



wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 2, 2023 – 02:49 PM EDT

PDB ID : 6NLL
Title : 1.80 Å resolution structure of WT BfrB from *Pseudomonas aeruginosa* in complex with a protein-protein interaction inhibitor (analog 14)
Authors : Lovell, S.; Punchi-Hewage, A.; Battaile, K.P.; Yao, H.; Nammalwar, B.; Gnanasekaran, K.K.; Bunce, R.A.; Reitz, A.B.; Rivera, M.
Deposited on : 2019-01-08
Resolution : 1.80 Å(reported)

This is a wwPDB X-ray Structure 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/XrayValidationReportHelp>

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:

MolProbity : **FAILED**
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : **FAILED**
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.35.1

1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.80 Å.

There are no overall percentile quality scores available for this entry.

MolProbity and EDS failed to run properly - the sequence quality summary graphics cannot be shown.

2 Entry composition [i](#)

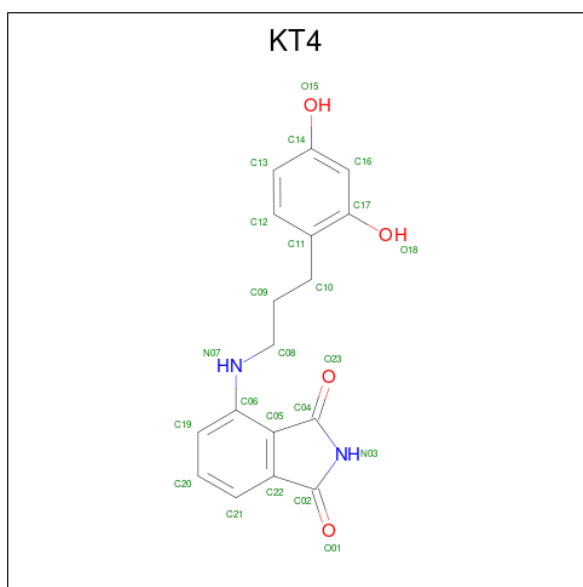
There are 6 unique types of molecules in this entry. The entry contains 17504 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 Ferroxidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	156	1271	807	215	242	7	0	1	0
1	B	155	1265	803	216	239	7	0	2	0
1	C	155	1254	796	212	239	7	0	1	0
1	D	155	1268	803	218	240	7	0	1	0
1	E	155	1266	802	217	240	7	0	1	0
1	F	156	1272	807	217	241	7	0	2	0
1	G	155	1260	800	212	241	7	0	2	0
1	H	155	1264	802	213	242	7	0	2	0
1	I	155	1256	796	214	239	7	0	1	0
1	J	155	1267	802	216	242	7	0	2	0
1	K	155	1260	800	212	241	7	0	2	0
1	L	156	1271	806	216	242	7	0	2	0

- Molecule 2 is 4-{{3-(2,4-dihydroxyphenyl)propyl}amino}-1H-isoindole-1,3(2H)-dione (three-letter code: KT4) (formula: C₁₇H₁₆N₂O₄).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
2	A	1	Total 13	C 9	N 2	O 2	0	0
2	B	1	Total 23	C 17	N 2	O 4	0	0
2	C	1	Total 23	C 17	N 2	O 4	0	0
2	D	1	Total 13	C 9	N 2	O 2	0	0
2	E	1	Total 23	C 17	N 2	O 4	0	0
2	F	1	Total 23	C 17	N 2	O 4	0	0
2	G	1	Total 16	C 12	N 2	O 2	0	0
2	H	1	Total 15	C 11	N 2	O 2	0	0
2	I	1	Total 23	C 17	N 2	O 4	0	0
2	J	1	Total 23	C 17	N 2	O 4	0	0
2	K	1	Total 23	C 17	N 2	O 4	0	0
2	L	1	Total 23	C 17	N 2	O 4	0	0

- Molecule 3 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: C₈H₁₈O₅).



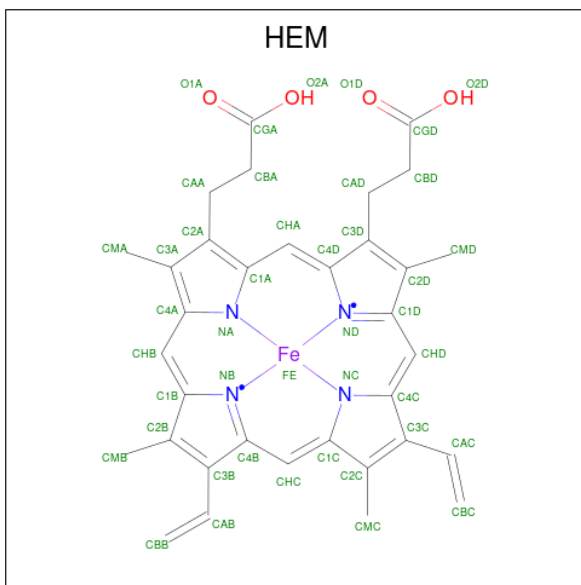
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 10 6 4	0	0
3	A	1	Total C O 7 4 3	0	0
3	B	1	Total C O 11 7 4	0	0
3	B	1	Total C O 10 6 4	0	0
3	C	1	Total C O 11 7 4	0	0
3	D	1	Total C O 13 8 5	0	0
3	D	1	Total C O 8 5 3	0	0
3	E	1	Total C O 13 8 5	0	0
3	E	1	Total C O 13 8 5	0	0
3	F	1	Total C O 13 8 5	0	0
3	F	1	Total C O 8 5 3	0	0
3	G	1	Total C O 13 8 5	0	0
3	G	1	Total C O 10 6 4	0	0
3	H	1	Total C O 13 8 5	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	H	1	Total	C	O	0	0
			13	8	5		
3	H	1	Total	C	O	0	0
			11	7	4		
3	I	1	Total	C	O	0	0
			13	8	5		
3	J	1	Total	C	O	0	0
			13	8	5		
3	J	1	Total	C	O	0	0
			10	6	4		
3	K	1	Total	C	O	0	0
			13	8	5		
3	K	1	Total	C	O	0	0
			10	6	4		
3	L	1	Total	C	O	0	0
			13	8	5		
3	L	1	Total	C	O	0	0
			13	8	5		

- Molecule 4 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: $C_{34}H_{32}FeN_4O_4$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
4	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
4	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
4	E	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
4	F	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
4	H	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
4	I	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
4	L	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 5 is FE (II) ION (three-letter code: FE2) (formula: Fe).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	Fe	0	0
			1	1		
5	B	1	Total	Fe	0	0
			1	1		
5	D	1	Total	Fe	0	0
			1	1		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	124	Total	O	0	0
			124	124		
6	B	123	Total	O	0	0
			123	123		
6	C	130	Total	O	0	0
			130	130		
6	D	133	Total	O	0	0
			133	133		
6	E	140	Total	O	0	0
			140	140		
6	F	121	Total	O	0	0
			121	121		
6	G	133	Total	O	0	0
			133	133		
6	H	131	Total	O	0	0
			131	131		
6	I	116	Total	O	0	0
			116	116		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	J	135	Total 135	O 135	0	0
6	K	122	Total 122	O 122	0	0
6	L	115	Total 115	O 115	0	0

MolProbity and EDS failed to run properly - this section is therefore empty.

3 Data and refinement statistics

EDS failed to run properly - this section is therefore incomplete.

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	129.60Å 194.39Å 202.60Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.76 – 1.80	Depositor
% Data completeness (in resolution range)	99.2 (46.76-1.80)	Depositor
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.82 (at 1.79Å)	Xtrriage
Refinement program	PHENIX	Depositor
R, R_{free}	0.152 , 0.179	Depositor
Wilson B-factor (Å ²)	24.0	Xtrriage
Anisotropy	0.418	Xtrriage
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	17504	wwPDB-VP
Average B, all atoms (Å ²)	26.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.74% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

4 Model quality [i](#)

4.1 Standard geometry [i](#)

MolProbity failed to run properly - this section is therefore empty.

4.2 Too-close contacts [i](#)

MolProbity failed to run properly - this section is therefore empty.

4.3 Torsion angles [i](#)

4.3.1 Protein backbone [i](#)

MolProbity failed to run properly - this section is therefore empty.

4.3.2 Protein sidechains [i](#)

MolProbity failed to run properly - this section is therefore empty.

4.3.3 RNA [i](#)

MolProbity failed to run properly - this section is therefore empty.

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

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

4.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

4.6 Ligand geometry [i](#)

Of 45 ligands modelled in this entry, 3 are monoatomic - leaving 42 for Mogul analysis.

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	PG4	K	203	-	9,9,12	0.41	0	8,8,11	0.22	0
3	PG4	L	203	-	12,12,12	0.52	0	11,11,11	0.33	0
4	HEM	F	204	1	41,50,50	1.48	5 (12%)	45,82,82	1.57	9 (20%)
3	PG4	A	202	-	9,9,12	0.50	0	8,8,11	0.26	0
3	PG4	H	204	-	10,10,12	0.54	0	9,9,11	0.31	0
3	PG4	D	202	-	12,12,12	0.52	0	11,11,11	0.47	0
3	PG4	H	202	-	12,12,12	0.45	0	11,11,11	0.52	0
3	PG4	G	202	-	12,12,12	0.48	0	11,11,11	0.63	0
4	HEM	D	204	1	41,50,50	1.45	5 (12%)	45,82,82	1.47	8 (17%)
3	PG4	B	202	-	10,10,12	0.45	0	9,9,11	0.38	0
4	HEM	L	204	1	41,50,50	1.41	4 (9%)	45,82,82	1.67	11 (24%)
3	PG4	K	202	-	12,12,12	0.38	0	11,11,11	0.58	0
2	KT4	E	201	-	25,25,25	1.71	6 (24%)	35,35,35	1.31	2 (5%)
3	PG4	J	202	-	12,12,12	0.43	0	11,11,11	0.50	0
2	KT4	G	201	-	17,17,25	1.83	5 (29%)	23,23,35	1.27	3 (13%)
3	PG4	H	203	-	12,12,12	0.38	0	11,11,11	0.59	0
3	PG4	B	203	-	9,9,12	0.45	0	8,8,11	0.45	0
3	PG4	I	202	-	12,12,12	0.47	0	11,11,11	0.57	0
3	PG4	E	202	-	12,12,12	0.54	0	11,11,11	0.38	0
2	KT4	A	201	-	14,14,25	2.53	5 (35%)	19,20,35	1.78	4 (21%)
2	KT4	B	201	-	25,25,25	1.67	6 (24%)	35,35,35	1.21	1 (2%)
2	KT4	K	201	-	25,25,25	1.78	5 (20%)	35,35,35	1.19	3 (8%)
3	PG4	J	203	-	9,9,12	0.53	0	8,8,11	1.47	2 (25%)
3	PG4	E	203	-	12,12,12	0.43	0	11,11,11	0.37	0
2	KT4	C	201	-	25,25,25	1.67	5 (20%)	35,35,35	1.06	2 (5%)
2	KT4	L	201	-	25,25,25	1.78	4 (16%)	35,35,35	0.99	3 (8%)
3	PG4	D	203	-	7,7,12	0.49	0	6,6,11	0.35	0
2	KT4	J	201	-	25,25,25	1.75	5 (20%)	35,35,35	1.21	4 (11%)
4	HEM	I	203	1	41,50,50	1.49	5 (12%)	45,82,82	1.56	9 (20%)
3	PG4	F	202	-	12,12,12	0.48	0	11,11,11	0.41	0
4	HEM	H	205	1	41,50,50	1.42	4 (9%)	45,82,82	1.67	11 (24%)
4	HEM	E	204	1	41,50,50	1.40	4 (9%)	45,82,82	1.68	10 (22%)
3	PG4	C	202	-	10,10,12	0.45	0	9,9,11	0.35	0
2	KT4	I	201	-	25,25,25	1.59	5 (20%)	35,35,35	1.18	3 (8%)
3	PG4	G	203	-	9,9,12	0.46	0	8,8,11	0.55	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	HEM	A	204	1	41,50,50	1.49	5 (12%)	45,82,82	1.77	10 (22%)
2	KT4	H	201	-	16,16,25	1.86	5 (31%)	22,22,35	1.41	3 (13%)
2	KT4	D	201	-	14,14,25	2.53	5 (35%)	19,20,35	1.79	4 (21%)
3	PG4	F	203	-	7,7,12	0.43	0	6,6,11	0.30	0
2	KT4	F	201	-	25,25,25	1.67	5 (20%)	35,35,35	1.15	2 (5%)
3	PG4	A	203	-	6,6,12	0.34	0	5,5,11	0.57	0
3	PG4	L	202	-	12,12,12	0.54	0	11,11,11	0.24	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
3	PG4	K	203	-	-	1/7/7/10	-
3	PG4	L	203	-	-	7/10/10/10	-
4	HEM	F	204	1	-	4/12/54/54	-
3	PG4	A	202	-	-	1/7/7/10	-
3	PG4	H	204	-	-	2/8/8/10	-
3	PG4	D	202	-	-	0/10/10/10	-
3	PG4	H	202	-	-	0/10/10/10	-
3	PG4	G	202	-	-	1/10/10/10	-
4	HEM	D	204	1	-	2/12/54/54	-
3	PG4	B	202	-	-	0/8/8/10	-
4	HEM	L	204	1	-	4/12/54/54	-
3	PG4	K	202	-	-	5/10/10/10	-
2	KT4	E	201	-	-	0/7/19/19	0/3/3/3
3	PG4	J	202	-	-	4/10/10/10	-
2	KT4	G	201	-	-	3/5/17/19	0/2/2/3
3	PG4	H	203	-	-	7/10/10/10	-
3	PG4	B	203	-	-	2/7/7/10	-
3	PG4	I	202	-	-	4/10/10/10	-
3	PG4	E	202	-	-	0/10/10/10	-
2	KT4	A	201	-	-	0/2/14/19	0/2/2/3
2	KT4	B	201	-	-	1/7/19/19	0/3/3/3
2	KT4	K	201	-	-	0/7/19/19	0/3/3/3
3	PG4	J	203	-	-	3/7/7/10	-
3	PG4	E	203	-	-	3/10/10/10	-
2	KT4	C	201	-	-	1/7/19/19	0/3/3/3

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	KT4	L	201	-	-	0/7/19/19	0/3/3/3
3	PG4	D	203	-	-	0/5/5/10	-
2	KT4	J	201	-	-	0/7/19/19	0/3/3/3
4	HEM	I	203	1	-	4/12/54/54	-
3	PG4	F	202	-	-	0/10/10/10	-
4	HEM	H	205	1	-	4/12/54/54	-
4	HEM	E	204	1	-	4/12/54/54	-
3	PG4	C	202	-	-	0/8/8/10	-
2	KT4	I	201	-	-	0/7/19/19	0/3/3/3
3	PG4	G	203	-	-	4/7/7/10	-
4	HEM	A	204	1	-	4/12/54/54	-
2	KT4	H	201	-	-	2/4/16/19	0/2/2/3
2	KT4	D	201	-	-	0/2/14/19	0/2/2/3
3	PG4	F	203	-	-	0/5/5/10	-
2	KT4	F	201	-	-	0/7/19/19	0/3/3/3
3	PG4	A	203	-	-	1/4/4/10	-
3	PG4	L	202	-	-	0/10/10/10	-

The worst 5 of 93 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	201	KT4	C04-N03	4.78	1.45	1.38
2	D	201	KT4	C06-N07	4.66	1.46	1.37
2	D	201	KT4	C04-N03	4.65	1.45	1.38
4	A	204	HEM	C3C-C2C	-4.57	1.34	1.40
4	H	205	HEM	C3C-C2C	-4.41	1.34	1.40

The worst 5 of 104 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	201	KT4	C04-N03-C02	-5.60	107.74	112.52
2	D	201	KT4	C04-N03-C02	-5.50	107.84	112.52
2	E	201	KT4	C05-C06-N07	-4.83	115.59	121.32
2	B	201	KT4	C05-C06-N07	-4.76	115.67	121.32
4	A	204	HEM	C4D-ND-C1D	4.53	109.75	105.07

There are no chirality outliers.

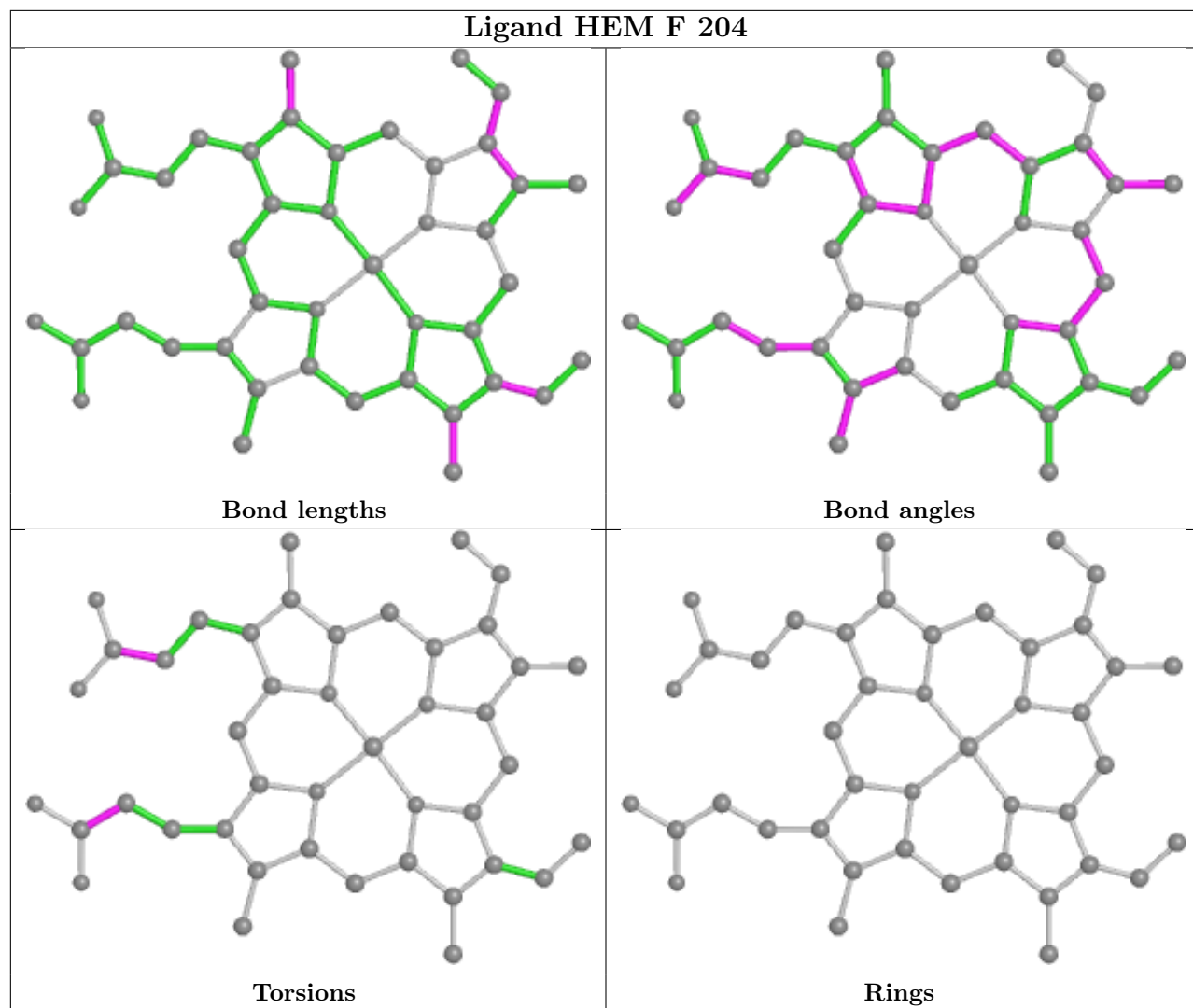
5 of 78 torsion outliers are listed below:

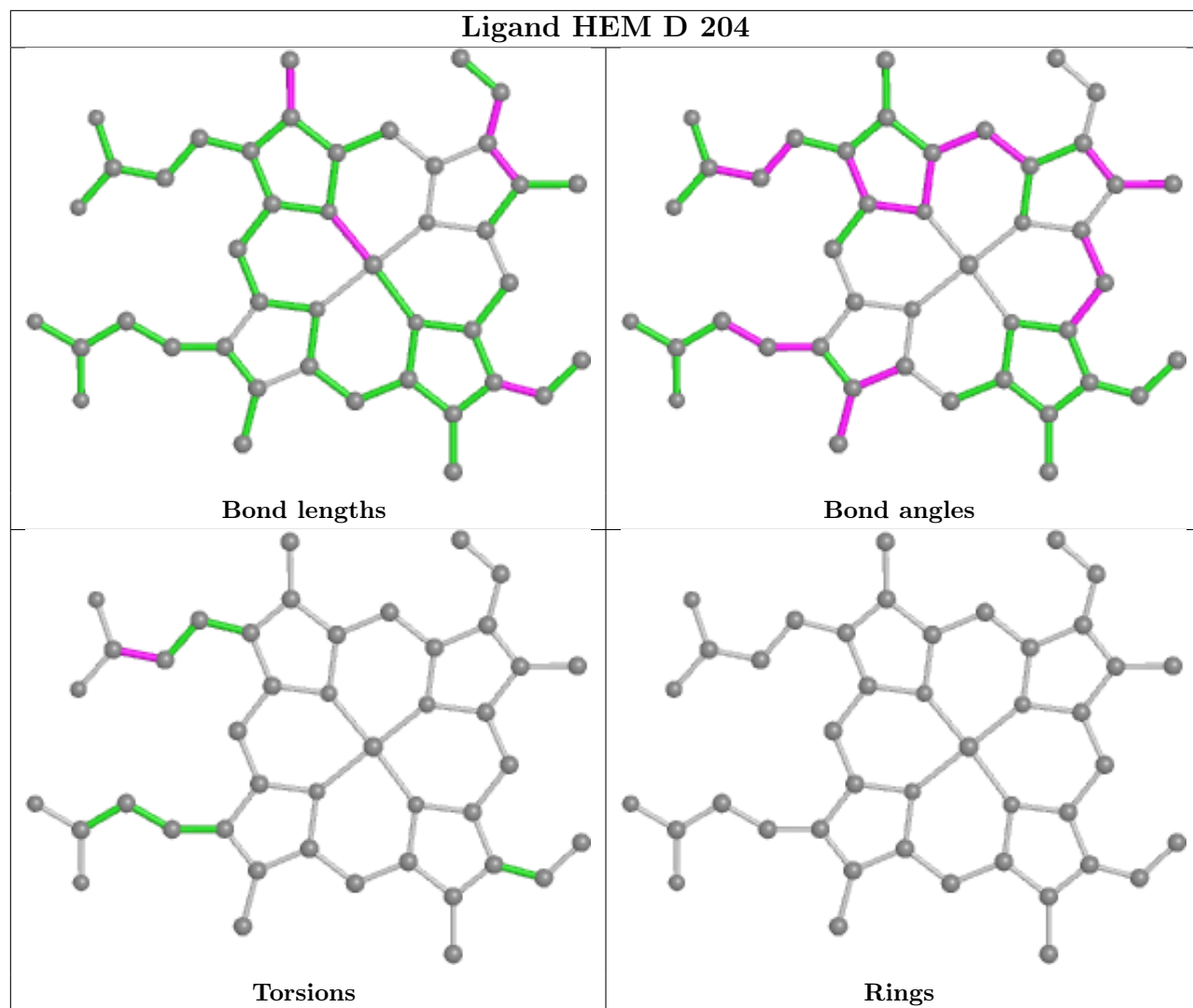
Mol	Chain	Res	Type	Atoms
3	G	203	PG4	O2-C3-C4-O3
3	J	202	PG4	O1-C1-C2-O2
3	K	202	PG4	O4-C7-C8-O5
3	I	202	PG4	O1-C1-C2-O2
3	B	203	PG4	O4-C7-C8-O5

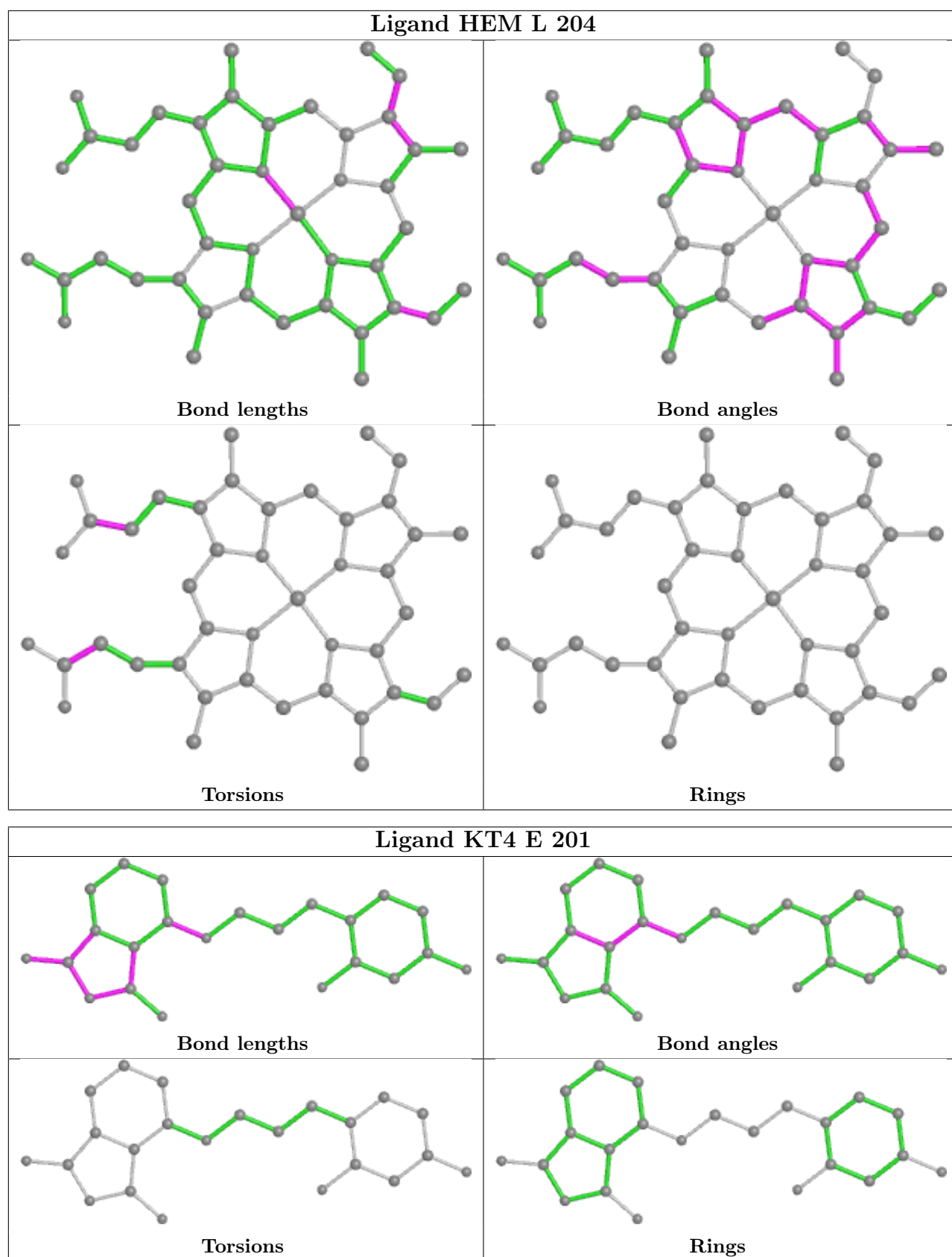
There are no ring outliers.

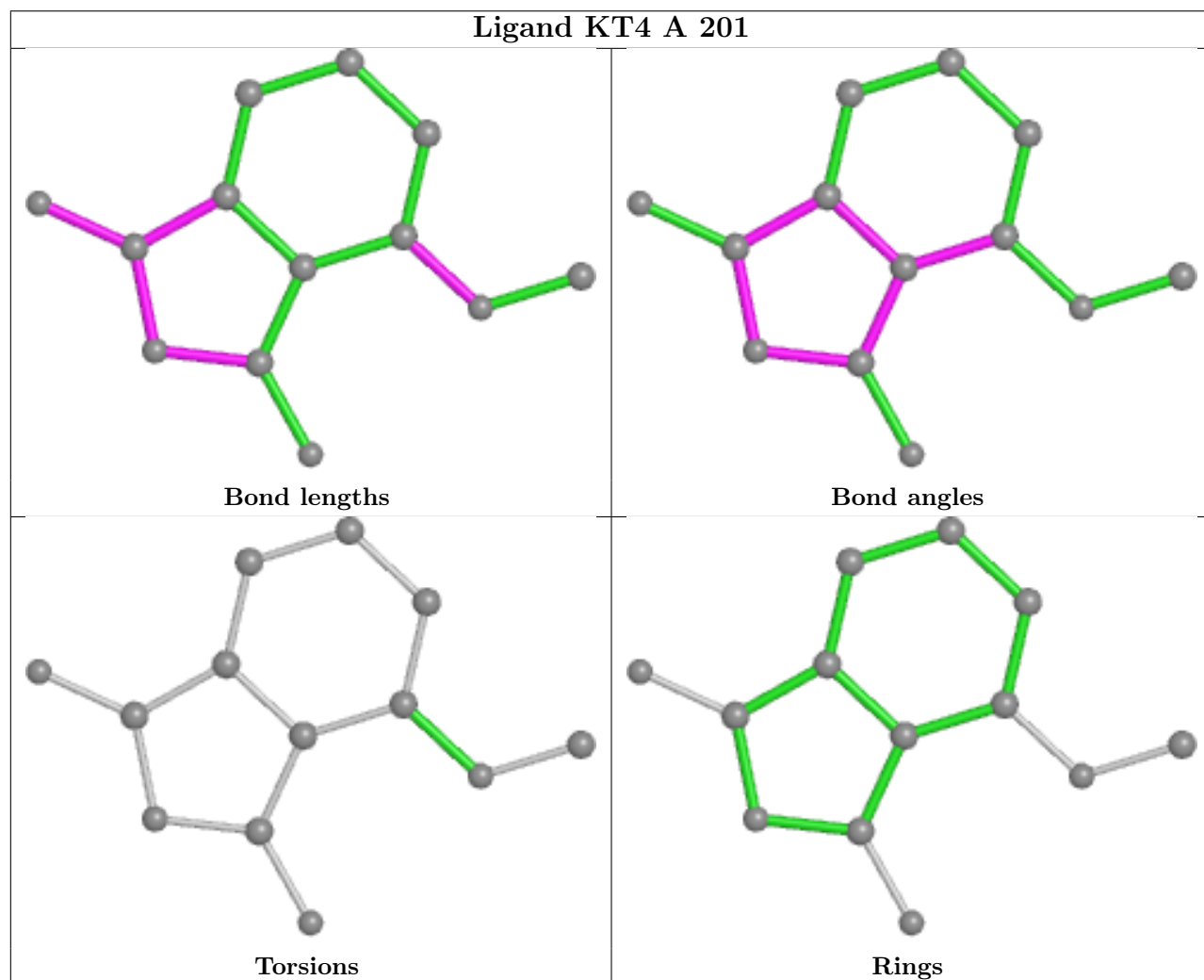
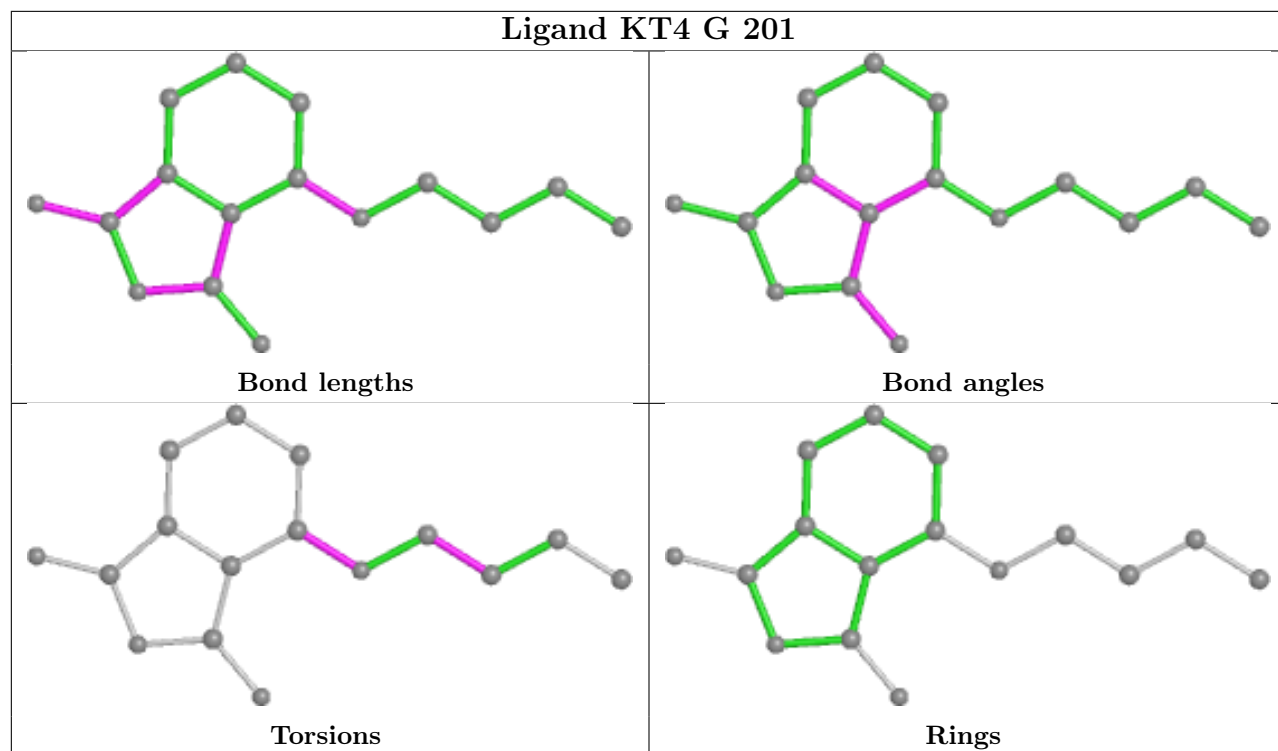
No monomer is involved in short contacts.

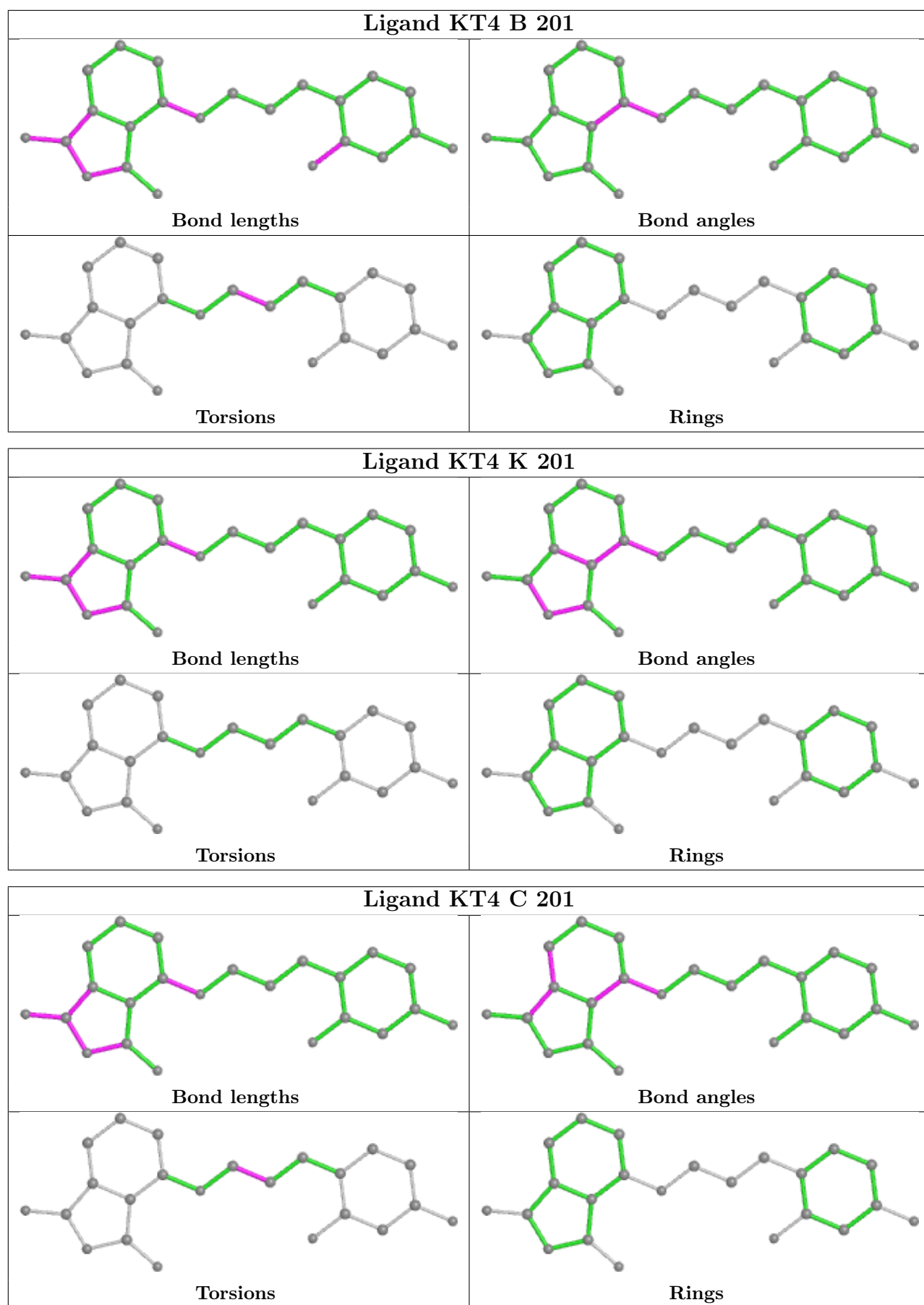
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

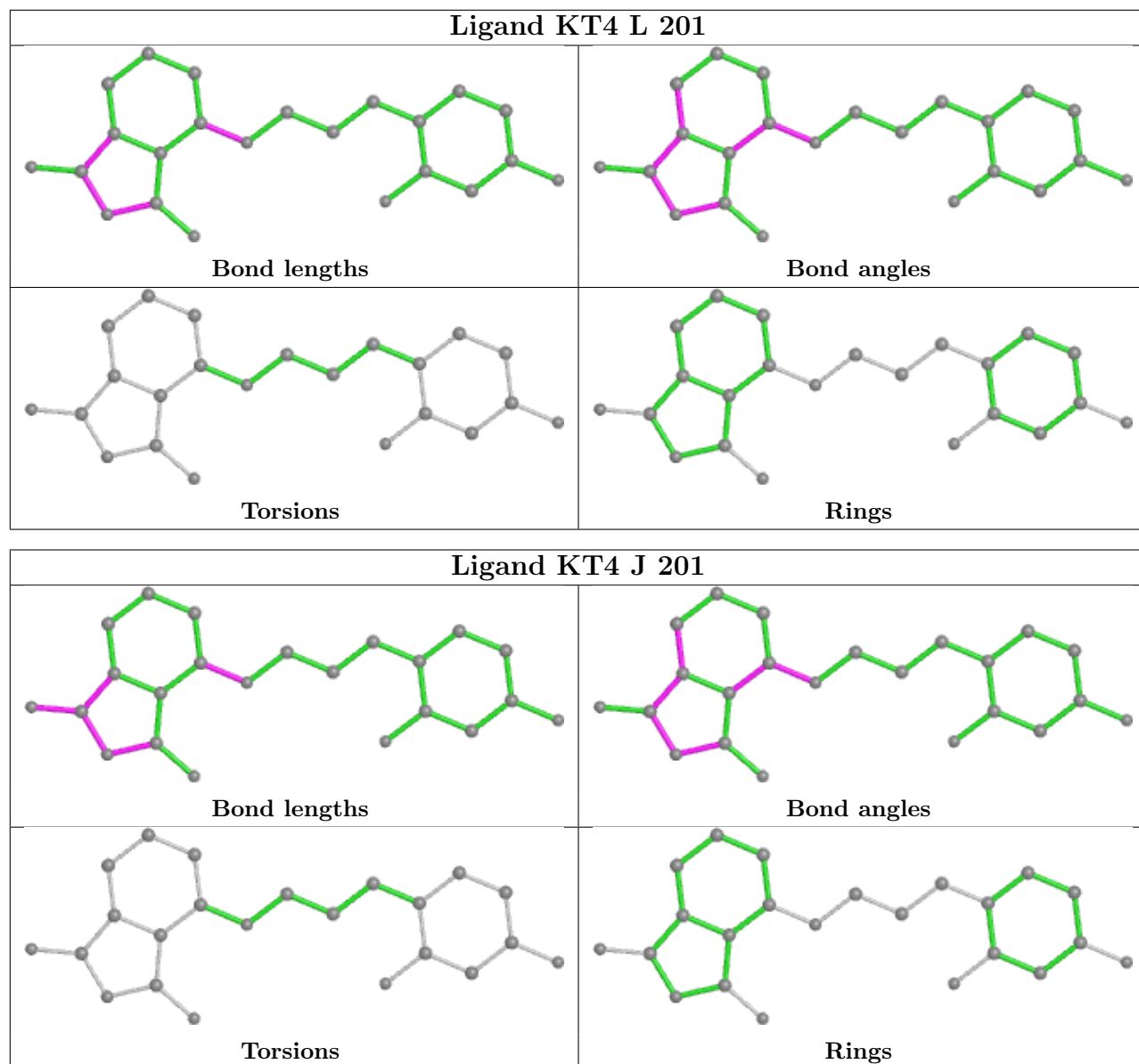


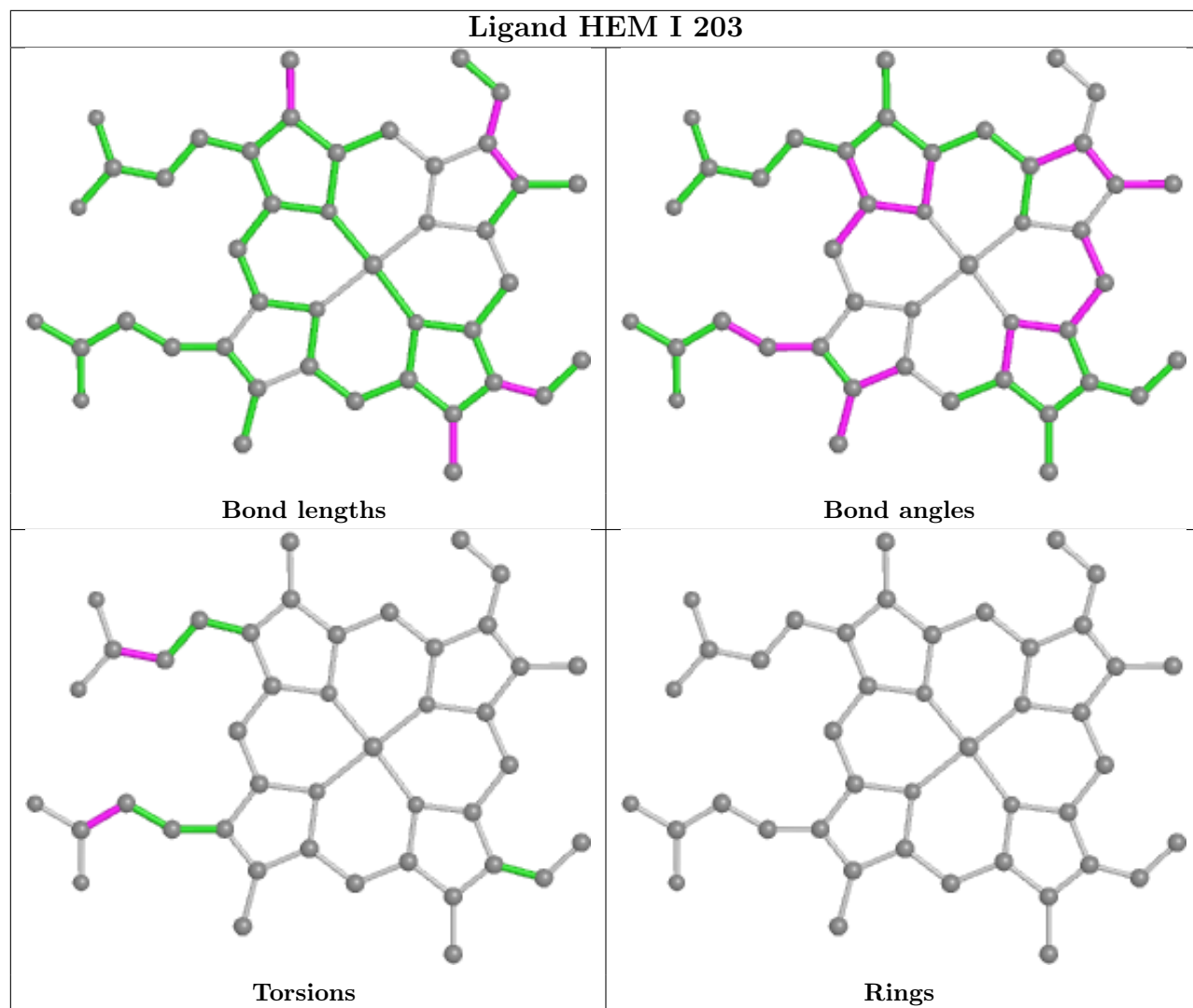


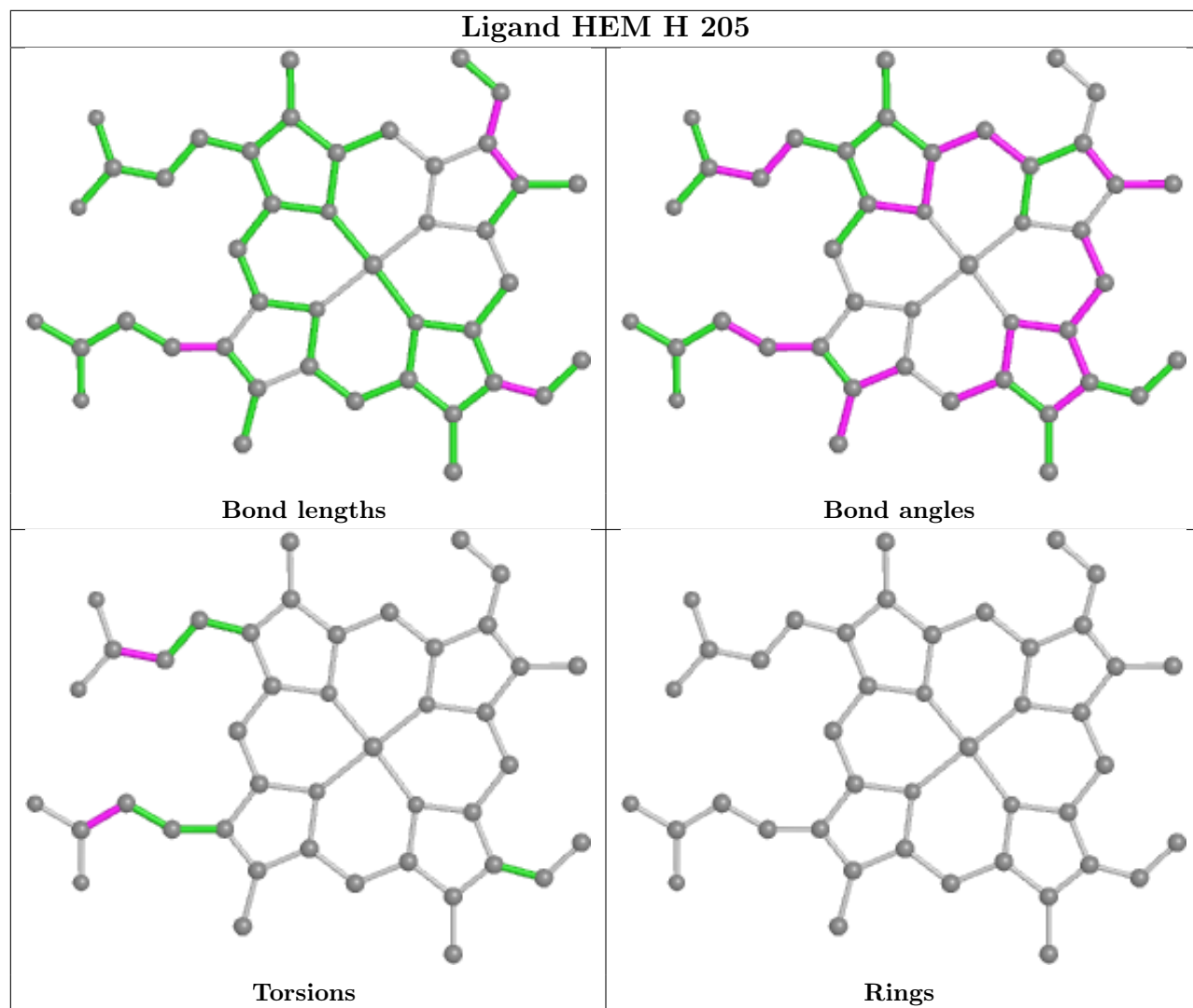


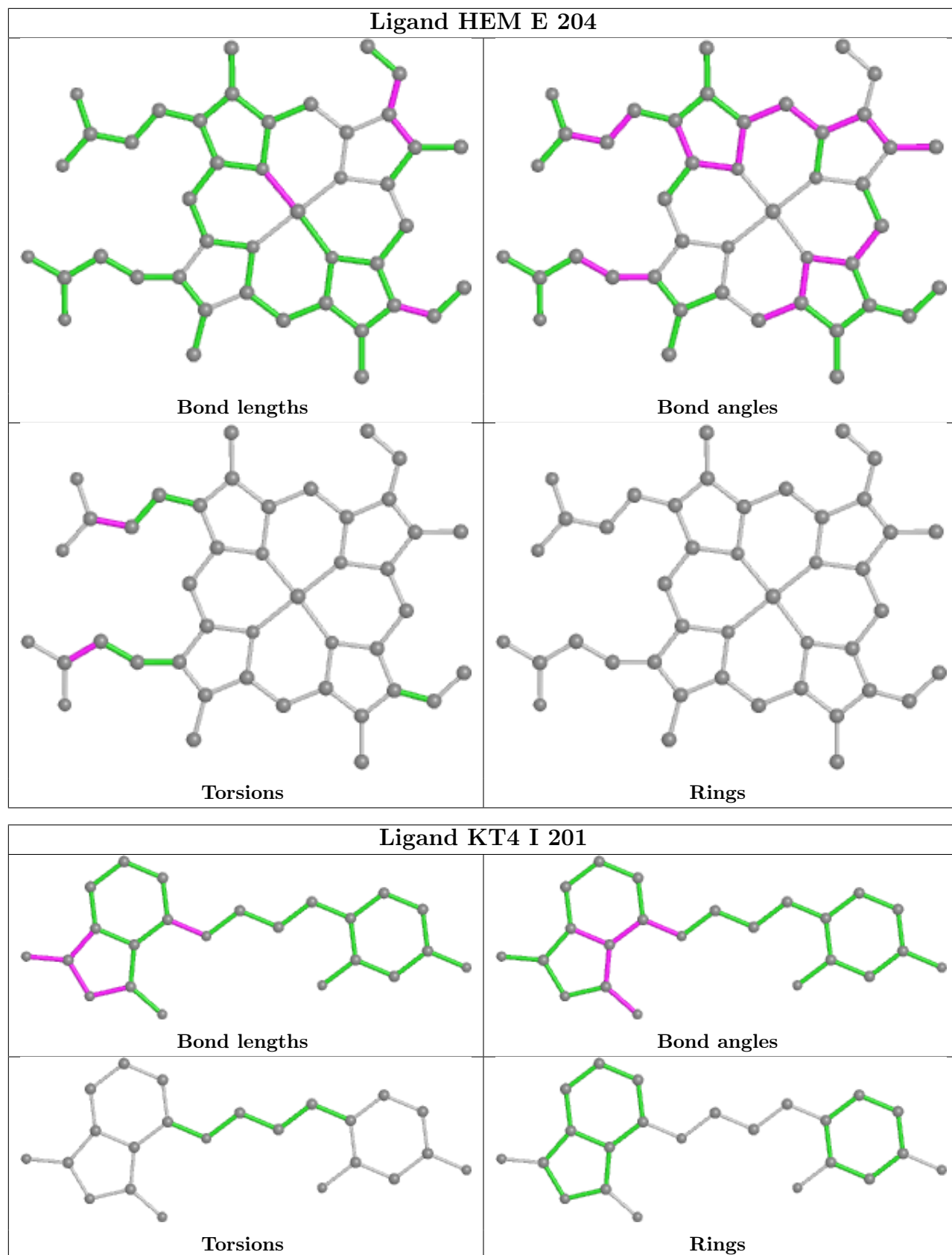


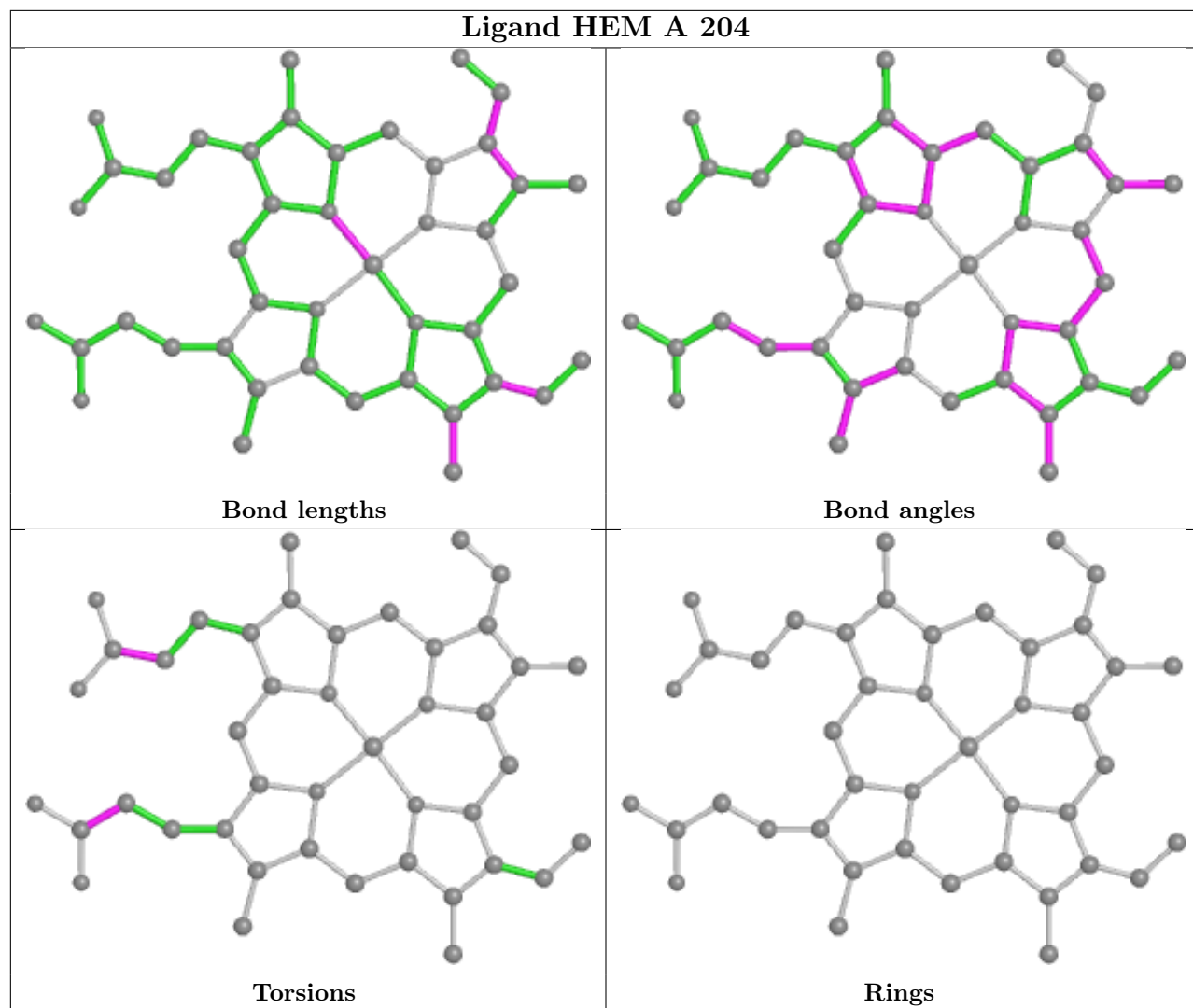


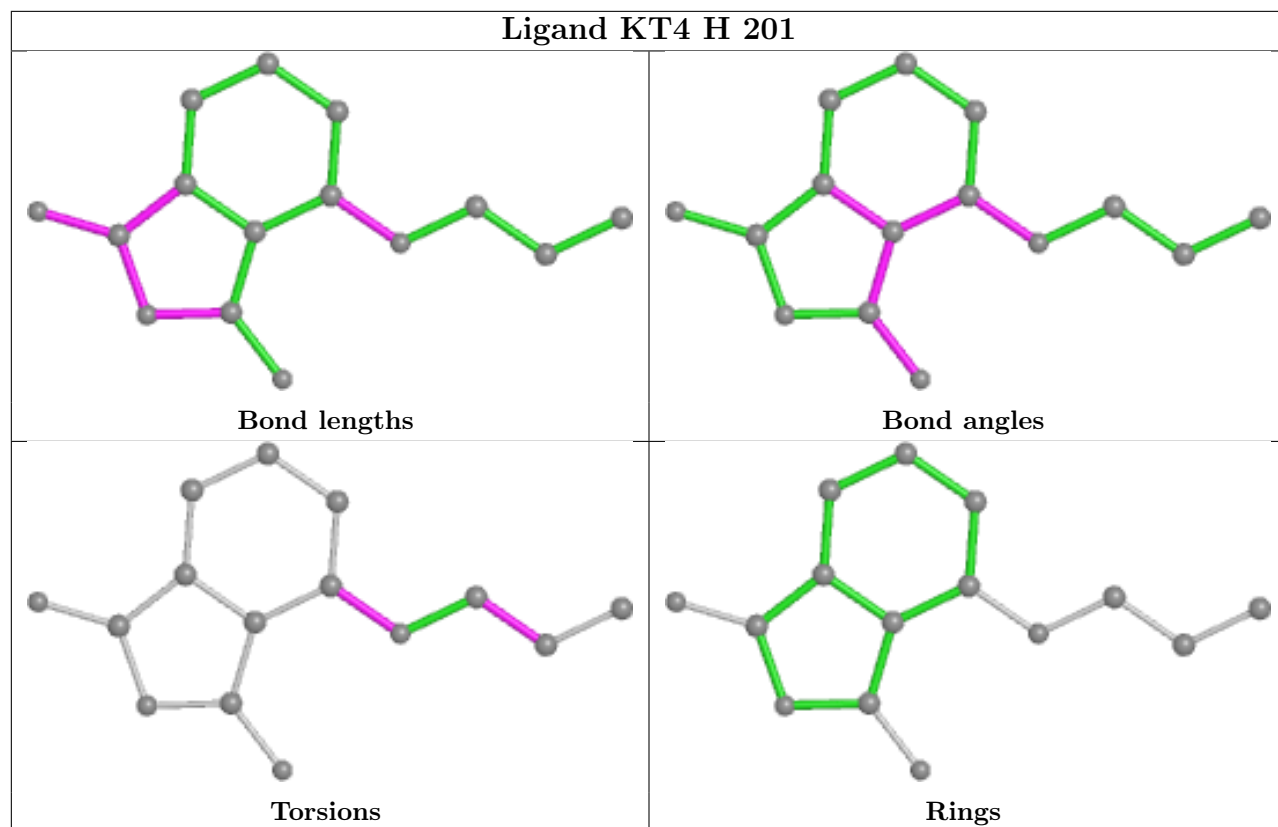




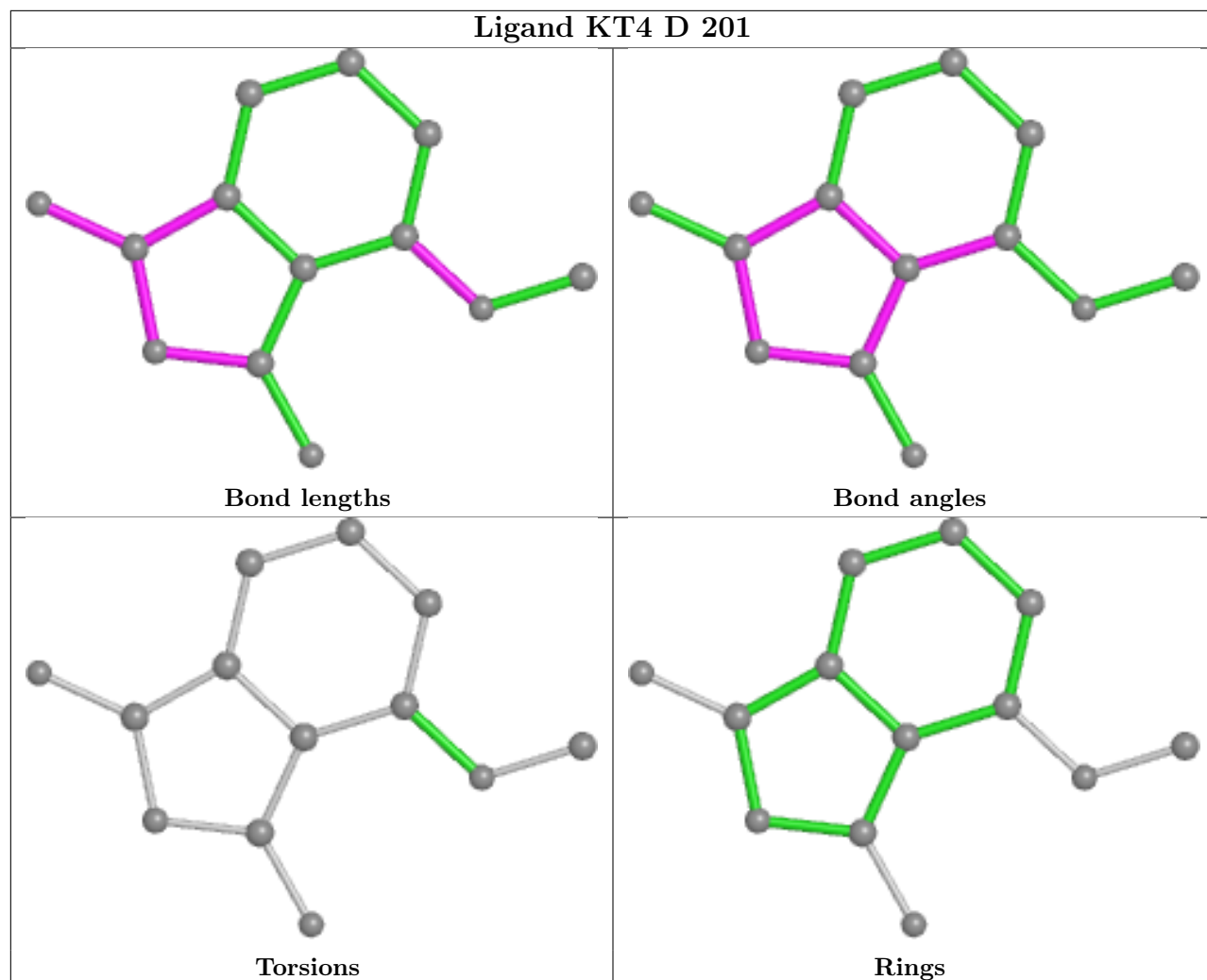




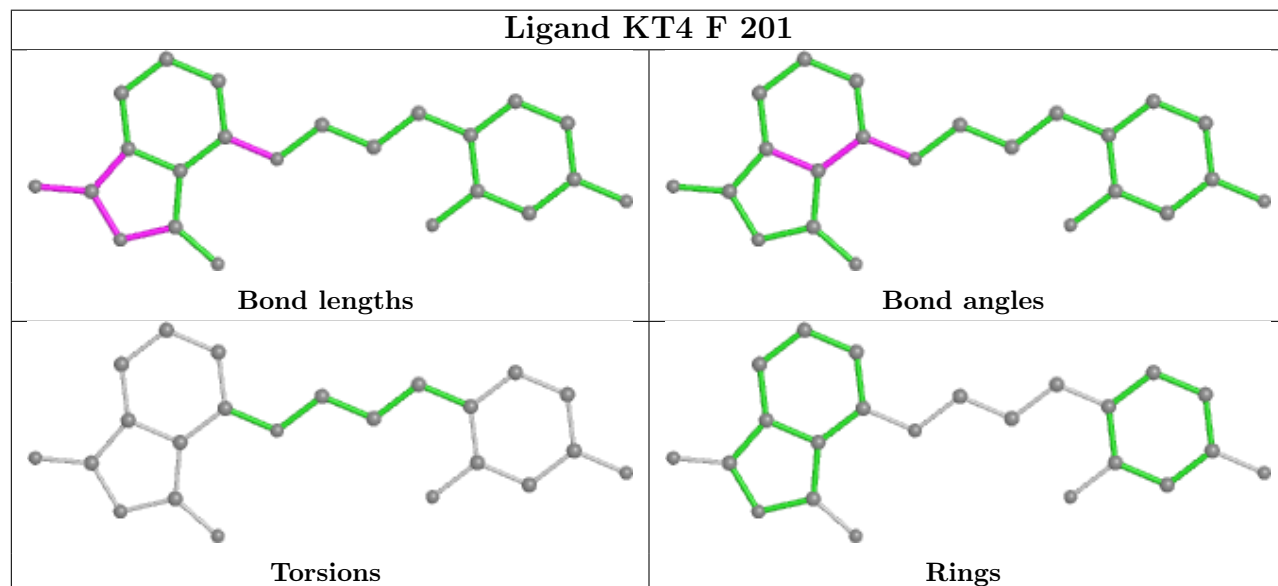




Ligand KT4 D 201



Ligand KT4 F 201



4.7 Other polymers [i](#)

There are no such residues in this entry.

4.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

5 Fit of model and data

5.1 Protein, DNA and RNA chains

EDS failed to run properly - this section is therefore empty.

5.2 Non-standard residues in protein, DNA, RNA chains

EDS failed to run properly - this section is therefore empty.

5.3 Carbohydrates

EDS failed to run properly - this section is therefore empty.

5.4 Ligands

EDS failed to run properly - this section is therefore empty.

5.5 Other polymers

EDS failed to run properly - this section is therefore empty.