Full wwPDB X-ray Structure Validation Report ⓘ

Nov 16, 2023 – 02:27 AM JST

PDB ID	:	6KI1
Title	:	The transmembrane domain of a cyanobacterium bicarbonate transporter BicA
Authors	:	Zhang, P.; Wang, C.C.
Deposited on	:	2019-07-17
Resolution	:	2.81 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:

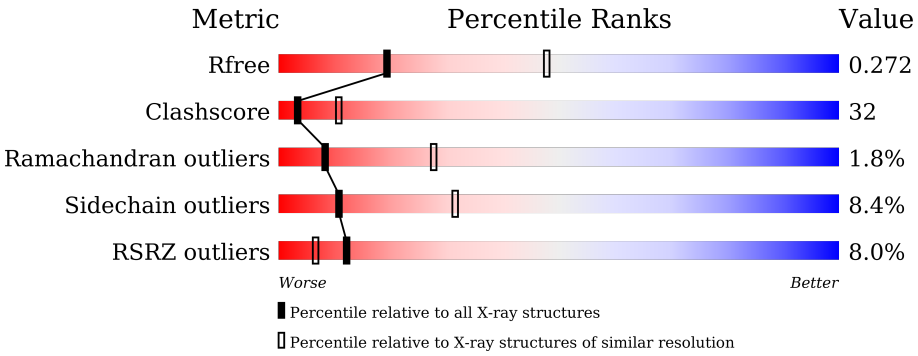
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.81 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	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

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	392	8% 51% 39% 6%
1	B	392	8% 55% 34% 7%

2 Entry composition

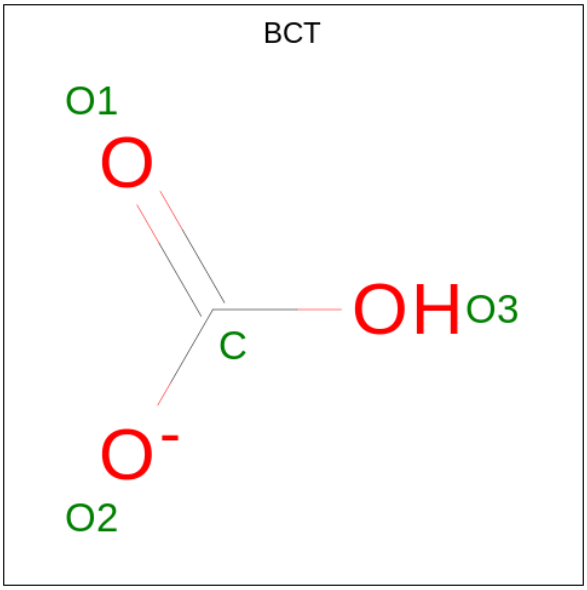
There are 4 unique types of molecules in this entry. The entry contains 5666 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Low affinity sulfate transporter.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	385	Total	C	N	O	S	0	0	0
			2768	1815	450	486	17			
1	B	392	Total	C	N	O	S	0	0	0
			2838	1859	469	493	17			

- Molecule 2 is BICARBONATE ION (three-letter code: BCT) (formula: CHO_3) (labeled as "Ligand of Interest" by depositor).

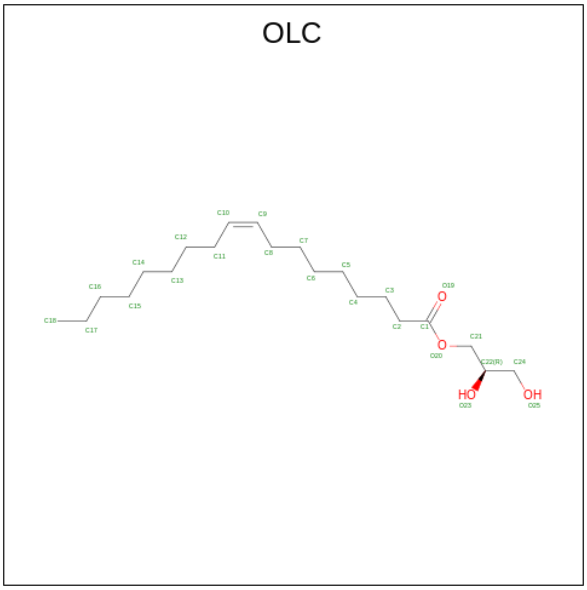


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	O		0	0
			4	1	3			
2	B	1	Total	C	O		0	0
			4	1	3			

- Molecule 3 is SODIUM ION (three-letter code: NA) (formula: Na) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Na 1 1	0	0
3	B	1	Total Na 1 1	0	0

- Molecule 4 is (2R)-2,3-dihydroxypropyl (9Z)-octadec-9-enoate (three-letter code: OLC) (formula: $C_{21}H_{40}O_4$).



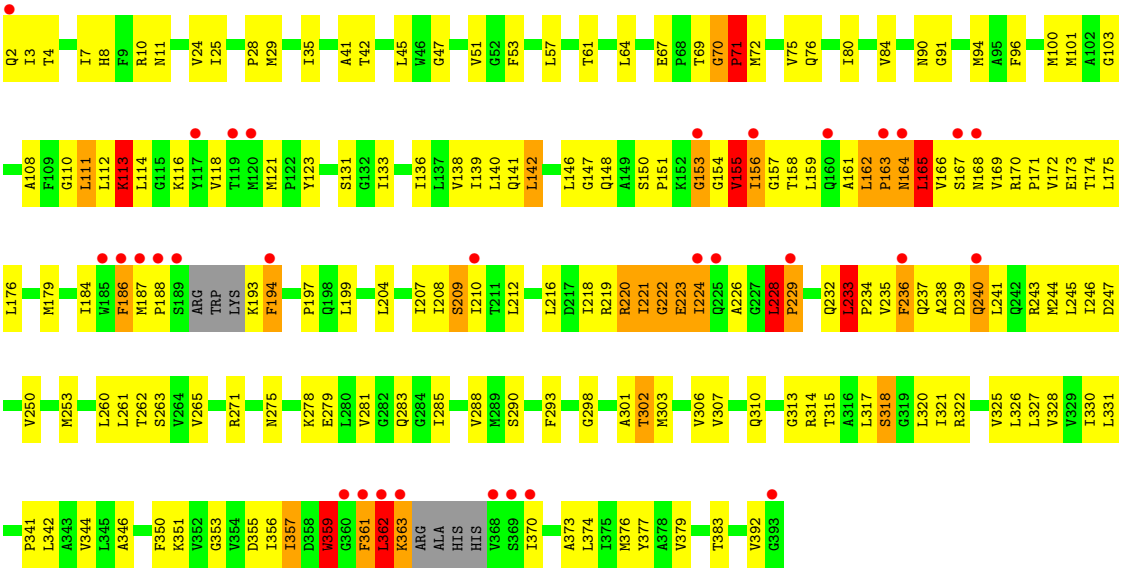
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 25 21 4	0	0
4	B	1	Total C O 25 21 4	0	0

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.

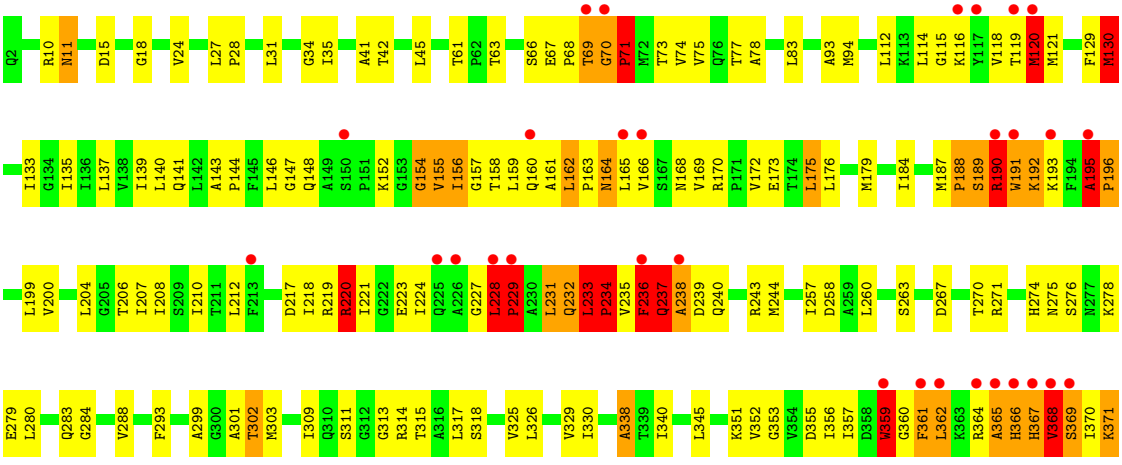
• Molecule 1: Low affinity sulfate transporter

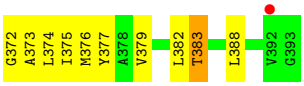
Chain A:



• Molecule 1: Low affinity sulfate transporter

Chain B:




G372
A373
L374
I375
M376
Y377
A378
V379
L382
T383
L388
V392
G393

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	51.81Å 103.35Å 81.52Å 90.00° 95.40° 90.00°	Depositor
Resolution (Å)	29.28 – 2.81 29.28 – 2.81	Depositor EDS
% Data completeness (in resolution range)	98.6 (29.28-2.81) 80.4 (29.28-2.81)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.27 (at 2.80Å)	Xtriage
Refinement program	PHENIX 1.9_1692	Depositor
R, R_{free}	0.227 , 0.273 0.236 , 0.272	Depositor DCC
R_{free} test set	888 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	42.7	Xtriage
Anisotropy	0.056	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 63.6	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	0.88	EDS
Total number of atoms	5666	wwPDB-VP
Average B, all atoms (Å^2)	50.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 23.99 % 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 4.1837e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: OLC, BCT, NA

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	0.69	0/2810	1.12	27/3824 (0.7%)
1	B	0.74	3/2886 (0.1%)	1.26	35/3929 (0.9%)
All	All	0.72	3/5696 (0.1%)	1.19	62/7753 (0.8%)

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	8
1	B	0	8
All	All	0	16

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	196	PRO	N-CD	11.66	1.64	1.47
1	B	188	PRO	N-CD	5.17	1.55	1.47
1	B	71	PRO	N-CD	5.05	1.54	1.47

All (62) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	359	TRP	CB-CA-C	-20.34	69.72	110.40
1	A	359	TRP	C-N-CA	19.36	162.95	122.30
1	A	359	TRP	CB-CA-C	-18.54	73.31	110.40
1	B	338	ALA	CB-CA-C	-17.59	83.71	110.10
1	B	195	ALA	CB-CA-C	-17.18	84.32	110.10
1	B	238	ALA	CB-CA-C	-15.10	87.44	110.10

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	186	PHE	CB-CA-C	-14.43	81.54	110.40
1	B	236	PHE	CB-CA-C	-14.31	81.78	110.40
1	B	195	ALA	N-CA-C	14.19	149.32	111.00
1	A	155	VAL	CB-CA-C	-13.36	86.02	111.40
1	A	359	TRP	N-CA-C	12.82	145.60	111.00
1	B	232	GLN	N-CA-C	-12.50	77.25	111.00
1	B	236	PHE	N-CA-C	12.47	144.68	111.00
1	B	195	ALA	C-N-CD	-11.55	95.19	120.60
1	B	302	THR	CB-CA-C	-9.63	85.59	111.60
1	A	187	MET	N-CA-CB	-9.19	94.05	110.60
1	B	237	GLN	N-CA-C	-9.17	86.24	111.00
1	A	156	ILE	N-CA-C	-8.99	86.71	111.00
1	B	229	PRO	CB-CA-C	8.84	134.10	112.00
1	B	120	MET	N-CA-C	-8.72	87.47	111.00
1	B	195	ALA	C-N-CA	8.66	158.38	122.00
1	B	238	ALA	C-N-CA	8.40	142.69	121.70
1	A	236	PHE	N-CA-C	8.07	132.79	111.00
1	B	120	MET	C-N-CA	8.02	141.76	121.70
1	A	70	GLY	C-N-CD	-7.99	103.02	120.60
1	A	186	PHE	N-CA-C	7.72	131.86	111.00
1	A	302	THR	CB-CA-C	-7.56	91.20	111.60
1	A	342	LEU	CA-CB-CG	7.48	132.51	115.30
1	B	359	TRP	C-N-CA	7.47	137.99	122.30
1	B	196	PRO	N-CA-CB	7.39	112.17	103.30
1	A	113	LYS	CB-CA-C	-7.34	95.71	110.40
1	A	237	GLN	N-CA-CB	7.33	123.80	110.60
1	B	162	LEU	CA-CB-CG	7.29	132.06	115.30
1	A	303	MET	N-CA-C	-7.08	91.88	111.00
1	B	303	MET	N-CA-C	-6.98	92.15	111.00
1	B	237	GLN	N-CA-CB	-6.97	98.06	110.60
1	B	229	PRO	N-CA-C	-6.95	94.03	112.10
1	B	196	PRO	CA-N-CD	-6.68	102.15	111.50
1	A	228	LEU	C-N-CD	6.49	142.04	128.40
1	B	130	MET	CG-SD-CE	-6.49	89.82	100.20
1	A	156	ILE	N-CA-CB	6.22	125.11	110.80
1	A	222	GLY	N-CA-C	-6.21	97.56	113.10
1	A	162	LEU	CA-CB-CG	5.92	128.92	115.30
1	B	233	LEU	C-N-CD	5.90	140.79	128.40
1	B	233	LEU	CB-CG-CD2	-5.78	101.17	111.00
1	A	165	LEU	CA-CB-CG	5.76	128.54	115.30
1	B	187	MET	C-N-CD	5.71	140.38	128.40
1	B	189	SER	CB-CA-C	-5.70	99.26	110.10

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	70	GLY	N-CA-C	5.69	127.32	113.10
1	A	229	PRO	CA-N-CD	-5.69	103.54	111.50
1	B	220	ARG	N-CA-C	-5.67	95.68	111.00
1	B	228	LEU	CB-CA-C	-5.66	99.44	110.20
1	B	362	LEU	CB-CA-C	-5.61	99.53	110.20
1	A	71	PRO	CB-CA-C	-5.52	98.21	112.00
1	B	61	THR	C-N-CD	5.50	139.96	128.40
1	A	239	ASP	N-CA-C	-5.48	96.21	111.00
1	A	233	LEU	CB-CA-C	5.29	120.25	110.20
1	A	142	LEU	CA-CB-CG	5.25	127.37	115.30
1	B	190	ARG	CB-CA-C	5.17	120.75	110.40
1	B	302	THR	N-CA-C	5.09	124.73	111.00
1	A	342	LEU	CB-CG-CD2	5.08	119.63	111.00
1	B	368	VAL	N-CA-C	-5.04	97.40	111.00

There are no chirality outliers.

All (16) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	153	GLY	Peptide
1	A	164	ASN	Peptide
1	A	193	LYS	Peptide
1	A	194	PHE	Peptide
1	A	209	SER	Peptide
1	A	233	LEU	Peptide
1	A	359	TRP	Peptide
1	A	70	GLY	Peptide
1	B	120	MET	Peptide
1	B	195	ALA	Peptide
1	B	229	PRO	Peptide
1	B	234	PRO	Peptide
1	B	238	ALA	Peptide
1	B	338	ALA	Peptide
1	B	359	TRP	Peptide
1	B	70	GLY	Peptide

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	2768	0	2960	181	3
1	B	2838	0	3030	202	4
2	A	4	0	0	1	0
2	B	4	0	0	1	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	25	0	40	2	0
4	B	25	0	40	7	0
All	All	5666	0	6070	381	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 32.

All (381) 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:B:69:THR:CG2	1:B:71:PRO:HD2	1.59	1.30
1:B:156:ILE:CD1	1:B:388:LEU:HG	1.67	1.23
1:B:69:THR:HG22	1:B:71:PRO:HD2	1.17	1.15
1:B:190:ARG:O	1:B:193:LYS:HG3	1.47	1.14
1:A:10:ARG:HD3	1:A:11:ASN:H	1.06	1.12
1:B:366:HIS:O	1:B:367:HIS:ND1	1.83	1.11
1:A:226:ALA:HA	1:A:331:LEU:HD23	1.32	1.10
1:B:302:THR:O	1:B:302:THR:HG22	1.34	1.10
1:B:130:MET:CE	4:B:403:OLC:H2	1.81	1.09
1:B:229:PRO:HB2	1:B:231:LEU:CD2	1.82	1.08
1:A:302:THR:HG22	1:A:302:THR:O	1.44	1.07
1:A:238:ALA:HB1	1:A:240:GLN:HB3	1.32	1.07
1:A:362:LEU:HD22	1:A:363:LYS:HD2	1.37	1.06
1:A:362:LEU:HD13	1:A:363:LYS:H	1.17	1.06
1:A:155:VAL:O	1:A:155:VAL:HG12	1.31	1.05
1:B:360:GLY:O	1:B:364:ARG:HB3	1.55	1.05
1:B:155:VAL:HG13	1:B:156:ILE:H	1.21	1.02
1:B:364:ARG:HG2	1:B:365:ALA:H	1.21	1.02
1:A:221:ILE:HG22	1:A:222:GLY:H	1.24	1.00
1:B:229:PRO:HB2	1:B:231:LEU:HD21	1.41	0.99
1:B:156:ILE:HD11	1:B:388:LEU:HG	1.00	0.98
1:B:156:ILE:HD11	1:B:388:LEU:CG	1.93	0.98
1:B:179:MET:HE1	1:B:208:ILE:HG21	1.46	0.96
1:A:155:VAL:O	1:A:155:VAL:CG1	2.08	0.96

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:69:THR:HG22	1:B:71:PRO:CD	1.95	0.96
1:A:228:LEU:HD12	1:A:228:LEU:H	1.30	0.95
1:B:315:THR:HG22	1:B:317:LEU:H	1.29	0.95
1:B:155:VAL:HG13	1:B:156:ILE:N	1.79	0.95
1:B:239:ASP:OD1	1:B:240:GLN:N	1.98	0.94
1:A:186:PHE:O	1:A:188:PRO:HD3	1.68	0.93
1:A:315:THR:HG22	1:A:317:LEU:H	1.34	0.92
1:B:155:VAL:CG1	1:B:156:ILE:H	1.83	0.90
1:A:35:ILE:HD11	1:A:220:ARG:HD3	1.52	0.90
1:B:93:ALA:HB1	1:B:234:PRO:HG2	1.53	0.90
1:A:302:THR:O	1:A:302:THR:CG2	2.18	0.89
1:A:238:ALA:CB	1:A:240:GLN:HB3	2.02	0.89
1:A:238:ALA:HB1	1:A:240:GLN:CB	2.03	0.89
1:A:170:ARG:NH1	1:A:216:LEU:O	2.05	0.89
1:B:146:LEU:HB3	1:B:169:VAL:HG12	1.55	0.88
1:B:302:THR:O	1:B:302:THR:CG2	2.10	0.87
1:A:238:ALA:HB1	1:A:240:GLN:H	1.37	0.87
1:A:153:GLY:HA3	1:A:157:GLY:H	1.38	0.86
1:B:130:MET:HE3	4:B:403:OLC:H2	1.58	0.85
1:B:231:LEU:C	1:B:232:GLN:O	1.96	0.85
1:B:130:MET:HE1	4:B:403:OLC:H2	1.56	0.85
1:A:10:ARG:HD3	1:A:11:ASN:N	1.90	0.84
1:A:228:LEU:HD22	1:A:293:PHE:HB3	1.59	0.84
1:A:362:LEU:CD2	1:A:363:LYS:HD2	2.07	0.84
1:B:364:ARG:CG	1:B:365:ALA:H	1.89	0.84
1:B:368:VAL:O	1:B:369:SER:C	2.11	0.84
1:B:233:LEU:O	1:B:235:VAL:N	2.12	0.82
1:A:362:LEU:HD13	1:A:363:LYS:N	1.94	0.81
1:B:93:ALA:HB1	1:B:234:PRO:CG	2.10	0.81
1:A:10:ARG:CD	1:A:11:ASN:H	1.91	0.81
1:A:226:ALA:HA	1:A:331:LEU:CD2	2.10	0.81
1:B:220:ARG:HH21	1:B:345:LEU:HD11	1.46	0.80
1:A:362:LEU:CD1	1:A:363:LYS:H	1.94	0.79
1:B:364:ARG:O	1:B:365:ALA:C	2.16	0.79
1:A:370:ILE:HD12	1:A:370:ILE:H	1.46	0.78
1:A:238:ALA:HB1	1:A:240:GLN:N	1.98	0.77
1:A:232:GLN:HG3	1:A:233:LEU:HG	1.64	0.77
1:B:220:ARG:HB3	1:B:220:ARG:NH1	2.01	0.76
1:B:232:GLN:CA	1:B:233:LEU:HD23	2.16	0.76
1:B:155:VAL:HG13	1:B:156:ILE:HG12	1.68	0.75
1:A:238:ALA:CB	1:A:240:GLN:CB	2.63	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:232:GLN:C	1:B:233:LEU:HD23	2.07	0.74
1:B:157:GLY:HA2	1:B:160:GLN:OE1	1.88	0.74
1:B:223:GLU:N	1:B:223:GLU:OE1	2.21	0.74
1:A:219:ARG:HA	1:A:341:PRO:HA	1.70	0.74
1:A:221:ILE:HG22	1:A:222:GLY:N	2.03	0.74
1:A:3:ILE:HD11	1:B:188:PRO:HD3	1.69	0.73
1:B:233:LEU:HD23	1:B:233:LEU:N	2.02	0.73
1:B:188:PRO:HG2	1:B:191:TRP:HB2	1.69	0.73
1:B:220:ARG:NH2	1:B:345:LEU:HD11	2.04	0.73
1:B:220:ARG:HB3	1:B:220:ARG:CZ	2.19	0.73
1:A:301:ALA:O	2:A:401:BCT:O1	2.07	0.73
1:A:153:GLY:HA3	1:A:157:GLY:N	2.03	0.72
1:B:360:GLY:O	1:B:364:ARG:CB	2.37	0.72
1:B:69:THR:HG23	1:B:69:THR:O	1.89	0.72
1:A:148:GLN:NE2	1:A:168:ASN:O	2.22	0.72
1:B:155:VAL:HG11	1:B:388:LEU:HD12	1.70	0.72
1:A:90:ASN:HB2	1:A:94:MET:HE3	1.70	0.72
1:A:161:ALA:O	1:A:165:LEU:HB2	1.90	0.72
1:A:94:MET:SD	1:A:240:GLN:OE1	2.48	0.71
1:A:228:LEU:HD12	1:A:228:LEU:N	2.04	0.71
1:B:228:LEU:O	1:B:228:LEU:HG	1.88	0.71
1:A:24:VAL:HB	1:A:199:LEU:HD22	1.72	0.71
1:B:229:PRO:O	1:B:293:PHE:HD1	1.73	0.71
1:B:190:ARG:O	1:B:193:LYS:CG	2.35	0.71
1:A:370:ILE:HD12	1:A:370:ILE:N	2.05	0.71
1:B:229:PRO:O	1:B:293:PHE:CD1	2.43	0.71
1:B:371:LYS:O	1:B:375:ILE:HG13	1.90	0.71
1:B:147:GLY:HA3	1:B:170:ARG:HG3	1.73	0.70
1:B:366:HIS:O	1:B:367:HIS:CG	2.45	0.69
1:A:232:GLN:HG3	1:A:233:LEU:H	1.58	0.68
1:A:373:ALA:O	1:A:377:TYR:HD2	1.77	0.68
1:B:159:LEU:HD23	1:B:162:LEU:HD11	1.75	0.67
1:B:155:VAL:H	1:B:158:THR:HG23	1.58	0.67
1:B:364:ARG:HG2	1:B:365:ALA:N	2.04	0.67
1:B:189:SER:HA	1:B:192:LYS:HE2	1.77	0.67
1:A:118:VAL:CG2	1:A:260:LEU:HD12	2.24	0.67
1:B:173:GLU:OE1	1:B:218:ILE:HG13	1.95	0.66
1:B:69:THR:HG21	1:B:71:PRO:HD2	1.74	0.66
1:B:313:GLY:O	1:B:314:ARG:NH1	2.29	0.66
1:B:45:LEU:HD12	1:B:330:ILE:HD11	1.78	0.66
1:B:364:ARG:O	1:B:365:ALA:O	2.15	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:357:ILE:O	1:A:359:TRP:CD1	2.49	0.65
1:A:136:ILE:O	1:A:140:LEU:HG	1.97	0.64
1:A:260:LEU:HA	1:A:263:SER:OG	1.97	0.64
1:B:188:PRO:HG2	1:B:191:TRP:CB	2.27	0.64
1:A:69:THR:HG23	1:A:71:PRO:HD2	1.81	0.63
1:B:221:ILE:HG12	1:B:221:ILE:O	1.98	0.63
1:A:207:ILE:O	1:A:210:ILE:HG12	1.99	0.62
1:B:93:ALA:CB	1:B:234:PRO:HG2	2.27	0.62
1:A:357:ILE:O	1:A:359:TRP:NE1	2.32	0.62
1:B:69:THR:CG2	1:B:69:THR:O	2.44	0.62
1:B:24:VAL:HG13	1:B:199:LEU:HD22	1.81	0.62
1:B:69:THR:CG2	1:B:71:PRO:CD	2.54	0.62
1:B:239:ASP:O	1:B:240:GLN:HB2	2.00	0.61
1:A:235:VAL:HG12	1:A:241:LEU:HD12	1.82	0.61
1:A:341:PRO:HG2	1:A:344:VAL:HG23	1.81	0.61
1:B:217:ASP:OD2	1:B:219:ARG:NH2	2.33	0.61
1:B:229:PRO:HB2	1:B:231:LEU:HD23	1.79	0.61
1:A:112:LEU:O	1:A:113:LYS:HG3	2.00	0.61
1:B:170:ARG:HB2	1:B:173:GLU:HG3	1.83	0.60
1:A:370:ILE:H	1:A:370:ILE:CD1	2.13	0.60
1:B:364:ARG:CG	1:B:365:ALA:N	2.57	0.60
1:A:45:LEU:HD13	1:A:330:ILE:HD12	1.82	0.60
1:A:226:ALA:CA	1:A:331:LEU:HD23	2.21	0.60
1:B:382:LEU:HD21	4:B:403:OLC:H17	1.84	0.60
1:A:90:ASN:HB2	1:A:94:MET:CE	2.31	0.60
1:B:70:GLY:O	1:B:133:ILE:HG21	2.02	0.59
1:B:362:LEU:HD23	1:B:376:MET:CE	2.31	0.59
1:A:362:LEU:O	1:A:363:LYS:HB3	2.01	0.59
1:B:220:ARG:CG	1:B:220:ARG:HH11	2.14	0.59
1:B:368:VAL:O	1:B:370:ILE:N	2.35	0.59
1:A:222:GLY:C	1:A:223:GLU:HG3	2.23	0.58
1:A:2:GLN:HG2	1:A:3:ILE:H	1.67	0.58
1:B:154:GLY:O	1:B:155:VAL:HG12	2.02	0.58
1:B:373:ALA:O	1:B:377:TYR:HD2	1.87	0.58
1:A:240:GLN:NE2	1:A:244:MET:SD	2.76	0.58
1:B:240:GLN:O	1:B:244:MET:HG3	2.03	0.58
1:B:69:THR:HG21	1:B:258:ASP:OD2	2.04	0.57
1:B:229:PRO:CB	1:B:231:LEU:HD21	2.26	0.57
1:B:366:HIS:N	1:B:366:HIS:CD2	2.72	0.57
1:A:35:ILE:CD1	1:A:220:ARG:HD3	2.31	0.57
1:B:366:HIS:C	1:B:367:HIS:CG	2.77	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:238:ALA:HB3	1:A:241:LEU:N	2.20	0.57
1:B:120:MET:O	1:B:120:MET:HG3	2.02	0.57
1:A:246:ILE:O	1:A:250:VAL:HG23	2.03	0.57
1:A:147:GLY:HA3	1:A:170:ARG:HB2	1.86	0.57
1:A:353:GLY:O	1:A:356:ILE:HG12	2.05	0.56
1:B:42:THR:OG1	1:B:223:GLU:HB3	2.04	0.56
1:A:67:GLU:OE1	1:A:322:ARG:NH2	2.38	0.56
1:B:220:ARG:HH11	1:B:220:ARG:HG2	1.70	0.56
1:B:220:ARG:HH22	1:B:340:ILE:HB	1.70	0.56
1:A:238:ALA:CB	1:A:240:GLN:N	2.69	0.56
1:B:175:LEU:O	1:B:179:MET:HG3	2.06	0.56
1:B:190:ARG:NH1	1:B:190:ARG:HG2	2.19	0.56
1:B:301:ALA:O	2:B:401:BCT:O1	2.24	0.56
1:A:240:GLN:HG2	1:A:241:LEU:N	2.16	0.55
1:B:260:LEU:HD11	1:B:280:LEU:HD21	1.87	0.55
1:B:156:ILE:HD13	1:B:388:LEU:HG	1.79	0.55
1:B:270:THR:HG23	1:B:309:ILE:HD13	1.87	0.55
1:B:267:ASP:OD2	1:B:274:HIS:ND1	2.37	0.55
1:A:238:ALA:CB	1:A:240:GLN:H	2.16	0.55
1:B:164:ASN:O	1:B:168:ASN:HB2	2.06	0.55
1:B:227:GLY:O	1:B:229:PRO:HD3	2.06	0.55
1:A:155:VAL:HA	1:A:158:THR:HB	1.89	0.55
1:A:159:LEU:O	1:A:162:LEU:HG	2.05	0.55
1:A:3:ILE:HD11	1:B:188:PRO:CD	2.37	0.54
1:B:41:ALA:HB3	1:B:220:ARG:HD3	1.88	0.54
1:B:236:PHE:CD1	1:B:236:PHE:N	2.73	0.54
1:B:69:THR:HG23	1:B:71:PRO:HD2	1.77	0.54
1:B:155:VAL:CG1	1:B:388:LEU:HD12	2.35	0.54
1:B:353:GLY:O	1:B:356:ILE:HG12	2.06	0.54
1:A:153:GLY:HA3	1:A:157:GLY:CA	2.37	0.54
1:A:260:LEU:O	1:A:263:SER:OG	2.22	0.54
1:A:321:ILE:O	1:A:325:VAL:HG23	2.07	0.54
1:A:238:ALA:HB2	1:A:240:GLN:NE2	2.23	0.54
1:A:240:GLN:HG3	1:A:244:MET:HG3	1.89	0.54
1:A:362:LEU:HD22	1:A:363:LYS:CD	2.26	0.53
1:A:232:GLN:O	1:A:234:PRO:HD3	2.08	0.53
1:B:220:ARG:CZ	1:B:220:ARG:CB	2.85	0.53
1:A:238:ALA:HB1	1:A:240:GLN:CA	2.38	0.53
1:B:137:LEU:O	1:B:141:GLN:HG2	2.08	0.53
1:A:240:GLN:O	1:A:243:ARG:HB3	2.07	0.53
1:A:301:ALA:O	1:A:302:THR:HB	2.09	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:313:GLY:O	1:A:314:ARG:NH1	2.35	0.52
1:B:184:ILE:HG21	1:B:351:LYS:HG2	1.91	0.52
1:B:353:GLY:O	1:B:356:ILE:CG1	2.57	0.52
1:A:123:TYR:HE2	1:A:361:PHE:CE2	2.27	0.52
1:A:138:VAL:HG13	1:A:350:PHE:CE1	2.45	0.52
1:A:221:ILE:CG2	1:A:222:GLY:H	2.06	0.52
1:B:27:LEU:HB3	1:B:28:PRO:HD3	1.91	0.52
1:A:362:LEU:CD2	1:A:363:LYS:CD	2.86	0.52
1:B:34:GLY:HA3	1:B:41:ALA:HA	1.91	0.52
1:B:130:MET:HE3	4:B:403:OLC:C2	2.37	0.52
1:B:368:VAL:CG2	1:B:369:SER:N	2.73	0.52
1:A:327:LEU:HD23	1:A:331:LEU:HD12	1.93	0.51
1:B:129:PHE:CE1	1:B:133:ILE:HD11	2.45	0.51
1:B:140:LEU:O	1:B:144:PRO:HD2	2.10	0.51
1:A:25:ILE:HG13	1:A:307:VAL:HG11	1.91	0.51
1:B:220:ARG:NH1	1:B:220:ARG:CG	2.73	0.51
1:A:209:SER:CB	1:A:219:ARG:HH22	2.24	0.51
1:B:11:ASN:OD1	1:B:314:ARG:HB2	2.11	0.51
1:B:231:LEU:HD23	1:B:231:LEU:N	2.26	0.51
1:A:271:ARG:O	1:A:271:ARG:HG3	2.10	0.50
1:B:220:ARG:NH1	1:B:220:ARG:CB	2.73	0.50
1:A:232:GLN:HG3	1:A:233:LEU:N	2.25	0.50
1:B:118:VAL:HG21	1:B:260:LEU:HD13	1.92	0.50
1:A:172:VAL:HG23	1:A:212:LEU:HD13	1.92	0.50
1:A:204:LEU:O	1:A:208:ILE:HG13	2.10	0.50
1:B:155:VAL:CG1	1:B:156:ILE:N	2.45	0.50
1:B:75:VAL:O	1:B:78:ALA:N	2.45	0.50
1:B:361:PHE:C	1:B:361:PHE:CD2	2.85	0.50
1:A:112:LEU:O	1:A:113:LYS:C	2.50	0.50
1:A:361:PHE:CE1	1:A:376:MET:SD	3.05	0.50
1:A:373:ALA:O	1:A:377:TYR:CD2	2.61	0.50
1:B:15:ASP:OD2	1:B:315:THR:HB	2.12	0.50
1:A:164:ASN:HA	1:A:166:VAL:HG12	1.94	0.50
1:A:238:ALA:CB	1:A:240:GLN:NE2	2.75	0.50
1:A:379:VAL:O	1:A:383:THR:OG1	2.19	0.50
1:A:24:VAL:O	1:A:28:PRO:HD3	2.12	0.50
1:B:118:VAL:HG21	1:B:260:LEU:CD1	2.42	0.49
1:A:163:PRO:O	1:A:166:VAL:HB	2.12	0.49
1:A:71:PRO:O	1:A:75:VAL:HG23	2.12	0.49
1:B:368:VAL:HG22	1:B:369:SER:N	2.28	0.49
1:B:373:ALA:O	1:B:376:MET:HB3	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:153:GLY:HA3	1:A:157:GLY:HA3	1.95	0.49
1:A:238:ALA:CB	1:A:240:GLN:CG	2.91	0.49
1:A:146:LEU:HD12	1:A:165:LEU:HD23	1.94	0.49
1:B:260:LEU:O	1:B:263:SER:HB2	2.12	0.49
1:A:139:ILE:HG23	1:A:142:LEU:HD12	1.95	0.49
1:A:4:THR:HB	1:A:57:LEU:O	2.12	0.49
1:B:67:GLU:HB2	1:B:68:PRO:CD	2.43	0.49
1:A:223:GLU:O	1:A:224:ILE:C	2.51	0.48
1:A:153:GLY:CA	1:A:157:GLY:HA3	2.43	0.48
1:B:315:THR:HG22	1:B:317:LEU:N	2.13	0.48
1:B:366:HIS:CD2	1:B:366:HIS:H	2.31	0.48
1:B:135:ILE:O	1:B:139:ILE:HG13	2.14	0.48
1:B:190:ARG:HG2	1:B:190:ARG:HH11	1.77	0.48
1:B:192:LYS:O	1:B:193:LYS:C	2.52	0.48
1:A:238:ALA:CB	1:A:240:GLN:CD	2.82	0.48
1:B:93:ALA:CB	1:B:234:PRO:CG	2.87	0.48
1:A:8:HIS:H	1:A:315:THR:HG21	1.78	0.48
1:B:206:THR:HG22	1:B:340:ILE:HA	1.96	0.48
1:A:226:ALA:CA	1:A:331:LEU:CD2	2.87	0.48
1:A:262:THR:O	1:A:265:VAL:N	2.47	0.48
1:B:70:GLY:O	1:B:133:ILE:CG2	2.62	0.48
1:B:71:PRO:HG3	1:B:133:ILE:HD13	1.95	0.48
1:B:275:ASN:OD1	1:B:278:LYS:HB2	2.13	0.48
1:B:155:VAL:C	1:B:157:GLY:N	2.66	0.48
1:A:279:GLU:O	1:A:283:GLN:HG2	2.13	0.47
1:A:71:PRO:HA	1:A:133:ILE:HD13	1.95	0.47
1:A:370:ILE:N	1:A:370:ILE:CD1	2.73	0.47
1:B:195:ALA:O	1:B:200:VAL:HG23	2.13	0.47
1:A:3:ILE:CD1	1:B:188:PRO:HD3	2.43	0.47
1:A:103:GLY:HA3	1:A:288:VAL:HG23	1.96	0.47
1:B:155:VAL:C	1:B:157:GLY:H	2.17	0.47
1:B:235:VAL:O	1:B:235:VAL:HG22	2.14	0.47
1:B:379:VAL:O	1:B:383:THR:OG1	2.30	0.47
1:B:326:LEU:O	1:B:330:ILE:HD13	2.15	0.47
1:A:91:GLY:O	1:A:94:MET:HB2	2.15	0.47
1:B:166:VAL:O	1:B:169:VAL:HG13	2.15	0.47
1:A:53:PHE:CE1	1:A:320:LEU:HD22	2.50	0.47
1:A:112:LEU:O	1:A:114:LEU:N	2.48	0.47
1:B:74:VAL:HG23	1:B:137:LEU:HD13	1.96	0.47
1:B:315:THR:C	1:B:317:LEU:N	2.68	0.47
1:B:325:VAL:O	1:B:329:VAL:HG23	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:208:ILE:HG22	1:A:208:ILE:O	2.16	0.46
1:B:24:VAL:HG12	1:B:196:PRO:HG3	1.97	0.46
1:B:284:GLY:O	1:B:288:VAL:HG23	2.15	0.46
1:A:184:ILE:HG23	1:A:197:PRO:HB2	1.97	0.46
1:B:112:LEU:HB3	1:B:114:LEU:HD23	1.98	0.46
1:A:173:GLU:OE2	1:A:218:ILE:HG13	2.15	0.46
1:A:221:ILE:C	1:A:222:GLY:O	2.50	0.46
1:A:45:LEU:HD22	1:A:330:ILE:HD11	1.97	0.46
1:B:163:PRO:HG2	1:B:164:ASN:H	1.81	0.46
1:B:362:LEU:HD23	1:B:376:MET:HE2	1.96	0.46
1:A:35:ILE:HD11	1:A:41:ALA:HB2	1.98	0.46
1:B:31:LEU:HG	1:B:45:LEU:HD21	1.98	0.46
1:A:148:GLN:HE22	1:A:169:VAL:HA	1.81	0.45
1:A:240:GLN:CD	1:A:244:MET:SD	2.94	0.45
1:A:141:GLN:OE1	1:A:346:ALA:HA	2.16	0.45
1:B:370:ILE:O	1:B:374:LEU:HG	2.16	0.45
1:B:161:ALA:O	1:B:165:LEU:HG	2.15	0.45
1:A:118:VAL:HG21	1:A:260:LEU:HD12	1.98	0.45
1:A:246:ILE:HG13	1:A:247:ASP:N	2.32	0.45
1:B:73:THR:O	1:B:77:THR:OG1	2.25	0.45
1:B:152:LYS:HA	1:B:152:LYS:HD3	1.57	0.45
1:A:151:PRO:HG2	1:A:158:THR:HA	1.99	0.45
1:B:362:LEU:HD23	1:B:376:MET:HE1	1.98	0.45
1:B:361:PHE:CD2	1:B:376:MET:HE2	2.52	0.44
1:A:101:MET:HB2	1:A:101:MET:HE2	1.67	0.44
1:A:220:ARG:HD2	1:A:220:ARG:HA	1.64	0.44
1:A:172:VAL:O	1:A:175:LEU:HB3	2.17	0.44
1:B:204:LEU:O	1:B:208:ILE:N	2.48	0.44
1:B:119:THR:O	1:B:121:MET:N	2.49	0.44
1:B:369:SER:O	1:B:372:GLY:N	2.49	0.44
4:B:403:OLC:H17	4:B:403:OLC:H14	1.75	0.44
1:A:7:ILE:HA	1:A:315:THR:HG23	1.99	0.44
1:A:112:LEU:C	1:A:113:LYS:CG	2.85	0.44
1:A:351:LYS:O	1:A:351:LYS:HG3	2.18	0.44
1:A:281:VAL:O	1:A:285:ILE:HG12	2.17	0.44
1:B:18:GLY:HA2	1:B:311:SER:HB2	1.99	0.44
1:B:130:MET:HE2	1:B:133:ILE:HD12	2.00	0.44
1:B:232:GLN:HA	1:B:233:LEU:HD23	1.99	0.44
1:A:262:THR:HG23	1:A:302:THR:OG1	2.19	0.43
1:A:357:ILE:HG12	1:A:359:TRP:CZ2	2.53	0.43
1:A:245:LEU:HD23	1:A:245:LEU:HA	1.75	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:72:MET:O	1:A:76:GLN:HB2	2.18	0.43
1:A:238:ALA:HB2	1:A:240:GLN:CD	2.38	0.43
1:B:220:ARG:HH21	1:B:345:LEU:CD1	2.25	0.43
1:B:366:HIS:C	1:B:367:HIS:ND1	2.64	0.43
1:A:47:GLY:HA2	1:A:290:SER:OG	2.19	0.43
1:B:115:GLY:O	1:B:118:VAL:HG22	2.18	0.43
1:B:143:ALA:HB3	1:B:144:PRO:HD3	2.01	0.43
1:A:25:ILE:O	1:A:28:PRO:HD2	2.19	0.43
1:B:161:ALA:C	1:B:163:PRO:HD2	2.40	0.43
1:B:233:LEU:C	1:B:235:VAL:N	2.72	0.43
1:A:51:VAL:HG11	1:A:298:GLY:HA3	2.01	0.42
1:A:61:THR:HB	1:A:64:LEU:HB2	2.01	0.42
1:A:154:GLY:O	1:A:155:VAL:HB	2.18	0.42
1:A:261:LEU:HD12	4:A:403:OLC:H5A	2.02	0.42
1:A:306:VAL:O	1:A:310:GLN:HG3	2.19	0.42
1:B:83:LEU:HD13	1:B:94:MET:HB2	2.01	0.42
1:A:110:GLY:C	1:A:112:LEU:H	2.21	0.42
1:A:110:GLY:C	1:A:112:LEU:N	2.73	0.42
1:B:370:ILE:H	1:B:370:ILE:HG13	1.56	0.42
1:A:2:GLN:CG	1:A:3:ILE:H	2.29	0.42
1:A:175:LEU:O	1:A:179:MET:HB2	2.20	0.42
1:B:66:SER:HA	1:B:299:ALA:O	2.19	0.42
1:B:276:SER:O	1:B:279:GLU:HB3	2.19	0.42
1:B:352:VAL:O	1:B:355:ASP:HB2	2.20	0.42
1:B:176:LEU:HD23	1:B:176:LEU:HA	1.70	0.42
1:B:369:SER:C	1:B:371:LYS:N	2.72	0.42
1:A:146:LEU:HD23	1:A:146:LEU:HA	1.87	0.42
1:A:176:LEU:HD12	1:A:179:MET:HE2	2.01	0.42
1:B:207:ILE:O	1:B:210:ILE:HB	2.18	0.42
1:A:171:PRO:O	1:A:174:THR:OG1	2.38	0.42
1:A:176:LEU:HD12	1:A:176:LEU:HA	1.89	0.42
1:A:238:ALA:HB3	1:A:240:GLN:CG	2.49	0.42
1:B:357:ILE:HB	1:B:359:TRP:CD1	2.54	0.42
1:A:150:SER:HA	1:A:151:PRO:HD2	1.75	0.42
1:A:222:GLY:C	1:A:223:GLU:CG	2.85	0.42
1:A:325:VAL:O	1:A:328:VAL:HG22	2.20	0.42
1:B:373:ALA:O	1:B:377:TYR:CD2	2.70	0.42
1:A:111:LEU:HD12	1:A:111:LEU:HA	1.77	0.41
1:A:204:LEU:HA	1:A:207:ILE:HG12	2.00	0.41
1:B:315:THR:O	1:B:318:SER:N	2.44	0.41
1:B:361:PHE:CE2	1:B:376:MET:CE	3.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:108:ALA:O	1:A:112:LEU:HB2	2.21	0.41
1:B:361:PHE:CE2	1:B:376:MET:HE3	2.56	0.41
1:A:121:MET:HE1	4:A:403:OLC:H11A	2.02	0.41
1:B:35:ILE:HD11	1:B:41:ALA:HB2	2.02	0.41
1:B:144:PRO:HA	1:B:148:GLN:O	2.20	0.41
1:A:69:THR:HG22	1:A:72:MET:HG2	2.02	0.41
1:A:166:VAL:HG13	1:A:167:SER:N	2.35	0.41
1:B:257:ILE:HG21	4:B:403:OLC:H5	2.03	0.41
1:B:271:ARG:HD3	1:B:271:ARG:HA	1.83	0.41
1:B:361:PHE:C	1:B:361:PHE:HD2	2.24	0.41
1:A:275:ASN:OD1	1:A:278:LYS:HB2	2.21	0.41
1:A:315:THR:O	1:A:318:SER:OG	2.31	0.41
1:A:326:LEU:HD23	1:A:326:LEU:HA	1.83	0.41
1:A:359:TRP:CD1	1:A:359:TRP:N	2.88	0.41
1:A:362:LEU:HD22	1:A:362:LEU:C	2.41	0.41
1:B:280:LEU:HD23	1:B:280:LEU:HA	1.89	0.41
1:A:96:PHE:O	1:A:100:MET:HG3	2.22	0.40
1:B:137:LEU:HD12	1:B:137:LEU:HA	1.82	0.40
1:B:172:VAL:HG13	1:B:212:LEU:HD13	2.03	0.40
1:A:80:ILE:O	1:A:84:VAL:HG23	2.21	0.40
1:B:162:LEU:N	1:B:163:PRO:HD2	2.37	0.40
1:B:232:GLN:HB3	1:B:233:LEU:H	1.65	0.40
1:B:146:LEU:O	1:B:148:GLN:NE2	2.53	0.40
1:A:172:VAL:CG2	1:A:212:LEU:HD13	2.51	0.40
1:B:71:PRO:HA	1:B:133:ILE:HD13	2.04	0.40
1:B:155:VAL:HG13	1:B:156:ILE:CG1	2.46	0.40
1:B:237:GLN:O	1:B:239:ASP:N	2.54	0.40
1:B:143:ALA:HB3	1:B:144:PRO:CD	2.51	0.40
1:B:283:GLN:OE1	1:B:299:ALA:HA	2.22	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)
1:A:221:ILE:CD1	1:B:221:ILE:CD1[2_655]	1.69	0.51
1:B:10:ARG:NH2	1:B:237:GLN:NE2[1_455]	2.02	0.18
1:A:221:ILE:CG2	1:B:221:ILE:CD1[2_655]	2.09	0.11
1:A:221:ILE:CG1	1:B:221:ILE:CD1[2_655]	2.14	0.06

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	379/392 (97%)	342 (90%)	30 (8%)	7 (2%)	8	28
1	B	390/392 (100%)	339 (87%)	44 (11%)	7 (2%)	8	28
All	All	769/784 (98%)	681 (89%)	74 (10%)	14 (2%)	8	28

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	362	LEU
1	B	155	VAL
1	B	224	ILE
1	B	228	LEU
1	A	229	PRO
1	A	113	LYS
1	B	234	PRO
1	B	365	ALA
1	A	155	VAL
1	A	163	PRO
1	B	154	GLY
1	A	71	PRO
1	A	221	ILE
1	B	71	PRO

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	288/294 (98%)	264 (92%)	24 (8%)	11 32
1	B	294/294 (100%)	269 (92%)	25 (8%)	10 31
All	All	582/588 (99%)	533 (92%)	49 (8%)	11 31

All (49) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	29	MET
1	A	42	THR
1	A	111	LEU
1	A	116	LYS
1	A	131	SER
1	A	156	ILE
1	A	165	LEU
1	A	194	PHE
1	A	220	ARG
1	A	223	GLU
1	A	224	ILE
1	A	228	LEU
1	A	233	LEU
1	A	236	PHE
1	A	240	GLN
1	A	253	MET
1	A	318	SER
1	A	355	ASP
1	A	357	ILE
1	A	361	PHE
1	A	362	LEU
1	A	363	LYS
1	A	374	LEU
1	A	392	VAL
1	B	11	ASN
1	B	63	THR
1	B	69	THR
1	B	116	LYS
1	B	120	MET
1	B	130	MET
1	B	156	ILE
1	B	164	ASN
1	B	175	LEU
1	B	190	ARG
1	B	191	TRP

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Mol	Chain	Res	Type
1	B	192	LYS
1	B	220	ARG
1	B	231	LEU
1	B	233	LEU
1	B	236	PHE
1	B	237	GLN
1	B	243	ARG
1	B	361	PHE
1	B	366	HIS
1	B	367	HIS
1	B	368	VAL
1	B	369	SER
1	B	371	LYS
1	B	383	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	237	GLN
1	A	240	GLN
1	B	164	ASN
1	B	225	GLN
1	B	366	HIS

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

There are no monosaccharides in this entry.

5.6 Ligand geometry

Of 6 ligands modelled in this entry, 2 are monoatomic - leaving 4 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	OLC	A	403	-	24,24,24	0.97	2 (8%)	25,25,25	1.03	1 (4%)
4	OLC	B	403	-	24,24,24	1.03	3 (12%)	25,25,25	0.98	2 (8%)
2	BCT	B	401	3	2,3,3	0.79	0	2,3,3	0.27	0
2	BCT	A	401	3	2,3,3	0.89	0	2,3,3	0.57	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
4	OLC	A	403	-	-	10/24/24/24	-
4	OLC	B	403	-	-	10/24/24/24	-

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	403	OLC	C9-C10	3.42	1.51	1.31
4	A	403	OLC	C9-C10	3.01	1.49	1.31
4	A	403	OLC	O20-C1	2.80	1.41	1.33
4	B	403	OLC	O20-C1	2.31	1.40	1.33
4	B	403	OLC	O20-C21	-2.26	1.40	1.45

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	403	OLC	O20-C1-C2	3.04	121.44	111.91
4	B	403	OLC	O20-C1-C2	2.88	120.94	111.91
4	B	403	OLC	O20-C1-O19	-2.05	118.41	123.59

There are no chirality outliers.

All (20) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	403	OLC	C2-C1-O20-C21
4	A	403	OLC	O19-C1-O20-C21
4	B	403	OLC	O20-C21-C22-C24
4	B	403	OLC	O20-C21-C22-O23
4	B	403	OLC	C11-C12-C13-C14
4	A	403	OLC	O20-C21-C22-C24
4	A	403	OLC	O20-C21-C22-O23
4	B	403	OLC	C2-C1-O20-C21
4	B	403	OLC	C14-C15-C16-C17
4	B	403	OLC	C13-C14-C15-C16
4	B	403	OLC	C1-C2-C3-C4
4	A	403	OLC	C2-C3-C4-C5
4	B	403	OLC	O19-C1-O20-C21
4	A	403	OLC	C13-C14-C15-C16
4	A	403	OLC	C15-C16-C17-C18
4	B	403	OLC	C10-C11-C12-C13
4	B	403	OLC	C9-C10-C11-C12
4	A	403	OLC	C3-C4-C5-C6
4	A	403	OLC	C10-C11-C12-C13
4	A	403	OLC	C11-C12-C13-C14

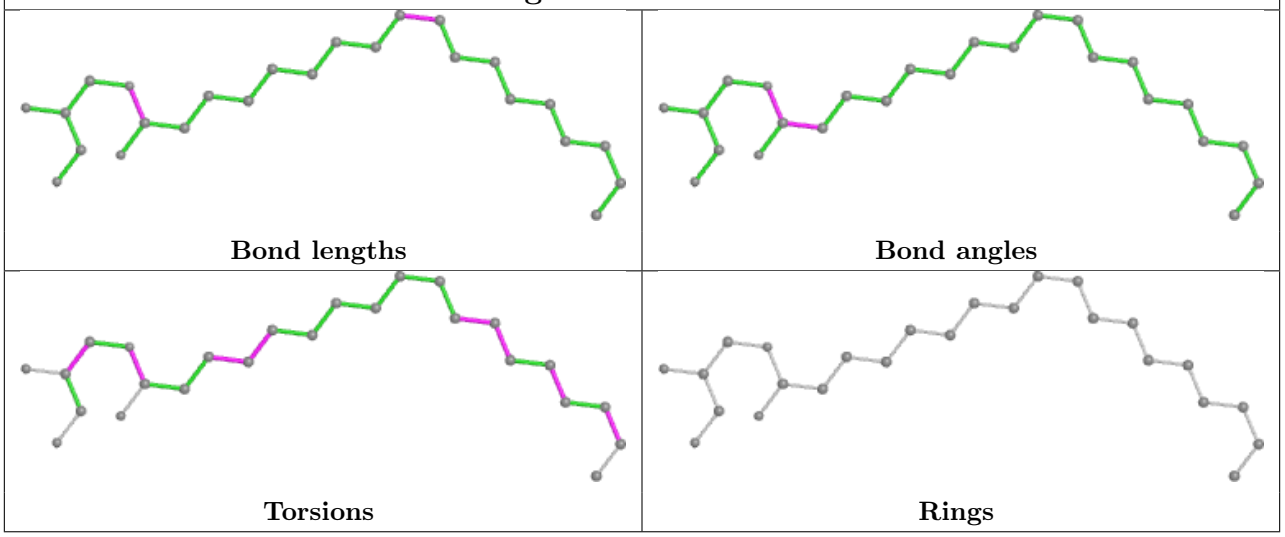
There are no ring outliers.

4 monomers are involved in 11 short contacts:

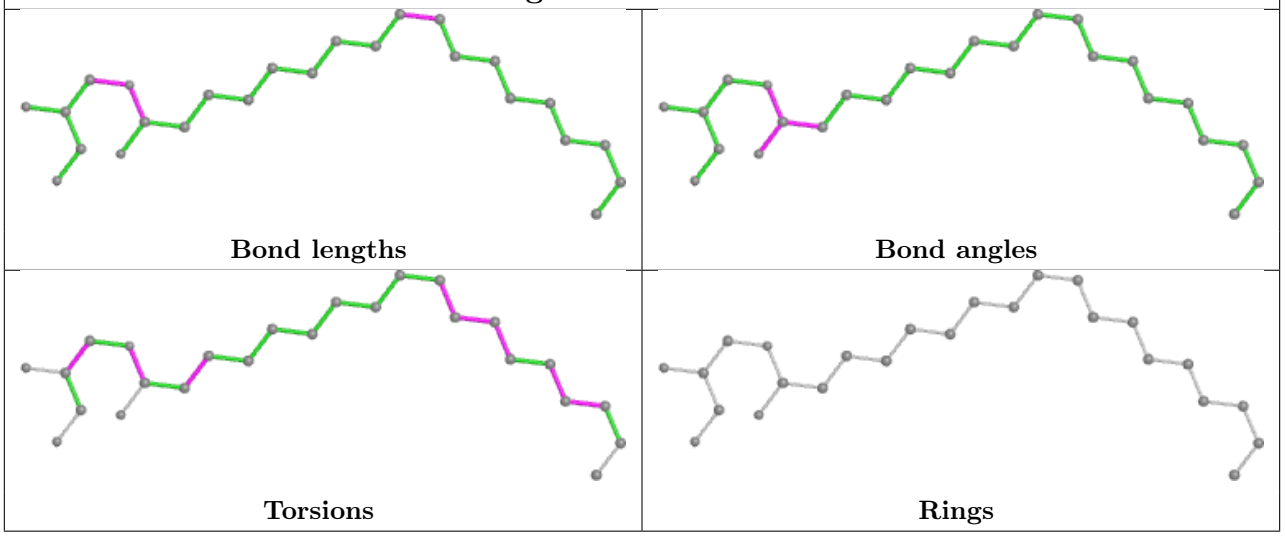
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	403	OLC	2	0
4	B	403	OLC	7	0
2	B	401	BCT	1	0
2	A	401	BCT	1	0

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 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.

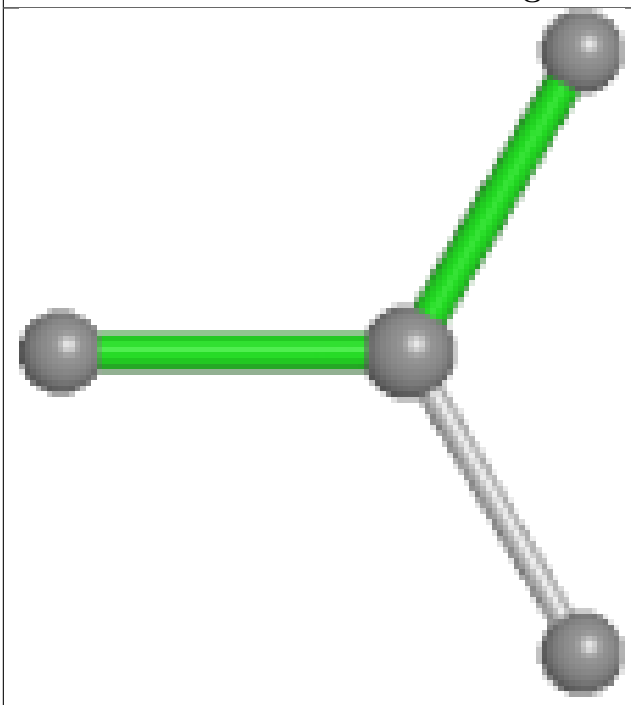
Ligand OLC A 403



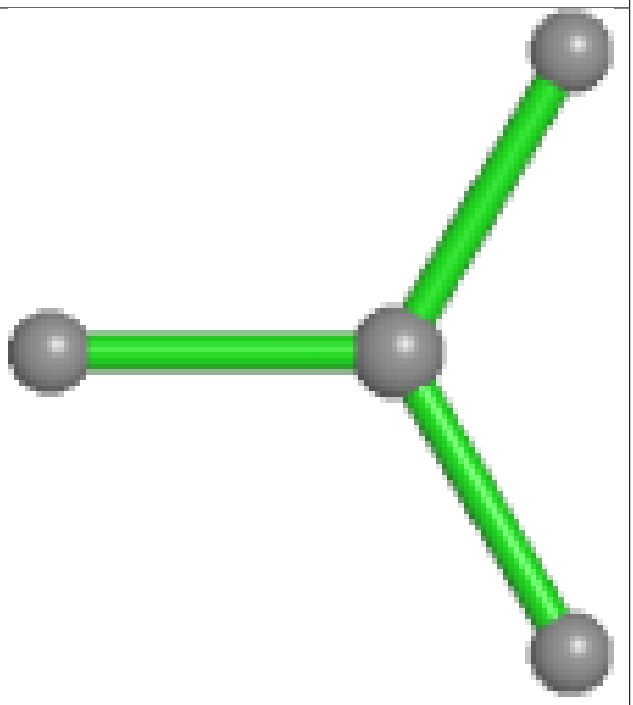
Ligand OLC B 403



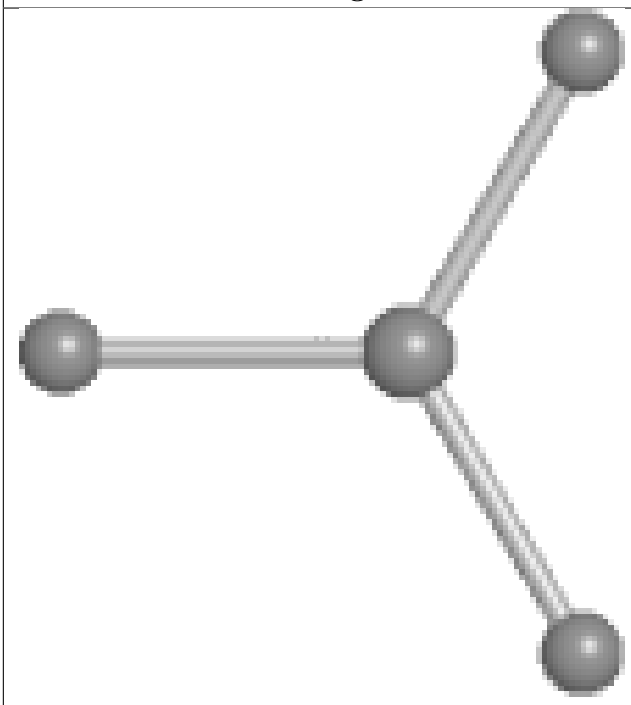
Ligand BCT B 401



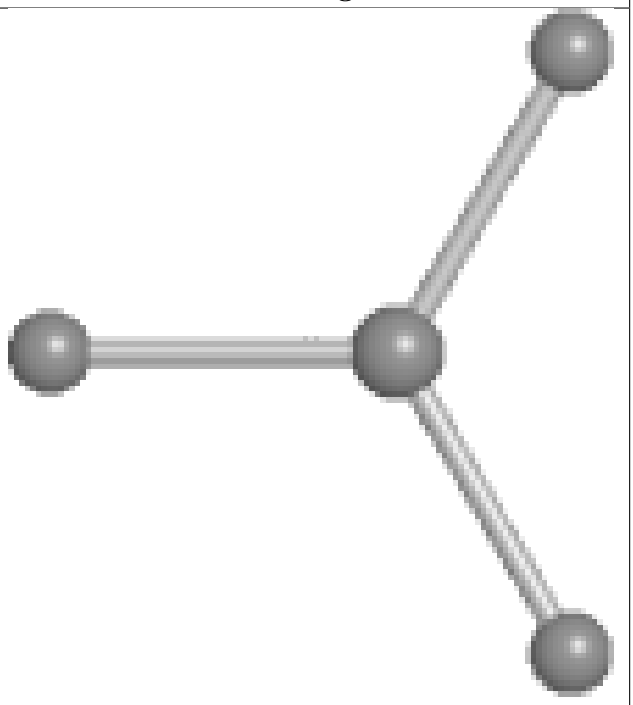
Bond lengths



Bond angles

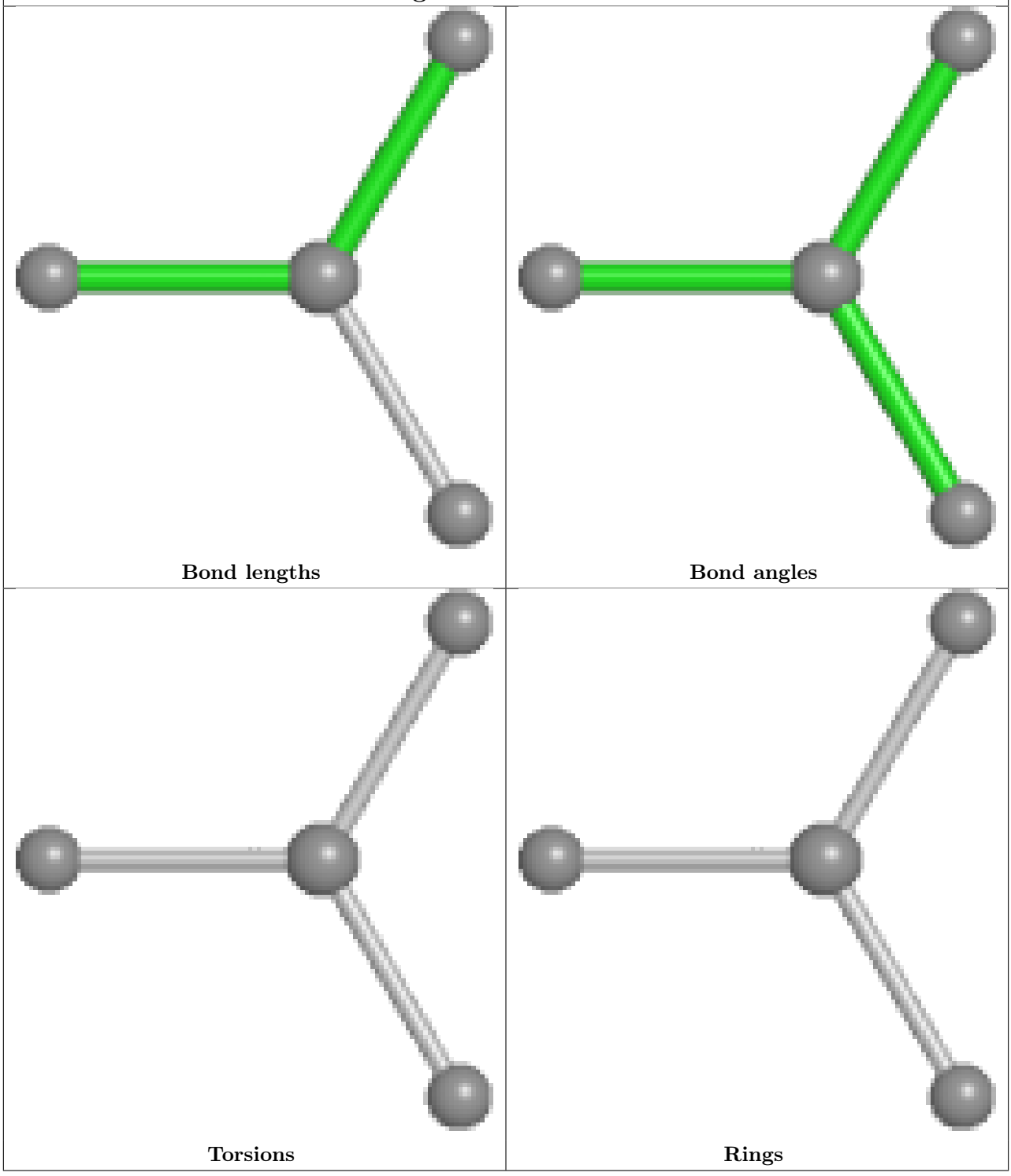


Torsions



Rings

Ligand BCT A 401



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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	385/392 (98%)	0.20	31 (8%)	12	6	30, 47, 79, 96	0
1	B	392/392 (100%)	0.19	31 (7%)	12	7	26, 42, 82, 117	0
All	All	777/784 (99%)	0.19	62 (7%)	12	6	26, 45, 81, 117	0

All (62) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	117	TYR	5.0
1	A	119	THR	5.0
1	B	367	HIS	4.7
1	B	368	VAL	4.1
1	B	238	ALA	4.0
1	B	365	ALA	3.9
1	B	361	PHE	3.9
1	B	366	HIS	3.8
1	B	193	LYS	3.7
1	B	228	LEU	3.7
1	A	164	ASN	3.6
1	B	117	TYR	3.6
1	B	359	TRP	3.3
1	B	190	ARG	3.3
1	B	364	ARG	3.3
1	B	150	SER	3.3
1	B	236	PHE	3.2
1	A	224	ILE	3.1
1	A	189	SER	3.1
1	A	360	GLY	3.1
1	A	236	PHE	3.1
1	A	229	PRO	3.0
1	B	213	PHE	3.0
1	A	168	ASN	2.9

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Mol	Chain	Res	Type	RSRZ
1	B	362	LEU	2.9
1	A	194	PHE	2.9
1	A	163	PRO	2.9
1	A	362	LEU	2.9
1	A	363	LYS	2.9
1	B	225	GLN	2.8
1	A	225	GLN	2.8
1	A	393	GLY	2.8
1	B	369	SER	2.8
1	A	361	PHE	2.7
1	B	119	THR	2.7
1	A	187	MET	2.7
1	A	2	GLN	2.6
1	A	153	GLY	2.5
1	A	370	ILE	2.5
1	A	369	SER	2.5
1	A	185	TRP	2.5
1	A	160	GLN	2.5
1	B	120	MET	2.4
1	B	191	TRP	2.4
1	B	229	PRO	2.3
1	A	186	PHE	2.3
1	B	160	GLN	2.3
1	A	368	VAL	2.2
1	B	166	VAL	2.2
1	A	167	SER	2.2
1	B	226	ALA	2.2
1	A	156	ILE	2.1
1	B	165	LEU	2.1
1	A	210	ILE	2.1
1	B	392	VAL	2.1
1	A	188	PRO	2.1
1	B	69	THR	2.1
1	A	240	GLN	2.1
1	B	116	LYS	2.1
1	B	195	ALA	2.0
1	A	120	MET	2.0
1	B	70	GLY	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)

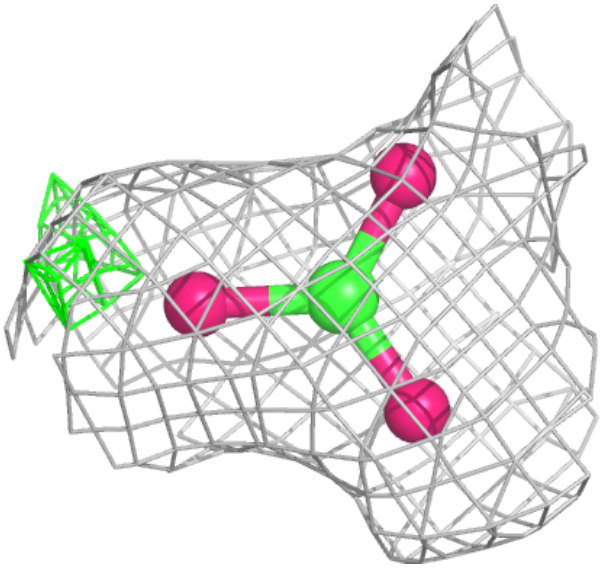
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

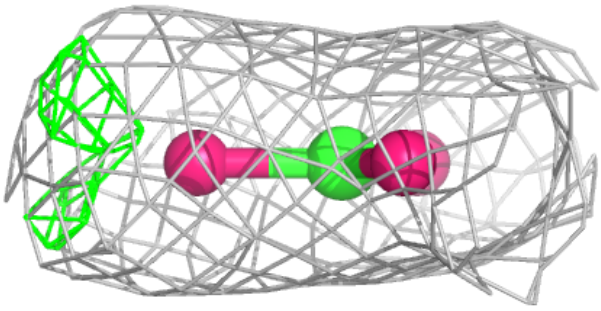
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	BCT	B	401	4/4	0.78	0.30	41,61,61,63	0
4	OLC	A	403	25/25	0.81	0.24	43,54,71,76	0
3	NA	A	402	1/1	0.85	0.21	51,51,51,51	0
4	OLC	B	403	25/25	0.86	0.24	45,54,67,73	0
2	BCT	A	401	4/4	0.88	0.33	50,58,61,62	0
3	NA	B	402	1/1	0.89	0.19	44,44,44,44	0

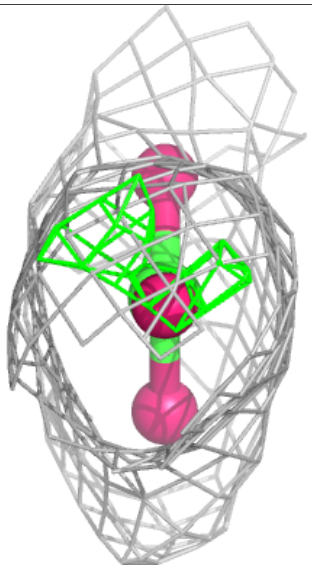
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around BCT B 401:

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

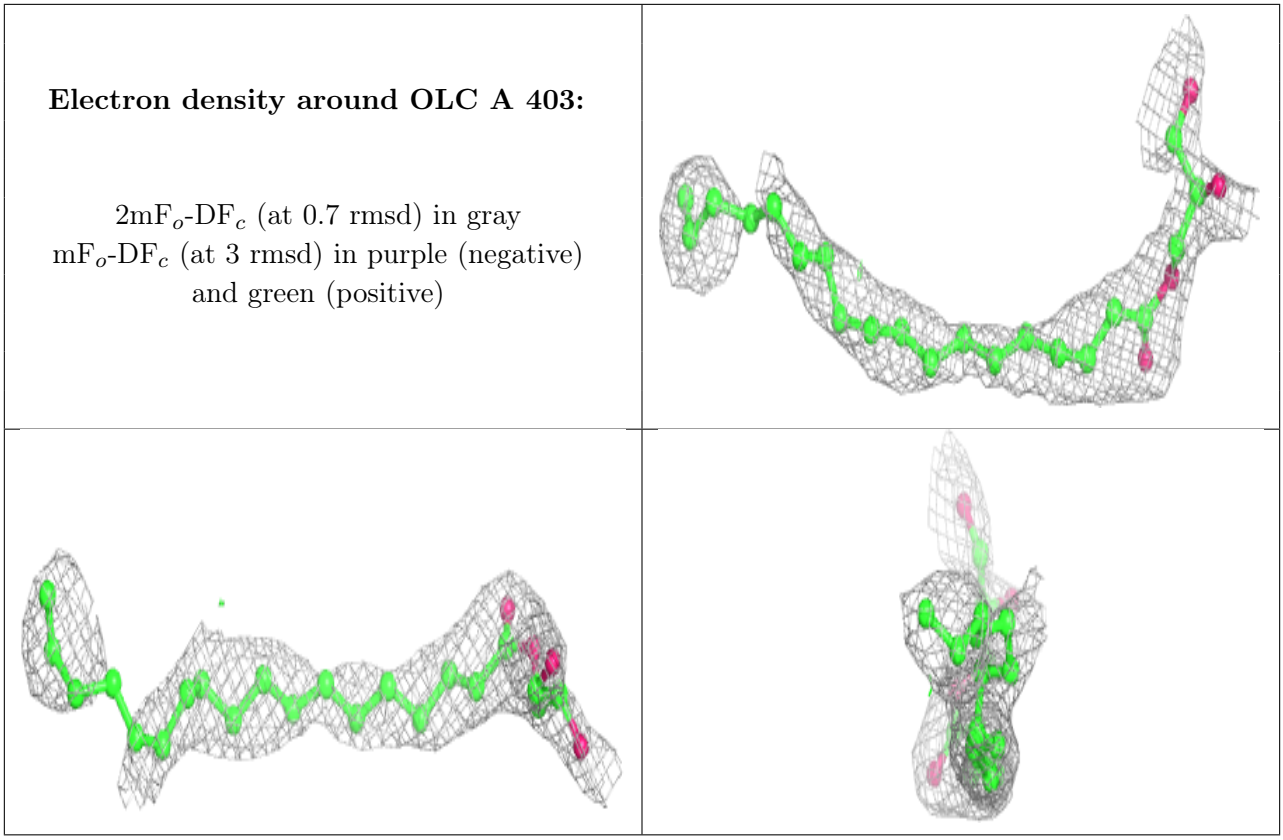






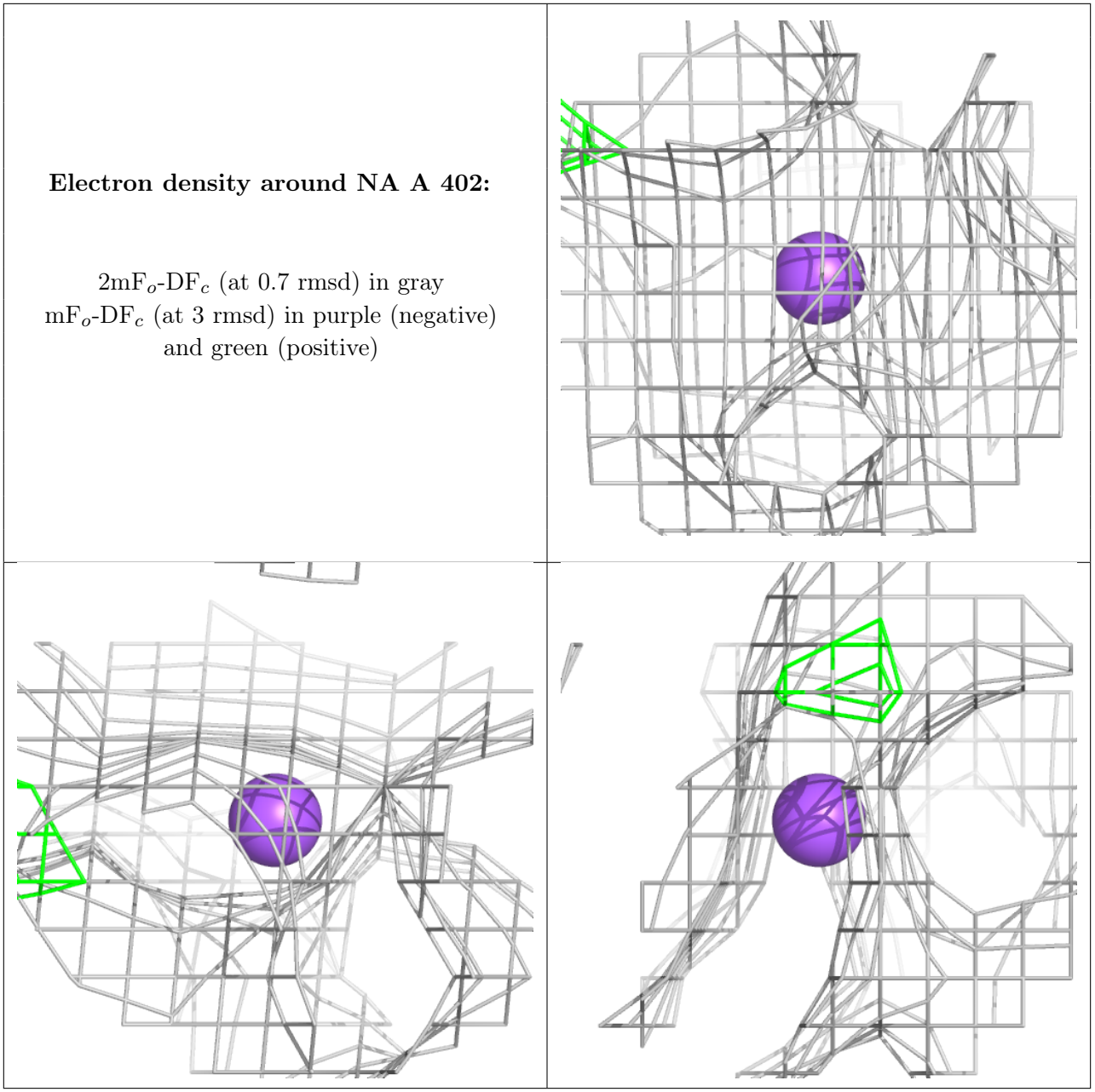
Electron density around OLC A 403:

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



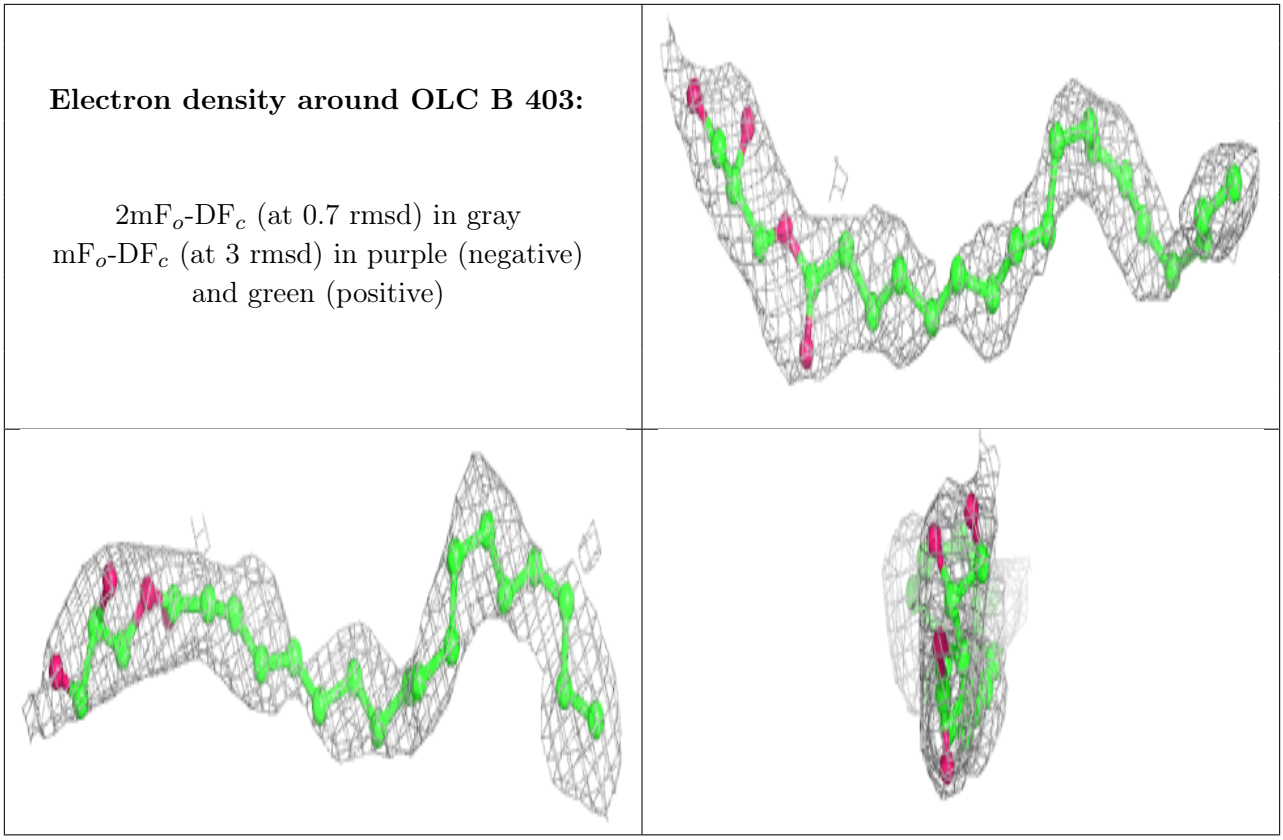
Electron density around NA A 402:

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



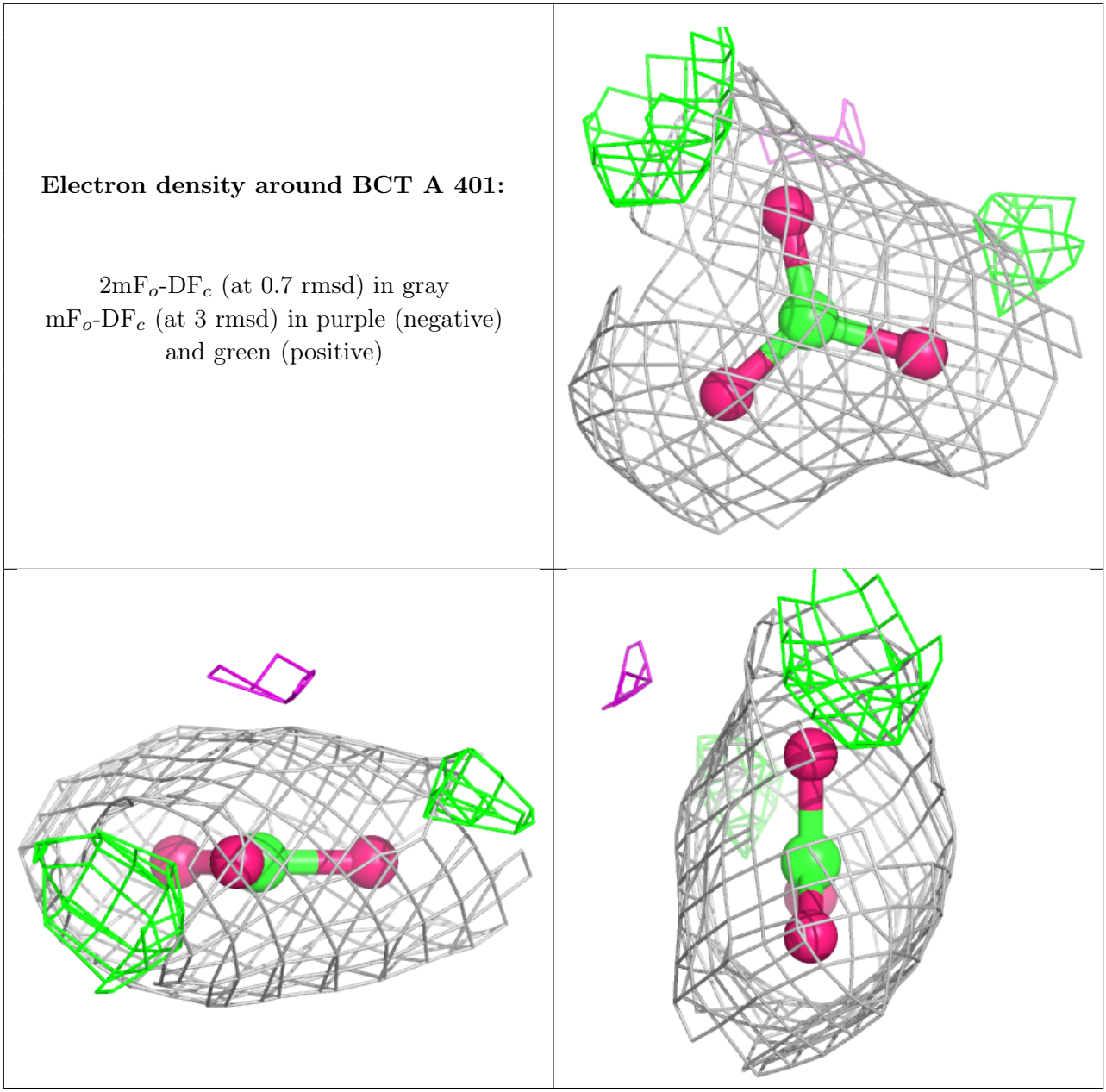
Electron density around OLC B 403:

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



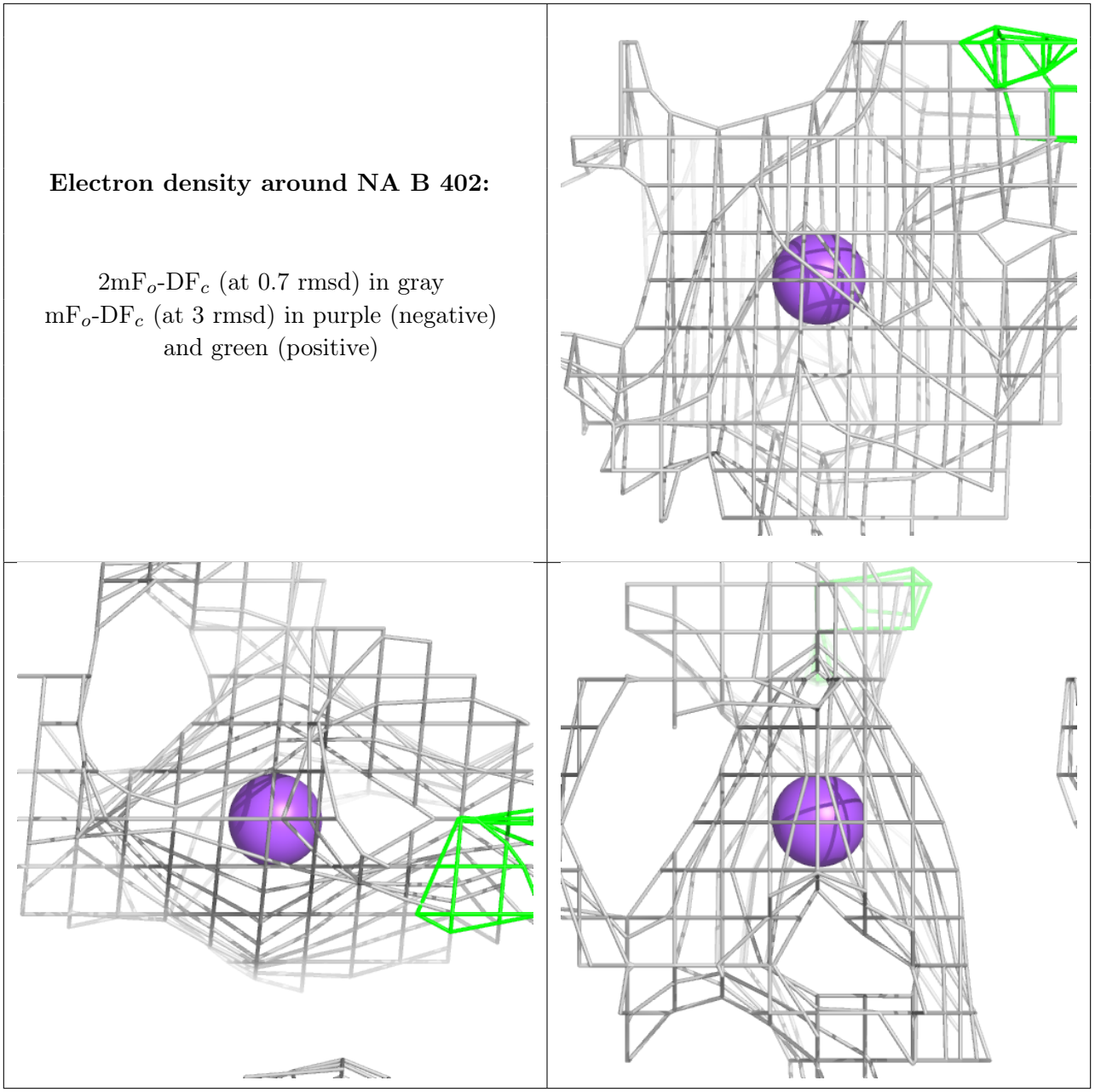
Electron density around BCT A 401:

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



Electron density around NA B 402:

$2mF_o$-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.