Full wwPDB X-ray Structure Validation Report (i)

Oct 8, 2023 – 11:05 AM EDT

PDB ID	:	4R2X
Title	:	Unique conformation of uridine and asymmetry of the hexameric molecule revealed in the high-resolution structures of Shewanella oneidensis uridine phosphorylase in the free form and in complex with uridine
Authors	:	Safonova, T.N.; Mordkovich, N.N.; Manuvera, V.A.; Veiko, V.P.; Popov, V.O.; Polyakov, K.M.
Deposited on	:	2014-08-13
Resolution	:	0.93 Å(reported)

This is a Full wwPDB X-ray Structure Validation 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 (i) 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 (i)) were used in the production of this report:

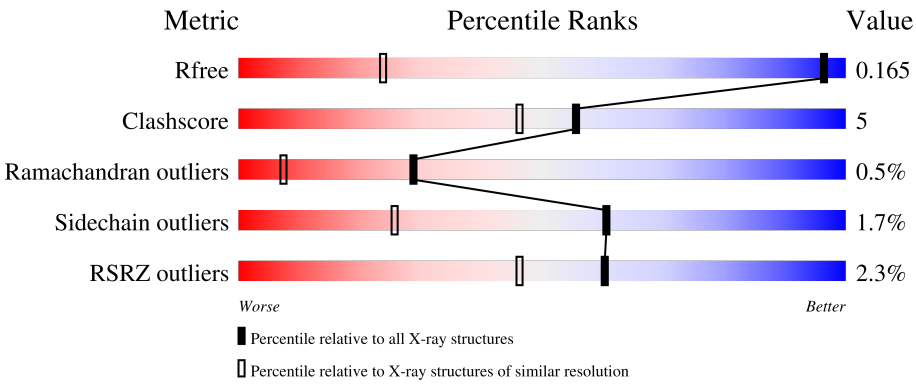
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 0.93 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	1280 (1.06-0.82)
Clashscore	141614	1065 (1.04-0.84)
Ramachandran outliers	138981	1270 (1.06-0.82)
Sidechain outliers	138945	1272 (1.06-0.82)
RSRZ outliers	127900	1245 (1.06-0.82)

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 <=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	252	2%, 90%, 5%, •
1	B	252	4%, 86%, 8%, • 5%
1	C	252	%, 88%, 10%, •
1	D	252	%, 94%, 5%, •

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Mol	Chain	Length	Quality of chain
1	E	252	4% 87% 9%
1	F	252	% 89% 6%

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	SO4	B	304[B]	-	-	X	-
2	SO4	E	301[A]	-	-	X	-
2	SO4	E	303[A]	-	-	X	-
4	GOL	E	305	-	-	X	-

2 Entry composition (i)

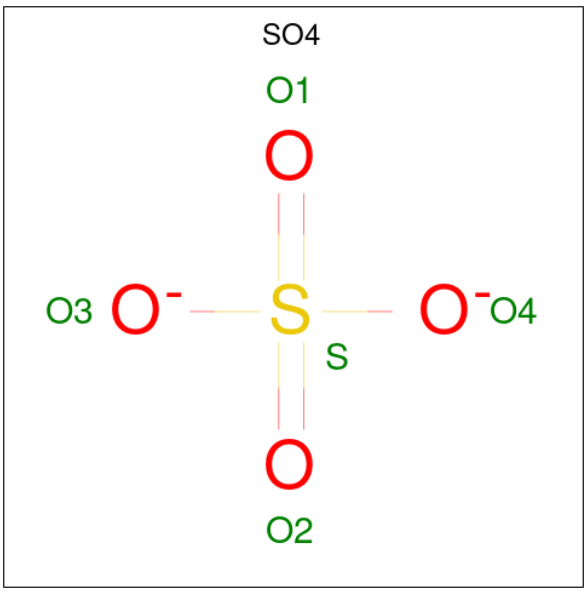
There are 5 unique types of molecules in this entry. The entry contains 23087 atoms, of which 10718 are hydrogens and 0 are deuteriums.

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 uridine phosphorylase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	C	247	3682	1175	1810	320	361	16	0	9	0
1	D	249	3659	1171	1789	319	364	16	0	8	0
1	E	241	3601	1157	1754	321	354	15	0	15	0
1	F	242	3551	1143	1734	310	349	15	0	5	0
1	A	241	3560	1146	1738	314	347	15	0	8	0
1	B	240	3631	1161	1775	325	355	15	0	18	0

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O_4S).

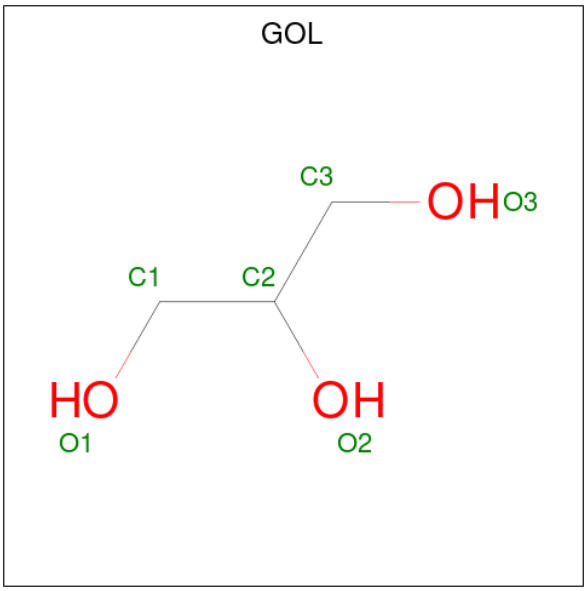


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	O	S		
2	C	1	5	4	1	0	0
2	D	1	5	4	1	0	0
2	E	1	10	8	2	0	1
2	E	1	10	8	2	0	1
2	F	1	5	4	1	0	0
2	A	1	5	4	1	0	0
2	B	1	10	8	2	0	1
2	B	1	10	8	2	0	1

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Cl		
3	C	1	1	1	0	0
3	D	1	1	1	0	0
3	F	1	1	1	0	0
3	A	1	1	1	0	0

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	C	1	Total C H O 12 3 5 4	0	1
4	C	1	Total C H O 12 3 6 3	0	0
4	C	1	Total C H O 12 3 6 3	0	0
4	C	1	Total C O 6 3 3	0	0
4	D	1	Total C H O 12 3 6 3	0	0
4	D	1	Total C H O 12 3 6 3	0	0
4	D	1	Total C H O 12 3 6 3	0	0
4	E	1	Total C H O 12 3 6 3	0	0
4	E	1	Total C H O 12 3 6 3	0	0
4	E	1	Total C H O 12 3 6 3	0	0
4	F	1	Total C H O 24 6 12 6	0	1
4	F	1	Total C H O 12 3 6 3	0	0
4	F	1	Total C H O 14 3 7 4	0	1
4	A	1	Total C H O 9 3 2 4	0	1

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
4	A	1	12	3	6	3	0	0
			Total	C	H	O		
4	A	1	14	3	8	3	0	0
			Total	C	H	O		
4	B	1	12	3	6	3	0	0
			Total	C	H	O		
4	B	1	12	3	6	3	0	0
			Total	C	H	O		
4	B	1	24	6	12	6	0	1

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
5	C	199	199	199	0	0
			Total	O		
5	D	210	210	210	0	0
			Total	O		
5	E	162	162	162	0	0
			Total	O		
5	F	175	175	175	0	0
			Total	O		
5	A	184	184	184	0	0
			Total	O		
5	B	162	162	162	0	0

3 Residue-property plots (i)

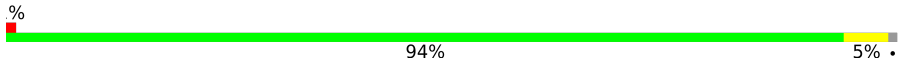
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density.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

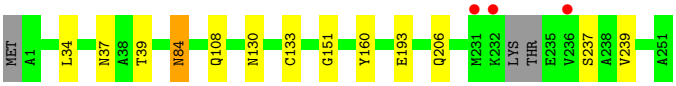
• Molecule 1: uridine phosphorylase

Chain C:

• Molecule 1: uridine phosphorylase

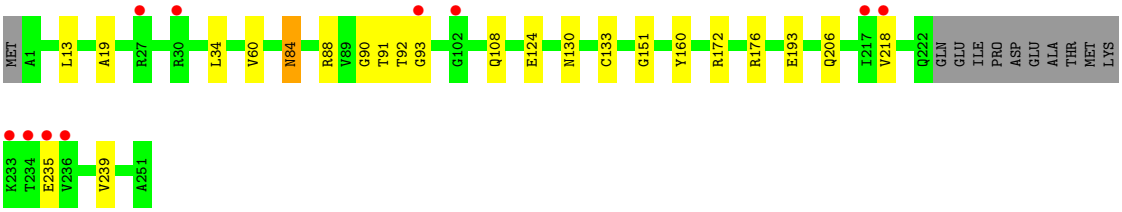
Chain D:





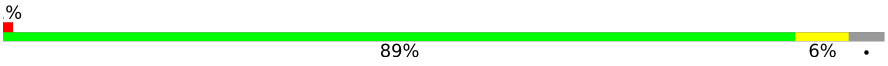
• Molecule 1: uridine phosphorylase

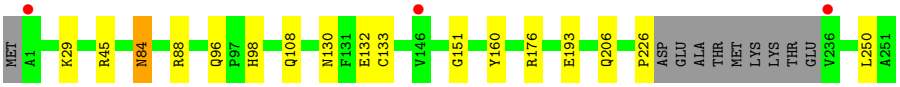
Chain E:



• Molecule 1: uridine phosphorylase

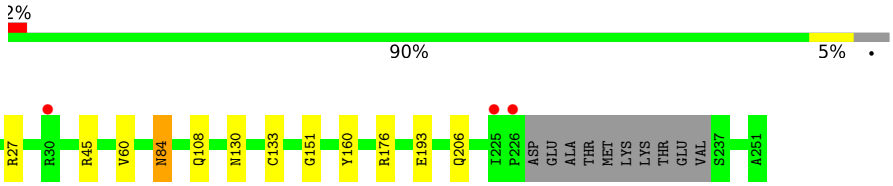
Chain F:





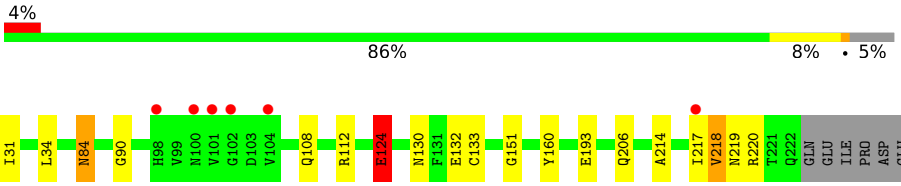
• Molecule 1: uridine phosphorylase

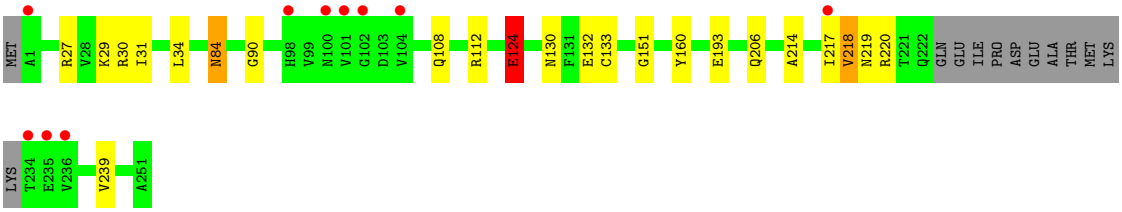
Chain A:



- Molecule 1: uridine phosphorylase

Chain B:





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	91.54Å 95.93Å 91.61Å 90.00° 120.00° 90.00°	Depositor
Resolution (Å)	29.66 – 0.93 29.66 – 0.93	Depositor EDS
% Data completeness (in resolution range)	95.9 (29.66-0.93) 95.8 (29.66-0.93)	Depositor EDS
R_{merge}	0.13	Depositor
R_{sym}	0.87	Depositor
$< I/\sigma(I) >$ [1]	1.07 (at 0.93Å)	Xtriage
Refinement program	REFMAC 5.5.0072	Depositor
R, R_{free}	0.149 , 0.164 0.155 , 0.165	Depositor DCC
R_{free} test set	43988 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å^2)	6.8	Xtriage
Anisotropy	0.742	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.42 , 29.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.43$, $< L^2 > = 0.26$	Xtriage
Estimated twinning fraction	0.198 for l,k,-h-l 0.198 for -h-l,k,h 0.048 for h,-k,-h-l 0.047 for l,-k,h 0.047 for -h-l,-k,l	Xtriage
Reported twinning fraction	0.802 for H, K, L 0.100 for -H-L, K, H 0.098 for L, K, -H-L	Depositor
Outliers	0 of 883283 reflections	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	23087	wwPDB-VP
Average B, all atoms (Å^2)	9.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.47% of the height of the origin peak. No significant pseudotranslation is detected.*

[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ 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: CL, GOL, SO4

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	0.75	0/1893	0.86	2/2573 (0.1%)
1	B	0.66	0/1934	0.83	6/2627 (0.2%)
1	C	0.77	0/1945	0.87	2/2643 (0.1%)
1	D	0.76	0/1941	0.84	0/2638
1	E	0.65	0/1932	0.80	2/2624 (0.1%)
1	F	0.71	0/1873	0.82	1/2545 (0.0%)
All	All	0.72	0/11518	0.84	13/15650 (0.1%)

There are no bond length outliers.

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	88	ARG	NE-CZ-NH2	-7.17	116.71	120.30
1	B	112	ARG	NE-CZ-NH1	6.46	123.53	120.30
1	E	176	ARG	NE-CZ-NH1	6.25	123.42	120.30
1	B	124[A]	GLU	CG-CD-OE2	-6.00	106.30	118.30
1	B	124[B]	GLU	CG-CD-OE2	-6.00	106.30	118.30
1	A	176	ARG	NE-CZ-NH1	5.82	123.21	120.30
1	C	112	ARG	NE-CZ-NH2	-5.70	117.45	120.30
1	C	209	ARG	NE-CZ-NH1	5.61	123.10	120.30
1	A	27	ARG	NE-CZ-NH1	5.26	122.93	120.30
1	B	124[A]	GLU	CA-CB-CG	5.25	124.94	113.40
1	B	124[B]	GLU	CA-CB-CG	5.25	124.94	113.40
1	E	172	ARG	NE-CZ-NH2	-5.16	117.72	120.30
1	B	112	ARG	NE-CZ-NH2	-5.02	117.79	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	1822	1738	1819	10	0
1	B	1856	1775	1838	22	0
1	C	1872	1810	1861	26	0
1	D	1870	1789	1841	10	0
1	E	1847	1754	1837	25	0
1	F	1817	1734	1803	11	0
2	A	5	0	0	0	0
2	B	20	0	0	3	0
2	C	5	0	0	0	0
2	D	5	0	0	0	0
2	E	20	0	0	7	0
2	F	5	0	0	0	0
3	A	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
3	F	1	0	0	0	0
4	A	19	16	22	0	0
4	B	24	24	32	2	0
4	C	25	17	30	3	0
4	D	18	18	24	0	0
4	E	18	18	24	7	0
4	F	25	25	30	4	0
5	A	184	0	0	2	0
5	B	162	0	0	4	0
5	C	199	0	0	7	0
5	D	210	0	0	4	0
5	E	162	0	0	20	0
5	F	175	0	0	1	0
All	All	12369	10718	11161	115	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 5.

All (115) 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)
4:E:305:GOL:H12	5:E:550:HOH:O	1.18	1.27
2:E:303[A]:SO4:O3	5:E:554:HOH:O	1.58	1.21
1:E:92[A]:THR:HA	5:E:536:HOH:O	1.42	1.17
2:E:301[A]:SO4:S	5:E:519:HOH:O	1.98	1.17
1:E:88[A]:ARG:NH2	5:E:554:HOH:O	1.70	1.13
1:C:167[B]:ASP:OD2	5:C:592:HOH:O	1.76	1.01
4:E:305:GOL:H32	5:E:550:HOH:O	1.73	0.87
4:E:305:GOL:C1	5:E:550:HOH:O	1.89	0.86
1:E:90[A]:GLY:HA3	5:E:554:HOH:O	1.81	0.80
1:B:218[B]:VAL:HG22	1:B:219[B]:ASN:H	1.46	0.78
1:E:91[A]:THR:O	5:E:536:HOH:O	2.02	0.77
1:D:237:SER:HB2	5:D:533:HOH:O	1.85	0.76
2:E:301[A]:SO4:O1	5:E:519:HOH:O	1.89	0.74
1:F:108[A]:GLN:HE21	1:F:151:GLY:HA2	1.53	0.74
1:E:88[A]:ARG:CZ	5:E:554:HOH:O	2.22	0.73
1:C:97:PRO:O	5:C:583:HOH:O	2.07	0.73
1:C:206[A]:GLN:NE2	5:C:599:HOH:O	2.21	0.72
1:A:108[B]:GLN:HE21	1:A:151:GLY:HA2	1.52	0.72
1:C:34:LEU:CD1	1:C:239[A]:VAL:HG12	2.22	0.70
1:F:130:ASN:HD22	1:F:133:CYS:H	1.40	0.70
4:E:305:GOL:H31	1:B:124[B]:GLU:OE1	1.93	0.69
1:B:27:ARG:NH2	2:B:304[B]:SO4:O1	2.23	0.69
1:C:124[B]:GLU:OE1	4:F:303[B]:GOL:H12	1.94	0.68
2:E:303[A]:SO4:O4	5:E:562:HOH:O	0.68	0.67
1:E:130:ASN:HD22	1:E:133:CYS:H	1.43	0.67
1:B:130:ASN:HD22	1:B:133:CYS:H	1.43	0.66
1:C:130:ASN:HD22	1:C:133:CYS:H	1.43	0.65
1:C:108[B]:GLN:HE21	1:C:151:GLY:HA2	1.61	0.65
1:E:88[A]:ARG:NH1	5:E:554:HOH:O	2.29	0.65
1:D:130:ASN:HD22	1:D:133:CYS:H	1.46	0.64
1:B:218[B]:VAL:HG22	1:B:219[B]:ASN:N	2.13	0.63
1:E:91[B]:THR:HG21	1:E:235:GLU:OE2	1.98	0.63
1:E:108[B]:GLN:HE21	1:E:151:GLY:HA2	1.62	0.63
1:D:108[A]:GLN:HE21	1:D:151:GLY:HA2	1.65	0.61
1:A:130:ASN:HD22	1:A:133:CYS:H	1.47	0.61
1:E:19:ALA:HB2	1:E:60[B]:VAL:HG23	1.82	0.60
1:F:226:PRO:HB3	5:F:542:HOH:O	2.01	0.60
1:F:176:ARG:HG3	4:F:303[A]:GOL:H12	1.83	0.60
1:D:108[B]:GLN:HG3	5:D:582:HOH:O	2.02	0.59
1:B:108[B]:GLN:HG3	5:B:514:HOH:O	2.02	0.59
1:C:13:LEU:HG	1:C:60[B]:VAL:HG21	1.83	0.59
1:E:93[B]:GLY:HA2	1:E:218:VAL:O	2.03	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:91[B]:THR:HG21	1:E:235:GLU:CD	2.24	0.57
1:B:218[A]:VAL:HG23	5:B:559:HOH:O	2.04	0.57
1:C:34:LEU:HD11	1:C:239[A]:VAL:HG12	1.87	0.56
1:B:108[A]:GLN:HE21	1:B:151:GLY:HA2	1.70	0.56
1:E:84:ASN:C	1:E:84:ASN:HD22	2.10	0.55
1:E:90[A]:GLY:HA2	5:E:561:HOH:O	2.07	0.55
1:C:108[A]:GLN:NE2	5:C:518:HOH:O	2.39	0.55
1:C:244:ALA:HB1	4:C:306:GOL:H11	1.88	0.55
1:E:124[B]:GLU:OE2	4:B:305[B]:GOL:H12	2.08	0.54
1:B:84:ASN:C	1:B:84:ASN:HD22	2.11	0.54
1:A:108[A]:GLN:HG3	5:A:531:HOH:O	2.07	0.54
1:D:37:ASN:O	1:D:39:THR:HG23	2.07	0.54
1:C:13:LEU:HG	1:C:60[B]:VAL:CG2	2.37	0.53
4:E:305:GOL:C2	5:E:550:HOH:O	2.38	0.53
1:F:176:ARG:CG	4:F:303[A]:GOL:H12	2.38	0.53
1:D:39:THR:HG23	5:D:609:HOH:O	2.08	0.52
1:A:84:ASN:C	1:A:84:ASN:HD22	2.13	0.51
1:E:108[A]:GLN:NE2	5:E:501:HOH:O	2.42	0.51
1:A:19:ALA:HB2	1:A:60[B]:VAL:HG13	1.92	0.51
1:B:108[B]:GLN:NE2	5:B:514:HOH:O	2.43	0.51
1:E:34:LEU:HD12	1:E:239[A]:VAL:HG12	1.92	0.51
1:E:19:ALA:CB	1:E:60[B]:VAL:HG23	2.40	0.50
2:E:301[A]:SO4:O3	5:E:519:HOH:O	2.14	0.50
1:C:84:ASN:HD22	1:C:84:ASN:C	2.15	0.50
1:D:84:ASN:C	1:D:84:ASN:HD22	2.14	0.50
1:E:34:LEU:CD1	1:E:239[A]:VAL:HG12	2.42	0.50
1:C:140:ALA:O	4:C:306:GOL:H31	2.12	0.50
4:E:302:GOL:H11	2:E:303[A]:SO4:O3	2.12	0.50
1:C:206[B]:GLN:NE2	5:C:427:HOH:O	2.44	0.50
1:B:217[A]:ILE:HG13	1:B:218[A]:VAL:HG13	1.95	0.49
1:E:108[A]:GLN:HG3	5:E:501:HOH:O	2.12	0.49
1:B:34:LEU:CD1	1:B:239:VAL:HG12	2.43	0.49
1:E:88[A]:ARG:NH1	5:E:561:HOH:O	2.41	0.48
1:C:108[A]:GLN:HG3	5:C:518:HOH:O	2.13	0.48
1:F:84:ASN:C	1:F:84:ASN:HD22	2.16	0.48
1:C:146:VAL:HG21	1:C:236:VAL:HB	1.95	0.48
1:A:45:ARG:NH2	2:B:304[B]:SO4:O1	2.46	0.47
1:C:124[B]:GLU:OE1	4:F:303[B]:GOL:C1	2.60	0.47
1:B:34:LEU:HD12	1:B:239:VAL:HG12	1.96	0.47
1:B:220:ARG:HG2	5:B:559:HOH:O	2.14	0.47
4:B:303:GOL:H11	2:B:304[A]:SO4:O3	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:34:LEU:CD1	1:C:239[A]:VAL:CG1	2.93	0.46
1:B:130:ASN:HD21	1:B:132:GLU:HB3	1.81	0.46
1:C:172[B]:ARG:NH1	5:C:537:HOH:O	2.40	0.45
1:D:39:THR:CG2	5:D:609:HOH:O	2.65	0.45
1:F:130:ASN:ND2	1:F:133:CYS:H	2.11	0.45
1:C:34:LEU:HD12	1:C:239[A]:VAL:HG12	1.99	0.45
1:D:34:LEU:CD1	1:D:239[A]:VAL:HG12	2.47	0.44
2:E:303[B]:SO4:O1	1:F:45:ARG:NH2	2.48	0.44
1:B:90[B]:GLY:O	1:B:214[B]:ALA:HA	2.17	0.44
1:B:31:ILE:HG12	1:B:239:VAL:HG13	2.00	0.43
1:C:130:ASN:ND2	1:C:133:CYS:H	2.14	0.43
1:F:130:ASN:HD21	1:F:132:GLU:HB3	1.83	0.43
1:E:108[A]:GLN:CG	5:E:501:HOH:O	2.66	0.43
4:E:305:GOL:C3	1:B:124[B]:GLU:OE1	2.65	0.42
1:F:96:GLN:HB3	1:F:98:HIS:CE1	2.54	0.42
1:A:19:ALA:CB	1:A:60[B]:VAL:HG13	2.49	0.42
1:A:130:ASN:ND2	1:A:133:CYS:H	2.16	0.42
1:B:217[A]:ILE:O	1:B:218[A]:VAL:CG1	2.67	0.42
1:C:34:LEU:HD12	1:C:239[A]:VAL:CG1	2.50	0.41
1:E:130:ASN:ND2	1:E:133:CYS:H	2.14	0.41
1:C:140:ALA:O	4:C:306:GOL:C3	2.69	0.41
1:E:13:LEU:HG	1:E:60[B]:VAL:CG1	2.51	0.41
1:A:108[A]:GLN:CG	5:A:531:HOH:O	2.68	0.41
1:B:217[A]:ILE:C	1:B:218[A]:VAL:HG13	2.40	0.41
1:B:218[B]:VAL:CG2	1:B:219[B]:ASN:H	2.26	0.41

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	245/252 (97%)	242 (99%)	2 (1%)	1 (0%)	34 11

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	254/252 (101%)	248 (98%)	3 (1%)	3 (1%)	13	1
1	C	252/252 (100%)	248 (98%)	3 (1%)	1 (0%)	34	11
1	D	253/252 (100%)	249 (98%)	3 (1%)	1 (0%)	34	11
1	E	252/252 (100%)	248 (98%)	3 (1%)	1 (0%)	34	11
1	F	243/252 (96%)	240 (99%)	2 (1%)	1 (0%)	34	11
All	All	1499/1512 (99%)	1475 (98%)	16 (1%)	8 (0%)	29	7

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	160	TYR
1	F	160	TYR
1	B	160	TYR
1	C	160	TYR
1	D	160	TYR
1	A	160	TYR
1	B	218[A]	VAL
1	B	218[B]	VAL

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	196/198 (99%)	194 (99%)	2 (1%)	76	45
1	B	197/198 (100%)	191 (97%)	6 (3%)	41	9
1	C	202/198 (102%)	198 (98%)	4 (2%)	55	19
1	D	200/198 (101%)	198 (99%)	2 (1%)	76	45
1	E	199/198 (100%)	197 (99%)	2 (1%)	76	45
1	F	194/198 (98%)	190 (98%)	4 (2%)	53	17
All	All	1188/1188 (100%)	1168 (98%)	20 (2%)	60	26

All (20) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	27	ARG
1	C	30	ARG
1	C	84	ASN
1	C	193	GLU
1	D	84	ASN
1	D	193	GLU
1	E	84	ASN
1	E	193	GLU
1	F	29	LYS
1	F	84	ASN
1	F	193	GLU
1	F	250	LEU
1	A	84	ASN
1	A	193	GLU
1	B	29	LYS
1	B	30	ARG
1	B	84	ASN
1	B	124[A]	GLU
1	B	124[B]	GLU
1	B	193	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	84	ASN
1	C	130	ASN
1	C	222	GLN
1	D	84	ASN
1	D	130	ASN
1	D	206	GLN
1	E	84	ASN
1	E	130	ASN
1	F	84	ASN
1	F	130	ASN
1	F	222	GLN
1	A	84	ASN
1	A	98	HIS
1	A	130	ASN
1	B	84	ASN
1	B	98	HIS
1	B	130	ASN
1	B	206	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 40 ligands modelled in this entry, 4 are monoatomic - leaving 36 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	SO4	B	301[A]	-	4,4,4	0.53	0	6,6,6	0.38	0
2	SO4	B	301[B]	-	4,4,4	0.24	0	6,6,6	0.65	0
4	GOL	E	305	-	5,5,5	0.15	0	5,5,5	0.64	0
4	GOL	A	304	-	5,5,5	0.29	0	5,5,5	0.50	0
4	GOL	D	303	-	5,5,5	0.31	0	5,5,5	0.65	0
2	SO4	A	301	-	4,4,4	0.53	0	6,6,6	0.47	0
4	GOL	D	305	-	5,5,5	0.54	0	5,5,5	0.58	0
4	GOL	C	306	-	5,5,5	0.56	0	5,5,5	1.08	0
4	GOL	B	305[A]	-	5,5,5	0.37	0	5,5,5	1.38	1 (20%)
4	GOL	B	305[B]	-	5,5,5	0.30	0	5,5,5	0.89	0
4	GOL	C	305	-	5,5,5	0.31	0	5,5,5	0.55	0
4	GOL	E	302	-	5,5,5	0.21	0	5,5,5	0.43	0
4	GOL	A	305	-	5,5,5	0.28	0	5,5,5	0.40	0
2	SO4	E	303[A]	-	4,4,4	0.38	0	6,6,6	0.31	0
2	SO4	E	303[B]	-	4,4,4	0.27	0	6,6,6	0.36	0
4	GOL	C	303[A]	-	5,5,5	0.40	0	5,5,5	0.64	0
4	GOL	C	303[B]	-	5,5,5	0.42	0	5,5,5	0.48	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
4	GOL	B	302	-	5,5,5	0.37	0	5,5,5	0.34	0
4	GOL	E	304	-	5,5,5	0.39	0	5,5,5	0.16	0
2	SO4	D	301	-	4,4,4	0.46	0	6,6,6	0.28	0
4	GOL	D	304	-	5,5,5	0.31	0	5,5,5	0.31	0
4	GOL	A	303[A]	-	5,5,5	0.36	0	5,5,5	0.53	0
2	SO4	C	301	-	4,4,4	0.37	0	6,6,6	0.25	0
4	GOL	A	303[B]	-	5,5,5	0.32	0	5,5,5	0.86	0
2	SO4	F	301	-	4,4,4	0.30	0	6,6,6	0.40	0
4	GOL	B	303	-	5,5,5	0.30	0	5,5,5	0.38	0
4	GOL	C	304	-	5,5,5	0.47	0	5,5,5	0.46	0
4	GOL	F	304	-	5,5,5	0.45	0	5,5,5	0.43	0
2	SO4	B	304[A]	-	4,4,4	0.42	0	6,6,6	0.46	0
2	SO4	B	304[B]	-	4,4,4	0.27	0	6,6,6	0.61	0
4	GOL	F	305[B]	-	5,5,5	0.46	0	5,5,5	0.60	0
4	GOL	F	303[A]	-	5,5,5	0.23	0	5,5,5	0.75	0
4	GOL	F	303[B]	-	5,5,5	0.28	0	5,5,5	0.48	0
4	GOL	F	305[A]	-	5,5,5	0.45	0	5,5,5	0.48	0
2	SO4	E	301[A]	-	4,4,4	0.32	0	6,6,6	0.60	0
2	SO4	E	301[B]	-	4,4,4	0.23	0	6,6,6	0.24	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	GOL	E	305	-	-	0/4/4/4	-
4	GOL	A	304	-	-	0/4/4/4	-
4	GOL	D	303	-	-	0/4/4/4	-
4	GOL	D	305	-	-	0/4/4/4	-
4	GOL	C	306	-	-	2/4/4/4	-
4	GOL	B	305[A]	-	-	2/4/4/4	-
4	GOL	B	305[B]	-	-	2/4/4/4	-
4	GOL	C	305	-	-	0/4/4/4	-
4	GOL	E	302	-	-	0/4/4/4	-
4	GOL	A	305	-	-	0/4/4/4	-
4	GOL	C	303[A]	-	-	2/4/4/4	-
4	GOL	C	303[B]	-	-	0/4/4/4	-
4	GOL	B	302	-	-	0/4/4/4	-
4	GOL	E	304	-	-	0/4/4/4	-
4	GOL	D	304	-	-	0/4/4/4	-
4	GOL	A	303[A]	-	-	0/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GOL	A	303[B]	-	-	2/4/4/4	-
4	GOL	B	303	-	-	0/4/4/4	-
4	GOL	C	304	-	-	0/4/4/4	-
4	GOL	F	304	-	-	0/4/4/4	-
4	GOL	F	303[A]	-	-	2/4/4/4	-
4	GOL	F	303[B]	-	-	0/4/4/4	-
4	GOL	F	305[A]	-	-	2/4/4/4	-
4	GOL	F	305[B]	-	-	0/4/4/4	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	305[A]	GOL	O3-C3-C2	2.12	120.36	110.20

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	C	303[A]	GOL	C1-C2-C3-O3
4	C	303[A]	GOL	O2-C2-C3-O3
4	C	306	GOL	C1-C2-C3-O3
4	F	305[A]	GOL	C1-C2-C3-O3
4	A	303[B]	GOL	O1-C1-C2-C3
4	A	303[B]	GOL	O1-C1-C2-O2
4	F	303[A]	GOL	O1-C1-C2-C3
4	B	305[A]	GOL	C1-C2-C3-O3
4	B	305[B]	GOL	C1-C2-C3-O3
4	C	306	GOL	O2-C2-C3-O3
4	F	303[A]	GOL	O1-C1-C2-O2
4	F	305[A]	GOL	O2-C2-C3-O3
4	B	305[B]	GOL	O2-C2-C3-O3
4	B	305[A]	GOL	O2-C2-C3-O3

There are no ring outliers.

12 monomers are involved in 24 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	E	305	GOL	6	0
4	C	306	GOL	3	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	305[B]	GOL	1	0
4	E	302	GOL	1	0
2	E	303[A]	SO4	3	0
2	E	303[B]	SO4	1	0
4	B	303	GOL	1	0
2	B	304[A]	SO4	1	0
2	B	304[B]	SO4	2	0
4	F	303[A]	GOL	2	0
4	F	303[B]	GOL	2	0
2	E	301[A]	SO4	3	0

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	241/252 (95%)	-0.23	5 (2%)	63	49	4, 7, 17, 20	1 (0%)
1	B	240/252 (95%)	-0.13	10 (4%)	36	26	5, 9, 20, 28	1 (0%)
1	C	247/252 (98%)	-0.26	3 (1%)	79	67	4, 7, 15, 28	0
1	D	249/252 (98%)	-0.24	3 (1%)	79	67	4, 7, 16, 35	0
1	E	241/252 (95%)	-0.13	10 (4%)	37	27	5, 8, 20, 28	1 (0%)
1	F	242/252 (96%)	-0.27	3 (1%)	79	67	4, 8, 18, 41	1 (0%)
All	All	1460/1512 (96%)	-0.21	34 (2%)	60	46	4, 8, 18, 41	4 (0%)

All (34) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	236	VAL	6.2
1	E	236	VAL	4.5
1	D	232	LYS	4.0
1	E	234	THR	4.0
1	F	236	VAL	3.9
1	E	217	ILE	3.8
1	B	236	VAL	3.6
1	B	234	THR	3.5
1	A	226	PRO	3.4
1	B	102	GLY	3.3
1	C	236	VAL	3.2
1	B	104	VAL	3.2
1	E	30	ARG	3.1
1	A	225	ILE	2.9
1	B	235	GLU	2.8
1	B	217[A]	ILE	2.5
1	C	231	MET	2.5
1	E	27	ARG	2.4
1	B	98	HIS	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	101	VAL	2.3
1	E	93[A]	GLY	2.3
1	E	235	GLU	2.3
1	A	4	PHE	2.3
1	F	1	ALA	2.3
1	E	218	VAL	2.3
1	D	231	MET	2.2
1	B	100	ASN	2.2
1	C	99	VAL	2.2
1	E	233	LYS	2.2
1	A	30	ARG	2.2
1	A	1	ALA	2.1
1	E	102	GLY	2.1
1	F	146	VAL	2.1
1	B	1	ALA	2.1

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 monosaccharides 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
4	GOL	C	306	6/6	0.81	0.19	19,20,22,24	0
4	GOL	F	303[A]	6/6	0.90	0.13	6,14,20,21	12
4	GOL	F	303[B]	6/6	0.90	0.13	4,4,6,11	12
4	GOL	B	305[A]	6/6	0.90	0.14	6,8,10,11	12
4	GOL	B	305[B]	6/6	0.90	0.14	7,8,11,12	12
4	GOL	C	305	6/6	0.92	0.16	7,16,19,20	0
4	GOL	A	305	6/6	0.93	0.12	5,10,12,14	14
4	GOL	F	305[A]	6/6	0.93	0.13	4,7,10,12	2

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	GOL	F	305[B]	6/6	0.93	0.13	4,5,9,10	2
4	GOL	E	302	6/6	0.94	0.09	5,10,12,12	12
4	GOL	A	303[A]	6/6	0.94	0.09	3,8,10,10	1
4	GOL	A	303[B]	6/6	0.94	0.09	3,8,10,10	1
2	SO4	B	301[B]	5/5	0.95	0.09	6,7,8,9	5
4	GOL	D	304	6/6	0.95	0.12	6,12,14,16	0
4	GOL	C	303[A]	6/6	0.95	0.12	3,7,8,10	2
4	GOL	E	305	6/6	0.95	0.08	5,6,8,10	12
4	GOL	A	304	6/6	0.95	0.11	7,8,10,11	0
4	GOL	C	303[B]	6/6	0.95	0.12	3,5,7,8	2
2	SO4	B	301[A]	5/5	0.95	0.09	11,13,14,15	5
4	GOL	F	304	6/6	0.95	0.09	6,9,10,10	0
2	SO4	B	304[B]	5/5	0.96	0.10	9,10,10,11	5
2	SO4	E	303[A]	5/5	0.96	0.10	6,9,9,11	5
2	SO4	E	303[B]	5/5	0.96	0.10	11,12,15,16	5
4	GOL	B	303	6/6	0.96	0.09	5,9,11,12	12
4	GOL	C	304	6/6	0.96	0.11	7,9,10,11	0
2	SO4	B	304[A]	5/5	0.96	0.10	9,9,11,11	5
4	GOL	B	302	6/6	0.97	0.07	7,7,10,10	0
4	GOL	D	303	6/6	0.97	0.12	3,6,7,8	0
4	GOL	E	304	6/6	0.97	0.07	7,8,10,10	0
4	GOL	D	305	6/6	0.97	0.11	6,8,9,10	0
2	SO4	E	301[A]	5/5	0.98	0.07	11,12,14,16	5
2	SO4	E	301[B]	5/5	0.98	0.07	8,11,11,12	5
3	CL	D	302	1/1	0.99	0.03	7,7,7,7	0
2	SO4	C	301	5/5	0.99	0.04	6,6,6,7	0
2	SO4	D	301	5/5	0.99	0.05	6,6,6,7	0
2	SO4	F	301	5/5	0.99	0.04	7,7,7,8	0
2	SO4	A	301	5/5	0.99	0.04	7,7,8,9	0
3	CL	C	302	1/1	1.00	0.03	7,7,7,7	0
3	CL	F	302	1/1	1.00	0.07	9,9,9,9	0
3	CL	A	302	1/1	1.00	0.06	10,10,10,10	0

6.5 Other polymers (i)

There are no such residues in this entry.