Full wwPDB X-ray Structure Validation Report (i)

Jul 22, 2025 – 02:27 PM JST

PDB ID	:	9UI2 / pdb_00009ui2
Title	:	Crystal structure of Thermus thermophilus HB8 transaldolase
Authors	:	Kamitori, S.
Deposited on	:	2025-04-15
Resolution	:	1.70 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 (1)) were used in the production of this report:

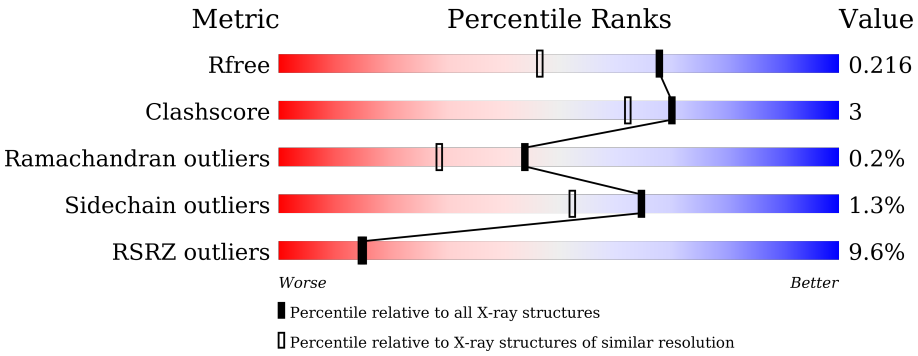
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

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 1.70 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}	164625	5161 (1.70-1.70)
Clashscore	180529	5671 (1.70-1.70)
Ramachandran outliers	177936	5594 (1.70-1.70)
Sidechain outliers	177891	5594 (1.70-1.70)
RSRZ outliers	164620	5159 (1.70-1.70)

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	243	6% 88% 5% 7%
1	B	243	7% 86% 6% • 7%
1	C	243	6% 87% 6% 7%
1	D	243	3% 87% 5% 7%
1	E	243	5% 87% 5% 7%
1	F	243	22% 80% 12% • 7%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	G	243	17% 81% 12% 7%
1	H	243	15% 82% 10% 7%
1	I	243	4% 86% 6% 7%
1	J	243	4% 87% 5% 7%

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	EDO	G	302	-	-	X	-

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 18735 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 Probable transaldolase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	225	Total	C	N	O	S	0	0	0
			1705	1086	295	317	7			
1	B	225	Total	C	N	O	S	0	0	0
			1705	1086	295	317	7			
1	C	225	Total	C	N	O	S	0	0	0
			1705	1086	295	317	7			
1	D	225	Total	C	N	O	S	0	0	0
			1705	1086	295	317	7			
1	E	225	Total	C	N	O	S	0	0	0
			1705	1086	295	317	7			
1	F	225	Total	C	N	O	S	0	0	0
			1705	1086	295	317	7			
1	G	225	Total	C	N	O	S	0	0	0
			1705	1086	295	317	7			
1	H	225	Total	C	N	O	S	0	0	0
			1705	1086	295	317	7			
1	I	225	Total	C	N	O	S	0	0	0
			1705	1086	295	317	7			
1	J	225	Total	C	N	O	S	0	0	0
			1705	1086	295	317	7			

There are 200 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	initiating methionine	UNP Q5SJE8
A	-18	GLY	-	expression tag	UNP Q5SJE8
A	-17	SER	-	expression tag	UNP Q5SJE8
A	-16	SER	-	expression tag	UNP Q5SJE8
A	-15	HIS	-	expression tag	UNP Q5SJE8
A	-14	HIS	-	expression tag	UNP Q5SJE8
A	-13	HIS	-	expression tag	UNP Q5SJE8
A	-12	HIS	-	expression tag	UNP Q5SJE8
A	-11	HIS	-	expression tag	UNP Q5SJE8

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
A	-10	HIS	-	expression tag	UNP Q5SJE8
A	-9	SER	-	expression tag	UNP Q5SJE8
A	-8	SER	-	expression tag	UNP Q5SJE8
A	-7	GLY	-	expression tag	UNP Q5SJE8
A	-6	LEU	-	expression tag	UNP Q5SJE8
A	-5	VAL	-	expression tag	UNP Q5SJE8
A	-4	PRO	-	expression tag	UNP Q5SJE8
A	-3	ARG	-	expression tag	UNP Q5SJE8
A	-2	GLY	-	expression tag	UNP Q5SJE8
A	-1	SER	-	expression tag	UNP Q5SJE8
A	0	HIS	-	expression tag	UNP Q5SJE8
B	-19	MET	-	initiating methionine	UNP Q5SJE8
B	-18	GLY	-	expression tag	UNP Q5SJE8
B	-17	SER	-	expression tag	UNP Q5SJE8
B	-16	SER	-	expression tag	UNP Q5SJE8
B	-15	HIS	-	expression tag	UNP Q5SJE8
B	-14	HIS	-	expression tag	UNP Q5SJE8
B	-13	HIS	-	expression tag	UNP Q5SJE8
B	-12	HIS	-	expression tag	UNP Q5SJE8
B	-11	HIS	-	expression tag	UNP Q5SJE8
B	-10	HIS	-	expression tag	UNP Q5SJE8
B	-9	SER	-	expression tag	UNP Q5SJE8
B	-8	SER	-	expression tag	UNP Q5SJE8
B	-7	GLY	-	expression tag	UNP Q5SJE8
B	-6	LEU	-	expression tag	UNP Q5SJE8
B	-5	VAL	-	expression tag	UNP Q5SJE8
B	-4	PRO	-	expression tag	UNP Q5SJE8
B	-3	ARG	-	expression tag	UNP Q5SJE8
B	-2	GLY	-	expression tag	UNP Q5SJE8
B	-1	SER	-	expression tag	UNP Q5SJE8
B	0	HIS	-	expression tag	UNP Q5SJE8
C	-19	MET	-	initiating methionine	UNP Q5SJE8
C	-18	GLY	-	expression tag	UNP Q5SJE8
C	-17	SER	-	expression tag	UNP Q5SJE8
C	-16	SER	-	expression tag	UNP Q5SJE8
C	-15	HIS	-	expression tag	UNP Q5SJE8
C	-14	HIS	-	expression tag	UNP Q5SJE8
C	-13	HIS	-	expression tag	UNP Q5SJE8
C	-12	HIS	-	expression tag	UNP Q5SJE8
C	-11	HIS	-	expression tag	UNP Q5SJE8
C	-10	HIS	-	expression tag	UNP Q5SJE8
C	-9	SER	-	expression tag	UNP Q5SJE8

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
C	-8	SER	-	expression tag	UNP Q5SJE8
C	-7	GLY	-	expression tag	UNP Q5SJE8
C	-6	LEU	-	expression tag	UNP Q5SJE8
C	-5	VAL	-	expression tag	UNP Q5SJE8
C	-4	PRO	-	expression tag	UNP Q5SJE8
C	-3	ARG	-	expression tag	UNP Q5SJE8
C	-2	GLY	-	expression tag	UNP Q5SJE8
C	-1	SER	-	expression tag	UNP Q5SJE8
C	0	HIS	-	expression tag	UNP Q5SJE8
D	-19	MET	-	initiating methionine	UNP Q5SJE8
D	-18	GLY	-	expression tag	UNP Q5SJE8
D	-17	SER	-	expression tag	UNP Q5SJE8
D	-16	SER	-	expression tag	UNP Q5SJE8
D	-15	HIS	-	expression tag	UNP Q5SJE8
D	-14	HIS	-	expression tag	UNP Q5SJE8
D	-13	HIS	-	expression tag	UNP Q5SJE8
D	-12	HIS	-	expression tag	UNP Q5SJE8
D	-11	HIS	-	expression tag	UNP Q5SJE8
D	-10	HIS	-	expression tag	UNP Q5SJE8
D	-9	SER	-	expression tag	UNP Q5SJE8
D	-8	SER	-	expression tag	UNP Q5SJE8
D	-7	GLY	-	expression tag	UNP Q5SJE8
D	-6	LEU	-	expression tag	UNP Q5SJE8
D	-5	VAL	-	expression tag	UNP Q5SJE8
D	-4	PRO	-	expression tag	UNP Q5SJE8
D	-3	ARG	-	expression tag	UNP Q5SJE8
D	-2	GLY	-	expression tag	UNP Q5SJE8
D	-1	SER	-	expression tag	UNP Q5SJE8
D	0	HIS	-	expression tag	UNP Q5SJE8
E	-19	MET	-	initiating methionine	UNP Q5SJE8
E	-18	GLY	-	expression tag	UNP Q5SJE8
E	-17	SER	-	expression tag	UNP Q5SJE8
E	-16	SER	-	expression tag	UNP Q5SJE8
E	-15	HIS	-	expression tag	UNP Q5SJE8
E	-14	HIS	-	expression tag	UNP Q5SJE8
E	-13	HIS	-	expression tag	UNP Q5SJE8
E	-12	HIS	-	expression tag	UNP Q5SJE8
E	-11	HIS	-	expression tag	UNP Q5SJE8
E	-10	HIS	-	expression tag	UNP Q5SJE8
E	-9	SER	-	expression tag	UNP Q5SJE8
E	-8	SER	-	expression tag	UNP Q5SJE8
E	-7	GLY	-	expression tag	UNP Q5SJE8

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
E	-6	LEU	-	expression tag	UNP Q5SJE8
E	-5	VAL	-	expression tag	UNP Q5SJE8
E	-4	PRO	-	expression tag	UNP Q5SJE8
E	-3	ARG	-	expression tag	UNP Q5SJE8
E	-2	GLY	-	expression tag	UNP Q5SJE8
E	-1	SER	-	expression tag	UNP Q5SJE8
E	0	HIS	-	expression tag	UNP Q5SJE8
F	-19	MET	-	initiating methionine	UNP Q5SJE8
F	-18	GLY	-	expression tag	UNP Q5SJE8
F	-17	SER	-	expression tag	UNP Q5SJE8
F	-16	SER	-	expression tag	UNP Q5SJE8
F	-15	HIS	-	expression tag	UNP Q5SJE8
F	-14	HIS	-	expression tag	UNP Q5SJE8
F	-13	HIS	-	expression tag	UNP Q5SJE8
F	-12	HIS	-	expression tag	UNP Q5SJE8
F	-11	HIS	-	expression tag	UNP Q5SJE8
F	-10	HIS	-	expression tag	UNP Q5SJE8
F	-9	SER	-	expression tag	UNP Q5SJE8
F	-8	SER	-	expression tag	UNP Q5SJE8
F	-7	GLY	-	expression tag	UNP Q5SJE8
F	-6	LEU	-	expression tag	UNP Q5SJE8
F	-5	VAL	-	expression tag	UNP Q5SJE8
F	-4	PRO	-	expression tag	UNP Q5SJE8
F	-3	ARG	-	expression tag	UNP Q5SJE8
F	-2	GLY	-	expression tag	UNP Q5SJE8
F	-1	SER	-	expression tag	UNP Q5SJE8
F	0	HIS	-	expression tag	UNP Q5SJE8
G	-19	MET	-	initiating methionine	UNP Q5SJE8
G	-18	GLY	-	expression tag	UNP Q5SJE8
G	-17	SER	-	expression tag	UNP Q5SJE8
G	-16	SER	-	expression tag	UNP Q5SJE8
G	-15	HIS	-	expression tag	UNP Q5SJE8
G	-14	HIS	-	expression tag	UNP Q5SJE8
G	-13	HIS	-	expression tag	UNP Q5SJE8
G	-12	HIS	-	expression tag	UNP Q5SJE8
G	-11	HIS	-	expression tag	UNP Q5SJE8
G	-10	HIS	-	expression tag	UNP Q5SJE8
G	-9	SER	-	expression tag	UNP Q5SJE8
G	-8	SER	-	expression tag	UNP Q5SJE8
G	-7	GLY	-	expression tag	UNP Q5SJE8
G	-6	LEU	-	expression tag	UNP Q5SJE8
G	-5	VAL	-	expression tag	UNP Q5SJE8

Continued on next page...

Continued from previous page...

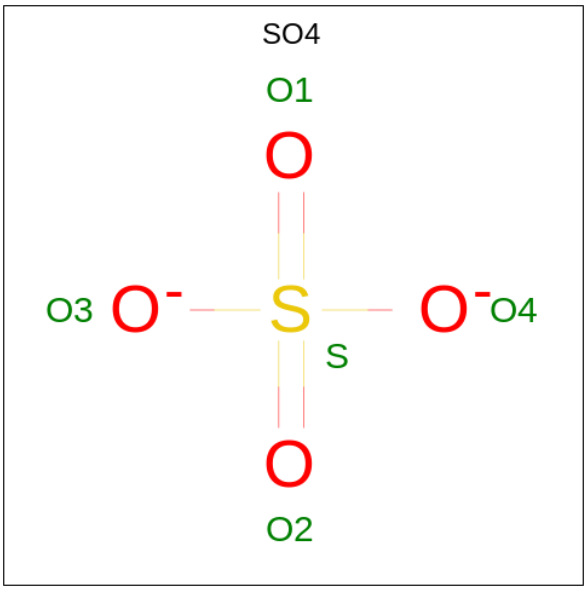
Chain	Residue	Modelled	Actual	Comment	Reference
G	-4	PRO	-	expression tag	UNP Q5SJE8
G	-3	ARG	-	expression tag	UNP Q5SJE8
G	-2	GLY	-	expression tag	UNP Q5SJE8
G	-1	SER	-	expression tag	UNP Q5SJE8
G	0	HIS	-	expression tag	UNP Q5SJE8
H	-19	MET	-	initiating methionine	UNP Q5SJE8
H	-18	GLY	-	expression tag	UNP Q5SJE8
H	-17	SER	-	expression tag	UNP Q5SJE8
H	-16	SER	-	expression tag	UNP Q5SJE8
H	-15	HIS	-	expression tag	UNP Q5SJE8
H	-14	HIS	-	expression tag	UNP Q5SJE8
H	-13	HIS	-	expression tag	UNP Q5SJE8
H	-12	HIS	-	expression tag	UNP Q5SJE8
H	-11	HIS	-	expression tag	UNP Q5SJE8
H	-10	HIS	-	expression tag	UNP Q5SJE8
H	-9	SER	-	expression tag	UNP Q5SJE8
H	-8	SER	-	expression tag	UNP Q5SJE8
H	-7	GLY	-	expression tag	UNP Q5SJE8
H	-6	LEU	-	expression tag	UNP Q5SJE8
H	-5	VAL	-	expression tag	UNP Q5SJE8
H	-4	PRO	-	expression tag	UNP Q5SJE8
H	-3	ARG	-	expression tag	UNP Q5SJE8
H	-2	GLY	-	expression tag	UNP Q5SJE8
H	-1	SER	-	expression tag	UNP Q5SJE8
H	0	HIS	-	expression tag	UNP Q5SJE8
I	-19	MET	-	initiating methionine	UNP Q5SJE8
I	-18	GLY	-	expression tag	UNP Q5SJE8
I	-17	SER	-	expression tag	UNP Q5SJE8
I	-16	SER	-	expression tag	UNP Q5SJE8
I	-15	HIS	-	expression tag	UNP Q5SJE8
I	-14	HIS	-	expression tag	UNP Q5SJE8
I	-13	HIS	-	expression tag	UNP Q5SJE8
I	-12	HIS	-	expression tag	UNP Q5SJE8
I	-11	HIS	-	expression tag	UNP Q5SJE8
I	-10	HIS	-	expression tag	UNP Q5SJE8
I	-9	SER	-	expression tag	UNP Q5SJE8
I	-8	SER	-	expression tag	UNP Q5SJE8
I	-7	GLY	-	expression tag	UNP Q5SJE8
I	-6	LEU	-	expression tag	UNP Q5SJE8
I	-5	VAL	-	expression tag	UNP Q5SJE8
I	-4	PRO	-	expression tag	UNP Q5SJE8
I	-3	ARG	-	expression tag	UNP Q5SJE8

Continued on next page...

Continued from previous page...

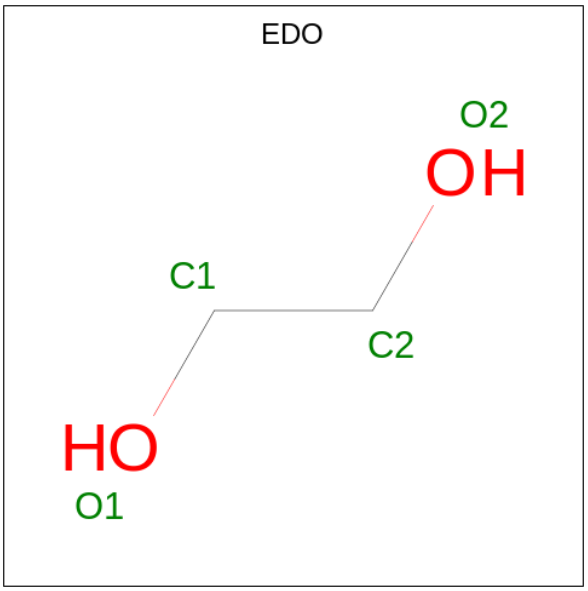
Chain	Residue	Modelled	Actual	Comment	Reference
I	-2	GLY	-	expression tag	UNP Q5SJE8
I	-1	SER	-	expression tag	UNP Q5SJE8
I	0	HIS	-	expression tag	UNP Q5SJE8
J	-19	MET	-	initiating methionine	UNP Q5SJE8
J	-18	GLY	-	expression tag	UNP Q5SJE8
J	-17	SER	-	expression tag	UNP Q5SJE8
J	-16	SER	-	expression tag	UNP Q5SJE8
J	-15	HIS	-	expression tag	UNP Q5SJE8
J	-14	HIS	-	expression tag	UNP Q5SJE8
J	-13	HIS	-	expression tag	UNP Q5SJE8
J	-12	HIS	-	expression tag	UNP Q5SJE8
J	-11	HIS	-	expression tag	UNP Q5SJE8
J	-10	HIS	-	expression tag	UNP Q5SJE8
J	-9	SER	-	expression tag	UNP Q5SJE8
J	-8	SER	-	expression tag	UNP Q5SJE8
J	-7	GLY	-	expression tag	UNP Q5SJE8
J	-6	LEU	-	expression tag	UNP Q5SJE8
J	-5	VAL	-	expression tag	UNP Q5SJE8
J	-4	PRO	-	expression tag	UNP Q5SJE8
J	-3	ARG	-	expression tag	UNP Q5SJE8
J	-2	GLY	-	expression tag	UNP Q5SJE8
J	-1	SER	-	expression tag	UNP Q5SJE8
J	0	HIS	-	expression tag	UNP Q5SJE8

- Molecule 2 is SULFATE ION (CCD ID: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	G	1	Total O S 5 4 1	0	0
2	H	1	Total O S 5 4 1	0	0
2	H	1	Total O S 5 4 1	0	0
2	I	1	Total O S 5 4 1	0	0
2	I	1	Total O S 5 4 1	0	0
2	J	1	Total O S 5 4 1	0	0

- Molecule 3 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: $C_2H_6O_2$).



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

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	E	1	Total C O 4 2 2	0	0
3	E	1	Total C O 4 2 2	0	0
3	E	1	Total C O 4 2 2	0	0
3	E	1	Total C O 4 2 2	0	0
3	F	1	Total C O 4 2 2	0	0
3	G	1	Total C O 4 2 2	0	0
3	G	1	Total C O 4 2 2	0	0
3	H	1	Total C O 4 2 2	0	0
3	H	1	Total C O 4 2 2	0	0
3	I	1	Total C O 4 2 2	0	0
3	I	1	Total C O 4 2 2	0	0
3	J	1	Total C O 4 2 2	0	0
3	J	1	Total C O 4 2 2	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	146	Total O 146 146	0	0
4	B	155	Total O 155 155	0	0
4	C	195	Total O 195 195	0	0
4	D	181	Total O 181 181	0	0
4	E	185	Total O 185 185	0	0
4	F	76	Total O 76 76	0	0

Continued on next page...

Continued from previous page...

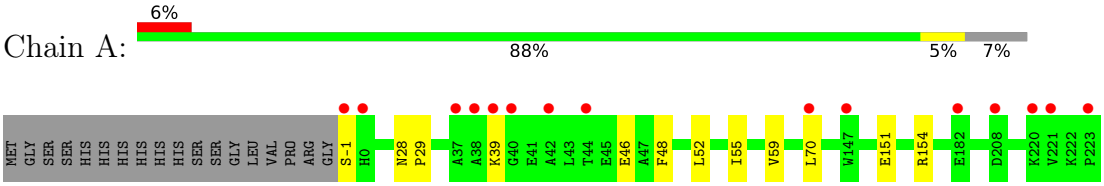
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	G	86	Total O 86 86	0	0
4	H	106	Total O 106 106	0	0
4	I	180	Total O 180 180	0	0
4	J	172	Total O 172 172	0	0

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.

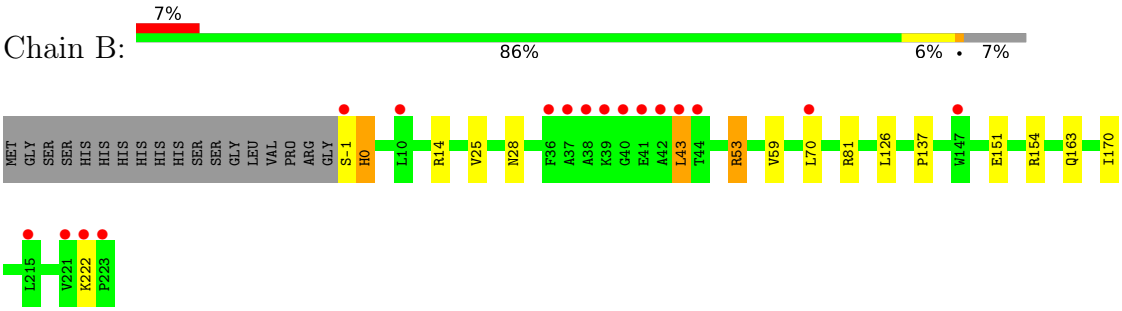
• Molecule 1: Probable transaldolase

Chain A:



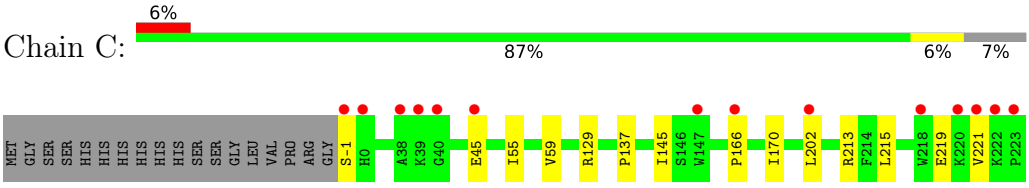
• Molecule 1: Probable transaldolase

Chain B:



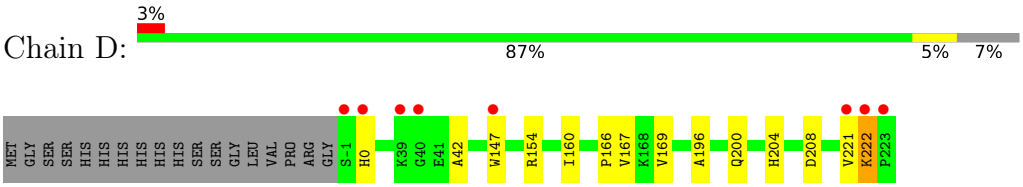
• Molecule 1: Probable transaldolase

Chain C:



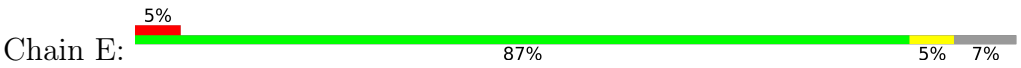
• Molecule 1: Probable transaldolase

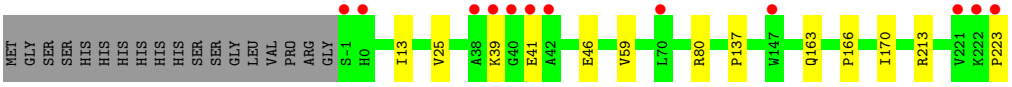
Chain D:



• Molecule 1: Probable transaldolase

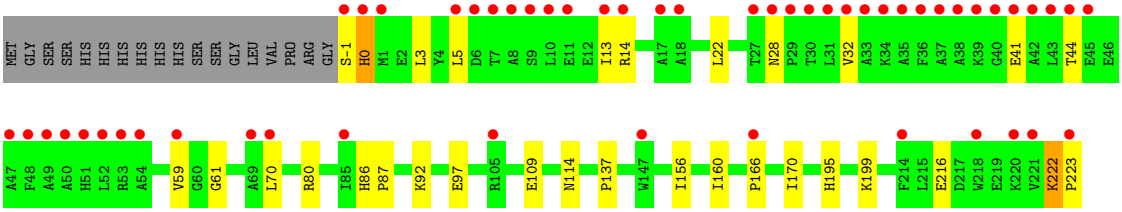
Chain E:





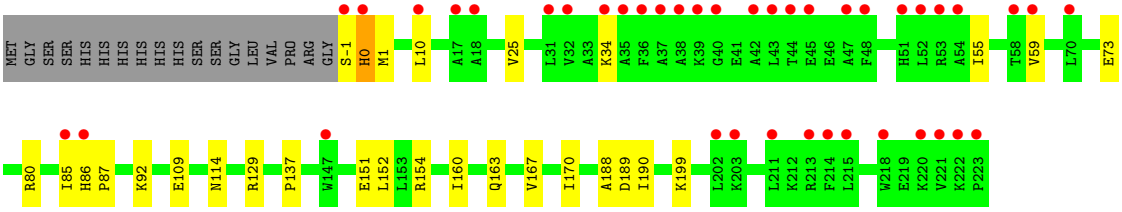
• Molecule 1: Probable transaldolase

Chain F:



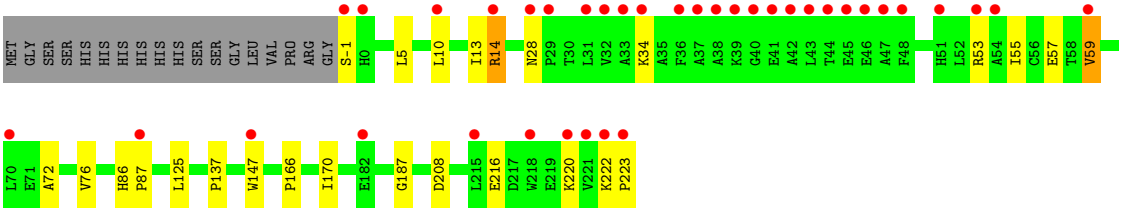
• Molecule 1: Probable transaldolase

Chain G:



• Molecule 1: Probable transaldolase

Chain H:

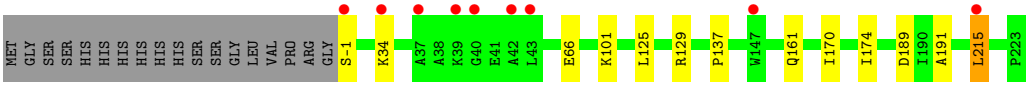


• Molecule 1: Probable transaldolase

Chain I:

• Molecule 1: Probable transaldolase

Chain J:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 65 2 2	Depositor
Cell constants a, b, c, α, β, γ	173.38Å 173.38Å 422.58Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	49.75 – 1.70 49.75 – 1.70	Depositor EDS
% Data completeness (in resolution range)	99.3 (49.75-1.70) 99.3 (49.75-1.70)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.33 (at 1.70Å)	Xtriage
Refinement program	REFMAC 5.8.0430	Depositor
R, R_{free}	0.189 , 0.211 0.198 , 0.216	Depositor DCC
R_{free} test set	20395 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	23.5	Xtriage
Anisotropy	0.099	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 38.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	18735	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 2.10% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: EDO, 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	0.44	0/1735	0.85	0/2355
1	B	0.44	0/1735	0.86	0/2355
1	C	0.44	0/1735	0.85	0/2355
1	D	0.44	0/1735	0.84	0/2355
1	E	0.44	0/1735	0.85	0/2355
1	F	0.44	0/1735	0.89	0/2355
1	G	0.44	0/1735	0.89	0/2355
1	H	0.44	0/1735	0.89	0/2355
1	I	0.45	0/1735	0.86	0/2355
1	J	0.44	0/1735	0.85	0/2355
All	All	0.44	0/17350	0.86	0/23550

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	B	0	3
1	C	0	2
1	D	0	1
1	E	0	1
1	F	0	1
1	G	0	1
1	H	0	1
1	I	0	3
1	J	0	1
All	All	0	14

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (14) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	14	ARG	Sidechain
1	B	53	ARG	Sidechain
1	B	81	ARG	Sidechain
1	C	129	ARG	Sidechain
1	C	213	ARG	Sidechain
1	D	154	ARG	Sidechain
1	E	213	ARG	Sidechain
1	F	14	ARG	Sidechain
1	G	129	ARG	Sidechain
1	H	14	ARG	Sidechain
1	I	105	ARG	Sidechain
1	I	129	ARG	Sidechain
1	I	154	ARG	Sidechain
1	J	129	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	1705	0	1755	10	0
1	B	1705	0	1755	10	0
1	C	1705	0	1755	10	0
1	D	1705	0	1755	10	0
1	E	1705	0	1755	10	0
1	F	1705	0	1755	20	0
1	G	1705	0	1755	20	0
1	H	1705	0	1755	20	0
1	I	1705	0	1755	10	0
1	J	1705	0	1755	7	0
2	A	5	0	0	0	0
2	B	15	0	0	0	0
2	C	20	0	0	0	0
2	D	5	0	0	0	0
2	E	15	0	0	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	F	5	0	0	0	0
2	G	5	0	0	0	0
2	H	10	0	0	0	0
2	I	10	0	0	0	0
2	J	5	0	0	0	0
3	A	16	0	24	2	0
3	B	16	0	24	1	0
3	C	12	0	18	0	0
3	D	12	0	18	0	0
3	E	16	0	24	1	0
3	F	4	0	6	0	0
3	G	8	0	12	4	0
3	H	8	0	12	3	0
3	I	8	0	12	0	0
3	J	8	0	12	1	0
4	A	146	0	0	0	0
4	B	155	0	0	0	0
4	C	195	0	0	2	0
4	D	181	0	0	2	0
4	E	185	0	0	2	0
4	F	76	0	0	3	0
4	G	86	0	0	0	0
4	H	106	0	0	1	0
4	I	180	0	0	0	0
4	J	172	0	0	2	0
All	All	18735	0	17712	114	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 (114) 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:154:ARG:HG2	1:A:154:ARG:HH11	1.49	0.77
1:I:148:ASP:OD2	1:I:151:GLU:HG2	1.95	0.66
1:E:25:VAL:HG23	1:E:59:VAL:HG21	1.79	0.64
1:B:163:GLN:OE1	1:C:-1:SER:HB2	1.97	0.64
1:H:55:ILE:O	1:H:59:VAL:HG23	1.97	0.63
1:B:126:LEU:HD13	1:C:202:LEU:HG	1.81	0.62
1:D:166:PRO:HD2	4:D:534:HOH:O	1.99	0.62
1:I:55:ILE:O	1:I:59:VAL:HG23	2.01	0.60

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:25:VAL:HG23	1:B:59:VAL:HG21	1.84	0.60
1:D:222:LYS:HE3	4:D:544:HOH:O	2.02	0.60
1:I:80:ARG:NH2	1:I:109:GLU:OE1	2.23	0.60
1:G:151:GLU:OE1	1:G:154:ARG:NH2	2.33	0.58
1:A:151:GLU:OE1	1:A:154:ARG:NH2	2.35	0.58
1:C:202:LEU:HB2	4:C:457:HOH:O	2.04	0.58
1:G:86:HIS:ND1	1:G:87:PRO:HD2	2.19	0.57
1:H:28:ASN:HD22	3:H:303:EDO:H21	1.69	0.57
1:E:39:LYS:HG3	1:E:41:GLU:HG2	1.85	0.56
1:A:154:ARG:HG2	1:A:154:ARG:NH1	2.17	0.56
1:D:147:TRP:CE2	3:G:302:EDO:H12	2.41	0.55
1:A:-1:SER:HB3	1:E:163:GLN:OE1	2.06	0.55
1:F:28:ASN:O	1:F:32:VAL:HG23	2.06	0.55
1:G:25:VAL:CG2	1:G:59:VAL:HG21	2.36	0.55
1:J:101:LYS:HE2	4:J:548:HOH:O	2.08	0.54
1:G:55:ILE:O	1:G:59:VAL:HG23	2.08	0.54
1:B:25:VAL:CG2	1:B:59:VAL:HG21	2.38	0.53
1:C:166:PRO:HD2	4:C:547:HOH:O	2.07	0.53
1:I:204:HIS:HD1	1:I:206:LEU:H	1.57	0.53
1:E:25:VAL:CG2	1:E:59:VAL:HG21	2.38	0.53
1:F:92:LYS:HA	1:F:114:ASN:O	2.09	0.53
1:F:195:HIS:CE1	1:F:199:LYS:HD2	2.44	0.53
1:G:151:GLU:CD	1:G:154:ARG:HH21	2.18	0.52
1:I:86:HIS:ND1	1:I:87:PRO:HD2	2.25	0.52
1:F:-1:SER:O	1:F:0:HIS:C	2.52	0.52
1:F:216:GLU:HG3	4:F:418:HOH:O	2.09	0.51
1:J:66:GLU:OE1	3:J:303:EDO:H21	2.09	0.51
1:E:46:GLU:HG3	4:E:528:HOH:O	2.11	0.51
1:G:137:PRO:HD2	1:G:170:ILE:O	2.11	0.51
1:H:137:PRO:HD2	1:H:170:ILE:O	2.11	0.51
1:B:43:LEU:HD12	1:C:221:VAL:HG23	1.93	0.51
1:D:204:HIS:NE2	1:H:147:TRP:CH2	2.79	0.50
1:A:28:ASN:HD22	3:A:302:EDO:H12	1.77	0.50
1:C:145:ILE:HD11	1:H:147:TRP:CH2	2.46	0.49
1:D:147:TRP:CD2	3:G:302:EDO:H12	2.47	0.49
1:H:86:HIS:ND1	1:H:87:PRO:HD2	2.26	0.49
1:B:28:ASN:HD22	3:B:304:EDO:H12	1.78	0.49
1:G:152:LEU:HD13	3:G:302:EDO:H22	1.95	0.49
1:H:166:PRO:HD2	4:H:474:HOH:O	2.13	0.48
1:F:166:PRO:HD2	4:F:455:HOH:O	2.13	0.48
1:G:25:VAL:HG23	1:G:59:VAL:HG21	1.94	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:28:ASN:HD22	3:H:303:EDO:C2	2.25	0.48
1:C:145:ILE:HD11	1:H:147:TRP:HH2	1.78	0.48
1:D:42:ALA:HB1	1:E:223:PRO:HG3	1.95	0.48
1:G:-1:SER:O	1:G:0:HIS:C	2.57	0.48
1:A:70:LEU:HD23	1:A:70:LEU:HA	1.79	0.48
1:B:70:LEU:HD21	1:C:215:LEU:HD11	1.96	0.47
1:F:5:LEU:HD23	1:F:13:ILE:HA	1.96	0.47
1:H:72:ALA:O	1:H:76:VAL:HG23	2.15	0.46
1:B:151:GLU:OE1	1:B:154:ARG:NH1	2.48	0.46
1:G:160:ILE:HD13	1:G:167:VAL:HG13	1.97	0.46
1:F:70:LEU:N	1:F:70:LEU:HD22	2.29	0.46
1:E:166:PRO:HD2	4:E:541:HOH:O	2.16	0.46
1:H:5:LEU:HD23	1:H:13:ILE:HA	1.98	0.46
1:G:1:MET:HE2	1:G:190:ILE:C	2.40	0.46
1:C:55:ILE:O	1:C:59:VAL:HG12	2.16	0.46
1:F:80:ARG:NH2	1:F:109:GLU:OE1	2.46	0.46
1:E:13:ILE:HG23	1:E:59:VAL:HG22	1.98	0.45
1:G:163:GLN:NE2	1:H:187:GLY:HA2	2.31	0.45
1:H:53:ARG:O	1:H:57:GLU:HG2	2.16	0.45
1:D:196:ALA:O	1:D:200:GLN:HG3	2.16	0.45
1:A:28:ASN:HD22	3:A:302:EDO:C1	2.30	0.45
1:H:28:ASN:ND2	3:H:303:EDO:H21	2.31	0.45
1:J:-1:SER:HB2	1:J:189:ASP:HB3	1.98	0.45
1:D:221:VAL:HG12	1:D:221:VAL:O	2.17	0.45
1:F:137:PRO:HD2	1:F:170:ILE:O	2.16	0.45
1:G:1:MET:HE1	1:G:188:ALA:HB3	1.98	0.44
1:F:156:ILE:O	1:F:160:ILE:HG12	2.17	0.44
1:H:10:LEU:O	1:H:14:ARG:HG2	2.18	0.44
1:J:137:PRO:HD2	1:J:170:ILE:O	2.17	0.44
1:I:25:VAL:CG2	1:I:59:VAL:HG21	2.48	0.44
1:J:174:ILE:CD1	1:J:191:ALA:HB1	2.48	0.44
1:A:55:ILE:O	1:A:59:VAL:HG12	2.18	0.44
1:I:-1:SER:O	1:I:0:HIS:C	2.59	0.44
1:I:25:VAL:HG23	1:I:59:VAL:HG21	1.98	0.44
1:J:215:LEU:HD23	4:J:565:HOH:O	2.18	0.43
1:G:85:ILE:O	1:G:86:HIS:HB2	2.17	0.43
1:G:163:GLN:OE1	1:H:-1:SER:HB2	2.18	0.43
1:F:-1:SER:O	1:F:0:HIS:O	2.36	0.43
1:E:80:ARG:O	3:E:307:EDO:H21	2.17	0.43
1:H:125:LEU:HD21	1:I:1:MET:HE2	2.01	0.43
1:B:137:PRO:HD2	1:B:170:ILE:O	2.19	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:28:ASN:HB2	1:A:29:PRO:CD	2.49	0.43
1:E:137:PRO:HD2	1:E:170:ILE:O	2.19	0.43
1:G:152:LEU:CD1	3:G:302:EDO:H22	2.48	0.43
1:D:160:ILE:HD12	1:D:169:VAL:CG2	2.49	0.43
1:G:92:LYS:HA	1:G:114:ASN:O	2.19	0.42
1:F:59:VAL:HG13	1:F:61:GLY:H	1.85	0.42
1:A:48:PHE:CZ	1:A:52:LEU:HD11	2.54	0.42
1:H:28:ASN:C	1:H:28:ASN:OD1	2.62	0.42
1:C:137:PRO:HD2	1:C:170:ILE:O	2.20	0.42
1:H:216:GLU:O	1:H:220:LYS:HG2	2.19	0.42
1:F:222:LYS:O	1:F:223:PRO:C	2.63	0.41
1:H:222:LYS:O	1:H:223:PRO:C	2.62	0.41
1:D:160:ILE:HD13	1:D:167:VAL:HG13	2.02	0.41
1:F:5:LEU:HB2	1:F:22:LEU:HD11	2.02	0.41
1:F:86:HIS:ND1	1:F:87:PRO:HD2	2.35	0.41
1:F:222:LYS:HB2	1:F:223:PRO:HD2	2.03	0.41
1:G:25:VAL:HG21	1:G:59:VAL:HG21	2.02	0.41
1:I:86:HIS:CG	1:I:87:PRO:HD2	2.55	0.41
1:F:97:GLU:HB2	4:F:445:HOH:O	2.20	0.41
1:F:3:LEU:HD21	1:J:125:LEU:HD21	2.03	0.41
1:F:28:ASN:OD1	1:F:28:ASN:C	2.63	0.41
1:G:-1:SER:HB2	1:G:189:ASP:OD1	2.21	0.41
1:B:-1:SER:O	1:B:0:HIS:C	2.63	0.41
1:G:80:ARG:NH2	1:G:109:GLU:OE1	2.40	0.41

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	223/243 (92%)	222 (100%)	1 (0%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	223/243 (92%)	220 (99%)	2 (1%)	1 (0%)	30	17
1	C	223/243 (92%)	221 (99%)	2 (1%)	0	100	100
1	D	223/243 (92%)	221 (99%)	1 (0%)	1 (0%)	30	17
1	E	223/243 (92%)	221 (99%)	2 (1%)	0	100	100
1	F	223/243 (92%)	218 (98%)	4 (2%)	1 (0%)	30	17
1	G	223/243 (92%)	218 (98%)	4 (2%)	1 (0%)	30	17
1	H	223/243 (92%)	219 (98%)	4 (2%)	0	100	100
1	I	223/243 (92%)	220 (99%)	2 (1%)	1 (0%)	30	17
1	J	223/243 (92%)	221 (99%)	2 (1%)	0	100	100
All	All	2230/2430 (92%)	2201 (99%)	24 (1%)	5 (0%)	44	29

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	0	HIS
1	B	0	HIS
1	D	0	HIS
1	G	0	HIS
1	I	0	HIS

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	177/192 (92%)	175 (99%)	2 (1%)	70	60
1	B	177/192 (92%)	174 (98%)	3 (2%)	56	41
1	C	177/192 (92%)	175 (99%)	2 (1%)	70	60
1	D	177/192 (92%)	175 (99%)	2 (1%)	70	60
1	E	177/192 (92%)	177 (100%)	0	100	100
1	F	177/192 (92%)	174 (98%)	3 (2%)	56	41

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	G	177/192 (92%)	173 (98%)	4 (2%)	45 29
1	H	177/192 (92%)	174 (98%)	3 (2%)	56 41
1	I	177/192 (92%)	176 (99%)	1 (1%)	84 78
1	J	177/192 (92%)	174 (98%)	3 (2%)	56 41
All	All	1770/1920 (92%)	1747 (99%)	23 (1%)	65 52

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	39	LYS
1	A	46	GLU
1	B	43	LEU
1	B	53	ARG
1	B	222	LYS
1	C	45	GLU
1	C	219	GLU
1	D	208	ASP
1	D	222	LYS
1	F	41	GLU
1	F	44	THR
1	F	222	LYS
1	G	10	LEU
1	G	34	LYS
1	G	73	GLU
1	G	199	LYS
1	H	34	LYS
1	H	59	VAL
1	H	208	ASP
1	I	-1	SER
1	J	34	LYS
1	J	161	GLN
1	J	215	LEU

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

Mol	Chain	Res	Type
1	C	0	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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

46 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	B	301	-	4,4,4	0.40	0	6,6,6	0.05	0
3	EDO	C	306	-	3,3,3	0.06	0	2,2,2	0.19	0
3	EDO	E	306	-	3,3,3	0.06	0	2,2,2	0.16	0
3	EDO	A	302	-	3,3,3	0.07	0	2,2,2	0.24	0
2	SO4	B	302	-	4,4,4	0.39	0	6,6,6	0.05	0
3	EDO	D	304	-	3,3,3	0.07	0	2,2,2	0.27	0
3	EDO	A	303	-	3,3,3	0.08	0	2,2,2	0.25	0
3	EDO	A	304	-	3,3,3	0.06	0	2,2,2	0.24	0
3	EDO	B	305	-	3,3,3	0.05	0	2,2,2	0.16	0
2	SO4	G	301	-	4,4,4	0.40	0	6,6,6	0.04	0
2	SO4	B	303	-	4,4,4	0.38	0	6,6,6	0.04	0
2	SO4	C	301	-	4,4,4	0.40	0	6,6,6	0.06	0
2	SO4	E	302	-	4,4,4	0.39	0	6,6,6	0.05	0
3	EDO	E	305	-	3,3,3	0.05	0	2,2,2	0.15	0
2	SO4	I	301	-	4,4,4	0.38	0	6,6,6	0.07	0
3	EDO	H	304	-	3,3,3	0.05	0	2,2,2	0.20	0
3	EDO	D	303	-	3,3,3	0.07	0	2,2,2	0.24	0
3	EDO	B	304	-	3,3,3	0.07	0	2,2,2	0.22	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
2	SO4	J	301	-	4,4,4	0.40	0	6,6,6	0.06	0
2	SO4	H	301	-	4,4,4	0.40	0	6,6,6	0.05	0
3	EDO	F	302	-	3,3,3	0.06	0	2,2,2	0.19	0
3	EDO	E	307	-	3,3,3	0.07	0	2,2,2	0.25	0
3	EDO	G	302	-	3,3,3	0.07	0	2,2,2	0.26	0
3	EDO	B	306	-	3,3,3	0.06	0	2,2,2	0.18	0
3	EDO	C	307	-	3,3,3	0.07	0	2,2,2	0.26	0
3	EDO	H	303	-	3,3,3	0.07	0	2,2,2	0.24	0
2	SO4	A	301	-	4,4,4	0.40	0	6,6,6	0.05	0
3	EDO	C	305	-	3,3,3	0.08	0	2,2,2	0.24	0
2	SO4	I	302	-	4,4,4	0.38	0	6,6,6	0.05	0
3	EDO	G	303	-	3,3,3	0.07	0	2,2,2	0.18	0
2	SO4	C	302	-	4,4,4	0.39	0	6,6,6	0.05	0
2	SO4	E	303	-	4,4,4	0.39	0	6,6,6	0.05	0
2	SO4	C	303	-	4,4,4	0.39	0	6,6,6	0.05	0
3	EDO	I	304	-	3,3,3	0.07	0	2,2,2	0.22	0
2	SO4	D	301	-	4,4,4	0.40	0	6,6,6	0.04	0
3	EDO	B	307	-	3,3,3	0.06	0	2,2,2	0.17	0
3	EDO	J	302	-	3,3,3	0.06	0	2,2,2	0.16	0
3	EDO	A	305	-	3,3,3	0.05	0	2,2,2	0.16	0
2	SO4	C	304	-	4,4,4	0.39	0	6,6,6	0.05	0
3	EDO	I	303	-	3,3,3	0.09	0	2,2,2	0.26	0
3	EDO	E	304	-	3,3,3	0.08	0	2,2,2	0.20	0
2	SO4	E	301	-	4,4,4	0.39	0	6,6,6	0.07	0
3	EDO	D	302	-	3,3,3	0.08	0	2,2,2	0.19	0
2	SO4	F	301	-	4,4,4	0.40	0	6,6,6	0.05	0
3	EDO	J	303	-	3,3,3	0.04	0	2,2,2	0.18	0
2	SO4	H	302	-	4,4,4	0.39	0	6,6,6	0.05	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	EDO	C	306	-	-	0/1/1/1	-
3	EDO	E	306	-	-	0/1/1/1	-
3	EDO	A	302	-	-	1/1/1/1	-
3	EDO	D	304	-	-	1/1/1/1	-
3	EDO	A	303	-	-	1/1/1/1	-
3	EDO	A	304	-	-	1/1/1/1	-
3	EDO	B	305	-	-	0/1/1/1	-
3	EDO	E	305	-	-	0/1/1/1	-

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	EDO	H	304	-	-	1/1/1/1	-
3	EDO	D	303	-	-	0/1/1/1	-
3	EDO	B	304	-	-	1/1/1/1	-
3	EDO	F	302	-	-	0/1/1/1	-
3	EDO	E	307	-	-	1/1/1/1	-
3	EDO	G	302	-	-	1/1/1/1	-
3	EDO	B	306	-	-	1/1/1/1	-
3	EDO	C	307	-	-	1/1/1/1	-
3	EDO	H	303	-	-	1/1/1/1	-
3	EDO	C	305	-	-	0/1/1/1	-
3	EDO	G	303	-	-	0/1/1/1	-
3	EDO	I	304	-	-	0/1/1/1	-
3	EDO	B	307	-	-	0/1/1/1	-
3	EDO	J	302	-	-	0/1/1/1	-
3	EDO	A	305	-	-	1/1/1/1	-
3	EDO	I	303	-	-	1/1/1/1	-
3	EDO	E	304	-	-	0/1/1/1	-
3	EDO	D	302	-	-	0/1/1/1	-
3	EDO	J	303	-	-	0/1/1/1	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (13) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	307	EDO	O1-C1-C2-O2
3	A	303	EDO	O1-C1-C2-O2
3	A	304	EDO	O1-C1-C2-O2
3	A	302	EDO	O1-C1-C2-O2
3	B	306	EDO	O1-C1-C2-O2
3	H	303	EDO	O1-C1-C2-O2
3	A	305	EDO	O1-C1-C2-O2
3	D	304	EDO	O1-C1-C2-O2
3	E	307	EDO	O1-C1-C2-O2
3	B	304	EDO	O1-C1-C2-O2
3	G	302	EDO	O1-C1-C2-O2
3	H	304	EDO	O1-C1-C2-O2
3	I	303	EDO	O1-C1-C2-O2

There are no ring outliers.

6 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	302	EDO	2	0
3	B	304	EDO	1	0
3	E	307	EDO	1	0
3	G	302	EDO	4	0
3	H	303	EDO	3	0
3	J	303	EDO	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

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, 95^{th} 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	225/243 (92%)	0.21	15 (6%)	25	26	19, 26, 58, 77	0
1	B	225/243 (92%)	0.27	17 (7%)	21	22	17, 25, 61, 92	0
1	C	225/243 (92%)	-0.08	14 (6%)	28	29	15, 20, 45, 95	0
1	D	225/243 (92%)	-0.10	8 (3%)	46	49	16, 22, 41, 83	0
1	E	225/243 (92%)	0.01	12 (5%)	33	35	18, 23, 45, 70	0
1	F	225/243 (92%)	1.10	53 (23%)	2	2	23, 40, 85, 108	0
1	G	225/243 (92%)	0.93	41 (18%)	4	3	20, 40, 77, 103	0
1	H	225/243 (92%)	0.84	37 (16%)	5	5	18, 36, 80, 106	0
1	I	225/243 (92%)	0.09	9 (4%)	43	46	18, 24, 49, 111	0
1	J	225/243 (92%)	0.21	9 (4%)	43	46	20, 27, 50, 72	0
All	All	2250/2430 (92%)	0.35	215 (9%)	15	15	15, 27, 64, 111	0

All (215) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	H	147	TRP	8.5
1	F	36	PHE	7.3
1	F	43	LEU	5.9
1	E	147	TRP	5.9
1	G	70	LEU	5.4
1	I	147	TRP	5.4
1	F	70	LEU	5.3
1	F	32	VAL	5.2
1	F	37	ALA	5.1
1	F	38	ALA	5.1
1	A	147	TRP	5.0
1	G	39	LYS	4.9
1	F	31	LEU	4.8

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	223	PRO	4.8
1	J	147	TRP	4.8
1	B	70	LEU	4.7
1	H	70	LEU	4.7
1	A	-1	SER	4.6
1	F	10	LEU	4.6
1	F	-1	SER	4.5
1	H	43	LEU	4.5
1	I	223	PRO	4.5
1	C	147	TRP	4.4
1	D	223	PRO	4.4
1	H	36	PHE	4.3
1	F	33	ALA	4.3
1	F	44	THR	4.3
1	E	-1	SER	4.3
1	F	51	HIS	4.2
1	A	70	LEU	4.2
1	F	29	PRO	4.2
1	H	223	PRO	4.2
1	F	34	LYS	4.2
1	H	44	THR	4.1
1	G	37	ALA	4.1
1	F	8	ALA	4.1
1	H	-1	SER	4.0
1	A	223	PRO	4.0
1	B	147	TRP	4.0
1	H	34	LYS	4.0
1	G	34	LYS	3.9
1	F	50	ALA	3.9
1	H	59	VAL	3.9
1	G	218	TRP	3.8
1	I	-1	SER	3.8
1	F	147	TRP	3.8
1	G	215	LEU	3.7
1	H	215	LEU	3.7
1	B	37	ALA	3.7
1	H	38	ALA	3.6
1	H	222	LYS	3.6
1	D	-1	SER	3.6
1	G	-1	SER	3.6
1	D	221	VAL	3.5
1	I	221	VAL	3.5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	H	42	ALA	3.5
1	G	223	PRO	3.5
1	J	42	ALA	3.4
1	B	-1	SER	3.4
1	F	48	PHE	3.4
1	J	40	GLY	3.4
1	B	42	ALA	3.4
1	F	47	ALA	3.4
1	H	39	LYS	3.4
1	F	27	THR	3.4
1	B	38	ALA	3.4
1	A	39	LYS	3.3
1	E	222	LYS	3.3
1	C	223	PRO	3.3
1	B	39	LYS	3.3
1	F	9	SER	3.3
1	B	43	LEU	3.3
1	A	37	ALA	3.3
1	H	220	LYS	3.3
1	H	221	VAL	3.3
1	F	42	ALA	3.3
1	E	40	GLY	3.2
1	G	220	LYS	3.2
1	G	42	ALA	3.2
1	E	39	LYS	3.2
1	G	48	PHE	3.2
1	G	214	PHE	3.2
1	G	47	ALA	3.2
1	H	47	ALA	3.2
1	G	0	HIS	3.1
1	F	41	GLU	3.1
1	H	0	HIS	3.1
1	E	223	PRO	3.1
1	G	203	LYS	3.1
1	F	13	ILE	3.0
1	G	147	TRP	3.0
1	F	28	ASN	3.0
1	F	39	LYS	3.0
1	G	59	VAL	3.0
1	G	53	ARG	3.0
1	G	31	LEU	3.0
1	G	44	THR	3.0

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	H	10	LEU	3.0
1	H	14	ARG	3.0
1	F	218	TRP	3.0
1	G	36	PHE	3.0
1	H	218	TRP	3.0
1	C	-1	SER	3.0
1	F	223	PRO	2.9
1	H	48	PHE	2.9
1	F	35	ALA	2.9
1	F	49	ALA	2.9
1	A	44	THR	2.9
1	G	211	LEU	2.9
1	J	43	LEU	2.9
1	J	39	LYS	2.9
1	G	18	ALA	2.9
1	H	33	ALA	2.9
1	F	166	PRO	2.9
1	B	41	GLU	2.9
1	G	222	LYS	2.9
1	F	220	LYS	2.8
1	A	208	ASP	2.8
1	B	44	THR	2.8
1	H	45	GLU	2.8
1	G	10	LEU	2.7
1	G	43	LEU	2.7
1	H	31	LEU	2.7
1	B	40	GLY	2.7
1	E	70	LEU	2.7
1	G	85	ILE	2.7
1	F	59	VAL	2.7
1	J	-1	SER	2.7
1	F	30	THR	2.7
1	C	221	VAL	2.7
1	F	54	ALA	2.6
1	A	40	GLY	2.6
1	C	222	LYS	2.6
1	D	147	TRP	2.6
1	G	58	THR	2.6
1	F	14	ARG	2.6
1	F	221	VAL	2.6
1	C	40	GLY	2.6
1	H	37	ALA	2.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	222	LYS	2.6
1	I	218	TRP	2.5
1	I	220	LYS	2.5
1	H	40	GLY	2.5
1	C	166	PRO	2.5
1	B	10	LEU	2.5
1	I	222	LYS	2.5
1	G	32	VAL	2.5
1	E	221	VAL	2.5
1	G	221	VAL	2.5
1	G	38	ALA	2.5
1	I	215	LEU	2.4
1	D	222	LYS	2.4
1	F	53	ARG	2.4
1	G	51	HIS	2.4
1	D	40	GLY	2.4
1	F	6	ASP	2.4
1	F	105	ARG	2.4
1	C	218	TRP	2.4
1	H	54	ALA	2.4
1	G	54	ALA	2.3
1	B	215	LEU	2.3
1	J	215	LEU	2.3
1	H	53	ARG	2.3
1	F	69	ALA	2.3
1	G	35	ALA	2.3
1	F	1	MET	2.3
1	F	40	GLY	2.3
1	B	221	VAL	2.3
1	C	0	HIS	2.3
1	G	202	LEU	2.3
1	C	45	GLU	2.3
1	F	18	ALA	2.3
1	F	45	GLU	2.3
1	D	39	LYS	2.2
1	F	214	PHE	2.2
1	J	37	ALA	2.2
1	H	41	GLU	2.2
1	F	7	THR	2.2
1	A	221	VAL	2.2
1	A	0	HIS	2.2
1	A	220	LYS	2.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	C	220	LYS	2.2
1	G	213	ARG	2.2
1	F	11	GLU	2.2
1	H	182	GLU	2.2
1	A	182	GLU	2.2
1	H	32	VAL	2.2
1	C	202	LEU	2.2
1	E	0	HIS	2.2
1	G	40	GLY	2.2
1	E	38	ALA	2.1
1	H	46	GLU	2.1
1	H	87	PRO	2.1
1	F	5	LEU	2.1
1	I	202	LEU	2.1
1	C	39	LYS	2.1
1	G	45	GLU	2.1
1	C	38	ALA	2.1
1	E	42	ALA	2.1
1	G	17	ALA	2.1
1	B	36	PHE	2.1
1	J	34	LYS	2.1
1	A	38	ALA	2.1
1	A	42	ALA	2.1
1	F	85	ILE	2.1
1	F	17	ALA	2.0
1	D	0	HIS	2.0
1	F	0	HIS	2.0
1	G	86	HIS	2.0
1	H	51	HIS	2.0
1	F	52	LEU	2.0
1	G	52	LEU	2.0
1	E	41	GLU	2.0
1	H	28	ASN	2.0
1	H	29	PRO	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 oligosaccharides 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^{th} 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	E	302	5/5	0.73	0.16	57,67,98,103	0
2	SO4	H	302	5/5	0.78	0.14	61,88,98,111	0
2	SO4	I	302	5/5	0.82	0.13	59,79,100,103	0
3	EDO	C	306	4/4	0.82	0.24	47,53,60,60	0
2	SO4	C	304	5/5	0.83	0.14	52,58,79,79	0
3	EDO	B	306	4/4	0.84	0.19	54,63,67,68	0
2	SO4	C	303	5/5	0.84	0.12	64,78,117,124	0
3	EDO	E	307	4/4	0.84	0.20	29,38,40,40	0
3	EDO	A	302	4/4	0.87	0.16	35,40,41,43	0
3	EDO	H	303	4/4	0.87	0.16	32,37,44,47	0
3	EDO	A	303	4/4	0.89	0.18	34,36,38,39	0
3	EDO	A	305	4/4	0.89	0.17	47,48,49,57	0
3	EDO	J	303	4/4	0.89	0.16	40,46,47,53	0
2	SO4	B	303	5/5	0.90	0.10	50,51,60,64	0
3	EDO	G	302	4/4	0.90	0.19	29,30,39,52	0
3	EDO	B	305	4/4	0.90	0.15	38,51,59,64	0
3	EDO	E	305	4/4	0.90	0.16	44,44,51,52	0
3	EDO	D	304	4/4	0.91	0.14	30,34,38,41	0
3	EDO	B	304	4/4	0.91	0.16	31,36,37,42	0
3	EDO	A	304	4/4	0.91	0.13	33,35,38,48	0
3	EDO	G	303	4/4	0.92	0.15	38,40,47,58	0
3	EDO	C	307	4/4	0.92	0.12	31,34,38,43	0
3	EDO	H	304	4/4	0.92	0.13	45,46,51,53	0
3	EDO	I	303	4/4	0.92	0.12	20,25,31,32	0
3	EDO	I	304	4/4	0.92	0.15	22,36,38,47	0
3	EDO	D	303	4/4	0.92	0.14	24,35,40,47	0
3	EDO	F	302	4/4	0.93	0.14	29,46,51,52	0
3	EDO	B	307	4/4	0.93	0.14	32,36,36,46	0
3	EDO	E	306	4/4	0.94	0.13	31,44,52,57	0
2	SO4	E	303	5/5	0.94	0.08	49,49,61,67	0
2	SO4	B	302	5/5	0.94	0.07	51,58,63,64	0
2	SO4	A	301	5/5	0.94	0.12	28,33,35,38	0

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	SO4	C	302	5/5	0.94	0.08	44,44,59,62	0
3	EDO	J	302	4/4	0.95	0.11	24,36,37,39	0
3	EDO	D	302	4/4	0.95	0.10	22,25,25,28	0
3	EDO	C	305	4/4	0.96	0.07	23,24,25,25	0
3	EDO	E	304	4/4	0.96	0.09	22,27,30,36	0
2	SO4	E	301	5/5	0.97	0.07	29,29,32,34	0
2	SO4	C	301	5/5	0.97	0.09	28,29,32,35	0
2	SO4	J	301	5/5	0.97	0.07	36,37,38,39	0
2	SO4	B	301	5/5	0.97	0.10	28,31,37,43	0
2	SO4	F	301	5/5	0.97	0.09	39,41,49,51	0
2	SO4	G	301	5/5	0.97	0.07	36,38,44,44	0
2	SO4	D	301	5/5	0.98	0.06	24,25,27,28	0
2	SO4	H	301	5/5	0.98	0.07	33,34,39,40	0
2	SO4	I	301	5/5	0.99	0.05	21,22,24,25	0

6.5 Other polymers (i)

There are no such residues in this entry.