



Full wwPDB X-ray Structure Validation Report ⓘ

May 25, 2020 – 02:32 pm BST

PDB ID : 3EFH
Title : Crystal structure of human phosphoribosyl pyrophosphate synthetase 1
Authors : Li, X.; Peng, X.; Li, Y.
Deposited on : 2008-09-08
Resolution : 2.60 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 ⓘ symbol.

The following versions of software and data (see [references ⓘ](#)) 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 : 2.11
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) : 2.11

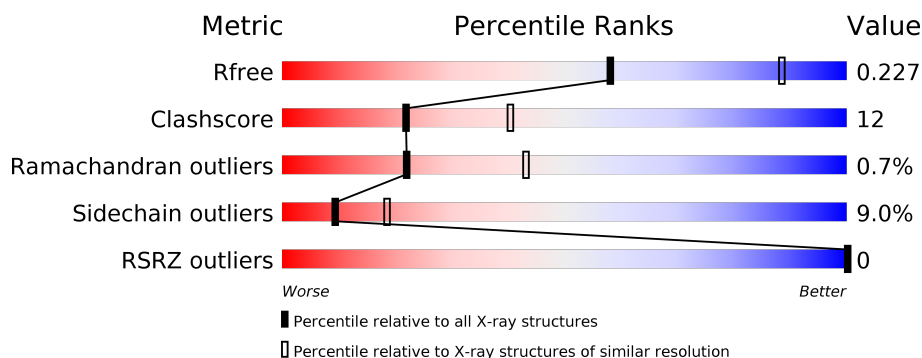
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.60 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	3163 (2.60-2.60)
Clashscore	141614	3518 (2.60-2.60)
Ramachandran outliers	138981	3455 (2.60-2.60)
Sidechain outliers	138945	3455 (2.60-2.60)
RSRZ outliers	127900	3104 (2.60-2.60)

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 respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	326	
1	B	326	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 4730 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 Ribose-phosphate pyrophosphokinase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	307	Total	C	N	O	S	0	0	0
			2296	1439	403	438	16			
1	B	307	Total	C	N	O	S	0	0	0
			2296	1439	403	438	16			

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	319	LEU	-	EXPRESSION TAG	UNP P60891
A	320	GLU	-	EXPRESSION TAG	UNP P60891
A	321	HIS	-	EXPRESSION TAG	UNP P60891
A	322	HIS	-	EXPRESSION TAG	UNP P60891
A	323	HIS	-	EXPRESSION TAG	UNP P60891
A	324	HIS	-	EXPRESSION TAG	UNP P60891
A	325	HIS	-	EXPRESSION TAG	UNP P60891
A	326	HIS	-	EXPRESSION TAG	UNP P60891
B	319	LEU	-	EXPRESSION TAG	UNP P60891
B	320	GLU	-	EXPRESSION TAG	UNP P60891
B	321	HIS	-	EXPRESSION TAG	UNP P60891
B	322	HIS	-	EXPRESSION TAG	UNP P60891
B	323	HIS	-	EXPRESSION TAG	UNP P60891
B	324	HIS	-	EXPRESSION TAG	UNP P60891
B	325	HIS	-	EXPRESSION TAG	UNP P60891
B	326	HIS	-	EXPRESSION TAG	UNP P60891

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



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

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	59	Total	O	0	0
			59	59		
3	B	49	Total	O	0	0
			49	49		

These plots are drawn for all protein, RNA and DNA 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.

[illegible]

Chain B:

71% 21% 6%

MET P80 R3 T6 F7 S10 D14 R22 V30 Y31 T32 K33 R34 F35 E39 E43 E46 Q57 E62 L67 I72 K78 I79 R84 K100 P106 L111 M115 V118 A119 G120 H123 L129 P141 N144 L145

E148 P149 L152 R156 E161 W162 V168 S169 T179 L185 L191 I192 K197 L197 ALA ASN GLU VAL ASP ARG N205 V211 V215 L218 D221 A222 A223 G227 T228 A232 L236 A241 T242 R243 L248 T249 H250 G255 I258 S259 R263

E267 V271 T274 I275 H283 C284 S285 M294 I295 E298 R302 T303 S308 V309 S310 Y311 L312 V316 P30 LEU LEU GLU HIS HIS HIS HIS HIS

4 Data and refinement statistics

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α , β , γ	169.18 Å 169.18 Å 61.84 Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	30.00 – 2.60 42.30 – 2.60	Depositor EDS
% Data completeness (in resolution range)	91.2 (30.00-2.60) 91.2 (42.30-2.60)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.76 (at 2.61 Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.216 , 0.231 0.210 , 0.227	Depositor DCC
R_{free} test set	947 reflections (5.11%)	wwPDB-VP
Wilson B-factor (Å ²)	40.6	Xtriage
Anisotropy	0.289	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 19.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.44$, $\langle L^2 \rangle = 0.27$	Xtriage
Estimated twinning fraction	0.098 for h,-h-k,-l	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	4730	wwPDB-VP
Average B, all atoms (Å ²)	33.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.18% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 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	0.41	0/2327	0.55	0/3156
1	B	0.44	0/2327	0.53	0/3156
All	All	0.43	0/4654	0.54	0/6312

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

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	2296	0	2276	71	0
1	B	2296	0	2276	48	0
2	A	15	0	0	2	0
2	B	15	0	0	1	0
3	A	59	0	0	3	0
3	B	49	0	0	1	0
All	All	4730	0	4552	108	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 12.

All (108) 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:B:169:SER:HB3	1:B:191:LEU:HD12	1.42	0.98
1:A:169:SER:HB3	1:A:191:LEU:HD13	1.56	0.87
1:A:72:ILE:HG23	1:B:106:PRO:HG3	1.62	0.82
1:B:250:HIS:ND1	1:B:274:THR:HG21	1.97	0.80
1:A:31:VAL:HG13	1:A:43:GLU:HB3	1.62	0.79
1:A:100:LYS:HE2	1:B:79:ILE:CG2	2.14	0.77
1:A:250:HIS:ND1	1:A:274:THR:HG21	2.00	0.76
1:A:258:ILE:HD11	1:A:280:LYS:HG3	1.70	0.73
1:A:281:MET:HE2	1:A:287:ILE:HB	1.73	0.70
1:A:281:MET:CE	1:A:281:MET:HA	2.23	0.67
1:A:115:MET:HG2	1:B:115:MET:HG2	1.77	0.67
1:A:281:MET:HE3	1:A:281:MET:HA	1.76	0.66
1:A:100:LYS:HE2	1:B:79:ILE:HG23	1.78	0.65
1:B:84:ARG:HH12	1:B:303:THR:HG22	1.62	0.65
1:A:281:MET:N	1:A:281:MET:HE3	2.12	0.65
1:A:106:PRO:HG3	1:B:72:ILE:HG23	1.78	0.64
1:B:274:THR:HG22	1:B:275:ILE:HG13	1.80	0.64
1:A:100:LYS:CE	1:B:79:ILE:HG23	2.29	0.63
1:B:298:GLU:HB3	1:B:312:LEU:HD21	1.82	0.62
1:A:281:MET:CA	1:A:281:MET:HE3	2.29	0.61
1:B:31:VAL:HG13	1:B:43:GLU:HB3	1.84	0.60
1:B:243:ARG:HD3	1:B:267:GLU:HG3	1.83	0.59
1:A:9:GLY:O	1:A:10:SER:HB2	2.02	0.59
1:A:79:ILE:HG23	1:B:100:LYS:HE2	1.86	0.58
1:B:298:GLU:O	1:B:302:ARG:HG3	2.04	0.58
1:A:72:ILE:CG2	1:B:106:PRO:HG3	2.31	0.58
1:B:169:SER:HB3	1:B:191:LEU:CD1	2.26	0.58
1:A:123:HIS:HD2	1:A:141:PRO:HB2	1.70	0.56
1:A:146:TYR:OH	2:A:329:SO4:O2	2.23	0.56
1:A:34:LYS:HE3	3:A:380:HOH:O	2.05	0.56
1:A:243:ARG:HB2	1:A:267:GLU:HG2	1.88	0.55
1:A:281:MET:CE	1:A:287:ILE:HB	2.36	0.55
1:A:152:LEU:HD21	1:A:184:ARG:HG2	1.89	0.54
1:A:256:PRO:HB2	1:A:260:ARG:HD2	1.89	0.54
1:A:106:PRO:HG3	1:B:72:ILE:CG2	2.38	0.54
1:A:256:PRO:HB2	1:A:260:ARG:CD	2.38	0.54
1:A:35:PHE:HD2	1:A:39:GLU:HB3	1.74	0.53
1:A:281:MET:HE1	1:A:287:ILE:HG21	1.91	0.53
1:A:277:GLN:O	1:A:281:MET:SD	2.67	0.52
1:B:161:GLU:N	1:B:161:GLU:OE1	2.40	0.52
1:B:248:LEU:O	1:B:271:VAL:HA	2.10	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:232:ALA:O	1:B:236:LEU:HG	2.10	0.52
1:B:46:GLU:HG2	3:B:372:HOH:O	2.10	0.52
1:A:79:ILE:HG23	1:B:100:LYS:CE	2.40	0.51
1:A:256:PRO:HB2	1:A:260:ARG:HH11	1.75	0.51
1:B:129:LEU:H	1:B:144:ASN:HD21	1.59	0.50
1:B:7:PHE:HD1	1:B:30:VAL:HG22	1.76	0.50
1:A:248:LEU:O	1:A:271:VAL:HA	2.11	0.49
1:A:281:MET:CE	1:A:281:MET:CA	2.88	0.49
1:A:181:ILE:HD12	1:A:219:VAL:HG11	1.94	0.48
1:A:237:LEU:CD1	1:A:265:CYS:SG	3.01	0.48
1:B:148:GLU:HB3	1:B:149:PRO:HD3	1.95	0.48
1:A:37:ASN:HD22	1:A:39:GLU:HB2	1.79	0.48
1:A:274:THR:HG22	1:A:275:ILE:HG13	1.96	0.48
1:A:126:THR:HG21	1:A:129:LEU:HD21	1.96	0.48
1:B:168:VAL:HG11	1:B:236:LEU:HD21	1.95	0.48
1:A:224:ASP:HB3	2:A:327:SO4:O4	2.14	0.47
1:A:213:ASP:O	1:A:214:ARG:HG3	2.15	0.47
1:B:145:LEU:HD13	1:B:295:ILE:HG22	1.96	0.47
1:B:308:SER:HG	1:B:310:SER:HG	1.62	0.47
1:B:211:VAL:CG1	1:B:241:ALA:HB2	2.45	0.47
1:A:178:VAL:HG12	1:A:219:VAL:HB	1.95	0.47
1:B:22:ARG:HH11	1:B:294:MET:CB	2.28	0.47
1:A:258:ILE:HG23	1:A:284:CYS:HB2	1.96	0.47
1:A:222:MET:HB2	1:A:250:HIS:HB2	1.97	0.46
1:A:185:LEU:HB3	1:A:187:VAL:HG22	1.98	0.46
1:A:129:LEU:H	1:A:144:ASN:HD21	1.63	0.46
1:B:10:SER:HB2	1:B:57:GLN:OE1	2.16	0.46
1:B:35:PHE:HD2	1:B:39:GLU:HB3	1.81	0.45
1:B:192:ILE:HD12	1:B:232:ALA:HB1	1.98	0.45
1:B:227:GLY:CA	1:B:260:ARG:HH21	2.30	0.45
1:A:57:GLN:HB2	1:A:70:LEU:HD13	1.98	0.45
1:A:278:GLU:HG2	3:A:352:HOH:O	2.16	0.45
1:A:75:ASN:ND2	1:A:79:ILE:HD12	2.31	0.45
1:B:7:PHE:CD1	1:B:30:VAL:HG22	2.50	0.45
1:B:223:ALA:CB	1:B:248:LEU:HD13	2.47	0.45
1:A:261:ILE:HG23	1:A:269:VAL:HG21	1.99	0.44
1:A:79:ILE:CG2	1:B:100:LYS:HE2	2.46	0.44
1:B:215:VAL:HB	1:B:243:ARG:HG3	1.99	0.44
1:A:237:LEU:HD11	1:A:265:CYS:CB	2.46	0.44
1:A:75:ASN:HD21	1:A:79:ILE:HD12	1.83	0.44
1:A:275:ILE:O	1:A:277:GLN:HG2	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:161:GLU:HB2	1:A:215:VAL:HG11	1.99	0.44
1:A:280:LYS:C	1:A:281:MET:HE3	2.37	0.43
1:A:222:MET:HE2	1:A:252:ILE:HD11	2.00	0.43
1:A:224:ASP:O	1:A:253:PHE:HA	2.18	0.43
1:B:111:LEU:HD22	1:B:115:MET:SD	2.59	0.43
1:B:123:HIS:HD2	1:B:141:PRO:HG2	1.84	0.43
1:A:57:GLN:HE21	1:A:70:LEU:HB2	1.85	0.42
1:A:34:LYS:HD3	1:A:38:GLN:HE22	1.84	0.42
1:A:31:VAL:CG1	1:A:43:GLU:HB3	2.42	0.42
1:B:78:LYS:HD3	1:B:120:GLY:O	2.19	0.42
1:B:7:PHE:HD1	1:B:30:VAL:CG2	2.33	0.42
1:A:10:SER:H	1:A:69:GLU:CD	2.23	0.41
1:A:133:GLN:NE2	1:A:133:GLN:H	2.18	0.41
1:B:169:SER:CB	1:B:191:LEU:HD12	2.31	0.41
1:A:91:CYS:HB2	1:A:274:THR:CG2	2.51	0.41
1:A:124:ILE:HD12	1:A:138:PHE:CE2	2.56	0.41
1:A:223:ALA:HB3	1:A:248:LEU:HD13	2.03	0.41
1:B:228:THR:HB	2:B:327:SO4:O4	2.21	0.41
1:A:309:VAL:O	1:A:312:LEU:HB2	2.21	0.41
1:B:302:ARG:HB2	1:B:309:VAL:HG12	2.03	0.41
1:A:223:ALA:HB2	1:A:248:LEU:HD22	2.02	0.41
1:A:284:CYS:SG	1:A:287:ILE:HG13	2.61	0.41
1:B:156:ARG:HA	1:B:162:TRP:CD1	2.56	0.41
1:A:258:ILE:HG12	3:A:358:HOH:O	2.20	0.40
1:A:271:VAL:HG23	1:A:289:VAL:HG22	2.02	0.40
1:B:211:VAL:HG13	1:B:241:ALA:HB2	2.04	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	303/326 (93%)	284 (94%)	16 (5%)	3 (1%)	15	32
1	B	303/326 (93%)	288 (95%)	14 (5%)	1 (0%)	41	64
All	All	606/652 (93%)	572 (94%)	30 (5%)	4 (1%)	22	43

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	255	GLY
1	B	255	GLY
1	A	10	SER
1	A	14	ASP

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	245/278 (88%)	225 (92%)	20 (8%)	11	22
1	B	245/278 (88%)	221 (90%)	24 (10%)	8	15
All	All	490/556 (88%)	446 (91%)	44 (9%)	9	18

All (44) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	6	ILE
1	A	32	THR
1	A	60	CYS
1	A	62	GLU
1	A	67	LEU
1	A	79	ILE
1	A	84	ARG
1	A	89	ILE
1	A	111	LEU
1	A	118	VAL
1	A	133	GLN
1	A	152	LEU

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Mol	Chain	Res	Type
1	A	215	VAL
1	A	218	LEU
1	A	248	LEU
1	A	249	THR
1	A	265	CYS
1	A	280	LYS
1	A	281	MET
1	A	288	GLN
1	B	6	ILE
1	B	14	ASP
1	B	31	VAL
1	B	33	LYS
1	B	62	GLU
1	B	67	LEU
1	B	111	LEU
1	B	118	VAL
1	B	152	LEU
1	B	179	THR
1	B	185	LEU
1	B	191	LEU
1	B	205	MET
1	B	211	VAL
1	B	215	VAL
1	B	218	LEU
1	B	221	ASP
1	B	248	LEU
1	B	249	THR
1	B	258	ILE
1	B	274	THR
1	B	283	HIS
1	B	285	SER
1	B	312	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	37	ASN
1	A	38	GLN
1	A	75	ASN
1	A	130	HIS
1	A	133	GLN
1	A	144	ASN

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Mol	Chain	Res	Type
1	B	144	ASN
1	B	186	ASN
1	B	263	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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

6 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	327	-	4,4,4	0.14	0	6,6,6	0.13	0
2	SO4	B	328	-	4,4,4	0.17	0	6,6,6	0.20	0
2	SO4	B	329	-	4,4,4	0.13	0	6,6,6	0.10	0
2	SO4	A	329	-	4,4,4	0.18	0	6,6,6	0.21	0
2	SO4	B	327	-	4,4,4	0.15	0	6,6,6	0.09	0
2	SO4	A	328	-	4,4,4	0.13	0	6,6,6	0.09	0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	327	SO4	1	0
2	A	329	SO4	1	0
2	B	327	SO4	1	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	307/326 (94%)	-0.22	0 100 100	18, 36, 51, 55	0
1	B	307/326 (94%)	-0.22	0 100 100	17, 33, 47, 51	0
All	All	614/652 (94%)	-0.22	0 100 100	17, 34, 48, 55	0

There are no RSRZ outliers to report.

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

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

6.3 Carbohydrates [i](#)

There are no carbohydrates 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
2	SO4	A	329	5/5	0.88	0.21	23,23,23,23	5
2	SO4	B	327	5/5	0.97	0.22	16,16,17,17	5
2	SO4	B	329	5/5	0.98	0.22	18,18,18,18	5
2	SO4	A	327	5/5	0.98	0.23	21,22,22,22	5
2	SO4	B	328	5/5	0.98	0.24	15,16,17,17	5
2	SO4	A	328	5/5	0.99	0.23	14,14,14,15	5

6.5 Other polymers

There are no such residues in this entry.