



wwPDB EM Validation Summary Report ⓘ

Feb 25, 2023 – 03:48 PM EST

PDB ID : 8EM7
EMDB ID : EMD-28241
Title : Cryo-EM structure of LRP2 at pH 5.2
Authors : Beenken, A.; Cerutti, G.; Fitzpatrick, A.W.; Barasch, J.; Shapiro, L.
Deposited on : 2022-09-27
Resolution : 2.97 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

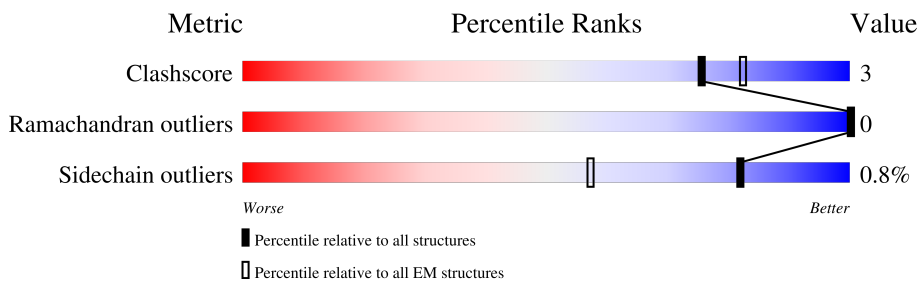
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.32.1

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 2.97 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)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	4660	
1	B	4660	
2	C	2	
2	D	2	

2 Entry composition [i](#)

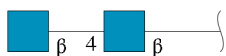
There are 5 unique types of molecules in this entry. The entry contains 67552 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Low-density lipoprotein receptor-related protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	4378	Total	C	N	O	S	0	0
			32850	20354	5778	6336	382		
1	B	4378	Total	C	N	O	S	0	0
			32850	20354	5778	6336	382		

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



Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	C	2	Total	C	N	O	0	0
			28	16	2	10		
2	D	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 3 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆) (labeled as "Ligand of Interest" by depositor).



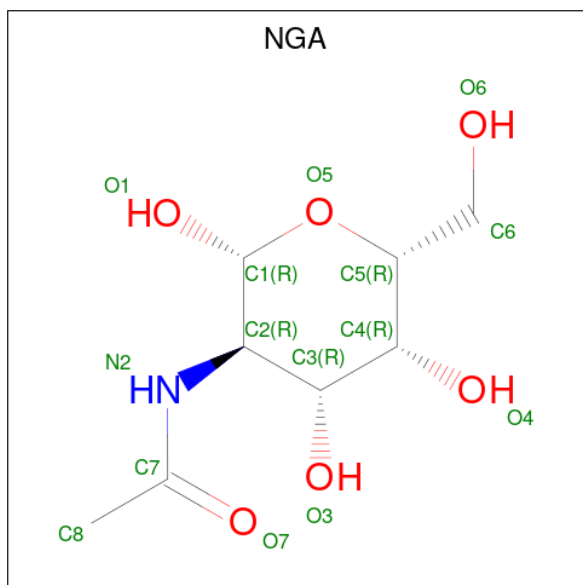
Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O	0
			14	8	1	5	
3	A	1	Total	C	N	O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

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-galactopyranose (three-letter code: NGA) (formula: C₈H₁₅NO₆) (labeled as "Ligand of Interest" by depositor).



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

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

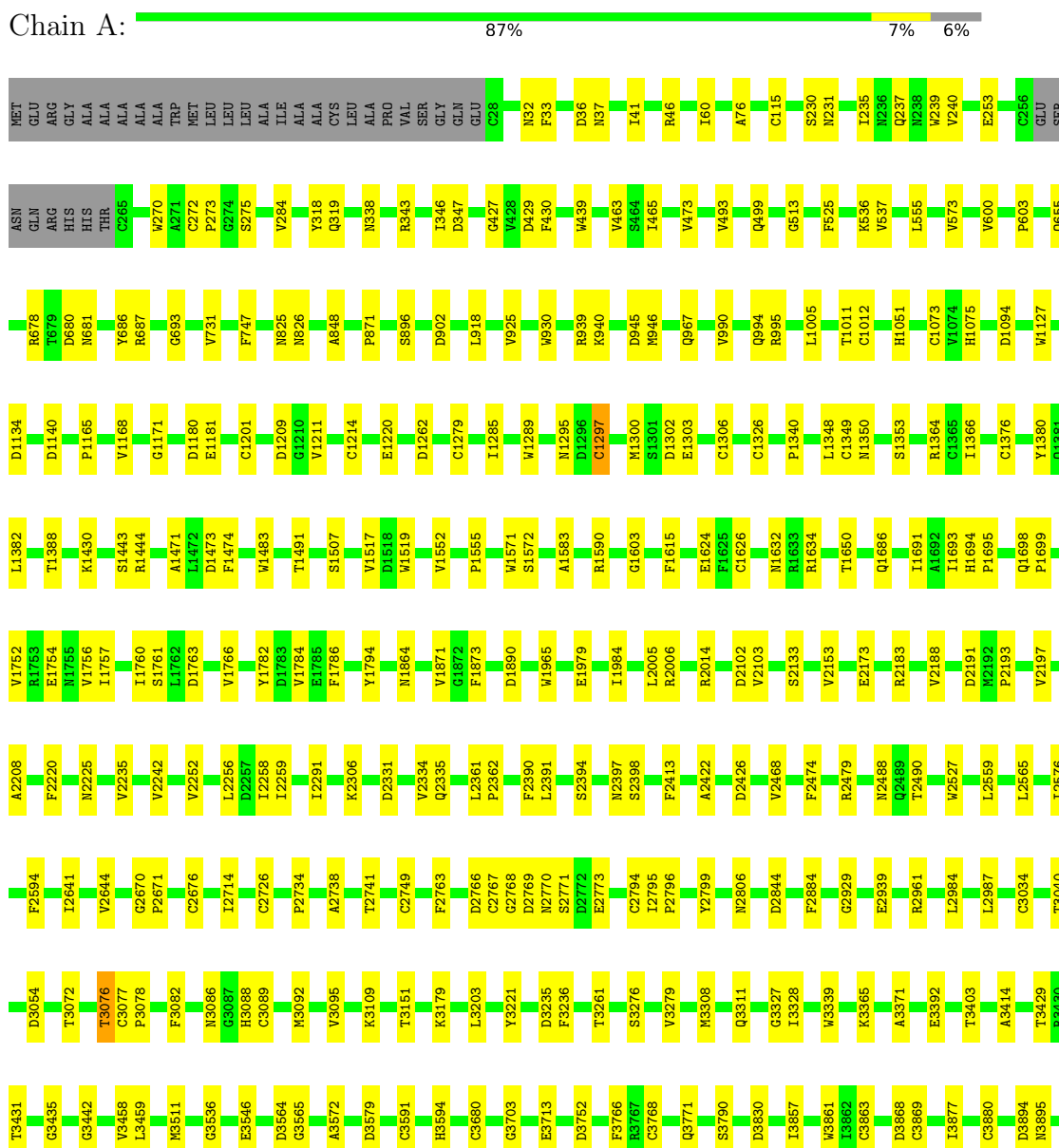
- Molecule 5 is CALCIUM ION (three-letter code: CA) (formula: Ca) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
5	A	44	Total 44	Ca 44	0
5	B	44	Total 44	Ca 44	0

3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Low-density lipoprotein receptor-related protein 2



D3913	F4361	SER	MET	THR	THR
D3916	D4370	SER	TYR	LYS	LYS
T3926	S4373	ALA	ALA	TRP	TRP
E4374	E4374	ASN	ALA	ASP	ASP
D3990	E4413	LYS	ILE	PHE	ILE
N3990	ILE	PRO	THR	LYS	ARG
K4004	GLY	ASN	ASN	LYS	ARG
I4018	GLY	LEU	VAL	LYS	GLY
Y4030	LEU	GLY	GLY	LEU	THR
F4038	THR	PHE	VAL	ALA	ASN
A4051	ILE	PRO	GLN	GLY	PHE
E4082	PRO	SER	GLY	PRO	GLY
E4084	THR	ALA	GLY	ASN	THR
I4089	MET	ASP	VAL	SER	TYR
D4090	THR	VAL	THR	ILE	THR
Y4104	THR	VAL	VAL	GLY	PHE
V4151	ALA	ALA	GLN	GLY	ALA
H4157	GLY	MET	ASN	PRO	ASN
A4171	ILE	VAL	ASN	VAL	ASN
T4172	ALA	ILE	TYR	ALA	ALA
L4173	LEU	ILE	GLY	ALA	ALA
Y4177	VAL	ASP	ARG	PRO	PRO
A4273	LEU	ARG	SER	PRO	SER
K4275	VAL	ILE	ASP	PRO	PRO
D4280	ARG	GLY	ALA	PRO	SER
F4281	ARG	GLN	LYS	ALA	LYS
F4282	THR	PHE	ALA	ALA	ALA
L4286	THR	THR	GLY	LYS	ARG
R4298	LEU	VAL	GLY	PRO	SER
V4313	LEU	VAL	ALA	ALA	SER
N4314	PRO	GLY	LYS	PRO	PRO
R4321	LEU	PRO	PRO	GLY	PRO
I4322	PRO	ALA	ALA	TYR	ALA
C4344	LEU	ILE	ASP	THR	THR
D4360	LEU	PHE	GLY	ALA	THR
	PRO	ASN	GLN	GLY	GLY
	SER	PRO	GLY	THR	THR
	LEU	ASP	GLY	THR	THR

● Molecule 1: Low-density lipoprotein receptor-related protein 2

Chain B: 87% 7% 6%

MET	ASN	P603	C1073	C1376	V1762	V2235	F2594	T3040
GLN	GLN	H1074	Y1074	Y1380	V1766	V2242	I2641	T3072
ARG	ARG	H1075	H1075	Q1381	I1757	I1757	V2644	T3076
HIS	HIS	Q655	D1094	L1382	I1760	V2252	G2670	C3077
ALA	ALA	R678	W1127	T1388	S1761	L2256	P2671	F3078
ALA	ALA	T679	P1185	T1388	L1762	S2257	C2676	F3082
ALA	ALA	D680	V1168	K1430	V1764	L2258	I2714	N3086
ALA	ALA	M681	G1171	R1430	D1763	I2259	C2726	N3088
TRP	TRP	Y686	D1140	S1443	V1766	I2291	C2726	N3089
MET	MET	R687	P1185	R1444	Y1762	K2306	P2734	N3092
P273	P273	G689	V1168	L1472	D1783	D2331	P2734	V3095
LEU	LEU	V731	G1171	F1474	Y1794	V2334	A2738	K3109
LEU	LEU	V284	D1180	W1483	N1864	O2335	T2741	T3151
ALA	ALA	V318	E1181	V1517	V1871	P2336	C2749	K3179
ALA	CYS	Q319	Y1518	W1519	F1873	L2342	F2763	L3203
LEU	LEU	N338	G1210	V1552	D1890	L2361	D2766	Y3221
ALA	ALA	R343	V1211	P1555	W1965	P2362	C2767	G3276
PRO	PRO	N825	G427	R1590	E1979	F2390	D2769	D3235
VAL	VAL	N826	V428	W1571	E1979	L2391	N2770	F3236
SER	SER	A848	D429	S1572	I1984	S2394	S2771	T3261
GLY	GLY	D347	F430	A1583	L2005	N2397	D2772	S3276
GLN	GLN	G427	W439	F1615	R2006	S2398	E2773	V3279
C28	C28	P871	V925	E1624	D2102	F2413	C2794	N3308
N32	N32	V463	V925	F1625	V2103	Q2414	I2795	Q3311
F33	F33	S464	W930	C1297	S2133	A2422	P2796	G3327
D36	D36	I465	L918	M1300	E2173	D2468	Y2799	I3328
N37	N37	V473	L918	S1301	R2183	F2474	D2844	W3339
I41	I41	V473	V925	D1296	V2188	R2479	D2884	A3371
R46	R46	V473	W930	E1303	V2188	R2479	F2884	E3392
I60	I60	V493	V938	E1306	D2191	N2488	G2929	T3403
A76	A76	K940	R939	C1306	M2192	O2489	R2961	A3414
C115	C115	Q499	K940	C1306	P2193	T2490	L2984	T3429
S230	S230	G513	D945	C1326	V2188	W2527	E2989	R3430
N231	N231	I514	M946	P1340	V2188	W2527	R2981	T3431
I235	I235	A515	Q967	L1348	D2191	A2208	L2984	C3034
N236	N236	F525	V990	C1349	M2192	F2220	L2987	G3435
Q237	Q237	K536	Q994	N1350	P2193	N2225	C3034	
W239	W239	V537	R995	S1353	V2197			
V240	V240	L555	L1005	R1364	A1692			
E253	E253	L563	T1011	C1365	H1694			
C256	C256	V573	C1012	I1366	P1695			
SER	SER	V600	H1051	T1373	Q1699			

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C2	Depositor
Number of particles used	209932	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	58.06	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	1500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	1.427	Depositor
Minimum map value	-0.462	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.045	Depositor
Recommended contour level	0.125	Depositor
Map size (\AA)	424.96, 424.96, 424.96	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	0.83, 0.83, 0.83	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: CA, NGA, 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	0.35	0/33663	0.74	0/45889
1	B	0.35	0/33663	0.74	0/45889
All	All	0.35	0/67326	0.74	0/91778

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	32850	0	29224	205	0
1	B	32850	0	29224	203	0
2	C	28	0	25	0	0
2	D	28	0	25	0	0
3	A	546	0	507	4	0
3	B	546	0	507	4	0
4	A	308	0	286	2	0
4	B	308	0	286	2	0
5	A	44	0	0	0	0
5	B	44	0	0	0	0
All	All	67552	0	60084	401	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.

The worst 5 of 401 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:2795:ILE:HD13	1:A:2806:ASN:CB	2.04	0.88
1:B:2795:ILE:HD13	1:B:2806:ASN:CB	2.04	0.88
1:B:2795:ILE:HD13	1:B:2806:ASN:HB3	1.64	0.79
1:A:2795:ILE:HG23	1:A:2796:PRO:HD2	1.65	0.79
1:A:2795:ILE:HD13	1:A:2806:ASN:HB3	1.64	0.78

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	4374/4660 (94%)	4133 (94%)	241 (6%)	0	100	100
1	B	4374/4660 (94%)	4133 (94%)	241 (6%)	0	100	100
All	All	8748/9320 (94%)	8266 (94%)	482 (6%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	3452/4092 (84%)	3423 (99%)	29 (1%)	81	92
1	B	3452/4092 (84%)	3423 (99%)	29 (1%)	81	92
All	All	6904/8184 (84%)	6846 (99%)	58 (1%)	82	92

5 of 58 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3980	ASN
1	B	3680	CYS
1	B	1073	CYS
1	B	3221	TYR
1	B	2676	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	129	HIS
1	A	1673	HIS
1	B	129	HIS
1	B	1673	HIS

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](#)

4 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	C	1	1,2	14,14,15	0.40	0	17,19,21	0.51	0
2	NAG	C	2	2	14,14,15	0.60	0	17,19,21	0.56	0
2	NAG	D	1	1,2	14,14,15	0.40	0	17,19,21	0.51	0
2	NAG	D	2	2	14,14,15	0.60	0	17,19,21	0.56	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	C	1	1,2	-	1/6/23/26	0/1/1/1
2	NAG	C	2	2	-	0/6/23/26	0/1/1/1
2	NAG	D	1	1,2	-	1/6/23/26	0/1/1/1
2	NAG	D	2	2	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

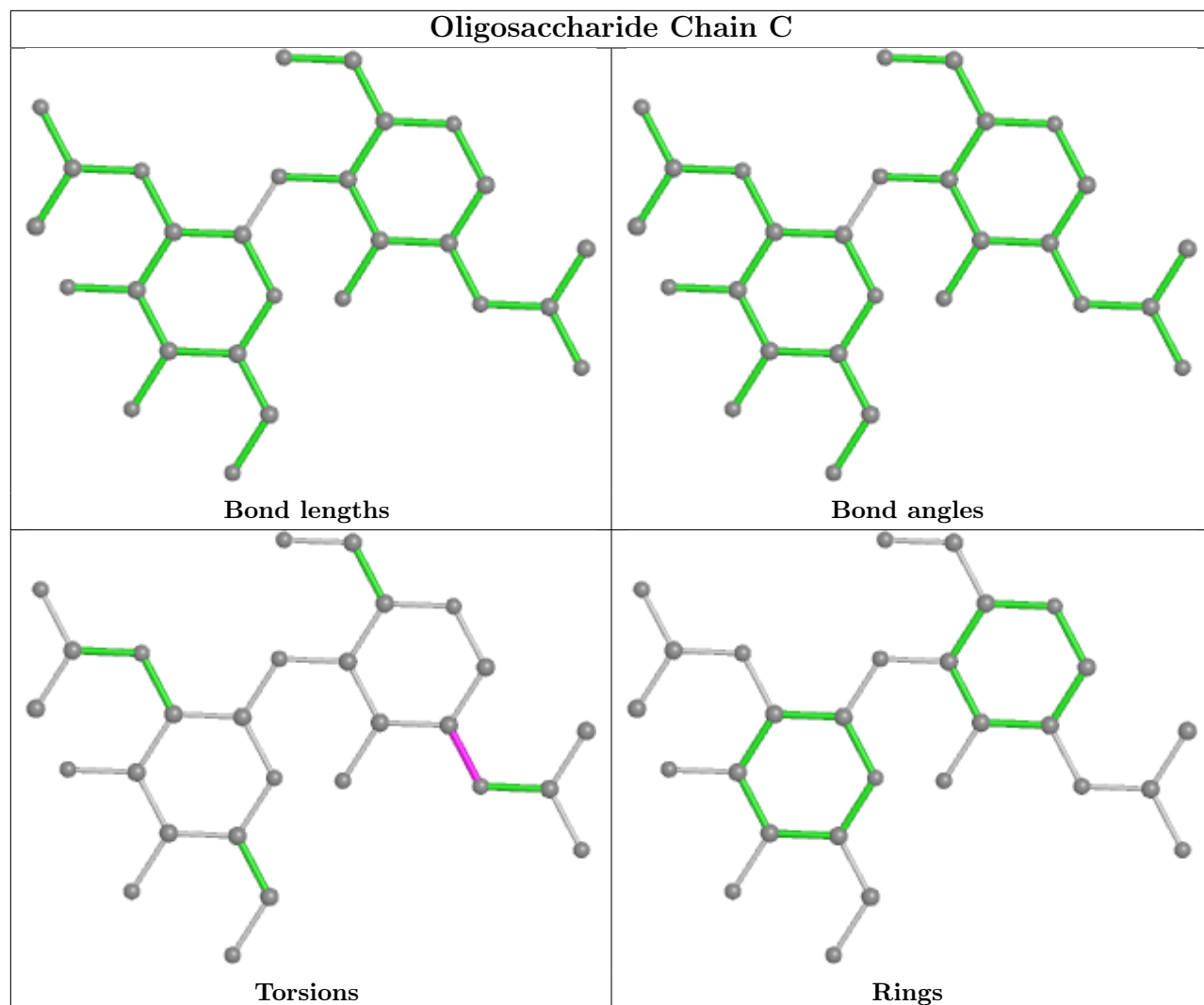
All (2) torsion outliers are listed below:

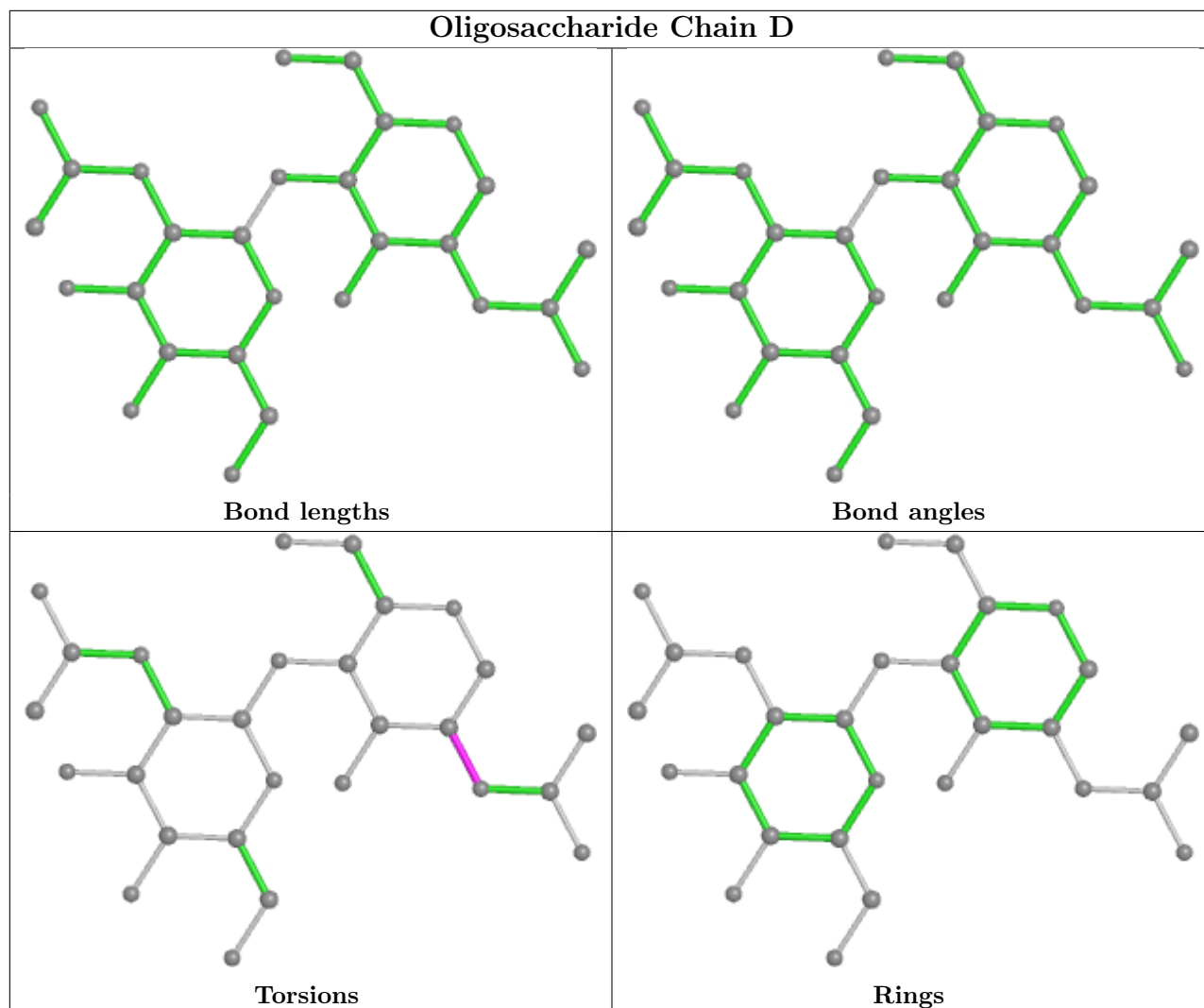
Mol	Chain	Res	Type	Atoms
2	C	1	NAG	C3-C2-N2-C7
2	D	1	NAG	C3-C2-N2-C7

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](#)

Of 210 ligands modelled in this entry, 88 are monoatomic - leaving 122 for Mogul analysis.

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	4727	1	14,14,15	0.28	0	17,19,21	0.75	0
4	NGA	B	4803	1	14,14,15	0.63	0	17,19,21	0.89	0
3	NAG	A	4708	1	14,14,15	0.53	0	17,19,21	0.44	0
3	NAG	A	4704	1	14,14,15	0.44	0	17,19,21	0.50	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	NGA	B	4752	1	14,14,15	0.35	0	17,19,21	0.77	0
4	NGA	A	4802	1	14,14,15	0.48	0	17,19,21	0.95	2 (11%)
3	NAG	A	4710	1	14,14,15	0.23	0	17,19,21	0.60	0
4	NGA	A	4751	1	14,14,15	0.52	0	17,19,21	0.88	0
3	NAG	A	4804	1	14,14,15	0.57	0	17,19,21	0.56	0
3	NAG	B	4709	1	14,14,15	0.24	0	17,19,21	0.88	1 (5%)
4	NGA	A	4745	1	14,14,15	0.99	1 (7%)	17,19,21	1.74	3 (17%)
3	NAG	B	4706	1	14,14,15	0.27	0	17,19,21	0.60	0
3	NAG	A	4733	1	14,14,15	0.40	0	17,19,21	0.61	0
3	NAG	A	4715	1	14,14,15	0.42	0	17,19,21	0.48	0
4	NGA	A	4752	1	14,14,15	0.35	0	17,19,21	0.77	0
3	NAG	B	4728	1	14,14,15	0.24	0	17,19,21	0.47	0
4	NGA	B	4802	1	14,14,15	0.48	0	17,19,21	0.95	2 (11%)
3	NAG	B	4710	1	14,14,15	0.23	0	17,19,21	0.60	0
3	NAG	A	4724	1	14,14,15	0.21	0	17,19,21	0.45	0
4	NGA	B	4744	1	14,14,15	1.11	1 (7%)	17,19,21	0.97	1 (5%)
3	NAG	B	4724	1	14,14,15	0.21	0	17,19,21	0.45	0
3	NAG	A	4719	1	14,14,15	0.27	0	17,19,21	0.57	0
4	NGA	A	4744	1	14,14,15	1.11	1 (7%)	17,19,21	0.97	1 (5%)
3	NAG	B	4705	1	14,14,15	0.19	0	17,19,21	0.59	0
4	NGA	B	4753	1	14,14,15	0.47	0	17,19,21	0.71	0
3	NAG	B	4804	1	14,14,15	0.57	0	17,19,21	0.56	0
3	NAG	B	4701	1	14,14,15	0.39	0	17,19,21	0.77	1 (5%)
3	NAG	B	4702	1	14,14,15	0.40	0	17,19,21	0.83	1 (5%)
3	NAG	B	4719	1	14,14,15	0.27	0	17,19,21	0.57	0
3	NAG	A	4736	1	14,14,15	0.38	0	17,19,21	0.43	0
3	NAG	A	4730	1	14,14,15	0.23	0	17,19,21	0.59	0
4	NGA	A	4737	-	14,14,15	0.47	0	17,19,21	0.91	1 (5%)
3	NAG	A	4728	1	14,14,15	0.24	0	17,19,21	0.47	0
3	NAG	A	4711	1	14,14,15	0.28	0	17,19,21	0.43	0
4	NGA	B	4746	1	14,14,15	0.57	0	17,19,21	0.94	0
3	NAG	B	4739	1	14,14,15	0.34	0	17,19,21	1.22	1 (5%)
4	NGA	B	4801	-	14,14,15	0.57	0	17,19,21	0.87	0
3	NAG	B	4723	1	14,14,15	0.40	0	17,19,21	0.98	2 (11%)
3	NAG	A	4709	1	14,14,15	0.24	0	17,19,21	0.88	1 (5%)
3	NAG	A	4734	1	14,14,15	0.26	0	17,19,21	0.71	1 (5%)
3	NAG	B	4730	1	14,14,15	0.23	0	17,19,21	0.59	0
3	NAG	B	4733	1	14,14,15	0.40	0	17,19,21	0.61	0
4	NGA	B	4737	-	14,14,15	0.47	0	17,19,21	0.91	1 (5%)
4	NGA	B	4751	1	14,14,15	0.52	0	17,19,21	0.88	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	NAG	A	4805	1	14,14,15	0.32	0	17,19,21	0.50	0
3	NAG	B	4711	1	14,14,15	0.28	0	17,19,21	0.43	0
4	NGA	B	4745	1	14,14,15	0.99	1 (7%)	17,19,21	1.74	3 (17%)
4	NGA	A	4741	1	14,14,15	0.95	1 (7%)	17,19,21	1.56	2 (11%)
4	NGA	A	4738	1	14,14,15	0.88	1 (7%)	17,19,21	1.44	3 (17%)
3	NAG	B	4714	1	14,14,15	0.34	0	17,19,21	0.55	0
4	NGA	A	4800	-	14,14,15	0.64	0	17,19,21	0.91	0
4	NGA	B	4750	-	14,14,15	0.52	0	17,19,21	0.66	0
3	NAG	A	4721	1	14,14,15	0.44	0	17,19,21	0.74	1 (5%)
3	NAG	B	4725	1	14,14,15	0.33	0	17,19,21	0.50	0
3	NAG	A	4705	1	14,14,15	0.19	0	17,19,21	0.59	0
4	NGA	A	4750	-	14,14,15	0.52	0	17,19,21	0.66	0
3	NAG	B	4734	1	14,14,15	0.26	0	17,19,21	0.71	1 (5%)
4	NGA	A	4749	1	14,14,15	0.63	0	17,19,21	0.72	0
4	NGA	B	4743	1	14,14,15	0.49	0	17,19,21	1.16	1 (5%)
4	NGA	A	4747	1	14,14,15	1.23	1 (7%)	17,19,21	1.65	3 (17%)
4	NGA	B	4741	1	14,14,15	0.95	1 (7%)	17,19,21	1.56	2 (11%)
3	NAG	B	4731	1	14,14,15	0.27	0	17,19,21	0.53	0
4	NGA	B	4738	1	14,14,15	0.88	1 (7%)	17,19,21	1.44	3 (17%)
3	NAG	A	4732	1	14,14,15	0.34	0	17,19,21	0.80	1 (5%)
3	NAG	B	4721	1	14,14,15	0.44	0	17,19,21	0.74	1 (5%)
3	NAG	A	4714	1	14,14,15	0.34	0	17,19,21	0.55	0
4	NGA	A	4746	1	14,14,15	0.57	0	17,19,21	0.94	0
3	NAG	A	4739	1	14,14,15	0.34	0	17,19,21	1.22	1 (5%)
4	NGA	A	4803	1	14,14,15	0.63	0	17,19,21	0.89	0
3	NAG	A	4726	1	14,14,15	0.44	0	17,19,21	0.64	1 (5%)
3	NAG	A	4703	1	14,14,15	0.47	0	17,19,21	1.16	2 (11%)
4	NGA	B	4747	1	14,14,15	1.23	1 (7%)	17,19,21	1.65	3 (17%)
4	NGA	A	4801	-	14,14,15	0.57	0	17,19,21	0.87	0
3	NAG	B	4716	1	14,14,15	0.47	0	17,19,21	0.63	1 (5%)
4	NGA	B	4740	1	14,14,15	1.19	1 (7%)	17,19,21	1.16	1 (5%)
4	NGA	A	4748	1	14,14,15	0.50	0	17,19,21	0.95	1 (5%)
3	NAG	A	4702	1	14,14,15	0.40	0	17,19,21	0.83	1 (5%)
4	NGA	B	4799	1	14,14,15	0.58	0	17,19,21	0.79	0
3	NAG	B	4729	1	14,14,15	0.40	0	17,19,21	1.07	1 (5%)
3	NAG	A	4717	1	14,14,15	0.41	0	17,19,21	0.98	1 (5%)
3	NAG	B	4805	1	14,14,15	0.32	0	17,19,21	0.50	0
4	NGA	B	4754	1	14,14,15	0.66	0	17,19,21	1.20	2 (11%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	NAG	A	4718	1	14,14,15	0.26	0	17,19,21	0.57	0
4	NGA	A	4742	1	14,14,15	0.88	1 (7%)	17,19,21	2.39	2 (11%)
3	NAG	A	4735	1	14,14,15	0.35	0	17,19,21	0.68	1 (5%)
3	NAG	A	4725	1	14,14,15	0.33	0	17,19,21	0.50	0
4	NGA	A	4753	1	14,14,15	0.47	0	17,19,21	0.71	0
3	NAG	A	4712	1	14,14,15	0.48	0	17,19,21	0.68	1 (5%)
3	NAG	B	4726	1	14,14,15	0.44	0	17,19,21	0.64	1 (5%)
3	NAG	B	4703	1	14,14,15	0.47	0	17,19,21	1.16	2 (11%)
3	NAG	A	4723	1	14,14,15	0.40	0	17,19,21	0.98	2 (11%)
3	NAG	A	4707	1	14,14,15	0.55	0	17,19,21	0.62	0
3	NAG	A	4716	1	14,14,15	0.47	0	17,19,21	0.63	1 (5%)
4	NGA	B	4748	1	14,14,15	0.50	0	17,19,21	0.95	1 (5%)
3	NAG	A	4722	1	14,14,15	0.48	0	17,19,21	0.97	0
3	NAG	B	4717	1	14,14,15	0.41	0	17,19,21	0.98	1 (5%)
3	NAG	A	4731	1	14,14,15	0.27	0	17,19,21	0.53	0
3	NAG	B	4720	1	14,14,15	0.50	0	17,19,21	0.63	0
3	NAG	A	4729	1	14,14,15	0.40	0	17,19,21	1.07	1 (5%)
3	NAG	B	4727	1	14,14,15	0.28	0	17,19,21	0.75	0
3	NAG	B	4736	1	14,14,15	0.38	0	17,19,21	0.43	0
4	NGA	A	4740	1	14,14,15	1.19	1 (7%)	17,19,21	1.16	1 (5%)
3	NAG	B	4735	1	14,14,15	0.35	0	17,19,21	0.68	1 (5%)
4	NGA	A	4743	1	14,14,15	0.49	0	17,19,21	1.16	1 (5%)
3	NAG	A	4713	1	14,14,15	0.30	0	17,19,21	0.61	0
3	NAG	B	4718	1	14,14,15	0.26	0	17,19,21	0.57	0
4	NGA	B	4800	-	14,14,15	0.64	0	17,19,21	0.91	0
4	NGA	A	4799	1	14,14,15	0.58	0	17,19,21	0.79	0
3	NAG	B	4707	1	14,14,15	0.55	0	17,19,21	0.62	0
4	NGA	A	4754	1	14,14,15	0.66	0	17,19,21	1.20	2 (11%)
3	NAG	B	4708	1	14,14,15	0.53	0	17,19,21	0.44	0
3	NAG	B	4722	1	14,14,15	0.48	0	17,19,21	0.97	0
3	NAG	B	4704	1	14,14,15	0.44	0	17,19,21	0.50	0
4	NGA	B	4742	1	14,14,15	0.88	1 (7%)	17,19,21	2.39	2 (11%)
4	NGA	B	4749	1	14,14,15	0.63	0	17,19,21	0.72	0
3	NAG	A	4706	1	14,14,15	0.27	0	17,19,21	0.60	0
3	NAG	B	4715	1	14,14,15	0.42	0	17,19,21	0.48	0
3	NAG	A	4720	1	14,14,15	0.50	0	17,19,21	0.63	0
3	NAG	B	4713	1	14,14,15	0.30	0	17,19,21	0.61	0
3	NAG	A	4701	1	14,14,15	0.39	0	17,19,21	0.77	1 (5%)
3	NAG	B	4732	1	14,14,15	0.34	0	17,19,21	0.80	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	NAG	B	4712	1	14,14,15	0.48	0	17,19,21	0.68	1 (5%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	A	4727	1	-	4/6/23/26	0/1/1/1
4	NGA	B	4803	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4708	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4704	1	-	0/6/23/26	0/1/1/1
4	NGA	B	4752	1	-	2/6/23/26	0/1/1/1
4	NGA	A	4802	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4710	1	-	0/6/23/26	0/1/1/1
4	NGA	A	4751	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4804	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4709	1	-	1/6/23/26	0/1/1/1
4	NGA	A	4745	1	-	3/6/23/26	0/1/1/1
3	NAG	B	4706	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4733	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4715	1	-	2/6/23/26	0/1/1/1
4	NGA	A	4752	1	-	2/6/23/26	0/1/1/1
3	NAG	B	4728	1	-	1/6/23/26	0/1/1/1
4	NGA	B	4802	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4710	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4724	1	-	0/6/23/26	0/1/1/1
4	NGA	B	4744	1	-	1/6/23/26	0/1/1/1
3	NAG	B	4724	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4719	1	-	0/6/23/26	0/1/1/1
4	NGA	A	4744	1	-	1/6/23/26	0/1/1/1
3	NAG	B	4705	1	-	0/6/23/26	0/1/1/1
4	NGA	B	4753	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4804	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4701	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4702	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4719	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4736	1	-	2/6/23/26	0/1/1/1
3	NAG	A	4730	1	-	0/6/23/26	0/1/1/1
4	NGA	A	4737	-	-	1/6/23/26	0/1/1/1
3	NAG	A	4728	1	-	1/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	A	4711	1	-	2/6/23/26	0/1/1/1
4	NGA	B	4746	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4739	1	-	0/6/23/26	0/1/1/1
4	NGA	B	4801	-	-	2/6/23/26	0/1/1/1
3	NAG	B	4723	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4709	1	-	1/6/23/26	0/1/1/1
3	NAG	A	4734	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4730	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4733	1	-	0/6/23/26	0/1/1/1
4	NGA	B	4737	-	-	1/6/23/26	0/1/1/1
4	NGA	B	4751	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4805	1	-	2/6/23/26	0/1/1/1
3	NAG	B	4711	1	-	2/6/23/26	0/1/1/1
4	NGA	B	4745	1	-	3/6/23/26	0/1/1/1
4	NGA	A	4741	1	-	0/6/23/26	0/1/1/1
4	NGA	A	4738	1	-	2/6/23/26	0/1/1/1
3	NAG	B	4714	1	-	2/6/23/26	0/1/1/1
4	NGA	A	4800	-	-	1/6/23/26	0/1/1/1
4	NGA	B	4750	-	-	1/6/23/26	0/1/1/1
3	NAG	A	4721	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4725	1	-	2/6/23/26	0/1/1/1
3	NAG	A	4705	1	-	0/6/23/26	0/1/1/1
4	NGA	A	4750	-	-	1/6/23/26	0/1/1/1
3	NAG	B	4734	1	-	0/6/23/26	0/1/1/1
4	NGA	A	4749	1	-	1/6/23/26	0/1/1/1
4	NGA	B	4743	1	-	0/6/23/26	0/1/1/1
4	NGA	A	4747	1	-	4/6/23/26	0/1/1/1
4	NGA	B	4741	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4731	1	-	0/6/23/26	0/1/1/1
4	NGA	B	4738	1	-	2/6/23/26	0/1/1/1
3	NAG	A	4732	1	-	4/6/23/26	0/1/1/1
3	NAG	B	4721	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4714	1	-	2/6/23/26	0/1/1/1
4	NGA	A	4746	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4739	1	-	0/6/23/26	0/1/1/1
4	NGA	A	4803	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4726	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4703	1	-	0/6/23/26	0/1/1/1
4	NGA	B	4747	1	-	4/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NGA	A	4801	-	-	2/6/23/26	0/1/1/1
3	NAG	B	4716	1	-	1/6/23/26	0/1/1/1
4	NGA	B	4740	1	-	0/6/23/26	0/1/1/1
4	NGA	A	4748	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4702	1	-	0/6/23/26	0/1/1/1
4	NGA	B	4799	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4729	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4717	1	-	2/6/23/26	0/1/1/1
3	NAG	B	4805	1	-	2/6/23/26	0/1/1/1
4	NGA	B	4754	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4718	1	-	2/6/23/26	0/1/1/1
4	NGA	A	4742	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4735	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4725	1	-	2/6/23/26	0/1/1/1
4	NGA	A	4753	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4712	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4726	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4703	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4723	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4707	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4716	1	-	1/6/23/26	0/1/1/1
4	NGA	B	4748	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4722	1	-	1/6/23/26	0/1/1/1
3	NAG	B	4717	1	-	2/6/23/26	0/1/1/1
3	NAG	A	4731	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4720	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4729	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4727	1	-	4/6/23/26	0/1/1/1
3	NAG	B	4736	1	-	2/6/23/26	0/1/1/1
4	NGA	A	4740	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4735	1	-	0/6/23/26	0/1/1/1
4	NGA	A	4743	1	-	0/6/23/26	0/1/1/1
3	NAG	A	4713	1	-	3/6/23/26	0/1/1/1
3	NAG	B	4718	1	-	2/6/23/26	0/1/1/1
4	NGA	B	4800	-	-	1/6/23/26	0/1/1/1
4	NGA	A	4799	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4707	1	-	0/6/23/26	0/1/1/1
4	NGA	A	4754	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4708	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4722	1	-	1/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	B	4704	1	-	0/6/23/26	0/1/1/1
4	NGA	B	4742	1	-	0/6/23/26	0/1/1/1
4	NGA	B	4749	1	-	1/6/23/26	0/1/1/1
3	NAG	A	4706	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4715	1	-	2/6/23/26	0/1/1/1
3	NAG	A	4720	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4713	1	-	3/6/23/26	0/1/1/1
3	NAG	A	4701	1	-	0/6/23/26	0/1/1/1
3	NAG	B	4732	1	-	4/6/23/26	0/1/1/1
3	NAG	B	4712	1	-	0/6/23/26	0/1/1/1

The worst 5 of 14 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	4747	NGA	C1-C2	4.46	1.59	1.52
4	B	4747	NGA	C1-C2	4.46	1.59	1.52
4	A	4740	NGA	C1-C2	4.27	1.58	1.52
4	B	4740	NGA	C1-C2	4.27	1.58	1.52
4	A	4744	NGA	C1-C2	3.95	1.58	1.52

The worst 5 of 78 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	4742	NGA	O5-C1-C2	-8.00	98.65	111.29
4	B	4742	NGA	O5-C1-C2	-8.00	98.65	111.29
4	A	4742	NGA	C1-O5-C5	5.45	119.58	112.19
4	B	4742	NGA	C1-O5-C5	5.45	119.58	112.19
4	A	4745	NGA	O5-C1-C2	-4.86	103.62	111.29

There are no chirality outliers.

5 of 98 torsion outliers are listed below:

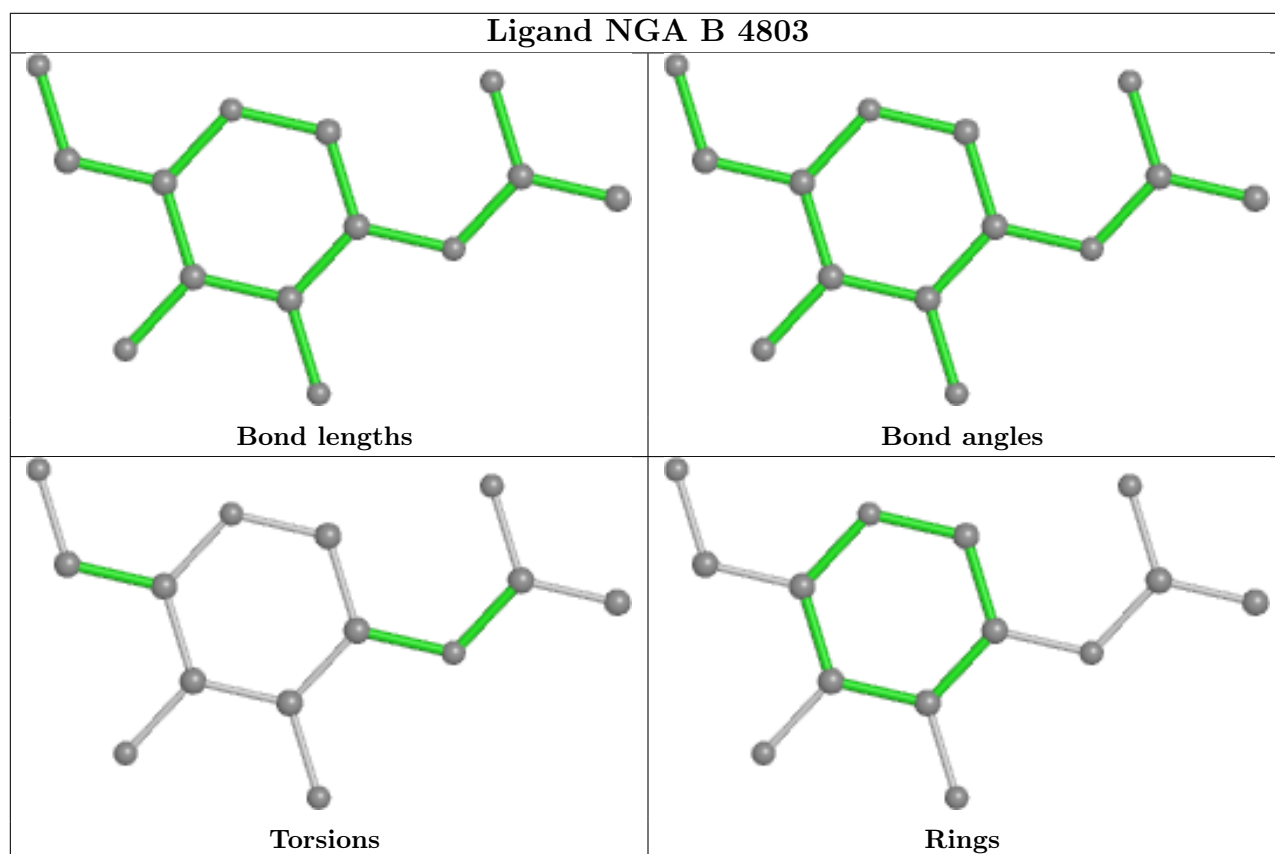
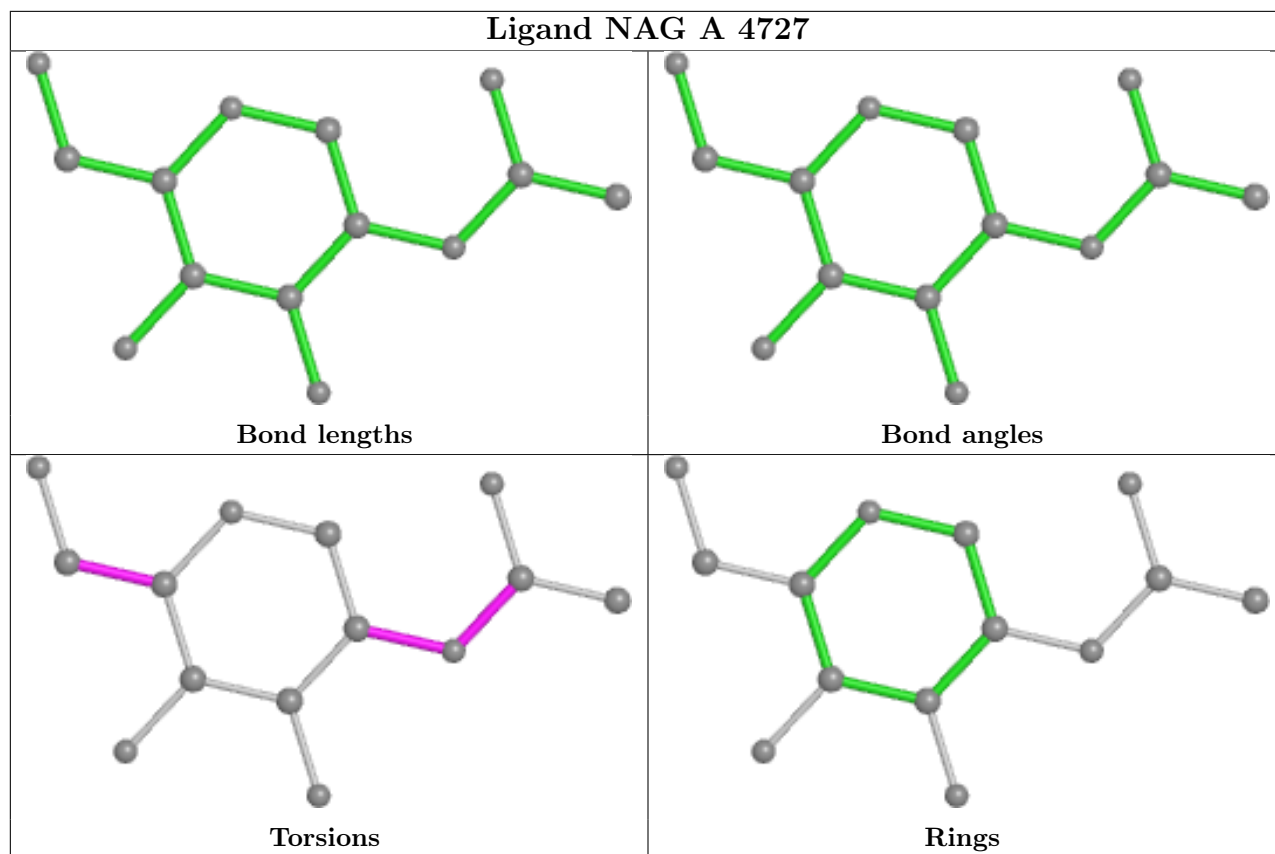
Mol	Chain	Res	Type	Atoms
3	A	4713	NAG	C3-C2-N2-C7
3	A	4713	NAG	C8-C7-N2-C2
3	A	4713	NAG	O7-C7-N2-C2
3	A	4732	NAG	C3-C2-N2-C7
3	A	4732	NAG	C8-C7-N2-C2

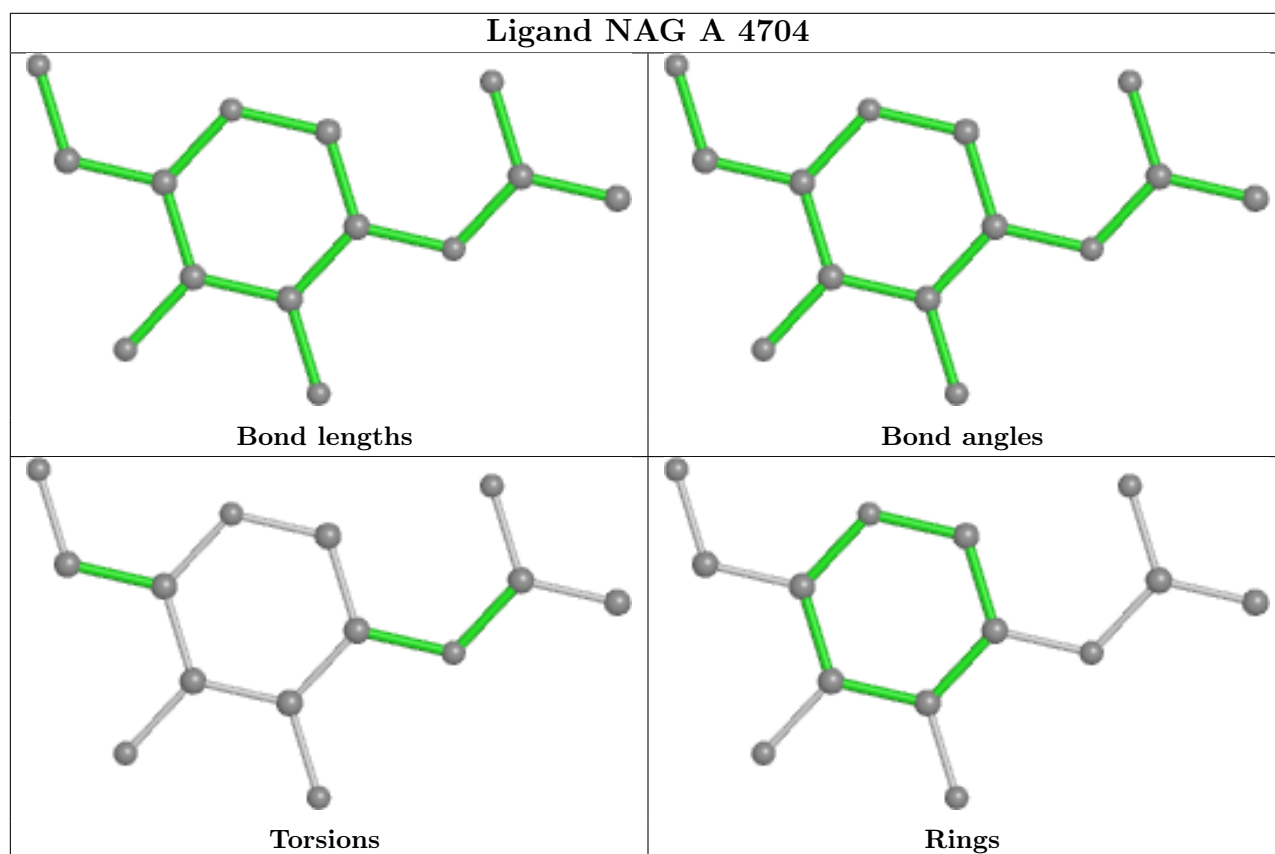
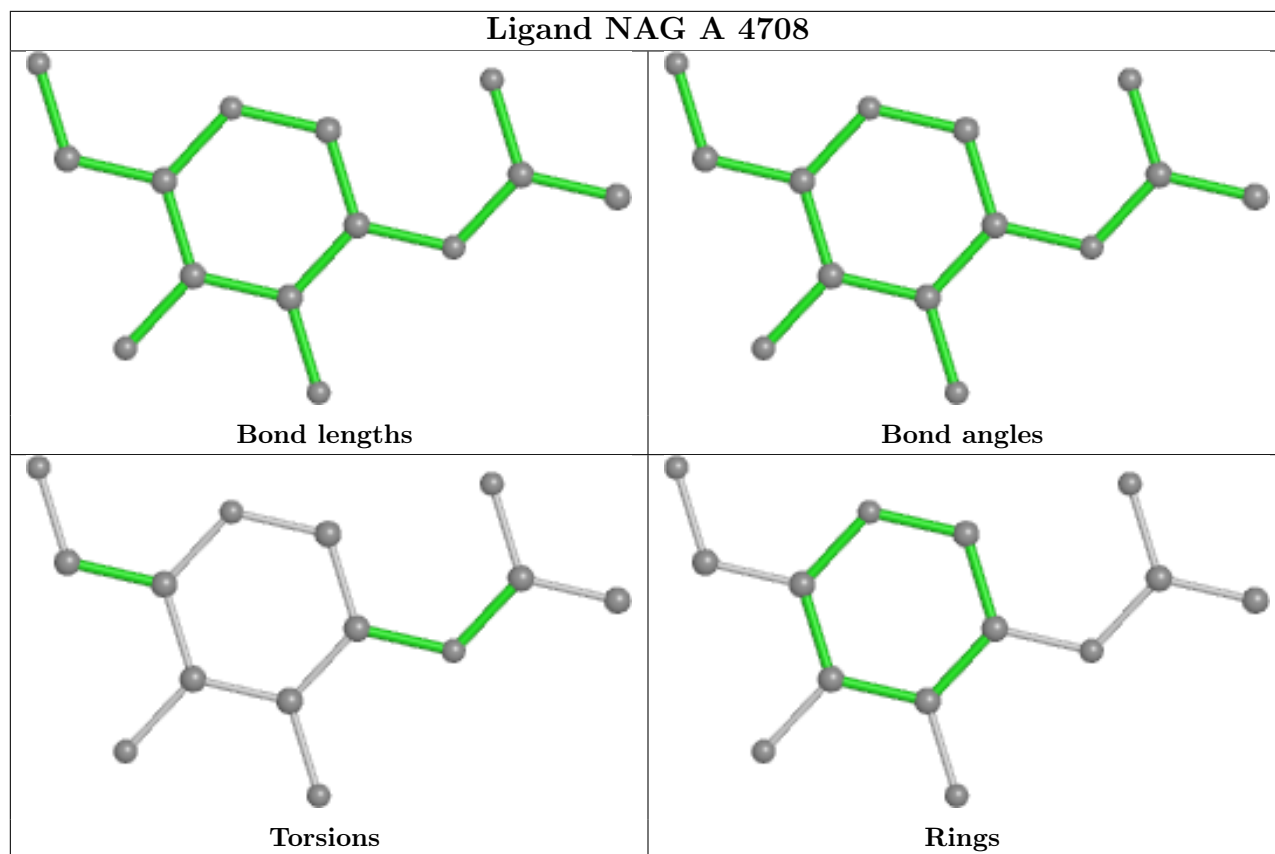
There are no ring outliers.

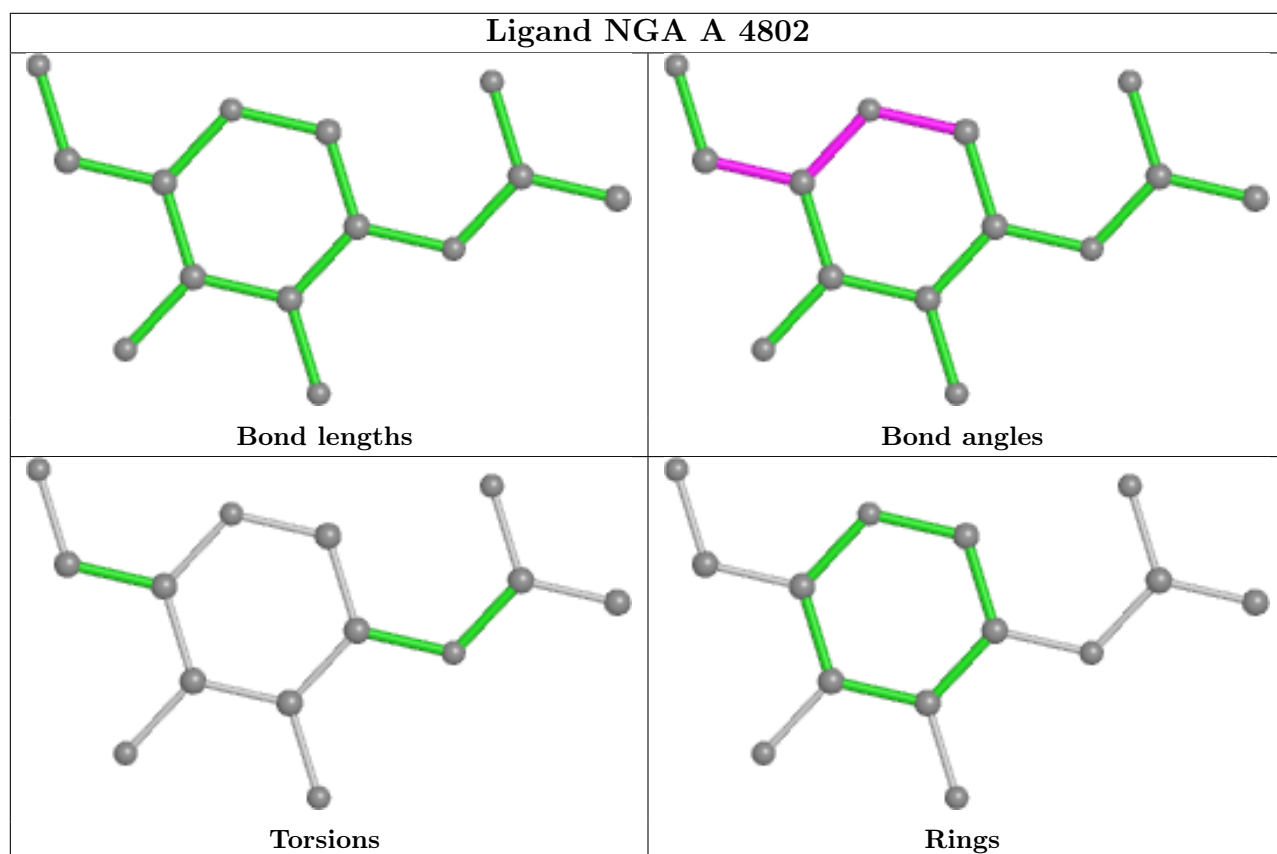
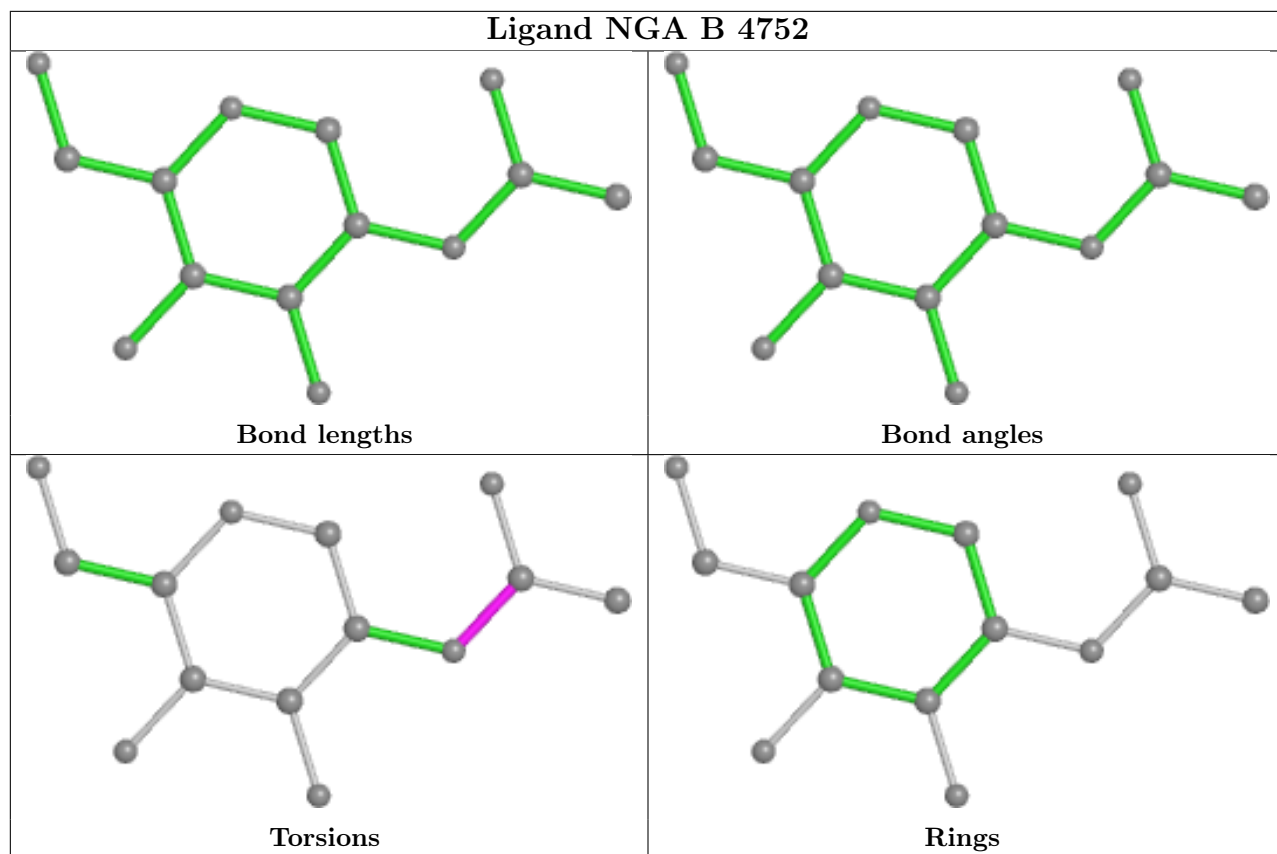
12 monomers are involved in 12 short contacts:

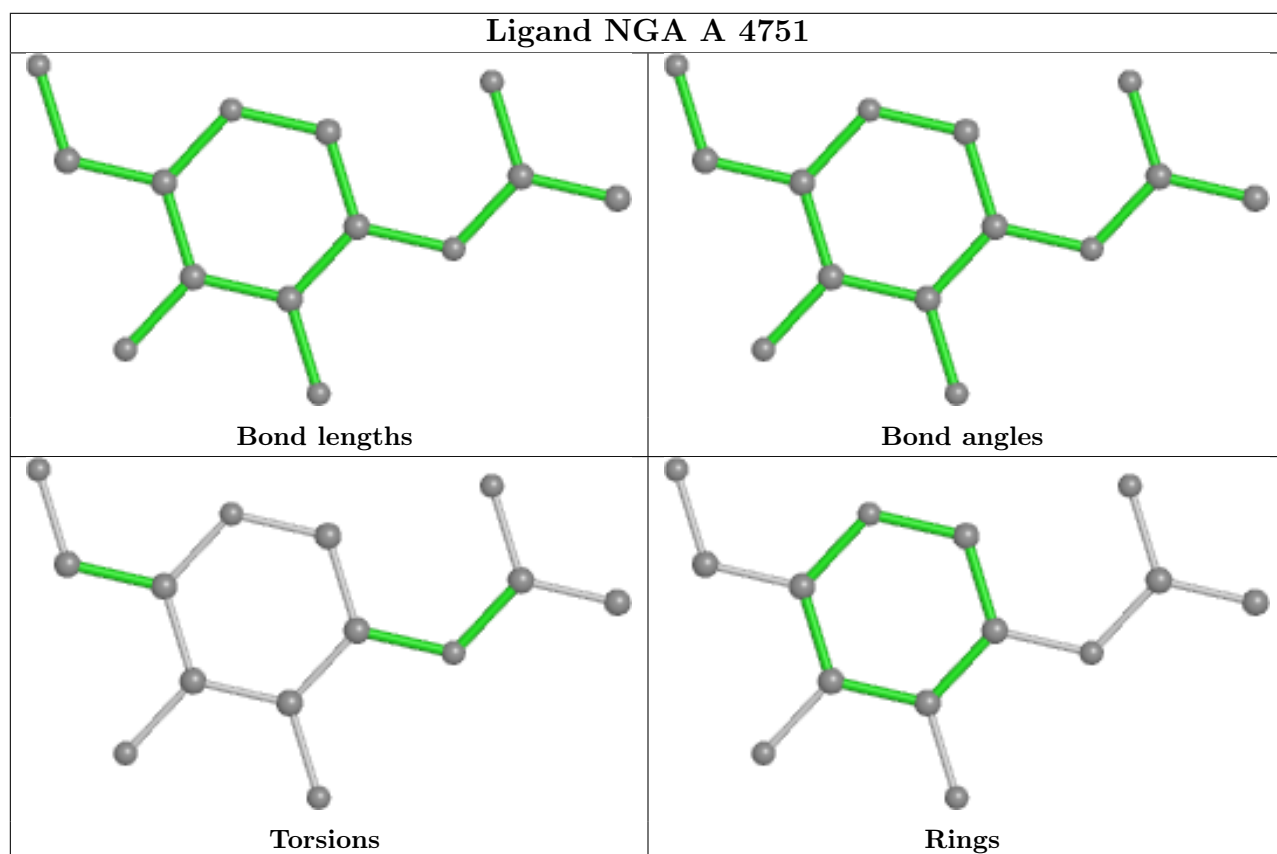
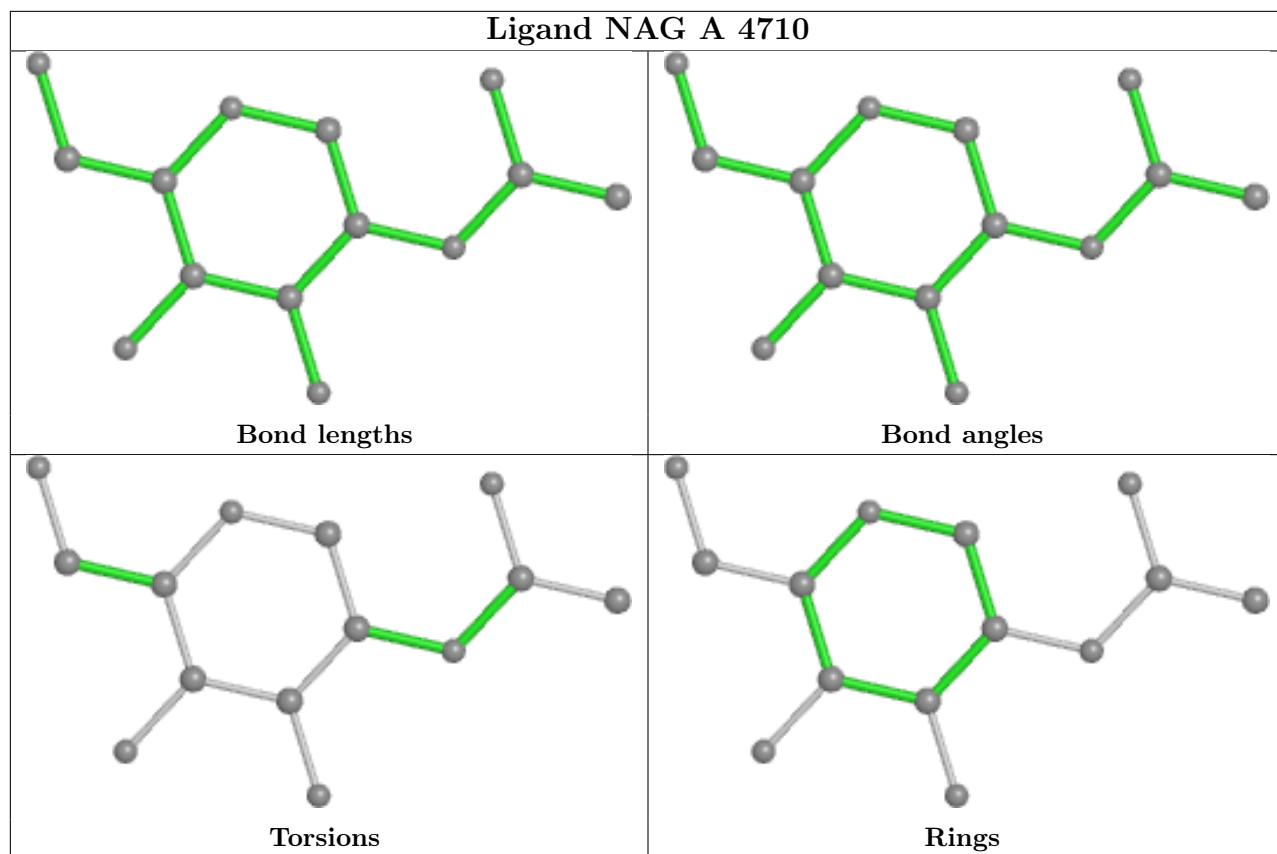
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	4715	NAG	1	0
4	A	4747	NGA	1	0
3	A	4726	NAG	1	0
4	B	4747	NGA	1	0
4	B	4754	NGA	1	0
3	B	4726	NAG	1	0
3	A	4707	NAG	1	0
3	A	4713	NAG	1	0
3	B	4707	NAG	1	0
4	A	4754	NGA	1	0
3	B	4715	NAG	1	0
3	B	4713	NAG	1	0

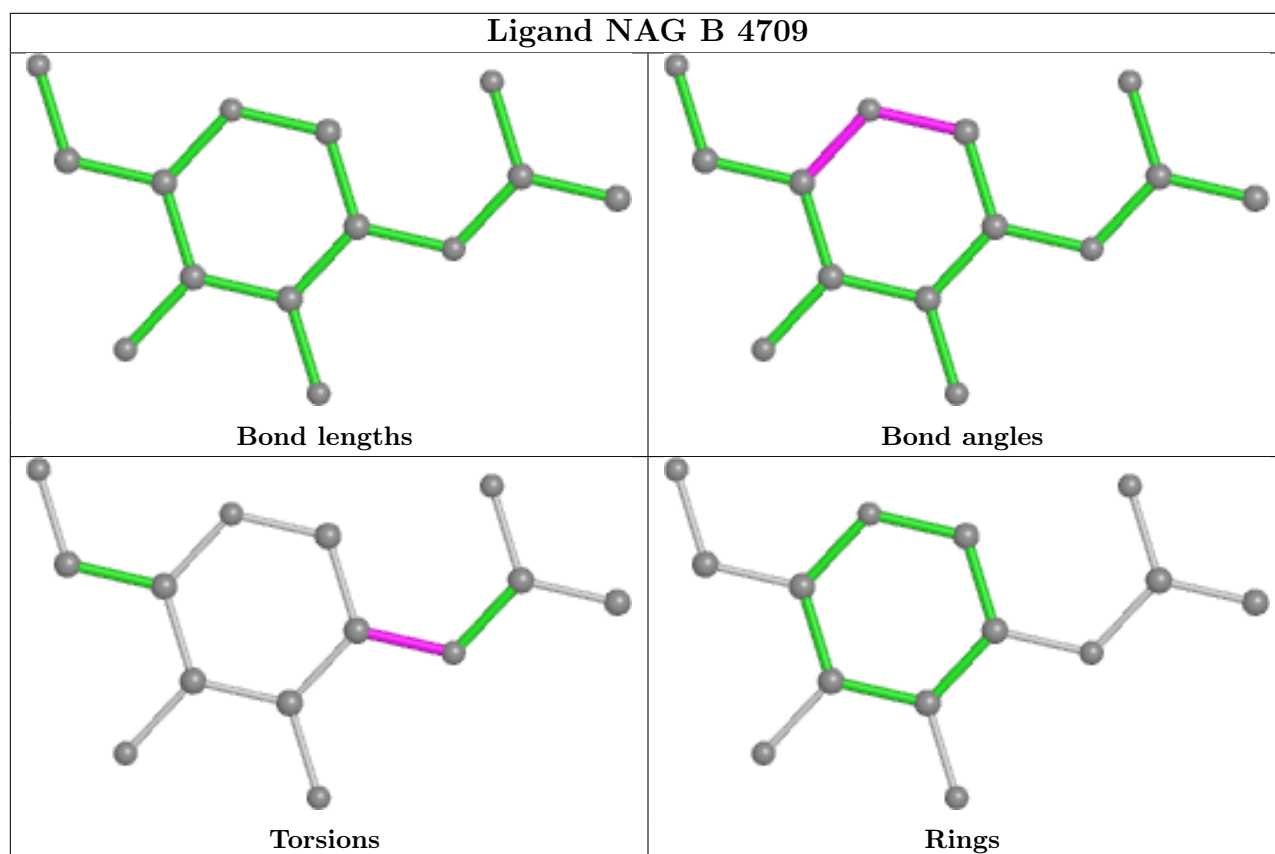
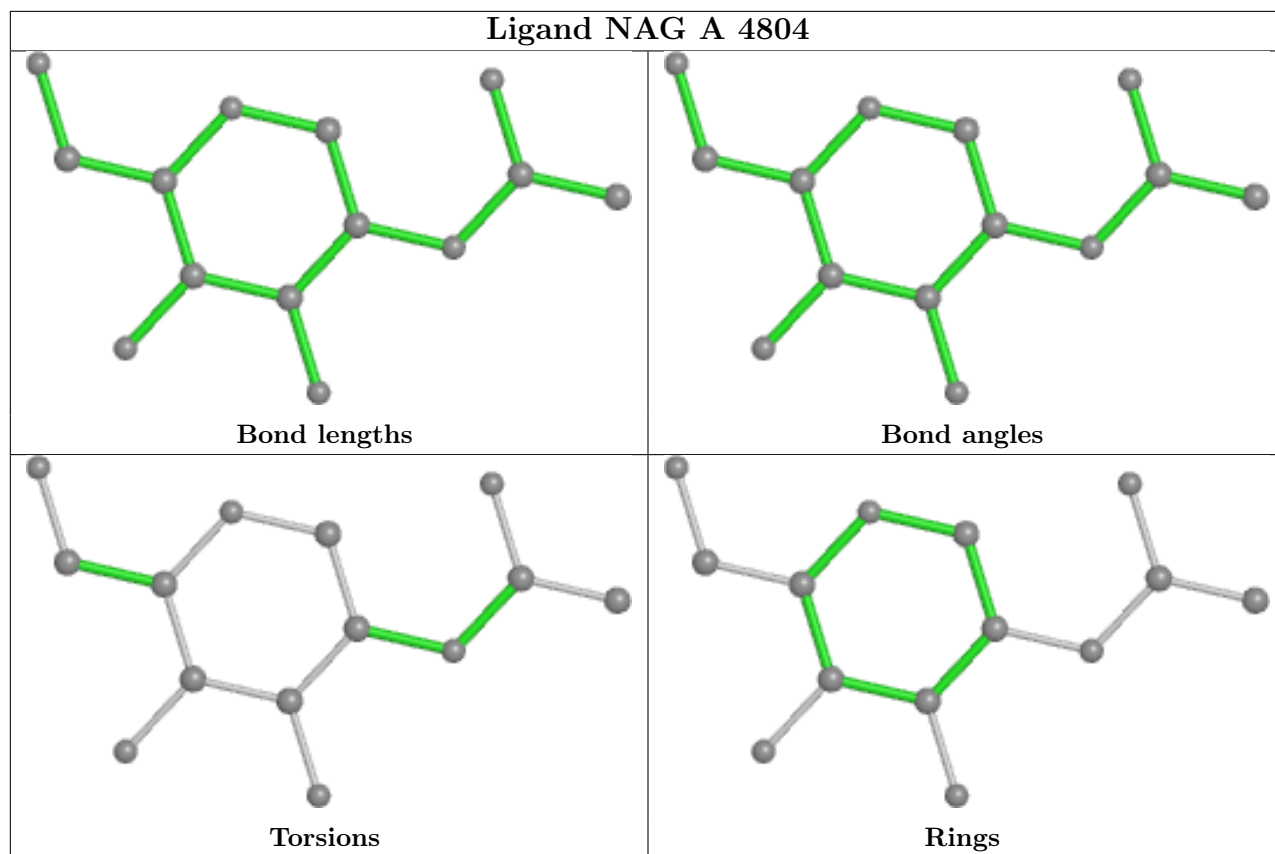
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

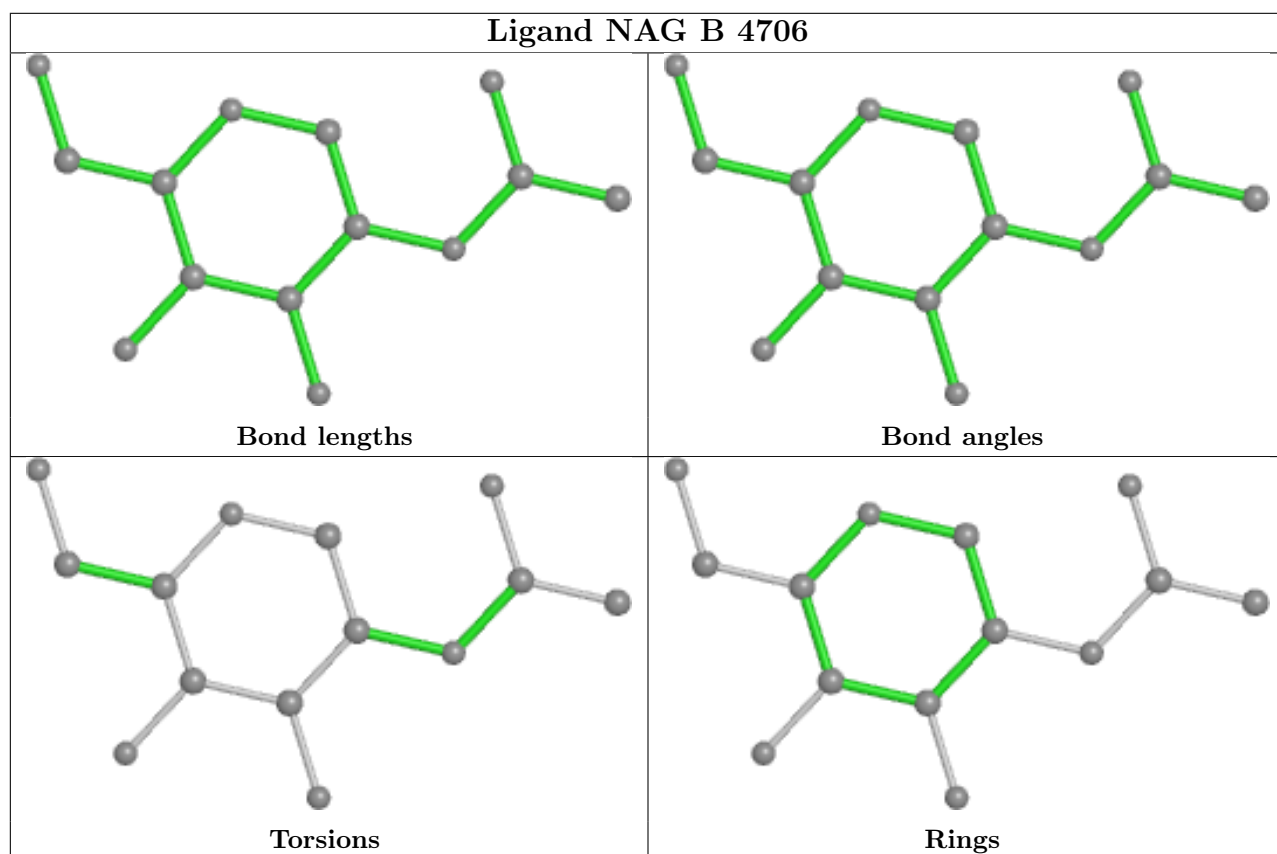
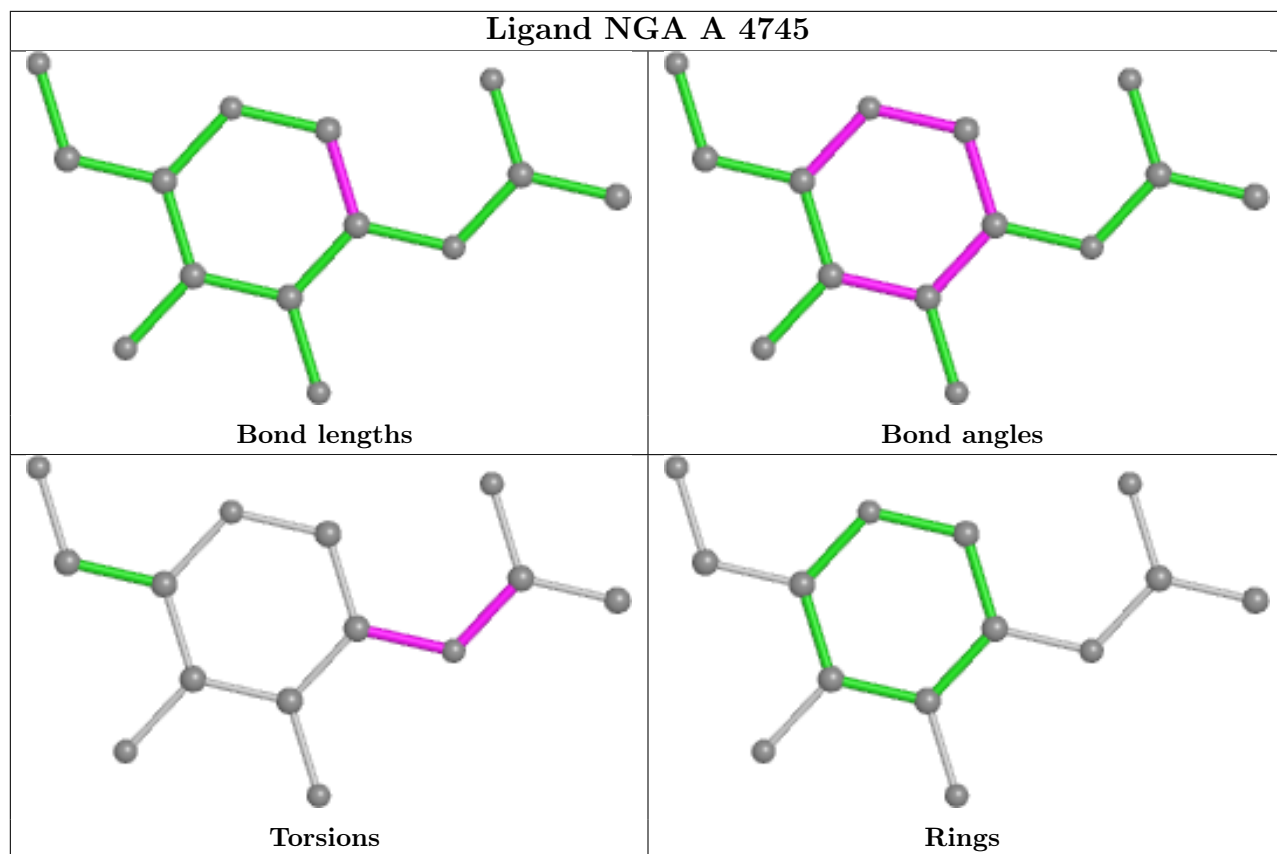


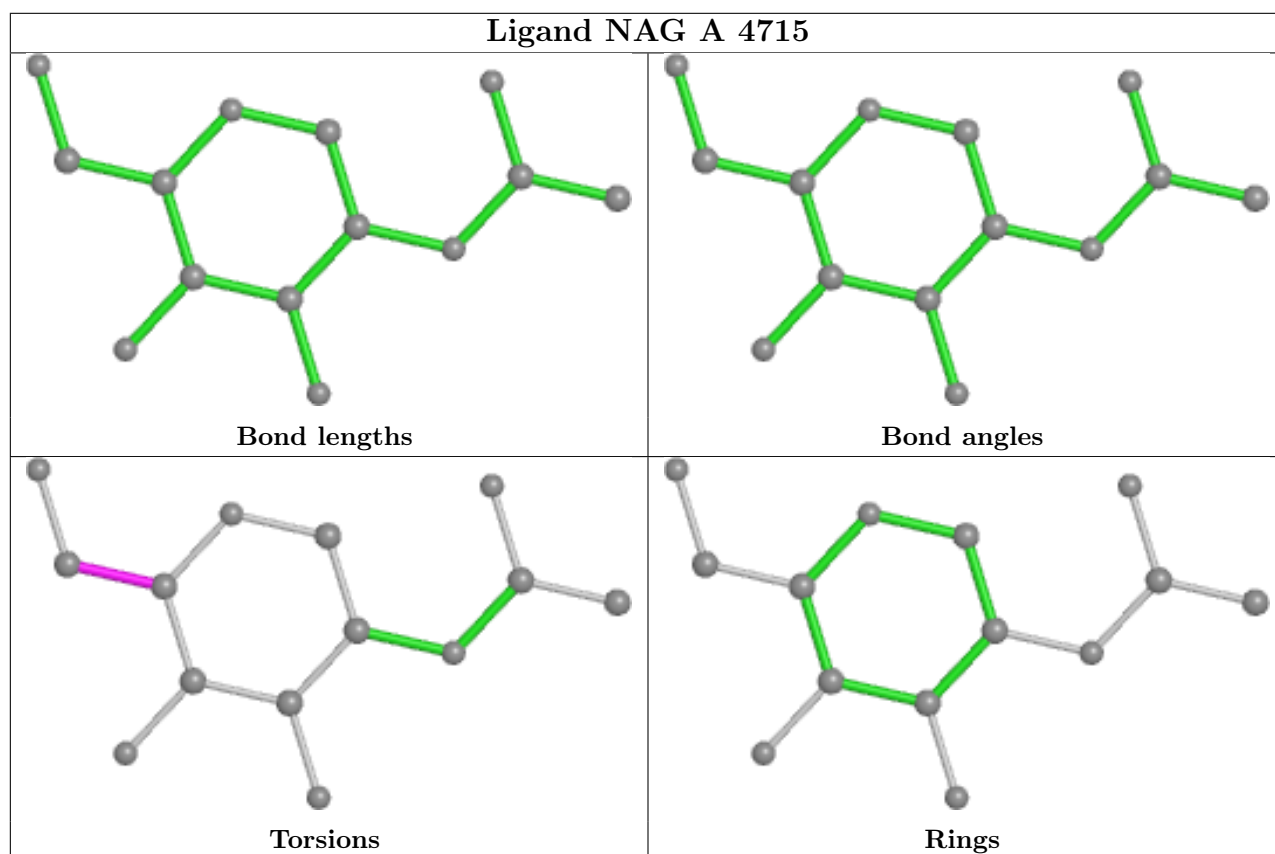
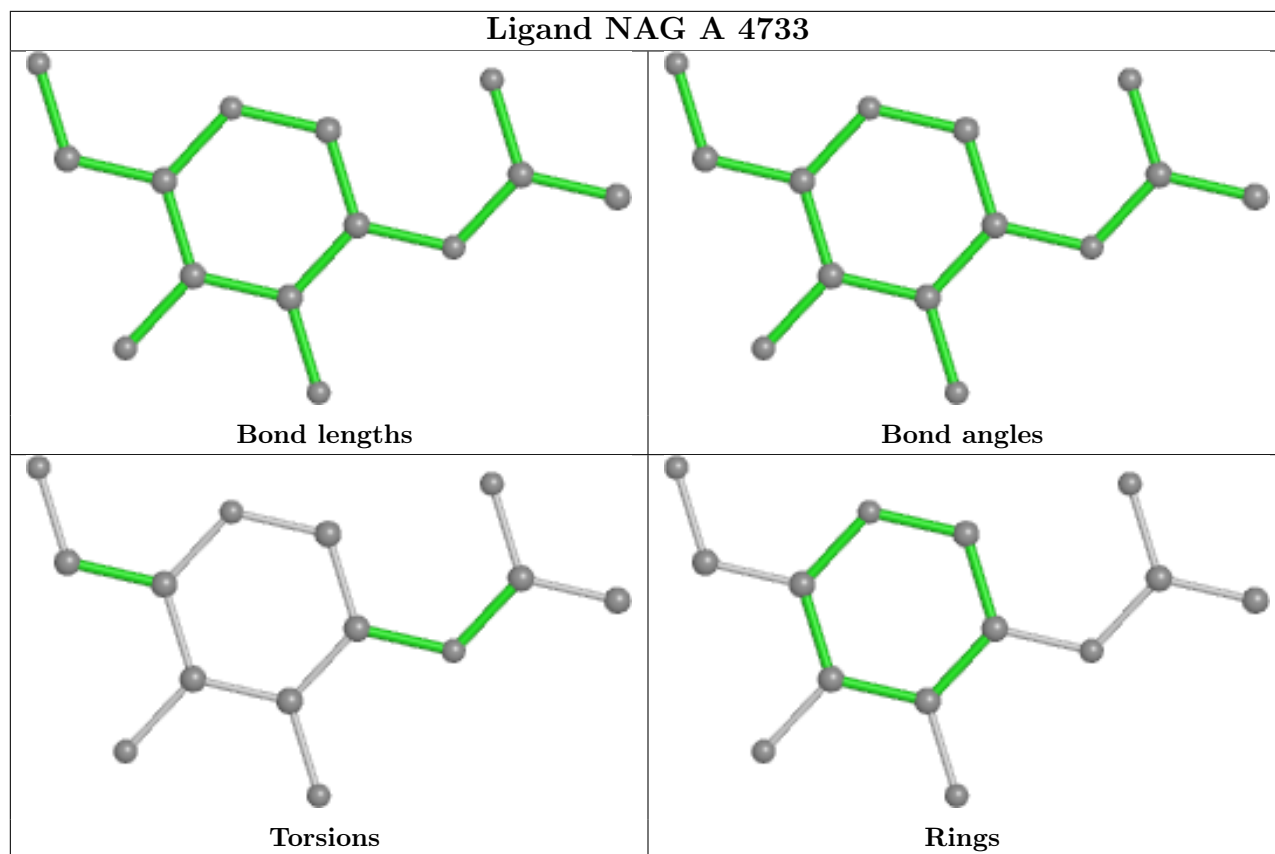


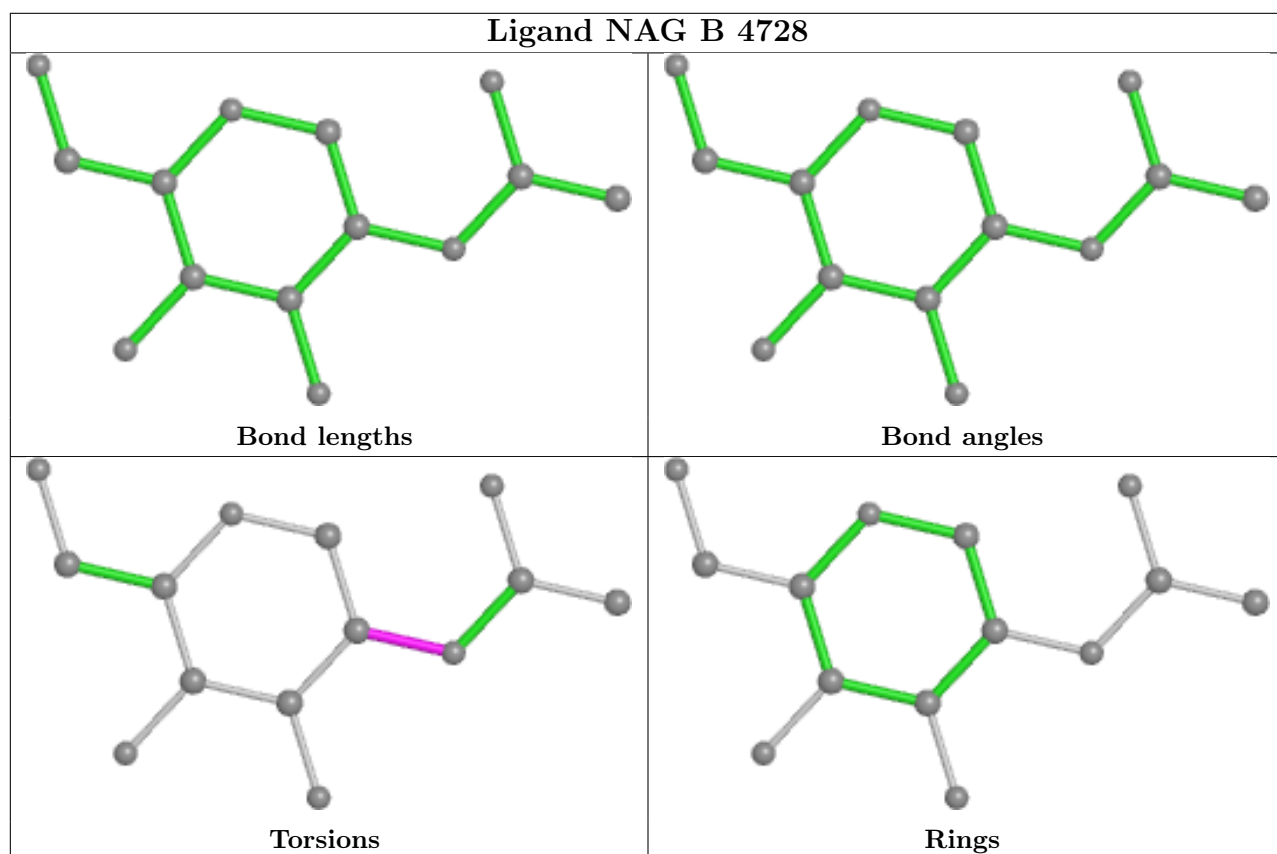
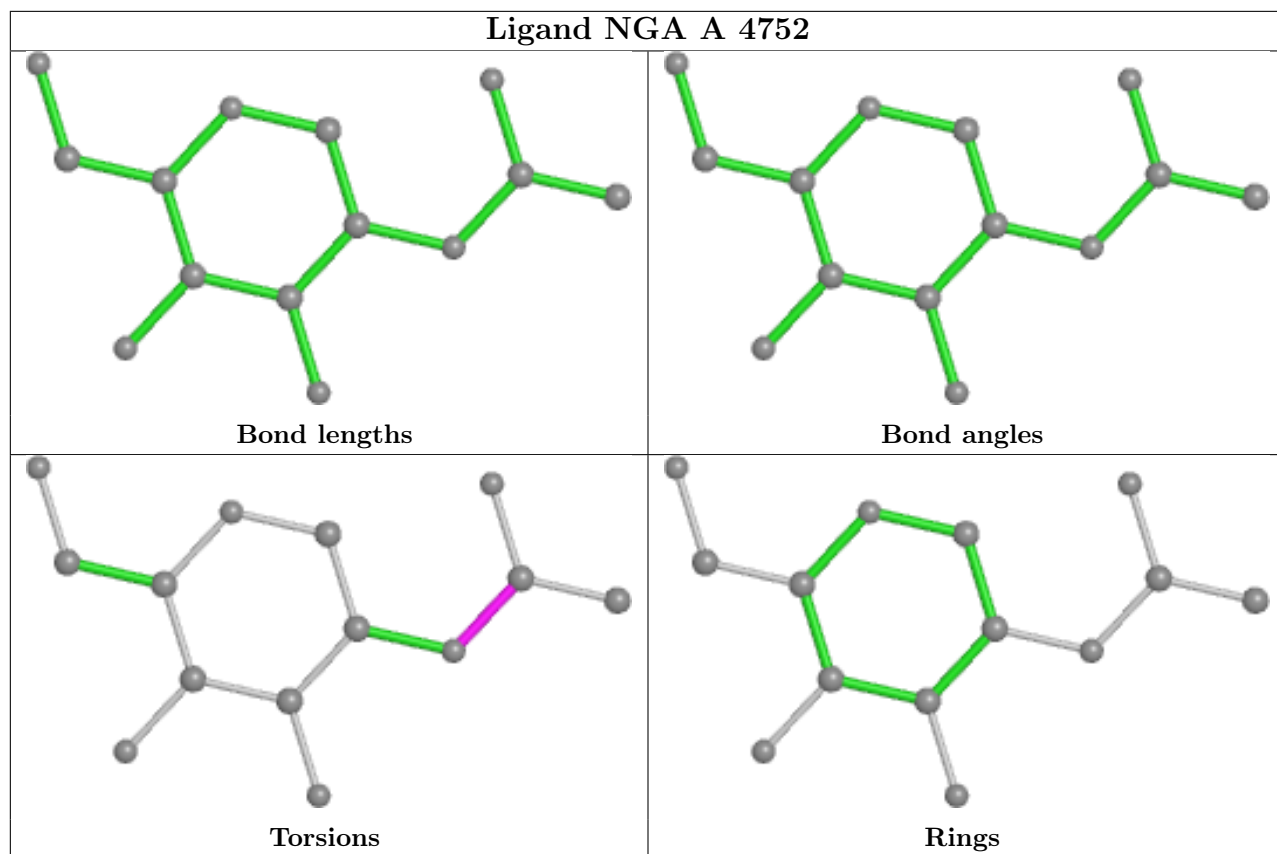


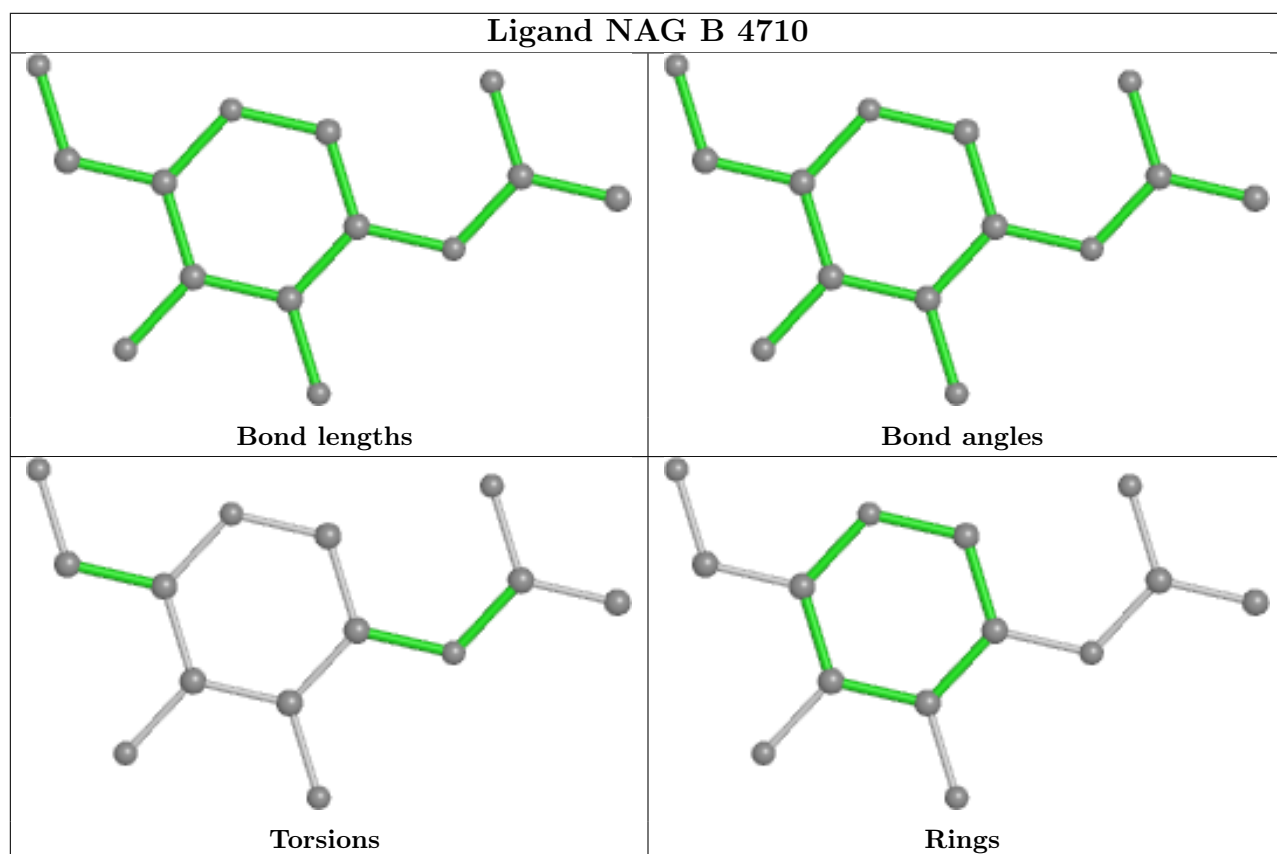
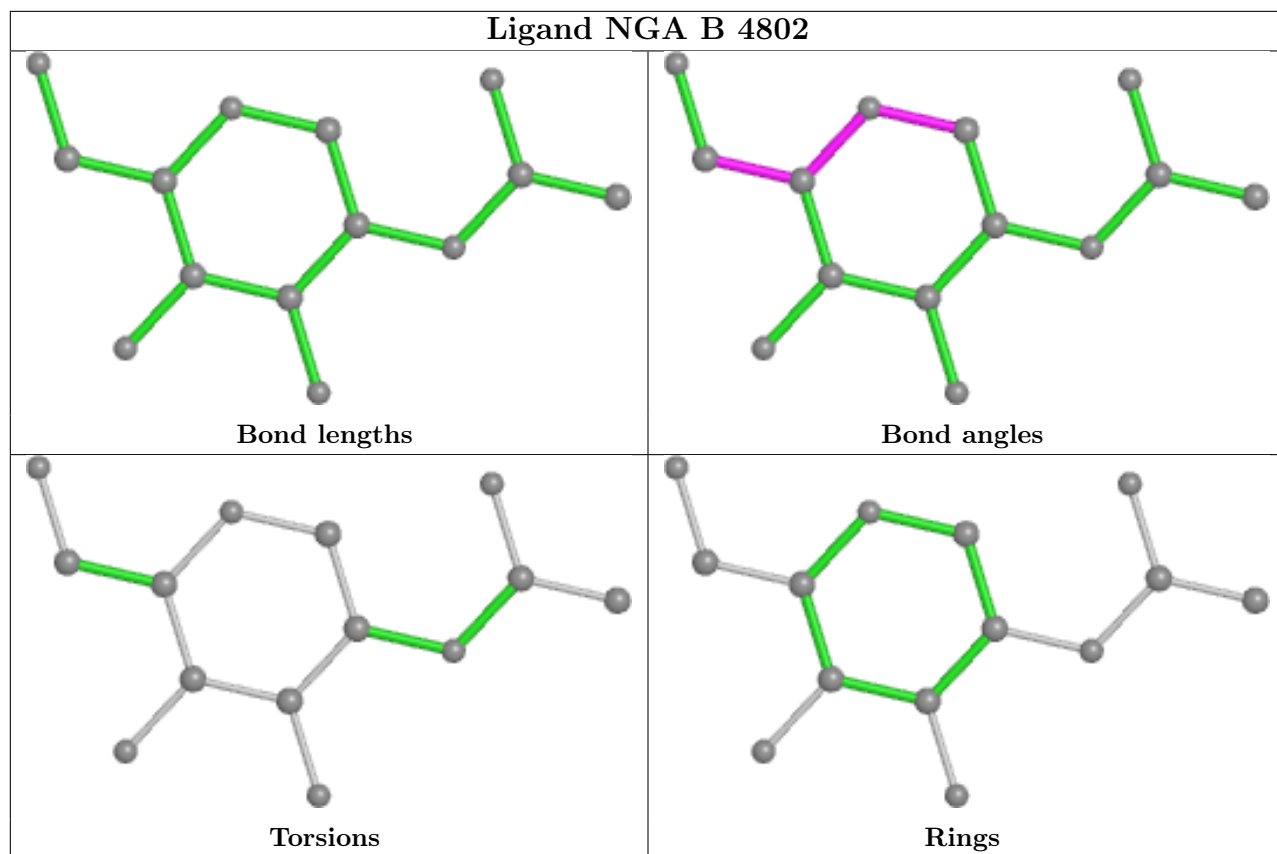


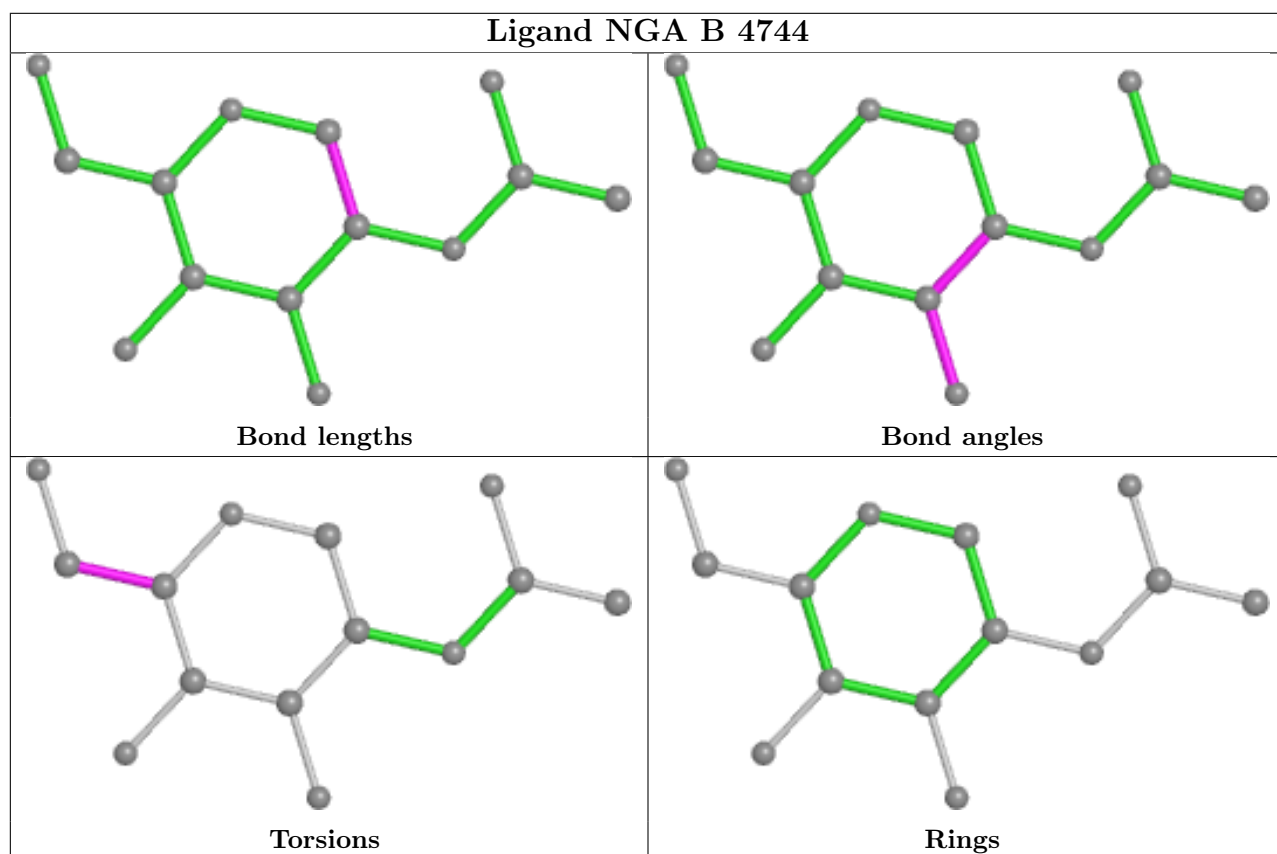
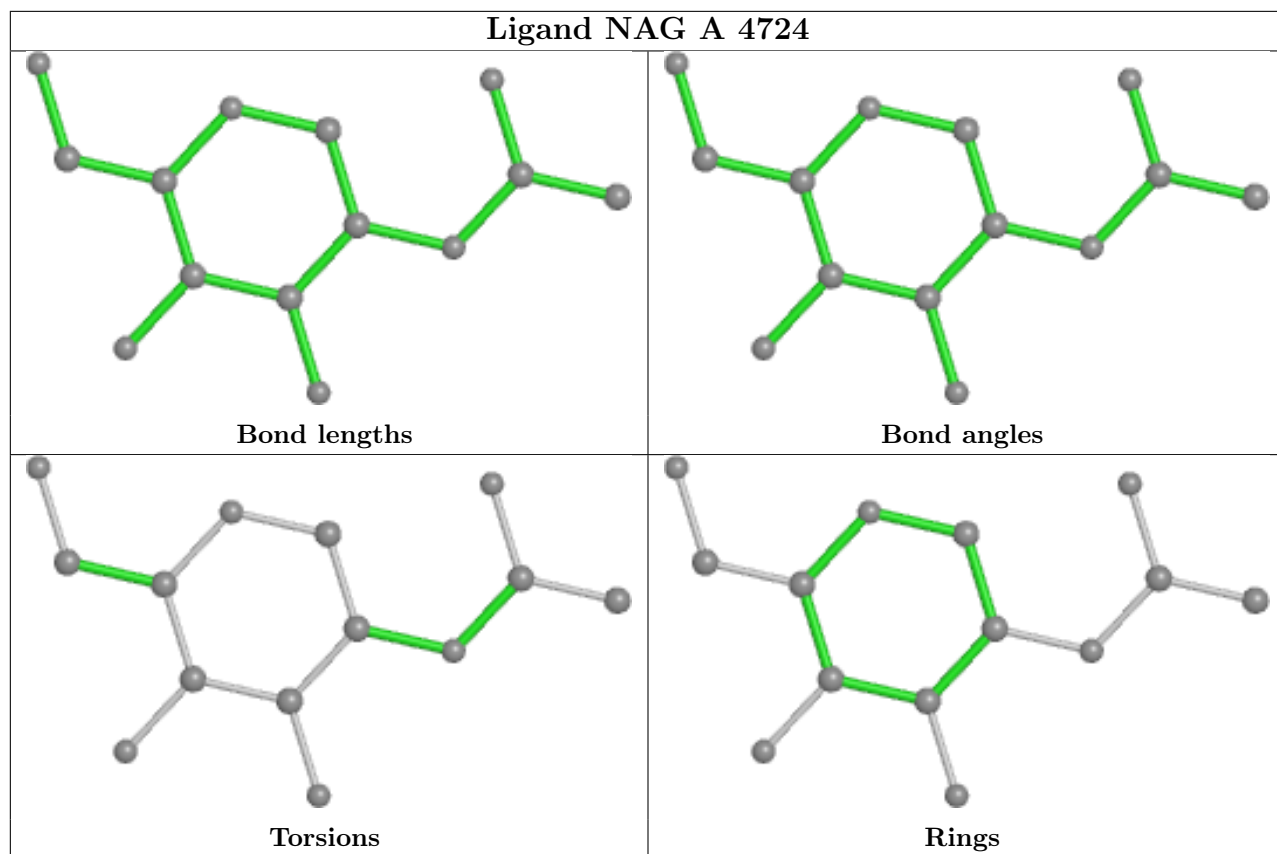


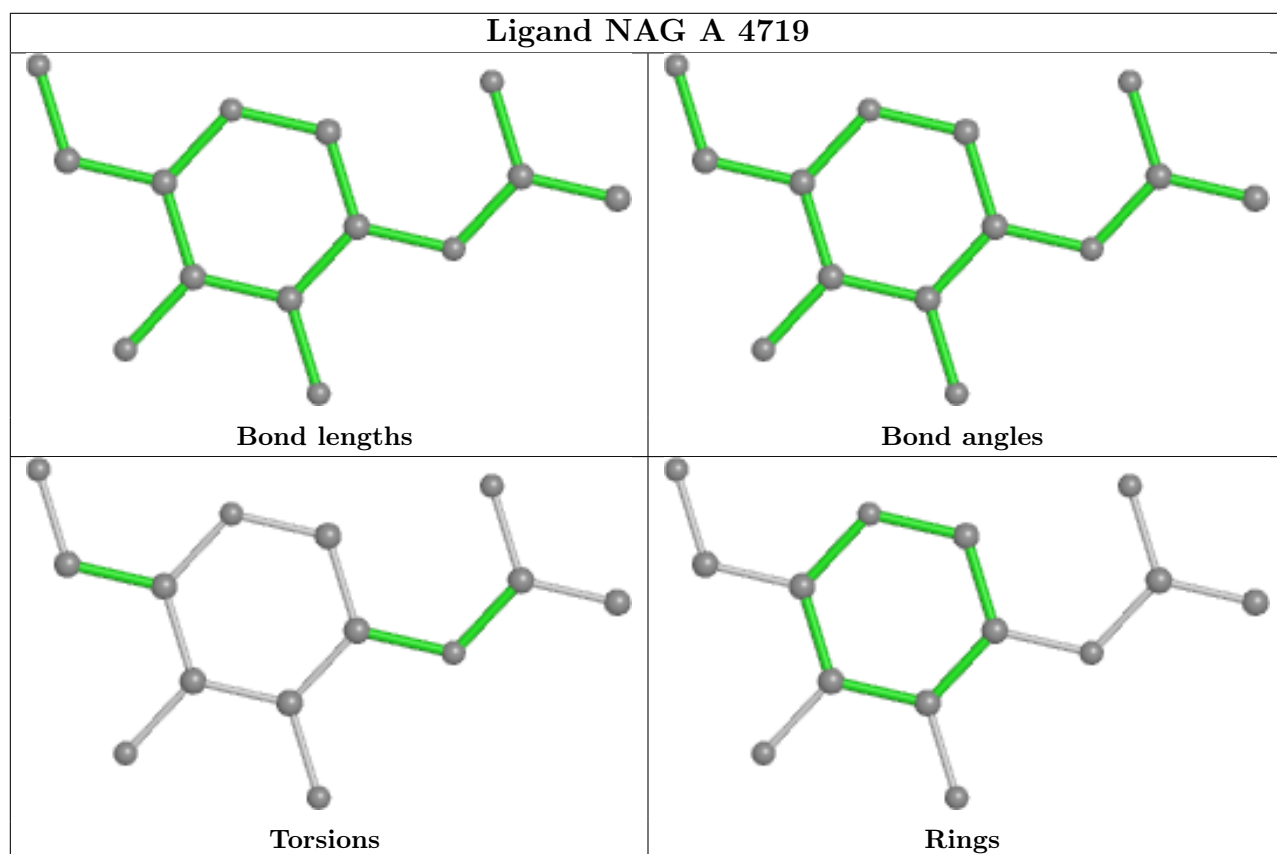
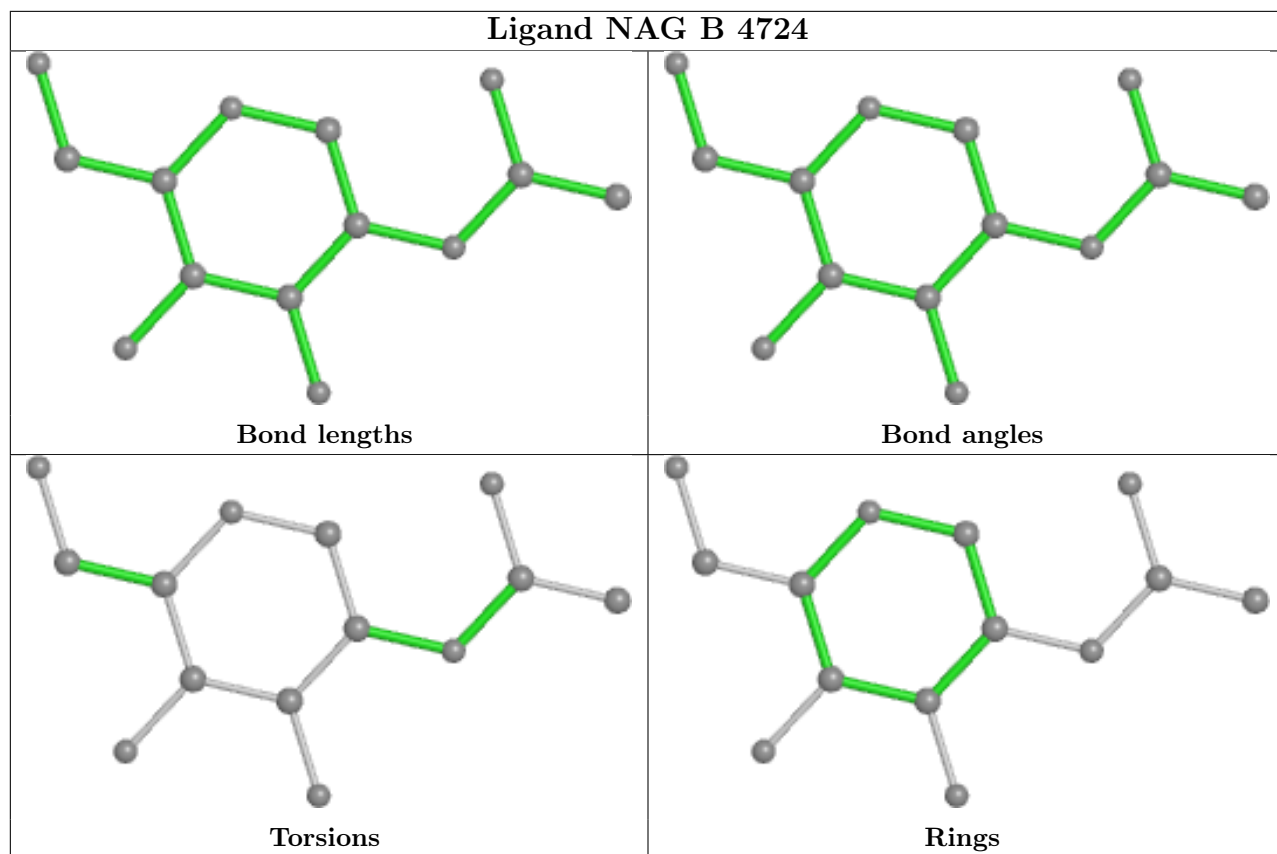


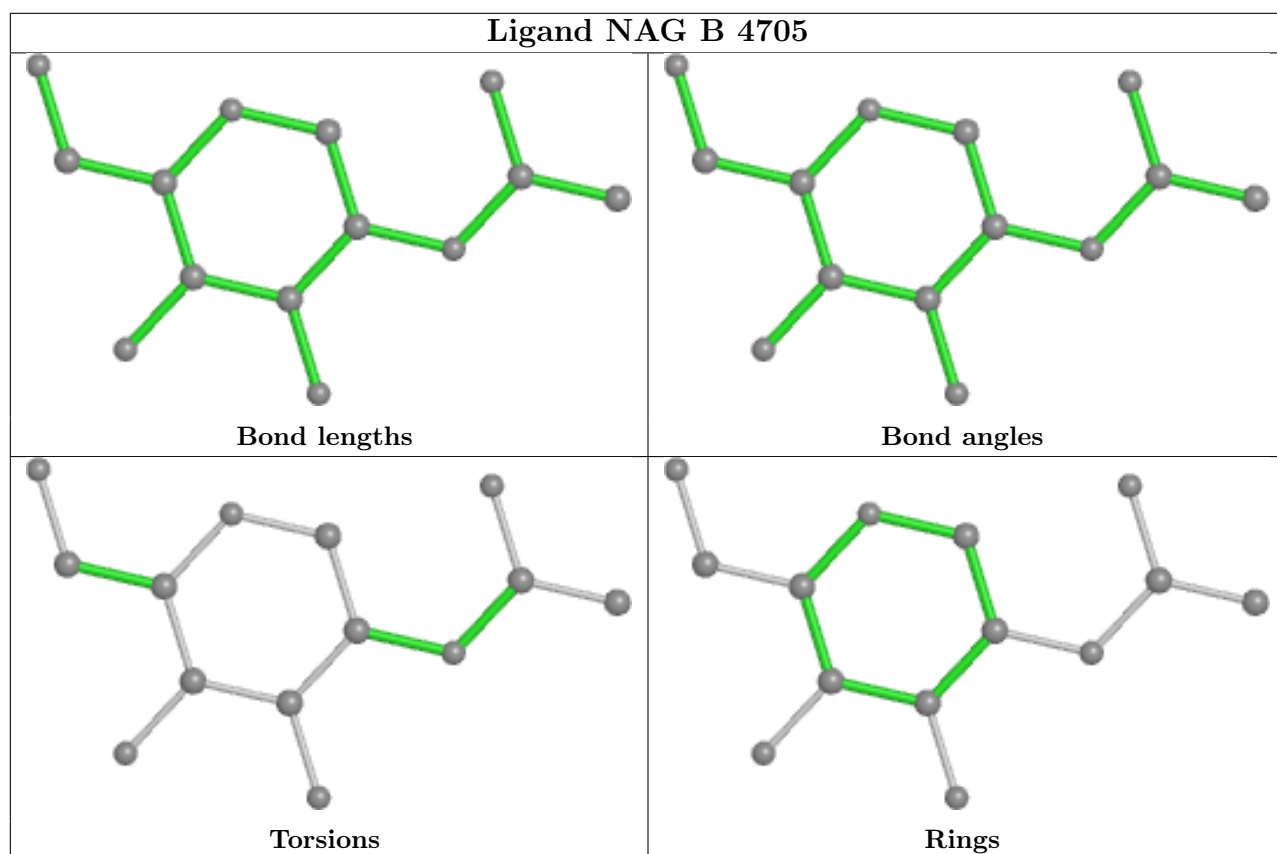
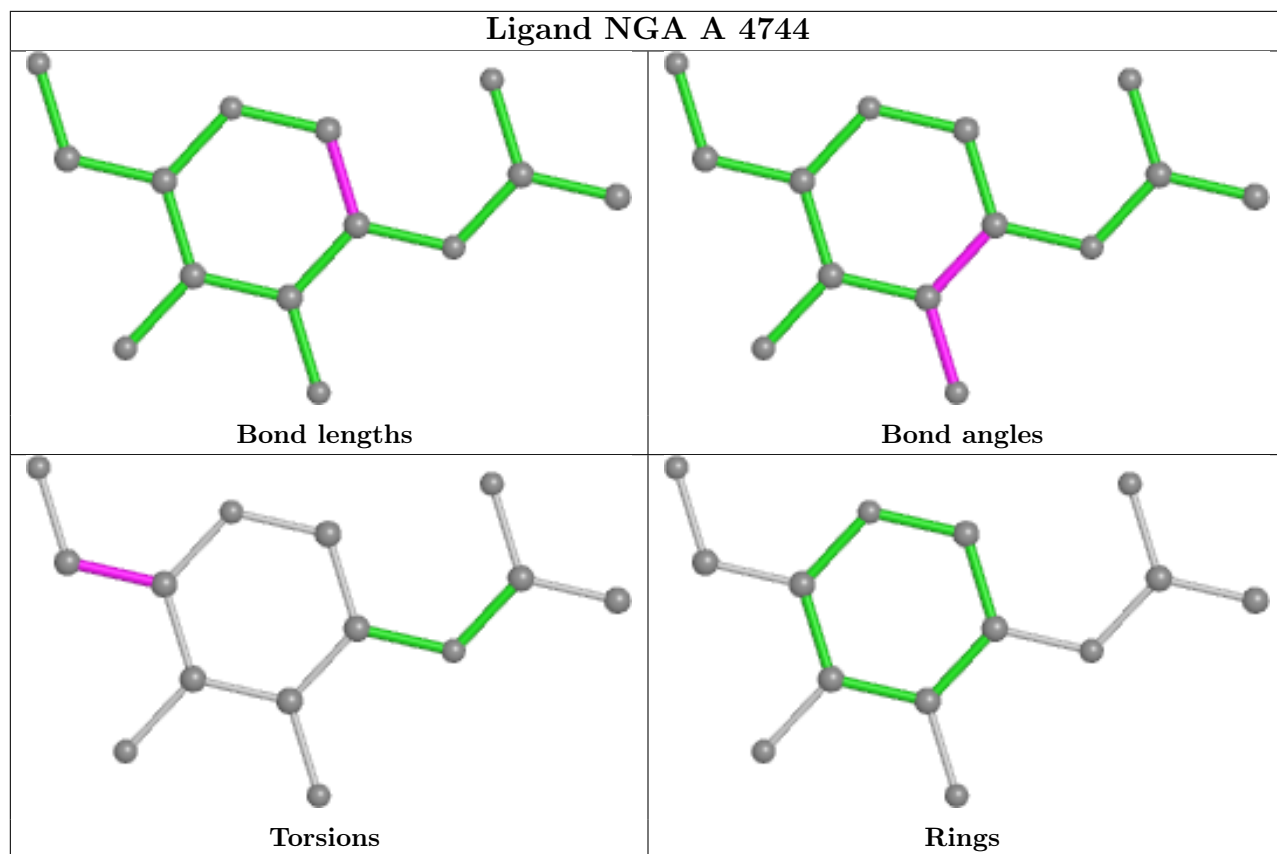


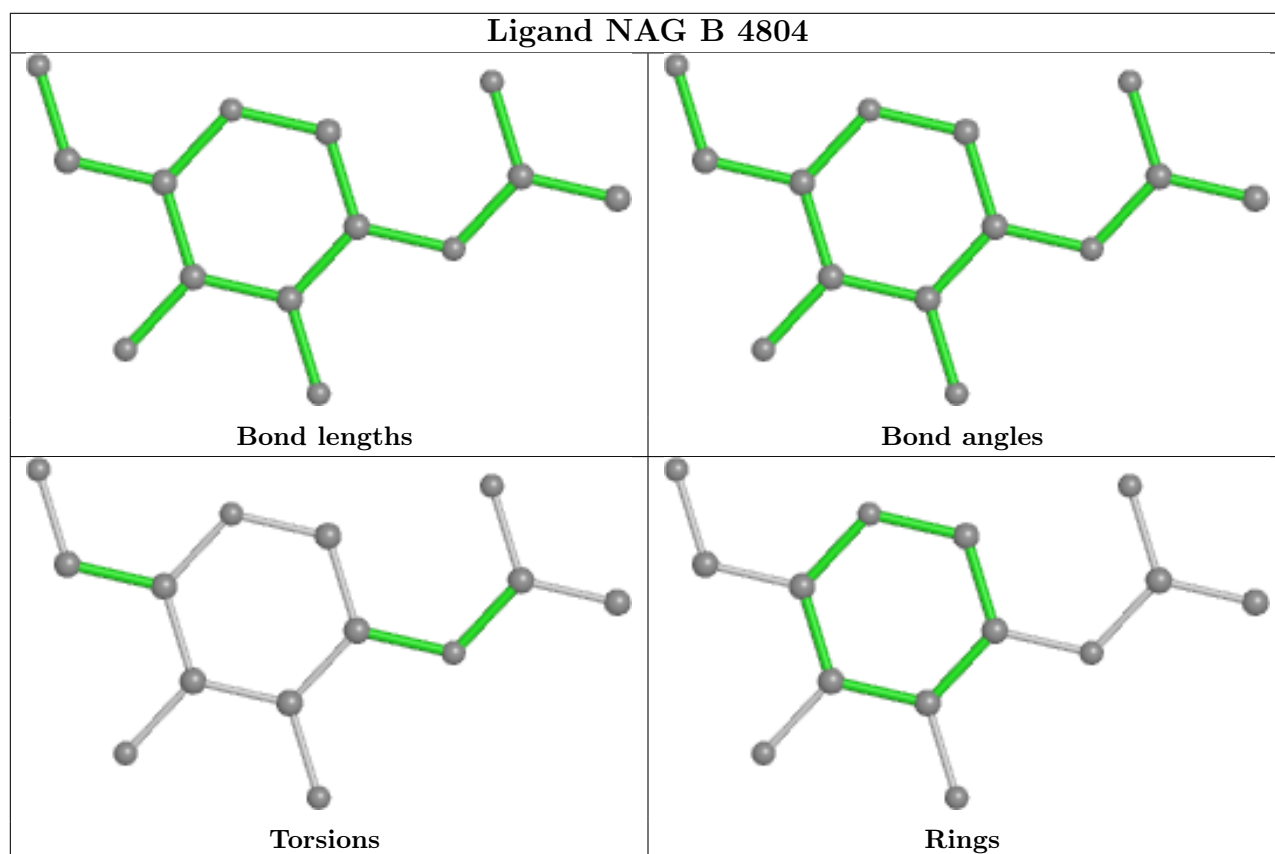
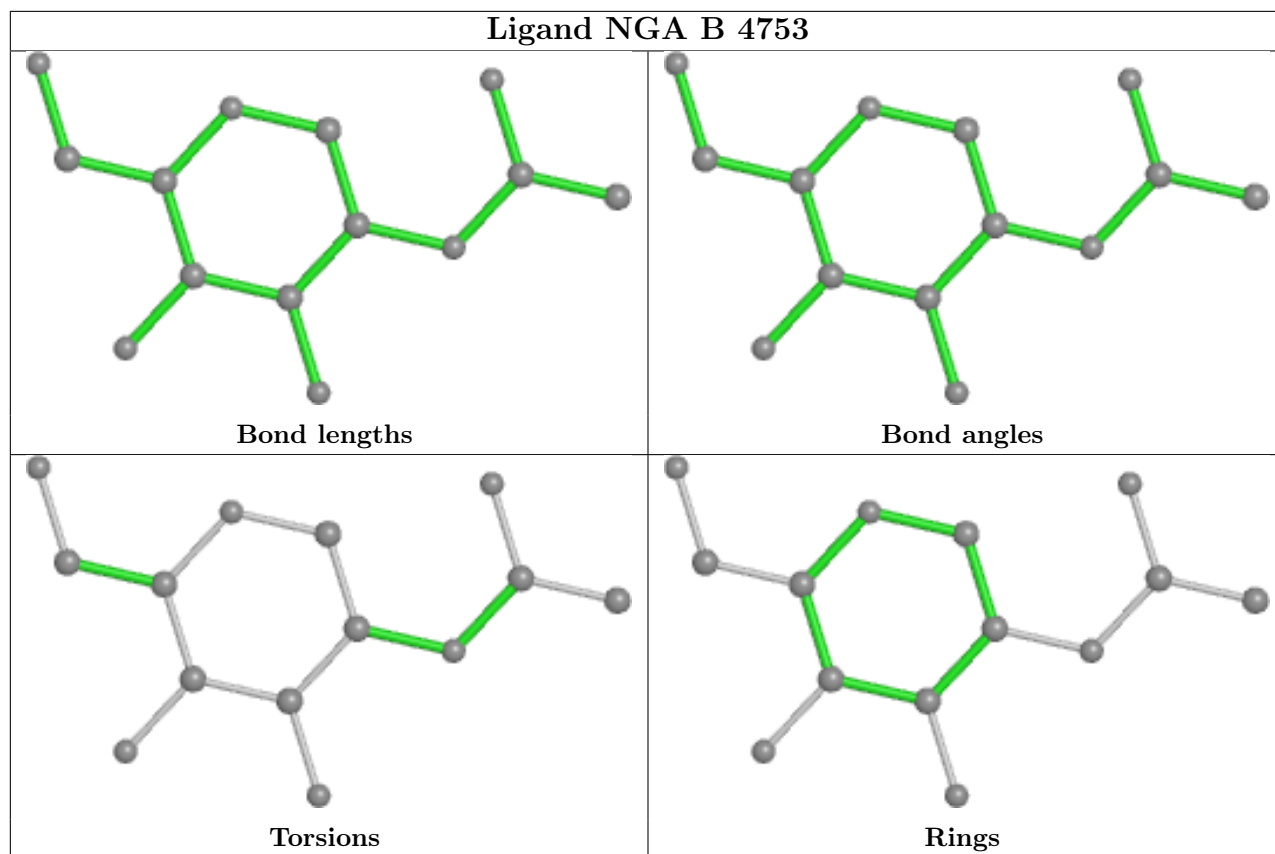


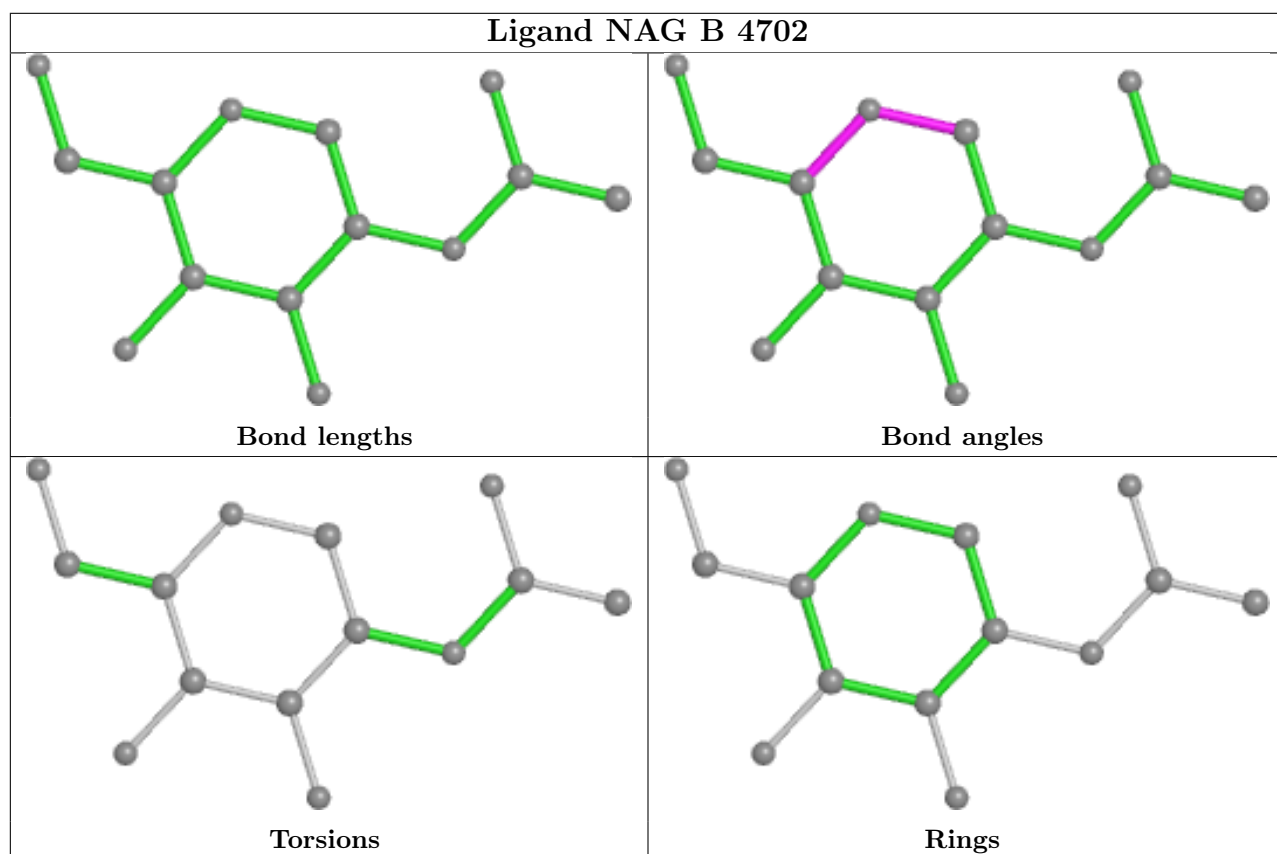
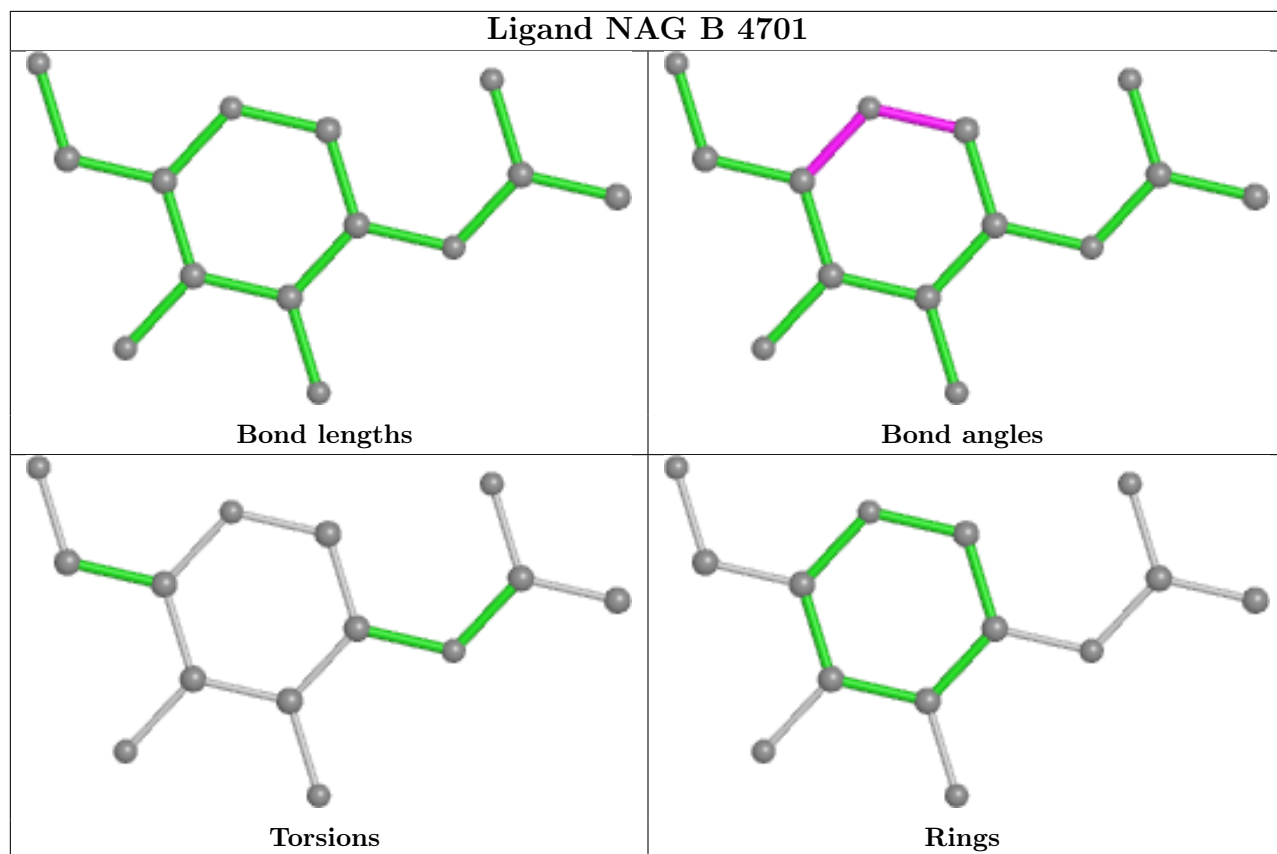


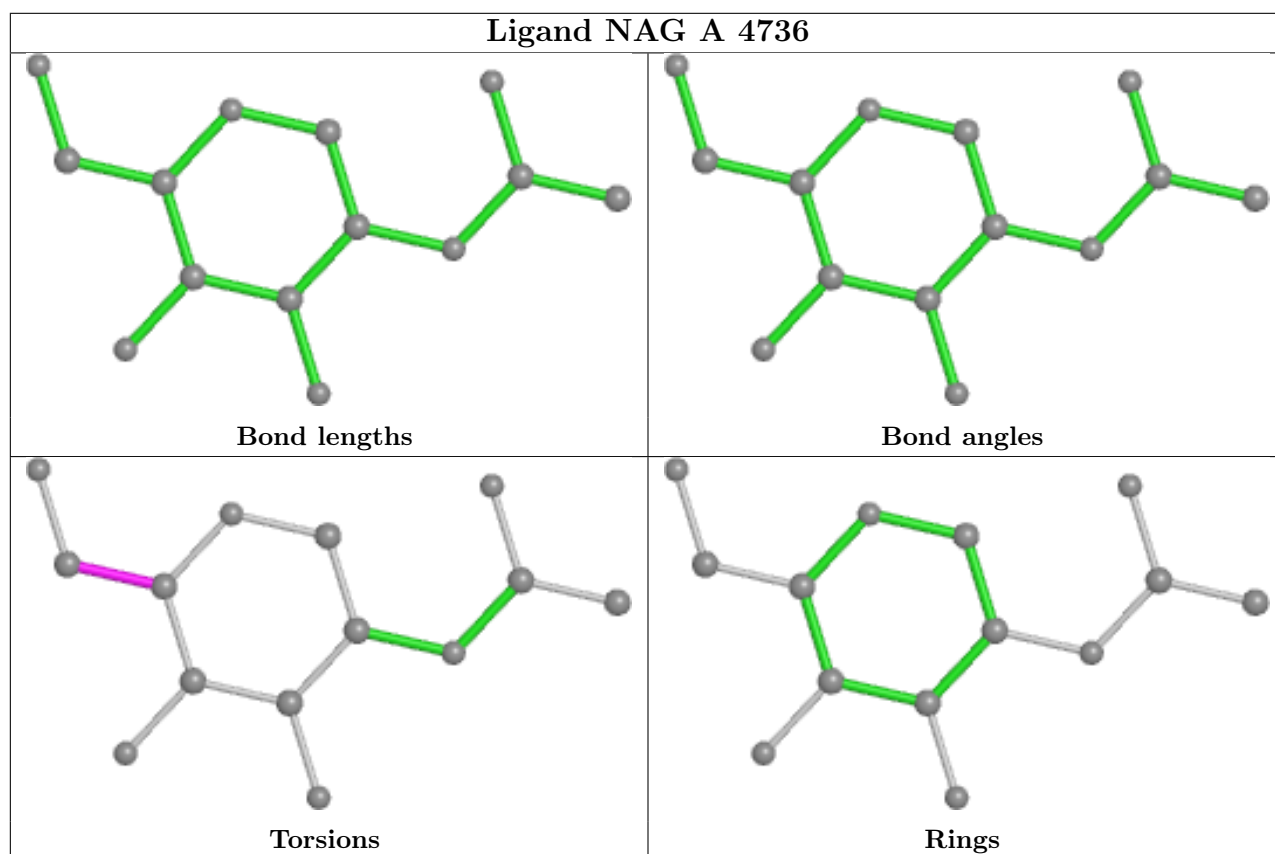
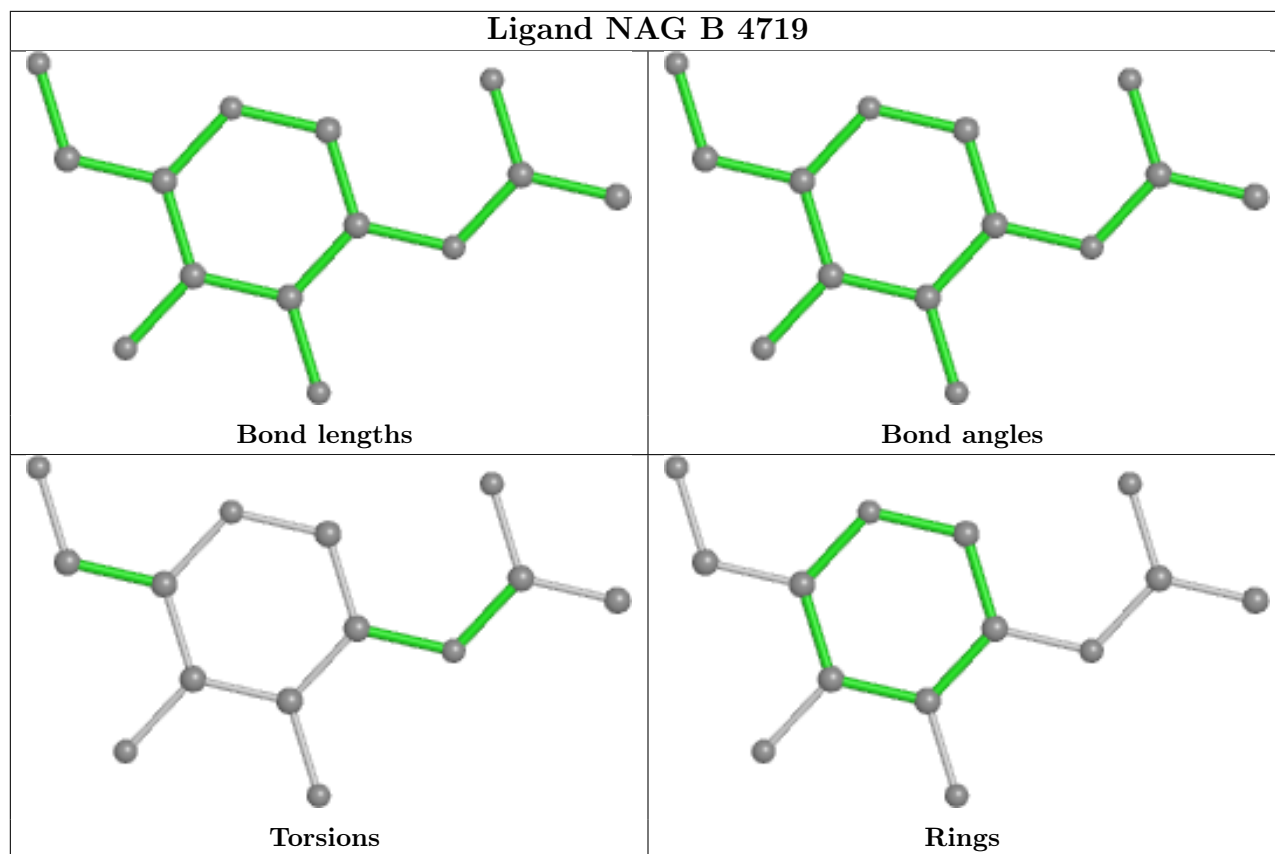


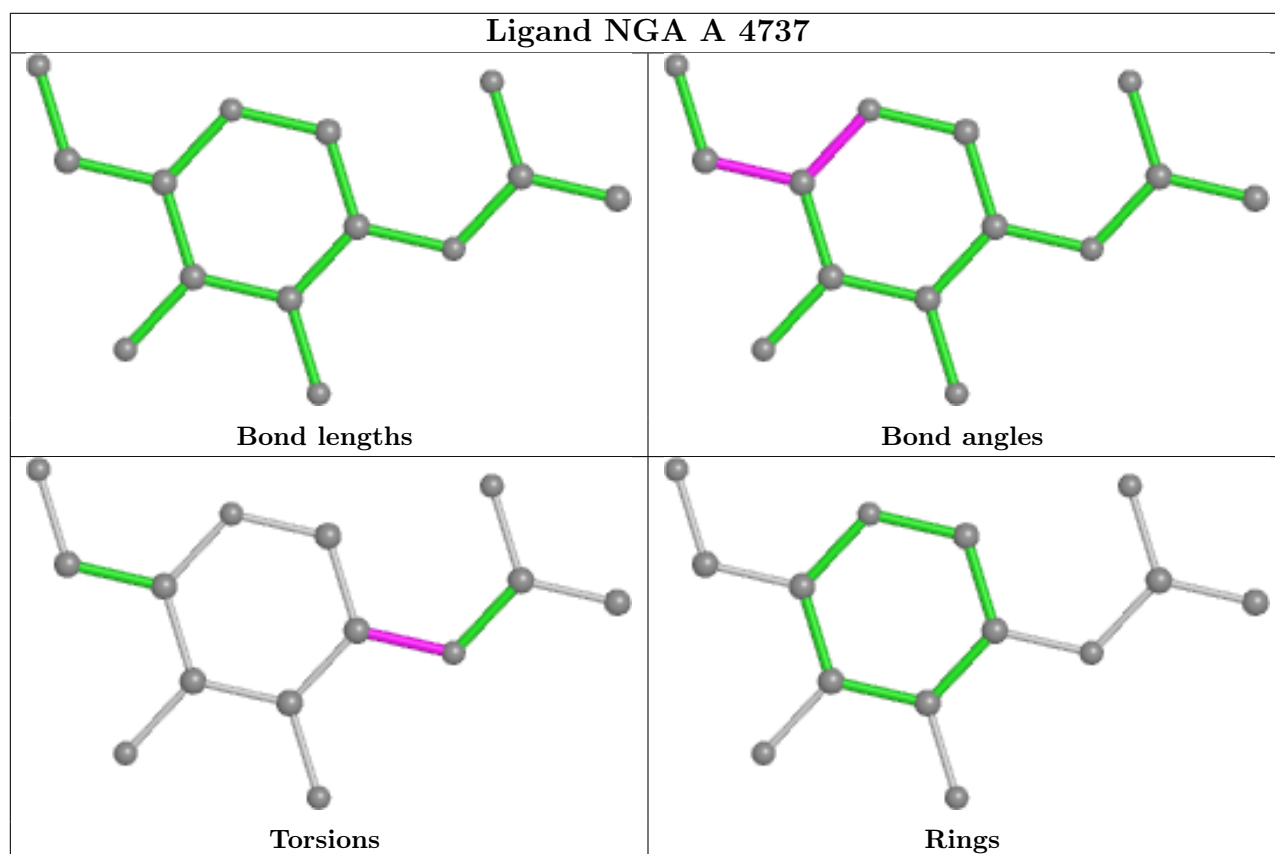
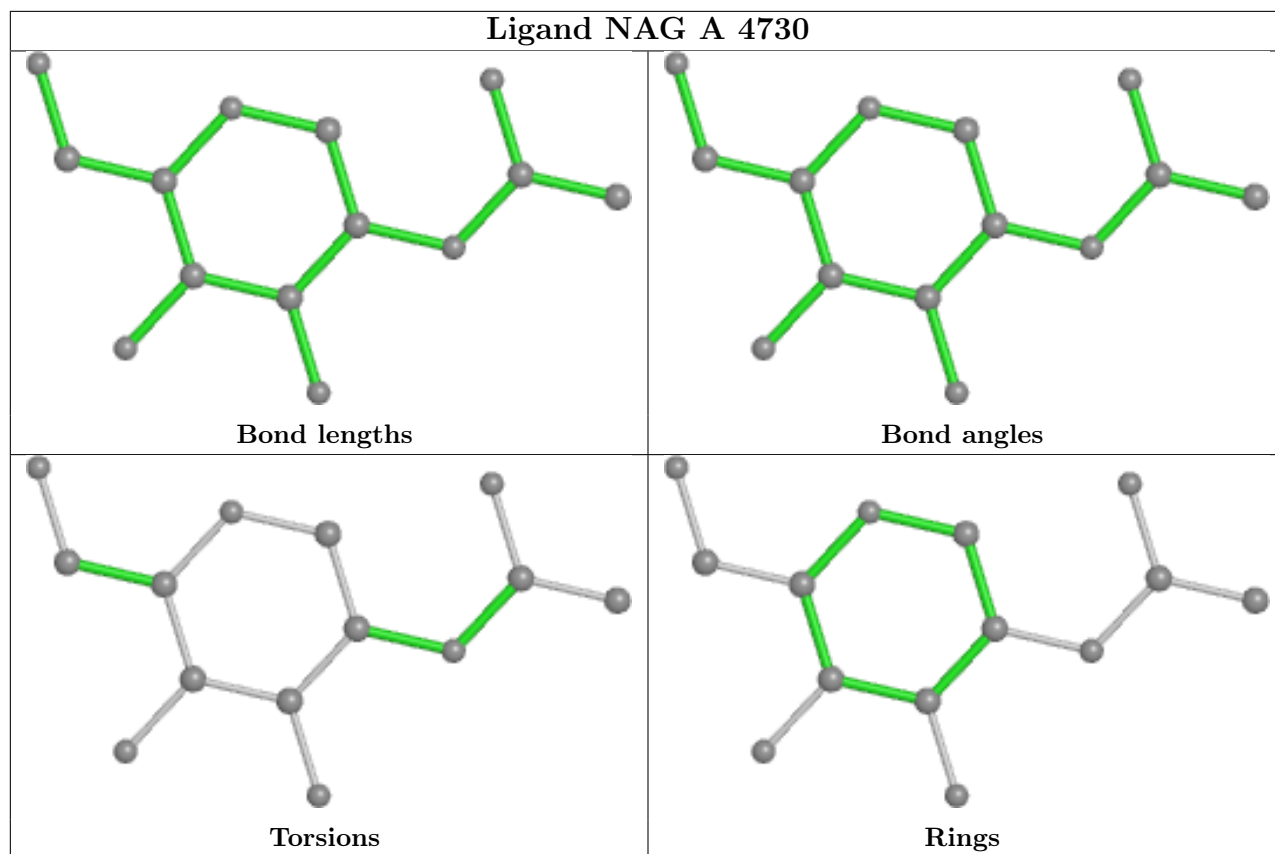


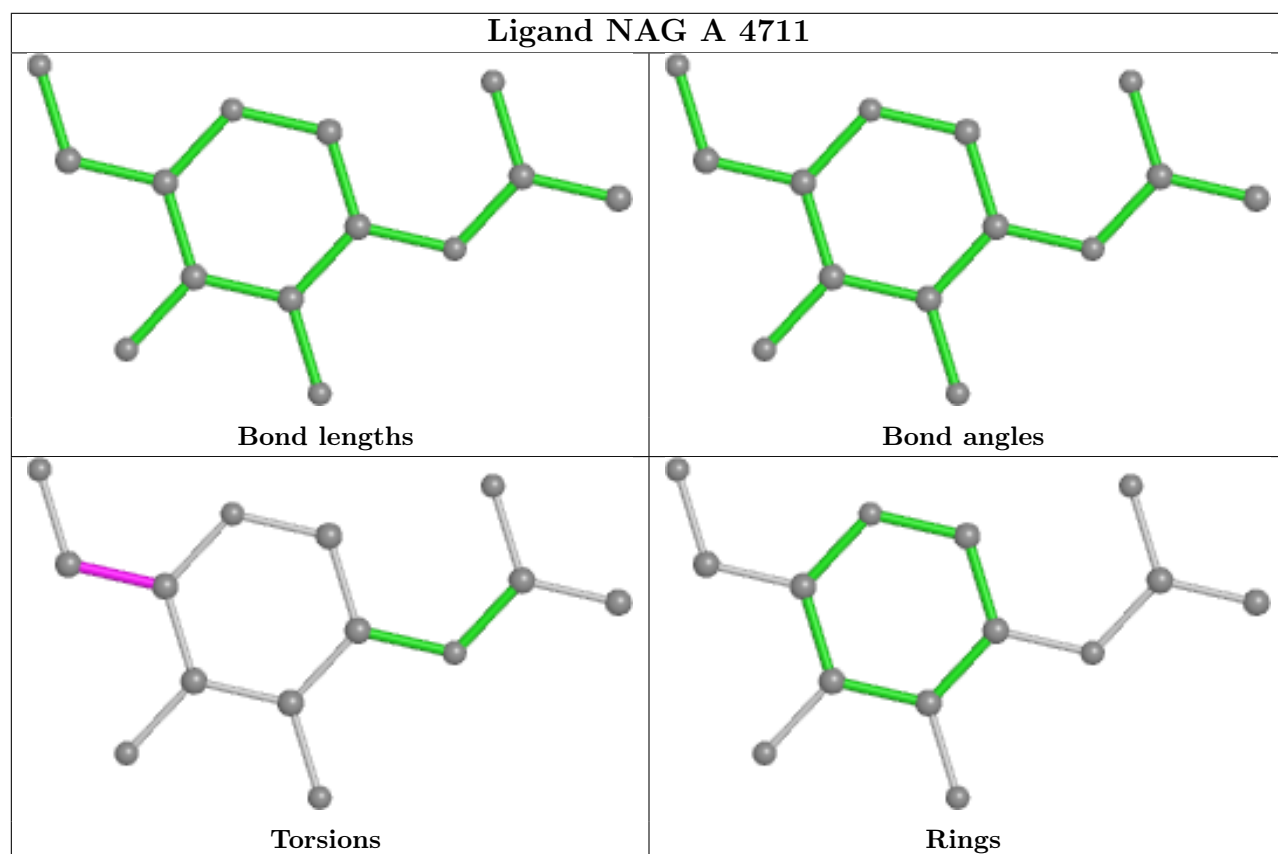
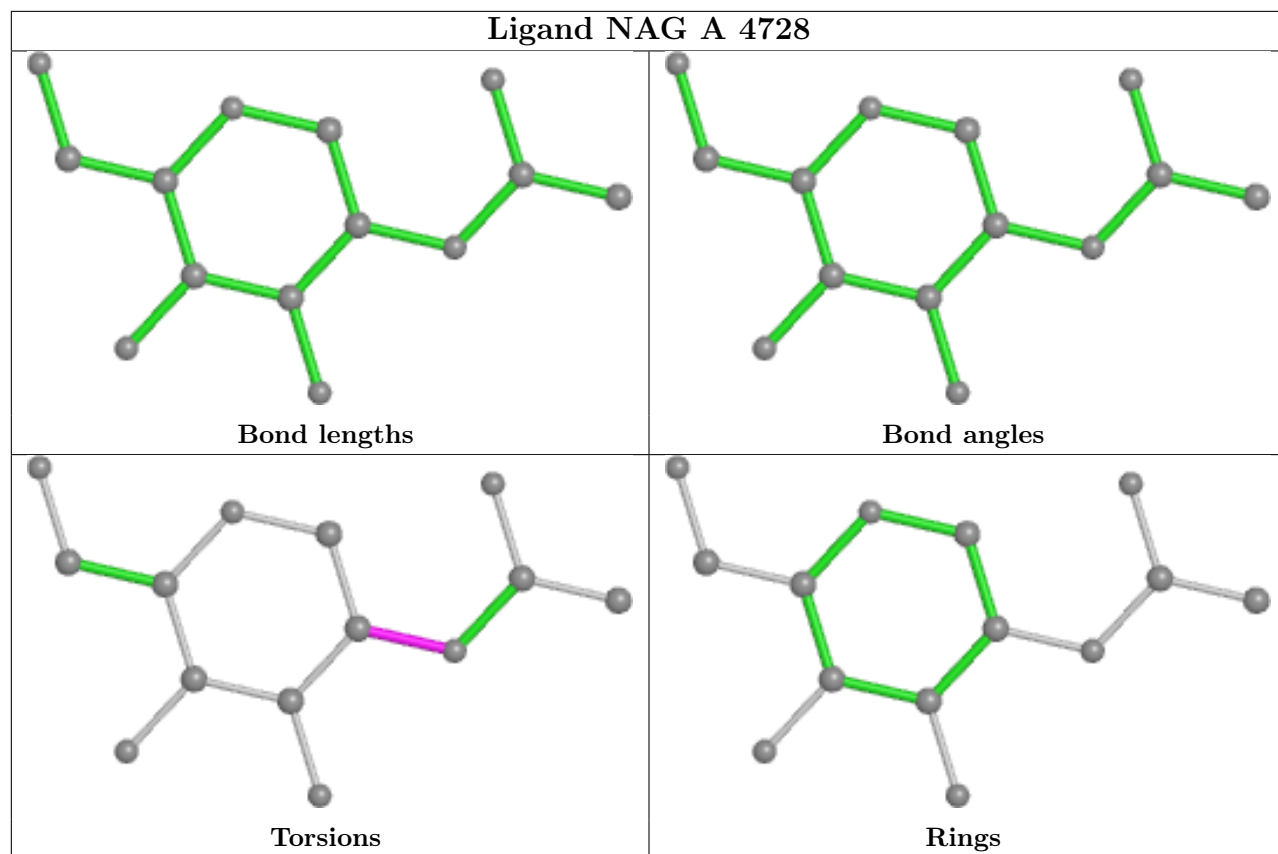


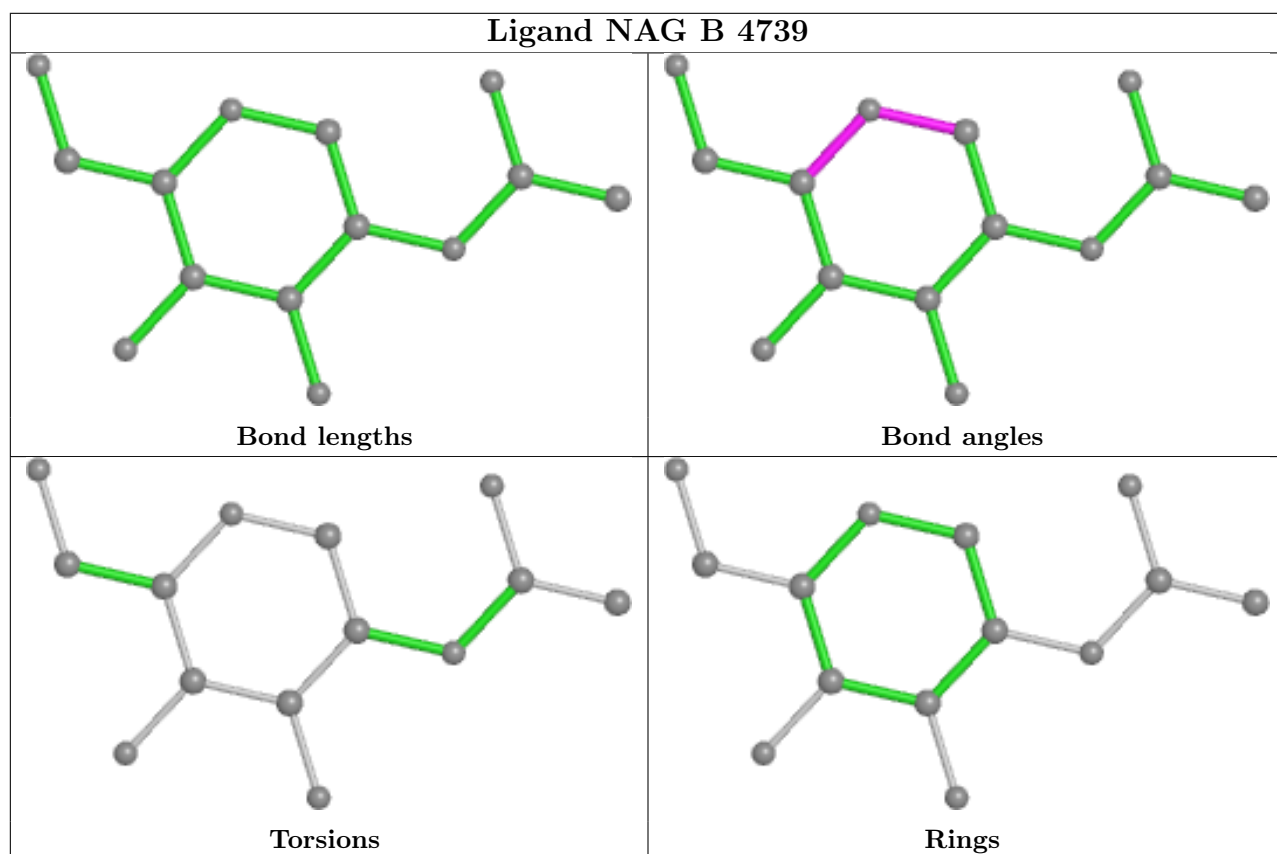
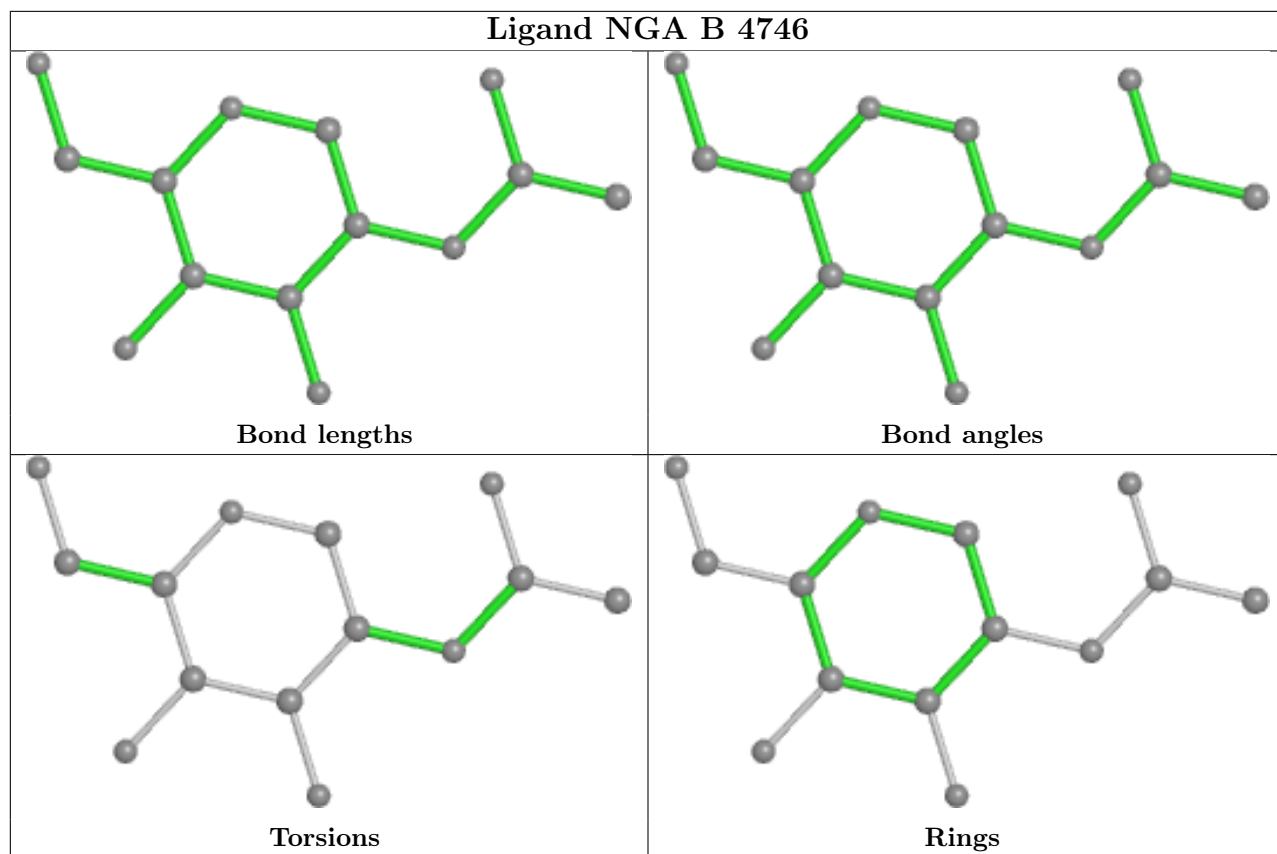


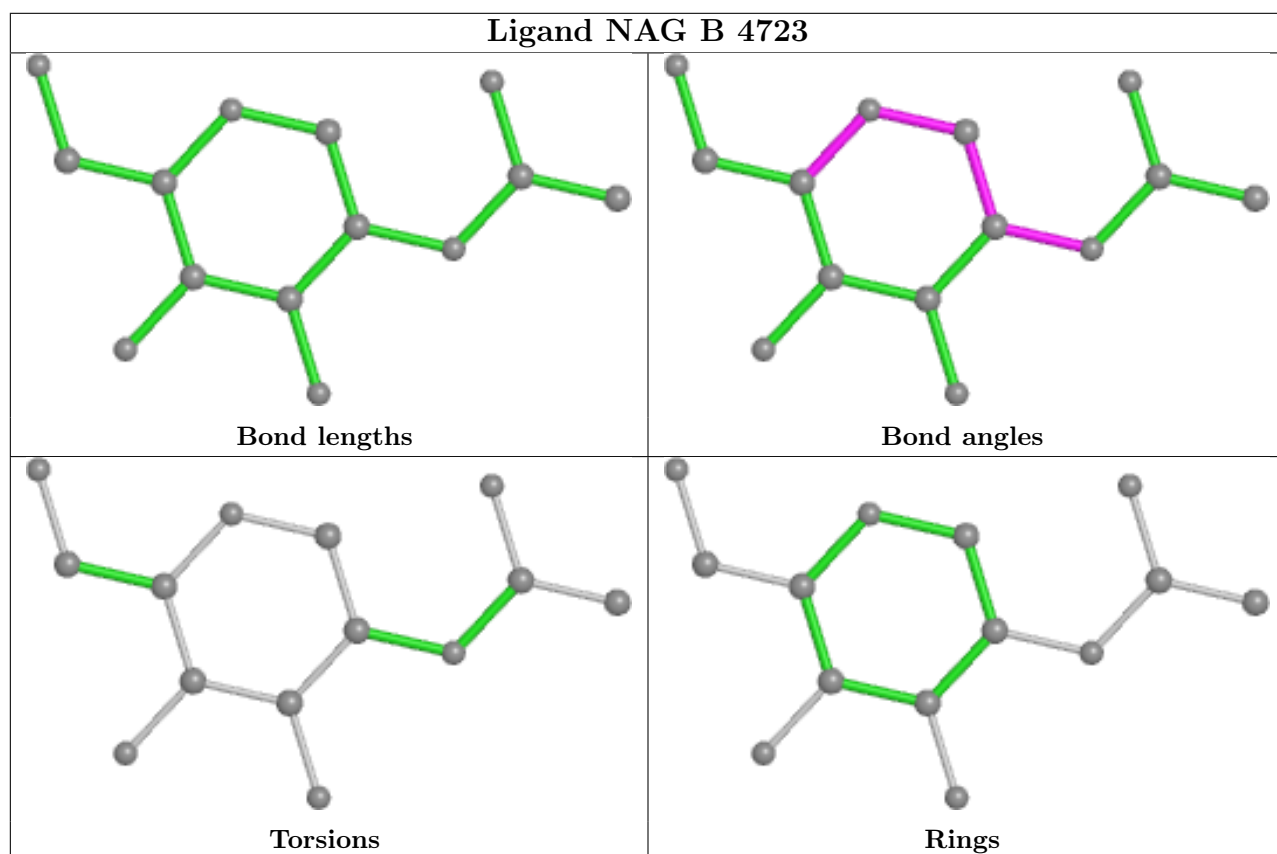
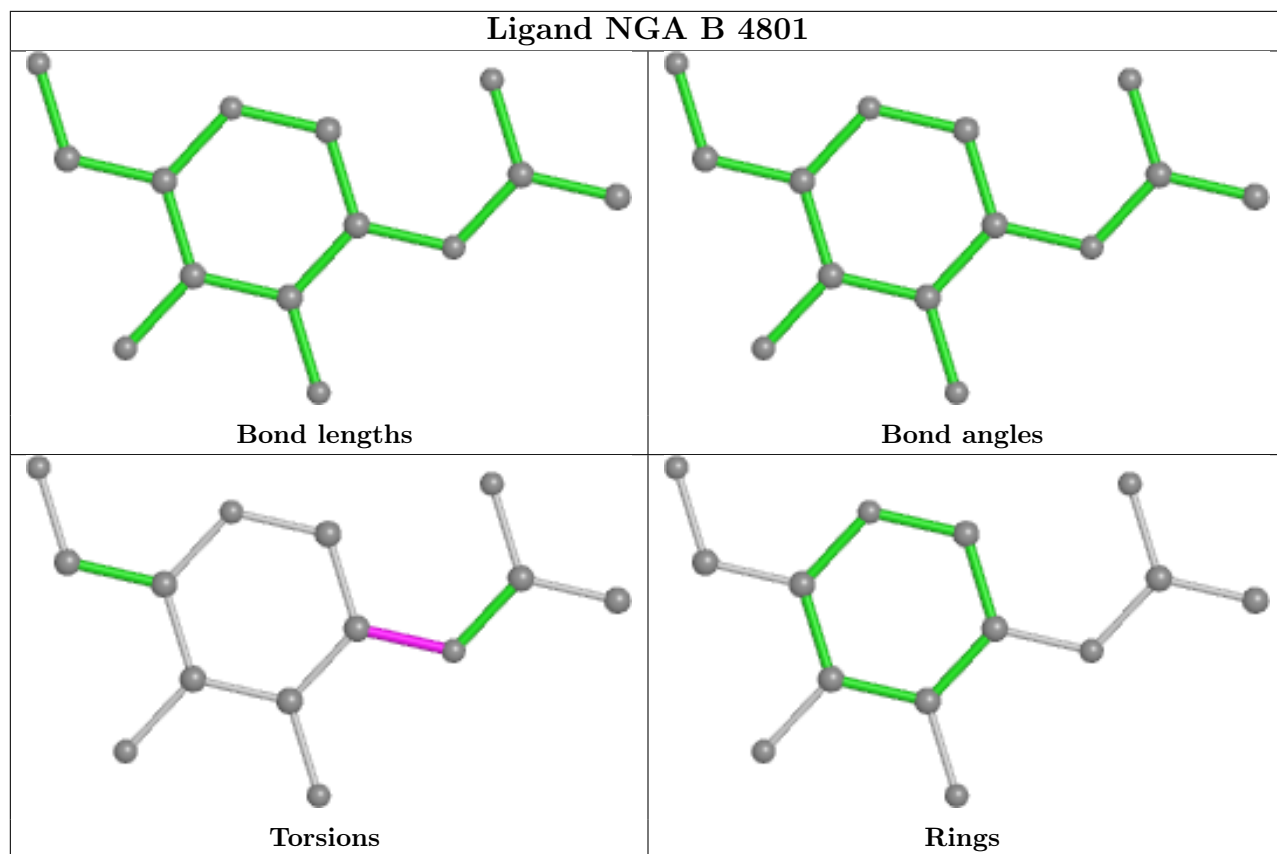


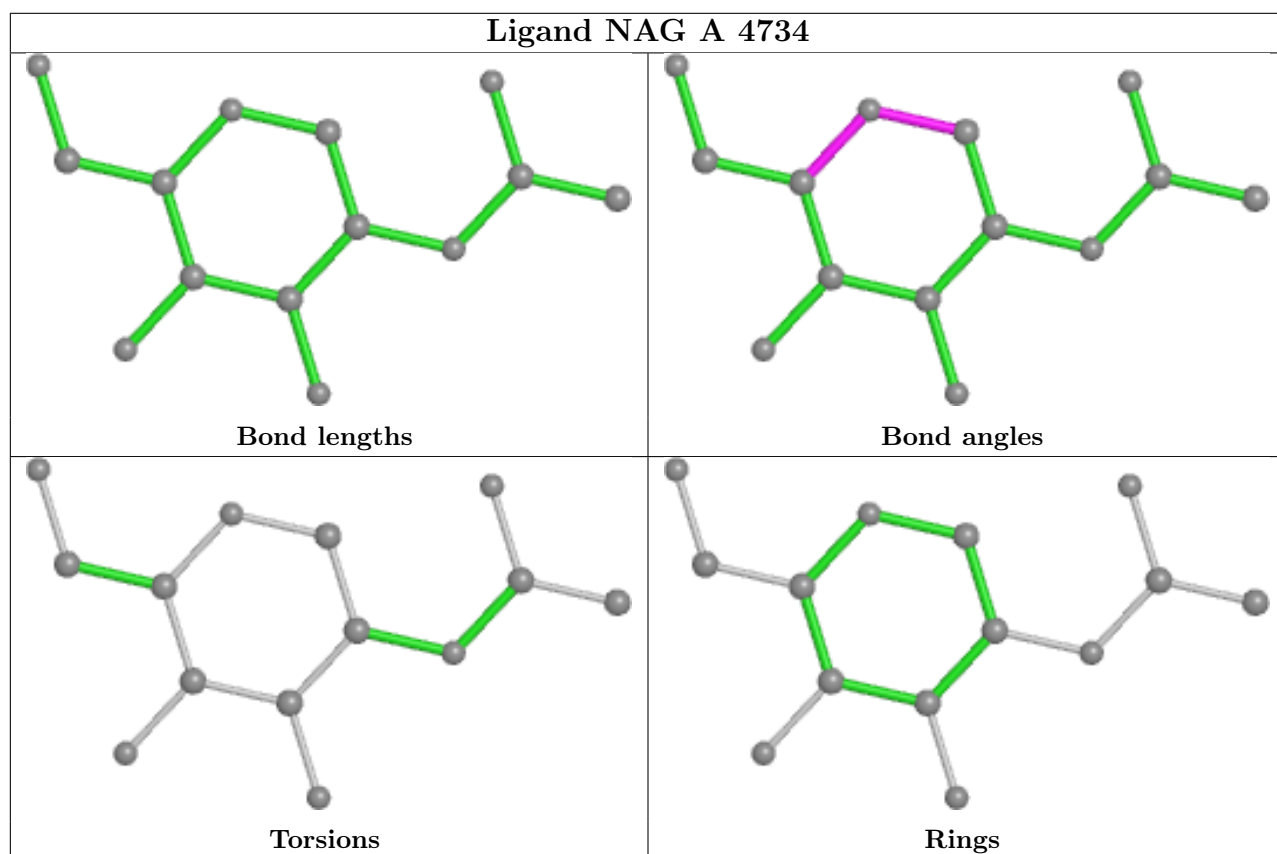
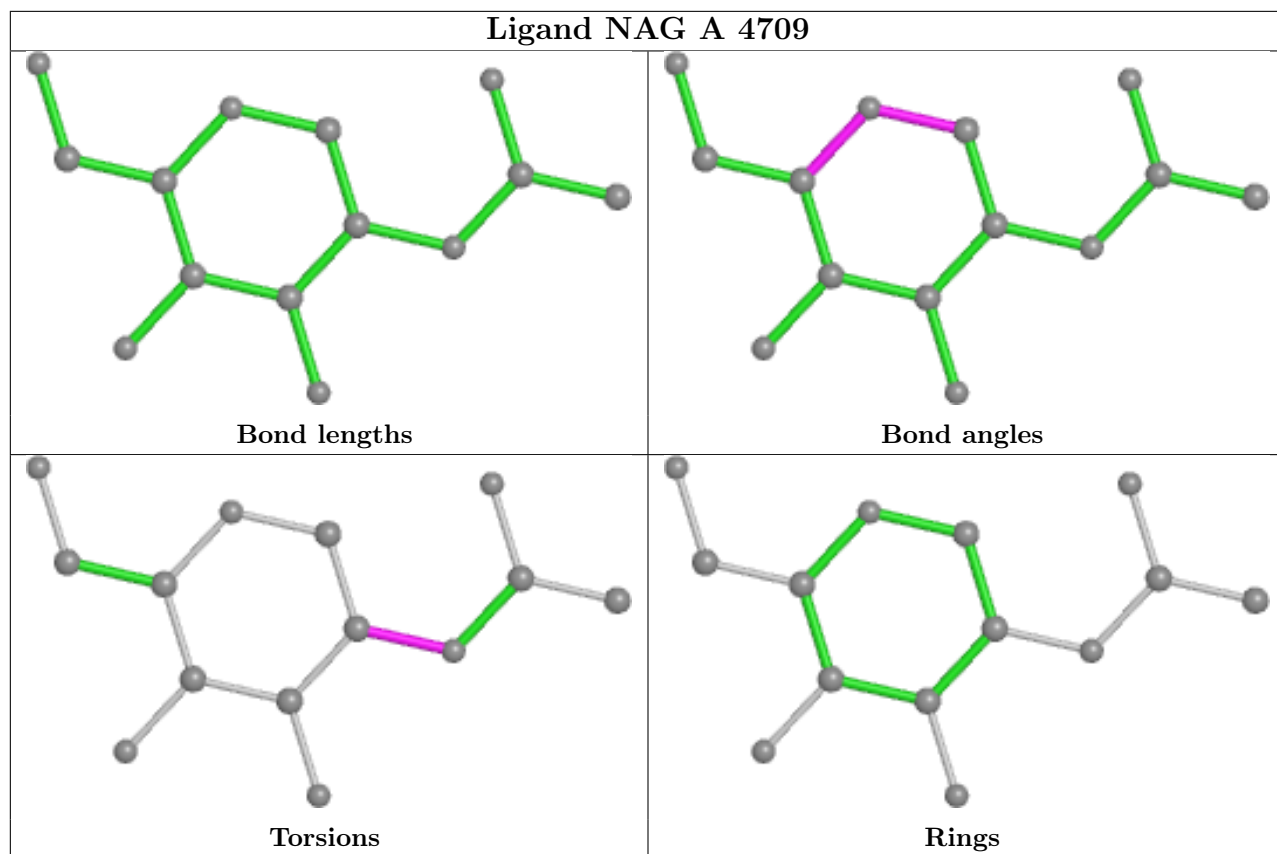


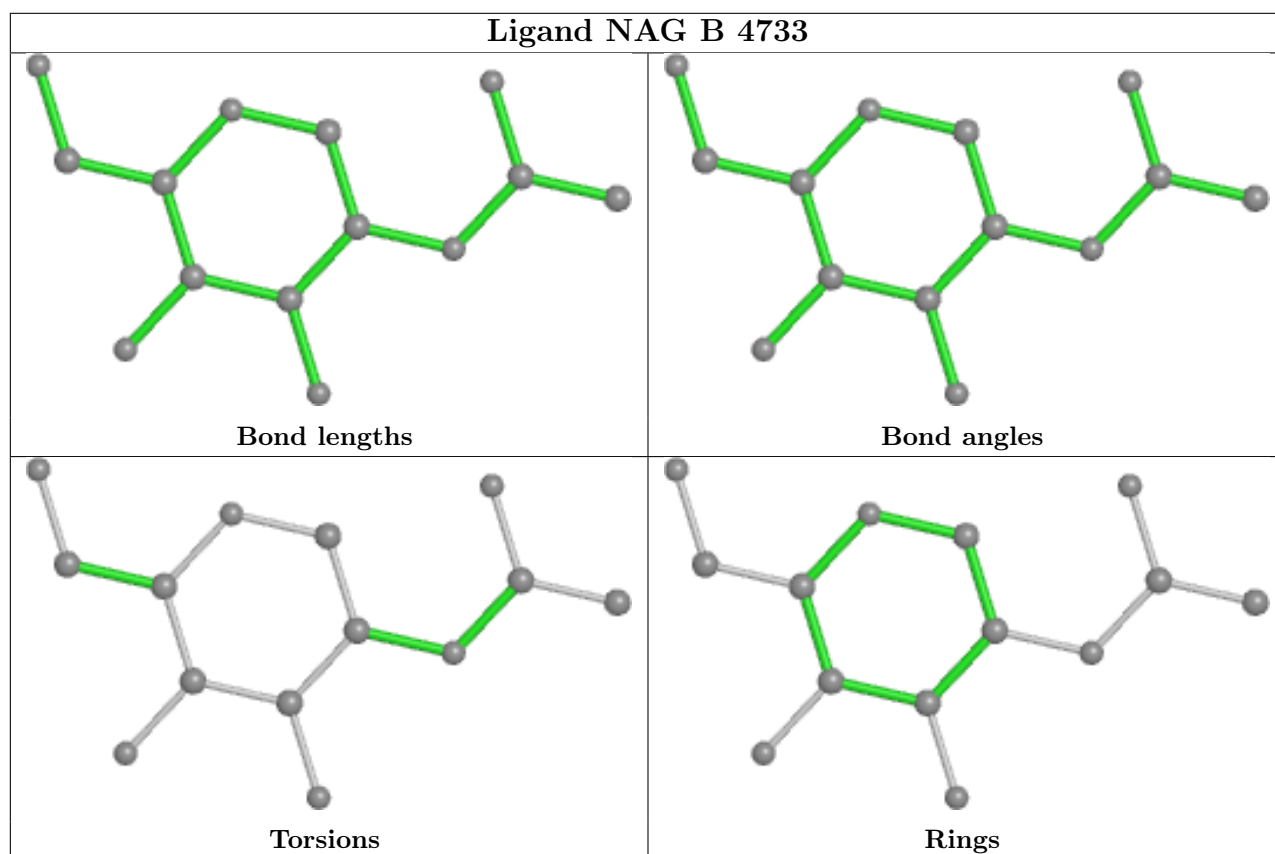
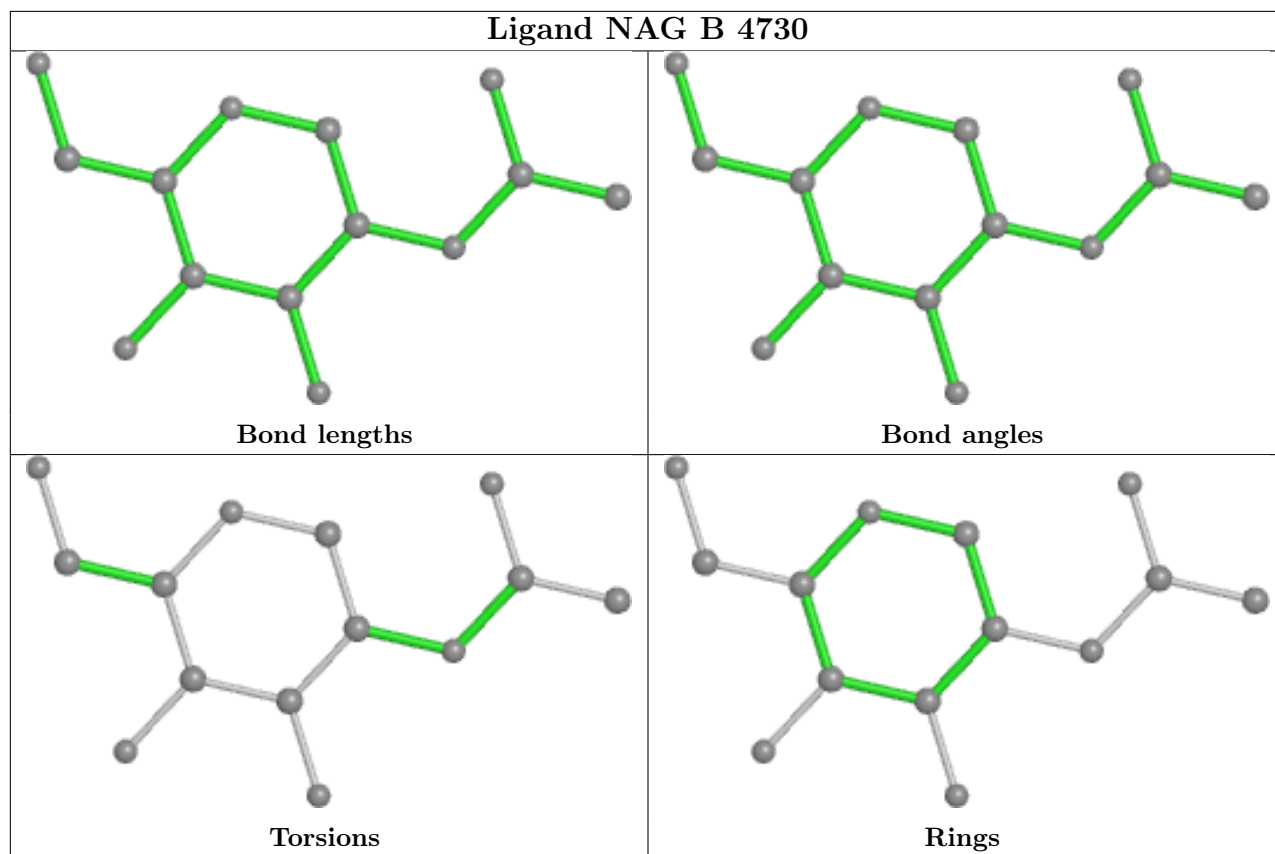


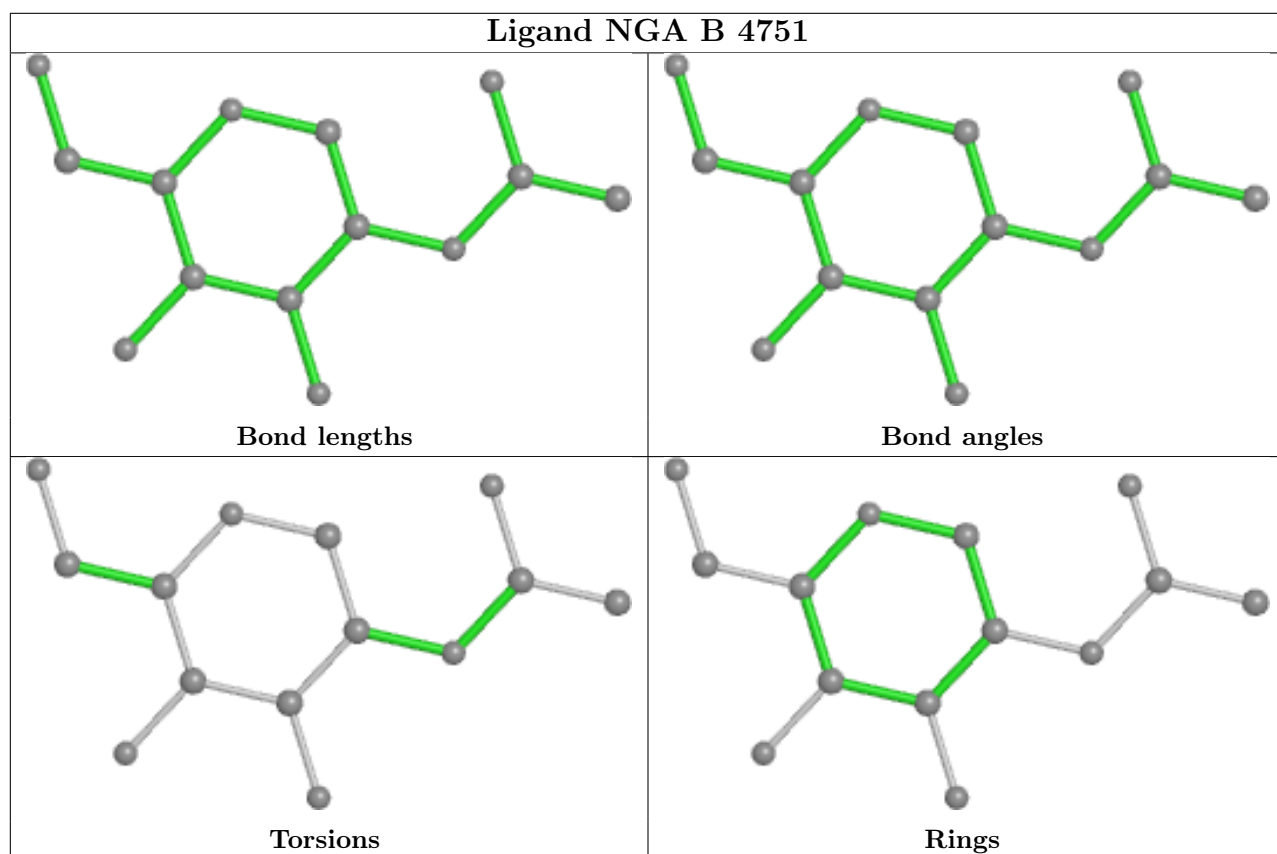
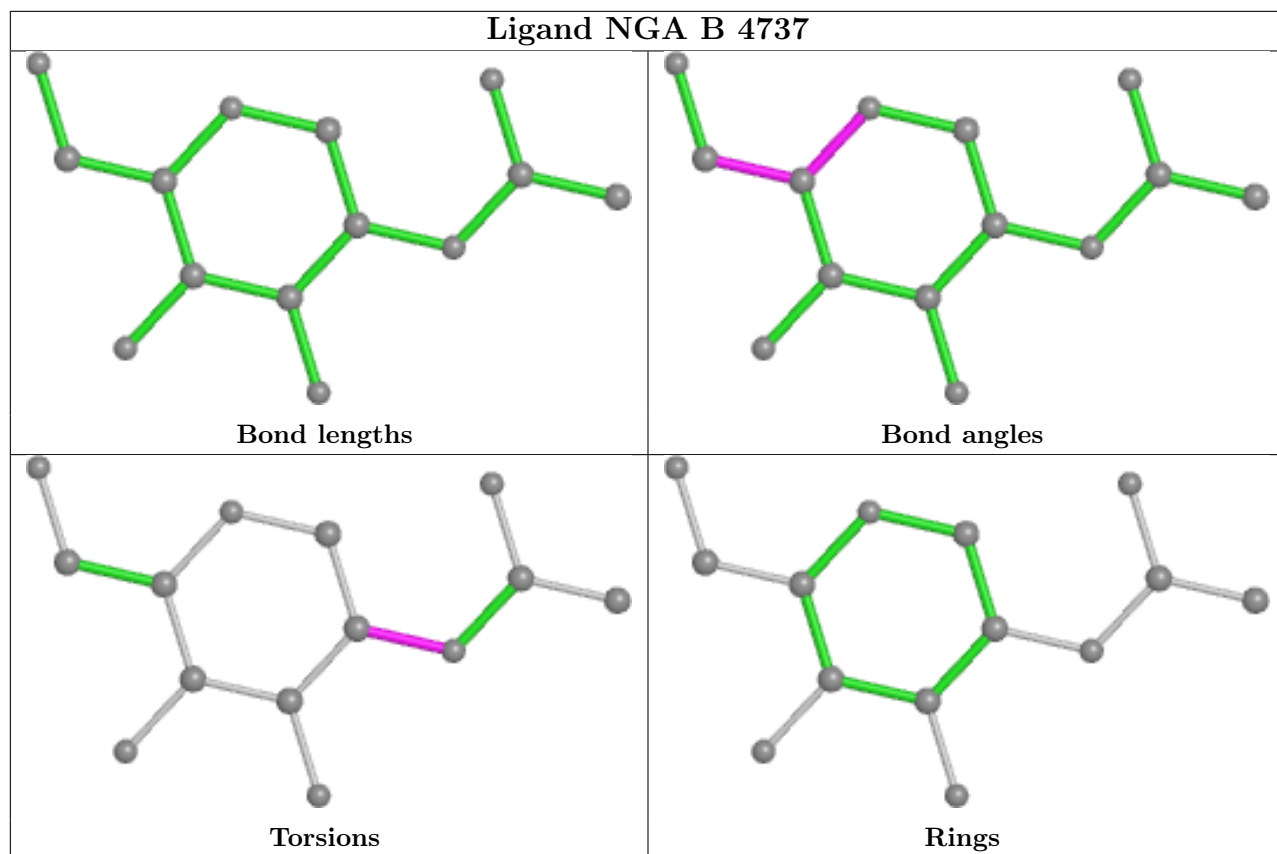


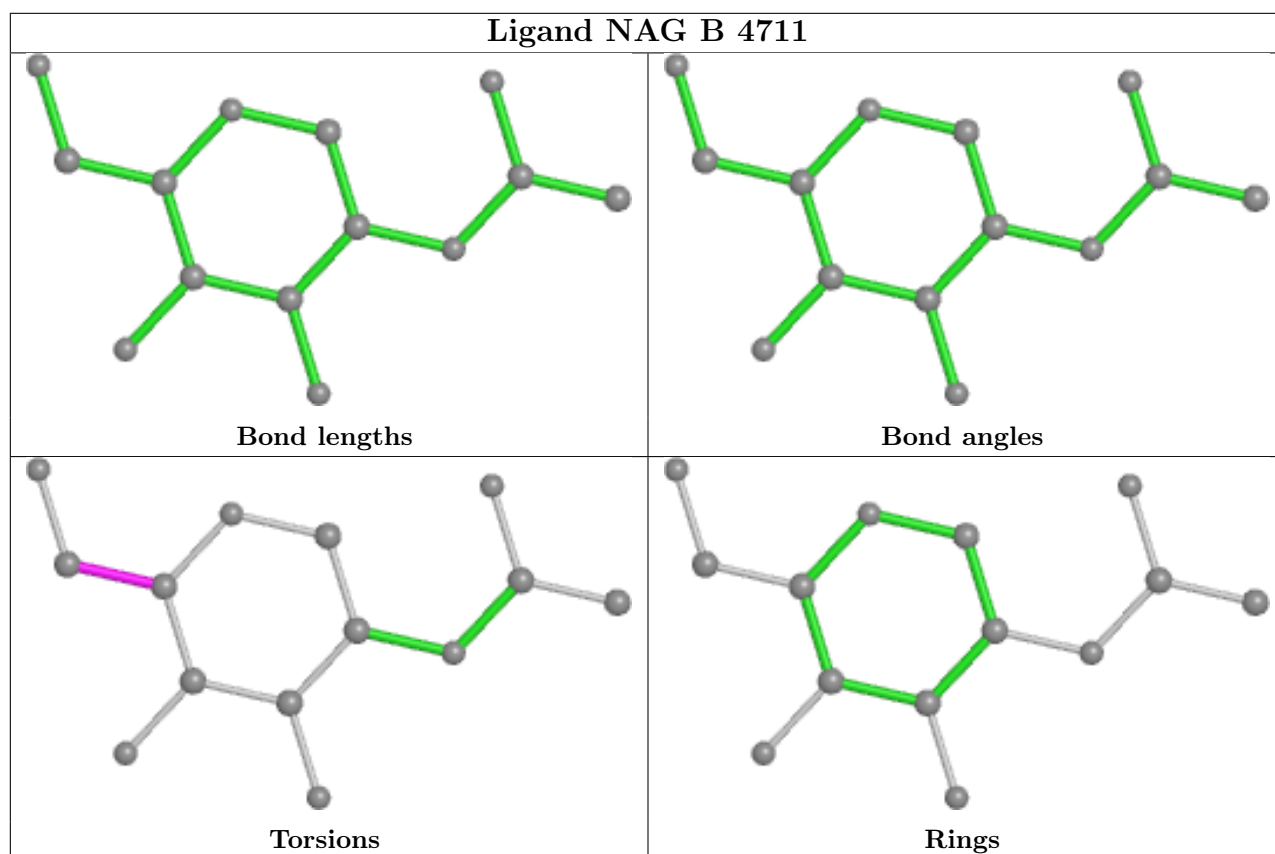
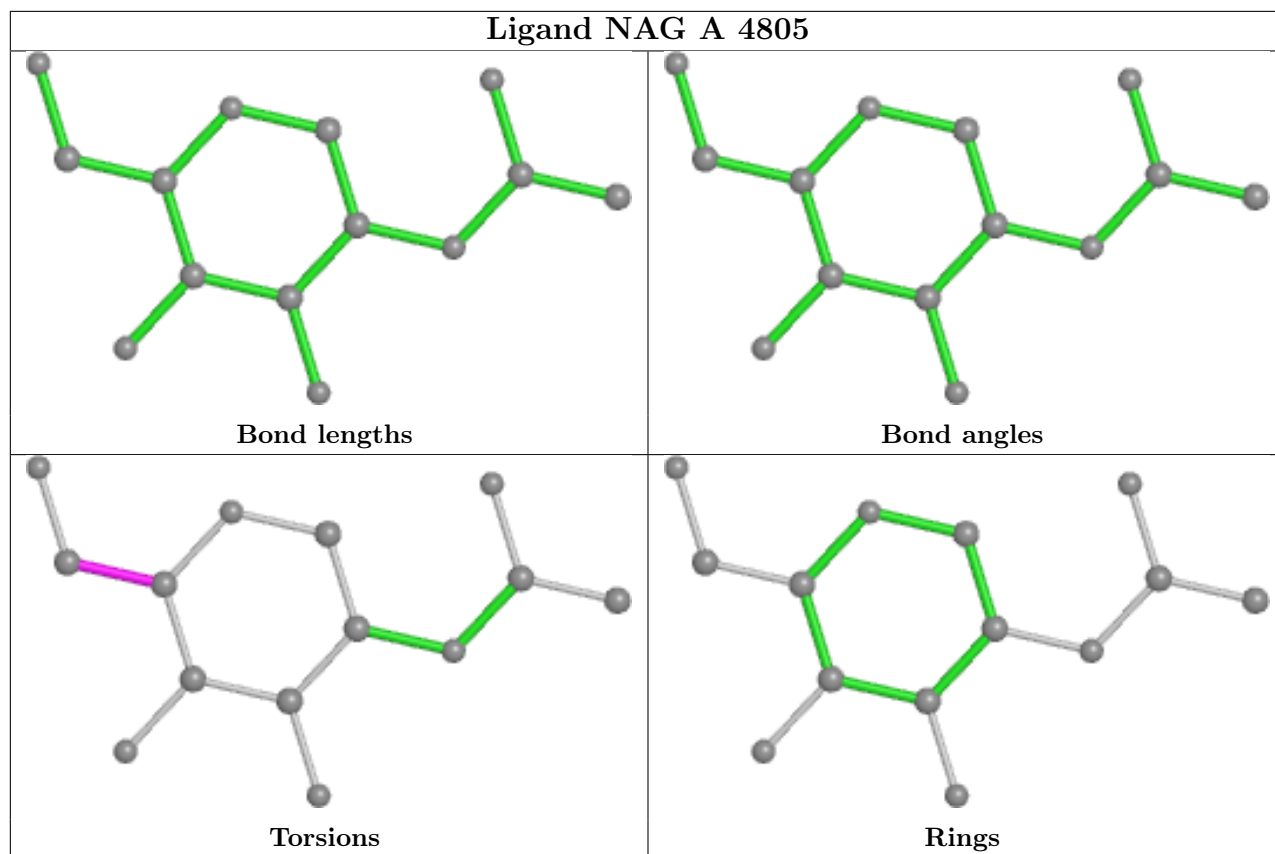


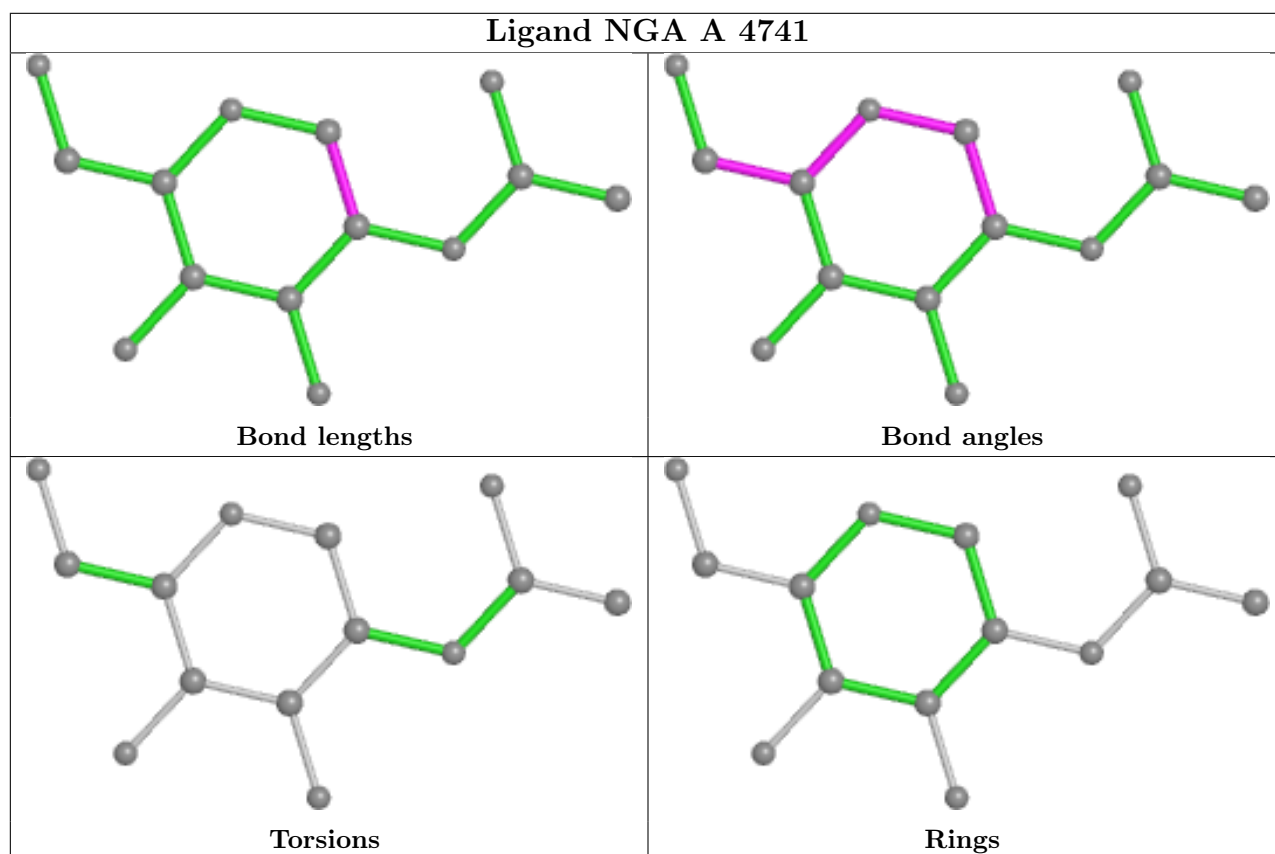
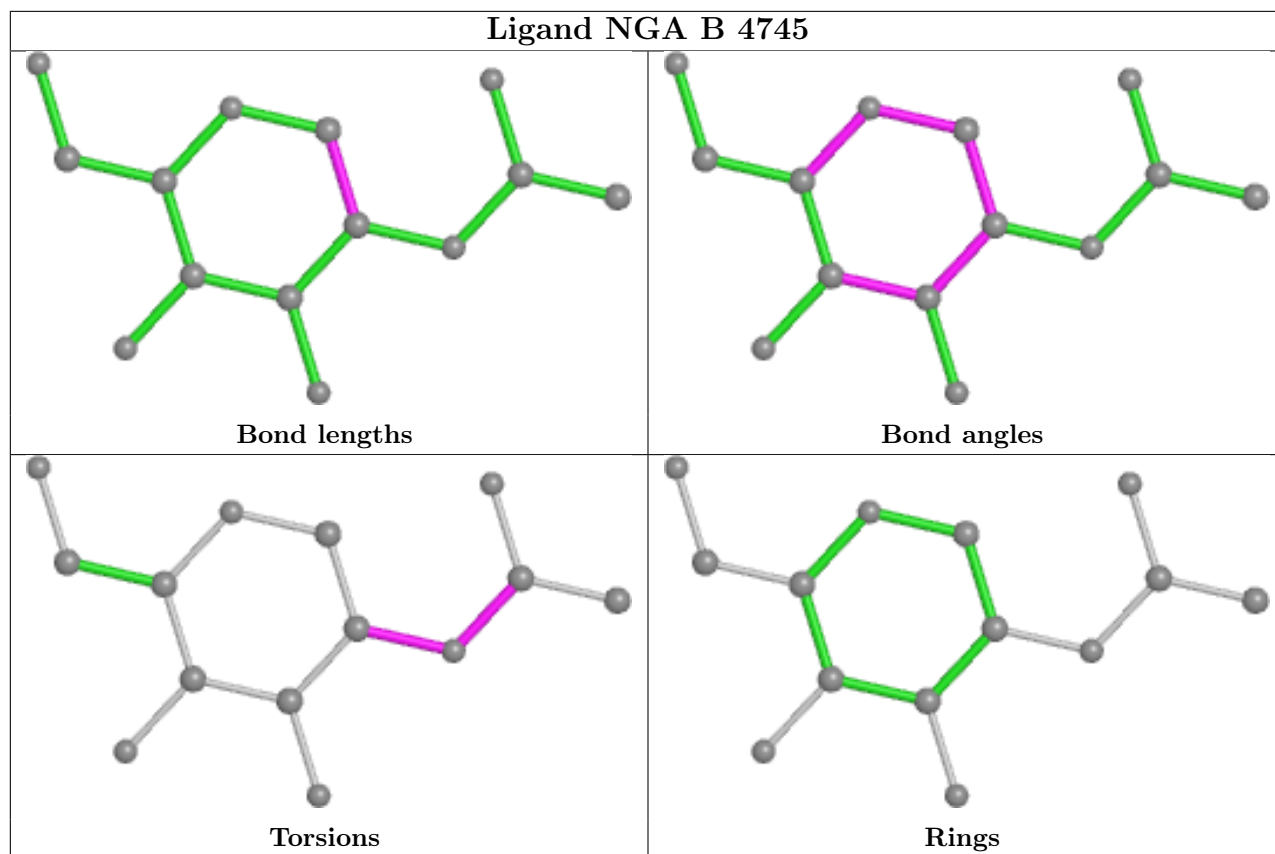


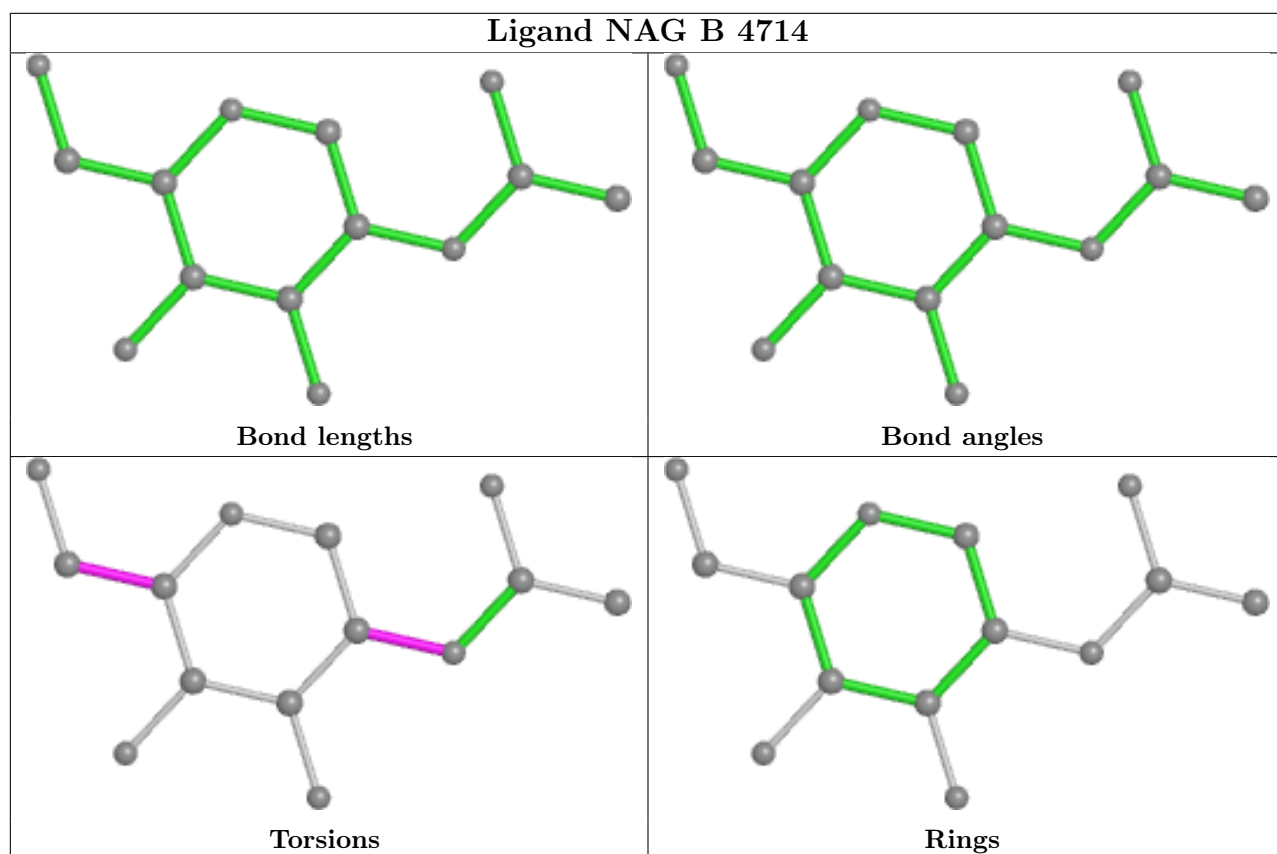
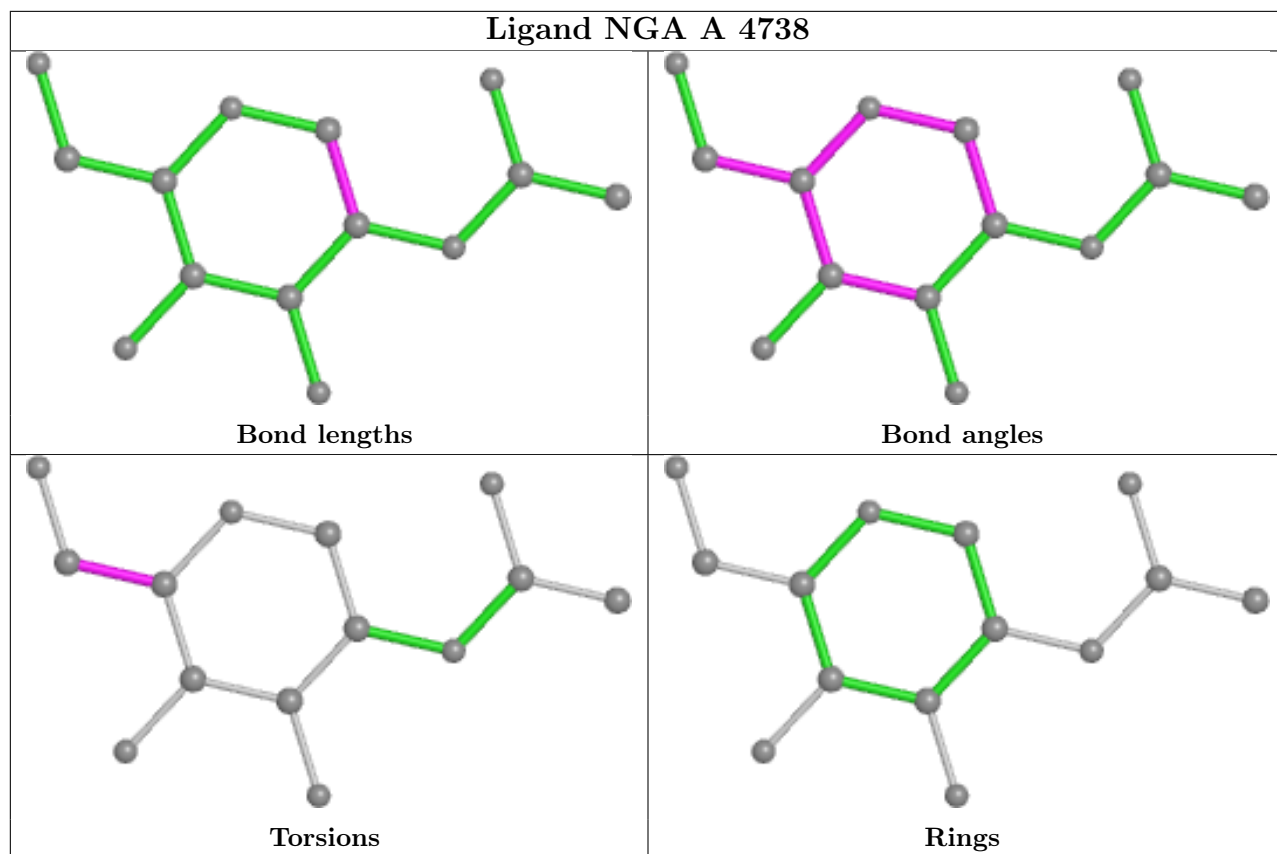


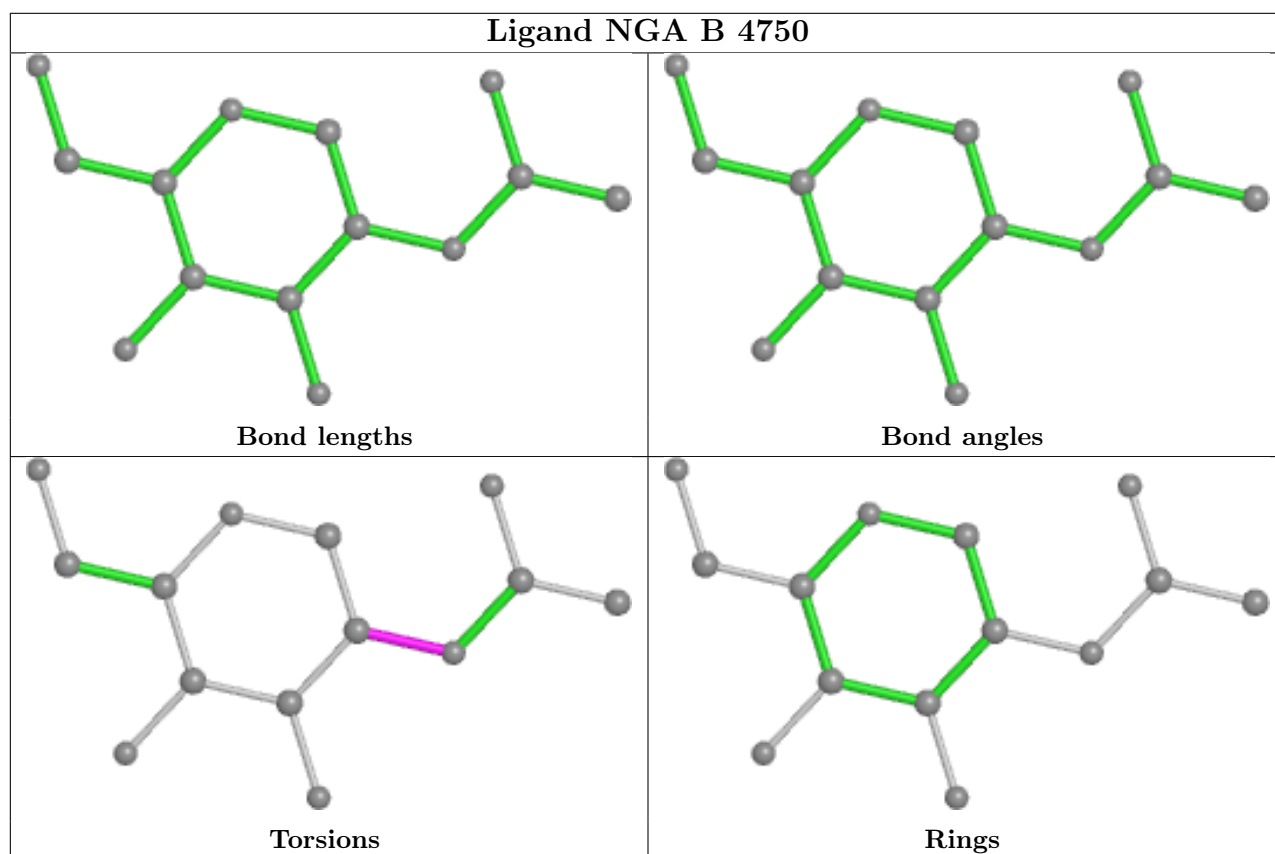
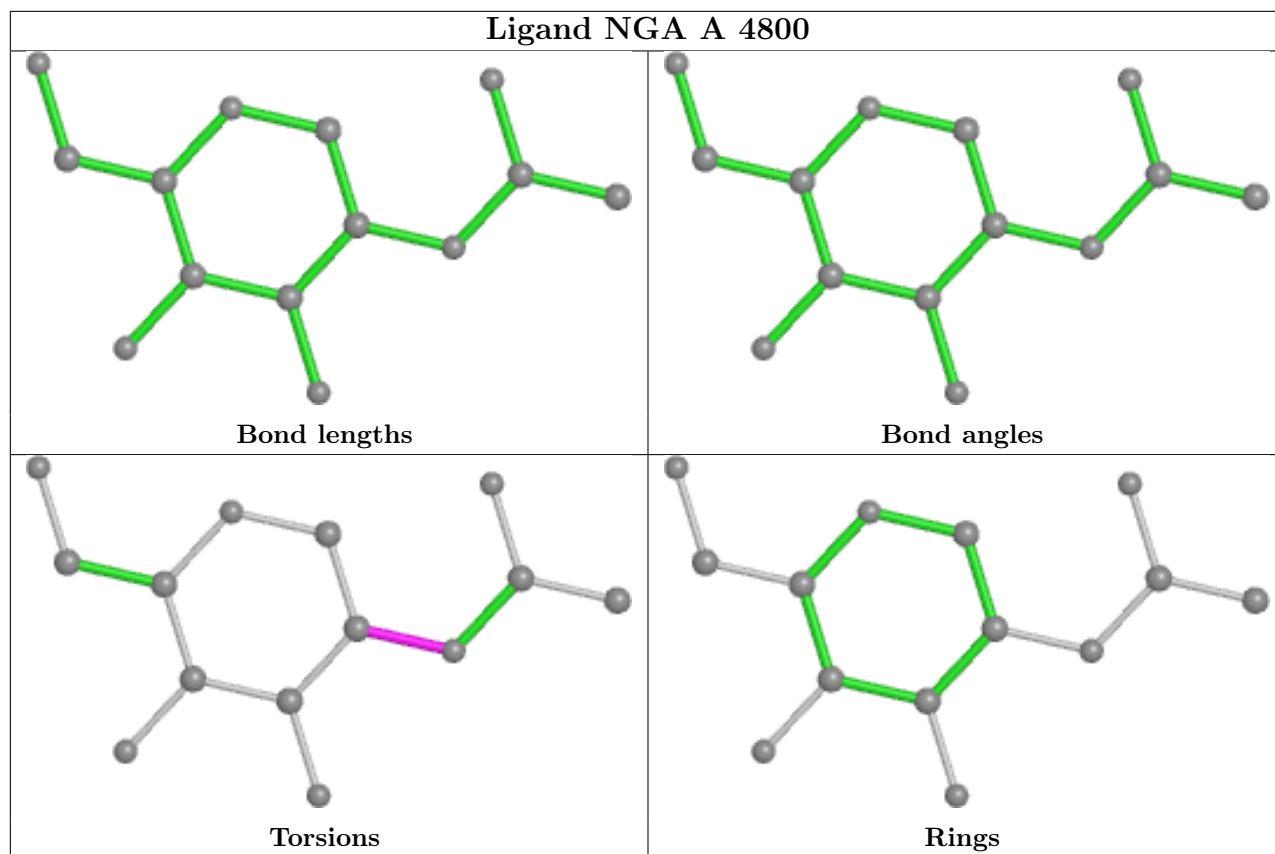


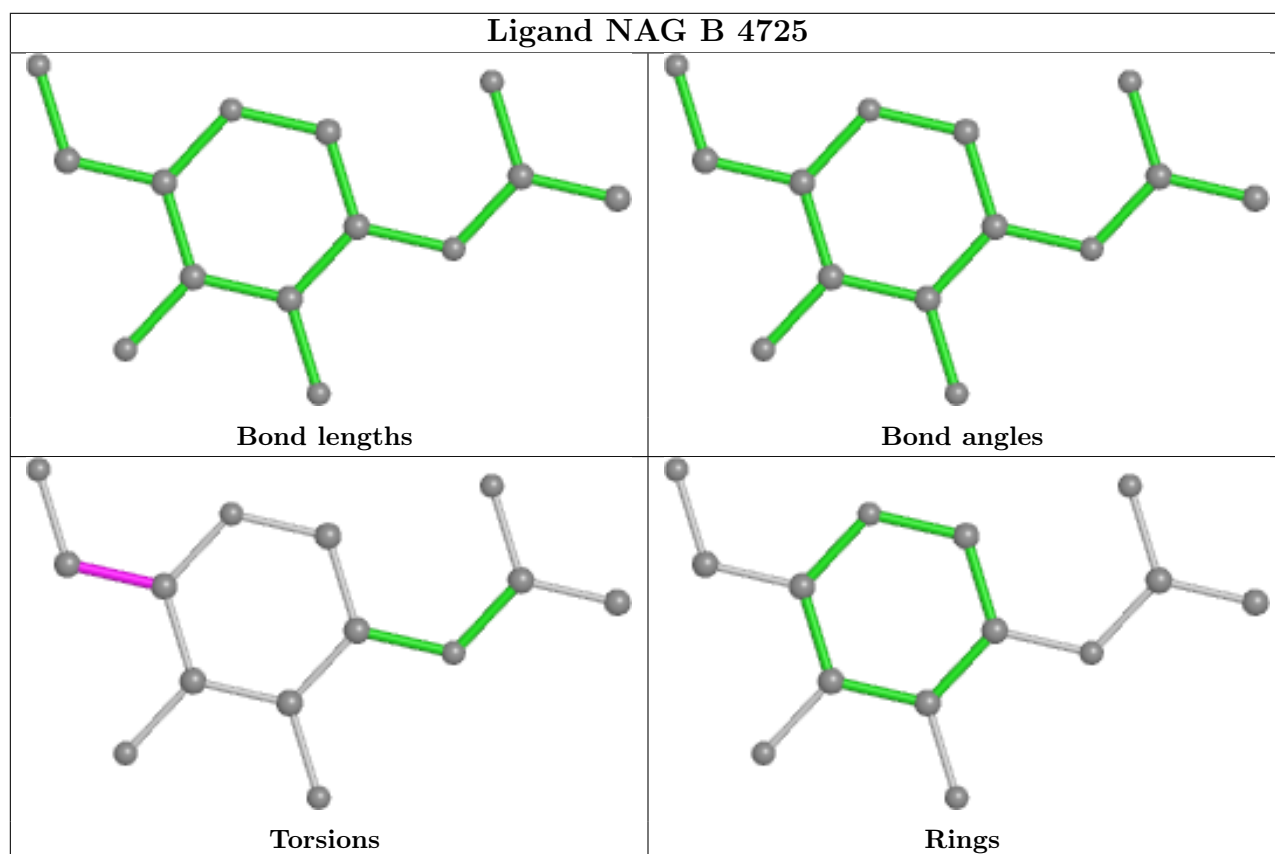
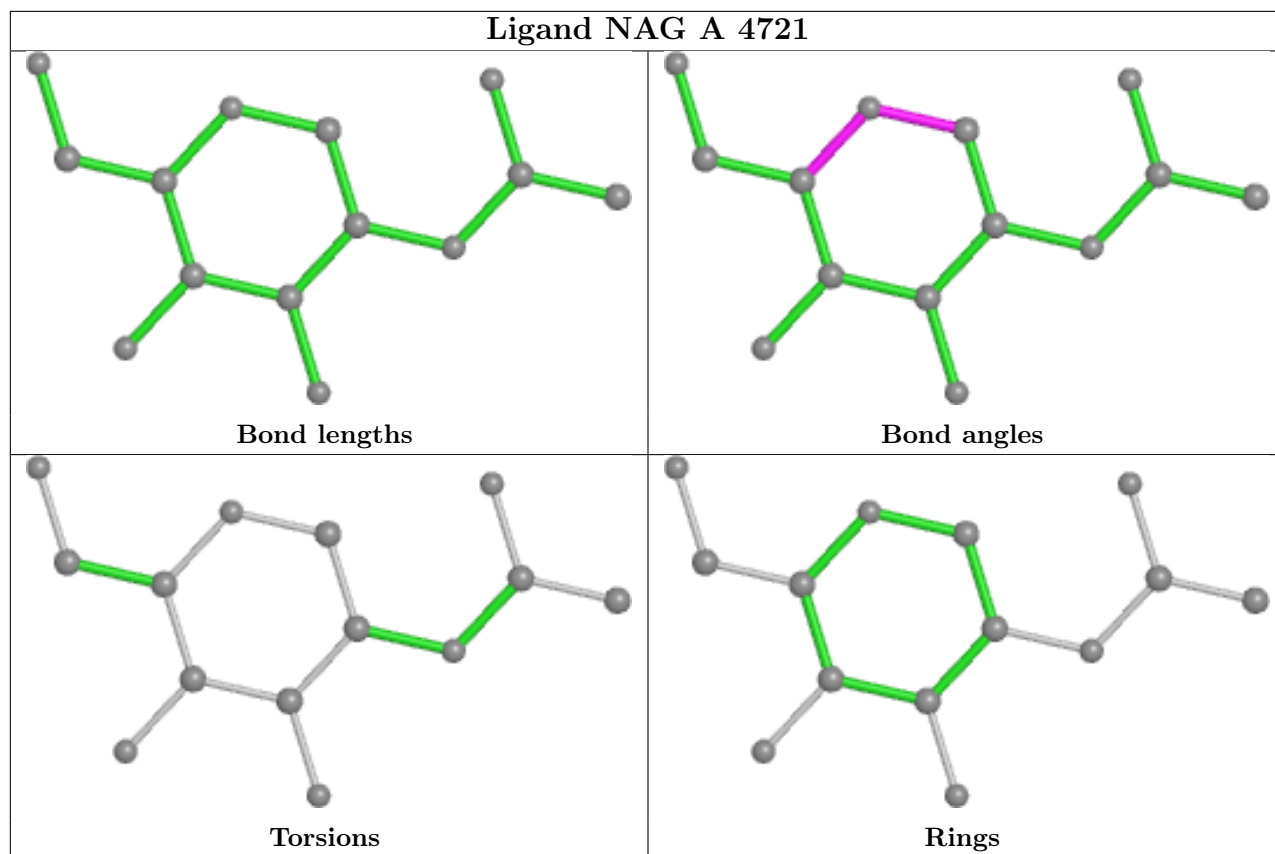


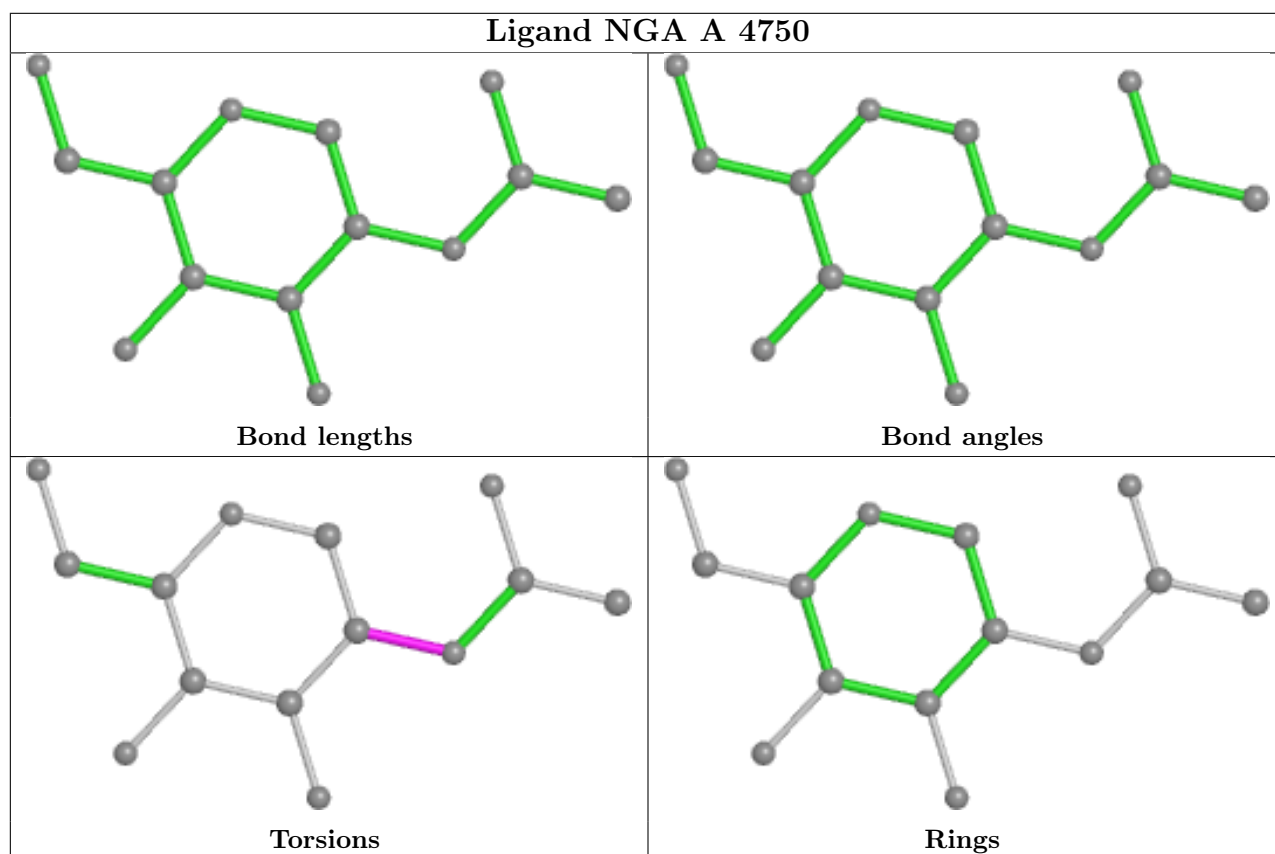
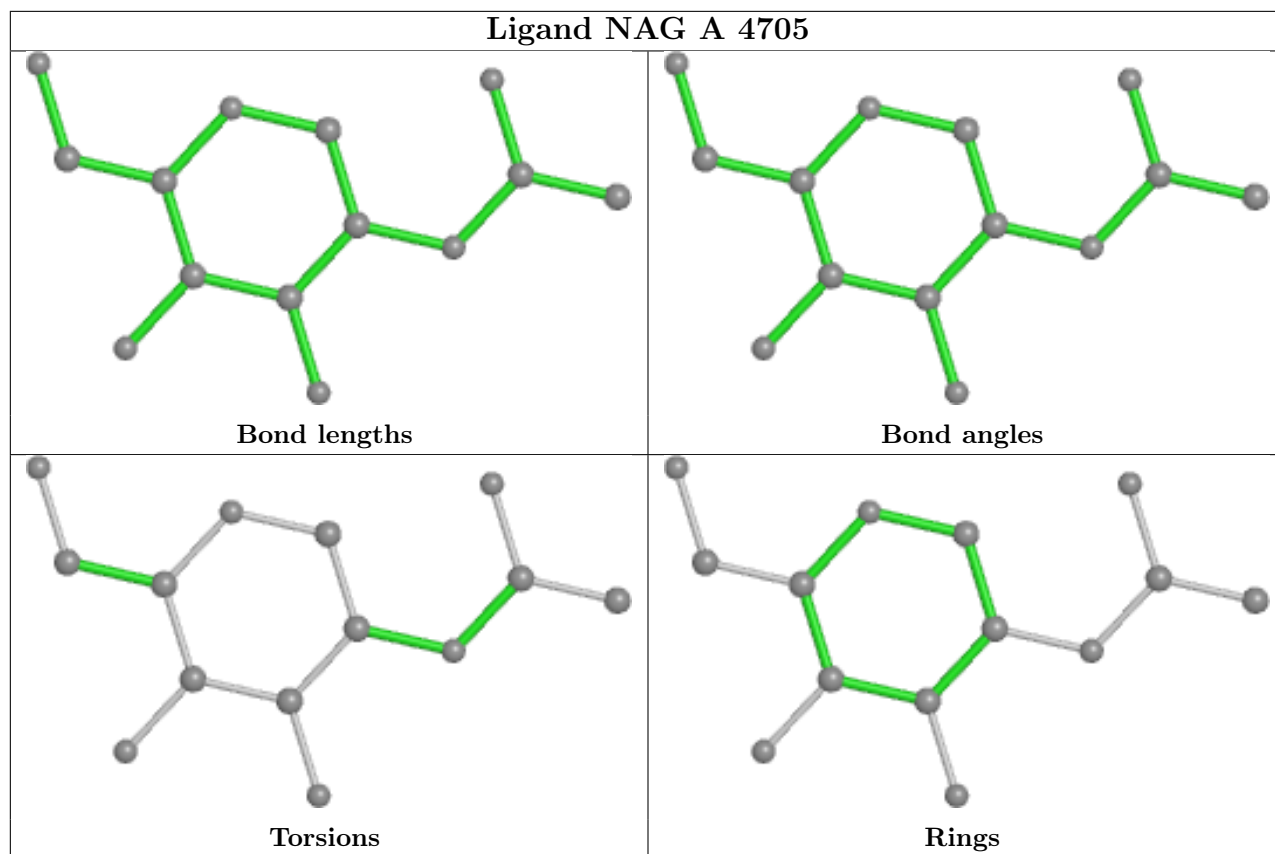


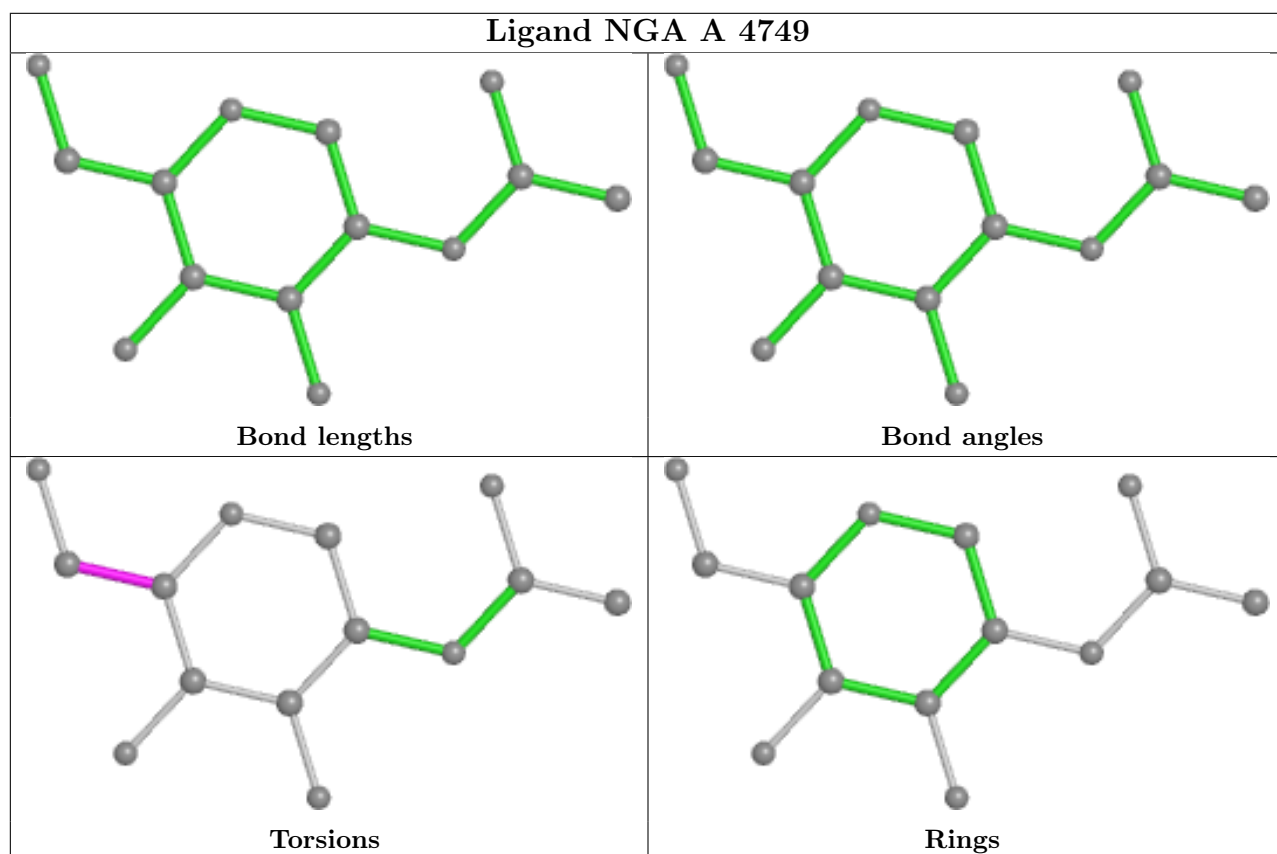
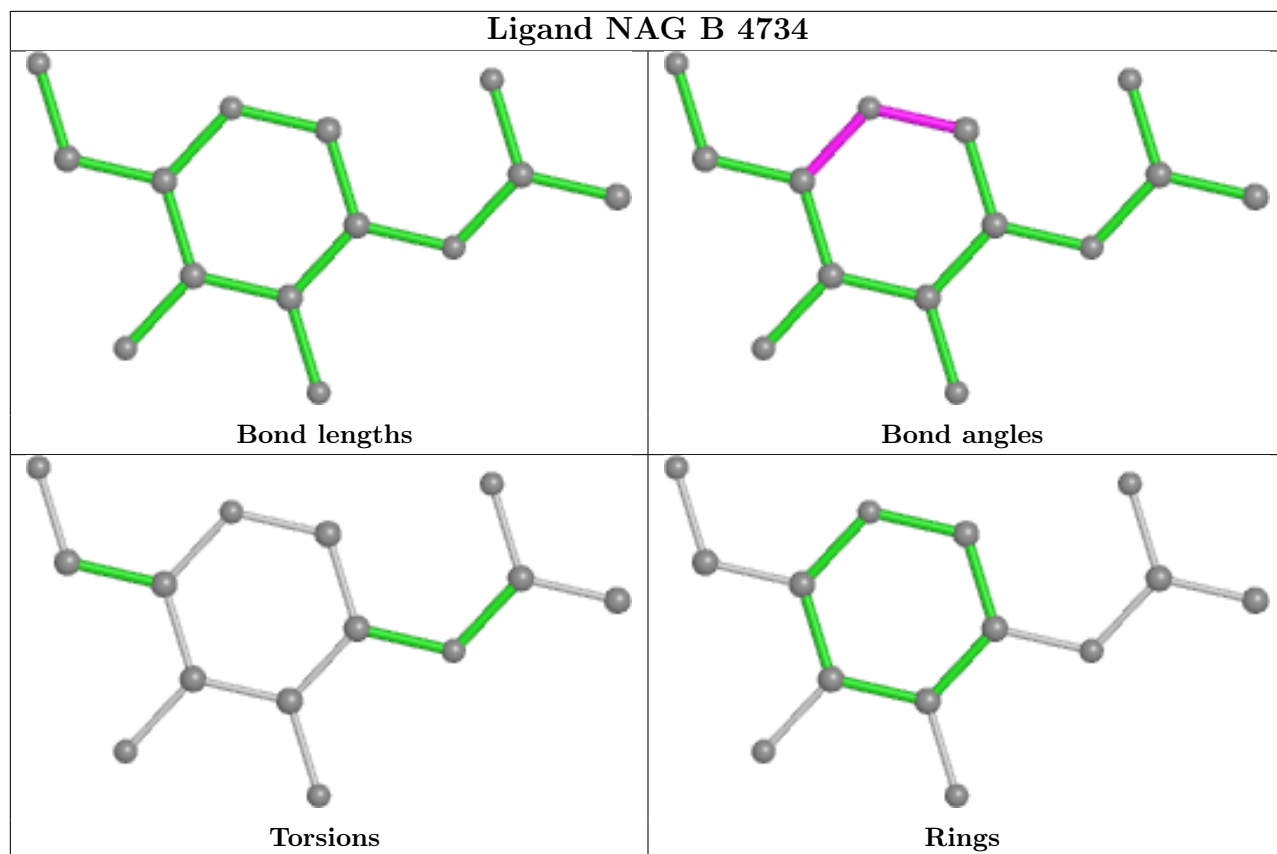


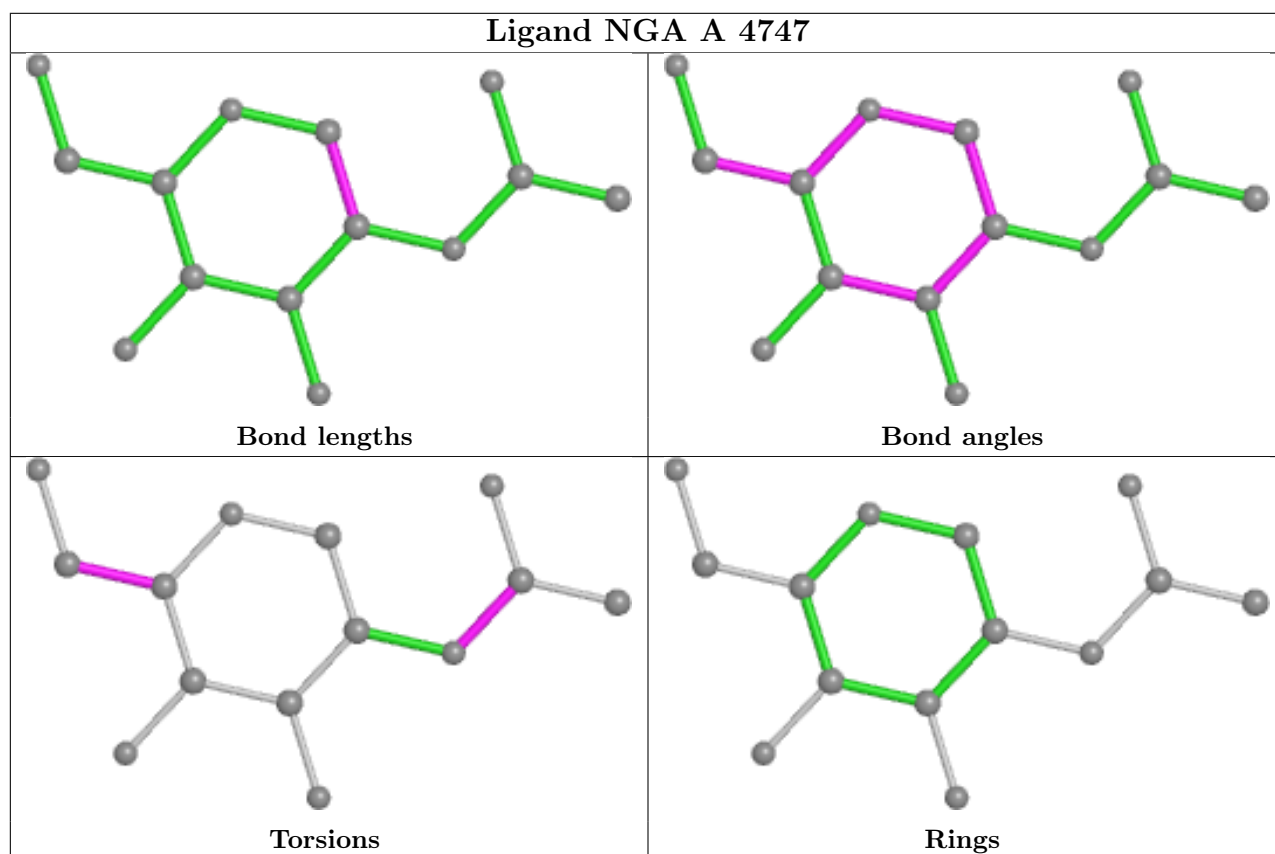
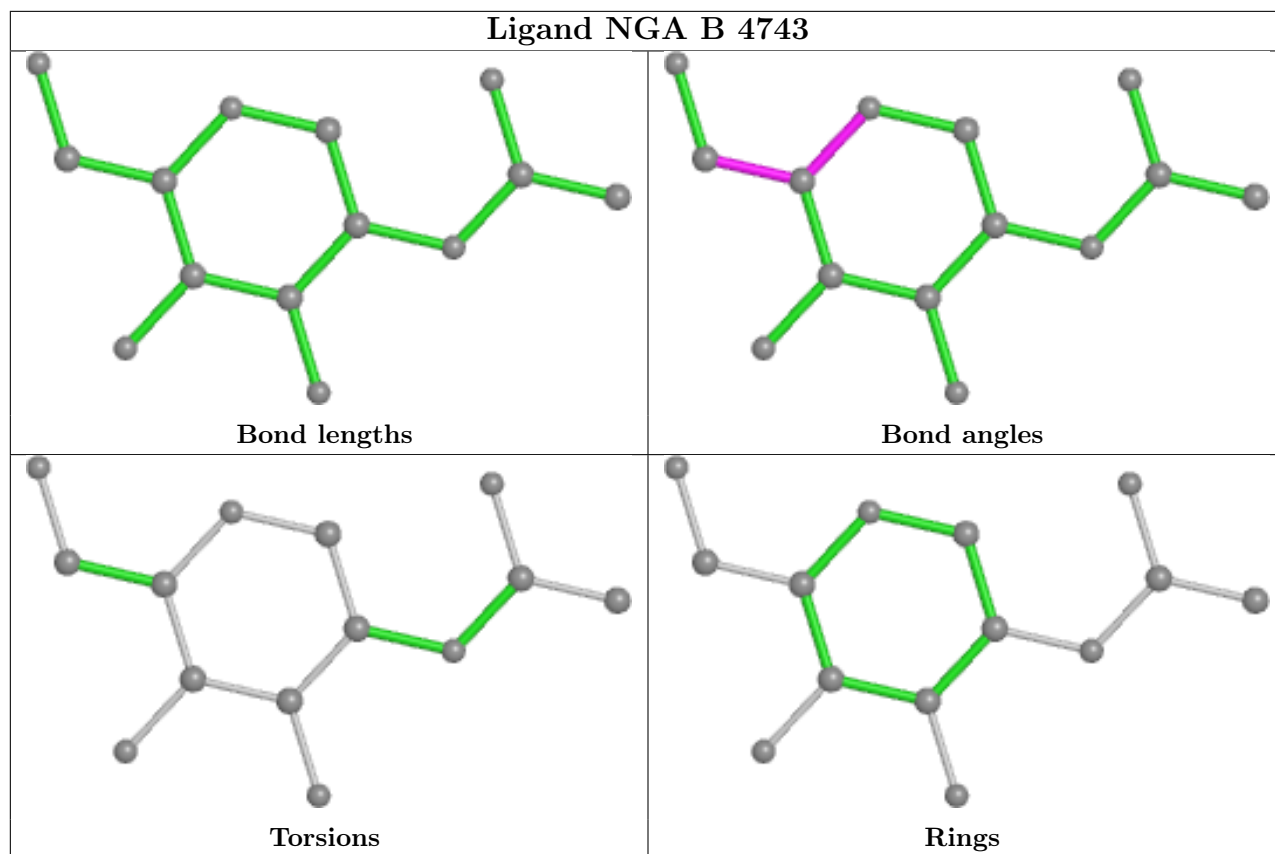


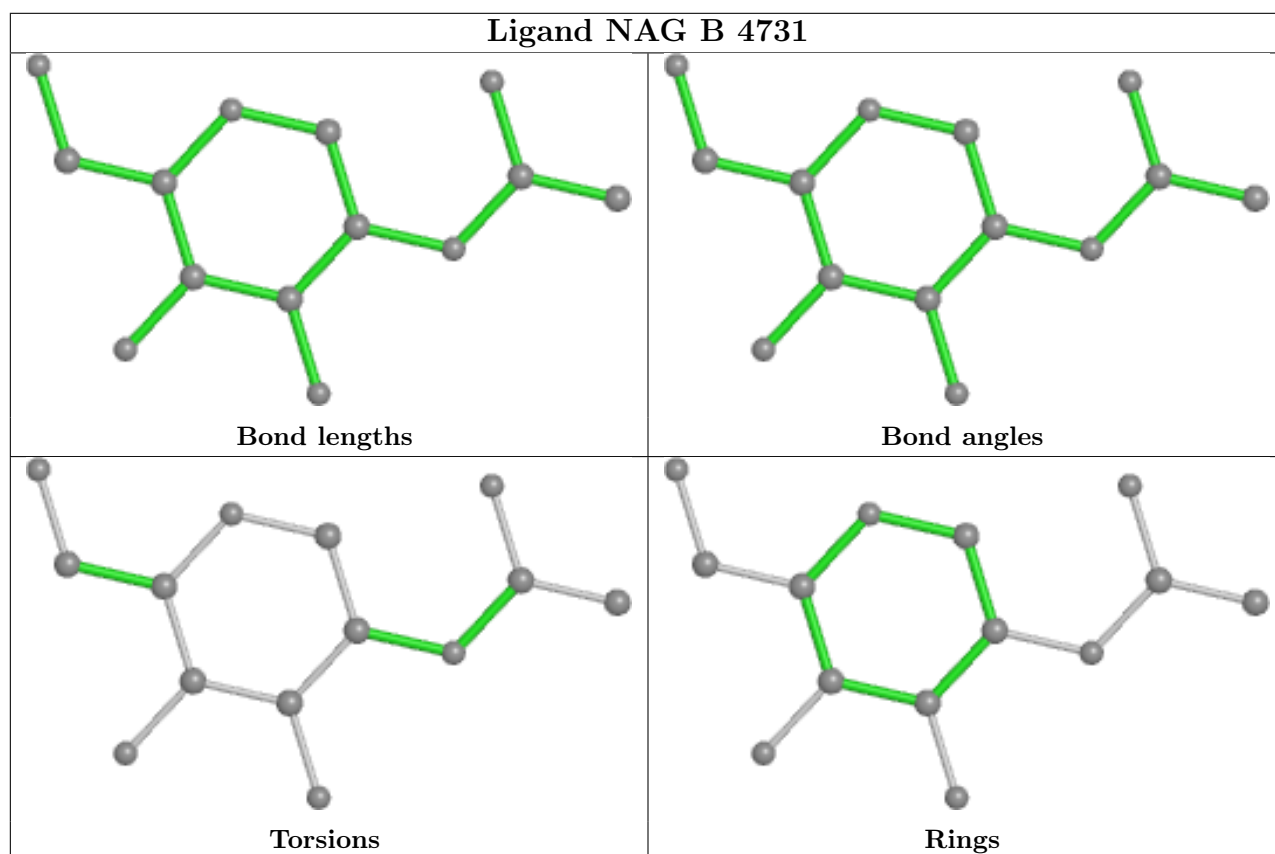
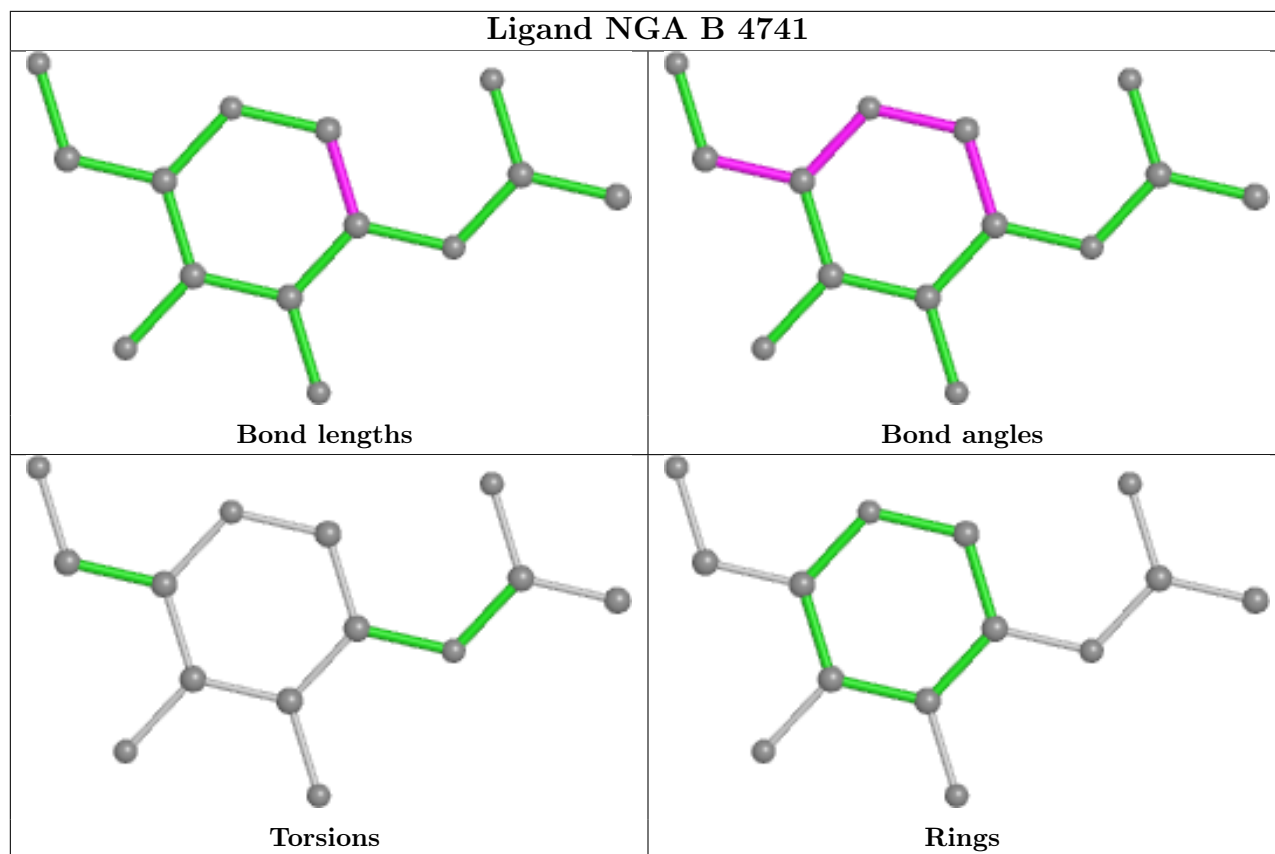


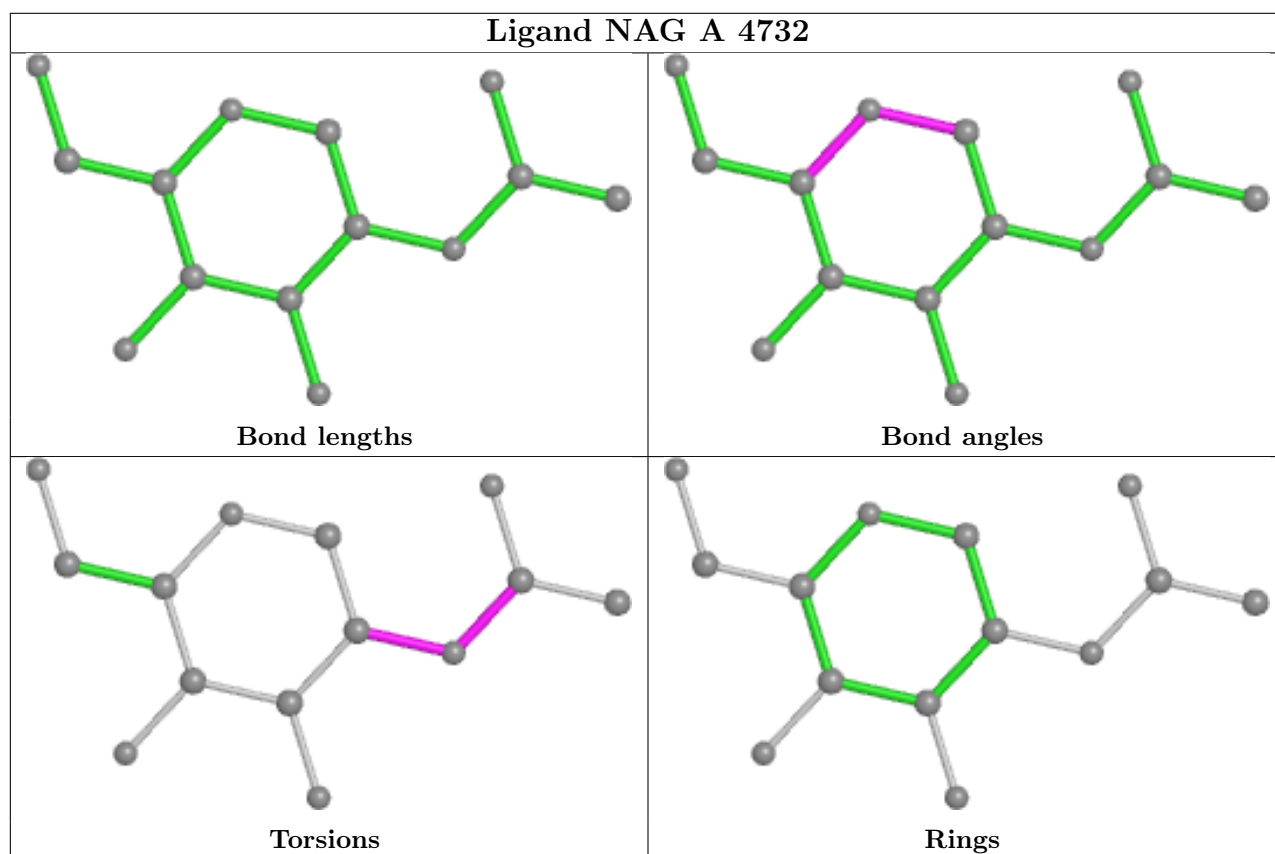
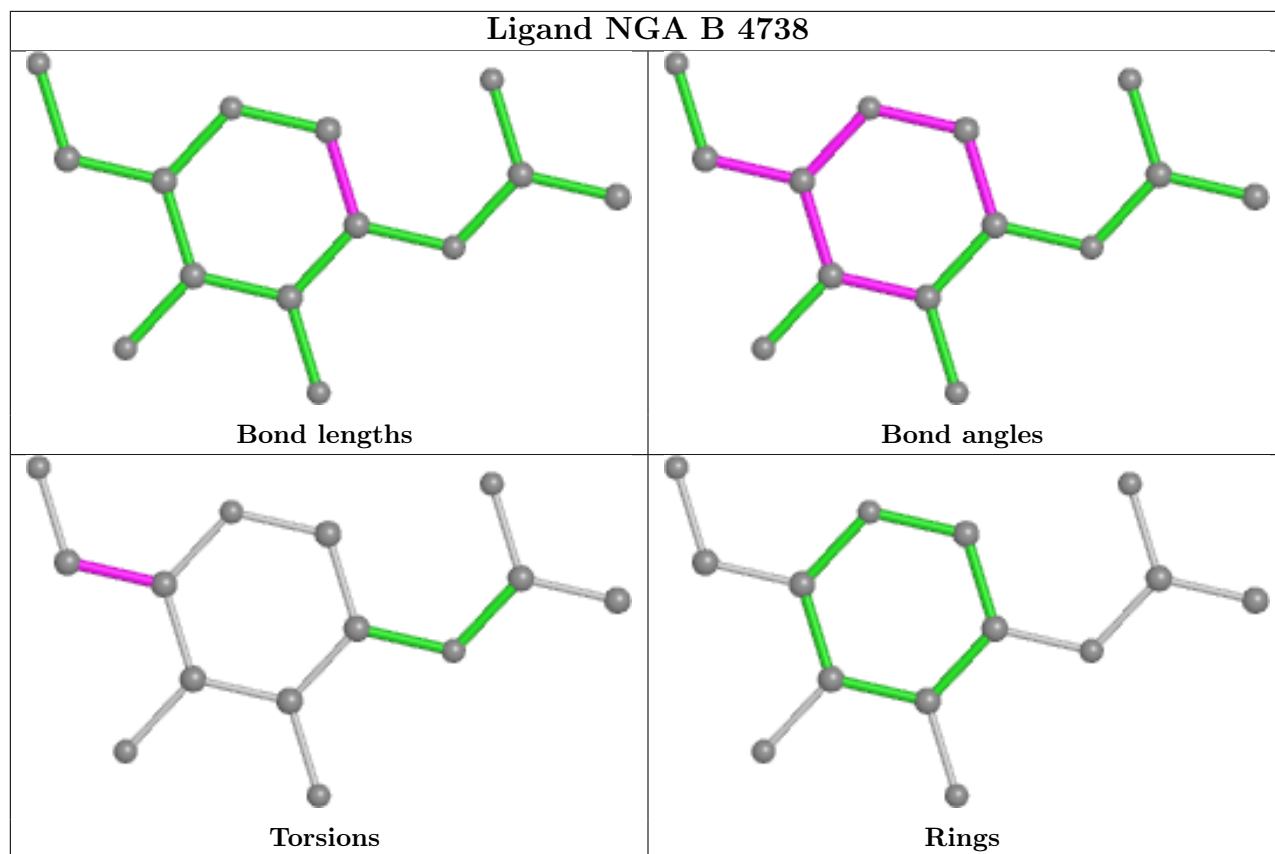


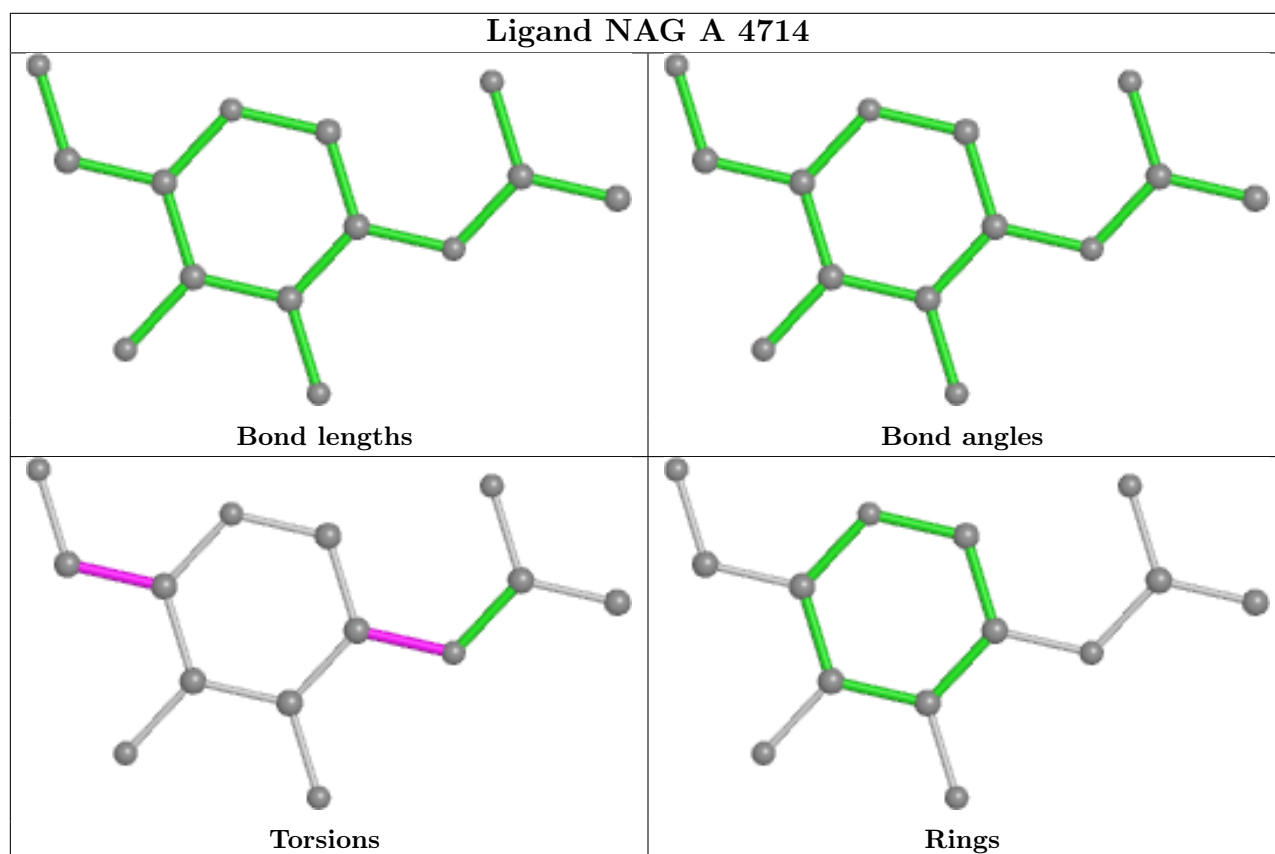
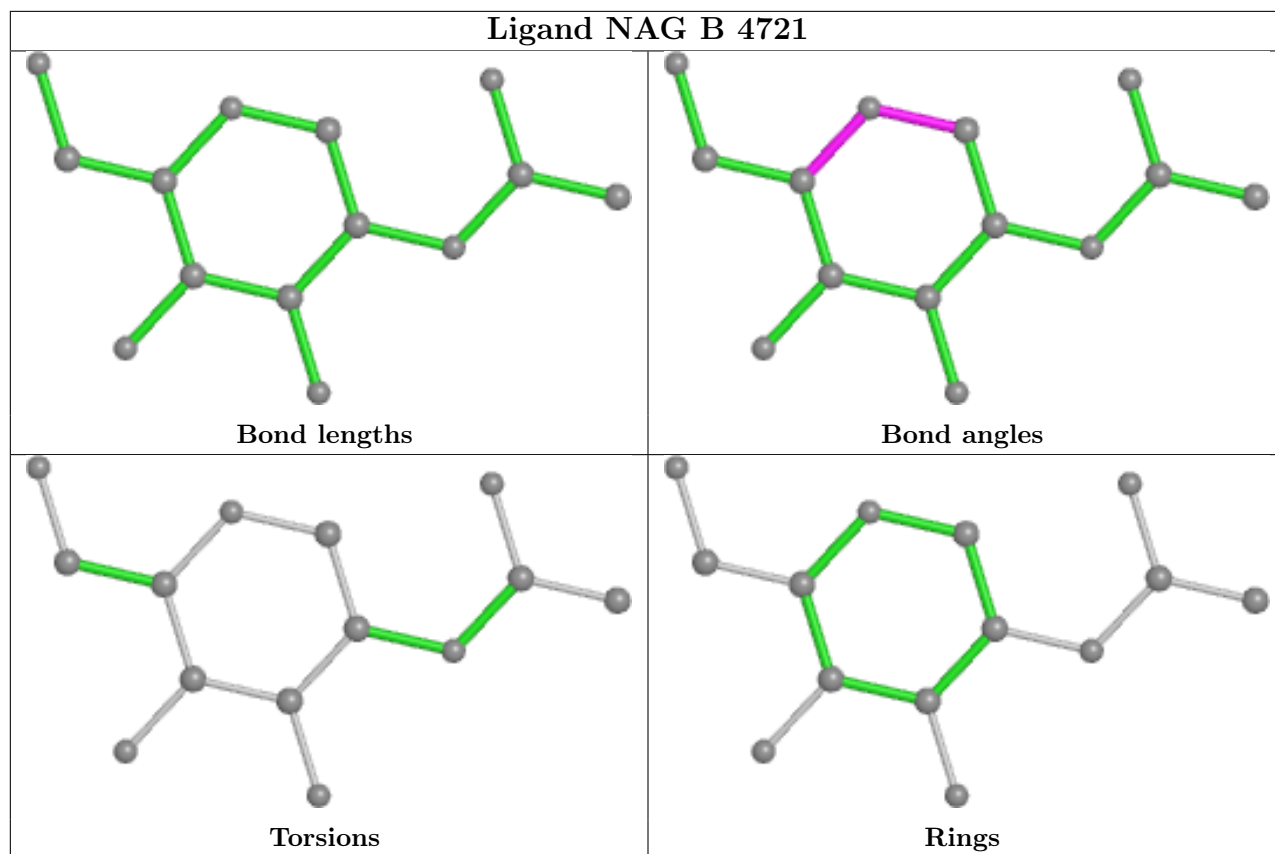


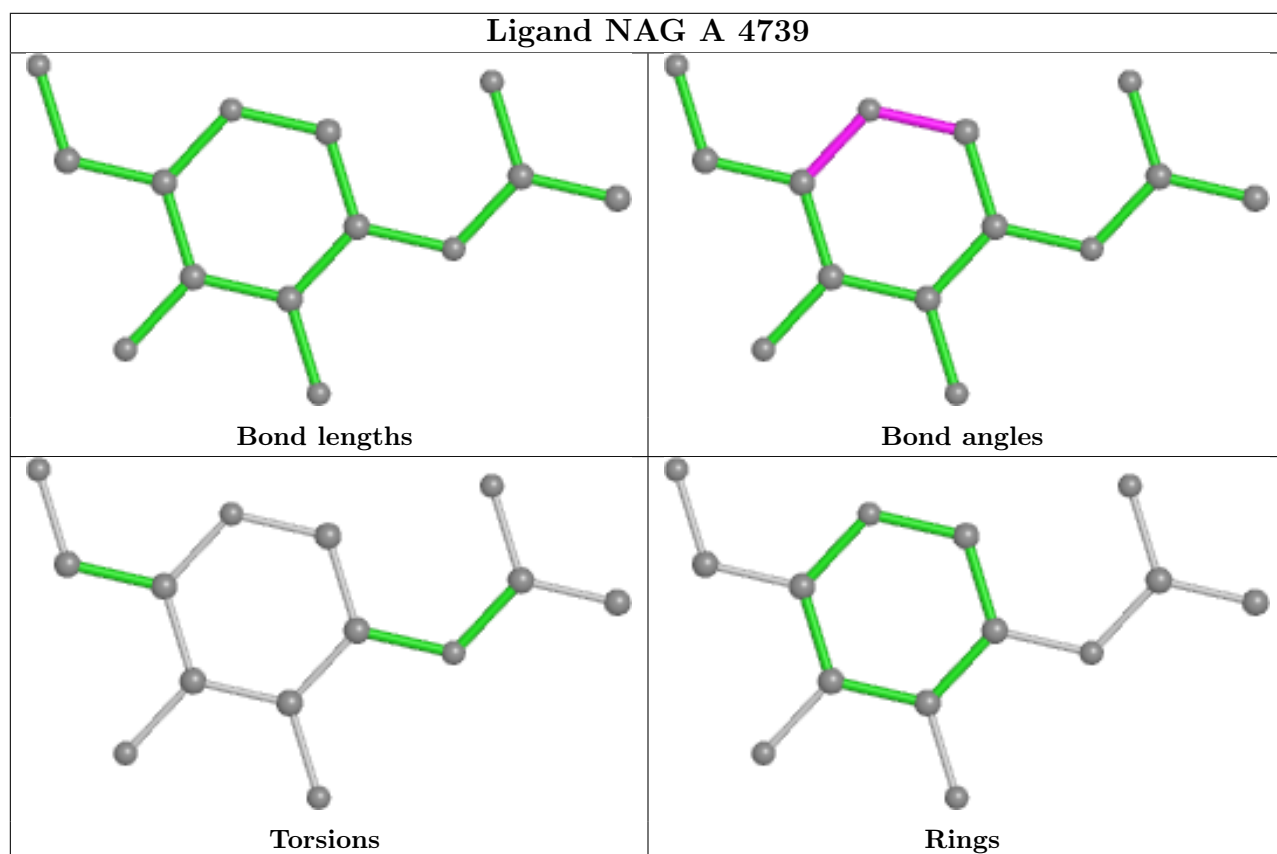
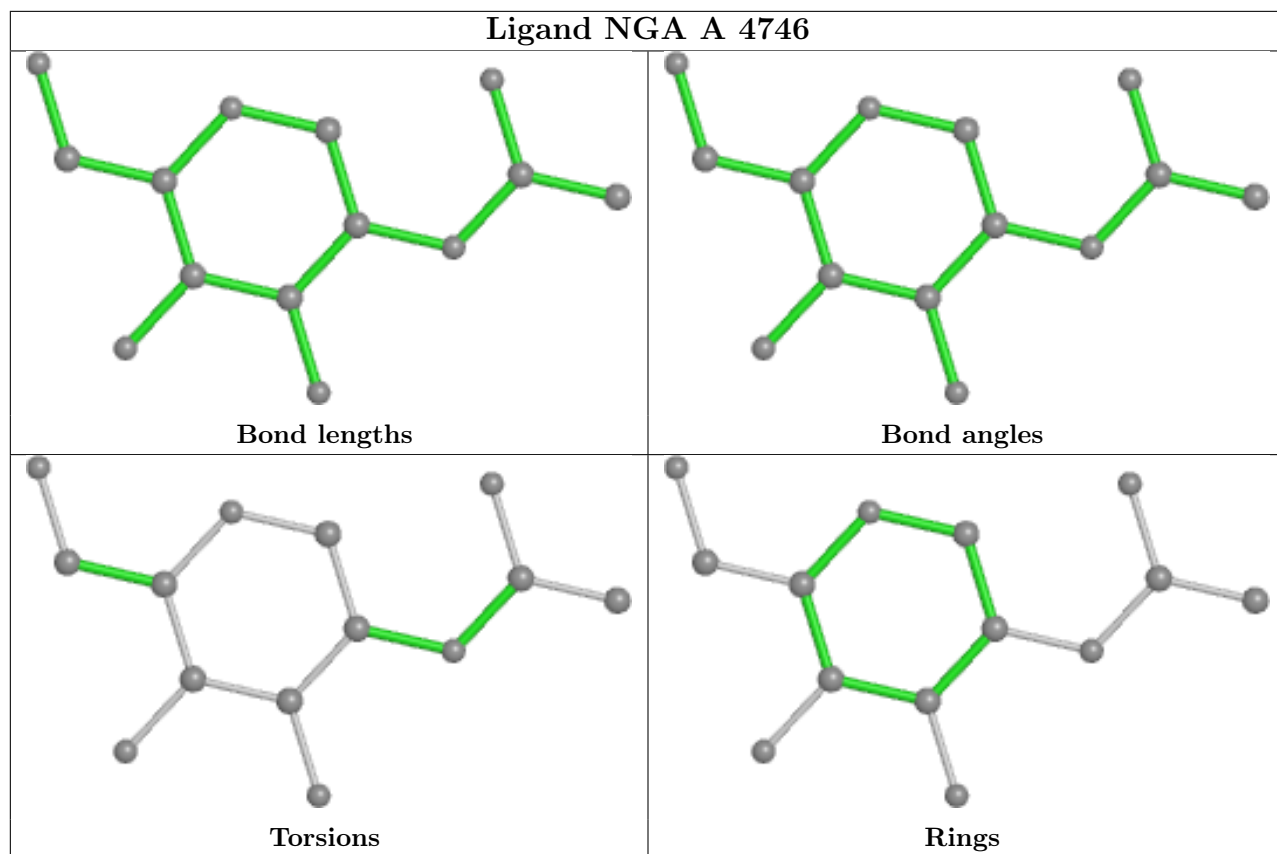


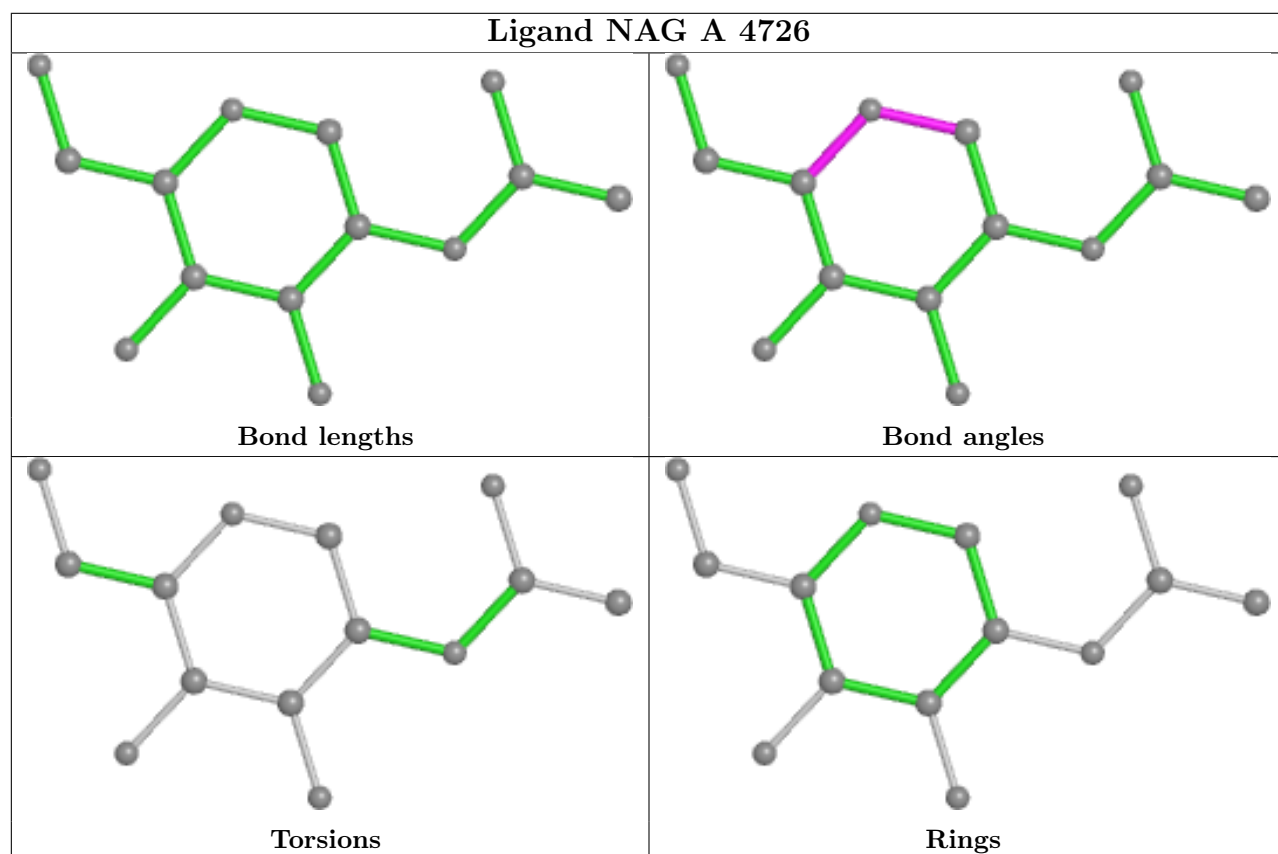
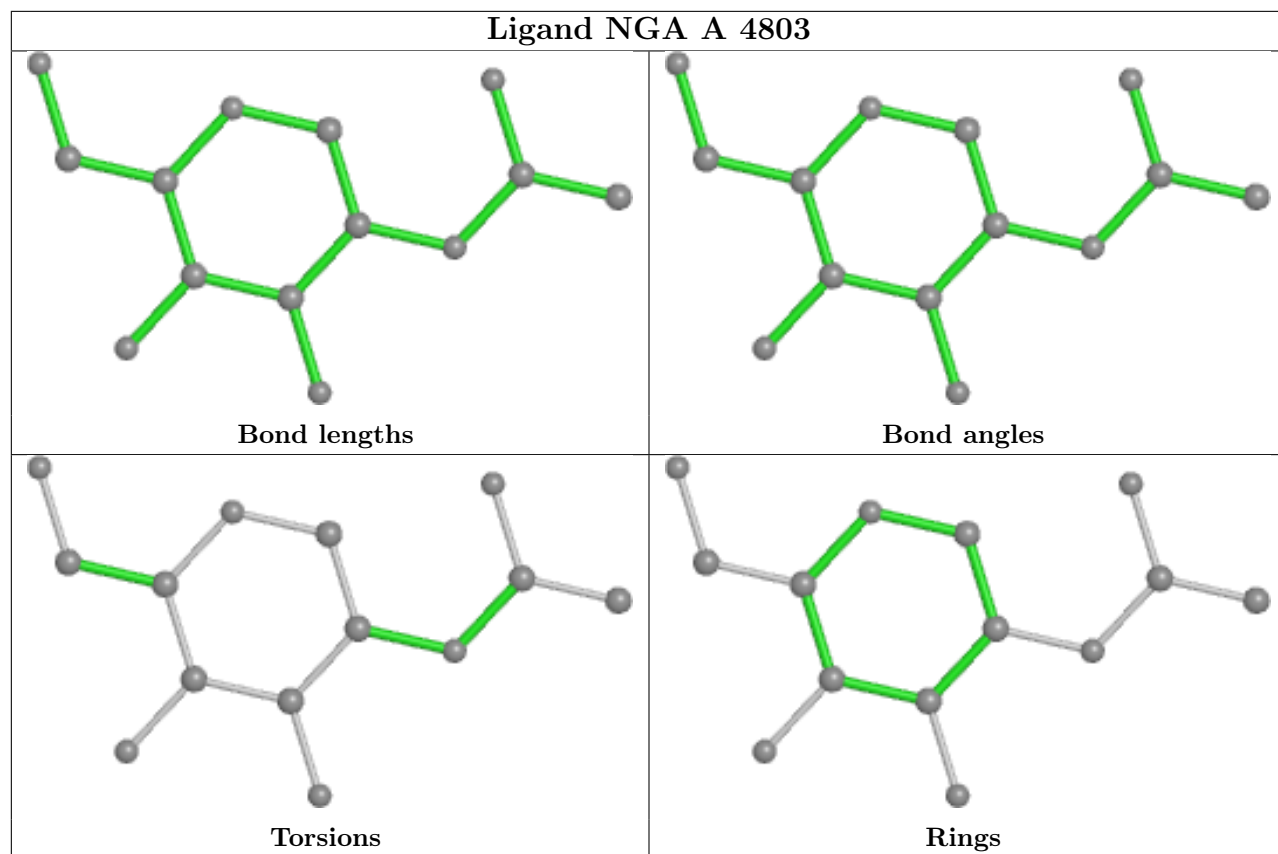


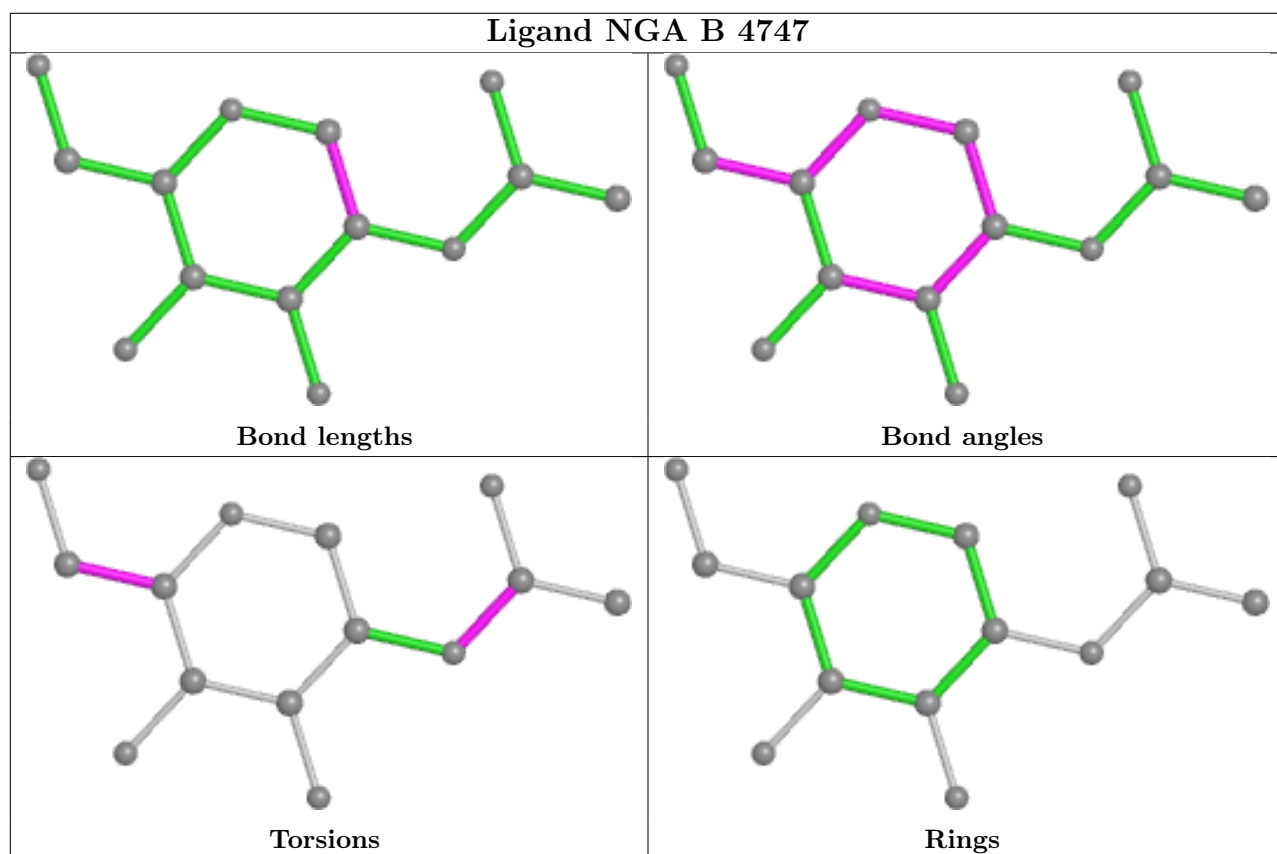
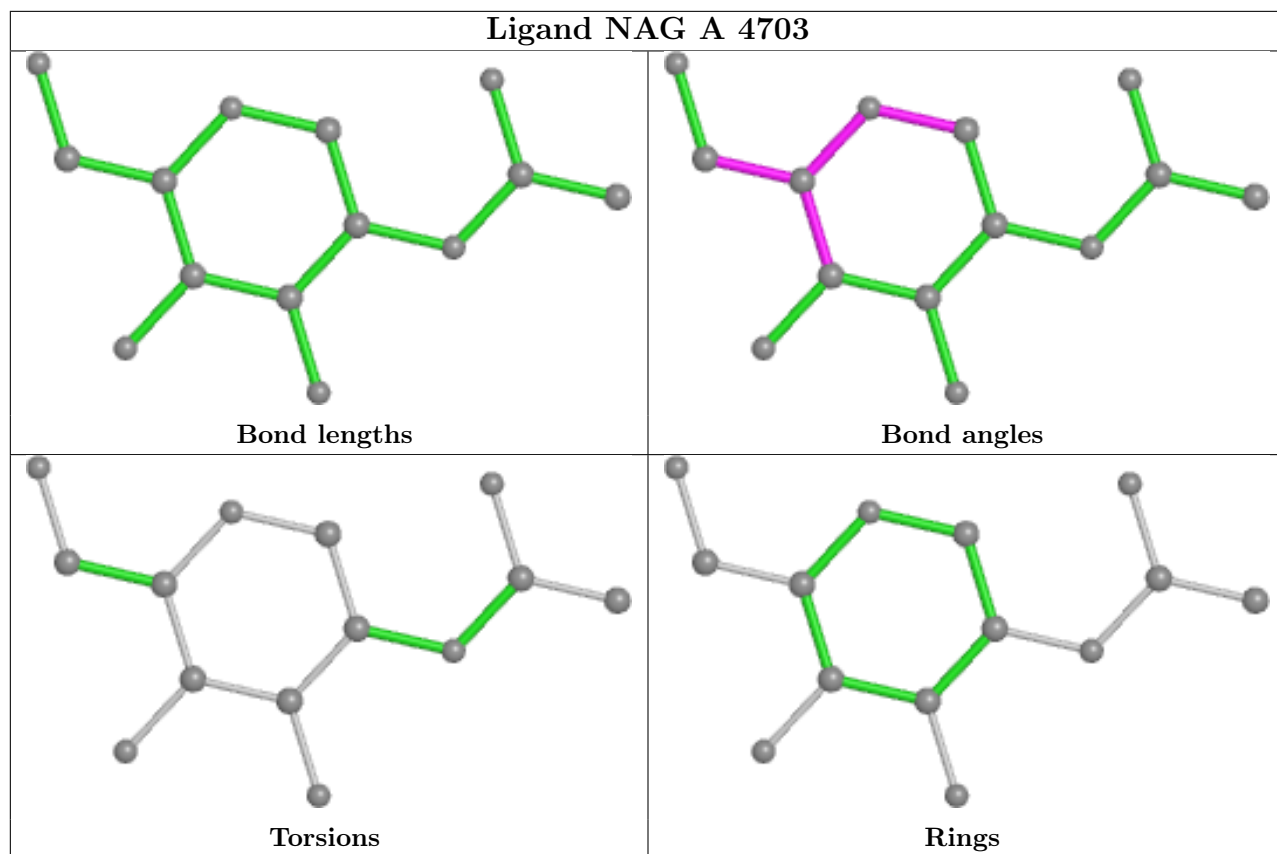


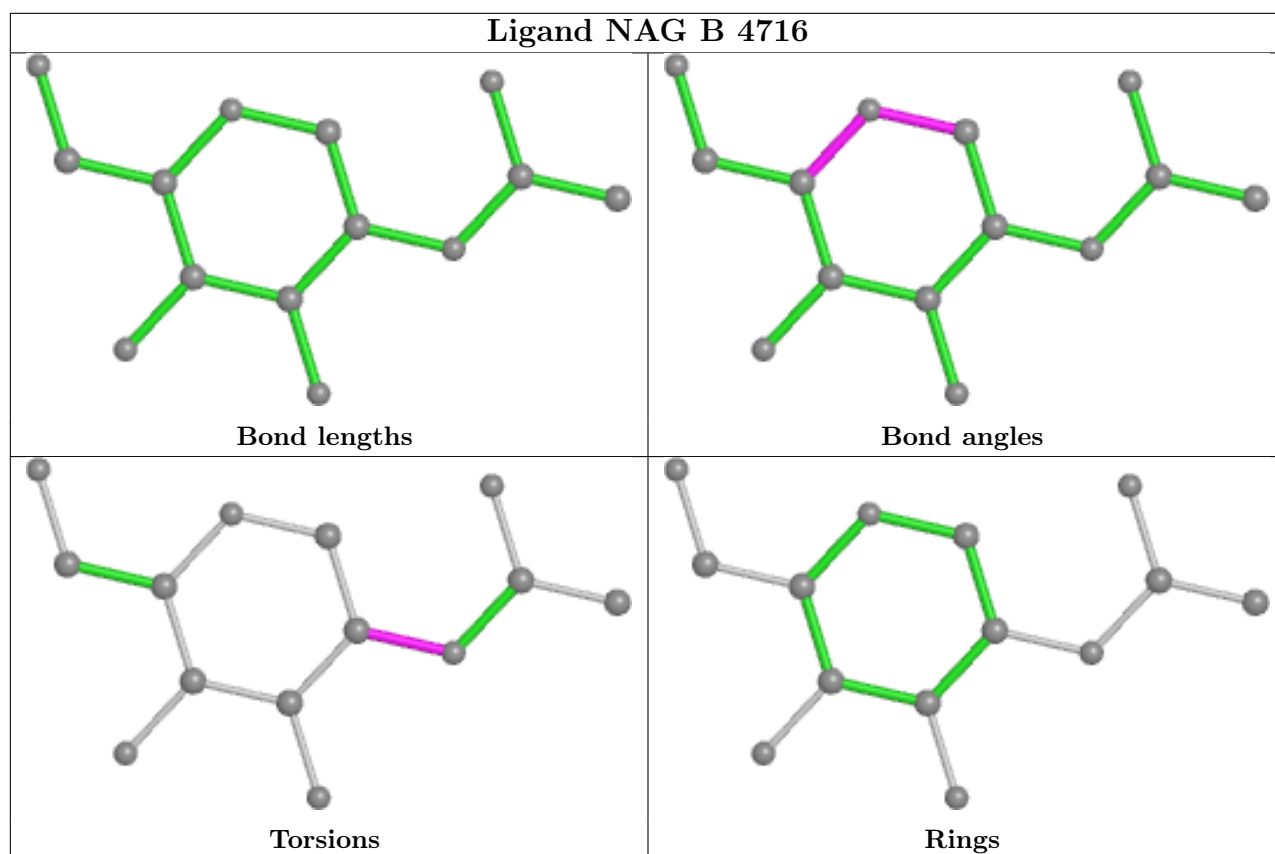
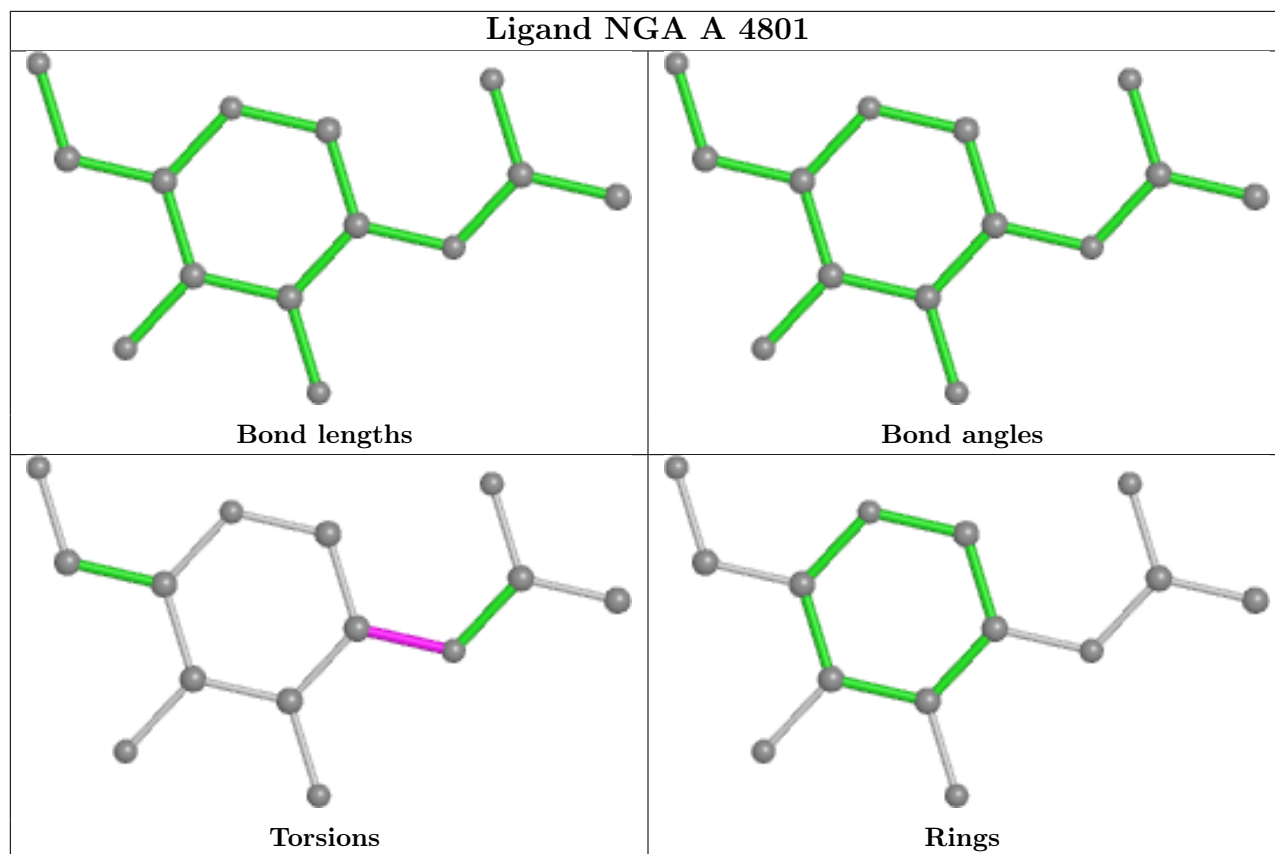


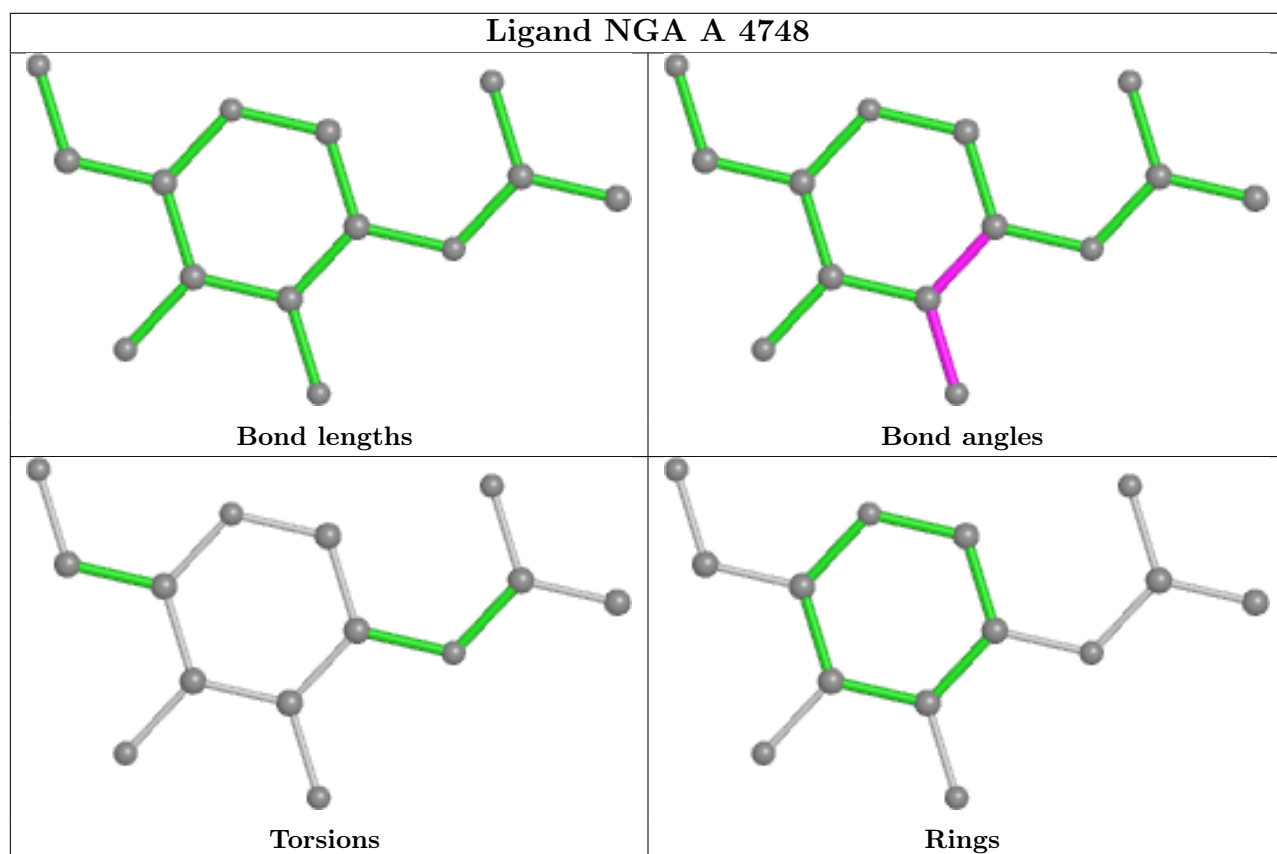
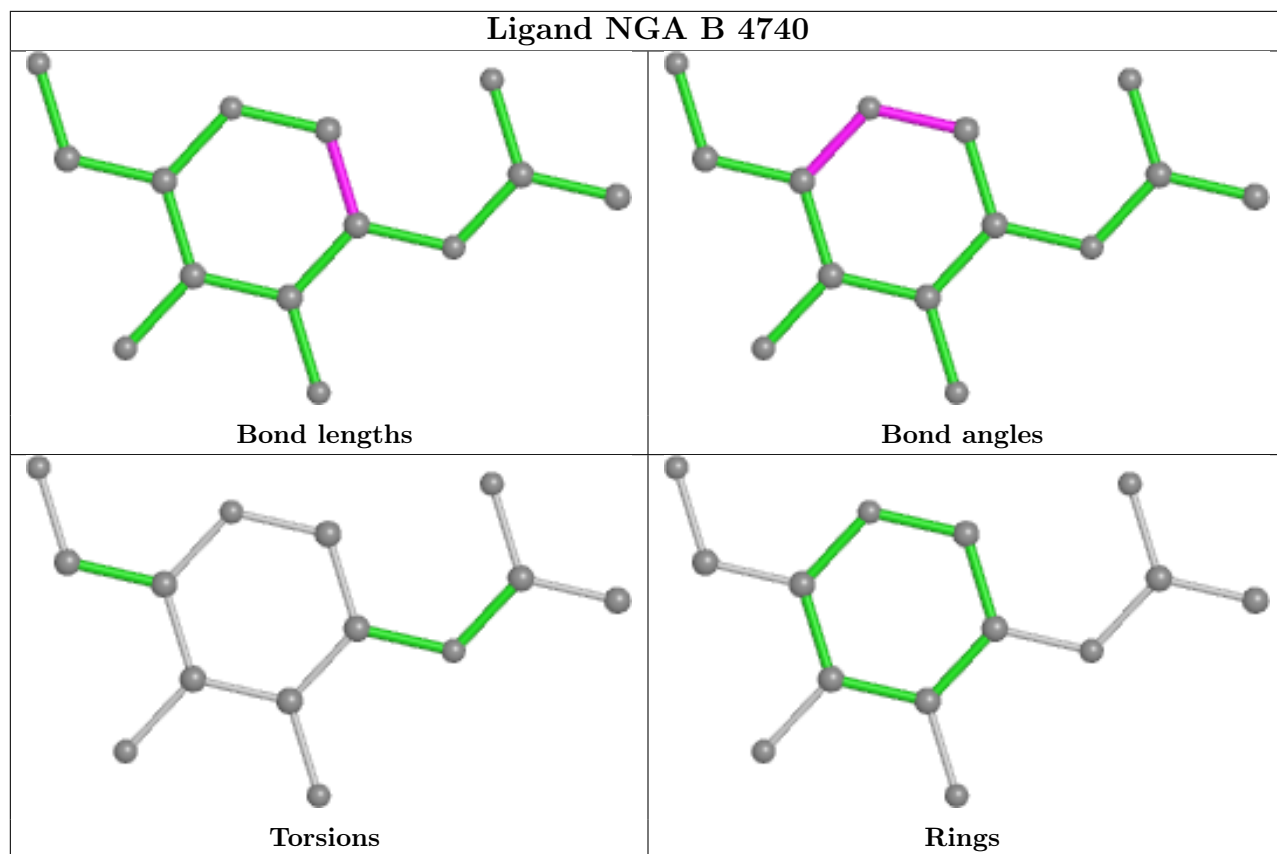


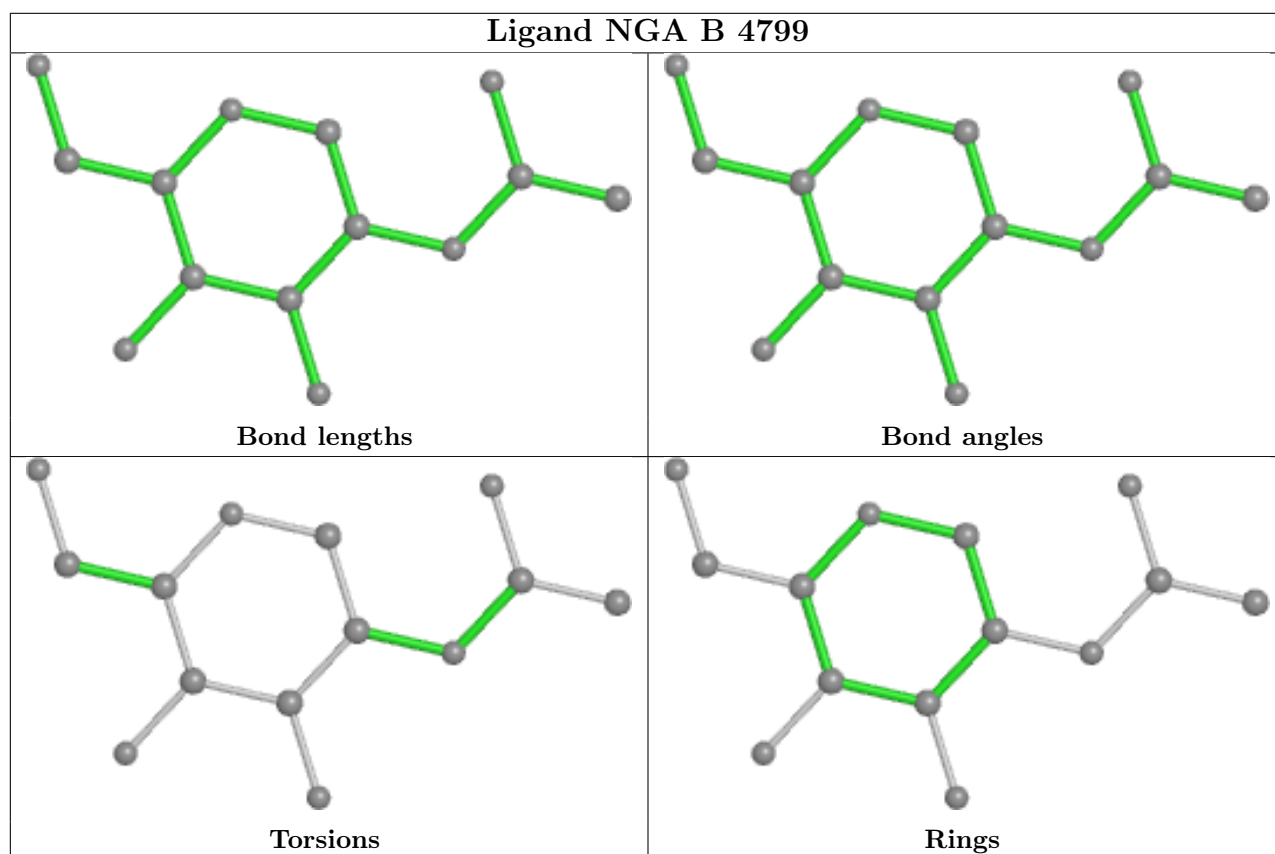
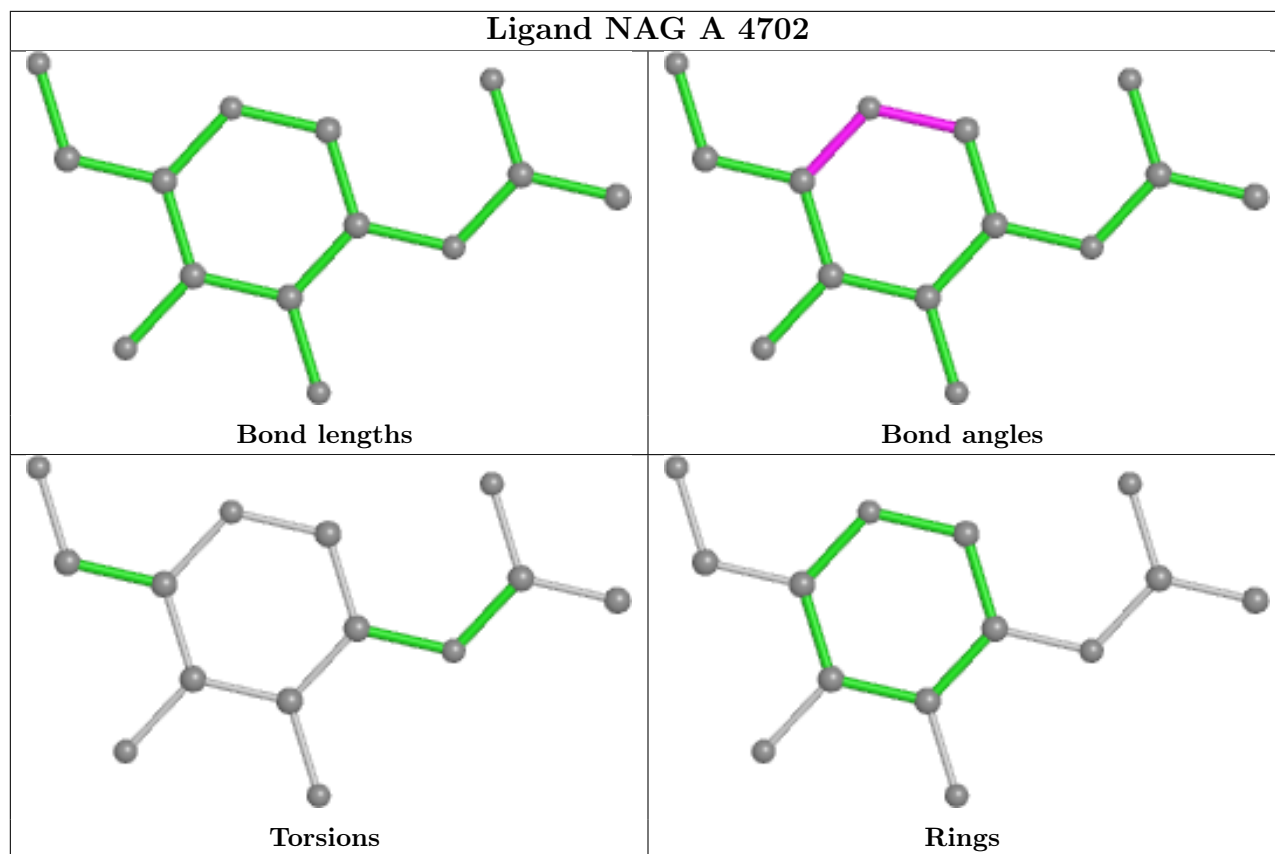


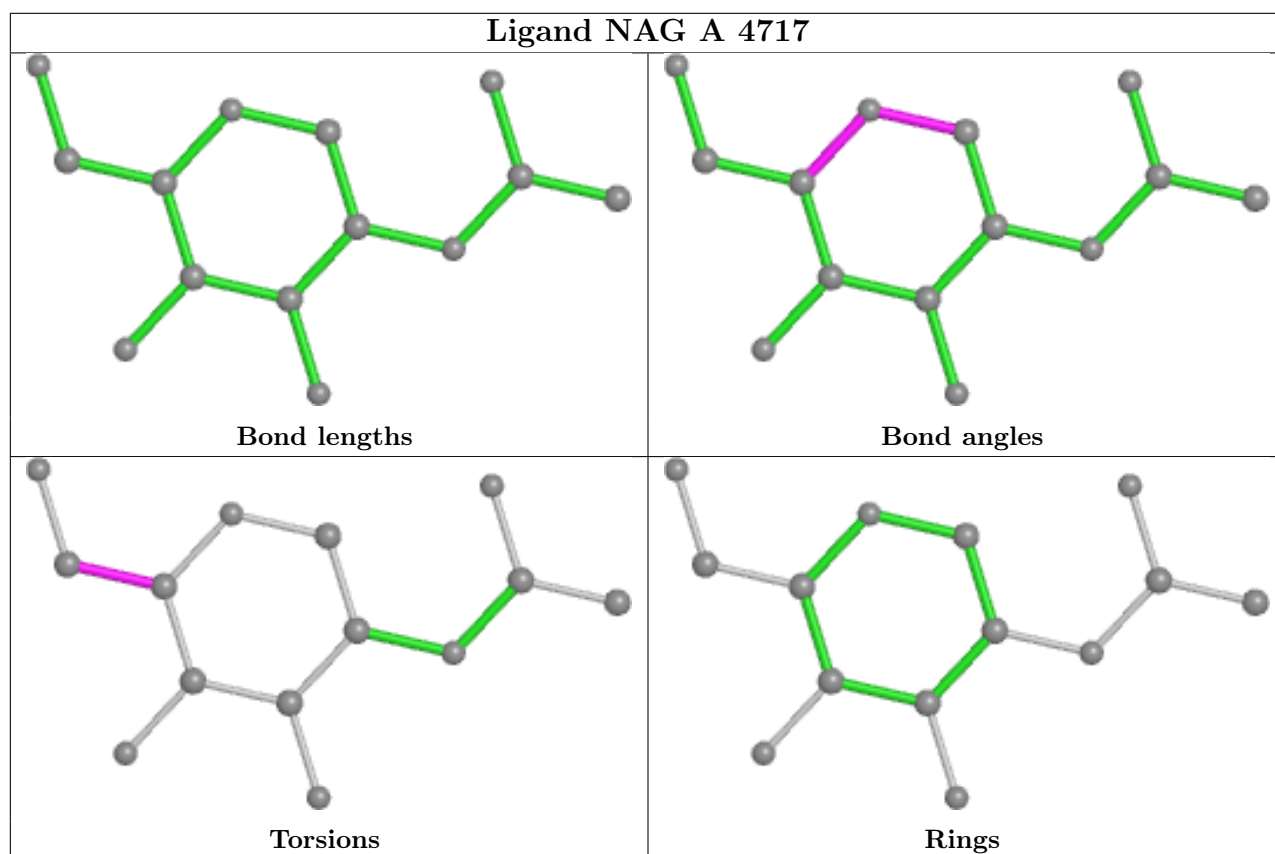
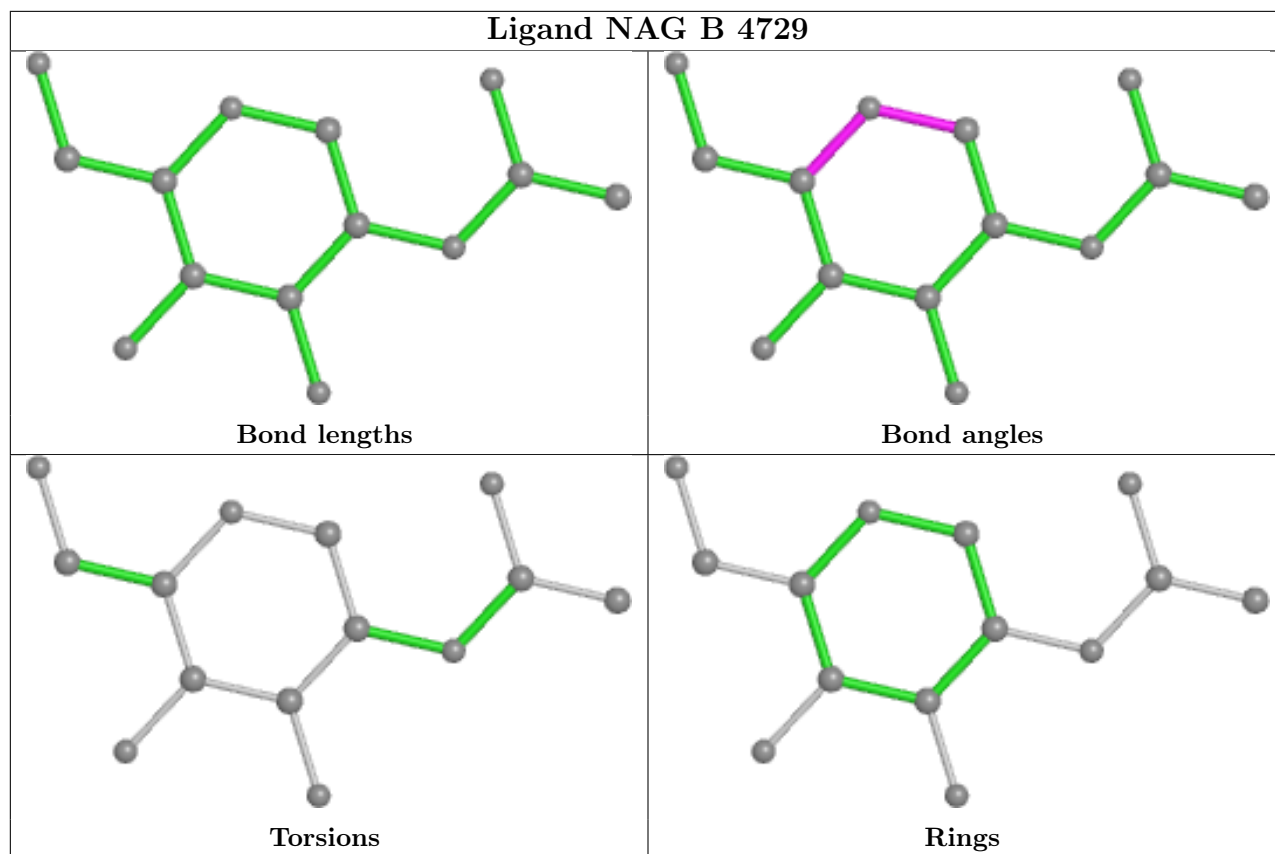


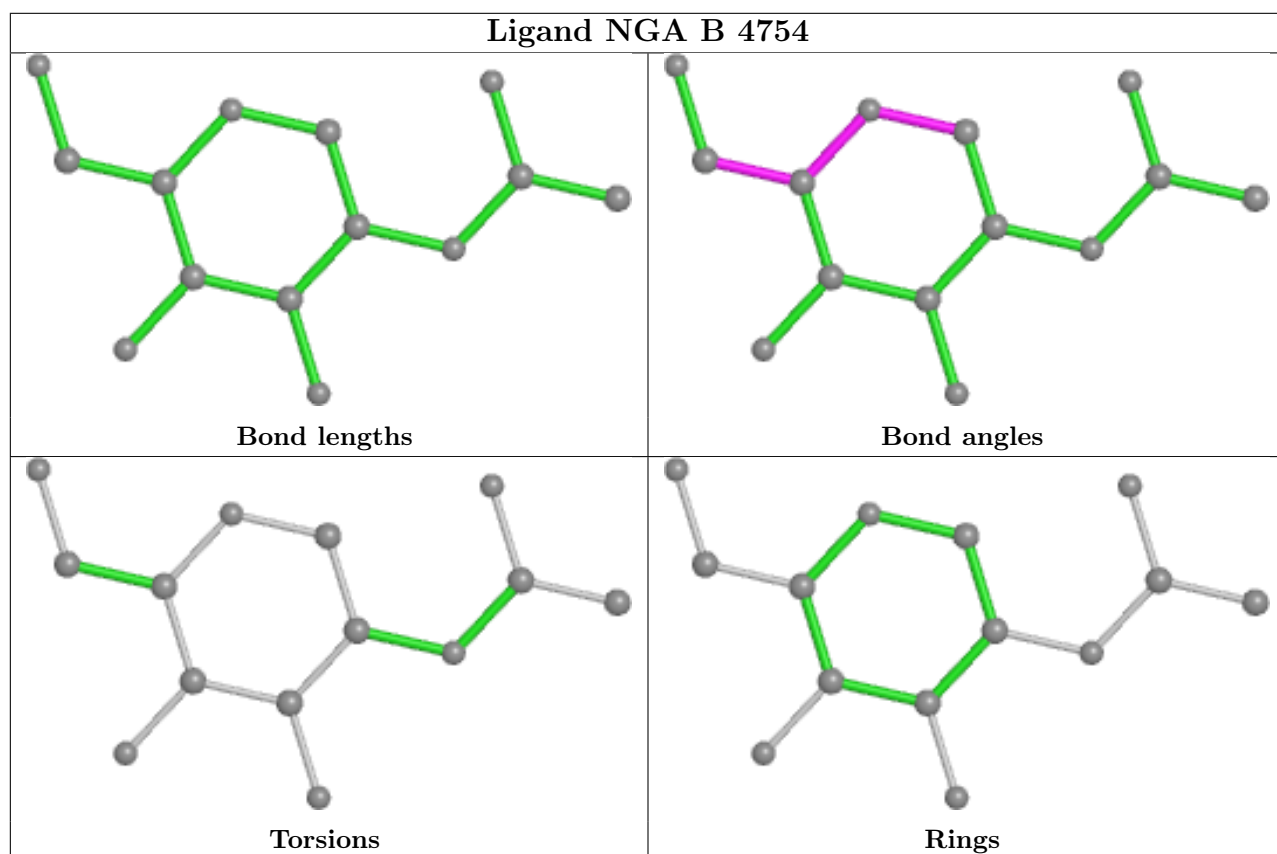
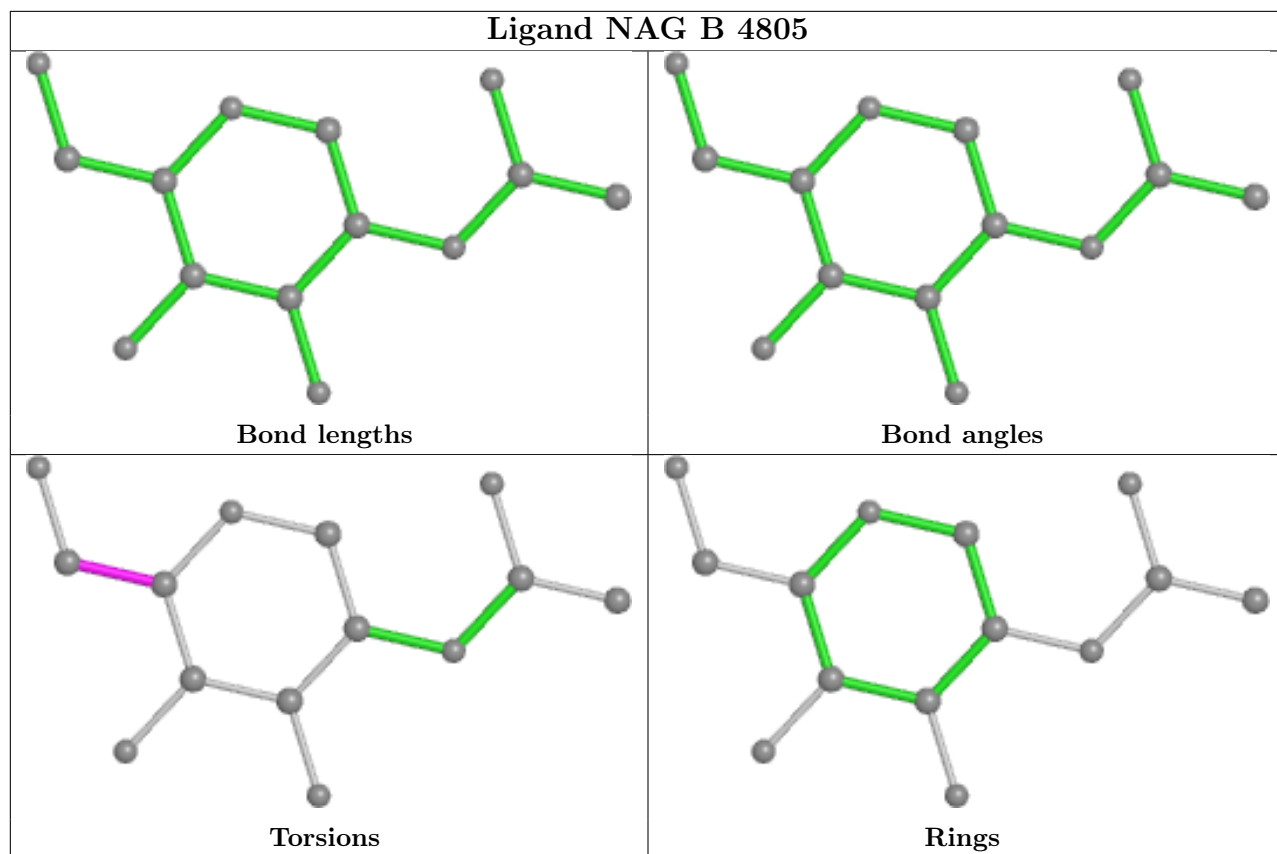


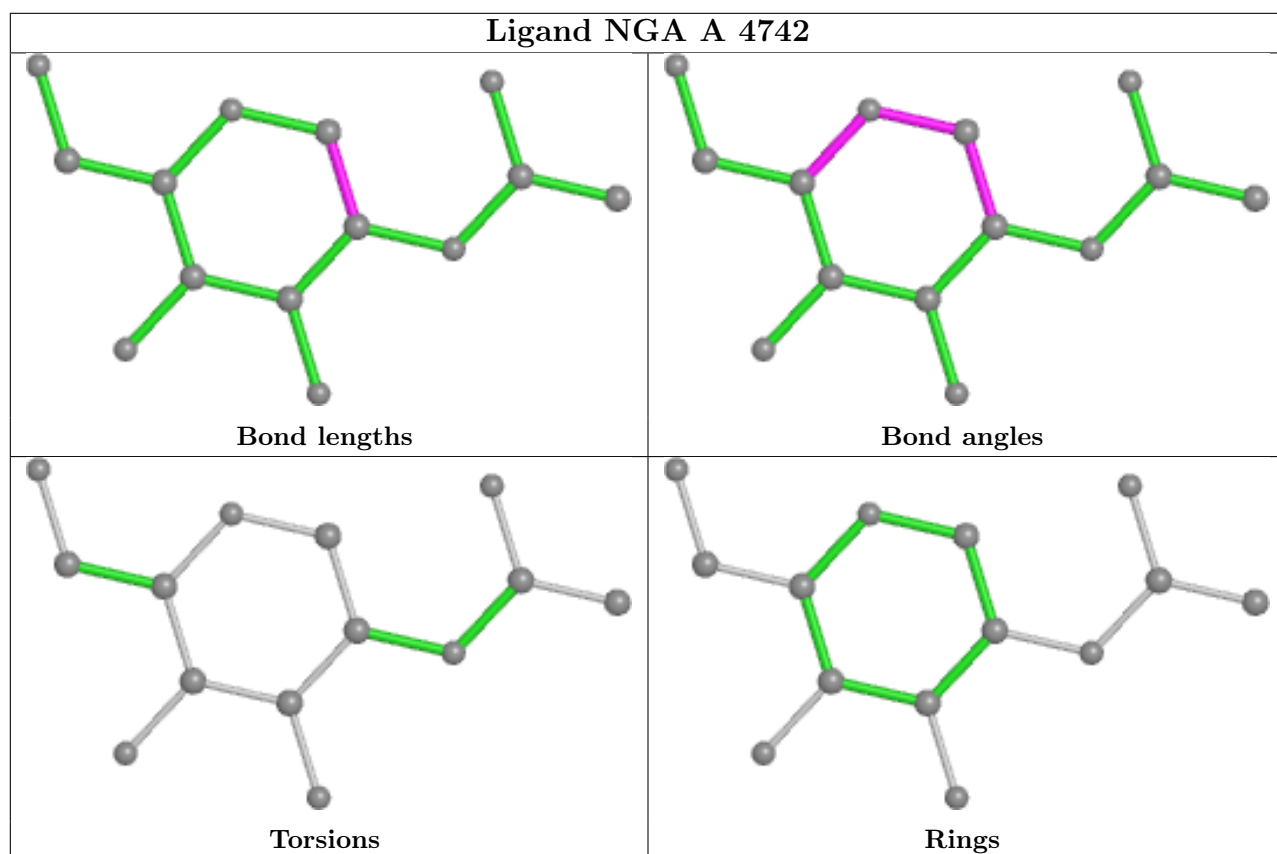
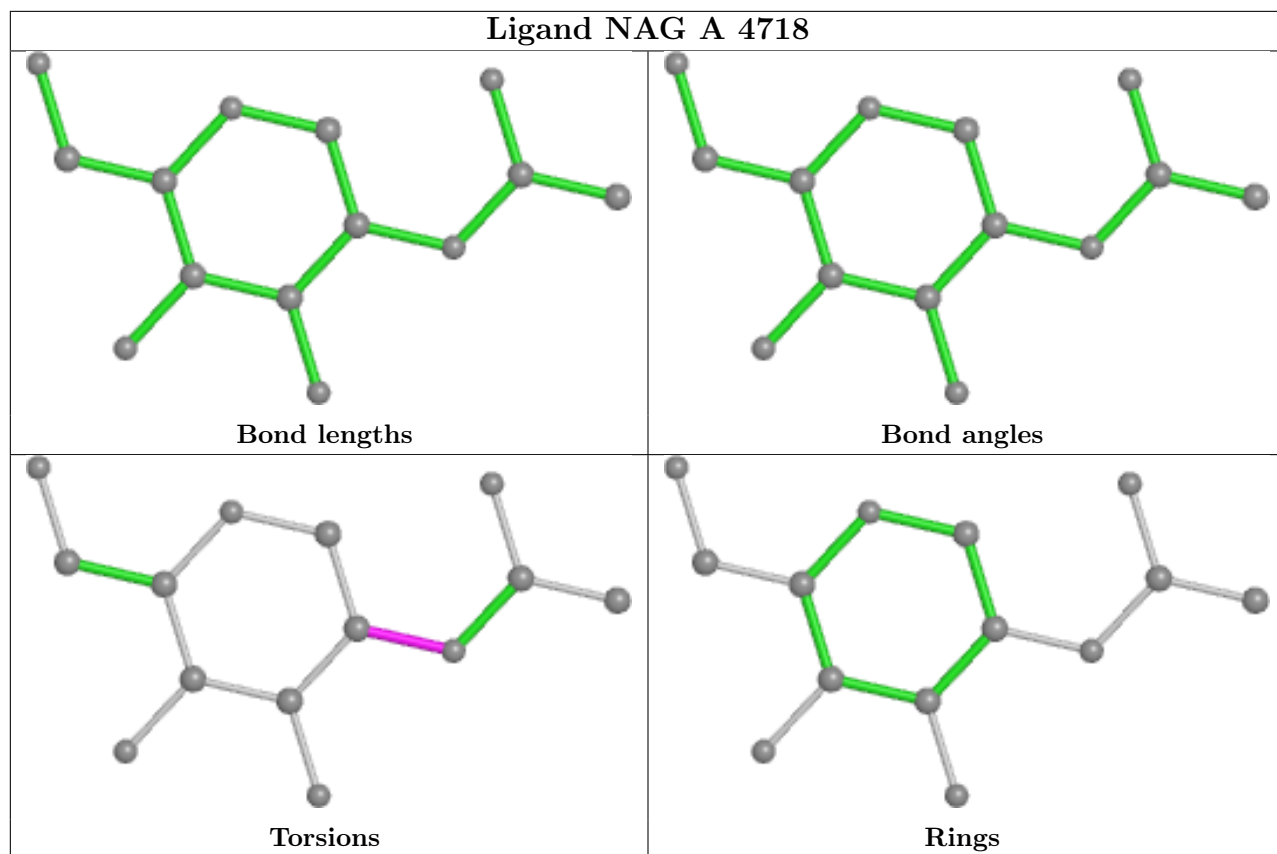


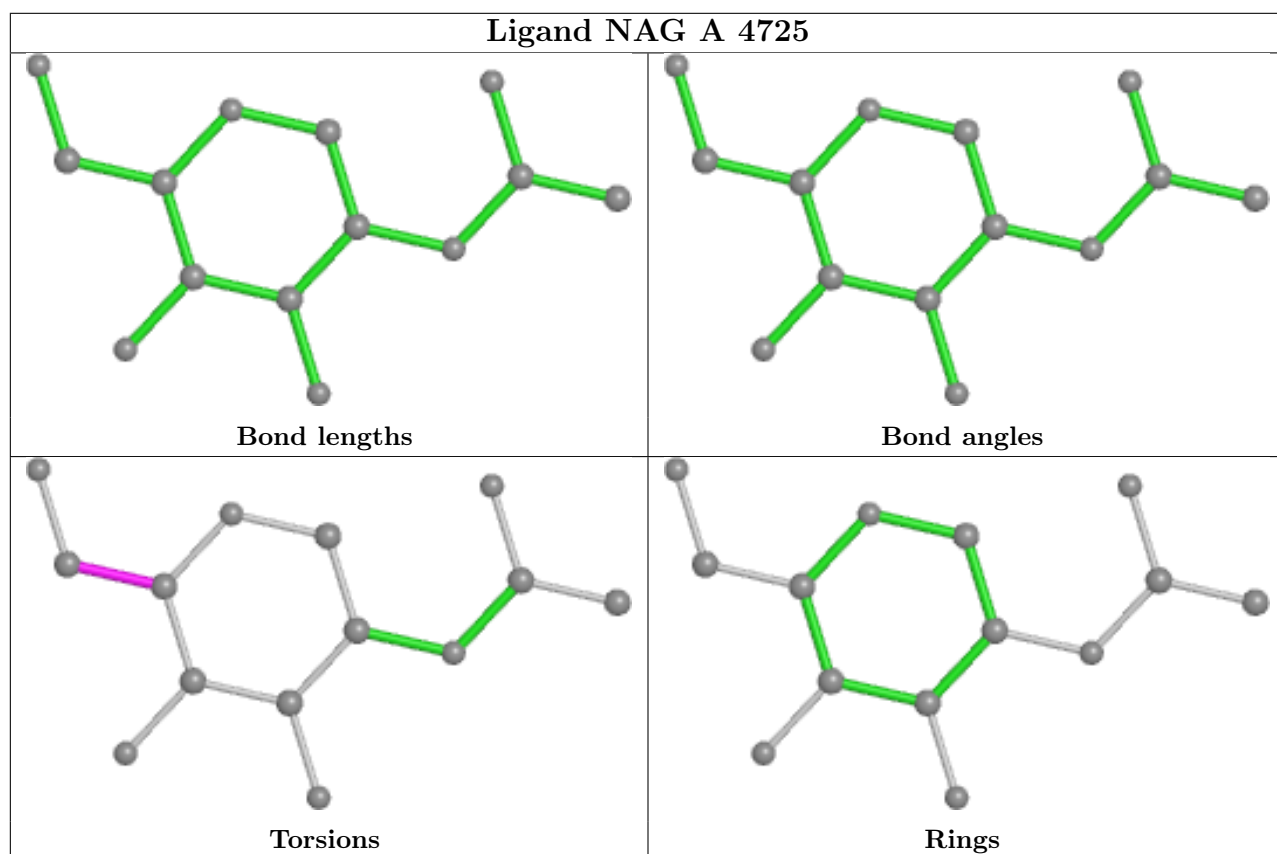
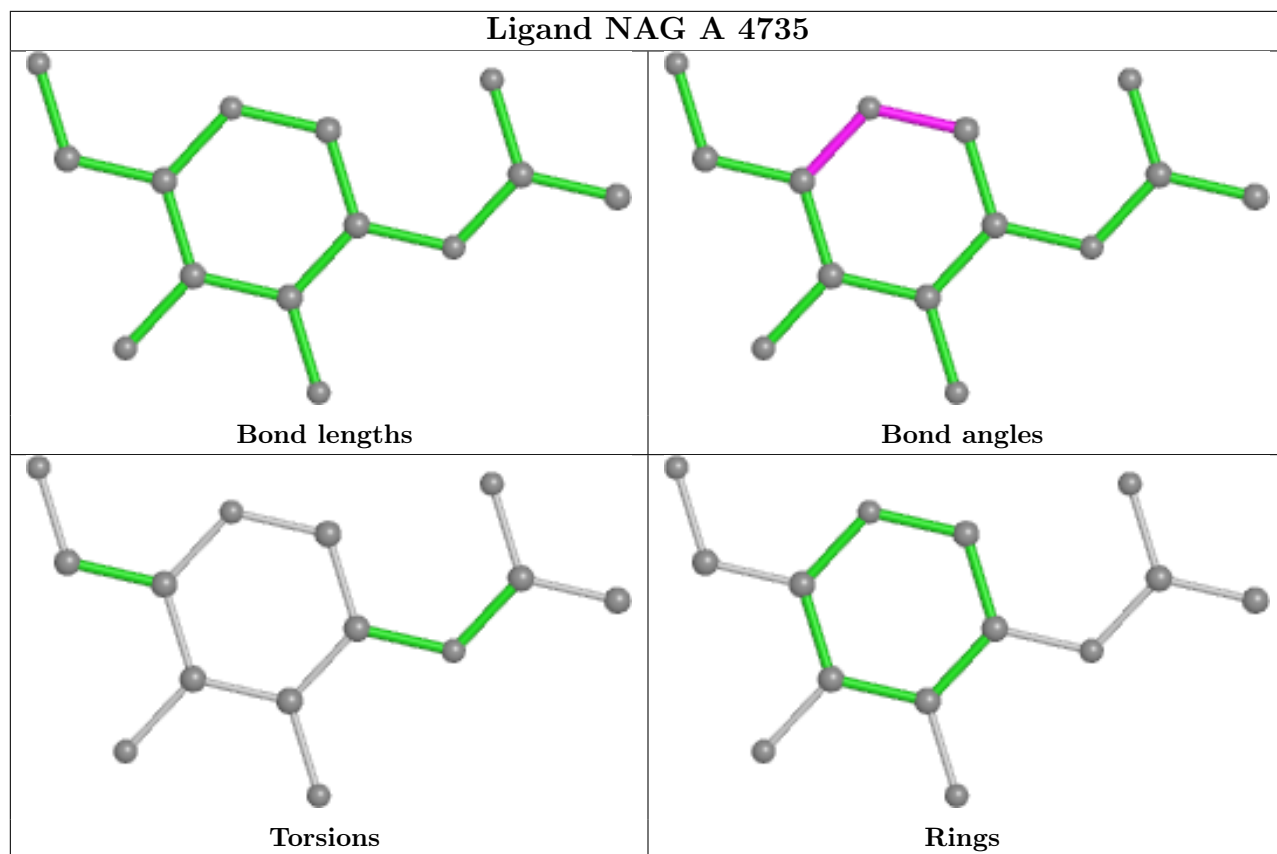


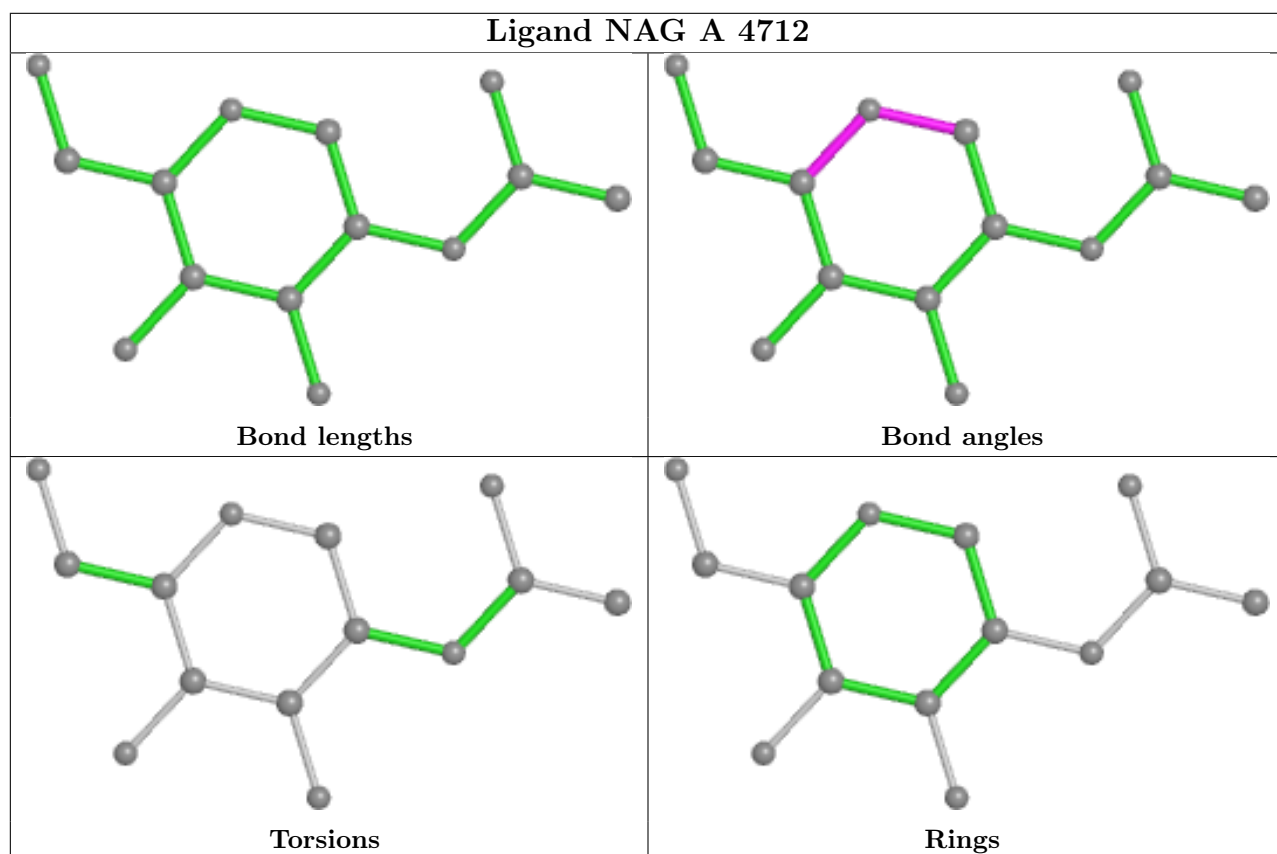
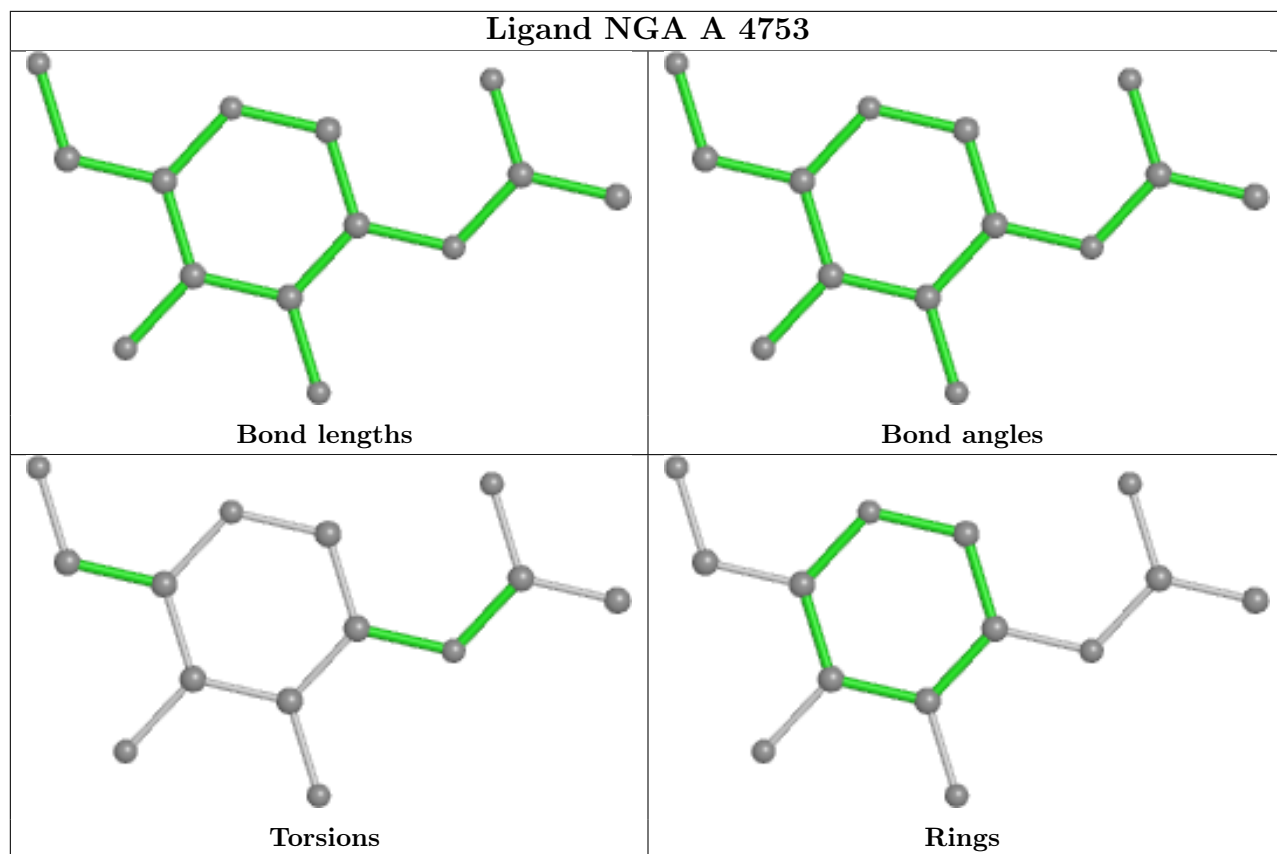


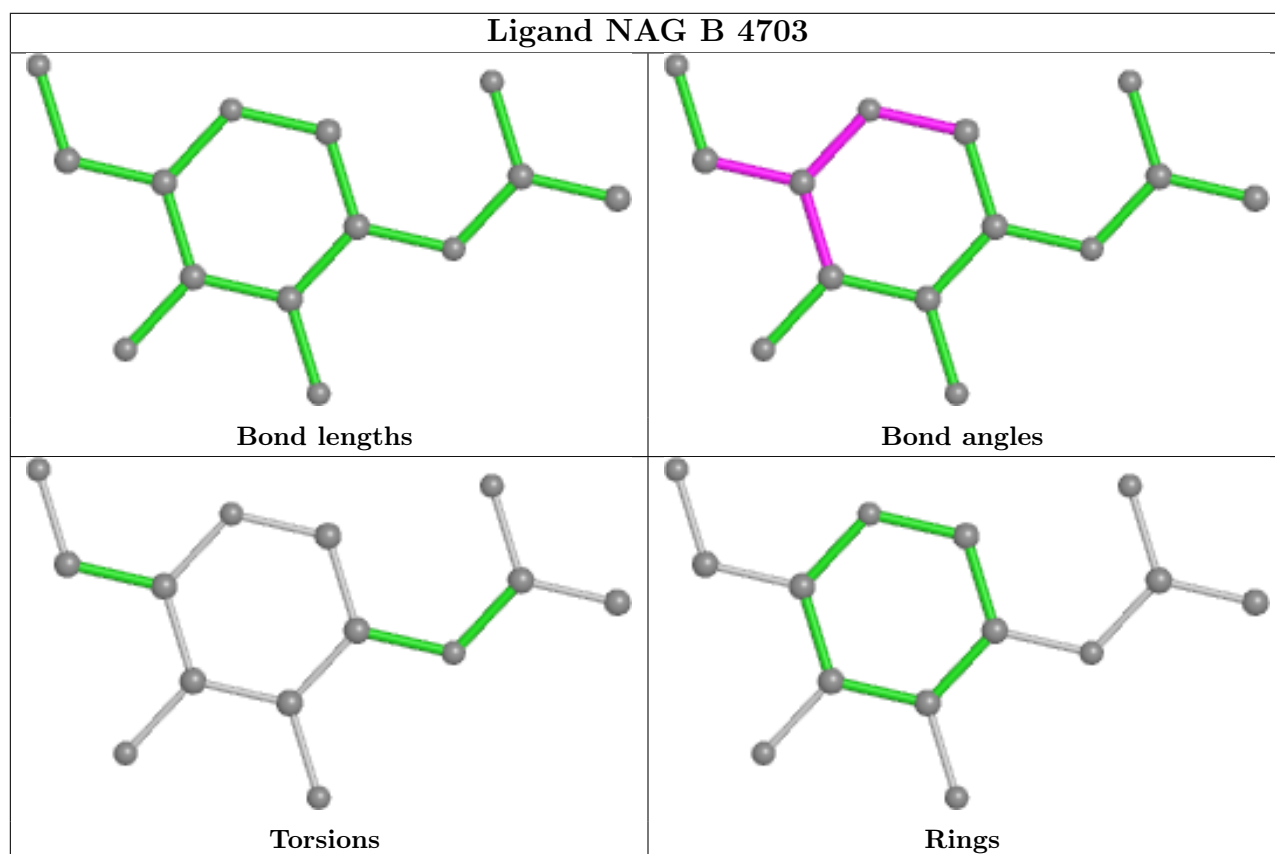
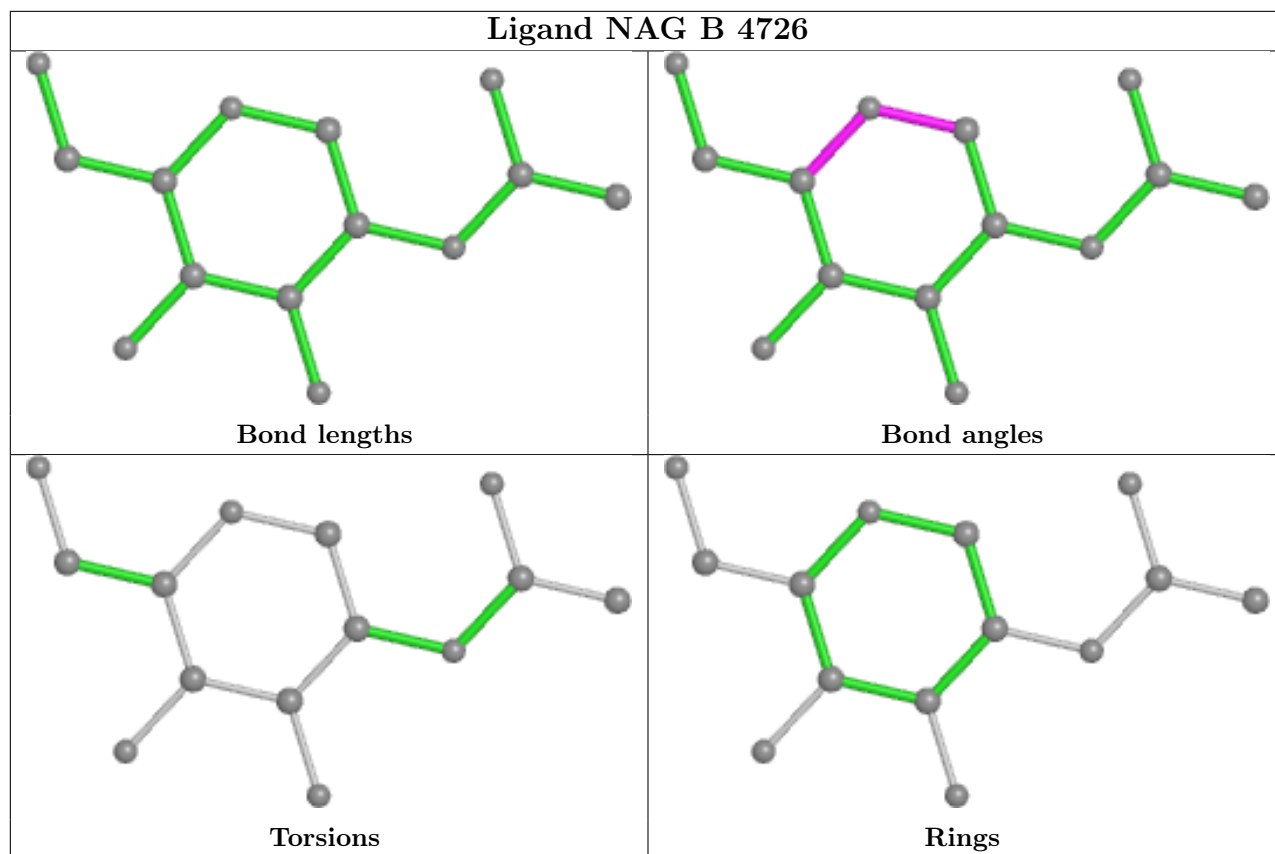


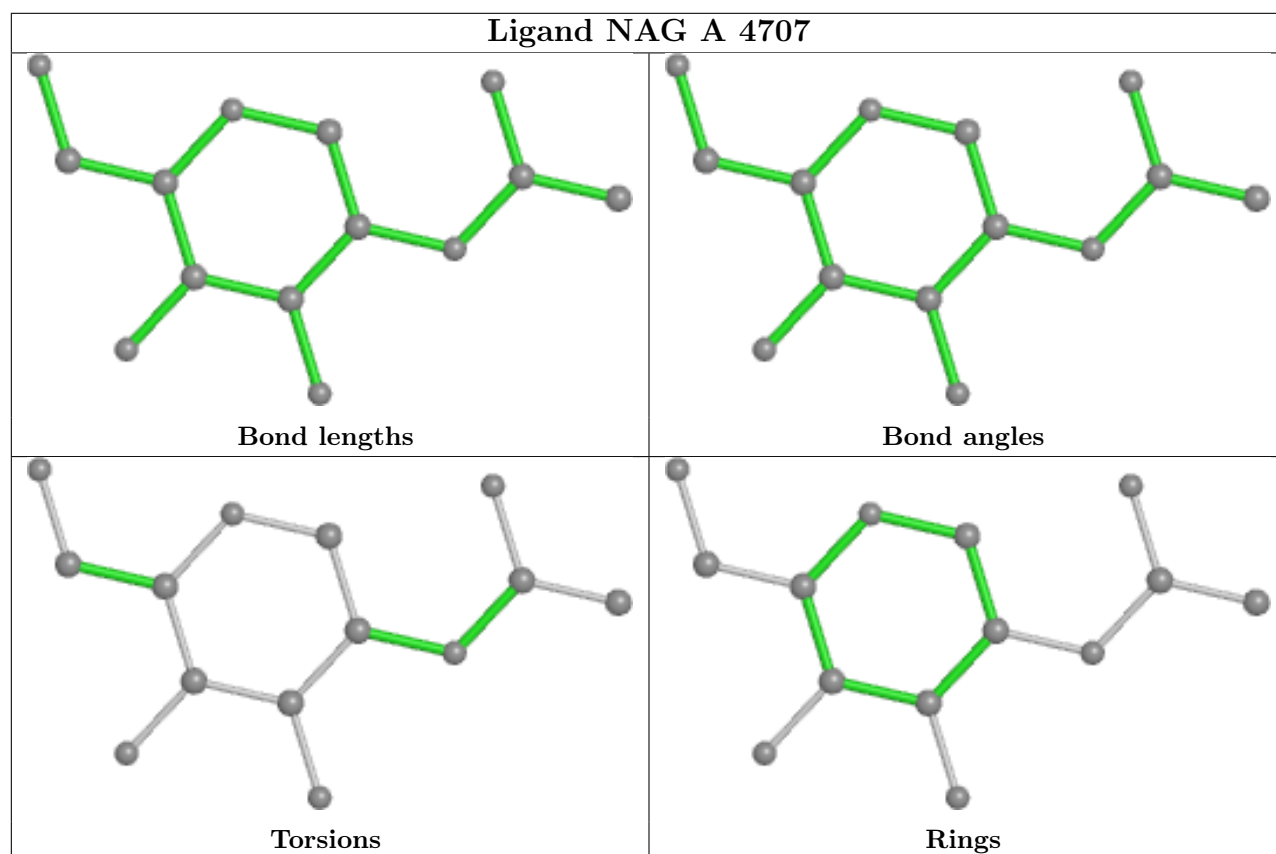
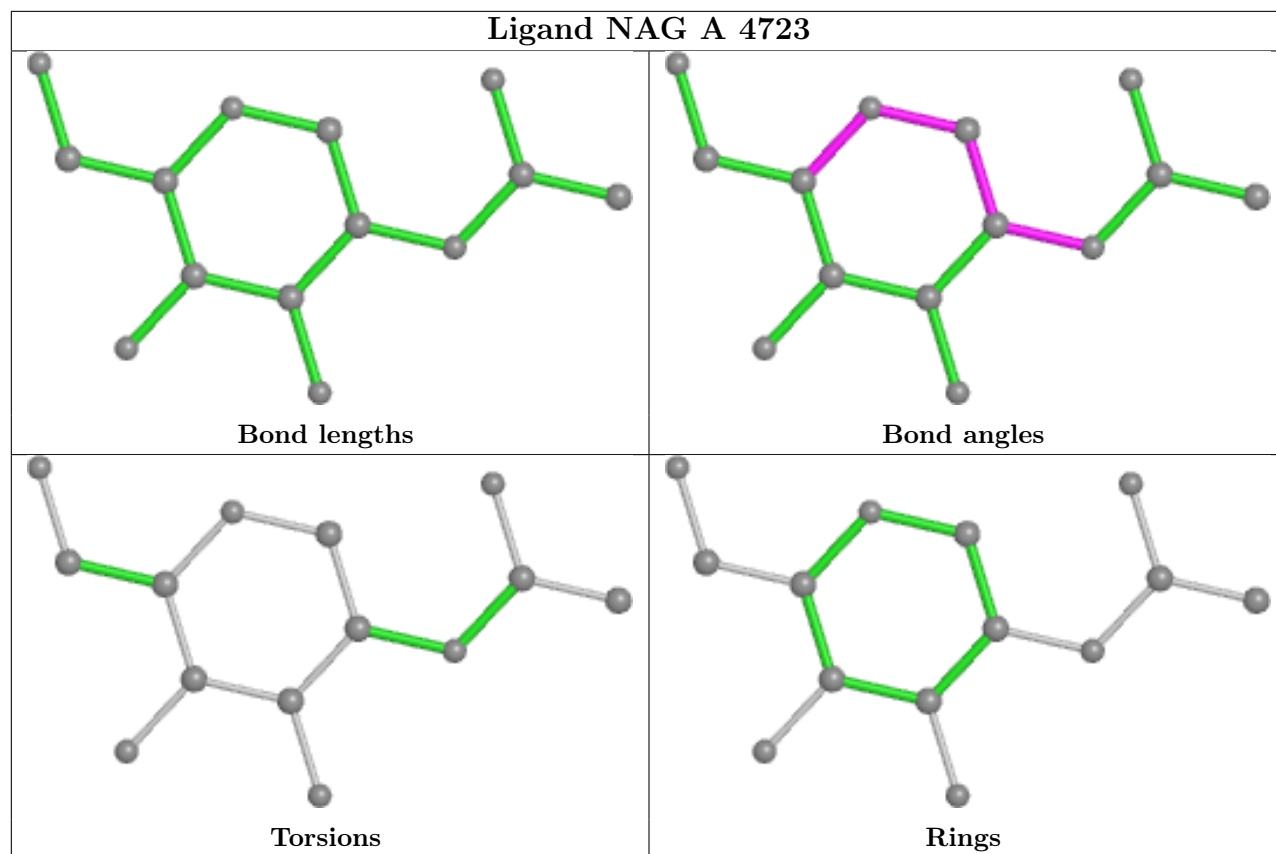


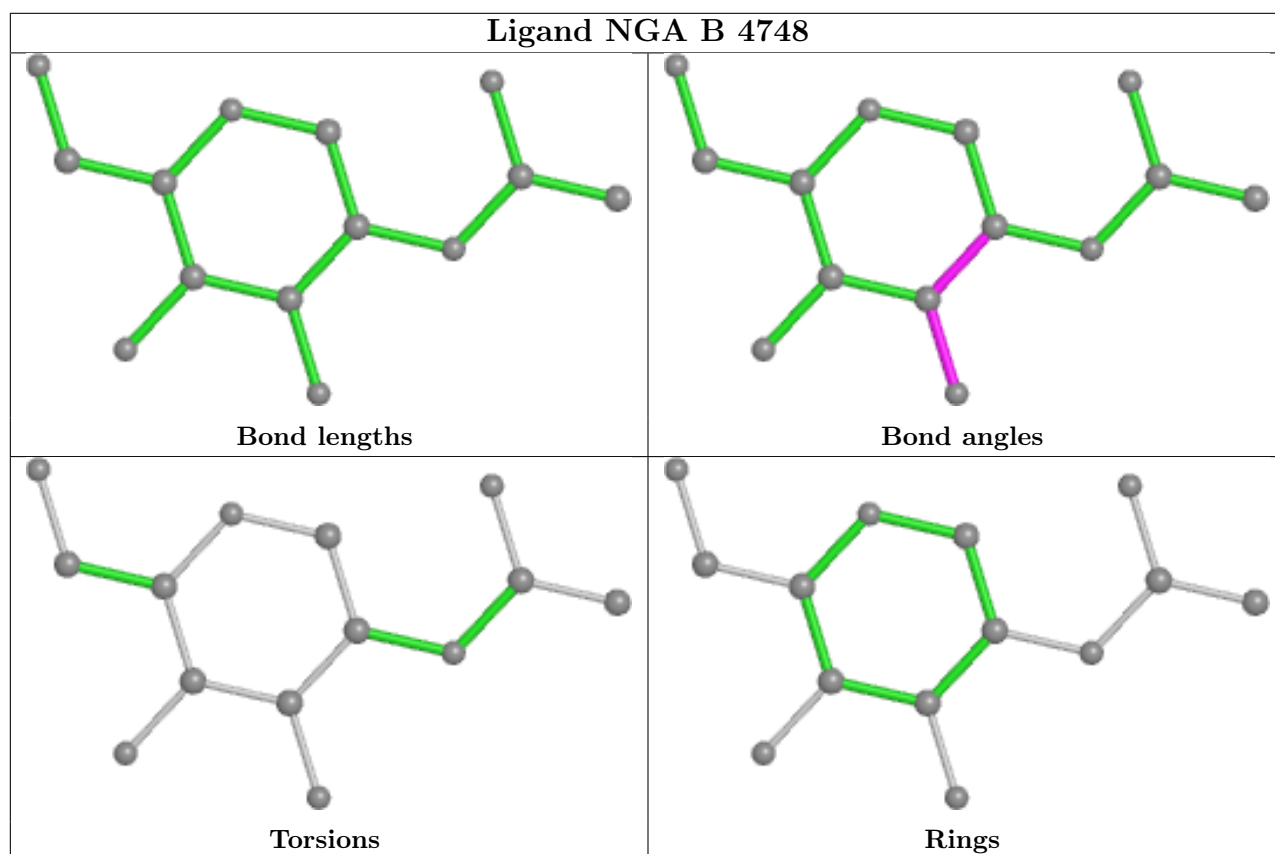
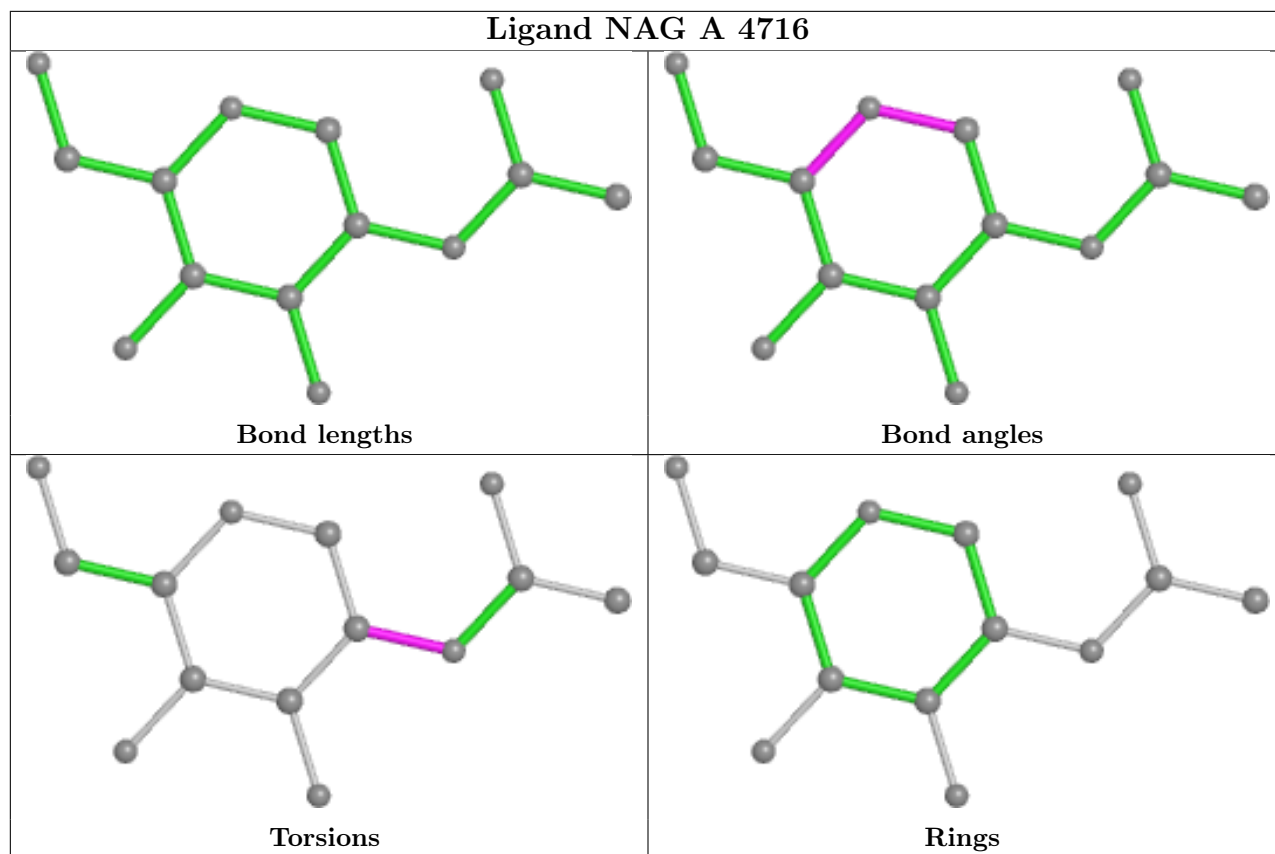


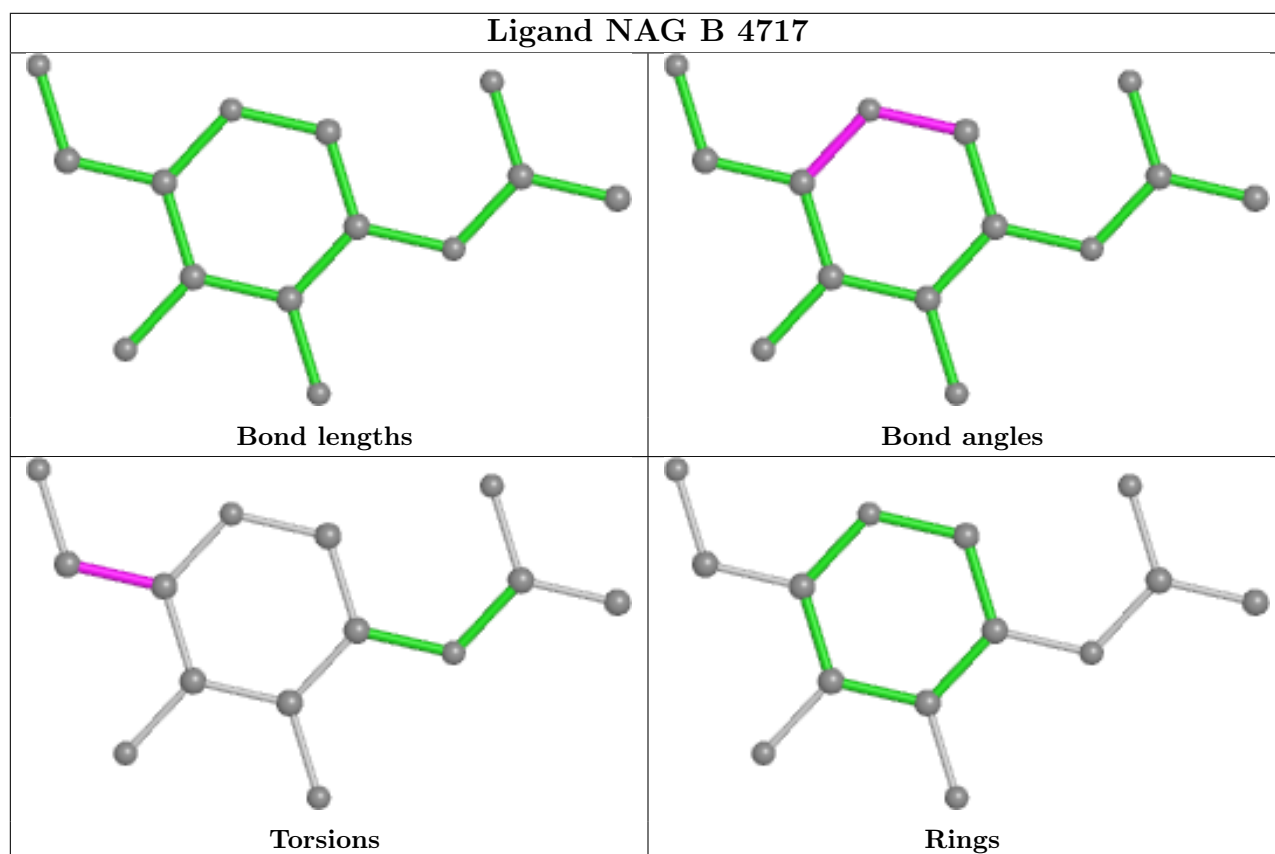
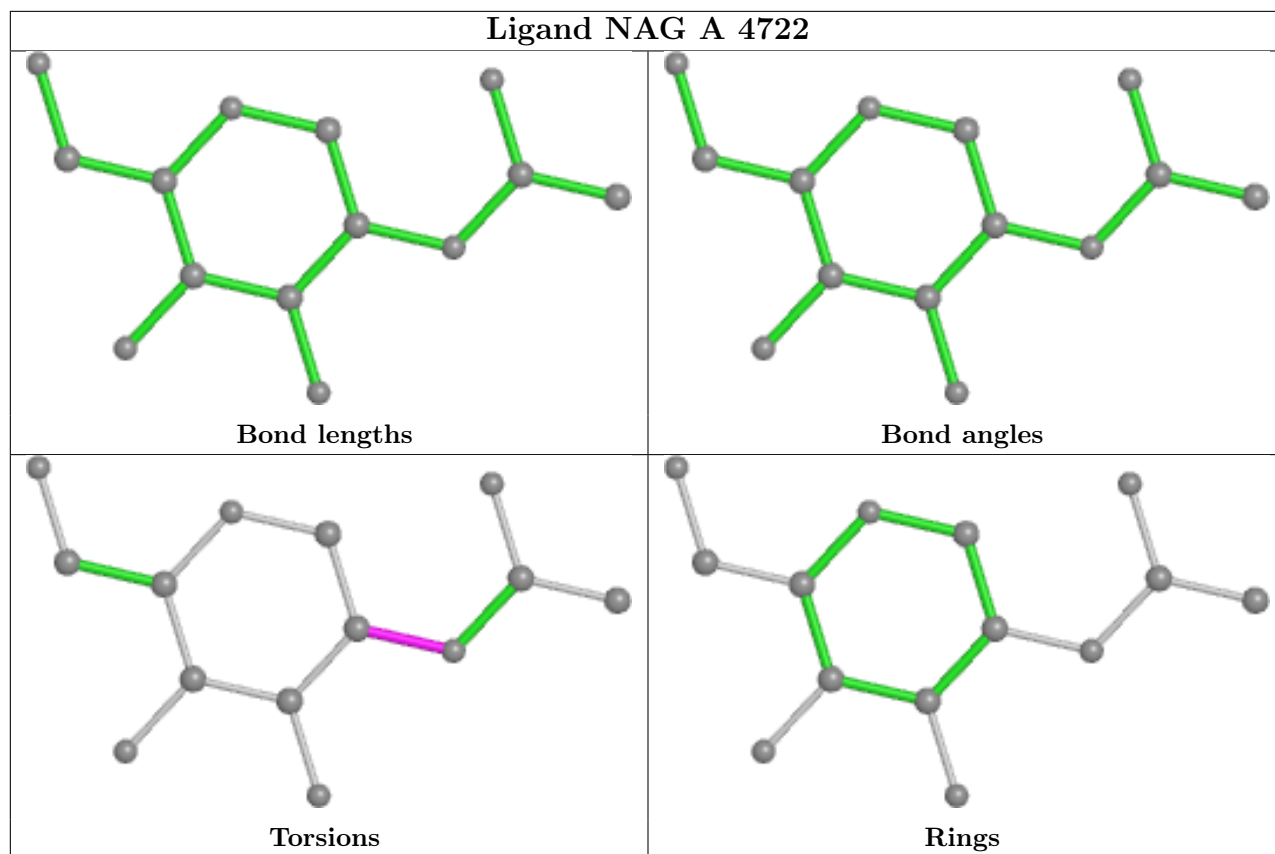


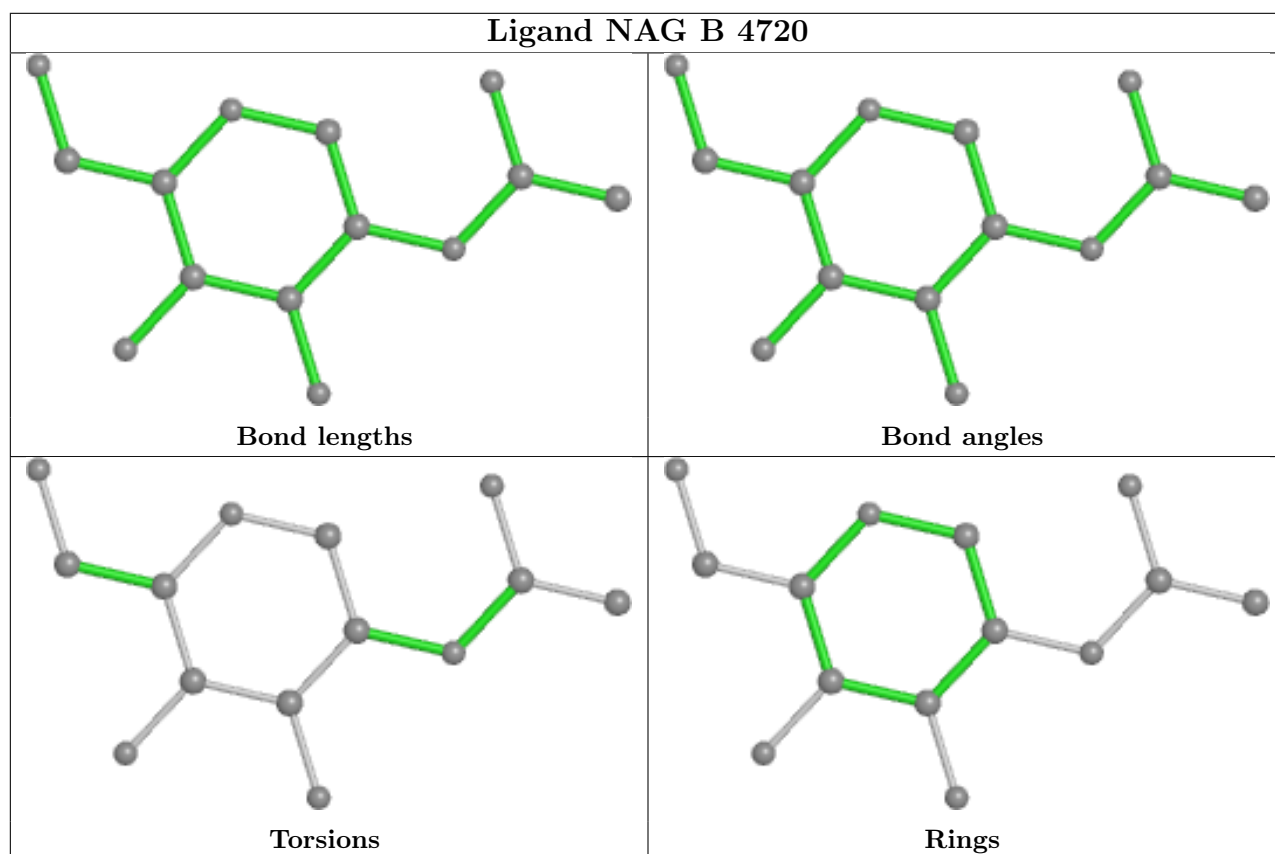
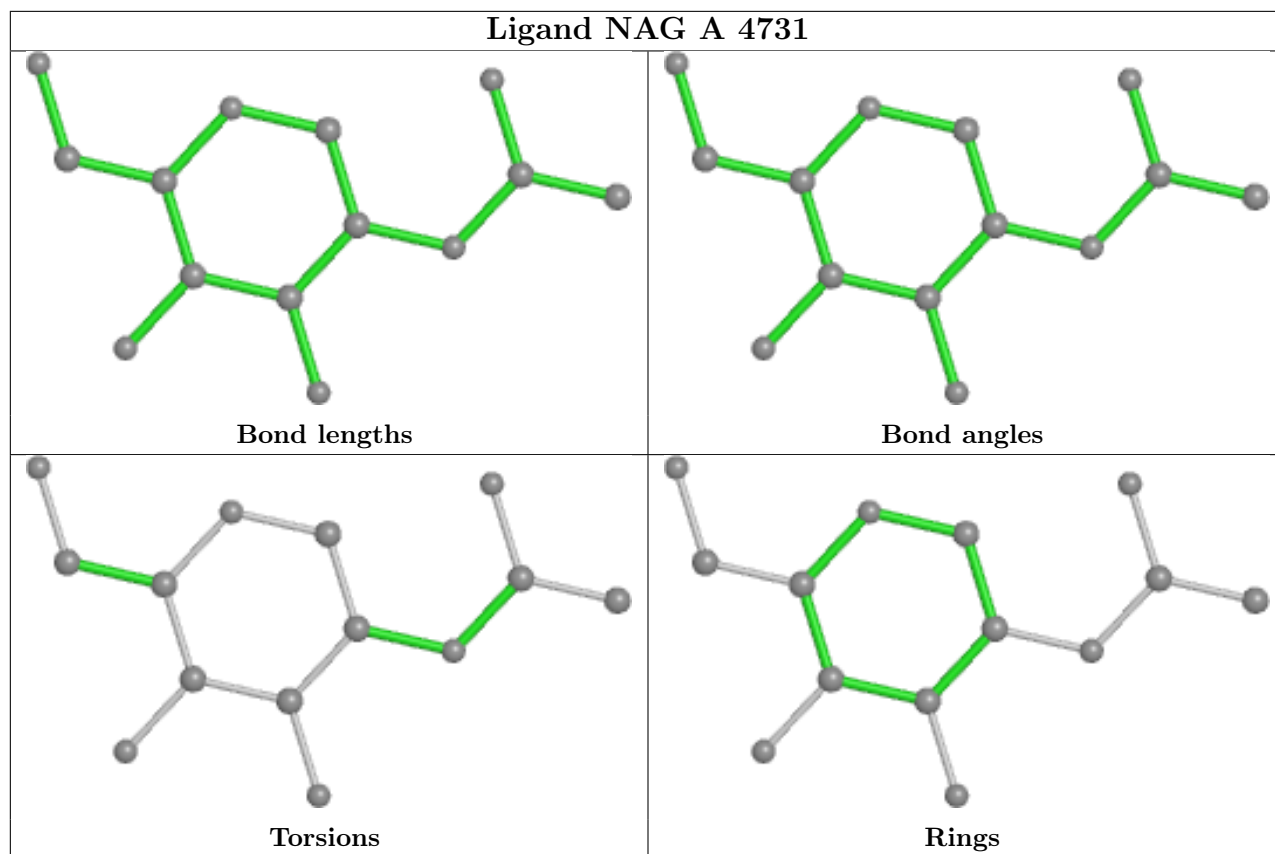


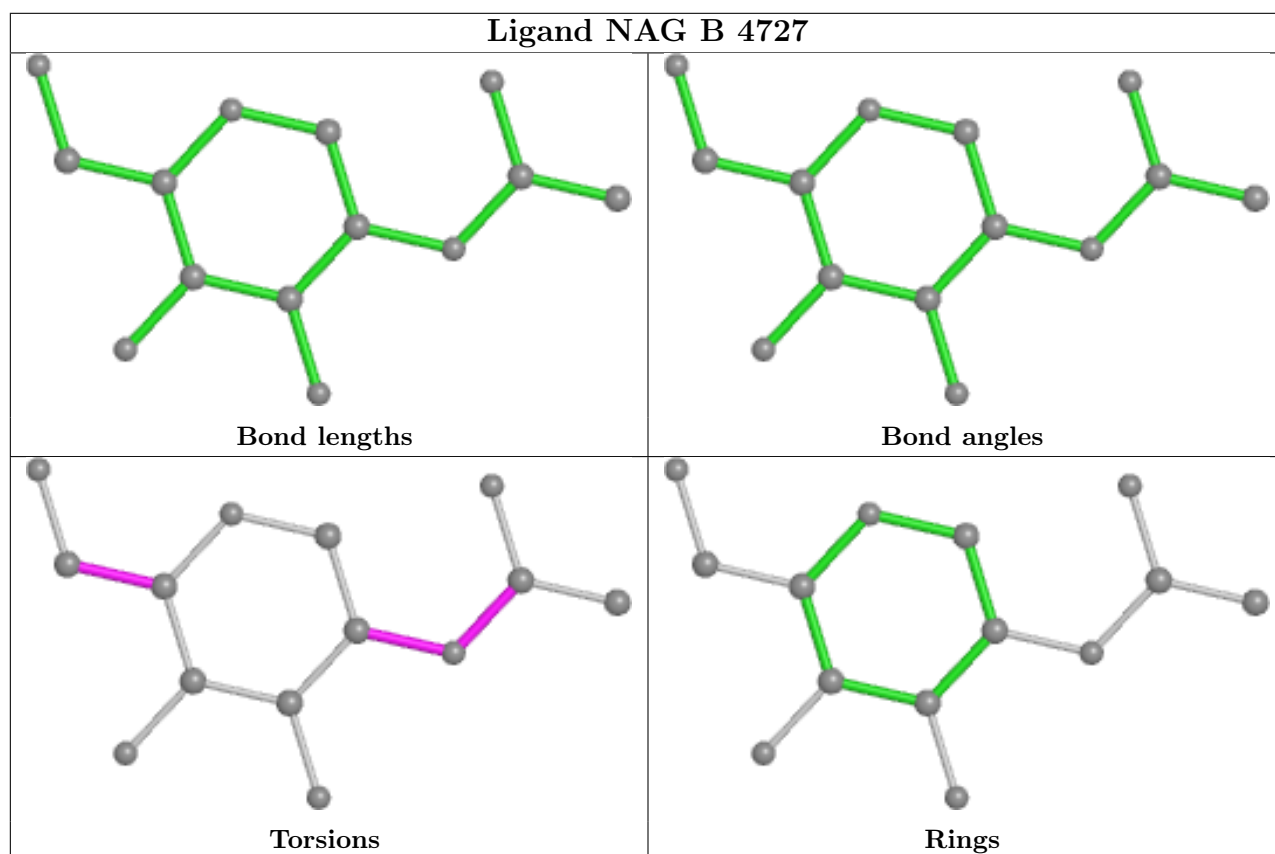
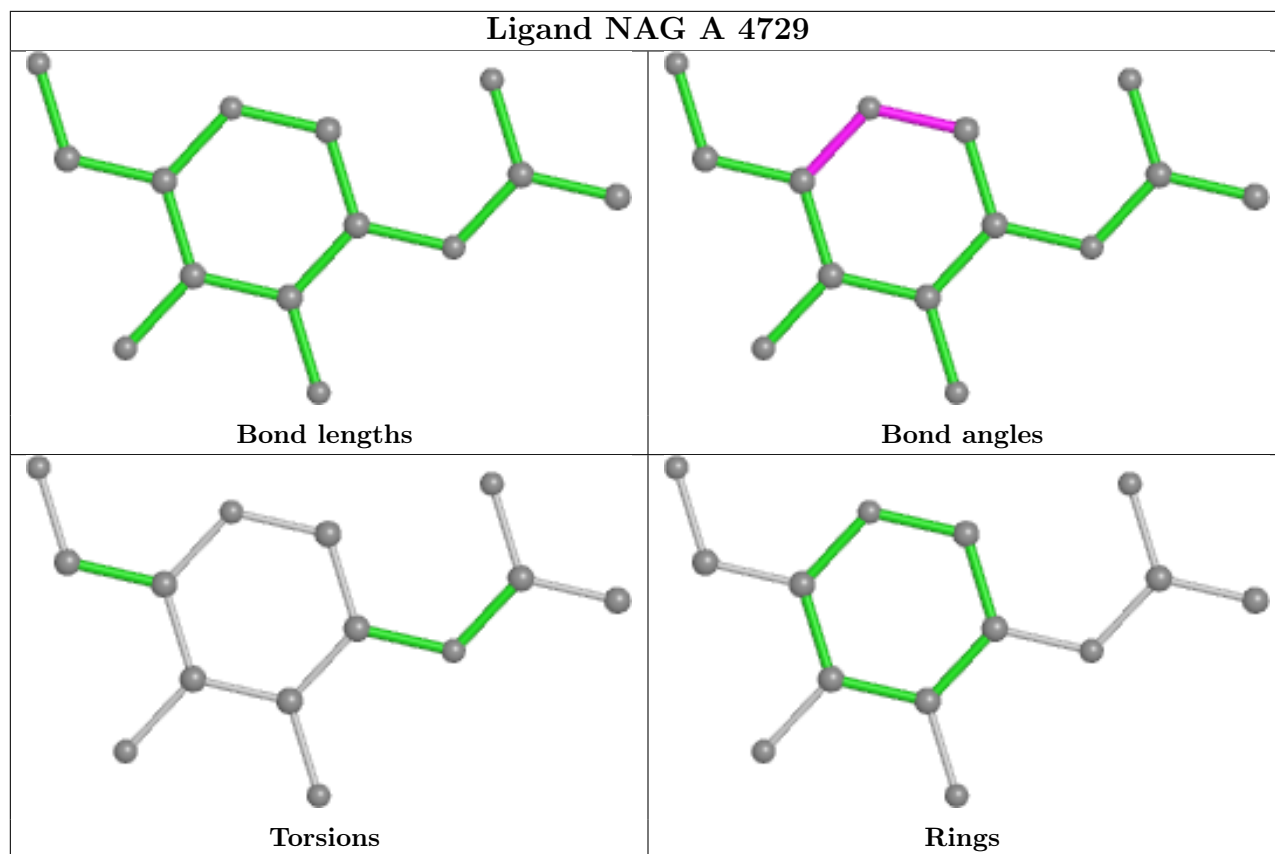


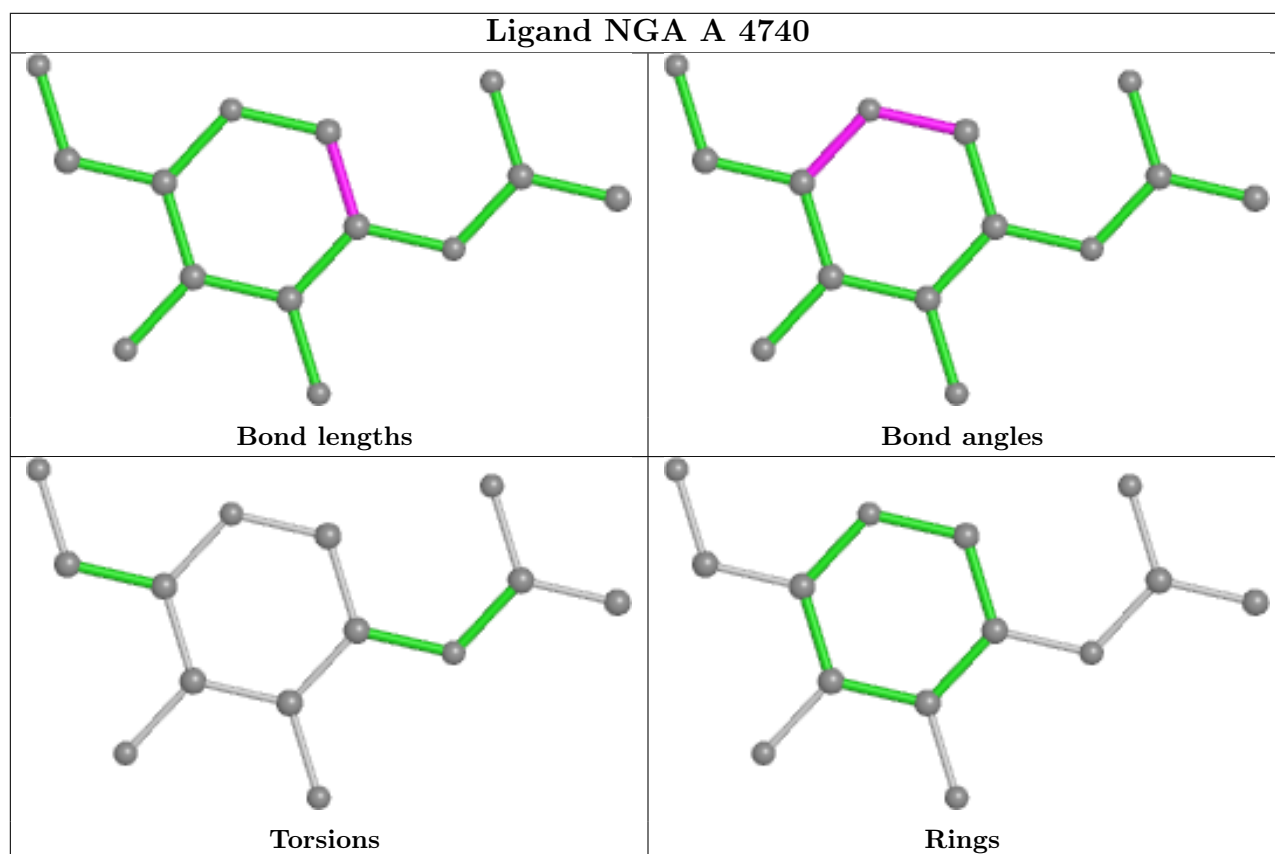
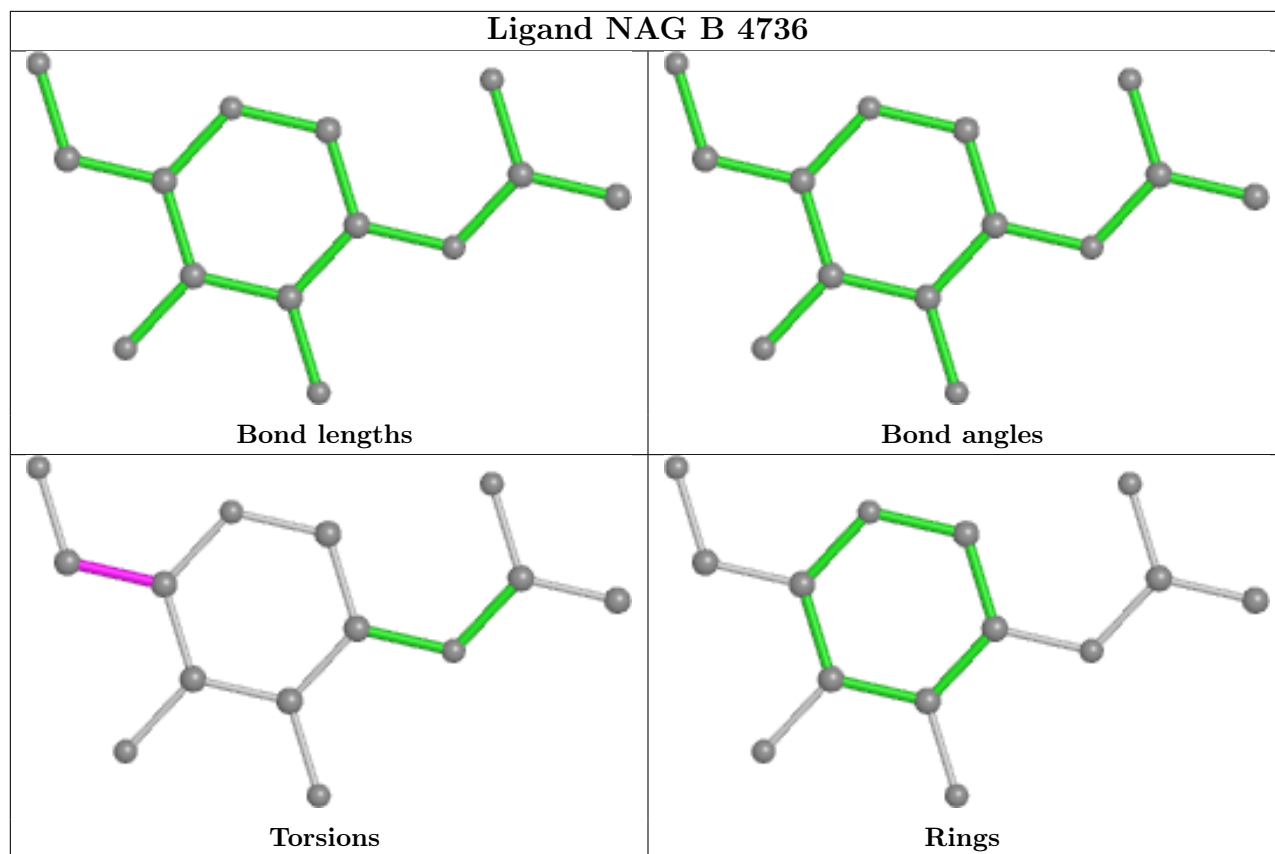


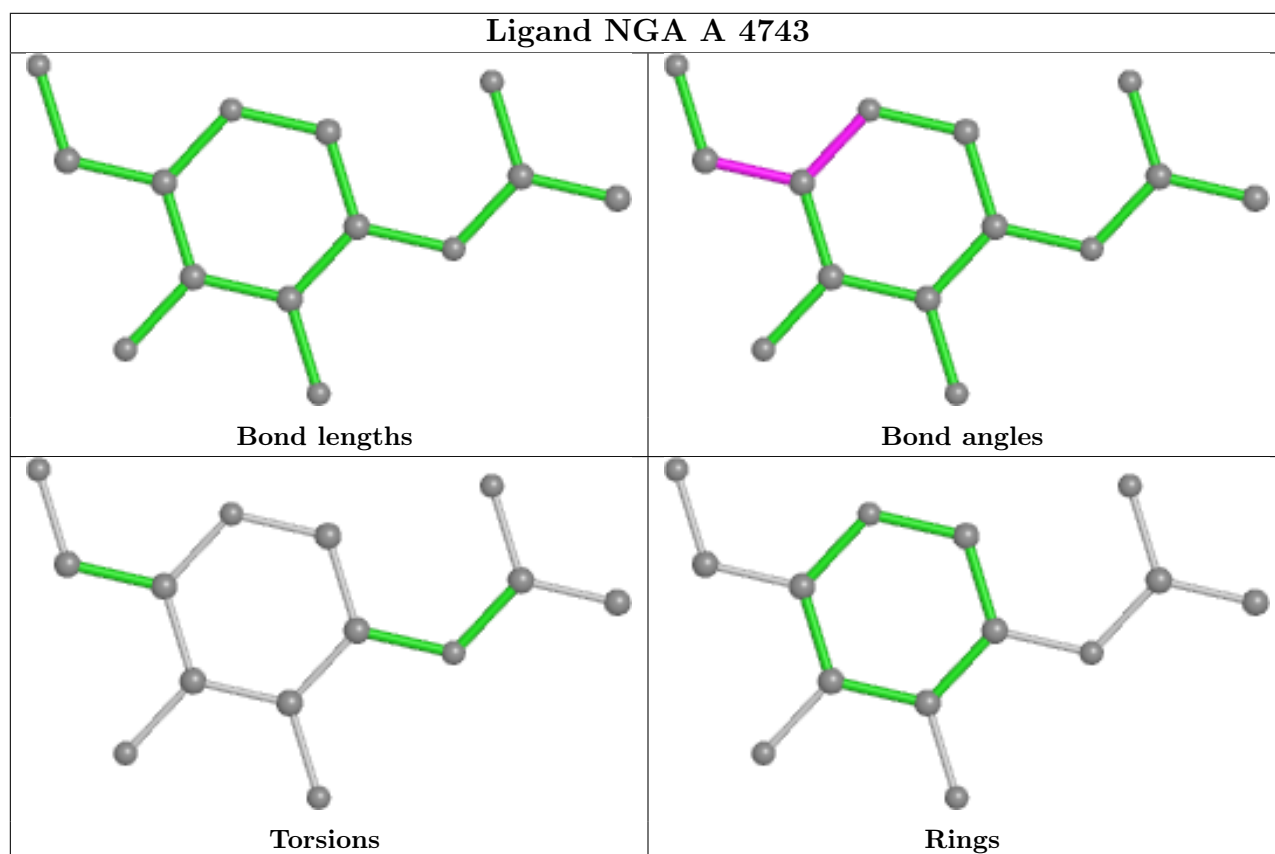
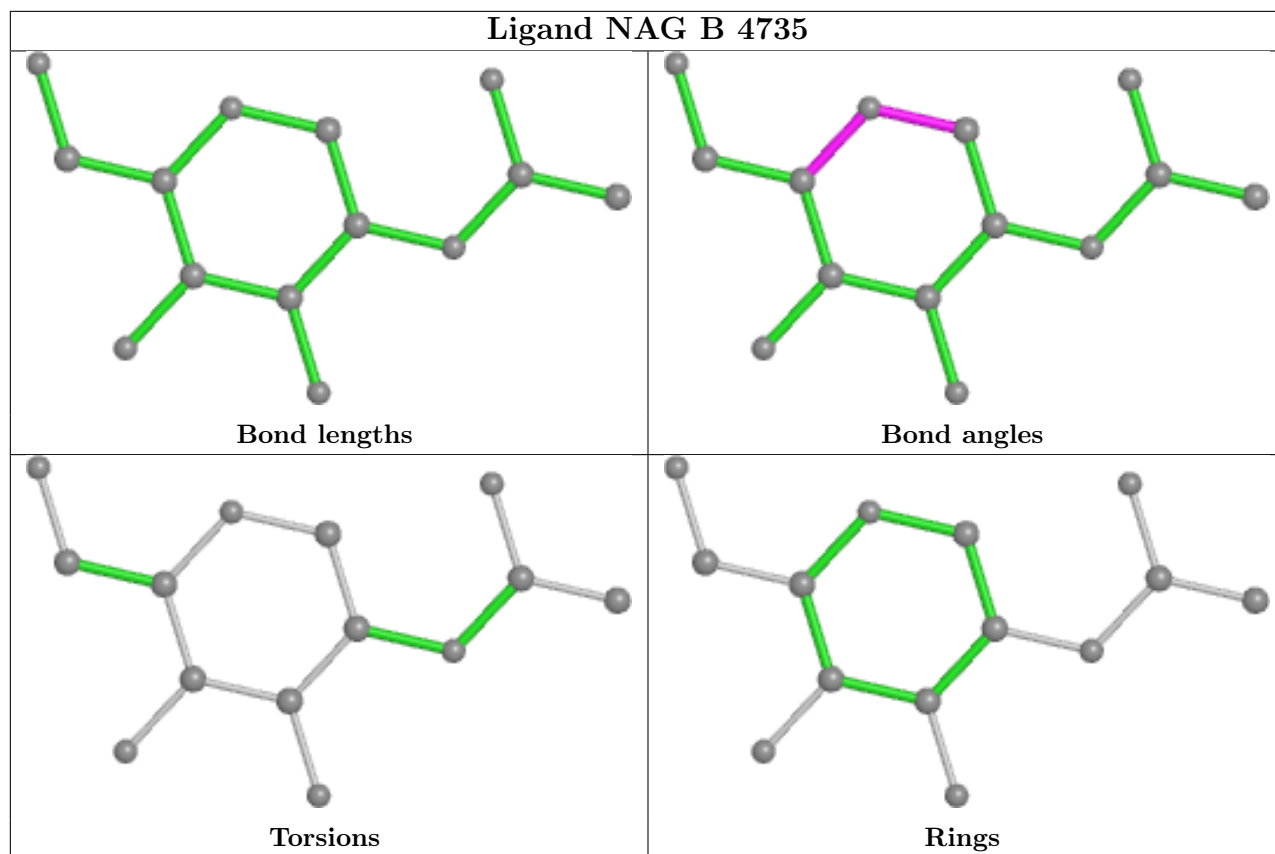


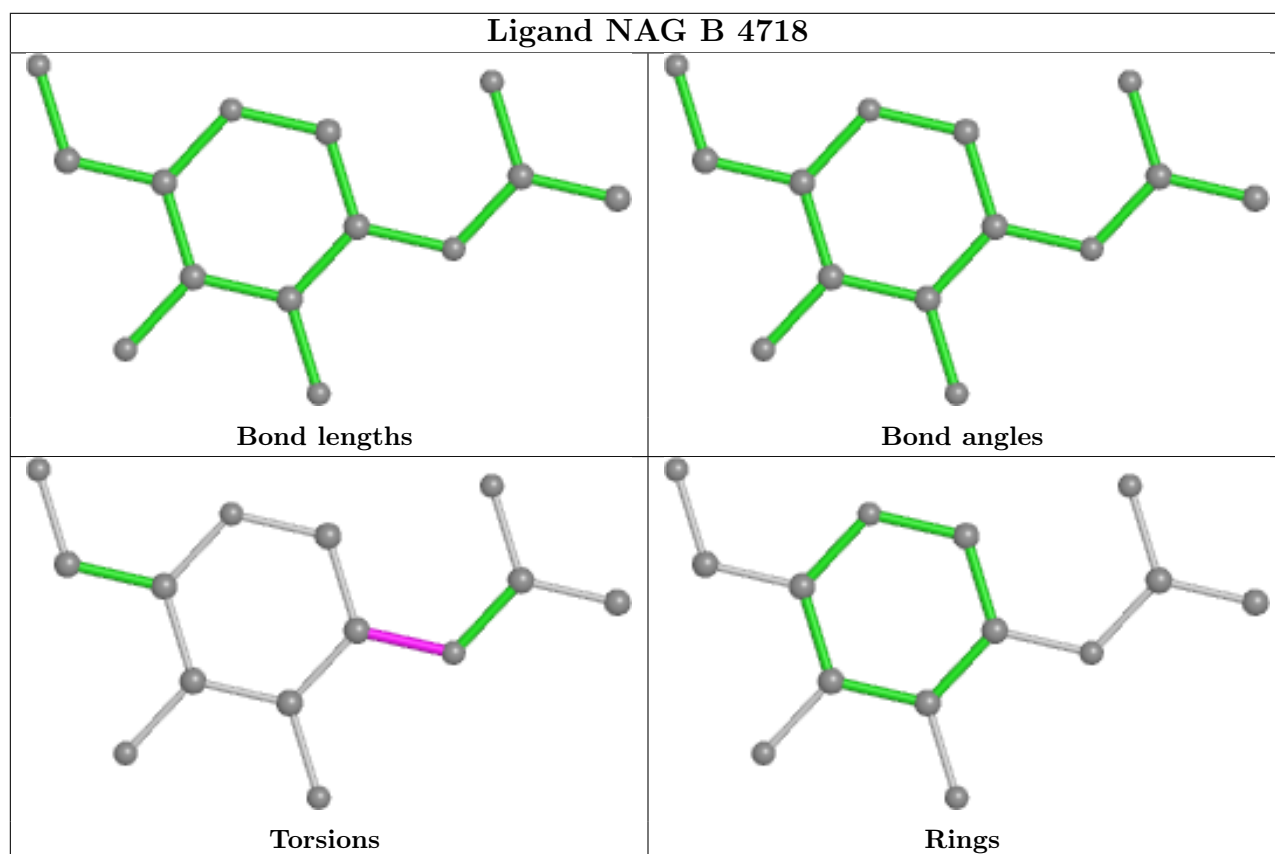
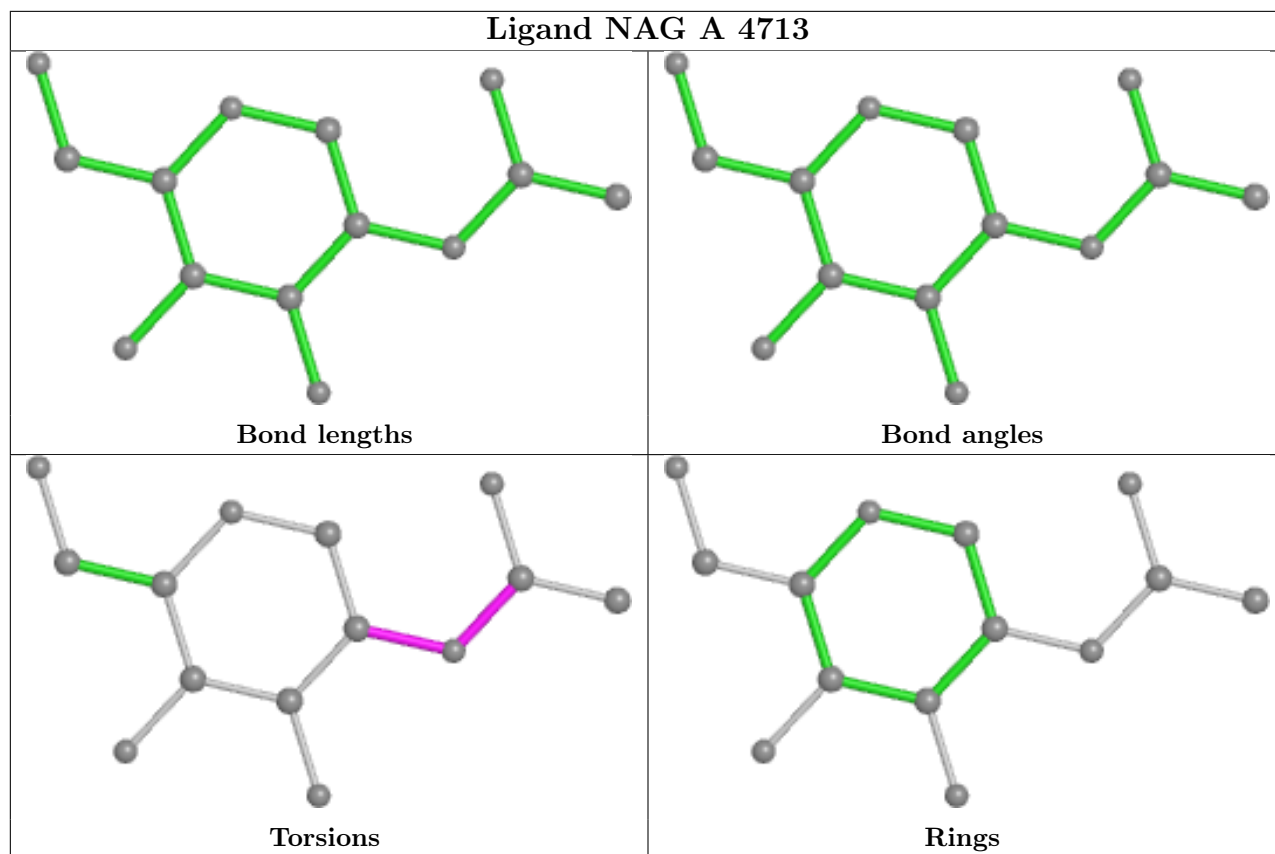


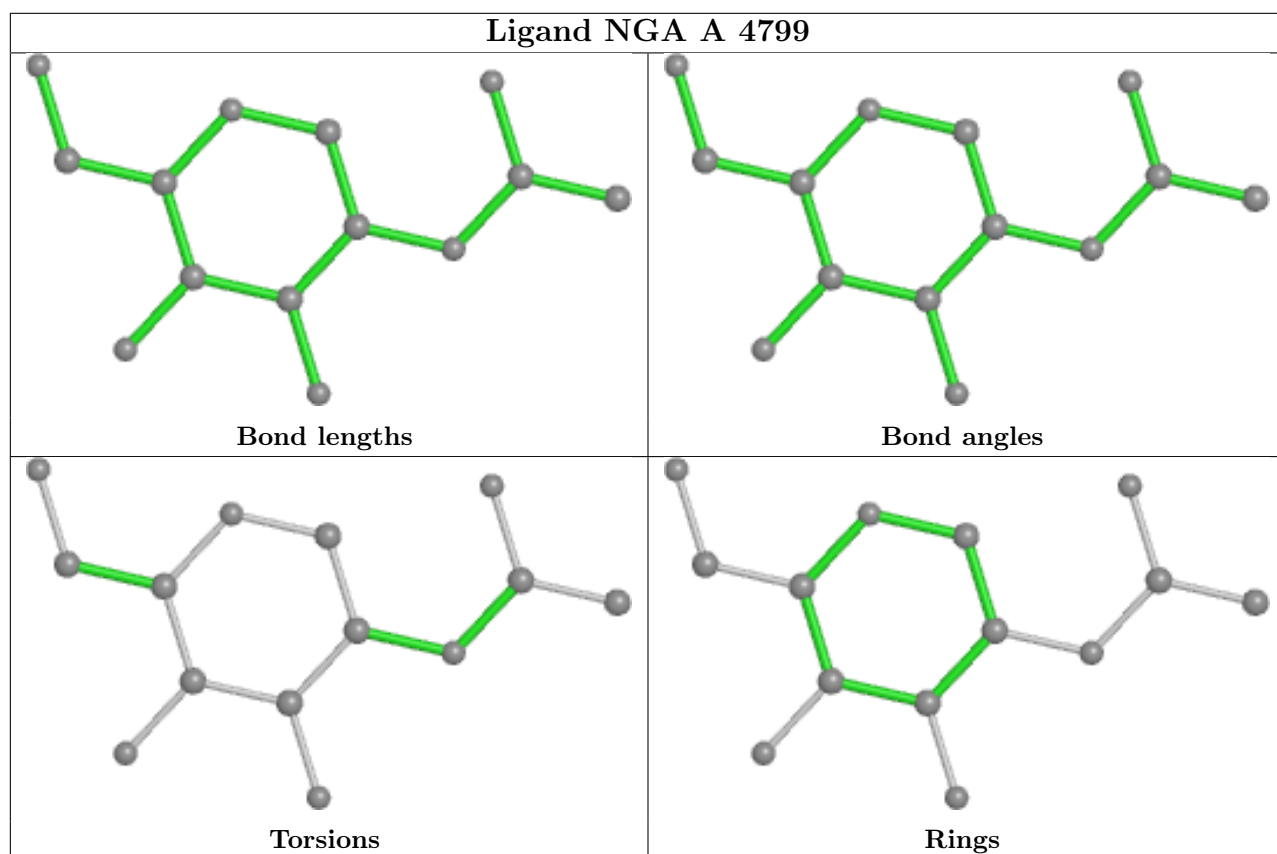
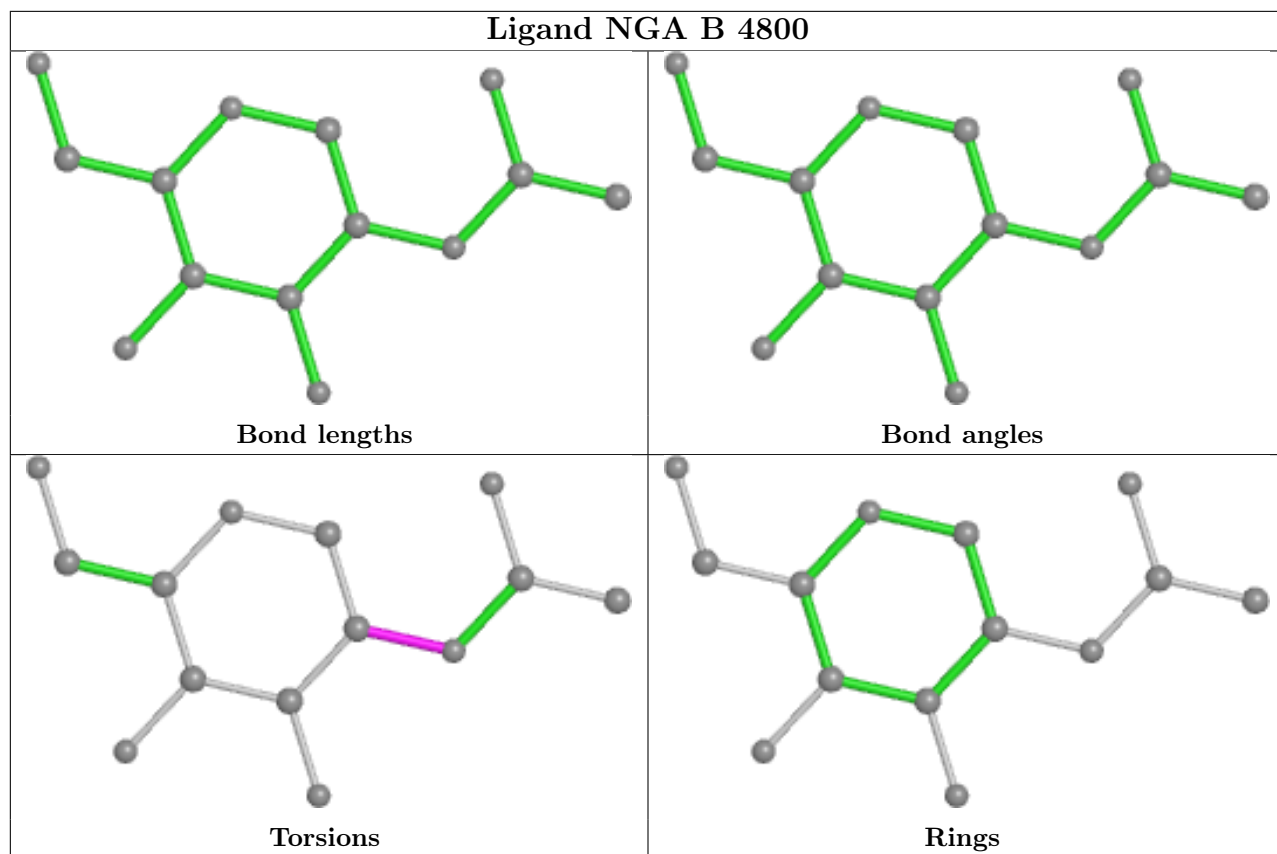


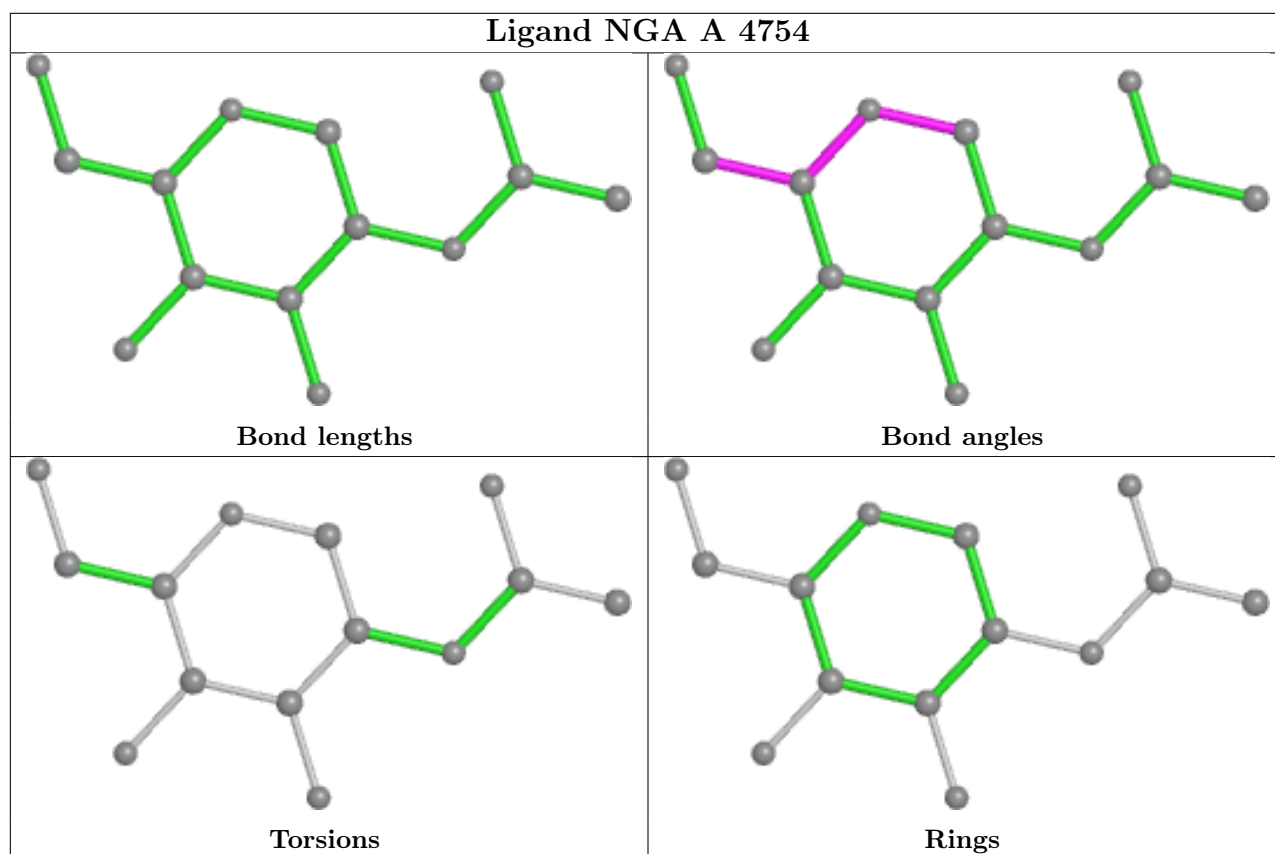
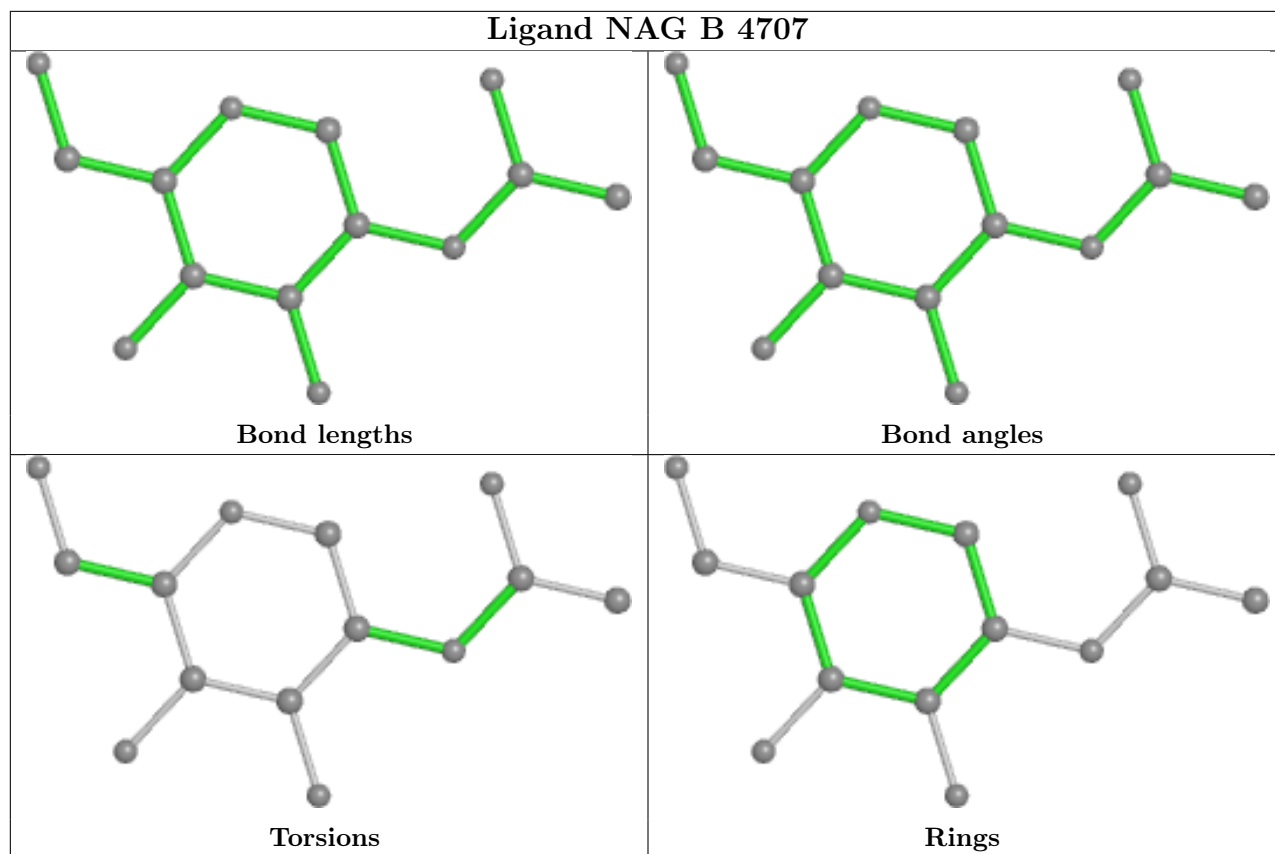


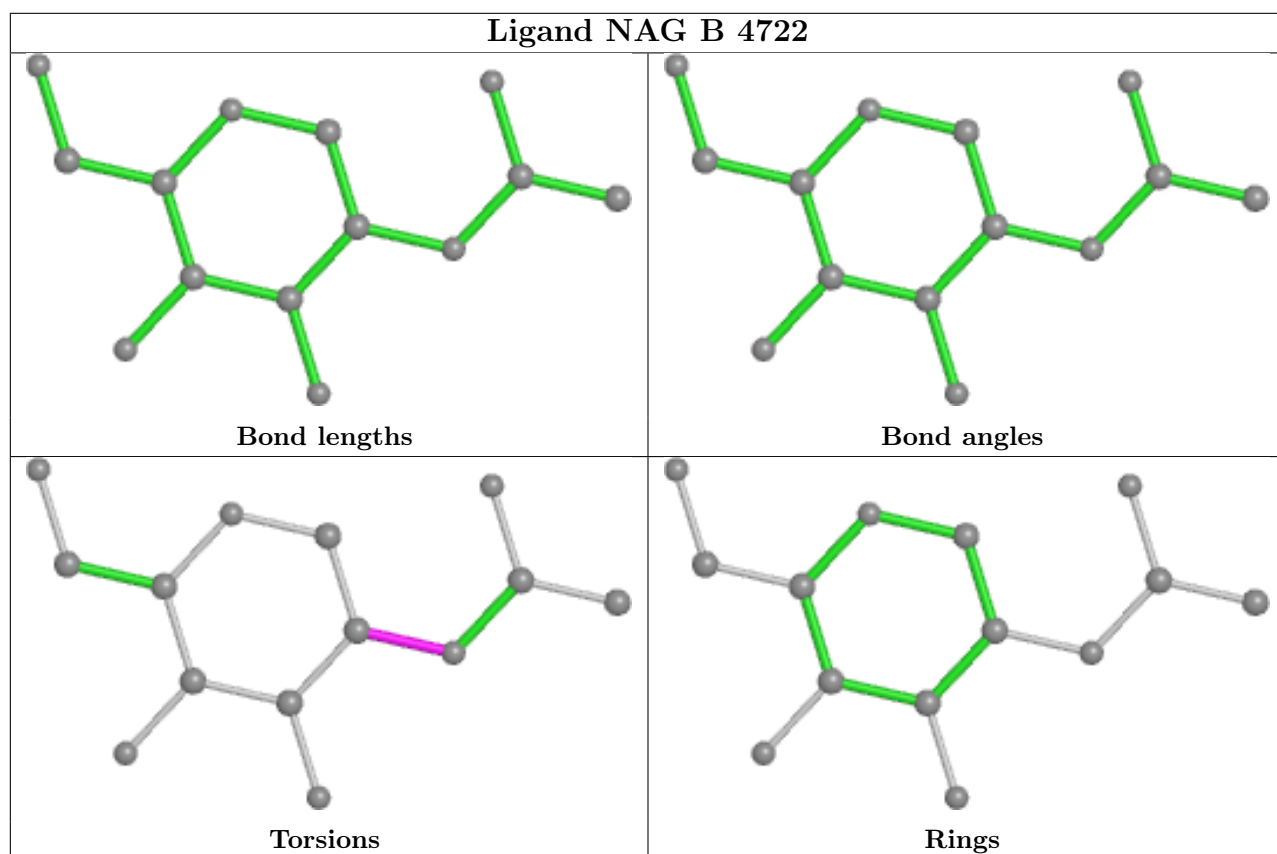
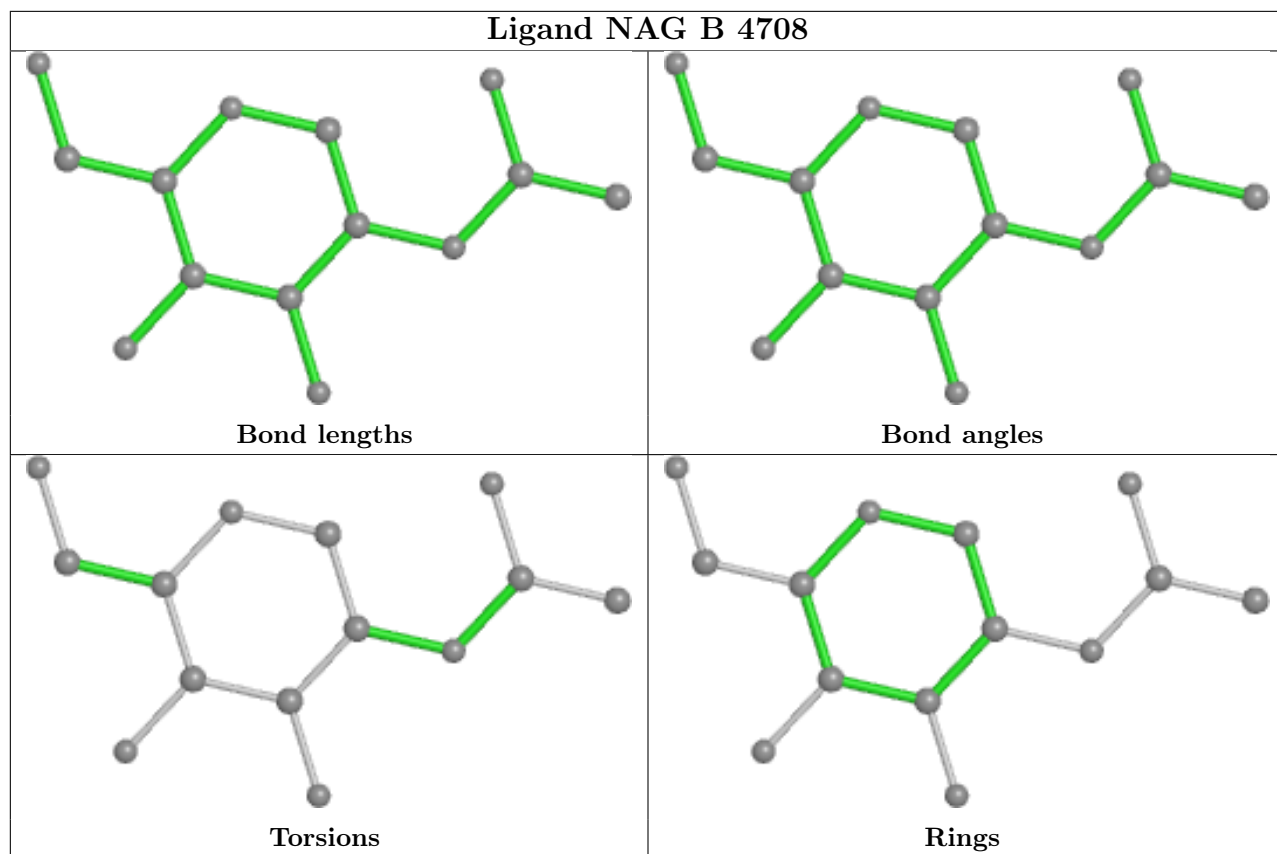


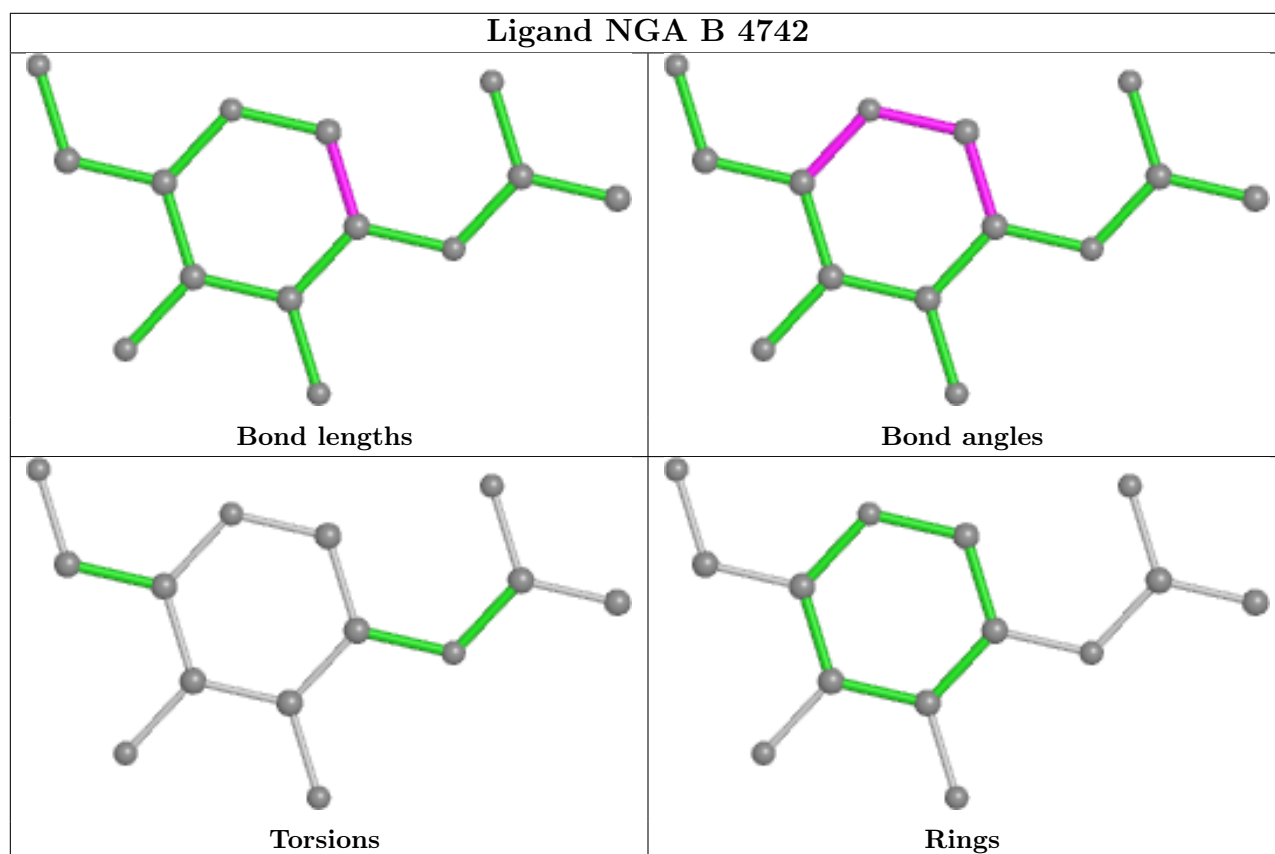
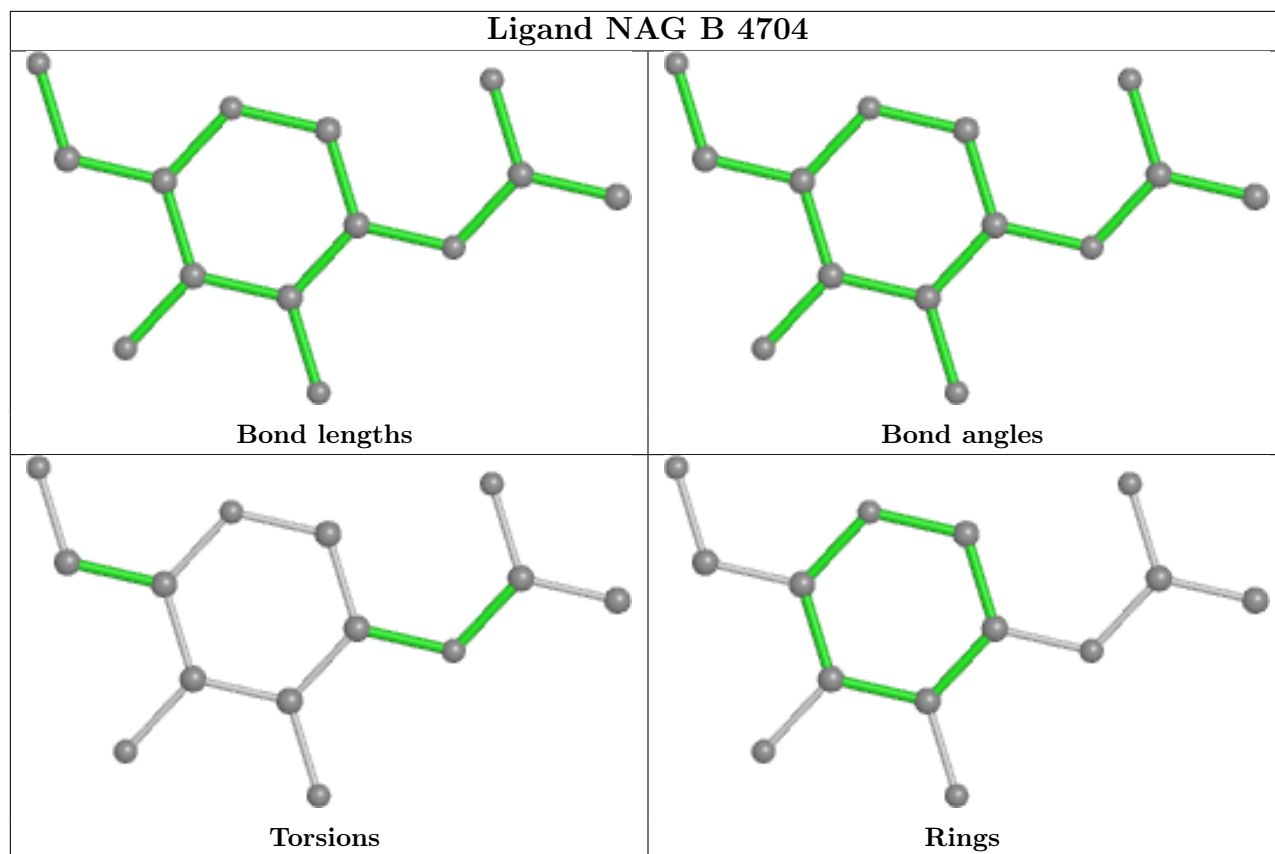


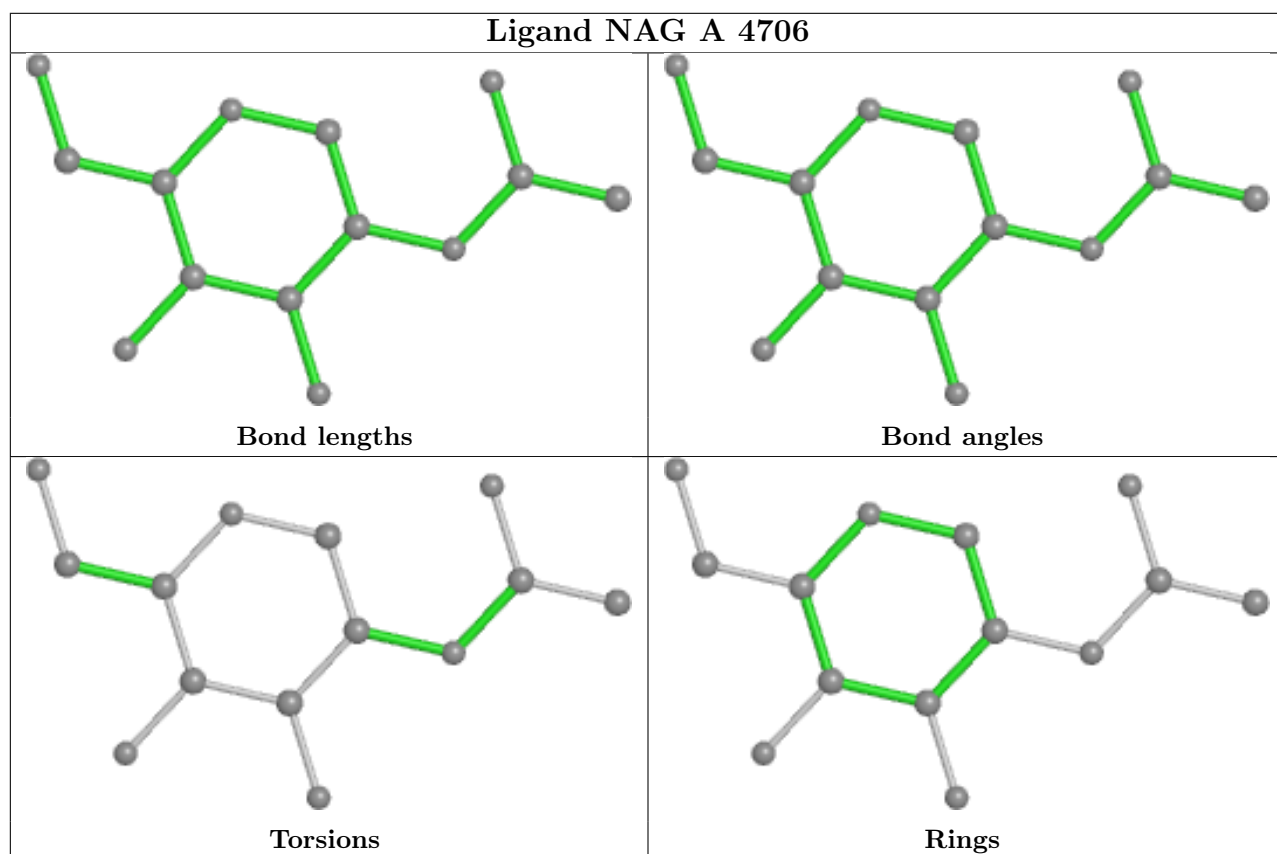
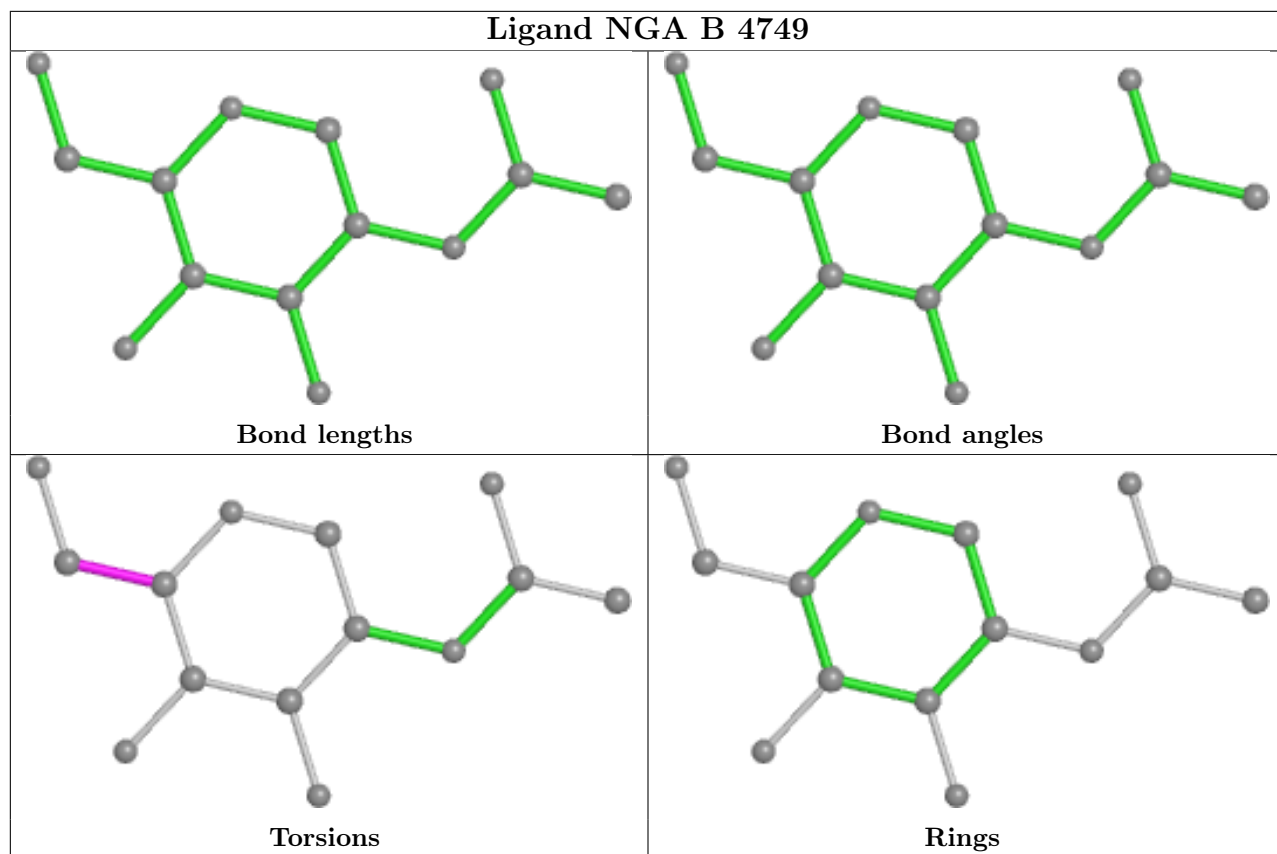


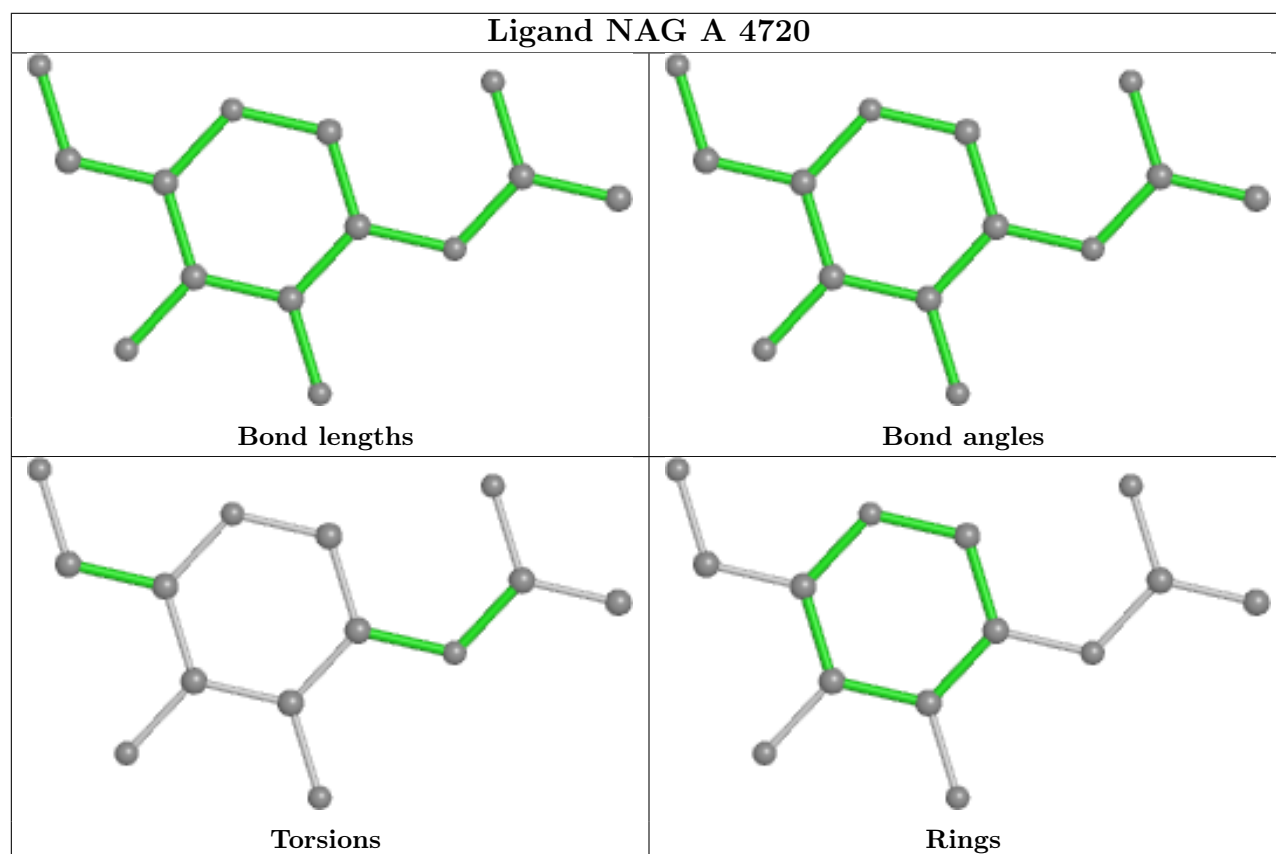
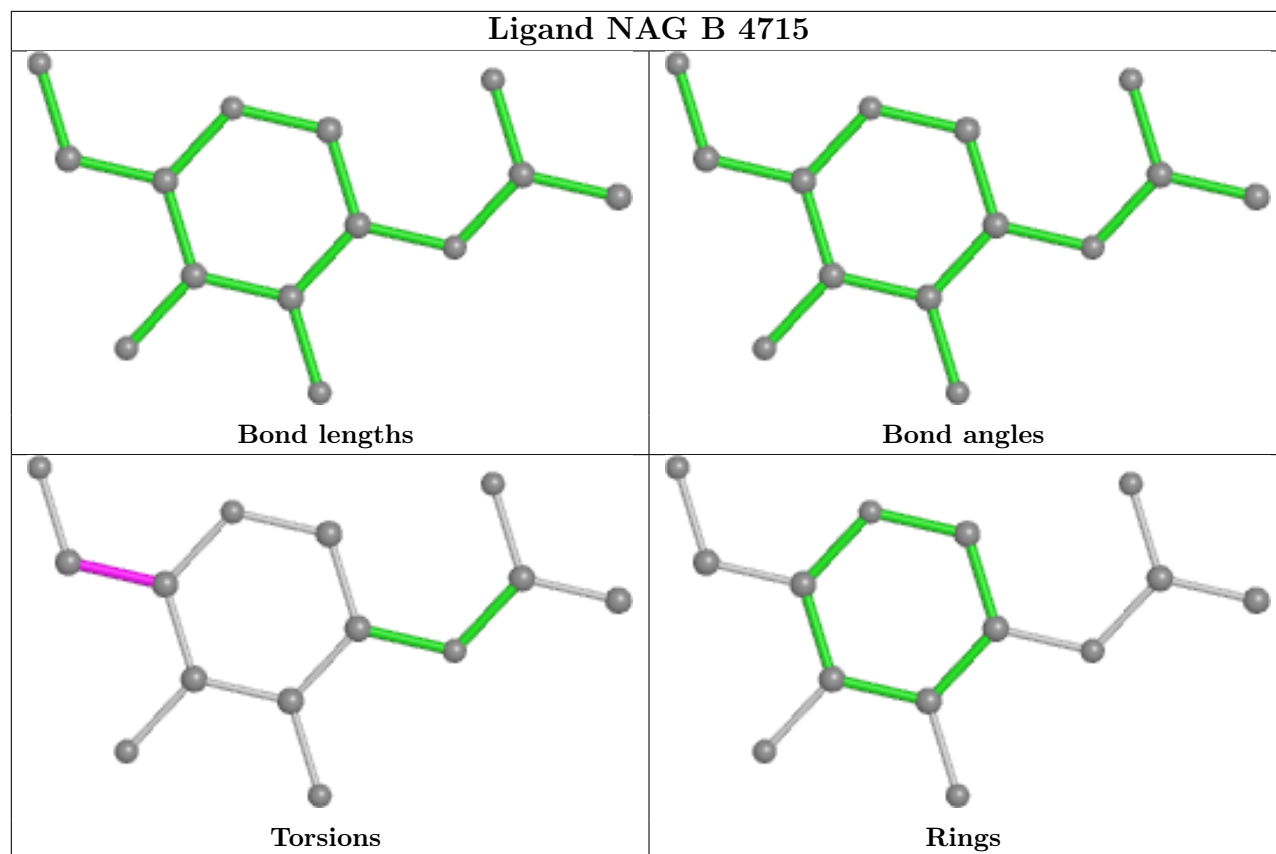


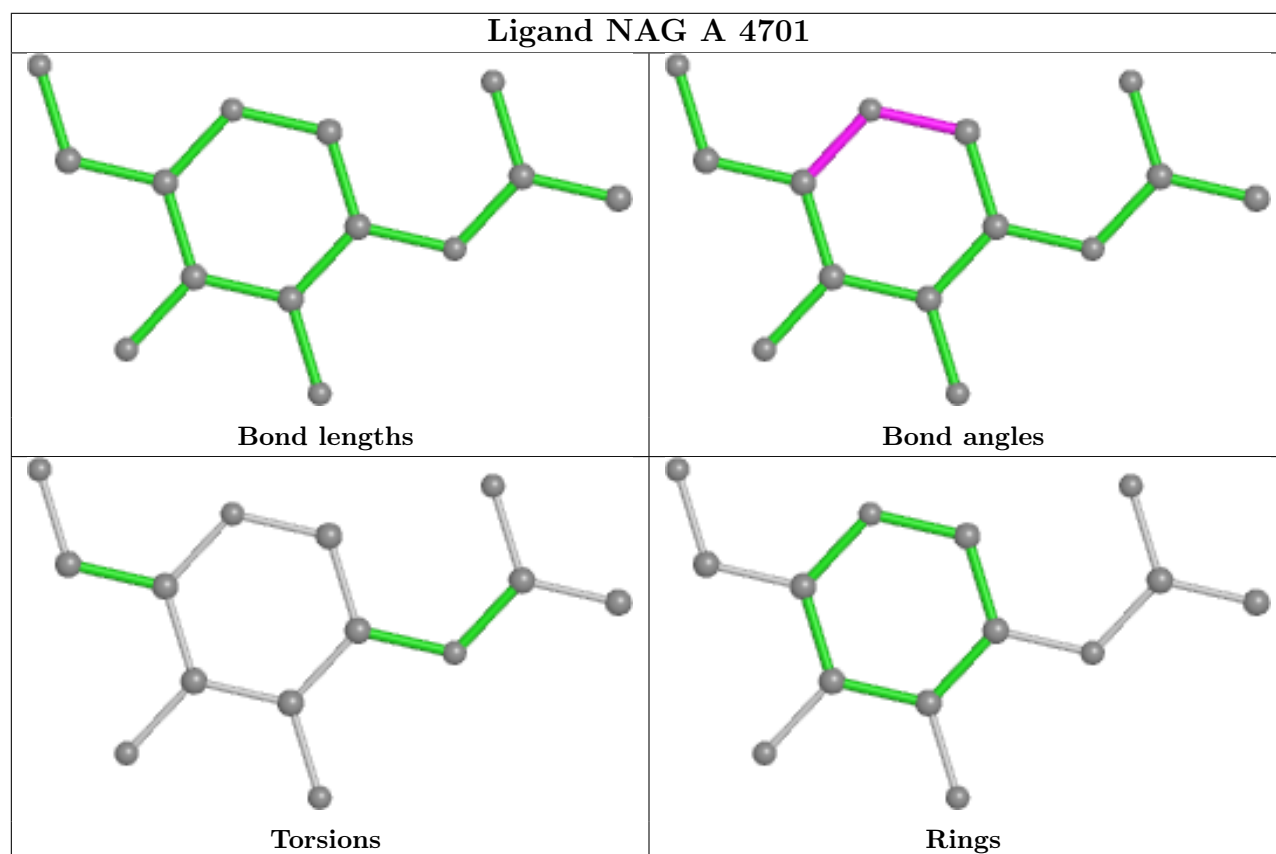
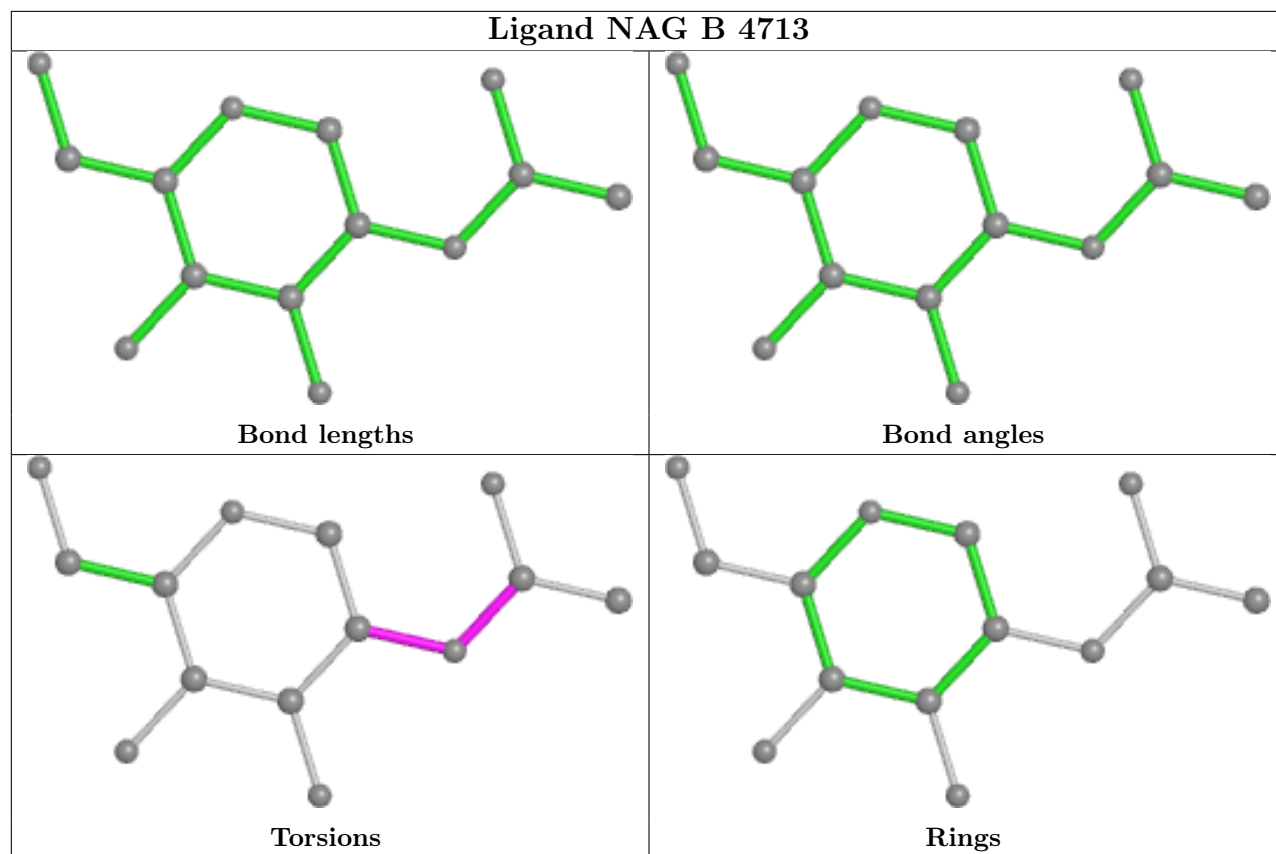


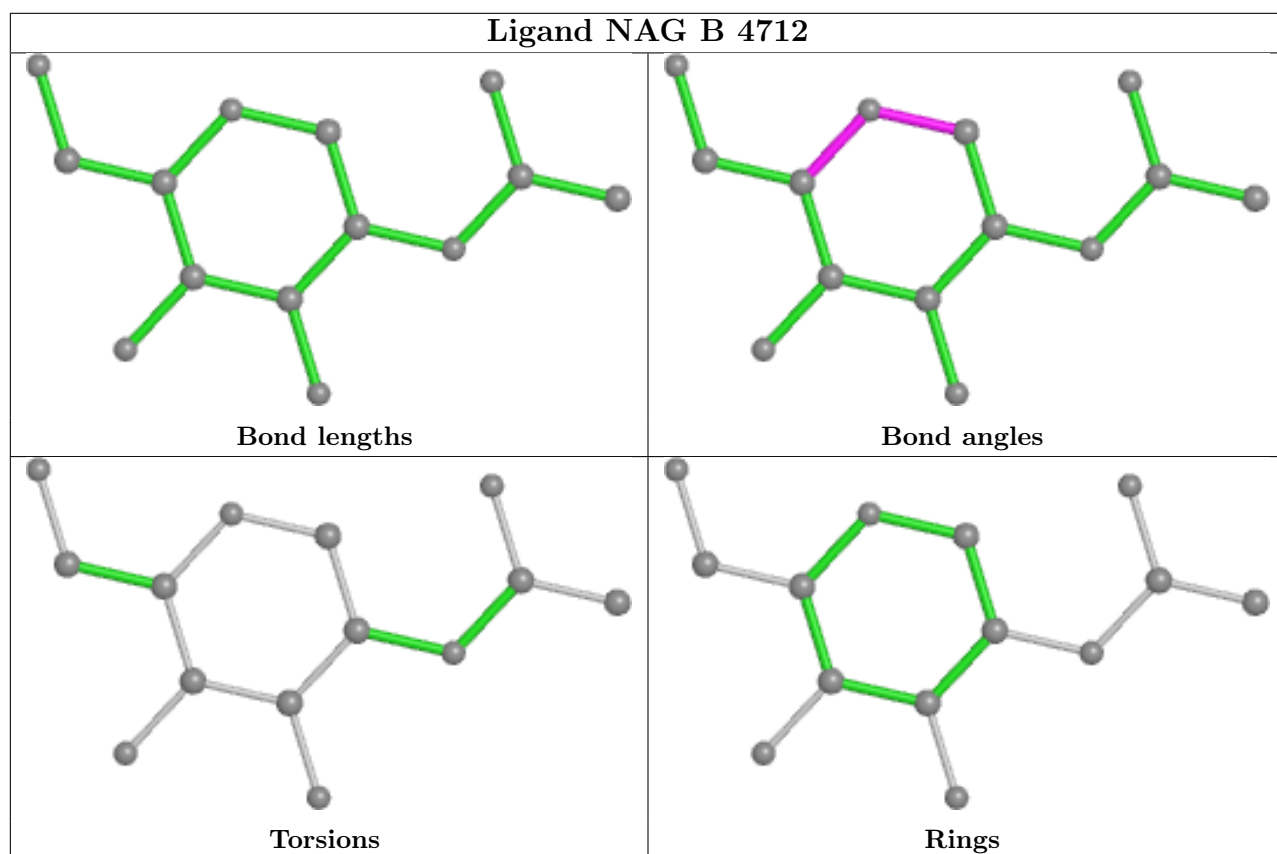
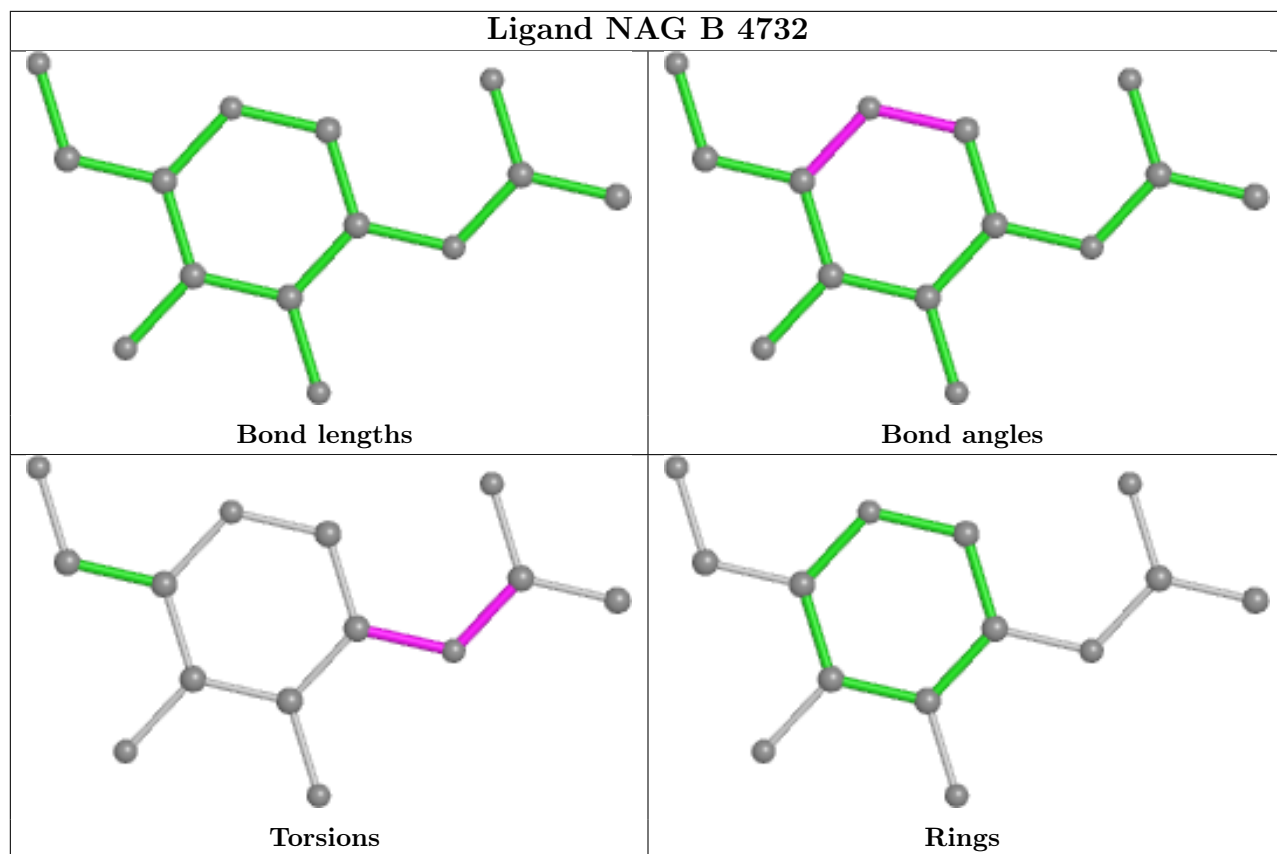












5.7 Other polymers [i](#)

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-28241. These allow visual inspection of the internal detail of the map and identification of artifacts.

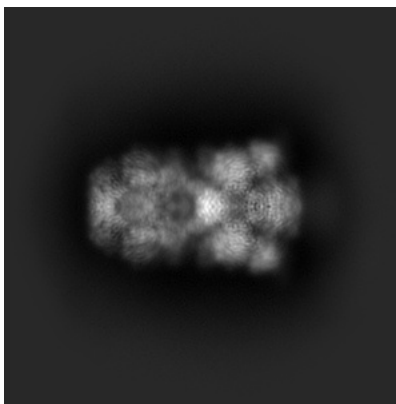
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

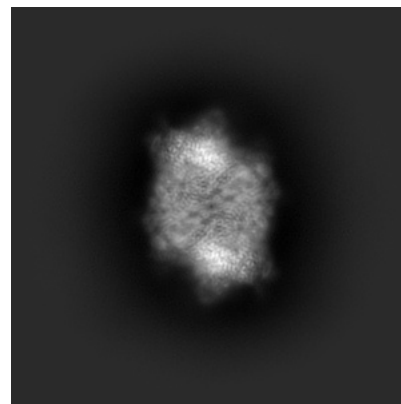
6.1.1 Primary map



X

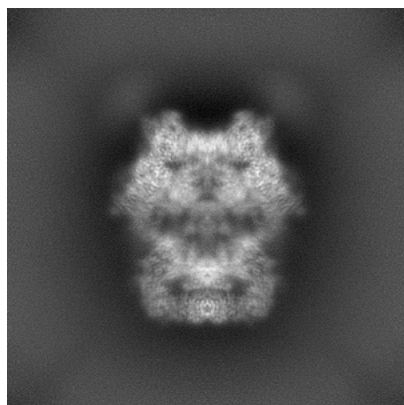


Y

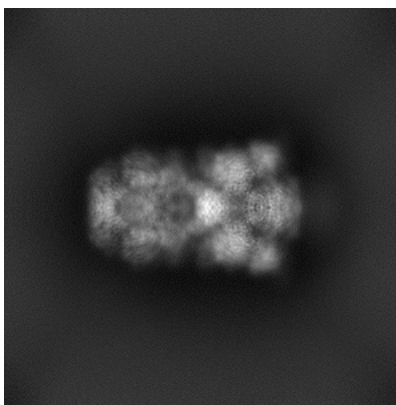


Z

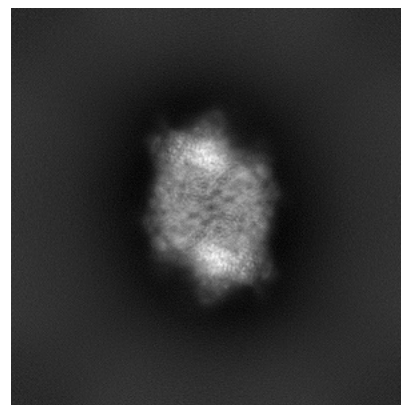
6.1.2 Raw map



X



Y

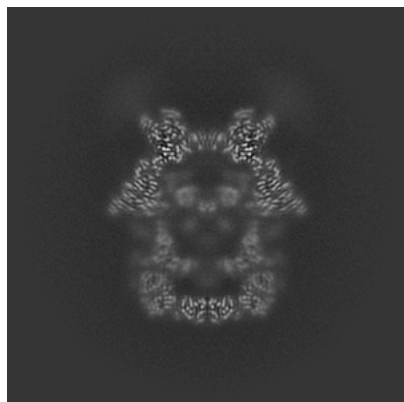


Z

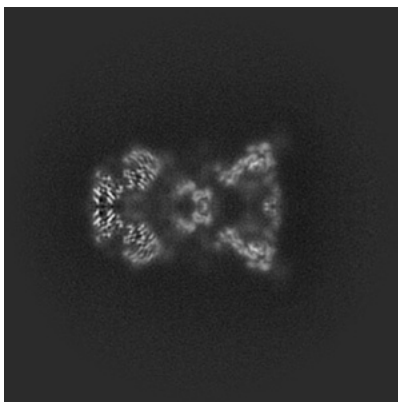
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

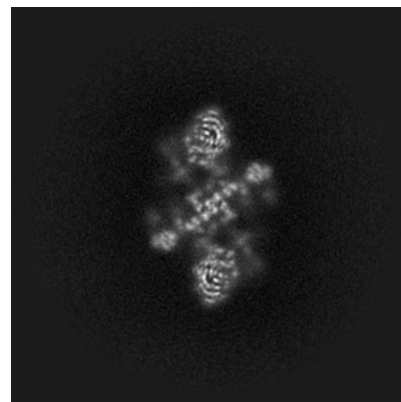
6.2.1 Primary map



X Index: 256

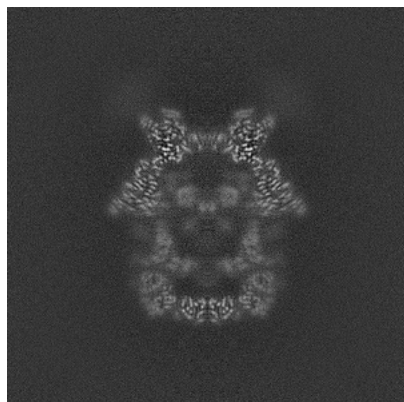


Y Index: 256

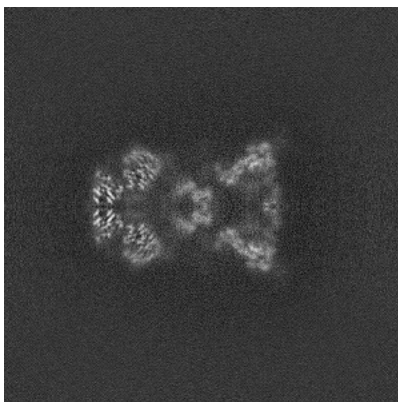


Z Index: 256

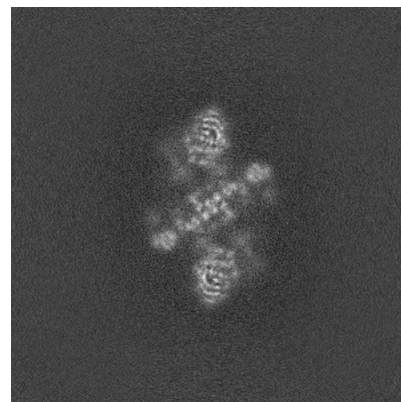
6.2.2 Raw map



X Index: 256



Y Index: 256

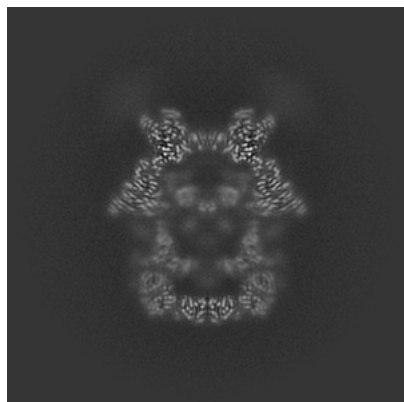


Z Index: 256

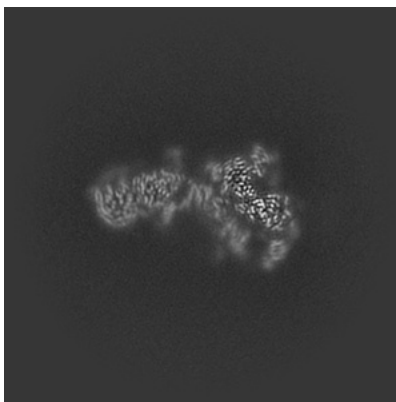
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

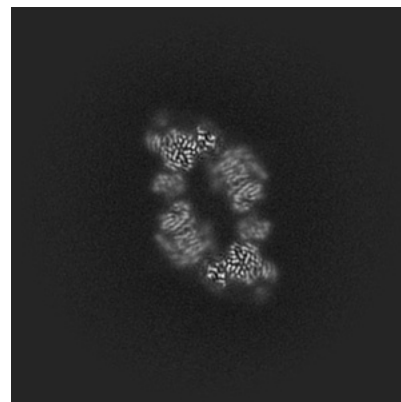
6.3.1 Primary map



X Index: 256

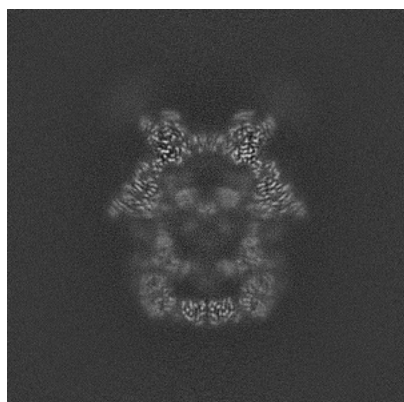


Y Index: 194

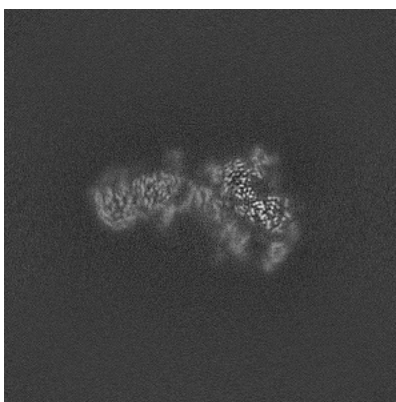


Z Index: 290

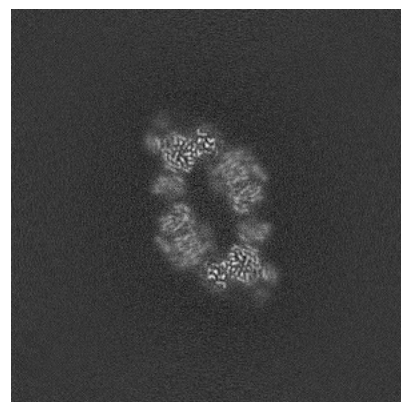
6.3.2 Raw map



X Index: 255



Y Index: 194

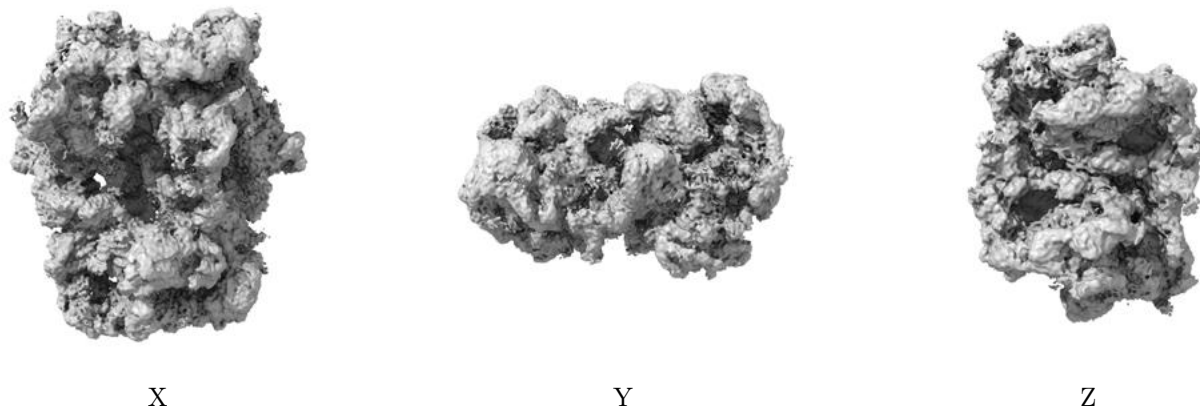


Z Index: 289

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

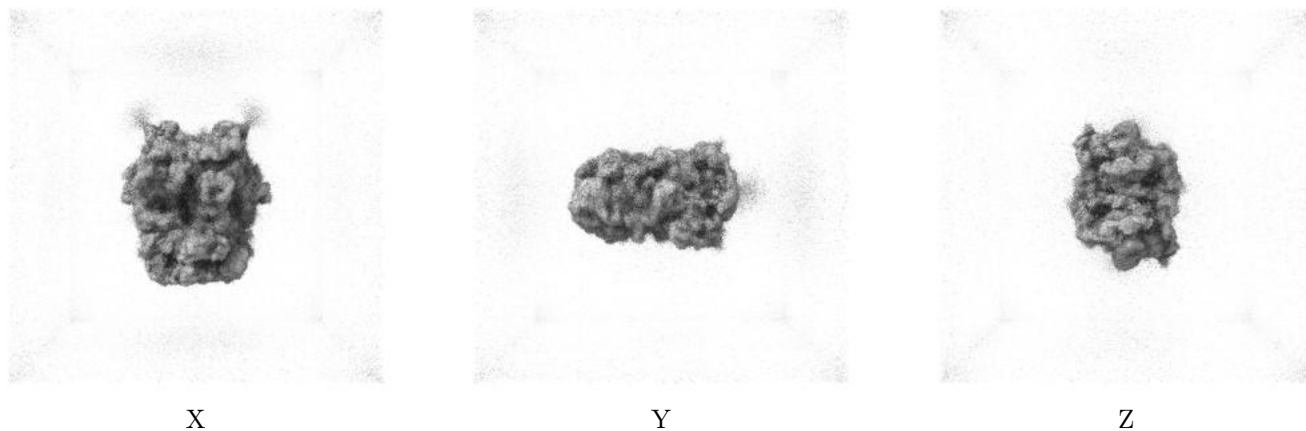
6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.125. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

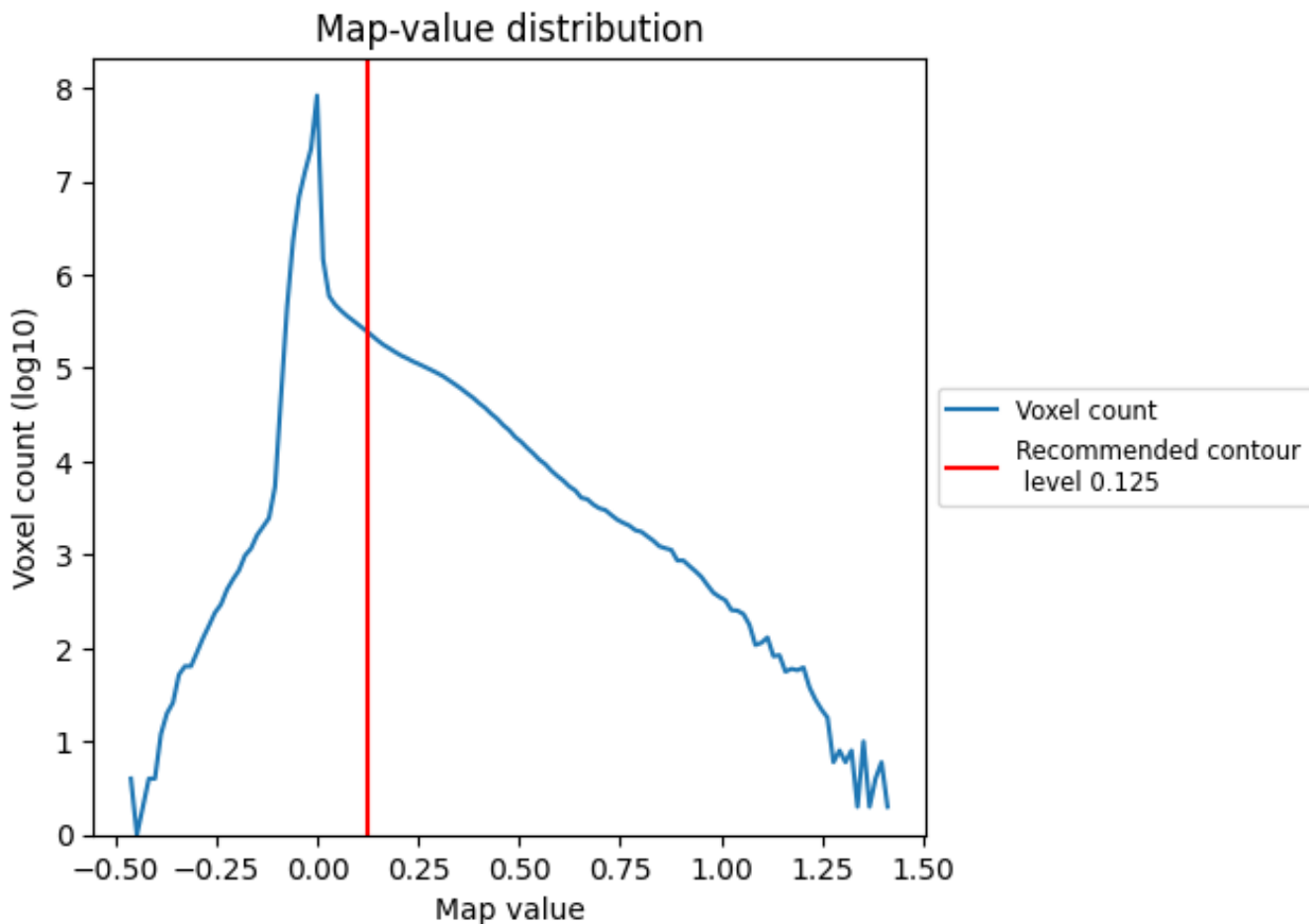
6.5 Mask visualisation [i](#)

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

7 Map analysis [i](#)

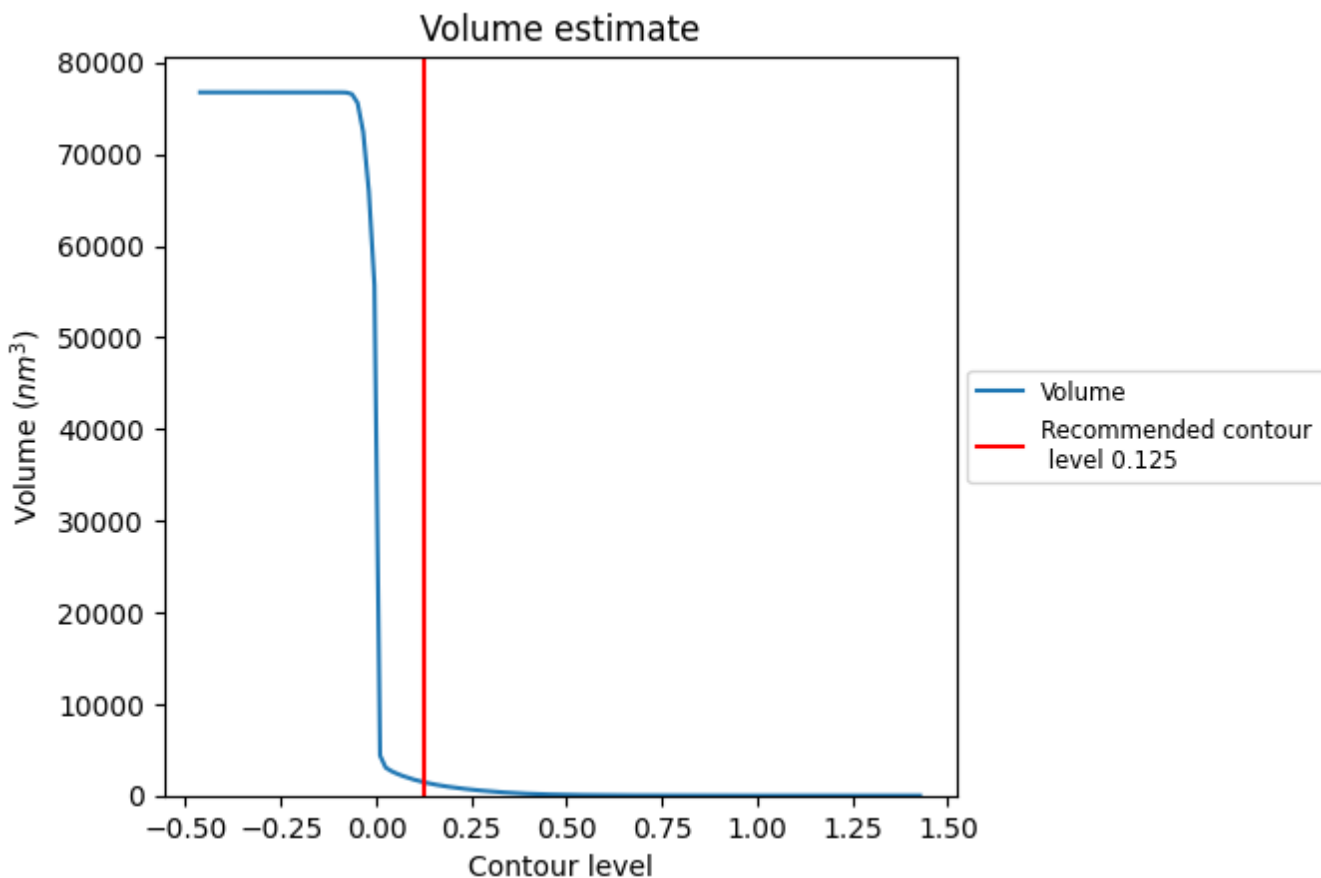
This section contains the results of statistical analysis of the map.

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.

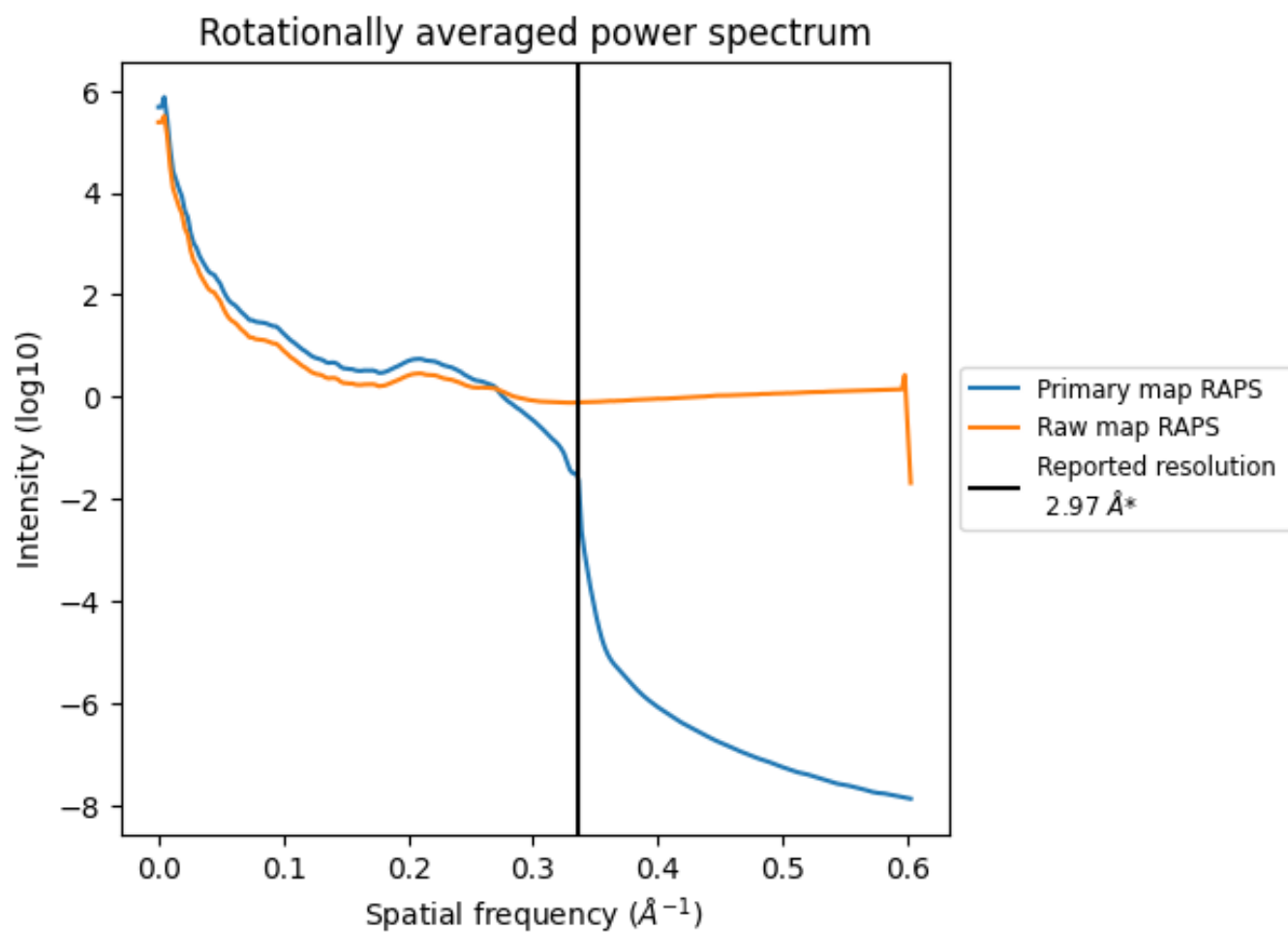
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 1462 nm³; this corresponds to an approximate mass of 1321 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 i

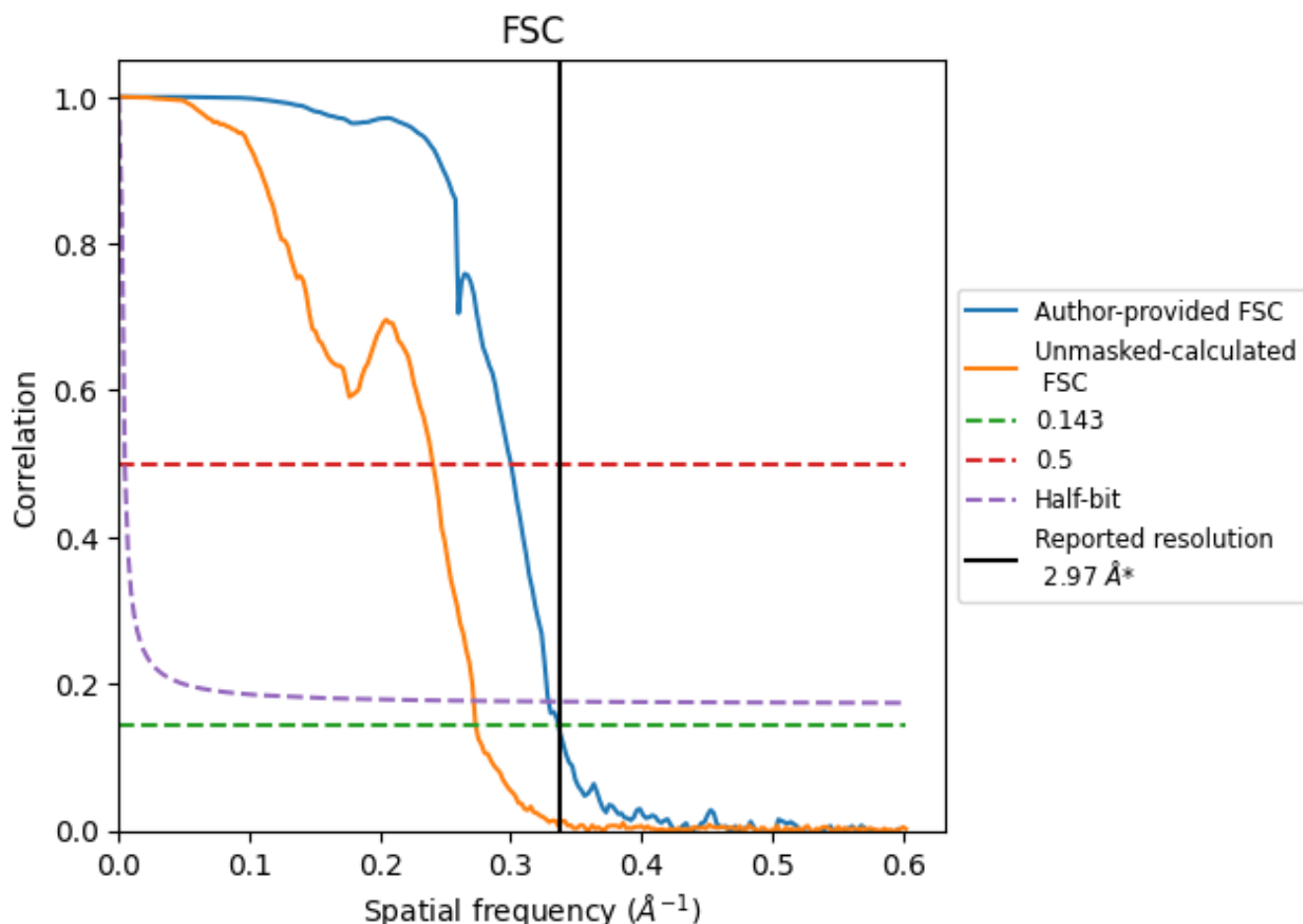


*Reported resolution corresponds to spatial frequency of 0.337 \AA^{-1}

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 0.337 Å⁻¹

8.2 Resolution estimates [i](#)

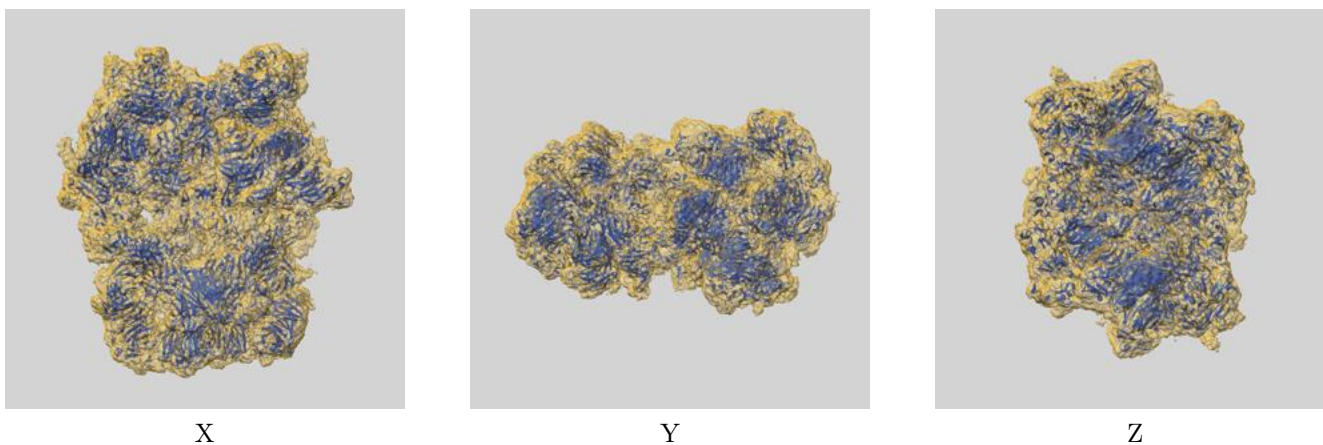
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.97	-	-
Author-provided FSC curve	2.97	3.33	3.04
Unmasked-calculated*	3.66	4.16	3.68

*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 3.66 differs from the reported value 2.97 by more than 10 %

9 Map-model fit [i](#)

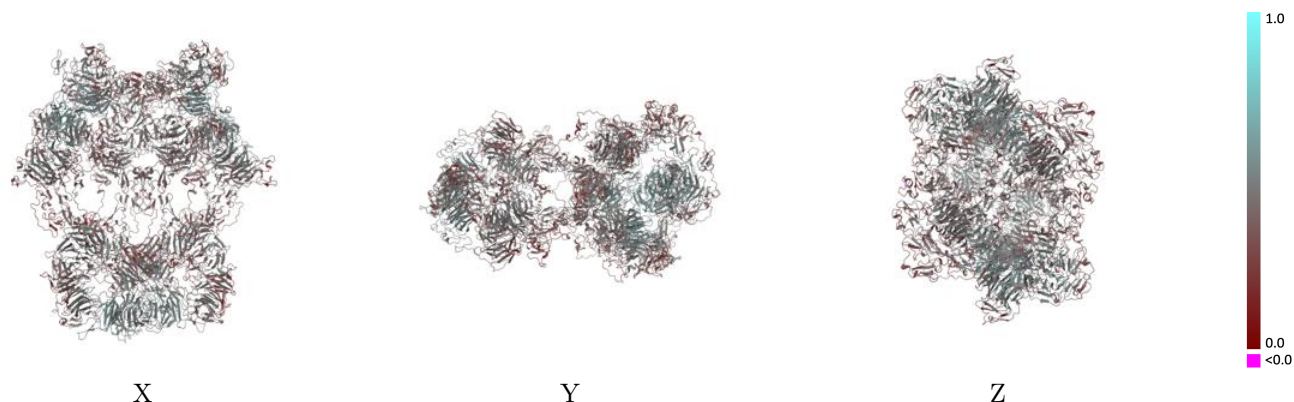
This section contains information regarding the fit between EMDB map EMD-28241 and PDB model 8EM7. Per-residue inclusion information can be found in section 3 on page 11.

9.1 Map-model overlay [i](#)



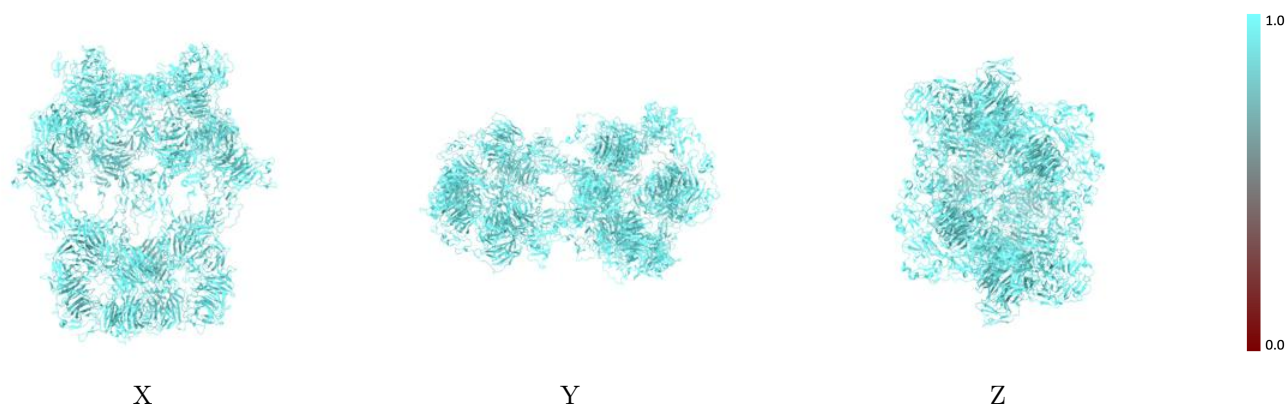
The images above show the 3D surface view of the map at the recommended contour level 0.125 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



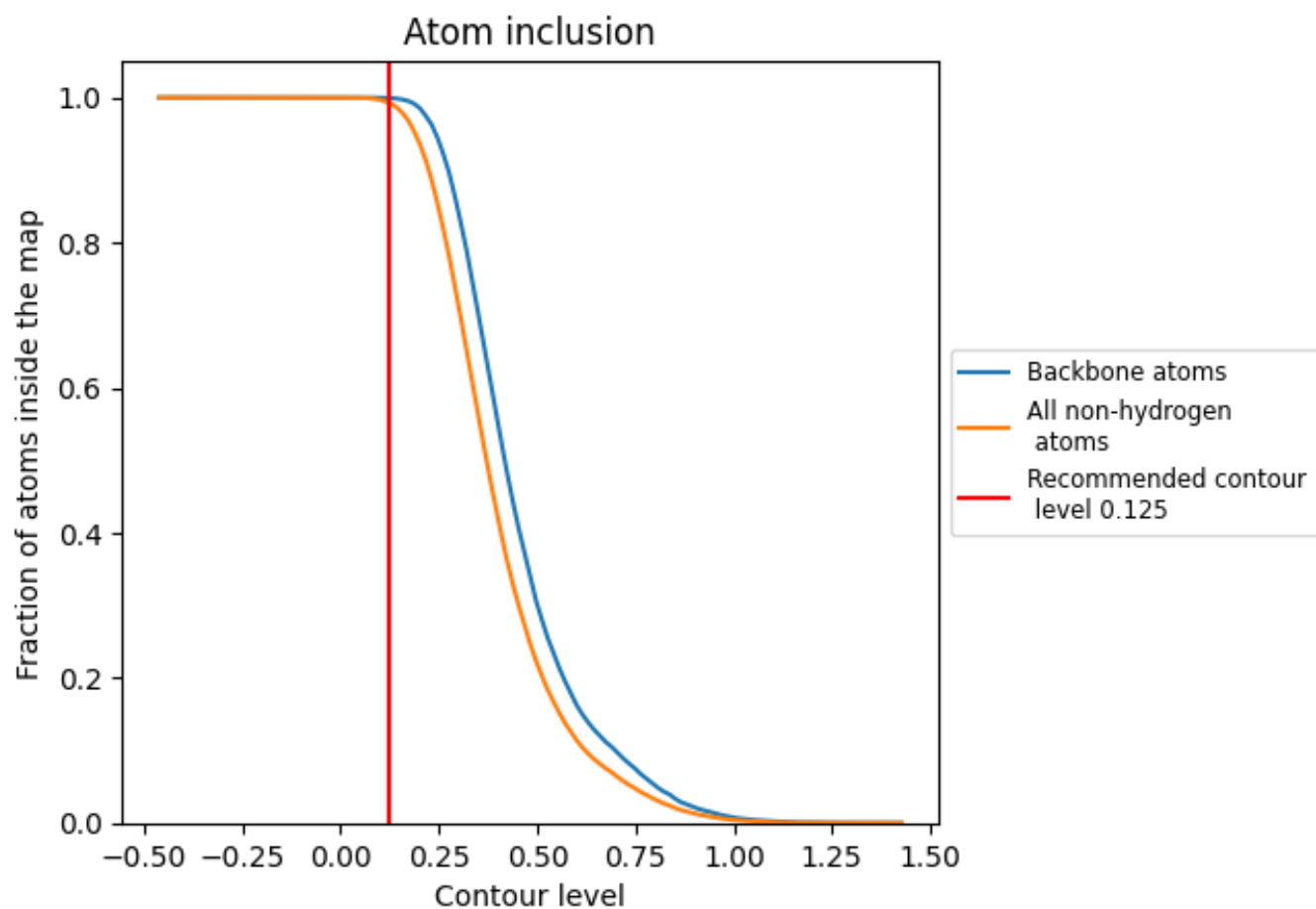
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.125).











9.4 Atom inclusion [i](#)



At the recommended contour level, 100% of all backbone atoms, 99% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary [i](#)

The table lists the average atom inclusion at the recommended contour level (0.125) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9927	 0.4230
A	 0.9927	 0.4230
B	 0.9927	 0.4230
C	 1.0000	 0.4880
D	 1.0000	 0.5010

