



# Full wwPDB X-ray Structure Validation Report

Feb 28, 2014 – 05:45 AM GMT

PDB ID : 2RF7  
Title : Crystal structure of the escherichia coli nrfa mutant Q263E  
Authors : Clarke, T.A.; Richardson, D.J.; Hemmings, A.M.  
Deposited on : 2007-09-28  
Resolution : 2.04 Å(reported)

This is a full wwPDB validation report for a publicly released PDB entry.  
We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)  
A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

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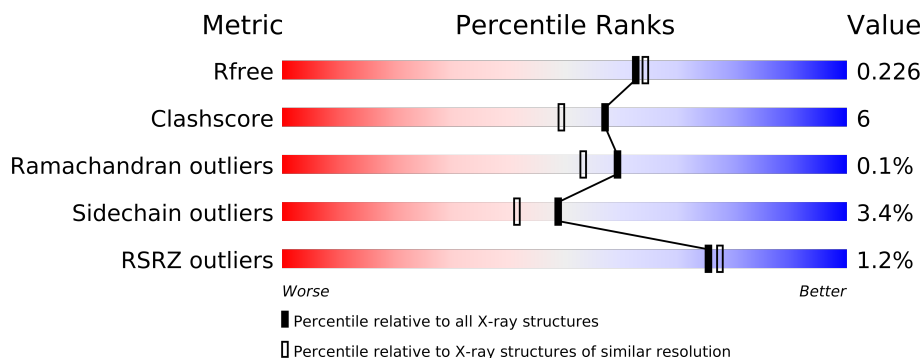
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.15 2013  
Xtriage (Phenix) : dev-1323  
EDS : stable22639  
Percentile statistics : 21963  
Refmac : 5.8.0049  
CCP4 : 6.3.0 (Settle)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)  
Validation Pipeline (wwPDB-VP) : stable22683

# 1 Overall quality at a glance

The reported resolution of this entry is 2.04 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))
$R_{free}$	66092	1380 (2.06-2.02)
Clashscore	79885	1577 (2.06-2.02)
Ramachandran outliers	78287	1565 (2.06-2.02)
Sidechain outliers	78261	1565 (2.06-2.02)
RSRZ outliers	66119	1381 (2.06-2.02)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	441	
1	B	441	
1	C	441	
1	D	441	

The following table lists non-polymeric compounds that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Geometry	Electron density
2	CA	C	1502	-	X
2	CA	D	1502	-	X
3	HEC	B	4	-	X
4	EDO	A	10	-	X

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Mol	Type	Chain	Res	Geometry	Electron density
4	EDO	A	480	-	X
4	EDO	B	12	-	X
4	EDO	B	14	-	X
4	EDO	B	15	-	X
4	EDO	B	480	-	X
4	EDO	B	481	-	X
4	EDO	B	6	-	X
4	EDO	B	8	-	X
4	EDO	C	11	-	X
4	EDO	C	13	-	X
4	EDO	C	9	-	X
4	EDO	D	481	-	X

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 16697 atoms, of which 0 are hydrogen and 0 are deuterium.

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 c-552.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	441	Total	C	N	O	S	0	4	0
			3500	2193	620	665	22			
1	B	441	Total	C	N	O	S	0	4	0
			3500	2196	621	660	23			
1	C	441	Total	C	N	O	S	3	1	0
			3482	2181	619	660	22			
1	D	441	Total	C	N	O	S	0	5	0
			3505	2198	622	663	22			

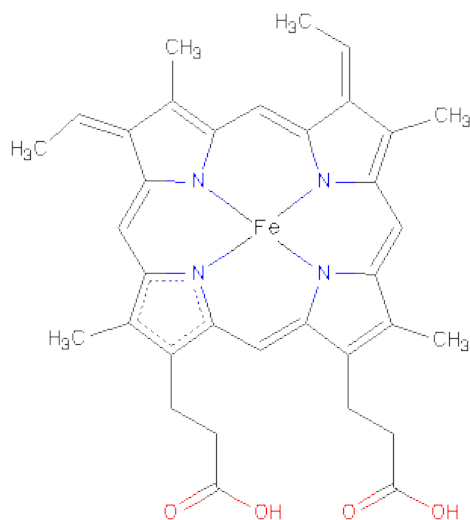
There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	263	GLU	GLN	ENGINEERED	UNP P0ABK9
B	263	GLU	GLN	ENGINEERED	UNP P0ABK9
C	263	GLU	GLN	ENGINEERED	UNP P0ABK9
D	263	GLU	GLN	ENGINEERED	UNP P0ABK9

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	2	Total	Ca	0	0
			2	2		
2	A	2	Total	Ca	0	0
			2	2		
2	D	2	Total	Ca	0	0
			2	2		
2	C	2	Total	Ca	0	0
			2	2		

- Molecule 3 is HEME C (three-letter code: HEC) (formula: C<sub>34</sub>H<sub>34</sub>FeN<sub>4</sub>O<sub>4</sub>).



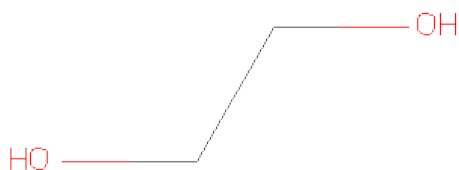
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
3	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
3	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
3	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
3	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
3	B	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
3	B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

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

- Molecule 4 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>).



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

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

- Molecule 5 is water.

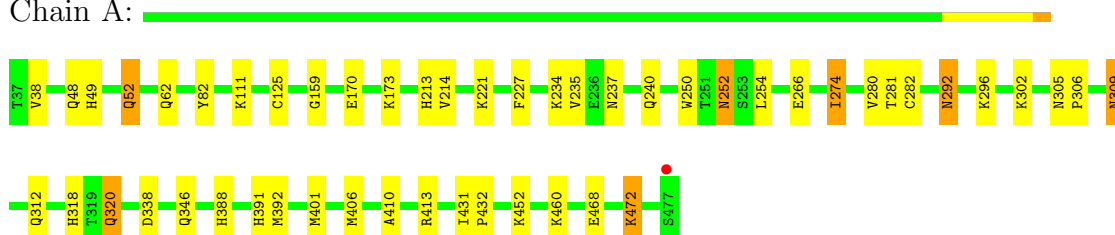
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	447	Total O 447 447	0	0
5	B	494	Total O 494 494	0	0
5	C	516	Total O 516 516	0	0
5	D	325	Total O 325 325	0	0

### 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.

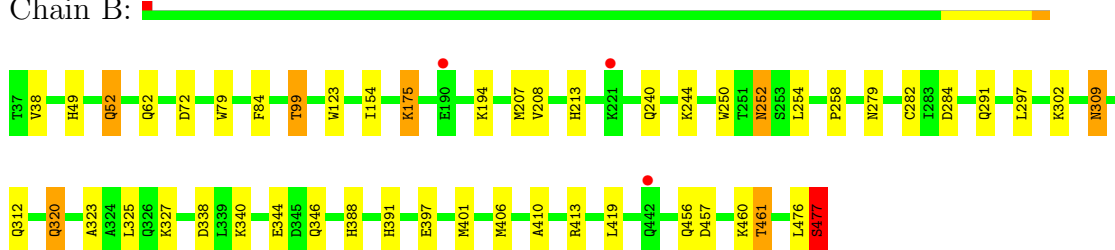
#### • Molecule 1: Cytochrome c-552

Chain A:



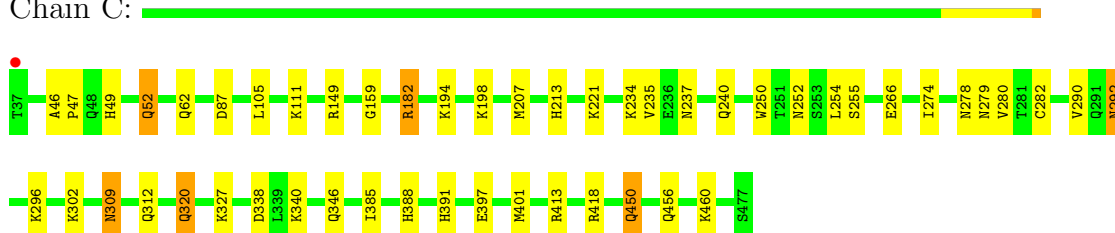
#### • Molecule 1: Cytochrome c-552

Chain B:



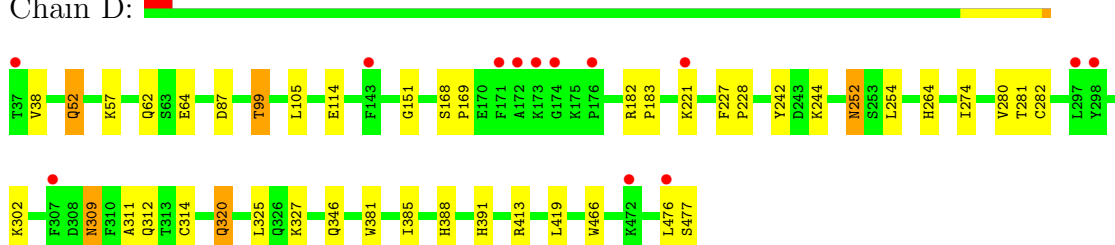
#### • Molecule 1: Cytochrome c-552

Chain C:



#### • Molecule 1: Cytochrome c-552

Chain D:





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	82.29Å 91.20Å 295.49Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	79.31 – 2.04 79.28 – 2.04	Depositor EDS
% Data completeness (in resolution range)	96.8 (79.31-2.04) 96.8 (79.28-2.04)	Depositor EDS
$R_{merge}$	0.10	Depositor
$R_{sym}$	0.10	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.95 (at 2.03Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, $R_{free}$	0.171 , 0.226 0.171 , 0.226	Depositor DCC
$R_{free}$ test set	6940 reflections (5.30%)	DCC
Wilson B-factor (Å <sup>2</sup> )	20.5	Xtriage
Anisotropy	0.053	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 39.3	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 137768 reflections	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	16697	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	22.0	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 29.48 % 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 1.5392e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: CA, EDO, HEC

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	0.76	0/3596	0.69	0/4862
1	B	0.80	0/3596	0.70	1/4859 (0.0%)
1	C	0.82	0/3569	0.71	1/4826 (0.0%)
1	D	0.67	0/3604	0.65	0/4871
All	All	0.77	0/14365	0.69	2/19418 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	182	ARG	NE-CZ-NH1	-5.96	117.32	120.30
1	B	477	SER	N-CA-CB	5.55	118.82	110.50

There are no chirality outliers.

There are no planarity outliers.

### 5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3500	0	3389	49	0
1	B	3500	0	3405	44	0
1	C	3482	0	3368	37	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	3505	0	3406	28	0
2	A	2	0	0	0	0
2	B	2	0	0	0	0
2	C	2	0	0	0	0
2	D	2	0	0	0	0
3	A	215	0	151	18	0
3	B	215	0	150	12	0
3	C	215	0	150	10	0
3	D	215	0	150	13	0
4	A	12	0	18	1	0
4	B	28	0	42	5	0
4	C	12	0	18	2	0
4	D	8	0	12	2	0
5	A	447	0	0	9	0
5	B	494	0	0	11	0
5	C	516	0	0	5	0
5	D	325	0	0	6	0
All	All	16697	0	14259	186	0

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 6.

All (186) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:309:ASN:OD1	1:A:312:GLN:HG3	1.42	1.19
1:A:125:CYS:SG	3:A:1:HEC:CAC	2.31	1.19
1:A:111:LYS:HG3	5:A:798:HOH:O	1.43	1.16
1:B:338:ASP:HB2	5:B:758:HOH:O	1.63	0.97
1:A:338:ASP:HB2	5:A:851:HOH:O	1.67	0.91
1:A:320:GLN:H	1:A:320:GLN:HE21	1.29	0.81
1:C:338:ASP:HB2	5:C:1095:HOH:O	1.83	0.79
1:B:309:ASN:ND2	1:B:312[B]:GLN:HG3	1.99	0.78
1:B:279:ASN:HB2	5:B:811:HOH:O	1.86	0.76
4:D:480:EDO:H12	5:D:786:HOH:O	1.88	0.72
1:B:240:GLN:O	1:B:244:LYS:HG2	1.90	0.71
1:B:456:GLN:O	1:B:460:LYS:HG2	1.92	0.70
1:D:320:GLN:H	1:D:320:GLN:HE21	1.39	0.69
3:C:4:HEC:HMC1	3:C:4:HEC:HBC3	1.75	0.68
1:A:62:GLN:HE21	1:A:302:LYS:HZ3	1.38	0.68
1:A:49:HIS:HD2	5:A:557:HOH:O	1.77	0.68
1:A:62:GLN:HE21	1:A:302:LYS:NZ	1.92	0.68
1:A:125:CYS:SG	3:A:1:HEC:C3C	2.82	0.68

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:309:ASN:CG	1:A:312:GLN:HG3	2.14	0.68
3:B:4:HEC:HBC3	3:B:4:HEC:HMC1	1.73	0.67
1:B:99:THR:HG22	4:B:8:EDO:H22	1.77	0.67
1:D:52:GLN:H	1:D:52:GLN:NE2	1.92	0.67
1:C:290:VAL:HG12	1:C:312:GLN:HG2	1.77	0.67
1:B:99:THR:HG23	5:B:521:HOH:O	1.94	0.66
4:B:8:EDO:H21	5:B:853:HOH:O	1.95	0.66
1:B:320:GLN:H	1:B:320:GLN:HE21	1.43	0.66
3:B:1:HEC:HMC1	3:B:1:HEC:HBC3	1.79	0.65
1:D:320:GLN:H	1:D:320:GLN:NE2	1.94	0.65
1:D:311:ALA:H	4:D:480:EDO:H11	1.61	0.65
3:C:5:HEC:HBB3	3:C:5:HEC:HMB1	1.79	0.64
1:D:52:GLN:H	1:D:52:GLN:HE21	1.44	0.64
1:B:309:ASN:HD21	1:B:312[B]:GLN:HG3	1.61	0.63
1:B:320:GLN:H	1:B:320:GLN:NE2	1.96	0.63
1:B:391:HIS:HE1	3:B:4:HEC:O2D	1.81	0.62
1:C:346:GLN:NE2	1:C:413:ARG:HH11	1.96	0.62
1:C:62:GLN:HE21	1:C:302:LYS:NZ	1.98	0.61
1:A:320:GLN:NE2	1:A:320:GLN:H	1.96	0.61
1:D:252:ASN:ND2	1:D:254:LEU:H	1.98	0.61
1:B:323:ALA:O	1:B:327[A]:LYS:HG3	2.00	0.61
1:B:62:GLN:HE21	1:B:302:LYS:NZ	1.99	0.61
1:D:57:LYS:HE3	5:D:623:HOH:O	2.00	0.61
1:A:388:HIS:HD2	5:A:796:HOH:O	1.85	0.60
1:C:62:GLN:HE21	1:C:302:LYS:HZ3	1.49	0.60
1:A:391:HIS:HE1	3:A:4:HEC:O2D	1.84	0.60
3:C:1:HEC:HBC3	3:C:1:HEC:HMC1	1.83	0.60
1:A:292:ASN:C	1:A:292:ASN:HD22	2.05	0.59
1:A:460:LYS:HG2	5:A:676:HOH:O	2.01	0.59
3:D:3:HEC:HBC3	3:D:3:HEC:HMC1	1.83	0.59
1:B:309:ASN:CG	1:B:312[B]:GLN:HG3	2.23	0.59
1:D:309:ASN:ND2	1:D:312:GLN:HG2	2.18	0.59
1:B:327[A]:LYS:HE3	5:B:771:HOH:O	2.01	0.59
1:C:320:GLN:H	1:C:320:GLN:NE2	2.01	0.58
1:D:391:HIS:HE1	3:D:4:HEC:O2D	1.87	0.58
1:A:125:CYS:SG	3:A:1:HEC:CBC	2.92	0.58
1:C:320:GLN:H	1:C:320:GLN:HE21	1.50	0.58
1:A:280:VAL:HG13	3:A:5:HEC:HBC2	1.86	0.58
1:A:52:GLN:H	1:A:52:GLN:NE2	2.01	0.57
3:A:2:HEC:HBC3	3:A:2:HEC:HMC1	1.85	0.57
1:B:388:HIS:HE1	5:B:482:HOH:O	1.88	0.57
1:A:252:ASN:ND2	1:A:254:LEU:H	2.02	0.57

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
3:D:2:HEC:HBC3	3:D:2:HEC:HMC1	1.87	0.57
1:C:340:LYS:HD2	1:C:385:ILE:HG21	1.88	0.56
1:B:52:GLN:NE2	1:B:52:GLN:H	2.04	0.55
1:A:292:ASN:ND2	1:A:296:LYS:H	2.05	0.55
1:A:125:CYS:SG	3:A:1:HEC:HAC	2.39	0.55
1:D:476:LEU:HG	1:D:477:SER:N	2.22	0.55
3:B:5:HEC:HMB1	3:B:5:HEC:HBB3	1.89	0.54
1:B:346:GLN:NE2	1:B:413:ARG:HH11	2.05	0.54
1:B:397:GLU:O	1:B:401[A]:MET:HG3	2.07	0.54
1:B:291:GLN:HG3	1:B:297:LEU:HD12	1.90	0.53
3:C:4:HEC:HMB1	3:C:4:HEC:HBB3	1.91	0.53
1:C:49:HIS:HD2	5:C:969:HOH:O	1.92	0.53
1:D:87:ASP:HB2	1:D:105:LEU:HB2	1.90	0.52
3:A:4:HEC:HBC3	3:A:4:HEC:HMC1	1.90	0.52
3:D:1:HEC:HMC1	3:D:1:HEC:HBC3	1.91	0.52
1:A:388:HIS:HE1	5:A:490:HOH:O	1.92	0.51
1:A:292:ASN:HD21	1:A:296:LYS:H	1.58	0.51
3:B:3:HEC:HBC3	3:B:3:HEC:HMC1	1.93	0.51
1:B:476:LEU:O	1:B:477:SER:HB2	2.10	0.51
1:A:346:GLN:NE2	1:A:413:ARG:HH11	2.09	0.51
1:C:391:HIS:HE1	3:C:4:HEC:O2D	1.93	0.51
1:C:52:GLN:H	1:C:52:GLN:NE2	2.08	0.51
3:B:5:HEC:HBC3	4:B:15:EDO:H11	1.92	0.50
1:C:456:GLN:HE21	1:C:460:LYS:HG3	1.75	0.50
1:B:49:HIS:HE1	5:B:594:HOH:O	1.95	0.50
1:B:340:LYS:CE	5:B:606:HOH:O	2.60	0.50
1:A:170:GLU:HA	1:A:173:LYS:HD2	1.94	0.50
1:C:418:ARG:HH22	4:C:11:EDO:C1	2.25	0.50
1:C:397:GLU:O	1:C:401:MET:HG3	2.12	0.49
1:A:52:GLN:H	1:A:52:GLN:HE21	1.60	0.49
3:A:3:HEC:HMC1	3:A:3:HEC:HBC3	1.93	0.49
1:B:62:GLN:HE21	1:B:302:LYS:HZ3	1.59	0.49
1:C:418:ARG:HH22	4:C:11:EDO:H11	1.77	0.48
3:B:4:HEC:HMB1	3:B:4:HEC:HBB3	1.95	0.48
1:C:388:HIS:HE1	5:C:1330:HOH:O	1.97	0.48
1:A:392:MET:HG2	3:A:4:HEC:C2D	2.45	0.47
1:C:252:ASN:ND2	1:C:254:LEU:H	2.12	0.47
3:D:4:HEC:HBC3	3:D:4:HEC:HMC1	1.95	0.47
1:C:235:VAL:HB	1:C:401:MET:HE3	1.97	0.47
1:D:99:THR:HG23	5:D:535:HOH:O	2.14	0.47
1:B:457:ASP:O	1:B:461:THR:HG23	2.15	0.47
1:B:258:PRO:HG2	4:B:12:EDO:H21	1.97	0.47

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:D:281:THR:HG22	5:D:565:HOH:O	2.14	0.47
1:B:284:ASP:OD1	4:B:15:EDO:H12	2.14	0.47
1:C:46:ALA:HB3	1:C:47:PRO:HD3	1.97	0.47
1:D:282:CYS:HA	3:D:4:HEC:CHC	2.45	0.46
1:B:194:LYS:HB3	1:B:207:MET:CE	2.45	0.46
3:A:1:HEC:HMC1	3:A:1:HEC:HBC3	1.97	0.46
1:B:309:ASN:OD1	1:B:312[B]:GLN:HG3	2.15	0.46
1:B:244:LYS:HG3	5:B:762:HOH:O	2.15	0.46
1:A:227:PHE:N	1:A:227:PHE:CD2	2.84	0.46
1:A:406:MET:HB3	1:B:406:MET:HG2	1.97	0.46
1:A:214:VAL:HG21	1:A:227:PHE:CZ	2.51	0.45
1:A:213:HIS:HB3	1:A:266:GLU:HB2	1.97	0.45
1:C:213:HIS:HB3	1:C:266:GLU:HB2	1.99	0.45
1:C:292:ASN:HD21	1:C:296:LYS:H	1.64	0.45
1:C:159:GLY:O	3:C:2:HEC:HMC3	2.17	0.45
1:D:391:HIS:CD2	1:D:391:HIS:H	2.35	0.45
3:B:2:HEC:HMC1	3:B:2:HEC:HBC3	1.99	0.45
1:D:62:GLN:HE21	1:D:302:LYS:NZ	2.15	0.45
1:B:194:LYS:HB3	1:B:207:MET:HE1	1.99	0.45
1:C:234:LYS:H	1:C:237:ASN:HD22	1.64	0.45
1:C:280:VAL:HG13	3:C:5:HEC:HBC2	1.98	0.45
3:D:5:HEC:HBC3	3:D:5:HEC:HMC1	1.98	0.45
1:C:87:ASP:HB2	1:C:105:LEU:HB2	1.99	0.44
3:D:4:HEC:HBB3	3:D:4:HEC:HMB1	1.99	0.44
1:A:48:GLN:HB2	5:A:539:HOH:O	2.17	0.44
3:A:5:HEC:HMC1	3:A:5:HEC:HBC3	1.99	0.44
3:C:5:HEC:HBA2	3:D:5:HEC:HBA2	2.00	0.44
1:D:346:GLN:NE2	1:D:413:ARG:HH11	2.16	0.43
3:A:5:HEC:HMB1	3:A:5:HEC:HBB3	1.98	0.43
1:D:227:PHE:N	1:D:227:PHE:CD2	2.87	0.43
1:A:431:ILE:HG22	1:A:432:PRO:O	2.17	0.43
1:A:282:CYS:HA	3:A:4:HEC:CHC	2.48	0.43
1:D:228:PRO:HG3	1:D:242:TYR:OH	2.19	0.43
1:A:391:HIS:CD2	1:A:391:HIS:H	2.37	0.43
1:A:452:LYS:NZ	5:A:919:HOH:O	2.52	0.43
1:B:309:ASN:HD21	1:B:312[A]:GLN:HG2	1.82	0.43
1:D:182:ARG:HA	1:D:183:PRO:HD3	1.89	0.43
1:B:240:GLN:NE2	5:B:762:HOH:O	2.51	0.43
1:B:52:GLN:HE21	1:B:52:GLN:H	1.65	0.43
1:A:410:ALA:HB2	1:B:410:ALA:HB2	2.01	0.42
1:A:235:VAL:HB	1:A:401:MET:HE3	2.00	0.42
1:A:159:GLY:O	3:A:2:HEC:HMC3	2.20	0.42

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:49:HIS:HD2	5:B:654:HOH:O	2.01	0.42
1:D:327[A]:LYS:HG3	5:D:560:HOH:O	2.20	0.42
1:D:168:SER:HA	1:D:169:PRO:HD3	1.91	0.42
1:C:49:HIS:HE1	5:C:991:HOH:O	2.03	0.42
1:D:151:GLY:HA3	1:D:466:TRP:CE2	2.55	0.42
1:D:281:THR:O	3:D:4:HEC:HMC3	2.19	0.42
1:C:194:LYS:HB3	1:C:207:MET:HE3	2.02	0.42
1:B:123:TRP:CG	1:B:154:ILE:HD13	2.55	0.42
3:A:5:HEC:HBA2	3:B:5:HEC:HBA2	2.01	0.42
1:C:182:ARG:HG3	5:C:908:HOH:O	2.19	0.42
1:A:309:ASN:CG	1:A:312:GLN:CG	2.86	0.41
1:D:280:VAL:HG13	3:D:5:HEC:HBC2	2.02	0.41
1:A:281:THR:HG22	5:A:580:HOH:O	2.20	0.41
1:B:213:HIS:CE1	3:B:1:HEC:HMD1	2.54	0.41
1:B:72:ASP:OD2	1:B:344:GLU:OE1	2.38	0.41
3:B:2:HEC:HBC1	3:B:3:HEC:HHC	2.01	0.41
1:C:282:CYS:HA	3:C:4:HEC:CHC	2.49	0.41
1:A:234:LYS:H	1:A:237:ASN:HD22	1.67	0.41
1:B:79:TRP:CE3	1:B:84:PHE:HB3	2.55	0.41
1:A:305:ASN:HA	1:A:306:PRO:HD3	1.95	0.41
1:B:252:ASN:ND2	1:B:254:LEU:H	2.17	0.41
1:A:82:TYR:CD1	1:A:250:TRP:HB3	2.55	0.41
1:C:252:ASN:HD22	1:C:255:SER:H	1.68	0.41
3:D:5:HEC:HBB3	3:D:5:HEC:HMB1	2.03	0.41
1:C:292:ASN:ND2	1:C:296:LYS:H	2.19	0.41
1:C:391:HIS:H	1:C:391:HIS:CD2	2.38	0.41
1:C:309:ASN:ND2	1:C:312:GLN:HE21	2.19	0.41
1:B:175:LYS:HA	1:B:175:LYS:HD2	1.86	0.41
1:A:472:LYS:HE3	1:A:472:LYS:N	2.35	0.41
1:C:278:ASN:O	1:C:279[B]:ASN:CG	2.59	0.41
1:D:314:CYS:HA	3:D:5:HEC:CHC	2.51	0.41
1:C:450:GLN:HE21	1:C:450:GLN:HB3	1.72	0.41
1:D:388:HIS:HE1	5:D:485:HOH:O	2.04	0.41
1:C:309:ASN:HD21	1:C:312:GLN:HE21	1.67	0.40
1:A:392:MET:HG2	3:A:4:HEC:C1D	2.51	0.40
1:A:318:HIS:HB3	1:A:320:GLN:NE2	2.36	0.40
1:D:381:TRP:O	1:D:385:ILE:HG13	2.21	0.40
1:B:282:CYS:HA	3:B:4:HEC:CHC	2.52	0.40
3:C:5:HEC:HBC3	3:C:5:HEC:HMC1	2.03	0.40
1:A:309:ASN:HA	4:A:480:EDO:H22	2.02	0.40
1:A:274:ILE:HG21	3:A:5:HEC:HBA1	2.03	0.40
1:C:198:LYS:HB3	1:C:198:LYS:HE3	1.78	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	443/441 (100%)	433 (98%)	10 (2%)	0	100	100
1	B	443/441 (100%)	433 (98%)	10 (2%)	0	100	100
1	C	440/441 (100%)	431 (98%)	9 (2%)	0	100	100
1	D	444/441 (101%)	427 (96%)	16 (4%)	1 (0%)	56	47
All	All	1770/1764 (100%)	1724 (97%)	45 (2%)	1 (0%)	59	53

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	264	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	366/362 (101%)	354 (97%)	12 (3%)	50	42
1	B	366/362 (101%)	353 (96%)	13 (4%)	47	38
1	C	363/362 (100%)	351 (97%)	12 (3%)	50	42
1	D	367/362 (101%)	354 (96%)	13 (4%)	48	40
All	All	1462/1448 (101%)	1412 (97%)	50 (3%)	49	41

All (50) residues with a non-rotameric sidechain are listed below:



Mol	Chain	Res	Type
1	A	38	VAL
1	A	52	GLN
1	A	221	LYS
1	A	240[A]	GLN
1	A	240[B]	GLN
1	A	252	ASN
1	A	274	ILE
1	A	292	ASN
1	A	309	ASN
1	A	320	GLN
1	A	468	GLU
1	A	472	LYS
1	B	38	VAL
1	B	52	GLN
1	B	99	THR
1	B	175	LYS
1	B	208	VAL
1	B	250	TRP
1	B	252	ASN
1	B	309	ASN
1	B	320	GLN
1	B	325	LEU
1	B	419	LEU
1	B	461	THR
1	B	477	SER
1	C	52	GLN
1	C	111	LYS
1	C	149	ARG
1	C	221	LYS
1	C	240	GLN
1	C	250	TRP
1	C	274	ILE
1	C	292	ASN
1	C	309	ASN
1	C	320	GLN
1	C	327	LYS
1	C	450	GLN
1	D	38	VAL
1	D	52	GLN
1	D	64	GLU
1	D	99	THR
1	D	114	GLU
1	D	221	LYS

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Mol	Chain	Res	Type
1	D	244	LYS
1	D	252	ASN
1	D	274	ILE
1	D	309	ASN
1	D	320	GLN
1	D	325	LEU
1	D	419	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (57) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	49	HIS
1	A	52	GLN
1	A	62	GLN
1	A	237	ASN
1	A	252	ASN
1	A	291	GLN
1	A	292	ASN
1	A	309	ASN
1	A	320	GLN
1	A	346	GLN
1	A	371	GLN
1	A	388	HIS
1	A	391	HIS
1	A	430	GLN
1	A	469	GLN
1	B	49	HIS
1	B	52	GLN
1	B	62	GLN
1	B	240	GLN
1	B	252	ASN
1	B	309	ASN
1	B	320	GLN
1	B	346	GLN
1	B	371	GLN
1	B	388	HIS
1	B	391	HIS
1	B	469	GLN
1	C	49	HIS
1	C	52	GLN
1	C	62	GLN
1	C	237	ASN

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Mol	Chain	Res	Type
1	C	240	GLN
1	C	252	ASN
1	C	292	ASN
1	C	309	ASN
1	C	320	GLN
1	C	326	GLN
1	C	337	ASN
1	C	346	GLN
1	C	371	GLN
1	C	388	HIS
1	C	391	HIS
1	C	450	GLN
1	C	456	GLN
1	C	469	GLN
1	D	52	GLN
1	D	62	GLN
1	D	237	ASN
1	D	252	ASN
1	D	291	GLN
1	D	309	ASN
1	D	320	GLN
1	D	346	GLN
1	D	371	GLN
1	D	388	HIS
1	D	391	HIS
1	D	450	GLN

### 5.3.3 RNA ⓘ

There are no RNA chains in this entry.

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

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

### 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry ⓘ

Of 43 ligands modelled in this entry, 8 are monoatomic - leaving 35 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	HEC	A	1	1,5	50,50,50	3.03	15 (30%)	56,82,82	2.05	16 (28%)
4	EDO	A	10	-	3,3,3	0.50	0	2,2,2	0.72	0
3	HEC	A	2	1	50,50,50	3.08	16 (32%)	56,82,82	2.14	16 (28%)
3	HEC	A	3	1,2	50,50,50	3.02	16 (32%)	56,82,82	2.06	15 (26%)
3	HEC	A	4	1,2	50,50,50	2.95	14 (28%)	56,82,82	2.17	17 (30%)
4	EDO	A	480	-	3,3,3	0.33	0	2,2,2	1.55	0
3	HEC	A	5	1	50,50,50	3.06	17 (34%)	56,82,82	2.08	18 (32%)
4	EDO	A	7	-	3,3,3	0.77	0	2,2,2	0.30	0
3	HEC	B	1	1,5	50,50,50	3.00	13 (26%)	56,82,82	2.01	15 (26%)
4	EDO	B	12	-	3,3,3	0.56	0	2,2,2	0.42	0
4	EDO	B	14	-	3,3,3	0.55	0	2,2,2	0.40	0
4	EDO	B	15	-	3,3,3	0.45	0	2,2,2	0.49	0
3	HEC	B	2	1	50,50,50	3.11	15 (30%)	56,82,82	2.36	22 (39%)
3	HEC	B	3	1,2	50,50,50	3.62	18 (36%)	56,82,82	3.04	18 (32%)
3	HEC	B	4	1	50,50,50	2.98	14 (28%)	56,82,82	2.03	13 (23%)
4	EDO	B	480	-	3,3,3	0.27	0	2,2,2	1.14	0
4	EDO	B	481	-	3,3,3	0.52	0	2,2,2	0.44	0
3	HEC	B	5	1	50,50,50	4.04	18 (36%)	56,82,82	2.86	20 (35%)
4	EDO	B	6	-	3,3,3	0.59	0	2,2,2	0.29	0
4	EDO	B	8	-	3,3,3	0.45	0	2,2,2	0.79	0
3	HEC	C	1	1,5	50,50,50	3.07	16 (32%)	56,82,82	2.09	17 (30%)
4	EDO	C	11	-	3,3,3	0.46	0	2,2,2	1.01	0
4	EDO	C	13	-	3,3,3	0.54	0	2,2,2	0.49	0
3	HEC	C	2	1	50,50,50	3.11	13 (26%)	56,82,82	2.01	14 (25%)
3	HEC	C	3	1,2	50,50,50	2.85	17 (34%)	56,82,82	2.09	18 (32%)
3	HEC	C	4	1,2	50,50,50	2.95	16 (32%)	56,82,82	1.94	12 (21%)
3	HEC	C	5	1	50,50,50	3.00	16 (32%)	56,82,82	1.90	15 (26%)
4	EDO	C	9	-	3,3,3	0.51	0	2,2,2	0.60	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	HEC	D	1	1	50,50,50	3.16	14 (28%)	56,82,82	1.98	12 (21%)
3	HEC	D	2	1	50,50,50	3.17	14 (28%)	56,82,82	2.27	16 (28%)
3	HEC	D	3	1,2	50,50,50	2.96	15 (30%)	56,82,82	2.29	19 (33%)
3	HEC	D	4	1,2	50,50,50	2.93	14 (28%)	56,82,82	2.07	16 (28%)
4	EDO	D	480	-	3,3,3	0.43	0	2,2,2	0.90	0
4	EDO	D	481	-	3,3,3	0.40	0	2,2,2	0.76	0
3	HEC	D	5	1	50,50,50	3.02	15 (30%)	56,82,82	1.88	13 (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
3	HEC	A	1	1,5	-	0/10/54/54	0/0/8/8
4	EDO	A	10	-	-	0/1/1/1	0/0/0/0
3	HEC	A	2	1	-	0/10/54/54	0/0/8/8
3	HEC	A	3	1,2	-	0/10/54/54	0/0/8/8
3	HEC	A	4	1,2	-	0/10/54/54	0/0/8/8
4	EDO	A	480	-	-	0/1/1/1	0/0/0/0
3	HEC	A	5	1	-	0/10/54/54	0/0/8/8
4	EDO	A	7	-	-	0/1/1/1	0/0/0/0
3	HEC	B	1	1,5	-	0/10/54/54	0/0/8/8
4	EDO	B	12	-	-	0/1/1/1	0/0/0/0
4	EDO	B	14	-	-	0/1/1/1	0/0/0/0
4	EDO	B	15	-	-	0/1/1/1	0/0/0/0
3	HEC	B	2	1	-	0/10/54/54	0/0/8/8
3	HEC	B	3	1,2	-	0/10/54/54	0/0/8/8
3	HEC	B	4	1	-	0/10/54/54	0/0/8/8
4	EDO	B	480	-	-	0/1/1/1	0/0/0/0
4	EDO	B	481	-	-	0/1/1/1	0/0/0/0
3	HEC	B	5	1	-	0/10/54/54	0/0/8/8
4	EDO	B	6	-	-	0/1/1/1	0/0/0/0
4	EDO	B	8	-	-	0/1/1/1	0/0/0/0
3	HEC	C	1	1,5	-	0/10/54/54	0/0/8/8
4	EDO	C	11	-	-	0/1/1/1	0/0/0/0
4	EDO	C	13	-	-	0/1/1/1	0/0/0/0
3	HEC	C	2	1	-	0/10/54/54	0/0/8/8
3	HEC	C	3	1,2	-	0/10/54/54	0/0/8/8
3	HEC	C	4	1,2	-	0/10/54/54	0/0/8/8
3	HEC	C	5	1	-	0/10/54/54	0/0/8/8

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	EDO	C	9	-	-	0/1/1/1	0/0/0/0
3	HEC	D	1	1	-	0/10/54/54	0/0/8/8
3	HEC	D	2	1	-	0/10/54/54	0/0/8/8
3	HEC	D	3	1,2	-	0/10/54/54	0/0/8/8
3	HEC	D	4	1,2	-	0/10/54/54	0/0/8/8
4	EDO	D	480	-	-	0/1/1/1	0/0/0/0
4	EDO	D	481	-	-	0/1/1/1	0/0/0/0
3	HEC	D	5	1	-	0/10/54/54	0/0/8/8

All (306) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	5	HEC	C1B-NB	14.66	1.65	1.36
3	B	3	HEC	C4B-NB	-12.30	1.19	1.37
3	B	5	HEC	C4B-NB	11.61	1.53	1.37
3	C	5	HEC	C3B-CAB	11.48	1.59	1.35
3	D	5	HEC	C3C-CAC	11.26	1.58	1.35
3	A	4	HEC	C3C-CAC	11.25	1.58	1.35
3	B	5	HEC	C3B-CAB	11.18	1.58	1.35
3	C	4	HEC	C3C-CAC	11.16	1.58	1.35
3	B	2	HEC	C3B-CAB	10.96	1.58	1.35
3	B	4	HEC	C3C-CAC	10.94	1.57	1.35
3	D	1	HEC	C3C-CAC	10.92	1.57	1.35
3	A	3	HEC	C3C-CAC	10.89	1.57	1.35
3	D	4	HEC	C3C-CAC	10.85	1.57	1.35
3	B	4	HEC	C3B-CAB	10.80	1.57	1.35
3	A	1	HEC	C3C-CAC	10.75	1.57	1.35
3	B	2	HEC	C3C-CAC	10.70	1.57	1.35
3	C	2	HEC	C3B-CAB	10.68	1.57	1.35
3	B	1	HEC	C3B-CAB	10.67	1.57	1.35
3	C	4	HEC	C3B-CAB	10.63	1.57	1.35
3	A	5	HEC	C3C-CAC	10.61	1.57	1.35
3	B	3	HEC	C3C-CAC	10.61	1.57	1.35
3	D	1	HEC	C3B-CAB	10.56	1.57	1.35
3	B	5	HEC	C3C-CAC	10.56	1.57	1.35
3	A	2	HEC	C3B-CAB	10.46	1.56	1.35
3	D	3	HEC	C3C-CAC	10.44	1.56	1.35
3	C	3	HEC	C3C-CAC	10.40	1.56	1.35
3	A	4	HEC	C3B-CAB	10.39	1.56	1.35
3	D	5	HEC	C3B-CAB	10.38	1.56	1.35
3	A	5	HEC	C3B-CAB	10.29	1.56	1.35
3	C	1	HEC	C3B-CAB	10.25	1.56	1.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	3	HEC	C3B-CAB	10.25	1.56	1.35
3	C	3	HEC	C3B-CAB	10.21	1.56	1.35
3	C	2	HEC	C3C-CAC	10.21	1.56	1.35
3	D	2	HEC	C3B-CAB	10.13	1.56	1.35
3	C	5	HEC	C3C-CAC	10.01	1.56	1.35
3	B	1	HEC	C3C-CAC	9.96	1.55	1.35
3	D	2	HEC	C3C-CAC	9.95	1.55	1.35
3	A	2	HEC	C3C-CAC	9.92	1.55	1.35
3	D	4	HEC	C3B-CAB	9.89	1.55	1.35
3	B	3	HEC	C3B-CAB	9.86	1.55	1.35
3	C	1	HEC	C3C-CAC	9.78	1.55	1.35
3	D	3	HEC	C3B-CAB	9.58	1.55	1.35
3	A	1	HEC	C3B-CAB	9.34	1.54	1.35
3	B	3	HEC	C3B-C4B	7.41	1.50	1.41
3	B	3	HEC	C4B-CHC	6.76	1.59	1.38
3	D	2	HEC	FE-ND	6.62	2.21	1.92
3	C	1	HEC	C1C-C2C	6.26	1.48	1.40
3	D	1	HEC	C1C-C2C	6.12	1.47	1.40
3	D	2	HEC	C3D-C2D	5.88	1.55	1.37
3	A	5	HEC	C1C-C2C	5.73	1.47	1.40
3	D	1	HEC	FE-NB	5.73	2.17	1.92
3	D	1	HEC	C3D-C2D	5.69	1.54	1.37
3	A	1	HEC	C1D-C2D	5.67	1.47	1.40
3	A	2	HEC	C1B-C2B	5.65	1.47	1.40
3	B	5	HEC	FE-NB	-5.64	1.67	1.92
3	B	1	HEC	C1B-C2B	5.58	1.47	1.40
3	A	1	HEC	C3D-C2D	5.55	1.54	1.37
3	D	4	HEC	C3D-C2D	5.54	1.54	1.37
3	A	2	HEC	C3D-C2D	5.49	1.53	1.37
3	D	2	HEC	FE-NC	5.44	2.15	1.92
3	D	3	HEC	C3D-C2D	5.44	1.53	1.37
3	C	2	HEC	C3D-C2D	5.41	1.53	1.37
3	D	4	HEC	C3C-C4C	5.37	1.48	1.41
3	B	4	HEC	C1D-C2D	5.35	1.46	1.40
3	B	1	HEC	FE-ND	5.34	2.15	1.92
3	D	1	HEC	FE-ND	5.28	2.15	1.92
3	C	1	HEC	C3D-C2D	5.27	1.53	1.37
3	B	5	HEC	C3D-C2D	5.27	1.53	1.37
3	C	2	HEC	C3B-C4B	5.26	1.48	1.41
3	C	2	HEC	FE-ND	5.23	2.14	1.92
3	C	1	HEC	C3C-C4C	5.22	1.48	1.41
3	D	5	HEC	C3D-C2D	5.21	1.53	1.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	3	HEC	C1B-C2B	5.19	1.46	1.40
3	D	5	HEC	C1C-C2C	5.15	1.46	1.40
3	C	2	HEC	C3C-C4C	5.15	1.48	1.41
3	D	2	HEC	C1B-C2B	5.15	1.46	1.40
3	A	3	HEC	C3D-C2D	5.15	1.52	1.37
3	B	2	HEC	FE-ND	5.12	2.14	1.92
3	C	5	HEC	C3D-C2D	5.11	1.52	1.37
3	B	2	HEC	C3D-C2D	5.08	1.52	1.37
3	A	4	HEC	C3D-C2D	5.05	1.52	1.37
3	A	5	HEC	C1D-C2D	5.04	1.46	1.40
3	C	4	HEC	C3D-C2D	5.01	1.52	1.37
3	A	2	HEC	FE-NC	5.01	2.14	1.92
3	A	5	HEC	FE-NA	5.00	2.14	1.92
3	D	1	HEC	C1B-C2B	5.00	1.46	1.40
3	A	5	HEC	C3D-C2D	4.94	1.52	1.37
3	A	5	HEC	C3C-C4C	4.90	1.47	1.41
3	B	3	HEC	C3D-C2D	4.90	1.52	1.37
3	C	4	HEC	C1D-C2D	4.87	1.46	1.40
3	C	1	HEC	C1B-C2B	4.87	1.46	1.40
3	C	3	HEC	C3D-C2D	4.86	1.52	1.37
3	A	1	HEC	FE-ND	4.85	2.13	1.92
3	A	4	HEC	C3C-C4C	4.85	1.47	1.41
3	B	1	HEC	C3D-C2D	4.84	1.52	1.37
3	D	3	HEC	FE-ND	4.83	2.13	1.92
3	B	2	HEC	C1D-C2D	4.80	1.46	1.40
3	C	2	HEC	C1C-C2C	4.79	1.46	1.40
3	C	2	HEC	C1B-C2B	4.79	1.46	1.40
3	A	1	HEC	C1C-C2C	4.79	1.46	1.40
3	A	2	HEC	FE-ND	4.78	2.13	1.92
3	A	2	HEC	C1C-C2C	4.77	1.46	1.40
3	C	5	HEC	FE-NC	4.75	2.12	1.92
3	C	1	HEC	FE-NB	4.75	2.12	1.92
3	D	3	HEC	C1C-C2C	4.74	1.46	1.40
3	A	4	HEC	C1C-C2C	4.73	1.46	1.40
3	A	1	HEC	C3C-C4C	4.72	1.47	1.41
3	B	3	HEC	C1D-C2D	4.70	1.46	1.40
3	D	1	HEC	C1D-C2D	4.70	1.46	1.40
3	A	1	HEC	C1B-C2B	4.69	1.46	1.40
3	D	2	HEC	C1C-C2C	4.68	1.46	1.40
3	D	5	HEC	C3C-C4C	4.67	1.47	1.41
3	D	4	HEC	C1D-C2D	4.67	1.46	1.40
3	D	2	HEC	C3C-C4C	4.62	1.47	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	3	HEC	C1C-C2C	4.60	1.45	1.40
3	B	5	HEC	C1D-C2D	4.60	1.45	1.40
3	A	3	HEC	C3C-C4C	4.59	1.47	1.41
3	A	2	HEC	C3B-C4B	4.59	1.47	1.41
3	B	5	HEC	FE-NC	4.59	2.12	1.92
3	D	3	HEC	FE-NC	4.55	2.12	1.92
3	B	1	HEC	C1C-C2C	4.53	1.45	1.40
3	A	3	HEC	FE-ND	4.52	2.11	1.92
3	D	5	HEC	FE-NC	4.52	2.11	1.92
3	B	2	HEC	C1B-C2B	4.51	1.45	1.40
3	C	5	HEC	C1C-C2C	4.47	1.45	1.40
3	B	3	HEC	FE-ND	4.45	2.11	1.92
3	A	5	HEC	C1B-C2B	4.44	1.45	1.40
3	C	1	HEC	C3B-C4B	4.44	1.47	1.41
3	D	3	HEC	C1D-C2D	4.43	1.45	1.40
3	B	4	HEC	C3D-C2D	4.43	1.50	1.37
3	B	2	HEC	FE-NA	4.41	2.11	1.92
3	D	5	HEC	FE-NA	4.41	2.11	1.92
3	C	2	HEC	FE-NC	4.40	2.11	1.92
3	A	2	HEC	C3C-C4C	4.37	1.47	1.41
3	D	2	HEC	C1D-C2D	4.34	1.45	1.40
3	B	3	HEC	C1C-C2C	4.31	1.45	1.40
3	C	5	HEC	C1D-C2D	4.27	1.45	1.40
3	B	2	HEC	FE-NC	4.27	2.10	1.92
3	D	2	HEC	FE-NB	4.27	2.10	1.92
3	C	5	HEC	C3C-C4C	4.24	1.46	1.41
3	D	4	HEC	C1C-C2C	4.24	1.45	1.40
3	D	2	HEC	C3B-C4B	4.23	1.46	1.41
3	C	1	HEC	FE-ND	4.22	2.10	1.92
3	B	1	HEC	C3B-C4B	4.20	1.46	1.41
3	B	5	HEC	C1C-C2C	4.16	1.45	1.40
3	B	1	HEC	FE-NB	4.15	2.10	1.92
3	D	3	HEC	FE-NB	4.15	2.10	1.92
3	B	2	HEC	FE-NB	4.15	2.10	1.92
3	C	4	HEC	C1B-C2B	4.14	1.45	1.40
3	D	3	HEC	C1B-C2B	4.14	1.45	1.40
3	D	2	HEC	FE-NA	4.12	2.10	1.92
3	D	1	HEC	C3B-C4B	4.11	1.46	1.41
3	B	4	HEC	C1B-C2B	4.07	1.45	1.40
3	B	4	HEC	C1C-C2C	4.05	1.45	1.40
3	B	1	HEC	C3C-C4C	4.05	1.46	1.41
3	D	4	HEC	C1B-C2B	4.04	1.45	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	4	HEC	FE-NC	4.03	2.09	1.92
3	B	2	HEC	C3B-C4B	4.02	1.46	1.41
3	D	5	HEC	C1D-C2D	4.00	1.45	1.40
3	D	4	HEC	FE-NA	3.95	2.09	1.92
3	B	2	HEC	C3C-C4C	3.93	1.46	1.41
3	D	3	HEC	C3B-C4B	3.93	1.46	1.41
3	A	3	HEC	C1D-C2D	3.93	1.45	1.40
3	D	3	HEC	C3C-C4C	3.93	1.46	1.41
3	B	3	HEC	C3C-C4C	3.92	1.46	1.41
3	C	3	HEC	C3C-C4C	3.89	1.46	1.41
3	C	4	HEC	C3B-C2B	-3.89	1.33	1.41
3	C	3	HEC	FE-NC	3.89	2.09	1.92
3	B	1	HEC	C1D-C2D	3.89	1.45	1.40
3	C	2	HEC	C1D-C2D	3.88	1.45	1.40
3	C	5	HEC	FE-NA	3.88	2.09	1.92
3	A	2	HEC	FE-NA	3.87	2.09	1.92
3	A	5	HEC	FE-NC	3.84	2.08	1.92
3	B	1	HEC	FE-NA	3.80	2.08	1.92
3	A	1	HEC	FE-NB	3.80	2.08	1.92
3	A	3	HEC	FE-NC	3.79	2.08	1.92
3	D	5	HEC	C1B-C2B	3.78	1.44	1.40
3	B	5	HEC	C3B-C2B	-3.78	1.33	1.41
3	B	5	HEC	C3C-C4C	3.75	1.46	1.41
3	A	4	HEC	C3B-C2B	-3.75	1.33	1.41
3	D	5	HEC	C3B-C2B	-3.74	1.33	1.41
3	B	4	HEC	C3B-C2B	-3.74	1.33	1.41
3	C	1	HEC	FE-NC	3.74	2.08	1.92
3	A	4	HEC	FE-ND	3.72	2.08	1.92
3	A	2	HEC	FE-NB	3.68	2.08	1.92
3	C	5	HEC	C1B-C2B	3.68	1.44	1.40
3	A	2	HEC	C1D-C2D	3.68	1.44	1.40
3	A	4	HEC	FE-NA	3.65	2.08	1.92
3	C	1	HEC	FE-NA	3.64	2.08	1.92
3	B	2	HEC	C1C-C2C	3.62	1.44	1.40
3	C	4	HEC	FE-ND	3.60	2.07	1.92
3	C	3	HEC	C1C-C2C	3.60	1.44	1.40
3	B	5	HEC	C1B-C2B	3.60	1.44	1.40
3	C	5	HEC	C4B-NB	3.55	1.42	1.37
3	A	1	HEC	FE-NC	3.54	2.07	1.92
3	C	3	HEC	FE-NA	3.54	2.07	1.92
3	B	3	HEC	FE-NC	3.50	2.07	1.92
3	A	4	HEC	C1B-C2B	3.49	1.44	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	3	HEC	C1B-C2B	3.45	1.44	1.40
3	B	4	HEC	FE-ND	3.44	2.07	1.92
3	B	4	HEC	C3B-C4B	3.44	1.45	1.41
3	B	3	HEC	C1B-C2B	3.41	1.44	1.40
3	C	5	HEC	C3C-C2C	-3.40	1.34	1.41
3	C	4	HEC	C3C-C4C	3.38	1.45	1.41
3	B	4	HEC	C3C-C4C	3.38	1.45	1.41
3	B	5	HEC	FE-NA	3.38	2.06	1.92
3	A	3	HEC	C3B-C4B	3.37	1.45	1.41
3	C	1	HEC	C1D-C2D	3.32	1.44	1.40
3	A	4	HEC	C1D-C2D	3.28	1.44	1.40
3	A	3	HEC	FE-NB	3.27	2.06	1.92
3	C	3	HEC	C3B-C2B	-3.25	1.34	1.41
3	C	3	HEC	C1D-C2D	3.25	1.44	1.40
3	C	3	HEC	C4D-ND	3.25	1.42	1.36
3	C	4	HEC	C3C-C2C	-3.23	1.34	1.41
3	A	3	HEC	C3B-C2B	-3.22	1.34	1.41
3	D	1	HEC	C3C-C4C	3.20	1.45	1.41
3	A	1	HEC	CAD-C3D	3.19	1.57	1.52
3	B	3	HEC	FE-NB	3.18	2.06	1.92
3	C	4	HEC	FE-NC	3.18	2.06	1.92
3	C	5	HEC	C3B-C2B	-3.15	1.34	1.41
3	A	5	HEC	C3B-C2B	-3.13	1.34	1.41
3	B	4	HEC	FE-NC	3.11	2.05	1.92
3	C	4	HEC	C3B-C4B	3.06	1.45	1.41
3	A	4	HEC	FE-NC	3.02	2.05	1.92
3	C	3	HEC	C3C-C2C	-3.02	1.35	1.41
3	C	2	HEC	C3C-C2C	-3.01	1.35	1.41
3	C	4	HEC	C1C-C2C	2.98	1.43	1.40
3	A	3	HEC	C3C-C2C	-2.97	1.35	1.41
3	C	2	HEC	FE-NB	2.95	2.05	1.92
3	B	4	HEC	C3C-C2C	-2.93	1.35	1.41
3	A	4	HEC	C3B-C4B	2.92	1.45	1.41
3	C	2	HEC	FE-NA	2.91	2.04	1.92
3	C	4	HEC	CMD-C2D	2.90	1.57	1.51
3	D	5	HEC	C3C-C2C	-2.89	1.35	1.41
3	A	1	HEC	C3C-C2C	-2.86	1.35	1.41
3	B	3	HEC	C3B-C2B	-2.86	1.35	1.41
3	D	4	HEC	C3C-C2C	-2.86	1.35	1.41
3	C	1	HEC	C3B-C2B	-2.86	1.35	1.41
3	A	5	HEC	FE-ND	2.85	2.04	1.92
3	C	3	HEC	C1D-ND	2.84	1.42	1.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	2	HEC	C3C-C2C	-2.80	1.35	1.41
3	A	1	HEC	C3B-C4B	2.79	1.45	1.41
3	D	1	HEC	C3C-C2C	-2.75	1.35	1.41
3	A	5	HEC	C4C-NC	2.74	1.41	1.37
3	A	4	HEC	FE-NB	2.73	2.04	1.92
3	B	5	HEC	C3C-C2C	-2.73	1.35	1.41
3	D	3	HEC	C3C-C2C	-2.72	1.35	1.41
3	D	2	HEC	C3B-C2B	-2.72	1.35	1.41
3	B	5	HEC	FE-ND	2.70	2.04	1.92
3	C	5	HEC	C1D-ND	2.66	1.41	1.36
3	B	4	HEC	FE-NB	2.65	2.03	1.92
3	D	5	HEC	CAD-C3D	2.64	1.56	1.52
3	C	4	HEC	FE-NB	2.63	2.03	1.92
3	C	1	HEC	C3C-C2C	-2.63	1.36	1.41
3	D	4	HEC	C3B-C2B	-2.62	1.36	1.41
3	B	5	HEC	C1D-ND	2.62	1.41	1.36
3	A	2	HEC	C3B-C2B	-2.60	1.36	1.41
3	C	3	HEC	FE-ND	2.58	2.03	1.92
3	B	5	HEC	C4D-ND	2.57	1.41	1.36
3	C	3	HEC	CAD-C3D	2.55	1.56	1.52
3	D	3	HEC	C3B-C2B	-2.54	1.36	1.41
3	D	2	HEC	C3C-C2C	-2.52	1.36	1.41
3	D	4	HEC	C1D-ND	2.49	1.41	1.36
3	C	5	HEC	CAD-C3D	2.48	1.56	1.52
3	A	1	HEC	FE-NA	2.48	2.03	1.92
3	B	2	HEC	C3B-C2B	-2.46	1.36	1.41
3	A	5	HEC	FE-NB	2.47	2.03	1.92
3	D	1	HEC	C3B-C2B	-2.45	1.36	1.41
3	C	4	HEC	CAD-C3D	2.42	1.56	1.52
3	B	1	HEC	C3B-C2B	-2.40	1.36	1.41
3	A	3	HEC	FE-NA	2.40	2.02	1.92
3	D	5	HEC	FE-ND	2.39	2.02	1.92
3	A	2	HEC	C1D-ND	2.38	1.41	1.36
3	B	5	HEC	CAD-C3D	2.38	1.56	1.52
3	A	4	HEC	C3C-C2C	-2.36	1.36	1.41
3	A	5	HEC	CAD-C3D	2.34	1.56	1.52
3	A	2	HEC	C3C-C2C	-2.34	1.36	1.41
3	C	5	HEC	FE-ND	2.34	2.02	1.92
3	D	1	HEC	C4C-NC	2.33	1.40	1.37
3	D	3	HEC	FE-NA	2.33	2.02	1.92
3	D	5	HEC	C3B-C4B	2.32	1.44	1.41
3	C	1	HEC	CAD-C3D	2.32	1.56	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	3	HEC	C3C-C2C	-2.30	1.36	1.41
3	A	3	HEC	CMD-C2D	2.30	1.56	1.51
3	D	5	HEC	C4D-ND	2.27	1.41	1.36
3	C	5	HEC	CMD-C2D	2.27	1.56	1.51
3	B	3	HEC	C4C-NC	2.26	1.40	1.37
3	A	5	HEC	C4D-ND	2.22	1.40	1.36
3	D	4	HEC	C4D-ND	2.20	1.40	1.36
3	C	3	HEC	C3B-C4B	2.20	1.44	1.41
3	A	5	HEC	C3C-C2C	-2.18	1.37	1.41
3	A	1	HEC	C3B-C2B	-2.17	1.37	1.41
3	B	1	HEC	C3C-C2C	-2.17	1.37	1.41
3	B	3	HEC	FE-NA	2.15	2.01	1.92
3	A	2	HEC	C4D-ND	2.13	1.40	1.36
3	C	1	HEC	CAA-C2A	2.11	1.56	1.52
3	D	4	HEC	FE-ND	2.11	2.01	1.92
3	D	1	HEC	FE-NC	2.10	2.01	1.92
3	B	2	HEC	CAD-C3D	2.09	1.55	1.52
3	C	3	HEC	CMD-C2D	2.09	1.56	1.51
3	B	3	HEC	C1C-NC	2.07	1.40	1.36
3	A	5	HEC	C3B-C4B	2.06	1.44	1.41
3	C	4	HEC	C4A-NA	2.05	1.40	1.37
3	D	3	HEC	C1C-NC	2.05	1.40	1.36
3	A	3	HEC	C4A-NA	2.05	1.40	1.37
3	B	4	HEC	FE-NA	2.03	2.01	1.92

All (322) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	5	HEC	C4B-NB-C1B	-13.65	88.79	106.76
3	B	3	HEC	C4B-C3B-C2B	-13.40	98.12	106.68
3	B	3	HEC	C4B-CHC-C1C	-9.33	115.20	127.47
3	B	3	HEC	CBB-CAB-C3B	-8.09	105.66	128.44
3	B	1	HEC	CBB-CAB-C3B	-7.49	107.36	128.44
3	D	1	HEC	CBB-CAB-C3B	-7.38	107.67	128.44
3	D	2	HEC	CBB-CAB-C3B	-7.23	108.08	128.44
3	C	4	HEC	CBB-CAB-C3B	-7.06	108.57	128.44
3	A	5	HEC	CBB-CAB-C3B	-7.03	108.64	128.44
3	D	4	HEC	CBB-CAB-C3B	-7.01	108.70	128.44
3	A	2	HEC	CBB-CAB-C3B	-7.00	108.73	128.44
3	D	3	HEC	CBB-CAB-C3B	-6.94	108.91	128.44
3	B	5	HEC	CBB-CAB-C3B	-6.91	108.97	128.44
3	D	5	HEC	CBB-CAB-C3B	-6.77	109.38	128.44

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	2	HEC	CBB-CAB-C3B	-6.52	110.09	128.44
3	A	1	HEC	CBB-CAB-C3B	-6.48	110.20	128.44
3	C	1	HEC	CBB-CAB-C3B	-6.31	110.67	128.44
3	C	3	HEC	CBB-CAB-C3B	-6.31	110.68	128.44
3	B	4	HEC	CBA-CAA-C2A	-6.02	101.09	112.35
3	C	5	HEC	CBB-CAB-C3B	-5.99	111.59	128.44
3	B	2	HEC	CMB-C2B-C1B	-5.90	119.55	128.62
3	B	2	HEC	CBB-CAB-C3B	-5.90	111.84	128.44
3	D	2	HEC	CBC-CAC-C3C	-5.76	112.23	128.44
3	B	4	HEC	CBB-CAB-C3B	-5.72	112.35	128.44
3	C	3	HEC	CMC-C2C-C1C	-5.71	119.83	128.62
3	A	4	HEC	CBB-CAB-C3B	-5.63	112.58	128.44
3	B	5	HEC	C3B-C4B-NB	5.62	119.64	111.52
3	A	2	HEC	CBC-CAC-C3C	-5.59	112.71	128.44
3	A	3	HEC	CBB-CAB-C3B	-5.50	112.97	128.44
3	B	2	HEC	CMC-C2C-C1C	-5.49	120.18	128.62
3	D	3	HEC	C4D-ND-C1D	5.31	113.76	106.76
3	D	4	HEC	CMC-C2C-C1C	-5.25	120.54	128.62
3	B	4	HEC	CBC-CAC-C3C	-5.24	113.67	128.44
3	A	4	HEC	CBA-CAA-C2A	-5.18	102.66	112.35
3	A	2	HEC	CMC-C2C-C1C	-5.09	120.78	128.62
3	B	2	HEC	C2B-C1B-NB	-5.03	105.61	109.41
3	D	1	HEC	C4D-ND-C1D	5.01	113.36	106.76
3	A	4	HEC	CBC-CAC-C3C	-5.00	114.36	128.44
3	B	2	HEC	C3B-C2B-C1B	4.95	110.36	107.07
3	D	2	HEC	C4D-ND-C1D	4.95	113.28	106.76
3	D	2	HEC	C2A-C1A-NA	-4.90	105.96	109.64
3	B	5	HEC	C2B-C1B-NB	4.85	113.07	109.41
3	B	4	HEC	CMC-C2C-C1C	-4.82	121.21	128.62
3	C	2	HEC	CMC-C2C-C1C	-4.77	121.29	128.62
3	D	5	HEC	CMC-C2C-C1C	-4.76	121.30	128.62
3	C	5	HEC	C3B-C2B-C1B	4.69	110.19	107.07
3	C	3	HEC	CBC-CAC-C3C	-4.68	115.27	128.44
3	A	4	HEC	C4D-ND-C1D	4.67	112.91	106.76
3	C	4	HEC	CBC-CAC-C3C	-4.65	115.34	128.44
3	C	4	HEC	CMC-C2C-C1C	-4.65	121.47	128.62
3	C	5	HEC	CBC-CAC-C3C	-4.65	115.36	128.44
3	C	2	HEC	CMB-C2B-C1B	-4.65	121.47	128.62
3	C	2	HEC	C4D-ND-C1D	4.64	112.88	106.76
3	A	1	HEC	CMC-C2C-C1C	-4.64	121.49	128.62
3	A	5	HEC	C3A-C4A-NA	-4.61	105.93	109.41
3	A	4	HEC	CMB-C2B-C1B	-4.60	121.54	128.62

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	4	HEC	CBA-CAA-C2A	-4.59	103.77	112.35
3	B	3	HEC	CBC-CAC-C3C	-4.59	115.52	128.44
3	A	3	HEC	C4D-ND-C1D	4.53	112.73	106.76
3	A	3	HEC	CMC-C2C-C1C	-4.53	121.66	128.62
3	A	5	HEC	CMC-C2C-C1C	-4.53	121.66	128.62
3	A	4	HEC	CMC-C2C-C1C	-4.51	121.68	128.62
3	D	3	HEC	CBA-CAA-C2A	-4.48	103.97	112.35
3	A	3	HEC	CBA-CAA-C2A	-4.48	103.98	112.35
3	C	1	HEC	CMB-C2B-C1B	-4.43	121.80	128.62
3	D	3	HEC	CBC-CAC-C3C	-4.42	116.01	128.44
3	D	3	HEC	CMB-C2B-C1B	-4.40	121.85	128.62
3	C	1	HEC	CBC-CAC-C3C	-4.30	116.34	128.44
3	B	2	HEC	C4D-ND-C1D	4.11	112.18	106.76
3	B	1	HEC	CBC-CAC-C3C	-4.10	116.90	128.44
3	A	2	HEC	C2A-C1A-NA	-4.09	106.57	109.64
3	D	4	HEC	CMC-C2C-C3C	4.07	130.21	125.72
3	A	5	HEC	C2B-C1B-NB	-4.06	106.35	109.41
3	A	1	HEC	C4B-C3B-C2B	4.04	109.25	106.68
3	B	1	HEC	CMB-C2B-C1B	-4.04	122.41	128.62
3	B	5	HEC	CMB-C2B-C1B	-4.00	122.47	128.62
3	C	2	HEC	CBC-CAC-C3C	-3.95	117.33	128.44
3	D	4	HEC	C4D-ND-C1D	3.93	111.94	106.76
3	D	1	HEC	CMC-C2C-C1C	-3.93	122.58	128.62
3	D	1	HEC	CBC-CAC-C3C	-3.91	117.43	128.44
3	C	1	HEC	C2A-C1A-NA	-3.91	106.70	109.64
3	A	2	HEC	C4D-ND-C1D	3.90	111.91	106.76
3	D	2	HEC	CMC-C2C-C1C	-3.90	122.63	128.62
3	A	3	HEC	CBC-CAC-C3C	-3.88	117.51	128.44
3	B	3	HEC	C4D-ND-C1D	3.88	111.87	106.76
3	C	1	HEC	C3A-C4A-NA	-3.85	106.50	109.41
3	D	1	HEC	CMB-C2B-C1B	-3.84	122.71	128.62
3	C	1	HEC	C4D-ND-C1D	3.79	111.76	106.76
3	C	1	HEC	CMC-C2C-C1C	-3.78	122.81	128.62
3	A	1	HEC	C4D-ND-C1D	3.77	111.72	106.76
3	B	2	HEC	C2A-C1A-NA	-3.76	106.81	109.64
3	B	5	HEC	C3B-C2B-C1B	3.74	109.56	107.07
3	B	3	HEC	CMC-C2C-C1C	-3.73	122.88	128.62
3	B	5	HEC	CMC-C2C-C1C	-3.67	122.98	128.62
3	D	5	HEC	CBC-CAC-C3C	-3.65	118.17	128.44
3	C	5	HEC	CMB-C2B-C1B	-3.65	123.01	128.62
3	D	5	HEC	CBA-CAA-C2A	-3.63	105.57	112.35
3	C	4	HEC	C4D-ND-C1D	3.63	111.54	106.76

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	3	HEC	CMB-C2B-C1B	-3.62	123.05	128.62
3	D	4	HEC	CBC-CAC-C3C	-3.61	118.28	128.44
3	D	4	HEC	C2D-C1D-ND	-3.57	106.72	109.41
3	A	4	HEC	C3B-C2B-C1B	3.56	109.44	107.07
3	A	5	HEC	CBC-CAC-C3C	-3.53	118.51	128.44
3	D	3	HEC	CBD-CAD-C3D	-3.52	106.49	112.69
3	C	1	HEC	C3B-C2B-C1B	3.51	109.40	107.07
3	A	3	HEC	C1A-C2A-C3A	3.51	109.45	106.69
3	A	3	HEC	CMB-C2B-C1B	-3.50	123.24	128.62
3	A	1	HEC	CMB-C2B-C3B	3.49	129.57	125.72
3	B	3	HEC	C2B-C1B-NB	-3.47	106.79	109.41
3	A	4	HEC	C2B-C1B-NB	-3.45	106.81	109.41
3	D	2	HEC	C3C-C4C-NC	-3.44	106.55	111.52
3	C	3	HEC	C3B-C2B-C1B	3.44	109.35	107.07
3	D	3	HEC	CMC-C2C-C1C	-3.42	123.36	128.62
3	B	2	HEC	CBC-CAC-C3C	-3.42	118.82	128.44
3	D	5	HEC	CMC-C2C-C3C	3.39	129.47	125.72
3	A	5	HEC	C4A-NA-C1A	3.39	110.66	105.58
3	A	5	HEC	C3B-C2B-C1B	3.37	109.31	107.07
3	B	1	HEC	C4D-ND-C1D	3.35	111.18	106.76
3	A	1	HEC	CBC-CAC-C3C	-3.35	119.01	128.44
3	D	3	HEC	C3B-C4B-NB	-3.35	106.68	111.52
3	A	1	HEC	CMC-C2C-C3C	3.34	129.41	125.72
3	B	4	HEC	C3A-C4A-NA	-3.33	106.90	109.41
3	D	3	HEC	C1A-C2A-C3A	3.31	109.30	106.69
3	D	3	HEC	C2B-C1B-NB	-3.32	106.91	109.41
3	B	5	HEC	CBC-CAC-C3C	-3.30	119.14	128.44
3	A	1	HEC	C4D-C3D-C2D	-3.29	103.51	106.92
3	B	1	HEC	C2A-C1A-NA	-3.29	107.17	109.64
3	B	3	HEC	C1A-CHA-C4D	-3.28	123.15	127.47
3	A	2	HEC	C3A-C4A-NA	-3.27	106.94	109.41
3	D	2	HEC	C2C-C1C-NC	-3.26	106.95	109.41
3	C	4	HEC	C1D-C2D-C3D	-3.26	104.73	107.00
3	C	4	HEC	CMB-C2B-C1B	-3.26	123.61	128.62
3	C	4	HEC	CBA-CAA-C2A	-3.24	106.29	112.35
3	A	3	HEC	C2A-C1A-NA	-3.24	107.21	109.64
3	C	5	HEC	C4A-CHB-C1B	-3.23	123.23	127.47
3	A	1	HEC	CMB-C2B-C1B	-3.21	123.68	128.62
3	B	1	HEC	CMC-C2C-C1C	-3.19	123.71	128.62
3	A	3	HEC	C3B-C2B-C1B	3.18	109.19	107.07
3	D	2	HEC	C4A-NA-C1A	3.16	110.33	105.58
3	B	1	HEC	C3B-C2B-C1B	3.15	109.16	107.07

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	2	HEC	CBA-CAA-C2A	-3.15	106.47	112.35
3	D	3	HEC	CMB-C2B-C3B	3.14	129.19	125.72
3	C	3	HEC	C3C-C4C-NC	-3.14	106.99	111.52
3	C	2	HEC	C3B-C2B-C1B	3.12	109.14	107.07
3	A	4	HEC	C2A-C1A-NA	-3.11	107.31	109.64
3	A	1	HEC	C3B-C4B-NB	-3.10	107.03	111.52
3	C	3	HEC	C1A-CHA-C4D	-3.10	123.39	127.47
3	D	1	HEC	C2B-C1B-NB	-3.09	107.08	109.41
3	B	2	HEC	CMB-C2B-C3B	3.09	129.13	125.72
3	B	4	HEC	CMC-C2C-C3C	3.09	129.13	125.72
3	B	1	HEC	CBA-CAA-C2A	-3.07	106.62	112.35
3	C	2	HEC	CMC-C2C-C3C	3.06	129.10	125.72
3	B	1	HEC	C2B-C1B-NB	-3.06	107.10	109.41
3	C	3	HEC	C4B-CHC-C1C	-3.02	123.50	127.47
3	D	3	HEC	C2A-C1A-NA	-2.99	107.39	109.64
3	A	2	HEC	C4A-NA-C1A	2.99	110.07	105.58
3	C	1	HEC	C4A-NA-C1A	2.99	110.06	105.58
3	B	1	HEC	C4A-C3A-C2A	2.98	108.79	106.89
3	B	5	HEC	C2A-C1A-NA	-2.98	107.40	109.64
3	C	3	HEC	CMC-C2C-C3C	2.97	129.00	125.72
3	B	5	HEC	CBA-CAA-C2A	-2.96	106.83	112.35
3	A	5	HEC	CMB-C2B-C1B	-2.95	124.08	128.62
3	D	2	HEC	C3A-C4A-NA	-2.95	107.18	109.41
3	C	5	HEC	CMC-C2C-C1C	-2.95	124.08	128.62
3	B	5	HEC	C4A-CHB-C1B	-2.94	123.61	127.47
3	A	2	HEC	CMB-C2B-C1B	-2.93	124.12	128.62
3	B	2	HEC	C4B-NB-C1B	2.91	110.60	106.76
3	A	3	HEC	C2B-C1B-NB	-2.91	107.21	109.41
3	A	4	HEC	C1A-C2A-C3A	2.91	108.98	106.69
3	A	4	HEC	C2D-C1D-ND	-2.91	107.22	109.41
3	B	3	HEC	CBA-CAA-C2A	-2.88	106.97	112.35
3	A	2	HEC	C2B-C1B-NB	-2.87	107.24	109.41
3	D	1	HEC	C4A-C3A-C2A	2.85	108.71	106.89
3	D	5	HEC	C2A-C1A-NA	-2.85	107.50	109.64
3	C	3	HEC	CMB-C2B-C1B	-2.84	124.25	128.62
3	B	3	HEC	CBD-CAD-C3D	-2.83	107.71	112.69
3	C	3	HEC	C2A-C1A-NA	-2.82	107.52	109.64
3	D	3	HEC	C2D-C1D-ND	-2.81	107.29	109.41
3	A	5	HEC	C4D-ND-C1D	2.80	110.45	106.76
3	D	2	HEC	CMB-C2B-C1B	-2.80	124.32	128.62
3	A	1	HEC	C4A-C3A-C2A	2.79	108.67	106.89
3	A	2	HEC	C3C-C4C-NC	-2.78	107.50	111.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	2	HEC	C2B-C1B-NB	-2.77	107.32	109.41
3	D	2	HEC	C1A-C2A-C3A	2.76	108.86	106.69
3	D	1	HEC	CMB-C2B-C3B	2.76	128.77	125.72
3	B	2	HEC	C2C-C1C-NC	-2.75	107.34	109.41
3	C	2	HEC	C2D-C1D-ND	-2.74	107.34	109.41
3	A	3	HEC	CBD-CAD-C3D	-2.73	107.88	112.69
3	A	1	HEC	C3A-C4A-NA	-2.72	107.36	109.41
3	C	5	HEC	CMA-C3A-C2A	2.72	130.07	124.94
3	D	3	HEC	C3C-C4C-NC	-2.70	107.62	111.52
3	D	5	HEC	C4D-C3D-C2D	-2.69	104.13	106.92
3	A	3	HEC	C3C-C4C-NC	-2.68	107.64	111.52
3	D	3	HEC	C3B-C2B-C1B	2.67	108.85	107.07
3	B	5	HEC	CBD-CAD-C3D	-2.66	108.01	112.69
3	D	5	HEC	C4A-NA-C1A	2.64	109.54	105.58
3	A	5	HEC	C3C-C4C-NC	-2.64	107.71	111.52
3	B	3	HEC	C3B-C2B-C1B	2.63	108.82	107.07
3	C	1	HEC	CMA-C3A-C2A	2.62	129.89	124.94
3	C	1	HEC	C4D-C3D-C2D	-2.62	104.20	106.92
3	D	3	HEC	C1D-C2D-C3D	-2.62	105.17	107.00
3	B	4	HEC	C4D-ND-C1D	2.62	110.21	106.76
3	D	2	HEC	C3B-C4B-NB	-2.62	107.74	111.52
3	D	3	HEC	C4C-C3C-C2C	2.61	108.34	106.68
3	C	1	HEC	C3C-C4C-NC	-2.59	107.77	111.52
3	B	1	HEC	C3A-C4A-NA	-2.59	107.45	109.41
3	B	2	HEC	CBD-CAD-C3D	-2.59	108.13	112.69
3	A	5	HEC	C2A-C1A-NA	-2.57	107.71	109.64
3	B	3	HEC	C2A-C1A-NA	-2.55	107.72	109.64
3	B	5	HEC	C3A-C4A-NA	-2.54	107.49	109.41
3	D	4	HEC	C3C-C4C-NC	-2.54	107.86	111.52
3	A	5	HEC	C4A-C3A-C2A	2.53	108.50	106.89
3	D	2	HEC	C2D-C1D-ND	-2.52	107.50	109.41
3	D	3	HEC	C4B-NB-C1B	2.52	110.08	106.76
3	B	5	HEC	C1D-C2D-C3D	-2.52	105.24	107.00
3	D	4	HEC	C3B-C2B-C1B	2.51	108.74	107.07
3	B	2	HEC	C4B-C3B-C2B	-2.51	105.08	106.68
3	C	5	HEC	CBA-CAA-C2A	-2.51	107.66	112.35
3	B	3	HEC	C3C-C4C-NC	-2.51	107.90	111.52
3	B	5	HEC	CAA-CBA-CGA	-2.51	105.41	113.47
3	D	4	HEC	CMB-C2B-C1B	-2.49	124.79	128.62
3	A	5	HEC	C4B-CHC-C1C	-2.49	124.20	127.47
3	B	2	HEC	C4A-NA-C1A	2.49	109.31	105.58
3	B	2	HEC	C3B-C4B-NB	-2.48	107.93	111.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	4	HEC	C2A-C1A-NA	-2.47	107.78	109.64
3	B	4	HEC	C1A-C2A-C3A	2.46	108.63	106.69
3	C	5	HEC	CMC-C2C-C3C	2.45	128.43	125.72
3	B	5	HEC	CHB-C1B-NB	-2.44	120.50	124.58
3	B	3	HEC	C1D-C2D-C3D	-2.44	105.30	107.00
3	C	5	HEC	CAA-CBA-CGA	-2.43	105.65	113.47
3	B	2	HEC	C3C-C4C-NC	-2.43	108.01	111.52
3	C	1	HEC	C2B-C1B-NB	-2.43	107.58	109.41
3	B	2	HEC	C3A-C4A-NA	-2.43	107.58	109.41
3	C	2	HEC	CMA-C3A-C2A	2.42	129.51	124.94
3	D	1	HEC	C1D-C2D-C3D	-2.42	105.31	107.00
3	A	3	HEC	C1D-C2D-C3D	-2.42	105.31	107.00
3	C	1	HEC	C4A-C3A-C2A	2.41	108.43	106.89
3	C	3	HEC	CBA-CAA-C2A	-2.41	107.84	112.35
3	C	4	HEC	CMC-C2C-C3C	2.41	128.38	125.72
3	D	4	HEC	C2B-C1B-NB	-2.38	107.61	109.41
3	C	5	HEC	C4B-C3B-C2B	-2.38	105.15	106.68
3	B	2	HEC	C1D-C2D-C3D	-2.38	105.34	107.00
3	C	2	HEC	C2B-C1B-NB	-2.37	107.62	109.41
3	A	5	HEC	CBA-CAA-C2A	-2.37	107.92	112.35
3	A	2	HEC	C2C-C1C-NC	-2.37	107.62	109.41
3	C	5	HEC	C1D-C2D-C3D	-2.36	105.35	107.00
3	A	2	HEC	C3B-C2B-C1B	2.36	108.64	107.07
3	A	4	HEC	C3C-C4C-NC	-2.36	108.12	111.52
3	B	5	HEC	C1A-C2A-C3A	2.35	108.54	106.69
3	D	4	HEC	C4B-CHC-C1C	-2.34	124.39	127.47
3	A	5	HEC	C3B-C4B-NB	-2.33	108.15	111.52
3	C	5	HEC	C2A-C1A-NA	-2.33	107.89	109.64
3	B	4	HEC	C2C-C1C-NC	-2.33	107.65	109.41
3	B	1	HEC	C1D-C2D-C3D	-2.31	105.39	107.00
3	D	1	HEC	C3B-C4B-NB	-2.30	108.19	111.52
3	A	1	HEC	C3C-C4C-NC	-2.30	108.20	111.52
3	B	1	HEC	C4A-NA-C1A	2.30	109.03	105.58
3	C	3	HEC	C1A-C2A-C3A	2.30	108.50	106.69
3	D	1	HEC	C3A-C4A-NA	-2.29	107.68	109.41
3	C	2	HEC	C2A-C1A-NA	-2.29	107.92	109.64
3	A	5	HEC	C4D-C3D-C2D	-2.29	104.55	106.92
3	C	4	HEC	C1A-CHA-C4D	-2.29	124.46	127.47
3	C	4	HEC	C4B-CHC-C1C	-2.29	124.46	127.47
3	A	1	HEC	C2A-C1A-NA	-2.28	107.92	109.64
3	B	4	HEC	C2A-C1A-NA	-2.28	107.93	109.64
3	A	1	HEC	C2D-C1D-ND	-2.27	107.70	109.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	1	HEC	CMA-C3A-C4A	-2.27	121.68	126.16
3	C	3	HEC	CHA-C4D-ND	2.26	128.36	124.58
3	B	4	HEC	C3C-C4C-NC	-2.26	108.25	111.52
3	C	4	HEC	C2B-C1B-NB	-2.26	107.70	109.41
3	B	2	HEC	CMA-C3A-C2A	2.26	129.19	124.94
3	B	3	HEC	C2C-C1C-NC	-2.24	107.72	109.41
3	C	2	HEC	C3B-C4B-NB	-2.24	108.28	111.52
3	A	4	HEC	C3B-C4B-NB	-2.23	108.30	111.52
3	C	4	HEC	CAD-CBD-CGD	-2.22	106.32	113.47
3	A	2	HEC	C3B-C4B-NB	-2.22	108.32	111.52
3	A	2	HEC	CBA-CAA-C2A	-2.21	108.22	112.35
3	C	3	HEC	C2C-C1C-NC	-2.20	107.75	109.41
3	A	2	HEC	C1A-C2A-C3A	2.17	108.40	106.69
3	B	5	HEC	CMA-C3A-C2A	2.17	129.04	124.94
3	C	3	HEC	C4D-ND-C1D	2.17	109.62	106.76
3	D	4	HEC	C4A-NA-C1A	2.16	108.82	105.58
3	B	5	HEC	C4D-ND-C1D	2.16	109.61	106.76
3	B	5	HEC	C4A-NA-C1A	2.15	108.81	105.58
3	D	3	HEC	CHB-C1B-NB	2.15	128.17	124.58
3	C	1	HEC	CMB-C2B-C3B	2.14	128.08	125.72
3	A	4	HEC	CMB-C2B-C3B	2.14	128.08	125.72
3	C	3	HEC	C4C-CHD-C1D	-2.13	124.67	127.47
3	C	2	HEC	CMB-C2B-C3B	2.13	128.07	125.72
3	C	5	HEC	C4D-ND-C1D	2.11	109.55	106.76
3	D	2	HEC	C4C-NC-C1C	2.11	109.54	106.76
3	D	5	HEC	C4D-ND-C1D	2.10	109.53	106.76
3	A	5	HEC	C3D-C4D-CHA	-2.10	122.02	126.00
3	A	3	HEC	O2A-CGA-CBA	2.10	121.63	114.22
3	B	4	HEC	C3B-C4B-NB	-2.10	108.49	111.52
3	A	1	HEC	C2B-C1B-NB	-2.09	107.83	109.41
3	A	3	HEC	C3B-C4B-NB	-2.09	108.51	111.52
3	D	1	HEC	C4B-NB-C1B	2.09	109.51	106.76
3	D	5	HEC	CMA-C3A-C2A	2.08	128.87	124.94
3	C	2	HEC	C3C-C4C-NC	-2.08	108.51	111.52
3	B	2	HEC	O2A-CGA-CBA	2.08	121.56	114.22
3	D	5	HEC	C3B-C4B-NB	-2.06	108.54	111.52
3	C	5	HEC	C3C-C4C-NC	-2.06	108.55	111.52
3	B	2	HEC	C1A-C2A-C3A	2.06	108.31	106.69
3	D	4	HEC	C1A-CHA-C4D	-2.06	124.77	127.47
3	A	4	HEC	CMC-C2C-C3C	2.05	127.99	125.72
3	A	5	HEC	CMC-C2C-C3C	2.05	127.99	125.72
3	C	3	HEC	C4C-C3C-C2C	2.05	107.99	106.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	1	HEC	C3C-C4C-NC	-2.05	108.56	111.52
3	C	1	HEC	C1A-C2A-C3A	2.05	108.30	106.69
3	A	4	HEC	C1A-CHA-C4D	-2.04	124.78	127.47
3	B	3	HEC	CMC-C2C-C3C	2.03	127.97	125.72
3	B	1	HEC	CMA-C3A-C2A	2.03	128.77	124.94
3	D	5	HEC	C3C-C4C-NC	-2.03	108.59	111.52
3	A	4	HEC	CBD-CAD-C3D	-2.03	109.12	112.69
3	B	2	HEC	O2A-CGA-O1A	-2.02	118.17	123.30
3	D	4	HEC	C4D-C3D-C2D	-2.02	104.83	106.92
3	A	2	HEC	CMD-C2D-C1D	-2.01	125.53	128.62
3	B	4	HEC	CMB-C2B-C1B	-2.01	125.54	128.62
3	D	5	HEC	C3A-C4A-NA	-2.00	107.90	109.41
3	B	3	HEC	C3C-C2C-C1C	2.00	108.40	107.07
3	C	3	HEC	CBD-CAD-C3D	-2.00	109.16	112.69

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

## 5.7 Other polymers ⓘ

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

## 6 Fit of model and data ⓘ

### 6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å <sup>2</sup> )	Q<0.9
1	A	441/441 (100%)	-0.19	1 (0%)	93	95	10, 20, 35, 45	10 (2%)
1	B	441/441 (100%)	-0.30	3 (0%)	84	87	9, 17, 29, 40	11 (2%)
1	C	441/441 (100%)	-0.35	1 (0%)	93	95	9, 16, 28, 43	6 (1%)
1	D	441/441 (100%)	0.15	13 (2%)	49	49	13, 26, 47, 54	12 (2%)
All	All	1764/1764 (100%)	-0.17	18 (1%)	75	81	9, 19, 37, 54	39 (2%)

All (18) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	37	THR	3.3
1	D	173	LYS	3.0
1	B	442	GLN	2.9
1	D	171	PHE	2.8
1	D	476	LEU	2.6
1	D	143	PHE	2.6
1	B	190	GLU	2.4
1	D	174	GLY	2.4
1	D	297	LEU	2.3
1	D	37	THR	2.3
1	D	176	PRO	2.3
1	D	172	ALA	2.2
1	B	221	LYS	2.2
1	D	298	TYR	2.2
1	A	477	SER	2.1
1	D	221	LYS	2.1
1	D	307	PHE	2.0
1	D	472	LYS	2.0

## 6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

## 6.3 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 6.4 Ligands ⓘ

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, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSR	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
4	EDO	B	14	4/4	0.37	20.95	35,38,40,44	0
4	EDO	B	15	4/4	0.41	10.89	42,43,44,46	0
4	EDO	A	480	4/4	0.23	8.25	33,34,34,36	0
4	EDO	B	481	4/4	0.26	7.60	36,36,37,37	0
4	EDO	C	11	4/4	0.20	6.37	29,32,33,38	0
4	EDO	C	13	4/4	0.26	6.13	40,40,40,43	0
4	EDO	B	8	4/4	0.17	6.02	36,37,39,40	0
4	EDO	B	12	4/4	0.24	5.69	46,46,47,47	0
2	CA	D	1502	1/1	0.32	5.32	87,87,87,87	0
4	EDO	D	481	4/4	0.23	4.47	28,29,30,33	0
4	EDO	C	9	4/4	0.15	4.20	17,19,21,26	0
3	HEC	B	4	43/43	0.13	4.15	6,10,24,34	0
4	EDO	B	480	4/4	0.20	3.69	26,26,29,32	0
4	EDO	B	6	4/4	0.13	2.85	17,21,23,29	0
4	EDO	A	10	4/4	0.15	2.65	27,29,29,31	0
2	CA	C	1502	1/1	0.20	2.35	61,61,61,61	0
3	HEC	C	4	43/43	0.12	1.74	6,11,23,33	0
3	HEC	A	4	43/43	0.12	1.62	10,14,27,35	0
3	HEC	A	5	43/43	0.12	1.56	14,17,26,35	0
3	HEC	B	3	43/43	0.11	1.42	5,9,15,22	0
2	CA	C	1501	1/1	0.10	1.33	13,13,13,13	0
3	HEC	B	5	43/43	0.13	1.21	8,13,26,30	0
3	HEC	B	1	43/43	0.11	1.15	4,10,14,17	0
4	EDO	A	7	4/4	0.12	0.97	17,19,20,23	0
3	HEC	C	1	43/43	0.11	0.93	5,8,11,14	0

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Mol	Type	Chain	Res	Atoms	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
3	HEC	C	3	43/43	0.11	0.54	5,8,11,19	0
3	HEC	D	2	43/43	0.20	0.54	25,34,37,38	0
3	HEC	B	2	43/43	0.11	0.52	7,11,13,15	0
2	CA	A	1502	1/1	0.12	0.47	64,64,64,64	0
3	HEC	A	3	43/43	0.12	0.46	10,15,18,24	0
3	HEC	D	5	43/43	0.13	0.33	19,23,31,34	0
2	CA	B	1502	1/1	0.11	0.27	64,64,64,64	0
3	HEC	D	3	43/43	0.14	0.13	18,23,26,27	0
3	HEC	A	2	43/43	0.12	0.13	12,21,23,23	0
3	HEC	D	4	43/43	0.13	0.10	15,21,31,38	0
3	HEC	D	1	43/43	0.12	-0.08	17,20,23,24	0
3	HEC	C	2	43/43	0.10	-0.12	7,11,15,17	0
3	HEC	C	5	43/43	0.11	-0.12	12,15,29,34	0
3	HEC	A	1	43/43	0.10	-0.14	8,13,15,16	0
4	EDO	D	480	4/4	0.16	-0.22	35,35,39,40	0
2	CA	B	1501	1/1	0.09	-0.69	16,16,16,16	0
2	CA	A	1501	1/1	0.09	-0.99	17,17,17,17	0
2	CA	D	1501	1/1	0.06	-4.32	22,22,22,22	0

## 6.5 Other polymers ⓘ

There are no such residues in this entry.