



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 04:19 PM GMT

PDB ID : 4EGM
Title : The X-ray crystal structure of CYP199A4 in complex with 4-ethylbenzoic acid
Authors : Zhou, W.; Bell, S.G.; Yang, W.; Zhou, R.M.; Tan, A.B.H.; Wong, L.-L.
Deposited on : 2012-03-31
Resolution : 2.91 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
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

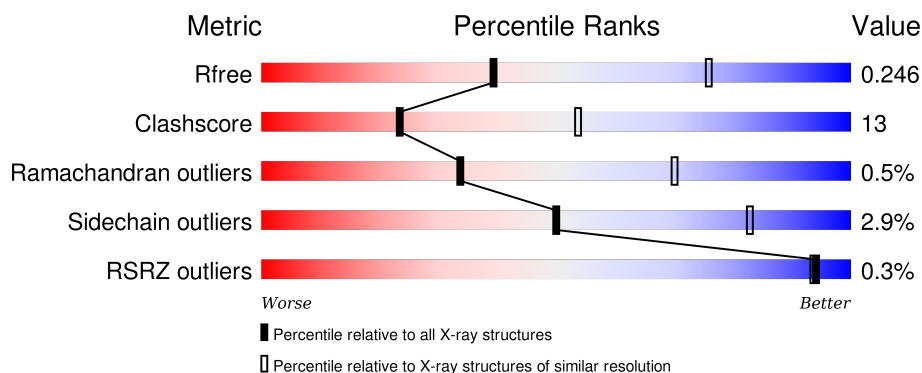
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION





The reported resolution of this entry is 2.91 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}	91344	1643 (2.94-2.90)
Clashscore	102246	1871 (2.94-2.90)
Ramachandran outliers	100387	1824 (2.94-2.90)
Sidechain outliers	100360	1826 (2.94-2.90)
RSRZ outliers	91569	1650 (2.94-2.90)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	410	 75% 19% . .
1	B	410	 75% 20% . .
1	C	410	 76% 19% . .
1	D	410	 75% 19% . .

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
5	GOL	A	504	-	-	-	X
5	GOL	B	504	-	-	-	X
6	SO4	A	507	-	-	-	X
6	SO4	D	505	-	-	X	-

2 Entry composition [i](#)

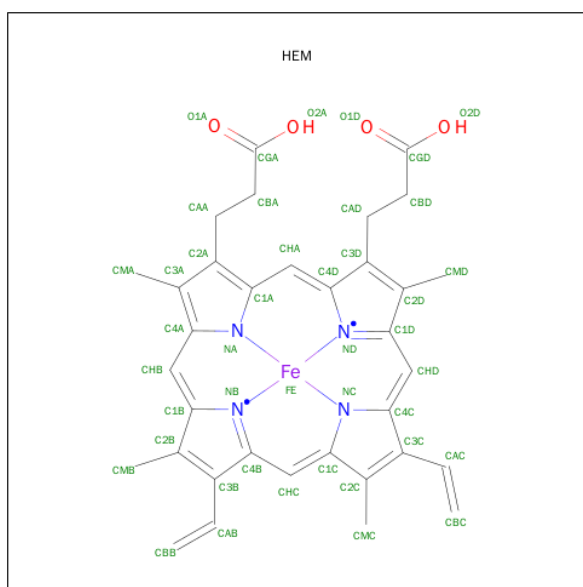
There are 7 unique types of molecules in this entry. The entry contains 12651 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Cytochrome P450.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	393	Total	C	N	O	S	0	0	0
			3021	1912	534	564	11			
1	B	394	Total	C	N	O	S	0	1	0
			3033	1919	536	567	11			
1	C	393	Total	C	N	O	S	0	1	0
			3027	1916	534	566	11			
1	D	393	Total	C	N	O	S	0	0	0
			3021	1912	534	564	11			

- Molecule 2 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: $C_{34}H_{32}FeN_4O_4$).



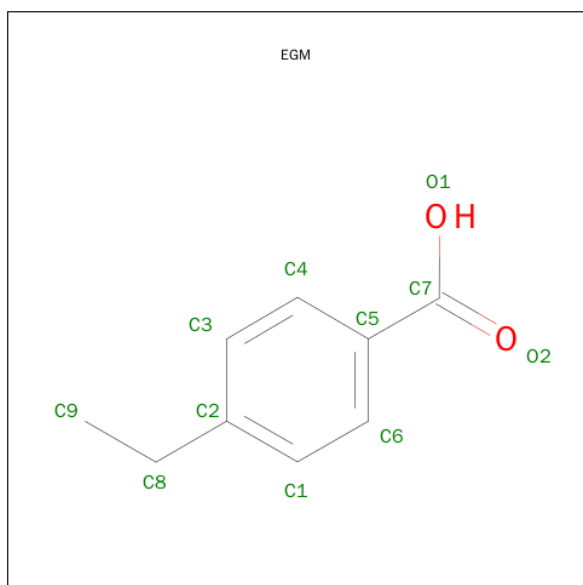
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	Fe	N O	0	0
			43	34	1	4 4		
2	B	1	Total	C	Fe	N O	0	0
			43	34	1	4 4		

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 3 is 4-ETHYLBENZOIC ACID (three-letter code: EGM) (formula: C₉H₁₀O₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			11	9	2		
3	B	1	Total	C	O	0	0
			11	9	2		
3	C	1	Total	C	O	0	0
			11	9	2		
3	D	1	Total	C	O	0	0
			11	9	2		

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	1	Total	Cl	0	0
			1	1		
4	A	1	Total	Cl	0	0
			1	1		
4	D	1	Total	Cl	0	0
			1	1		

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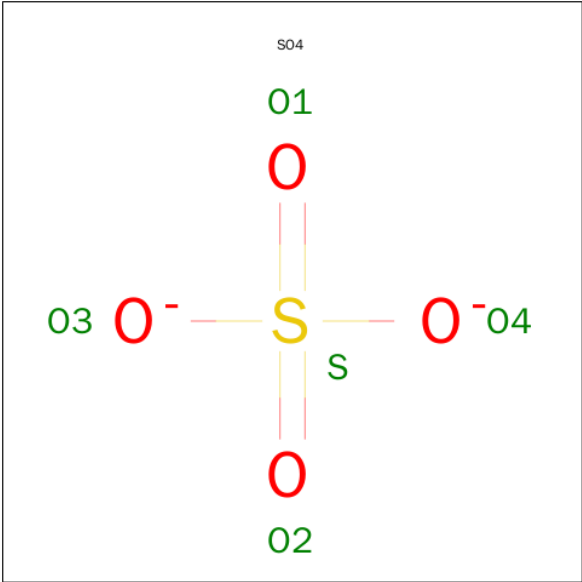
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	C	1	Total	Cl	0	0
			1	1		

- Molecule 5 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

- Molecule 6 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



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

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	D	1	Total	O	S	0	0
			5	4	1		

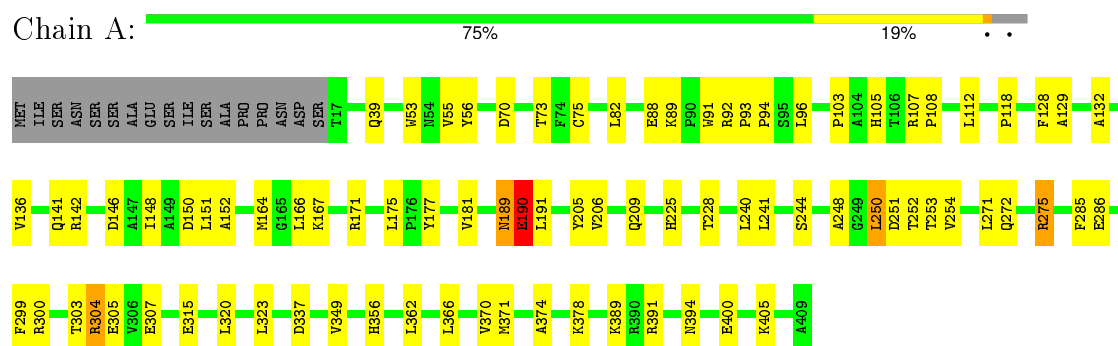
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	61	Total	O	0	0
			61	61		
7	B	65	Total	O	0	0
			65	65		
7	C	58	Total	O	0	0
			58	58		
7	D	46	Total	O	0	0
			46	46		

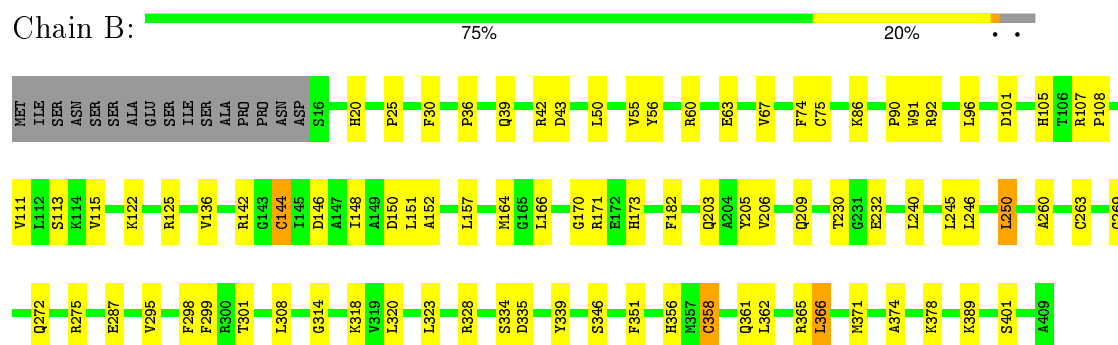
3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

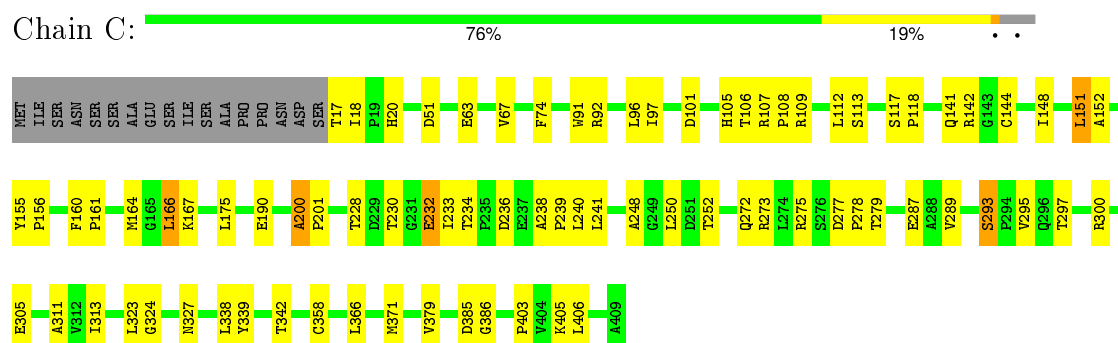
• Molecule 1: Cytochrome P450



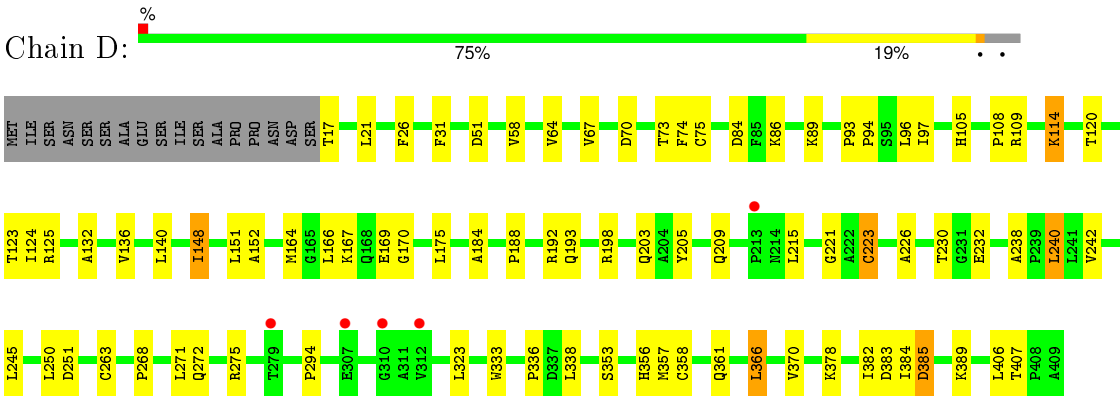
• Molecule 1: Cytochrome P450



• Molecule 1: Cytochrome P450



• Molecule 1: Cytochrome P450



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	106.86Å 143.28Å 172.51Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	41.57 – 2.91 41.57 – 2.91	Depositor EDS
% Data completeness (in resolution range)	99.3 (41.57-2.91) 98.9 (41.57-2.91)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	0.10	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.28 (at 2.90Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.182 , 0.249 0.185 , 0.246	Depositor DCC
R_{free} test set	2968 reflections (5.36%)	DCC
Wilson B-factor (Å ²)	41.8	Xtriage
Anisotropy	0.447	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 28.6	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.29$	Xtriage
Outliers	0 of 58587 reflections	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	12651	wwPDB-VP
Average B, all atoms (Å ²)	36.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 51.12 % of the origin peak, indicating pseudo translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo translational symmetry is equal to 5.8696e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.375 respectively for untwinned datasets, and 0.333, 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, HEM, SO4, EGM, CL

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	0.84	2/3093 (0.1%)	0.85	2/4209 (0.0%)
1	B	0.80	1/3108 (0.0%)	0.83	1/4229 (0.0%)
1	C	0.78	1/3102 (0.0%)	0.82	1/4221 (0.0%)
1	D	0.82	4/3093 (0.1%)	0.84	1/4209 (0.0%)
All	All	0.81	8/12396 (0.1%)	0.84	5/16868 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	D	0	1

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	190	GLU	CB-CG	7.25	1.66	1.52
1	D	169	GLU	CB-CG	6.49	1.64	1.52
1	B	144	CYS	CB-SG	6.33	1.93	1.82
1	D	169	GLU	CG-CD	6.27	1.61	1.51
1	A	190	GLU	CG-CD	6.14	1.61	1.51
1	C	144	CYS	CB-SG	5.85	1.92	1.82
1	D	263	CYS	CB-SG	-5.83	1.72	1.81
1	D	223	CYS	CB-SG	5.02	1.90	1.82

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	250	LEU	CA-CB-CG	5.67	128.34	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	308	LEU	CA-CB-CG	5.50	127.95	115.30
1	D	338	LEU	CA-CB-CG	5.15	127.15	115.30
1	A	304	ARG	NE-CZ-NH2	5.14	122.87	120.30
1	C	166	LEU	CA-CB-CG	5.04	126.89	115.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	105	HIS	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	3021	0	2993	93	0
1	B	3033	0	3006	81	0
1	C	3027	0	2999	63	0
1	D	3021	0	2993	87	0
2	A	43	0	30	1	0
2	B	43	0	30	7	0
2	C	43	0	30	5	0
2	D	43	0	30	3	0
3	A	11	0	9	1	0
3	B	11	0	9	1	0
3	C	11	0	9	1	0
3	D	11	0	9	0	0
4	A	1	0	0	0	0
4	B	1	0	0	1	0
4	C	1	0	0	0	0
4	D	1	0	0	1	0
5	A	6	0	8	0	0
5	B	6	0	8	2	0
5	C	6	0	8	3	0
5	D	6	0	8	1	0
6	A	20	0	0	0	0
6	B	15	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	C	20	0	0	1	0
6	D	20	0	0	2	0
7	A	61	0	0	7	0
7	B	65	0	0	3	0
7	C	58	0	0	5	0
7	D	46	0	0	4	0
All	All	12651	0	12179	326	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 13.

All (326) 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:129:ALA:HA	1:A:370:VAL:CG2	1.69	1.21
1:A:175:LEU:HD21	1:A:250:LEU:HD11	1.26	1.16
1:D:223:CYS:HB2	7:D:638:HOH:O	1.45	1.15
1:A:96:LEU:HD23	1:A:240:LEU:HG	1.34	1.03
1:A:175:LEU:CD2	1:A:250:LEU:HD11	1.90	1.00
1:A:129:ALA:CA	1:A:370:VAL:HG21	1.90	1.00
1:C:164:MET:HB2	1:C:166:LEU:HD13	1.46	0.97
1:D:70:ASP:CG	1:D:73:THR:HG22	1.83	0.97
1:A:129:ALA:HA	1:A:370:VAL:HG21	0.98	0.95
1:A:175:LEU:HD21	1:A:250:LEU:CD1	1.95	0.95
1:A:164:MET:HB3	1:A:166:LEU:CD2	1.96	0.95
1:C:63:GLU:O	1:C:67:VAL:HG23	1.65	0.94
1:C:164:MET:HB2	1:C:166:LEU:CD1	1.98	0.93
1:A:96:LEU:HD23	1:A:240:LEU:CG	1.99	0.92
1:D:366:LEU:O	1:D:366:LEU:HD12	1.69	0.92
1:B:164:MET:HB2	1:B:166:LEU:HD23	1.51	0.92
1:A:175:LEU:CD2	1:A:250:LEU:CD1	2.48	0.91
2:B:501:HEM:HBC2	2:B:501:HEM:HMC1	1.51	0.91
1:B:230:THR:HB	1:B:232:GLU:OE1	1.74	0.87
1:D:70:ASP:OD2	1:D:73:THR:CG2	2.23	0.85
1:D:272:GLN:HE22	1:D:275:ARG:HH11	1.21	0.84
1:A:96:LEU:CD2	1:A:240:LEU:CD2	2.55	0.83
1:A:164:MET:CB	1:A:166:LEU:HD23	2.09	0.83
1:B:164:MET:CB	1:B:166:LEU:HD23	2.11	0.81
1:B:164:MET:HB3	1:B:166:LEU:CD2	2.11	0.80
1:B:301:THR:HG22	1:B:318:LYS:HD3	1.63	0.80
1:B:230:THR:CG2	1:B:232:GLU:OE2	2.31	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:96:LEU:HD23	1:A:240:LEU:CD2	2.12	0.79
1:C:141:GLN:HG3	7:C:643:HOH:O	1.83	0.79
1:D:175:LEU:HD21	1:D:250:LEU:HD11	1.65	0.78
1:D:250:LEU:HD13	1:D:250:LEU:C	2.04	0.77
1:D:166:LEU:CD1	1:D:209:GLN:HB3	2.15	0.77
1:D:70:ASP:OD2	1:D:73:THR:HG21	1.83	0.77
1:B:96:LEU:HD23	1:B:240:LEU:HB3	1.65	0.77
1:A:96:LEU:CD2	1:A:240:LEU:HD23	2.14	0.76
1:B:36:PRO:O	1:B:39[B]:GLN:HG2	1.84	0.76
1:A:107:ARG:HB3	1:A:108:PRO:HD3	1.67	0.76
1:B:136:VAL:CG1	1:B:378:LYS:HD2	2.16	0.76
1:D:366:LEU:HD12	1:D:366:LEU:C	2.05	0.76
1:B:164:MET:CB	1:B:166:LEU:CD2	2.63	0.76
1:B:107:ARG:HB3	1:B:108:PRO:HD3	1.69	0.75
1:A:164:MET:CB	1:A:166:LEU:CD2	2.65	0.75
1:A:366:LEU:C	1:A:366:LEU:HD13	2.07	0.74
1:C:96:LEU:HD23	1:C:240:LEU:HB3	1.69	0.73
1:B:96:LEU:HD21	1:B:240:LEU:HG	1.71	0.72
1:C:107:ARG:HB3	1:C:108:PRO:CD	2.20	0.72
1:A:164:MET:HB2	1:A:166:LEU:HD23	1.70	0.72
1:D:272:GLN:HE22	1:D:275:ARG:NH1	1.88	0.71
1:B:136:VAL:HG11	1:B:378:LYS:HD2	1.71	0.71
1:D:96:LEU:HD23	1:D:240:LEU:HG	1.72	0.70
1:A:96:LEU:HD21	1:A:240:LEU:HD23	1.73	0.70
1:D:96:LEU:CD2	1:D:240:LEU:HD23	2.21	0.70
1:A:175:LEU:HD23	1:A:250:LEU:CD1	2.22	0.70
1:A:132:ALA:HB3	1:A:370:VAL:HG22	1.74	0.69
1:B:203:GLN:HG2	4:B:503:CL:CL	2.29	0.69
1:C:164:MET:CB	1:C:166:LEU:CD1	2.70	0.69
1:B:75:CYS:HB2	1:B:101:ASP:OD2	1.92	0.69
1:D:96:LEU:HD21	1:D:240:LEU:HD23	1.74	0.69
1:B:39[A]:GLN:OE1	1:B:42:ARG:NH2	2.26	0.69
1:C:200:ALA:HB3	1:C:201:PRO:HD3	1.75	0.68
1:B:230:THR:HG21	1:B:232:GLU:OE2	1.93	0.67
1:D:70:ASP:OD2	1:D:73:THR:HG22	1.87	0.67
1:B:136:VAL:HG11	1:B:374:ALA:HB1	1.77	0.67
1:A:190:GLU:CD	1:A:190:GLU:H	1.96	0.67
1:A:337:ASP:HB2	7:A:636:HOH:O	1.93	0.67
1:A:146:ASP:O	1:A:150:ASP:HB2	1.95	0.67
1:B:39[A]:GLN:HE21	1:B:43:ASP:CG	1.97	0.66
1:D:70:ASP:OD1	1:D:73:THR:HG22	1.96	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:151:LEU:C	1:B:151:LEU:HD13	2.15	0.66
2:B:501:HEM:HBC2	2:B:501:HEM:CMC	2.23	0.66
1:C:155:TYR:HB3	1:C:156:PRO:HD3	1.77	0.66
1:A:272:GLN:HE22	1:A:275:ARG:HH11	1.43	0.66
1:C:17:THR:HB	7:C:610:HOH:O	1.95	0.65
1:A:151:LEU:HD21	1:A:371:MET:SD	2.35	0.65
1:B:146:ASP:O	1:B:150:ASP:HB2	1.96	0.65
1:D:384:ILE:HG22	1:D:385:ASP:N	2.12	0.64
1:D:323:LEU:CD1	1:D:323:LEU:H	2.11	0.64
1:D:323:LEU:N	1:D:323:LEU:HD12	2.13	0.64
1:D:17:THR:HA	7:D:623:HOH:O	1.98	0.63
1:C:112:LEU:HD21	1:C:241:LEU:HB3	1.80	0.63
1:C:175:LEU:HD21	1:C:250:LEU:CD1	2.28	0.63
1:A:175:LEU:HD23	1:A:250:LEU:HD12	1.79	0.63
1:D:223:CYS:CB	7:D:638:HOH:O	2.22	0.63
1:B:314:GLY:HA3	1:D:21:LEU:HD21	1.81	0.63
1:C:175:LEU:HD21	1:C:250:LEU:HD11	1.81	0.63
1:A:240:LEU:HD12	1:A:240:LEU:O	2.00	0.62
1:C:272:GLN:HE22	1:C:275:ARG:HD3	1.65	0.62
1:D:109:ARG:NH2	6:D:505:SO4:O3	2.32	0.62
1:D:96:LEU:CD2	1:D:240:LEU:CD2	2.77	0.62
1:B:301:THR:HG23	7:B:655:HOH:O	1.99	0.62
1:B:113:SER:OG	5:B:504:GOL:H12	2.00	0.62
1:C:250:LEU:HD13	1:C:250:LEU:C	2.20	0.61
1:D:73:THR:HG23	1:D:74:PHE:CD1	2.35	0.60
1:A:389:LYS:HD3	1:A:400:GLU:OE1	2.01	0.60
1:A:205:TYR:HA	1:B:142:ARG:HD3	1.83	0.60
1:B:287:GLU:HG3	1:B:339:TYR:CD1	2.37	0.60
1:C:151:LEU:HD11	1:C:371:MET:SD	2.42	0.60
1:C:67:VAL:HG13	1:C:74:PHE:CG	2.37	0.60
1:D:250:LEU:HD13	1:D:251:ASP:N	2.18	0.59
1:B:366:LEU:HD12	1:B:366:LEU:O	2.03	0.59
1:B:136:VAL:HG13	1:B:378:LYS:CD	2.32	0.59
1:C:272:GLN:NE2	1:C:275:ARG:HH11	2.00	0.59
1:A:391:ARG:HD3	7:A:623:HOH:O	2.02	0.58
1:C:272:GLN:NE2	1:C:275:ARG:HD3	2.18	0.58
1:A:250:LEU:HB3	7:A:647:HOH:O	2.03	0.58
1:A:91:TRP:CE2	1:A:92:ARG:HG2	2.39	0.58
1:D:384:ILE:CG2	1:D:385:ASP:N	2.66	0.58
1:A:271:LEU:O	1:A:275:ARG:HG3	2.03	0.58
1:A:241:LEU:O	1:A:244:SER:HB2	2.03	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:136:VAL:HG13	1:B:378:LYS:HD2	1.86	0.57
1:B:272:GLN:HE22	1:B:275:ARG:HH11	1.52	0.57
1:A:107:ARG:HB3	1:A:108:PRO:CD	2.32	0.57
1:B:25:PRO:HD3	1:B:50:LEU:HD23	1.86	0.57
1:D:120:THR:O	1:D:123:THR:HB	2.04	0.57
1:B:105:HIS:HE1	2:B:501:HEM:O1D	1.88	0.57
1:D:164:MET:HB3	1:D:166:LEU:CD2	2.35	0.57
1:A:132:ALA:CB	1:A:370:VAL:HG22	2.34	0.56
1:A:366:LEU:O	1:A:366:LEU:HD13	2.03	0.56
1:C:117:SER:HA	5:C:504:GOL:O3	2.04	0.56
1:A:175:LEU:CD2	1:A:250:LEU:HD12	2.31	0.56
1:A:304:ARG:HD2	1:A:305:GLU:O	2.05	0.56
1:A:70:ASP:OD2	1:A:73:THR:HB	2.04	0.56
1:A:250:LEU:HD13	1:A:250:LEU:C	2.25	0.56
1:D:175:LEU:HD21	1:D:250:LEU:CD1	2.34	0.56
1:D:70:ASP:CG	1:D:73:THR:CG2	2.62	0.56
1:A:189:ASN:ND2	1:A:394:ASN:OD1	2.38	0.56
1:C:20:HIS:HD2	1:C:51:ASP:OD1	1.89	0.56
1:D:166:LEU:HD11	1:D:209:GLN:HB3	1.88	0.55
1:B:90:PRO:HB2	1:B:92:ARG:O	2.06	0.55
1:B:314:GLY:HA3	1:D:21:LEU:CD2	2.36	0.55
1:D:240:LEU:HD12	1:D:240:LEU:O	2.06	0.55
1:D:175:LEU:CD2	1:D:250:LEU:CD1	2.85	0.55
1:D:175:LEU:CD2	1:D:250:LEU:HD11	2.34	0.55
1:A:366:LEU:C	1:A:366:LEU:CD1	2.75	0.55
1:D:271:LEU:HD22	1:D:382:ILE:HD12	1.88	0.55
1:D:323:LEU:N	1:D:323:LEU:CD1	2.70	0.54
1:A:129:ALA:CA	1:A:370:VAL:CG2	2.64	0.54
1:C:230:THR:OG1	1:C:232:GLU:HG3	2.06	0.54
1:D:268:PRO:HB3	7:D:640:HOH:O	2.06	0.54
1:D:384:ILE:CG2	1:D:385:ASP:H	2.20	0.54
1:A:225:HIS:O	1:A:228:THR:HB	2.08	0.54
1:A:299:PHE:O	1:A:300:ARG:HD3	2.08	0.54
1:A:118:PRO:HG3	1:A:362:LEU:CD1	2.38	0.54
1:B:157:LEU:HD23	1:B:250:LEU:HD21	1.90	0.53
1:C:105:HIS:HE1	2:C:501:HEM:O1D	1.92	0.53
1:A:374:ALA:O	1:A:378:LYS:HB2	2.09	0.53
1:A:39:GLN:HG3	7:A:638:HOH:O	2.09	0.53
1:C:379:VAL:HG21	1:C:406:LEU:HD22	1.90	0.53
1:B:301:THR:HG21	1:B:318:LYS:HE2	1.90	0.52
1:A:129:ALA:HA	1:A:370:VAL:HG23	1.80	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:323:LEU:HD12	1:D:323:LEU:H	1.70	0.52
1:D:96:LEU:HD23	1:D:240:LEU:CG	2.38	0.52
1:D:188:PRO:HA	1:D:193:GLN:HE21	1.75	0.52
1:A:177:TYR:O	1:A:181:VAL:HG23	2.10	0.52
1:A:128:PHE:CD2	1:A:366:LEU:CD1	2.93	0.52
1:A:304:ARG:HA	1:A:315:GLU:HG3	1.92	0.51
1:C:113:SER:OG	5:C:504:GOL:H31	2.10	0.51
1:B:299:PHE:CZ	1:B:320:LEU:HD13	2.46	0.51
1:D:26:PHE:HA	1:D:31:PHE:CZ	2.46	0.51
1:B:230:THR:HB	1:B:232:GLU:CD	2.30	0.51
1:D:97:ILE:HD11	1:D:108:PRO:HB2	1.93	0.51
1:D:192:ARG:HD3	1:D:193:GLN:NE2	2.26	0.51
1:D:250:LEU:C	1:D:250:LEU:CD1	2.76	0.50
1:B:334:SER:O	1:B:335:ASP:C	2.50	0.50
1:D:250:LEU:CD1	1:D:251:ASP:N	2.75	0.50
1:A:151:LEU:C	1:A:151:LEU:HD13	2.32	0.50
1:B:67:VAL:HG13	1:B:74:PHE:CG	2.47	0.50
1:D:384:ILE:HG22	1:D:385:ASP:H	1.76	0.50
1:C:152:ALA:O	1:C:156:PRO:HD2	2.12	0.50
1:D:164:MET:CB	1:D:166:LEU:HD23	2.42	0.49
1:D:385:ASP:OD1	1:D:385:ASP:O	2.30	0.49
1:D:238:ALA:O	1:D:242:VAL:HG23	2.11	0.49
1:D:97:ILE:HD11	1:D:108:PRO:C	2.32	0.49
1:C:175:LEU:CD2	1:C:250:LEU:CD1	2.91	0.49
1:D:230:THR:OG1	1:D:232:GLU:OE1	2.29	0.49
1:A:128:PHE:CD2	1:A:366:LEU:HD12	2.47	0.49
1:C:151:LEU:HD11	1:C:371:MET:CE	2.43	0.49
1:B:151:LEU:CD1	1:B:151:LEU:C	2.81	0.49
1:A:55:VAL:HG12	1:A:56:TYR:N	2.27	0.49
1:C:252:THR:HB	2:C:501:HEM:C3B	2.48	0.49
1:B:272:GLN:HE22	1:B:275:ARG:NH1	2.11	0.49
1:B:63:GLU:O	1:B:67:VAL:HG23	2.13	0.49
1:C:238:ALA:N	1:C:239:PRO:HD2	2.28	0.49
1:A:164:MET:HB3	1:A:166:LEU:HD22	1.90	0.48
5:D:504:GOL:O3	6:D:505:SO4:O1	2.31	0.48
1:B:358:CYS:HA	2:B:501:HEM:CHA	2.43	0.48
1:D:223:CYS:O	1:D:226:ALA:HB3	2.13	0.48
1:B:25:PRO:HA	1:B:30:PHE:CD1	2.49	0.48
1:D:97:ILE:HD11	1:D:109:ARG:N	2.29	0.48
2:A:501:HEM:C3D	3:A:502:EGM:H3	2.48	0.48
1:A:252:THR:OG1	1:A:253:THR:N	2.46	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:234:THR:HB	7:C:629:HOH:O	2.14	0.48
1:B:366:LEU:HD12	1:B:366:LEU:C	2.34	0.48
1:B:182:PHE:CZ	3:B:502:EGM:H5	2.49	0.48
1:B:301:THR:HG22	1:B:318:LYS:CD	2.39	0.47
1:D:166:LEU:HD12	1:D:209:GLN:HB3	1.93	0.47
1:A:177:TYR:CD2	1:A:206:VAL:HG21	2.49	0.47
1:C:107:ARG:HB3	1:C:108:PRO:HD2	1.95	0.47
1:A:299:PHE:CZ	1:A:320:LEU:HD13	2.49	0.47
1:C:323:LEU:HD12	1:C:323:LEU:N	2.29	0.47
1:B:20:HIS:HE1	1:D:51:ASP:O	1.97	0.47
1:B:299:PHE:CE1	1:B:320:LEU:HD13	2.50	0.47
1:C:160:PHE:HB3	1:C:161:PRO:HD3	1.96	0.47
1:B:230:THR:O	1:B:230:THR:HG22	2.15	0.47
1:D:383:ASP:C	1:D:384:ILE:O	2.47	0.47
1:C:293:SER:OG	1:C:324:GLY:HA2	2.14	0.47
1:C:107:ARG:HB3	1:C:108:PRO:HD3	1.94	0.47
1:A:118:PRO:HG3	1:A:362:LEU:HD11	1.97	0.47
1:B:55:VAL:HG22	1:B:56:TYR:O	2.13	0.47
1:A:128:PHE:CB	1:A:366:LEU:HD11	2.45	0.47
1:A:142:ARG:HD3	1:B:205:TYR:HA	1.97	0.47
1:A:148:ILE:HA	1:A:152:ALA:HB3	1.97	0.47
1:A:272:GLN:NE2	1:A:272:GLN:HA	2.30	0.47
1:C:151:LEU:HD12	1:C:151:LEU:C	2.36	0.46
2:B:501:HEM:HBB2	2:B:501:HEM:CMB	2.45	0.46
1:A:272:GLN:HE22	1:A:275:ARG:NH1	2.12	0.46
1:A:105:HIS:CD2	1:A:356:HIS:CE1	3.03	0.46
1:C:18:ILE:HD11	1:C:311:ALA:HB1	1.98	0.46
1:B:269:GLY:HA3	6:B:506:SO4:O4	2.14	0.46
1:C:323:LEU:H	1:C:323:LEU:CD1	2.28	0.46
1:C:248:ALA:HB1	3:C:502:EGM:H7	1.98	0.46
1:B:136:VAL:CG1	1:B:374:ALA:HB1	2.45	0.46
1:D:148:ILE:HA	1:D:152:ALA:HB3	1.98	0.46
1:D:170:GLY:HA3	1:D:205:TYR:CE1	2.51	0.46
2:B:501:HEM:HMC1	2:B:501:HEM:CBC	2.37	0.46
1:B:250:LEU:HD12	1:B:250:LEU:C	2.37	0.46
1:A:93:PRO:HA	1:A:94:PRO:HD3	1.82	0.46
1:B:206:VAL:HG13	1:B:246:LEU:HD12	1.97	0.46
1:A:251:ASP:HA	1:A:254:VAL:HG23	1.98	0.46
1:A:307:GLU:CG	7:A:649:HOH:O	2.64	0.45
1:C:101:ASP:C	1:C:105:HIS:HB3	2.36	0.45
1:D:358:CYS:O	1:D:361:GLN:HG2	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:111:VAL:O	1:B:115:VAL:HG23	2.16	0.45
1:A:96:LEU:CD2	1:A:240:LEU:HD21	2.44	0.45
1:B:107:ARG:HB3	1:B:108:PRO:CD	2.44	0.45
1:B:151:LEU:HD21	1:B:371:MET:SD	2.56	0.45
1:B:148:ILE:HA	1:B:152:ALA:HB3	1.98	0.45
1:D:215:LEU:HD13	1:D:221:GLY:HA3	1.98	0.45
1:B:230:THR:HG22	1:B:232:GLU:OE2	2.14	0.45
1:D:164:MET:HB2	1:D:166:LEU:HD23	1.98	0.45
1:B:356:HIS:ND1	2:B:501:HEM:O2D	2.35	0.45
1:A:55:VAL:HG21	1:A:82:LEU:CD1	2.47	0.45
1:A:112:LEU:HA	1:A:112:LEU:HD23	1.76	0.45
1:B:171:ARG:C	1:B:173:HIS:N	2.70	0.45
1:D:166:LEU:CD1	1:D:209:GLN:CB	2.92	0.45
1:D:245:LEU:HD22	2:D:501:HEM:HBC1	1.98	0.45
1:A:55:VAL:HG21	1:A:82:LEU:HD11	1.99	0.44
1:C:293:SER:HG	1:C:327:ASN:HD22	1.64	0.44
1:C:273:ARG:NH2	1:C:342:THR:OG1	2.51	0.44
1:C:277:ASP:OD1	1:C:279:THR:OG1	2.33	0.44
1:A:53:TRP:O	1:A:55:VAL:HG23	2.17	0.44
1:D:151:LEU:HD13	1:D:151:LEU:C	2.38	0.44
1:B:260:ALA:O	1:B:263:CYS:HB2	2.17	0.44
1:D:97:ILE:CG2	2:D:501:HEM:CGD	2.96	0.44
1:B:125:ARG:HA	1:B:366:LEU:HD21	2.00	0.44
1:A:128:PHE:CD2	1:A:366:LEU:HD11	2.52	0.44
1:B:171:ARG:C	1:B:173:HIS:H	2.19	0.44
1:C:300:ARG:HH22	2:C:501:HEM:CGA	2.31	0.44
1:C:118:PRO:HG2	7:C:627:HOH:O	2.18	0.43
1:C:289:VAL:O	1:C:293:SER:HA	2.18	0.43
1:B:351:PHE:HB3	1:B:358:CYS:HB3	1.99	0.43
1:C:293:SER:CB	1:C:324:GLY:HA2	2.49	0.43
1:B:361:GLN:O	1:B:365:ARG:HG3	2.17	0.43
1:D:356:HIS:O	1:D:357:MET:C	2.57	0.43
1:C:175:LEU:HA	1:C:175:LEU:HD23	1.77	0.43
5:C:504:GOL:O2	6:C:505:SO4:O3	2.36	0.43
1:C:228:THR:HG22	1:C:233:ILE:HG13	2.00	0.43
1:D:366:LEU:CD1	1:D:370:VAL:HG13	2.48	0.43
1:A:189:ASN:HD22	1:A:394:ASN:HD21	1.66	0.43
1:B:96:LEU:CD2	1:B:240:LEU:HB3	2.42	0.43
1:D:97:ILE:HD13	1:D:97:ILE:HA	1.65	0.43
1:A:136:VAL:HG23	1:A:378:LYS:HD3	2.01	0.43
1:D:389:LYS:HD2	1:D:389:LYS:HA	1.63	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:67:VAL:HG13	1:D:74:PHE:CG	2.52	0.43
1:B:25:PRO:HA	1:B:30:PHE:CG	2.54	0.43
1:D:184:ALA:HA	1:D:192:ARG:HG3	2.01	0.43
1:D:203:GLN:HG2	4:D:503:CL:CL	2.56	0.42
1:D:166:LEU:HD11	1:D:209:GLN:CB	2.49	0.42
1:C:96:LEU:CD2	1:C:240:LEU:HB3	2.46	0.42
1:D:114:LYS:HB2	1:D:114:LYS:HE3	1.62	0.42
1:A:189:ASN:HB3	1:A:191:LEU:N	2.34	0.42
1:C:167:LYS:O	7:C:639:HOH:O	2.21	0.42
1:A:323:LEU:HD12	1:A:349:VAL:O	2.20	0.42
1:B:299:PHE:CE2	1:B:320:LEU:HB2	2.54	0.42
1:A:75:CYS:HB3	1:A:303:THR:CG2	2.49	0.42
1:B:245:LEU:HA	1:B:245:LEU:HD23	1.73	0.42
1:C:323:LEU:N	1:C:323:LEU:CD1	2.83	0.42
1:C:97:ILE:HD12	1:C:109:ARG:HA	2.00	0.42
1:B:328:ARG:HG3	7:B:622:HOH:O	2.19	0.42
1:C:295:VAL:HG23	2:C:501:HEM:HMB1	2.01	0.42
1:D:125:ARG:HA	1:D:366:LEU:HD21	2.02	0.42
1:D:97:ILE:HG22	2:D:501:HEM:CGD	2.50	0.42
1:C:91:TRP:CZ2	1:C:92:ARG:HD3	2.55	0.42
1:B:91:TRP:CZ2	1:B:92:ARG:HD3	2.55	0.42
1:A:55:VAL:CG1	1:A:56:TYR:N	2.82	0.42
1:A:307:GLU:HG3	7:A:649:HOH:O	2.20	0.42
1:A:128:PHE:HD2	1:A:366:LEU:HD12	1.84	0.41
1:C:236:ASP:O	1:C:240:LEU:HD23	2.20	0.41
1:B:362:LEU:CD1	5:B:504:GOL:H31	2.50	0.41
1:B:170:GLY:O	1:B:173:HIS:HB2	2.20	0.41
1:B:60:ARG:HB2	7:B:652:HOH:O	2.20	0.41
1:C:358:CYS:HB2	2:C:501:HEM:NA	2.35	0.41
1:A:356:HIS:HB2	7:A:657:HOH:O	2.20	0.41
1:A:250:LEU:CD1	1:A:251:ASP:N	2.83	0.41
1:C:386:GLY:HA3	1:C:403:PRO:HG2	2.00	0.41
1:D:123:THR:HG22	1:D:124:ILE:HG23	2.01	0.41
1:A:248:ALA:O	1:A:252:THR:CG2	2.68	0.41
1:A:151:LEU:HD13	1:A:152:ALA:N	2.36	0.41
1:A:299:PHE:CE1	1:A:320:LEU:HD13	2.56	0.41
1:C:74:PHE:HB3	1:C:300:ARG:HB3	2.03	0.41
1:D:140:LEU:HD11	1:D:378:LYS:O	2.21	0.41
1:C:287:GLU:HG3	1:C:339:TYR:CD1	2.55	0.41
1:A:250:LEU:C	1:A:250:LEU:CD1	2.90	0.41
1:A:285:PHE:O	1:A:286:GLU:C	2.60	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:295:VAL:HG11	1:B:298:PHE:CE1	2.56	0.41
1:D:58:VAL:HG12	1:D:64:VAL:HG23	2.02	0.41
1:D:175:LEU:HD23	1:D:250:LEU:HD12	2.02	0.40
1:D:93:PRO:HA	1:D:94:PRO:HD3	1.80	0.40
1:A:167:LYS:HE3	1:A:209:GLN:HE22	1.86	0.40
1:D:333:TRP:HB2	1:D:336:PRO:HB3	2.04	0.40
1:C:305:GLU:HA	1:C:313:ILE:O	2.22	0.40
1:D:132:ALA:O	1:D:136:VAL:HG23	2.21	0.40
1:B:96:LEU:N	1:B:96:LEU:HD22	2.37	0.40
1:C:148:ILE:HA	1:C:148:ILE:HD13	1.85	0.40
1:B:166:LEU:CD1	1:B:209:GLN:HB3	2.52	0.40
1:D:84:ASP:OD1	1:D:86:LYS:HB3	2.20	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	391/410 (95%)	371 (95%)	18 (5%)	2 (0%)	34	70
1	B	393/410 (96%)	374 (95%)	18 (5%)	1 (0%)	46	78
1	C	392/410 (96%)	371 (95%)	19 (5%)	2 (0%)	34	70
1	D	391/410 (95%)	368 (94%)	20 (5%)	3 (1%)	24	58
All	All	1567/1640 (96%)	1484 (95%)	75 (5%)	8 (0%)	34	70

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	167	LYS
1	A	189	ASN
1	D	385	ASP

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Mol	Chain	Res	Type
1	D	148	ILE
1	A	171	ARG
1	B	358	CYS
1	C	200	ALA
1	C	278	PRO

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	319/334 (96%)	312 (98%)	7 (2%)	60	87
1	B	321/334 (96%)	312 (97%)	9 (3%)	51	83
1	C	320/334 (96%)	309 (97%)	11 (3%)	44	78
1	D	319/334 (96%)	309 (97%)	10 (3%)	47	81
All	All	1279/1336 (96%)	1242 (97%)	37 (3%)	50	83

All (37) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	88	GLU
1	A	89	LYS
1	A	103	PRO
1	A	141	GLN
1	A	190	GLU
1	A	275	ARG
1	A	405	LYS
1	B	86	LYS
1	B	122	LYS
1	B	144	CYS
1	B	250	LEU
1	B	323	LEU
1	B	346	SER
1	B	366	LEU
1	B	389	LYS
1	B	401	SER

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Mol	Chain	Res	Type
1	C	106	THR
1	C	142	ARG
1	C	151	LEU
1	C	190	GLU
1	C	232	GLU
1	C	293	SER
1	C	297	THR
1	C	338	LEU
1	C	366	LEU
1	C	385	ASP
1	C	405	LYS
1	D	75	CYS
1	D	89	LYS
1	D	114	LYS
1	D	198	ARG
1	D	240	LEU
1	D	294	PRO
1	D	353	SER
1	D	366	LEU
1	D	406	LEU
1	D	407	THR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (33) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	189	ASN
1	A	209	GLN
1	A	211	GLN
1	A	272	GLN
1	A	283	ASN
1	A	296	GLN
1	A	394	ASN
1	B	20	HIS
1	B	54	ASN
1	B	105	HIS
1	B	168	GLN
1	B	209	GLN
1	B	211	GLN
1	B	214	ASN
1	B	272	GLN
1	B	283	ASN
1	C	20	HIS

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Mol	Chain	Res	Type
1	C	105	HIS
1	C	168	GLN
1	C	209	GLN
1	C	214	ASN
1	C	272	GLN
1	C	283	ASN
1	C	296	GLN
1	D	69	ASN
1	D	105	HIS
1	D	168	GLN
1	D	193	GLN
1	D	209	GLN
1	D	214	ASN
1	D	272	GLN
1	D	283	ASN
1	D	296	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 31 ligands modelled in this entry, 4 are monoatomic - leaving 27 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
2	HEM	A	501	1	30,50,50	2.59	8 (26%)	24,82,82	2.39	8 (33%)
3	EGM	A	502	-	8,11,11	0.56	0	11,14,14	1.05	1 (9%)
5	GOL	A	504	-	5,5,5	0.60	0	5,5,5	0.42	0
6	SO4	A	505	-	4,4,4	0.50	0	6,6,6	1.05	1 (16%)
6	SO4	A	506	-	4,4,4	0.24	0	6,6,6	0.41	0
6	SO4	A	507	-	4,4,4	0.16	0	6,6,6	0.43	0
6	SO4	A	508	-	4,4,4	0.25	0	6,6,6	0.60	0
2	HEM	B	501	1	30,50,50	2.26	5 (16%)	24,82,82	2.52	12 (50%)
3	EGM	B	502	-	8,11,11	0.34	0	11,14,14	0.85	0
5	GOL	B	504	-	5,5,5	0.40	0	5,5,5	0.74	0
6	SO4	B	505	-	4,4,4	0.29	0	6,6,6	0.69	0
6	SO4	B	506	-	4,4,4	0.28	0	6,6,6	0.39	0
6	SO4	B	507	-	4,4,4	0.09	0	6,6,6	0.56	0
2	HEM	C	501	1	30,50,50	2.26	6 (20%)	24,82,82	2.51	10 (41%)
3	EGM	C	502	-	8,11,11	0.57	0	11,14,14	1.05	0
5	GOL	C	504	-	5,5,5	0.37	0	5,5,5	0.62	0
6	SO4	C	505	-	4,4,4	0.37	0	6,6,6	0.43	0
6	SO4	C	506	-	4,4,4	0.10	0	6,6,6	0.25	0
6	SO4	C	507	-	4,4,4	0.22	0	6,6,6	0.34	0
6	SO4	C	508	-	4,4,4	0.50	0	6,6,6	0.49	0
2	HEM	D	501	1	30,50,50	2.51	6 (20%)	24,82,82	2.39	10 (41%)
3	EGM	D	502	-	8,11,11	0.84	0	11,14,14	1.12	0
5	GOL	D	504	-	5,5,5	0.36	0	5,5,5	0.52	0
6	SO4	D	505	-	4,4,4	0.33	0	6,6,6	0.18	0
6	SO4	D	506	-	4,4,4	0.13	0	6,6,6	0.34	0
6	SO4	D	507	-	4,4,4	0.08	0	6,6,6	0.22	0
6	SO4	D	508	-	4,4,4	0.22	0	6,6,6	0.33	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
2	HEM	A	501	1	-	0/10/54/54	0/0/8/8
3	EGM	A	502	-	-	0/2/6/6	0/1/1/1
5	GOL	A	504	-	-	0/4/4/4	0/0/0/0
6	SO4	A	505	-	-	0/0/0/0	0/0/0/0
6	SO4	A	506	-	-	0/0/0/0	0/0/0/0
6	SO4	A	507	-	-	0/0/0/0	0/0/0/0
6	SO4	A	508	-	-	0/0/0/0	0/0/0/0

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	HEM	B	501	1	-	0/10/54/54	0/0/8/8
3	EGM	B	502	-	-	0/2/6/6	0/1/1/1
5	GOL	B	504	-	-	0/4/4/4	0/0/0/0
6	SO4	B	505	-	-	0/0/0/0	0/0/0/0
6	SO4	B	506	-	-	0/0/0/0	0/0/0/0
6	SO4	B	507	-	-	0/0/0/0	0/0/0/0
2	HEM	C	501	1	-	0/10/54/54	0/0/8/8
3	EGM	C	502	-	-	0/2/6/6	0/1/1/1
5	GOL	C	504	-	-	0/4/4/4	0/0/0/0
6	SO4	C	505	-	-	0/0/0/0	0/0/0/0
6	SO4	C	506	-	-	0/0/0/0	0/0/0/0
6	SO4	C	507	-	-	0/0/0/0	0/0/0/0
6	SO4	C	508	-	-	0/0/0/0	0/0/0/0
2	HEM	D	501	1	-	0/10/54/54	0/0/8/8
3	EGM	D	502	-	-	0/2/6/6	0/1/1/1
5	GOL	D	504	-	-	0/4/4/4	0/0/0/0
6	SO4	D	505	-	-	0/0/0/0	0/0/0/0
6	SO4	D	506	-	-	0/0/0/0	0/0/0/0
6	SO4	D	507	-	-	0/0/0/0	0/0/0/0
6	SO4	D	508	-	-	0/0/0/0	0/0/0/0

All (25) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	HEM	C3B-C4B	-9.96	1.43	1.51
2	C	501	HEM	C3B-C4B	-9.19	1.43	1.51
2	D	501	HEM	C3B-C4B	-9.17	1.43	1.51
2	B	501	HEM	C3B-C4B	-8.49	1.44	1.51
2	D	501	HEM	C3D-C4D	-6.42	1.43	1.51
2	A	501	HEM	C3D-C4D	-6.15	1.43	1.51
2	B	501	HEM	C3D-C4D	-4.95	1.45	1.51
2	C	501	HEM	C3D-C4D	-4.41	1.45	1.51
2	C	501	HEM	C2C-C1C	-3.65	1.45	1.52
2	A	501	HEM	C2C-C1C	-3.63	1.45	1.52
2	B	501	HEM	C2C-C1C	-3.22	1.46	1.52
2	D	501	HEM	C2C-C1C	-2.97	1.46	1.52
2	C	501	HEM	C2D-C1D	-2.53	1.43	1.51
2	A	501	HEM	C2D-C1D	-2.24	1.44	1.51
2	D	501	HEM	C2D-C1D	-2.20	1.44	1.51
2	D	501	HEM	C2B-C1B	-2.16	1.44	1.51
2	C	501	HEM	C2B-C1B	-2.04	1.45	1.51
2	B	501	HEM	CAA-C2A	2.04	1.55	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	HEM	C3C-CAC	2.14	1.55	1.51
2	A	501	HEM	C4C-NC	2.31	1.38	1.36
2	A	501	HEM	CAA-C2A	2.47	1.56	1.52
2	C	501	HEM	FE-NC	2.67	2.06	1.95
2	A	501	HEM	FE-NC	2.71	2.06	1.95
2	B	501	HEM	FE-NC	3.70	2.10	1.95
2	D	501	HEM	FE-NC	4.55	2.13	1.95

All (42) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	501	HEM	C3B-CAB-CBB	-3.80	118.63	124.46
2	C	501	HEM	CAA-CBA-CGA	-3.36	106.59	112.75
2	C	501	HEM	C3B-CAB-CBB	-3.30	119.40	124.46
2	B	501	HEM	C3B-CAB-CBB	-3.17	119.59	124.46
2	D	501	HEM	CBD-CAD-C3D	-2.89	105.16	113.55
2	A	501	HEM	CBD-CAD-C3D	-2.82	105.36	113.55
2	C	501	HEM	C3C-CAC-CBC	-2.80	120.16	124.46
2	B	501	HEM	CAA-C2A-C1A	-2.72	124.06	127.01
2	B	501	HEM	CBD-CAD-C3D	-2.68	105.74	113.55
2	D	501	HEM	C3B-C4B-NB	-2.30	107.22	111.63
2	A	501	HEM	CMA-C3A-C4A	-2.28	124.59	128.36
2	B	501	HEM	C3B-C4B-NB	-2.18	107.46	111.63
3	A	502	EGM	C6-C1-C2	-2.13	118.12	121.04
2	B	501	HEM	C3C-CAC-CBC	-2.12	121.20	124.46
6	A	505	SO4	O2-S-O1	2.09	116.13	109.50
2	A	501	HEM	C2D-C3D-C4D	2.17	105.17	101.50
2	D	501	HEM	C2D-C3D-C4D	2.35	105.48	101.50
2	C	501	HEM	C2C-C1C-CHC	2.45	127.41	123.68
2	B	501	HEM	C1D-CHD-C4C	2.50	129.99	125.82
2	B	501	HEM	CMD-C2D-C3D	2.87	127.04	114.35
2	C	501	HEM	CMD-C2D-C3D	2.95	127.41	114.35
2	A	501	HEM	CMD-C2D-C3D	2.96	127.43	114.35
2	D	501	HEM	CMC-C2C-C3C	3.09	124.24	116.53
2	D	501	HEM	CMD-C2D-C3D	3.09	128.03	114.35
2	D	501	HEM	C2C-C1C-CHC	3.13	128.44	123.68
2	C	501	HEM	CBA-CAA-C2A	3.53	118.86	112.53
2	B	501	HEM	C2C-C1C-CHC	3.59	129.15	123.68
2	A	501	HEM	CAD-C3D-C4D	3.87	126.11	112.47
2	D	501	HEM	CAD-C3D-C4D	3.90	126.23	112.47
2	B	501	HEM	CMB-C2B-C3B	3.92	126.31	116.53
2	C	501	HEM	CMB-C2B-C3B	3.93	126.34	116.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	501	HEM	CMC-C2C-C3C	4.00	126.51	116.53
2	D	501	HEM	CMB-C2B-C3B	4.05	126.64	116.53
2	B	501	HEM	CMC-C2C-C3C	4.08	126.72	116.53
2	C	501	HEM	CAD-C3D-C4D	4.43	128.08	112.47
2	B	501	HEM	CAD-C3D-C4D	4.54	128.50	112.47
2	A	501	HEM	CMC-C2C-C3C	4.79	128.49	116.53
2	C	501	HEM	CAD-C3D-C2D	4.91	127.33	113.22
2	A	501	HEM	CMB-C2B-C3B	5.04	129.10	116.53
2	B	501	HEM	CAD-C3D-C2D	5.06	127.78	113.22
2	D	501	HEM	CAD-C3D-C2D	5.23	128.25	113.22
2	A	501	HEM	CAD-C3D-C2D	5.39	128.72	113.22

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

13 monomers are involved in 26 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	501	HEM	1	0
3	A	502	EGM	1	0
2	B	501	HEM	7	0
3	B	502	EGM	1	0
5	B	504	GOL	2	0
6	B	506	SO4	1	0
2	C	501	HEM	5	0
3	C	502	EGM	1	0
5	C	504	GOL	3	0
6	C	505	SO4	1	0
2	D	501	HEM	3	0
5	D	504	GOL	1	0
6	D	505	SO4	2	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(Å²)	Q<0.9	
1	A	393/410 (95%)	-0.59	0	100	100	20, 32, 43, 49	0
1	B	394/410 (96%)	-0.56	0	100	100	22, 33, 45, 55	0
1	C	393/410 (95%)	-0.40	0	100	100	25, 37, 48, 56	0
1	D	393/410 (95%)	-0.26	5 (1%)	79	78	25, 41, 56, 70	0
All	All	1573/1640 (95%)	-0.45	5 (0%)	94	93	20, 35, 50, 70	0

All (5) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	279	THR	2.5
1	D	307	GLU	2.4
1	D	213	PRO	2.3
1	D	310	GLY	2.1
1	D	312	VAL	2.0

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

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

6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains.

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	LLDF	B-factors(Å ²)	Q<0.9
5	GOL	A	504	6/6	0.96	0.21	3.80	39,40,43,43	0
6	SO4	A	507	5/5	0.89	0.27	3.74	98,99,99,100	0
5	GOL	B	504	6/6	0.95	0.20	2.88	40,44,46,46	0
2	HEM	D	501	43/43	0.98	0.19	0.92	26,29,33,34	0
2	HEM	C	501	43/43	0.98	0.17	0.45	22,26,31,37	0
3	EGM	C	502	11/11	0.97	0.14	0.38	23,24,28,31	0
5	GOL	D	504	6/6	0.94	0.16	0.16	45,48,51,52	0
2	HEM	B	501	43/43	0.99	0.13	0.08	16,22,27,29	0
6	SO4	B	507	5/5	0.95	0.13	0.00	66,66,67,67	0
3	EGM	B	502	11/11	0.98	0.13	-0.02	18,20,24,25	0
5	GOL	C	504	6/6	0.95	0.14	-0.13	33,36,38,39	0
3	EGM	A	502	11/11	0.97	0.13	-0.21	24,26,31,34	0
6	SO4	D	505	5/5	0.97	0.14	-0.22	61,61,63,63	0
3	EGM	D	502	11/11	0.98	0.13	-0.48	19,20,24,25	0
2	HEM	A	501	43/43	0.99	0.11	-0.51	20,27,30,32	0
6	SO4	C	508	5/5	0.98	0.11	-0.88	43,45,48,50	0
6	SO4	D	508	5/5	0.98	0.11	-1.46	54,54,55,55	0
6	SO4	C	505	5/5	0.98	0.10	-	32,33,35,36	0
4	CL	C	503	1/1	0.93	0.12	-	53,53,53,53	0
6	SO4	C	506	5/5	0.91	0.37	-	87,87,88,88	0
6	SO4	D	506	5/5	0.90	0.40	-	87,88,89,89	0
4	CL	D	503	1/1	0.97	0.25	-	46,46,46,46	0
6	SO4	D	507	5/5	0.88	0.43	-	107,108,109,109	0
4	CL	B	503	1/1	0.95	0.09	-	38,38,38,38	0
4	CL	A	503	1/1	0.98	0.07	-	33,33,33,33	0
6	SO4	A	508	5/5	0.85	0.36	-	97,98,99,99	0
6	SO4	B	506	5/5	0.93	0.47	-	101,101,102,103	0
6	SO4	A	506	5/5	0.93	0.42	-	91,91,91,91	0
6	SO4	C	507	5/5	0.79	0.33	-	86,87,87,88	0
6	SO4	A	505	5/5	0.98	0.09	-	33,35,36,36	0
6	SO4	B	505	5/5	0.97	0.12	-	56,58,59,59	0

6.5 Other polymers ⓘ

There are no such residues in this entry.