wwPDB X-ray Structure Validation Summary Report (i)

Dec 13, 2023 – 06:34 PM JST

PDB ID	:	8HQL
Title	:	Crystal structure of mouse SNX25 PX domain
Authors	:	Yu, Z.; Xu, J.; Liu, J.
Deposited on	:	2022-12-13
Resolution	:	2.40 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (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:

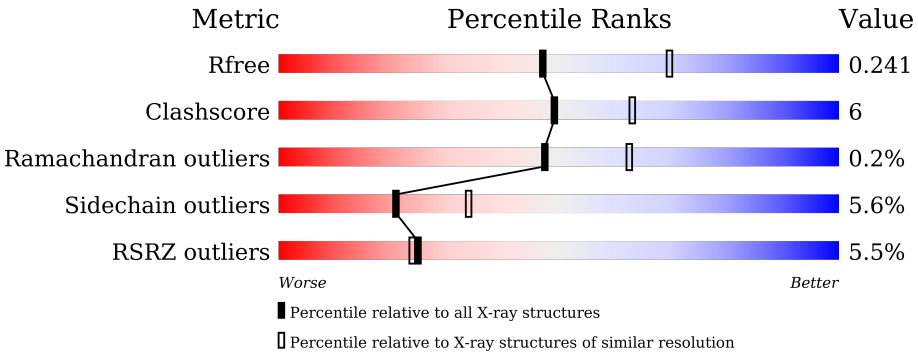
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber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

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.40 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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	128	83% 11% • 5%
1	B	128	5% 78% 12% • 8%
1	C	128	9% 79% 16% • 5%
1	D	128	5% 83% 9% 8%
1	E	128	6% 79% 15% • 5%

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	GOL	C	702	-	-	X	-
3	GOL	E	703	-	-	X	-
4	CL	E	706	-	-	X	-

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 5209 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 Sorting nexin-25.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	122	Total	C	N	O	S	0	0	0
			985	627	172	182	4			
1	B	118	Total	C	N	O	S	0	0	0
			953	607	167	175	4			
1	C	122	Total	C	N	O	S	0	0	0
			985	627	172	182	4			
1	D	118	Total	C	N	O	S	0	0	0
			952	605	167	176	4			
1	E	121	Total	C	N	O	S	0	0	0
			976	622	171	179	4			

There are 45 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	505	MET	-	initiating methionine	UNP Q3ZT31
A	625	LEU	-	expression tag	UNP Q3ZT31
A	626	GLU	-	expression tag	UNP Q3ZT31
A	627	HIS	-	expression tag	UNP Q3ZT31
A	628	HIS	-	expression tag	UNP Q3ZT31
A	629	HIS	-	expression tag	UNP Q3ZT31
A	630	HIS	-	expression tag	UNP Q3ZT31
A	631	HIS	-	expression tag	UNP Q3ZT31
A	632	HIS	-	expression tag	UNP Q3ZT31
B	505	MET	-	initiating methionine	UNP Q3ZT31
B	625	LEU	-	expression tag	UNP Q3ZT31
B	626	GLU	-	expression tag	UNP Q3ZT31
B	627	HIS	-	expression tag	UNP Q3ZT31
B	628	HIS	-	expression tag	UNP Q3ZT31
B	629	HIS	-	expression tag	UNP Q3ZT31
B	630	HIS	-	expression tag	UNP Q3ZT31
B	631	HIS	-	expression tag	UNP Q3ZT31
B	632	HIS	-	expression tag	UNP Q3ZT31
C	505	MET	-	initiating methionine	UNP Q3ZT31

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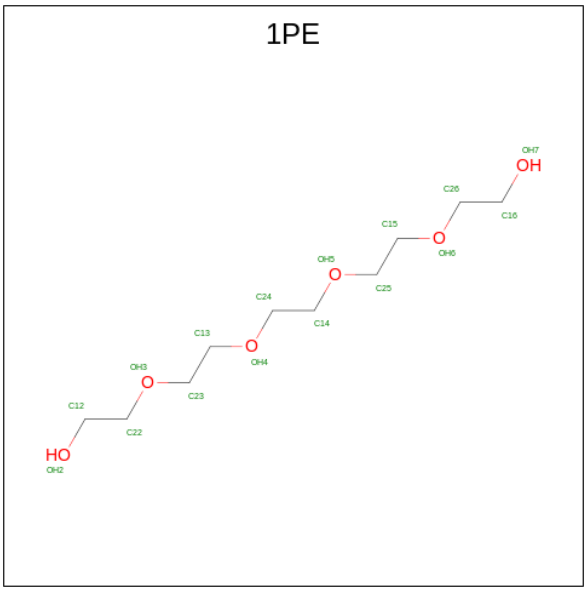
Chain	Residue	Modelled	Actual	Comment	Reference
C	625	LEU	-	expression tag	UNP Q3ZT31
C	626	GLU	-	expression tag	UNP Q3ZT31
C	627	HIS	-	expression tag	UNP Q3ZT31
C	628	HIS	-	expression tag	UNP Q3ZT31
C	629	HIS	-	expression tag	UNP Q3ZT31
C	630	HIS	-	expression tag	UNP Q3ZT31
C	631	HIS	-	expression tag	UNP Q3ZT31
C	632	HIS	-	expression tag	UNP Q3ZT31
D	505	MET	-	initiating methionine	UNP Q3ZT31
D	625	LEU	-	expression tag	UNP Q3ZT31
D	626	GLU	-	expression tag	UNP Q3ZT31
D	627	HIS	-	expression tag	UNP Q3ZT31
D	628	HIS	-	expression tag	UNP Q3ZT31
D	629	HIS	-	expression tag	UNP Q3ZT31
D	630	HIS	-	expression tag	UNP Q3ZT31
D	631	HIS	-	expression tag	UNP Q3ZT31
D	632	HIS	-	expression tag	UNP Q3ZT31
E	505	MET	-	initiating methionine	UNP Q3ZT31
E	625	LEU	-	expression tag	UNP Q3ZT31
E	626	GLU	-	expression tag	UNP Q3ZT31
E	627	HIS	-	expression tag	UNP Q3ZT31
E	628	HIS	-	expression tag	UNP Q3ZT31
E	629	HIS	-	expression tag	UNP Q3ZT31
E	630	HIS	-	expression tag	UNP Q3ZT31
E	631	HIS	-	expression tag	UNP Q3ZT31
E	632	HIS	-	expression tag	UNP Q3ZT31

- Molecule 2 is PENTAETHYLENE GLYCOL (three-letter code: 1PE) (formula: $C_{10}H_{22}O_6$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 10 6 4	0	0
2	A	1	Total C O 4 2 2	0	0
2	A	1	Total C O 13 8 5	0	0
2	A	1	Total C O 4 2 2	0	0
2	B	1	Total C O 13 8 5	0	0
2	B	1	Total C O 10 6 4	0	0
2	B	1	Total C O 10 6 4	0	0
2	B	1	Total C O 4 2 2	0	0
2	B	1	Total C O 4 2 2	0	0
2	B	1	Total C O 4 2 2	0	0
2	C	1	Total C O 9 6 3	0	0
2	D	1	Total C O 7 4 3	0	0
2	D	1	Total C O 7 4 3	0	0
2	D	1	Total C O 4 2 2	0	0

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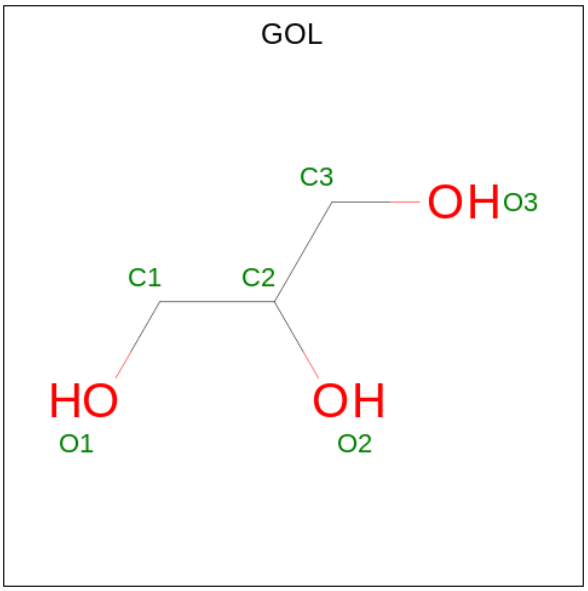
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	D	1	Total C O 10 6 4	0	0
2	E	1	Total C O 10 6 4	0	0
2	E	1	Total C O 4 2 2	0	0

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$) (labeled as "Ligand of Interest" by depositor).



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

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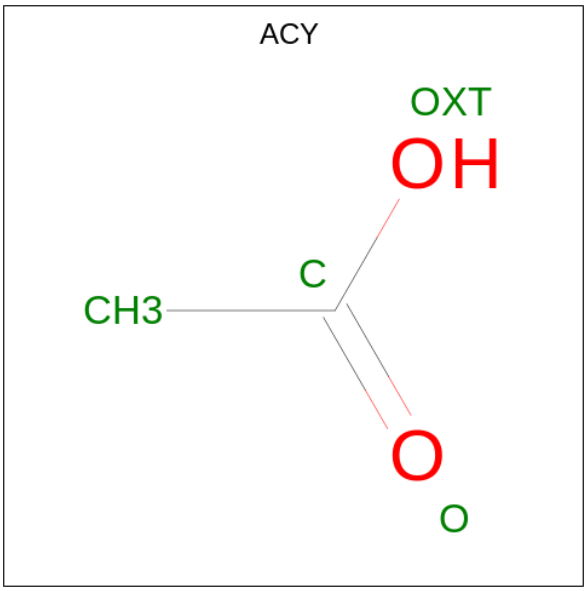
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	C	1	Total C O 6 3 3	0	0
3	C	1	Total C O 6 3 3	0	0
3	D	1	Total C O 6 3 3	0	0
3	E	1	Total C O 6 3 3	0	0
3	E	1	Total C O 6 3 3	0	0
3	E	1	Total C O 6 3 3	0	0

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl) (labeled as "Ligand of Interest" by depositor).

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

- Molecule 5 is ACETIC ACID (three-letter code: ACY) (formula: $C_2H_4O_2$) (labeled as "Ligand of Interest" by depositor).



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

- Molecule 6 is water.

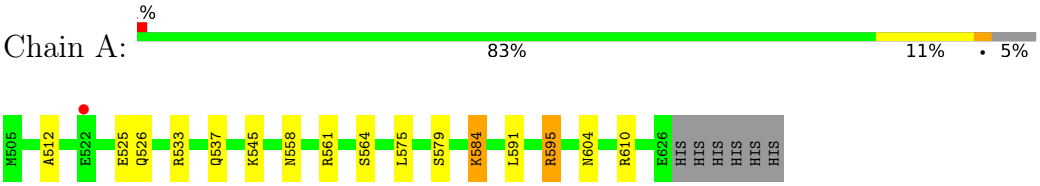
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	43	Total O 43 43	0	0
6	B	30	Total O 30 30	0	0
6	C	23	Total O 23 23	0	0
6	D	21	Total O 21 21	0	0
6	E	17	Total O 17 17	0	0

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.

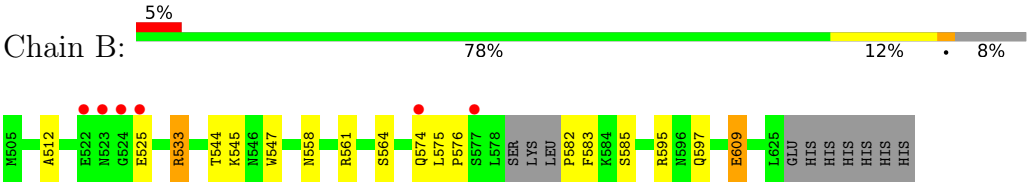
• Molecule 1: Sorting nexin-25

Chain A:



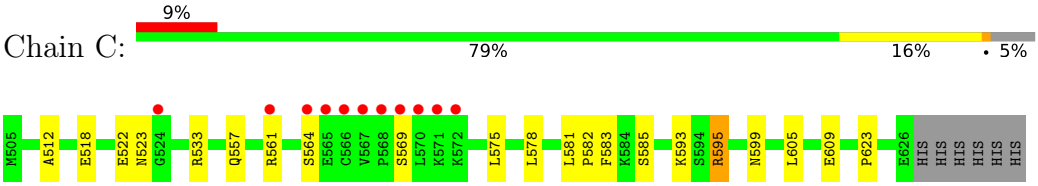
• Molecule 1: Sorting nexin-25

Chain B:



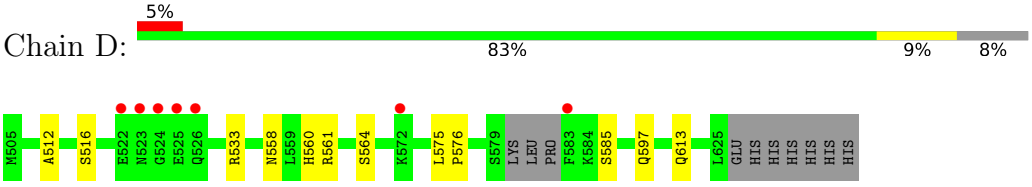
• Molecule 1: Sorting nexin-25

Chain C:



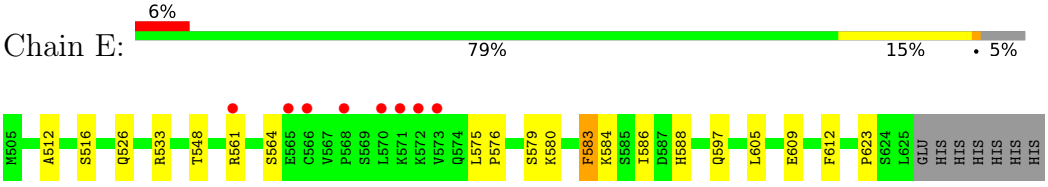
• Molecule 1: Sorting nexin-25

Chain D:



• Molecule 1: Sorting nexin-25

Chain E:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 61 2 2	Depositor
Cell constants a, b, c, α, β, γ	92.68Å 92.68Å 449.52Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	39.00 – 2.40 39.97 – 2.40	Depositor EDS
% Data completeness (in resolution range)	99.8 (39.00-2.40) 99.9 (39.97-2.40)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.35 (at 2.39Å)	Xtriage
Refinement program	REFMAC 5.8.0267	Depositor
R, R_{free}	0.199 , 0.242 0.201 , 0.241	Depositor DCC
R_{free} test set	2319 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	48.9	Xtriage
Anisotropy	0.065	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 47.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	5209	wwPDB-VP
Average B, all atoms (Å^2)	58.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.15% 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: ACY, 1PE, CL, 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	A	0.84	0/1005	1.05	3/1356 (0.2%)
1	B	0.80	0/972	0.98	1/1310 (0.1%)
1	C	0.82	1/1005 (0.1%)	1.00	0/1356
1	D	0.79	0/970	0.93	0/1307
1	E	0.77	0/996	0.97	1/1344 (0.1%)
All	All	0.81	1/4948 (0.0%)	0.99	5/6673 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	518	GLU	CD-OE2	6.39	1.32	1.25

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	595	ARG	NE-CZ-NH1	11.16	125.88	120.30
1	E	583	PHE	CB-CA-C	7.52	125.44	110.40
1	A	595	ARG	CD-NE-CZ	5.74	131.64	123.60
1	A	595	ARG	CB-CG-CD	5.61	126.18	111.60
1	B	533	ARG	NE-CZ-NH2	5.31	122.95	120.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	985	0	993	11	0
1	B	953	0	957	9	0
1	C	985	0	993	18	0
1	D	952	0	954	7	0
1	E	976	0	987	17	0
2	A	31	0	39	1	0
2	B	45	0	58	4	0
2	C	9	0	11	0	0
2	D	28	0	35	1	0
2	E	14	0	17	4	0
3	A	30	0	40	0	0
3	C	30	0	40	8	0
3	D	6	0	8	1	0
3	E	18	0	24	6	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	1	0
4	D	1	0	0	0	0
4	E	1	0	0	3	0
5	C	4	0	3	0	0
5	D	4	0	3	0	0
6	A	43	0	0	1	0
6	B	30	0	0	1	0
6	C	23	0	0	1	0
6	D	21	0	0	0	0
6	E	17	0	0	1	0
All	All	5209	0	5162	60	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.

The worst 5 of 60 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:557:GLN:HG3	1:C:578:LEU:HD23	1.56	0.85
1:C:569:SER:HB3	3:C:702:GOL:H11	1.59	0.84
1:C:599:ASN:HD21	3:C:705:GOL:H32	1.44	0.82
1:E:576:PRO:HG3	1:E:597:GLN:HE21	1.48	0.78
1:B:576:PRO:HG3	1:B:597:GLN:HE21	1.47	0.78

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	120/128 (94%)	116 (97%)	4 (3%)	0	100 100
1	B	114/128 (89%)	109 (96%)	5 (4%)	0	100 100
1	C	120/128 (94%)	115 (96%)	4 (3%)	1 (1%)	19 29
1	D	114/128 (89%)	111 (97%)	3 (3%)	0	100 100
1	E	119/128 (93%)	113 (95%)	6 (5%)	0	100 100
All	All	587/640 (92%)	564 (96%)	22 (4%)	1 (0%)	47 62

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	523	ASN

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	112/118 (95%)	106 (95%)	6 (5%)	22 36
1	B	108/118 (92%)	99 (92%)	9 (8%)	11 17
1	C	112/118 (95%)	104 (93%)	8 (7%)	14 23
1	D	108/118 (92%)	105 (97%)	3 (3%)	43 63

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	E	111/118 (94%)	106 (96%)	5 (4%)	27 44
All	All	551/590 (93%)	520 (94%)	31 (6%)	21 34

5 of 31 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	609	GLU
1	E	564	SER
1	C	564	SER
1	E	580	LYS
1	D	575	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 8 such sidechains are listed below:

Mol	Chain	Res	Type
1	E	603	GLN
1	E	597	GLN
1	D	603	GLN
1	D	597	GLN
1	E	588	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 38 ligands modelled in this entry, 5 are monoatomic - leaving 33 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
3	GOL	C	706	-	5,5,5	0.22	0	5,5,5	0.62	0
3	GOL	C	703	-	5,5,5	0.14	0	5,5,5	0.34	0
3	GOL	E	703	-	5,5,5	0.18	0	5,5,5	0.63	0
2	1PE	A	701	-	9,9,15	0.35	0	8,8,14	0.25	0
2	1PE	B	702	-	9,9,15	0.70	0	8,8,14	0.33	0
2	1PE	E	702	-	3,3,15	0.36	0	2,2,14	0.19	0
3	GOL	C	705	-	5,5,5	0.19	0	5,5,5	0.43	0
3	GOL	C	704	-	5,5,5	0.17	0	5,5,5	0.27	0
2	1PE	D	703	-	3,3,15	0.41	0	2,2,14	0.14	0
2	1PE	D	704	-	9,9,15	0.42	0	8,8,14	0.46	0
2	1PE	B	703	-	9,9,15	0.47	0	8,8,14	0.44	0
2	1PE	B	704	-	3,3,15	0.29	0	2,2,14	0.19	0
2	1PE	E	701	-	9,9,15	0.56	0	8,8,14	0.44	0
5	ACY	D	707	-	3,3,3	1.20	0	3,3,3	0.68	0
2	1PE	A	704	-	3,3,15	0.45	0	2,2,14	0.28	0
2	1PE	D	702	-	6,6,15	0.17	0	5,5,14	0.36	0
3	GOL	A	705	-	5,5,5	0.19	0	5,5,5	0.45	0
2	1PE	B	701	-	12,12,15	0.64	0	11,11,14	0.50	0
3	GOL	A	706	-	5,5,5	0.32	0	5,5,5	0.68	0
2	1PE	A	702	-	3,3,15	0.53	0	2,2,14	0.26	0
3	GOL	A	707	-	5,5,5	0.14	0	5,5,5	0.50	0
3	GOL	E	704	-	5,5,5	0.29	0	5,5,5	0.65	0
5	ACY	C	708	-	3,3,3	1.09	0	3,3,3	0.93	0
2	1PE	D	701	-	6,6,15	1.02	0	5,5,14	0.73	0
3	GOL	C	702	-	5,5,5	0.05	0	5,5,5	0.44	0
2	1PE	B	705	-	3,3,15	0.49	0	2,2,14	0.26	0
3	GOL	A	709	-	5,5,5	0.20	0	5,5,5	0.61	0
3	GOL	D	705	-	5,5,5	0.20	0	5,5,5	0.40	0
2	1PE	C	701	-	8,8,15	0.80	0	7,7,14	0.39	0
2	1PE	B	706	-	3,3,15	0.20	0	2,2,14	0.34	0
2	1PE	A	703	-	12,12,15	0.53	0	11,11,14	0.41	0
3	GOL	E	705	-	5,5,5	0.14	0	5,5,5	0.39	0
3	GOL	A	708	-	5,5,5	0.11	0	5,5,5	0.35	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns.

'-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	GOL	C	706	-	-	4/4/4/4	-
3	GOL	C	703	-	-	2/4/4/4	-
3	GOL	E	703	-	-	0/4/4/4	-
2	1PE	A	701	-	-	1/7/7/13	-
2	1PE	B	702	-	-	5/7/7/13	-
2	1PE	E	702	-	-	1/1/1/13	-
3	GOL	C	705	-	-	4/4/4/4	-
3	GOL	C	704	-	-	0/4/4/4	-
2	1PE	D	703	-	-	1/1/1/13	-
2	1PE	D	704	-	-	4/7/7/13	-
2	1PE	B	703	-	-	6/7/7/13	-
2	1PE	B	704	-	-	0/1/1/13	-
2	1PE	E	701	-	-	4/7/7/13	-
2	1PE	A	704	-	-	0/1/1/13	-
2	1PE	D	702	-	-	2/4/4/13	-
3	GOL	A	705	-	-	4/4/4/4	-
2	1PE	B	701	-	-	8/10/10/13	-
3	GOL	A	706	-	-	4/4/4/4	-
2	1PE	A	702	-	-	1/1/1/13	-
3	GOL	A	707	-	-	3/4/4/4	-
3	GOL	E	704	-	-	4/4/4/4	-
2	1PE	D	701	-	-	2/4/4/13	-
3	GOL	C	702	-	-	4/4/4/4	-
2	1PE	B	705	-	-	0/1/1/13	-
3	GOL	A	709	-	-	0/4/4/4	-
3	GOL	D	705	-	-	0/4/4/4	-
2	1PE	C	701	-	-	5/6/6/13	-
2	1PE	B	706	-	-	0/1/1/13	-
2	1PE	A	703	-	-	6/10/10/13	-
3	GOL	E	705	-	-	2/4/4/4	-
3	GOL	A	708	-	-	2/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 79 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	706	GOL	O1-C1-C2-C3
3	A	706	GOL	C1-C2-C3-O3
3	A	706	GOL	O2-C2-C3-O3
3	C	702	GOL	O1-C1-C2-C3
3	C	702	GOL	C1-C2-C3-O3

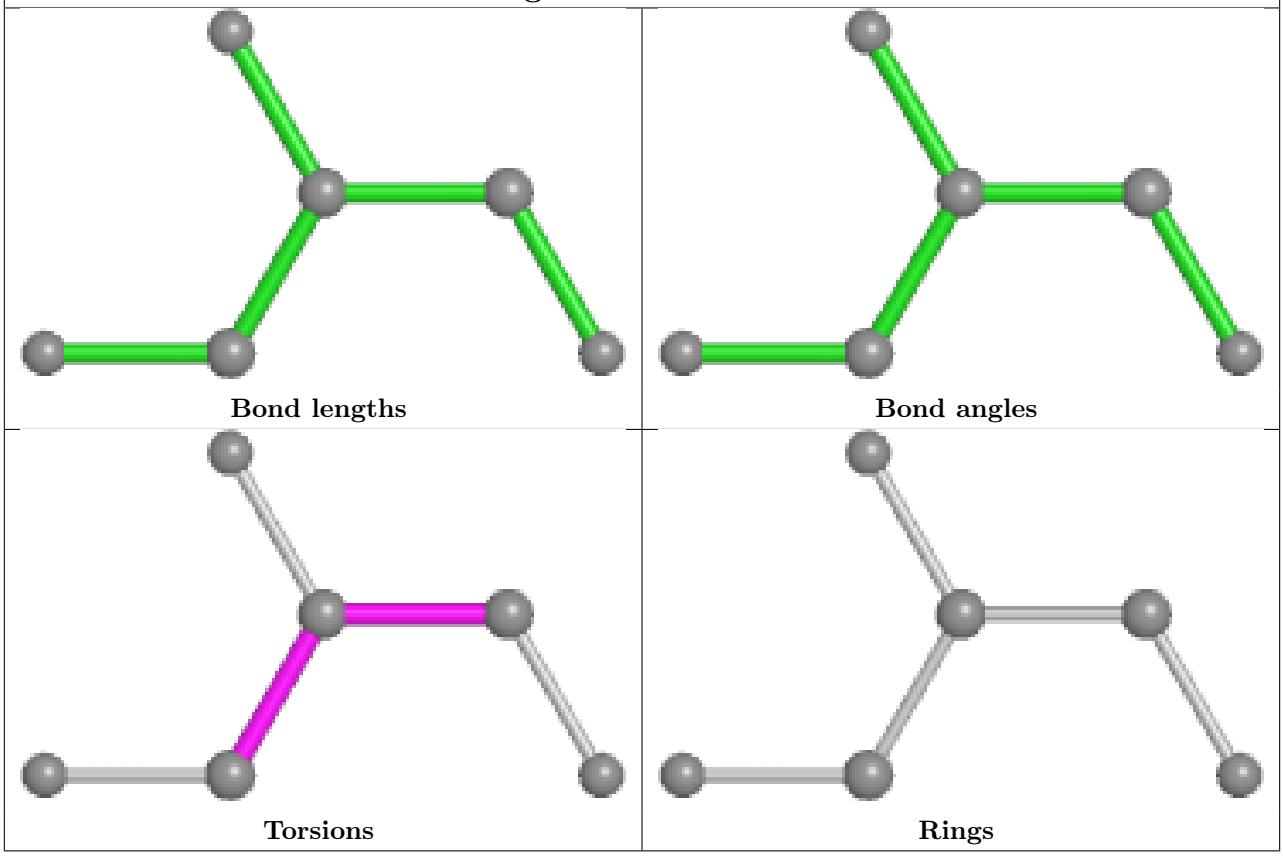
There are no ring outliers.

10 monomers are involved in 25 short contacts:

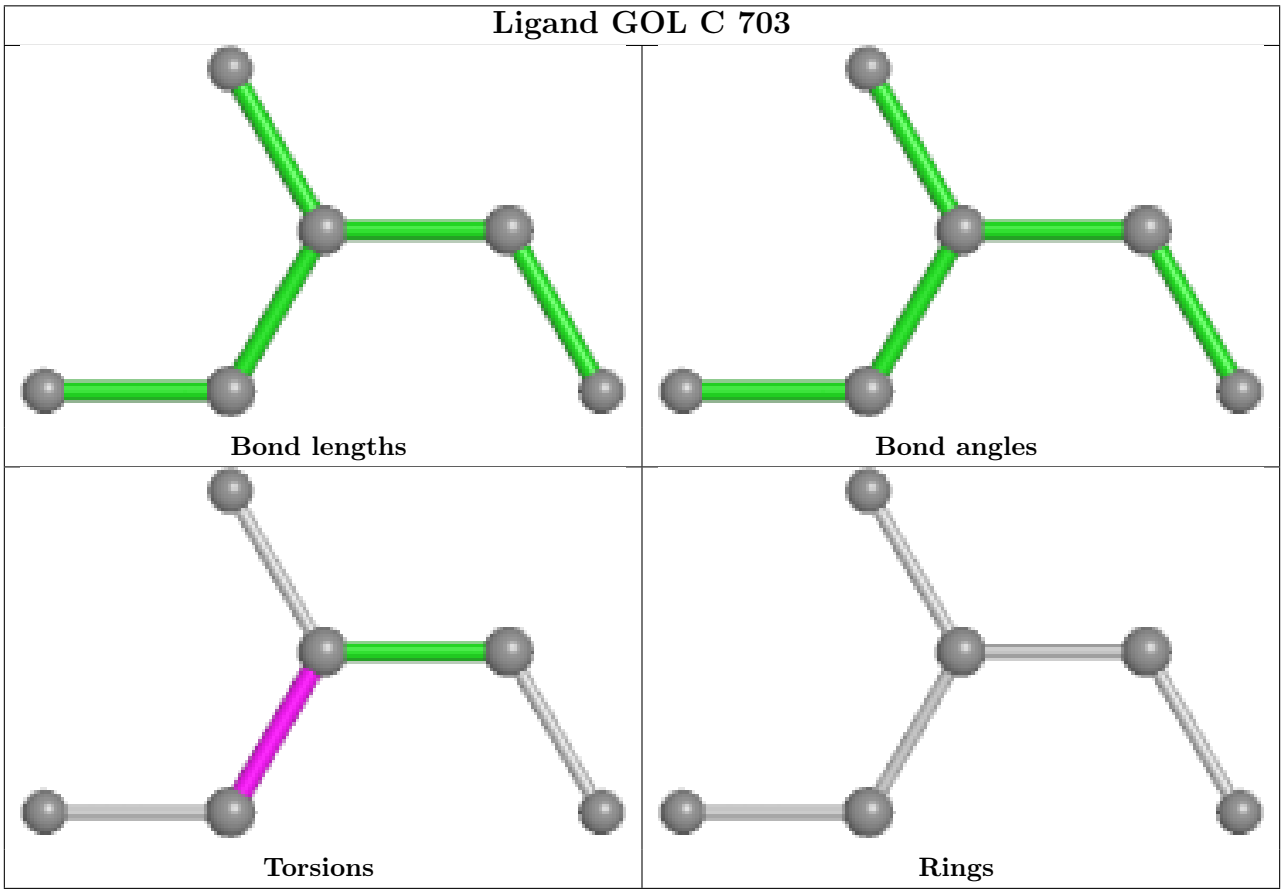
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	703	GOL	5	0
2	B	702	1PE	2	0
3	C	705	GOL	3	0
2	D	704	1PE	1	0
2	E	701	1PE	4	0
2	B	701	1PE	2	0
3	E	704	GOL	1	0
3	C	702	GOL	5	0
3	D	705	GOL	1	0
2	A	703	1PE	1	0

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.

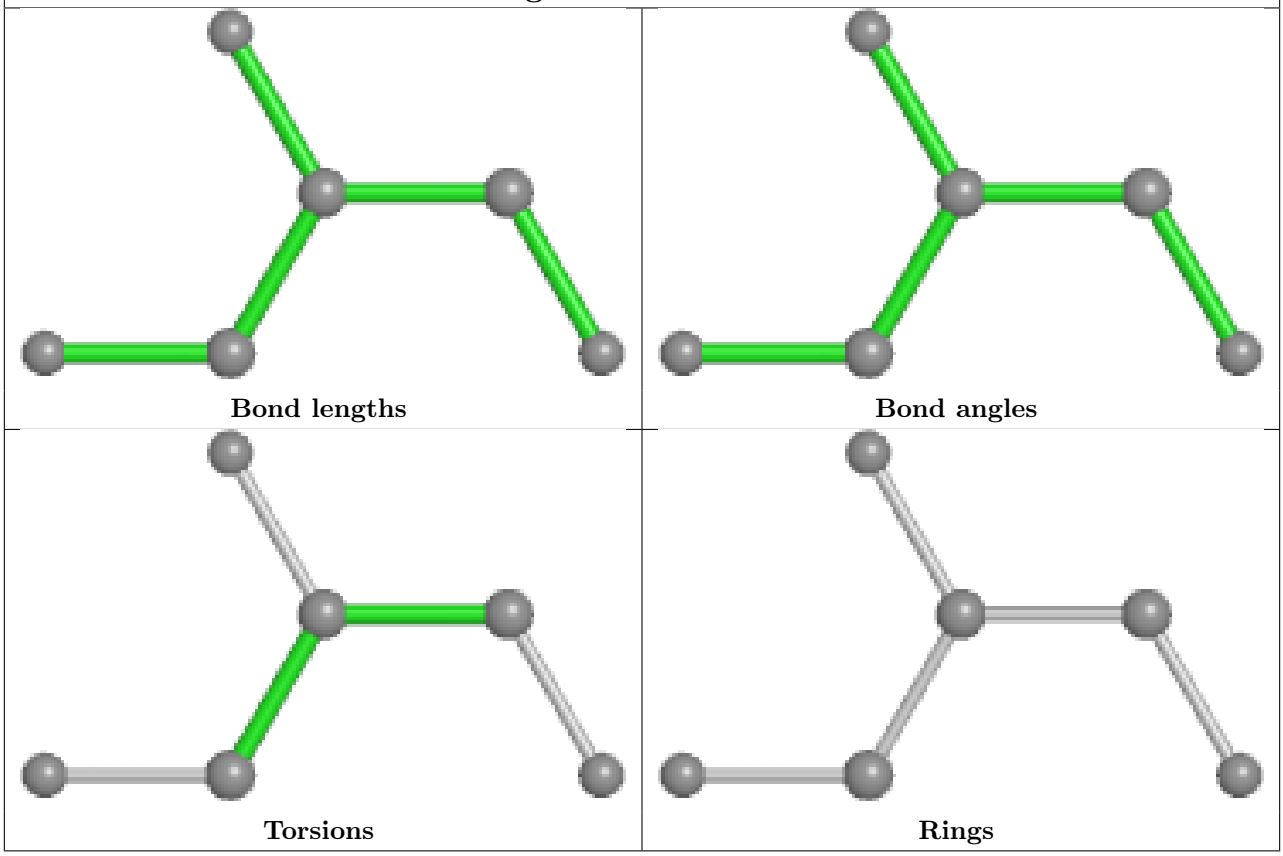
Ligand GOL C 706



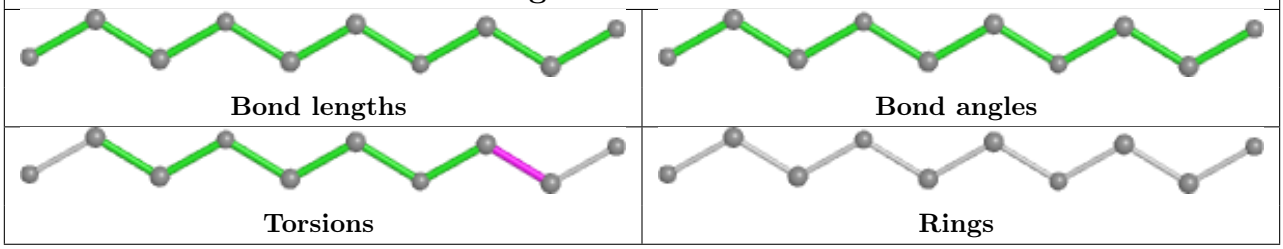
Ligand GOL C 703



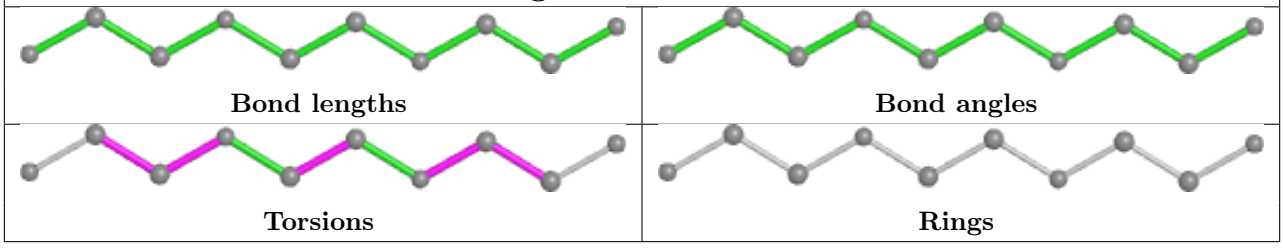
Ligand GOL E 703



Ligand 1PE A 701



Ligand 1PE B 702



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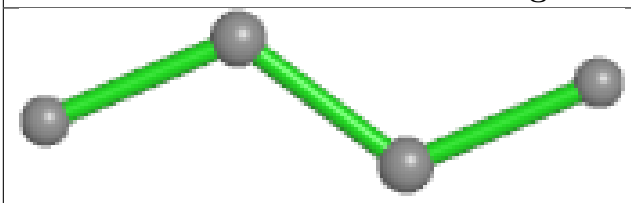
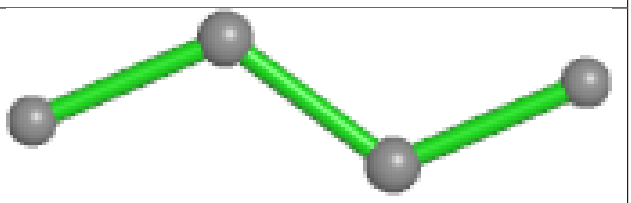
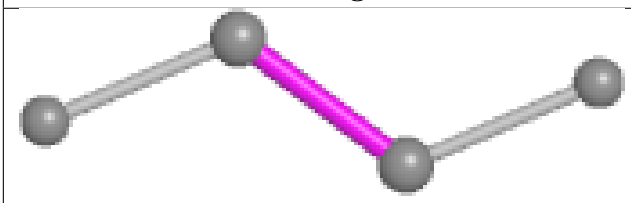


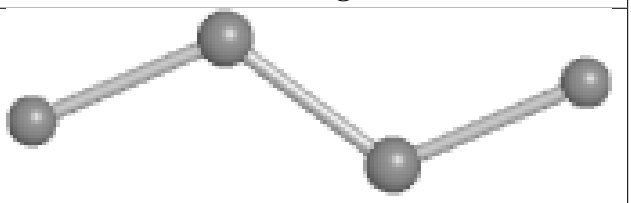
Bond lengths



Bond angles

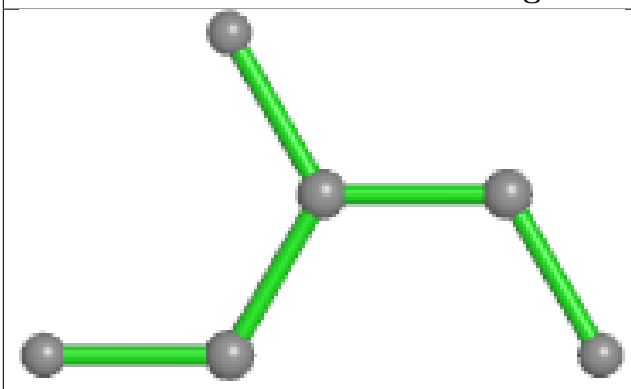


Torsions

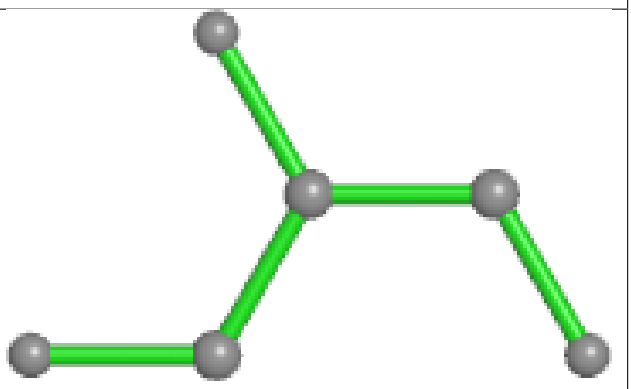


Rings

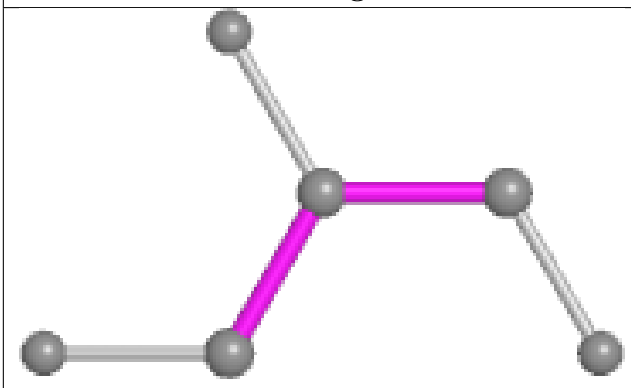
Ligand GOL C 705



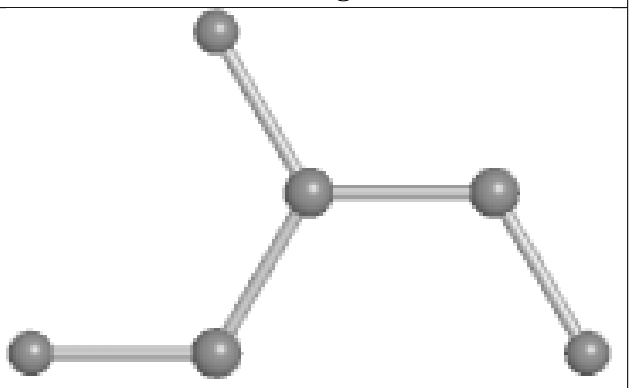
Bond lengths



Bond angles

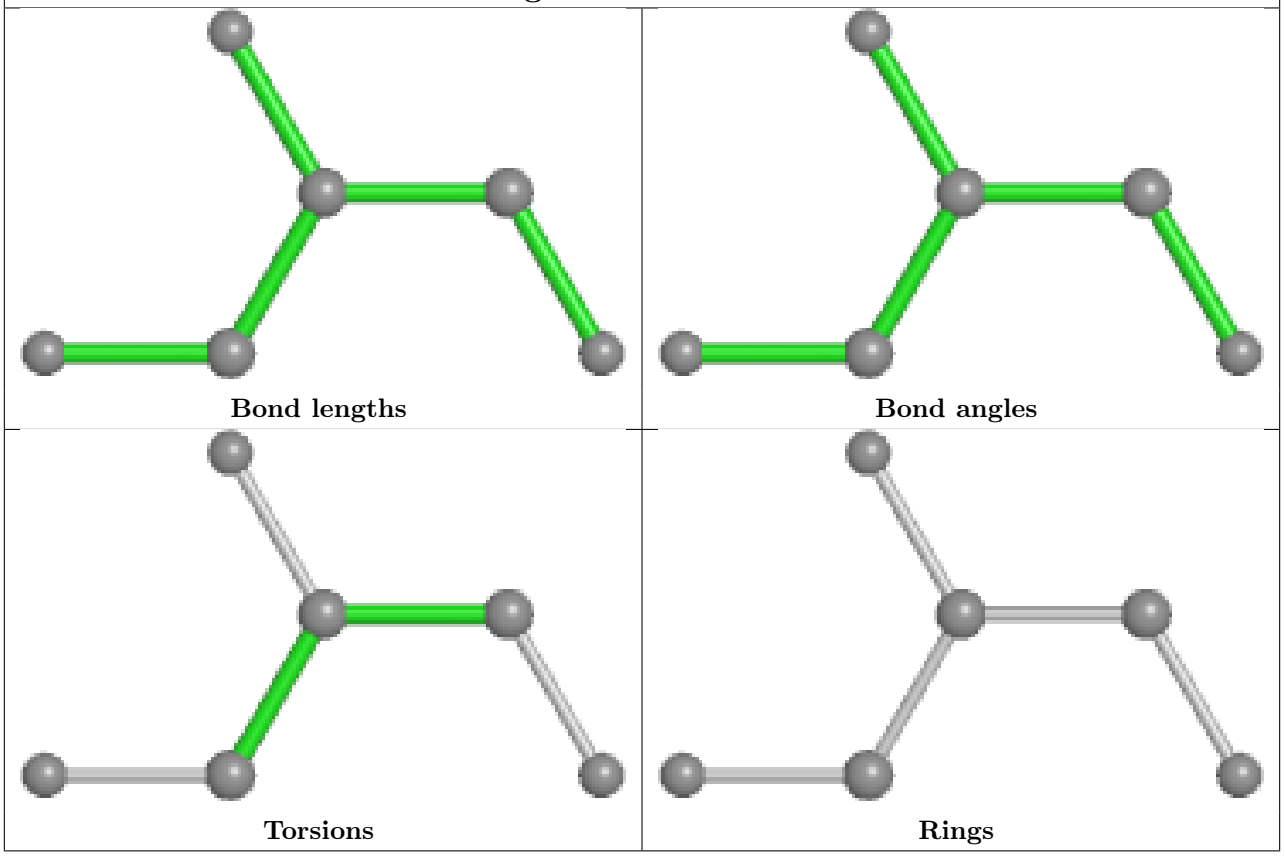


Torsions

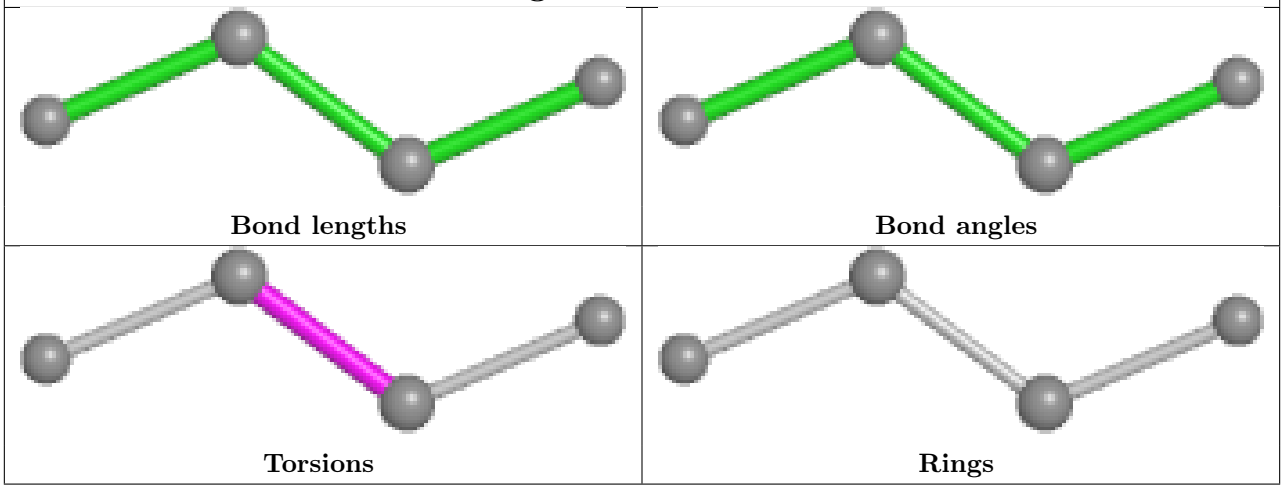


Rings

Ligand GOL C 704



Ligand 1PE D 703



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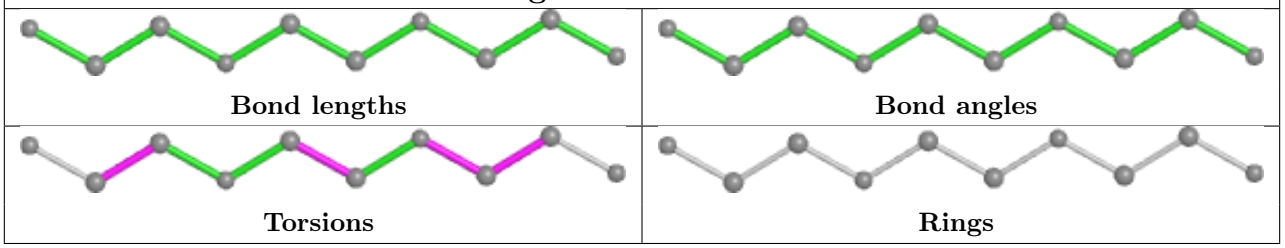
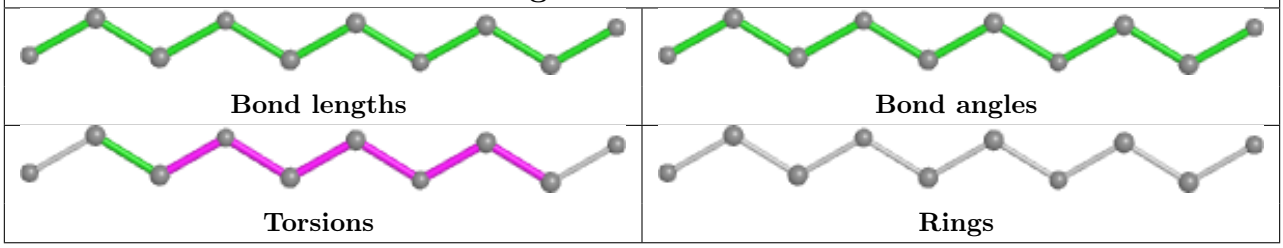


Ligand 1PE B 703



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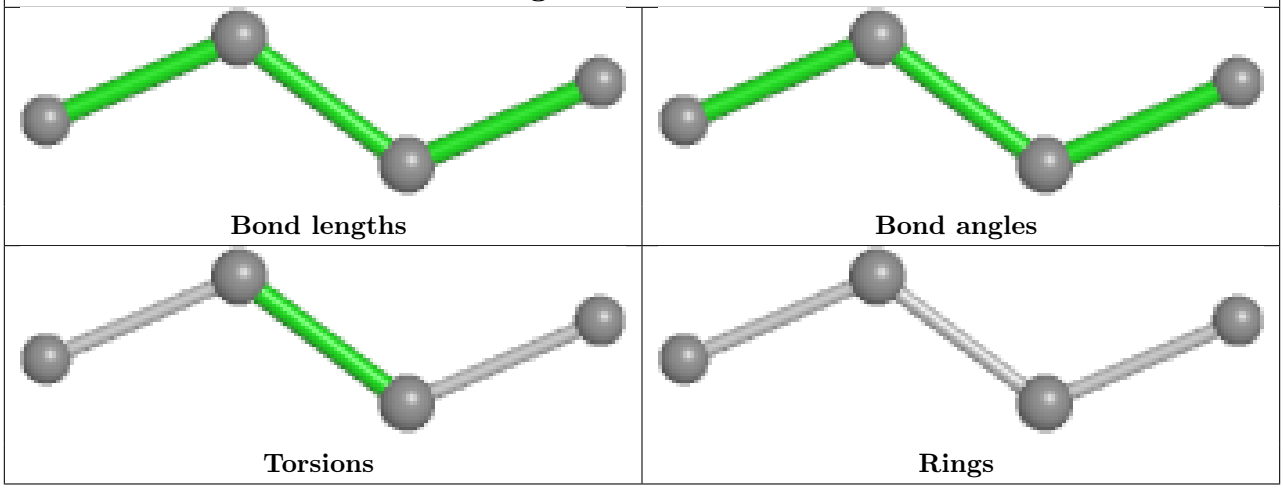
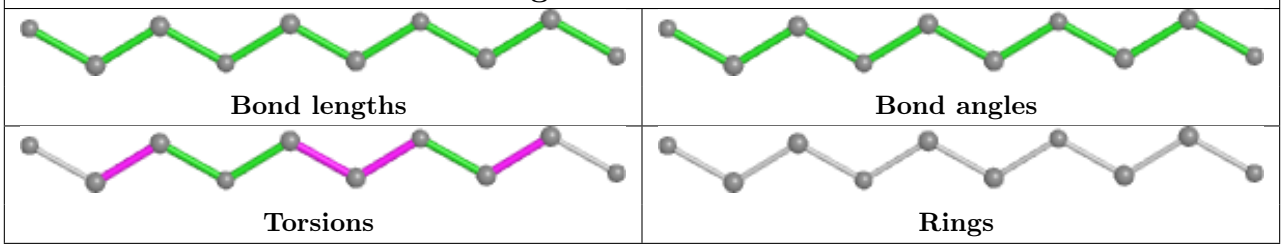
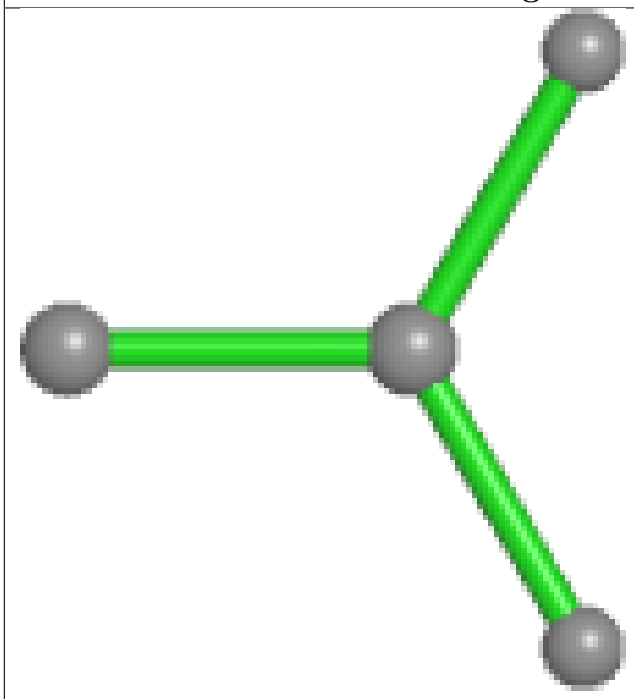


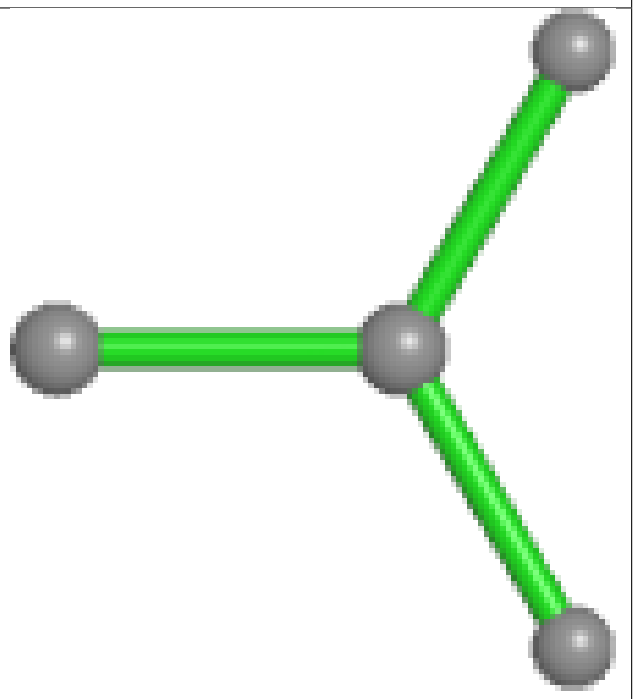
Ligand 1PE E 701



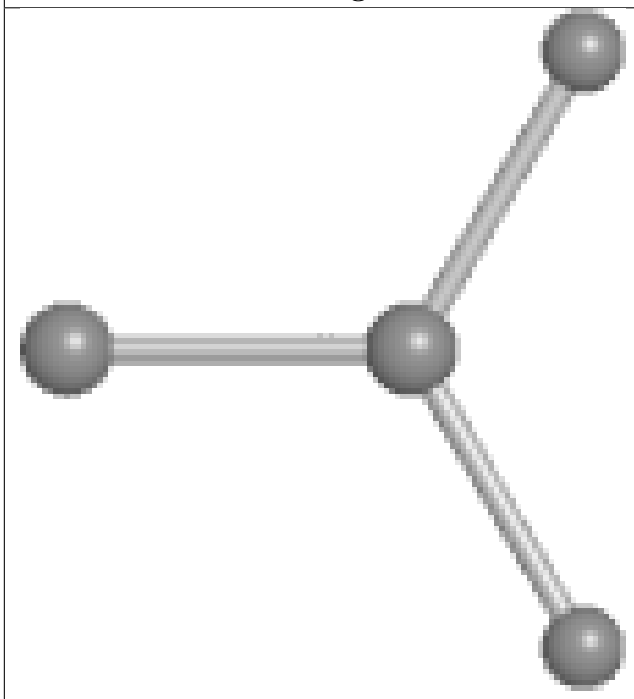
Ligand ACY D 707



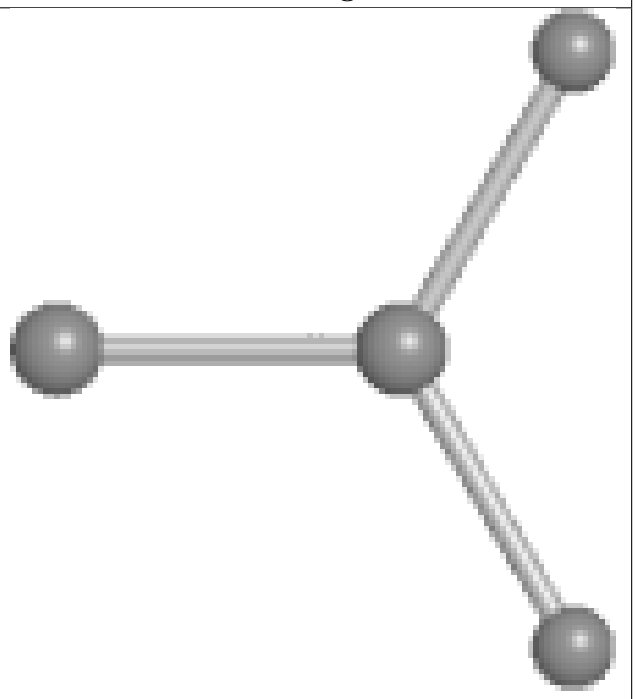
Bond lengths



Bond angles

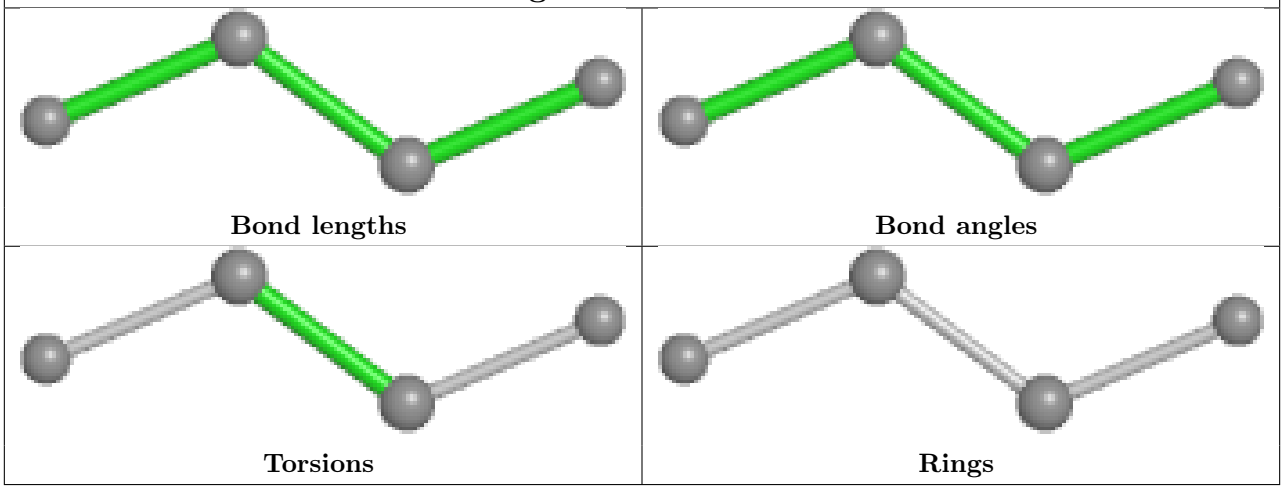


Torsions



Rings

Ligand 1PE A 704



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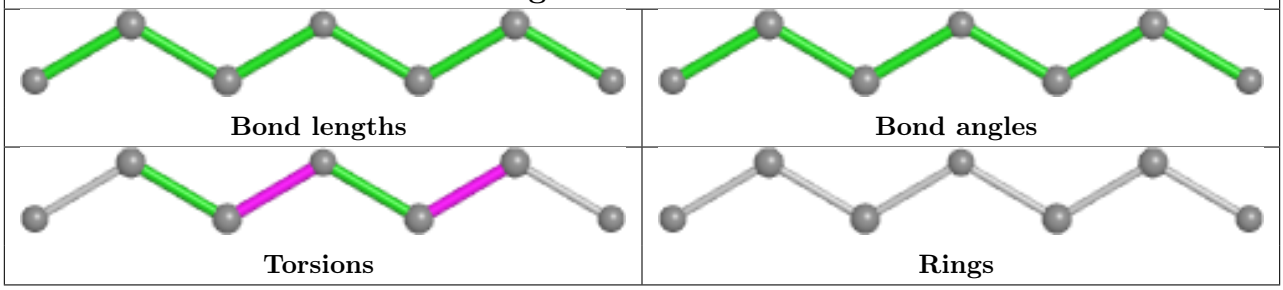
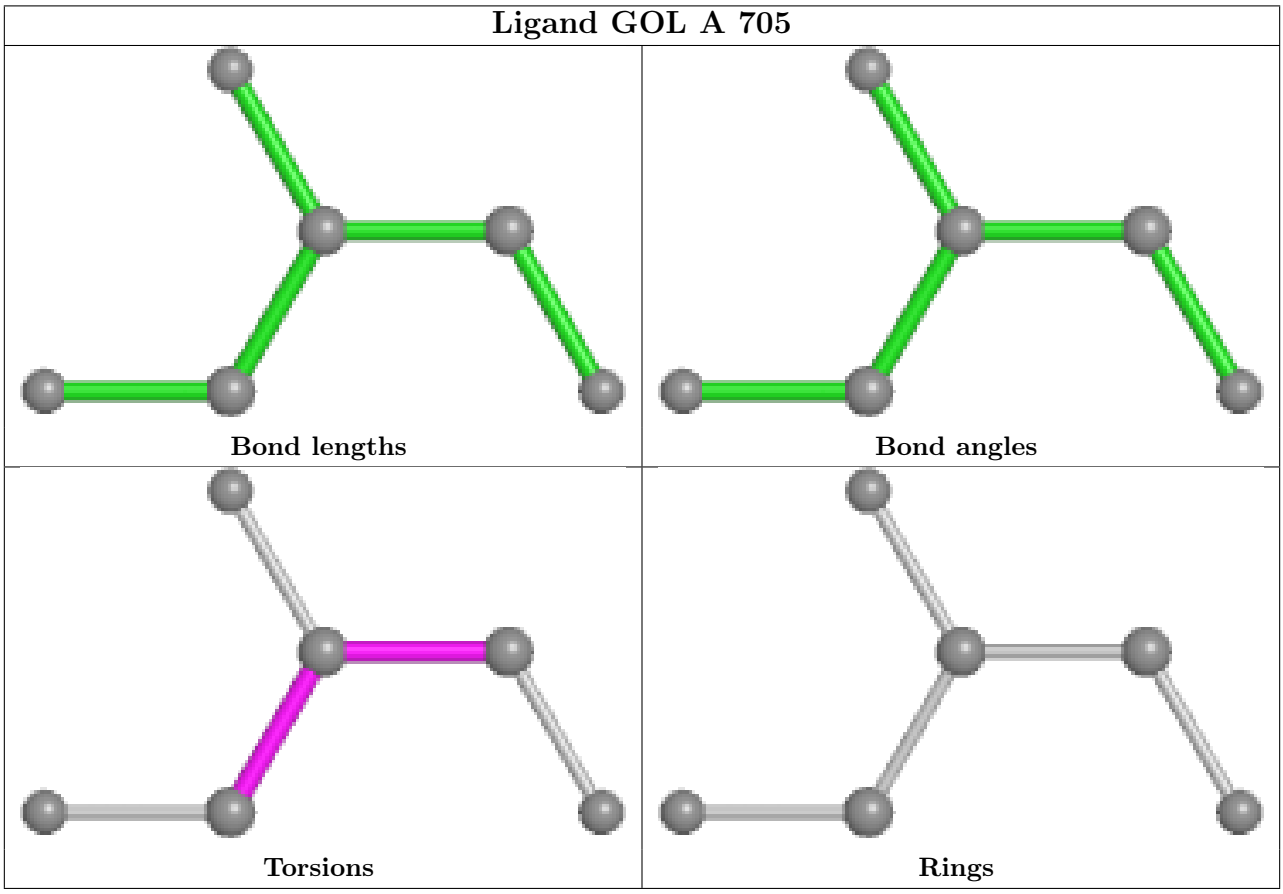


Ligand GOL A 705



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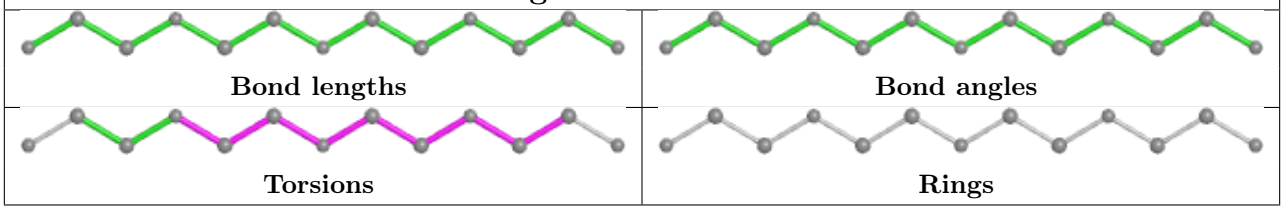

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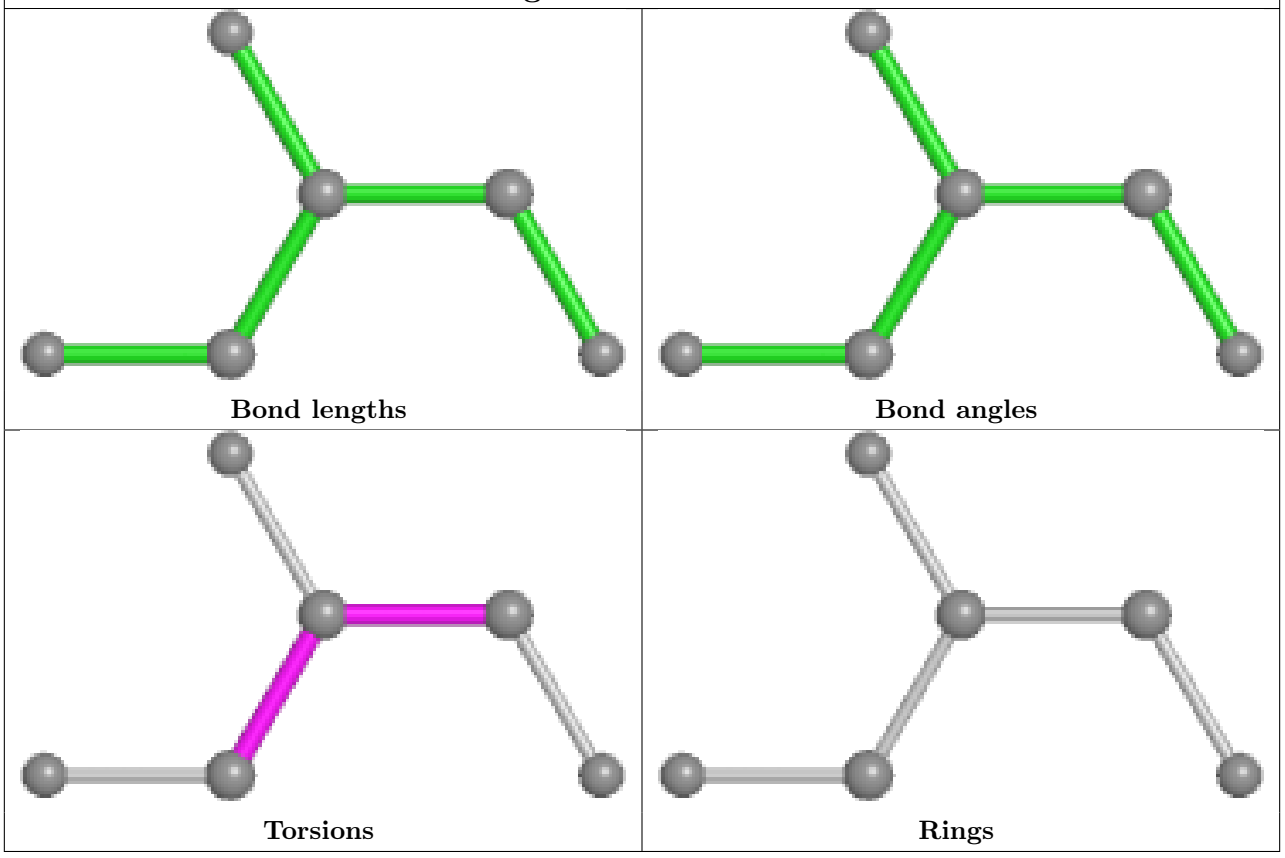

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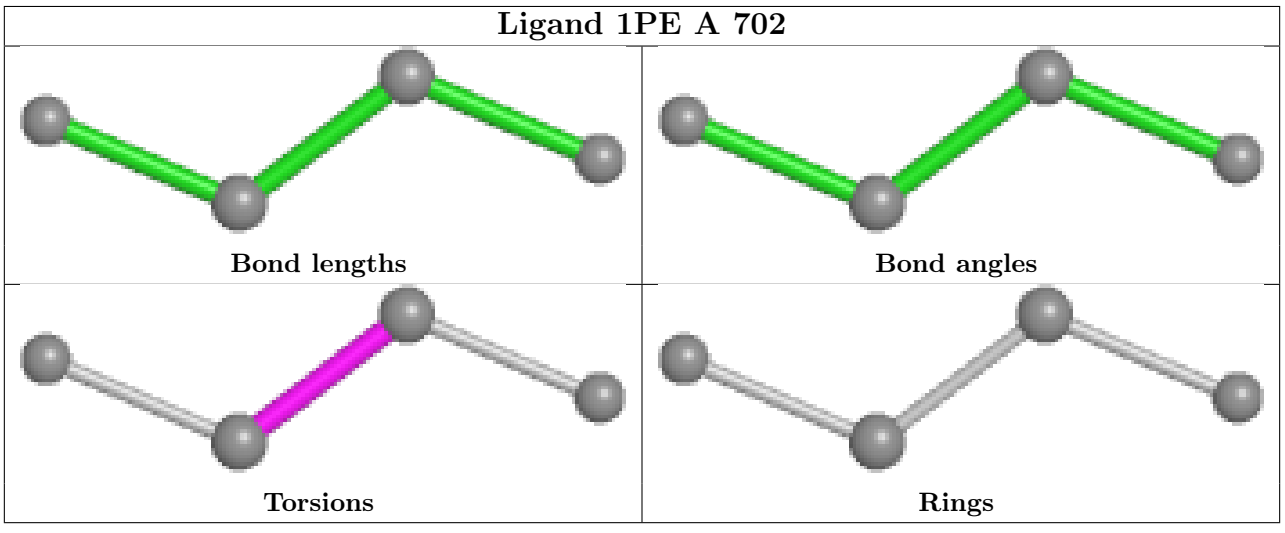

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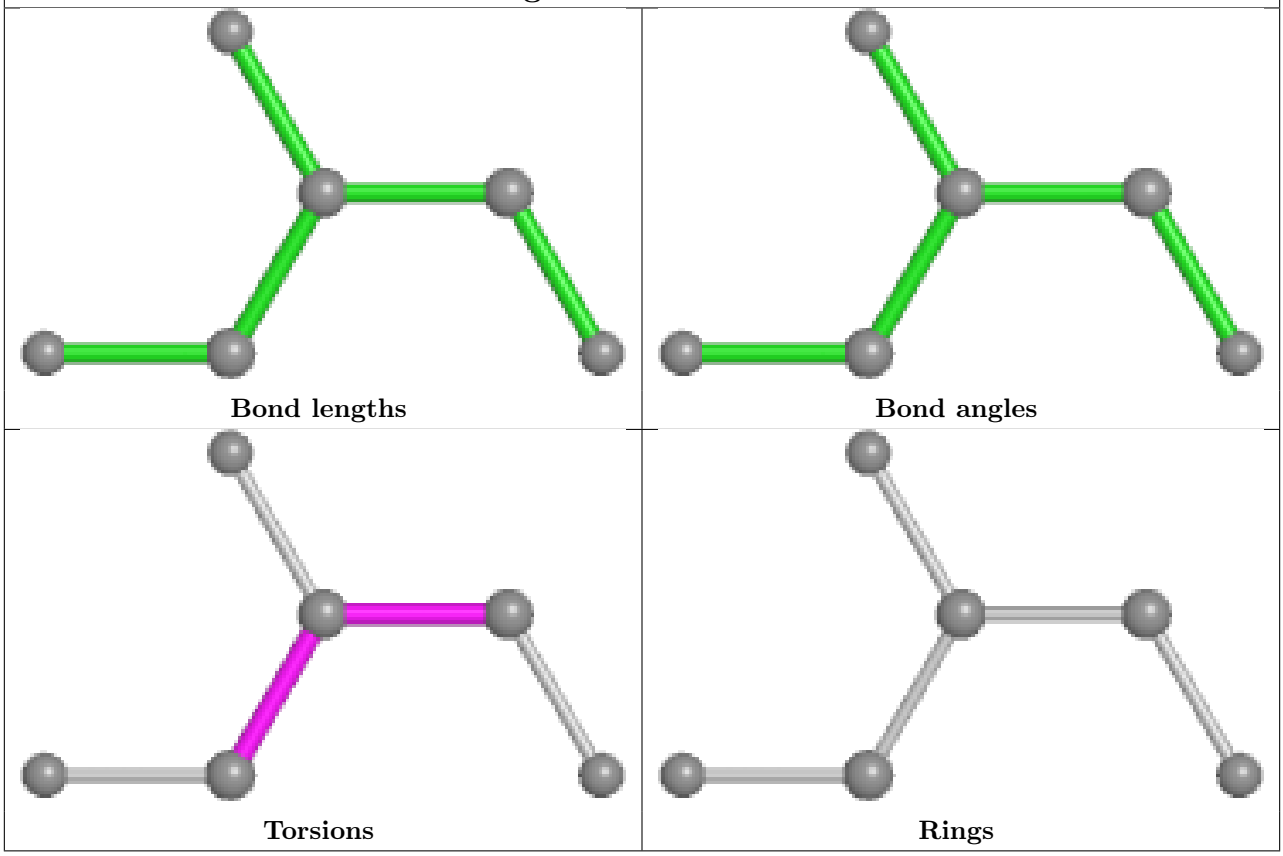
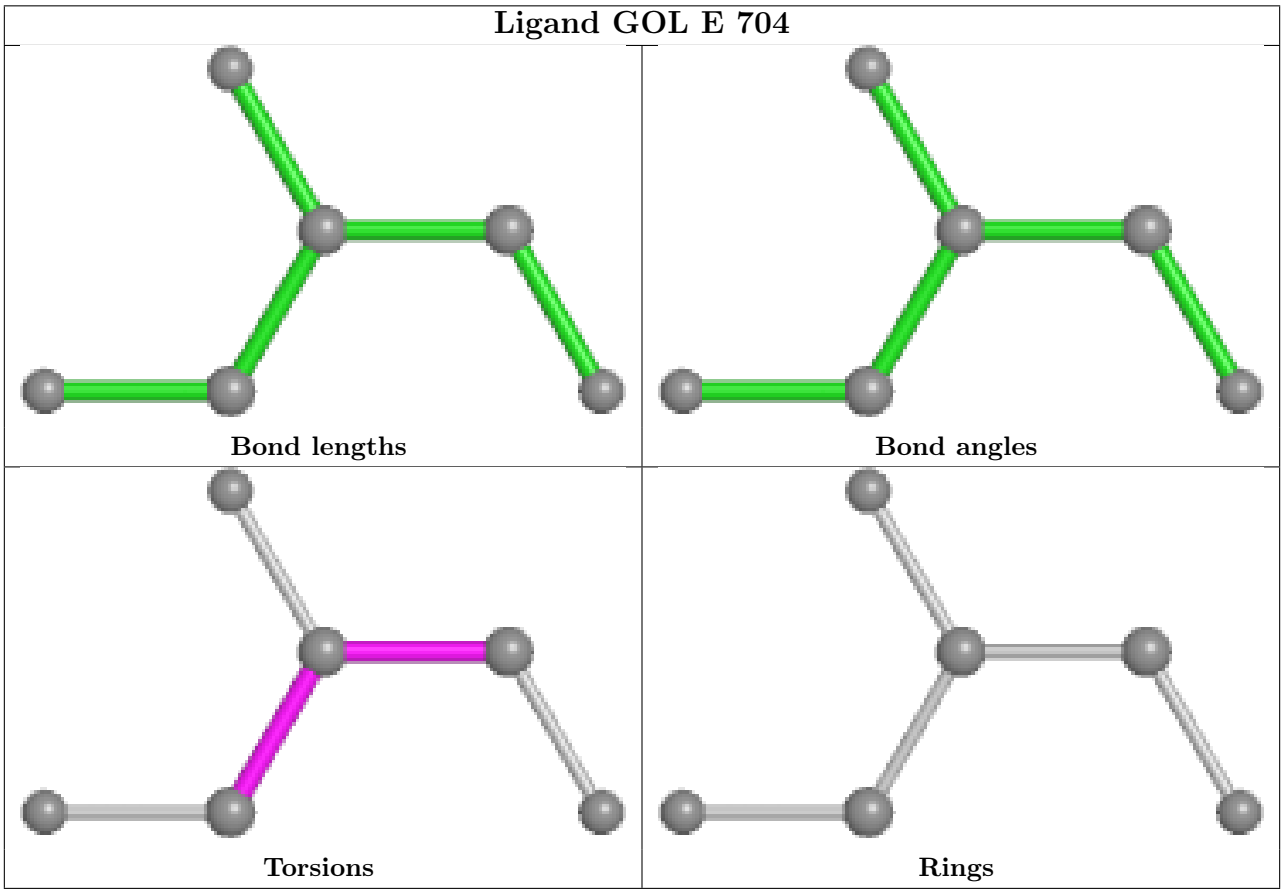
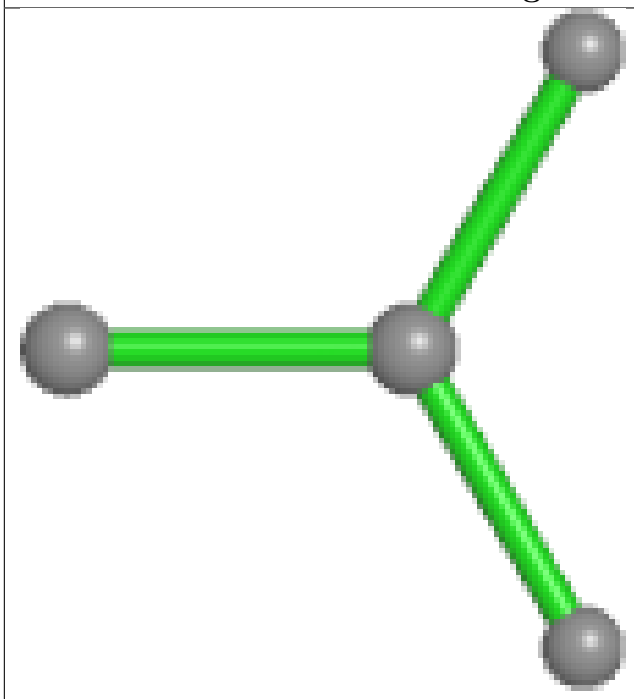


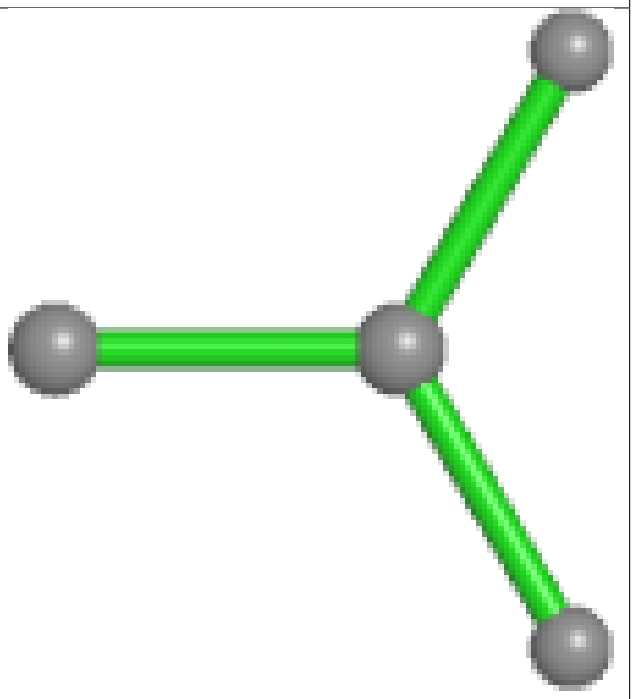
Ligand GOL E 704



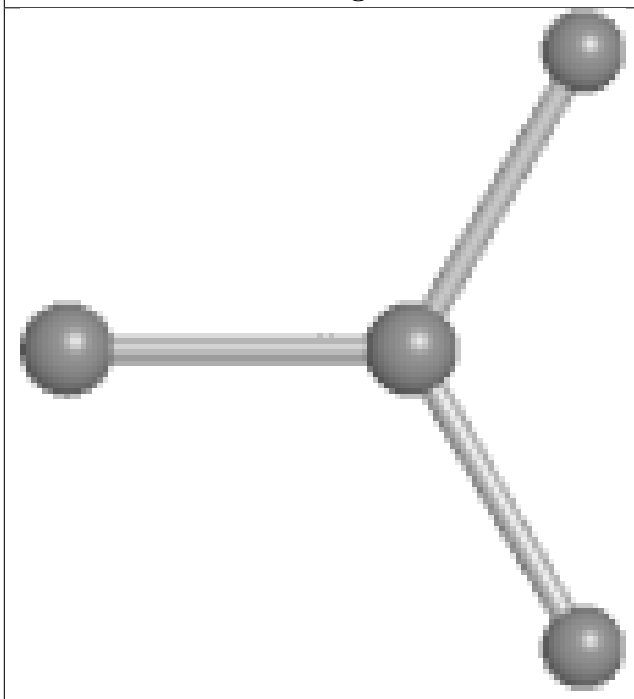
Ligand ACY C 708



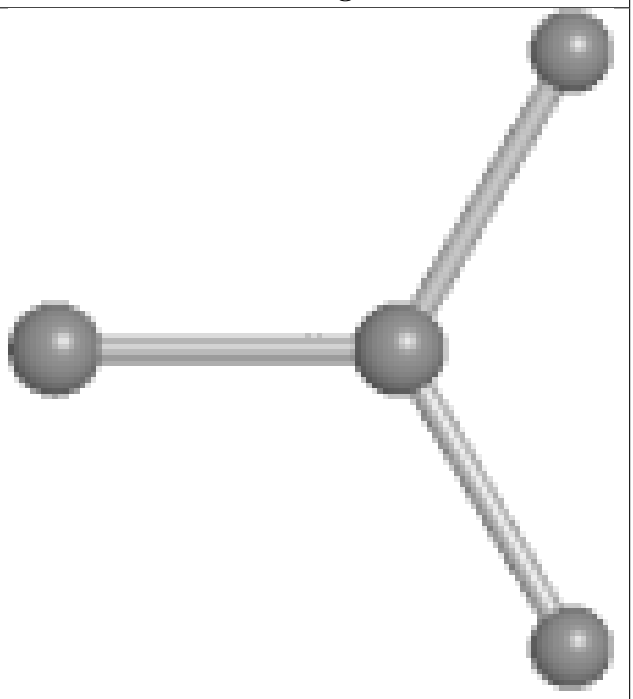
Bond lengths



Bond angles

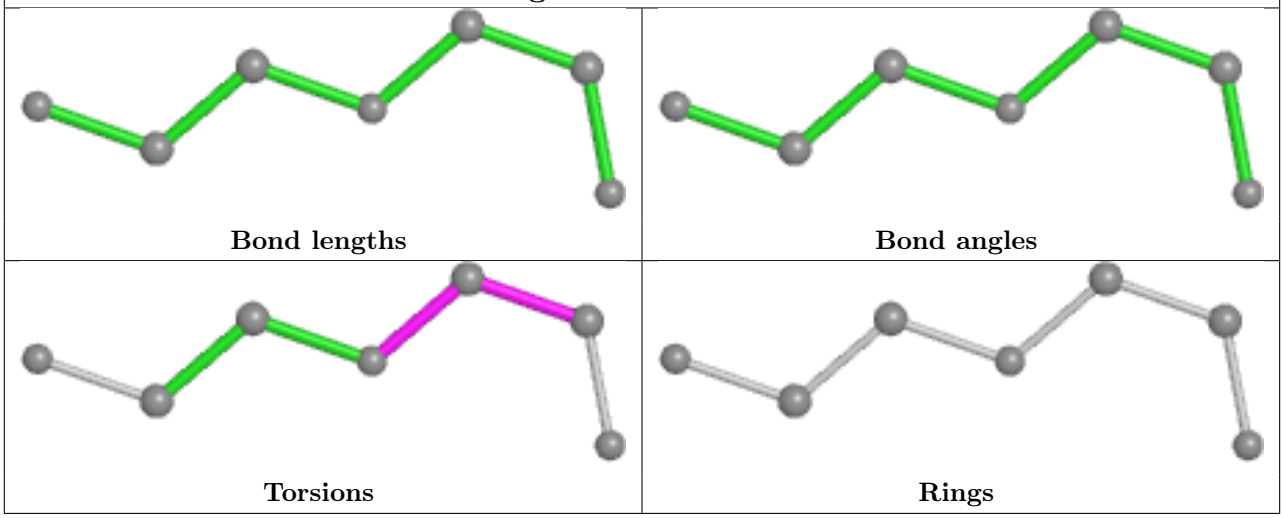


Torsions

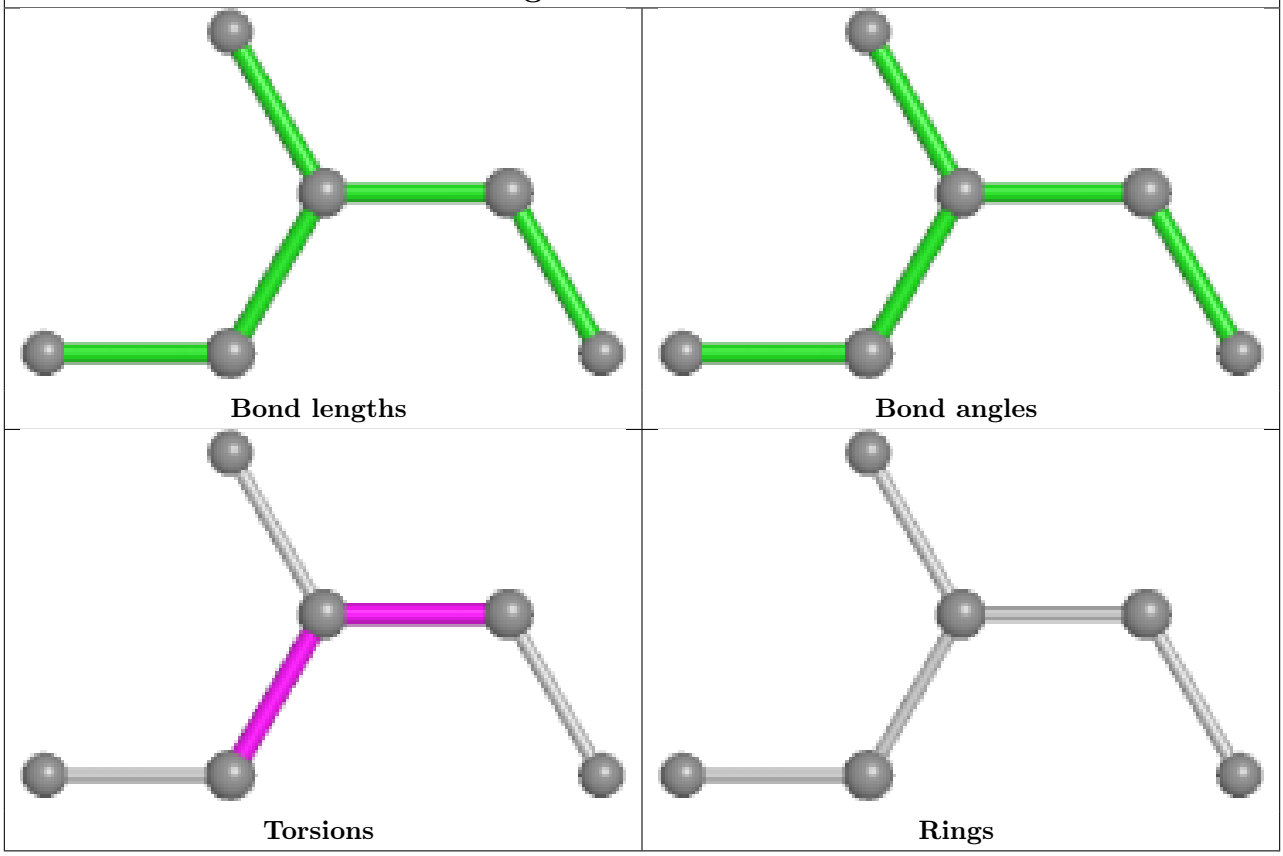


Rings

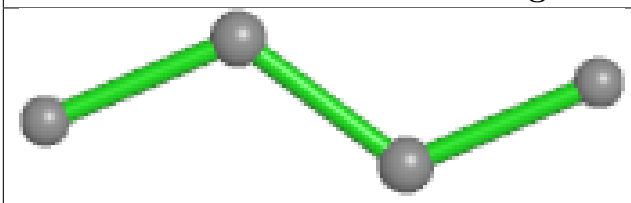
Ligand 1PE D 701



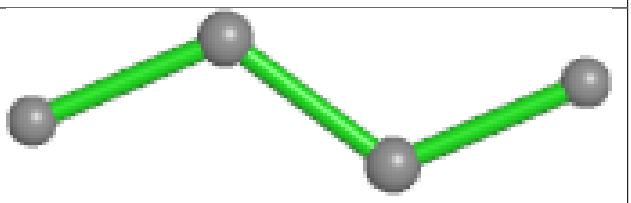
Ligand GOL C 702



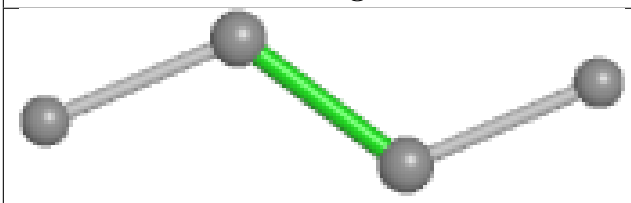
Ligand 1PE B 705



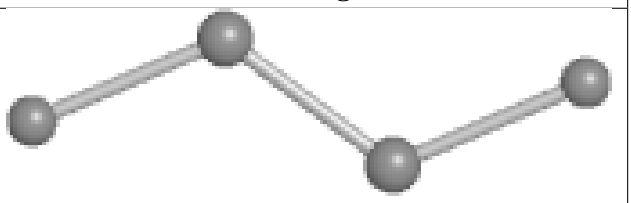
Bond lengths



Bond angles

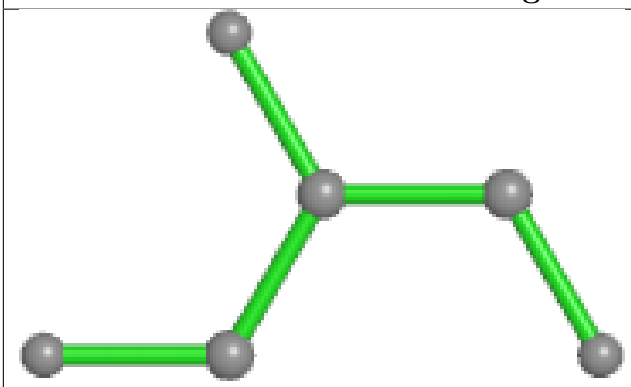


Torsions

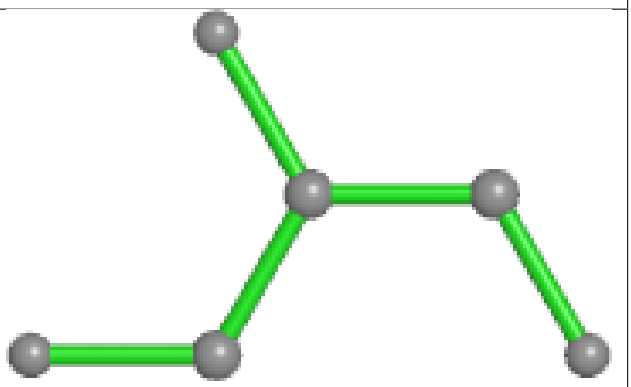


Rings

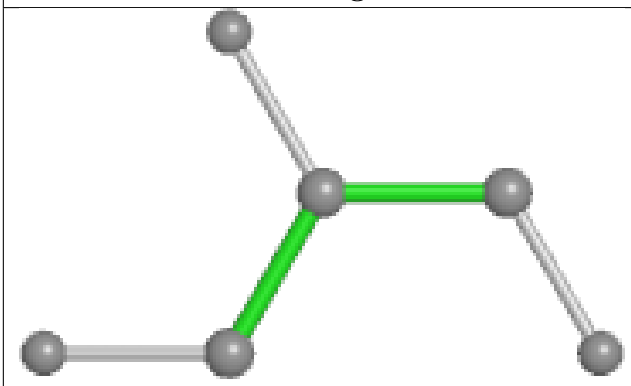
Ligand GOL A 709



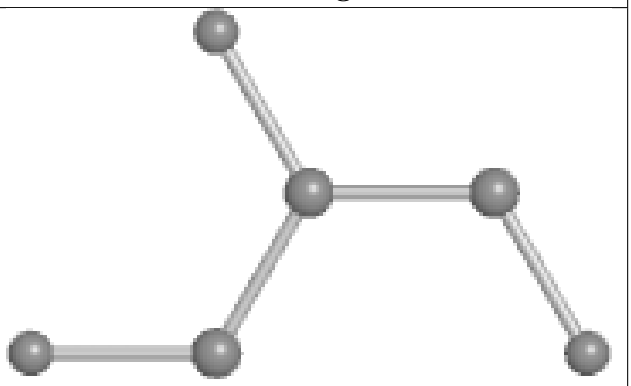
Bond lengths



Bond angles

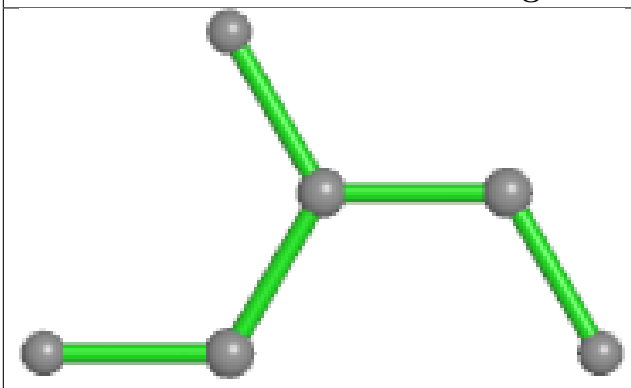


Torsions

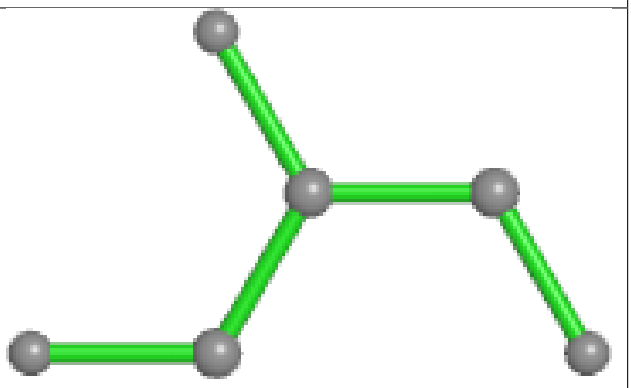


Rings

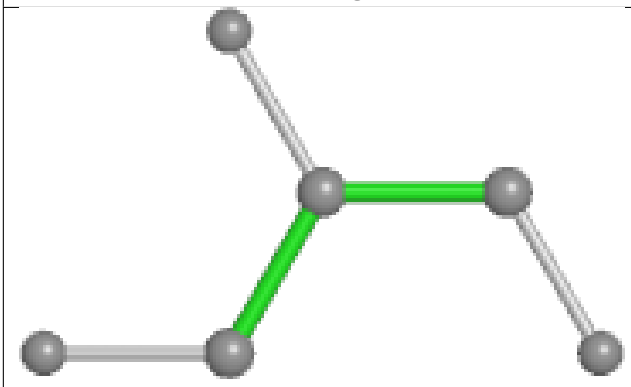
Ligand GOL D 705



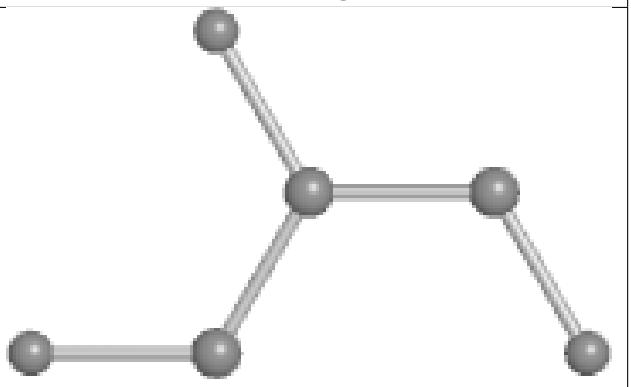
Bond lengths



Bond angles

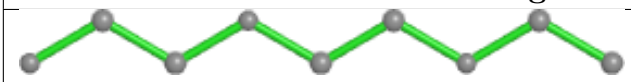


Torsions



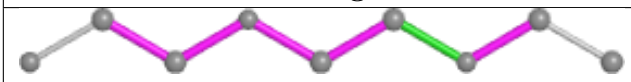
Rings

Ligand 1PE C 701



Bond lengths

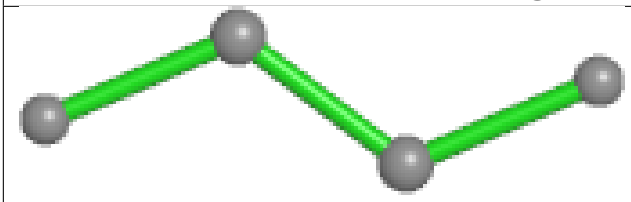
Bond angles



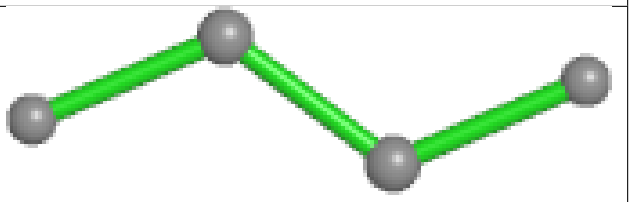
Torsions

Rings

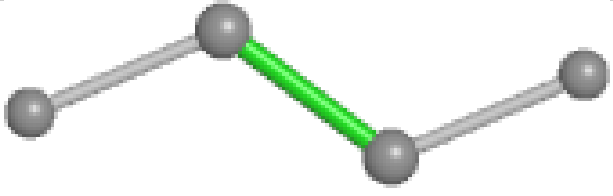
Ligand 1PE B 706



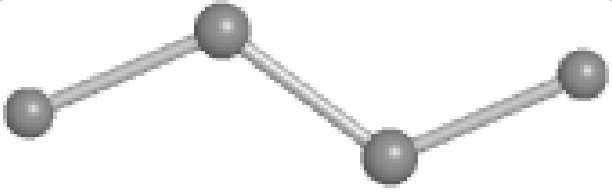
Bond lengths



Bond angles

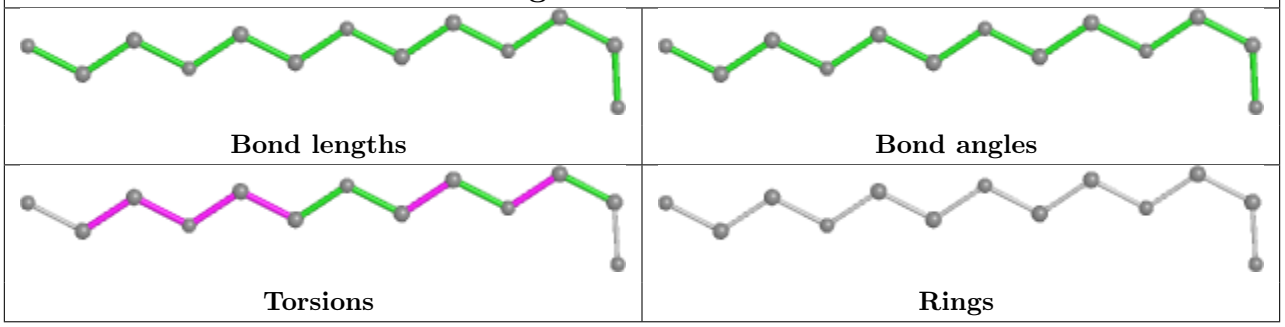


Torsions

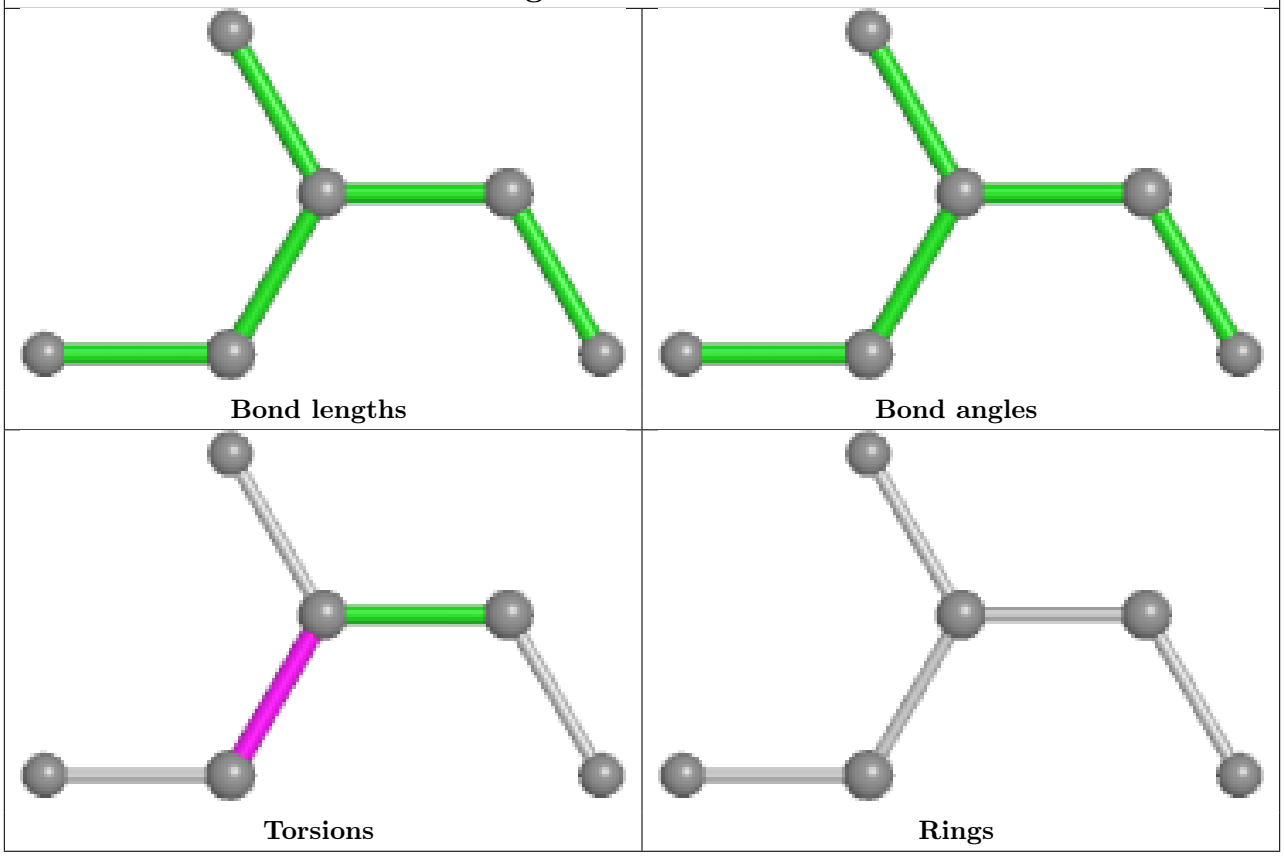


Rings

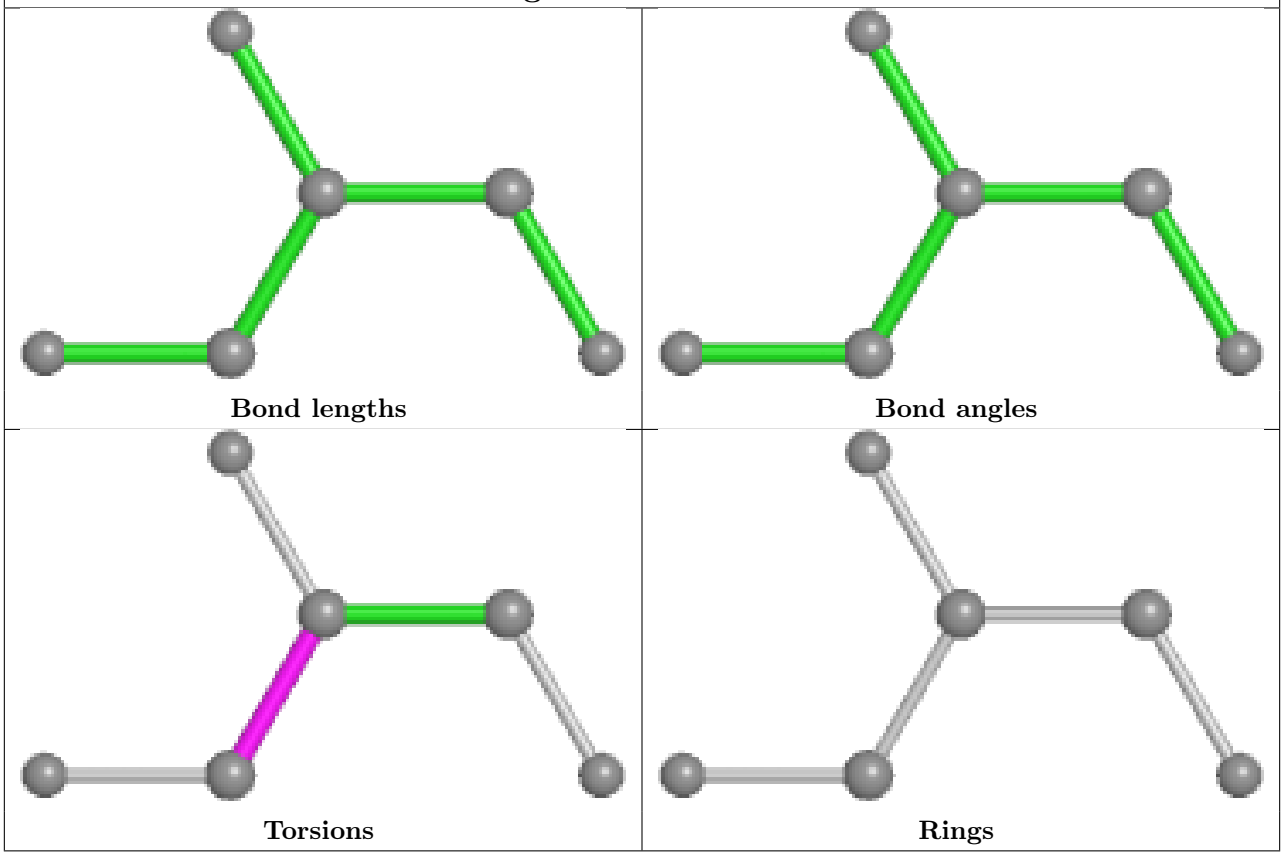
Ligand 1PE A 703



Ligand GOL E 705



Ligand GOL A 708



5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	122/128 (95%)	-0.12	1 (0%)	86	84	28, 44, 93, 117	0
1	B	118/128 (92%)	-0.05	6 (5%)	28	26	30, 46, 104, 134	0
1	C	122/128 (95%)	0.09	11 (9%)	9	8	34, 53, 97, 117	0
1	D	118/128 (92%)	0.03	7 (5%)	22	21	34, 54, 109, 132	0
1	E	121/128 (94%)	0.24	8 (6%)	18	17	38, 59, 105, 125	0
All	All	601/640 (93%)	0.04	33 (5%)	25	24	28, 52, 103, 134	0

The worst 5 of 33 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	523	ASN	5.6
1	D	583	PHE	5.1
1	E	568	PRO	5.1
1	C	568	PRO	4.9
1	C	572	LYS	4.5

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

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

6.3 Carbohydrates

There are no monosaccharides in this entry.

6.4 Ligands

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.

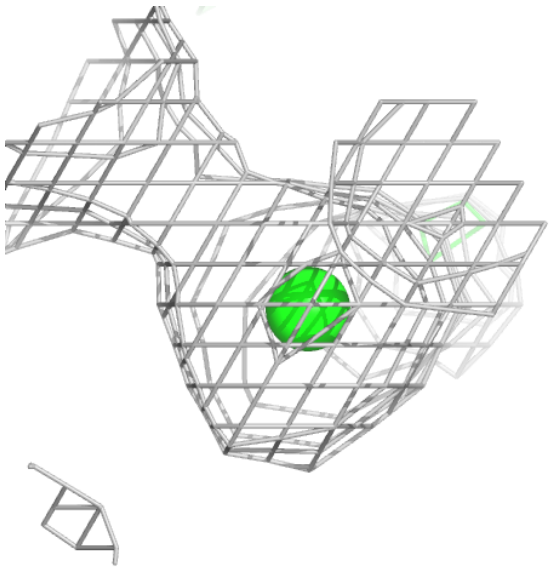
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	CL	B	707	1/1	0.75	0.09	100,100,100,100	0
2	1PE	E	702	4/16	0.77	0.20	85,95,97,104	0
3	GOL	E	705	6/6	0.78	0.36	90,98,103,105	0
2	1PE	A	703	13/16	0.79	0.40	68,93,101,110	0
3	GOL	C	705	6/6	0.79	0.38	82,86,94,98	0
4	CL	E	706	1/1	0.79	0.12	89,89,89,89	0
3	GOL	E	704	6/6	0.80	0.25	65,82,95,97	0
3	GOL	A	707	6/6	0.81	0.29	74,80,93,97	0
3	GOL	C	702	6/6	0.81	0.27	71,81,84,85	0
2	1PE	B	705	4/16	0.81	0.14	63,76,83,91	0
3	GOL	C	706	6/6	0.81	0.32	71,80,94,95	0
3	GOL	A	706	6/6	0.82	0.26	71,92,96,100	0
3	GOL	E	703	6/6	0.82	0.35	82,92,95,95	0
2	1PE	D	704	10/16	0.83	0.22	73,84,92,97	0
3	GOL	D	705	6/6	0.86	0.24	64,87,95,96	0
2	1PE	A	701	10/16	0.86	0.29	75,113,118,119	0
5	ACY	D	707	4/4	0.86	0.23	75,90,91,97	0
2	1PE	B	702	10/16	0.87	0.20	53,70,84,85	0
2	1PE	D	702	7/16	0.87	0.15	81,92,97,105	0
2	1PE	B	703	10/16	0.87	0.17	75,84,101,108	0
2	1PE	B	704	4/16	0.87	0.27	68,73,85,87	0
4	CL	C	707	1/1	0.88	0.06	89,89,89,89	0
2	1PE	B	701	13/16	0.89	0.18	49,71,86,87	0
3	GOL	A	705	6/6	0.89	0.33	62,64,72,76	0
2	1PE	C	701	9/16	0.89	0.21	49,76,82,84	0
2	1PE	A	702	4/16	0.90	0.24	47,69,70,71	0
2	1PE	D	703	4/16	0.90	0.17	75,76,79,85	0
2	1PE	D	701	7/16	0.90	0.18	55,65,71,74	0
2	1PE	A	704	4/16	0.91	0.10	69,74,79,82	0
3	GOL	A	708	6/6	0.92	0.29	69,86,93,93	0
2	1PE	E	701	10/16	0.92	0.13	52,79,85,86	0
3	GOL	C	704	6/6	0.93	0.22	78,85,93,95	0
4	CL	A	710	1/1	0.93	0.19	94,94,94,94	0
5	ACY	C	708	4/4	0.93	0.17	68,76,76,90	0
3	GOL	A	709	6/6	0.93	0.30	65,80,90,93	0
3	GOL	C	703	6/6	0.94	0.18	63,78,82,85	0
2	1PE	B	706	4/16	0.96	0.15	75,77,80,86	0
4	CL	D	706	1/1	0.97	0.06	103,103,103,103	1

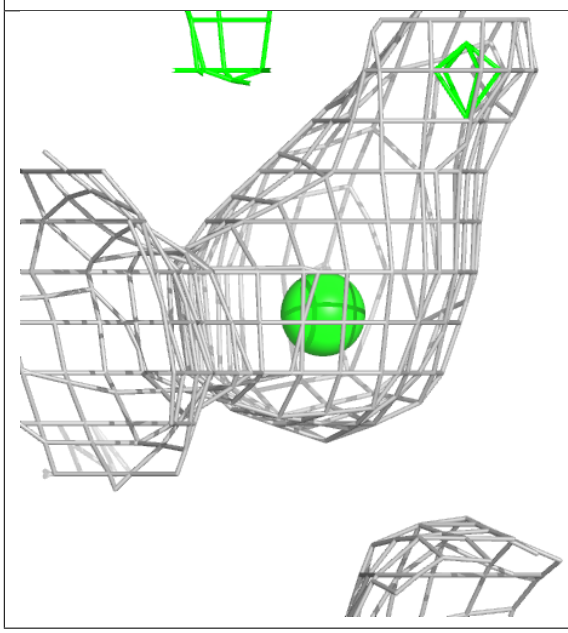
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers

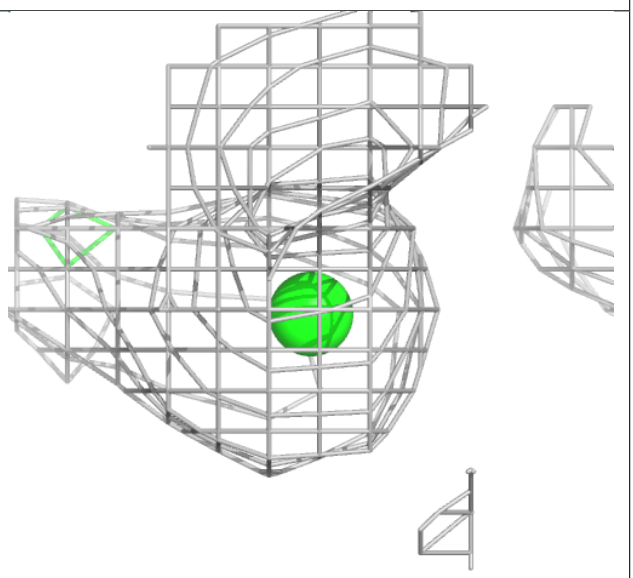
as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around CL B 707:

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

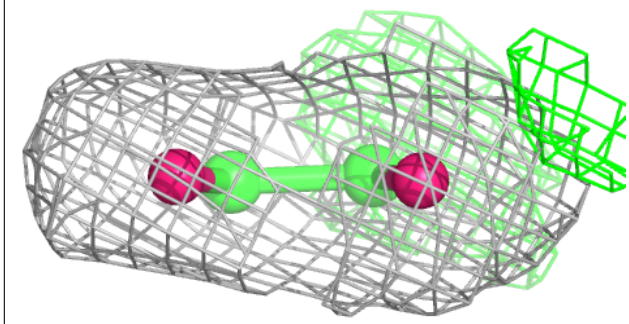


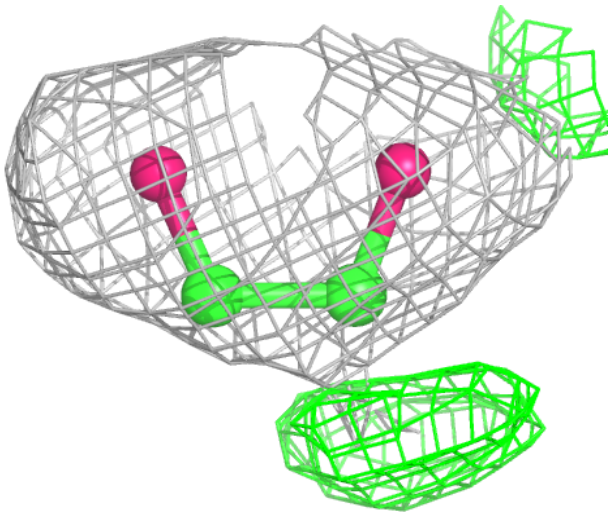


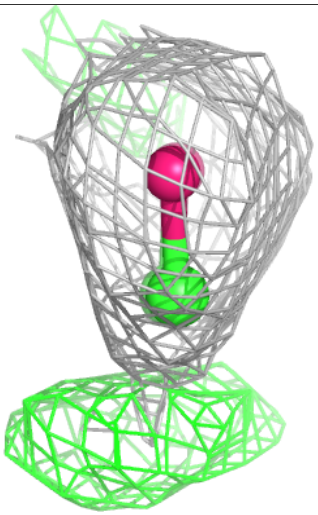


Electron density around 1PE E 702:

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

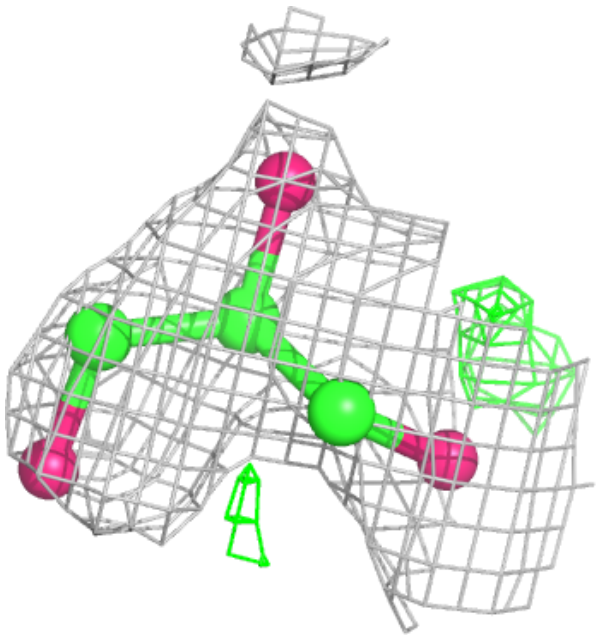


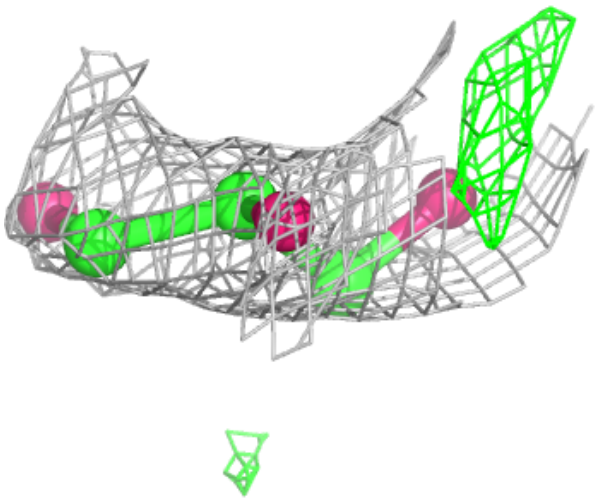


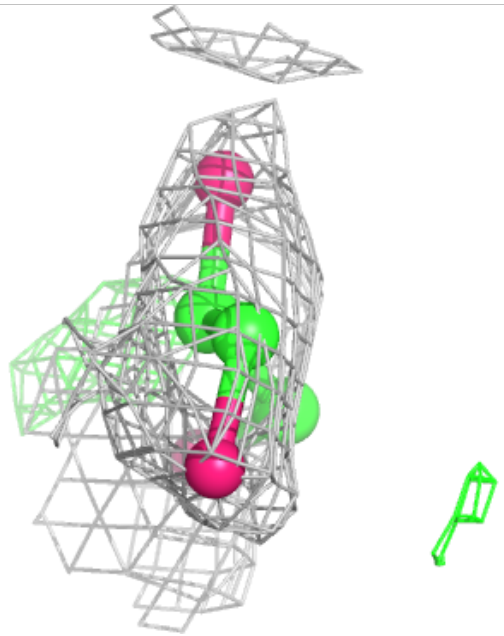


Electron density around GOL E 705:

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

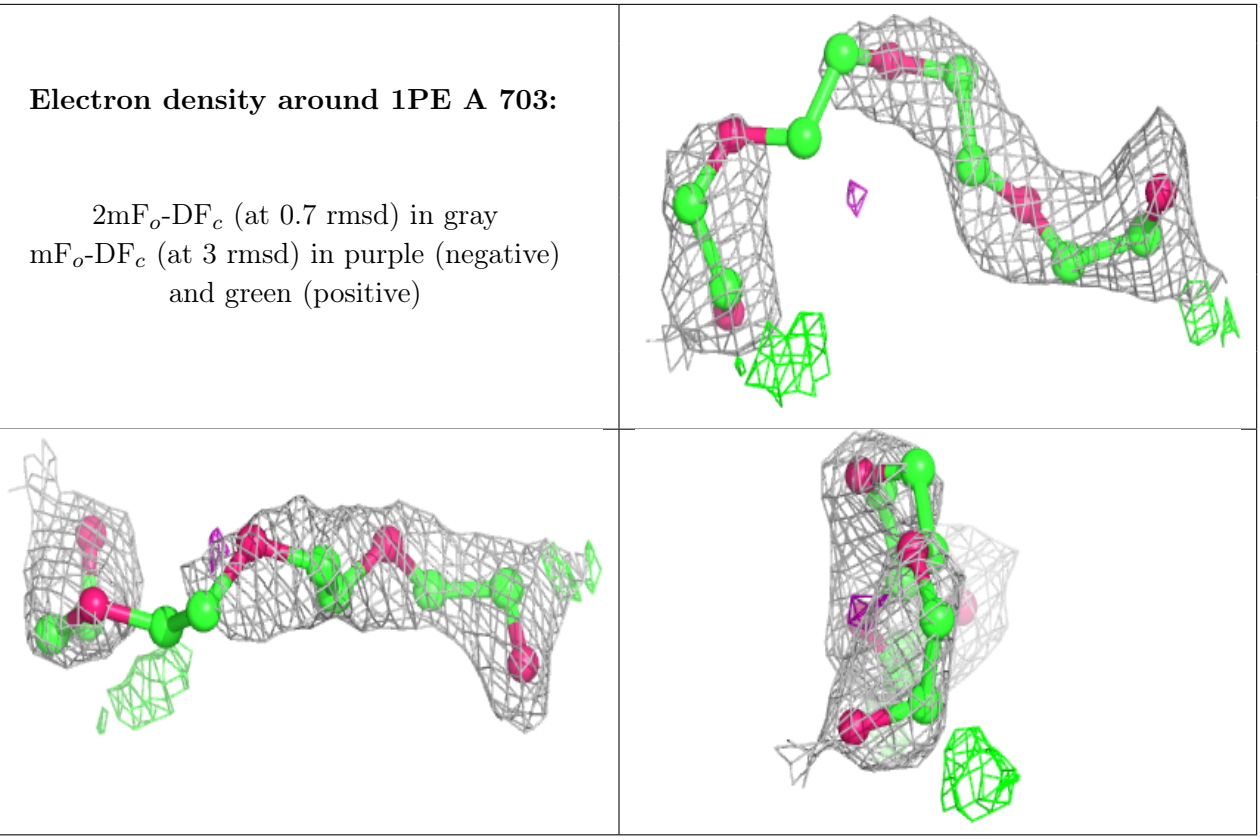






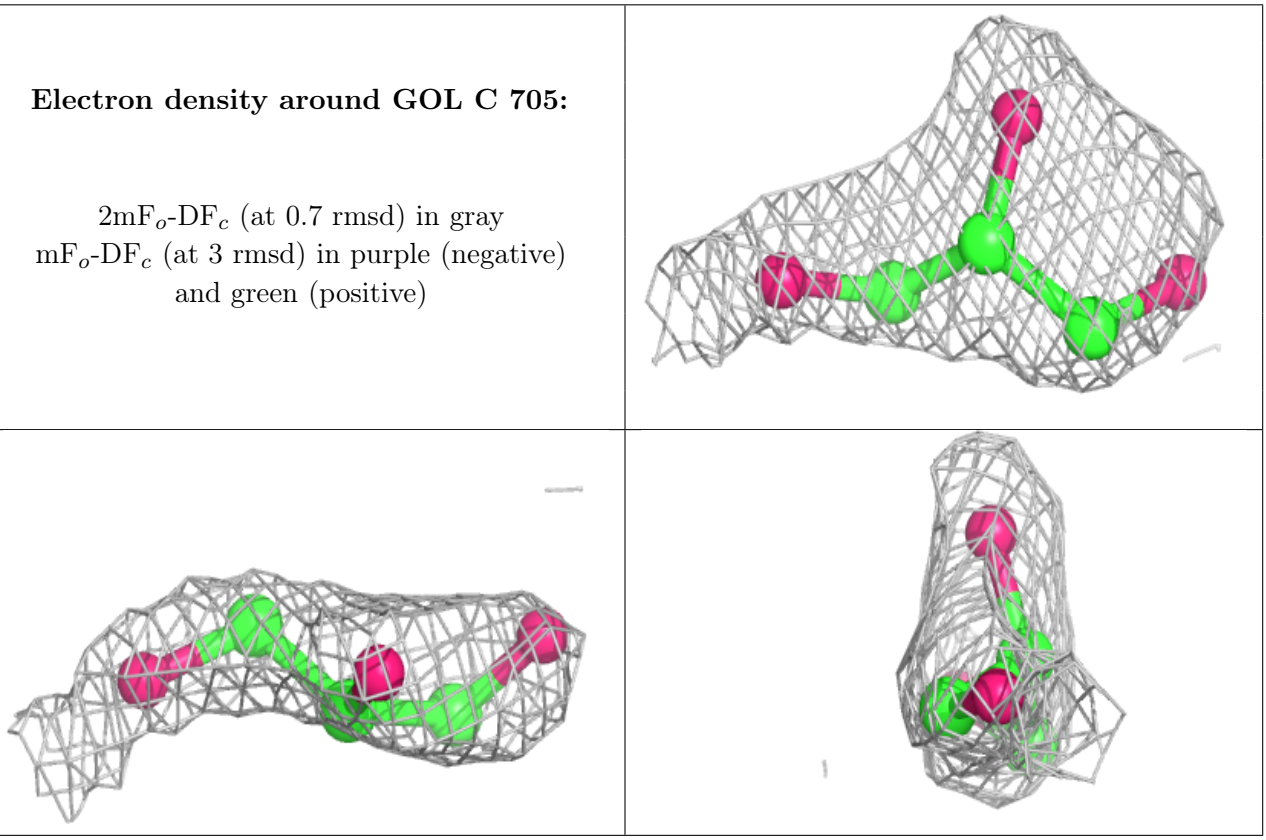
Electron density around 1PE A 703:

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



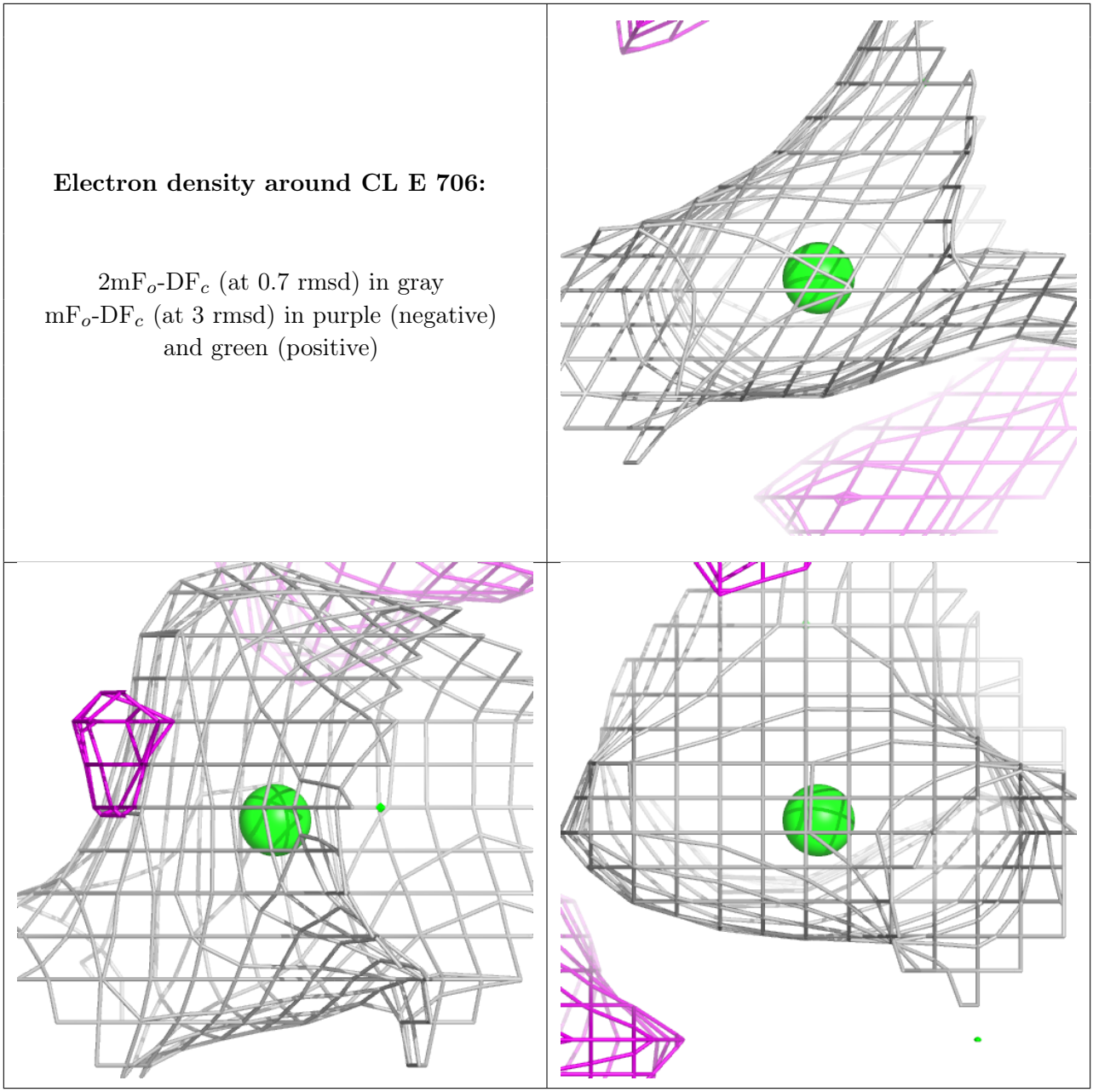
Electron density around GOL C 705:

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



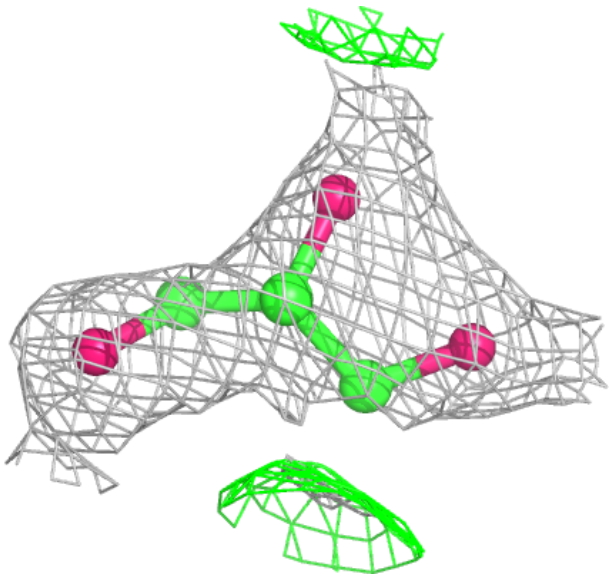
Electron density around CL E 706:

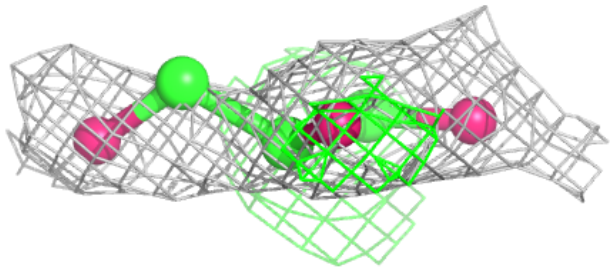
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

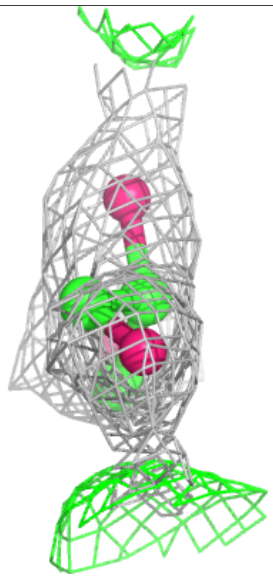


Electron density around GOL E 704:

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

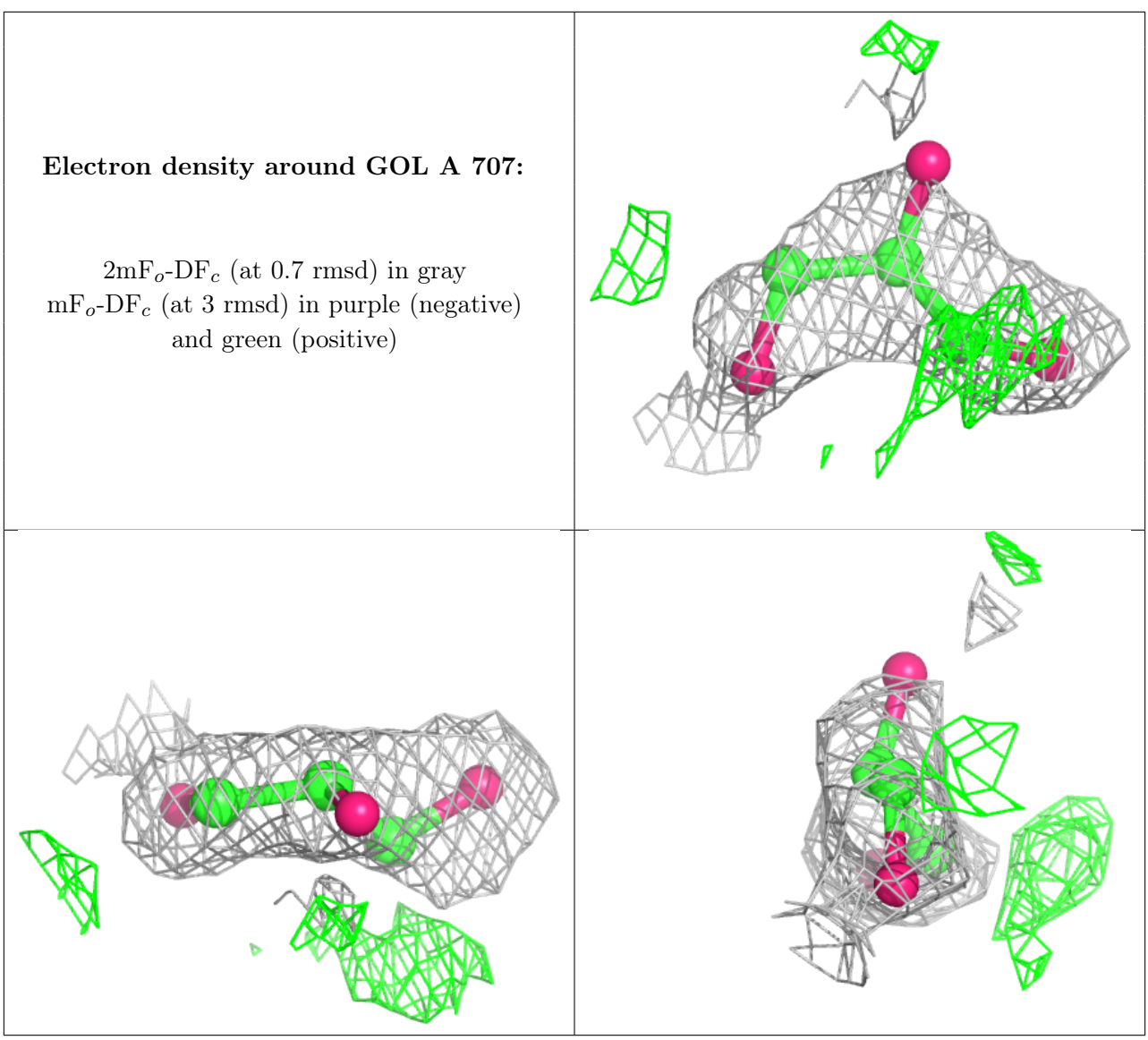






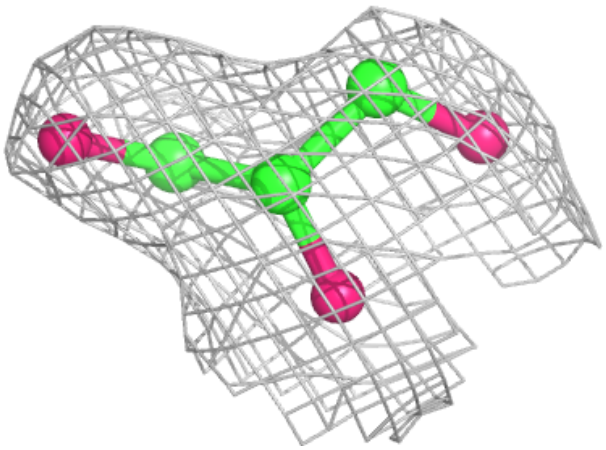
Electron density around GOL A 707:

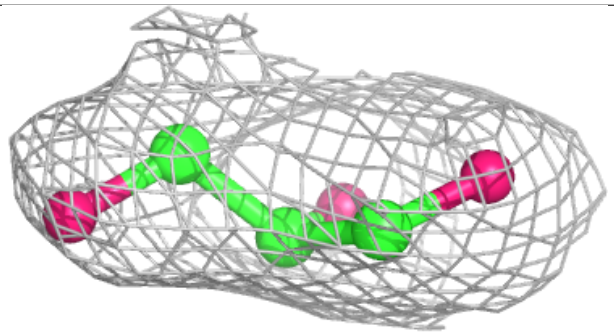
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

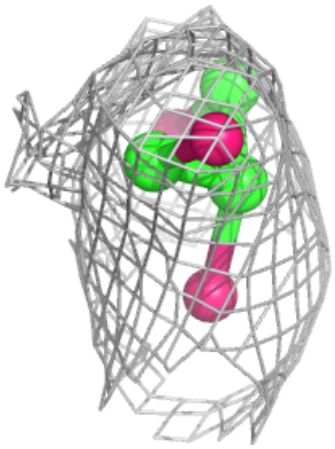


Electron density around GOL C 702:

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

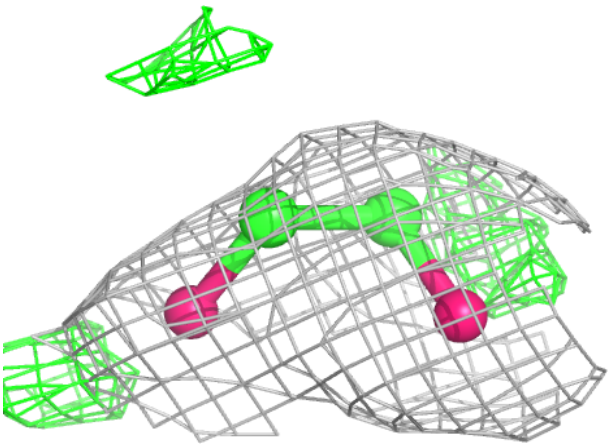


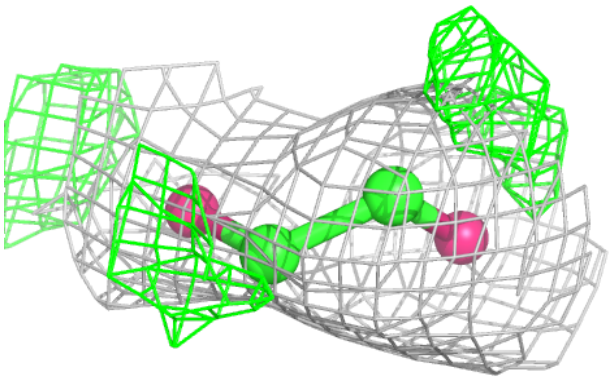


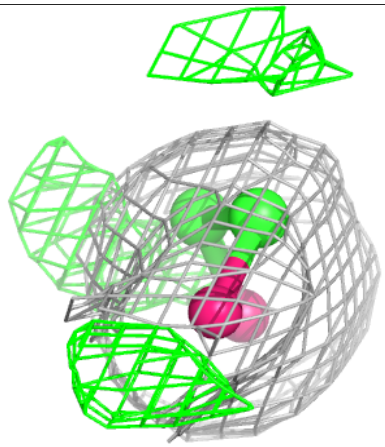


Electron density around 1PE B 705:

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

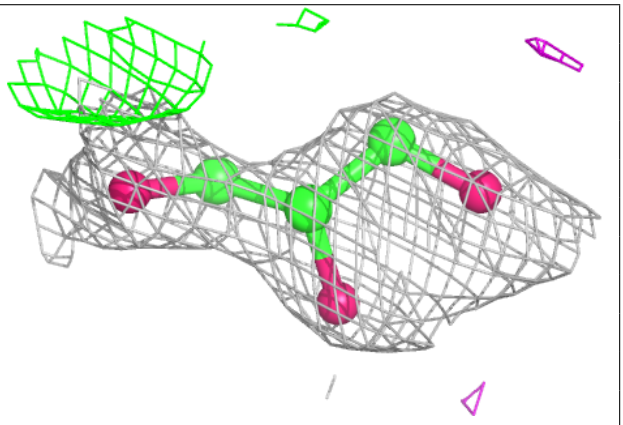


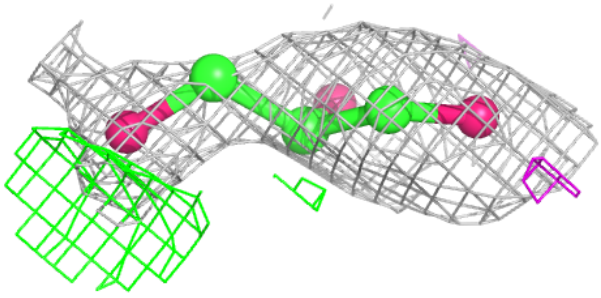


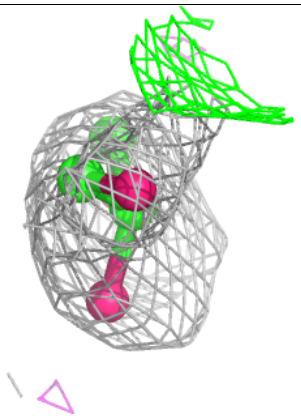


Electron density around GOL C 706:

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

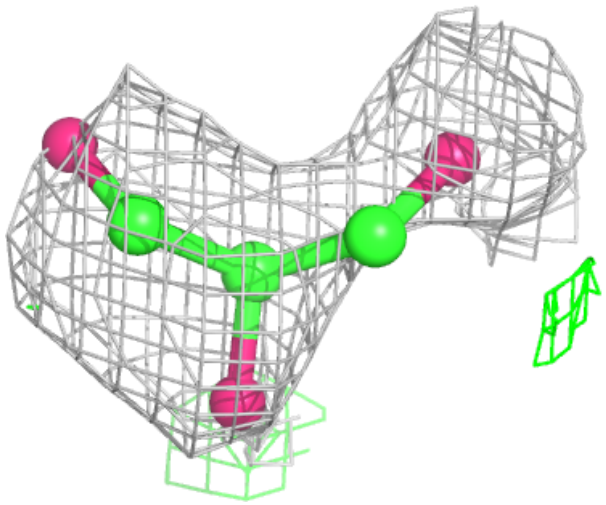


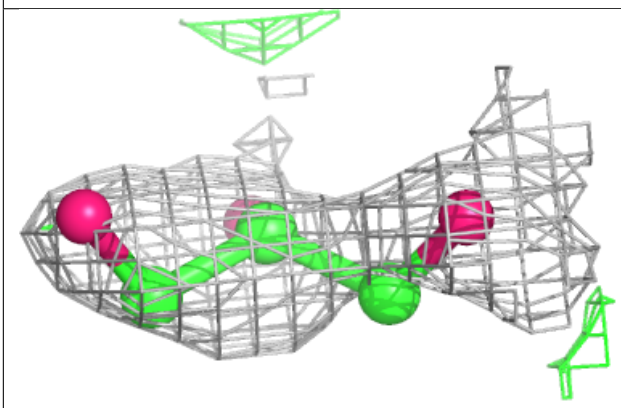


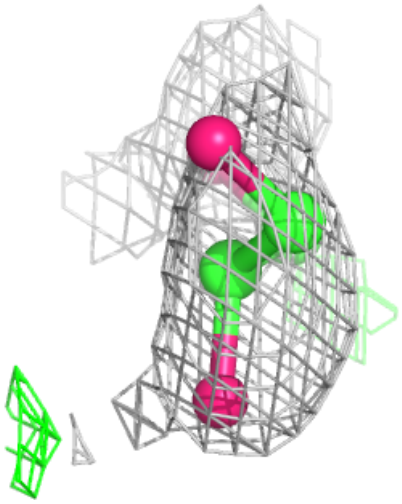


Electron density around GOL A 706:

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

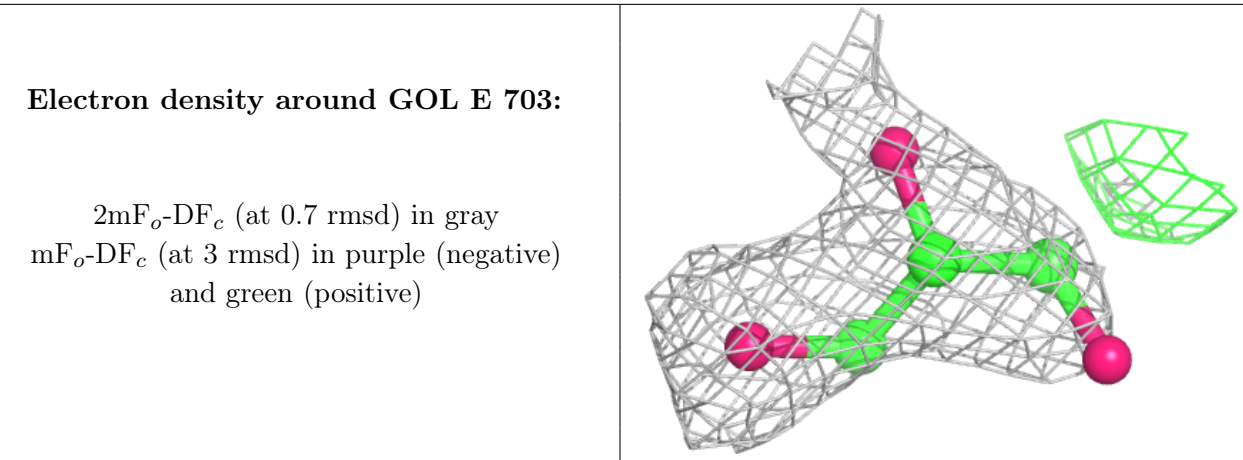


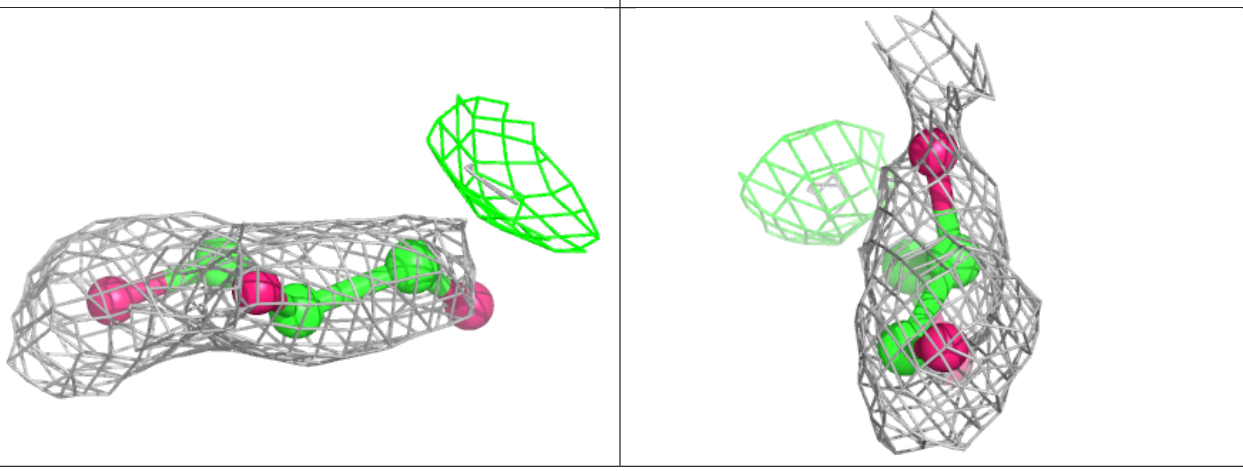




Electron density around GOL E 703:

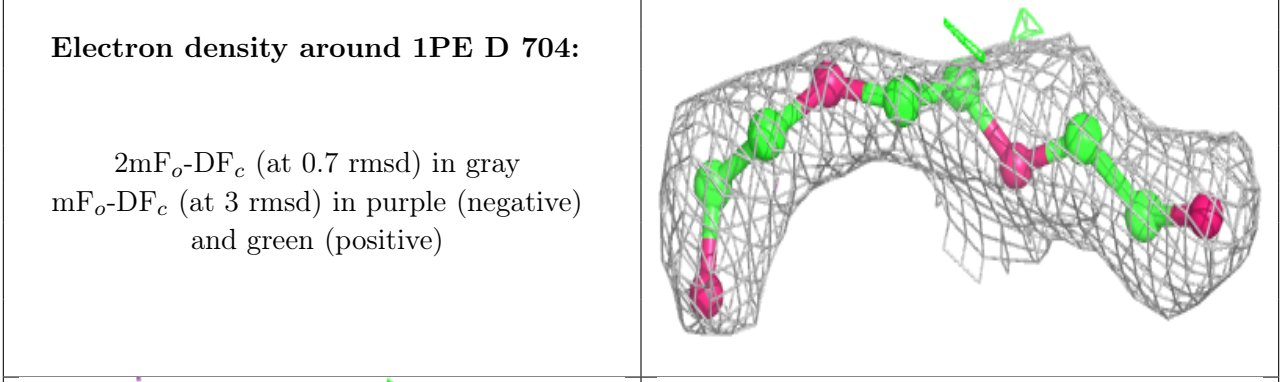
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

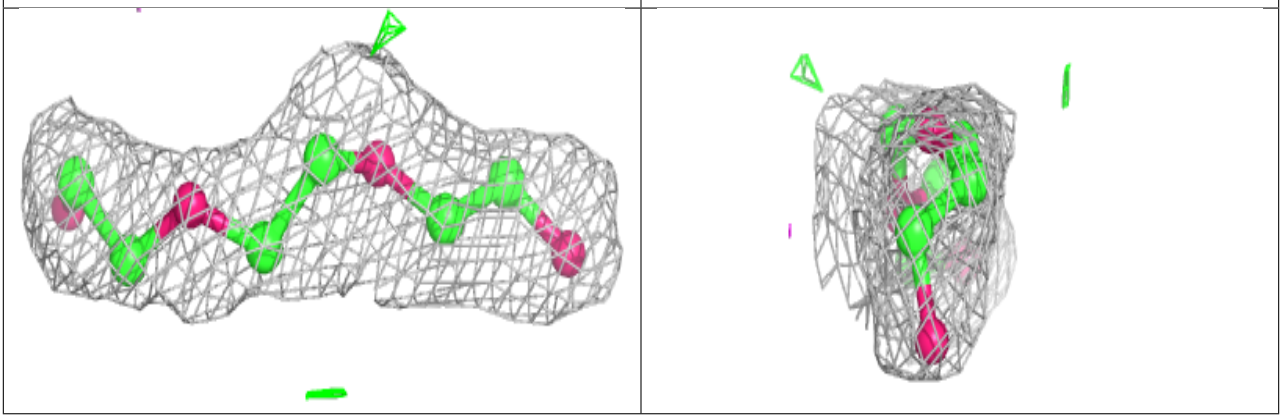




Electron density around 1PE D 704:

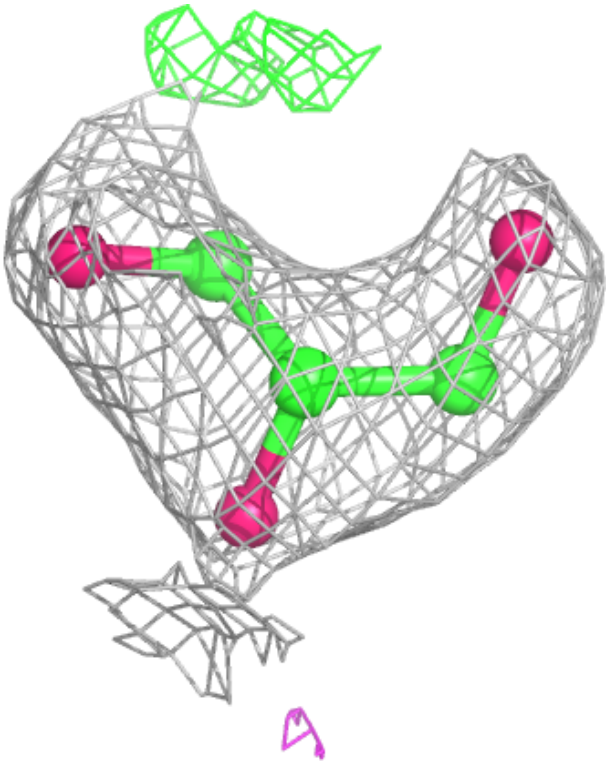
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

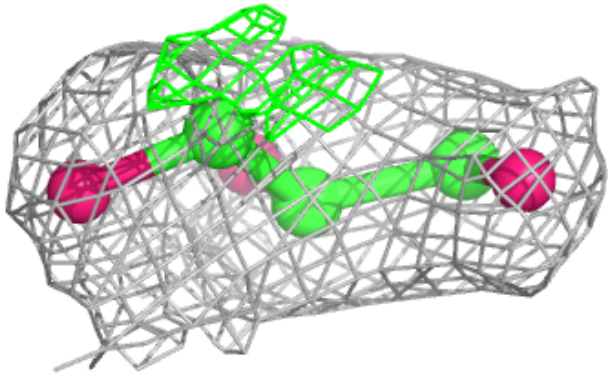


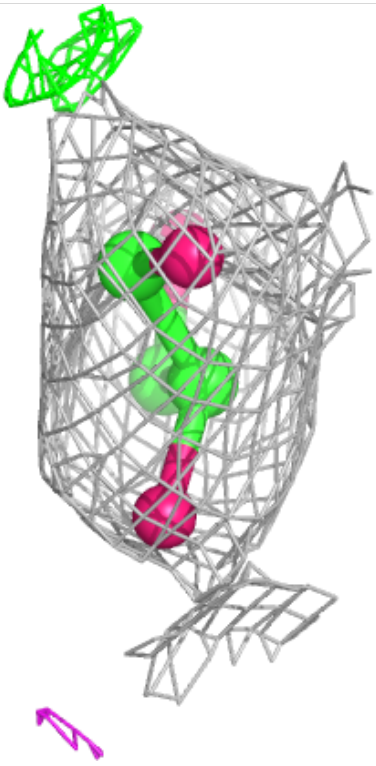


Electron density around GOL D 705:

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

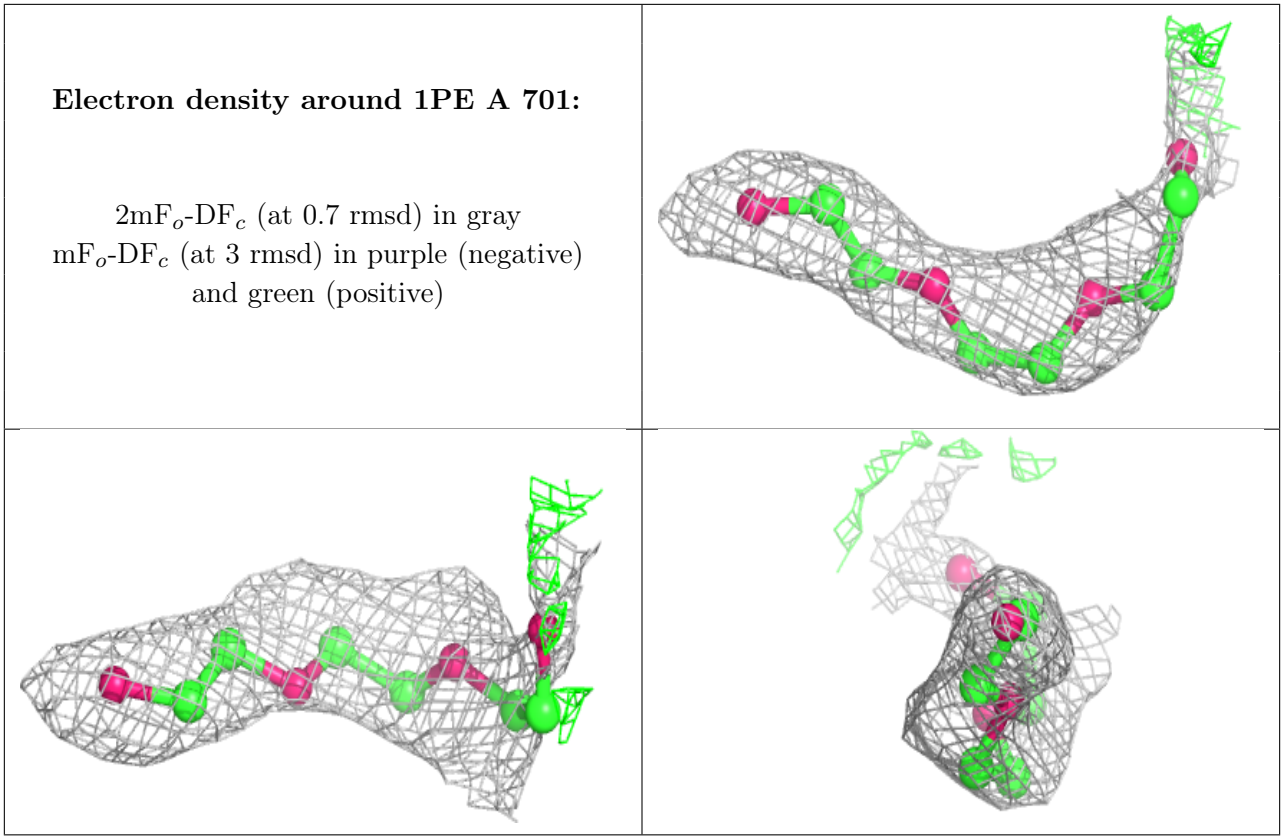






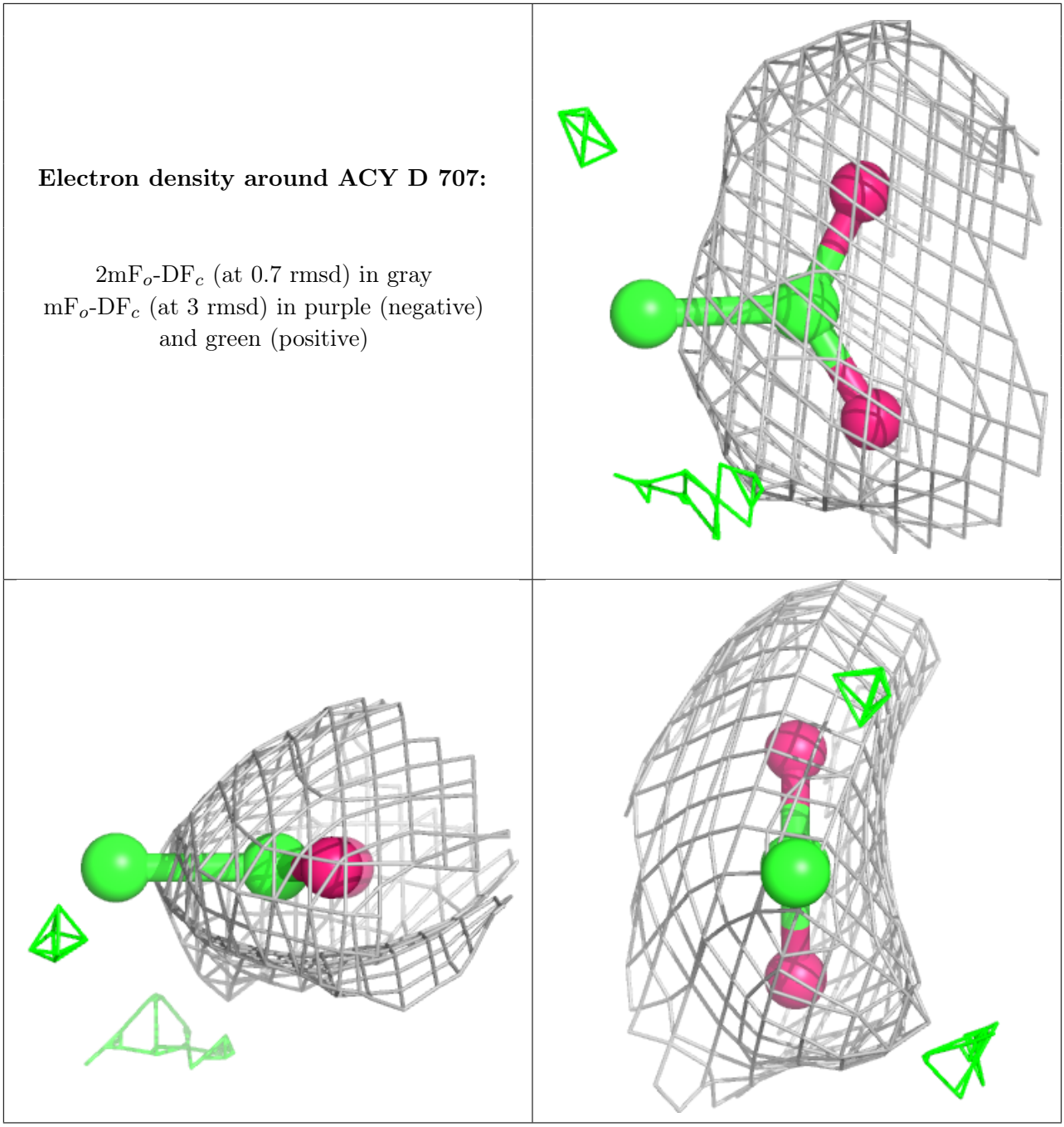
Electron density around 1PE A 701:

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



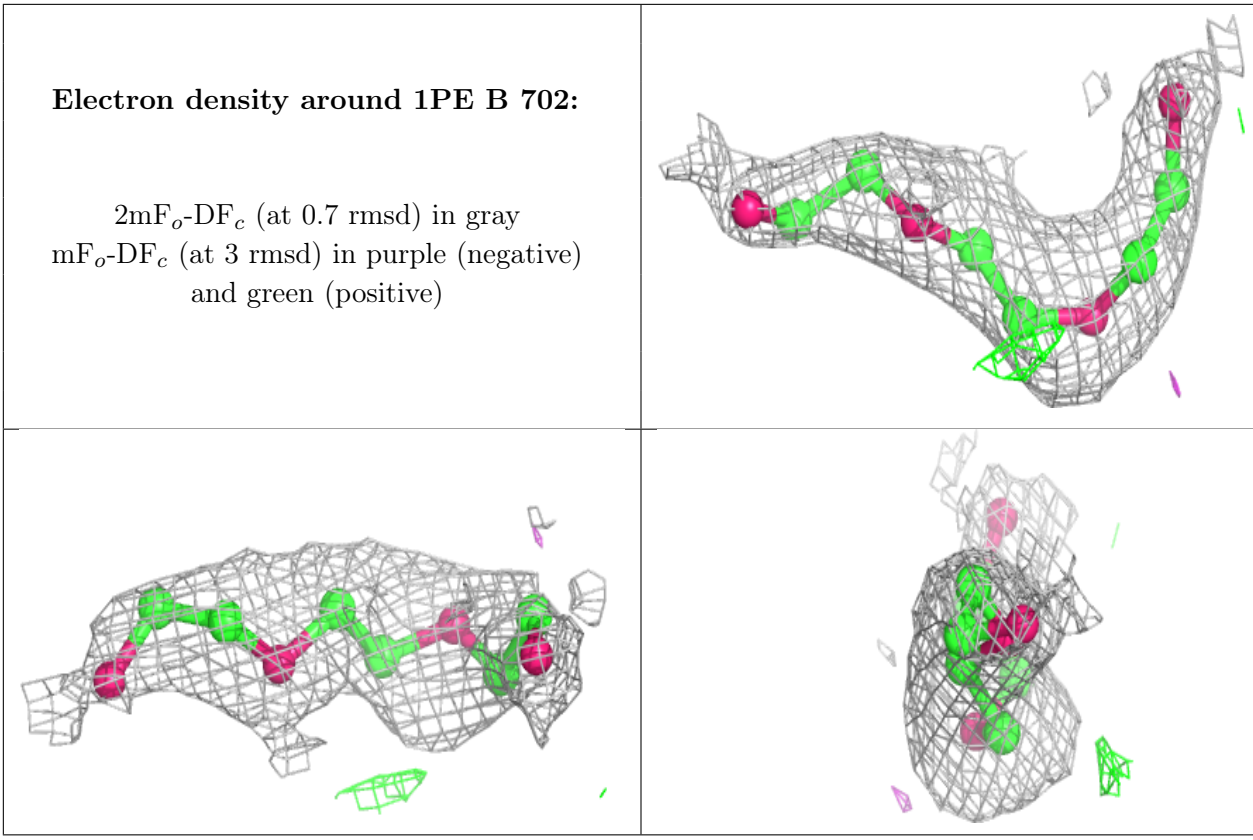
Electron density around ACY D 707:

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



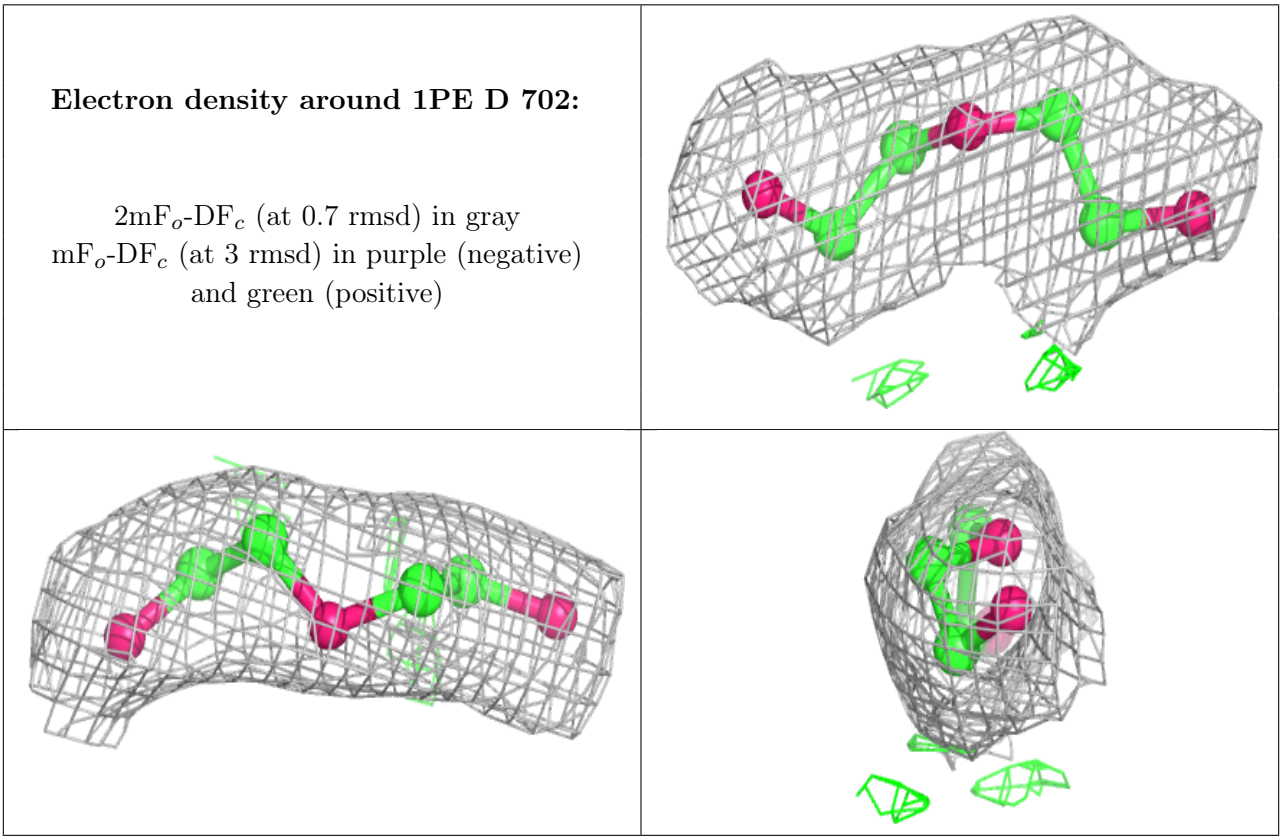
Electron density around 1PE B 702:

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



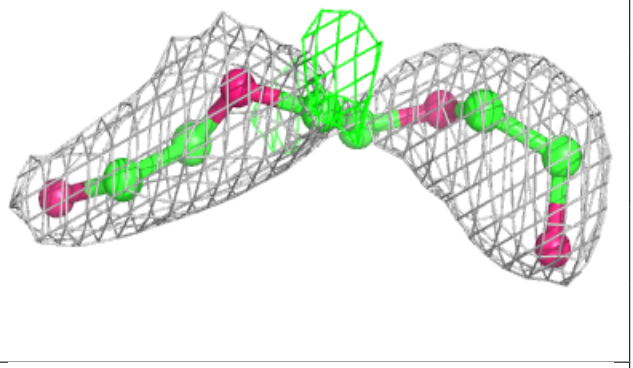
Electron density around 1PE D 702:

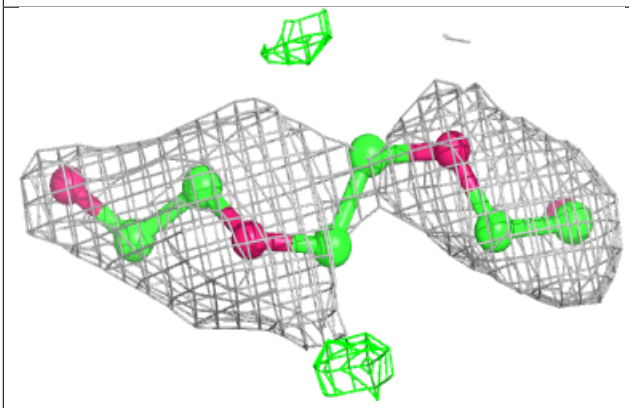
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

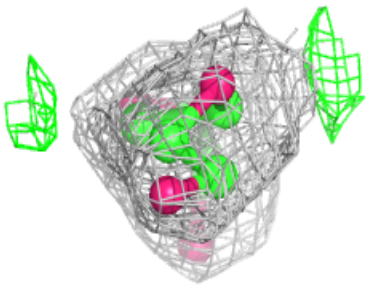


Electron density around 1PE B 703:

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

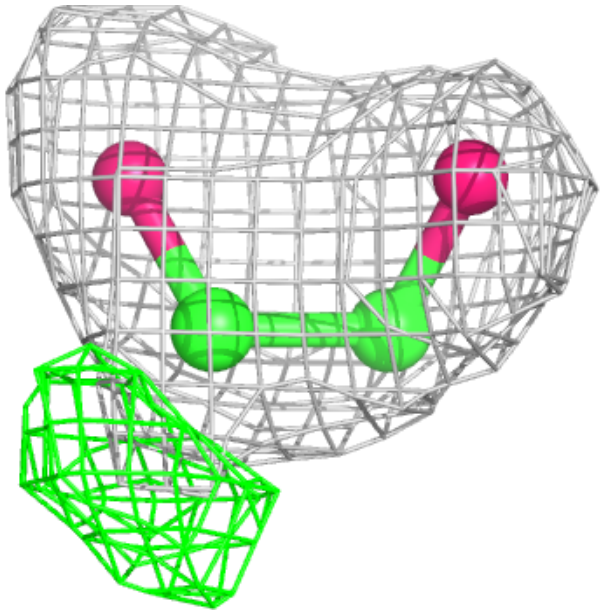


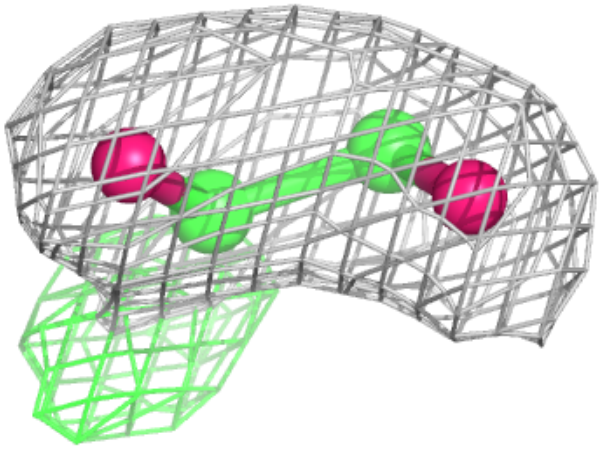


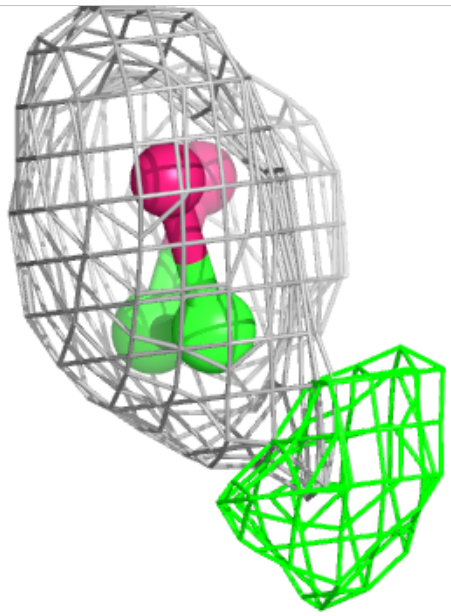


Electron density around 1PE B 704:

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

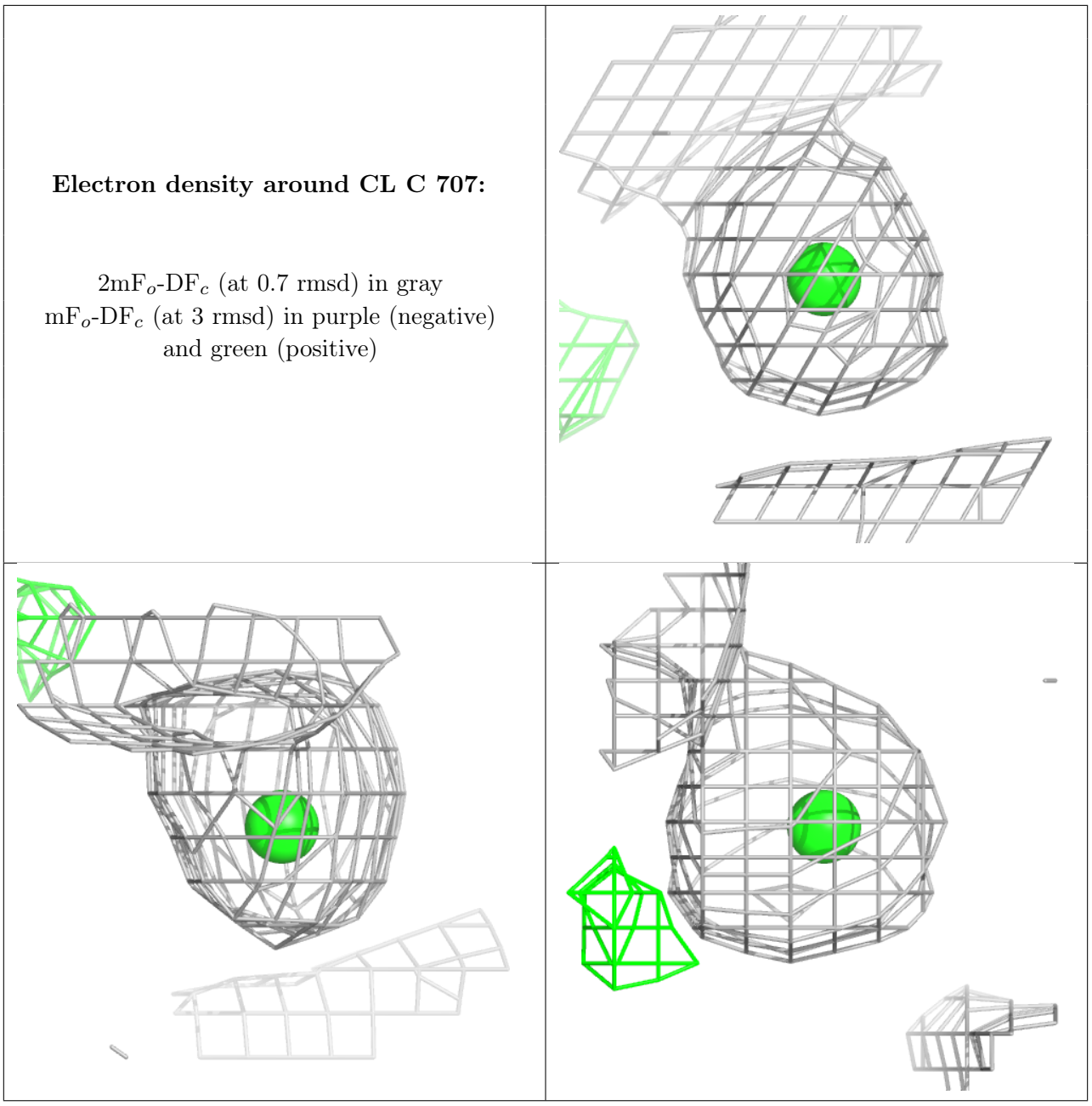






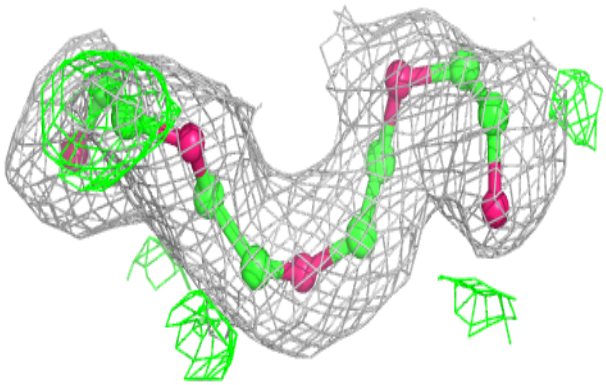
Electron density around CL C 707:

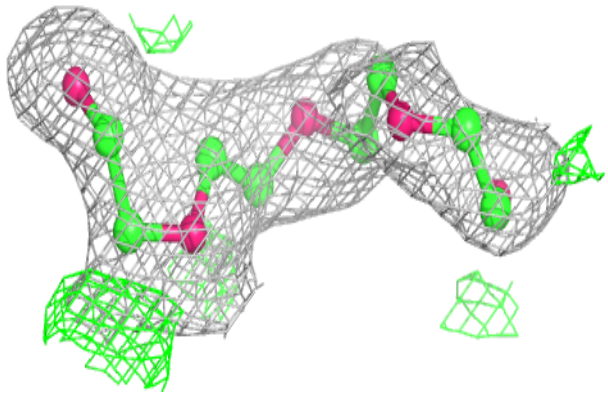
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

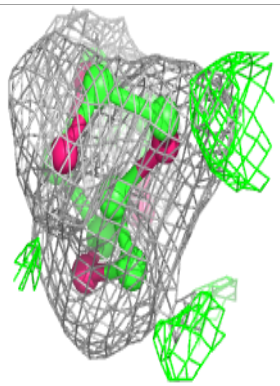


Electron density around 1PE B 701:

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

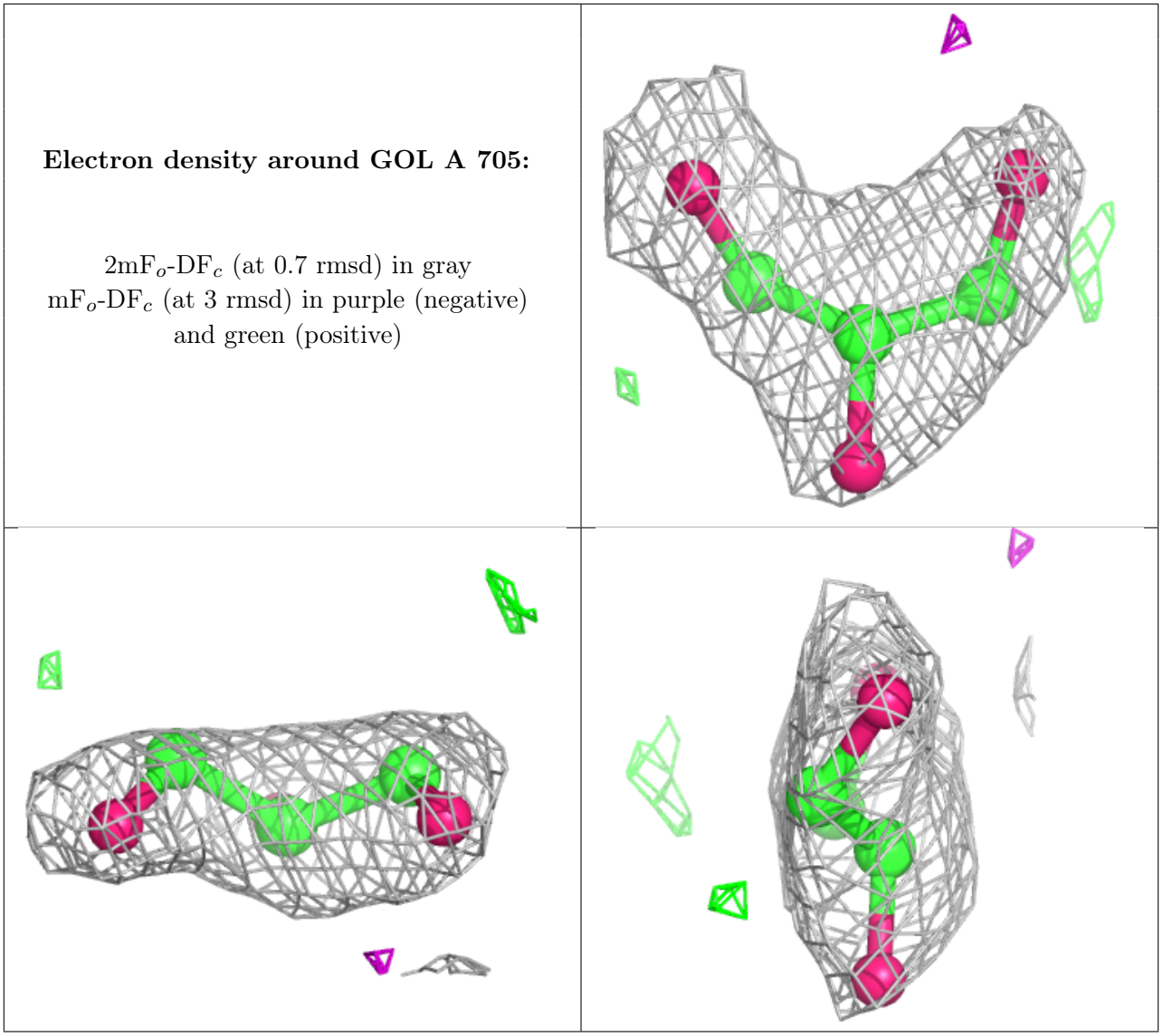






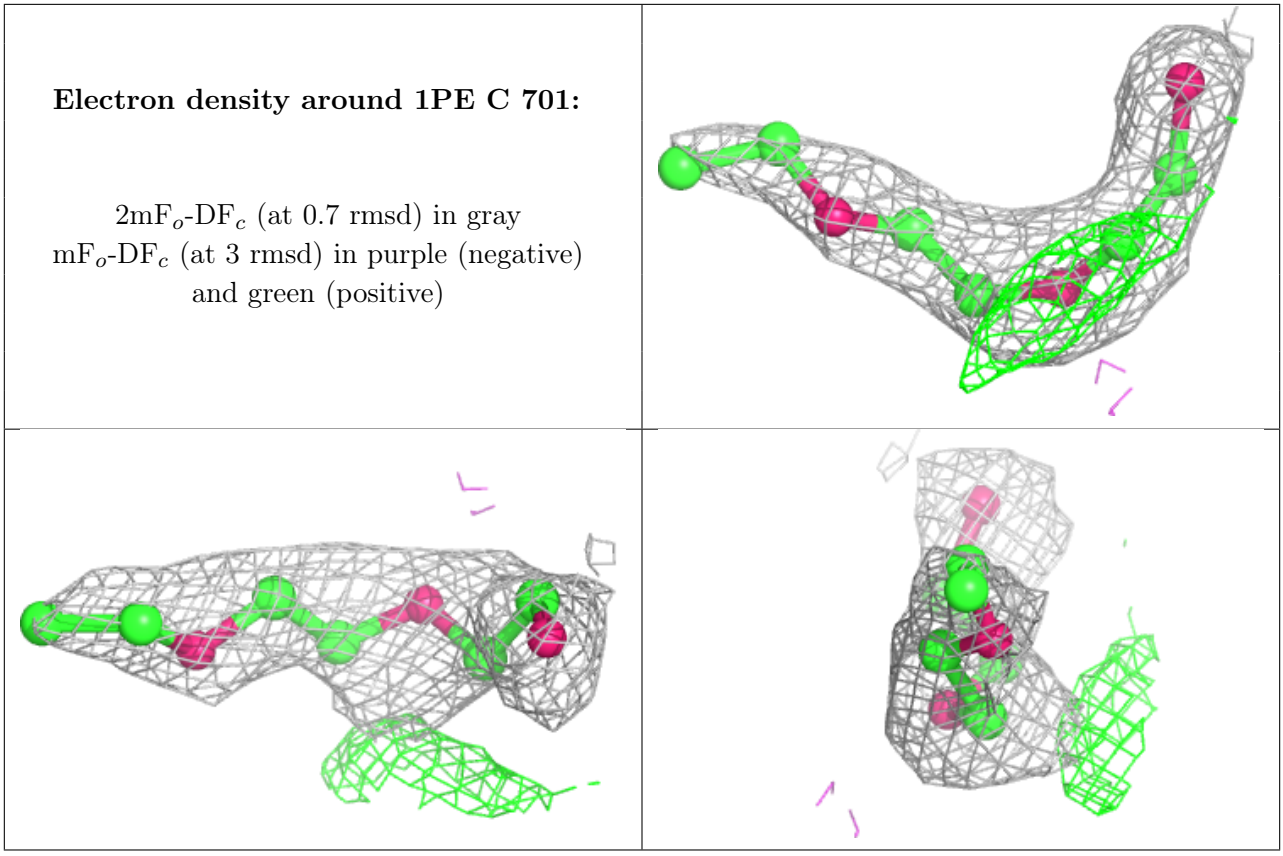
Electron density around GOL A 705:

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



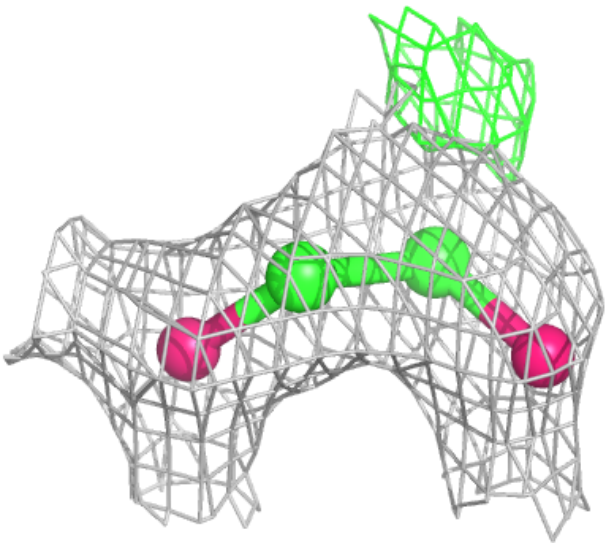
Electron density around 1PE C 701:

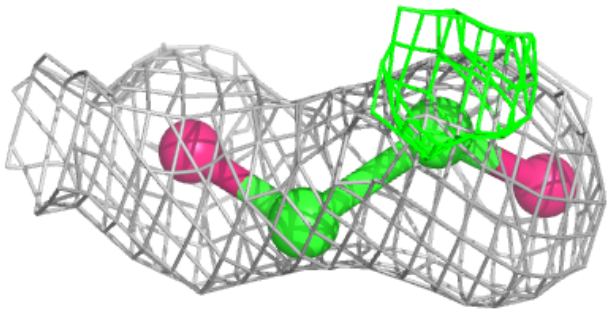
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

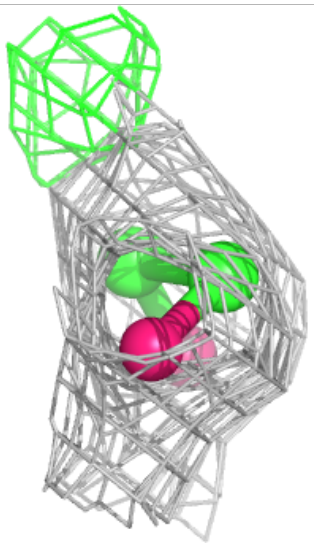


Electron density around 1PE A 702:

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

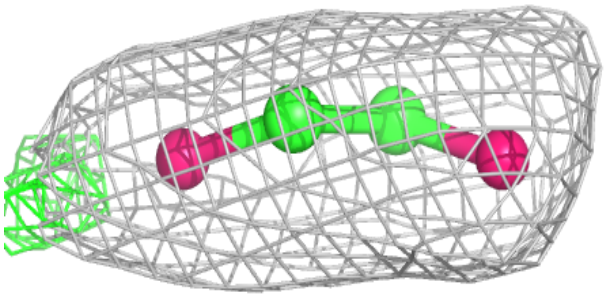


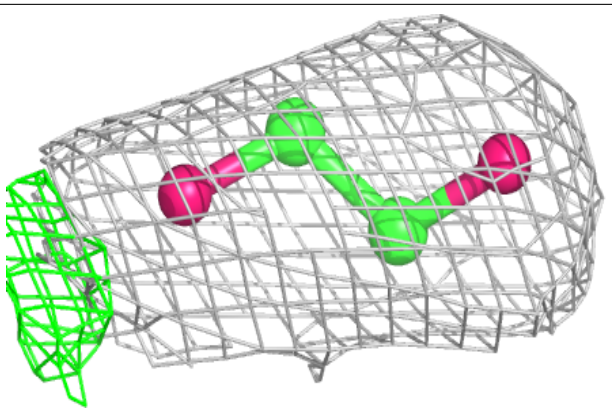


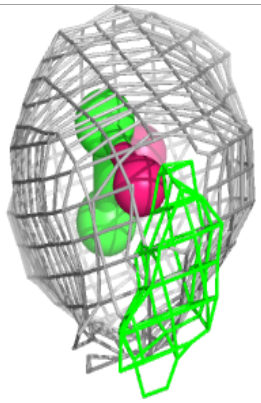


Electron density around 1PE D 703:

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

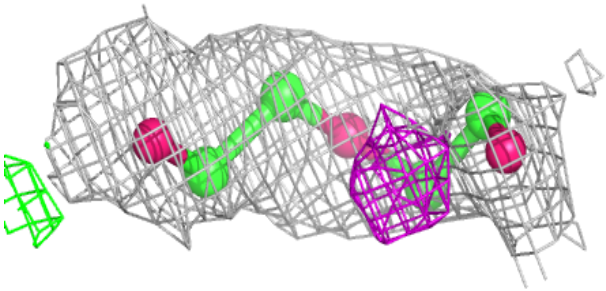


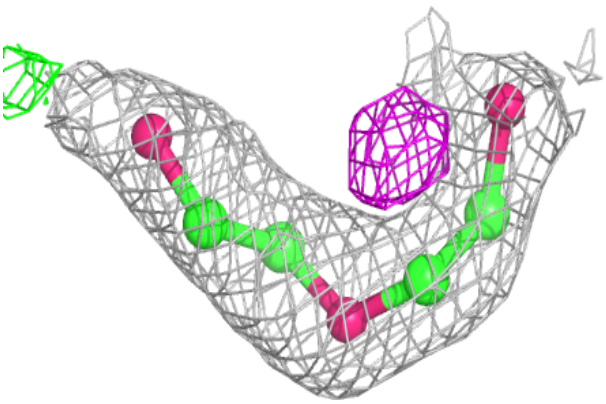


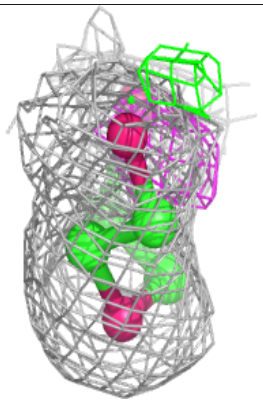


Electron density around 1PE D 701:

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

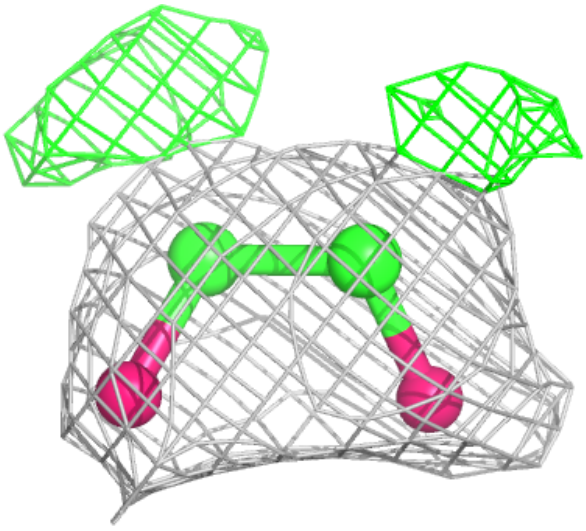


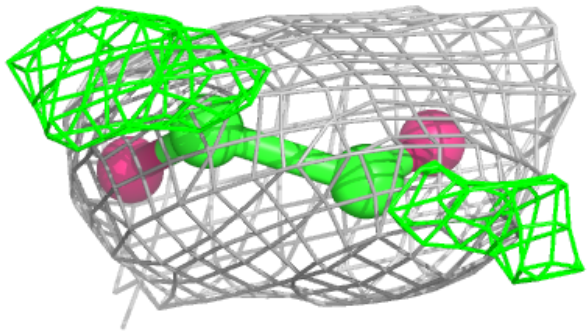


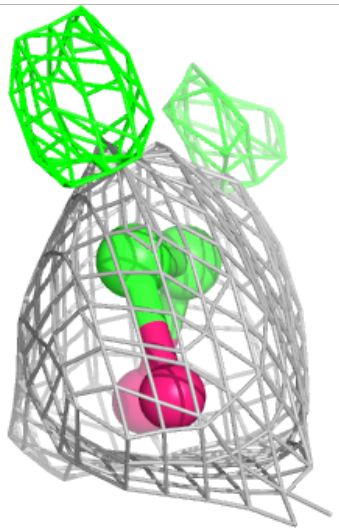


Electron density around 1PE A 704:

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

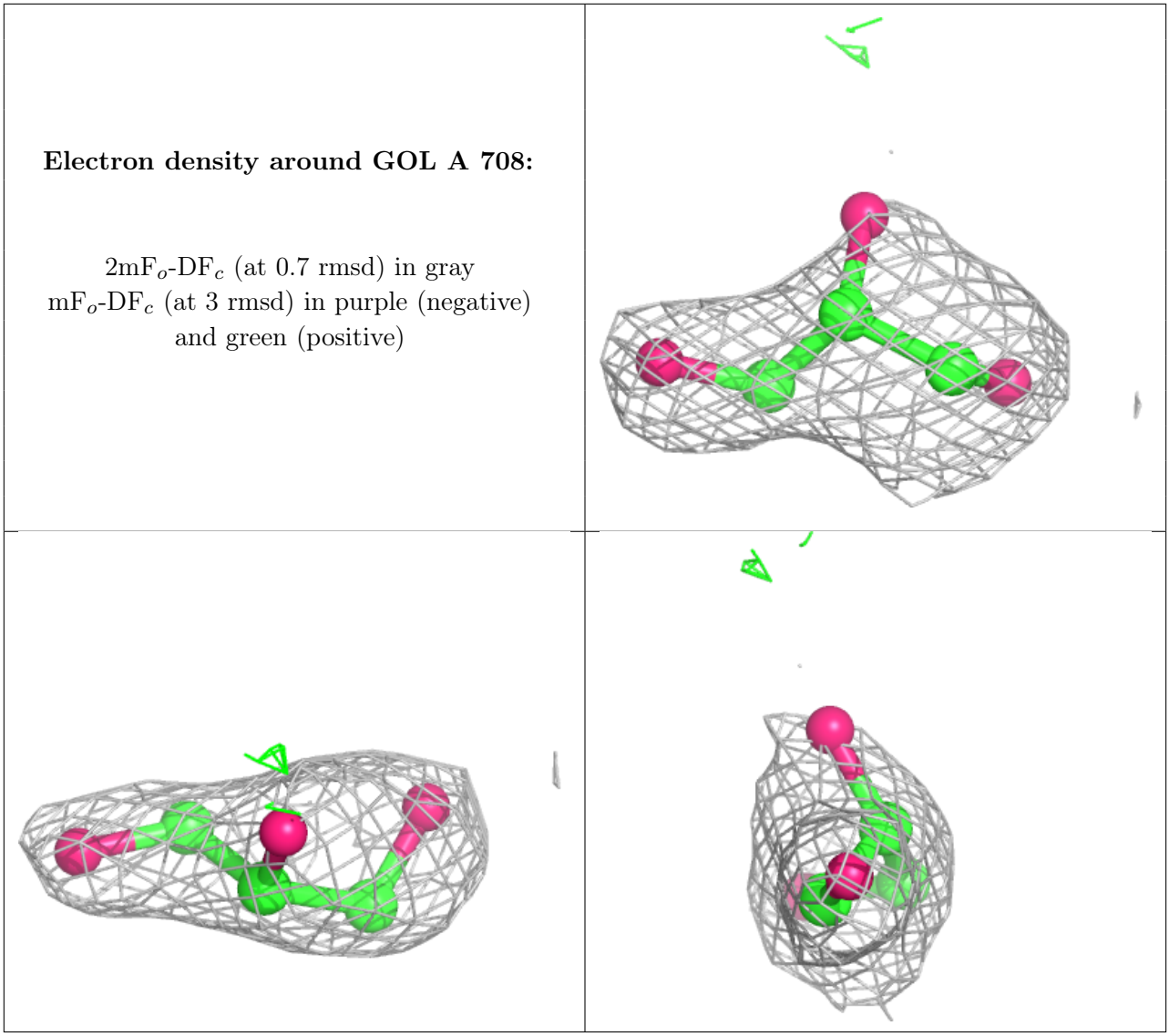






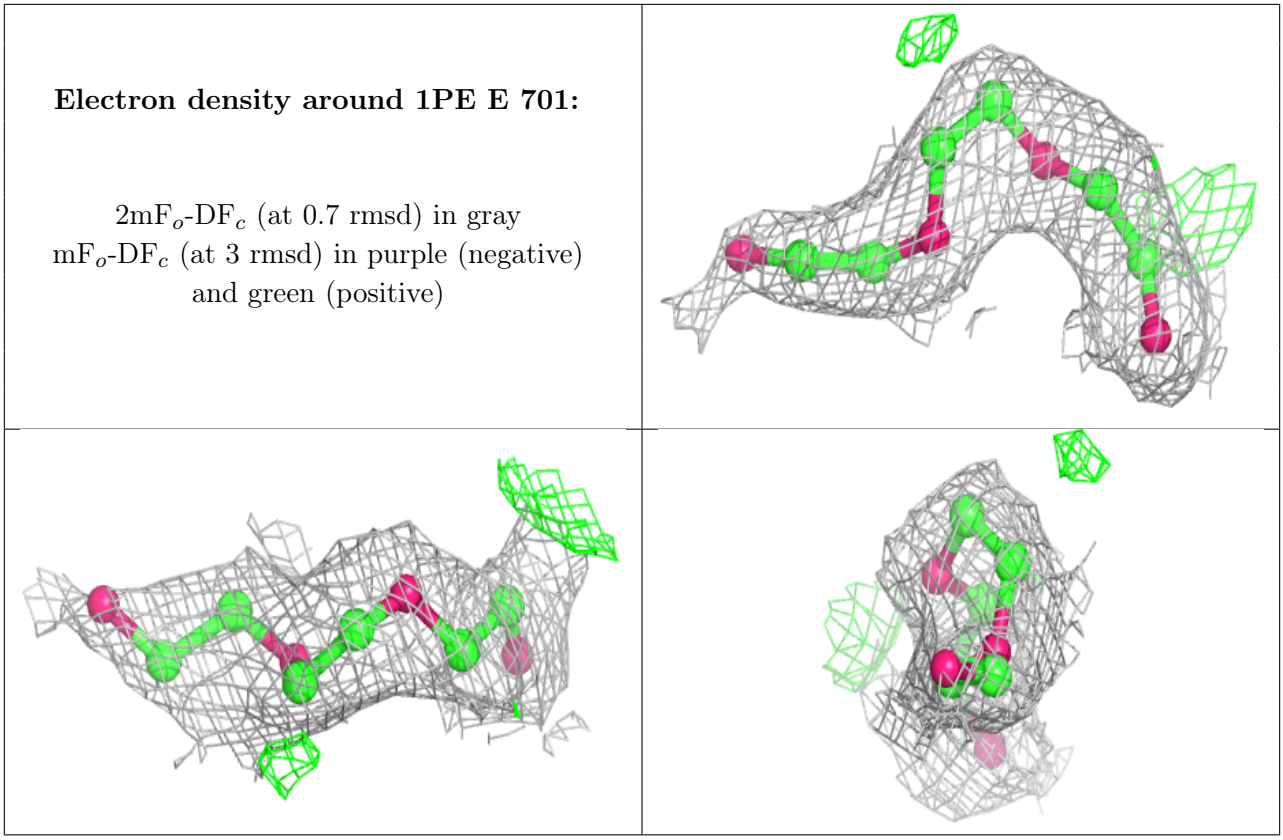
Electron density around GOL A 708:

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



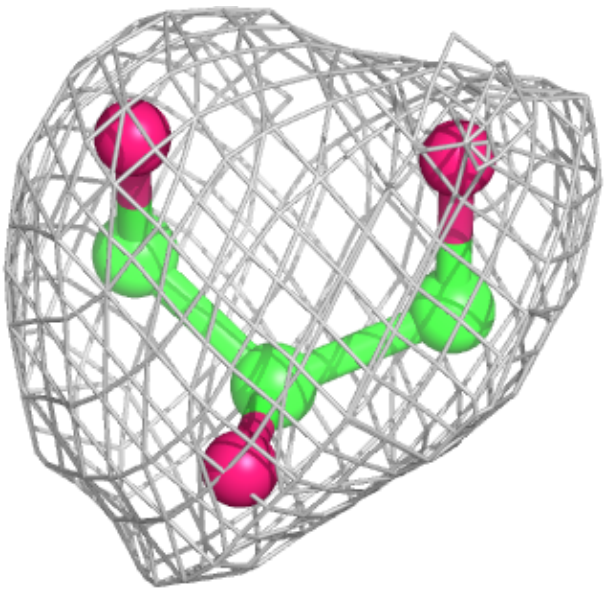
Electron density around 1PE E 701:

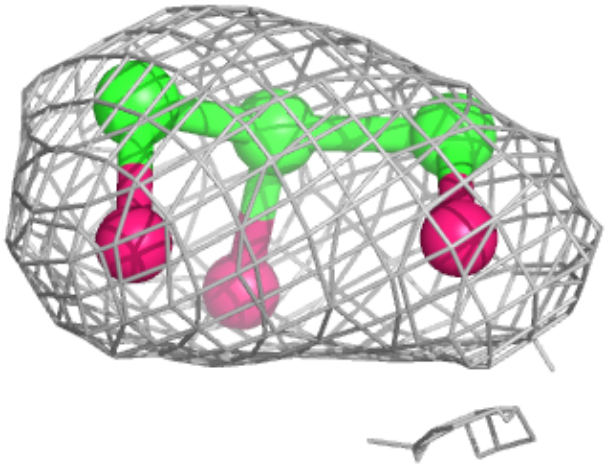
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

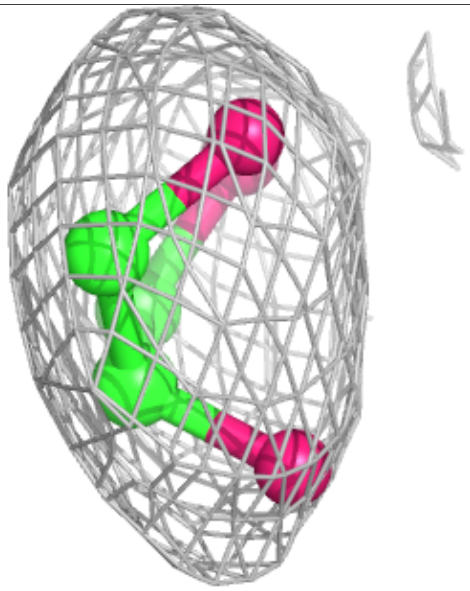


Electron density around GOL C 704:

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

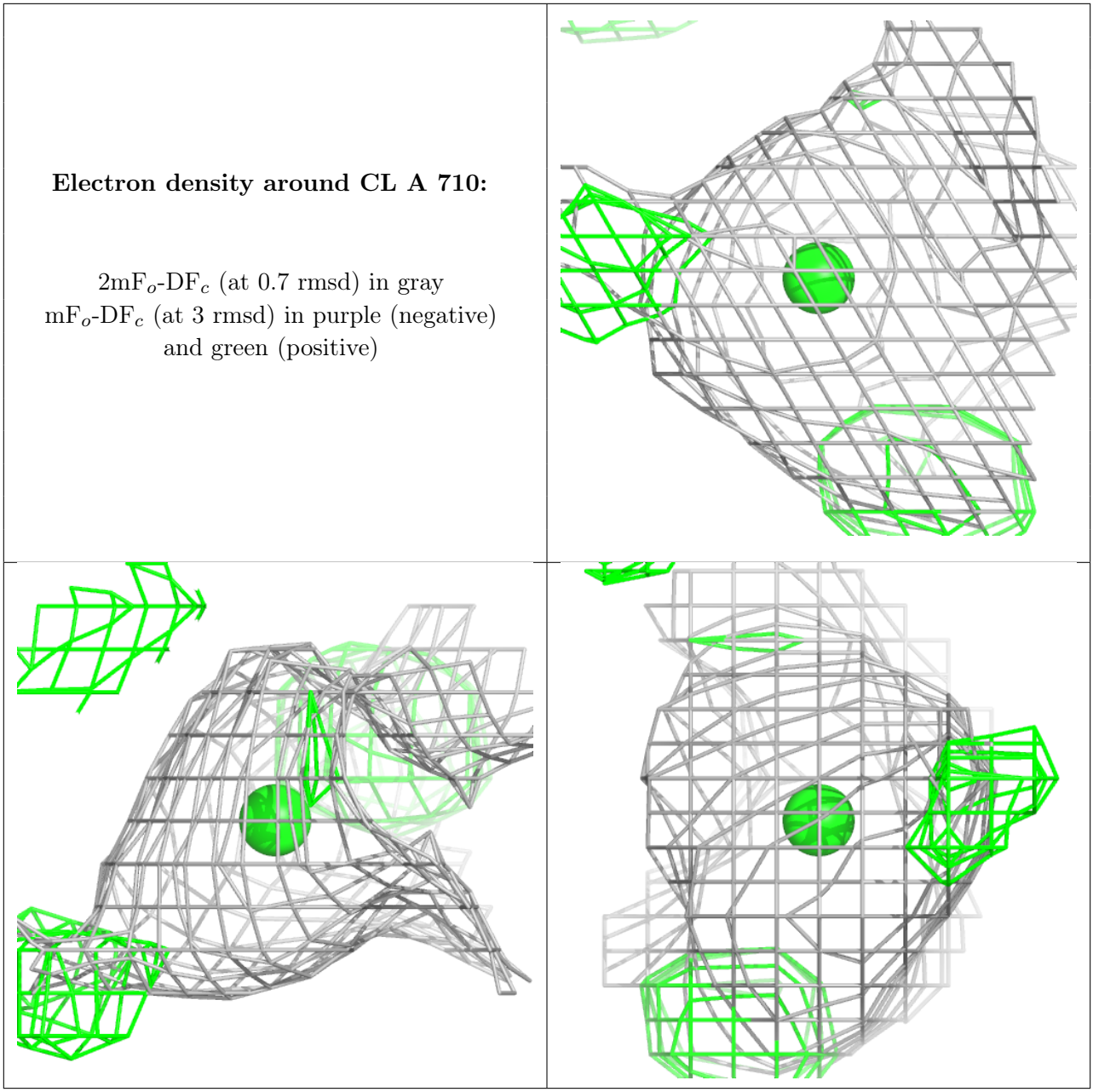






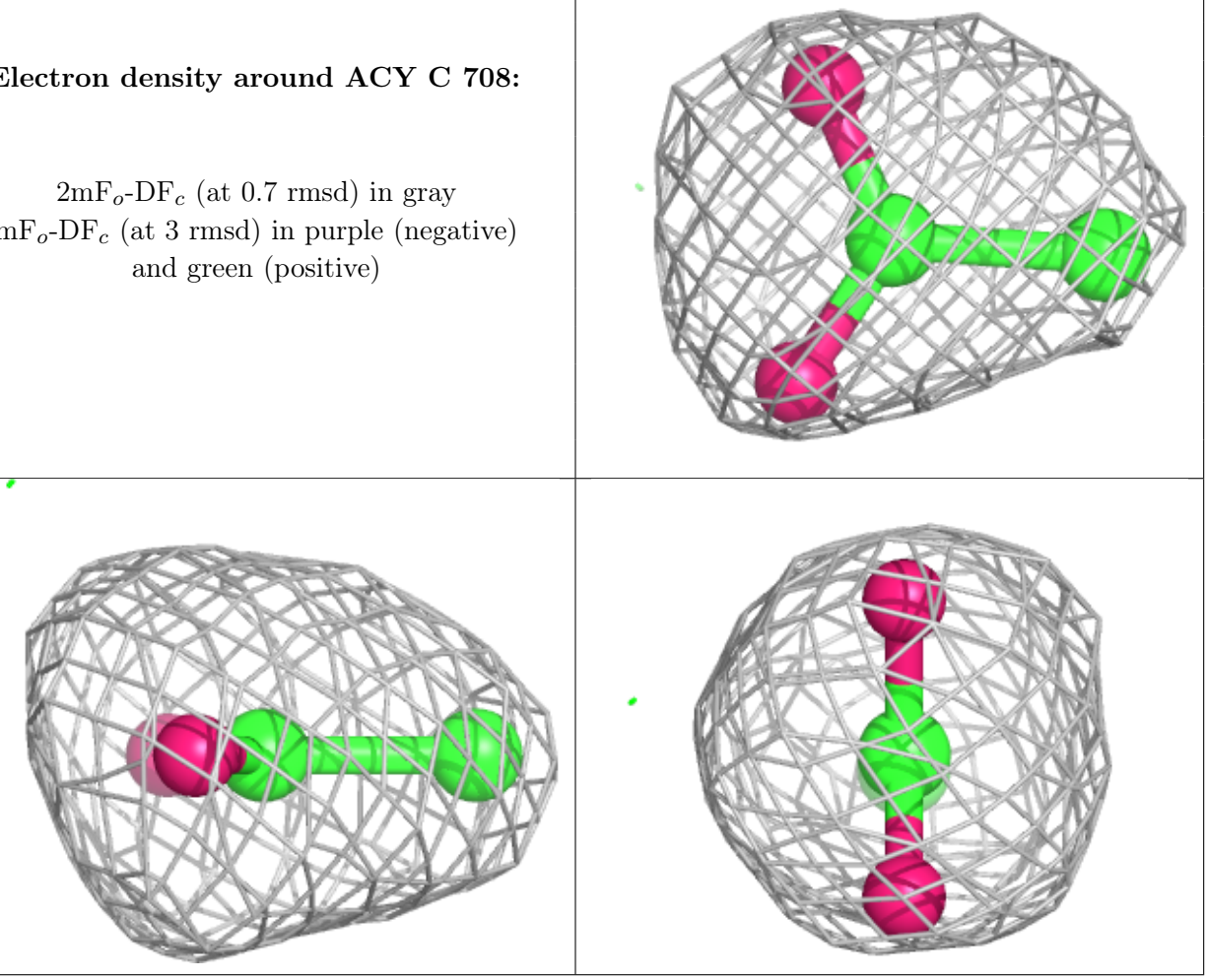
Electron density around CL A 710:

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



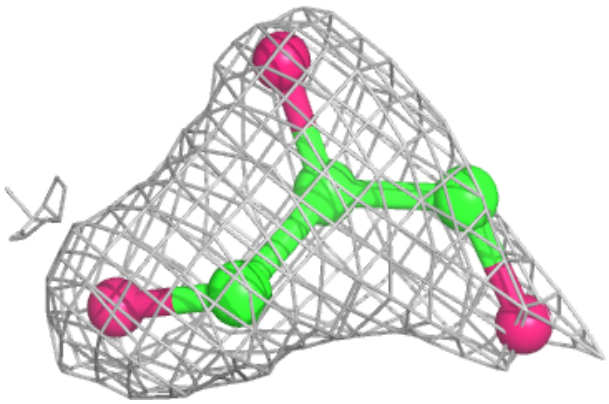
Electron density around ACY C 708:

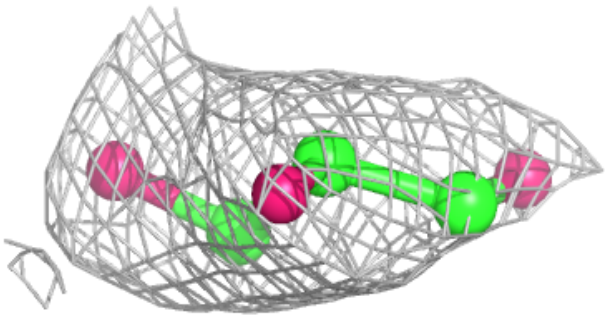
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

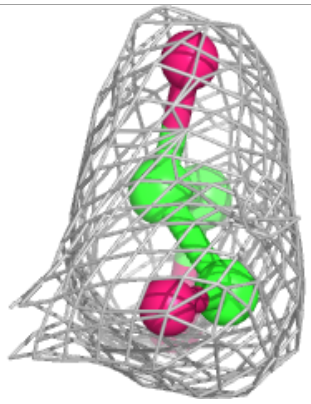


Electron density around GOL A 709:

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

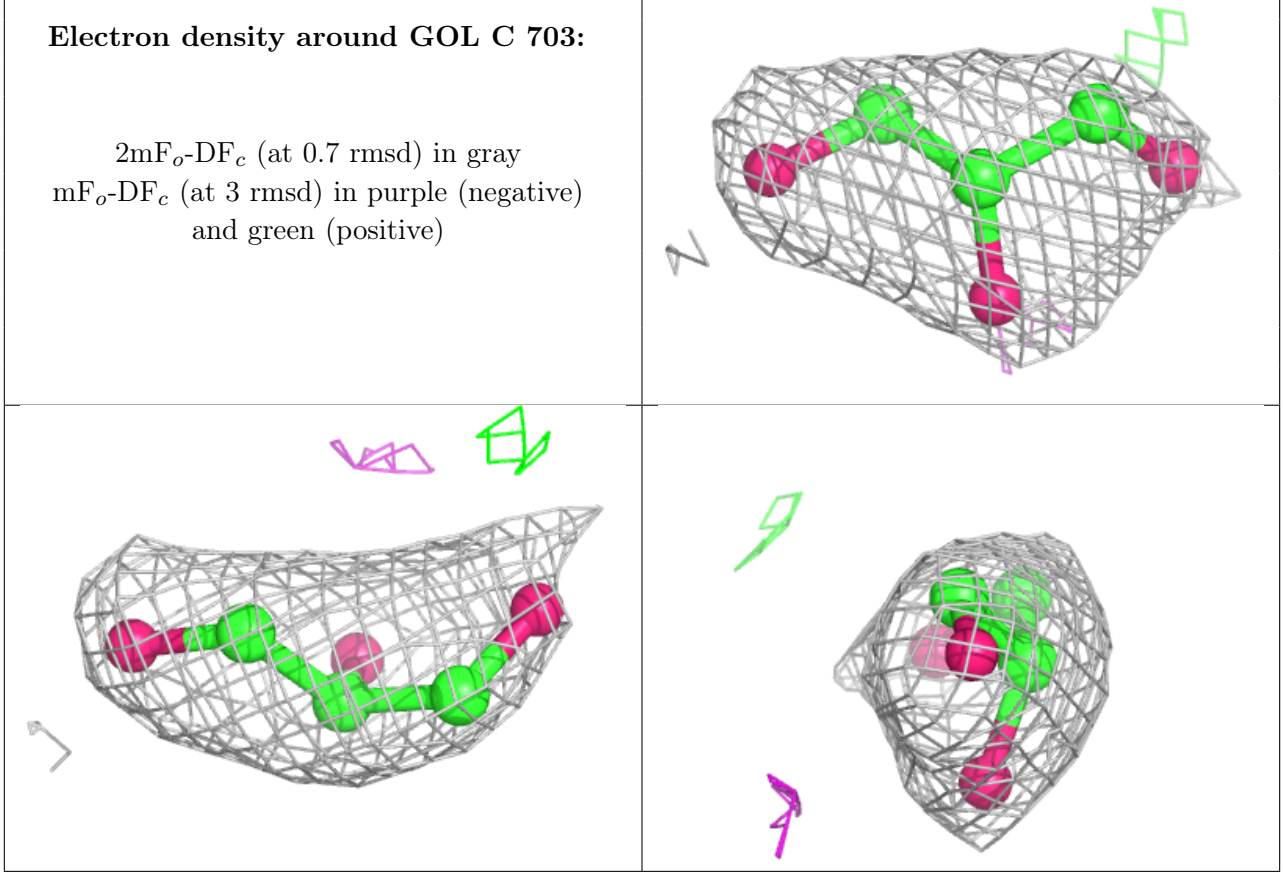






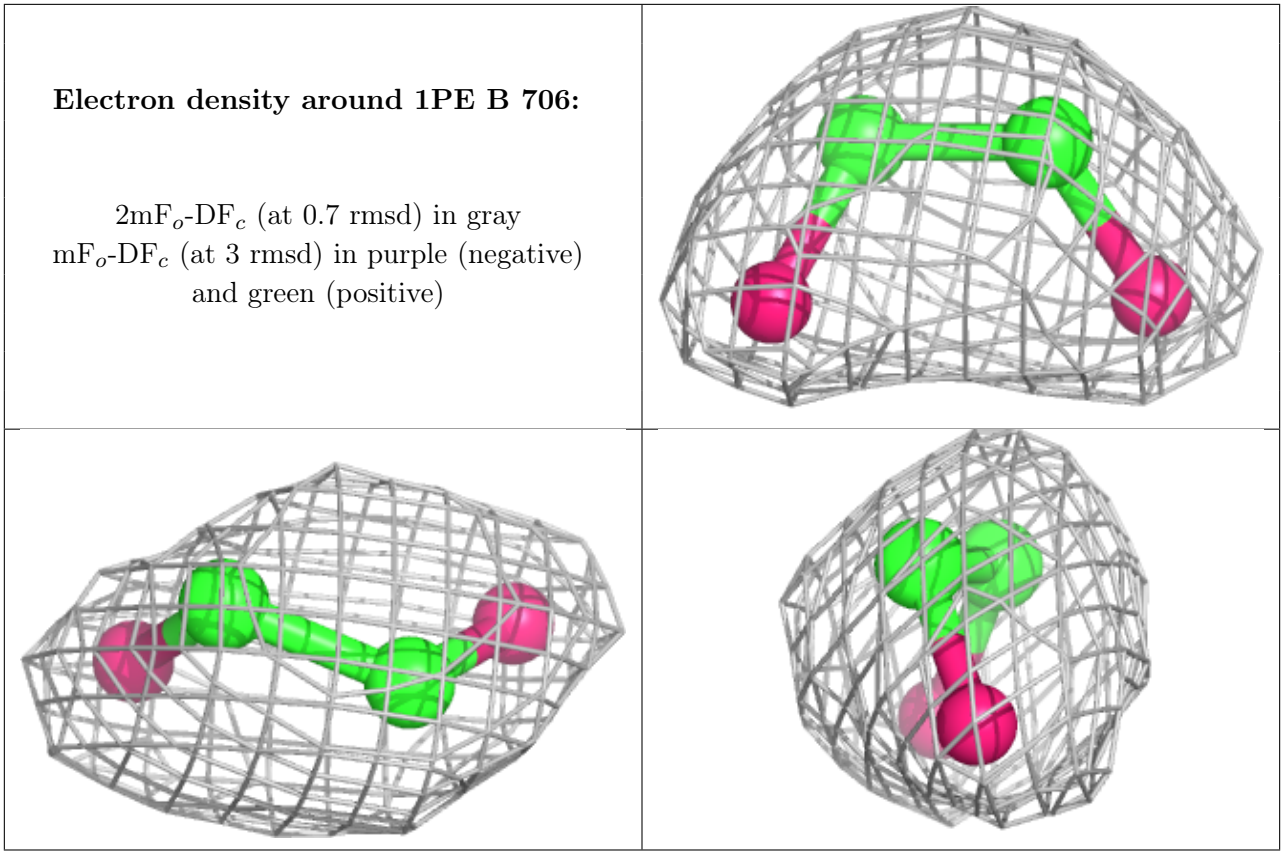
Electron density around GOL C 703:

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



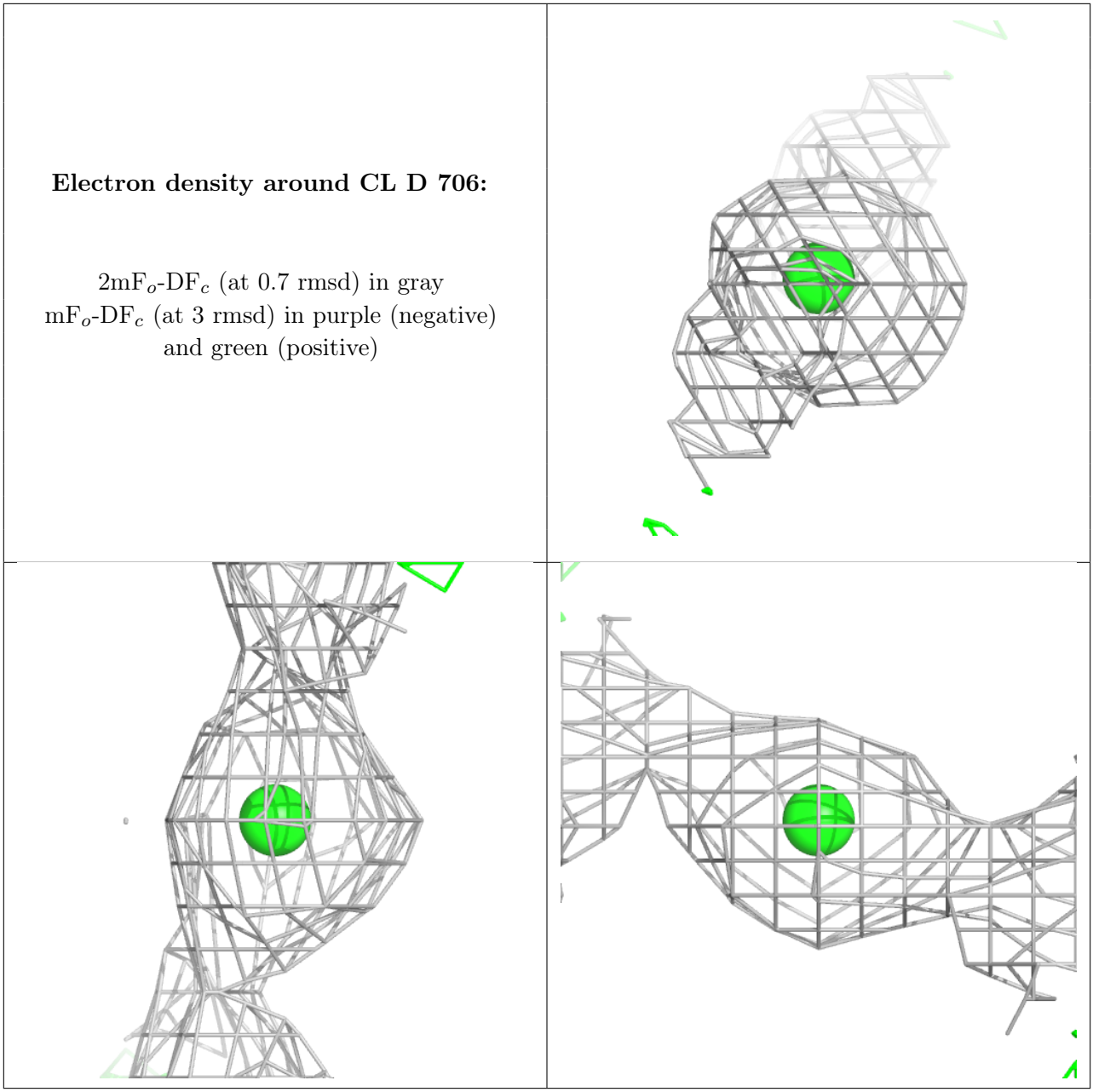
Electron density around 1PE B 706:

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



Electron density around CL D 706:

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



6.5 Other polymers

There are no such residues in this entry.