Full wwPDB X-ray Structure Validation Report (i)

Aug 8, 2023 – 07:54 PM EDT

PDB ID	:	1OX6
Title	:	TOWARDS UNDERSTANDING THE MECHANISM OF THE COMPLEX CYCLIZATION REACTION CATALYZED BY IMIDAZOLE GLYCEROPHOSPHATE SYNTHASE
Authors	:	Chaudhuri, B.N.; Smith, J.L.
Deposited on	:	2003-04-01
Resolution	:	2.40 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:

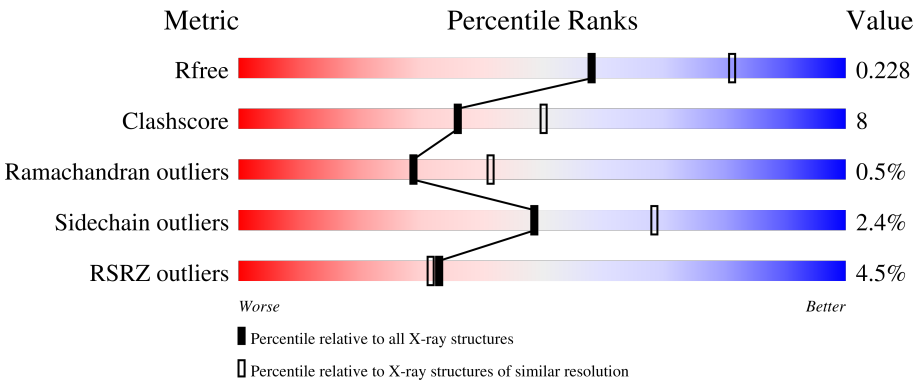
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

1 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 2.40 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	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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	555	5% 79% 16% · ·
1	B	555	4% 79% 16% · ·

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 8573 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Imidazole glycerol phosphate synthase hisHF.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	531	4128	2628	690	795	15	0	0	0
1	B	531	4128	2628	690	795	15	0	0	0

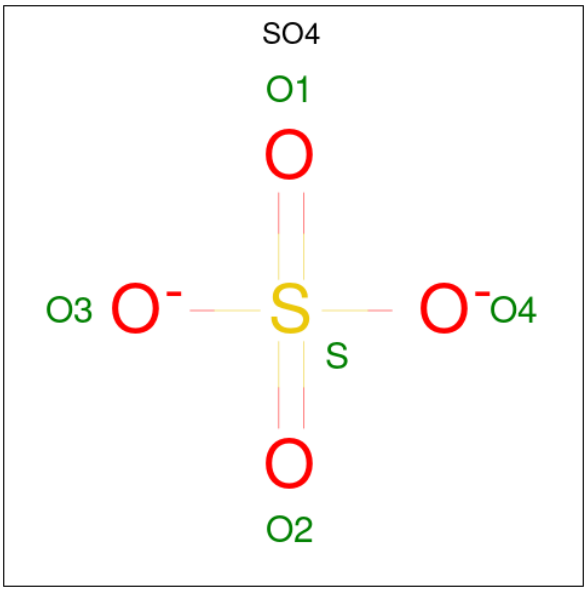
There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-3	GLY	-	cloning artifact	UNP P33734
A	-2	SER	-	cloning artifact	UNP P33734
A	-1	HIS	-	cloning artifact	UNP P33734
B	-3	GLY	-	cloning artifact	UNP P33734
B	-2	SER	-	cloning artifact	UNP P33734
B	-1	HIS	-	cloning artifact	UNP P33734

- Molecule 2 is NICKEL (II) ION (three-letter code: NI) (formula: Ni).

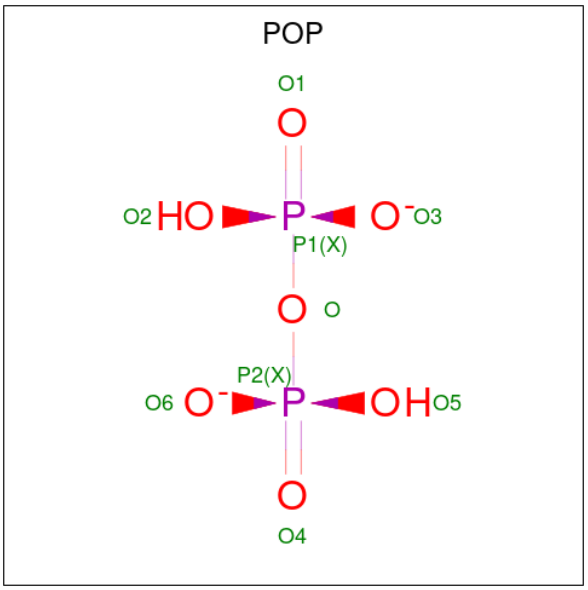
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Ni		
2	A	1	1	1	0	0
2	B	1	1	1	0	0

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



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

- Molecule 4 is PYROPHOSPHATE 2- (three-letter code: POP) (formula: $H_2O_7P_2$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	O	P		
4	B	1	9	7	2	0	0

- Molecule 5 is water.

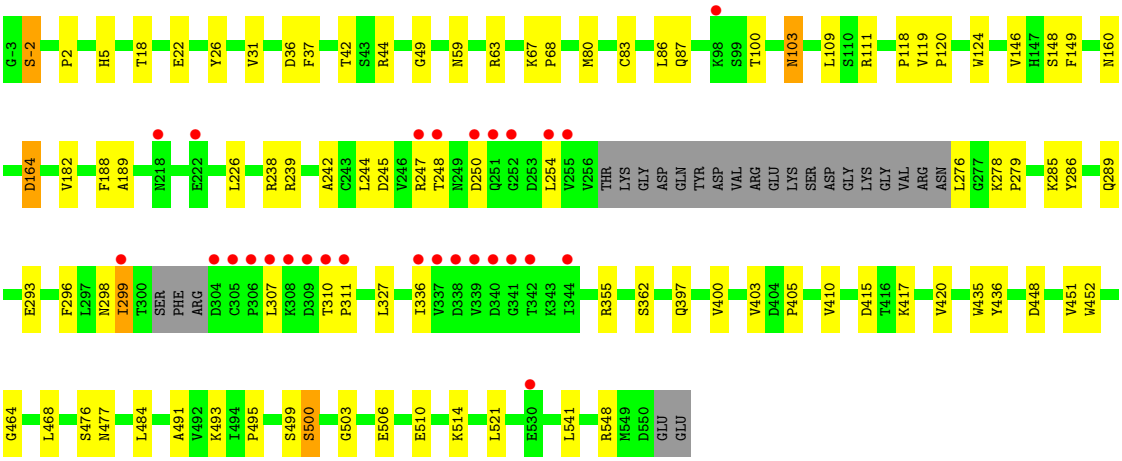
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
5	A	145	145	145	0	0
5	B	136	136	136	0	0

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.

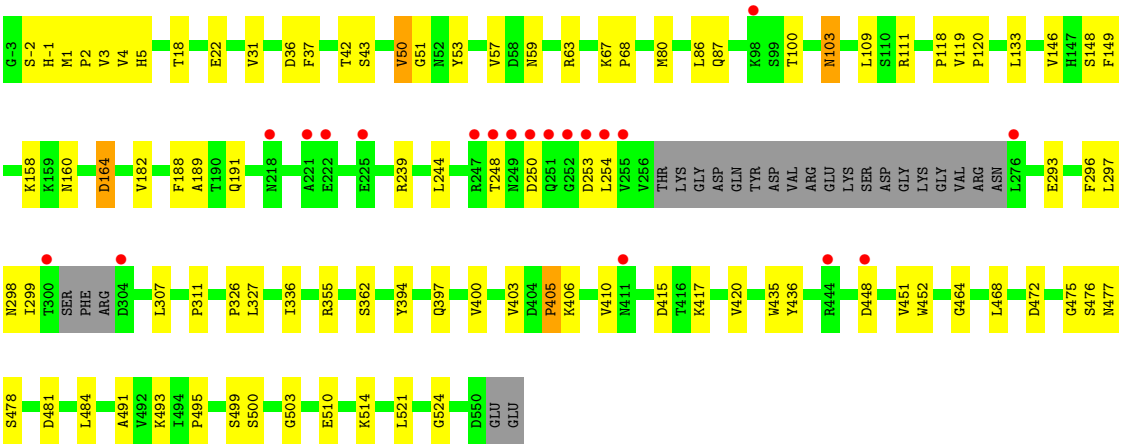
• Molecule 1: Imidazole glycerol phosphate synthase hisHF

Chain A:



• Molecule 1: Imidazole glycerol phosphate synthase hisHF

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	97.00Å 112.00Å 114.80Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.40 44.68 – 2.40	Depositor EDS
% Data completeness (in resolution range)	93.4 (50.00-2.40) 92.9 (44.68-2.40)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	0.11	Depositor
$< I/\sigma(I) >$ [1]	2.24 (at 2.39Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.228 , 0.255 0.227 , 0.228	Depositor DCC
R_{free} test set	2350 reflections (5.10%)	wwPDB-VP
Wilson B-factor (Å^2)	36.0	Xtriage
Anisotropy	0.385	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 40.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.46$, $< L^2 > = 0.29$	Xtriage
Estimated twinning fraction	0.025 for -h,l,k	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	8573	wwPDB-VP
Average B, all atoms (Å^2)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.06% 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: POP, NI, 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	0.40	0/4215	0.61	0/5703
1	B	0.41	0/4215	0.62	0/5703
All	All	0.40	0/8430	0.61	0/11406

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	4128	0	4070	67	0
1	B	4128	0	4070	69	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	15	0	0	1	0
3	B	10	0	0	1	0
4	B	9	0	0	2	0
5	A	145	0	0	8	0
5	B	136	0	0	3	0
All	All	8573	0	8140	131	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 8.

All (131) 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:A:310:THR:CG2	5:A:972:HOH:O	2.22	0.87
1:A:310:THR:HG23	5:A:972:HOH:O	1.81	0.79
1:A:87:GLN:HB3	1:A:109:LEU:HD13	1.68	0.76
1:A:510:GLU:HG3	1:A:514:LYS:HD2	1.68	0.76
1:B:510:GLU:HG3	1:B:514:LYS:HD2	1.67	0.76
1:A:87:GLN:HB3	1:A:109:LEU:CD1	2.19	0.72
1:B:87:GLN:HB3	1:B:109:LEU:HD13	1.71	0.71
1:A:500:SER:HA	3:A:802:SO4:O2	1.90	0.70
1:A:296:PHE:HE1	1:A:327:LEU:HD23	1.55	0.69
1:B:296:PHE:HE1	1:B:327:LEU:HD23	1.56	0.69
1:B:87:GLN:HB3	1:B:109:LEU:CD1	2.23	0.68
1:B:51:GLY:HA2	1:B:394:TYR:O	1.93	0.68
5:A:946:HOH:O	1:B:478:SER:HB2	1.94	0.68
1:B:-1:HIS:CD2	1:B:1:MET:HG3	2.28	0.67
1:B:80:MET:HA	1:B:188:PHE:O	1.94	0.66
1:A:468:LEU:HD21	1:A:484:LEU:HG	1.78	0.65
1:A:2:PRO:HB3	1:B:476:SER:HB2	1.80	0.63
1:B:417:LYS:HE2	1:B:448:ASP:OD2	1.98	0.62
1:A:417:LYS:HE2	1:A:448:ASP:OD2	1.99	0.62
1:B:468:LEU:HD21	1:B:484:LEU:HG	1.80	0.61
1:B:3:VAL:HG12	1:B:4:VAL:N	2.16	0.61
1:A:499:SER:O	1:A:500:SER:HB2	2.00	0.60
1:B:475:GLY:HA2	4:B:999:POP:O3	2.02	0.60
1:A:44:ARG:HH22	1:B:477:ASN:HD22	1.49	0.60
1:B:406:LYS:HA	5:B:1022:HOH:O	2.02	0.60
1:B:307:LEU:HD13	1:B:336:ILE:CD1	2.32	0.59
1:B:362:SER:HA	1:B:400:VAL:HG13	1.85	0.59
1:A:276:LEU:O	1:A:279:PRO:HD2	2.03	0.59
1:B:499:SER:O	1:B:500:SER:HB2	2.03	0.59
1:A:307:LEU:HD13	1:A:336:ILE:CD1	2.33	0.58
1:A:245:ASP:HB3	1:A:299:ILE:HD11	1.86	0.57
1:B:191:GLN:NE2	5:B:1111:HOH:O	2.33	0.57
1:B:182:VAL:HG22	1:B:189:ALA:HB3	1.87	0.56
1:A:362:SER:HA	1:A:400:VAL:HG13	1.87	0.56
1:A:307:LEU:HD22	1:A:336:ILE:HD11	1.87	0.55
1:A:254:LEU:CD2	1:A:311:PRO:HB2	2.36	0.55
1:A:310:THR:HG22	5:A:972:HOH:O	1.96	0.55
1:A:403:VAL:HG11	1:A:451:VAL:HG23	1.89	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:103:ASN:C	1:A:103:ASN:HD22	2.09	0.55
1:B:307:LEU:HD22	1:B:336:ILE:HD11	1.89	0.55
1:B:103:ASN:C	1:B:103:ASN:HD22	2.10	0.55
1:A:293:GLU:HG3	5:A:910:HOH:O	2.07	0.54
1:A:239:ARG:HD2	1:A:293:GLU:OE2	2.08	0.54
1:A:254:LEU:HD21	1:A:311:PRO:HB2	1.89	0.54
1:A:521:LEU:C	1:A:521:LEU:HD23	2.28	0.54
1:B:146:VAL:CG2	1:B:397:GLN:HB2	2.37	0.54
1:A:111:ARG:HE	1:A:119:VAL:HG11	1.72	0.53
1:A:86:LEU:HB2	1:A:189:ALA:HB1	1.91	0.53
1:A:247:ARG:NH1	1:A:299:ILE:HD12	2.23	0.53
1:B:420:VAL:HG12	1:B:435:TRP:HB3	1.91	0.53
1:B:86:LEU:HB2	1:B:189:ALA:HB1	1.90	0.52
1:B:111:ARG:HE	1:B:119:VAL:HG11	1.74	0.52
1:A:182:VAL:HG22	1:A:189:ALA:HB3	1.91	0.52
1:A:67:LYS:HB2	1:A:68:PRO:HD3	1.91	0.52
1:B:118:PRO:HA	1:B:493:LYS:O	2.09	0.52
1:B:405:PRO:HB2	1:B:436:TYR:HB3	1.92	0.52
1:A:2:PRO:HD3	1:B:472:ASP:O	2.11	0.51
1:A:146:VAL:O	1:A:146:VAL:HG13	2.10	0.51
1:B:403:VAL:HG11	1:B:451:VAL:HG23	1.93	0.51
1:B:521:LEU:C	1:B:521:LEU:HD23	2.31	0.50
1:B:146:VAL:HG13	1:B:146:VAL:O	2.12	0.50
1:A:80:MET:HA	1:A:188:PHE:O	2.11	0.50
1:A:420:VAL:HG12	1:A:435:TRP:HB3	1.93	0.50
1:B:355:ARG:HH11	1:B:355:ARG:HG2	1.77	0.49
1:A:405:PRO:HB2	1:A:436:TYR:HB3	1.95	0.48
1:B:67:LYS:HB2	1:B:68:PRO:HD3	1.95	0.48
1:A:31:VAL:HG13	1:A:36:ASP:HB2	1.94	0.48
1:A:410:VAL:HB	1:A:415:ASP:HB2	1.96	0.48
1:B:524:GLY:HA3	4:B:999:POP:O1	2.14	0.48
1:A:18:THR:O	1:A:22:GLU:HG3	2.14	0.48
1:B:476:SER:O	1:B:477:ASN:HB2	2.14	0.48
1:A:111:ARG:HB2	1:A:149:PHE:CE2	2.49	0.47
1:B:31:VAL:HG13	1:B:36:ASP:HB2	1.97	0.47
1:A:278:LYS:N	1:A:279:PRO:HD2	2.29	0.47
1:A:355:ARG:HG2	1:A:355:ARG:HH11	1.78	0.47
1:B:103:ASN:O	1:B:103:ASN:ND2	2.47	0.47
1:B:410:VAL:HB	1:B:415:ASP:HB2	1.96	0.47
1:B:111:ARG:HB2	1:B:149:PHE:CE2	2.49	0.47
1:B:160:ASN:O	1:B:164:ASP:HB2	2.15	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:87:GLN:HB3	1:A:109:LEU:HD11	1.96	0.46
1:B:59:ASN:O	1:B:63:ARG:HG3	2.16	0.46
1:A:146:VAL:CG2	1:A:397:GLN:HB2	2.45	0.46
1:A:464:GLY:O	1:A:495:PRO:HD2	2.15	0.46
1:B:146:VAL:HG22	1:B:397:GLN:HB2	1.96	0.46
1:B:2:PRO:HB2	1:B:43:SER:OG	2.16	0.46
1:A:86:LEU:HD23	1:A:87:GLN:N	2.30	0.46
1:A:86:LEU:HD23	1:A:86:LEU:C	2.35	0.46
1:A:103:ASN:O	1:A:103:ASN:ND2	2.48	0.45
1:B:50:VAL:CG1	1:B:51:GLY:N	2.80	0.45
1:B:18:THR:O	1:B:22:GLU:HG3	2.16	0.45
1:A:452:TRP:CE3	1:A:491:ALA:HB2	2.52	0.45
1:B:452:TRP:CE3	1:B:491:ALA:HB2	2.52	0.45
1:B:296:PHE:CE1	1:B:327:LEU:HD23	2.45	0.44
1:B:254:LEU:HD21	1:B:311:PRO:HB2	1.99	0.44
1:B:86:LEU:C	1:B:86:LEU:HD23	2.38	0.44
1:B:50:VAL:HG13	1:B:51:GLY:N	2.32	0.44
1:B:5:HIS:ND1	1:B:42:THR:HG23	2.33	0.43
1:B:133:LEU:HD23	1:B:133:LEU:HA	1.85	0.43
1:A:499:SER:O	1:A:500:SER:CB	2.66	0.43
1:A:118:PRO:HA	1:A:493:LYS:O	2.17	0.43
1:A:2:PRO:HB3	1:B:476:SER:CB	2.47	0.43
1:A:59:ASN:O	1:A:63:ARG:HG3	2.19	0.43
1:A:285:LYS:O	1:A:289:GLN:HG3	2.18	0.43
1:B:362:SER:HA	1:B:400:VAL:CG1	2.48	0.43
1:B:53:TYR:CE2	1:B:57:VAL:HG21	2.54	0.43
1:A:160:ASN:O	1:A:164:ASP:HB2	2.18	0.43
1:B:87:GLN:HB3	1:B:109:LEU:HD11	2.00	0.43
1:A:5:HIS:ND1	1:A:42:THR:HG23	2.34	0.43
1:A:120:PRO:HB3	1:A:148:SER:OG	2.19	0.43
1:B:464:GLY:O	1:B:495:PRO:HD2	2.18	0.42
1:B:239:ARG:HD2	1:B:293:GLU:OE2	2.20	0.42
1:B:3:VAL:CG1	1:B:4:VAL:N	2.82	0.42
1:A:-2:SER:O	1:B:481:ASP:HA	2.20	0.42
1:B:86:LEU:HD23	1:B:87:GLN:N	2.35	0.42
1:B:120:PRO:HB3	1:B:148:SER:OG	2.20	0.42
1:A:124:TRP:CE3	1:A:548:ARG:HD2	2.55	0.42
1:A:242:ALA:HB1	1:A:286:TYR:CD1	2.55	0.41
1:B:297:LEU:HD12	5:B:1119:HOH:O	2.20	0.41
1:A:506:GLU:OE1	1:A:506:GLU:N	2.48	0.41
1:A:541:LEU:HD11	5:A:1013:HOH:O	2.19	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:158:LYS:HD2	3:B:803:SO4:O1	2.20	0.41
1:A:49:GLY:O	1:A:83:CYS:HB3	2.21	0.41
1:A:238:ARG:HA	5:A:982:HOH:O	2.19	0.41
1:A:476:SER:O	1:A:477:ASN:HB2	2.19	0.41
1:B:355:ARG:HG2	1:B:355:ARG:NH1	2.36	0.41
1:A:2:PRO:HG2	1:A:26:TYR:CD2	2.56	0.41
1:B:436:TYR:CD2	1:B:484:LEU:HD13	2.56	0.41
1:A:226:LEU:O	5:A:1013:HOH:O	2.22	0.40
1:B:293:GLU:HG2	1:B:326:PRO:HB2	2.03	0.40
1:A:362:SER:HA	1:A:400:VAL:CG1	2.50	0.40
1:B:499:SER:O	1:B:500:SER:CB	2.69	0.40

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	525/555 (95%)	504 (96%)	18 (3%)	3 (1%)	25 36
1	B	525/555 (95%)	503 (96%)	20 (4%)	2 (0%)	34 48
All	All	1050/1110 (95%)	1007 (96%)	38 (4%)	5 (0%)	29 41

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	-2	SER
1	A	-2	SER
1	A	500	SER
1	A	503	GLY
1	B	503	GLY

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	446/467 (96%)	437 (98%)	9 (2%)	55	74
1	B	446/467 (96%)	434 (97%)	12 (3%)	44	65
All	All	892/934 (96%)	871 (98%)	21 (2%)	49	68

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

Mol	Chain	Res	Type
1	A	37	PHE
1	A	100	THR
1	A	103	ASN
1	A	164	ASP
1	A	244	LEU
1	A	248	THR
1	A	250	ASP
1	A	298	ASN
1	A	299	ILE
1	B	37	PHE
1	B	50	VAL
1	B	100	THR
1	B	103	ASN
1	B	164	ASP
1	B	244	LEU
1	B	248	THR
1	B	250	ASP
1	B	253	ASP
1	B	298	ASN
1	B	299	ILE
1	B	405	PRO

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	103	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	298	ASN
1	A	534	ASN
1	B	103	ASN
1	B	298	ASN
1	B	477	ASN
1	B	534	ASN

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 8 ligands modelled in this entry, 2 are monoatomic - leaving 6 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	$\#\|Z\| > 2$
3	SO4	B	803	-	4,4,4	0.20	0	6,6,6	0.08	0
3	SO4	A	801	-	4,4,4	0.29	0	6,6,6	0.08	0
3	SO4	A	802	-	4,4,4	0.27	0	6,6,6	0.15	0
3	SO4	B	804	-	4,4,4	0.24	0	6,6,6	0.11	0
3	SO4	A	806	-	4,4,4	0.28	0	6,6,6	0.11	0
4	POP	B	999	-	6,8,8	1.16	0	13,13,13	2.07	6 (46%)

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	POP	B	999	-	-	0/6/6/6	-

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	999	POP	P2-O-P1	3.88	146.16	132.83
4	B	999	POP	O5-P2-O	-3.54	92.76	104.64
4	B	999	POP	O5-P2-O4	-2.83	99.59	110.68
4	B	999	POP	O-P2-O4	2.70	126.16	111.19
4	B	999	POP	O6-P2-O4	2.53	120.57	110.68
4	B	999	POP	O3-P1-O	2.09	111.64	104.64

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	803	SO4	1	0
3	A	802	SO4	1	0
4	B	999	POP	2	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	531/555 (95%)	0.10	28 (5%)	26	25	20, 35, 60, 89	0
1	B	531/555 (95%)	-0.04	20 (3%)	40	39	21, 35, 60, 90	0
All	All	1062/1110 (95%)	0.03	48 (4%)	33	31	20, 35, 60, 90	0

All (48) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	304	ASP	5.8
1	A	305	CYS	5.8
1	B	248	THR	5.6
1	A	339	VAL	5.5
1	A	341	GLY	4.7
1	A	337	VAL	4.6
1	A	250	ASP	4.4
1	B	251	GLN	4.4
1	A	307	LEU	4.4
1	B	249	ASN	4.3
1	B	218	ASN	4.3
1	A	255	VAL	4.0
1	B	247	ARG	3.8
1	B	253	ASP	3.7
1	A	342	THR	3.7
1	B	250	ASP	3.5
1	A	340	ASP	3.5
1	B	225	GLU	3.4
1	A	344	ILE	3.4
1	A	306	PRO	3.3
1	A	309	ASP	3.3
1	B	276	LEU	3.3
1	A	308	LYS	3.1
1	A	248	THR	3.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	252	GLY	3.0
1	A	251	GLN	3.0
1	A	336	ILE	3.0
1	A	247	ARG	2.9
1	A	338	ASP	2.8
1	B	254	LEU	2.8
1	B	304	ASP	2.7
1	B	411	ASN	2.6
1	A	252	GLY	2.6
1	B	444	ARG	2.6
1	A	254	LEU	2.5
1	A	98	LYS	2.5
1	A	218	ASN	2.4
1	A	310	THR	2.4
1	B	300	THR	2.4
1	B	98	LYS	2.4
1	A	299	ILE	2.4
1	B	255	VAL	2.3
1	A	311	PRO	2.2
1	B	221	ALA	2.2
1	A	530	GLU	2.2
1	A	222	GLU	2.1
1	B	448	ASP	2.1
1	B	222	GLU	2.0

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

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

6.3 Carbohydrates (i)

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
3	SO4	A	802	5/5	0.84	0.25	57,57,58,58	0
3	SO4	A	806	5/5	0.90	0.19	74,75,76,76	0
3	SO4	B	803	5/5	0.92	0.25	49,52,52,52	0
4	POP	B	999	9/9	0.92	0.19	52,55,57,57	0
3	SO4	A	801	5/5	0.93	0.13	59,60,60,60	0
3	SO4	B	804	5/5	0.94	0.13	51,51,51,51	0
2	NI	A	902	1/1	0.95	0.05	26,26,26,26	0
2	NI	B	901	1/1	0.97	0.12	27,27,27,27	0

6.5 Other polymers (i)

There are no such residues in this entry.