Full wwPDB X-ray Structure Validation Report (i)

May 3, 2025 – 03:26 PM EDT

PDB ID	:	2Z2C / pdb_00002z2c
Title	:	MURA inhibited by unag-cnicin adduct
Authors	:	Steinbach, A.; Skarzynski, T.; Scheidig, A.J.; Klein, C.D.
Deposited on	:	2007-05-17
Resolution	:	2.05 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 (i) 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 (i)) were used in the production of this report:

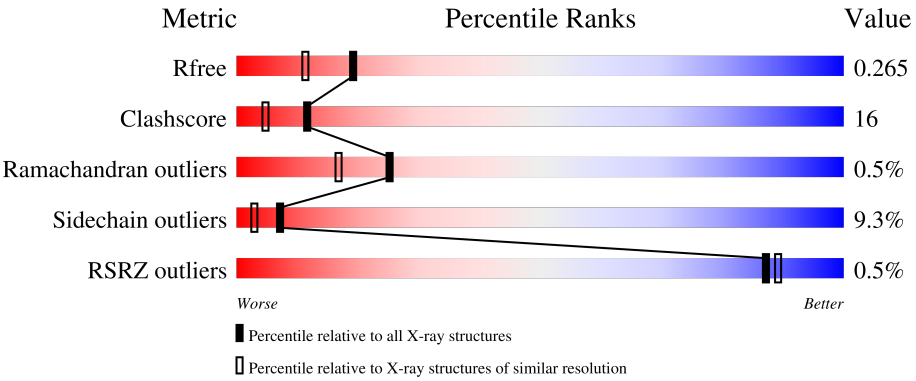
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.05 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}	164625	2096 (2.04-2.04)
Clashscore	180529	2229 (2.04-2.04)
Ramachandran outliers	177936	2217 (2.04-2.04)
Sidechain outliers	177891	2217 (2.04-2.04)
RSRZ outliers	164620	2096 (2.04-2.04)

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	423	71% 23%
1	B	423	73% 23%
1	C	423	68% 27%
1	D	423	% 66% 26% 6%

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
1	IAS	A	67	-	-	X	-
1	IAS	C	67	-	-	X	-
1	IAS	D	67	-	-	X	-

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 13786 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.

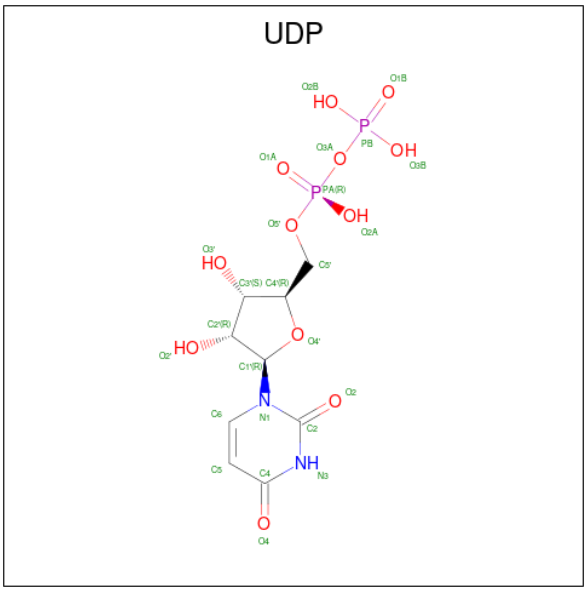
- Molecule 1 is a protein called UDP-N-acetylglucosamine 1-carboxyvinyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	418	Total	C	N	O	S	0	1	0
			3139	1971	558	594	16			
1	B	418	Total	C	N	O	S	0	9	0
			3185	2005	563	601	16			
1	C	418	Total	C	N	O	S	0	3	0
			3153	1982	561	594	16			
1	D	418	Total	C	N	O	S	0	3	0
			3149	1978	559	596	16			

There are 16 discrepancies between the modelled and reference sequences:

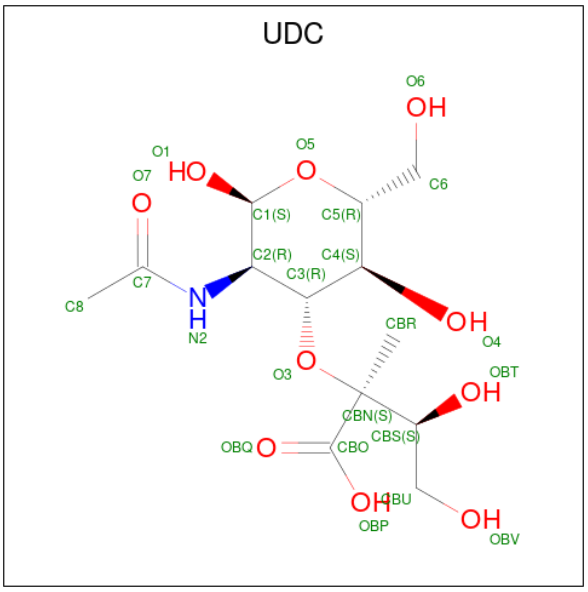
Chain	Residue	Modelled	Actual	Comment	Reference
A	420	LEU	-	SEE REMARK 999	UNP P0A749
A	421	VAL	-	SEE REMARK 999	UNP P0A749
A	422	PRO	-	SEE REMARK 999	UNP P0A749
A	423	ARG	-	SEE REMARK 999	UNP P0A749
B	420	LEU	-	SEE REMARK 999	UNP P0A749
B	421	VAL	-	SEE REMARK 999	UNP P0A749
B	422	PRO	-	SEE REMARK 999	UNP P0A749
B	423	ARG	-	SEE REMARK 999	UNP P0A749
C	420	LEU	-	SEE REMARK 999	UNP P0A749
C	421	VAL	-	SEE REMARK 999	UNP P0A749
C	422	PRO	-	SEE REMARK 999	UNP P0A749
C	423	ARG	-	SEE REMARK 999	UNP P0A749
D	420	LEU	-	SEE REMARK 999	UNP P0A749
D	421	VAL	-	SEE REMARK 999	UNP P0A749
D	422	PRO	-	SEE REMARK 999	UNP P0A749
D	423	ARG	-	SEE REMARK 999	UNP P0A749

- Molecule 2 is URIDINE-5'-DIPHOSPHATE (CCD ID: UDP) (formula: $C_9H_{14}N_2O_{12}P_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			25	9	2	12	2		
2	B	1	Total	C	N	O	P	0	0
			25	9	2	12	2		
2	C	1	Total	C	N	O	P	0	0
			25	9	2	12	2		
2	D	1	Total	C	N	O	P	0	0
			25	9	2	12	2		

- Molecule 3 is 2-acetamido-3-O-[(2S,3S)-2-carboxy-3,4-dihydroxybutan-2-yl]-2-deoxy-alpha-D-glucopyranose (CCD ID: UDC) (formula: $C_{13}H_{23}NO_{10}$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	1
			32	18	1	13		
3	B	1	Total	C	N	O	0	1
			32	18	1	13		
3	C	1	Total	C	N	O	0	1
			32	18	1	13		
3	D	1	Total	C	N	O	0	1
			32	18	1	13		

- Molecule 4 is water.

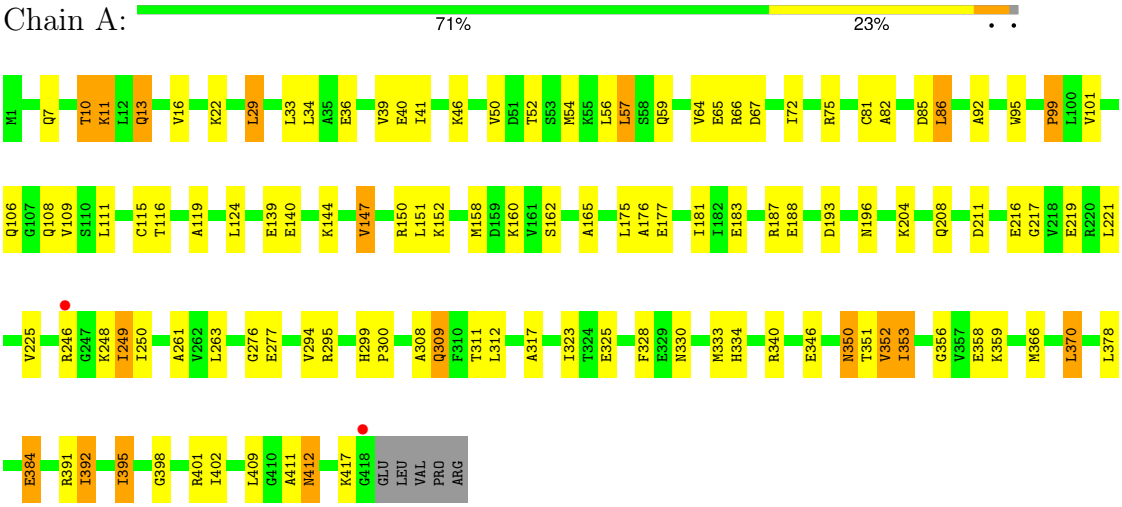
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	220	Total	O	0	0
			220	220		
4	B	248	Total	O	0	0
			248	248		
4	C	257	Total	O	0	0
			257	257		
4	D	207	Total	O	0	0
			207	207		

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.

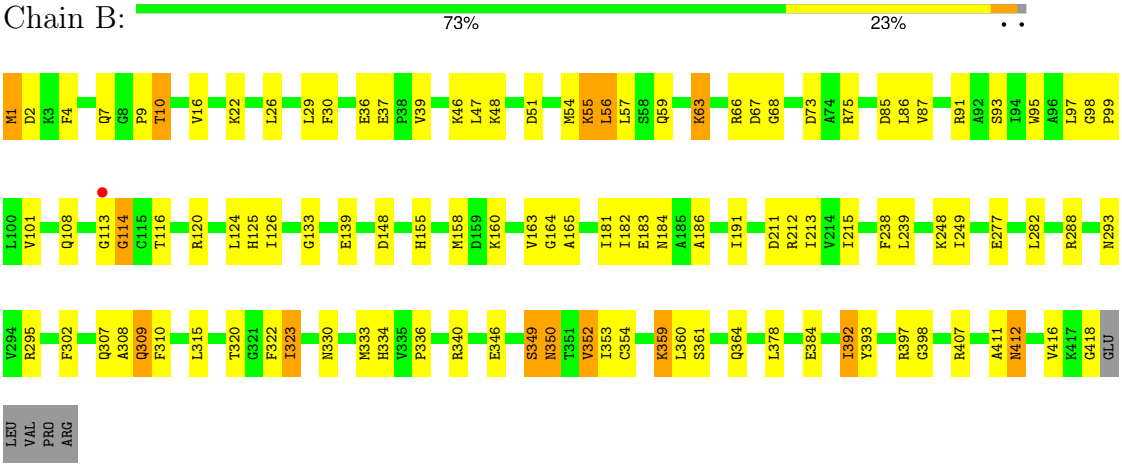
• Molecule 1: UDP-N-acetylglucosamine 1-carboxyvinyltransferase

Chain A:



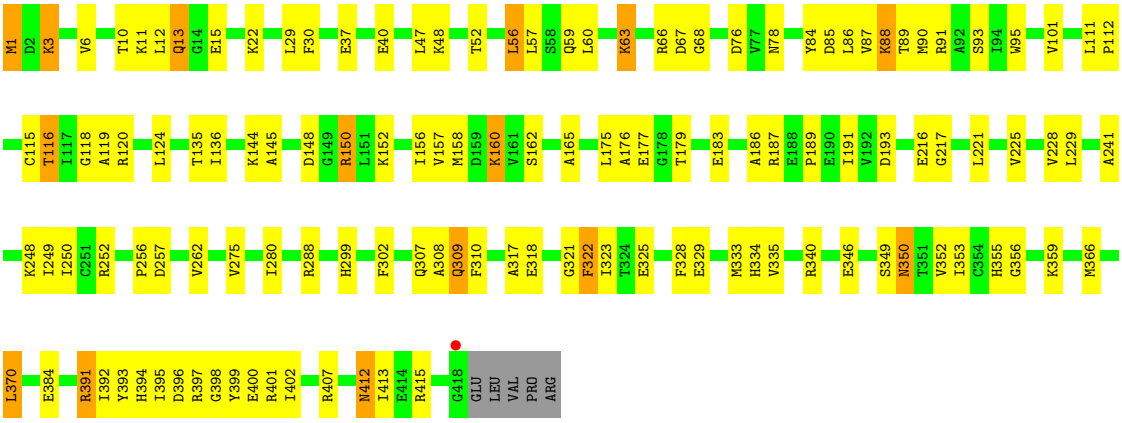
• Molecule 1: UDP-N-acetylglucosamine 1-carboxyvinyltransferase

Chain B:



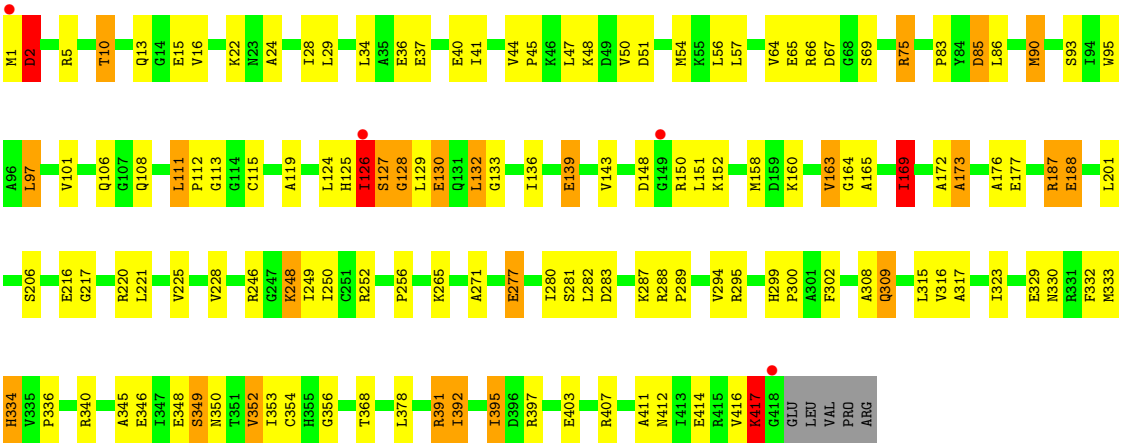
• Molecule 1: UDP-N-acetylglucosamine 1-carboxyvinyltransferase

Chain C:



• Molecule 1: UDP-N-acetylglucosamine 1-carboxyvinyltransferase

Chain D:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	65.13Å 80.37Å 84.87Å 108.69° 111.07° 101.17°	Depositor
Resolution (Å)	19.14 – 2.05 19.14 – 2.05	Depositor EDS
% Data completeness (in resolution range)	93.8 (19.14-2.05) 94.1 (19.14-2.05)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	0.07	Depositor
$< I/\sigma(I) >$ [1]	2.68 (at 2.06Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.191 , 0.271 0.189 , 0.265	Depositor DCC
R_{free} test set	4202 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å^2)	23.6	Xtriage
Anisotropy	0.293	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 27.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	13786	wwPDB-VP
Average B, all atoms (Å^2)	10.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.17% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: UDP, UDC, IAS

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	0.96	1/3179 (0.0%)	1.04	3/4304 (0.1%)
1	B	0.97	1/3262 (0.0%)	1.06	5/4411 (0.1%)
1	C	0.94	2/3202 (0.1%)	1.02	2/4334 (0.0%)
1	D	0.86	0/3197	1.08	11/4327 (0.3%)
All	All	0.93	4/12840 (0.0%)	1.05	21/17376 (0.1%)

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	B	0	1
1	D	0	2
All	All	0	3

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	262	VAL	CA-CB	7.07	1.63	1.54
1	B	352	VAL	CA-CB	5.81	1.61	1.54
1	C	335	VAL	CA-CB	5.58	1.57	1.54
1	A	352	VAL	CA-CB	5.36	1.60	1.54

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	127	SER	N-CA-C	-7.75	94.30	110.80
1	B	26	LEU	CA-C-N	-7.15	111.61	119.19
1	B	26	LEU	C-N-CA	-7.15	111.61	119.19

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	173	ALA	N-CA-C	-6.43	106.39	114.56
1	B	288	ARG	CA-C-N	-6.14	113.95	120.03
1	B	288	ARG	C-N-CA	-6.14	113.95	120.03
1	D	2	ASP	N-CA-C	6.01	123.61	110.80
1	C	370	LEU	N-CA-C	6.01	118.35	111.02
1	D	169	ILE	N-CA-C	-5.97	104.92	110.53
1	D	349	SER	CB-CA-C	-5.89	109.79	116.63
1	B	2	ASP	N-CA-C	-5.79	102.36	110.35
1	C	95	TRP	N-CA-C	5.78	119.95	113.01
1	D	132	LEU	N-CA-C	-5.70	103.13	110.19
1	D	302	PHE	CA-C-N	5.64	125.40	119.76
1	D	302	PHE	C-N-CA	5.64	125.40	119.76
1	D	163	VAL	CB-CA-C	-5.59	104.73	111.88
1	D	287	LYS	N-CA-C	5.28	117.85	109.24
1	A	188	GLU	CA-C-N	5.22	125.03	119.28
1	A	188	GLU	C-N-CA	5.22	125.03	119.28
1	A	370	LEU	N-CA-C	5.19	117.35	111.02
1	D	97	LEU	N-CA-C	5.14	116.57	110.97

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	66	ARG	Mainchain
1	D	113	GLY	Peptide
1	D	126	ILE	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	3139	0	3214	94	1
1	B	3185	0	3264	98	1
1	C	3153	0	3228	116	0
1	D	3149	0	3225	109	0
2	A	25	0	11	1	0
2	B	25	0	11	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	25	0	11	1	0
2	D	25	0	11	0	0
3	A	32	0	15	4	0
3	B	32	0	15	5	0
3	C	32	0	15	9	0
3	D	32	0	16	2	0
4	A	220	0	0	7	0
4	B	248	0	0	17	0
4	C	257	0	0	18	0
4	D	207	0	0	21	0
All	All	13786	0	13036	404	1

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 16.

All (404) 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:C:66:ARG:C	1:C:67:IAS:N	1.74	1.46
1:A:66:ARG:C	1:A:67:IAS:N	1.76	1.43
1:B:350:ASN:HB3	4:B:1012:HOH:O	1.36	1.26
1:D:66:ARG:C	1:D:67:IAS:N	1.94	1.25
1:C:116:THR:OG1	1:C:333:MET:HE1	1.45	1.15
1:A:66:ARG:C	1:A:67:IAS:H	1.47	1.10
1:D:1:MET:HG2	1:D:391:ARG:HH21	1.16	1.10
1:B:295:ARG:HD3	4:B:1201:HOH:O	1.52	1.09
1:C:88:LYS:HE2	1:C:112:PRO:HA	1.35	1.08
1:C:66:ARG:C	1:C:67:IAS:H	1.46	1.08
1:C:252:ARG:HG2	4:C:1220:HOH:O	1.52	1.08
1:D:172:ALA:C	4:D:1180:HOH:O	1.96	1.07
1:C:120:ARG:NH2	3:C:971[A]:UDC:OBV	1.86	1.07
1:D:133:GLY:N	4:D:1063:HOH:O	1.59	1.05
1:B:346:GLU:OE1	1:C:322[A]:PHE:CZ	2.12	1.03
1:C:391:ARG:HG2	1:C:391:ARG:HH11	1.22	0.99
1:D:1:MET:HG2	1:D:391:ARG:NH2	1.78	0.98
1:B:309:GLN:H	1:B:309:GLN:HE21	1.13	0.95
1:D:127:SER:C	4:D:1117:HOH:O	2.10	0.94
1:C:120:ARG:HH22	3:C:971[A]:UDC:HOBV	1.06	0.93
1:A:309:GLN:H	1:A:309:GLN:HE21	1.07	0.93
1:B:346:GLU:OE1	1:C:322[A]:PHE:HZ	1.50	0.92
1:D:309:GLN:H	1:D:309:GLN:HE21	1.14	0.90

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:119:ALA:HB3	4:D:1062:HOH:O	1.70	0.90
1:A:359:LYS:HE3	1:A:384:GLU:HG3	1.51	0.90
1:D:66:ARG:C	1:D:67:IAS:H2	1.80	0.89
1:C:116:THR:HG1	1:C:333:MET:HE1	1.36	0.84
1:B:359[A]:LYS:HZ2	1:B:384:GLU:HB2	1.40	0.84
1:C:13:GLN:OE1	4:C:1157:HOH:O	1.95	0.83
1:D:165:ALA:O	1:D:169:ILE:HD13	1.82	0.80
1:C:66:ARG:CA	1:C:67:IAS:N	2.44	0.80
1:C:396:ASP:OD2	1:C:415:ARG:NH2	2.14	0.79
1:C:391:ARG:HG2	1:C:391:ARG:NH1	1.90	0.78
1:B:99:PRO:HD3	4:B:1158:HOH:O	1.83	0.78
1:D:128:GLY:N	4:D:1117:HOH:O	2.15	0.78
1:C:87:VAL:HG12	1:C:88:LYS:HE3	1.66	0.78
1:D:66:ARG:C	1:D:67:IAS:H	1.90	0.77
1:D:130:GLU:N	4:D:1156:HOH:O	2.18	0.77
1:C:67:IAS:OD1	1:C:68:GLY:N	2.17	0.76
1:D:176:ALA:O	1:D:217:GLY:HA3	1.84	0.76
1:B:120:ARG:HH22	3:B:961[A]:UDC:CBU	1.99	0.76
1:B:346:GLU:OE1	1:C:322[A]:PHE:CE2	2.38	0.76
1:D:16:VAL:HG12	1:D:249:ILE:HD11	1.67	0.75
1:A:204:LYS:HD3	1:A:216:GLU:HB3	1.69	0.74
1:D:417:LYS:O	4:D:1153:HOH:O	2.05	0.74
1:D:124:LEU:HD11	1:D:160:LYS:HB2	1.68	0.74
1:C:66:ARG:CA	1:C:67:IAS:H	2.01	0.72
1:A:10:THR:HG21	1:A:411:ALA:HA	1.70	0.72
1:B:116:THR:HB	1:B:333:MET:HE1	1.71	0.72
1:C:91:ARG:HD3	4:C:1211:HOH:O	1.89	0.72
1:C:120:ARG:HH12	3:C:971[B]:UDC:HBUA	1.54	0.72
1:C:84:TYR:CZ	1:C:88:LYS:HG3	2.26	0.71
1:D:127:SER:O	1:D:130:GLU:HB2	1.90	0.71
1:D:129:LEU:C	4:D:1156:HOH:O	2.33	0.70
1:C:412:ASN:C	1:C:412:ASN:HD22	2.00	0.70
4:C:1112:HOH:O	1:D:139:GLU:HG2	1.91	0.70
4:C:1154:HOH:O	1:D:333:MET:HG2	1.91	0.69
1:C:84:TYR:CE1	1:C:88:LYS:HG3	2.26	0.69
1:D:126:ILE:HG22	1:D:136:ILE:HD13	1.75	0.69
1:C:359:LYS:HE3	1:C:384:GLU:OE2	1.93	0.69
1:A:351:THR:HG21	1:D:348:GLU:HG2	1.74	0.69
1:D:130:GLU:O	1:D:132:LEU:O	2.10	0.69
1:B:350:ASN:ND2	4:B:1200:HOH:O	2.25	0.69
1:C:59:GLN:HE22	1:C:86:LEU:CD2	2.06	0.69

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:248:LYS:HA	1:D:282:LEU:O	1.93	0.68
1:C:11:LYS:HZ3	1:C:13:GLN:HB3	1.56	0.68
1:D:64:VAL:O	1:D:65[A]:GLU:HG3	1.94	0.68
1:D:316:VAL:O	4:D:1181:HOH:O	2.10	0.68
1:A:366:MET:HG3	1:A:391:ARG:HD2	1.74	0.68
1:D:115:CYS:SG	4:D:1168:HOH:O	2.27	0.68
1:A:309:GLN:HE21	1:A:309:GLN:N	1.89	0.68
1:A:359:LYS:CE	1:A:384:GLU:HG3	2.23	0.67
1:C:59:GLN:HE22	1:C:86:LEU:HD23	1.59	0.67
1:B:322[B]:PHE:CE1	1:C:353:ILE:HG21	2.29	0.67
1:B:350:ASN:H	1:B:350:ASN:HD22	1.42	0.66
1:D:126:ILE:HG21	1:D:143:VAL:HG11	1.76	0.66
1:B:10:THR:HG21	1:B:411:ALA:HA	1.77	0.66
1:C:150:ARG:CZ	4:C:1080:HOH:O	2.44	0.66
1:C:309:GLN:H	1:C:309:GLN:HE21	1.41	0.66
1:C:11:LYS:HZ3	1:C:13:GLN:CB	2.08	0.66
1:D:173:ALA:N	4:D:1180:HOH:O	2.16	0.66
1:C:366:MET:HE1	1:C:391:ARG:NH1	2.11	0.66
1:B:46:LYS:NZ	1:B:67:IAS:OXT	2.29	0.65
1:B:184:ASN:ND2	4:B:1191:HOH:O	2.28	0.65
1:D:295:ARG:HD3	4:D:987:HOH:O	1.95	0.65
4:A:1078:HOH:O	1:B:333:MET:HG2	1.96	0.65
1:A:412:ASN:C	1:A:412:ASN:HD22	2.05	0.64
1:A:359:LYS:HE3	1:A:384:GLU:CG	2.27	0.64
1:A:261:ALA:HA	1:C:157:VAL:HG11	1.79	0.64
1:B:416:VAL:HG12	1:B:418:GLY:H	1.62	0.63
1:C:66:ARG:C	1:C:67:IAS:CA	2.69	0.63
1:B:334:HIS:CD2	1:B:334:HIS:H	2.16	0.63
1:A:13:GLN:HA	1:A:13:GLN:OE1	1.99	0.63
1:B:359[B]:LYS:HE2	1:B:384:GLU:HB2	1.79	0.63
1:B:116:THR:HB	1:B:333:MET:CE	2.28	0.63
1:D:34:LEU:HB3	1:D:221:LEU:HD12	1.81	0.63
1:B:124:LEU:HD11	1:B:160:LYS:HG3	1.81	0.62
1:B:322[B]:PHE:CD1	1:C:353:ILE:HD13	2.35	0.62
1:B:186:ALA:HB3	1:B:191:ILE:CD1	2.30	0.62
1:C:40:GLU:HB3	1:C:225:VAL:HG22	1.80	0.62
1:B:91:ARG:HG3	4:B:1120:HOH:O	1.99	0.62
1:A:66:ARG:C	1:A:67:IAS:CA	2.72	0.62
1:C:116:THR:OG1	1:C:333:MET:CE	2.35	0.62
1:C:120:ARG:NH2	3:C:971[A]:UDC:HOBV	1.80	0.62
1:B:359[A]:LYS:NZ	1:B:384:GLU:HB2	2.12	0.61

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:366:MET:CG	1:A:391:ARG:HD2	2.31	0.61
1:A:325:GLU:HG3	1:A:328:PHE:O	1.99	0.61
1:D:334:HIS:H	1:D:334:HIS:CD2	2.18	0.61
1:B:97:LEU:O	1:B:101:VAL:HG23	2.00	0.61
1:D:16:VAL:CG1	1:D:249:ILE:HD11	2.31	0.60
1:C:30:PHE:HE1	1:C:56:LEU:HD12	1.67	0.60
1:B:397:ARG:CZ	4:B:1185:HOH:O	2.49	0.60
1:A:52:THR:HG23	1:A:86:LEU:CD2	2.32	0.60
1:D:248:LYS:HE2	1:D:250:ILE:HD11	1.84	0.60
1:D:130:GLU:C	1:D:132:LEU:O	2.45	0.60
1:A:211:ASP:HB3	1:C:187:ARG:HH21	1.66	0.59
1:B:113:GLY:O	1:B:114:GLY:O	2.20	0.59
1:D:50:VAL:HG12	1:D:54:MET:HE2	1.84	0.59
1:A:309:GLN:H	1:A:309:GLN:NE2	1.90	0.59
1:D:5:ARG:NH1	1:D:414:GLU:OE1	2.35	0.59
1:A:330:ASN:HD21	1:A:333:MET:HE2	1.68	0.59
1:C:407:ARG:HD3	4:C:1001:HOH:O	2.02	0.59
1:B:116:THR:CB	1:B:333:MET:HE1	2.33	0.59
1:B:322[B]:PHE:HZ	1:C:355:HIS:CE1	2.21	0.59
1:B:30:PHE:HE1	1:B:56:LEU:HD13	1.68	0.58
1:C:334:HIS:H	1:C:334:HIS:CD2	2.21	0.58
1:D:22:LYS:HB2	1:D:47:LEU:CD1	2.33	0.58
1:B:322[B]:PHE:CE2	1:C:346:GLU:OE1	2.57	0.58
1:C:307:GLN:HG2	1:C:323:ILE:HG21	1.85	0.58
1:A:52:THR:CG2	1:A:86:LEU:HD23	2.34	0.58
1:A:334:HIS:H	1:A:334:HIS:CD2	2.20	0.58
1:C:22:LYS:HD2	1:C:398:GLY:HA2	1.86	0.57
1:A:50:VAL:O	1:A:54:MET:HG3	2.04	0.57
1:A:181:ILE:CD1	4:A:1155:HOH:O	2.52	0.57
1:C:30:PHE:HE1	1:C:56:LEU:CD1	2.17	0.57
1:D:36:GLU:HG2	1:D:220:ARG:HE	1.69	0.57
1:B:359[A]:LYS:HG2	1:B:360:LEU:O	2.04	0.57
1:C:6:VAL:HG13	1:C:413:ILE:HG12	1.87	0.57
1:B:407:ARG:HD3	4:B:1177:HOH:O	2.03	0.57
1:C:87:VAL:CG1	1:C:88:LYS:HE3	2.35	0.56
1:B:353:ILE:N	1:B:353:ILE:HD12	2.20	0.56
1:C:66:ARG:C	1:C:67:IAS:H2	2.03	0.56
1:C:391:ARG:HG3	1:C:393:TYR:HE1	1.69	0.56
1:C:302:PHE:HZ	1:C:310:PHE:CD1	2.23	0.56
1:A:124:LEU:HB2	2:A:950:UDP:O4	2.06	0.56
1:A:246:ARG:N	4:A:984:HOH:O	2.10	0.56

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:52:THR:CG2	1:A:86:LEU:CD2	2.85	0.55
1:C:350:ASN:ND2	4:C:1192:HOH:O	2.39	0.55
1:A:11:LYS:HZ1	1:A:13:GLN:HG2	1.70	0.55
1:A:116:THR:CG2	1:A:333:MET:HE3	2.35	0.55
1:C:186:ALA:HB3	1:C:191:ILE:CD1	2.36	0.55
1:D:22:LYS:NZ	3:D:981[A]:UDC:OBT	2.39	0.55
1:A:59:GLN:HE22	1:A:86:LEU:HD12	1.72	0.55
1:B:322[B]:PHE:HZ	1:C:355:HIS:HE1	1.53	0.55
1:C:150:ARG:HD3	1:C:175:LEU:O	2.07	0.55
1:D:334:HIS:HD2	4:D:1148:HOH:O	1.90	0.55
1:B:238:PHE:HB3	1:B:249:ILE:CD1	2.37	0.54
1:B:412:ASN:C	1:B:412:ASN:HD22	2.15	0.54
1:A:350:ASN:HD22	1:A:350:ASN:H	1.55	0.54
1:B:182:ILE:O	1:B:212:ARG:HA	2.06	0.54
1:B:309:GLN:HE21	1:B:309:GLN:N	1.94	0.54
1:C:84:TYR:CE1	1:C:88:LYS:CG	2.91	0.54
1:D:323:ILE:HB	1:D:352:VAL:HG13	1.90	0.54
1:C:391:ARG:HH11	1:C:391:ARG:CG	2.08	0.54
1:A:106:GLN:HE21	1:A:108:GLN:HE22	1.56	0.54
1:D:106:GLN:HE21	1:D:108:GLN:HE22	1.54	0.54
1:A:36:GLU:O	1:A:75:ARG:HG2	2.08	0.54
1:A:317:ALA:O	1:A:356:GLY:HA3	2.07	0.53
1:A:392:ILE:O	1:A:395:ILE:HG22	2.08	0.53
1:A:52:THR:HG23	1:A:86:LEU:HD23	1.89	0.53
1:D:163:VAL:HG22	1:D:188:GLU:CG	2.38	0.53
1:B:113:GLY:HA3	4:B:1034:HOH:O	2.08	0.53
1:A:150:ARG:HD3	1:A:175:LEU:O	2.09	0.53
1:A:13:GLN:O	1:A:409:LEU:HA	2.09	0.53
1:C:350:ASN:HD22	1:C:350:ASN:H	1.55	0.53
1:C:288:ARG:HD3	1:C:318:GLU:HG2	1.91	0.52
1:D:151:LEU:O	1:D:177:GLU:HG2	2.09	0.52
1:A:34:LEU:HB3	1:A:221:LEU:HD12	1.91	0.52
1:D:67:IAS:N	1:D:67:IAS:OD1	2.42	0.52
1:D:150:ARG:HH12	1:D:177:GLU:HB3	1.73	0.52
1:D:315:LEU:HD21	1:D:345:ALA:HB2	1.92	0.52
1:A:66:ARG:C	1:A:67:IAS:H2	2.05	0.52
1:A:119:ALA:HB1	1:B:336:PRO:HG3	1.90	0.52
1:C:317:ALA:O	1:C:356:GLY:HA3	2.08	0.52
1:A:13:GLN:OE1	1:A:248:LYS:HG2	2.10	0.52
1:B:51[B]:ASP:OD2	1:B:55:LYS:HE3	2.10	0.52
1:C:22:LYS:HE3	4:C:1222:HOH:O	2.09	0.51

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:370:LEU:HD22	4:C:1222:HOH:O	2.10	0.51
1:D:308:ALA:HA	1:D:334:HIS:CE1	2.46	0.51
1:C:288:ARG:CD	1:C:318:GLU:HG2	2.40	0.51
1:C:321:GLY:C	1:C:322[A]:PHE:CD1	2.89	0.51
1:C:308:ALA:HA	1:C:334:HIS:CE1	2.46	0.51
1:C:152:LYS:HA	1:C:177:GLU:HG3	1.93	0.51
1:D:299:HIS:CG	1:D:300:PRO:HA	2.46	0.51
1:A:162:SER:HB3	1:A:165:ALA:HB3	1.93	0.50
1:C:179:THR:OG1	1:C:216:GLU:OE2	2.21	0.50
1:A:139:GLU:HB2	1:A:144:LYS:HE3	1.93	0.50
1:B:9:PRO:HD3	1:B:384:GLU:OE1	2.10	0.50
1:B:133:GLY:HA3	4:B:1025:HOH:O	2.11	0.50
1:C:22:LYS:NZ	3:C:971[A]:UDC:OBP	2.44	0.50
1:C:48:LYS:HG3	4:C:1050:HOH:O	2.12	0.50
1:D:248:LYS:HD2	1:D:283:ASP:HB2	1.94	0.50
1:C:397:ARG:HD2	4:C:1196:HOH:O	2.11	0.50
1:D:277:GLU:OE2	4:D:1102:HOH:O	2.20	0.50
1:C:15:GLU:HG3	1:C:250:ILE:HB	1.93	0.50
1:B:158:MET:HE1	1:B:165:ALA:HB3	1.94	0.50
1:D:85:ASP:OD1	1:D:85:ASP:N	2.41	0.50
1:A:115:CYS:O	1:A:116:THR:C	2.55	0.49
1:B:315:LEU:HD23	1:B:354:CYS:HB3	1.94	0.49
1:C:85:ASP:O	1:C:89:THR:HG23	2.12	0.49
1:C:120:ARG:HH12	3:C:971[B]:UDC:CBU	2.23	0.49
1:C:395:ILE:HD11	1:C:402:ILE:HD13	1.95	0.49
1:A:276:GLY:O	1:A:277:GLU:C	2.55	0.49
1:A:346:GLU:O	1:A:353:ILE:HG12	2.12	0.49
1:B:295:ARG:NE	1:D:160:LYS:HE2	2.28	0.49
1:B:308:ALA:HA	1:B:334:HIS:CE1	2.47	0.49
1:D:111:LEU:HD23	1:D:112:PRO:HD2	1.93	0.49
1:D:83:PRO:HG2	1:D:86:LEU:HD12	1.94	0.48
1:A:150:ARG:HB2	4:A:969:HOH:O	2.12	0.48
1:A:175:LEU:HD21	1:A:221:LEU:HG	1.94	0.48
1:A:350:ASN:HD22	1:A:350:ASN:N	2.11	0.48
1:D:332:PHE:HE2	1:D:350:ASN:HA	1.77	0.48
1:A:204:LYS:HB2	1:A:216:GLU:HB3	1.96	0.48
1:A:295:ARG:HD2	1:C:160:LYS:HB3	1.95	0.48
1:B:148:ASP:C	1:B:148:ASP:OD1	2.56	0.48
1:B:120:ARG:HH22	3:B:961[A]:UDC:HBU	1.73	0.48
1:C:257:ASP:HB2	4:C:1155:HOH:O	2.13	0.48
1:D:248:LYS:HE2	1:D:250:ILE:CD1	2.42	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:116:THR:HG22	1:A:333:MET:HE3	1.94	0.48
1:C:52:THR:HG21	1:C:90:MET:HG2	1.96	0.48
1:B:322[B]:PHE:CZ	1:C:353:ILE:HG21	2.49	0.48
1:B:293:ASN:ND2	1:B:322[B]:PHE:CD2	2.82	0.47
1:C:115:CYS:HB3	1:C:118:GLY:O	2.13	0.47
1:C:101:VAL:CG2	1:C:145:ALA:HB3	2.44	0.47
1:D:64:VAL:C	1:D:65[A]:GLU:HG3	2.39	0.47
1:C:56:LEU:O	1:C:60:LEU:HG	2.15	0.47
1:C:394:HIS:HE1	4:C:1007:HOH:O	1.96	0.47
1:D:97:LEU:O	1:D:101:VAL:HG23	2.14	0.47
1:D:330:ASN:O	1:D:333:MET:HE2	2.15	0.47
1:C:13:GLN:NE2	1:C:248:LYS:HB3	2.30	0.47
1:D:24:ALA:HB3	1:D:228:VAL:HG13	1.97	0.47
1:B:120:ARG:NH2	3:B:961[A]:UDC:OBV	2.40	0.47
1:B:98:GLY:HA3	4:B:1158:HOH:O	2.15	0.47
1:D:416:VAL:HG12	1:D:417:LYS:N	2.30	0.47
1:A:33:LEU:HD21	1:A:57:LEU:HD12	1.97	0.46
1:B:211:ASP:HB3	1:D:187:ARG:HH12	1.80	0.46
1:C:30:PHE:CE1	1:C:56:LEU:HD12	2.49	0.46
1:C:309:GLN:HE21	1:C:309:GLN:N	2.11	0.46
1:D:353:ILE:HD12	1:D:353:ILE:N	2.29	0.46
1:D:125:HIS:CE1	1:D:164:GLY:C	2.93	0.46
1:A:263:LEU:HD12	4:A:1098:HOH:O	2.16	0.46
1:D:40:GLU:HB3	1:D:225:VAL:HG22	1.97	0.46
1:A:330:ASN:HB2	1:B:330:ASN:OD1	2.16	0.46
1:B:239:LEU:HD22	1:B:282:LEU:HB2	1.98	0.46
1:C:397:ARG:NH1	4:C:1222:HOH:O	2.48	0.46
1:D:28:ILE:CG2	1:D:41:ILE:HG12	2.46	0.46
1:A:52:THR:HG23	1:A:86:LEU:HD21	1.97	0.46
1:A:309:GLN:O	1:A:312:LEU:HB3	2.16	0.46
4:C:1215:HOH:O	1:D:119:ALA:HB2	2.16	0.46
1:C:119:ALA:N	1:C:329:GLU:OE2	2.43	0.45
1:D:66:ARG:O	1:D:67:IAS:N	2.41	0.45
1:A:370:LEU:HD21	1:A:398:GLY:HA3	1.98	0.45
1:B:1:MET:H1	1:B:393:TYR:HD2	1.64	0.45
1:D:250:ILE:HG13	1:D:281:SER:HB2	1.98	0.45
1:D:317:ALA:O	1:D:356:GLY:HA3	2.16	0.45
1:A:116:THR:HG23	1:A:333:MET:CE	2.46	0.45
1:B:63[C]:LYS:HB2	1:B:73:ASP:HB3	1.97	0.45
1:D:56:LEU:HD23	1:D:56:LEU:O	2.16	0.45
1:D:246:ARG:NH2	1:D:288:ARG:HD2	2.31	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:302:PHE:HZ	1:B:310:PHE:CD1	2.35	0.45
1:A:22:LYS:NZ	3:A:951[B]:UDC:OBT	2.49	0.45
1:B:59:GLN:HB3	4:B:1075:HOH:O	2.15	0.45
1:C:63:LYS:HZ1	1:C:76:ASP:HB2	1.81	0.45
1:A:249:ILE:HG12	1:A:250:ILE:H	1.80	0.45
1:A:333:MET:HE1	1:B:116:THR:HG22	1.99	0.45
1:B:155:HIS:CD2	1:B:181:ILE:HB	2.52	0.45
1:A:334:HIS:HD2	4:A:980:HOH:O	2.00	0.45
1:C:124:LEU:HD11	1:C:160:LYS:HG3	1.99	0.45
1:C:323:ILE:HB	1:C:352:VAL:CG1	2.47	0.45
1:A:116:THR:HG23	1:A:333:MET:HE3	1.98	0.44
1:D:403:GLU:O	1:D:407:ARG:HB2	2.17	0.44
1:C:22:LYS:HB2	1:C:47:LEU:CD1	2.47	0.44
1:A:294:VAL:HB	1:A:323:ILE:HD13	1.98	0.44
1:A:11:LYS:HE2	1:A:11:LYS:HB2	1.70	0.44
1:A:64:VAL:C	1:A:65:GLU:HG2	2.42	0.44
1:B:47:LEU:HD13	1:B:398:GLY:HA2	1.99	0.44
1:B:51[B]:ASP:OD1	4:B:1020:HOH:O	2.21	0.44
1:D:132:LEU:HD23	1:D:152:LYS:O	2.18	0.44
1:A:340:ARG:CZ	1:A:340:ARG:HB3	2.48	0.44
1:D:392:ILE:O	1:D:395:ILE:HG22	2.18	0.44
1:D:416:VAL:CG1	1:D:417:LYS:N	2.81	0.44
1:A:29:LEU:HD12	1:A:41:ILE:HD13	1.99	0.44
1:A:299:HIS:CG	1:A:300:PRO:HA	2.53	0.44
1:C:176:ALA:O	1:C:217:GLY:HA3	2.17	0.44
1:A:16:VAL:HG12	1:A:249:ILE:HD11	1.99	0.43
1:B:22:LYS:NZ	3:B:961[B]:UDC:OBT	2.51	0.43
1:C:175:LEU:HD21	1:C:221:LEU:HG	2.00	0.43
1:D:340:ARG:HB3	1:D:340:ARG:CZ	2.48	0.43
1:A:46:LYS:NZ	1:A:67:IAS:O	2.51	0.43
1:A:81:CYS:HA	1:A:108:GLN:O	2.18	0.43
1:A:92:ALA:O	1:A:95:TRP:HB2	2.18	0.43
1:A:249:ILE:HG12	1:A:250:ILE:N	2.33	0.43
1:B:353:ILE:HG21	1:C:322[A]:PHE:CZ	2.53	0.43
1:D:256:PRO:HG3	1:D:280:ILE:HG13	1.98	0.43
1:D:41:ILE:HG22	1:D:44:VAL:CG2	2.49	0.43
1:A:211:ASP:HB3	1:C:187:ARG:NH2	2.33	0.43
1:C:399:TYR:HB3	1:C:402:ILE:HB	2.00	0.43
1:B:48:LYS:HB3	1:B:397:ARG:HA	1.99	0.43
1:D:288:ARG:HG3	1:D:289:PRO:HD2	2.00	0.43
1:D:119:ALA:N	1:D:329:GLU:OE2	2.43	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:401:ARG:NE	4:A:1033:HOH:O	2.30	0.43
1:B:309:GLN:H	1:B:309:GLN:NE2	1.96	0.43
1:D:13:GLN:HA	1:D:248:LYS:O	2.18	0.43
1:A:330:ASN:O	1:A:330:ASN:CG	2.61	0.43
1:B:68:GLY:N	4:B:1155:HOH:O	2.51	0.43
1:C:333:MET:HG2	4:D:1176:HOH:O	2.18	0.43
1:A:152:LYS:HG2	1:A:177:GLU:HG2	2.01	0.43
1:C:3:LYS:HB3	1:C:3:LYS:HE3	1.64	0.43
1:C:48:LYS:HB3	1:C:397:ARG:HA	2.01	0.43
1:D:22:LYS:HB2	1:D:47:LEU:HD11	2.01	0.43
1:A:40:GLU:HB3	1:A:225:VAL:HG22	2.00	0.42
1:A:176:ALA:O	1:A:217:GLY:HA3	2.19	0.42
1:A:350:ASN:H	1:A:350:ASN:ND2	2.17	0.42
1:B:87:VAL:HG22	1:B:93:SER:OG	2.20	0.42
1:C:340:ARG:NH1	1:D:111:LEU:O	2.47	0.42
1:B:113:GLY:CA	4:B:1034:HOH:O	2.64	0.42
1:B:163:VAL:HA	1:B:191:ILE:HD11	2.01	0.42
1:B:46:LYS:O	1:B:47:LEU:HD23	2.18	0.42
1:B:364:GLN:NE2	4:B:1022:HOH:O	2.52	0.42
1:D:201:LEU:HB3	1:D:221:LEU:HB3	2.01	0.42
1:B:36:GLU:O	1:B:75:ARG:HG2	2.20	0.42
1:C:12:LEU:CD1	1:C:241:ALA:HB1	2.50	0.42
1:D:50:VAL:O	1:D:54:MET:HG3	2.20	0.42
1:C:189:PRO:HD3	1:C:299:HIS:CD2	2.55	0.42
1:D:271:ALA:HB1	1:D:282:LEU:HG	2.02	0.42
1:A:308:ALA:HA	1:A:334:HIS:CE1	2.55	0.42
1:C:158:MET:HE1	1:C:165:ALA:HB3	2.02	0.42
1:B:320:THR:HG22	1:B:322[B]:PHE:CE1	2.55	0.42
1:D:1:MET:HE1	4:D:1096:HOH:O	2.19	0.42
1:D:309:GLN:HE21	1:D:309:GLN:N	1.96	0.42
1:D:397:ARG:HD2	4:D:1120:HOH:O	2.20	0.42
1:D:93:SER:C	1:D:95:TRP:N	2.76	0.41
1:B:9:PRO:HD3	1:B:384:GLU:CD	2.45	0.41
1:B:125:HIS:CE1	1:B:164:GLY:C	2.98	0.41
1:B:158:MET:HE1	1:B:165:ALA:CB	2.49	0.41
1:B:213:ILE:HG22	1:B:215:ILE:CD1	2.51	0.41
1:C:256:PRO:HG3	1:C:280:ILE:HG12	2.02	0.41
1:D:51:ASP:HA	1:D:54:MET:HE3	2.02	0.41
1:D:252:ARG:NH2	4:D:1106:HOH:O	2.47	0.41
1:A:34:LEU:CB	1:A:221:LEU:HD12	2.51	0.41
1:A:64:VAL:HG13	1:A:72:ILE:HD13	2.02	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:181:ILE:HD12	1:A:181:ILE:N	2.35	0.41
1:B:340:ARG:CZ	1:B:340:ARG:HB3	2.51	0.41
1:B:4:PHE:CD2	1:B:392:ILE:HG12	2.56	0.41
1:C:391:ARG:NH1	4:C:1007:HOH:O	2.52	0.41
1:D:315:LEU:HD23	1:D:354:CYS:HB3	2.01	0.41
1:A:196:ASN:OD1	1:A:208:GLN:NE2	2.53	0.41
3:B:961[A]:UDC:HBU	3:B:961[A]:UDC:HBRA	1.76	0.41
1:C:325:GLU:HG3	1:C:328:PHE:O	2.20	0.41
1:B:22:LYS:HD3	1:B:398:GLY:HA2	2.02	0.41
1:B:307:GLN:HG2	1:B:323:ILE:HG21	2.03	0.41
1:B:139:GLU:HB2	4:B:1198:HOH:O	2.19	0.41
1:C:1:MET:HE3	1:C:391:ARG:HE	1.86	0.41
1:D:54:MET:HE1	1:D:66:ARG:HD2	2.02	0.41
1:D:130:GLU:HG2	4:D:1034:HOH:O	2.20	0.41
1:A:82:ALA:HB3	1:A:109:VAL:HG13	2.03	0.41
1:C:162:SER:OG	2:C:970:UDP:O2A	2.35	0.41
1:C:401:ARG:NH1	4:C:1091:HOH:O	2.48	0.41
1:D:36:GLU:CG	1:D:220:ARG:HE	2.34	0.41
1:D:45:PRO:HG2	1:D:47:LEU:CD1	2.51	0.41
1:D:173:ALA:CA	4:D:1180:HOH:O	2.65	0.41
1:D:36:GLU:O	1:D:75:ARG:HG2	2.20	0.41
1:D:333:MET:HB3	1:D:368:THR:HG21	2.03	0.41
1:D:412:ASN:HD22	1:D:412:ASN:C	2.28	0.41
1:A:147:VAL:HG21	1:A:151:LEU:CD2	2.52	0.40
1:B:55:LYS:HB3	1:B:86:LEU:HD11	2.03	0.40
1:D:90:MET:HB3	1:D:90:MET:HE3	1.74	0.40
1:A:95:TRP:O	1:A:99:PRO:HD2	2.21	0.40
1:B:16:VAL:CG1	1:B:249:ILE:HD11	2.51	0.40
1:C:136:ILE:HA	1:C:144:LYS:O	2.20	0.40
1:B:93:SER:C	1:B:95:TRP:N	2.78	0.40
1:B:213:ILE:HG22	1:B:215:ILE:HD11	2.02	0.40
1:C:323:ILE:HB	1:C:352:VAL:HG12	2.03	0.40
1:C:366:MET:HE1	1:C:391:ARG:CZ	2.51	0.40
1:D:349:SER:N	4:D:1178:HOH:O	2.43	0.40
1:A:36:GLU:C	1:A:75:ARG:HG2	2.46	0.40
1:A:311:THR:HG21	1:A:334:HIS:CE1	2.56	0.40
1:B:320:THR:HG22	1:B:322[B]:PHE:CZ	2.57	0.40
1:C:158:MET:HE2	1:C:158:MET:HB3	1.98	0.40
1:D:10:THR:HG21	1:D:411:ALA:HA	2.04	0.40
1:D:333:MET:O	1:D:336:PRO:HD2	2.22	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the sym-

metry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:358:GLU:OE2	1:B:10:THR:OG1[1_455]	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	A	415/423 (98%)	398 (96%)	16 (4%)	1 (0%)	44	38
1	B	424/423 (100%)	418 (99%)	4 (1%)	2 (0%)	25	17
1	C	417/423 (99%)	410 (98%)	6 (1%)	1 (0%)	44	38
1	D	417/423 (99%)	400 (96%)	13 (3%)	4 (1%)	13	6
All	All	1673/1692 (99%)	1626 (97%)	39 (2%)	8 (0%)	25	17

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	114	GLY
1	D	2	ASP
1	D	128	GLY
1	A	417	LYS
1	B	349	SER
1	C	93	SER
1	D	130	GLU
1	D	417	LYS

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	331/335 (99%)	299 (90%)	32 (10%)	6 2
1	B	340/335 (102%)	312 (92%)	28 (8%)	9 4
1	C	333/335 (99%)	300 (90%)	33 (10%)	6 2
1	D	333/335 (99%)	299 (90%)	34 (10%)	6 2
All	All	1337/1340 (100%)	1210 (90%)	127 (10%)	7 2

All (127) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	7	GLN
1	A	10	THR
1	A	11	LYS
1	A	13	GLN
1	A	29	LEU
1	A	39	VAL
1	A	56	LEU
1	A	57	LEU
1	A	85	ASP
1	A	86	LEU
1	A	99	PRO
1	A	101	VAL
1	A	111	LEU
1	A	140	GLU
1	A	147	VAL
1	A	158	MET
1	A	160	LYS
1	A	183	GLU
1	A	187	ARG
1	A	193	ASP
1	A	219	GLU
1	A	249	ILE
1	A	309	GLN
1	A	350	ASN
1	A	352	VAL
1	A	353	ILE
1	A	378	LEU
1	A	384	GLU
1	A	392	ILE
1	A	395	ILE
1	A	402	ILE

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	412	ASN
1	B	1	MET
1	B	7	GLN
1	B	10	THR
1	B	29	LEU
1	B	37	GLU
1	B	39	VAL
1	B	55	LYS
1	B	56	LEU
1	B	57	LEU
1	B	63[A]	LYS
1	B	63[B]	LYS
1	B	63[C]	LYS
1	B	85	ASP
1	B	108	GLN
1	B	126	ILE
1	B	183	GLU
1	B	277	GLU
1	B	309	GLN
1	B	323	ILE
1	B	349	SER
1	B	350	ASN
1	B	352	VAL
1	B	359[A]	LYS
1	B	359[B]	LYS
1	B	361	SER
1	B	378	LEU
1	B	392	ILE
1	B	412	ASN
1	C	1	MET
1	C	3	LYS
1	C	10	THR
1	C	13	GLN
1	C	29	LEU
1	C	37	GLU
1	C	56	LEU
1	C	57	LEU
1	C	63	LYS
1	C	78	ASN
1	C	88	LYS
1	C	111	LEU
1	C	116	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	135	THR
1	C	148	ASP
1	C	150	ARG
1	C	156	ILE
1	C	160	LYS
1	C	183	GLU
1	C	193	ASP
1	C	228	VAL
1	C	229	LEU
1	C	249	ILE
1	C	275	VAL
1	C	309	GLN
1	C	322[A]	PHE
1	C	322[B]	PHE
1	C	349	SER
1	C	350	ASN
1	C	391	ARG
1	C	392	ILE
1	C	400	GLU
1	C	412	ASN
1	D	2	ASP
1	D	10	THR
1	D	15	GLU
1	D	29	LEU
1	D	37	GLU
1	D	48	LYS
1	D	57	LEU
1	D	69	SER
1	D	75	ARG
1	D	85	ASP
1	D	90	MET
1	D	111	LEU
1	D	126	ILE
1	D	139	GLU
1	D	148	ASP
1	D	158	MET
1	D	169	ILE
1	D	187	ARG
1	D	188	GLU
1	D	206	SER
1	D	216	GLU
1	D	248	LYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	D	265	LYS
1	D	277	GLU
1	D	294	VAL
1	D	309	GLN
1	D	334	HIS
1	D	346	GLU
1	D	352	VAL
1	D	378	LEU
1	D	391	ARG
1	D	392	ILE
1	D	395	ILE
1	D	417	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (42) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	7	GLN
1	A	106	GLN
1	A	184	ASN
1	A	253	ASN
1	A	293	ASN
1	A	309	GLN
1	A	330	ASN
1	A	334	HIS
1	A	350	ASN
1	A	412	ASN
1	B	155	HIS
1	B	184	ASN
1	B	255	GLN
1	B	293	ASN
1	B	307	GLN
1	B	309	GLN
1	B	330	ASN
1	B	334	HIS
1	B	350	ASN
1	B	364	GLN
1	B	412	ASN
1	C	13	GLN
1	C	59	GLN
1	C	131	GLN
1	C	184	ASN
1	C	253	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	293	ASN
1	C	309	GLN
1	C	334	HIS
1	C	350	ASN
1	C	394	HIS
1	C	412	ASN
1	D	42	GLN
1	D	108	GLN
1	D	131	GLN
1	D	184	ASN
1	D	253	ASN
1	D	293	ASN
1	D	309	GLN
1	D	334	HIS
1	D	350	ASN
1	D	412	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains (i)

4 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
1	IAS	B	67	1	6,7,8	1.10	0	3,8,10	0.93	0
1	IAS	A	67	1	6,7,8	1.11	0	3,8,10	1.18	0
1	IAS	D	67	1	6,7,8	0.95	0	3,8,10	1.26	0
1	IAS	C	67	1	6,7,8	1.03	0	3,8,10	0.63	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
1	IAS	B	67	1	-	1/7/7/8	-
1	IAS	A	67	1	-	1/7/7/8	-
1	IAS	D	67	1	-	2/7/7/8	-
1	IAS	C	67	1	-	0/7/7/8	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	D	67	IAS	N-CA-CB-CG
1	D	67	IAS	C-CA-CB-CG
1	A	67	IAS	O-C-CA-N
1	B	67	IAS	N-CA-CB-CG

There are no ring outliers.

4 monomers are involved in 18 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	B	67	IAS	1	0
1	A	67	IAS	5	0
1	D	67	IAS	5	0
1	C	67	IAS	7	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

12 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the

expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
3	UDC	C	971[A]	-	21,23,24	1.58	2 (9%)	23,33,35	2.05	4 (17%)
3	UDC	B	961[A]	-	21,23,24	1.76	5 (23%)	23,33,35	1.42	4 (17%)
2	UDP	A	950	3	25,26,26	1.62	7 (28%)	38,40,40	1.91	10 (26%)
2	UDP	C	970	3	25,26,26	1.65	6 (24%)	38,40,40	2.17	10 (26%)
3	UDC	A	951[A]	-	21,23,24	1.80	4 (19%)	23,33,35	1.41	2 (8%)
2	UDP	D	980	3	25,26,26	1.49	3 (12%)	38,40,40	1.72	7 (18%)
3	UDC	B	961[B]	-	21,23,24	1.24	2 (9%)	23,33,35	1.20	3 (13%)
2	UDP	B	960	3	25,26,26	1.38	2 (8%)	38,40,40	1.78	8 (21%)
3	UDC	A	951[B]	-	21,23,24	1.24	2 (9%)	23,33,35	1.02	1 (4%)
3	UDC	C	971[B]	-	21,23,24	1.15	1 (4%)	23,33,35	1.47	2 (8%)
3	UDC	D	981[A]	-	21,23,24	1.84	6 (28%)	23,33,35	1.78	7 (30%)
3	UDC	D	981[B]	-	21,23,24	1.53	4 (19%)	23,33,35	1.65	5 (21%)

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	UDC	C	971[A]	-	-	6/24/42/45	0/1/1/1
3	UDC	B	961[A]	-	-	8/24/42/45	0/1/1/1
2	UDP	A	950	3	-	4/16/32/32	0/2/2/2
2	UDP	C	970	3	-	4/16/32/32	0/2/2/2
3	UDC	A	951[A]	-	-	7/24/42/45	0/1/1/1
2	UDP	D	980	3	-	4/16/32/32	0/2/2/2
3	UDC	B	961[B]	-	-	4/24/42/45	0/1/1/1
2	UDP	B	960	3	-	4/16/32/32	0/2/2/2
3	UDC	A	951[B]	-	-	2/24/42/45	0/1/1/1
3	UDC	C	971[B]	-	-	7/24/42/45	0/1/1/1
3	UDC	D	981[A]	-	-	1/24/42/45	0/1/1/1
3	UDC	D	981[B]	-	-	8/24/42/45	0/1/1/1

All (44) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	951[A]	UDC	OBT-CBS	-5.34	1.34	1.43
3	B	961[A]	UDC	OBT-CBS	-5.14	1.35	1.43
3	C	971[A]	UDC	OBT-CBS	-4.41	1.36	1.43
3	D	981[A]	UDC	OBT-CBS	-3.96	1.37	1.43
2	B	960	UDP	PB-O1B	3.52	1.61	1.50
3	D	981[A]	UDC	O3-C3	3.51	1.46	1.42
3	D	981[B]	UDC	O3-C3	3.51	1.46	1.42
2	A	950	UDP	PB-O1B	3.44	1.61	1.50
2	C	970	UDP	PB-O1B	3.30	1.60	1.50
2	D	980	UDP	PB-O1B	3.30	1.60	1.50
2	D	980	UDP	PA-O3A	-3.17	1.56	1.59
2	C	970	UDP	C6-C5	3.07	1.42	1.35
3	B	961[A]	UDC	O3-C3	2.81	1.45	1.42
3	B	961[B]	UDC	O3-C3	2.81	1.45	1.42
3	B	961[A]	UDC	CBU-CBS	-2.71	1.47	1.51
3	D	981[A]	UDC	CBU-CBS	-2.62	1.47	1.51
2	C	970	UDP	PA-O5'	-2.61	1.49	1.59
2	A	950	UDP	O4'-C1'	2.58	1.48	1.42
2	C	970	UDP	O4'-C1'	2.57	1.47	1.42
3	A	951[A]	UDC	CBU-CBS	-2.57	1.47	1.51
2	C	970	UDP	PB-O3B	-2.57	1.45	1.54
3	A	951[A]	UDC	C2-N2	2.55	1.50	1.46
3	A	951[B]	UDC	C2-N2	2.55	1.50	1.46
2	B	960	UDP	PB-O3B	-2.52	1.45	1.54
3	A	951[A]	UDC	O5-C1	2.51	1.47	1.43
3	A	951[B]	UDC	O5-C1	2.51	1.47	1.43
3	D	981[A]	UDC	O5-C5	-2.50	1.38	1.43
3	D	981[B]	UDC	O5-C5	-2.50	1.38	1.43
2	D	980	UDP	C6-C5	2.48	1.40	1.35
2	A	950	UDP	PB-O2B	-2.46	1.45	1.54
3	C	971[A]	UDC	C6-C5	2.42	1.59	1.51
3	C	971[B]	UDC	C6-C5	2.42	1.59	1.51
3	D	981[A]	UDC	C8-C7	2.37	1.55	1.50
3	D	981[B]	UDC	C8-C7	2.37	1.55	1.50
2	A	950	UDP	C6-C5	2.36	1.40	1.35
2	A	950	UDP	C5'-C4'	2.34	1.58	1.51
3	D	981[A]	UDC	C2-N2	2.22	1.49	1.46
3	D	981[B]	UDC	C2-N2	2.22	1.49	1.46
2	A	950	UDP	PB-O3B	-2.20	1.46	1.54
3	B	961[A]	UDC	CBR-CBN	2.17	1.55	1.52
3	B	961[A]	UDC	O5-C5	2.11	1.47	1.43
3	B	961[B]	UDC	O5-C5	2.11	1.47	1.43
2	C	970	UDP	PA-O1A	-2.11	1.43	1.50

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	950	UDP	O4'-C4'	2.04	1.49	1.45

All (63) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	970	UDP	C4-N3-C2	-6.26	118.84	126.61
2	C	970	UDP	N3-C2-N1	6.08	122.81	114.89
3	C	971[A]	UDC	OBT-CBS-CBU	-5.79	97.88	109.00
2	B	960	UDP	C4-N3-C2	-5.52	119.76	126.61
2	A	950	UDP	C4-N3-C2	-5.23	120.12	126.61
3	C	971[A]	UDC	C1-O5-C5	5.13	119.07	112.19
3	C	971[B]	UDC	C1-O5-C5	5.13	119.07	112.19
2	D	980	UDP	C5-C4-N3	4.97	121.76	114.80
3	A	951[A]	UDC	OBT-CBS-CBU	-4.72	99.95	109.00
2	D	980	UDP	C4-N3-C2	-4.71	120.76	126.61
2	A	950	UDP	C5-C4-N3	4.23	120.73	114.80
2	B	960	UDP	C5-C4-N3	4.19	120.67	114.80
2	B	960	UDP	N3-C2-N1	3.94	120.02	114.89
2	A	950	UDP	O3B-PB-O2B	3.85	122.23	107.80
2	C	970	UDP	C5-C4-N3	3.84	120.17	114.80
3	C	971[A]	UDC	O3-CBN-CBO	-3.78	100.65	108.72
2	A	950	UDP	N3-C2-N1	3.74	119.76	114.89
2	C	970	UDP	O3B-PB-O2B	3.66	121.54	107.80
2	C	970	UDP	O4-C4-C5	-3.63	118.91	125.16
2	B	960	UDP	O3B-PB-O2B	3.58	121.21	107.80
2	A	950	UDP	O4'-C1'-N1	-3.44	100.57	108.36
2	D	980	UDP	O3B-PB-O2B	3.41	120.58	107.80
3	D	981[A]	UDC	C4-C3-C2	-3.41	105.24	111.18
3	D	981[B]	UDC	C4-C3-C2	-3.41	105.24	111.18
3	D	981[A]	UDC	OBT-CBS-CBU	-3.37	102.54	109.00
3	B	961[A]	UDC	OBT-CBS-CBU	-3.23	102.81	109.00
3	B	961[A]	UDC	O3-CBN-CBO	-3.18	101.93	108.72
3	D	981[A]	UDC	C1-O5-C5	3.16	116.42	112.19
3	D	981[B]	UDC	C1-O5-C5	3.16	116.42	112.19
2	D	980	UDP	N3-C2-N1	3.04	118.85	114.89
2	A	950	UDP	O3A-PB-O1B	-2.93	95.61	111.04
3	B	961[B]	UDC	O3-CBN-CBO	-2.92	102.48	108.72
3	D	981[A]	UDC	O3-C3-C4	2.77	115.40	109.82
3	D	981[B]	UDC	O3-C3-C4	2.77	115.40	109.82
2	A	950	UDP	O2A-PA-O3A	2.74	114.68	107.27
2	D	980	UDP	O2B-PB-O3A	2.68	113.63	104.64
2	C	970	UDP	C1'-N1-C2	2.61	122.29	117.59

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	950	UDP	O2-C2-N1	-2.60	119.41	122.80
2	C	970	UDP	O3A-PB-O1B	-2.60	97.35	111.04
2	A	950	UDP	O4-C4-C5	-2.59	120.69	125.16
3	B	961[A]	UDC	O5-C1-C2	-2.56	107.33	111.29
3	B	961[B]	UDC	O5-C1-C2	-2.56	107.33	111.29
2	B	960	UDP	O4-C4-C5	-2.52	120.82	125.16
2	B	960	UDP	O3A-PB-O1B	-2.47	98.04	111.04
2	C	970	UDP	O2-C2-N1	-2.43	119.63	122.80
3	D	981[A]	UDC	O3-CBN-CBO	-2.34	103.71	108.72
3	D	981[A]	UDC	O3-C3-C2	-2.34	102.46	107.89
3	D	981[B]	UDC	O3-C3-C2	-2.34	102.46	107.89
3	B	961[A]	UDC	C4-C3-C2	-2.29	107.19	111.18
3	B	961[B]	UDC	C4-C3-C2	-2.29	107.19	111.18
2	D	980	UDP	O3B-PB-O1B	-2.17	102.39	110.83
3	C	971[A]	UDC	O4-C4-C5	-2.15	104.03	109.32
3	C	971[B]	UDC	O4-C4-C5	-2.15	104.03	109.32
2	C	970	UDP	O2-C2-N3	-2.13	117.56	121.49
3	A	951[A]	UDC	O3-C3-C4	2.12	114.08	109.82
3	A	951[B]	UDC	O3-C3-C4	2.12	114.08	109.82
2	C	970	UDP	C6-N1-C2	-2.11	118.43	121.00
3	D	981[A]	UDC	O5-C5-C6	-2.11	103.55	107.66
3	D	981[B]	UDC	O5-C5-C6	-2.11	103.55	107.66
2	B	960	UDP	O2-C2-N1	-2.08	120.08	122.80
2	B	960	UDP	O2B-PB-O3A	2.07	111.59	104.64
2	D	980	UDP	O4-C4-C5	-2.05	121.64	125.16
2	A	950	UDP	O2B-PB-O3A	2.02	111.42	104.64

There are no chirality outliers.

All (59) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	950	UDP	C5'-O5'-PA-O1A
2	A	950	UDP	C5'-O5'-PA-O2A
2	A	950	UDP	C5'-O5'-PA-O3A
2	B	960	UDP	C5'-O5'-PA-O1A
2	B	960	UDP	C5'-O5'-PA-O2A
2	B	960	UDP	C5'-O5'-PA-O3A
2	C	970	UDP	C5'-O5'-PA-O1A
2	C	970	UDP	C5'-O5'-PA-O2A
2	C	970	UDP	C5'-O5'-PA-O3A
2	D	980	UDP	C5'-O5'-PA-O1A
2	D	980	UDP	C5'-O5'-PA-O2A

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
2	D	980	UDP	C5'-O5'-PA-O3A
3	A	951[A]	UDC	O3-CBN-CBO-OBQ
3	A	951[A]	UDC	CBN-CBS-CBU-OBV
3	A	951[A]	UDC	OBT-CBS-CBU-OBV
3	B	961[A]	UDC	O3-CBN-CBS-OBT
3	B	961[A]	UDC	O3-CBN-CBS-CBU
3	B	961[A]	UDC	CBO-CBN-CBS-CBU
3	B	961[A]	UDC	CBN-CBS-CBU-OBV
3	B	961[A]	UDC	OBT-CBS-CBU-OBV
3	B	961[B]	UDC	O3-CBN-CBO-OBP
3	B	961[B]	UDC	O3-CBN-CBO-OBQ
3	B	961[B]	UDC	CBS-CBN-CBO-OBQ
3	C	971[A]	UDC	O3-CBN-CBO-OBQ
3	C	971[A]	UDC	O3-CBN-CBS-CBU
3	C	971[A]	UDC	CBO-CBN-CBS-CBU
3	C	971[A]	UDC	CBN-CBS-CBU-OBV
3	C	971[A]	UDC	OBT-CBS-CBU-OBV
3	C	971[B]	UDC	O3-CBN-CBS-OBT
3	C	971[B]	UDC	O3-CBN-CBS-CBU
3	C	971[B]	UDC	CBO-CBN-CBS-OBT
3	C	971[B]	UDC	CBO-CBN-CBS-CBU
3	C	971[B]	UDC	CBR-CBN-CBS-OBT
3	C	971[B]	UDC	CBR-CBN-CBS-CBU
3	D	981[B]	UDC	O3-CBN-CBS-CBU
3	D	981[B]	UDC	CBN-CBS-CBU-OBV
3	D	981[B]	UDC	OBT-CBS-CBU-OBV
3	D	981[A]	UDC	C4-C5-C6-O6
3	D	981[B]	UDC	C4-C5-C6-O6
3	D	981[B]	UDC	CBR-CBN-O3-C3
3	D	981[B]	UDC	O3-CBN-CBS-OBT
3	D	981[B]	UDC	CBO-CBN-CBS-CBU
3	B	961[A]	UDC	C4-C5-C6-O6
3	B	961[B]	UDC	C4-C5-C6-O6
3	A	951[A]	UDC	CBR-CBN-CBO-OBQ
2	A	950	UDP	PB-O3A-PA-O2A
2	B	960	UDP	PB-O3A-PA-O1A
2	C	970	UDP	PB-O3A-PA-O2A
2	D	980	UDP	PB-O3A-PA-O2A
3	B	961[A]	UDC	CBR-CBN-CBS-CBU
3	A	951[A]	UDC	CBS-CBN-O3-C3
3	A	951[A]	UDC	O3-CBN-CBO-OBP
3	A	951[B]	UDC	CBS-CBN-O3-C3

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
3	B	961[A]	UDC	CBS-CBN-O3-C3
3	C	971[A]	UDC	O3-CBN-CBO-OBP
3	C	971[B]	UDC	CBS-CBN-O3-C3
3	D	981[B]	UDC	CBS-CBN-O3-C3
3	A	951[A]	UDC	C4-C5-C6-O6
3	A	951[B]	UDC	C4-C5-C6-O6

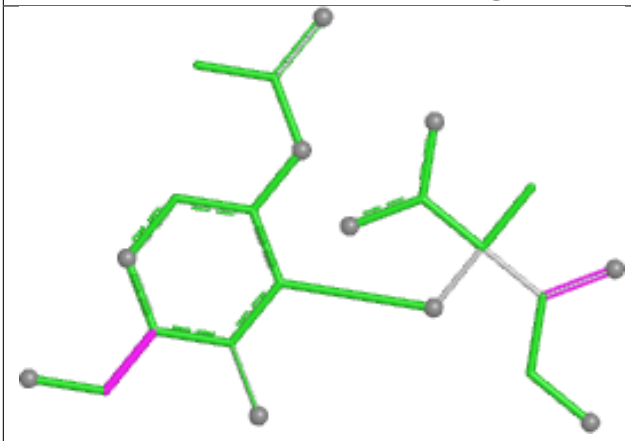
There are no ring outliers.

9 monomers are involved in 22 short contacts:

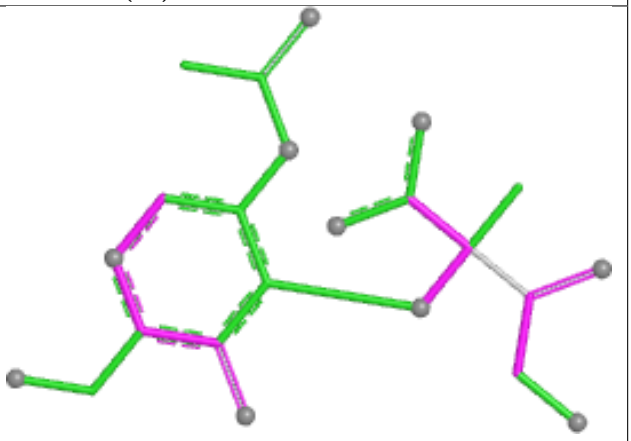
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	971[A]	UDC	5	0
3	B	961[A]	UDC	4	0
2	A	950	UDP	1	0
2	C	970	UDP	1	0
3	A	951[A]	UDC	3	0
3	B	961[B]	UDC	1	0
3	A	951[B]	UDC	1	0
3	C	971[B]	UDC	4	0
3	D	981[A]	UDC	2	0

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.

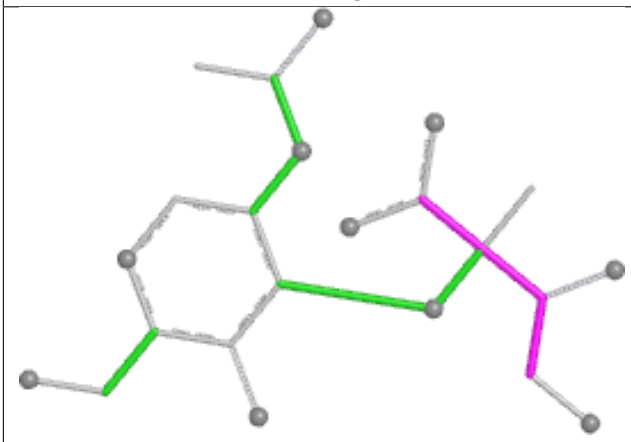
Ligand UDC C 971 (A)



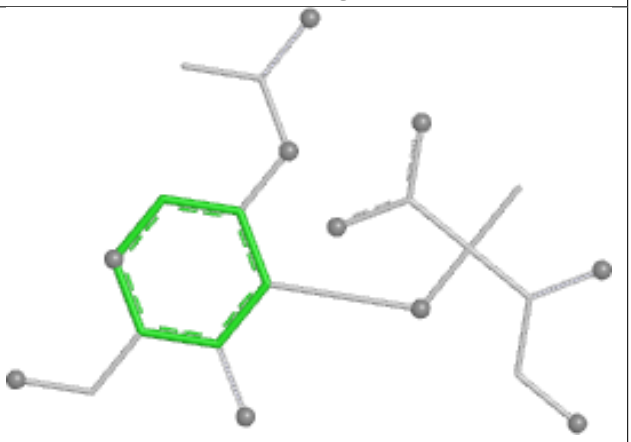
Bond lengths



Bond angles

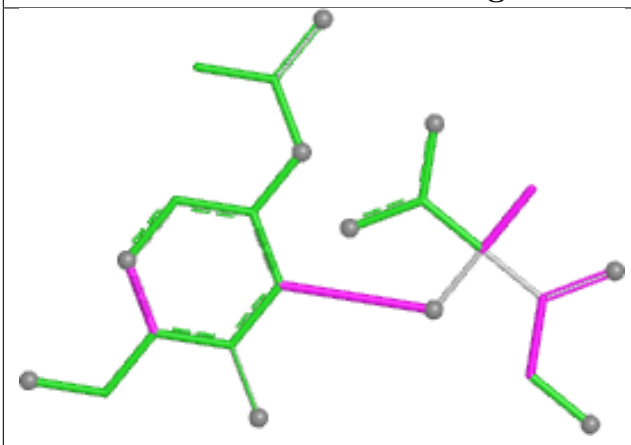


Torsions

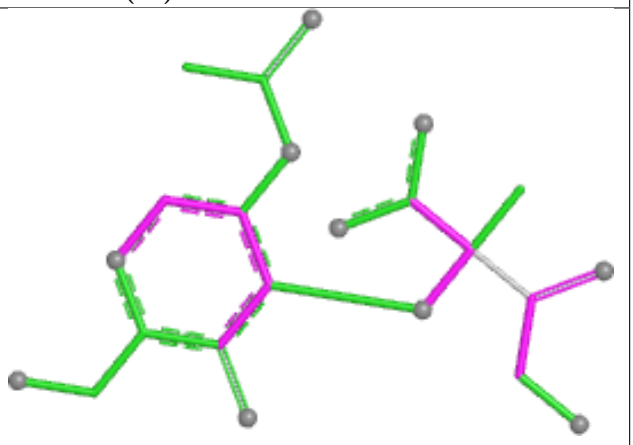


Rings

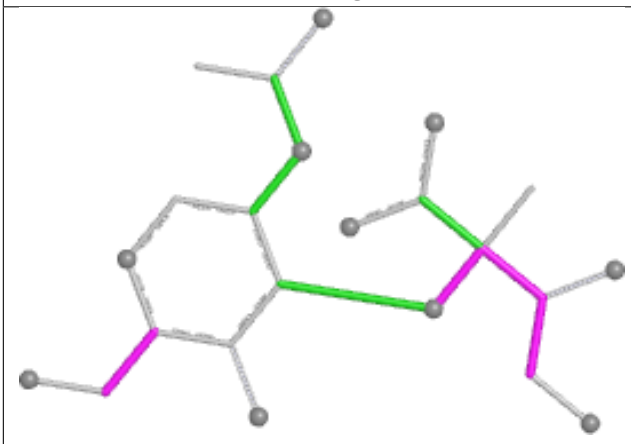
Ligand UDC B 961 (A)



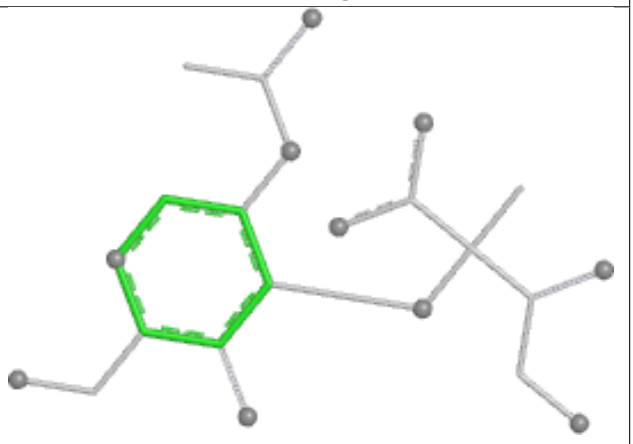
Bond lengths



Bond angles

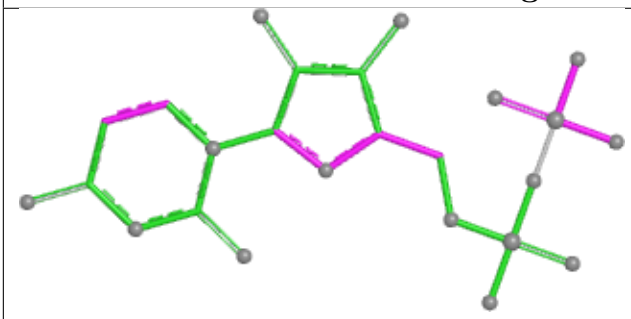


Torsions

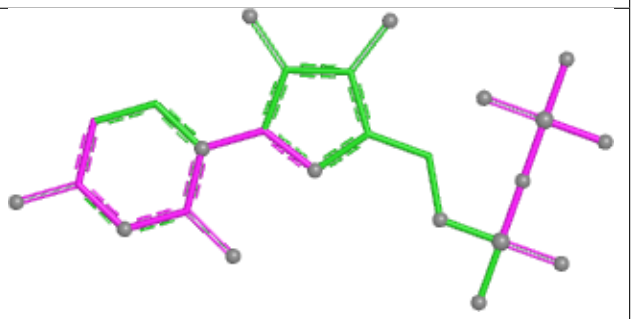


Rings

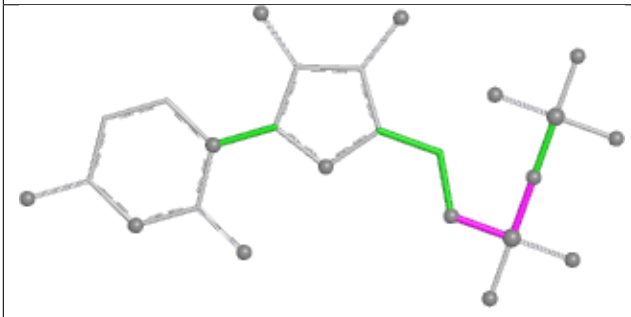
Ligand UDP A 950



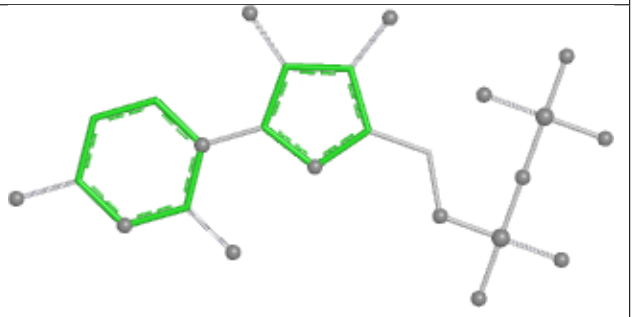
Bond lengths



Bond angles

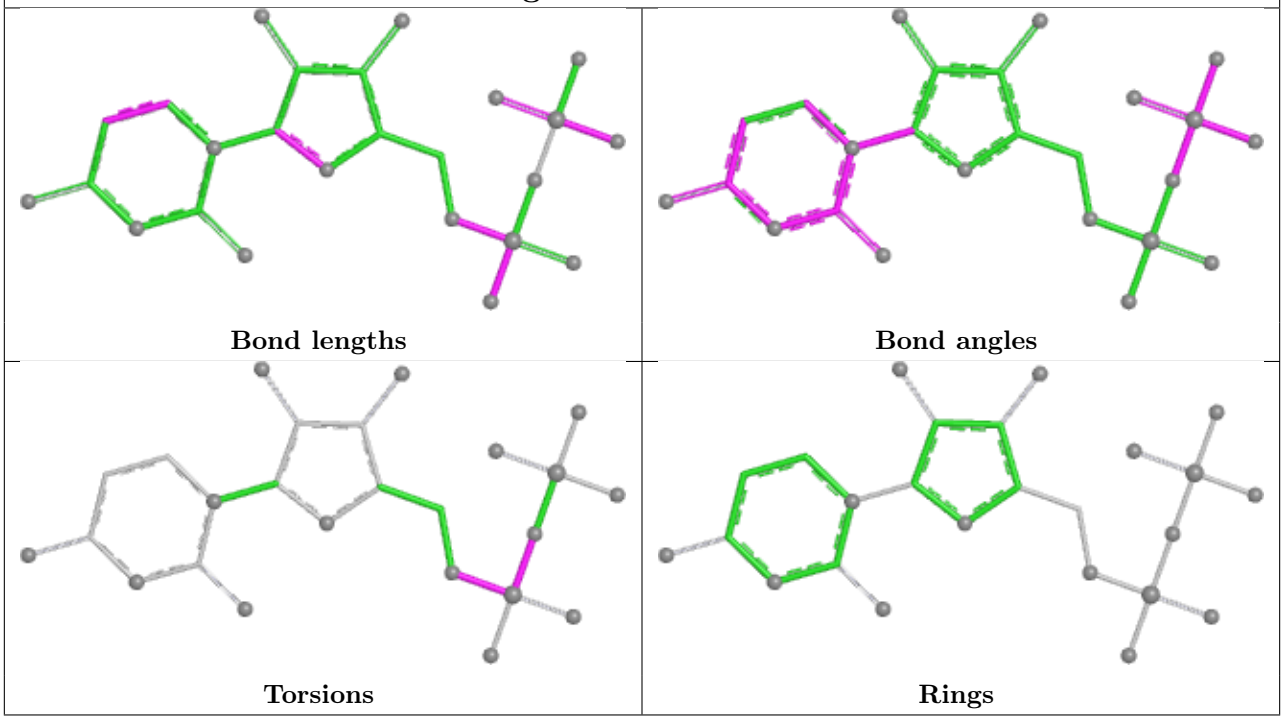


Torsions

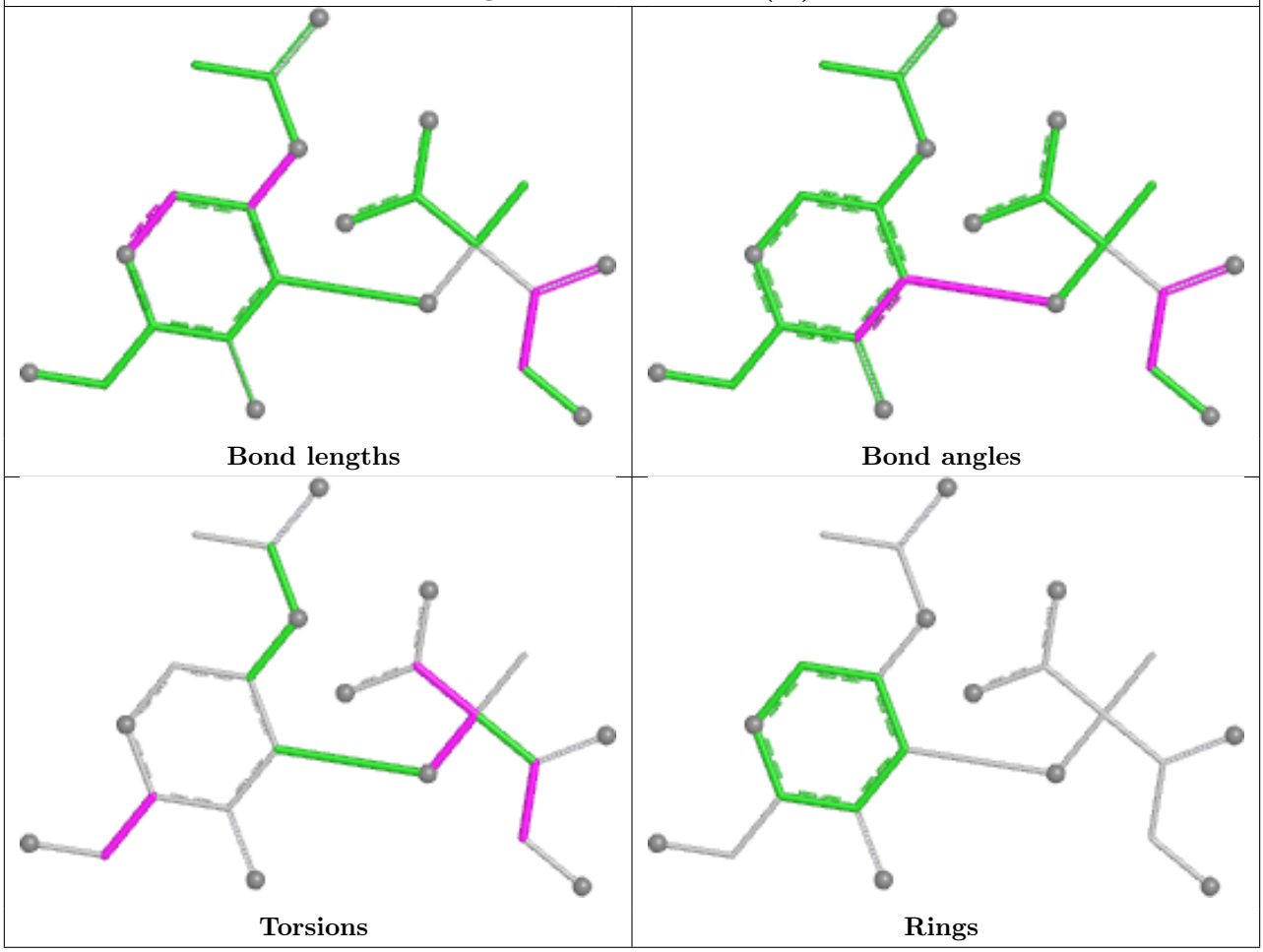


Rings

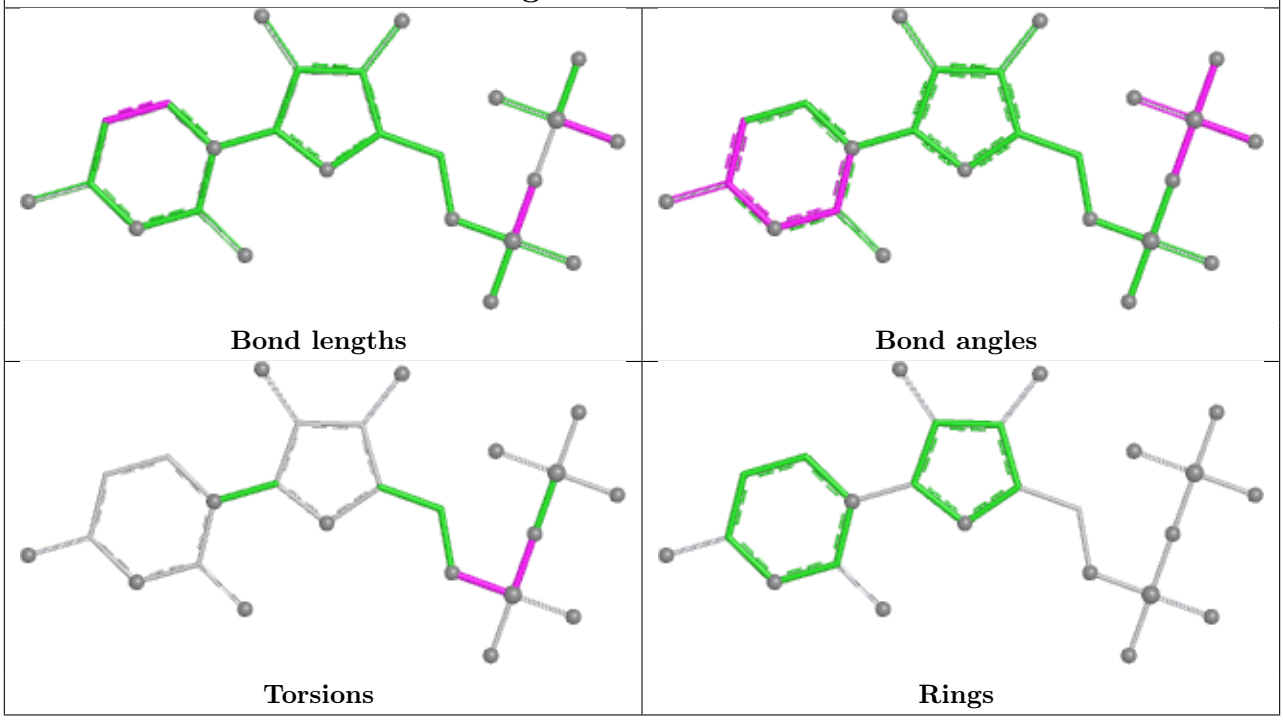
Ligand UDP C 970



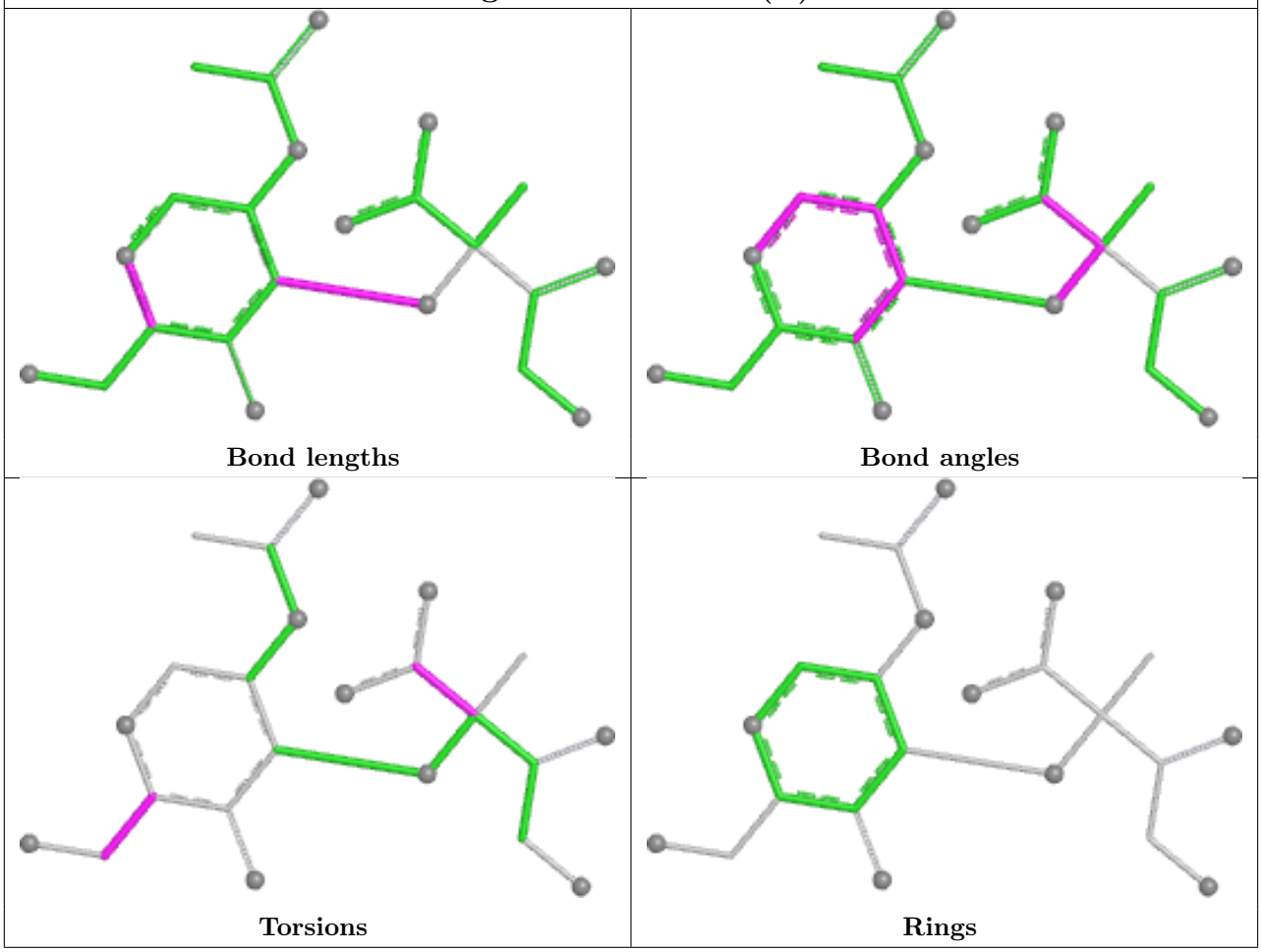
Ligand UDC A 951 (A)



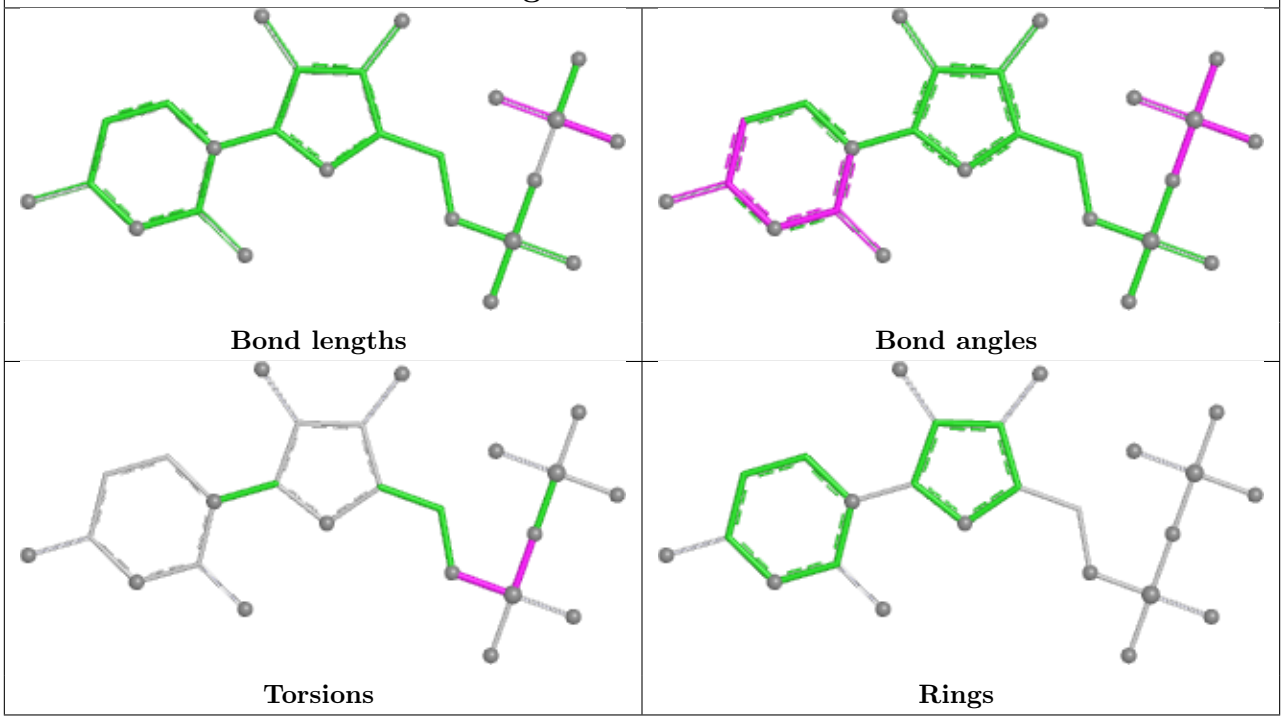
Ligand UDP D 980



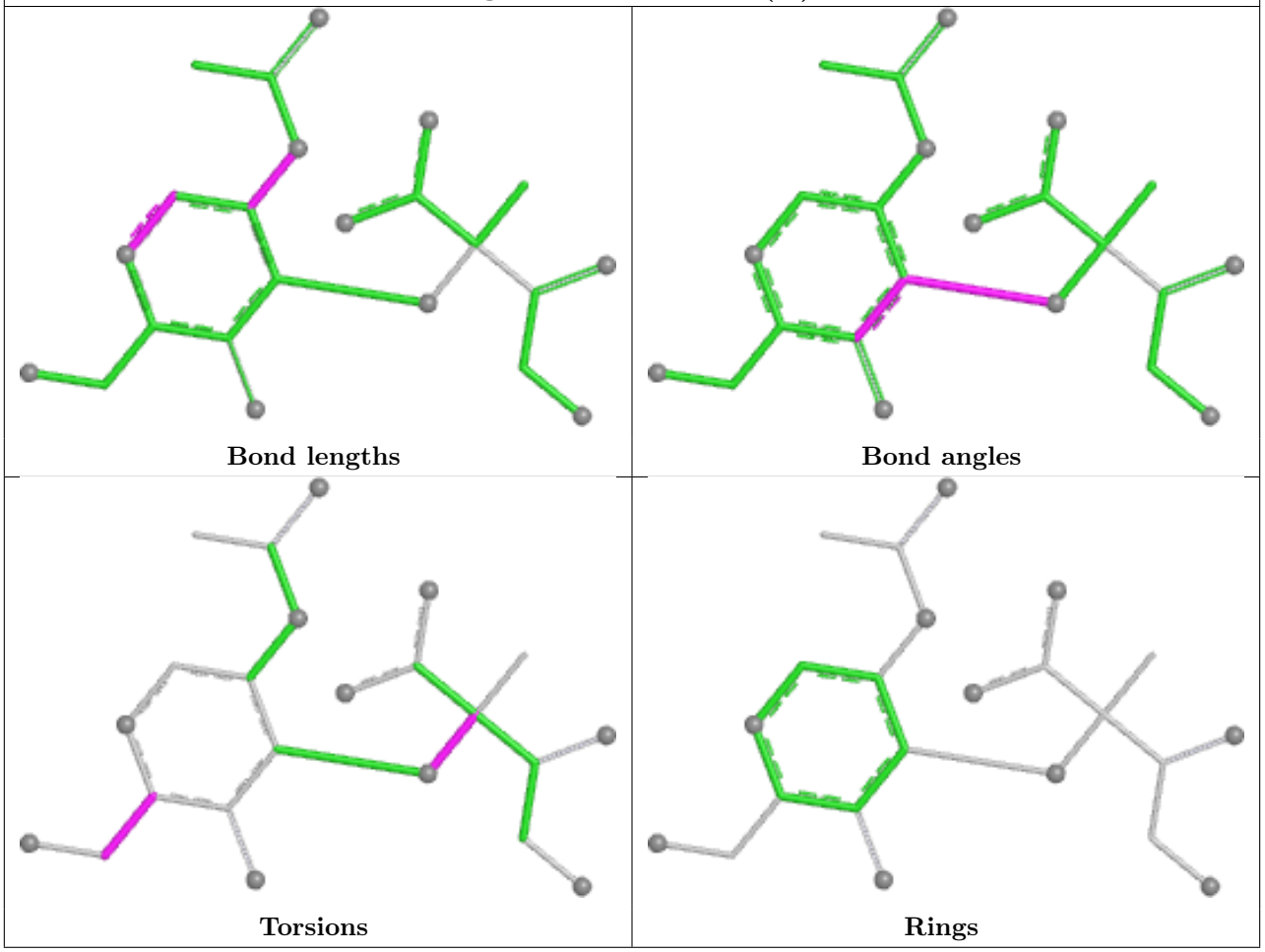
Ligand UDC B 961 (B)



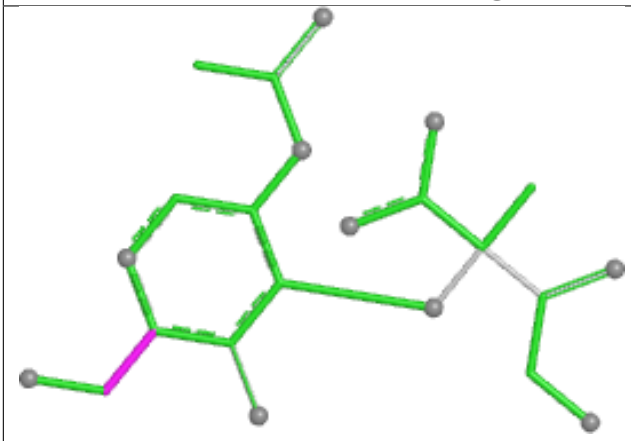
Ligand UDP B 960



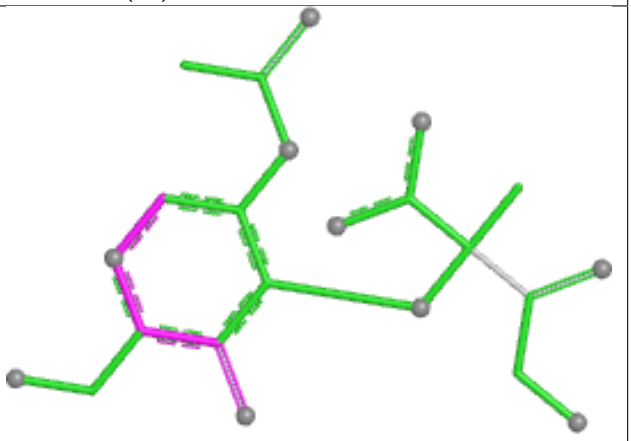
Ligand UDC A 951 (B)



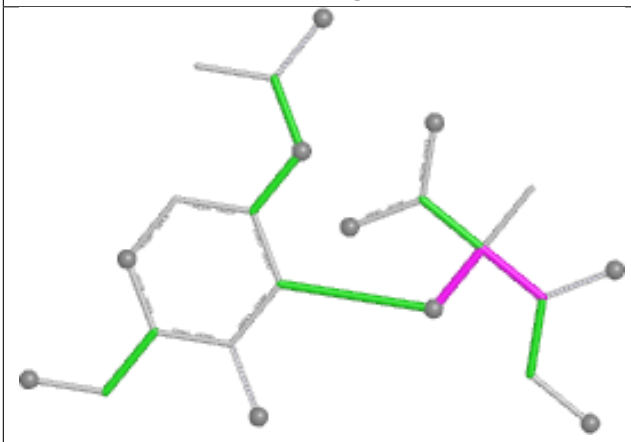
Ligand UDC C 971 (B)



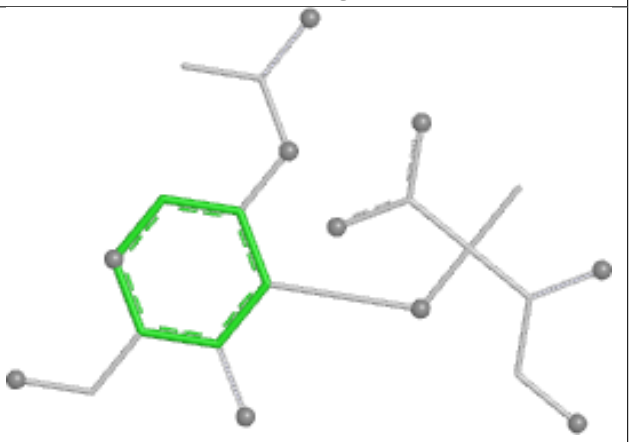
Bond lengths



Bond angles

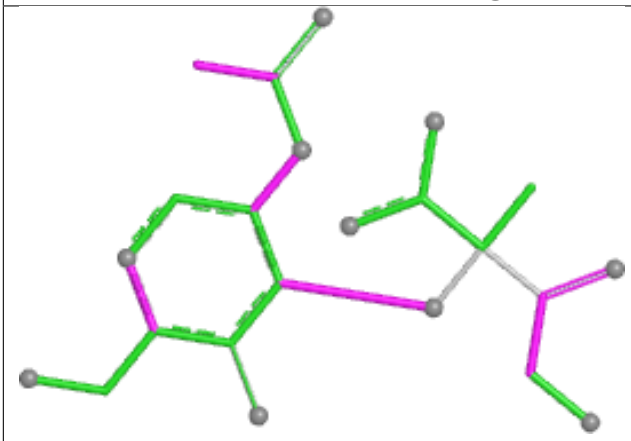


Torsions

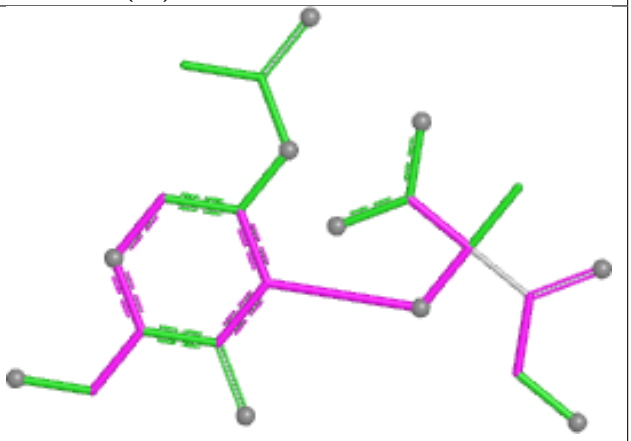


Rings

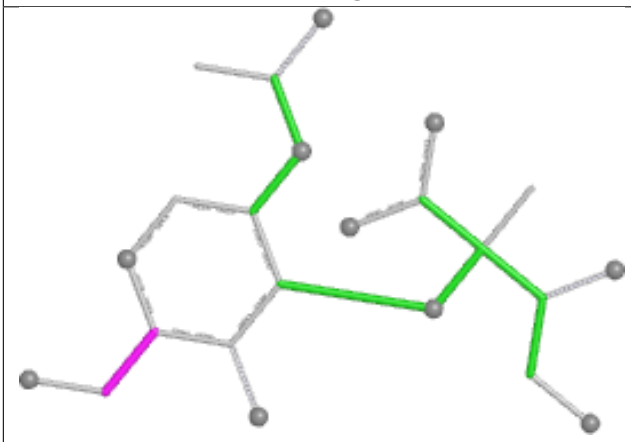
Ligand UDC D 981 (A)



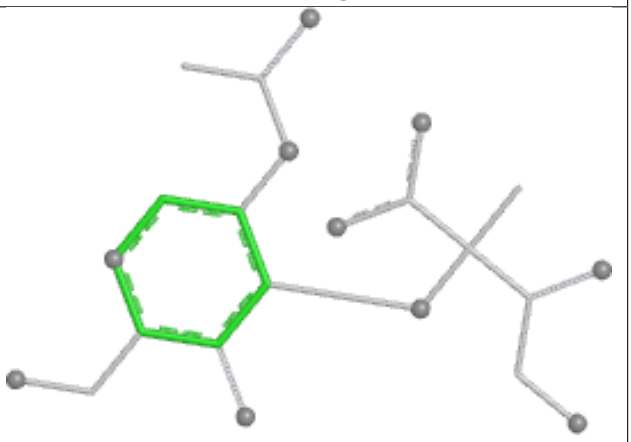
Bond lengths



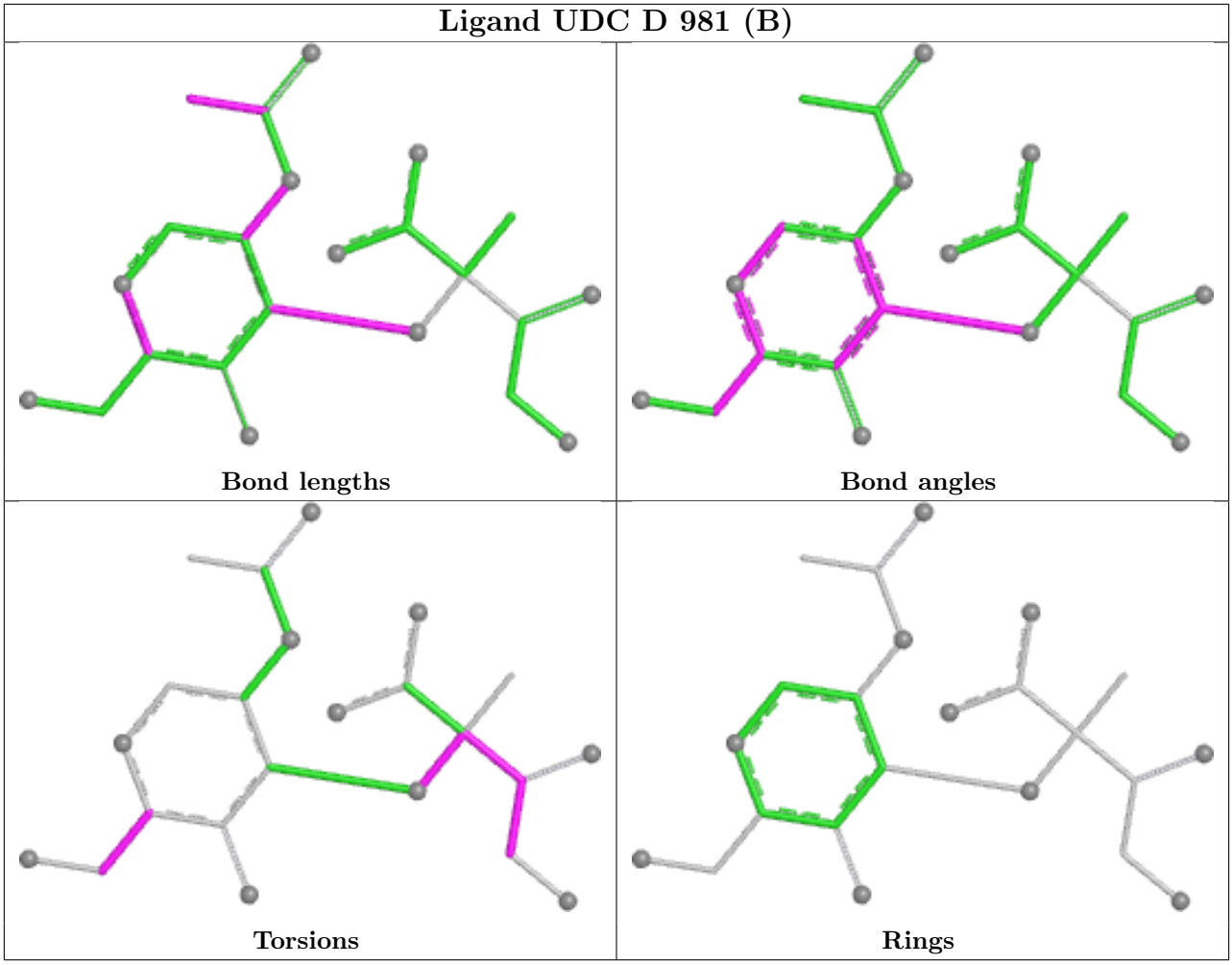
Bond angles



Torsions



Rings



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	D	2
1	B	2
1	A	2
1	C	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	D	67:IAS	CG	68:GLY	N	2.19
1	D	66:ARG	C	67:IAS	N	1.94
1	B	67:IAS	CG	68:GLY	N	1.82
1	A	66:ARG	C	67:IAS	N	1.76
1	C	66:ARG	C	67:IAS	N	1.74
1	C	67:IAS	CG	68:GLY	N	1.68
1	A	67:IAS	CG	68:GLY	N	1.65
1	B	66:ARG	C	67:IAS	N	1.61

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	417/423 (98%)	-0.29	2 (0%)	87	89	3, 9, 18, 29	1 (0%)
1	B	417/423 (98%)	-0.36	1 (0%)	92	93	3, 9, 18, 32	9 (2%)
1	C	417/423 (98%)	-0.42	1 (0%)	92	93	3, 10, 17, 28	3 (0%)
1	D	417/423 (98%)	-0.10	4 (0%)	79	81	2, 9, 17, 28	3 (0%)
All	All	1668/1692 (98%)	-0.29	8 (0%)	87	89	2, 9, 18, 32	16 (0%)

All (8) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	418	GLY	4.6
1	B	113	GLY	3.7
1	D	1	MET	3.3
1	D	126	ILE	2.6
1	A	418	GLY	2.6
1	D	149	GLY	2.3
1	C	418	GLY	2.1
1	A	246	ARG	2.0

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

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
1	IAS	C	67	8/9	0.85	0.08	4,6,7,8	0
1	IAS	D	67	8/9	0.85	0.08	14,15,16,18	0
1	IAS	B	67	8/9	0.86	0.08	14,14,15,16	0
1	IAS	A	67	8/9	0.95	0.07	8,8,9,9	0

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

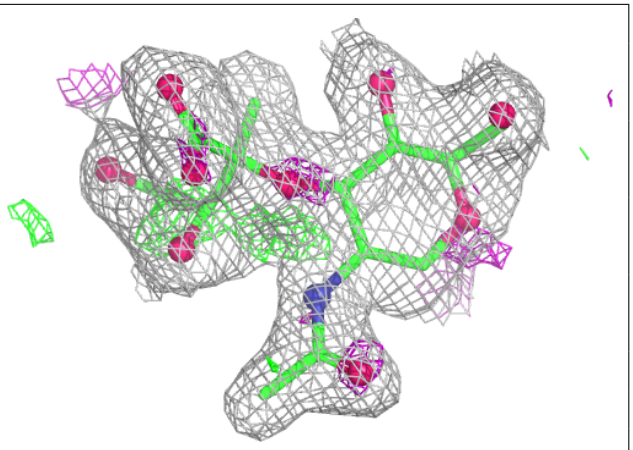
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

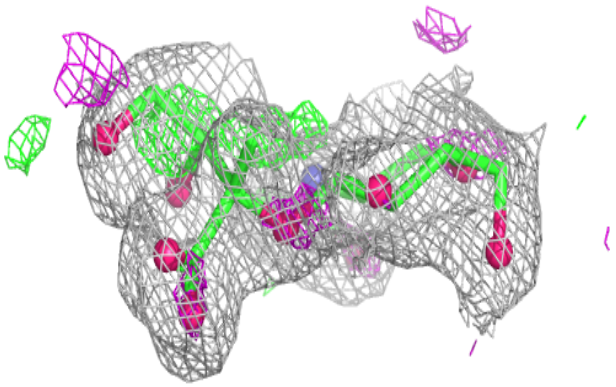
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	UDC	D	981[A]	23/24	0.89	0.08	2,3,5,6	9
3	UDC	D	981[B]	23/24	0.89	0.08	2,2,5,6	9
3	UDC	C	971[A]	23/24	0.91	0.07	2,2,2,8	9
3	UDC	C	971[B]	23/24	0.91	0.07	2,2,2,2	9
3	UDC	A	951[A]	23/24	0.92	0.07	2,2,2,3	9
3	UDC	A	951[B]	23/24	0.92	0.07	2,2,2,3	9
3	UDC	B	961[A]	23/24	0.93	0.07	2,2,2,7	9
3	UDC	B	961[B]	23/24	0.93	0.07	2,2,2,2	9
2	UDP	A	950	25/25	0.97	0.06	2,2,5,6	0
2	UDP	B	960	25/25	0.97	0.06	2,2,4,5	0
2	UDP	C	970	25/25	0.97	0.05	2,2,7,10	0
2	UDP	D	980	25/25	0.97	0.05	2,4,6,7	0

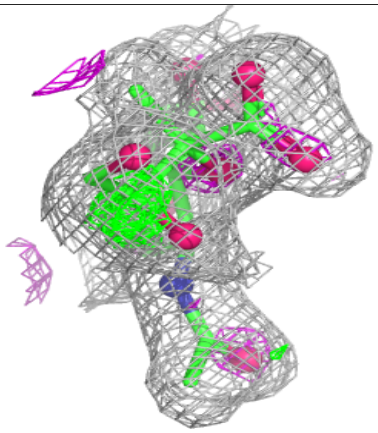
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around UDC D 981 (A):

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

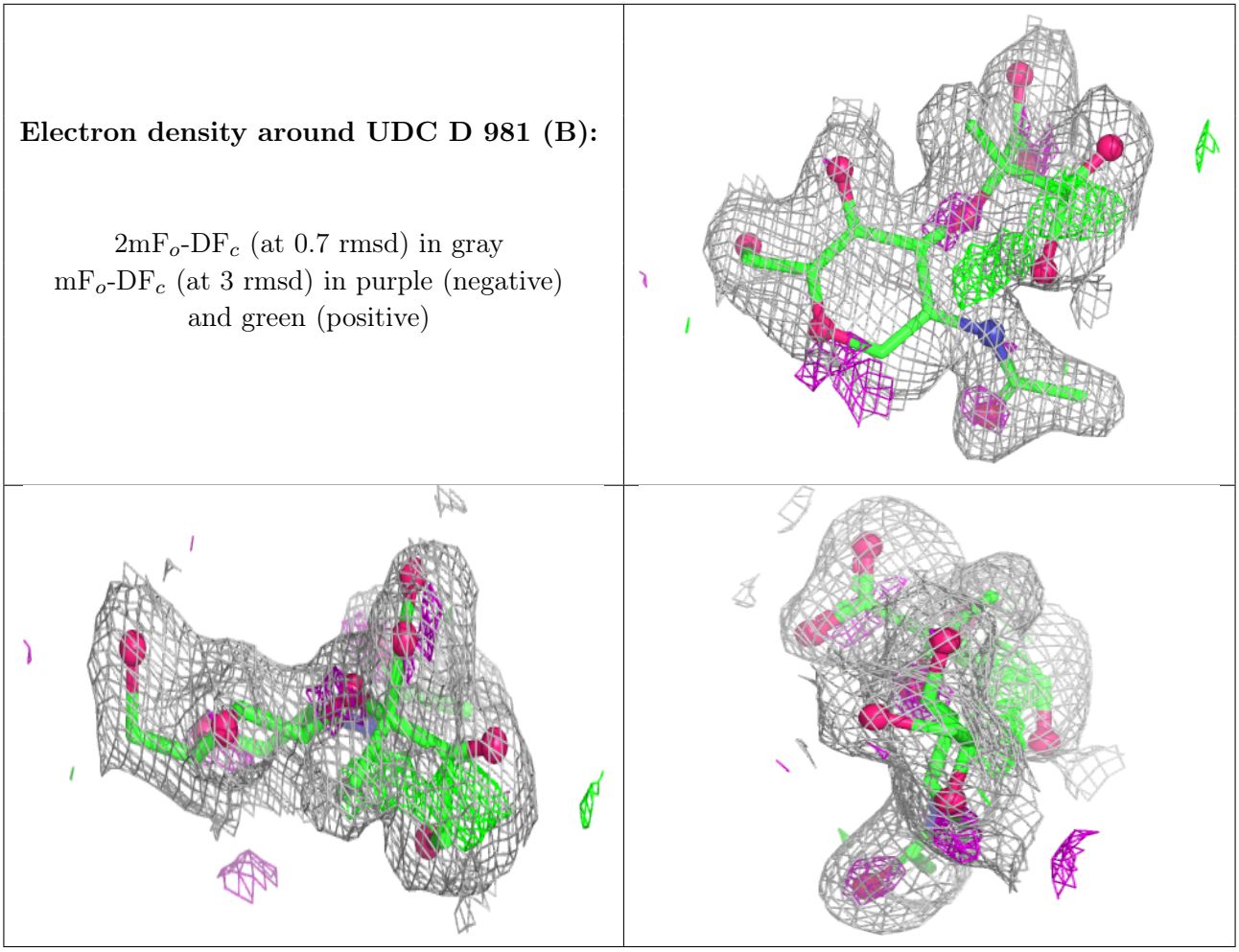






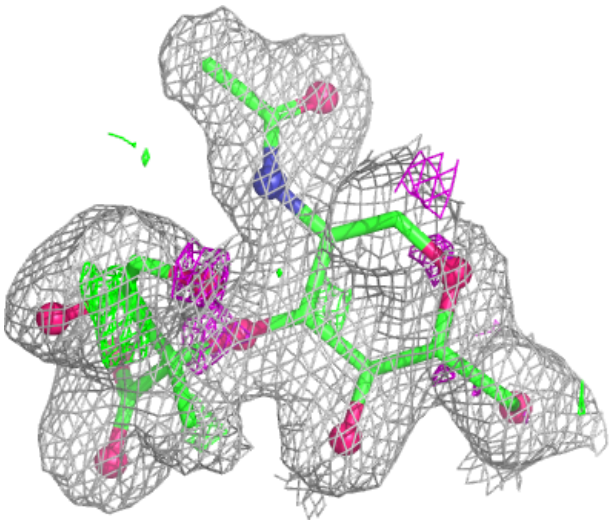
Electron density around UDC D 981 (B):

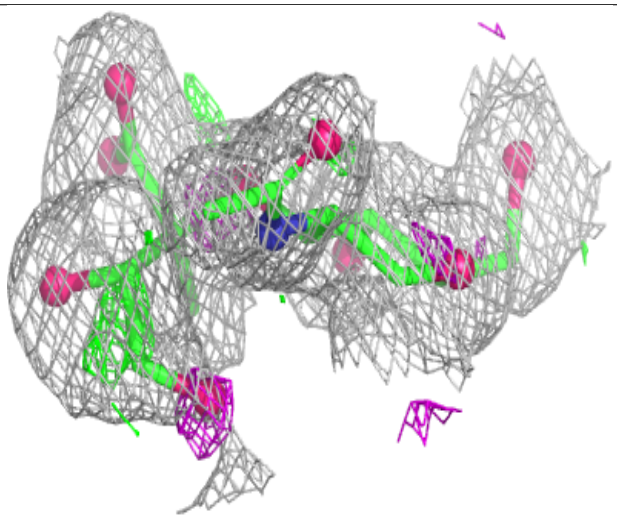
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

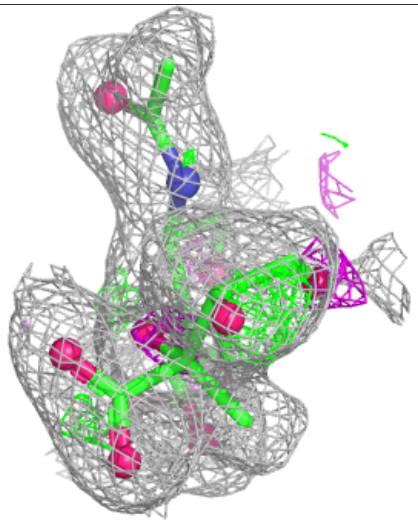


Electron density around UDC C 971 (A):

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

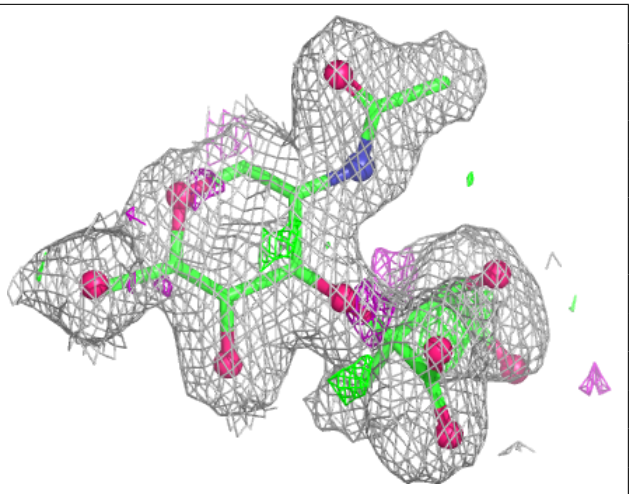


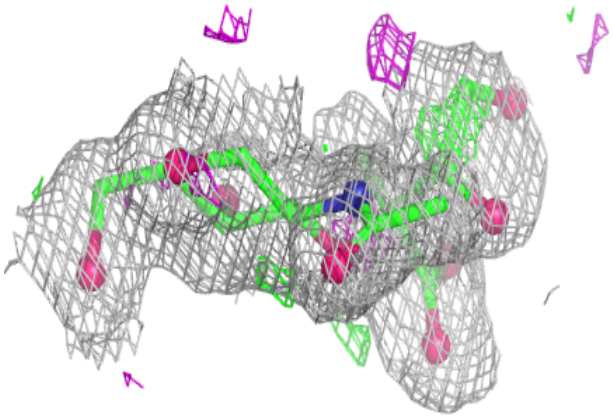


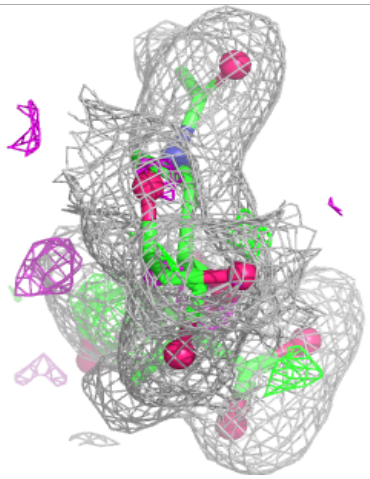


Electron density around UDC C 971 (B):

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

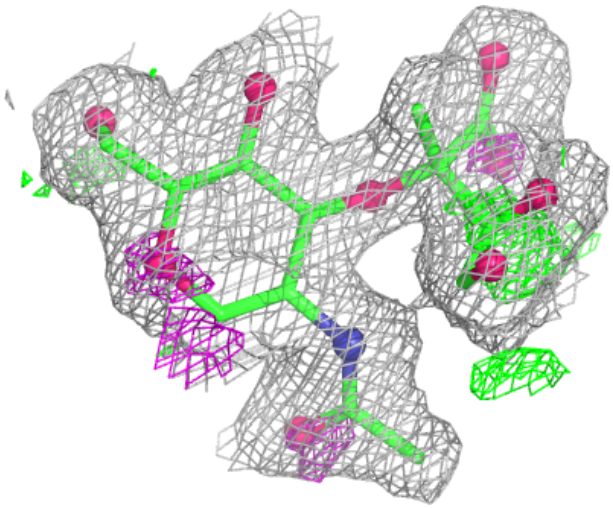


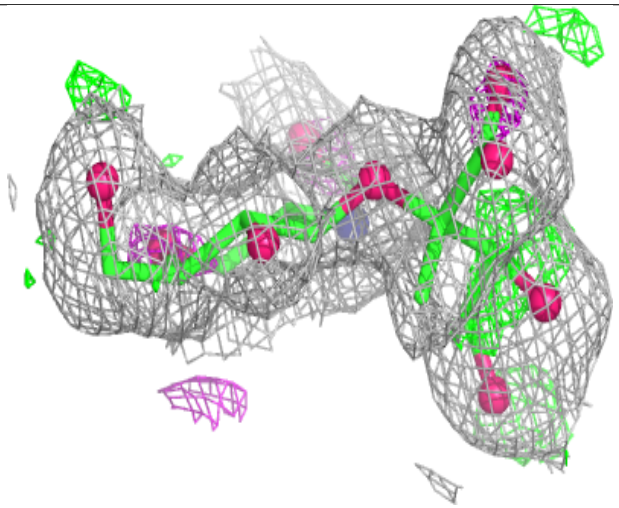


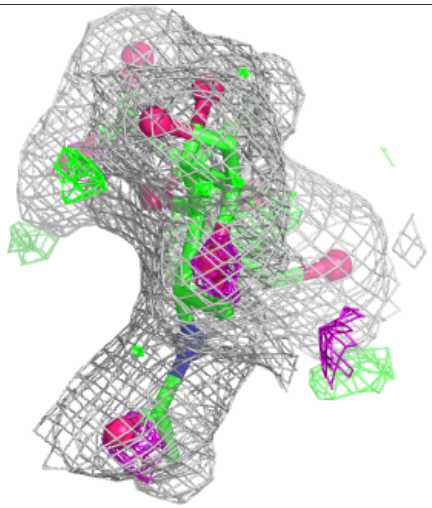


Electron density around UDC A 951 (A):

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

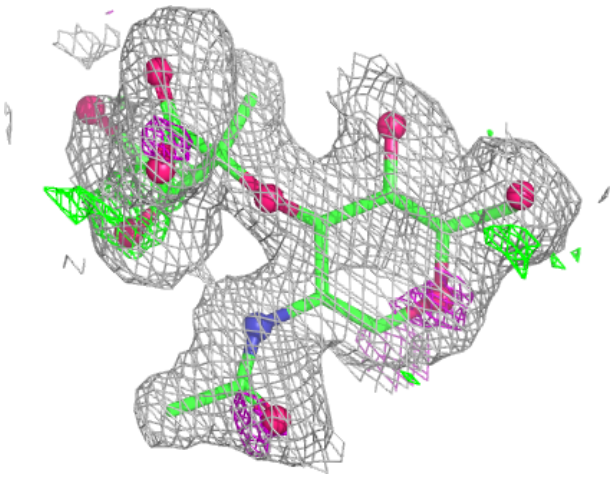


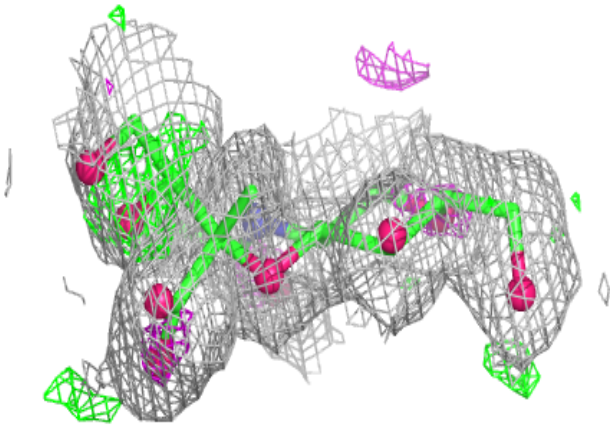


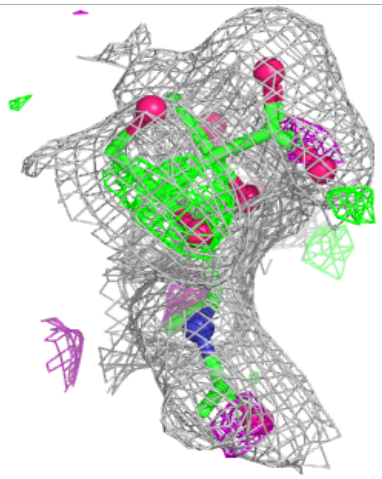


Electron density around UDC A 951 (B):

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

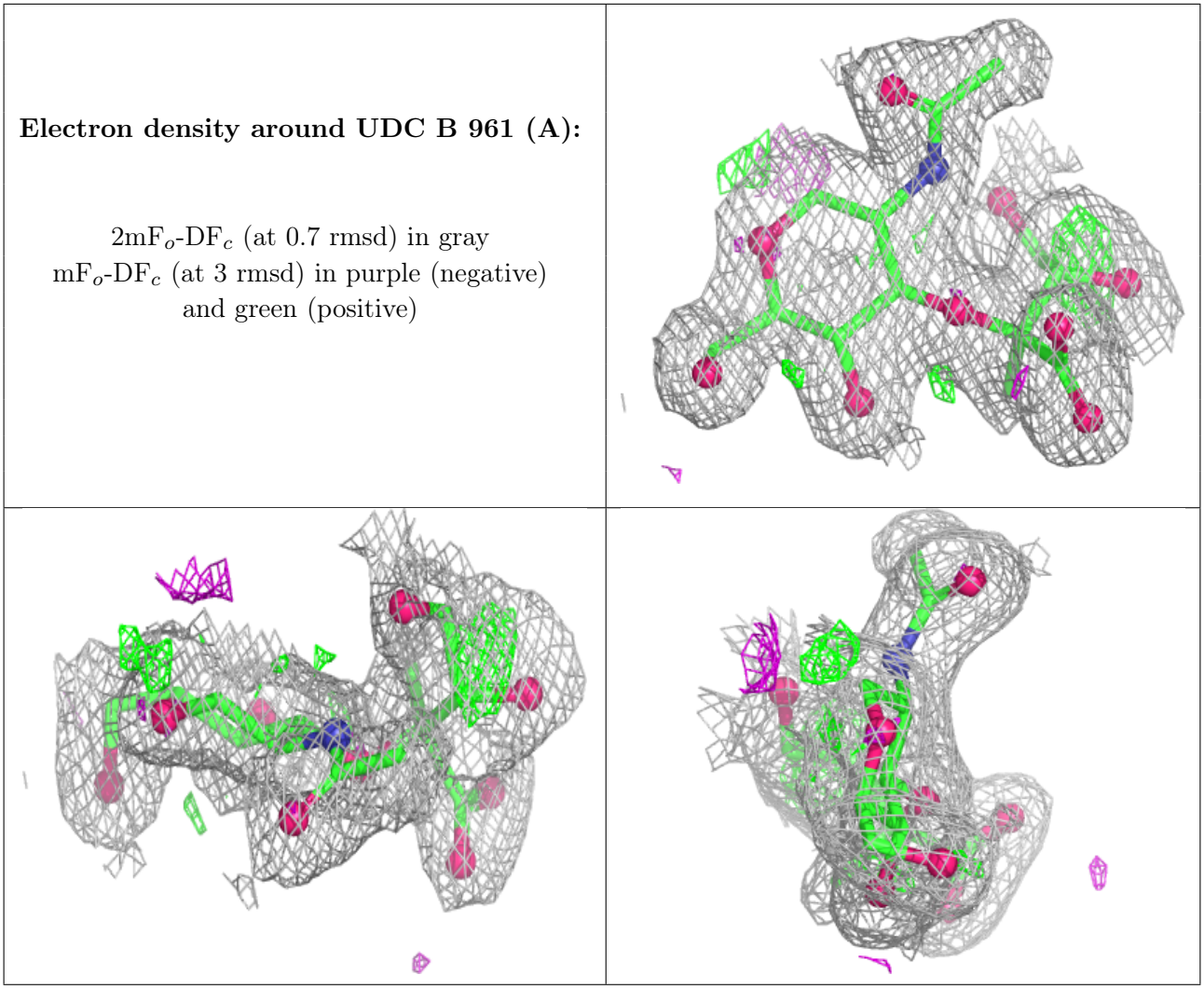






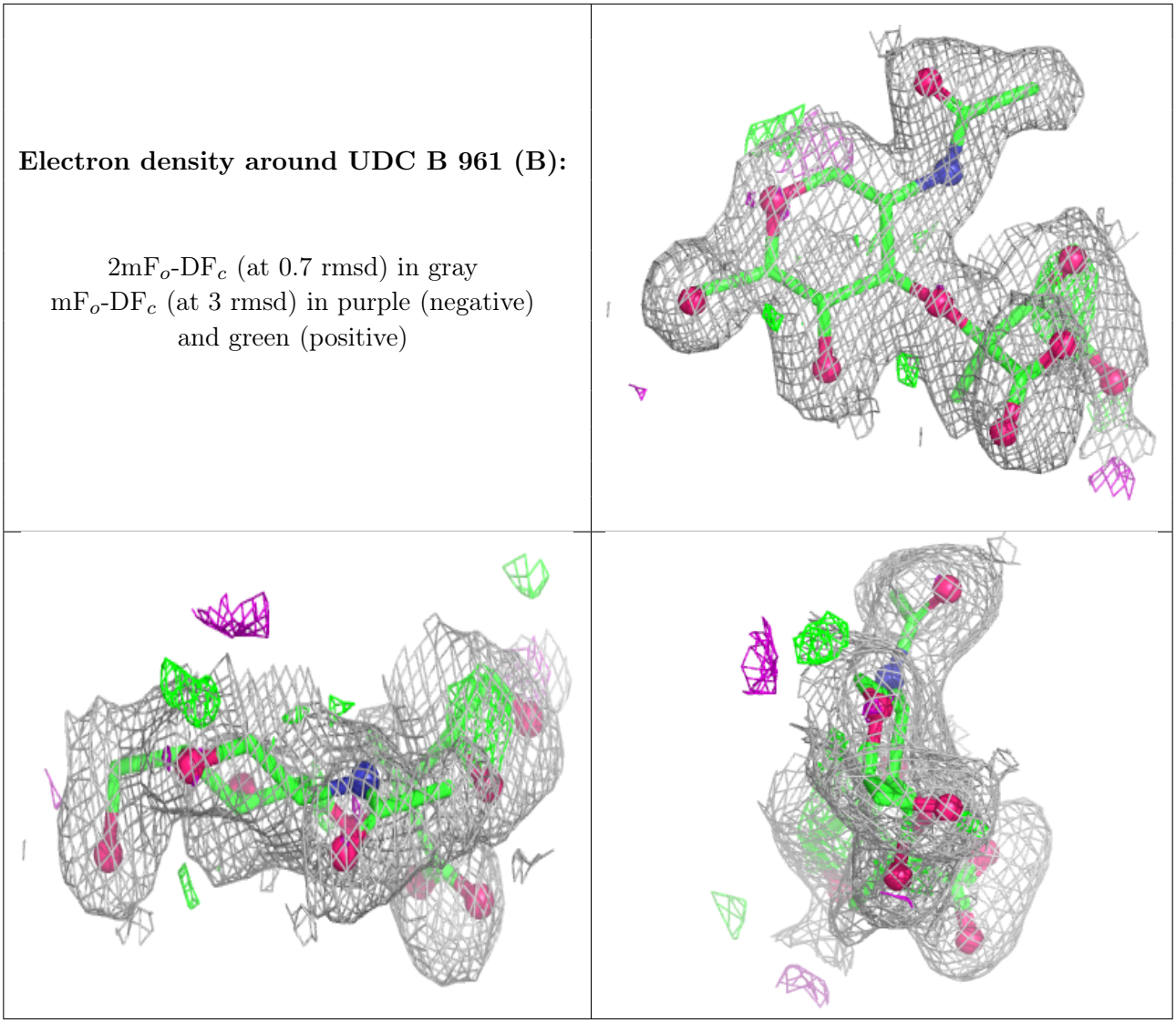
Electron density around UDC B 961 (A):

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



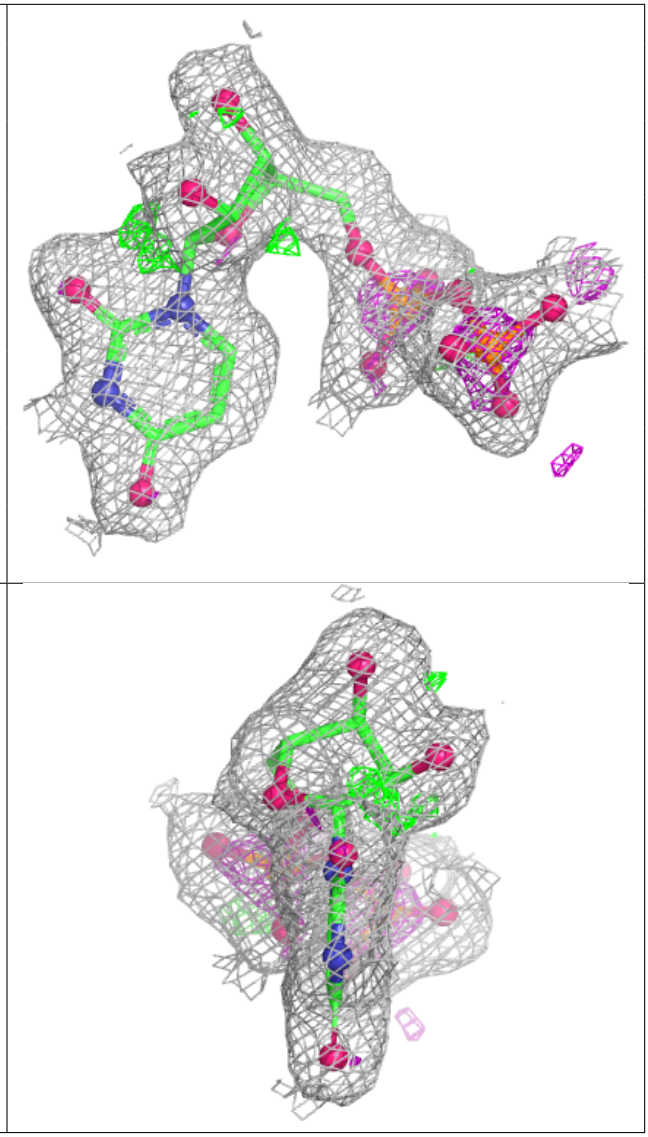
Electron density around UDC B 961 (B):

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



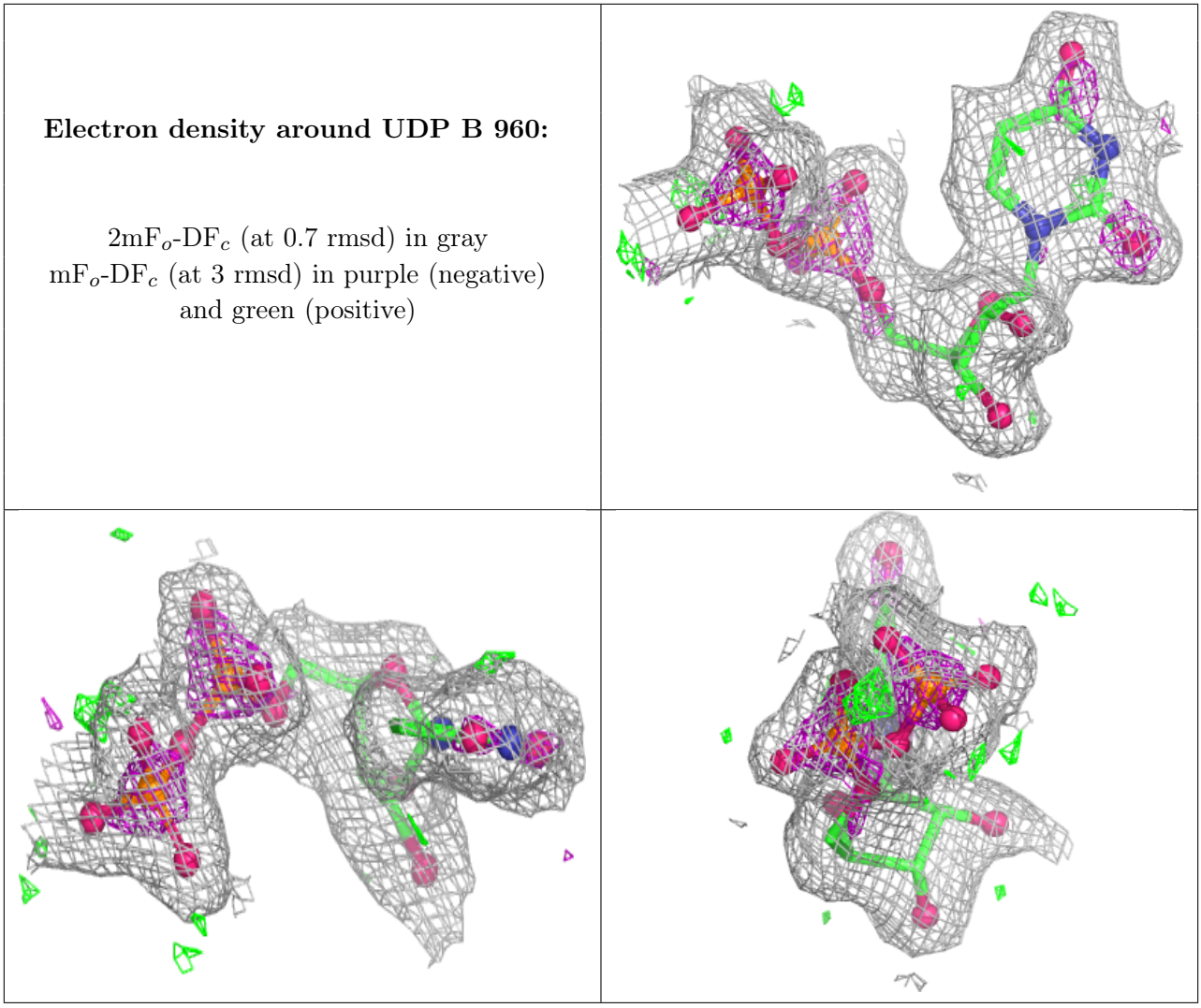
Electron density around UDP A 950:

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



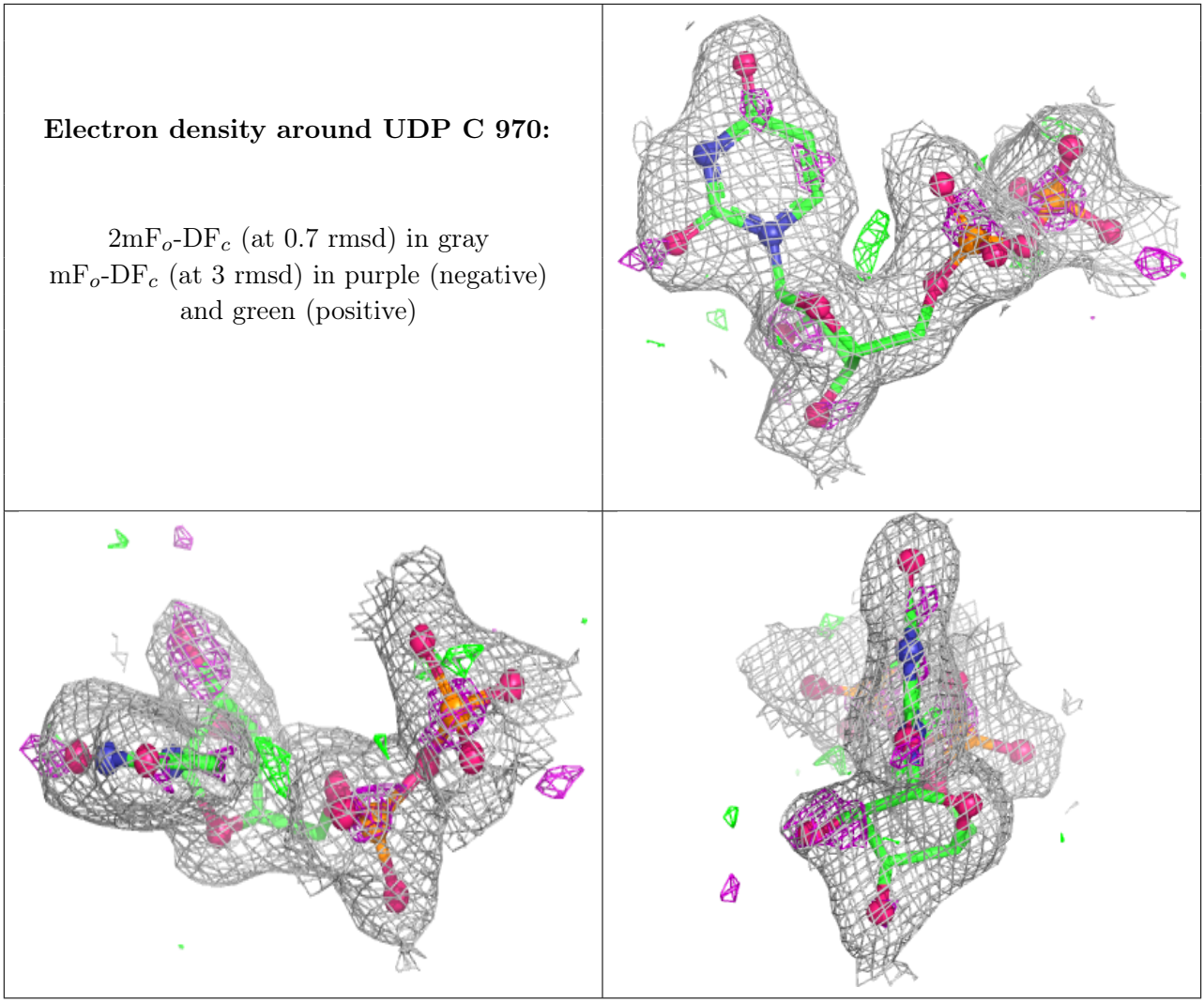
Electron density around UDP B 960:

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



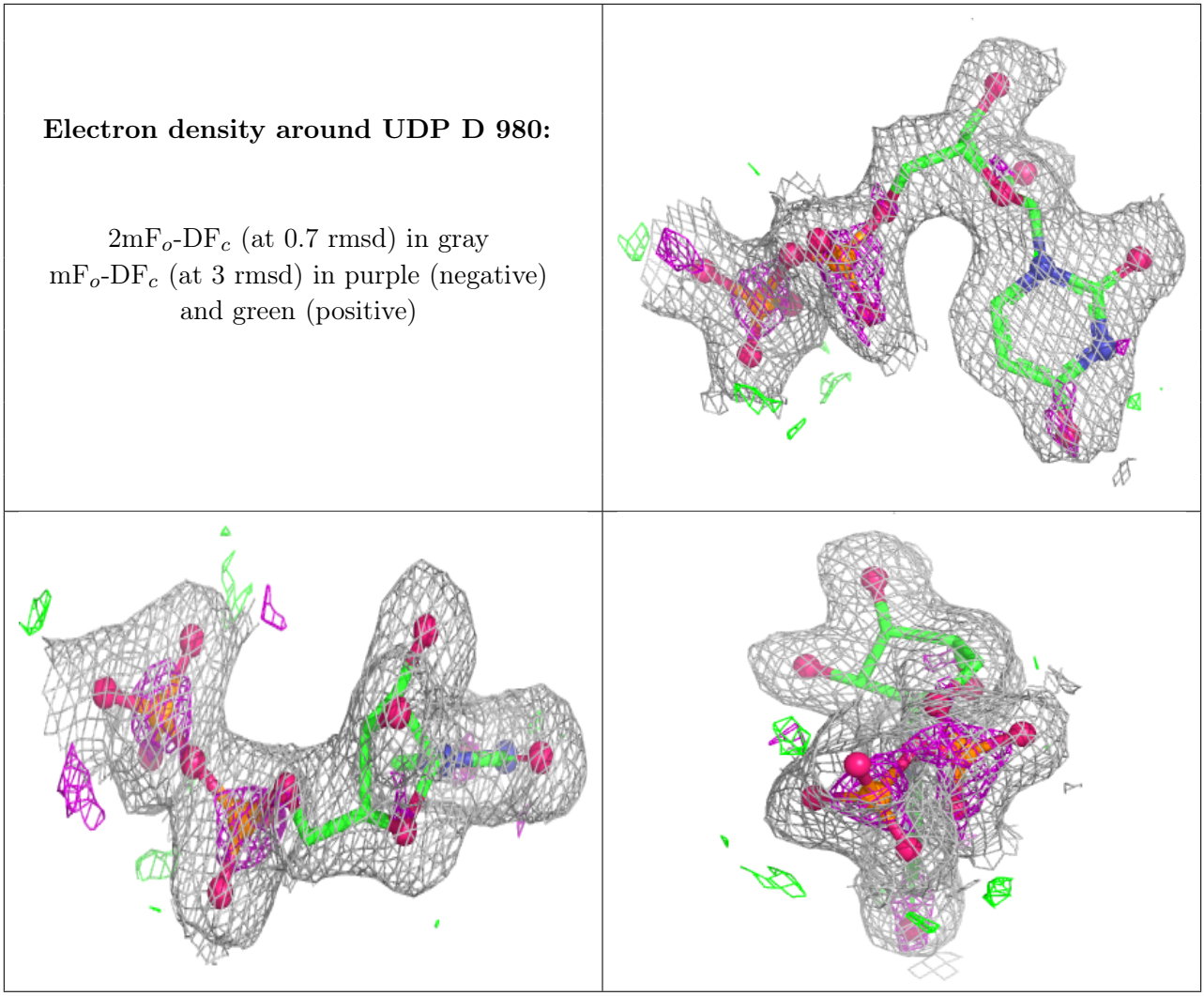
Electron density around UDP C 970:

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



Electron density around UDP D 980:

$2mF_o$-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 (i)

There are no such residues in this entry.