



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 17, 2026 – 10:46 PM UTC

PDB ID : 1OAR / pdb_00001oar
Title : Fv IgE SPE-7 in complex with Alizarin Red
Authors : James, L.C.; Roversi, P.; Tawfik, D.
Deposited on : 2003-01-21
Resolution : 2.23 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

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	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

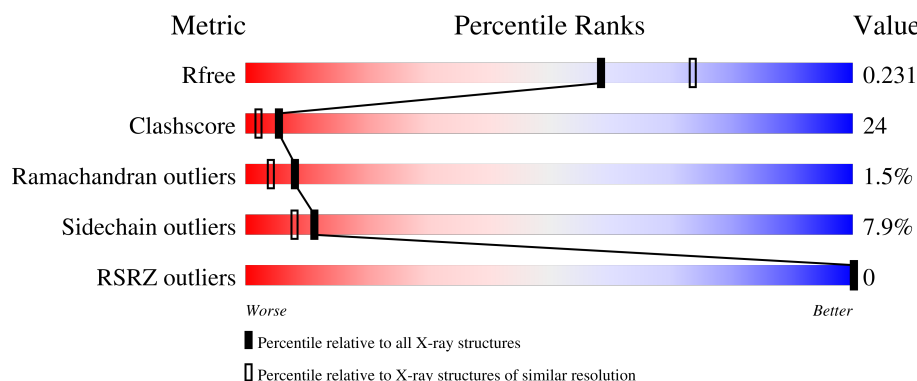
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.23 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}	180053	3416 (2.26-2.22)
Clashscore	190562	3556 (2.26-2.22)
Ramachandran outliers	187476	3500 (2.26-2.22)
Sidechain outliers	187428	3501 (2.26-2.22)
RSRZ outliers	180081	3415 (2.26-2.22)

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 $\leq 5\%$. 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	H	122	 79% 19% .
1	I	122	 22% 36% 13% . 28%
1	J	122	 80% 17% .
1	K	122	 26% 34% 7% 33%
2	L	110	 80% 16% . .

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Mol	Chain	Length	Quality of chain
2	M	110	
2	N	110	
2	O	110	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	CAC	H	201	-	X	-	-
3	CAC	J	201	-	X	-	-
4	DMS	H	300	-	-	X	-
4	DMS	H	302	-	-	X	-
4	DMS	H	304	-	-	X	-
4	DMS	J	300	-	-	X	-
4	DMS	J	302	-	-	X	-
4	DMS	J	304	-	-	X	-
4	DMS	L	300	-	-	X	-
4	DMS	L	303	-	-	X	-
4	DMS	L	304	-	-	X	-
4	DMS	N	300	-	-	X	-
4	DMS	N	303	-	-	X	-
4	DMS	N	304	-	-	X	-
6	AZN	K	500	-	-	X	-

2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 7050 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 IMMUNOGLOBULIN E.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	H	122	Total	C	N	O	S	0	0	0
			964	617	158	184	5			
1	I	88	Total	C	N	O	S	0	0	0
			728	477	115	131	5			
1	J	122	Total	C	N	O	S	0	0	0
			964	617	158	184	5			
1	K	82	Total	C	N	O	S	0	0	0
			683	447	109	122	5			

- Molecule 2 is a protein called IMMUNOGLOBULIN E.

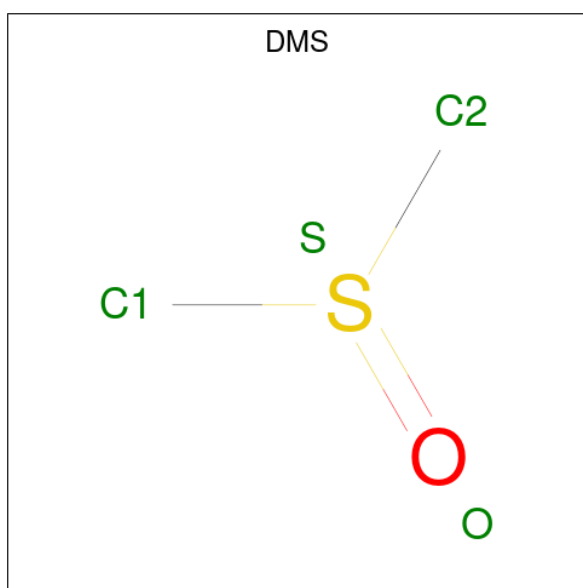
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	L	108	Total	C	N	O	S	0	0	0
			795	500	135	158	2			
2	M	103	Total	C	N	O	S	0	0	0
			767	485	130	150	2			
2	N	108	Total	C	N	O	S	0	0	0
			795	500	135	158	2			
2	O	106	Total	C	N	O	S	0	0	0
			786	495	133	156	2			

- Molecule 3 is CACODYLATE ION (CCD ID: CAC) (formula: C₂H₆AsO₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	H	1	Total	As	C	O	0	0
			5	1	2	2		
3	J	1	Total	As	C	O	0	0
			5	1	2	2		

- Molecule 4 is DIMETHYL SULFOXIDE (CCD ID: DMS) (formula: C_2H_6OS).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	H	1	Total	C	O	S	0	0
			4	2	1	1		
4	H	1	Total	C	O	S	0	0
			4	2	1	1		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	H	1	Total 4	C 2	O 1	S 1	0	0
4	H	1	Total 4	C 2	O 1	S 1	0	0
4	H	1	Total 4	C 2	O 1	S 1	0	0
4	H	1	Total 4	C 2	O 1	S 1	0	0
4	H	1	Total 4	C 2	O 1	S 1	0	0
4	J	1	Total 4	C 2	O 1	S 1	0	0
4	J	1	Total 4	C 2	O 1	S 1	0	0
4	J	1	Total 4	C 2	O 1	S 1	0	0
4	J	1	Total 4	C 2	O 1	S 1	0	0
4	J	1	Total 4	C 2	O 1	S 1	0	0
4	J	1	Total 4	C 2	O 1	S 1	0	0
4	J	1	Total 4	C 2	O 1	S 1	0	0
4	J	1	Total 4	C 2	O 1	S 1	0	0
4	L	1	Total 4	C 2	O 1	S 1	0	0
4	L	1	Total 4	C 2	O 1	S 1	0	0
4	L	1	Total 4	C 2	O 1	S 1	0	0
4	L	1	Total 4	C 2	O 1	S 1	0	0
4	L	1	Total 4	C 2	O 1	S 1	0	0
4	N	1	Total 4	C 2	O 1	S 1	0	0
4	N	1	Total 4	C 2	O 1	S 1	0	0
4	N	1	Total 4	C 2	O 1	S 1	0	0
4	N	1	Total 4	C 2	O 1	S 1	0	0

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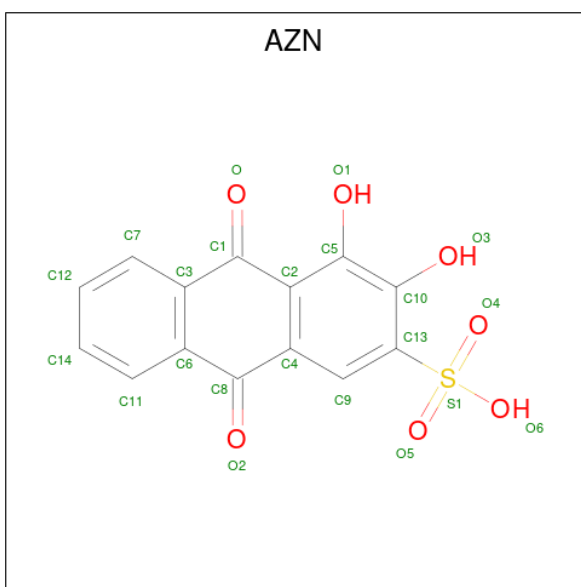
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	N	1	Total	C	O	S	
			4	2	1	1	
							0
							0

- Molecule 5 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: $C_2H_6O_2$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	H	1	Total	C	O		
			4	2	2		
						0	0
5	J	1	Total	C	O		
			4	2	2		
						0	0

- Molecule 6 is ALIZARIN RED (CCD ID: AZN) (formula: $C_{14}H_8O_7S$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	H	1	Total	C	O	S	0	0
			22	14	7	1		
6	I	1	Total	C	O	S	0	0
			22	14	7	1		
6	J	1	Total	C	O	S	0	0
			22	14	7	1		
6	K	1	Total	C	O	S	0	0
			22	14	7	1		

- Molecule 7 is SODIUM ION (CCD ID: NA) (formula: Na).

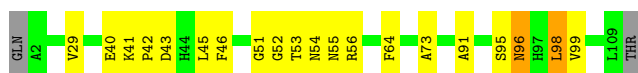
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	H	1	Total	Na	0	0
			1	1		
7	I	1	Total	Na	0	0
			1	1		
7	J	1	Total	Na	0	0
			1	1		
7	L	1	Total	Na	0	0
			1	1		
7	M	1	Total	Na	0	0
			1	1		
7	N	1	Total	Na	0	0
			1	1		

- Molecule 8 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	J	1	Total Cl 1 1	0	0
8	L	3	Total Cl 3 3	0	0
8	M	1	Total Cl 1 1	0	0
8	N	2	Total Cl 2 2	0	0
8	O	1	Total Cl 1 1	0	0

- Molecule 9 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	H	69	Total O 69 69	0	0
9	I	5	Total O 5 5	0	0
9	J	67	Total O 67 67	0	0
9	K	5	Total O 5 5	0	0
9	L	67	Total O 67 67	0	0
9	M	34	Total O 34 34	0	0
9	N	69	Total O 69 69	0	0
9	O	36	Total O 36 36	0	0



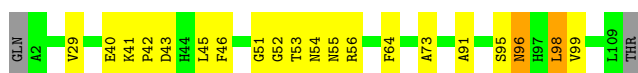
• Molecule 2: IMMUNOGLOBULING E

Chain M: 63% 25% 5% • 6%



• Molecule 2: IMMUNOGLOBULING E

Chain N: 80% 16% • •



• Molecule 2: IMMUNOGLOBULING E

Chain O: 67% 24% 5% • •



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	78.92Å 78.88Å 169.04Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	33.71 – 2.23 33.71 – 2.23	Depositor EDS
% Data completeness (in resolution range)	100.0 (33.71-2.23) 99.7 (33.71-2.23)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.76 (at 2.22Å)	Xtriage
Refinement program	REFMAC 5.1.19	Depositor
R, R_{free}	0.205 , 0.241 0.235 , 0.231	Depositor DCC
R_{free} test set	2666 reflections (5.10%)	wwPDB-VP
Wilson B-factor (Å ²)	32.1	Xtriage
Anisotropy	0.157	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 37.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.487 for k,h,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	7050	wwPDB-VP
Average B, all atoms (Å ²)	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.30% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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: CAC, AZN, CL, NA, EDO, DMS

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	H	0.54	0/992	0.80	1/1345 (0.1%)
1	I	0.93	4/749 (0.5%)	1.08	10/1008 (1.0%)
1	J	0.54	0/992	0.80	1/1345 (0.1%)
1	K	0.28	0/701	0.60	0/941
2	L	0.52	0/811	0.84	1/1109 (0.1%)
2	M	0.78	2/782 (0.3%)	0.84	1/1068 (0.1%)
2	N	0.53	0/811	0.84	1/1109 (0.1%)
2	O	0.86	2/801 (0.2%)	0.84	1/1094 (0.1%)
All	All	0.65	8/6639 (0.1%)	0.84	16/9019 (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	I	0	2

The worst 5 of 8 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	O	42	PRO	C-N	16.97	1.57	1.33
1	I	29	PHE	CA-C	-14.51	1.34	1.52
2	M	42	PRO	C-N	13.24	1.52	1.33
2	M	43	ASP	C-N	10.65	1.48	1.33
2	O	43	ASP	C-N	10.53	1.48	1.33

The worst 5 of 16 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	I	29	PHE	CB-CA-C	-9.97	95.61	110.96
1	I	30	THR	N-CA-C	-9.36	101.78	113.01
1	I	107	PHE	O-C-N	8.53	132.62	123.06
1	I	27	TYR	N-CA-C	7.54	119.59	108.14
1	I	28	THR	CA-C-N	7.36	130.36	120.65

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	I	24	ALA	Mainchain
1	I	29	PHE	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	H	964	0	924	38	0
1	I	728	0	688	67	0
1	J	964	0	924	37	0
1	K	683	0	649	57	0
2	L	795	0	777	19	0
2	M	767	0	751	33	0
2	N	795	0	777	19	0
2	O	786	0	768	35	0
3	H	5	0	0	0	0
3	J	5	0	0	0	0
4	H	28	0	42	27	0
4	J	28	0	42	27	0
4	L	20	0	30	13	0
4	N	20	0	30	13	0
5	H	4	0	6	1	0
5	J	4	0	6	1	0
6	H	22	0	5	3	0
6	I	22	0	5	2	0
6	J	22	0	5	3	0
6	K	22	0	5	7	0
7	H	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	I	1	0	0	0	0
7	J	1	0	0	0	0
7	L	1	0	0	0	0
7	M	1	0	0	0	0
7	N	1	0	0	0	0
8	J	1	0	0	0	0
8	L	3	0	0	0	0
8	M	1	0	0	0	0
8	N	2	0	0	0	0
8	O	1	0	0	0	0
9	H	69	0	0	4	1
9	I	5	0	0	0	0
9	J	67	0	0	4	1
9	K	5	0	0	0	0
9	L	67	0	0	2	0
9	M	34	0	0	1	1
9	N	69	0	0	2	0
9	O	36	0	0	1	1
All	All	7050	0	6434	313	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 24.

The worst 5 of 313 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:J:57:GLY:HA3	4:J:300:DMS:H13	1.27	1.12
1:H:57:GLY:HA3	4:H:300:DMS:H13	1.27	1.08
1:H:57:GLY:CA	4:H:300:DMS:H13	1.95	0.97
1:I:35:HIS:HD2	1:I:47:TRP:HE1	1.10	0.97
1:I:51:ILE:HG13	1:I:58:THR:HG22	1.44	0.97

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)
9:J:2048:HOH:O	9:M:2004:HOH:O[3_555]	2.00	0.20
9:H:2051:HOH:O	9:O:2004:HOH:O[4_466]	2.01	0.19

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	H	120/122 (98%)	117 (98%)	3 (2%)	0	100	100
1	I	78/122 (64%)	71 (91%)	6 (8%)	1 (1%)	9	5
1	J	120/122 (98%)	117 (98%)	3 (2%)	0	100	100
1	K	70/122 (57%)	63 (90%)	6 (9%)	1 (1%)	9	5
2	L	106/110 (96%)	99 (93%)	5 (5%)	2 (2%)	6	2
2	M	99/110 (90%)	89 (90%)	7 (7%)	3 (3%)	3	1
2	N	106/110 (96%)	99 (93%)	5 (5%)	2 (2%)	6	2
2	O	102/110 (93%)	92 (90%)	7 (7%)	3 (3%)	3	1
All	All	801/928 (86%)	747 (93%)	42 (5%)	12 (2%)	8	4

5 of 12 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	L	95	SER
2	M	43	ASP
2	M	95	SER
2	N	95	SER
2	O	43	ASP

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	H	101/101 (100%)	97 (96%)	4 (4%)	28	32

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	I	75/101 (74%)	60 (80%)	15 (20%)	1	0
1	J	101/101 (100%)	97 (96%)	4 (4%)	28	32
1	K	71/101 (70%)	56 (79%)	15 (21%)	1	0
2	L	85/87 (98%)	82 (96%)	3 (4%)	32	37
2	M	82/87 (94%)	77 (94%)	5 (6%)	17	15
2	N	85/87 (98%)	82 (96%)	3 (4%)	32	37
2	O	85/87 (98%)	80 (94%)	5 (6%)	18	16
All	All	685/752 (91%)	631 (92%)	54 (8%)	11	8

5 of 54 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	K	50	ARG
1	K	93	VAL
2	O	26	THR
1	K	63	LYS
1	K	77	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 16 such sidechains are listed below:

Mol	Chain	Res	Type
2	L	55	ASN
1	K	112	GLN
1	J	35	HIS
1	K	35	HIS
1	J	5	GLN

5.3.3 RNA ⓘ

There are no RNA molecules 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 [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 46 ligands modelled in this entry, 14 are monoatomic - leaving 32 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	$\# Z > 2$
4	DMS	L	303	-	3,3,3	0.36	0	3,3,3	0.35	0
4	DMS	J	302	-	3,3,3	0.33	0	3,3,3	0.35	0
6	AZN	I	500	-	24,24,24	1.85	7 (29%)	36,38,38	2.01	8 (22%)
4	DMS	L	302	-	3,3,3	0.34	0	3,3,3	0.34	0
4	DMS	H	300	-	3,3,3	0.59	0	3,3,3	0.39	0
4	DMS	H	304	-	3,3,3	0.35	0	3,3,3	0.36	0
6	AZN	K	500	-	24,24,24	1.86	7 (29%)	36,38,38	2.00	8 (22%)
4	DMS	J	305	-	3,3,3	0.35	0	3,3,3	0.35	0
4	DMS	H	302	-	3,3,3	0.32	0	3,3,3	0.35	0
3	CAC	J	201	9	2,4,4	2.54	1 (50%)	4,6,6	25.74	3 (75%)
4	DMS	H	306	-	3,3,3	0.36	0	3,3,3	0.35	0
6	AZN	J	500	-	24,24,24	1.82	5 (20%)	36,38,38	1.85	8 (22%)
4	DMS	L	300	-	3,3,3	0.36	0	3,3,3	0.32	0
4	DMS	N	303	-	3,3,3	0.37	0	3,3,3	0.35	0
4	DMS	J	301	-	3,3,3	0.37	0	3,3,3	0.34	0
4	DMS	N	304	-	3,3,3	0.35	0	3,3,3	0.32	0
4	DMS	J	300	-	3,3,3	0.59	0	3,3,3	0.39	0
4	DMS	L	304	-	3,3,3	0.35	0	3,3,3	0.33	0
4	DMS	N	301	-	3,3,3	0.34	0	3,3,3	0.35	0
5	EDO	J	401	-	3,3,3	0.57	0	2,2,2	0.61	0
4	DMS	N	300	-	3,3,3	0.36	0	3,3,3	0.32	0
5	EDO	H	401	-	3,3,3	0.57	0	2,2,2	0.62	0
4	DMS	J	304	-	3,3,3	0.35	0	3,3,3	0.36	0
4	DMS	L	301	-	3,3,3	0.35	0	3,3,3	0.35	0
4	DMS	J	306	-	3,3,3	0.35	0	3,3,3	0.35	0
4	DMS	J	303	-	3,3,3	0.35	0	3,3,3	0.35	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
6	AZN	H	500	-	24,24,24	1.82	5 (20%)	36,38,38	1.84	8 (22%)
4	DMS	H	301	-	3,3,3	0.36	0	3,3,3	0.34	0
4	DMS	H	303	-	3,3,3	0.36	0	3,3,3	0.35	0
4	DMS	N	302	-	3,3,3	0.34	0	3,3,3	0.35	0
3	CAC	H	201	9	2,4,4	2.52	1 (50%)	4,6,6	25.74	3 (75%)
4	DMS	H	305	-	3,3,3	0.35	0	3,3,3	0.36	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
6	AZN	K	500	-	-	3/6/22/22	0/3/3/3
6	AZN	H	500	-	-	4/6/22/22	0/3/3/3
5	EDO	J	401	-	-	0/1/1/1	-
6	AZN	J	500	-	-	4/6/22/22	0/3/3/3
6	AZN	I	500	-	-	3/6/22/22	0/3/3/3
5	EDO	H	401	-	-	0/1/1/1	-

The worst 5 of 26 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	J	500	AZN	C4-C2	5.91	1.50	1.41
6	H	500	AZN	C4-C2	5.88	1.50	1.41
6	K	500	AZN	C4-C2	4.97	1.48	1.41
6	I	500	AZN	C4-C2	4.92	1.48	1.41
6	I	500	AZN	C9-C13	-4.57	1.31	1.39

The worst 5 of 38 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	H	201	CAC	O1-AS-C2	-46.07	54.21	111.50
3	J	201	CAC	O1-AS-C2	-46.07	54.22	111.50
3	J	201	CAC	O1-AS-C1	22.73	139.76	111.50
3	H	201	CAC	O1-AS-C1	22.70	139.73	111.50
6	I	500	AZN	C10-C13-S1	-6.97	113.18	120.70

There are no chirality outliers.

5 of 14 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	I	500	AZN	C10-C13-S1-O6
6	K	500	AZN	C10-C13-S1-O6
6	H	500	AZN	C10-C13-S1-O4
6	I	500	AZN	C10-C13-S1-O5
6	J	500	AZN	C10-C13-S1-O4

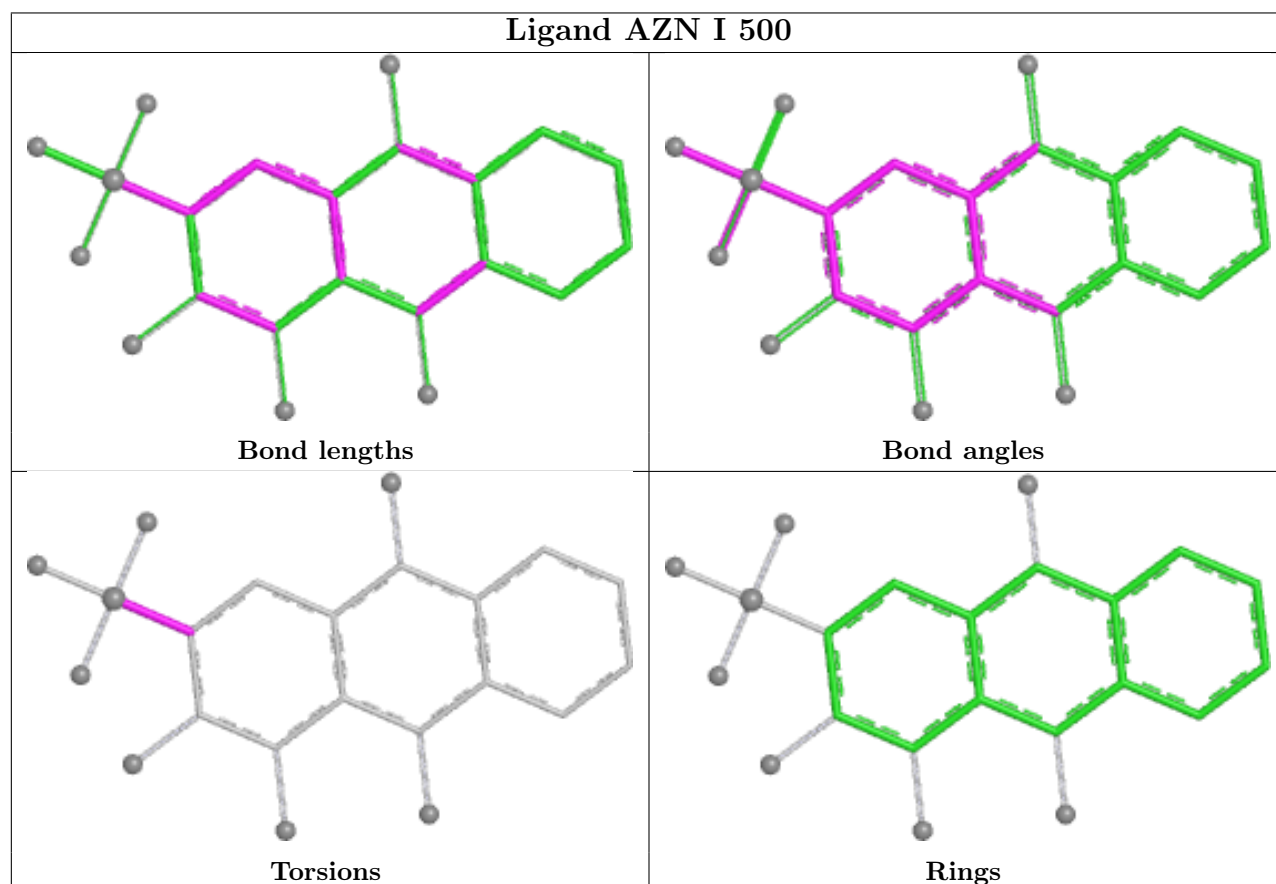
There are no ring outliers.

26 monomers are involved in 95 short contacts:

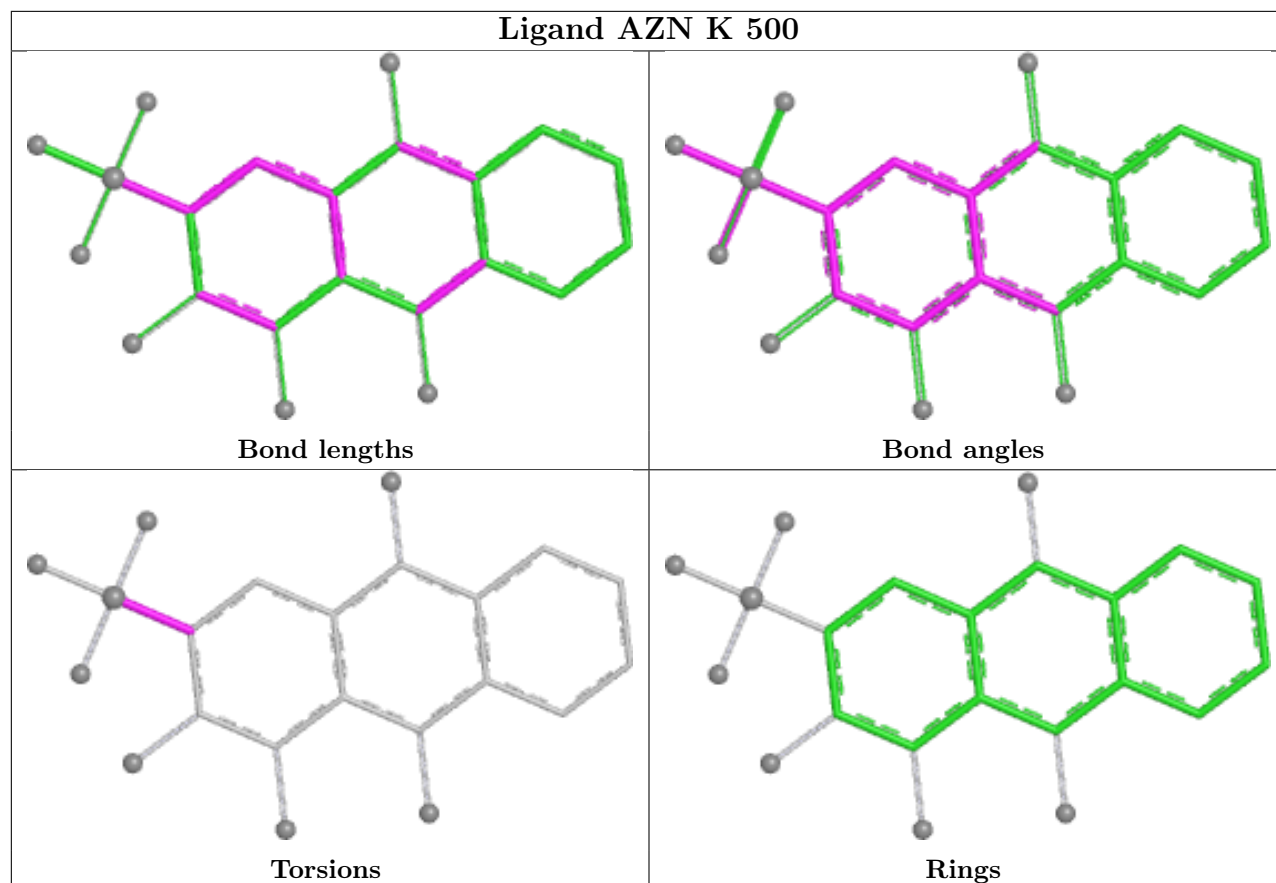
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	L	303	DMS	5	0
4	J	302	DMS	5	0
6	I	500	AZN	2	0
4	H	300	DMS	15	0
4	H	304	DMS	4	0
6	K	500	AZN	7	0
4	J	305	DMS	1	0
4	H	302	DMS	5	0
6	J	500	AZN	3	0
4	L	300	DMS	5	0
4	N	303	DMS	5	0
4	J	301	DMS	3	0
4	N	304	DMS	5	0
4	J	300	DMS	15	0
4	L	304	DMS	5	0
4	N	301	DMS	1	0
5	J	401	EDO	1	0
4	N	300	DMS	5	0
5	H	401	EDO	1	0
4	J	304	DMS	4	0
4	L	301	DMS	1	0
4	J	303	DMS	1	0
6	H	500	AZN	3	0
4	H	301	DMS	3	0
4	H	303	DMS	1	0
4	H	305	DMS	1	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 than 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

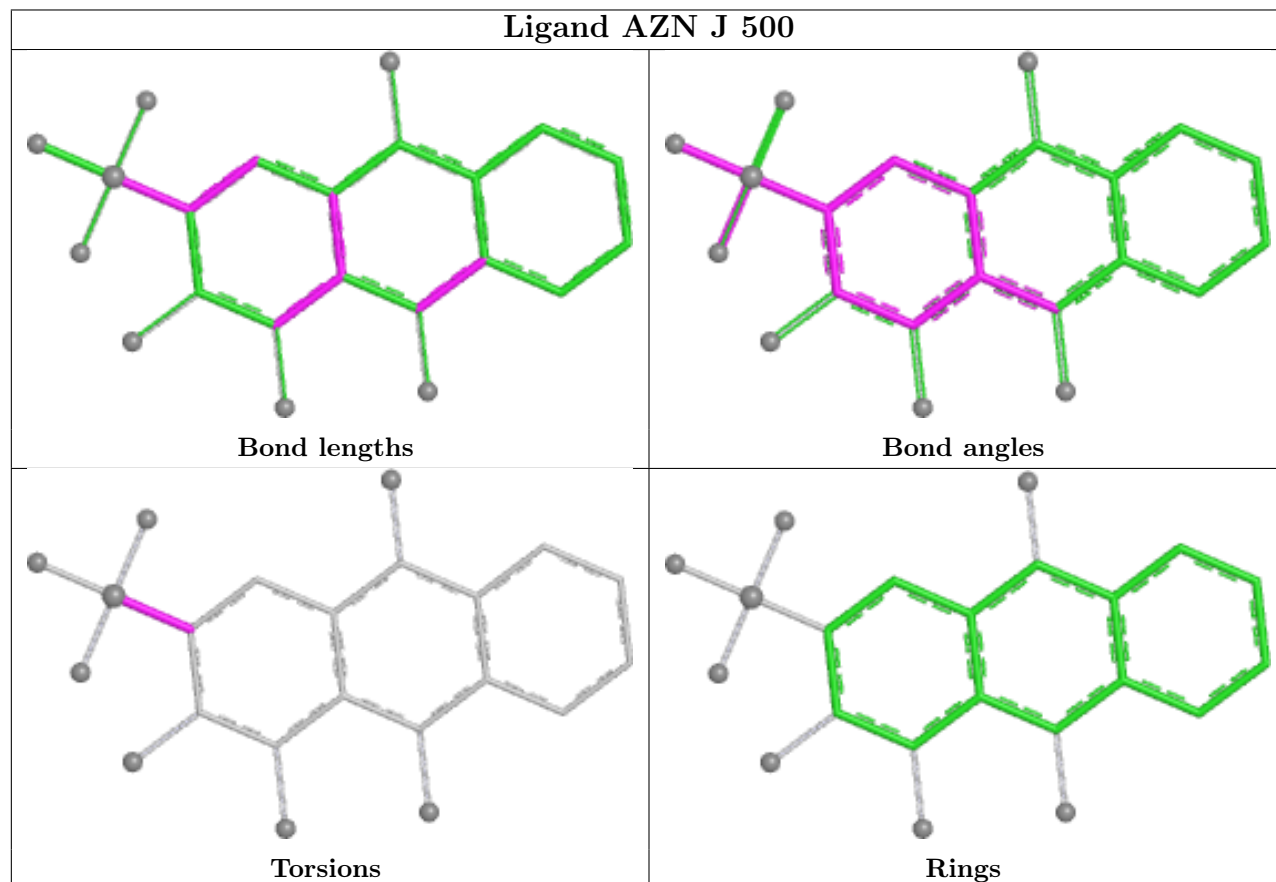
highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified 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.

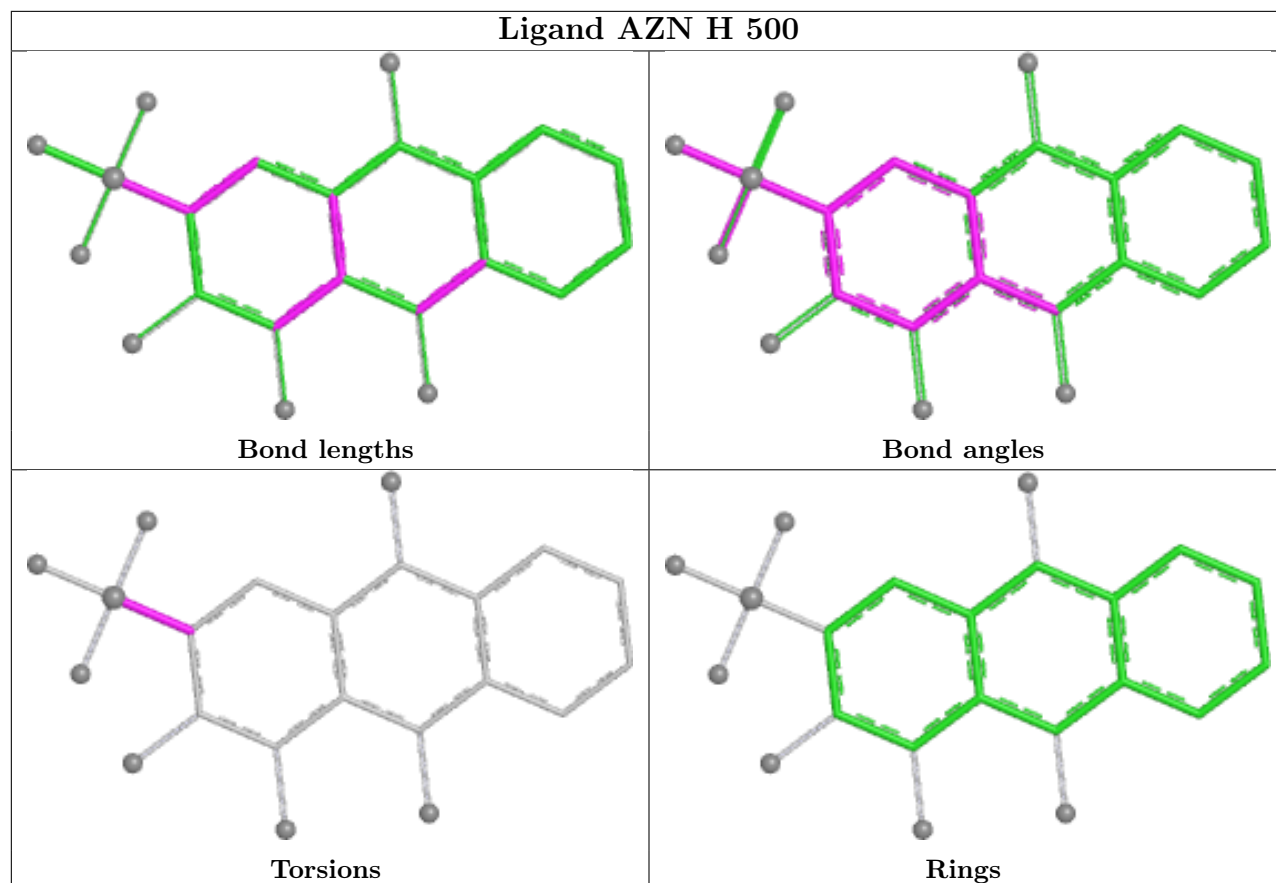


Ligand AZN K 500



Ligand AZN J 500





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

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

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

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	H	122/122 (100%)	-1.37	0 100 100	18, 27, 42, 51	0
1	I	88/122 (72%)	-0.57	0 100 100	27, 81, 93, 100	0
1	J	122/122 (100%)	-1.35	0 100 100	18, 27, 42, 52	0
1	K	82/122 (67%)	-0.60	0 100 100	64, 82, 94, 99	0
2	L	108/110 (98%)	-1.42	0 100 100	18, 24, 34, 37	0
2	M	103/110 (93%)	-1.01	0 100 100	18, 45, 61, 70	0
2	N	108/110 (98%)	-1.42	0 100 100	17, 24, 34, 37	0
2	O	106/110 (96%)	-0.99	0 100 100	18, 46, 62, 71	0
All	All	839/928 (90%)	-1.13	0 100 100	17, 33, 87, 100	0

There are no RSRZ outliers to report.

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 oligosaccharides 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, 95th percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q< 0.9’ lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	DMS	H	306	4/4	0.93	0.12	99,99,99,99	0
4	DMS	J	306	4/4	0.93	0.11	99,99,99,99	0
4	DMS	H	304	4/4	0.96	0.14	99,99,99,99	0
4	DMS	L	300	4/4	0.96	0.11	93,93,93,93	0
4	DMS	H	305	4/4	0.97	0.07	99,99,99,99	0
3	CAC	J	201	5/5	0.97	0.08	90,90,90,90	0
4	DMS	J	301	4/4	0.97	0.10	69,69,69,69	0
4	DMS	J	303	4/4	0.97	0.09	76,76,76,76	0
4	DMS	J	304	4/4	0.97	0.10	99,99,99,99	0
4	DMS	J	305	4/4	0.97	0.09	99,99,99,99	0
4	DMS	H	301	4/4	0.97	0.10	68,68,69,69	0
3	CAC	H	201	5/5	0.97	0.08	90,90,90,90	0
4	DMS	L	302	4/4	0.97	0.12	83,83,83,83	0
4	DMS	L	304	4/4	0.97	0.11	94,94,94,94	0
5	EDO	H	401	4/4	0.97	0.08	58,58,58,58	0
5	EDO	J	401	4/4	0.97	0.07	58,58,58,58	0
6	AZN	I	500	22/22	0.97	0.06	79,79,79,79	0
7	NA	I	903	1/1	0.97	0.13	127,127,127,127	0
8	CL	L	912	1/1	0.97	0.07	68,68,68,68	0
4	DMS	N	300	4/4	0.98	0.10	93,93,93,93	0
4	DMS	N	302	4/4	0.98	0.07	83,83,83,83	0
4	DMS	N	303	4/4	0.98	0.08	58,58,58,58	0
4	DMS	N	304	4/4	0.98	0.12	94,94,94,94	0
4	DMS	H	303	4/4	0.98	0.08	76,76,76,76	0
4	DMS	L	301	4/4	0.98	0.06	66,66,66,66	0
4	DMS	J	302	4/4	0.98	0.09	63,63,63,63	0
6	AZN	K	500	22/22	0.98	0.06	80,80,80,80	0
7	NA	H	903	1/1	0.98	0.11	39,39,39,39	0
4	DMS	L	303	4/4	0.98	0.06	58,58,58,58	0
7	NA	J	903	1/1	0.98	0.09	39,39,39,39	0
7	NA	L	901	1/1	0.98	0.07	71,71,71,71	0
4	DMS	H	302	4/4	0.98	0.10	63,63,63,63	0
8	CL	N	913	1/1	0.98	0.08	65,65,65,65	0
8	CL	O	913	1/1	0.98	0.04	50,50,50,50	0
4	DMS	N	301	4/4	0.99	0.06	66,66,66,66	0
6	AZN	J	500	22/22	0.99	0.03	31,34,37,37	0
7	NA	M	903	1/1	0.99	0.06	49,49,49,49	0
7	NA	N	901	1/1	0.99	0.05	71,71,71,71	0
8	CL	J	912	1/1	0.99	0.08	68,68,68,68	0
8	CL	L	911	1/1	0.99	0.13	39,39,39,39	0
4	DMS	H	300	4/4	0.99	0.12	56,56,56,56	0
8	CL	L	913	1/1	0.99	0.05	65,65,65,65	0
8	CL	M	913	1/1	0.99	0.04	49,49,49,49	0

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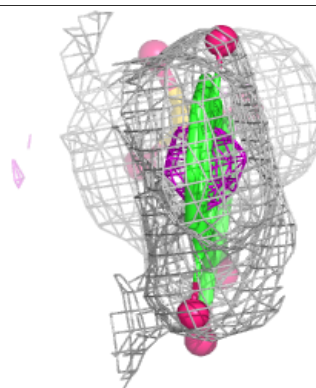
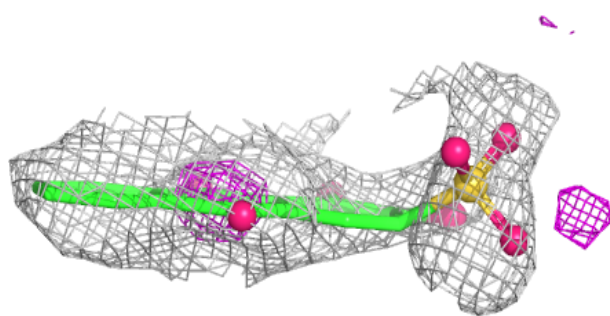
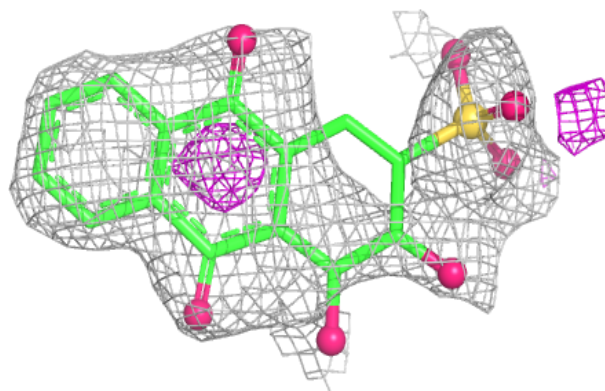
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	DMS	J	300	4/4	0.99	0.06	56,56,56,56	0
6	AZN	H	500	22/22	0.99	0.03	31,34,37,37	0
8	CL	N	911	1/1	1.00	0.02	39,39,39,39	0

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.

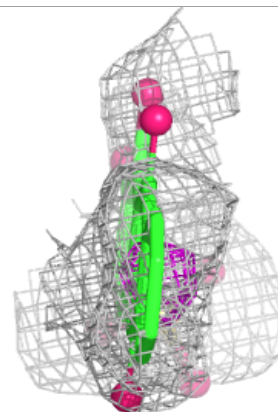
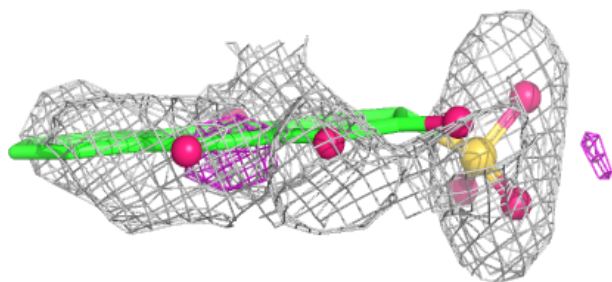
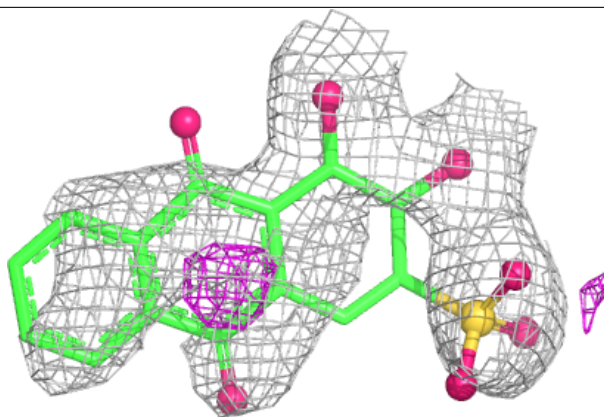
Electron density around AZN I 500:

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

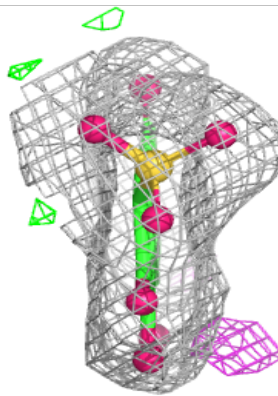
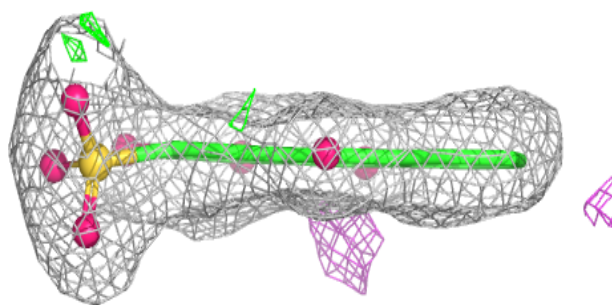
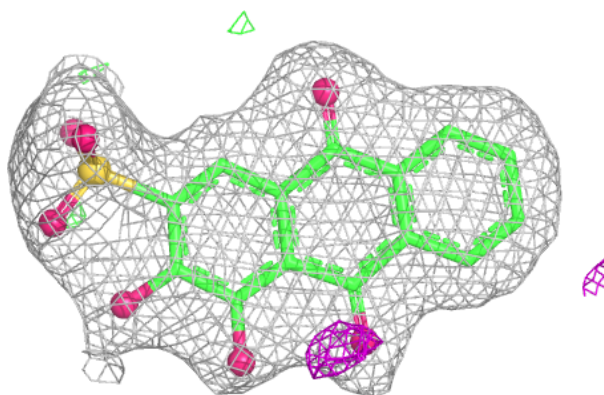


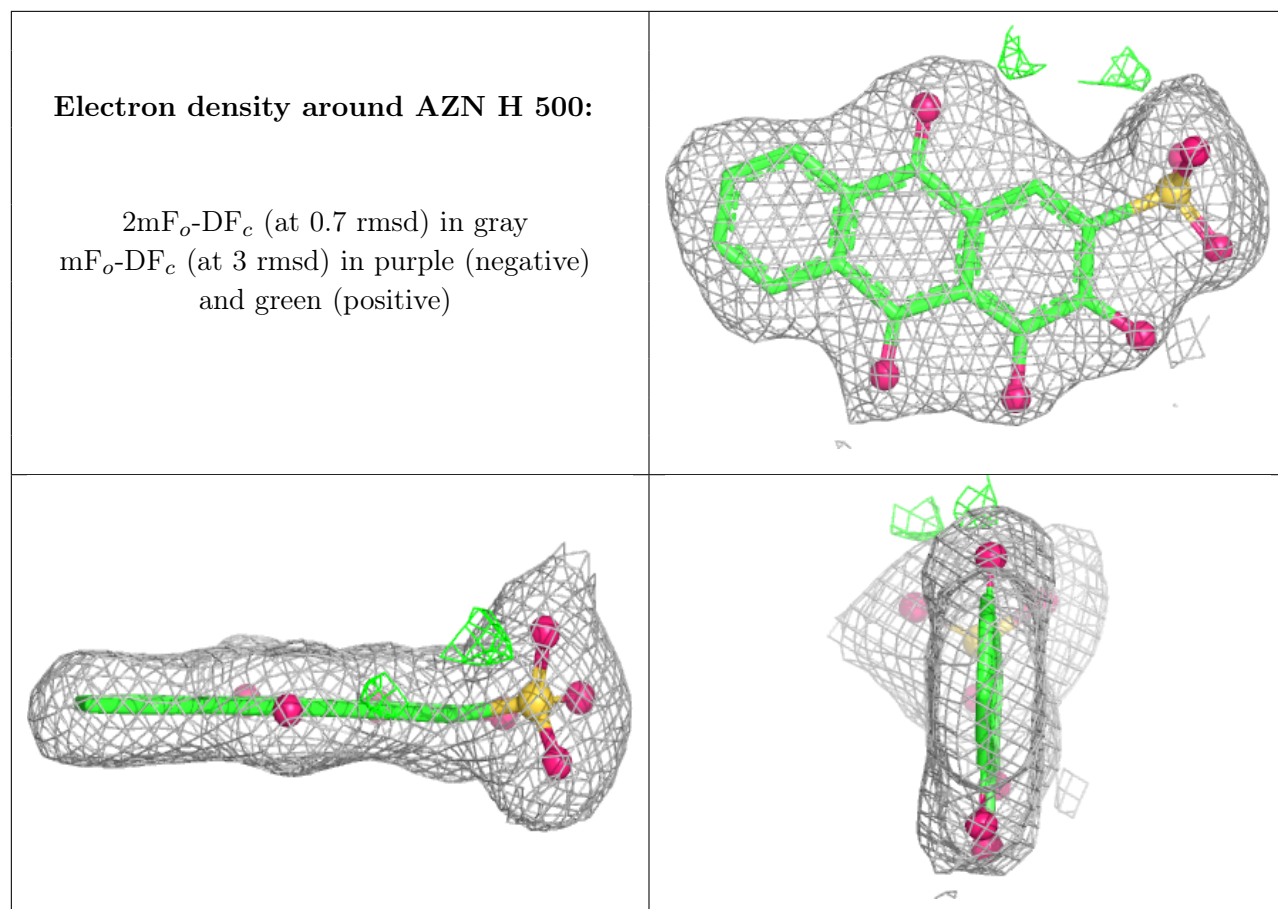
Electron density around AZN K 500:

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

**Electron density around AZN J 500:**

$2mF_o-DF_c$ (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.