



wwPDB EM Validation Summary Report ⓘ

Nov 3, 2024 – 10:29 AM EST

PDB ID : 6V22
EMDB ID : EMD-21025
Title : Cryo-EM structure of Ca²⁺-bound hsSlo1-beta4 channel complex
Authors : Tao, X.; MacKinnon, R.
Deposited on : 2019-11-22
Resolution : 3.20 Å(reported)
Based on initial models : 3MT5, 5TJ6, ?

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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.dev113
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

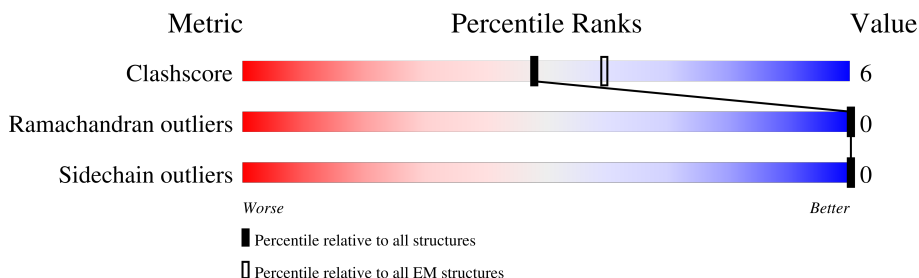
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.20 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	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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	1065	
1	B	1065	
1	C	1065	
1	D	1065	
2	E	219	
2	F	219	
2	G	219	
2	H	219	

2 Entry composition i

There are 8 unique types of molecules in this entry. The entry contains 37004 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 Calcium-activated potassium channel subunit alpha-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	896	7137	4634	1165	1290	48	0	0
1	B	896	7137	4634	1165	1290	48	0	0
1	C	896	7137	4634	1165	1290	48	0	0
1	D	896	7137	4634	1165	1290	48	0	0

There are 36 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1057	SER	-	expression tag	UNP Q12791
A	1058	ASN	-	expression tag	UNP Q12791
A	1059	SER	-	expression tag	UNP Q12791
A	1060	LEU	-	expression tag	UNP Q12791
A	1061	GLU	-	expression tag	UNP Q12791
A	1062	VAL	-	expression tag	UNP Q12791
A	1063	LEU	-	expression tag	UNP Q12791
A	1064	PHE	-	expression tag	UNP Q12791
A	1065	GLN	-	expression tag	UNP Q12791
B	1057	SER	-	expression tag	UNP Q12791
B	1058	ASN	-	expression tag	UNP Q12791
B	1059	SER	-	expression tag	UNP Q12791
B	1060	LEU	-	expression tag	UNP Q12791
B	1061	GLU	-	expression tag	UNP Q12791
B	1062	VAL	-	expression tag	UNP Q12791
B	1063	LEU	-	expression tag	UNP Q12791
B	1064	PHE	-	expression tag	UNP Q12791
B	1065	GLN	-	expression tag	UNP Q12791
C	1057	SER	-	expression tag	UNP Q12791
C	1058	ASN	-	expression tag	UNP Q12791
C	1059	SER	-	expression tag	UNP Q12791
C	1060	LEU	-	expression tag	UNP Q12791

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Chain	Residue	Modelled	Actual	Comment	Reference
C	1061	GLU	-	expression tag	UNP Q12791
C	1062	VAL	-	expression tag	UNP Q12791
C	1063	LEU	-	expression tag	UNP Q12791
C	1064	PHE	-	expression tag	UNP Q12791
C	1065	GLN	-	expression tag	UNP Q12791
D	1057	SER	-	expression tag	UNP Q12791
D	1058	ASN	-	expression tag	UNP Q12791
D	1059	SER	-	expression tag	UNP Q12791
D	1060	LEU	-	expression tag	UNP Q12791
D	1061	GLU	-	expression tag	UNP Q12791
D	1062	VAL	-	expression tag	UNP Q12791
D	1063	LEU	-	expression tag	UNP Q12791
D	1064	PHE	-	expression tag	UNP Q12791
D	1065	GLN	-	expression tag	UNP Q12791

- Molecule 2 is a protein called Calcium-activated potassium channel subunit beta-4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	E	199	1586	1015	263	295	13	0	0
2	F	199	1586	1015	263	295	13	0	0
2	G	199	1586	1015	263	295	13	0	0
2	H	199	1586	1015	263	295	13	0	0

There are 36 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	2211	SER	-	expression tag	UNP Q86W47
E	2212	ASN	-	expression tag	UNP Q86W47
E	2213	SER	-	expression tag	UNP Q86W47
E	2214	LEU	-	expression tag	UNP Q86W47
E	2215	GLU	-	expression tag	UNP Q86W47
E	2216	VAL	-	expression tag	UNP Q86W47
E	2217	LEU	-	expression tag	UNP Q86W47
E	2218	PHE	-	expression tag	UNP Q86W47
E	2219	GLN	-	expression tag	UNP Q86W47
F	2211	SER	-	expression tag	UNP Q86W47
F	2212	ASN	-	expression tag	UNP Q86W47
F	2213	SER	-	expression tag	UNP Q86W47

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Chain	Residue	Modelled	Actual	Comment	Reference
F	2214	LEU	-	expression tag	UNP Q86W47
F	2215	GLU	-	expression tag	UNP Q86W47
F	2216	VAL	-	expression tag	UNP Q86W47
F	2217	LEU	-	expression tag	UNP Q86W47
F	2218	PHE	-	expression tag	UNP Q86W47
F	2219	GLN	-	expression tag	UNP Q86W47
G	2211	SER	-	expression tag	UNP Q86W47
G	2212	ASN	-	expression tag	UNP Q86W47
G	2213	SER	-	expression tag	UNP Q86W47
G	2214	LEU	-	expression tag	UNP Q86W47
G	2215	GLU	-	expression tag	UNP Q86W47
G	2216	VAL	-	expression tag	UNP Q86W47
G	2217	LEU	-	expression tag	UNP Q86W47
G	2218	PHE	-	expression tag	UNP Q86W47
G	2219	GLN	-	expression tag	UNP Q86W47
H	2211	SER	-	expression tag	UNP Q86W47
H	2212	ASN	-	expression tag	UNP Q86W47
H	2213	SER	-	expression tag	UNP Q86W47
H	2214	LEU	-	expression tag	UNP Q86W47
H	2215	GLU	-	expression tag	UNP Q86W47
H	2216	VAL	-	expression tag	UNP Q86W47
H	2217	LEU	-	expression tag	UNP Q86W47
H	2218	PHE	-	expression tag	UNP Q86W47
H	2219	GLN	-	expression tag	UNP Q86W47

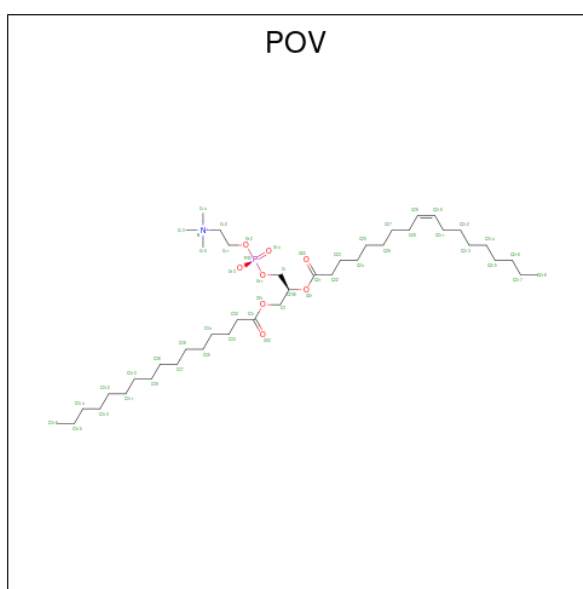
- Molecule 3 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	AltConf
3	A	1	Total Mg 1 1	0
3	B	1	Total Mg 1 1	0
3	C	1	Total Mg 1 1	0
3	D	1	Total Mg 1 1	0

- Molecule 4 is CALCIUM ION (three-letter code: CA) (formula: Ca) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	AltConf
4	A	2	Total Ca 2 2	0
4	B	2	Total Ca 2 2	0
4	C	2	Total Ca 2 2	0
4	D	2	Total Ca 2 2	0

- Molecule 5 is (2S)-3-(hexadecanoyloxy)-2-[(9Z)-octadec-9-enoyloxy]propyl 2-(trimethylamm onio)ethyl phosphate (three-letter code: POV) (formula: C₄₂H₈₂NO₈P).



Mol	Chain	Residues	Atoms	AltConf
5	A	1	Total C O P 31 22 8 1	0
5	A	1	Total C O 13 11 2	0
5	A	1	Total C N O P 36 26 1 8 1	0
5	A	1	Total C N O P 24 16 1 6 1	0
5	A	1	Total C 8 8	0
5	A	1	Total C 13 13	0
5	A	1	Total C N O P 45 35 1 8 1	0

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Mol	Chain	Residues	Atoms				AltConf	
			Total	C	O	P		
5	A	1	23	16	6	1	0	
5	A	1	35	25	1	8	1	0
5	A	1	32	22	1	8	1	0
5	A	1	40	30	1	8	1	0
5	E	1	52	42	1	8	1	0
5	E	1	8	8				0
5	E	1	9	9				0
5	E	1	15	8	6	1		0
5	B	1	45	35	1	8	1	0
5	B	1	23	16	6	1		0
5	B	1	35	25	1	8	1	0
5	B	1	32	22	1	8	1	0
5	B	1	40	30	1	8	1	0
5	B	1	31	22	8	1		0
5	B	1	13	11	2			0
5	B	1	36	26	1	8	1	0
5	B	1	24	16	1	6	1	0
5	B	1	8	8				0
5	B	1	13	13				0
5	F	1	52	42	1	8	1	0
5	F	1	8	8				0

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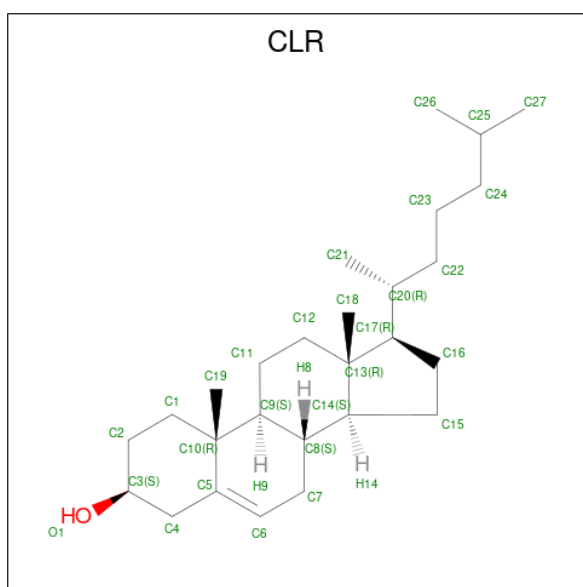
Mol	Chain	Residues	Atoms	AltConf
5	F	1	Total C 9 9	0
5	F	1	Total C O P 15 8 6 1	0
5	C	1	Total C N O P 45 35 1 8 1	0
5	C	1	Total C O P 23 16 6 1	0
5	C	1	Total C N O P 35 25 1 8 1	0
5	C	1	Total C N O P 32 22 1 8 1	0
5	C	1	Total C N O P 40 30 1 8 1	0
5	C	1	Total C O P 31 22 8 1	0
5	C	1	Total C O 13 11 2	0
5	C	1	Total C N O P 36 26 1 8 1	0
5	C	1	Total C N O P 24 16 1 6 1	0
5	C	1	Total C 8 8	0
5	C	1	Total C 13 13	0
5	G	1	Total C N O P 52 42 1 8 1	0
5	G	1	Total C 8 8	0
5	G	1	Total C 9 9	0
5	G	1	Total C O P 15 8 6 1	0
5	D	1	Total C N O P 45 35 1 8 1	0
5	D	1	Total C O P 23 16 6 1	0
5	D	1	Total C N O P 35 25 1 8 1	0
5	D	1	Total C N O P 32 22 1 8 1	0

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Mol	Chain	Residues	Atoms	AltConf
5	D	1	Total C N O P 40 30 1 8 1	0
5	D	1	Total C O P 31 22 8 1	0
5	D	1	Total C O 13 11 2	0
5	D	1	Total C N O P 36 26 1 8 1	0
5	D	1	Total C N O P 24 16 1 6 1	0
5	D	1	Total C 8 8	0
5	D	1	Total C 13 13	0
5	H	1	Total C N O P 52 42 1 8 1	0
5	H	1	Total C 8 8	0
5	H	1	Total C 9 9	0
5	H	1	Total C O P 15 8 6 1	0

- Molecule 6 is CHOLESTEROL (three-letter code: CLR) (formula: C₂₇H₄₆O).



Mol	Chain	Residues	Atoms			AltConf
6	A	1	Total	C	O	0
			28	27	1	
6	A	1	Total	C	O	0
			28	27	1	
6	A	1	Total	C	O	0
			28	27	1	
6	A	1	Total	C	O	0
			28	27	1	
6	B	1	Total	C	O	0
			28	27	1	
6	B	1	Total	C	O	0
			28	27	1	
6	B	1	Total	C	O	0
			28	27	1	
6	B	1	Total	C	O	0
			28	27	1	
6	C	1	Total	C	O	0
			28	27	1	
6	C	1	Total	C	O	0
			28	27	1	
6	C	1	Total	C	O	0
			28	27	1	
6	C	1	Total	C	O	0
			28	27	1	
6	D	1	Total	C	O	0
			28	27	1	
6	D	1	Total	C	O	0
			28	27	1	
6	D	1	Total	C	O	0
			28	27	1	
6	D	1	Total	C	O	0
			28	27	1	

- Molecule 7 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms		AltConf
7	A	4	Total	K	0
			4	4	

- Molecule 8 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).



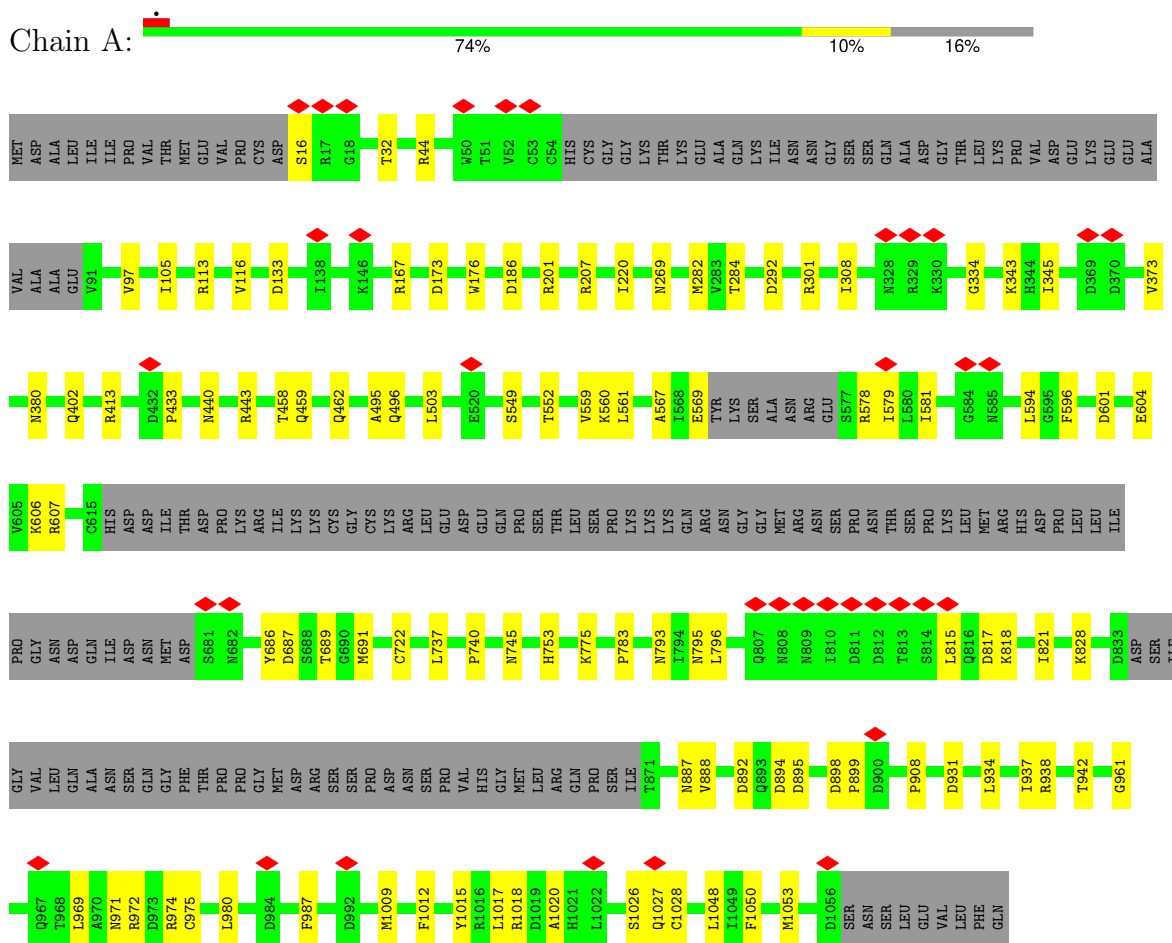
Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
8	E	1	Total 14	8	1	5	0
8	E	1	Total 14	8	1	5	0
8	F	1	Total 14	8	1	5	0
8	F	1	Total 14	8	1	5	0
8	G	1	Total 14	8	1	5	0
8	G	1	Total 14	8	1	5	0
8	H	1	Total 14	8	1	5	0
8	H	1	Total 14	8	1	5	0

3 Residue-property plots [i](#)

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

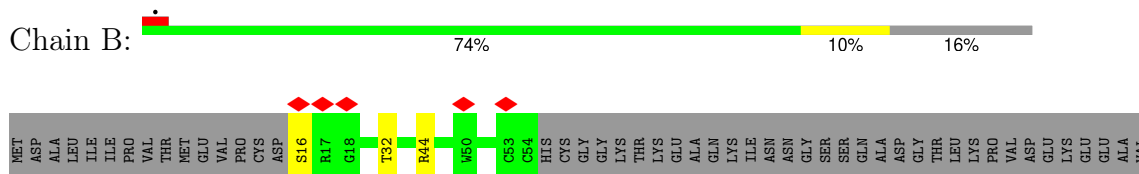
- Molecule 1: Calcium-activated potassium channel subunit alpha-1

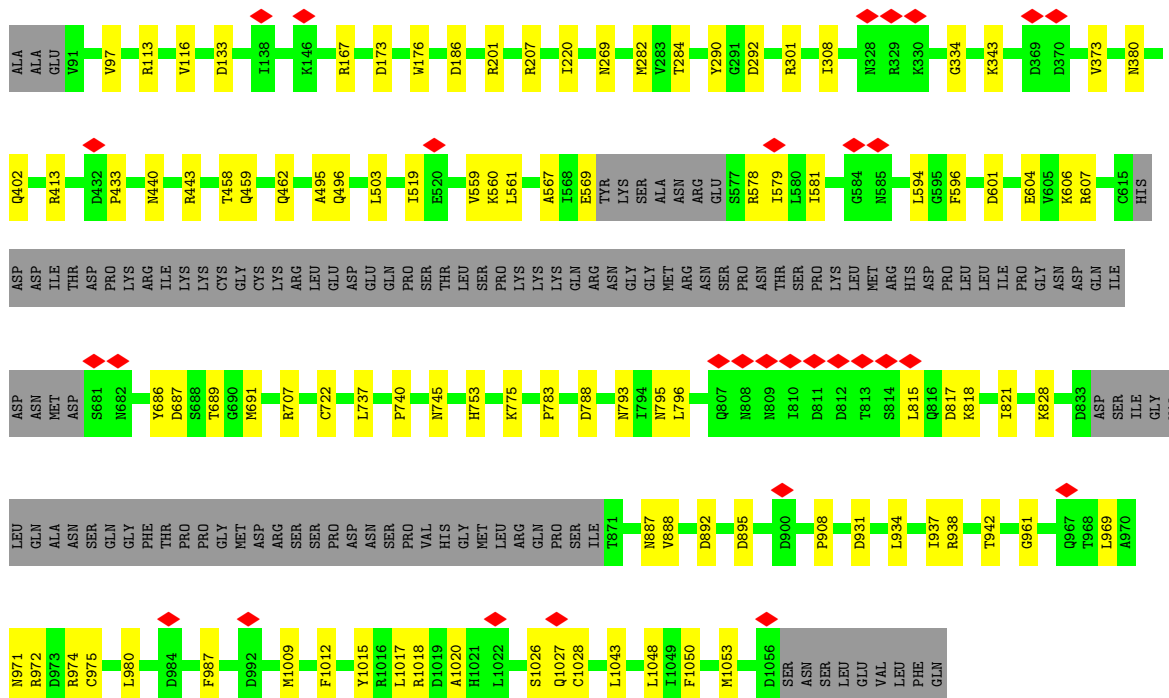
Chain A:



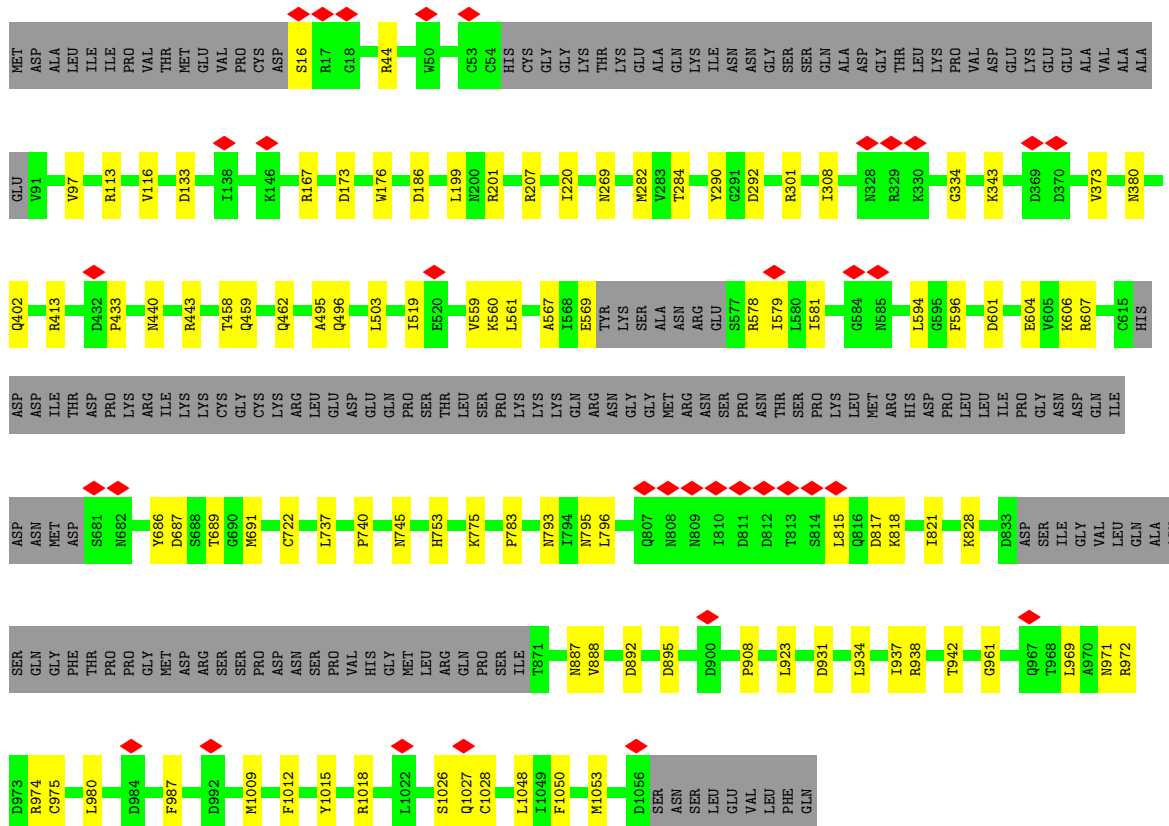
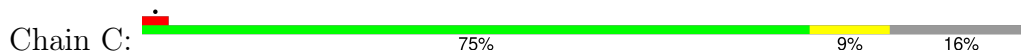
- Molecule 1: Calcium-activated potassium channel subunit alpha-1

Chain B:



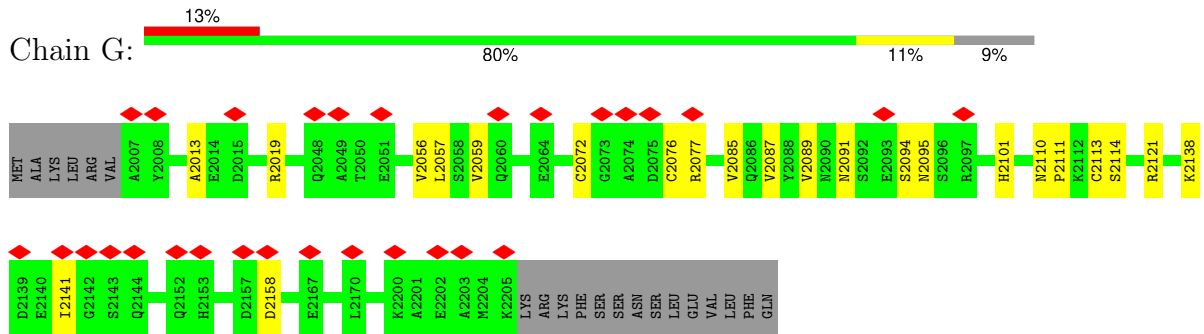


• Molecule 1: Calcium-activated potassium channel subunit alpha-1

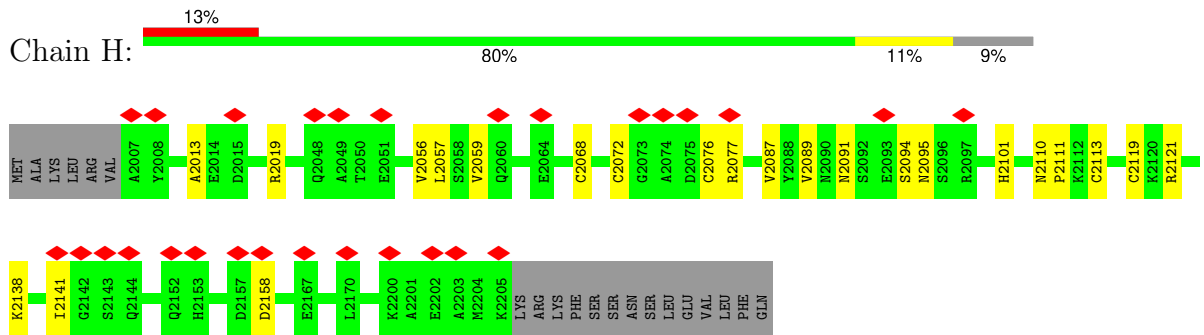


• Molecule 1: Calcium-activated potassium channel subunit alpha-1

• Molecule 2: Calcium-activated potassium channel subunit beta-4



• Molecule 2: Calcium-activated potassium channel subunit beta-4



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C4	Depositor
Number of particles used	117791	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	74	Depositor
Minimum defocus (nm)	700	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	28.675	Depositor
Minimum map value	-12.814	Depositor
Average map value	-0.319	Depositor
Map value standard deviation	0.838	Depositor
Recommended contour level	6.19	Depositor
Map size (\AA)	399.36, 399.36, 399.36	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.04, 1.04, 1.04	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: CA, NAG, MG, K, CLR, POV

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	0.40	0/7302	0.50	0/9911
1	B	0.40	0/7302	0.50	0/9911
1	C	0.40	0/7302	0.50	0/9911
1	D	0.40	0/7302	0.50	0/9911
2	E	0.33	0/1624	0.49	0/2211
2	F	0.33	0/1624	0.49	0/2211
2	G	0.33	0/1624	0.49	0/2211
2	H	0.33	0/1624	0.49	0/2211
All	All	0.39	0/35704	0.50	0/48488

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	7137	0	7131	69	0
1	B	7137	0	7131	67	0
1	C	7137	0	7131	64	0
1	D	7137	0	7131	67	0
2	E	1586	0	1543	19	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	F	1586	0	1543	18	0
2	G	1586	0	1543	16	0
2	H	1586	0	1543	17	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
4	A	2	0	0	0	0
4	B	2	0	0	0	0
4	C	2	0	0	0	0
4	D	2	0	0	0	0
5	A	300	0	378	8	0
5	B	300	0	378	9	0
5	C	300	0	378	8	0
5	D	300	0	378	10	0
5	E	84	0	116	0	0
5	F	84	0	116	0	0
5	G	84	0	116	0	0
5	H	84	0	116	0	0
6	A	112	0	173	24	0
6	B	112	0	173	23	0
6	C	112	0	173	22	0
6	D	112	0	173	24	0
7	A	4	0	0	0	0
8	E	28	0	26	0	0
8	F	28	0	26	0	0
8	G	28	0	26	0	0
8	H	28	0	26	0	0
All	All	37004	0	37468	426	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 6.

The worst 5 of 426 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:C:1115:CLR:C16	6:C:1115:CLR:C17	1.75	1.57
6:D:1115:CLR:C17	6:D:1115:CLR:C16	1.75	1.56
6:A:1111:CLR:C17	6:A:1111:CLR:C16	1.74	1.56
6:B:1118:CLR:C16	6:B:1118:CLR:C17	1.75	1.56
6:B:1115:CLR:C16	6:B:1115:CLR:C17	1.75	1.55

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	886/1065 (83%)	847 (96%)	39 (4%)	0	100	100
1	B	886/1065 (83%)	847 (96%)	39 (4%)	0	100	100
1	C	886/1065 (83%)	846 (96%)	40 (4%)	0	100	100
1	D	886/1065 (83%)	847 (96%)	39 (4%)	0	100	100
2	E	197/219 (90%)	190 (96%)	7 (4%)	0	100	100
2	F	197/219 (90%)	190 (96%)	7 (4%)	0	100	100
2	G	197/219 (90%)	190 (96%)	7 (4%)	0	100	100
2	H	197/219 (90%)	190 (96%)	7 (4%)	0	100	100
All	All	4332/5136 (84%)	4147 (96%)	185 (4%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	788/937 (84%)	788 (100%)	0	100	100
1	B	788/937 (84%)	788 (100%)	0	100	100
1	C	788/937 (84%)	788 (100%)	0	100	100
1	D	788/937 (84%)	788 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	E	180/199 (90%)	180 (100%)	0	100	100
2	F	180/199 (90%)	180 (100%)	0	100	100
2	G	180/199 (90%)	180 (100%)	0	100	100
2	H	180/199 (90%)	180 (100%)	0	100	100
All	All	3872/4544 (85%)	3872 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 40 such sidechains are listed below:

Mol	Chain	Res	Type
2	G	2095	ASN
1	D	884	ASN
1	D	142	GLN
1	D	471	ASN
2	H	2091	ASN

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 100 ligands modelled in this entry, 16 are monoatomic - leaving 84 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the

expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z > 2$	Counts	RMSZ	# $ Z > 2$
5	POV	A	1106	-	35,35,51	1.35	4 (11%)	41,43,59	1.28	3 (7%)
5	POV	D	1104	-	31,31,51	1.25	4 (12%)	37,39,59	1.18	3 (8%)
5	POV	C	1111	-	35,35,51	1.36	4 (11%)	41,43,59	1.28	3 (7%)
6	CLR	D	1118	-	31,31,31	4.42	14 (45%)	48,48,48	2.60	16 (33%)
5	POV	G	2301	-	51,51,51	1.14	5 (9%)	57,59,59	1.16	3 (5%)
5	POV	F	2302	-	7,7,51	0.27	0	6,6,59	0.77	0
5	POV	E	2301	-	51,51,51	1.14	5 (9%)	57,59,59	1.16	3 (5%)
5	POV	B	1103	-	34,34,51	1.39	5 (14%)	40,42,59	1.25	4 (10%)
5	POV	D	1112	-	23,23,51	1.45	2 (8%)	28,30,59	1.36	3 (10%)
5	POV	C	1109	-	30,30,51	1.40	7 (23%)	33,35,59	1.46	4 (12%)
5	POV	B	1102	-	22,22,51	1.41	4 (18%)	25,25,59	1.33	2 (8%)
5	POV	F	2301	-	51,51,51	1.14	5 (9%)	57,59,59	1.16	3 (5%)
5	POV	C	1112	-	23,23,51	1.46	2 (8%)	28,30,59	1.36	3 (10%)
5	POV	C	1101	-	44,44,51	1.20	5 (11%)	50,52,59	1.24	4 (8%)
8	NAG	E	2305	2	14,14,15	0.53	0	17,19,21	1.53	2 (11%)
5	POV	C	1104	-	31,31,51	1.25	4 (12%)	37,39,59	1.18	3 (8%)
5	POV	D	1102	-	22,22,51	1.41	4 (18%)	25,25,59	1.33	2 (8%)
6	CLR	B	1115	-	31,31,31	4.39	14 (45%)	48,48,48	2.62	16 (33%)
5	POV	H	2304	-	14,14,51	1.48	3 (21%)	17,17,59	1.31	2 (11%)
5	POV	H	2302	-	7,7,51	0.27	0	6,6,59	0.77	0
5	POV	A	1120	-	34,34,51	1.39	5 (14%)	40,42,59	1.25	4 (10%)
5	POV	C	1110	-	12,12,51	0.94	1 (8%)	12,12,59	1.17	0
5	POV	C	1105	-	39,39,51	1.16	4 (10%)	45,47,59	1.20	3 (6%)
5	POV	A	1121	-	31,31,51	1.25	4 (12%)	37,39,59	1.18	3 (8%)
5	POV	E	2304	-	14,14,51	1.48	3 (21%)	17,17,59	1.31	2 (11%)
6	CLR	B	1118	-	31,31,31	4.42	14 (45%)	48,48,48	2.60	16 (33%)
5	POV	C	1103	-	34,34,51	1.39	5 (14%)	40,42,59	1.25	4 (10%)
5	POV	A	1105	-	12,12,51	0.95	1 (8%)	12,12,59	1.17	0
5	POV	G	2304	-	14,14,51	1.48	3 (21%)	17,17,59	1.30	2 (11%)
5	POV	D	1110	-	12,12,51	0.94	1 (8%)	12,12,59	1.17	0
6	CLR	B	1117	-	31,31,31	4.33	14 (45%)	48,48,48	2.66	18 (37%)
5	POV	B	1111	-	35,35,51	1.36	5 (14%)	41,43,59	1.28	3 (7%)
6	CLR	A	1110	-	31,31,31	4.38	14 (45%)	48,48,48	2.61	16 (33%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	POV	B	1101	-	44,44,51	1.20	5 (11%)	50,52,59	1.24	4 (8%)
5	POV	A	1109	-	12,12,51	0.27	0	11,11,59	0.77	0
5	POV	B	1109	-	30,30,51	1.40	7 (23%)	33,35,59	1.46	4 (12%)
5	POV	C	1102	-	22,22,51	1.41	4 (18%)	25,25,59	1.33	2 (8%)
5	POV	A	1104	-	30,30,51	1.40	7 (23%)	33,35,59	1.46	4 (12%)
6	CLR	D	1116	-	31,31,31	4.41	15 (48%)	48,48,48	2.64	17 (35%)
8	NAG	G	2305	2	14,14,15	0.54	0	17,19,21	1.53	2 (11%)
8	NAG	H	2305	2	14,14,15	0.54	0	17,19,21	1.52	2 (11%)
8	NAG	F	2305	2	14,14,15	0.54	0	17,19,21	1.52	2 (11%)
5	POV	B	1105	-	39,39,51	1.16	4 (10%)	45,47,59	1.20	3 (6%)
5	POV	B	1114	-	12,12,51	0.27	0	11,11,59	0.77	0
5	POV	D	1103	-	34,34,51	1.38	5 (14%)	40,42,59	1.25	4 (10%)
5	POV	D	1114	-	12,12,51	0.27	0	11,11,59	0.77	0
8	NAG	H	2306	2	14,14,15	0.56	0	17,19,21	1.05	1 (5%)
6	CLR	C	1116	-	31,31,31	4.40	15 (48%)	48,48,48	2.64	17 (35%)
5	POV	D	1109	-	30,30,51	1.40	7 (23%)	33,35,59	1.46	4 (12%)
5	POV	B	1104	-	31,31,51	1.25	4 (12%)	37,39,59	1.18	3 (8%)
5	POV	B	1113	-	7,7,51	0.26	0	6,6,59	0.77	0
5	POV	G	2303	-	8,8,51	0.31	0	7,7,59	0.79	0
6	CLR	D	1117	-	31,31,31	4.33	14 (45%)	48,48,48	2.66	18 (37%)
6	CLR	C	1115	-	31,31,31	4.38	14 (45%)	48,48,48	2.62	16 (33%)
6	CLR	A	1112	-	31,31,31	4.33	14 (45%)	48,48,48	2.66	18 (37%)
5	POV	A	1107	-	23,23,51	1.45	1 (4%)	28,30,59	1.36	3 (10%)
5	POV	D	1113	-	7,7,51	0.26	0	6,6,59	0.77	0
5	POV	A	1118	-	44,44,51	1.19	5 (11%)	50,52,59	1.24	4 (8%)
6	CLR	D	1115	-	31,31,31	4.39	14 (45%)	48,48,48	2.62	16 (33%)
5	POV	C	1114	-	12,12,51	0.27	0	11,11,59	0.77	0
5	POV	D	1101	-	44,44,51	1.19	5 (11%)	50,52,59	1.24	4 (8%)
5	POV	B	1112	-	23,23,51	1.45	2 (8%)	28,30,59	1.36	3 (10%)
5	POV	H	2301	-	51,51,51	1.14	5 (9%)	57,59,59	1.16	3 (5%)
5	POV	A	1108	-	7,7,51	0.27	0	6,6,59	0.78	0
8	NAG	F	2306	2	14,14,15	0.56	0	17,19,21	1.05	1 (5%)
5	POV	E	2303	-	8,8,51	0.30	0	7,7,59	0.79	0
6	CLR	C	1118	-	31,31,31	4.41	14 (45%)	48,48,48	2.60	16 (33%)
5	POV	A	1122	-	39,39,51	1.16	4 (10%)	45,47,59	1.20	3 (6%)
6	CLR	A	1113	-	31,31,31	4.41	14 (45%)	48,48,48	2.60	15 (31%)
5	POV	G	2302	-	7,7,51	0.27	0	6,6,59	0.76	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	POV	D	1111	-	35,35,51	1.36	5 (14%)	41,43,59	1.28	3 (7%)
8	NAG	E	2306	2	14,14,15	0.56	0	17,19,21	1.05	1 (5%)
6	CLR	A	1111	-	31,31,31	4.41	15 (48%)	48,48,48	2.64	17 (35%)
6	CLR	C	1117	-	31,31,31	4.33	14 (45%)	48,48,48	2.66	18 (37%)
5	POV	C	1113	-	7,7,51	0.27	0	6,6,59	0.78	0
5	POV	B	1110	-	12,12,51	0.94	1 (8%)	12,12,59	1.17	0
6	CLR	B	1116	-	31,31,31	4.41	15 (48%)	48,48,48	2.64	17 (35%)
5	POV	H	2303	-	8,8,51	0.30	0	7,7,59	0.79	0
8	NAG	G	2306	2	14,14,15	0.56	0	17,19,21	1.04	1 (5%)
5	POV	F	2304	-	14,14,51	1.48	3 (21%)	17,17,59	1.31	2 (11%)
5	POV	D	1105	-	39,39,51	1.16	5 (12%)	45,47,59	1.20	3 (6%)
5	POV	E	2302	-	7,7,51	0.27	0	6,6,59	0.76	0
5	POV	A	1119	-	22,22,51	1.41	4 (18%)	25,25,59	1.33	2 (8%)
5	POV	F	2303	-	8,8,51	0.30	0	7,7,59	0.79	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	POV	A	1106	-	-	21/39/39/55	-
5	POV	D	1104	-	-	14/35/35/55	-
5	POV	C	1111	-	-	21/39/39/55	-
6	CLR	D	1118	-	-	7/10/68/68	0/4/4/4
5	POV	G	2301	-	-	18/55/55/55	-
5	POV	F	2302	-	-	1/5/5/55	-
5	POV	E	2301	-	-	18/55/55/55	-
5	POV	B	1103	-	-	12/38/38/55	-
5	POV	D	1112	-	-	12/25/25/55	-
5	POV	C	1109	-	-	17/32/32/55	-
5	POV	B	1102	-	-	9/21/21/55	-
5	POV	F	2301	-	-	18/55/55/55	-
5	POV	C	1112	-	-	12/25/25/55	-
5	POV	C	1101	-	-	30/48/48/55	-
8	NAG	E	2305	2	-	0/6/23/26	0/1/1/1
5	POV	C	1104	-	-	14/35/35/55	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	POV	D	1102	-	-	9/21/21/55	-
6	CLR	B	1115	-	-	8/10/68/68	0/4/4/4
5	POV	H	2304	-	-	3/13/13/55	-
5	POV	H	2302	-	-	1/5/5/55	-
5	POV	A	1120	-	-	12/38/38/55	-
5	POV	C	1110	-	-	4/10/10/55	-
5	POV	C	1105	-	-	23/43/43/55	-
5	POV	A	1121	-	-	14/35/35/55	-
5	POV	E	2304	-	-	3/13/13/55	-
6	CLR	B	1118	-	-	7/10/68/68	0/4/4/4
5	POV	C	1103	-	-	12/38/38/55	-
5	POV	A	1105	-	-	4/10/10/55	-
5	POV	G	2304	-	-	3/13/13/55	-
5	POV	D	1110	-	-	4/10/10/55	-
6	CLR	B	1117	-	-	5/10/68/68	0/4/4/4
5	POV	B	1111	-	-	21/39/39/55	-
6	CLR	A	1110	-	-	8/10/68/68	0/4/4/4
5	POV	B	1101	-	-	30/48/48/55	-
5	POV	A	1109	-	-	4/10/10/55	-
5	POV	B	1109	-	-	17/32/32/55	-
5	POV	C	1102	-	-	9/21/21/55	-
5	POV	A	1104	-	-	17/32/32/55	-
6	CLR	D	1116	-	-	5/10/68/68	0/4/4/4
8	NAG	G	2305	2	-	0/6/23/26	0/1/1/1
8	NAG	H	2305	2	-	0/6/23/26	0/1/1/1
8	NAG	F	2305	2	-	0/6/23/26	0/1/1/1
5	POV	B	1105	-	-	23/43/43/55	-
5	POV	B	1114	-	-	4/10/10/55	-
5	POV	D	1103	-	-	12/38/38/55	-
5	POV	D	1114	-	-	4/10/10/55	-
8	NAG	H	2306	2	-	2/6/23/26	0/1/1/1
6	CLR	C	1116	-	-	5/10/68/68	0/4/4/4
5	POV	D	1109	-	-	17/32/32/55	-
5	POV	B	1104	-	-	14/35/35/55	-
5	POV	B	1113	-	-	1/5/5/55	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	POV	G	2303	-	-	3/6/6/55	-
6	CLR	D	1117	-	-	5/10/68/68	0/4/4/4
6	CLR	C	1115	-	-	8/10/68/68	0/4/4/4
6	CLR	A	1112	-	-	5/10/68/68	0/4/4/4
5	POV	A	1107	-	-	12/25/25/55	-
5	POV	D	1113	-	-	1/5/5/55	-
5	POV	A	1118	-	-	30/48/48/55	-
6	CLR	D	1115	-	-	8/10/68/68	0/4/4/4
5	POV	C	1114	-	-	4/10/10/55	-
5	POV	D	1101	-	-	30/48/48/55	-
5	POV	B	1112	-	-	12/25/25/55	-
5	POV	H	2301	-	-	18/55/55/55	-
5	POV	A	1108	-	-	1/5/5/55	-
8	NAG	F	2306	2	-	2/6/23/26	0/1/1/1
5	POV	E	2303	-	-	3/6/6/55	-
6	CLR	C	1118	-	-	7/10/68/68	0/4/4/4
5	POV	A	1122	-	-	23/43/43/55	-
6	CLR	A	1113	-	-	7/10/68/68	0/4/4/4
5	POV	G	2302	-	-	1/5/5/55	-
5	POV	D	1111	-	-	21/39/39/55	-
8	NAG	E	2306	2	-	2/6/23/26	0/1/1/1
6	CLR	A	1111	-	-	5/10/68/68	0/4/4/4
6	CLR	C	1117	-	-	5/10/68/68	0/4/4/4
5	POV	C	1113	-	-	1/5/5/55	-
5	POV	B	1110	-	-	4/10/10/55	-
6	CLR	B	1116	-	-	5/10/68/68	0/4/4/4
5	POV	H	2303	-	-	3/6/6/55	-
8	NAG	G	2306	2	-	2/6/23/26	0/1/1/1
5	POV	F	2304	-	-	3/13/13/55	-
5	POV	D	1105	-	-	23/43/43/55	-
5	POV	E	2302	-	-	1/5/5/55	-
5	POV	A	1119	-	-	9/21/21/55	-
5	POV	F	2303	-	-	3/6/6/55	-

The worst 5 of 406 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	1113	CLR	C6-C5	11.92	1.57	1.33
6	C	1118	CLR	C6-C5	11.92	1.57	1.33
6	B	1118	CLR	C6-C5	11.91	1.57	1.33
6	D	1118	CLR	C6-C5	11.91	1.57	1.33
6	A	1111	CLR	C6-C5	11.80	1.57	1.33

The worst 5 of 403 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	A	1113	CLR	C4-C5-C6	-9.81	107.27	120.57
6	C	1118	CLR	C4-C5-C6	-9.81	107.27	120.57
6	B	1118	CLR	C4-C5-C6	-9.81	107.27	120.57
6	D	1118	CLR	C4-C5-C6	-9.81	107.27	120.57
6	A	1112	CLR	C4-C5-C6	-9.56	107.62	120.57

There are no chirality outliers.

5 of 796 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	1104	POV	O21-C2-C3-O31
5	A	1104	POV	C211-C210-C29-C28
5	A	1106	POV	C1-O11-P-O12
5	A	1106	POV	C1-O11-P-O13
5	A	1106	POV	C211-C210-C29-C28

There are no ring outliers.

43 monomers are involved in 128 short contacts:

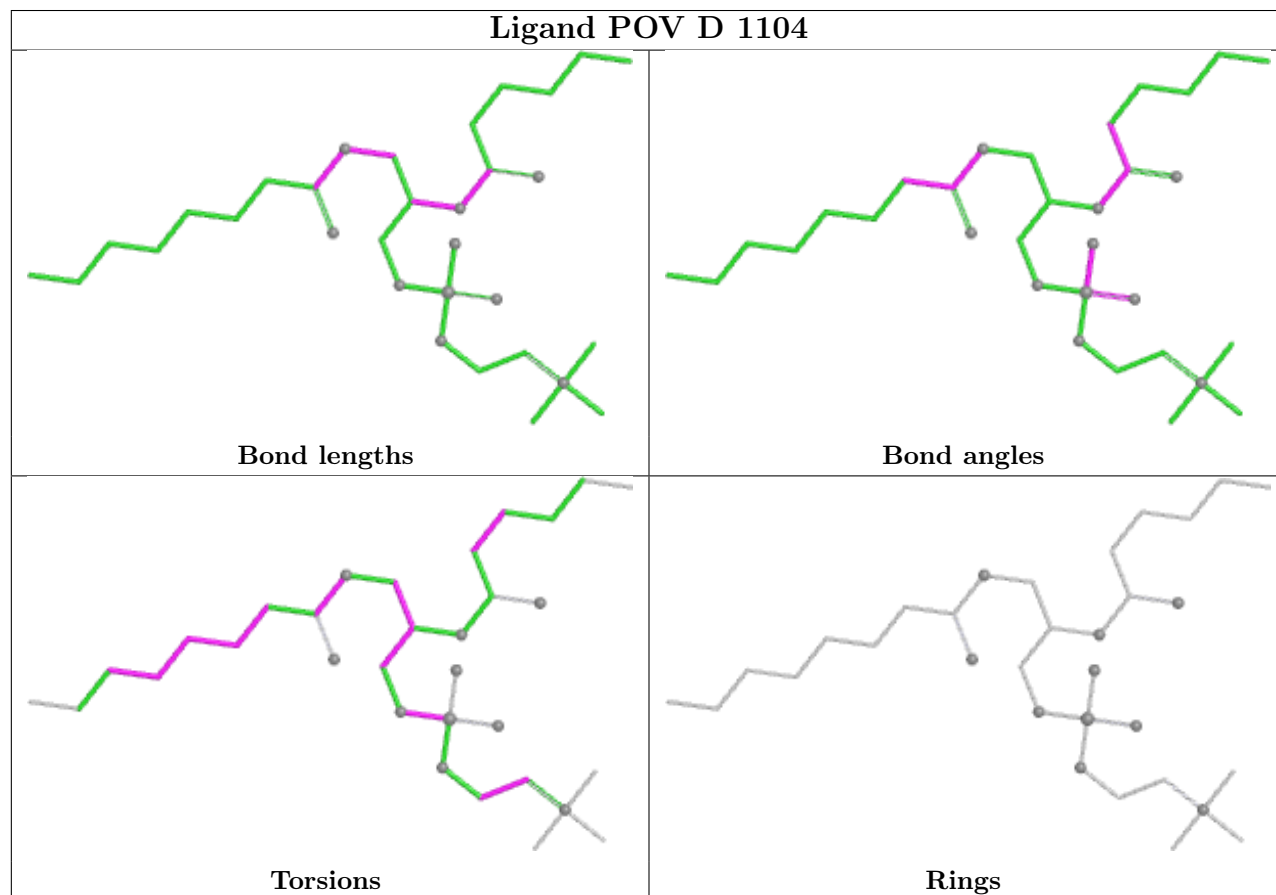
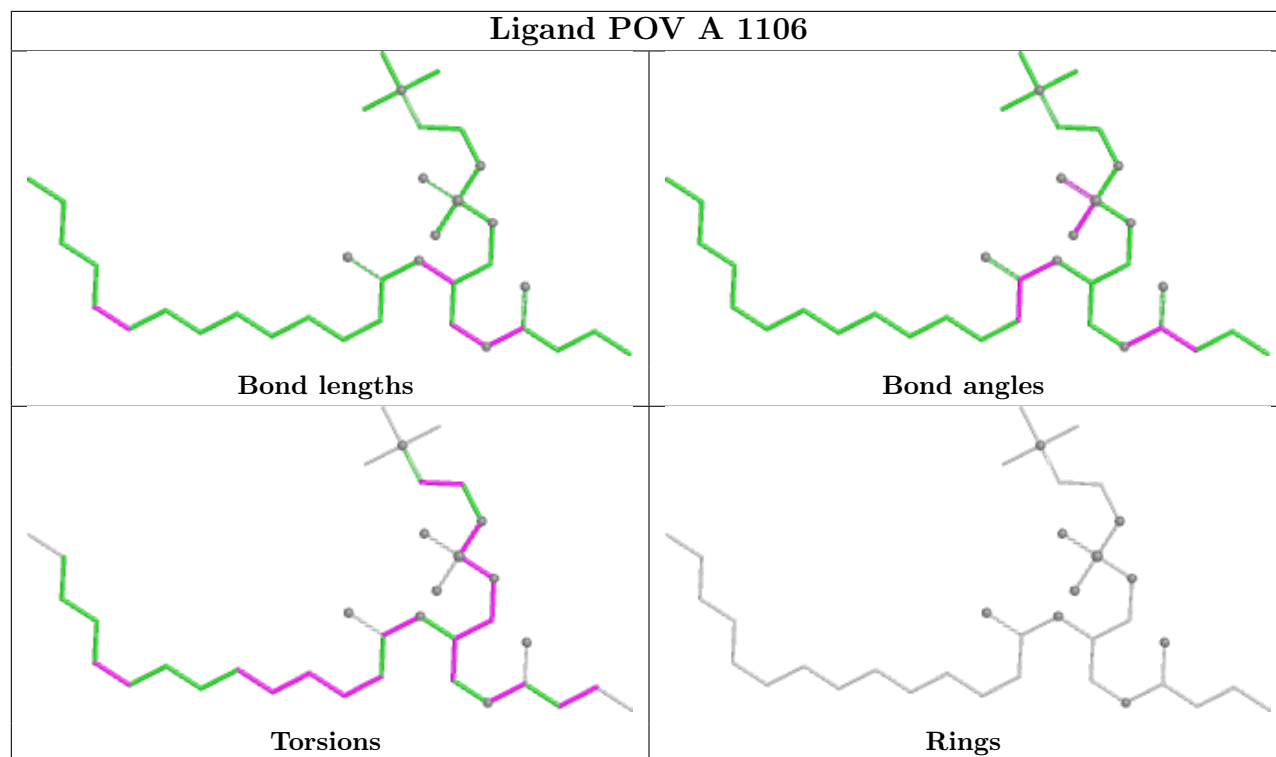
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1106	POV	1	0
5	D	1104	POV	2	0
5	C	1111	POV	1	0
6	D	1118	CLR	6	0
5	C	1109	POV	2	0
5	C	1101	POV	2	0
5	C	1104	POV	2	0
6	B	1115	CLR	7	0
5	A	1120	POV	1	0
5	C	1110	POV	1	0
5	C	1105	POV	1	0
5	A	1121	POV	2	0
6	B	1118	CLR	6	0

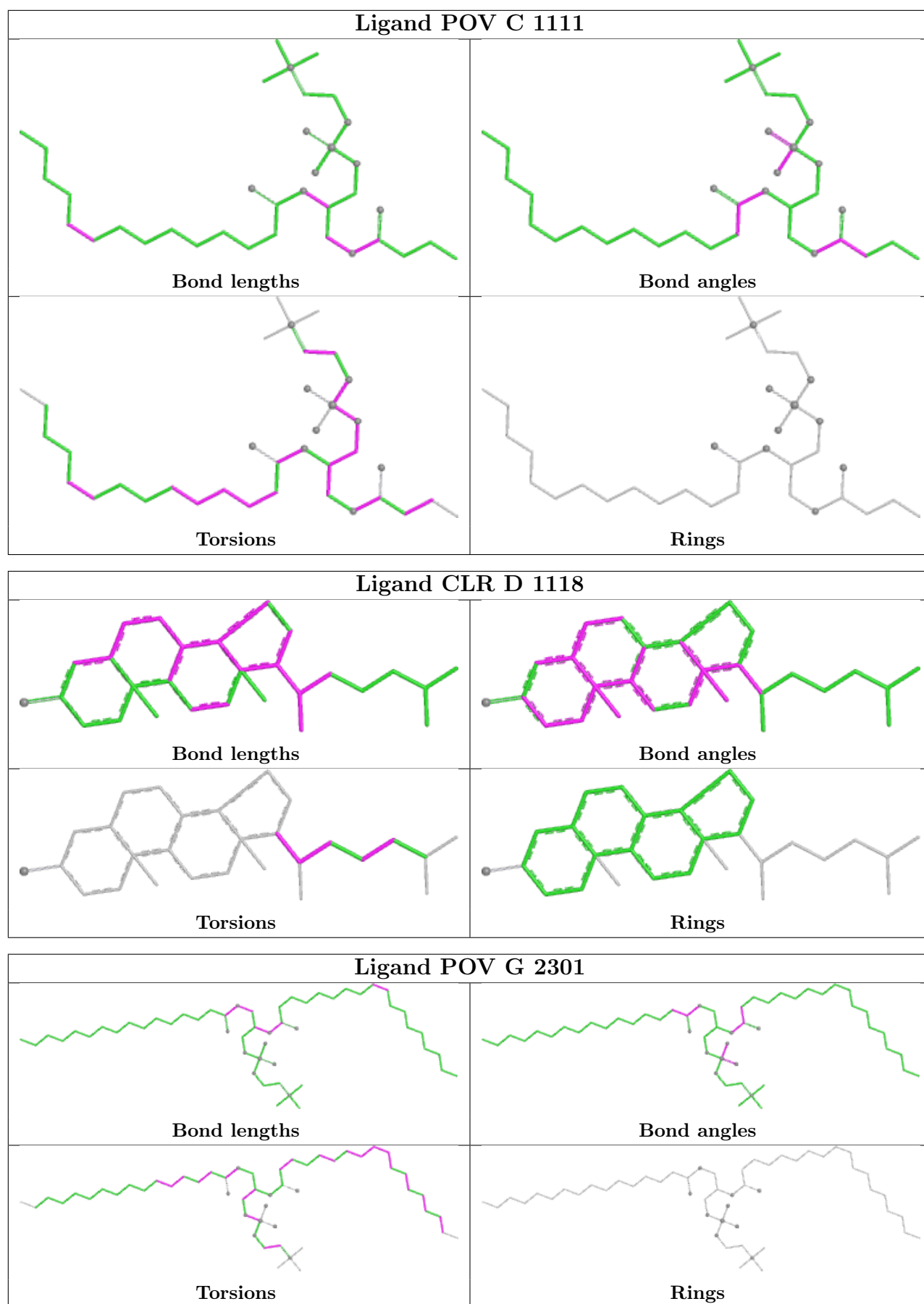
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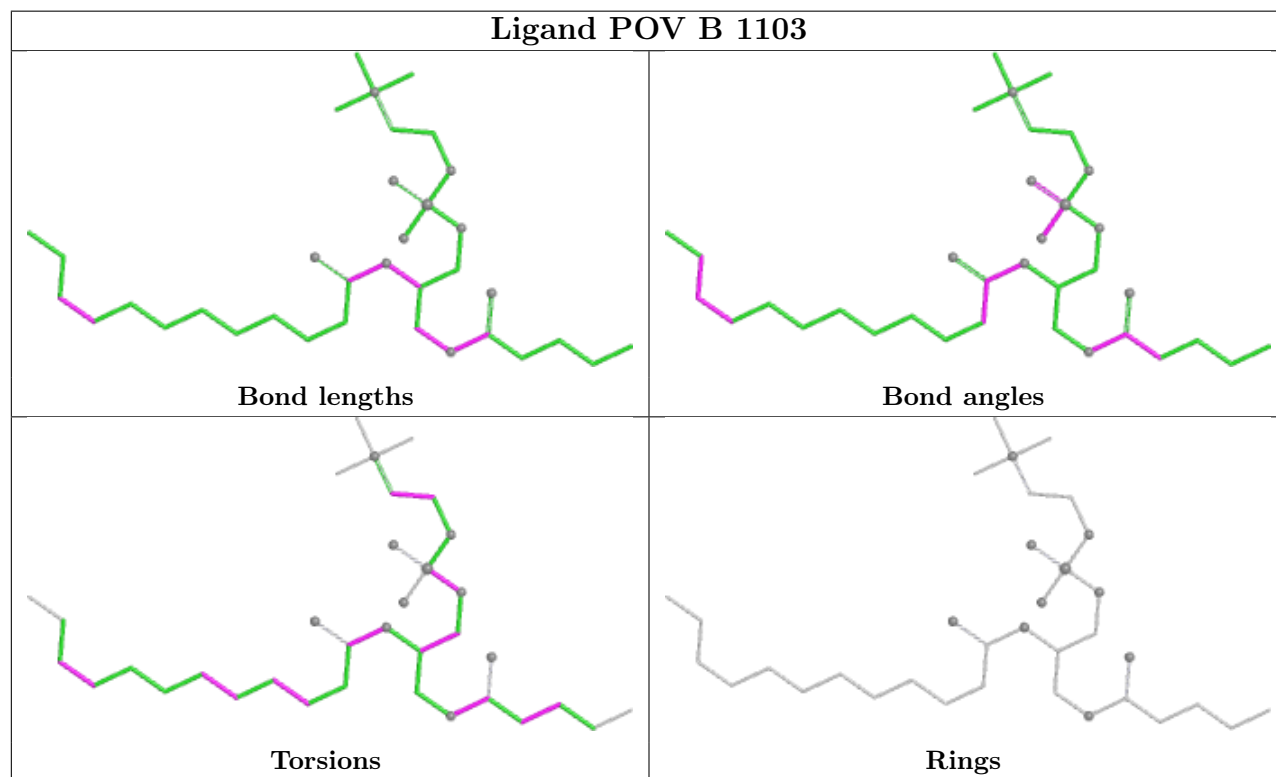
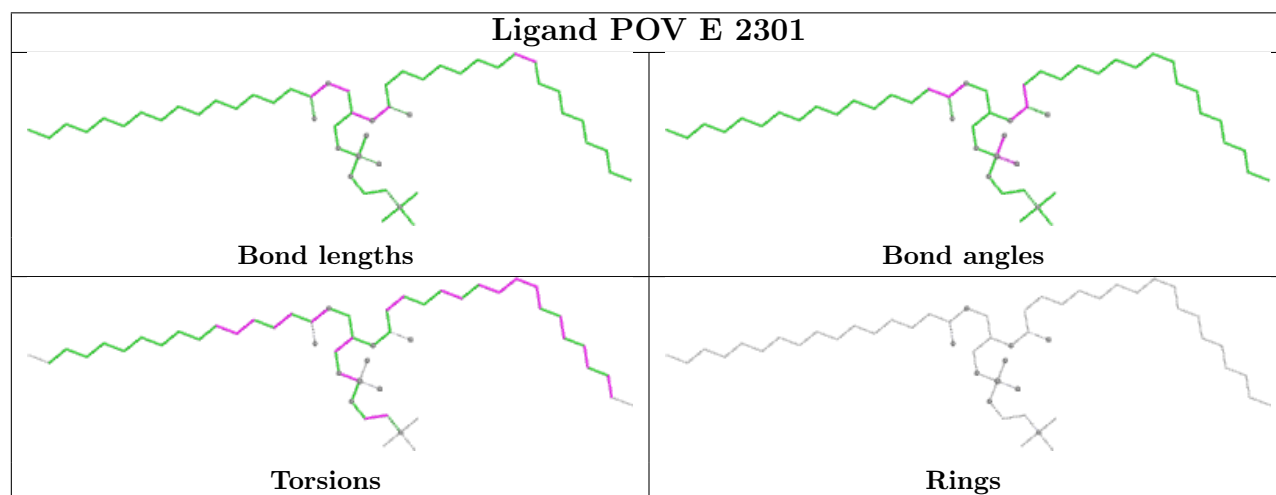
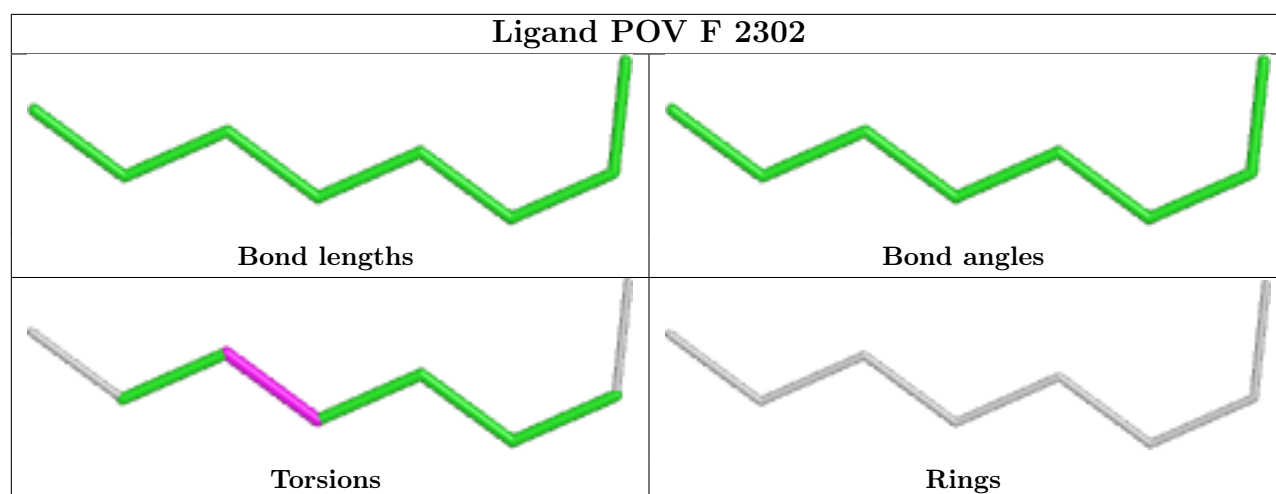
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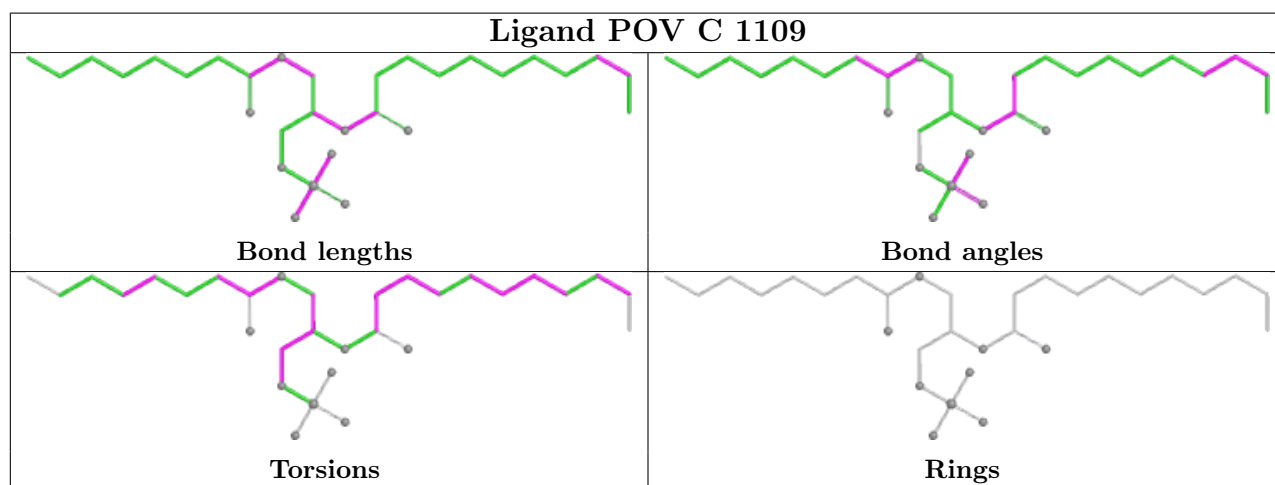
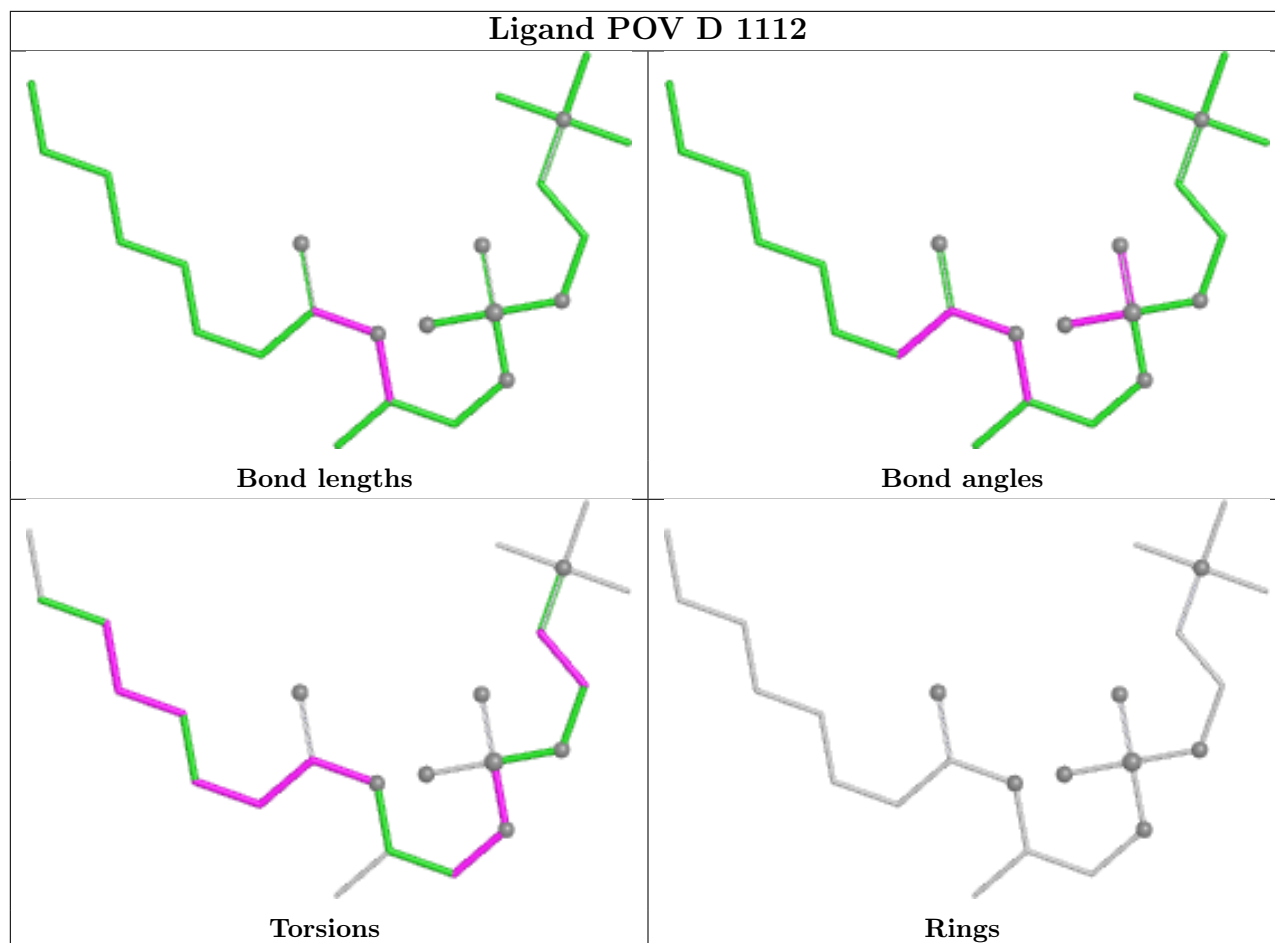
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1105	POV	1	0
5	D	1110	POV	1	0
6	B	1117	CLR	5	0
5	B	1111	POV	2	0
6	A	1110	CLR	8	0
5	B	1101	POV	2	0
5	B	1109	POV	1	0
5	A	1104	POV	1	0
6	D	1116	CLR	4	0
5	B	1105	POV	1	0
5	D	1103	POV	2	0
6	C	1116	CLR	4	0
5	D	1109	POV	2	0
5	B	1104	POV	2	0
6	D	1117	CLR	7	0
6	C	1115	CLR	8	0
6	A	1112	CLR	5	0
5	A	1118	POV	2	0
6	D	1115	CLR	7	0
5	D	1101	POV	2	0
5	B	1112	POV	1	0
6	C	1118	CLR	6	0
5	A	1122	POV	1	0
6	A	1113	CLR	6	0
5	D	1111	POV	1	0
6	A	1111	CLR	5	0
6	C	1117	CLR	4	0
5	B	1110	POV	1	0
6	B	1116	CLR	5	0
5	D	1105	POV	1	0

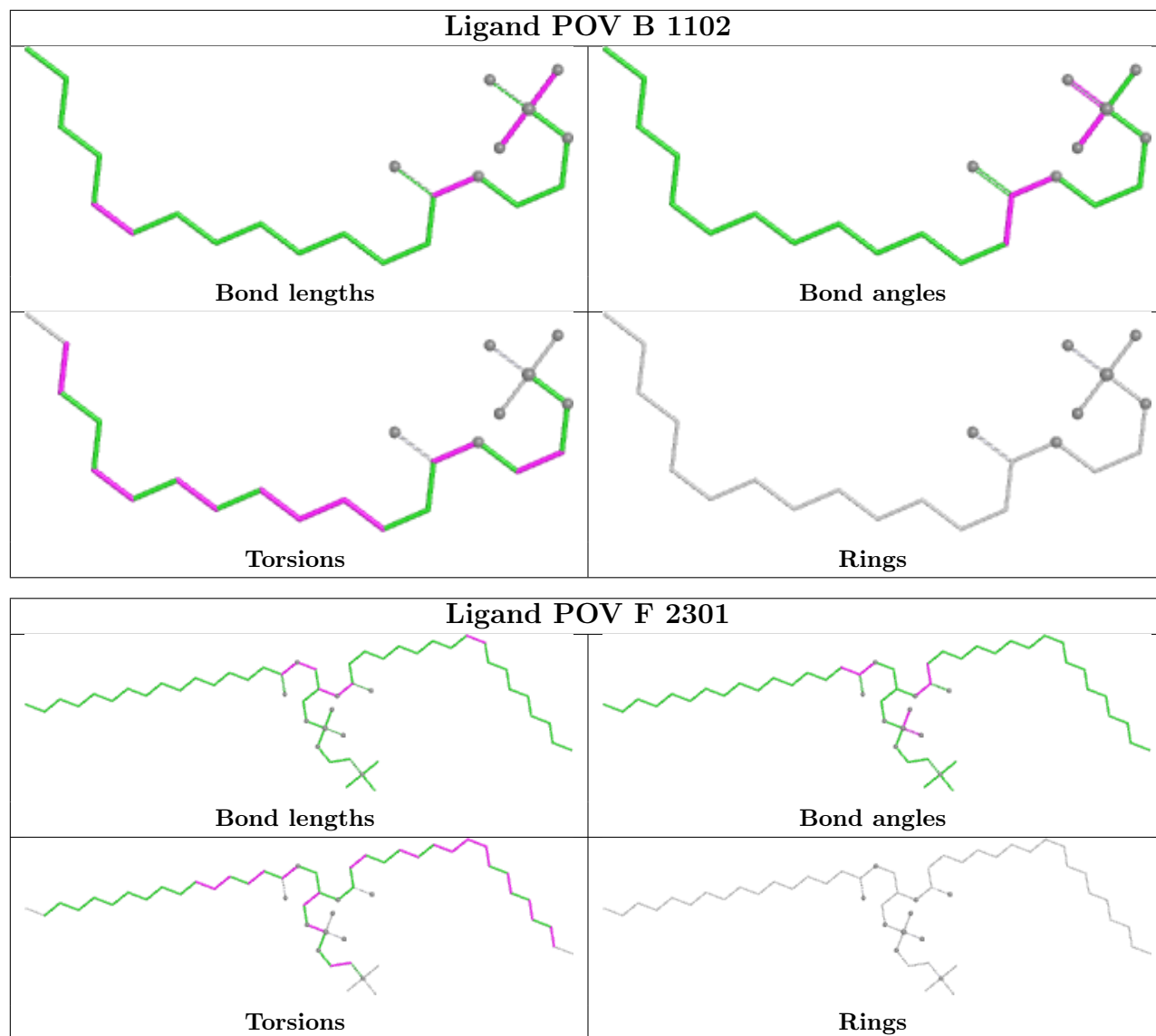
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

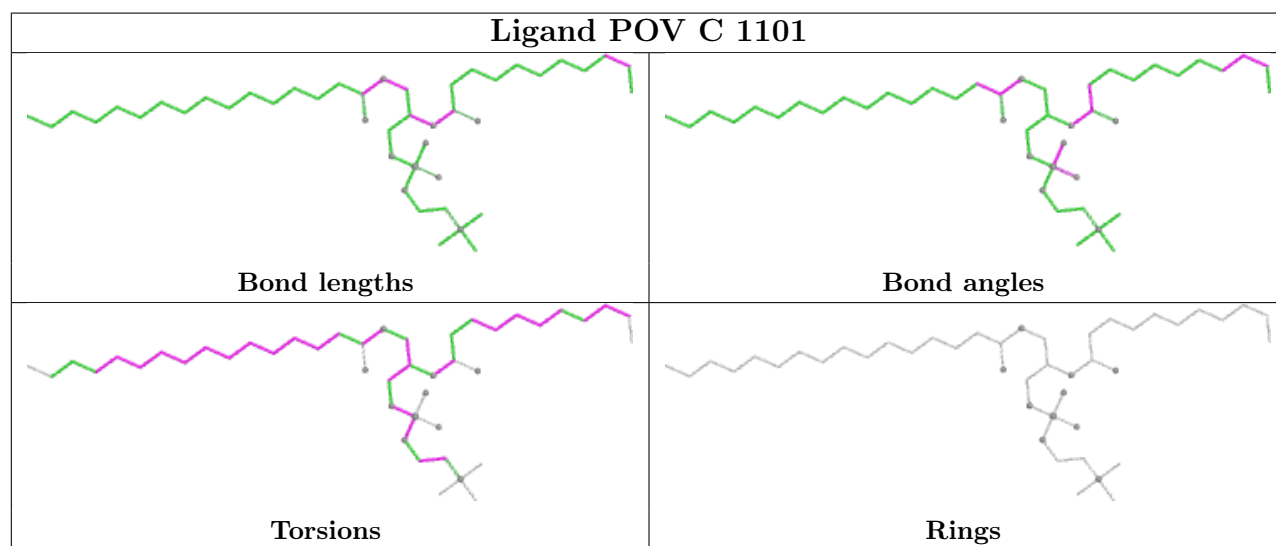
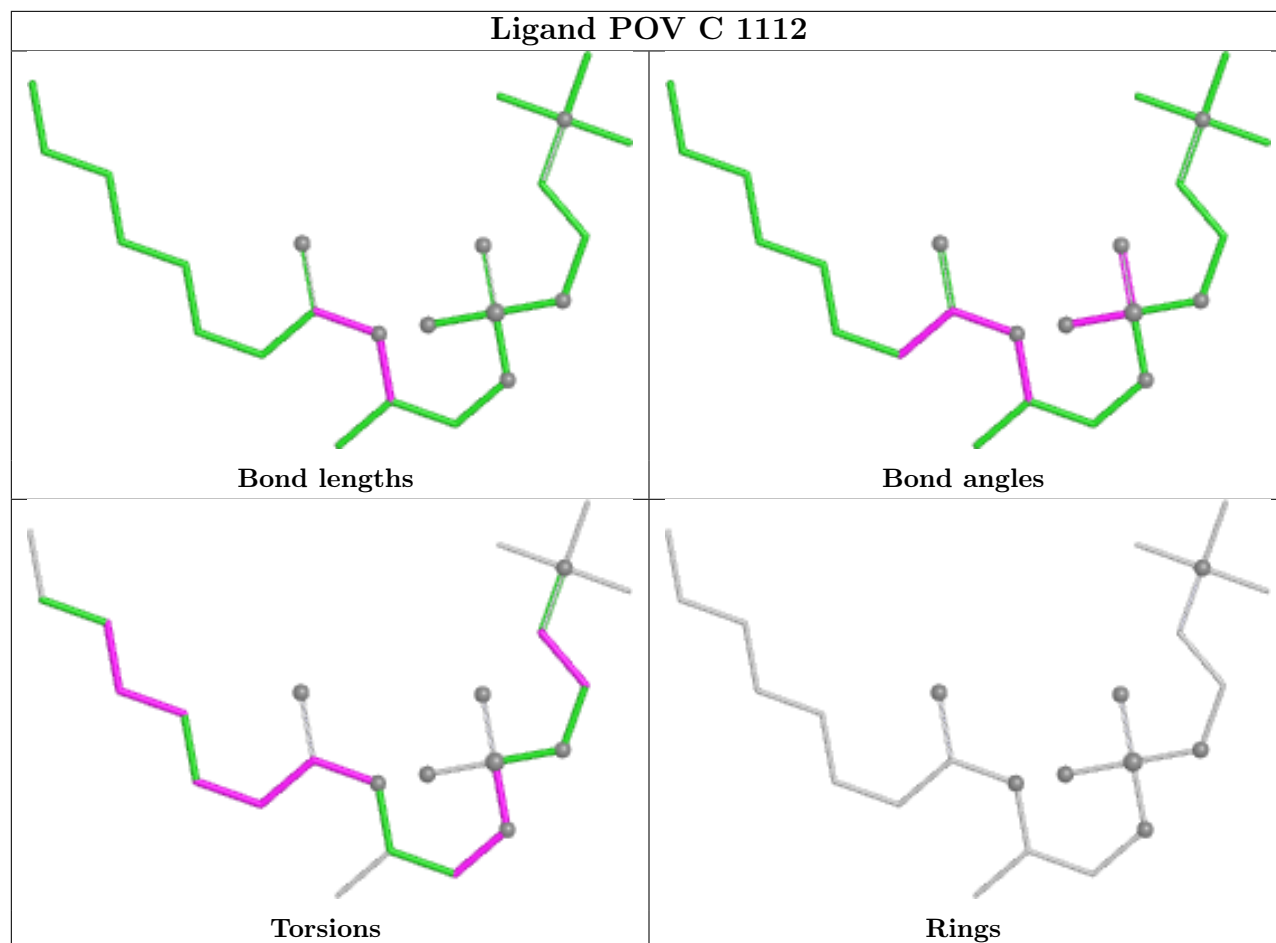


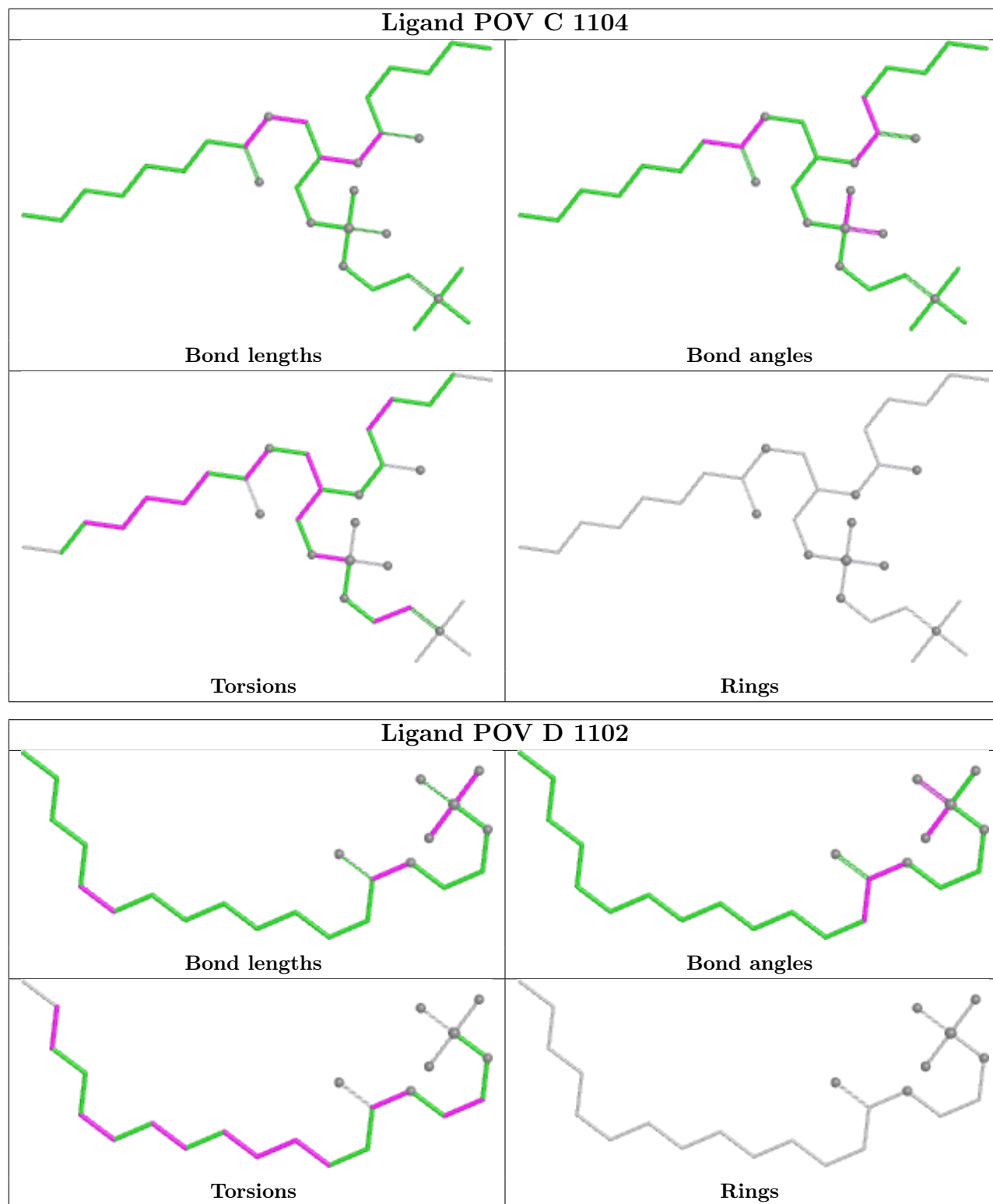


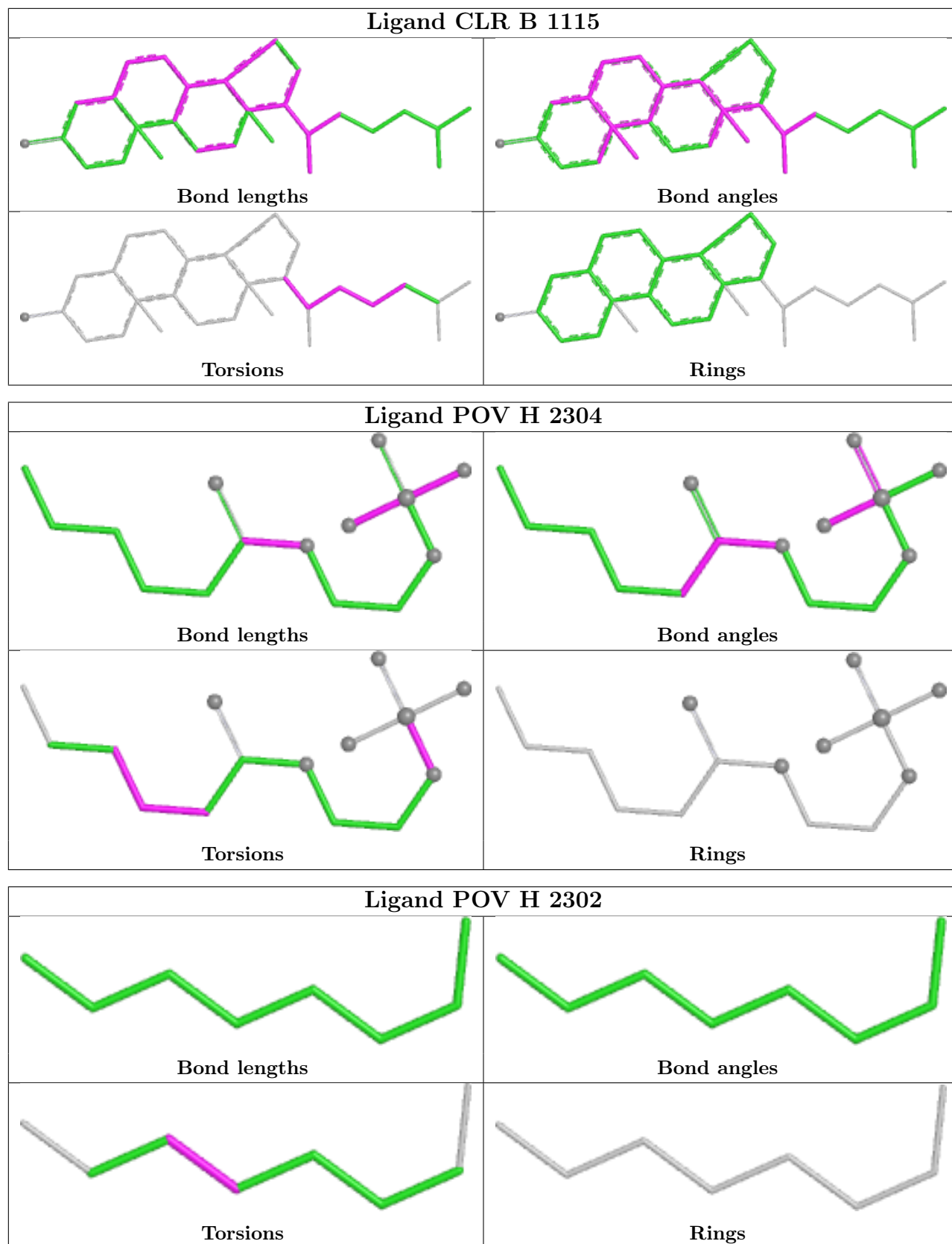


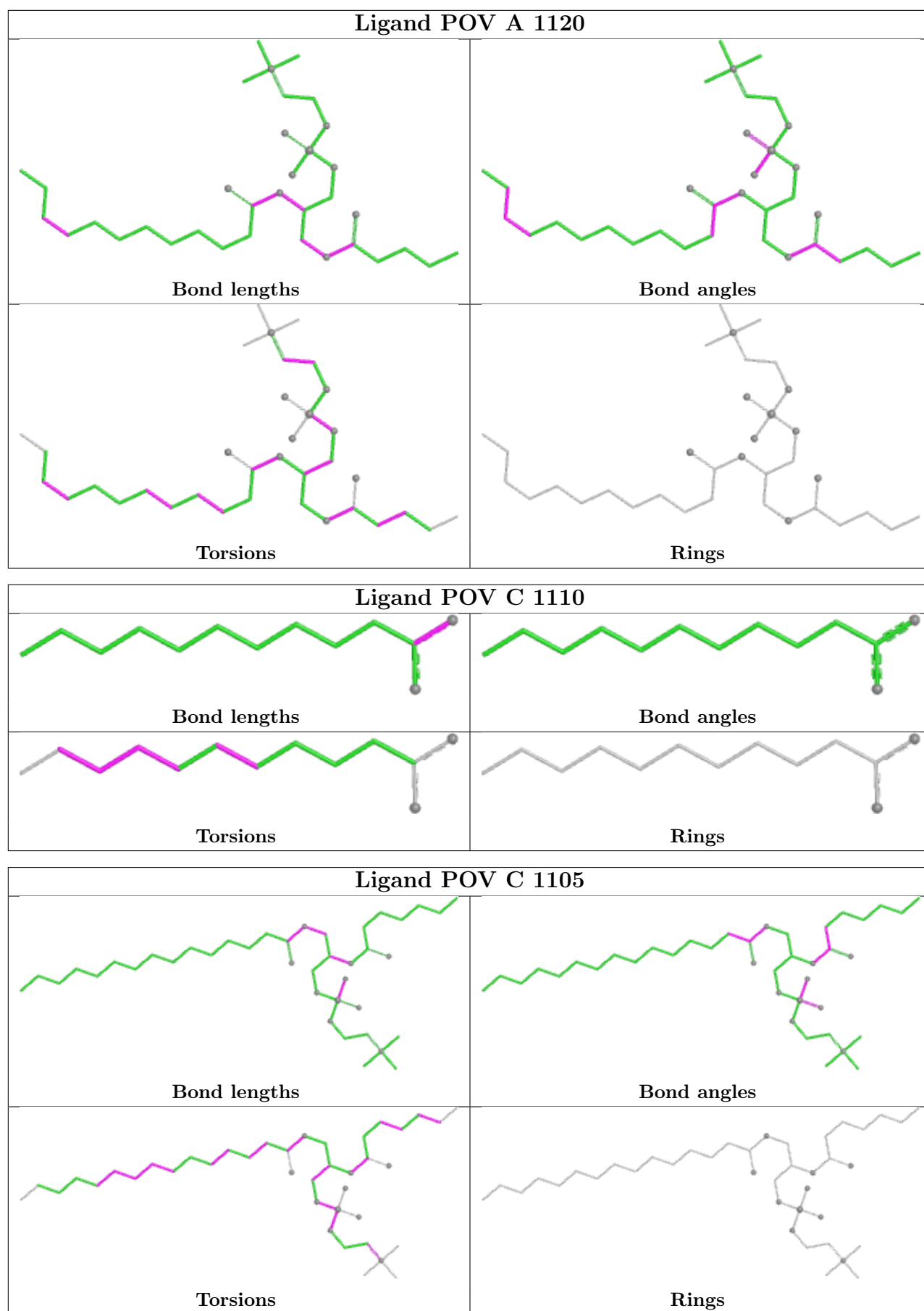


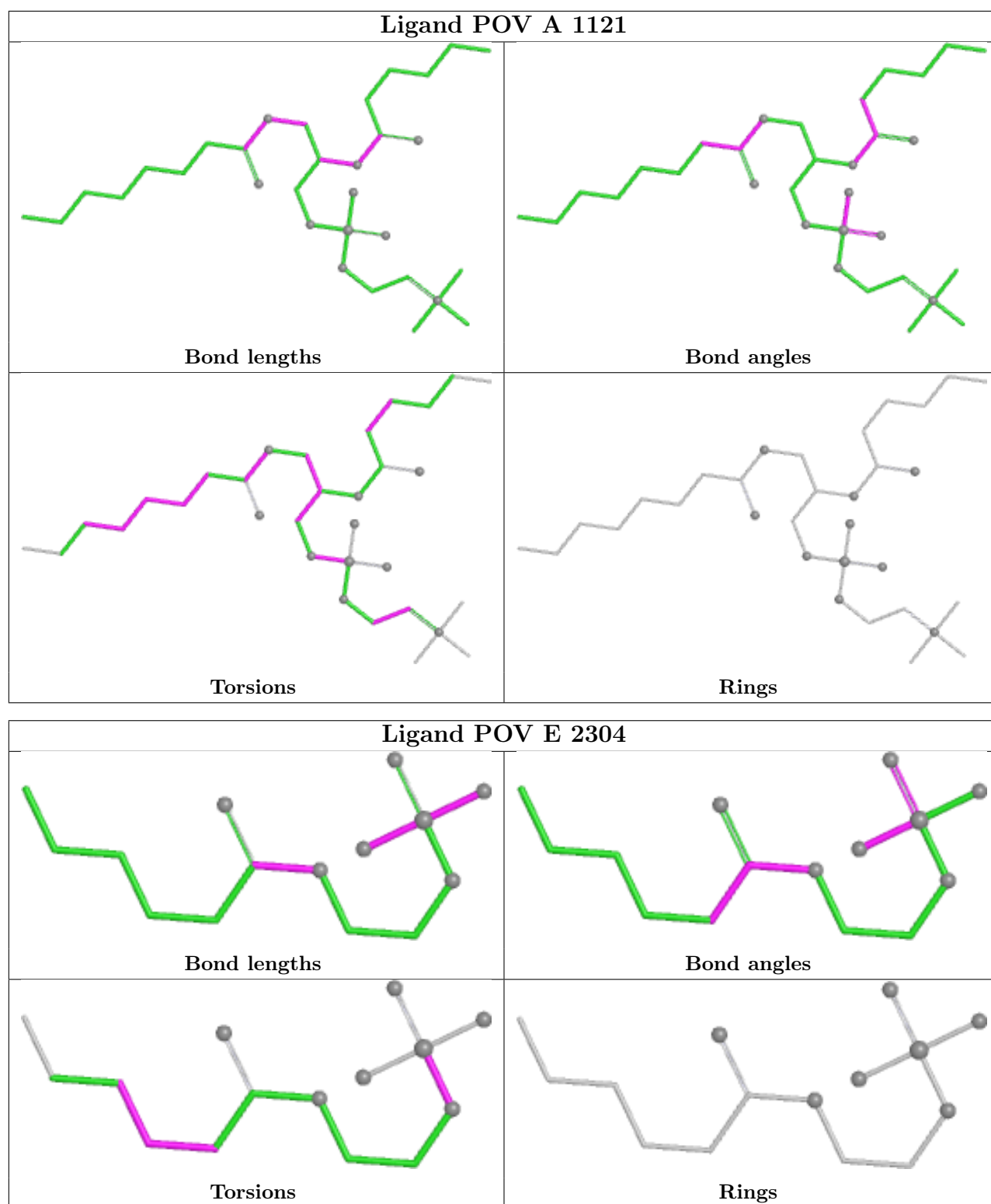


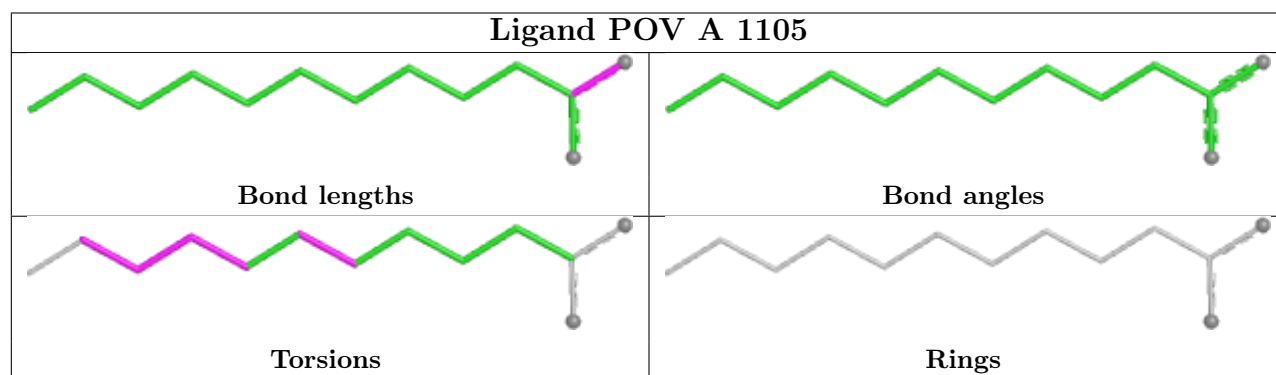
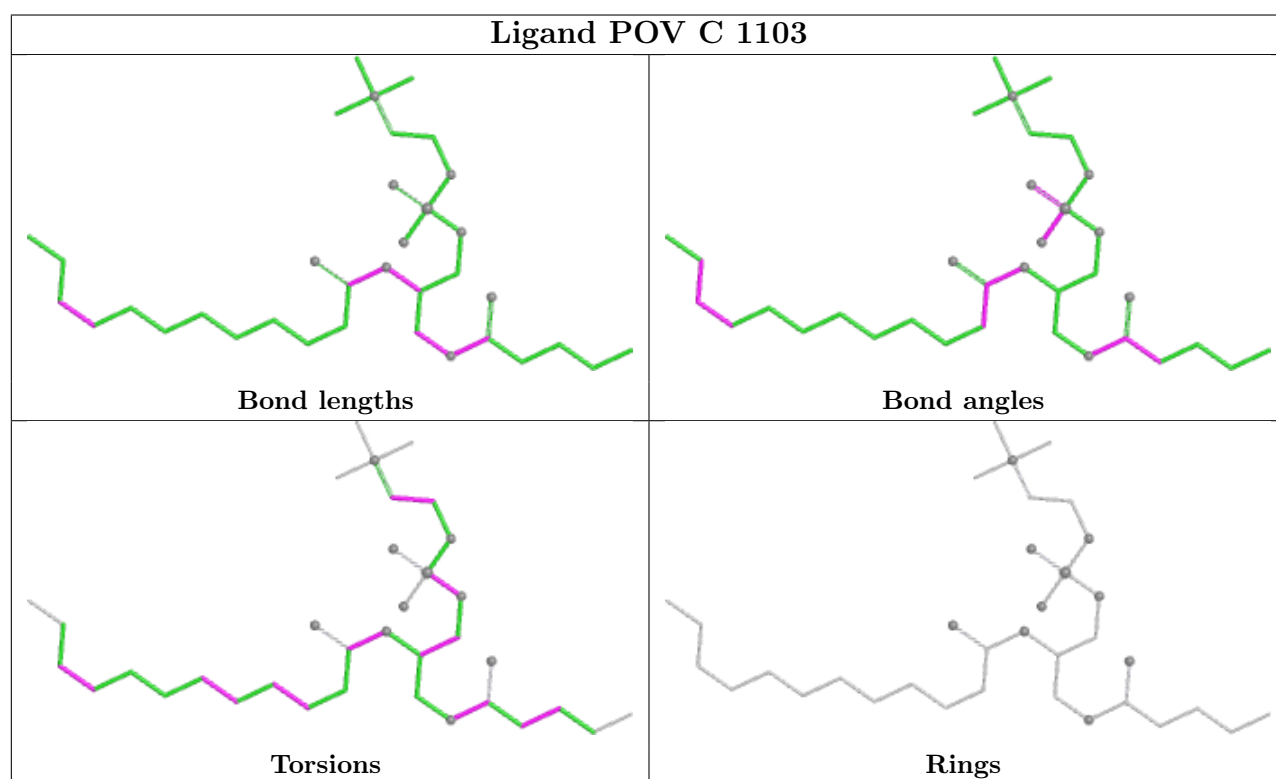
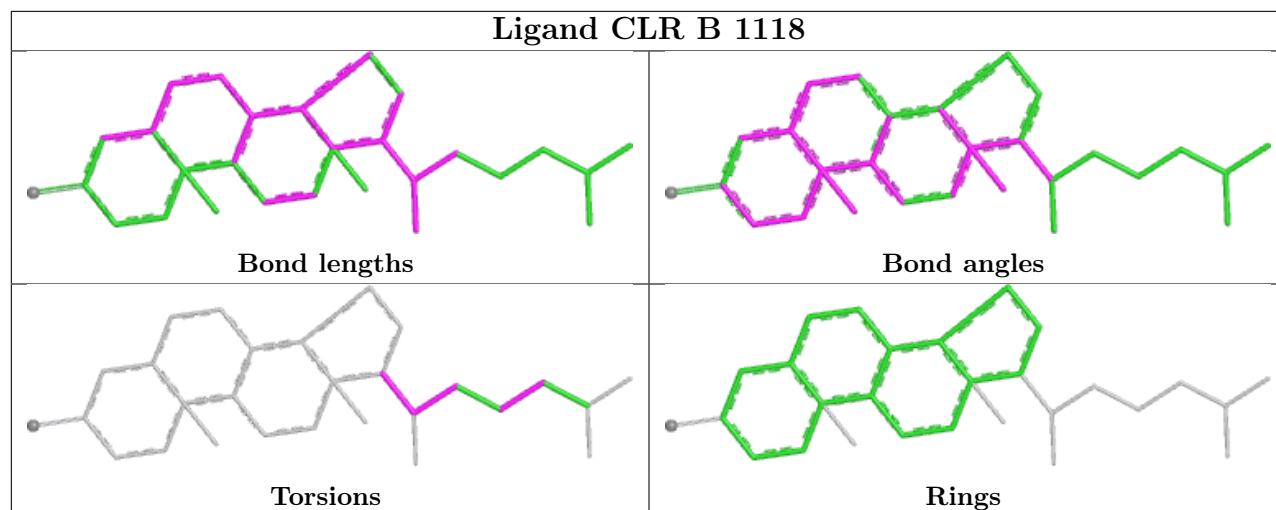


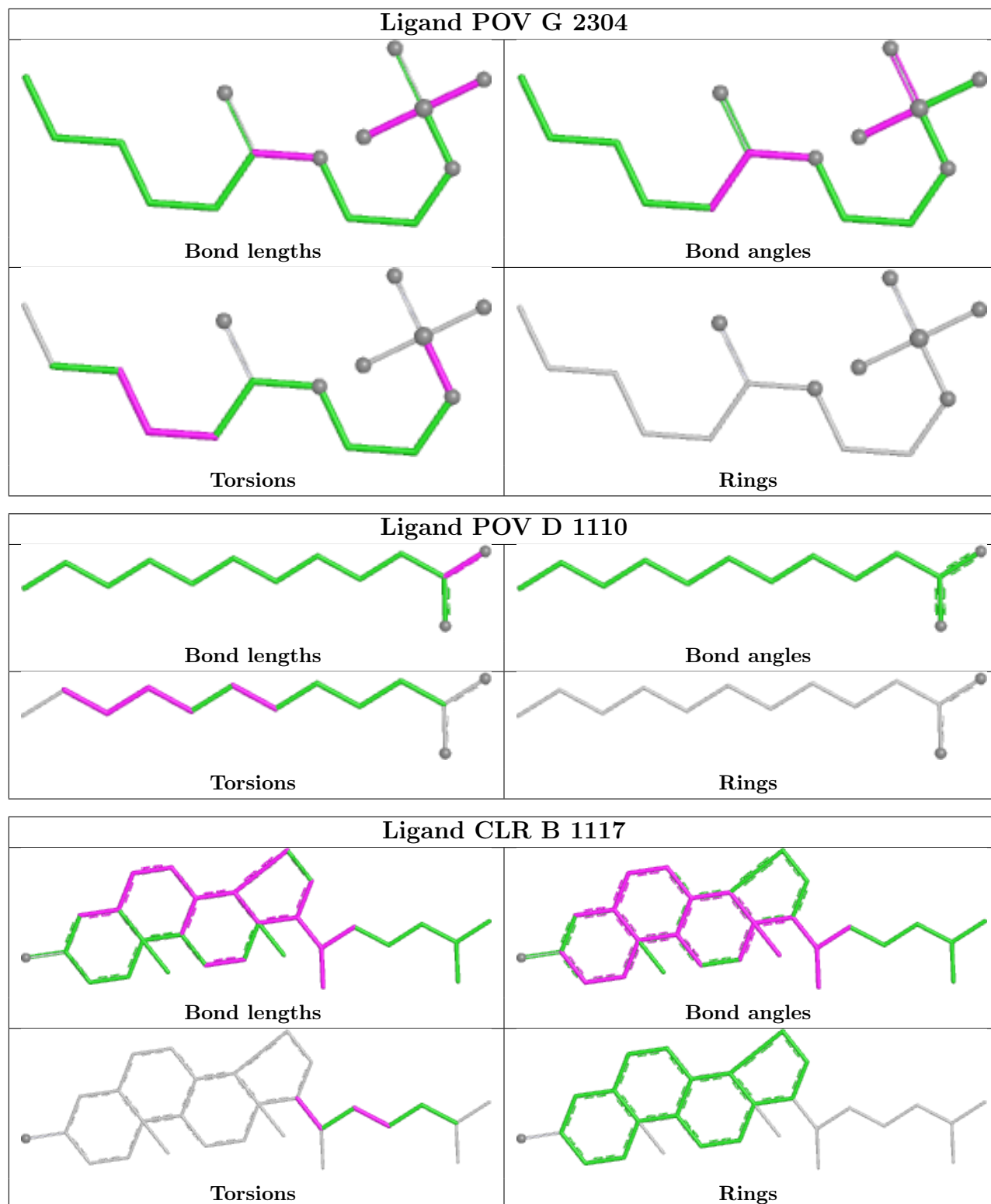


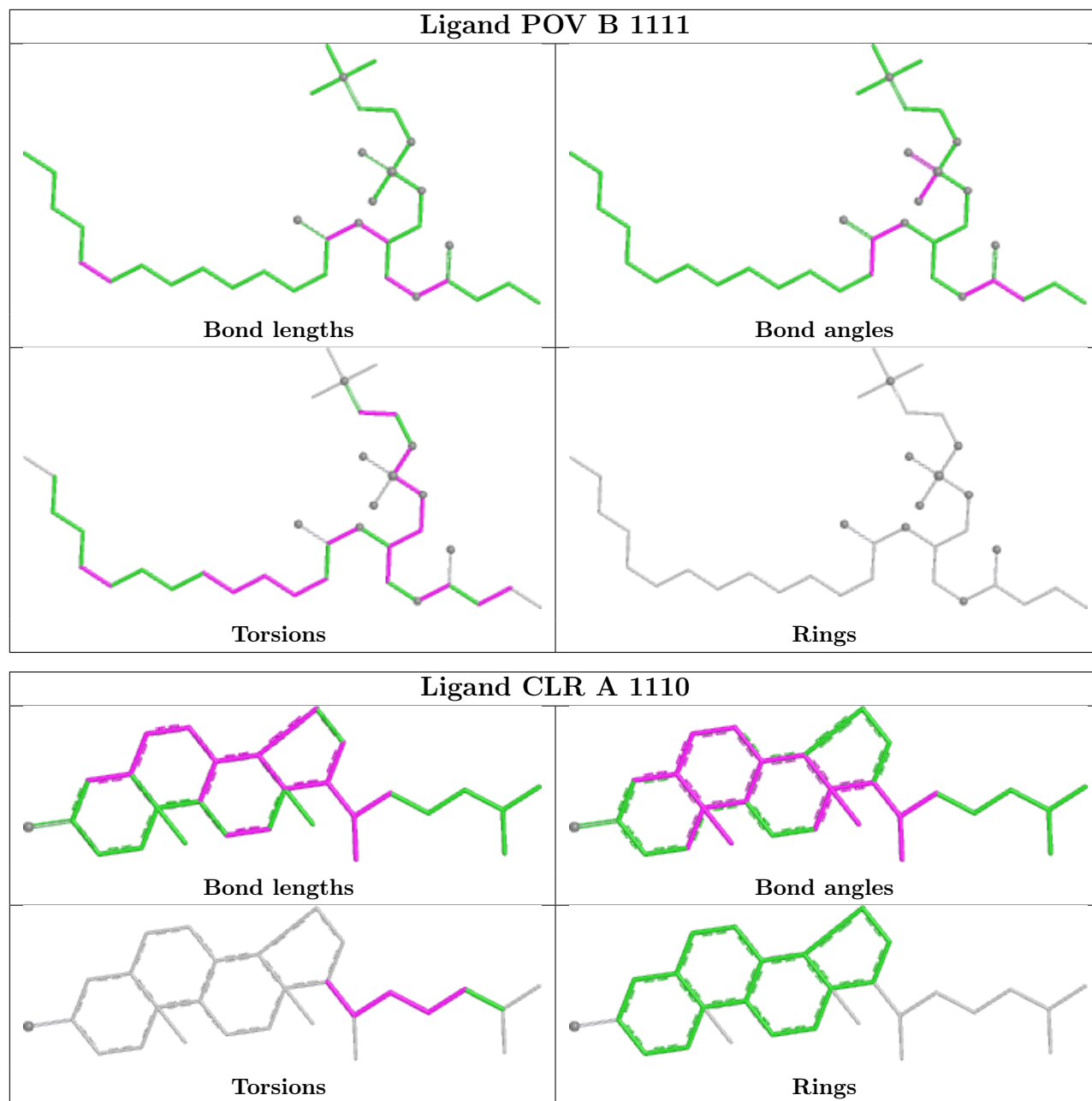


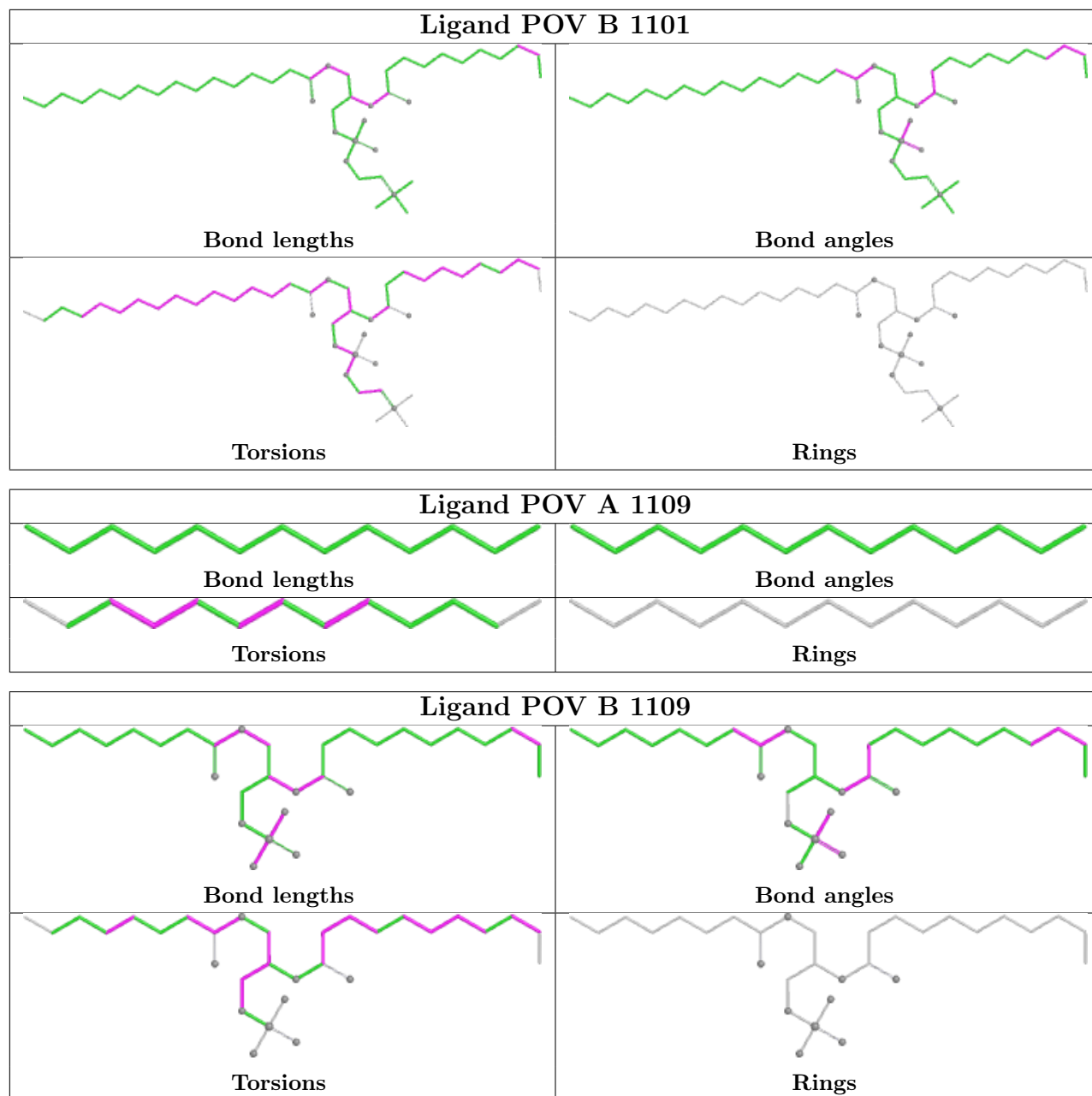


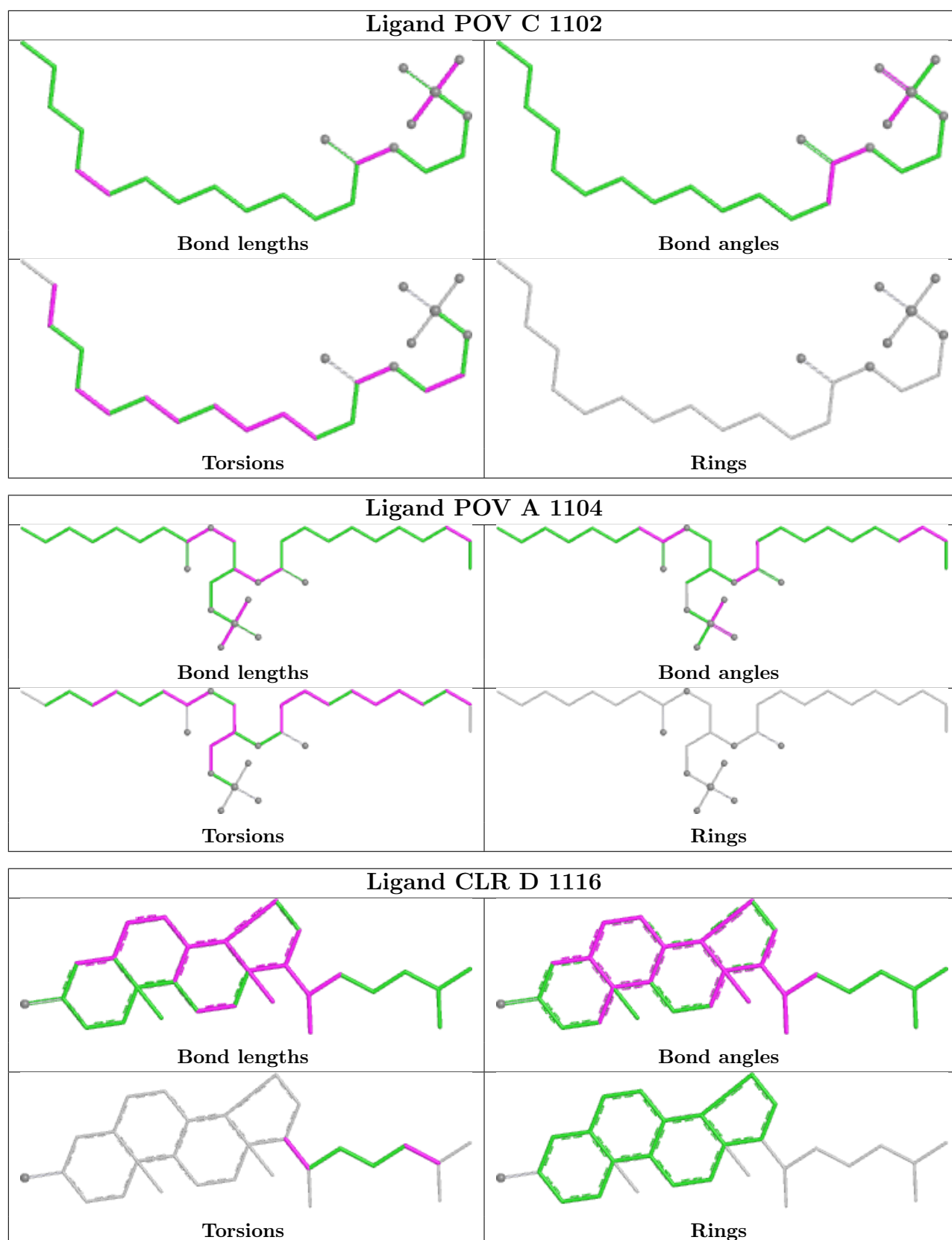


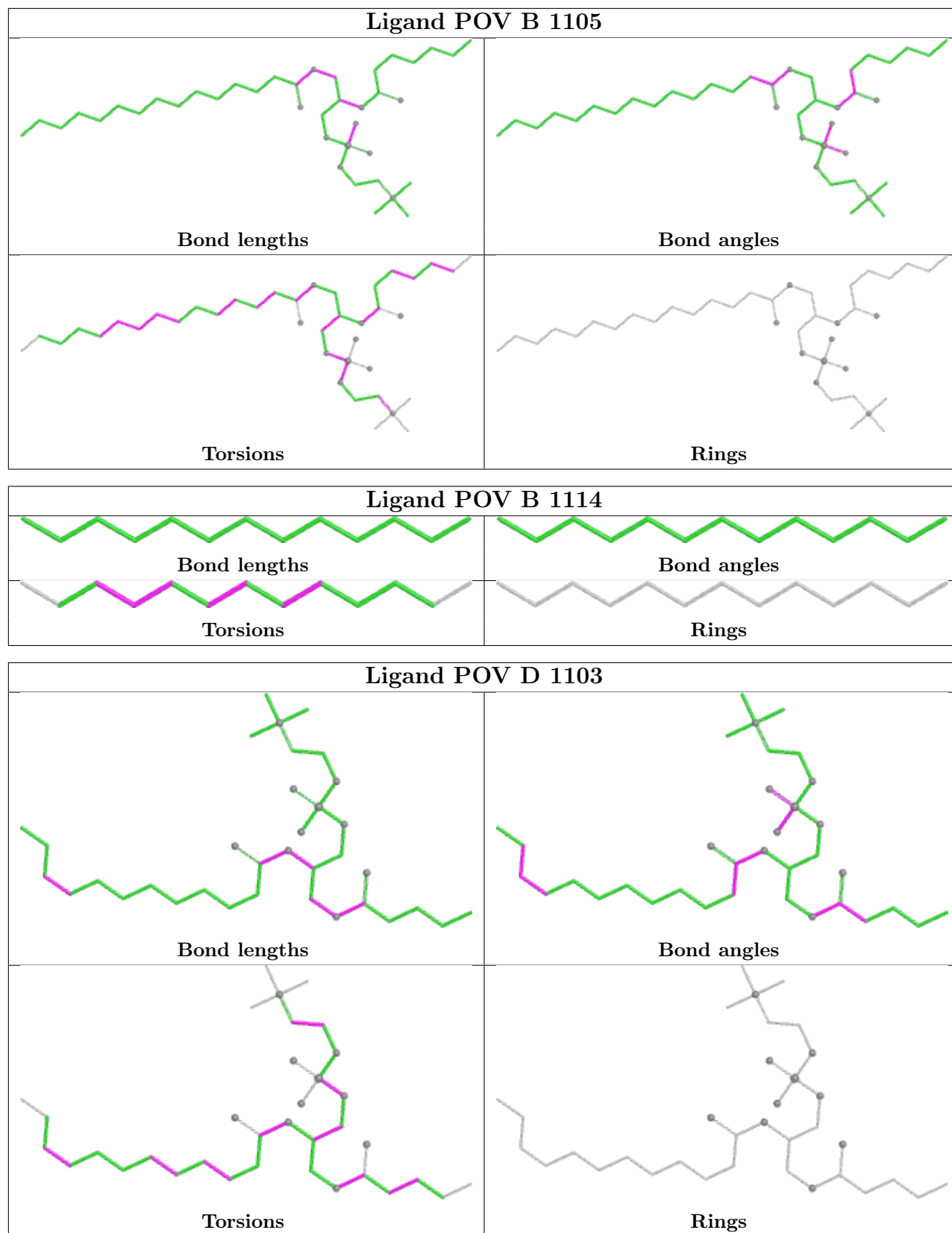


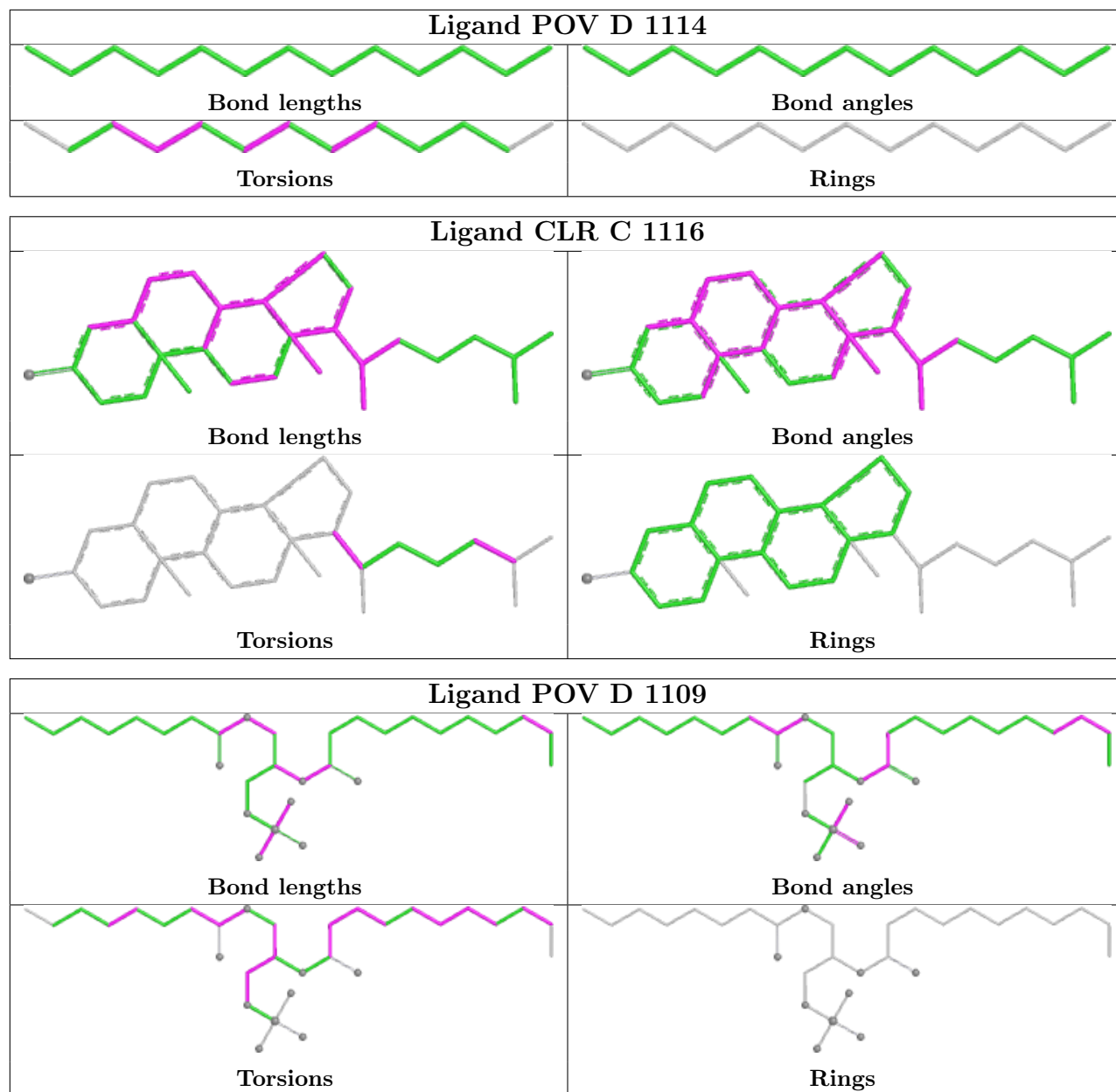


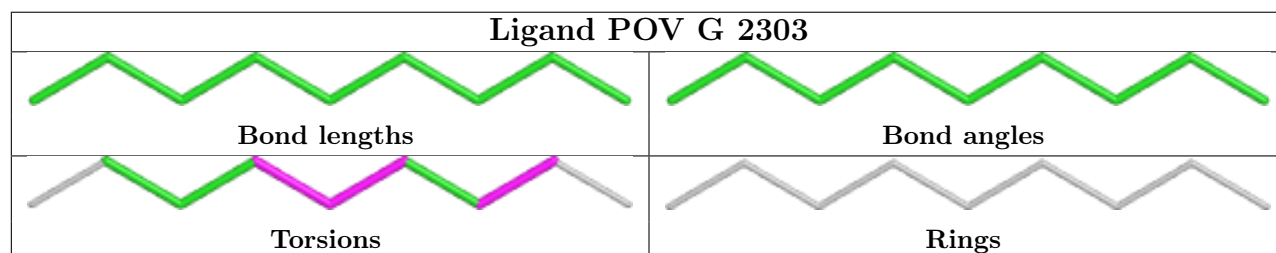
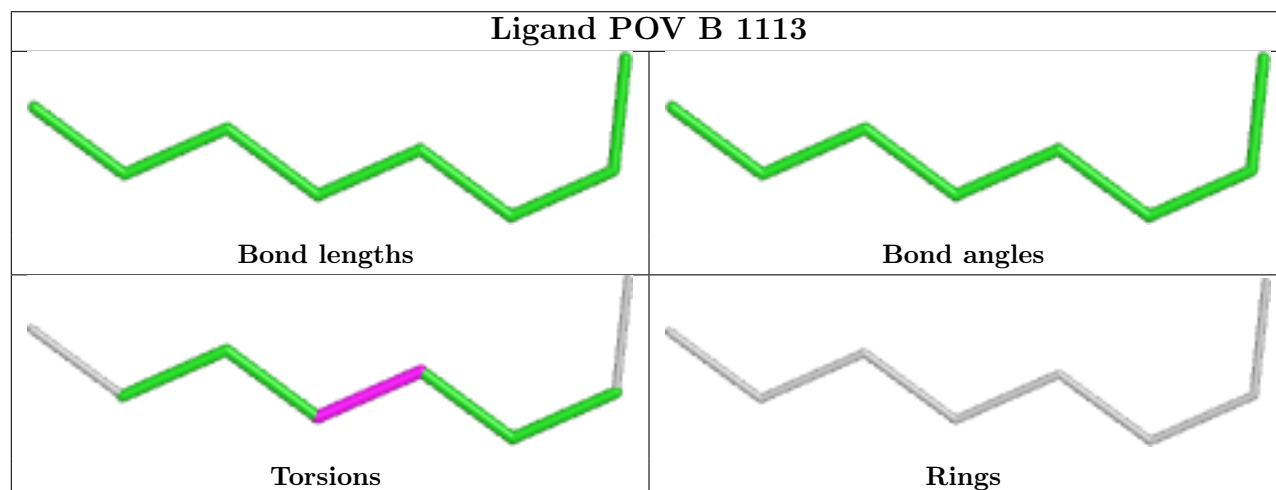
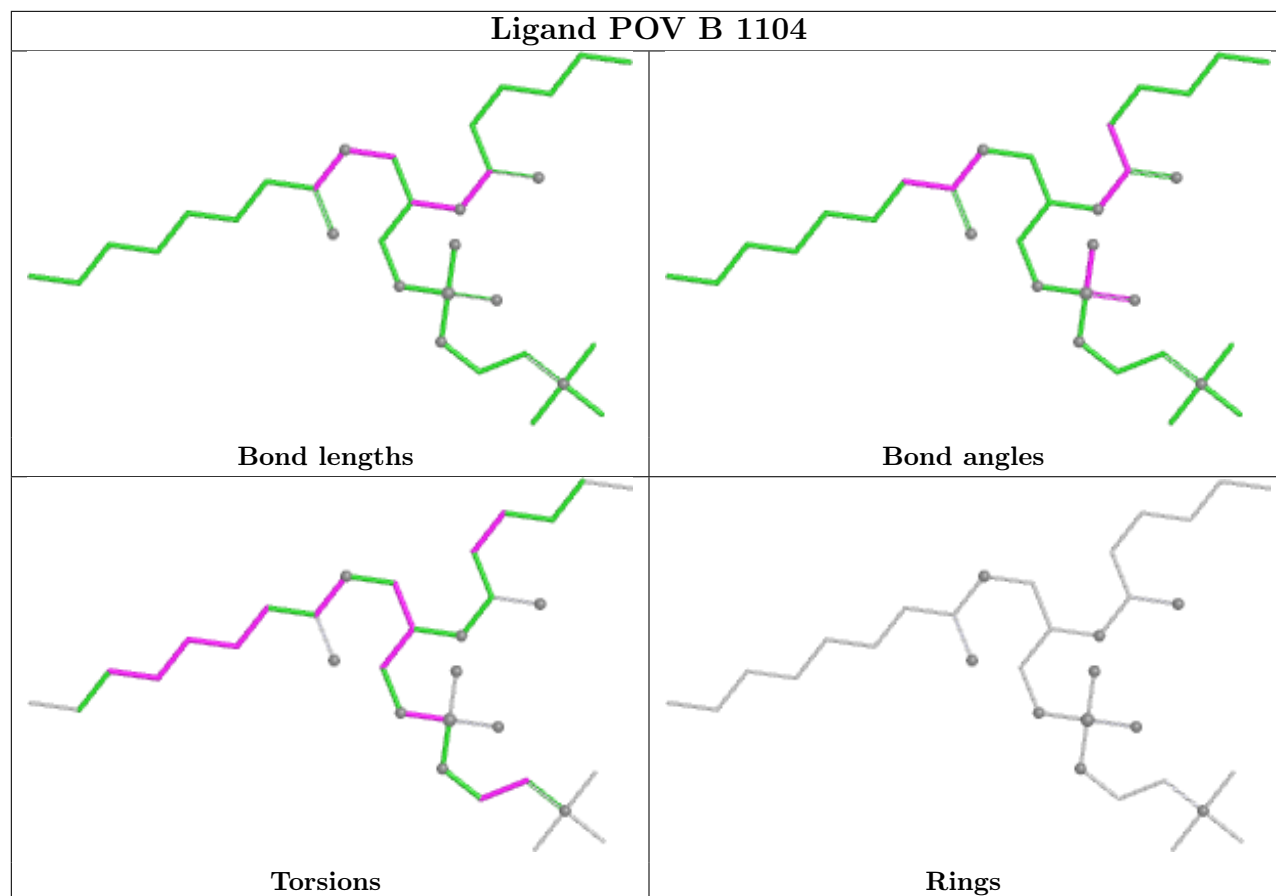


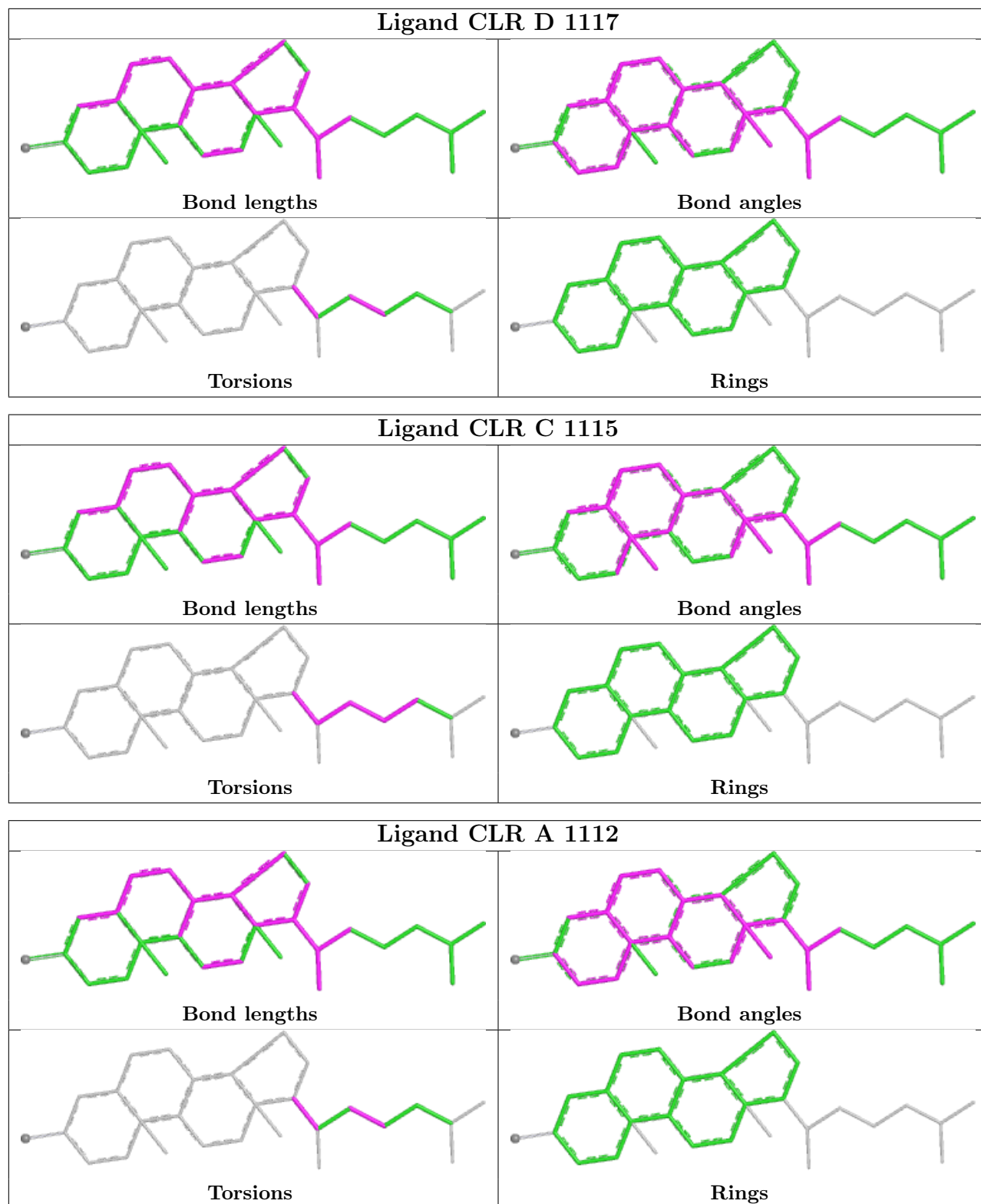


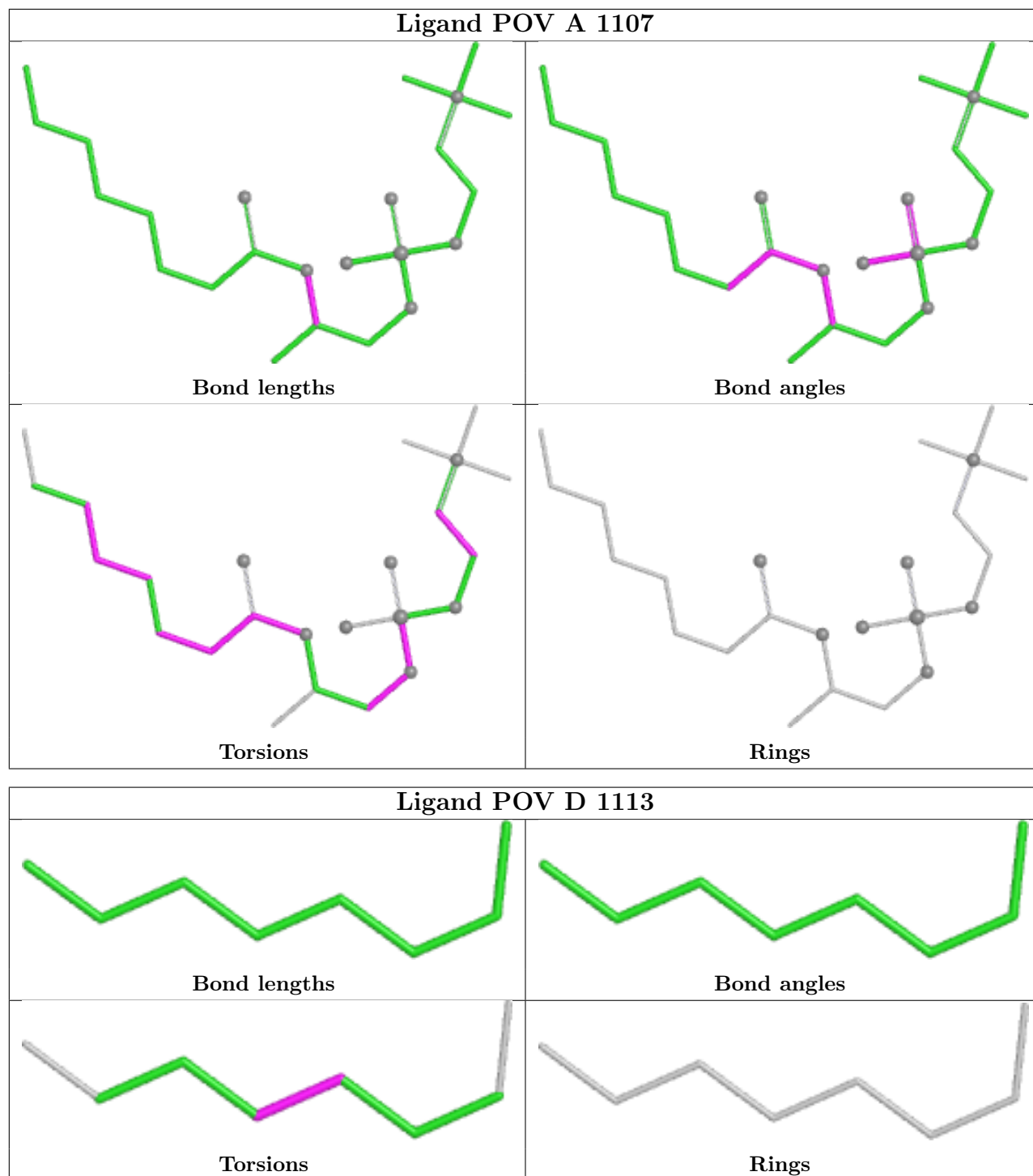


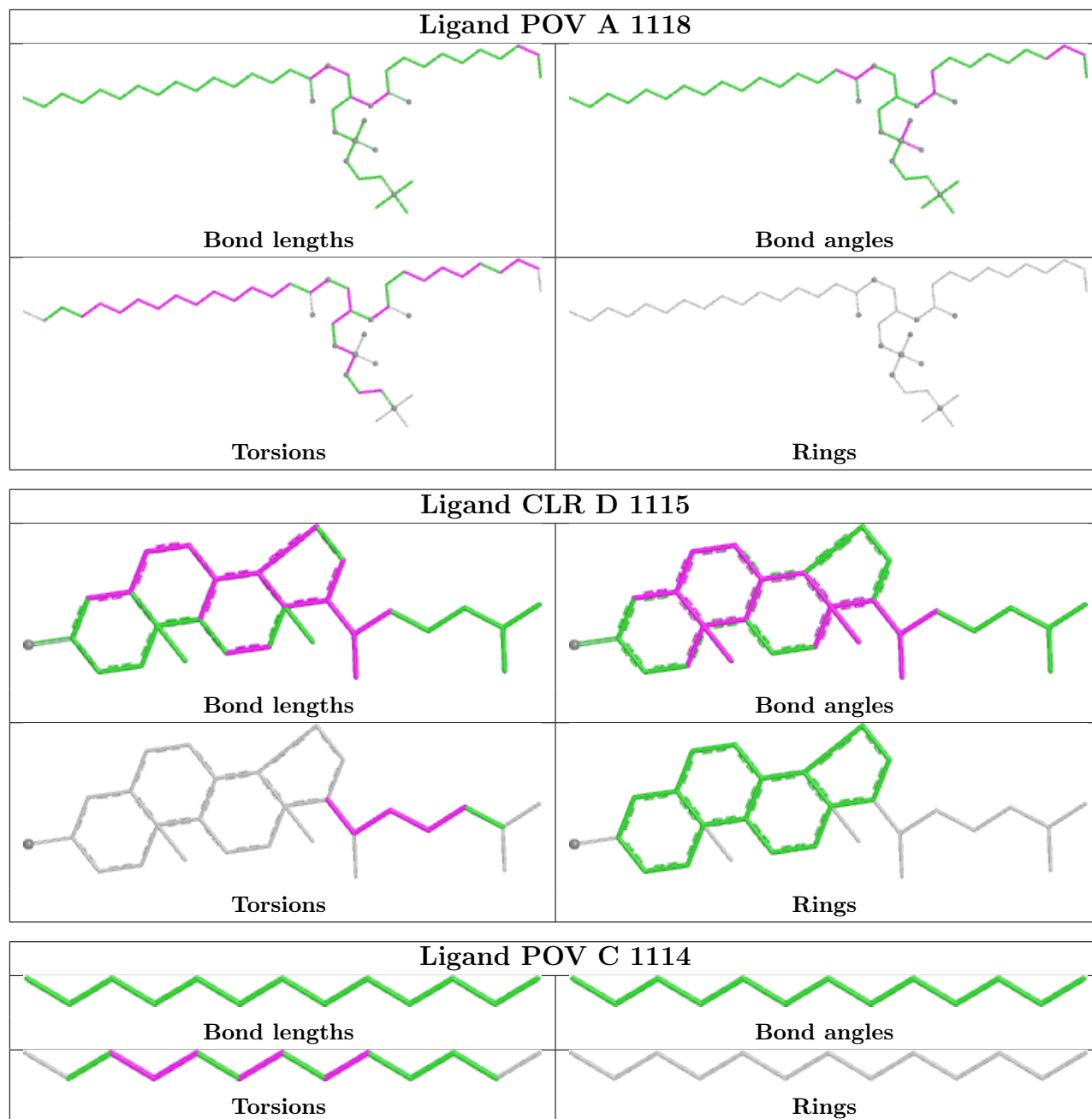


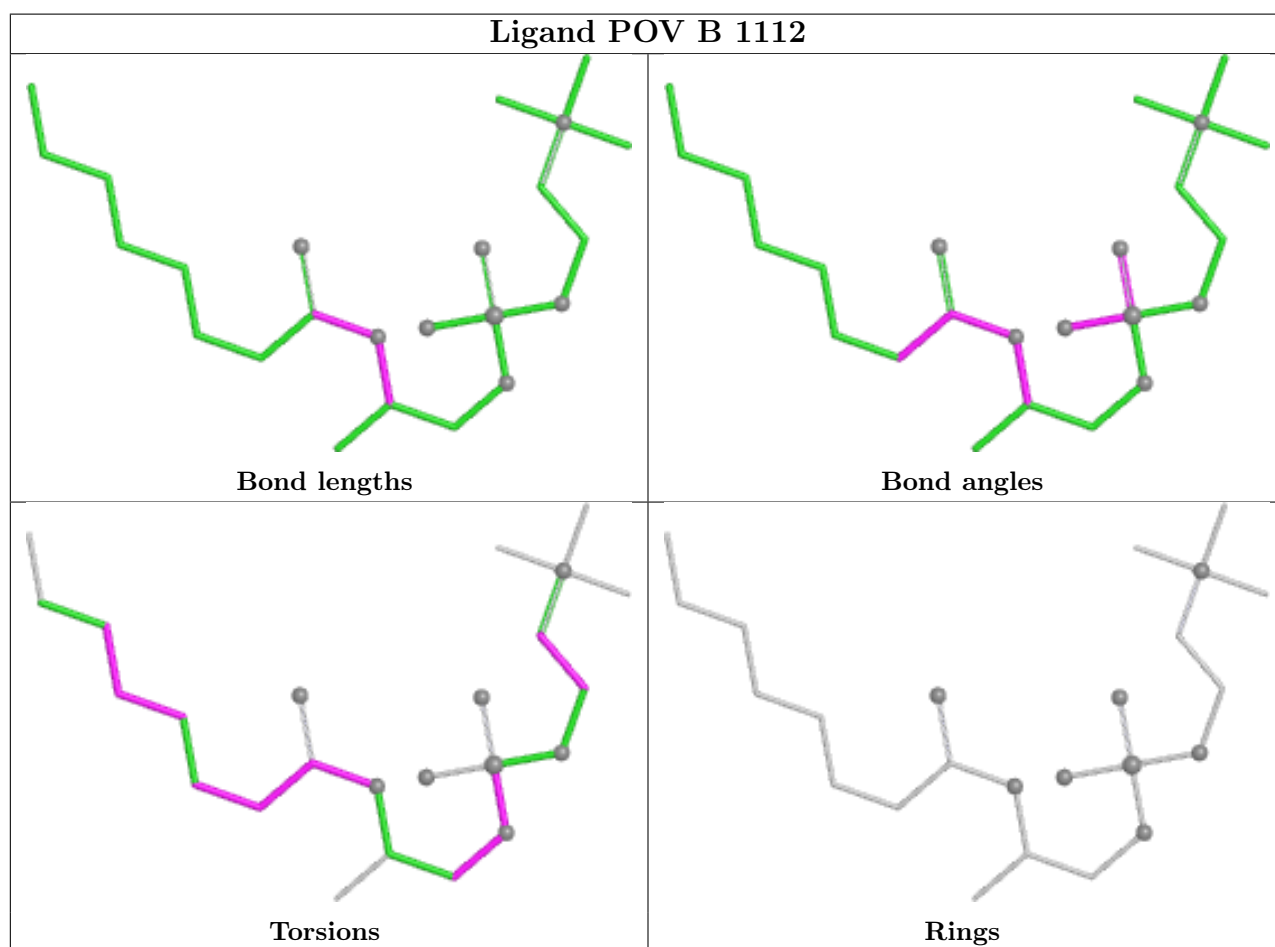
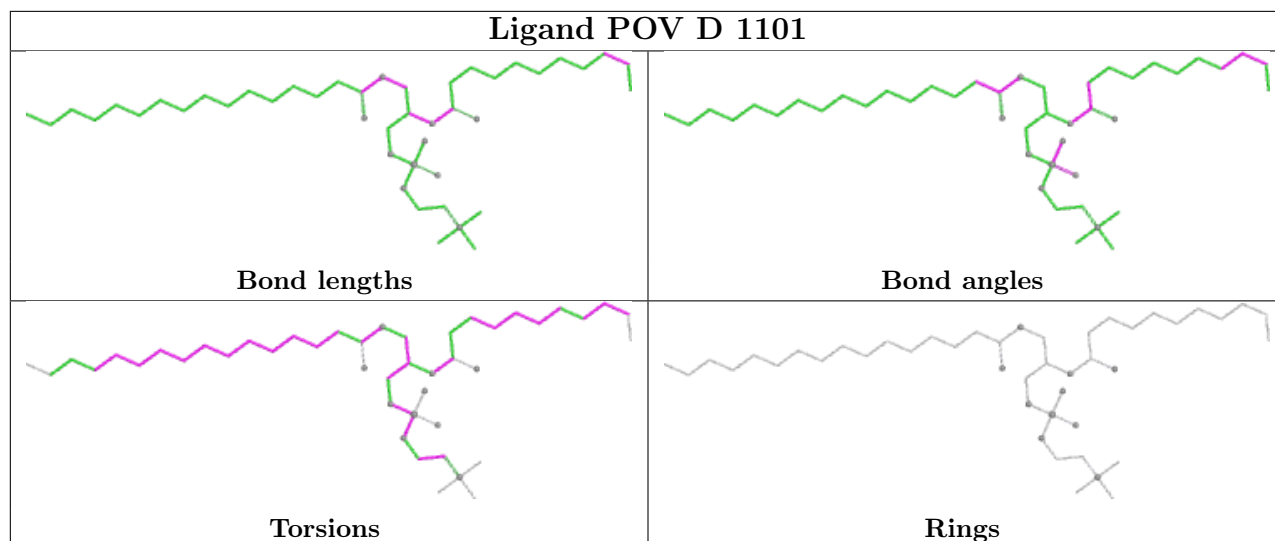


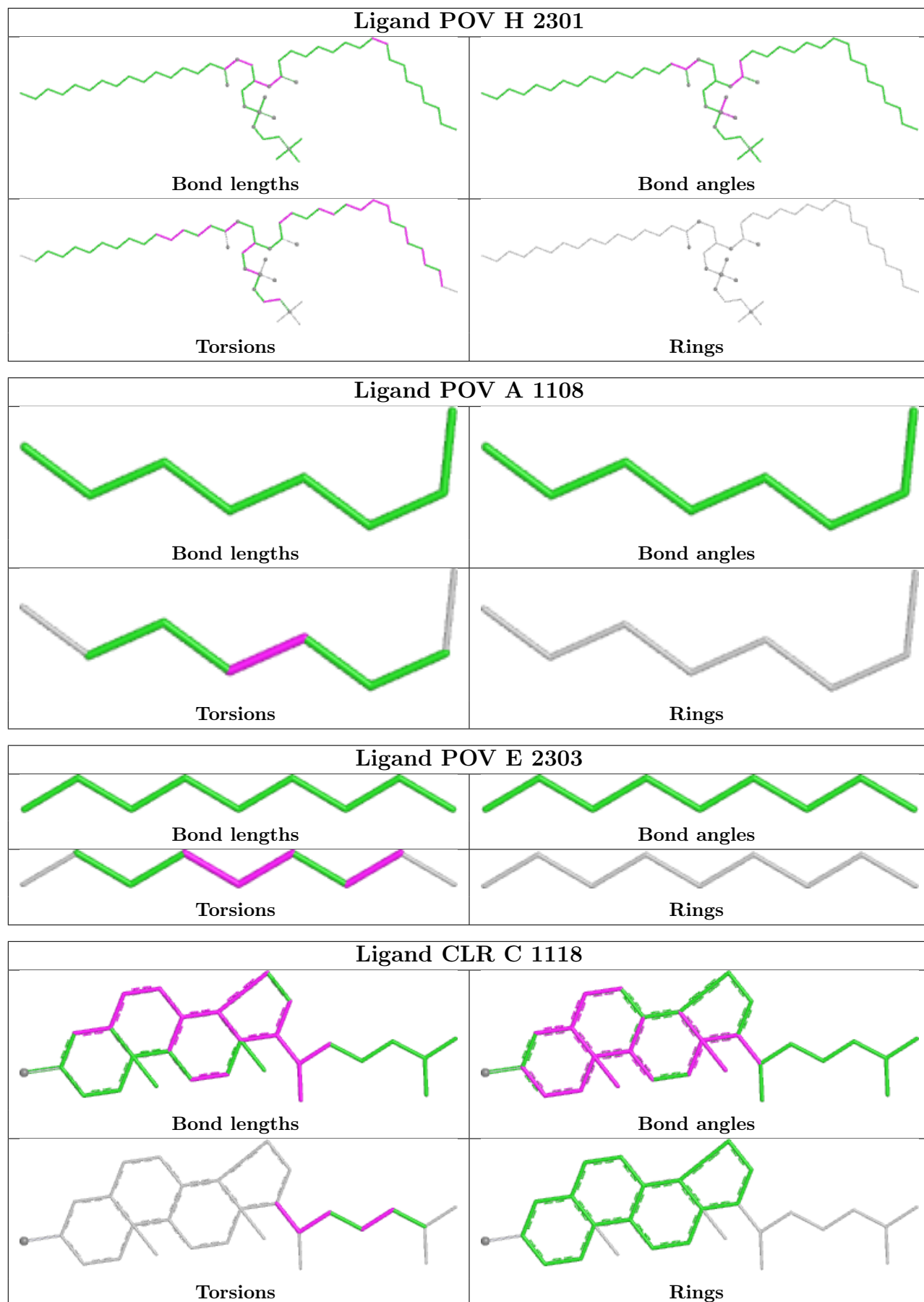


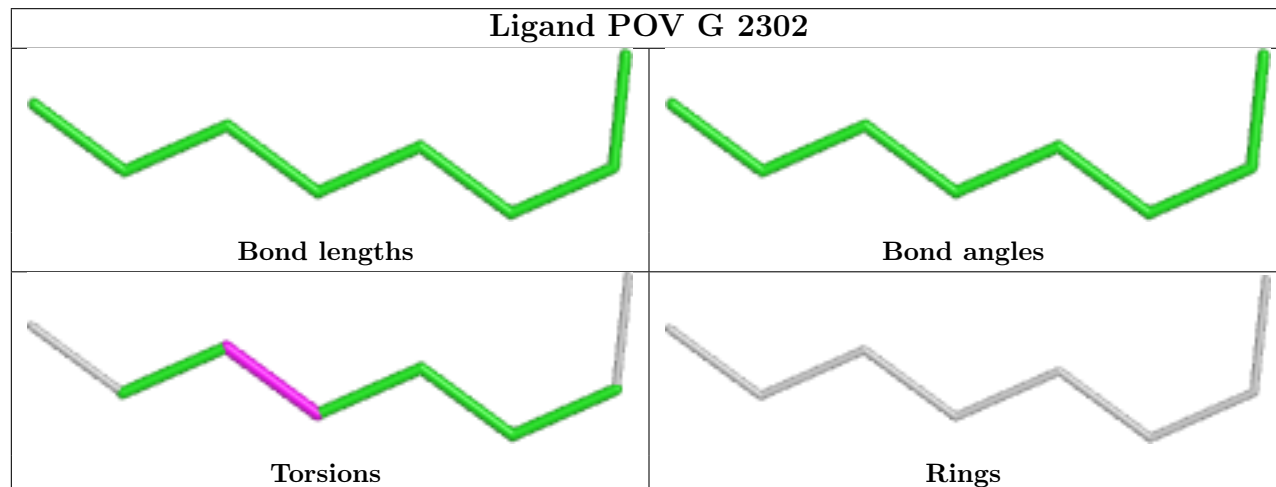
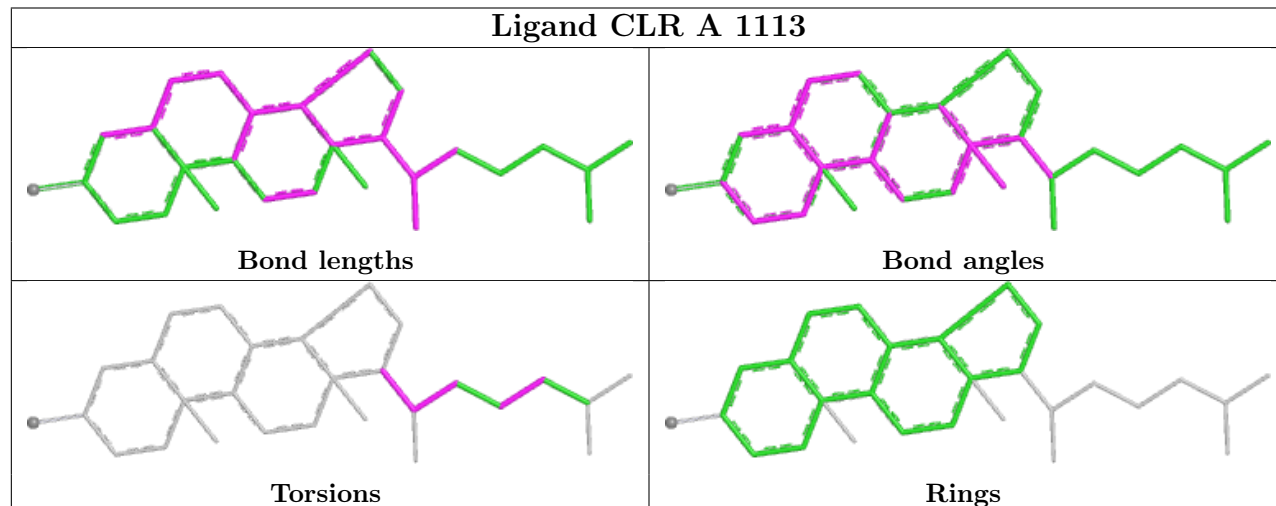
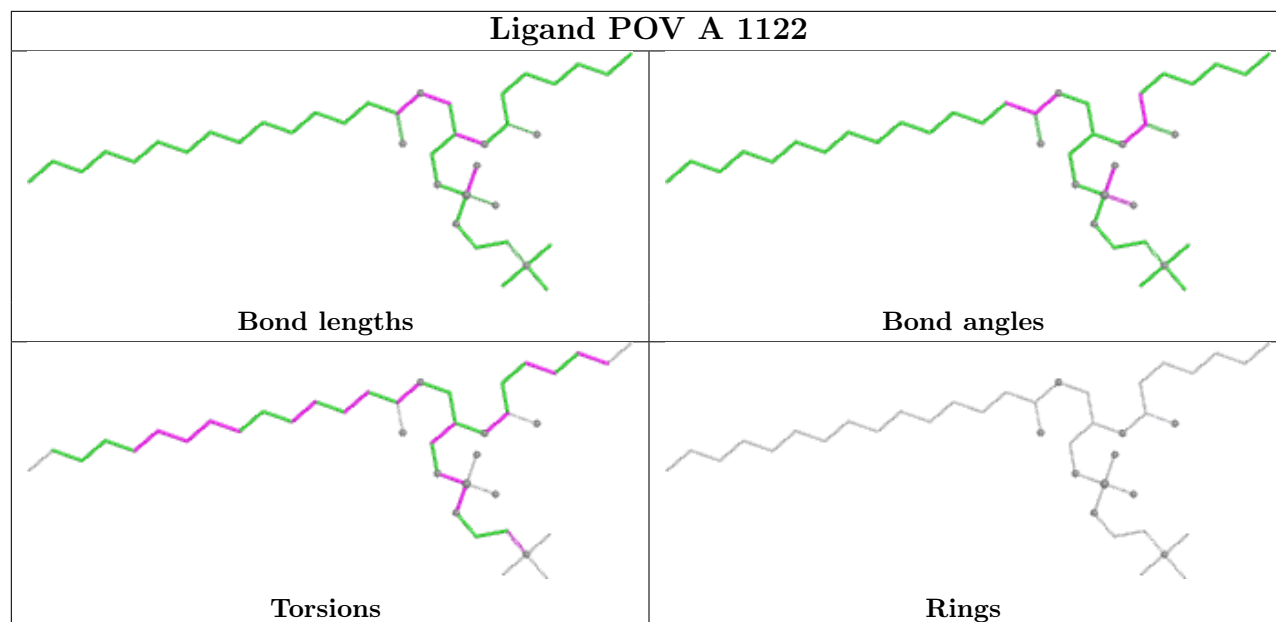


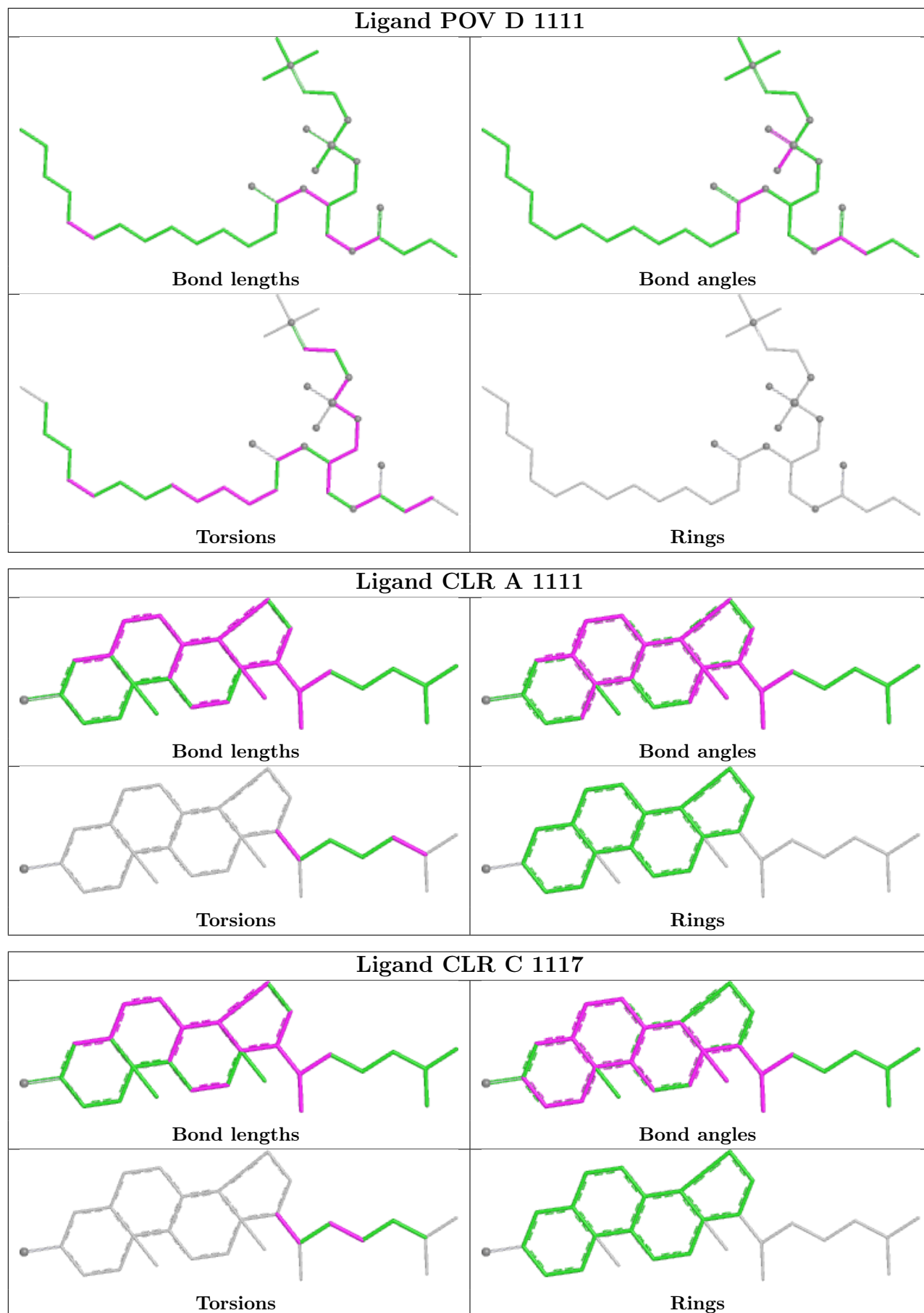


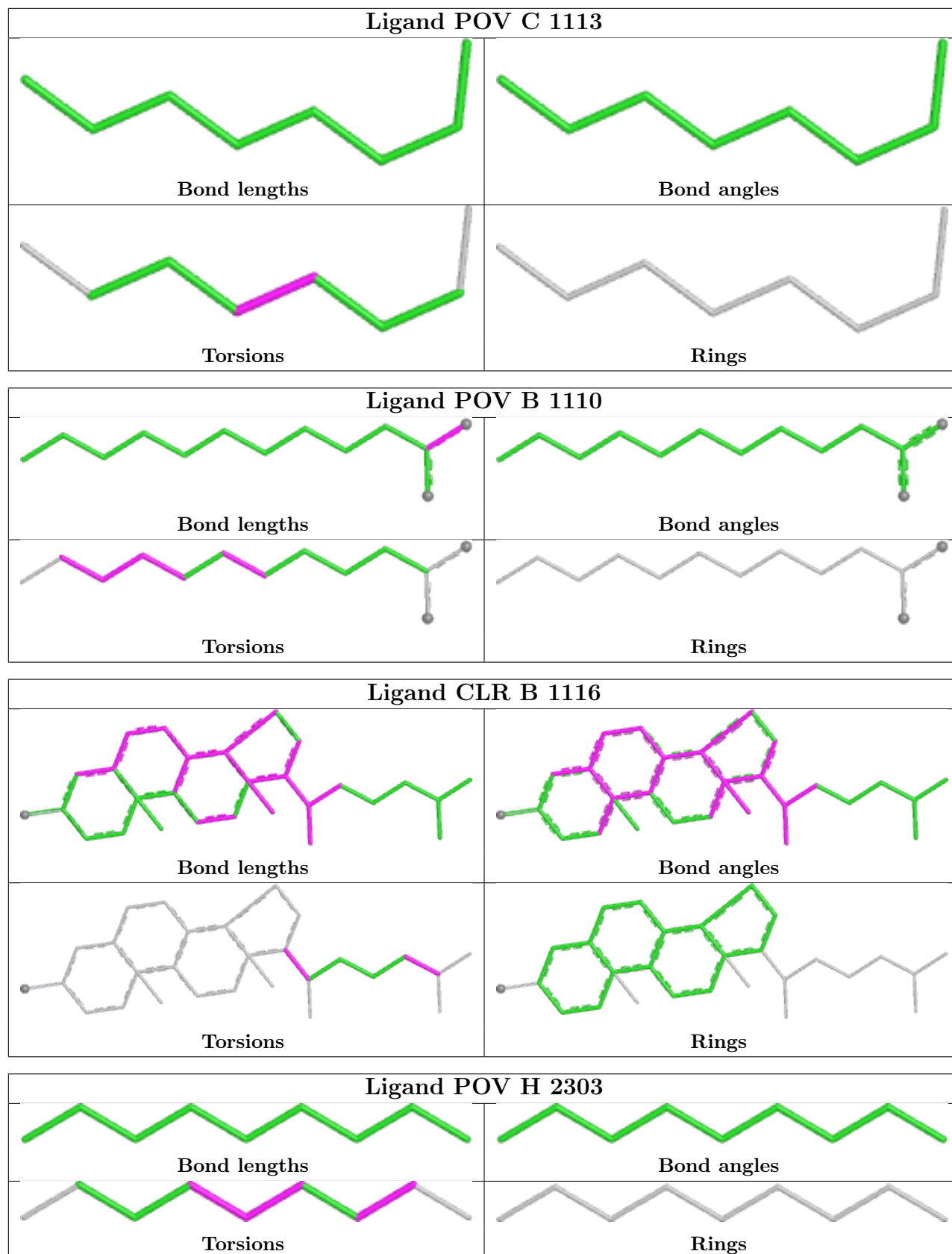


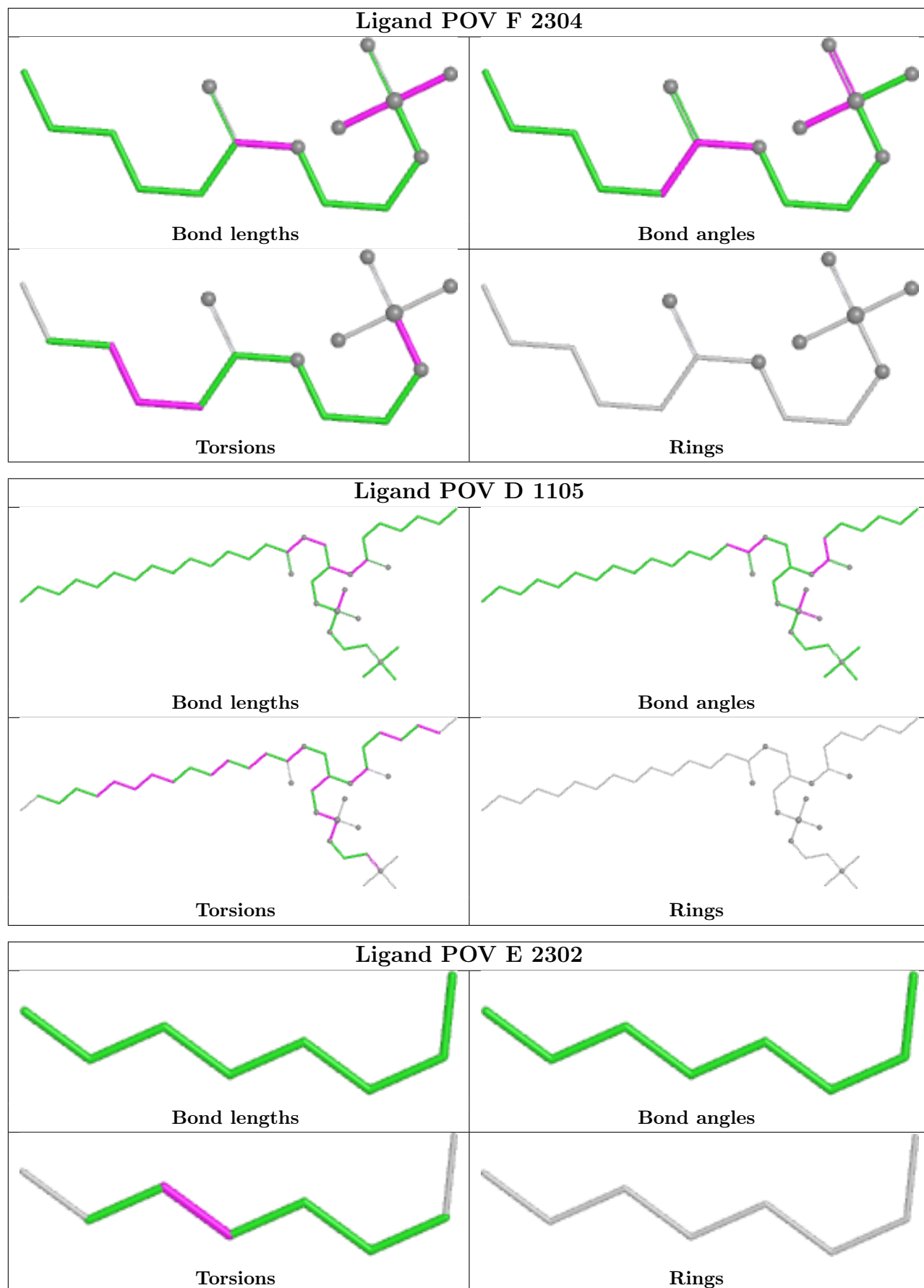


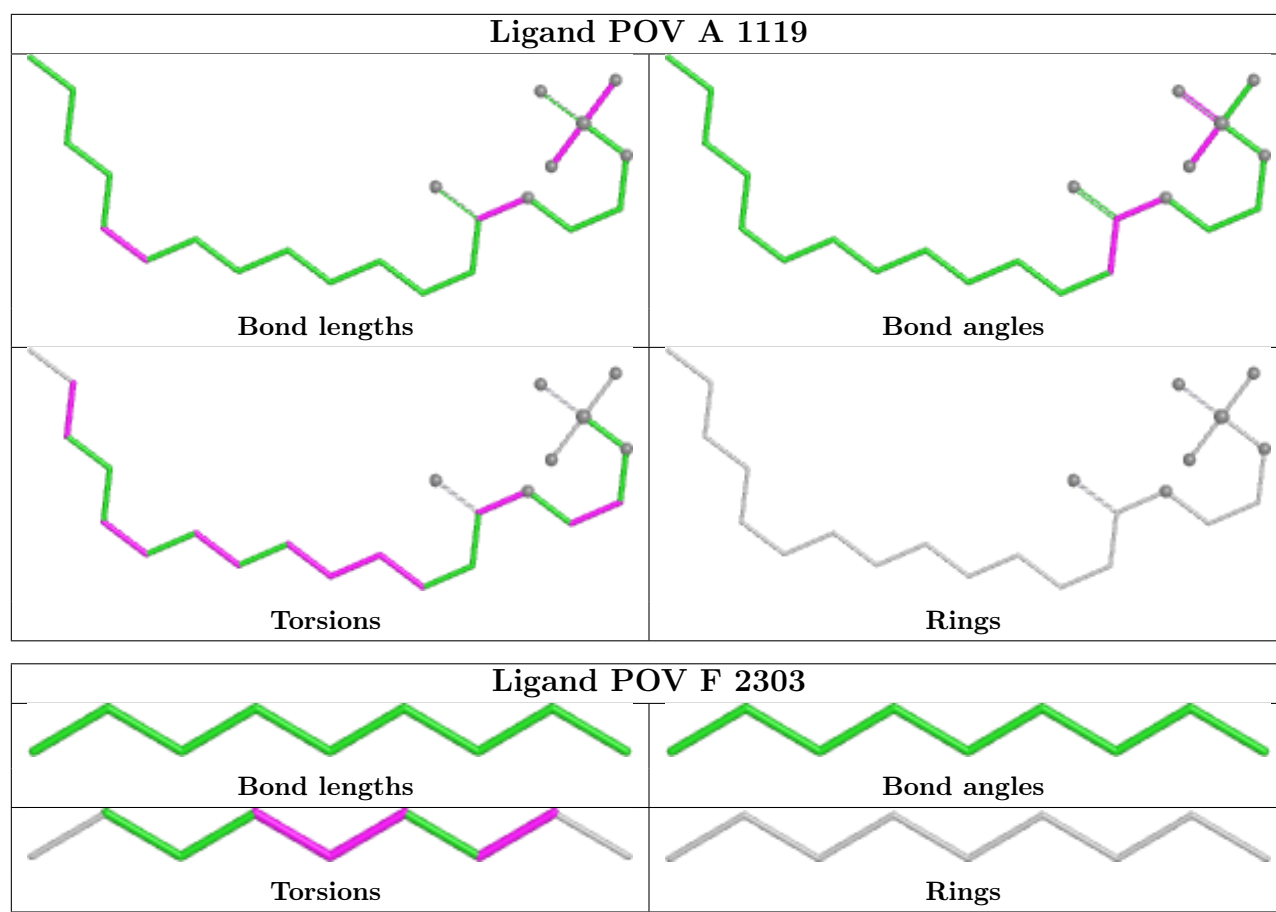












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

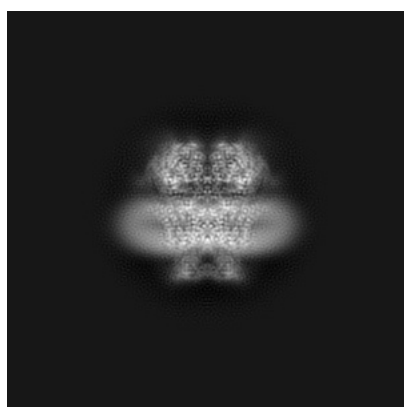
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-21025. These allow visual inspection of the internal detail of the map and identification of artifacts.

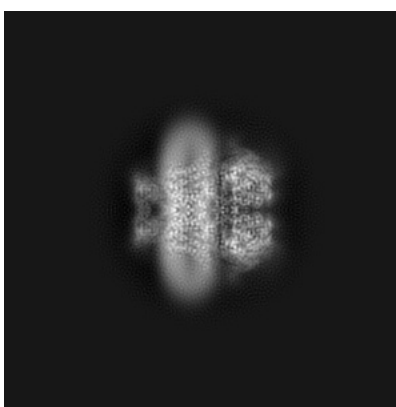
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

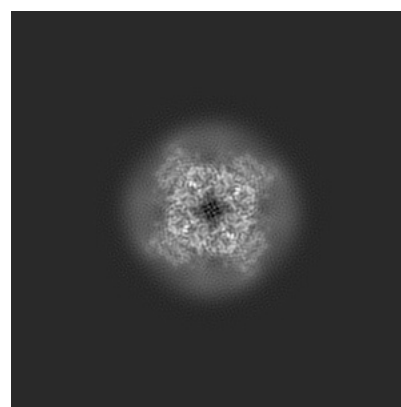
6.1.1 Primary map



X



Y

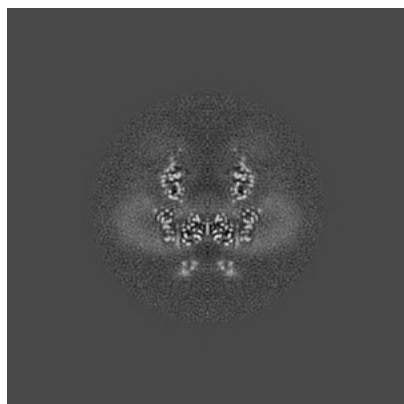


Z

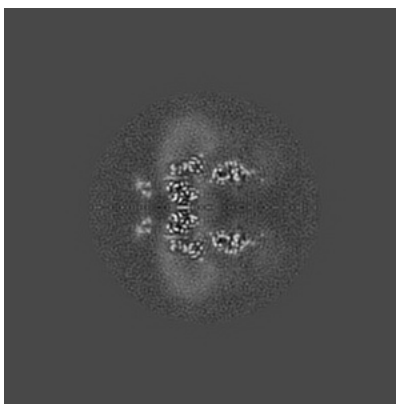
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

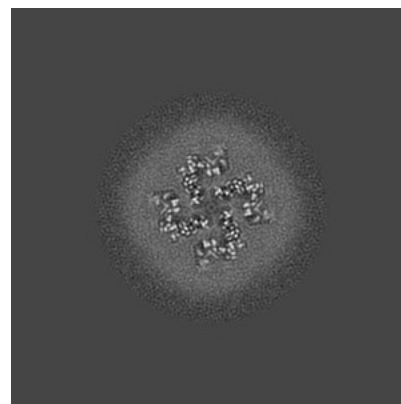
6.2.1 Primary map



X Index: 192



Y Index: 192

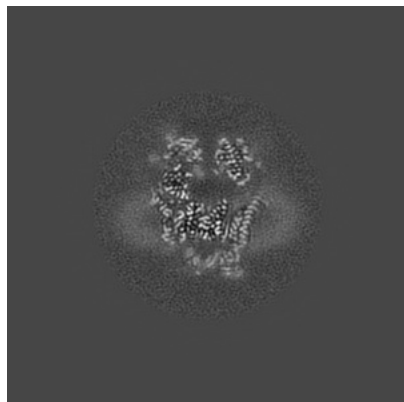


Z Index: 192

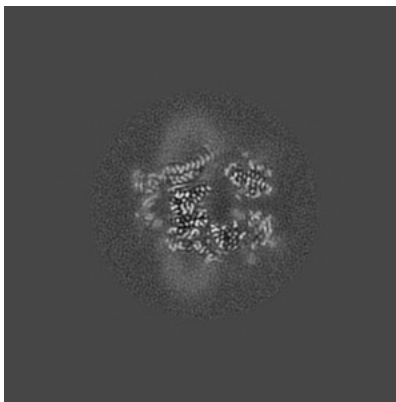
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

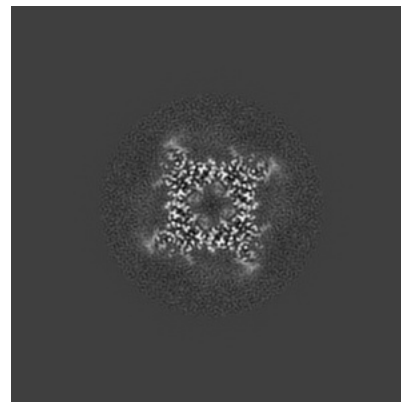
6.3.1 Primary map



X Index: 205



Y Index: 179

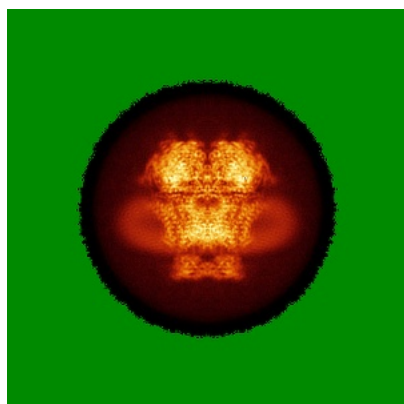


Z Index: 222

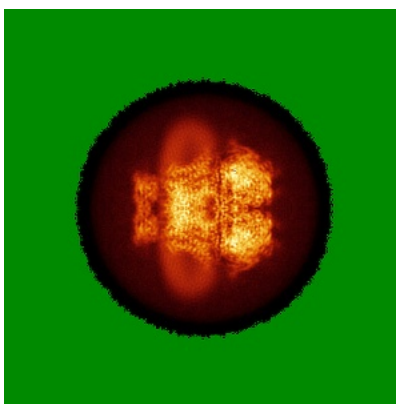
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

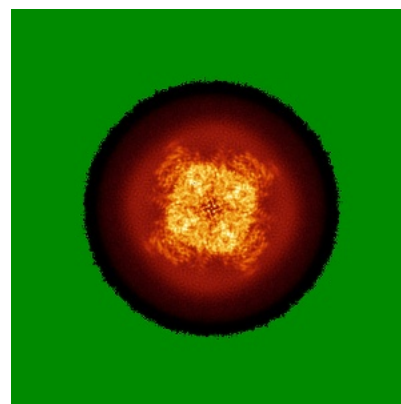
6.4.1 Primary map



X



Y



Z

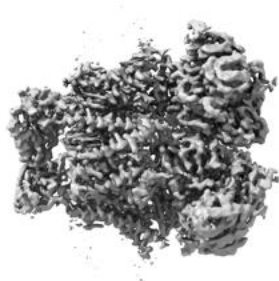
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

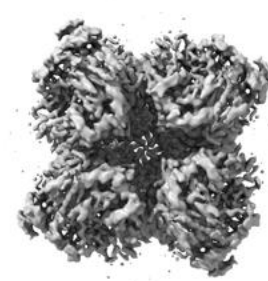
6.5.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 6.19. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

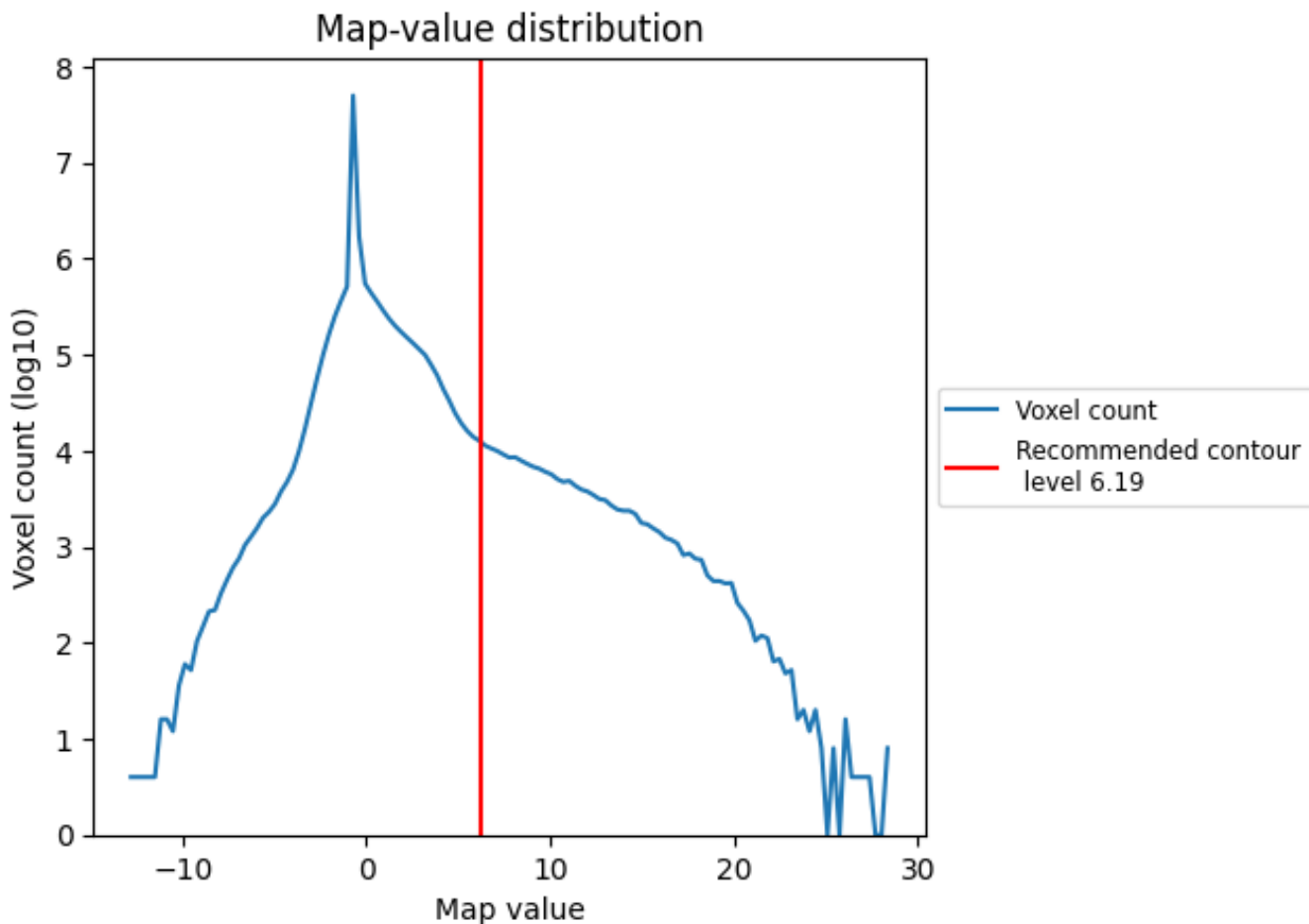
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

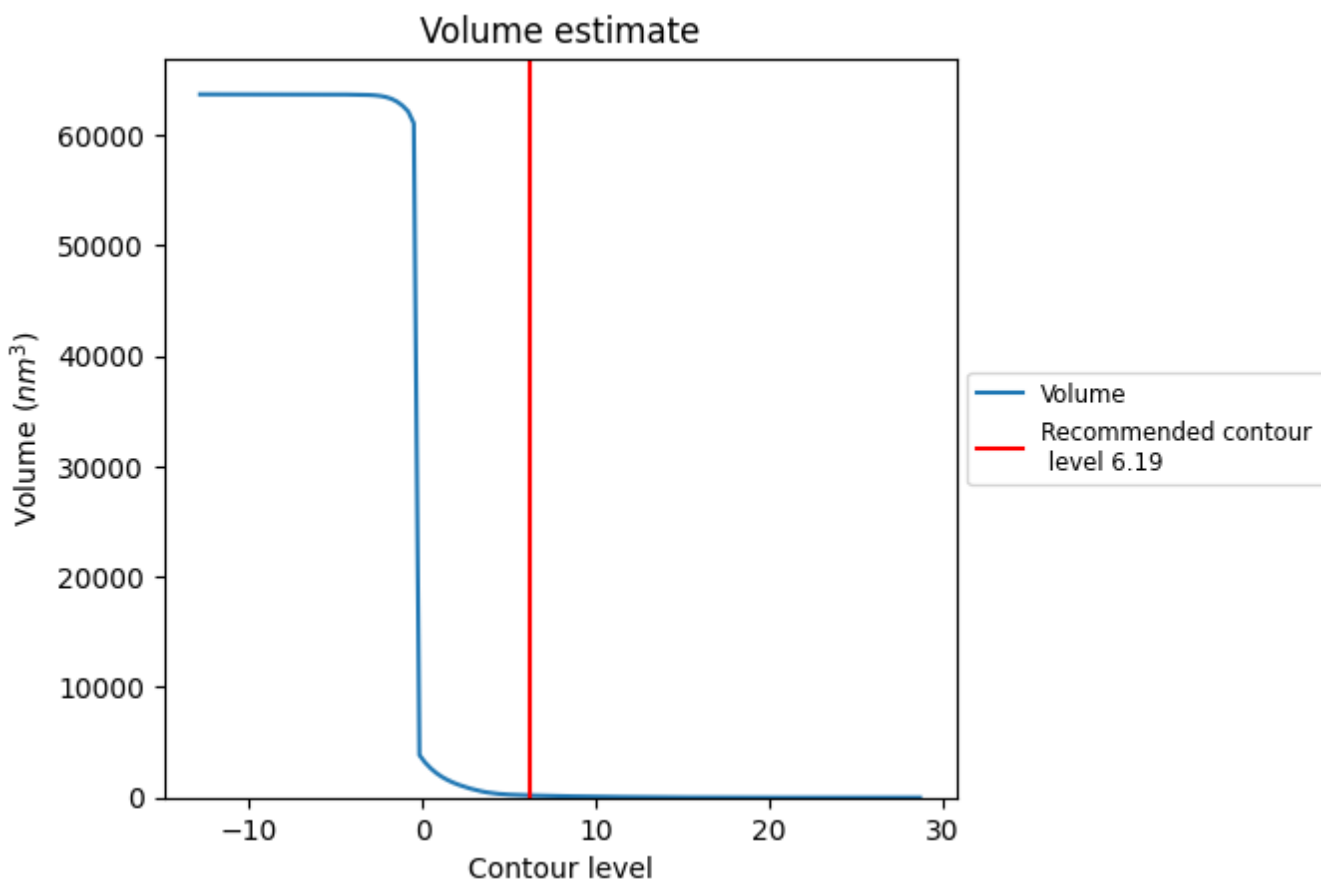
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

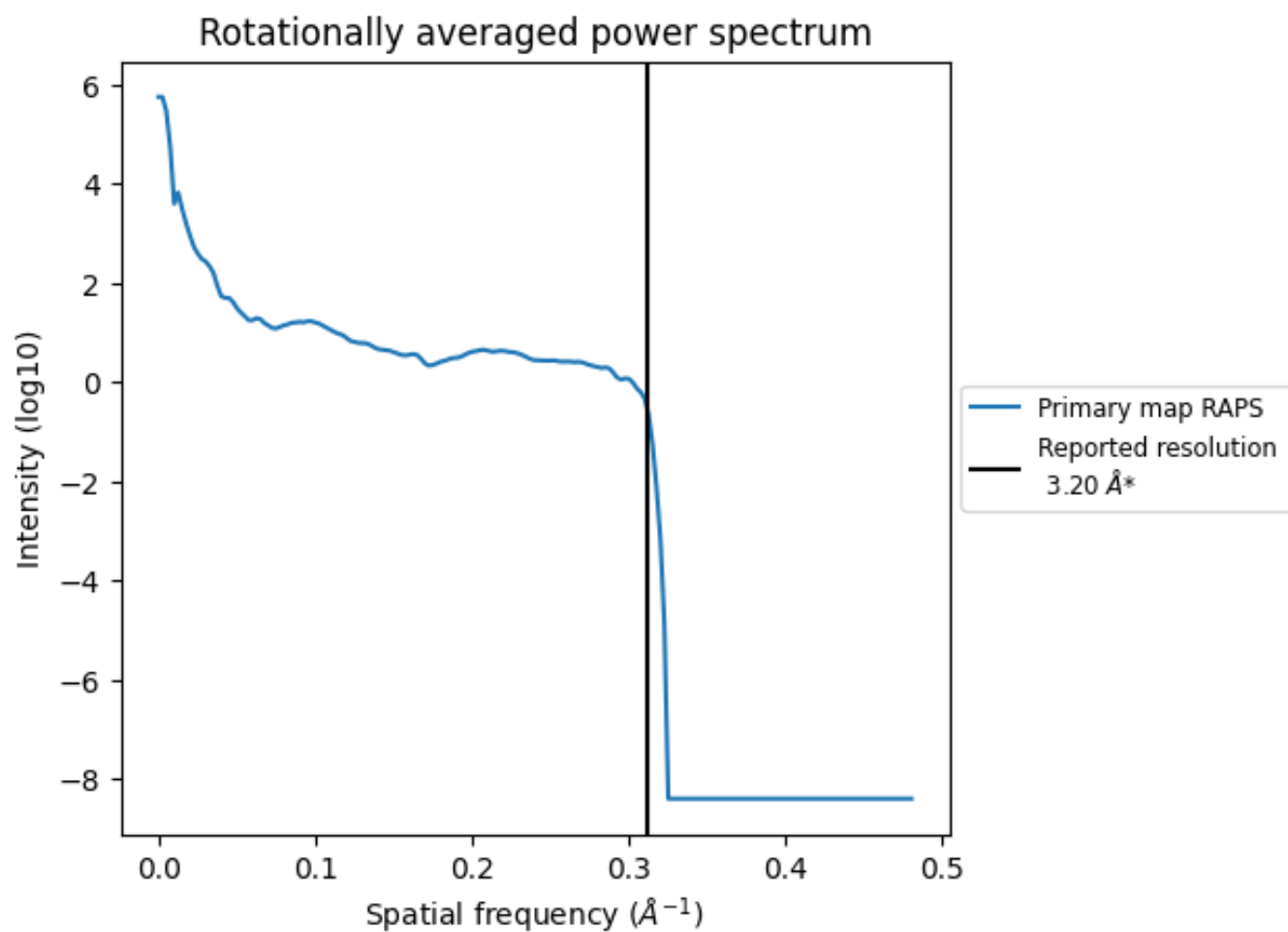
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 196 nm³; this corresponds to an approximate mass of 177 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 0.312 Å⁻¹

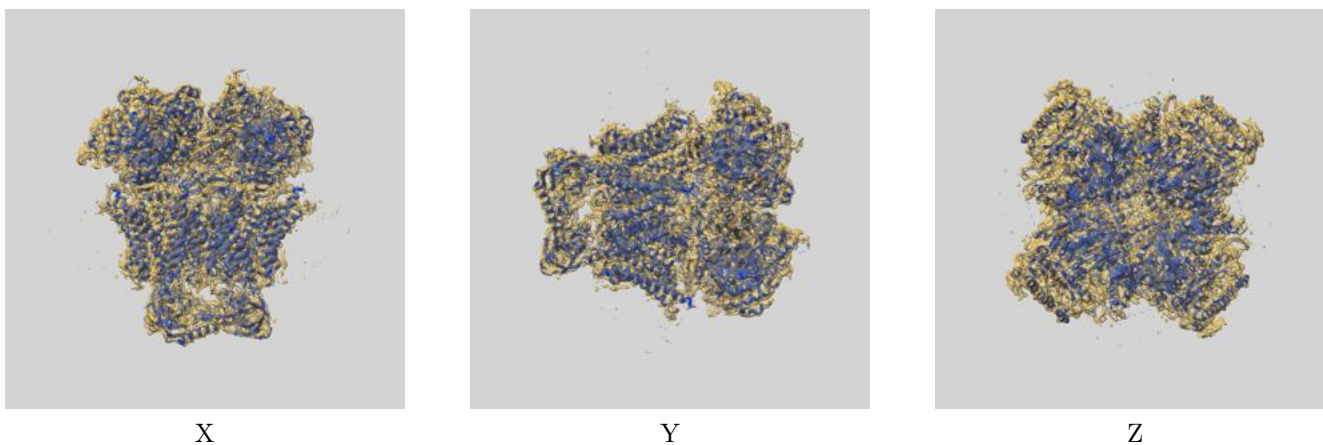
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

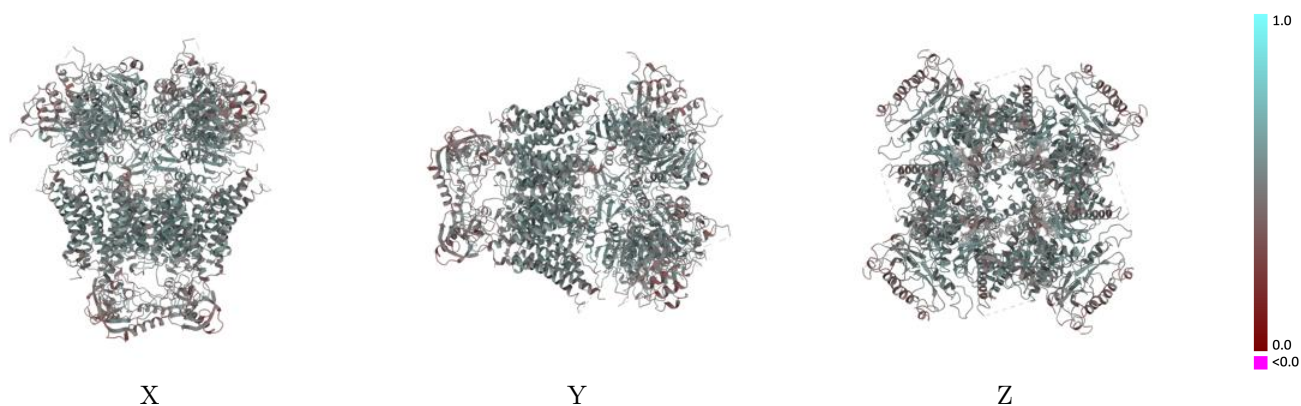
This section contains information regarding the fit between EMDB map EMD-21025 and PDB model 6V22. Per-residue inclusion information can be found in section 3 on page 12.

9.1 Map-model overlay [i](#)



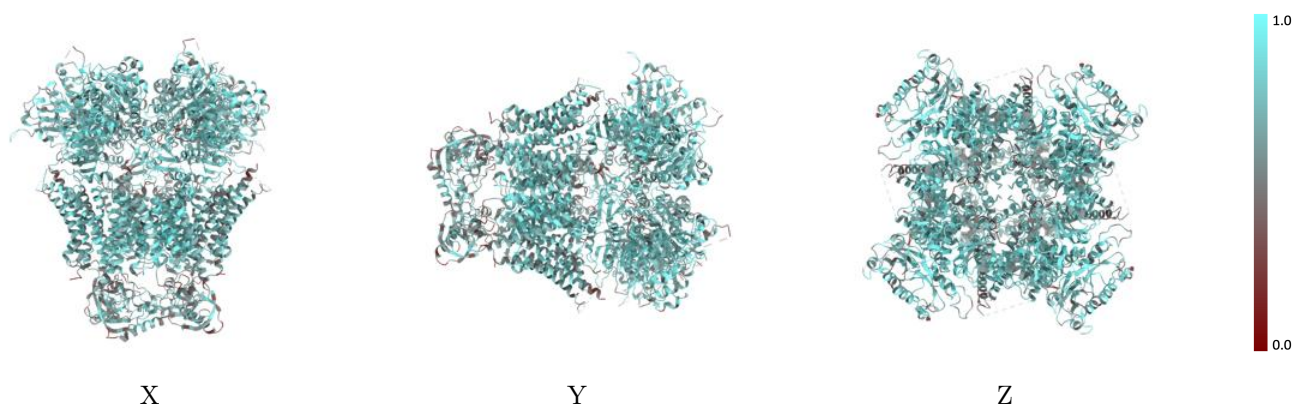
The images above show the 3D surface view of the map at the recommended contour level 6.19 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



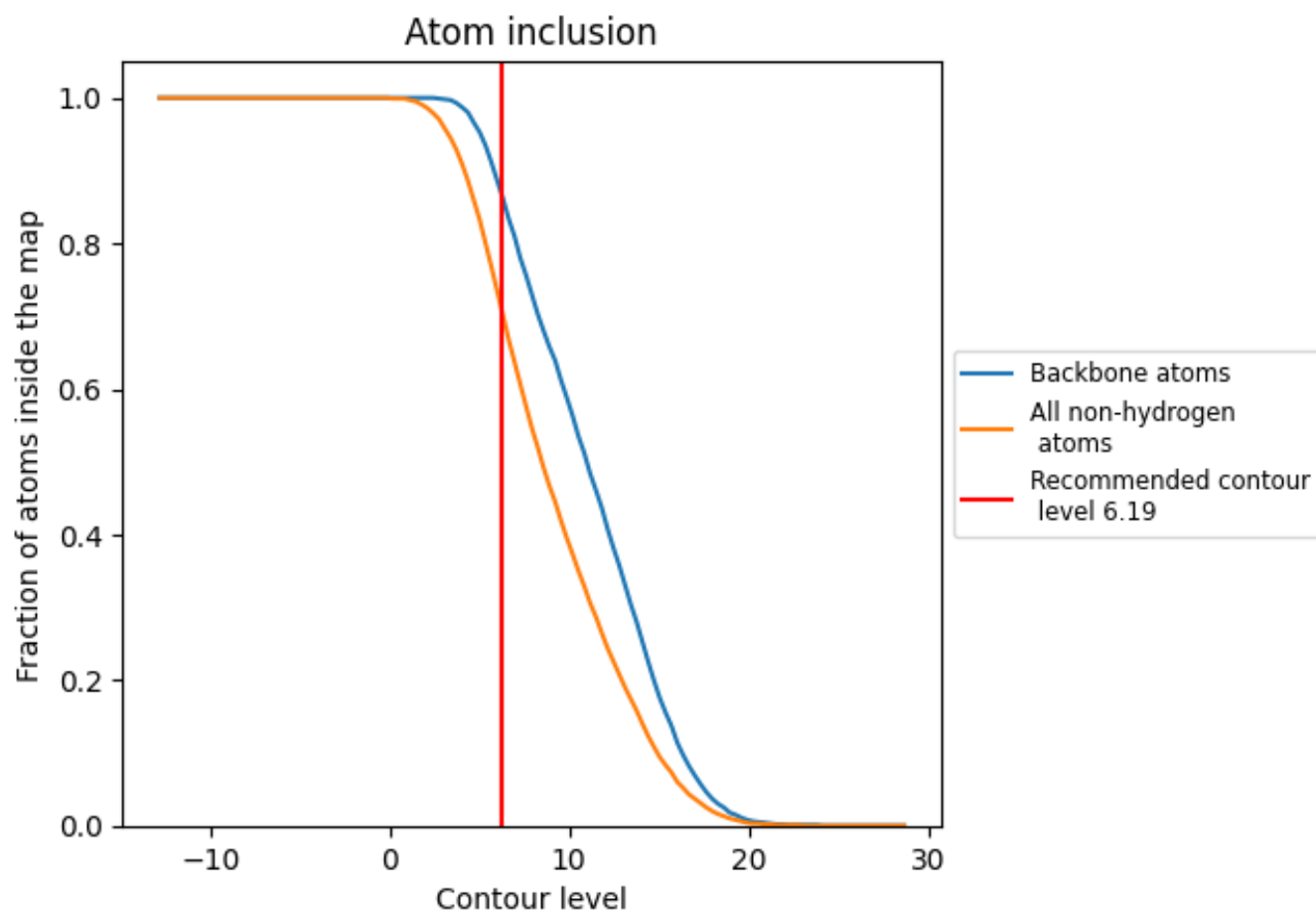
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (6.19).



















9.4 Atom inclusion [i](#)



At the recommended contour level, 87% of all backbone atoms, 71% of all non-hydrogen atoms, are inside the map.

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

The table lists the average atom inclusion at the recommended contour level (6.19) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7140	 0.5080
A	 0.7410	 0.5180
B	 0.7400	 0.5180
C	 0.7400	 0.5190
D	 0.7400	 0.5170
E	 0.5950	 0.4650
F	 0.5950	 0.4650
G	 0.5940	 0.4670
H	 0.5950	 0.4680

