



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 5, 2026 – 10:16 AM UTC

PDB ID : 7USI / pdb_00007usi
Title : BRD2-BD1 in complex with MDP5
Authors : Jayasinghe, T.D.; Ronning, D.R.
Deposited on : 2022-04-25
Resolution : 2.50 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

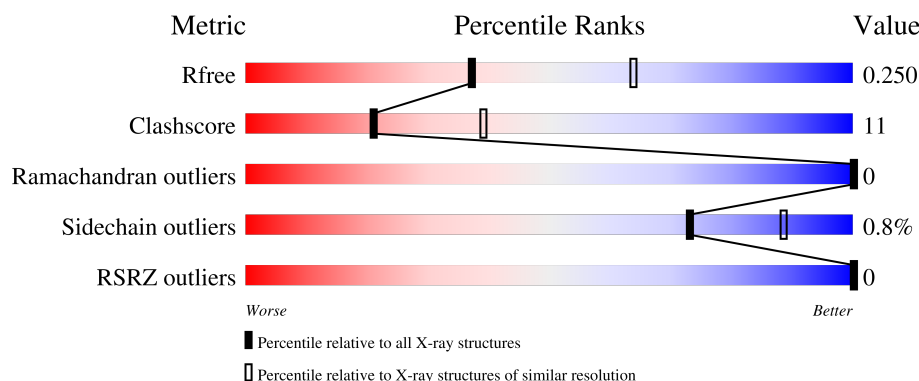
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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	5829 (2.50-2.50)
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)
RSRZ outliers	180081	5833 (2.50-2.50)

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	114	
1	B	114	
1	C	114	
1	D	114	
1	E	114	

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Mol	Chain	Length	Quality of chain
1	F	114	 78% 19%

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
3	PEG	A	202	-	-	X	-
3	PEG	E	204	-	-	X	-
5	DMS	A	207	-	X	-	-
5	DMS	B	209	-	X	-	-
5	DMS	C	202	-	X	-	-
5	DMS	C	205	-	X	X	-
5	DMS	C	207	-	X	-	-
5	DMS	D	203	-	X	-	-
5	DMS	E	209	-	X	-	-
5	DMS	F	203	-	X	-	-

2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 5980 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 Bromodomain-containing protein 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	111	Total	C	N	O	S	0	0	0
			922	598	157	158	9			
1	B	111	Total	C	N	O	S	0	0	0
			926	600	157	160	9			
1	C	111	Total	C	N	O	S	1	0	0
			921	597	157	158	9			
1	D	111	Total	C	N	O	S	0	0	0
			926	600	157	160	9			
1	E	111	Total	C	N	O	S	0	0	0
			921	597	157	158	9			
1	F	111	Total	C	N	O	S	0	0	0
			921	597	157	158	9			

There are 18 discrepancies between the modelled and reference sequences:

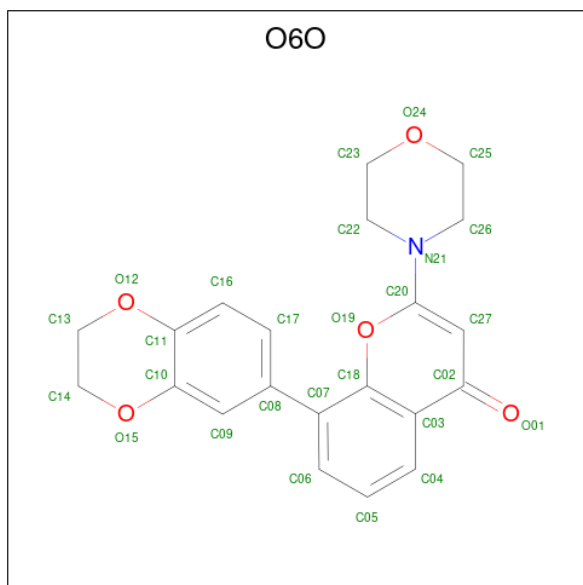
Chain	Residue	Modelled	Actual	Comment	Reference
A	70	GLY	-	expression tag	UNP P25440
A	71	PRO	-	expression tag	UNP P25440
A	72	MET	-	expression tag	UNP P25440
B	70	GLY	-	expression tag	UNP P25440
B	71	PRO	-	expression tag	UNP P25440
B	72	MET	-	expression tag	UNP P25440
C	70	GLY	-	expression tag	UNP P25440
C	71	PRO	-	expression tag	UNP P25440
C	72	MET	-	expression tag	UNP P25440
D	70	GLY	-	expression tag	UNP P25440
D	71	PRO	-	expression tag	UNP P25440
D	72	MET	-	expression tag	UNP P25440
E	70	GLY	-	expression tag	UNP P25440
E	71	PRO	-	expression tag	UNP P25440
E	72	MET	-	expression tag	UNP P25440
F	70	GLY	-	expression tag	UNP P25440
F	71	PRO	-	expression tag	UNP P25440

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Chain	Residue	Modelled	Actual	Comment	Reference
F	72	MET	-	expression tag	UNP P25440

- Molecule 2 is (8M)-8-(2,3-dihydro-1,4-benzodioxin-6-yl)-2-(morpholin-4-yl)-4H-1-benzopyran-4-one (CCD ID: O6O) (formula: $C_{21}H_{19}NO_5$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			27	21	1	5		
2	B	1	Total	C	N	O	0	0
			27	21	1	5		
2	C	1	Total	C	N	O	0	0
			27	21	1	5		
2	D	1	Total	C	N	O	0	0
			27	21	1	5		
2	E	1	Total	C	N	O	0	0
			27	21	1	5		
2	F	1	Total	C	N	O	0	0
			27	21	1	5		

- Molecule 3 is DI(HYDROXYETHYL)ETHER (CCD ID: PEG) (formula: $C_4H_{10}O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			7	4	3		
3	A	1	Total	C	O	0	0
			7	4	3		
3	A	1	Total	C	O	0	0
			7	4	3		
3	A	1	Total	C	O	0	0
			7	4	3		
3	B	1	Total	C	O	0	0
			7	4	3		
3	C	1	Total	C	O	0	0
			7	4	3		
3	E	1	Total	C	O	0	0
			7	4	3		

- Molecule 4 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: C₂H₆O₂).



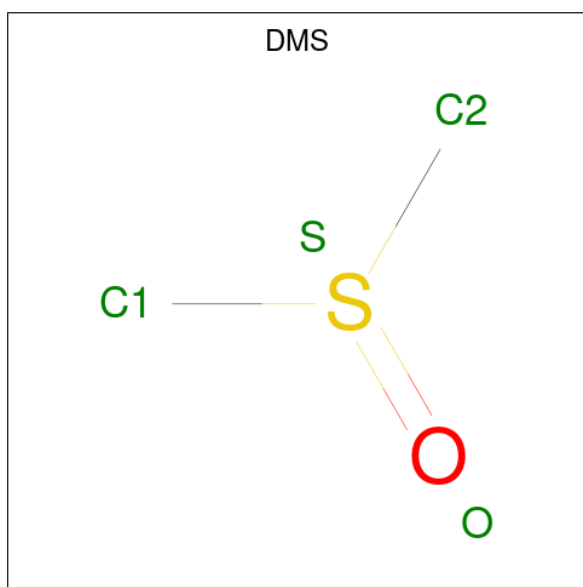
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		
4	B	1	Total	C	O	0	0
			4	2	2		
4	B	1	Total	C	O	0	0
			4	2	2		
4	B	1	Total	C	O	0	0
			4	2	2		
4	B	1	Total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

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	C	1	Total	C	O	0	0
			4	2	2		
4	D	1	Total	C	O	0	0
			4	2	2		
4	E	1	Total	C	O	0	0
			4	2	2		
4	E	1	Total	C	O	0	0
			4	2	2		
4	E	1	Total	C	O	0	0
			4	2	2		
4	E	1	Total	C	O	0	0
			4	2	2		
4	E	1	Total	C	O	0	0
			4	2	2		
4	E	1	Total	C	O	0	0
			4	2	2		
4	F	1	Total	C	O	0	0
			4	2	2		
4	F	1	Total	C	O	0	0
			4	2	2		
4	F	1	Total	C	O	0	0
			4	2	2		

- Molecule 5 is DIMETHYL SULFOXIDE (CCD ID: DMS) (formula: C₂H₆OS).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	O	S	0	0
			4	2	1	1		
5	B	1	Total	C	O	S	0	0
			4	2	1	1		
5	C	1	Total	C	O	S	0	0
			4	2	1	1		
5	C	1	Total	C	O	S	0	0
			4	2	1	1		
5	C	1	Total	C	O	S	0	0
			4	2	1	1		
5	D	1	Total	C	O	S	0	0
			4	2	1	1		
5	E	1	Total	C	O	S	0	0
			4	2	1	1		
5	F	1	Total	C	O	S	0	0
			4	2	1	1		

- Molecule 6 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

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

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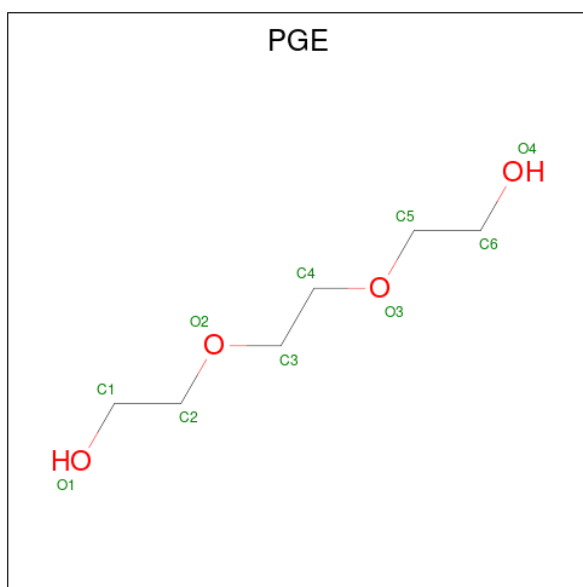
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	E	1	Total	Cl	0	0
			1	1		
6	F	1	Total	Cl	0	0
			1	1		

- Molecule 7 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	1	Total	Na	0	0
			1	1		
7	E	1	Total	Na	0	0
			1	1		

- Molecule 8 is TRIETHYLENE GLYCOL (CCD ID: PGE) (formula: C₆H₁₄O₄).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	F	1	Total	C	O	0	0
			10	6	4		

- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	13	Total	O	0	0
			13	13		
9	B	13	Total	O	0	0
			13	13		

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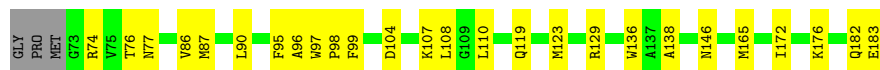
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	C	12	Total 12	O 12	0	0
9	D	16	Total 16	O 16	0	0
9	E	5	Total 5	O 5	0	0
9	F	15	Total 15	O 15	0	0

3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry 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: Bromodomain-containing protein 2

Chain A: 



- Molecule 1: Bromodomain-containing protein 2

Chain B: 



- Molecule 1: Bromodomain-containing protein 2

Chain C: 



- Molecule 1: Bromodomain-containing protein 2

Chain D: 



- Molecule 1: Bromodomain-containing protein 2

Chain E: 



- Molecule 1: Bromodomain-containing protein 2

Chain F: 

GLY	PRO	MET	G73	Q78	K84	L90	W91	K92	A96	W97	P98	F99	R100	K107	L110	P111	D112	K115	M123	Y155	D160	L164	F173	K176	V177	M180	E183
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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	63.81Å 149.87Å 63.82Å 90.00° 112.27° 90.00°	Depositor
Resolution (Å)	35.56 – 2.50 35.56 – 2.50	Depositor EDS
% Data completeness (in resolution range)	99.5 (35.56-2.50) 95.8 (35.56-2.50)	Depositor EDS
R_{merge}	0.13	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.39 (at 2.48Å)	Xtriage
Refinement program	PHENIX 1.19.1_4122	Depositor
R, R_{free}	0.201 , 0.250 0.203 , 0.250	Depositor DCC
R_{free} test set	1995 reflections (5.20%)	wwPDB-VP
Wilson B-factor (Å ²)	46.2	Xtriage
Anisotropy	0.401	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 41.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.478 for l,-k,h	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	5980	wwPDB-VP
Average B, all atoms (Å ²)	55.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.95% of the height of the origin peak. No significant pseudotranslation is detected.*

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: EDO, PEG, NA, DMS, O6O, PGE, CL

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	0.39	0/947	0.50	0/1281
1	B	0.40	0/951	0.53	0/1286
1	C	0.35	0/946	0.48	0/1279
1	D	0.34	0/951	0.48	0/1286
1	E	0.37	0/946	0.52	0/1279
1	F	0.36	0/946	0.49	0/1279
All	All	0.37	0/5687	0.50	0/7690

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	922	0	922	22	0
1	B	926	0	926	22	0
1	C	921	0	921	24	0
1	D	926	0	926	26	0
1	E	921	0	921	27	0
1	F	921	0	921	16	0
2	A	27	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	27	0	0	0	0
2	C	27	0	0	1	0
2	D	27	0	0	1	0
2	E	27	0	0	0	0
2	F	27	0	0	0	0
3	A	28	0	40	8	0
3	B	7	0	10	0	0
3	C	7	0	10	2	0
3	E	7	0	10	4	0
4	A	20	0	30	2	0
4	B	32	0	48	1	0
4	C	8	0	12	0	0
4	D	4	0	6	2	0
4	E	32	0	48	9	0
4	F	12	0	18	0	0
5	A	4	0	6	0	0
5	B	4	0	6	0	0
5	C	12	0	18	7	0
5	D	4	0	6	1	0
5	E	4	0	6	0	0
5	F	4	0	6	0	0
6	A	1	0	0	0	0
6	B	1	0	0	0	0
6	C	1	0	0	0	0
6	D	1	0	0	0	0
6	E	1	0	0	0	0
6	F	1	0	0	0	0
7	A	1	0	0	0	0
7	E	1	0	0	0	0
8	F	10	0	14	3	0
9	A	13	0	0	0	0
9	B	13	0	0	0	0
9	C	12	0	0	1	0
9	D	16	0	0	1	0
9	E	5	0	0	0	0
9	F	15	0	0	1	0
All	All	5980	0	5831	129	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 11.

The worst 5 of 129 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)
3:A:202:PEG:H22	1:D:100:ARG:HH22	1.45	0.82
1:C:118:LYS:HB2	5:C:205:DMS:H21	1.62	0.82
3:A:202:PEG:H11	1:D:100:ARG:HH12	1.43	0.80
1:B:99:PHE:HB2	1:B:123:MET:HE2	1.64	0.78
1:D:87:MET:HE1	1:D:123:MET:SD	2.27	0.74

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	109/114 (96%)	107 (98%)	2 (2%)	0	100	100
1	B	109/114 (96%)	104 (95%)	5 (5%)	0	100	100
1	C	109/114 (96%)	105 (96%)	4 (4%)	0	100	100
1	D	109/114 (96%)	108 (99%)	1 (1%)	0	100	100
1	E	109/114 (96%)	108 (99%)	1 (1%)	0	100	100
1	F	109/114 (96%)	108 (99%)	1 (1%)	0	100	100
All	All	654/684 (96%)	640 (98%)	14 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	100/103 (97%)	100 (100%)	0	100	100
1	B	101/103 (98%)	101 (100%)	0	100	100
1	C	100/103 (97%)	100 (100%)	0	100	100
1	D	101/103 (98%)	99 (98%)	2 (2%)	48	75
1	E	100/103 (97%)	99 (99%)	1 (1%)	68	86
1	F	100/103 (97%)	98 (98%)	2 (2%)	48	75
All	All	602/618 (97%)	597 (99%)	5 (1%)	73	88

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	106	VAL
1	D	175	GLN
1	E	179	SER
1	F	84	LYS
1	F	177	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 12 such sidechains are listed below:

Mol	Chain	Res	Type
1	E	80	GLN
1	E	175	GLN
1	F	167	GLN
1	F	119	GLN
1	C	80	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 ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 57 ligands modelled in this entry, 8 are monoatomic - leaving 49 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	EDO	B	207	-	3,3,3	0.76	0	2,2,2	1.09	0
4	EDO	B	205	-	3,3,3	0.61	0	2,2,2	1.15	0
4	EDO	B	208	-	3,3,3	0.61	0	2,2,2	1.16	0
3	PEG	C	201	-	6,6,6	1.39	0	5,5,5	0.96	0
5	DMS	C	202	-	3,3,3	0.77	0	3,3,3	3.36	3 (100%)
4	EDO	B	203	-	3,3,3	0.57	0	2,2,2	1.17	0
4	EDO	B	211	-	3,3,3	0.58	0	2,2,2	1.23	0
4	EDO	E	207	-	3,3,3	0.61	0	2,2,2	1.16	0
4	EDO	E	210	-	3,3,3	0.57	0	2,2,2	1.18	0
4	EDO	E	205	-	3,3,3	0.55	0	2,2,2	1.16	0
2	O6O	E	203	-	29,31,31	1.39	3 (10%)	38,44,44	1.11	2 (5%)
4	EDO	B	210	-	3,3,3	0.56	0	2,2,2	1.23	0
4	EDO	E	208	-	3,3,3	0.60	0	2,2,2	1.16	0
4	EDO	A	210	-	3,3,3	0.78	0	2,2,2	1.07	0
4	EDO	F	204	-	3,3,3	0.55	0	2,2,2	1.18	0
4	EDO	F	206	-	3,3,3	0.63	0	2,2,2	1.09	0
4	EDO	C	206	-	3,3,3	0.59	0	2,2,2	1.13	0
4	EDO	A	209	-	3,3,3	0.61	0	2,2,2	1.13	0
4	EDO	C	204	-	3,3,3	0.60	0	2,2,2	1.16	0
3	PEG	A	202	-	6,6,6	1.30	0	5,5,5	0.85	0
4	EDO	B	202	-	3,3,3	0.63	0	2,2,2	1.10	0
5	DMS	B	209	-	3,3,3	0.80	0	3,3,3	3.28	3 (100%)
5	DMS	F	203	-	3,3,3	0.86	0	3,3,3	3.30	3 (100%)
3	PEG	A	204	-	6,6,6	1.05	0	5,5,5	0.72	0
3	PEG	A	203	-	6,6,6	1.50	1 (16%)	5,5,5	0.65	0
5	DMS	D	203	-	3,3,3	0.87	0	3,3,3	3.27	3 (100%)
4	EDO	E	202	-	3,3,3	0.58	0	2,2,2	1.17	0
2	O6O	A	201	-	29,31,31	1.20	3 (10%)	38,44,44	1.08	3 (7%)
3	PEG	B	204	-	6,6,6	1.30	0	5,5,5	0.78	0
2	O6O	F	201	-	29,31,31	1.40	4 (13%)	38,44,44	1.13	3 (7%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	O6O	B	201	-	29,31,31	1.26	4 (13%)	38,44,44	1.09	3 (7%)
4	EDO	E	206	-	3,3,3	0.68	0	2,2,2	1.10	0
5	DMS	E	209	-	3,3,3	0.74	0	3,3,3	3.32	3 (100%)
4	EDO	F	205	-	3,3,3	0.64	0	2,2,2	1.16	0
2	O6O	C	203	-	29,31,31	1.28	3 (10%)	38,44,44	1.01	3 (7%)
4	EDO	E	211	-	3,3,3	0.70	0	2,2,2	1.08	0
2	O6O	D	201	-	29,31,31	1.21	3 (10%)	38,44,44	0.95	2 (5%)
5	DMS	A	207	-	3,3,3	0.79	0	3,3,3	3.28	3 (100%)
4	EDO	D	202	-	3,3,3	0.59	0	2,2,2	1.17	0
4	EDO	A	208	-	3,3,3	0.70	0	2,2,2	1.07	0
3	PEG	A	206	-	6,6,6	1.16	0	5,5,5	0.60	0
8	PGE	F	202	-	9,9,9	0.54	0	8,8,8	0.48	0
5	DMS	C	207	-	3,3,3	0.83	0	3,3,3	3.28	3 (100%)
4	EDO	A	205	-	3,3,3	0.61	0	2,2,2	1.15	0
5	DMS	C	205	-	3,3,3	0.72	0	3,3,3	3.41	3 (100%)
4	EDO	E	201	-	3,3,3	0.56	0	2,2,2	1.20	0
4	EDO	B	206	-	3,3,3	0.60	0	2,2,2	1.13	0
4	EDO	A	211	-	3,3,3	0.63	0	2,2,2	1.16	0
3	PEG	E	204	-	6,6,6	1.44	1 (16%)	5,5,5	0.78	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
4	EDO	B	207	-	-	0/1/1/1	-
4	EDO	B	205	-	-	1/1/1/1	-
4	EDO	B	208	-	-	0/1/1/1	-
3	PEG	C	201	-	-	2/4/4/4	-
4	EDO	B	203	-	-	0/1/1/1	-
4	EDO	B	211	-	-	1/1/1/1	-
4	EDO	E	207	-	-	1/1/1/1	-
4	EDO	E	210	-	-	1/1/1/1	-
4	EDO	E	205	-	-	1/1/1/1	-
2	O6O	E	203	-	-	1/8/23/23	0/5/5/5
4	EDO	B	210	-	-	1/1/1/1	-
4	EDO	E	208	-	-	1/1/1/1	-
4	EDO	A	210	-	-	1/1/1/1	-
4	EDO	F	204	-	-	1/1/1/1	-
4	EDO	F	206	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	EDO	C	206	-	-	1/1/1/1	-
4	EDO	A	209	-	-	0/1/1/1	-
4	EDO	C	204	-	-	1/1/1/1	-
3	PEG	A	202	-	-	3/4/4/4	-
4	EDO	B	202	-	-	0/1/1/1	-
3	PEG	A	204	-	-	1/4/4/4	-
3	PEG	A	203	-	-	4/4/4/4	-
4	EDO	E	202	-	-	1/1/1/1	-
2	O6O	A	201	-	-	1/8/23/23	0/5/5/5
3	PEG	B	204	-	-	1/4/4/4	-
2	O6O	F	201	-	-	1/8/23/23	0/5/5/5
2	O6O	B	201	-	-	1/8/23/23	0/5/5/5
4	EDO	E	206	-	-	1/1/1/1	-
4	EDO	F	205	-	-	1/1/1/1	-
2	O6O	C	203	-	-	1/8/23/23	0/5/5/5
4	EDO	E	211	-	-	1/1/1/1	-
2	O6O	D	201	-	-	2/8/23/23	0/5/5/5
4	EDO	D	202	-	-	0/1/1/1	-
4	EDO	A	208	-	-	0/1/1/1	-
3	PEG	A	206	-	-	2/4/4/4	-
8	PGE	F	202	-	-	4/7/7/7	-
4	EDO	A	205	-	-	1/1/1/1	-
4	EDO	E	201	-	-	0/1/1/1	-
4	EDO	B	206	-	-	1/1/1/1	-
4	EDO	A	211	-	-	1/1/1/1	-
3	PEG	E	204	-	-	4/4/4/4	-

The worst 5 of 22 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	203	O6O	C26-N21	4.30	1.54	1.47
2	D	201	O6O	C22-N21	3.92	1.54	1.47
2	F	201	O6O	C26-N21	3.88	1.54	1.47
2	C	203	O6O	C22-N21	3.84	1.53	1.47
2	E	203	O6O	C22-N21	3.74	1.53	1.47

The worst 5 of 40 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	205	DMS	C2-S-C1	4.84	123.24	98.42
5	C	202	DMS	C2-S-C1	4.67	122.35	98.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	209	DMS	C2-S-C1	4.40	120.95	98.42
5	F	203	DMS	C2-S-C1	4.34	120.64	98.42
5	A	207	DMS	C2-S-C1	4.20	119.97	98.42

There are no chirality outliers.

5 of 47 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	F	201	O6O	O19-C20-N21-C22
3	A	203	PEG	C4-C3-O2-C2
3	A	202	PEG	C1-C2-O2-C3
3	B	204	PEG	O1-C1-C2-O2
3	E	204	PEG	O2-C3-C4-O4

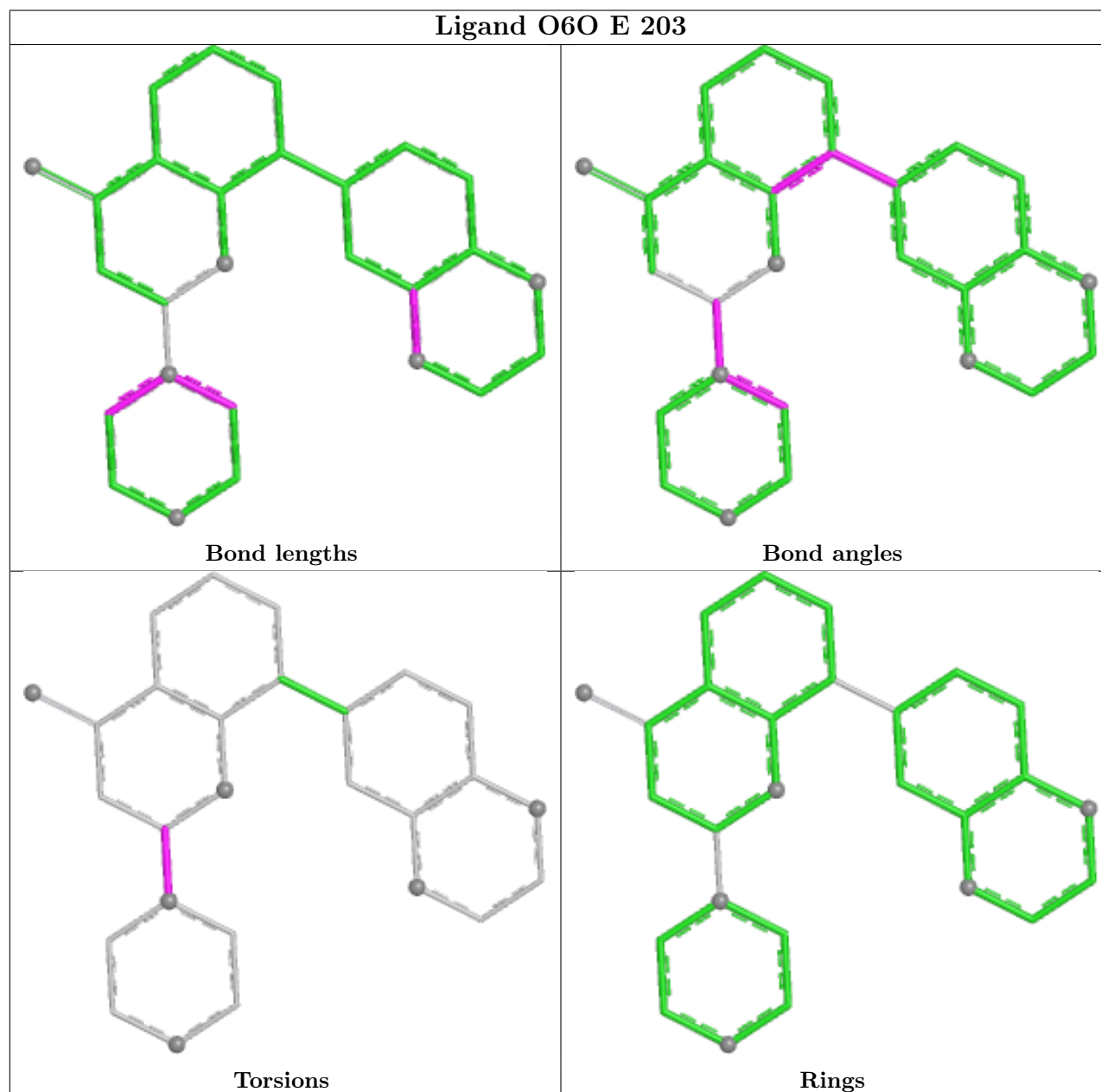
There are no ring outliers.

19 monomers are involved in 41 short contacts:

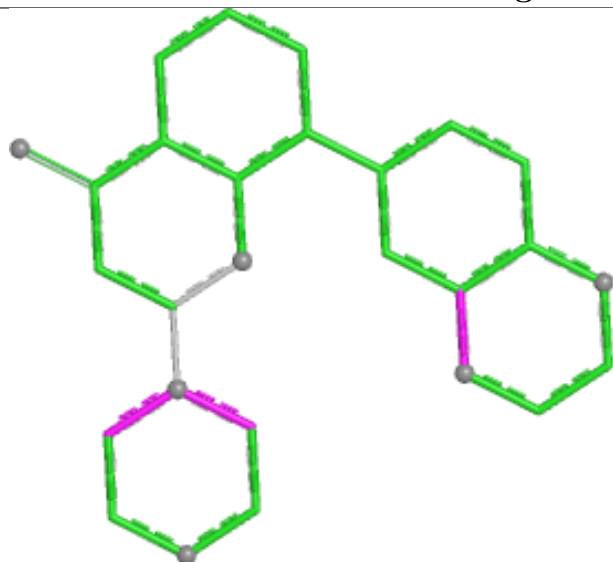
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	207	EDO	1	0
3	C	201	PEG	2	0
5	C	202	DMS	1	0
4	E	207	EDO	1	0
4	E	210	EDO	2	0
4	E	208	EDO	1	0
4	A	210	EDO	2	0
3	A	202	PEG	5	0
3	A	203	PEG	3	0
5	D	203	DMS	1	0
4	E	206	EDO	2	0
2	C	203	O6O	1	0
4	E	211	EDO	1	0
2	D	201	O6O	1	0
4	D	202	EDO	2	0
8	F	202	PGE	3	0
5	C	205	DMS	6	0
4	E	201	EDO	2	0
3	E	204	PEG	4	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

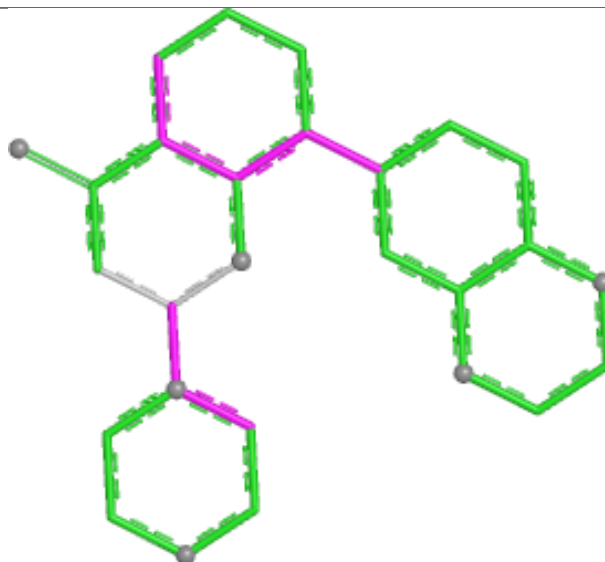
within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question 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.



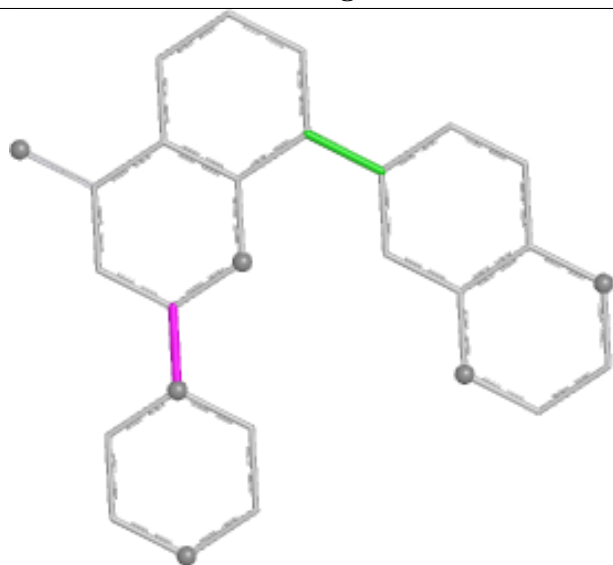
Ligand O6O A 201



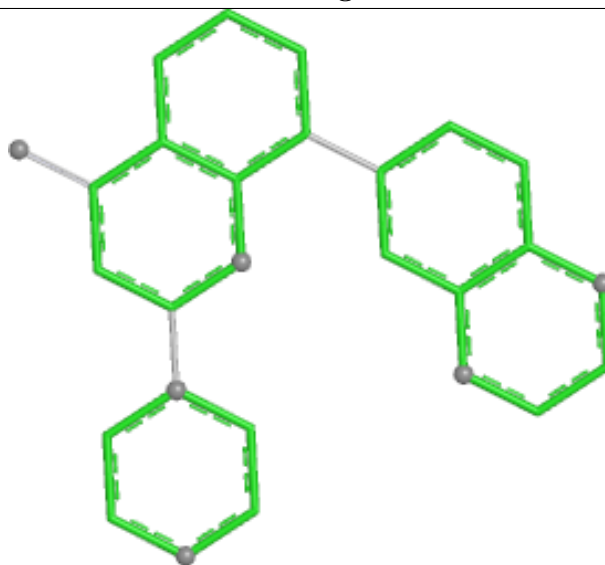
Bond lengths



Bond angles

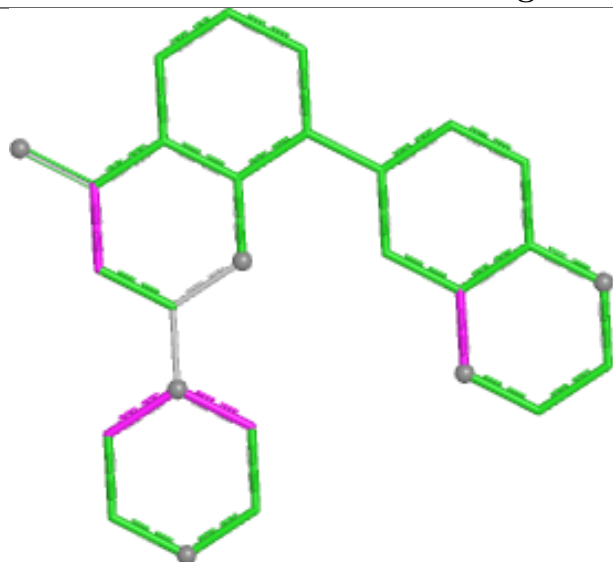


Torsions

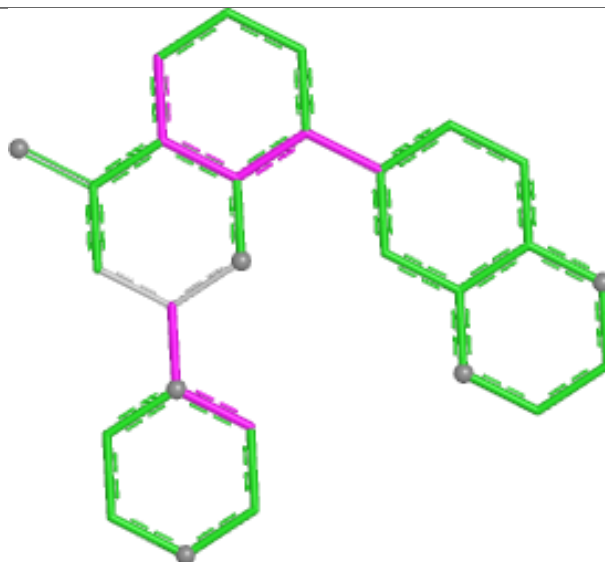


Rings

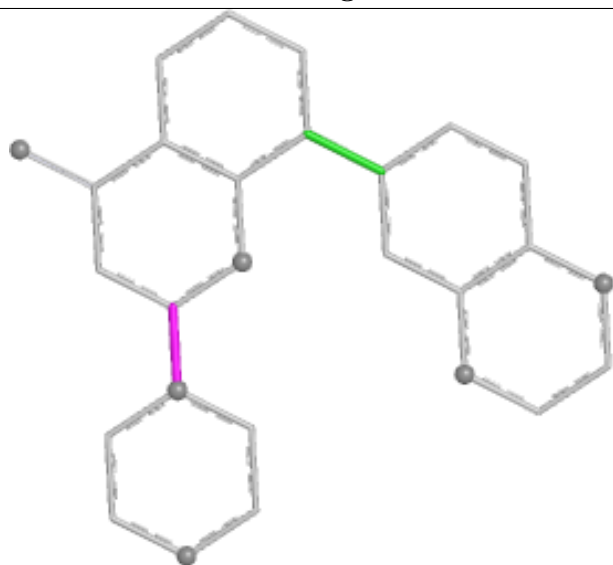
Ligand O6O F 201



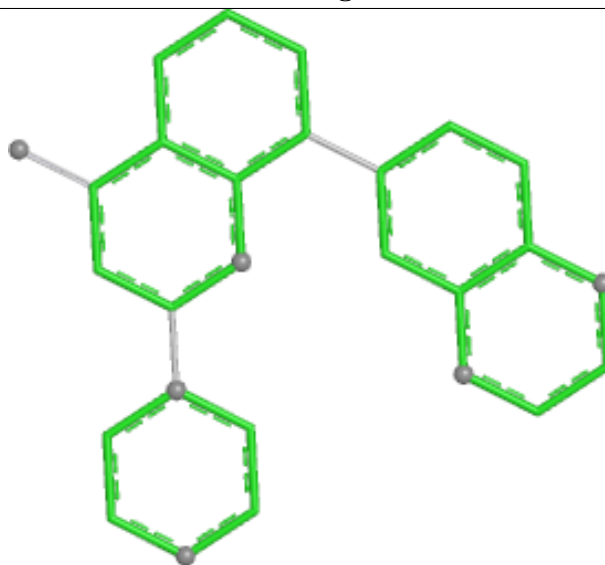
Bond lengths



Bond angles

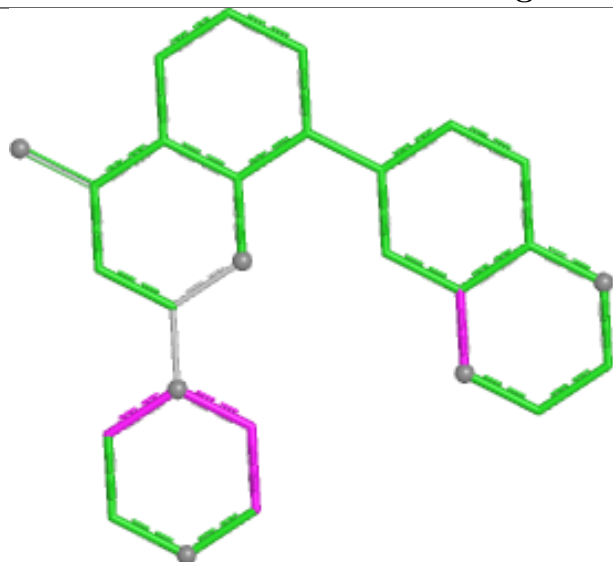


Torsions

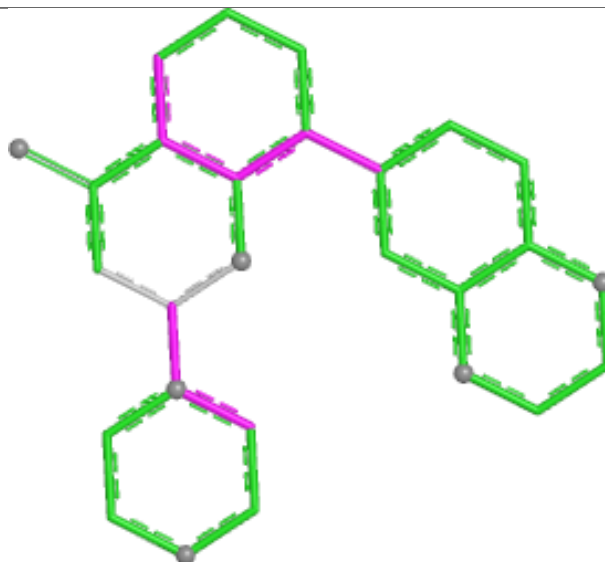


Rings

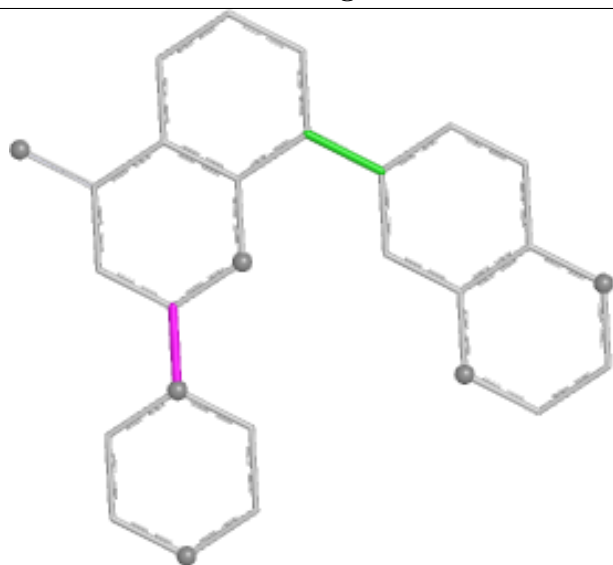
Ligand O6O B 201



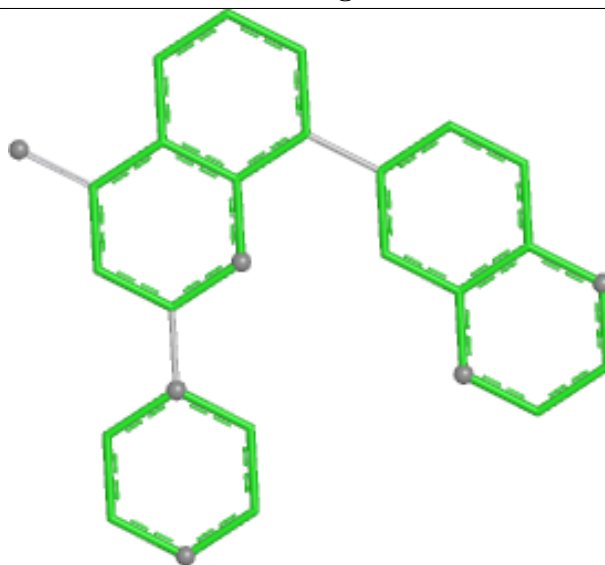
Bond lengths



Bond angles

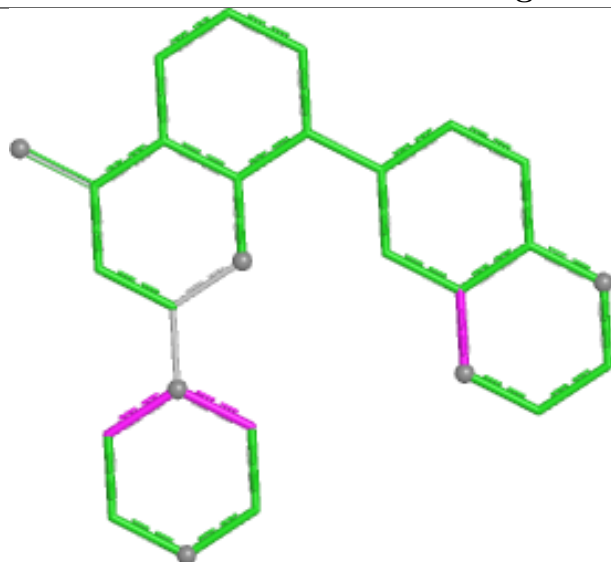


Torsions

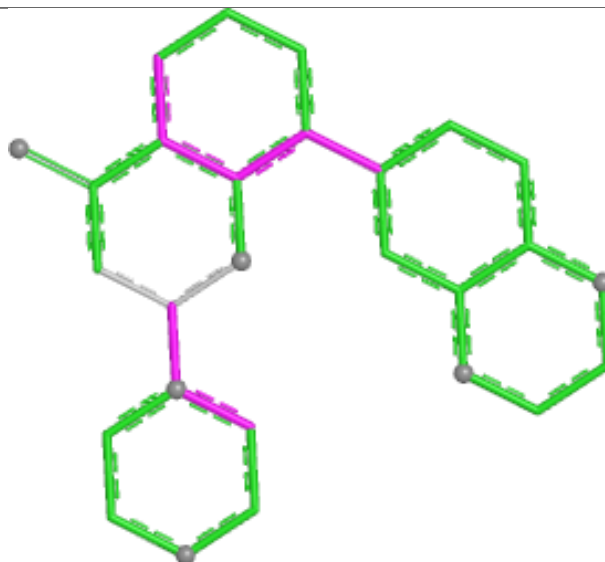


Rings

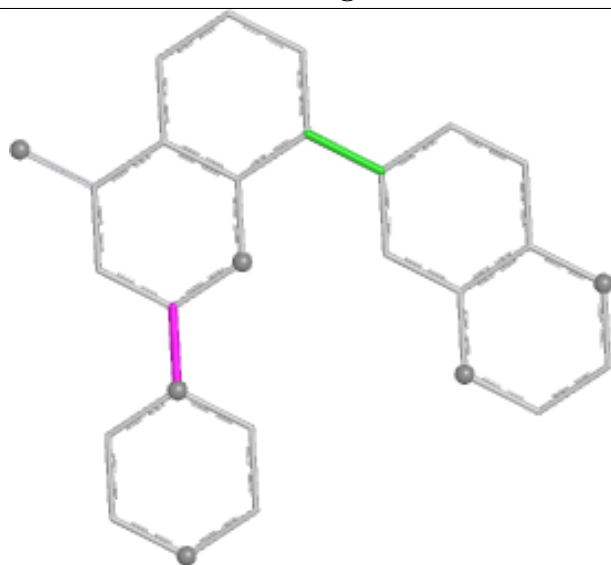
Ligand O6O C 203



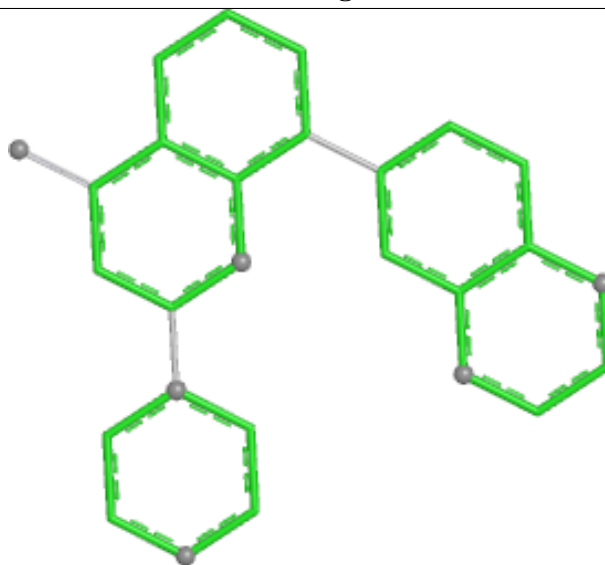
Bond lengths



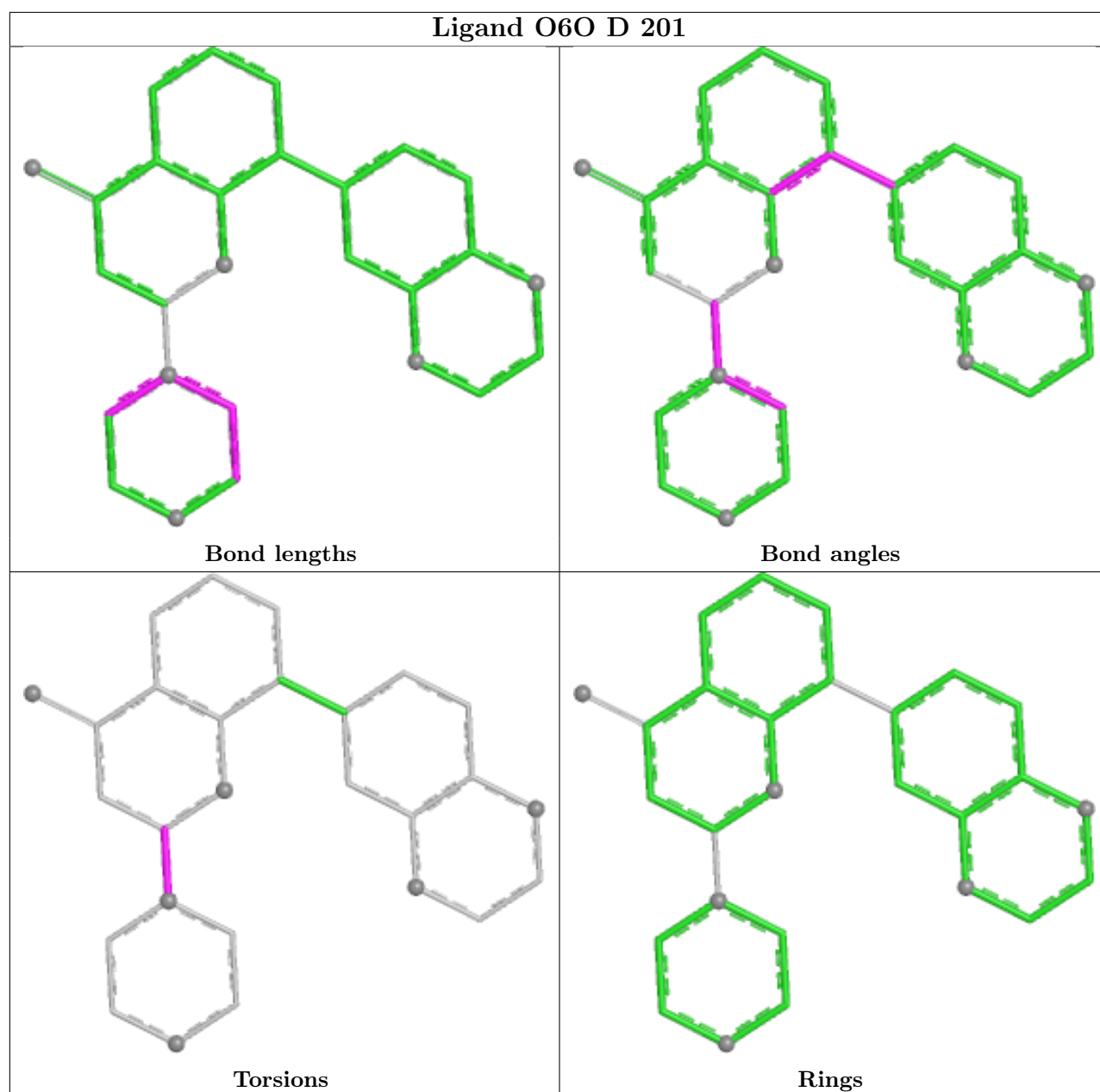
Bond angles



Torsions



Rings



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	111/114 (97%)	-1.02	0 100 100	37, 47, 70, 77	0
1	B	111/114 (97%)	-0.97	0 100 100	36, 46, 73, 78	0
1	C	111/114 (97%)	-0.97	0 100 100	40, 56, 78, 89	1 (0%)
1	D	111/114 (97%)	-1.01	0 100 100	41, 57, 79, 94	0
1	E	111/114 (97%)	-0.99	0 100 100	39, 52, 79, 90	0
1	F	111/114 (97%)	-0.99	0 100 100	38, 53, 79, 87	0
All	All	666/684 (97%)	-0.99	0 100 100	36, 53, 77, 94	1 (0%)

There are no RSRZ outliers to report.

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](#)

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(Å ²)	Q<0.9
5	DMS	B	209	4/4	0.89	0.14	70,71,79,105	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	EDO	E	202	4/4	0.91	0.10	81,81,83,84	0
4	EDO	A	205	4/4	0.94	0.12	63,65,71,75	0
4	EDO	E	207	4/4	0.94	0.10	59,59,63,67	0
4	EDO	B	208	4/4	0.94	0.09	72,73,76,78	0
5	DMS	A	207	4/4	0.95	0.11	62,64,79,95	0
4	EDO	E	205	4/4	0.96	0.11	57,63,67,68	0
4	EDO	F	205	4/4	0.96	0.10	52,56,61,61	0
4	EDO	B	207	4/4	0.97	0.08	45,49,57,67	0
3	PEG	B	204	7/7	0.97	0.07	64,66,73,73	0
4	EDO	B	210	4/4	0.97	0.11	61,66,68,69	0
4	EDO	B	211	4/4	0.97	0.08	52,59,65,68	0
3	PEG	C	201	7/7	0.97	0.09	49,52,62,67	0
2	O6O	C	203	27/27	0.97	0.08	61,73,84,86	0
4	EDO	A	211	4/4	0.97	0.08	56,57,62,64	0
4	EDO	B	203	4/4	0.97	0.06	51,56,60,61	0
4	EDO	B	205	4/4	0.97	0.07	59,60,63,67	0
4	EDO	B	206	4/4	0.97	0.09	64,65,70,73	0
5	DMS	C	202	4/4	0.97	0.08	52,56,81,83	0
5	DMS	D	203	4/4	0.97	0.11	48,52,59,76	0
5	DMS	E	209	4/4	0.97	0.07	57,66,72,80	0
6	CL	D	204	1/1	0.97	0.07	86,86,86,86	0
4	EDO	D	202	4/4	0.98	0.11	63,64,71,72	0
4	EDO	E	201	4/4	0.98	0.07	56,56,62,74	0
4	EDO	A	210	4/4	0.98	0.07	50,52,53,63	0
3	PEG	A	202	7/7	0.98	0.06	47,54,60,70	0
4	EDO	E	206	4/4	0.98	0.09	55,56,59,60	0
3	PEG	A	203	7/7	0.98	0.10	58,61,65,68	0
4	EDO	E	208	4/4	0.98	0.05	56,56,61,70	0
4	EDO	E	210	4/4	0.98	0.06	50,54,55,69	0
4	EDO	E	211	4/4	0.98	0.07	53,57,58,60	0
4	EDO	F	204	4/4	0.98	0.07	56,60,61,70	0
3	PEG	A	204	7/7	0.98	0.07	61,64,67,68	0
4	EDO	F	206	4/4	0.98	0.09	43,56,60,61	0
3	PEG	A	206	7/7	0.98	0.06	57,61,65,70	0
2	O6O	A	201	27/27	0.98	0.06	53,66,72,76	0
2	O6O	D	201	27/27	0.98	0.07	66,75,86,87	0
5	DMS	C	205	4/4	0.98	0.06	53,54,67,78	0
5	DMS	C	207	4/4	0.98	0.08	51,53,62,74	0
2	O6O	E	203	27/27	0.98	0.06	54,67,74,77	0
4	EDO	A	208	4/4	0.98	0.08	50,57,58,58	0
5	DMS	F	203	4/4	0.98	0.08	56,68,68,87	0
6	CL	A	212	1/1	0.98	0.05	84,84,84,84	0

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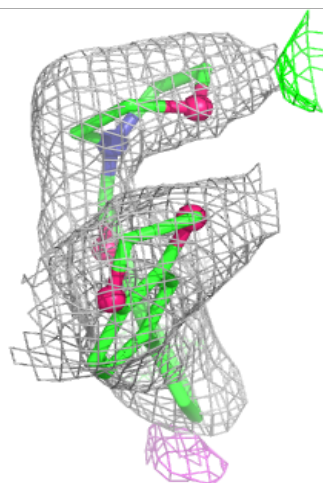
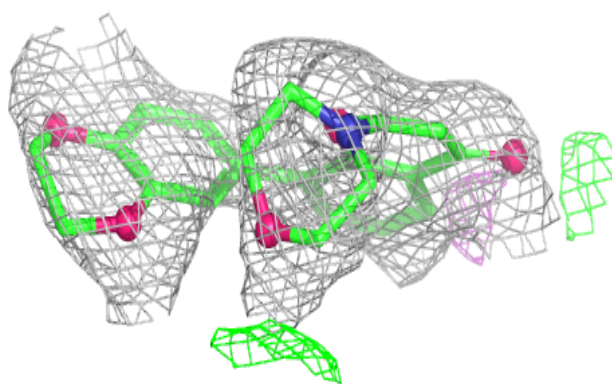
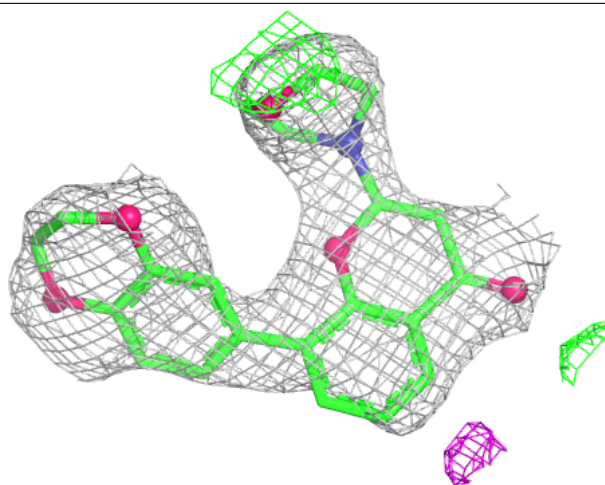
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	EDO	C	206	4/4	0.98	0.09	64,66,67,70	0
6	CL	F	207	1/1	0.98	0.09	82,82,82,82	0
7	NA	E	213	1/1	0.98	0.04	72,72,72,72	0
8	PGE	F	202	10/10	0.98	0.07	53,65,67,69	0
4	EDO	B	202	4/4	0.99	0.07	57,57,58,64	0
2	O6O	F	201	27/27	0.99	0.05	56,66,79,84	0
6	CL	B	212	1/1	0.99	0.06	83,83,83,83	0
6	CL	C	208	1/1	0.99	0.08	87,87,87,87	0
4	EDO	A	209	4/4	0.99	0.06	47,53,53,58	0
4	EDO	C	204	4/4	0.99	0.05	58,59,60,64	0
7	NA	A	213	1/1	0.99	0.08	64,64,64,64	0
3	PEG	E	204	7/7	0.99	0.05	41,44,53,57	0
2	O6O	B	201	27/27	0.99	0.05	55,64,72,80	0
6	CL	E	212	1/1	1.00	0.09	82,82,82,82	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.

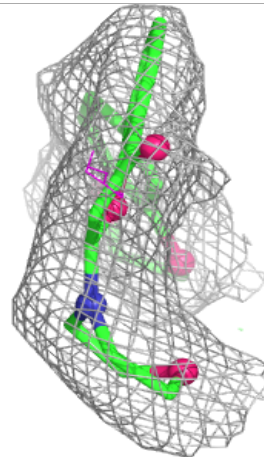
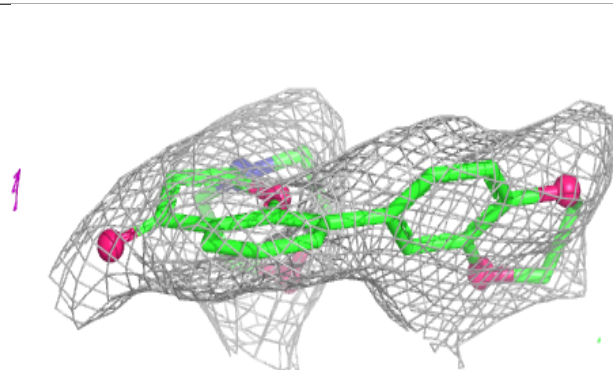
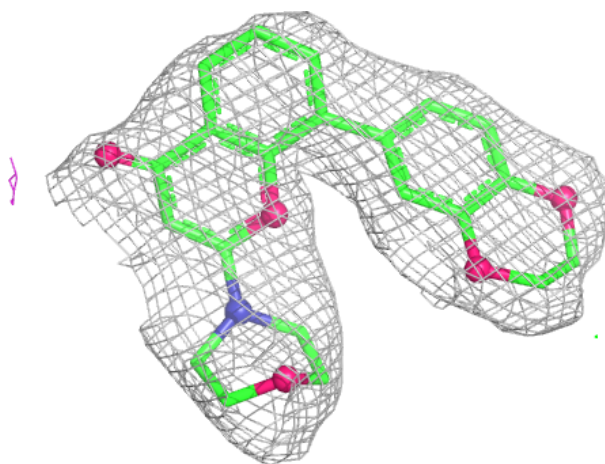
Electron density around O6O C 203:

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



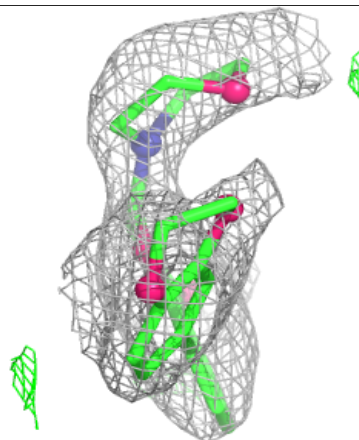
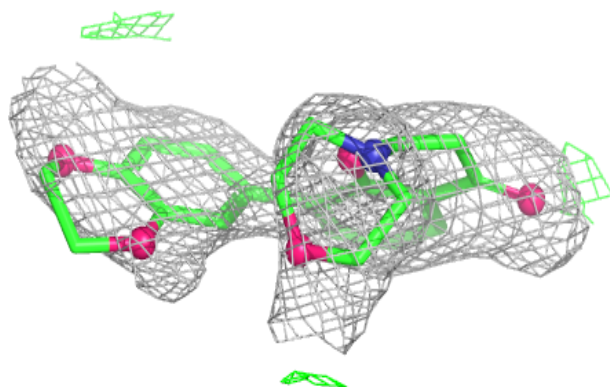
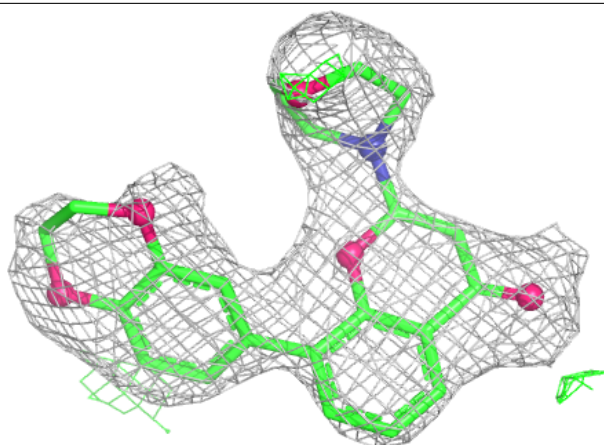
Electron density around O6O A 201:

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



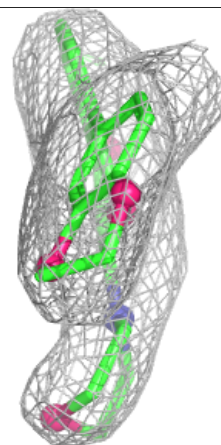
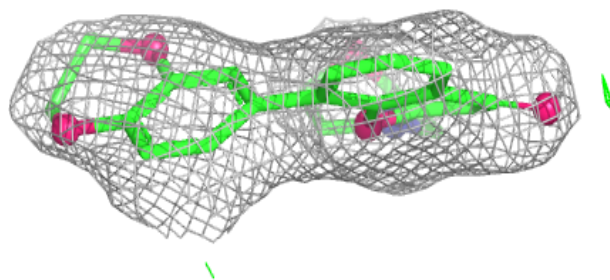
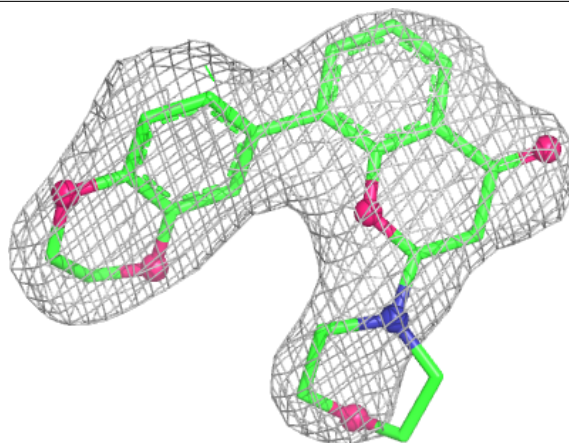
Electron density around O6O D 201:

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



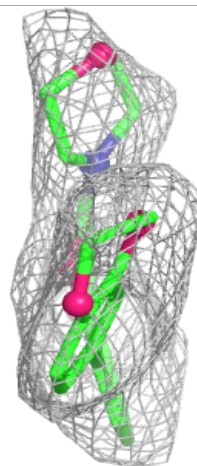
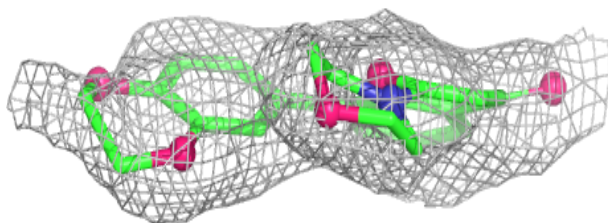
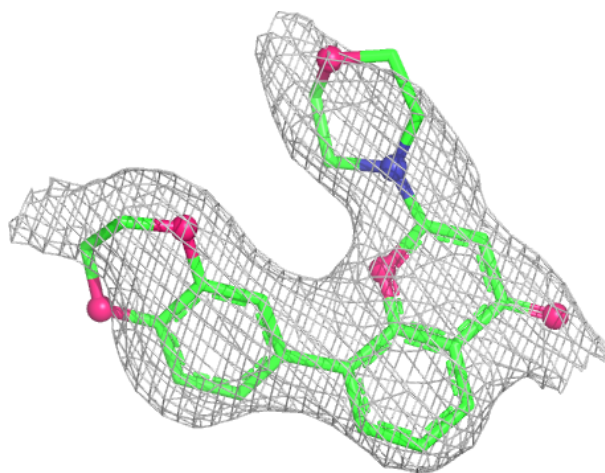
Electron density around O6O E 203:

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



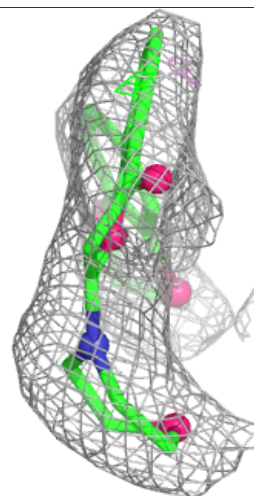
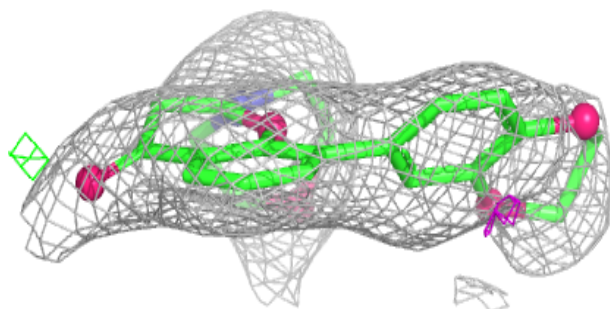
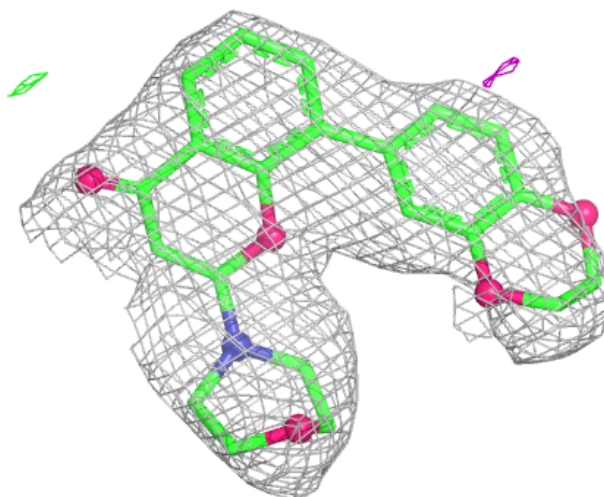
Electron density around O6O F 201:

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



Electron density around O6O B 201:

$2mF_o-DF_c$ (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.