



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 7, 2020 – 01:39 am BST

PDB ID : 6FK3  
Title : Structure and function of aldehyde dehydrogenase from *Thermus thermophilus*: An enzyme with an evolutionarily-distinct C-terminal arm (Recombinant full-length protein in complex with propanal)  
Authors : Hayes, K.A.; Noor, M.R.; Djeghader, A.; Soulimane, T.  
Deposited on : 2018-01-23  
Resolution : 2.30 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](mailto: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.

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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

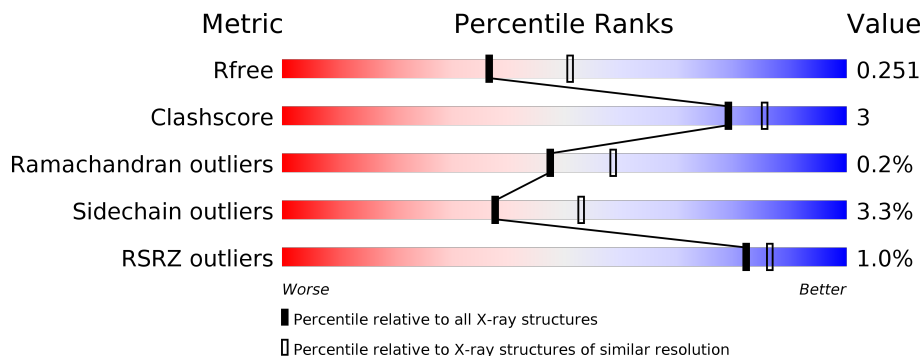
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

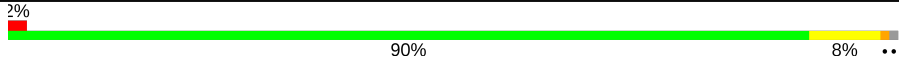

The reported resolution of this entry is 2.30 Å.

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	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

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  $\geq 3$ , 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	536	 2% 90% 8% ..
1	B	536	 90% 9% ..

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
3	PPI	B	705	-	-	X	-

## 2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 8632 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 Aldehyde dehydrogenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	530	Total	C	N	O	S	0	1	0
			4149	2661	727	752	9			
1	B	530	Total	C	N	O	S	0	1	0
			4152	2662	728	753	9			

There are 14 discrepancies between the modelled and reference sequences:

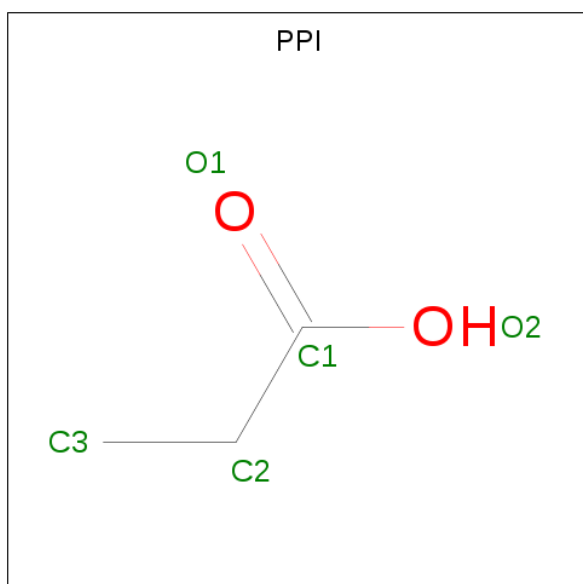
Chain	Residue	Modelled	Actual	Comment	Reference
A	-5	MET	-	initiating methionine	UNP Q72KD3
A	-4	HIS	-	expression tag	UNP Q72KD3
A	-3	HIS	-	expression tag	UNP Q72KD3
A	-2	HIS	-	expression tag	UNP Q72KD3
A	-1	HIS	-	expression tag	UNP Q72KD3
A	0	HIS	-	expression tag	UNP Q72KD3
A	1	HIS	-	expression tag	UNP Q72KD3
B	-5	MET	-	initiating methionine	UNP Q72KD3
B	-4	HIS	-	expression tag	UNP Q72KD3
B	-3	HIS	-	expression tag	UNP Q72KD3
B	-2	HIS	-	expression tag	UNP Q72KD3
B	-1	HIS	-	expression tag	UNP Q72KD3
B	0	HIS	-	expression tag	UNP Q72KD3
B	1	HIS	-	expression tag	UNP Q72KD3

- Molecule 2 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: C<sub>4</sub>H<sub>10</sub>O<sub>3</sub>).



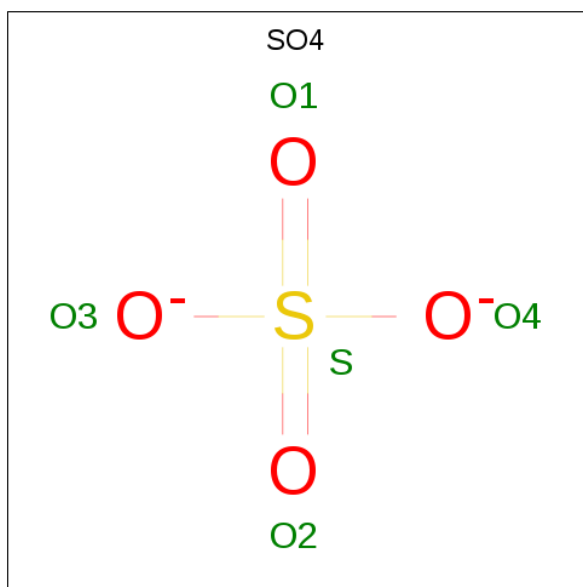
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 7 4 3	0	0
2	A	1	Total C O 7 4 3	0	0
2	A	1	Total C O 7 4 3	0	0
2	B	1	Total C O 7 4 3	0	0
2	B	1	Total C O 7 4 3	0	0

- Molecule 3 is PROPANOIC ACID (three-letter code: PPI) (formula:  $C_3H_6O_2$ ).



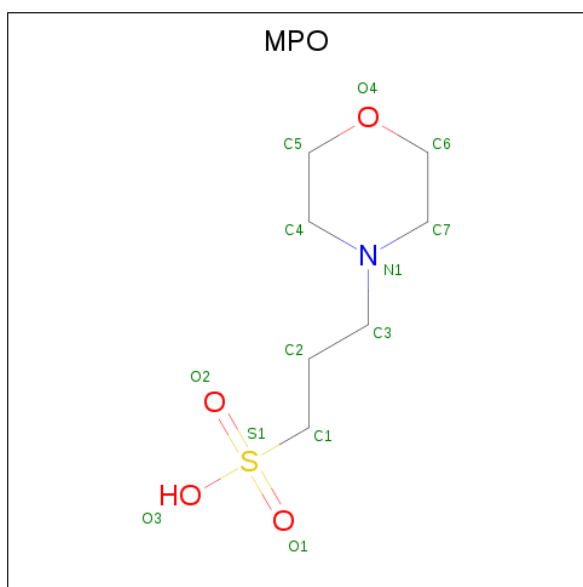
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 5 3 2	0	0
3	B	1	Total C O 5 3 2	0	0

- Molecule 4 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



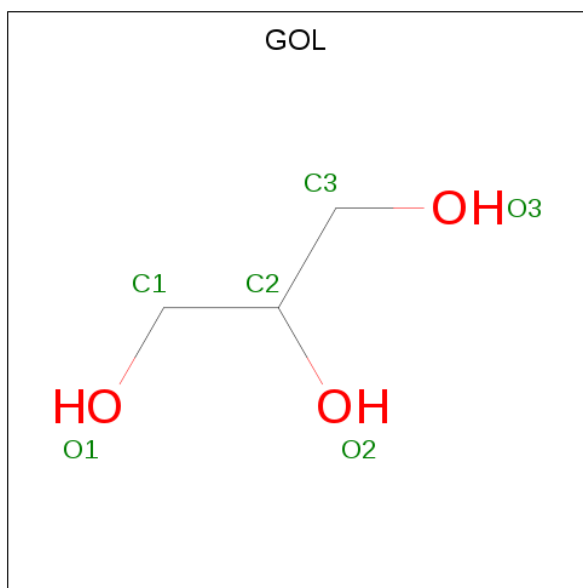
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total O S 5 4 1	0	0
4	A	1	Total O S 5 4 1	0	0
4	A	1	Total O S 5 4 1	0	0
4	A	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0

- Molecule 5 is 3[N-MORPHOLINO]PROPANE SULFONIC ACID (three-letter code: MPO) (formula: C<sub>7</sub>H<sub>15</sub>NO<sub>4</sub>S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
5	B	1	13	7	1	4	1	0	0

- Molecule 6 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



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

- Molecule 7 is water.

<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
7	A	116	Total 116	O 116	0	0
7	B	116	Total 116	O 116	0	0





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 41 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	105.18Å 105.18Å 315.64Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.13 – 2.30 48.13 – 2.30	Depositor EDS
% Data completeness (in resolution range)	99.9 (48.13-2.30) 100.0 (48.13-2.30)	Depositor EDS
$R_{merge}$	0.29	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.42 (at 2.29Å)	Xtrriage
Refinement program	REFMAC 5.8.0222	Depositor
R, $R_{free}$	0.198 , 0.243 0.210 , 0.251	Depositor DCC
$R_{free}$ test set	2000 reflections (2.51%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	47.7	Xtrriage
Anisotropy	0.185	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 39.4	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	8632	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	57.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.35% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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 [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, PPI, PEG, SO4, MPO

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	0.43	0/4262	0.63	0/5791
1	B	0.44	0/4262	0.64	1/5791 (0.0%)
All	All	0.43	0/8524	0.63	1/11582 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	6
1	B	0	4
All	All	0	10

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed( $^{\circ}$ )	Ideal( $^{\circ}$ )
1	B	48	ASP	CB-CG-OD1	5.04	122.84	118.30

There are no chirality outliers.

All (10) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	146	ARG	Sidechain
1	A	272	ARG	Sidechain
1	A	313	ARG	Sidechain
1	A	346	ARG	Sidechain
1	A	360	ARG	Sidechain

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Mol	Chain	Res	Type	Group
1	A	60	ARG	Sidechain
1	B	146	ARG	Sidechain
1	B	342	ARG	Sidechain
1	B	395	ARG	Sidechain
1	B	399	ARG	Sidechain

## 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	4149	0	4106	23	0
1	B	4152	0	4105	24	0
2	A	21	0	30	0	0
2	B	14	0	20	0	0
3	A	5	0	5	0	0
3	B	5	0	5	4	0
4	A	20	0	0	0	0
4	B	15	0	0	0	0
5	B	13	0	15	0	0
6	B	6	0	8	0	0
7	A	116	0	0	4	0
7	B	116	0	0	5	0
All	All	8632	0	8294	46	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 3.

All (46) 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:295[B]:CYS:SG	7:A:799:HOH:O	2.31	0.89
1:A:428:THR:HG22	1:A:430:TYR:H	1.50	0.76
1:B:428:THR:HG22	1:B:430:TYR:H	1.52	0.74
1:B:295[A]:CYS:SG	7:B:913:HOH:O	2.48	0.70
1:B:296:THR:HG21	3:B:705:PPI:H22	1.75	0.67
1:A:123:SER:OG	1:A:127:ARG:NH1	2.28	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:362:LEU:HD11	1:B:393:GLU:HG3	1.79	0.65
1:B:123:SER:OG	1:B:127:ARG:NH1	2.29	0.63
1:A:310:GLU:OE2	1:A:313:ARG:NH1	2.34	0.60
1:A:362:LEU:HD11	1:A:393:GLU:HG3	1.83	0.59
1:A:310:GLU:OE1	1:A:313:ARG:NH1	2.36	0.59
1:B:440:HIS:CD2	7:B:834:HOH:O	2.56	0.57
1:B:399:ARG:HD2	1:B:403:GLU:OE1	2.04	0.57
1:A:330:HIS:HD2	7:A:746:HOH:O	1.89	0.56
1:A:310:GLU:CD	1:A:313:ARG:NH1	2.59	0.56
1:A:265:LYS:HB3	1:A:428:THR:HG21	1.88	0.56
1:A:370:ARG:NH1	1:A:380:ASP:OD1	2.39	0.55
1:B:265:LYS:HB3	1:B:428:THR:HG21	1.89	0.54
1:B:346:ARG:HD3	7:B:908:HOH:O	2.07	0.54
1:A:511:MET:HE3	7:A:800:HOH:O	2.10	0.52
1:B:471:PHE:HE2	3:B:705:PPI:H22	1.75	0.52
1:B:428:THR:HB	7:B:870:HOH:O	2.10	0.51
1:A:428:THR:CG2	1:A:430:TYR:H	2.23	0.51
1:B:349:GLU:OE2	1:B:352:ARG:NH1	2.39	0.50
1:B:428:THR:CG2	1:B:430:TYR:H	2.22	0.50
1:B:296:THR:HG21	3:B:705:PPI:C2	2.41	0.49
1:B:102:LYS:HE3	1:B:159:ASN:O	2.13	0.48
1:A:79:PHE:CE2	1:A:83:LYS:HE2	2.50	0.46
1:B:342:ARG:NH1	7:B:809:HOH:O	2.48	0.46
1:A:102:LYS:HE3	1:A:159:ASN:O	2.16	0.45
1:B:305:ALA:HB3	1:B:306:PRO:HD3	2.00	0.44
1:B:296:THR:HG21	3:B:705:PPI:C3	2.49	0.43
1:A:261:GLU:OE2	1:A:295[B]:CYS:SG	2.77	0.42
1:B:16:HIS:CE1	1:B:47:ALA:HB2	2.54	0.42
1:A:33:ASN:HD21	1:A:328:LEU:HD11	1.84	0.42
1:A:305:ALA:HB3	1:A:306:PRO:HD3	2.02	0.42
1:B:96:MET:HA	1:B:190:LEU:HD11	2.01	0.42
1:A:286:SER:HB3	1:A:298:ALA:HB2	2.02	0.41
1:B:16:HIS:CD2	1:B:51:LEU:CD2	3.04	0.41
1:A:16:HIS:CE1	1:A:47:ALA:HB2	2.56	0.41
1:B:302:LEU:CD1	1:B:302:LEU:N	2.84	0.41
1:B:286:SER:HB3	1:B:298:ALA:HB2	2.02	0.41
1:A:530:LEU:HA	1:A:530:LEU:HD22	1.84	0.41
1:A:65:GLU:OE2	1:A:68:ARG:NH2	2.51	0.41
1:A:37:ARG:NH1	7:A:701:HOH:O	2.19	0.40
1:A:142:LEU:HB3	1:B:469:LEU:HD11	2.03	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	529/536 (99%)	512 (97%)	16 (3%)	1 (0%)	47	58
1	B	529/536 (99%)	513 (97%)	15 (3%)	1 (0%)	47	58
All	All	1058/1072 (99%)	1025 (97%)	31 (3%)	2 (0%)	47	58

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	4	ALA
1	B	4	ALA

### 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	424/429 (99%)	414 (98%)	10 (2%)	49	66
1	B	424/429 (99%)	406 (96%)	18 (4%)	30	42
All	All	848/858 (99%)	820 (97%)	28 (3%)	38	53

All (28) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	182	LYS
1	A	261	GLU
1	A	290	THR
1	A	317	GLU

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Mol	Chain	Res	Type
1	A	346	ARG
1	A	350	HIS
1	A	400	LEU
1	A	428	THR
1	A	517	SER
1	A	526	GLU
1	B	1	HIS
1	B	2	ARG
1	B	7	LYS
1	B	105	LYS
1	B	182	LYS
1	B	261	GLU
1	B	290	THR
1	B	317	GLU
1	B	328	LEU
1	B	350	HIS
1	B	352	ARG
1	B	370	ARG
1	B	400	LEU
1	B	428	THR
1	B	505	ARG
1	B	508	LEU
1	B	516	VAL
1	B	517	SER

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	440	HIS

### 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](#)

16 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
4	SO4	A	606	-	4,4,4	0.44	0	6,6,6	0.17	0
2	PEG	A	603	-	6,6,6	0.57	0	5,5,5	0.24	0
4	SO4	B	706	-	4,4,4	0.42	0	6,6,6	0.38	0
4	SO4	B	708	-	4,4,4	0.53	0	6,6,6	0.61	0
4	SO4	B	707	-	4,4,4	0.41	0	6,6,6	0.41	0
2	PEG	A	601	-	6,6,6	0.67	0	5,5,5	0.45	0
5	MPO	B	703	-	13,13,13	2.75	2 (15%)	17,17,17	1.63	2 (11%)
4	SO4	A	607	-	4,4,4	0.59	0	6,6,6	0.41	0
2	PEG	B	701	-	6,6,6	0.52	0	5,5,5	0.27	0
3	PPI	B	705	-	1,4,4	0.84	0	1,4,4	7.39	1 (100%)
4	SO4	A	605	-	4,4,4	0.59	0	6,6,6	0.61	0
4	SO4	A	608	-	4,4,4	0.32	0	6,6,6	0.38	0
2	PEG	B	702	-	6,6,6	0.51	0	5,5,5	0.34	0
2	PEG	A	602	-	6,6,6	0.54	0	5,5,5	0.39	0
6	GOL	B	704	-	5,5,5	0.39	0	5,5,5	0.25	0
3	PPI	A	604	-	1,4,4	0.30	0	1,4,4	2.73	1 (100%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	PEG	A	603	-	-	2/4/4/4	-
2	PEG	A	601	-	-	1/4/4/4	-
2	PEG	B	701	-	-	3/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	PPI	B	705	-	-	0/0/2/2	-
5	MPO	B	703	-	-	1/7/15/15	0/1/1/1
2	PEG	B	702	-	-	3/4/4/4	-
2	PEG	A	602	-	-	1/4/4/4	-
6	GOL	B	704	-	-	0/4/4/4	-
3	PPI	A	604	-	-	0/0/2/2	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	703	MPO	C1-S1	-8.44	1.65	1.77
5	B	703	MPO	O3-S1	5.02	1.65	1.47

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	705	PPI	C3-C2-C1	7.39	122.81	112.59
5	B	703	MPO	C2-C1-S1	-3.82	107.39	113.25
5	B	703	MPO	O3-S1-C1	3.15	110.87	105.77
3	A	604	PPI	C3-C2-C1	-2.73	108.80	112.59

There are no chirality outliers.

All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	703	MPO	C1-C2-C3-N1
2	A	603	PEG	O2-C3-C4-O4
2	A	601	PEG	O2-C3-C4-O4
2	B	702	PEG	O1-C1-C2-O2
2	B	701	PEG	O2-C3-C4-O4
2	B	701	PEG	O1-C1-C2-O2
2	B	702	PEG	O2-C3-C4-O4
2	B	702	PEG	C4-C3-O2-C2
2	A	602	PEG	O2-C3-C4-O4
2	A	603	PEG	C1-C2-O2-C3
2	B	701	PEG	C1-C2-O2-C3

There are no ring outliers.

1 monomer is involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	705	PPI	4	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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	530/536 (98%)	-0.20	9 (1%) 70 76	40, 54, 76, 130	0
1	B	530/536 (98%)	-0.29	2 (0%) 92 95	41, 54, 75, 116	0
All	All	1060/1072 (98%)	-0.24	11 (1%) 82 86	40, 54, 76, 130	0

All (11) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	1	HIS	5.2
1	B	1	HIS	4.9
1	A	6	GLY	4.0
1	A	2	ARG	3.6
1	A	3	LYS	3.5
1	A	4	ALA	2.7
1	A	516	VAL	2.5
1	A	295[A]	CYS	2.4
1	A	21	GLU	2.3
1	B	516	VAL	2.3
1	A	57	LEU	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 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
6	GOL	B	704	6/6	0.72	0.21	96,104,108,109	0
2	PEG	A	603	7/7	0.79	0.21	77,79,85,87	0
2	PEG	B	701	7/7	0.84	0.16	71,74,79,81	0
2	PEG	A	602	7/7	0.85	0.18	71,77,86,87	0
2	PEG	A	601	7/7	0.85	0.20	75,83,85,86	0
2	PEG	B	702	7/7	0.88	0.39	78,80,89,90	0
4	SO4	A	607	5/5	0.92	0.21	78,85,89,91	0
3	PPI	B	705	5/5	0.92	0.33	48,50,61,62	0
4	SO4	A	608	5/5	0.92	0.30	116,123,124,132	0
5	MPO	B	703	13/13	0.95	0.14	53,56,86,92	0
4	SO4	B	707	5/5	0.95	0.11	83,91,95,102	0
4	SO4	B	708	5/5	0.96	0.11	50,64,71,77	0
4	SO4	A	606	5/5	0.97	0.23	82,90,98,100	0
4	SO4	A	605	5/5	0.97	0.17	70,81,87,90	0
4	SO4	B	706	5/5	0.97	0.09	55,59,64,67	0
3	PPI	A	604	5/5	0.97	0.31	43,44,53,56	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.