



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 8, 2023 – 06:17 PM EDT

PDB ID : 1QSG  
Title : CRYSTAL STRUCTURE OF ENOYL REDUCTASE INHIBITION BY TRI-CLOSAN  
Authors : Stewart, M.J.; Parikh, S.; Xiao, G.; Tonge, P.J.; Kisker, C.  
Deposited on : 1999-06-21  
Resolution : 1.75 Å(reported)

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

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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 : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (Phenix) : **NOT EXECUTED**  
EDS : **NOT EXECUTED**  
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

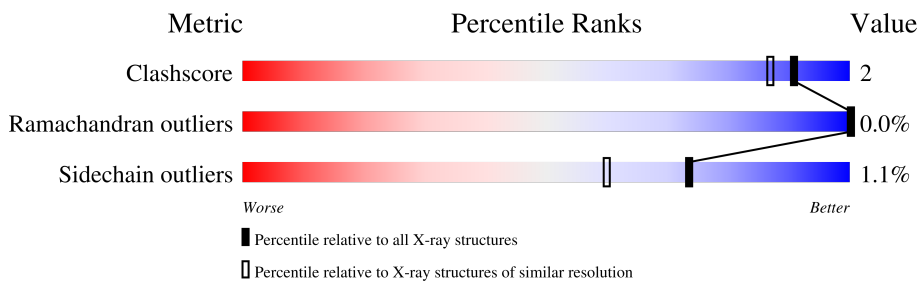
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.75 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)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	2466 (1.76-1.76)
Ramachandran outliers	138981	2437 (1.76-1.76)
Sidechain outliers	138945	2437 (1.76-1.76)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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  $\leq 5\%$ .

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	265	90% 7% . .
1	B	265	91% 5% . .
1	C	265	91% 6% .
1	D	265	91% 6% .
1	E	265	89% 7% . .
1	F	265	88% 8% . .
1	G	265	91% 5% . .
1	H	265	92% 5% .

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

<b>Mol</b>	<b>Type</b>	<b>Chain</b>	<b>Res</b>	<b>Chirality</b>	<b>Geometry</b>	<b>Clashes</b>	<b>Electron density</b>
2	GLC	A	1303	X	-	-	-
2	GLC	B	1306	X	-	-	-
2	GLC	C	1309	X	-	-	-
2	GLC	D	1312	X	-	-	-
2	GLC	E	1315	X	-	-	-
2	GLC	F	1318	X	-	-	-
2	GLC	G	1321	X	-	-	-
2	GLC	H	1324	X	-	-	-

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 17287 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 ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	258	1918	1209	331	365	13	0	0	0
1	B	258	1918	1209	331	365	13	0	0	0
1	C	258	1918	1209	331	365	13	0	0	0
1	D	258	1918	1209	331	365	13	0	0	0
1	E	258	1918	1209	331	365	13	0	0	0
1	F	258	1918	1209	331	365	13	0	0	0
1	G	259	1927	1214	332	368	13	0	0	0
1	H	258	1918	1209	331	365	13	0	0	0

There are 24 discrepancies between the modelled and reference sequences:

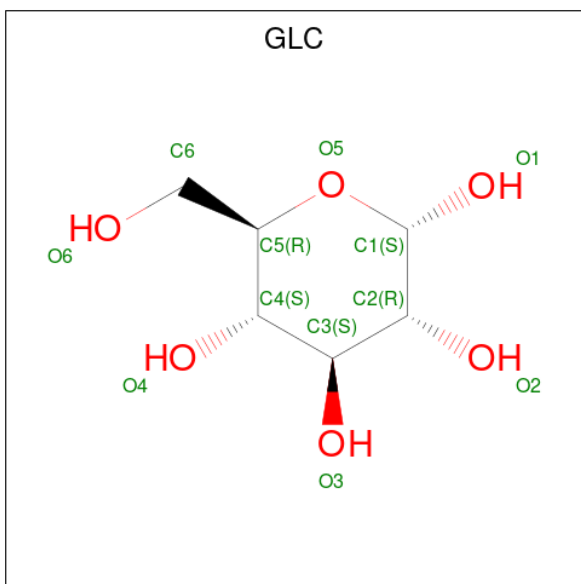
Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	GLY	-	expression tag	UNP P29132
A	-1	SER	-	expression tag	UNP P29132
A	0	HIS	-	expression tag	UNP P29132
B	-2	GLY	-	expression tag	UNP P29132
B	-1	SER	-	expression tag	UNP P29132
B	0	HIS	-	expression tag	UNP P29132
C	-2	GLY	-	expression tag	UNP P29132
C	-1	SER	-	expression tag	UNP P29132
C	0	HIS	-	expression tag	UNP P29132
D	-2	GLY	-	expression tag	UNP P29132
D	-1	SER	-	expression tag	UNP P29132
D	0	HIS	-	expression tag	UNP P29132
E	-2	GLY	-	expression tag	UNP P29132

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Chain	Residue	Modelled	Actual	Comment	Reference
E	-1	SER	-	expression tag	UNP P29132
E	0	HIS	-	expression tag	UNP P29132
F	-2	GLY	-	expression tag	UNP P29132
F	-1	SER	-	expression tag	UNP P29132
F	0	HIS	-	expression tag	UNP P29132
G	-2	GLY	-	expression tag	UNP P29132
G	-1	SER	-	expression tag	UNP P29132
G	0	HIS	-	expression tag	UNP P29132
H	-2	GLY	-	expression tag	UNP P29132
H	-1	SER	-	expression tag	UNP P29132
H	0	HIS	-	expression tag	UNP P29132

- Molecule 2 is alpha-D-glucopyranose (three-letter code: GLC) (formula: C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>).



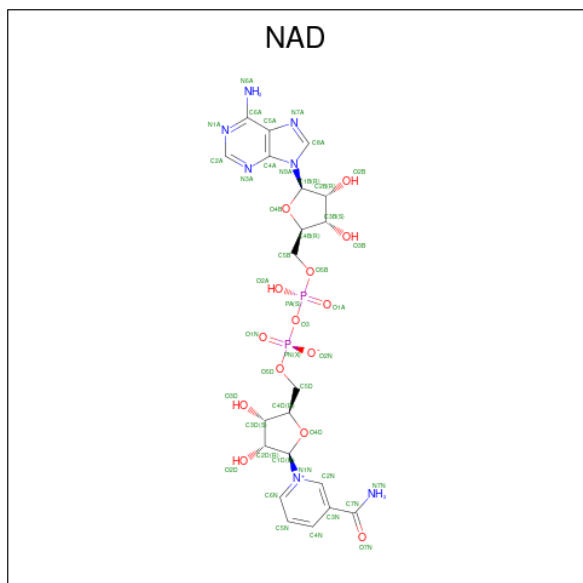
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf		
2	A	1	Total	C	O	0	0
			12	6	6		
2	B	1	Total	C	O	0	0
			12	6	6		
2	C	1	Total	C	O	0	0
			12	6	6		
2	D	1	Total	C	O	0	0
			12	6	6		
2	E	1	Total	C	O	0	0
			12	6	6		
2	F	1	Total	C	O	0	0
			12	6	6		

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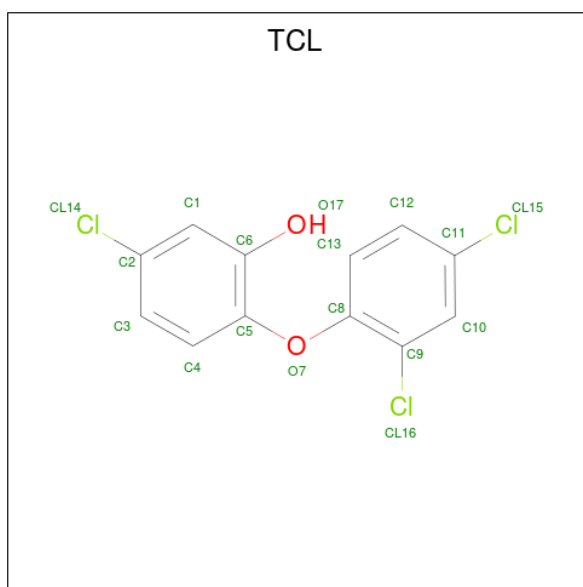
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	G	1	Total	C	O	0	0
			12	6	6		
2	H	1	Total	C	O	0	0
			12	6	6		

- Molecule 3 is NICOTINAMIDE-ADENINE-DINUCLEOTIDE (three-letter code: NAD) (formula:  $C_{21}H_{27}N_7O_{14}P_2$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
3	A	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	B	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	C	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	D	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	E	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	F	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	G	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	H	1	Total	C	N	O	P	0	0
			44	21	7	14	2		

- Molecule 4 is TRICLOSAN (three-letter code: TCL) (formula:  $C_{12}H_7Cl_3O_2$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	Cl	O	0	0
			17	12	3	2		
4	B	1	Total	C	Cl	O	0	0
			17	12	3	2		
4	C	1	Total	C	Cl	O	0	0
			17	12	3	2		
4	D	1	Total	C	Cl	O	0	0
			17	12	3	2		
4	E	1	Total	C	Cl	O	0	0
			17	12	3	2		
4	F	1	Total	C	Cl	O	0	0
			17	12	3	2		
4	G	1	Total	C	Cl	O	0	0
			17	12	3	2		
4	H	1	Total	C	Cl	O	0	0
			17	12	3	2		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	214	Total	O	0	0
			214	214		
5	B	165	Total	O	0	0
			165	165		
5	C	177	Total	O	0	0
			177	177		
5	D	180	Total	O	0	0
			180	180		

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<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
5	E	144	Total 144	O 144	0	0
5	F	132	Total 132	O 132	0	0
5	G	188	Total 188	O 188	0	0
5	H	150	Total 150	O 150	0	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. 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. 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.

Note EDS was not executed.

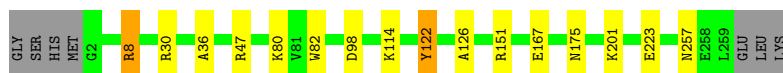
- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE

Chain A:  90% 7% . .




- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE

Chain B:  91% 5% . .



- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE

Chain C:  91% 6% .



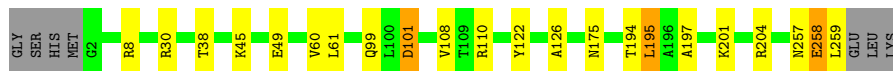
- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE

Chain D:  91% 6% .




- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE

Chain E:  89% 7% . .



- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE

Chain F:  88% 8% ..



● Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE

Chain G:  91% 5% ..



● Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE

Chain H:  92% 5% .



## 4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	73.73Å 82.08Å 84.18Å 89.54° 87.43° 77.77°	Depositor
Resolution (Å)	20.00 – 1.75	Depositor
% Data completeness (in resolution range)	94.2 (20.00-1.75)	Depositor
$R_{merge}$	0.04	Depositor
$R_{sym}$	(Not available)	Depositor
Refinement program	REFMAC	Depositor
R, $R_{free}$	0.172 , 0.215	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	17287	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	27.0	wwPDB-VP

## 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: GLC, NAD, TCL

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	0.72	0/1950	1.26	12/2634 (0.5%)
1	B	0.65	0/1950	1.20	10/2634 (0.4%)
1	C	0.66	0/1950	1.23	12/2634 (0.5%)
1	D	0.65	0/1950	1.17	6/2634 (0.2%)
1	E	0.56	0/1950	1.09	4/2634 (0.2%)
1	F	0.57	0/1950	1.21	13/2634 (0.5%)
1	G	0.61	0/1959	1.21	11/2646 (0.4%)
1	H	0.60	0/1950	1.15	9/2634 (0.3%)
All	All	0.63	0/15609	1.19	77/21084 (0.4%)

There are no bond length outliers.

All (77) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	G	110	ARG	NE-CZ-NH1	11.10	125.85	120.30
1	D	98	ASP	CB-CG-OD1	11.03	128.23	118.30
1	C	8	ARG	NE-CZ-NH1	10.99	125.80	120.30
1	F	193	ARG	NE-CZ-NH1	10.90	125.75	120.30
1	A	151	ARG	NE-CZ-NH1	10.72	125.66	120.30
1	C	151	ARG	CD-NE-CZ	10.71	138.60	123.60
1	A	8	ARG	NE-CZ-NH2	-10.17	115.21	120.30
1	G	8	ARG	CD-NE-CZ	9.96	137.55	123.60
1	C	8	ARG	CD-NE-CZ	9.87	137.42	123.60
1	F	193	ARG	NE-CZ-NH2	-9.81	115.39	120.30
1	A	98	ASP	CB-CG-OD1	9.49	126.84	118.30
1	B	151	ARG	CD-NE-CZ	8.41	135.37	123.60
1	F	151	ARG	NE-CZ-NH1	8.25	124.42	120.30
1	B	98	ASP	CB-CG-OD1	7.93	125.44	118.30
1	G	151	ARG	NE-CZ-NH1	7.91	124.25	120.30
1	A	110	ARG	NE-CZ-NH1	7.77	124.19	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	101	ASP	CB-CG-OD1	7.64	125.18	118.30
1	H	151	ARG	NE-CZ-NH1	7.47	124.04	120.30
1	A	151	ARG	CD-NE-CZ	7.30	133.81	123.60
1	G	151	ARG	CD-NE-CZ	7.26	133.77	123.60
1	G	98	ASP	CB-CG-OD1	7.06	124.66	118.30
1	G	8	ARG	NE-CZ-NH2	6.99	123.80	120.30
1	B	151	ARG	NE-CZ-NH1	6.95	123.78	120.30
1	F	8	ARG	NE-CZ-NH1	6.88	123.74	120.30
1	C	64	ASP	CB-CG-OD1	6.88	124.49	118.30
1	C	8	ARG	NE-CZ-NH2	-6.71	116.95	120.30
1	F	151	ARG	CD-NE-CZ	6.63	132.88	123.60
1	D	132	ARG	NE-CZ-NH1	6.62	123.61	120.30
1	E	110	ARG	NE-CZ-NH1	6.62	123.61	120.30
1	A	167	GLU	OE1-CD-OE2	-6.61	115.37	123.30
1	G	30	ARG	NE-CZ-NH2	-6.60	117.00	120.30
1	D	98	ASP	OD1-CG-OD2	-6.34	111.25	123.30
1	H	30	ARG	NE-CZ-NH2	-6.33	117.13	120.30
1	C	218	ARG	NE-CZ-NH1	6.18	123.39	120.30
1	C	110	ARG	NE-CZ-NH1	6.17	123.38	120.30
1	A	103	ASP	CB-CG-OD2	6.16	123.85	118.30
1	F	30	ARG	NE-CZ-NH1	-6.15	117.22	120.30
1	F	101	ASP	CB-CG-OD1	6.15	123.83	118.30
1	F	218	ARG	NE-CZ-NH1	6.15	123.37	120.30
1	B	30	ARG	NE-CZ-NH2	-6.11	117.24	120.30
1	E	30	ARG	NE-CZ-NH2	-6.11	117.25	120.30
1	C	30	ARG	NE-CZ-NH2	-6.09	117.25	120.30
1	A	42	ASP	CB-CG-OD1	6.08	123.77	118.30
1	F	98	ASP	CB-CG-OD1	6.05	123.75	118.30
1	F	110	ARG	NE-CZ-NH1	6.05	123.32	120.30
1	F	47	ARG	NE-CZ-NH2	6.01	123.31	120.30
1	G	260	GLU	OE1-CD-OE2	-5.95	116.16	123.30
1	H	183	ARG	NE-CZ-NH1	5.86	123.23	120.30
1	B	8	ARG	CD-NE-CZ	5.84	131.77	123.60
1	H	122	TYR	CB-CG-CD1	-5.82	117.51	121.00
1	E	8	ARG	NE-CZ-NH1	5.81	123.20	120.30
1	G	110	ARG	NE-CZ-NH2	-5.77	117.42	120.30
1	H	151	ARG	NE-CZ-NH2	-5.74	117.43	120.30
1	B	8	ARG	NE-CZ-NH1	5.73	123.17	120.30
1	C	132	ARG	NE-CZ-NH2	5.67	123.14	120.30
1	A	8	ARG	NE-CZ-NH1	5.65	123.12	120.30
1	F	235	ASP	CB-CG-OD1	5.64	123.38	118.30
1	C	58	ASP	CB-CG-OD1	5.58	123.32	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	G	167	GLU	OE1-CD-OE2	-5.57	116.62	123.30
1	D	150	GLU	OE1-CD-OE2	-5.54	116.66	123.30
1	C	98	ASP	CB-CG-OD1	5.51	123.26	118.30
1	B	167	GLU	OE1-CD-OE2	-5.49	116.72	123.30
1	H	47	ARG	NE-CZ-NH2	5.48	123.04	120.30
1	C	183	ARG	NE-CZ-NH2	-5.46	117.57	120.30
1	H	67	GLU	OE1-CD-OE2	-5.45	116.76	123.30
1	G	151	ARG	NE-CZ-NH2	-5.45	117.58	120.30
1	H	235	ASP	CB-CG-OD1	5.44	123.19	118.30
1	B	36	ALA	N-CA-CB	5.38	117.63	110.10
1	B	223	GLU	OE1-CD-OE2	-5.35	116.88	123.30
1	D	235	ASP	CB-CG-OD1	5.35	123.12	118.30
1	A	166	LEU	O-C-N	-5.32	114.19	122.70
1	B	122	TYR	CB-CG-CD1	-5.31	117.82	121.00
1	H	47	ARG	NE-CZ-NH1	-5.30	117.65	120.30
1	F	8	ARG	NE-CZ-NH2	-5.11	117.74	120.30
1	D	8	ARG	NE-CZ-NH1	5.07	122.84	120.30
1	A	217	ARG	NE-CZ-NH2	5.07	122.83	120.30
1	E	101	ASP	CB-CG-OD1	5.04	122.83	118.30

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	1918	0	1909	9	0
1	B	1918	0	1909	7	0
1	C	1918	0	1909	4	0
1	D	1918	0	1909	8	0
1	E	1918	0	1909	13	0
1	F	1918	0	1909	9	0
1	G	1927	0	1915	9	0
1	H	1918	0	1909	4	0
2	A	12	0	12	0	0
2	B	12	0	12	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	12	0	12	0	0
2	D	12	0	12	1	0
2	E	12	0	12	0	0
2	F	12	0	12	0	0
2	G	12	0	11	0	0
2	H	12	0	12	0	0
3	A	44	0	26	0	0
3	B	44	0	25	0	0
3	C	44	0	25	0	0
3	D	44	0	26	0	0
3	E	44	0	24	2	0
3	F	44	0	25	0	0
3	G	44	0	25	0	0
3	H	44	0	25	0	0
4	A	17	0	7	0	0
4	B	17	0	7	0	0
4	C	17	0	7	0	0
4	D	17	0	7	0	0
4	E	17	0	7	1	0
4	F	17	0	7	0	0
4	G	17	0	7	0	0
4	H	17	0	7	0	0
5	A	214	0	0	1	0
5	B	165	0	0	2	0
5	C	177	0	0	2	0
5	D	180	0	0	2	0
5	E	144	0	0	1	0
5	F	132	0	0	2	0
5	G	188	0	0	3	0
5	H	150	0	0	1	0
All	All	17287	0	15630	54	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 2.

All (54) 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)
1:E:259:LEU:HD22	1:H:205:LYS:HD3	1.60	0.83
1:E:257:ASN:HD21	1:G:175:ASN:HD21	1.31	0.78
1:B:175:ASN:HD21	1:D:257:ASN:HD21	1.34	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:175:ASN:HD21	1:G:257:ASN:HD21	1.33	0.76
1:G:213:VAL:HG11	1:G:258:GLU:HG3	1.71	0.71
1:A:175:ASN:HD21	1:C:257:ASN:HD21	1.37	0.70
1:E:49:GLU:HG2	1:E:60:VAL:HG11	1.74	0.70
1:A:114:LYS:HD2	1:B:114:LYS:HD2	1.77	0.67
1:A:257:ASN:HD21	1:C:175:ASN:HD21	1.43	0.66
1:F:257:ASN:HD21	1:H:175:ASN:HD21	1.48	0.62
1:G:17:LYS:HD3	5:G:1357:HOH:O	2.02	0.59
1:B:80:LYS:HE3	5:B:1443:HOH:O	2.04	0.58
3:E:1313:NAD:H51N	4:E:1314:TCL:CL16	2.41	0.57
1:E:195:LEU:HD23	5:E:1424:HOH:O	2.08	0.53
1:D:94:PHE:CD2	2:D:1312:GLC:H2	2.45	0.51
3:E:1313:NAD:H2N	3:E:1313:NAD:H52N	1.93	0.51
1:A:26:GLN:NE2	5:A:1444:HOH:O	2.43	0.51
1:E:101:ASP:OD1	1:E:201:LYS:HD2	2.11	0.50
1:A:101:ASP:OD1	1:A:201:LYS:HD2	2.11	0.50
1:F:198:SER:HB3	5:F:1417:HOH:O	2.12	0.50
1:C:26:GLN:NE2	5:C:1449:HOH:O	2.45	0.49
1:B:114:LYS:HE2	5:B:1432:HOH:O	2.12	0.49
1:E:45:LYS:O	1:E:49:GLU:HG3	2.13	0.48
1:G:101:ASP:OD1	1:G:201:LYS:HD2	2.14	0.48
1:E:99:GLN:OE1	1:E:108:VAL:HA	2.14	0.48
1:B:257:ASN:HD21	1:D:175:ASN:HD21	1.60	0.48
1:A:47:ARG:NH2	1:H:72:ASP:OD1	2.47	0.47
1:D:101:ASP:OD1	1:D:201:LYS:HD2	2.15	0.47
1:F:122:TYR:CE2	1:F:126:ALA:HB2	2.50	0.47
1:F:43:LYS:NZ	5:F:1427:HOH:O	2.45	0.46
1:B:122:TYR:CE2	1:B:126:ALA:HB2	2.51	0.46
1:D:8:ARG:NH1	5:D:1404:HOH:O	2.35	0.46
1:D:122:TYR:CE2	1:D:126:ALA:HB2	2.50	0.46
1:B:8:ARG:HD3	1:B:82:TRP:NE1	2.30	0.46
1:H:38:THR:HA	1:H:61:LEU:O	2.16	0.45
1:F:155:ASN:ND2	1:G:260:GLU:OE2	2.47	0.44
1:D:204:ARG:HG2	5:D:1444:HOH:O	2.17	0.44
1:E:204:ARG:HD2	1:E:204:ARG:O	2.18	0.43
1:E:38:THR:HA	1:E:61:LEU:O	2.19	0.42
1:G:213:VAL:CG1	1:G:258:GLU:HG3	2.44	0.42
1:D:38:THR:HA	1:D:61:LEU:O	2.19	0.42
1:E:122:TYR:CE2	1:E:126:ALA:HB2	2.55	0.42
1:F:8:ARG:HD3	1:F:82:TRP:NE1	2.34	0.42
1:G:220:VAL:HG22	5:G:1397:HOH:O	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:8:ARG:NH1	5:C:1371:HOH:O	2.49	0.41
1:F:39:TYR:OH	1:F:45:LYS:HD2	2.20	0.41
1:F:136:ASN:HB3	1:F:137:PRO:HD2	2.01	0.41
1:A:122:TYR:CE2	1:A:126:ALA:HB2	2.54	0.41
1:E:258:GLU:H	1:E:258:GLU:HG3	1.29	0.41
1:A:30:ARG:HH11	1:A:30:ARG:HD3	1.73	0.41
1:F:45:LYS:HE3	1:F:49:GLU:OE2	2.21	0.41
1:A:43:LYS:HE3	5:H:1373:HOH:O	2.20	0.40
1:E:194:THR:H	1:E:197:ALA:HB3	1.86	0.40
1:G:47:ARG:HG2	5:G:1484:HOH:O	2.22	0.40

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 X-ray entries followed by that with respect to entries of similar resolution.

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	256/265 (97%)	250 (98%)	6 (2%)	0	100	100
1	B	256/265 (97%)	249 (97%)	7 (3%)	0	100	100
1	C	256/265 (97%)	250 (98%)	6 (2%)	0	100	100
1	D	256/265 (97%)	250 (98%)	6 (2%)	0	100	100
1	E	256/265 (97%)	249 (97%)	6 (2%)	1 (0%)	34	17
1	F	256/265 (97%)	247 (96%)	9 (4%)	0	100	100
1	G	257/265 (97%)	251 (98%)	6 (2%)	0	100	100
1	H	256/265 (97%)	245 (96%)	11 (4%)	0	100	100
All	All	2049/2120 (97%)	1991 (97%)	57 (3%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	258	GLU

### 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 X-ray entries followed by that with respect to entries of similar resolution.

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	197/203 (97%)	196 (100%)	1 (0%)	88	83
1	B	197/203 (97%)	195 (99%)	2 (1%)	76	63
1	C	197/203 (97%)	194 (98%)	3 (2%)	65	49
1	D	197/203 (97%)	195 (99%)	2 (1%)	76	63
1	E	197/203 (97%)	196 (100%)	1 (0%)	88	83
1	F	197/203 (97%)	194 (98%)	3 (2%)	65	49
1	G	198/203 (98%)	195 (98%)	3 (2%)	65	49
1	H	197/203 (97%)	195 (99%)	2 (1%)	76	63
All	All	1577/1624 (97%)	1560 (99%)	17 (1%)	73	60

All (17) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	47	ARG
1	B	47	ARG
1	B	201	LYS
1	C	47	ARG
1	C	84	LYS
1	C	206	MET
1	D	62	GLN
1	D	114	LYS
1	E	195	LEU
1	F	17	LYS
1	F	43	LYS
1	F	62	GLN
1	G	17	LYS
1	G	47	ARG
1	G	111	GLU

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Mol	Chain	Res	Type
1	H	151	ARG
1	H	258	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (16) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	26	GLN
1	A	40	GLN
1	A	257	ASN
1	B	257	ASN
1	C	26	GLN
1	C	257	ASN
1	D	26	GLN
1	D	40	GLN
1	D	62	GLN
1	D	257	ASN
1	E	257	ASN
1	F	257	ASN
1	G	257	ASN
1	H	26	GLN
1	H	54	GLN
1	H	257	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 monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

24 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	GLC	G	1321	-	12,12,12	0.94	0	17,17,17	2.62	7 (41%)
4	TCL	A	1302	-	18,18,18	1.10	1 (5%)	25,25,25	1.14	3 (12%)
3	NAD	E	1313	-	42,48,48	2.03	13 (30%)	50,73,73	2.76	17 (34%)
4	TCL	D	1311	-	18,18,18	0.88	0	25,25,25	1.29	2 (8%)
3	NAD	B	1304	-	42,48,48	1.96	12 (28%)	50,73,73	2.82	14 (28%)
4	TCL	E	1314	-	18,18,18	0.91	0	25,25,25	0.96	1 (4%)
4	TCL	G	1320	-	18,18,18	1.13	0	25,25,25	1.01	1 (4%)
2	GLC	F	1318	-	12,12,12	1.00	0	17,17,17	2.28	6 (35%)
2	GLC	C	1309	-	12,12,12	1.22	1 (8%)	17,17,17	1.77	3 (17%)
4	TCL	C	1308	-	18,18,18	1.03	0	25,25,25	1.06	2 (8%)
4	TCL	B	1305	-	18,18,18	1.02	1 (5%)	25,25,25	1.01	1 (4%)
3	NAD	H	1322	-	42,48,48	2.00	12 (28%)	50,73,73	2.62	16 (32%)
3	NAD	D	1310	-	42,48,48	1.96	13 (30%)	50,73,73	2.64	13 (26%)
3	NAD	G	1319	-	42,48,48	2.15	13 (30%)	50,73,73	2.73	14 (28%)
4	TCL	F	1317	-	18,18,18	0.84	0	25,25,25	1.03	1 (4%)
3	NAD	C	1307	-	42,48,48	2.04	12 (28%)	50,73,73	2.45	14 (28%)
2	GLC	A	1303	-	12,12,12	1.10	1 (8%)	17,17,17	2.89	9 (52%)
3	NAD	A	1301	-	42,48,48	2.13	13 (30%)	50,73,73	2.89	12 (24%)
3	NAD	F	1316	-	42,48,48	1.94	10 (23%)	50,73,73	2.59	17 (34%)
2	GLC	D	1312	-	12,12,12	0.88	1 (8%)	17,17,17	2.22	4 (23%)
2	GLC	E	1315	-	12,12,12	1.08	0	17,17,17	1.93	4 (23%)
2	GLC	B	1306	-	12,12,12	1.14	1 (8%)	17,17,17	1.63	2 (11%)
4	TCL	H	1323	-	18,18,18	1.01	0	25,25,25	1.01	2 (8%)
2	GLC	H	1324	-	12,12,12	0.87	0	17,17,17	2.72	7 (41%)

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
2	GLC	G	1321	-	1/1/5/5	0/2/22/22	0/1/1/1
4	TCL	A	1302	-	-	0/4/4/4	0/2/2/2
3	NAD	E	1313	-	-	8/26/62/62	0/5/5/5
4	TCL	D	1311	-	-	0/4/4/4	0/2/2/2
3	NAD	B	1304	-	-	6/26/62/62	0/5/5/5
4	TCL	E	1314	-	-	0/4/4/4	0/2/2/2
4	TCL	G	1320	-	-	0/4/4/4	0/2/2/2
2	GLC	F	1318	-	1/1/5/5	0/2/22/22	0/1/1/1
2	GLC	C	1309	-	1/1/5/5	2/2/22/22	0/1/1/1
4	TCL	C	1308	-	-	0/4/4/4	0/2/2/2
4	TCL	B	1305	-	-	0/4/4/4	0/2/2/2
3	NAD	H	1322	-	-	8/26/62/62	0/5/5/5
3	NAD	D	1310	-	-	6/26/62/62	0/5/5/5
3	NAD	G	1319	-	-	5/26/62/62	0/5/5/5
4	TCL	F	1317	-	-	0/4/4/4	0/2/2/2
3	NAD	C	1307	-	-	6/26/62/62	0/5/5/5
2	GLC	A	1303	-	1/1/5/5	0/2/22/22	0/1/1/1
3	NAD	A	1301	-	-	6/26/62/62	0/5/5/5
3	NAD	F	1316	-	-	6/26/62/62	0/5/5/5
2	GLC	D	1312	-	1/1/5/5	1/2/22/22	0/1/1/1
2	GLC	E	1315	-	1/1/5/5	1/2/22/22	0/1/1/1
2	GLC	B	1306	-	1/1/5/5	2/2/22/22	0/1/1/1
4	TCL	H	1323	-	-	0/4/4/4	0/2/2/2
2	GLC	H	1324	-	1/1/5/5	2/2/22/22	0/1/1/1

All (104) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	1307	NAD	C3N-C7N	5.53	1.58	1.50
3	H	1322	NAD	C3N-C7N	5.47	1.58	1.50
3	E	1313	NAD	C2A-N3A	5.47	1.40	1.32
3	A	1301	NAD	C2A-N3A	5.27	1.40	1.32
3	H	1322	NAD	C2A-N3A	5.19	1.40	1.32
3	E	1313	NAD	O4D-C4D	5.15	1.56	1.45
3	B	1304	NAD	C3N-C7N	5.07	1.58	1.50
3	G	1319	NAD	C2A-N3A	5.07	1.40	1.32
3	D	1310	NAD	C2N-N1N	5.00	1.41	1.35
3	H	1322	NAD	C2N-N1N	4.99	1.41	1.35
3	B	1304	NAD	C2N-N1N	4.82	1.40	1.35
3	C	1307	NAD	C2A-N3A	4.74	1.39	1.32
3	A	1301	NAD	C2N-N1N	4.73	1.40	1.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	1310	NAD	C3N-C7N	4.71	1.57	1.50
3	G	1319	NAD	C3N-C7N	4.62	1.57	1.50
3	F	1316	NAD	C2A-N3A	4.58	1.39	1.32
3	F	1316	NAD	C3N-C7N	4.43	1.57	1.50
3	E	1313	NAD	C3N-C7N	4.42	1.57	1.50
3	F	1316	NAD	C2N-N1N	4.40	1.40	1.35
3	C	1307	NAD	C2N-N1N	4.40	1.40	1.35
3	G	1319	NAD	O4D-C4D	4.38	1.54	1.45
3	G	1319	NAD	C2N-N1N	4.27	1.40	1.35
3	A	1301	NAD	O4D-C4D	4.17	1.54	1.45
3	D	1310	NAD	C2A-N3A	4.15	1.38	1.32
3	G	1319	NAD	O4D-C1D	4.13	1.46	1.41
3	A	1301	NAD	C3N-C7N	3.89	1.56	1.50
3	F	1316	NAD	O4D-C4D	3.89	1.53	1.45
3	E	1313	NAD	C2N-N1N	3.77	1.39	1.35
3	C	1307	NAD	O4D-C4D	3.71	1.53	1.45
3	A	1301	NAD	O4D-C1D	3.60	1.46	1.41
3	B	1304	NAD	C2A-N3A	3.59	1.37	1.32
3	D	1310	NAD	C4A-N3A	3.57	1.40	1.35
3	A	1301	NAD	O3B-C3B	3.54	1.51	1.43
3	D	1310	NAD	O4D-C4D	3.48	1.52	1.45
3	B	1304	NAD	O2B-C2B	-3.48	1.34	1.43
3	E	1313	NAD	O3D-C3D	-3.46	1.34	1.43
3	G	1319	NAD	C4A-N3A	3.36	1.40	1.35
3	A	1301	NAD	C4A-N3A	3.36	1.40	1.35
3	F	1316	NAD	O4D-C1D	3.35	1.45	1.41
3	H	1322	NAD	O4D-C4D	3.30	1.52	1.45
3	G	1319	NAD	O3B-C3B	3.29	1.50	1.43
3	B	1304	NAD	O4D-C4D	3.26	1.52	1.45
3	F	1316	NAD	O2B-C2B	-3.26	1.35	1.43
3	H	1322	NAD	O2B-C2B	-3.10	1.35	1.43
3	C	1307	NAD	O2B-C2B	-3.04	1.35	1.43
3	B	1304	NAD	O4B-C4B	2.97	1.51	1.45
3	E	1313	NAD	C3D-C4D	2.93	1.60	1.53
3	G	1319	NAD	C5N-C4N	2.90	1.45	1.38
3	B	1304	NAD	O3B-C3B	2.88	1.49	1.43
3	B	1304	NAD	C4A-N3A	2.88	1.39	1.35
3	C	1307	NAD	O3B-C3B	2.85	1.49	1.43
3	C	1307	NAD	C4A-N3A	2.85	1.39	1.35
3	E	1313	NAD	O2B-C2B	-2.82	1.36	1.43
3	G	1319	NAD	O4B-C4B	2.78	1.51	1.45
3	A	1301	NAD	O4B-C4B	2.74	1.51	1.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	1316	NAD	O3B-C3B	2.73	1.49	1.43
3	A	1301	NAD	C2B-C1B	2.73	1.57	1.53
3	D	1310	NAD	O3B-C3B	2.71	1.49	1.43
3	G	1319	NAD	O2B-C2B	-2.70	1.36	1.43
3	C	1307	NAD	O4D-C1D	2.69	1.44	1.41
3	D	1310	NAD	O4D-C1D	2.66	1.44	1.41
3	C	1307	NAD	O4B-C4B	2.60	1.50	1.45
3	A	1301	NAD	C2D-C1D	2.59	1.57	1.53
3	D	1310	NAD	C3B-C4B	2.58	1.59	1.53
3	H	1322	NAD	O3B-C3B	2.53	1.48	1.43
3	F	1316	NAD	C4A-N3A	2.50	1.39	1.35
3	D	1310	NAD	O4B-C4B	2.50	1.50	1.45
3	D	1310	NAD	C2B-C1B	2.48	1.57	1.53
3	G	1319	NAD	O2D-C2D	-2.47	1.37	1.43
3	B	1304	NAD	C3B-C4B	2.46	1.59	1.53
3	A	1301	NAD	O2D-C2D	-2.45	1.37	1.43
3	F	1316	NAD	C3B-C4B	2.42	1.59	1.53
2	A	1303	GLC	C4-C3	2.40	1.58	1.52
2	D	1312	GLC	C4-C3	2.40	1.58	1.52
3	D	1310	NAD	O2D-C2D	-2.39	1.37	1.43
3	H	1322	NAD	O2D-C2D	-2.37	1.37	1.43
3	E	1313	NAD	C3B-C4B	2.37	1.59	1.53
3	G	1319	NAD	C4N-C3N	2.36	1.43	1.39
3	H	1322	NAD	C4A-N3A	2.35	1.38	1.35
3	H	1322	NAD	C2B-C1B	2.34	1.57	1.53
3	H	1322	NAD	O4B-C4B	2.32	1.50	1.45
3	A	1301	NAD	C5N-C4N	2.31	1.43	1.38
3	D	1310	NAD	C3D-C4D	2.26	1.58	1.53
3	E	1313	NAD	C4A-N3A	2.25	1.38	1.35
3	F	1316	NAD	O2D-C2D	-2.20	1.37	1.43
2	B	1306	GLC	C4-C3	2.19	1.57	1.52
3	G	1319	NAD	C2D-C1D	2.19	1.57	1.53
3	E	1313	NAD	O4B-C4B	2.18	1.49	1.45
3	A	1301	NAD	C3B-C4B	2.17	1.58	1.53
3	C	1307	NAD	C2B-C1B	2.16	1.57	1.53
3	C	1307	NAD	O3D-C3D	-2.16	1.37	1.43
3	C	1307	NAD	C3B-C4B	2.15	1.58	1.53
3	E	1313	NAD	O3B-C3B	2.13	1.48	1.43
3	B	1304	NAD	O4D-C1D	2.13	1.44	1.41
3	B	1304	NAD	C5N-C4N	2.09	1.43	1.38
4	B	1305	TCL	O17-C6	2.08	1.40	1.36
3	D	1310	NAD	O2B-C2B	-2.08	1.38	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	H	1322	NAD	C3B-C4B	2.06	1.58	1.53
4	A	1302	TCL	O17-C6	2.04	1.40	1.36
3	E	1313	NAD	C2B-C1B	2.04	1.56	1.53
3	E	1313	NAD	O2D-C2D	-2.04	1.38	1.43
2	C	1309	GLC	C4-C3	2.03	1.57	1.52
3	H	1322	NAD	C3D-C4D	2.03	1.58	1.53
3	B	1304	NAD	C2D-C1D	2.02	1.56	1.53

All (172) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1301	NAD	C2N-C3N-C4N	9.76	129.33	118.26
3	H	1322	NAD	C2N-C3N-C4N	9.25	128.74	118.26
3	A	1301	NAD	C3N-C2N-N1N	-9.22	111.42	120.43
3	B	1304	NAD	C2N-C3N-C4N	9.07	128.54	118.26
3	F	1316	NAD	C3N-C2N-N1N	-8.97	111.66	120.43
3	G	1319	NAD	C2N-C3N-C4N	8.94	128.39	118.26
3	D	1310	NAD	C3N-C2N-N1N	-8.85	111.78	120.43
3	D	1310	NAD	C2N-C3N-C4N	8.73	128.15	118.26
3	C	1307	NAD	C2N-C3N-C4N	8.71	128.13	118.26
3	B	1304	NAD	C3N-C2N-N1N	-8.52	112.10	120.43
3	F	1316	NAD	C2N-C3N-C4N	8.47	127.86	118.26
3	E	1313	NAD	C2N-C3N-C4N	8.22	127.58	118.26
3	H	1322	NAD	C3N-C2N-N1N	-7.95	112.66	120.43
3	C	1307	NAD	C3N-C2N-N1N	-7.63	112.97	120.43
3	G	1319	NAD	C3N-C2N-N1N	-7.56	113.04	120.43
3	E	1313	NAD	C3N-C2N-N1N	-7.26	113.33	120.43
3	B	1304	NAD	O7N-C7N-C3N	-7.20	111.01	119.63
3	G	1319	NAD	C5N-C4N-C3N	-6.55	112.60	120.34
3	H	1322	NAD	C5N-C4N-C3N	-6.29	112.90	120.34
3	E	1313	NAD	C5N-C4N-C3N	-6.18	113.03	120.34
3	A	1301	NAD	C5N-C4N-C3N	-6.17	113.04	120.34
3	G	1319	NAD	C3N-C7N-N7N	6.12	125.09	117.75
3	C	1307	NAD	C5N-C4N-C3N	-6.05	113.18	120.34
2	D	1312	GLC	O5-C5-C6	5.89	121.07	106.44
2	F	1318	GLC	C1-O5-C5	5.86	124.72	113.66
3	B	1304	NAD	C5N-C4N-C3N	-5.79	113.49	120.34
2	H	1324	GLC	O5-C5-C4	5.67	119.98	109.69
2	H	1324	GLC	O5-C1-C2	5.55	120.18	110.28
3	A	1301	NAD	C2A-N1A-C6A	5.53	128.21	118.75
3	G	1319	NAD	C2A-N1A-C6A	5.52	128.19	118.75
2	A	1303	GLC	O5-C1-C2	5.30	119.74	110.28

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1301	NAD	C3N-C7N-N7N	5.26	124.06	117.75
3	E	1313	NAD	C2A-N1A-C6A	5.25	127.73	118.75
3	F	1316	NAD	C5N-C4N-C3N	-5.24	114.14	120.34
3	A	1301	NAD	O7N-C7N-C3N	-5.24	113.36	119.63
2	A	1303	GLC	O3-C3-C2	5.16	122.27	110.35
2	G	1321	GLC	O5-C1-C2	5.15	119.47	110.28
3	E	1313	NAD	C5D-C4D-C3D	-4.93	96.72	115.18
3	D	1310	NAD	C2A-N1A-C6A	4.91	127.16	118.75
3	D	1310	NAD	C5N-C4N-C3N	-4.91	114.53	120.34
2	E	1315	GLC	C1-O5-C5	4.84	122.80	113.66
3	D	1310	NAD	C5A-C6A-N6A	4.72	127.53	120.35
3	F	1316	NAD	C2A-N1A-C6A	4.67	126.74	118.75
3	H	1322	NAD	O7N-C7N-C3N	-4.61	114.11	119.63
3	E	1313	NAD	N3A-C2A-N1A	-4.60	121.48	128.68
3	B	1304	NAD	C2A-N1A-C6A	4.51	126.47	118.75
3	F	1316	NAD	C5A-C6A-N6A	4.46	127.13	120.35
3	A	1301	NAD	N3A-C2A-N1A	-4.40	121.80	128.68
2	E	1315	GLC	O5-C5-C4	4.34	117.57	109.69
2	C	1309	GLC	C1-O5-C5	4.33	121.83	113.66
2	G	1321	GLC	O1-C1-C2	4.27	121.05	109.03
2	G	1321	GLC	O3-C3-C2	4.24	120.16	110.35
2	H	1324	GLC	O4-C4-C3	4.22	120.10	110.35
2	A	1303	GLC	O2-C2-C1	4.16	118.81	109.16
3	E	1313	NAD	O4D-C4D-C5D	-4.16	95.69	109.37
3	H	1322	NAD	C2A-N1A-C6A	4.09	125.75	118.75
2	B	1306	GLC	O5-C5-C4	4.05	117.04	109.69
3	F	1316	NAD	N3A-C2A-N1A	-3.98	122.45	128.68
3	D	1310	NAD	N3A-C2A-N1A	-3.97	122.47	128.68
3	B	1304	NAD	N3A-C2A-N1A	-3.94	122.53	128.68
3	G	1319	NAD	C5A-C6A-N1A	-3.92	111.46	120.35
3	G	1319	NAD	O7N-C7N-C3N	-3.91	114.96	119.63
3	C	1307	NAD	C2A-N1A-C6A	3.87	125.38	118.75
2	F	1318	GLC	O5-C5-C4	3.87	116.72	109.69
2	C	1309	GLC	O5-C5-C4	3.86	116.70	109.69
3	C	1307	NAD	C5A-C6A-N6A	3.84	126.18	120.35
3	A	1301	NAD	C5A-C6A-N6A	3.81	126.15	120.35
2	G	1321	GLC	O5-C5-C6	3.76	115.80	106.44
3	E	1313	NAD	C5A-C6A-N1A	-3.76	111.83	120.35
3	G	1319	NAD	N3A-C2A-N1A	-3.75	122.81	128.68
3	A	1301	NAD	C5A-C6A-N1A	-3.68	112.00	120.35
3	E	1313	NAD	O3D-C3D-C2D	3.67	123.68	111.82
3	D	1310	NAD	C5A-C6A-N1A	-3.65	112.07	120.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	F	1316	NAD	C5A-C6A-N1A	-3.62	112.15	120.35
3	E	1313	NAD	C5A-C6A-N6A	3.59	125.81	120.35
2	B	1306	GLC	C1-O5-C5	3.58	120.41	113.66
3	D	1310	NAD	C3B-C2B-C1B	-3.57	95.60	100.98
2	D	1312	GLC	O5-C1-C2	3.56	116.63	110.28
3	B	1304	NAD	C3N-C7N-N7N	3.54	122.00	117.75
2	G	1321	GLC	C3-C4-C5	-3.52	103.96	110.24
3	H	1322	NAD	C5A-C6A-N1A	-3.47	112.49	120.35
3	C	1307	NAD	C3N-C7N-N7N	3.45	121.89	117.75
3	B	1304	NAD	C5A-C6A-N1A	-3.44	112.56	120.35
3	H	1322	NAD	N3A-C2A-N1A	-3.39	123.38	128.68
2	H	1324	GLC	O1-C1-O5	3.39	120.55	110.38
3	D	1310	NAD	C2B-C3B-C4B	3.38	109.21	102.64
2	A	1303	GLC	O5-C5-C6	3.37	114.82	106.44
2	A	1303	GLC	O4-C4-C5	-3.35	100.98	109.30
3	C	1307	NAD	C5A-C6A-N1A	-3.34	112.79	120.35
3	B	1304	NAD	C5A-C6A-N6A	3.32	125.40	120.35
3	F	1316	NAD	C6N-N1N-C2N	3.30	124.98	121.97
3	H	1322	NAD	C5A-C6A-N6A	3.30	125.36	120.35
3	E	1313	NAD	C3N-C7N-N7N	3.26	121.66	117.75
3	G	1319	NAD	C5A-C6A-N6A	3.23	125.26	120.35
3	B	1304	NAD	C6N-N1N-C2N	3.21	124.91	121.97
3	C	1307	NAD	N3A-C2A-N1A	-3.19	123.69	128.68
3	C	1307	NAD	O7N-C7N-C3N	-3.19	115.82	119.63
2	A	1303	GLC	O2-C2-C3	3.17	117.69	110.35
3	D	1310	NAD	C6N-N1N-C2N	3.17	124.87	121.97
2	H	1324	GLC	C1-O5-C5	3.16	119.63	113.66
2	F	1318	GLC	O5-C1-C2	3.15	115.91	110.28
2	H	1324	GLC	O1-C1-C2	3.11	117.78	109.03
3	B	1304	NAD	O7N-C7N-N7N	3.08	126.95	122.58
3	G	1319	NAD	C6N-N1N-C2N	3.06	124.77	121.97
2	G	1321	GLC	O4-C4-C5	-3.06	101.71	109.30
2	A	1303	GLC	C3-C4-C5	-3.00	104.89	110.24
3	E	1313	NAD	C6N-N1N-C2N	2.98	124.70	121.97
3	A	1301	NAD	C2B-C3B-C4B	2.96	108.39	102.64
3	H	1322	NAD	C3N-C7N-N7N	2.95	121.29	117.75
2	G	1321	GLC	O2-C2-C1	2.91	115.90	109.16
3	D	1310	NAD	C3N-C7N-N7N	2.87	121.19	117.75
3	A	1301	NAD	C6N-N1N-C2N	2.87	124.59	121.97
4	C	1308	TCL	C1-C6-C5	2.85	122.73	119.81
3	E	1313	NAD	C2B-C3B-C4B	2.84	108.16	102.64
3	H	1322	NAD	C3B-C2B-C1B	-2.79	96.78	100.98

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1303	GLC	C1-C2-C3	2.75	116.01	110.31
2	D	1312	GLC	C3-C4-C5	-2.73	105.37	110.24
3	C	1307	NAD	C2B-C3B-C4B	2.72	107.92	102.64
3	H	1322	NAD	C2D-C3D-C4D	2.65	107.79	102.64
2	A	1303	GLC	O1-C1-C2	2.65	116.49	109.03
2	F	1318	GLC	O3-C3-C4	2.65	116.47	110.35
3	F	1316	NAD	C3D-C2D-C1D	-2.64	97.00	100.98
3	B	1304	NAD	C3D-C2D-C1D	-2.64	97.01	100.98
4	C	1308	TCL	C6-C1-C2	-2.56	115.91	118.98
2	E	1315	GLC	O5-C1-C2	2.56	114.85	110.28
3	H	1322	NAD	C2B-C3B-C4B	2.55	107.60	102.64
4	A	1302	TCL	C13-C12-C11	-2.54	116.56	119.24
3	B	1304	NAD	C2D-C3D-C4D	2.46	107.42	102.64
3	E	1313	NAD	C3B-C2B-C1B	-2.44	97.30	100.98
4	E	1314	TCL	C8-O7-C5	2.44	123.84	118.04
4	H	1323	TCL	O7-C5-C4	2.40	127.13	120.73
3	F	1316	NAD	C2B-C3B-C4B	2.38	107.26	102.64
2	D	1312	GLC	C4-C3-C2	-2.37	106.69	110.82
4	A	1302	TCL	C4-C3-C2	-2.36	116.75	119.24
4	D	1311	TCL	O7-C5-C6	2.36	120.62	116.22
3	C	1307	NAD	O2N-PN-O1N	2.34	123.82	112.24
3	C	1307	NAD	C2D-C3D-C4D	2.34	107.19	102.64
3	E	1313	NAD	C2D-C3D-C4D	-2.33	98.12	102.64
2	C	1309	GLC	O5-C1-C2	2.33	114.43	110.28
3	C	1307	NAD	C6N-N1N-C2N	2.30	124.07	121.97
3	H	1322	NAD	O2A-PA-O1A	2.29	123.55	112.24
3	F	1316	NAD	O7N-C7N-C3N	-2.28	116.90	119.63
3	D	1310	NAD	C2D-C3D-C4D	2.27	107.06	102.64
2	H	1324	GLC	C6-C5-C4	-2.27	107.68	113.00
3	G	1319	NAD	N6A-C6A-N1A	2.24	123.23	118.57
3	F	1316	NAD	O3B-C3B-C4B	-2.23	104.60	111.05
2	F	1318	GLC	O4-C4-C3	2.19	115.42	110.35
3	A	1301	NAD	C3B-C2B-C1B	-2.18	97.69	100.98
3	H	1322	NAD	C6N-N1N-C2N	2.18	123.97	121.97
3	H	1322	NAD	O4D-C4D-C3D	-2.17	100.81	105.11
3	B	1304	NAD	O2B-C2B-C3B	2.16	118.81	111.82
3	F	1316	NAD	O4D-C4D-C5D	-2.15	102.31	109.37
3	F	1316	NAD	C2D-C3D-C4D	2.15	106.81	102.64
3	E	1313	NAD	O2N-PN-O1N	2.14	122.81	112.24
4	D	1311	TCL	C4-C5-C6	-2.12	117.21	119.86
3	F	1316	NAD	O2N-PN-O1N	2.10	122.60	112.24
3	F	1316	NAD	C3N-C7N-N7N	2.09	120.26	117.75

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	1310	NAD	O4B-C4B-C3B	-2.08	100.99	105.11
3	G	1319	NAD	O7N-C7N-N7N	-2.08	119.62	122.58
2	F	1318	GLC	C6-C5-C4	-2.08	108.13	113.00
4	G	1320	TCL	C1-C6-C5	2.08	121.94	119.81
4	H	1323	TCL	C1-C6-C5	2.06	121.92	119.81
3	H	1322	NAD	O4D-C4D-C5D	-2.06	102.58	109.37
3	G	1319	NAD	C3B-C2B-C1B	-2.06	97.87	100.98
2	E	1315	GLC	O4-C4-C3	2.05	115.09	110.35
4	F	1317	TCL	C1-C6-C5	2.03	121.89	119.81
3	C	1307	NAD	O3D-C3D-C4D	-2.03	105.17	111.05
4	B	1305	TCL	C13-C12-C11	-2.02	117.11	119.24
4	A	1302	TCL	C8-O7-C5	2.02	122.85	118.04
3	F	1316	NAD	O2A-PA-O1A	2.02	122.23	112.24
3	G	1319	NAD	C4N-C3N-C7N	-2.01	115.66	121.04
3	E	1313	NAD	C6N-C5N-C4N	2.00	122.35	119.44

All (8) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	A	1303	GLC	C2
2	B	1306	GLC	C1
2	C	1309	GLC	C1
2	D	1312	GLC	C2
2	E	1315	GLC	C1
2	F	1318	GLC	C1
2	G	1321	GLC	C2
2	H	1324	GLC	C1

All (59) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1301	NAD	C5D-O5D-PN-O1N
3	A	1301	NAD	C5D-O5D-PN-O2N
3	A	1301	NAD	O4D-C1D-N1N-C2N
3	B	1304	NAD	C5D-O5D-PN-O3
3	B	1304	NAD	C5D-O5D-PN-O2N
3	B	1304	NAD	O4D-C1D-N1N-C2N
3	B	1304	NAD	O4D-C1D-N1N-C6N
3	C	1307	NAD	C5D-O5D-PN-O1N
3	C	1307	NAD	C5D-O5D-PN-O2N
3	C	1307	NAD	O4D-C1D-N1N-C2N
3	C	1307	NAD	O4D-C1D-N1N-C6N

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Mol	Chain	Res	Type	Atoms
3	D	1310	NAD	C5D-O5D-PN-O1N
3	D	1310	NAD	C5D-O5D-PN-O2N
3	D	1310	NAD	O4D-C1D-N1N-C2N
3	D	1310	NAD	O4D-C1D-N1N-C6N
3	E	1313	NAD	C5D-O5D-PN-O1N
3	E	1313	NAD	O4D-C4D-C5D-O5D
3	E	1313	NAD	C3D-C4D-C5D-O5D
3	E	1313	NAD	O4D-C1D-N1N-C2N
3	E	1313	NAD	O4D-C1D-N1N-C6N
3	F	1316	NAD	C5D-O5D-PN-O3
3	F	1316	NAD	C5D-O5D-PN-O1N
3	F	1316	NAD	C5D-O5D-PN-O2N
3	F	1316	NAD	O4D-C1D-N1N-C2N
3	G	1319	NAD	C5D-O5D-PN-O1N
3	G	1319	NAD	C5D-O5D-PN-O2N
3	G	1319	NAD	O4D-C1D-N1N-C2N
3	H	1322	NAD	C5D-O5D-PN-O1N
3	H	1322	NAD	C5D-O5D-PN-O2N
3	H	1322	NAD	O4D-C1D-N1N-C2N
3	H	1322	NAD	O4D-C1D-N1N-C6N
2	H	1324	GLC	O5-C5-C6-O6
2	D	1312	GLC	C4-C5-C6-O6
2	C	1309	GLC	C4-C5-C6-O6
2	B	1306	GLC	C4-C5-C6-O6
2	E	1315	GLC	C4-C5-C6-O6
3	H	1322	NAD	PA-O3-PN-O1N
2	H	1324	GLC	C4-C5-C6-O6
3	A	1301	NAD	C5D-O5D-PN-O3
3	E	1313	NAD	C5D-O5D-PN-O3
3	G	1319	NAD	C5D-O5D-PN-O3
3	B	1304	NAD	C5D-O5D-PN-O1N
3	E	1313	NAD	C5D-O5D-PN-O2N
3	H	1322	NAD	O4B-C4B-C5B-O5B
3	F	1316	NAD	PA-O3-PN-O2N
3	H	1322	NAD	PA-O3-PN-O2N
3	A	1301	NAD	PN-O3-PA-O5B
3	C	1307	NAD	C5D-O5D-PN-O3
3	D	1310	NAD	C5D-O5D-PN-O3
3	H	1322	NAD	C5D-O5D-PN-O3
3	A	1301	NAD	O4B-C4B-C5B-O5B
3	B	1304	NAD	O4B-C4B-C5B-O5B
3	D	1310	NAD	O4B-C4B-C5B-O5B

*Continued on next page...*

*Continued from previous page...*

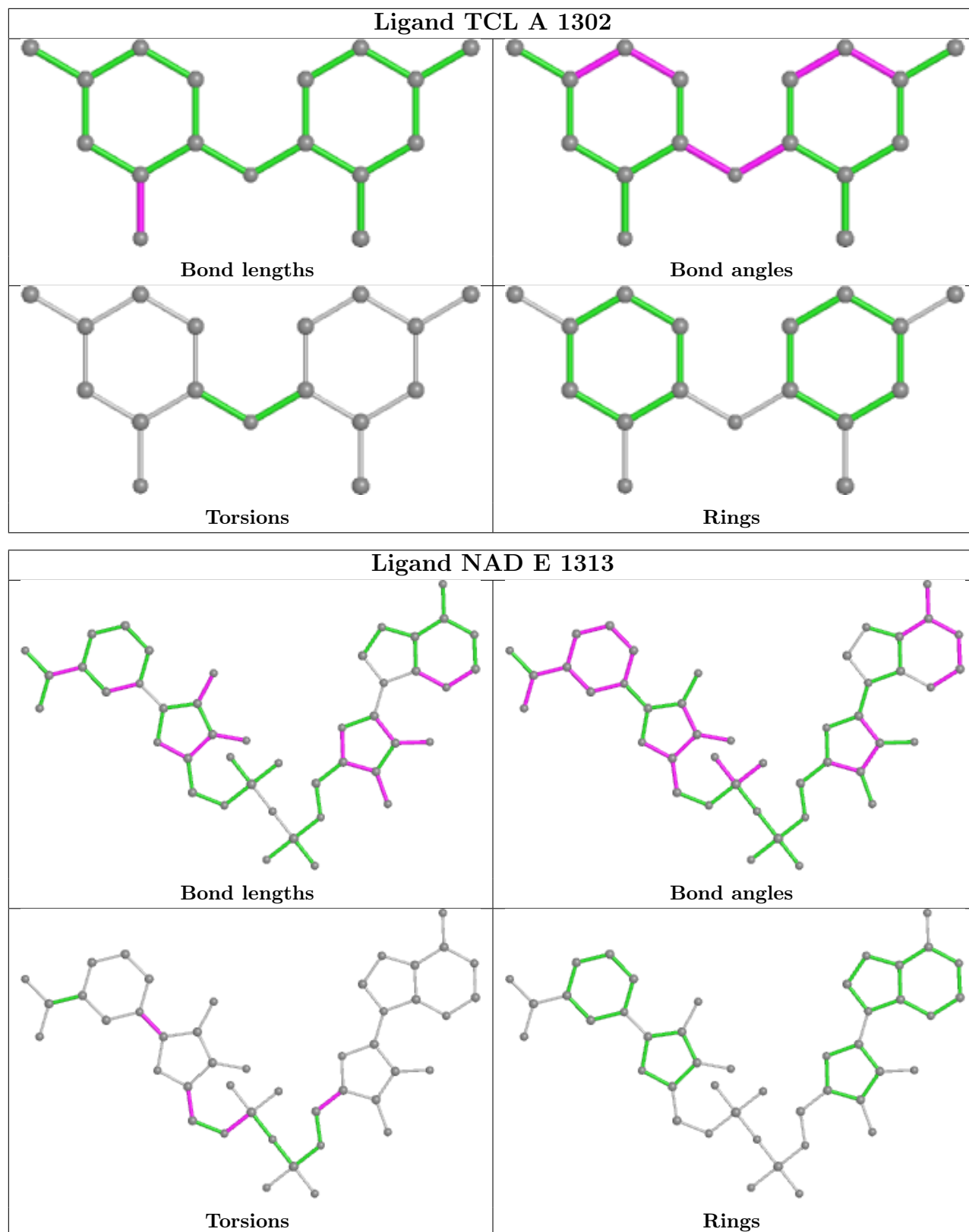
Mol	Chain	Res	Type	Atoms
3	E	1313	NAD	O4B-C4B-C5B-O5B
3	F	1316	NAD	O4B-C4B-C5B-O5B
2	C	1309	GLC	O5-C5-C6-O6
3	C	1307	NAD	O4B-C4B-C5B-O5B
3	G	1319	NAD	O4B-C4B-C5B-O5B
2	B	1306	GLC	O5-C5-C6-O6

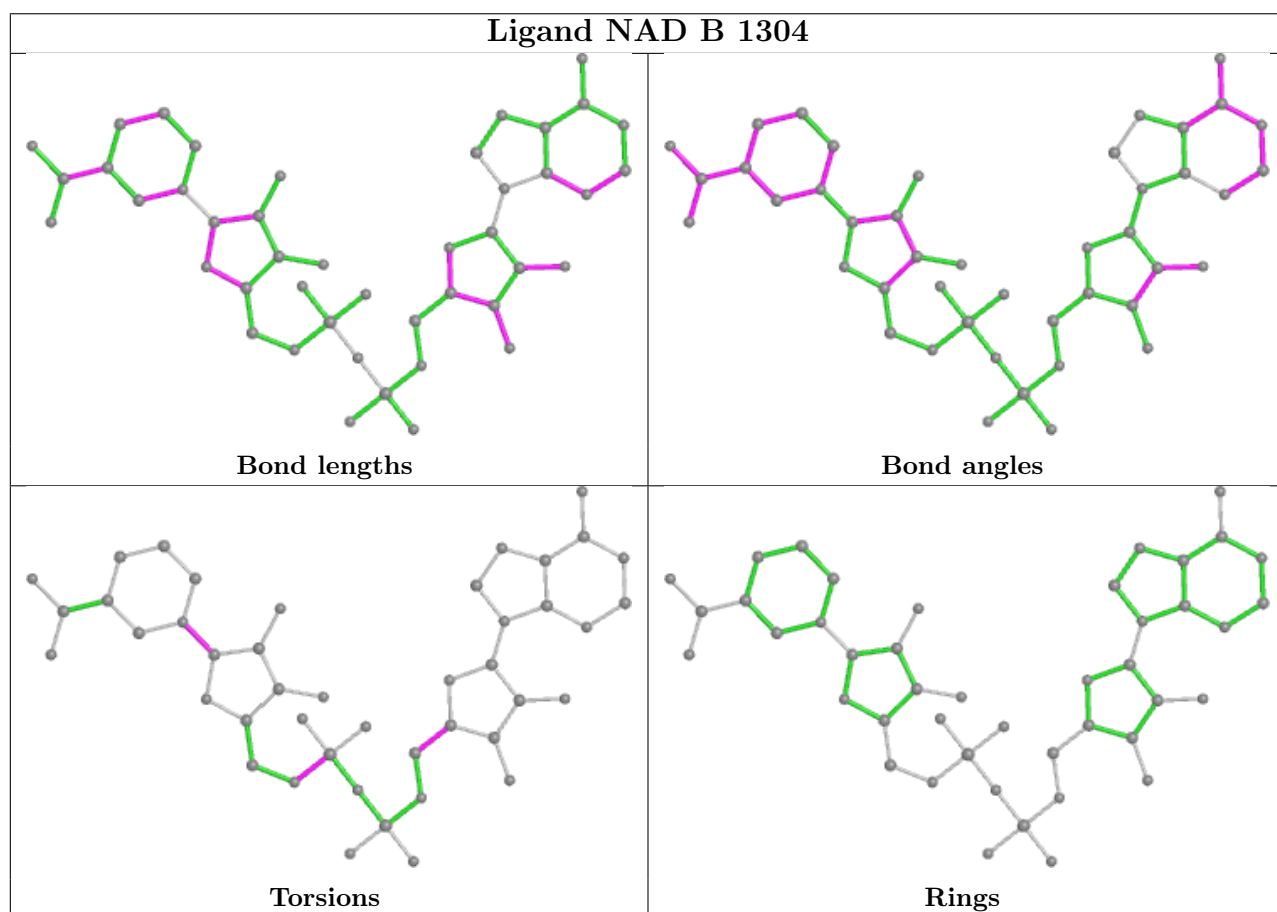
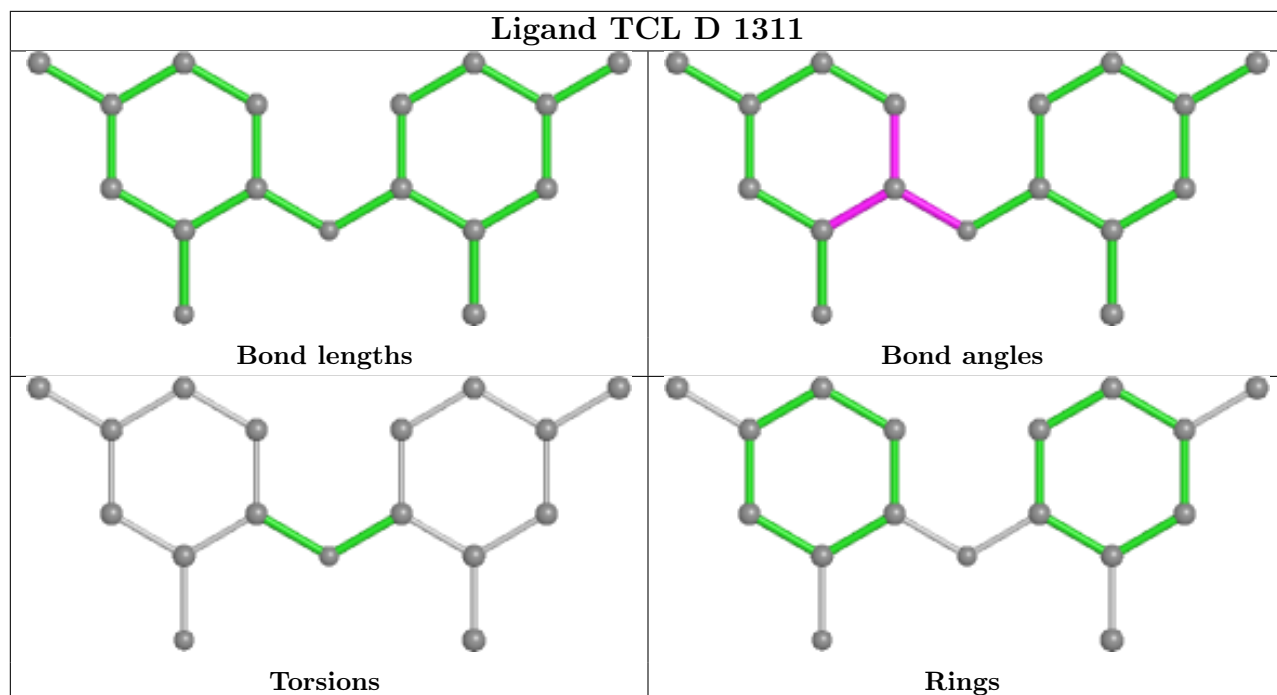
There are no ring outliers.

3 monomers are involved in 3 short contacts:

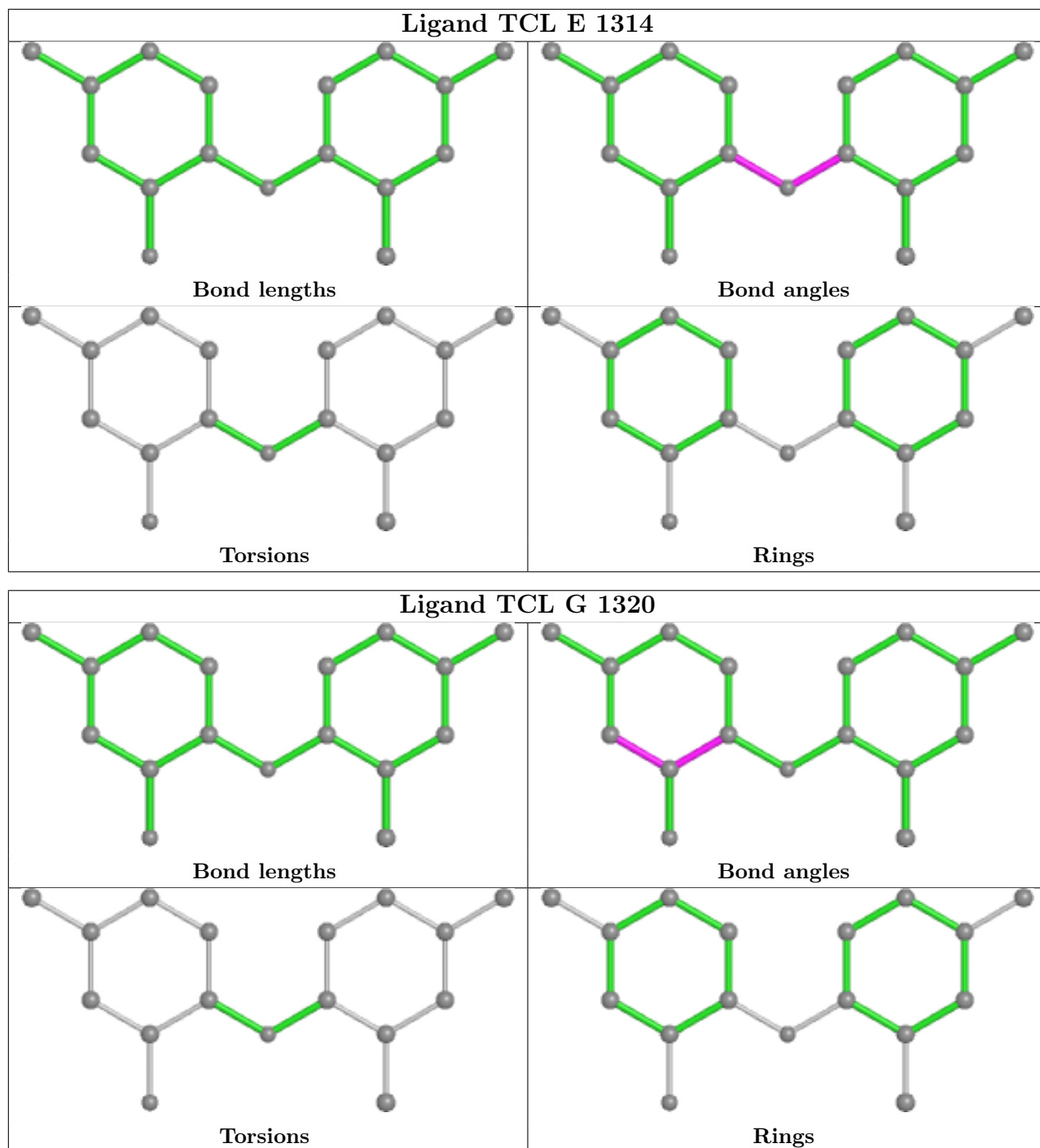
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	1313	NAD	2	0
4	E	1314	TCL	1	0
2	D	1312	GLC	1	0

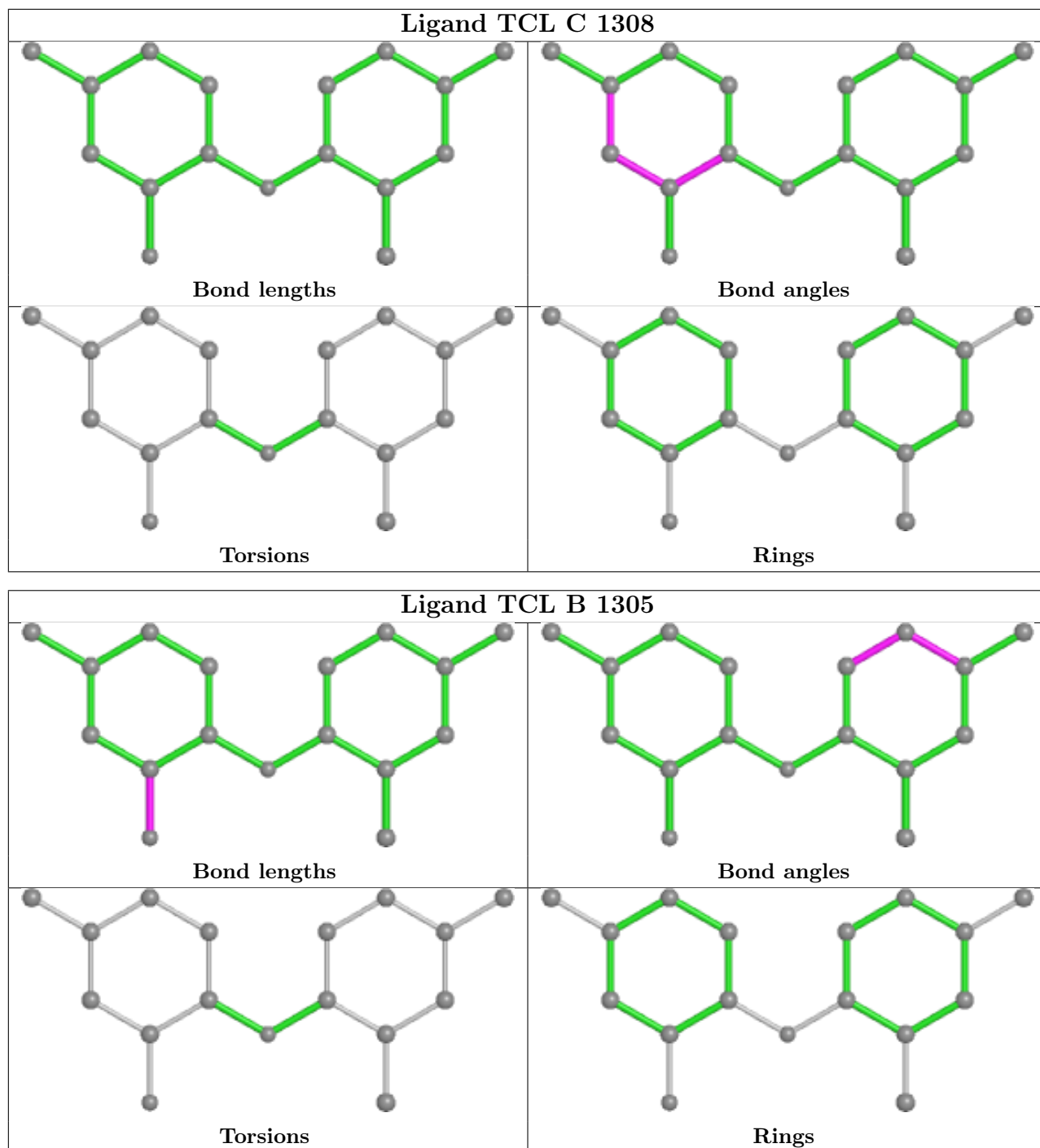
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

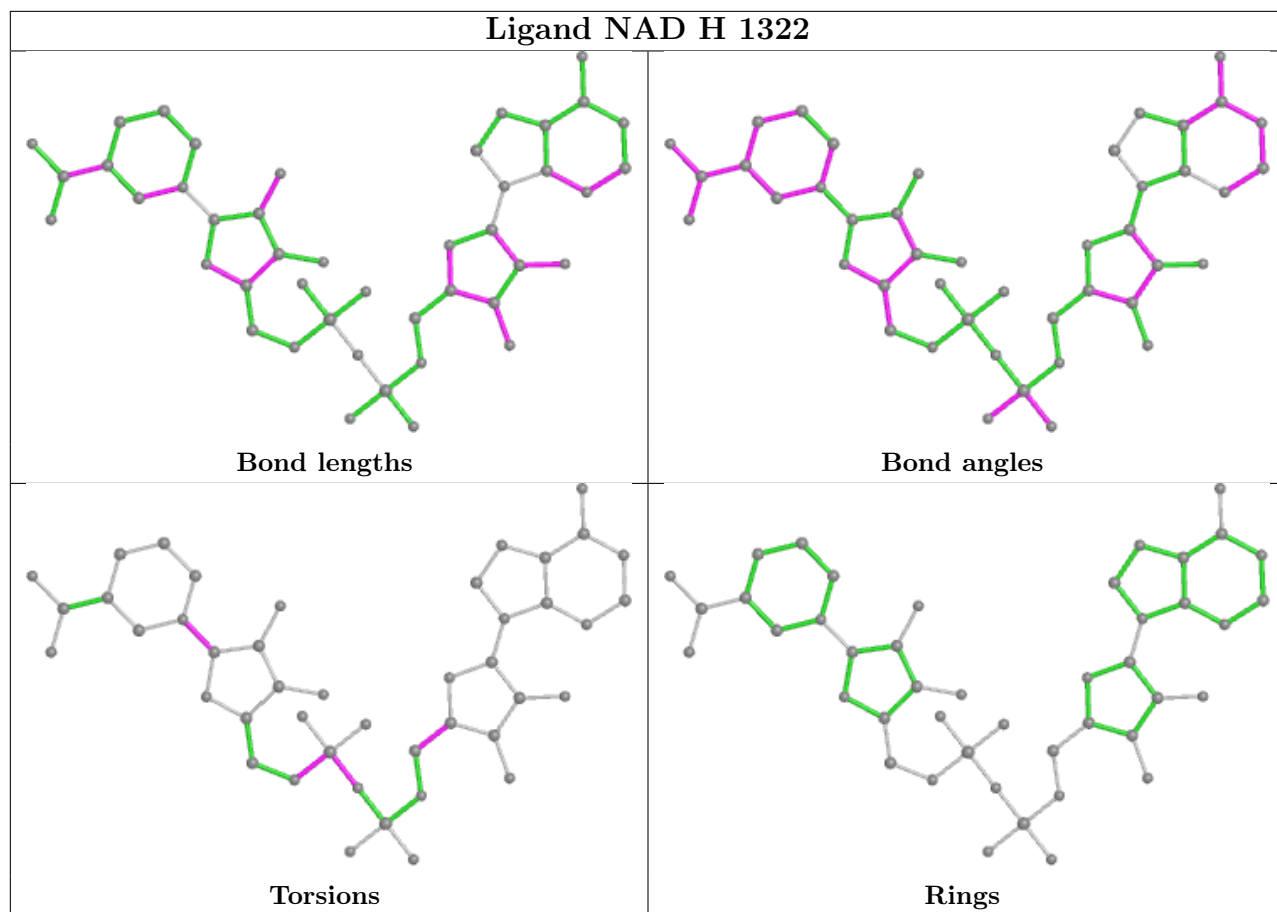


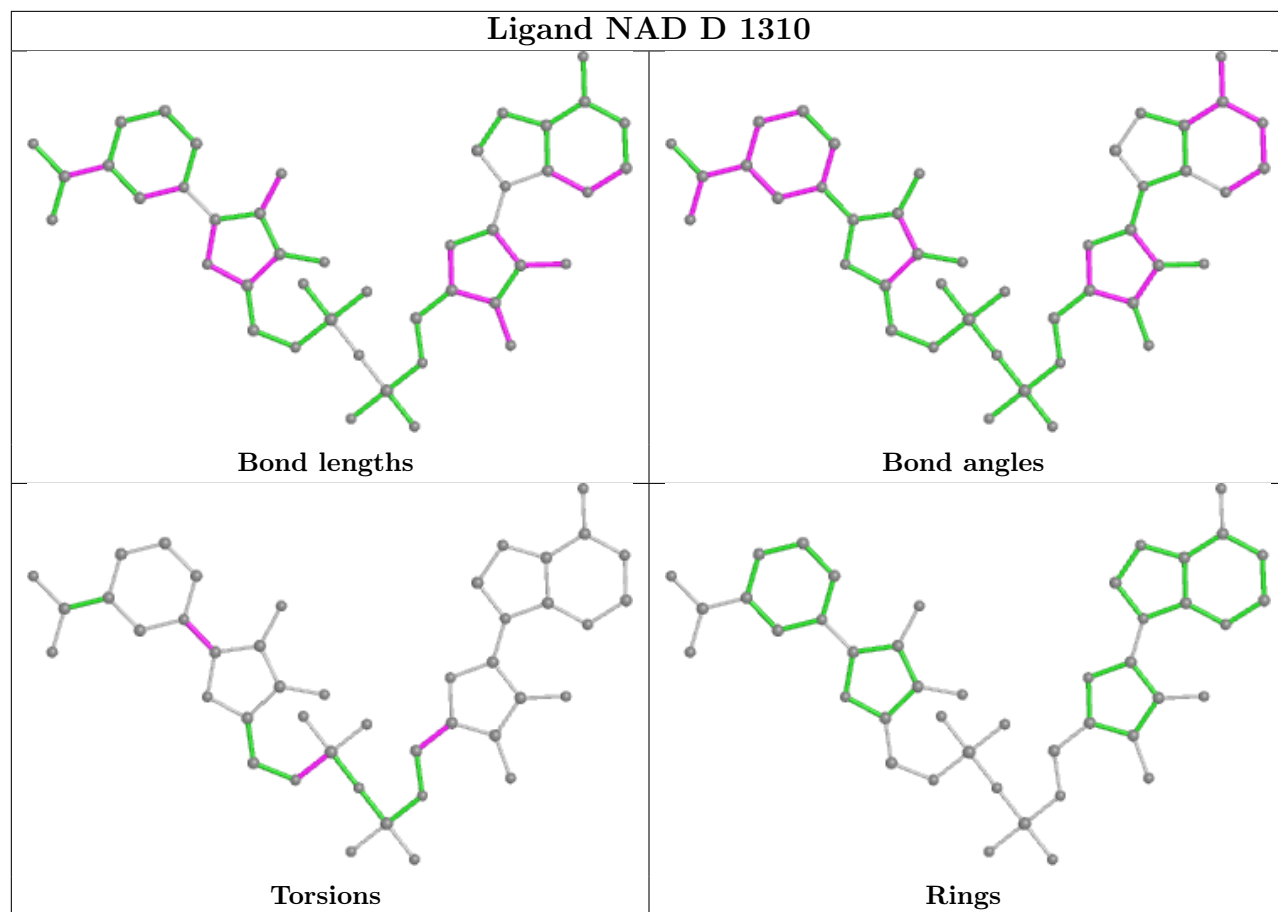


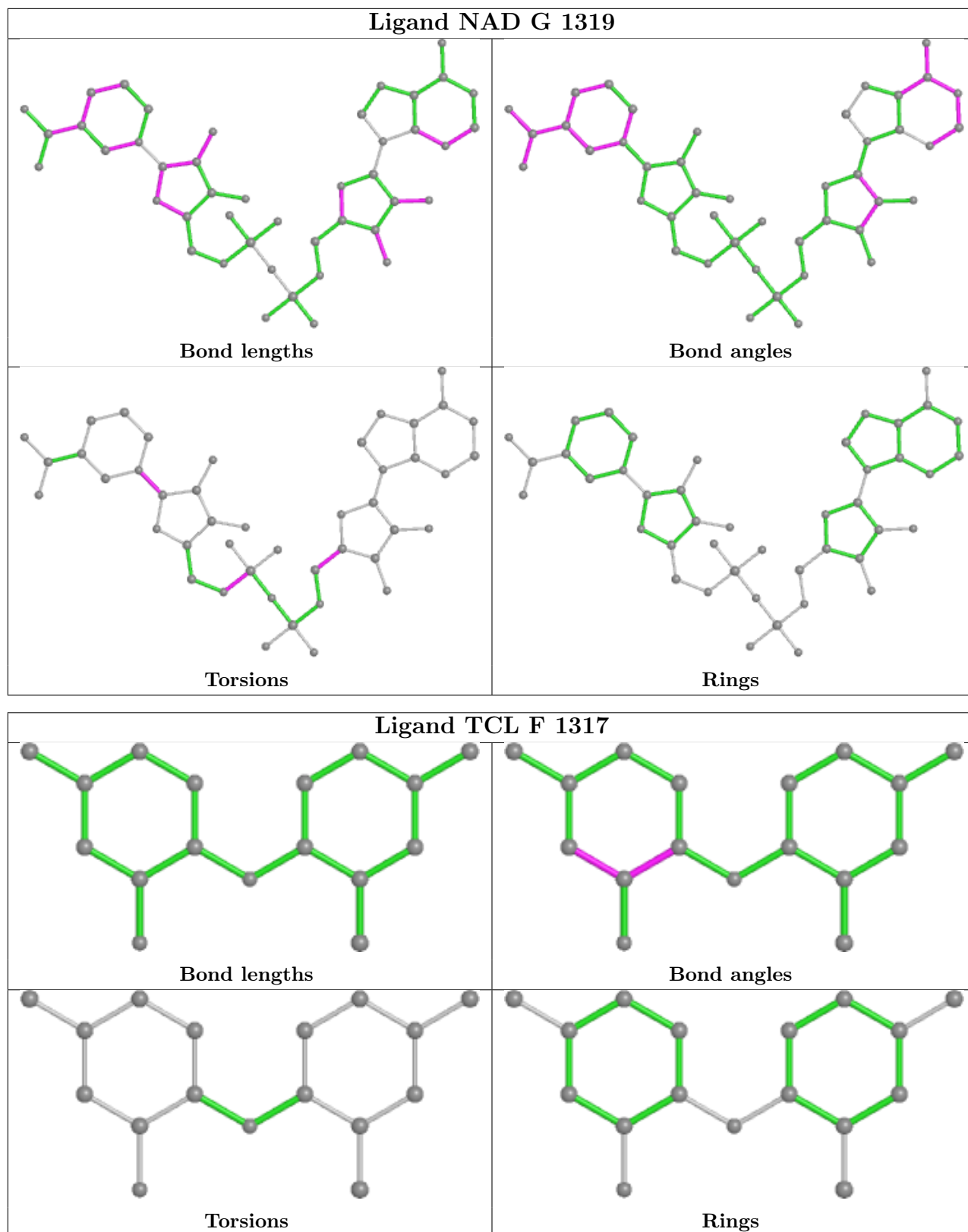


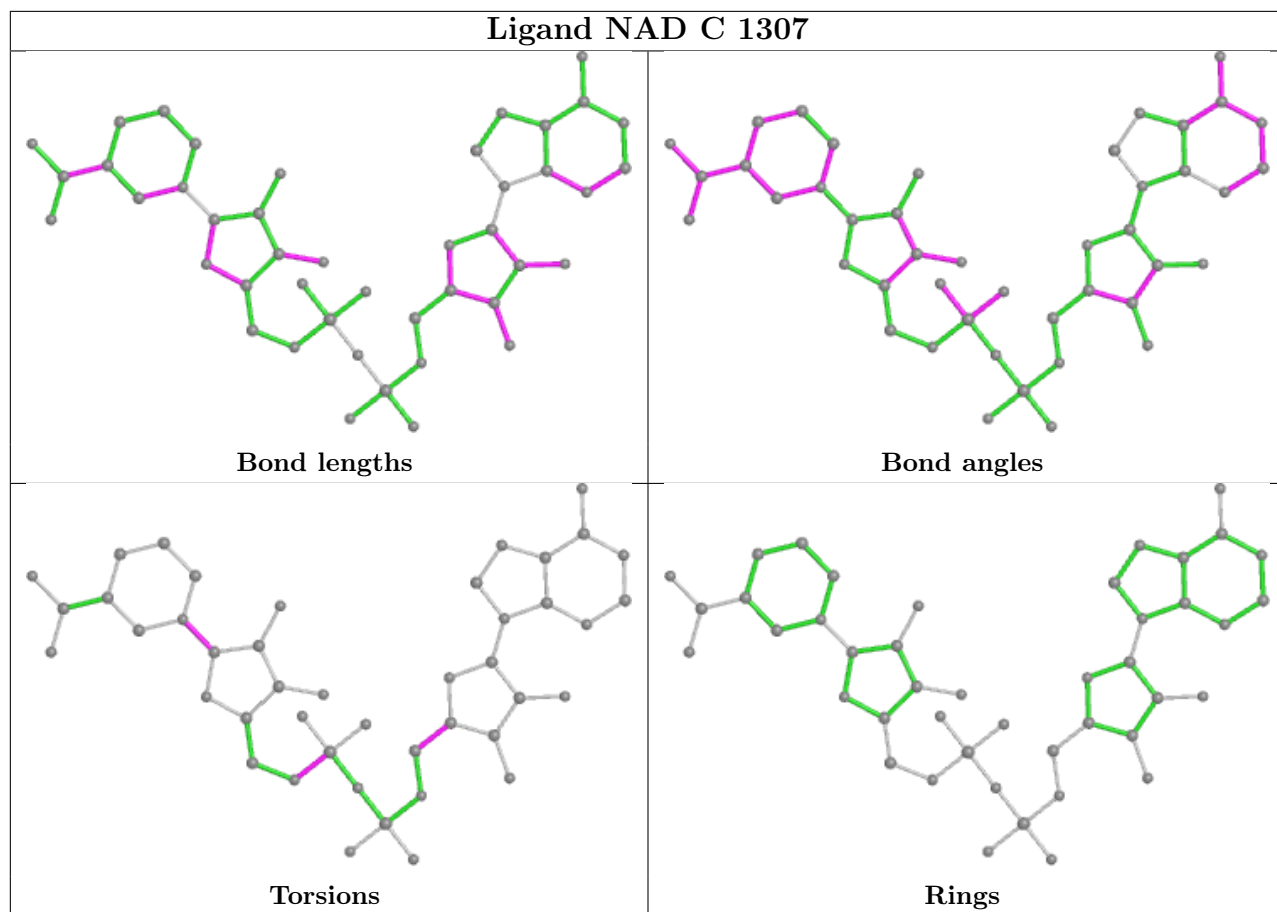


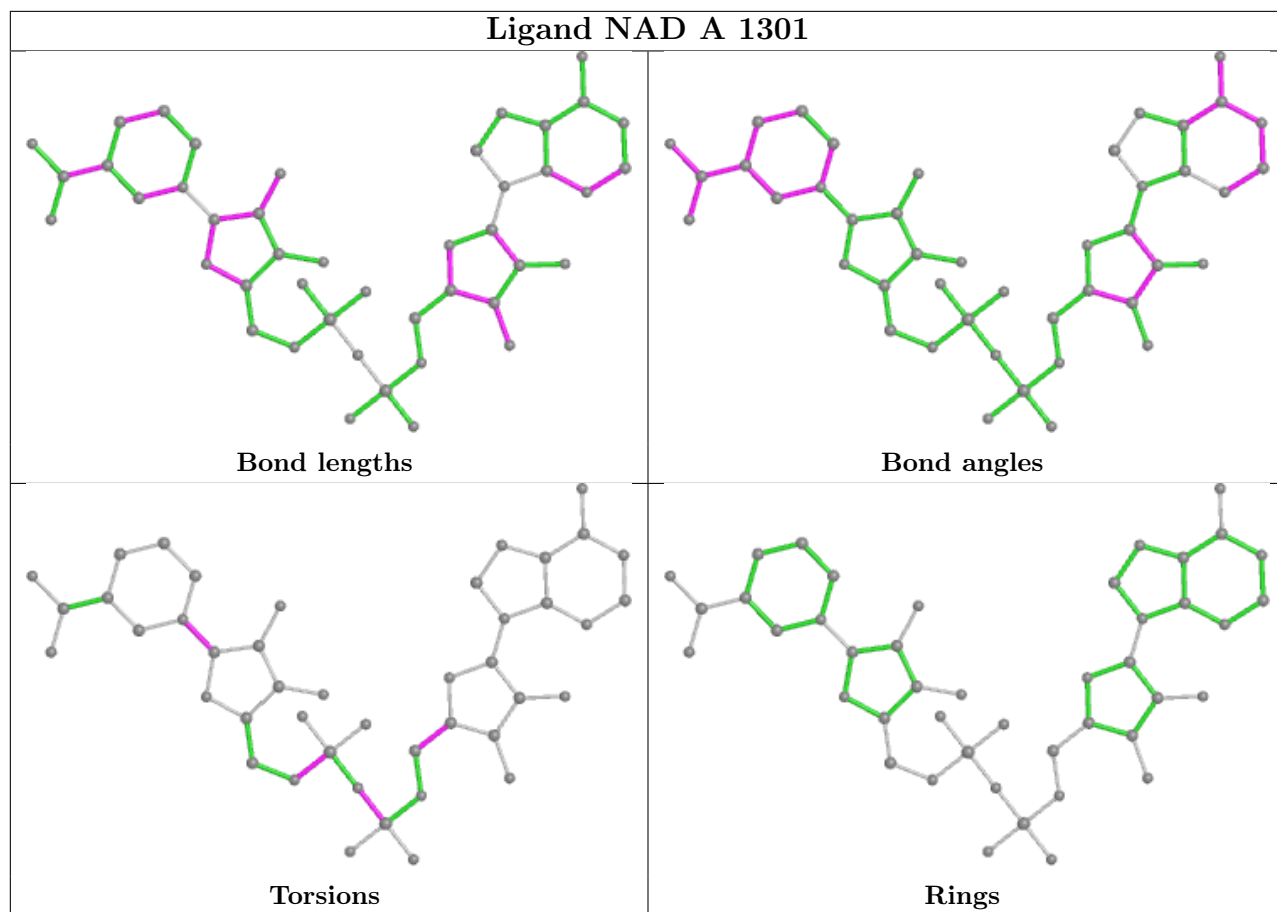


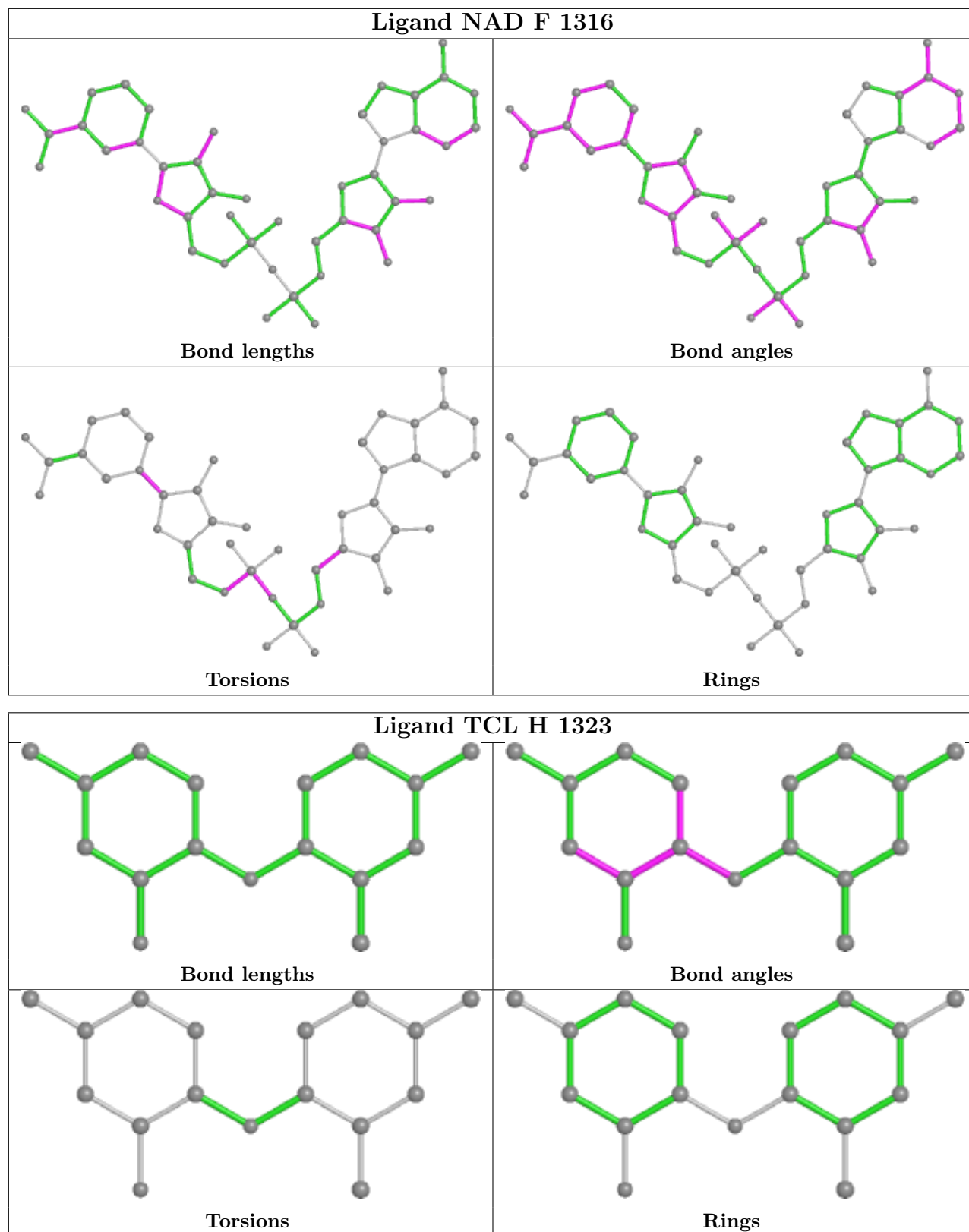












## 5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.



## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

### 6.2 Non-standard residues in protein, DNA, RNA chains

EDS was not executed - this section is therefore empty.

### 6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

### 6.4 Ligands

EDS was not executed - this section is therefore empty.

### 6.5 Other polymers

EDS was not executed - this section is therefore empty.