



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 06:56 PM UTC

PDB ID : 4H9M / pdb_00004h9m
Title : The first Jack bean urease (*Canavalia ensiformis*) complex obtained at 1.52 resolution
Authors : Begum, A.; Choudhary, M.I.; Betzel, C.
Deposited on : 2012-09-24
Resolution : 1.52 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 types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

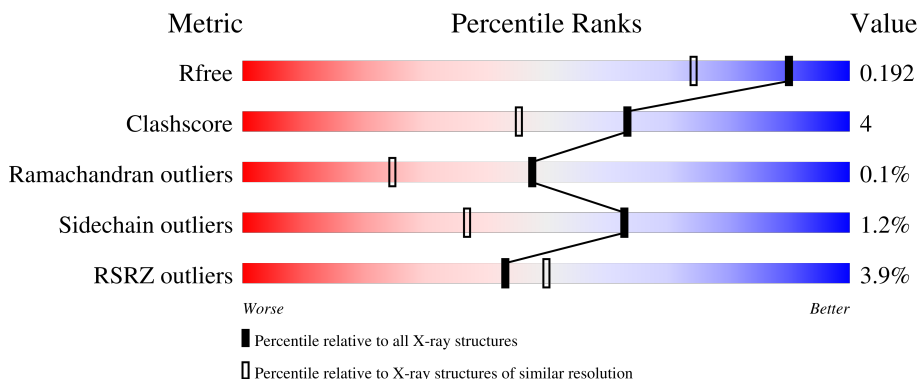
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.52 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}	180053	5890 (1.54-1.50)
Clashscore	190562	6116 (1.54-1.50)
Ramachandran outliers	187476	6002 (1.54-1.50)
Sidechain outliers	187428	5999 (1.54-1.50)
RSRZ outliers	180081	5891 (1.54-1.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	840	4% 92% 7%

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 7605 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 Urease.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	836	Total	C	N	O	S	0	31	0
			6517	4106	1123	1244	44			

- Molecule 2 is NICKEL (II) ION (CCD ID: NI) (formula: Ni).

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

- Molecule 3 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: C₂H₆O₂).



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		

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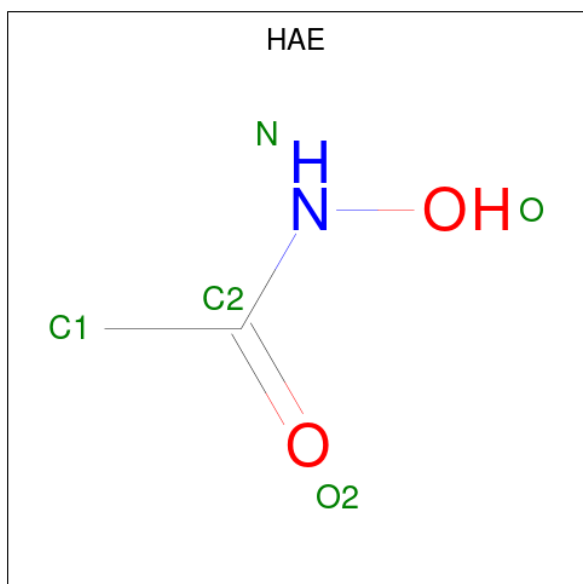
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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		

- Molecule 4 is ACETOHYDROXAMIC ACID (CCD ID: HAE) (formula: $C_2H_5NO_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			5	2	1	2		

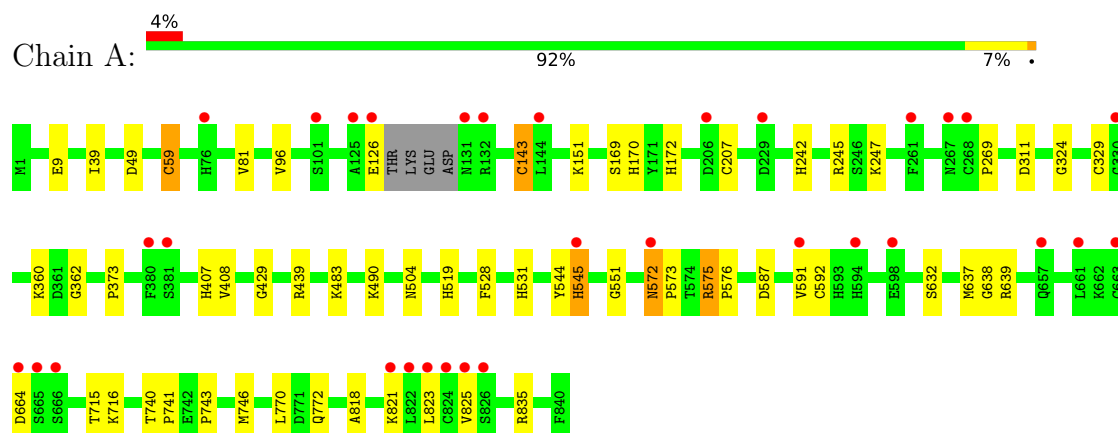
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	965	Total	O	0	0
			965	965		

3 Residue-property plots

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

- Molecule 1: Urease



4 Data and refinement statistics

Property	Value	Source
Space group	P 63 2 2	Depositor
Cell constants a, b, c, α , β , γ	140.39Å 140.39Å 198.75Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	19.61 – 1.52 19.61 – 1.52	Depositor EDS
% Data completeness (in resolution range)	99.6 (19.61-1.52) 99.7 (19.61-1.52)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.91 (at 1.52Å)	Xtriage
Refinement program	REFMAC 5.7.0029	Depositor
R, R_{free}	0.178 , 0.191 0.179 , 0.192	Depositor DCC
R_{free} test set	8824 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	14.7	Xtriage
Anisotropy	0.524	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 42.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	7605	wwPDB-VP
Average B, all atoms (Å ²)	19.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.96% 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: NI, KCX, CME, HAE, EDO

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	1/6627 (0.0%)	0.70	1/8964 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	269	PRO	C-O	-5.55	1.16	1.24

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	572	ASN	N-CA-C	5.33	121.58	109.81

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	6517	0	6614	52	0
2	A	2	0	0	0	0
3	A	116	0	174	7	0
4	A	5	0	4	0	0
5	A	965	0	0	4	0
All	All	7605	0	6792	54	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 4.

All (54) 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:143:CME:SG	1:A:143:CME:OH	2.25	0.95
1:A:528:PHE:H	1:A:531:HIS:HD2	1.21	0.87
1:A:143:CME:OH	1:A:143:CME:HB3	1.74	0.87
1:A:572:ASN:HD21	1:A:639:ARG:H	1.23	0.86
1:A:572:ASN:OD1	1:A:573[A]:PRO:HD3	1.82	0.79
1:A:39:ILE:HG21	1:A:81[B]:VAL:HG11	1.62	0.79
1:A:143:CME:OH	1:A:143:CME:CB	2.30	0.79
1:A:572:ASN:OD1	1:A:573[B]:PRO:HD3	1.88	0.73
1:A:573[B]:PRO:HG3	1:A:638:GLY:HA2	1.74	0.69
1:A:572:ASN:OD1	1:A:573[B]:PRO:CD	2.44	0.66
1:A:39:ILE:CG2	1:A:81[B]:VAL:HG11	2.27	0.64
1:A:637:MET:O	1:A:637:MET:HG2	1.96	0.64
1:A:572:ASN:ND2	1:A:639:ARG:H	1.94	0.62
1:A:572:ASN:HD21	1:A:639:ARG:N	1.94	0.62
1:A:544:TYR:O	1:A:545:HIS:C	2.43	0.61
1:A:715[B]:THR:HG23	1:A:716:LYS:N	2.19	0.58
1:A:483:LYS:CE	1:A:772[B]:GLN:HE22	2.16	0.57
1:A:169:SER:OG	1:A:170:HIS:HD2	1.88	0.57
1:A:632:SER:O	1:A:638:GLY:HA3	2.05	0.57
1:A:362:GLY:HA3	3:A:910:EDO:H21	1.88	0.56
1:A:81[B]:VAL:HG13	1:A:96:VAL:HB	1.88	0.56
1:A:504:ASN:HB2	3:A:917:EDO:H11	1.87	0.55
1:A:528:PHE:H	1:A:531:HIS:CD2	2.14	0.54
1:A:835[A]:ARG:NH2	5:A:1965:HOH:O	2.42	0.53
1:A:170:HIS:HE1	1:A:311:ASP:OD1	1.90	0.53
1:A:573[A]:PRO:HG2	5:A:1653:HOH:O	2.08	0.52
1:A:519:HIS:CE1	1:A:551:GLY:HA3	2.45	0.51
1:A:9[B]:GLU:HG2	1:A:743:PRO:CG	2.42	0.50
1:A:483:LYS:HE3	1:A:772[B]:GLN:HE22	1.77	0.49
1:A:818:ALA:HB2	1:A:823:LEU:HD11	1.94	0.49
1:A:242[B]:HIS:HD2	1:A:245[B]:ARG:HH22	1.60	0.48
1:A:373:PRO:HB3	3:A:908:EDO:H11	1.95	0.48
1:A:572:ASN:OD1	1:A:573[A]:PRO:CD	2.51	0.48
1:A:143:CME:CB	1:A:143:CME:HH	2.20	0.47
1:A:483:LYS:HE3	1:A:772[B]:GLN:NE2	2.29	0.47
1:A:172:HIS:HE1	1:A:324:GLY:O	1.97	0.47
3:A:924:EDO:H22	5:A:1186:HOH:O	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:439[A]:ARG:NH2	5:A:1569:HOH:O	2.45	0.46
1:A:483:LYS:HE2	1:A:772[B]:GLN:HE22	1.81	0.45
1:A:528:PHE:N	1:A:531:HIS:HD2	2.02	0.45
1:A:740:THR:N	1:A:741:PRO:CD	2.81	0.44
1:A:715[B]:THR:CG2	1:A:716:LYS:N	2.80	0.44
1:A:770:LEU:HD11	3:A:923:EDO:H21	2.01	0.41
1:A:360:LYS:HD2	3:A:924:EDO:H21	2.02	0.41
1:A:572:ASN:N	1:A:573[A]:PRO:HD2	2.35	0.41
1:A:408:VAL:O	1:A:429:GLY:HA3	2.21	0.41
1:A:81[B]:VAL:CG1	1:A:96:VAL:HB	2.50	0.41
1:A:242[B]:HIS:CD2	1:A:245[B]:ARG:HH22	2.37	0.41
1:A:59[B]:CME:HA	1:A:59[B]:CME:HE2	2.03	0.40
1:A:575:ARG:HA	1:A:576:PRO:HA	1.94	0.40
1:A:407:HIS:CE1	1:A:544:TYR:CD2	3.08	0.40
1:A:573[B]:PRO:CG	1:A:638:GLY:HA2	2.48	0.40
1:A:587:ASP:O	1:A:591:VAL:HG23	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	854/840 (102%)	823 (96%)	30 (4%)	1 (0%)	48 25

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	545	HIS

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	705/679 (104%)	695 (99%)	10 (1%)	59 31

All (10) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	49	ASP
1	A	126	GLU
1	A	151	LYS
1	A	575	ARG
1	A	664[A]	ASP
1	A	664[B]	ASP
1	A	746	MET
1	A	821	LYS
1	A	825[A]	VAL
1	A	825[B]	VAL

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	62	GLN
1	A	170	HIS
1	A	172	HIS
1	A	524	ASN
1	A	531	HIS
1	A	635	GLN
1	A	688	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

9 non-standard protein/DNA/RNA residues 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$
1	CME	A	139	1	8,9,10	0.82	0	6,9,11	1.11	0
1	KCX	A	247	1	10,11,12	0.95	1 (10%)	6,12,14	2.15	2 (33%)
1	CME	A	59[B]	-	8,9,10	0.81	0	6,9,11	1.30	1 (16%)
1	CME	A	207	1	8,9,10	0.71	0	6,9,11	1.23	1 (16%)
1	CME	A	143	1	8,9,10	1.02	0	6,9,11	1.65	2 (33%)
1	KCX	A	490	1,2	10,11,12	0.91	1 (10%)	6,12,14	1.70	2 (33%)
1	CME	A	329	1	8,9,10	0.81	0	6,9,11	1.11	1 (16%)
1	CME	A	592	1	8,9,10	0.79	0	6,9,11	1.08	1 (16%)
1	CME	A	59[A]	-	8,9,10	0.89	0	6,9,11	1.02	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
1	CME	A	139	1	-	2/5/8/10	-
1	KCX	A	247	1	-	3/9/10/12	-
1	CME	A	59[B]	-	-	0/5/8/10	-
1	CME	A	207	1	-	1/5/8/10	-
1	CME	A	143	1	-	2/5/8/10	-
1	KCX	A	490	1,2	-	0/9/10/12	-
1	CME	A	329	1	-	0/5/8/10	-
1	CME	A	592	1	-	3/5/8/10	-
1	CME	A	59[A]	-	-	3/5/8/10	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	490	KCX	OQ1-CX	2.25	1.25	1.21
1	A	247	KCX	OQ1-CX	2.14	1.25	1.21

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	247	KCX	OQ1-CX-NZ	-4.04	118.78	124.92
1	A	490	KCX	OQ1-CX-NZ	-3.12	120.17	124.92
1	A	247	KCX	CE-NZ-CX	2.57	126.34	121.98
1	A	59[B]	CME	CB-SG-SD	2.55	110.46	103.86
1	A	207	CME	CB-SG-SD	2.53	110.42	103.86
1	A	143	CME	CE-SD-SG	-2.50	92.47	103.46
1	A	490	KCX	CE-NZ-CX	2.21	125.73	121.98
1	A	592	CME	CB-SG-SD	2.16	109.46	103.86
1	A	329	CME	CB-SG-SD	2.12	109.34	103.86
1	A	143	CME	CZ-CE-SD	-2.07	106.46	113.39

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	59[A]	CME	SD-CE-CZ-OH
1	A	143	CME	CZ-CE-SD-SG
1	A	207	CME	SD-CE-CZ-OH
1	A	247	KCX	C-CA-CB-CG
1	A	592	CME	CZ-CE-SD-SG
1	A	592	CME	SD-CE-CZ-OH
1	A	59[A]	CME	CE-SD-SG-CB
1	A	247	KCX	CA-CB-CG-CD
1	A	592	CME	CA-CB-SG-SD
1	A	139	CME	SD-CE-CZ-OH
1	A	59[A]	CME	CZ-CE-SD-SG
1	A	139	CME	CZ-CE-SD-SG
1	A	143	CME	CA-CB-SG-SD
1	A	247	KCX	N-CA-CB-CG

There are no ring outliers.

2 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	59[B]	CME	1	0
1	A	143	CME	4	0

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 32 ligands modelled in this entry, 2 are monoatomic - leaving 30 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	EDO	A	923	-	3,3,3	0.45	0	2,2,2	0.30	0
3	EDO	A	925	-	3,3,3	0.43	0	2,2,2	0.37	0
3	EDO	A	930	-	3,3,3	0.48	0	2,2,2	0.22	0
3	EDO	A	908	-	3,3,3	0.43	0	2,2,2	0.34	0
3	EDO	A	920	-	3,3,3	0.42	0	2,2,2	0.39	0
3	EDO	A	909	-	3,3,3	0.42	0	2,2,2	0.40	0
3	EDO	A	905	-	3,3,3	0.43	0	2,2,2	0.35	0
3	EDO	A	928	-	3,3,3	0.46	0	2,2,2	0.43	0
4	HAE	A	929	2	4,4,4	0.21	0	2,4,4	0.20	0
3	EDO	A	924	-	3,3,3	0.45	0	2,2,2	0.25	0
3	EDO	A	926	-	3,3,3	0.45	0	2,2,2	0.32	0
3	EDO	A	927	-	3,3,3	0.45	0	2,2,2	0.36	0
3	EDO	A	916	-	3,3,3	0.41	0	2,2,2	0.40	0
3	EDO	A	907	-	3,3,3	0.42	0	2,2,2	0.39	0
3	EDO	A	914	-	3,3,3	0.40	0	2,2,2	0.37	0
3	EDO	A	903	-	3,3,3	0.43	0	2,2,2	0.39	0
3	EDO	A	915	-	3,3,3	0.43	0	2,2,2	0.38	0
3	EDO	A	919	-	3,3,3	0.42	0	2,2,2	0.30	0
3	EDO	A	913	-	3,3,3	0.42	0	2,2,2	0.38	0
3	EDO	A	931	-	3,3,3	0.40	0	2,2,2	0.43	0
3	EDO	A	910	-	3,3,3	0.41	0	2,2,2	0.30	0
3	EDO	A	917	-	3,3,3	0.49	0	2,2,2	0.39	0
3	EDO	A	922	-	3,3,3	0.42	0	2,2,2	0.39	0
3	EDO	A	918	-	3,3,3	0.42	0	2,2,2	0.39	0
3	EDO	A	921	-	3,3,3	0.43	0	2,2,2	0.39	0
3	EDO	A	912	-	3,3,3	0.43	0	2,2,2	0.38	0
3	EDO	A	932	-	3,3,3	0.42	0	2,2,2	0.41	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	EDO	A	906	-	3,3,3	0.45	0	2,2,2	0.39	0
3	EDO	A	911	-	3,3,3	0.40	0	2,2,2	0.38	0
3	EDO	A	904	-	3,3,3	0.43	0	2,2,2	0.45	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	A	923	-	-	1/1/1/1	-
3	EDO	A	925	-	-	1/1/1/1	-
3	EDO	A	930	-	-	0/1/1/1	-
3	EDO	A	908	-	-	0/1/1/1	-
3	EDO	A	920	-	-	0/1/1/1	-
3	EDO	A	909	-	-	0/1/1/1	-
3	EDO	A	905	-	-	0/1/1/1	-
3	EDO	A	928	-	-	0/1/1/1	-
4	HAE	A	929	2	-	0/1/2/2	-
3	EDO	A	924	-	-	0/1/1/1	-
3	EDO	A	926	-	-	1/1/1/1	-
3	EDO	A	927	-	-	1/1/1/1	-
3	EDO	A	916	-	-	1/1/1/1	-
3	EDO	A	907	-	-	1/1/1/1	-
3	EDO	A	914	-	-	0/1/1/1	-
3	EDO	A	903	-	-	0/1/1/1	-
3	EDO	A	915	-	-	0/1/1/1	-
3	EDO	A	919	-	-	1/1/1/1	-
3	EDO	A	913	-	-	0/1/1/1	-
3	EDO	A	931	-	-	1/1/1/1	-
3	EDO	A	910	-	-	1/1/1/1	-
3	EDO	A	917	-	-	1/1/1/1	-
3	EDO	A	922	-	-	1/1/1/1	-
3	EDO	A	918	-	-	0/1/1/1	-
3	EDO	A	921	-	-	0/1/1/1	-
3	EDO	A	912	-	-	0/1/1/1	-
3	EDO	A	932	-	-	0/1/1/1	-
3	EDO	A	906	-	-	0/1/1/1	-
3	EDO	A	911	-	-	0/1/1/1	-
3	EDO	A	904	-	-	0/1/1/1	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	910	EDO	O1-C1-C2-O2
3	A	917	EDO	O1-C1-C2-O2
3	A	927	EDO	O1-C1-C2-O2
3	A	919	EDO	O1-C1-C2-O2
3	A	925	EDO	O1-C1-C2-O2
3	A	907	EDO	O1-C1-C2-O2
3	A	922	EDO	O1-C1-C2-O2
3	A	931	EDO	O1-C1-C2-O2
3	A	923	EDO	O1-C1-C2-O2
3	A	916	EDO	O1-C1-C2-O2
3	A	926	EDO	O1-C1-C2-O2

There are no ring outliers.

5 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	923	EDO	2	0
3	A	908	EDO	1	0
3	A	924	EDO	2	0
3	A	910	EDO	1	0
3	A	917	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, 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	828/840 (98%)	-0.10	32 (3%)	43 50	8, 15, 27, 72	36 (4%)

All (32) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	125	ALA	5.5
1	A	665	SER	5.0
1	A	666	SER	4.8
1	A	572	ASN	4.8
1	A	825[A]	VAL	3.7
1	A	380	PHE	3.7
1	A	76	HIS	3.5
1	A	131	ASN	3.4
1	A	126	GLU	3.4
1	A	267	ASN	3.3
1	A	132	ARG	3.2
1	A	824	CYS	3.2
1	A	664[A]	ASP	3.1
1	A	330	GLY	3.1
1	A	206	ASP	3.0
1	A	598	GLU	2.9
1	A	822	LEU	2.8
1	A	545	HIS	2.7
1	A	823	LEU	2.6
1	A	268	CYS	2.5
1	A	663	CYS	2.5
1	A	591	VAL	2.3
1	A	594	HIS	2.3
1	A	821	LYS	2.3
1	A	144	LEU	2.3
1	A	826	SER	2.3
1	A	261	PHE	2.3

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Mol	Chain	Res	Type	RSRZ
1	A	381	SER	2.2
1	A	661	LEU	2.1
1	A	229	ASP	2.0
1	A	657	GLN	2.0
1	A	101[A]	SER	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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
1	CME	A	592	10/11	0.75	0.17	28,29,31,33	5
1	CME	A	59[B]	10/11	0.83	0.18	18,19,20,21	9
1	KCX	A	247	12/13	0.83	0.14	24,27,29,29	0
1	CME	A	59[A]	10/11	0.83	0.18	18,21,25,26	9
1	CME	A	143	10/11	0.85	0.17	24,28,36,36	2
1	CME	A	329	10/11	0.89	0.12	18,19,20,21	4
1	CME	A	207	10/11	0.95	0.10	21,21,24,25	0
1	CME	A	139	10/11	0.96	0.09	22,24,26,27	7
1	KCX	A	490	12/13	0.97	0.05	12,12,13,13	0

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, 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	EDO	A	917	4/4	0.53	0.23	38,40,42,44	0
3	EDO	A	924	4/4	0.64	0.31	33,34,34,37	0
3	EDO	A	928	4/4	0.66	0.22	41,41,41,43	0
3	EDO	A	907	4/4	0.67	0.25	50,51,51,52	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	EDO	A	927	4/4	0.68	0.18	42,43,44,44	0
3	EDO	A	916	4/4	0.68	0.19	34,35,36,38	0
3	EDO	A	908	4/4	0.69	0.28	29,32,32,34	0
3	EDO	A	925	4/4	0.69	0.20	48,48,48,49	0
3	EDO	A	905	4/4	0.70	0.18	36,36,38,39	0
3	EDO	A	918	4/4	0.70	0.18	53,54,55,56	0
3	EDO	A	922	4/4	0.71	0.22	57,57,58,59	0
3	EDO	A	920	4/4	0.72	0.20	49,49,50,50	0
3	EDO	A	926	4/4	0.72	0.18	37,38,38,39	0
3	EDO	A	912	4/4	0.73	0.15	42,42,42,43	0
3	EDO	A	923	4/4	0.76	0.28	33,35,35,35	0
3	EDO	A	919	4/4	0.77	0.17	38,39,39,40	0
3	EDO	A	931	4/4	0.78	0.19	45,45,45,45	0
3	EDO	A	910	4/4	0.80	0.18	34,35,35,35	0
3	EDO	A	914	4/4	0.82	0.16	35,36,36,37	0
3	EDO	A	913	4/4	0.82	0.13	43,43,43,44	0
3	EDO	A	932	4/4	0.82	0.18	51,51,52,52	0
3	EDO	A	921	4/4	0.83	0.12	42,42,42,43	0
3	EDO	A	909	4/4	0.83	0.14	31,31,32,32	0
3	EDO	A	904	4/4	0.84	0.14	23,24,25,26	0
3	EDO	A	930	4/4	0.85	0.12	20,22,22,24	0
3	EDO	A	911	4/4	0.87	0.17	34,34,34,36	0
3	EDO	A	915	4/4	0.90	0.10	31,31,31,32	0
3	EDO	A	906	4/4	0.93	0.09	24,24,24,25	0
3	EDO	A	903	4/4	0.95	0.07	22,23,23,23	0
4	HAE	A	929	5/5	0.96	0.07	14,15,16,17	0
2	NI	A	901	1/1	1.00	0.01	11,11,11,11	0
2	NI	A	902	1/1	1.00	0.01	13,13,13,13	0

6.5 Other polymers

There are no such residues in this entry.