



wwPDB EM Validation Summary Report ⓘ

Nov 22, 2022 – 07:06 PM JST

PDB ID : 7EW6
EMDB ID : EMD-31348
Title : Barley photosystem I-LHCI-Lhca5 supercomplex
Authors : Wang, W.D.; Shen, L.; Tang, K.; Han, G.Y.; Zhang, X.; Shen, J.R.
Deposited on : 2021-05-24
Resolution : 3.40 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:

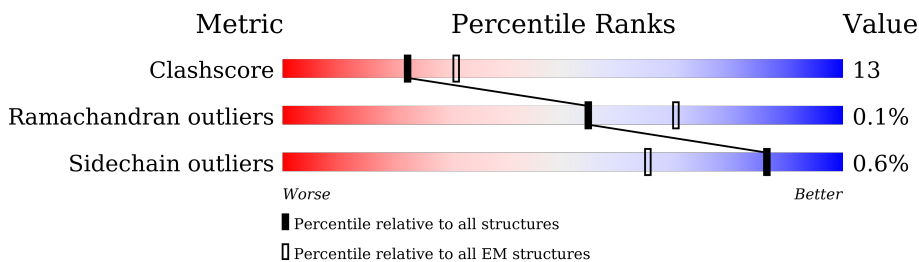
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry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

1 Overall quality at a glance i

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

The reported resolution of this entry is 3.40 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	750	77% 21%
2	B	734	84% 15%
3	C	81	73% 27%
4	D	205	8% 53% 16% 31%
5	E	147	38% 8% 54%
6	F	235	49% 17% 33%
7	H	143	20% 37% 6% 57%
8	I	36	69% 14% 17%

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Mol	Chain	Length	Quality of chain
9	J	42	
10	K	131	
11	L	209	
12	1	247	
13	2	255	
14	3	269	
15	5	257	

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
16	CL0	A	801	X	-	-	-
17	CLA	1	504	X	-	-	-
17	CLA	1	505	X	-	-	-
17	CLA	1	506	X	-	-	-
17	CLA	1	507	X	-	-	-
17	CLA	1	508	X	-	-	-
17	CLA	1	510	X	-	-	-
17	CLA	1	511	X	-	-	-
17	CLA	1	515	X	-	-	-
17	CLA	2	504	X	-	-	-
17	CLA	2	506	X	-	-	-
17	CLA	2	507	X	-	-	-
17	CLA	2	508	X	-	-	-
17	CLA	2	509	X	-	-	-
17	CLA	2	510	X	-	-	-
17	CLA	2	511	X	-	-	-
17	CLA	2	514	X	-	-	-
17	CLA	3	301	X	-	-	-
17	CLA	3	306	X	-	-	-
17	CLA	3	307	X	-	-	-
17	CLA	3	308	X	-	-	-
17	CLA	3	310	X	-	-	-
17	CLA	3	311	X	-	-	-
17	CLA	3	312	X	-	-	-
17	CLA	3	313	X	-	-	-

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Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
17	CLA	3	314	X	-	-	-
17	CLA	3	316	X	-	-	-
17	CLA	3	317	X	-	-	-
17	CLA	3	318	X	-	-	-
17	CLA	5	305	X	-	-	-
17	CLA	5	306	X	-	-	-
17	CLA	5	307	X	-	-	-
17	CLA	5	308	X	-	-	-
17	CLA	5	309	X	-	-	-
17	CLA	5	310	X	-	-	-
17	CLA	5	311	X	-	-	-
17	CLA	5	312	X	-	-	-
17	CLA	5	313	X	-	-	-
17	CLA	5	316	X	-	-	-
17	CLA	A	802	X	-	-	-
17	CLA	A	803	X	-	-	-
17	CLA	A	804	X	-	-	-
17	CLA	A	805	X	-	-	-
17	CLA	A	806	X	-	-	-
17	CLA	A	807	X	-	-	-
17	CLA	A	808	X	-	-	-
17	CLA	A	809	X	-	-	-
17	CLA	A	810	X	-	-	-
17	CLA	A	811	X	-	-	-
17	CLA	A	812	X	-	-	-
17	CLA	A	813	X	-	-	-
17	CLA	A	814	X	-	-	-
17	CLA	A	815	X	-	-	-
17	CLA	A	816	X	-	-	-
17	CLA	A	817	X	-	-	-
17	CLA	A	818	X	-	-	-
17	CLA	A	819	X	-	-	-
17	CLA	A	820	X	-	-	-
17	CLA	A	821	X	-	-	-
17	CLA	A	822	X	-	-	-
17	CLA	A	823	X	-	-	-
17	CLA	A	824	X	-	-	-
17	CLA	A	825	X	-	-	-
17	CLA	A	826	X	-	-	-
17	CLA	A	827	X	-	-	-
17	CLA	A	828	X	-	-	-
17	CLA	A	829	X	-	-	-

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Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
17	CLA	A	830	X	-	-	-
17	CLA	A	831	X	-	-	-
17	CLA	A	832	X	-	-	-
17	CLA	A	833	X	-	-	-
17	CLA	A	834	X	-	-	-
17	CLA	A	835	X	-	-	-
17	CLA	A	836	X	-	-	-
17	CLA	A	837	X	-	-	-
17	CLA	A	838	X	-	-	-
17	CLA	A	839	X	-	-	-
17	CLA	A	840	X	-	-	-
17	CLA	A	842	X	-	-	-
17	CLA	A	852	X	-	-	-
17	CLA	B	801	X	-	-	-
17	CLA	B	802	X	-	-	-
17	CLA	B	803	X	-	-	-
17	CLA	B	804	X	-	-	-
17	CLA	B	805	X	-	-	-
17	CLA	B	806	X	-	-	-
17	CLA	B	807	X	-	-	-
17	CLA	B	808	X	-	-	-
17	CLA	B	809	X	-	-	-
17	CLA	B	810	X	-	-	-
17	CLA	B	811	X	-	-	-
17	CLA	B	812	X	-	-	-
17	CLA	B	813	X	-	-	-
17	CLA	B	814	X	-	-	-
17	CLA	B	815	X	-	-	-
17	CLA	B	816	X	-	-	-
17	CLA	B	817	X	-	-	-
17	CLA	B	818	X	-	-	-
17	CLA	B	819	X	-	-	-
17	CLA	B	820	X	-	-	-
17	CLA	B	821	X	-	-	-
17	CLA	B	822	X	-	-	-
17	CLA	B	823	X	-	-	-
17	CLA	B	824	X	-	-	-
17	CLA	B	825	X	-	-	-
17	CLA	B	826	X	-	-	-
17	CLA	B	827	X	-	-	-
17	CLA	B	828	X	-	-	-
17	CLA	B	829	X	-	-	-

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Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
17	CLA	B	830	X	-	-	-
17	CLA	B	831	X	-	-	-
17	CLA	B	832	X	-	-	-
17	CLA	B	833	X	-	-	-
17	CLA	B	834	X	-	-	-
17	CLA	B	835	X	-	-	-
17	CLA	B	837	X	-	-	-
17	CLA	B	838	X	-	-	-
17	CLA	B	839	X	-	-	-
17	CLA	B	840	X	-	-	-
17	CLA	B	841	X	-	-	-
17	CLA	B	842	X	-	-	-
17	CLA	F	802	X	-	-	-
17	CLA	F	803	X	-	-	-
17	CLA	J	101	X	-	-	-
17	CLA	K	201	X	-	-	-
17	CLA	K	202	X	-	-	-
17	CLA	K	203	X	-	-	-
17	CLA	K	205	X	-	-	-
17	CLA	L	301	X	-	-	-
17	CLA	L	302	X	-	-	-
17	CLA	L	303	X	-	-	-
17	CLA	L	304	X	-	-	-
25	CHL	1	512	X	-	-	-
25	CHL	1	514	X	-	-	-
25	CHL	1	517	X	-	-	-
25	CHL	2	512	X	-	-	-
25	CHL	2	513	X	-	-	-
25	CHL	2	515	X	-	-	-
25	CHL	2	516	X	-	-	-
25	CHL	3	302	X	-	-	-
25	CHL	3	315	X	-	-	-
25	CHL	5	314	X	-	-	-
25	CHL	5	315	X	-	-	-
25	CHL	5	317	X	-	-	-

2 Entry composition

There are 26 unique types of molecules in this entry. The entry contains 32973 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 Photosystem I P700 chlorophyll a apoprotein A1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	742	5813	3812	983	1000	18	0	0

- Molecule 2 is a protein called Photosystem I P700 chlorophyll a apoprotein A2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	733	5849	3834	995	1006	14	0	0

- Molecule 3 is a protein called Photosystem I iron-sulfur center.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	81	610	376	105	117	12	0	0

- Molecule 4 is a protein called Photosystem I reaction center subunit II, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	142	1113	716	193	201	3	0	0

- Molecule 5 is a protein called Photosystem I reaction center subunit IV, chloroplastic.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
5	E	68	538	341	98	99	0	0

- Molecule 6 is a protein called Photosystem I reaction center subunit III, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	F	158	1203	774	208	218	3	0	0

- Molecule 7 is a protein called Photosystem I reaction center subunit VI, chloroplastic.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
7	H	61	454	303	76	75	0	0

- Molecule 8 is a protein called Photosystem I reaction center subunit VIII.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
8	I	30	232	161	35	36	0	0

- Molecule 9 is a protein called Photosystem I reaction center subunit IX.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	J	42	333	228	51	53	1	0	0

- Molecule 10 is a protein called Photosystem I reaction center subunit psaK, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	K	84	565	359	94	108	4	0	0

- Molecule 11 is a protein called Photosystem I reaction center subunit XI, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	L	146	1088	716	174	197	1	0	0

- Molecule 12 is a protein called Chlorophyll a-b binding protein Lhca1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	1	191	1422	921	239	258	4	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
1	73	PHE	UNK	conflict	UNP A0A287WC32
1	74	GLU	UNK	conflict	UNP A0A287WC32
1	75	ARG	UNK	conflict	UNP A0A287WC32

- Molecule 13 is a protein called Chlorophyll a-b binding protein, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	2	203	1561	1018	257	283	3	0	0

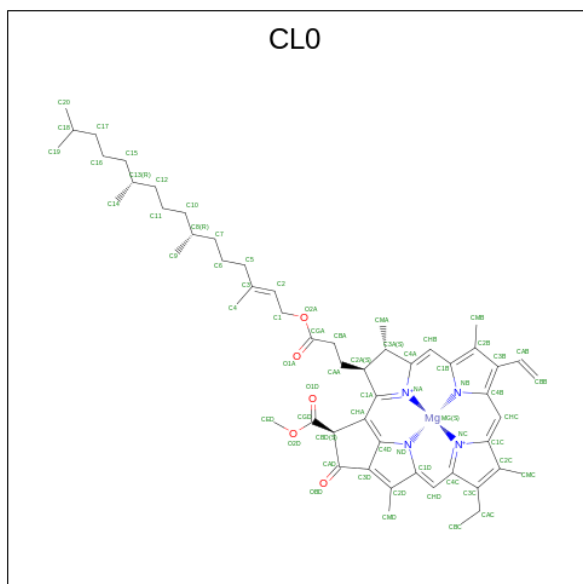
- Molecule 14 is a protein called Chlorophyll a-b binding protein, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	3	222	1629	1063	271	292	3	0	0

- Molecule 15 is a protein called Chlorophyll a-b binding protein Lhca5.

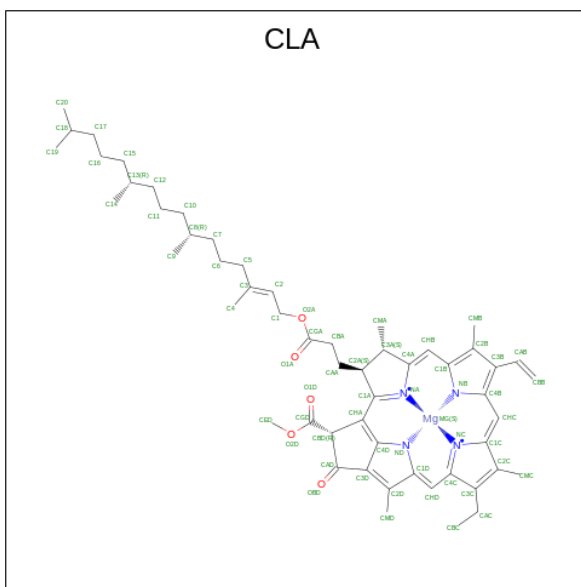
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	5	205	1486	962	247	270	7	0	0

- Molecule 16 is CHLOROPHYLL A ISOMER (three-letter code: CL0) (formula: $C_{55}H_{72}MgN_4O_5$).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	Mg	N	O	
16	A	1	61	52	1	4	4	0

- Molecule 17 is CHLOROPHYLL A (three-letter code: CLA) (formula: $C_{55}H_{72}MgN_4O_5$).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	Mg	N	O	
17	A	1	2024	1655	41	164	164	0
17	A	1	2024	1655	41	164	164	0
17	A	1	2024	1655	41	164	164	0
17	A	1	2024	1655	41	164	164	0
17	A	1	2024	1655	41	164	164	0
17	A	1	2024	1655	41	164	164	0
17	A	1	2024	1655	41	164	164	0
17	A	1	2024	1655	41	164	164	0
17	A	1	2024	1655	41	164	164	0
17	A	1	2024	1655	41	164	164	0
17	A	1	2024	1655	41	164	164	0
17	A	1	2024	1655	41	164	164	0
17	A	1	2024	1655	41	164	164	0
17	A	1	2024	1655	41	164	164	0

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Mol	Chain	Residues	Atoms					AltConf
			Total	C	Mg	N	O	
17	A	1	Total 2024	C 1655	Mg 41	N 164	O 164	0
17	A	1	Total 2024	C 1655	Mg 41	N 164	O 164	0
17	A	1	Total 2024	C 1655	Mg 41	N 164	O 164	0
17	A	1	Total 2024	C 1655	Mg 41	N 164	O 164	0
17	A	1	Total 2024	C 1655	Mg 41	N 164	O 164	0
17	A	1	Total 2024	C 1655	Mg 41	N 164	O 164	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0

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Mol	Chain	Residues	Atoms					AltConf
			Total	C	Mg	N	O	
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	B	1	Total 2118	C 1731	Mg 42	N 168	O 177	0
17	F	1	Total 83	C 67	Mg 2	N 8	O 6	0
17	F	1	Total 83	C 67	Mg 2	N 8	O 6	0
17	J	1	Total 42	C 34	Mg 1	N 4	O 3	0
17	K	1	Total 157	C 127	Mg 4	N 16	O 10	0
17	K	1	Total 157	C 127	Mg 4	N 16	O 10	0
17	K	1	Total 157	C 127	Mg 4	N 16	O 10	0
17	K	1	Total 157	C 127	Mg 4	N 16	O 10	0
17	L	1	Total 193	C 155	Mg 4	N 16	O 18	0
17	L	1	Total 193	C 155	Mg 4	N 16	O 18	0
17	L	1	Total 193	C 155	Mg 4	N 16	O 18	0
17	L	1	Total 193	C 155	Mg 4	N 16	O 18	0
17	1	1	Total 471	C 380	Mg 10	N 40	O 41	0
17	1	1	Total 471	C 380	Mg 10	N 40	O 41	0
17	1	1	Total 471	C 380	Mg 10	N 40	O 41	0
17	1	1	Total 471	C 380	Mg 10	N 40	O 41	0

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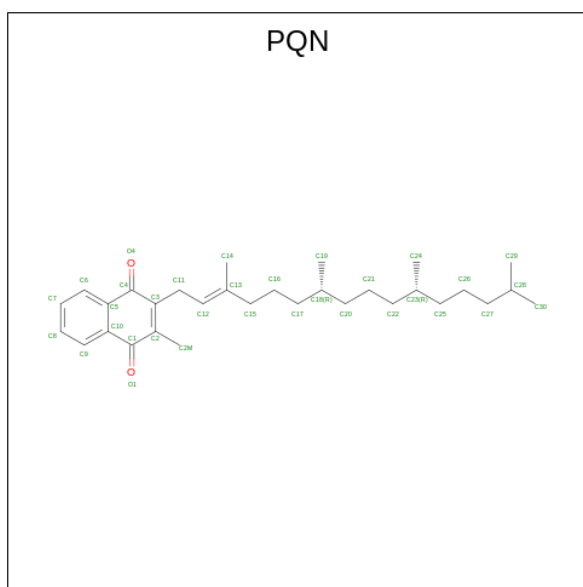
Mol	Chain	Residues	Atoms					AltConf
			Total	C	Mg	N	O	
17	1	1	Total 471	C 380	Mg 10	N 40	O 41	0
17	1	1	Total 471	C 380	Mg 10	N 40	O 41	0
17	1	1	Total 471	C 380	Mg 10	N 40	O 41	0
17	1	1	Total 471	C 380	Mg 10	N 40	O 41	0
17	1	1	Total 471	C 380	Mg 10	N 40	O 41	0
17	1	1	Total 471	C 380	Mg 10	N 40	O 41	0
17	2	1	Total 454	C 372	Mg 9	N 36	O 37	0
17	2	1	Total 454	C 372	Mg 9	N 36	O 37	0
17	2	1	Total 454	C 372	Mg 9	N 36	O 37	0
17	2	1	Total 454	C 372	Mg 9	N 36	O 37	0
17	2	1	Total 454	C 372	Mg 9	N 36	O 37	0
17	2	1	Total 454	C 372	Mg 9	N 36	O 37	0
17	2	1	Total 454	C 372	Mg 9	N 36	O 37	0
17	2	1	Total 454	C 372	Mg 9	N 36	O 37	0
17	2	1	Total 454	C 372	Mg 9	N 36	O 37	0
17	2	1	Total 454	C 372	Mg 9	N 36	O 37	0
17	3	1	Total 590	C 474	Mg 13	N 52	O 51	0
17	3	1	Total 590	C 474	Mg 13	N 52	O 51	0
17	3	1	Total 590	C 474	Mg 13	N 52	O 51	0
17	3	1	Total 590	C 474	Mg 13	N 52	O 51	0
17	3	1	Total 590	C 474	Mg 13	N 52	O 51	0
17	3	1	Total 590	C 474	Mg 13	N 52	O 51	0

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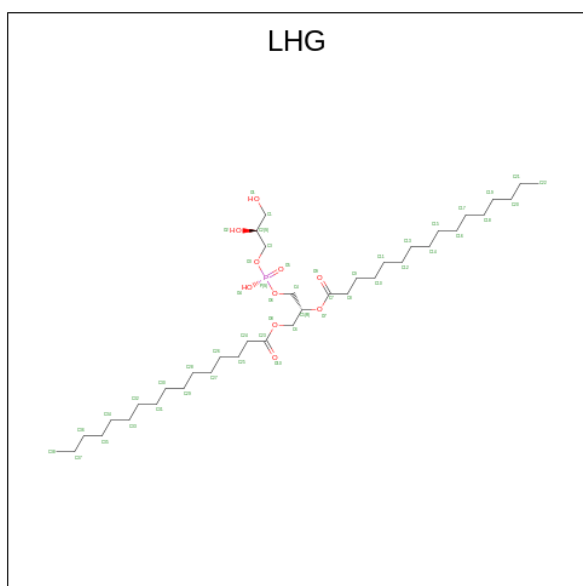
Mol	Chain	Residues	Atoms					AltConf
			Total	C	Mg	N	O	
17	3	1	590	474	13	52	51	0
17	3	1	590	474	13	52	51	0
17	3	1	590	474	13	52	51	0
17	3	1	590	474	13	52	51	0
17	3	1	590	474	13	52	51	0
17	3	1	590	474	13	52	51	0
17	3	1	590	474	13	52	51	0
17	3	1	590	474	13	52	51	0
17	5	1	468	378	10	40	40	0
17	5	1	468	378	10	40	40	0
17	5	1	468	378	10	40	40	0
17	5	1	468	378	10	40	40	0
17	5	1	468	378	10	40	40	0
17	5	1	468	378	10	40	40	0
17	5	1	468	378	10	40	40	0
17	5	1	468	378	10	40	40	0
17	5	1	468	378	10	40	40	0
17	5	1	468	378	10	40	40	0
17	5	1	468	378	10	40	40	0

- Molecule 18 is PHYLLOQUINONE (three-letter code: PQN) (formula: C₃₁H₄₆O₂).



Mol	Chain	Residues	Atoms			AltConf
18	A	1	Total	C	O	0
			33	31	2	
18	B	1	Total	C	O	0
			30	28	2	

- Molecule 19 is 1,2-DIPALMITOYL-PHOSPHATIDYL-GLYCEROLE (three-letter code: LHG) (formula: $C_{38}H_{75}O_{10}P$).



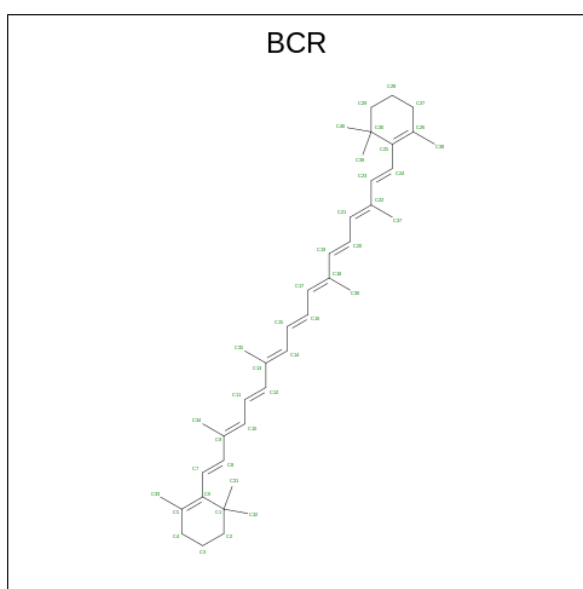
Mol	Chain	Residues	Atoms				AltConf
19	A	1	Total	C	O	P	0
			79	57	20	2	

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Mol	Chain	Residues	Atoms				AltConf
			Total	C	O	P	
19	A	1	79	57	20	2	0
19	B	1	38	27	10	1	0
19	1	1	49	38	10	1	0
19	2	1	35	24	10	1	0

- Molecule 20 is BETA-CAROTENE (three-letter code: BCR) (formula: C₄₀H₅₆).



Mol	Chain	Residues	Atoms		AltConf
20	A	1	Total	C	0
			279	279	
20	A	1	Total	C	0
			279	279	
20	A	1	Total	C	0
			279	279	
20	A	1	Total	C	0
			279	279	
20	A	1	Total	C	0
			279	279	
20	A	1	Total	C	0
			279	279	

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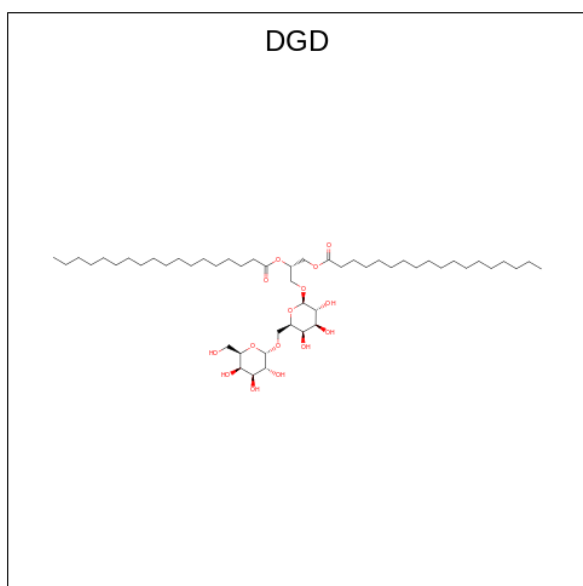
Mol	Chain	Residues	Atoms		AltConf
20	B	1	Total 280	C 280	0
20	B	1	Total 280	C 280	0
20	B	1	Total 280	C 280	0
20	B	1	Total 280	C 280	0
20	B	1	Total 280	C 280	0
20	B	1	Total 280	C 280	0
20	B	1	Total 280	C 280	0
20	F	1	Total 80	C 80	0
20	F	1	Total 80	C 80	0
20	I	1	Total 40	C 40	0
20	J	1	Total 40	C 40	0
20	K	1	Total 40	C 40	0
20	L	1	Total 80	C 80	0
20	L	1	Total 80	C 80	0
20	1	1	Total 19	C 19	0
20	2	1	Total 40	C 40	0
20	3	1	Total 40	C 40	0
20	5	1	Total 40	C 40	0

- Molecule 21 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe₄S₄).



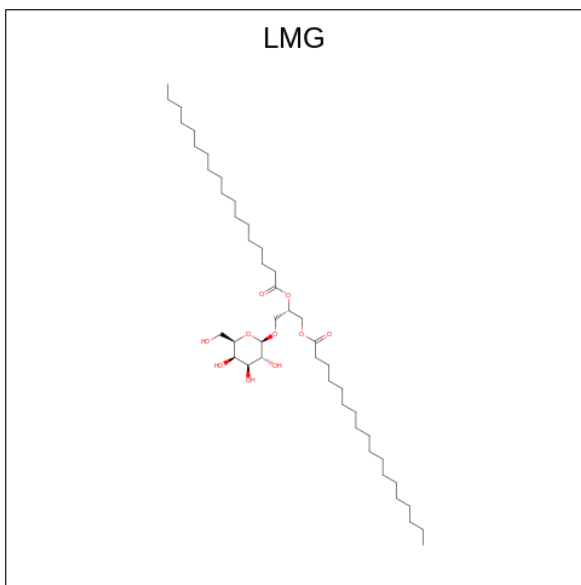
Mol	Chain	Residues	Atoms			AltConf
21	A	1	Total	Fe	S	0
			8	4	4	
21	C	1	Total	Fe	S	0
			16	8	8	
21	C	1	Total	Fe	S	0
			16	8	8	

- Molecule 22 is DIGALACTOSYL DIACYL GLYCEROL (DGDG) (three-letter code: DGD) (formula: $C_{51}H_{96}O_{15}$).



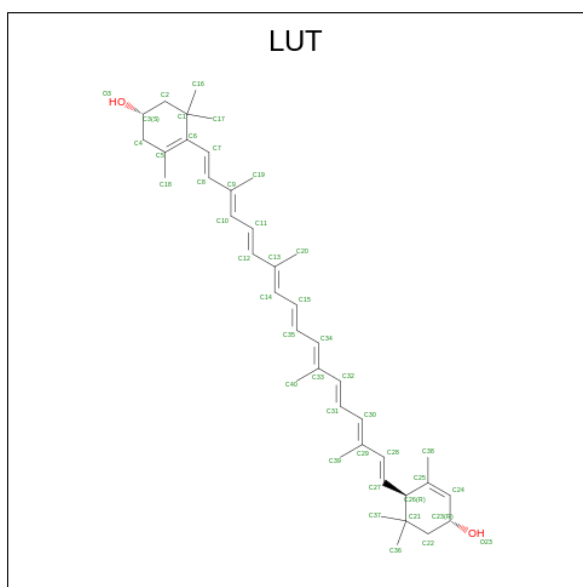
Mol	Chain	Residues	Atoms			AltConf
22	B	1	Total	C	O	0
			59	44	15	
22	J	1	Total	C	O	0
			66	51	15	

- Molecule 23 is 1,2-DISTEAROYL-MONOGALACTOSYL-DIGLYCERIDE (three-letter code: LMG) (formula: C₄₅H₈₆O₁₀).



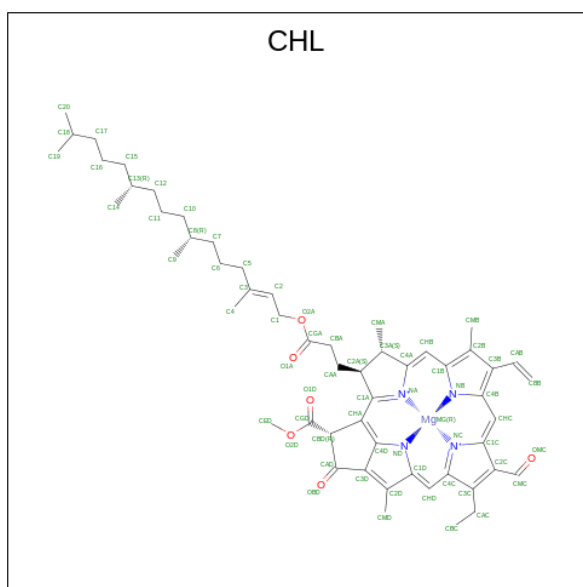
Mol	Chain	Residues	Atoms			AltConf
23	F	1	Total	C	O	0
			75	55	20	
23	F	1	Total	C	O	0
			75	55	20	
23	2	1	Total	C	O	0
			52	35	17	
23	2	1	Total	C	O	0
			52	35	17	
23	5	1	Total	C	O	0
			32	22	10	

- Molecule 24 is (3R,3'R,6S)-4,5-DIDEHYDRO-5,6-DIHYDRO-BETA,BETA-CAROTENE-3,3'-DIOL (three-letter code: LUT) (formula: C₄₀H₅₆O₂).



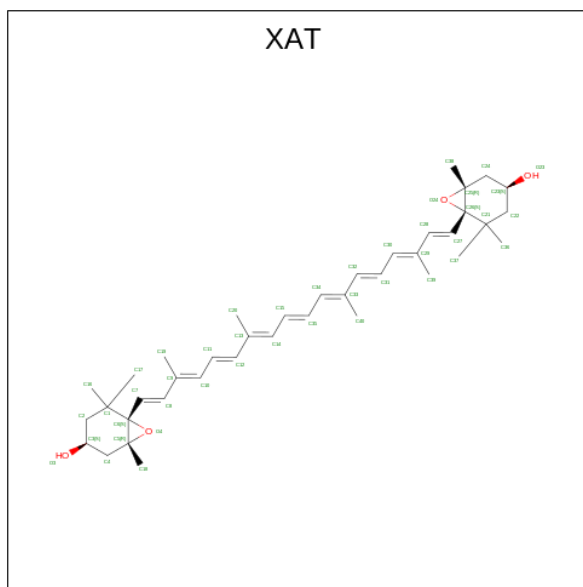
Mol	Chain	Residues	Atoms			AltConf
24	1	1	Total	C	O	0
			84	80	4	
24	1	1	Total	C	O	0
			84	80	4	
24	2	1	Total	C	O	0
			42	40	2	
24	3	1	Total	C	O	0
			84	80	4	
24	3	1	Total	C	O	0
			84	80	4	
24	5	1	Total	C	O	0
			42	40	2	

- Molecule 25 is CHLOROPHYLL B (three-letter code: CHL) (formula: $C_{55}H_{70}MgN_4O_6$).



Mol	Chain	Residues	Atoms				AltConf	
			Total	C	Mg	N		O
25	1	1	Total	C	Mg	N	O	0
			129	100	3	12	14	
25	1	1	Total	C	Mg	N	O	0
			129	100	3	12	14	
25	1	1	Total	C	Mg	N	O	0
			129	100	3	12	14	
25	2	1	Total	C	Mg	N	O	0
			174	135	4	16	19	
25	2	1	Total	C	Mg	N	O	0
			174	135	4	16	19	
25	2	1	Total	C	Mg	N	O	0
			174	135	4	16	19	
25	2	1	Total	C	Mg	N	O	0
			174	135	4	16	19	
25	3	1	Total	C	Mg	N	O	0
			90	70	2	8	10	
25	3	1	Total	C	Mg	N	O	0
			90	70	2	8	10	
25	5	1	Total	C	Mg	N	O	0
			133	102	3	12	16	
25	5	1	Total	C	Mg	N	O	0
			133	102	3	12	16	
25	5	1	Total	C	Mg	N	O	0
			133	102	3	12	16	

- Molecule 26 is (3S,5R,6S,3'S,5'R,6'S)-5,6,5',6'-DIEPOXY-5,6,5',6'- TETRAHYDRO-BETA ,BETA-CAROTENE-3,3'-DIOL (three-letter code: XAT) (formula: C₄₀H₅₆O₄).

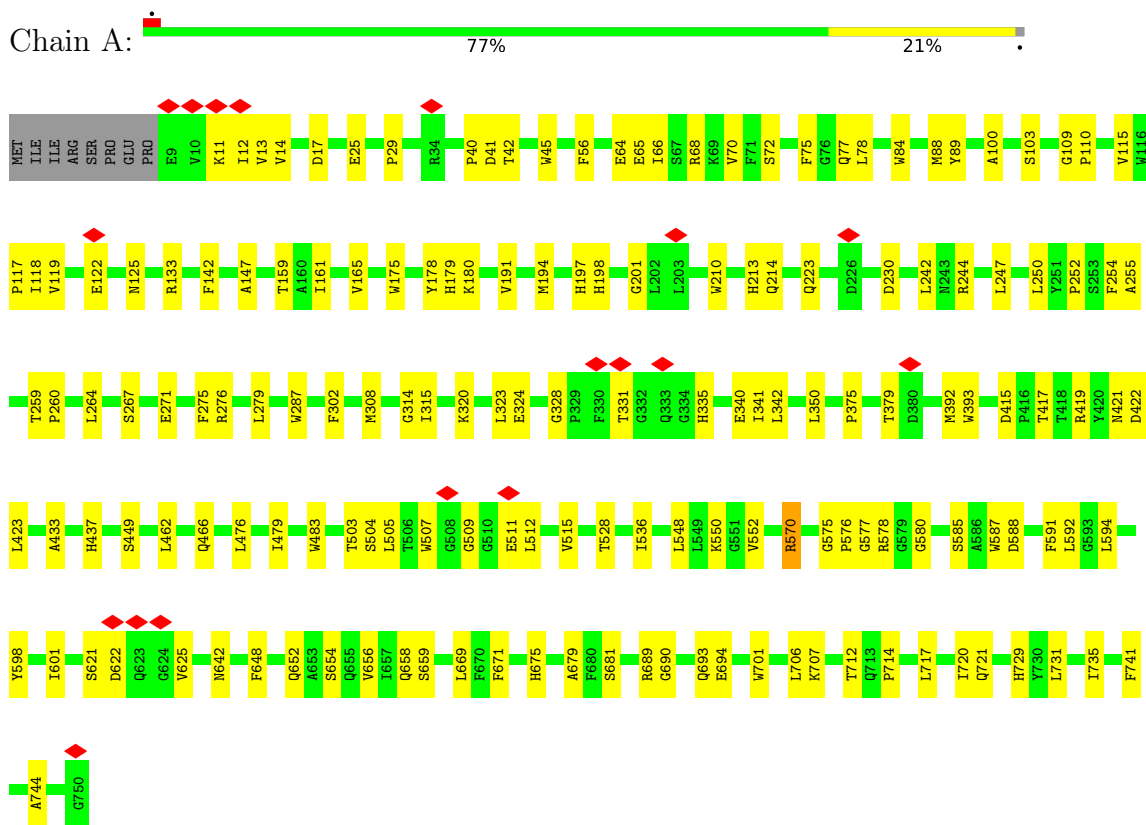


Mol	Chain	Residues	Atoms			AltConf
26	2	1	Total	C	O	0
			44	40	4	
26	5	1	Total	C	O	0
			44	40	4	

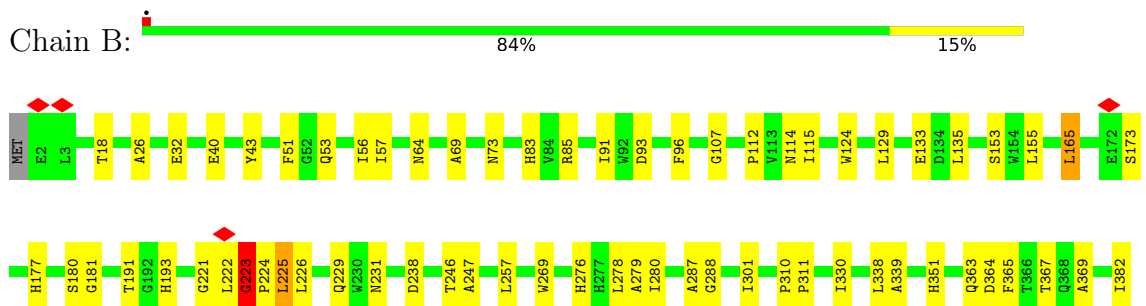
3 Residue-property plots

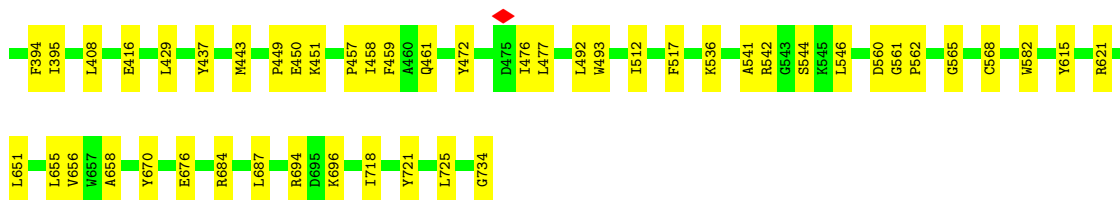
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Photosystem I P700 chlorophyll a apoprotein A1

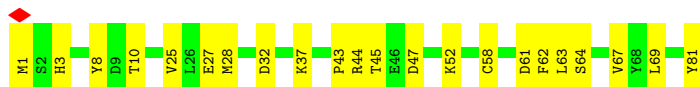


- Molecule 2: Photosystem I P700 chlorophyll a apoprotein A2

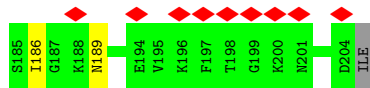
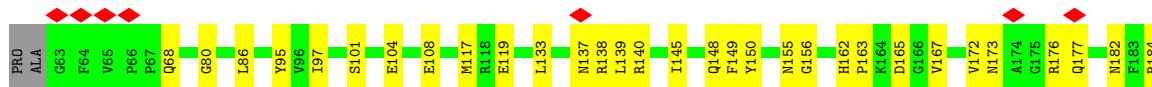
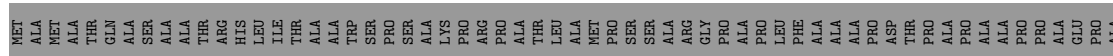




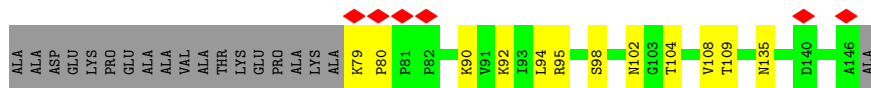
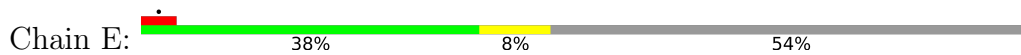
• Molecule 3: Photosystem I iron-sulfur center



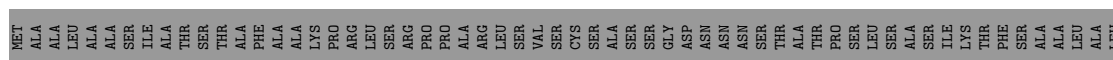
• Molecule 4: Photosystem I reaction center subunit II, chloroplactic

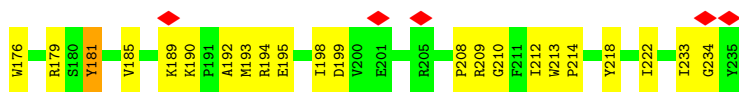


• Molecule 5: Photosystem I reaction center subunit IV, chloroplactic

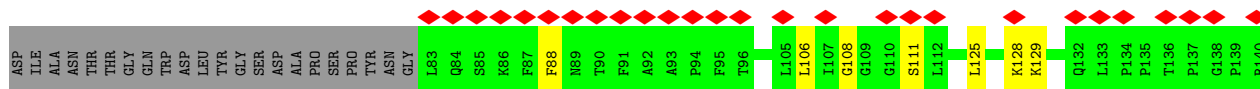
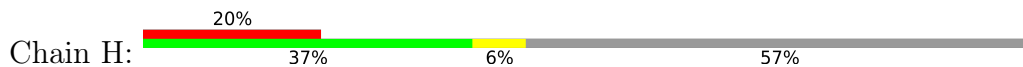


• Molecule 6: Photosystem I reaction center subunit III, chloroplactic

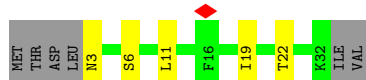




- Molecule 7: Photosystem I reaction center subunit VI, chloroplastic



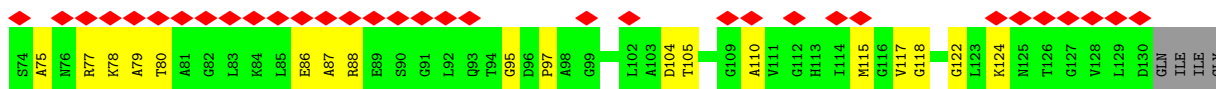
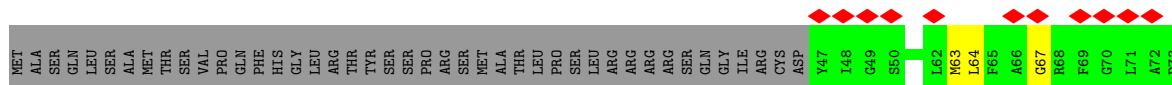
- Molecule 8: Photosystem I reaction center subunit VIII



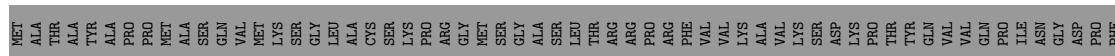
- Molecule 9: Photosystem I reaction center subunit IX

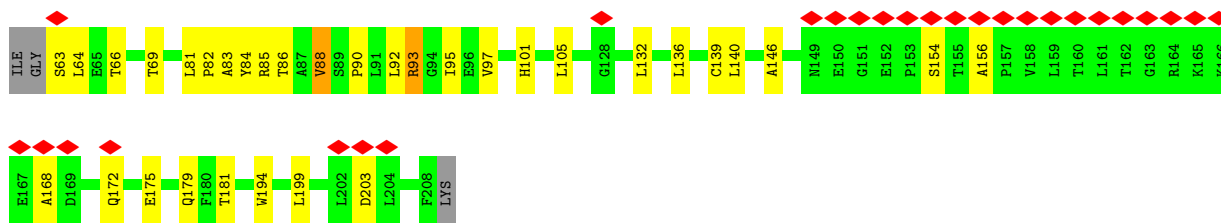


- Molecule 10: Photosystem I reaction center subunit psaK, chloroplastic

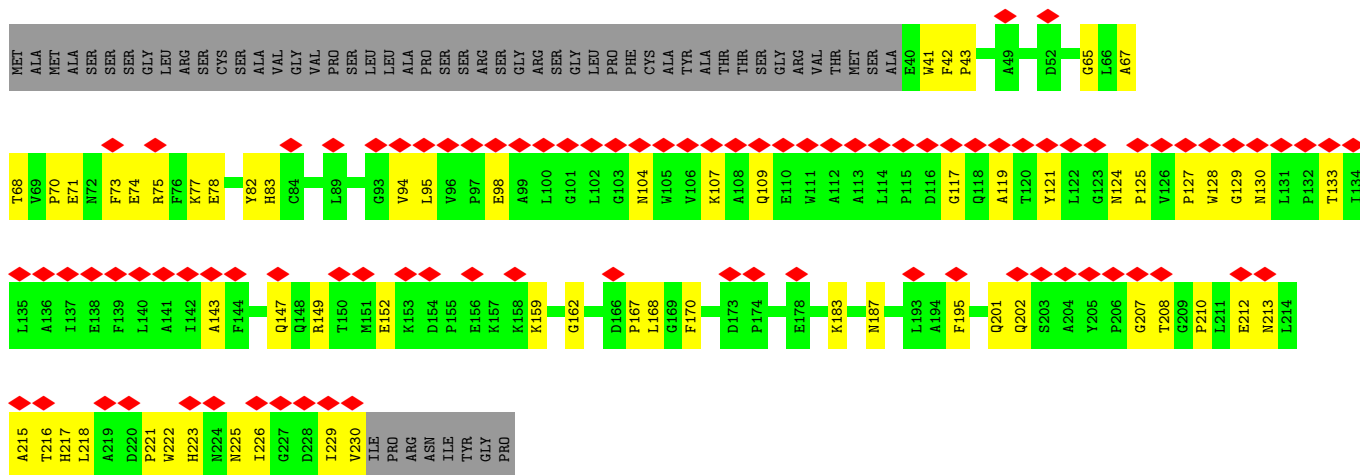


- Molecule 11: Photosystem I reaction center subunit XI, chloroplastic

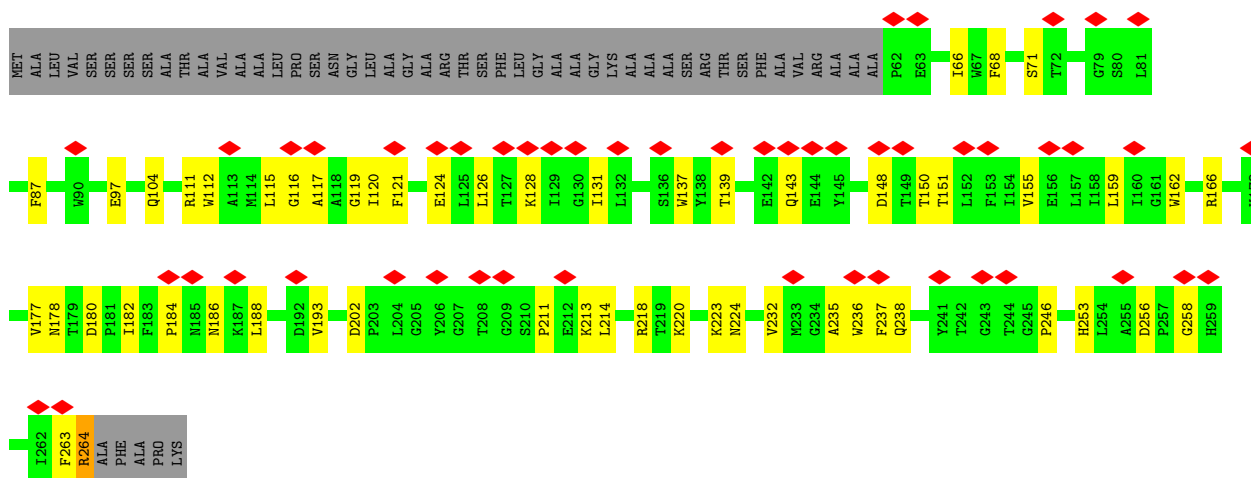




• Molecule 12: Chlorophyll a-b binding protein Lhca1

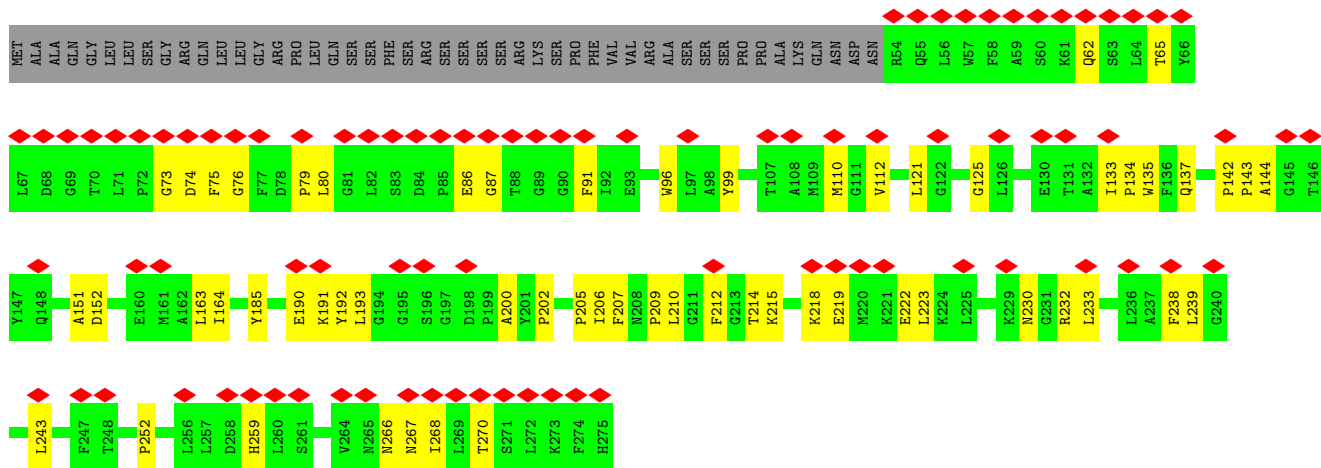


• Molecule 13: Chlorophyll a-b binding protein, chloroplastic

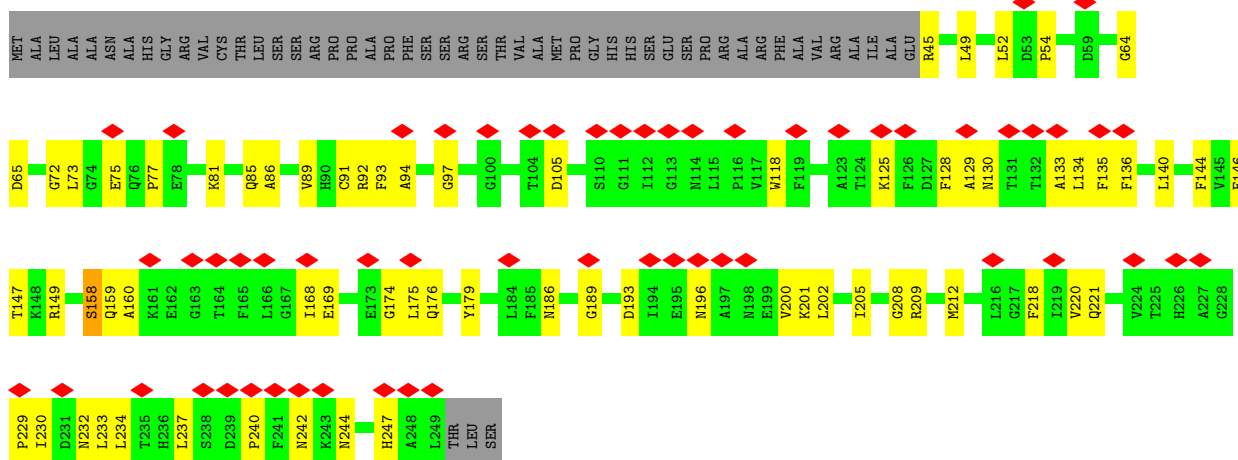


• Molecule 14: Chlorophyll a-b binding protein, chloroplastic





● Molecule 15: Chlorophyll a-b binding protein Lhca5



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	103844	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 ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	5.056	Depositor
Minimum map value	-2.079	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.082	Depositor
Recommended contour level	0.72	Depositor
Map size (Å)	575.08, 575.08, 575.08	wwPDB
Map dimensions	440, 440, 440	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.307, 1.307, 1.307	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: SF4, LHG, DGD, LMG, CLA, PQN, XAT, BCR, CHL, LUT, CL0

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	0.66	0/6010	0.49	0/8202
2	B	0.69	0/6058	0.51	1/8273 (0.0%)
3	C	0.73	0/621	0.53	0/840
4	D	0.61	0/1142	0.53	0/1542
5	E	0.65	0/551	0.49	0/751
6	F	0.63	2/1229 (0.2%)	0.48	0/1664
7	H	0.37	0/467	0.46	0/631
8	I	0.55	0/238	0.48	0/324
9	J	0.54	0/343	0.58	0/467
10	K	0.38	0/571	0.55	0/775
11	L	0.57	0/1120	0.52	0/1534
12	1	0.36	0/1467	0.43	0/2008
13	2	0.42	0/1616	0.46	0/2215
14	3	0.41	0/1682	0.50	0/2295
15	5	0.45	0/1527	0.50	0/2085
All	All	0.59	2/24642 (0.0%)	0.50	1/33606 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
2	B	0	1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	F	181	TYR	CE1-CZ	-8.91	1.26	1.38
6	F	181	TYR	CG-CD1	-5.10	1.32	1.39

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	223	GLY	N-CA-C	-5.13	100.26	113.10

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	222	LEU	Mainchain

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	5813	0	5633	132	0
2	B	5849	0	5600	95	0
3	C	610	0	597	22	0
4	D	1113	0	1113	27	0
5	E	538	0	537	8	0
6	F	1203	0	1199	42	0
7	H	454	0	487	6	0
8	I	232	0	254	4	0
9	J	333	0	347	12	0
10	K	565	0	557	18	0
11	L	1088	0	1079	30	0
12	1	1422	0	1324	50	0
13	2	1561	0	1485	57	0
14	3	1629	0	1496	47	0
15	5	1486	0	1389	58	0
16	A	61	0	62	4	0
17	1	471	0	375	27	0
17	2	454	0	383	23	0
17	3	590	0	442	33	0
17	5	468	0	375	21	0
17	A	2024	0	1724	73	0
17	B	2118	0	1848	86	0
17	F	83	0	60	5	0
17	J	42	0	31	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
17	K	157	0	107	7	0
17	L	193	0	152	8	0
18	A	33	0	46	2	0
18	B	30	0	37	1	0
19	1	49	0	74	5	0
19	2	35	0	40	2	0
19	A	79	0	104	8	0
19	B	38	0	46	0	0
20	1	19	0	26	3	0
20	2	40	0	56	4	0
20	3	40	0	56	4	0
20	5	40	0	56	6	0
20	A	279	0	389	18	0
20	B	280	0	392	20	0
20	F	80	0	112	5	0
20	I	40	0	56	4	0
20	J	40	0	56	1	0
20	K	40	0	56	2	0
20	L	80	0	112	10	0
21	A	8	0	0	0	0
21	C	16	0	0	1	0
22	B	59	0	79	4	0
22	J	66	0	96	3	0
23	2	52	0	55	3	0
23	5	32	0	34	1	0
23	F	75	0	90	3	0
24	1	84	0	112	11	0
24	2	42	0	56	9	0
24	3	84	0	112	14	0
24	5	42	0	56	8	0
25	1	129	0	83	7	0
25	2	174	0	110	13	0
25	3	90	0	60	2	0
25	5	133	0	80	8	0
26	2	44	0	56	7	0
26	5	44	0	56	5	0
All	All	32973	0	31505	816	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 13.

The worst 5 of 816 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)
6:F:181:TYR:CE1	6:F:185:VAL:CG1	2.51	0.92
6:F:181:TYR:HE1	6:F:185:VAL:CG1	1.82	0.92
6:F:181:TYR:CE1	6:F:185:VAL:HG11	2.07	0.88
16:A:801:CL0:H13	17:B:802:CLA:OBD	1.77	0.84
6:F:181:TYR:CE1	6:F:185:VAL:HG13	2.18	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	740/750 (99%)	690 (93%)	50 (7%)	0	100	100
2	B	731/734 (100%)	688 (94%)	42 (6%)	1 (0%)	51	82
3	C	79/81 (98%)	70 (89%)	9 (11%)	0	100	100
4	D	140/205 (68%)	118 (84%)	22 (16%)	0	100	100
5	E	66/147 (45%)	61 (92%)	5 (8%)	0	100	100
6	F	156/235 (66%)	150 (96%)	6 (4%)	0	100	100
7	H	59/143 (41%)	58 (98%)	1 (2%)	0	100	100
8	I	28/36 (78%)	28 (100%)	0	0	100	100
9	J	40/42 (95%)	37 (92%)	2 (5%)	1 (2%)	5	26
10	K	82/131 (63%)	73 (89%)	9 (11%)	0	100	100
11	L	144/209 (69%)	135 (94%)	9 (6%)	0	100	100
12	1	189/247 (76%)	179 (95%)	10 (5%)	0	100	100
13	2	201/255 (79%)	185 (92%)	16 (8%)	0	100	100
14	3	220/269 (82%)	195 (89%)	25 (11%)	0	100	100
15	5	203/257 (79%)	173 (85%)	30 (15%)	0	100	100
All	All	3078/3741 (82%)	2840 (92%)	236 (8%)	2 (0%)	54	82

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	223	GLY
9	J	36	ALA

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	592/608 (97%)	589 (100%)	3 (0%)	88	94
2	B	594/601 (99%)	590 (99%)	4 (1%)	84	92
3	C	70/71 (99%)	69 (99%)	1 (1%)	67	83
4	D	119/160 (74%)	119 (100%)	0	100	100
5	E	58/112 (52%)	58 (100%)	0	100	100
6	F	120/183 (66%)	120 (100%)	0	100	100
7	H	48/110 (44%)	48 (100%)	0	100	100
8	I	26/33 (79%)	26 (100%)	0	100	100
9	J	35/36 (97%)	35 (100%)	0	100	100
10	K	52/102 (51%)	51 (98%)	1 (2%)	57	78
11	L	112/166 (68%)	110 (98%)	2 (2%)	59	79
12	1	134/196 (68%)	133 (99%)	1 (1%)	84	92
13	2	156/194 (80%)	155 (99%)	1 (1%)	86	94
14	3	147/216 (68%)	147 (100%)	0	100	100
15	5	139/202 (69%)	138 (99%)	1 (1%)	84	92
All	All	2402/2990 (80%)	2388 (99%)	14 (1%)	86	94

5 of 14 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	C	47	ASP
10	K	104	ASP
15	5	158	SER

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
12	1	170	PHE
13	2	264	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
4	D	68	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

199 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	$\# Z > 2$
17	CLA	A	833	-	39,48,73	1.74	10 (25%)	45,82,113	1.77	9 (20%)
17	CLA	A	814	-	42,50,73	1.82	10 (23%)	48,85,113	1.73	9 (18%)
20	BCR	B	849	-	41,41,41	1.07	2 (4%)	56,56,56	2.01	17 (30%)
23	LMG	2	519	-	36,36,55	1.09	2 (5%)	44,44,63	1.37	8 (18%)
17	CLA	3	310	-	45,53,73	1.77	7 (15%)	52,89,113	1.63	9 (17%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
17	CLA	A	816	-	59,67,73	1.47	8 (13%)	68,105,113	1.56	8 (11%)
22	DGD	B	850	-	60,60,67	0.88	2 (3%)	74,74,81	1.39	11 (14%)
16	CL0	A	801	-	61,69,73	1.64	10 (16%)	70,107,113	2.21	16 (22%)
17	CLA	3	309	-	41,48,73	2.19	11 (26%)	50,82,113	1.57	6 (12%)
25	CHL	2	512	-	46,54,74	2.17	14 (30%)	53,90,114	2.91	20 (37%)
17	CLA	5	316	-	41,49,73	1.73	9 (21%)	47,84,113	1.80	9 (19%)
19	LHG	1	516	17	48,48,48	0.91	2 (4%)	51,54,54	1.16	4 (7%)
25	CHL	1	512	-	47,55,74	2.31	16 (34%)	50,91,114	2.77	20 (40%)
20	BCR	B	844	-	41,41,41	0.85	1 (2%)	56,56,56	2.59	19 (33%)
17	CLA	B	837	-	50,58,73	1.62	10 (20%)	58,95,113	1.62	10 (17%)
24	LUT	1	502	-	42,43,43	0.90	2 (4%)	51,60,60	1.68	11 (21%)
17	CLA	3	313	-	48,56,73	1.71	6 (12%)	55,92,113	1.66	9 (16%)
17	CLA	A	827	-	65,73,73	1.42	12 (18%)	76,113,113	1.51	9 (11%)
17	CLA	B	808	-	52,60,73	1.68	9 (17%)	60,97,113	1.57	9 (15%)
17	CLA	3	311	-	50,58,73	1.51	7 (14%)	58,95,113	1.74	11 (18%)
24	LUT	3	303	-	42,43,43	0.89	2 (4%)	51,60,60	1.51	10 (19%)
20	BCR	K	204	-	41,41,41	0.99	2 (4%)	56,56,56	2.02	16 (28%)
17	CLA	B	827	-	41,49,73	1.78	10 (24%)	47,84,113	1.86	10 (21%)
20	BCR	3	305	-	41,41,41	0.90	2 (4%)	56,56,56	1.98	13 (23%)
17	CLA	B	826	-	62,70,73	1.40	10 (16%)	72,109,113	1.52	10 (13%)
17	CLA	J	101	9	42,50,73	1.79	6 (14%)	48,85,113	1.68	7 (14%)
20	BCR	B	848	-	41,41,41	1.05	2 (4%)	56,56,56	1.98	18 (32%)
20	BCR	A	845	-	41,41,41	1.17	4 (9%)	56,56,56	2.29	20 (35%)
24	LUT	5	303	-	42,43,43	0.95	2 (4%)	51,60,60	1.83	13 (25%)
25	CHL	3	315	-	43,51,74	2.17	14 (32%)	45,86,114	3.02	19 (42%)
17	CLA	2	505	-	52,60,73	1.58	7 (13%)	60,97,113	1.53	6 (10%)
17	CLA	A	809	1	38,47,73	1.83	9 (23%)	39,80,113	1.63	5 (12%)
17	CLA	B	822	-	47,55,73	1.72	10 (21%)	54,91,113	1.75	7 (12%)
17	CLA	1	508	-	39,48,73	1.83	6 (15%)	45,82,113	1.71	7 (15%)
17	CLA	B	840	-	41,49,73	1.75	9 (21%)	47,84,113	1.80	8 (17%)
20	BCR	A	848	-	41,41,41	1.06	2 (4%)	56,56,56	2.00	12 (21%)
17	CLA	1	515	-	45,52,73	1.81	9 (20%)	47,87,113	1.61	6 (12%)
17	CLA	B	819	-	41,49,73	1.77	10 (24%)	47,84,113	1.83	12 (25%)
25	CHL	1	517	12	40,49,74	2.29	14 (35%)	42,83,114	3.16	20 (47%)
17	CLA	B	834	-	45,53,73	1.73	9 (20%)	52,89,113	1.66	10 (19%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
17	CLA	1	513	-	65,73,73	1.53	7 (10%)	76,113,113	1.36	7 (9%)
17	CLA	5	310	-	50,58,73	1.65	8 (16%)	58,95,113	1.59	8 (13%)
17	CLA	3	308	-	55,63,73	1.49	9 (16%)	64,101,113	1.54	9 (14%)
20	BCR	L	306	-	41,41,41	0.85	1 (2%)	56,56,56	1.96	19 (33%)
17	CLA	1	510	19	46,54,73	1.73	8 (17%)	53,90,113	1.56	7 (13%)
17	CLA	F	802	-	42,50,73	1.78	9 (21%)	48,85,113	1.68	7 (14%)
17	CLA	A	812	-	42,50,73	1.75	10 (23%)	48,85,113	1.76	10 (20%)
19	LHG	A	844	17	29,29,48	1.20	3 (10%)	32,35,54	1.19	3 (9%)
17	CLA	B	828	-	41,49,73	1.74	10 (24%)	47,84,113	1.81	12 (25%)
17	CLA	A	829	-	55,63,73	1.60	10 (18%)	64,101,113	1.59	9 (14%)
20	BCR	F	801	-	41,41,41	0.99	2 (4%)	56,56,56	2.09	17 (30%)
25	CHL	1	514	-	40,49,74	2.55	15 (37%)	42,83,114	3.00	19 (45%)
17	CLA	A	811	-	39,48,73	1.73	9 (23%)	45,82,113	1.74	10 (22%)
17	CLA	A	819	-	39,48,73	1.82	9 (23%)	45,82,113	1.67	7 (15%)
17	CLA	A	840	-	41,49,73	1.82	9 (21%)	47,84,113	1.64	8 (17%)
17	CLA	B	803	-	65,73,73	1.45	9 (13%)	76,113,113	1.40	10 (13%)
17	CLA	A	805	-	64,72,73	1.50	12 (18%)	74,111,113	1.57	10 (13%)
17	CLA	B	814	-	41,49,73	1.78	11 (26%)	47,84,113	1.77	12 (25%)
17	CLA	K	203	-	39,48,73	1.71	10 (25%)	45,82,113	1.68	8 (17%)
17	CLA	A	803	-	41,49,73	1.80	10 (24%)	47,84,113	1.79	10 (21%)
17	CLA	L	303	-	52,60,73	1.62	9 (17%)	60,97,113	1.73	10 (16%)
17	CLA	A	808	1	65,73,73	1.42	10 (15%)	76,113,113	1.44	7 (9%)
17	CLA	A	807	-	37,47,73	1.78	10 (27%)	41,80,113	1.76	8 (19%)
17	CLA	A	828	-	41,49,73	1.76	10 (24%)	47,84,113	1.68	7 (14%)
17	CLA	F	803	-	41,49,73	1.77	9 (21%)	47,84,113	1.65	8 (17%)
17	CLA	L	304	-	45,53,73	1.65	10 (22%)	52,89,113	1.88	11 (21%)
17	CLA	B	805	-	41,49,73	1.79	9 (21%)	47,84,113	1.75	10 (21%)
20	BCR	B	852	-	41,41,41	1.22	3 (7%)	56,56,56	2.06	18 (32%)
17	CLA	L	302	-	41,48,73	1.92	9 (21%)	45,82,113	1.80	8 (17%)
17	CLA	3	306	-	52,60,73	1.60	7 (13%)	65,97,113	1.75	11 (16%)
25	CHL	2	513	-	40,48,74	2.49	16 (40%)	37,81,114	3.16	19 (51%)
17	CLA	B	810	2	39,48,73	1.75	10 (25%)	45,82,113	1.81	9 (20%)
17	CLA	B	802	-	64,72,73	1.46	10 (15%)	74,111,113	1.49	10 (13%)
18	PQN	B	843	-	31,31,34	1.36	2 (6%)	38,41,45	1.49	5 (13%)
17	CLA	B	809	-	39,48,73	1.81	10 (25%)	45,82,113	1.69	6 (13%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
17	CLA	A	806	1	65,73,73	1.44	9 (13%)	76,113,113	1.41	8 (10%)
17	CLA	1	505	-	42,50,73	1.86	7 (16%)	48,85,113	1.58	8 (16%)
17	CLA	1	507	12	42,50,73	1.71	9 (21%)	48,85,113	1.68	9 (18%)
17	CLA	3	318	-	45,53,73	1.67	7 (15%)	56,89,113	1.59	8 (14%)
17	CLA	B	832	-	43,51,73	1.67	9 (20%)	49,86,113	1.62	5 (10%)
17	CLA	A	838	-	65,73,73	1.46	10 (15%)	76,113,113	1.45	10 (13%)
17	CLA	A	837	-	41,49,73	1.84	11 (26%)	47,84,113	1.87	10 (21%)
17	CLA	3	307	-	39,48,73	2.01	9 (23%)	45,82,113	1.58	7 (15%)
17	CLA	A	839	-	42,50,73	1.81	10 (23%)	48,85,113	1.73	7 (14%)
17	CLA	A	831	-	63,71,73	1.50	10 (15%)	77,110,113	1.53	12 (15%)
22	DGD	J	103	-	67,67,67	0.83	2 (2%)	81,81,81	1.11	4 (4%)
17	CLA	A	824	-	39,48,73	1.77	8 (20%)	45,82,113	1.68	8 (17%)
17	CLA	K	202	-	41,49,73	1.75	8 (19%)	47,84,113	1.70	8 (17%)
17	CLA	3	312	-	41,49,73	1.84	7 (17%)	47,84,113	1.63	8 (17%)
25	CHL	3	302	13	47,55,74	2.24	15 (31%)	50,91,114	2.81	18 (36%)
17	CLA	5	306	-	39,48,73	1.78	6 (15%)	44,83,113	1.70	7 (15%)
17	CLA	B	812	-	54,62,73	1.59	8 (14%)	67,100,113	1.57	13 (19%)
17	CLA	5	307	15	65,73,73	1.47	8 (12%)	76,113,113	1.35	8 (10%)
25	CHL	5	315	-	46,54,74	2.23	15 (32%)	49,90,114	2.89	21 (42%)
20	BCR	A	849	-	40,40,41	1.04	2 (5%)	54,54,56	1.90	15 (27%)
17	CLA	5	312	-	46,54,73	1.73	8 (17%)	53,90,113	1.50	7 (13%)
17	CLA	B	811	-	55,63,73	1.58	11 (20%)	64,101,113	1.53	7 (10%)
17	CLA	A	830	-	50,58,73	1.59	9 (18%)	58,95,113	1.64	6 (10%)
17	CLA	B	804	-	65,73,73	1.42	11 (16%)	76,113,113	1.42	6 (7%)
20	BCR	B	845	-	41,41,41	1.04	1 (2%)	56,56,56	2.07	17 (30%)
17	CLA	B	818	-	59,67,73	1.50	10 (16%)	68,105,113	1.59	9 (13%)
23	LMG	F	806	-	45,45,55	0.95	2 (4%)	53,53,63	1.07	4 (7%)
17	CLA	3	316	-	38,45,73	1.80	5 (13%)	43,78,113	1.82	8 (18%)
17	CLA	3	317	-	41,49,73	1.79	8 (19%)	47,84,113	1.74	10 (21%)
17	CLA	A	825	-	59,67,73	1.55	10 (16%)	68,105,113	1.47	8 (11%)
17	CLA	B	820	-	53,61,73	1.68	10 (18%)	61,98,113	1.48	8 (13%)
17	CLA	A	821	-	42,50,73	1.78	9 (21%)	48,85,113	1.79	8 (16%)
17	CLA	2	506	-	65,73,73	1.44	9 (13%)	76,113,113	1.51	7 (9%)
25	CHL	5	317	-	41,48,74	2.34	15 (36%)	42,82,114	3.07	22 (52%)
17	CLA	B	823	-	42,50,73	1.76	9 (21%)	48,85,113	1.68	7 (14%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
17	CLA	K	201	-	38,45,73	1.92	9 (23%)	43,78,113	1.66	6 (13%)
17	CLA	A	810	17	54,62,73	1.59	10 (18%)	62,99,113	1.66	7 (11%)
20	BCR	A	851	-	41,41,41	0.91	1 (2%)	56,56,56	2.17	20 (35%)
17	CLA	B	815	-	65,73,73	1.50	11 (16%)	76,113,113	1.44	10 (13%)
25	CHL	2	516	13	43,51,74	2.19	13 (30%)	49,86,114	3.04	19 (38%)
23	LMG	F	805	-	30,30,55	1.22	2 (6%)	38,38,63	1.21	3 (7%)
17	CLA	B	830	-	56,64,73	1.72	11 (19%)	65,102,113	1.45	7 (10%)
18	PQN	A	841	-	34,34,34	1.38	2 (5%)	42,45,45	1.24	4 (9%)
17	CLA	1	511	-	46,54,73	1.71	9 (19%)	53,90,113	1.61	7 (13%)
17	CLA	B	816	-	43,51,73	1.67	9 (20%)	49,86,113	1.66	6 (12%)
20	BCR	J	102	-	41,41,41	1.01	2 (4%)	56,56,56	2.18	24 (42%)
17	CLA	2	504	13	34,44,73	2.06	10 (29%)	42,76,113	1.87	10 (23%)
17	CLA	A	834	1	41,49,73	1.82	9 (21%)	47,84,113	1.62	7 (14%)
17	CLA	5	313	15	39,48,73	1.80	9 (23%)	45,82,113	1.64	8 (17%)
20	BCR	2	503	-	41,41,41	0.89	1 (2%)	56,56,56	3.62	27 (48%)
17	CLA	A	822	-	41,49,73	1.80	9 (21%)	47,84,113	1.79	9 (19%)
20	BCR	B	846	-	41,41,41	1.05	3 (7%)	56,56,56	2.31	18 (32%)
20	BCR	5	302	-	41,41,41	0.83	0	56,56,56	1.97	13 (23%)
23	LMG	5	301	-	32,32,55	1.18	2 (6%)	40,40,63	1.15	3 (7%)
19	LHG	B	851	-	37,37,48	1.08	2 (5%)	40,43,54	1.17	4 (10%)
20	BCR	L	305	-	41,41,41	1.00	1 (2%)	56,56,56	2.16	18 (32%)
24	LUT	2	501	-	42,43,43	0.94	1 (2%)	51,60,60	1.94	15 (29%)
17	CLA	B	801	-	65,73,73	1.47	11 (16%)	76,113,113	1.47	10 (13%)
17	CLA	B	824	-	45,53,73	1.74	9 (20%)	52,89,113	1.54	6 (11%)
20	BCR	A	847	-	41,41,41	0.97	2 (4%)	56,56,56	2.00	20 (35%)
17	CLA	A	818	-	39,48,73	1.75	10 (25%)	45,82,113	1.74	9 (20%)
20	BCR	I	101	-	41,41,41	1.22	3 (7%)	56,56,56	2.08	19 (33%)
17	CLA	B	813	-	43,51,73	1.72	9 (20%)	49,86,113	1.69	9 (18%)
17	CLA	A	817	-	39,47,73	2.03	13 (33%)	42,81,113	1.80	7 (16%)
17	CLA	A	835	-	51,59,73	1.62	10 (19%)	59,96,113	1.75	9 (15%)
17	CLA	B	835	-	60,68,73	1.49	9 (15%)	70,107,113	1.50	11 (15%)
17	CLA	2	511	-	39,48,73	1.82	10 (25%)	45,82,113	1.93	11 (24%)
17	CLA	5	305	-	38,46,73	2.22	10 (26%)	47,79,113	1.71	10 (21%)
17	CLA	A	820	-	57,65,73	1.53	8 (14%)	66,103,113	1.69	9 (13%)
25	CHL	5	314	-	47,55,74	2.22	15 (31%)	50,91,114	2.82	21 (42%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
17	CLA	A	832	-	44,53,73	1.68	10 (22%)	52,88,113	1.78	8 (15%)
17	CLA	B	806	-	38,47,73	1.98	12 (31%)	46,80,113	1.77	10 (21%)
20	BCR	A	846	-	41,41,41	1.05	2 (4%)	56,56,56	2.07	17 (30%)
26	XAT	2	502	-	39,47,47	1.13	4 (10%)	54,74,74	2.84	20 (37%)
17	CLA	B	821	-	50,58,73	1.71	9 (18%)	58,95,113	1.62	8 (13%)
17	CLA	K	205	10	37,47,73	1.93	7 (18%)	42,81,113	1.73	8 (19%)
25	CHL	2	515	-	45,53,74	2.23	14 (31%)	52,89,114	2.82	21 (40%)
17	CLA	B	842	-	57,65,73	1.55	8 (14%)	66,103,113	1.46	7 (10%)
17	CLA	1	506	-	55,63,73	1.62	8 (14%)	64,101,113	1.50	8 (12%)
26	XAT	5	304	-	39,47,47	1.24	5 (12%)	54,74,74	2.53	18 (33%)
17	CLA	B	829	-	39,48,73	1.77	11 (28%)	45,82,113	1.73	9 (20%)
17	CLA	3	301	-	41,49,73	1.80	9 (21%)	47,84,113	1.74	10 (21%)
17	CLA	5	309	-	45,53,73	1.72	8 (17%)	52,89,113	1.65	7 (13%)
17	CLA	A	802	-	58,66,73	1.54	9 (15%)	67,104,113	1.51	7 (10%)
17	CLA	5	311	-	42,50,73	1.72	7 (16%)	48,85,113	1.74	8 (16%)
17	CLA	L	301	-	56,64,73	1.59	11 (19%)	65,102,113	1.50	8 (12%)
19	LHG	2	517	17	34,34,48	1.07	2 (5%)	37,40,54	1.21	4 (10%)
17	CLA	1	509	-	50,58,73	1.63	7 (14%)	58,95,113	1.60	7 (12%)
17	CLA	B	825	-	42,50,73	1.70	10 (23%)	48,85,113	1.69	7 (14%)
20	BCR	1	503	-	19,19,41	0.67	0	26,26,56	2.04	7 (26%)
17	CLA	3	314	14	55,63,73	1.58	6 (10%)	64,101,113	1.55	10 (15%)
17	CLA	A	813	-	45,53,73	1.69	9 (20%)	52,89,113	1.63	7 (13%)
24	LUT	3	304	-	42,43,43	0.91	2 (4%)	51,60,60	1.56	10 (19%)
24	LUT	1	501	-	42,43,43	0.89	1 (2%)	51,60,60	1.65	11 (21%)
17	CLA	A	815	-	45,53,73	1.71	9 (20%)	52,89,113	1.61	8 (15%)
17	CLA	1	504	-	41,49,73	1.78	7 (17%)	47,84,113	1.60	6 (12%)
19	LHG	A	843	-	48,48,48	0.90	3 (6%)	51,54,54	1.29	5 (9%)
17	CLA	B	831	-	43,51,73	1.80	9 (20%)	49,86,113	1.62	7 (14%)
20	BCR	B	847	-	41,41,41	1.03	2 (4%)	56,56,56	2.35	19 (33%)
17	CLA	2	514	-	55,63,73	1.55	10 (18%)	64,101,113	1.47	8 (12%)
17	CLA	A	826	-	60,68,73	1.48	8 (13%)	70,107,113	1.54	9 (12%)
21	SF4	C	102	3	0,12,12	-	-	-	-	-
17	CLA	B	807	2	65,73,73	1.46	11 (16%)	76,113,113	1.42	6 (7%)
21	SF4	A	850	1,2	0,12,12	-	-	-	-	-
17	CLA	B	836	-	42,50,73	1.84	9 (21%)	48,85,113	1.56	7 (14%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
17	CLA	A	804	17	52,60,73	1.56	9 (17%)	60,97,113	1.60	7 (11%)
17	CLA	2	509	-	50,58,73	1.60	7 (14%)	58,95,113	1.63	8 (13%)
17	CLA	5	308	-	60,68,73	1.52	9 (15%)	70,107,113	1.57	8 (11%)
17	CLA	B	838	-	65,73,73	1.47	10 (15%)	76,113,113	1.49	8 (10%)
17	CLA	B	841	-	54,62,73	1.56	10 (18%)	62,99,113	1.53	9 (14%)
17	CLA	2	508	-	47,55,73	1.72	7 (14%)	54,91,113	1.49	6 (11%)
17	CLA	A	842	19	50,58,73	1.66	10 (20%)	58,95,113	1.52	8 (13%)
20	BCR	F	804	-	41,41,41	1.03	1 (2%)	56,56,56	1.97	18 (32%)
17	CLA	B	839	-	47,55,73	1.66	9 (19%)	54,91,113	1.73	9 (16%)
17	CLA	2	507	13	47,56,73	1.97	9 (19%)	54,91,113	1.81	10 (18%)
21	SF4	C	101	3	0,12,12	-	-	-	-	-
17	CLA	A	836	-	55,63,73	1.65	10 (18%)	64,101,113	1.60	10 (15%)
17	CLA	B	833	-	65,73,73	1.39	8 (12%)	76,113,113	1.57	10 (13%)
17	CLA	A	852	-	57,65,73	1.61	9 (15%)	66,103,113	1.43	9 (13%)
17	CLA	2	510	19	60,68,73	1.50	7 (11%)	70,107,113	1.51	9 (12%)
17	CLA	B	817	-	49,57,73	1.68	11 (22%)	55,93,113	1.59	7 (12%)
23	LMG	2	518	-	16,16,55	0.47	0	22,22,63	0.99	2 (9%)
17	CLA	A	823	-	55,62,73	1.74	11 (20%)	60,99,113	1.54	10 (16%)
20	BCR	A	853	-	41,41,41	0.97	2 (4%)	56,56,56	2.24	18 (32%)

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
17	CLA	A	833	-	1/1/9/20	1/8/82/115	-
17	CLA	A	814	-	1/1/10/20	1/10/88/115	-
20	BCR	B	849	-	-	3/29/63/63	0/2/2/2
23	LMG	2	519	-	-	14/31/51/70	0/1/1/1
17	CLA	3	310	-	1/1/11/20	4/13/91/115	-
17	CLA	A	816	-	1/1/13/20	12/29/107/115	-
22	DGD	B	850	-	-	19/48/88/95	0/2/2/2
16	CL0	A	801	-	3/3/18/25	5/33/125/135	-
17	CLA	3	309	-	-	4/10/86/115	-
25	CHL	2	512	-	3/3/16/26	3/17/113/137	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
17	CLA	5	316	-	1/1/10/20	2/8/86/115	-
19	LHG	1	516	17	-	23/53/53/53	-
25	CHL	1	512	-	3/3/16/26	8/17/115/137	-
20	BCR	B	844	-	-	4/29/63/63	0/2/2/2
17	CLA	B	837	-	1/1/12/20	5/19/97/115	-
24	LUT	1	502	-	-	4/29/67/67	0/2/2/2
17	CLA	3	313	-	1/1/11/20	10/17/95/115	-
17	CLA	A	827	-	1/1/15/20	17/37/115/115	-
17	CLA	B	808	-	1/1/12/20	7/22/100/115	-
17	CLA	3	311	-	1/1/12/20	8/19/97/115	-
24	LUT	3	303	-	-	2/29/67/67	0/2/2/2
20	BCR	K	204	-	-	8/29/63/63	0/2/2/2
17	CLA	B	827	-	1/1/10/20	3/8/86/115	-
20	BCR	3	305	-	-	8/29/63/63	0/2/2/2
17	CLA	B	826	-	1/1/14/20	8/34/112/115	-
17	CLA	J	101	9	1/1/10/20	7/10/88/115	-
20	BCR	B	848	-	-	2/29/63/63	0/2/2/2
20	BCR	A	845	-	-	6/29/63/63	0/2/2/2
25	CHL	3	315	-	3/3/15/26	3/12/110/137	-
24	LUT	5	303	-	-	2/29/67/67	0/2/2/2
17	CLA	2	505	-	-	11/22/100/115	-
17	CLA	A	809	1	1/1/9/20	1/4/84/115	-
17	CLA	B	822	-	1/1/11/20	4/16/94/115	-
17	CLA	1	508	-	1/1/9/20	3/8/82/115	-
17	CLA	B	840	-	1/1/10/20	1/8/86/115	-
20	BCR	A	848	-	-	6/29/63/63	0/2/2/2
17	CLA	1	515	-	1/1/10/20	6/13/87/115	-
17	CLA	B	819	-	1/1/10/20	0/8/86/115	-
25	CHL	1	517	12	3/3/14/26	5/10/104/137	-
17	CLA	B	834	-	1/1/11/20	6/13/91/115	-
17	CLA	5	310	-	1/1/12/20	10/19/97/115	-
17	CLA	1	513	-	-	19/37/115/115	-
17	CLA	3	308	-	1/1/13/20	14/25/103/115	-
20	BCR	L	306	-	-	6/29/63/63	0/2/2/2
17	CLA	1	510	19	1/1/11/20	7/15/93/115	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
17	CLA	F	802	-	1/1/10/20	2/10/88/115	-
17	CLA	A	812	-	1/1/10/20	3/10/88/115	-
19	LHG	A	844	17	-	11/34/34/53	-
17	CLA	B	828	-	1/1/10/20	3/8/86/115	-
17	CLA	A	829	-	1/1/13/20	6/25/103/115	-
20	BCR	A	853	-	-	2/29/63/63	0/2/2/2
20	BCR	F	801	-	-	6/29/63/63	0/2/2/2
17	CLA	A	811	-	1/1/9/20	2/8/82/115	-
17	CLA	A	819	-	1/1/9/20	3/8/82/115	-
17	CLA	A	840	-	1/1/10/20	2/8/86/115	-
17	CLA	B	803	-	1/1/15/20	16/37/115/115	-
17	CLA	A	805	-	1/1/14/20	18/36/114/115	-
17	CLA	B	814	-	1/1/10/20	5/8/86/115	-
17	CLA	K	203	-	1/1/9/20	5/8/82/115	-
17	CLA	A	803	-	1/1/10/20	0/8/86/115	-
17	CLA	L	303	-	1/1/12/20	12/22/100/115	-
17	CLA	A	808	1	1/1/15/20	8/37/115/115	-
17	CLA	A	807	-	1/1/8/20	1/5/79/115	-
17	CLA	A	828	-	1/1/10/20	2/8/86/115	-
17	CLA	F	803	-	1/1/10/20	3/8/86/115	-
17	CLA	L	304	-	1/1/11/20	6/13/91/115	-
17	CLA	B	805	-	1/1/10/20	2/8/86/115	-
20	BCR	B	852	-	-	6/29/63/63	0/2/2/2
17	CLA	L	302	-	1/1/9/20	1/8/82/115	-
17	CLA	3	306	-	1/1/13/20	14/23/99/115	-
25	CHL	2	513	-	3/3/13/26	5/10/100/137	-
17	CLA	B	810	2	1/1/9/20	2/8/82/115	-
17	CLA	B	802	-	1/1/14/20	6/35/113/115	-
18	PQN	B	843	-	-	7/20/40/43	0/2/2/2
17	CLA	B	809	-	1/1/9/20	2/8/82/115	-
17	CLA	A	806	1	1/1/15/20	20/37/115/115	-
17	CLA	1	505	-	1/1/10/20	3/10/88/115	-
17	CLA	1	507	12	1/1/10/20	4/10/88/115	-
17	CLA	3	318	-	1/1/11/20	6/15/91/115	-
17	CLA	B	832	-	1/1/10/20	3/11/89/115	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
17	CLA	A	838	-	1/1/15/20	15/37/115/115	-
17	CLA	A	837	-	1/1/10/20	4/8/86/115	-
17	CLA	3	307	-	1/1/9/20	3/8/82/115	-
17	CLA	A	839	-	1/1/10/20	3/10/88/115	-
17	CLA	A	831	-	1/1/14/20	17/35/111/115	-
22	DGD	J	103	-	-	26/55/95/95	0/2/2/2
17	CLA	A	824	-	1/1/9/20	5/8/82/115	-
17	CLA	K	202	-	1/1/10/20	2/8/86/115	-
17	CLA	3	312	-	1/1/10/20	5/8/86/115	-
25	CHL	3	302	13	3/3/16/26	3/17/115/137	-
17	CLA	5	306	-	1/1/10/20	2/6/84/115	-
17	CLA	B	812	-	1/1/13/20	6/25/101/115	-
17	CLA	5	307	15	1/1/15/20	17/37/115/115	-
25	CHL	5	315	-	3/3/16/26	4/15/113/137	-
20	BCR	A	849	-	-	2/27/61/63	0/2/2/2
17	CLA	5	312	-	1/1/11/20	7/15/93/115	-
17	CLA	B	811	-	1/1/13/20	12/25/103/115	-
17	CLA	A	830	-	1/1/12/20	3/19/97/115	-
17	CLA	B	804	-	1/1/15/20	14/37/115/115	-
20	BCR	B	845	-	-	6/29/63/63	0/2/2/2
17	CLA	B	818	-	1/1/13/20	16/30/108/115	-
23	LMG	F	806	-	-	18/40/60/70	0/1/1/1
17	CLA	3	316	-	1/1/8/20	0/2/76/115	-
17	CLA	3	317	-	1/1/10/20	4/8/86/115	-
17	CLA	A	825	-	1/1/13/20	8/30/108/115	-
17	CLA	B	820	-	1/1/12/20	5/23/101/115	-
17	CLA	A	821	-	1/1/10/20	2/10/88/115	-
17	CLA	2	506	-	1/1/15/20	16/37/115/115	-
25	CHL	5	317	-	3/3/14/26	4/8/102/137	-
17	CLA	B	823	-	1/1/10/20	4/10/88/115	-
17	CLA	K	201	-	1/1/8/20	0/2/76/115	-
17	CLA	A	810	17	1/1/12/20	5/24/102/115	-
20	BCR	A	851	-	-	6/29/63/63	0/2/2/2
17	CLA	B	815	-	1/1/15/20	7/37/115/115	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
25	CHL	2	516	13	3/3/15/26	8/13/109/137	-
23	LMG	F	805	-	-	4/25/45/70	0/1/1/1
17	CLA	B	830	-	1/1/13/20	11/27/105/115	-
18	PQN	A	841	-	-	13/23/43/43	0/2/2/2
17	CLA	1	511	-	1/1/11/20	5/15/93/115	-
17	CLA	B	816	-	1/1/10/20	4/11/89/115	-
20	BCR	J	102	-	-	3/29/63/63	0/2/2/2
17	CLA	2	504	13	1/1/7/20	0/2/73/115	-
17	CLA	A	834	1	1/1/10/20	4/8/86/115	-
17	CLA	5	313	15	1/1/9/20	2/8/82/115	-
20	BCR	2	503	-	-	8/29/63/63	0/2/2/2
17	CLA	A	822	-	1/1/10/20	2/8/86/115	-
20	BCR	B	846	-	-	6/29/63/63	0/2/2/2
20	BCR	5	302	-	-	9/29/63/63	0/2/2/2
23	LMG	5	301	-	-	8/27/47/70	0/1/1/1
19	LHG	B	851	-	-	18/42/42/53	-
20	BCR	L	305	-	-	9/29/63/63	0/2/2/2
24	LUT	2	501	-	-	0/29/67/67	0/2/2/2
17	CLA	B	801	-	1/1/15/20	9/37/115/115	-
17	CLA	B	824	-	1/1/11/20	6/13/91/115	-
20	BCR	A	847	-	-	2/29/63/63	0/2/2/2
17	CLA	A	818	-	1/1/9/20	4/8/82/115	-
20	BCR	I	101	-	-	4/29/63/63	0/2/2/2
17	CLA	B	813	-	1/1/10/20	3/11/89/115	-
17	CLA	A	817	-	1/1/9/20	0/2/82/115	-
17	CLA	A	835	-	1/1/12/20	12/21/99/115	-
17	CLA	B	835	-	1/1/14/20	6/31/109/115	-
17	CLA	2	511	-	1/1/9/20	1/8/82/115	-
17	CLA	5	305	-	1/1/9/20	1/8/80/115	-
17	CLA	A	820	-	1/1/13/20	10/28/106/115	-
25	CHL	5	314	-	3/3/16/26	7/17/115/137	-
17	CLA	A	832	-	1/1/10/20	5/11/89/115	-
17	CLA	B	806	-	1/1/8/20	4/8/79/115	-
20	BCR	A	846	-	-	7/29/63/63	0/2/2/2
26	XAT	2	502	-	-	6/31/93/93	0/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
17	CLA	B	821	-	1/1/12/20	5/19/97/115	-
17	CLA	K	205	10	1/1/9/20	0/6/80/115	-
25	CHL	2	515	-	3/3/16/26	6/15/111/137	-
17	CLA	B	842	-	1/1/13/20	15/28/106/115	-
17	CLA	1	506	-	1/1/13/20	9/25/103/115	-
26	XAT	5	304	-	-	2/31/93/93	0/4/4/4
17	CLA	B	829	-	1/1/9/20	2/8/82/115	-
17	CLA	3	301	-	1/1/10/20	2/8/86/115	-
17	CLA	5	309	-	1/1/11/20	5/13/91/115	-
17	CLA	A	802	-	1/1/13/20	12/29/107/115	-
17	CLA	5	311	-	1/1/10/20	4/10/88/115	-
17	CLA	L	301	-	1/1/13/20	5/27/105/115	-
19	LHG	2	517	17	-	5/39/39/53	-
17	CLA	1	509	-	-	6/19/97/115	-
17	CLA	B	825	-	1/1/10/20	3/10/88/115	-
20	BCR	1	503	-	-	4/11/28/63	0/1/1/2
17	CLA	3	314	14	1/1/13/20	13/25/103/115	-
17	CLA	A	813	-	1/1/11/20	9/13/91/115	-
24	LUT	3	304	-	-	2/29/67/67	0/2/2/2
24	LUT	1	501	-	-	2/29/67/67	0/2/2/2
17	CLA	A	815	-	1/1/11/20	4/13/91/115	-
17	CLA	1	504	-	1/1/10/20	5/8/86/115	-
19	LHG	A	843	-	-	13/53/53/53	-
17	CLA	B	831	-	1/1/10/20	1/11/89/115	-
20	BCR	B	847	-	-	5/29/63/63	0/2/2/2
17	CLA	2	514	-	1/1/13/20	8/25/103/115	-
17	CLA	A	826	-	1/1/14/20	13/31/109/115	-
21	SF4	C	102	3	-	-	0/6/5/5
17	CLA	B	807	2	1/1/15/20	11/37/115/115	-
21	SF4	A	850	1,2	-	-	0/6/5/5
17	CLA	B	836	-	-	4/10/88/115	-
17	CLA	A	804	17	1/1/12/20	5/22/100/115	-
17	CLA	2	509	-	1/1/12/20	10/19/97/115	-
17	CLA	5	308	-	1/1/14/20	14/31/109/115	-
17	CLA	B	838	-	1/1/15/20	4/37/115/115	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
17	CLA	B	841	-	1/1/12/20	8/24/102/115	-
17	CLA	2	508	-	1/1/11/20	2/15/93/115	-
17	CLA	A	842	19	1/1/12/20	9/19/97/115	-
20	BCR	F	804	-	-	2/29/63/63	0/2/2/2
17	CLA	B	839	-	1/1/11/20	5/16/94/115	-
17	CLA	2	507	13	2/2/11/20	5/14/88/115	-
21	SF4	C	101	3	-	-	0/6/5/5
17	CLA	A	836	-	1/1/13/20	11/25/103/115	-
17	CLA	B	833	-	1/1/15/20	4/37/115/115	-
17	CLA	A	852	-	1/1/13/20	9/28/106/115	-
17	CLA	2	510	19	1/1/14/20	16/31/109/115	-
17	CLA	B	817	-	1/1/11/20	7/18/96/115	-
23	LMG	2	518	-	-	3/7/27/70	0/1/1/1
17	CLA	A	823	-	1/1/12/20	13/25/99/115	-
25	CHL	1	514	-	3/3/14/26	4/10/104/137	-

The worst 5 of 1514 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
17	3	307	CLA	C4B-NB	8.26	1.42	1.35
17	3	309	CLA	C3B-C4B	7.94	1.48	1.39
17	1	513	CLA	C4B-NB	7.88	1.42	1.35
17	3	313	CLA	C4B-NB	7.60	1.42	1.35
17	1	505	CLA	C4B-NB	7.57	1.42	1.35

The worst 5 of 2004 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
20	2	503	BCR	C40-C30-C25	-12.70	89.71	110.30
16	A	801	CL0	C4A-NA-C1A	10.86	111.59	106.71
25	5	315	CHL	CMD-C2D-C1D	9.11	140.76	124.71
20	2	503	BCR	C20-C21-C22	-8.87	114.64	127.31
25	2	516	CHL	CMD-C2D-C1D	8.70	140.05	124.71

5 of 171 chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
16	A	801	CL0	NA
16	A	801	CL0	ND

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Mol	Chain	Res	Type	Atom
16	A	801	CL0	NC
17	A	802	CLA	ND
17	A	803	CLA	ND

5 of 1257 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
16	A	801	CL0	C1A-C2A-CAA-CBA
16	A	801	CL0	CHA-CBD-CGD-O2D
17	A	802	CLA	CHA-CBD-CGD-O1D
17	A	802	CLA	CHA-CBD-CGD-O2D
17	A	802	CLA	C6-C7-C8-C9

There are no ring outliers.

174 monomers are involved in 434 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
17	A	833	CLA	1	0
20	B	849	BCR	2	0
23	2	519	LMG	2	0
17	3	310	CLA	2	0
17	A	816	CLA	4	0
22	B	850	DGD	4	0
16	A	801	CL0	4	0
17	3	309	CLA	3	0
25	2	512	CHL	4	0
17	5	316	CLA	4	0
19	1	516	LHG	5	0
20	B	844	BCR	10	0
17	B	837	CLA	3	0
24	1	502	LUT	7	0
17	3	313	CLA	4	0
17	A	827	CLA	7	0
17	B	808	CLA	2	0
17	3	311	CLA	5	0
24	3	303	LUT	8	0
20	K	204	BCR	2	0
17	B	827	CLA	1	0
20	3	305	BCR	4	0
17	B	826	CLA	4	0
17	J	101	CLA	3	0
20	B	848	BCR	3	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
20	A	845	BCR	4	0
24	5	303	LUT	8	0
25	3	315	CHL	2	0
17	2	505	CLA	2	0
17	A	809	CLA	1	0
17	B	822	CLA	5	0
17	1	508	CLA	1	0
20	A	848	BCR	2	0
17	1	515	CLA	3	0
17	B	819	CLA	1	0
25	1	517	CHL	6	0
17	1	513	CLA	4	0
17	5	310	CLA	3	0
17	3	308	CLA	7	0
20	L	306	BCR	2	0
17	1	510	CLA	2	0
17	F	802	CLA	3	0
17	A	812	CLA	1	0
19	A	844	LHG	4	0
17	B	828	CLA	5	0
17	A	829	CLA	1	0
20	F	801	BCR	1	0
25	1	514	CHL	1	0
17	A	840	CLA	1	0
17	B	803	CLA	2	0
17	A	805	CLA	6	0
17	A	803	CLA	3	0
17	L	303	CLA	3	0
17	A	808	CLA	1	0
17	A	828	CLA	1	0
17	F	803	CLA	2	0
17	L	304	CLA	2	0
17	B	805	CLA	1	0
20	B	852	BCR	1	0
17	L	302	CLA	2	0
17	3	306	CLA	4	0
25	2	513	CHL	4	0
17	B	810	CLA	2	0
17	B	802	CLA	7	0
18	B	843	PQN	1	0
17	A	806	CLA	5	0
17	1	507	CLA	2	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
17	3	318	CLA	1	0
17	B	832	CLA	1	0
17	A	838	CLA	2	0
17	A	837	CLA	1	0
17	3	307	CLA	2	0
17	A	839	CLA	1	0
17	A	831	CLA	3	0
22	J	103	DGD	3	0
17	A	824	CLA	2	0
17	K	202	CLA	3	0
17	3	312	CLA	2	0
17	5	306	CLA	1	0
17	B	812	CLA	2	0
17	5	307	CLA	4	0
25	5	315	CHL	4	0
20	A	849	BCR	1	0
17	B	811	CLA	5	0
17	B	804	CLA	4	0
20	B	845	BCR	1	0
17	B	818	CLA	4	0
23	F	806	LMG	2	0
17	3	316	CLA	3	0
17	3	317	CLA	1	0
17	A	825	CLA	1	0
17	B	820	CLA	3	0
17	A	821	CLA	3	0
17	2	506	CLA	8	0
25	5	317	CHL	3	0
17	B	823	CLA	1	0
17	K	201	CLA	4	0
17	A	810	CLA	4	0
20	A	851	BCR	4	0
17	B	815	CLA	4	0
25	2	516	CHL	3	0
23	F	805	LMG	1	0
17	B	830	CLA	2	0
18	A	841	PQN	2	0
17	1	511	CLA	2	0
17	B	816	CLA	2	0
20	J	102	BCR	1	0
17	2	504	CLA	2	0
20	2	503	BCR	4	0

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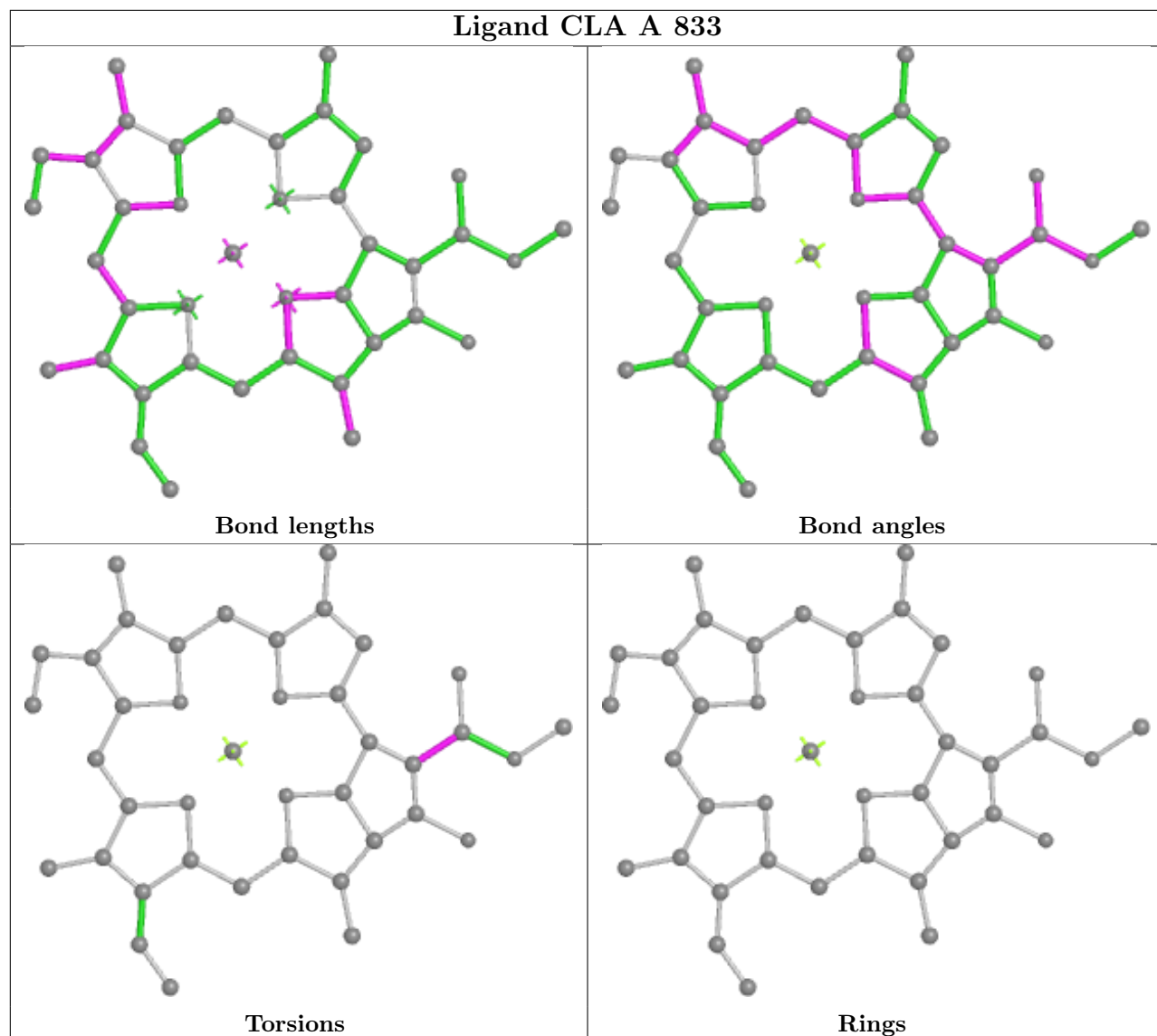
Mol	Chain	Res	Type	Clashes	Symm-Clashes
17	A	822	CLA	1	0
20	B	846	BCR	1	0
20	5	302	BCR	6	0
23	5	301	LMG	1	0
20	L	305	BCR	8	0
24	2	501	LUT	9	0
17	B	801	CLA	3	0
17	B	824	CLA	4	0
20	A	847	BCR	1	0
17	A	818	CLA	1	0
20	I	101	BCR	4	0
17	B	813	CLA	1	0
17	A	817	CLA	3	0
17	A	835	CLA	2	0
17	B	835	CLA	2	0
17	2	511	CLA	2	0
17	5	305	CLA	2	0
17	A	820	CLA	5	0
25	5	314	CHL	2	0
17	B	806	CLA	4	0
20	A	846	BCR	3	0
26	2	502	XAT	7	0
25	2	515	CHL	2	0
17	B	842	CLA	3	0
17	1	506	CLA	7	0
26	5	304	XAT	5	0
17	3	301	CLA	2	0
17	5	309	CLA	3	0
17	A	802	CLA	4	0
17	L	301	CLA	2	0
19	2	517	LHG	2	0
17	1	509	CLA	4	0
17	B	825	CLA	2	0
20	1	503	BCR	3	0
17	3	314	CLA	3	0
17	A	813	CLA	3	0
24	3	304	LUT	6	0
24	1	501	LUT	4	0
17	A	815	CLA	2	0
17	1	504	CLA	2	0
19	A	843	LHG	4	0
17	B	831	CLA	2	0

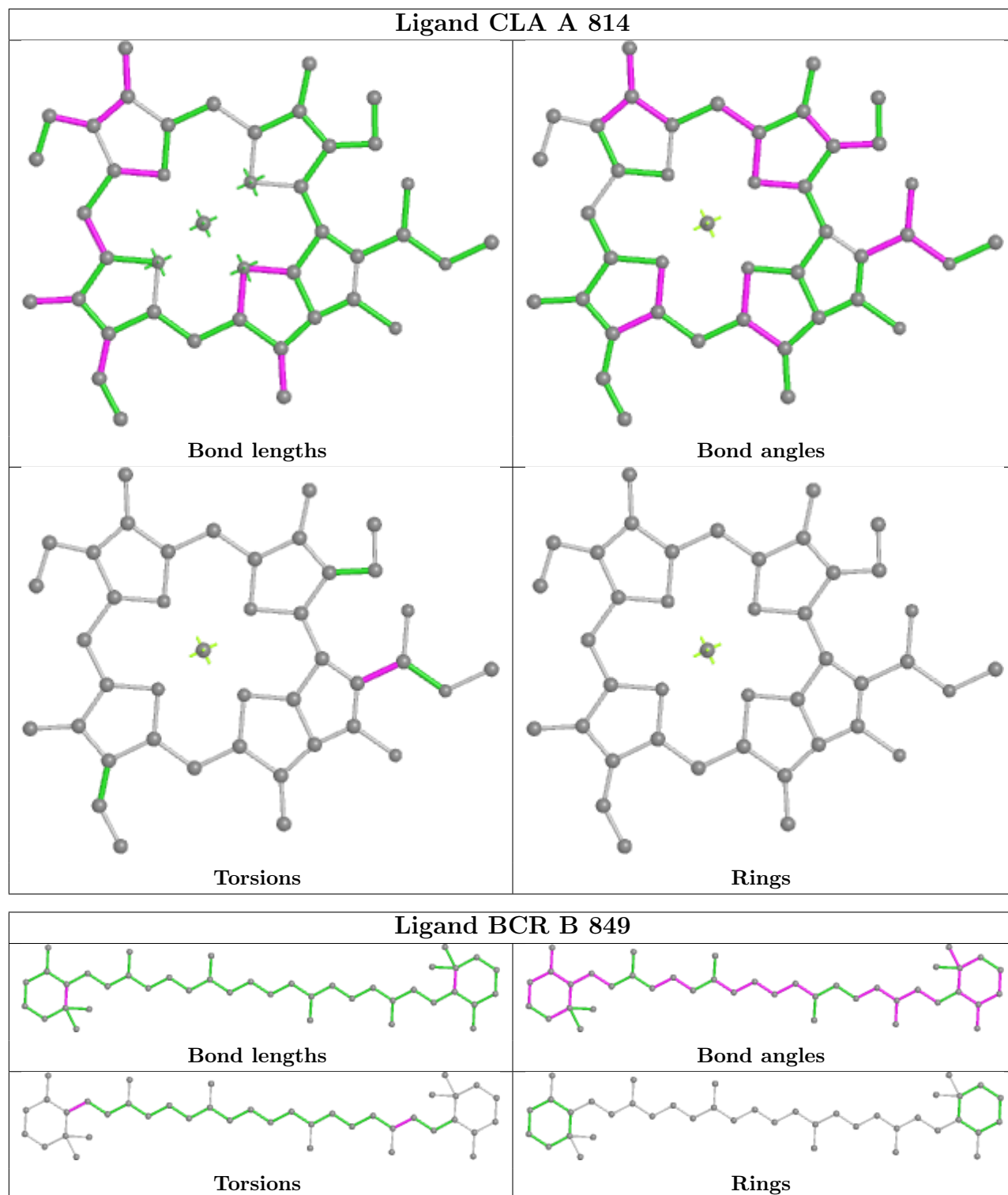
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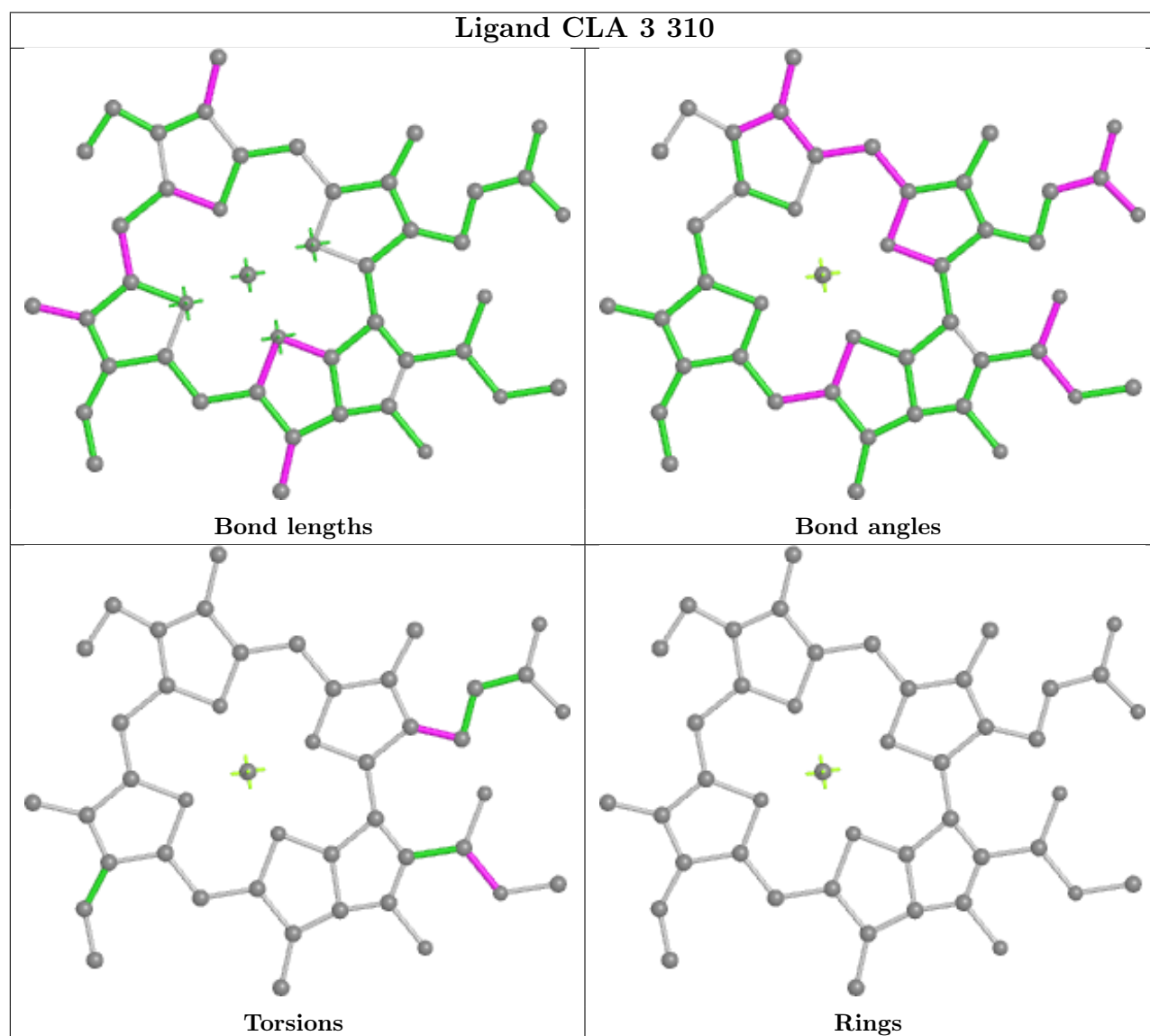
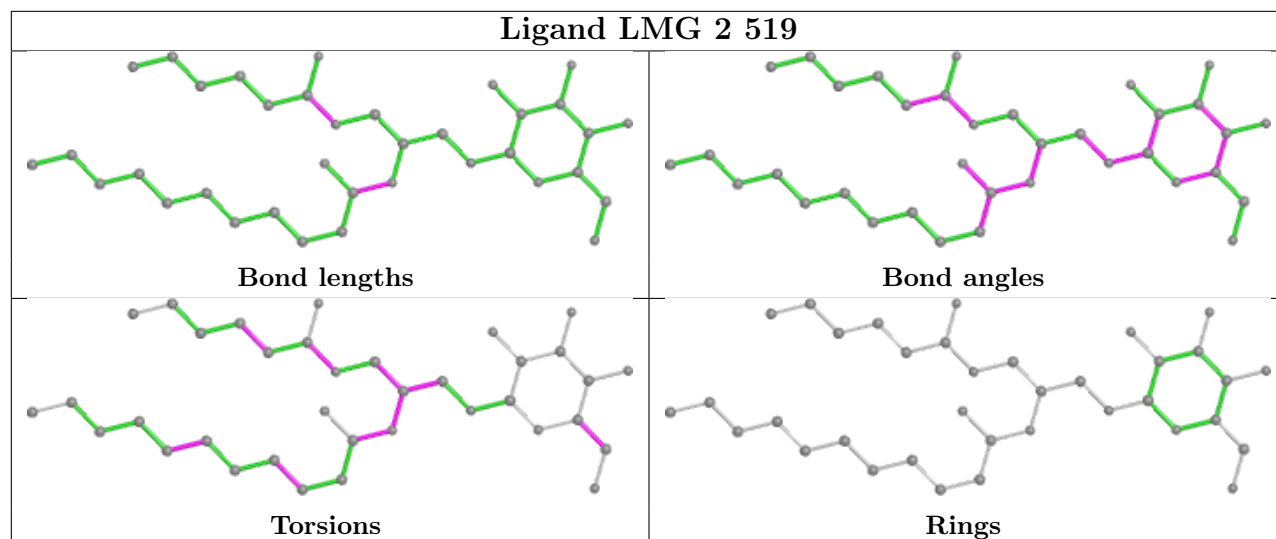
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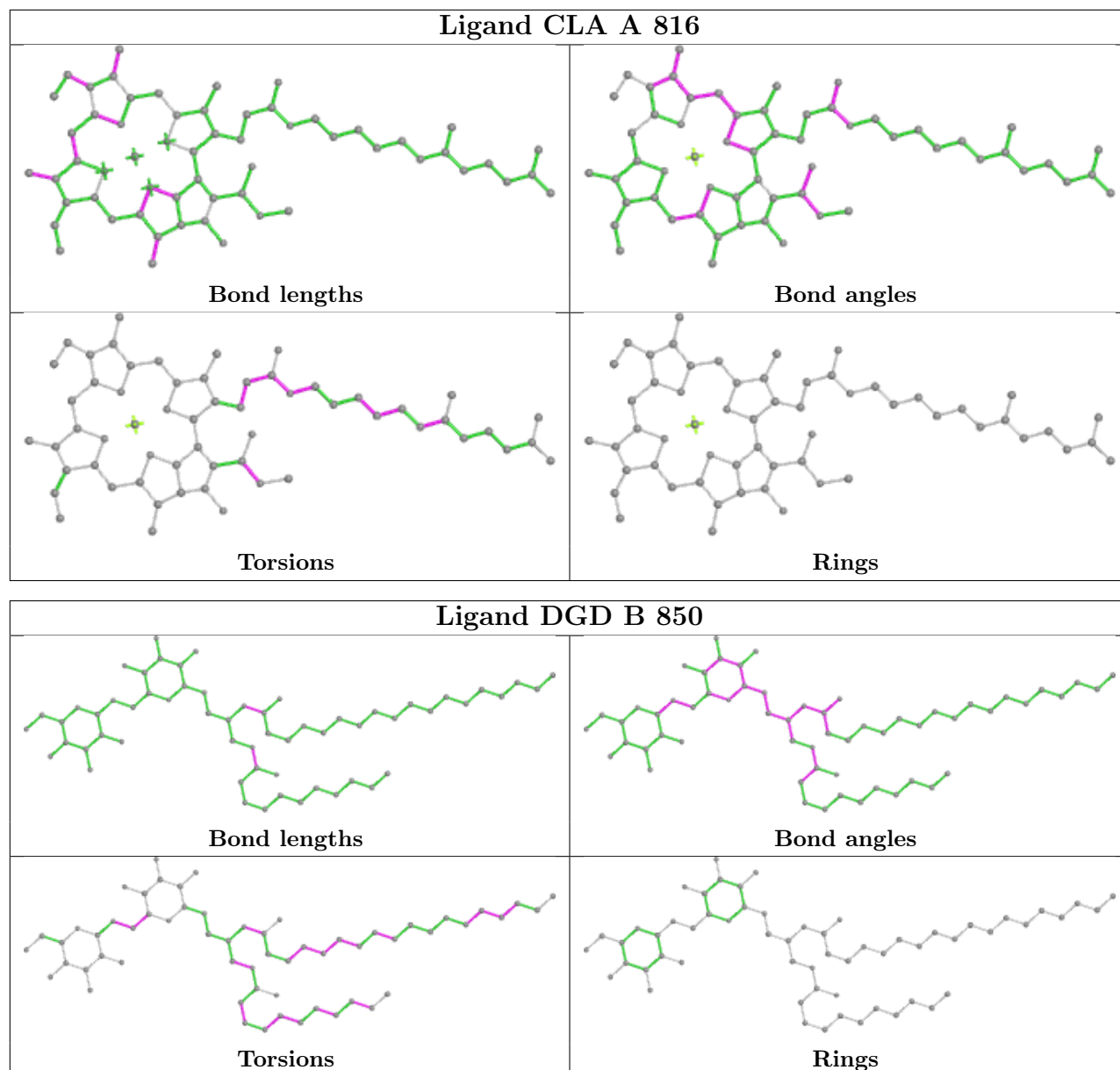
Mol	Chain	Res	Type	Clashes	Symm-Clashes
20	B	847	BCR	2	0
17	2	514	CLA	3	0
21	C	102	SF4	1	0
17	B	807	CLA	4	0
17	B	836	CLA	1	0
17	A	804	CLA	3	0
17	2	509	CLA	1	0
17	5	308	CLA	6	0
17	B	838	CLA	6	0
17	B	841	CLA	2	0
17	2	508	CLA	3	0
17	A	842	CLA	1	0
20	F	804	BCR	4	0
17	B	839	CLA	1	0
17	2	507	CLA	2	0
17	A	836	CLA	3	0
17	B	833	CLA	3	0
17	A	852	CLA	2	0
17	2	510	CLA	4	0
17	B	817	CLA	2	0
23	2	518	LMG	1	0
17	A	823	CLA	1	0
20	A	853	BCR	4	0

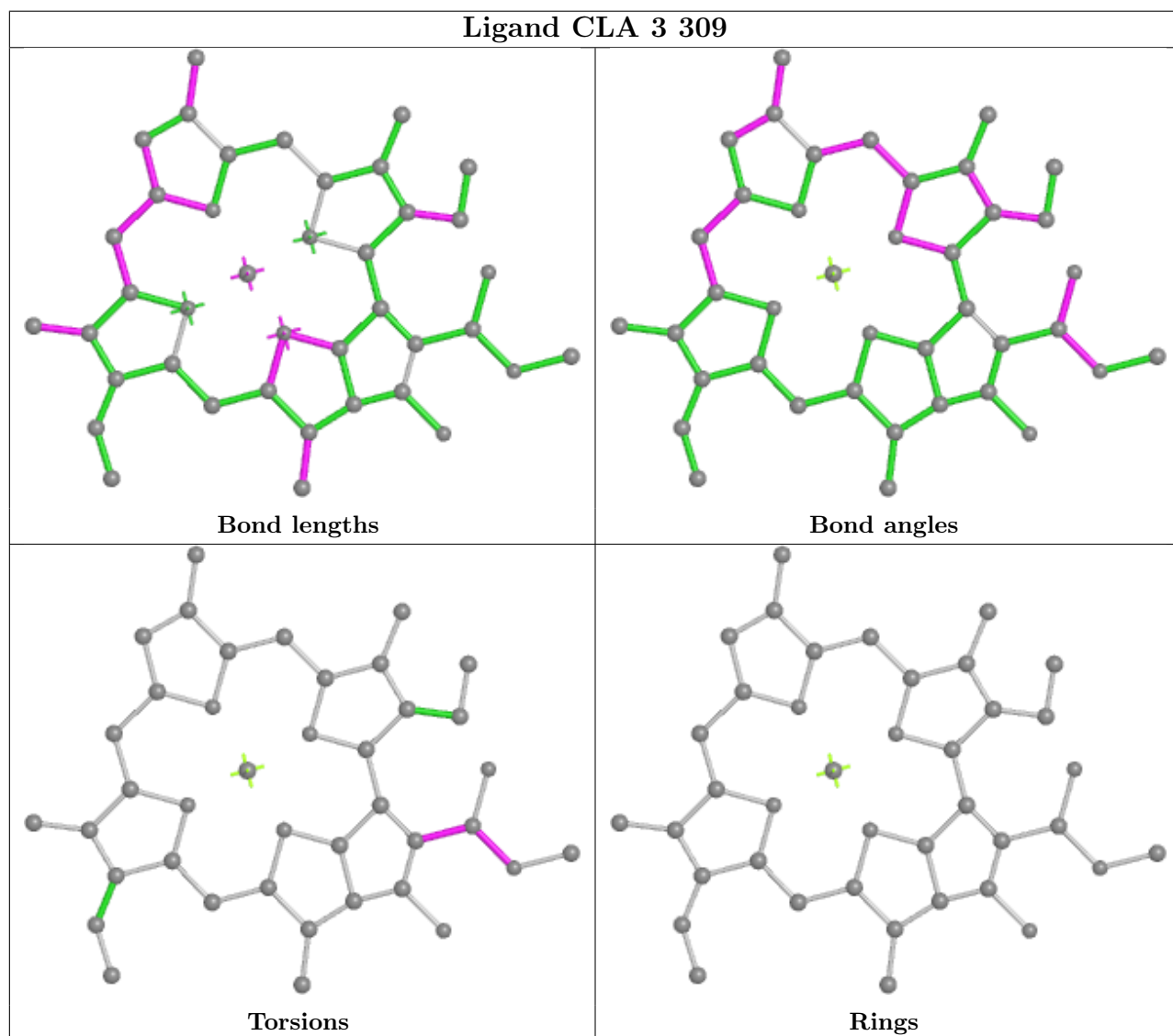
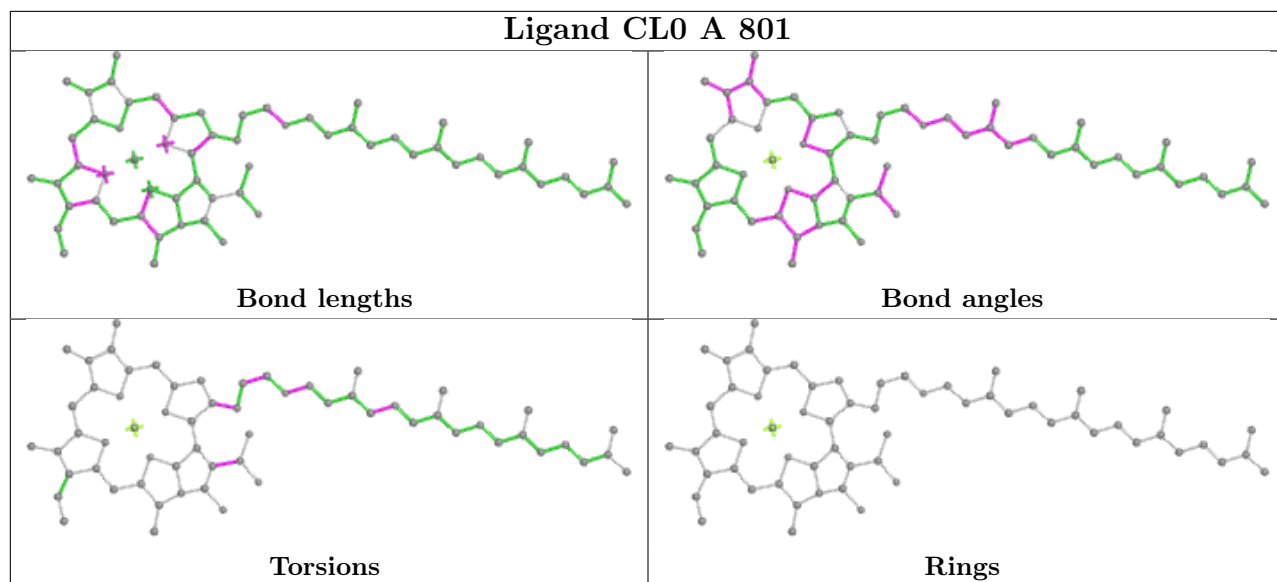
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

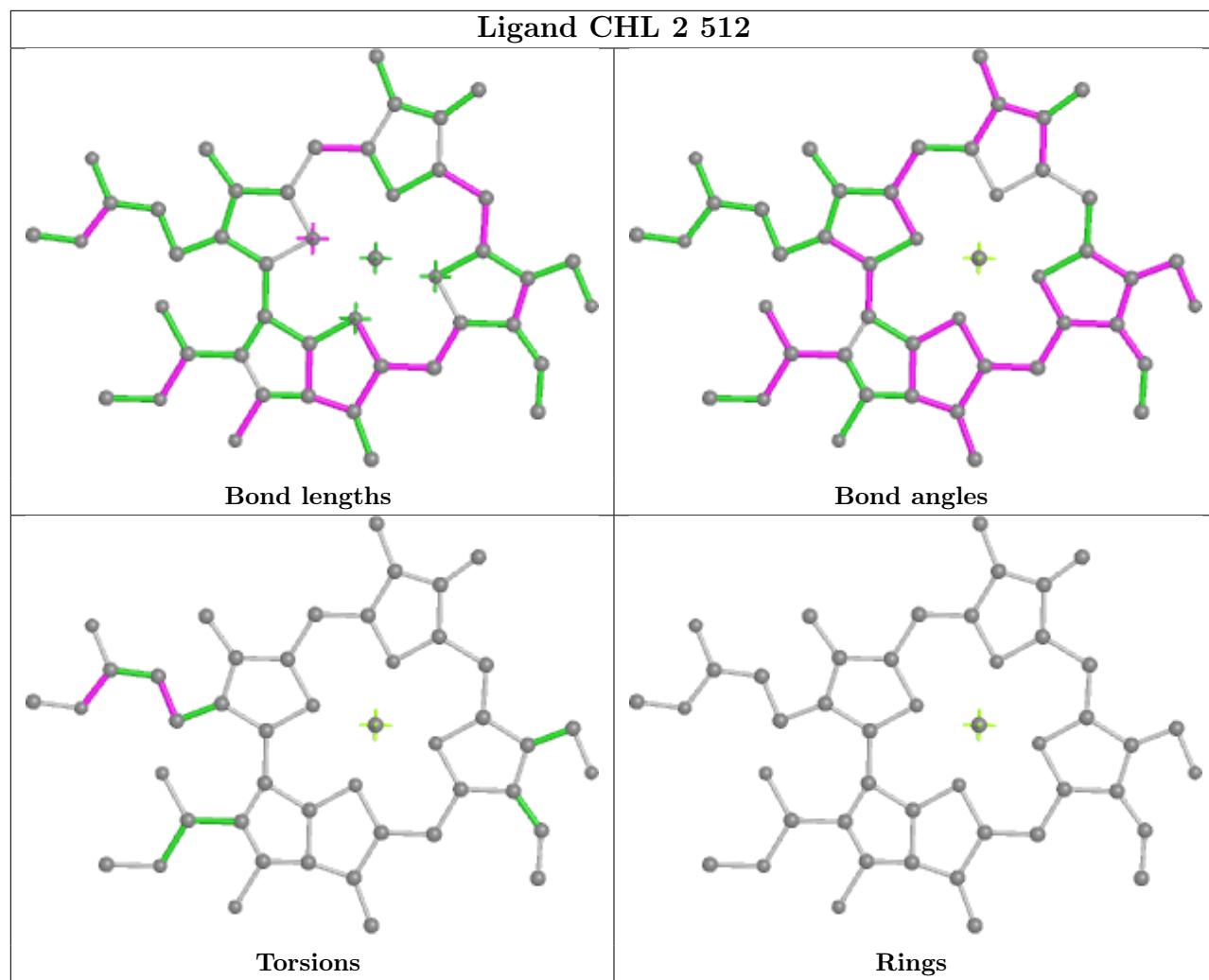


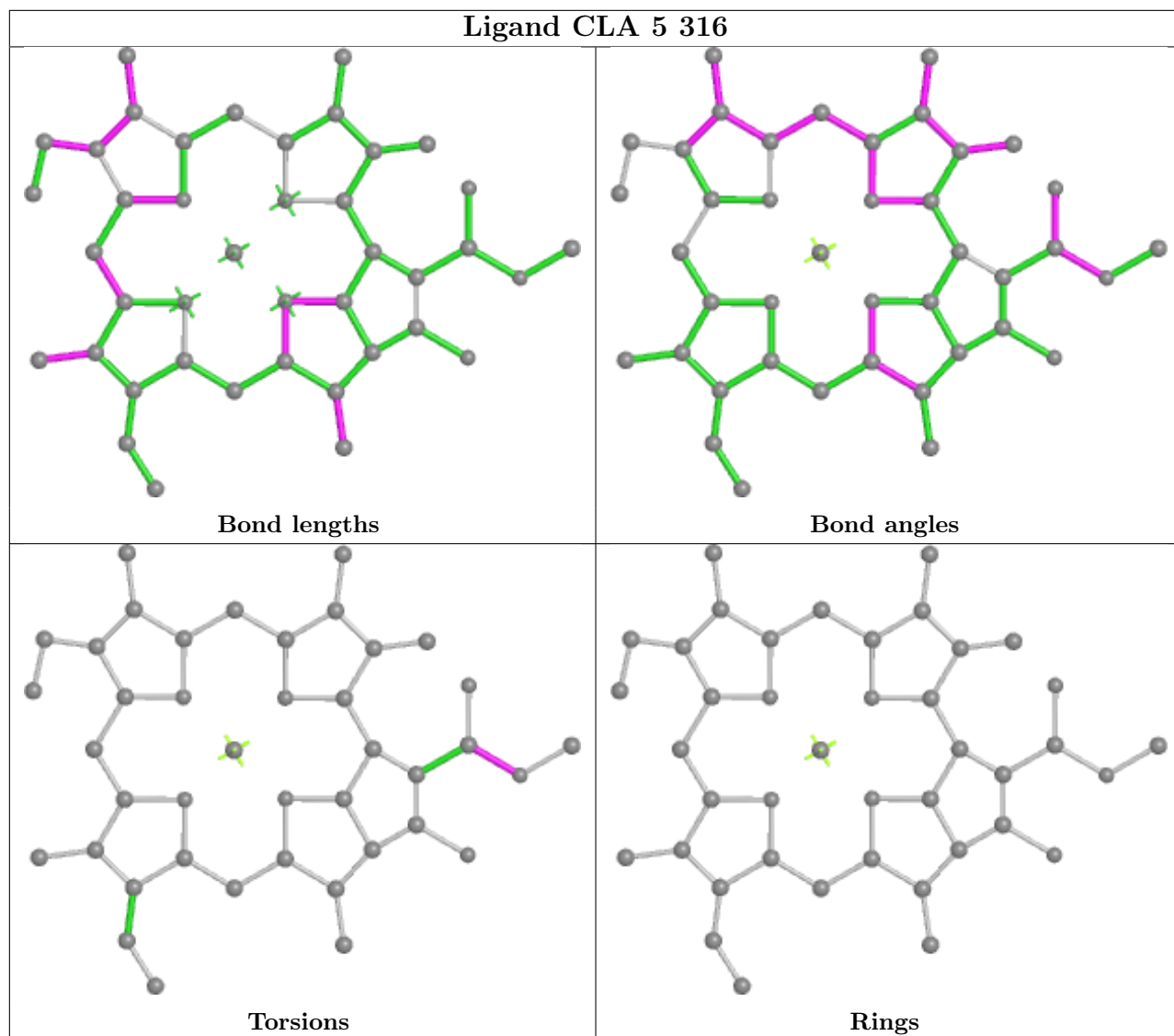


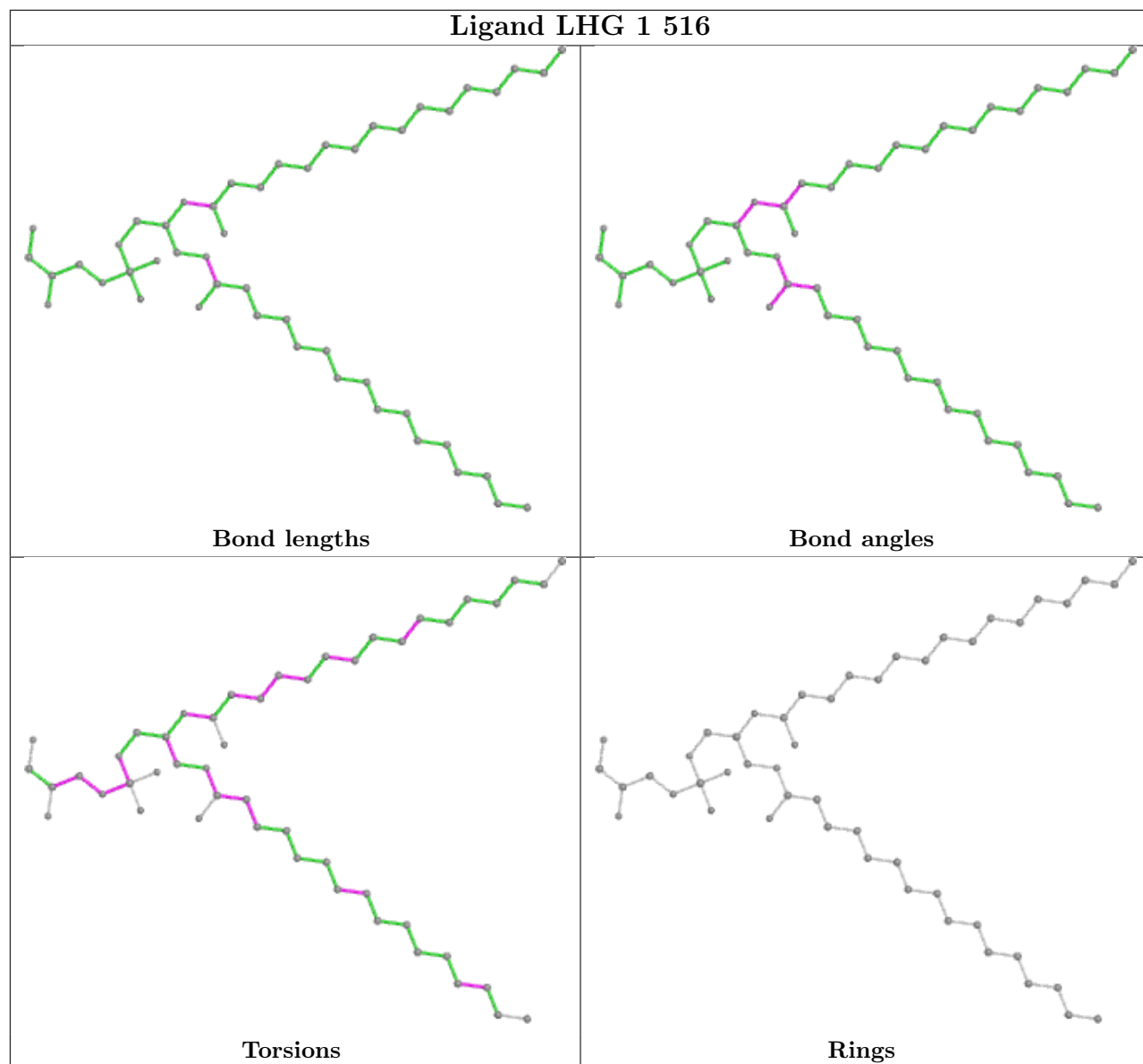


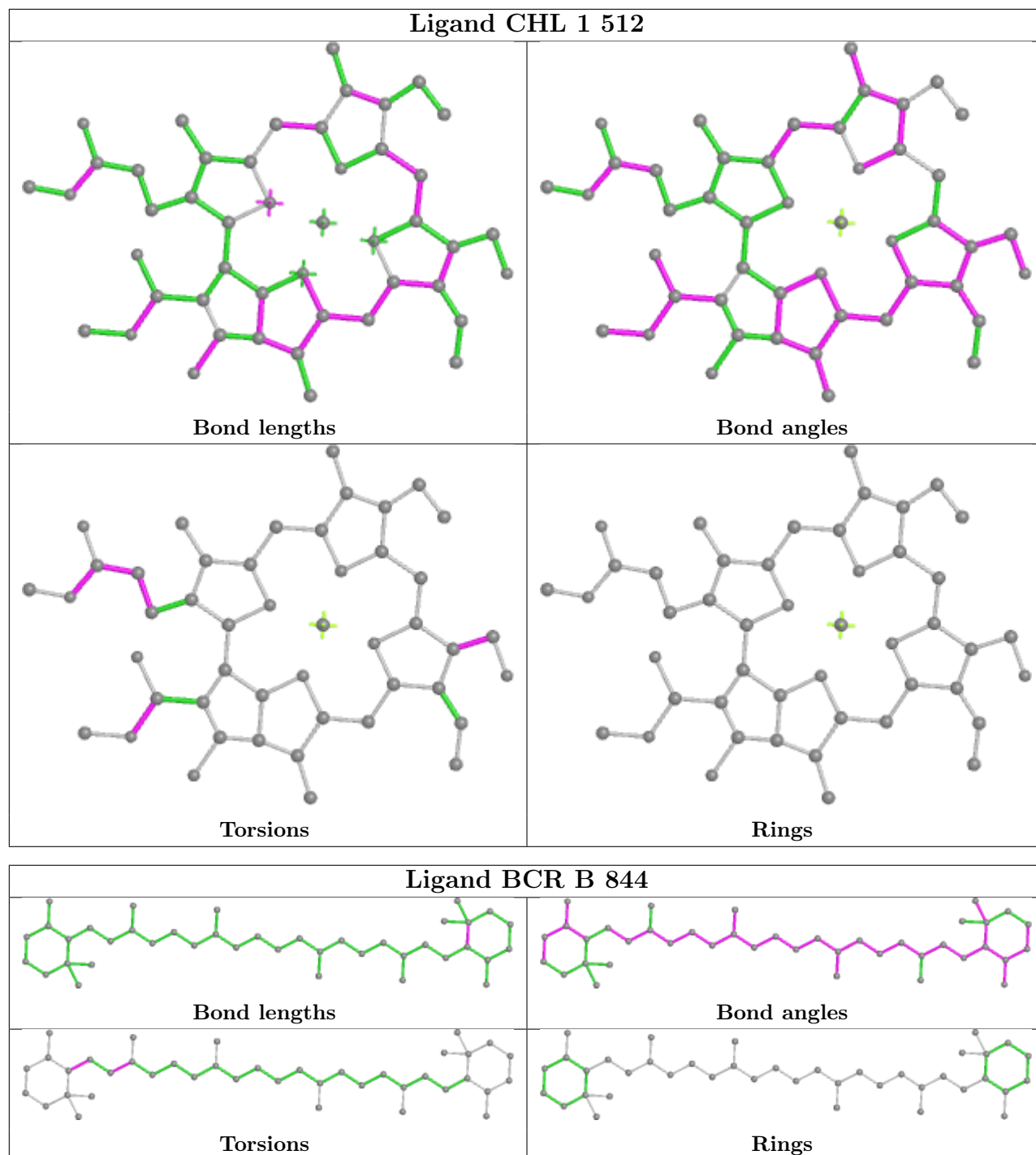


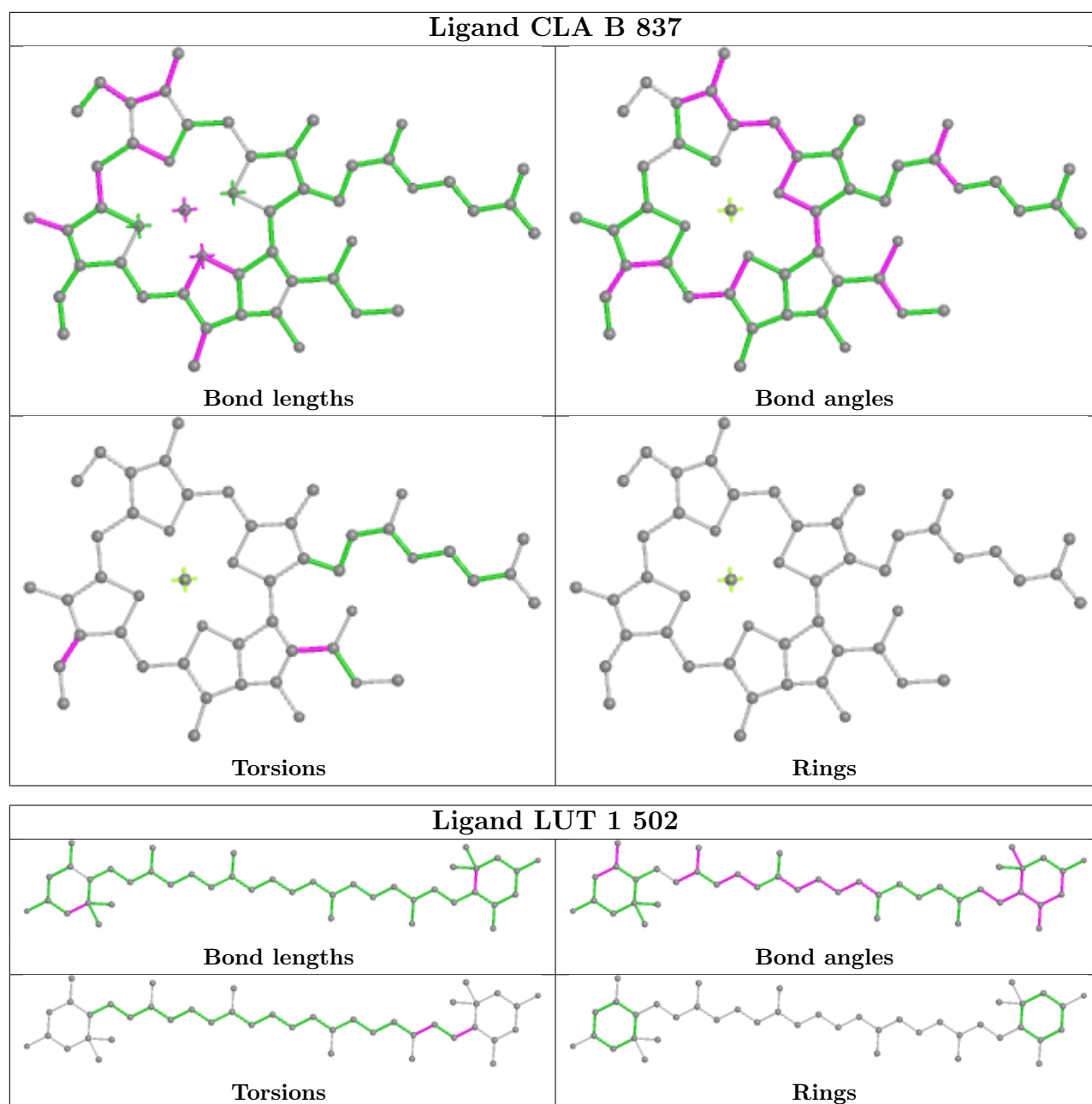


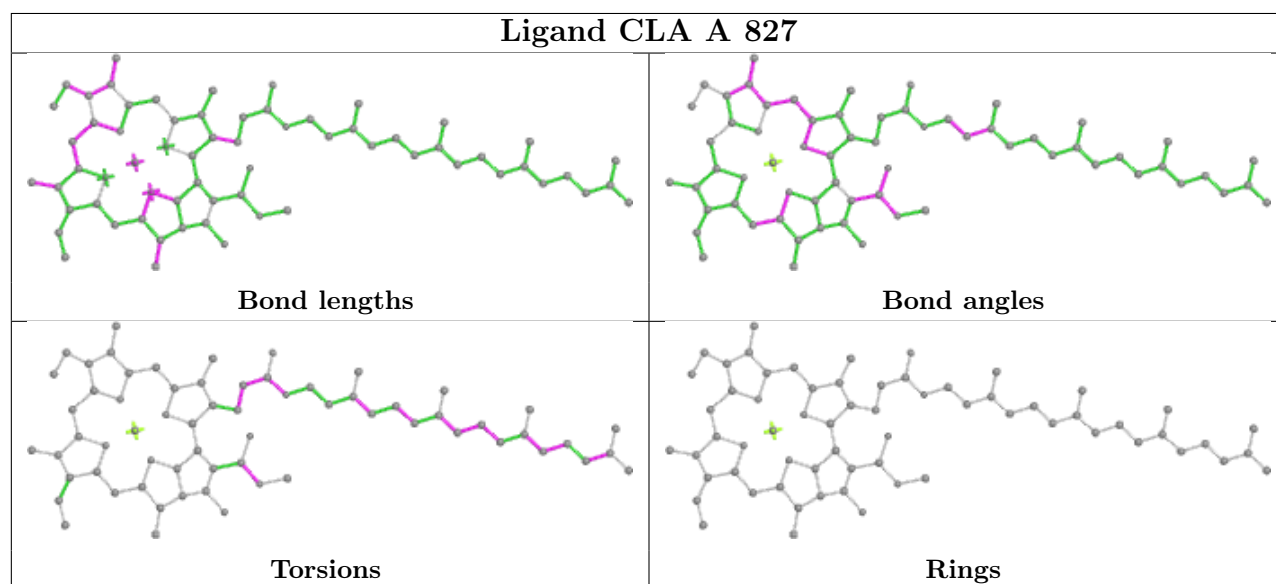
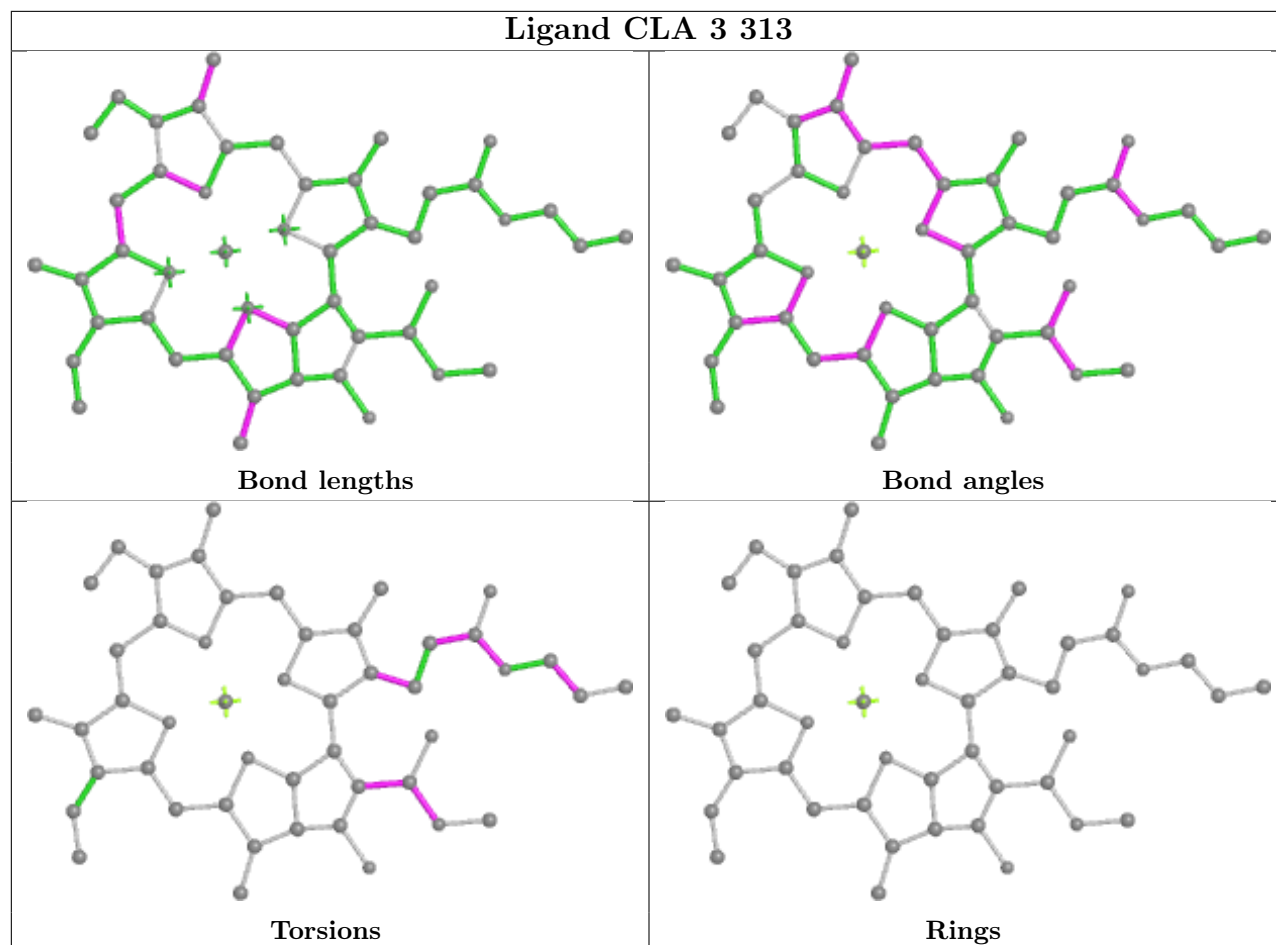


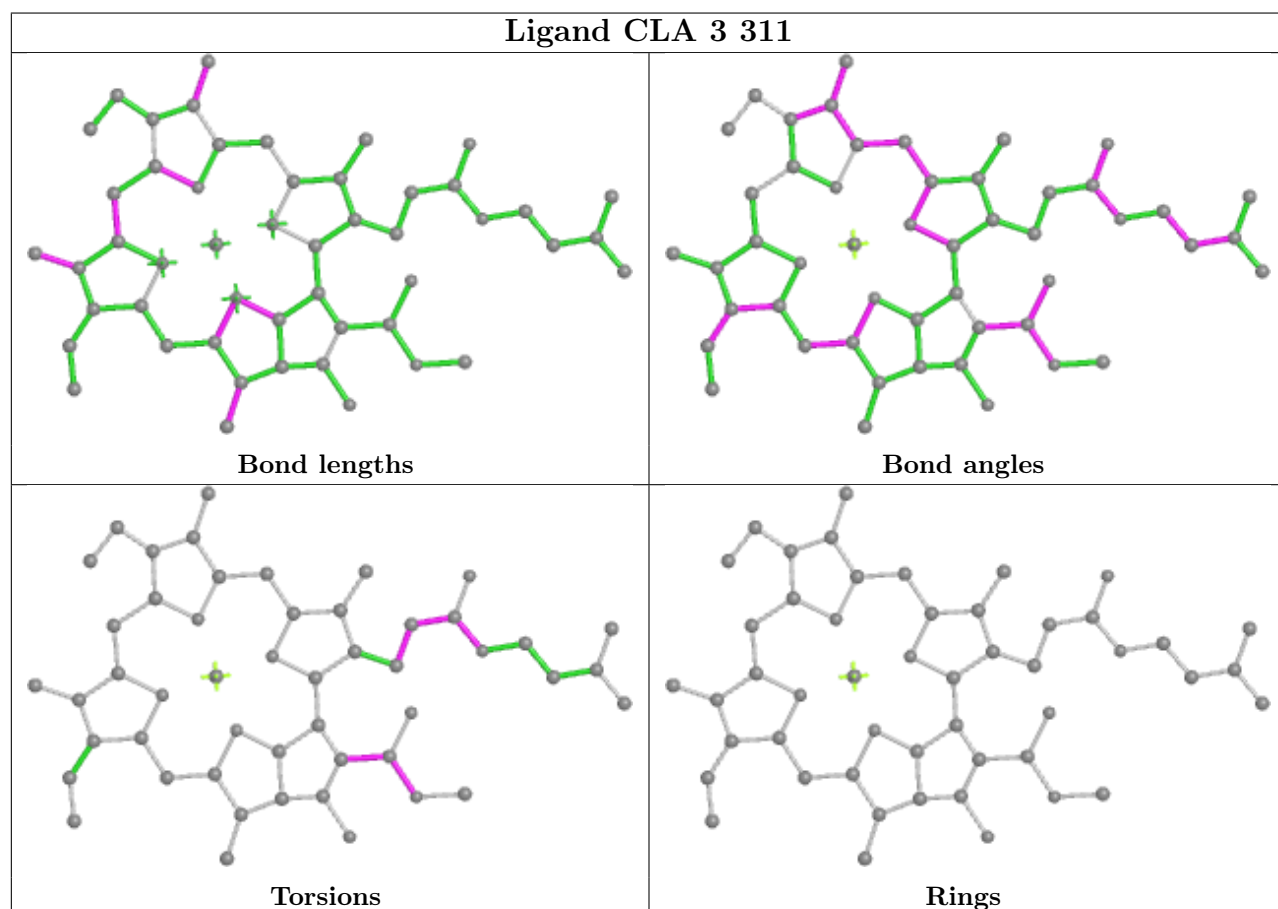
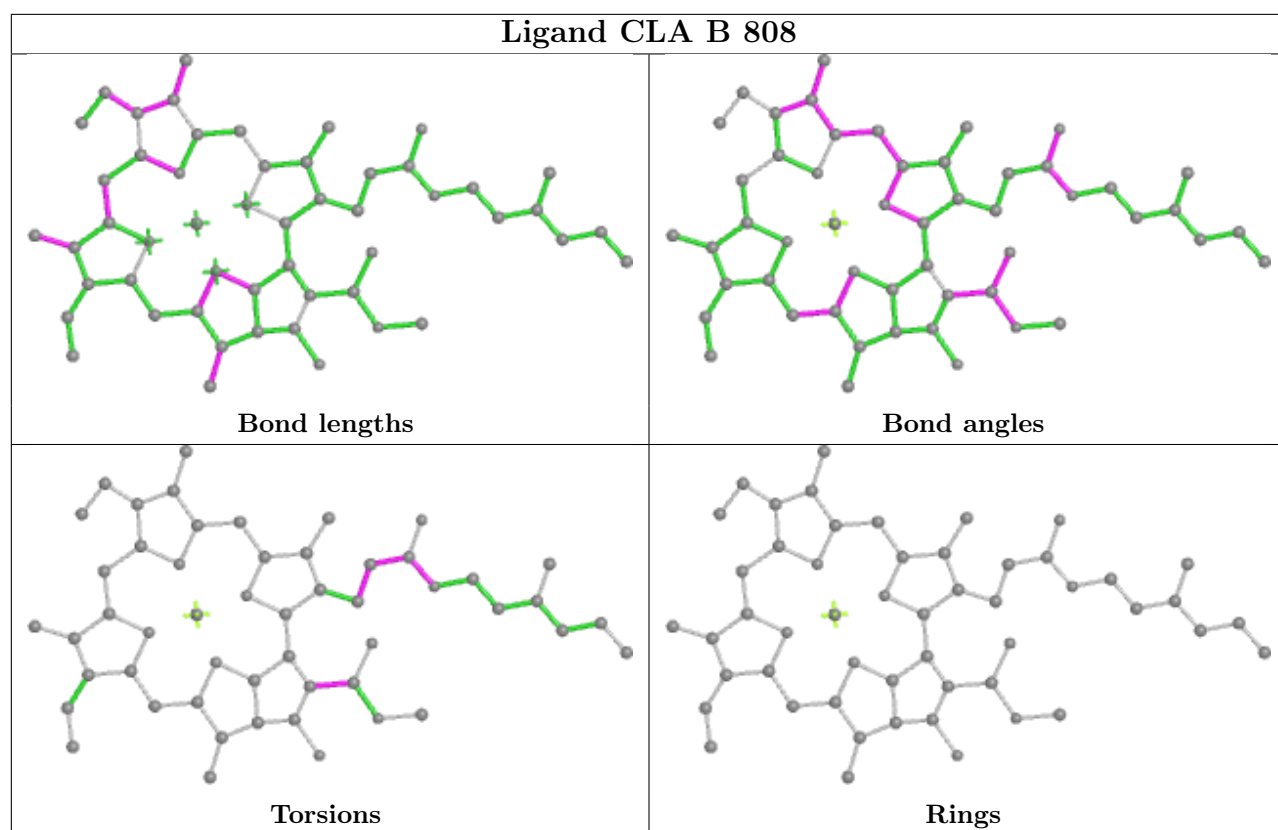


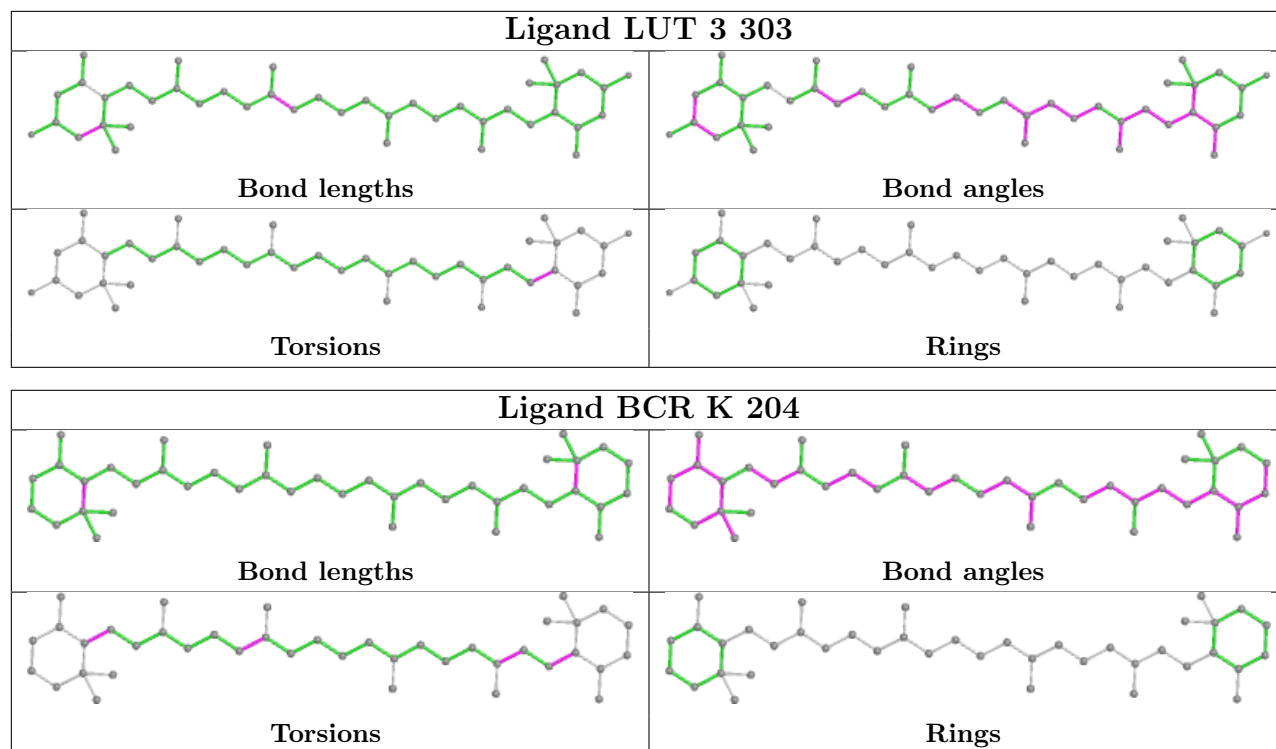


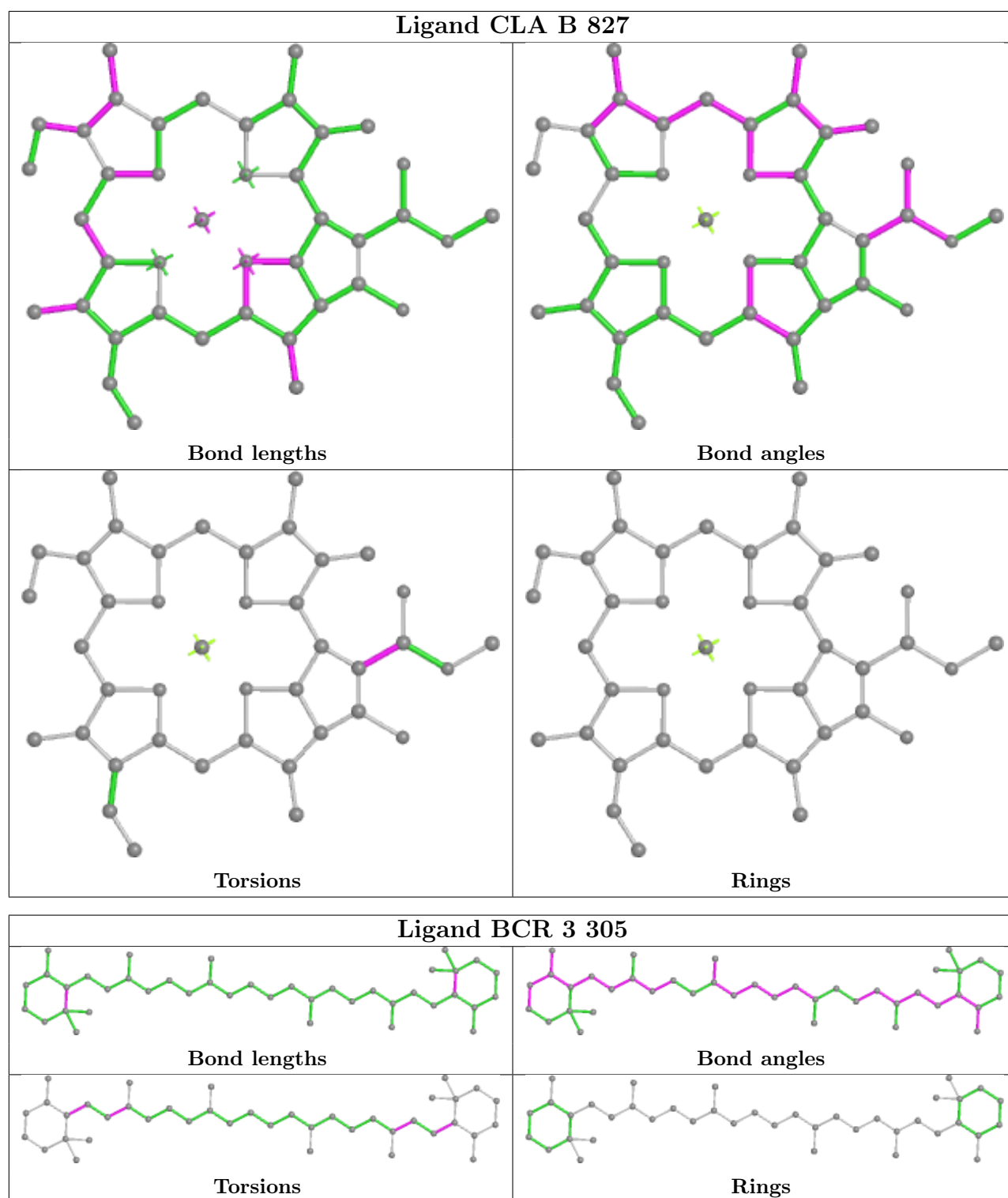


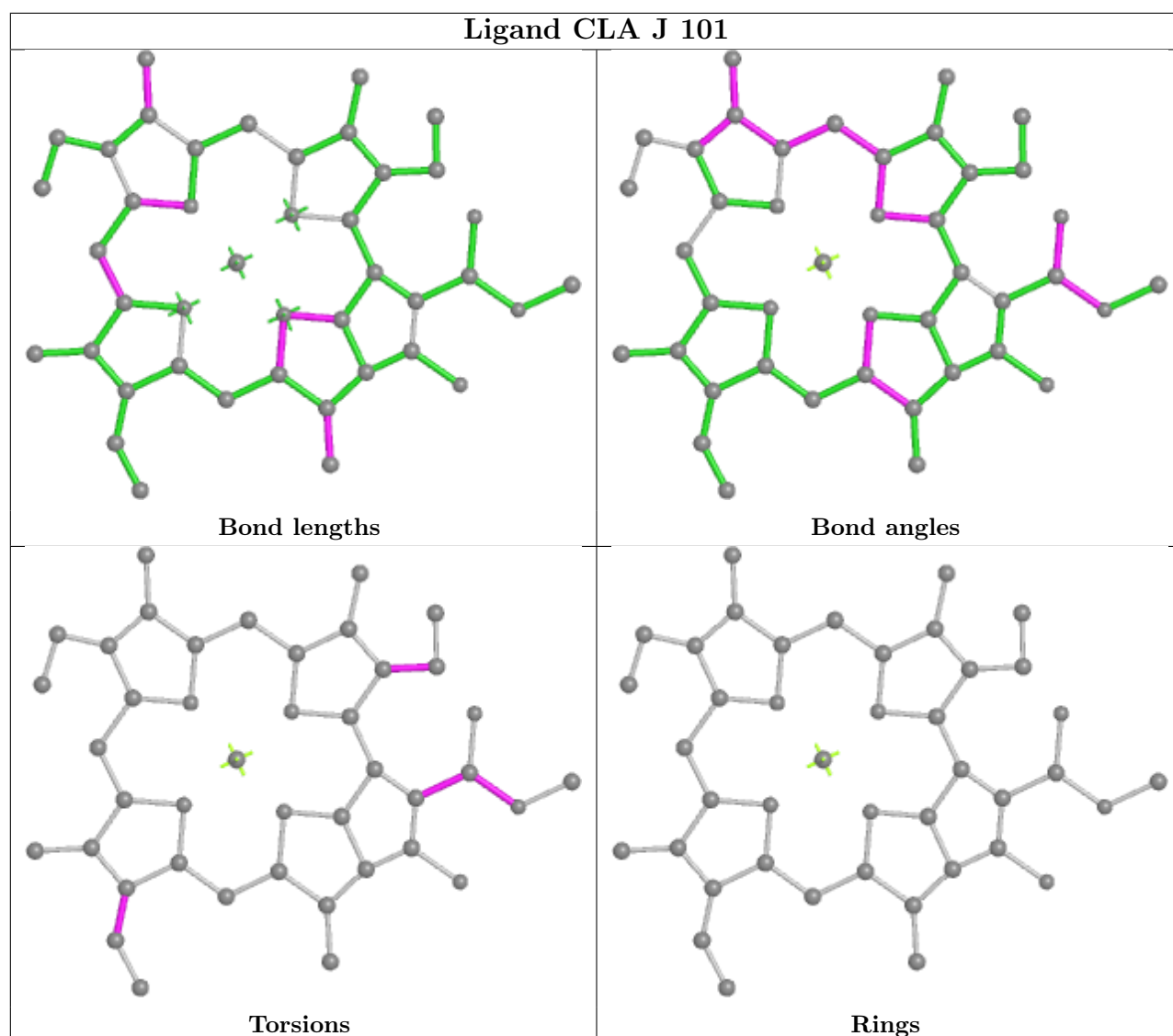
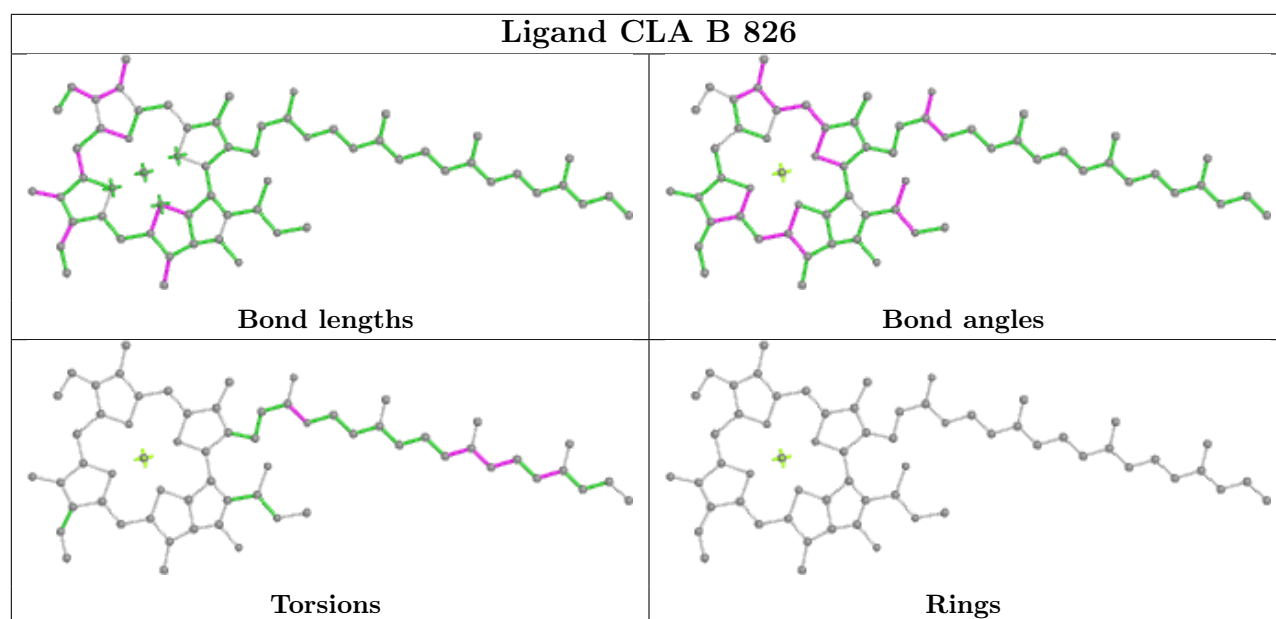


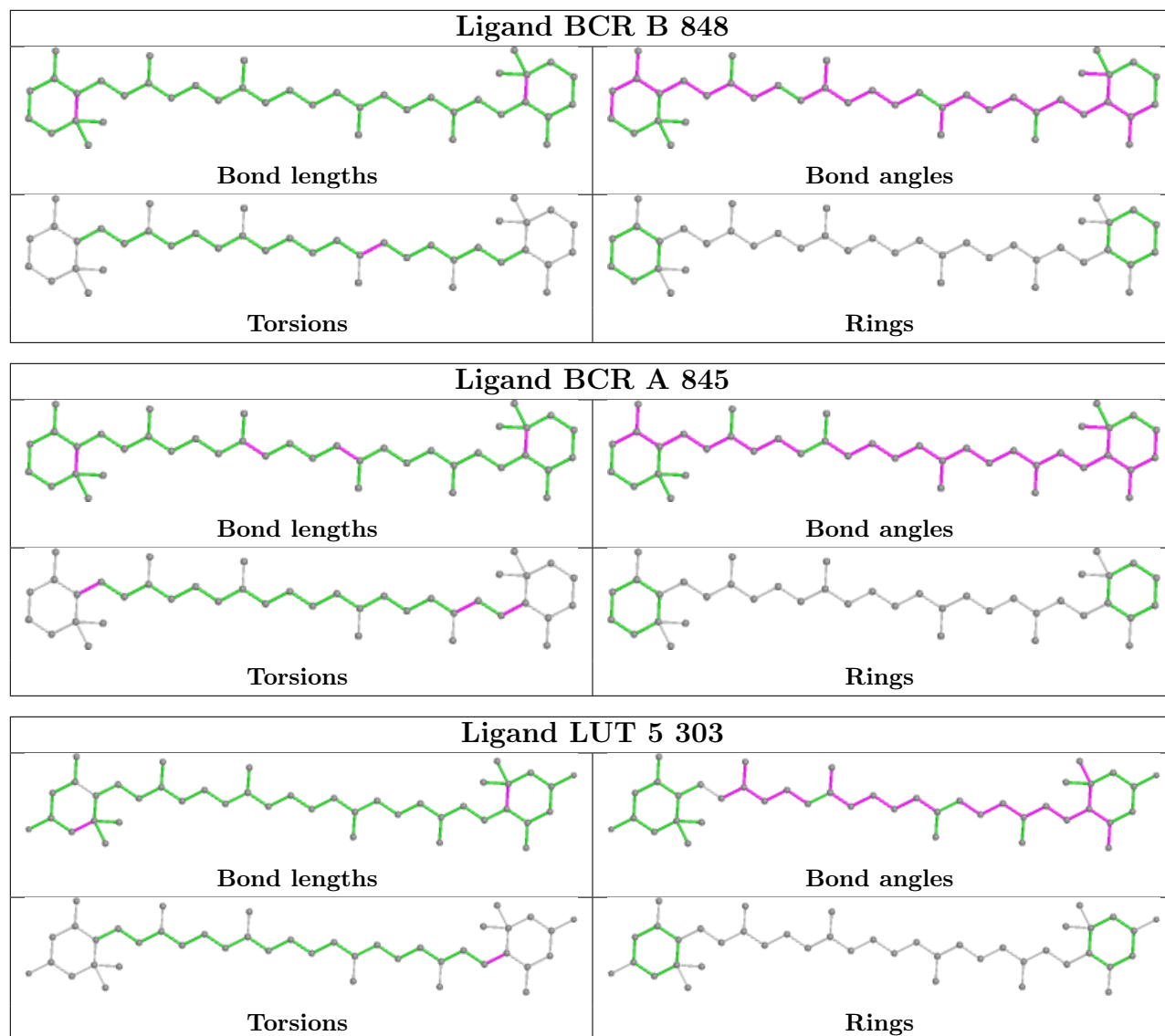


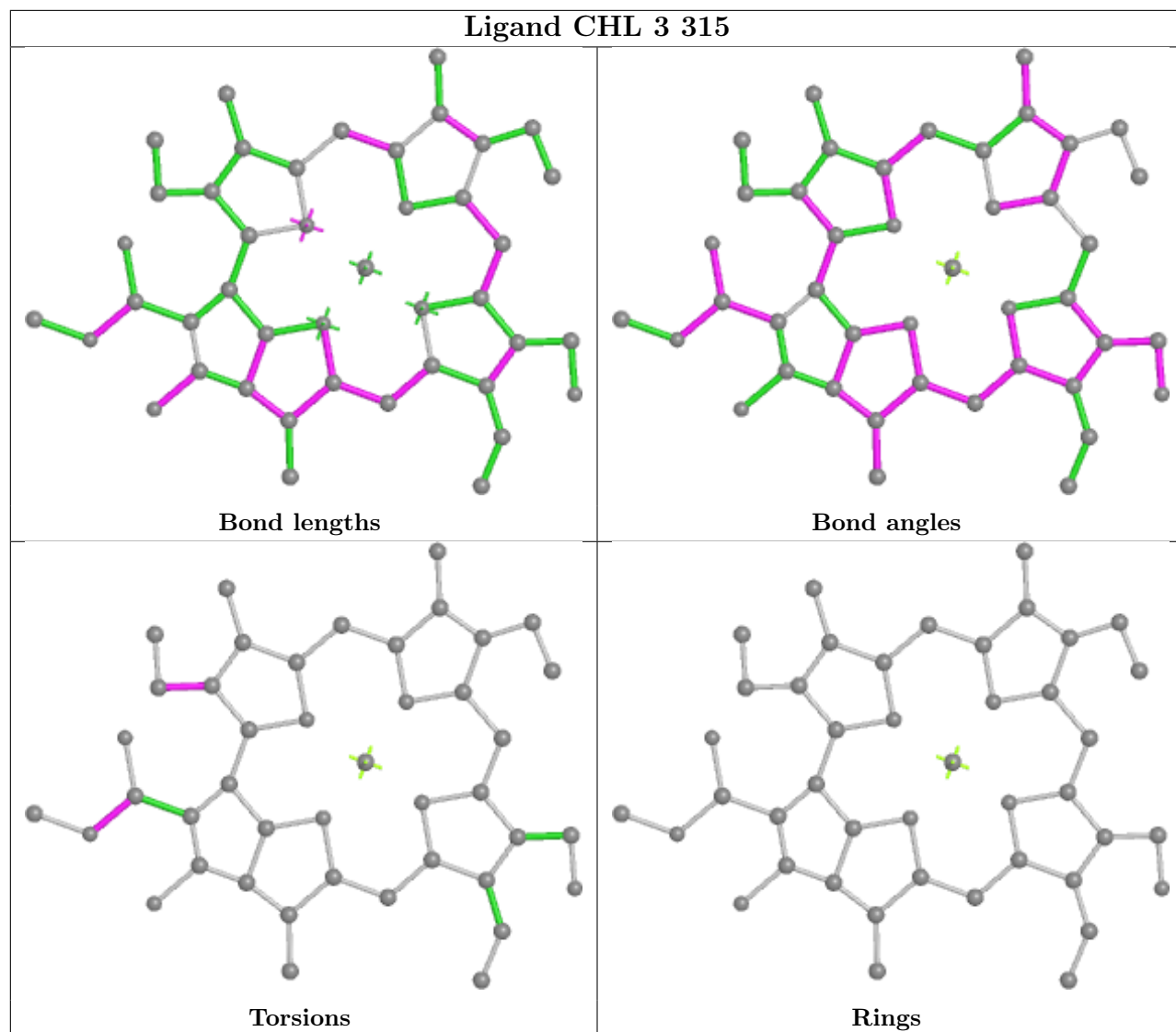


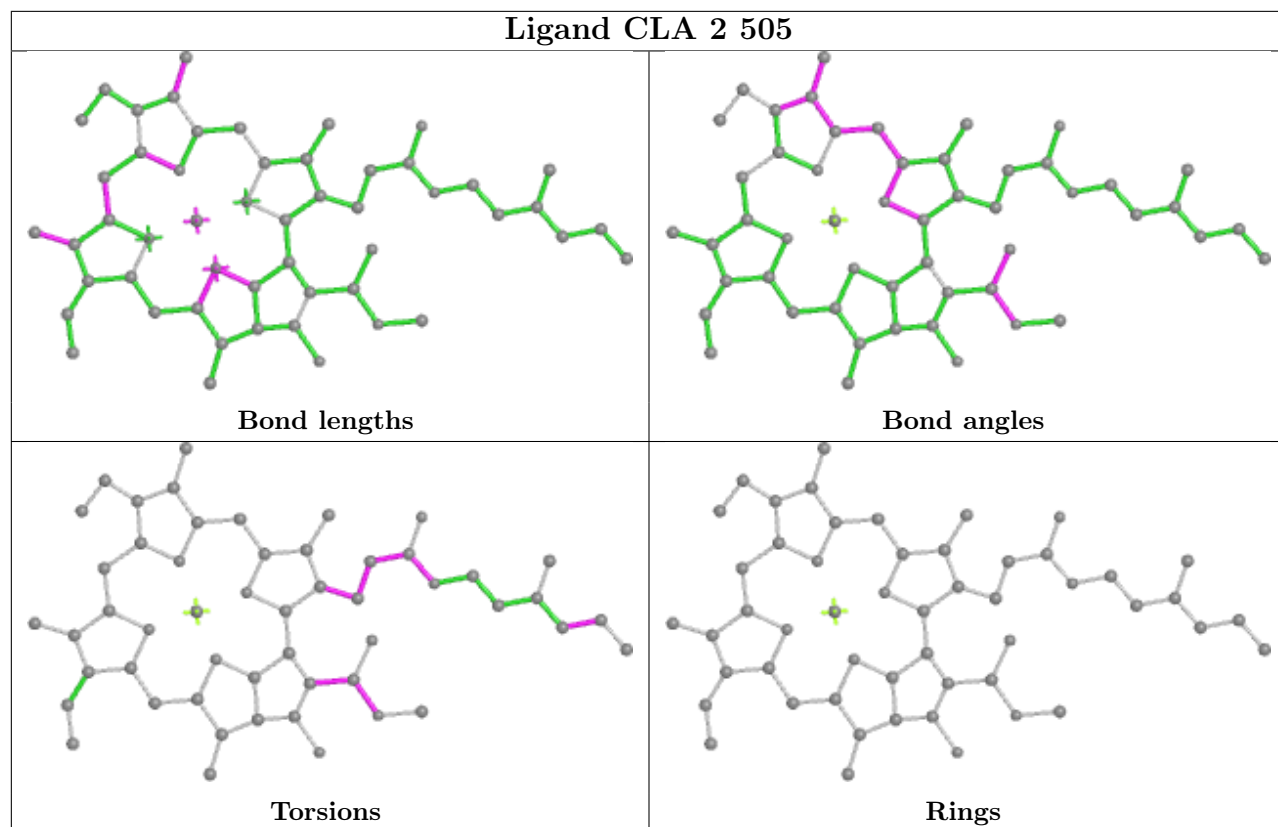


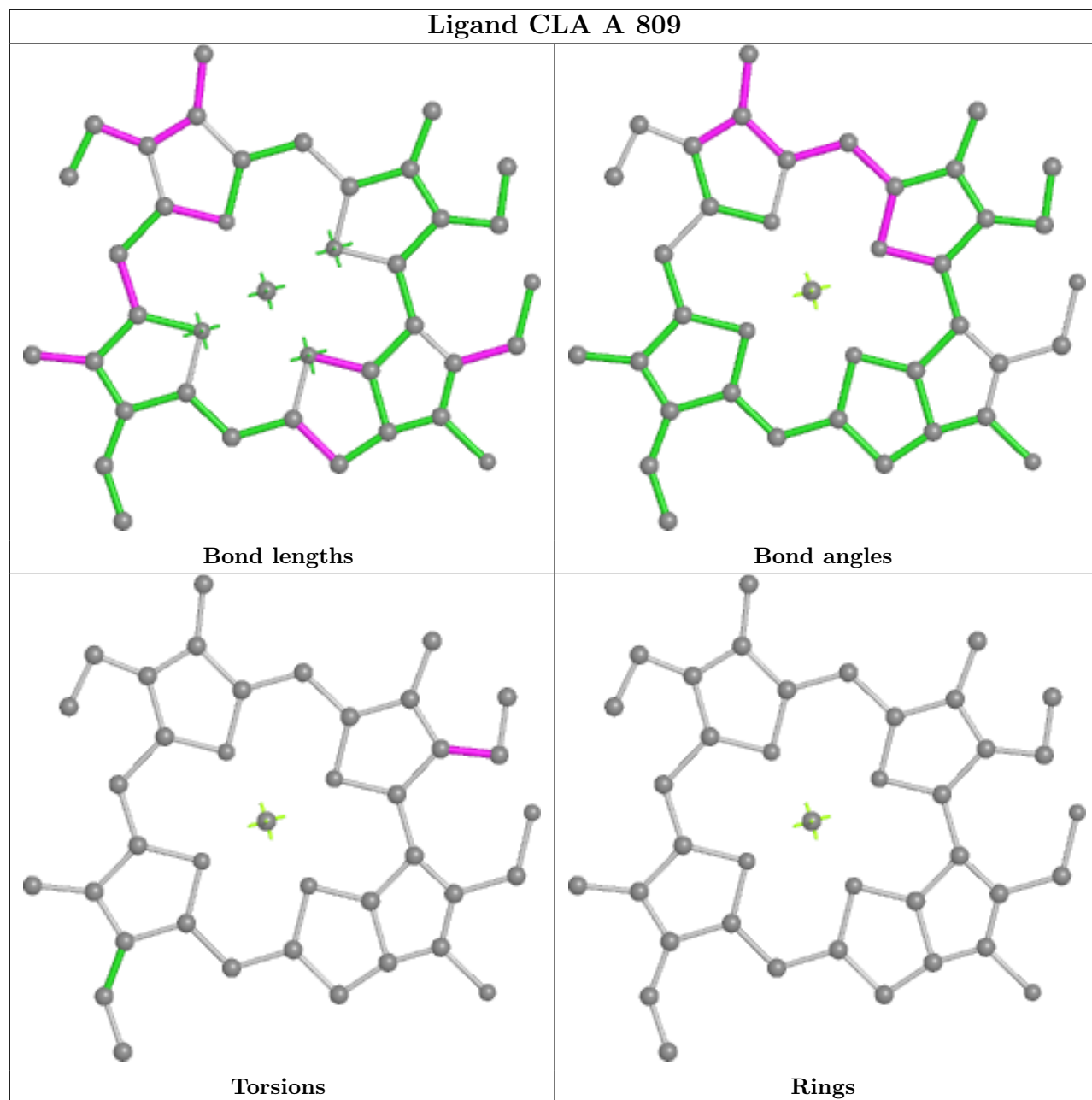


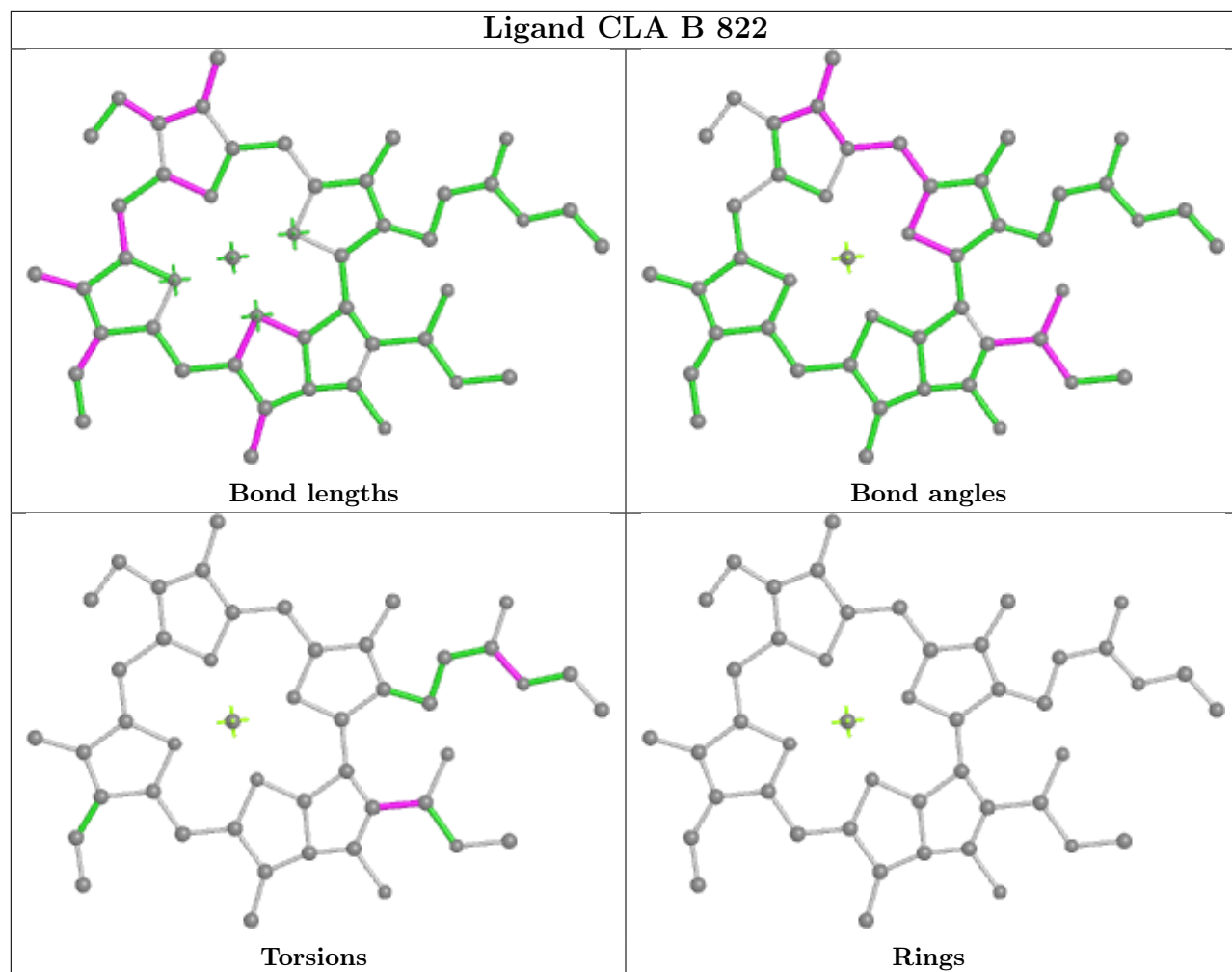


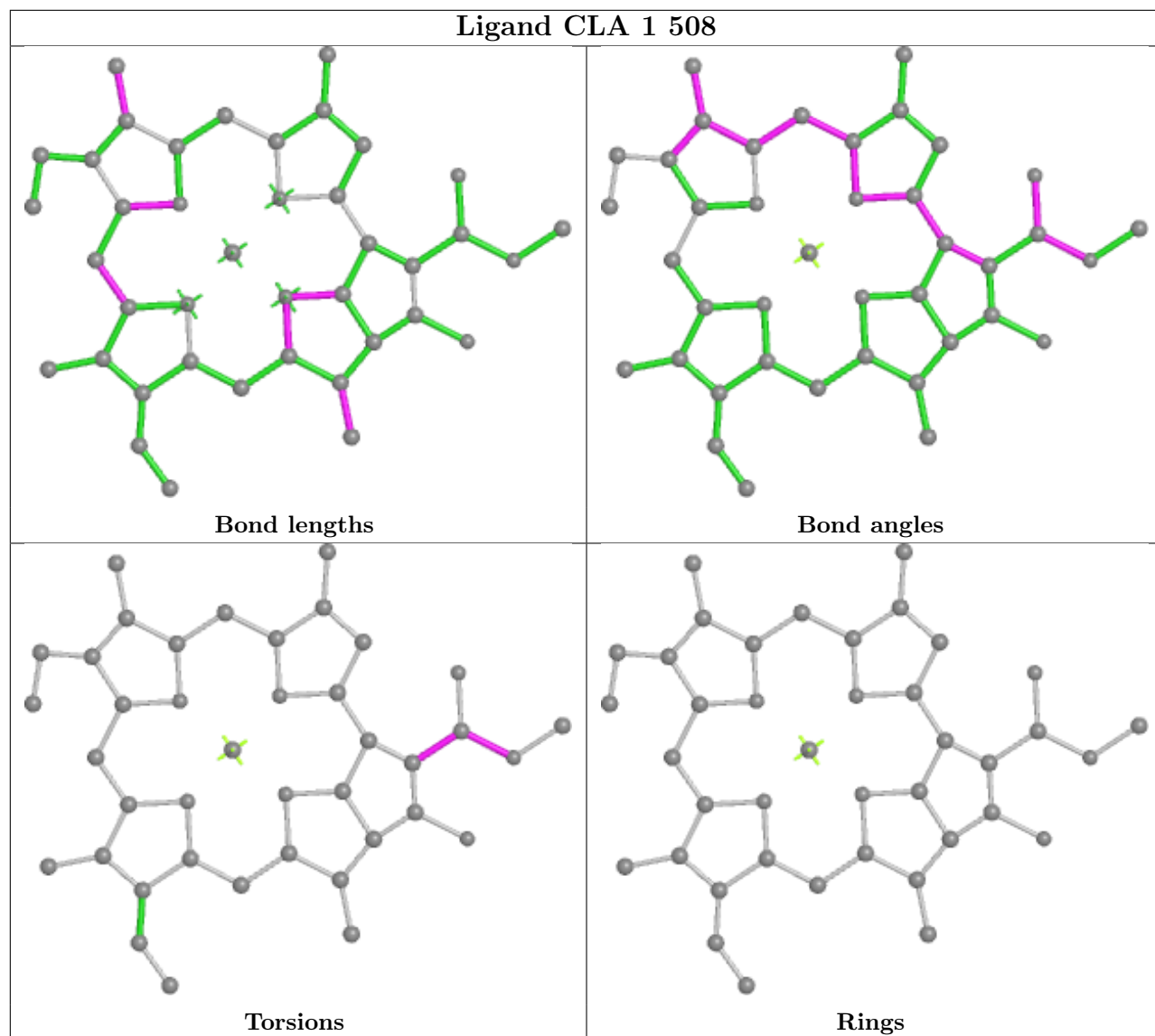


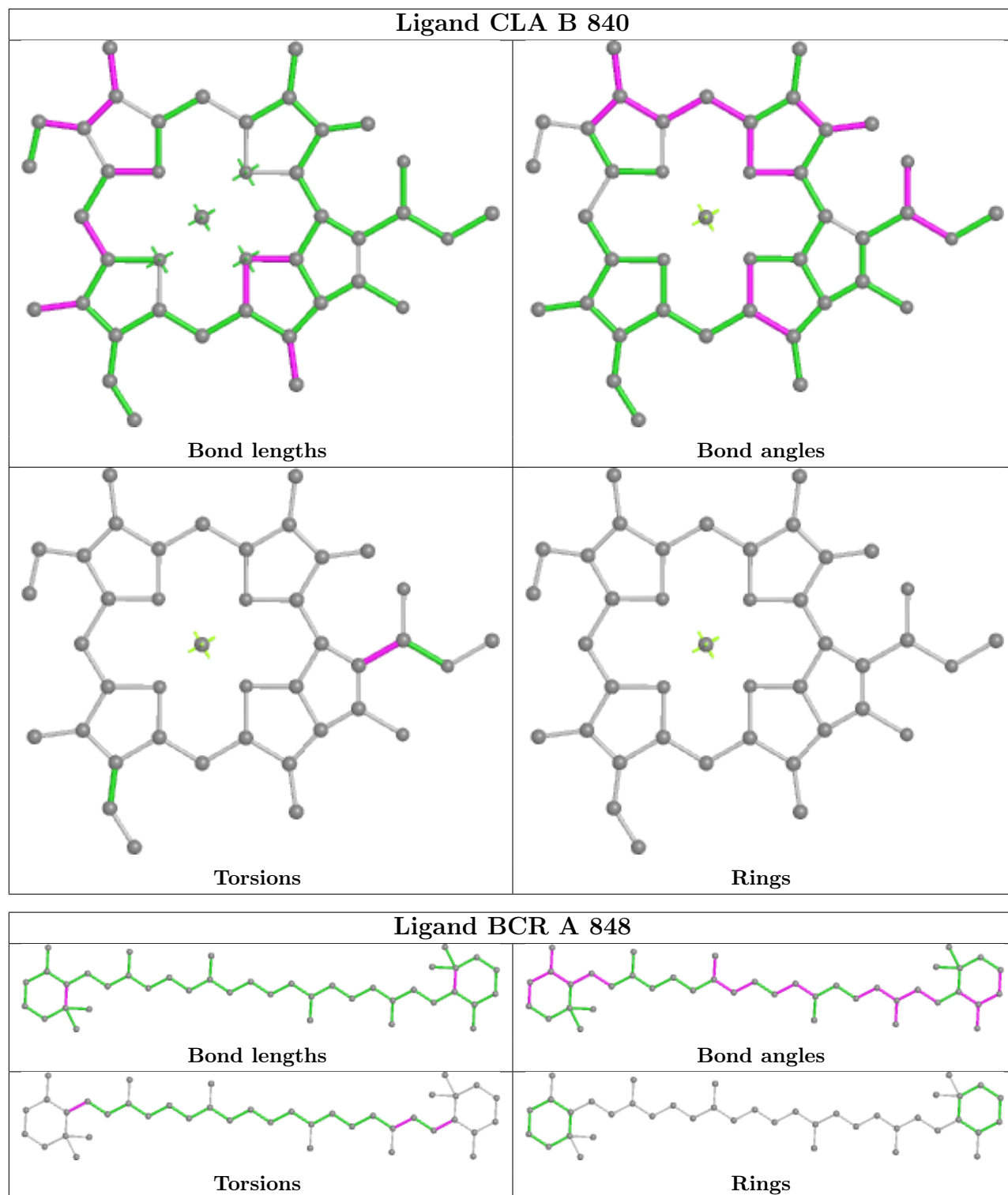


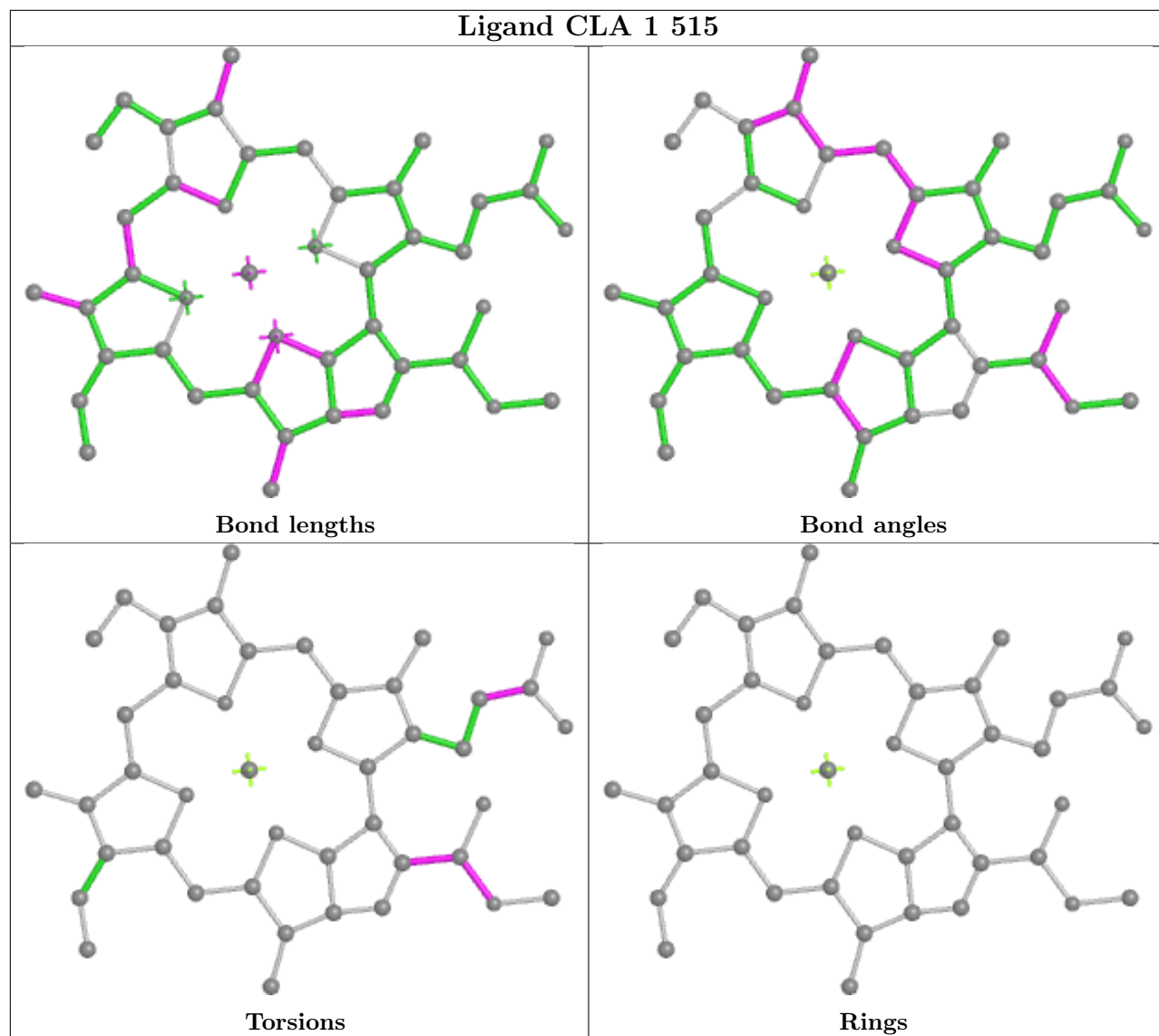


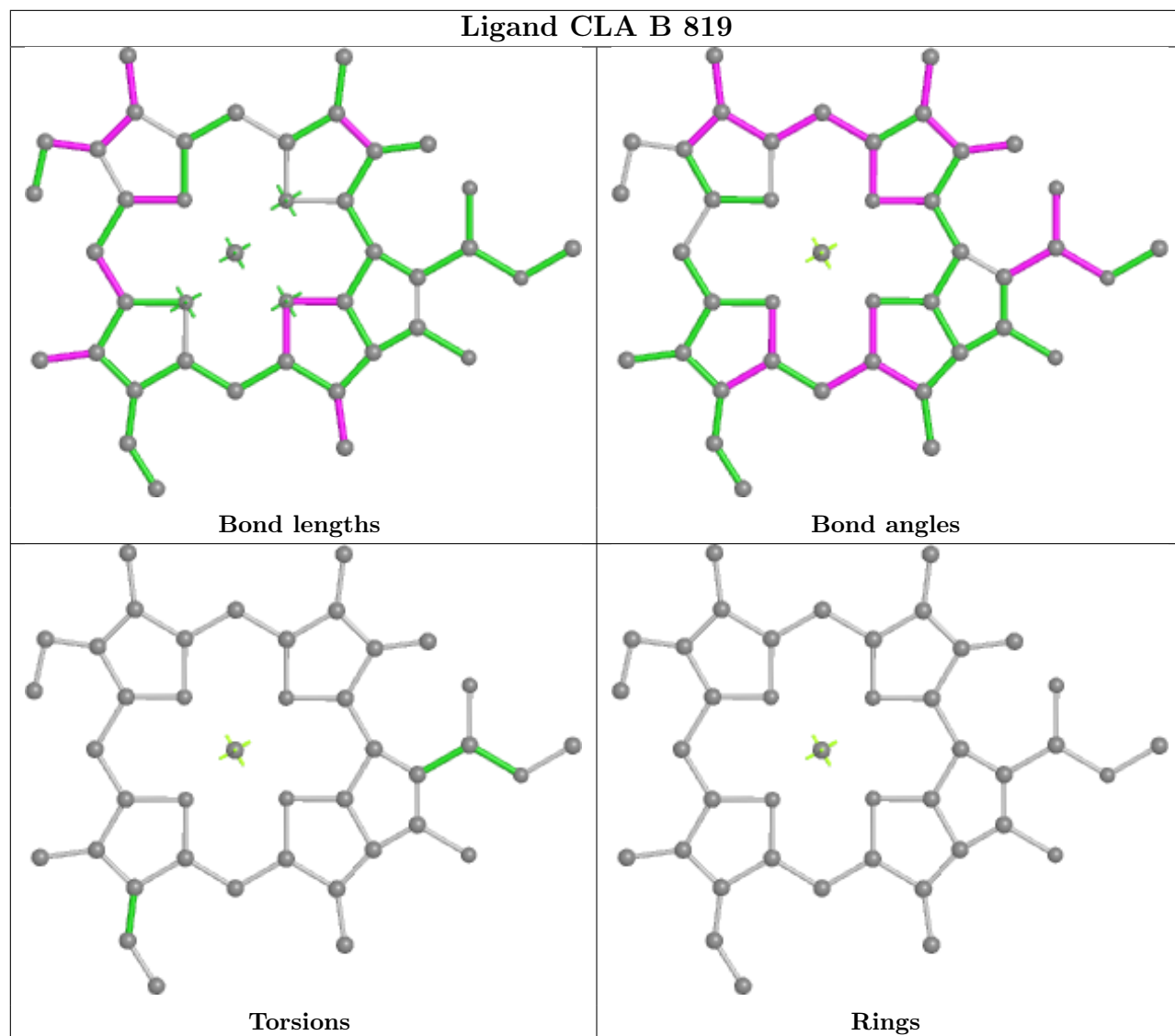


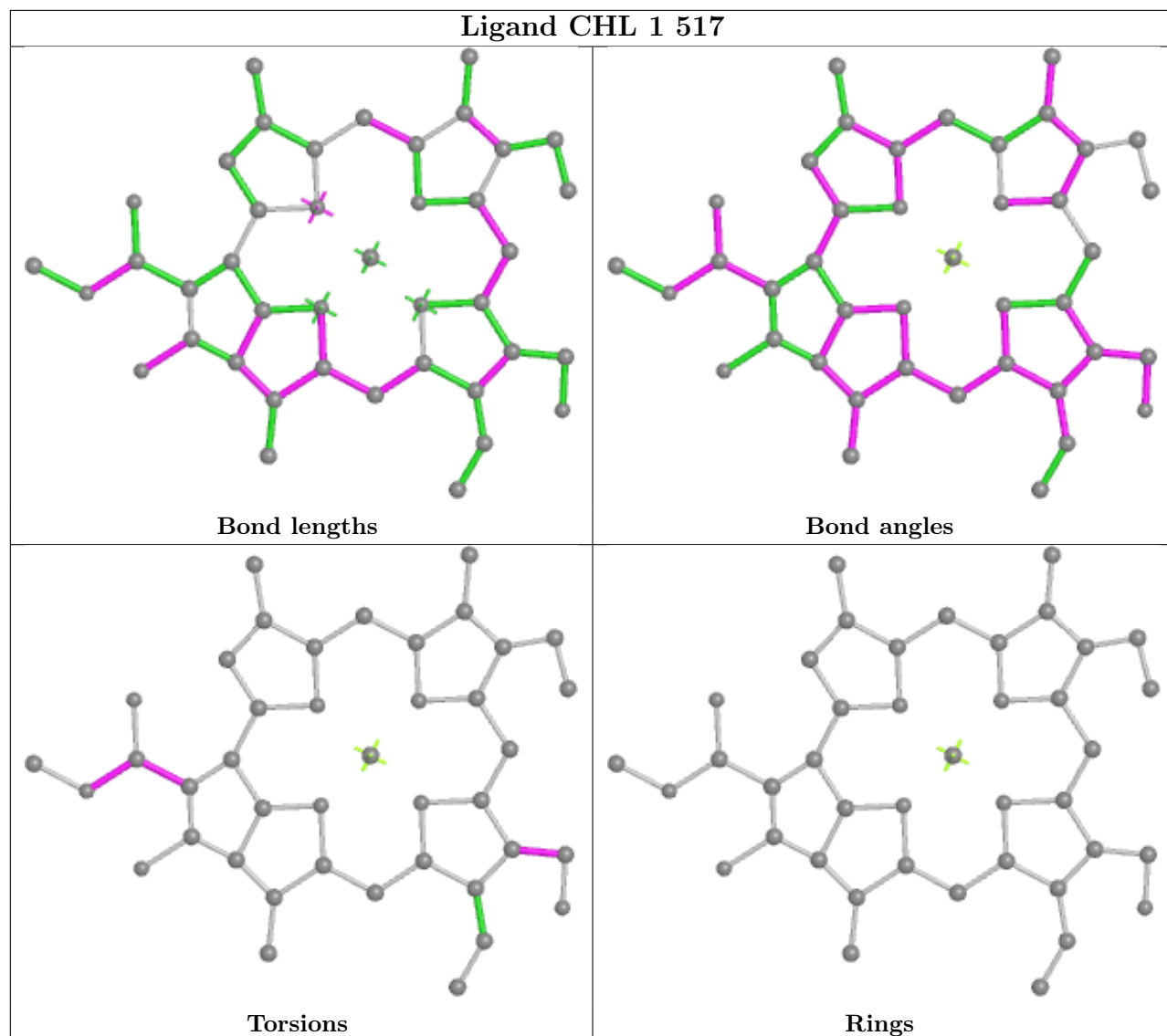


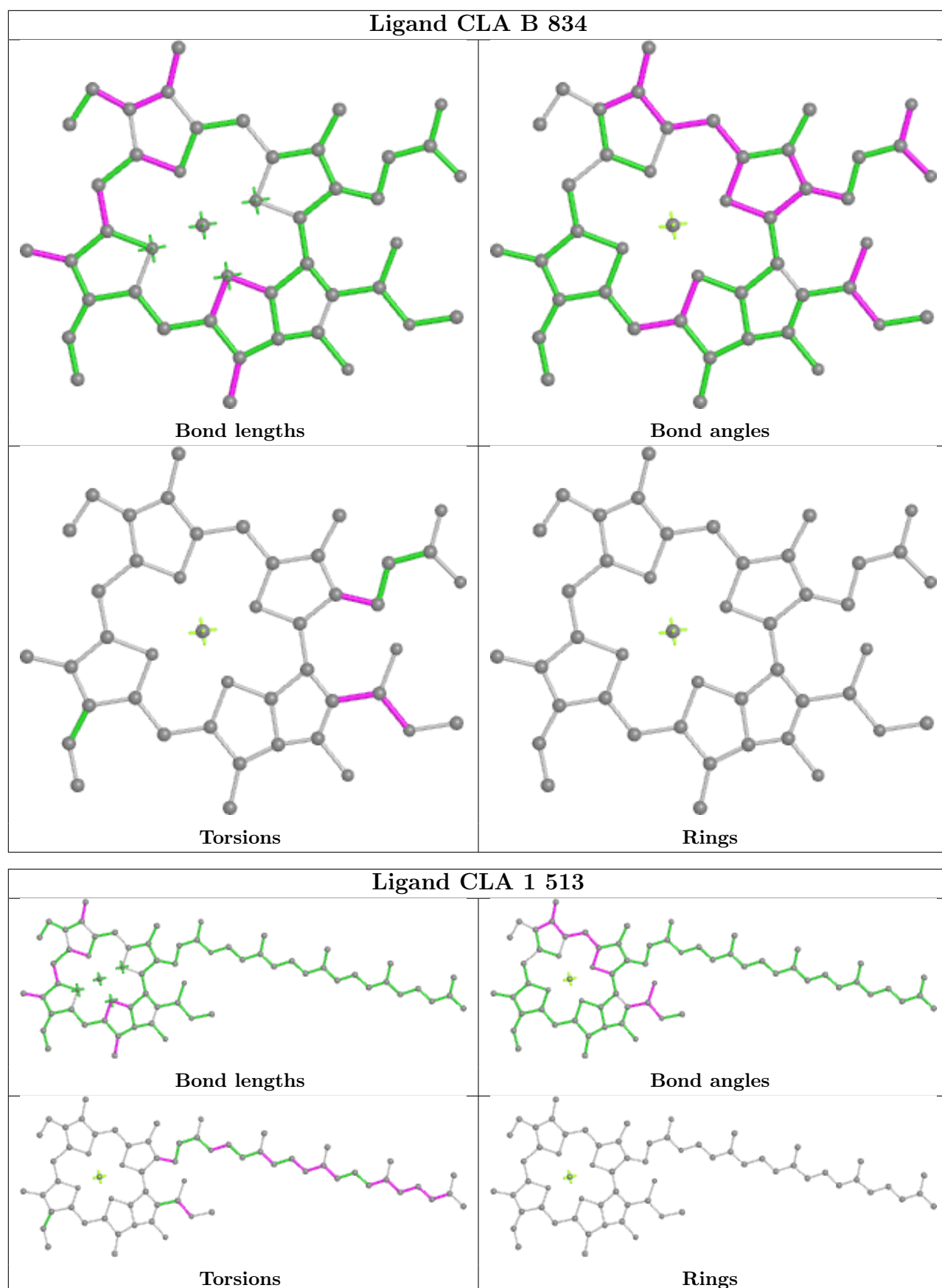


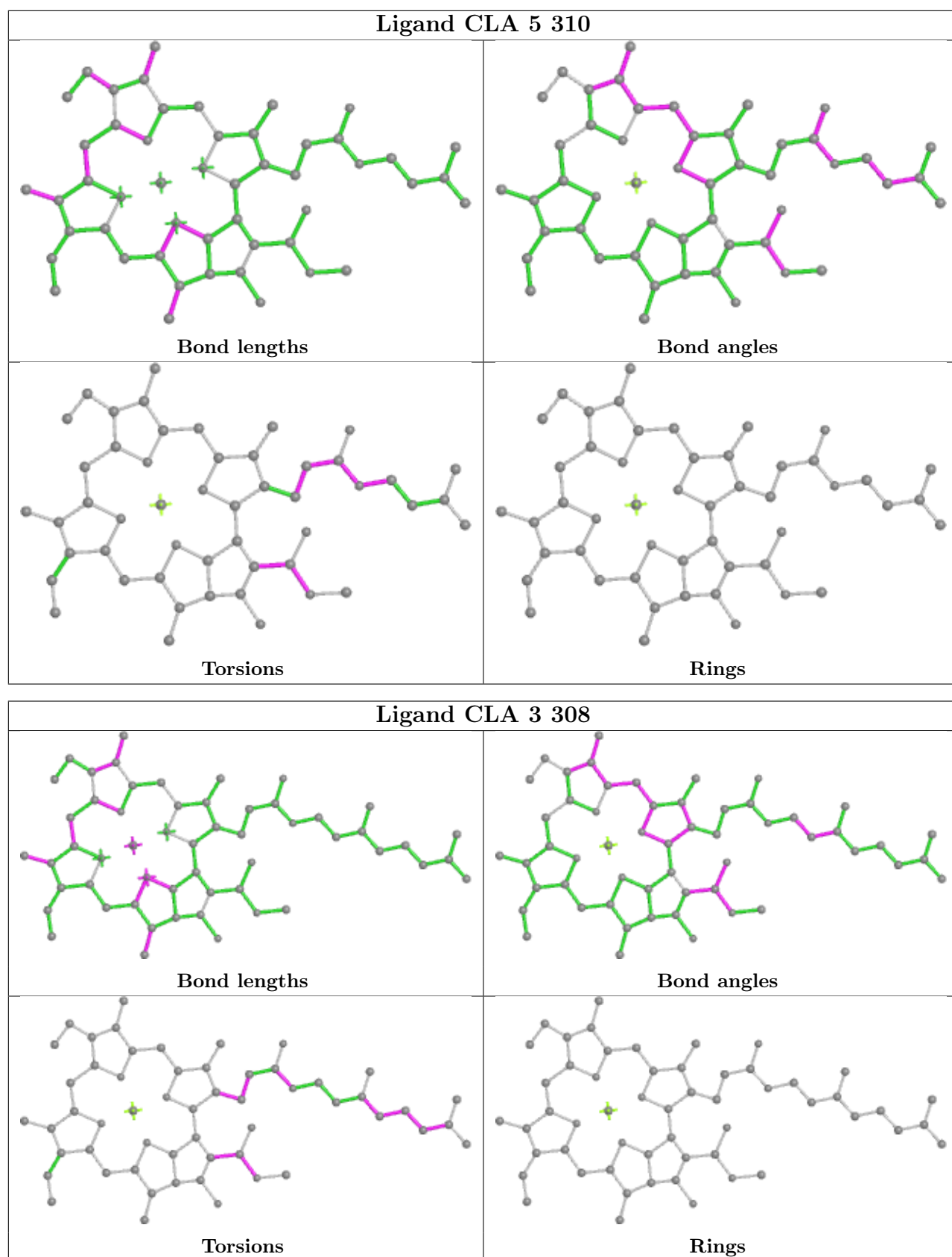


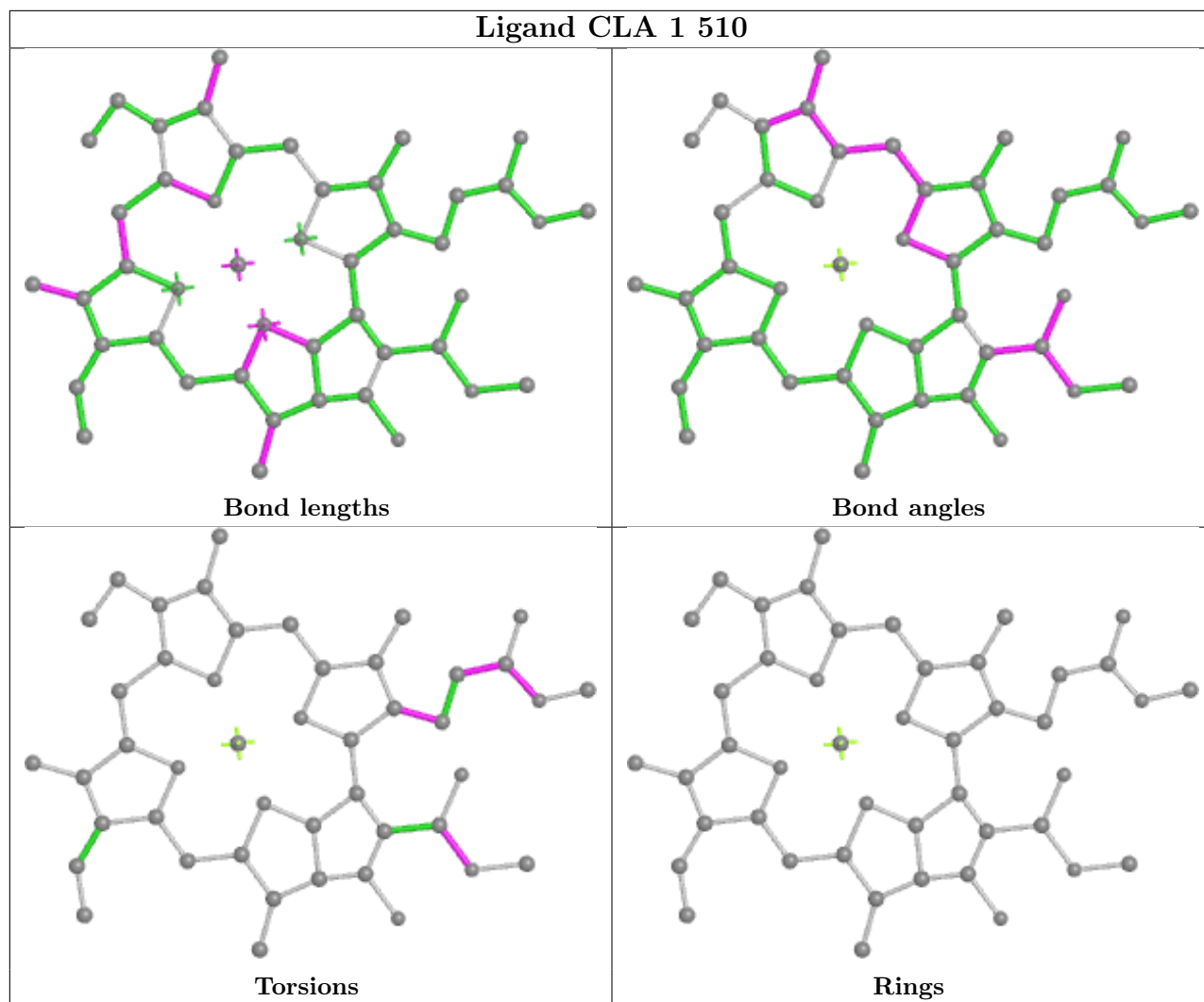
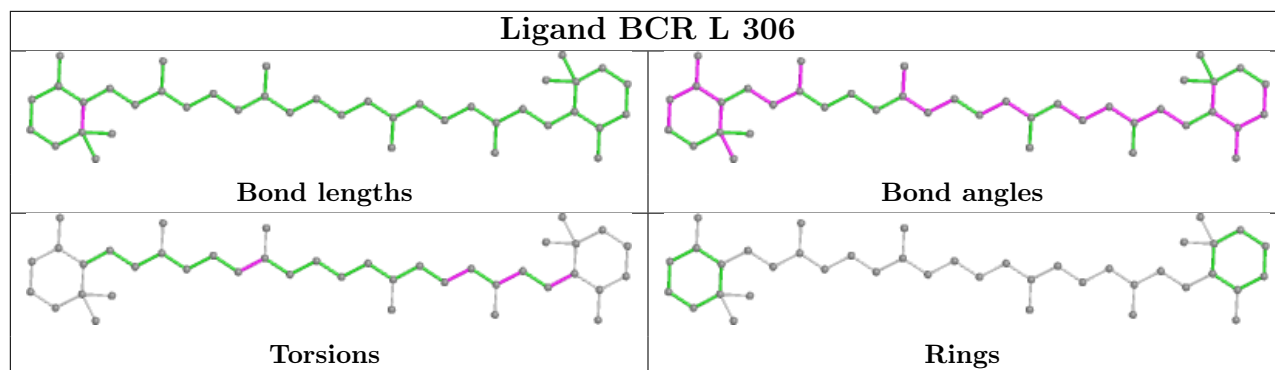


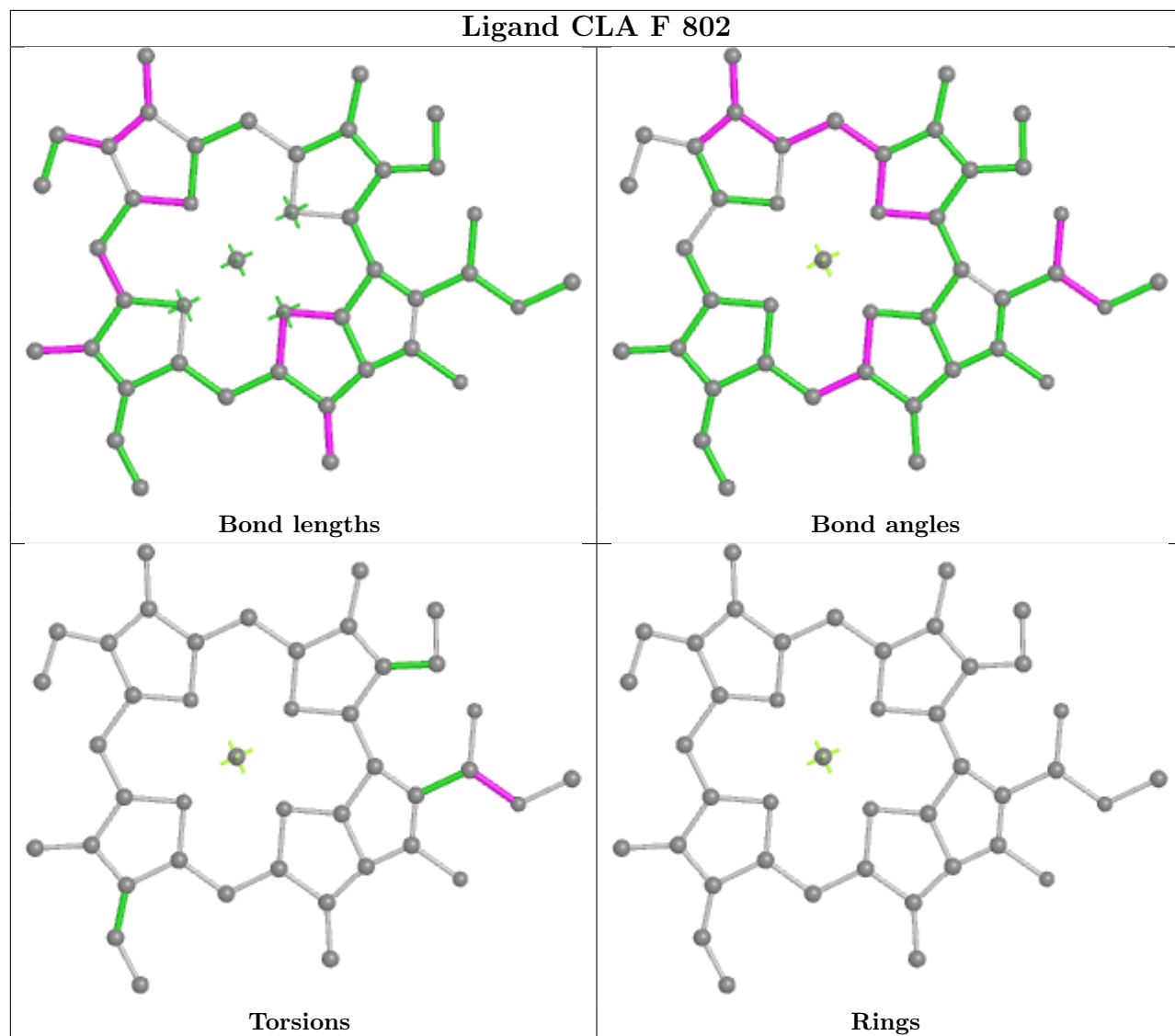


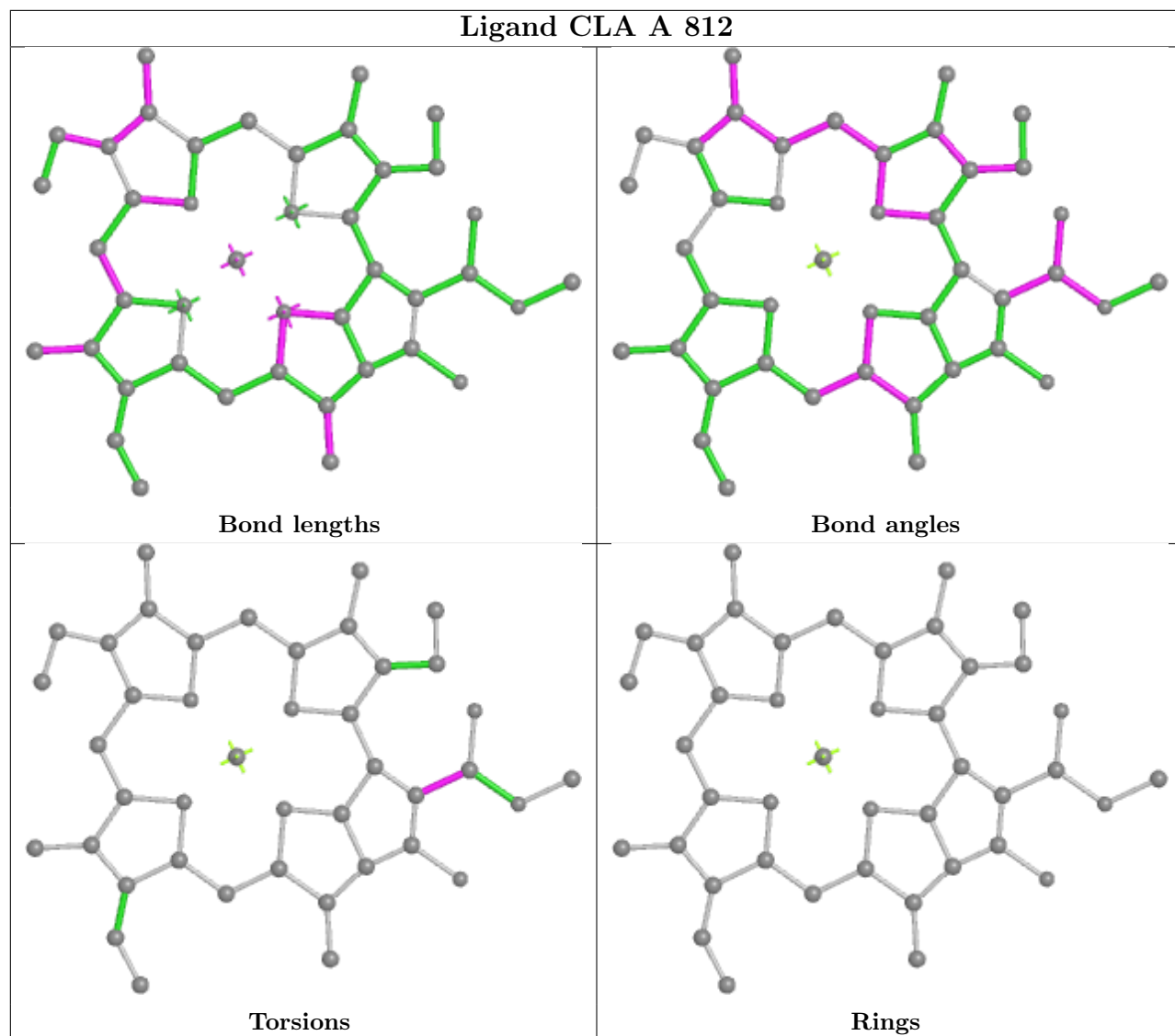


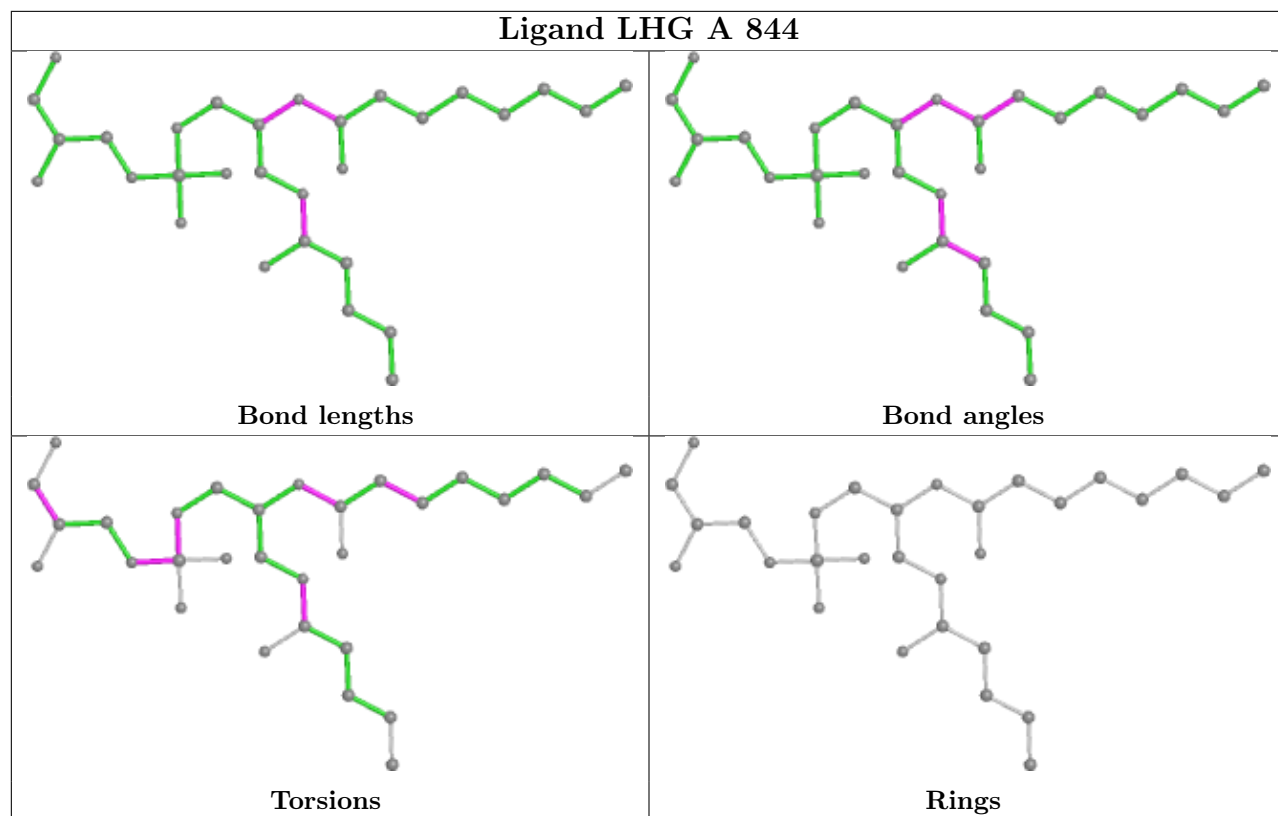


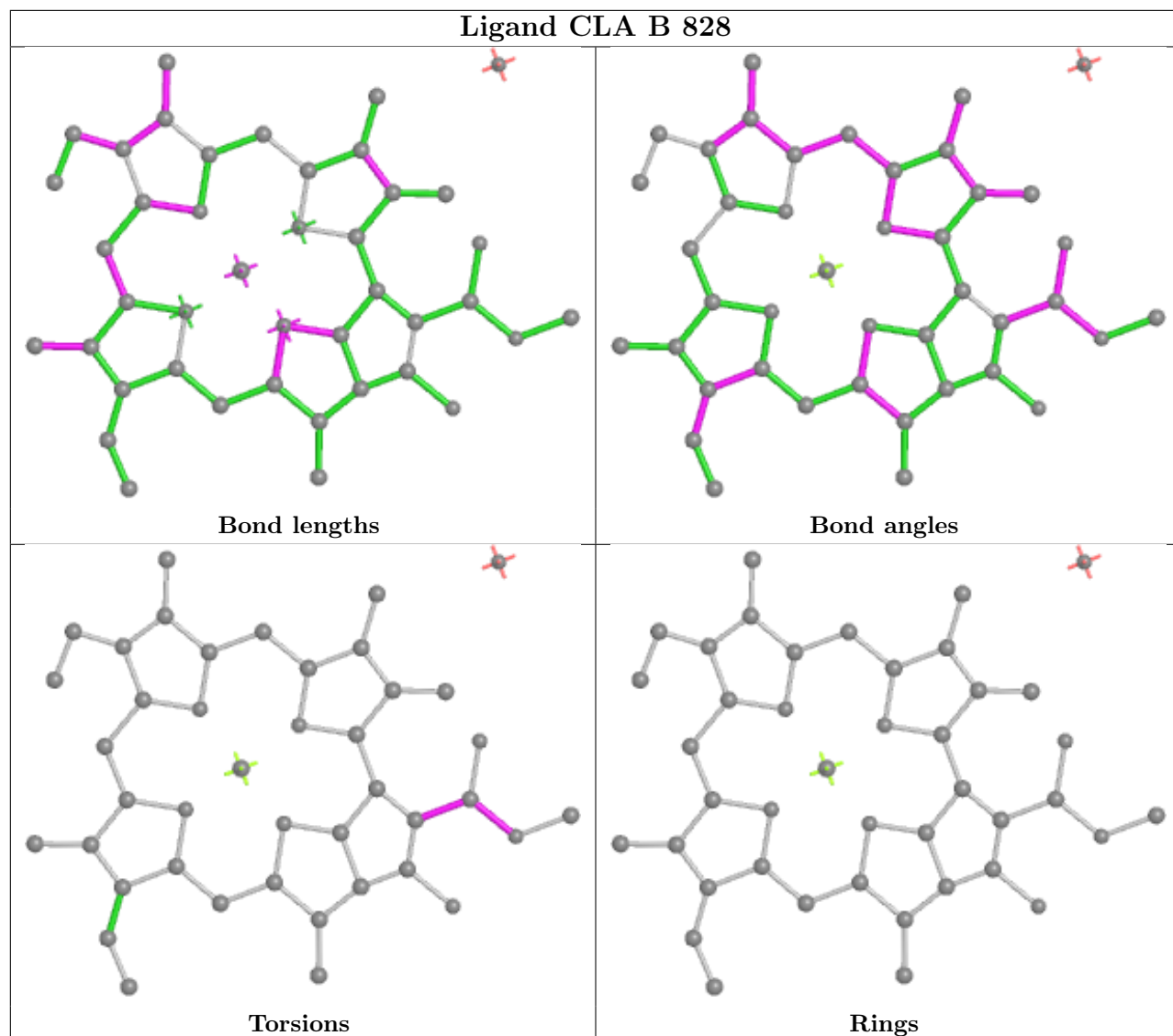


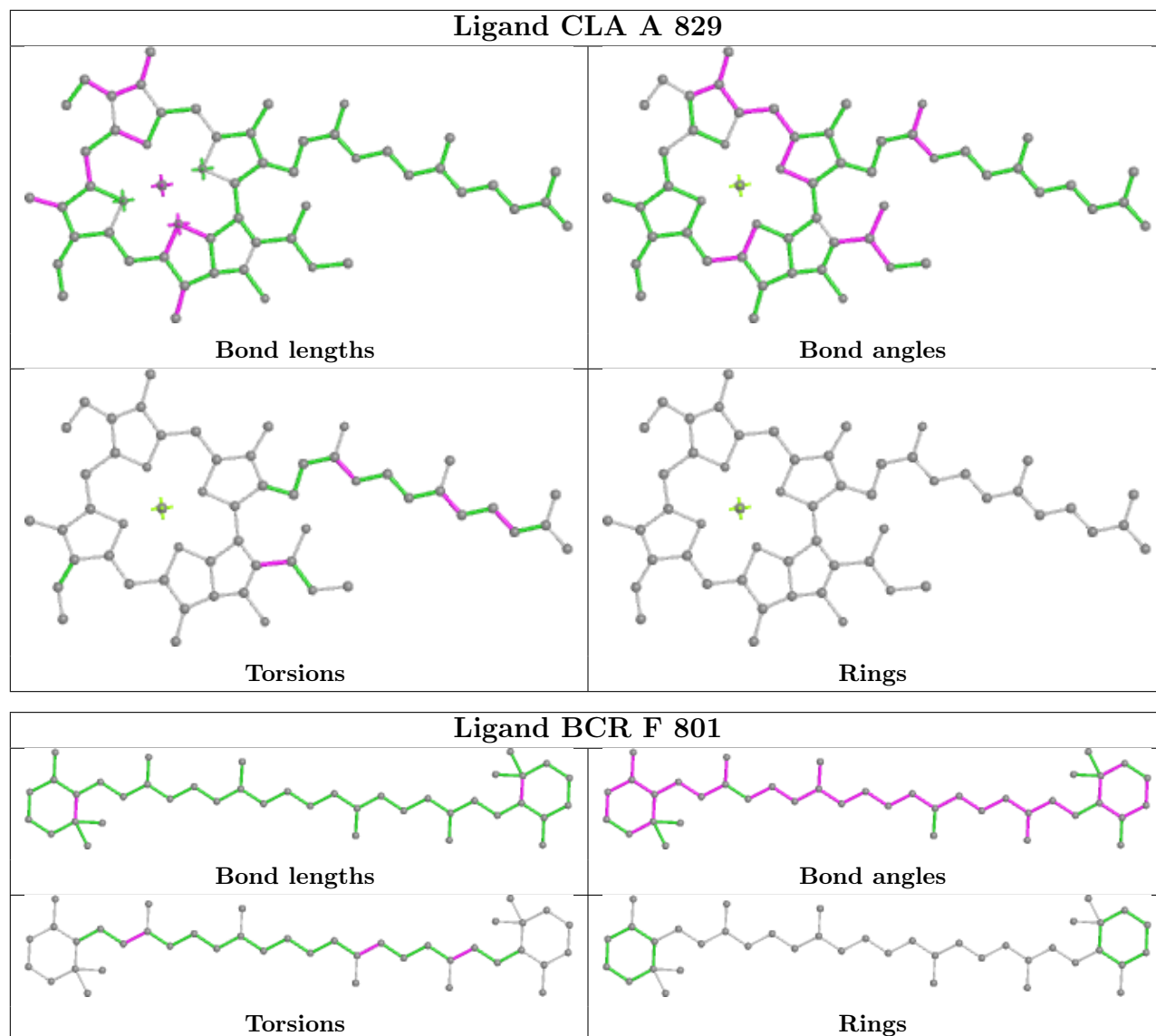


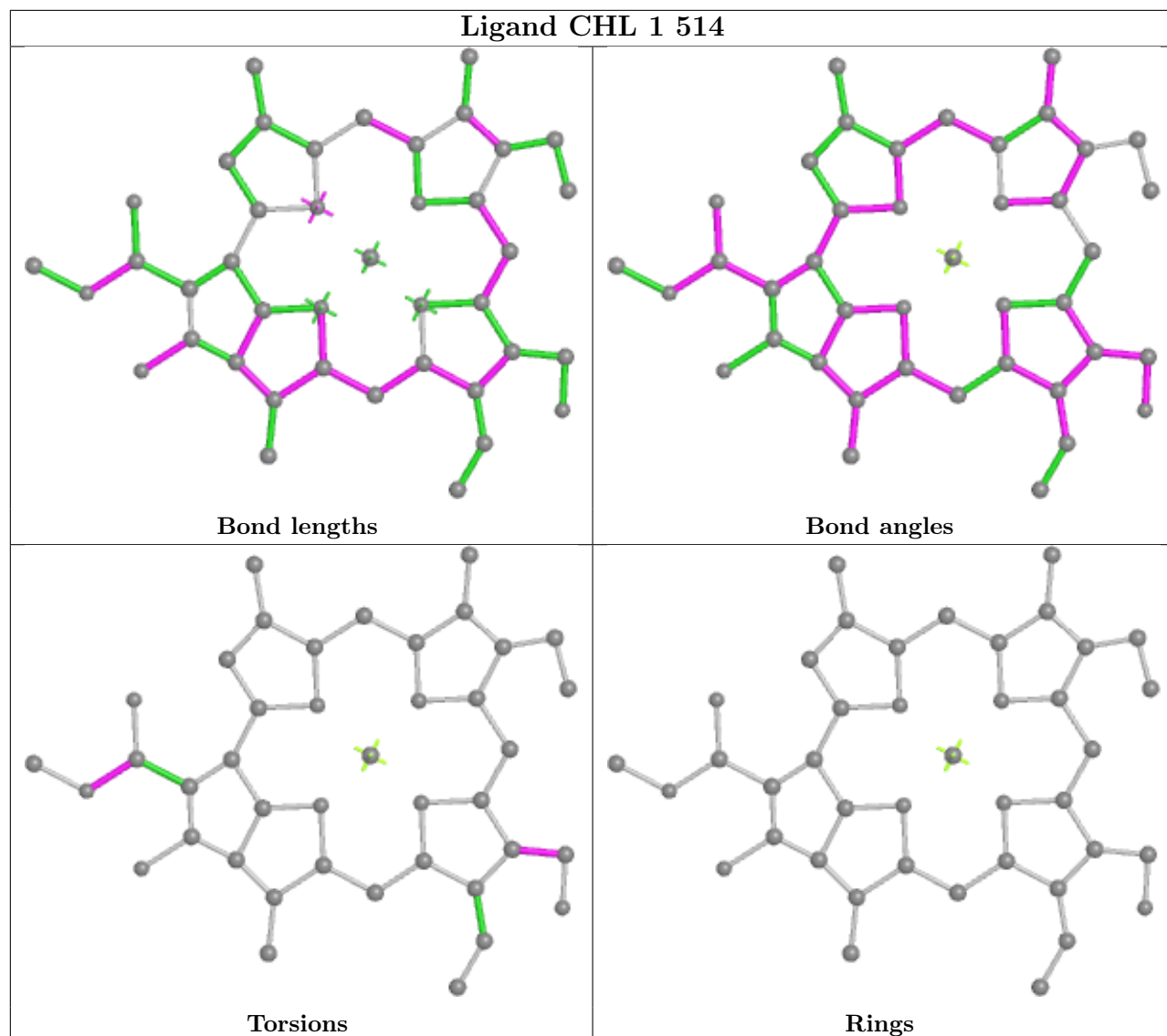


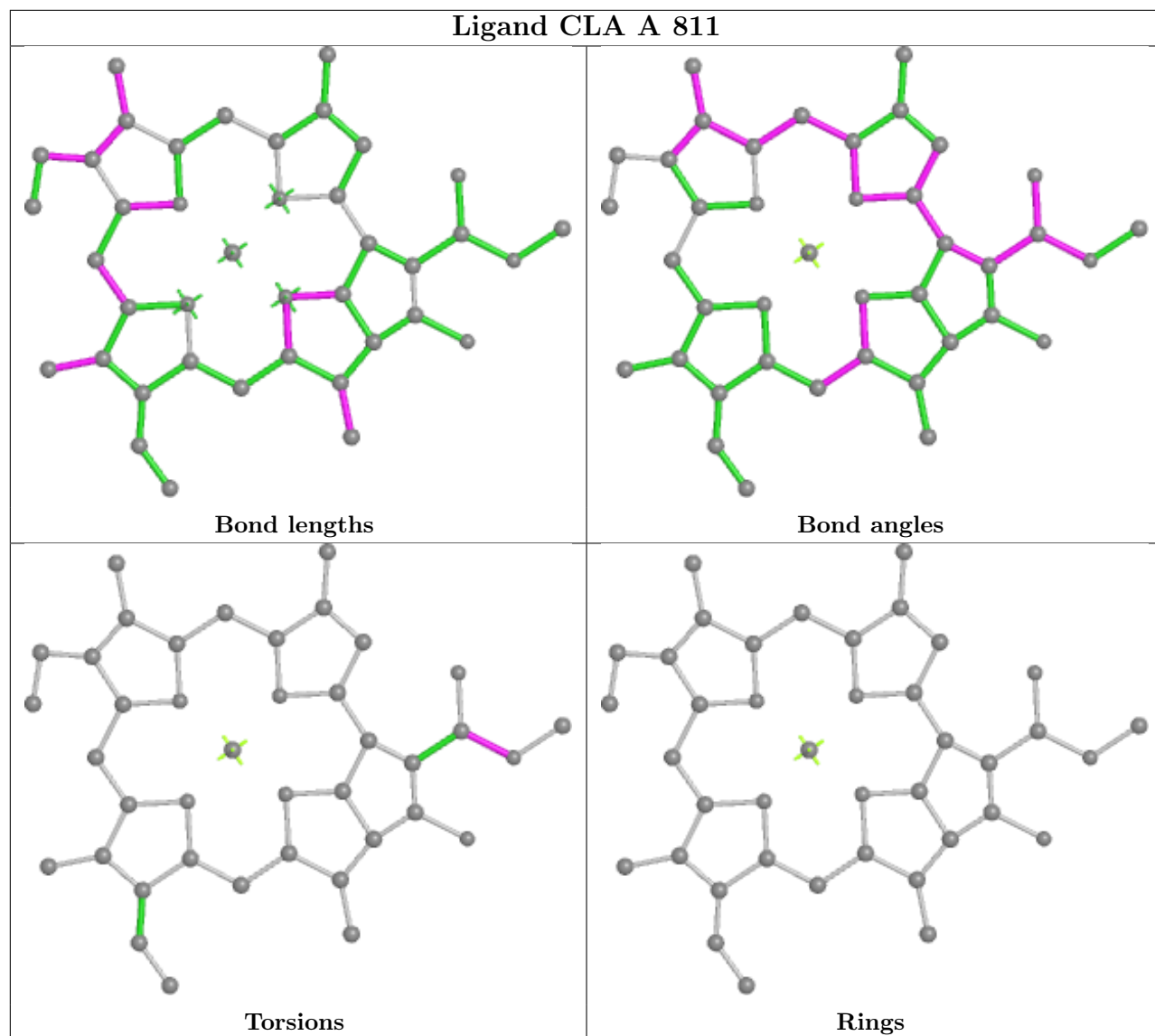


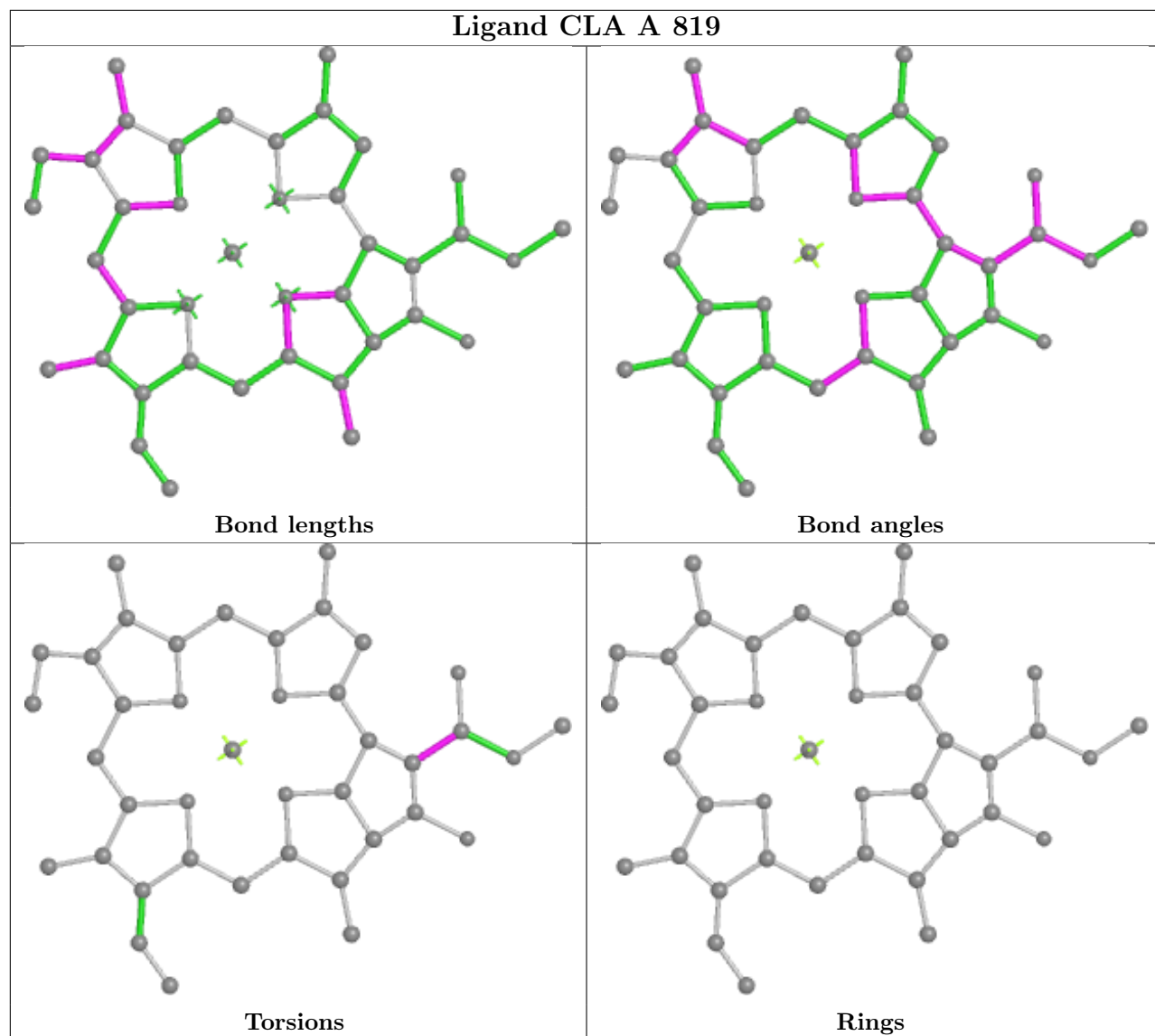


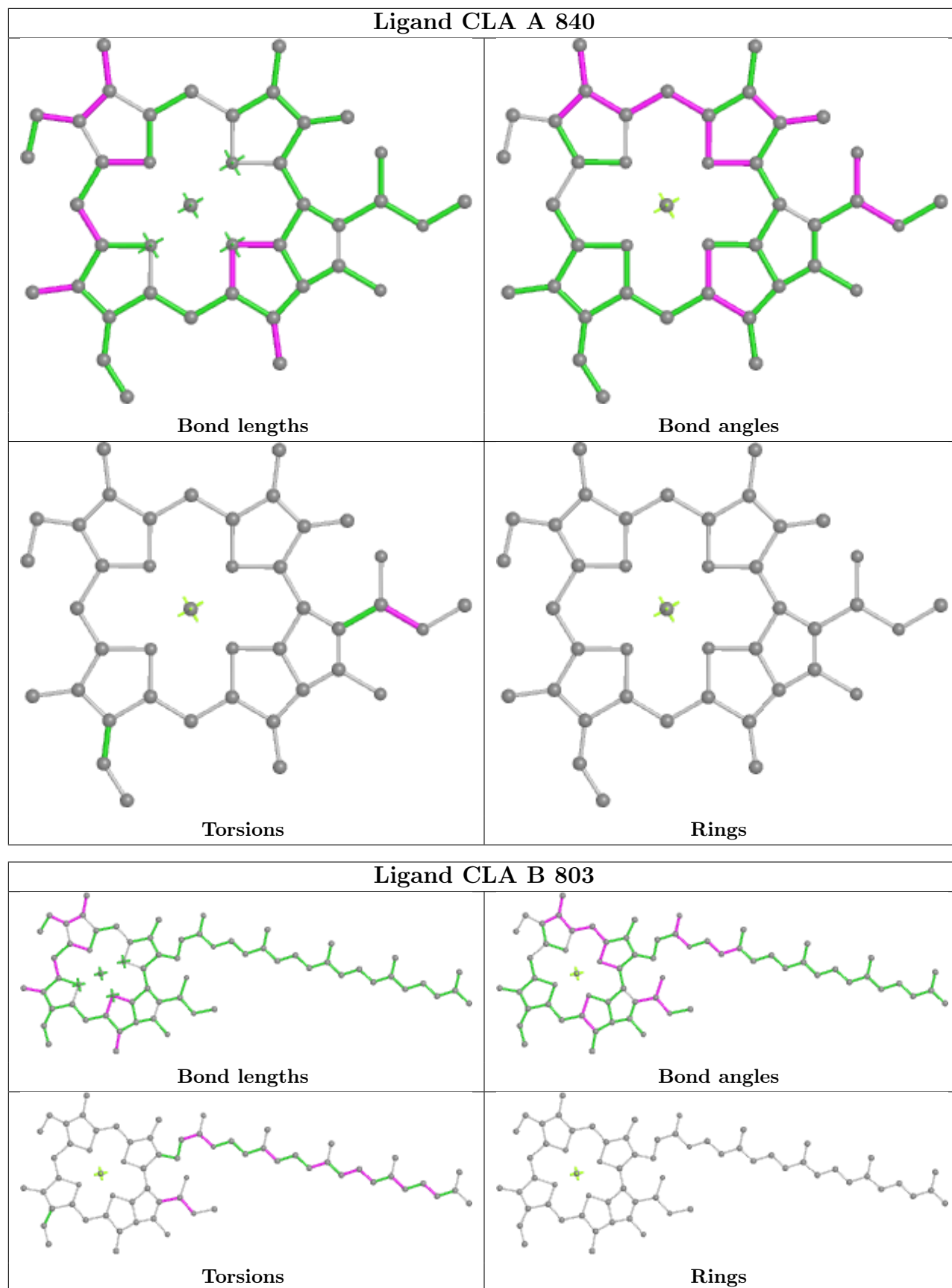


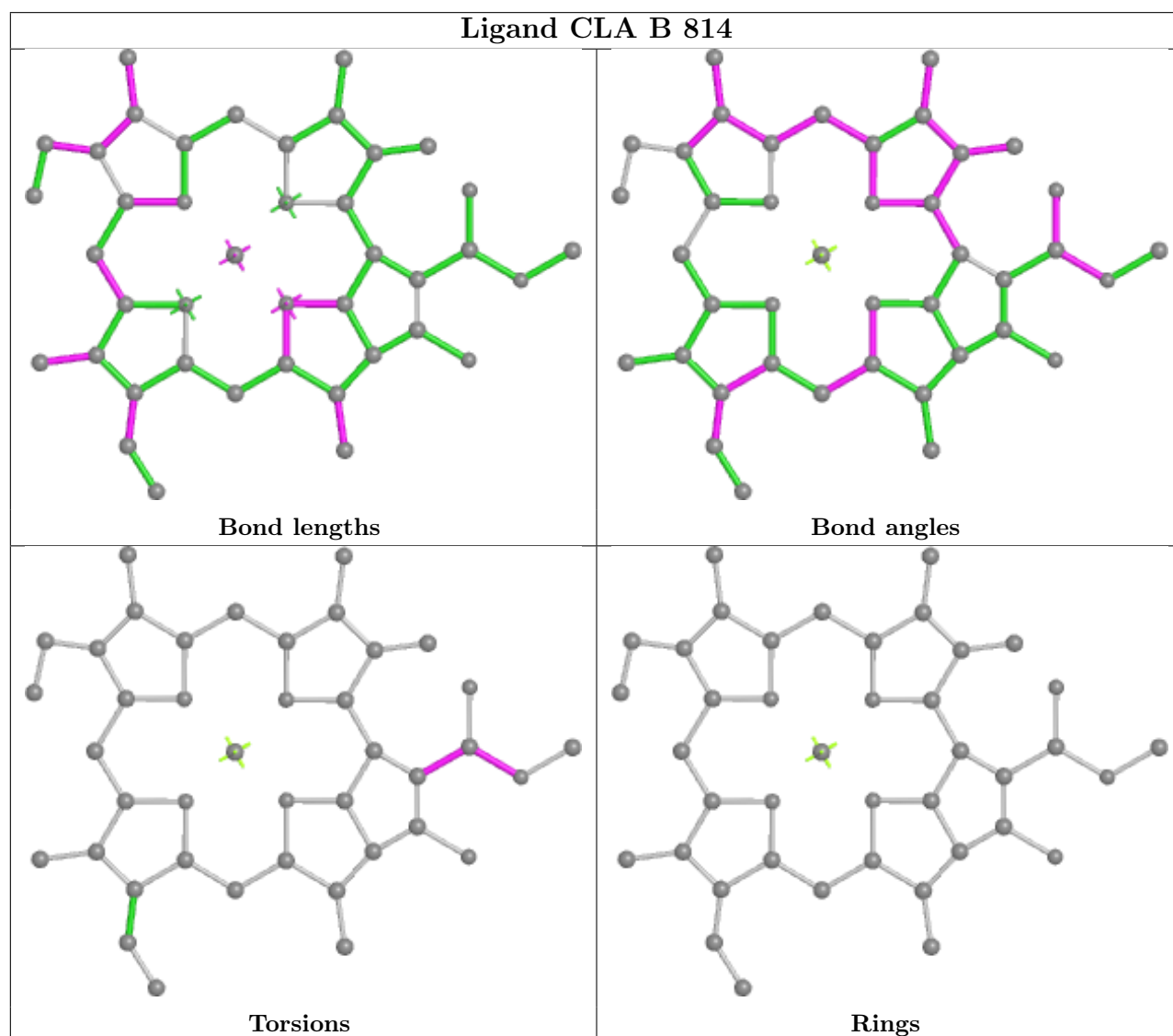
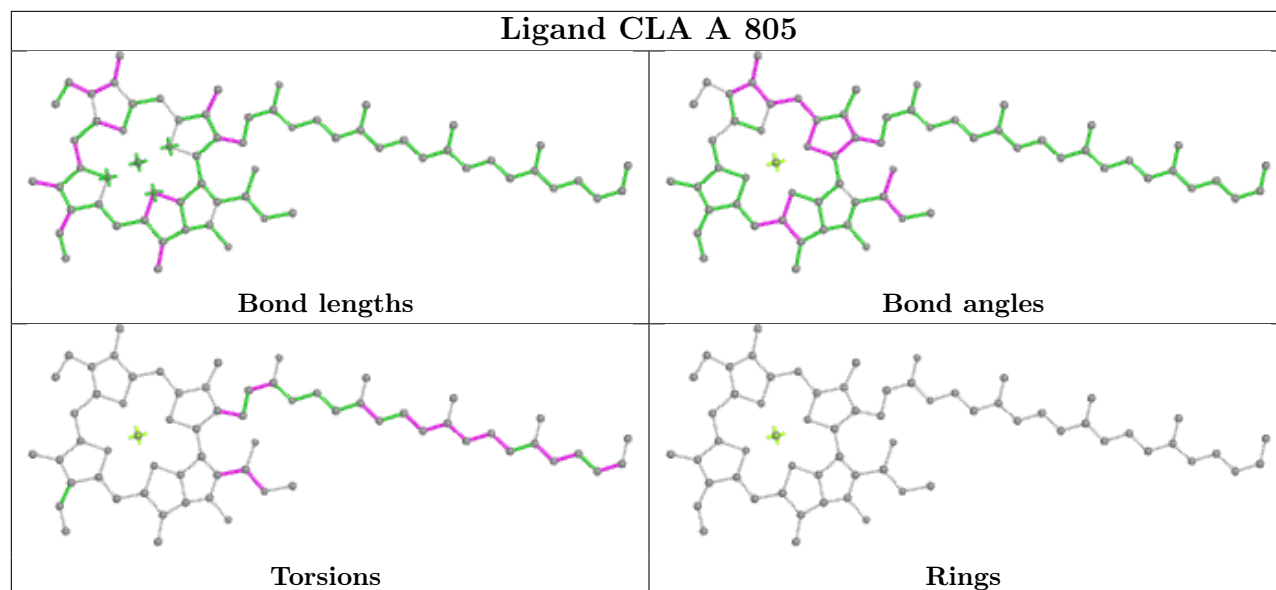


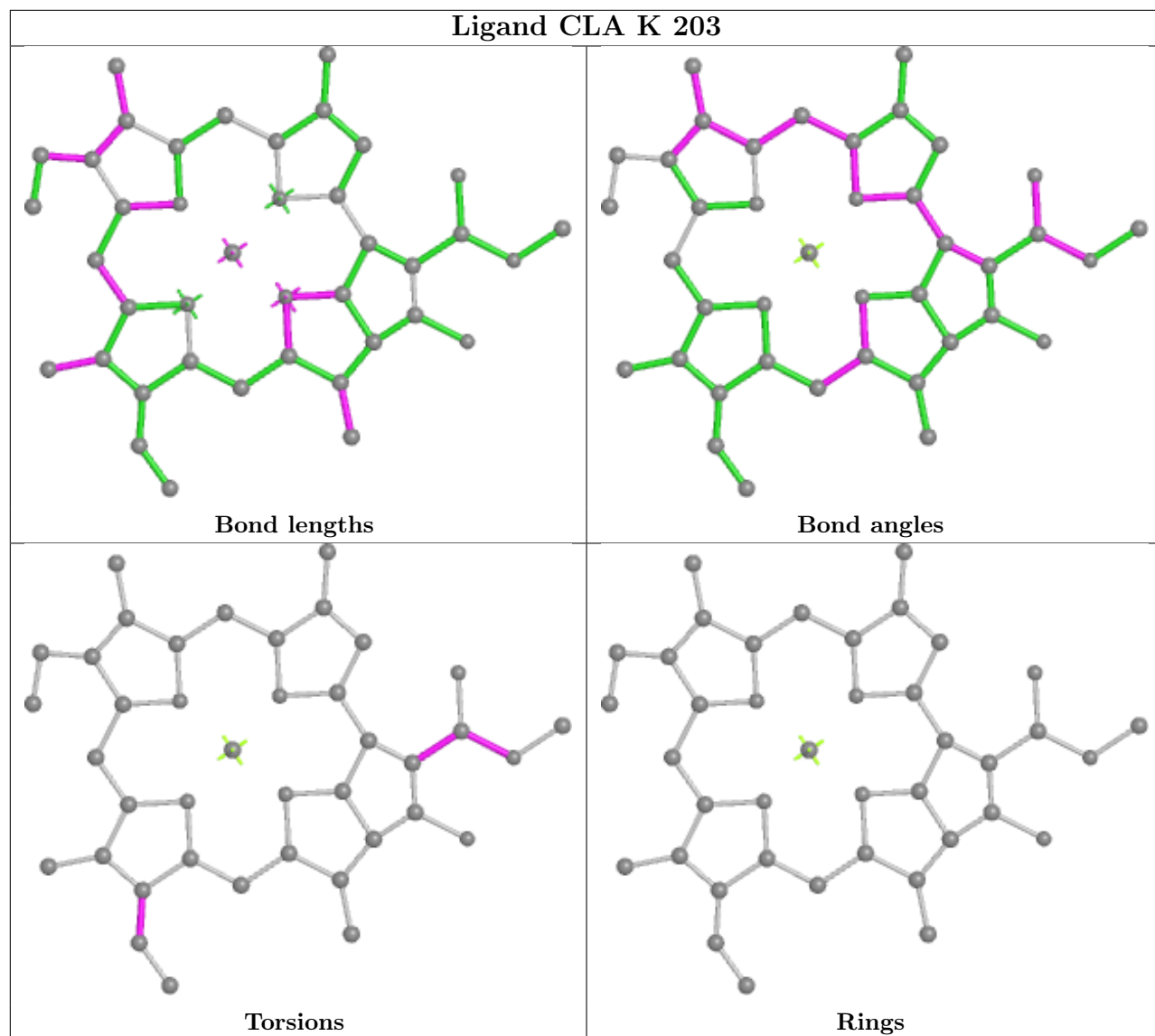


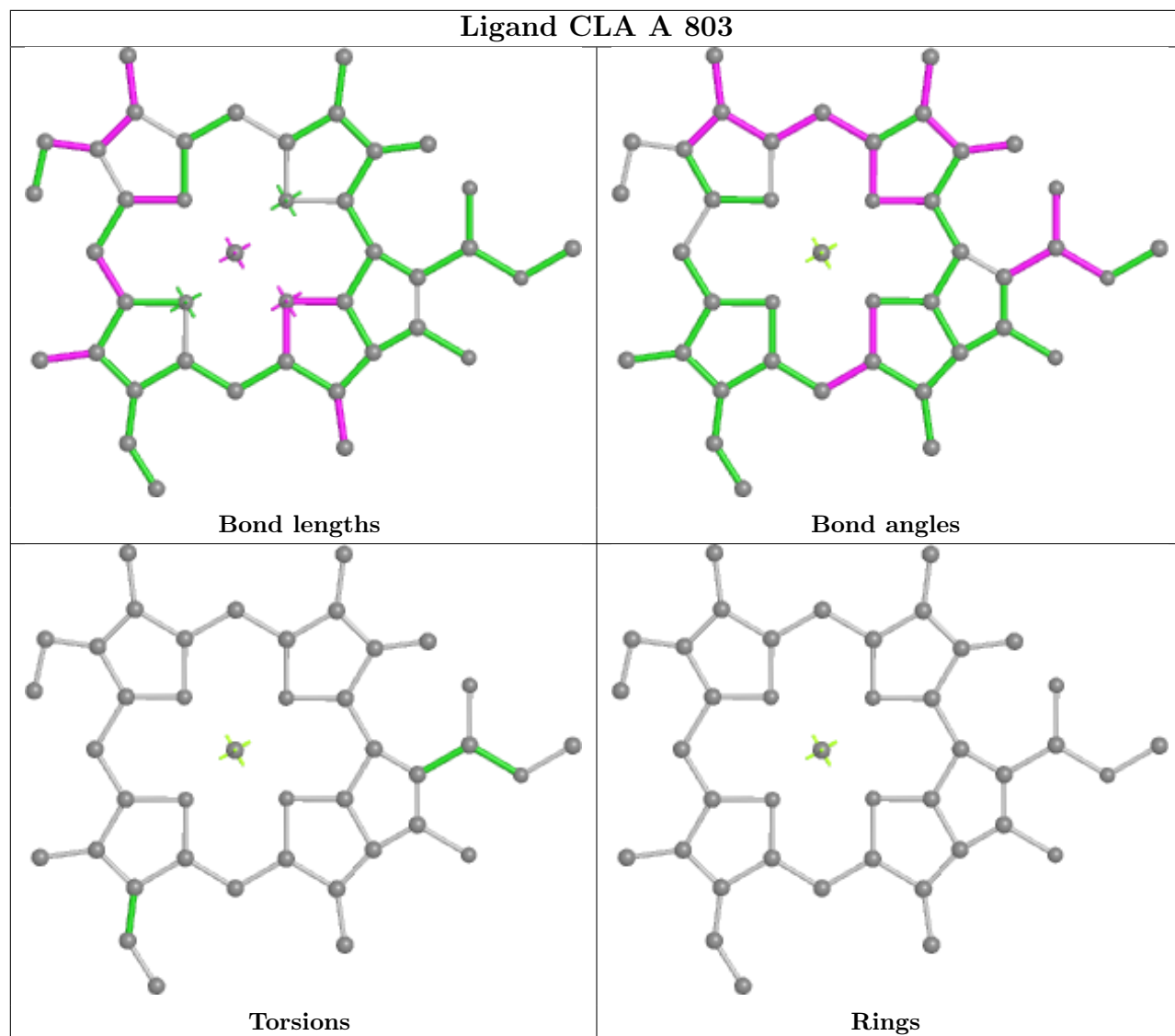


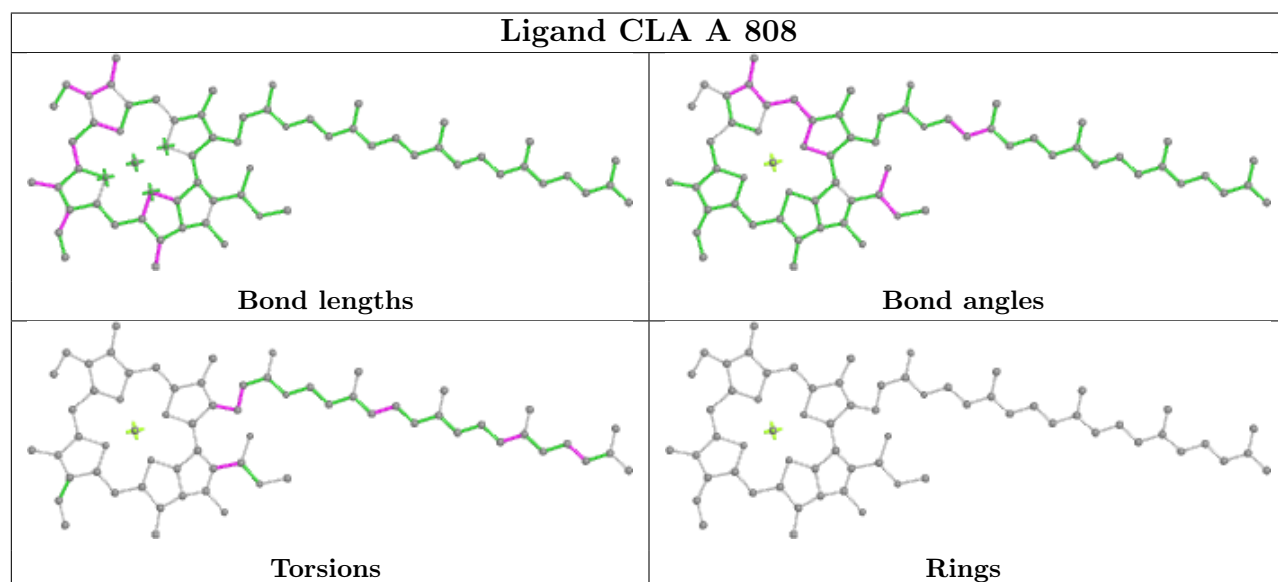
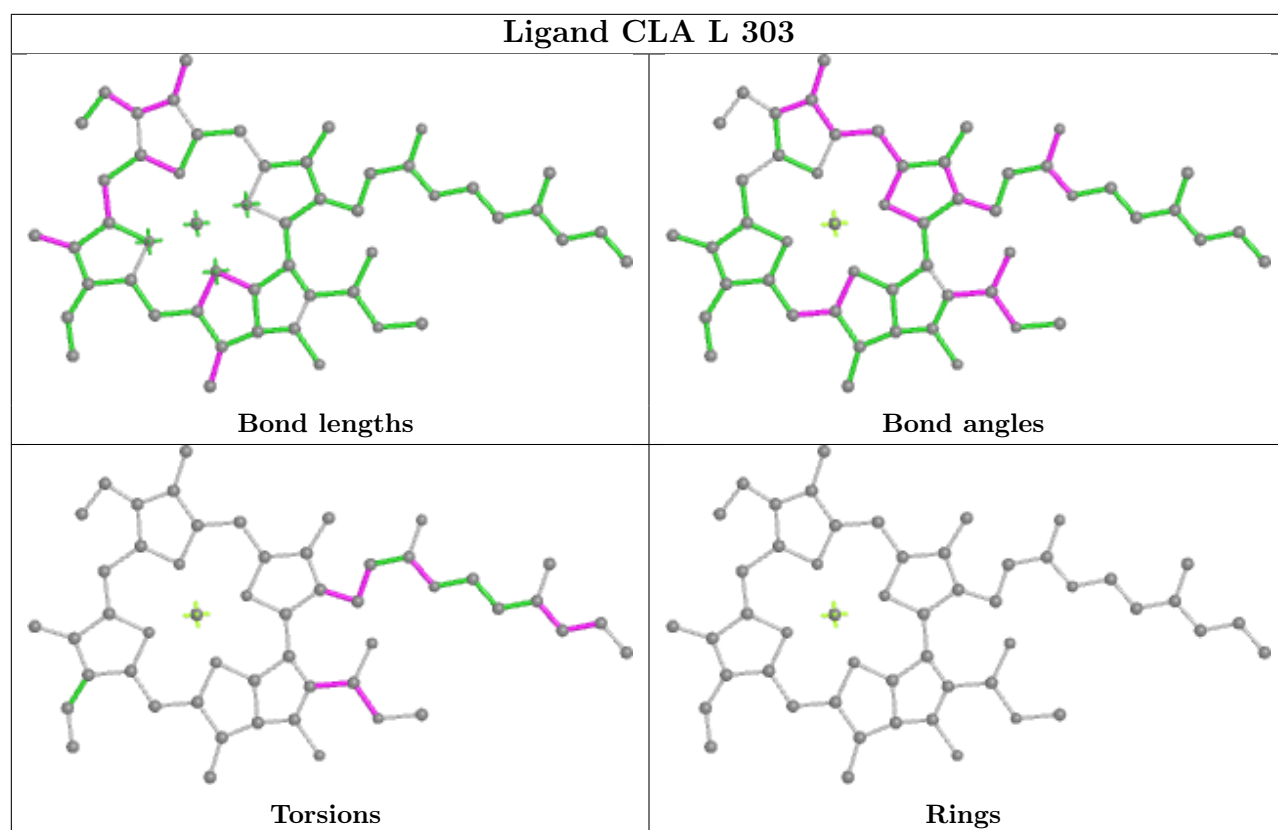


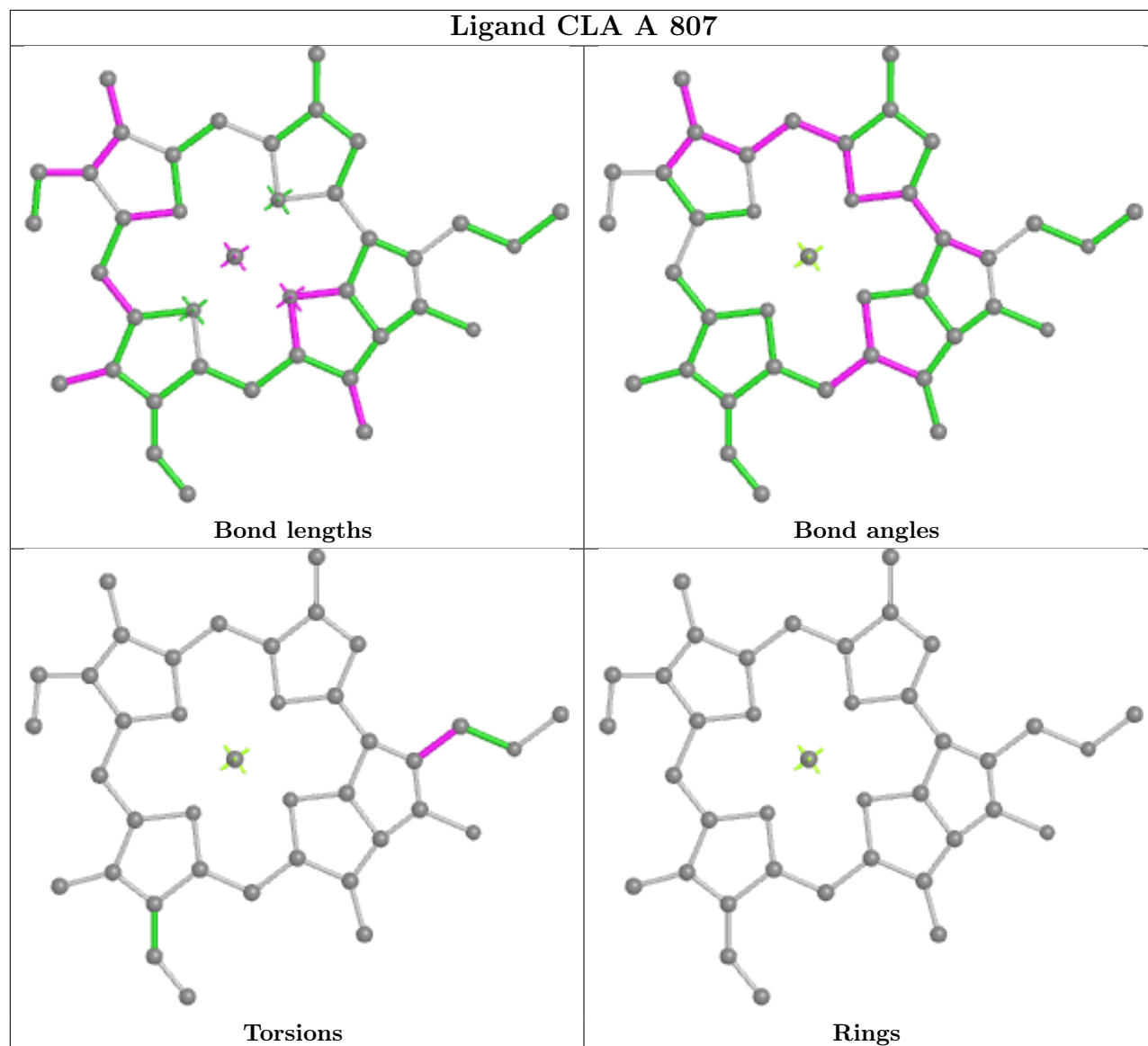


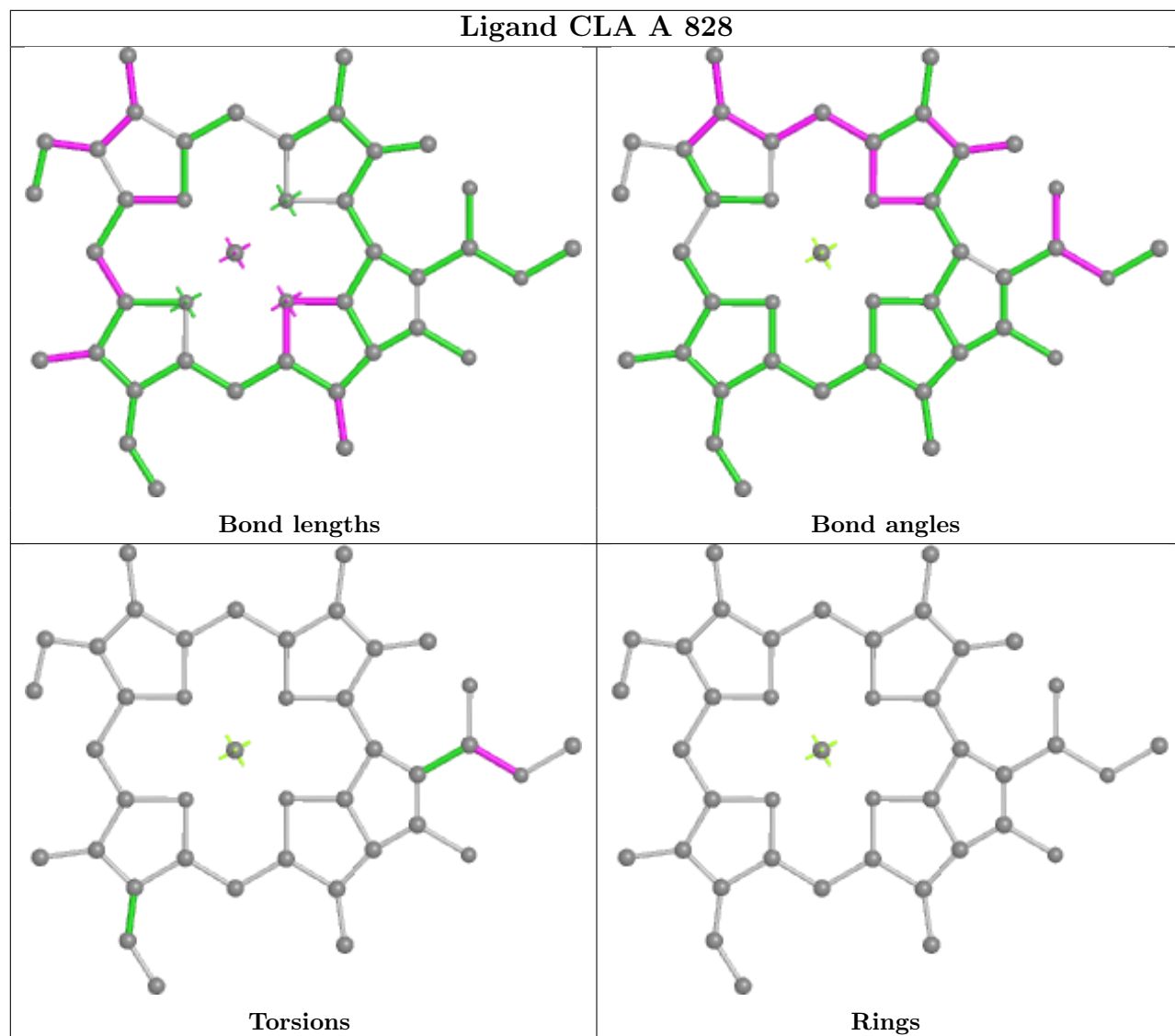


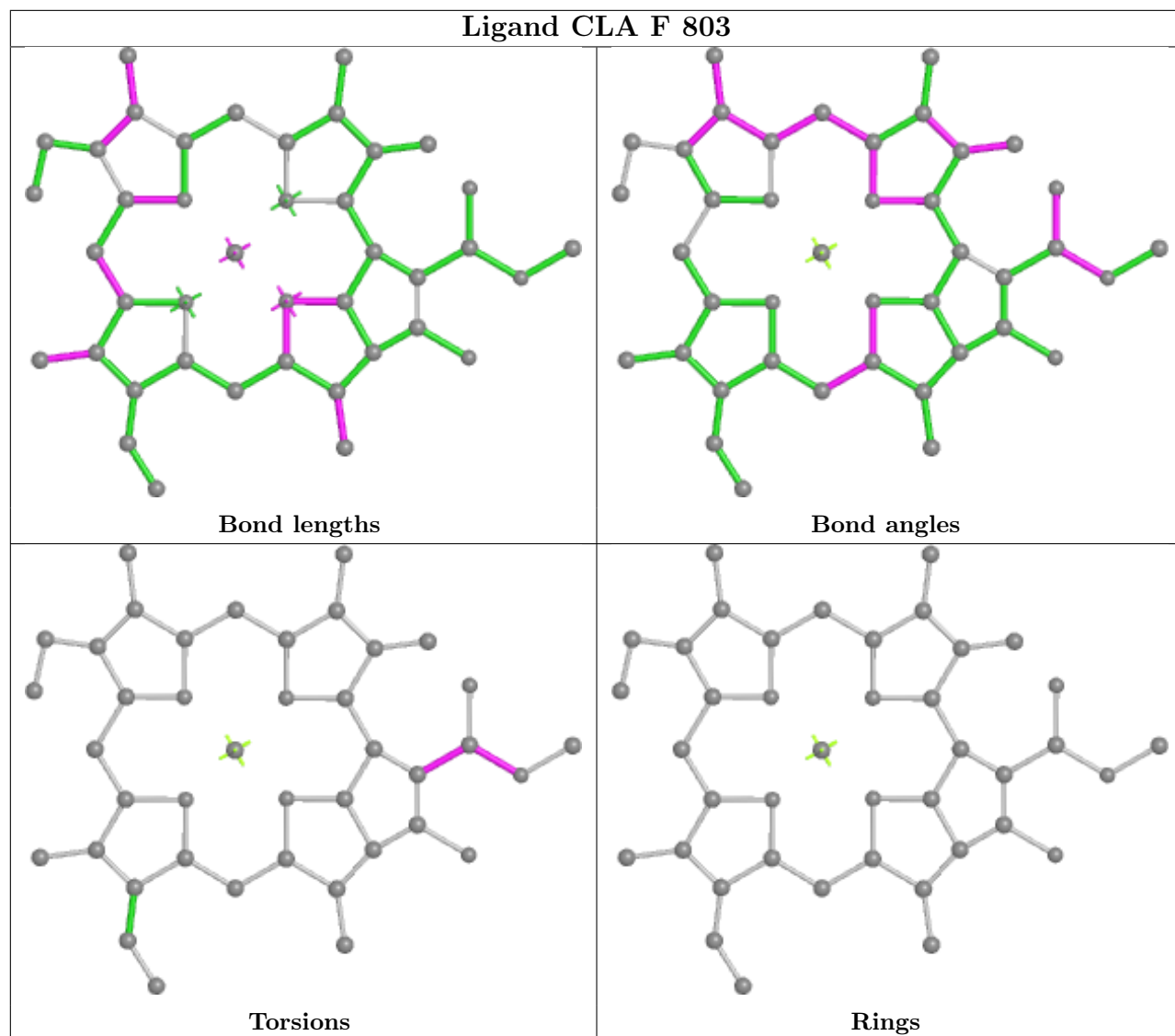


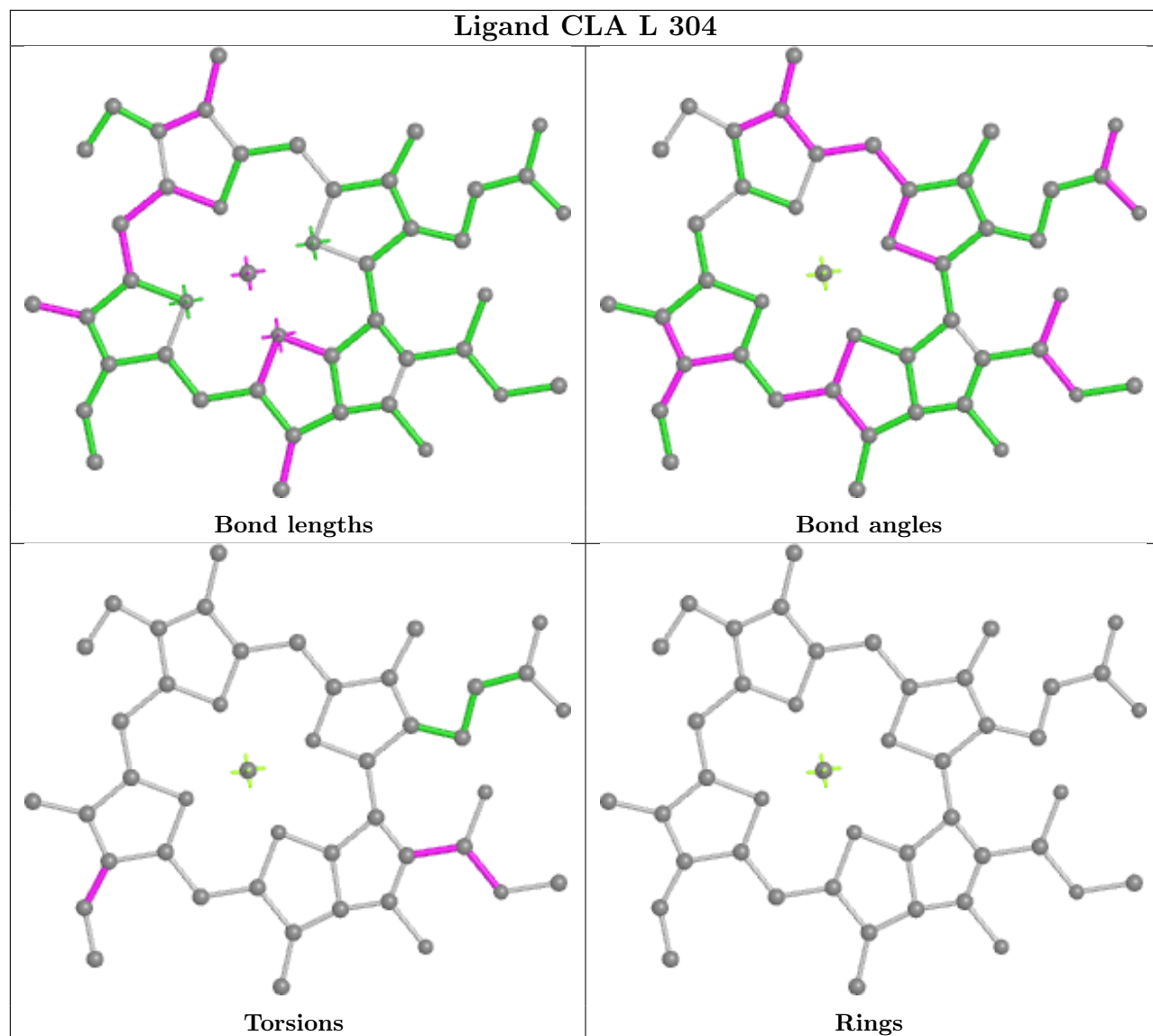


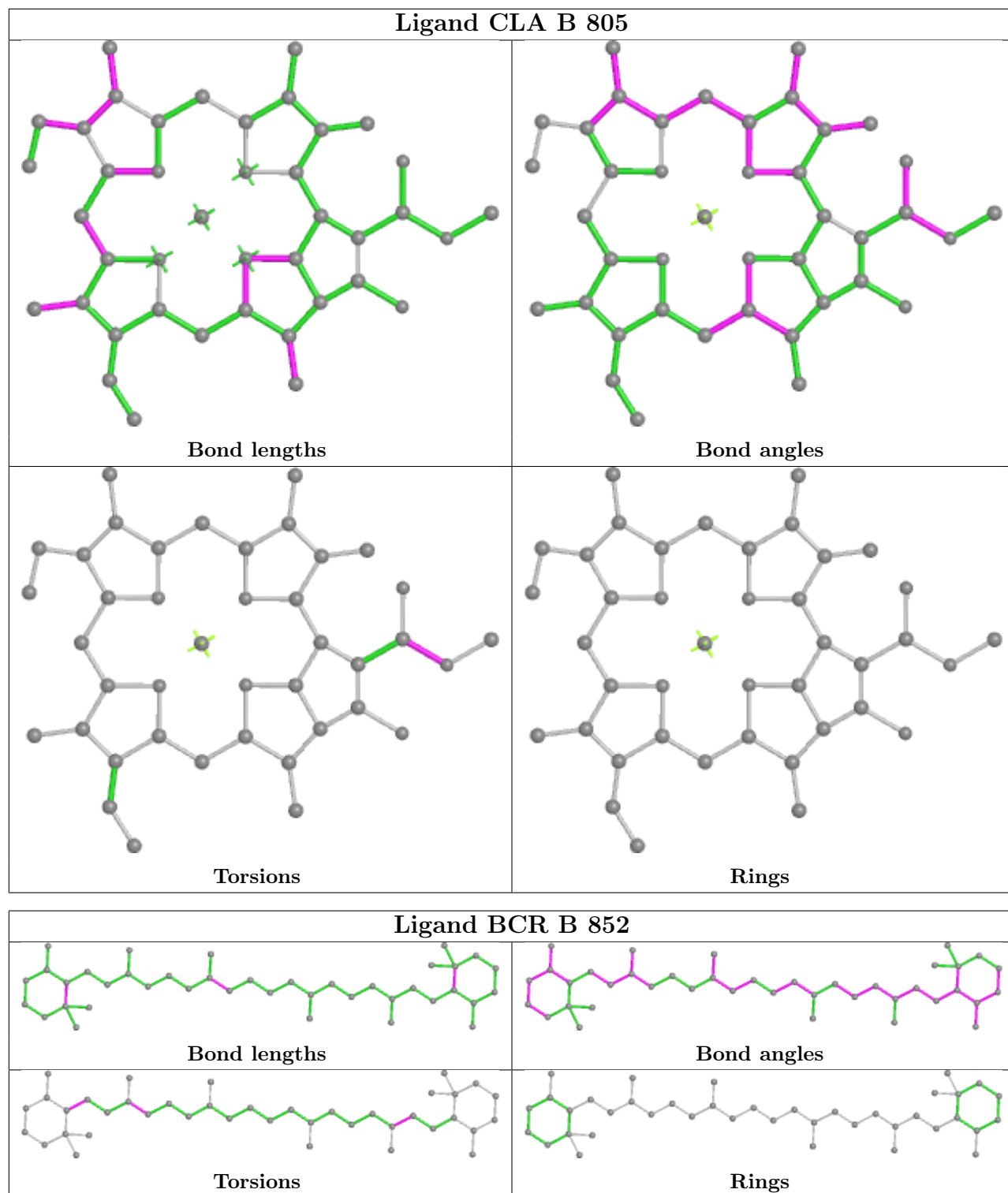


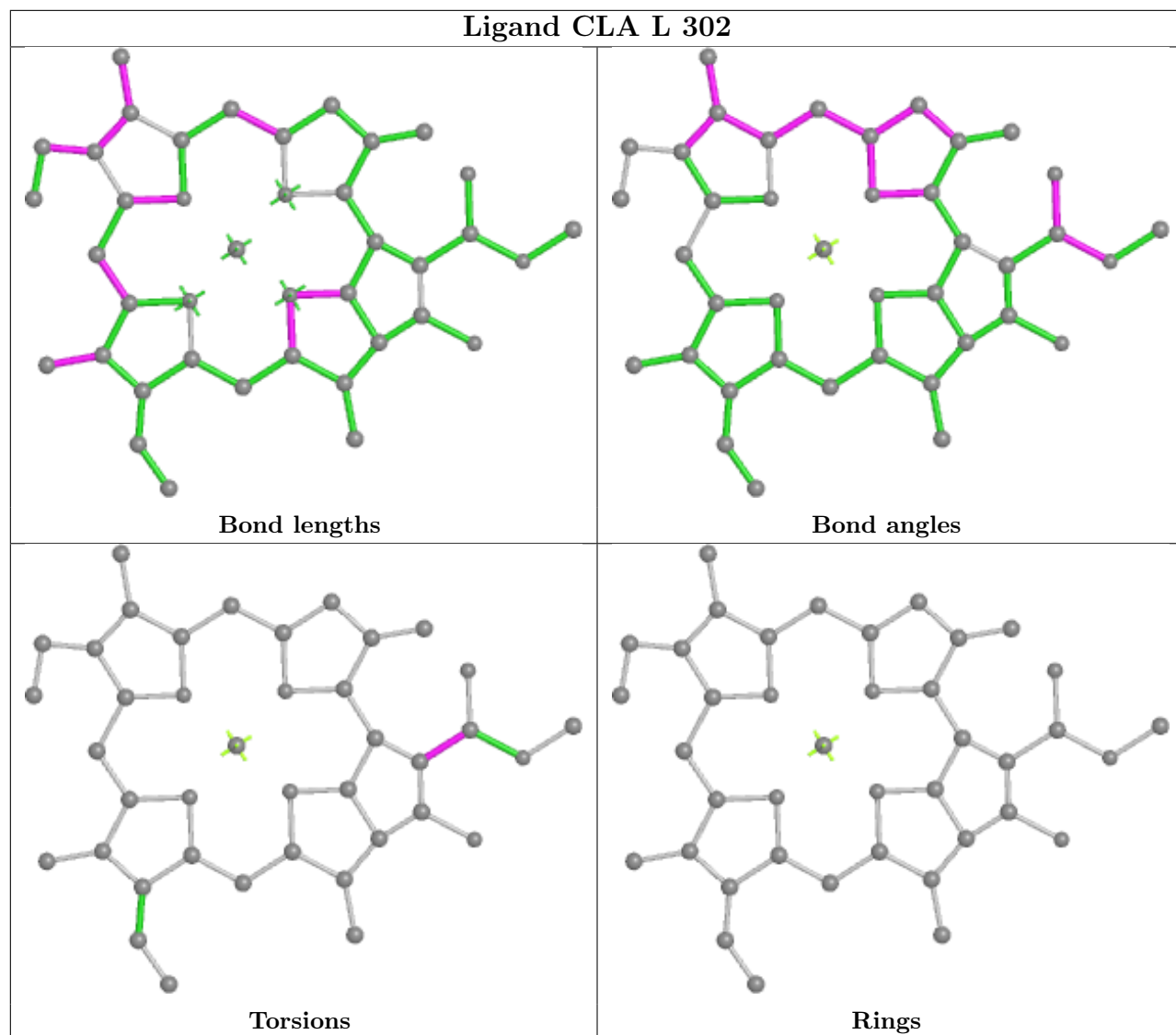


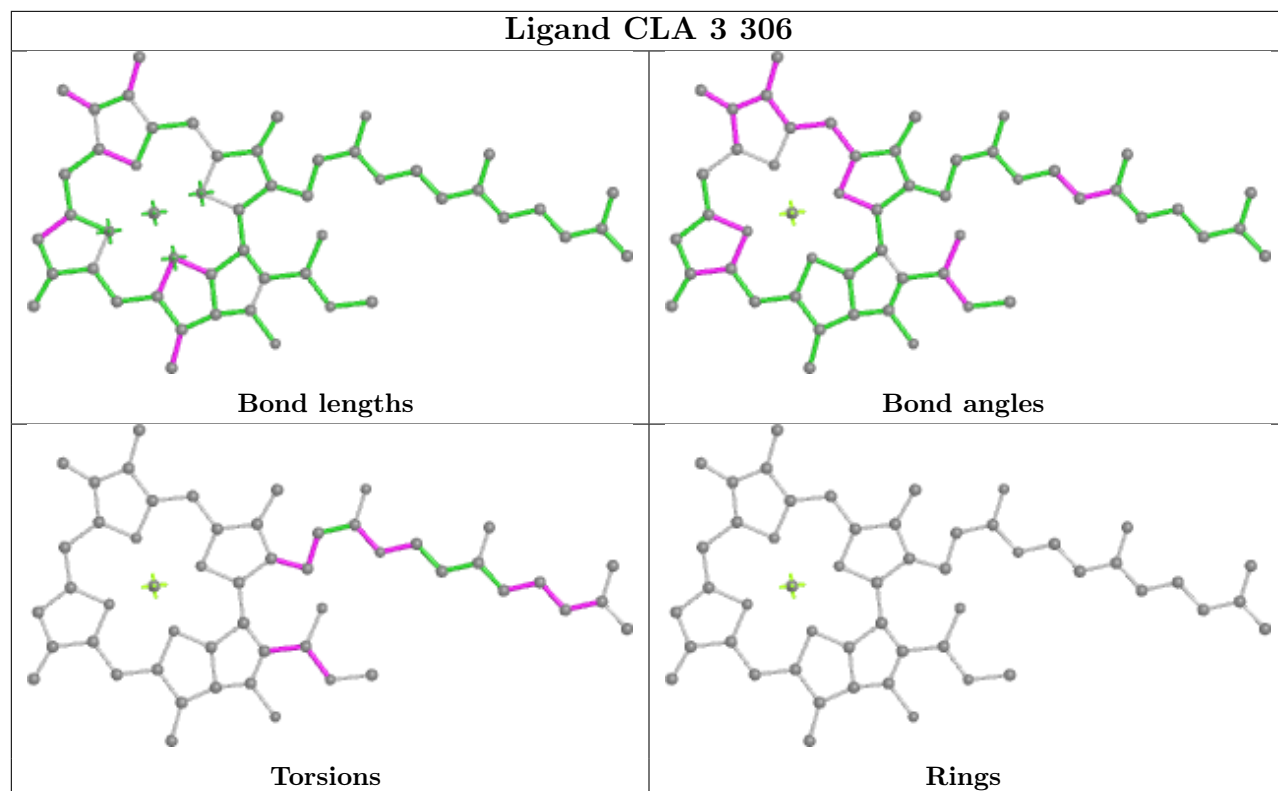


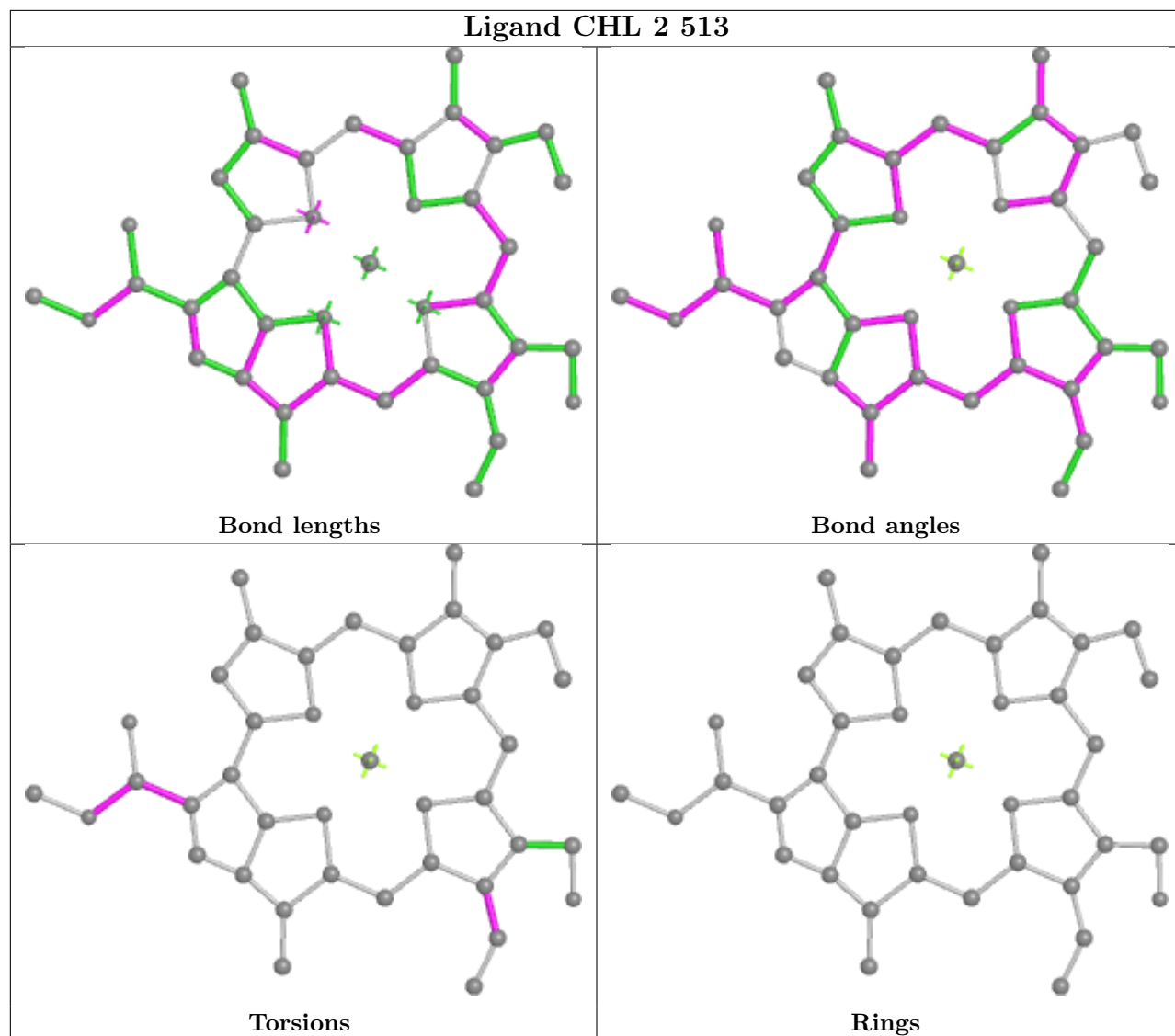


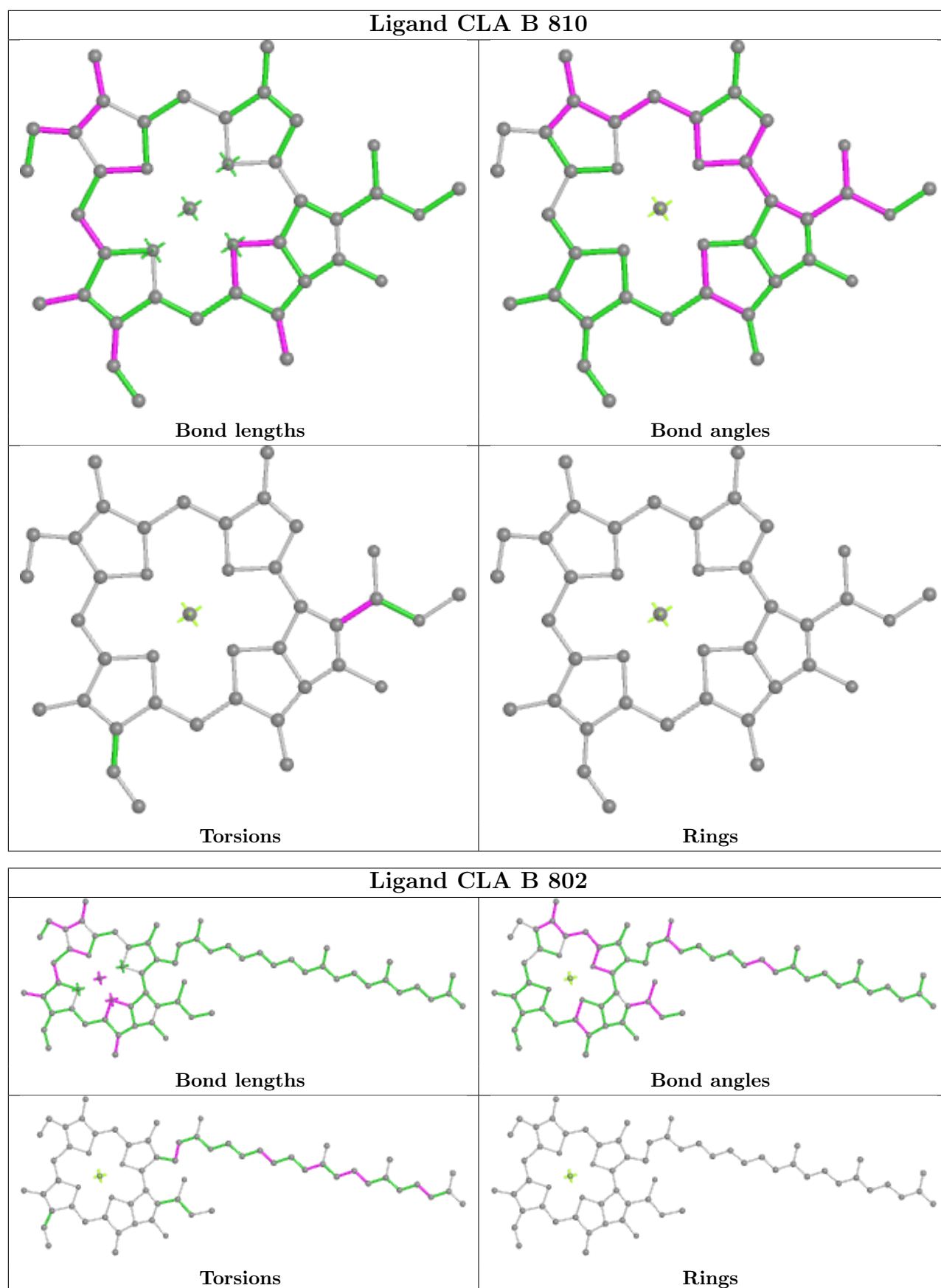


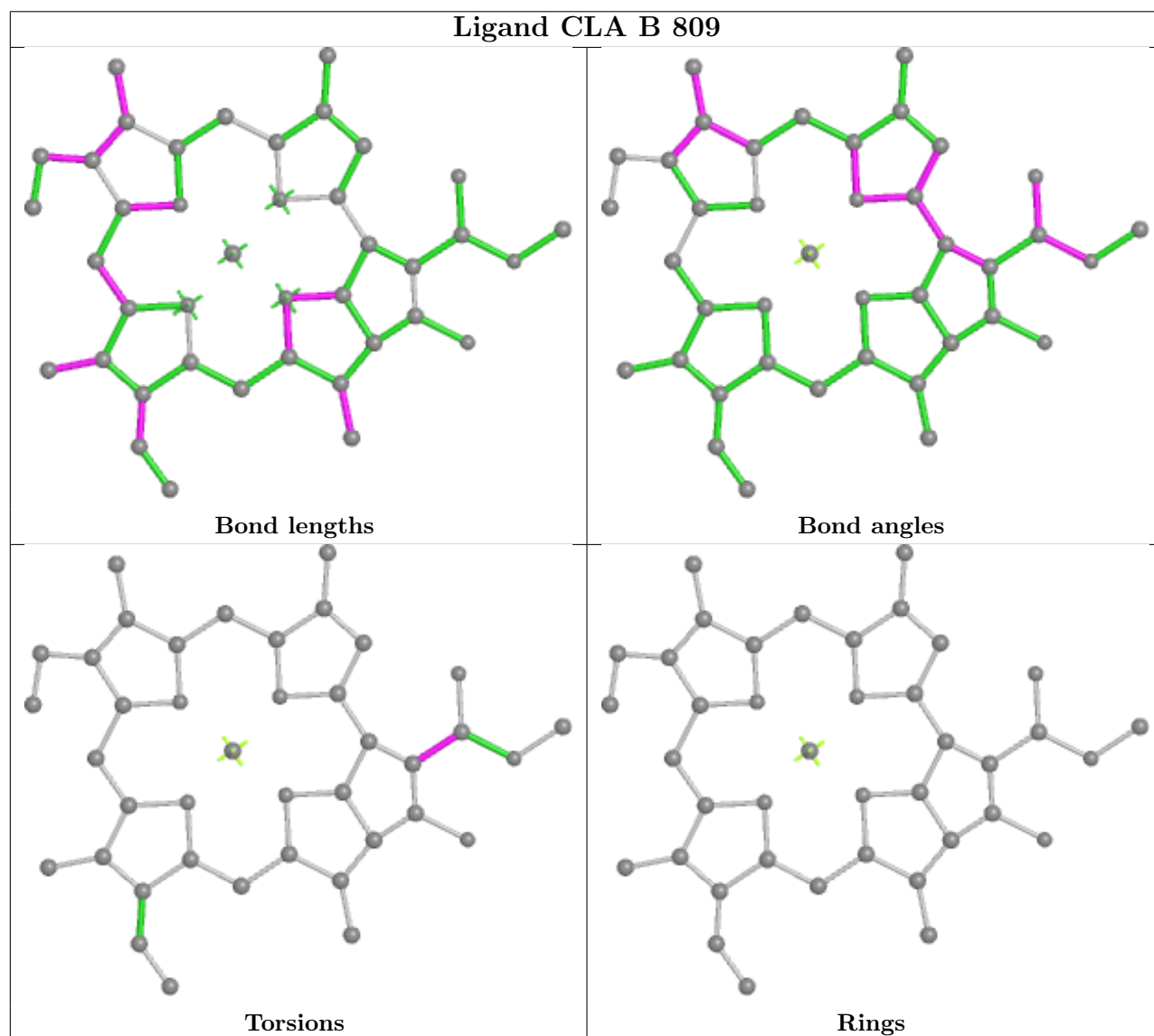
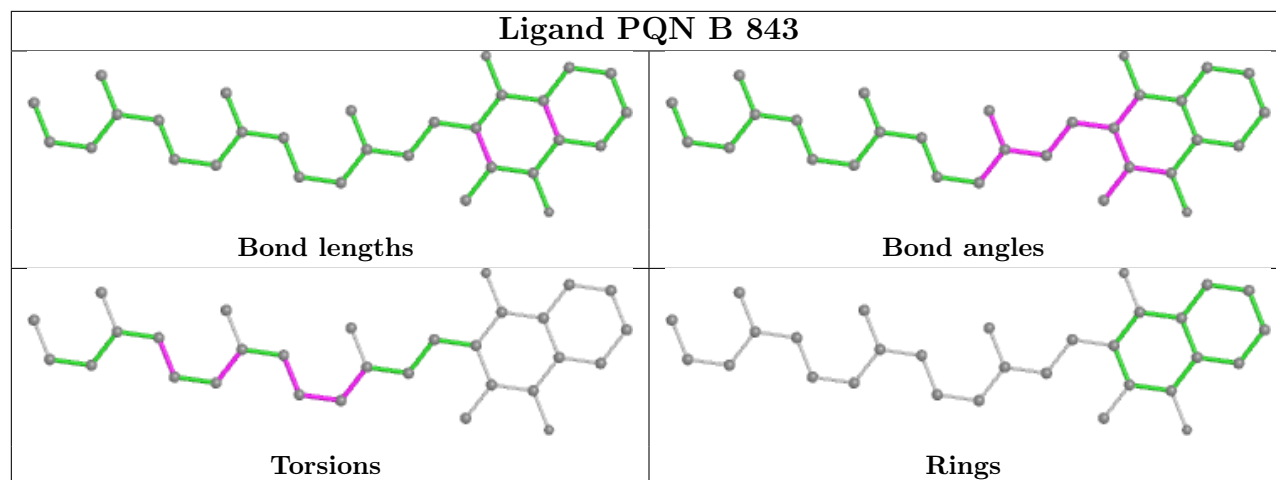


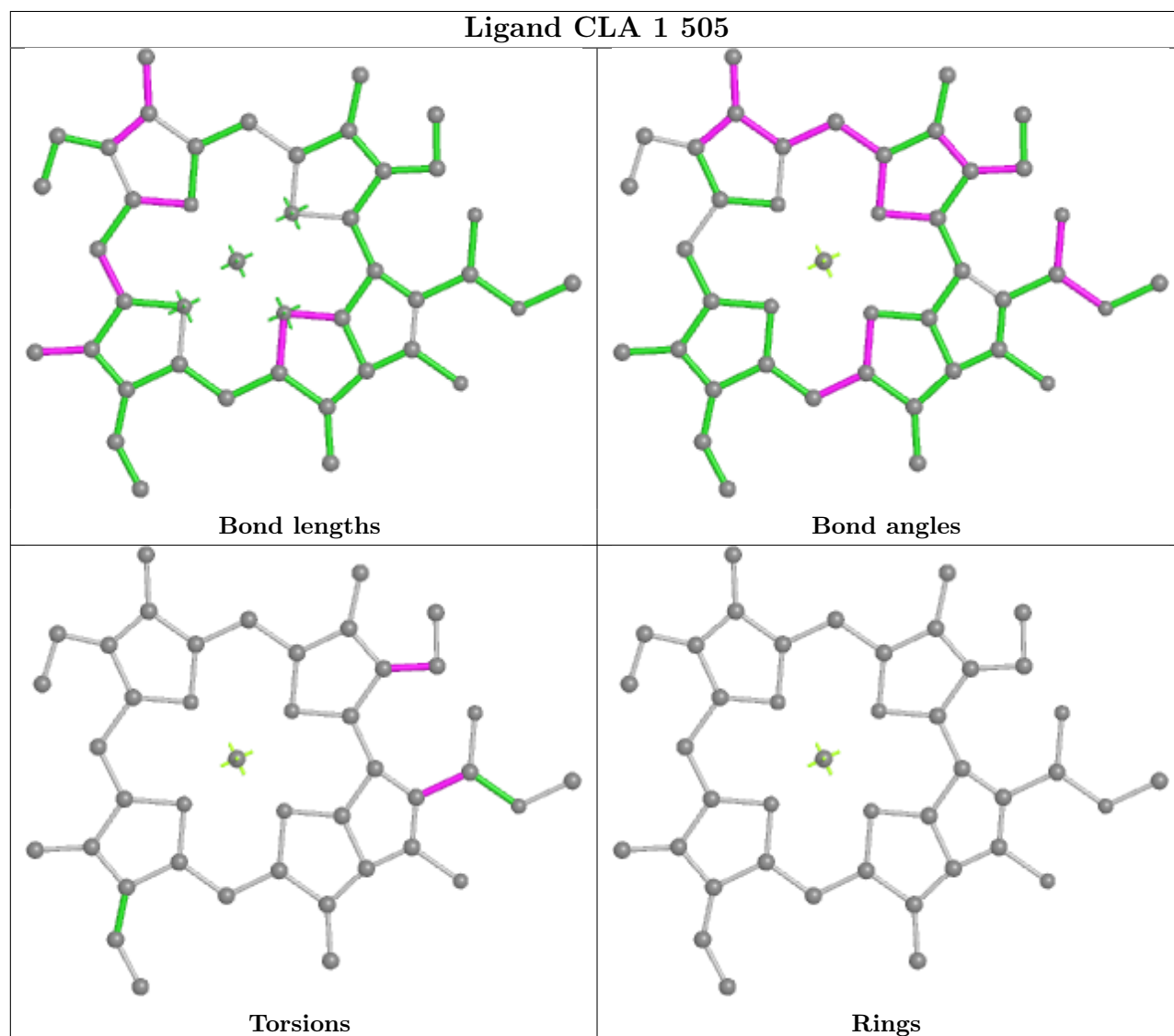
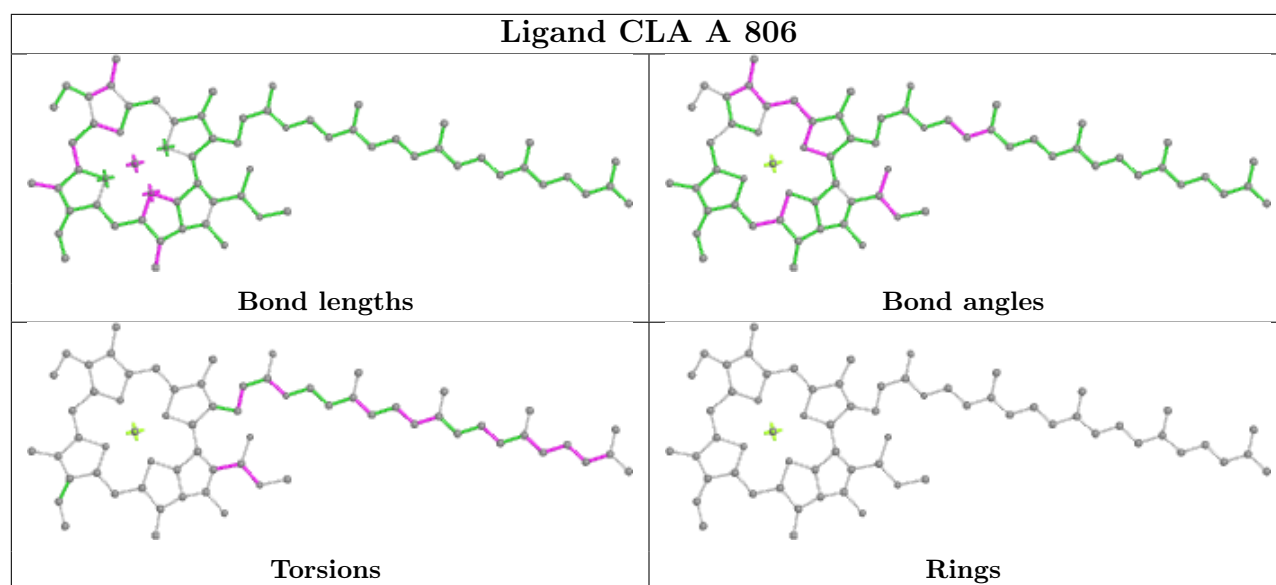


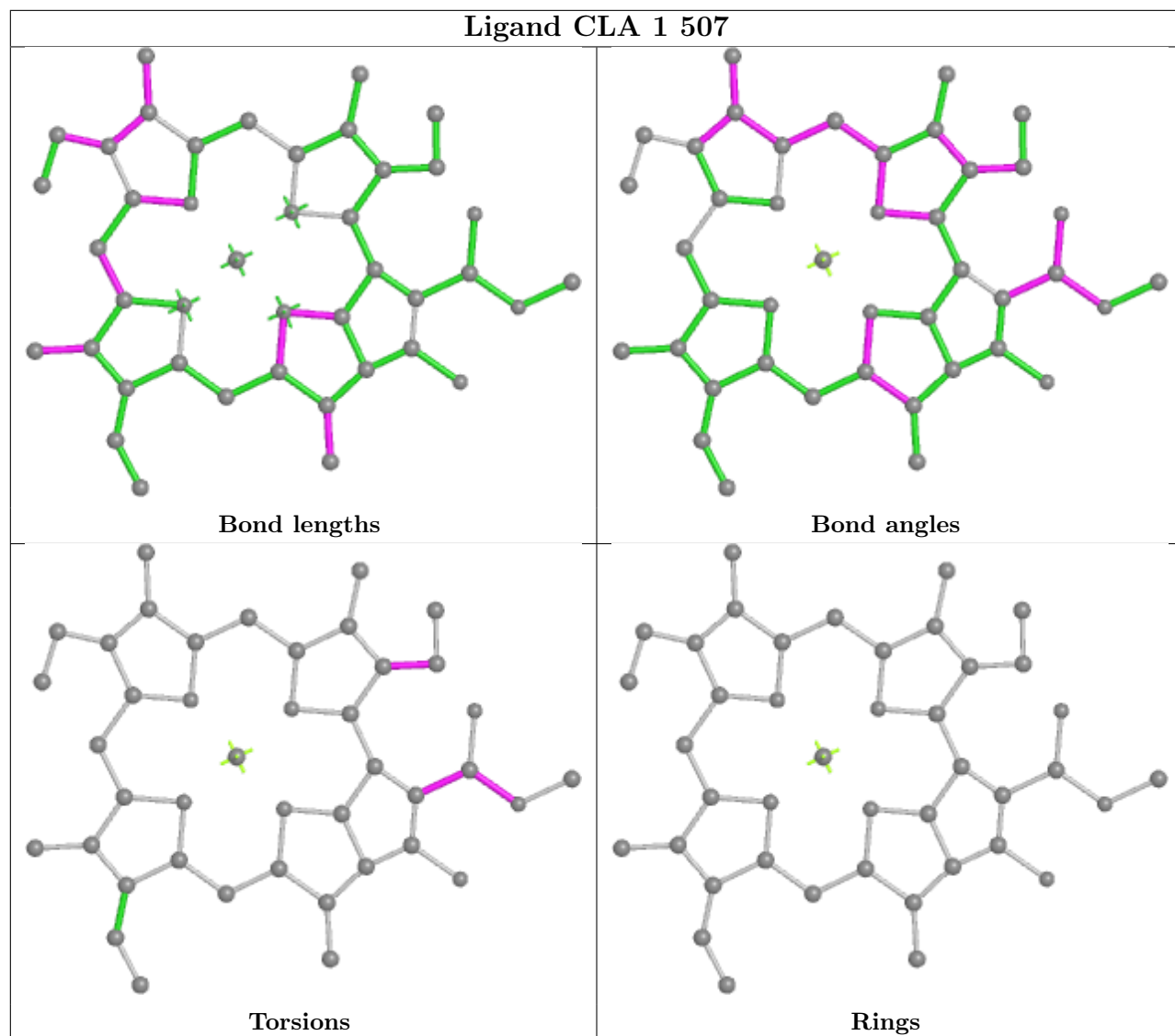


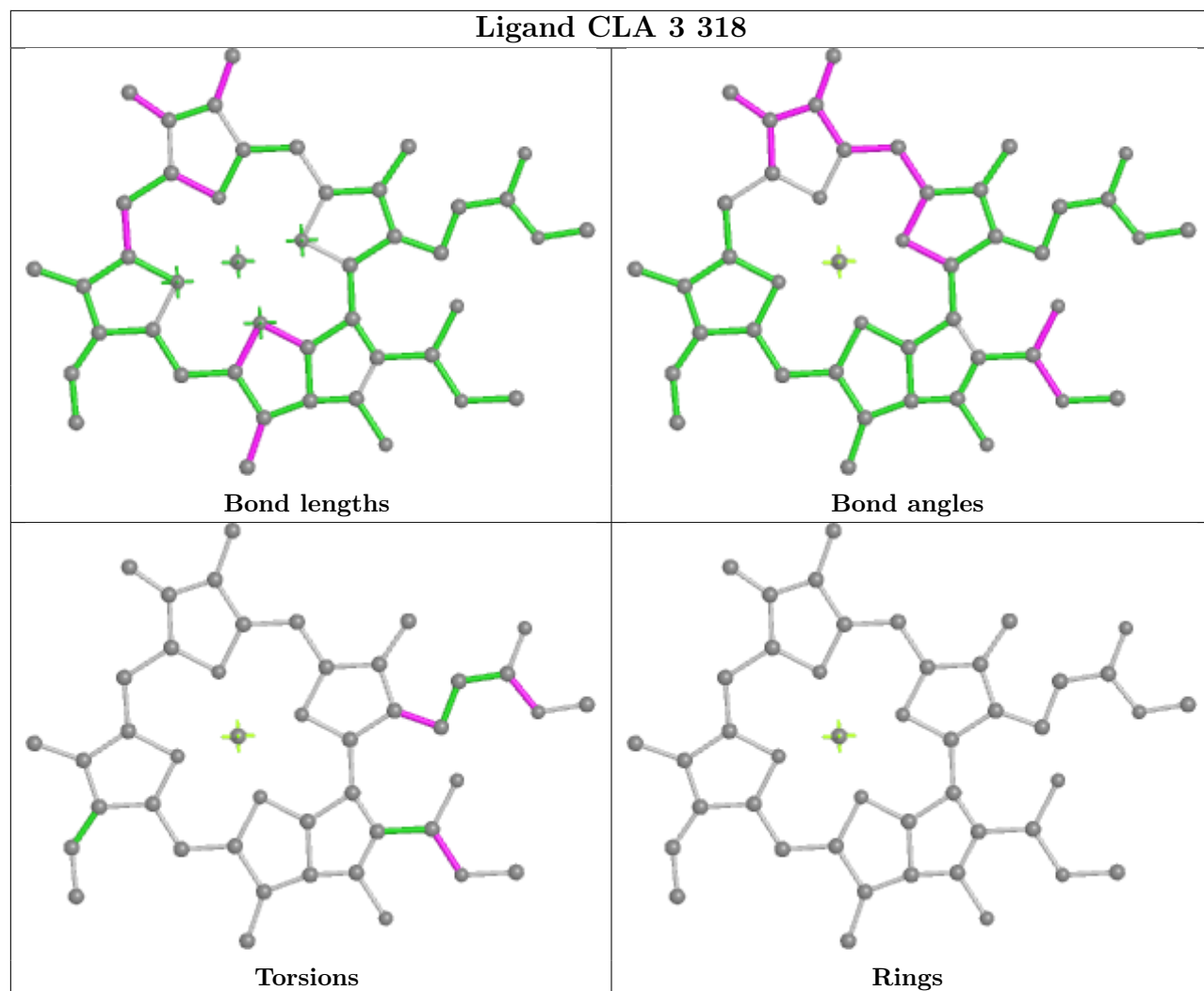


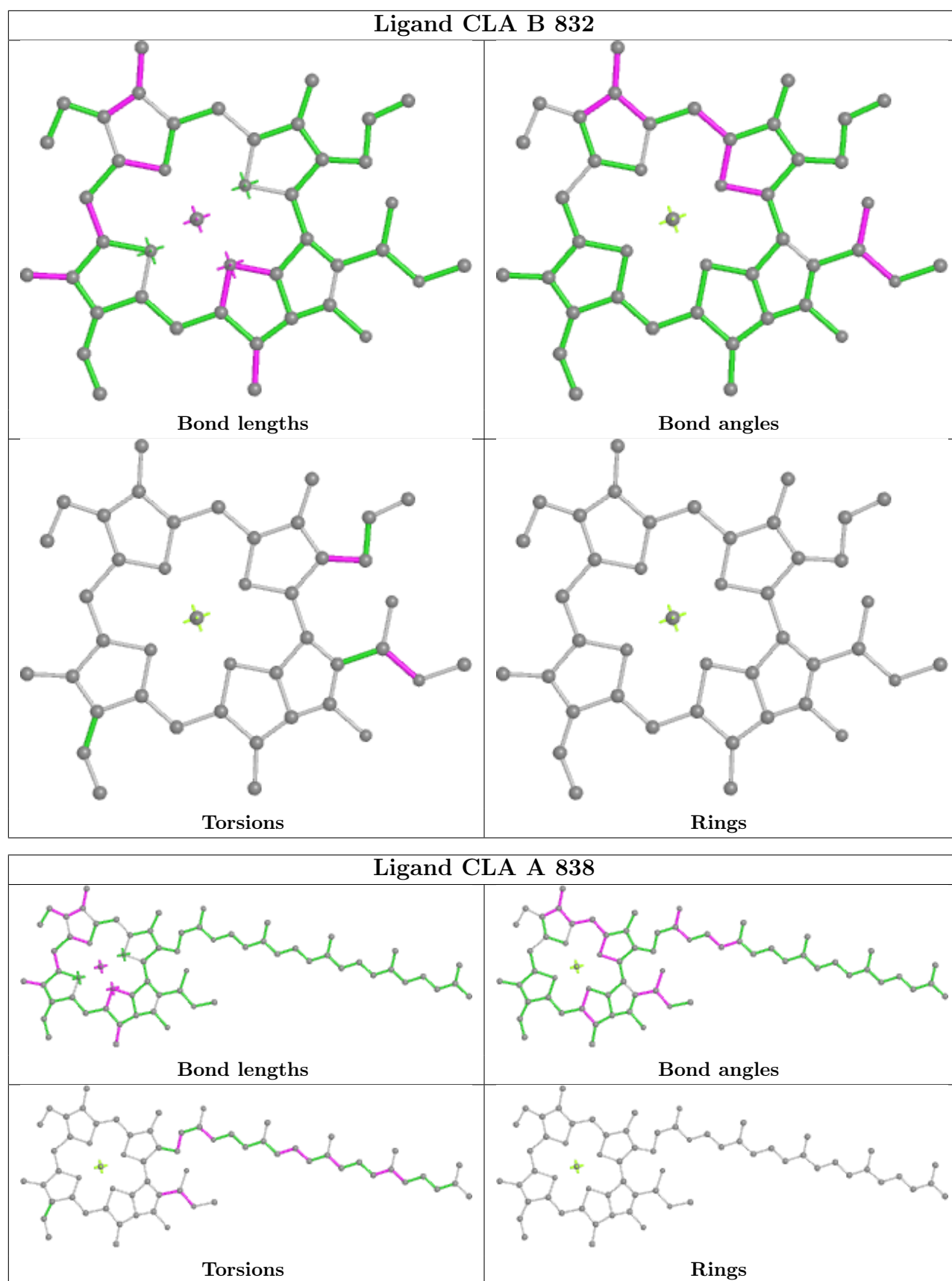


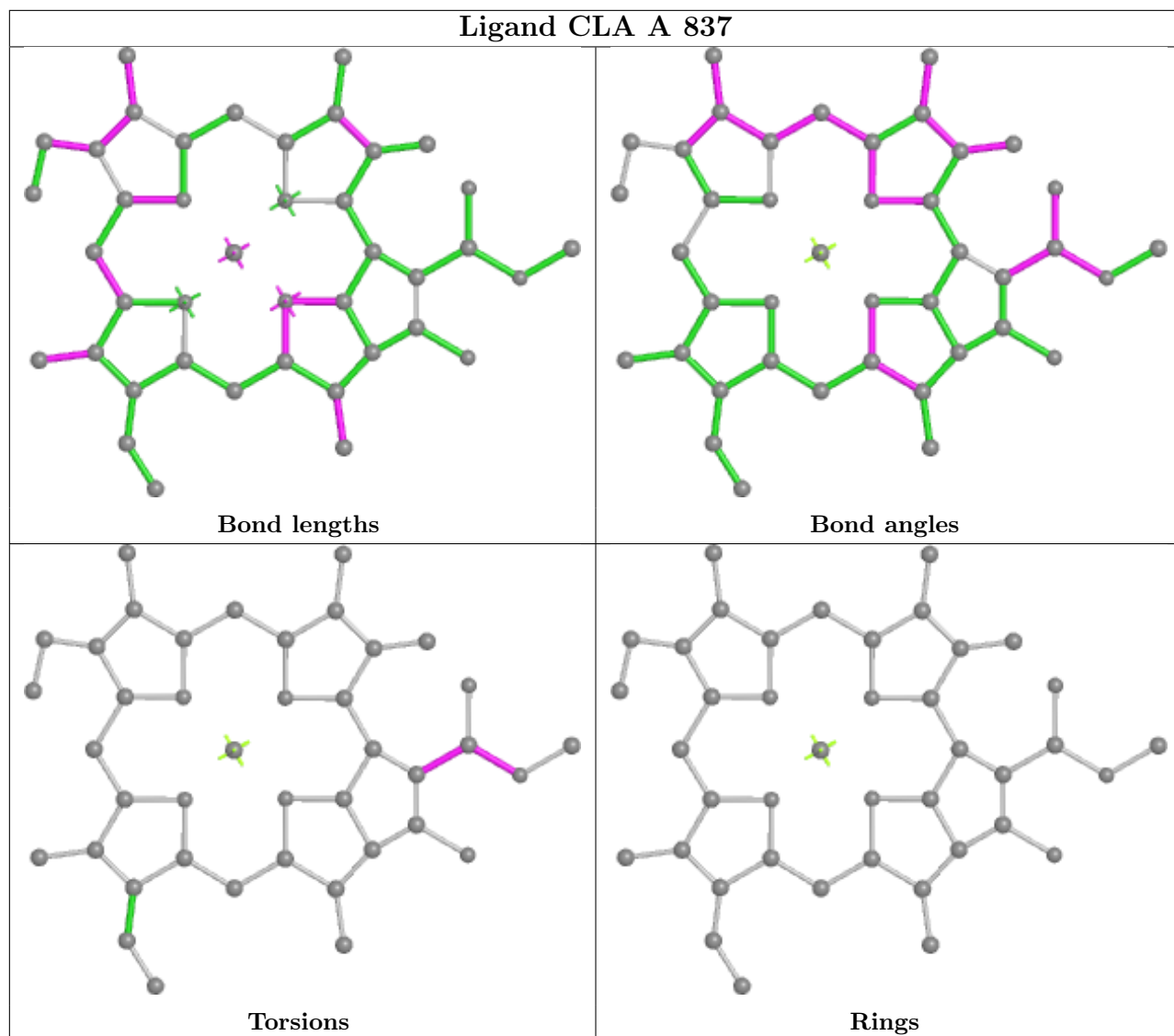


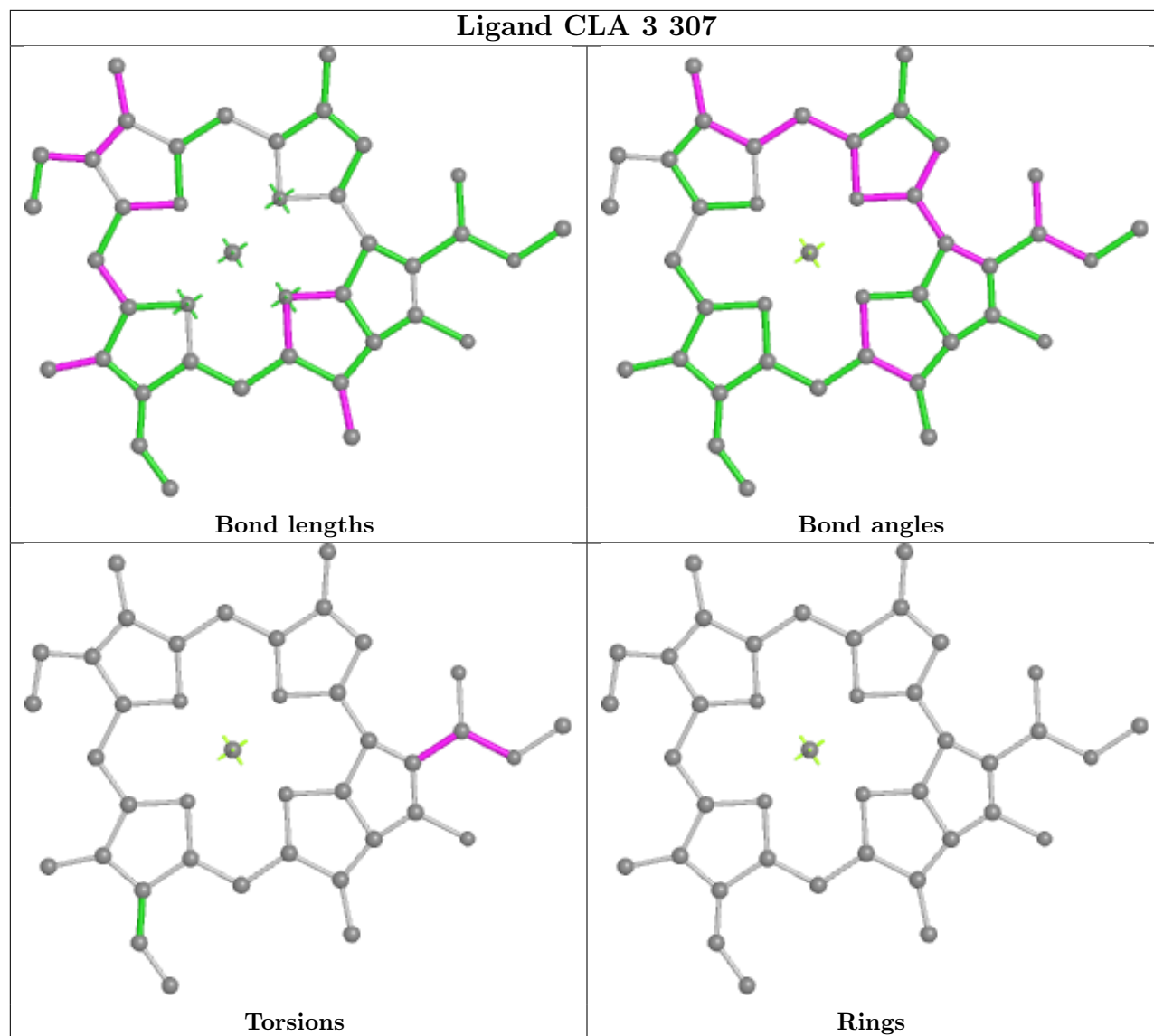


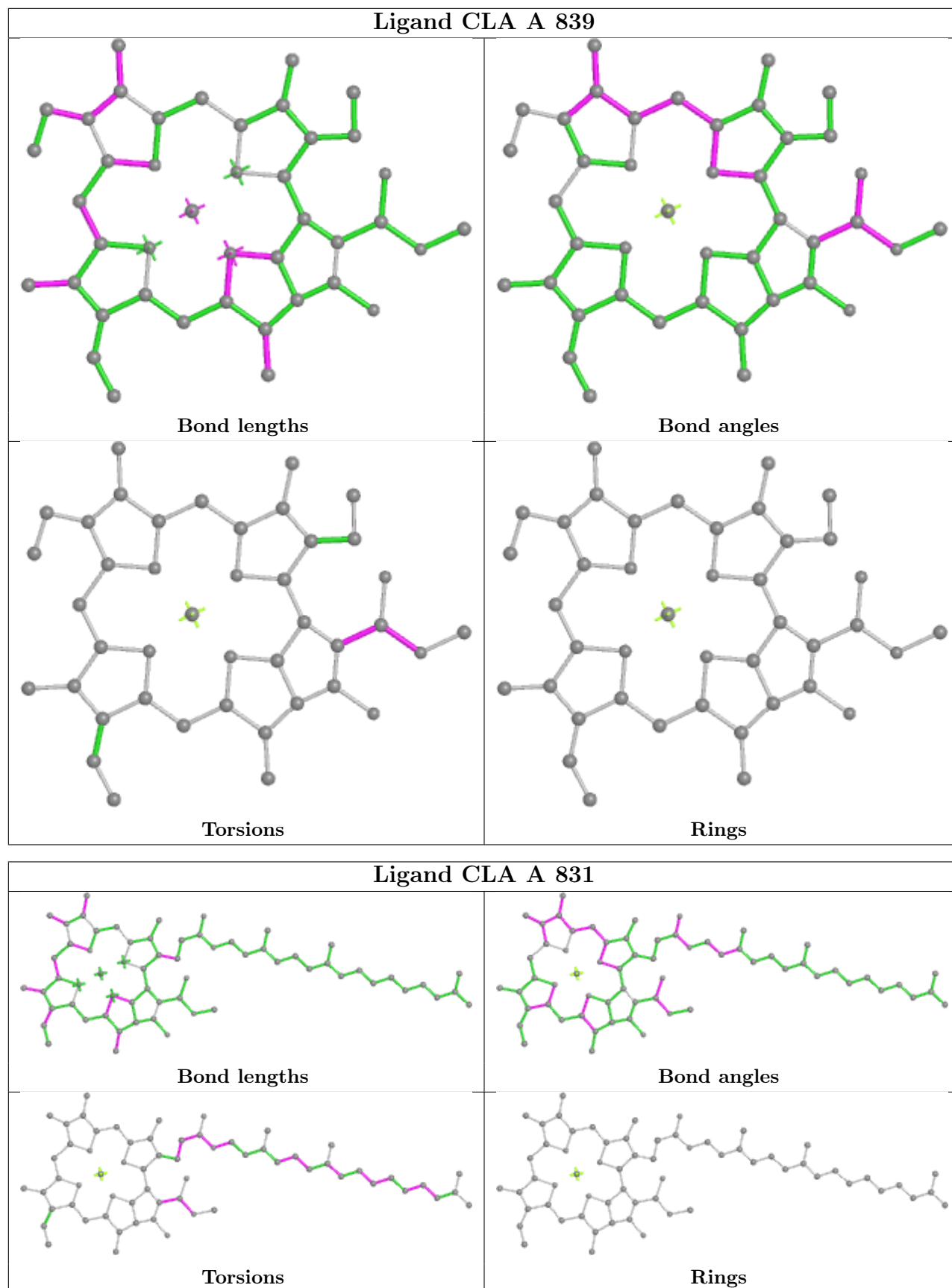


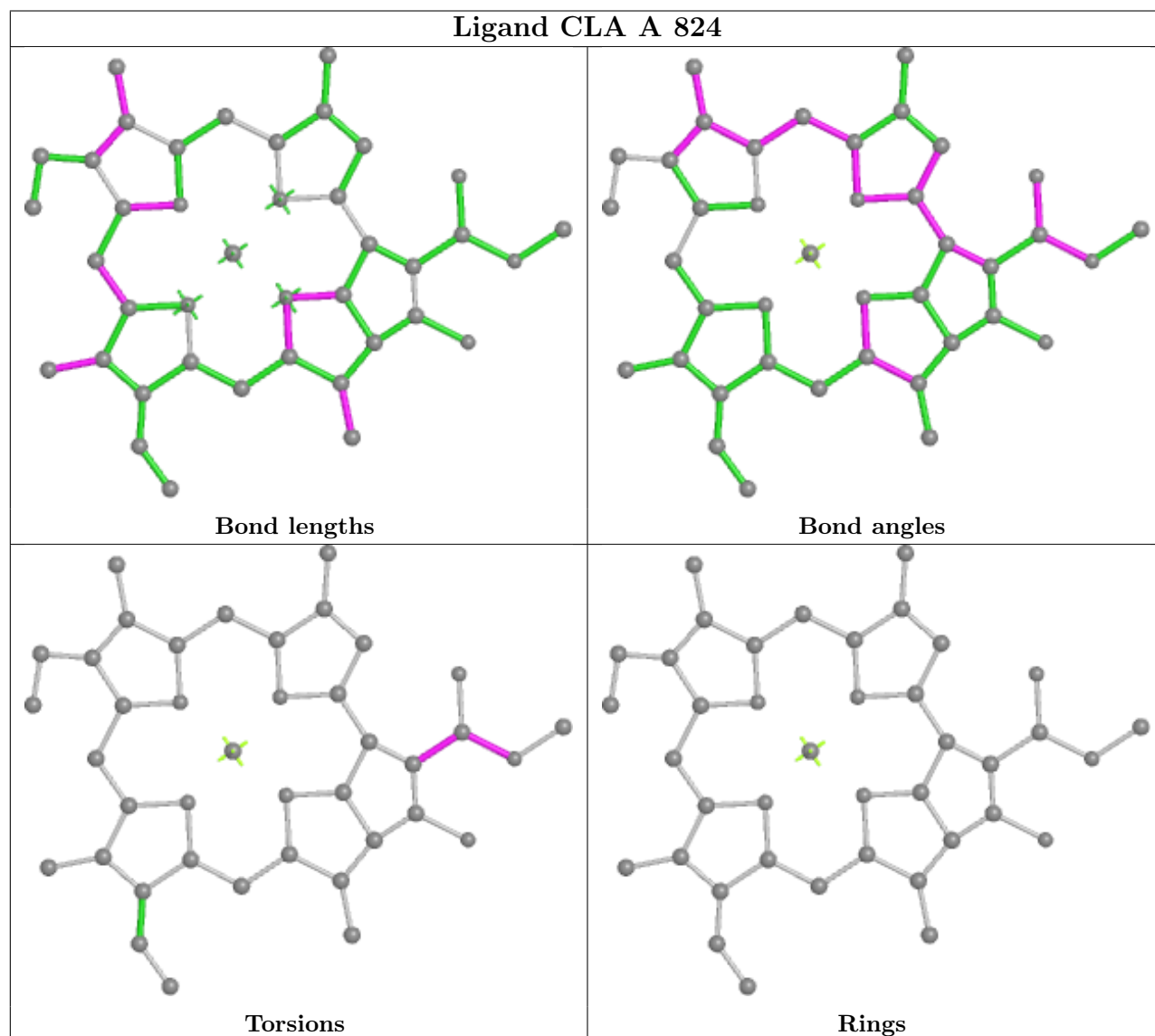
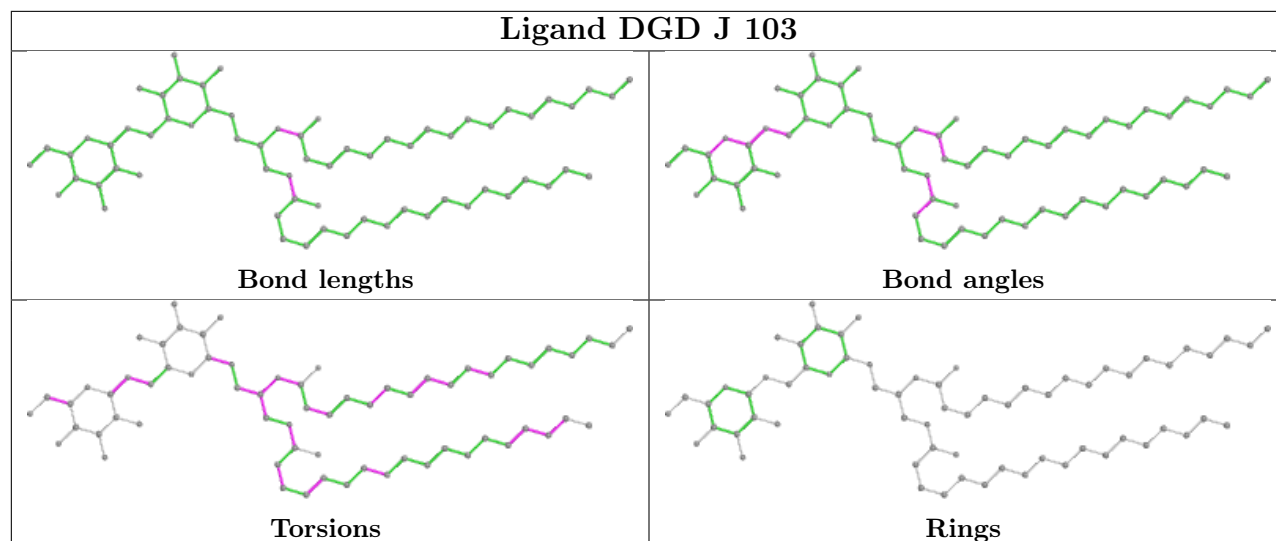


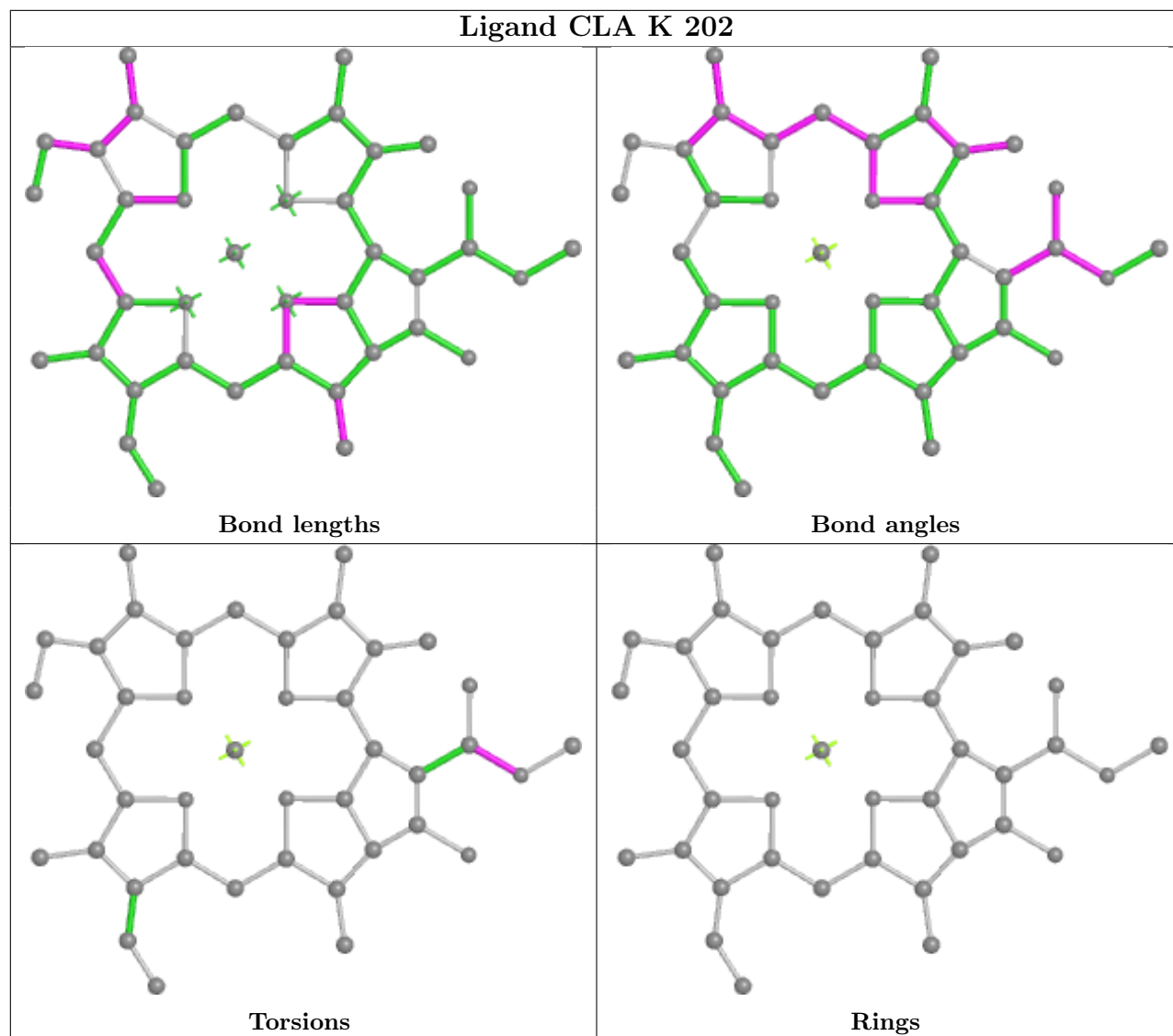


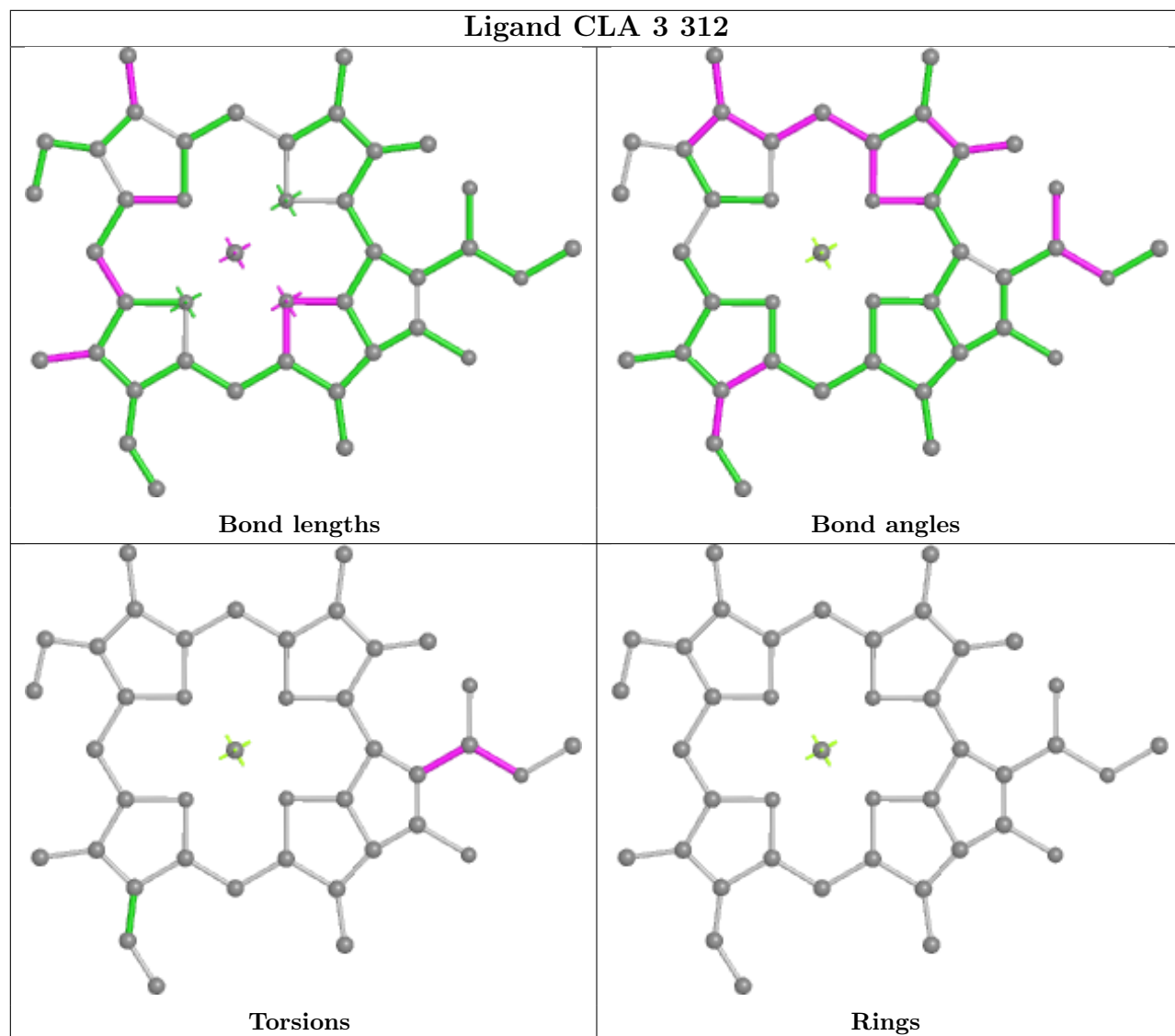


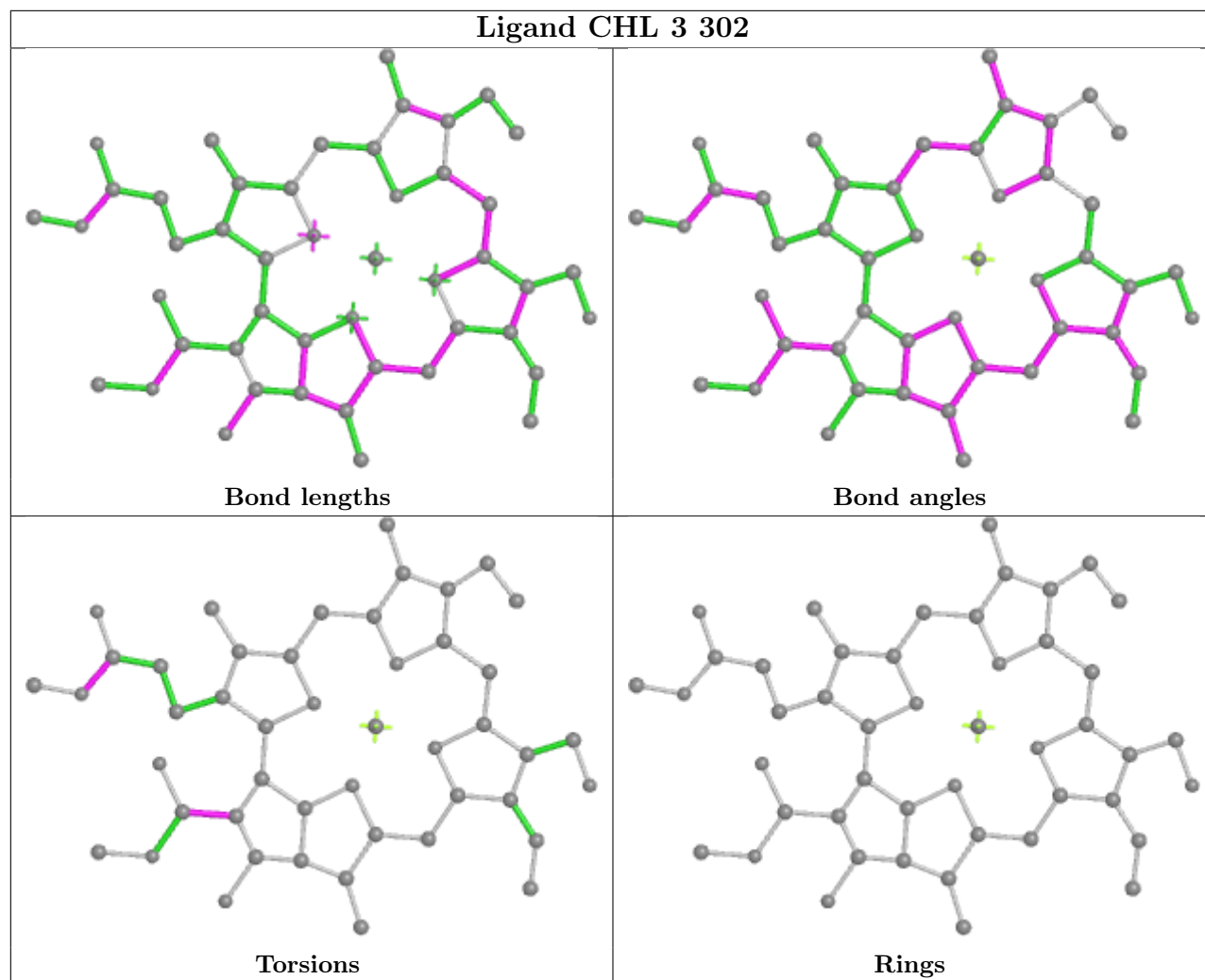


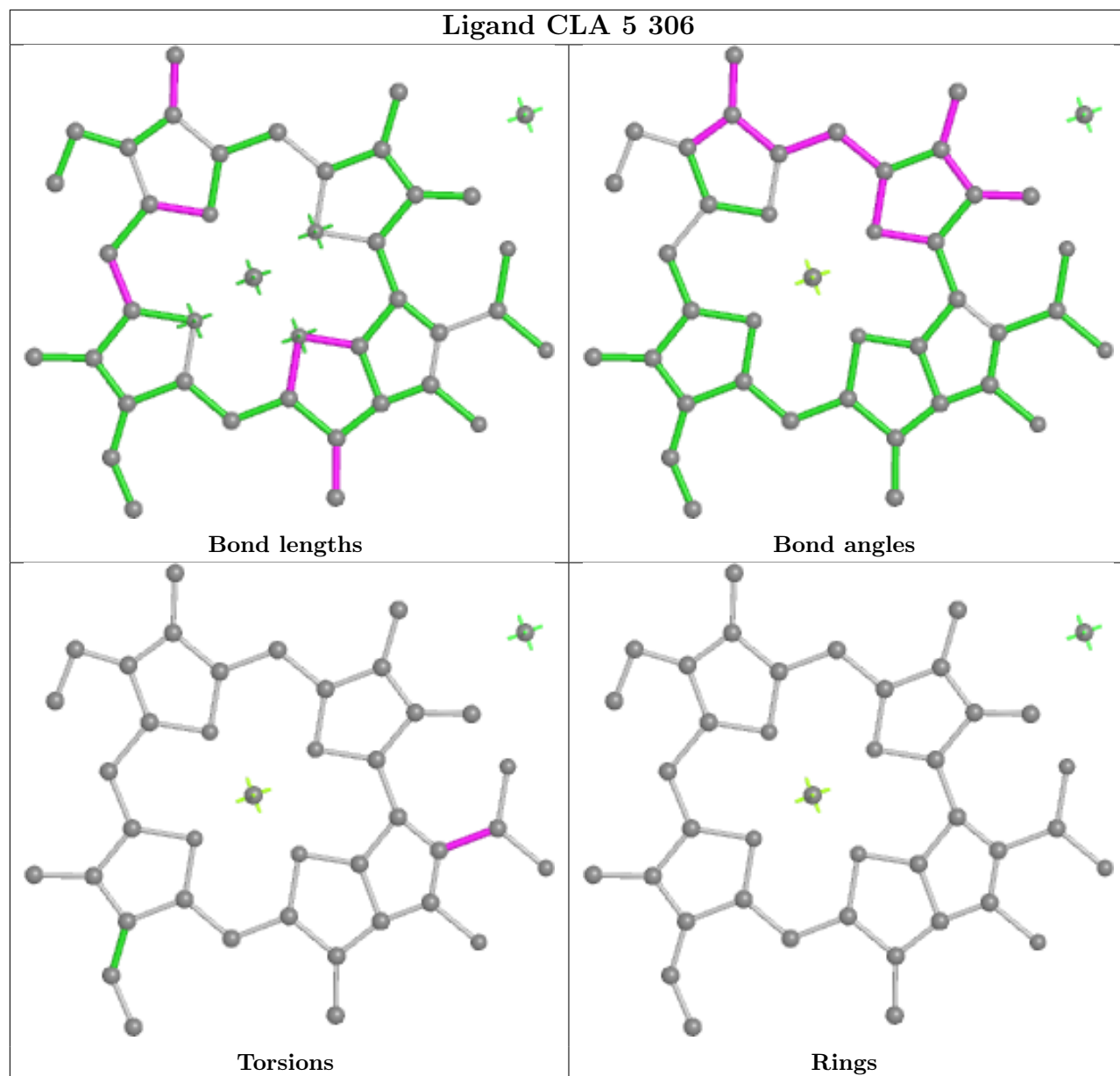


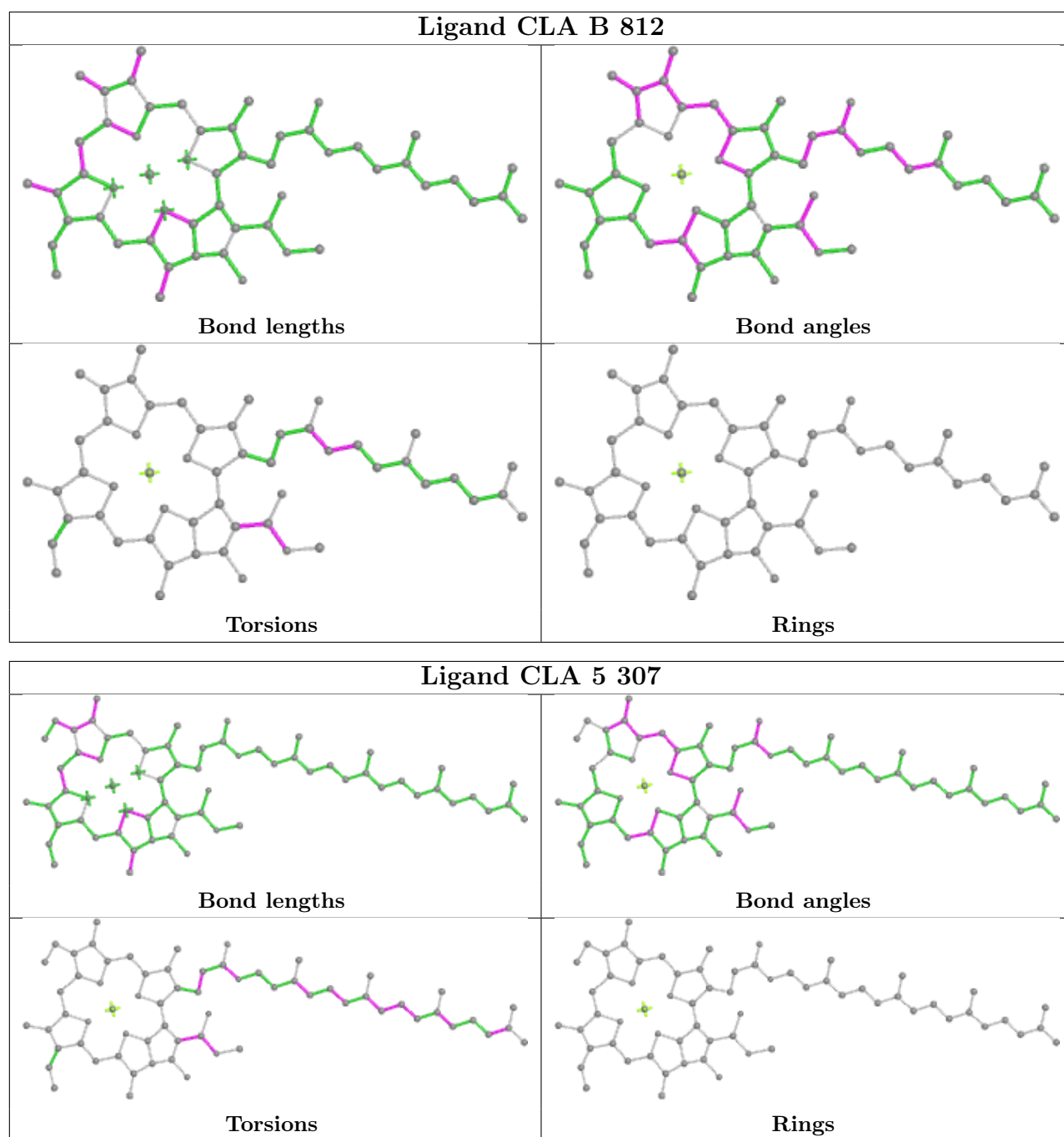


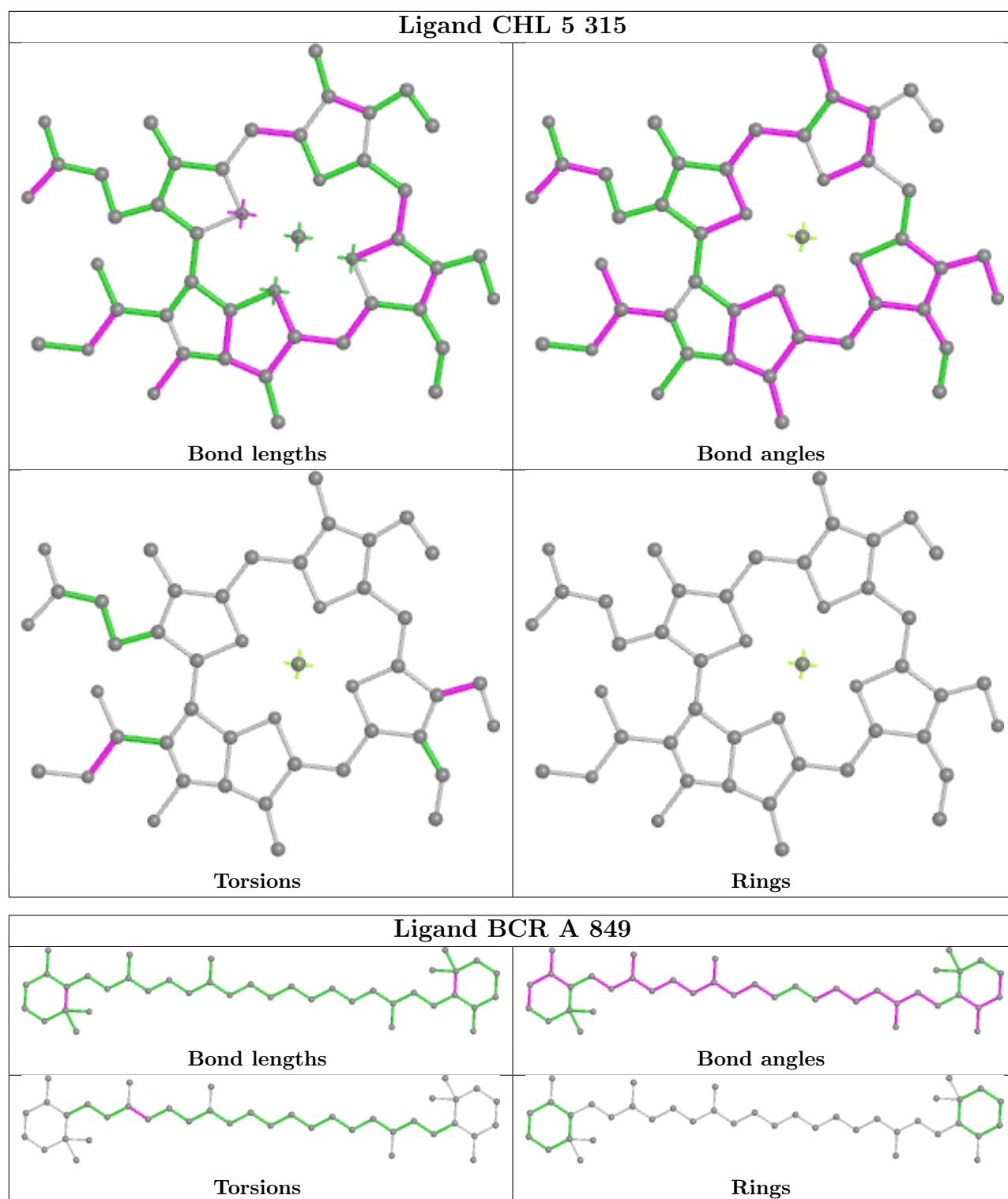


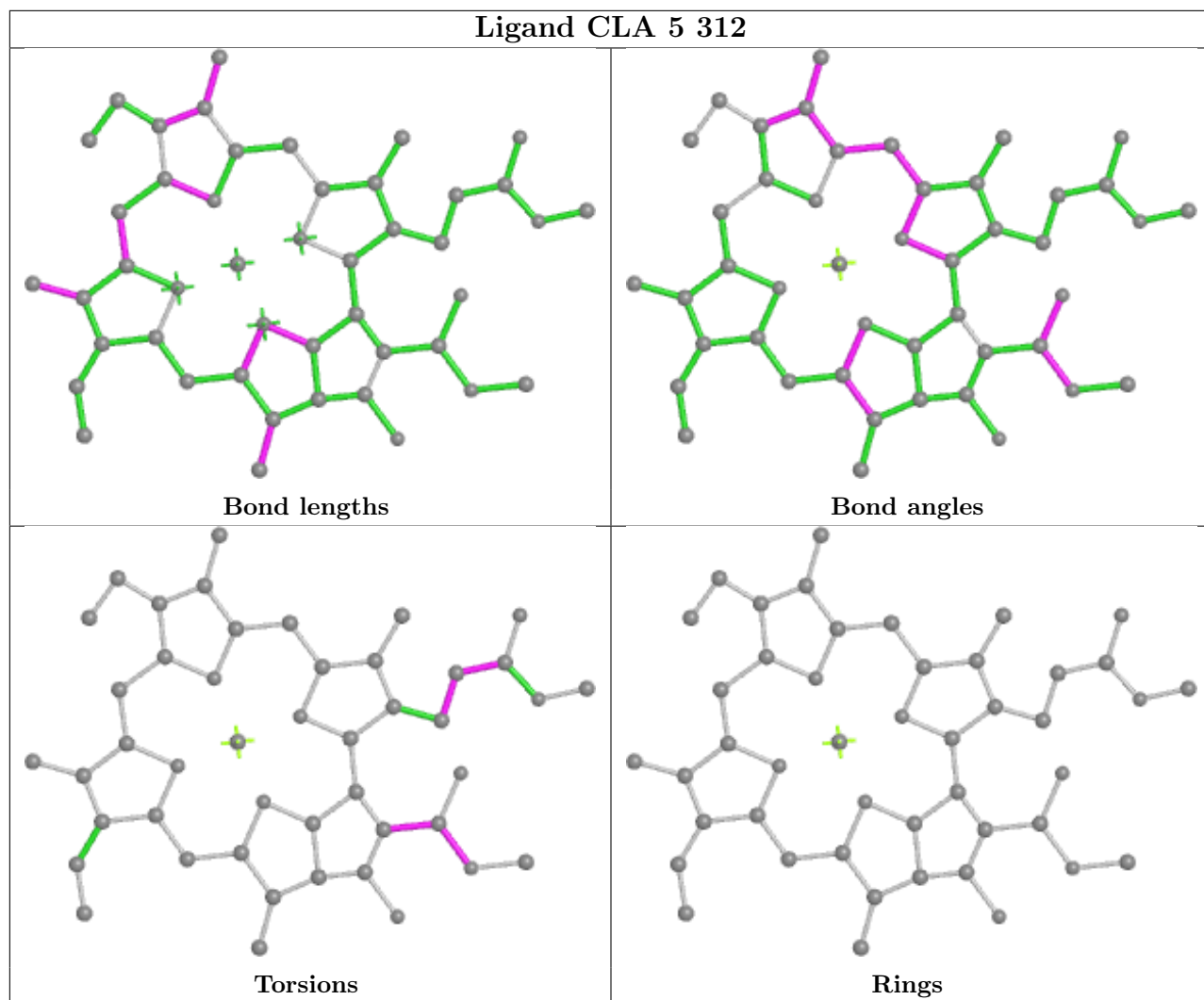


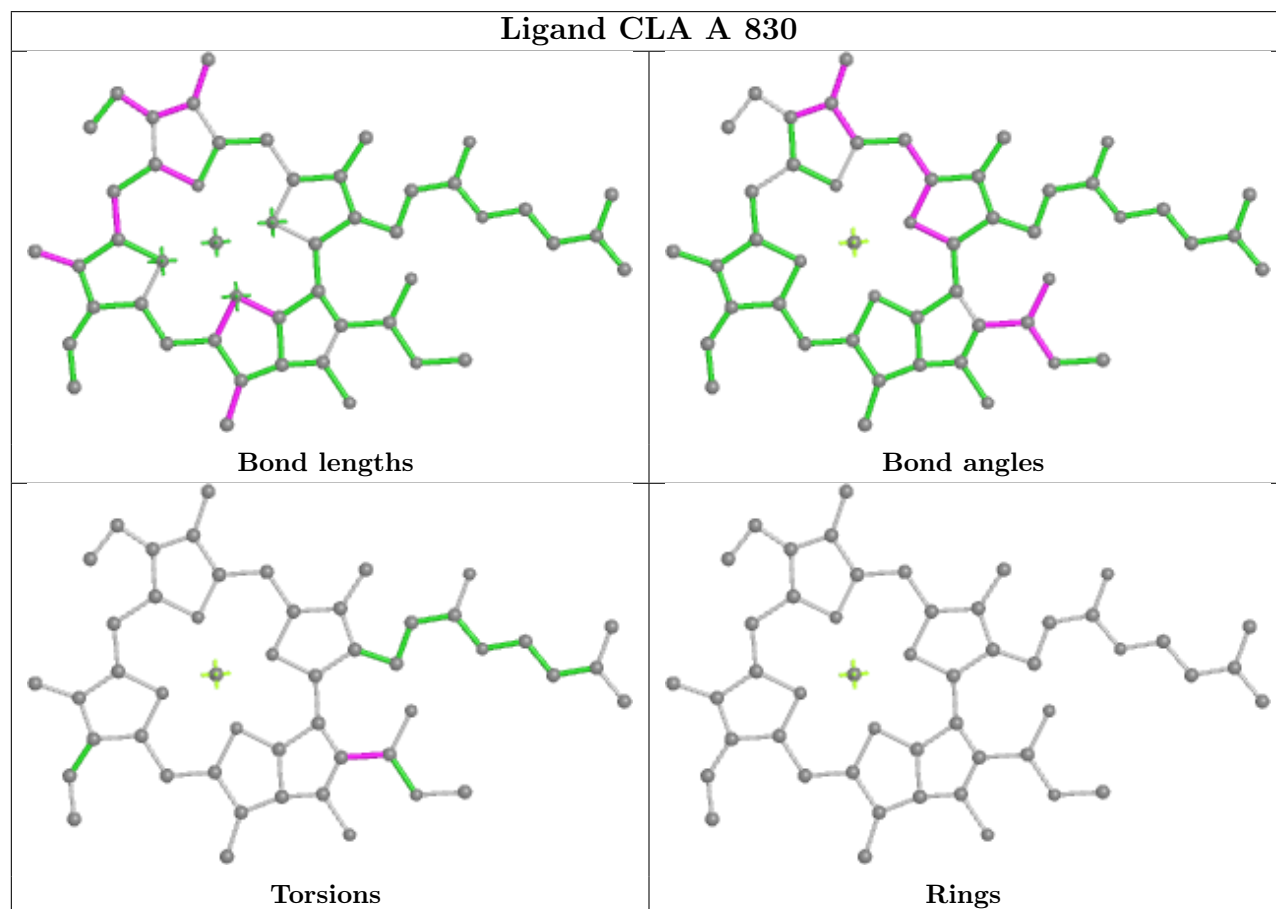
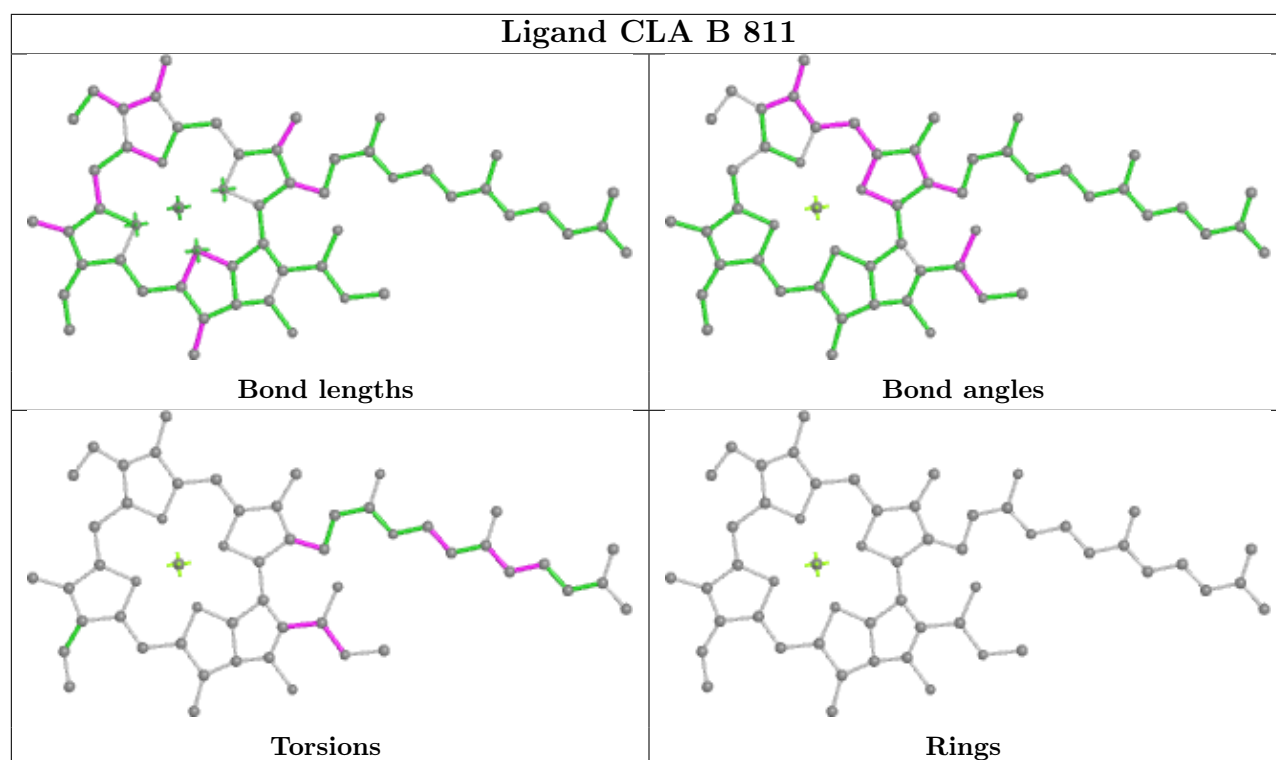


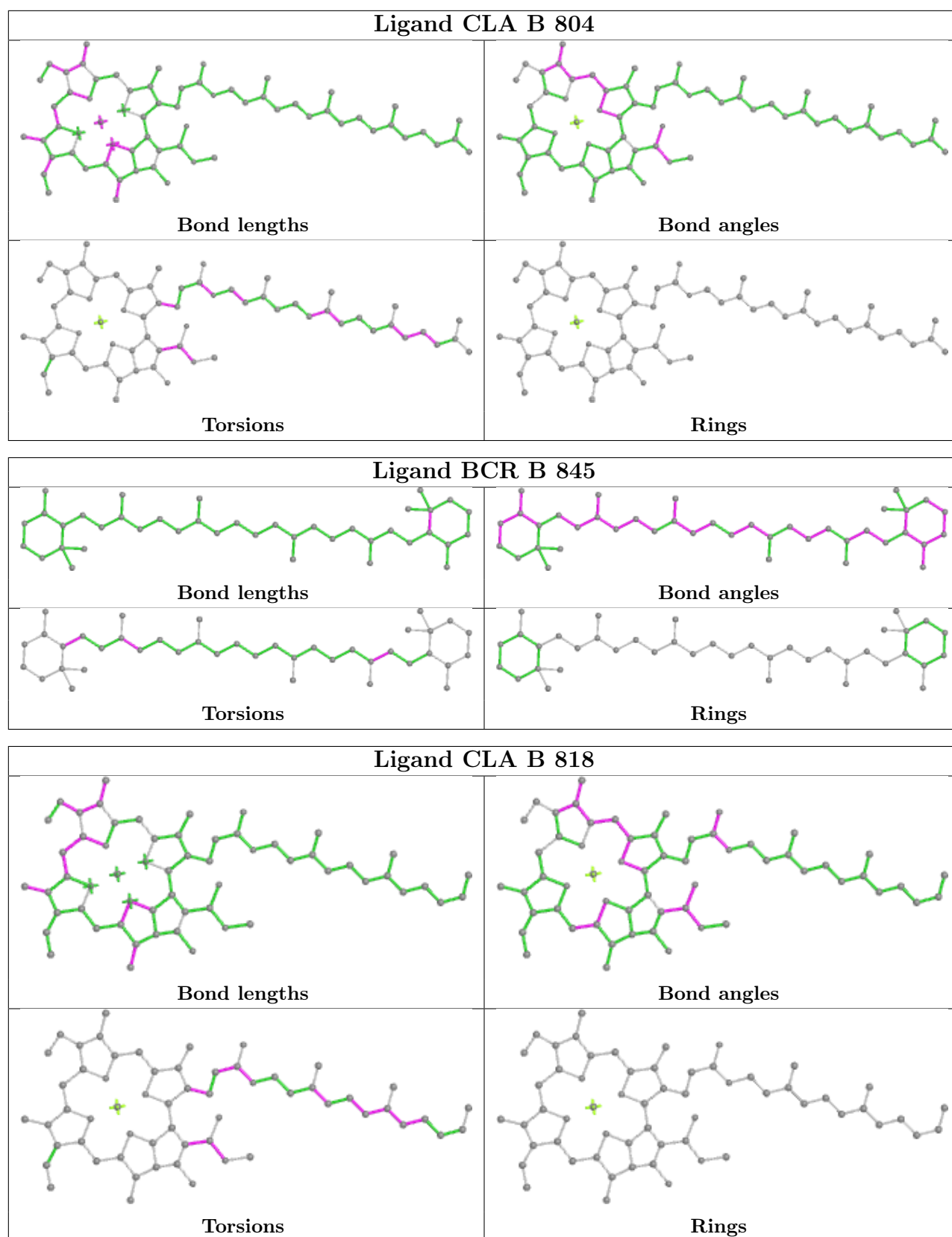


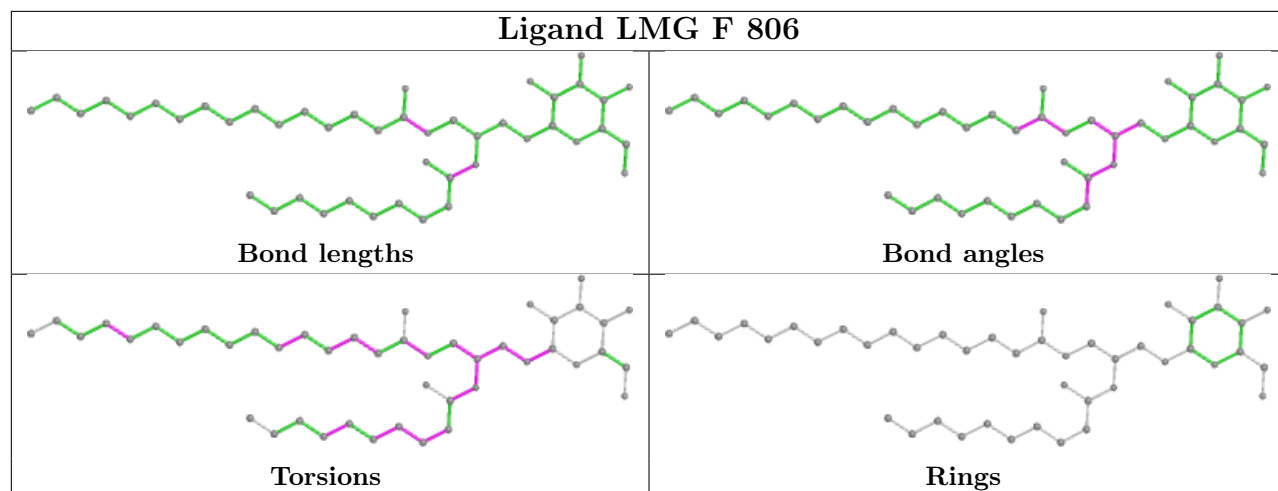


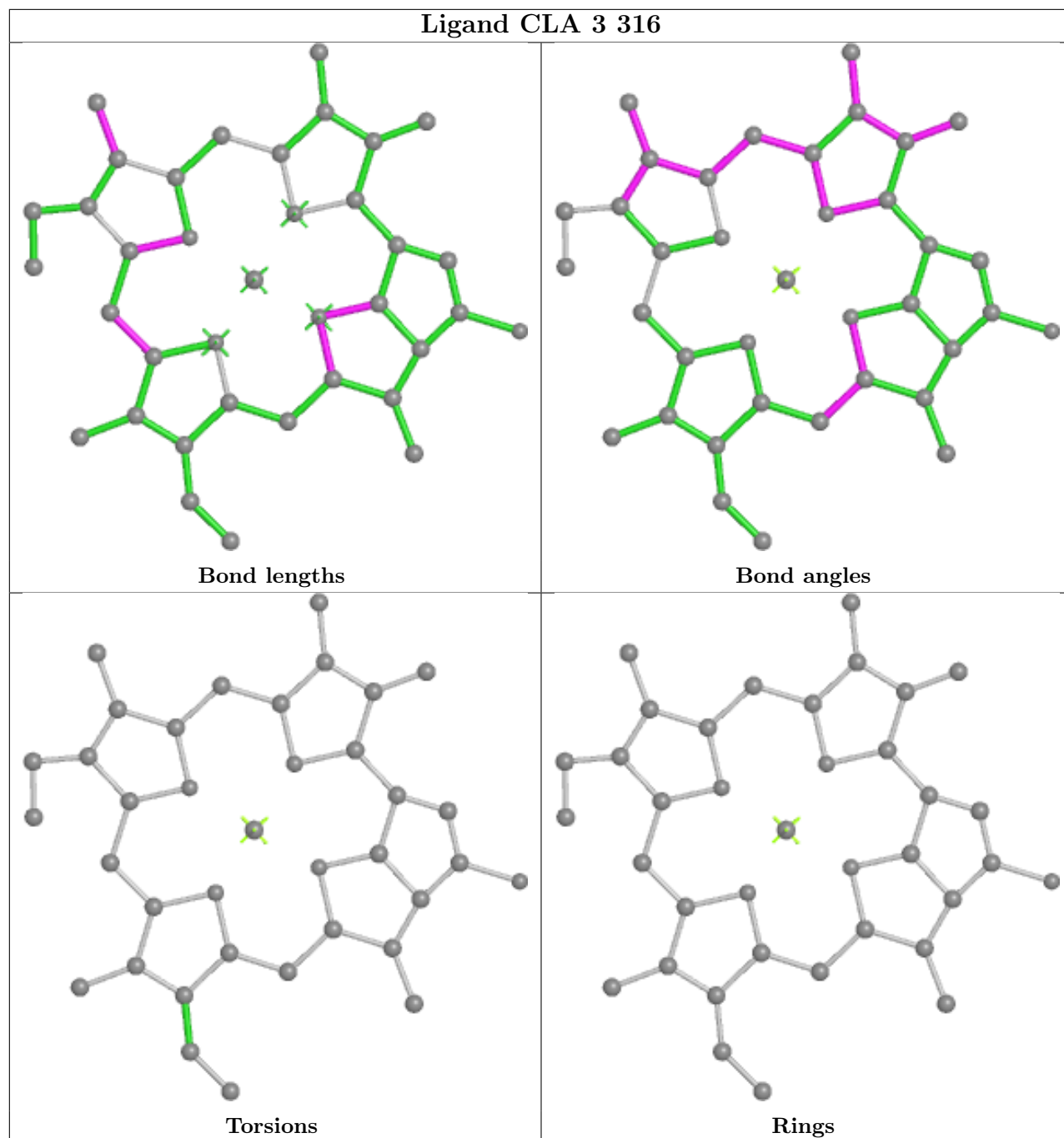


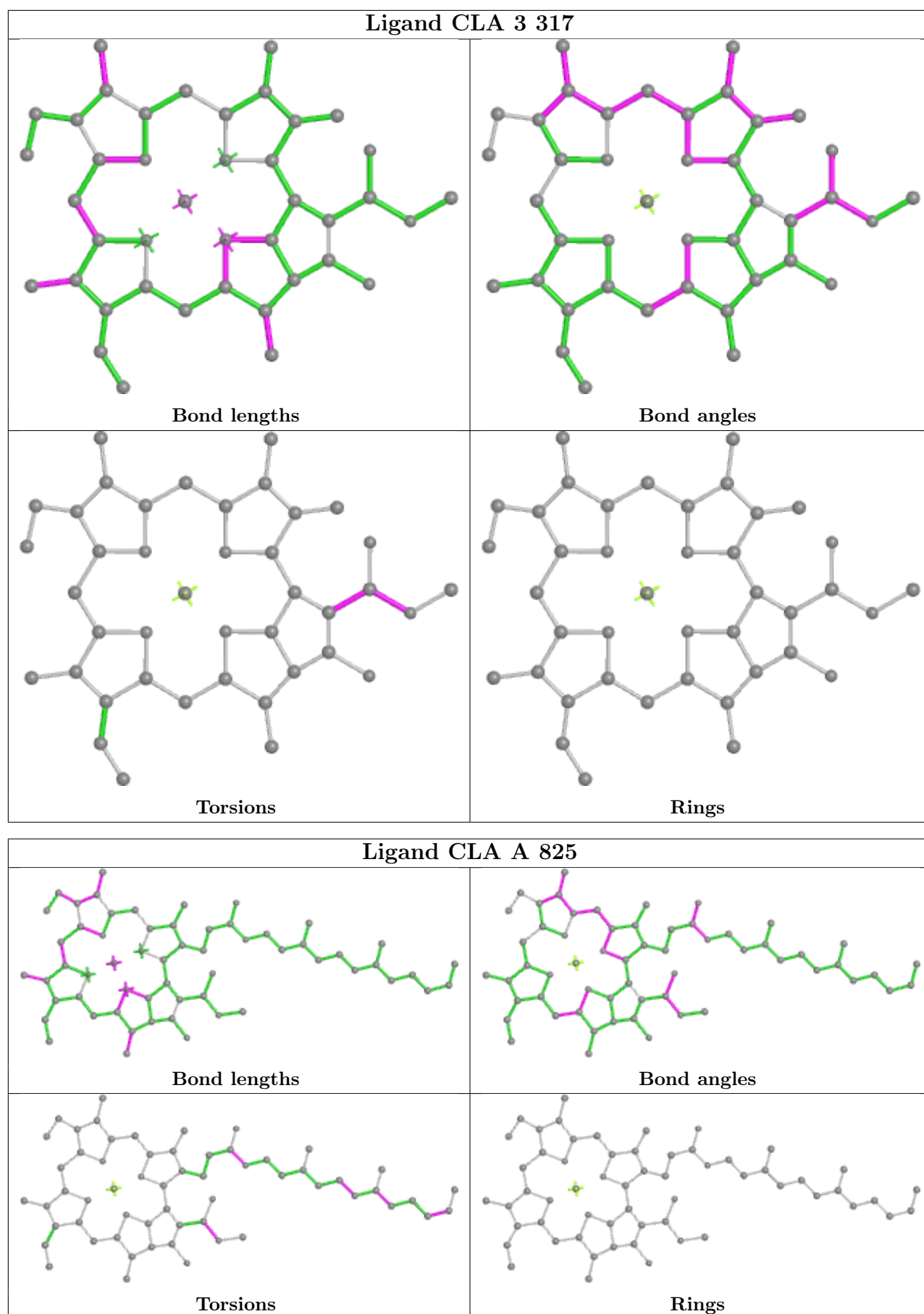


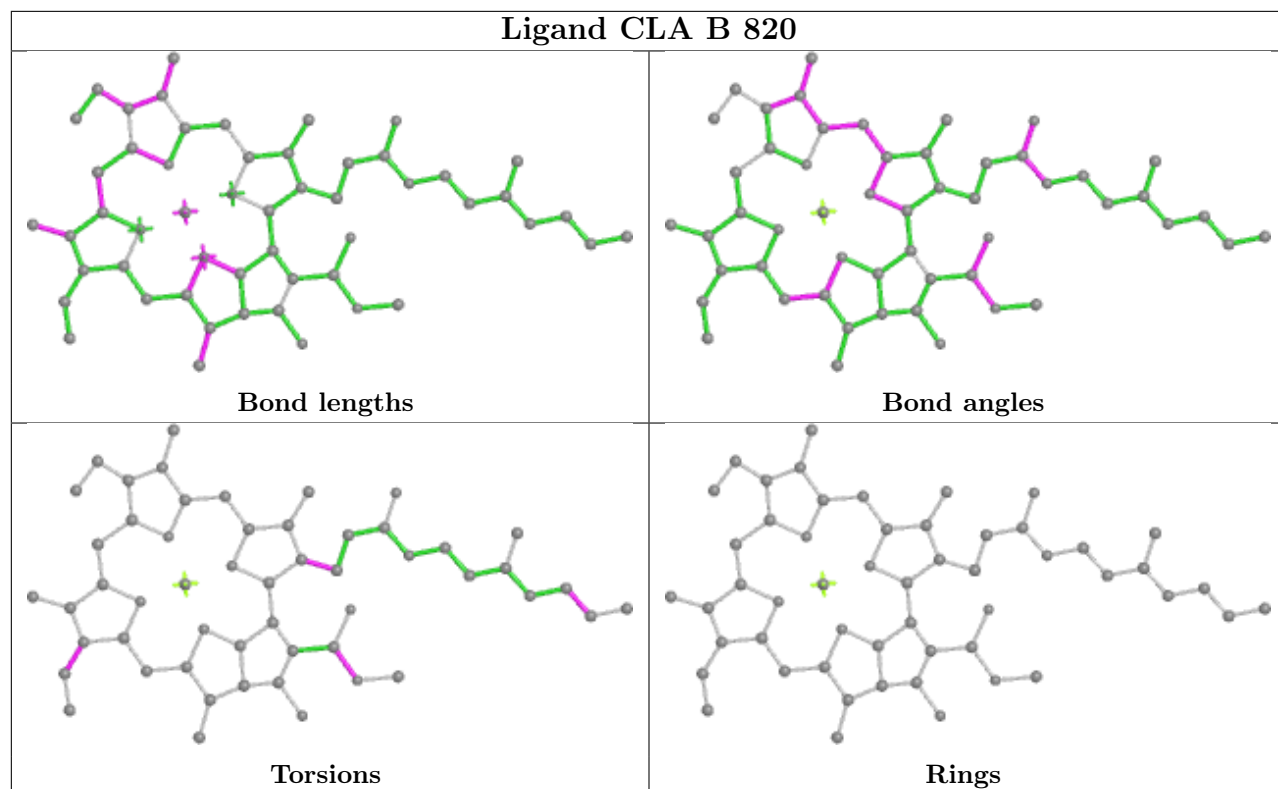


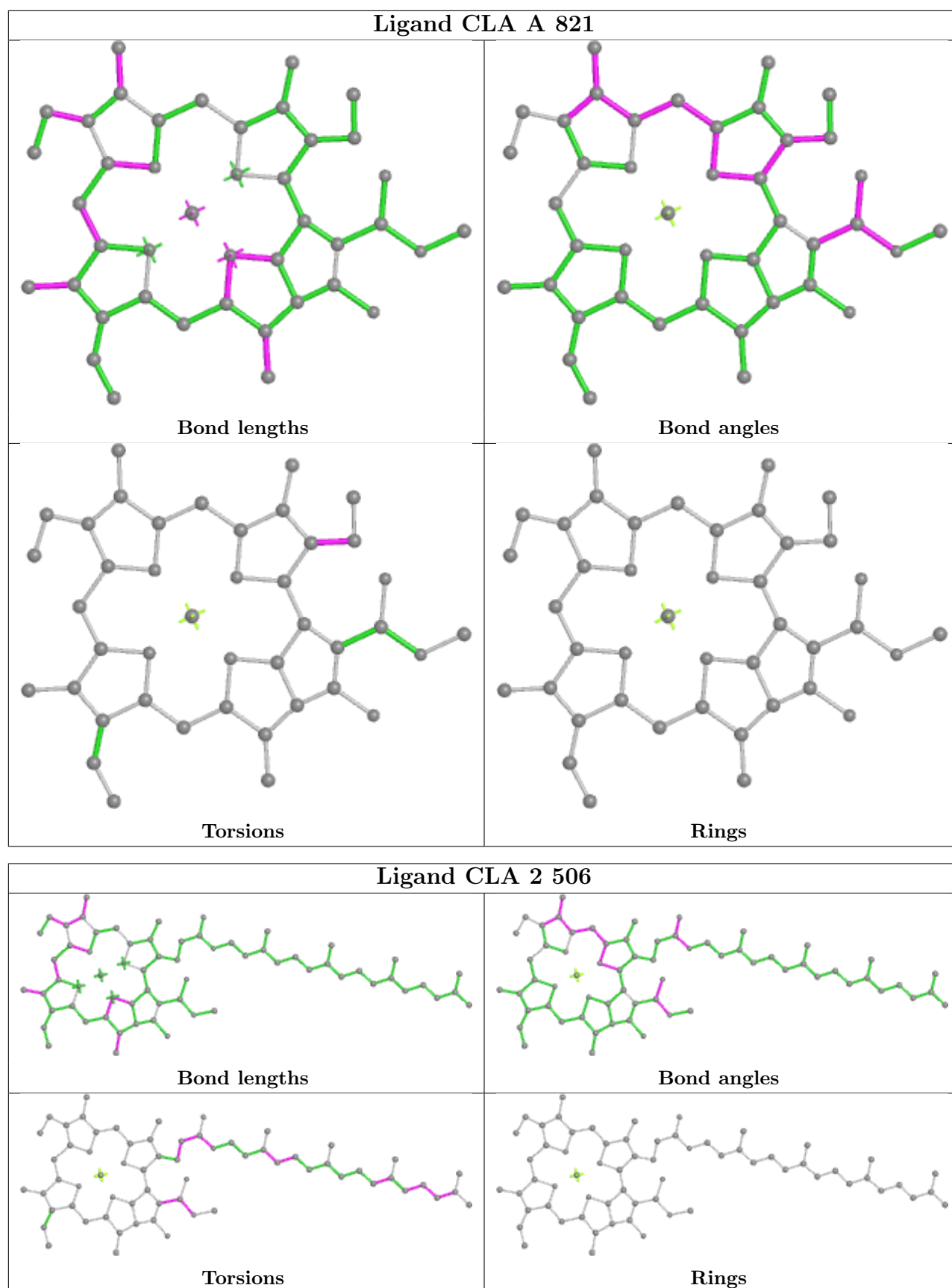


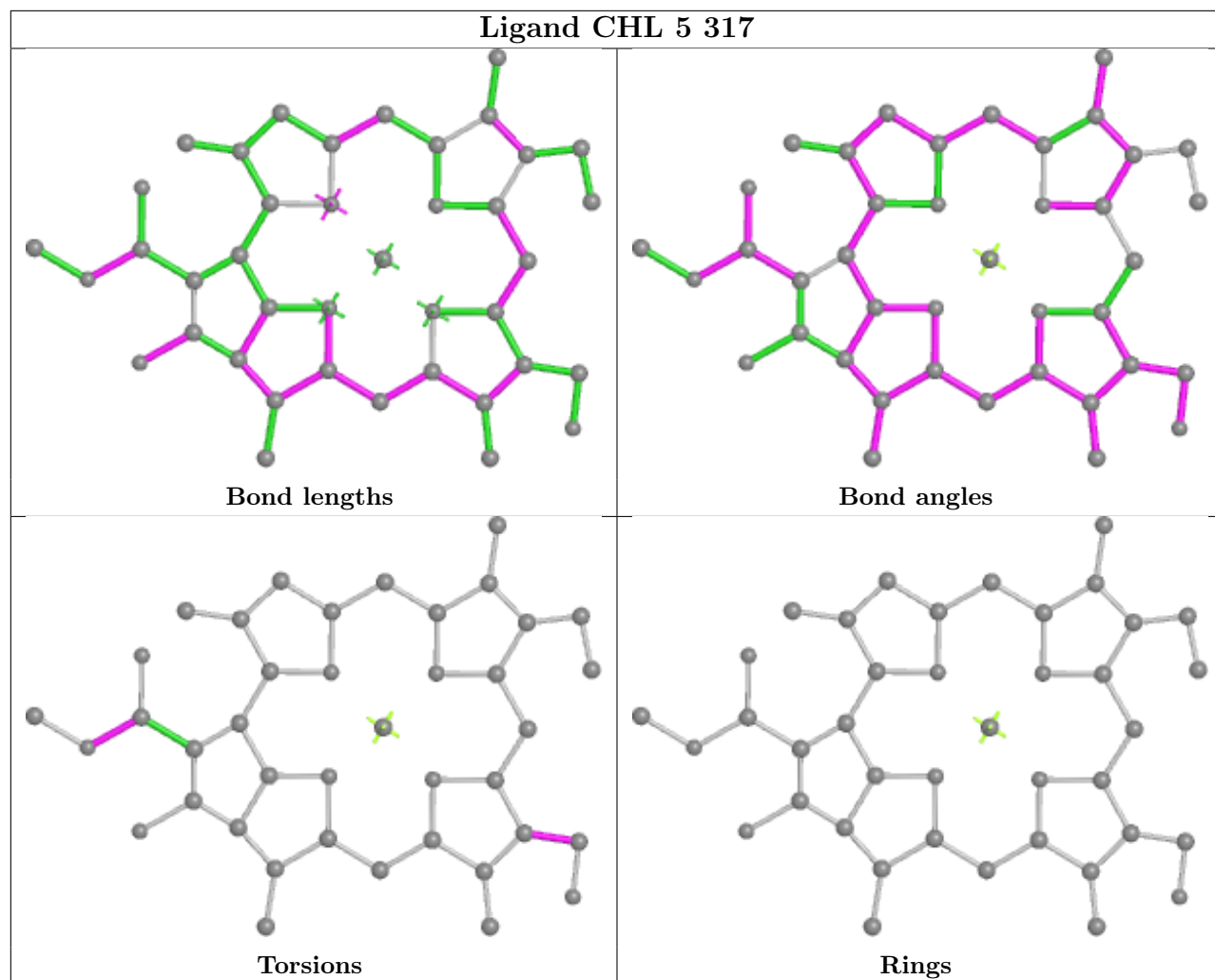


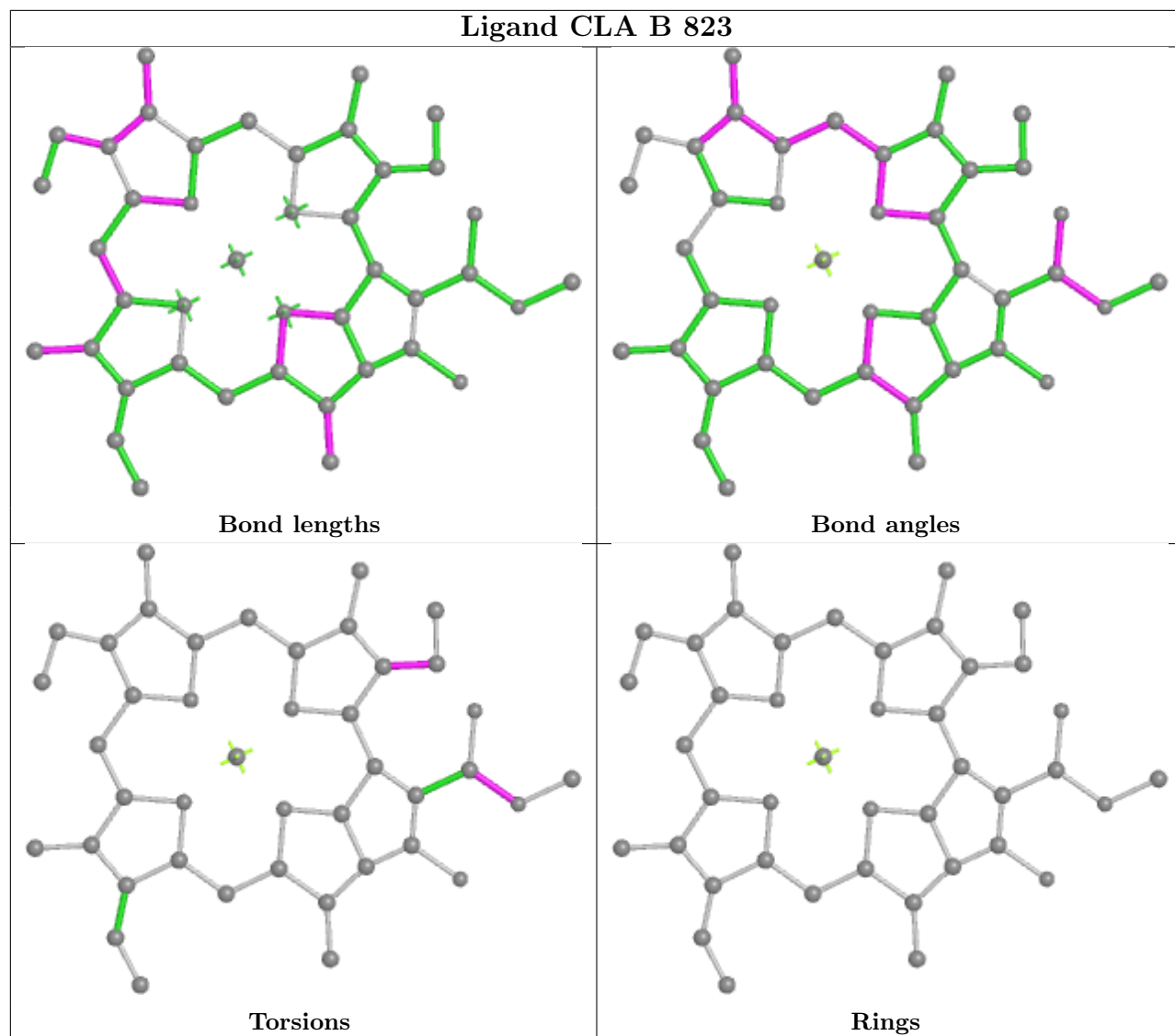


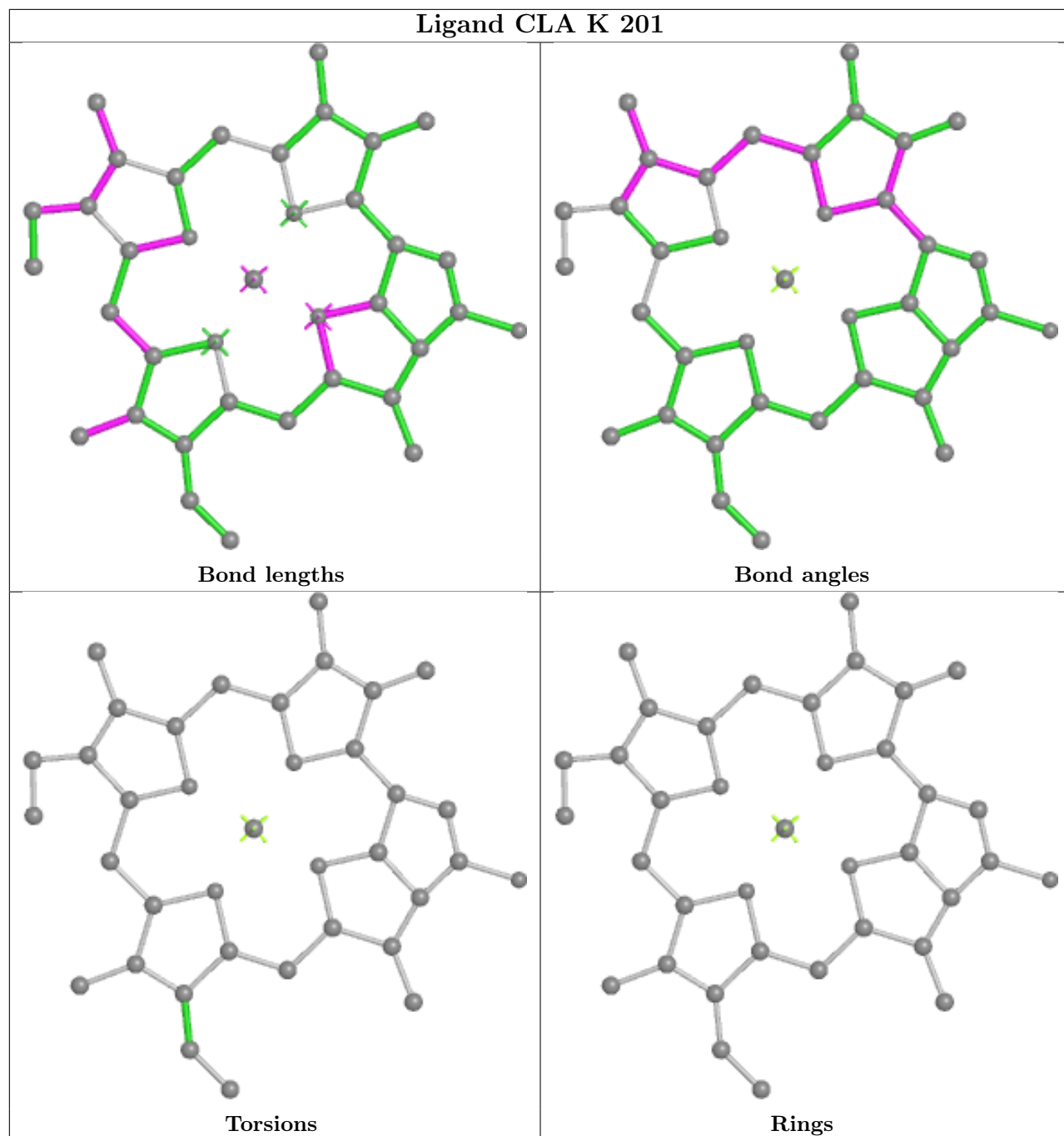


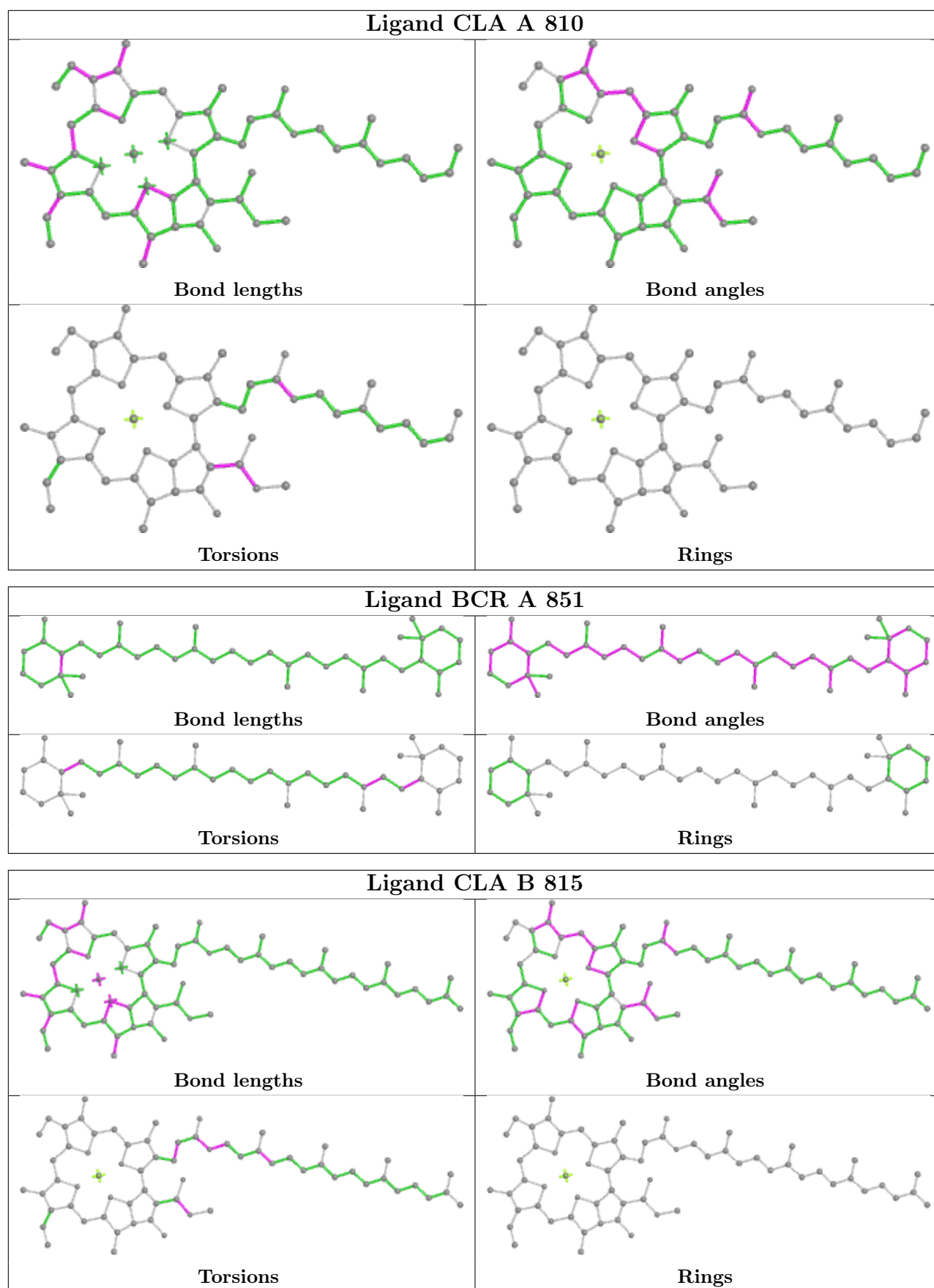


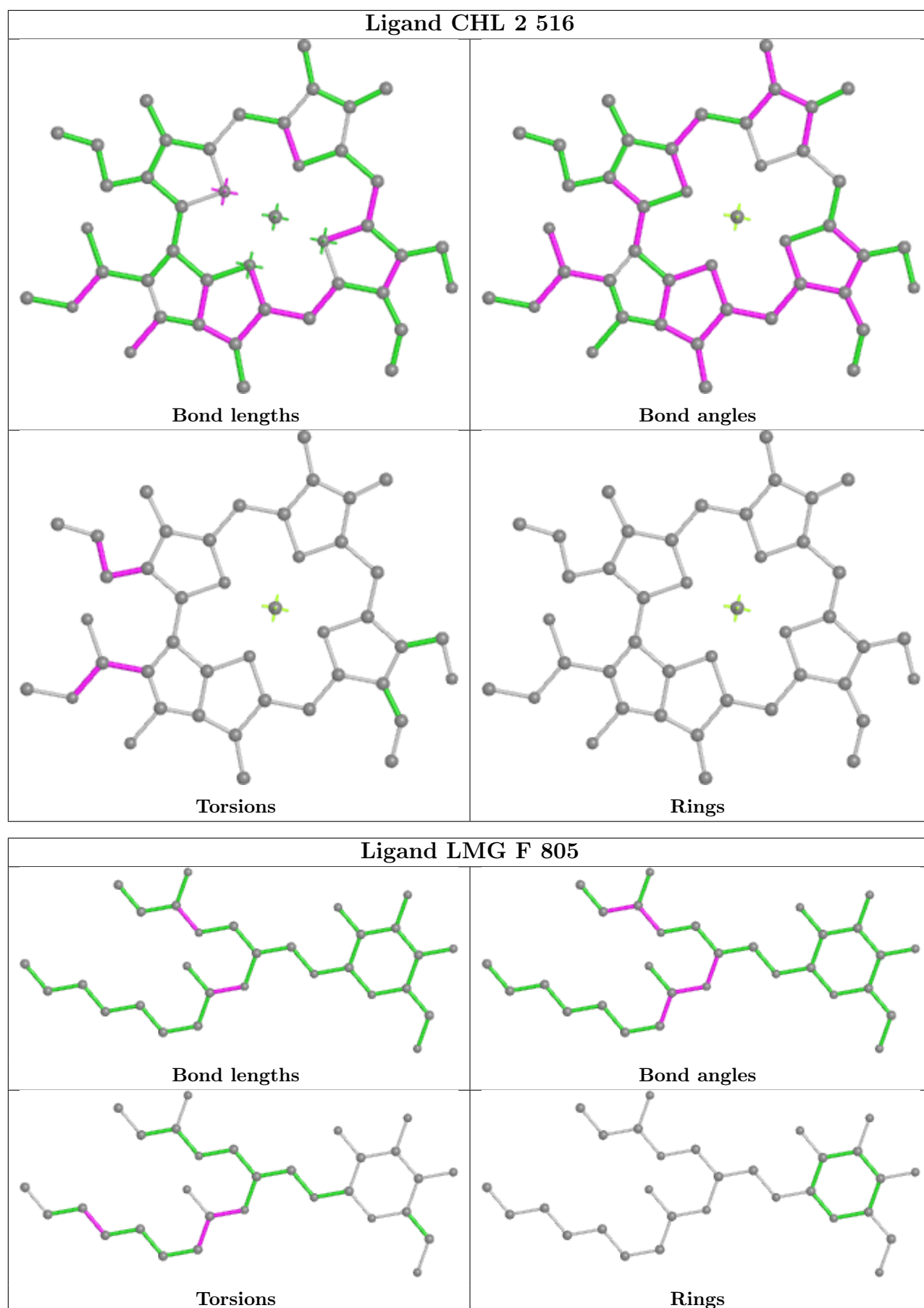


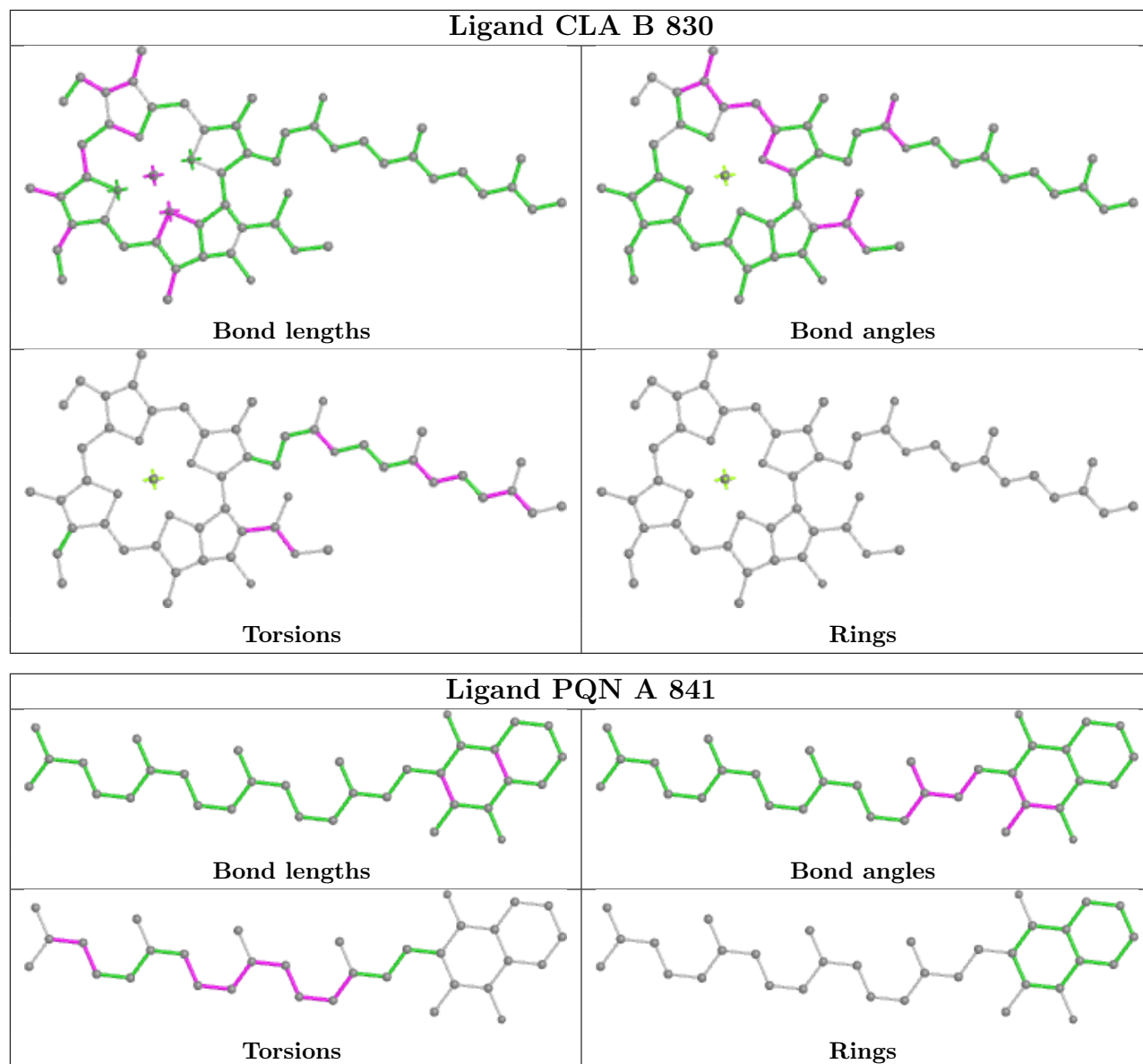


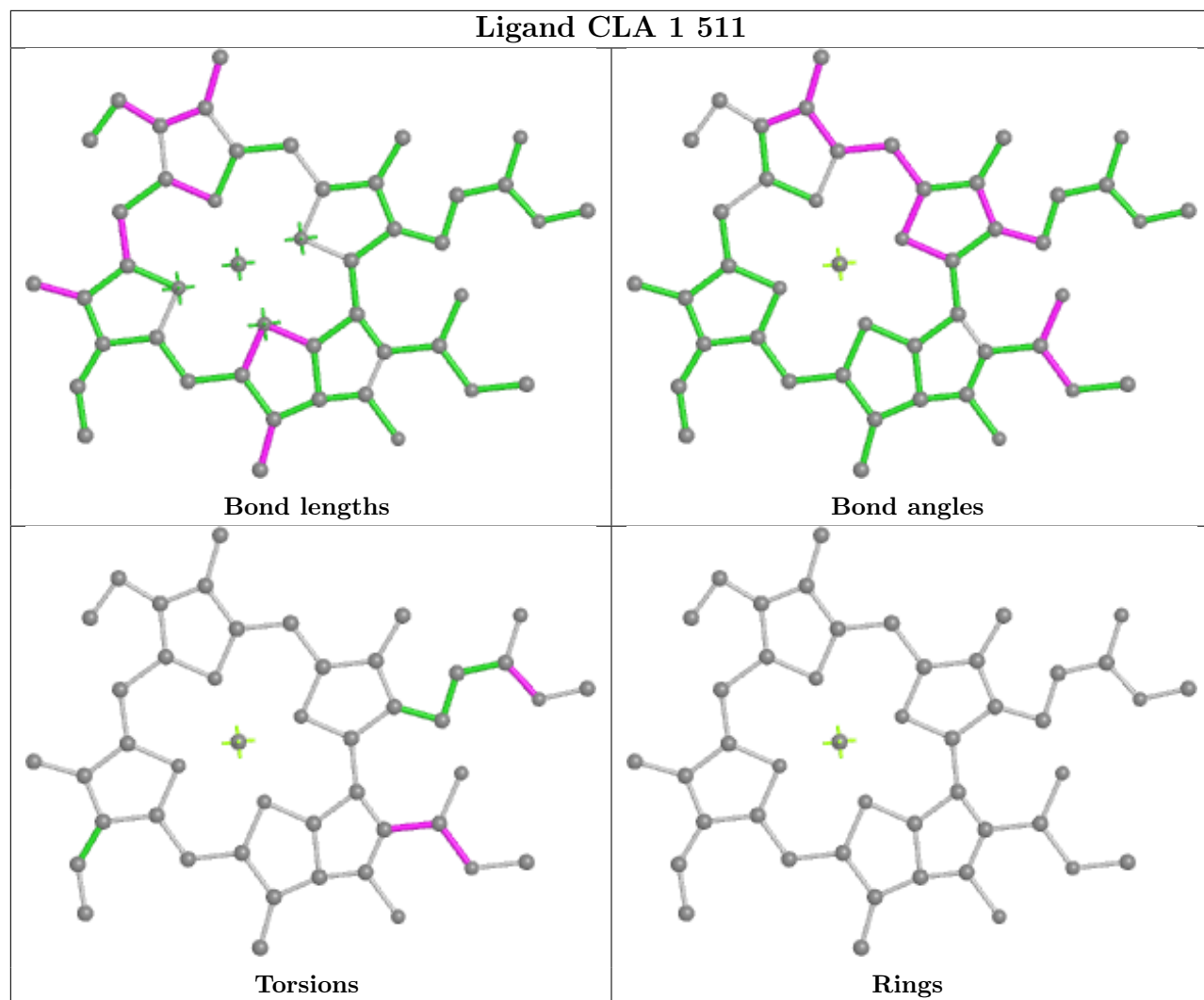


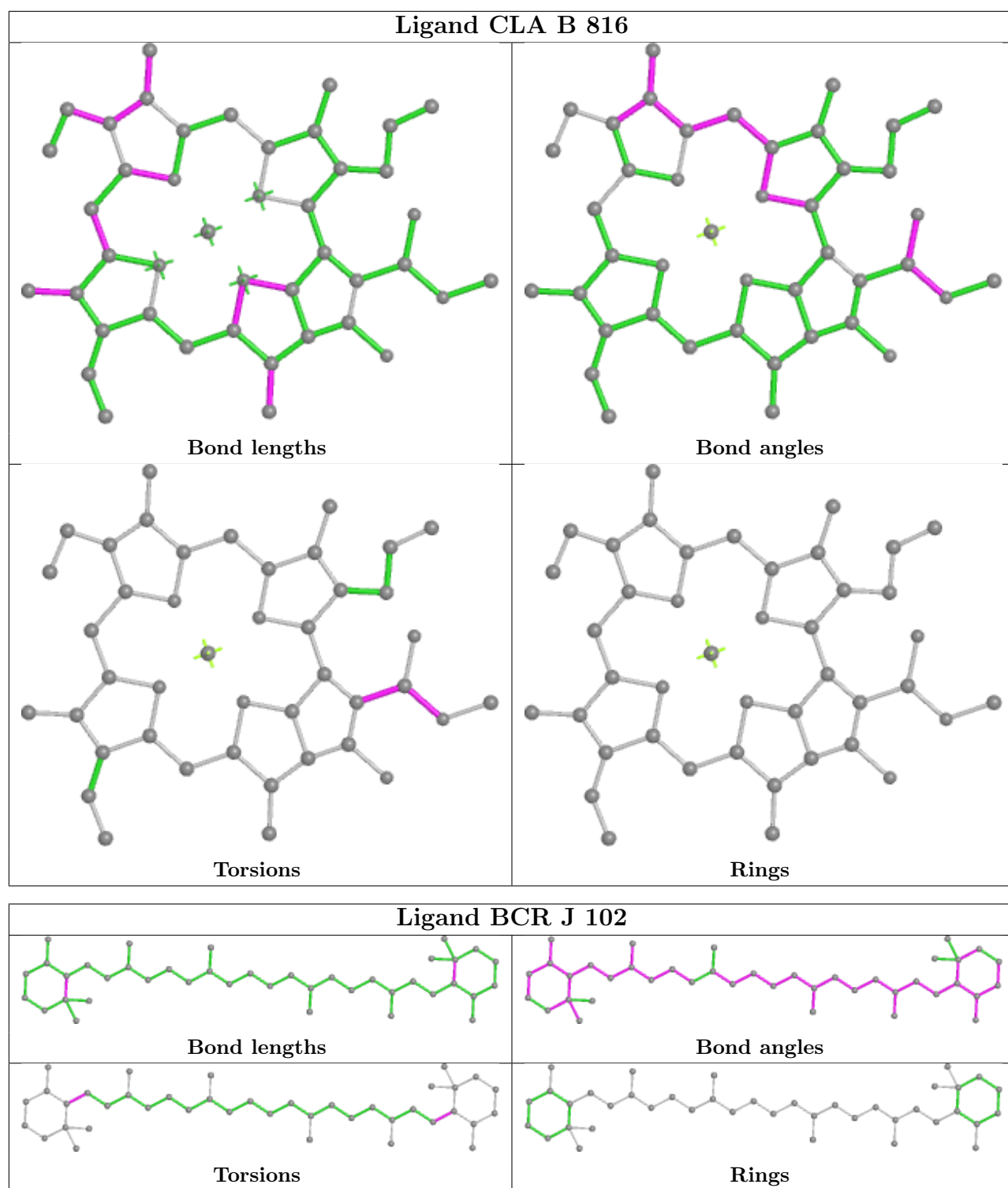


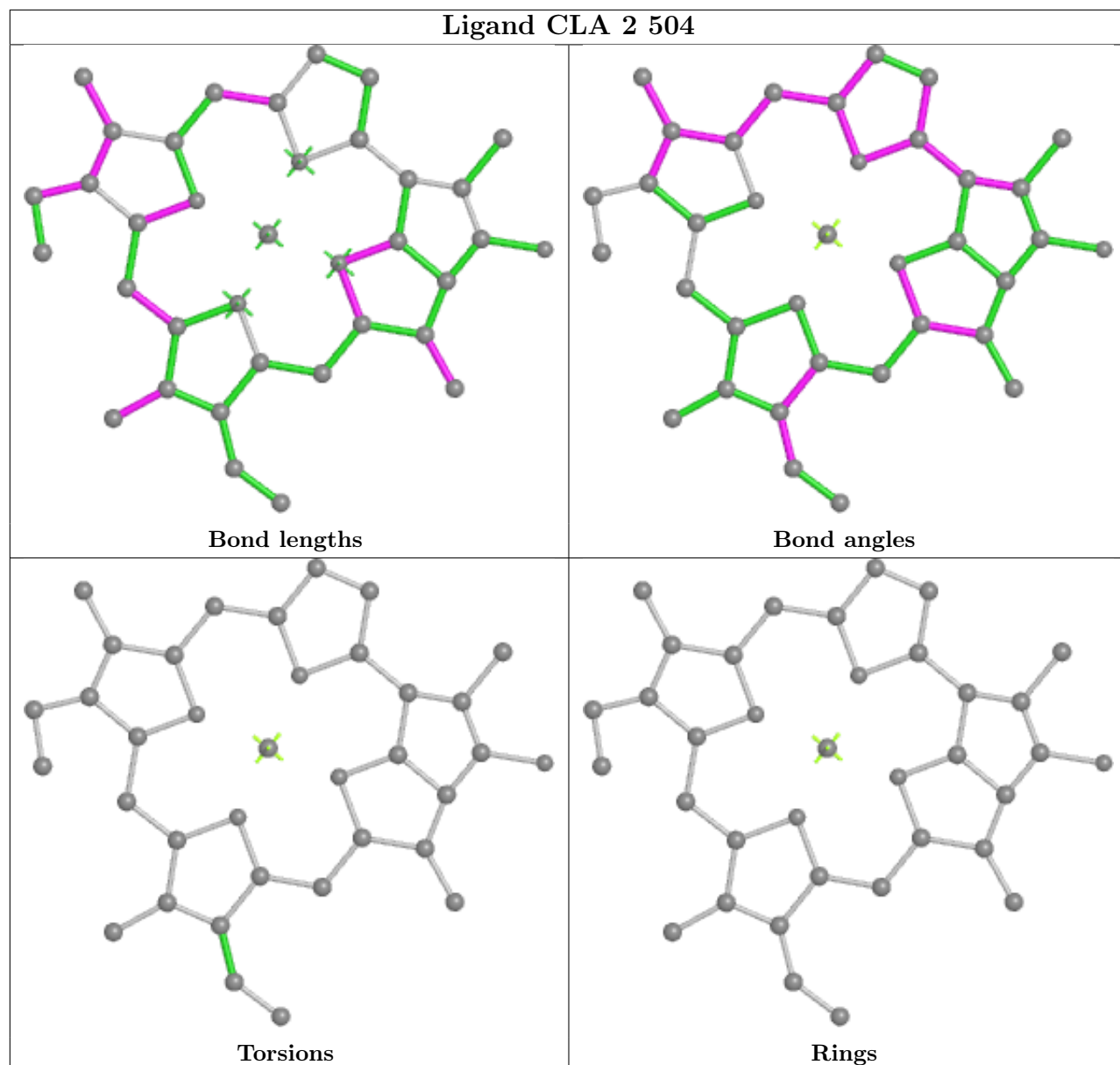


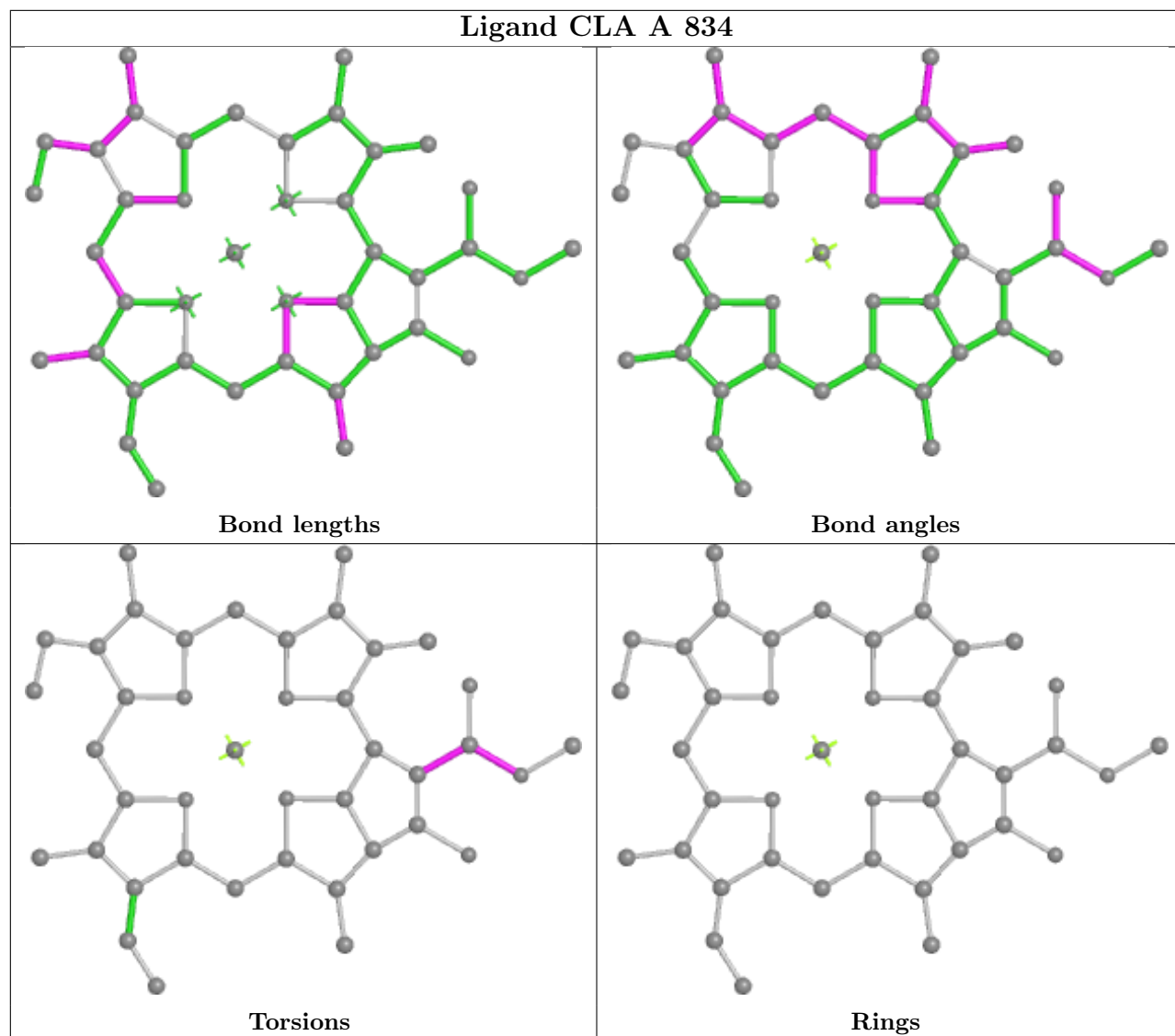


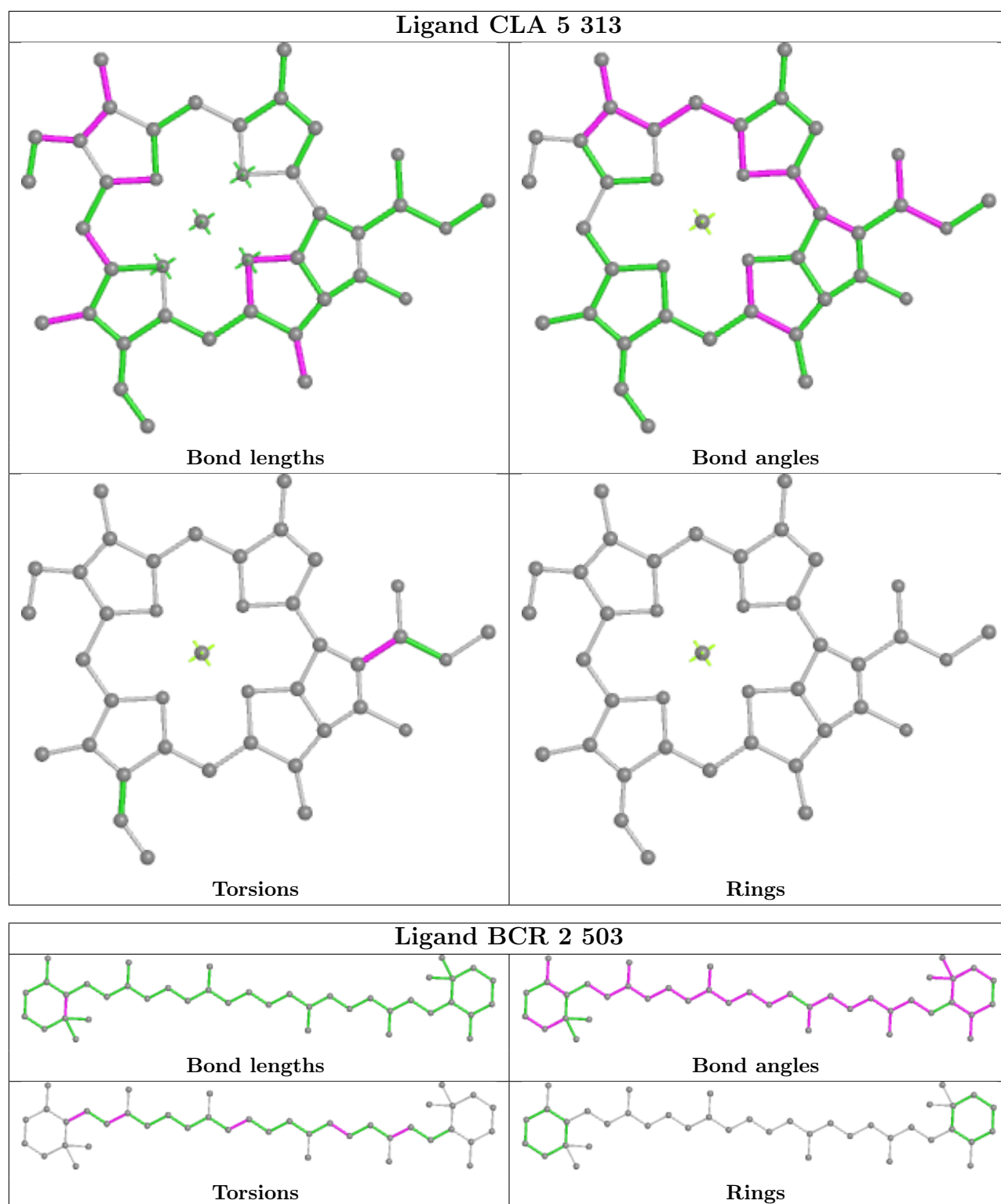


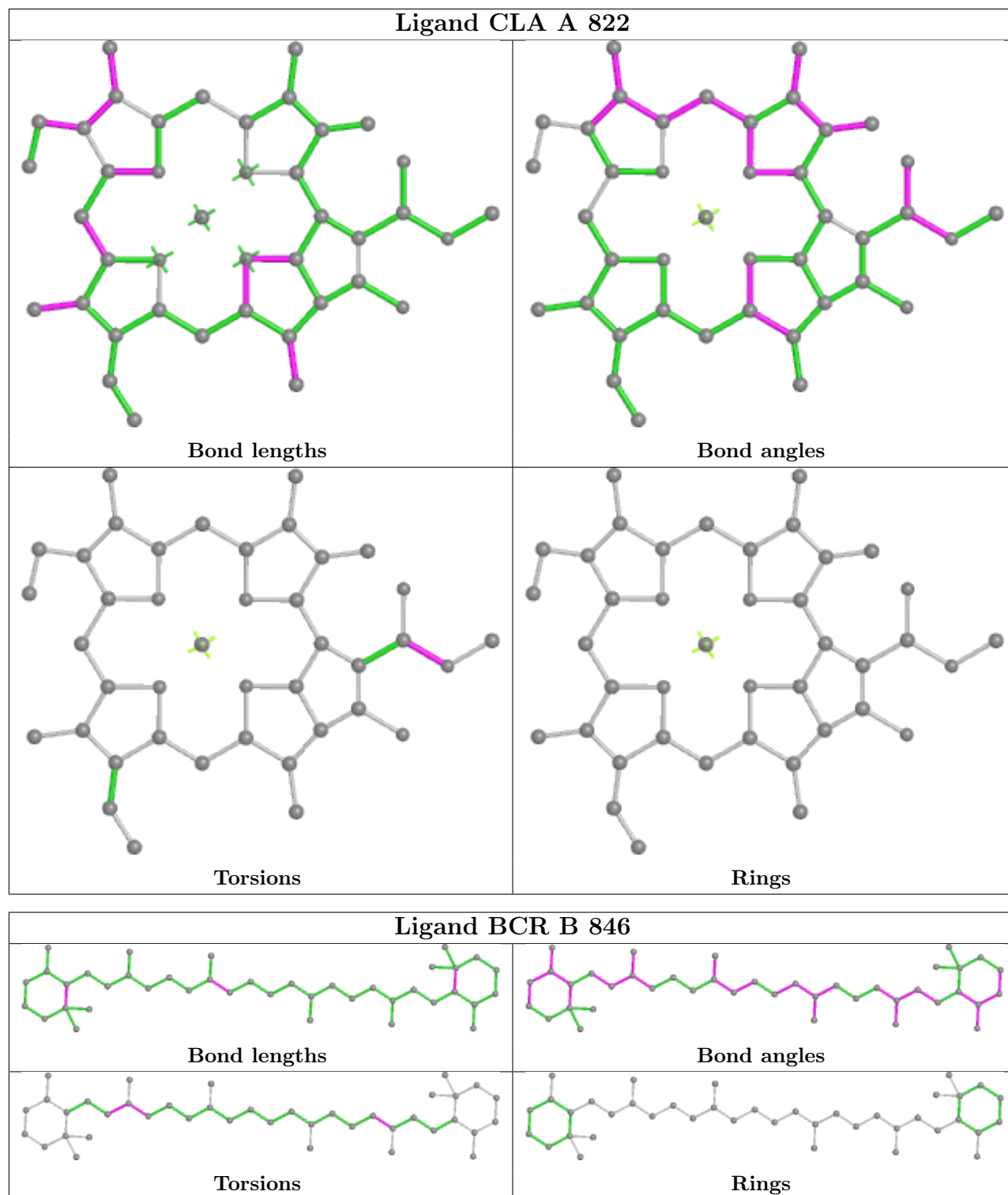


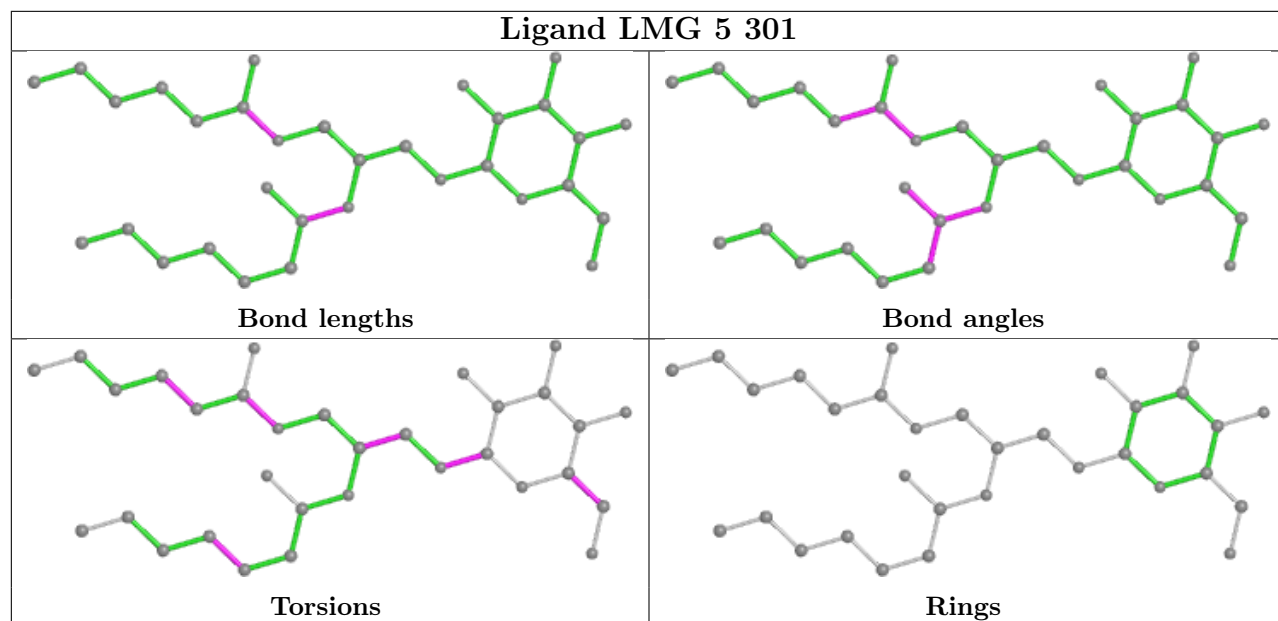
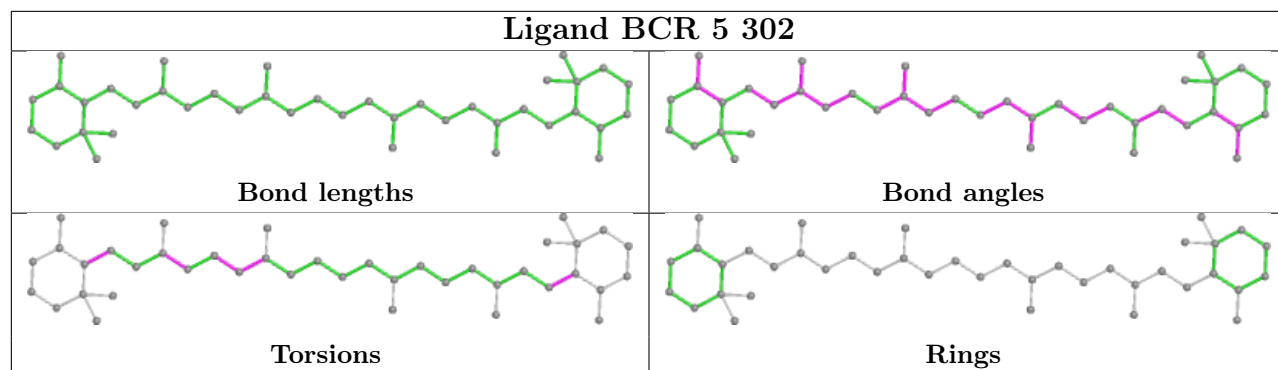


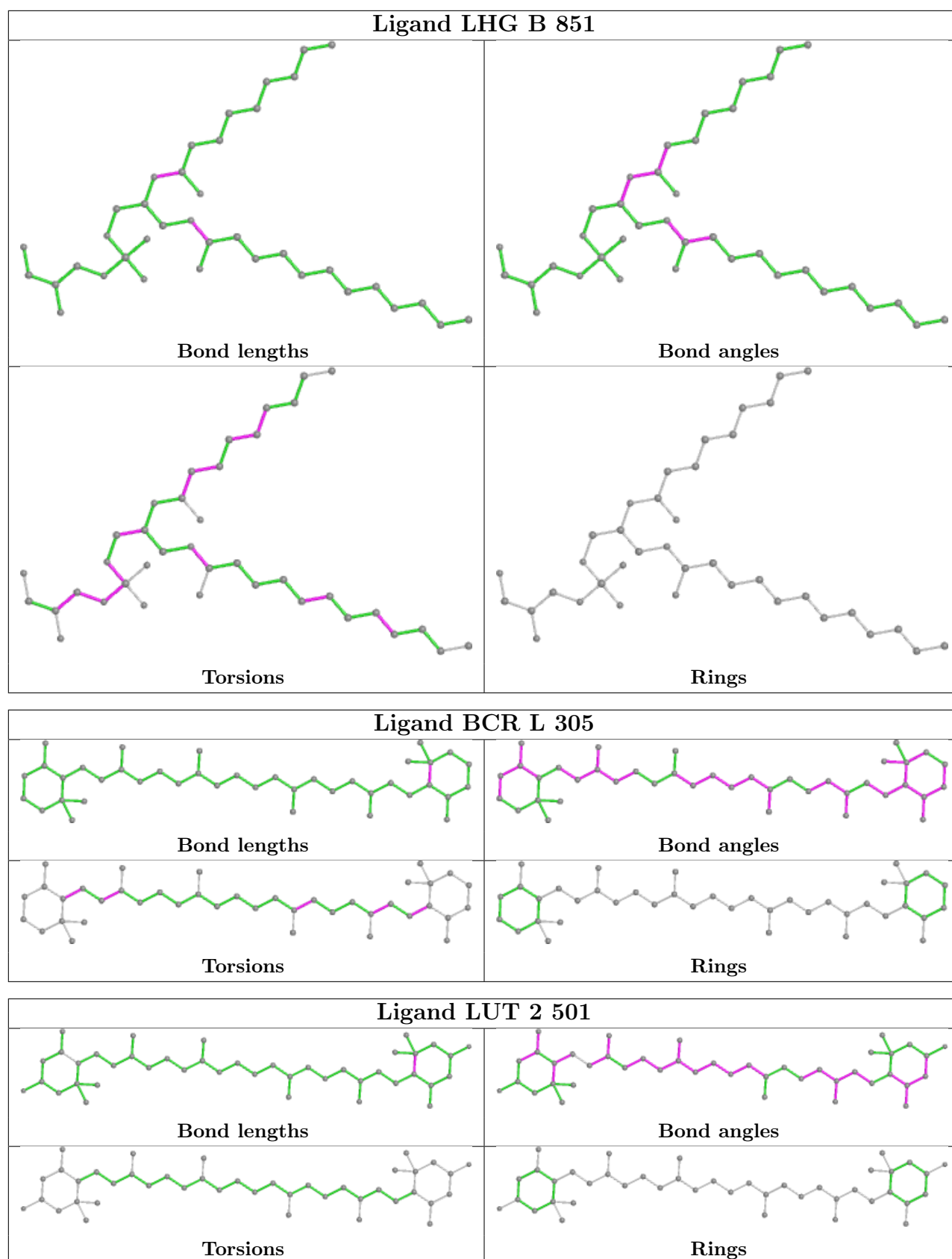


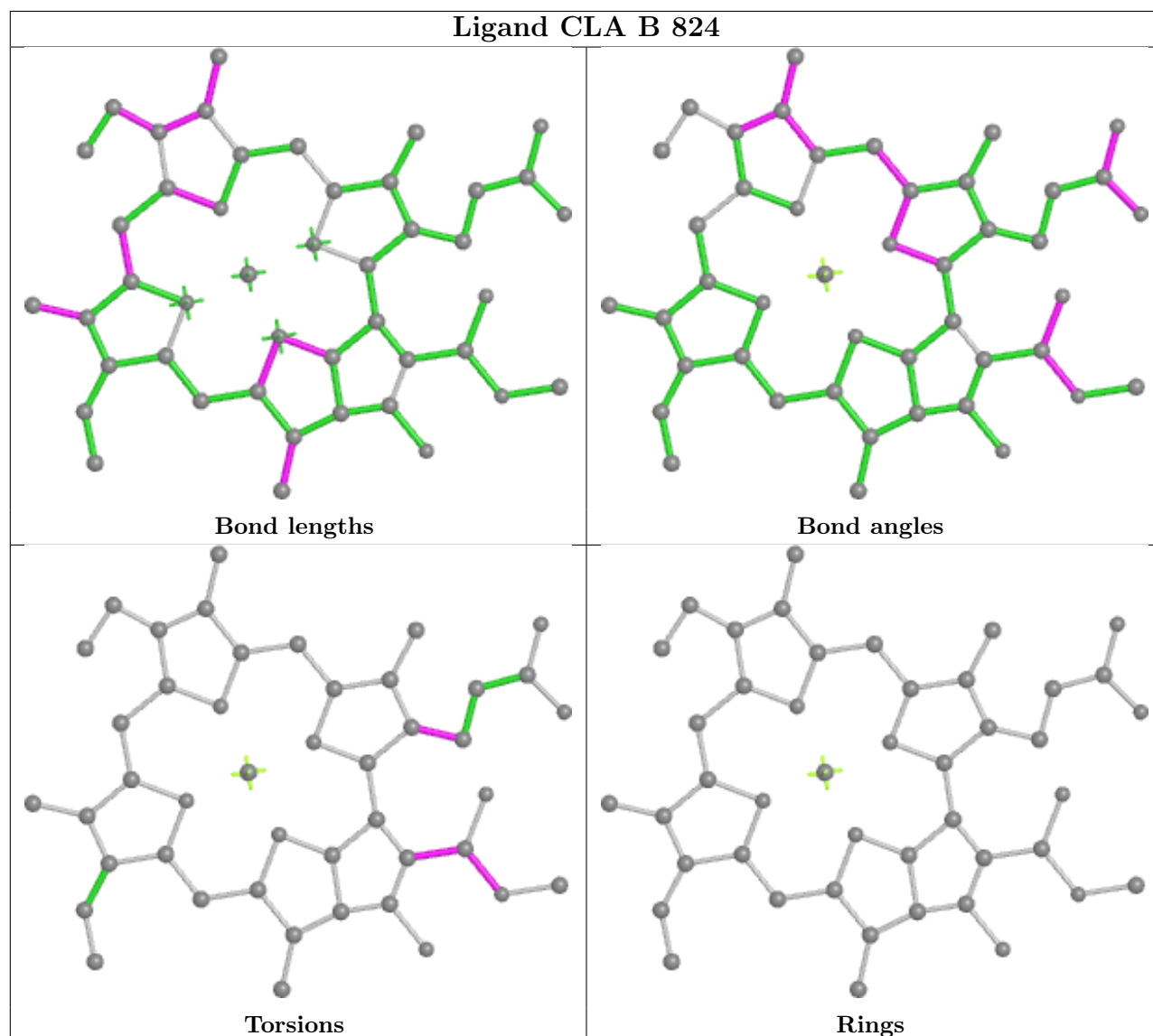
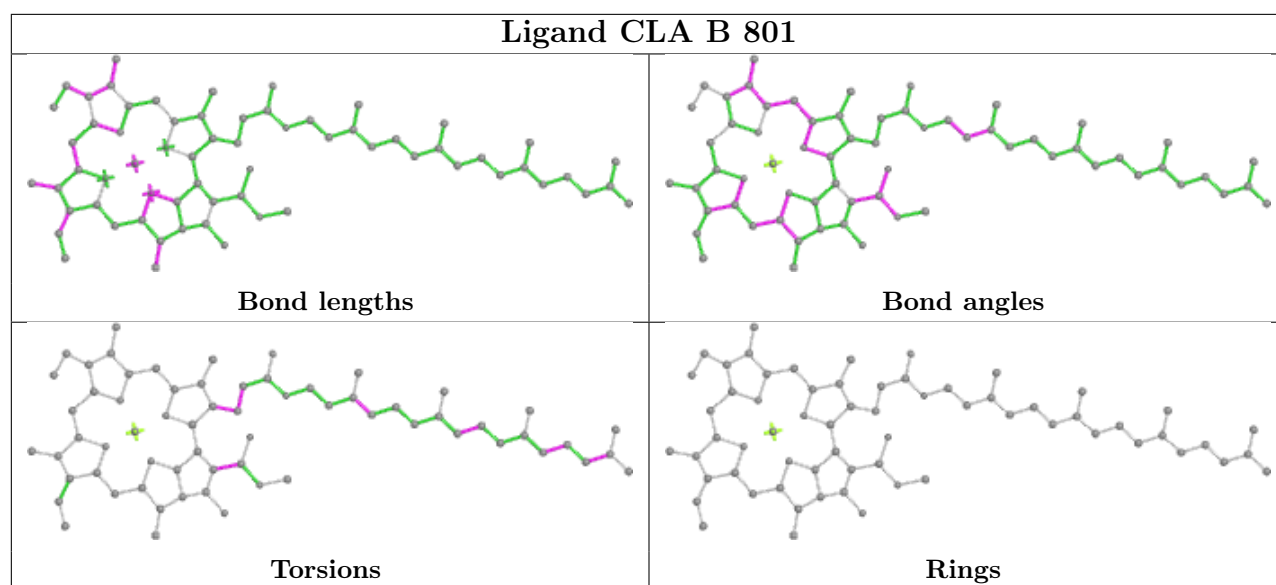


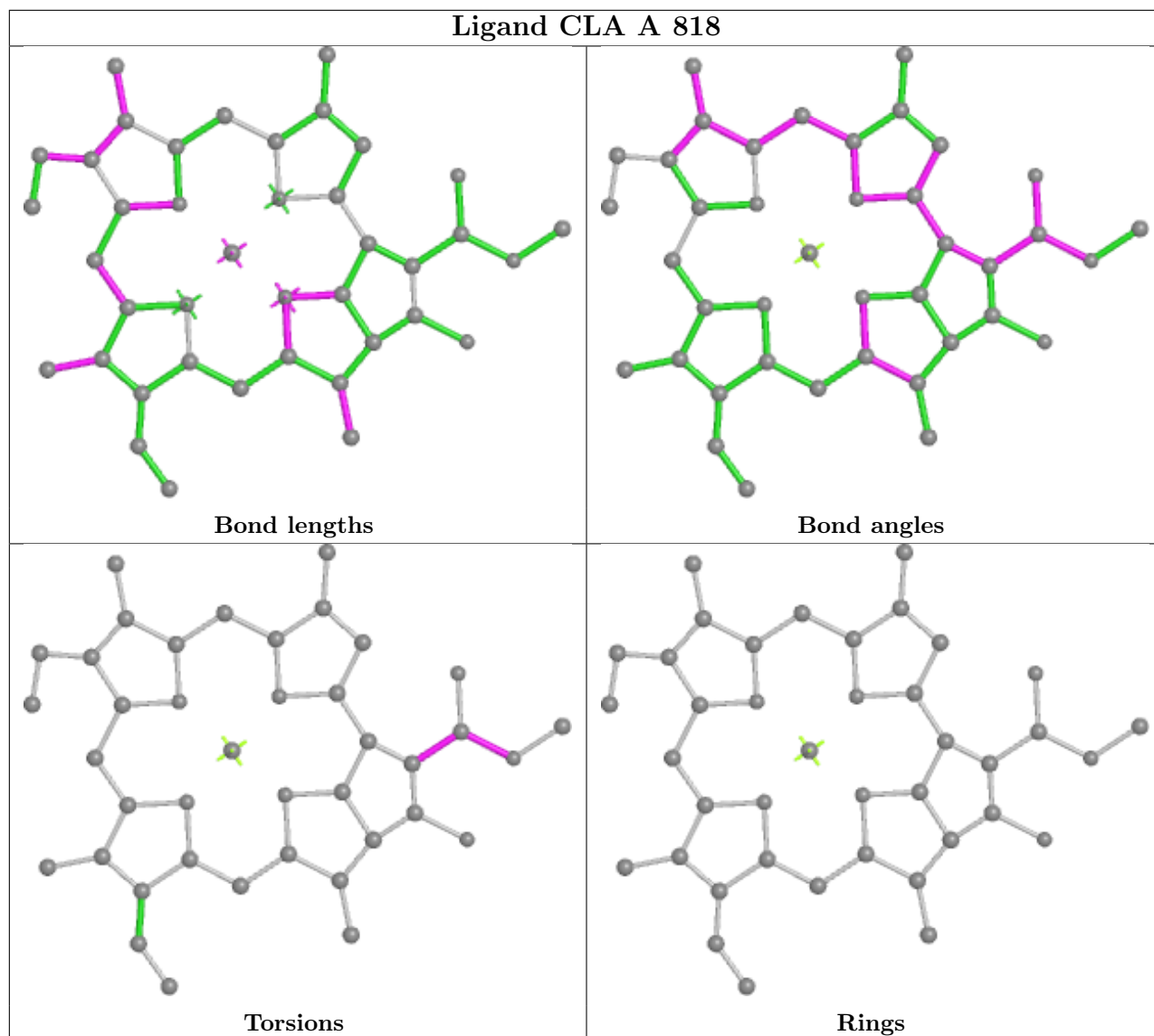
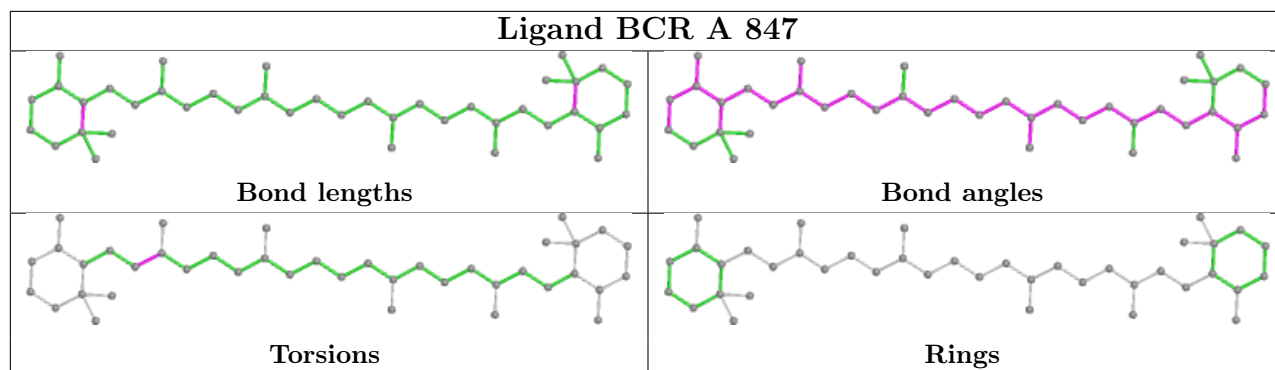


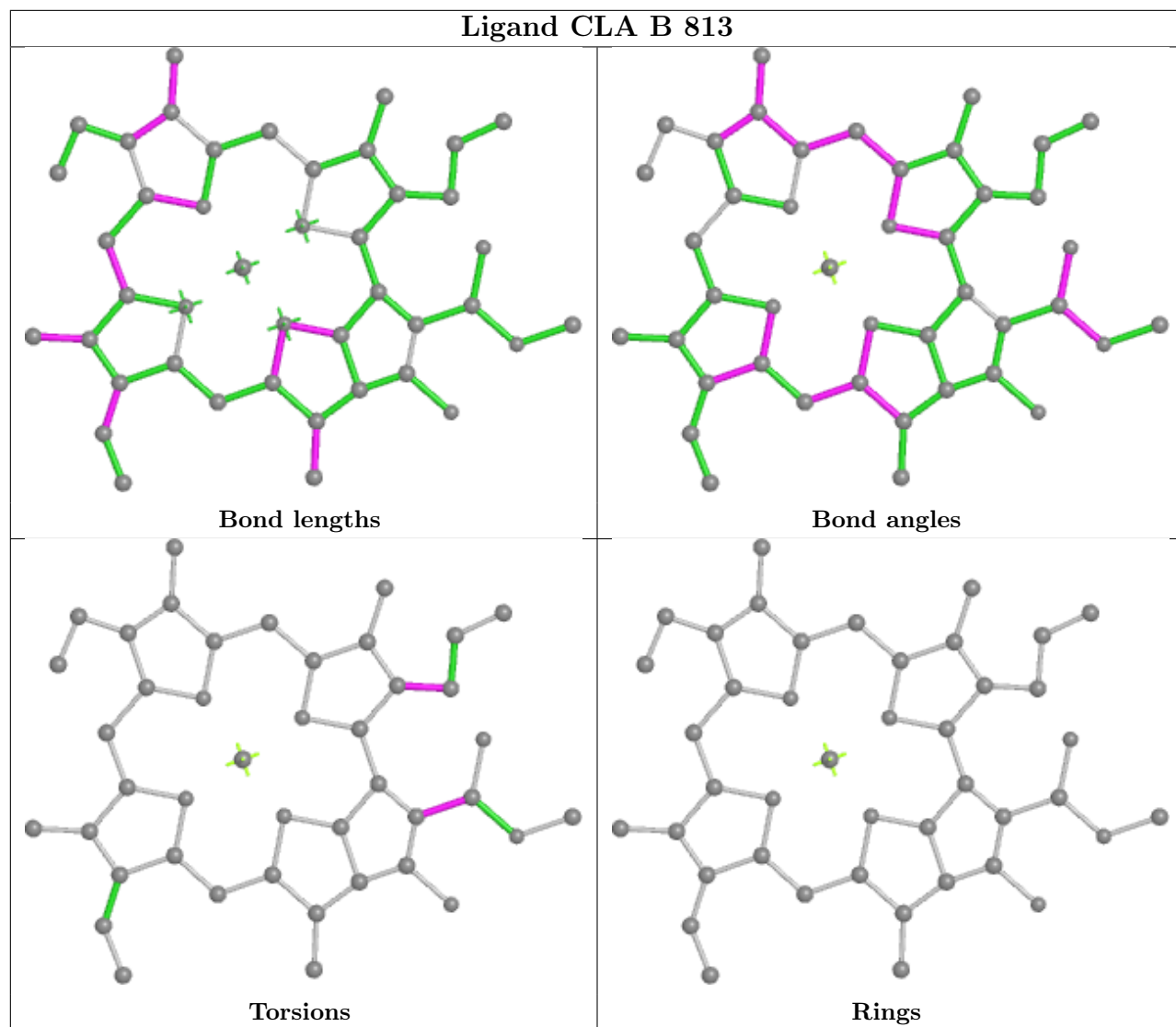
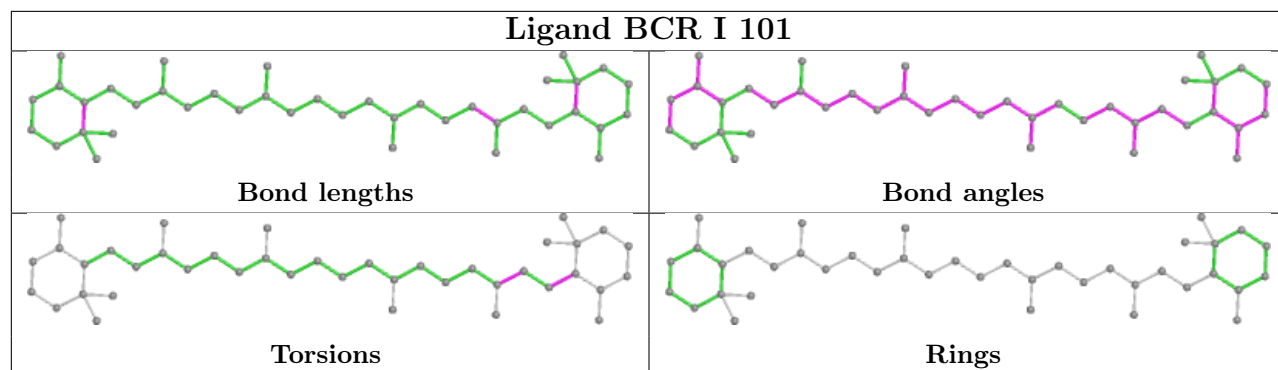


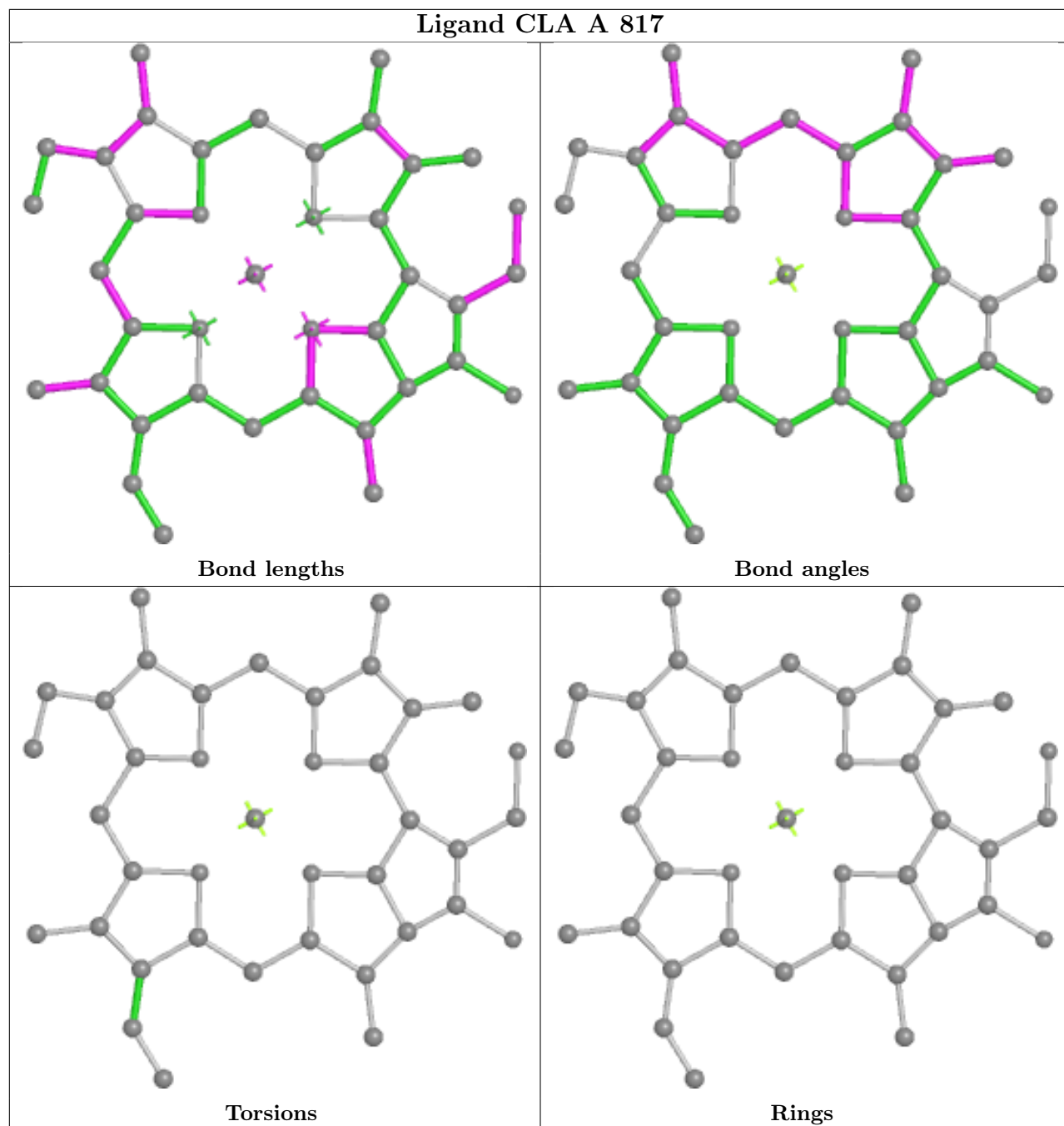


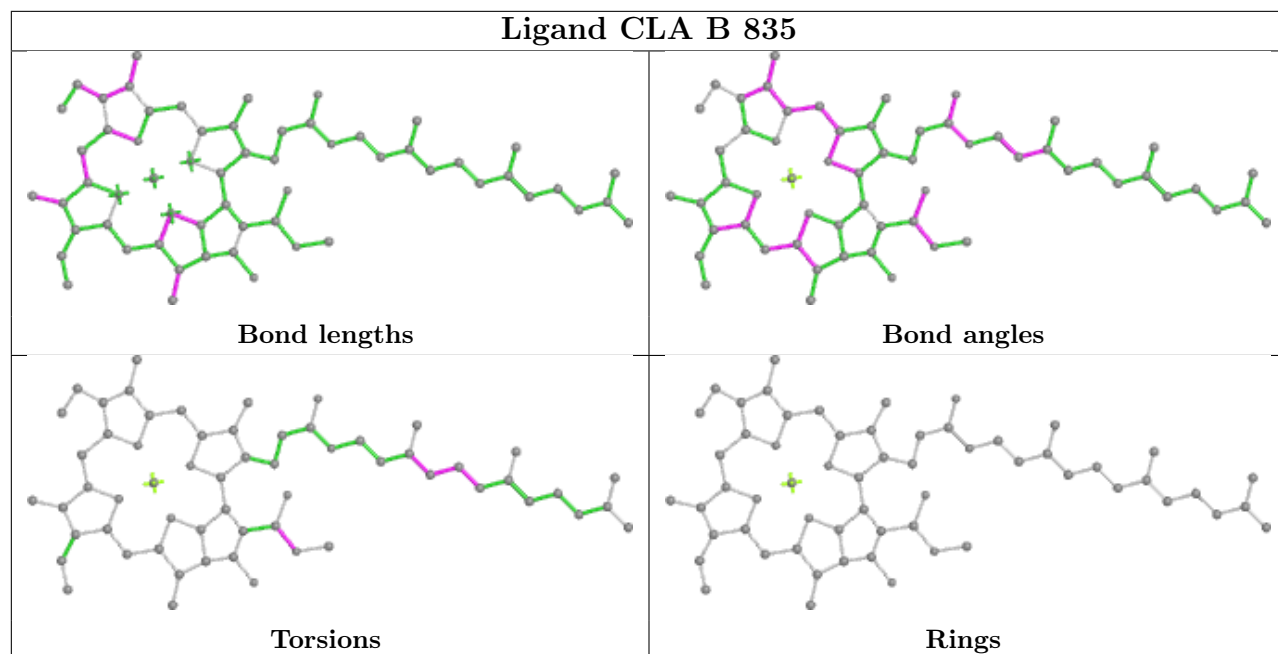
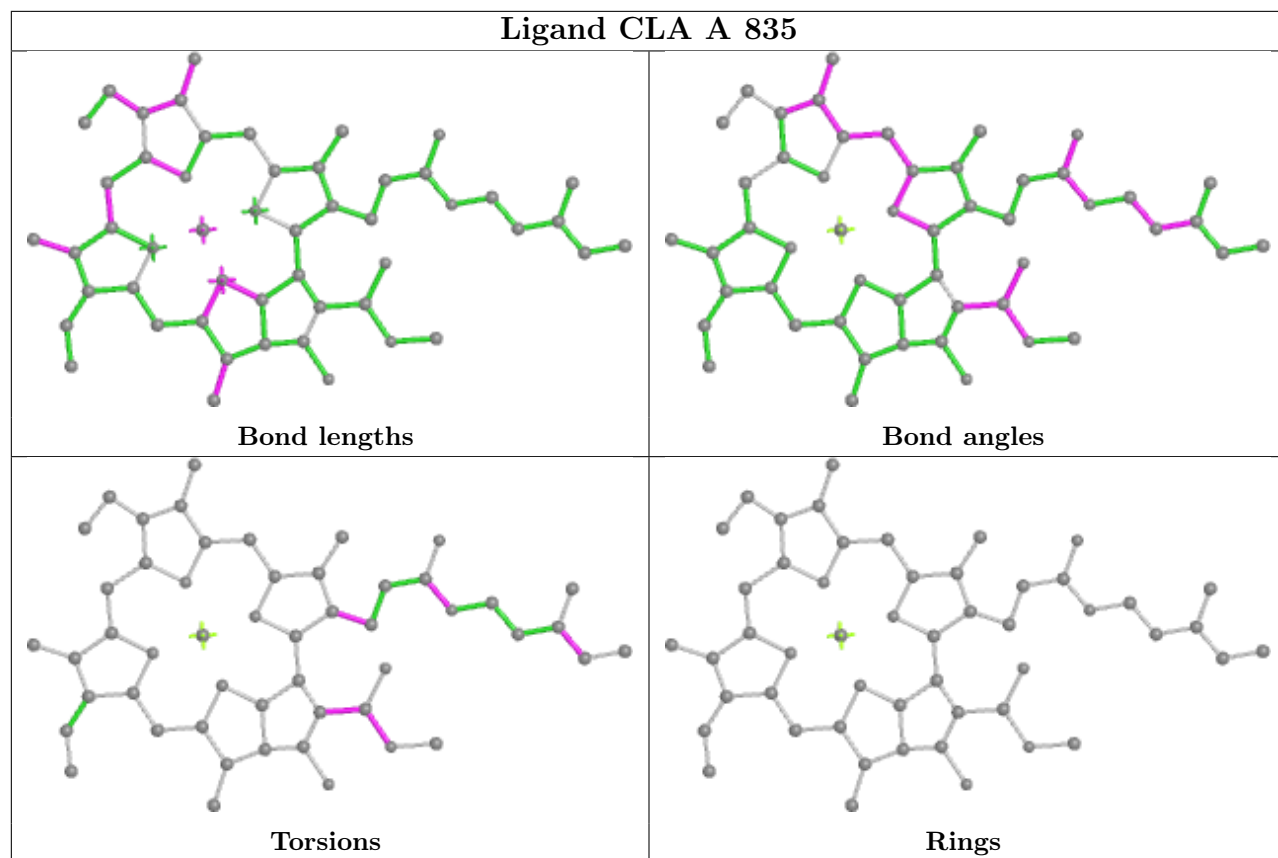


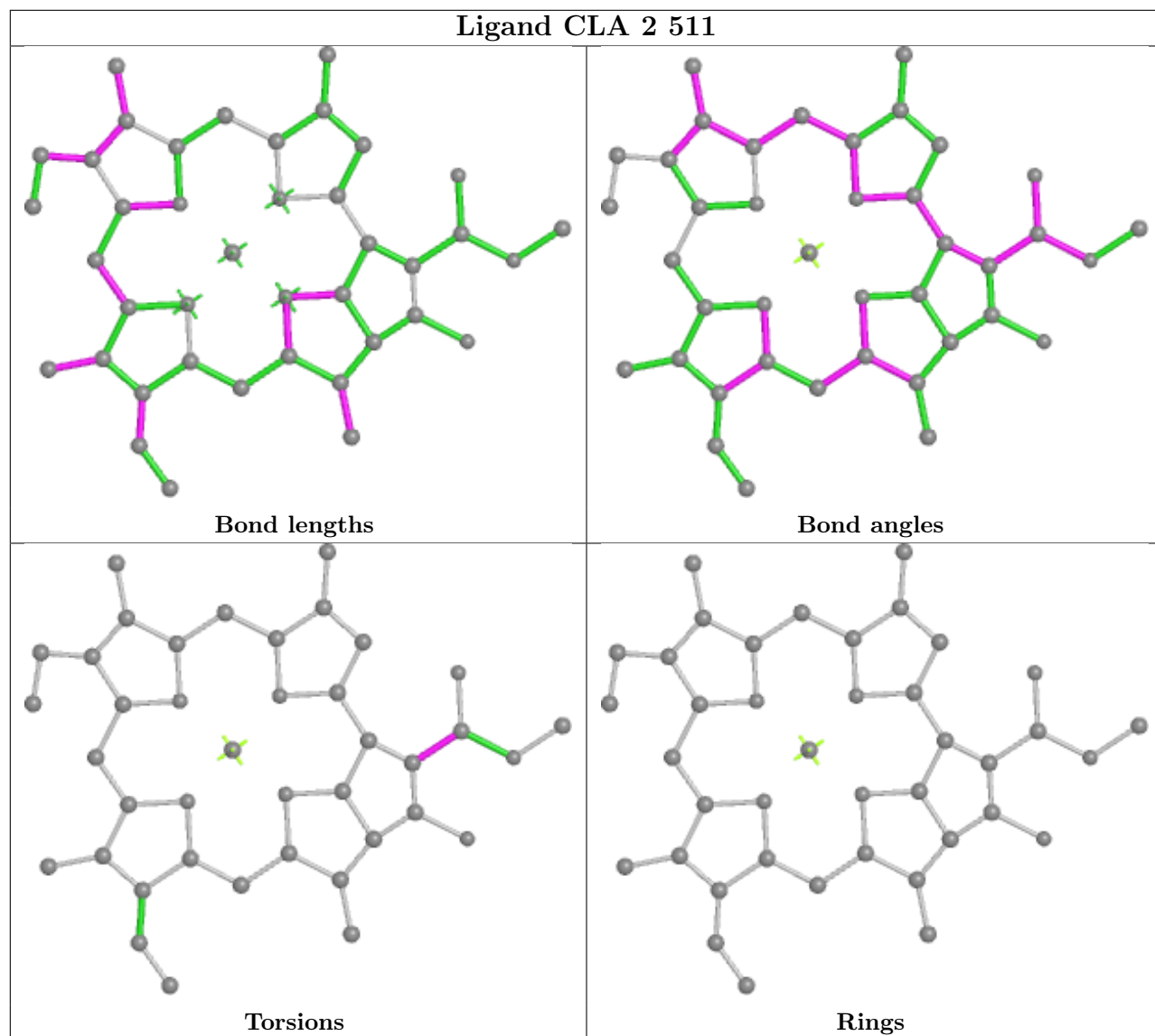


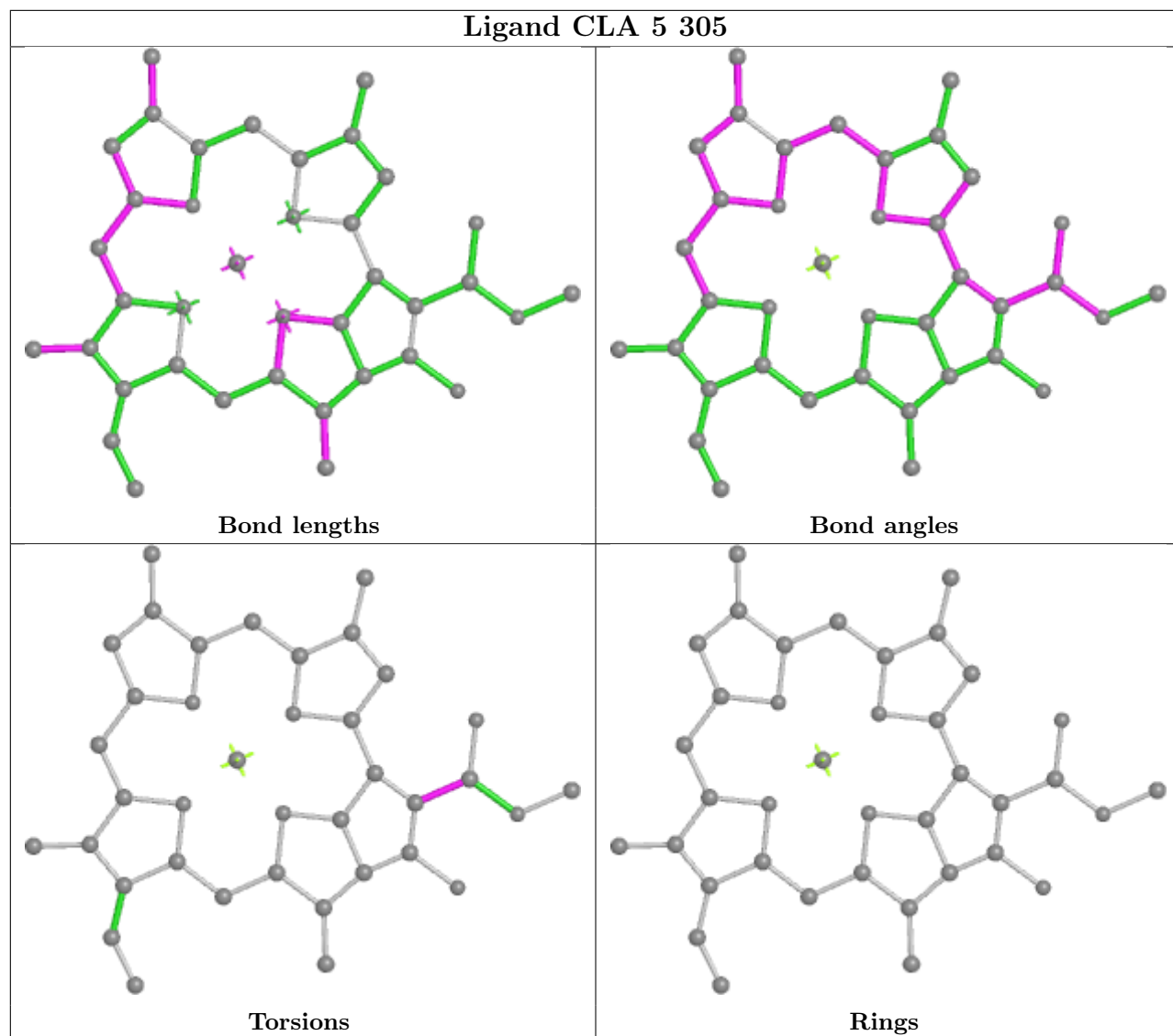


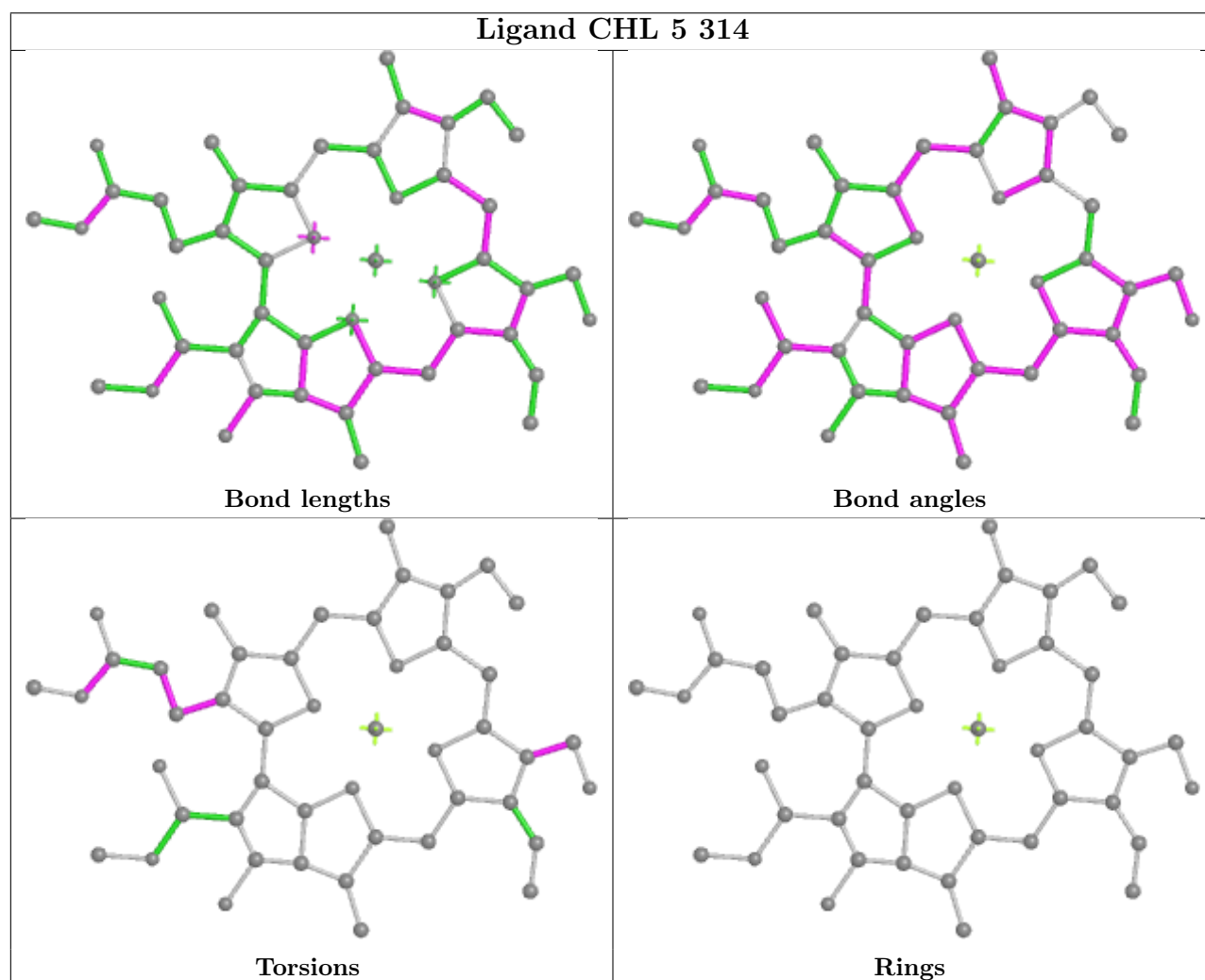
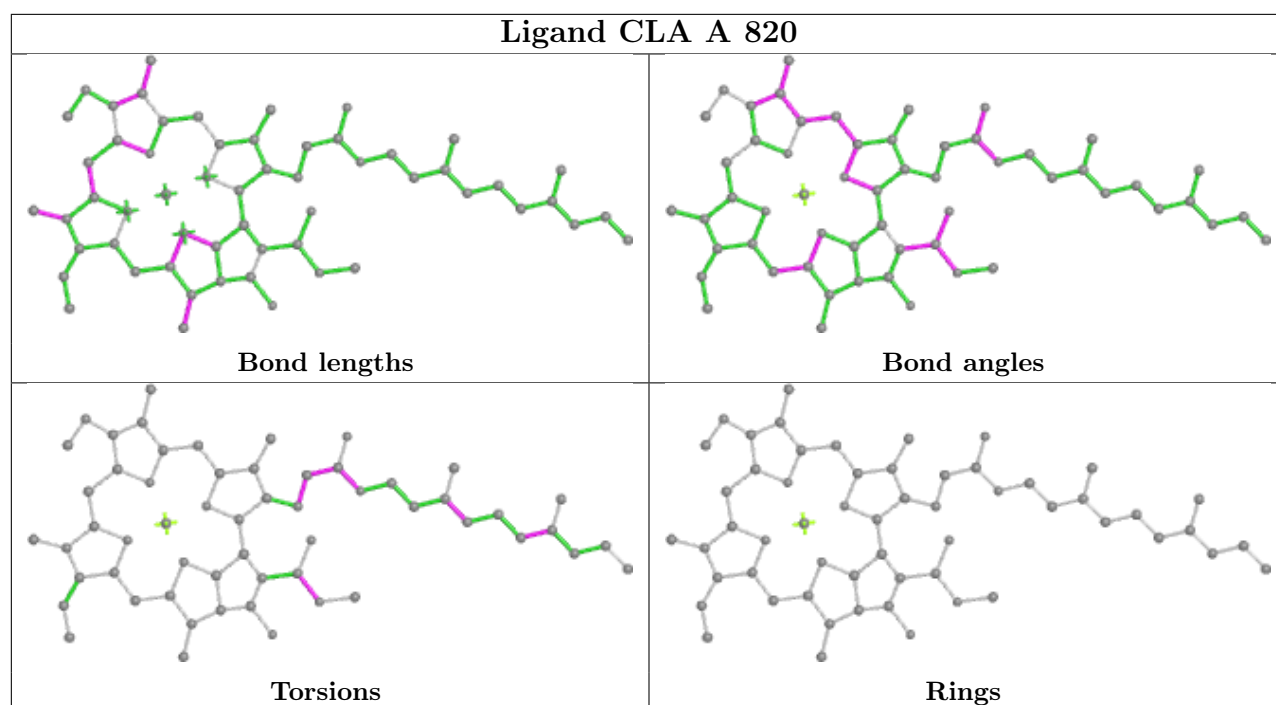


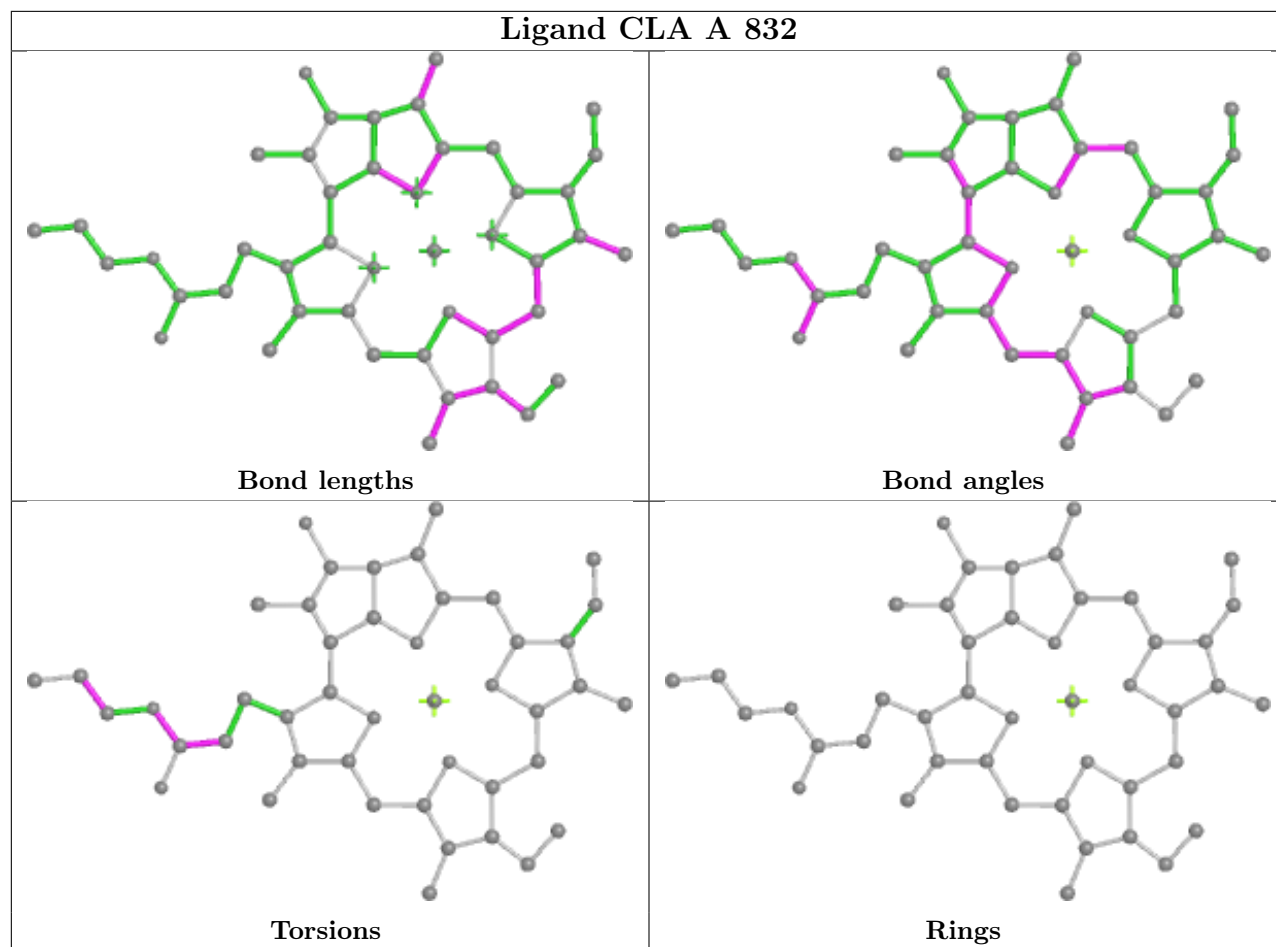


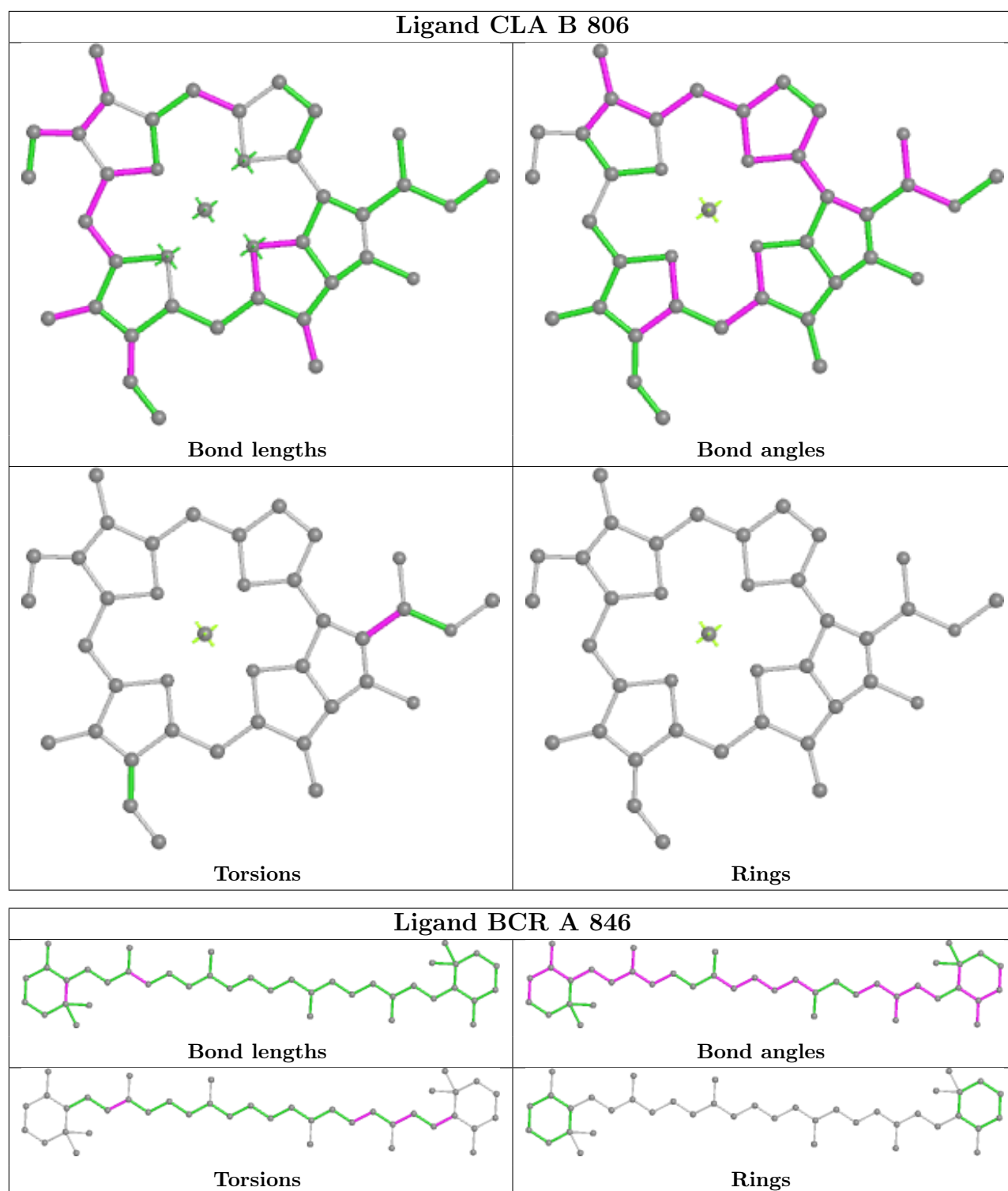


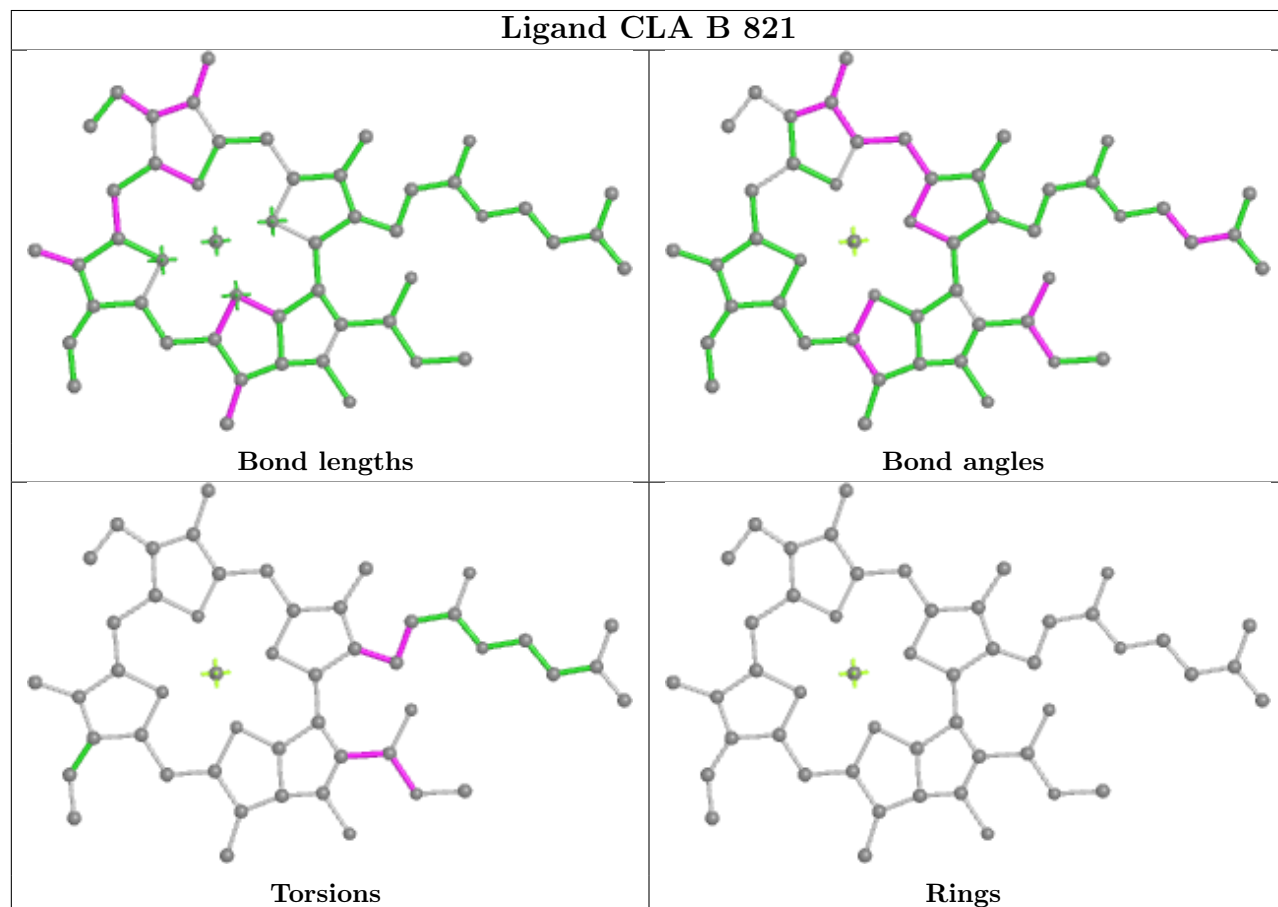
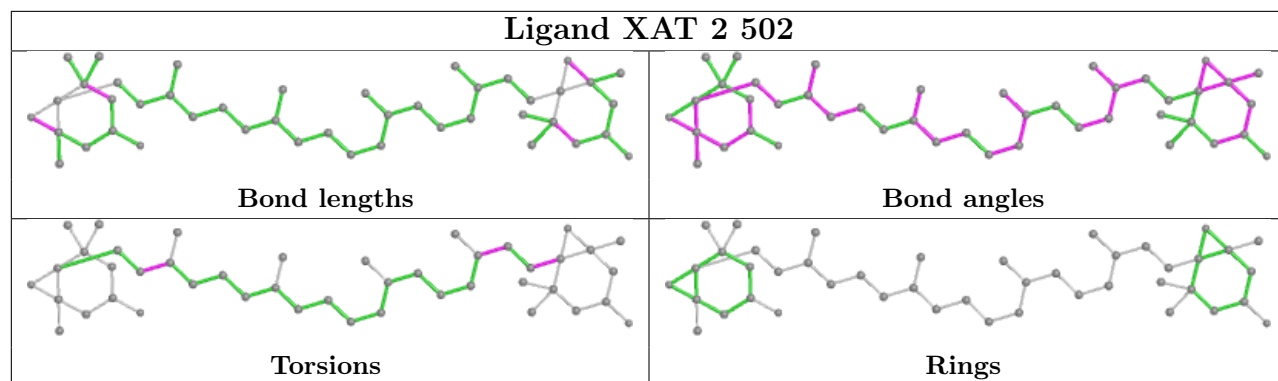


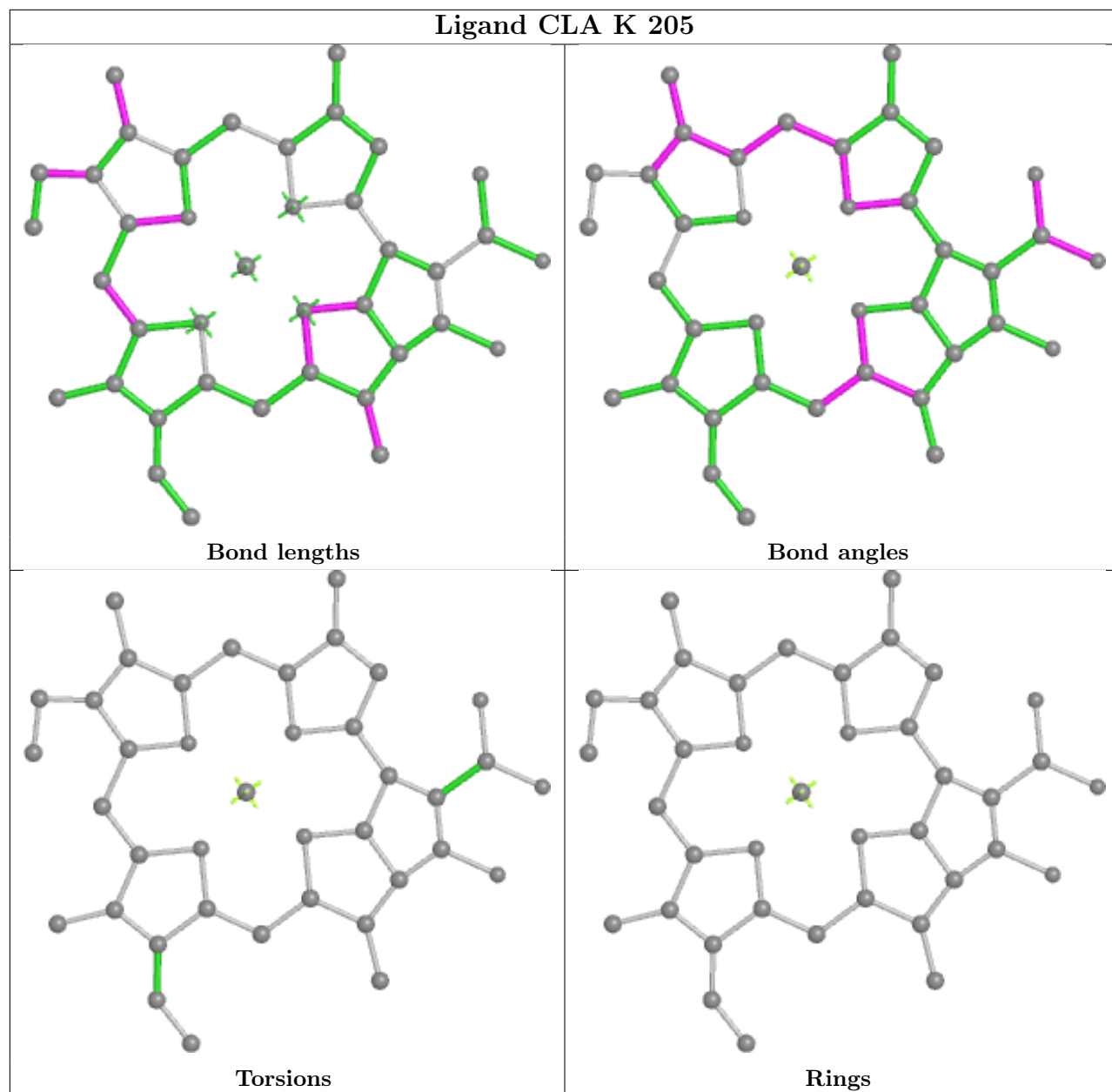


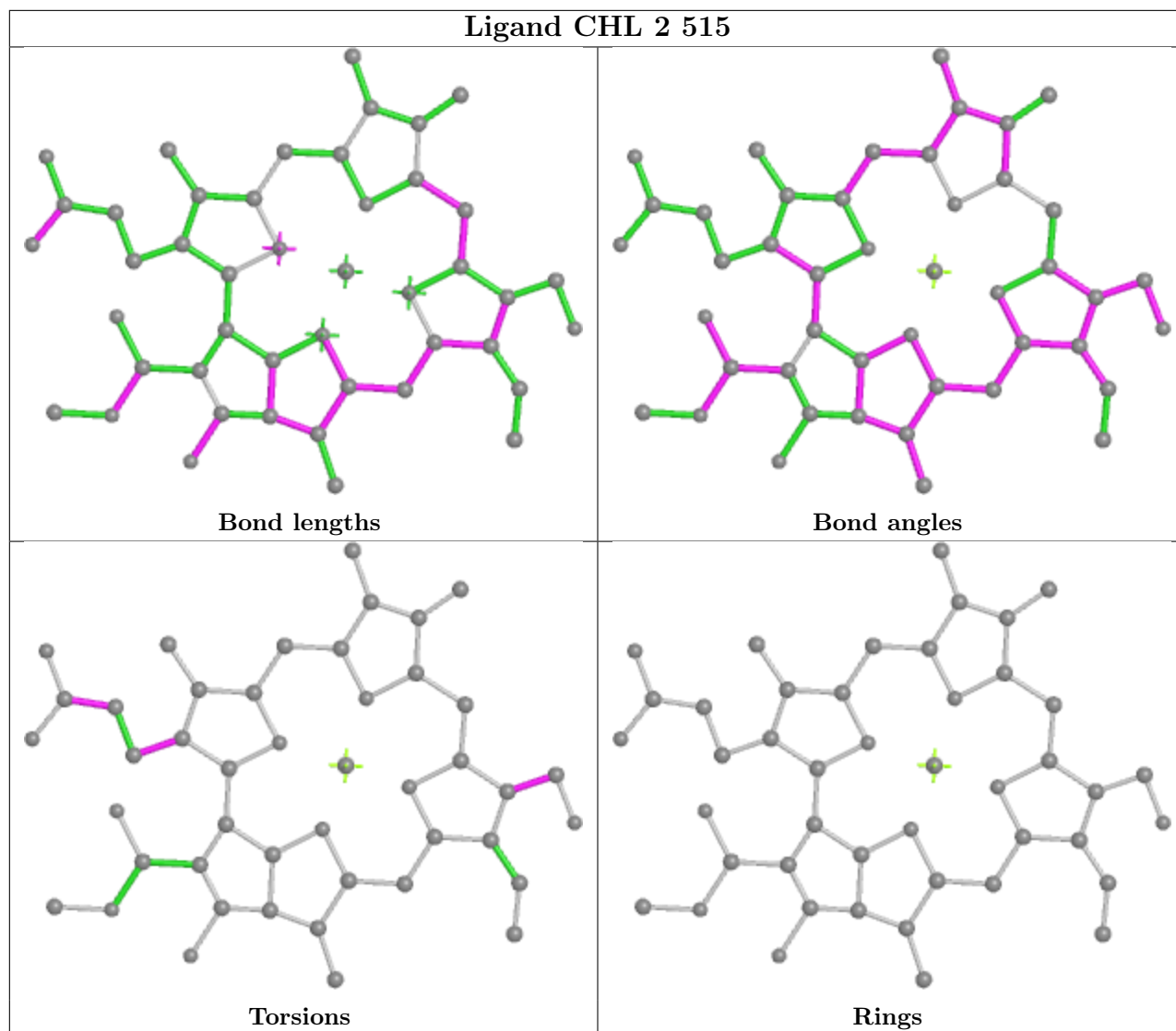


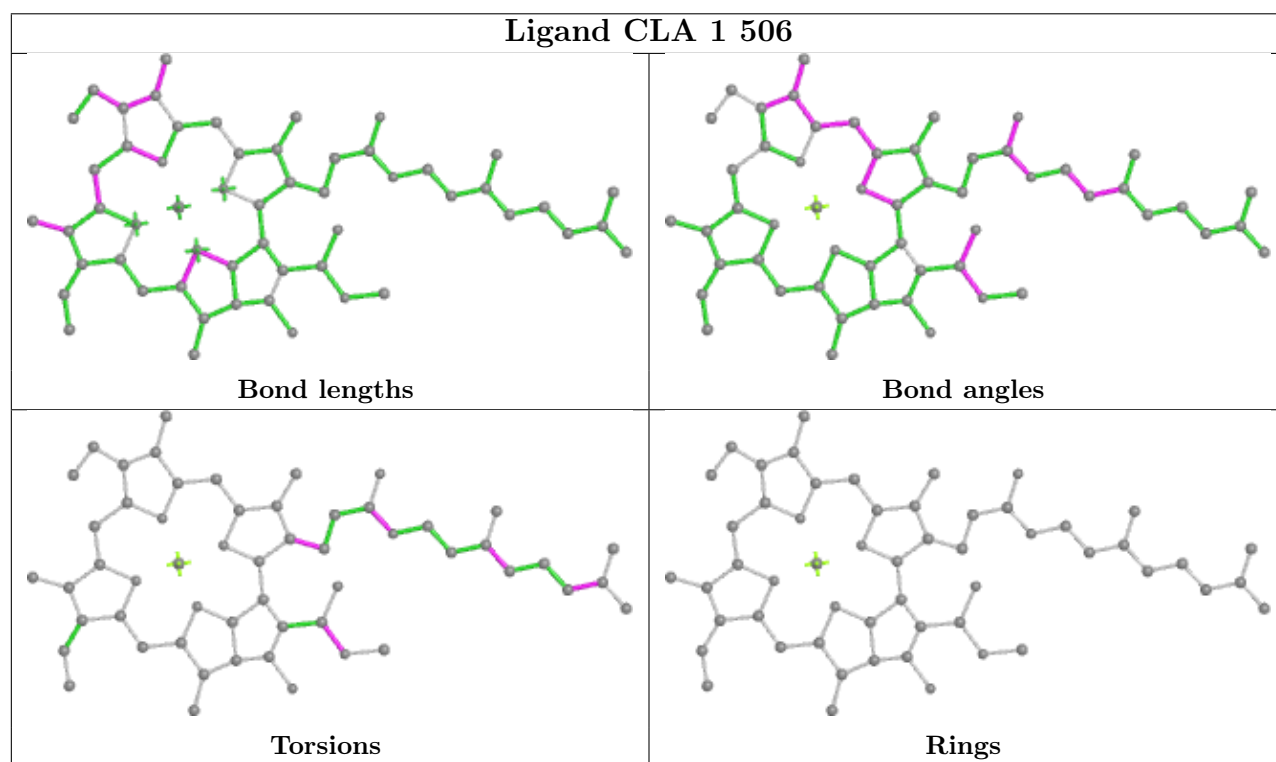
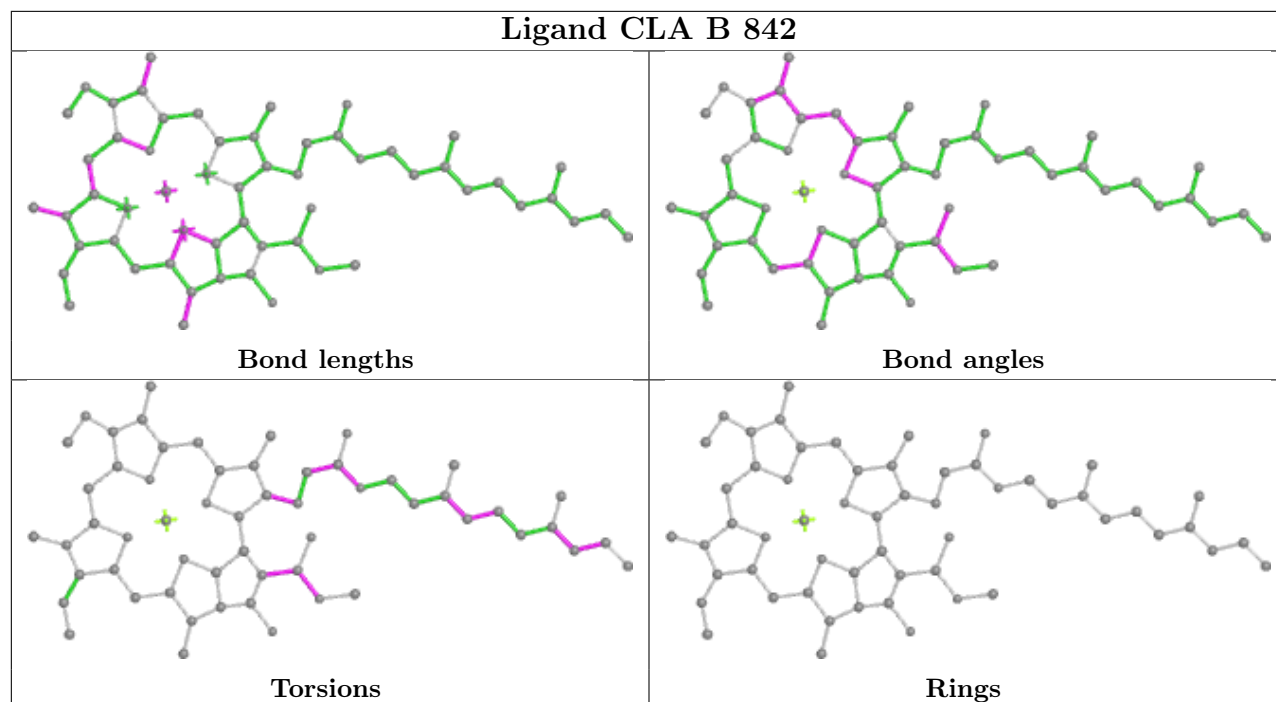


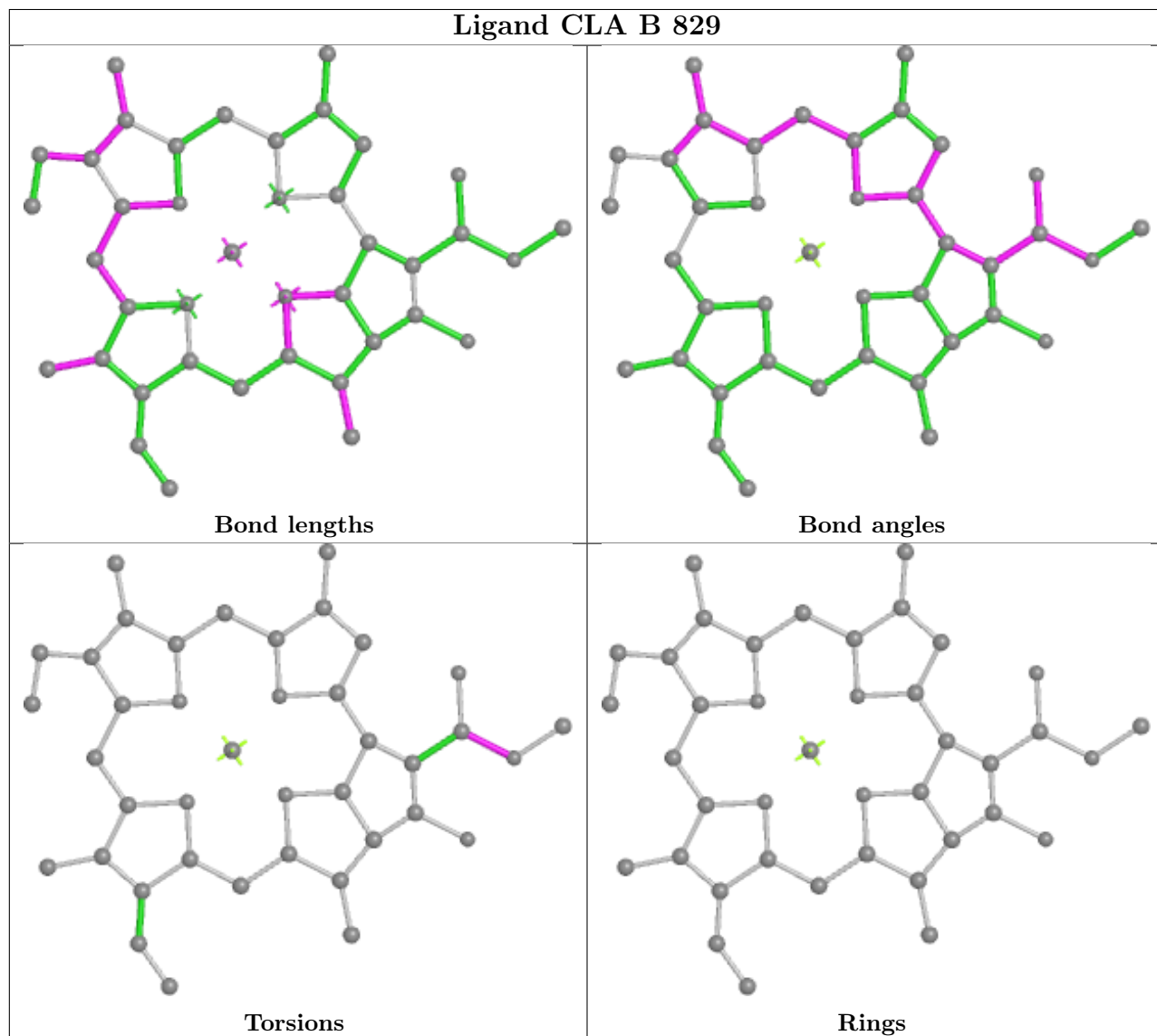
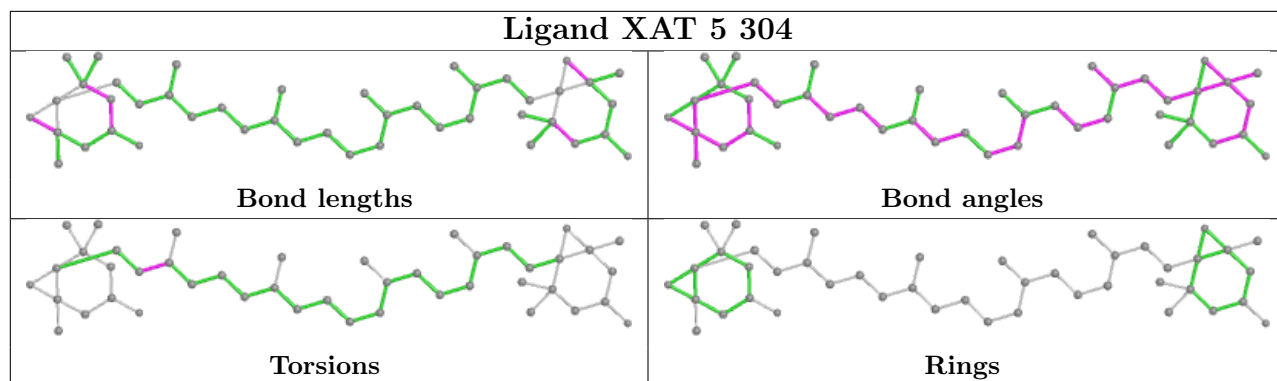


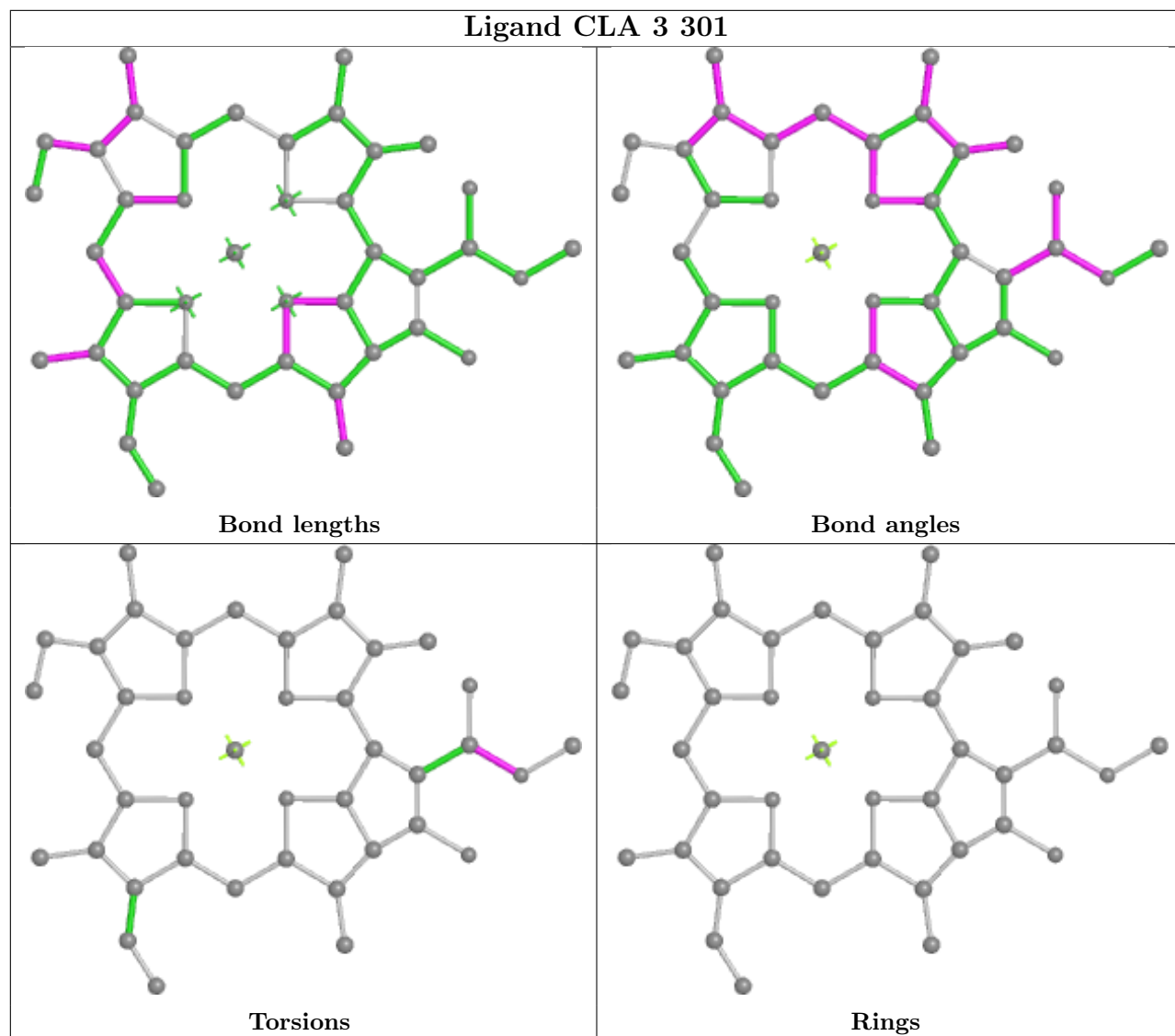


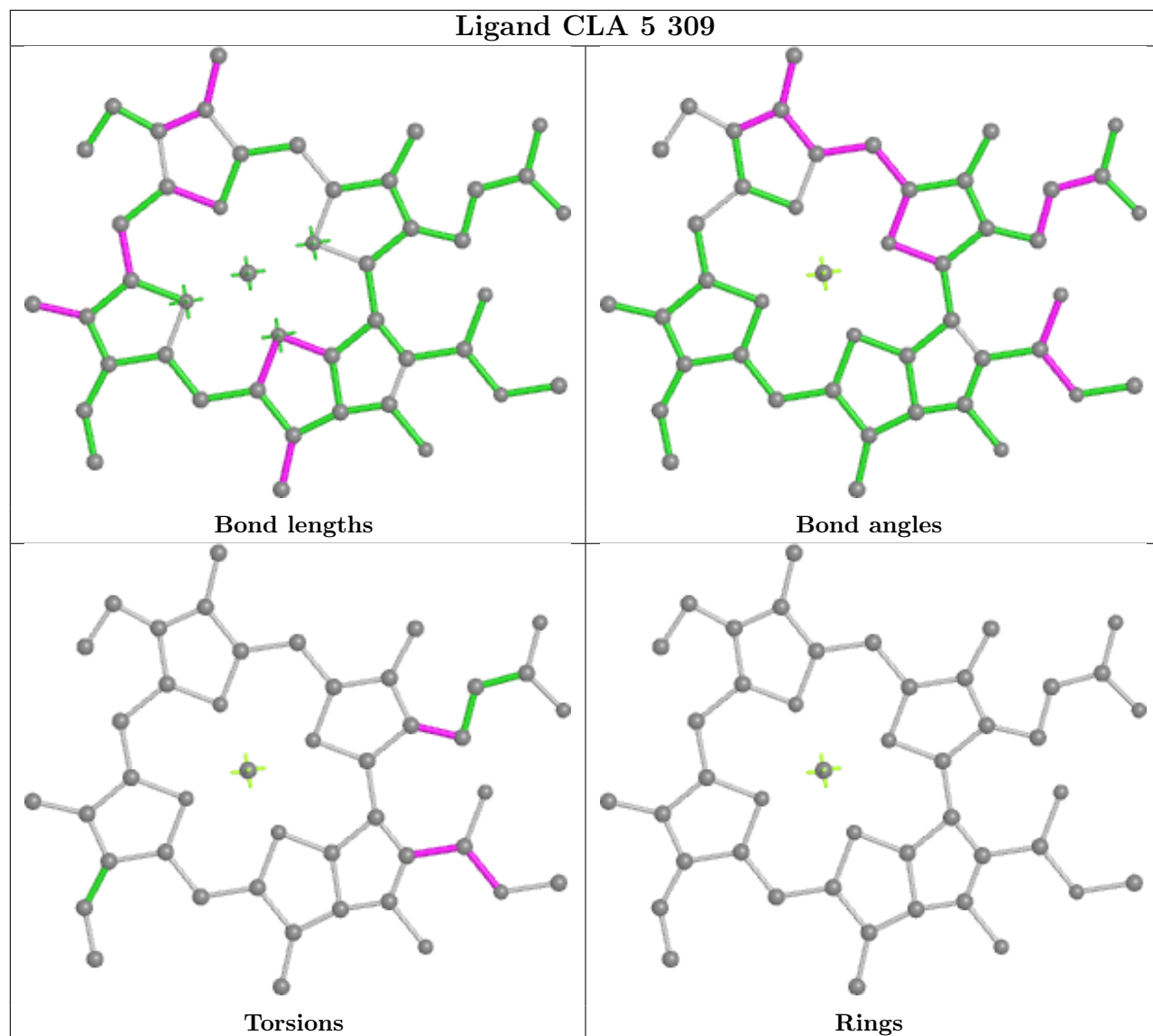


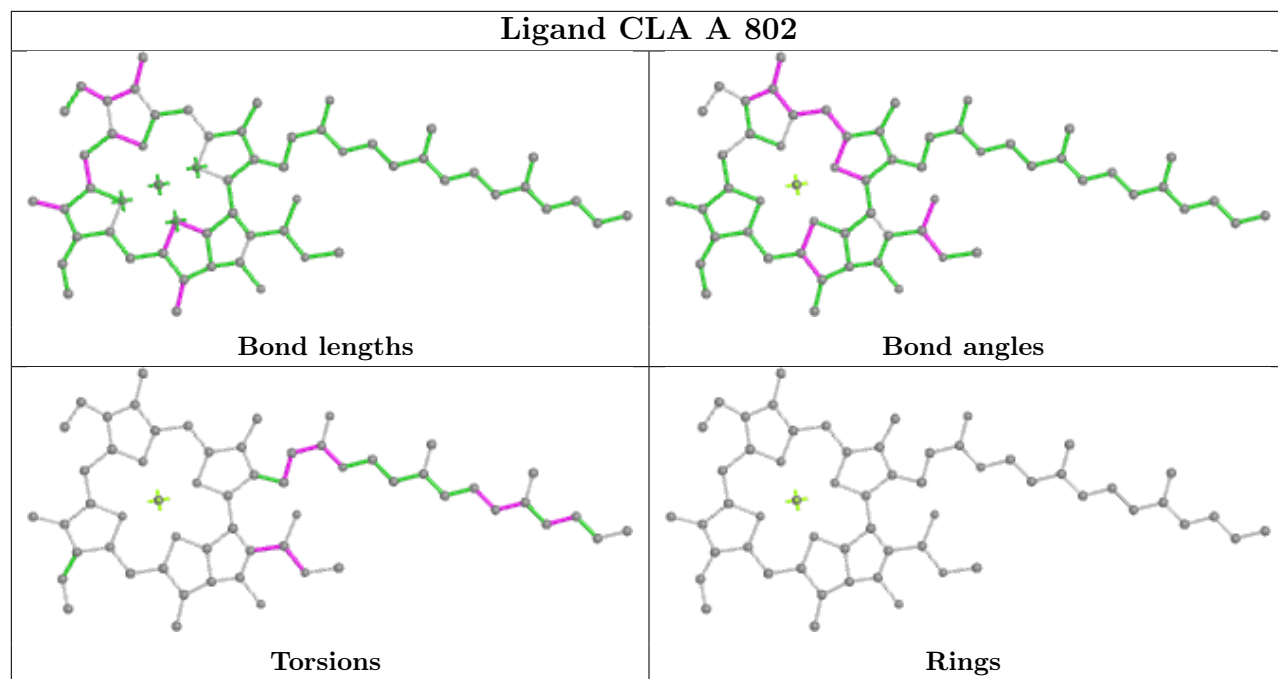




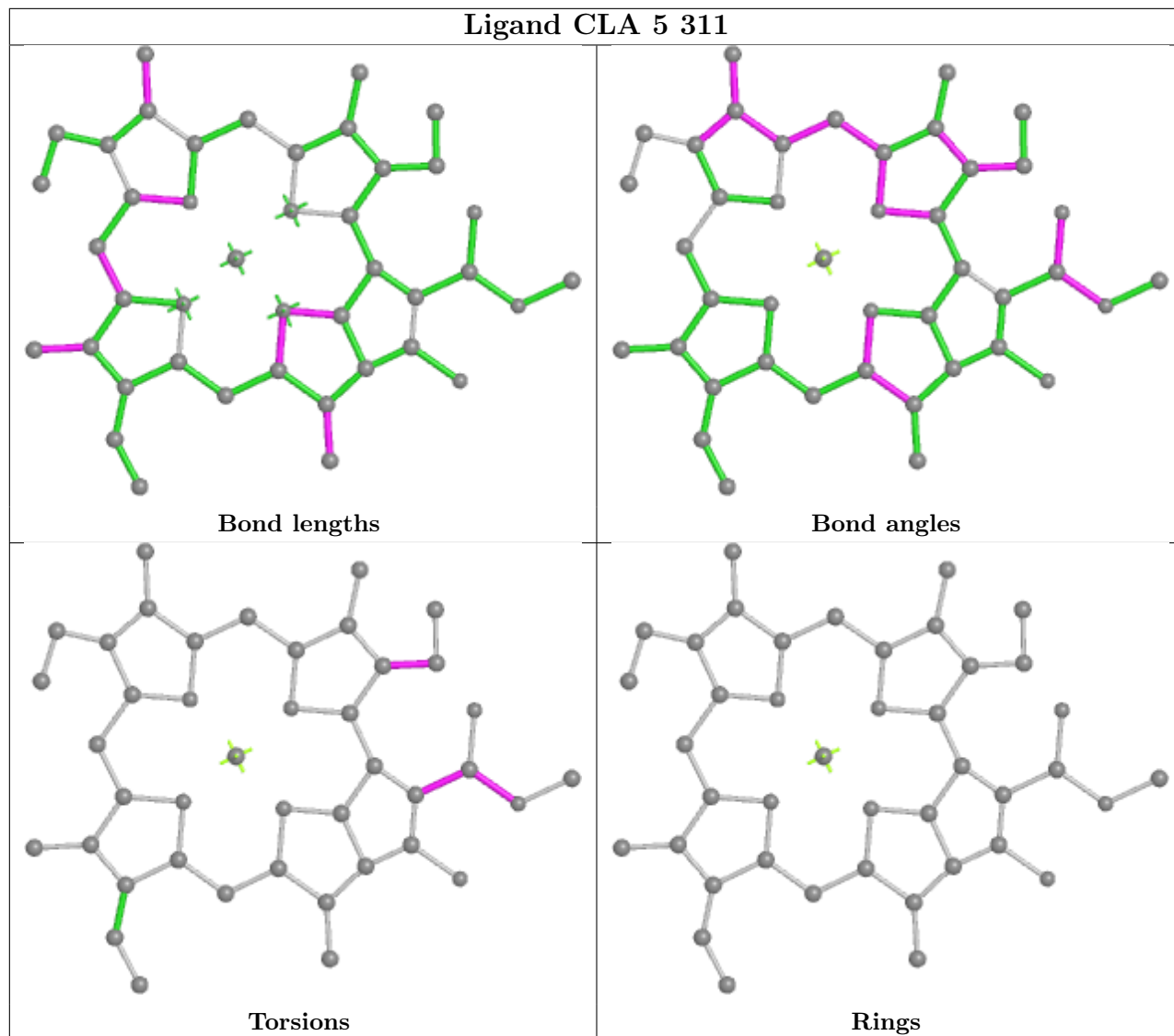


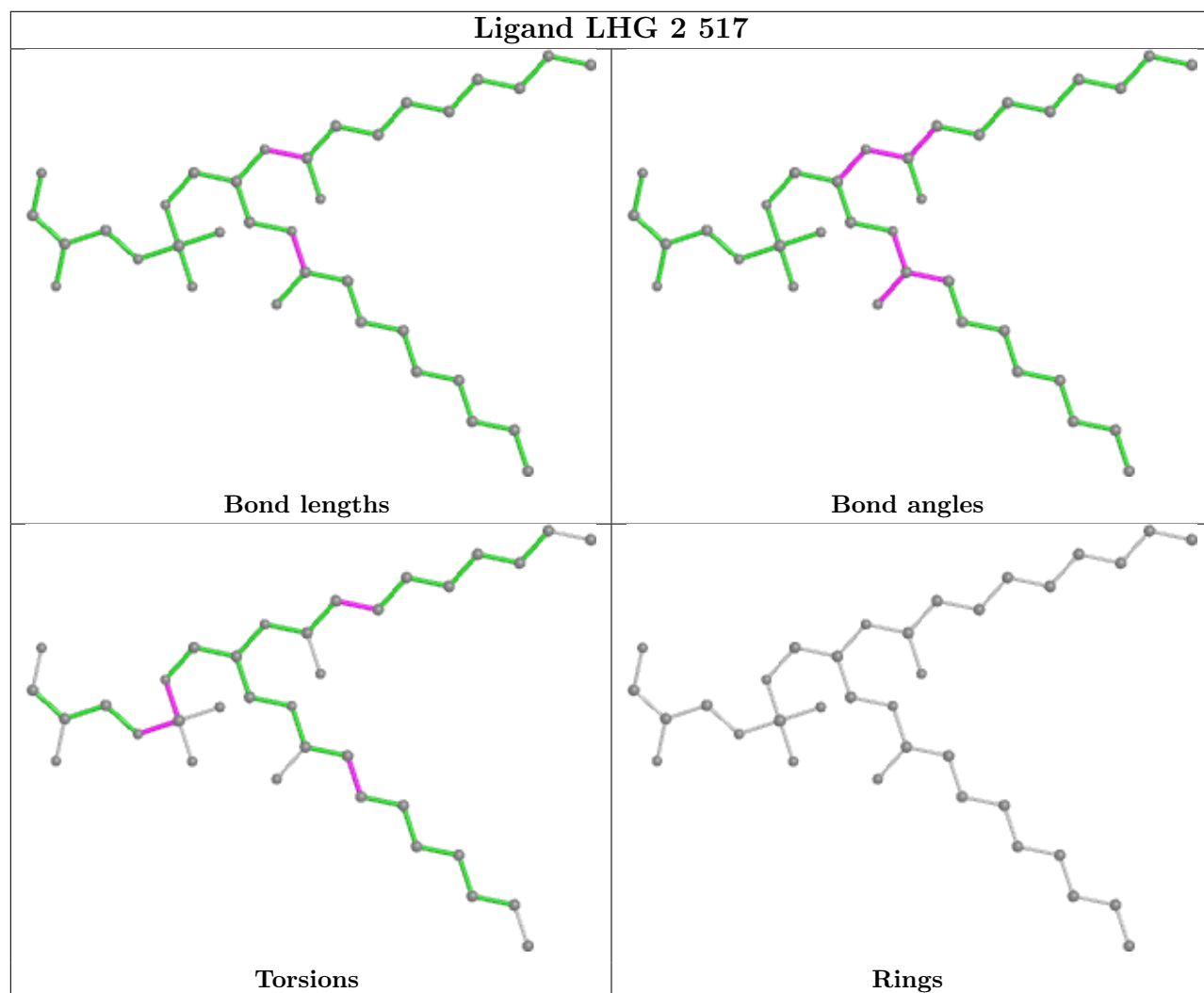
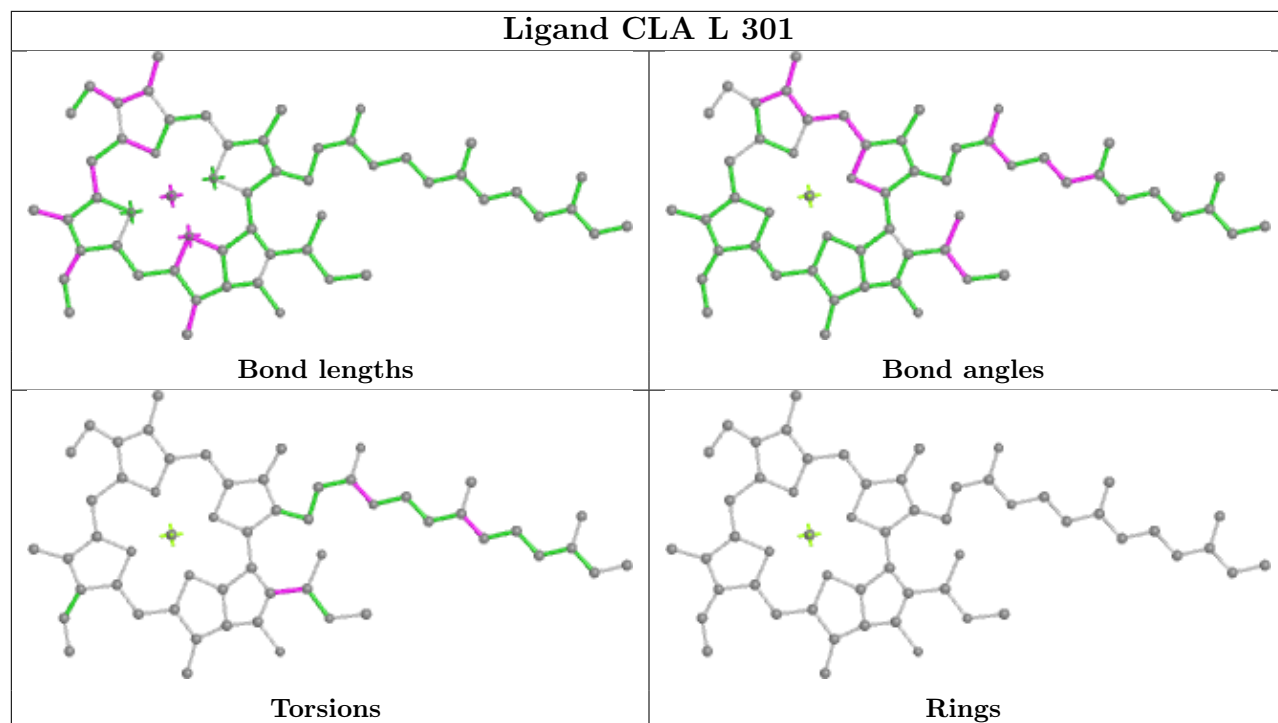


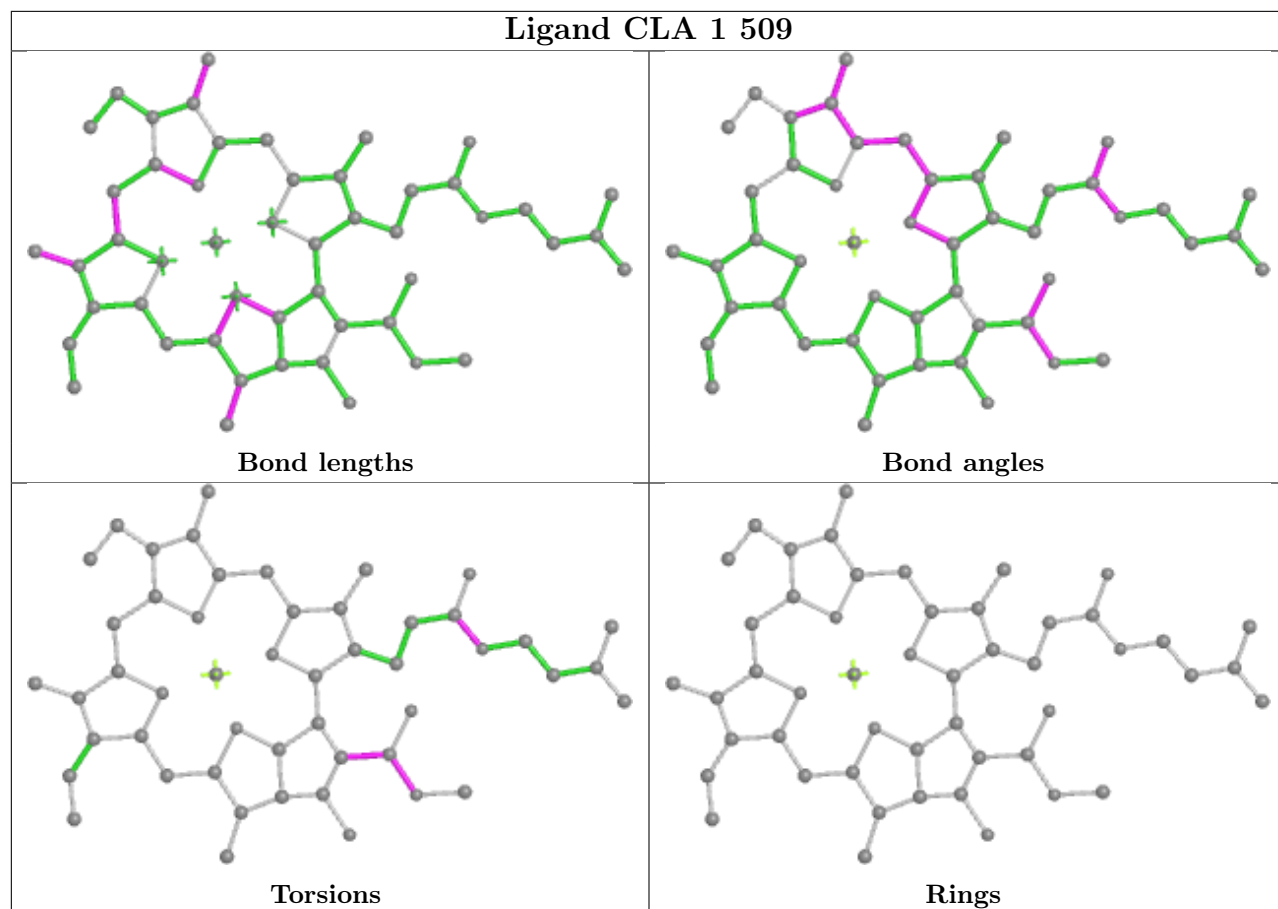


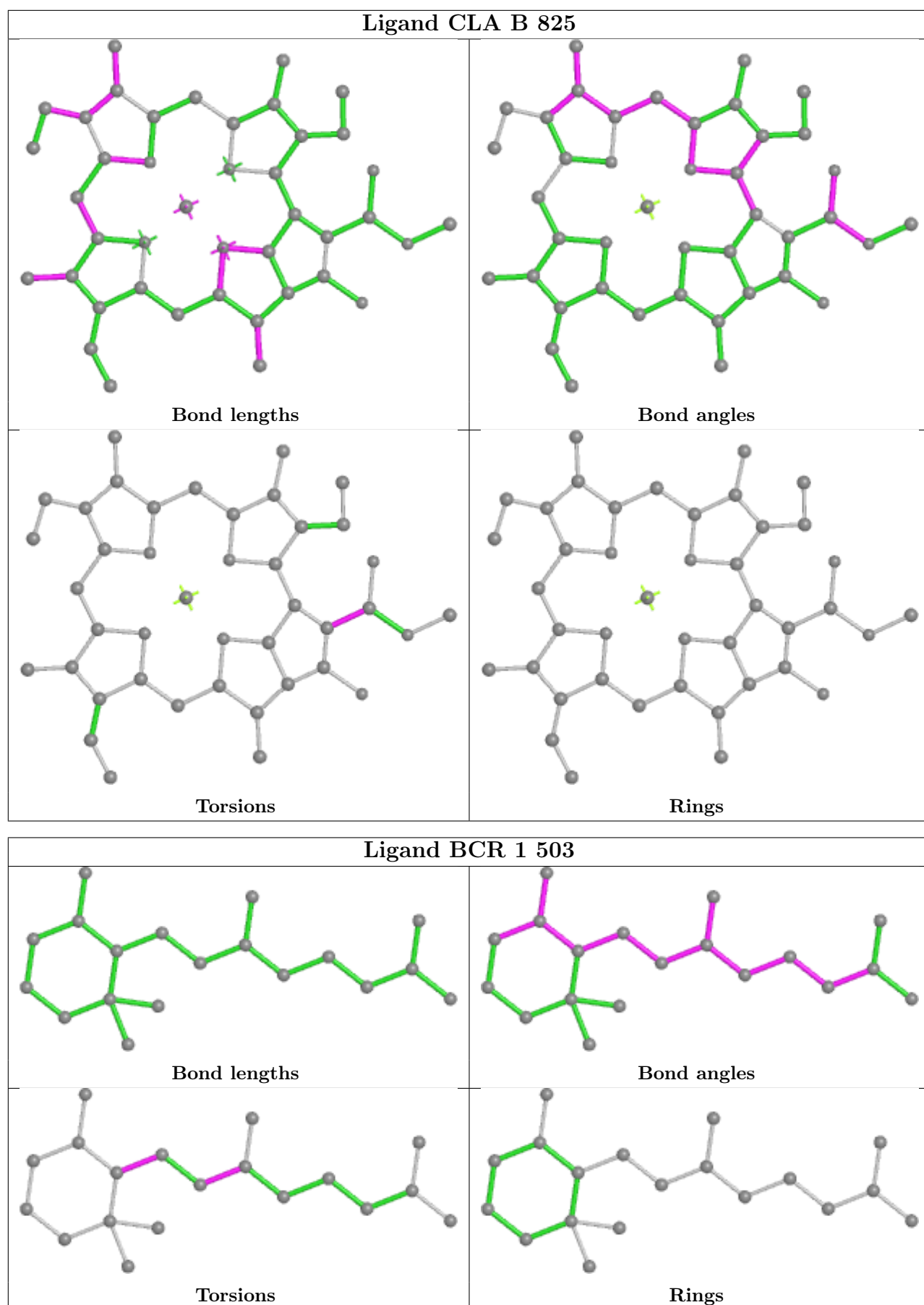


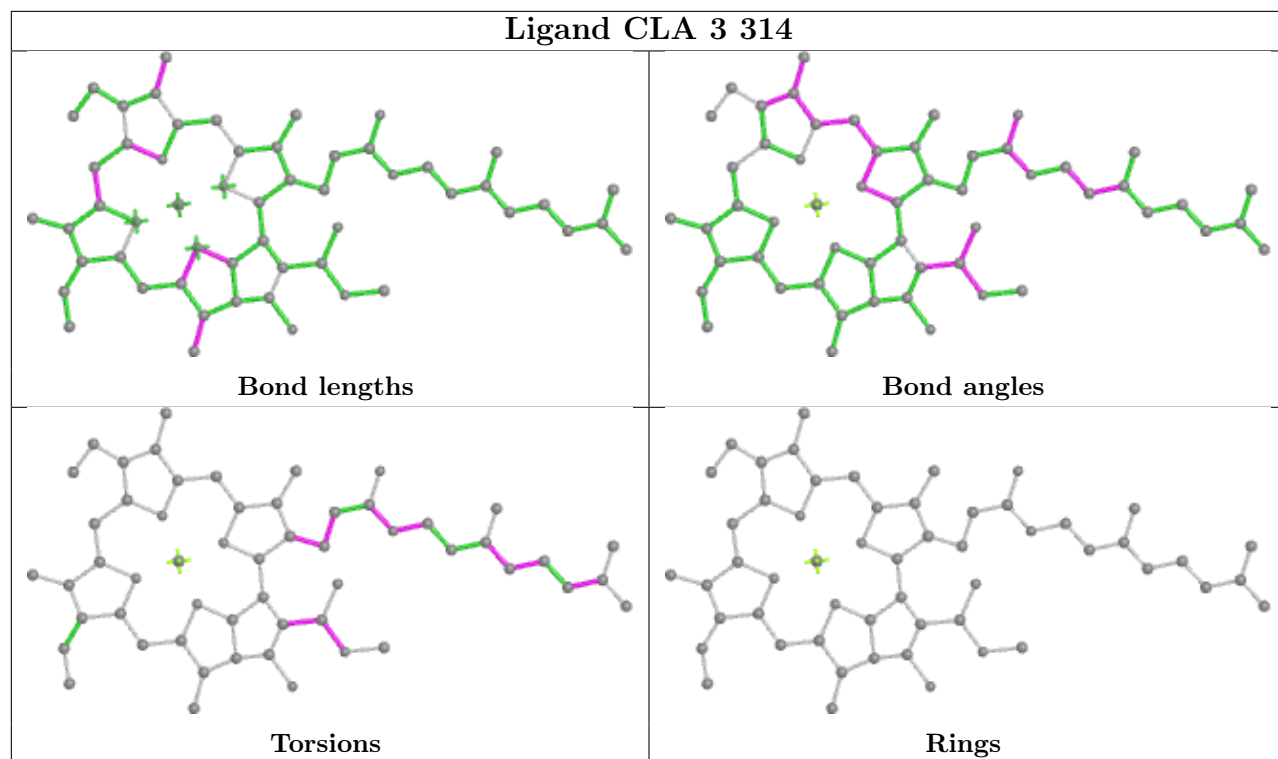
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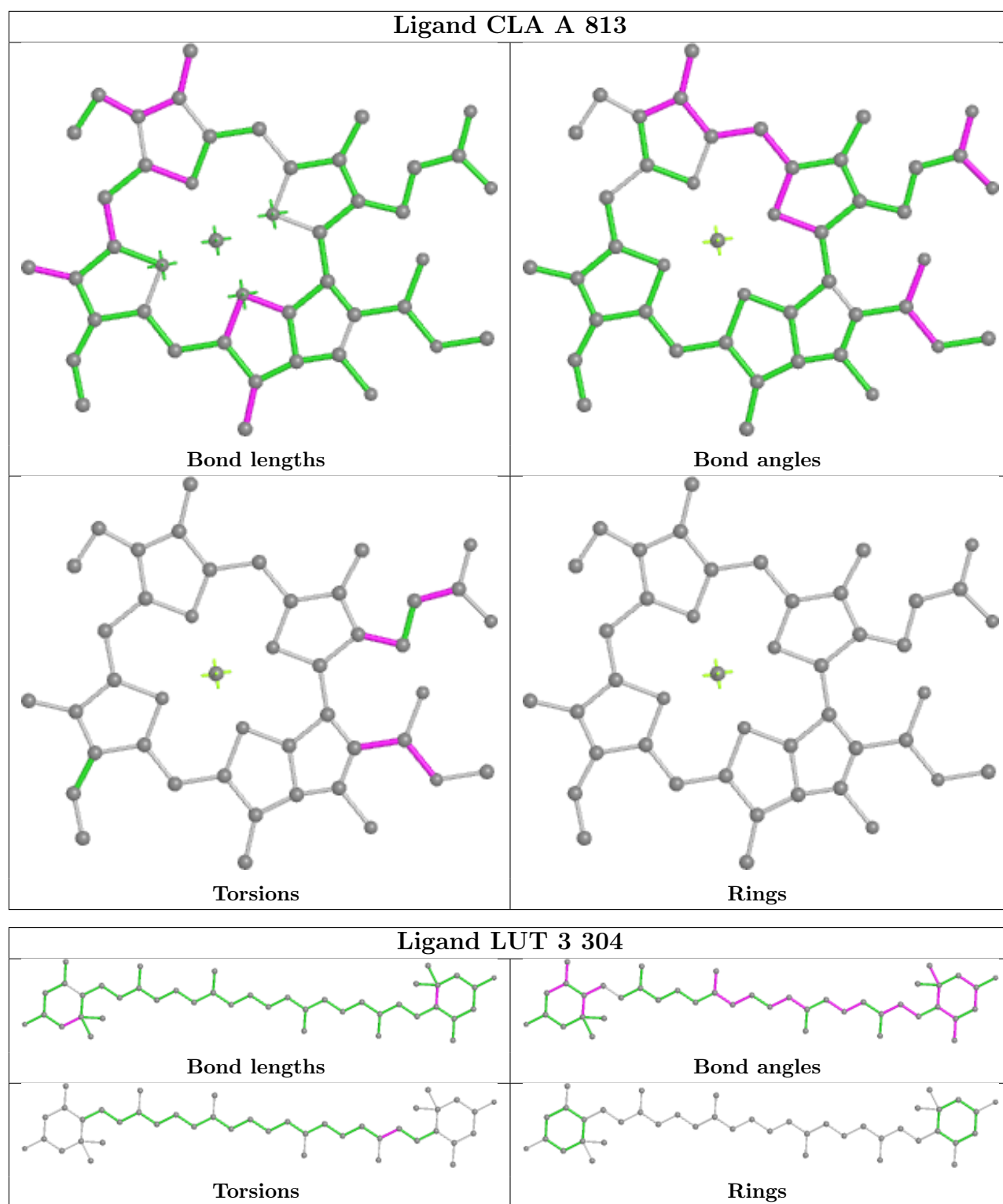


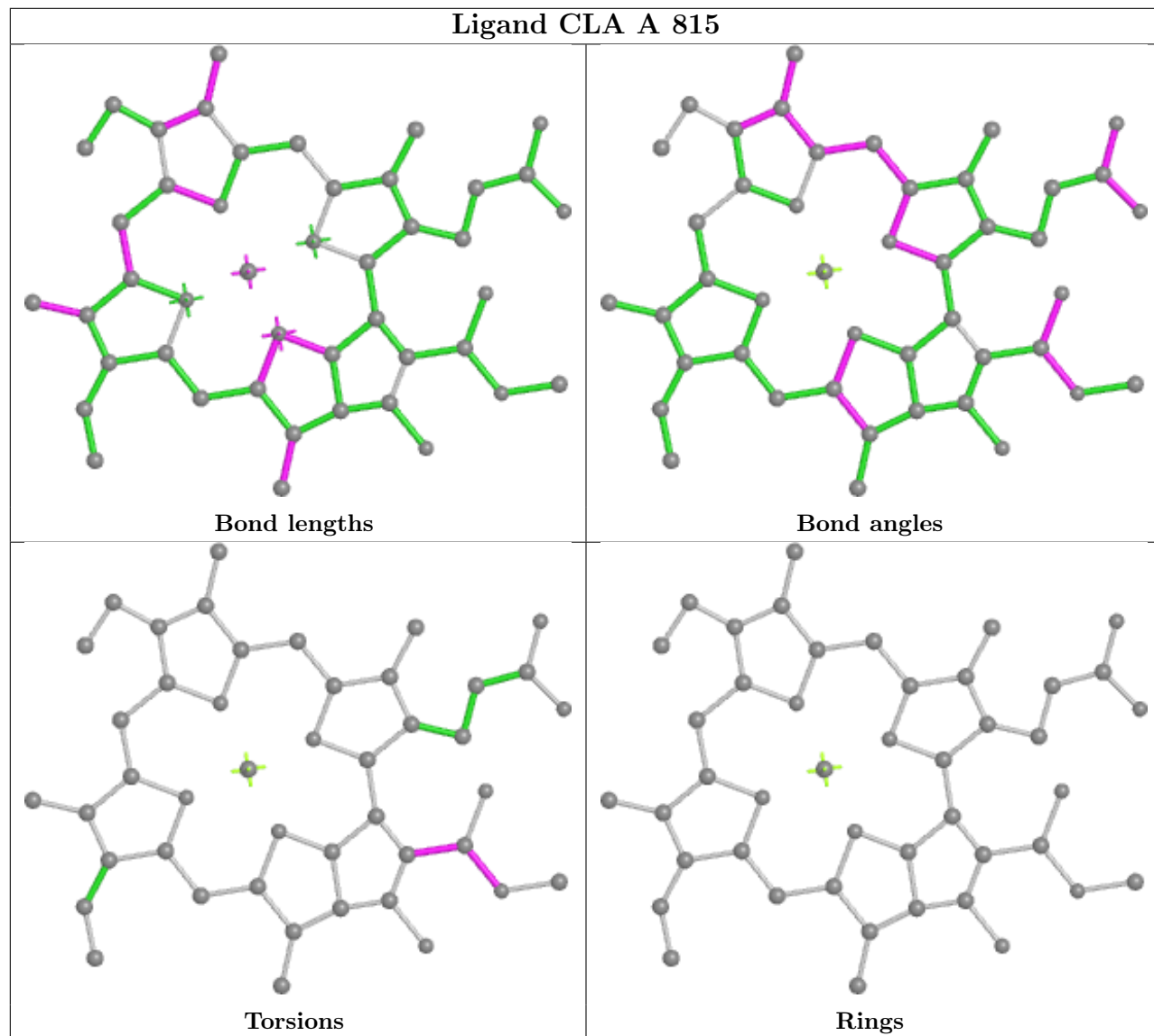
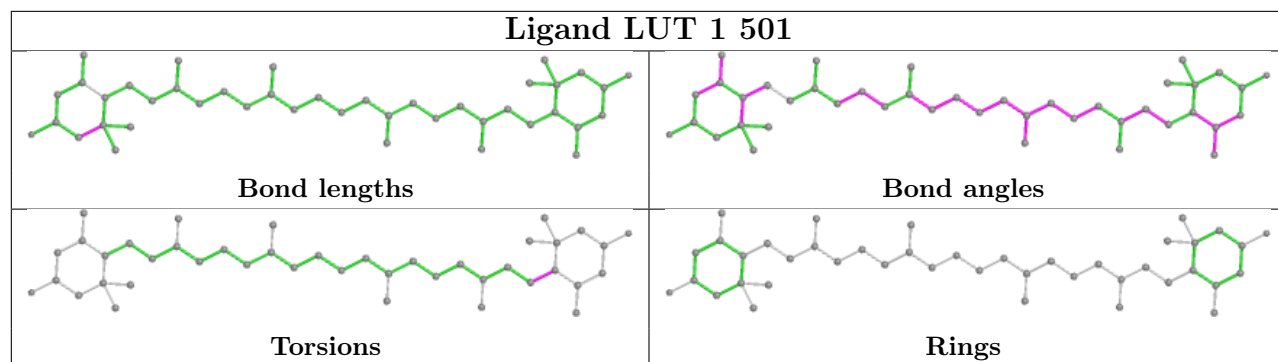


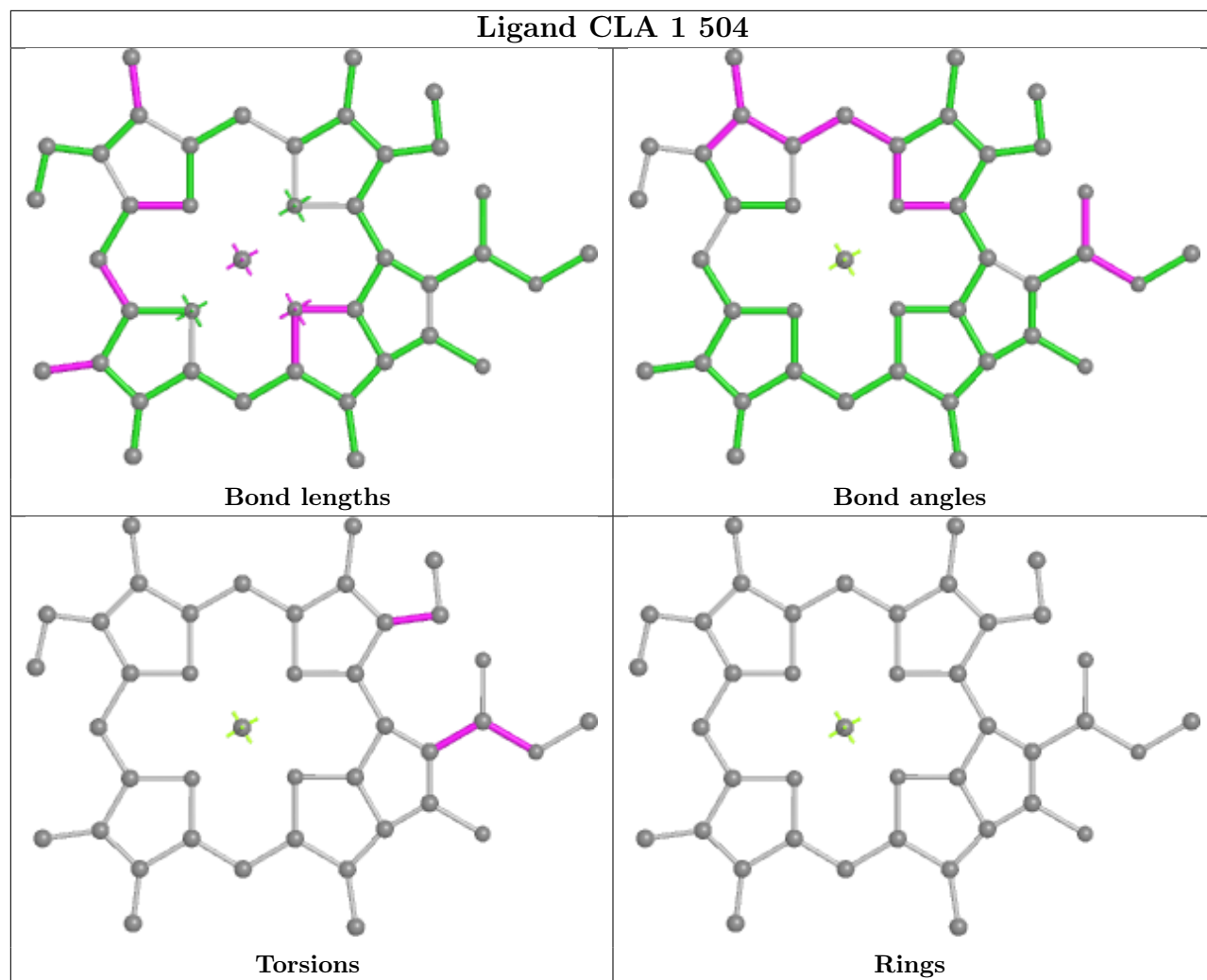


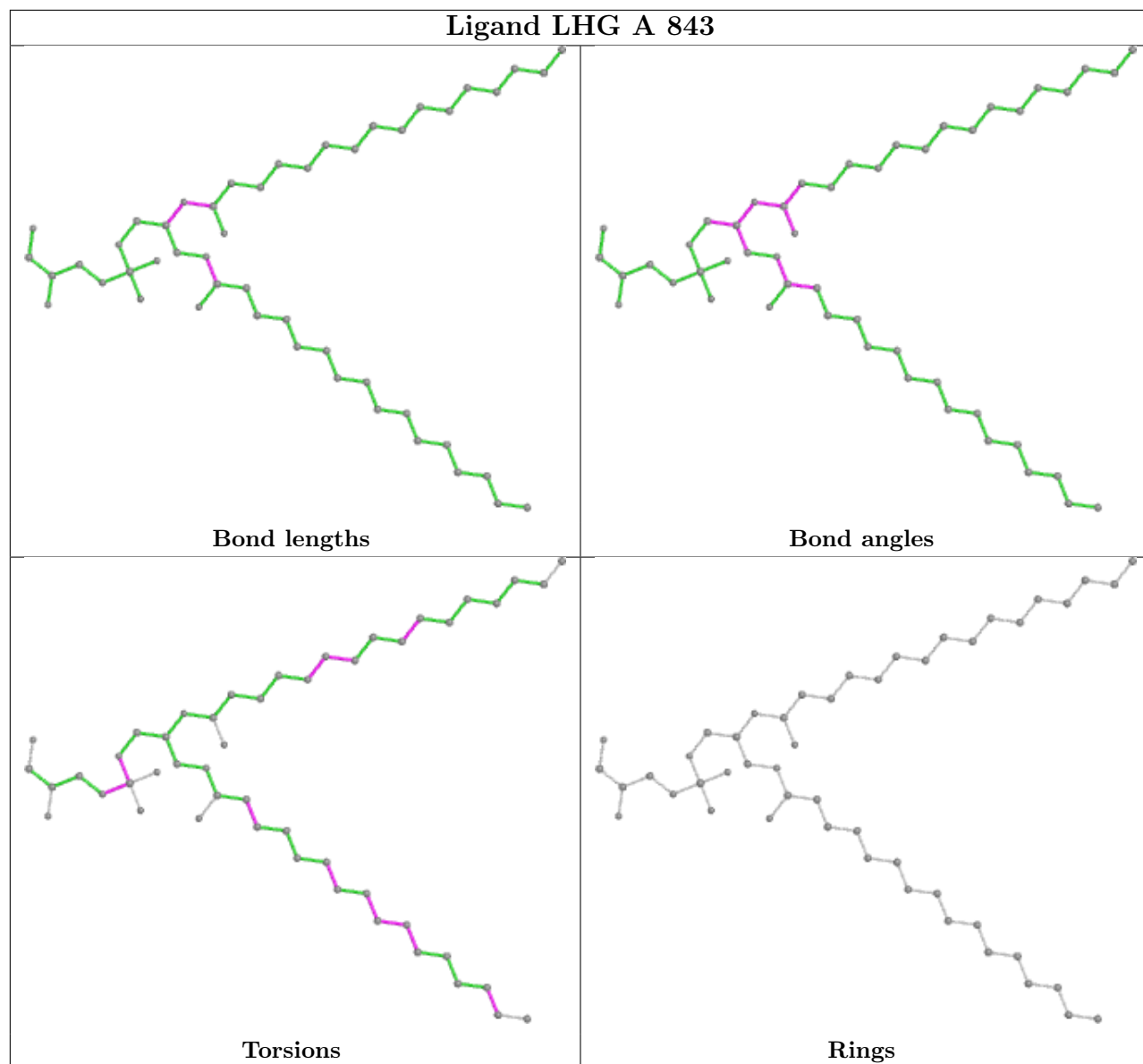


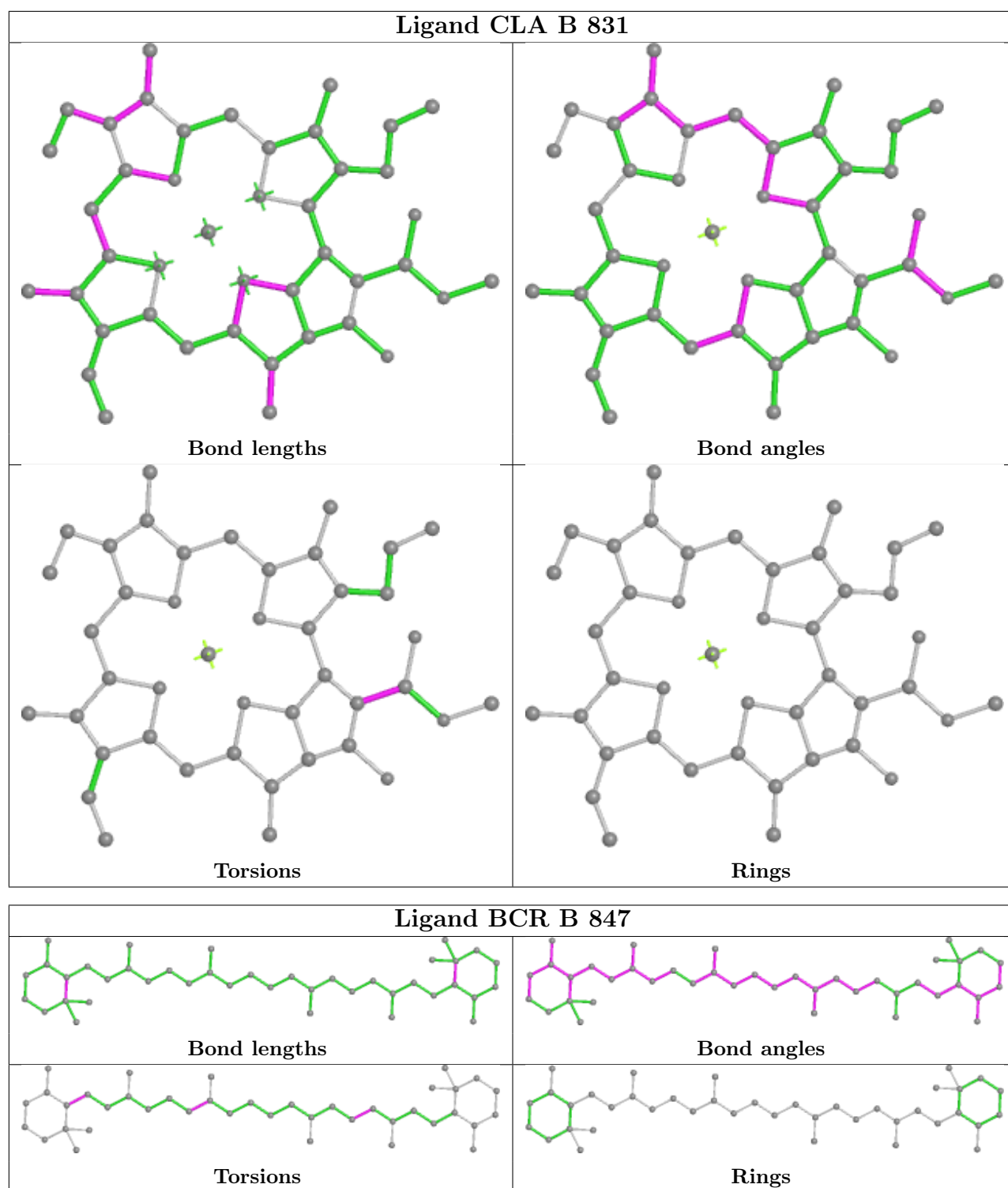


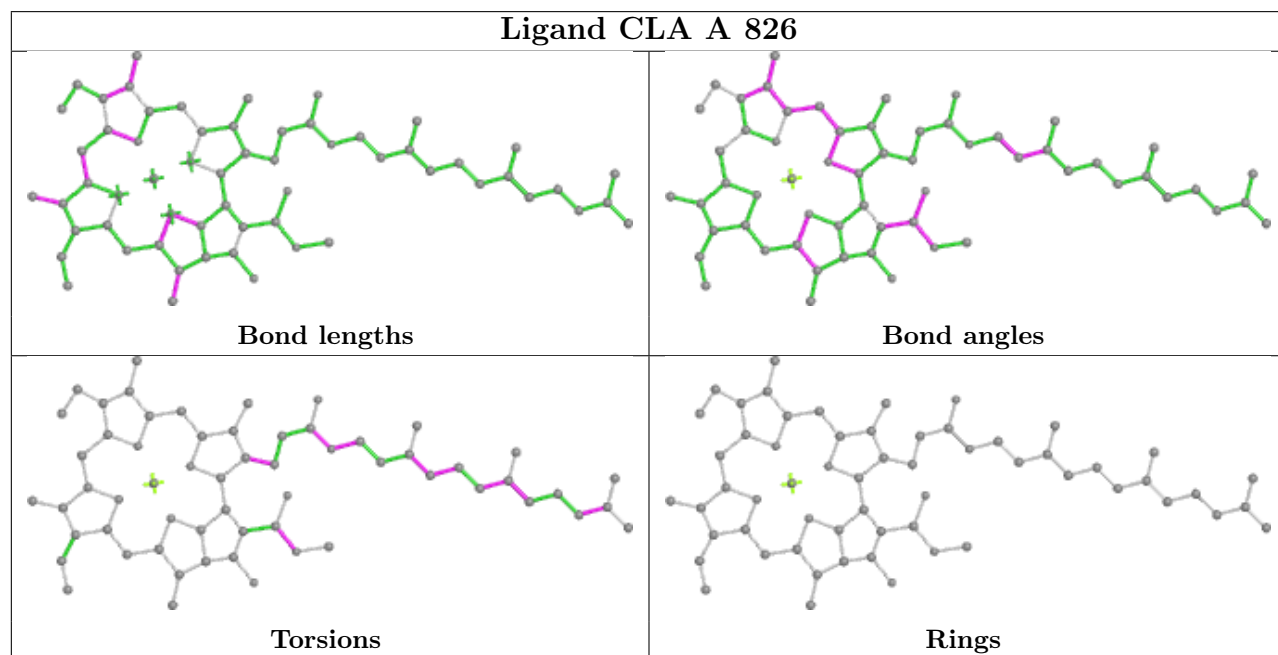
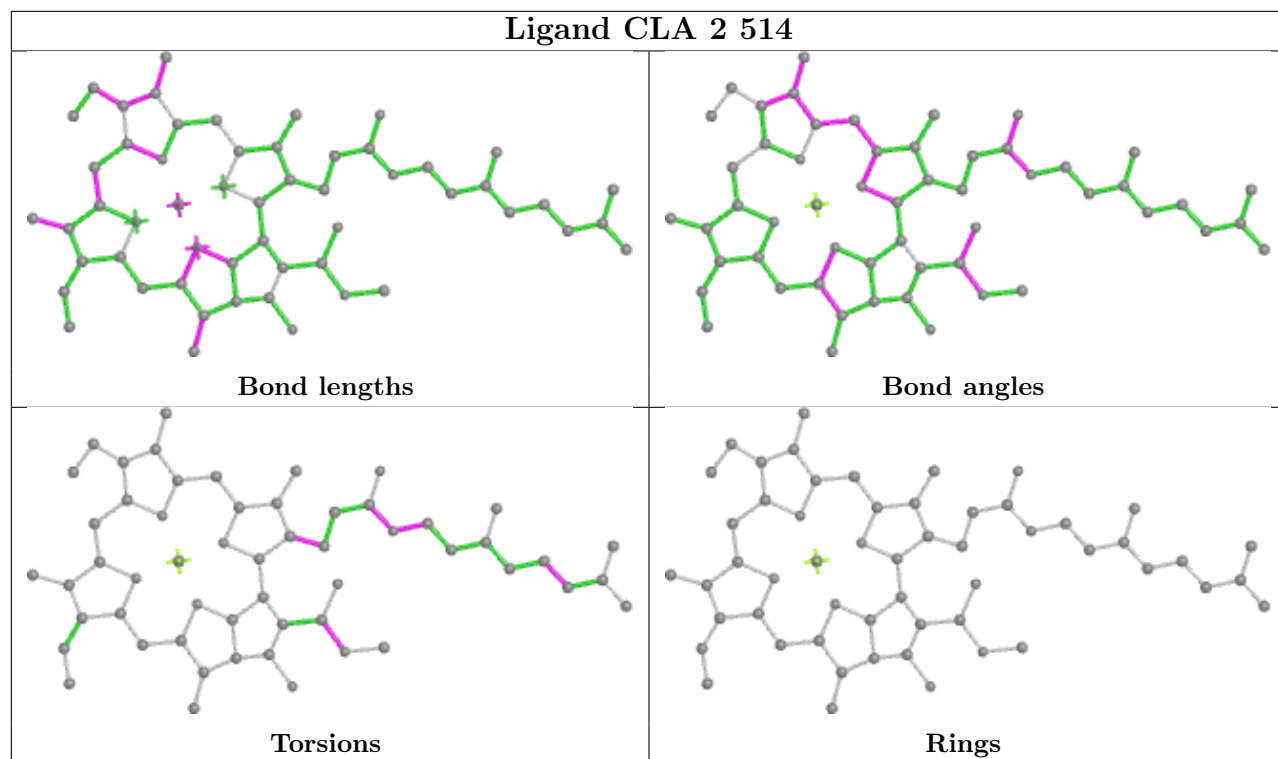


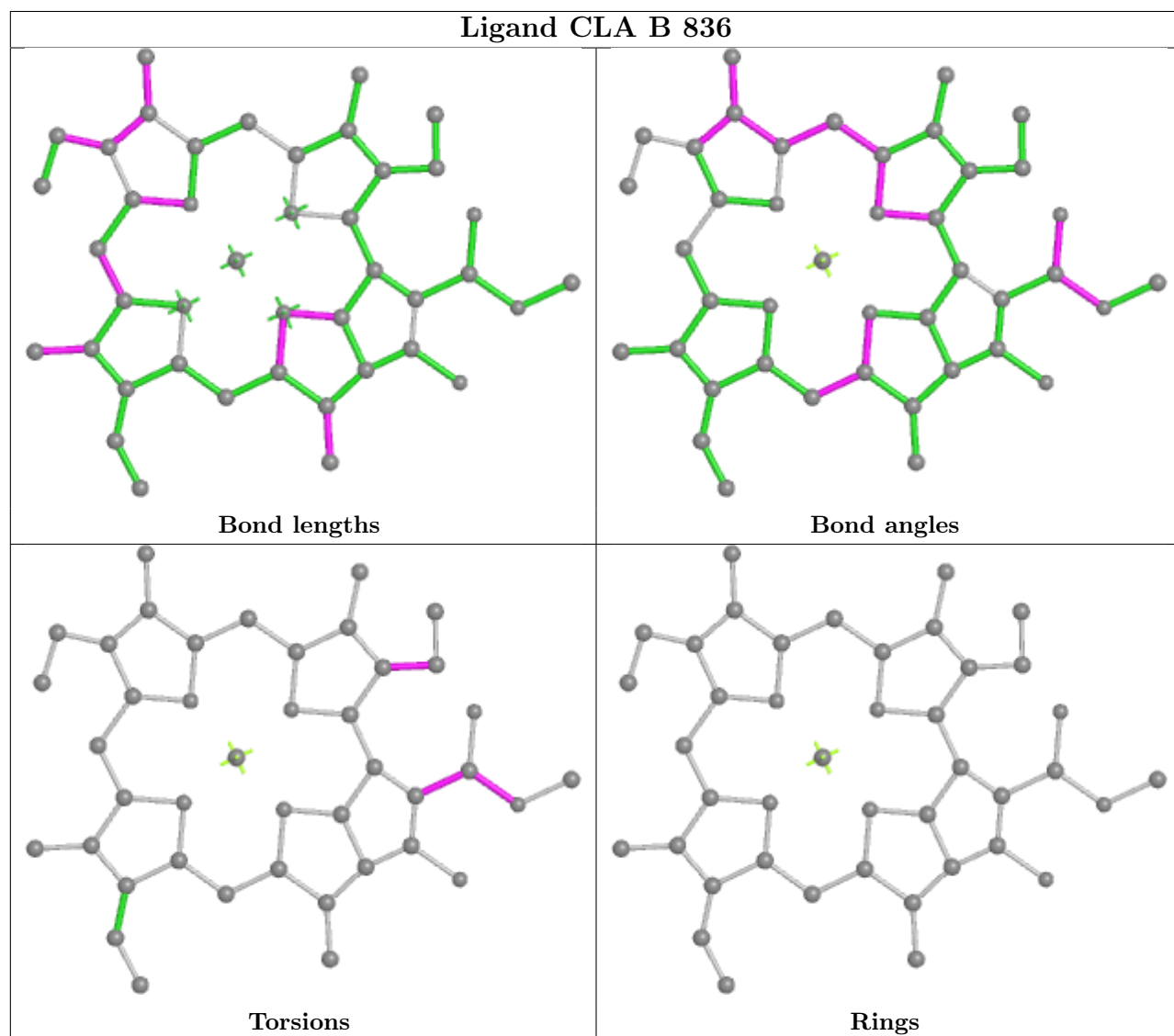
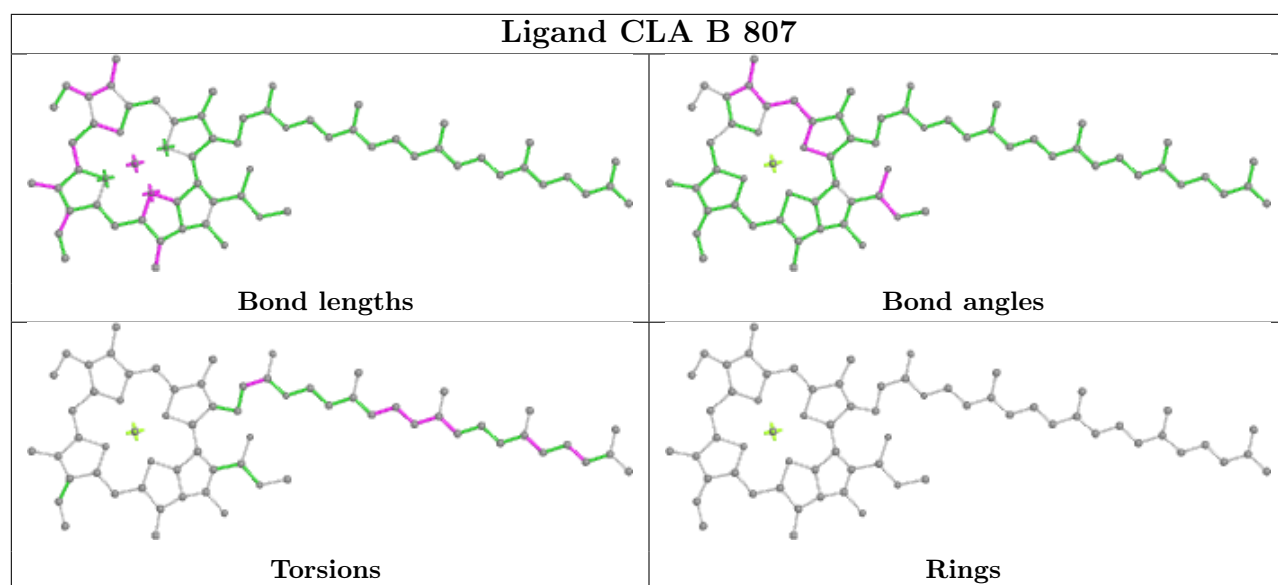


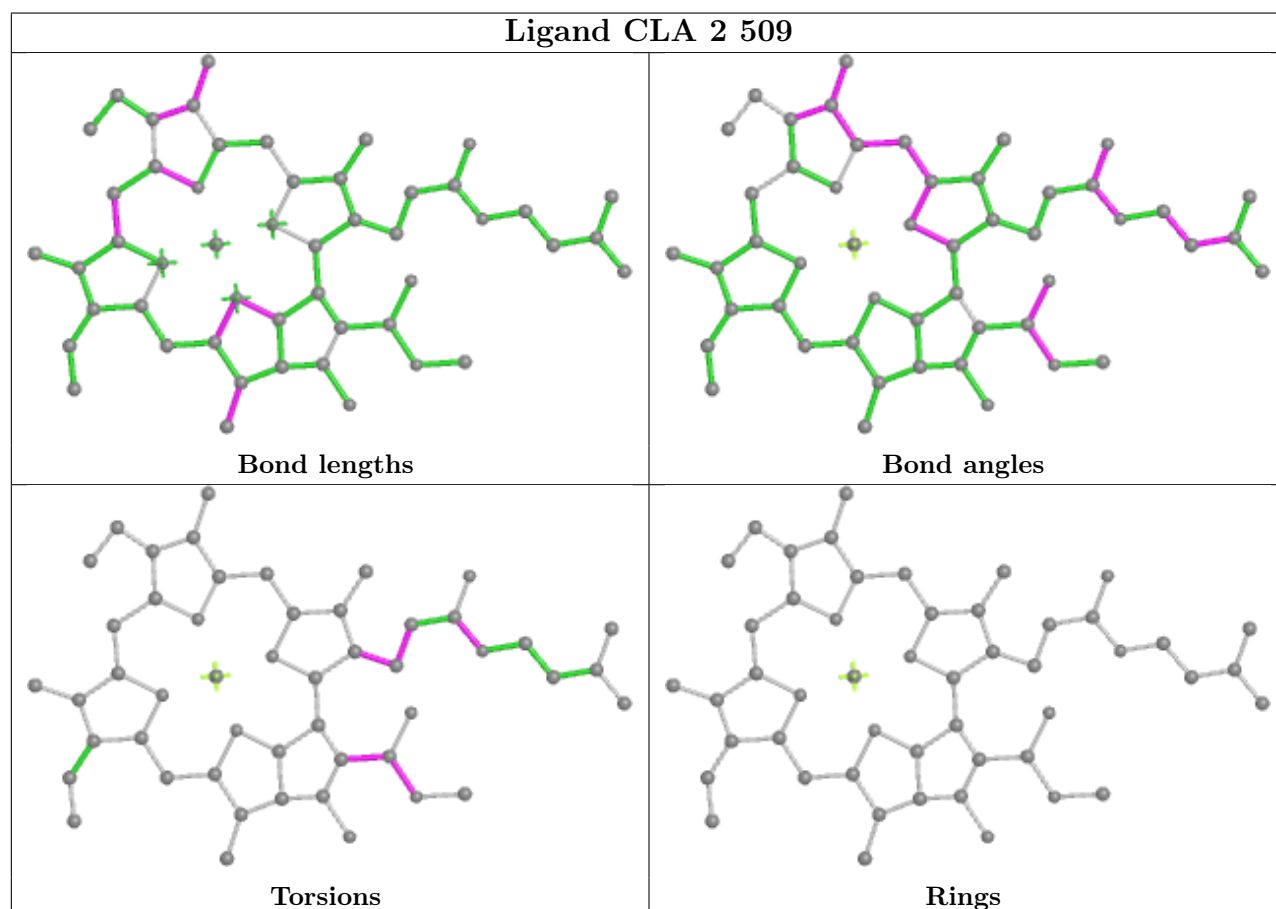
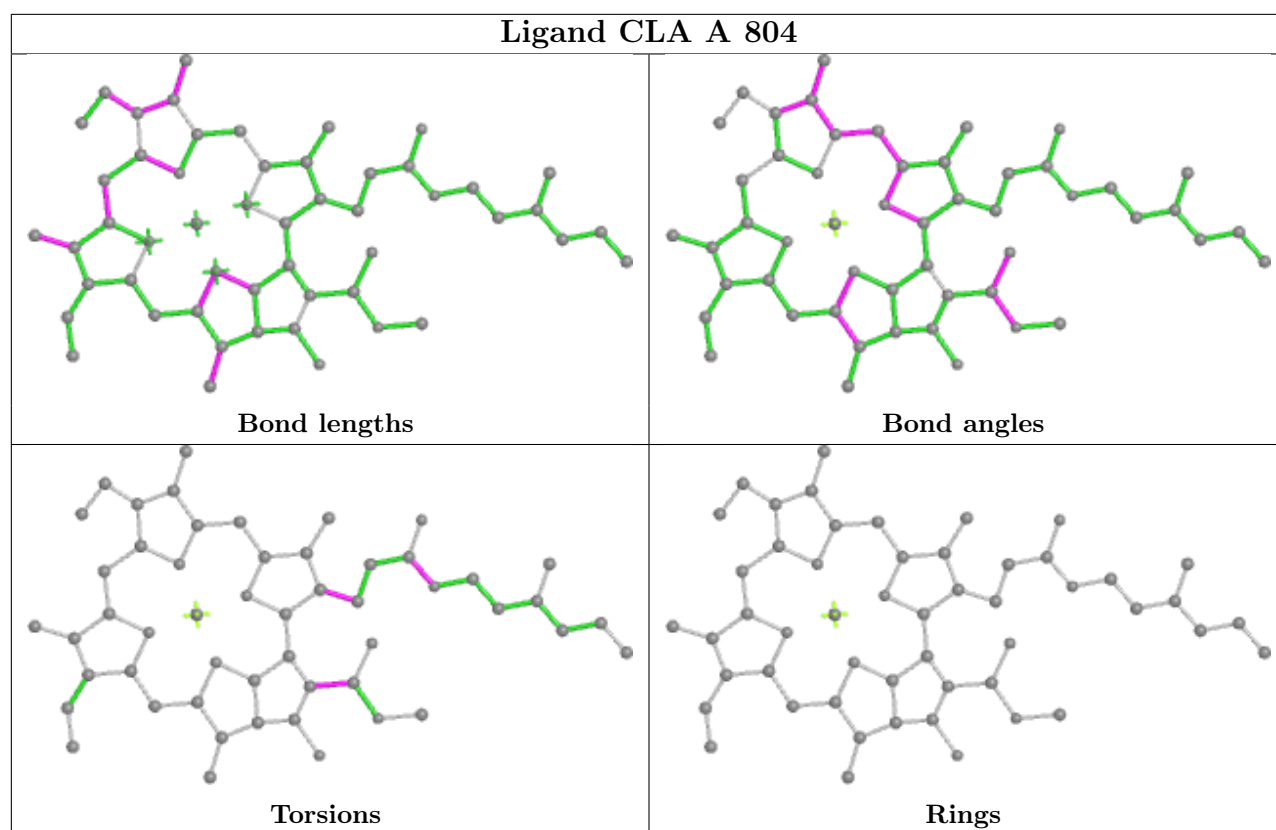


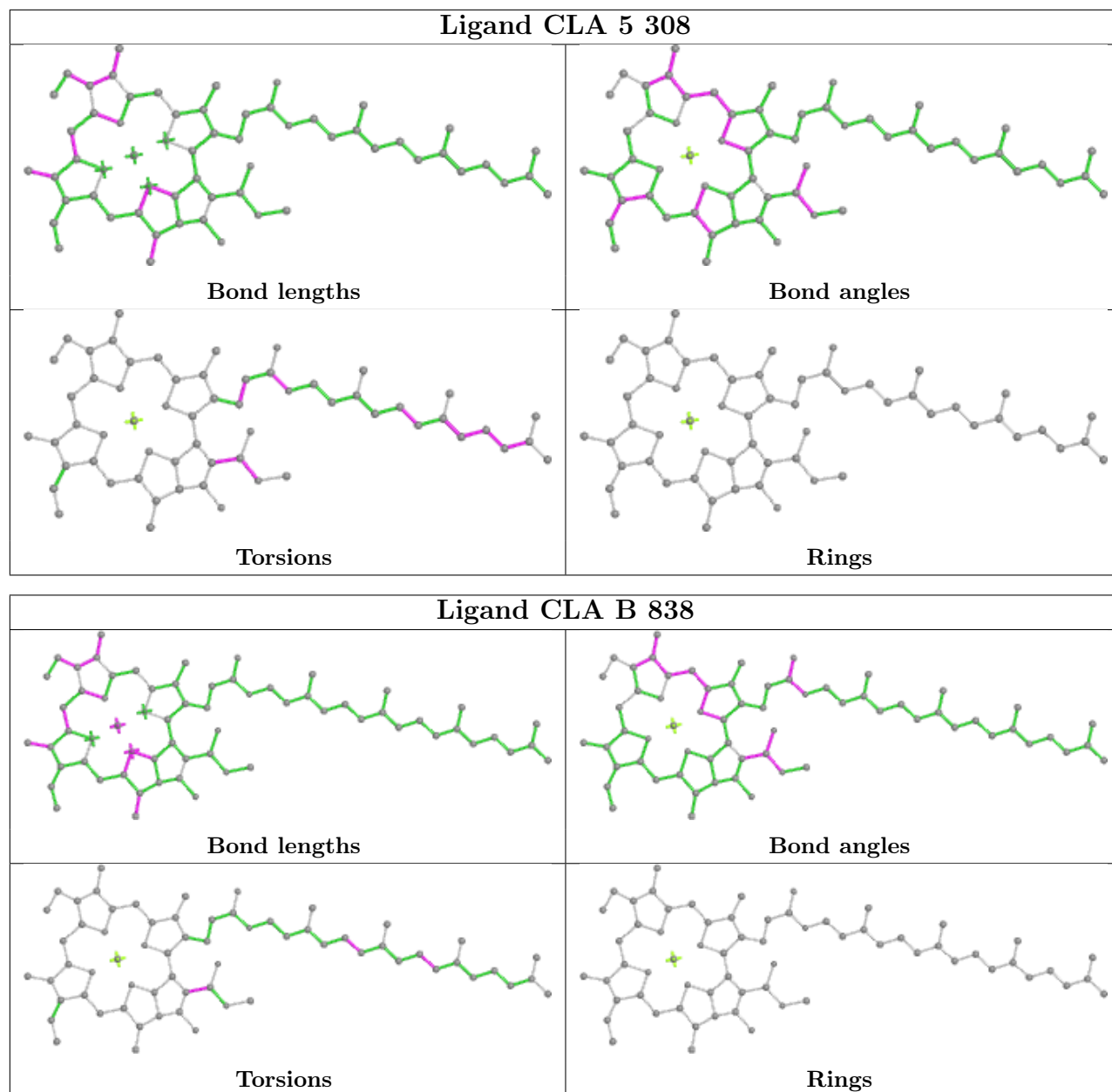


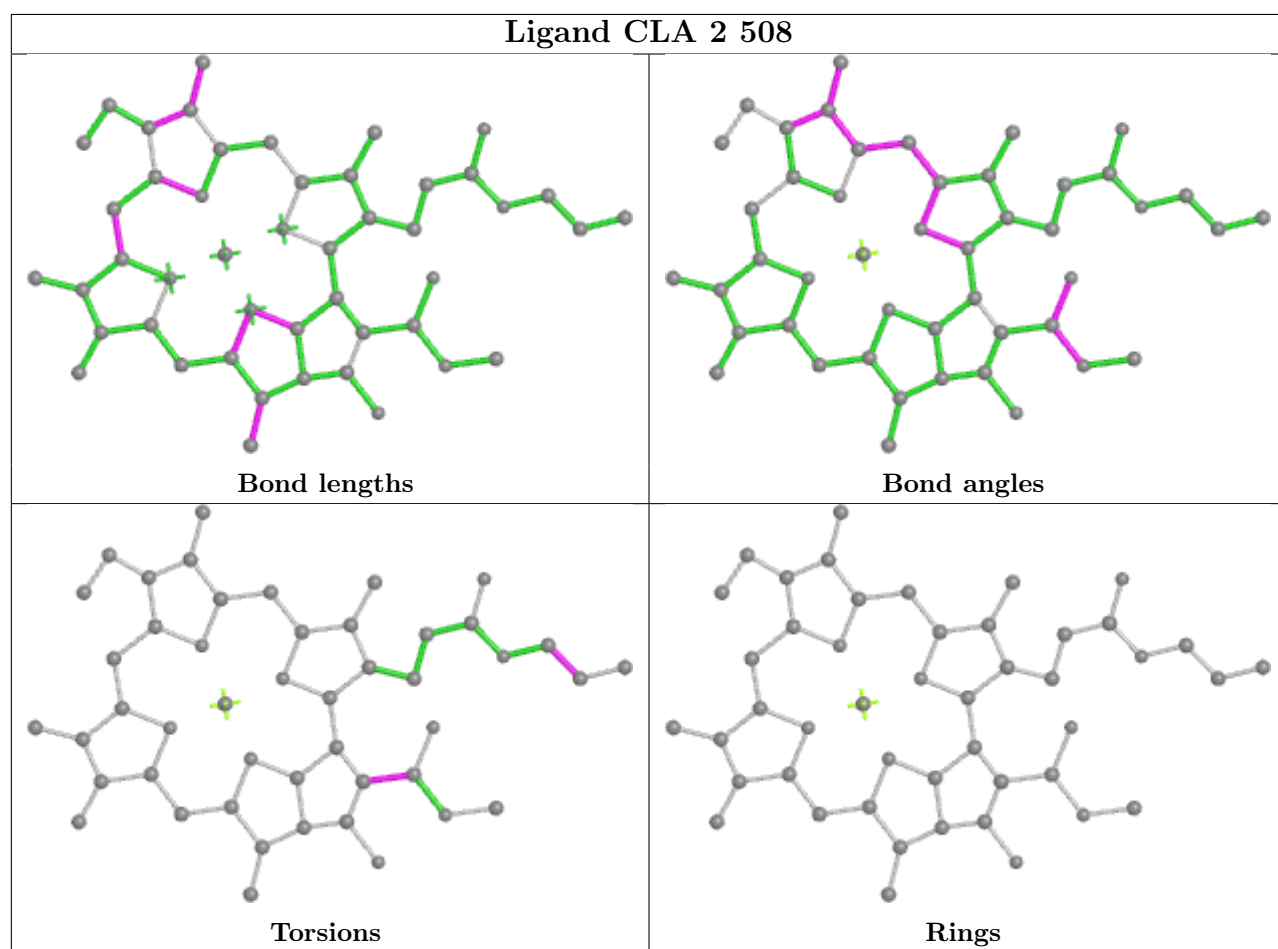
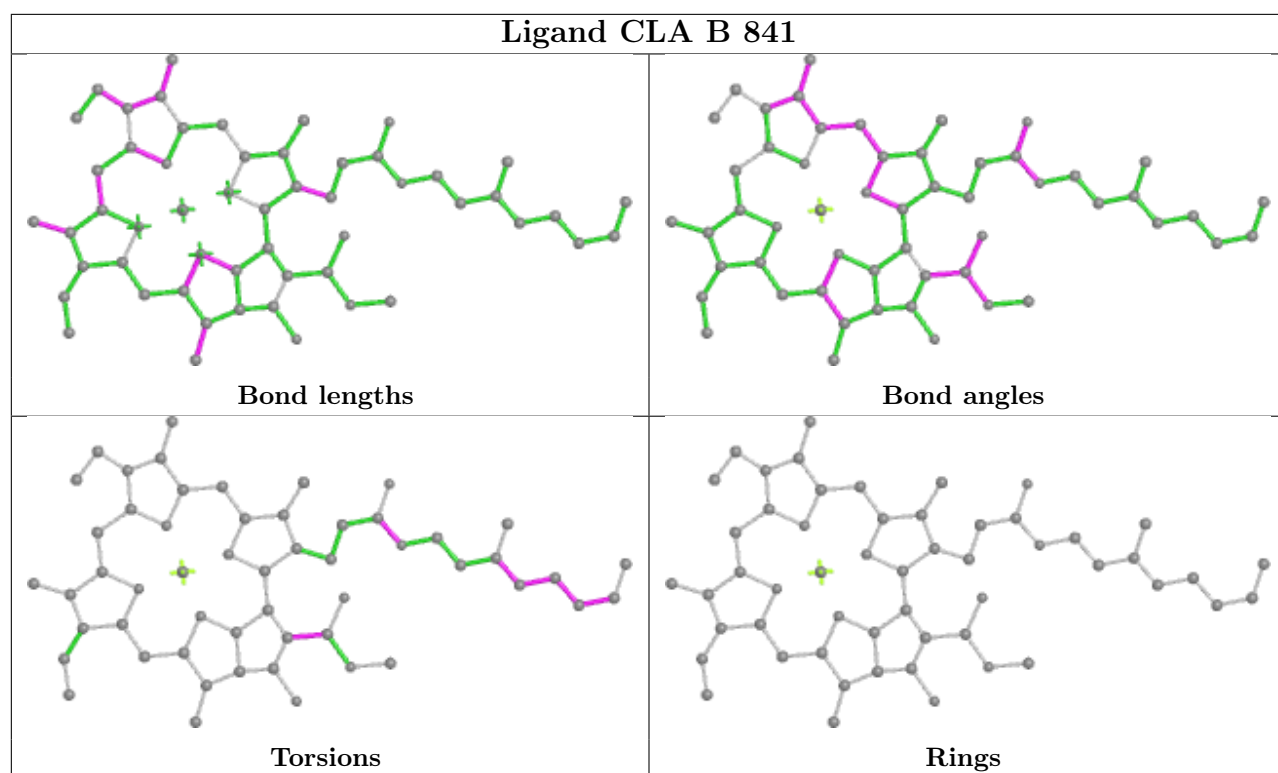


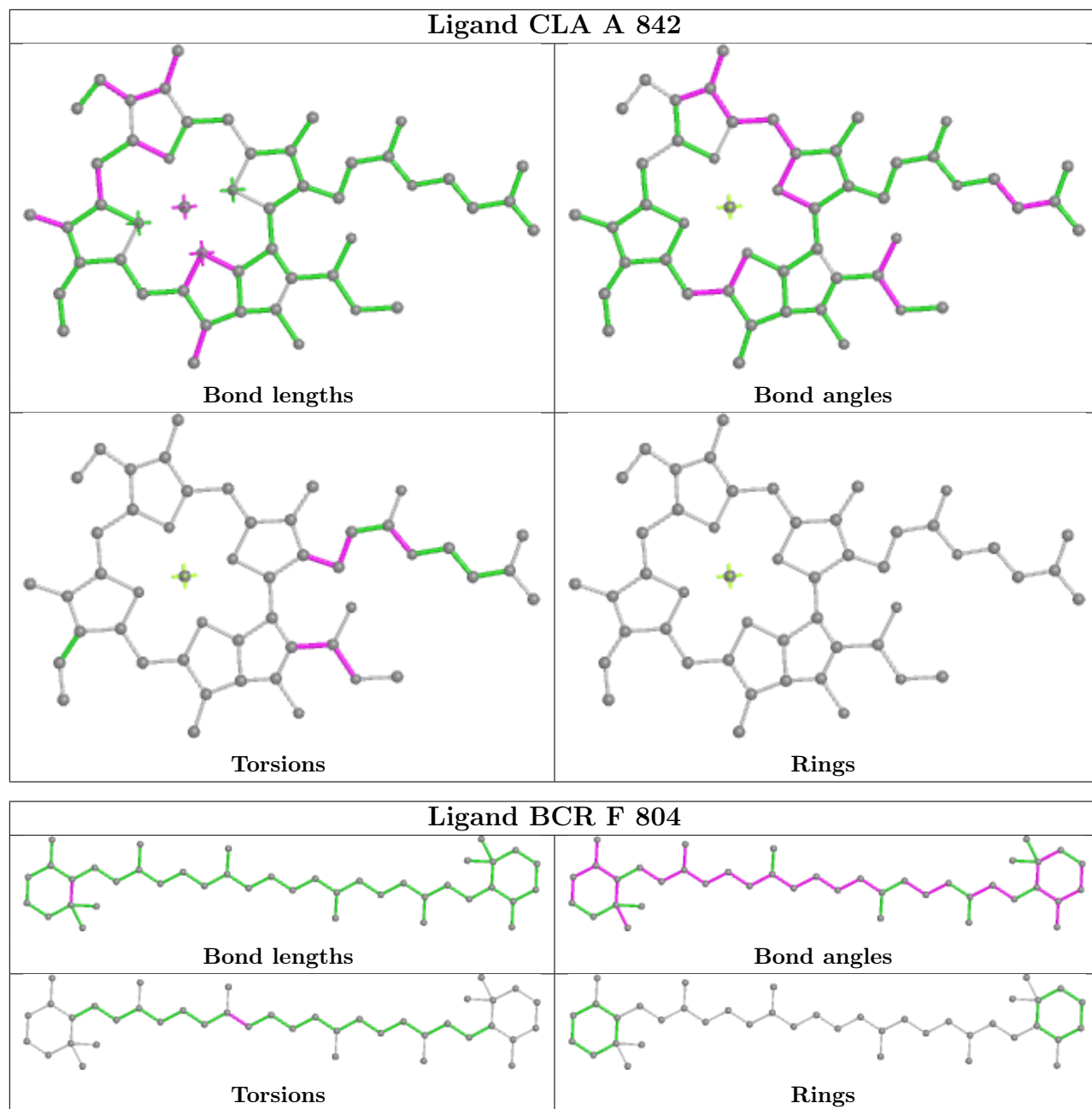


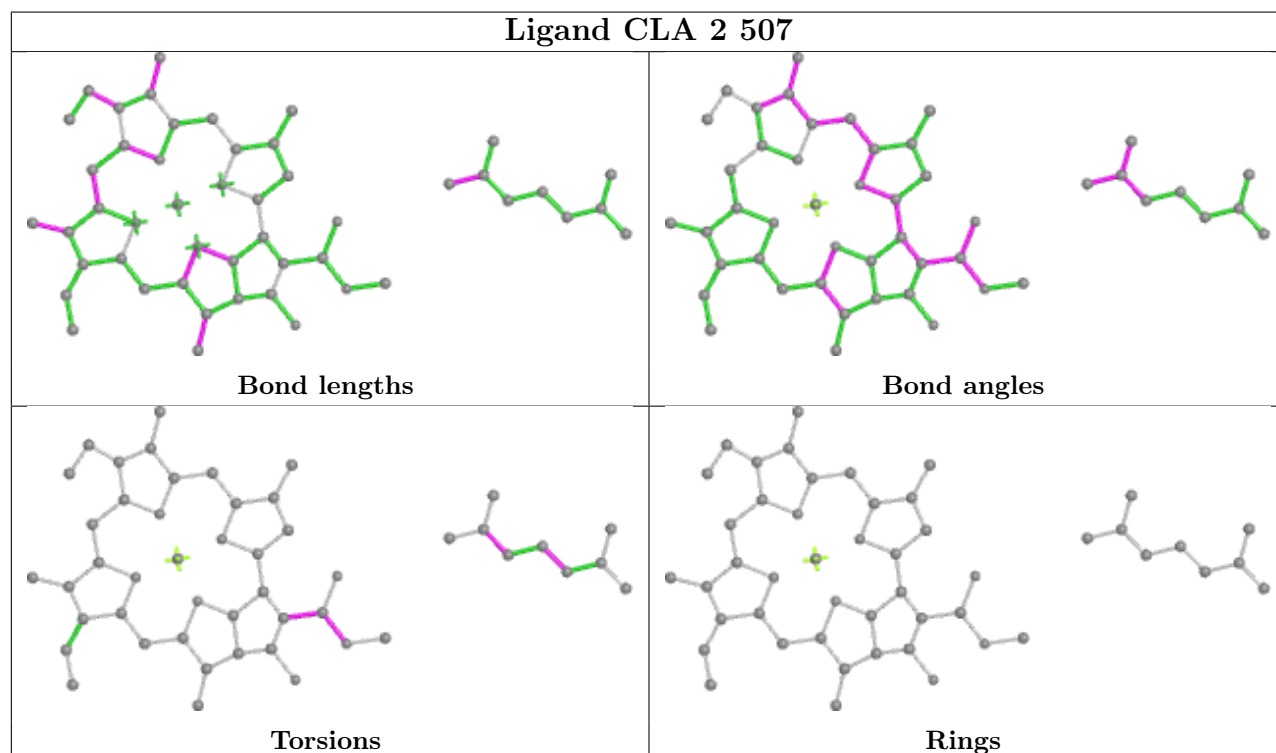
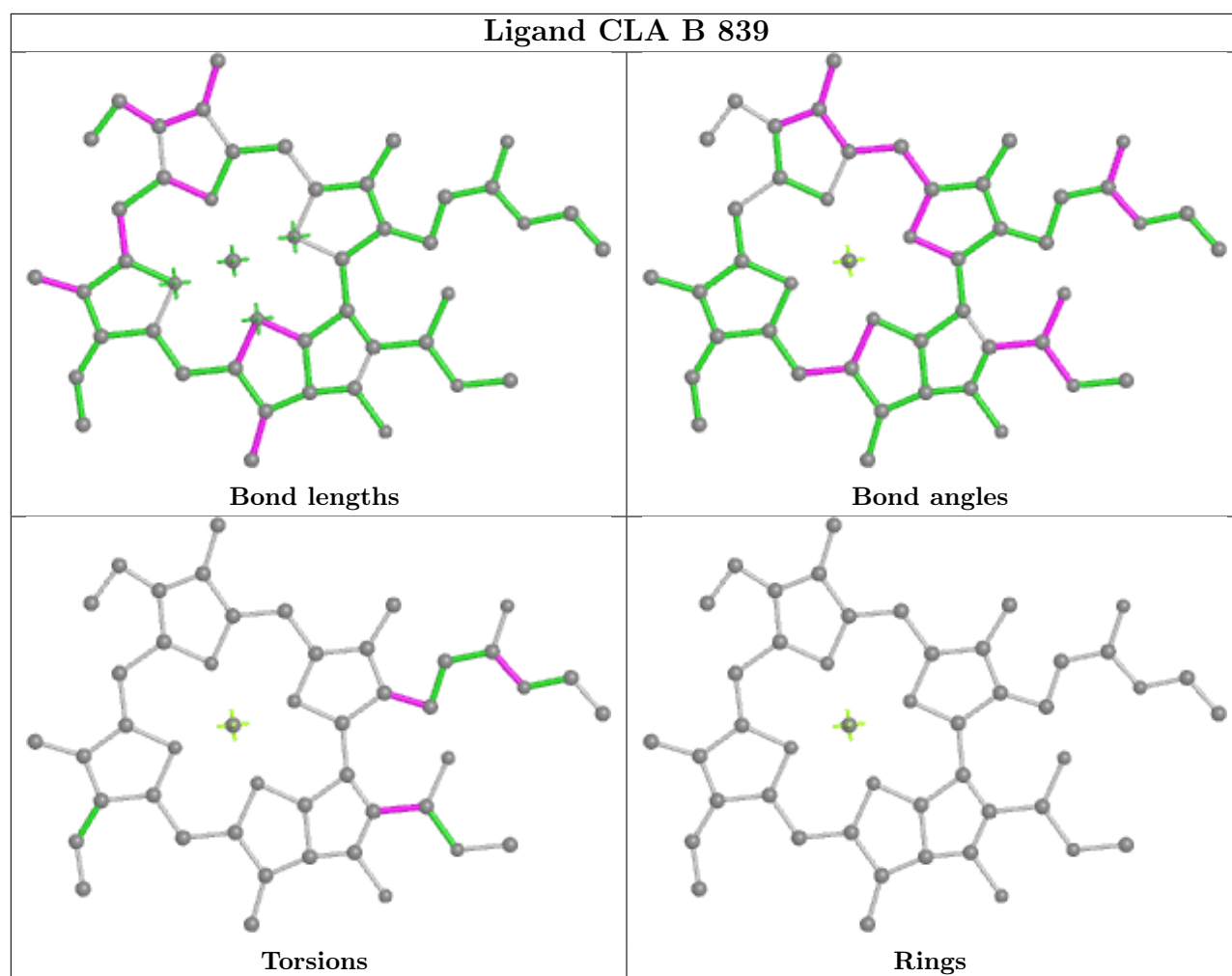


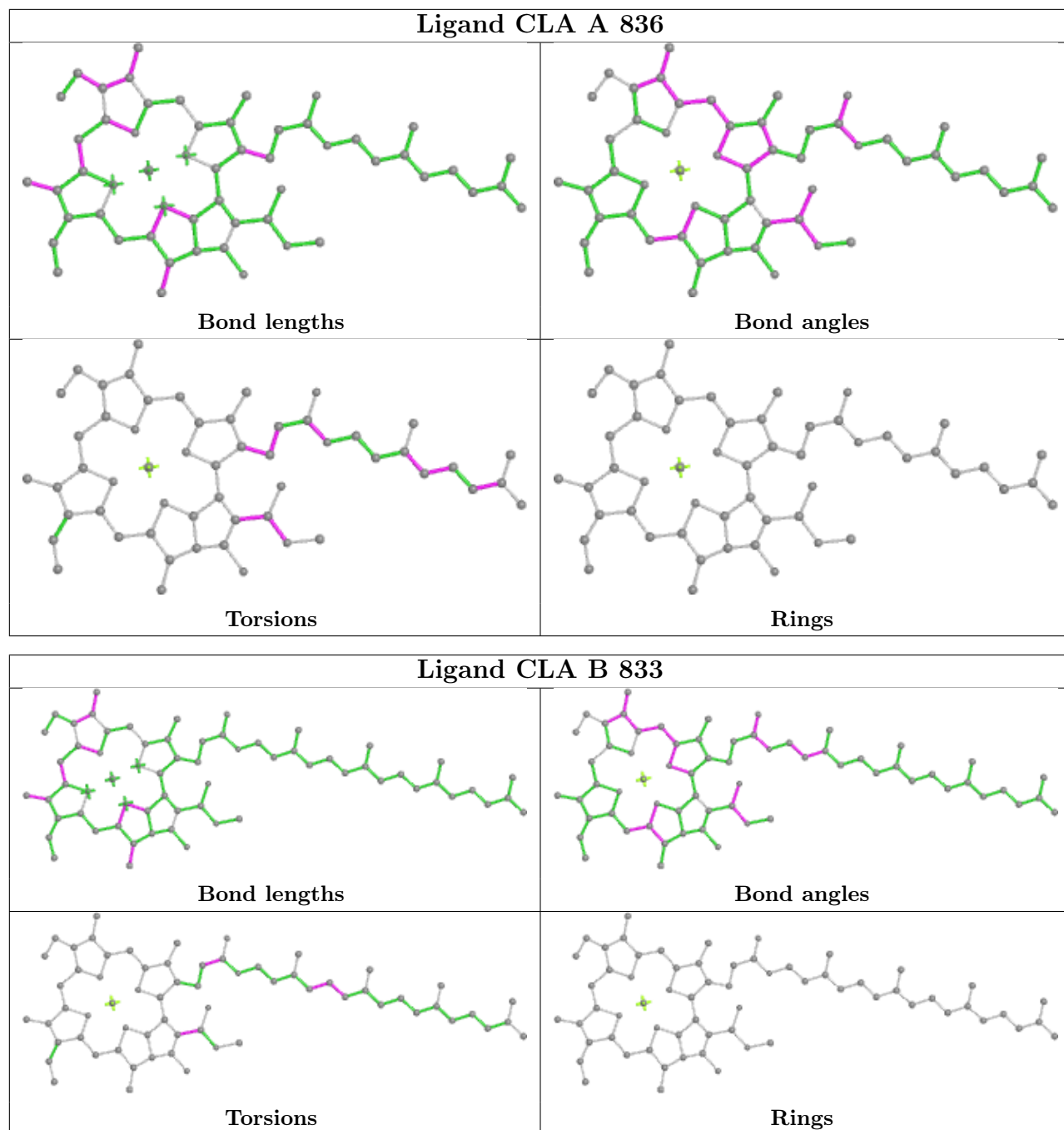


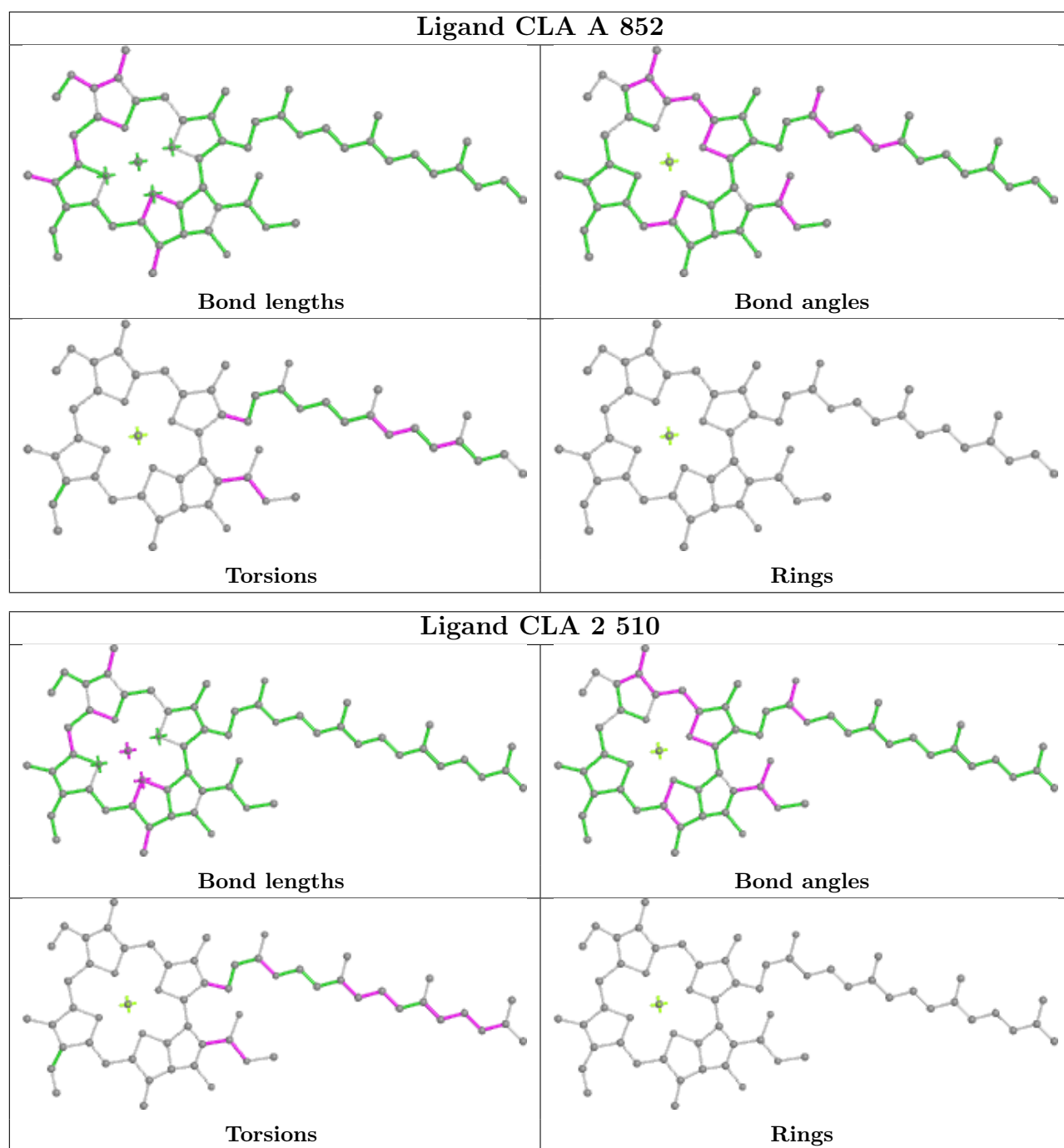


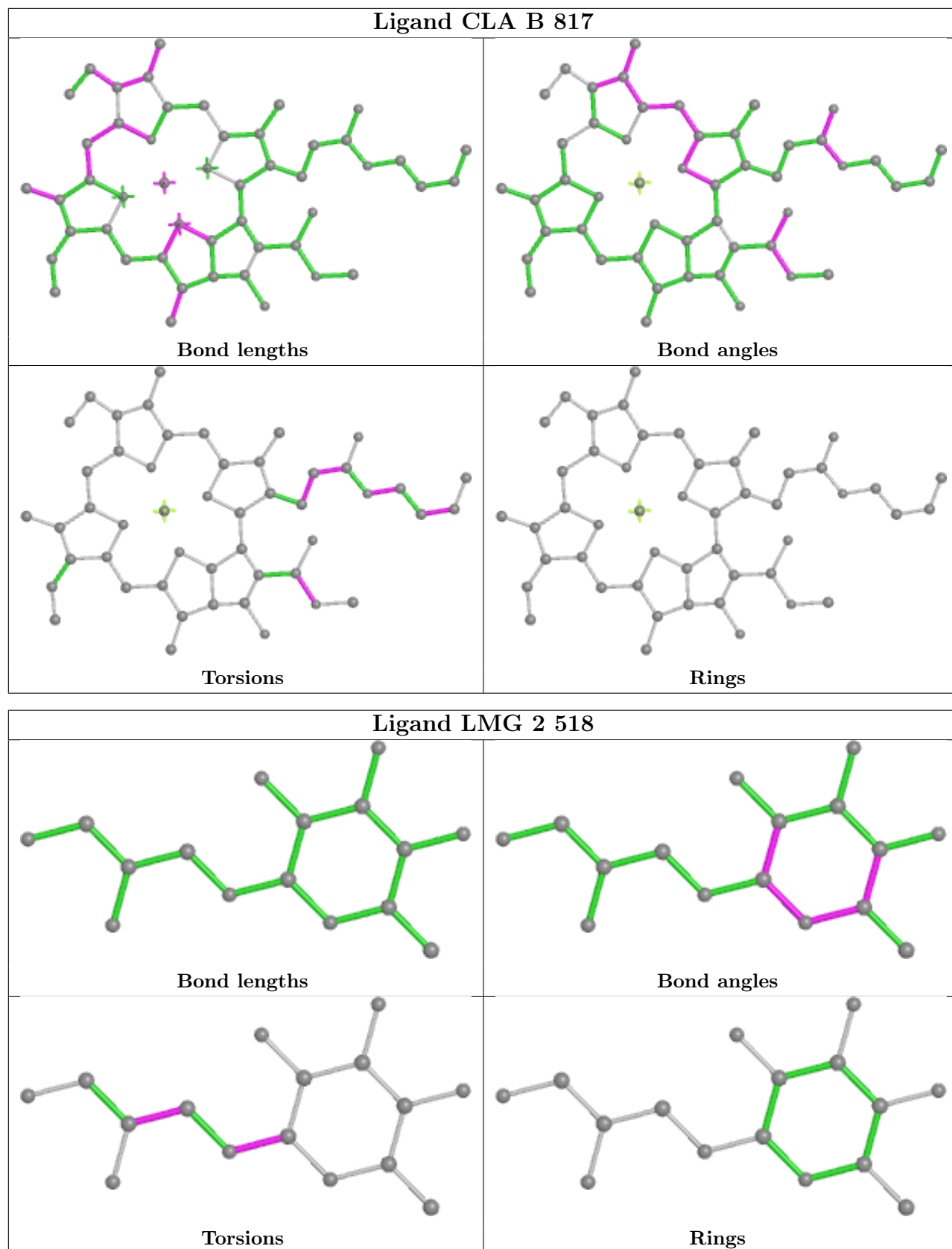


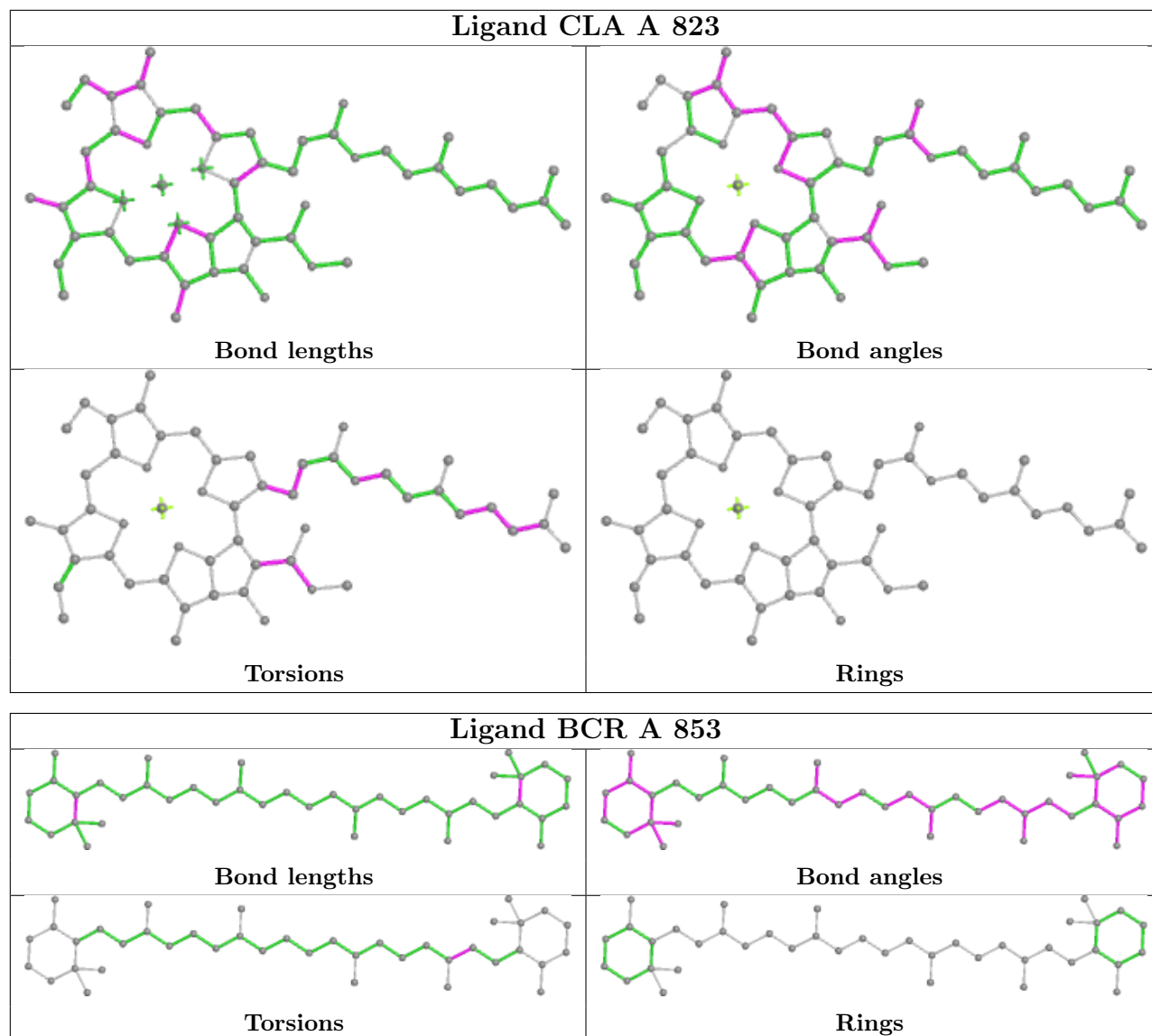












5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [\(i\)](#)

There are no chain breaks in this entry.

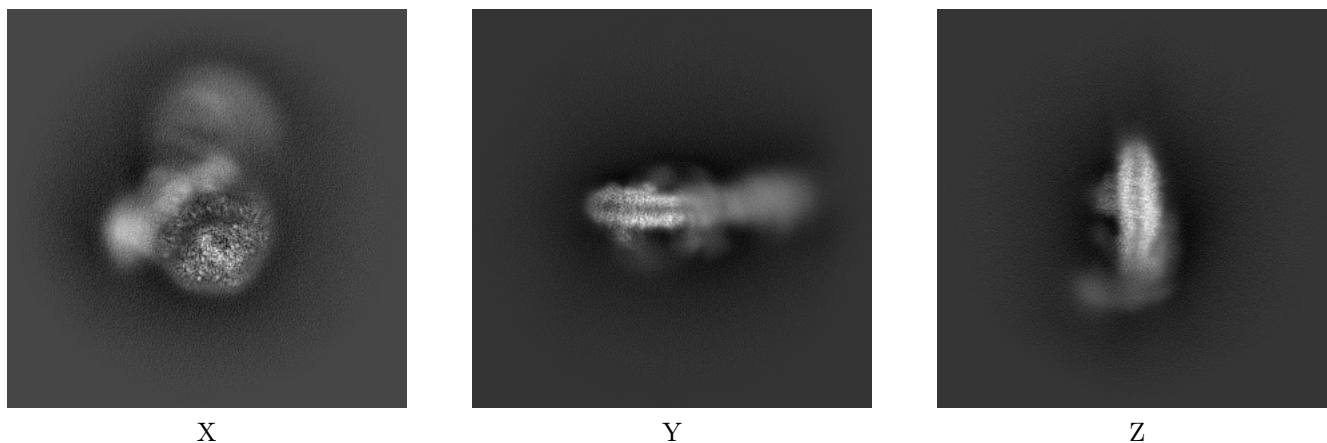
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-31348. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections [i](#)

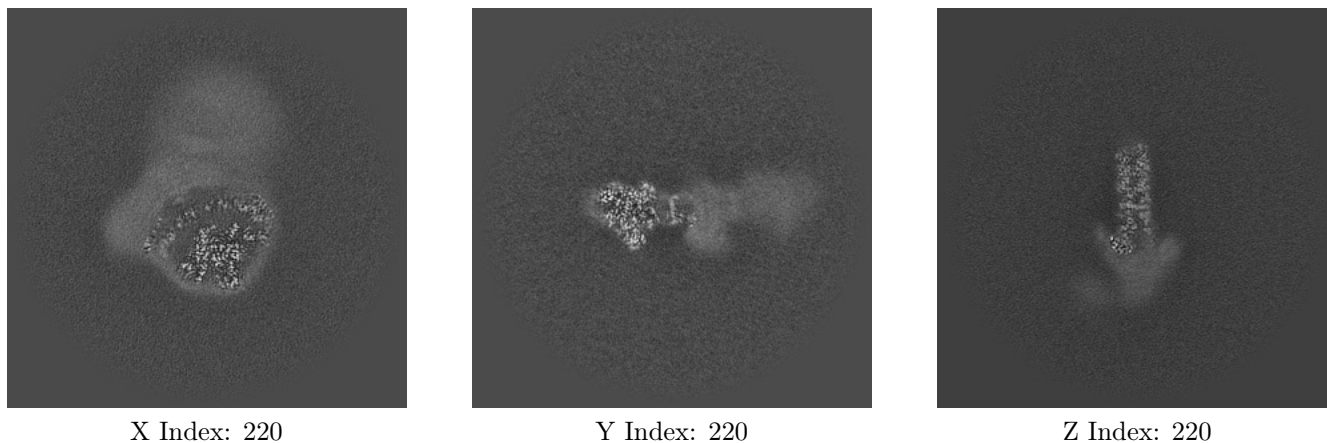
6.1.1 Primary map



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

6.2 Central slices [i](#)

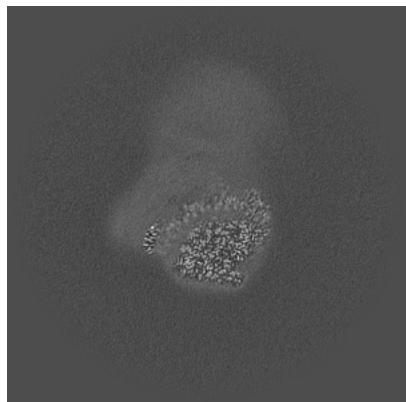
6.2.1 Primary map



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

6.3 Largest variance slices [i](#)

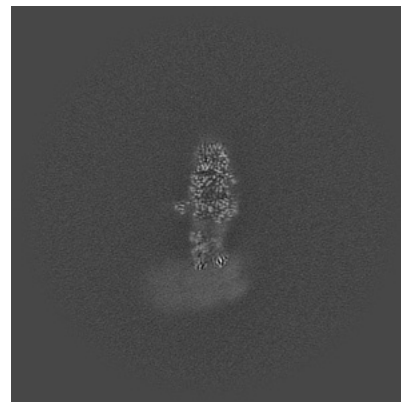
6.3.1 Primary map



X Index: 229



Y Index: 231



Z Index: 188

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

6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.72. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

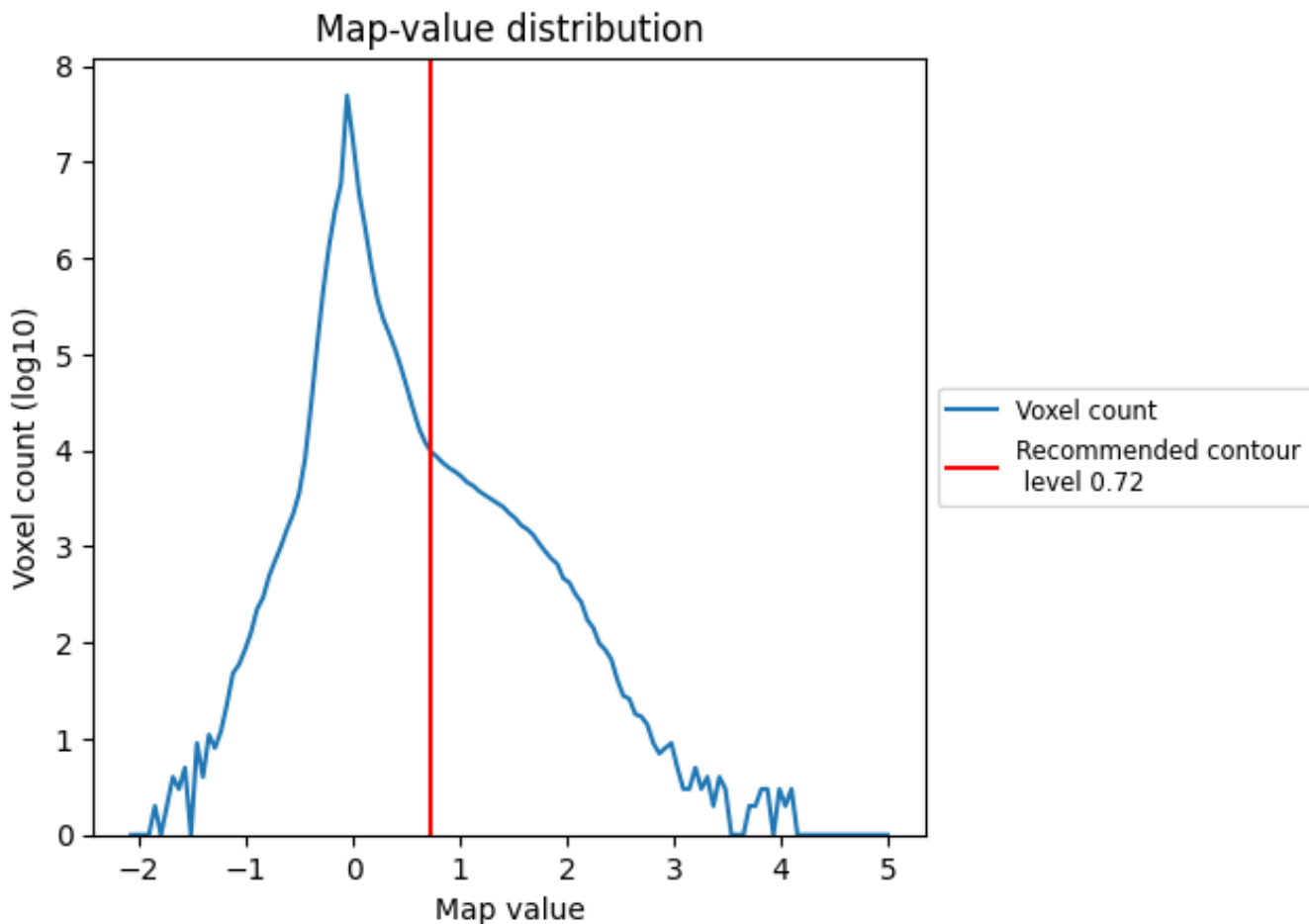
6.5 Mask visualisation

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

7 Map analysis [i](#)

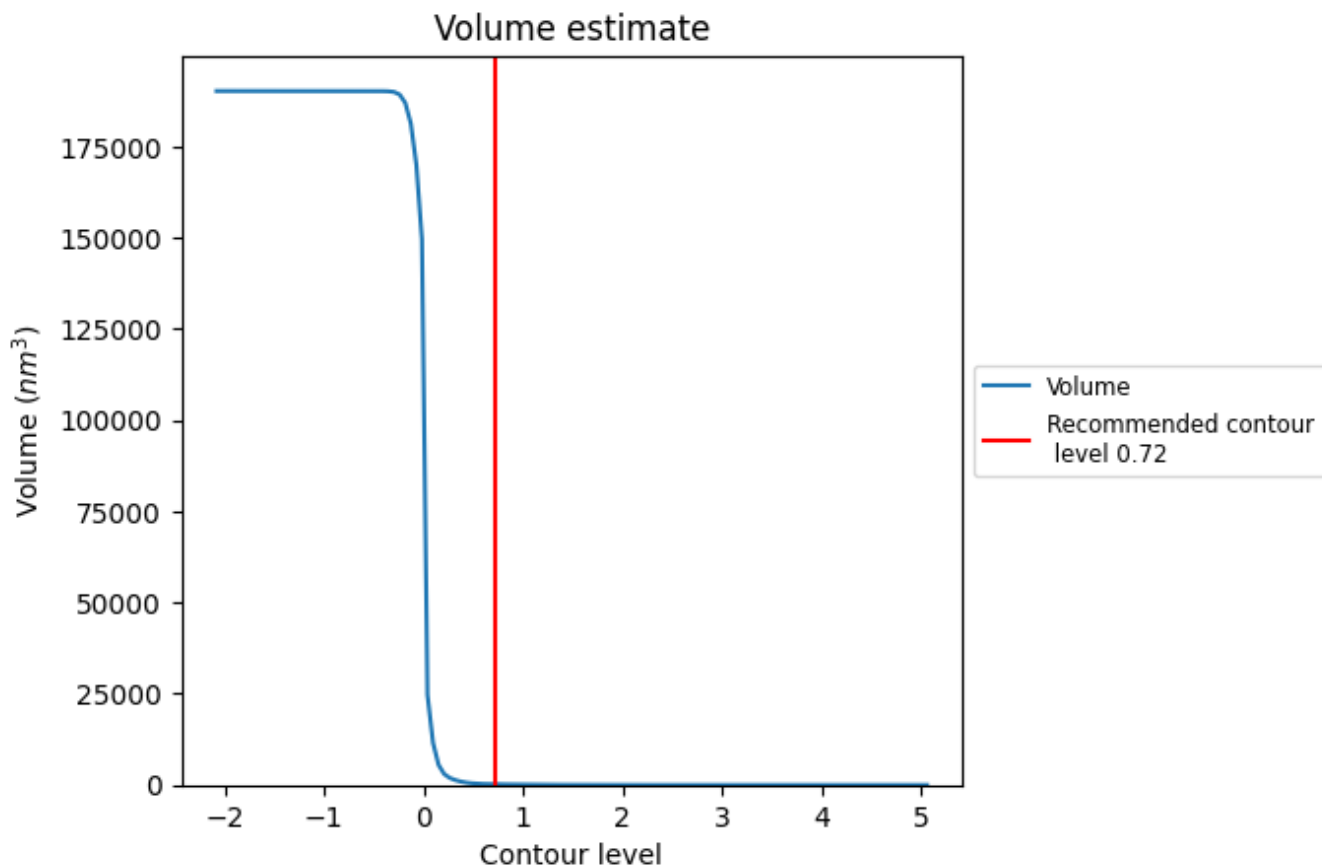
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

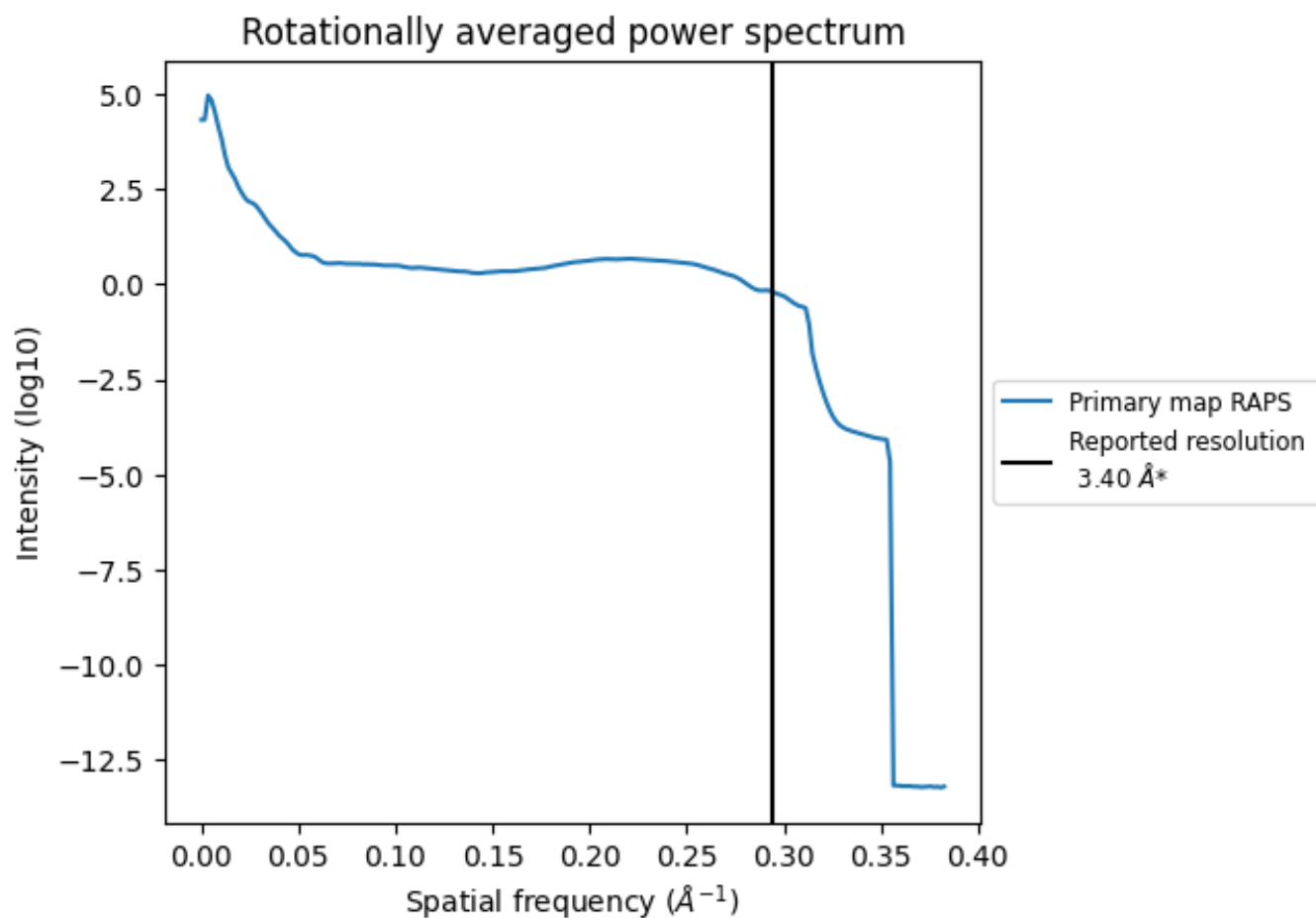
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 189 nm^3 ; this corresponds to an approximate mass of 170 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 0.294 Å⁻¹

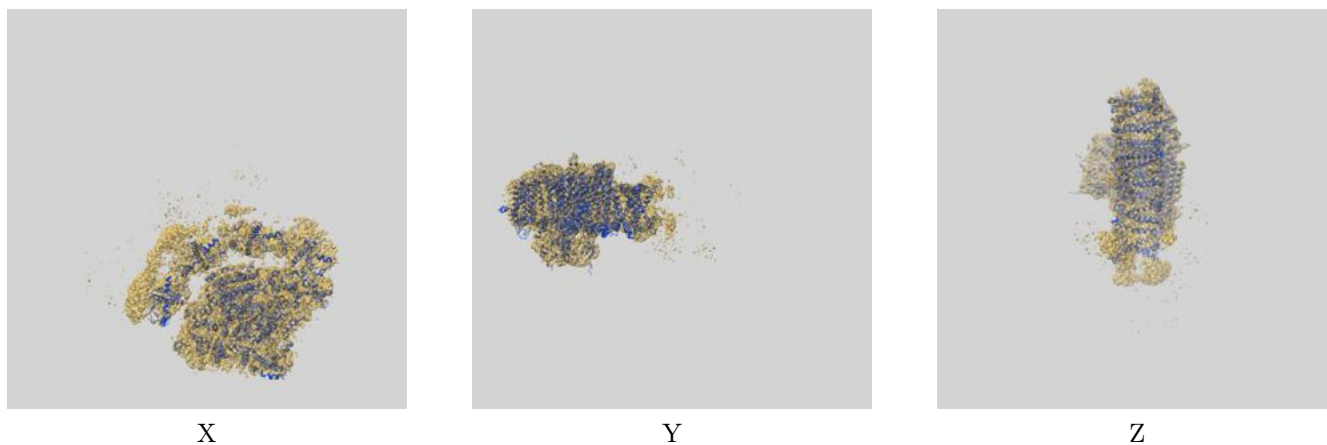
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

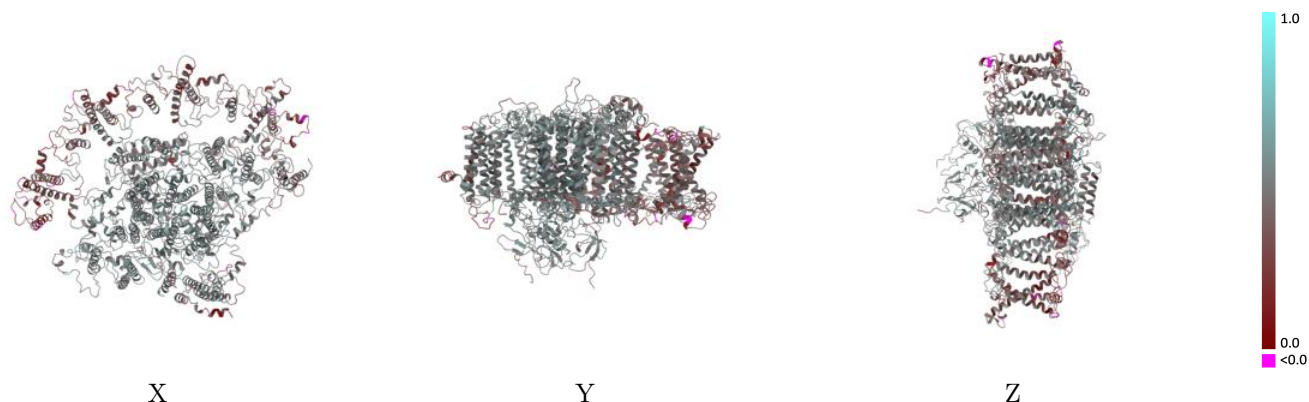
This section contains information regarding the fit between EMDB map EMD-31348 and PDB model 7EW6. Per-residue inclusion information can be found in section [3](#) on page [25](#).

9.1 Map-model overlay [i](#)



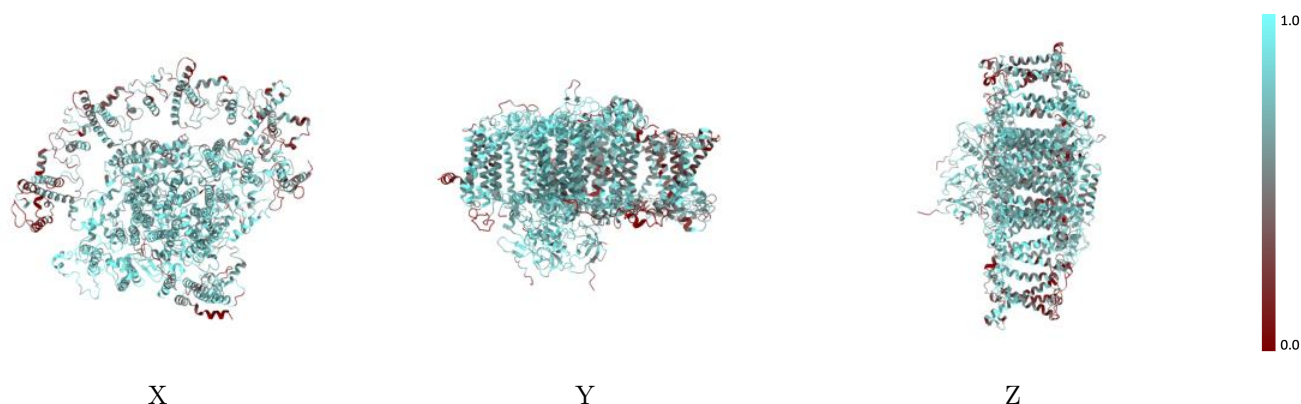
The images above show the 3D surface view of the map at the recommended contour level 0.72 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



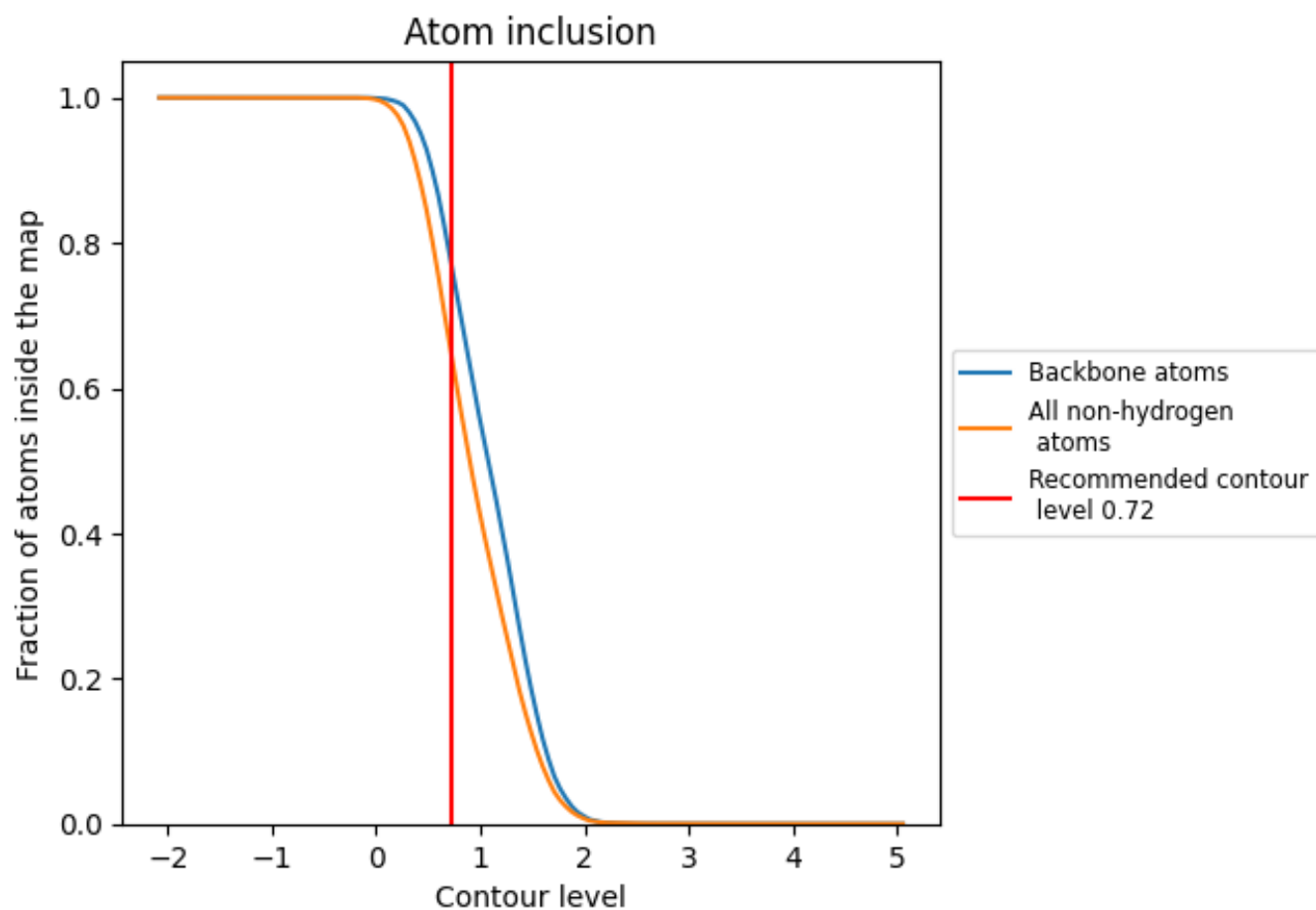
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.72).

































9.4 Atom inclusion [i](#)



At the recommended contour level, 77% of all backbone atoms, 65% 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 (0.72) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6483	 0.4660
1	 0.3976	 0.3020
2	 0.5250	 0.3870
3	 0.4570	 0.3520
5	 0.5641	 0.3970
A	 0.7347	 0.5220
B	 0.7691	 0.5240
C	 0.8611	 0.5200
D	 0.6941	 0.4910
E	 0.6981	 0.4810
F	 0.6446	 0.4880
H	 0.3742	 0.3900
I	 0.6753	 0.5100
J	 0.4840	 0.4810
K	 0.3903	 0.3820
L	 0.6167	 0.4580

