



# wwPDB X-ray Structure Validation Summary Report ⓘ

Aug 10, 2020 – 07:57 AM BST

PDB ID : 6S82  
Title : Structure Of D80A-Fructofuranosidase From Xanthophyllomyces Dendrorhous  
Complexed With Tris-buffer molecule And hydroquinone  
Authors : Ramirez-Escudero, M.; Sanz-Aparicio, J.  
Deposited on : 2019-07-08  
Resolution : 1.85 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](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.

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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)  
Xtriage (Phenix) : 1.13  
EDS : 2.13.1  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.13.1

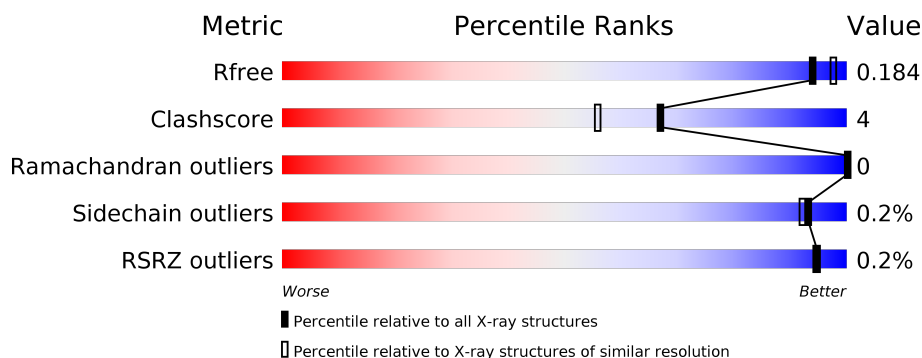
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 1.85 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.



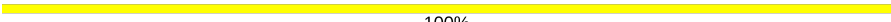
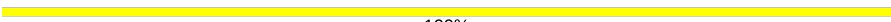
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	2469 (1.86-1.86)
Clashscore	141614	2625 (1.86-1.86)
Ramachandran outliers	138981	2592 (1.86-1.86)
Sidechain outliers	138945	2592 (1.86-1.86)
RSRZ outliers	127900	2436 (1.86-1.86)

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 on 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  $\leq 5\%$ . 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	665	<div> <div>88%</div> <div>6%</div> <div>6%</div> </div>
1	B	665	<div> <div>88%</div> <div>6%</div> <div>6%</div> </div>
2	C	7	<div> <div>86%</div> <div>14%</div> </div>
3	D	10	<div> <div>90%</div> <div>10%</div> </div>
3	G	10	<div> <div>10%</div> <div>90%</div> </div>
4	E	2	<div> <div>100%</div> </div>

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Mol	Chain	Length	Quality of chain
4	H	2	 100%
5	F	6	 100%

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
2	MAN	C	5	-	-	-	X
2	MAN	C	6	-	-	-	X
5	MAN	F	4	-	-	-	X
6	TRS	A	1000	-	-	X	-
6	TRS	B	1000	-	-	X	-
8	EDO	A	1003	-	-	X	-

## 2 Entry composition [i](#)

There are 10 unique types of molecules in this entry. The entry contains 11911 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.

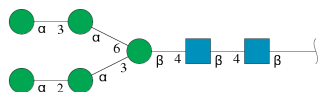
- Molecule 1 is a protein called Beta-fructofuranosidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	624	Total	C	N	O	S	0	1	0
			4805	3063	784	951	7			
1	B	624	Total	C	N	O	S	0	1	0
			4805	3063	784	951	7			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	2	VAL	ILE	conflict	UNP J7HDY4
A	663	ALA	SER	conflict	UNP J7HDY4
A	665	TYR	ARG	conflict	UNP J7HDY4
B	2	VAL	ILE	conflict	UNP J7HDY4
B	663	ALA	SER	conflict	UNP J7HDY4
B	665	TYR	ARG	conflict	UNP J7HDY4

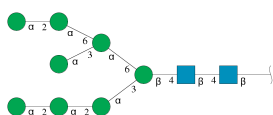
- Molecule 2 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	7	Total	C	N	O		0	0	0
			83	46	2	35				

- Molecule 3 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

ucopyranose.



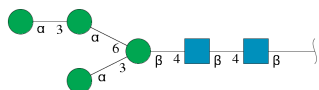
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	D	10	Total	C	N	O	0	0	0
			116	64	2	50			
3	G	10	Total	C	N	O	0	0	0
			116	64	2	50			

- Molecule 4 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
4	E	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	H	2	Total	C	N	O	0	0	0
			28	16	2	10			

- Molecule 5 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



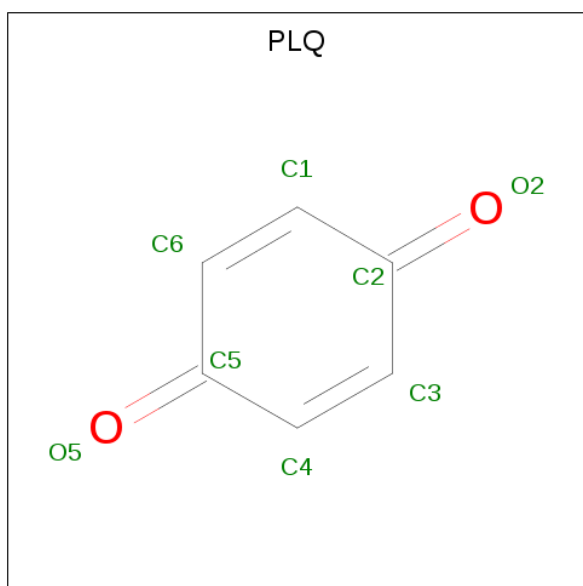
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
5	F	6	Total	C	N	O	0	0	0
			72	40	2	30			

- Molecule 6 is 2-AMINO-2-HYDROXYMETHYL-PROPANE-1,3-DIOL (three-letter code: TRS) (formula: C<sub>4</sub>H<sub>12</sub>NO<sub>3</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	A	1	Total	C	N	O	0	0
			8	4	1	3		
6	B	1	Total	C	N	O	0	0
			8	4	1	3		

- Molecule 7 is 1,4-benzoquinone (three-letter code: PLQ) (formula: C<sub>6</sub>H<sub>4</sub>O<sub>2</sub>) (labeled as "Ligand of Interest" by author).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total	C	O	0	0
			8	6	2		

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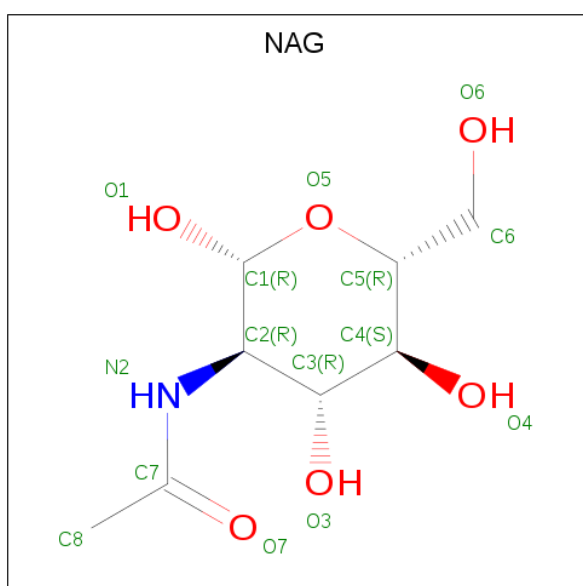
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total	C	O	0	0
			8	6	2		
7	A	1	Total	C	O	0	0
			8	6	2		
7	A	1	Total	C	O	0	0
			8	6	2		
7	A	1	Total	C	O	0	0
			8	6	2		
7	A	1	Total	C	O	0	0
			8	6	2		
7	A	1	Total	C	O	0	0
			8	6	2		
7	A	1	Total	C	O	0	0
			8	6	2		
7	B	1	Total	C	O	0	0
			8	6	2		
7	B	1	Total	C	O	0	0
			8	6	2		
7	B	1	Total	C	O	0	0
			8	6	2		
7	B	1	Total	C	O	0	0
			8	6	2		
7	B	1	Total	C	O	0	0
			8	6	2		
7	B	1	Total	C	O	0	0
			8	6	2		

- Molecule 8 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	A	1	Total	C	O	0	0
			4	2	2		
8	A	1	Total	C	O	0	0
			4	2	2		
8	B	1	Total	C	O	0	0
			4	2	2		
8	B	1	Total	C	O	0	0
			4	2	2		

- Molecule 9 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ).





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

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

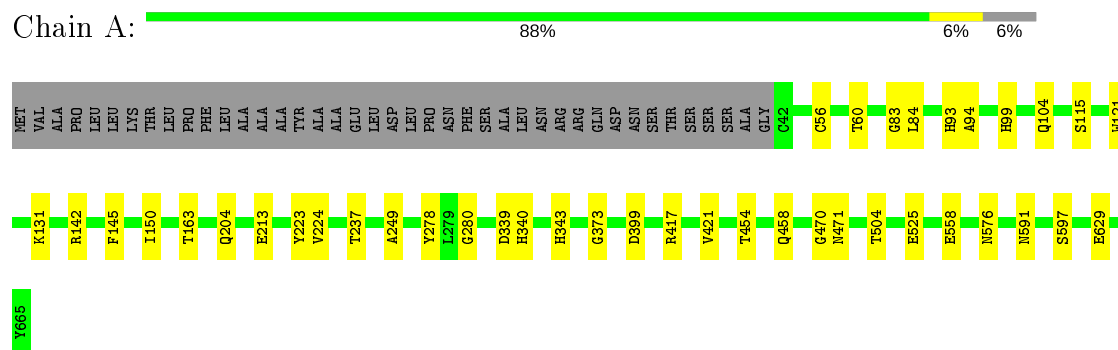
- Molecule 10 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	A	728	Total	O	0	0
			728	728		
10	B	620	Total	O	0	0
			620	620		

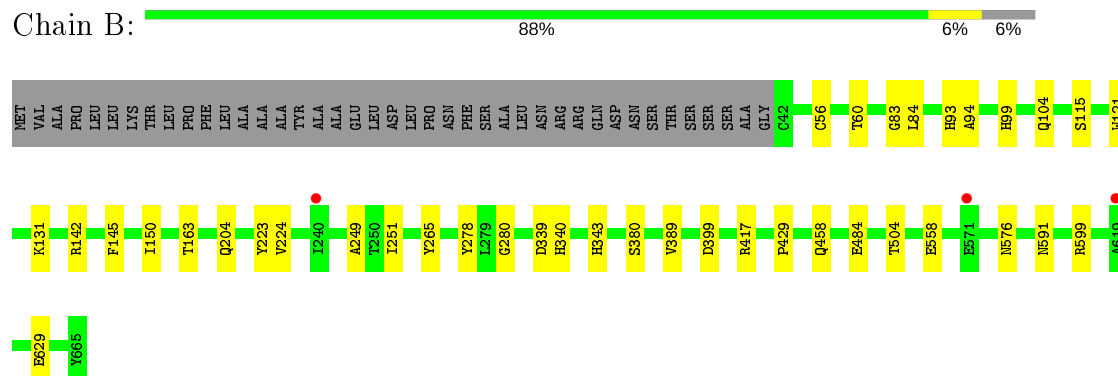
### 3 Residue-property plots

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.

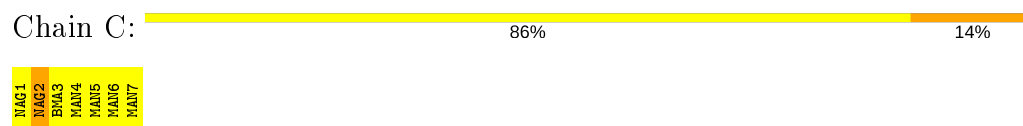
- Molecule 1: Beta-fructofuranosidase



- Molecule 1: Beta-fructofuranosidase



- Molecule 2: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 3: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]-alpha-D-mannopyranose-

(1-3)]alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D:  90% 10%

MAN1  
MAN2  
MAN3  
MAN4  
MAN5  
MAN6  
MAN7  
MAN8  
MAN9  
MAN10

- Molecule 3: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:  10% 90%

MAN1  
MAN2  
MAN3  
MAN4  
MAN5  
MAN6  
MAN7  
MAN8  
MAN9  
MAN10

- Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain E:  100%

MAN1  
MAN2

- Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain H:  100%

MAN1  
MAN2

- Molecule 5: alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain F:  100%

MAN1  
MAN2  
MAN3  
MAN4  
MAN5  
MAN6

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	74.58Å 205.62Å 145.37Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	83.94 – 1.85 83.94 – 1.85	Depositor EDS
% Data completeness (in resolution range)	99.9 (83.94-1.85) 99.9 (83.94-1.85)	Depositor EDS
$R_{merge}$	0.08	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.15 (at 1.84Å)	Xtriage
Refinement program	REFMAC 5.8.0238	Depositor
R, $R_{free}$	0.154 , 0.175 0.166 , 0.184	Depositor DCC
$R_{free}$ test set	9619 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	21.6	Xtriage
Anisotropy	0.753	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.38 , 48.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	11911	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.82% 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.

## 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: BMA, NAG, PLQ, EDO, TRS, MAN

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	0.74	1/4940 (0.0%)	0.84	0/6754
1	B	0.71	0/4940	0.82	1/6754 (0.0%)
All	All	0.73	1/9880 (0.0%)	0.83	1/13508 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	213	GLU	CD-OE2	7.12	1.33	1.25

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	599	ARG	NE-CZ-NH2	-5.63	117.49	120.30

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	4805	0	4498	36	0
1	B	4805	0	4501	29	0
2	C	83	0	70	1	0
3	D	116	0	97	0	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	G	116	0	97	0	0
4	E	28	0	25	0	0
4	H	28	0	25	0	0
5	F	72	0	61	0	0
6	A	8	0	12	9	0
6	B	8	0	12	6	0
7	A	72	0	36	3	0
7	B	56	0	28	3	0
8	A	8	0	12	7	0
8	B	8	0	12	5	0
9	A	196	0	182	6	0
9	B	154	0	143	1	0
10	A	728	0	0	7	1
10	B	620	0	0	5	0
All	All	11911	0	9811	79	2

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 4.

The worst 5 of 79 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)
6:B:1000:TRS:H31	8:B:1003:EDO:O1	1.56	1.04
6:A:1000:TRS:H32	8:A:1003:EDO:H21	1.62	0.80
1:A:525:GLU:H	9:A:1606:NAG:H81	1.45	0.79
7:A:1001:PLQ:H6	8:A:1002:EDO:O2	1.83	0.77
1:A:576:ASN:H	1:A:591:ASN:HD21	1.32	0.77

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:A:2588:HOH:O	10:A:2588:HOH:O[2_555]	1.87	0.33
3:D:8:MAN:O4	3:D:8:MAN:O4[2_555]	2.05	0.15

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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	623/665 (94%)	595 (96%)	28 (4%)	0	100	100
1	B	623/665 (94%)	595 (96%)	28 (4%)	0	100	100
All	All	1246/1330 (94%)	1190 (96%)	56 (4%)	0	100	100

There are no Ramachandran outliers to report.

### 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	498/530 (94%)	497 (100%)	1 (0%)	93	92
1	B	498/530 (94%)	497 (100%)	1 (0%)	93	92
All	All	996/1060 (94%)	994 (100%)	2 (0%)	93	92

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	142	ARG
1	B	142	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 19 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	458	GLN

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Mol	Chain	Res	Type
1	B	93	HIS
1	B	343	HIS
1	A	426	ASN
1	B	388	GLN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates ⓘ

37 monosaccharides 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	NAG	C	1	1,2	14,14,15	0.55	0	17,19,21	1.62	3 (17%)
2	NAG	C	2	2	14,14,15	1.37	3 (21%)	17,19,21	1.46	2 (11%)
2	BMA	C	3	2	11,11,12	1.02	1 (9%)	15,15,17	1.87	5 (33%)
2	MAN	C	4	2	11,11,12	0.46	0	15,15,17	1.38	2 (13%)
2	MAN	C	5	2	11,11,12	1.02	2 (18%)	15,15,17	2.25	4 (26%)
2	MAN	C	6	2	11,11,12	1.56	3 (27%)	15,15,17	2.24	6 (40%)
2	MAN	C	7	2	11,11,12	1.10	1 (9%)	15,15,17	1.45	2 (13%)
3	NAG	D	1	1,3	14,14,15	1.37	1 (7%)	17,19,21	1.15	1 (5%)
3	MAN	D	10	3	11,11,12	1.06	0	15,15,17	1.47	2 (13%)
3	NAG	D	2	3	14,14,15	1.28	3 (21%)	17,19,21	1.55	3 (17%)
3	BMA	D	3	3	11,11,12	0.91	0	15,15,17	1.33	1 (6%)
3	MAN	D	4	3	11,11,12	0.65	0	15,15,17	1.88	5 (33%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	MAN	D	5	3	11,11,12	0.83	0	15,15,17	1.71	1 (6%)
3	MAN	D	6	3	11,11,12	0.49	0	15,15,17	1.12	2 (13%)
3	MAN	D	7	3	11,11,12	0.85	0	15,15,17	1.46	3 (20%)
3	MAN	D	8	3	11,11,12	1.12	1 (9%)	15,15,17	1.36	3 (20%)
3	MAN	D	9	3	11,11,12	1.08	1 (9%)	15,15,17	1.67	3 (20%)
4	NAG	E	1	1,4	14,14,15	0.51	0	17,19,21	1.36	2 (11%)
4	NAG	E	2	4	14,14,15	0.59	0	17,19,21	1.48	2 (11%)
5	NAG	F	1	1,5	14,14,15	0.51	0	17,19,21	1.62	3 (17%)
5	NAG	F	2	5	14,14,15	1.34	1 (7%)	17,19,21	1.14	1 (5%)
5	BMA	F	3	5	11,11,12	0.68	0	15,15,17	1.75	2 (13%)
5	MAN	F	4	5	11,11,12	1.55	2 (18%)	15,15,17	2.50	4 (26%)
5	MAN	F	5	5	11,11,12	0.85	0	15,15,17	1.12	2 (13%)
5	MAN	F	6	5	11,11,12	0.59	0	15,15,17	1.53	2 (13%)
3	NAG	G	1	1,3	14,14,15	1.37	2 (14%)	17,19,21	1.18	2 (11%)
3	MAN	G	10	3	11,11,12	0.76	0	15,15,17	1.00	0
3	NAG	G	2	3	14,14,15	0.92	0	17,19,21	1.32	3 (17%)
3	BMA	G	3	3	11,11,12	0.86	0	15,15,17	1.15	2 (13%)
3	MAN	G	4	3	11,11,12	0.77	0	15,15,17	1.69	2 (13%)
3	MAN	G	5	3	11,11,12	0.73	0	15,15,17	0.98	1 (6%)
3	MAN	G	6	3	11,11,12	0.69	0	15,15,17	2.26	4 (26%)
3	MAN	G	7	3	11,11,12	0.75	0	15,15,17	1.46	2 (13%)
3	MAN	G	8	3	11,11,12	0.98	1 (9%)	15,15,17	1.30	3 (20%)
3	MAN	G	9	3	11,11,12	1.20	1 (9%)	15,15,17	1.85	4 (26%)
4	NAG	H	1	1,4	14,14,15	0.43	0	17,19,21	1.44	3 (17%)
4	NAG	H	2	4	14,14,15	0.80	0	17,19,21	1.24	1 (5%)

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	NAG	C	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	C	2	2	-	2/6/23/26	0/1/1/1
2	BMA	C	3	2	-	1/2/19/22	0/1/1/1
2	MAN	C	4	2	-	0/2/19/22	0/1/1/1
2	MAN	C	5	2	-	1/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	MAN	C	6	2	-	0/2/19/22	0/1/1/1
2	MAN	C	7	2	-	1/2/19/22	0/1/1/1
3	NAG	D	1	1,3	-	0/6/23/26	0/1/1/1
3	MAN	D	10	3	-	0/2/19/22	0/1/1/1
3	NAG	D	2	3	-	0/6/23/26	0/1/1/1
3	BMA	D	3	3	-	0/2/19/22	0/1/1/1
3	MAN	D	4	3	-	0/2/19/22	0/1/1/1
3	MAN	D	5	3	-	2/2/19/22	0/1/1/1
3	MAN	D	6	3	-	2/2/19/22	0/1/1/1
3	MAN	D	7	3	-	0/2/19/22	0/1/1/1
3	MAN	D	8	3	-	0/2/19/22	0/1/1/1
3	MAN	D	9	3	-	0/2/19/22	0/1/1/1
4	NAG	E	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	E	2	4	-	2/6/23/26	0/1/1/1
5	NAG	F	1	1,5	-	0/6/23/26	0/1/1/1
5	NAG	F	2	5	-	0/6/23/26	0/1/1/1
5	BMA	F	3	5	-	2/2/19/22	0/1/1/1
5	MAN	F	4	5	-	0/2/19/22	0/1/1/1
5	MAN	F	5	5	-	1/2/19/22	0/1/1/1
5	MAN	F	6	5	-	0/2/19/22	0/1/1/1
3	NAG	G	1	1,3	-	0/6/23/26	0/1/1/1
3	MAN	G	10	3	-	0/2/19/22	0/1/1/1
3	NAG	G	2	3	-	0/6/23/26	0/1/1/1
3	BMA	G	3	3	-	0/2/19/22	0/1/1/1
3	MAN	G	4	3	-	1/2/19/22	0/1/1/1
3	MAN	G	5	3	-	2/2/19/22	0/1/1/1
3	MAN	G	6	3	-	2/2/19/22	0/1/1/1
3	MAN	G	7	3	-	0/2/19/22	0/1/1/1
3	MAN	G	8	3	-	0/2/19/22	0/1/1/1
3	MAN	G	9	3	-	1/2/19/22	0/1/1/1
4	NAG	H	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	H	2	4	-	0/6/23/26	0/1/1/1

The worst 5 of 23 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	F	2	NAG	O5-C1	-3.78	1.37	1.43
5	F	4	MAN	C2-C3	3.64	1.57	1.52
3	D	1	NAG	C1-C2	3.41	1.57	1.52
3	G	1	NAG	O5-C1	-3.09	1.38	1.43
2	C	2	NAG	C8-C7	-3.09	1.44	1.50

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

Mol	Chain	Res	Type	Atoms	Z	Observed( $^{\circ}$ )	Ideal( $^{\circ}$ )
5	F	4	MAN	C1-C2-C3	7.81	119.26	109.67
3	G	6	MAN	C1-O5-C5	5.80	120.05	112.19
2	C	5	MAN	C1-C2-C3	5.42	116.33	109.67
3	D	5	MAN	C1-O5-C5	5.35	119.44	112.19
5	F	3	BMA	O5-C5-C6	5.24	115.42	107.20

There are no chirality outliers.

5 of 20 torsion outliers are listed below:

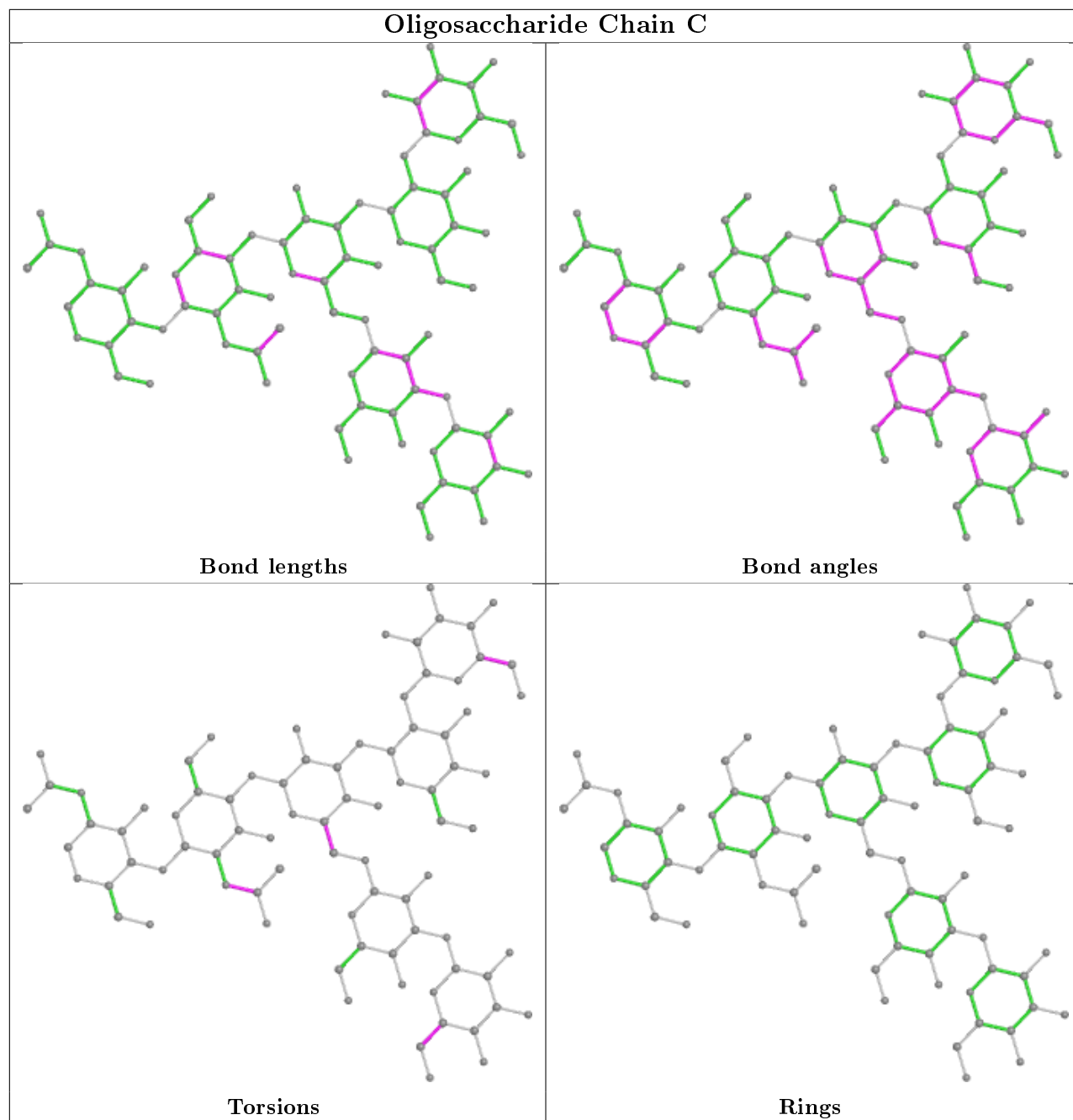
Mol	Chain	Res	Type	Atoms
3	G	6	MAN	O5-C5-C6-O6
3	D	6	MAN	O5-C5-C6-O6
5	F	3	BMA	O5-C5-C6-O6
3	D	5	MAN	O5-C5-C6-O6
4	E	2	NAG	O7-C7-N2-C2

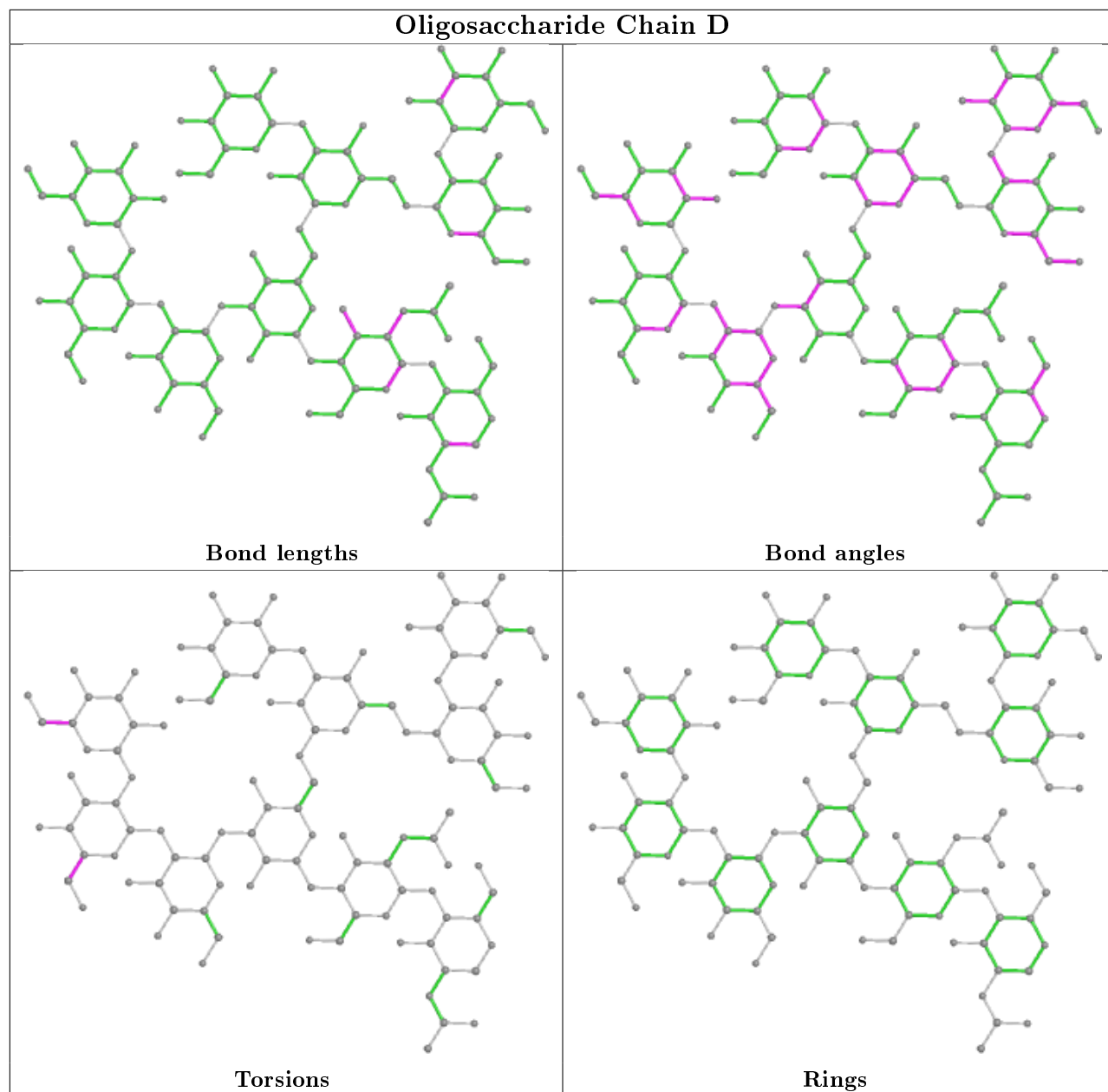
There are no ring outliers.

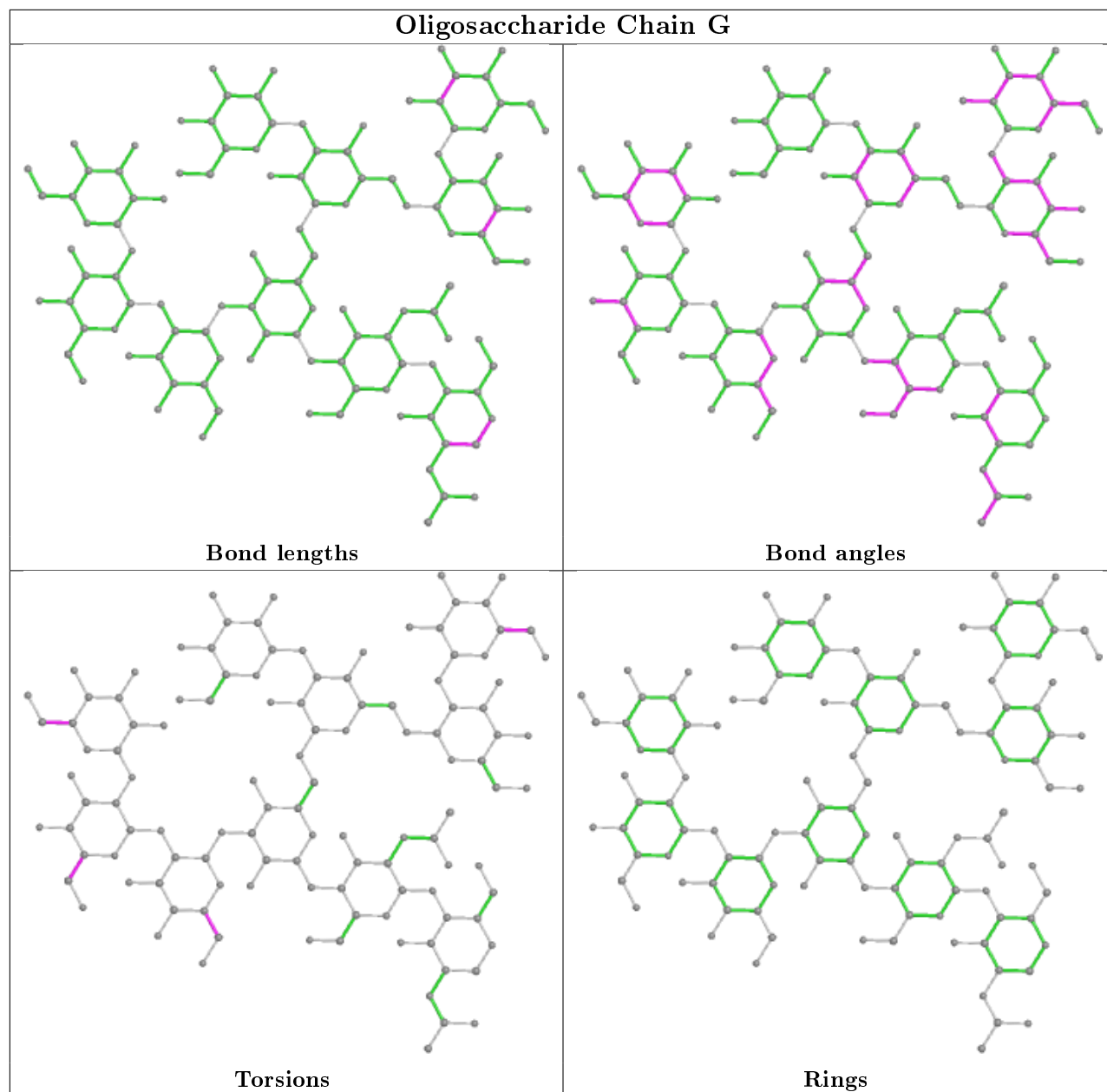
2 monomers are involved in 2 short contacts:

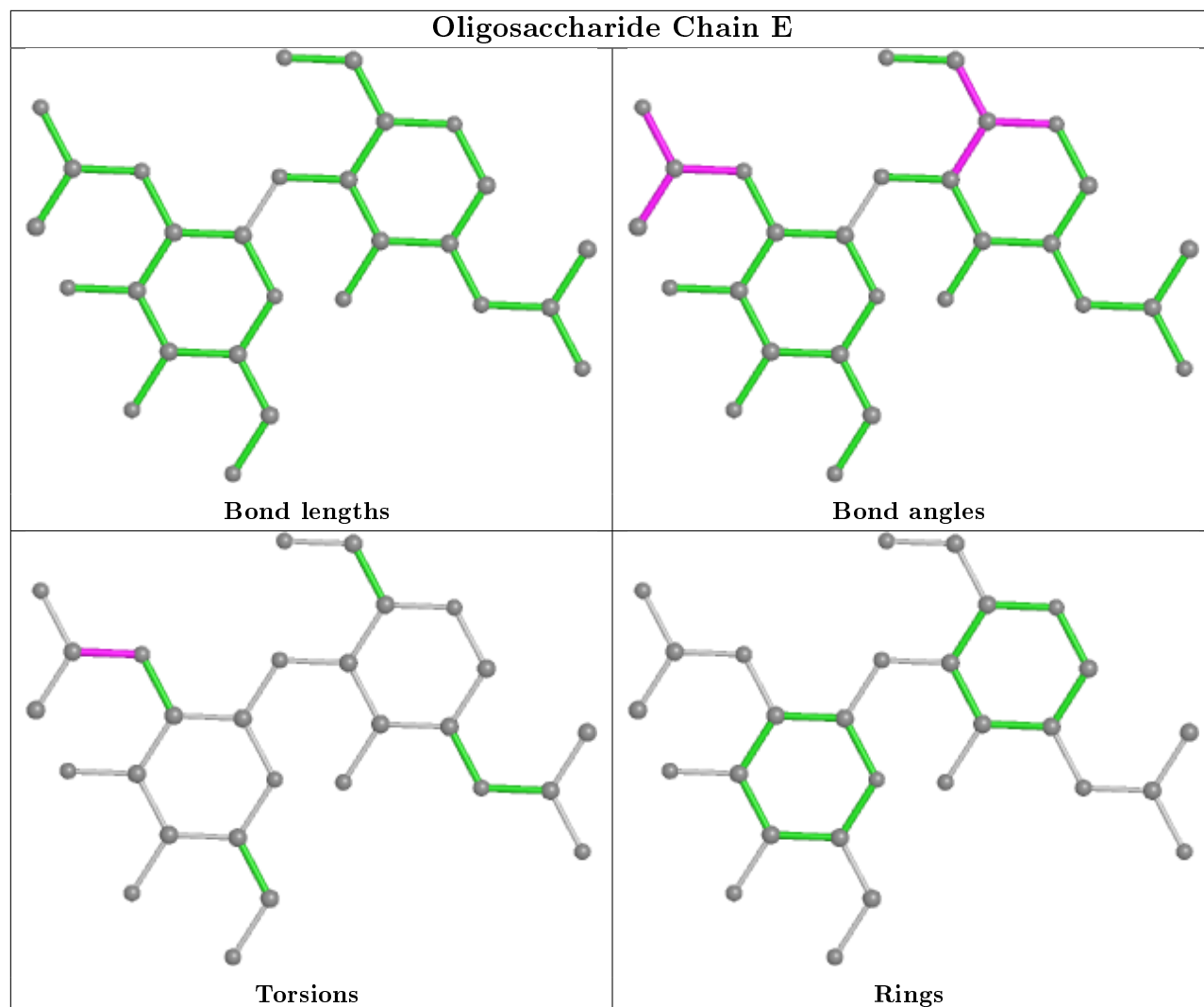
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	2	NAG	1	0
3	D	8	MAN	0	1

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

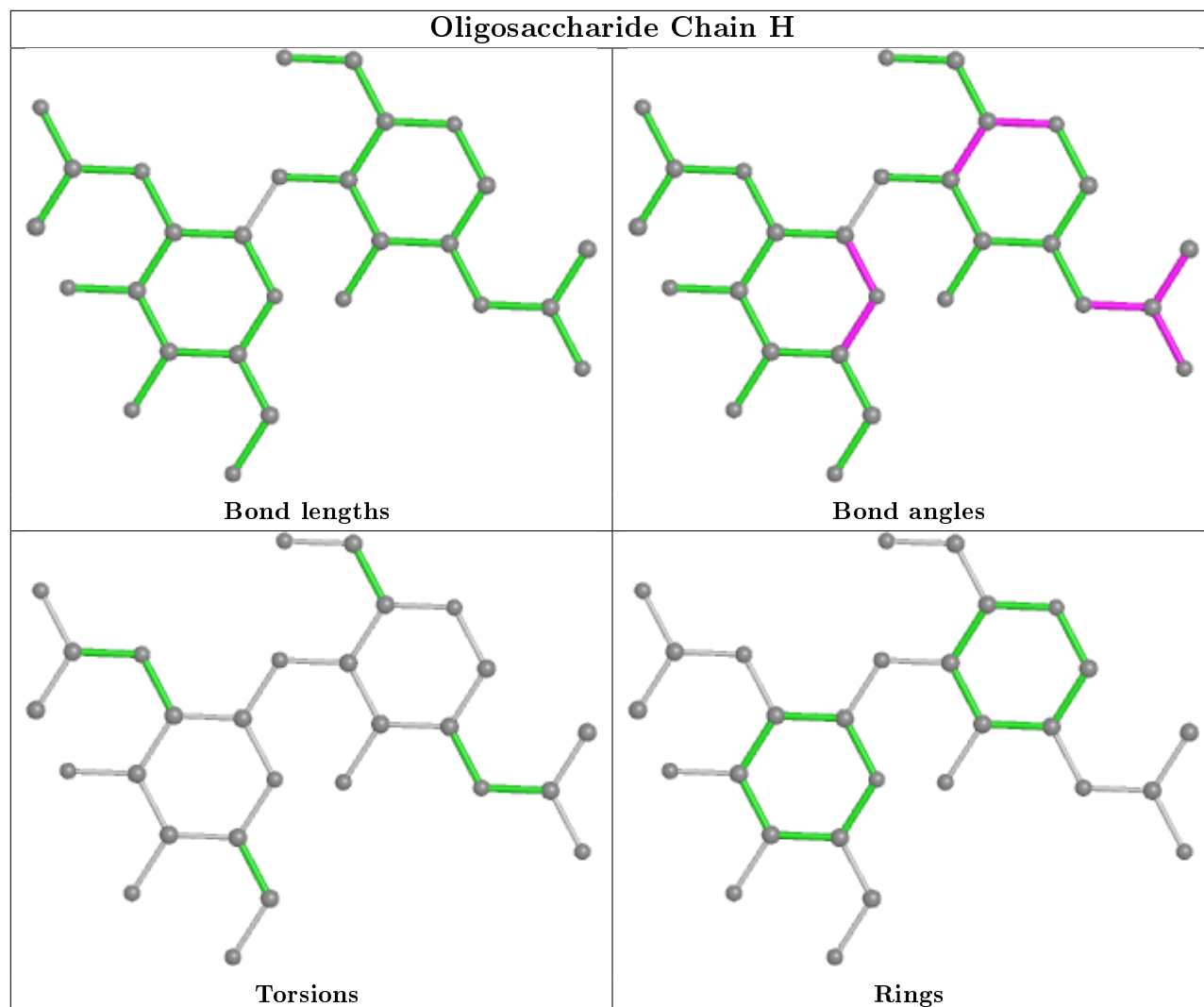


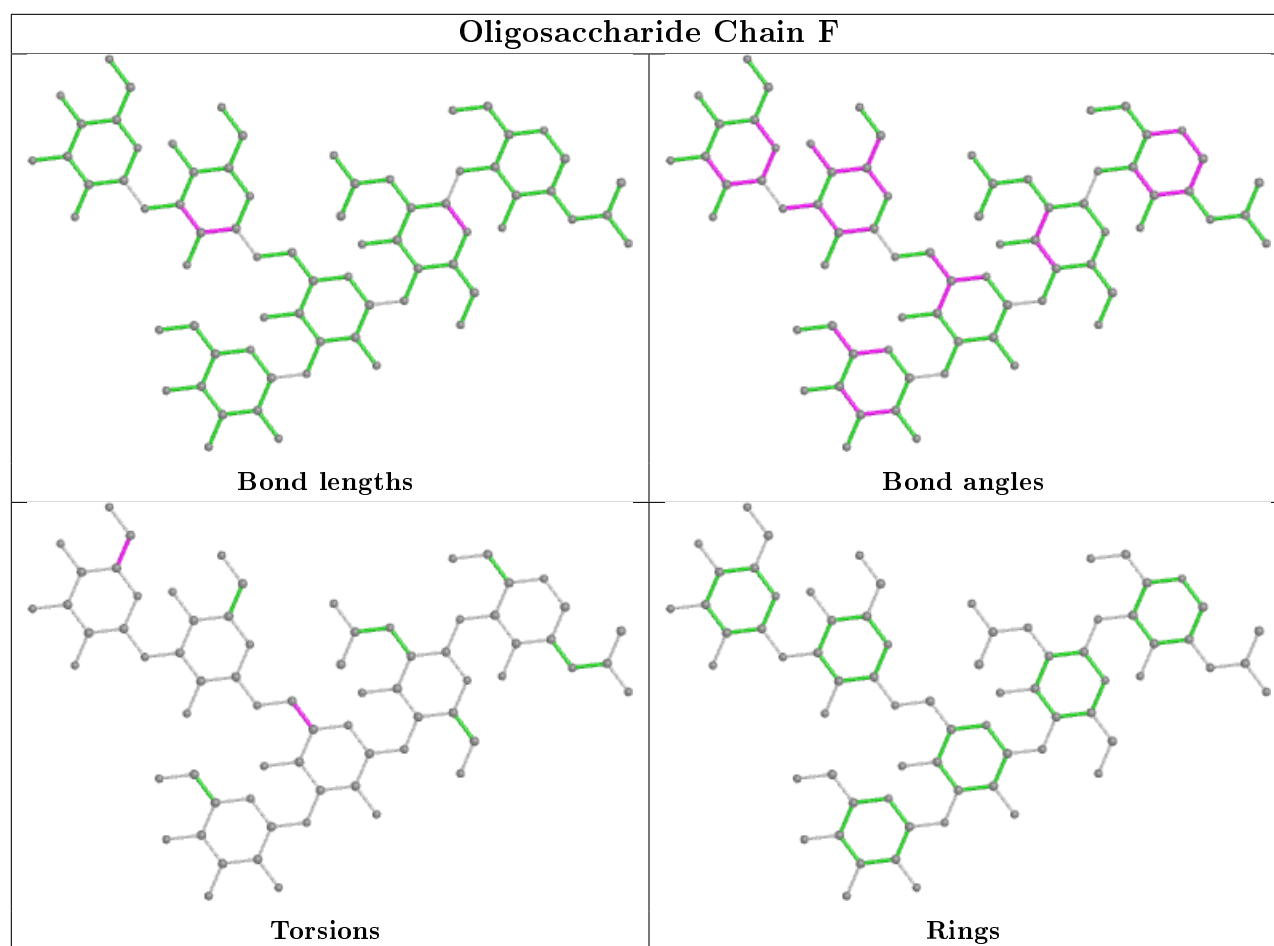












## 5.6 Ligand geometry [i](#)

47 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	$\# Z  > 2$
9	NAG	B	1555	1	14,14,15	1.00	1 (7%)	17,19,21	1.26	1 (5%)
9	NAG	B	1539	1	14,14,15	1.22	2 (14%)	17,19,21	1.99	5 (29%)
9	NAG	A	1539	1	14,14,15	1.00	2 (14%)	17,19,21	1.61	2 (11%)
9	NAG	A	1644	1	14,14,15	1.03	1 (7%)	17,19,21	1.37	3 (17%)
9	NAG	A	1357	1	14,14,15	0.88	0	17,19,21	1.66	4 (23%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
9	NAG	A	1444	1	14,14,15	0.89	0	17,19,21	1.13	2 (11%)
9	NAG	B	1052	1	14,14,15	0.30	0	17,19,21	1.05	0
9	NAG	B	1319	1	14,14,15	0.49	0	17,19,21	1.98	2 (11%)
9	NAG	A	1052	1	14,14,15	0.49	0	17,19,21	1.95	5 (29%)
7	PLQ	B	1009	-	8,8,8	0.93	0	10,10,10	0.29	0
6	TRS	B	1000	-	7,7,7	0.73	0	9,9,9	1.27	1 (11%)
9	NAG	A	1236	1	14,14,15	1.38	2 (14%)	17,19,21	1.35	3 (17%)
8	EDO	A	1002	-	3,3,3	0.06	0	2,2,2	0.25	0
9	NAG	A	1483	1	14,14,15	0.57	0	17,19,21	1.33	4 (23%)
9	NAG	B	1644	1	14,14,15	1.03	2 (14%)	17,19,21	1.53	2 (11%)
9	NAG	B	1444	1	14,14,15	0.95	1 (7%)	17,19,21	1.60	2 (11%)
9	NAG	A	1555	1	14,14,15	0.83	0	17,19,21	2.34	10 (58%)
7	PLQ	A	1001	-	8,8,8	0.92	0	10,10,10	0.29	0
8	EDO	B	1002	-	3,3,3	0.06	0	2,2,2	0.18	0
7	PLQ	B	1001	-	8,8,8	0.92	0	10,10,10	0.28	0
9	NAG	A	1471	1	14,14,15	0.66	0	17,19,21	1.64	2 (11%)
9	NAG	A	1242	1	14,14,15	0.42	0	17,19,21	1.57	4 (23%)
8	EDO	A	1003	-	3,3,3	0.13	0	2,2,2	0.44	0
8	EDO	B	1003	-	3,3,3	0.06	0	2,2,2	0.30	0
7	PLQ	A	1007	-	8,8,8	0.92	0	10,10,10	0.29	0
9	NAG	A	1215	1	14,14,15	0.86	0	17,19,21	2.79	7 (41%)
9	NAG	B	1357	1	14,14,15	0.70	0	17,19,21	1.54	3 (17%)
7	PLQ	A	1004	-	8,8,8	0.92	0	10,10,10	0.29	0
7	PLQ	A	1010	-	8,8,8	0.94	0	10,10,10	0.30	0
7	PLQ	B	1006	-	8,8,8	0.93	0	10,10,10	0.28	0
7	PLQ	B	1005	-	8,8,8	0.93	0	10,10,10	0.29	0
9	NAG	A	1606	1	14,14,15	0.65	0	17,19,21	2.09	5 (29%)
6	TRS	A	1000	-	7,7,7	0.94	0	9,9,9	1.58	3 (33%)
7	PLQ	A	1005	-	8,8,8	0.91	0	10,10,10	0.29	0
9	NAG	A	1512	1	14,14,15	0.49	0	17,19,21	2.39	5 (29%)
7	PLQ	A	1006	-	8,8,8	0.93	0	10,10,10	0.29	0
9	NAG	B	1471	1	14,14,15	0.90	0	17,19,21	1.40	3 (17%)
7	PLQ	B	1004	-	8,8,8	0.93	0	10,10,10	0.28	0
7	PLQ	A	1008	-	8,8,8	0.92	0	10,10,10	0.29	0
7	PLQ	B	1008	-	8,8,8	0.92	0	10,10,10	0.28	0
9	NAG	B	1215	1	14,14,15	0.57	0	17,19,21	1.86	4 (23%)
7	PLQ	B	1007	-	8,8,8	0.93	0	10,10,10	0.30	0
7	PLQ	A	1011	-	8,8,8	0.91	0	10,10,10	0.28	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
9	NAG	B	1483	1	14,14,15	0.50	0	17,19,21	1.78	3 (17%)
9	NAG	A	1319	1	14,14,15	0.68	0	17,19,21	1.34	3 (17%)
7	PLQ	A	1009	-	8,8,8	0.93	0	10,10,10	0.29	0
9	NAG	B	1242	1	14,14,15	0.80	0	17,19,21	2.42	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
9	NAG	B	1555	1	-	0/6/23/26	0/1/1/1
9	NAG	B	1539	1	-	2/6/23/26	0/1/1/1
9	NAG	A	1539	1	-	2/6/23/26	0/1/1/1
9	NAG	A	1644	1	-	0/6/23/26	0/1/1/1
9	NAG	A	1357	1	-	2/6/23/26	0/1/1/1
9	NAG	A	1444	1	-	1/6/23/26	0/1/1/1
9	NAG	B	1052	1	-	1/6/23/26	0/1/1/1
9	NAG	B	1319	1	-	1/6/23/26	0/1/1/1
9	NAG	A	1052	1	-	3/6/23/26	0/1/1/1
9	NAG	A	1483	1	-	0/6/23/26	0/1/1/1
6	TRS	B	1000	-	-	3/9/9/9	-
7	PLQ	B	1009	-	-	-	0/1/1/1
9	NAG	A	1236	1	-	0/6/23/26	0/1/1/1
8	EDO	A	1002	-	-	1/1/1/1	-
9	NAG	B	1644	1	-	0/6/23/26	0/1/1/1
9	NAG	B	1444	1	-	2/6/23/26	0/1/1/1
9	NAG	A	1555	1	-	3/6/23/26	0/1/1/1
7	PLQ	A	1001	-	-	-	0/1/1/1
8	EDO	B	1002	-	-	1/1/1/1	-
7	PLQ	B	1001	-	-	-	0/1/1/1
9	NAG	A	1471	1	-	2/6/23/26	0/1/1/1
9	NAG	A	1242	1	-	0/6/23/26	0/1/1/1
8	EDO	A	1003	-	-	1/1/1/1	-
8	EDO	B	1003	-	-	1/1/1/1	-
7	PLQ	A	1007	-	-	-	0/1/1/1
7	PLQ	A	1009	-	-	-	0/1/1/1
9	NAG	B	1357	1	-	2/6/23/26	0/1/1/1
7	PLQ	A	1004	-	-	-	0/1/1/1
7	PLQ	A	1010	-	-	-	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	PLQ	B	1006	-	-	-	0/1/1/1
7	PLQ	B	1005	-	-	-	0/1/1/1
9	NAG	A	1606	1	-	4/6/23/26	0/1/1/1
6	TRS	A	1000	-	-	2/9/9/9	-
7	PLQ	A	1005	-	-	-	0/1/1/1
9	NAG	A	1512	1	-	4/6/23/26	0/1/1/1
9	NAG	B	1215	1	-	0/6/23/26	0/1/1/1
9	NAG	B	1471	1	-	0/6/23/26	0/1/1/1
7	PLQ	B	1004	-	-	-	0/1/1/1
7	PLQ	A	1008	-	-	-	0/1/1/1
7	PLQ	B	1008	-	-	-	0/1/1/1
7	PLQ	A	1006	-	-	-	0/1/1/1
7	PLQ	B	1007	-	-	-	0/1/1/1
7	PLQ	A	1011	-	-	-	0/1/1/1
9	NAG	B	1483	1	-	0/6/23/26	0/1/1/1
9	NAG	A	1319	1	-	2/6/23/26	0/1/1/1
9	NAG	A	1215	1	-	1/6/23/26	0/1/1/1
9	NAG	B	1242	1	-	2/6/23/26	0/1/1/1

The worst 5 of 11 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	B	1539	NAG	C1-C2	3.02	1.56	1.52
9	A	1644	NAG	C1-C2	2.69	1.56	1.52
9	B	1644	NAG	C1-C2	2.58	1.56	1.52
9	B	1539	NAG	O5-C1	2.57	1.47	1.43
9	A	1236	NAG	O5-C1	2.39	1.47	1.43

The worst 5 of 95 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	A	1215	NAG	C1-O5-C5	7.10	121.82	112.19
9	A	1512	NAG	C1-O5-C5	6.81	121.42	112.19
9	B	1242	NAG	C1-O5-C5	6.69	121.25	112.19
9	B	1539	NAG	C1-O5-C5	5.90	120.19	112.19
9	B	1319	NAG	C1-O5-C5	5.73	119.95	112.19

There are no chirality outliers.

5 of 43 torsion outliers are listed below:

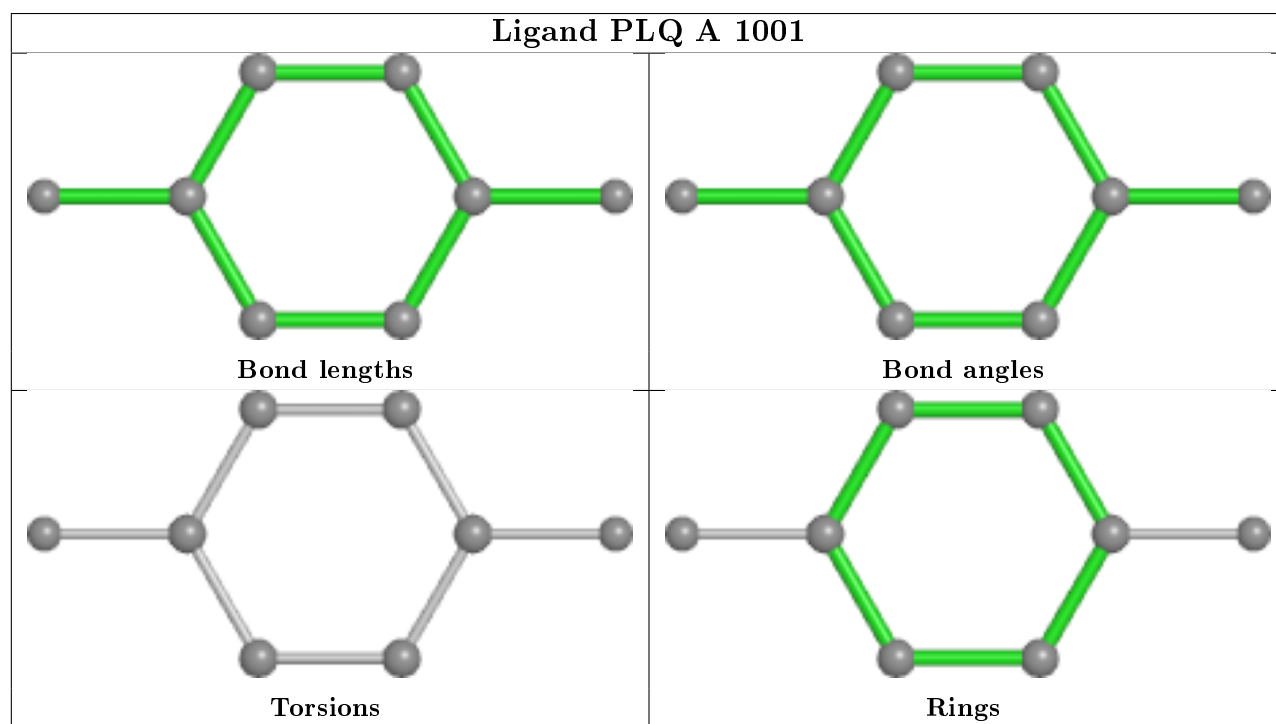
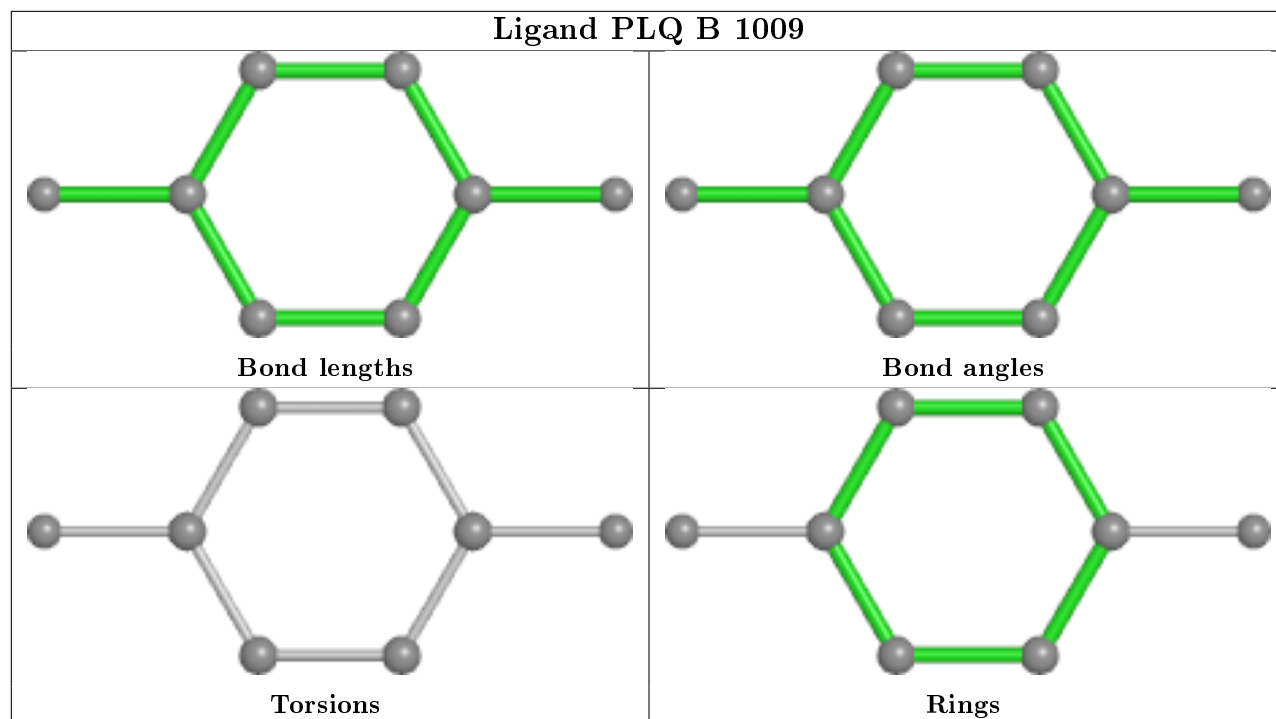
Mol	Chain	Res	Type	Atoms
6	A	1000	TRS	N-C-C1-O1
9	A	1512	NAG	O5-C5-C6-O6
9	B	1539	NAG	C4-C5-C6-O6
9	A	1319	NAG	O5-C5-C6-O6
9	A	1512	NAG	C4-C5-C6-O6

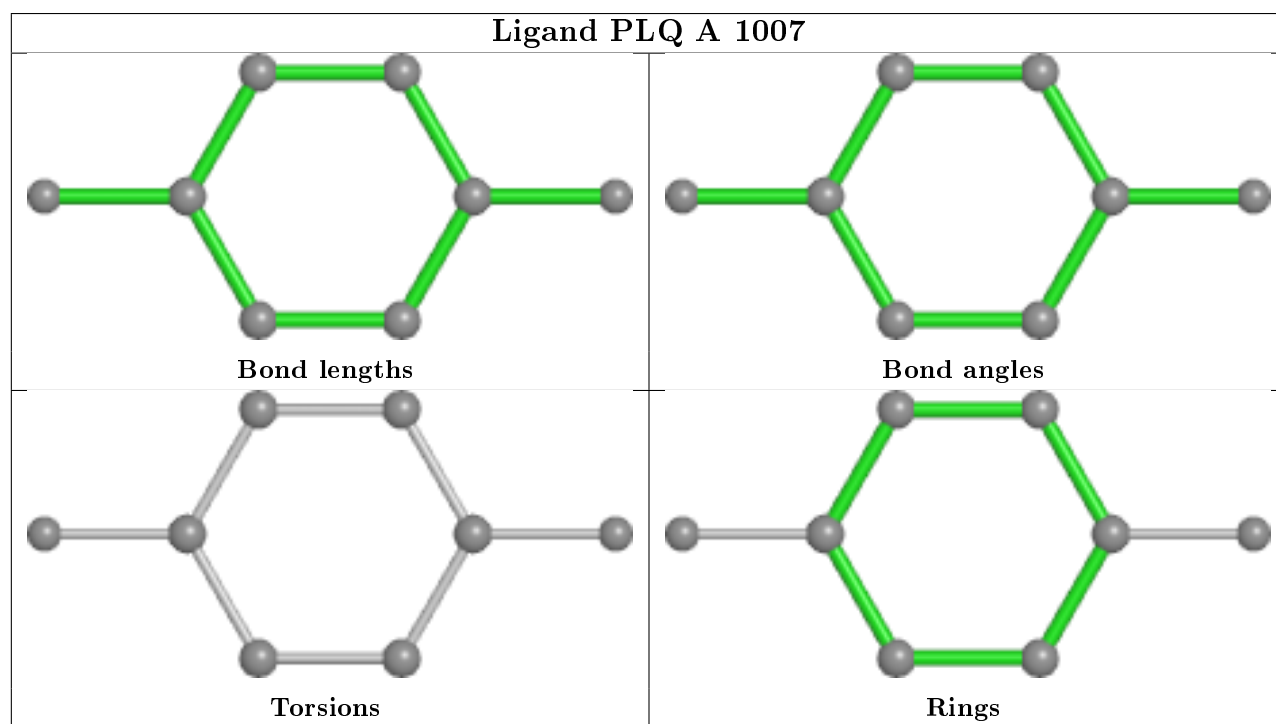
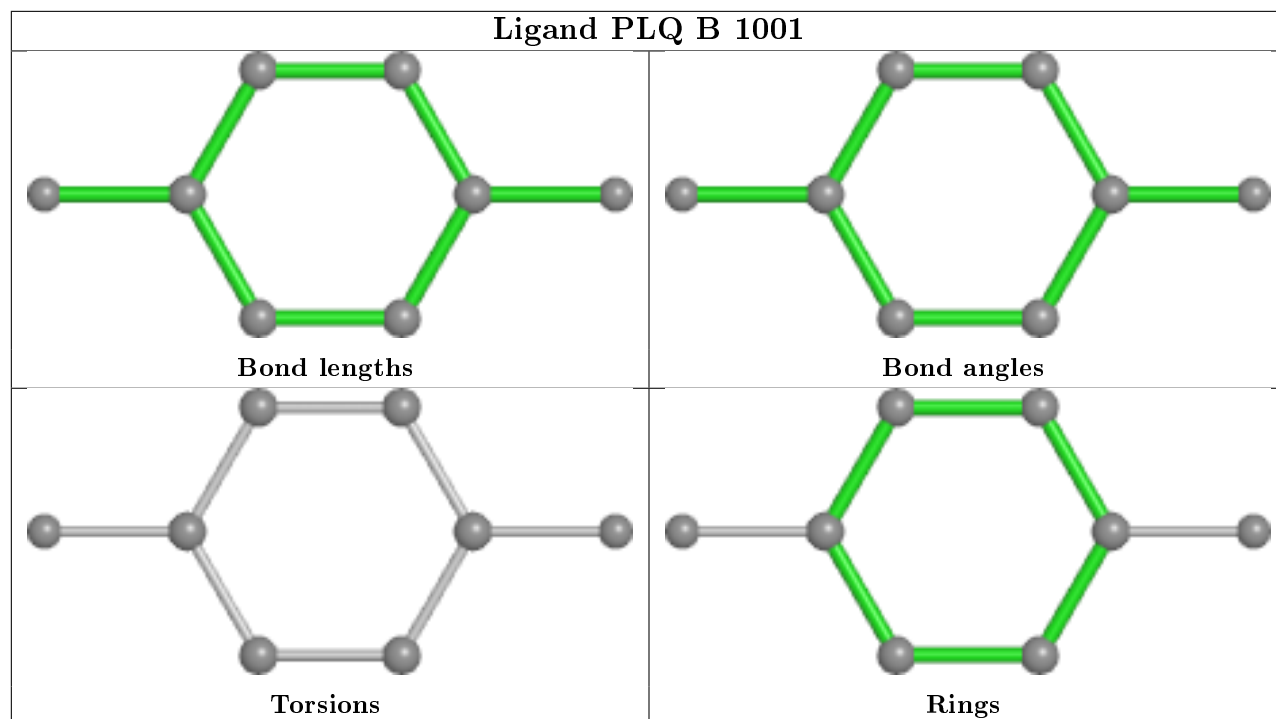
There are no ring outliers.

13 monomers are involved in 28 short contacts:

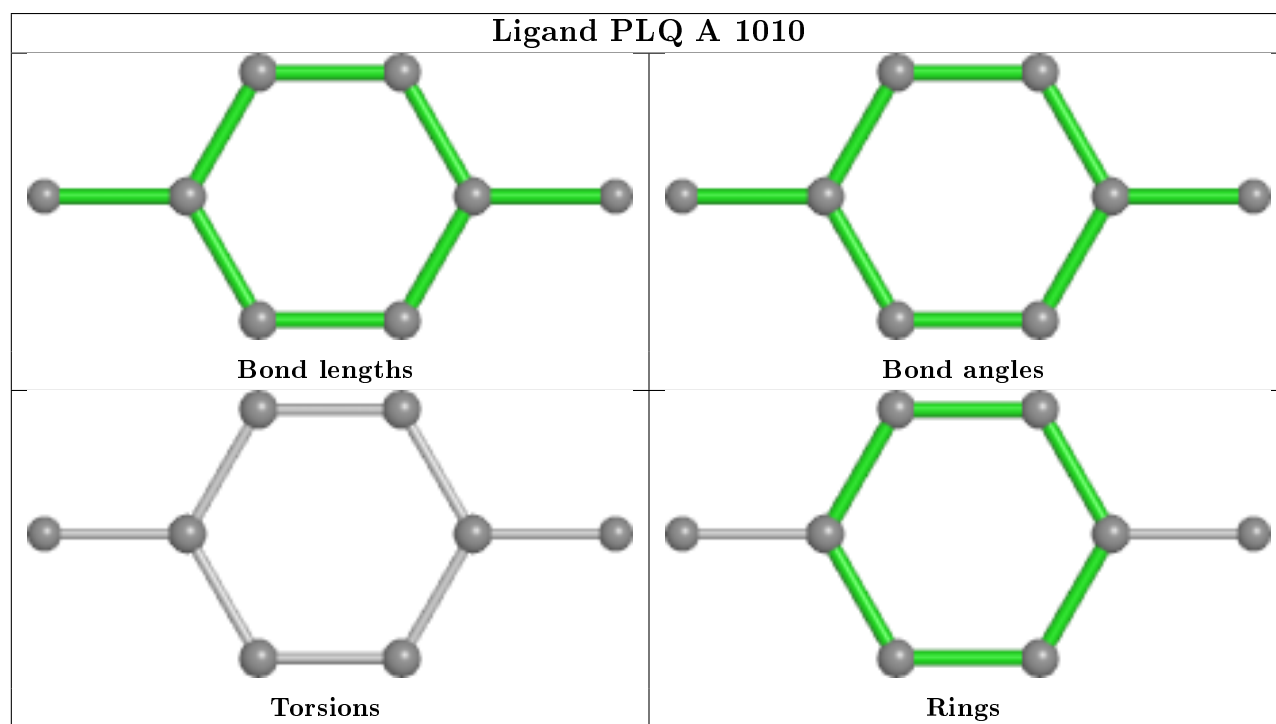
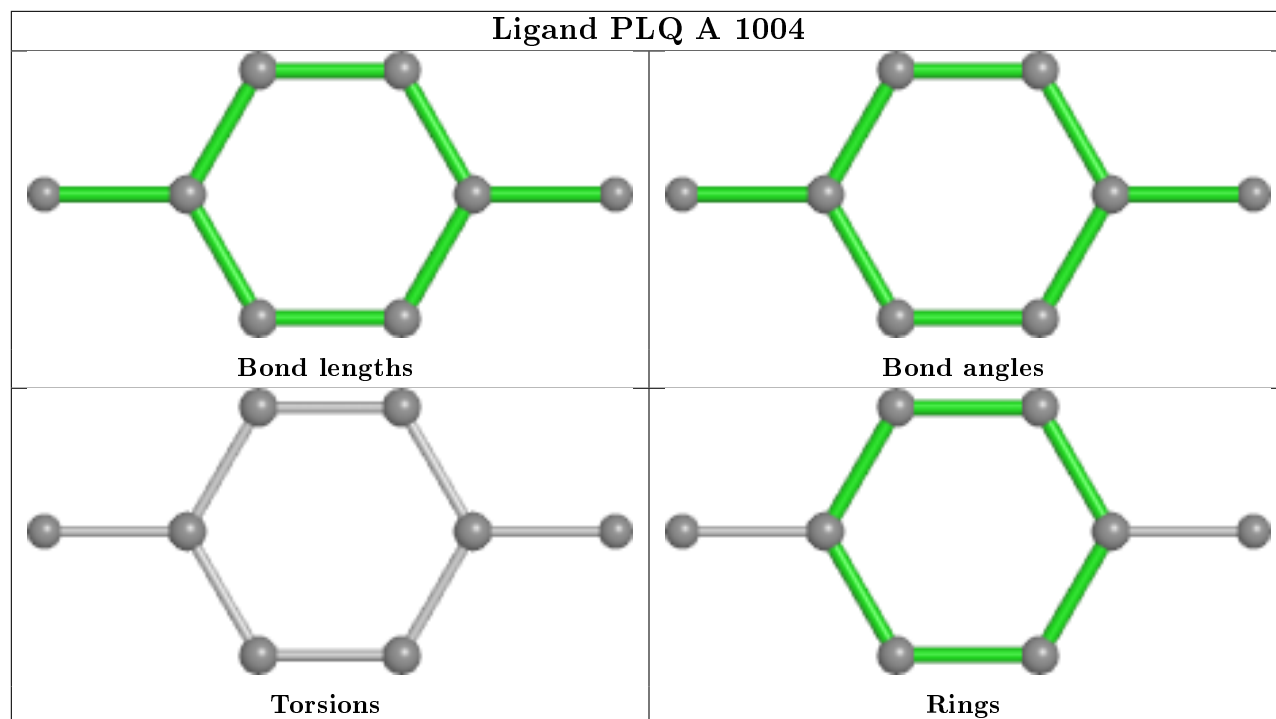
Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	1000	TRS	6	0
8	A	1002	EDO	2	0
9	B	1444	NAG	1	0
7	A	1001	PLQ	2	0
8	B	1002	EDO	2	0
7	B	1001	PLQ	2	0
9	A	1471	NAG	3	0
8	A	1003	EDO	5	0
8	B	1003	EDO	3	0
7	A	1004	PLQ	1	0
9	A	1606	NAG	3	0
6	A	1000	TRS	9	0
7	B	1004	PLQ	1	0

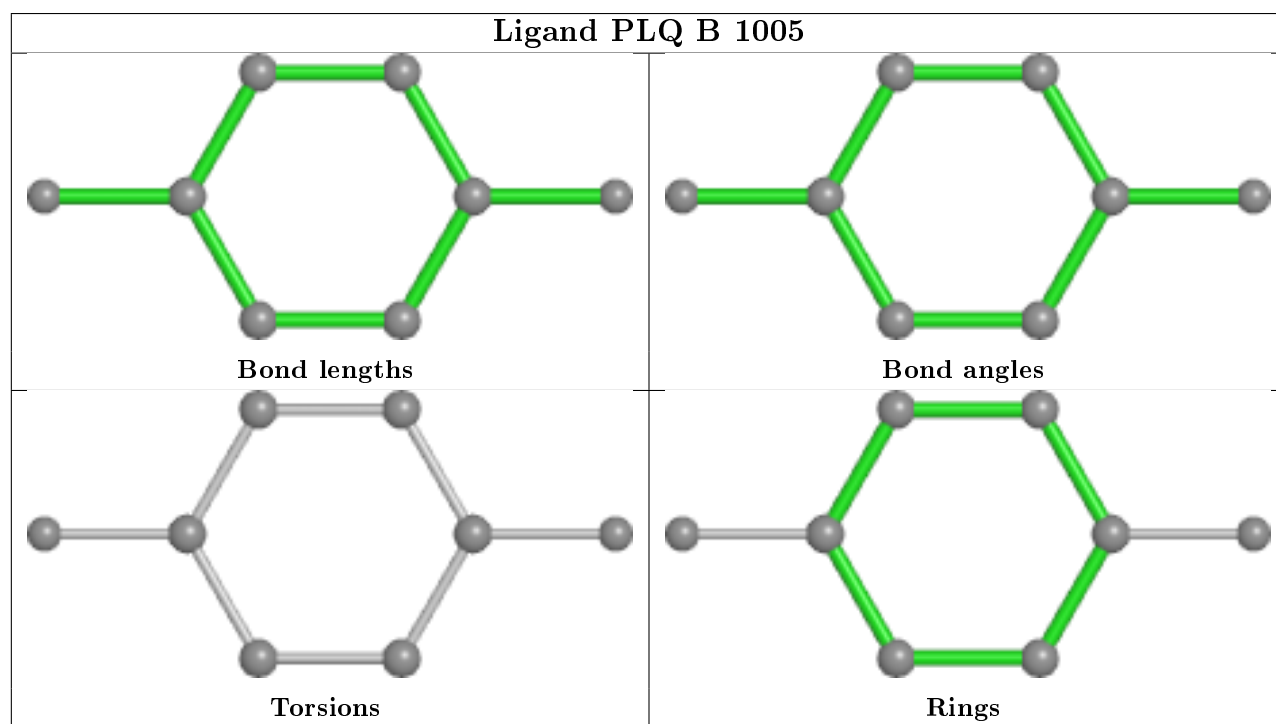
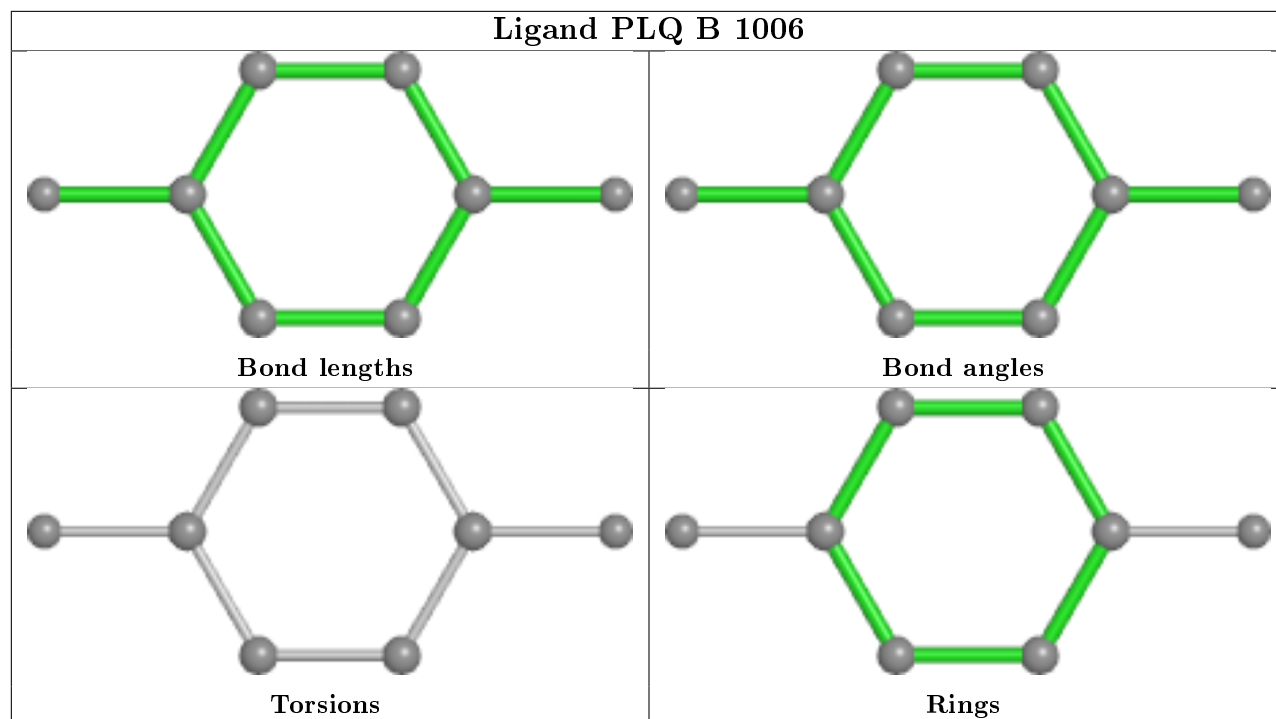
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

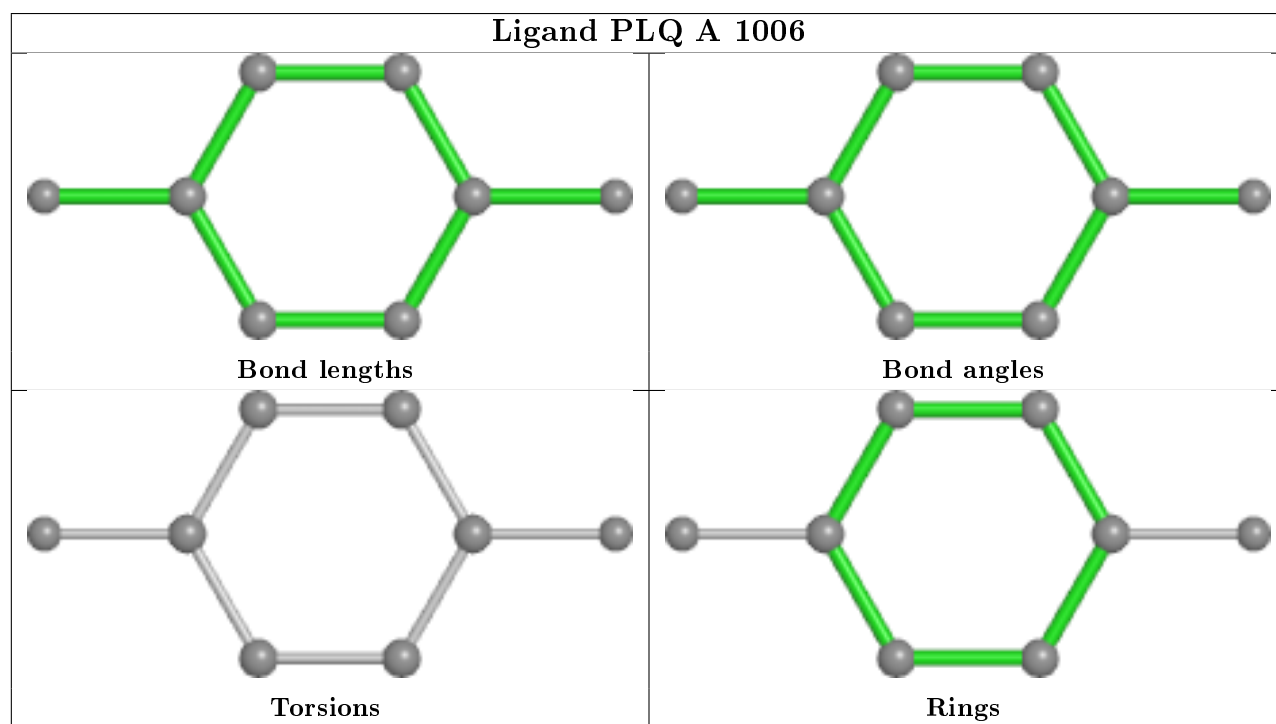
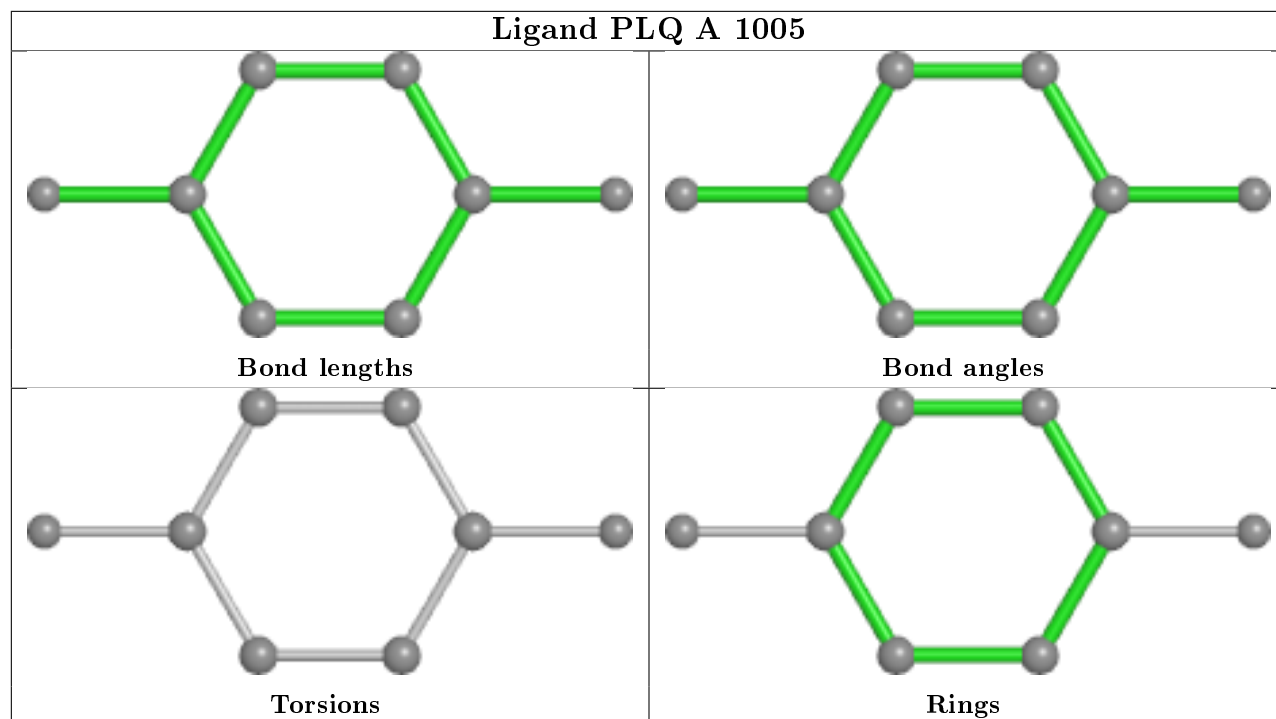


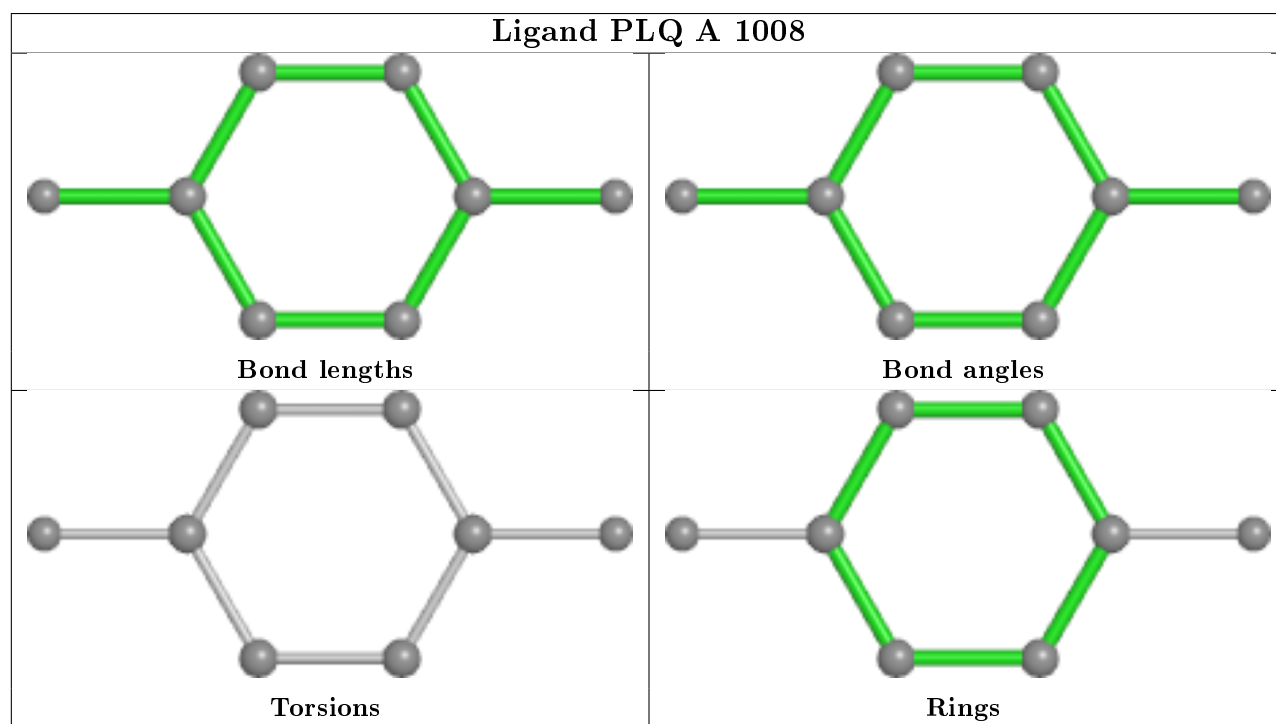
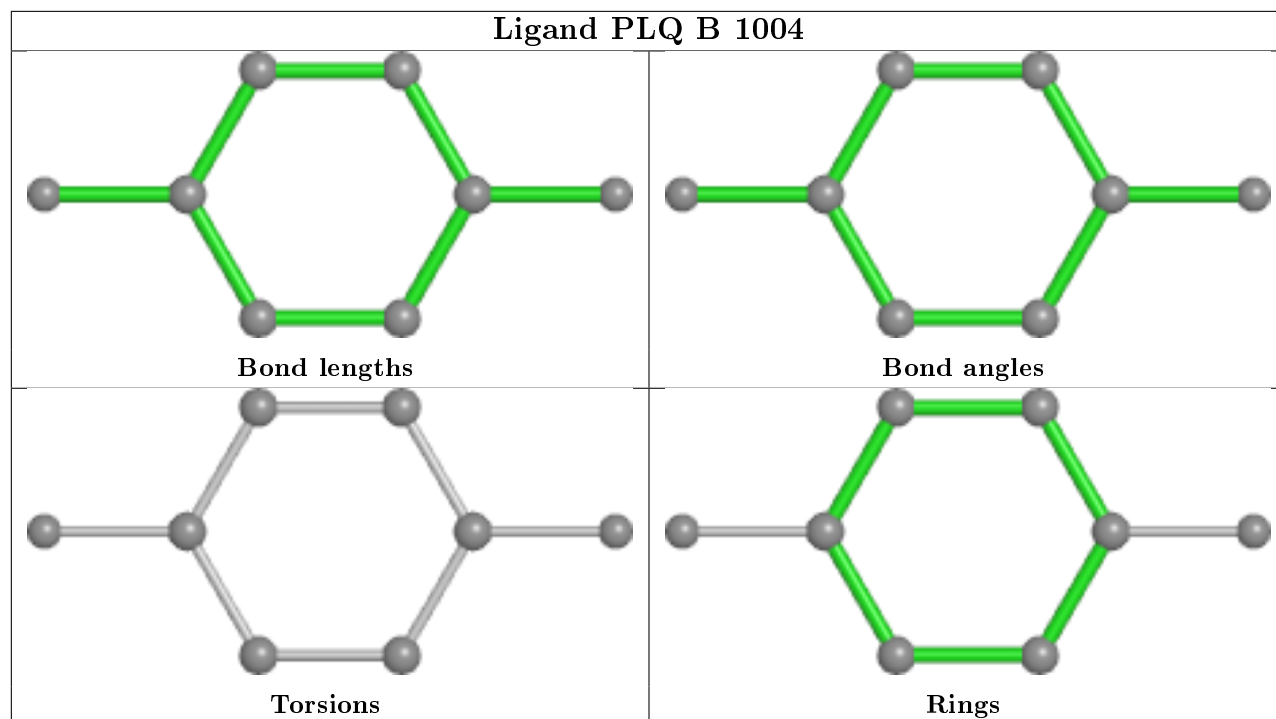


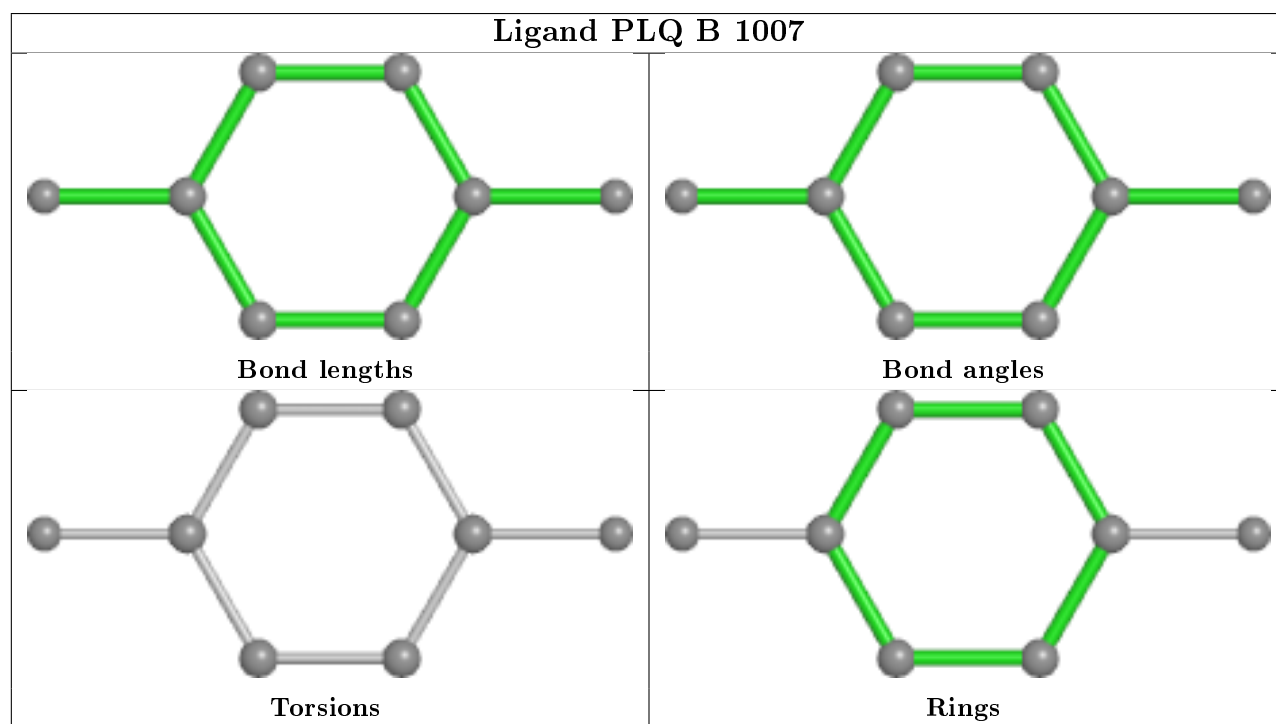
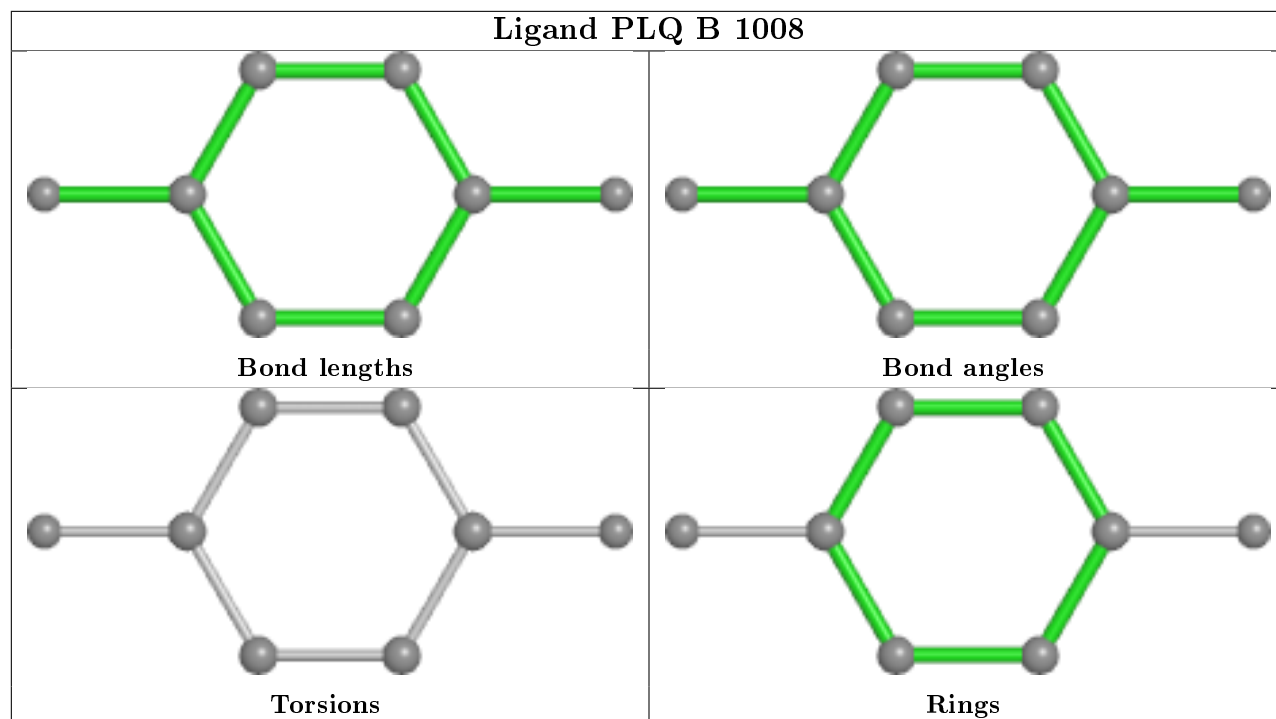


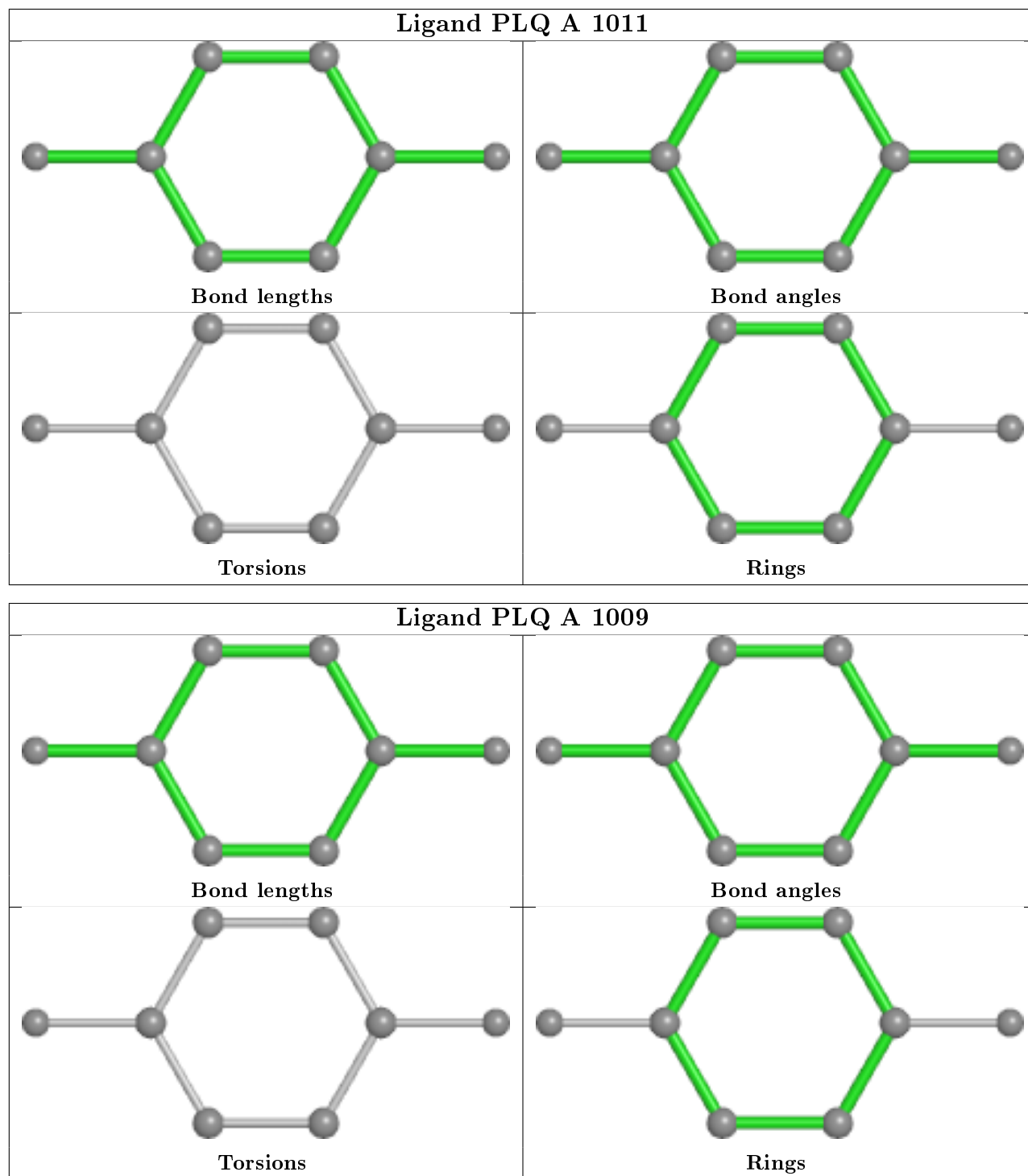












## 5.7 Other polymers [i](#)

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 [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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	624/665 (93%)	-0.23	0 100 100	13, 23, 36, 54	0
1	B	624/665 (93%)	-0.27	3 (0%) 91 91	14, 27, 42, 67	0
All	All	1248/1330 (93%)	-0.25	3 (0%) 95 94	13, 25, 40, 67	0

All (3) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	619	ALA	2.2
1	B	240	ILE	2.1
1	B	571	GLU	2.0

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

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

### 6.3 Carbohydrates [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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
2	MAN	C	5	11/12	0.56	0.40	80,92,98,102	0
2	MAN	C	6	11/12	0.64	0.48	62,81,87,93	0
3	MAN	G	9	11/12	0.65	0.24	60,71,78,81	0
4	NAG	E	2	14/15	0.66	0.30	70,86,93,99	0
3	MAN	G	6	11/12	0.68	0.34	83,95,102,103	0
3	MAN	D	6	11/12	0.69	0.33	93,100,108,112	0

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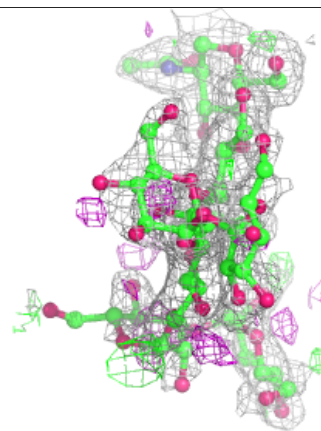
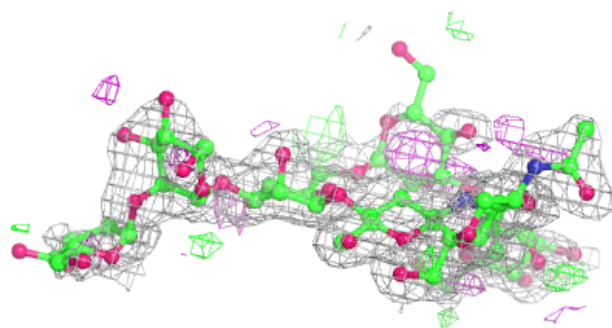
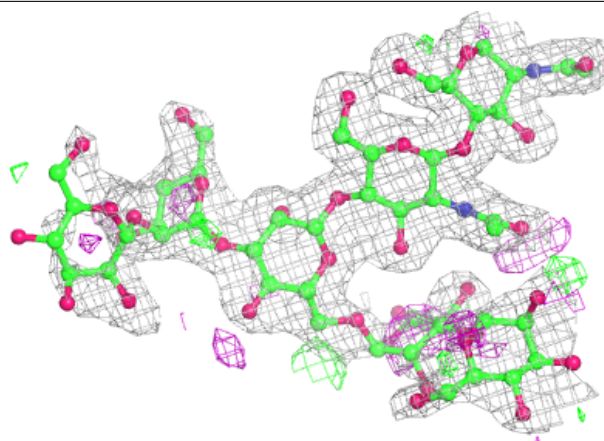
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	NAG	H	2	14/15	0.72	0.30	66,85,94,96	0
5	MAN	F	4	11/12	0.73	0.41	76,90,94,96	0
5	MAN	F	6	11/12	0.73	0.27	75,81,85,93	0
5	MAN	F	5	11/12	0.77	0.27	72,80,86,88	0
3	MAN	D	9	11/12	0.78	0.20	64,76,83,83	0
2	MAN	C	7	11/12	0.79	0.25	57,61,70,71	0
3	MAN	D	5	11/12	0.84	0.16	55,61,67,75	0
3	MAN	G	5	11/12	0.85	0.14	52,59,66,75	0
3	MAN	D	8	11/12	0.87	0.15	36,43,52,56	0
2	MAN	C	4	11/12	0.87	0.23	61,72,74,76	0
3	MAN	G	8	11/12	0.88	0.13	41,44,50,54	0
5	BMA	F	3	11/12	0.89	0.13	37,48,62,69	0
4	NAG	E	1	14/15	0.90	0.17	43,49,57,76	0
4	NAG	H	1	14/15	0.91	0.11	43,52,63,73	0
3	MAN	D	4	11/12	0.91	0.12	35,44,54,64	0
3	MAN	G	4	11/12	0.92	0.12	36,45,53,64	0
2	BMA	C	3	11/12	0.94	0.10	33,40,48,64	0
5	NAG	F	2	14/15	0.95	0.09	28,30,35,36	0
3	MAN	G	7	11/12	0.96	0.09	19,20,27,32	0
3	MAN	D	7	11/12	0.97	0.09	18,20,26,31	0
3	BMA	G	3	11/12	0.97	0.07	22,23,26,31	0
2	NAG	C	2	14/15	0.97	0.07	23,27,31,45	0
3	NAG	D	2	14/15	0.97	0.08	17,18,20,21	0
2	NAG	C	1	14/15	0.97	0.10	19,22,31,34	0
3	NAG	D	1	14/15	0.98	0.08	15,16,17,19	0
3	MAN	D	10	11/12	0.98	0.09	16,17,17,18	0
3	NAG	G	1	14/15	0.98	0.07	17,19,22,22	0
3	NAG	G	2	14/15	0.98	0.08	19,20,21,22	0
3	BMA	D	3	11/12	0.98	0.07	21,22,24,29	0
5	NAG	F	1	14/15	0.98	0.08	22,26,37,39	0
3	MAN	G	10	11/12	0.98	0.08	17,19,19,20	0

The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

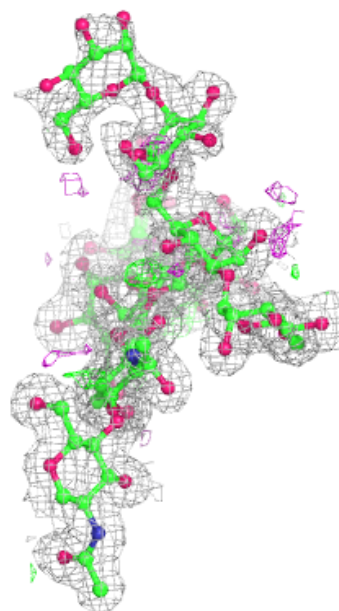
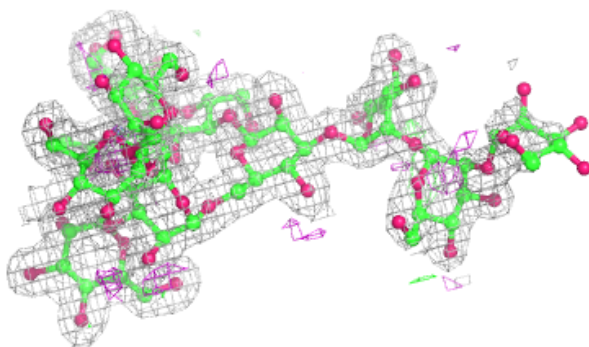
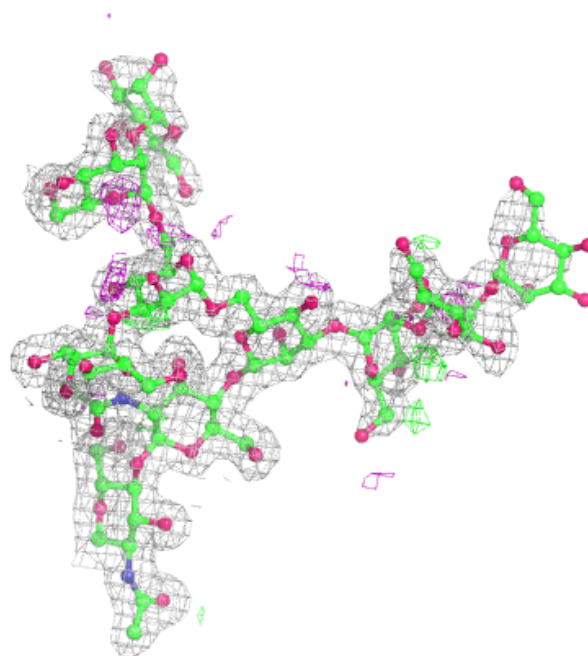
**Electron density around Chain C:**

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



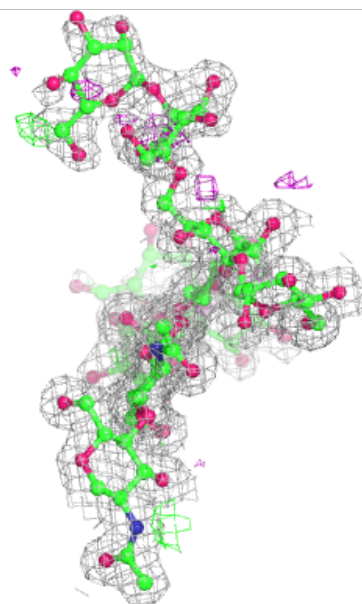
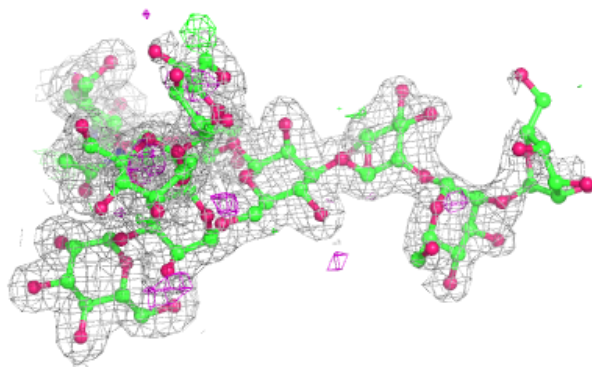
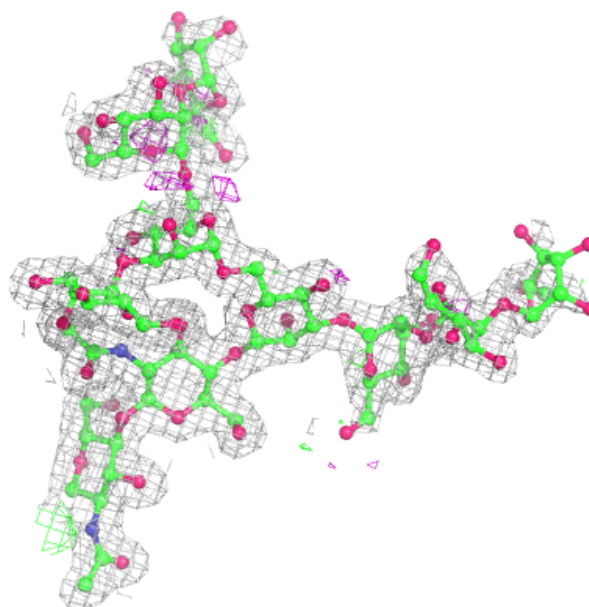
**Electron density around Chain D:**

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



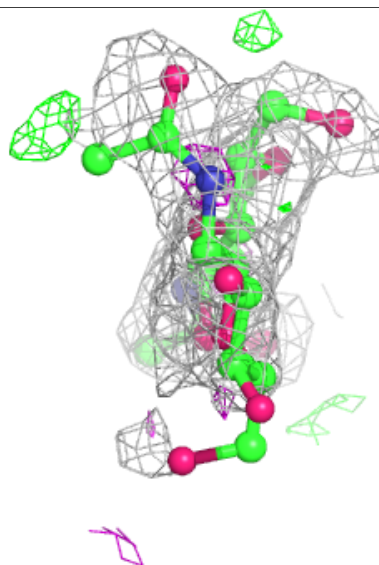
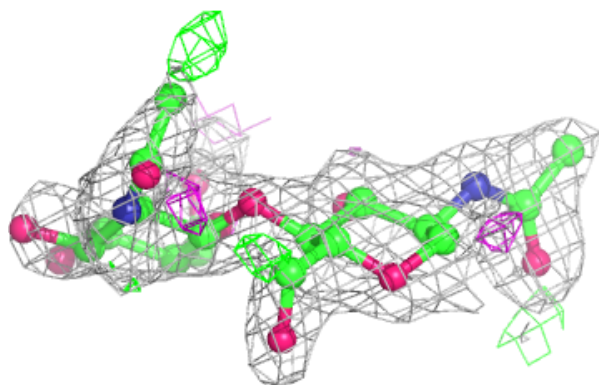
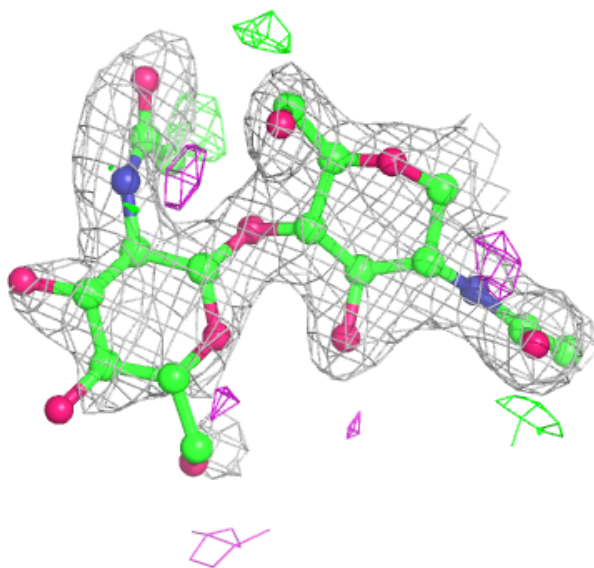
**Electron density around Chain G:**

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



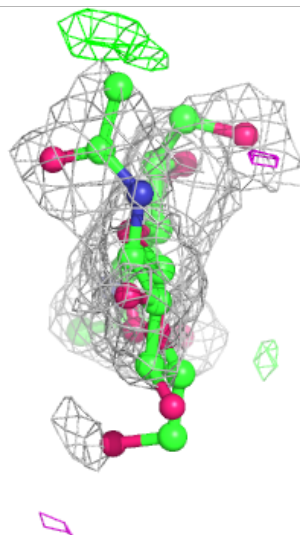
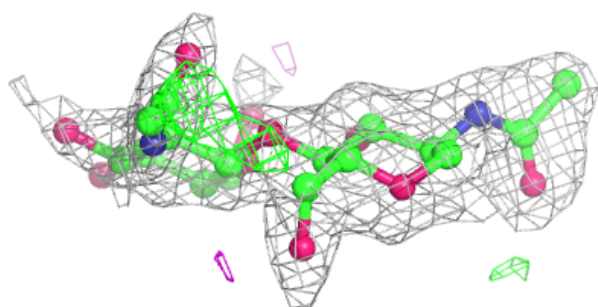
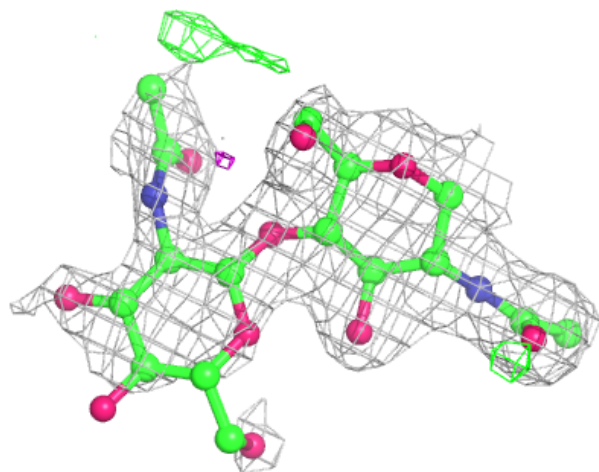
**Electron density around Chain E:**

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

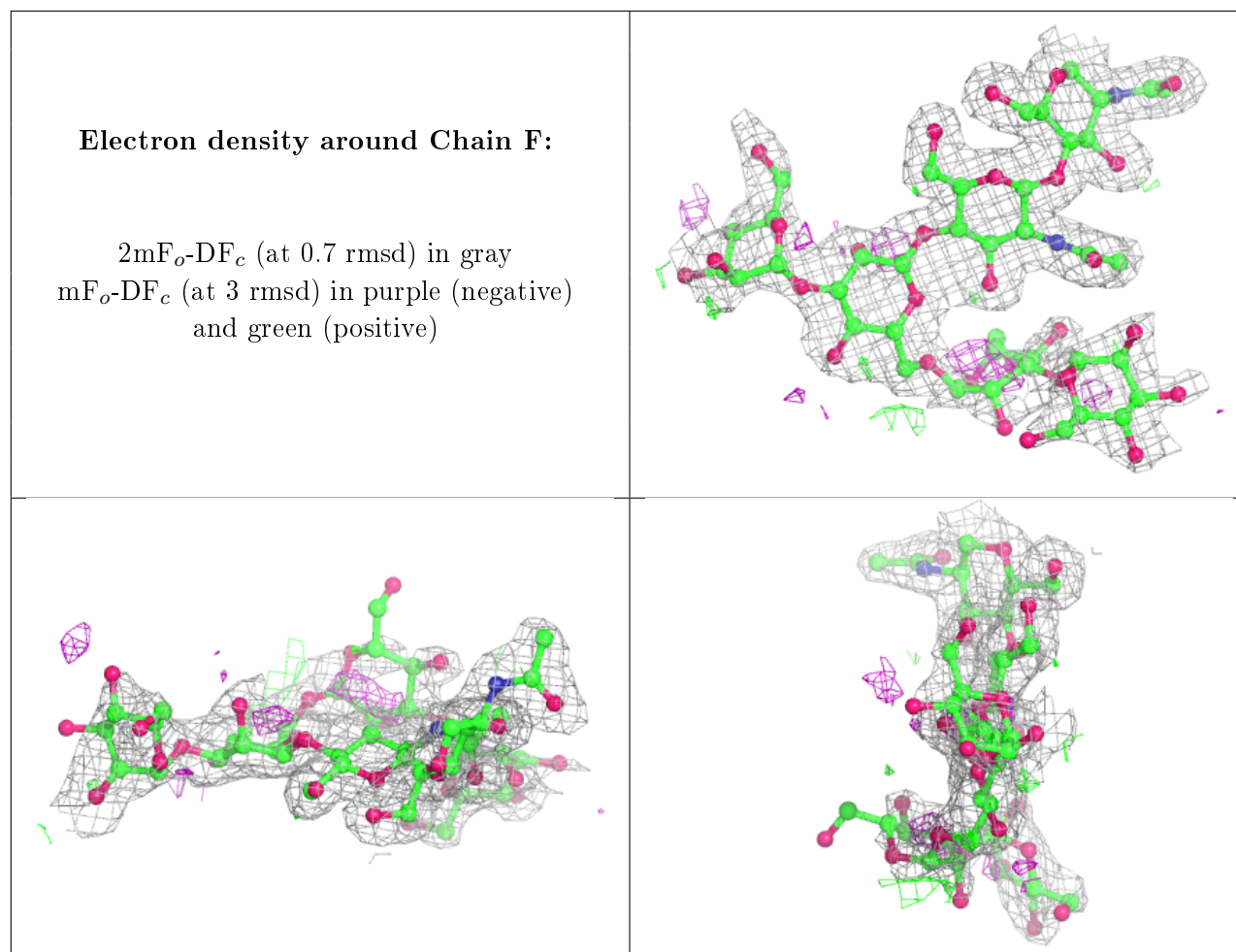


**Electron density around Chain H:**

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







## 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
7	PLQ	B	1001	8/8	0.63	0.28	65,73,81,82	0
7	PLQ	A	1001	8/8	0.66	0.30	59,64,69,70	0
8	EDO	B	1002	4/4	0.67	0.22	59,61,65,66	0
7	PLQ	A	1006	8/8	0.74	0.19	50,58,67,68	0
9	NAG	B	1319	14/15	0.75	0.33	76,85,90,94	0
7	PLQ	B	1005	8/8	0.76	0.34	44,55,58,65	0
7	PLQ	A	1004	8/8	0.77	0.36	31,58,63,63	0
9	NAG	A	1215	14/15	0.78	0.32	60,68,77,85	0
9	NAG	A	1606	14/15	0.78	0.24	43,52,57,63	0
7	PLQ	B	1009	8/8	0.78	0.34	55,65,70,72	0
9	NAG	B	1539	14/15	0.80	0.27	51,63,67,68	0

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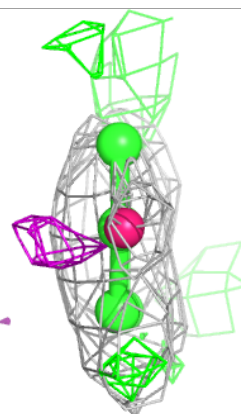
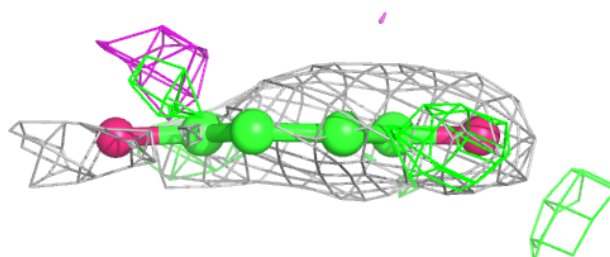
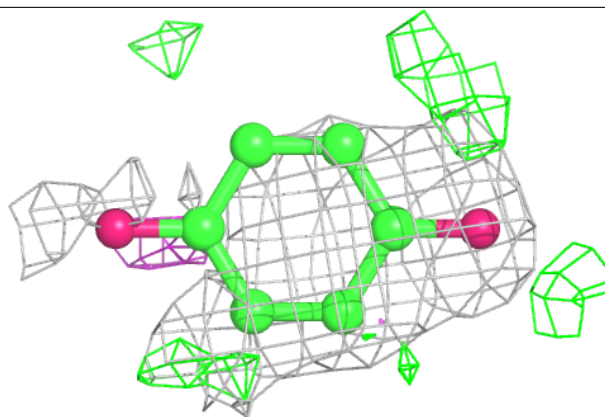
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
9	NAG	B	1242	14/15	0.80	0.29	77,86,95,105	0
9	NAG	A	1539	14/15	0.81	0.27	52,63,71,76	0
9	NAG	A	1512	14/15	0.81	0.27	56,80,93,105	0
7	PLQ	A	1005	8/8	0.82	0.26	38,48,50,53	0
7	PLQ	B	1008	8/8	0.82	0.23	50,52,61,62	0
9	NAG	A	1242	14/15	0.82	0.28	59,66,73,77	0
7	PLQ	A	1007	8/8	0.83	0.20	34,36,41,42	0
7	PLQ	A	1010	8/8	0.83	0.33	48,54,60,63	0
6	TRS	A	1000	8/8	0.84	0.22	24,44,53,55	0
9	NAG	B	1215	14/15	0.84	0.40	62,70,77,83	0
9	NAG	A	1555	14/15	0.84	0.15	38,45,52,57	0
9	NAG	A	1319	14/15	0.85	0.28	65,68,78,83	0
7	PLQ	A	1011	8/8	0.85	0.26	55,60,67,72	0
7	PLQ	A	1008	8/8	0.86	0.19	35,48,58,69	0
7	PLQ	A	1009	8/8	0.86	0.27	44,49,50,53	0
7	PLQ	B	1006	8/8	0.86	0.15	35,40,43,45	0
6	TRS	B	1000	8/8	0.87	0.21	32,52,64,66	0
9	NAG	A	1052	14/15	0.88	0.21	50,59,64,65	0
9	NAG	B	1052	14/15	0.88	0.20	54,62,70,74	0
9	NAG	B	1483	14/15	0.89	0.24	50,60,67,67	0
7	PLQ	B	1004	8/8	0.89	0.30	33,57,62,65	0
8	EDO	A	1002	4/4	0.90	0.22	56,60,61,62	0
8	EDO	B	1003	4/4	0.90	0.19	42,49,50,54	0
9	NAG	A	1236	14/15	0.90	0.12	29,35,42,43	0
8	EDO	A	1003	4/4	0.92	0.15	35,43,47,54	0
9	NAG	B	1555	14/15	0.92	0.13	35,38,41,42	0
9	NAG	A	1483	14/15	0.92	0.17	42,51,56,64	0
9	NAG	A	1471	14/15	0.93	0.10	31,35,39,49	0
9	NAG	B	1444	14/15	0.94	0.09	32,35,40,41	0
9	NAG	B	1357	14/15	0.94	0.14	38,40,49,50	0
9	NAG	B	1471	14/15	0.94	0.14	33,36,46,47	0
7	PLQ	B	1007	8/8	0.95	0.20	33,56,62,80	0
9	NAG	A	1644	14/15	0.96	0.09	23,28,39,40	0
9	NAG	B	1644	14/15	0.96	0.08	27,29,41,45	0
9	NAG	A	1444	14/15	0.97	0.08	26,29,32,36	0
9	NAG	A	1357	14/15	0.97	0.10	32,35,40,47	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.

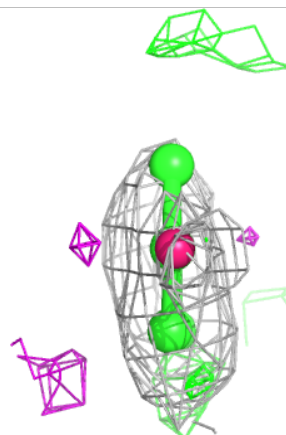
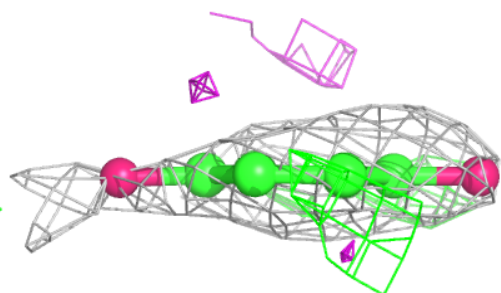
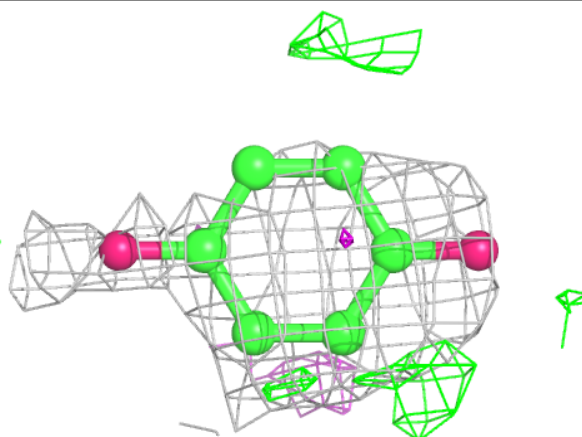


**Electron density around PLQ B 1001:**

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

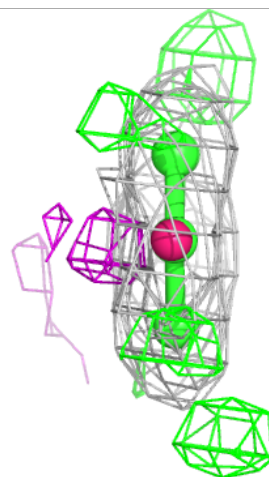
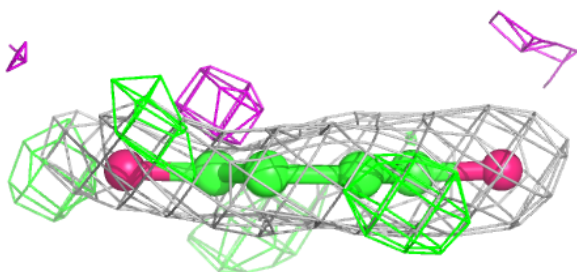
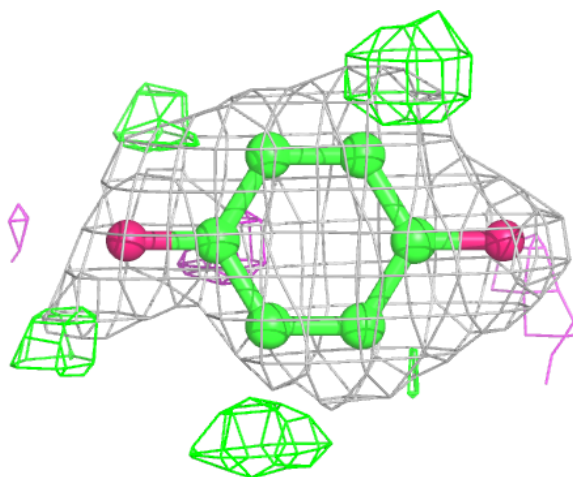
**Electron density around PLQ A 1001:**

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



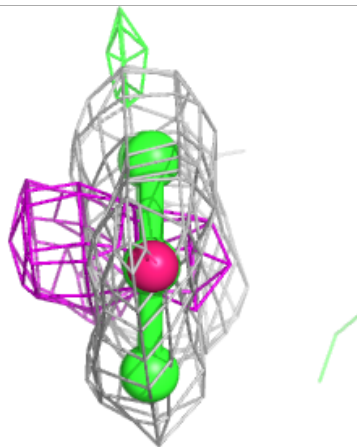
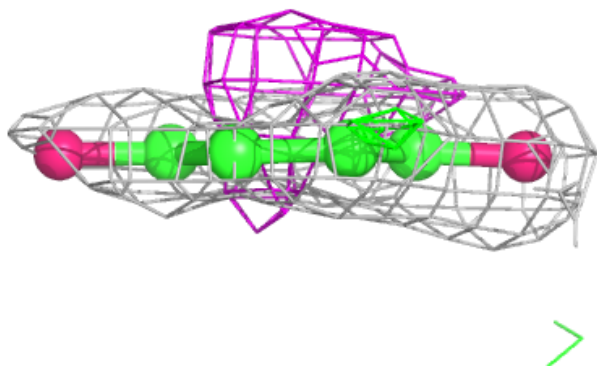
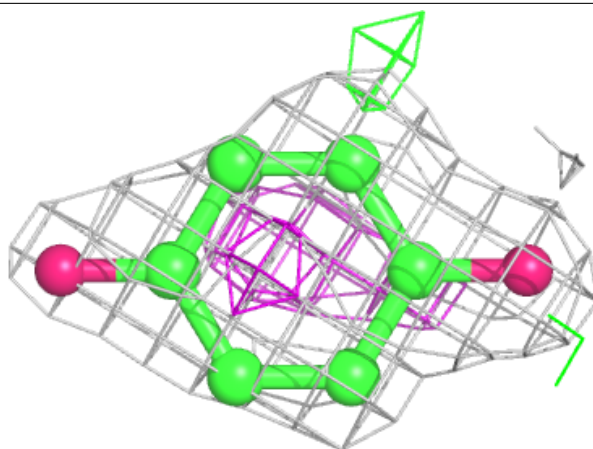
**Electron density around PLQ A 1006:**

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



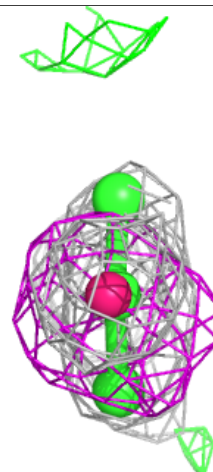
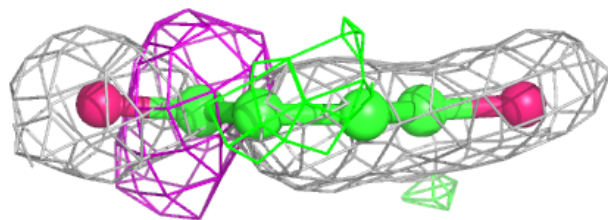
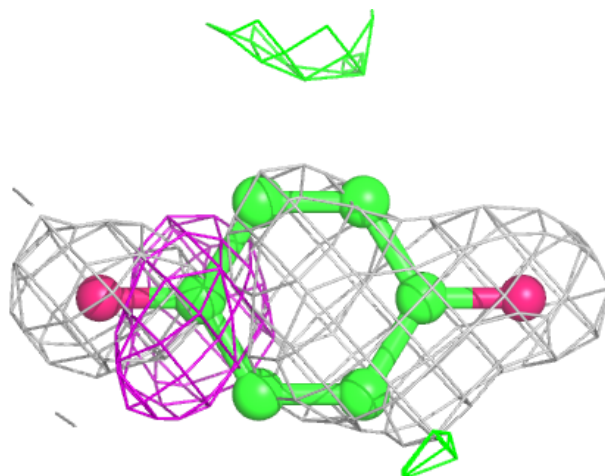
**Electron density around PLQ B 1005:**

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



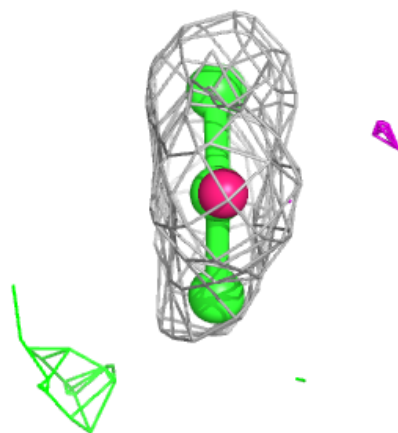
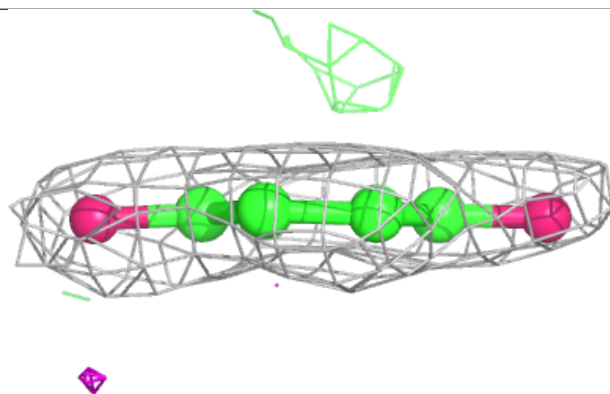
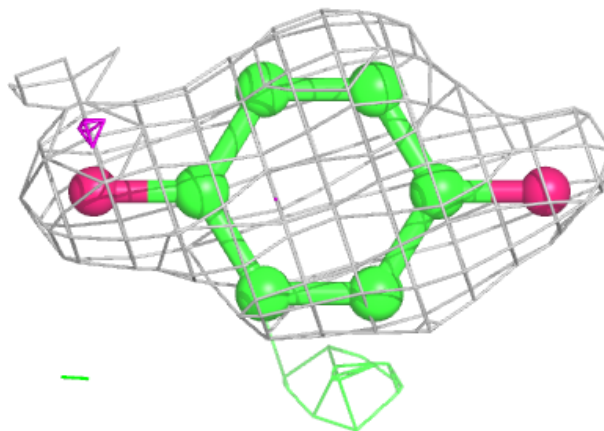
**Electron density around PLQ A 1004:**

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



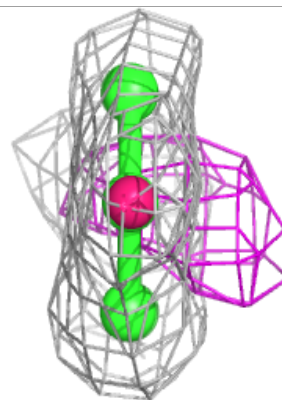
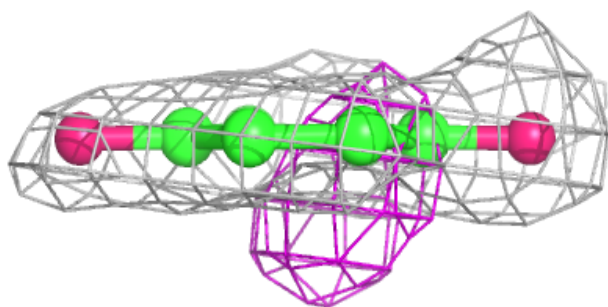
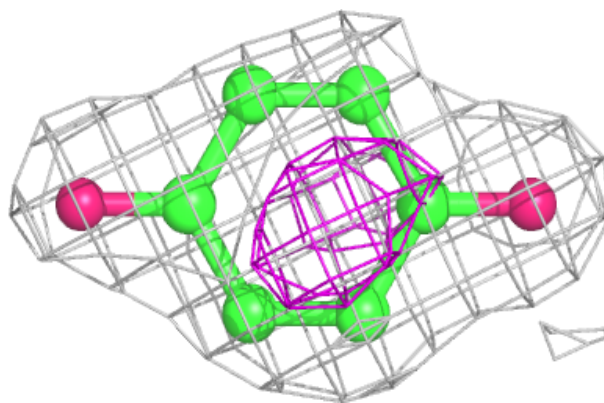
**Electron density around PLQ B 1009:**

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



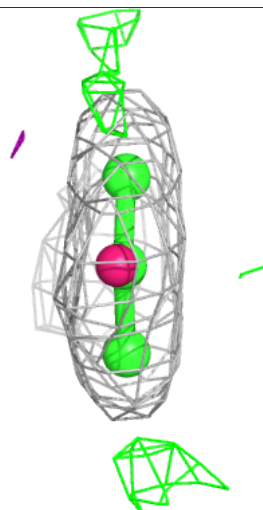
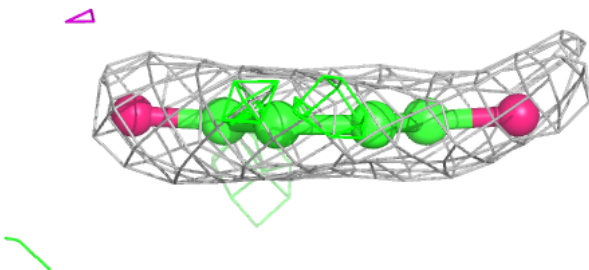
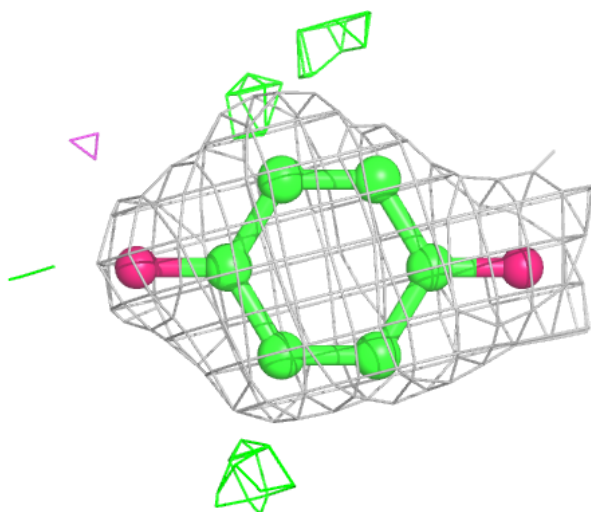
**Electron density around PLQ A 1005:**

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



**Electron density around PLQ B 1008:**

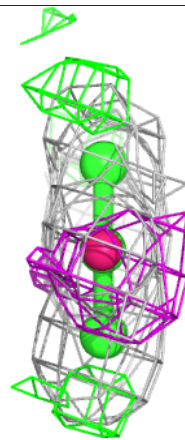
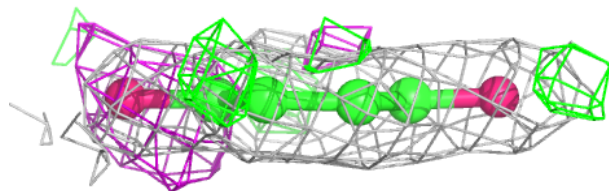
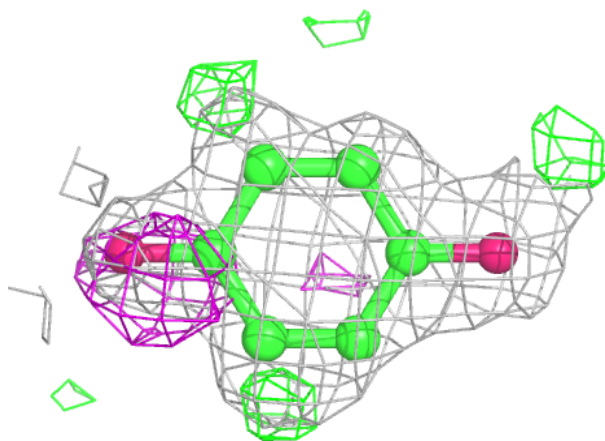
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





**Electron density around PLQ A 1007:**

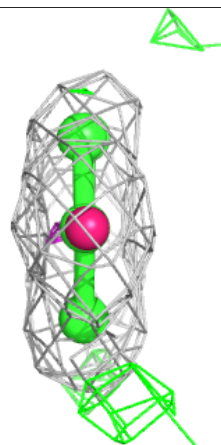
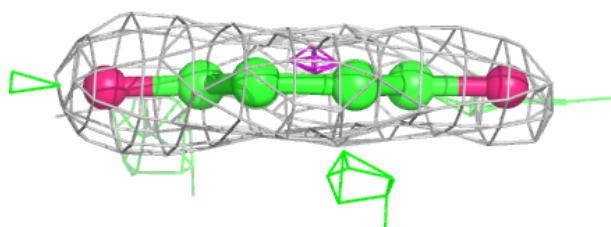
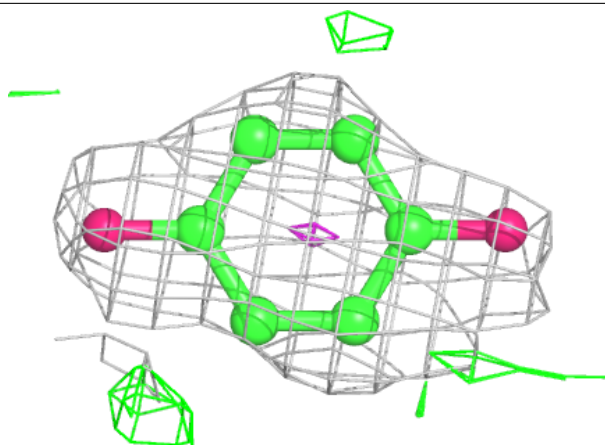
$2mF_o - DF_c$  (at 0.7 rmsd) in gray  
 $mF_o - DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



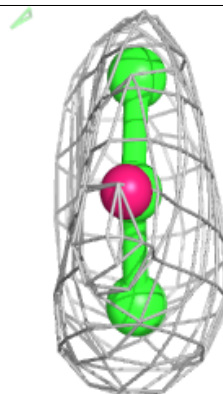
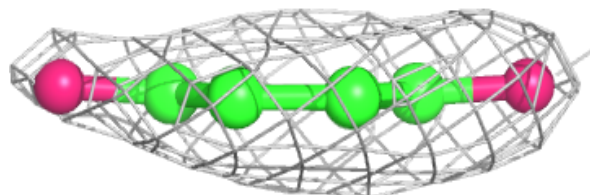
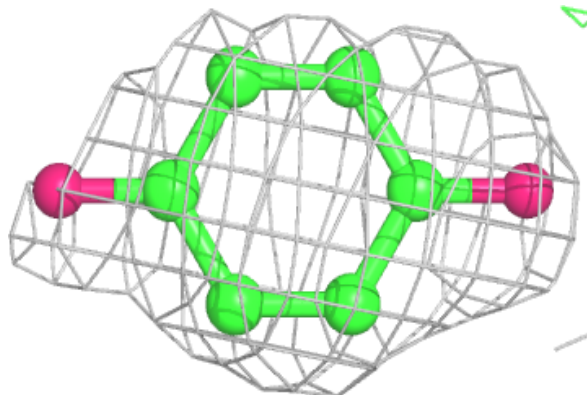


**Electron density around PLQ A 1010:**

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

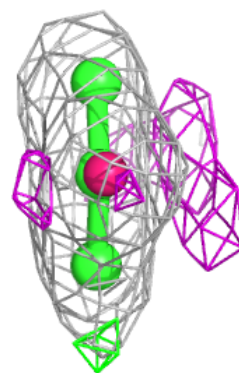
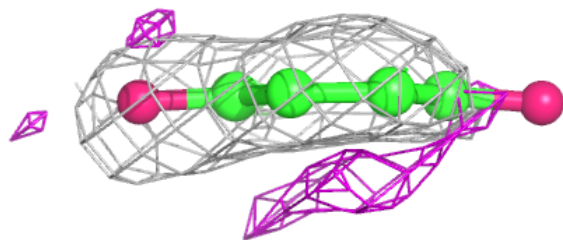
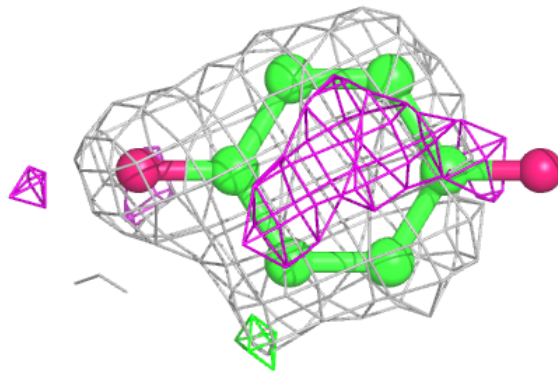
**Electron density around PLQ A 1011:**

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



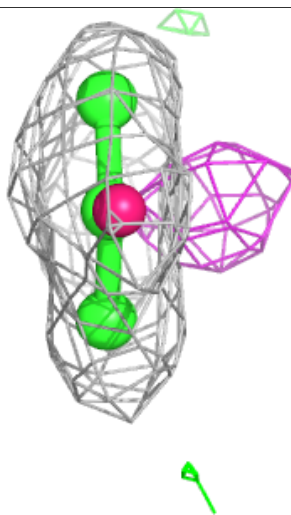
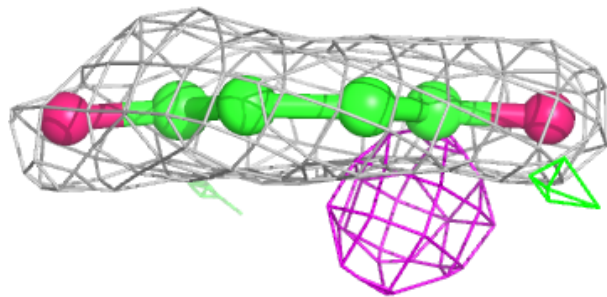
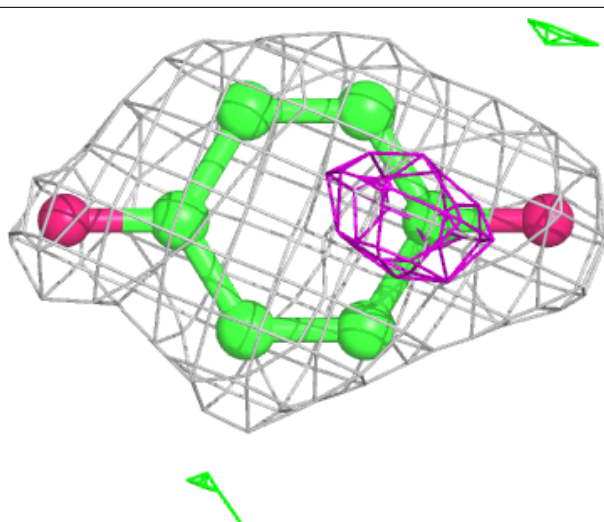
**Electron density around PLQ A 1008:**

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



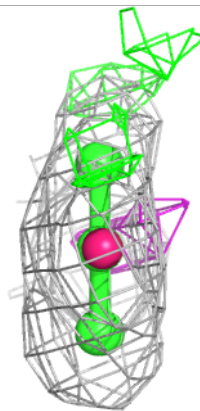
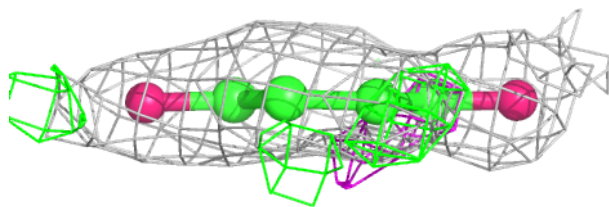
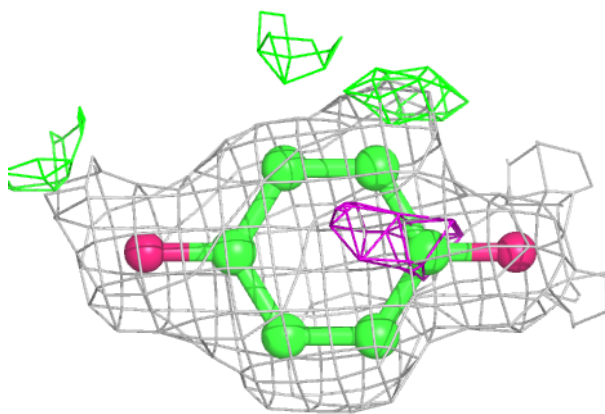
**Electron density around PLQ A 1009:**

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



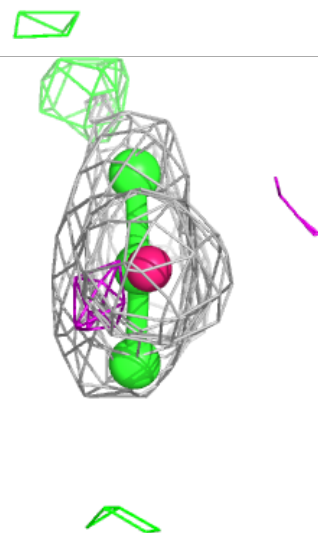
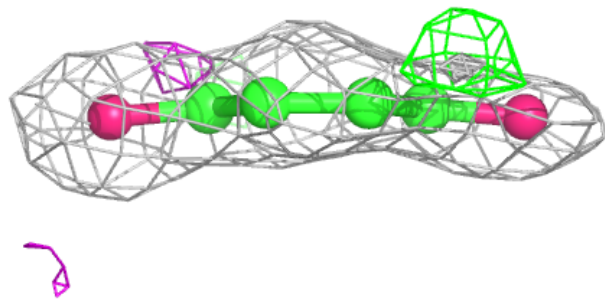
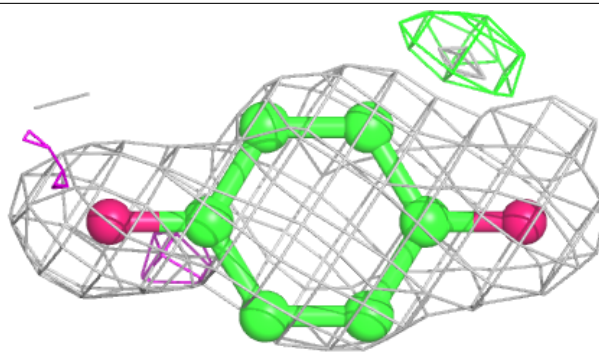
**Electron density around PLQ B 1006:**

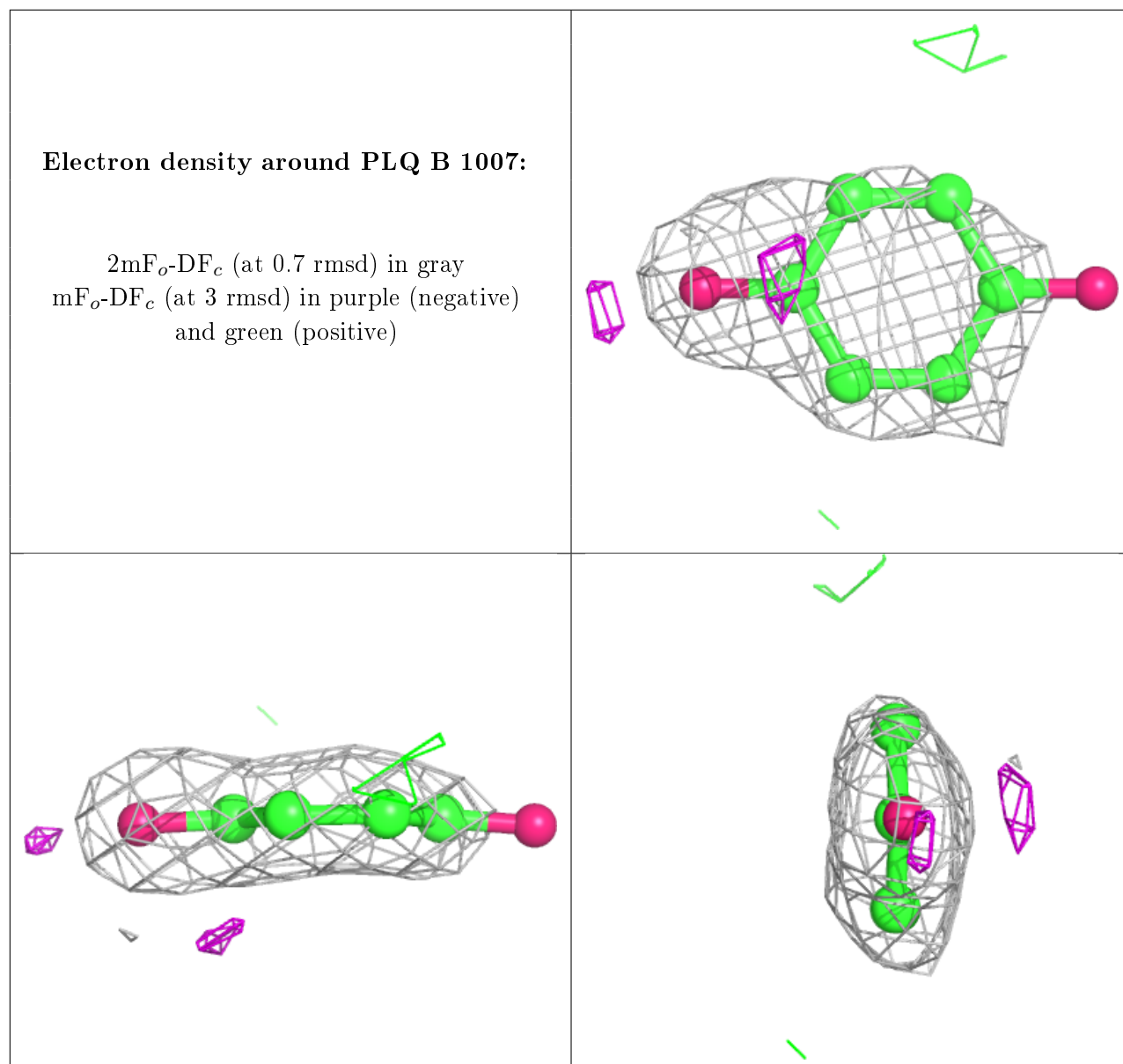
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around PLQ B 1004:**

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





## 6.5 Other polymers ⓘ

There are no such residues in this entry.