



# Full wwPDB X-ray Structure Validation Report ⓘ

Jul 31, 2023 – 03:19 AM EDT

PDB ID : 1CP2  
Title : NITROGENASE IRON PROTEIN FROM CLOSTRIDIUM PASTEURIANUM  
Authors : Schlessman, J.L.; Woo, D.; Joshua-Tor, L.; Howard, J.B.; Rees, D.C.  
Deposited on : 1998-05-11  
Resolution : 1.93 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](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

---

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (Phenix) : **NOT EXECUTED**  
EDS : **NOT EXECUTED**  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.34

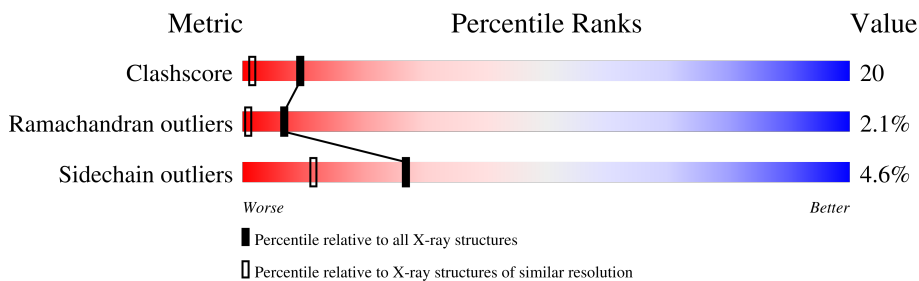
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.93 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))
Clashscore	141614	1023 (1.94-1.94)
Ramachandran outliers	138981	1007 (1.94-1.94)
Sidechain outliers	138945	1007 (1.94-1.94)

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

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	269	 67% 30% .
1	B	269	 64% 30% . .

## 2 Entry composition [i](#)

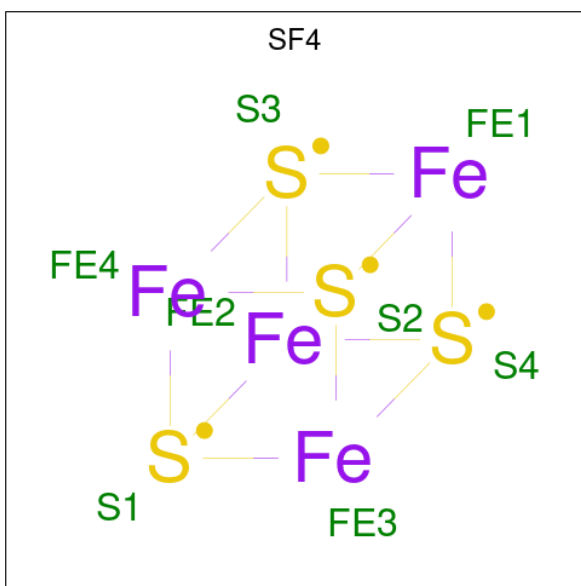
There are 3 unique types of molecules in this entry. The entry contains 4206 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 NITROGENASE IRON PROTEIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	269	Total 2040	C 1279	N 344	O 401	S 16	83	0	0
1	B	269	Total 2040	C 1279	N 344	O 401	S 16	110	0	0

- Molecule 2 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe<sub>4</sub>S<sub>4</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	Fe	S		
2	B	1	Total 8	Fe 4	S 4	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
3	A	62	Total 62	O 62	0	0

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
3	B	56	Total	O	0	0
			56	56		

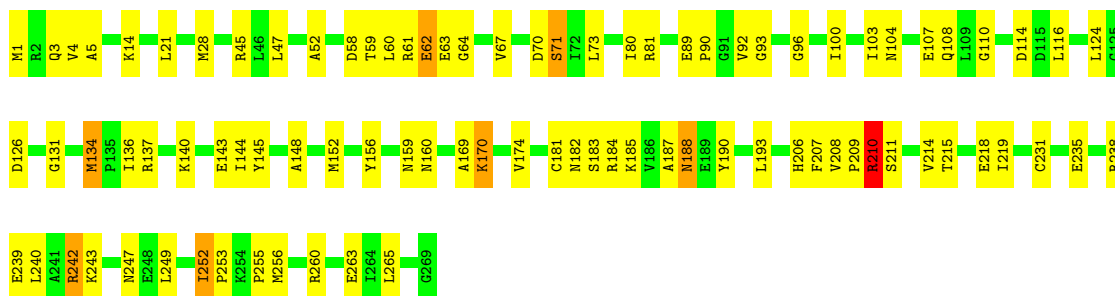
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. 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. 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.

Note EDS was not executed.

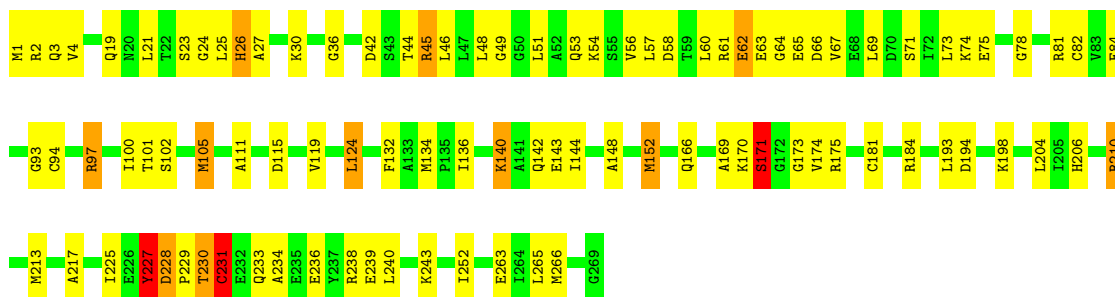
- Molecule 1: NITROGENASE IRON PROTEIN

Chain A:  67% 30%



- Molecule 1: NITROGENASE IRON PROTEIN

Chain B:  64% 30%



## 4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	67.60Å 75.87Å 53.55Å 90.00° 114.17° 90.00°	Depositor
Resolution (Å)	5.00 – 1.93	Depositor
% Data completeness (in resolution range)	98.8 (5.00-1.93)	Depositor
$R_{merge}$	0.07	Depositor
$R_{sym}$	(Not available)	Depositor
Refinement program	X-PLOR 3.1	Depositor
R, $R_{free}$	0.209 , 0.297	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	4206	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	35.0	wwPDB-VP

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: SF4

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	0.85	0/2067	0.99	7/2782 (0.3%)
1	B	0.86	0/2067	0.98	6/2782 (0.2%)
All	All	0.86	0/4134	0.98	13/5564 (0.2%)

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	A	0	2

There are no bond length outliers.

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed( $^{\circ}$ )	Ideal( $^{\circ}$ )
1	A	210	ARG	NE-CZ-NH2	7.99	124.30	120.30
1	A	137	ARG	NE-CZ-NH2	7.99	124.29	120.30
1	A	45	ARG	NE-CZ-NH2	7.50	124.05	120.30
1	B	61	ARG	NE-CZ-NH2	7.28	123.94	120.30
1	A	61	ARG	NE-CZ-NH2	7.14	123.87	120.30
1	B	45	ARG	NE-CZ-NH2	7.11	123.85	120.30
1	A	134	MET	CG-SD-CE	6.60	110.77	100.20
1	A	252	ILE	N-CA-C	-6.50	93.46	111.00
1	B	230	THR	N-CA-C	-5.70	95.62	111.00
1	B	134	MET	CG-SD-CE	5.38	108.82	100.20
1	B	2	ARG	NE-CZ-NH1	-5.35	117.62	120.30
1	A	52	ALA	N-CA-C	-5.24	96.86	111.00
1	B	231	CYS	N-CA-C	-5.23	96.88	111.00

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	145	TYR	Sidechain
1	A	210	ARG	Sidechain

## 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2040	0	2053	65	2
1	B	2040	0	2053	86	2
2	B	8	0	0	0	0
3	A	62	0	0	7	0
3	B	56	0	0	2	0
All	All	4206	0	4106	151	2

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 20.

All (151) 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:14:LYS:HE3	3:A:331:HOH:O	1.36	1.20
1:A:14:LYS:HB3	3:A:331:HOH:O	1.01	1.18
1:A:100:ILE:HD11	1:A:134:MET:HB3	1.24	1.13
1:B:93:GLY:HA2	1:B:97:ARG:HH22	1.31	0.94
1:B:60:LEU:HD12	1:B:67:VAL:HG21	1.50	0.93
1:A:188:ASN:HD21	1:A:190:TYR:HB2	1.39	0.87
1:A:131:GLY:O	1:A:134:MET:HG2	1.76	0.85
1:A:100:ILE:HD11	1:A:134:MET:CB	2.06	0.85
1:A:1:MET:HE1	1:A:116:LEU:HD12	1.60	0.82
1:B:144:ILE:HD11	1:B:174:VAL:CG1	2.12	0.79
1:B:94:CYS:HB3	1:B:97:ARG:HG3	1.64	0.78
1:B:97:ARG:O	1:B:100:ILE:HG13	1.85	0.77
1:B:93:GLY:HA2	1:B:97:ARG:NH2	2.00	0.77
1:B:19:GLN:HE22	1:B:46:LEU:H	1.31	0.77

*Continued on next page...*



*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:60:LEU:CD1	1:B:67:VAL:HG21	2.15	0.75
1:B:144:ILE:HD12	1:B:175:ARG:O	1.86	0.75
1:A:214:VAL:O	1:A:218:GLU:HG3	1.86	0.74
1:B:67:VAL:HG11	1:B:105:MET:HE1	1.68	0.74
1:B:26:HIS:CD2	1:B:78:GLY:HA3	2.22	0.74
1:B:54:LYS:HG2	1:B:58:ASP:HB2	1.71	0.72
1:B:97:ARG:HH11	1:B:97:ARG:HB2	1.53	0.72
1:A:159:ASN:HD21	1:A:256:MET:H	1.38	0.72
1:A:73:LEU:HD21	1:A:81:ARG:HB3	1.72	0.72
1:A:260:ARG:HH11	1:A:263:GLU:HB2	1.56	0.71
1:A:28:MET:SD	1:A:242:ARG:HG2	2.32	0.70
1:A:63:GLU:HB2	1:A:67:VAL:HG22	1.74	0.69
1:B:184:ARG:NH1	1:B:210:ARG:HE	1.90	0.69
1:B:26:HIS:NE2	1:B:78:GLY:HA3	2.09	0.68
1:A:21:LEU:HD13	1:A:240:LEU:HG	1.76	0.67
1:B:56:VAL:HG13	1:B:105:MET:HE2	1.75	0.67
1:A:103:ILE:O	1:A:107:GLU:HG3	1.95	0.67
1:B:56:VAL:HG13	1:B:105:MET:CE	2.26	0.66
1:A:100:ILE:CD1	1:A:134:MET:HB3	2.16	0.66
1:A:96:GLY:O	1:A:100:ILE:HG12	1.95	0.66
1:A:64:GLY:O	1:A:67:VAL:HG23	1.97	0.64
1:A:131:GLY:O	1:A:134:MET:CG	2.46	0.64
1:B:42:ASP:HB3	1:B:45:ARG:HB2	1.79	0.63
1:B:1:MET:HE1	1:B:3:GLN:HE21	1.64	0.63
1:B:69:LEU:HD11	1:B:111:ALA:HB2	1.82	0.61
1:B:144:ILE:HD11	1:B:174:VAL:HG12	1.81	0.61
1:A:188:ASN:ND2	1:A:190:TYR:HB2	2.11	0.60
1:B:97:ARG:HH11	1:B:97:ARG:CB	2.15	0.60
1:B:225:ILE:HG13	3:B:327:HOH:O	2.01	0.58
1:B:60:LEU:HD12	1:B:67:VAL:CG2	2.31	0.58
1:B:67:VAL:HG11	1:B:105:MET:SD	2.44	0.58
1:B:73:LEU:HD12	1:B:82:CYS:O	2.05	0.57
1:A:124:LEU:HG	3:A:276:HOH:O	2.04	0.57
1:A:58:ASP:O	1:A:62:GLU:HG2	2.06	0.56
1:B:1:MET:CE	1:B:3:GLN:HE21	2.19	0.56
1:B:144:ILE:HD11	1:B:174:VAL:HG13	1.86	0.56
1:A:14:LYS:CB	3:A:331:HOH:O	1.89	0.56
1:B:71:SER:O	1:B:74:LYS:HE2	2.05	0.56
1:A:152:MET:HE3	1:A:156:TYR:HB2	1.88	0.56
1:B:54:LYS:CG	1:B:58:ASP:CB	2.83	0.56
1:B:62:GLU:O	1:B:64:GLY:N	2.40	0.55

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:225:ILE:HA	1:B:234:ALA:HB1	1.88	0.55
1:A:60:LEU:HD23	1:A:67:VAL:HG21	1.88	0.55
1:B:67:VAL:HG11	1:B:105:MET:CE	2.33	0.55
1:B:193:LEU:HB3	1:B:204:LEU:HD13	1.89	0.55
1:B:230:THR:O	1:B:231:CYS:HB2	2.07	0.55
1:B:184:ARG:NH1	1:B:210:ARG:NE	2.54	0.54
1:B:54:LYS:HG2	1:B:58:ASP:CB	2.37	0.54
1:B:54:LYS:CG	1:B:58:ASP:HB2	2.36	0.54
1:B:228:ASP:HB2	1:B:231:CYS:HB2	1.89	0.54
1:A:100:ILE:HG22	1:A:104:ASN:HD21	1.74	0.52
1:A:235:GLU:OE1	1:A:238:ARG:NH1	2.42	0.52
1:B:181:CYS:SG	1:B:193:LEU:HG	2.50	0.52
1:B:194:ASP:OD1	1:B:198:LYS:HE2	2.10	0.52
1:B:42:ASP:CB	1:B:45:ARG:HB2	2.40	0.51
1:A:215:THR:O	1:A:219:ILE:HG13	2.10	0.51
1:A:169:ALA:HB3	1:A:252:ILE:HG23	1.92	0.50
1:A:89:GLU:O	1:A:92:VAL:O	2.29	0.50
1:B:229:PRO:HA	1:B:238:ARG:NH2	2.27	0.49
1:B:23:SER:HB3	1:B:225:ILE:HD12	1.94	0.49
1:B:217:ALA:HA	1:B:227:TYR:CE1	2.48	0.49
1:A:47:LEU:HD22	1:A:80:ILE:HD12	1.95	0.49
1:B:239:GLU:CD	1:B:243:LYS:HE3	2.32	0.49
1:B:48:LEU:HB3	1:B:51:LEU:HB3	1.94	0.49
1:B:229:PRO:CA	1:B:238:ARG:HH22	2.26	0.48
1:A:4:VAL:HA	1:A:143:GLU:O	2.13	0.48
1:B:166:GLN:O	1:B:166:GLN:HG2	2.13	0.48
1:A:100:ILE:HG13	1:A:134:MET:CE	2.43	0.48
1:B:21:LEU:HD13	1:B:240:LEU:HG	1.95	0.48
1:B:25:LEU:O	1:B:30:LYS:HB2	2.14	0.48
1:A:152:MET:CE	1:A:156:TYR:HB2	2.44	0.47
1:B:142:GLN:OE1	1:B:173:GLY:HA3	2.13	0.47
1:B:36:GLY:HA3	1:B:84:GLU:OE1	2.15	0.47
1:A:206:HIS:HB3	1:A:240:LEU:HD13	1.95	0.47
1:A:231:CYS:HB2	3:A:297:HOH:O	2.14	0.47
1:B:136:ILE:HG23	1:B:174:VAL:HG21	1.96	0.47
1:B:206:HIS:HB3	1:B:240:LEU:HD13	1.97	0.47
1:A:100:ILE:HG22	1:A:104:ASN:ND2	2.29	0.47
1:B:229:PRO:C	1:B:238:ARG:HH22	2.18	0.47
1:A:148:ALA:O	1:A:181:CYS:HA	2.14	0.47
1:B:233:GLN:O	1:B:236:GLU:HB2	2.14	0.47
1:B:3:GLN:HB3	1:B:140:LYS:O	2.15	0.46

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:263:GLU:O	1:B:266:MET:HB3	2.14	0.46
1:B:124:LEU:HD22	1:B:132:PHE:CE2	2.50	0.46
1:A:238:ARG:O	1:A:242:ARG:HG3	2.15	0.46
1:B:227:TYR:HD2	1:B:228:ASP:OD1	1.99	0.46
1:B:73:LEU:HA	1:B:82:CYS:O	2.15	0.46
1:A:108:GLN:O	1:A:108:GLN:HG2	2.16	0.45
1:A:185:LYS:CE	1:A:187:ALA:HB3	2.46	0.45
1:B:213:MET:SD	1:B:233:GLN:HB2	2.57	0.45
1:A:3:GLN:HB3	1:A:140:LYS:O	2.17	0.45
1:B:119:VAL:HG11	3:B:298:HOH:O	2.17	0.45
1:A:239:GLU:O	1:A:243:LYS:HD2	2.18	0.44
1:B:100:ILE:HD12	1:B:101:THR:N	2.33	0.44
1:B:213:MET:SD	1:B:231:CYS:SG	3.15	0.44
1:B:54:LYS:CG	1:B:58:ASP:HB3	2.48	0.44
1:A:60:LEU:O	1:A:64:GLY:HA2	2.18	0.43
1:B:169:ALA:HB1	1:B:252:ILE:HG12	1.99	0.43
1:A:253:PRO:O	1:A:255:PRO:HD3	2.18	0.43
1:B:152:MET:HG2	1:B:265:LEU:HD13	1.99	0.43
1:B:24:GLY:O	1:B:27:ALA:HB3	2.19	0.43
1:B:239:GLU:O	1:B:243:LYS:HG3	2.18	0.43
1:A:59:THR:HG21	1:A:71:SER:OG	2.19	0.43
1:A:243:LYS:O	1:A:247:ASN:HB2	2.19	0.43
1:A:249:LEU:HA	1:A:249:LEU:HD12	1.70	0.43
1:A:5:ALA:HB3	1:A:144:ILE:HD13	2.01	0.43
1:A:14:LYS:CE	3:A:331:HOH:O	2.11	0.43
1:A:181:CYS:HB2	1:A:193:LEU:HG	2.01	0.43
1:A:208:VAL:HA	1:A:209:PRO:HD3	1.78	0.43
1:A:107:GLU:HG3	1:A:107:GLU:H	1.68	0.42
1:B:230:THR:O	1:B:231:CYS:CB	2.67	0.42
1:B:229:PRO:CA	1:B:238:ARG:NH2	2.83	0.42
1:A:183:SER:HB2	1:A:207:PHE:CZ	2.55	0.42
1:A:211:SER:O	1:A:214:VAL:HG22	2.19	0.42
1:A:124:LEU:HD11	1:A:126:ASP:OD2	2.20	0.42
1:A:188:ASN:ND2	1:A:188:ASN:C	2.72	0.42
1:B:56:VAL:HG11	1:B:102:SER:HA	2.02	0.42
1:B:229:PRO:HA	1:B:238:ARG:HH22	1.84	0.42
1:A:260:ARG:NH1	1:A:263:GLU:HB2	2.30	0.42
1:B:42:ASP:CG	1:B:45:ARG:HB2	2.40	0.42
1:A:136:ILE:HG23	1:A:174:VAL:HG11	2.02	0.42
1:B:170:LYS:O	1:B:171:SER:CB	2.68	0.42
1:B:124:LEU:HD22	1:B:132:PHE:CD2	2.55	0.41

*Continued on next page...*

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:206:HIS:ND1	1:A:243:LYS:NZ	2.60	0.41
1:B:4:VAL:HA	1:B:143:GLU:O	2.20	0.41
1:B:148:ALA:O	1:B:181:CYS:HA	2.20	0.41
1:A:1:MET:HE2	1:A:116:LEU:HB2	2.01	0.41
1:B:44:THR:OG1	1:B:53:GLN:NE2	2.53	0.41
1:A:96:GLY:CA	1:A:134:MET:HG3	2.50	0.41
1:B:73:LEU:HD11	1:B:81:ARG:CB	2.50	0.41
1:A:110:GLY:HA2	3:A:324:HOH:O	2.21	0.41
1:B:65:GLU:O	1:B:67:VAL:N	2.50	0.41
1:B:19:GLN:NE2	1:B:44:THR:HA	2.36	0.40
1:B:81:ARG:NH2	1:B:115:ASP:OD2	2.49	0.40
1:B:227:TYR:O	1:B:229:PRO:HD3	2.21	0.40
1:A:265:LEU:HD23	1:A:265:LEU:HA	1.80	0.40
1:A:92:VAL:HG12	1:A:93:GLY:N	2.37	0.40

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:170:LYS:CE	1:B:266:MET:CE[1_554]	1.45	0.75
1:A:170:LYS:NZ	1:B:266:MET:CE[1_554]	1.98	0.22

## 5.3 Torsion angles [\(i\)](#)

### 5.3.1 Protein backbone [\(i\)](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	267/269 (99%)	256 (96%)	8 (3%)	3 (1%)	14	5
1	B	267/269 (99%)	245 (92%)	14 (5%)	8 (3%)	4	0
All	All	534/538 (99%)	501 (94%)	22 (4%)	11 (2%)	7	1

All (11) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	170	LYS
1	B	63	GLU
1	B	171	SER
1	B	227	TYR
1	A	114	ASP
1	B	62	GLU
1	B	140	LYS
1	B	231	CYS
1	A	70	ASP
1	B	66	ASP
1	B	49	GLY

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	217/217 (100%)	208 (96%)	9 (4%)	30 15
1	B	217/217 (100%)	206 (95%)	11 (5%)	24 9
All	All	434/434 (100%)	414 (95%)	20 (5%)	27 12

All (20) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	62	GLU
1	A	71	SER
1	A	90	PRO
1	A	160	ASN
1	A	182	ASN
1	A	184	ARG
1	A	188	ASN
1	A	210	ARG
1	A	242	ARG
1	B	26	HIS
1	B	57	LEU
1	B	75	GLU
1	B	97	ARG

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	B	105	MET
1	B	124	LEU
1	B	152	MET
1	B	171	SER
1	B	210	ARG
1	B	227	TYR
1	B	228	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	53	GLN
1	A	104	ASN
1	A	108	GLN
1	A	142	GLN
1	A	159	ASN
1	A	182	ASN
1	A	188	ASN
1	A	233	GLN
1	B	3	GLN
1	B	19	GLN
1	B	53	GLN
1	B	104	ASN
1	B	166	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 monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

1 ligand is modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	SF4	B	290	1,3	0,12,12	-	-	-		

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	SF4	B	290	1,3	-	-	0/6/5/5

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

### 6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

### 6.4 Ligands

EDS was not executed - this section is therefore empty.

### 6.5 Other polymers

EDS was not executed - this section is therefore empty.