



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 9, 2026 – 12:24 PM UTC

PDB ID : 2X3T / pdb_00002x3t
Title : Glutaraldehyde-crosslinked wheat germ agglutinin isolectin 1 crystal soaked with a synthetic glycopeptide
Authors : Schwefel, D.; Maierhofer, C.; Wittmann, V.; Diederichs, K.; Welte, W.
Deposited on : 2010-01-26
Resolution : 2.75 Å(reported)

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

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

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

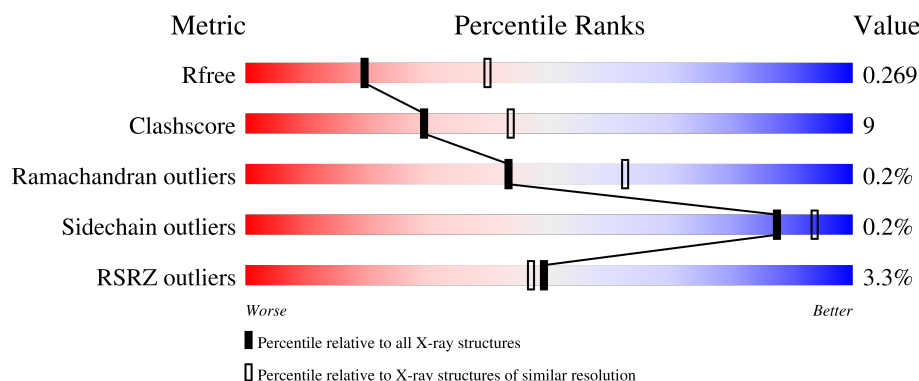
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

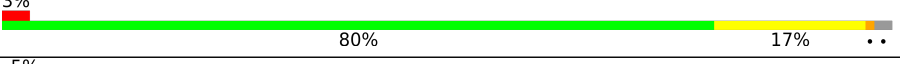
The reported resolution of this entry is 2.75 Å.

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))
R_{free}	180053	1819 (2.76-2.72)
Clashscore	190562	1866 (2.76-2.72)
Ramachandran outliers	187476	1830 (2.76-2.72)
Sidechain outliers	187428	1831 (2.76-2.72)
RSRZ outliers	180081	1819 (2.76-2.72)

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 ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	171	
1	B	171	
1	C	171	
1	D	171	
2	E	9	

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Mol	Chain	Length	Quality of chain
2	M	9	

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:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	DBB	A	1173	-	-	-	X

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 4820 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.

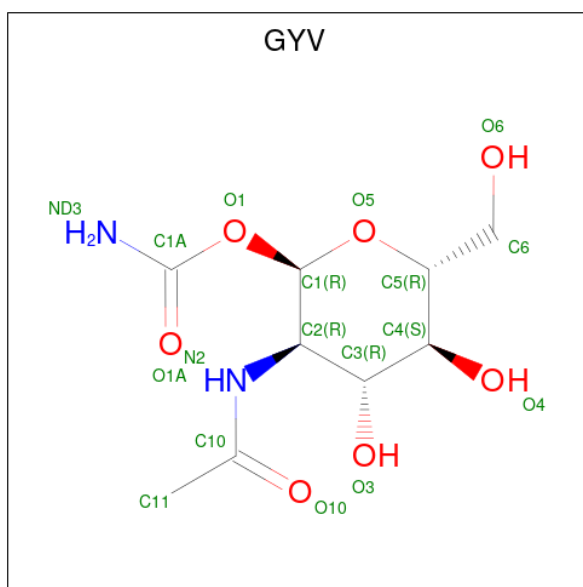
- Molecule 1 is a protein called AGGLUTININ ISOLECTIN 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	170	Total	C	N	O	S	0	0	0
			1145	668	209	234	34			
1	B	167	Total	C	N	O	S	0	0	0
			1117	653	202	228	34			
1	C	166	Total	C	N	O	S	0	0	0
			1122	653	204	231	34			
1	D	171	Total	C	N	O	S	0	0	0
			1137	664	205	234	34			

- Molecule 2 is a protein called GLYCOPEPTIDE.

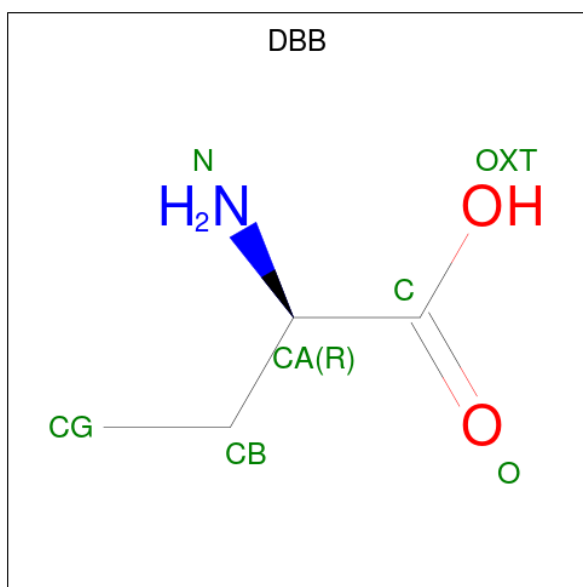
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	E	2	Total	C	N	O	0	0	0
			12	8	2	2			
2	M	2	Total	C	N	O	0	0	0
			12	8	2	2			

- Molecule 3 is 2-acetamido-1-O-carbamoyl-2-deoxy-alpha-D-glucopyranose (CCD ID: GYV) (formula: C₉H₁₆N₂O₇).



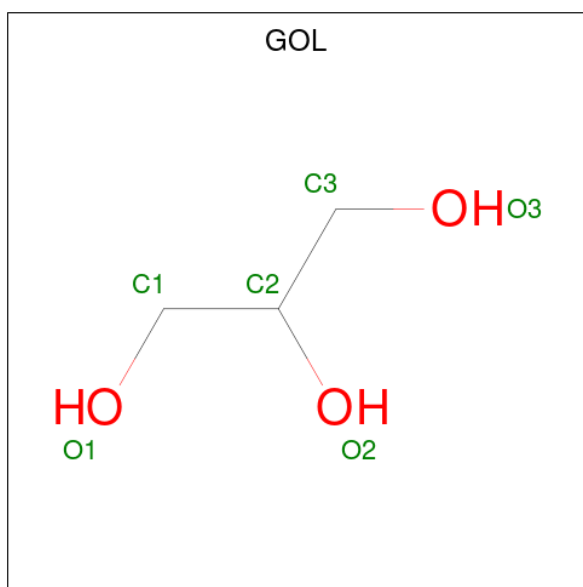
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			18	9	2	7		
3	A	1	Total	C	N	O	0	0
			18	9	2	7		
3	B	1	Total	C	N	O	0	0
			18	9	2	7		
3	B	1	Total	C	N	O	0	0
			18	9	2	7		
3	C	1	Total	C	N	O	0	0
			18	9	2	7		
3	D	1	Total	C	N	O	0	0
			18	9	2	7		
3	D	1	Total	C	N	O	0	0
			18	9	2	7		
3	E	1	Total	C	N	O	0	0
			18	9	2	7		
3	E	1	Total	C	N	O	0	0
			18	9	2	7		
3	M	1	Total	C	N	O	0	0
			18	9	2	7		
3	M	1	Total	C	N	O	0	0
			18	9	2	7		

- Molecule 4 is D-ALPHA-AMINOBUTYRIC ACID (CCD ID: DBB) (formula: $C_4H_9NO_2$).



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

- Molecule 5 is GLYCEROL (CCD ID: GOL) (formula: C₃H₈O₃).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			6	3	3		
5	B	1	Total	C	O	0	0
			6	3	3		
5	D	1	Total	C	O	0	0
			6	3	3		

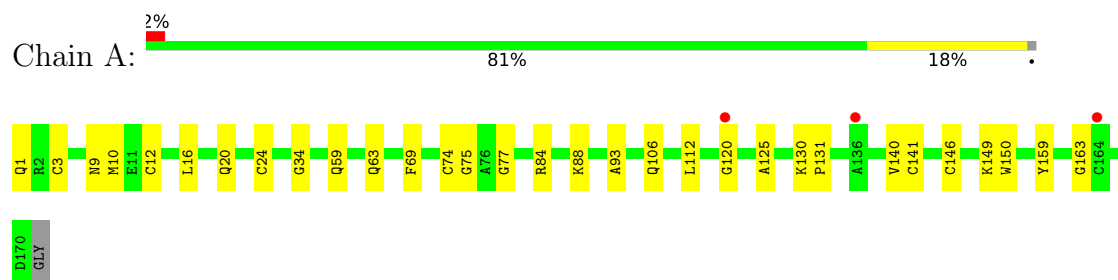
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	11	Total	O	0	0
			11	11		
6	B	9	Total	O	0	0
			9	9		
6	C	12	Total	O	0	0
			12	12		
6	D	6	Total	O	0	0
			6	6		

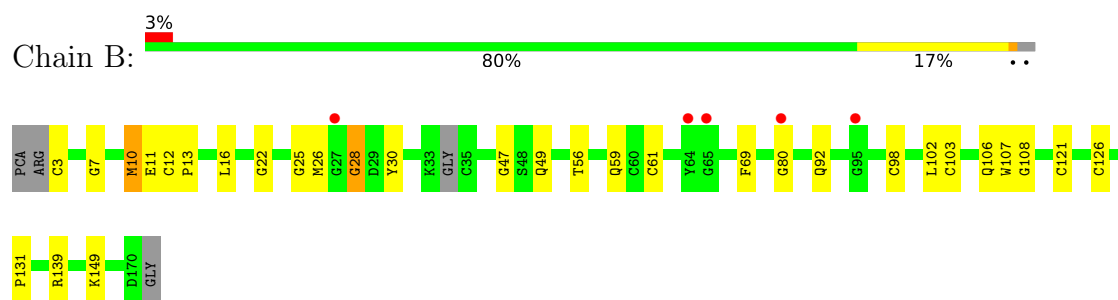
3 Residue-property plots [i](#)

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

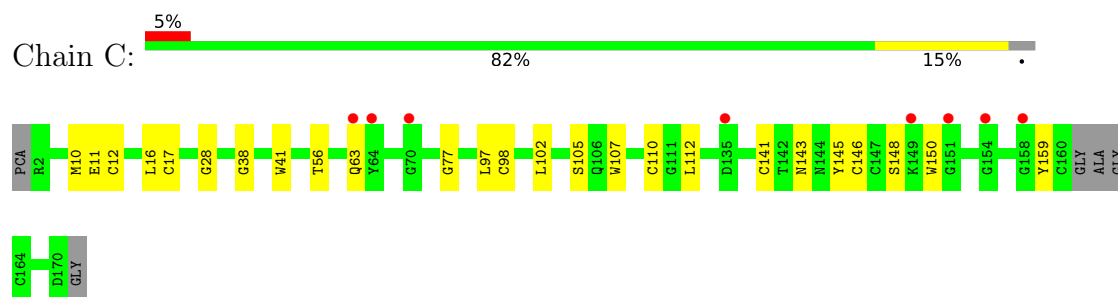
- Molecule 1: AGGLUTININ ISOLECTIN 1



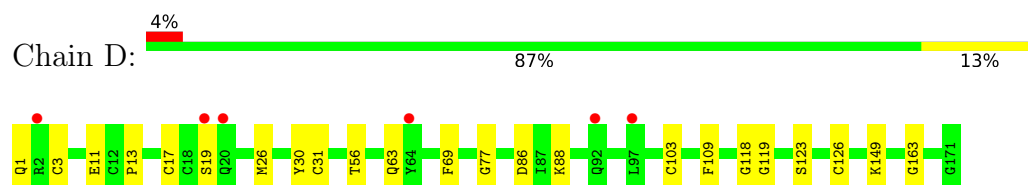
- Molecule 1: AGGLUTININ ISOLECTIN 1



- Molecule 1: AGGLUTININ ISOLECTIN 1



- Molecule 1: AGGLUTININ ISOLECTIN 1



- Molecule 2: GLYCOPEPTIDE

Chain E:  22% 78%

LYS	DBB	DVA	DBB4	DBB5	DVA	DBB	GLU	BAL
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● Molecule 2: GLYCOPEPTIDE

Chain M:  22% 78%

LYS	DBB	DVA	DBB4	DBB5	DVA	DBB	GLU	BAL
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4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	44.64Å 93.21Å 92.50Å 90.00° 98.32° 90.00°	Depositor
Resolution (Å)	32.65 – 2.75 32.65 – 2.75	Depositor EDS
% Data completeness (in resolution range)	99.6 (32.65-2.75) 99.5 (32.65-2.75)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.34 (at 2.76Å)	Xtrriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, R_{free}	0.229 , 0.285 (Not available) , 0.269	Depositor DCC
R_{free} test set	1000 reflections (5.11%)	wwPDB-VP
Wilson B-factor (Å ²)	42.4	Xtrriage
Anisotropy	1.024	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 59.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	4820	wwPDB-VP
Average B, all atoms (Å ²)	55.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 39.64 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 3.0784e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

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

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: DBB, GOL, PCA, GYV

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	0.24	0/1159	0.64	0/1557
1	B	0.26	0/1137	0.62	0/1525
1	C	0.24	0/1142	0.63	0/1533
1	D	0.25	0/1151	0.65	0/1546
All	All	0.25	0/4589	0.64	0/6161

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1145	0	954	25	0
1	B	1117	0	924	26	0
1	C	1122	0	924	16	0
1	D	1137	0	936	15	0
2	E	12	0	13	2	0
2	M	12	0	11	2	0
3	A	36	0	0	0	0
3	B	36	0	0	0	0
3	C	18	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	D	36	0	0	0	0
3	E	36	0	1	1	0
3	M	36	0	1	1	0
4	A	6	0	0	0	0
4	B	6	0	0	0	0
4	C	3	0	0	0	0
4	D	6	0	0	0	0
5	A	6	0	8	0	0
5	B	6	0	8	1	0
5	D	6	0	8	2	0
6	A	11	0	0	0	0
6	B	9	0	0	0	0
6	C	12	0	0	0	0
6	D	6	0	0	0	0
All	All	4820	0	3788	74	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 9.

The worst 5 of 74 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:B:92:GLN:HG3	1:B:108:GLY:HA3	1.61	0.80
1:A:63:GLN:HB3	1:A:77:GLY:HA3	1.64	0.79
1:A:3:CYS:HB3	1:B:10:MET:HE3	1.69	0.75
1:C:63:GLN:HB3	1:C:77:GLY:HA3	1.70	0.74
1:C:102:LEU:HD23	1:C:110:CYS:HB3	1.73	0.70

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	168/171 (98%)	151 (90%)	17 (10%)	0	100	100
1	B	163/171 (95%)	148 (91%)	14 (9%)	1 (1%)	21	36
1	C	162/171 (95%)	144 (89%)	18 (11%)	0	100	100
1	D	169/171 (99%)	148 (88%)	21 (12%)	0	100	100
All	All	662/684 (97%)	591 (89%)	70 (11%)	1 (0%)	43	62

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	28	GLY

5.3.2 Protein sidechains ⓘ

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	114/119 (96%)	114 (100%)	0	100	100
1	B	112/119 (94%)	111 (99%)	1 (1%)	70	82
1	C	114/119 (96%)	114 (100%)	0	100	100
1	D	111/119 (93%)	111 (100%)	0	100	100
All	All	451/476 (95%)	450 (100%)	1 (0%)	87	94

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	10	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 6 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	106	GLN
1	D	14	ASN
1	D	144	ASN

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Mol	Chain	Res	Type
1	A	63	GLN
1	A	14	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

6 non-standard protein/DNA/RNA residues 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
1	PCA	D	1	1	7,8,9	1.90	1 (14%)	9,10,12	2.01	5 (55%)
2	DBB	E	5	2,3	4,5,6	0.59	0	1,5,7	0.15	0
2	DBB	E	4	2,3	4,5,6	0.59	0	1,5,7	0.29	0
1	PCA	A	1	1	7,8,9	1.91	1 (14%)	9,10,12	2.08	4 (44%)
2	DBB	M	4	2,3	4,5,6	0.56	0	1,5,7	0.03	0
2	DBB	M	5	2,3	4,5,6	0.42	0	1,5,7	0.29	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
1	PCA	D	1	1	-	0/0/11/13	0/1/1/1
2	DBB	E	5	2,3	-	3/3/4/6	-
2	DBB	E	4	2,3	-	2/3/4/6	-
1	PCA	A	1	1	-	0/0/11/13	0/1/1/1
2	DBB	M	4	2,3	-	0/3/4/6	-
2	DBB	M	5	2,3	-	1/3/4/6	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	1	PCA	CD-N	4.93	1.46	1.34
1	D	1	PCA	CD-N	4.91	1.46	1.34

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	1	PCA	CA-N-CD	-3.17	102.72	113.58
1	A	1	PCA	CA-N-CD	-2.96	103.45	113.58
1	A	1	PCA	OE-CD-CG	-2.87	121.60	126.72
1	A	1	PCA	CB-CA-N	2.75	110.81	103.24
1	D	1	PCA	OE-CD-CG	-2.63	122.03	126.72

There are no chirality outliers.

5 of 6 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	E	5	DBB	O-C-CA-CB
2	E	5	DBB	C-CA-CB-CG
2	M	5	DBB	O-C-CA-CB
2	E	4	DBB	C-CA-CB-CG
2	E	4	DBB	N-CA-CB-CG

There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	5	DBB	1	0
2	E	4	DBB	2	0
2	M	4	DBB	2	0
2	M	5	DBB	2	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

21 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
3	GYV	D	1172	4	18,18,18	1.32	1 (5%)	25,25,25	1.97	7 (28%)
5	GOL	B	1174	-	5,5,5	0.39	0	5,5,5	0.25	0
3	GYV	M	1004	2	18,18,18	1.55	1 (5%)	25,25,25	2.50	10 (40%)
3	GYV	A	1172	4	18,18,18	1.32	1 (5%)	25,25,25	1.98	7 (28%)
3	GYV	A	1170	4	18,18,18	1.70	3 (16%)	25,25,25	3.07	12 (48%)
4	DBB	C	1173	3	2,2,6	0.20	0	1,1,7	0.04	0
4	DBB	A	1173	3	2,2,6	0.18	0	1,1,7	0.02	0
5	GOL	A	1174	-	5,5,5	0.37	0	5,5,5	0.32	0
4	DBB	D	1173	3	2,2,6	0.19	0	1,1,7	0.01	0
3	GYV	B	1170	4	18,18,18	1.31	1 (5%)	25,25,25	2.03	7 (28%)
3	GYV	E	1005	2	18,18,18	1.37	1 (5%)	25,25,25	1.81	5 (20%)
3	GYV	E	1004	2	18,18,18	1.50	1 (5%)	25,25,25	2.19	8 (32%)
3	GYV	M	1005	2	18,18,18	1.53	3 (16%)	25,25,25	2.92	10 (40%)
4	DBB	D	1171	3	2,2,6	0.17	0	1,1,7	0.01	0
4	DBB	B	1173	3	2,2,6	0.18	0	1,1,7	0.01	0
4	DBB	A	1171	3	2,2,6	0.15	0	1,1,7	0.07	0
3	GYV	D	1170	4	18,18,18	1.32	1 (5%)	25,25,25	2.05	8 (32%)
3	GYV	B	1172	4	18,18,18	1.31	1 (5%)	25,25,25	1.78	5 (20%)
4	DBB	B	1171	3	2,2,6	0.17	0	1,1,7	0.02	0
5	GOL	D	1176	-	5,5,5	0.38	0	5,5,5	0.32	0
3	GYV	C	1172	4	18,18,18	1.31	1 (5%)	25,25,25	1.66	7 (28%)

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	GYV	D	1172	4	-	2/10/30/30	0/1/1/1
5	GOL	B	1174	-	-	4/4/4/4	-
3	GYV	M	1004	2	-	2/10/30/30	0/1/1/1
3	GYV	E	1004	2	-	2/10/30/30	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	GOL	A	1174	-	-	2/4/4/4	-
3	GYV	M	1005	2	-	2/10/30/30	0/1/1/1
3	GYV	B	1170	4	-	2/10/30/30	0/1/1/1
3	GYV	A	1172	4	-	4/10/30/30	0/1/1/1
3	GYV	D	1170	4	-	2/10/30/30	0/1/1/1
3	GYV	A	1170	4	-	3/10/30/30	0/1/1/1
5	GOL	D	1176	-	-	2/4/4/4	-
3	GYV	E	1005	2	-	0/10/30/30	0/1/1/1
3	GYV	C	1172	4	-	0/10/30/30	0/1/1/1
3	GYV	B	1172	4	-	1/10/30/30	0/1/1/1

The worst 5 of 15 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	1004	GYV	O1-C1A	6.02	1.47	1.35
3	E	1005	GYV	O1-C1A	5.62	1.46	1.35
3	M	1004	GYV	O1-C1A	5.55	1.46	1.35
3	D	1172	GYV	O1-C1A	5.45	1.46	1.35
3	D	1170	GYV	O1-C1A	5.44	1.46	1.35

The worst 5 of 86 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1170	GYV	O1-C1A-ND3	8.84	124.62	110.92
3	M	1005	GYV	O1-C1A-O1A	-7.08	112.24	123.06
3	M	1005	GYV	O1-C1A-ND3	7.07	121.87	110.92
3	M	1004	GYV	O1-C1A-ND3	6.23	120.57	110.92
3	M	1004	GYV	O1-C1-C2	6.12	115.42	107.19

There are no chirality outliers.

5 of 28 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1170	GYV	ND3-C1A-O1-C1
3	A	1170	GYV	O1A-C1A-O1-C1
3	A	1172	GYV	ND3-C1A-O1-C1
3	A	1172	GYV	O1A-C1A-O1-C1
3	B	1170	GYV	ND3-C1A-O1-C1

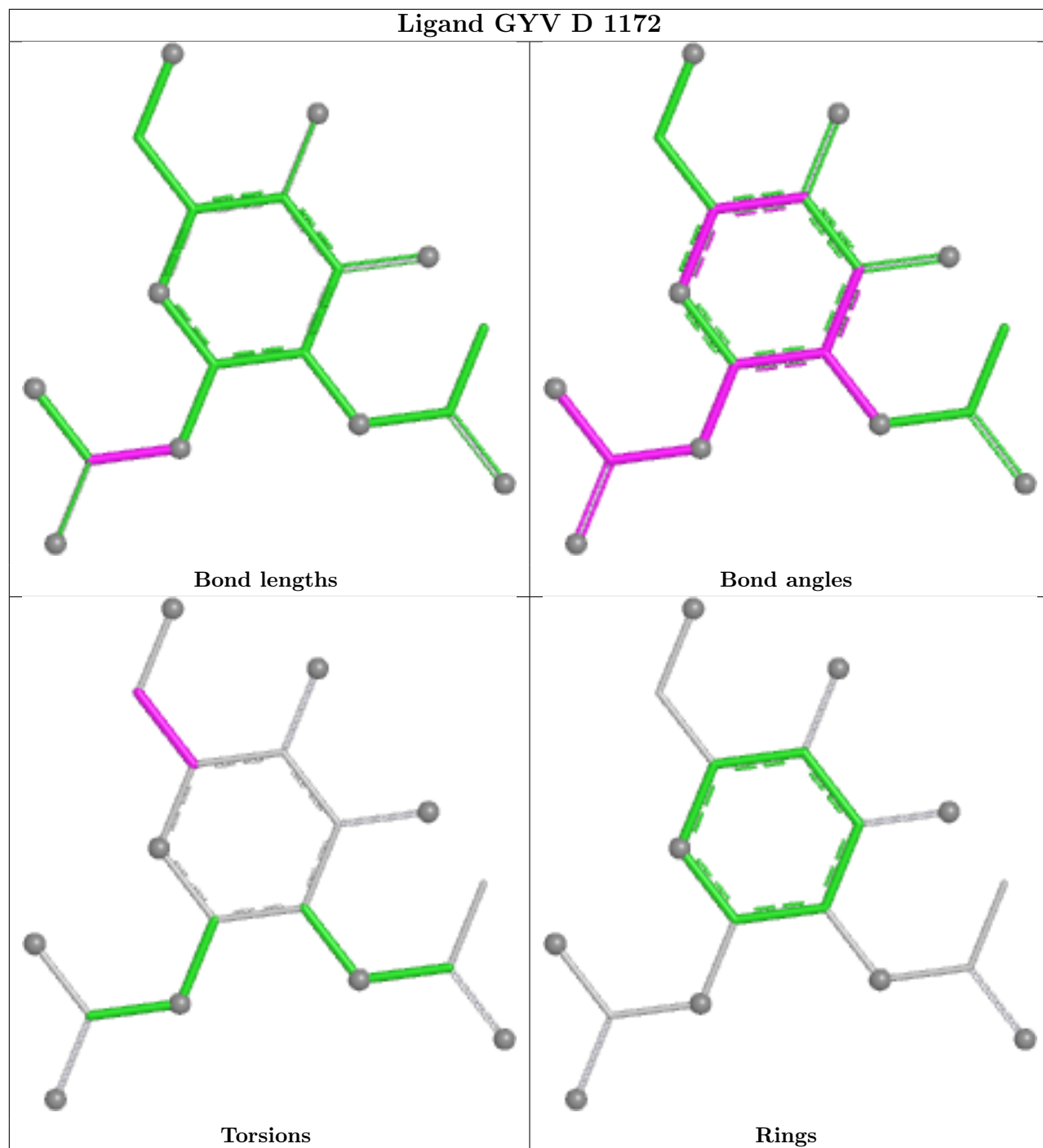
There are no ring outliers.

4 monomers are involved in 5 short contacts:

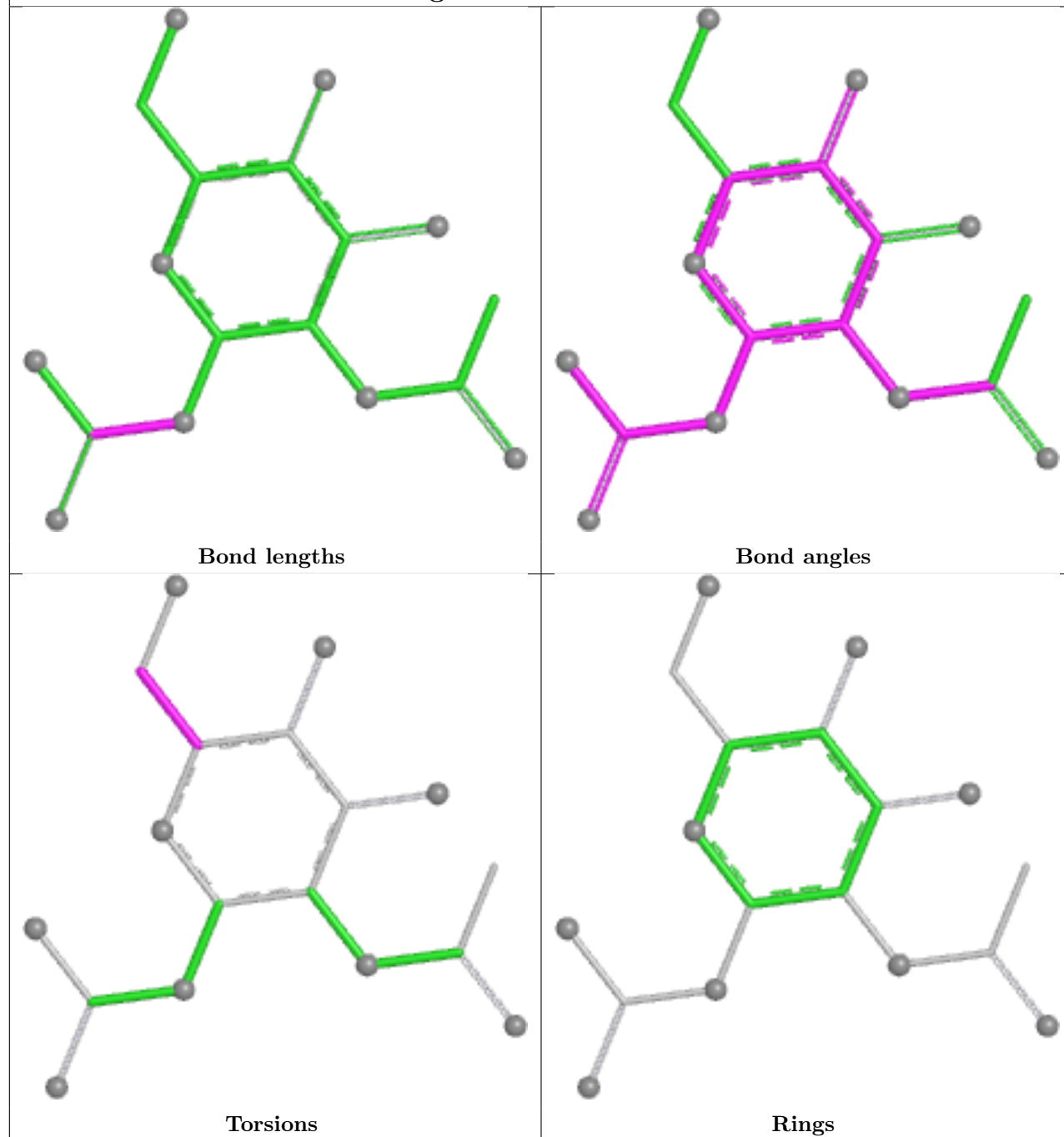
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	1174	GOL	1	0
3	E	1004	GYV	1	0
3	M	1005	GYV	1	0
5	D	1176	GOL	2	0

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.

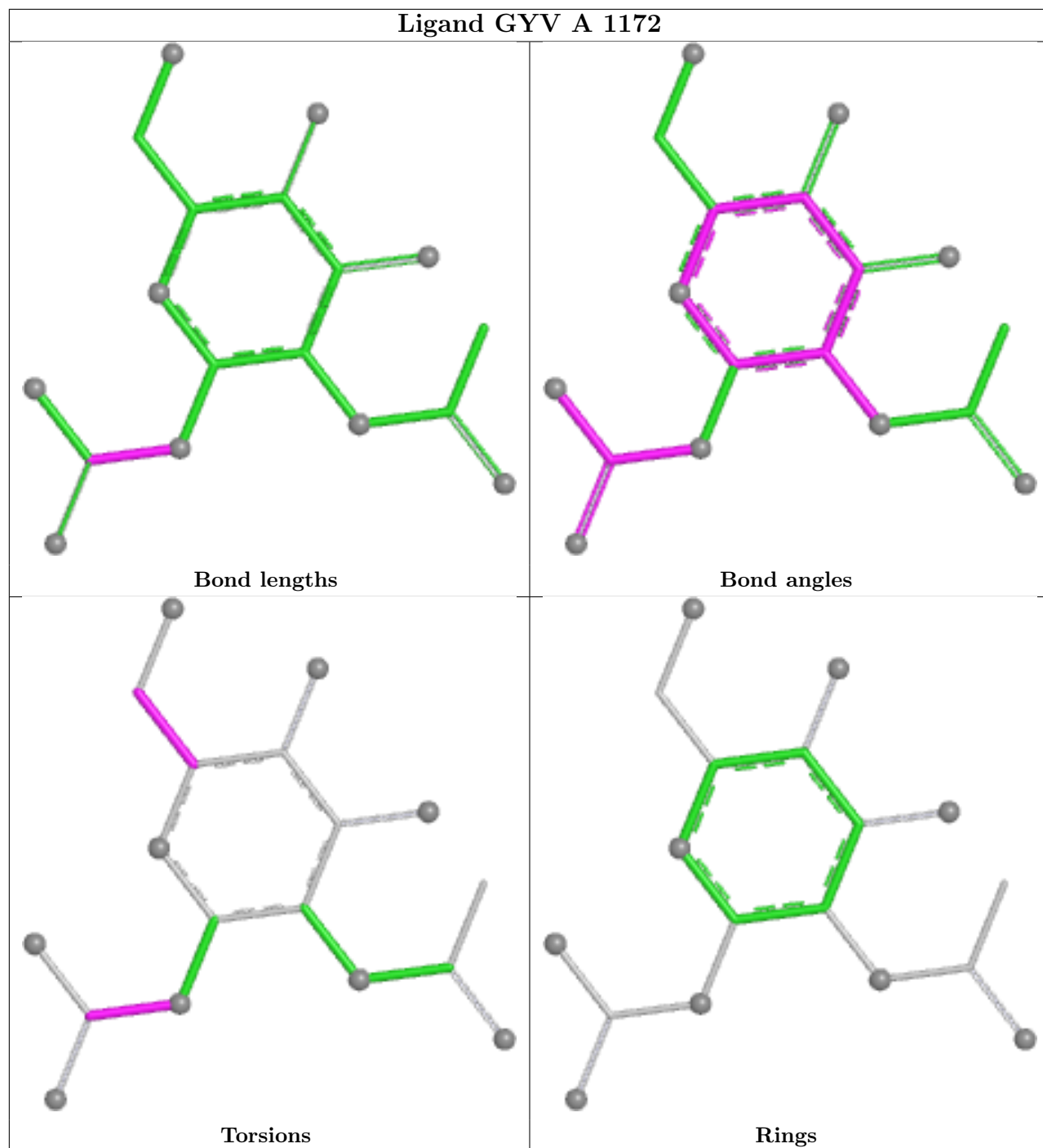
Ligand GYV D 1172



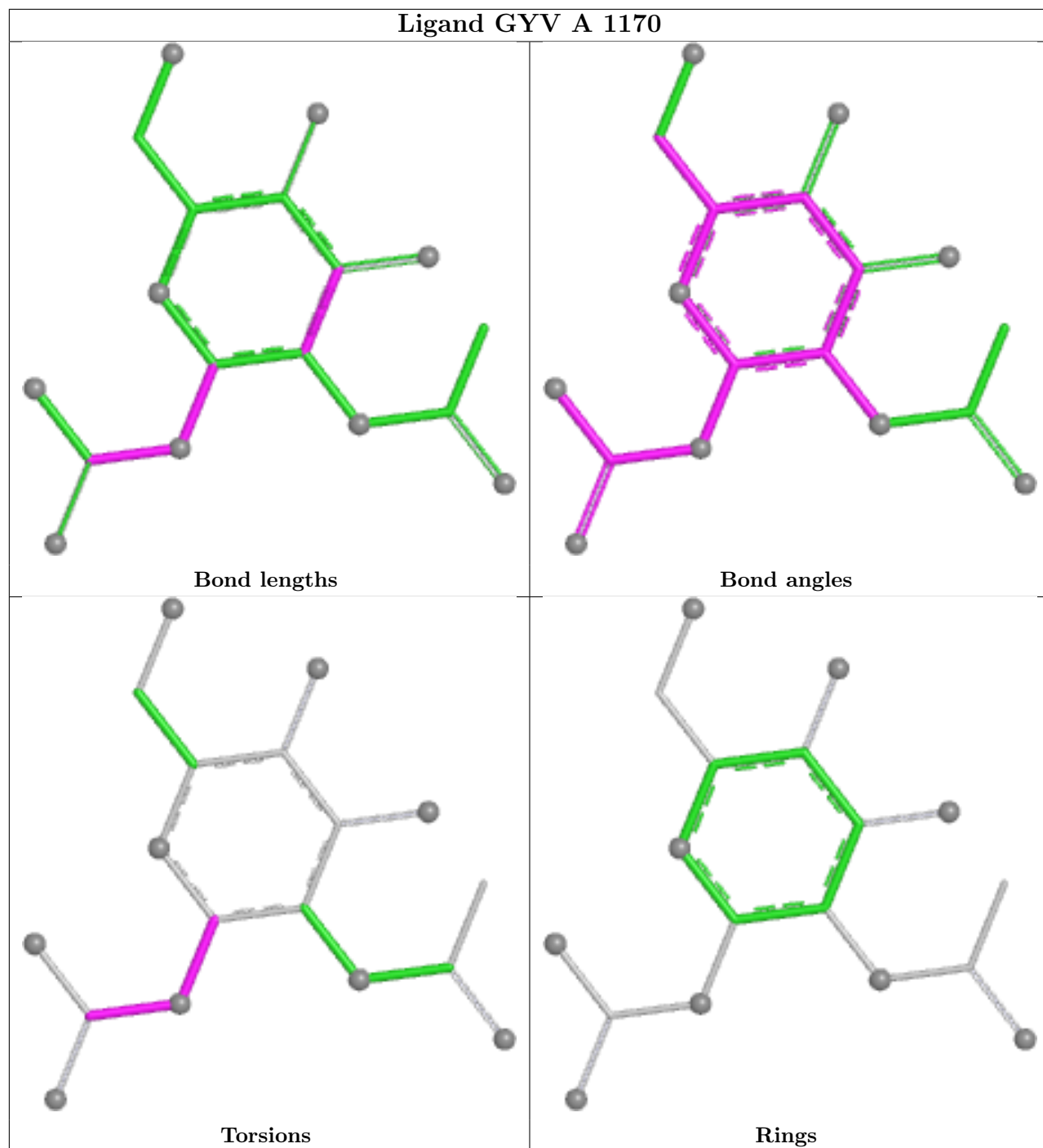
Ligand GYV M 1004



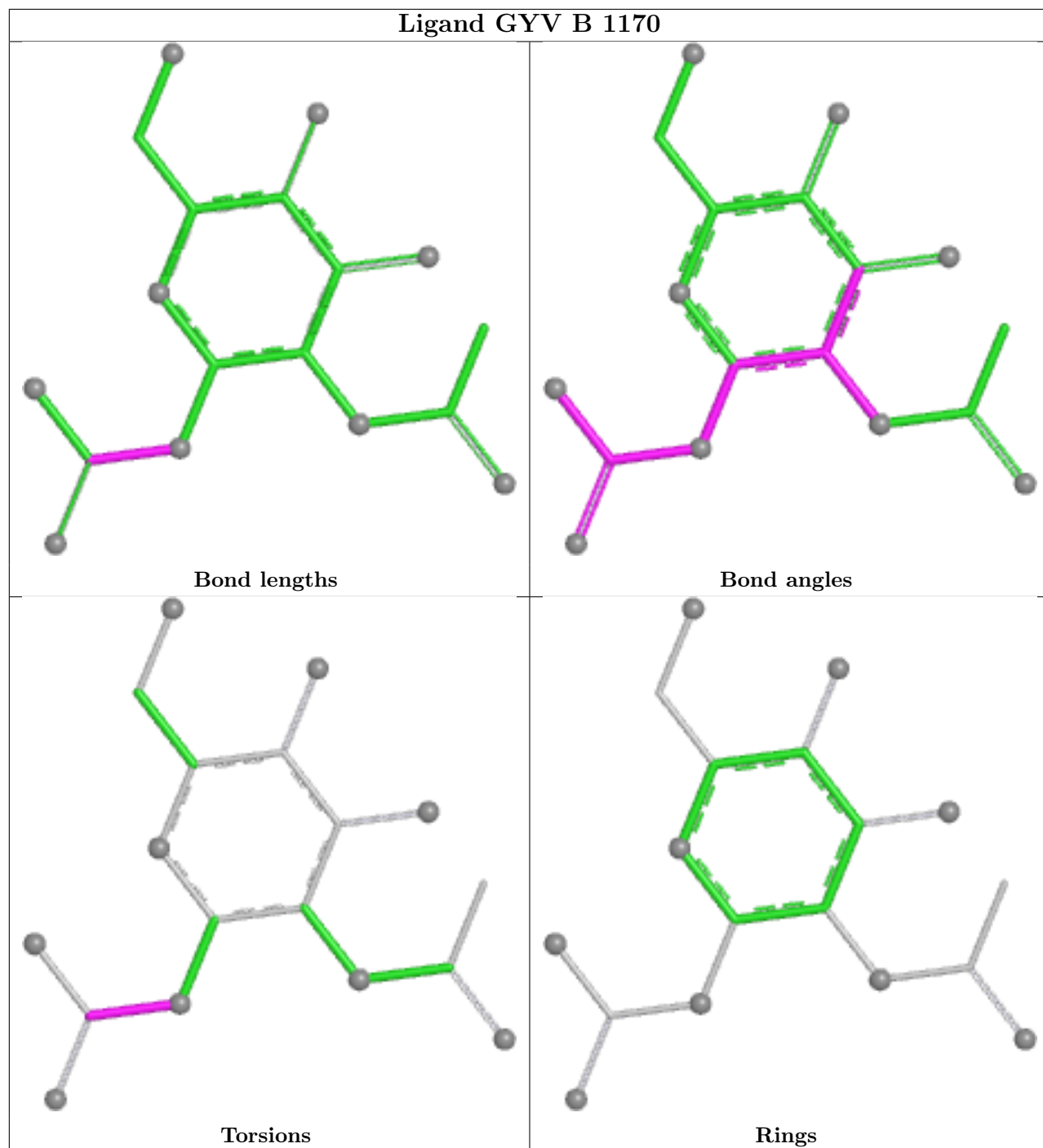
Ligand GYV A 1172



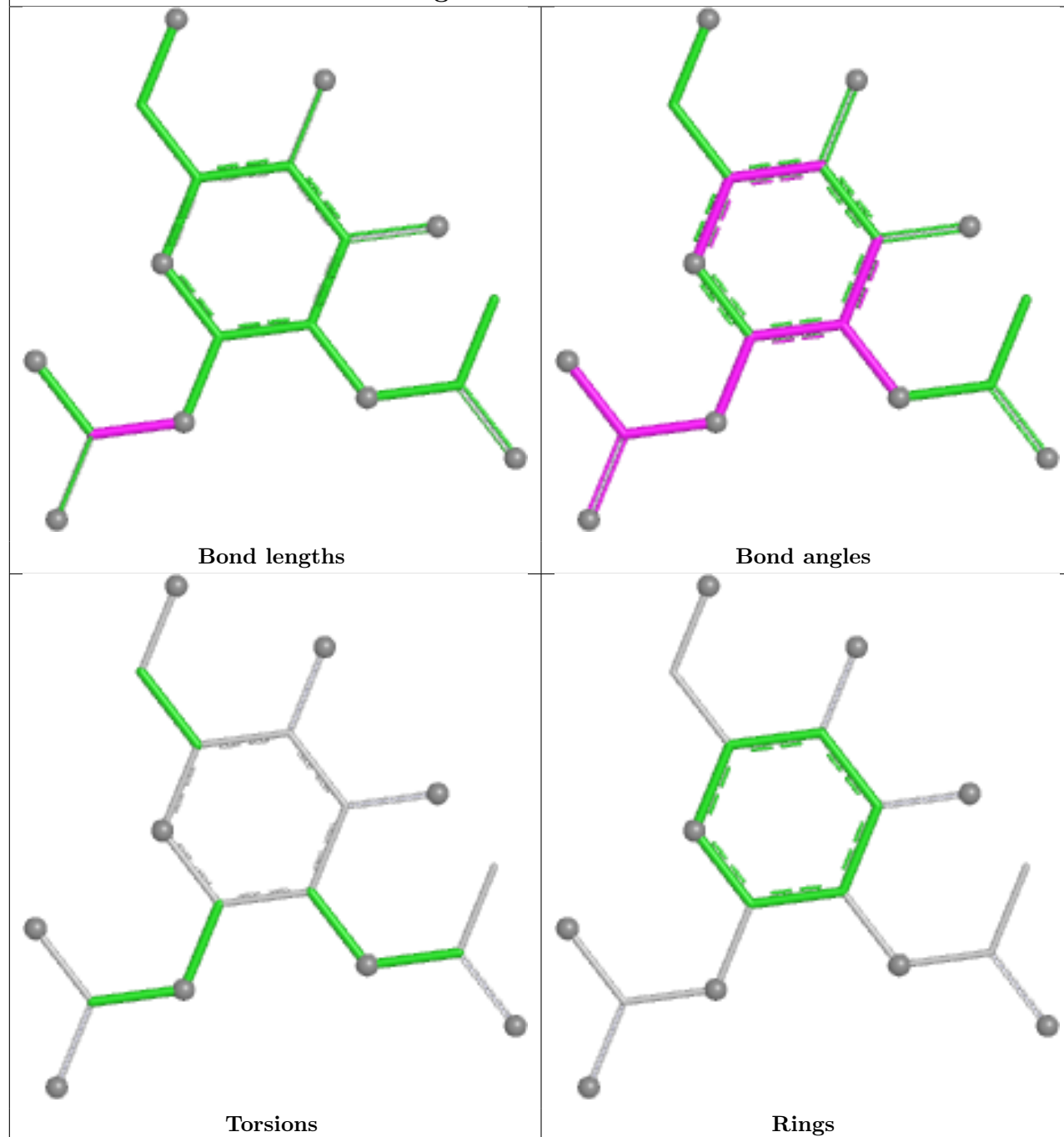
Ligand GYV A 1170



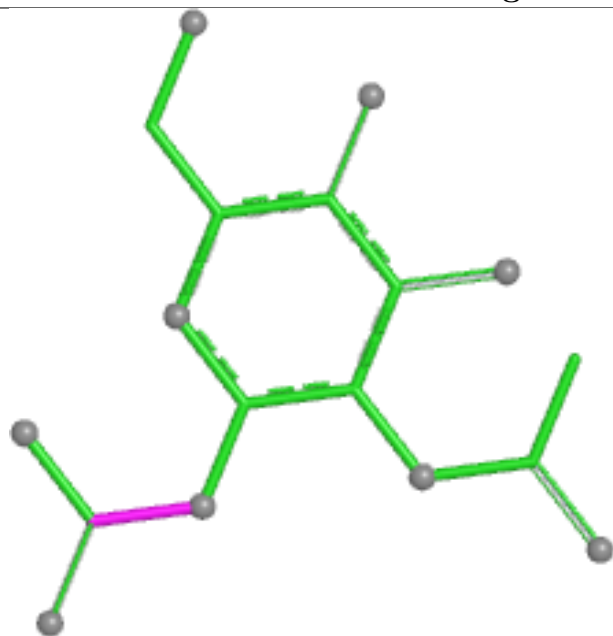
Ligand GYV B 1170



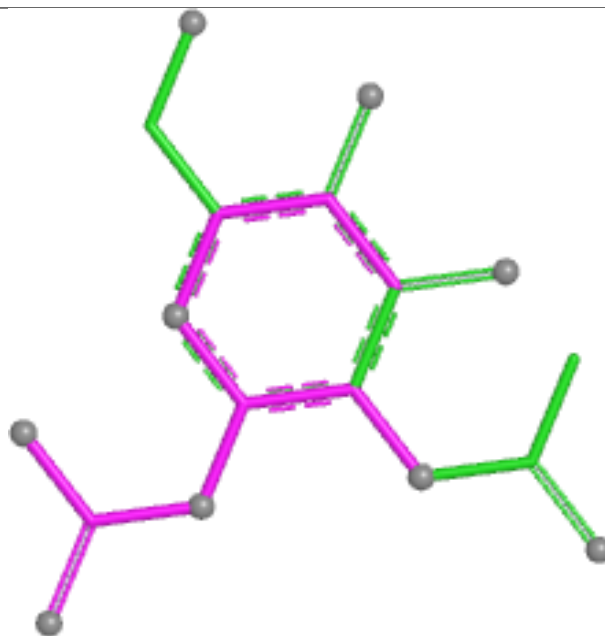
Ligand GYV E 1005



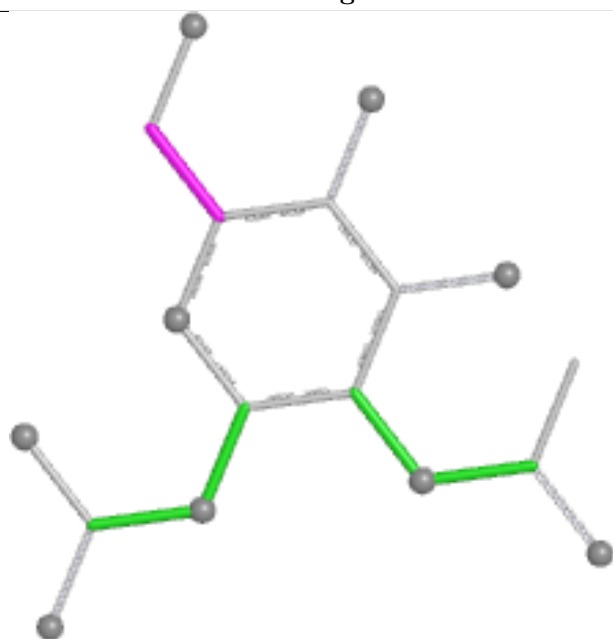
Ligand GYV E 1004



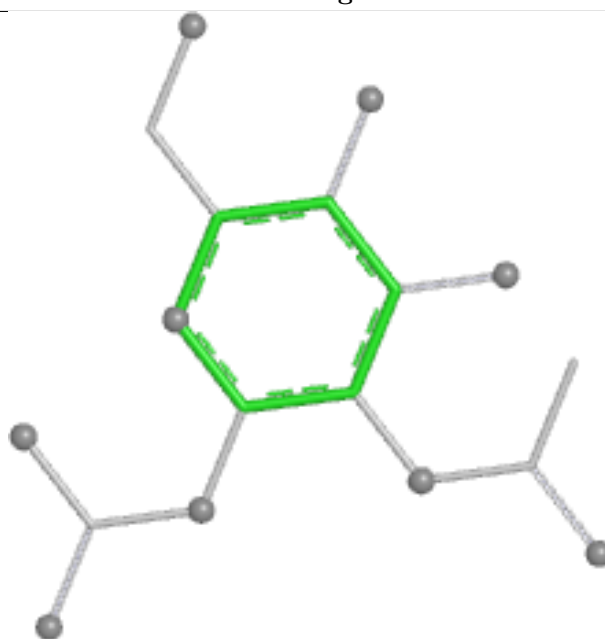
Bond lengths



Bond angles

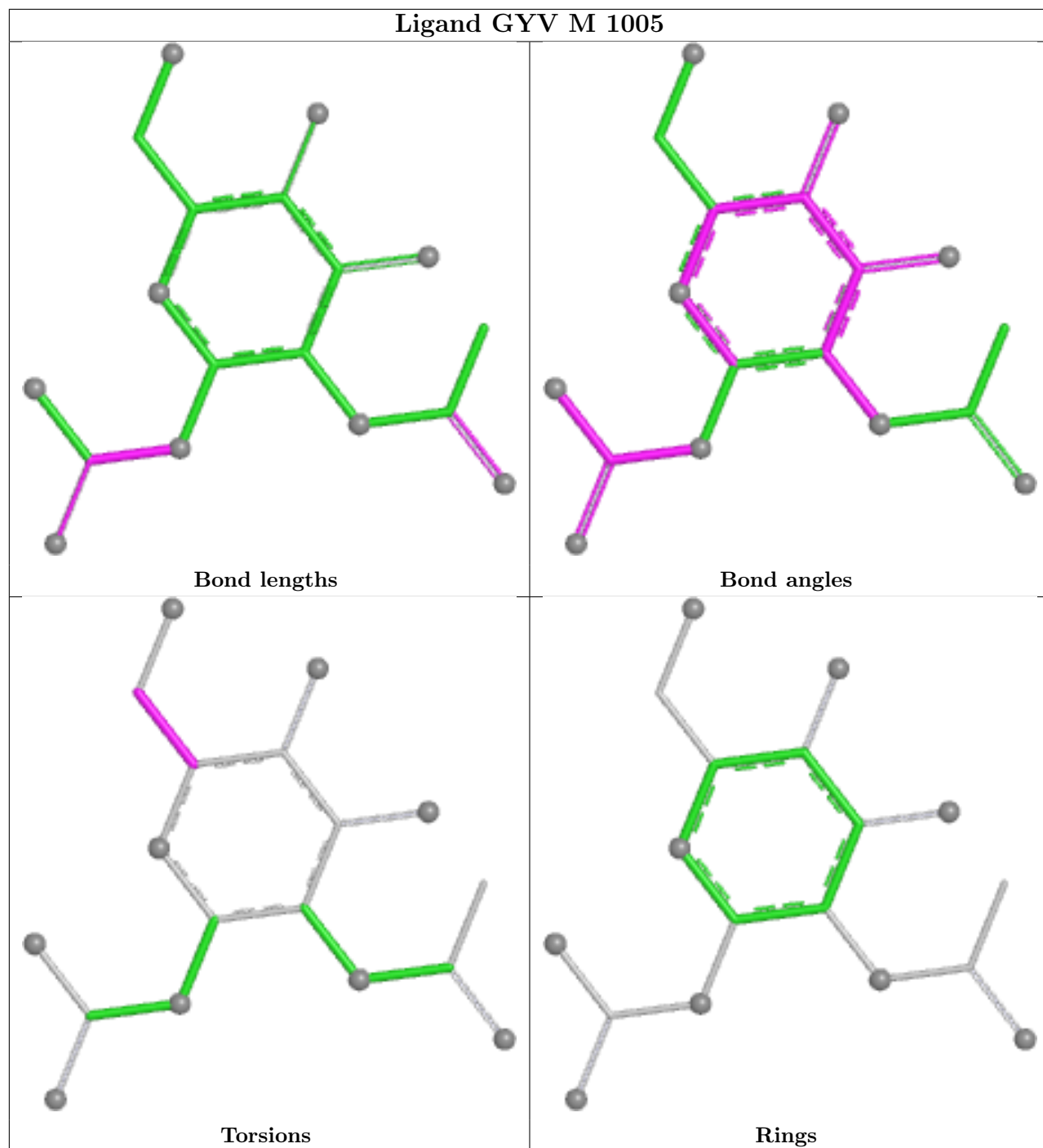


Torsions

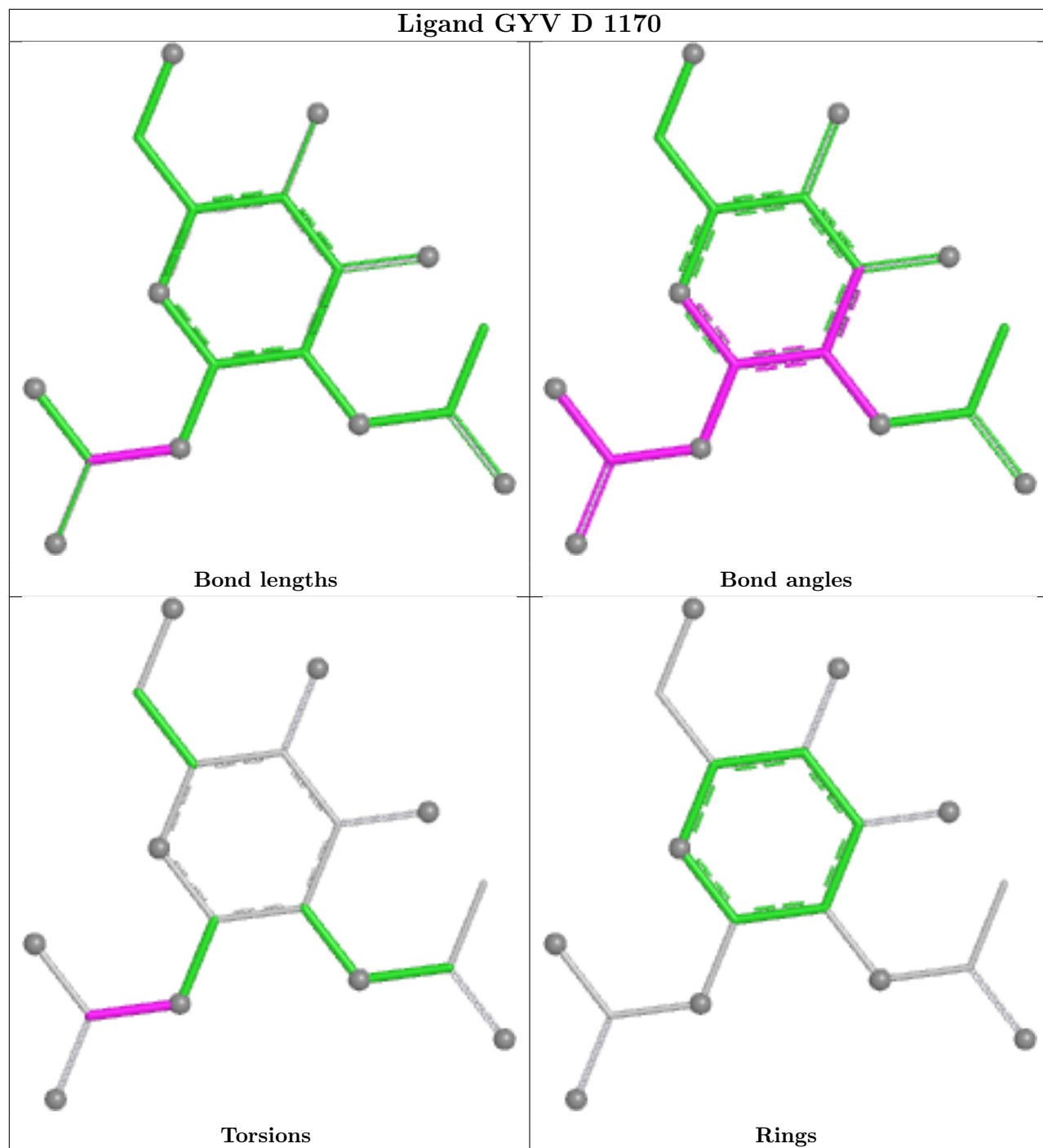


Rings

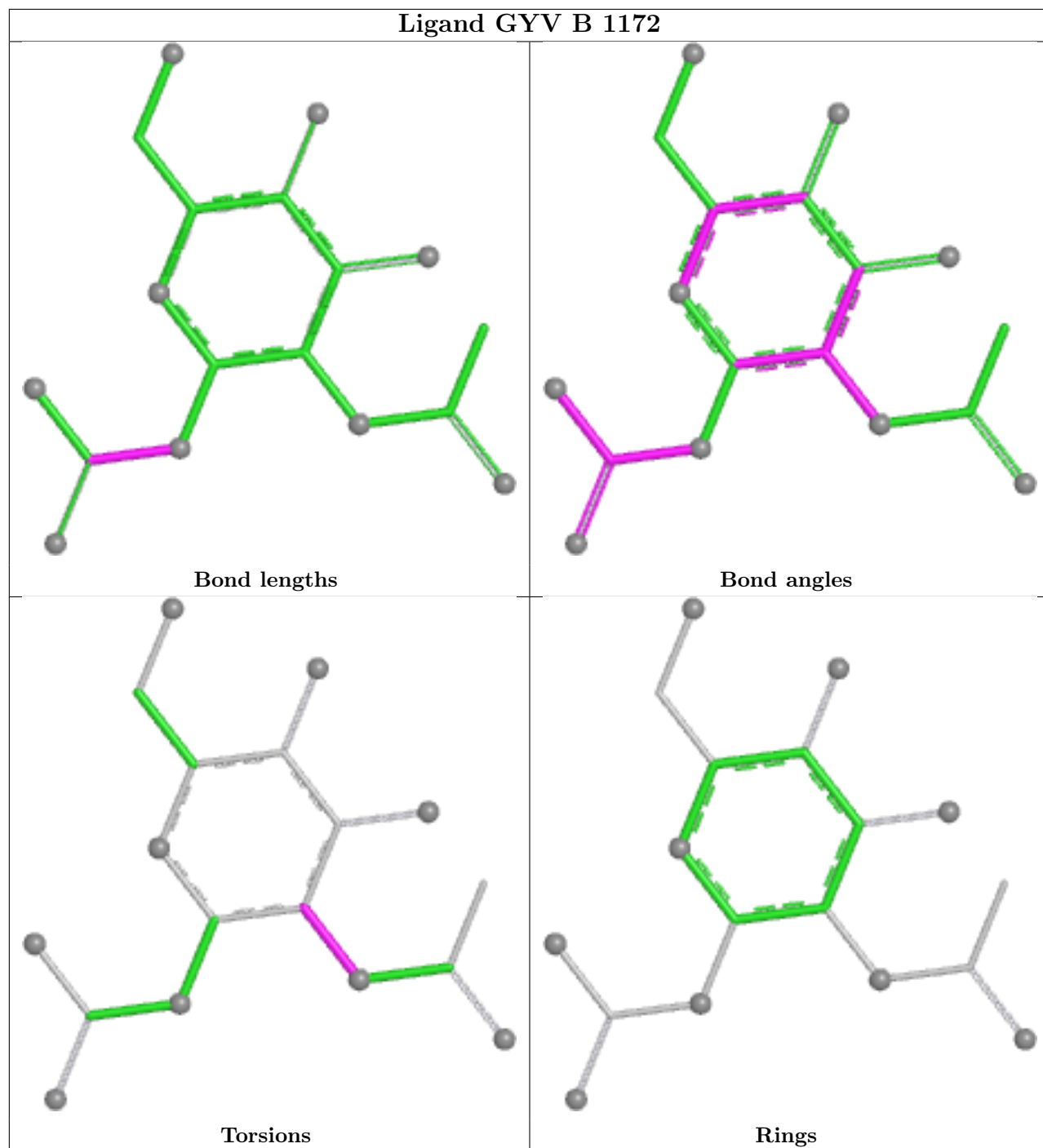
Ligand GYV M 1005

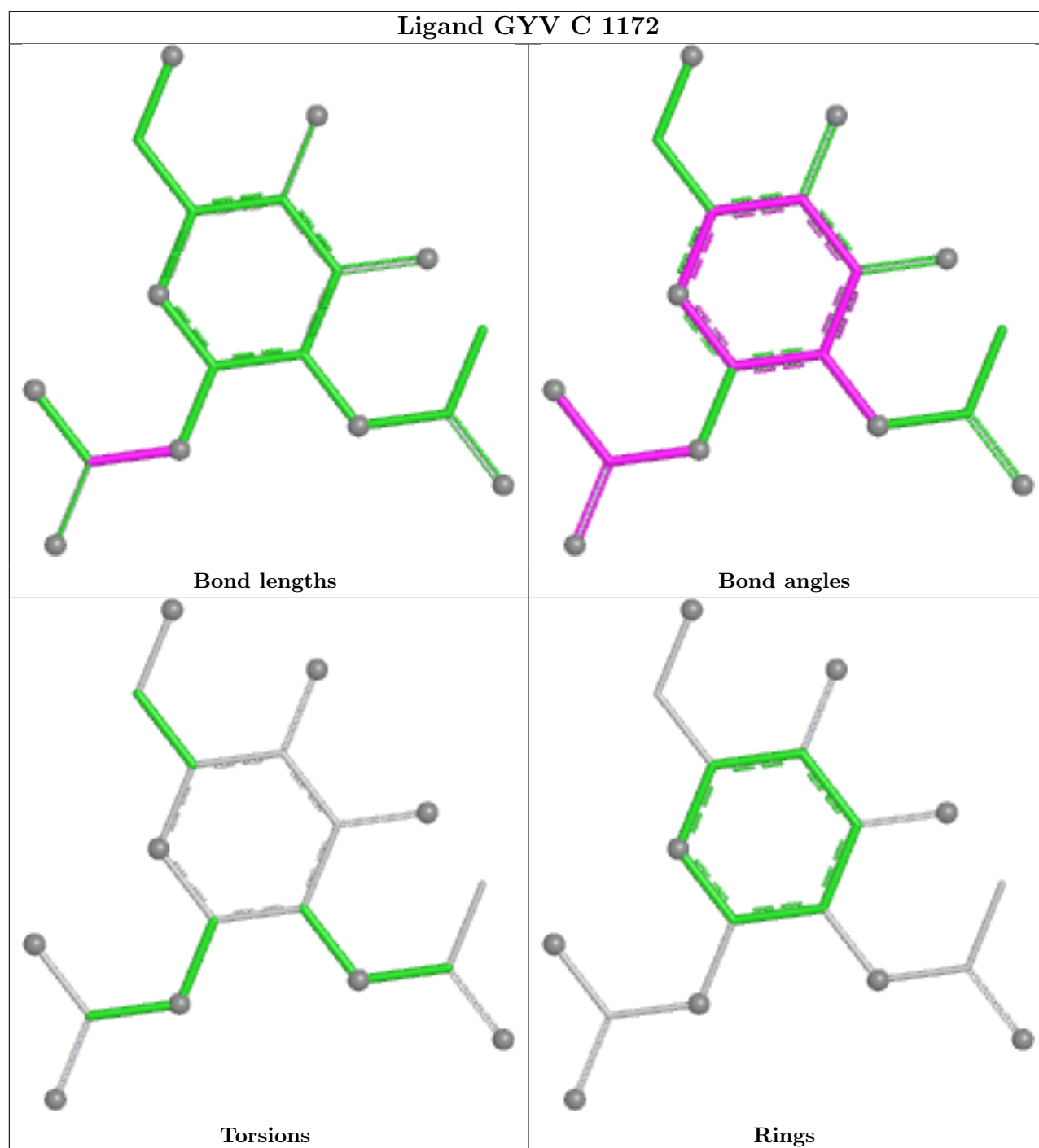


Ligand GYV D 1170



Ligand GYV B 1172





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

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

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	169/171 (98%)	0.25	3 (1%) 67 64	31, 47, 73, 105	2 (1%)
1	B	167/171 (97%)	0.31	5 (2%) 52 50	32, 49, 76, 102	0
1	C	166/171 (97%)	0.36	8 (4%) 35 35	38, 52, 91, 130	2 (1%)
1	D	170/171 (99%)	0.39	6 (3%) 47 45	37, 56, 86, 117	0
2	E	0/9	-	-	-	-
2	M	0/9	-	-	-	-
All	All	672/702 (95%)	0.33	22 (3%) 49 47	31, 51, 84, 130	4 (0%)

The worst 5 of 22 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	92	GLN	4.2
1	A	136	ALA	3.3
1	D	2	ARG	3.2
1	C	63	GLN	3.1
1	D	20	GLN	3.1

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q < 0.9’ lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	DBB	E	5	6/7	0.33	0.19	53,54,54,54	0
2	DBB	E	4	6/7	0.46	0.17	53,53,53,53	0
2	DBB	M	5	6/7	0.60	0.15	64,68,69,71	0
2	DBB	M	4	6/7	0.62	0.14	72,73,74,75	0
1	PCA	A	1	8/9	0.78	0.19	94,94,95,95	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
1	PCA	D	1	8/9	0.81	0.17	82,84,86,86	0

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

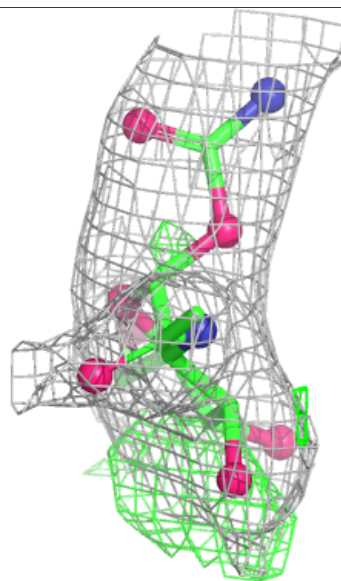
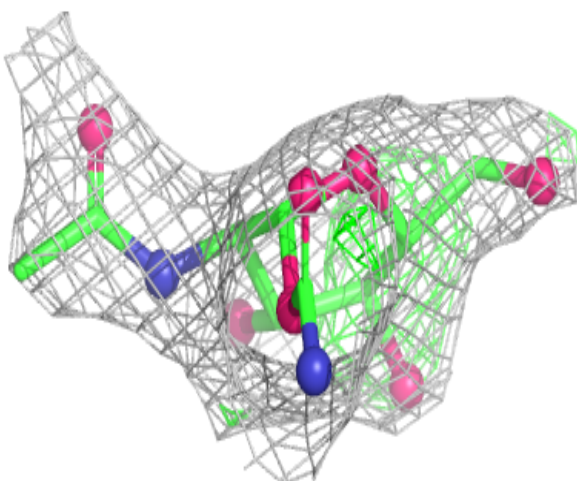
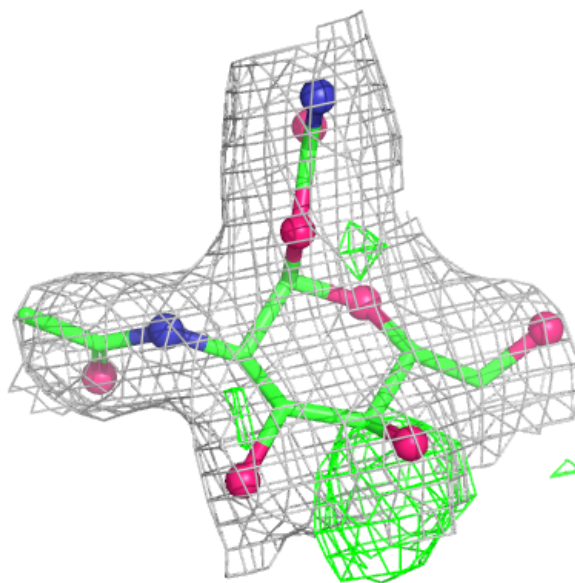
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	DBB	D	1173	3/7	-0.05	0.37	75,75,75,76	0
4	DBB	A	1171	3/7	0.27	0.25	47,47,48,48	0
4	DBB	C	1173	3/7	0.41	0.26	51,51,52,52	0
4	DBB	B	1173	3/7	0.49	0.24	58,58,62,66	0
4	DBB	B	1171	3/7	0.51	0.37	84,84,84,84	0
4	DBB	A	1173	3/7	0.53	0.42	92,92,92,93	0
4	DBB	D	1171	3/7	0.57	0.34	70,70,70,71	0
3	GYV	E	1004	18/18	0.84	0.16	52,52,53,53	0
3	GYV	D	1170	18/18	0.85	0.11	63,66,72,73	0
3	GYV	B	1170	18/18	0.86	0.12	74,78,83,84	0
3	GYV	M	1004	18/18	0.86	0.13	74,77,78,78	0
3	GYV	A	1170	18/18	0.86	0.12	48,49,51,52	0
5	GOL	B	1174	6/6	0.86	0.17	52,53,53,54	0
3	GYV	E	1005	18/18	0.87	0.11	53,53,54,54	0
3	GYV	A	1172	18/18	0.87	0.13	71,82,90,91	0
5	GOL	A	1174	6/6	0.88	0.20	73,76,77,78	0
3	GYV	M	1005	18/18	0.89	0.11	43,55,59,62	0
3	GYV	B	1172	18/18	0.89	0.12	70,80,84,86	0
3	GYV	D	1172	18/18	0.90	0.10	75,76,78,79	0
5	GOL	D	1176	6/6	0.91	0.13	60,60,61,62	0
3	GYV	C	1172	18/18	0.92	0.09	50,51,54,54	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

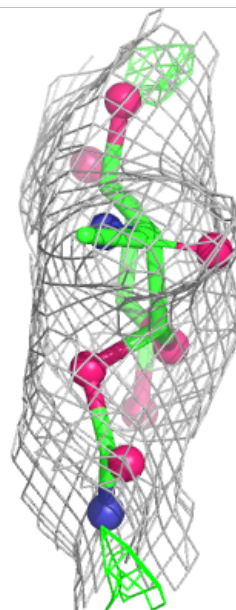
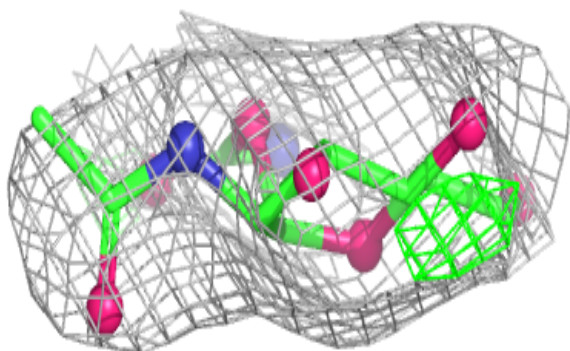
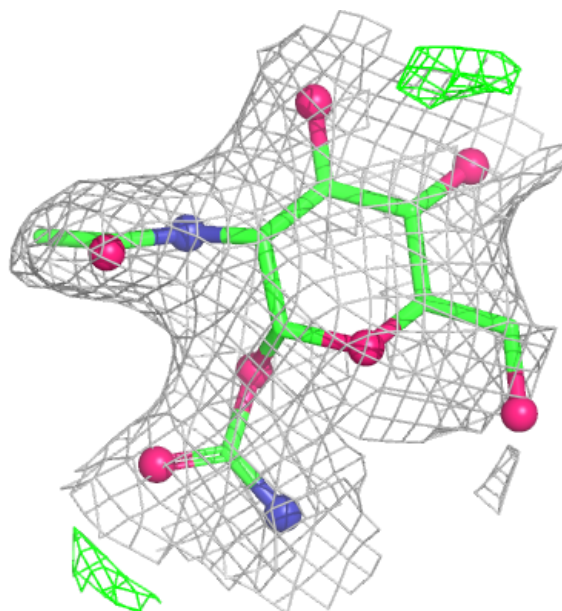
Electron density around GYV E 1004:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



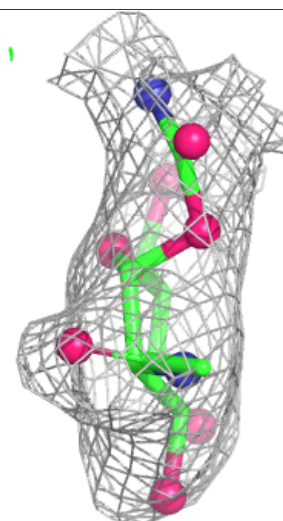
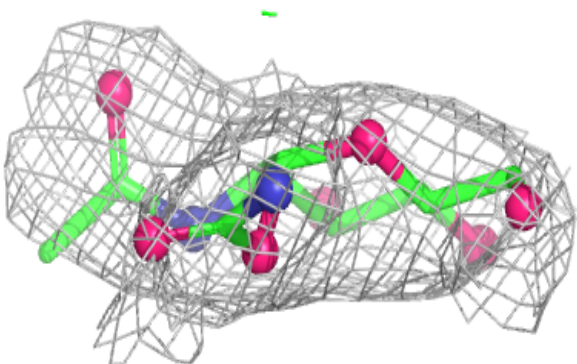
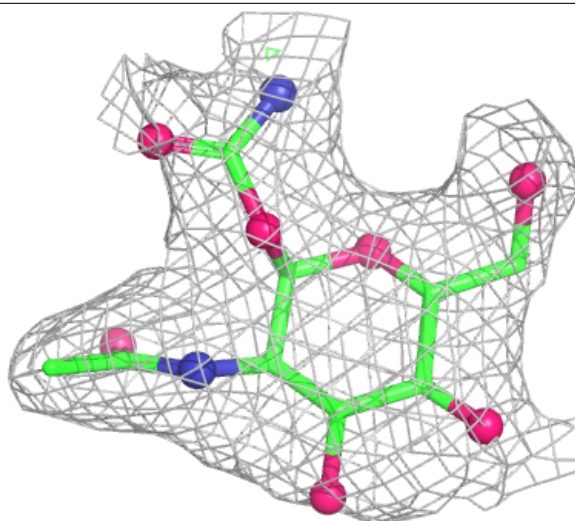
Electron density around GYV D 1170:

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and green (positive)



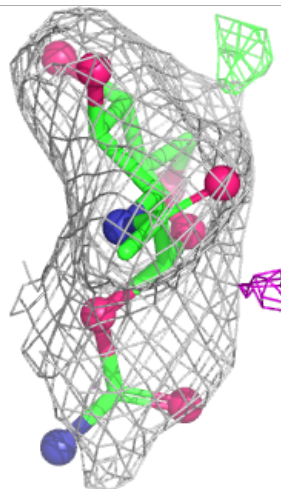
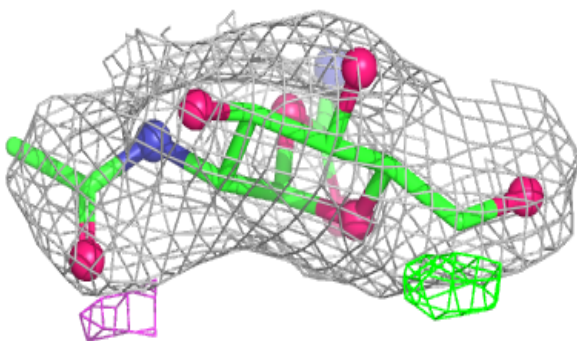
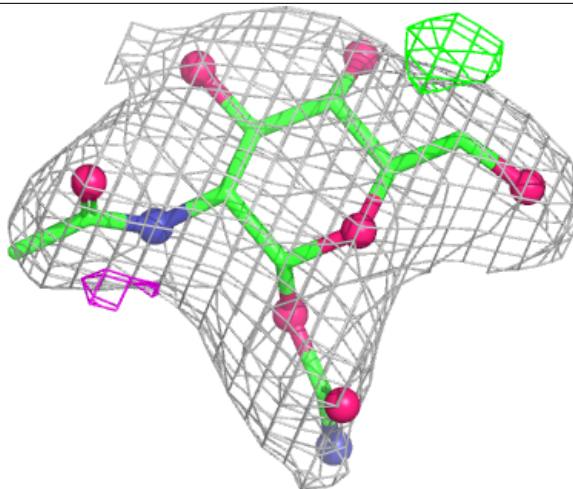
Electron density around GYV B 1170:

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and green (positive)



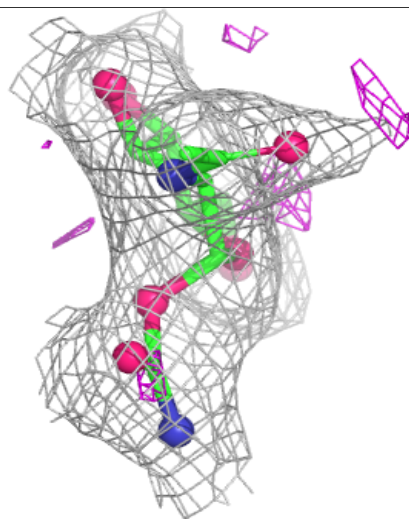
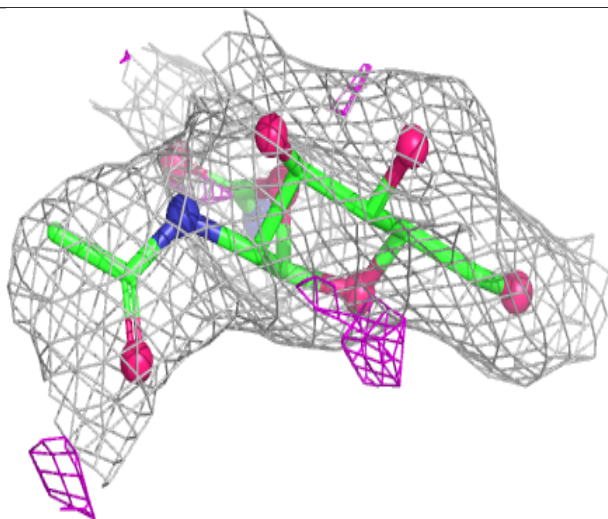
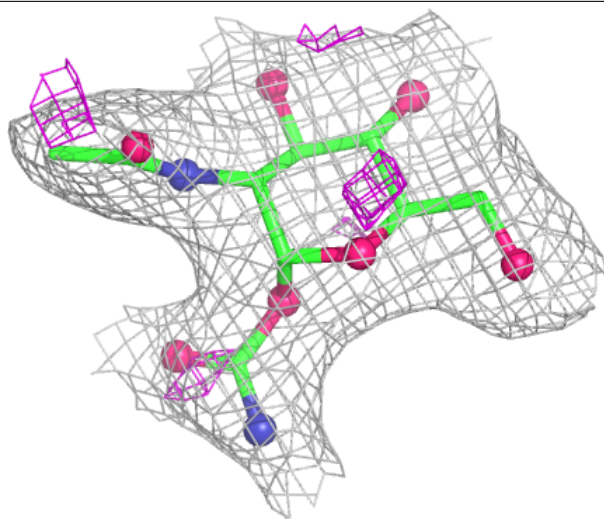
Electron density around GYV M 1004:

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and green (positive)



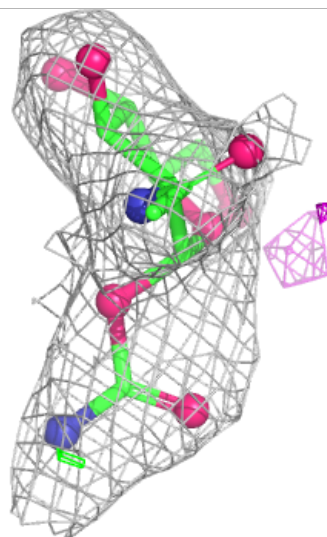
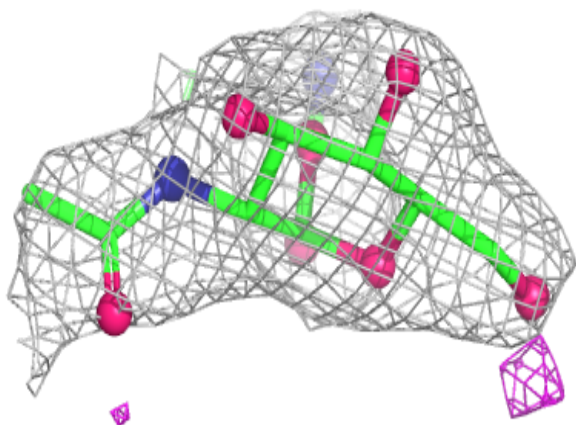
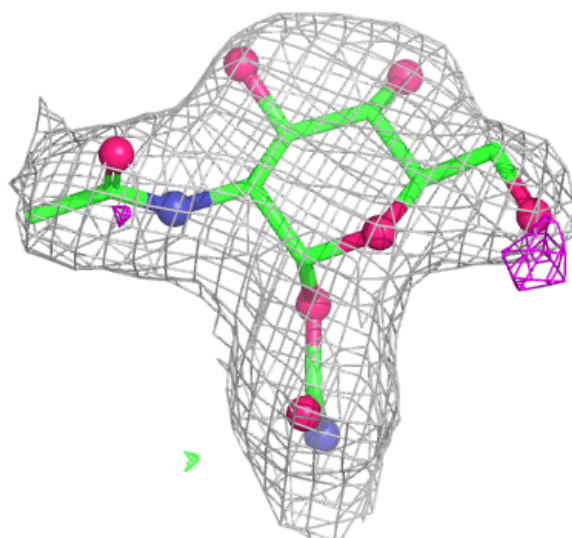
Electron density around GYV A 1170:

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and green (positive)



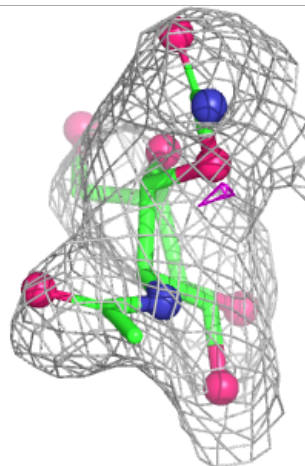
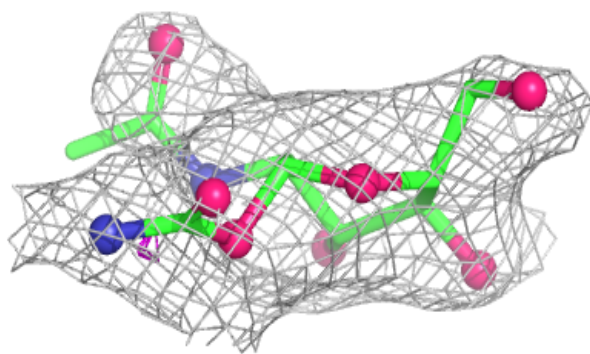
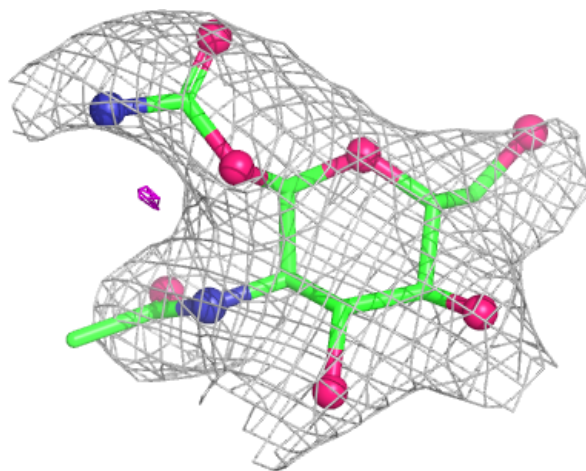
Electron density around GYV E 1005:

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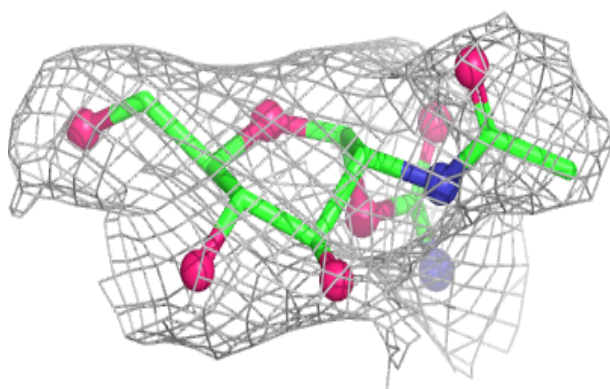
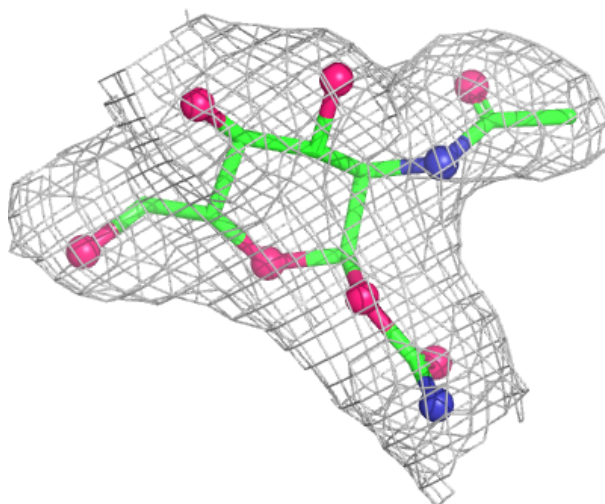
Electron density around GYV A 1172:

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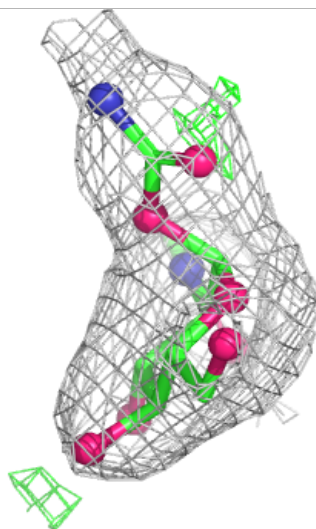
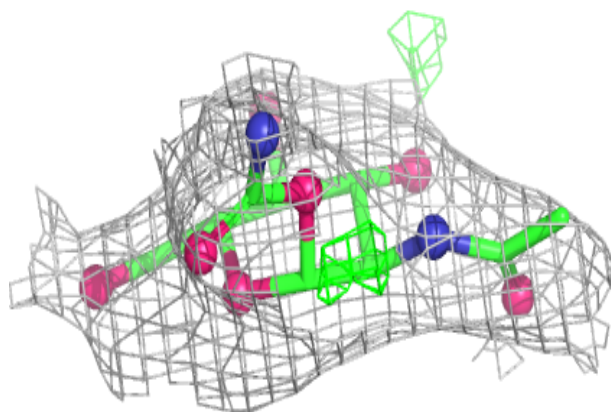
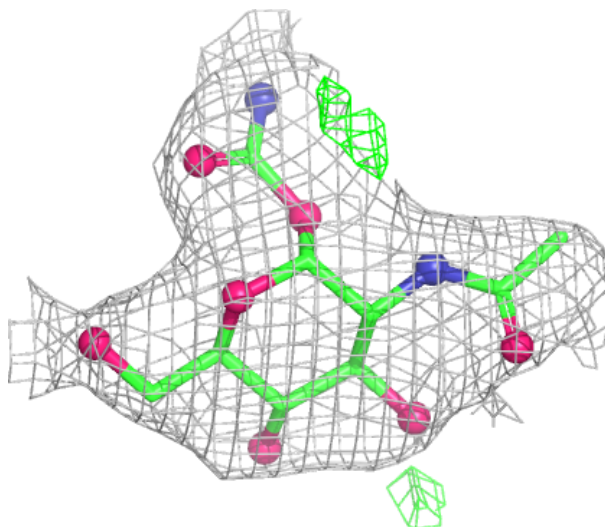
Electron density around GYV M 1005:

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and green (positive)



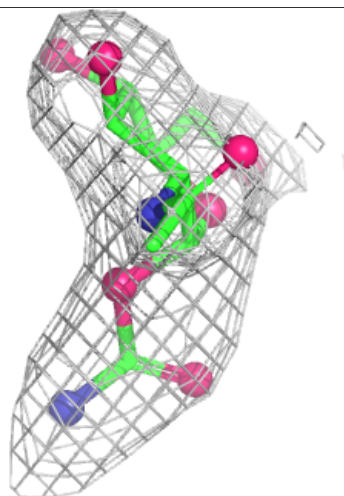
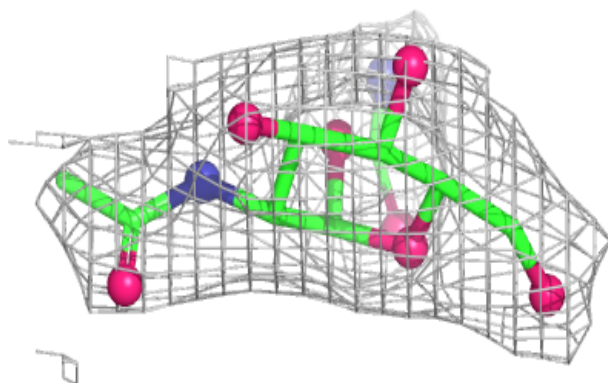
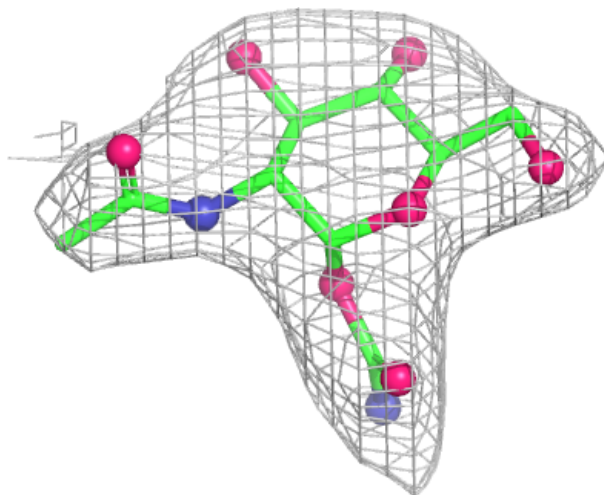
Electron density around GYV B 1172:

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and green (positive)



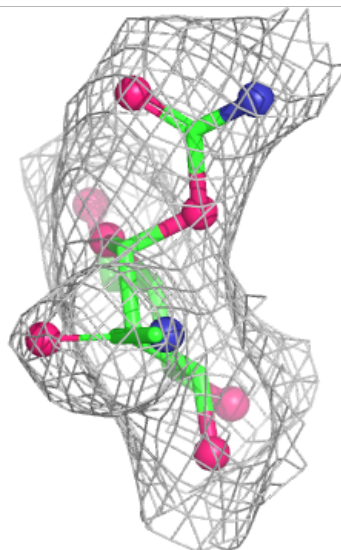
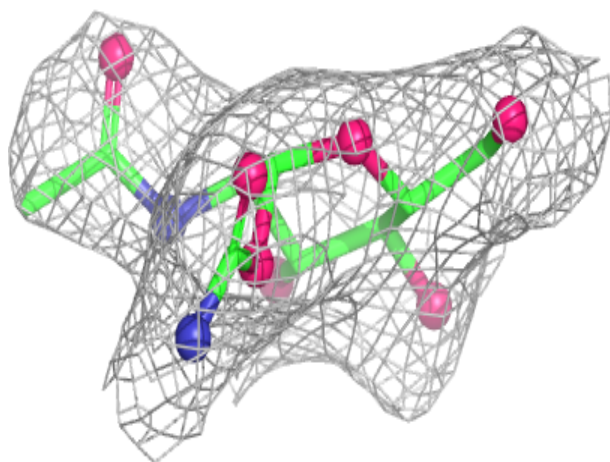
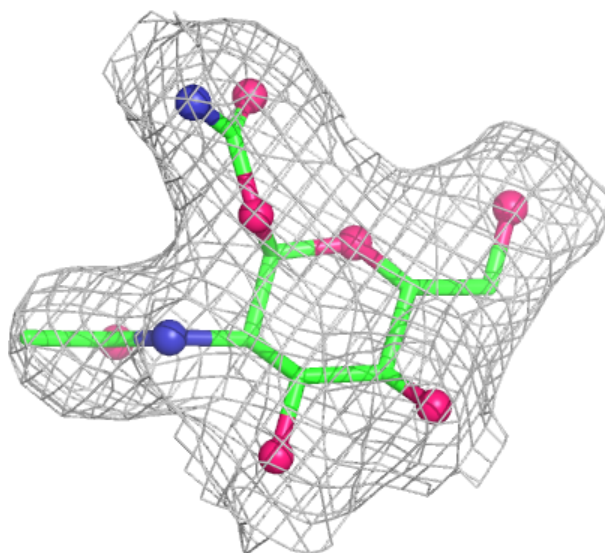
Electron density around GYV D 1172:

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and green (positive)



Electron density around GYV C 1172:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



6.5 Other polymers [i](#)

There are no such residues in this entry.