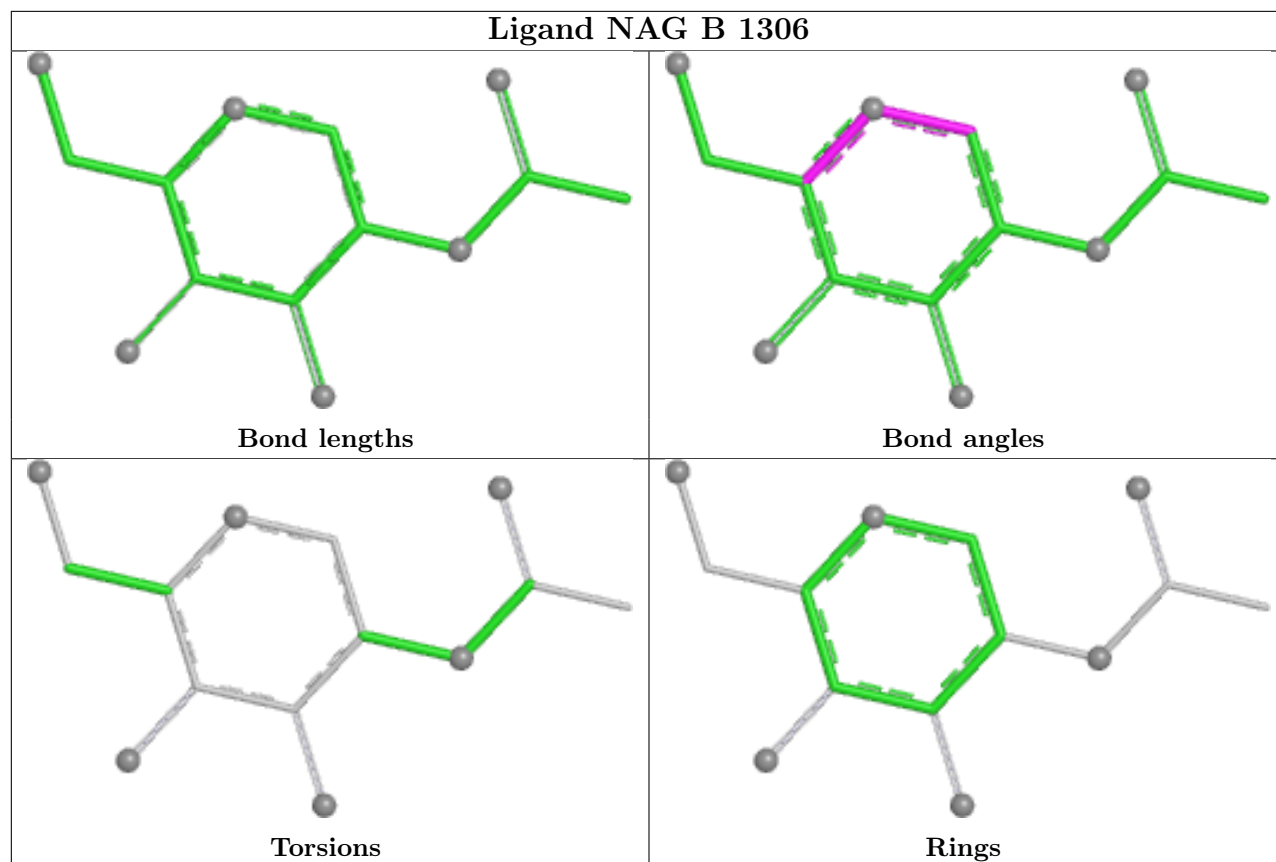
Ligand NAG A 1302



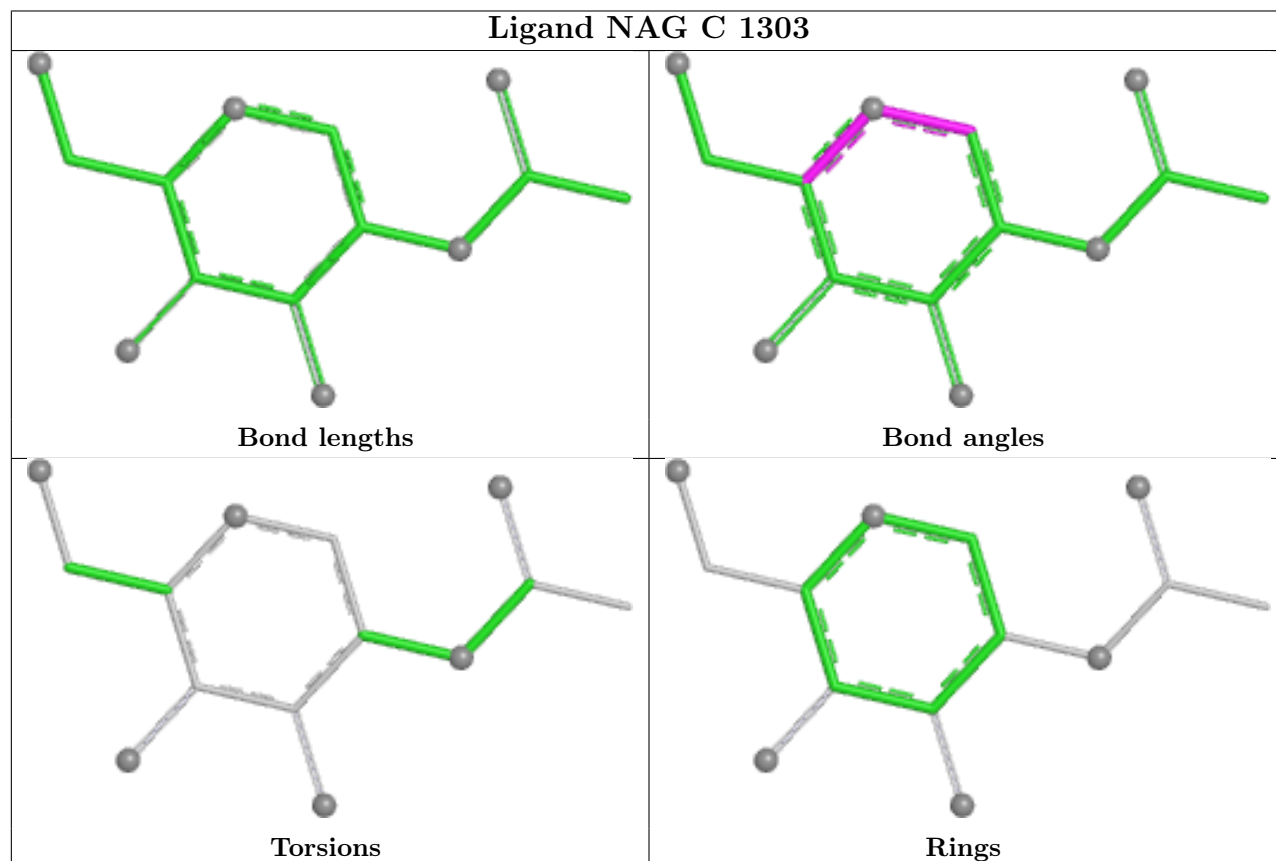
Ligand NAG C 1313



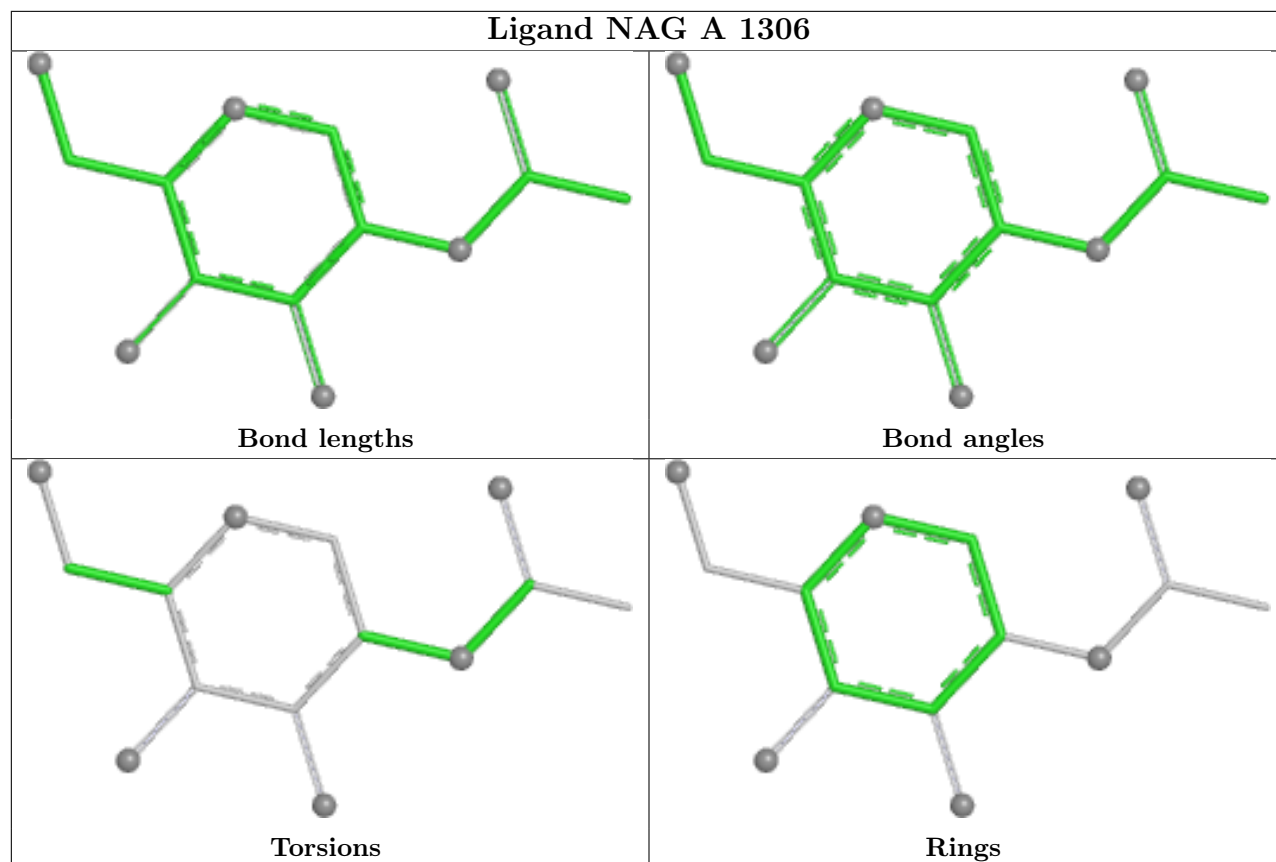
Ligand NAG B 1306



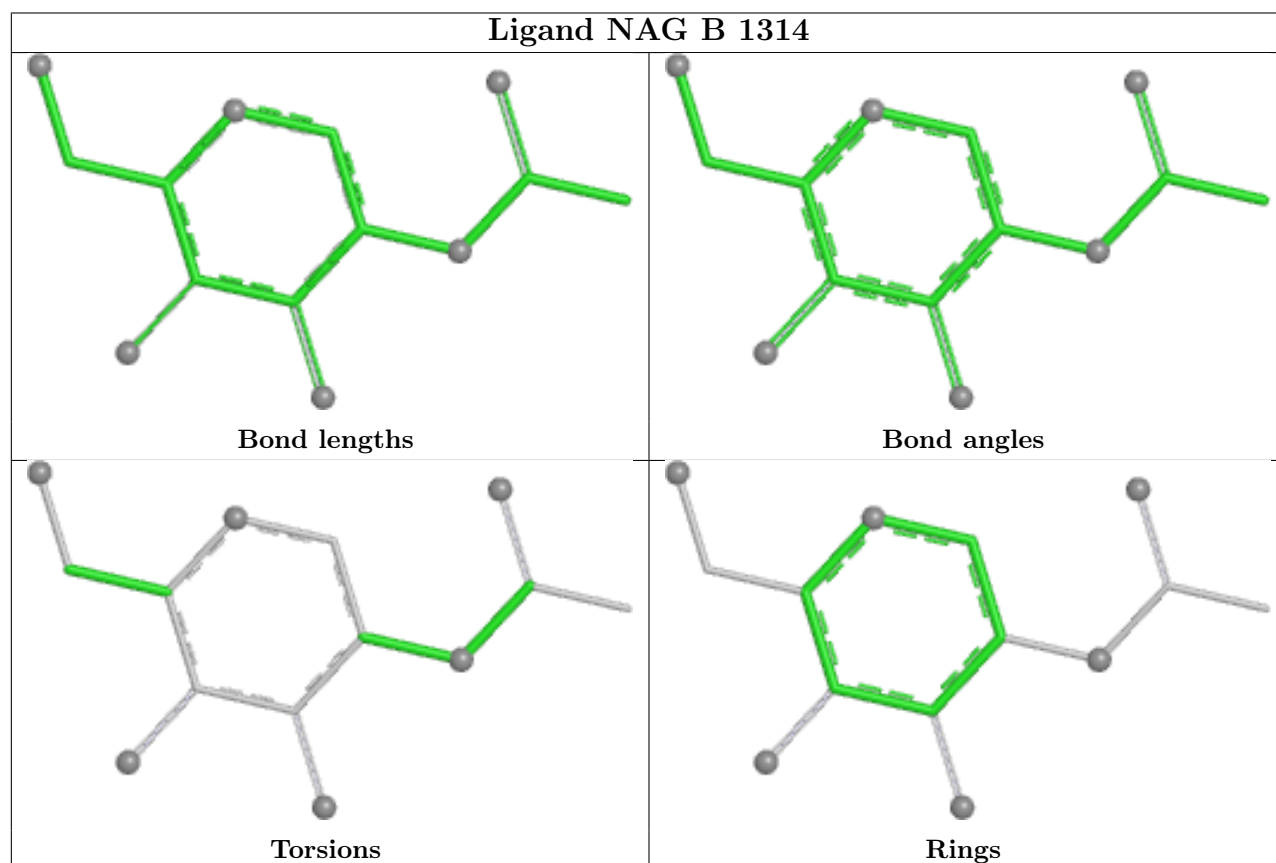
Ligand NAG C 1303



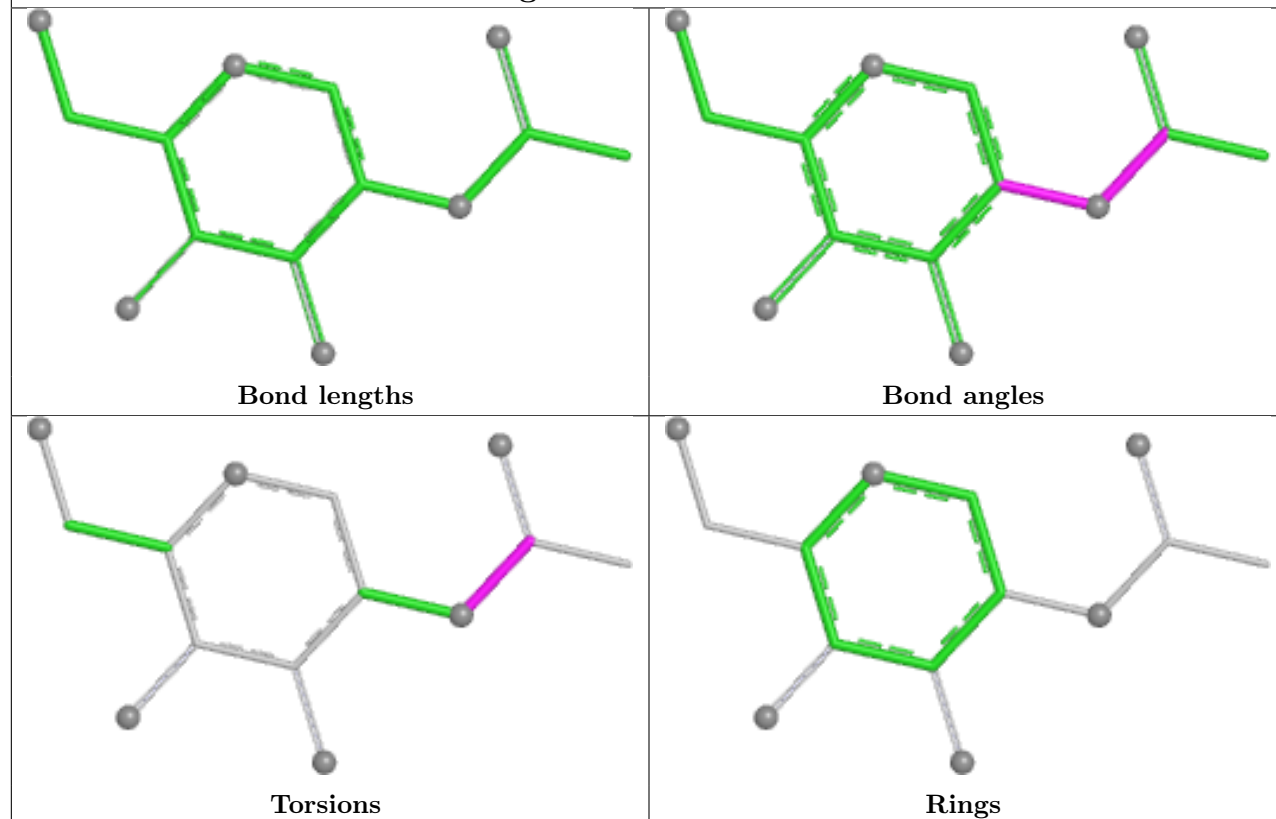
Ligand NAG A 1306



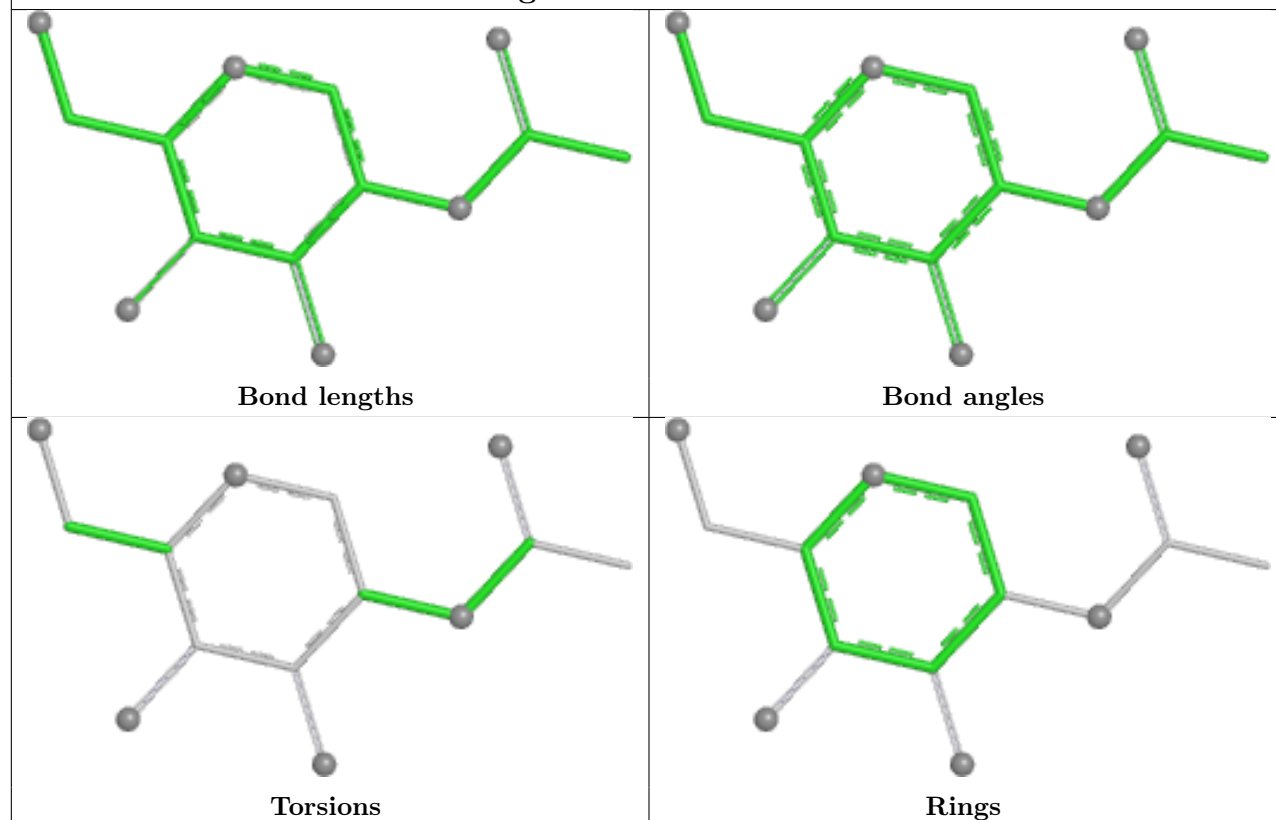
Ligand NAG B 1314



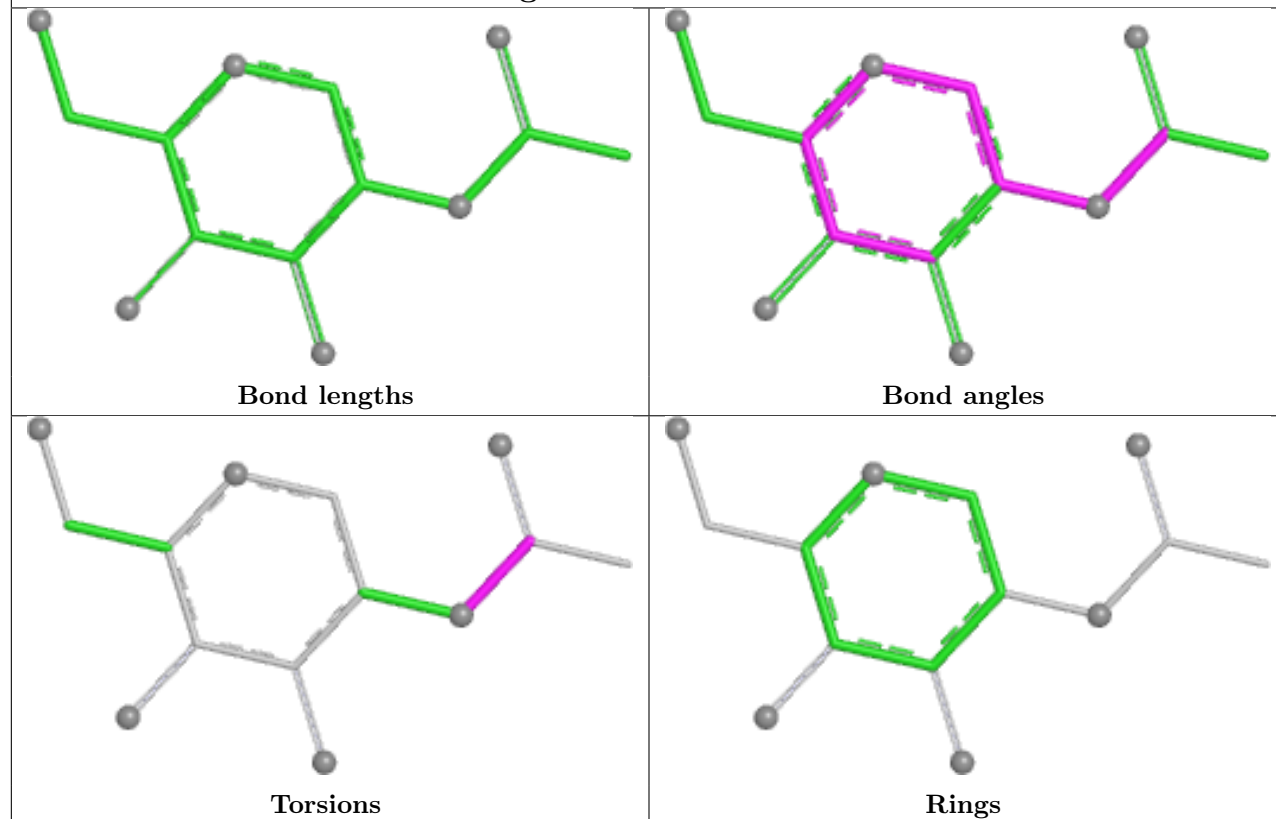
Ligand NAG C 1304



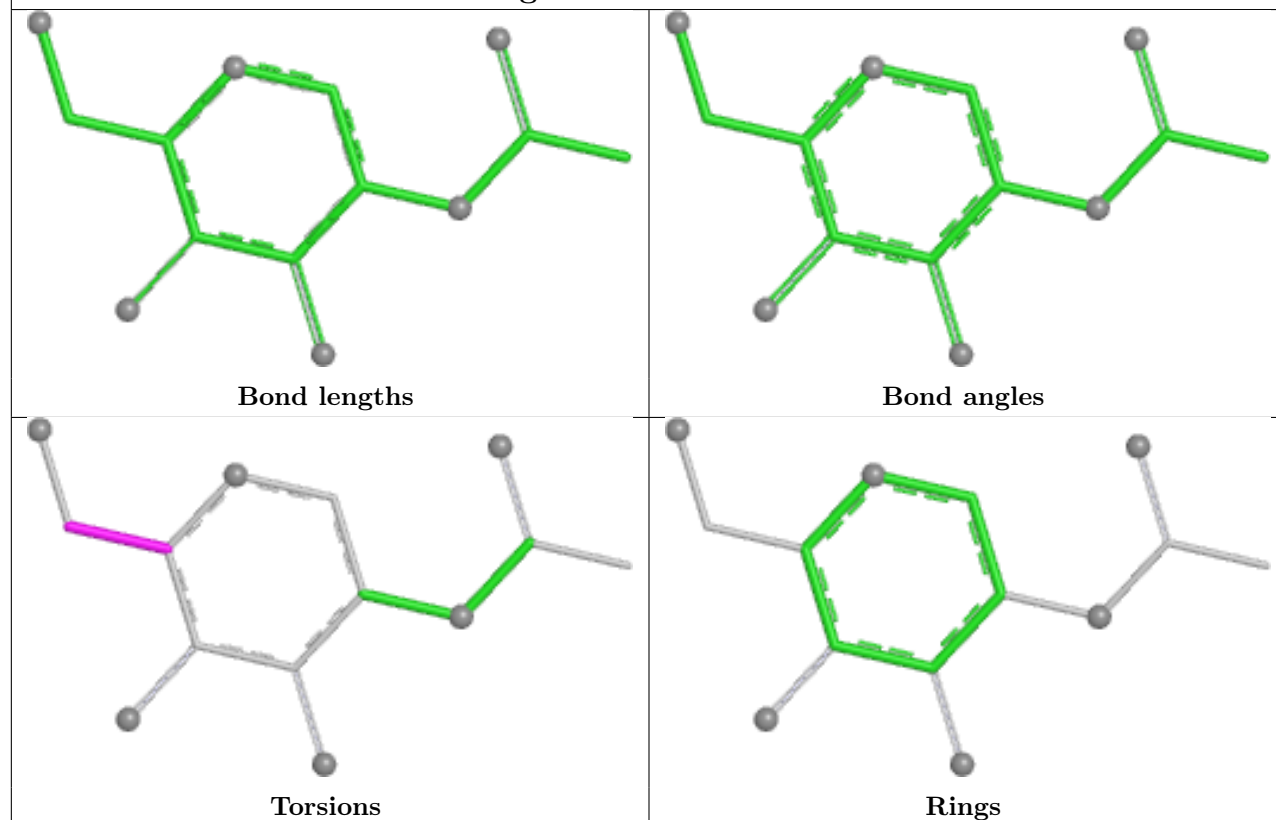
Ligand NAG A 1312



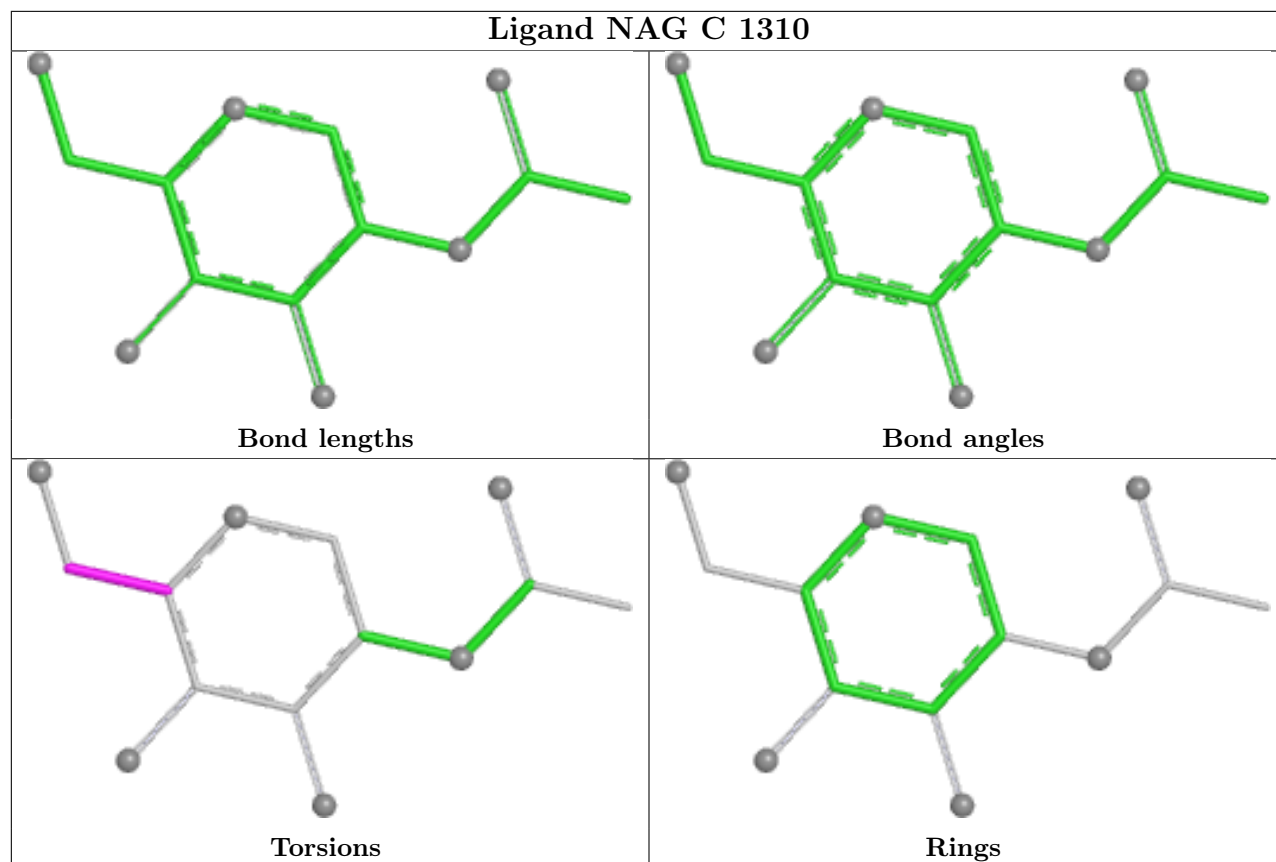
Ligand NAG B 1304



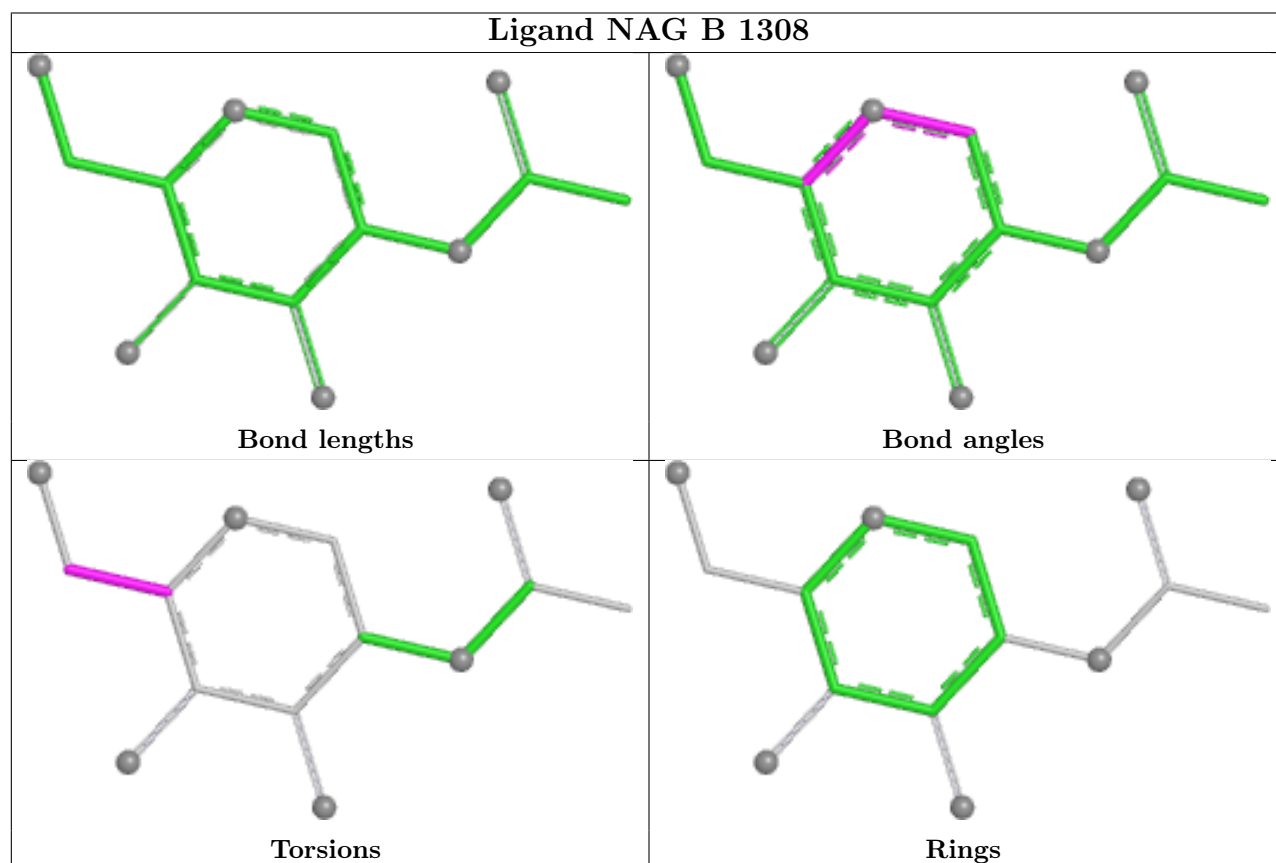
Ligand NAG B 1313



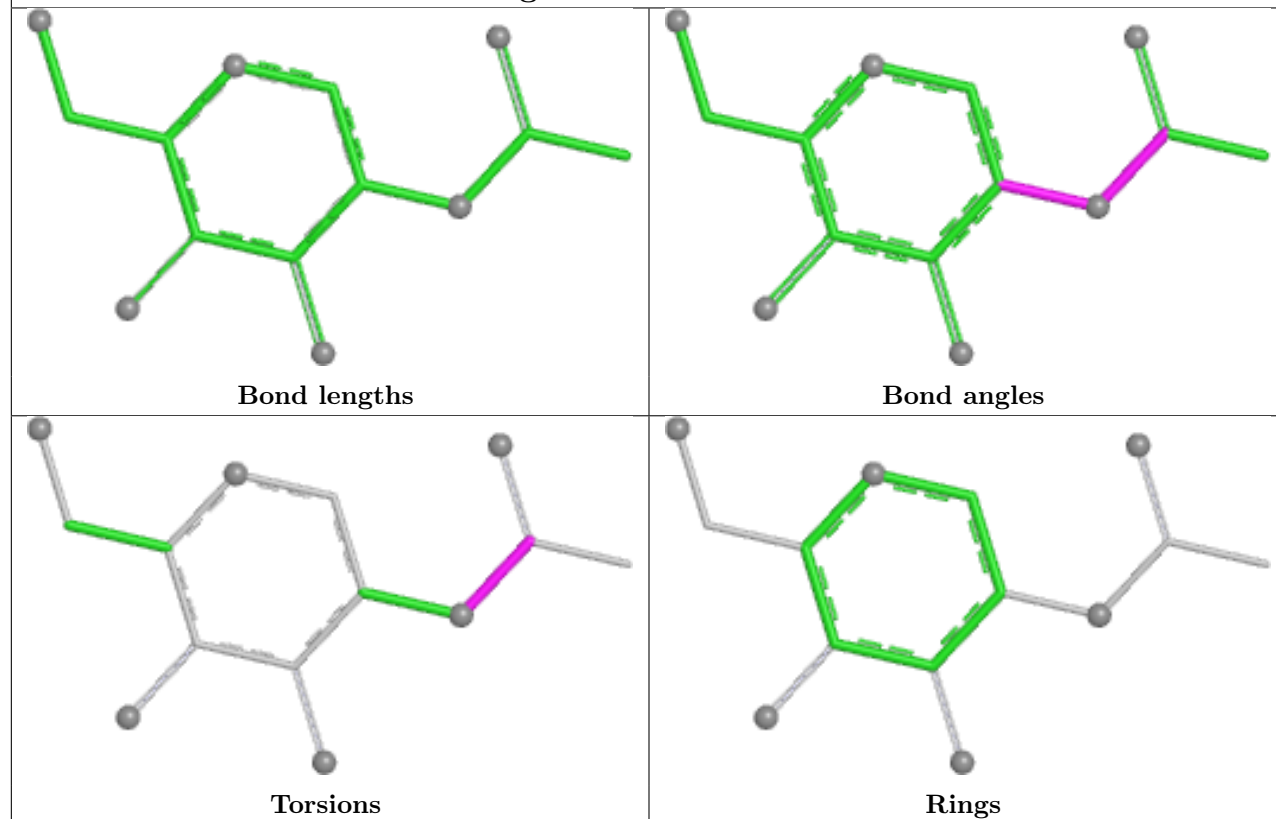
Ligand NAG C 1310



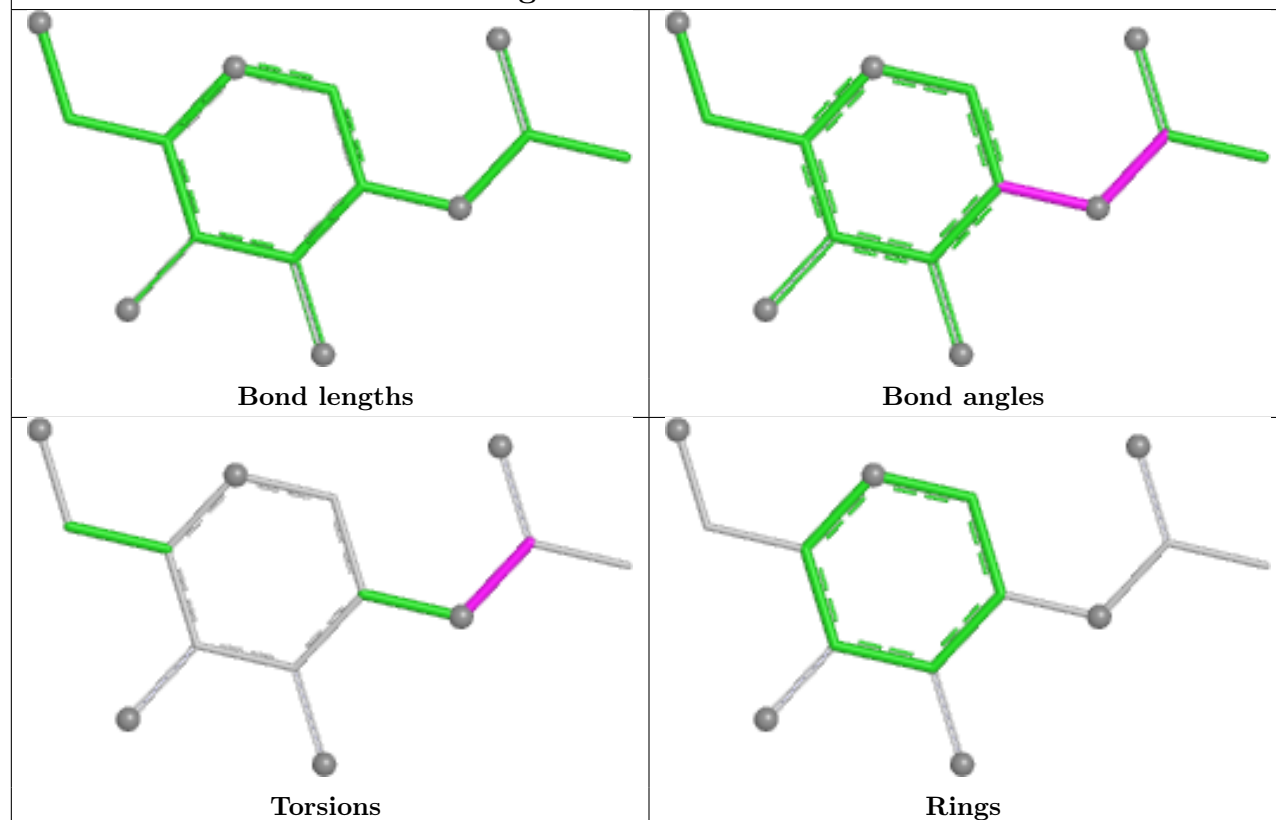
Ligand NAG B 1308



Ligand NAG B 1307



Ligand NAG A 1305



5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

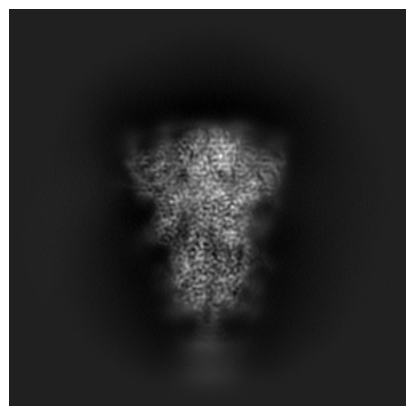
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-60555. These allow visual inspection of the internal detail of the map and identification of artifacts.

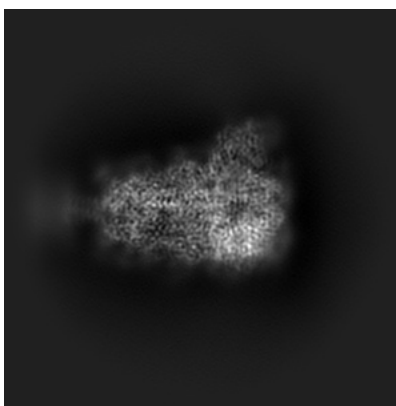
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

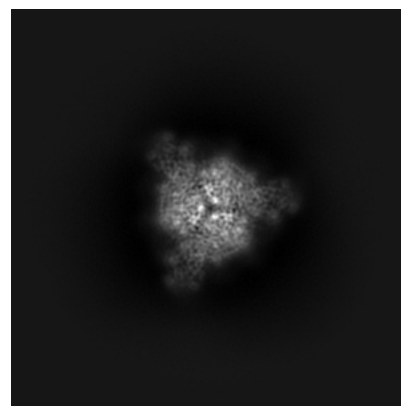
6.1.1 Primary map



X

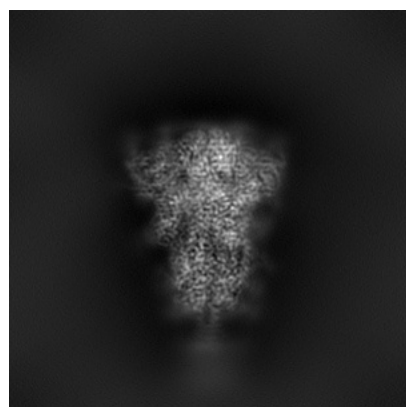


Y

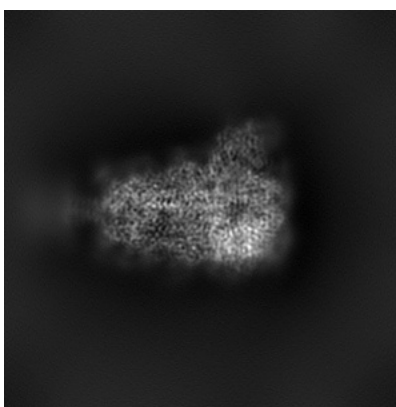


Z

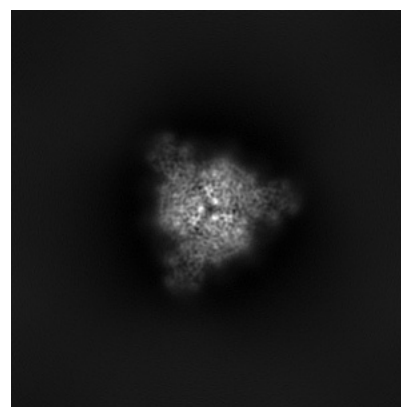
6.1.2 Raw map



X



Y

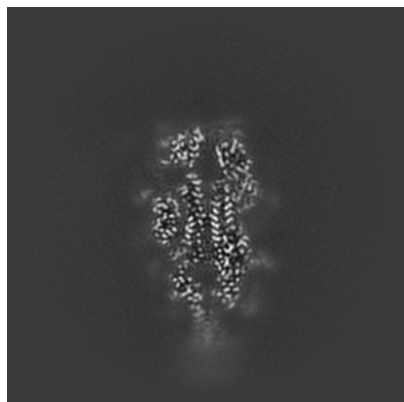


Z

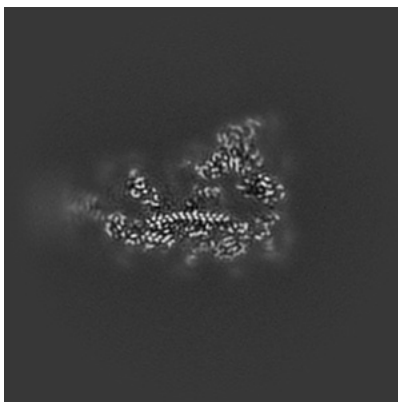
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

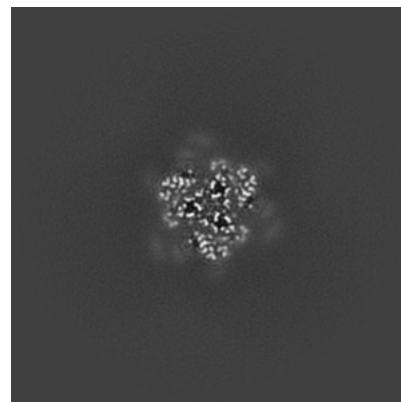
6.2.1 Primary map



X Index: 150

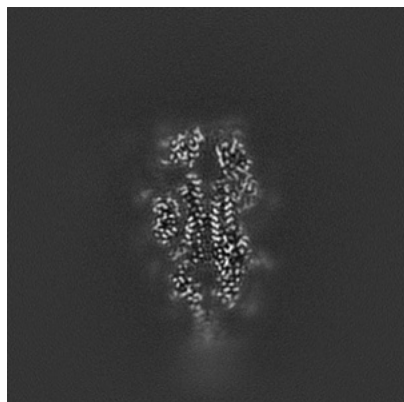


Y Index: 150

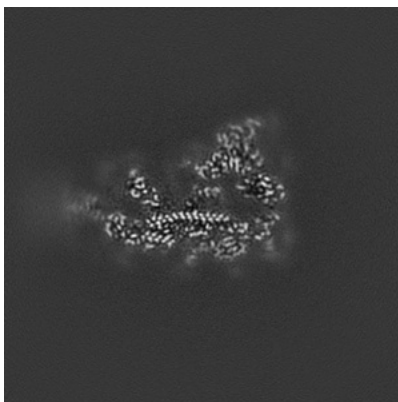


Z Index: 150

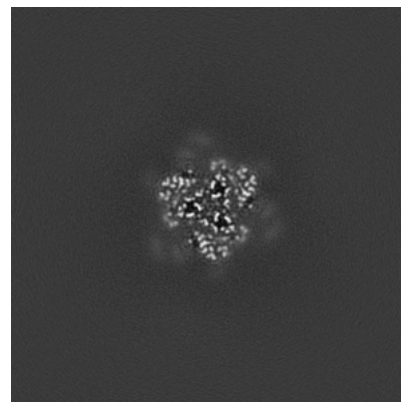
6.2.2 Raw map



X Index: 150



Y Index: 150

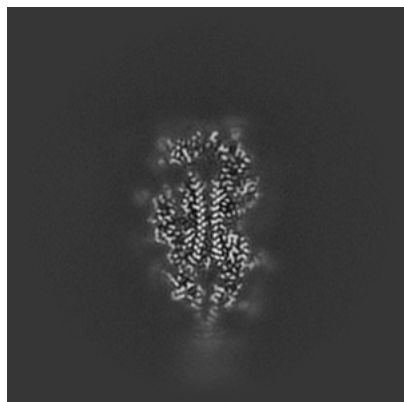


Z Index: 150

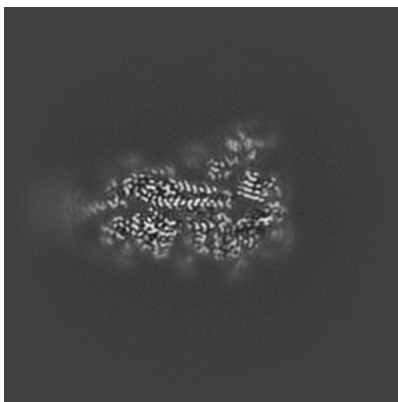
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

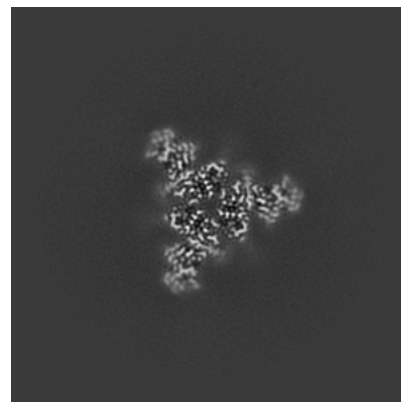
6.3.1 Primary map



X Index: 153

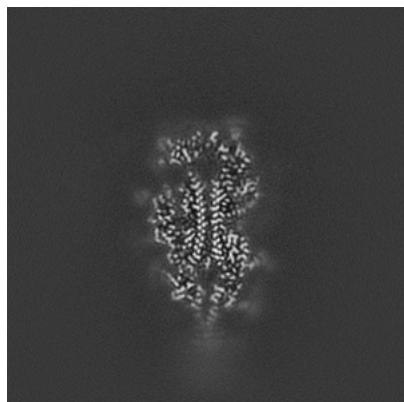


Y Index: 144

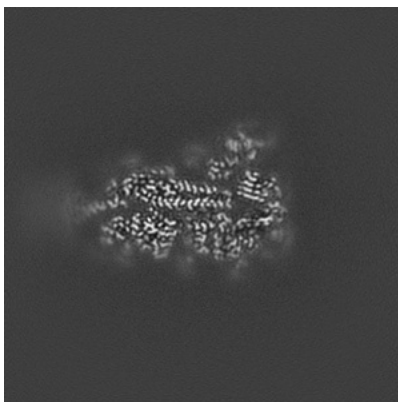


Z Index: 184

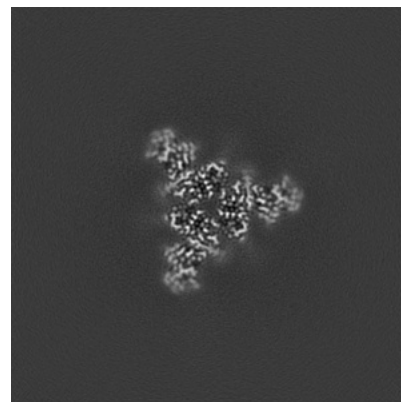
6.3.2 Raw map



X Index: 153



Y Index: 144

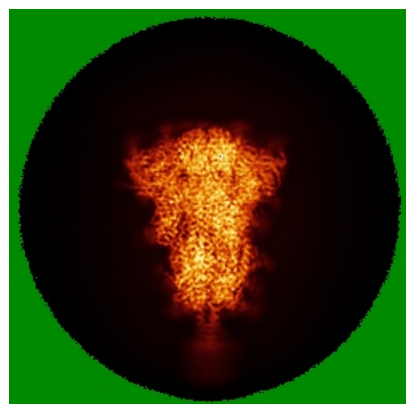


Z Index: 184

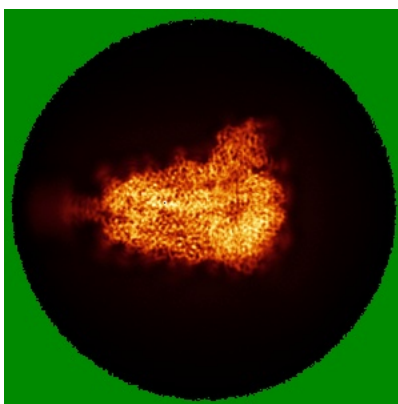
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) ⓘ

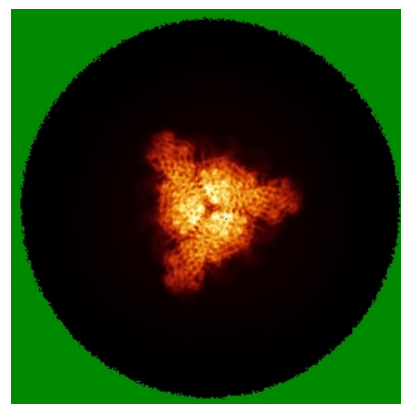
6.4.1 Primary map



X

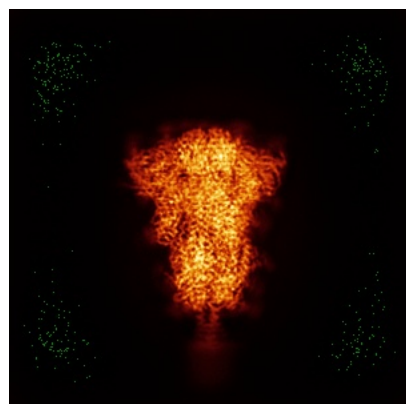


Y

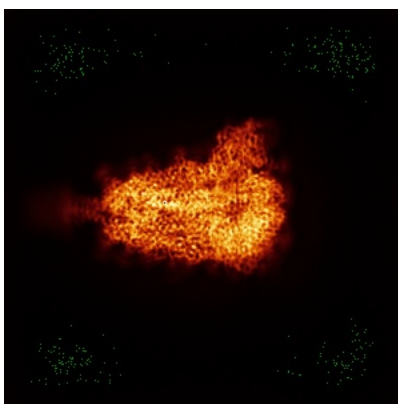


Z

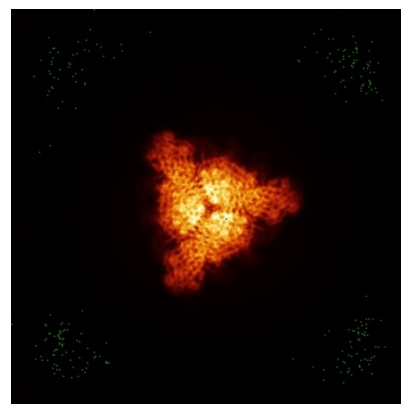
6.4.2 Raw map



X



Y

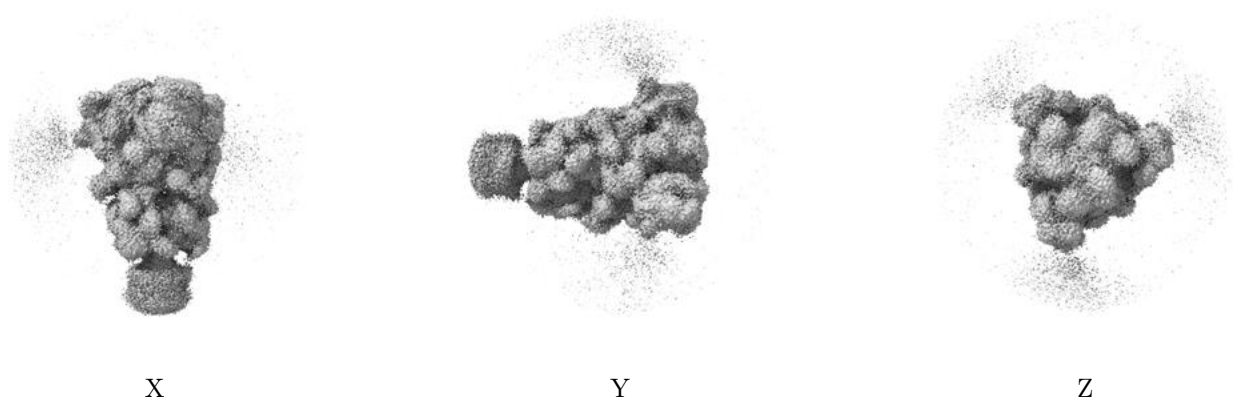


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.0157. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

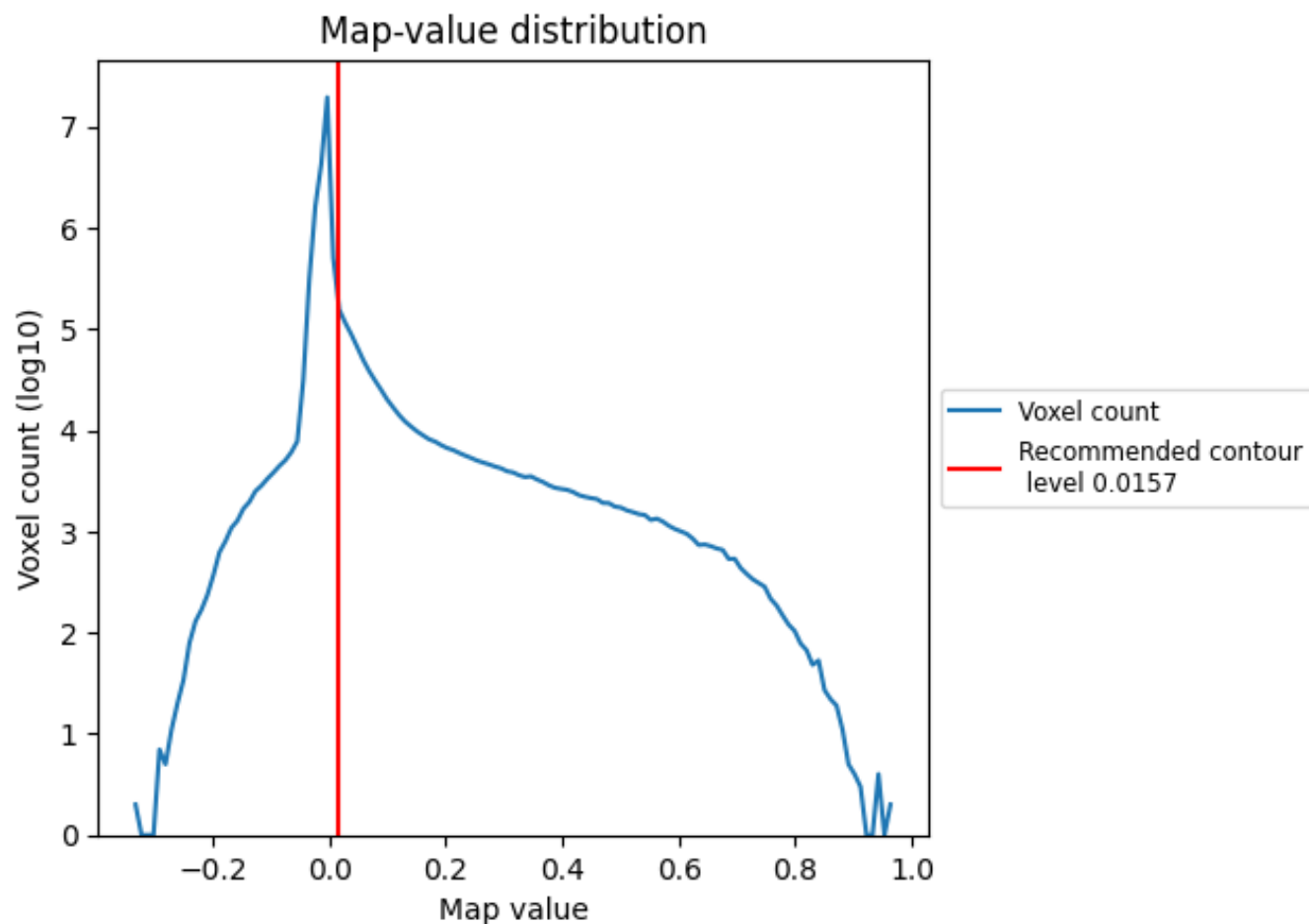
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

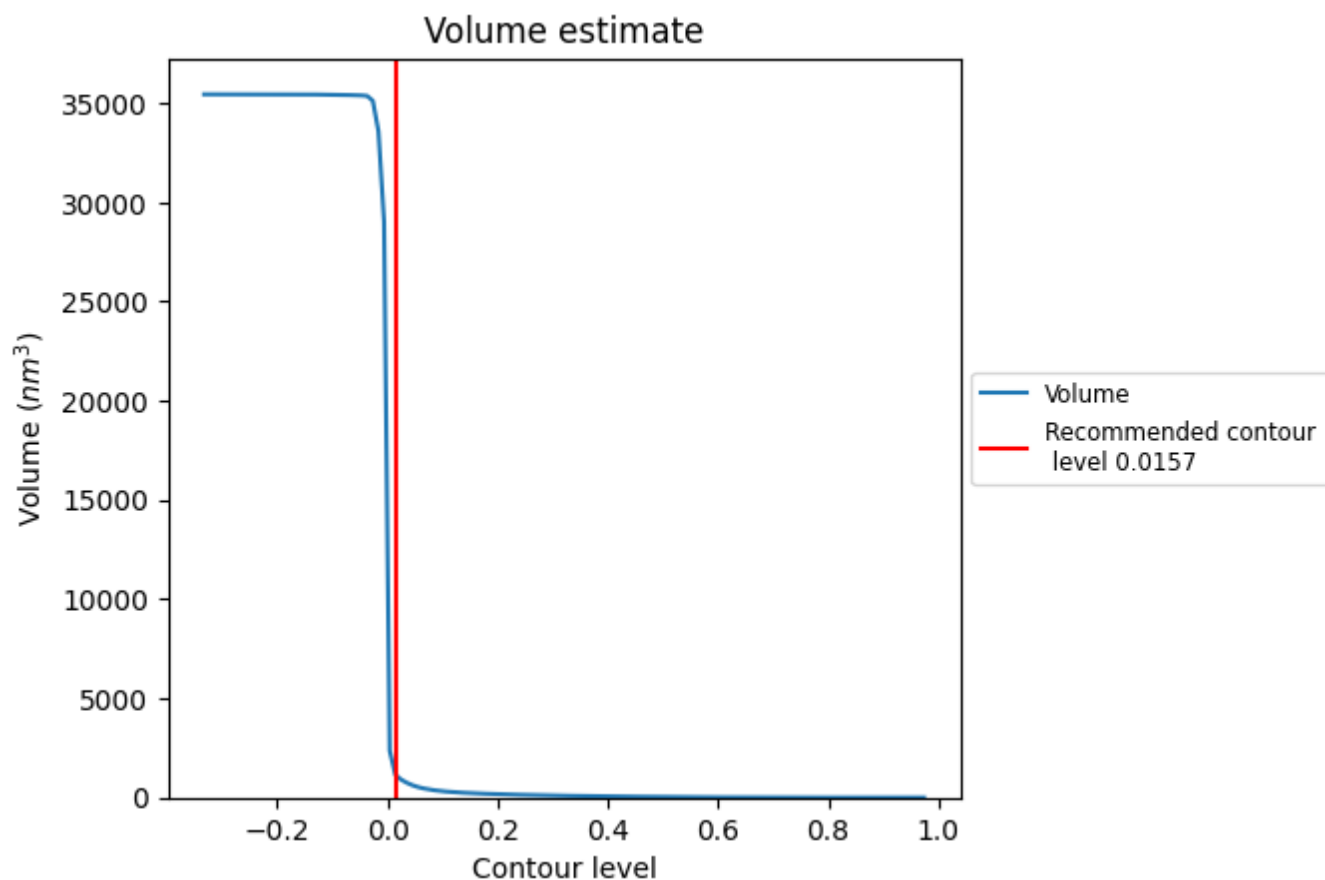
This section contains the results of statistical analysis of the map.

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.

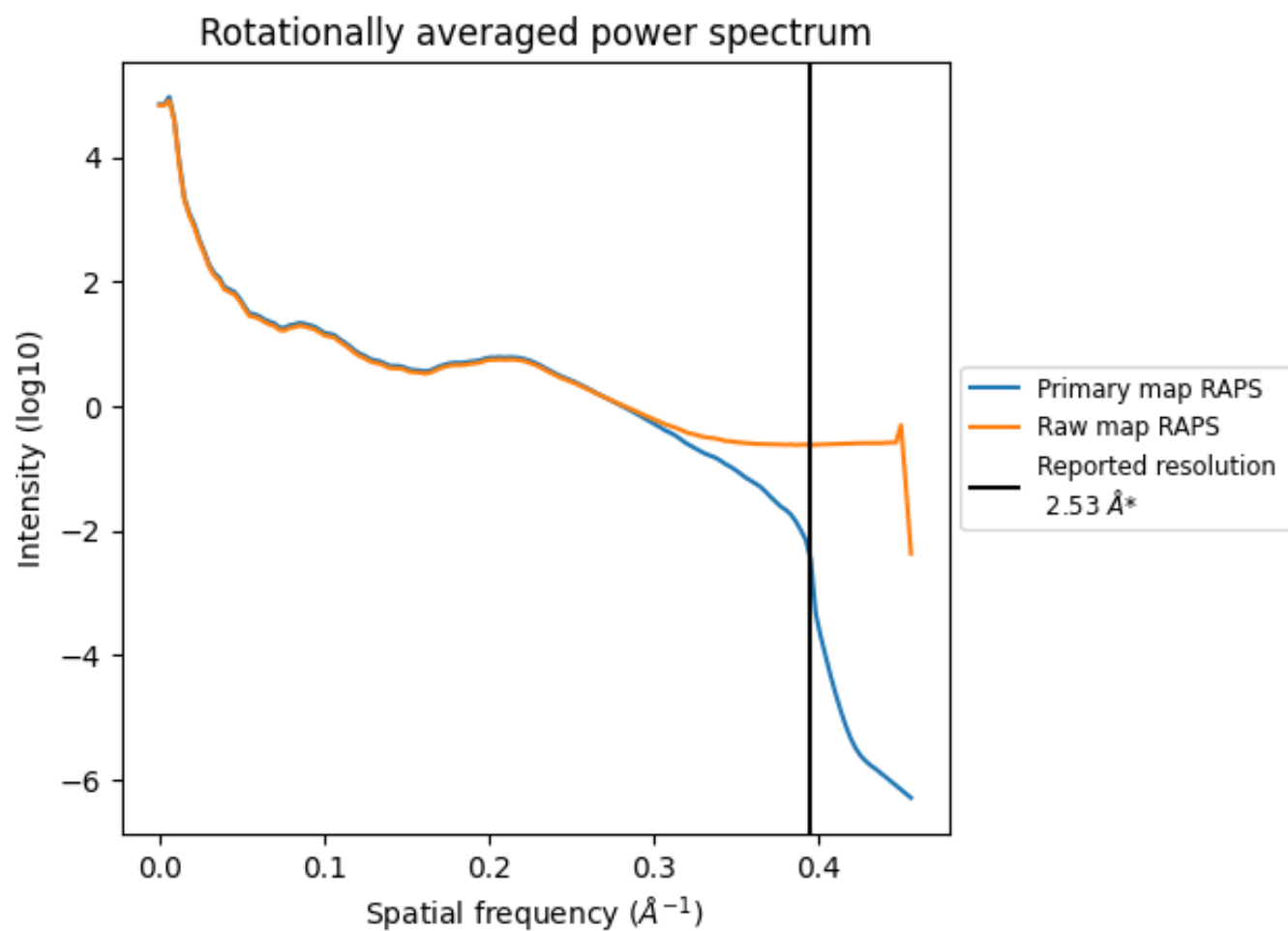
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1119 nm^3 ; this corresponds to an approximate mass of 1011 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 ⓘ

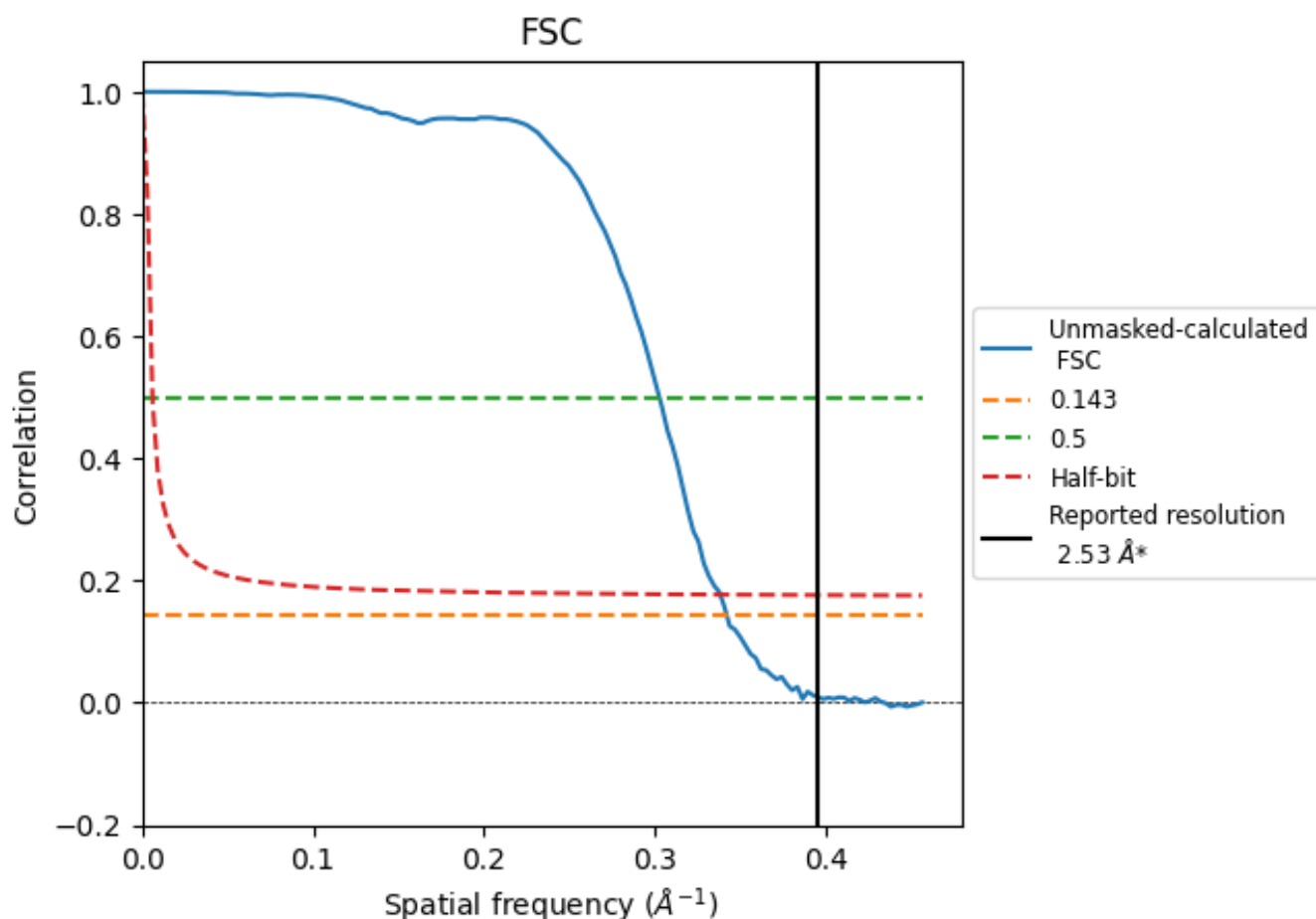


*Reported resolution corresponds to spatial frequency of 0.395 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.395 Å⁻¹

8.2 Resolution estimates [i](#)

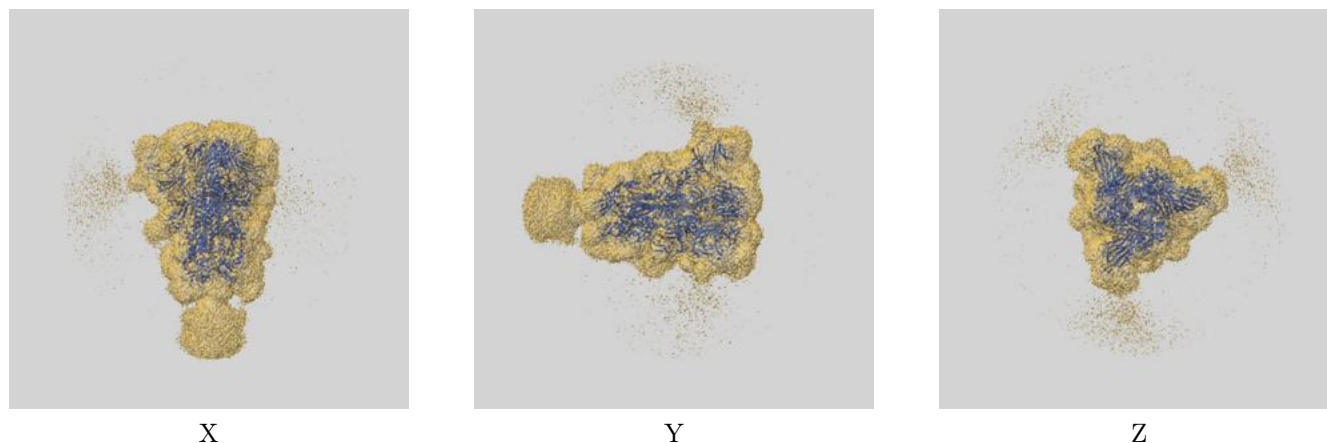
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.53	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	2.92	3.30	2.96

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 2.92 differs from the reported value 2.53 by more than 10 %

9 Map-model fit [i](#)

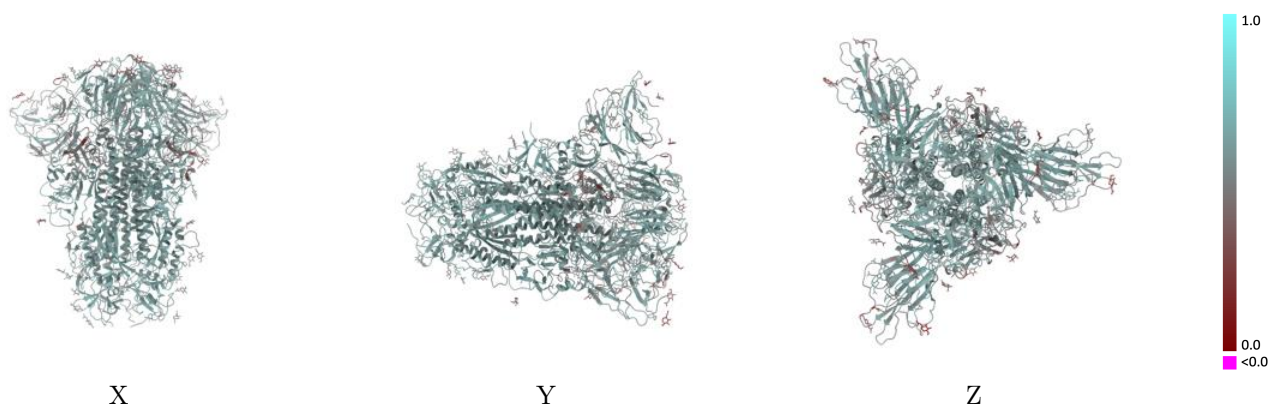
This section contains information regarding the fit between EMDB map EMD-60555 and PDB model 8ZY4. Per-residue inclusion information can be found in section [3](#) on page [15](#).

9.1 Map-model overlay [i](#)



The images above show the 3D surface view of the map at the recommended contour level 0.0157 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](#)

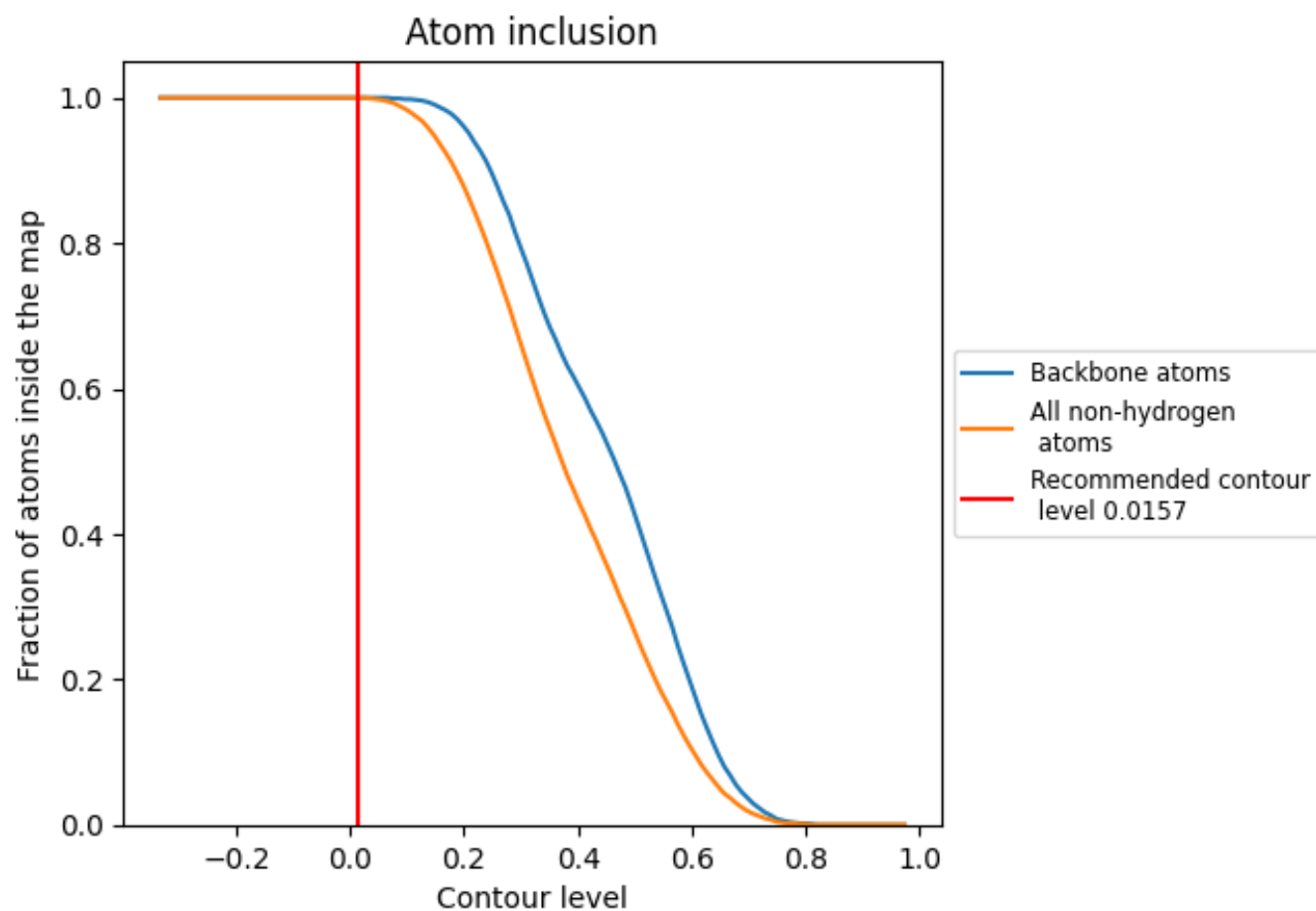


The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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](#)

This section was not generated.

9.4 Atom inclusion [i](#)



At the recommended contour level, 100% of all backbone atoms, 100% 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 (0.0157) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	1.0000	0.5680
A	1.0000	0.5720
B	1.0000	0.5680
C	1.0000	0.5670
D	1.0000	0.5220
E	1.0000	0.5100
F	1.0000	0.4920
G	1.0000	0.5250
H	1.0000	0.5580
I	1.0000	0.5510
J	1.0000	0.4950
K	1.0000	0.5070
L	1.0000	0.5000
M	1.0000	0.5800
N	1.0000	0.5410
O	1.0000	0.4940
P	1.0000	0.4370
Q	1.0000	0.5060
R	1.0000	0.5810

1.0

0.0

<0.0