WORLDWIDE PDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Mar 23, 2026 – 12:34 PM EDT

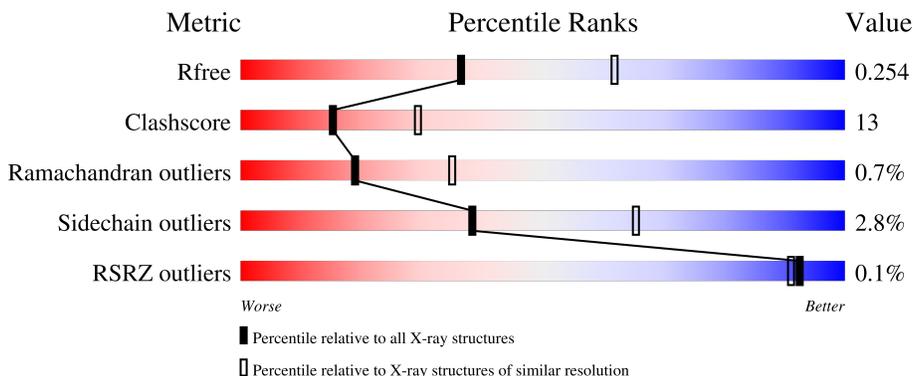|		
PDB ID	:	9NLD / pdb_00009nld
Title	:	O-acetylserine sulfhydrylase A (CysK) from Neisseria gonorrhoeae
Authors	:	McGarvie, J.; Warrender, A.K.; Hicks, J.L.; Oldham, K.E.A.; Prentice, E.A.; Jiao, W.
Deposited on	:	2025-03-03
Resolution	:	2.50 Å(reported)

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	Percentile Ranks	Value
Rfree		0.254
Clashscore		13
Ramachandran outliers		0.7%
Sidechain outliers		2.8%
RSRZ outliers		0.1%

Worse *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	5504 (2.50-2.50)
Clashscore	180529	6282 (2.50-2.50)
Ramachandran outliers	177936	6191 (2.50-2.50)
Sidechain outliers	177891	6193 (2.50-2.50)
RSRZ outliers	164620	5504 (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 <=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	318	66% 20% • 12%
1	B	318	71% 16% • 12%
1	C	318	60% 25% • 13%
1	D	318	67% 20% • 12%

WORLDWIDE
wwPDB
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2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 8240 atoms, of which 88 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 Cysteine synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	279	Total	C	N	O	S	0	0	0
			2009	1280	331	388	10			
1	B	279	Total	C	N	O	S	0	0	0
			2007	1277	334	386	10			
1	C	278	Total	C	N	O	S	0	0	1
			1932	1224	325	373	10			
1	D	279	Total	C	N	O	S	2	0	0
			1947	1232	328	377	10			

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	311	LEU	-	expression tag	UNP Q5F9Q2
A	312	GLU	-	expression tag	UNP Q5F9Q2
A	313	HIS	-	expression tag	UNP Q5F9Q2
A	314	HIS	-	expression tag	UNP Q5F9Q2
A	315	HIS	-	expression tag	UNP Q5F9Q2
A	316	HIS	-	expression tag	UNP Q5F9Q2
A	317	HIS	-	expression tag	UNP Q5F9Q2
A	318	HIS	-	expression tag	UNP Q5F9Q2
B	311	LEU	-	expression tag	UNP Q5F9Q2
B	312	GLU	-	expression tag	UNP Q5F9Q2
B	313	HIS	-	expression tag	UNP Q5F9Q2
B	314	HIS	-	expression tag	UNP Q5F9Q2
B	315	HIS	-	expression tag	UNP Q5F9Q2
B	316	HIS	-	expression tag	UNP Q5F9Q2
B	317	HIS	-	expression tag	UNP Q5F9Q2
B	318	HIS	-	expression tag	UNP Q5F9Q2
C	311	LEU	-	expression tag	UNP Q5F9Q2
C	312	GLU	-	expression tag	UNP Q5F9Q2
C	313	HIS	-	expression tag	UNP Q5F9Q2
C	314	HIS	-	expression tag	UNP Q5F9Q2
C	315	HIS	-	expression tag	UNP Q5F9Q2

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Chain	Residue	Modelled	Actual	Comment	Reference
C	316	HIS	-	expression tag	UNP Q5F9Q2
C	317	HIS	-	expression tag	UNP Q5F9Q2
C	318	HIS	-	expression tag	UNP Q5F9Q2
D	311	LEU	-	expression tag	UNP Q5F9Q2
D	312	GLU	-	expression tag	UNP Q5F9Q2
D	313	HIS	-	expression tag	UNP Q5F9Q2
D	314	HIS	-	expression tag	UNP Q5F9Q2
D	315	HIS	-	expression tag	UNP Q5F9Q2
D	316	HIS	-	expression tag	UNP Q5F9Q2
D	317	HIS	-	expression tag	UNP Q5F9Q2
D	318	HIS	-	expression tag	UNP Q5F9Q2

- Molecule 2 is SULFATE ION (CCD ID: SO4) (formula: O_4S).
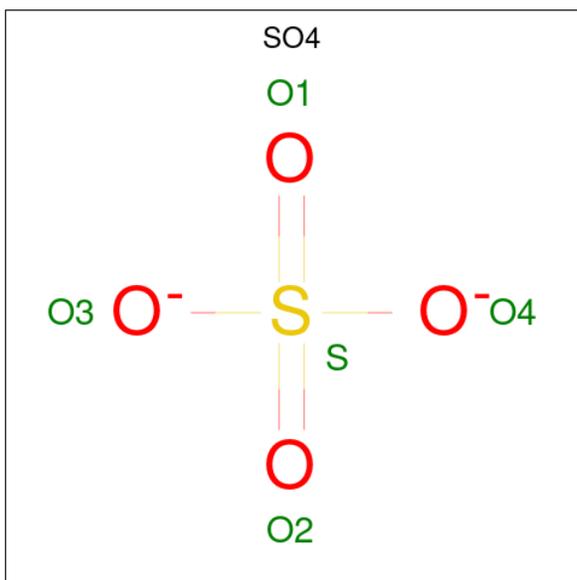
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total 5	O 4	S 1	0	0
2	A	1	Total 5	O 4	S 1	0	0
2	A	1	Total 5	O 4	S 1	0	0
2	A	1	Total 5	O 4	S 1	0	0
2	A	1	Total 5	O 4	S 1	0	0
2	A	1	Total 5	O 4	S 1	0	0

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

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

PEG

C4

OH O4

O2

O

C3

C1

C2

HO

O1

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	H	O	0	0
			17	4	10	3		
3	A	1	Total	C	H	O	0	0
			17	4	10	3		
3	A	1	Total	C	H	O	0	0
			17	4	10	3		
3	B	1	Total	C	H	O	0	0
			17	4	10	3		
3	C	1	Total	C	H	O	0	0
			17	4	10	3		
3	D	1	Total	C	H	O	0	0
			17	4	10	3		
3	D	1	Total	C	H	O	0	0
			17	4	10	3		
3	D	1	Total	C	H	O	0	0
			17	4	10	3		

- Molecule 4 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).

GOL
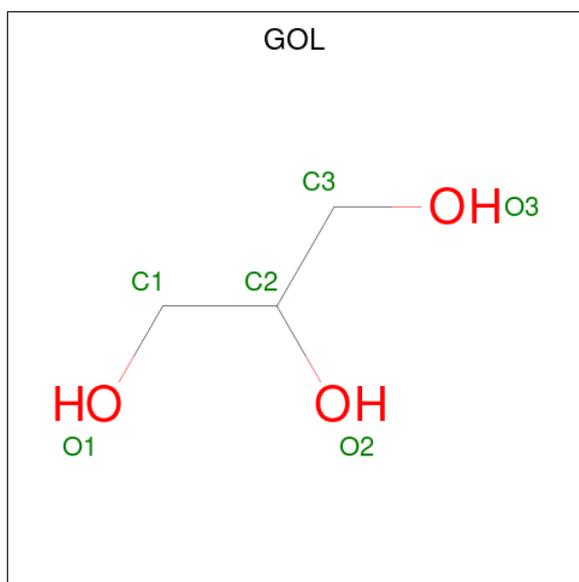
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total 14	C 3	H 8	O 3	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	28	Total 28	O 28	0	0
5	B	36	Total 36	O 36	0	0
5	C	12	Total 12	O 12	0	0
5	D	14	Total 14	O 14	0	0

3 Residue-property plots ⓘ

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

• Molecule 1: Cysteine synthase

Chain A:
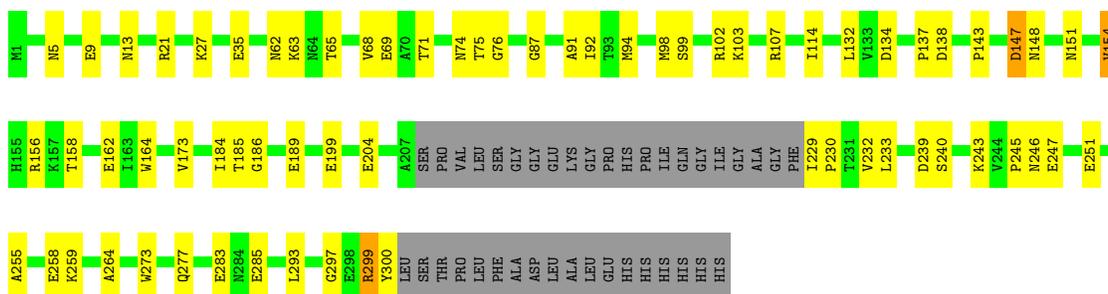
• Molecule 1: Cysteine synthase

Chain B:

• Molecule 1: Cysteine synthase

Chain C:

GLY ALA GLY PHE ILE PRO THR VAL LEU ASN T235 Y238 I241 A242 K243 V244 R254 A255 M256 A257 E258 G265 W273 E285 G286 K287 L288 V291 L292 L293 P294 S295 Y296 GLY GLU ARG TYR LEU SER THR PRO LEU PHE ALA ASP LEU ALA LEU GLU HIS HIS HIS HIS
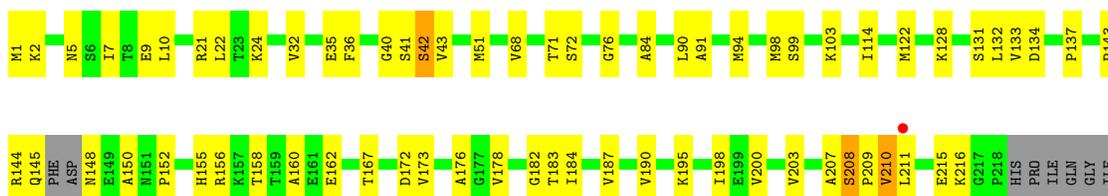
HIS HIS

• Molecule 1: Cysteine synthase

Chain D:

67% 20% • 12%

M1 K2 I3 A4 N5 S6 I7 T8 E9 L10 R21 K24 G25 L26 F37 G40 S41 K44 D45 R46 I47 A48 E49 A50 M51 I52 E53 E56 E69 A70 T71 N74 L79 S99 K103 T108 L113 I114 A118 L132 H136 P137 D138

P143 R144 Q145 PHE ASP N148 E149 V154 H155 R156 D166 A176 G182 T183 I184 T185 G186 V190 K195 P196 E197 I198 E199 V200 P209 V210 P218 HIS PRO ILE GLN GLY ILE GLY ALA GLY PHE ILE PRO THR VAL LEU N234 T235 Y238 D239 S240 R254 E258

G265 S268 A279 E283 Y296 GLY GLU ARG TYR LEU SER THR PRO LEU PHE ALA ASP LEU ALA LEU GLU HIS HIS HIS HIS HIS HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	102.74Å 62.18Å 105.67Å 90.00° 90.08° 90.00°	Depositor
Resolution (Å)	37.07 – 2.50 37.07 – 2.50	Depositor EDS
% Data completeness (in resolution range)	99.9 (37.07-2.50) 99.5 (37.07-2.50)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.48 (at 2.51Å)	Xtriage
Refinement program	PHENIX 1.21.2_5419	Depositor
R, R_{free}	0.198 , 0.255 0.197 , 0.254	Depositor DCC
R_{free} test set	2306 reflections (4.95%)	wwPDB-VP
Wilson B-factor (Å^2)	60.2	Xtriage
Anisotropy	0.250	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 57.2	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.000 for l,k,-h 0.486 for h,-k,-l 0.005 for l,-k,h	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	8240	wwPDB-VP
Average B, all atoms (Å^2)	64.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.98% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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: PEG, SO4, GOL

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	0.15	0/2038	0.33	0/2762
1	B	0.14	0/2035	0.33	0/2759
1	C	0.15	0/1958	0.35	0/2655
1	D	0.13	0/1973	0.31	0/2675
All	All	0.14	0/8004	0.33	0/10851

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	2009	0	1979	49	0
1	B	2007	0	1985	42	0
1	C	1932	0	1860	75	0
1	D	1947	0	1882	51	0
2	A	30	0	0	0	0
2	B	30	0	0	0	0
2	C	25	0	0	0	0
2	D	20	0	0	0	0
3	A	21	30	30	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	7	10	10	1	0
3	C	7	10	10	3	0
3	D	21	30	30	7	0
4	A	6	8	8	0	0
5	A	28	0	0	4	0
5	B	36	0	0	1	0
5	C	12	0	0	3	0
5	D	14	0	0	4	0
All	All	8152	88	7794	212	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 13.

All (212) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:208:SER:HB3	1:C:209:PRO:HD3	1.36	1.03
1:C:94:MET:HE2	1:C:98:MET:HG2	1.49	0.91
1:B:102:ARG:HE	1:B:299:ARG:HD2	1.38	0.88
1:C:42:SER:HA	1:C:294:PRO:CB	2.09	0.82
1:C:42:SER:HA	1:C:294:PRO:HG2	1.61	0.82
1:B:144:ARG:NE	1:B:144:ARG:HA	1.95	0.81
1:A:297:GLY:HA2	1:A:300:TYR:CD2	2.16	0.81
1:C:43:VAL:N	1:C:294:PRO:HG2	1.95	0.80
1:B:102:ARG:HH21	1:B:299:ARG:HB2	1.47	0.79
1:B:94:MET:HE2	1:B:98:MET:HG3	1.63	0.79
1:A:283:GLU:OE1	5:A:501:HOH:O	2.01	0.79
1:B:71:THR:HG21	1:B:76:GLY:CA	2.12	0.79
1:B:71:THR:HG21	1:B:76:GLY:HA3	1.64	0.78
1:C:42:SER:HA	1:C:294:PRO:CG	2.15	0.77
1:B:245:PRO:HB3	1:D:210:VAL:HG12	1.66	0.75
1:C:208:SER:HB3	1:C:209:PRO:CD	2.14	0.73
1:C:42:SER:HA	1:C:294:PRO:HB2	1.70	0.73
1:D:50:ALA:HB2	1:D:154:VAL:HG21	1.70	0.73
1:C:178:VAL:HG23	1:C:203:VAL:O	1.88	0.72
1:C:94:MET:CE	1:C:98:MET:HG2	2.20	0.71
1:D:45:ASP:OD1	5:D:501:HOH:O	2.10	0.70
1:D:186:GLY:O	1:D:190:VAL:HG23	1.92	0.70
1:C:43:VAL:H	1:C:294:PRO:HG2	1.53	0.70
1:C:36:PHE:HB3	1:C:294:PRO:HB3	1.75	0.68
1:D:145:GLN:C	1:D:148:ASN:HB2	2.17	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:195:LYS:HG2	1:C:198:ILE:HG13	1.76	0.68
3:A:406:PEG:H11	1:C:209:PRO:HG3	1.76	0.67
1:A:13:ASN:OD1	5:A:502:HOH:O	2.13	0.66
1:C:176:ALA:HB3	1:C:184:ILE:HG23	1.78	0.66
1:D:182:GLY:HA3	5:D:508:HOH:O	1.96	0.65
1:A:94:MET:CG	1:A:98:MET:HG3	2.27	0.65
1:B:102:ARG:HE	1:B:299:ARG:CD	2.09	0.65
1:C:144:ARG:HA	1:C:148:ASN:N	2.12	0.64
1:A:75:THR:HB	1:A:147:ASP:HB2	1.80	0.64
1:C:182:GLY:HA3	5:C:504:HOH:O	1.96	0.63
1:C:42:SER:CA	1:C:294:PRO:HG2	2.26	0.63
1:D:21:ARG:O	1:D:24:LYS:HE2	1.99	0.63
1:C:21:ARG:O	1:C:24:LYS:HG2	1.99	0.62
1:C:156:ARG:HG3	1:C:190:VAL:CG2	2.30	0.62
1:D:218:PRO:HD3	1:D:240:SER:HA	1.82	0.62
1:D:47:ILE:H	1:D:47:ILE:HD12	1.66	0.61
1:C:172:ASP:OD2	1:C:286:GLY:HA3	2.01	0.60
1:D:254:ARG:O	1:D:258:GLU:HG2	2.02	0.60
1:D:44:LYS:HA	1:D:47:ILE:HD13	1.83	0.60
1:D:156:ARG:HG3	1:D:190:VAL:CG2	2.32	0.59
1:C:254:ARG:O	1:C:258:GLU:HG2	2.01	0.59
1:B:71:THR:HG21	1:B:76:GLY:N	2.17	0.59
1:A:71:THR:HG22	1:A:92:ILE:HG23	1.85	0.59
1:D:26:LEU:HD23	1:D:279:ALA:HB3	1.85	0.59
1:A:71:THR:HG21	1:A:76:GLY:HA3	1.85	0.59
1:D:5:ASN:HB2	1:D:9:GLU:OE2	2.03	0.58
1:C:145:GLN:N	1:C:148:ASN:HA	2.17	0.58
1:A:102:ARG:HH21	1:A:300:TYR:HA	1.68	0.58
1:B:138:ASP:OD2	1:B:139:THR:HG23	2.04	0.58
1:A:103:LYS:O	1:A:107:ARG:HG3	2.04	0.57
1:A:258:GLU:HG3	1:D:108:THR:O	2.03	0.57
1:B:102:ARG:NE	1:B:299:ARG:HD2	2.13	0.57
1:A:134:ASP:O	1:A:137:PRO:HD3	2.05	0.57
1:A:158:THR:O	1:A:162:GLU:HG3	2.05	0.57
1:A:283:GLU:HB3	5:A:501:HOH:O	2.05	0.57
1:B:102:ARG:HH21	1:B:299:ARG:CB	2.15	0.57
1:A:247:GLU:HG3	1:A:251:GLU:OE2	2.05	0.57
1:A:255:ALA:O	1:A:259:LYS:HB2	2.04	0.57
1:C:1:MET:C	1:C:2:LYS:HD3	2.30	0.56
1:A:21:ARG:HD2	1:A:259:LYS:HD3	1.88	0.56
1:C:293:LEU:HD12	1:C:294:PRO:CD	2.35	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:68:VAL:HG11	1:B:133:VAL:HG23	1.88	0.56
1:C:155:HIS:CD2	1:C:183:THR:HA	2.42	0.55
1:A:74:ASN:ND2	1:A:300:TYR:HB2	2.22	0.55
1:D:1:MET:HE3	1:D:3:ILE:HD12	1.88	0.55
1:C:42:SER:C	1:C:294:PRO:HG2	2.32	0.55
1:C:94:MET:HE2	1:C:98:MET:CG	2.29	0.55
1:D:1:MET:HE3	1:D:3:ILE:CD1	2.37	0.55
1:A:245:PRO:HD3	1:C:209:PRO:HG2	1.89	0.54
1:A:185:THR:O	1:A:189:GLU:HG3	2.08	0.54
1:C:21:ARG:O	1:C:24:LYS:HE2	2.07	0.54
1:D:52:ILE:O	1:D:56:GLU:HG3	2.07	0.54
1:D:195:LYS:HB3	1:D:198:ILE:HG13	1.90	0.54
1:C:84:ALA:O	5:C:501:HOH:O	2.19	0.54
1:D:176:ALA:HB3	1:D:184:ILE:HD11	1.90	0.54
1:D:99:SER:O	1:D:103:LYS:HG3	2.08	0.53
1:D:200:VAL:O	1:D:238:TYR:HB2	2.08	0.53
1:C:99:SER:O	1:C:103:LYS:HG3	2.08	0.53
1:A:63:LYS:N	1:A:63:LYS:HD3	2.23	0.53
1:D:74:ASN:H	3:D:403:PEG:H42	1.73	0.53
1:B:144:ARG:HA	1:B:144:ARG:CZ	2.38	0.53
1:A:68:VAL:HA	1:A:91:ALA:O	2.09	0.53
1:A:173:VAL:HG13	1:A:199:GLU:HG2	1.91	0.53
1:B:143:PRO:O	1:B:144:ARG:HD2	2.09	0.53
1:C:51:MET:CE	1:C:143:PRO:HG2	2.39	0.53
1:B:298:GLU:C	1:B:299:ARG:HG3	2.34	0.52
1:D:200:VAL:HB	1:D:238:TYR:HA	1.91	0.52
1:B:102:ARG:NH2	1:B:299:ARG:HB2	2.20	0.52
1:D:51:MET:HE1	1:D:79:LEU:HD11	1.90	0.52
1:D:166:ASP:OD2	5:D:502:HOH:O	2.19	0.52
1:C:35:GLU:HB2	1:C:294:PRO:HG3	1.92	0.52
1:C:68:VAL:HG11	1:C:133:VAL:HG23	1.91	0.52
1:B:282:PRO:HA	1:B:285:GLU:HG3	1.90	0.51
1:C:134:ASP:O	1:C:137:PRO:HD3	2.10	0.51
1:D:176:ALA:HB3	1:D:184:ILE:CD1	2.40	0.51
1:C:173:VAL:HB	1:C:288:LEU:HG	1.91	0.51
1:C:288:LEU:HD12	1:C:288:LEU:N	2.25	0.51
1:A:62:ASN:HB2	1:A:63:LYS:HZ2	1.75	0.51
1:A:164:TRP:HE1	3:A:405:PEG:C2	2.23	0.51
1:B:37:PHE:HA	3:B:405:PEG:H32	1.91	0.51
1:B:151:ASN:O	1:B:154:VAL:HG12	2.11	0.51
1:C:208:SER:CB	1:C:209:PRO:HD3	2.25	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:51:MET:HE3	1:B:143:PRO:HB2	1.93	0.51
1:C:241:ILE:HG12	1:C:242:ALA:N	2.26	0.51
1:B:267:SER:OG	1:B:300:TYR:HB2	2.11	0.50
1:C:98:MET:O	1:C:103:LYS:HE3	2.11	0.50
1:A:5:ASN:HB3	1:A:9:GLU:OE1	2.11	0.50
1:C:71:THR:HG21	1:C:76:GLY:CA	2.41	0.50
1:D:155:HIS:CD2	1:D:183:THR:HA	2.47	0.50
1:B:39:PRO:HB2	1:B:81:MET:SD	2.52	0.50
1:D:26:LEU:HD23	1:D:279:ALA:CB	2.42	0.50
1:C:200:VAL:O	1:C:238:TYR:HB2	2.12	0.49
1:C:295:SER:HB3	3:C:404:PEG:H12	1.94	0.49
1:D:265:GLY:HA3	3:D:406:PEG:H21	1.94	0.49
1:A:156:ARG:HG2	1:A:186:GLY:O	2.12	0.49
1:A:243:LYS:HD2	1:C:208:SER:HB2	1.92	0.49
1:C:5:ASN:HB2	1:C:9:GLU:OE1	2.13	0.49
1:B:295:SER:OG	1:B:300:TYR:HA	2.13	0.49
1:B:158:THR:O	1:B:162:GLU:HG3	2.13	0.49
1:B:156:ARG:HG2	1:B:190:VAL:HG23	1.95	0.49
1:C:72:SER:O	1:C:98:MET:HE2	2.13	0.49
1:A:114:ILE:HD13	1:A:132:LEU:HD11	1.94	0.49
1:B:134:ASP:O	1:B:137:PRO:HD3	2.13	0.48
1:B:94:MET:HE2	1:B:98:MET:CG	2.39	0.48
1:A:99:SER:HB2	1:A:102:ARG:HB2	1.95	0.48
1:B:40:GLY:O	1:B:41:SER:HB2	2.12	0.48
1:D:47:ILE:HD12	1:D:47:ILE:N	2.26	0.48
1:D:71:THR:OG1	3:D:403:PEG:H12	2.14	0.48
1:C:40:GLY:O	1:C:41:SER:HB2	2.13	0.48
1:C:291:VAL:O	1:C:291:VAL:HG12	2.13	0.48
1:D:49:GLU:O	1:D:53:GLU:HG3	2.12	0.48
1:D:7:ILE:HD12	1:D:10:LEU:HD12	1.96	0.48
1:B:64:ASN:HA	1:B:89:LYS:HE2	1.96	0.48
1:A:229:ILE:CB	1:A:230:PRO:HD3	2.44	0.47
1:C:35:GLU:CB	1:C:294:PRO:HG3	2.44	0.47
1:C:158:THR:O	1:C:162:GLU:HG3	2.13	0.47
1:D:197:GLU:H	1:D:197:GLU:CD	2.22	0.47
1:D:156:ARG:HG3	1:D:190:VAL:HG22	1.96	0.47
1:B:246:ASN:HB2	3:D:407:PEG:H31	1.97	0.47
1:A:151:ASN:CG	1:A:154:VAL:HG12	2.39	0.47
1:B:86:ARG:HD3	5:B:529:HOH:O	2.13	0.47
1:B:69:GLU:OE1	1:B:143:PRO:HD2	2.14	0.47
1:B:250:PHE:HD1	1:B:266:ILE:HD11	1.79	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:239:ASP:O	1:A:240:SER:HB3	2.14	0.46
1:B:246:ASN:H	3:D:407:PEG:H31	1.81	0.46
3:A:410:PEG:H42	1:D:37:PHE:HA	1.96	0.46
1:C:128:LYS:NZ	1:C:132:LEU:HD21	2.31	0.46
1:A:230:PRO:HG3	5:C:508:HOH:O	2.14	0.45
1:B:144:ARG:NE	1:B:144:ARG:CA	2.73	0.45
1:A:273:TRP:O	1:A:277:GLN:HG2	2.17	0.45
1:C:244:VAL:HG22	1:C:273:TRP:CE3	2.51	0.45
1:A:27:LYS:HB2	1:A:285:GLU:HG2	1.98	0.45
1:B:68:VAL:HA	1:B:91:ALA:O	2.17	0.45
1:D:40:GLY:O	1:D:41:SER:HB2	2.16	0.45
1:C:207:ALA:HB1	1:C:210:VAL:CG1	2.47	0.45
1:A:62:ASN:HB2	1:A:63:LYS:NZ	2.32	0.45
1:C:160:ALA:HB2	1:C:187:VAL:HA	1.98	0.45
1:B:156:ARG:HG2	1:B:186:GLY:O	2.17	0.44
1:B:273:TRP:O	1:B:277:GLN:HG2	2.18	0.44
1:D:195:LYS:HG2	1:D:197:GLU:HG2	2.00	0.44
1:A:74:ASN:HD21	1:A:300:TYR:HB2	1.82	0.44
1:A:114:ILE:CD1	1:A:132:LEU:HD11	2.48	0.44
1:B:185:THR:OG1	1:B:232:VAL:HG23	2.17	0.44
1:C:207:ALA:HB1	1:C:210:VAL:HG11	2.00	0.44
1:D:103:LYS:HA	1:D:113:LEU:HD11	2.00	0.44
1:A:71:THR:HG21	1:A:76:GLY:CA	2.48	0.44
1:D:114:ILE:HD13	1:D:132:LEU:HD11	1.99	0.44
1:D:283:GLU:H	1:D:283:GLU:HG3	1.57	0.44
1:A:204:GLU:OE2	1:A:233:LEU:HD11	2.18	0.43
1:A:94:MET:HG3	1:A:98:MET:HG3	1.99	0.43
1:A:264:ALA:N	5:A:506:HOH:O	2.45	0.43
1:C:208:SER:CB	1:C:209:PRO:CD	2.89	0.43
1:C:285:GLU:OE1	1:C:285:GLU:HA	2.14	0.43
1:C:293:LEU:HD12	1:C:294:PRO:HD3	2.01	0.43
1:C:295:SER:HB2	3:C:404:PEG:C2	2.49	0.43
1:C:43:VAL:H	1:C:294:PRO:CG	2.26	0.42
1:C:71:THR:HG21	1:C:76:GLY:HA3	1.99	0.42
1:C:22:LEU:HD11	1:C:256:MET:HG2	2.00	0.42
1:C:90:LEU:HD12	1:C:91:ALA:H	1.83	0.42
1:D:21:ARG:O	1:D:24:LYS:HG2	2.19	0.42
1:C:71:THR:CA	1:C:122:MET:HE1	2.50	0.42
1:C:293:LEU:HA	1:C:294:PRO:HD3	1.83	0.42
1:D:118:ALA:O	5:D:503:HOH:O	2.22	0.42
1:A:87:GLY:HA2	1:D:21:ARG:NH2	2.35	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:185:THR:O	1:B:189:GLU:HG3	2.21	0.41
1:A:63:LYS:N	1:A:63:LYS:CD	2.83	0.41
1:C:114:ILE:HD13	1:C:132:LEU:HD11	2.02	0.41
1:A:69:GLU:OE1	1:A:143:PRO:HD2	2.20	0.41
1:A:184:ILE:HG23	1:A:232:VAL:HG21	2.02	0.41
1:C:36:PHE:CB	1:C:294:PRO:HB3	2.45	0.41
1:C:215:GLU:O	1:C:216:LYS:CB	2.69	0.41
1:D:136:HIS:N	1:D:137:PRO:HD3	2.36	0.41
1:D:184:ILE:HD13	1:D:184:ILE:HA	1.91	0.41
1:B:81:MET:HE2	1:B:81:MET:HB3	1.99	0.41
1:D:210:VAL:HG11	3:D:407:PEG:H11	2.03	0.41
1:C:293:LEU:HD12	1:C:294:PRO:HD2	2.02	0.40
1:A:35:GLU:HB2	1:A:293:LEU:O	2.22	0.40
1:C:150:ALA:C	1:C:152:PRO:HD3	2.45	0.40
1:C:167:THR:HB	1:C:287:LYS:CE	2.51	0.40
1:D:69:GLU:OE1	1:D:143:PRO:HG2	2.22	0.40
1:C:7:ILE:HD12	1:C:10:LEU:HD12	2.03	0.40
1:D:145:GLN:HE22	1:D:149:GLU:HG3	1.87	0.40
1:A:299:ARG:O	1:A:300:TYR:C	2.63	0.40
1:D:268:SER:H	3:D:406:PEG:HO1	1.69	0.40
1:A:71:THR:HG22	1:A:92:ILE:CG2	2.50	0.40
1:C:32:VAL:HB	1:C:292:LEU:HG	2.03	0.40
1:C:265:GLY:HA3	3:C:404:PEG:H22	2.04	0.40

There are no symmetry-related clashes.

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	275/318 (86%)	264 (96%)	9 (3%)	2 (1%)	19	35
1	B	275/318 (86%)	266 (97%)	7 (2%)	2 (1%)	19	35

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	272/318 (86%)	255 (94%)	15 (6%)	2 (1%)	19	35
1	D	273/318 (86%)	257 (94%)	14 (5%)	2 (1%)	19	35
All	All	1095/1272 (86%)	1042 (95%)	45 (4%)	8 (1%)	19	35

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	2	LYS
1	B	299	ARG
1	C	208	SER
1	A	148	ASN
1	A	299	ARG
1	D	209	PRO
1	C	210	VAL
1	D	210	VAL

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	192/247 (78%)	187 (97%)	5 (3%)	41	68
1	B	191/247 (77%)	185 (97%)	6 (3%)	35	62
1	C	178/247 (72%)	172 (97%)	6 (3%)	32	58
1	D	183/247 (74%)	179 (98%)	4 (2%)	47	73
All	All	744/988 (75%)	723 (97%)	21 (3%)	38	65

All (21) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	65	THR
1	A	138	ASP
1	A	147	ASP
1	A	154	VAL

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Mol	Chain	Res	Type
1	A	246	ASN
1	B	5	ASN
1	B	65	THR
1	B	99	SER
1	B	138	ASP
1	B	161	GLU
1	B	283	GLU
1	C	42	SER
1	C	131	SER
1	C	211	LEU
1	C	241	ILE
1	C	285	GLU
1	C	291	VAL
1	D	138	ASP
1	D	154	VAL
1	D	235	THR
1	D	239	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	5	ASN
1	A	20	ASN
1	A	74	ASN
1	A	136	HIS
1	B	136	HIS
1	C	5	ASN
1	C	20	ASN
1	D	20	ASN
1	D	130	GLN
1	D	145	GLN
1	D	277	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 ⓘ

30 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
2	SO4	A	402	-	4,4,4	0.68	0	6,6,6	0.06	0
3	PEG	A	406	-	6,6,6	0.25	0	5,5,5	0.40	0
2	SO4	B	403	-	4,4,4	0.69	0	6,6,6	0.10	0
3	PEG	C	404	-	6,6,6	0.28	0	5,5,5	0.31	0
3	PEG	B	405	-	6,6,6	0.22	0	5,5,5	0.54	0
3	PEG	A	405	-	6,6,6	0.25	0	5,5,5	0.58	0
2	SO4	A	407	-	4,4,4	0.67	0	6,6,6	0.14	0
2	SO4	A	401	-	4,4,4	0.68	0	6,6,6	0.08	0
2	SO4	B	401	-	4,4,4	0.68	0	6,6,6	0.08	0
2	SO4	D	404	-	4,4,4	0.69	0	6,6,6	0.10	0
2	SO4	C	402	-	4,4,4	0.67	0	6,6,6	0.07	0
2	SO4	C	406	-	4,4,4	0.72	0	6,6,6	0.07	0
3	PEG	D	406	-	6,6,6	0.25	0	5,5,5	0.71	0
4	GOL	A	409	-	5,5,5	0.35	0	5,5,5	0.44	0
2	SO4	A	403	-	4,4,4	0.73	0	6,6,6	0.08	0
2	SO4	C	403	-	4,4,4	0.70	0	6,6,6	0.07	0
2	SO4	D	402	-	4,4,4	0.68	0	6,6,6	0.05	0
2	SO4	D	405	-	4,4,4	0.70	0	6,6,6	0.08	0
3	PEG	D	403	-	6,6,6	0.25	0	5,5,5	0.49	0
2	SO4	C	405	-	4,4,4	0.69	0	6,6,6	0.10	0
3	PEG	A	410	-	6,6,6	0.27	0	5,5,5	0.23	0
2	SO4	C	401	-	4,4,4	0.72	0	6,6,6	0.08	0
2	SO4	B	407	-	4,4,4	0.71	0	6,6,6	0.10	0
3	PEG	D	407	-	6,6,6	0.27	0	5,5,5	0.69	0
2	SO4	B	402	-	4,4,4	0.71	0	6,6,6	0.09	0
2	SO4	A	404	-	4,4,4	0.69	0	6,6,6	0.14	0
2	SO4	B	406	-	4,4,4	0.70	0	6,6,6	0.08	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
2	SO4	A	408	-	4,4,4	0.70	0	6,6,6	0.05	0
2	SO4	D	401	-	4,4,4	0.73	0	6,6,6	0.07	0
2	SO4	B	404	-	4,4,4	0.63	0	6,6,6	0.19	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
3	PEG	A	406	-	-	2/4/4/4	-
3	PEG	D	407	-	-	1/4/4/4	-
3	PEG	C	404	-	-	0/4/4/4	-
3	PEG	B	405	-	-	1/4/4/4	-
3	PEG	A	405	-	-	1/4/4/4	-
3	PEG	D	403	-	-	0/4/4/4	-
3	PEG	A	410	-	-	2/4/4/4	-
3	PEG	D	406	-	-	0/4/4/4	-
4	GOL	A	409	-	-	3/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	409	GOL	O1-C1-C2-C3
4	A	409	GOL	O1-C1-C2-O2
3	A	406	PEG	O1-C1-C2-O2
3	A	410	PEG	O2-C3-C4-O4
3	B	405	PEG	C1-C2-O2-C3
3	A	405	PEG	O2-C3-C4-O4
3	A	410	PEG	O1-C1-C2-O2
3	A	406	PEG	C4-C3-O2-C2
4	A	409	GOL	O2-C2-C3-O3
3	D	407	PEG	C4-C3-O2-C2

There are no ring outliers.

8 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	406	PEG	1	0
3	C	404	PEG	3	0
3	B	405	PEG	1	0
3	A	405	PEG	1	0
3	D	406	PEG	2	0
3	D	403	PEG	2	0
3	A	410	PEG	1	0
3	D	407	PEG	3	0

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	279/318 (87%)	-1.30	0	100	100	42, 57, 86, 102	0
1	B	279/318 (87%)	-1.31	0	100	100	42, 57, 88, 110	0
1	C	278/318 (87%)	-1.21	1 (0%)	89	86	47, 66, 90, 111	0
1	D	279/318 (87%)	-1.20	0	100	100	48, 65, 90, 108	1 (0%)
All	All	1115/1272 (87%)	-1.26	1 (0%)	92	91	42, 62, 88, 111	1 (0%)

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	211	LEU	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 oligosaccharides 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. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	SO4	A	401	5/5	0.93	0.06	150,151,153,163	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å²)	Q<0.9
2	SO4	A	402	5/5	0.95	0.06	125,129,139,141	0
2	SO4	B	401	5/5	0.95	0.04	140,142,148,150	0
3	PEG	D	406	7/7	0.96	0.08	78,100,121,121	0
2	SO4	C	405	5/5	0.97	0.05	87,104,108,111	0
2	SO4	C	406	5/5	0.97	0.05	94,97,133,136	0
2	SO4	D	401	5/5	0.97	0.06	80,87,114,116	0
2	SO4	A	403	5/5	0.97	0.04	90,102,126,135	0
2	SO4	C	403	5/5	0.98	0.04	87,93,98,100	0
2	SO4	A	408	5/5	0.98	0.04	80,85,104,112	0
2	SO4	A	407	5/5	0.98	0.09	76,78,93,95	0
2	SO4	B	407	5/5	0.98	0.05	80,85,107,108	0
2	SO4	D	402	5/5	0.98	0.04	89,92,95,96	0
2	SO4	D	404	5/5	0.98	0.04	84,91,97,99	0
3	PEG	A	406	7/7	0.98	0.05	70,84,95,95	0
3	PEG	C	404	7/7	0.98	0.04	72,86,101,110	0
3	PEG	D	403	7/7	0.98	0.04	71,86,100,100	0
2	SO4	C	401	5/5	0.98	0.05	93,100,114,126	0
3	PEG	D	407	7/7	0.98	0.05	77,97,116,119	0
4	GOL	A	409	6/6	0.98	0.05	73,87,104,104	0
2	SO4	D	405	5/5	0.99	0.03	93,98,103,109	0
3	PEG	A	405	7/7	0.99	0.05	65,84,101,101	0
2	SO4	B	403	5/5	0.99	0.03	89,92,102,106	0
3	PEG	A	410	7/7	0.99	0.08	52,66,81,87	0
3	PEG	B	405	7/7	0.99	0.05	54,71,87,92	0
2	SO4	B	404	5/5	0.99	0.04	53,54,59,64	0
2	SO4	B	406	5/5	0.99	0.06	75,79,91,94	0
2	SO4	A	404	5/5	0.99	0.04	53,54,58,67	0
2	SO4	B	402	5/5	0.99	0.03	85,104,129,137	0
2	SO4	C	402	5/5	0.99	0.03	82,83,92,97	0

6.5 Other polymers ⓘ

There are no such residues in this entry.