



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 2, 2023 – 10:10 AM EDT

PDB ID : 6NH2  
Title : Structure of human endothelial nitric oxide synthase heme domain in complex with (R)-6-(3-fluoro-5-(2-(pyrrolidin-2-yl)ethyl)phenethyl)-4-methylpyridin-2-amine  
Authors : Chreifi, G.; Li, H.; Poulos, T.L.  
Deposited on : 2018-12-21  
Resolution : 2.29 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](mailto: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>.

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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 2.29 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 10 unique types of molecules in this entry. The entry contains 14127 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 Endothelial nitric oxide synthase splice variant eNOS13A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	404	Total 3237	C 2062	N 570	O 589	S 16	0	2	0
1	B	402	Total 3221	C 2051	N 566	O 587	S 17	0	3	0
1	C	401	Total 3209	C 2044	N 563	O 586	S 16	0	2	0
1	D	402	Total 3221	C 2051	N 566	O 587	S 17	0	3	0

- Molecule 2 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula:  $C_{34}H_{32}FeN_4O_4$ ).



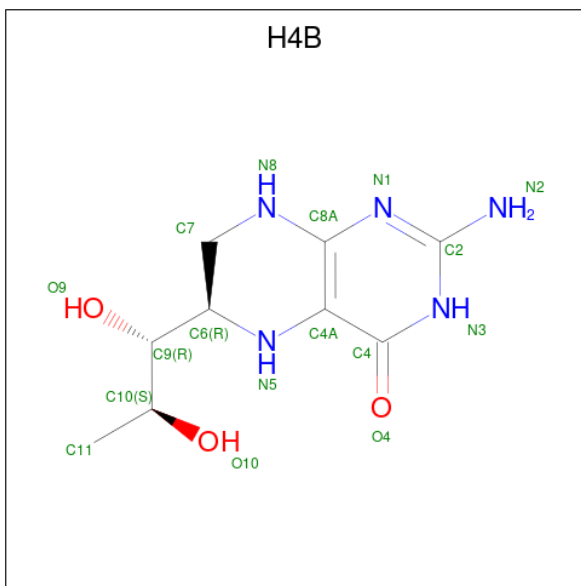
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	Fe	N			O
2	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0

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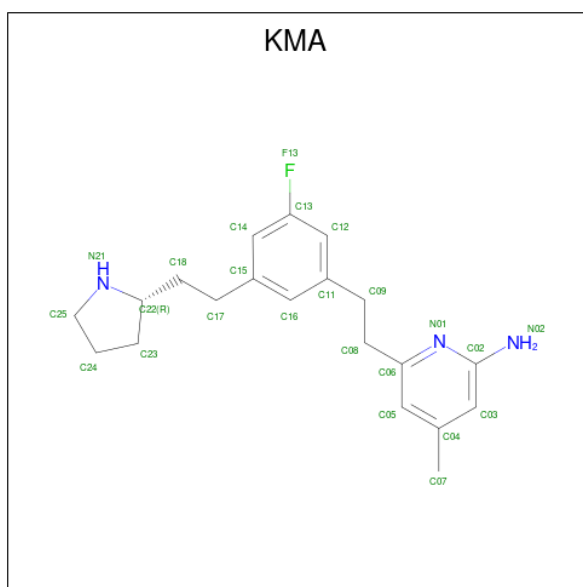
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
2	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 3 is 5,6,7,8-TETRAHYDROBIOPTERIN (three-letter code: H4B) (formula:  $C_9H_{15}N_5O_3$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			17	9	5	3		
3	C	1	Total	C	N	O	0	0
			17	9	5	3		

- Molecule 4 is 6-[2-(3-fluoro-5-{2-[(2R)-pyrrolidin-2-yl]ethyl}phenyl)ethyl]-4-methylpyridin-2-amine (three-letter code: KMA) (formula:  $C_{20}H_{26}FN_3$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	F	N		
4	A	1	24	20	1	3	0	0
4	A	1	24	20	1	3	0	0
4	B	1	24	20	1	3	0	0
4	C	1	24	20	1	3	0	0
4	C	1	24	20	1	3	0	0
4	D	1	24	20	1	3	0	0

- Molecule 5 is 2-[BIS-(2-HYDROXY-ETHYL)-AMINO]-2-HYDROXYMETHYL-PROPAN E-1,3-DIOL (three-letter code: BTB) (formula: C<sub>8</sub>H<sub>19</sub>NO<sub>5</sub>).



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

- Molecule 6 is ZINC ION (three-letter code: ZN) (formula: Zn).

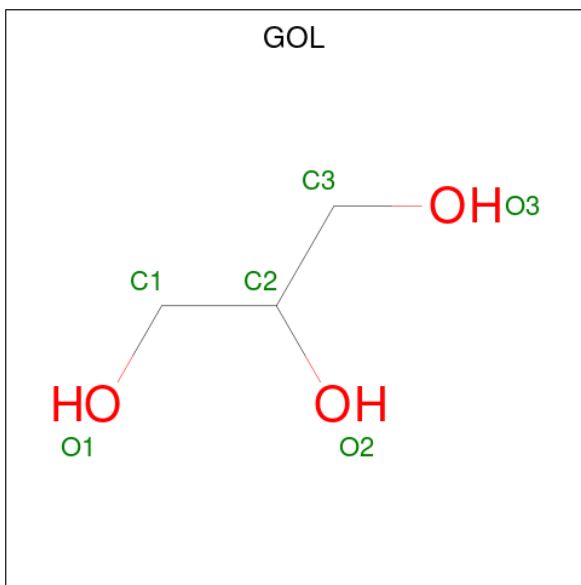
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	3	Total	Zn	0	0
			3	3		

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	C	2	Total Zn 2 2	0	0
6	D	1	Total Zn 1 1	0	0

- Molecule 7 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total C O 6 3 3	0	0
7	C	1	Total C O 6 3 3	0	0

- Molecule 8 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	1	Total Cl 1 1	0	0
8	B	1	Total Cl 1 1	0	0
8	C	1	Total Cl 1 1	0	0
8	D	1	Total Cl 1 1	0	0

- Molecule 9 is GADOLINIUM ATOM (three-letter code: GD) (formula: Gd).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	B	1	Total Gd 1 1	0	0
9	D	1	Total Gd 1 1	0	0

- Molecule 10 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	A	149	Total O 149 149	0	0
10	B	192	Total O 192 192	0	0
10	C	136	Total O 136 136	0	0
10	D	234	Total O 234 234	0	0

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



### 3 Data and refinement statistics i

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

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	60.33Å 153.77Å 108.94Å 90.00° 90.86° 90.00°	Depositor
Resolution (Å)	88.89 – 2.29	Depositor
% Data completeness (in resolution range)	98.0 (88.89-2.29)	Depositor
$R_{merge}$	0.14	Depositor
$R_{sym}$	0.14	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.43 (at 2.29Å)	Xtrriage
Refinement program	PHENIX 1.11.1-2575_1496	Depositor
R, $R_{free}$	0.173 , 0.222	Depositor
Wilson B-factor (Å <sup>2</sup> )	29.6	Xtrriage
Anisotropy	0.560	Xtrriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.095 for h,-k,-l	Xtrriage
Total number of atoms	14127	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	39.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.83% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup> Intensities estimated from amplitudes.

<sup>2</sup> 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 37 ligands modelled in this entry, 12 are monoatomic - leaving 25 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	BTB	D	504	9	13,13,13	0.39	0	7,16,16	0.68	0
7	GOL	C	508	-	5,5,5	0.41	0	5,5,5	0.43	0
2	HEM	D	502	1	41,50,50	1.44	8 (19%)	45,82,82	1.68	9 (20%)
3	H4B	A	502	-	16,18,18	0.72	0	11,26,26	2.59	6 (54%)
3	H4B	C	503	-	16,18,18	0.68	0	11,26,26	2.88	7 (63%)
2	HEM	A	501	1	41,50,50	1.50	6 (14%)	45,82,82	1.89	13 (28%)
5	BTB	A	504	-	13,13,13	0.65	0	7,16,16	0.92	0
4	KMA	A	503	-	25,26,26	0.37	0	32,35,35	1.56	6 (18%)
2	HEM	C	502	1	41,50,50	1.49	6 (14%)	45,82,82	1.64	12 (26%)
5	BTB	D	506	-	13,13,13	0.42	0	7,16,16	0.83	0
4	KMA	C	504	-	25,26,26	0.41	0	32,35,35	1.52	6 (18%)
5	BTB	B	504	-	13,13,13	0.63	0	7,16,16	0.81	0
2	HEM	B	501	1	41,50,50	1.47	6 (14%)	45,82,82	1.69	10 (22%)
4	KMA	B	502	-	25,26,26	0.45	0	32,35,35	1.50	8 (25%)
5	BTB	B	508	-	13,13,13	0.94	2 (15%)	7,16,16	1.19	1 (14%)
5	BTB	C	501	-	13,13,13	1.95	2 (15%)	7,16,16	0.79	0
4	KMA	D	503	-	25,26,26	0.41	0	32,35,35	1.46	6 (18%)
7	GOL	A	507	-	5,5,5	0.37	0	5,5,5	0.23	0
5	BTB	C	506	-	13,13,13	0.36	0	7,16,16	0.35	0
5	BTB	B	505	-	13,13,13	0.36	0	7,16,16	0.48	0
4	KMA	A	509	-	25,26,26	0.44	0	32,35,35	1.37	5 (15%)
4	KMA	C	510	-	25,26,26	0.41	0	32,35,35	1.79	6 (18%)
5	BTB	C	505	-	13,13,13	1.56	2 (15%)	7,16,16	1.37	2 (28%)
5	BTB	B	503	9	13,13,13	0.40	0	7,16,16	0.47	0
5	BTB	D	505	-	13,13,13	0.72	0	7,16,16	1.08	1 (14%)

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	BTB	D	504	9	-	4/21/21/21	-
7	GOL	C	508	-	-	2/4/4/4	-
2	HEM	D	502	1	-	4/12/54/54	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	H4B	A	502	-	-	3/8/17/17	0/2/2/2
3	H4B	C	503	-	-	3/8/17/17	0/2/2/2
2	HEM	A	501	1	-	4/12/54/54	-
5	BTB	A	504	-	-	6/21/21/21	-
4	KMA	A	503	-	-	1/10/17/17	0/3/3/3
2	HEM	C	502	1	-	2/12/54/54	-
5	BTB	D	506	-	-	6/21/21/21	-
4	KMA	C	504	-	-	2/10/17/17	0/3/3/3
5	BTB	B	504	-	-	3/21/21/21	-
2	HEM	B	501	1	-	3/12/54/54	-
4	KMA	B	502	-	-	1/10/17/17	0/3/3/3
5	BTB	B	508	-	-	12/21/21/21	-
5	BTB	C	501	-	-	13/21/21/21	-
4	KMA	D	503	-	-	1/10/17/17	0/3/3/3
7	GOL	A	507	-	-	2/4/4/4	-
5	BTB	C	506	-	-	2/21/21/21	-
5	BTB	B	505	-	-	8/21/21/21	-
4	KMA	A	509	-	-	1/10/17/17	0/3/3/3
4	KMA	C	510	-	-	1/10/17/17	0/3/3/3
5	BTB	C	505	-	-	10/21/21/21	-
5	BTB	B	503	9	-	3/21/21/21	-
5	BTB	D	505	-	-	9/21/21/21	-

All (32) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	501	BTB	C5-N	-5.68	1.39	1.48
5	C	505	BTB	C5-N	-4.72	1.41	1.48
2	A	501	HEM	C3C-C2C	-3.94	1.34	1.40
2	C	502	HEM	C3C-C2C	-3.75	1.35	1.40
2	C	502	HEM	C3C-CAC	3.69	1.55	1.47
5	C	501	BTB	C7-N	-3.59	1.42	1.48
2	A	501	HEM	C3C-CAC	3.59	1.55	1.47
2	B	501	HEM	C3C-CAC	3.54	1.55	1.47
2	B	501	HEM	C3C-C2C	-3.42	1.35	1.40
2	C	502	HEM	FE-NB	3.28	2.13	1.96
2	D	502	HEM	C3C-C2C	-3.28	1.35	1.40
2	B	501	HEM	CAB-C3B	2.89	1.55	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	HEM	CAB-C3B	2.79	1.55	1.47
2	D	502	HEM	C3C-CAC	2.72	1.53	1.47
2	D	502	HEM	CAB-C3B	2.71	1.54	1.47
2	B	501	HEM	FE-NB	2.64	2.09	1.96
5	C	505	BTB	C2-N	-2.62	1.43	1.48
2	C	502	HEM	CAB-C3B	2.60	1.54	1.47
2	B	501	HEM	C3B-C2B	-2.41	1.32	1.37
2	C	502	HEM	CMB-C2B	2.37	1.55	1.50
2	D	502	HEM	CMB-C2B	2.31	1.55	1.50
2	D	502	HEM	CAA-C2A	2.24	1.55	1.52
2	B	501	HEM	CAA-C2A	2.24	1.55	1.52
2	A	501	HEM	FE-NB	2.24	2.07	1.96
2	D	502	HEM	FE-NB	2.22	2.07	1.96
2	A	501	HEM	CMA-C3A	2.21	1.56	1.51
2	D	502	HEM	FE-ND	2.18	2.07	1.96
2	D	502	HEM	CMA-C3A	2.13	1.56	1.51
2	A	501	HEM	CAA-C2A	2.12	1.55	1.52
5	B	508	BTB	C2-N	-2.11	1.44	1.48
2	C	502	HEM	CAA-C2A	2.09	1.55	1.52
5	B	508	BTB	C4-C2	-2.07	1.50	1.53

All (98) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	501	HEM	CMA-C3A-C4A	-5.35	120.25	128.46
3	C	503	H4B	C8A-C4A-C4	4.95	118.97	114.57
2	A	501	HEM	CBD-CAD-C3D	-4.82	99.22	112.63
3	C	503	H4B	C4-C4A-N5	4.57	122.96	119.12
3	A	502	H4B	C4-C4A-N5	4.50	122.90	119.12
4	C	510	KMA	C02-N01-C06	4.47	121.48	118.10
4	A	503	KMA	C02-N01-C06	4.37	121.41	118.10
4	C	504	KMA	C02-N01-C06	4.29	121.35	118.10
2	B	501	HEM	CMA-C3A-C4A	-4.25	121.92	128.46
2	C	502	HEM	CMA-C3A-C4A	-4.24	121.95	128.46
3	A	502	H4B	C8A-C4A-C4	3.91	118.05	114.57
2	A	501	HEM	CMA-C3A-C2A	3.89	132.27	124.94
4	D	503	KMA	C02-N01-C06	3.74	120.94	118.10
2	D	502	HEM	CBD-CAD-C3D	-3.67	102.43	112.63
2	D	502	HEM	CMA-C3A-C4A	-3.62	122.89	128.46
3	C	503	H4B	N2-C2-N3	3.58	122.83	117.25
4	C	510	KMA	C04-C05-C06	-3.44	118.06	120.32
2	B	501	HEM	CBA-CAA-C2A	3.38	118.38	112.62

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	502	HEM	CBD-CAD-C3D	-3.32	103.39	112.63
3	A	502	H4B	N2-C2-N3	3.30	122.38	117.25
2	B	501	HEM	C3B-C2B-C1B	3.29	108.93	106.49
4	A	503	KMA	C14-C13-C12	-3.25	119.41	123.52
2	A	501	HEM	C4D-ND-C1D	3.22	108.40	105.07
4	A	509	KMA	C02-N01-C06	3.10	120.45	118.10
4	B	502	KMA	C14-C13-C12	-3.09	119.62	123.52
4	B	502	KMA	C08-C06-N01	3.07	120.53	115.95
4	B	502	KMA	C02-N01-C06	3.05	120.41	118.10
4	C	504	KMA	C14-C13-C12	-3.02	119.70	123.52
2	D	502	HEM	C4B-CHC-C1C	3.02	126.54	122.56
4	C	510	KMA	C14-C13-C12	-2.99	119.74	123.52
2	D	502	HEM	CHC-C4B-C3B	2.96	129.10	124.57
4	D	503	KMA	F13-C13-C12	2.95	122.46	118.25
3	A	502	H4B	N1-C2-N3	-2.93	120.83	125.42
4	A	509	KMA	C08-C06-N01	2.92	120.29	115.95
5	B	508	BTB	O4-C4-C2	-2.91	103.47	111.44
2	B	501	HEM	CBD-CAD-C3D	-2.91	104.54	112.63
2	A	501	HEM	C1B-NB-C4B	2.88	108.05	105.07
4	C	510	KMA	N02-C02-N01	2.87	121.03	116.49
4	D	503	KMA	C14-C13-C12	-2.87	119.89	123.52
2	D	502	HEM	C1B-NB-C4B	2.86	108.02	105.07
2	C	502	HEM	C4B-CHC-C1C	2.83	126.29	122.56
4	C	510	KMA	C08-C06-N01	2.82	120.15	115.95
2	B	501	HEM	CMA-C3A-C2A	2.80	130.22	124.94
4	A	503	KMA	F13-C13-C12	2.79	122.24	118.25
2	D	502	HEM	C3B-C2B-C1B	2.78	108.55	106.49
3	C	503	H4B	C4A-N5-C6	-2.77	113.61	121.16
4	D	503	KMA	C08-C06-N01	2.75	120.04	115.95
3	A	502	H4B	C2-N1-C8A	2.73	120.66	114.54
2	D	502	HEM	C4D-ND-C1D	2.72	107.88	105.07
4	C	504	KMA	C04-C05-C06	-2.70	118.55	120.32
2	C	502	HEM	C3D-C4D-ND	-2.70	107.16	110.17
4	A	503	KMA	C05-C06-N01	-2.69	120.05	122.90
2	C	502	HEM	C1B-NB-C4B	2.67	107.84	105.07
3	C	503	H4B	C2-N1-C8A	2.65	120.49	114.54
4	B	502	KMA	N02-C02-N01	2.65	120.68	116.49
3	A	502	H4B	C2-N3-C4	2.65	120.14	115.93
5	C	505	BTB	C6-C5-N	-2.63	101.32	111.59
4	C	504	KMA	F13-C13-C12	2.61	121.98	118.25
2	B	501	HEM	C4B-CHC-C1C	2.59	125.97	122.56
2	C	502	HEM	CHD-C1D-ND	2.58	127.23	124.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	501	HEM	C3D-C4D-ND	-2.54	107.33	110.17
4	B	502	KMA	F13-C13-C12	2.54	121.88	118.25
2	A	501	HEM	C4B-CHC-C1C	2.53	125.90	122.56
3	C	503	H4B	C2-N3-C4	2.52	119.94	115.93
4	D	503	KMA	C05-C06-N01	-2.52	120.23	122.90
4	C	510	KMA	C03-C04-C05	2.46	121.02	118.09
4	A	503	KMA	C08-C06-N01	2.45	119.60	115.95
2	A	501	HEM	C3B-C2B-C1B	2.44	108.29	106.49
2	A	501	HEM	CAA-CBA-CGA	-2.43	106.94	113.76
4	A	509	KMA	C14-C13-C12	-2.43	120.45	123.52
3	C	503	H4B	N1-C2-N3	-2.42	121.61	125.42
2	D	502	HEM	CMA-C3A-C2A	2.39	129.46	124.94
2	C	502	HEM	C4A-C3A-C2A	2.39	108.66	107.00
2	A	501	HEM	CHC-C4B-C3B	2.38	128.22	124.57
2	C	502	HEM	CMA-C3A-C2A	2.36	129.39	124.94
2	C	502	HEM	CHA-C4D-ND	2.36	127.29	124.38
2	D	502	HEM	CMC-C2C-C3C	2.35	129.07	124.68
4	C	504	KMA	C08-C06-N01	2.30	119.38	115.95
2	B	501	HEM	CHC-C4B-C3B	2.29	128.07	124.57
2	C	502	HEM	CAD-CBD-CGD	-2.29	108.68	113.60
4	B	502	KMA	C15-C14-C13	2.28	120.88	118.81
2	A	501	HEM	CMC-C2C-C3C	2.27	128.93	124.68
2	A	501	HEM	O2A-CGA-CBA	2.23	121.20	114.03
4	A	503	KMA	C11-C12-C13	2.23	120.84	118.81
2	B	501	HEM	C4D-ND-C1D	2.23	107.38	105.07
2	B	501	HEM	C1B-NB-C4B	2.19	107.34	105.07
5	C	505	BTB	O6-C6-C5	-2.18	102.15	111.19
2	C	502	HEM	C4D-ND-C1D	2.18	107.32	105.07
4	B	502	KMA	C04-C05-C06	-2.16	118.90	120.32
2	C	502	HEM	CHC-C4B-C3B	2.16	127.88	124.57
4	A	509	KMA	C04-C05-C06	-2.12	118.93	120.32
5	D	505	BTB	O3-C3-C2	-2.07	105.77	111.44
4	A	509	KMA	N02-C02-N01	2.06	119.75	116.49
2	A	501	HEM	O1A-CGA-CBA	-2.06	116.47	123.08
4	B	502	KMA	C05-C06-N01	-2.05	120.73	122.90
4	C	504	KMA	C05-C06-N01	-2.02	120.76	122.90
4	D	503	KMA	N02-C02-N01	2.01	119.66	116.49
2	B	501	HEM	C3D-C4D-ND	-2.00	107.94	110.17

There are no chirality outliers.

All (106) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	HEM	C1A-C2A-CAA-CBA
2	A	501	HEM	C3A-C2A-CAA-CBA
2	B	501	HEM	C1A-C2A-CAA-CBA
2	B	501	HEM	C3A-C2A-CAA-CBA
2	D	502	HEM	C1A-C2A-CAA-CBA
2	D	502	HEM	C3A-C2A-CAA-CBA
3	C	503	H4B	C7-C6-C9-O9
3	C	503	H4B	C7-C6-C9-C10
4	C	504	KMA	C17-C18-C22-C23
4	D	503	KMA	C17-C18-C22-N21
5	A	504	BTB	C1-C2-C4-O4
5	A	504	BTB	C3-C2-C4-O4
5	A	504	BTB	N-C2-C4-O4
5	B	503	BTB	C1-C2-C4-O4
5	B	503	BTB	C3-C2-C4-O4
5	B	503	BTB	N-C2-C4-O4
5	B	504	BTB	C8-C7-N-C5
5	B	505	BTB	O1-C1-C2-C3
5	B	505	BTB	O1-C1-C2-C4
5	B	505	BTB	C1-C2-C4-O4
5	B	505	BTB	C3-C2-C4-O4
5	B	505	BTB	N-C2-C4-O4
5	B	505	BTB	C8-C7-N-C5
5	B	508	BTB	C1-C2-C3-O3
5	B	508	BTB	C4-C2-C3-O3
5	B	508	BTB	N-C2-C3-O3
5	B	508	BTB	C1-C2-C4-O4
5	B	508	BTB	C3-C2-C4-O4
5	B	508	BTB	N-C2-C4-O4
5	B	508	BTB	C1-C2-N-C5
5	B	508	BTB	C1-C2-N-C7
5	B	508	BTB	C3-C2-N-C5
5	B	508	BTB	C3-C2-N-C7
5	B	508	BTB	C4-C2-N-C5
5	B	508	BTB	C4-C2-N-C7
5	C	501	BTB	O1-C1-C2-C3
5	C	501	BTB	O1-C1-C2-C4
5	C	501	BTB	O1-C1-C2-N
5	C	501	BTB	C1-C2-C3-O3
5	C	501	BTB	C3-C2-N-C5
5	C	501	BTB	C4-C2-N-C5
5	C	505	BTB	O1-C1-C2-C3
5	C	505	BTB	O1-C1-C2-C4

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Mol	Chain	Res	Type	Atoms
5	C	505	BTB	O1-C1-C2-N
5	C	505	BTB	C1-C2-C3-O3
5	C	505	BTB	C4-C2-C3-O3
5	C	505	BTB	N-C2-C3-O3
5	C	505	BTB	C1-C2-C4-O4
5	C	505	BTB	C3-C2-C4-O4
5	C	505	BTB	N-C2-C4-O4
5	C	505	BTB	N-C7-C8-O8
5	D	504	BTB	O1-C1-C2-C3
5	D	504	BTB	O1-C1-C2-C4
5	D	504	BTB	O1-C1-C2-N
5	D	505	BTB	O1-C1-C2-C3
5	D	505	BTB	O1-C1-C2-C4
5	D	505	BTB	O1-C1-C2-N
5	D	505	BTB	C1-C2-C4-O4
5	D	505	BTB	C3-C2-C4-O4
5	D	505	BTB	N-C2-C4-O4
5	D	506	BTB	O1-C1-C2-C3
5	D	506	BTB	O1-C1-C2-C4
5	D	506	BTB	O1-C1-C2-N
5	D	506	BTB	C8-C7-N-C5
7	C	508	GOL	O1-C1-C2-C3
5	B	504	BTB	N-C5-C6-O6
5	C	501	BTB	N-C5-C6-O6
5	B	504	BTB	N-C7-C8-O8
5	B	505	BTB	N-C7-C8-O8
2	A	501	HEM	C2A-CAA-CBA-CGA
2	C	502	HEM	C2A-CAA-CBA-CGA
2	D	502	HEM	C2A-CAA-CBA-CGA
5	D	506	BTB	N-C7-C8-O8
5	A	504	BTB	N-C5-C6-O6
5	D	505	BTB	N-C5-C6-O6
7	A	507	GOL	C1-C2-C3-O3
5	D	506	BTB	N-C5-C6-O6
7	C	508	GOL	O1-C1-C2-O2
5	D	504	BTB	N-C5-C6-O6
3	A	502	H4B	C7-C6-C9-C10
7	A	507	GOL	O2-C2-C3-O3
5	D	505	BTB	C8-C7-N-C5
2	B	501	HEM	C4B-C3B-CAB-CBB
2	C	502	HEM	C4B-C3B-CAB-CBB
2	D	502	HEM	C4B-C3B-CAB-CBB

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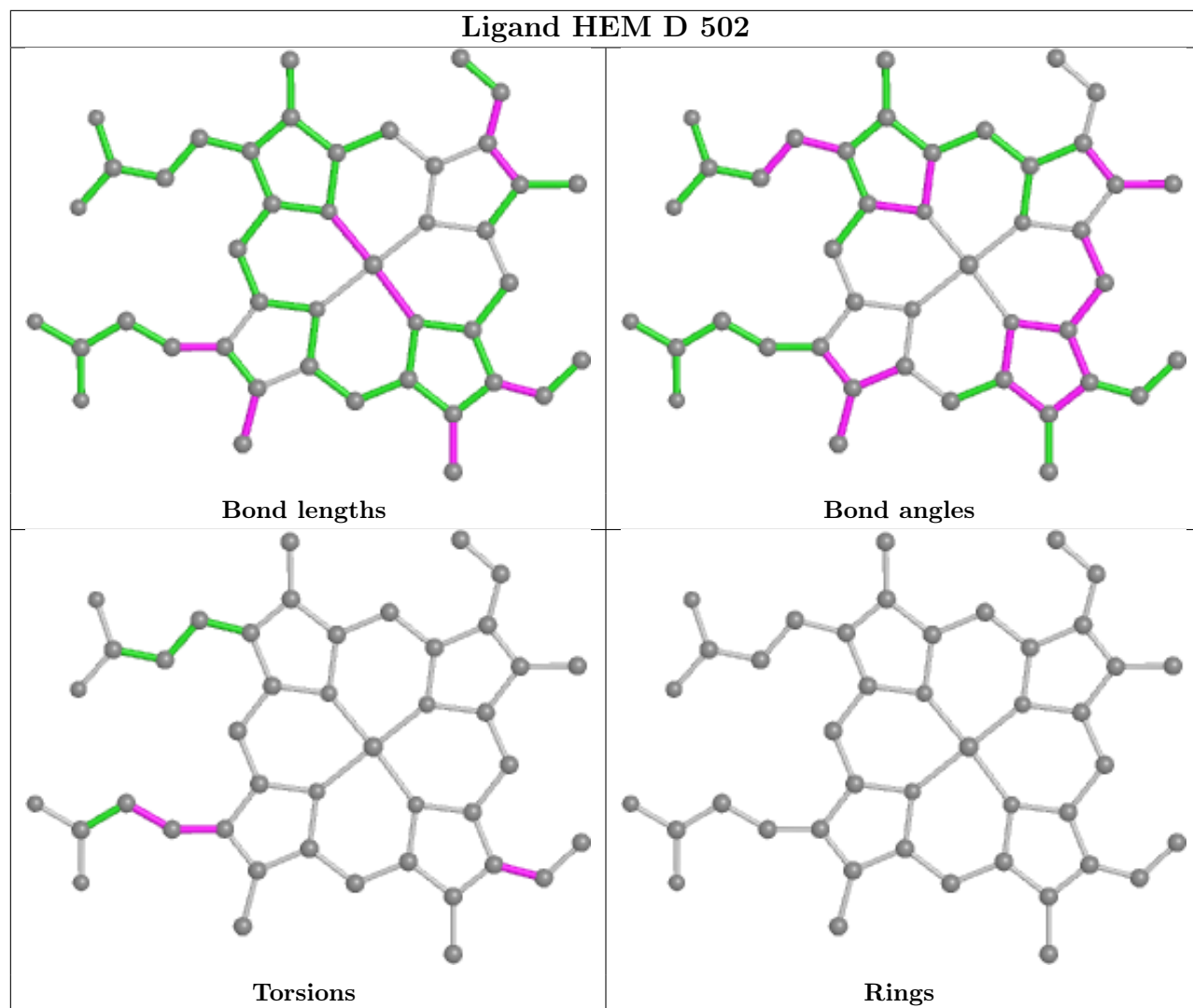
Mol	Chain	Res	Type	Atoms
4	A	503	KMA	C17-C18-C22-N21
4	A	509	KMA	C17-C18-C22-N21
4	B	502	KMA	C17-C18-C22-N21
4	C	504	KMA	C17-C18-C22-N21
4	C	510	KMA	C17-C18-C22-N21
3	C	503	H4B	N5-C6-C9-O9
5	A	504	BTB	C4-C2-C3-O3
5	C	506	BTB	C1-C2-C3-O3
5	B	505	BTB	O1-C1-C2-N
5	C	501	BTB	N-C2-C3-O3
5	C	501	BTB	C1-C2-N-C5
5	C	501	BTB	C1-C2-N-C7
5	C	501	BTB	C3-C2-N-C7
5	C	501	BTB	C4-C2-N-C7
3	A	502	H4B	C7-C6-C9-O9
5	D	505	BTB	N-C7-C8-O8
2	A	501	HEM	C4B-C3B-CAB-CBB
3	A	502	H4B	N5-C6-C9-O9
5	A	504	BTB	C1-C2-C3-O3
5	C	501	BTB	C4-C2-C3-O3
5	C	506	BTB	C4-C2-C3-O3

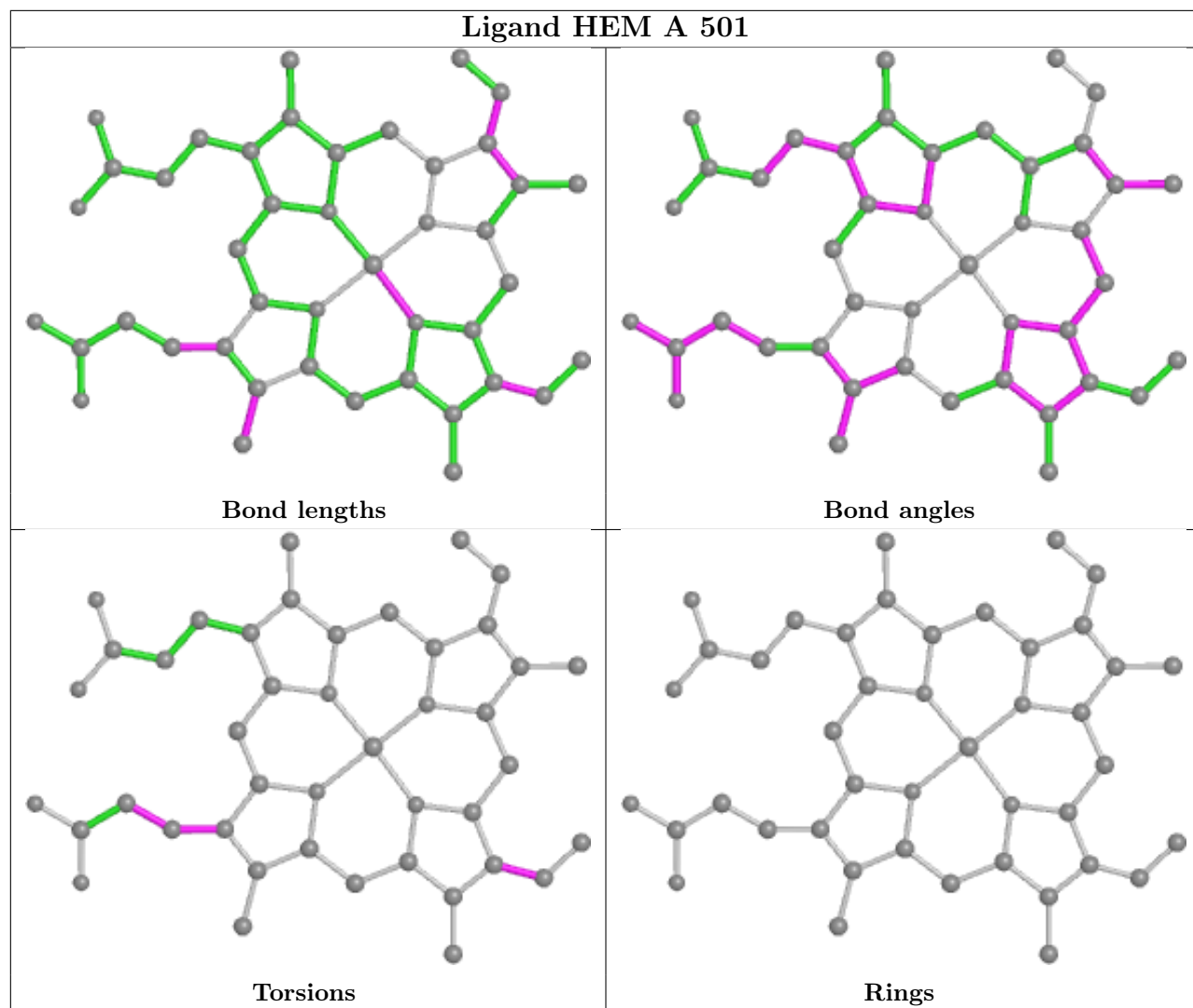
There are no ring outliers.

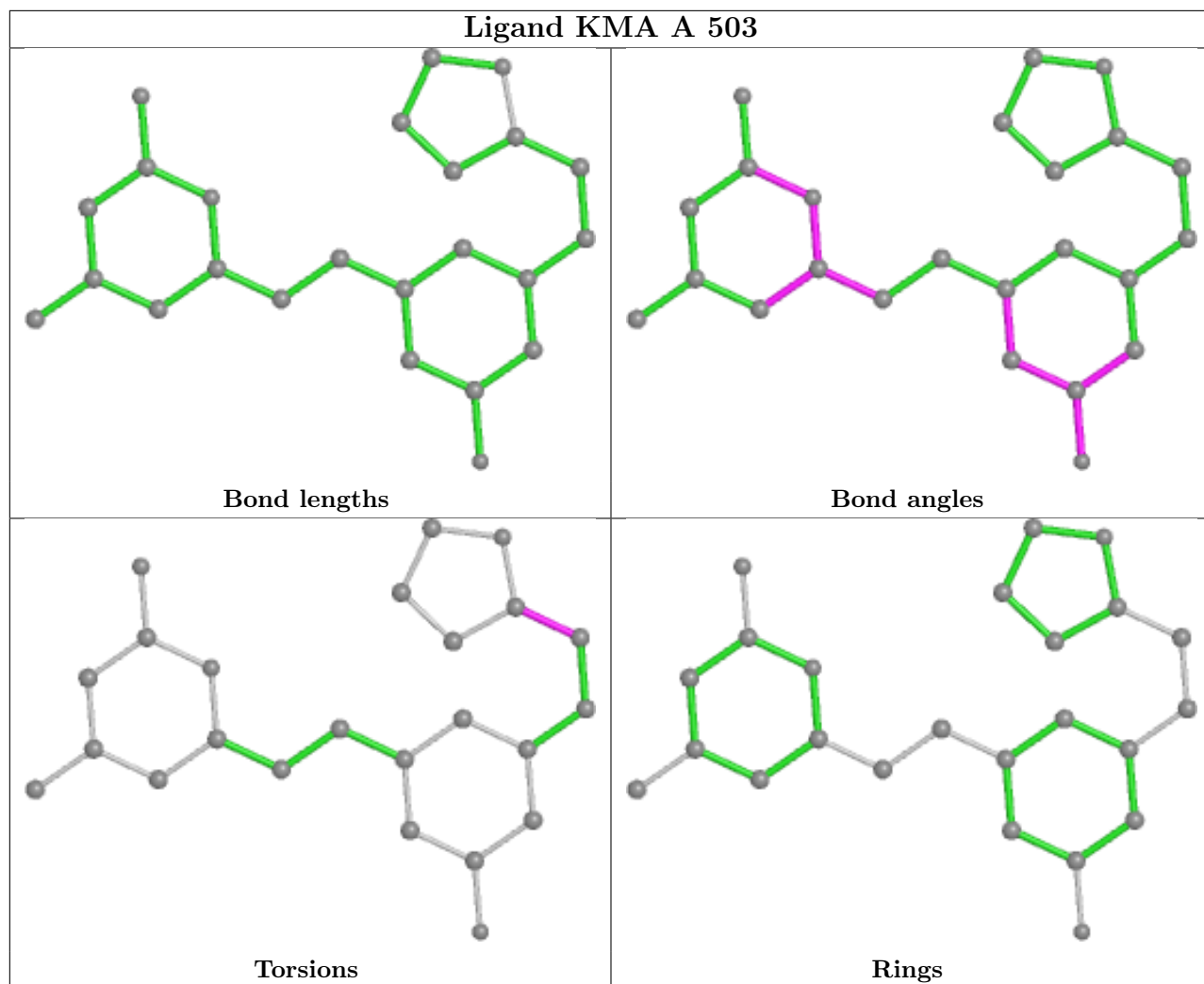
1 monomer is involved in 1 short contact:

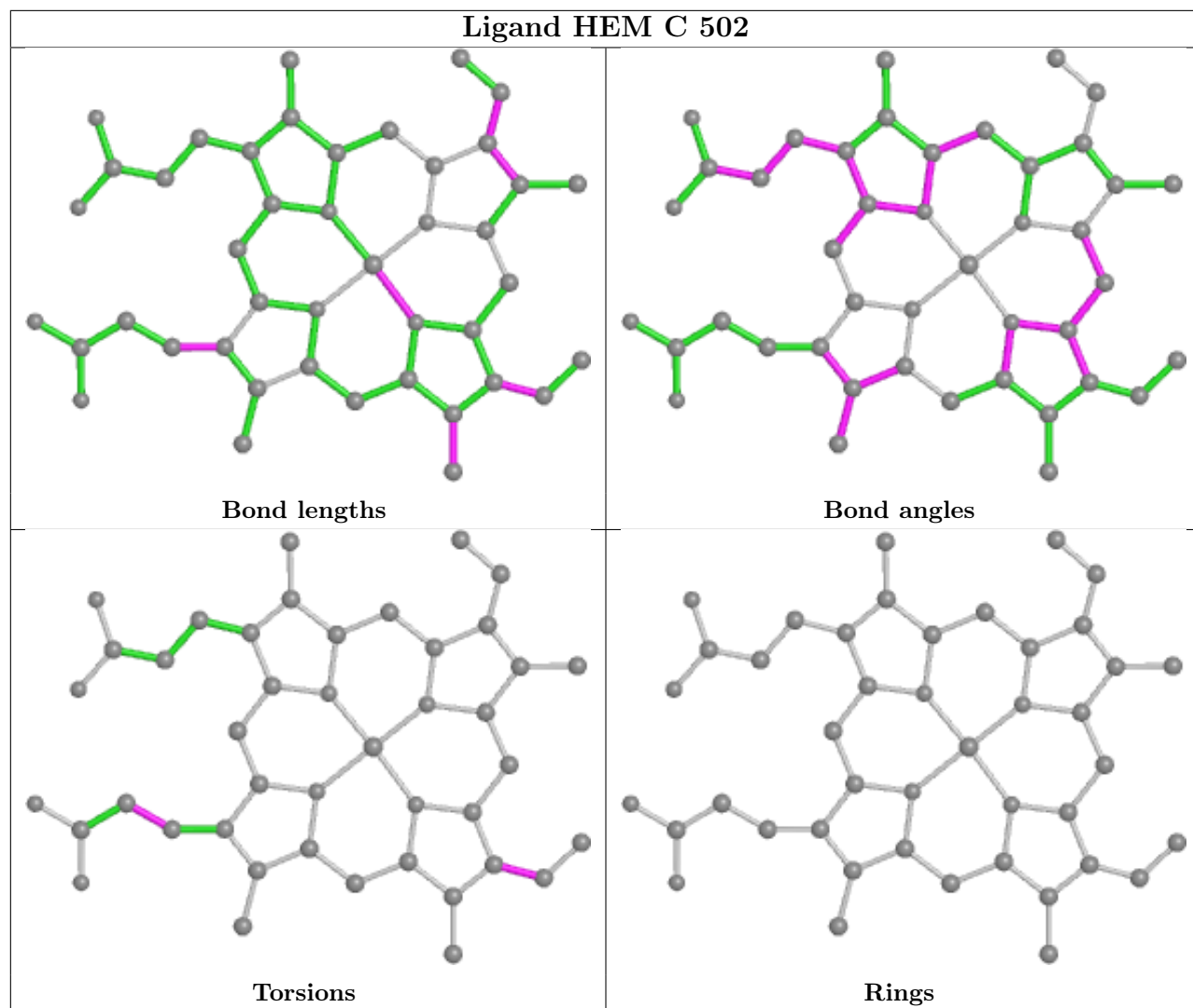
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	D	505	BTB	0	1

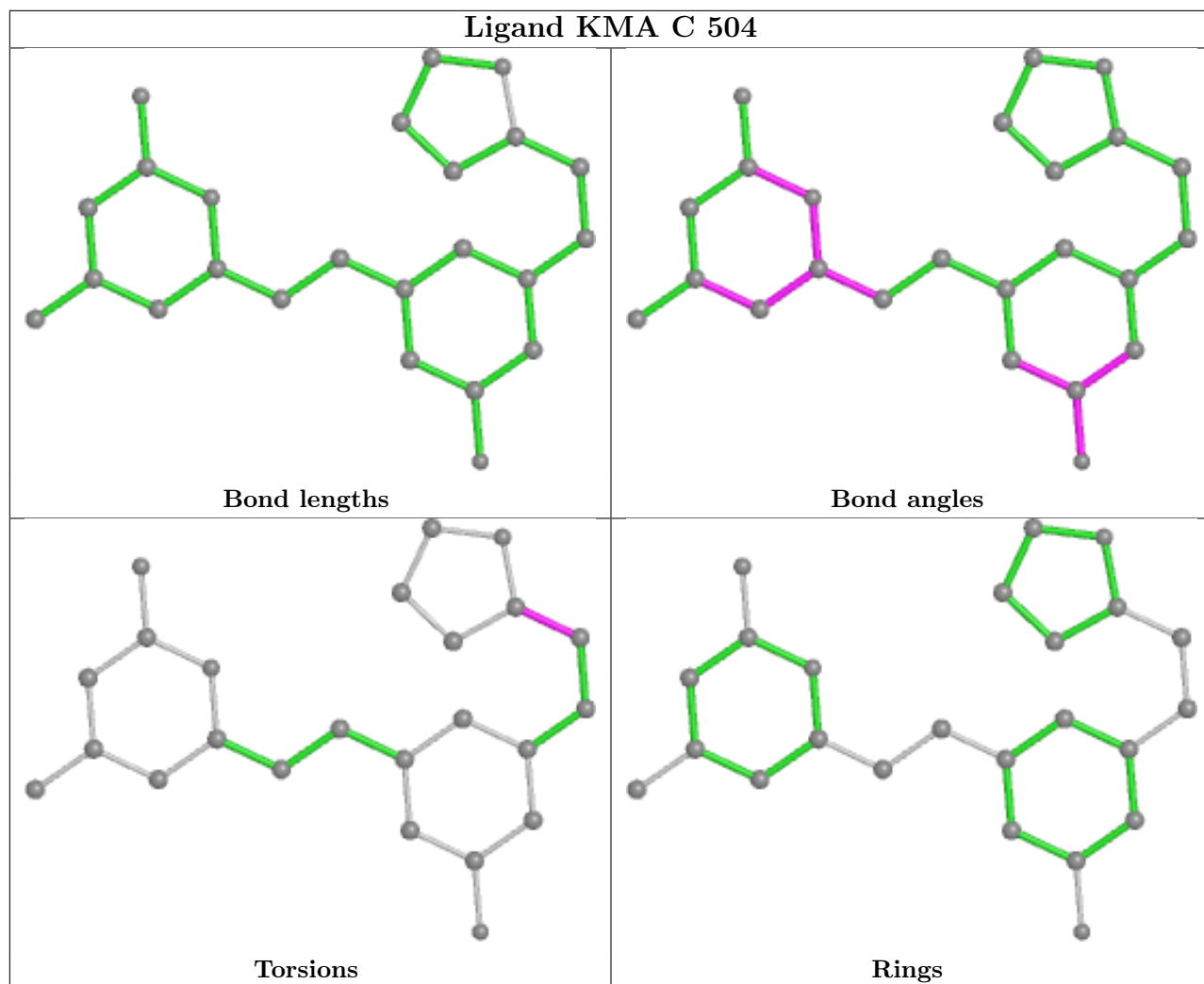
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

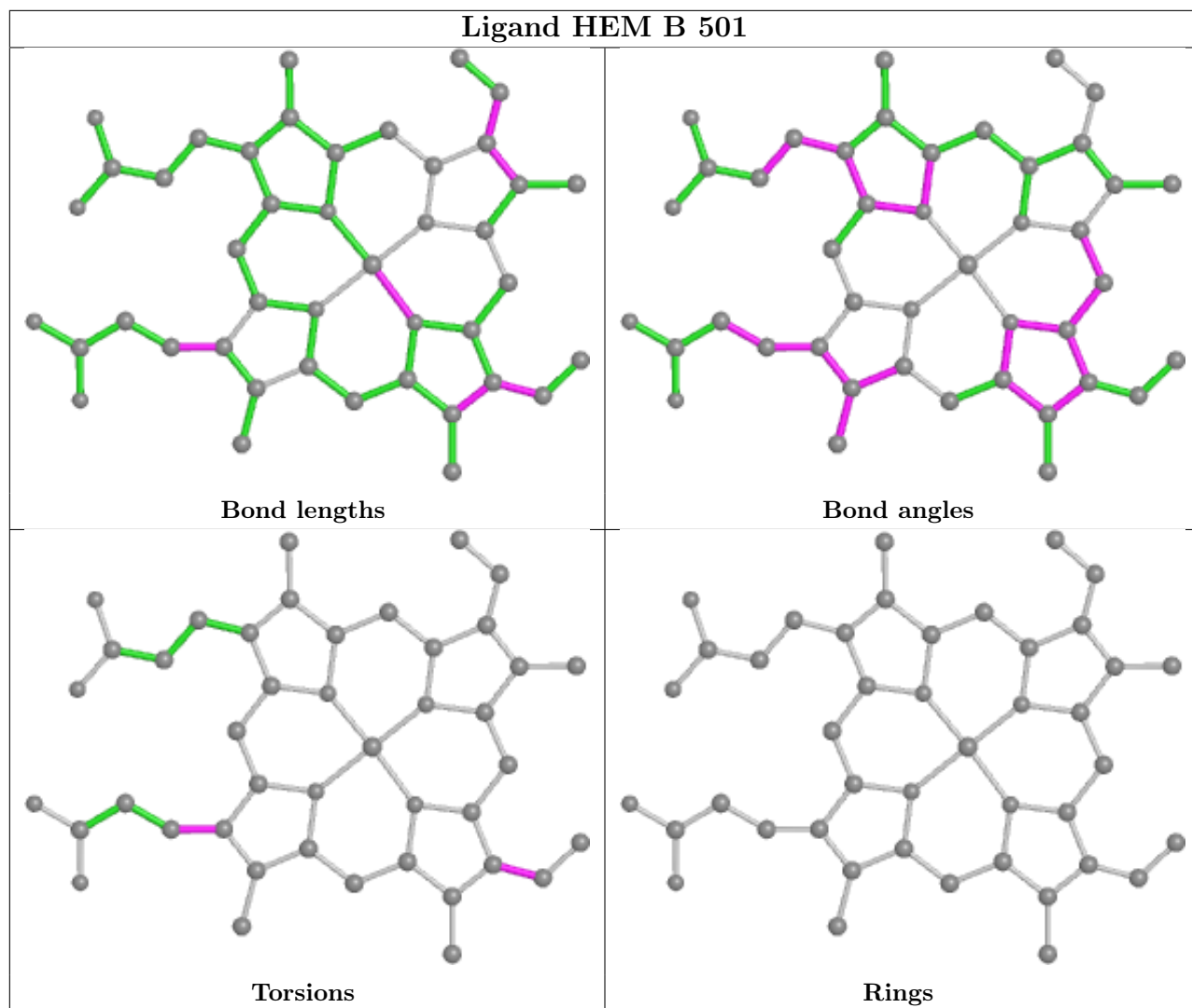




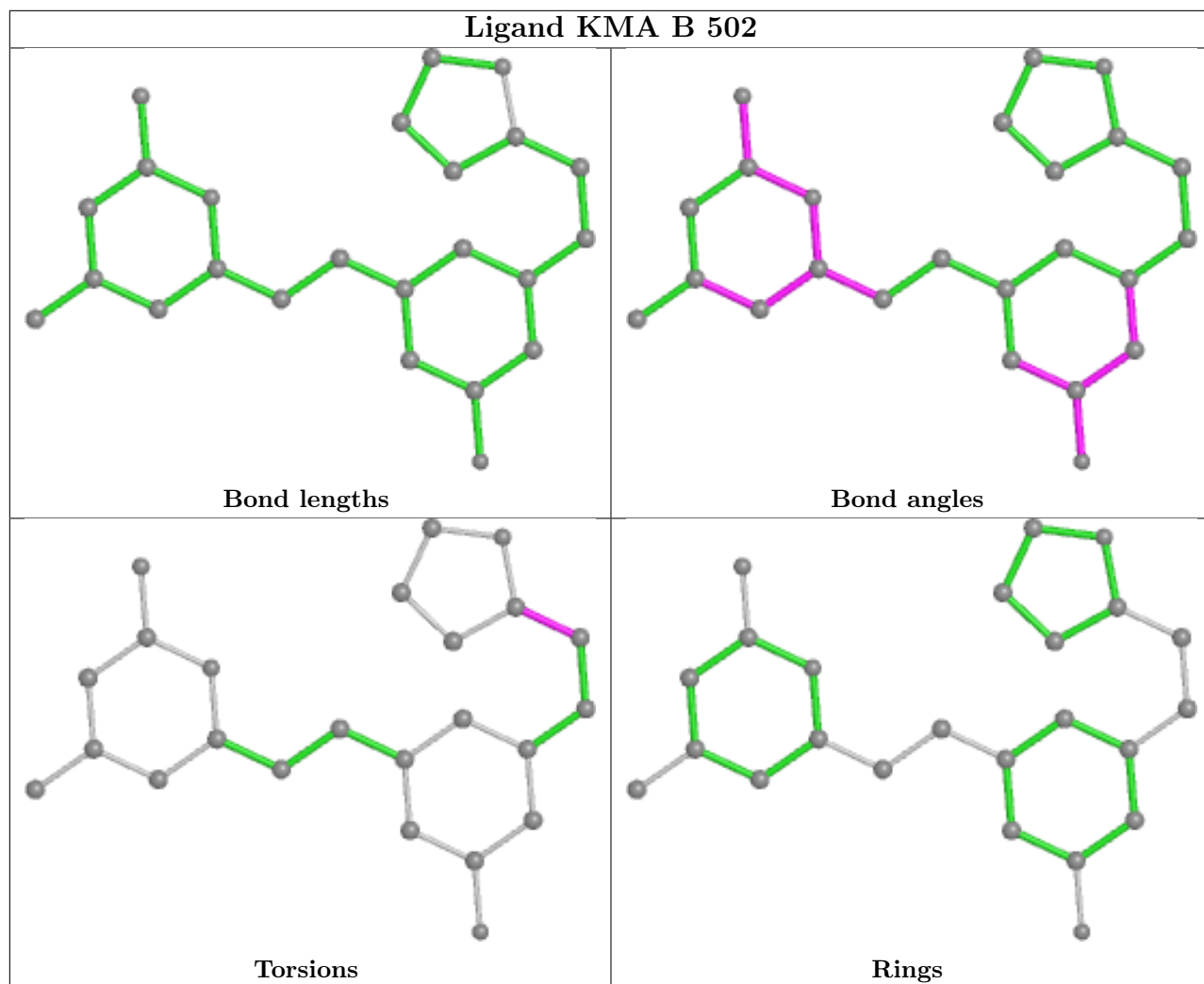


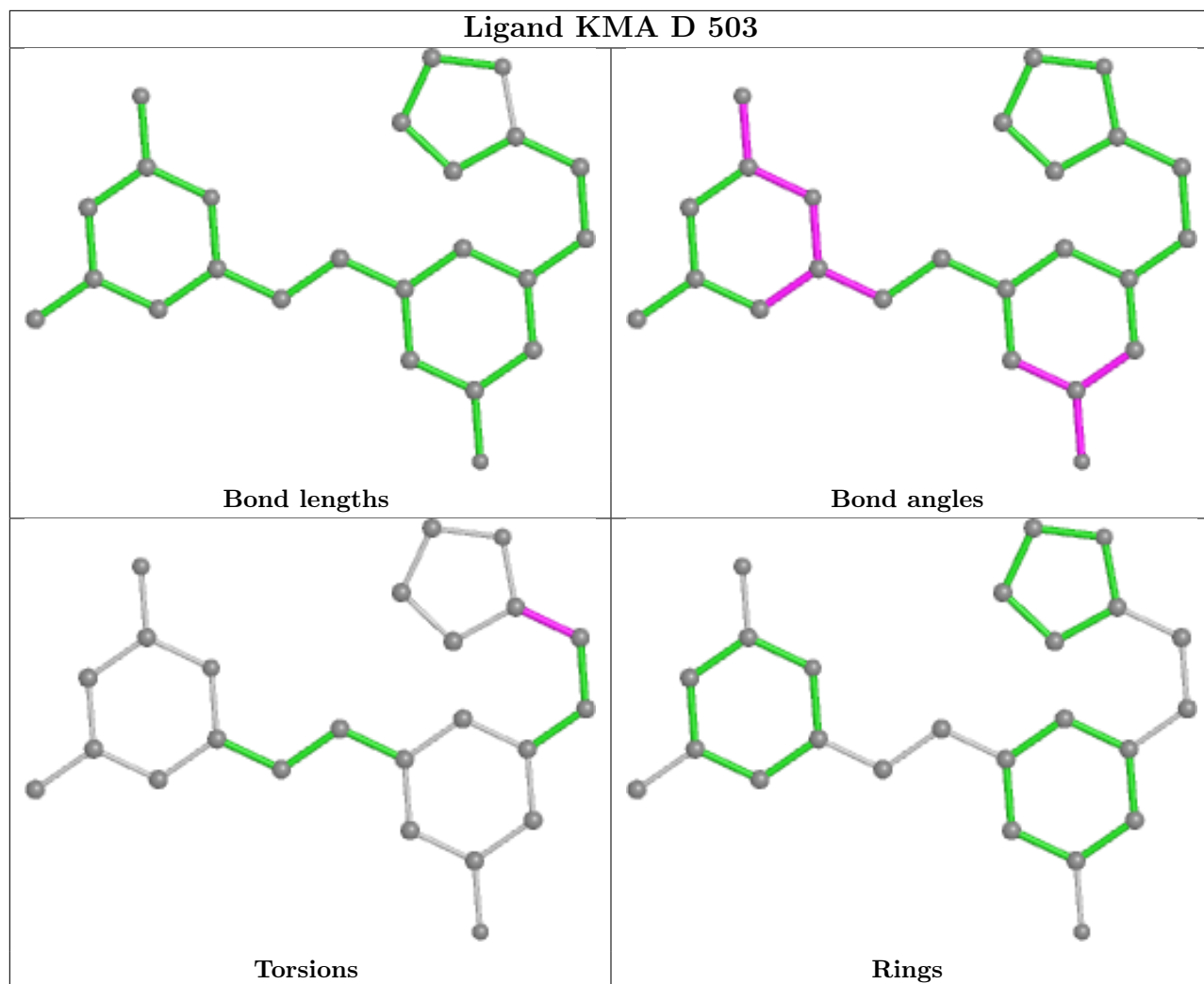


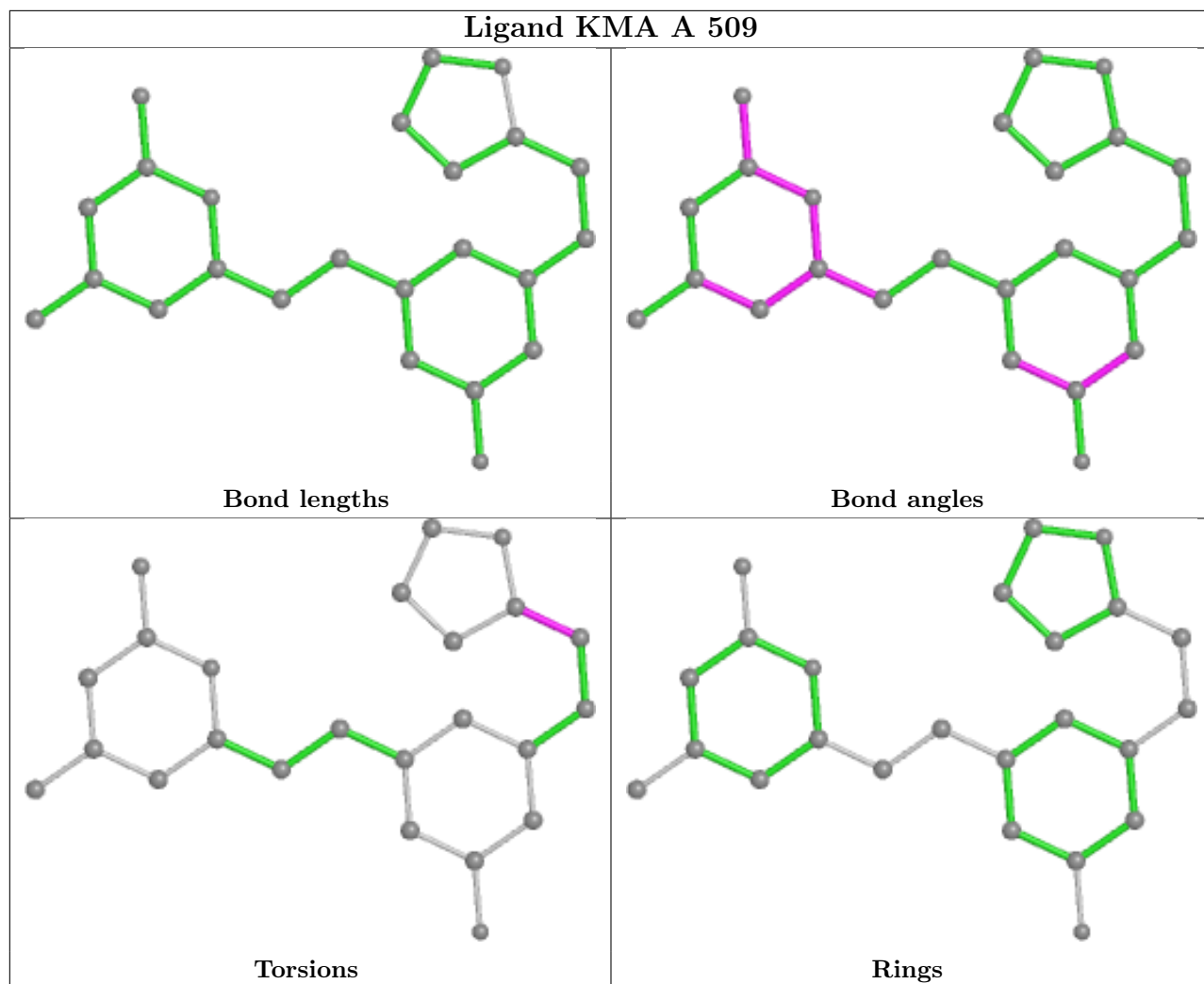


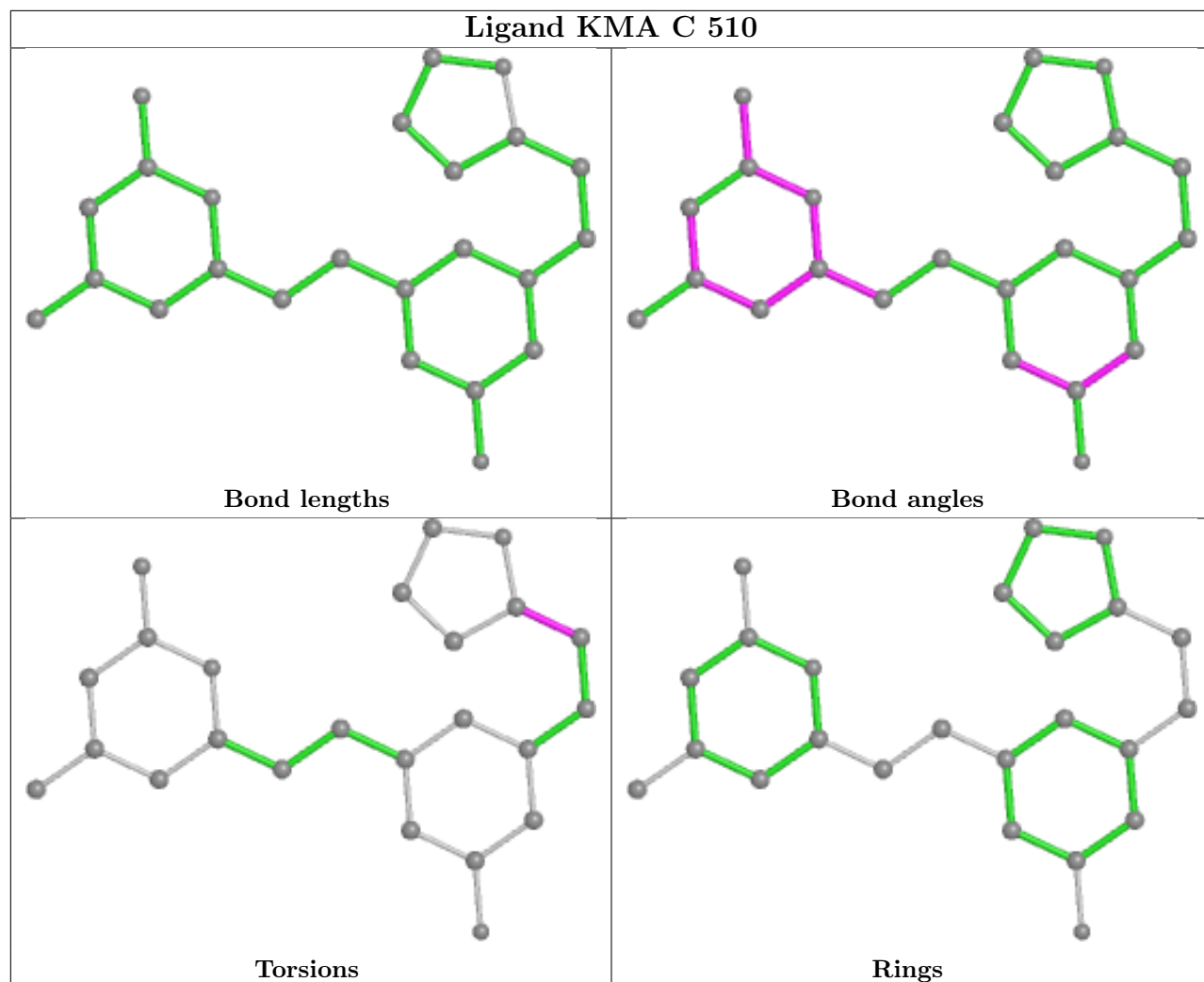












#### 4.7 Other polymers [i](#)

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 [i](#)

### 5.1 Protein, DNA and RNA chains [i](#)

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

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

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

### 5.3 Carbohydrates [i](#)

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

### 5.4 Ligands [i](#)

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

### 5.5 Other polymers [i](#)

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