Full wwPDB X-ray Structure Validation Report (i)

Nov 1, 2026 – 12:09 PM EST

PDB ID	:	9Z5B / pdb_00009z5b
Title	:	Crystal structure of MPXV-A35 in complex with antibody A35-Ab9gr2
Authors	:	Zhang, D.; Wilson, I.A.
Deposited on	:	2025-11-11
Resolution	:	3.31 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:

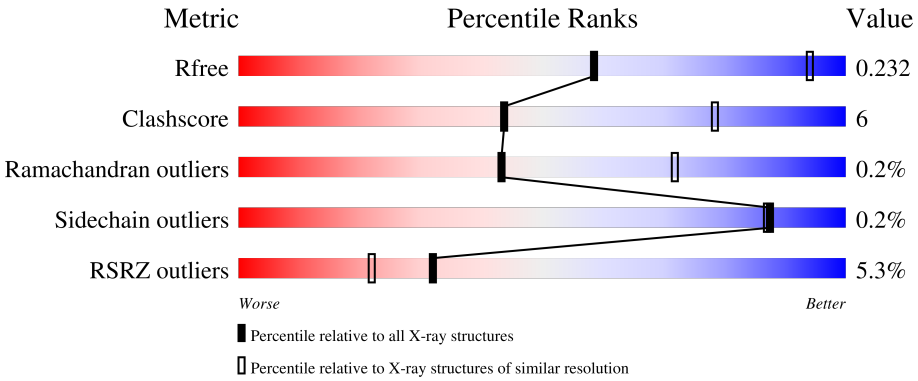
MolProbity	:	4-5-2 with Phenix2.2
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.2
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.51

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 3.31 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



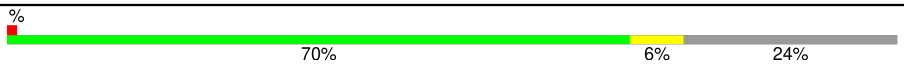
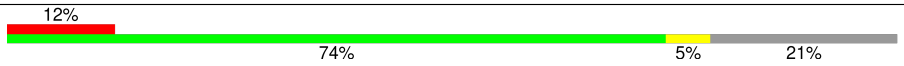
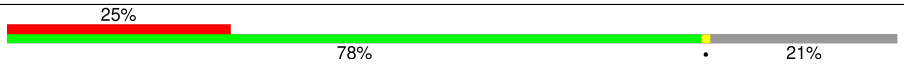
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1153 (3.34-3.30)
Clashscore	190562	1193 (3.34-3.30)
Ramachandran outliers	187476	1172 (3.34-3.30)
Sidechain outliers	187428	1171 (3.34-3.30)
RSRZ outliers	180081	1153 (3.34-3.30)

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	B	216	4% 81% 18%
1	L	216	83% 16%
2	A	228	5% 85% 14%
2	H	228	% 82% 17%
3	C	100	2% 62% 17% 21%

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Mol	Chain	Length	Quality of chain
3	D	100	
3	E	100	
3	F	100	

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 9133 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 A35-Ab9gr2 antibody light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	L	215	Total	C	N	O	S	0	0	0
			1638	1023	276	333	6			
1	B	216	Total	C	N	O	S	0	0	0
			1644	1026	277	335	6			

- Molecule 2 is a protein called A35-Ab9gr2 antibody heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	H	226	Total	C	N	O	S	0	0	0
			1674	1061	281	328	4			
2	A	226	Total	C	N	O	S	0	0	0
			1674	1061	281	328	4			

- Molecule 3 is a protein called Protein OPG161.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	D	76	Total	C	N	O	S	0	0	0
			593	370	93	126	4			
3	C	79	Total	C	N	O	S	0	0	0
			615	383	97	131	4			
3	E	79	Total	C	N	O	S	0	0	0
			615	383	97	131	4			
3	F	79	Total	C	N	O	S	0	0	0
			615	383	97	131	4			

There are 32 discrepancies between the modelled and reference sequences:

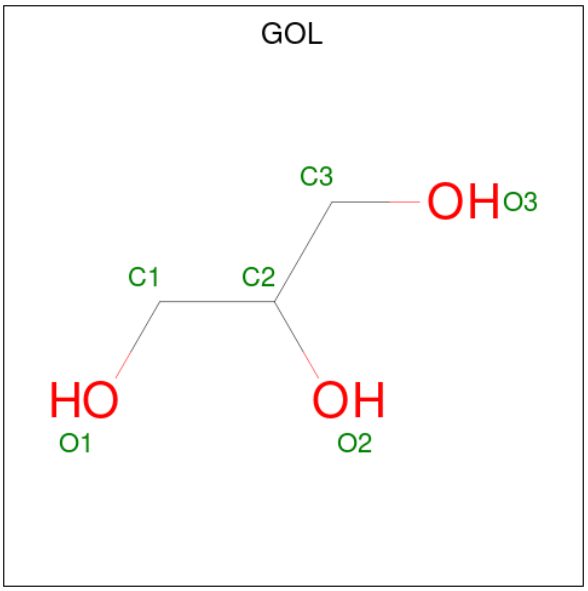
Chain	Residue	Modelled	Actual	Comment	Reference
D	182	GLY	-	expression tag	UNP A0A7H0DND2
D	183	SER	-	expression tag	UNP A0A7H0DND2
D	184	HIS	-	expression tag	UNP A0A7H0DND2
D	185	HIS	-	expression tag	UNP A0A7H0DND2

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Chain	Residue	Modelled	Actual	Comment	Reference
D	186	HIS	-	expression tag	UNP A0A7H0DND2
D	187	HIS	-	expression tag	UNP A0A7H0DND2
D	188	HIS	-	expression tag	UNP A0A7H0DND2
D	189	HIS	-	expression tag	UNP A0A7H0DND2
C	182	GLY	-	expression tag	UNP A0A7H0DND2
C	183	SER	-	expression tag	UNP A0A7H0DND2
C	184	HIS	-	expression tag	UNP A0A7H0DND2
C	185	HIS	-	expression tag	UNP A0A7H0DND2
C	186	HIS	-	expression tag	UNP A0A7H0DND2
C	187	HIS	-	expression tag	UNP A0A7H0DND2
C	188	HIS	-	expression tag	UNP A0A7H0DND2
C	189	HIS	-	expression tag	UNP A0A7H0DND2
E	182	GLY	-	expression tag	UNP A0A7H0DND2
E	183	SER	-	expression tag	UNP A0A7H0DND2
E	184	HIS	-	expression tag	UNP A0A7H0DND2
E	185	HIS	-	expression tag	UNP A0A7H0DND2
E	186	HIS	-	expression tag	UNP A0A7H0DND2
E	187	HIS	-	expression tag	UNP A0A7H0DND2
E	188	HIS	-	expression tag	UNP A0A7H0DND2
E	189	HIS	-	expression tag	UNP A0A7H0DND2
F	182	GLY	-	expression tag	UNP A0A7H0DND2
F	183	SER	-	expression tag	UNP A0A7H0DND2
F	184	HIS	-	expression tag	UNP A0A7H0DND2
F	185	HIS	-	expression tag	UNP A0A7H0DND2
F	186	HIS	-	expression tag	UNP A0A7H0DND2
F	187	HIS	-	expression tag	UNP A0A7H0DND2
F	188	HIS	-	expression tag	UNP A0A7H0DND2
F	189	HIS	-	expression tag	UNP A0A7H0DND2

- Molecule 4 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	L	1	Total C O 6 3 3	0	0
4	L	1	Total C O 6 3 3	0	0
4	H	1	Total C O 6 3 3	0	0
4	H	1	Total C O 6 3 3	0	0
4	H	1	Total C O 6 3 3	0	0
4	H	1	Total C O 6 3 3	0	0
4	H	1	Total C O 6 3 3	0	0
4	B	1	Total C O 6 3 3	0	0
4	A	1	Total C O 6 3 3	0	0
4	A	1	Total C O 6 3 3	0	0

- Molecule 5 is water.

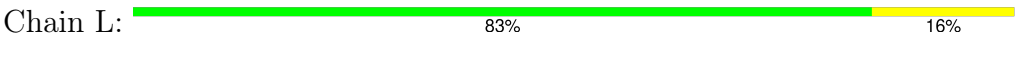
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	L	1	Total O 1 1	0	0
5	D	4	Total O 4 4	0	0

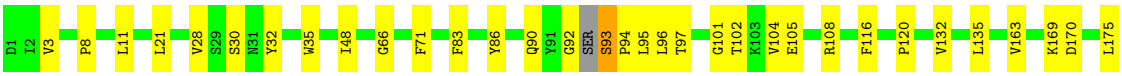
3 Residue-property plots (i)

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: A35-Ab9gr2 antibody light chain

Chain L:

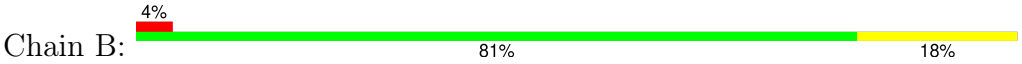


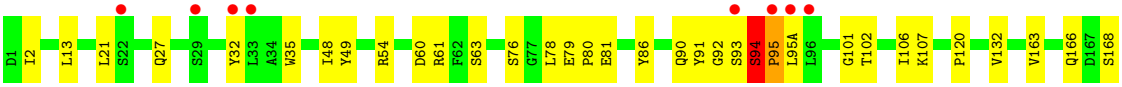




• Molecule 1: A35-Ab9gr2 antibody light chain

Chain B:

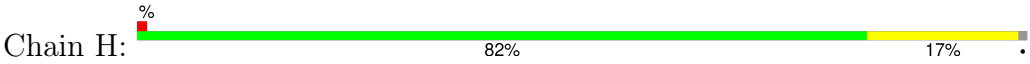


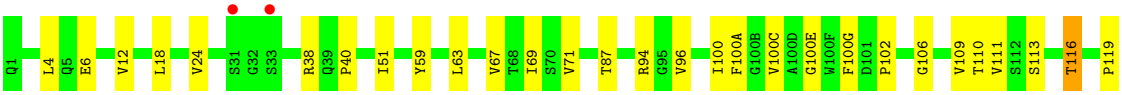




• Molecule 2: A35-Ab9gr2 antibody heavy chain

Chain H:

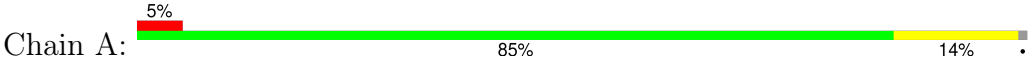


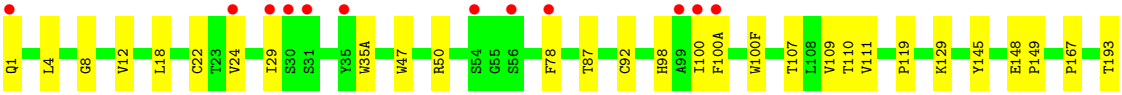




• Molecule 2: A35-Ab9gr2 antibody heavy chain

Chain A:



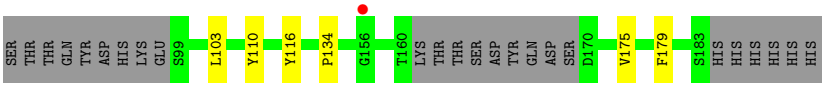




• Molecule 3: Protein OPG161

Chain D:

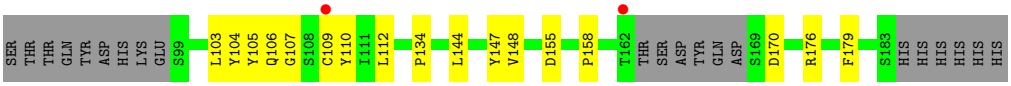




• Molecule 3: Protein OPG161

Chain C:

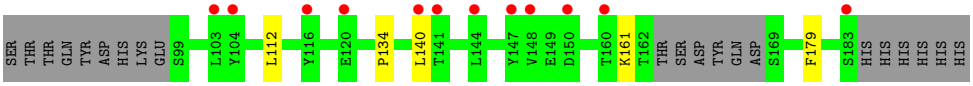




• Molecule 3: Protein OPG161

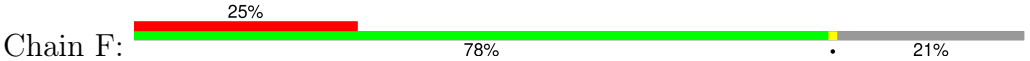
Chain E:

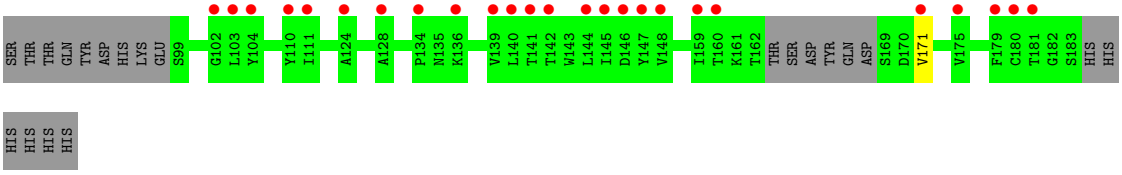




• Molecule 3: Protein OPG161

Chain F:





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 65	Depositor
Cell constants a, b, c, α, β, γ	119.19Å 119.19Å 188.49Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	42.87 – 3.31 42.87 – 3.31	Depositor EDS
% Data completeness (in resolution range)	99.2 (42.87-3.31) 95.0 (42.87-3.31)	Depositor EDS
R_{merge}	0.30	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.83 (at 3.32Å)	Xtriage
Refinement program	PHENIX (1.21.2_5419: ???)	Depositor
R, R_{free}	0.193 , 0.233 0.192 , 0.232	Depositor DCC
R_{free} test set	1996 reflections (8.86%)	wwPDB-VP
Wilson B-factor (Å^2)	51.4	Xtriage
Anisotropy	0.125	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 67.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	0.064 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	9133	wwPDB-VP
Average B, all atoms (Å^2)	71.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.72% 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: GOL

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	B	0.23	0/1679	0.48	0/2280
1	L	0.24	0/1672	0.44	0/2269
2	A	0.24	0/1718	0.43	0/2349
2	H	0.27	0/1718	0.47	0/2349
3	C	0.13	0/628	0.38	0/852
3	D	0.11	0/606	0.33	0/823
3	E	0.10	0/628	0.27	0/852
3	F	0.08	0/628	0.25	0/852
All	All	0.22	0/9277	0.42	0/12626

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	L	0	1
All	All	0	2

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	94	SER	Peptide
1	L	93	SER	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	B	1644	0	1594	26	0
1	L	1638	0	1588	26	0
2	A	1674	0	1657	21	0
2	H	1674	0	1657	25	0
3	C	615	0	560	13	0
3	D	593	0	535	3	0
3	E	615	0	560	3	0
3	F	615	0	560	1	0
4	A	12	0	16	2	0
4	B	6	0	8	0	0
4	H	30	0	40	2	0
4	L	12	0	16	0	0
5	D	4	0	0	0	0
5	L	1	0	0	0	0
All	All	9133	0	8791	110	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 6.

All (110) 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)
2:H:18:LEU:HD12	2:H:109:VAL:HG11	1.54	0.89
2:A:18:LEU:HD12	2:A:109:VAL:HG11	1.58	0.83
1:L:96:LEU:HD21	2:H:100(G):PHE:HE2	1.50	0.77
2:H:126:PRO:HG3	2:H:138:LEU:HB3	1.68	0.75
1:L:90:GLN:HE21	1:L:97:THR:H	1.35	0.75
2:A:87:THR:HG23	2:A:110:THR:HA	1.74	0.69
2:A:148:GLU:HG2	2:A:149:PRO:HA	1.75	0.68
2:H:51:ILE:HD13	2:H:71:VAL:HG13	1.79	0.65
2:A:193:THR:HG23	4:A:302:GOL:H11	1.79	0.64
2:H:87:THR:HG23	2:H:110:THR:HA	1.82	0.62
3:C:103:LEU:HB2	3:C:110:TYR:HB2	1.81	0.62
1:B:21:LEU:HD23	1:B:102:THR:HB	1.85	0.59
2:H:4:LEU:HD22	2:H:24:VAL:HG22	1.84	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:103:LEU:O	3:C:109:CYS:HA	2.05	0.57
1:L:21:LEU:HD23	1:L:102:THR:HB	1.87	0.56
3:C:104:TYR:CZ	3:C:107:GLY:HA2	2.41	0.56
2:A:167:PRO:O	4:A:301:GOL:O1	2.24	0.56
2:H:126:PRO:HD2	2:H:213:PRO:HA	1.87	0.56
2:H:12:VAL:O	2:H:111:VAL:HA	2.05	0.55
1:B:86:TYR:O	1:B:101:GLY:HA2	2.07	0.55
1:B:78:LEU:HD12	1:B:106:ILE:HD11	1.89	0.55
3:C:155:ASP:N	3:C:155:ASP:OD1	2.39	0.55
1:B:32:TYR:HD2	1:B:92:GLY:HA2	1.72	0.53
2:A:193:THR:HG22	2:A:210:ARG:NH2	2.23	0.53
2:H:121:VAL:O	2:H:209:LYS:NZ	2.38	0.53
1:B:79:GLU:HG3	1:B:80:PRO:HD2	1.91	0.51
1:B:166:GLN:HG3	1:B:173:TYR:CZ	2.45	0.51
3:C:134:PRO:HD3	3:C:179:PHE:O	2.10	0.51
2:H:100:ILE:HD11	3:C:147:TYR:HA	1.92	0.51
1:B:163:VAL:HG22	1:B:175:LEU:HD12	1.93	0.51
2:H:94:ARG:HB3	2:H:102:PRO:HD2	1.92	0.50
2:A:4:LEU:HD22	2:A:24:VAL:HG22	1.93	0.50
3:C:105:TYR:CD2	3:C:106:GLN:HG2	2.46	0.50
1:L:92:GLY:C	1:L:93:SER:HB3	2.37	0.50
2:H:100:ILE:HG13	2:H:100(A):PHE:H	1.77	0.50
2:H:6:GLU:OE1	2:H:106:GLY:N	2.42	0.49
1:B:90:GLN:NE2	1:B:95:PRO:HD3	2.27	0.49
1:L:35:TRP:HB2	1:L:48:ILE:HB	1.93	0.49
1:B:54:ARG:HE	1:B:63:SER:HA	1.78	0.48
3:C:170:ASP:N	3:C:170:ASP:OD1	2.47	0.48
1:L:3:VAL:HA	1:L:97:THR:HG21	1.96	0.48
2:H:119:PRO:HB3	2:H:145:TYR:HB3	1.96	0.48
1:L:92:GLY:C	1:L:94:PRO:HD3	2.39	0.47
2:H:100(C):VAL:HB	3:C:176:ARG:HH11	1.79	0.47
1:B:91:TYR:C	1:B:93:SER:H	2.21	0.47
3:E:140:LEU:HD21	3:E:161:LYS:HG2	1.96	0.47
1:B:93:SER:O	1:B:94:SER:OG	2.22	0.47
1:L:169:LYS:HD3	1:L:169:LYS:HA	1.66	0.47
2:H:212:GLU:HG3	2:H:213:PRO:HD2	1.96	0.47
1:B:13:LEU:C	1:B:107:LYS:HG2	2.40	0.47
1:B:120:PRO:HD3	1:B:132:VAL:HG22	1.95	0.47
2:A:8:GLY:H	2:A:107:THR:HG21	1.79	0.47
1:L:8:PRO:HG3	1:L:11:LEU:HD13	1.96	0.47
1:B:2:ILE:HG12	1:B:27:GLN:HB2	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:100:ILE:HD12	2:A:100(A):PHE:CE2	2.50	0.47
1:L:163:VAL:HG22	1:L:175:LEU:HD12	1.97	0.46
2:H:96:VAL:O	2:H:100(E):GLY:HA3	2.16	0.46
2:H:63:LEU:O	2:H:67:VAL:HG23	2.16	0.46
1:L:120:PRO:HD3	1:L:132:VAL:HG22	1.97	0.46
1:L:66:GLY:HA3	1:L:71:PHE:HA	1.98	0.46
2:H:116:THR:HG23	2:H:147:PRO:HD2	1.98	0.46
3:D:103:LEU:HB2	3:D:110:TYR:HB2	1.96	0.46
1:B:106:ILE:O	1:B:166:GLN:NE2	2.40	0.46
2:A:119:PRO:HB3	2:A:145:TYR:HB3	1.98	0.45
1:B:2:ILE:HB	1:B:90:GLN:NE2	2.31	0.45
1:B:60:ASP:N	1:B:60:ASP:OD1	2.50	0.45
1:B:61:ARG:HB2	1:B:76:SER:O	2.16	0.45
1:B:95:PRO:HD2	1:B:95(A):LEU:H	1.82	0.45
1:B:35:TRP:HB2	1:B:48:ILE:HB	1.98	0.45
2:A:4:LEU:HB3	2:A:22:CYS:SG	2.56	0.45
2:A:47:TRP:HZ2	2:A:50:ARG:HB3	1.81	0.45
1:L:96:LEU:HD21	2:H:100(G):PHE:CE2	2.40	0.44
1:L:90:GLN:HE22	1:L:94:PRO:HD2	1.82	0.44
3:D:116:TYR:HB3	3:D:175:VAL:CG1	2.47	0.44
1:L:28:VAL:HG23	1:L:30:SER:H	1.83	0.44
1:B:185:ASP:HA	1:B:188:LYS:HG2	1.99	0.44
1:B:188:LYS:HE2	1:B:189:HIS:NE2	2.32	0.44
3:C:158:PRO:CG	3:C:176:ARG:HE	2.31	0.44
3:C:148:VAL:HG12	3:C:179:PHE:CD1	2.51	0.44
1:L:96:LEU:HD23	1:L:96:LEU:O	2.18	0.44
1:L:116:PHE:HD2	1:L:135:LEU:HD23	1.82	0.44
1:L:95:LEU:O	1:L:95:LEU:HD12	2.18	0.43
2:A:210:ARG:NH1	2:A:212:GLU:HG3	2.33	0.43
1:L:32:TYR:CD2	1:L:92:GLY:HA2	2.54	0.43
1:L:83:PHE:HD1	1:L:105:GLU:HA	1.83	0.43
2:A:78:PHE:CZ	2:A:92:CYS:HB2	2.53	0.43
1:L:83:PHE:HA	1:L:104:VAL:O	2.18	0.43
1:B:91:TYR:CE2	2:A:98:HIS:HB2	2.53	0.43
1:B:81:GLU:HG3	1:B:168:SER:O	2.19	0.43
3:E:134:PRO:HD3	3:E:179:PHE:O	2.20	0.42
1:L:188:LYS:HE3	1:L:189:HIS:NE2	2.34	0.42
2:H:185:PRO:O	2:H:188:SER:OG	2.34	0.42
2:H:148:GLU:OE1	4:H:305:GOL:O3	2.38	0.42
2:A:1:GLN:HG2	3:F:171:VAL:O	2.20	0.42
1:L:188:LYS:HG3	1:L:189:HIS:CD2	2.54	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:109:VAL:HG22	4:H:301:GOL:H12	2.02	0.41
2:H:38:ARG:HG3	2:H:40:PRO:HD3	2.01	0.41
1:B:208:SER:O	2:A:129:LYS:HE2	2.20	0.41
2:A:12:VAL:O	2:A:111:VAL:HA	2.20	0.41
2:A:214:LYS:HA	2:A:214:LYS:HD2	1.90	0.41
3:C:112:LEU:HB2	3:C:179:PHE:CE2	2.56	0.41
3:D:134:PRO:HD3	3:D:179:PHE:O	2.21	0.41
1:L:86:TYR:O	1:L:101:GLY:HA2	2.21	0.41
3:E:112:LEU:HB2	3:E:179:PHE:CE2	2.55	0.41
1:L:11:LEU:HD12	1:L:11:LEU:HA	1.80	0.41
1:B:49:TYR:HB2	2:A:100(F):TRP:CE3	2.55	0.41
2:H:59:TYR:HE1	2:H:69:ILE:HG22	1.85	0.41
3:C:144:LEU:O	3:C:148:VAL:HG22	2.20	0.41
2:A:29:ILE:HG23	2:A:35(A):TRP:NE1	2.36	0.40
1:L:108:ARG:NH1	1:L:170:ASP:O	2.49	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	B	214/216 (99%)	203 (95%)	9 (4%)	2 (1%)	14 43
1	L	211/216 (98%)	200 (95%)	11 (5%)	0	100 100
2	A	224/228 (98%)	221 (99%)	3 (1%)	0	100 100
2	H	224/228 (98%)	220 (98%)	4 (2%)	0	100 100
3	C	75/100 (75%)	72 (96%)	3 (4%)	0	100 100
3	D	72/100 (72%)	69 (96%)	3 (4%)	0	100 100
3	E	75/100 (75%)	72 (96%)	3 (4%)	0	100 100
3	F	75/100 (75%)	73 (97%)	2 (3%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	1170/1288 (91%)	1130 (97%)	38 (3%)	2 (0%)	43 72

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	95	PRO
1	B	94	SER

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	B	186/186 (100%)	186 (100%)	0	100 100
1	L	185/186 (100%)	185 (100%)	0	100 100
2	A	191/193 (99%)	191 (100%)	0	100 100
2	H	191/193 (99%)	189 (99%)	2 (1%)	68 75
3	C	70/91 (77%)	70 (100%)	0	100 100
3	D	67/91 (74%)	67 (100%)	0	100 100
3	E	70/91 (77%)	70 (100%)	0	100 100
3	F	70/91 (77%)	70 (100%)	0	100 100
All	All	1030/1122 (92%)	1028 (100%)	2 (0%)	87 87

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	H	113	SER
2	H	116	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	L	53	ASN

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Mol	Chain	Res	Type
1	L	90	GLN
1	L	152	ASN
2	H	192	GLN
3	D	125	ASN
1	B	27	GLN
1	B	90	GLN
3	E	125	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)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

10 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	$\#\|Z\| > 2$
4	GOL	L	302	-	5,5,5	0.40	0	5,5,5	0.49	0
4	GOL	H	303	-	5,5,5	0.38	0	5,5,5	0.49	0
4	GOL	H	305	-	5,5,5	0.35	0	5,5,5	0.45	0
4	GOL	A	302	-	5,5,5	0.40	0	5,5,5	0.43	0
4	GOL	H	304	-	5,5,5	0.34	0	5,5,5	0.53	0
4	GOL	H	302	-	5,5,5	0.34	0	5,5,5	0.47	0
4	GOL	B	301	-	5,5,5	0.41	0	5,5,5	0.46	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
4	GOL	A	301	-	5,5,5	0.39	0	5,5,5	0.58	0
4	GOL	L	301	-	5,5,5	0.35	0	5,5,5	0.45	0
4	GOL	H	301	-	5,5,5	0.37	0	5,5,5	0.44	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	GOL	L	302	-	-	0/4/4/4	-
4	GOL	H	303	-	-	0/4/4/4	-
4	GOL	H	305	-	-	0/4/4/4	-
4	GOL	A	302	-	-	2/4/4/4	-
4	GOL	H	304	-	-	0/4/4/4	-
4	GOL	H	302	-	-	0/4/4/4	-
4	GOL	B	301	-	-	0/4/4/4	-
4	GOL	A	301	-	-	2/4/4/4	-
4	GOL	L	301	-	-	2/4/4/4	-
4	GOL	H	301	-	-	0/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	301	GOL	O1-C1-C2-C3
4	L	301	GOL	C1-C2-C3-O3
4	A	302	GOL	O1-C1-C2-C3
4	A	301	GOL	O1-C1-C2-O2
4	L	301	GOL	O2-C2-C3-O3
4	A	302	GOL	O1-C1-C2-O2

There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	H	305	GOL	1	0
4	A	302	GOL	1	0

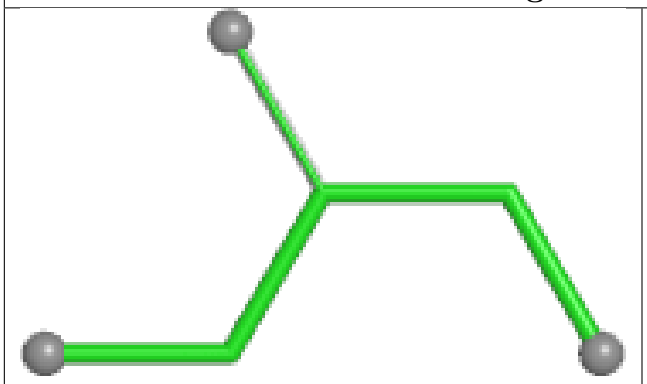
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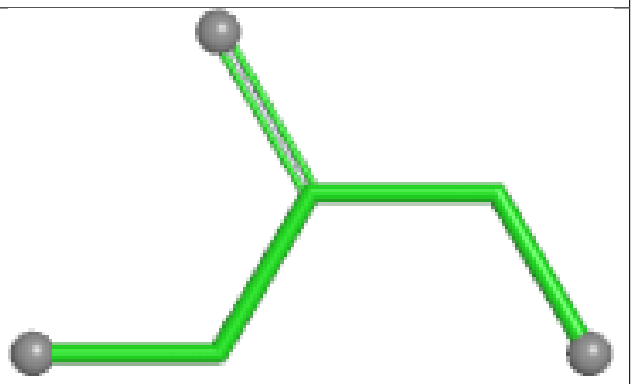
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	301	GOL	1	0
4	H	301	GOL	1	0

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.

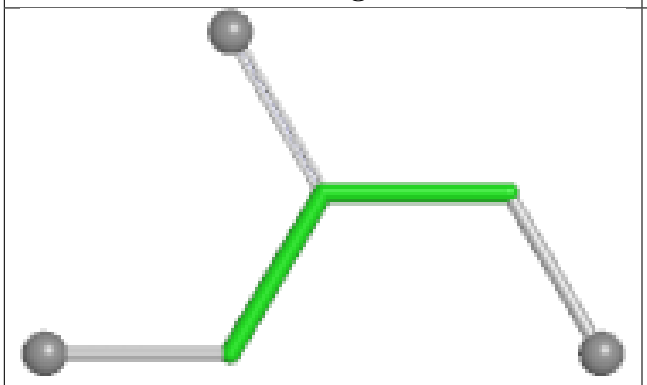
Ligand GOL L 302



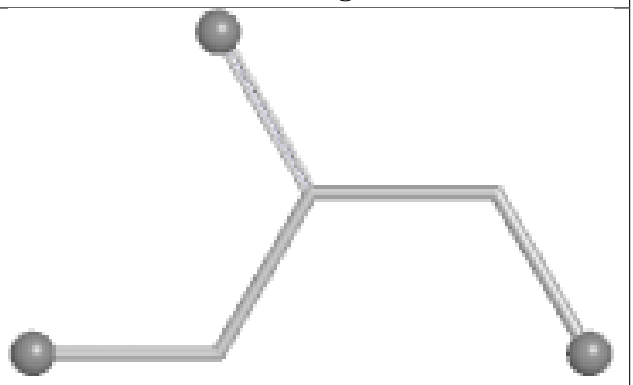
Bond lengths



Bond angles

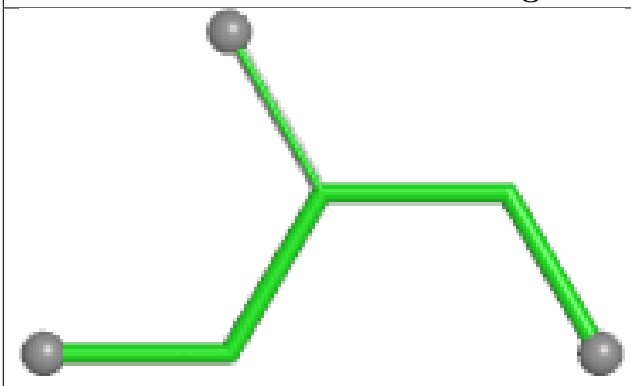


Torsions

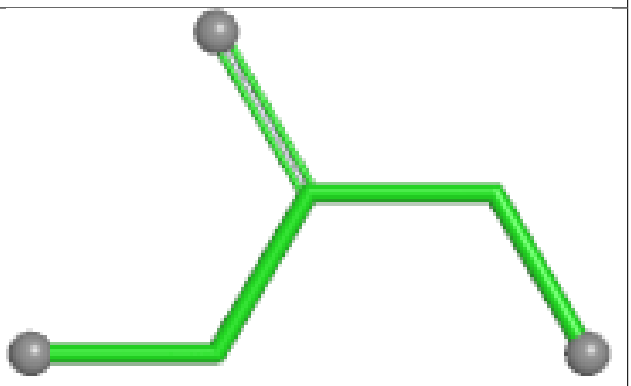


Rings

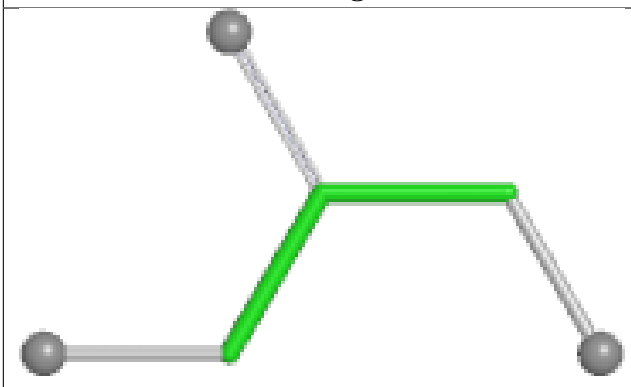
Ligand GOL H 303



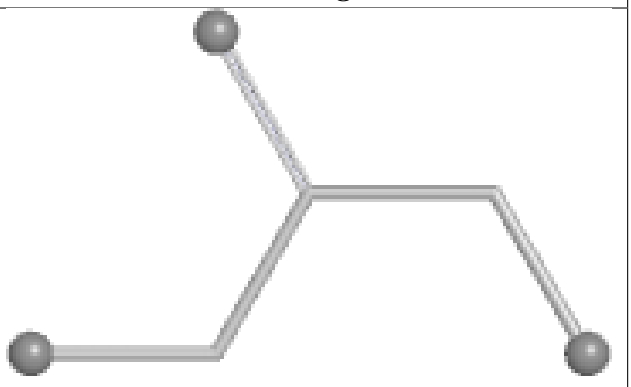
Bond lengths



Bond angles

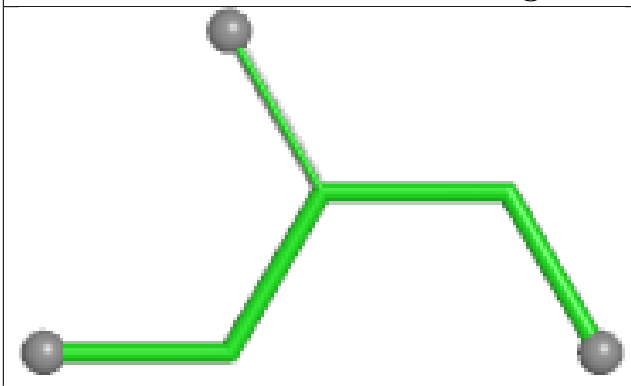


Torsions

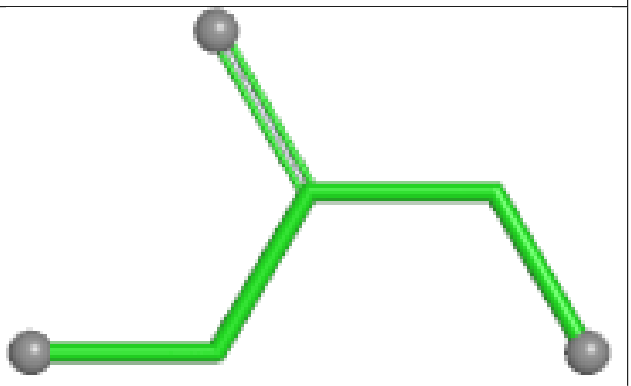


Rings

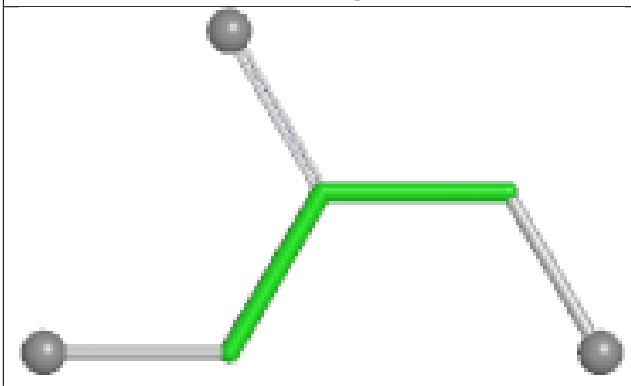
Ligand GOL H 305



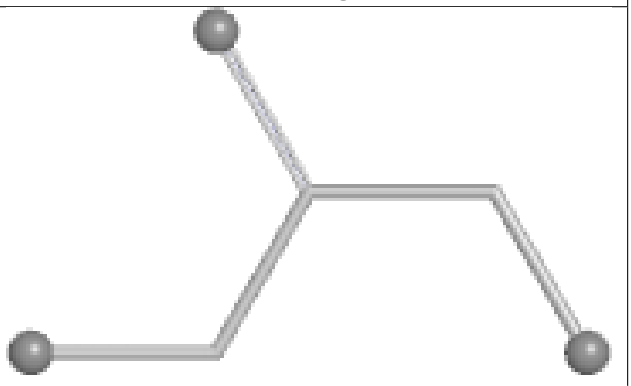
Bond lengths



Bond angles

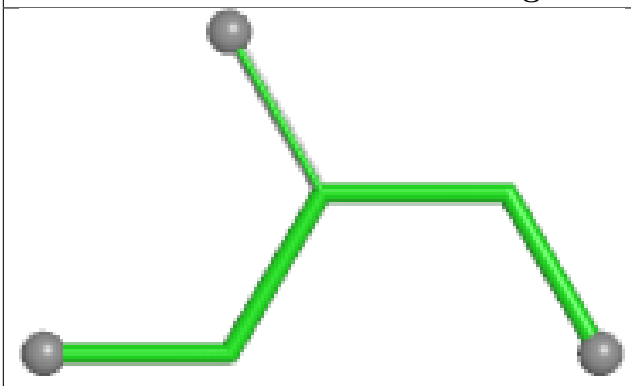


Torsions

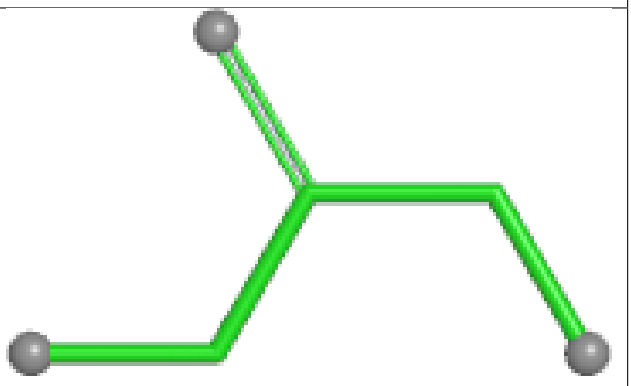


Rings

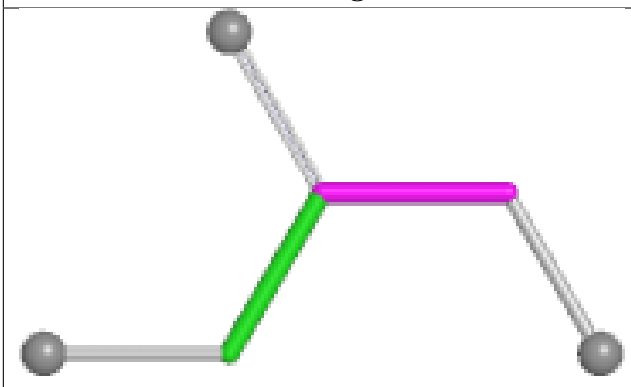
Ligand GOL A 302



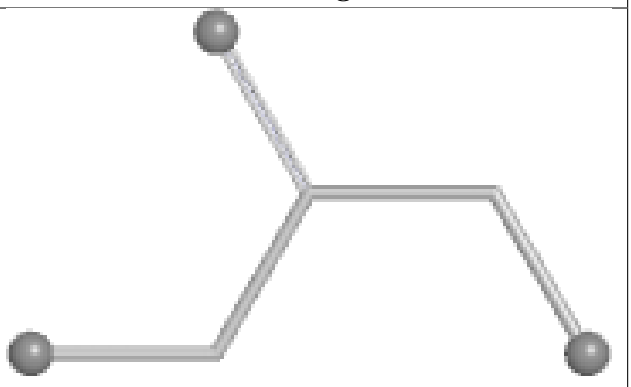
Bond lengths



Bond angles

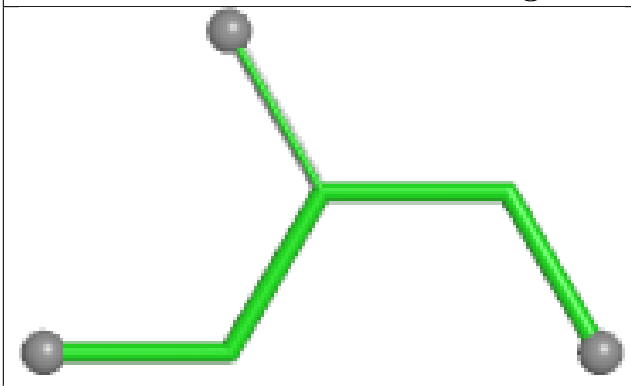


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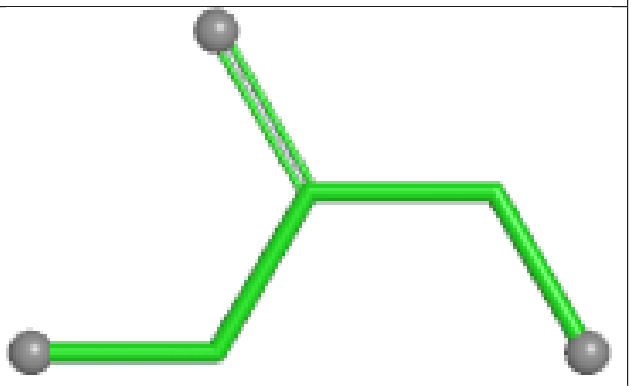


Rings

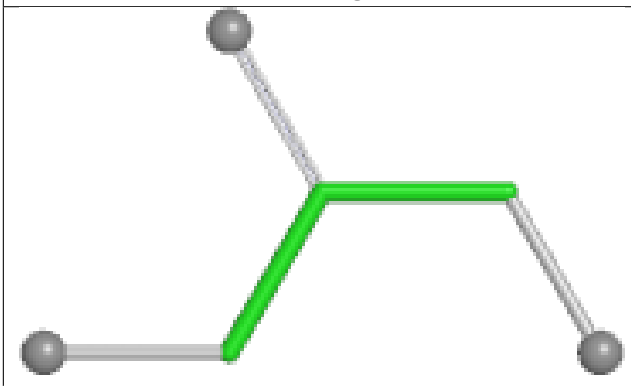
Ligand GOL H 304



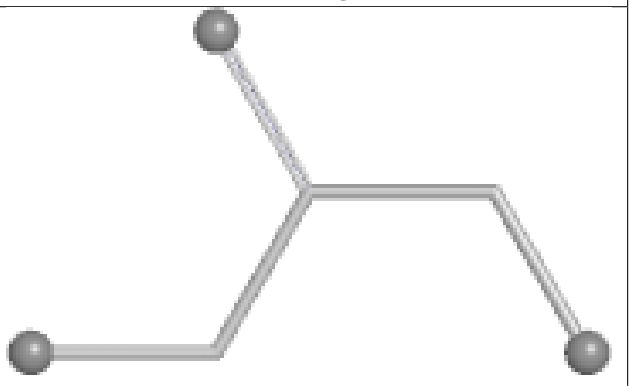
Bond lengths



Bond angles

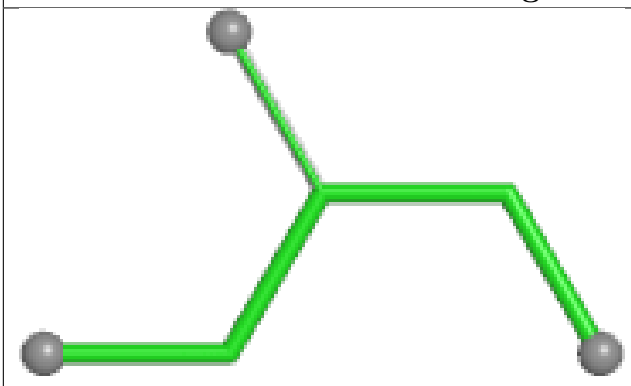


Torsions

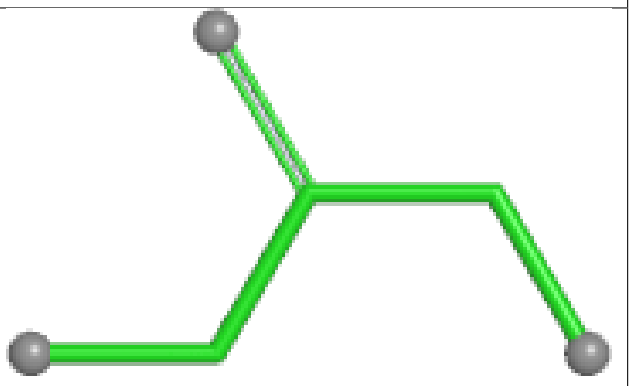


Rings

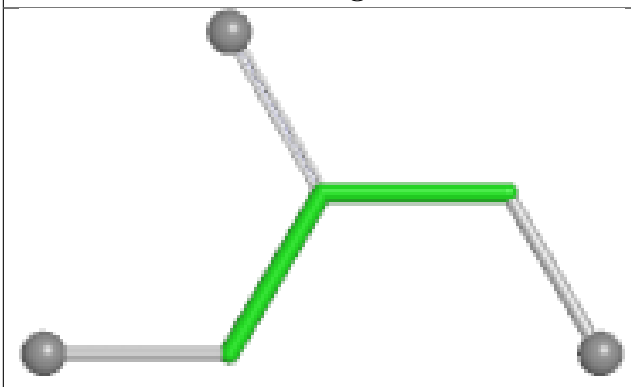
Ligand GOL H 302



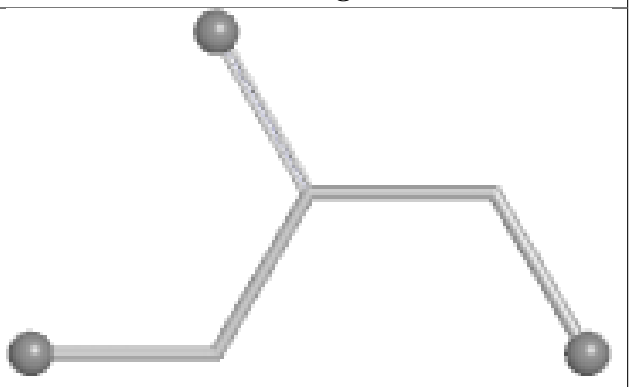
Bond lengths



Bond angles

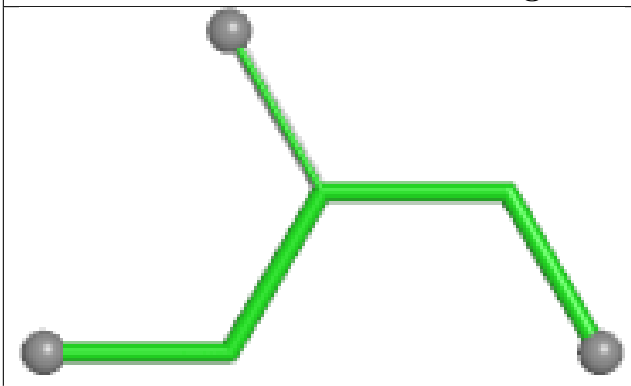


Torsions

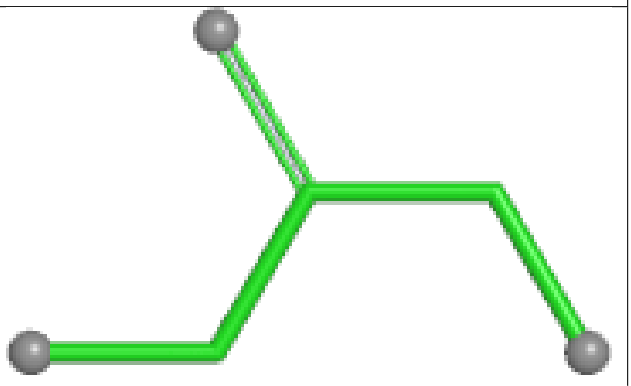


Rings

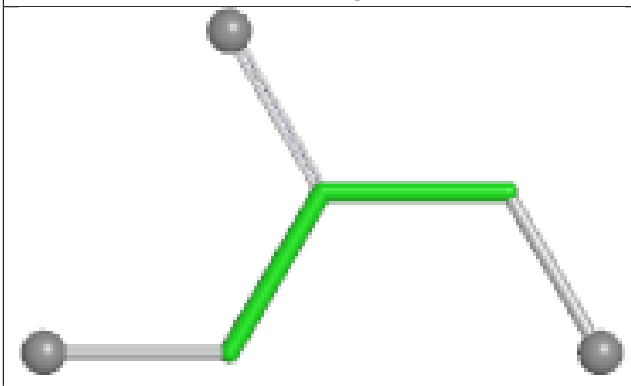
Ligand GOL B 301



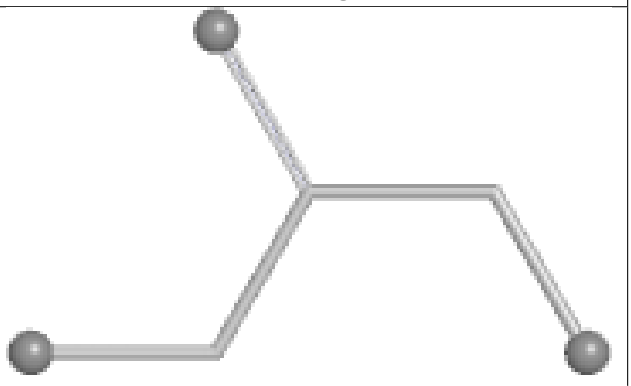
Bond lengths



Bond angles

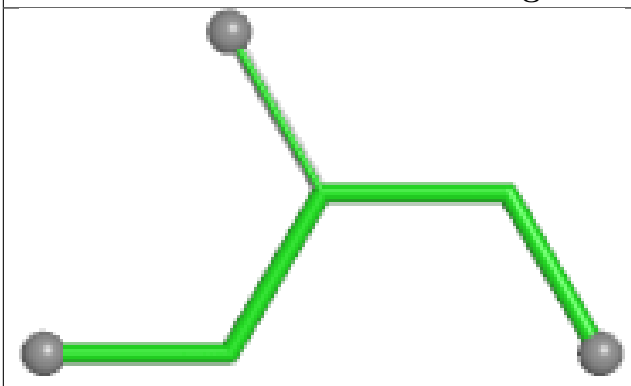


Torsions

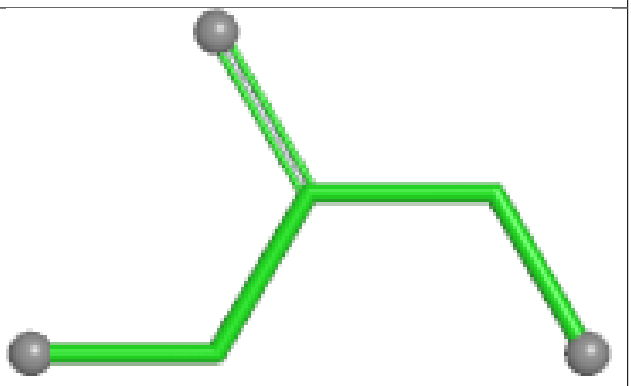


Rings

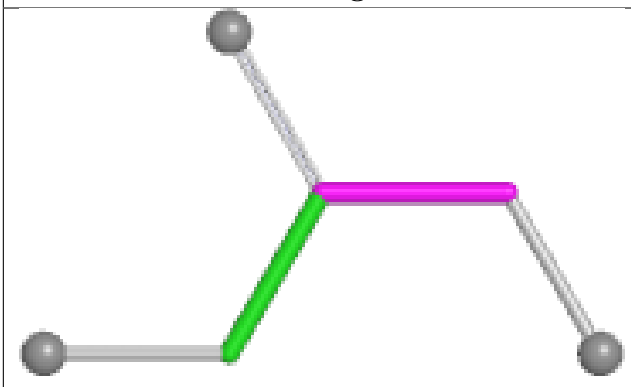
Ligand GOL A 301



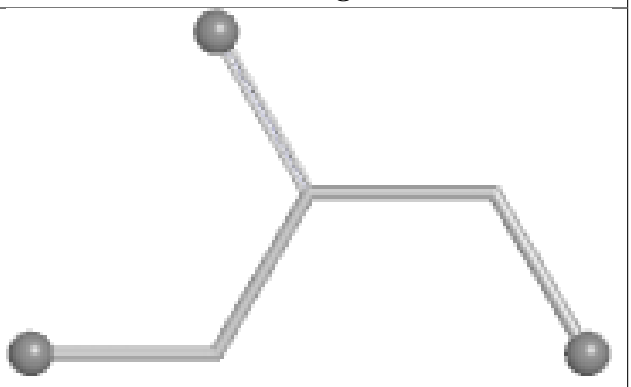
Bond lengths



Bond angles

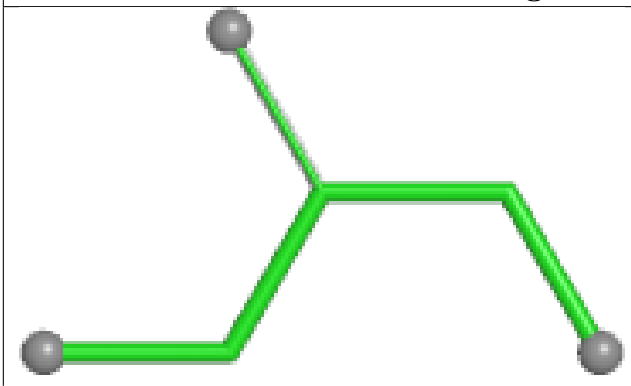


Torsions

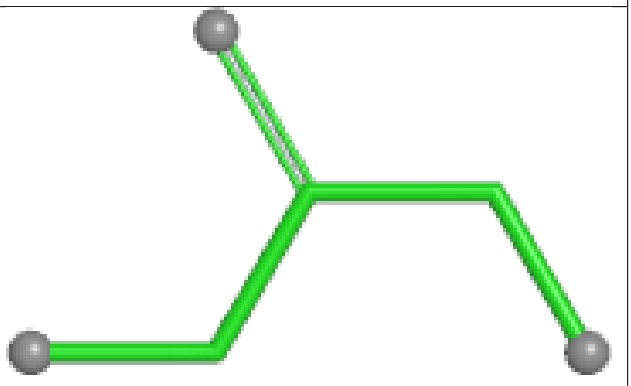


Rings

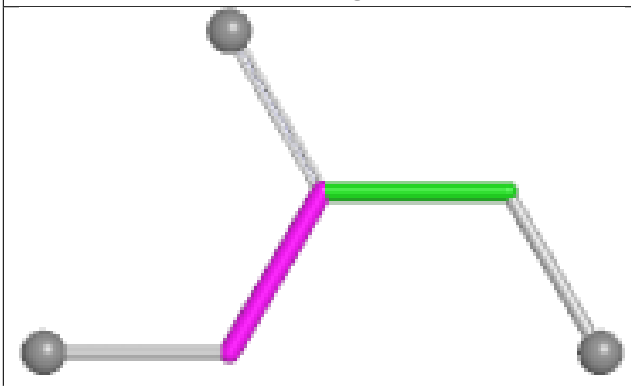
Ligand GOL L 301



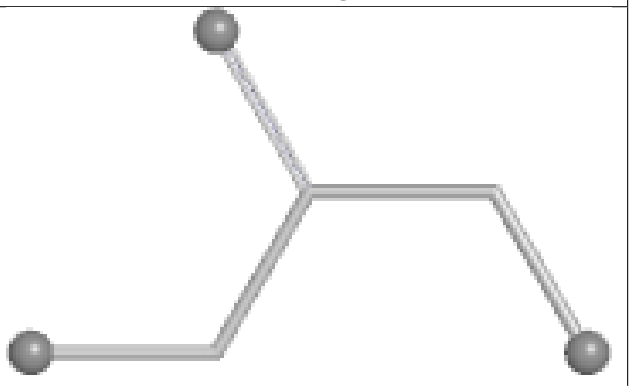
Bond lengths



Bond angles

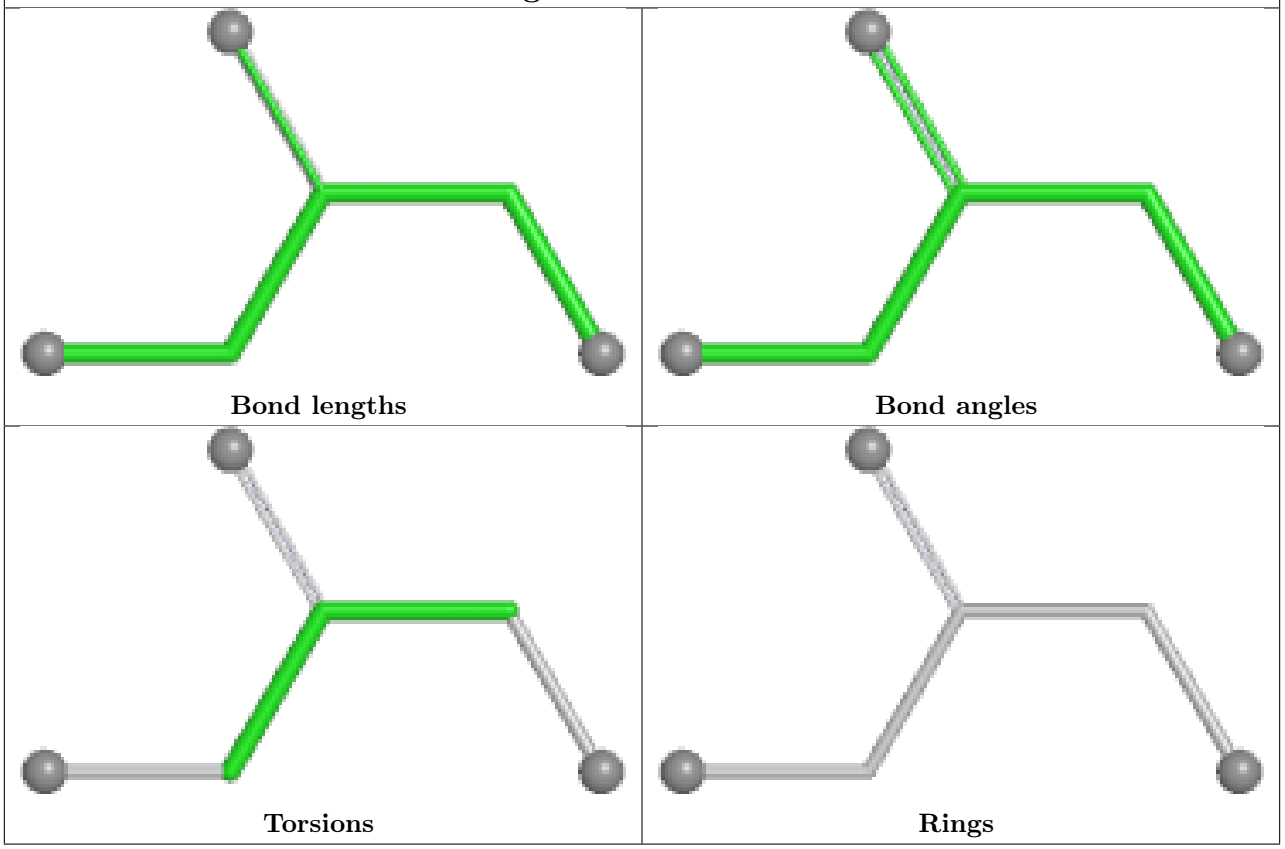


Torsions



Rings

Ligand GOL H 301



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	B	216/216 (100%)	0.40	8 (3%) 45 30	28, 68, 127, 149	0
1	L	215/216 (99%)	-0.12	1 (0%) 87 76	26, 47, 90, 111	0
2	A	226/228 (99%)	0.32	12 (5%) 32 22	20, 66, 119, 156	0
2	H	226/228 (99%)	-0.17	2 (0%) 81 66	18, 44, 68, 97	0
3	C	79/100 (79%)	0.37	2 (2%) 58 39	41, 62, 103, 124	0
3	D	76/100 (76%)	0.39	1 (1%) 75 57	41, 64, 98, 116	0
3	E	79/100 (79%)	1.37	12 (15%) 5 5	109, 133, 153, 165	0
3	F	79/100 (79%)	1.66	25 (31%) 1 1	115, 155, 176, 193	0
All	All	1196/1288 (92%)	0.33	63 (5%) 32 22	18, 58, 150, 193	0

All (63) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	F	110	TYR	3.9
3	F	175	VAL	3.8
3	F	140	LEU	3.7
3	F	134	PRO	3.7
3	E	150	ASP	3.6
3	F	103	LEU	3.6
1	B	96	LEU	3.5
3	F	145	ILE	3.5
3	F	139	VAL	3.4
3	F	181	THR	3.3
3	F	147	TYR	3.3
1	B	29	SER	3.2
3	C	109	CYS	3.1
1	B	93	SER	3.0
3	F	171	VAL	2.9
1	L	214	CYS	2.9

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Mol	Chain	Res	Type	RSRZ
2	H	33	SER	2.8
3	F	148	VAL	2.7
2	A	35	TYR	2.7
3	F	102	GLY	2.6
3	E	103	LEU	2.6
3	F	180	CYS	2.6
1	B	32	TYR	2.5
1	B	95	PRO	2.5
3	E	140	LEU	2.5
2	H	31	SER	2.5
2	A	29	ILE	2.5
2	A	100	ILE	2.4
3	F	179	PHE	2.4
3	F	141	THR	2.4
3	E	116	TYR	2.4
2	A	31	SER	2.4
1	B	95(A)	LEU	2.4
2	A	24	VAL	2.4
2	A	30	SER	2.4
3	F	142	THR	2.3
3	E	183	SER	2.3
3	F	104	TYR	2.3
3	F	128	ALA	2.3
3	C	162	THR	2.3
2	A	1	GLN	2.3
1	B	22	SER	2.2
1	B	33	LEU	2.2
3	E	144	LEU	2.2
2	A	78	PHE	2.2
3	E	148	VAL	2.2
3	F	111	ILE	2.2
3	D	156	GLY	2.2
2	A	100(A)	PHE	2.2
2	A	99	ALA	2.1
3	F	159	ILE	2.1
3	F	136	LYS	2.1
3	F	144	LEU	2.1
3	F	146	ASP	2.1
3	E	141	THR	2.1
2	A	54	SER	2.1
2	A	56	SER	2.1
3	E	104	TYR	2.1

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Mol	Chain	Res	Type	RSRZ
3	E	160	THR	2.1
3	E	147	TYR	2.0
3	F	124	ALA	2.0
3	E	120	GLU	2.0
3	F	160	THR	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 oligosaccharides in this entry.

6.4 Ligands (i)

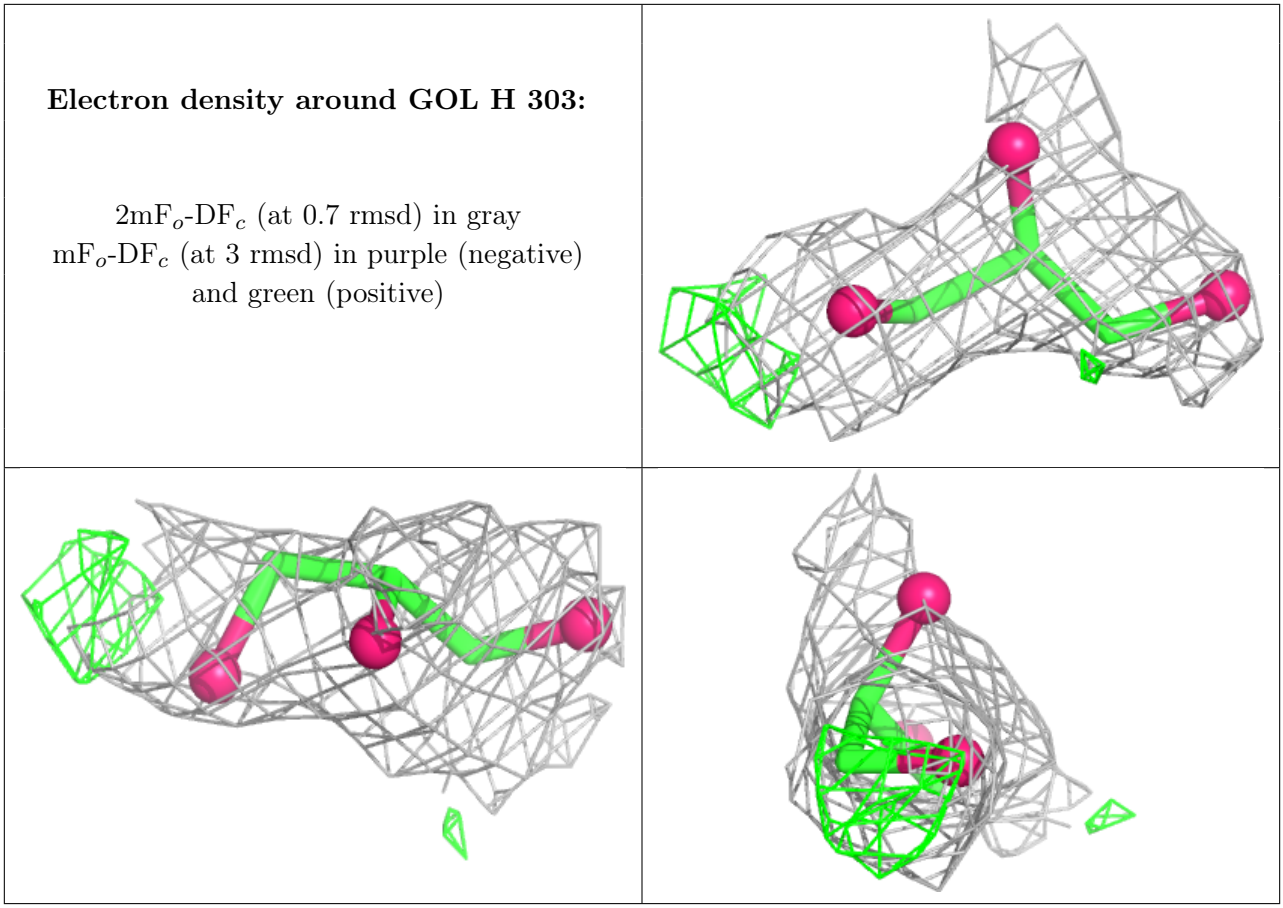
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' 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
4	GOL	H	303	6/6	0.77	0.20	65,75,89,98	0
4	GOL	H	302	6/6	0.82	0.12	55,65,69,69	0
4	GOL	B	301	6/6	0.84	0.21	76,78,84,100	0
4	GOL	H	304	6/6	0.85	0.15	71,74,82,93	0
4	GOL	L	302	6/6	0.88	0.18	62,76,86,87	0
4	GOL	A	302	6/6	0.88	0.16	52,62,74,86	0
4	GOL	A	301	6/6	0.91	0.16	34,48,52,59	0
4	GOL	L	301	6/6	0.93	0.15	45,55,71,81	0
4	GOL	H	305	6/6	0.94	0.14	48,62,67,83	0
4	GOL	H	301	6/6	0.94	0.10	37,51,59,69	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.

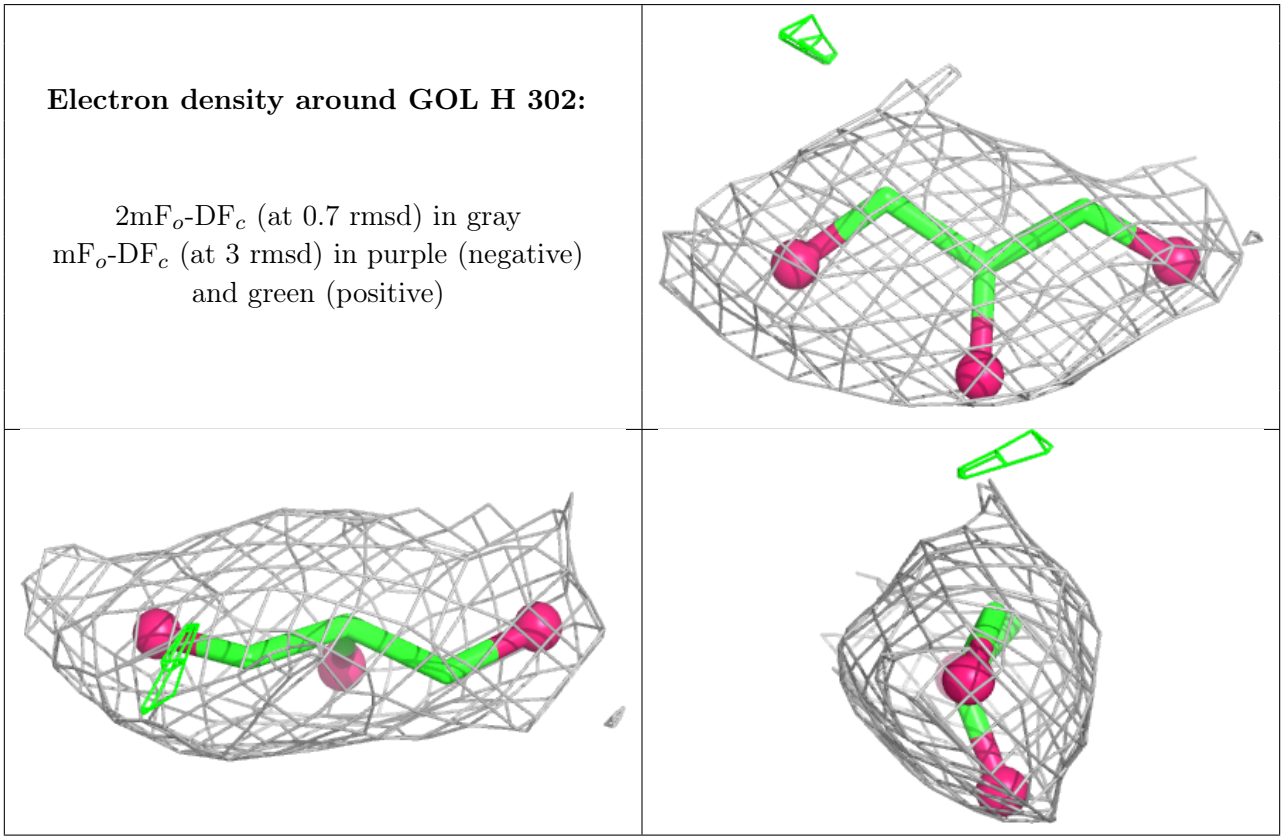
Electron density around GOL H 303:

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



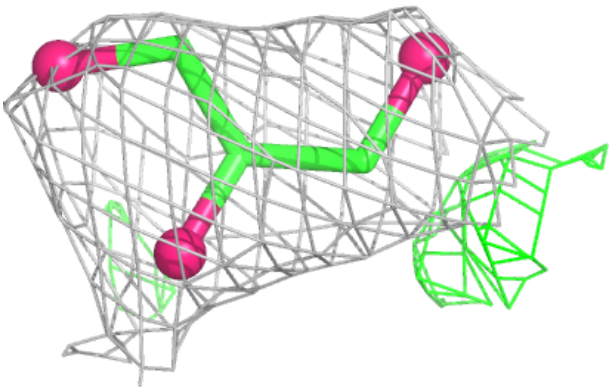
Electron density around GOL H 302:

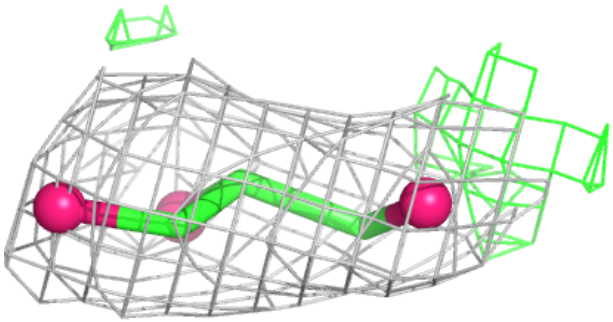
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

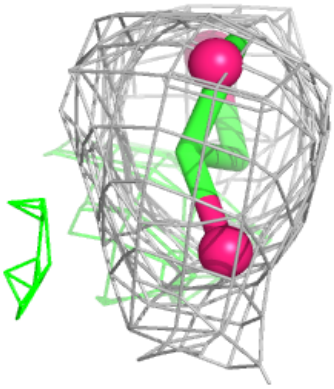


Electron density around GOL B 301:

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

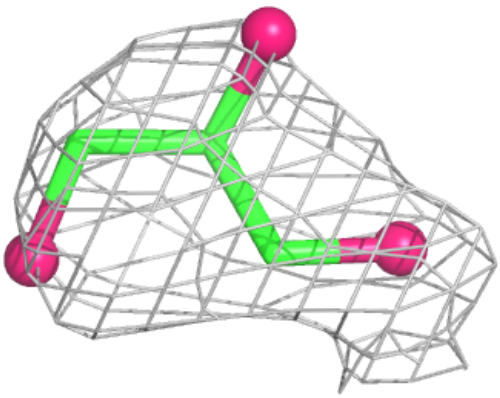


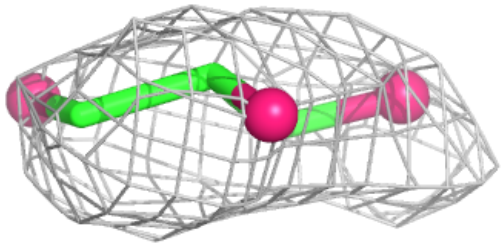


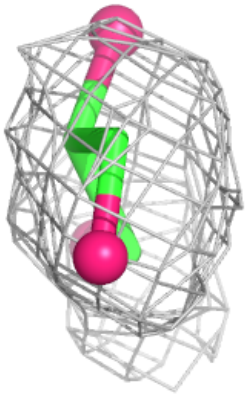


Electron density around GOL H 304:

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

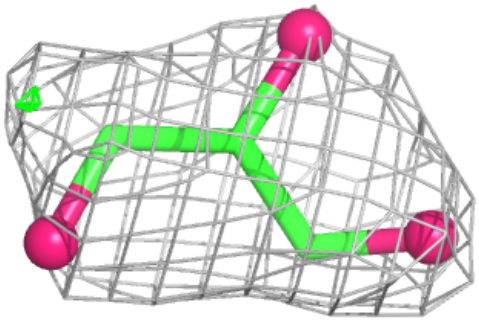


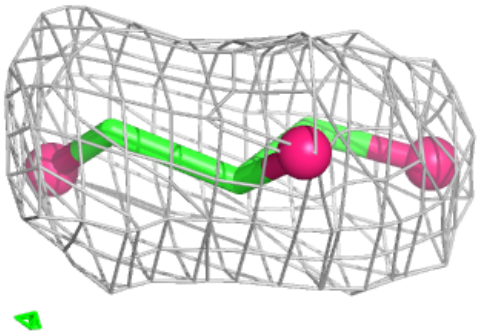


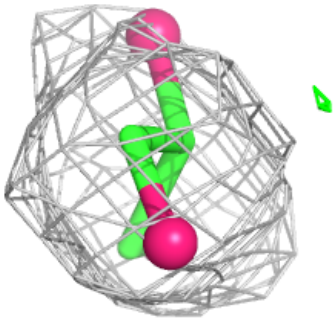


Electron density around GOL L 302:

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

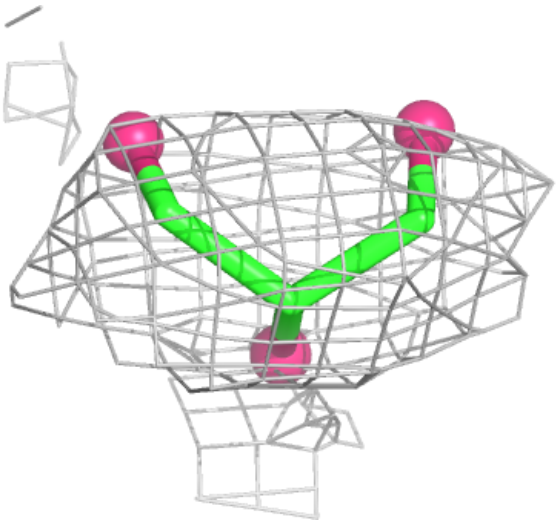


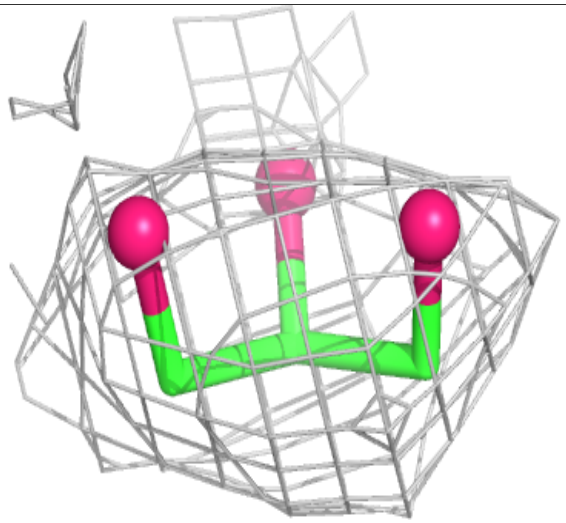


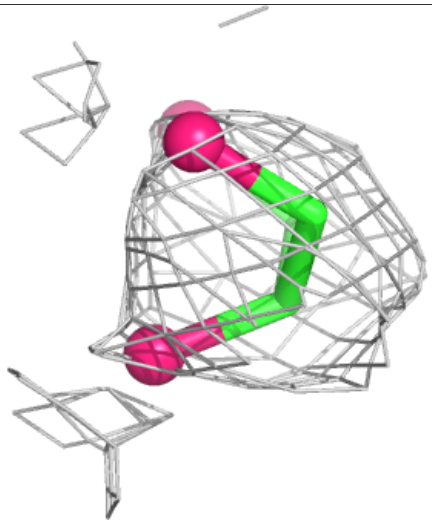


Electron density around GOL A 302:

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

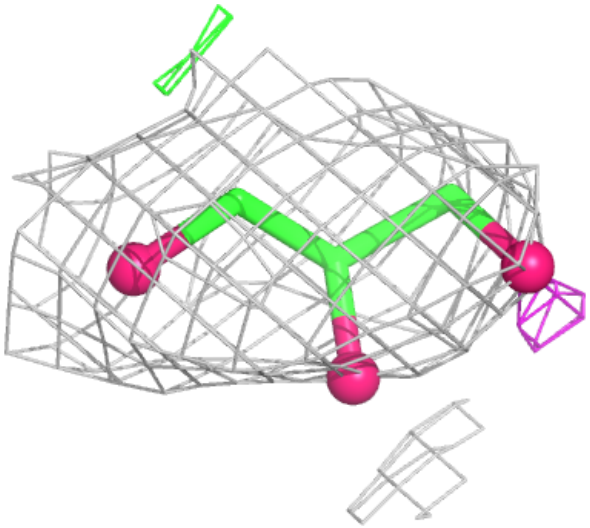


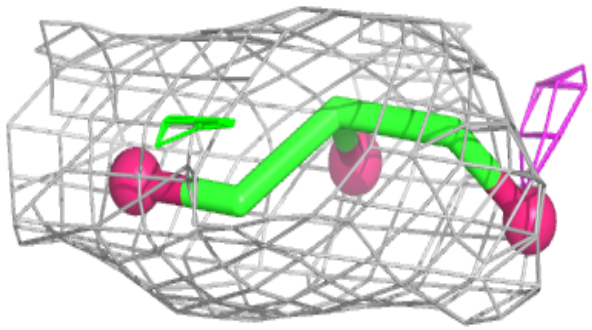


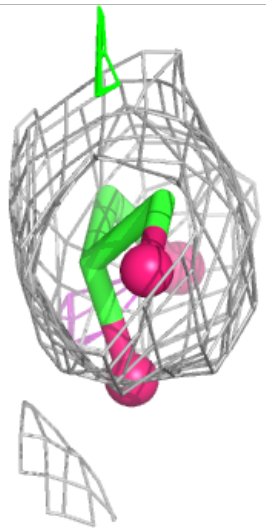


Electron density around GOL A 301:

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

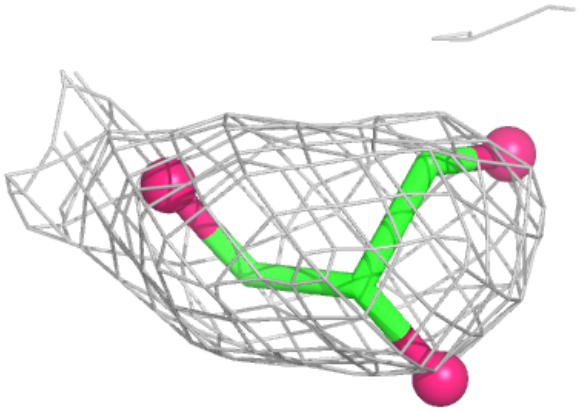


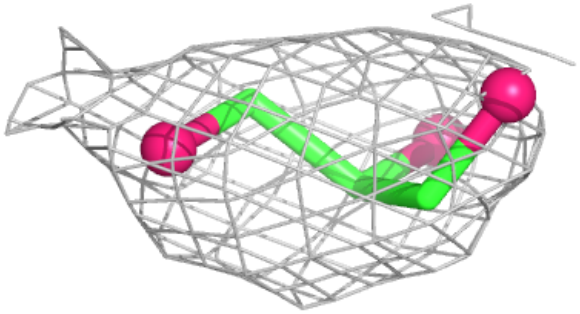


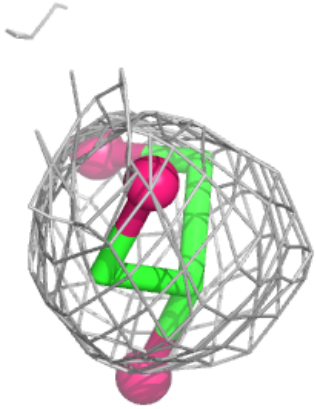


Electron density around GOL L 301:

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

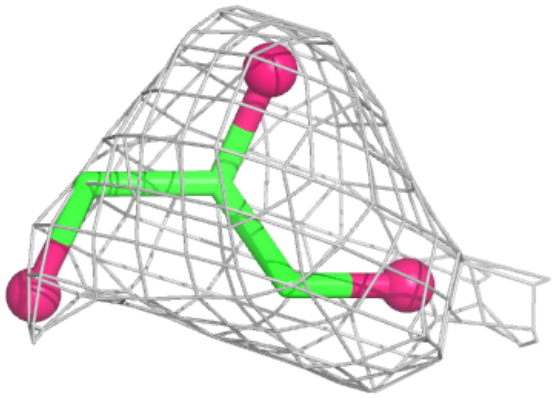


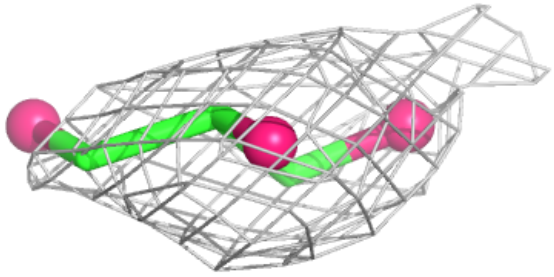


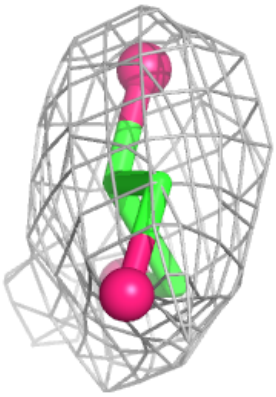


Electron density around GOL H 305:

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

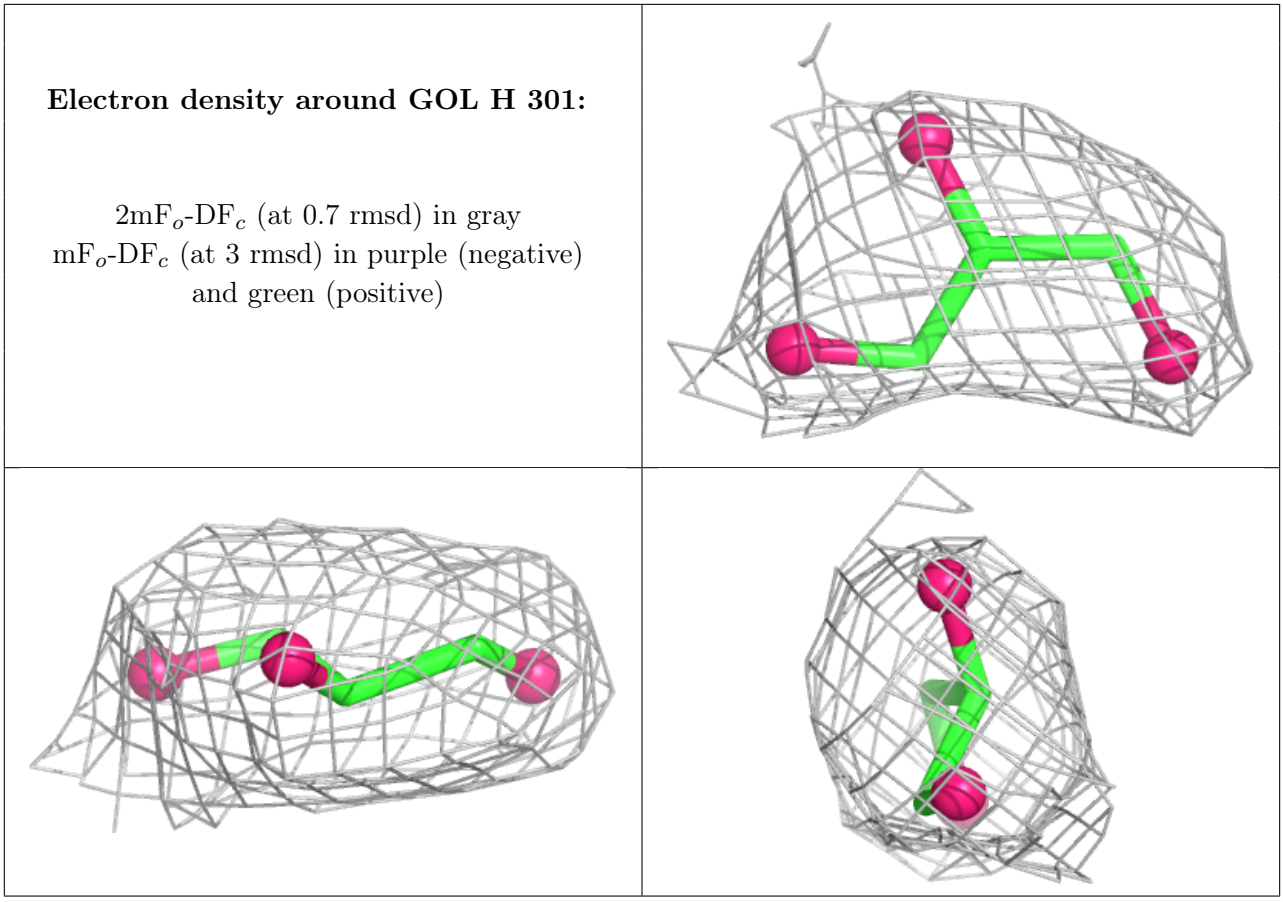






Electron density around GOL H 301:

$2mF_o$-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.