



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 5, 2024 – 02:39 pm BST

PDB ID : 6Q3O
Title : PROTEIN-AROMATIC FOLDAMER COMPLEX CRYSTAL STRUCTURE
Authors : Zeberko, C.; Langlois d'Estaintot, B.; Fischer, L.; Granier, T.; Kauffmann, B.;
Huc, I.
Deposited on : 2018-12-04
Resolution : 2.23 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 : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 3.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.003 (Gargrove)
Density-Fitness : 1.0.11
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

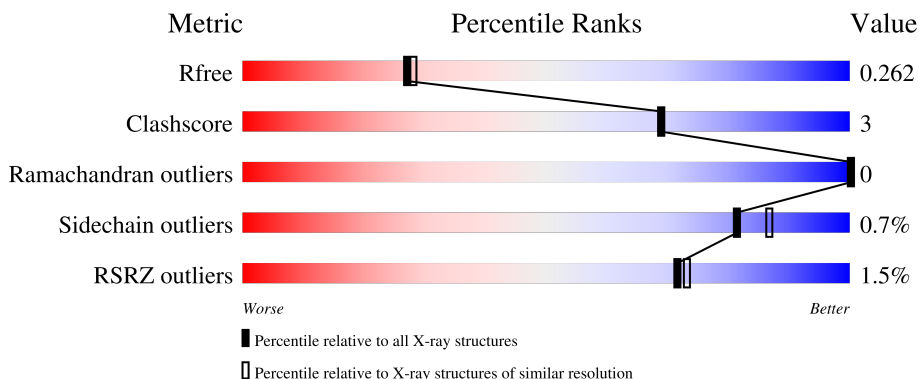
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.23 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.





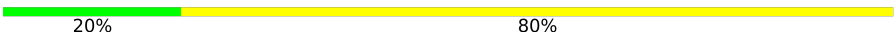
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	3139 (2.26-2.22)
Clashscore	180529	3381 (2.26-2.22)
Ramachandran outliers	177936	3334 (2.26-2.22)
Sidechain outliers	177891	3335 (2.26-2.22)
RSRZ outliers	164620	3138 (2.26-2.22)

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	259	 91% 8%
1	B	259	 90% 9%
1	C	259	 90% 8%
1	D	259	 88% 11%
2	E	5	 20% 60% 20%

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Mol	Chain	Length	Quality of chain
2	F	5	 20% 40% 40%
2	G	5	 20% 80%
2	H	5	 20% 80%

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 9280 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 Carbonic anhydrase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	257	2027	1303	347	375	2	0	0	0
1	B	257	2036	1309	350	375	2	0	1	0
1	C	257	2035	1307	350	376	2	0	0	0
1	D	257	2041	1313	351	375	2	0	1	0

- Molecule 2 is a protein called Aromatic foldamer.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	H	5	91	65	13	13	0	0	0
2	E	5	91	65	13	13	0	0	0
2	F	5	91	65	13	13	0	0	0
2	G	5	91	65	13	13	0	0	0

- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn).

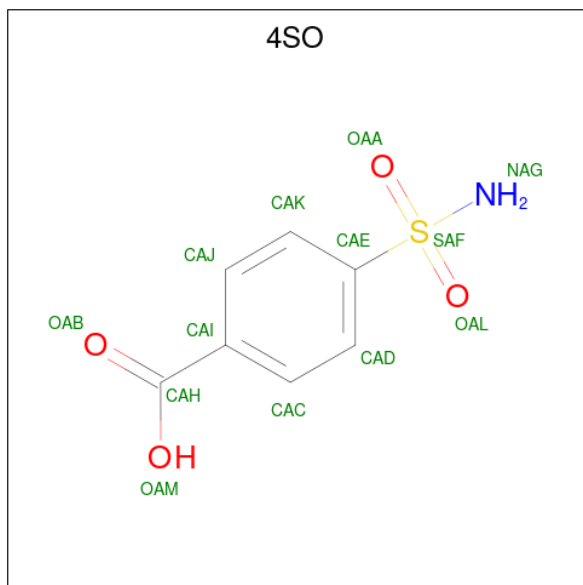
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	10	Total	Zn	0	0
			10	10		
3	B	8	Total	Zn	0	0
			8	8		
3	C	5	Total	Zn	0	0
			5	5		
3	D	6	Total	Zn	0	0
			6	6		

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

- Molecule 5 is 4-sulfamoylbenzoic acid (three-letter code: 4SO) (formula: $C_7H_7NO_4S$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	H	1	Total	C	N	O	S	0	0
			12	7	1	3	1		
5	E	1	Total	C	N	O	S	0	0
			12	7	1	3	1		

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	F	1	Total	C	N	O	S	0	0
			12	7	1	3	1		
5	G	1	Total	C	N	O	S	0	0
			12	7	1	3	1		

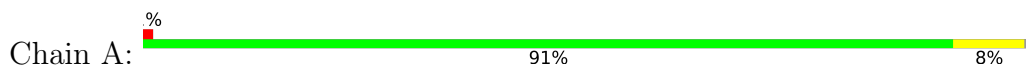
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	197	Total	O	0	0
			197	197		
6	B	179	Total	O	0	0
			179	179		
6	C	132	Total	O	0	0
			132	132		
6	D	155	Total	O	0	0
			155	155		
6	H	5	Total	O	0	0
			5	5		
6	E	10	Total	O	0	0
			10	10		
6	F	6	Total	O	0	0
			6	6		
6	G	10	Total	O	0	0
			10	10		

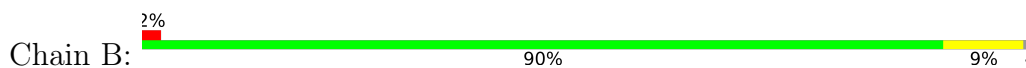
3 Residue-property plots [i](#)

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.

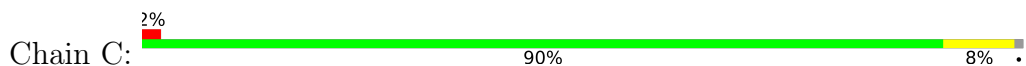
- Molecule 1: Carbonic anhydrase 2



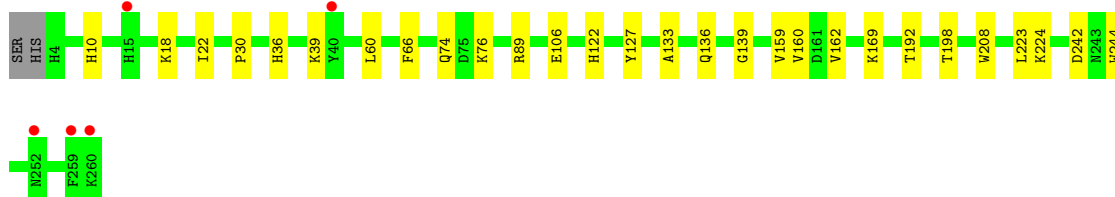
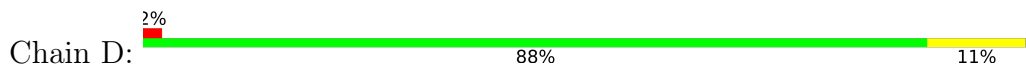
- Molecule 1: Carbonic anhydrase 2



- Molecule 1: Carbonic anhydrase 2



- Molecule 1: Carbonic anhydrase 2

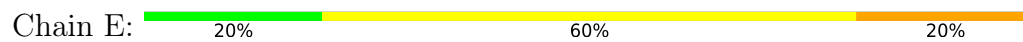


- Molecule 2: Aromatic foldamer

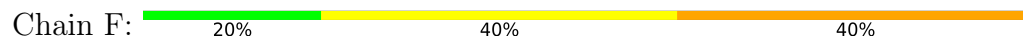




- Molecule 2: Aromatic foldamer



- Molecule 2: Aromatic foldamer



- Molecule 2: Aromatic foldamer



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	59.11Å 76.48Å 81.42Å 66.10° 86.83° 73.60°	Depositor
Resolution (Å)	28.29 – 2.23 28.29 – 2.23	Depositor EDS
% Data completeness (in resolution range)	99.5 (28.29-2.23) 99.5 (28.29-2.23)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.10	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.95 (at 2.24Å)	Xtrriage
Refinement program	REFMAC 5.8.0238	Depositor
R, R_{free}	0.212 , 0.253 0.221 , 0.262	Depositor DCC
R_{free} test set	3009 reflections (4.95%)	wwPDB-VP
Wilson B-factor (Å ²)	21.2	Xtrriage
Anisotropy	0.473	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 28.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	9280	wwPDB-VP
Average B, all atoms (Å ²)	33.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.95% 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: GOL, A1IMX, QUK, 4SO, QVE, ZN, ACE, QUJ

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	0.73	0/2088	0.86	0/2839
1	B	0.72	0/2100	0.87	0/2854
1	C	0.75	0/2096	0.86	0/2848
1	D	0.74	0/2106	0.84	0/2861
All	All	0.74	0/8390	0.86	0/11402

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
2	E	0	1
2	F	0	2
All	All	0	3

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	E	4	QUK	Peptide
2	F	2	QUJ	Peptide
2	F	4	QUK	Peptide

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	2027	0	1956	13	0
1	B	2036	0	1971	14	0
1	C	2035	0	1976	13	0
1	D	2041	0	1983	16	0
2	E	91	0	3	0	0
2	F	91	0	3	0	0
2	G	91	0	3	0	0
2	H	91	0	3	0	0
3	A	10	0	0	0	0
3	B	8	0	0	0	0
3	C	5	0	0	0	0
3	D	6	0	0	0	0
4	C	6	0	8	0	0
5	E	12	0	5	0	0
5	F	12	0	5	0	0
5	G	12	0	5	1	0
5	H	12	0	5	0	0
6	A	197	0	0	3	0
6	B	179	0	0	2	0
6	C	132	0	0	0	0
6	D	155	0	0	4	0
6	E	10	0	0	0	0
6	F	6	0	0	0	0
6	G	10	0	0	0	0
6	H	5	0	0	0	0
All	All	9280	0	7926	56	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 (56) 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:160:VAL:HG13	1:B:224:LYS:HG3	1.63	0.79
1:D:74:GLN:OE1	1:D:76:LYS:HE2	1.92	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:138:ASP:HA	6:B:412:HOH:O	1.99	0.63
1:D:160:VAL:HG13	1:D:224:LYS:HG3	1.83	0.61
1:A:160:VAL:HG13	1:A:224:LYS:HG3	1.86	0.57
1:C:160:VAL:HG13	1:C:224:LYS:HG3	1.91	0.52
1:B:60:LEU:O	1:B:66:PHE:HA	2.12	0.50
1:D:60:LEU:O	1:D:66:PHE:HA	2.10	0.50
1:A:138:ASP:HA	6:A:404:HOH:O	2.11	0.50
1:A:127:TYR:CE1	1:A:136:GLN:HG3	2.48	0.49
1:B:127:TYR:CE1	1:B:136:GLN:HG3	2.48	0.49
1:D:18:LYS:HE3	6:D:517:HOH:O	2.12	0.49
1:C:223:LEU:HD23	1:C:227:LYS:NZ	2.28	0.48
1:C:60:LEU:O	1:C:66:PHE:HA	2.13	0.48
1:A:60:LEU:O	1:A:66:PHE:HA	2.13	0.48
1:B:133:ALA:O	1:B:139:GLY:HA3	2.14	0.48
1:A:27:ARG:HG2	1:A:253:ARG:HD3	1.96	0.48
1:A:133:ALA:O	1:A:139:GLY:HA3	2.14	0.48
1:B:27:ARG:NH2	6:B:406:HOH:O	2.47	0.47
1:B:229:ASN:HB3	1:B:231:ASN:OD1	2.14	0.47
1:D:159:VAL:O	1:D:162:VAL:HG22	2.14	0.47
1:C:133:ALA:O	1:C:139:GLY:HA3	2.14	0.47
1:D:133:ALA:O	1:D:139:GLY:HA3	2.15	0.47
1:D:127:TYR:CE1	1:D:136:GLN:HG3	2.50	0.47
1:A:192:THR:HA	1:A:208:TRP:O	2.16	0.46
1:C:127:TYR:CE1	1:C:136:GLN:HG3	2.51	0.46
1:D:36:HIS:O	1:D:39:LYS:HE2	2.16	0.46
1:D:74:GLN:HG2	6:D:537:HOH:O	2.16	0.45
1:C:229:ASN:HB3	1:C:231:ASN:OD1	2.17	0.45
1:B:192:THR:HA	1:B:208:TRP:O	2.17	0.45
1:D:192:THR:HA	1:D:208:TRP:O	2.16	0.45
1:B:126:LYS:HE3	1:B:127:TYR:CZ	2.53	0.44
1:A:15:HIS:HB2	6:A:558:HOH:O	2.18	0.44
1:D:242:ASP:HA	1:D:244:TRP:CD1	2.53	0.43
1:B:224:LYS:HD2	1:B:224:LYS:HA	1.74	0.43
1:D:169:LYS:HD2	6:D:507:HOH:O	2.18	0.43
1:C:89:ARG:O	1:C:122:HIS:HA	2.18	0.43
1:B:89:ARG:O	1:B:122:HIS:HA	2.18	0.43
1:D:198:THR:OG1	5:G:101:4SO:NAG	2.52	0.42
1:C:192:THR:HA	1:C:208:TRP:O	2.19	0.42
1:B:242:ASP:HA	1:B:244:TRP:CD1	2.55	0.42
1:C:164:ASP:OD2	1:C:224:LYS:NZ	2.53	0.42
1:D:89:ARG:O	1:D:122:HIS:HA	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:223:LEU:HD23	1:C:227:LYS:HZ3	1.85	0.42
1:D:10:HIS:ND1	6:D:401:HOH:O	2.20	0.42
1:A:89:ARG:O	1:A:122:HIS:HA	2.20	0.42
1:D:30:PRO:HG3	1:D:106:GLU:HB3	2.02	0.41
1:C:200:PRO:HA	1:C:202:LEU:HG	2.02	0.41
1:C:126:LYS:HE3	1:C:127:TYR:CZ	2.55	0.41
1:A:30:PRO:HG3	1:A:106:GLU:HB3	2.03	0.41
1:C:242:ASP:HA	1:C:244:TRP:CD1	2.55	0.41
1:B:30:PRO:HG3	1:B:106:GLU:HB3	2.03	0.41
1:A:158:LYS:NZ	6:A:407:HOH:O	2.51	0.41
1:B:200:PRO:HA	1:B:202:LEU:HG	2.02	0.41
1:A:242:ASP:HA	1:A:244:TRP:CD1	2.56	0.41
1:A:22:ILE:HD12	1:A:22:ILE:HA	1.95	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	255/259 (98%)	246 (96%)	9 (4%)	0	100	100
1	B	256/259 (99%)	246 (96%)	10 (4%)	0	100	100
1	C	255/259 (98%)	245 (96%)	10 (4%)	0	100	100
1	D	256/259 (99%)	246 (96%)	10 (4%)	0	100	100
All	All	1022/1036 (99%)	983 (96%)	39 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	216/224 (96%)	216 (100%)	0	100	100
1	B	217/224 (97%)	215 (99%)	2 (1%)	75	82
1	C	219/224 (98%)	217 (99%)	2 (1%)	75	82
1	D	219/224 (98%)	217 (99%)	2 (1%)	75	82
All	All	871/896 (97%)	865 (99%)	6 (1%)	81	87

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	80	LYS
1	B	224	LYS
1	C	27	ARG
1	C	223	LEU
1	D	22	ILE
1	D	223	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	53	GLN
1	A	229	ASN
1	C	177	ASN
1	C	229	ASN
1	D	229	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

16 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
2	QUJ	G	2	2	19,19,20	1.93	1 (5%)	23,26,28	2.24	4 (17%)
2	QVE	F	5	2	20,20,20	2.36	3 (15%)	27,28,28	1.76	5 (18%)
2	QUJ	F	2	2	19,19,20	1.93	1 (5%)	23,26,28	2.31	5 (21%)
2	QVE	H	5	2	20,20,20	2.11	2 (10%)	27,28,28	1.80	5 (18%)
2	QVE	G	5	2	20,20,20	2.00	2 (10%)	27,28,28	1.58	3 (11%)
2	A1IMX	G	3	5,2	36,36,37	1.96	3 (8%)	38,48,50	1.68	7 (18%)
2	QVE	E	5	2	20,20,20	2.15	2 (10%)	27,28,28	1.65	5 (18%)
2	A1IMX	F	3	5,2	36,36,37	1.86	2 (5%)	38,48,50	1.75	5 (13%)
2	QUK	F	4	2	19,19,20	2.49	2 (10%)	22,25,27	1.80	4 (18%)
2	QUK	G	4	2	19,19,20	1.67	2 (10%)	22,25,27	2.25	5 (22%)
2	QUJ	H	2	2	19,19,20	2.61	4 (21%)	23,26,28	1.88	4 (17%)
2	QUK	E	4	2	19,19,20	2.13	2 (10%)	22,25,27	2.13	4 (18%)
2	QUJ	E	2	2	19,19,20	2.43	1 (5%)	23,26,28	1.60	5 (21%)
2	A1IMX	E	3	5,2	36,36,37	1.84	5 (13%)	38,48,50	1.87	8 (21%)
2	A1IMX	H	3	5,2	36,36,37	2.18	6 (16%)	38,48,50	2.03	12 (31%)
2	QUK	H	4	2	19,19,20	1.89	3 (15%)	22,25,27	1.98	6 (27%)

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	QUJ	G	2	2	-	1/7/7/9	0/2/2/2
2	QVE	F	5	2	-	0/9/9/9	0/2/2/2
2	QUJ	F	2	2	-	2/7/7/9	0/2/2/2
2	QVE	H	5	2	-	0/9/9/9	0/2/2/2
2	QVE	G	5	2	-	0/9/9/9	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	A1IMX	G	3	5,2	-	2/16/17/19	0/4/4/4
2	QVE	E	5	2	-	0/9/9/9	0/2/2/2
2	A1IMX	F	3	5,2	-	3/16/17/19	0/4/4/4
2	QUK	F	4	2	-	1/7/7/9	0/2/2/2
2	QUK	G	4	2	-	1/7/7/9	0/2/2/2
2	QUJ	H	2	2	-	0/7/7/9	0/2/2/2
2	QUK	E	4	2	-	1/7/7/9	0/2/2/2
2	QUJ	E	2	2	-	3/7/7/9	0/2/2/2
2	A1IMX	E	3	5,2	-	1/16/17/19	0/4/4/4
2	A1IMX	H	3	5,2	-	4/16/17/19	0/4/4/4
2	QUK	H	4	2	-	1/7/7/9	0/2/2/2

All (41) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	G	3	A1IMX	CA-C	-9.97	1.38	1.48
2	H	3	A1IMX	CA-C	-9.64	1.38	1.48
2	E	2	QUJ	CA-C	-9.62	1.38	1.48
2	H	2	QUJ	CA-C	-9.62	1.38	1.48
2	F	4	QUK	C10-C	-9.44	1.38	1.48
2	F	3	A1IMX	CA-C	-8.93	1.39	1.48
2	F	5	QVE	CA-C	-8.02	1.39	1.50
2	E	5	QVE	CA-C	-7.88	1.39	1.50
2	G	2	QUJ	CA-C	-7.53	1.40	1.48
2	E	4	QUK	C10-C	-7.35	1.40	1.48
2	F	2	QUJ	CA-C	-7.09	1.41	1.48
2	G	5	QVE	CA-C	-6.91	1.41	1.50
2	E	3	A1IMX	CA-C	-6.70	1.41	1.48
2	H	4	QUK	C10-C	-6.48	1.41	1.48
2	G	4	QUK	C10-C	-6.15	1.42	1.48
2	H	5	QVE	OXT-C	-6.11	1.12	1.30
2	H	5	QVE	CA-C	-5.94	1.42	1.50
2	E	3	A1IMX	CA-N1	5.07	1.38	1.33
2	F	5	QVE	OXT-C	-5.02	1.15	1.30
2	E	4	QUK	C10-N11	4.68	1.38	1.33
2	F	4	QUK	C10-N11	4.29	1.37	1.33
2	H	3	A1IMX	N22-N23	-4.14	1.26	1.34
2	E	3	A1IMX	N22-N23	3.80	1.41	1.34
2	H	4	QUK	C10-N11	3.61	1.37	1.33
2	G	5	QVE	O-C	-3.58	1.12	1.22
2	E	3	A1IMX	N23-N24	-3.19	1.28	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	H	3	A1IMX	CA-N1	3.14	1.36	1.33
2	H	3	A1IMX	C25-N24	-3.01	1.42	1.47
2	G	3	A1IMX	CA-N1	2.98	1.36	1.33
2	H	3	A1IMX	N23-N24	-2.83	1.28	1.34
2	G	3	A1IMX	N23-N24	-2.78	1.29	1.34
2	E	5	QVE	O-C	-2.76	1.14	1.22
2	G	4	QUK	C10-N11	2.72	1.36	1.33
2	H	4	QUK	C4-C5	2.61	1.42	1.36
2	H	2	QUJ	OB-CG	2.60	1.51	1.44
2	F	3	A1IMX	C34-C32	-2.49	1.42	1.51
2	H	2	QUJ	C2-C7	-2.45	1.38	1.42
2	H	2	QUJ	CA-N11	2.39	1.35	1.33
2	E	3	A1IMX	C34-C32	-2.28	1.43	1.51
2	F	5	QVE	C2-C7	-2.15	1.38	1.42
2	H	3	A1IMX	C34-C32	-2.13	1.44	1.51

All (87) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	G	2	QUJ	CA-N11-C7	8.00	124.18	118.11
2	F	3	A1IMX	CA-N1-C71	7.58	123.86	118.11
2	H	3	A1IMX	CA-N1-C71	7.17	123.55	118.11
2	F	2	QUJ	CA-N11-C7	6.92	123.36	118.11
2	G	4	QUK	C10-N11-C7	6.88	123.33	118.11
2	H	2	QUJ	CA-N11-C7	6.58	123.10	118.11
2	F	5	QVE	CG-OB-C8	-6.27	109.81	116.95
2	E	3	A1IMX	CA-N1-C71	6.23	122.83	118.11
2	E	5	QVE	CG-OB-C8	-6.19	109.91	116.95
2	F	2	QUJ	C-CA-N11	6.18	120.72	114.66
2	H	5	QVE	CG-OB-C8	-6.15	109.94	116.95
2	G	5	QVE	CG-OB-C8	-5.99	110.13	116.95
2	E	4	QUK	C10-N11-C7	5.87	122.56	118.11
2	E	3	A1IMX	C-CA-N1	5.85	120.39	114.66
2	E	4	QUK	C-C10-N11	5.58	120.13	114.66
2	G	3	A1IMX	CA-N1-C71	5.55	122.32	118.11
2	H	4	QUK	C10-N11-C7	5.08	121.96	118.11
2	F	4	QUK	C10-N11-C7	5.02	121.91	118.11
2	G	2	QUJ	C-CA-N11	4.89	119.46	114.66
2	E	2	QUJ	CA-N11-C7	4.79	121.74	118.11
2	G	4	QUK	C-C10-N11	4.10	118.68	114.66
2	G	4	QUK	O-C-C10	-4.07	120.36	124.22
2	F	4	QUK	C-C10-N11	3.81	118.40	114.66

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	2	QUJ	C-CA-N11	3.70	118.29	114.66
2	H	4	QUK	C-C10-N11	3.64	118.23	114.66
2	H	5	QVE	OXT-C-CA	3.52	122.69	114.69
2	F	2	QUJ	C3-C2-N	3.49	127.34	120.36
2	F	3	A1IMX	C35-C22-N	3.47	127.29	120.36
2	G	2	QUJ	C3-C2-N	3.46	127.28	120.36
2	H	4	QUK	C3-CA-N	3.44	127.25	120.36
2	G	3	A1IMX	N22-N23-N24	3.42	109.89	107.31
2	H	3	A1IMX	C28-C33-C32	3.41	123.49	119.73
2	H	3	A1IMX	C27-O27-C28	3.35	126.69	117.93
2	E	3	A1IMX	C35-C22-N	3.30	126.97	120.36
2	G	4	QUK	C3-CA-N	3.28	126.92	120.36
2	H	3	A1IMX	C35-C22-N	3.27	126.89	120.36
2	H	3	A1IMX	N22-N23-N24	3.22	109.74	107.31
2	G	3	A1IMX	C27-O27-C28	3.19	126.28	117.93
2	E	3	A1IMX	C27-O27-C28	3.19	126.26	117.93
2	H	4	QUK	O-C-C10	-3.15	121.24	124.22
2	F	5	QVE	OXT-C-CA	3.12	121.80	114.69
2	H	2	QUJ	C-CA-N11	3.10	117.70	114.66
2	F	2	QUJ	C7-C2-N	-3.05	112.26	118.07
2	G	3	A1IMX	C35-C22-N	2.98	126.31	120.36
2	H	4	QUK	C7-CA-N	-2.97	112.40	118.07
2	H	4	QUK	CG-OB-C8	2.92	126.47	117.74
2	E	4	QUK	C3-CA-N	2.89	126.15	120.36
2	E	2	QUJ	C3-C2-N	2.89	126.14	120.36
2	E	4	QUK	O-C-C10	-2.88	121.49	124.22
2	H	2	QUJ	C3-C2-N	2.85	126.06	120.36
2	F	4	QUK	O-C-C10	-2.76	121.61	124.22
2	F	4	QUK	C3-CA-N	2.73	125.81	120.36
2	H	3	A1IMX	C25-C26-C27	-2.68	102.91	112.68
2	G	3	A1IMX	O-C-CA	-2.60	121.75	124.22
2	H	5	QVE	C-CA-N11	2.55	120.35	116.28
2	F	2	QUJ	O-C-CA	-2.52	121.83	124.22
2	G	4	QUK	C7-CA-N	-2.52	113.26	118.07
2	E	5	QVE	C3-C2-N	2.50	125.36	120.36
2	F	3	A1IMX	C28-C33-C32	2.48	122.46	119.73
2	F	3	A1IMX	C91-CA-C	2.48	123.37	121.23
2	E	3	A1IMX	C71-C22-N	-2.46	113.38	118.07
2	H	3	A1IMX	C-CA-N1	2.40	117.02	114.66
2	H	3	A1IMX	C20-C21-N22	-2.32	107.89	111.34
2	E	3	A1IMX	N22-N23-N24	2.32	109.06	107.31
2	H	3	A1IMX	C91-CA-C	2.30	123.22	121.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	G	2	QUJ	C7-C2-N	-2.28	113.73	118.07
2	E	3	A1IMX	C28-C33-C32	2.27	122.23	119.73
2	F	3	A1IMX	C71-C22-N	-2.26	113.76	118.07
2	H	2	QUJ	C7-C2-N	-2.24	113.80	118.07
2	E	5	QVE	C-CA-N11	2.22	119.83	116.28
2	E	3	A1IMX	O-C-CA	-2.21	122.13	124.22
2	G	5	QVE	C-CA-N11	2.19	119.77	116.28
2	H	3	A1IMX	O-C-CA	-2.15	122.19	124.22
2	H	3	A1IMX	C51-OB1-C81	-2.13	111.37	117.74
2	E	2	QUJ	O-C-CA	-2.13	122.21	124.22
2	G	3	A1IMX	C20-C21-N22	-2.12	108.19	111.34
2	H	5	QVE	C2-C7-N11	2.12	120.73	118.64
2	H	5	QVE	CA-N11-C7	2.11	121.69	117.24
2	E	5	QVE	CA-N11-C7	2.11	121.69	117.24
2	F	5	QVE	O-C-CA	-2.09	116.99	121.24
2	F	5	QVE	CA-N11-C7	2.09	121.65	117.24
2	E	2	QUJ	C7-C2-N	-2.07	114.11	118.07
2	G	3	A1IMX	C61-C71-N1	-2.06	118.53	122.78
2	E	5	QVE	C7-C2-N	-2.05	114.16	118.07
2	F	5	QVE	C3-C2-N	2.05	124.46	120.36
2	G	5	QVE	CA-N11-C7	2.02	121.50	117.24
2	H	3	A1IMX	C61-C71-N1	-2.02	118.61	122.78

There are no chirality outliers.

All (20) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	E	2	QUJ	O-C-CA-N11
2	H	3	A1IMX	O-C-CA-C91
2	H	3	A1IMX	O-C-CA-N1
2	F	3	A1IMX	O-C-CA-C91
2	F	3	A1IMX	O-C-CA-N1
2	H	3	A1IMX	C25-C26-C27-O27
2	E	4	QUK	CG-CD-CE-N1
2	F	2	QUJ	CE2-CD-CG-OB
2	F	2	QUJ	CE1-CD-CG-OB
2	E	3	A1IMX	C25-C26-C27-O27
2	G	3	A1IMX	C25-C26-C27-O27
2	E	2	QUJ	C9-C8-OB-CG
2	H	3	A1IMX	C26-C27-O27-C28
2	E	2	QUJ	C6-C8-OB-CG
2	H	4	QUK	CE-CD-CG-OB

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Mol	Chain	Res	Type	Atoms
2	F	3	A1IMX	C25-C26-C27-O27
2	F	4	QUK	CG-CD-CE-N1
2	G	4	QUK	CG-CD-CE-N1
2	G	2	QUJ	CE1-CD-CG-OB
2	G	3	A1IMX	O-C-CA-N1

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 34 ligands modelled in this entry, 29 are monoatomic - leaving 5 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
5	4SO	H	101	3,2	12,12,13	2.68	3 (25%)	17,17,19	1.33	2 (11%)
4	GOL	C	304	-	5,5,5	0.23	0	5,5,5	0.28	0
5	4SO	E	101	3,2	12,12,13	3.16	4 (33%)	17,17,19	1.26	1 (5%)
5	4SO	G	101	3,2	12,12,13	3.01	4 (33%)	17,17,19	2.13	3 (17%)
5	4SO	F	101	3,2	12,12,13	3.13	4 (33%)	17,17,19	1.74	4 (23%)

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
5	4SO	H	101	3,2	-	1/8/8/10	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GOL	C	304	-	-	0/4/4/4	-
5	4SO	E	101	3,2	-	2/8/8/10	0/1/1/1
5	4SO	G	101	3,2	-	2/8/8/10	0/1/1/1
5	4SO	F	101	3,2	-	2/8/8/10	0/1/1/1

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	G	101	4SO	OAA-SAF	7.22	1.57	1.43
5	E	101	4SO	OAL-SAF	6.55	1.55	1.43
5	G	101	4SO	OAL-SAF	6.43	1.55	1.43
5	F	101	4SO	OAA-SAF	6.31	1.55	1.43
5	E	101	4SO	OAA-SAF	6.20	1.55	1.43
5	F	101	4SO	OAL-SAF	6.02	1.54	1.43
5	H	101	4SO	OAL-SAF	5.71	1.54	1.43
5	H	101	4SO	OAA-SAF	5.61	1.54	1.43
5	F	101	4SO	SAF-NAG	-5.50	1.49	1.60
5	E	101	4SO	CAE-SAF	-5.26	1.68	1.77
5	H	101	4SO	CAE-SAF	3.40	1.82	1.77
5	G	101	4SO	CAI-CAH	-2.23	1.40	1.47
5	G	101	4SO	SAF-NAG	2.15	1.64	1.60
5	F	101	4SO	CAE-SAF	-2.08	1.73	1.77
5	E	101	4SO	CAI-CAH	-2.01	1.41	1.47

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	G	101	4SO	OAL-SAF-OAA	-5.85	109.14	118.76
5	G	101	4SO	OAL-SAF-CAE	4.68	112.57	107.35
5	F	101	4SO	CAE-SAF-NAG	4.57	114.85	108.38
5	H	101	4SO	OAA-SAF-NAG	4.04	113.35	107.36
5	F	101	4SO	OAA-SAF-CAE	-3.42	103.54	107.35
5	F	101	4SO	OAL-SAF-OAA	-3.00	113.82	118.76
5	E	101	4SO	OAA-SAF-NAG	2.89	111.65	107.36
5	G	101	4SO	CAE-SAF-NAG	2.69	112.19	108.38
5	F	101	4SO	OAA-SAF-NAG	2.33	110.82	107.36
5	H	101	4SO	OAL-SAF-NAG	-2.02	104.38	107.36

There are no chirality outliers.

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	G	101	4SO	CAD-CAE-SAF-OAL
5	F	101	4SO	CAK-CAE-SAF-OAL
5	G	101	4SO	CAK-CAE-SAF-OAL
5	F	101	4SO	CAD-CAE-SAF-OAL
5	E	101	4SO	CAK-CAE-SAF-OAL
5	E	101	4SO	CAD-CAE-SAF-OAL
5	H	101	4SO	CAK-CAE-SAF-OAL

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	G	101	4SO	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	257/259 (99%)	-0.05	2 (0%) 82 84	23, 30, 40, 45	0
1	B	257/259 (99%)	0.00	4 (1%) 70 71	18, 33, 42, 48	1 (0%)
1	C	257/259 (99%)	0.17	4 (1%) 70 71	24, 36, 53, 66	0
1	D	257/259 (99%)	0.25	5 (1%) 66 66	21, 38, 54, 64	1 (0%)
2	E	0/5	-	-	-	-
2	F	0/5	-	-	-	-
2	G	0/5	-	-	-	-
2	H	0/5	-	-	-	-
All	All	1028/1056 (97%)	0.09	15 (1%) 71 73	18, 34, 51, 66	2 (0%)

All (15) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	260	LYS	4.6
1	D	252	ASN	3.8
1	C	260	LYS	3.5
1	C	252	ASN	3.4
1	B	15	HIS	2.9
1	B	252	ASN	2.9
1	A	260	LYS	2.9
1	D	15[A]	HIS	2.6
1	A	252	ASN	2.5
1	B	46	PRO	2.5
1	C	46	PRO	2.4
1	C	10	HIS	2.3
1	D	40	TYR	2.2
1	B	260	LYS	2.2
1	D	259	PHE	2.1

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
2	QUK	E	4	18/19	0.89	0.09	18,19,21,21	0
2	QVE	E	5	19/19	0.90	0.09	19,19,21,23	0
2	QVE	F	5	19/19	0.90	0.09	17,19,23,24	0
2	A1IMX	H	3	33/34	0.91	0.09	16,18,21,22	0
2	QUJ	E	2	18/19	0.91	0.09	18,19,22,23	0
2	A1IMX	E	3	33/34	0.92	0.08	16,18,20,20	0
2	QUK	F	4	18/19	0.92	0.09	17,18,20,20	0
2	A1IMX	G	3	33/34	0.92	0.08	16,18,21,21	0
2	QUK	H	4	18/19	0.92	0.08	16,18,20,21	0
2	QUJ	G	2	18/19	0.93	0.08	17,19,22,23	0
2	QUK	G	4	18/19	0.93	0.08	17,19,20,21	0
2	QVE	H	5	19/19	0.93	0.08	16,18,20,20	0
2	QUJ	H	2	18/19	0.93	0.08	16,18,21,22	0
2	QUJ	F	2	18/19	0.93	0.08	15,18,21,21	0
2	A1IMX	F	3	33/34	0.94	0.07	17,18,19,20	0
2	QVE	G	5	19/19	0.94	0.07	18,19,20,21	0

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	GOL	C	304	6/6	0.87	0.14	19,19,21,21	0
3	ZN	B	306	1/1	0.91	0.11	43,43,43,43	1
3	ZN	D	306	1/1	0.93	0.26	45,45,45,45	0
3	ZN	B	308	1/1	0.95	0.20	39,39,39,39	0
3	ZN	C	306	1/1	0.95	0.09	21,21,21,21	1
3	ZN	A	306	1/1	0.95	0.06	18,18,18,18	1

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	ZN	A	304	1/1	0.95	0.10	53,53,53,53	0
3	ZN	B	305	1/1	0.96	0.15	39,39,39,39	1
3	ZN	D	304	1/1	0.96	0.11	37,37,37,37	1
3	ZN	D	305	1/1	0.96	0.05	57,57,57,57	0
3	ZN	A	305	1/1	0.96	0.15	45,45,45,45	0
3	ZN	B	304	1/1	0.96	0.06	54,54,54,54	0
5	4SO	F	101	12/13	0.96	0.09	16,18,19,19	0
5	4SO	E	101	12/13	0.97	0.07	16,17,19,19	0
3	ZN	A	310	1/1	0.97	0.25	37,37,37,37	0
5	4SO	G	101	12/13	0.97	0.06	16,17,19,19	0
3	ZN	A	302	1/1	0.98	0.17	34,34,34,34	0
3	ZN	C	303	1/1	0.98	0.08	49,49,49,49	0
3	ZN	C	305	1/1	0.98	0.04	56,56,56,56	0
5	4SO	H	101	12/13	0.98	0.06	15,16,17,18	0
3	ZN	A	307	1/1	0.98	0.05	18,18,18,18	0
3	ZN	D	303	1/1	0.98	0.05	45,45,45,45	0
3	ZN	A	303	1/1	0.98	0.03	35,35,35,35	0
3	ZN	B	303	1/1	0.99	0.03	36,36,36,36	0
3	ZN	C	301	1/1	0.99	0.03	27,27,27,27	0
3	ZN	C	302	1/1	0.99	0.07	30,30,30,30	0
3	ZN	A	309	1/1	0.99	0.04	30,30,30,30	0
3	ZN	A	308	1/1	0.99	0.03	42,42,42,42	0
3	ZN	B	302	1/1	0.99	0.07	33,33,33,33	0
3	ZN	D	302	1/1	0.99	0.07	31,31,31,31	0
3	ZN	B	307	1/1	0.99	0.02	44,44,44,44	0
3	ZN	B	301	1/1	1.00	0.04	24,24,24,24	0
3	ZN	D	301	1/1	1.00	0.03	27,27,27,27	0
3	ZN	A	301	1/1	1.00	0.03	23,23,23,23	0

6.5 Other polymers [\(i\)](#)

There are no such residues in this entry.