



Full wwPDB X-ray Structure Validation 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 Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

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

A user guide is available at

<https://www.wwpdb.org/validation/2017/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](#)

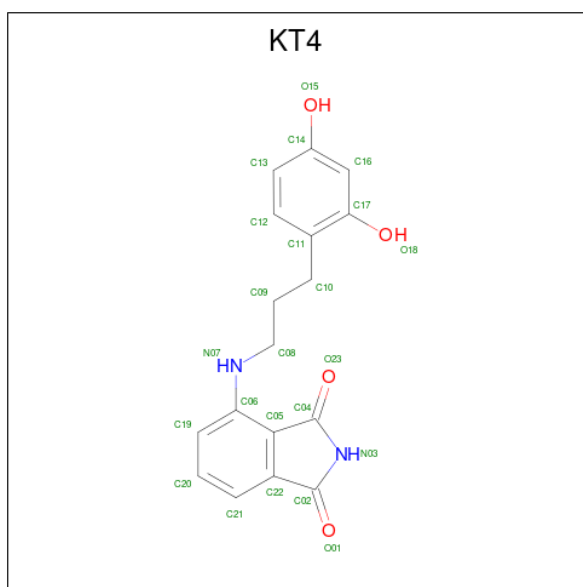
There are 6 unique types of molecules in this entry. The entry contains 17504 atoms, of which 0 are hydrogens and 0 are deuteriums.

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	Total 1271	C 807	N 215	O 242	S 7	0	1	0
1	B	155	Total 1265	C 803	N 216	O 239	S 7	0	2	0
1	C	155	Total 1254	C 796	N 212	O 239	S 7	0	1	0
1	D	155	Total 1268	C 803	N 218	O 240	S 7	0	1	0
1	E	155	Total 1266	C 802	N 217	O 240	S 7	0	1	0
1	F	156	Total 1272	C 807	N 217	O 241	S 7	0	2	0
1	G	155	Total 1260	C 800	N 212	O 241	S 7	0	2	0
1	H	155	Total 1264	C 802	N 213	O 242	S 7	0	2	0
1	I	155	Total 1256	C 796	N 214	O 239	S 7	0	1	0
1	J	155	Total 1267	C 802	N 216	O 242	S 7	0	2	0
1	K	155	Total 1260	C 800	N 212	O 241	S 7	0	2	0
1	L	156	Total 1271	C 806	N 216	O 242	S 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	13	9	2	2	0	0
2	B	1	23	17	2	4	0	0
2	C	1	23	17	2	4	0	0
2	D	1	13	9	2	2	0	0
2	E	1	23	17	2	4	0	0
2	F	1	23	17	2	4	0	0
2	G	1	16	12	2	2	0	0
2	H	1	15	11	2	2	0	0
2	I	1	23	17	2	4	0	0
2	J	1	23	17	2	4	0	0
2	K	1	23	17	2	4	0	0
2	L	1	23	17	2	4	0	0

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



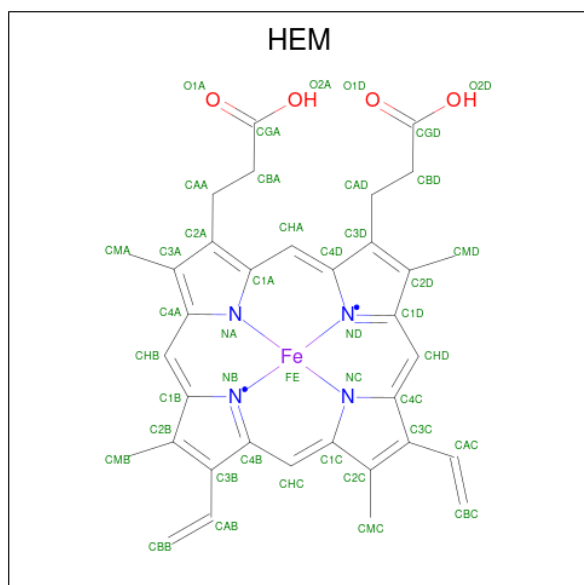
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 10 6 4	0	0
3	A	1	Total C O 7 4 3	0	0
3	B	1	Total C O 11 7 4	0	0
3	B	1	Total C O 10 6 4	0	0
3	C	1	Total C O 11 7 4	0	0
3	D	1	Total C O 13 8 5	0	0
3	D	1	Total C O 8 5 3	0	0
3	E	1	Total C O 13 8 5	0	0
3	E	1	Total C O 13 8 5	0	0
3	F	1	Total C O 13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

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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		

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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		

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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.*

¹ Intensities estimated from amplitudes.

² Theoretical 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

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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	-

All (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
2	C	201	KT4	C22-C02	4.39	1.55	1.48
2	A	201	KT4	C06-N07	4.38	1.45	1.37
4	E	204	HEM	C3C-C2C	-4.38	1.34	1.40
4	F	204	HEM	C3C-C2C	-4.27	1.34	1.40
2	A	201	KT4	C22-C02	4.27	1.55	1.48
2	L	201	KT4	C02-N03	4.23	1.44	1.38
4	I	203	HEM	C3C-C2C	-4.23	1.34	1.40
2	L	201	KT4	C22-C02	4.18	1.55	1.48
2	D	201	KT4	C02-N03	4.09	1.44	1.38
2	I	201	KT4	C22-C02	4.09	1.54	1.48
2	J	201	KT4	C02-N03	4.08	1.44	1.38
2	K	201	KT4	C22-C02	4.07	1.54	1.48
2	E	201	KT4	C02-N03	3.94	1.44	1.38
2	L	201	KT4	C04-N03	3.92	1.44	1.38
2	B	201	KT4	C22-C02	3.88	1.54	1.48

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	H	201	KT4	C22-C02	3.85	1.54	1.48
2	D	201	KT4	C22-C02	3.85	1.54	1.48
4	D	204	HEM	C3C-C2C	-3.84	1.35	1.40
2	K	201	KT4	C04-N03	3.81	1.44	1.38
4	H	205	HEM	C3C-CAC	3.77	1.55	1.47
2	E	201	KT4	C22-C02	3.76	1.54	1.48
2	G	201	KT4	C22-C02	3.74	1.54	1.48
2	J	201	KT4	C04-N03	3.74	1.44	1.38
2	F	201	KT4	C22-C02	3.74	1.54	1.48
2	K	201	KT4	C02-N03	3.68	1.44	1.38
4	L	204	HEM	C3C-CAC	3.66	1.55	1.47
4	F	204	HEM	C3C-CAC	3.60	1.55	1.47
2	A	201	KT4	C02-N03	3.59	1.43	1.38
4	A	204	HEM	C3C-CAC	3.49	1.55	1.47
2	J	201	KT4	C22-C02	3.44	1.53	1.48
4	L	204	HEM	C3C-C2C	-3.42	1.35	1.40
2	F	201	KT4	C04-N03	3.40	1.43	1.38
4	I	203	HEM	C3C-CAC	3.37	1.54	1.47
2	F	201	KT4	C06-N07	3.36	1.46	1.37
2	B	201	KT4	C06-N07	3.34	1.46	1.37
4	D	204	HEM	C3C-CAC	3.30	1.54	1.47
2	E	201	KT4	C04-N03	3.27	1.43	1.38
2	G	201	KT4	C06-N07	3.23	1.46	1.37
2	F	201	KT4	C02-N03	3.19	1.43	1.38
2	B	201	KT4	C02-N03	3.17	1.43	1.38
2	G	201	KT4	C04-N03	3.15	1.43	1.38
2	C	201	KT4	C04-N03	3.12	1.43	1.38
2	K	201	KT4	C06-N07	3.11	1.46	1.37
2	E	201	KT4	C06-N07	3.08	1.46	1.37
2	H	201	KT4	C06-N07	3.07	1.45	1.37
2	J	201	KT4	C06-N07	3.06	1.45	1.37
2	C	201	KT4	C06-N07	2.99	1.45	1.37
2	I	201	KT4	C06-N07	2.98	1.45	1.37
4	E	204	HEM	C3C-CAC	2.98	1.53	1.47
2	G	201	KT4	O01-C02	-2.96	1.17	1.23
4	I	203	HEM	CAB-C3B	2.95	1.55	1.47
2	L	201	KT4	C06-N07	2.91	1.45	1.37
4	A	204	HEM	CAB-C3B	2.88	1.55	1.47
2	I	201	KT4	C02-N03	2.85	1.42	1.38
2	B	201	KT4	C04-N03	2.81	1.42	1.38
4	L	204	HEM	CAB-C3B	2.80	1.55	1.47
2	I	201	KT4	C04-N03	2.77	1.42	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	J	201	KT4	O01-C02	-2.76	1.17	1.23
2	H	201	KT4	C02-N03	2.74	1.42	1.38
2	H	201	KT4	O01-C02	-2.74	1.17	1.23
2	A	201	KT4	O01-C02	-2.71	1.17	1.23
2	D	201	KT4	O01-C02	-2.70	1.17	1.23
2	C	201	KT4	C02-N03	2.62	1.42	1.38
4	D	204	HEM	CAB-C3B	2.61	1.54	1.47
2	E	201	KT4	O01-C02	-2.52	1.18	1.23
4	D	204	HEM	FE-ND	2.48	2.09	1.96
4	F	204	HEM	CAB-C3B	2.43	1.54	1.47
4	L	204	HEM	FE-ND	2.40	2.08	1.96
2	H	201	KT4	C04-N03	2.38	1.42	1.38
4	H	205	HEM	CAB-C3B	2.33	1.53	1.47
4	F	204	HEM	CMD-C2D	2.33	1.55	1.50
2	C	201	KT4	O01-C02	-2.26	1.18	1.23
4	I	203	HEM	CMD-C2D	2.23	1.55	1.50
2	K	201	KT4	O01-C02	-2.21	1.18	1.23
2	F	201	KT4	O01-C02	-2.19	1.18	1.23
4	A	204	HEM	FE-ND	2.19	2.07	1.96
2	B	201	KT4	O18-C17	2.19	1.40	1.36
2	B	201	KT4	O01-C02	-2.16	1.18	1.23
4	E	204	HEM	CAB-C3B	2.16	1.53	1.47
2	I	201	KT4	O01-C02	-2.16	1.18	1.23
4	F	204	HEM	CMB-C2B	2.14	1.55	1.50
4	H	205	HEM	CAA-C2A	2.14	1.55	1.52
4	D	204	HEM	CMD-C2D	2.14	1.55	1.50
4	A	204	HEM	CMB-C2B	2.10	1.55	1.50
2	G	201	KT4	C05-C04	2.09	1.55	1.49
4	I	203	HEM	CMB-C2B	2.04	1.55	1.50
4	E	204	HEM	FE-ND	2.03	2.06	1.96
2	E	201	KT4	C05-C04	2.03	1.55	1.49

All (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
4	E	204	HEM	CMC-C2C-C3C	4.25	132.63	124.68
4	H	205	HEM	CMC-C2C-C3C	4.18	132.51	124.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	201	KT4	C05-C06-N07	-4.17	116.38	121.32
2	K	201	KT4	C05-C06-N07	-4.03	116.54	121.32
4	D	204	HEM	CMC-C2C-C3C	3.93	132.03	124.68
4	L	204	HEM	CMC-C2C-C3C	3.93	132.02	124.68
4	E	204	HEM	C4D-ND-C1D	3.91	109.11	105.07
4	A	204	HEM	CMC-C2C-C3C	3.85	131.89	124.68
2	J	201	KT4	C04-N03-C02	-3.84	109.25	112.52
2	H	201	KT4	C05-C06-N07	-3.82	116.79	121.32
2	C	201	KT4	C05-C06-N07	-3.78	116.85	121.32
4	L	204	HEM	C4D-ND-C1D	3.64	108.83	105.07
2	I	201	KT4	C05-C06-N07	-3.57	117.09	121.32
4	F	204	HEM	CBA-CAA-C2A	-3.56	106.55	112.62
4	A	204	HEM	C4B-CHC-C1C	3.39	127.03	122.56
4	I	203	HEM	CMC-C2C-C3C	3.37	130.99	124.68
4	I	203	HEM	C4D-ND-C1D	3.34	108.53	105.07
2	D	201	KT4	C22-C05-C06	-3.30	119.64	121.91
2	G	201	KT4	C22-C05-C06	-3.29	119.65	121.91
2	J	201	KT4	C05-C06-N07	-3.27	117.45	121.32
2	G	201	KT4	O23-C04-C05	3.26	133.40	128.55
2	L	201	KT4	C05-C06-N07	-3.26	117.46	121.32
4	A	204	HEM	C3D-C4D-ND	-3.21	106.59	110.17
4	F	204	HEM	CMC-C2C-C3C	3.18	130.62	124.68
4	H	205	HEM	CBA-CAA-C2A	-3.15	107.24	112.62
2	I	201	KT4	C22-C05-C06	-3.15	119.74	121.91
4	D	204	HEM	CBA-CAA-C2A	-3.12	107.30	112.62
4	D	204	HEM	C4D-ND-C1D	3.09	108.26	105.07
4	L	204	HEM	C4C-CHD-C1D	3.08	126.62	122.56
2	A	201	KT4	C22-C02-N03	3.04	108.69	105.89
4	H	205	HEM	C4D-ND-C1D	3.02	108.19	105.07
4	E	204	HEM	CBA-CAA-C2A	-2.98	107.54	112.62
4	H	205	HEM	CMA-C3A-C4A	-2.95	123.93	128.46
2	A	201	KT4	C22-C05-C06	-2.94	119.89	121.91
4	I	203	HEM	C4B-CHC-C1C	2.89	126.38	122.56
4	A	204	HEM	CBA-CAA-C2A	-2.86	107.73	112.62
2	D	201	KT4	C22-C02-N03	2.85	108.51	105.89
4	D	204	HEM	C4C-CHD-C1D	2.84	126.30	122.56
4	F	204	HEM	C4C-CHD-C1D	2.78	126.23	122.56
4	F	204	HEM	C4D-ND-C1D	2.77	107.94	105.07
2	I	201	KT4	O23-C04-C05	2.77	132.67	128.55
4	E	204	HEM	CAD-CBD-CGD	-2.70	107.79	113.60
4	L	204	HEM	C1B-NB-C4B	2.70	107.86	105.07
4	L	204	HEM	CBA-CAA-C2A	-2.69	108.03	112.62

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	E	204	HEM	C2C-C3C-C4C	2.68	108.77	106.90
2	F	201	KT4	C22-C05-C06	-2.68	120.07	121.91
4	A	204	HEM	CMA-C3A-C4A	-2.67	124.36	128.46
2	E	201	KT4	C22-C05-C06	-2.67	120.07	121.91
4	F	204	HEM	C4B-CHC-C1C	2.66	126.07	122.56
2	K	201	KT4	C22-C05-C06	-2.63	120.10	121.91
4	A	204	HEM	C1B-NB-C4B	2.61	107.77	105.07
4	F	204	HEM	CMA-C3A-C4A	-2.58	124.50	128.46
4	I	203	HEM	C3D-C4D-ND	-2.56	107.32	110.17
4	H	205	HEM	C1B-NB-C4B	2.53	107.69	105.07
4	E	204	HEM	C3D-C4D-ND	-2.51	107.38	110.17
4	E	204	HEM	C1B-NB-C4B	2.48	107.64	105.07
4	H	205	HEM	CHD-C1D-ND	2.48	127.12	124.43
2	H	201	KT4	C22-C05-C06	-2.48	120.20	121.91
4	I	203	HEM	CMA-C3A-C4A	-2.47	124.67	128.46
4	L	204	HEM	C3B-C2B-C1B	2.46	108.31	106.49
2	J	201	KT4	C22-C02-N03	2.43	108.12	105.89
4	L	204	HEM	CMB-C2B-C1B	-2.42	121.35	125.04
4	H	205	HEM	C4B-CHC-C1C	2.39	125.71	122.56
4	H	205	HEM	CAD-CBD-CGD	-2.37	108.51	113.60
4	L	204	HEM	C4B-CHC-C1C	2.36	125.67	122.56
2	D	201	KT4	C06-C05-C04	2.36	132.53	129.21
2	A	201	KT4	C06-C05-C04	2.36	132.53	129.21
3	J	203	PG4	O2-C3-C4	2.35	120.99	110.39
4	L	204	HEM	C3D-C4D-ND	-2.31	107.59	110.17
4	I	203	HEM	C2C-C3C-C4C	2.30	108.51	106.90
4	L	204	HEM	C2D-C1D-ND	-2.29	107.13	109.88
4	I	203	HEM	CHA-C4D-ND	2.29	127.21	124.38
4	E	204	HEM	C4C-CHD-C1D	2.28	125.57	122.56
4	H	205	HEM	CHB-C1B-NB	2.28	127.20	124.38
4	D	204	HEM	CAD-CBD-CGD	-2.26	108.73	113.60
4	A	204	HEM	C2D-C1D-ND	-2.26	107.17	109.88
2	L	201	KT4	C04-N03-C02	-2.24	110.61	112.52
4	A	204	HEM	CHD-C1D-ND	2.23	126.85	124.43
4	E	204	HEM	CHB-C1B-NB	2.22	127.13	124.38
4	F	204	HEM	CHC-C4B-NB	2.20	126.82	124.43
2	G	201	KT4	C06-C05-C04	2.20	132.31	129.21
3	J	203	PG4	C3-O2-C2	-2.18	103.83	113.29
4	H	205	HEM	C4B-C3B-C2B	2.17	108.84	107.11
4	H	205	HEM	C4C-CHD-C1D	2.17	125.42	122.56
2	K	201	KT4	C04-N03-C02	-2.16	110.68	112.52
4	I	203	HEM	C1B-NB-C4B	2.16	107.30	105.07

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	E	204	HEM	CHC-C4B-NB	2.16	126.77	124.43
4	L	204	HEM	CHB-C1B-NB	2.15	127.04	124.38
4	I	203	HEM	CBA-CAA-C2A	-2.15	108.95	112.62
2	H	201	KT4	O23-C04-C05	2.15	131.74	128.55
2	C	201	KT4	C21-C22-C02	2.13	133.63	129.37
4	D	204	HEM	CMA-C3A-C4A	-2.10	125.24	128.46
4	F	204	HEM	O2D-CGD-CBD	2.07	120.68	114.03
4	D	204	HEM	C3D-C4D-ND	-2.07	107.86	110.17
2	L	201	KT4	C21-C22-C02	2.02	133.42	129.37
4	F	204	HEM	C3D-C4D-ND	-2.01	107.92	110.17
4	A	204	HEM	CMB-C2B-C1B	-2.01	121.98	125.04
2	J	201	KT4	C21-C22-C02	2.00	133.38	129.37
4	D	204	HEM	C4B-CHC-C1C	2.00	125.20	122.56

There are no chirality outliers.

All (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
2	G	201	KT4	N07-C08-C09-C10
3	G	203	PG4	O3-C5-C6-O4
3	L	203	PG4	O4-C7-C8-O5
2	G	201	KT4	C05-C06-N07-C08
3	A	203	PG4	O3-C5-C6-O4
3	H	203	PG4	O2-C3-C4-O3
2	H	201	KT4	N07-C08-C09-C10
2	C	201	KT4	N07-C08-C09-C10
2	G	201	KT4	C19-C06-N07-C08
3	K	203	PG4	O2-C3-C4-O3
3	G	203	PG4	C3-C4-O3-C5
3	L	203	PG4	O1-C1-C2-O2
3	J	203	PG4	C4-C3-O2-C2
3	L	203	PG4	C5-C6-O4-C7
3	I	202	PG4	C1-C2-O2-C3
3	G	202	PG4	C1-C2-O2-C3
3	K	202	PG4	C8-C7-O4-C6
3	J	203	PG4	C1-C2-O2-C3
3	H	203	PG4	C4-C3-O2-C2

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Mol	Chain	Res	Type	Atoms
3	I	202	PG4	C3-C4-O3-C5
3	L	203	PG4	C6-C5-O3-C4
3	E	203	PG4	O4-C7-C8-O5
3	H	203	PG4	O4-C7-C8-O5
2	B	201	KT4	N07-C08-C09-C10
3	I	202	PG4	C4-C3-O2-C2
3	E	203	PG4	O1-C1-C2-O2
3	G	203	PG4	C4-C3-O2-C2
3	K	202	PG4	C5-C6-O4-C7
3	L	203	PG4	C1-C2-O2-C3
3	H	203	PG4	C5-C6-O4-C7
3	H	203	PG4	C1-C2-O2-C3
3	K	202	PG4	C6-C5-O3-C4
3	H	203	PG4	O1-C1-C2-O2
3	J	202	PG4	C4-C3-O2-C2
4	A	204	HEM	CAD-CBD-CGD-O2D
3	L	203	PG4	C4-C3-O2-C2
3	H	204	PG4	O2-C3-C4-O3
3	H	204	PG4	C1-C2-O2-C3
4	H	205	HEM	CAD-CBD-CGD-O2D
3	J	202	PG4	C3-C4-O3-C5
3	B	203	PG4	C8-C7-O4-C6
4	F	204	HEM	CAD-CBD-CGD-O1D
4	F	204	HEM	CAD-CBD-CGD-O2D
4	I	203	HEM	CAA-CBA-CGA-O2A
4	H	205	HEM	CAD-CBD-CGD-O1D
4	L	204	HEM	CAD-CBD-CGD-O1D
4	A	204	HEM	CAA-CBA-CGA-O1A
4	A	204	HEM	CAA-CBA-CGA-O2A
4	I	203	HEM	CAA-CBA-CGA-O1A
4	F	204	HEM	CAA-CBA-CGA-O1A
4	L	204	HEM	CAD-CBD-CGD-O2D
3	J	202	PG4	C1-C2-O2-C3
4	A	204	HEM	CAD-CBD-CGD-O1D
4	I	203	HEM	CAD-CBD-CGD-O2D
4	I	203	HEM	CAD-CBD-CGD-O1D
3	E	203	PG4	C5-C6-O4-C7
4	F	204	HEM	CAA-CBA-CGA-O2A
4	L	204	HEM	CAA-CBA-CGA-O2A
4	E	204	HEM	CAA-CBA-CGA-O1A
4	E	204	HEM	CAA-CBA-CGA-O2A
3	K	202	PG4	O1-C1-C2-O2

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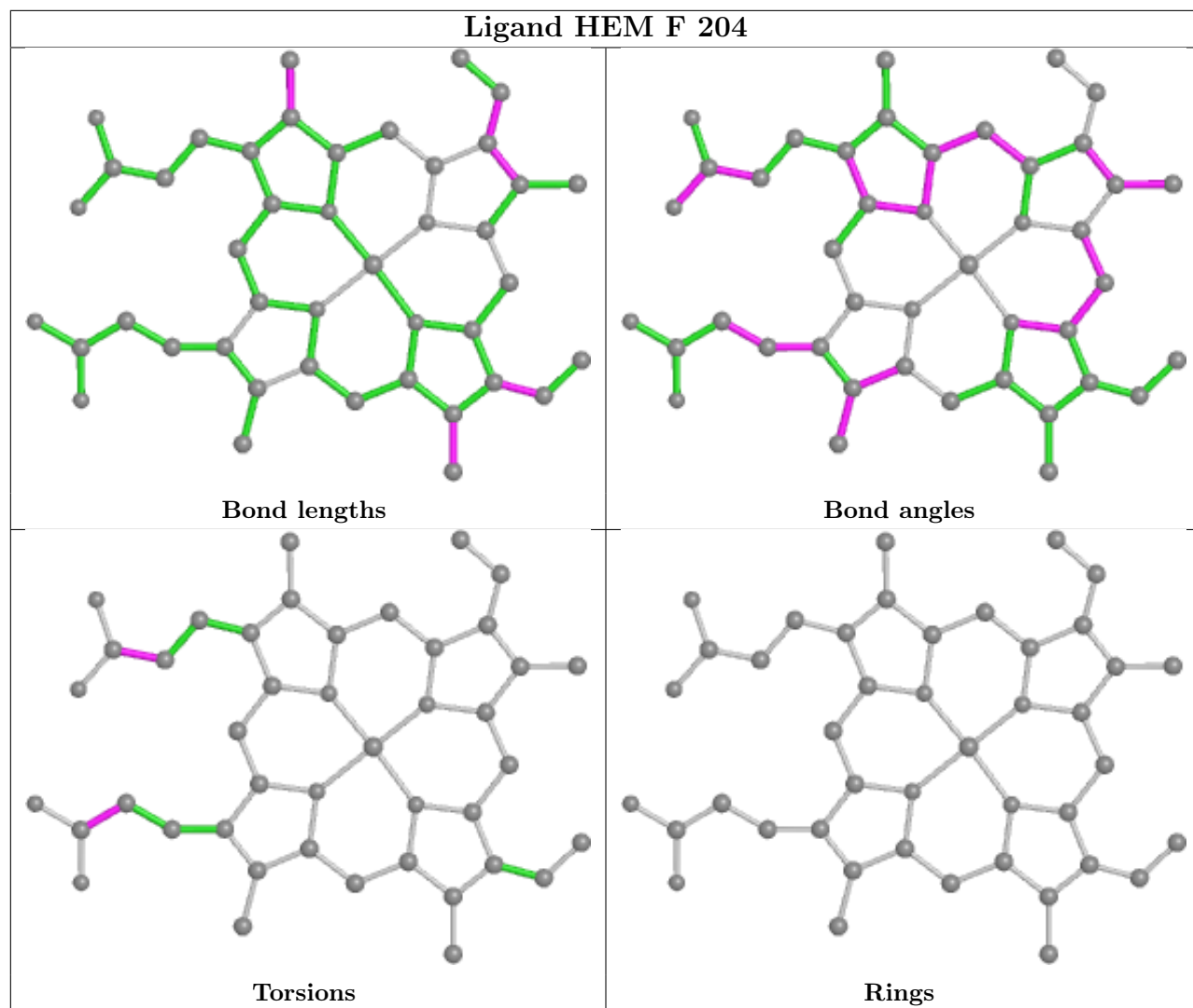
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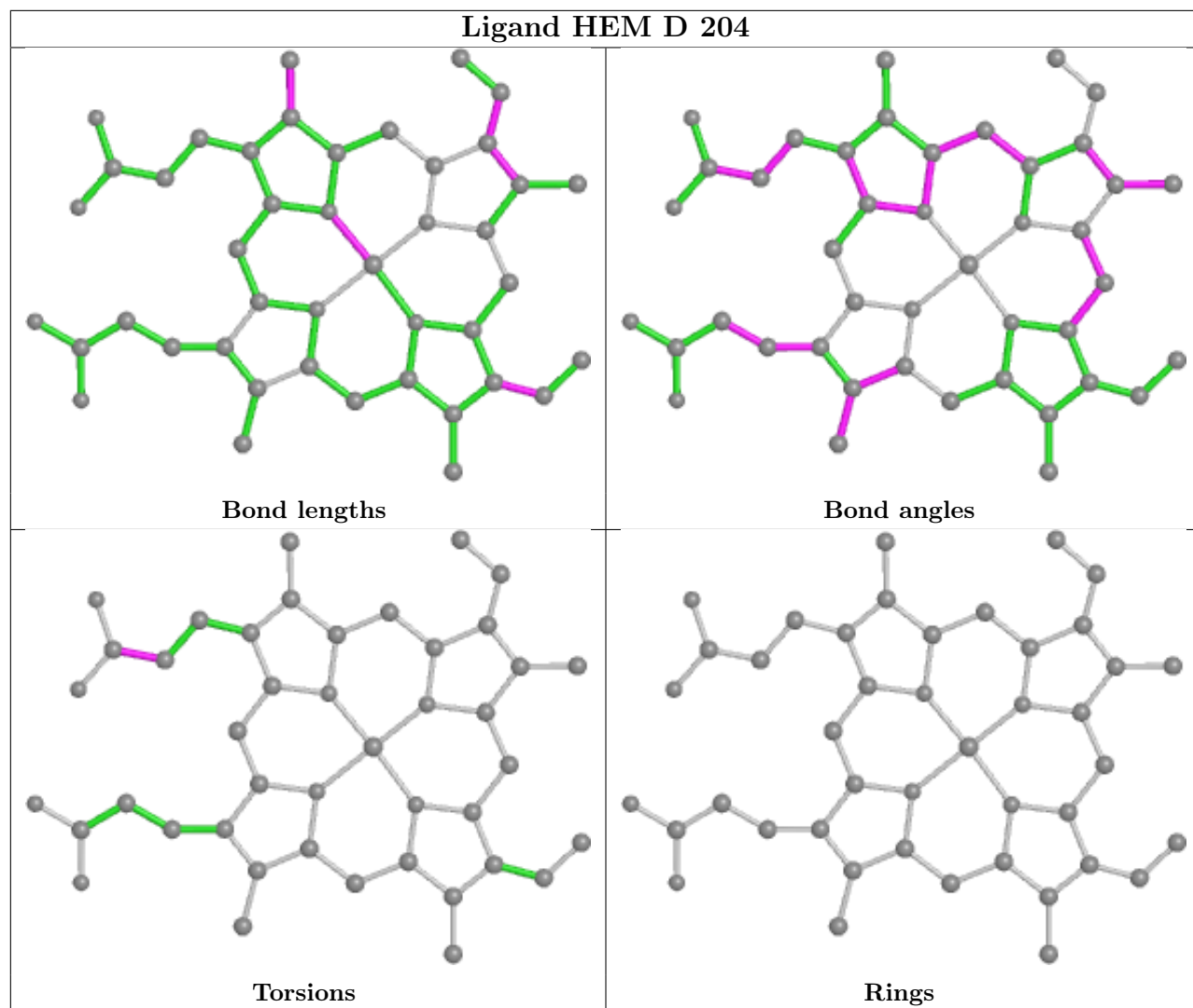
Mol	Chain	Res	Type	Atoms
3	H	203	PG4	O3-C5-C6-O4
4	D	204	HEM	CAD-CBD-CGD-O2D
4	E	204	HEM	CAD-CBD-CGD-O1D
4	H	205	HEM	CAA-CBA-CGA-O2A
4	L	204	HEM	CAA-CBA-CGA-O1A
4	H	205	HEM	CAA-CBA-CGA-O1A
4	E	204	HEM	CAD-CBD-CGD-O2D
4	D	204	HEM	CAD-CBD-CGD-O1D
3	A	202	PG4	O4-C7-C8-O5
3	J	203	PG4	O2-C3-C4-O3
2	H	201	KT4	C05-C06-N07-C08
3	L	203	PG4	O2-C3-C4-O3

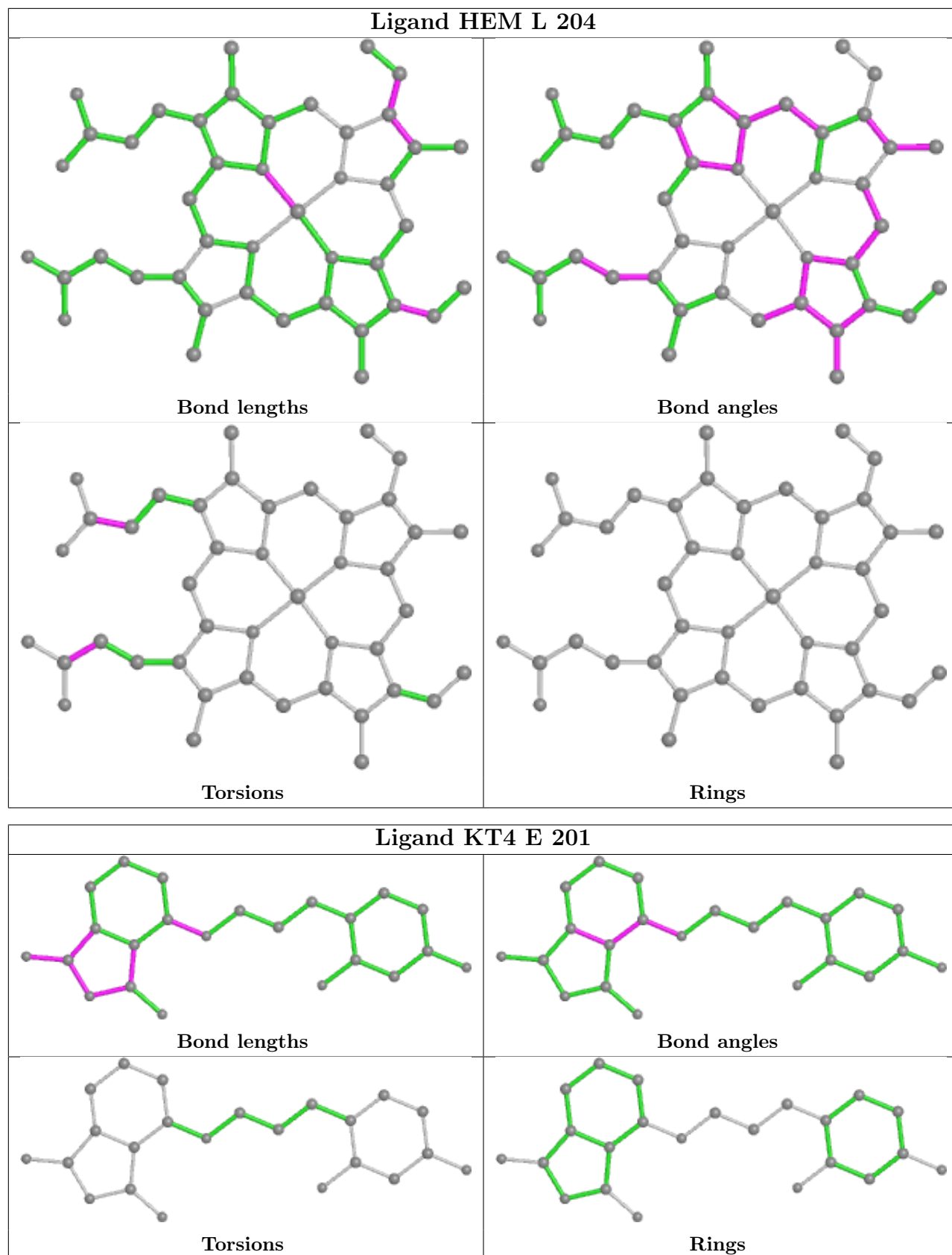
There are no ring outliers.

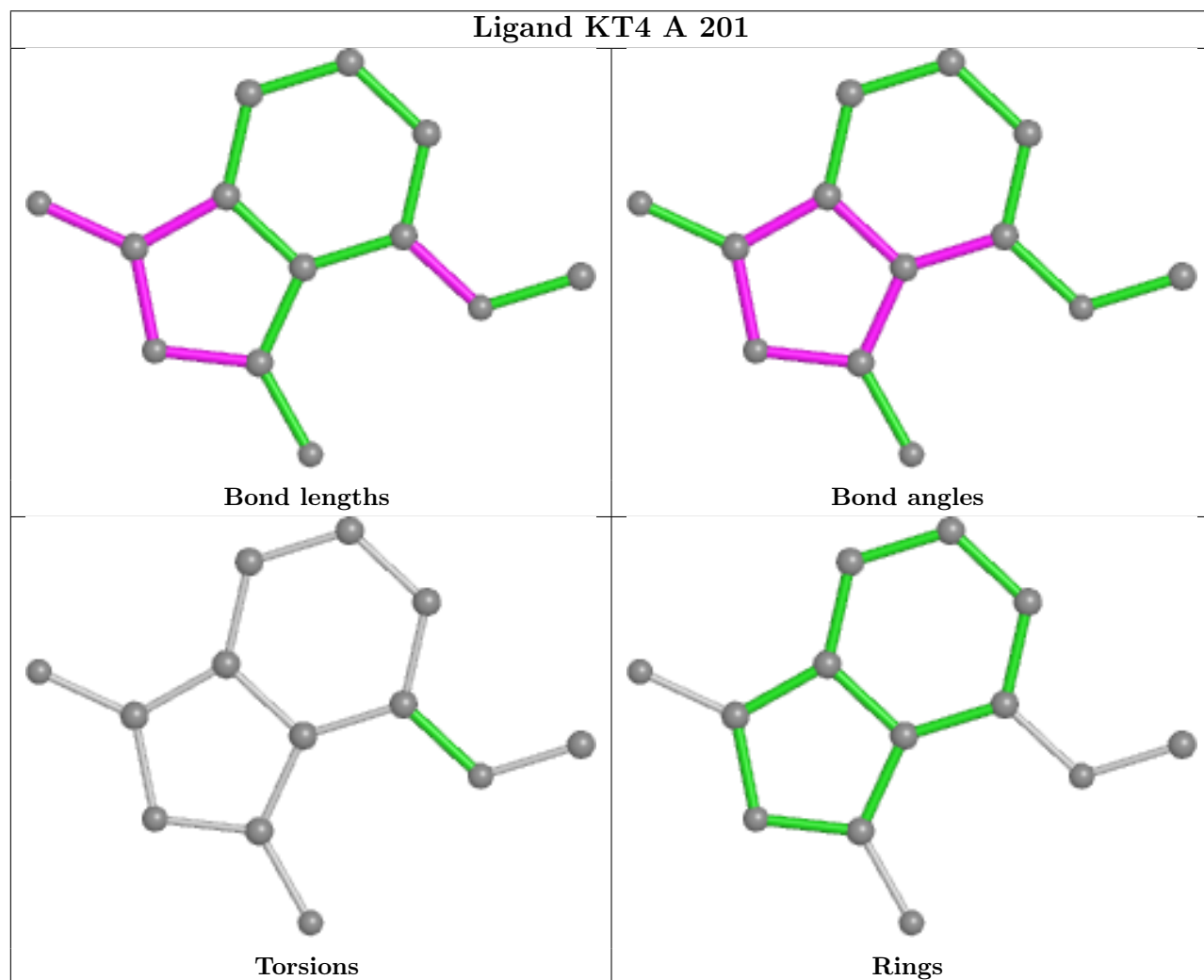
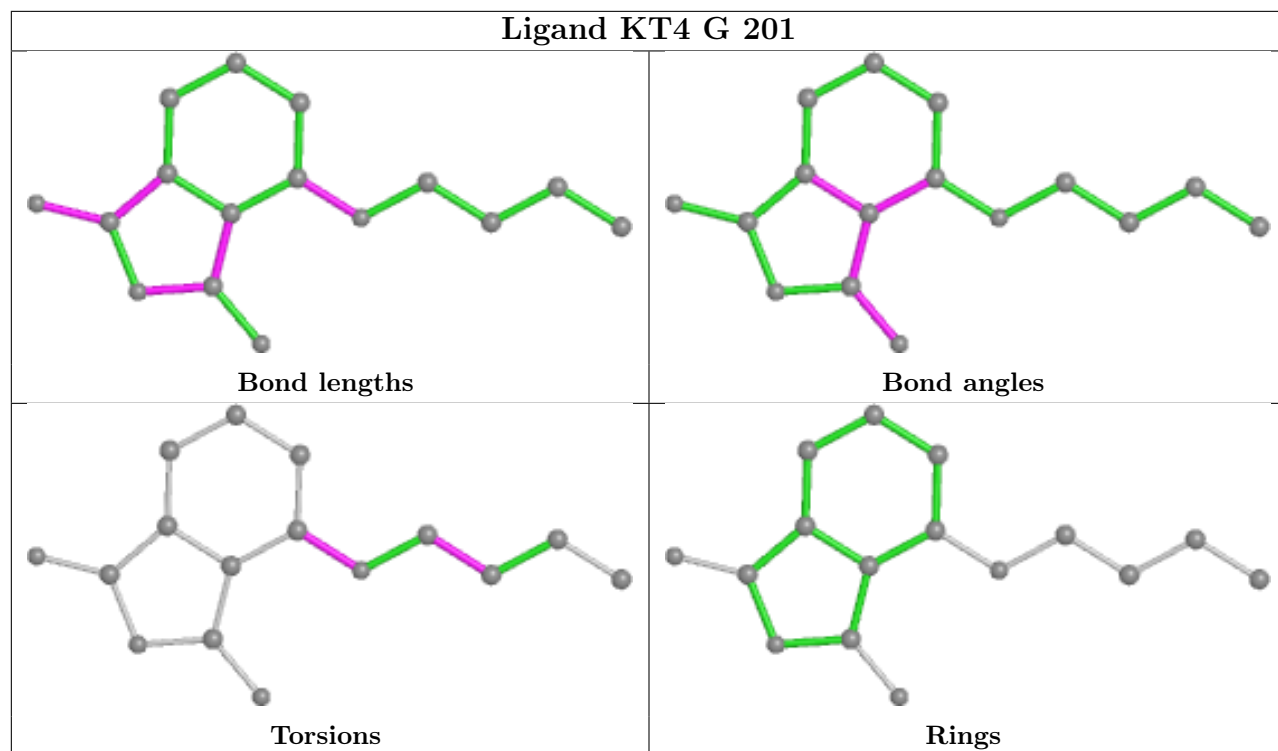
No monomer is involved in short contacts.

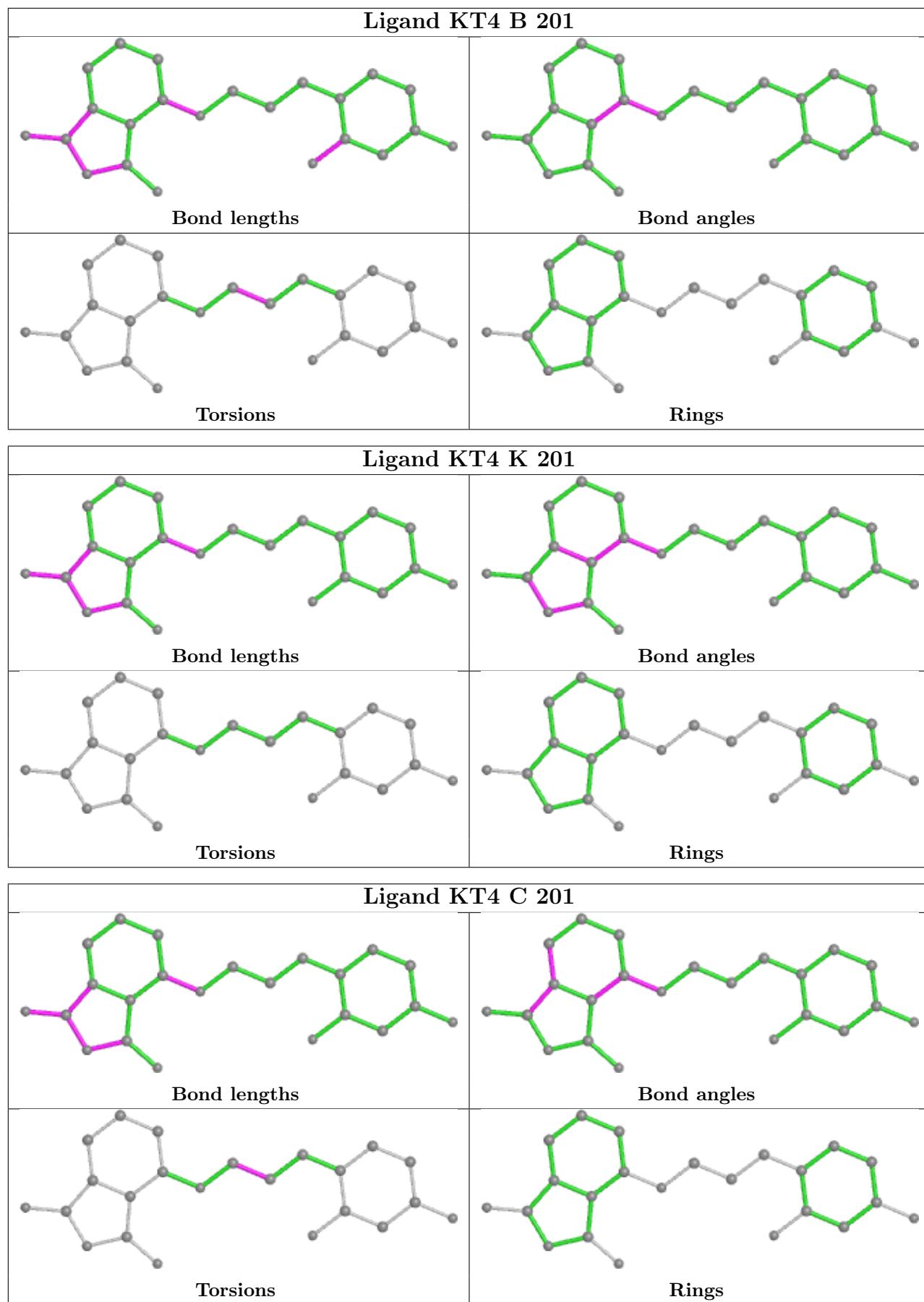
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

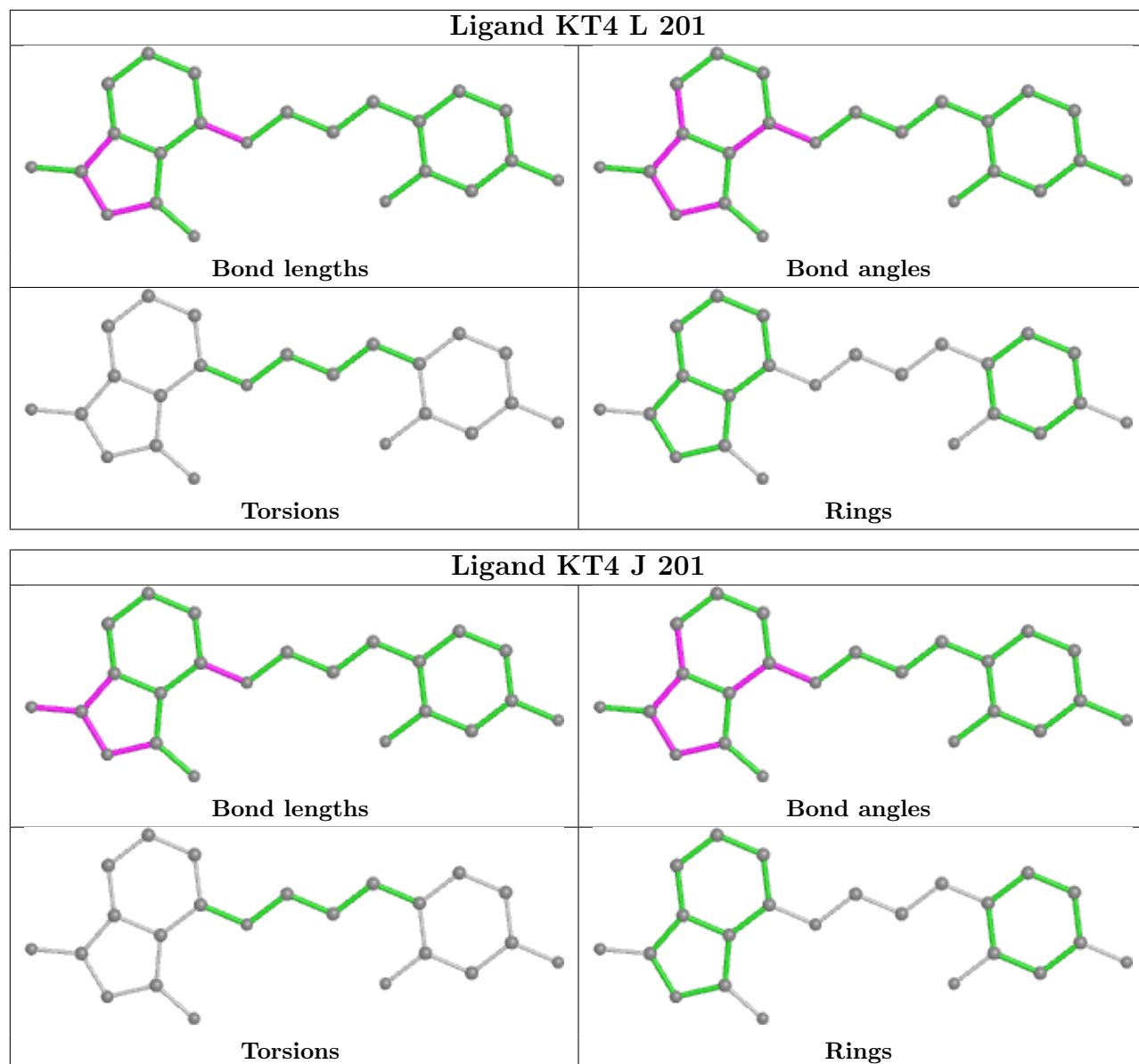


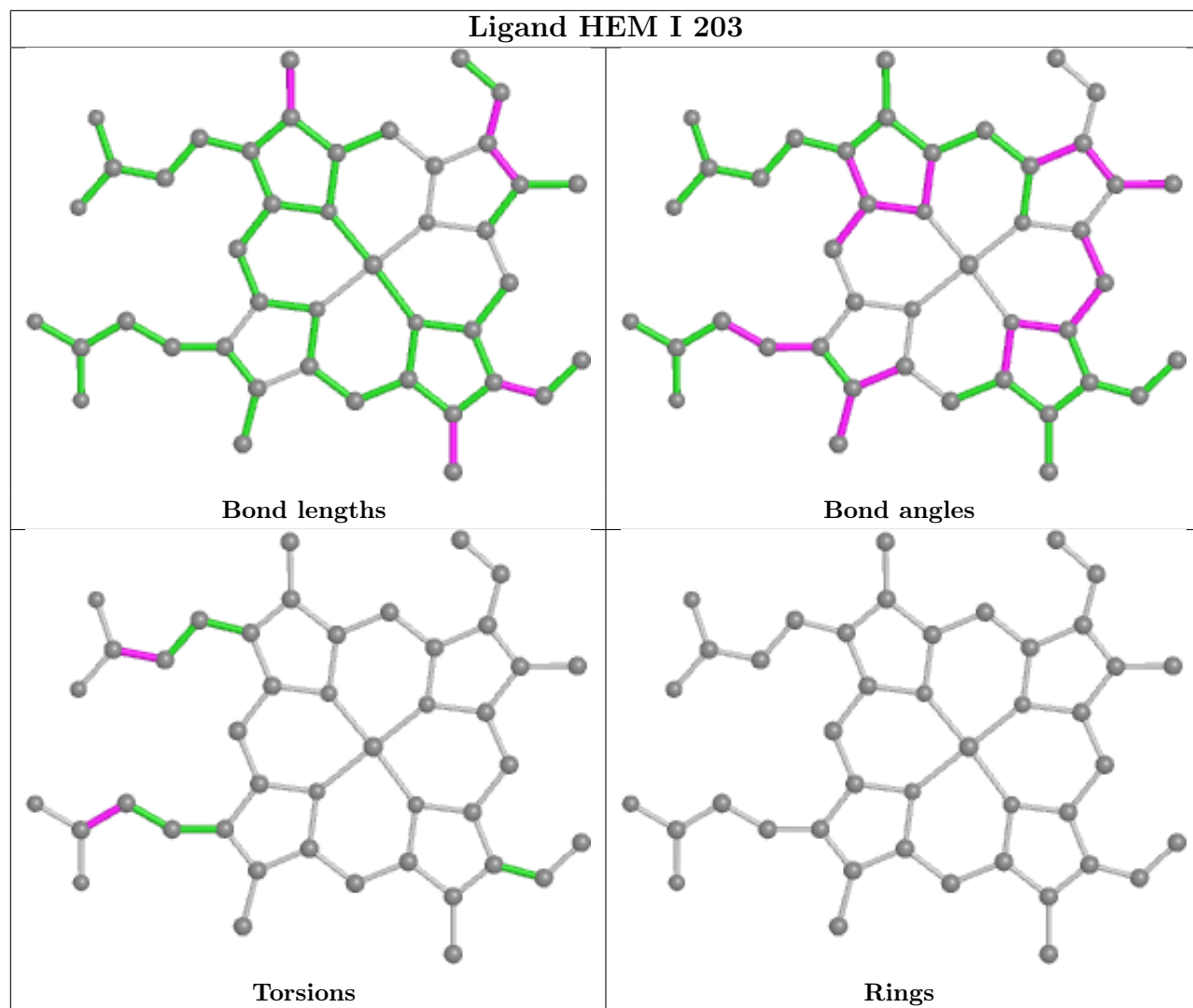


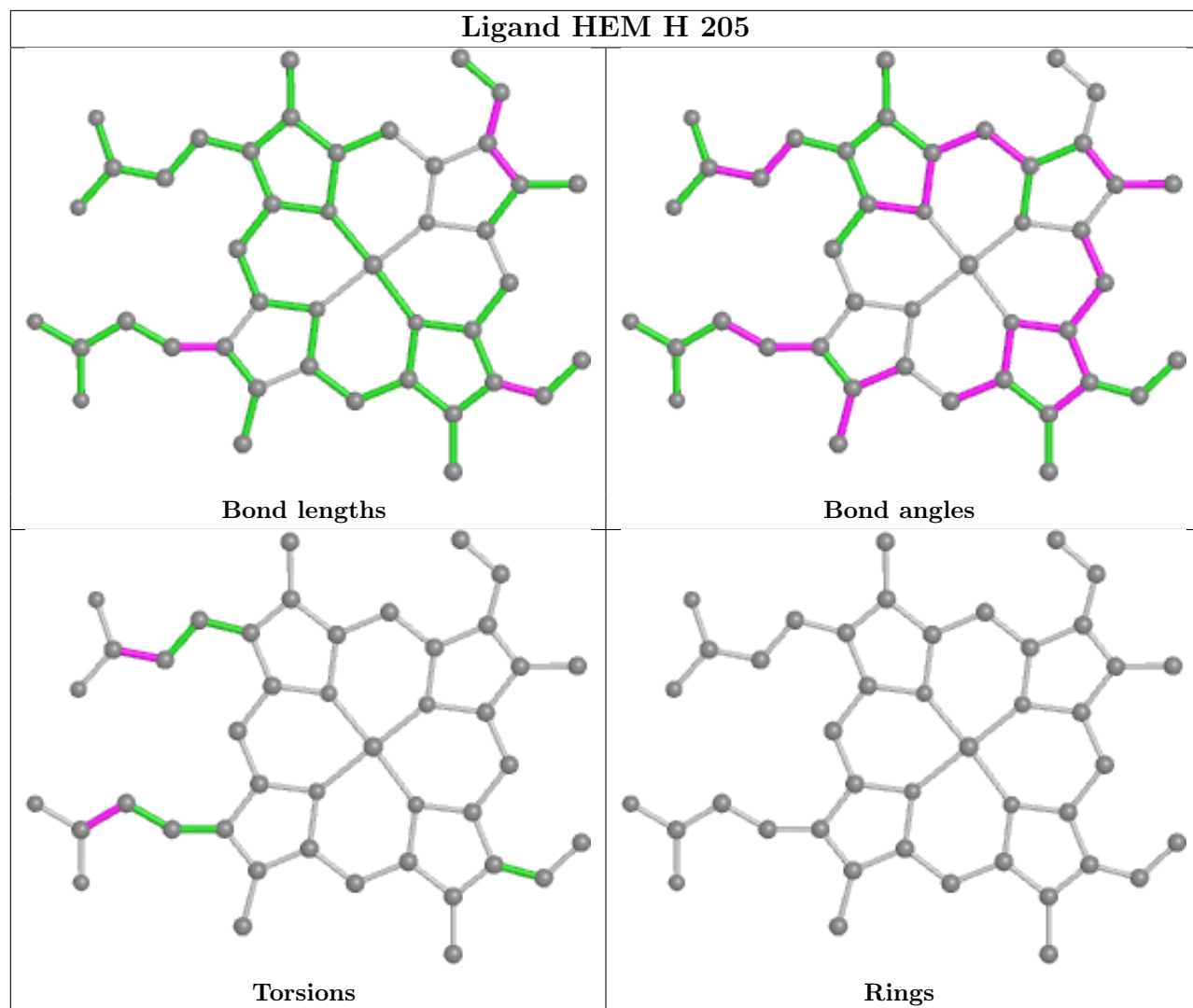


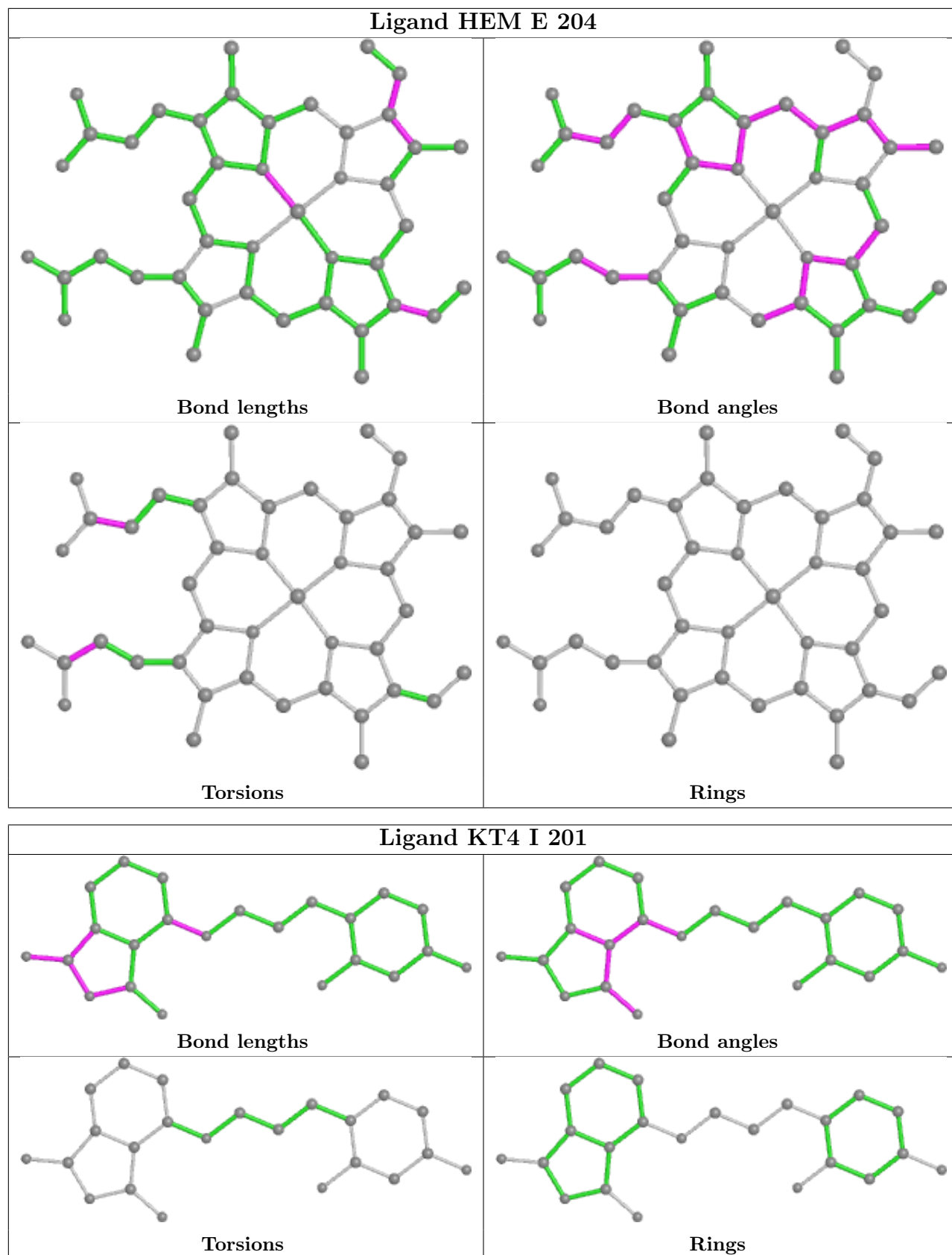


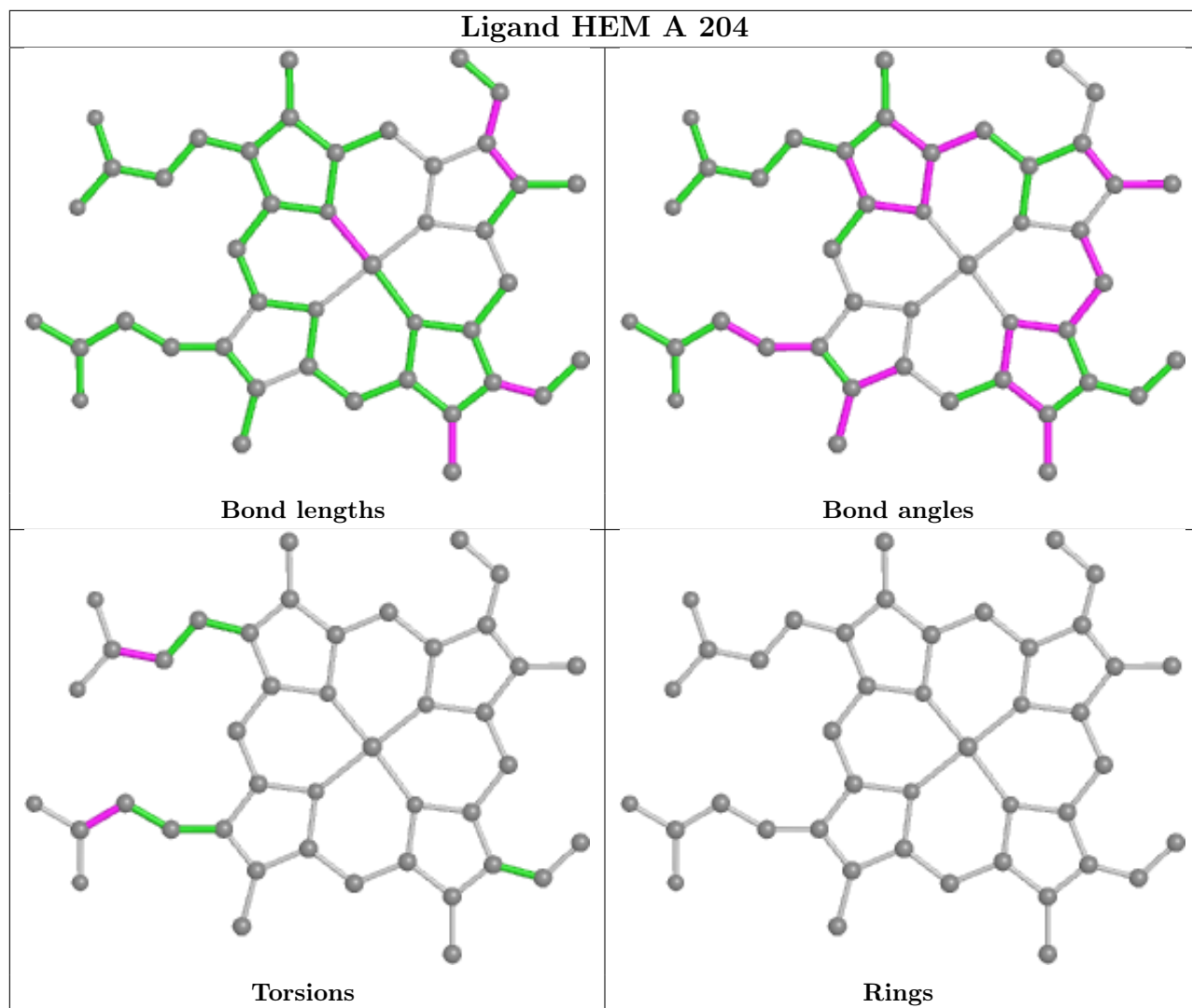


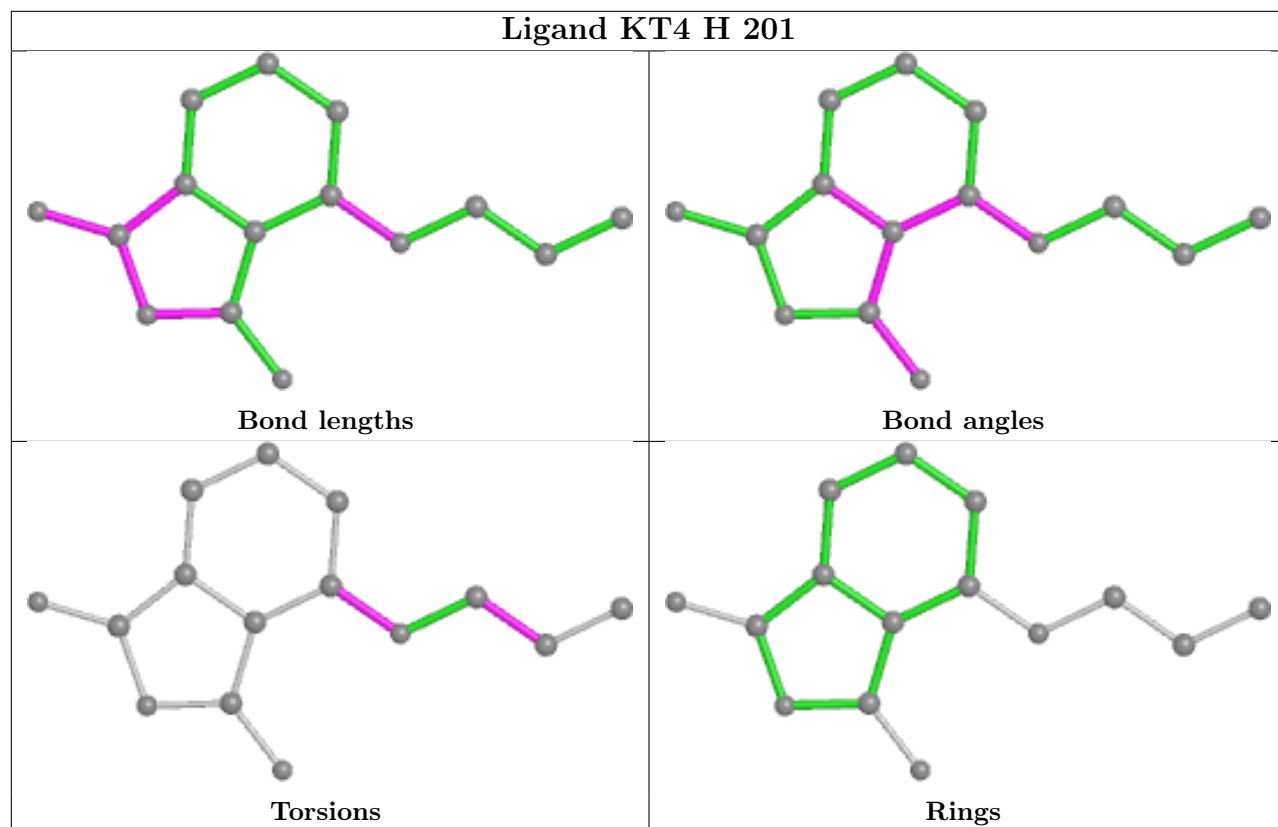


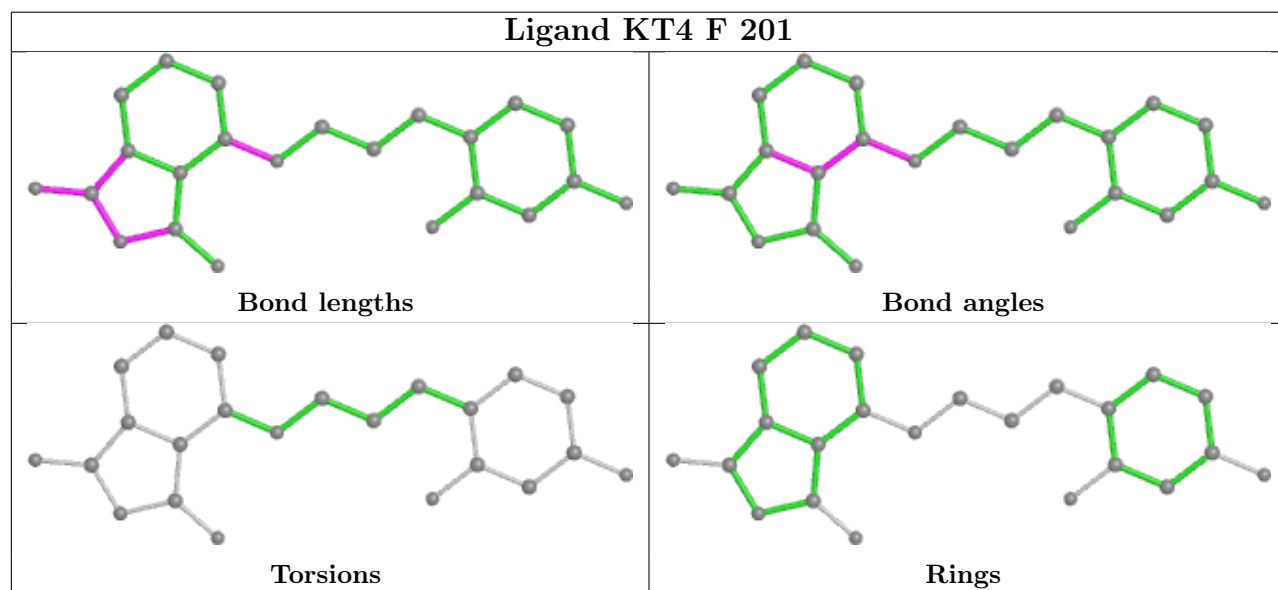
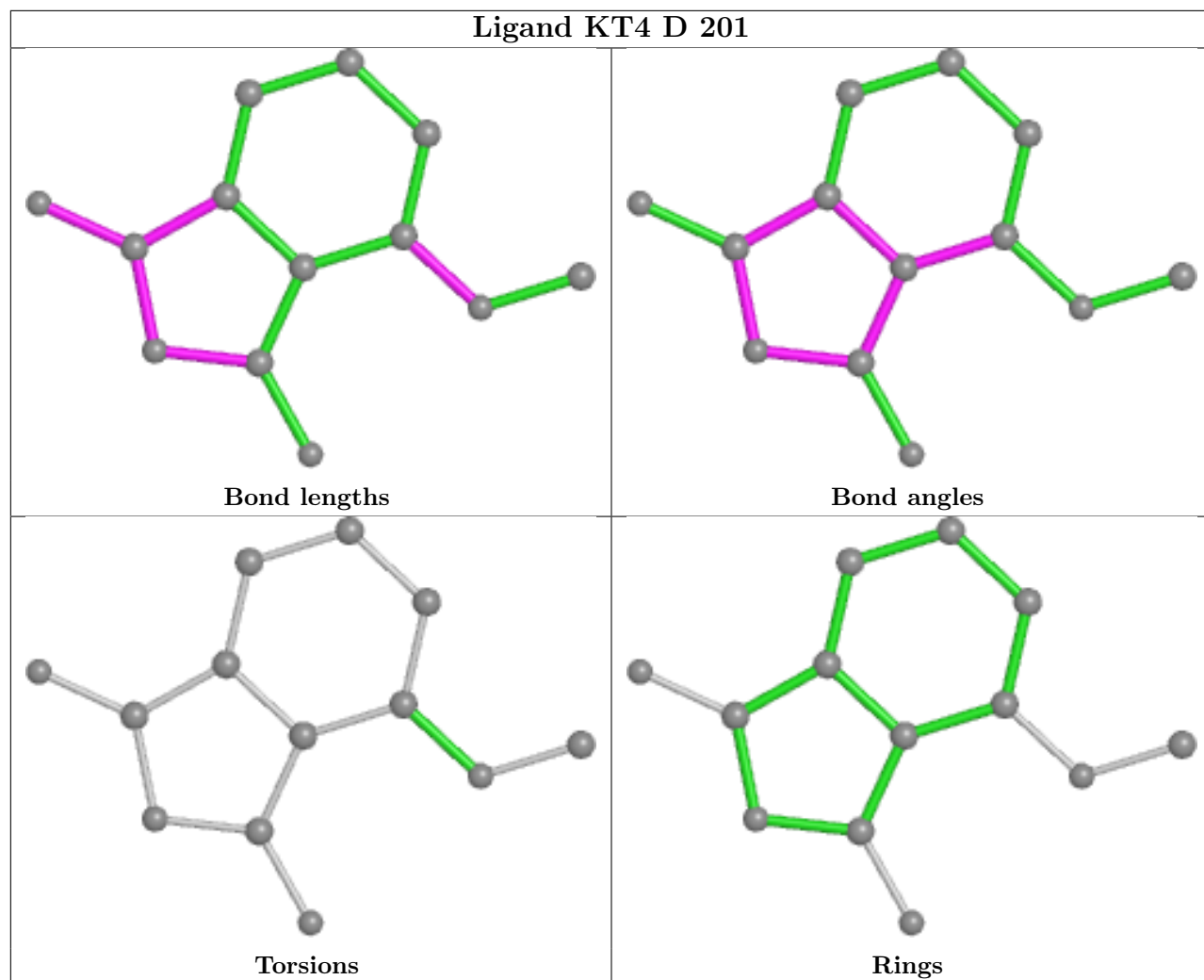












4.7 Other polymers [i](#)

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.