



# wwPDB X-ray Structure Validation Summary Report ⓘ

Apr 10, 2024 – 01:22 pm BST

PDB ID : 8RUF  
Title : Crystal structure of Rhizobium etli L-asparaginase ReAV D187A mutant  
Authors : Pokrywka, K.; Grzechowiak, M.; Sliwiak, J.; Worsztynowicz, P.; Loch, J.I.;  
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Deposited on : 2024-01-30  
Resolution : 1.60 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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>.

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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 : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.36  
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) : 2.36

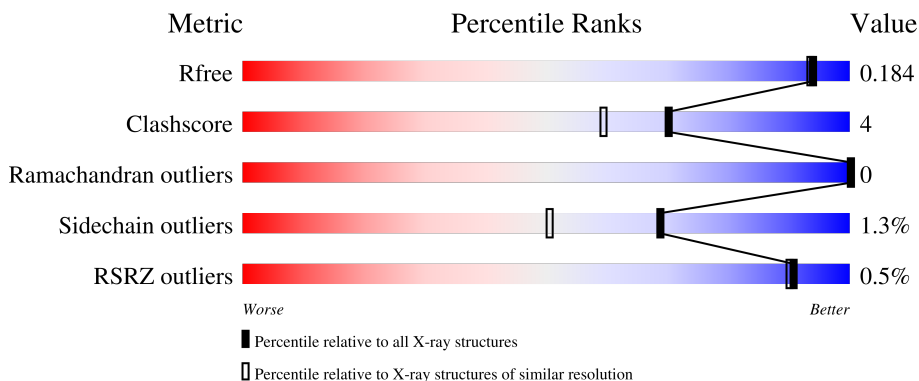
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.60 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	3398 (1.60-1.60)
Clashscore	141614	3665 (1.60-1.60)
Ramachandran outliers	138981	3564 (1.60-1.60)
Sidechain outliers	138945	3563 (1.60-1.60)
RSRZ outliers	127900	3321 (1.60-1.60)

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  $\leq 5\%$ . 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	373	 88% 5% 6%
1	B	373	 86% 7% 6%
1	C	373	 89% 5% 6%
1	D	373	 87% 6% • 6%

## 2 Entry composition i

There are 9 unique types of molecules in this entry. The entry contains 12462 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 L-asparaginase II protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	349	2683	1665	490	505	23	0	19	0
1	B	349	2694	1678	489	504	23	0	22	0
1	C	350	2687	1670	489	505	23	0	20	0
1	D	350	2692	1675	488	506	23	0	20	0

There are 28 discrepancies between the modelled and reference sequences:

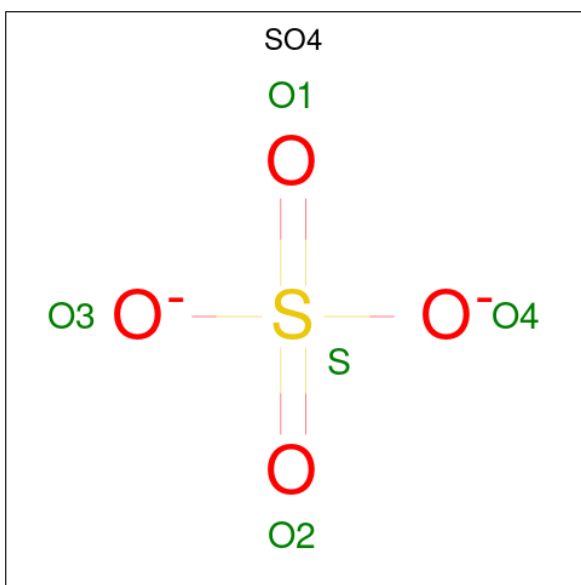
Chain	Residue	Modelled	Actual	Comment	Reference
A	-5	GLY	-	expression tag	UNP Q2K0Z2
A	-4	ILE	-	expression tag	UNP Q2K0Z2
A	-3	ASP	-	expression tag	UNP Q2K0Z2
A	-2	PRO	-	expression tag	UNP Q2K0Z2
A	-1	PHE	-	expression tag	UNP Q2K0Z2
A	0	THR	-	expression tag	UNP Q2K0Z2
A	187	ALA	ASP	engineered mutation	UNP Q2K0Z2
B	-5	GLY	-	expression tag	UNP Q2K0Z2
B	-4	ILE	-	expression tag	UNP Q2K0Z2
B	-3	ASP	-	expression tag	UNP Q2K0Z2
B	-2	PRO	-	expression tag	UNP Q2K0Z2
B	-1	PHE	-	expression tag	UNP Q2K0Z2
B	0	THR	-	expression tag	UNP Q2K0Z2
B	187	ALA	ASP	engineered mutation	UNP Q2K0Z2
C	-5	GLY	-	expression tag	UNP Q2K0Z2
C	-4	ILE	-	expression tag	UNP Q2K0Z2
C	-3	ASP	-	expression tag	UNP Q2K0Z2
C	-2	PRO	-	expression tag	UNP Q2K0Z2
C	-1	PHE	-	expression tag	UNP Q2K0Z2
C	0	THR	-	expression tag	UNP Q2K0Z2
C	187	ALA	ASP	engineered mutation	UNP Q2K0Z2

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-5	GLY	-	expression tag	UNP Q2K0Z2
D	-4	ILE	-	expression tag	UNP Q2K0Z2
D	-3	ASP	-	expression tag	UNP Q2K0Z2
D	-2	PRO	-	expression tag	UNP Q2K0Z2
D	-1	PHE	-	expression tag	UNP Q2K0Z2
D	0	THR	-	expression tag	UNP Q2K0Z2
D	187	ALA	ASP	engineered mutation	UNP Q2K0Z2

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



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

- Molecule 3 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
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	C	1	Total C O 4 2 2	0	0
3	C	1	Total C O 4 2 2	0	0
3	C	1	Total C O 4 2 2	0	0
3	C	1	Total C O 4 2 2	0	0

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

- Molecule 4 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

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

- Molecule 5 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

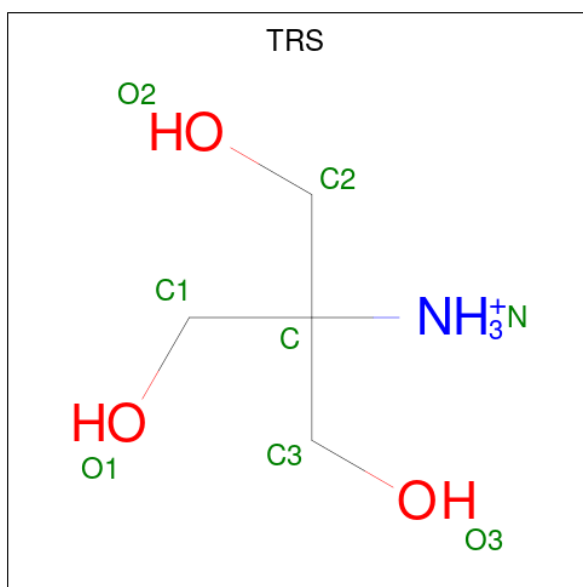
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total Cl 1 1	0	0
5	B	1	Total Cl 1 1	0	0
5	C	1	Total Cl 1 1	0	0
5	D	1	Total Cl 1 1	0	0

- Molecule 6 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



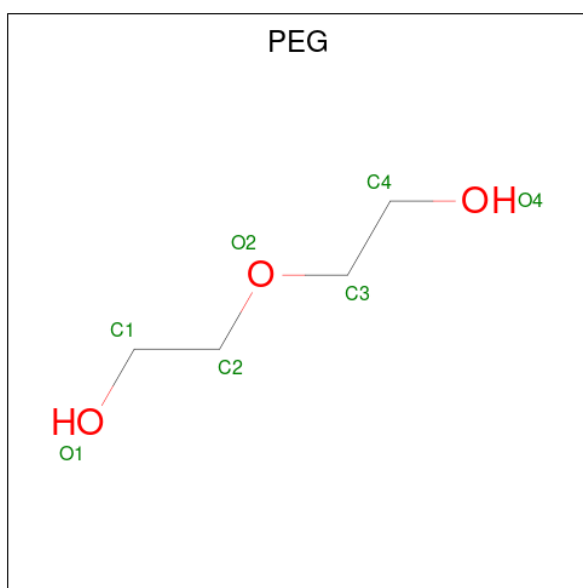
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			6	3	3		
6	B	1	Total	C	O	0	0
			6	3	3		
6	B	1	Total	C	O	0	0
			6	3	3		
6	C	1	Total	C	O	0	0
			6	3	3		
6	D	1	Total	C	O	0	0
			6	3	3		

- Molecule 7 is 2-AMINO-2-HYDROXYMETHYL-PROPANE-1,3-DIOL (three-letter code: TRS) (formula: C<sub>4</sub>H<sub>12</sub>NO<sub>3</sub>).



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

- Molecule 8 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: C<sub>4</sub>H<sub>10</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	D	1	Total	C	O	0	0
			7	4	3		
8	D	1	Total	C	O	0	0
			7	4	3		



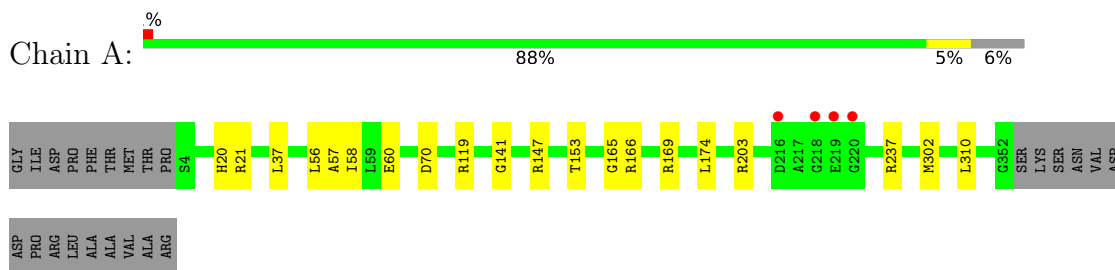
- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	366	Total 366	O 366	0	0
9	B	390	Total 390	O 390	0	0
9	C	379	Total 379	O 379	0	0
9	D	399	Total 399	O 399	0	0

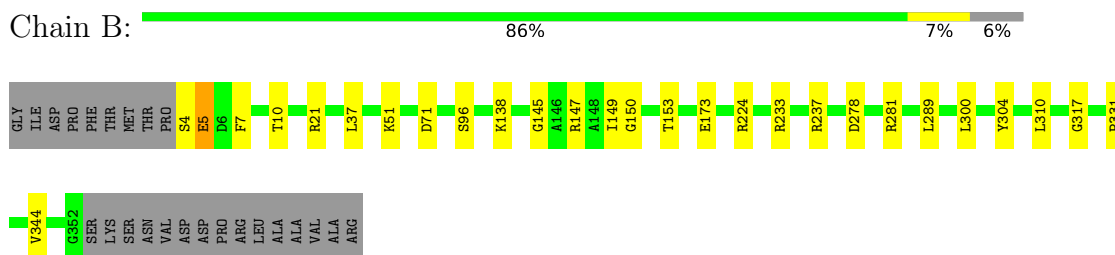
### 3 Residue-property plots

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.

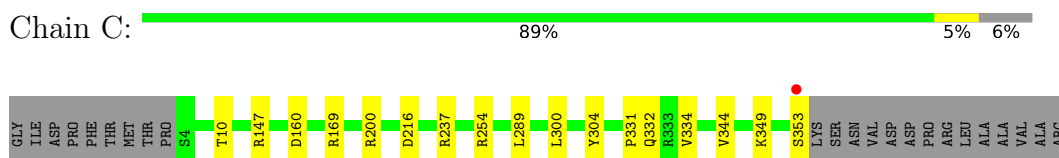
- Molecule 1: L-asparaginase II protein



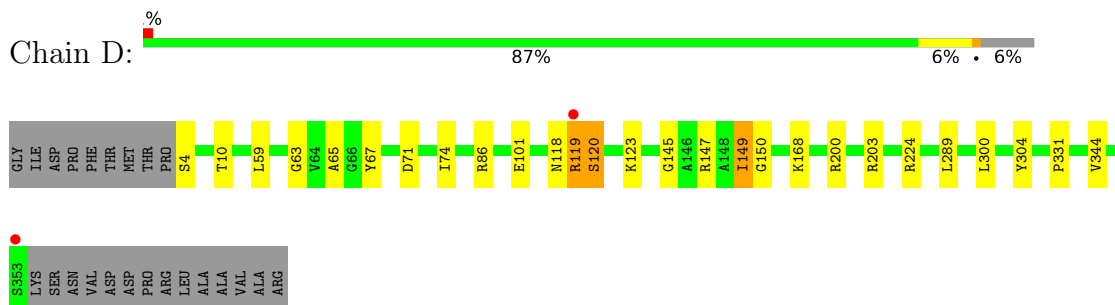
- Molecule 1: L-asparaginase II protein



- Molecule 1: L-asparaginase II protein



- Molecule 1: L-asparaginase II protein



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	77.72Å 91.26Å 114.20Å 90.00° 96.95° 90.00°	Depositor
Resolution (Å)	48.57 – 1.60 71.09 – 1.60	Depositor EDS
% Data completeness (in resolution range)	99.8 (48.57-1.60) 99.9 (71.09-1.60)	Depositor EDS
$R_{merge}$	0.12	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.57 (at 1.60Å)	Xtrriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, $R_{free}$	0.158 , 0.184 0.159 , 0.184	Depositor DCC
$R_{free}$ test set	2090 reflections (1.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	18.2	Xtrriage
Anisotropy	0.468	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 43.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.98	EDS
Total number of atoms	12462	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	24.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 39.34 % 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 3.2218e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

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

Bond lengths and bond angles in the following residue types are not validated in this section: EDO, ZN, CL, PEG, SO4, GOL, TRS

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	0.48	0/2785	0.69	0/3759
1	B	0.53	0/2804	0.73	0/3783
1	C	0.48	0/2792	0.68	0/3768
1	D	0.50	0/2796	0.72	0/3772
All	All	0.50	0/11177	0.71	0/15082

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 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	2683	0	2699	20	0
1	B	2694	0	2737	19	0
1	C	2687	0	2715	12	0
1	D	2692	0	2725	27	0
2	A	5	0	0	0	0
2	B	5	0	0	0	0
2	C	5	0	0	0	0
2	D	5	0	0	0	0
3	A	20	0	30	7	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	20	0	30	4	0
3	C	16	0	24	3	0
3	D	28	0	42	6	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
5	A	1	0	0	0	0
5	B	1	0	0	0	0
5	C	1	0	0	0	0
5	D	1	0	0	0	0
6	A	6	0	8	3	0
6	B	12	0	16	2	0
6	C	6	0	8	1	0
6	D	6	0	8	2	0
7	B	8	0	12	2	0
7	D	8	0	12	3	0
8	D	14	0	20	5	0
9	A	366	0	0	5	0
9	B	390	0	0	3	0
9	C	379	0	0	4	0
9	D	399	0	0	1	0
All	All	12462	0	11086	80	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

The worst 5 of 80 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:D:63:GLY:H	8:D:411:PEG:H31	1.19	1.02
1:D:71:ASP:HB2	7:D:409:TRS:H31	1.52	0.90
1:A:237:ARG:HH12	3:A:407:EDO:H22	1.37	0.88
1:D:200:ARG:HH12	8:D:406:PEG:H21	1.43	0.84
1:B:96[A]:SER:OG	1:D:101[A]:GLU:OE1	1.97	0.82

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

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

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	366/373 (98%)	356 (97%)	10 (3%)	0	100	100
1	B	369/373 (99%)	360 (98%)	9 (2%)	0	100	100
1	C	368/373 (99%)	358 (97%)	10 (3%)	0	100	100
1	D	368/373 (99%)	359 (98%)	9 (2%)	0	100	100
All	All	1471/1492 (99%)	1433 (97%)	38 (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	281/282 (100%)	281 (100%)	0	100	100
1	B	284/282 (101%)	279 (98%)	5 (2%)	59	36
1	C	283/282 (100%)	279 (99%)	4 (1%)	67	47
1	D	283/282 (100%)	275 (97%)	8 (3%)	43	18
All	All	1131/1128 (100%)	1114 (98%)	17 (2%)	69	44

5 of 17 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	168[A]	LYS
1	D	289	LEU
1	C	289	LEU

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Mol	Chain	Res	Type
1	C	353	SER
1	D	4	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 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 42 ligands modelled in this entry, 8 are monoatomic - leaving 34 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	EDO	A	407	-	3,3,3	0.65	0	2,2,2	0.45	0
2	SO4	C	401	-	4,4,4	0.56	0	6,6,6	0.17	0
3	EDO	B	411	-	3,3,3	0.41	0	2,2,2	0.78	0
3	EDO	D	413	-	3,3,3	0.58	0	2,2,2	0.16	0
3	EDO	D	407	-	3,3,3	0.58	0	2,2,2	0.67	0
3	EDO	D	405	-	3,3,3	0.42	0	2,2,2	0.32	0
3	EDO	A	408	-	3,3,3	0.35	0	2,2,2	0.78	0
3	EDO	D	403	-	3,3,3	0.45	0	2,2,2	0.26	0
3	EDO	D	412	-	3,3,3	0.50	0	2,2,2	0.34	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	SO4	B	401	-	4,4,4	0.56	0	6,6,6	0.06	0
3	EDO	A	402	-	3,3,3	0.55	0	2,2,2	0.29	0
3	EDO	C	408	-	3,3,3	0.61	0	2,2,2	0.24	0
3	EDO	C	406	-	3,3,3	0.50	0	2,2,2	0.16	0
7	TRS	B	409	-	7,7,7	0.30	0	9,9,9	0.90	0
3	EDO	B	408	-	3,3,3	0.58	0	2,2,2	0.52	0
7	TRS	D	409	-	7,7,7	0.54	0	9,9,9	1.04	0
6	GOL	B	406	-	5,5,5	0.79	0	5,5,5	0.99	0
6	GOL	C	405	-	5,5,5	1.12	1 (20%)	5,5,5	0.89	0
2	SO4	A	401	-	4,4,4	0.55	0	6,6,6	0.15	0
6	GOL	B	410	-	5,5,5	0.85	0	5,5,5	0.95	0
3	EDO	A	403	-	3,3,3	0.43	0	2,2,2	0.46	0
6	GOL	D	410	-	5,5,5	0.42	0	5,5,5	1.22	1 (20%)
3	EDO	D	404	-	3,3,3	0.50	0	2,2,2	0.18	0
2	SO4	D	401	-	4,4,4	0.56	0	6,6,6	0.11	0
3	EDO	B	402	-	3,3,3	0.57	0	2,2,2	0.18	0
3	EDO	D	402	-	3,3,3	0.34	0	2,2,2	0.79	0
3	EDO	C	407	-	3,3,3	0.45	0	2,2,2	0.58	0
8	PEG	D	406	-	6,6,6	0.08	0	5,5,5	0.43	0
3	EDO	A	406	-	3,3,3	0.27	0	2,2,2	0.60	0
8	PEG	D	411	-	6,6,6	0.10	0	5,5,5	0.18	0
3	EDO	C	402	-	3,3,3	0.39	0	2,2,2	0.59	0
3	EDO	B	403	-	3,3,3	0.45	0	2,2,2	0.21	0
3	EDO	B	407	-	3,3,3	0.59	0	2,2,2	0.26	0
6	GOL	A	409	-	5,5,5	0.79	0	5,5,5	1.25	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
3	EDO	A	407	-	-	0/1/1/1	-
3	EDO	B	411	-	-	0/1/1/1	-
3	EDO	D	413	-	-	1/1/1/1	-
3	EDO	D	407	-	-	1/1/1/1	-
3	EDO	D	405	-	-	1/1/1/1	-
3	EDO	A	408	-	-	1/1/1/1	-
3	EDO	D	403	-	-	0/1/1/1	-
3	EDO	D	412	-	-	0/1/1/1	-
3	EDO	A	402	-	-	1/1/1/1	-
3	EDO	C	408	-	-	0/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	EDO	C	406	-	-	0/1/1/1	-
7	TRS	B	409	-	-	6/9/9/9	-
3	EDO	B	408	-	-	1/1/1/1	-
7	TRS	D	409	-	-	6/9/9/9	-
6	GOL	B	406	-	-	2/4/4/4	-
6	GOL	C	405	-	-	3/4/4/4	-
6	GOL	B	410	-	-	0/4/4/4	-
3	EDO	A	403	-	-	1/1/1/1	-
6	GOL	D	410	-	-	2/4/4/4	-
3	EDO	D	404	-	-	1/1/1/1	-
3	EDO	B	402	-	-	0/1/1/1	-
3	EDO	D	402	-	-	1/1/1/1	-
3	EDO	C	407	-	-	1/1/1/1	-
8	PEG	D	406	-	-	2/4/4/4	-
3	EDO	A	406	-	-	1/1/1/1	-
8	PEG	D	411	-	-	1/4/4/4	-
3	EDO	C	402	-	-	0/1/1/1	-
3	EDO	B	403	-	-	0/1/1/1	-
3	EDO	B	407	-	-	0/1/1/1	-
6	GOL	A	409	-	-	1/4/4/4	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	C	405	GOL	C1-C2	2.02	1.60	1.51

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	D	410	GOL	C3-C2-C1	-2.05	103.74	111.70

There are no chirality outliers.

5 of 34 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	B	406	GOL	O1-C1-C2-C3
6	C	405	GOL	C1-C2-C3-O3
6	D	410	GOL	C1-C2-C3-O3
7	B	409	TRS	C2-C-C1-O1
7	B	409	TRS	N-C-C3-O3

There are no ring outliers.

18 monomers are involved in 38 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	407	EDO	3	0
3	D	413	EDO	2	0
3	D	405	EDO	3	0
3	C	408	EDO	1	0
7	B	409	TRS	2	0
7	D	409	TRS	3	0
6	B	406	GOL	2	0
6	C	405	GOL	1	0
3	A	403	EDO	1	0
6	D	410	GOL	2	0
3	D	404	EDO	1	0
8	D	406	PEG	2	0
3	A	406	EDO	3	0
8	D	411	PEG	3	0
3	C	402	EDO	2	0
3	B	403	EDO	3	0
3	B	407	EDO	1	0
6	A	409	GOL	3	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	349/373 (93%)	-0.38	4 (1%) 80 80	14, 22, 43, 60	0
1	B	349/373 (93%)	-0.43	0 100 100	13, 19, 35, 54	0
1	C	350/373 (93%)	-0.40	1 (0%) 94 93	15, 21, 40, 68	0
1	D	350/373 (93%)	-0.41	2 (0%) 89 89	14, 19, 35, 60	0
All	All	1398/1492 (93%)	-0.40	7 (0%) 91 90	13, 20, 39, 68	0

The worst 5 of 7 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	218	GLY	3.7
1	C	353	SER	3.4
1	A	216	ASP	2.8
1	D	353	SER	2.5
1	D	119	ARG	2.5

### 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.

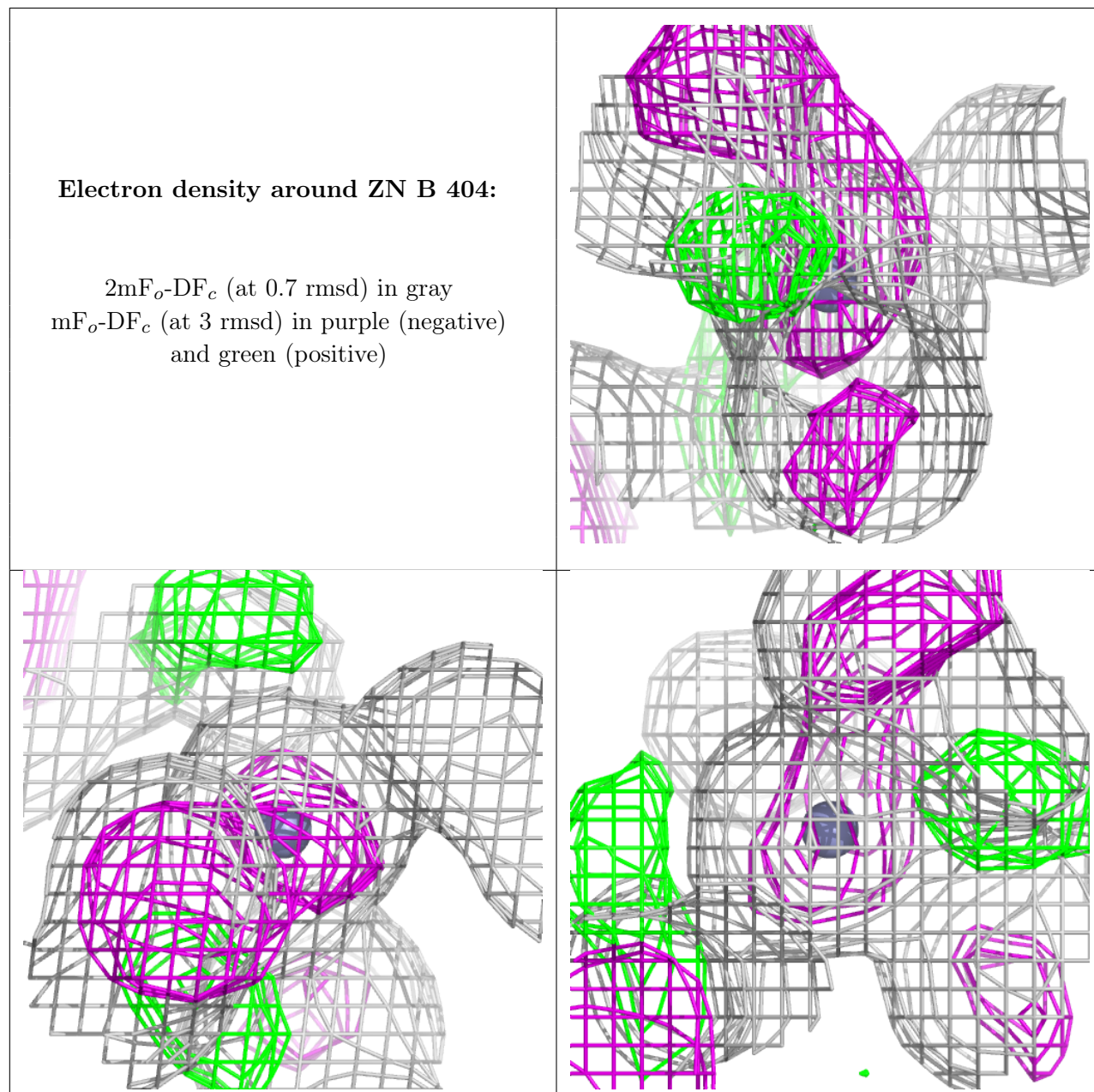
### 6.4 Ligands [i](#)

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<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	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
3	EDO	C	407	4/4	0.73	0.22	42,42,53,54	0
7	TRS	B	409	8/8	0.78	0.15	27,31,38,40	8
6	GOL	C	405	6/6	0.79	0.21	43,47,48,49	0
6	GOL	B	410	6/6	0.80	0.20	35,44,49,50	0
3	EDO	A	406	4/4	0.81	0.17	35,37,40,53	0
3	EDO	D	412	4/4	0.82	0.17	44,48,50,54	0
8	PEG	D	406	7/7	0.82	0.14	27,35,42,48	7
3	EDO	B	407	4/4	0.85	0.34	35,35,37,40	0
3	EDO	C	406	4/4	0.85	0.19	39,43,44,47	0
6	GOL	A	409	6/6	0.86	0.12	36,43,46,51	6
3	EDO	A	402	4/4	0.86	0.25	41,44,46,51	0
3	EDO	A	407	4/4	0.86	0.22	26,34,37,39	0
3	EDO	A	403	4/4	0.86	0.33	35,37,41,48	0
3	EDO	D	413	4/4	0.86	0.15	18,32,39,49	0
3	EDO	B	408	4/4	0.87	0.20	29,31,32,36	0
8	PEG	D	411	7/7	0.87	0.17	20,28,31,39	7
7	TRS	D	409	8/8	0.88	0.18	21,35,44,45	8
6	GOL	D	410	6/6	0.88	0.19	33,37,43,51	0
3	EDO	D	407	4/4	0.88	0.26	26,31,34,35	0
3	EDO	D	404	4/4	0.89	0.21	26,36,37,41	0
3	EDO	C	408	4/4	0.89	0.25	29,34,40,47	0
3	EDO	B	411	4/4	0.90	0.46	33,37,40,42	0
3	EDO	B	403	4/4	0.91	0.18	42,49,50,55	0
2	SO4	A	401	5/5	0.92	0.18	27,35,39,42	0
3	EDO	A	408	4/4	0.92	0.10	41,42,45,50	0
3	EDO	C	402	4/4	0.92	0.10	39,45,47,51	0
6	GOL	B	406	6/6	0.93	0.18	22,36,43,57	0
3	EDO	D	402	4/4	0.93	0.19	26,33,33,39	0
2	SO4	C	401	5/5	0.94	0.14	28,35,36,40	0
3	EDO	B	402	4/4	0.94	0.10	26,29,29,38	0
3	EDO	D	403	4/4	0.95	0.09	30,31,37,41	0
2	SO4	D	401	5/5	0.95	0.13	28,29,36,37	0
3	EDO	D	405	4/4	0.95	0.07	39,41,41,42	0
5	CL	B	405	1/1	0.96	0.04	39,39,39,39	0
5	CL	A	405	1/1	0.96	0.06	36,36,36,36	0
5	CL	D	414	1/1	0.97	0.04	34,34,34,34	0
5	CL	C	404	1/1	0.97	0.06	35,35,35,35	0
2	SO4	B	401	5/5	0.98	0.09	27,29,32,34	0
4	ZN	B	404	1/1	0.99	0.04	20,20,20,20	1
4	ZN	A	404	1/1	0.99	0.05	21,21,21,21	1
4	ZN	D	408	1/1	1.00	0.05	20,20,20,20	1
4	ZN	C	403	1/1	1.00	0.05	19,19,19,19	1

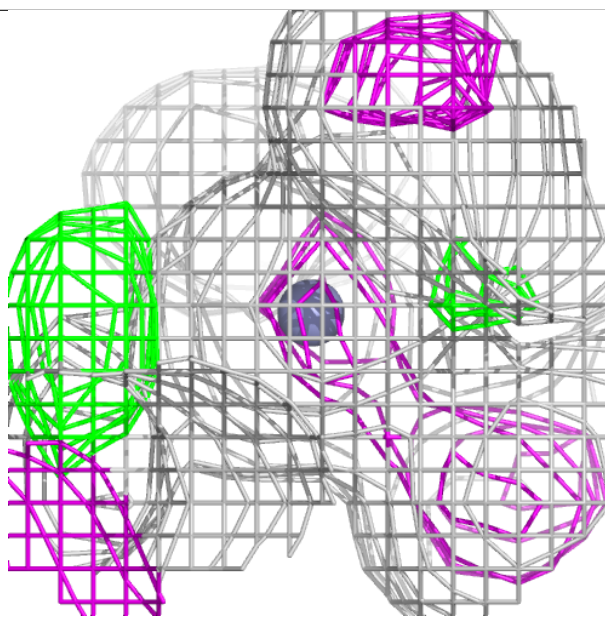
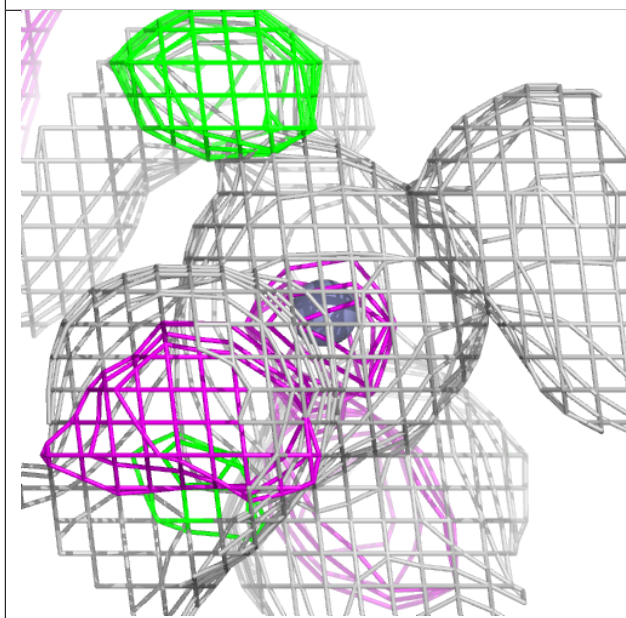
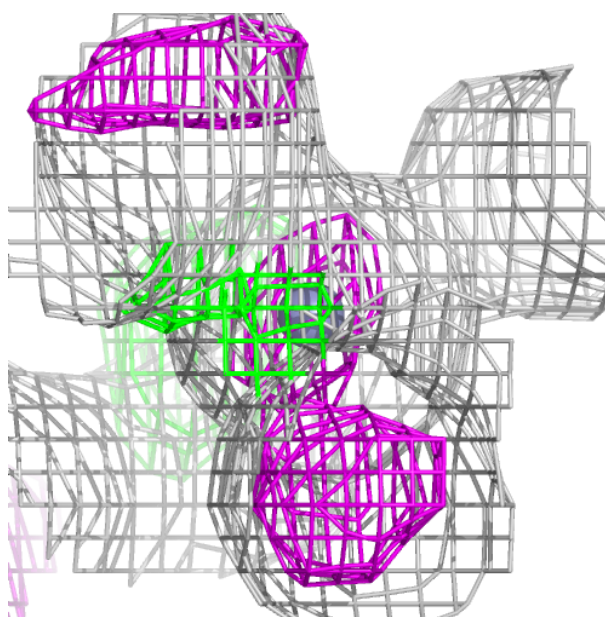
The following is a graphical depiction of the model fit to experimental electron density of all

instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.



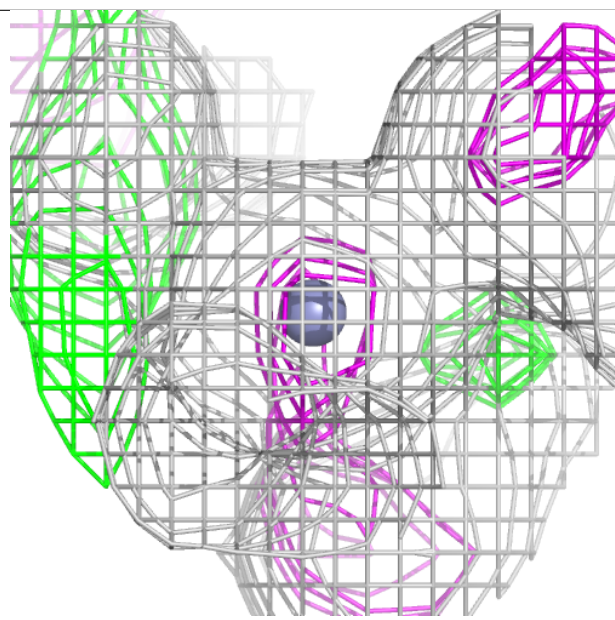
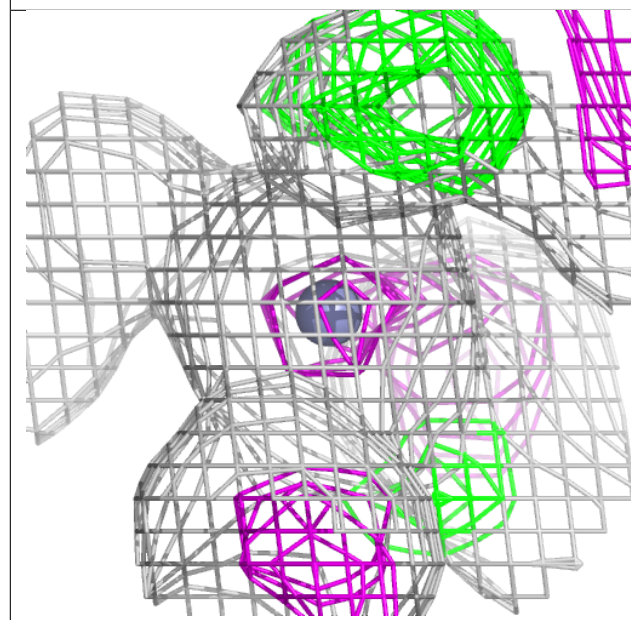
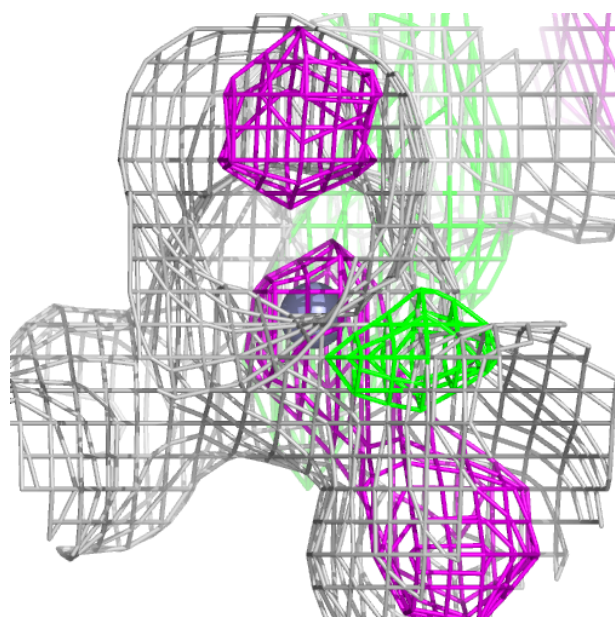
**Electron density around ZN A 404:**

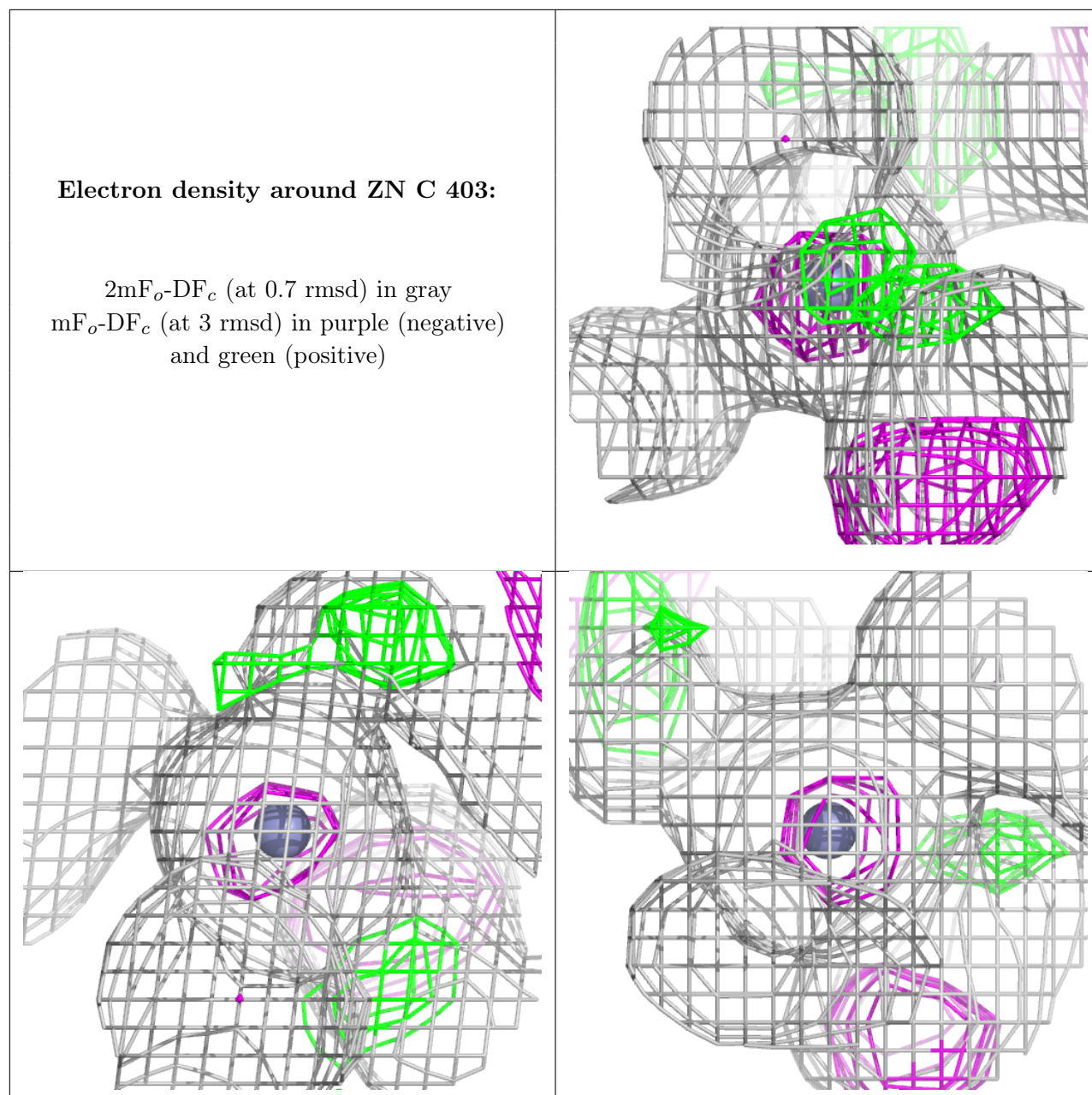
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around ZN D 408:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





## 6.5 Other polymers ⓘ

There are no such residues in this entry.