



Full wwPDB X-ray Structure Validation Report

Mar 1, 2014 – 12:49 AM GMT

PDB ID : 3SFU
Title : crystal structure of murine norovirus RNA dependent RNA polymerase in complex with ribavirin
Authors : Kim, K.H.; Alam, I.
Deposited on : 2011-06-14
Resolution : 2.50 Å(reported)

This is a full wwPDB validation report for a publicly released PDB entry.
We welcome your comments at validation@mail.wwpdb.org
A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

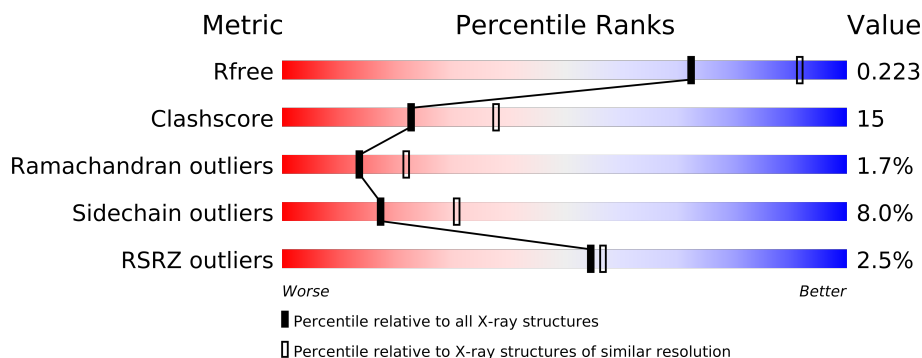
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.15 2013
Xtriage (Phenix) : dev-1323
EDS : stable22639
Percentile statistics : 21963
Refmac : 5.8.0049
CCP4 : 6.3.0 (Settle)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP) : stable22683

1 Overall quality at a glance

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}	66092	2784 (2.50-2.50)
Clashscore	79885	3562 (2.50-2.50)
Ramachandran outliers	78287	3480 (2.50-2.50)
Sidechain outliers	78261	3482 (2.50-2.50)
RSRZ outliers	66119	2785 (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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	517	
1	B	517	
1	C	517	

The following table lists non-polymeric compounds that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Geometry	Electron density
2	RBV	A	601	-	X
2	RBV	B	601	-	X
2	RBV	C	601	-	X
3	SO4	A	602	-	X
3	SO4	A	603	-	X

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Mol	Type	Chain	Res	Geometry	Electron density
3	SO4	A	604	-	X
3	SO4	A	606	-	X
3	SO4	A	608	-	X
3	SO4	A	609	-	X
3	SO4	B	602	-	X
3	SO4	B	603	-	X
3	SO4	B	605	-	X
3	SO4	B	606	-	X
3	SO4	B	607	-	X
3	SO4	C	602	-	X
3	SO4	C	605	-	X
3	SO4	C	607	-	X
3	SO4	C	609	-	X
3	SO4	C	610	-	X
3	SO4	C	612	-	X
3	SO4	C	613	-	X
3	SO4	C	614	-	X
3	SO4	C	615	-	X
5	GOL	A	612	-	X
5	GOL	A	615	-	X
5	GOL	A	617	-	X
5	GOL	A	618	-	X
5	GOL	A	619	-	X
5	GOL	B	610	-	X
5	GOL	B	611	-	X
5	GOL	B	612	-	X
5	GOL	B	614	-	X
5	GOL	B	615	-	X
5	GOL	B	616	-	X
5	GOL	B	617	-	X
5	GOL	B	618	-	X
5	GOL	C	606	-	X
5	GOL	C	619	-	X
5	GOL	C	620	-	X
5	GOL	C	621	-	X

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 12321 atoms, of which 0 are hydrogen and 0 are deuterium.

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 RNA polymerase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	480	Total	C	N	O	S	0	1	0
			3828	2423	674	706	25			
1	B	487	Total	C	N	O	S	0	0	0
			3865	2444	680	716	25			
1	C	478	Total	C	N	O	S	0	0	0
			3800	2405	669	702	24			

There are 33 discrepancies between the modelled and reference sequences:

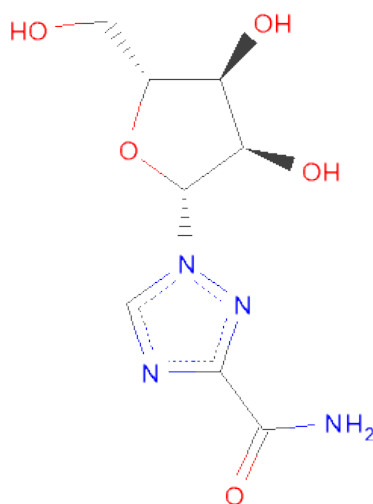
Chain	Residue	Modelled	Actual	Comment	Reference
A	510	ALA	-	EXPRESSION TAG	UNP Q80J95
A	511	ALA	-	EXPRESSION TAG	UNP Q80J95
A	512	ALA	-	EXPRESSION TAG	UNP Q80J95
A	513	LEU	-	EXPRESSION TAG	UNP Q80J95
A	514	GLU	-	EXPRESSION TAG	UNP Q80J95
A	515	HIS	-	EXPRESSION TAG	UNP Q80J95
A	516	HIS	-	EXPRESSION TAG	UNP Q80J95
A	517	HIS	-	EXPRESSION TAG	UNP Q80J95
A	518	HIS	-	EXPRESSION TAG	UNP Q80J95
A	519	HIS	-	EXPRESSION TAG	UNP Q80J95
A	520	HIS	-	EXPRESSION TAG	UNP Q80J95
B	510	ALA	-	EXPRESSION TAG	UNP Q80J95
B	511	ALA	-	EXPRESSION TAG	UNP Q80J95
B	512	ALA	-	EXPRESSION TAG	UNP Q80J95
B	513	LEU	-	EXPRESSION TAG	UNP Q80J95
B	514	GLU	-	EXPRESSION TAG	UNP Q80J95
B	515	HIS	-	EXPRESSION TAG	UNP Q80J95
B	516	HIS	-	EXPRESSION TAG	UNP Q80J95
B	517	HIS	-	EXPRESSION TAG	UNP Q80J95
B	518	HIS	-	EXPRESSION TAG	UNP Q80J95
B	519	HIS	-	EXPRESSION TAG	UNP Q80J95
B	520	HIS	-	EXPRESSION TAG	UNP Q80J95
C	510	ALA	-	EXPRESSION TAG	UNP Q80J95

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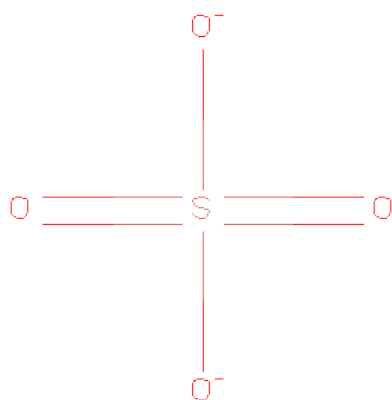
Chain	Residue	Modelled	Actual	Comment	Reference
C	511	ALA	-	EXPRESSION TAG	UNP Q80J95
C	512	ALA	-	EXPRESSION TAG	UNP Q80J95
C	513	LEU	-	EXPRESSION TAG	UNP Q80J95
C	514	GLU	-	EXPRESSION TAG	UNP Q80J95
C	515	HIS	-	EXPRESSION TAG	UNP Q80J95
C	516	HIS	-	EXPRESSION TAG	UNP Q80J95
C	517	HIS	-	EXPRESSION TAG	UNP Q80J95
C	518	HIS	-	EXPRESSION TAG	UNP Q80J95
C	519	HIS	-	EXPRESSION TAG	UNP Q80J95
C	520	HIS	-	EXPRESSION TAG	UNP Q80J95

- Molecule 2 is 1-(BETA-D-RIBOFURANOSYL)-1H-1,2,4-TRIAZOLE-3-CARBOXAMIDE (three-letter code: RBV) (formula: C₈H₁₂N₄O₅).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			17	8	4	5		
2	B	1	Total	C	N	O	0	0
			17	8	4	5		
2	C	1	Total	C	N	O	0	0
			17	8	4	5		

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	O	S	0	0
			5	4	1		
3	A	1	Total	O	S	0	0
			5	4	1		
3	A	1	Total	O	S	0	0
			5	4	1		
3	A	1	Total	O	S	0	0
			5	4	1		
3	A	1	Total	O	S	0	0
			5	4	1		
3	A	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		

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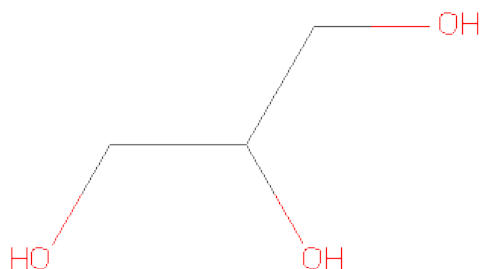
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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	B	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		

- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

- Molecule 5 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



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

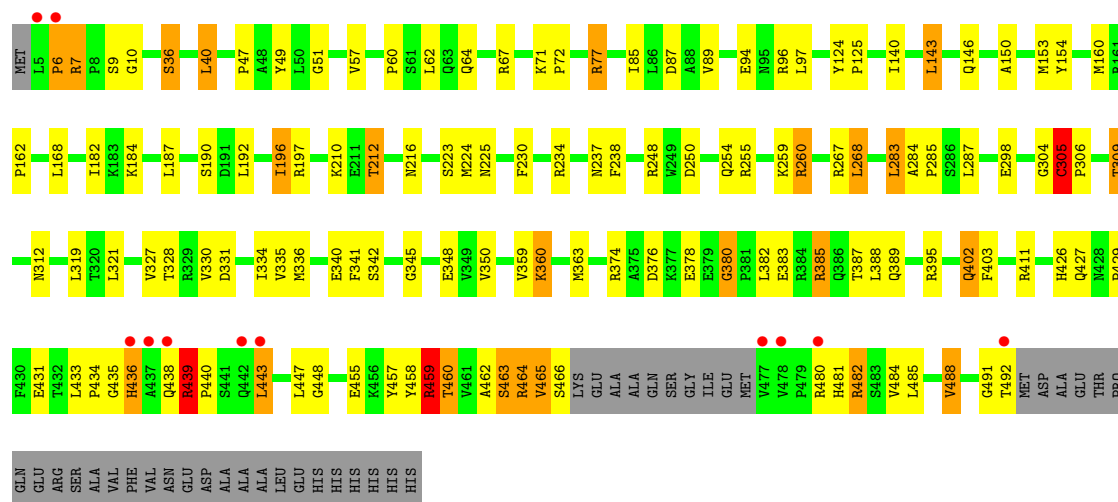
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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	1	Total C O 6 3 3	0	0
5	B	1	Total C O 6 3 3	0	0
5	B	1	Total C O 6 3 3	0	0
5	B	1	Total C O 6 3 3	0	0
5	B	1	Total C O 6 3 3	0	0
5	C	1	Total C O 6 3 3	0	0
5	C	1	Total C O 6 3 3	0	0
5	C	1	Total C O 6 3 3	0	0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

- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	179	Total O 179 179	0	0
6	B	149	Total O 149 149	0	0
6	C	155	Total O 155 155	0	0



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	119.95Å 196.08Å 109.21Å 90.00° 114.12° 90.00°	Depositor
Resolution (Å)	47.85 – 2.50 49.02 – 2.50	Depositor EDS
% Data completeness (in resolution range)	99.6 (47.85-2.50) 95.6 (49.02-2.50)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	0.46	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.77 (at 2.51Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.7.1_743)	Depositor
R, R_{free}	0.181 , 0.229 0.179 , 0.223	Depositor DCC
R_{free} test set	1922 reflections (2.54%)	DCC
Wilson B-factor (Å ²)	28.6	Xtriage
Anisotropy	0.631	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 26.5	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 78927 reflections	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	12321	wwPDB-VP
Average B, all atoms (Å ²)	34.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.46% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, MG, SO4, RBV

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	0.42	0/3923	0.58	0/5314
1	B	0.40	0/3961	0.57	1/5368 (0.0%)
1	C	0.41	0/3895	0.58	0/5280
All	All	0.41	0/11779	0.58	1/15962 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	C	0	1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	57	VAL	CB-CA-C	-5.28	101.38	111.40

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	459	ARG	Peptide

5.2 Close contacts

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 hydrogens

added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3828	0	3790	119	1
1	B	3865	0	3822	111	0
1	C	3800	0	3757	113	0
2	A	17	0	12	4	0
2	B	17	0	12	4	0
2	C	17	0	12	10	0
3	A	40	0	0	1	0
3	B	35	0	0	4	0
3	C	60	0	0	4	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
5	A	60	0	80	13	0
5	B	54	0	72	5	0
5	C	42	0	56	8	0
6	A	179	0	0	5	0
6	B	149	0	0	4	0
6	C	155	0	0	4	0
All	All	12321	0	11613	345	1

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 15.

All (345) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:463:SER:HA	1:A:464:ARG:HB3	1.18	1.17
1:A:104:GLN:H	5:A:618:GOL:H32	1.02	1.15
1:B:436:HIS:H	1:B:437:ALA:HA	1.16	1.08
1:B:161:ARG:HG3	1:B:161:ARG:HH11	1.22	1.04
1:A:305:CYS:HB2	1:A:306:PRO:HD2	1.36	1.04
1:A:411:ARG:HD3	5:A:615:GOL:H12	1.40	1.01
1:C:146:GLN:HG3	5:C:620:GOL:H2	1.45	0.97
1:C:312:ASN:HD22	2:C:601:RBV:H3'	1.30	0.97
1:C:464:ARG:H	1:C:464:ARG:NE	1.67	0.91
1:C:259:LYS:HG3	1:C:283:LEU:HD23	1.52	0.90
1:A:104:GLN:N	5:A:618:GOL:H32	1.86	0.89
1:C:459:ARG:HA	1:C:462:ALA:HB3	1.55	0.88
1:B:366:ARG:HH22	1:B:380:GLY:HA3	1.38	0.88

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:476:MET:HB3	1:A:477:VAL:HA	1.57	0.86
1:A:464:ARG:HG2	1:A:465:VAL:HG22	1.59	0.85
1:A:477:VAL:HG22	1:A:478:VAL:H	1.42	0.85
1:C:491:GLY:HA2	1:C:492:THR:HB	1.58	0.85
1:C:385:ARG:NH1	1:C:387:THR:O	2.09	0.84
1:C:458:TYR:O	1:C:459:ARG:HB3	1.77	0.83
1:B:309:THR:HB	2:B:601:RBV:O2'	1.77	0.83
1:B:234:ARG:NH1	1:B:340:GLU:OE2	2.11	0.83
1:B:436:HIS:N	1:B:437:ALA:HA	1.85	0.83
1:B:212:THR:HG21	1:B:216:ASN:HD22	1.44	0.83
1:C:345:GLY:HA3	2:C:601:RBV:H5'A	1.61	0.82
1:A:463:SER:CA	1:A:464:ARG:HB3	2.06	0.80
1:B:82:PRO:HA	5:B:614:GOL:H12	1.64	0.80
1:B:83:GLN:H	5:B:614:GOL:H2	1.48	0.79
1:B:403:PHE:O	1:C:234:ARG:NH2	2.16	0.79
1:A:217:PRO:HD3	5:A:617:GOL:H32	1.64	0.78
1:A:305:CYS:HB2	1:A:306:PRO:CD	2.14	0.78
1:A:305:CYS:CB	1:A:306:PRO:HD2	2.12	0.77
1:A:459:ARG:HH11	1:A:459:ARG:CG	1.97	0.77
1:A:305:CYS:SG	6:A:772:HOH:O	2.42	0.77
1:A:463:SER:HA	1:A:464:ARG:CB	2.06	0.76
1:C:383:GLU:HB2	3:C:613:SO4:O1	1.84	0.76
1:A:466:SER:H	1:A:467:LYS:HA	1.49	0.76
1:A:341:PHE:N	5:A:617:GOL:O2	2.17	0.75
1:B:150:ALA:HA	1:B:160:MET:HE1	1.68	0.74
5:C:620:GOL:H12	6:C:855:HOH:O	1.87	0.74
1:A:225:ASN:H	5:A:614:GOL:H31	1.52	0.74
1:C:309:THR:HB	2:C:601:RBV:O3'	1.88	0.74
1:B:150:ALA:HA	1:B:160:MET:CE	2.18	0.73
1:A:464:ARG:HG2	1:A:465:VAL:N	2.04	0.72
1:B:161:ARG:CG	1:B:161:ARG:HH11	2.03	0.71
1:C:223:SER:HA	5:C:618:GOL:H32	1.72	0.71
1:A:476:MET:HB3	1:A:477:VAL:CA	2.20	0.71
1:A:217:PRO:CD	5:A:617:GOL:H32	2.21	0.71
1:B:337:GLN:HG2	1:C:402:GLN:HG3	1.72	0.70
1:C:385:ARG:NH1	1:C:389:GLN:O	2.25	0.69
1:B:212:THR:CG2	1:B:216:ASN:HD22	2.05	0.69
1:B:161:ARG:NH1	1:B:161:ARG:HG3	2.02	0.69
1:A:436:HIS:HD2	1:A:467:LYS:HG3	1.58	0.68
1:A:161:ARG:HD2	1:A:287:LEU:HD22	1.74	0.68
1:A:459:ARG:HG2	1:A:459:ARG:HH11	1.59	0.68
1:A:465:VAL:HB	1:A:466:SER:HB3	1.77	0.67

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:87:ASP:OD1	1:A:260:ARG:NH2	2.27	0.67
1:A:465:VAL:HB	1:A:466:SER:CB	2.24	0.67
1:C:327:VAL:HG22	1:C:360:LYS:HB3	1.76	0.67
1:A:396:ARG:NH1	6:A:759:HOH:O	2.13	0.67
1:A:309:THR:HB	2:A:601:RBV:H2'	1.76	0.66
1:B:455:GLU:O	1:B:459:ARG:HG2	1.96	0.66
1:C:150:ALA:HA	1:C:160:MET:HE1	1.76	0.66
1:B:29:LYS:HD2	5:B:612:GOL:H32	1.78	0.66
1:A:96:ARG:HE	1:A:216:ASN:ND2	1.93	0.66
1:C:431:GLU:OE1	6:C:834:HOH:O	2.13	0.66
1:A:417:GLN:O	1:A:439:ARG:NH2	2.28	0.65
1:C:464:ARG:N	1:C:464:ARG:NE	2.42	0.65
1:B:68:ASP:O	1:B:71:LYS:HE2	1.97	0.65
1:C:330:VAL:HG22	1:C:335:VAL:HG23	1.79	0.65
1:B:476:MET:O	1:B:477:VAL:HG22	1.97	0.64
1:A:461:VAL:C	1:A:463:SER:H	2.01	0.64
1:A:110:LYS:O	1:A:114:GLU:HG2	1.98	0.63
1:A:459:ARG:CZ	1:A:460:THR:HG22	2.29	0.63
1:C:491:GLY:CA	1:C:492:THR:HB	2.27	0.63
1:A:77:ARG:HG2	1:A:254:GLN:HG2	1.78	0.63
1:A:96:ARG:HE	1:A:216:ASN:HD22	1.47	0.63
1:A:178:ILE:O	1:A:182:ILE:HD11	1.99	0.63
1:B:110:LYS:O	1:B:114:GLU:HG3	1.97	0.63
1:C:480:ARG:CZ	1:C:482:ARG:HG3	2.28	0.62
1:A:330:VAL:HG22	1:A:335:VAL:HG23	1.81	0.62
1:A:395:ARG:NH2	6:A:792:HOH:O	2.32	0.62
1:A:466:SER:N	1:A:467:LYS:HA	2.11	0.62
1:B:240:TYR:OH	1:B:355:GLU:OE2	2.06	0.62
1:A:439:ARG:HG2	1:A:439:ARG:HH11	1.65	0.61
3:A:608:SO4:O1	6:A:843:HOH:O	2.15	0.61
1:B:411:ARG:HG2	3:B:606:SO4:O2	1.99	0.61
1:B:408:ARG:NH2	3:B:608:SO4:O2	2.30	0.61
1:B:234:ARG:NH2	1:C:403:PHE:O	2.32	0.61
1:C:439:ARG:HG2	1:C:443:LEU:HD23	1.83	0.61
1:B:13:ALA:HB2	1:B:67:ARG:HG2	1.82	0.61
1:C:77:ARG:HG2	1:C:254:GLN:HG2	1.82	0.60
1:B:5:LEU:N	1:B:6:PRO:HD2	2.15	0.60
1:C:438:GLN:O	1:C:439:ARG:HB2	2.01	0.60
1:C:85:ILE:O	1:C:89:VAL:HG13	2.01	0.60
1:A:464:ARG:HG2	1:A:465:VAL:CG2	2.32	0.60
1:C:143:LEU:HG	1:C:192:LEU:HD22	1.84	0.60
1:A:436:HIS:CD2	1:A:467:LYS:HG3	2.37	0.59

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:345:GLY:HA3	2:B:601:RBV:H1'	1.84	0.59
1:C:62:LEU:N	3:C:609:SO4:O4	2.33	0.59
1:B:153:MET:HB2	1:B:160:MET:HE1	1.85	0.59
1:A:464:ARG:HG2	1:A:465:VAL:H	1.68	0.58
1:B:436:HIS:N	1:B:437:ALA:CA	2.64	0.58
1:B:77:ARG:HD2	1:B:299:GLU:HG3	1.83	0.58
1:A:360:LYS:HE3	5:B:618:GOL:H31	1.84	0.58
1:A:477:VAL:HG22	1:A:478:VAL:HG12	1.85	0.58
1:A:439:ARG:HG2	1:A:439:ARG:NH1	2.17	0.58
1:C:9:SER:HB3	1:C:10:GLY:HA2	1.86	0.58
1:A:117:ASP:O	1:A:130:LYS:HE2	2.04	0.58
1:A:477:VAL:HG22	1:A:478:VAL:N	2.14	0.57
1:A:52:SER:HB2	1:A:53:LYS:NZ	2.19	0.57
5:A:620:GOL:O3	5:A:620:GOL:O1	2.19	0.57
1:C:94:GLU:OE2	1:C:267:ARG:HD2	2.04	0.57
1:B:212:THR:HG23	1:B:212:THR:O	2.03	0.57
1:B:61:SER:OG	1:B:64:GLN:HG3	2.05	0.57
1:A:306:PRO:HB2	5:A:619:GOL:H11	1.86	0.57
1:C:190:SER:HB2	1:C:305:CYS:N	2.20	0.57
1:A:212:THR:CG2	1:A:216:ASN:HB2	2.35	0.57
1:C:480:ARG:HG2	1:C:482:ARG:HE	1.69	0.57
1:B:239:ARG:HD3	1:B:240:TYR:CE2	2.39	0.57
1:B:480:ARG:H	1:B:480:ARG:HH11	1.53	0.57
1:C:225:ASN:HB2	5:C:618:GOL:O1	2.05	0.56
1:A:85:ILE:O	1:A:89:VAL:HG13	2.04	0.56
1:C:436:HIS:CD2	1:C:466:SER:HA	2.40	0.56
1:A:143:LEU:HG	1:A:192:LEU:HD22	1.87	0.56
1:B:461:VAL:O	1:B:465:VAL:HG23	2.05	0.56
1:B:77:ARG:HD2	1:B:299:GLU:CG	2.36	0.56
1:B:47:PRO:HG2	1:B:429:PRO:HB3	1.88	0.55
1:A:341:PHE:H	5:A:617:GOL:HO2	1.50	0.55
1:B:153:MET:HB2	1:B:160:MET:CE	2.36	0.55
1:B:374:ARG:HD2	1:B:381:PRO:O	2.06	0.55
1:C:87:ASP:OD1	1:C:260:ARG:NH2	2.39	0.55
1:C:96:ARG:HE	1:C:216:ASN:ND2	2.04	0.55
1:B:474:ILE:HG22	1:B:475:GLU:N	2.22	0.55
1:B:330:VAL:HG22	1:B:335:VAL:HG23	1.88	0.55
1:C:481:HIS:CE1	1:C:485:LEU:HD12	2.42	0.54
1:C:331:ASP:HB2	1:C:334:ILE:HD13	1.89	0.54
1:C:463:SER:HA	1:C:464:ARG:HH21	1.73	0.54
1:A:330:VAL:HG22	1:A:335:VAL:CG2	2.37	0.54
1:B:85:ILE:O	1:B:89:VAL:HG13	2.07	0.54

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:160:MET:HE2	1:B:197:ARG:HD3	1.89	0.54
1:B:242:MET:HE3	1:B:358:MET:HE1	1.89	0.54
1:A:309:THR:HB	2:A:601:RBV:C2'	2.37	0.54
1:B:330:VAL:HG22	1:B:335:VAL:CG2	2.37	0.54
1:A:53:LYS:HE2	1:A:53:LYS:H	1.72	0.54
1:A:476:MET:CB	1:A:477:VAL:HA	2.25	0.54
1:A:464:ARG:CG	1:A:465:VAL:N	2.71	0.54
1:B:474:ILE:O	1:B:475:GLU:HB2	2.08	0.54
1:C:153:MET:HB2	1:C:160:MET:HE1	1.90	0.53
1:A:379:GLU:O	1:A:380:GLY:O	2.26	0.53
1:B:212:THR:HG23	1:B:216:ASN:HB2	1.89	0.53
1:B:341:PHE:CE1	1:B:350:VAL:HG13	2.43	0.53
1:B:163:ILE:HD13	1:B:287:LEU:HD23	1.90	0.53
1:B:255:ARG:HG3	1:B:298:GLU:O	2.09	0.53
1:C:464:ARG:HD2	1:C:465:VAL:N	2.24	0.53
1:C:196:ILE:C	1:C:196:ILE:HD12	2.29	0.53
1:A:212:THR:HG23	1:A:216:ASN:HB2	1.91	0.53
1:B:143:LEU:HG	1:B:192:LEU:HD22	1.91	0.53
1:C:96:ARG:HE	1:C:216:ASN:HD22	1.57	0.52
1:B:160:MET:CE	1:B:197:ARG:HD3	2.39	0.52
1:C:49:TYR:CE2	1:C:51:GLY:HA2	2.44	0.52
1:A:439:ARG:CG	1:A:439:ARG:HH11	2.23	0.52
1:B:394:LEU:O	1:B:395:ARG:HB2	2.10	0.52
1:B:348:GLU:OE1	6:B:753:HOH:O	2.19	0.52
1:B:411:ARG:N	3:B:606:SO4:O2	2.29	0.52
1:B:263:ASP:HB3	1:B:267:ARG:NH2	2.25	0.52
1:C:312:ASN:ND2	2:C:601:RBV:H3'	2.13	0.52
1:C:154:TYR:HB2	1:C:197:ARG:HG3	1.90	0.52
1:A:77:ARG:HD2	1:A:299:GLU:HG3	1.91	0.51
1:C:248:ARG:NH1	6:C:775:HOH:O	2.42	0.51
1:C:457:TYR:O	1:C:460:THR:HB	2.11	0.51
1:C:459:ARG:O	1:C:460:THR:HB	2.09	0.51
1:A:316:HIS:CE1	1:A:348:GLU:HB3	2.46	0.51
1:A:45:TRP:HB2	1:A:416:ARG:HD3	1.92	0.51
1:A:309:THR:HA	2:A:601:RBV:O2'	2.11	0.50
1:B:270:PRO:HD2	6:B:796:HOH:O	2.12	0.50
1:A:5:LEU:N	1:A:6:PRO:CD	2.75	0.50
1:C:462:ALA:O	1:C:463:SER:HB3	2.12	0.50
1:A:372:PRO:HB2	1:A:382:LEU:HD21	1.94	0.50
1:C:190:SER:HB2	1:C:305:CYS:H	1.77	0.50
1:A:443:LEU:O	1:A:447:LEU:HD22	2.12	0.50
1:A:477:VAL:CG2	1:A:478:VAL:H	2.20	0.50

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:C:459:ARG:O	1:C:460:THR:CB	2.60	0.50
1:A:28:THR:HG21	1:A:53:LYS:HE3	1.93	0.50
1:B:341:PHE:HE1	1:B:350:VAL:HG13	1.76	0.50
1:B:5:LEU:N	1:B:6:PRO:CD	2.74	0.49
1:B:163:ILE:CD1	1:B:287:LEU:HD23	2.42	0.49
1:B:62:LEU:N	3:B:607:SO4:O2	2.39	0.49
1:A:464:ARG:CG	1:A:465:VAL:H	2.25	0.49
1:B:476:MET:HG3	1:B:478:VAL:HG22	1.95	0.49
1:B:376:ASP:O	1:B:377:LYS:HG2	2.12	0.49
1:B:316:HIS:CE1	1:B:348:GLU:HB3	2.47	0.49
1:B:239:ARG:NH2	6:B:814:HOH:O	2.45	0.49
1:C:6:PRO:O	1:C:7:ARG:HB3	2.12	0.49
1:A:341:PHE:CE1	1:A:350:VAL:HG13	2.48	0.49
1:C:250:ASP:OD1	2:C:601:RBV:C5	2.61	0.48
1:B:212:THR:CG2	1:B:212:THR:O	2.60	0.48
1:B:439:ARG:O	1:B:443:LEU:HB2	2.13	0.48
1:A:345:GLY:HA3	2:A:601:RBV:H1'	1.95	0.48
1:B:239:ARG:HD3	1:B:240:TYR:CZ	2.49	0.48
1:C:411:ARG:N	3:C:615:SO4:O2	2.35	0.48
1:A:276:ARG:NH2	6:A:741:HOH:O	2.45	0.48
1:A:305:CYS:CB	1:A:306:PRO:CD	2.82	0.48
1:A:77:ARG:HD2	1:A:299:GLU:CG	2.44	0.48
1:C:448:GLY:HA3	1:C:488:VAL:HG11	1.94	0.48
1:C:480:ARG:O	1:C:484:VAL:HG23	2.14	0.48
1:B:447:LEU:HD13	1:B:465:VAL:HG21	1.96	0.48
1:A:178:ILE:O	1:A:182:ILE:CD1	2.61	0.48
1:C:459:ARG:HA	1:C:462:ALA:CB	2.37	0.47
1:A:117:ASP:O	1:A:130:LYS:CE	2.62	0.47
1:C:374:ARG:HD3	1:C:378:GLU:O	2.13	0.47
1:B:435:GLY:HA2	1:B:436:HIS:HA	1.54	0.47
1:B:71:LYS:N	1:B:72:PRO:HD2	2.29	0.47
1:B:484:VAL:O	1:B:488:VAL:HG22	2.13	0.47
1:C:402:GLN:H	1:C:402:GLN:CD	2.18	0.47
1:C:190:SER:HB2	1:C:304:GLY:HA3	1.97	0.47
1:C:383:GLU:N	3:C:613:SO4:O4	2.33	0.47
1:B:328:THR:OG1	1:B:330:VAL:HG13	2.14	0.47
1:C:259:LYS:HE3	1:C:283:LEU:HB3	1.96	0.47
1:A:459:ARG:HG3	1:A:459:ARG:HH11	1.79	0.46
1:B:217:PRO:HB3	1:B:341:PHE:HB2	1.97	0.46
1:C:462:ALA:O	1:C:463:SER:CB	2.63	0.46
1:A:217:PRO:HD3	5:A:617:GOL:C3	2.38	0.46
1:B:244:ALA:O	1:B:245:ASP:C	2.53	0.46

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
2:B:601:RBV:H5	6:B:776:HOH:O	2.15	0.46
1:B:387:THR:HG22	1:B:389:GLN:H	1.80	0.46
1:A:464:ARG:NE	1:A:465:VAL:O	2.49	0.46
1:C:64:GLN:OE1	1:C:67:ARG:NH1	2.49	0.46
1:C:77:ARG:CG	1:C:254:GLN:HG2	2.45	0.46
1:A:464:ARG:CG	1:A:465:VAL:HG22	2.39	0.46
1:A:459:ARG:HG3	1:A:460:THR:N	2.30	0.46
1:B:362:THR:HG22	1:B:366:ARG:NH1	2.30	0.46
1:C:150:ALA:HA	1:C:160:MET:CE	2.43	0.46
1:C:455:GLU:O	1:C:458:TYR:O	2.33	0.46
1:C:458:TYR:O	1:C:459:ARG:CB	2.53	0.46
1:B:376:ASP:OD2	1:B:376:ASP:N	2.48	0.46
1:C:374:ARG:NH2	1:C:376:ASP:OD2	2.43	0.46
1:A:220:VAL:HA	1:A:344:TYR:CE2	2.51	0.46
1:C:464:ARG:H	1:C:464:ARG:HE	1.60	0.45
1:C:250:ASP:OD1	2:C:601:RBV:H5	2.16	0.45
2:C:601:RBV:H2'	2:C:601:RBV:H5	1.76	0.45
1:C:464:ARG:CZ	1:C:464:ARG:N	2.78	0.45
1:B:77:ARG:HD2	1:B:299:GLU:CD	2.37	0.45
1:A:411:ARG:HG2	1:A:411:ARG:H	1.50	0.45
1:A:461:VAL:C	1:A:463:SER:N	2.66	0.45
1:C:85:ILE:O	1:C:89:VAL:CG1	2.64	0.45
1:C:168:LEU:HB3	1:C:184:LYS:HG2	1.99	0.45
1:A:480:ARG:HH12	1:A:482:ARG:HD3	1.82	0.45
1:A:259[B]:LYS:HA	1:A:283:LEU:HD23	1.98	0.45
1:A:47:PRO:HD3	1:A:420:TRP:CH2	2.52	0.45
1:A:464:ARG:HD3	1:A:464:ARG:N	2.32	0.45
1:C:187:LEU:HD23	2:C:601:RBV:O3	2.17	0.44
1:A:13:ALA:HB2	1:A:67:ARG:HG3	1.98	0.44
1:A:103:PRO:HA	5:A:618:GOL:H31	1.99	0.44
1:B:330:VAL:HG23	1:B:334:ILE:HB	2.00	0.44
1:B:133:ASP:HB2	1:B:143:LEU:HD22	2.00	0.44
1:B:212:THR:CG2	1:B:216:ASN:HB2	2.48	0.44
1:C:304:GLY:O	1:C:305:CYS:O	2.35	0.44
1:C:374:ARG:HD2	1:C:380:GLY:HA2	2.00	0.44
1:C:385:ARG:HB2	1:C:385:ARG:HE	1.45	0.44
1:B:9:SER:HB2	1:B:10:GLY:HA2	2.00	0.44
1:B:433:LEU:HA	1:B:434:PRO:HD3	1.79	0.44
1:A:52:SER:HB2	1:A:53:LYS:HZ3	1.82	0.44
1:B:140:ILE:HD12	1:B:140:ILE:C	2.38	0.44
1:A:212:THR:O	1:A:212:THR:CG2	2.65	0.43
1:A:21:GLY:HA3	1:A:291:GLY:O	2.18	0.43

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:C:160:MET:O	1:C:162:PRO:HD3	2.18	0.43
1:C:196:ILE:O	1:C:196:ILE:HD12	2.18	0.43
1:C:47:PRO:HG2	1:C:429:PRO:HB3	2.00	0.43
1:C:342:SER:O	1:C:348:GLU:HA	2.17	0.43
1:B:366:ARG:NH2	1:B:380:GLY:HA3	2.19	0.43
1:B:82:PRO:HA	5:B:614:GOL:C1	2.43	0.43
1:B:77:ARG:CG	1:B:254:GLN:HG2	2.48	0.43
1:A:217:PRO:HB3	1:A:341:PHE:HB2	2.00	0.43
1:A:80:LEU:HD12	1:A:80:LEU:HA	1.86	0.43
1:A:480:ARG:NH1	1:A:482:ARG:HD3	2.34	0.43
1:A:478:VAL:O	1:A:478:VAL:HG13	2.19	0.43
1:C:212:THR:O	1:C:212:THR:HG23	2.18	0.43
1:B:118:LYS:HE2	1:B:134:TRP:CD2	2.53	0.43
1:A:212:THR:O	1:A:212:THR:HG23	2.19	0.43
1:A:210:LYS:HG3	1:A:221:GLY:HA3	2.00	0.43
1:A:328:THR:OG1	1:A:330:VAL:HG13	2.18	0.43
1:B:388:LEU:HG	1:B:398:ILE:HG21	2.00	0.43
1:B:396:ARG:HG2	1:B:396:ARG:HH11	1.83	0.43
1:B:242:MET:HE1	1:B:361:TYR:CE2	2.53	0.43
1:A:259[A]:LYS:HA	1:A:283:LEU:HD23	2.00	0.43
1:C:36:SER:HB3	6:C:806:HOH:O	2.19	0.43
1:B:402:GLN:HG3	1:B:402:GLN:H	1.31	0.43
1:B:121:SER:O	1:B:130:LYS:HE2	2.18	0.43
1:B:388:LEU:HD12	1:B:388:LEU:HA	1.86	0.42
1:C:284:ALA:O	1:C:285:PRO:C	2.55	0.42
1:A:190:SER:O	1:A:195:MET:HE3	2.19	0.42
1:C:255:ARG:O	1:C:259:LYS:HD2	2.19	0.42
1:C:143:LEU:HD12	1:C:143:LEU:HA	1.78	0.42
1:C:309:THR:HA	2:C:601:RBV:O3'	2.19	0.42
1:B:242:MET:CE	1:B:358:MET:HE1	2.49	0.42
1:A:192:LEU:O	1:A:196:ILE:HG12	2.20	0.42
1:C:40:LEU:HA	1:C:40:LEU:HD12	1.91	0.42
1:C:388:LEU:H	5:C:616:GOL:H31	1.84	0.42
1:C:146:GLN:HG3	5:C:620:GOL:C2	2.33	0.42
1:A:210:LYS:C	1:A:212:THR:H	2.21	0.42
1:B:357:ASP:OD1	1:B:357:ASP:C	2.58	0.42
1:B:357:ASP:OD2	1:B:360:LYS:HD2	2.20	0.42
1:B:309:THR:HA	2:B:601:RBV:O3'	2.20	0.42
1:B:247:THR:HG22	1:B:248:ARG:HG3	2.01	0.42
1:B:242:MET:CE	1:B:358:MET:CE	2.98	0.42
1:B:77:ARG:HG2	1:B:254:GLN:HG2	2.01	0.42
1:C:336:MET:HB3	5:C:621:GOL:H12	2.02	0.42

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:C:312:ASN:HD22	2:C:601:RBV:C3'	2.16	0.41
1:C:255:ARG:HG3	1:C:298:GLU:O	2.21	0.41
1:A:212:THR:HG21	1:A:216:ASN:OD1	2.20	0.41
1:C:341:PHE:CE1	1:C:350:VAL:HG13	2.55	0.41
1:C:124:TYR:HA	1:C:125:PRO:HA	1.76	0.41
1:B:436:HIS:H	1:B:437:ALA:CA	2.06	0.41
1:A:476:MET:CE	1:A:477:VAL:HG23	2.51	0.41
1:A:490:PHE:O	1:A:491:GLY:C	2.58	0.41
1:A:459:ARG:NH1	1:A:459:ARG:CG	2.65	0.41
1:C:140:ILE:HD12	1:C:140:ILE:C	2.41	0.41
1:B:385:ARG:HA	1:B:385:ARG:HD2	1.93	0.41
1:C:464:ARG:HB2	1:C:465:VAL:H	1.62	0.41
1:B:383:GLU:H	1:B:383:GLU:CD	2.24	0.41
1:A:284:ALA:O	1:A:285:PRO:C	2.58	0.41
1:A:203:GLY:HA2	5:A:619:GOL:H32	2.02	0.41
1:C:459:ARG:H	1:C:462:ALA:H	1.69	0.41
1:B:477:VAL:HG23	1:B:477:VAL:O	2.21	0.41
1:C:359:VAL:O	1:C:363:MET:HG3	2.20	0.41
1:C:268:LEU:HD12	1:C:268:LEU:HA	1.91	0.41
1:A:133:ASP:CB	1:A:143:LEU:HB2	2.50	0.41
1:C:71:LYS:N	1:C:72:PRO:HD2	2.36	0.41
1:A:316:HIS:NE2	1:A:348:GLU:OE1	2.42	0.41
1:B:243:ASP:C	1:B:243:ASP:OD2	2.60	0.41
1:C:328:THR:OG1	1:C:330:VAL:HG13	2.21	0.40
1:C:319:LEU:HA	1:C:319:LEU:HD23	1.95	0.40
1:A:440:PRO:HG2	1:A:441:SER:H	1.86	0.40
1:B:150:ALA:HA	1:B:160:MET:HE3	2.00	0.40
1:C:464:ARG:NH1	1:C:465:VAL:HA	2.35	0.40
1:C:330:VAL:HG22	1:C:335:VAL:CG2	2.46	0.40
1:A:52:SER:HB2	1:A:53:LYS:HZ1	1.85	0.40
1:C:238:PHE:CE1	1:C:340:GLU:HB2	2.56	0.40
1:B:34:ARG:HD2	1:B:40:LEU:CD1	2.51	0.40
1:C:212:THR:CG2	1:C:216:ASN:OD1	2.70	0.40
1:C:433:LEU:HD12	1:C:434:PRO:HD2	2.03	0.40
1:C:224:MET:H	5:C:618:GOL:H32	1.86	0.40
1:B:389:GLN:HG2	1:B:405:TRP:CH2	2.57	0.40
1:C:60:PRO:HD2	1:C:182:ILE:HD12	2.04	0.40
1:A:34:ARG:HG3	1:A:430:PHE:HA	2.04	0.40

All (1) 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	Distance(Å)	Clash(Å)
1:A:234:ARG:NH2	1:A:403:PHE:O[2_454]	2.02	0.18

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	477/517 (92%)	455 (95%)	16 (3%)	6 (1%)	18	29
1	B	485/517 (94%)	456 (94%)	22 (4%)	7 (1%)	16	27
1	C	474/517 (92%)	444 (94%)	18 (4%)	12 (2%)	9	12
All	All	1436/1551 (93%)	1355 (94%)	56 (4%)	25 (2%)	14	22

All (25) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	440	PRO
1	B	475	GLU
1	C	6	PRO
1	C	305	CYS
1	C	436	HIS
1	C	439	ARG
1	C	440	PRO
1	C	460	THR
1	C	463	SER
1	A	6	PRO
1	A	380	GLY
1	A	464	ARG
1	B	476	MET
1	C	380	GLY
1	C	435	GLY
1	B	245	ASP
1	B	377	LYS
1	B	470	ALA
1	B	474	ILE
1	A	38	GLU
1	C	7	ARG

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Mol	Chain	Res	Type
1	A	462	ALA
1	B	440	PRO
1	C	465	VAL
1	C	306	PRO

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	412/440 (94%)	377 (92%)	35 (8%)	15	28
1	B	415/440 (94%)	383 (92%)	32 (8%)	18	33
1	C	409/440 (93%)	377 (92%)	32 (8%)	18	32
All	All	1236/1320 (94%)	1137 (92%)	99 (8%)	17	31

All (99) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	7	ARG
1	A	9	SER
1	A	11	THR
1	A	36	SER
1	A	38	GLU
1	A	40	LEU
1	A	57	VAL
1	A	77	ARG
1	A	97	LEU
1	A	114	GLU
1	A	143	LEU
1	A	161	ARG
1	A	212	THR
1	A	230	PHE
1	A	283	LEU
1	A	287	LEU
1	A	305	CYS
1	A	309	THR
1	A	330	VAL

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Mol	Chain	Res	Type
1	A	373	THR
1	A	379	GLU
1	A	382	LEU
1	A	389	GLN
1	A	411	ARG
1	A	426	HIS
1	A	438	GLN
1	A	439	ARG
1	A	443	LEU
1	A	446	LEU
1	A	447	LEU
1	A	459	ARG
1	A	464	ARG
1	A	466	SER
1	A	467	LYS
1	A	484	VAL
1	B	34	ARG
1	B	40	LEU
1	B	57	VAL
1	B	77	ARG
1	B	97	LEU
1	B	143	LEU
1	B	161	ARG
1	B	200	ARG
1	B	210	LYS
1	B	212	THR
1	B	268	LEU
1	B	283	LEU
1	B	287	LEU
1	B	305	CYS
1	B	308	THR
1	B	309	THR
1	B	330	VAL
1	B	355	GLU
1	B	363	MET
1	B	374	ARG
1	B	382	LEU
1	B	387	THR
1	B	392	SER
1	B	402	GLN
1	B	411	ARG
1	B	426	HIS

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Mol	Chain	Res	Type
1	B	443	LEU
1	B	446	LEU
1	B	447	LEU
1	B	460	THR
1	B	480	ARG
1	B	488	VAL
1	C	36	SER
1	C	40	LEU
1	C	57	VAL
1	C	77	ARG
1	C	97	LEU
1	C	143	LEU
1	C	196	ILE
1	C	210	LYS
1	C	212	THR
1	C	230	PHE
1	C	237	ASN
1	C	260	ARG
1	C	268	LEU
1	C	283	LEU
1	C	287	LEU
1	C	305	CYS
1	C	309	THR
1	C	321	LEU
1	C	360	LYS
1	C	382	LEU
1	C	385	ARG
1	C	395	ARG
1	C	402	GLN
1	C	426	HIS
1	C	427	GLN
1	C	439	ARG
1	C	443	LEU
1	C	447	LEU
1	C	459	ARG
1	C	464	ARG
1	C	482	ARG
1	C	488	VAL

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	216	ASN
1	A	436	HIS
1	B	216	ASN
1	C	481	HIS

5.3.3 RNA ⓘ

There are no RNA chains 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 carbohydrates in this entry.

5.6 Ligand geometry ⓘ

Of 59 ligands modelled in this entry, 3 are monoatomic - leaving 56 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	$\# Z > 2$
2	RBV	A	601	-	18,18,18	1.36	1 (5%)	25,26,26	2.33	6 (24%)
3	SO4	A	602	-	4,4,4	0.19	0	6,6,6	0.20	0
3	SO4	A	603	-	4,4,4	0.18	0	6,6,6	0.18	0
3	SO4	A	604	-	4,4,4	0.22	0	6,6,6	0.07	0
3	SO4	A	605	-	4,4,4	0.15	0	6,6,6	0.18	0
3	SO4	A	606	-	4,4,4	0.25	0	6,6,6	0.07	0
3	SO4	A	607	-	4,4,4	0.20	0	6,6,6	0.10	0
3	SO4	A	608	-	4,4,4	0.25	0	6,6,6	0.13	0
3	SO4	A	609	-	4,4,4	0.17	0	6,6,6	0.12	0
5	GOL	A	611	-	5,5,5	0.35	0	5,5,5	0.22	0
5	GOL	A	612	-	5,5,5	0.29	0	5,5,5	0.35	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	GOL	A	613	-	5,5,5	0.32	0	5,5,5	0.34	0
5	GOL	A	614	-	5,5,5	0.30	0	5,5,5	0.40	0
5	GOL	A	615	-	5,5,5	0.33	0	5,5,5	0.49	0
5	GOL	A	616	-	5,5,5	0.36	0	5,5,5	0.26	0
5	GOL	A	617	-	5,5,5	0.34	0	5,5,5	0.25	0
5	GOL	A	618	-	5,5,5	0.34	0	5,5,5	0.26	0
5	GOL	A	619	-	5,5,5	0.31	0	5,5,5	0.45	0
5	GOL	A	620	-	5,5,5	0.41	0	5,5,5	0.22	0
2	RBV	B	601	-	18,18,18	1.28	1 (5%)	25,26,26	2.24	6 (24%)
3	SO4	B	602	-	4,4,4	0.24	0	6,6,6	0.08	0
3	SO4	B	603	-	4,4,4	0.16	0	6,6,6	0.16	0
3	SO4	B	604	-	4,4,4	0.24	0	6,6,6	0.12	0
3	SO4	B	605	-	4,4,4	0.19	0	6,6,6	0.11	0
3	SO4	B	606	-	4,4,4	0.21	0	6,6,6	0.09	0
3	SO4	B	607	-	4,4,4	0.22	0	6,6,6	0.20	0
3	SO4	B	608	-	4,4,4	0.17	0	6,6,6	0.12	0
5	GOL	B	610	-	5,5,5	0.32	0	5,5,5	0.32	0
5	GOL	B	611	-	5,5,5	0.31	0	5,5,5	0.28	0
5	GOL	B	612	-	5,5,5	0.32	0	5,5,5	0.30	0
5	GOL	B	613	-	5,5,5	0.32	0	5,5,5	0.31	0
5	GOL	B	614	-	5,5,5	0.31	0	5,5,5	0.32	0
5	GOL	B	615	-	5,5,5	0.32	0	5,5,5	0.32	0
5	GOL	B	616	-	5,5,5	0.35	0	5,5,5	0.22	0
5	GOL	B	617	-	5,5,5	0.37	0	5,5,5	0.32	0
5	GOL	B	618	-	5,5,5	0.31	0	5,5,5	0.40	0
2	RBV	C	601	-	18,18,18	1.24	1 (5%)	25,26,26	2.64	5 (20%)
3	SO4	C	602	-	4,4,4	0.19	0	6,6,6	0.20	0
3	SO4	C	603	-	4,4,4	0.21	0	6,6,6	0.09	0
3	SO4	C	605	-	4,4,4	0.23	0	6,6,6	0.07	0
5	GOL	C	606	-	5,5,5	0.29	0	5,5,5	0.36	0
3	SO4	C	607	-	4,4,4	0.23	0	6,6,6	0.07	0
3	SO4	C	608	-	4,4,4	0.24	0	6,6,6	0.09	0
3	SO4	C	609	-	4,4,4	0.24	0	6,6,6	0.07	0
3	SO4	C	610	-	4,4,4	0.23	0	6,6,6	0.07	0
3	SO4	C	611	-	4,4,4	0.19	0	6,6,6	0.08	0
3	SO4	C	612	-	4,4,4	0.21	0	6,6,6	0.08	0
3	SO4	C	613	-	4,4,4	0.25	0	6,6,6	0.09	0
3	SO4	C	614	-	4,4,4	0.18	0	6,6,6	0.11	0
3	SO4	C	615	-	4,4,4	0.21	0	6,6,6	0.11	0
5	GOL	C	616	-	5,5,5	0.26	0	5,5,5	0.36	0
5	GOL	C	617	-	5,5,5	0.34	0	5,5,5	0.29	0
5	GOL	C	618	-	5,5,5	0.33	0	5,5,5	0.46	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	GOL	C	619	-	5,5,5	0.32	0	5,5,5	0.27	0
5	GOL	C	620	-	5,5,5	0.46	0	5,5,5	0.43	0
5	GOL	C	621	-	5,5,5	0.25	0	5,5,5	0.48	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
2	RBV	A	601	-	-	0/4/26/26	0/2/2/2
3	SO4	A	602	-	-	0/0/0/0	0/0/0/0
3	SO4	A	603	-	-	0/0/0/0	0/0/0/0
3	SO4	A	604	-	-	0/0/0/0	0/0/0/0
3	SO4	A	605	-	-	0/0/0/0	0/0/0/0
3	SO4	A	606	-	-	0/0/0/0	0/0/0/0
3	SO4	A	607	-	-	0/0/0/0	0/0/0/0
3	SO4	A	608	-	-	0/0/0/0	0/0/0/0
3	SO4	A	609	-	-	0/0/0/0	0/0/0/0
5	GOL	A	611	-	-	0/4/4/4	0/0/0/0
5	GOL	A	612	-	-	0/4/4/4	0/0/0/0
5	GOL	A	613	-	-	0/4/4/4	0/0/0/0
5	GOL	A	614	-	-	0/4/4/4	0/0/0/0
5	GOL	A	615	-	-	0/4/4/4	0/0/0/0
5	GOL	A	616	-	-	0/4/4/4	0/0/0/0
5	GOL	A	617	-	-	0/4/4/4	0/0/0/0
5	GOL	A	618	-	-	0/4/4/4	0/0/0/0
5	GOL	A	619	-	-	0/4/4/4	0/0/0/0
5	GOL	A	620	-	-	0/4/4/4	0/0/0/0
2	RBV	B	601	-	-	0/4/26/26	0/2/2/2
3	SO4	B	602	-	-	0/0/0/0	0/0/0/0
3	SO4	B	603	-	-	0/0/0/0	0/0/0/0
3	SO4	B	604	-	-	0/0/0/0	0/0/0/0
3	SO4	B	605	-	-	0/0/0/0	0/0/0/0
3	SO4	B	606	-	-	0/0/0/0	0/0/0/0
3	SO4	B	607	-	-	0/0/0/0	0/0/0/0
3	SO4	B	608	-	-	0/0/0/0	0/0/0/0
5	GOL	B	610	-	-	0/4/4/4	0/0/0/0
5	GOL	B	611	-	-	0/4/4/4	0/0/0/0
5	GOL	B	612	-	-	0/4/4/4	0/0/0/0
5	GOL	B	613	-	-	0/4/4/4	0/0/0/0
5	GOL	B	614	-	-	0/4/4/4	0/0/0/0
5	GOL	B	615	-	-	0/4/4/4	0/0/0/0

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	GOL	B	616	-	-	0/4/4/4	0/0/0/0
5	GOL	B	617	-	-	0/4/4/4	0/0/0/0
5	GOL	B	618	-	-	0/4/4/4	0/0/0/0
2	RBV	C	601	-	-	0/4/26/26	0/2/2/2
3	SO4	C	602	-	-	0/0/0/0	0/0/0/0
3	SO4	C	603	-	-	0/0/0/0	0/0/0/0
3	SO4	C	605	-	-	0/0/0/0	0/0/0/0
5	GOL	C	606	-	-	0/4/4/4	0/0/0/0
3	SO4	C	607	-	-	0/0/0/0	0/0/0/0
3	SO4	C	608	-	-	0/0/0/0	0/0/0/0
3	SO4	C	609	-	-	0/0/0/0	0/0/0/0
3	SO4	C	610	-	-	0/0/0/0	0/0/0/0
3	SO4	C	611	-	-	0/0/0/0	0/0/0/0
3	SO4	C	612	-	-	0/0/0/0	0/0/0/0
3	SO4	C	613	-	-	0/0/0/0	0/0/0/0
3	SO4	C	614	-	-	0/0/0/0	0/0/0/0
3	SO4	C	615	-	-	0/0/0/0	0/0/0/0
5	GOL	C	616	-	-	0/4/4/4	0/0/0/0
5	GOL	C	617	-	-	0/4/4/4	0/0/0/0
5	GOL	C	618	-	-	0/4/4/4	0/0/0/0
5	GOL	C	619	-	-	0/4/4/4	0/0/0/0
5	GOL	C	620	-	-	0/4/4/4	0/0/0/0
5	GOL	C	621	-	-	0/4/4/4	0/0/0/0

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	601	RBV	C6-N3	4.77	1.43	1.33
2	B	601	RBV	C6-N3	4.62	1.43	1.33
2	C	601	RBV	C6-N3	4.58	1.43	1.33

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	601	RBV	N2-C3-N4	-9.22	107.63	115.09
2	B	601	RBV	N2-C3-N4	-9.03	107.78	115.09
2	C	601	RBV	C1'-N1-N2	8.98	129.75	120.96
2	C	601	RBV	N2-C3-N4	-7.34	109.14	115.09
2	C	601	RBV	C5-N1-C1'	-3.88	120.46	127.92
2	A	601	RBV	C1'-N1-N2	3.79	124.67	120.96
2	B	601	RBV	C3-N2-N1	3.30	107.66	102.50
2	A	601	RBV	C3-N2-N1	3.15	107.42	102.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	601	RBV	N4-C5-N1	-2.46	107.39	111.40
2	A	601	RBV	N4-C5-N1	-2.44	107.42	111.40
2	A	601	RBV	C3-C6-N3	2.39	119.86	115.81
2	B	601	RBV	C1'-N1-N2	2.31	123.22	120.96
2	B	601	RBV	C3-C6-N3	2.31	119.72	115.81
2	C	601	RBV	C3-N2-N1	2.25	106.02	102.50
2	B	601	RBV	C2'-C1'-N1	2.17	113.98	112.18
2	C	601	RBV	C3-C6-N3	2.03	119.25	115.81
2	A	601	RBV	O3-C6-N3	-2.02	119.67	122.59

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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	480/517 (92%)	-0.26	13 (2%) 52 54	13, 25, 72, 161	0
1	B	487/517 (94%)	-0.20	13 (2%) 52 54	15, 29, 77, 149	0
1	C	478/517 (92%)	-0.15	11 (2%) 57 60	14, 28, 75, 137	0
All	All	1445/1551 (93%)	-0.20	37 (2%) 54 55	13, 28, 74, 161	0

All (37) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	476	MET	7.7
1	C	5	LEU	7.6
1	B	5	LEU	6.7
1	B	474	ILE	6.2
1	C	437	ALA	6.0
1	C	492	THR	5.3
1	B	379	GLU	5.3
1	A	475	GLU	5.3
1	A	5	LEU	5.3
1	C	438	GLN	4.6
1	A	6	PRO	4.5
1	B	476	MET	4.4
1	A	7	ARG	4.1
1	C	477	VAL	4.0
1	A	465	VAL	3.8
1	B	480	ARG	3.7
1	A	466	SER	3.6
1	A	459	ARG	3.2
1	C	442	GLN	3.2
1	A	478	VAL	3.1
1	B	475	GLU	3.0
1	A	477	VAL	3.0
1	B	378	GLU	2.9

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Mol	Chain	Res	Type	RSRZ
1	C	478	VAL	2.9
1	C	443	LEU	2.7
1	A	8	PRO	2.7
1	B	6	PRO	2.6
1	B	436	HIS	2.5
1	A	380	GLY	2.4
1	B	470	ALA	2.4
1	B	380	GLY	2.4
1	C	6	PRO	2.3
1	C	436	HIS	2.2
1	A	58	ASP	2.1
1	C	480	ARG	2.1
1	B	459	ARG	2.1
1	B	467	LYS	2.1

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

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

6.3 Carbohydrates ⓘ

There are no carbohydrates in this entry.

6.4 Ligands ⓘ

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	RSR	LLDF	B-factors(Å ²)	Q<0.9
2	RBV	C	601	17/17	0.46	14.85	49,72,82,83	17
3	SO4	C	605	5/5	0.20	14.00	60,65,80,81	3
3	SO4	C	602	5/5	0.19	13.89	29,34,43,43	3
3	SO4	C	613	5/5	0.35	10.10	59,64,66,72	4
5	GOL	C	620	6/6	0.27	9.62	26,28,31,41	4
3	SO4	A	606	5/5	0.17	9.60	68,69,84,95	1
3	SO4	B	602	5/5	0.16	8.60	40,47,51,54	3

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Mol	Type	Chain	Res	Atoms	RSR	LLDF	B-factors(\AA^2)	Q<0.9
5	GOL	B	618	6/6	0.26	7.43	47,48,57,59	1
2	RBV	A	601	17/17	0.28	7.20	24,39,45,45	17
5	GOL	B	611	6/6	0.23	7.14	51,52,61,66	2
5	GOL	C	621	6/6	0.25	6.97	35,39,41,46	4
2	RBV	B	601	17/17	0.31	6.95	40,53,63,70	17
5	GOL	B	617	6/6	0.30	6.92	41,45,49,54	4
3	SO4	A	604	5/5	0.25	6.68	41,48,54,57	3
3	SO4	C	610	5/5	0.23	6.49	42,44,46,55	2
3	SO4	A	602	5/5	0.17	6.03	45,47,53,59	4
5	GOL	A	618	6/6	0.34	5.54	31,34,40,40	4
3	SO4	C	609	5/5	0.39	5.54	8,23,26,26	4
3	SO4	A	603	5/5	0.18	5.46	49,50,55,57	3
5	GOL	C	606	6/6	0.23	5.40	58,61,68,70	1
5	GOL	B	614	6/6	0.18	5.04	54,56,60,61	1
5	GOL	C	619	6/6	0.20	4.83	49,54,60,65	0
3	SO4	B	607	5/5	0.31	4.77	34,35,37,38	4
3	SO4	A	608	5/5	0.17	4.69	44,47,60,65	4
5	GOL	A	617	6/6	0.28	4.59	19,24,29,31	4
3	SO4	A	609	5/5	0.15	4.38	72,76,88,92	2
5	GOL	A	615	6/6	0.23	3.49	28,37,39,44	4
3	SO4	C	614	5/5	0.25	3.22	75,77,93,100	2
5	GOL	B	610	6/6	0.17	3.07	46,52,56,57	0
5	GOL	B	616	6/6	0.20	2.92	57,63,66,69	1
5	GOL	A	612	6/6	0.16	2.61	53,55,63,65	1
3	SO4	C	612	5/5	0.30	2.57	74,75,87,102	4
5	GOL	B	612	6/6	0.18	2.57	49,51,55,58	2
3	SO4	B	606	5/5	0.17	2.52	53,58,64,68	3
3	SO4	C	607	5/5	0.21	2.32	62,64,74,81	2
3	SO4	B	603	5/5	0.18	2.31	59,67,81,87	2
5	GOL	A	619	6/6	0.17	2.31	46,49,54,56	2
3	SO4	B	605	5/5	0.17	2.21	61,65,77,80	2
3	SO4	C	615	5/5	0.18	2.19	66,71,73,74	3
5	GOL	B	615	6/6	0.20	2.09	68,75,75,81	0
5	GOL	A	616	6/6	0.16	1.75	33,35,36,37	1
5	GOL	A	613	6/6	0.19	1.68	58,62,64,66	0
3	SO4	C	611	5/5	0.21	1.63	86,91,106,109	1
5	GOL	C	616	6/6	0.16	1.36	43,47,48,54	1
5	GOL	B	613	6/6	0.16	1.31	41,44,46,47	2
3	SO4	C	603	5/5	0.15	1.14	52,60,80,81	2
3	SO4	C	608	5/5	0.16	0.92	52,65,73,74	3
3	SO4	A	605	5/5	0.17	0.75	52,52,55,58	1

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Mol	Type	Chain	Res	Atoms	RSR	LLDF	B-factors(\AA^2)	Q<0.9
5	GOL	C	618	6/6	0.17	0.57	38,39,44,47	2
5	GOL	C	617	6/6	0.22	0.28	49,50,55,55	1
3	SO4	B	604	5/5	0.14	-0.21	43,46,55,60	3
5	GOL	A	620	6/6	0.20	-0.26	31,37,41,55	2
5	GOL	A	614	6/6	0.14	-0.44	48,55,58,59	0
5	GOL	A	611	6/6	0.10	-0.62	35,37,40,44	2
3	SO4	A	607	5/5	0.16	-0.62	58,58,73,74	2
4	MG	B	609	1/1	0.09	-1.33	45,45,45,45	0
4	MG	C	604	1/1	0.10	-1.46	40,40,40,40	0
3	SO4	B	608	5/5	0.10	-2.29	59,69,74,79	2
4	MG	A	610	1/1	0.07	-3.15	29,29,29,29	0

6.5 Other polymers ⓘ

There are no such residues in this entry.