Full wwPDB X-ray Structure Validation Report ⓘ

Jun 24, 2024 – 10:19 AM EDT

PDB ID	:	7ADR
Title	:	CO bound as bridging ligand at the active site of vanadium nitrogenase VFe protein
Authors	:	Rohde, M.; Grunau, K.; Einsle, O.
Deposited on	:	2020-09-16
Resolution	:	1.00 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

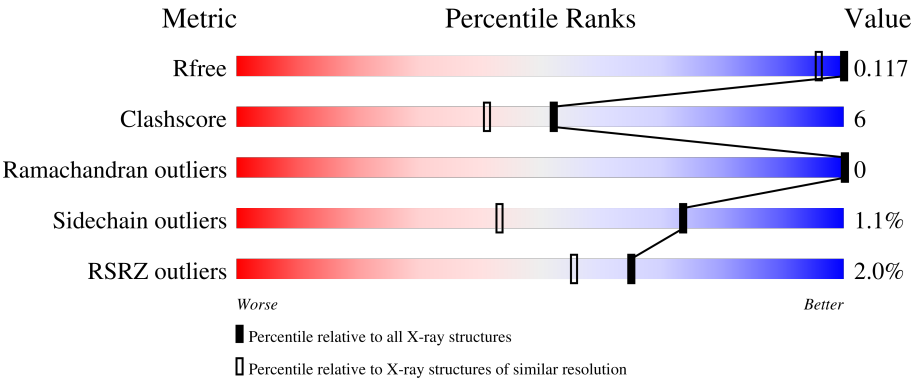
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	2.37.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 1.00 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}	130704	1050 (1.06-0.94)
Clashscore	141614	1117 (1.06-0.94)
Ramachandran outliers	138981	1043 (1.06-0.94)
Sidechain outliers	138945	1045 (1.06-0.94)
RSRZ outliers	127900	1023 (1.06-0.94)

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 >=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 <=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	474	92% 6%
1	D	474	2% 87% 12%
2	B	475	91% 6%
2	E	475	89% 7%
3	C	113	3% 88% 10%

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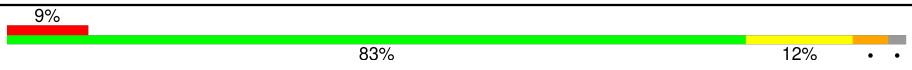
Mol	Chain	Length	Quality of chain
3	F	113	

2 Entry composition (i)

There are 12 unique types of molecules in this entry. The entry contains 20071 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 vanadium-iron protein alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	473	Total	C	N	O	S	0	10	0
			3865	2463	662	711	29			
1	D	473	Total	C	N	O	S	0	13	0
			3879	2473	661	716	29			

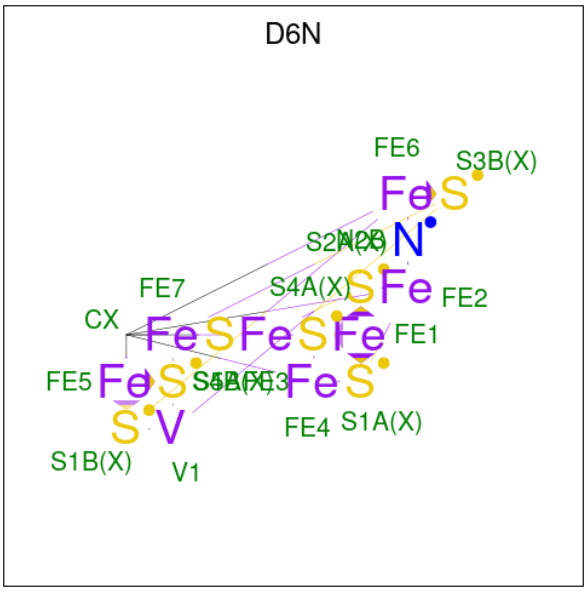
- Molecule 2 is a protein called Nitrogenase vanadium-iron protein beta chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	465	Total	C	N	O	S	0	12	0
			3725	2370	637	694	24			
2	E	466	Total	C	N	O	S	0	22	0
			3814	2425	654	710	25			

- Molecule 3 is a protein called Nitrogenase vanadium-iron protein delta chain.

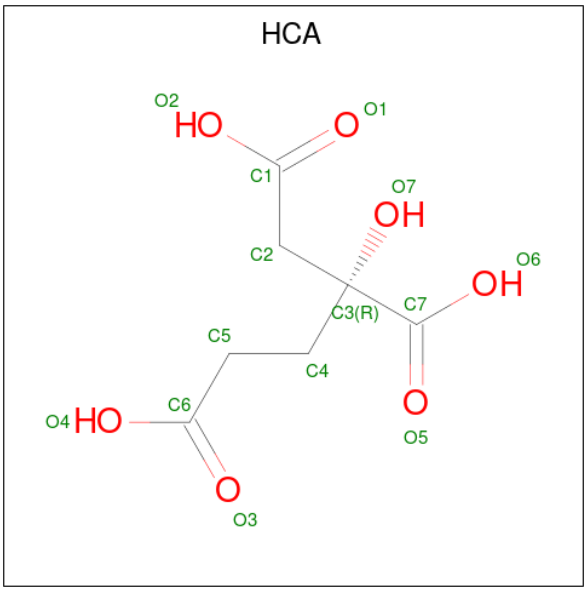
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	113	Total	C	N	O	S	0	2	0
			964	604	175	182	3			
3	F	111	Total	C	N	O	S	0	4	0
			969	606	180	181	2			

- Molecule 4 is FeV (three-letter code: D6N) (formula: CFe_7NS_7V) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C Fe S V 16 1 7 7 1	0	0
4	D	1	Total C Fe S V 16 1 7 7 1	0	0

- Molecule 5 is 3-HYDROXY-3-CARBOXY-ADIPIC ACID (three-letter code: HCA) (formula: $C_7H_{10}O_7$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 14 7 7	0	0

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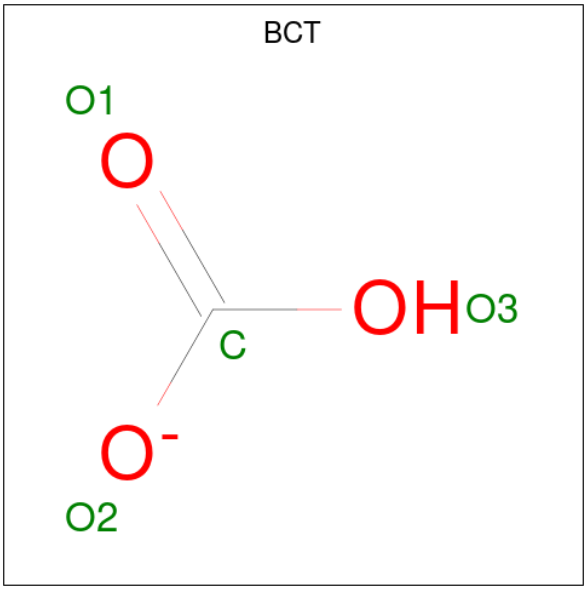
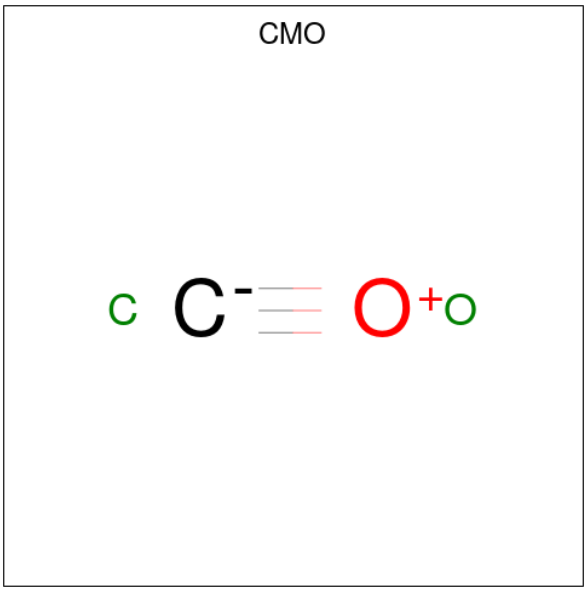
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	D	1	Total C O 14 7 7	0	0

- Molecule 6 is BICARBONATE ION (three-letter code: BCT) (formula: CHO_3).



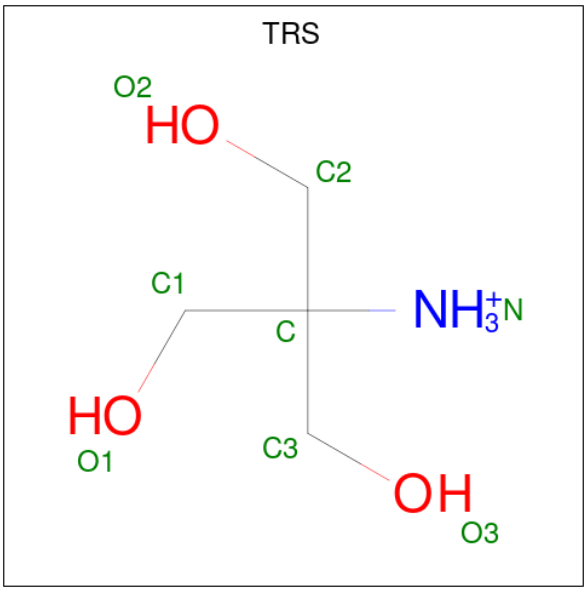
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C O 4 1 3	0	0
6	D	1	Total C O 4 1 3	0	0

- Molecule 7 is CARBON MONOXIDE (three-letter code: CMO) (formula: CO) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total C O 2 1 1	0	0
7	D	1	Total C O 2 1 1	0	0

- Molecule 8 is 2-AMINO-2-HYDROXYMETHYL-PROPANE-1,3-DIOL (three-letter code: TRS) (formula: $C_4H_{12}NO_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	1	Total C N O 8 4 1 3	0	0

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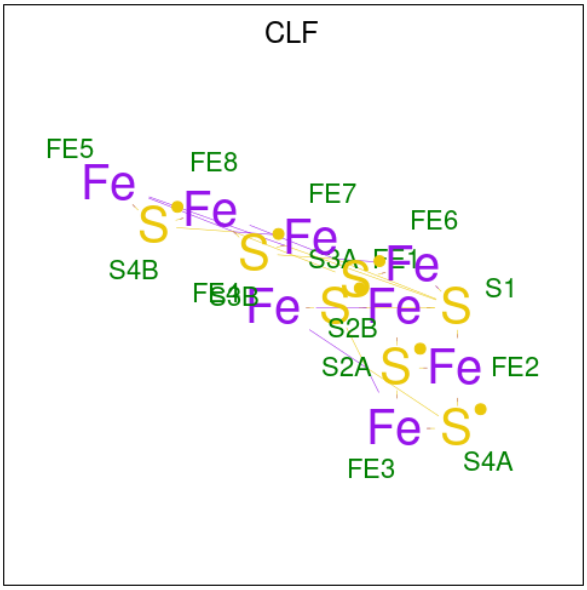
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	1	Total C N O 8 4 1 3	0	0
8	D	1	Total C N O 8 4 1 3	0	0

- Molecule 9 is FE(8)-S(7) CLUSTER (three-letter code: CLF) (formula: Fe_8S_7).

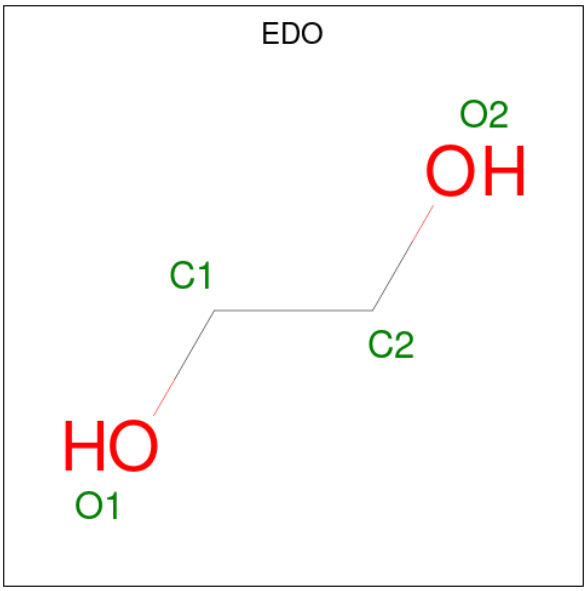


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	B	1	Total Fe S 16 9 7	0	1
9	E	1	Total Fe S 16 9 7	0	1

- Molecule 10 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	B	2	Total Mg 2 2	0	0
10	C	1	Total Mg 1 1	0	0
10	F	1	Total Mg 1 1	0	0

- Molecule 11 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
11	B	1	Total C O 8 4 4	0	1
11	B	1	Total C O 4 2 2	0	0
11	B	1	Total C O 8 4 4	0	1
11	C	1	Total C O 4 2 2	0	0
11	E	1	Total C O 4 2 2	0	0
11	E	1	Total C O 8 4 4	0	1
11	E	1	Total C O 8 4 4	0	1
11	E	1	Total C O 4 2 2	0	0
11	F	1	Total C O 4 2 2	0	0

- Molecule 12 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	A	542	Total O 565 565	0	22
12	B	540	Total O 566 566	0	25
12	C	172	Total O 175 175	0	4

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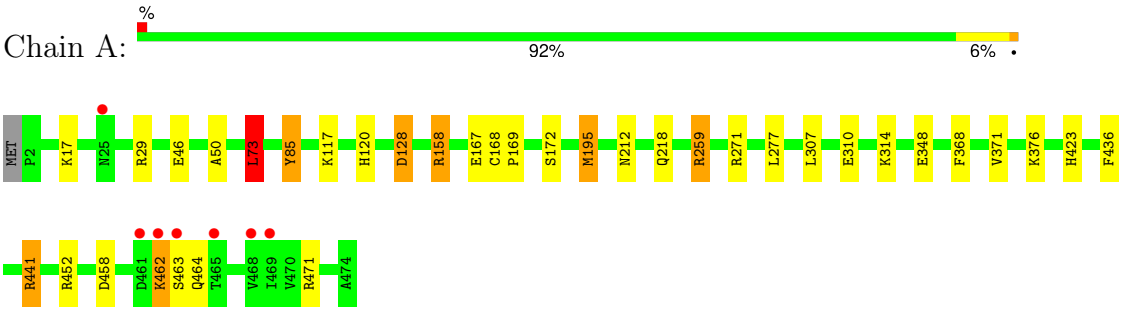
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	D	559	Total O 585 585	0	25
12	E	593	Total O 631 631	0	34
12	F	144	Total O 149 149	0	5

3 Residue-property plots (i)

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

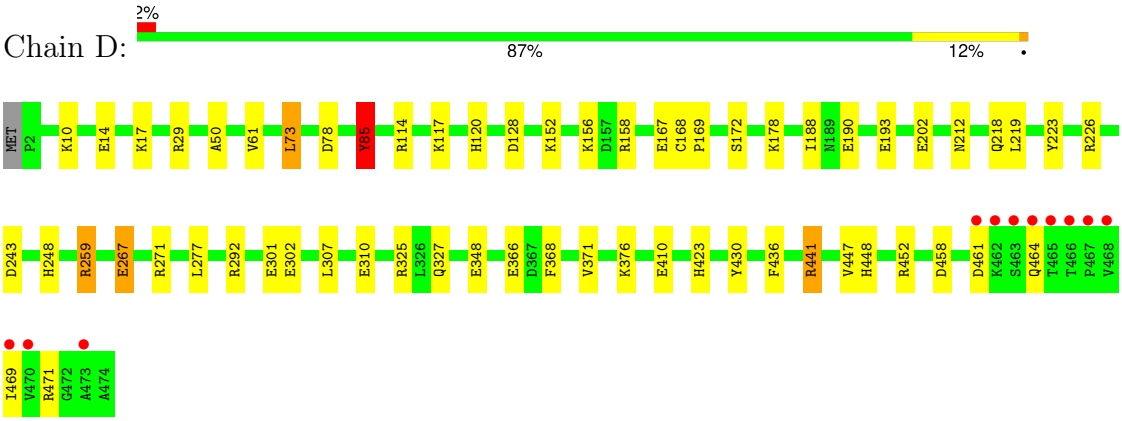
• Molecule 1: Nitrogenase vanadium-iron protein alpha chain

Chain A:



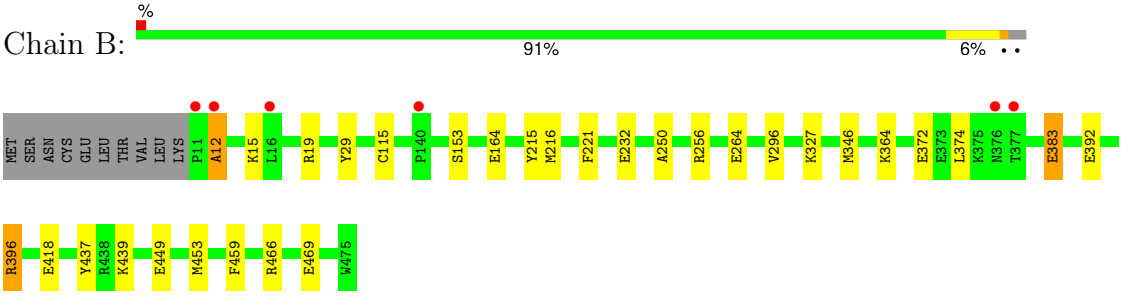
• Molecule 1: Nitrogenase vanadium-iron protein alpha chain

Chain D:



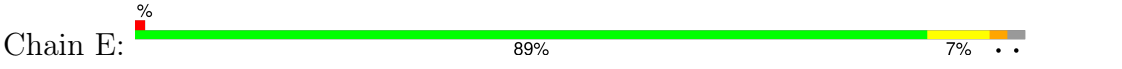
• Molecule 2: Nitrogenase vanadium-iron protein beta chain

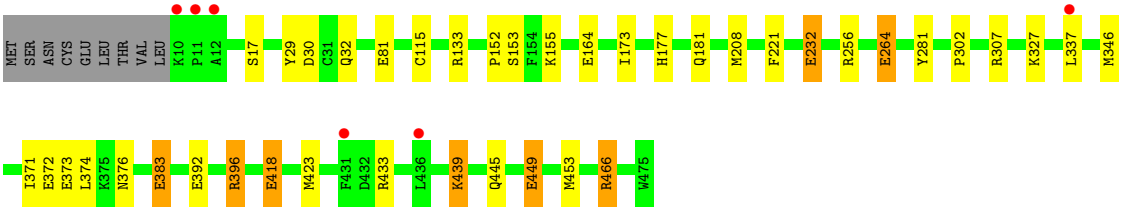
Chain B:



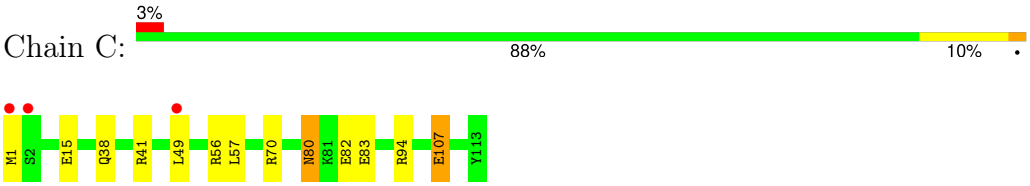
• Molecule 2: Nitrogenase vanadium-iron protein beta chain

Chain E:

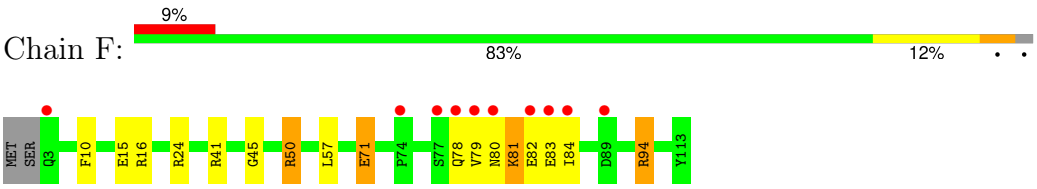




• Molecule 3: Nitrogenase vanadium-iron protein delta chain



• Molecule 3: Nitrogenase vanadium-iron protein delta chain



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	75.58Å 79.93Å 107.22Å 84.11° 72.42° 75.19°	Depositor
Resolution (Å)	48.45 – 1.00 48.40 – 1.00	Depositor EDS
% Data completeness (in resolution range)	88.1 (48.45-1.00) 88.1 (48.40-1.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.46 (at 1.00Å)	Xtriage
Refinement program	REFMAC 5.8.0258	Depositor
R, R_{free}	0.102 , 0.117 0.103 , 0.117	Depositor DCC
R_{free} test set	5649 reflections (0.51%)	wwPDB-VP
Wilson B-factor (Å^2)	12.0	Xtriage
Anisotropy	0.413	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 44.2	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.99	EDS
Total number of atoms	20071	wwPDB-VP
Average B, all atoms (Å^2)	15.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.52% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: MG, CLF, BCT, HCA, D6N, EDO, TRS, CMO

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	0.88	7/3966 (0.2%)	0.99	13/5357 (0.2%)
1	D	0.89	5/3986 (0.1%)	0.98	14/5384 (0.3%)
2	B	0.92	8/3811 (0.2%)	1.03	9/5156 (0.2%)
2	E	0.94	11/3908 (0.3%)	1.02	19/5284 (0.4%)
3	C	1.00	2/984 (0.2%)	1.03	2/1329 (0.2%)
3	F	1.39	10/989 (1.0%)	1.12	8/1335 (0.6%)
All	All	0.95	43/17644 (0.2%)	1.01	65/23845 (0.3%)

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	1
1	D	0	1
2	B	0	1
2	E	0	1
3	F	0	2
All	All	0	6

All (43) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	348	GLU	CD-OE2	-17.39	1.06	1.25
3	F	50[A]	ARG	C-N	16.38	1.62	1.33
3	F	50[B]	ARG	C-N	16.38	1.62	1.33
3	F	83	GLU	CD-OE2	13.98	1.41	1.25
1	D	172	SER	CB-OG	-10.80	1.28	1.42
2	B	469	GLU	CD-OE2	9.91	1.36	1.25
1	A	172	SER	CB-OG	-9.22	1.30	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	84	ILE	C-O	9.18	1.40	1.23
2	B	383	GLU	CD-OE1	9.00	1.35	1.25
2	E	449[A]	GLU	CD-OE2	-8.71	1.16	1.25
2	E	449[B]	GLU	CD-OE2	-8.71	1.16	1.25
1	A	128	ASP	CG-OD1	8.56	1.45	1.25
3	C	15	GLU	CD-OE2	8.28	1.34	1.25
2	E	373	GLU	CD-OE1	-7.87	1.17	1.25
1	D	267	GLU	CD-OE2	-7.70	1.17	1.25
1	A	172	SER	CA-CB	-7.69	1.41	1.52
2	B	396	ARG	NE-CZ	-7.63	1.23	1.33
2	E	396	ARG	NE-CZ	-7.60	1.23	1.33
3	F	83	GLU	CD-OE1	-6.99	1.18	1.25
2	E	17	SER	CA-CB	-6.67	1.43	1.52
1	D	14	GLU	CD-OE2	6.29	1.32	1.25
2	E	264	GLU	CD-OE1	5.88	1.32	1.25
2	E	81[A]	GLU	CD-OE1	-5.87	1.19	1.25
2	E	81[B]	GLU	CD-OE1	-5.87	1.19	1.25
2	B	449	GLU	CG-CD	-5.82	1.43	1.51
3	F	15	GLU	CD-OE2	5.73	1.31	1.25
2	E	376	ASN	C-O	-5.71	1.12	1.23
3	F	71	GLU	CD-OE1	-5.70	1.19	1.25
1	A	441	ARG	CD-NE	-5.68	1.36	1.46
2	E	383	GLU	CD-OE1	5.66	1.31	1.25
3	F	50[A]	ARG	C-O	5.55	1.33	1.23
3	F	50[B]	ARG	C-O	5.55	1.33	1.23
1	A	348	GLU	CD-OE2	-5.52	1.19	1.25
1	D	410	GLU	CD-OE2	5.44	1.31	1.25
1	A	441	ARG	NE-CZ	-5.34	1.26	1.33
2	B	418	GLU	CD-OE2	5.31	1.31	1.25
2	B	469	GLU	CD-OE1	-5.29	1.19	1.25
1	A	46	GLU	CD-OE2	-5.27	1.19	1.25
2	B	164	GLU	CD-OE2	-5.20	1.20	1.25
2	E	232	GLU	CD-OE1	5.16	1.31	1.25
3	C	107	GLU	CD-OE2	-5.14	1.20	1.25
3	F	45	GLY	C-O	5.11	1.31	1.23
2	B	256	ARG	CZ-NH2	-5.09	1.26	1.33

All (65) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	396	ARG	NE-CZ-NH1	-18.28	111.16	120.30
2	B	466	ARG	NE-CZ-NH2	-11.91	114.34	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	396	ARG	NE-CZ-NH2	11.12	125.86	120.30
2	E	256	ARG	NE-CZ-NH1	-10.07	115.26	120.30
2	E	396	ARG	NE-CZ-NH1	-9.40	115.60	120.30
3	C	56	ARG	NE-CZ-NH2	-8.90	115.85	120.30
1	A	271	ARG	NE-CZ-NH2	-8.36	116.12	120.30
1	D	471	ARG	NE-CZ-NH1	8.29	124.44	120.30
2	E	133[A]	ARG	NE-CZ-NH2	-8.03	116.29	120.30
2	E	133[B]	ARG	NE-CZ-NH2	-8.03	116.29	120.30
2	B	466	ARG	NE-CZ-NH1	7.91	124.25	120.30
2	E	466	ARG	NE-CZ-NH2	-7.86	116.37	120.30
3	C	41	ARG	NE-CZ-NH2	-7.64	116.48	120.30
1	D	114	ARG	NE-CZ-NH1	7.36	123.98	120.30
1	A	441	ARG	NE-CZ-NH1	7.08	123.84	120.30
1	D	325	ARG	NE-CZ-NH2	-7.01	116.80	120.30
2	B	29	TYR	CB-CG-CD1	6.96	125.18	121.00
3	F	16	ARG	NE-CZ-NH1	-6.74	116.93	120.30
1	D	325	ARG	NE-CZ-NH1	6.73	123.67	120.30
1	D	271	ARG	NE-CZ-NH2	-6.72	116.94	120.30
2	E	466	ARG	NE-CZ-NH1	6.69	123.64	120.30
1	A	85	TYR	CB-CG-CD1	6.52	124.91	121.00
2	B	437	TYR	CB-CG-CD1	6.43	124.86	121.00
1	D	223	TYR	CB-CG-CD1	6.30	124.78	121.00
2	E	133[A]	ARG	NE-CZ-NH1	6.30	123.45	120.30
2	E	133[B]	ARG	NE-CZ-NH1	6.30	123.45	120.30
1	D	259	ARG	NE-CZ-NH1	6.26	123.43	120.30
1	A	471[A]	ARG	NE-CZ-NH2	6.15	123.38	120.30
1	A	471[B]	ARG	NE-CZ-NH2	6.15	123.38	120.30
2	E	433	ARG	NE-CZ-NH2	-6.14	117.23	120.30
3	F	83	GLU	CB-CG-CD	6.01	130.42	114.20
1	A	462	LYS	CA-C-O	5.97	132.64	120.10
1	D	78	ASP	CB-CG-OD2	-5.87	113.02	118.30
1	D	223	TYR	CB-CG-CD2	-5.73	117.56	121.00
3	F	41	ARG	NE-CZ-NH1	5.73	123.17	120.30
1	D	366[A]	GLU	N-CA-CB	-5.69	100.36	110.60
1	D	366[B]	GLU	N-CA-CB	-5.69	100.36	110.60
1	A	348	GLU	OE1-CD-OE2	-5.68	116.49	123.30
1	A	128	ASP	CB-CG-OD1	5.66	123.39	118.30
2	B	459	PHE	CB-CG-CD1	5.64	124.75	120.80
2	E	221	PHE	CB-CG-CD1	5.64	124.75	120.80
1	D	292	ARG	CD-NE-CZ	5.54	131.36	123.60
2	E	439[A]	LYS	CB-CA-C	5.50	121.40	110.40
2	E	439[B]	LYS	CB-CA-C	5.50	121.40	110.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	73	LEU	CB-CG-CD1	5.49	120.33	111.00
2	B	221	PHE	CB-CG-CD1	5.41	124.59	120.80
1	D	430	TYR	CB-CG-CD1	5.40	124.24	121.00
1	A	471[A]	ARG	CG-CD-NE	5.36	123.05	111.80
1	A	471[B]	ARG	CG-CD-NE	5.36	123.05	111.80
3	F	50[A]	ARG	CA-C-N	-5.33	105.54	116.20
3	F	50[B]	ARG	CA-C-N	-5.33	105.54	116.20
2	E	30	ASP	CB-CG-OD2	-5.26	113.57	118.30
2	E	371[A]	ILE	CB-CA-C	-5.23	101.14	111.60
2	E	371[B]	ILE	CB-CA-C	-5.23	101.14	111.60
3	F	24	ARG	NE-CZ-NH2	-5.19	117.70	120.30
1	A	158	ARG	CG-CD-NE	5.19	122.69	111.80
2	E	418[A]	GLU	CB-CG-CD	5.17	128.15	114.20
2	E	418[B]	GLU	CB-CG-CD	5.17	128.15	114.20
2	B	19	ARG	CD-NE-CZ	5.16	130.83	123.60
2	E	29	TYR	CB-CG-CD1	5.13	124.08	121.00
1	A	172	SER	CB-CA-C	5.10	119.79	110.10
1	D	85	TYR	CB-CG-CD1	5.08	124.05	121.00
3	F	83	GLU	CG-CD-OE2	-5.04	108.21	118.30
2	E	373	GLU	OE1-CD-OE2	-5.02	117.28	123.30
3	F	41	ARG	NE-CZ-NH2	-5.01	117.80	120.30

There are no chirality outliers.

All (6) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	441	ARG	Sidechain
2	B	12	ALA	Peptide
1	D	441	ARG	Sidechain
2	E	445	GLN	Sidechain
3	F	50[A]	ARG	Mainchain
3	F	50[B]	ARG	Mainchain

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	3865	0	3778	35	0
1	D	3879	0	3800	54	0
2	B	3725	0	3710	26	0
2	E	3814	0	3808	47	0
3	C	964	0	928	17	2
3	F	969	0	933	14	0
4	A	16	0	0	0	0
4	D	16	0	0	0	0
5	A	14	0	6	1	0
5	D	14	0	6	1	0
6	A	4	0	0	0	0
6	D	4	0	0	0	0
7	A	2	0	0	0	0
7	D	2	0	0	0	0
8	A	16	0	24	0	0
8	D	8	0	12	1	0
9	B	16	0	0	0	0
9	E	16	0	0	0	0
10	B	2	0	0	0	0
10	C	1	0	0	0	0
10	F	1	0	0	0	0
11	B	20	0	30	0	0
11	C	4	0	6	0	0
11	E	24	0	34	3	0
11	F	4	0	6	0	0
12	A	565	0	0	9	1
12	B	566	0	0	16	1
12	C	175	0	0	12	0
12	D	585	0	0	34	3
12	E	631	0	0	17	1
12	F	149	0	0	5	0
All	All	20071	0	17081	190	4

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 6.

All (190) 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)
3:C:38[A]:GLN:NE2	12:C:301:HOH:O	1.60	1.26
2:E:392[B]:GLU:OE2	2:E:396:ARG:NH1	1.68	1.23
1:D:190:GLU:HG2	12:D:968:HOH:O	1.39	1.21

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:80:ASN:HB3	12:F:306:HOH:O	1.42	1.18
3:C:70:ARG:HB2	12:C:306:HOH:O	1.01	1.17
1:D:178:LYS:CE	12:D:838:HOH:O	1.90	1.16
2:B:392[B]:GLU:OE2	2:B:396:ARG:NH1	1.80	1.14
2:E:383:GLU:OE1	12:E:602:HOH:O	1.61	1.14
1:D:167:GLU:CD	12:D:603:HOH:O	1.86	1.12
1:A:73:LEU:HD11	12:B:636:HOH:O	1.52	1.08
12:D:750:HOH:O	2:E:418[A]:GLU:HG3	1.55	1.06
2:E:392[B]:GLU:CD	2:E:396:ARG:HH12	1.56	1.06
1:A:73:LEU:CD1	12:B:636:HOH:O	2.04	1.04
2:E:392[B]:GLU:HG3	2:E:396:ARG:NH1	1.73	1.03
1:D:178:LYS:HE3	12:D:838:HOH:O	1.51	1.02
1:A:462:LYS:O	1:A:463:SER:N	1.92	1.01
3:C:70:ARG:CB	12:C:306:HOH:O	1.67	1.01
3:F:81:LYS:C	3:F:81:LYS:HE2	1.82	0.99
1:D:461:ASP:HB3	12:D:726[B]:HOH:O	1.62	0.99
2:E:392[B]:GLU:CG	2:E:396:ARG:NH1	2.26	0.98
1:D:17[A]:LYS:HG3	12:D:985:HOH:O	1.64	0.97
1:D:461:ASP:HB3	12:D:726[A]:HOH:O	1.65	0.97
2:E:439[B]:LYS:HZ1	2:E:453[B]:MET:HE2	1.31	0.96
2:E:392[B]:GLU:CG	2:E:396:ARG:HH12	1.80	0.94
3:F:81:LYS:HE2	3:F:81:LYS:O	1.67	0.94
2:B:392[B]:GLU:HG3	2:B:396:ARG:NH1	1.80	0.94
2:B:392[B]:GLU:CD	2:B:396:ARG:HH12	1.72	0.93
2:B:392[B]:GLU:CG	2:B:396:ARG:NH1	2.32	0.92
1:D:168[B]:CYS:CA	1:D:169:PRO:N	2.31	0.92
2:B:392[B]:GLU:CG	2:B:396:ARG:HH12	1.83	0.90
1:D:178:LYS:HE2	12:D:838:HOH:O	1.57	0.89
1:A:452:ARG:HD3	12:A:614:HOH:O	1.72	0.87
2:E:449[A]:GLU:OE1	12:E:604[A]:HOH:O	1.91	0.87
1:A:168[B]:CYS:CA	1:A:169:PRO:N	2.38	0.86
2:B:383:GLU:HG3	12:B:692:HOH:O	1.72	0.86
1:D:243:ASP:OD2	12:D:601:HOH:O	1.92	0.85
1:A:462:LYS:C	1:A:463:SER:N	2.30	0.85
1:D:152[B]:LYS:HG3	12:D:992:HOH:O	1.78	0.84
3:C:107:GLU:CD	12:C:302:HOH:O	2.15	0.83
1:A:120:HIS:HD2	1:A:158:ARG:HH11	1.28	0.82
1:D:461:ASP:CB	12:D:726[B]:HOH:O	2.23	0.80
3:F:78:GLN:HG2	12:F:321:HOH:O	1.82	0.79
2:E:439[B]:LYS:NZ	2:E:453[B]:MET:CE	2.45	0.79
1:D:120:HIS:HD2	1:D:158:ARG:HH11	1.31	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:117:LYS:NZ	12:A:602:HOH:O	2.09	0.78
2:E:392[B]:GLU:HG3	2:E:396:ARG:HH11	1.49	0.77
3:C:70:ARG:CG	12:C:306:HOH:O	2.14	0.77
1:A:128:ASP:HB3	12:A:1024:HOH:O	1.84	0.76
1:D:117:LYS:NZ	12:D:602:HOH:O	2.08	0.76
2:E:439[A]:LYS:HG3	2:E:449[A]:GLU:OE2	1.86	0.75
1:D:461:ASP:CG	12:D:726[B]:HOH:O	2.25	0.75
2:E:177[A]:HIS:HE1	12:E:1034[A]:HOH:O	1.70	0.75
1:D:202:GLU:HG3	12:D:1046:HOH:O	1.88	0.74
2:B:392[B]:GLU:HG3	2:B:396:ARG:HH11	1.52	0.74
12:D:725:HOH:O	2:E:155:LYS:HE3	1.87	0.74
2:E:439[B]:LYS:HZ1	2:E:453[B]:MET:CE	1.97	0.74
1:D:447[A]:VAL:HG23	1:D:448:HIS:CD2	2.21	0.74
2:E:392[B]:GLU:CD	2:E:396:ARG:NH1	2.27	0.72
2:E:281:TYR:CZ	2:E:337[B]:LEU:HD23	2.24	0.72
2:B:232:GLU:OE1	2:E:307[B]:ARG:NH2	2.20	0.72
2:B:392[B]:GLU:CD	2:B:396:ARG:NH1	2.39	0.71
2:E:307[B]:ARG:NH2	12:E:605:HOH:O	2.00	0.71
2:E:439[B]:LYS:NZ	2:E:453[B]:MET:HE2	2.06	0.70
2:E:264:GLU:HG2	12:E:973:HOH:O	1.91	0.69
1:D:327[B]:GLN:CD	12:D:642:HOH:O	2.30	0.69
2:E:152:PRO:HD2	11:E:505:EDO:H11	1.74	0.69
2:E:232:GLU:OE2	12:E:606:HOH:O	2.10	0.69
2:E:327:LYS:NZ	12:E:610:HOH:O	2.24	0.69
1:D:452:ARG:HD3	12:D:621:HOH:O	1.92	0.69
3:C:80:ASN:C	3:C:80:ASN:HD22	1.97	0.69
1:D:167:GLU:CG	12:D:603:HOH:O	2.32	0.69
2:E:181[B]:GLN:NE2	12:E:611:HOH:O	2.26	0.68
3:F:94[A]:ARG:HH21	3:F:94[A]:ARG:HG3	1.57	0.68
2:E:307[B]:ARG:HD2	12:E:605:HOH:O	1.94	0.68
2:E:418[A]:GLU:OE2	12:E:608:HOH:O	2.12	0.68
2:E:307[B]:ARG:HD3	12:E:1081:HOH:O	1.93	0.67
1:A:167:GLU:CD	12:A:606:HOH:O	2.33	0.67
2:B:327:LYS:NZ	12:B:601:HOH:O	1.79	0.67
3:C:107:GLU:OE1	12:C:302:HOH:O	2.09	0.67
2:B:12:ALA:HB1	12:B:1021:HOH:O	1.96	0.66
2:E:208[B]:MET:HG2	2:E:302:PRO:HD3	1.76	0.66
1:A:167:GLU:C	1:A:168[B]:CYS:CA	2.64	0.65
1:D:448:HIS:HE1	12:D:918:HOH:O	1.78	0.65
1:D:190:GLU:OE2	12:D:636[B]:HOH:O	2.13	0.65
1:A:167:GLU:O	1:A:168[C]:CYS:HB2	1.95	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:120:HIS:HE1	12:D:688:HOH:O	1.80	0.65
1:A:50:ALA:HB1	1:A:168[C]:CYS:SG	2.38	0.64
2:B:372:GLU:HB2	12:B:658[A]:HOH:O	1.98	0.64
2:B:12:ALA:CA	12:B:1021:HOH:O	2.44	0.64
2:E:372:GLU:HG2	12:E:689:HOH:O	1.97	0.64
2:B:15:LYS:HE2	12:B:692:HOH:O	1.98	0.64
1:A:120:HIS:HE1	12:A:677:HOH:O	1.82	0.63
2:B:12:ALA:HA	12:B:1021:HOH:O	1.98	0.63
1:D:376[A]:LYS:HE2	12:D:1034:HOH:O	1.99	0.63
3:F:94[A]:ARG:HH21	3:F:94[A]:ARG:CG	2.11	0.62
2:E:346[A]:MET:HE1	2:E:374:LEU:HD23	1.83	0.61
1:D:167:GLU:HG3	12:D:603:HOH:O	2.00	0.61
1:D:190:GLU:OE1	12:D:605:HOH:O	2.16	0.61
2:B:383:GLU:HG3	12:B:614:HOH:O	2.01	0.60
2:B:12:ALA:CB	12:B:1021:HOH:O	2.49	0.60
3:F:81:LYS:O	3:F:81:LYS:CE	2.47	0.59
2:B:383:GLU:CG	12:B:692:HOH:O	2.41	0.58
3:C:38[B]:GLN:HE22	3:C:49:LEU:HG	1.69	0.58
1:D:120:HIS:CD2	1:D:158:ARG:HH11	2.16	0.57
2:E:439[B]:LYS:HZ3	2:E:453[B]:MET:CE	2.17	0.57
2:E:208[B]:MET:HG2	2:E:302:PRO:CD	2.35	0.56
3:C:1:MET:HB2	12:C:412:HOH:O	2.04	0.55
1:A:307:LEU:C	1:A:307:LEU:HD23	2.27	0.55
1:A:452:ARG:CD	12:A:614:HOH:O	2.41	0.55
1:A:376:LYS:HE2	12:A:1016:HOH:O	2.07	0.54
3:F:10:PHE:CD1	3:F:94[A]:ARG:HG2	2.42	0.54
1:D:190:GLU:CG	12:D:968:HOH:O	2.19	0.54
1:A:310:GLU:HG3	12:A:893:HOH:O	2.06	0.53
1:A:73:LEU:C	1:A:73:LEU:HD22	2.29	0.53
1:A:458:ASP:H	1:A:464:GLN:HE22	1.57	0.53
2:E:346[A]:MET:CE	2:E:374:LEU:HD23	2.38	0.53
1:D:277:LEU:HD13	3:F:57:LEU:HD11	1.90	0.53
2:B:346[B]:MET:HE1	2:B:374:LEU:HD23	1.89	0.53
3:C:107:GLU:OE2	12:C:303:HOH:O	2.19	0.53
1:A:167:GLU:O	1:A:168[C]:CYS:CB	2.49	0.52
1:D:458:ASP:H	1:D:464:GLN:HE22	1.58	0.52
12:B:811:HOH:O	1:D:464:GLN:HB2	2.08	0.52
3:C:80:ASN:ND2	3:C:83:GLU:H	2.06	0.52
1:D:190:GLU:CD	12:D:636[B]:HOH:O	2.47	0.52
3:F:10:PHE:CE1	3:F:94[A]:ARG:HG2	2.44	0.52
2:E:164:GLU:HG2	11:E:505:EDO:H22	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:346[A]:MET:CE	2:E:374:LEU:CD2	2.89	0.51
2:E:346[A]:MET:HE2	2:E:374:LEU:CD2	2.40	0.51
3:C:94:ARG:HD3	12:C:404:HOH:O	2.09	0.51
2:E:439[B]:LYS:NZ	2:E:453[B]:MET:SD	2.84	0.51
3:F:81:LYS:HE2	3:F:82:GLU:N	2.26	0.50
2:E:32:GLN:HE22	11:E:505:EDO:C1	2.24	0.50
1:A:462:LYS:CA	1:A:463:SER:N	2.75	0.50
1:D:167:GLU:C	1:D:168[B]:CYS:CA	2.79	0.50
1:D:301:GLU:OE2	12:F:301:HOH:O	2.19	0.50
1:D:461:ASP:CB	12:D:726[A]:HOH:O	2.41	0.49
1:A:277:LEU:HD13	3:C:57:LEU:HD11	1.95	0.49
1:A:73:LEU:HD12	12:B:636:HOH:O	1.91	0.48
2:E:307[B]:ARG:HG2	12:E:605:HOH:O	2.13	0.48
1:D:302:GLU:HG3	12:D:897:HOH:O	2.14	0.47
1:D:73:LEU:HD22	1:D:73:LEU:C	2.34	0.47
1:D:307:LEU:C	1:D:307:LEU:HD23	2.34	0.47
1:A:120:HIS:CD2	1:A:158:ARG:HH11	2.19	0.47
2:E:307[B]:ARG:CD	12:E:605:HOH:O	2.57	0.47
1:D:327[B]:GLN:CG	12:D:642:HOH:O	2.63	0.47
3:F:94[A]:ARG:CG	3:F:94[A]:ARG:NH2	2.76	0.47
3:C:1:MET:CB	12:C:412:HOH:O	2.60	0.46
2:E:173:ILE:O	2:E:177[A]:HIS:HD2	1.98	0.46
2:B:264[B]:GLU:OE1	12:B:602:HOH:O	2.21	0.46
2:E:466:ARG:NH2	12:E:607:HOH:O	2.11	0.46
1:A:212:ASN:HD21	1:A:218:GLN:NE2	2.13	0.45
1:A:462:LYS:N	1:A:463:SER:N	2.64	0.45
1:D:423:HIS:HB3	5:D:502:HCA:O6	2.17	0.45
1:A:423:HIS:HB3	5:A:502:HCA:O5	2.17	0.45
1:D:128[B]:ASP:OD1	8:D:505:TRS:O3	2.17	0.45
1:D:226:ARG:NH2	1:D:310:GLU:OE2	2.50	0.44
1:A:462:LYS:O	1:A:463:SER:CA	2.65	0.44
2:E:423[B]:MET:HE3	12:E:746:HOH:O	2.17	0.44
1:D:452:ARG:CD	12:D:621:HOH:O	2.58	0.44
2:E:383:GLU:CD	12:E:602:HOH:O	2.29	0.44
2:B:346[B]:MET:HE1	2:B:374:LEU:CD2	2.48	0.44
1:D:188:ILE:HD13	1:D:267:GLU:HB3	1.99	0.44
1:D:167:GLU:OE2	12:D:603:HOH:O	2.12	0.43
1:D:441:ARG:HD3	12:D:951[B]:HOH:O	2.17	0.43
3:F:81:LYS:N	12:F:304:HOH:O	2.51	0.43
1:A:368:PHE:HA	1:A:371:VAL:HG12	1.99	0.43
2:B:439[B]:LYS:HG3	12:B:818:HOH:O	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:212:ASN:HD21	1:D:218:GLN:NE2	2.16	0.43
1:D:368:PHE:HA	1:D:371:VAL:HG12	2.01	0.43
2:E:115:CYS:HB3	2:E:153:SER:OG	2.18	0.43
1:D:50:ALA:HB1	1:D:168[C]:CYS:SG	2.59	0.42
2:B:115:CYS:HB3	2:B:153:SER:OG	2.20	0.42
1:D:458:ASP:H	1:D:464:GLN:NE2	2.17	0.42
3:F:80:ASN:C	12:F:304:HOH:O	2.57	0.42
1:A:314:LYS:HE2	1:A:314:LYS:HB2	1.65	0.42
1:A:452:ARG:NE	12:A:614:HOH:O	2.52	0.42
1:A:259:ARG:CZ	1:A:259:ARG:HA	2.49	0.42
3:C:80:ASN:C	3:C:80:ASN:ND2	2.70	0.42
1:D:193:GLU:HA	1:D:248:HIS:CE1	2.55	0.42
2:B:215:TYR:HA	2:B:216:MET:HA	1.90	0.41
1:D:452:ARG:HD2	12:D:742:HOH:O	2.20	0.41
3:C:70:ARG:NE	12:C:306:HOH:O	2.53	0.41
1:D:219:LEU:C	1:D:219:LEU:HD23	2.41	0.41
1:A:195[A]:MET:HE2	1:A:195[A]:MET:HB2	1.89	0.41
2:B:250:ALA:CB	2:B:296:VAL:HG11	2.51	0.41
1:A:17[A]:LYS:HD3	1:A:17[A]:LYS:HA	1.72	0.41
3:C:70:ARG:HG3	12:C:306:HOH:O	2.05	0.40
1:D:61:VAL:HG22	1:D:85:TYR:CE2	2.57	0.40
2:E:439[A]:LYS:NZ	2:E:449[A]:GLU:OE1	2.55	0.40
2:B:453[B]:MET:HE2	2:B:453[B]:MET:HB2	1.83	0.40

All (4) 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)
3:C:82:GLU:CD	12:D:1152:HOH:O[1_644]	1.37	0.83
3:C:82:GLU:OE1	12:D:1152:HOH:O[1_644]	1.45	0.75
12:B:938:HOH:O	12:D:1103:HOH:O[1_554]	1.78	0.42
12:A:808:HOH:O	12:E:1190:HOH:O[1_654]	2.04	0.16

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	480/474 (101%)	461 (96%)	19 (4%)	0	100	100
1	D	485/474 (102%)	470 (97%)	15 (3%)	0	100	100
2	B	474/475 (100%)	465 (98%)	9 (2%)	0	100	100
2	E	486/475 (102%)	476 (98%)	10 (2%)	0	100	100
3	C	113/113 (100%)	109 (96%)	4 (4%)	0	100	100
3	F	113/113 (100%)	109 (96%)	4 (4%)	0	100	100
All	All	2151/2124 (101%)	2090 (97%)	61 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	414/404 (102%)	407 (98%)	7 (2%)	60	27
1	D	417/404 (103%)	409 (98%)	8 (2%)	57	23
2	B	400/398 (100%)	399 (100%)	1 (0%)	92	71
2	E	411/398 (103%)	411 (100%)	0	100	100
3	C	104/102 (102%)	103 (99%)	1 (1%)	76	47
3	F	104/102 (102%)	99 (95%)	5 (5%)	25	3
All	All	1850/1808 (102%)	1828 (99%)	22 (1%)	73	39

All (22) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	29	ARG
1	A	73	LEU
1	A	85	TYR
1	A	195[A]	MET

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Mol	Chain	Res	Type
1	A	195[B]	MET
1	A	259	ARG
1	A	436	PHE
2	B	364	LYS
3	C	80	ASN
1	D	10	LYS
1	D	29	ARG
1	D	73	LEU
1	D	85	TYR
1	D	156	LYS
1	D	259	ARG
1	D	436	PHE
1	D	469	ILE
3	F	71	GLU
3	F	79	VAL
3	F	81	LYS
3	F	94[A]	ARG
3	F	94[B]	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (16) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	120	HIS
1	A	218	GLN
1	A	327	GLN
1	A	464	GLN
2	B	54	GLN
2	B	363	ASN
3	C	46	GLN
3	C	78	GLN
3	C	80	ASN
3	C	110	HIS
1	D	120	HIS
1	D	218	GLN
1	D	448	HIS
1	D	464	GLN
2	E	54	GLN
3	F	46	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)

Of 32 ligands modelled in this entry, 4 are monoatomic - leaving 28 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	$\#\|Z\| > 2$
7	CMO	D	504	4	0,1,1	-	-	-		
11	EDO	E	503[B]	-	3,3,3	0.45	0	2,2,2	0.43	0
11	EDO	E	504[B]	-	3,3,3	0.51	0	2,2,2	0.47	0
9	CLF	B	501[A]	2	0,24,24	-	-	-		
9	CLF	E	501[A]	2	0,24,24	-	-	-		
11	EDO	C	202	-	3,3,3	0.88	0	2,2,2	0.37	0
8	TRS	A	506	-	7,7,7	0.27	0	9,9,9	0.54	0
5	HCA	A	502	4	13,13,13	1.32	3 (23%)	15,18,18	1.45	1 (6%)
7	CMO	A	504	4	0,1,1	-	-	-		
11	EDO	B	506[A]	-	3,3,3	0.46	0	2,2,2	0.40	0
8	TRS	D	505	-	7,7,7	0.31	0	9,9,9	0.45	0
9	CLF	B	501[B]	2	0,24,24	-	-	-		
4	D6N	D	501	7,6,5,1	4,26,28	1.05	0	-		
9	CLF	E	501[B]	2	0,24,24	-	-	-		
11	EDO	B	504[A]	-	3,3,3	0.24	0	2,2,2	0.79	0
8	TRS	A	505	-	7,7,7	0.30	0	9,9,9	0.69	0
11	EDO	B	506[B]	-	3,3,3	0.27	0	2,2,2	0.37	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
11	EDO	E	502	-	3,3,3	1.12	0	2,2,2	0.21	0
11	EDO	B	505	-	3,3,3	0.64	0	2,2,2	0.12	0
6	BCT	D	503	4	3,3,3	0.76	0	2,3,3	0.47	0
11	EDO	F	202	-	3,3,3	0.74	0	2,2,2	0.48	0
6	BCT	A	503	4	3,3,3	0.70	0	2,3,3	0.41	0
11	EDO	B	504[B]	-	3,3,3	0.11	0	2,2,2	0.61	0
4	D6N	A	501	7,6,5,1	4,26,28	1.00	0	-		
11	EDO	E	504[A]	-	3,3,3	0.96	0	2,2,2	0.30	0
5	HCA	D	502	4	13,13,13	1.18	1 (7%)	15,18,18	1.18	1 (6%)
11	EDO	E	503[A]	-	3,3,3	0.31	0	2,2,2	0.63	0
11	EDO	E	505	-	3,3,3	1.80	1 (33%)	2,2,2	1.32	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
11	EDO	E	504[B]	-	-	0/1/1/1	-
11	EDO	E	503[B]	-	-	1/1/1/1	-
9	CLF	B	501[A]	2	-	-	0/12/10/10
9	CLF	E	501[A]	2	-	-	0/12/10/10
11	EDO	C	202	-	-	0/1/1/1	-
8	TRS	A	506	-	-	2/9/9/9	-
5	HCA	A	502	4	-	2/17/17/17	-
11	EDO	B	506[A]	-	-	0/1/1/1	-
8	TRS	D	505	-	-	0/9/9/9	-
9	CLF	B	501[B]	2	-	-	0/12/10/10
9	CLF	E	501[B]	2	-	-	0/12/10/10
11	EDO	B	504[A]	-	-	1/1/1/1	-
8	TRS	A	505	-	-	0/9/9/9	-
11	EDO	B	506[B]	-	-	0/1/1/1	-
11	EDO	E	502	-	-	0/1/1/1	-
11	EDO	B	505	-	-	0/1/1/1	-
11	EDO	F	202	-	-	0/1/1/1	-
11	EDO	B	504[B]	-	-	1/1/1/1	-
11	EDO	E	504[A]	-	-	0/1/1/1	-
5	HCA	D	502	4	-	2/17/17/17	-
11	EDO	E	503[A]	-	-	0/1/1/1	-
11	EDO	E	505	-	-	1/1/1/1	-

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	502	HCA	C3-C7	-2.31	1.51	1.53
11	E	505	EDO	O2-C2	2.25	1.53	1.42
5	D	502	HCA	C3-C7	-2.20	1.51	1.53
5	A	502	HCA	O4-C6	-2.15	1.23	1.30
5	A	502	HCA	O2-C1	-2.08	1.23	1.30

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	502	HCA	O1-C1-C2	-3.21	113.86	122.95
5	D	502	HCA	O6-C7-C3	2.60	118.12	113.14

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	A	506	TRS	C2-C-C3-O3
8	A	506	TRS	N-C-C3-O3
11	B	504[B]	EDO	O1-C1-C2-O2
11	E	505	EDO	O1-C1-C2-O2
11	E	503[B]	EDO	O1-C1-C2-O2
5	A	502	HCA	C4-C5-C6-O3
5	D	502	HCA	C4-C5-C6-O4
5	D	502	HCA	C4-C5-C6-O3
5	A	502	HCA	C4-C5-C6-O4
11	B	504[A]	EDO	O1-C1-C2-O2

There are no ring outliers.

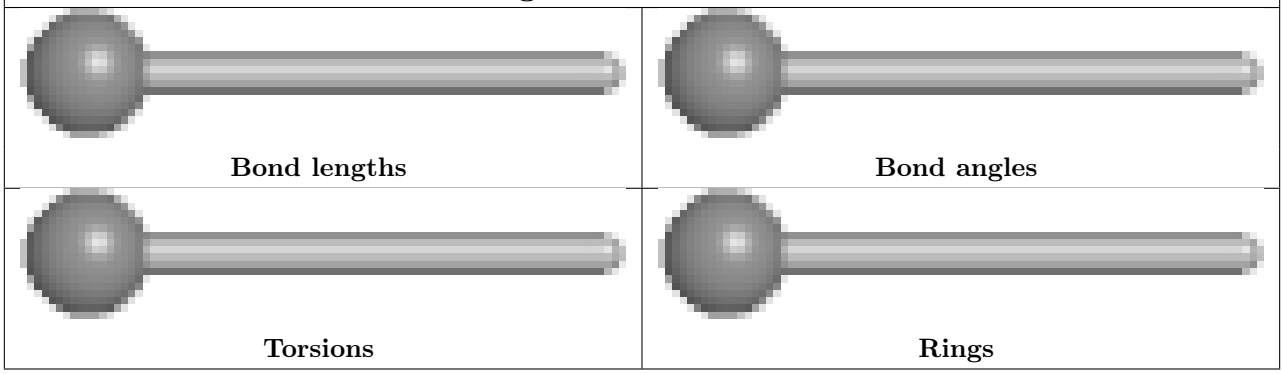
4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	502	HCA	1	0
8	D	505	TRS	1	0
5	D	502	HCA	1	0
11	E	505	EDO	3	0

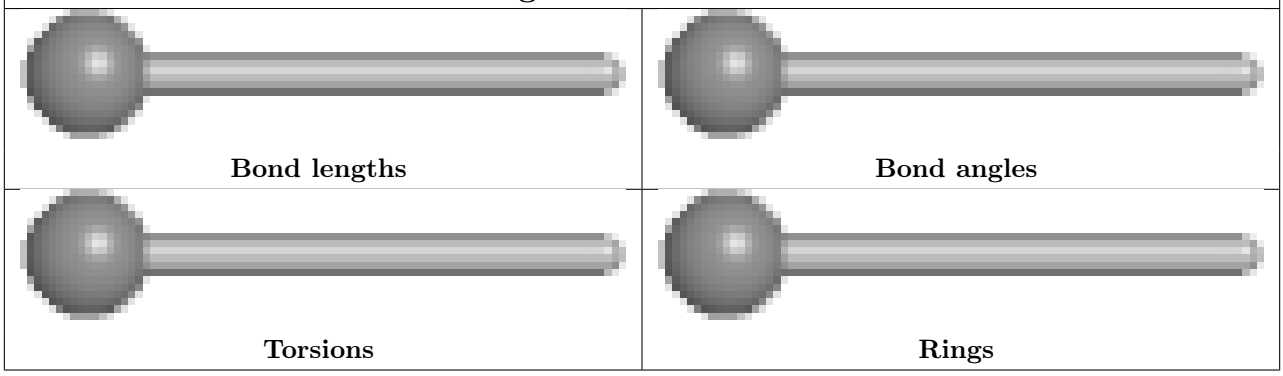
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be

highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

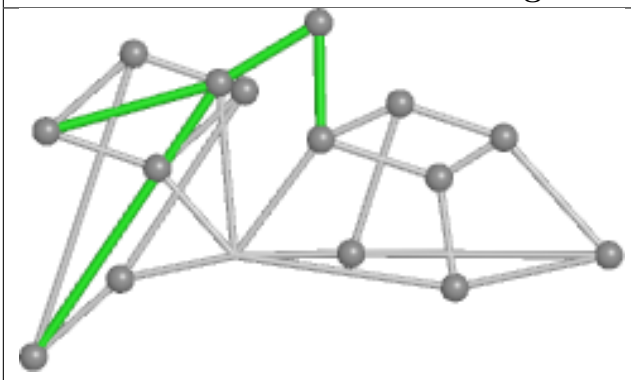
Ligand CMO D 504



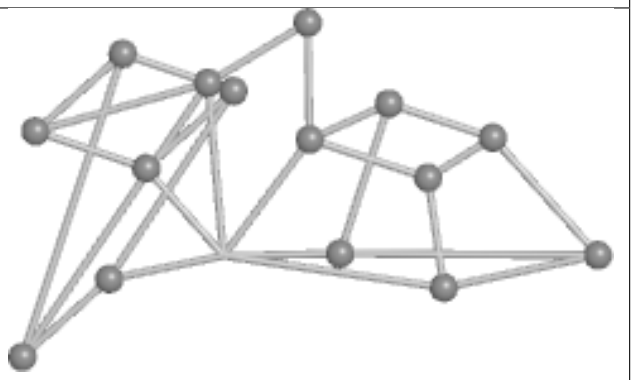
Ligand CMO A 504



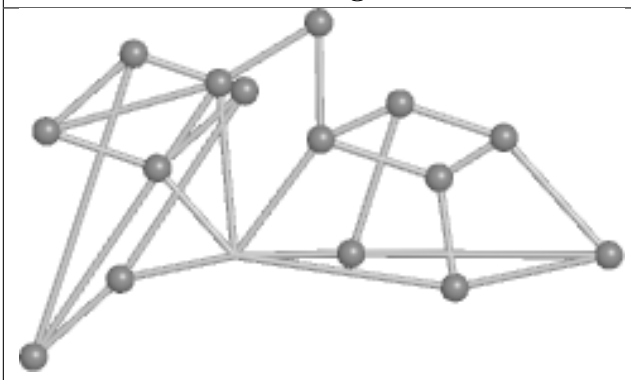
Ligand D6N D 501



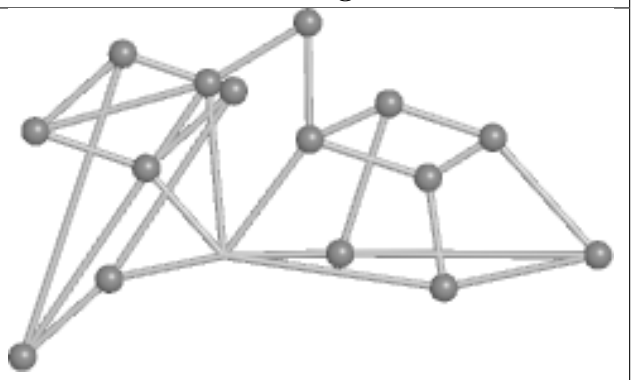
Bond lengths



Bond angles

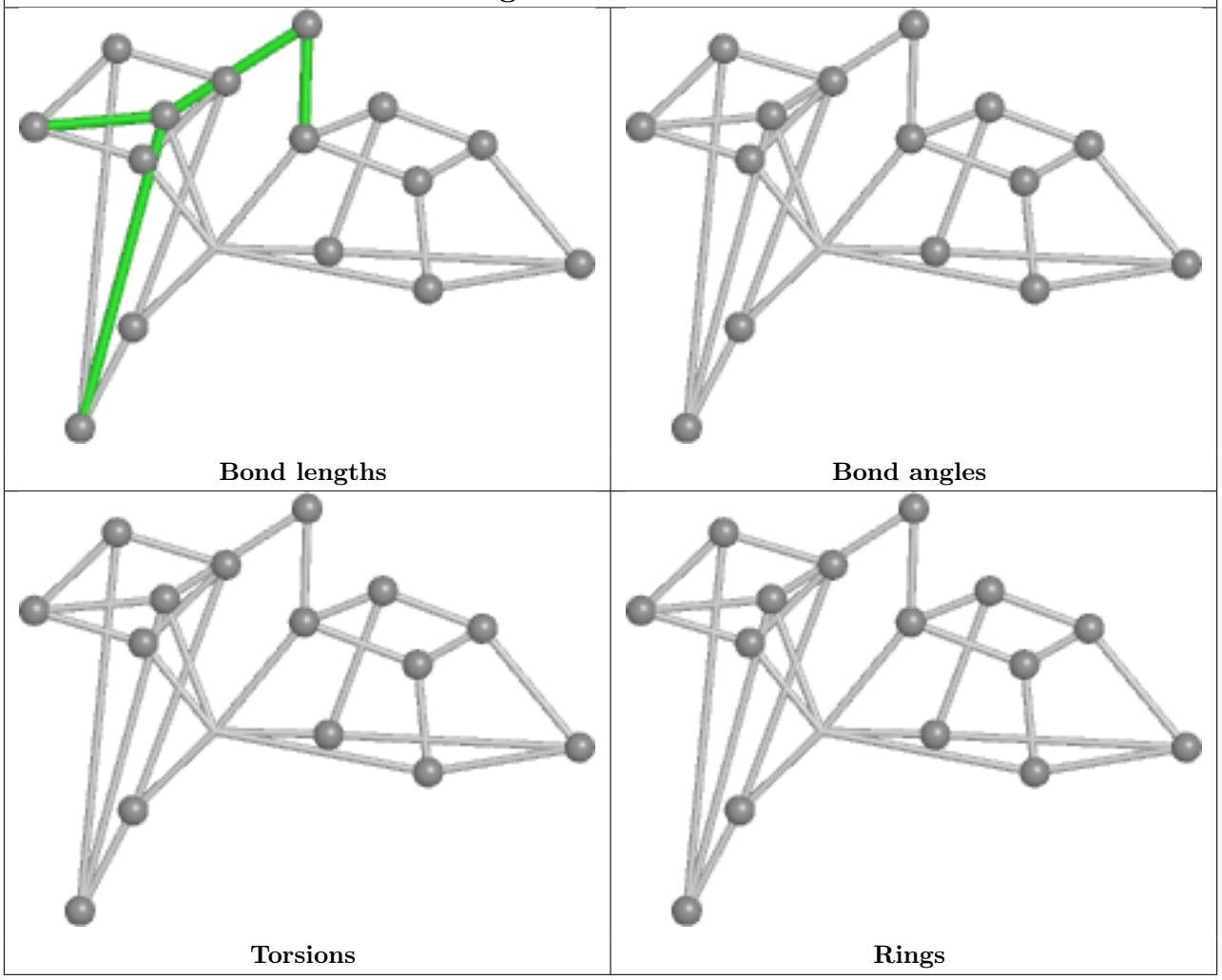


Torsions



Rings

Ligand D6N A 501



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	1
3	F	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	462:LYS	C	463:SER	N	2.30

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Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	F	50[A]:ARG	C	51:GLY	N	1.62

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^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	473/474 (99%)	-0.46	7 (1%)	73	65	9, 12, 23, 41	0
1	D	473/474 (99%)	-0.37	11 (2%)	60	51	7, 11, 23, 42	0
2	B	465/475 (97%)	-0.38	6 (1%)	77	69	8, 13, 25, 86	0
2	E	466/475 (98%)	-0.28	6 (1%)	77	69	7, 11, 21, 70	0
3	C	113/113 (100%)	-0.11	3 (2%)	54	45	12, 17, 31, 67	0
3	F	111/113 (98%)	0.09	10 (9%)	9	12	11, 17, 40, 46	0
All	All	2101/2124 (98%)	-0.34	43 (2%)	65	55	7, 12, 25, 86	0

All (43) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	F	79	VAL	6.5
2	E	10	LYS	6.5
3	F	84	ILE	5.7
3	C	1	MET	5.4
1	D	465	THR	4.9
1	D	468	VAL	4.8
3	F	80	ASN	4.7
2	B	11[A]	PRO	4.6
2	B	12	ALA	4.5
1	D	463	SER	4.2
1	D	462	LYS	3.9
3	C	2	SER	3.7
1	D	470	VAL	3.6
1	D	467	PRO	3.4
2	E	11	PRO	3.3
2	B	376	ASN	3.3
1	D	464	GLN	3.3
3	F	77	SER	3.1
1	A	461	ASP	3.1

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Mol	Chain	Res	Type	RSRZ
3	F	78	GLN	3.0
2	E	12	ALA	2.9
1	A	469	ILE	2.9
1	D	469	ILE	2.8
1	A	462	LYS	2.8
1	A	25	ASN	2.7
1	A	463	SER	2.7
1	D	461	ASP	2.7
1	D	473	ALA	2.7
1	D	466	THR	2.6
3	F	74	PRO	2.6
2	E	431	PHE	2.5
1	A	465	THR	2.4
3	C	49	LEU	2.4
2	B	140	PRO	2.3
2	E	337[A]	LEU	2.2
2	E	436	LEU	2.2
2	B	377	THR	2.2
2	B	16	LEU	2.2
3	F	89	ASP	2.2
1	A	468	VAL	2.1
3	F	3	GLN	2.1
3	F	82	GLU	2.1
3	F	83	GLU	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 monosaccharides in this entry.

6.4 Ligands (i)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
11	EDO	C	202	4/4	0.79	0.23	23,25,26,27	0
8	TRS	D	505	8/8	0.83	0.17	23,26,27,38	0
8	TRS	A	506	8/8	0.87	0.19	27,34,36,38	0
11	EDO	B	506[B]	4/4	0.88	0.14	15,21,22,22	4
11	EDO	B	506[A]	4/4	0.88	0.14	14,26,28,34	4
11	EDO	F	202	4/4	0.90	0.12	17,19,19,20	4
11	EDO	E	504[B]	4/4	0.93	0.13	16,29,31,36	4
11	EDO	E	504[A]	4/4	0.93	0.13	11,16,17,17	4
8	TRS	A	505	8/8	0.94	0.08	21,25,31,31	0
11	EDO	B	505	4/4	0.95	0.20	26,28,30,33	0
11	EDO	E	503[B]	4/4	0.96	0.10	17,19,21,21	4
11	EDO	B	504[A]	4/4	0.96	0.14	14,15,16,17	4
11	EDO	B	504[B]	4/4	0.96	0.14	19,20,20,21	4
11	EDO	E	503[A]	4/4	0.96	0.10	12,12,13,16	4
11	EDO	E	505	4/4	0.97	0.19	18,19,20,25	0
11	EDO	E	502	4/4	0.98	0.08	17,20,21,23	0
5	HCA	A	502	14/14	0.99	0.06	8,9,12,14	0
5	HCA	D	502	14/14	0.99	0.07	6,7,11,12	0
7	CMO	A	504	2/2	0.99	0.05	7,7,7,12	0
7	CMO	D	504	2/2	0.99	0.05	6,6,6,11	0
6	BCT	A	503	4/4	1.00	0.07	8,9,9,9	0
6	BCT	D	503	4/4	1.00	0.06	7,7,7,8	0
4	D6N	A	501	16/17	1.00	0.05	8,8,9,9	0
9	CLF	B	501[A]	15/15	1.00	0.04	7,9,9,10	1
9	CLF	B	501[B]	15/15	1.00	0.04	9,9,10,16	1
9	CLF	E	501[A]	15/15	1.00	0.05	5,7,7,7	1
9	CLF	E	501[B]	15/15	1.00	0.05	6,7,7,13	1
10	MG	B	502	1/1	1.00	0.02	10,10,10,10	0
10	MG	B	503	1/1	1.00	0.03	9,9,9,9	0
10	MG	C	201	1/1	1.00	0.07	15,15,15,15	0
10	MG	F	201	1/1	1.00	0.09	15,15,15,15	0
4	D6N	D	501	16/17	1.00	0.05	6,7,8,8	0

6.5 Other polymers (i)

There are no such residues in this entry.