wwPDB X-ray Structure Validation Summary Report (i)

Sep 30, 2024 – 12:22 PM EDT

PDB ID	:	9BT4
Title	:	Pyruvate:Ferredoxin Oxidoreductase from Methanosarcina acetivorans
Authors	:	Catlin, D.; Nair, S.J.
Deposited on	:	2024-05-14
Resolution	:	1.92 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:

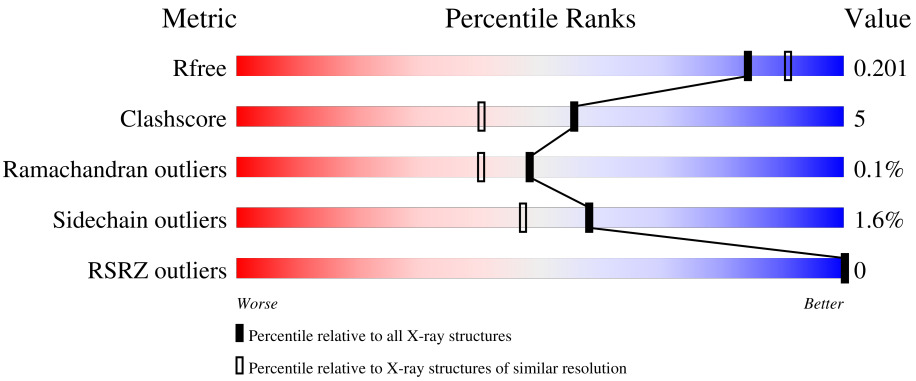
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 1.92 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	1028 (1.92-1.92)
Clashscore	180529	1100 (1.92-1.92)
Ramachandran outliers	177936	1087 (1.92-1.92)
Sidechain outliers	177891	1087 (1.92-1.92)
RSRZ outliers	164620	1028 (1.92-1.92)

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	403	88% 11% •
1	B	403	91% 9%
2	C	296	89% 9% •
2	D	296	89% 8% • •
3	G	85	95% 5%

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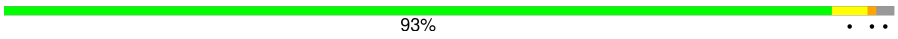
Mol	Chain	Length	Quality of chain
3	H	85	
4	E	182	
4	F	182	

2 Entry composition (i)

There are 8 unique types of molecules in this entry. The entry contains 15364 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 Pyruvate:Ferredoxin Oxidoreductase, subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	402	Total	C	N	O	S	0	0	0
			3102	1974	513	598	17			
1	A	402	Total	C	N	O	S	0	0	0
			3102	1974	513	598	17			

- Molecule 2 is a protein called Pyruvate:Ferredoxin Oxidoreductase, subunit beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	291	Total	C	N	O	S	0	0	0
			2196	1383	382	412	19			
2	D	291	Total	C	N	O	S	0	0	0
			2196	1383	382	412	19			

- Molecule 3 is a protein called Pyruvate:Ferredoxin Oxidoreductase, subunit delta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	G	85	Total	C	N	O	S	0	0	0
			651	410	105	125	11			
3	H	83	Total	C	N	O	S	0	0	0
			633	399	102	121	11			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	-5	ALA	-	expression tag	UNP Q8TUN3
H	-5	ALA	-	expression tag	UNP Q8TUN3

- Molecule 4 is a protein called Pyruvate:Ferredoxin Oxidoreductase, subunit gamma.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	E	170	Total	C	N	O	S	0	0	0
			1285	812	223	246	4			

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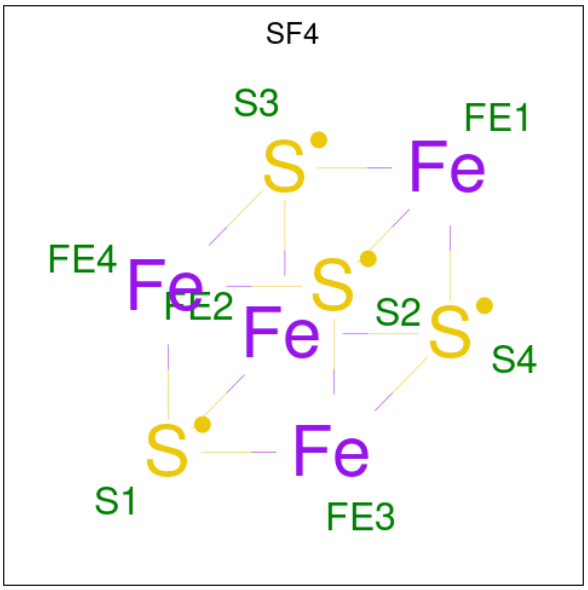
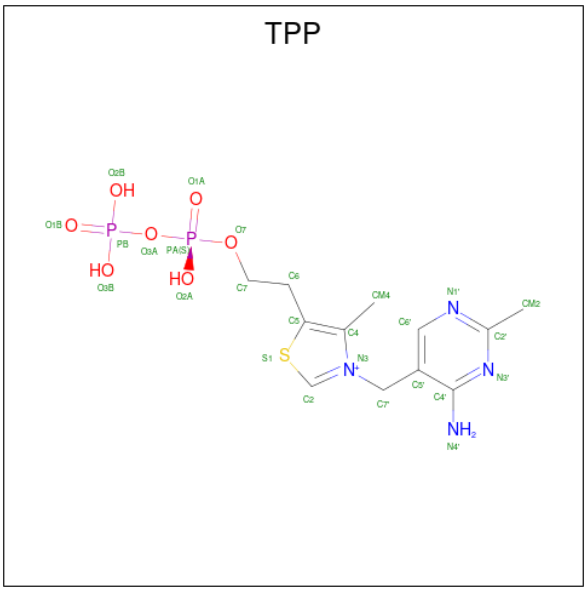
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	F	170	Total	C	N	O	S	0	0	0
			1291	818	223	246	4			

- Molecule 5 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe_4S_4) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	C	1	Total	Fe	S		0	0
			8	4	4			
5	D	1	Total	Fe	S		0	0
			8	4	4			
5	G	1	Total	Fe	S		0	0
			8	4	4			
5	G	1	Total	Fe	S		0	0
			8	4	4			
5	H	1	Total	Fe	S		0	0
			8	4	4			
5	H	1	Total	Fe	S		0	0
			8	4	4			

- Molecule 6 is THIAMINE DIPHOSPHATE (three-letter code: TPP) (formula: $C_{12}H_{19}N_4O_7P_2S$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	C	1	Total C N O P S 26 12 4 7 2 1	0	0
6	D	1	Total C N O P S 26 12 4 7 2 1	0	0

- Molecule 7 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	C	1	Total Mg 1 1	0	0
7	D	1	Total Mg 1 1	0	0

- Molecule 8 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	B	233	Total O 233 233	0	0
8	A	234	Total O 234 234	0	0
8	C	116	Total O 116 116	0	0
8	D	111	Total O 111 111	0	0
8	G	28	Total O 28 28	0	0

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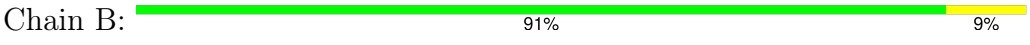
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	H	25	Total O 25 25	0	0
8	E	32	Total O 32 32	0	0
8	F	27	Total O 27 27	0	0

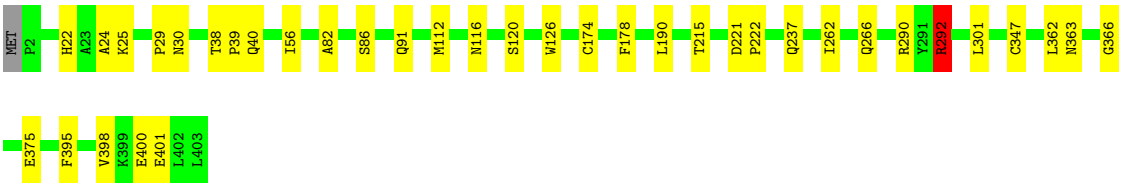
3 Residue-property plots (i)

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: Pyruvate:Ferredoxin Oxidoreductase, subunit alpha

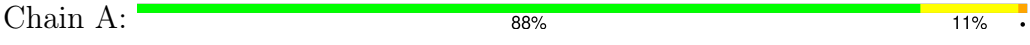
Chain B:

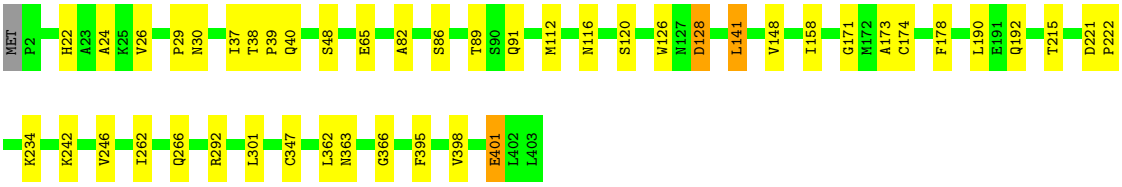




• Molecule 1: Pyruvate:Ferredoxin Oxidoreductase, subunit alpha

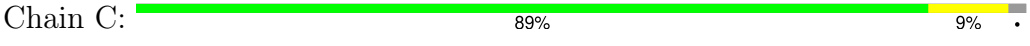
Chain A:





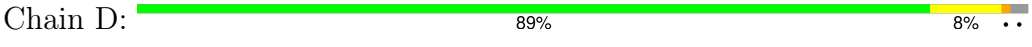
• Molecule 2: Pyruvate:Ferredoxin Oxidoreductase, subunit beta

Chain C:



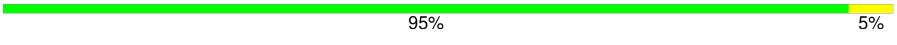
• Molecule 2: Pyruvate:Ferredoxin Oxidoreductase, subunit beta

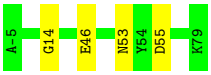
Chain D:



• Molecule 3: Pyruvate:Ferredoxin Oxidoreductase, subunit delta

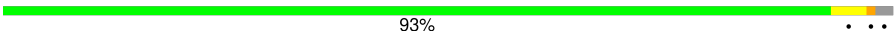
Chain G:

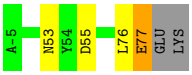




• Molecule 3: Pyruvate:Ferredoxin Oxidoreductase, subunit delta

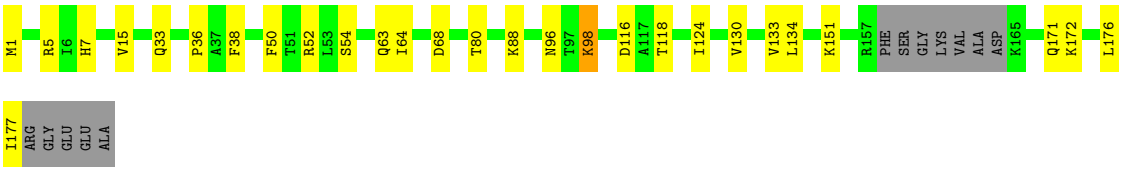
Chain H:





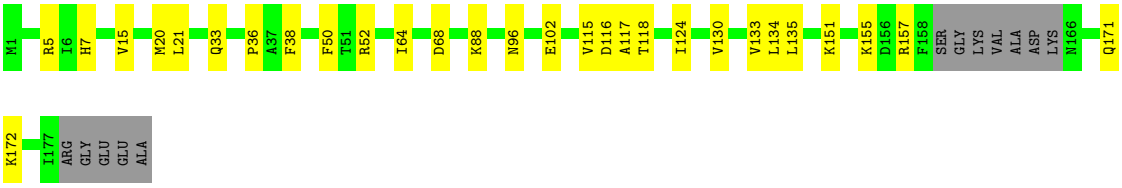
• Molecule 4: Pyruvate:Ferredoxin Oxidoreductase, subunit gamma

Chain E:



• Molecule 4: Pyruvate:Ferredoxin Oxidoreductase, subunit gamma

Chain F:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 65	Depositor
Cell constants a, b, c, α, β, γ	79.12Å 79.12Å 496.52Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	25.00 – 1.92 25.00 – 1.92	Depositor EDS
% Data completeness (in resolution range)	99.7 (25.00-1.92) 99.7 (25.00-1.92)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.32 (at 1.92Å)	Xtriage
Refinement program	REFMAC 5.8.0425	Depositor
R, R_{free}	0.173 , 0.200 0.174 , 0.201	Depositor DCC
R_{free} test set	6492 reflections (4.89%)	wwPDB-VP
Wilson B-factor (Å^2)	17.4	Xtriage
Anisotropy	0.238	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 28.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.52$, $< L^2 > = 0.35$	Xtriage
Estimated twinning fraction	0.477 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	15364	wwPDB-VP
Average B, all atoms (Å^2)	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.33% 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: TPP, MG, SF4

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	0.30	0/3160	0.64	1/4287 (0.0%)
1	B	0.29	0/3160	0.64	1/4287 (0.0%)
2	C	0.31	0/2250	0.62	0/3047
2	D	0.31	0/2250	0.61	0/3047
3	G	0.31	0/666	0.57	0/901
3	H	0.31	0/648	0.57	0/878
4	E	0.29	0/1299	0.59	0/1753
4	F	0.30	0/1306	0.60	0/1762
All	All	0.30	0/14739	0.62	2/19962 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	292	ARG	CD-NE-CZ	6.18	132.26	123.60
1	A	128	ASP	CB-CA-C	5.79	121.98	110.40

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	3102	0	3104	26	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	3102	0	3105	21	0
2	C	2196	0	2160	22	0
2	D	2196	0	2160	16	0
3	G	651	0	617	2	0
3	H	633	0	598	3	0
4	E	1285	0	1331	20	0
4	F	1291	0	1338	25	0
5	C	8	0	0	0	0
5	D	8	0	0	0	0
5	G	16	0	0	0	0
5	H	16	0	0	0	0
6	C	26	0	16	3	0
6	D	26	0	16	2	0
7	C	1	0	0	0	0
7	D	1	0	0	0	0
8	A	234	0	0	4	0
8	B	233	0	0	2	0
8	C	116	0	0	4	0
8	D	111	0	0	1	0
8	E	32	0	0	1	0
8	F	27	0	0	0	0
8	G	28	0	0	1	0
8	H	25	0	0	0	0
All	All	15364	0	14445	133	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 5.

The worst 5 of 133 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:C:168:ILE:HG22	2:C:169:MET:HE2	1.28	1.13
4:E:124:ILE:HD11	4:E:172:LYS:HD2	1.42	1.01
1:B:91:GLN:HE22	1:B:120:SER:H	1.16	0.89
1:A:91:GLN:HE22	1:A:120:SER:H	1.16	0.88
4:F:33:GLN:HE22	4:F:52:ARG:HH11	1.21	0.85

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	400/403 (99%)	388 (97%)	12 (3%)	0	100	100
1	B	400/403 (99%)	388 (97%)	12 (3%)	0	100	100
2	C	289/296 (98%)	283 (98%)	5 (2%)	1 (0%)	37	26
2	D	289/296 (98%)	283 (98%)	5 (2%)	1 (0%)	37	26
3	G	83/85 (98%)	81 (98%)	2 (2%)	0	100	100
3	H	81/85 (95%)	80 (99%)	1 (1%)	0	100	100
4	E	166/182 (91%)	159 (96%)	7 (4%)	0	100	100
4	F	166/182 (91%)	164 (99%)	2 (1%)	0	100	100
All	All	1874/1932 (97%)	1826 (97%)	46 (2%)	2 (0%)	48	40

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	C	134	ILE
2	D	134	ILE

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	335/336 (100%)	328 (98%)	7 (2%)	48	34
1	B	335/336 (100%)	329 (98%)	6 (2%)	54	42
2	C	231/236 (98%)	229 (99%)	2 (1%)	75	70

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
2	D	231/236 (98%)	227 (98%)	4 (2%)	56 45
3	G	71/71 (100%)	70 (99%)	1 (1%)	62 51
3	H	69/71 (97%)	68 (99%)	1 (1%)	62 51
4	E	136/145 (94%)	135 (99%)	1 (1%)	81 77
4	F	137/145 (94%)	135 (98%)	2 (2%)	60 49
All	All	1545/1576 (98%)	1521 (98%)	24 (2%)	58 47

5 of 24 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	C	250	VAL
2	D	251	LYS
2	D	54	PRO
2	D	276	GLU
1	A	40	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 37 such sidechains are listed below:

Mol	Chain	Res	Type
4	E	7	HIS
4	F	63	GLN
4	E	33	GLN
4	E	171	GLN
1	A	116	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)

Of 10 ligands modelled in this entry, 2 are monoatomic - leaving 8 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	$\#\|Z\| > 2$
5	SF4	C	301	2	0,12,12	-	-	-		
6	TPP	C	302	7	23,27,27	1.09	2 (8%)	30,40,40	0.92	2 (6%)
5	SF4	G	901	3	0,12,12	-	-	-		
5	SF4	D	301	2	0,12,12	-	-	-		
5	SF4	G	900	3	0,12,12	-	-	-		
5	SF4	H	900	3	0,12,12	-	-	-		
6	TPP	D	302	7	23,27,27	1.07	2 (8%)	30,40,40	0.92	2 (6%)
5	SF4	H	901	3	0,12,12	-	-	-		

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
5	SF4	C	301	2	-	-	0/6/5/5
5	SF4	H	900	3	-	-	0/6/5/5
6	TPP	C	302	7	-	3/16/17/17	0/2/2/2
5	SF4	G	901	3	-	-	0/6/5/5
5	SF4	D	301	2	-	-	0/6/5/5
5	SF4	G	900	3	-	-	0/6/5/5
6	TPP	D	302	7	-	2/16/17/17	0/2/2/2
5	SF4	H	901	3	-	-	0/6/5/5

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	D	302	TPP	C6-C5	-3.92	1.48	1.51
6	C	302	TPP	C6-C5	-3.86	1.48	1.51
6	C	302	TPP	C4-N3	2.47	1.41	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	D	302	TPP	C4-N3	2.24	1.41	1.39

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	C	302	TPP	C5-C4-N3	2.86	113.30	107.57
6	D	302	TPP	C5-C4-N3	2.67	112.91	107.57
6	D	302	TPP	O2A-PA-O1A	2.07	122.06	112.44
6	C	302	TPP	O2A-PA-O1A	2.02	121.85	112.44

There are no chirality outliers.

All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	C	302	TPP	C4-C5-C6-C7
6	D	302	TPP	C4-C5-C6-C7
6	C	302	TPP	C5-C6-C7-O7
6	C	302	TPP	PA-O3A-PB-O2B
6	D	302	TPP	PA-O3A-PB-O2B

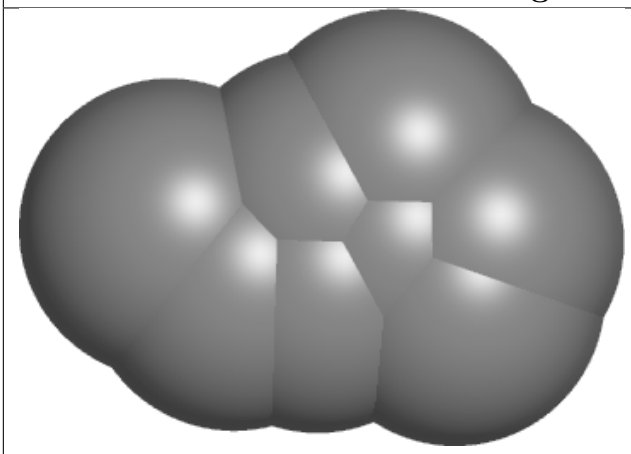
There are no ring outliers.

2 monomers are involved in 5 short contacts:

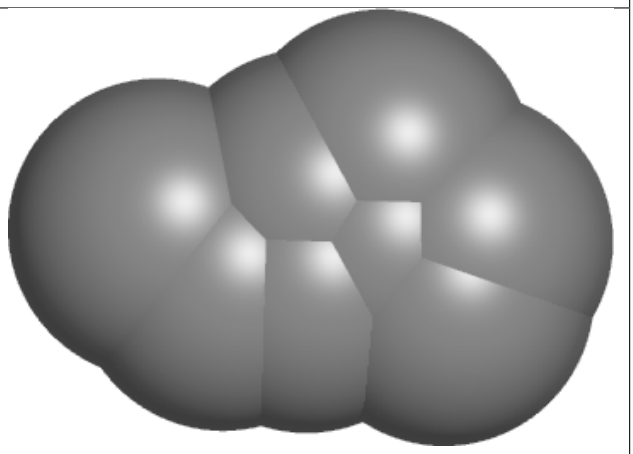
Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	C	302	TPP	3	0
6	D	302	TPP	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

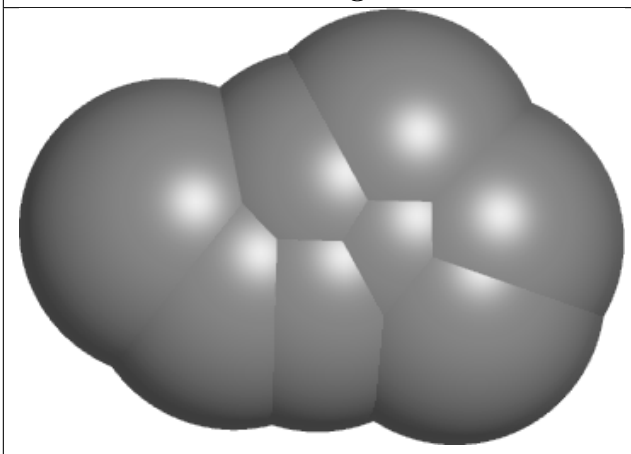
Ligand SF4 C 301



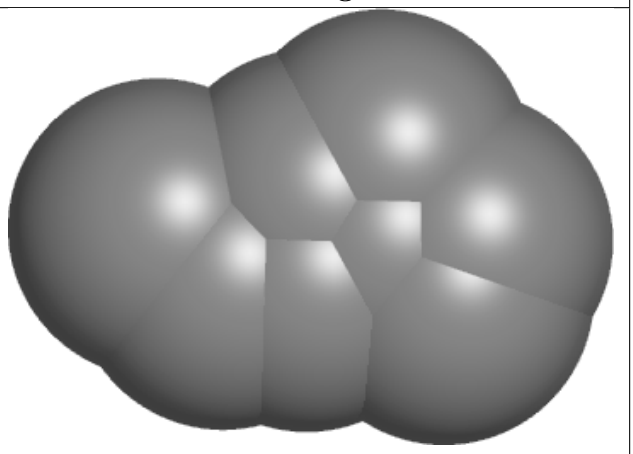
Bond lengths



Bond angles

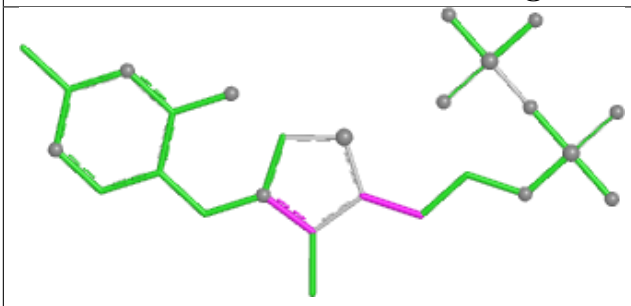


Torsions

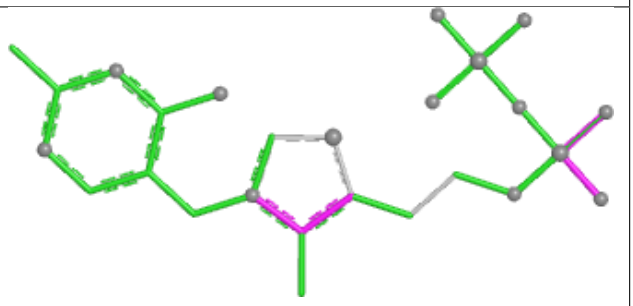


Rings

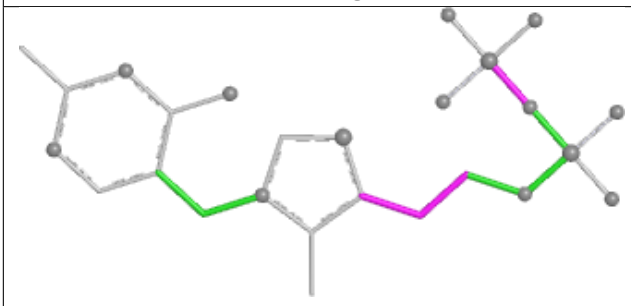
Ligand TPP C 302



Bond lengths



Bond angles



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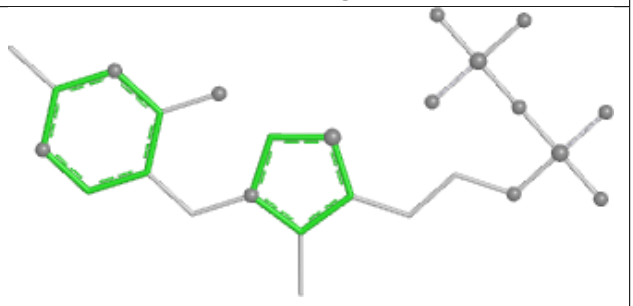
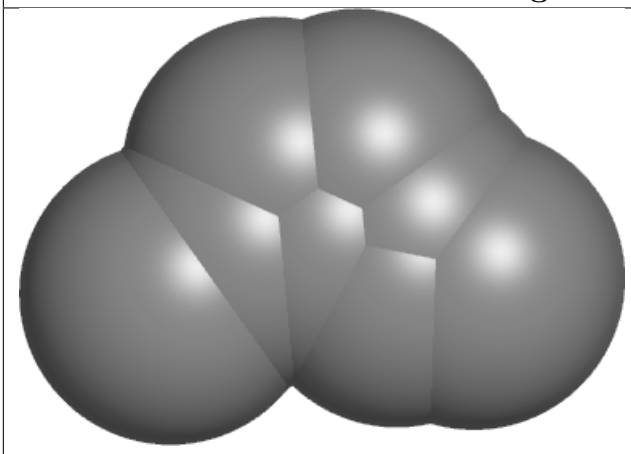
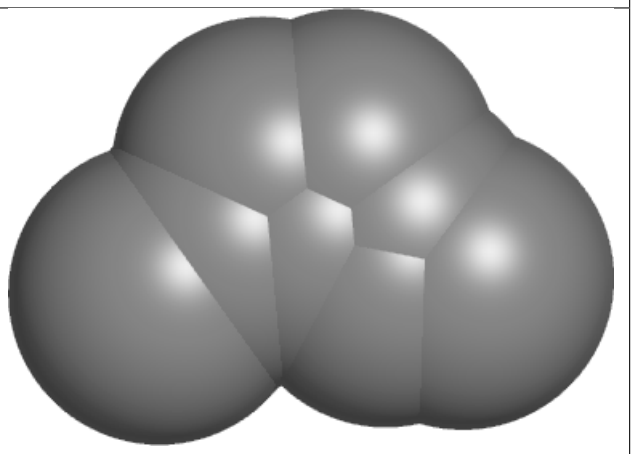


Rings

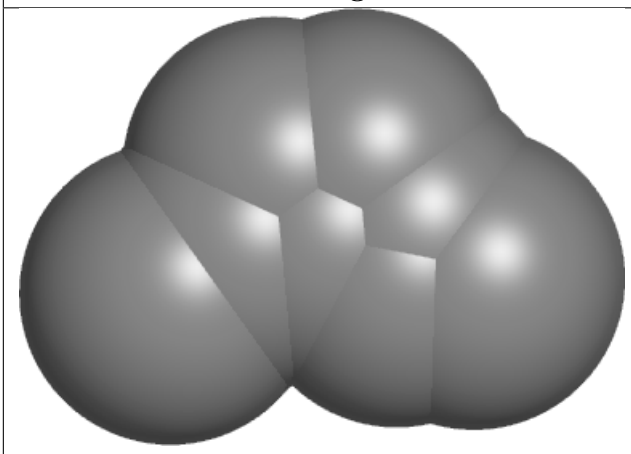
Ligand SF4 G 901



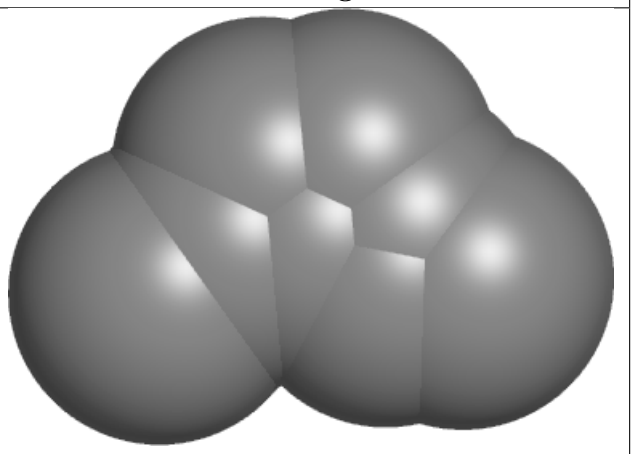
Bond lengths



Bond angles

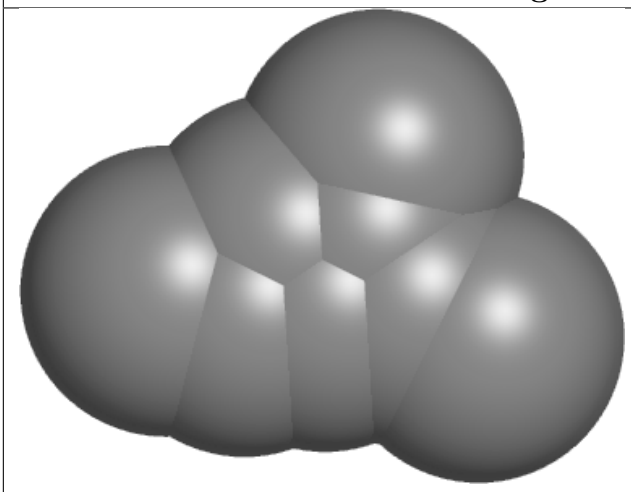


Torsions

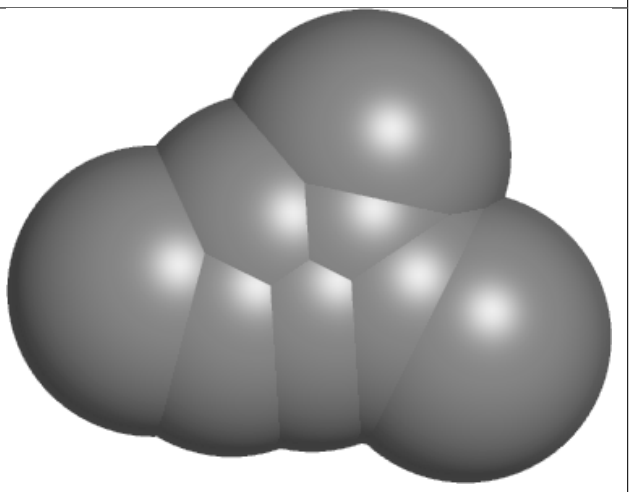


Rings

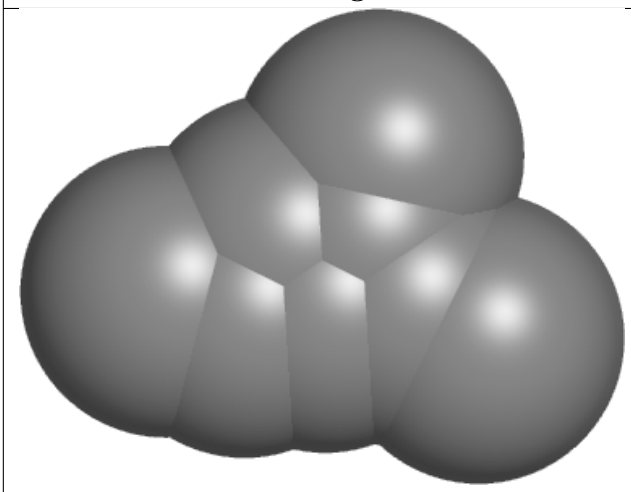
Ligand SF4 D 301



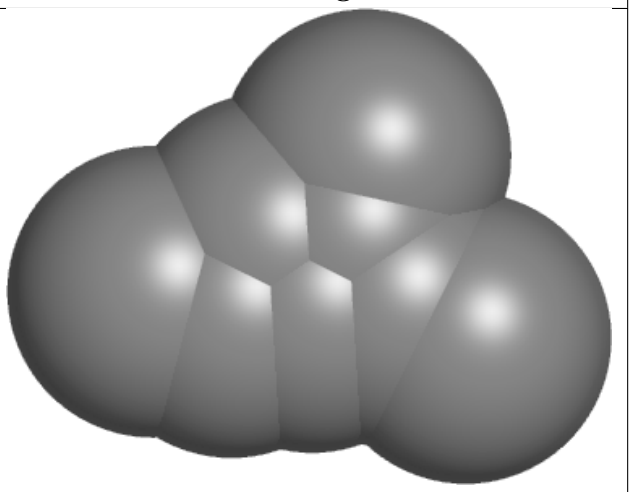
Bond lengths



Bond angles

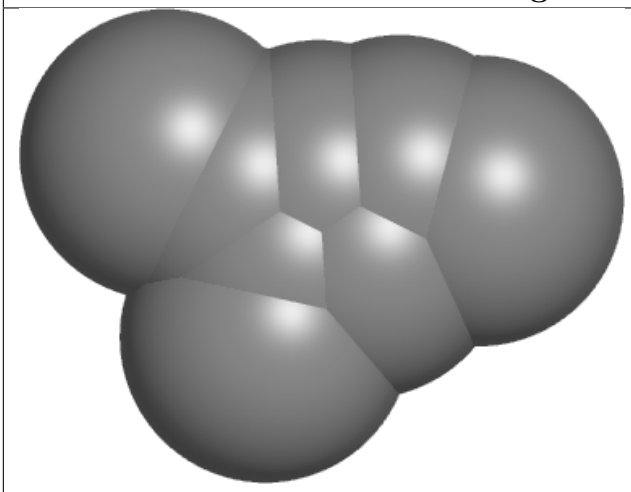


Torsions

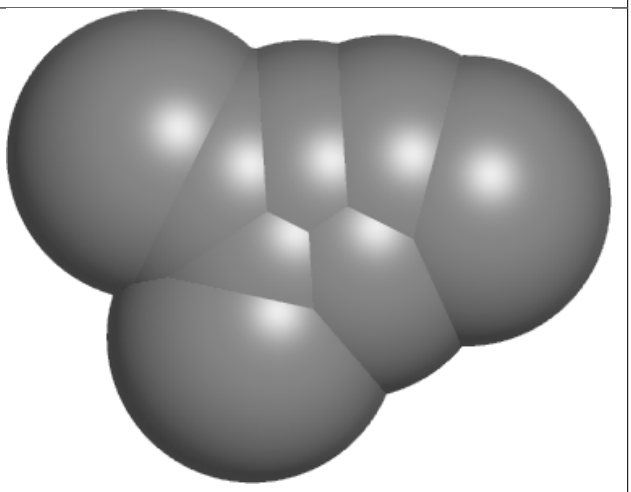


Rings

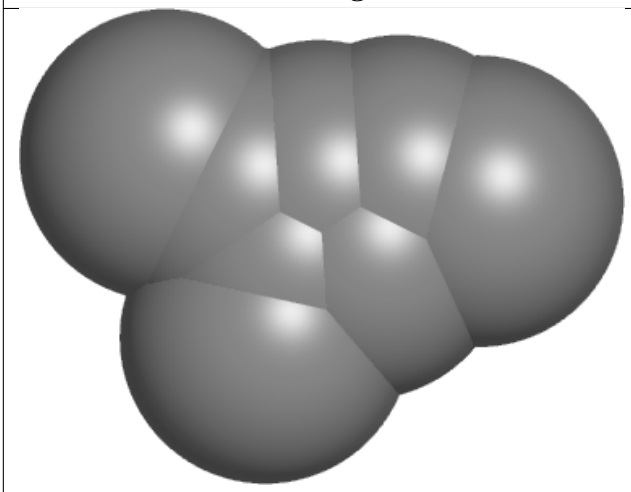
Ligand SF4 G 900



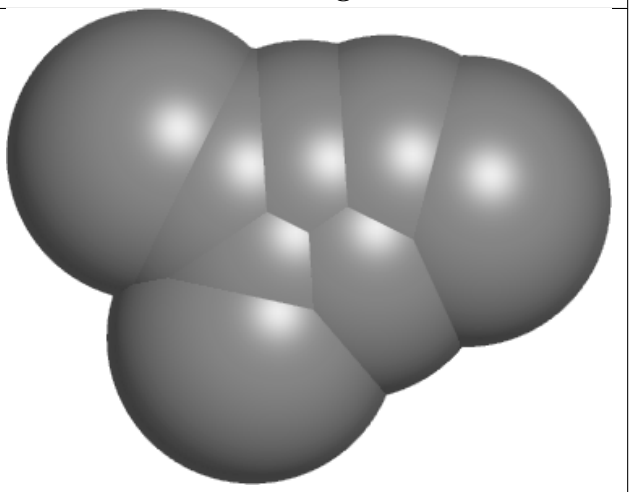
Bond lengths



Bond angles

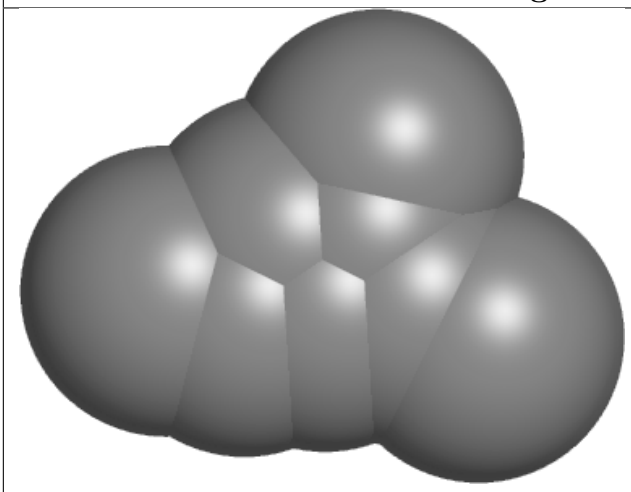


Torsions



Rings

Ligand SF4 H 900



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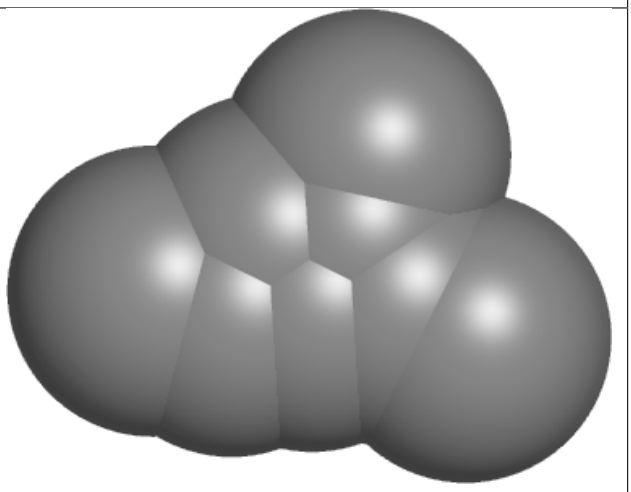
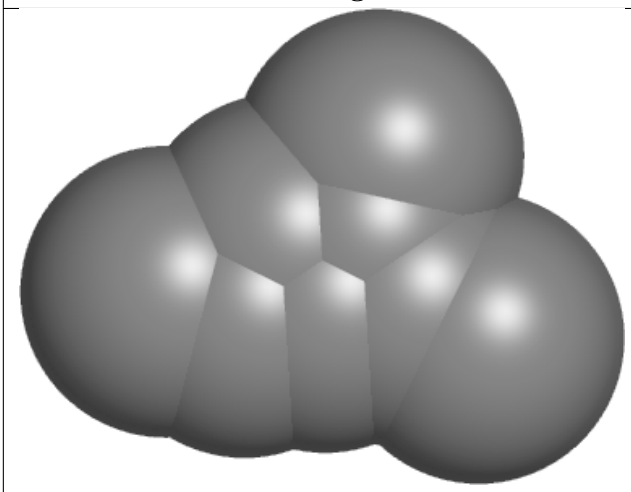
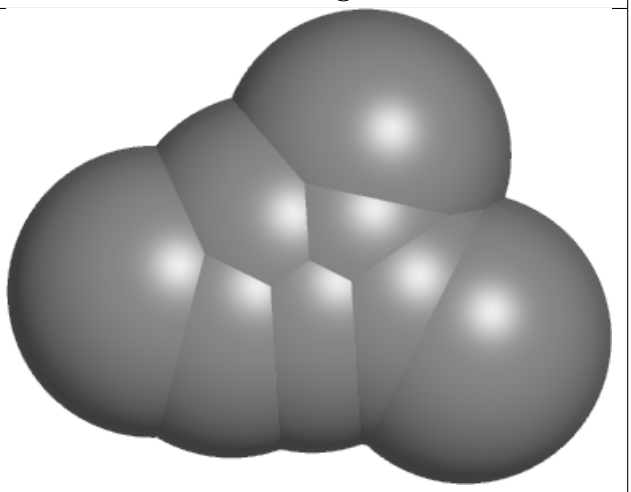


Bond angles

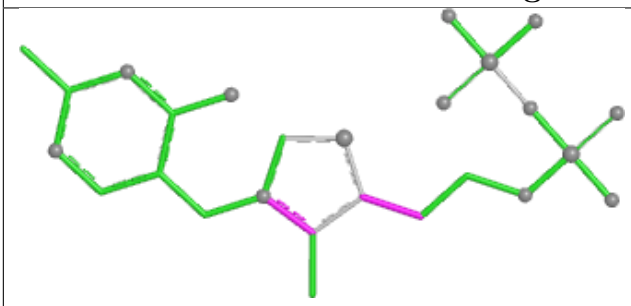


Torsions

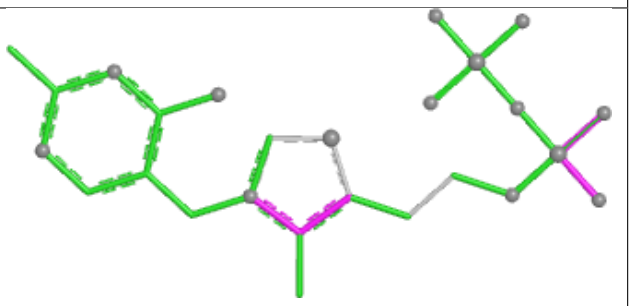


Rings

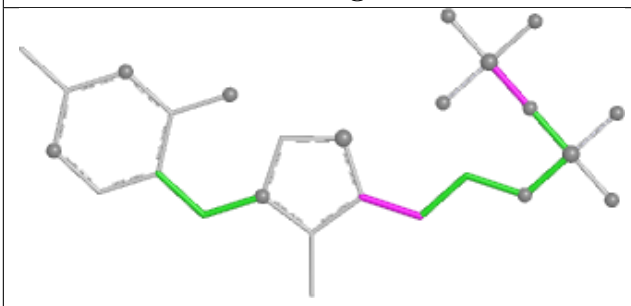
Ligand TPP D 302



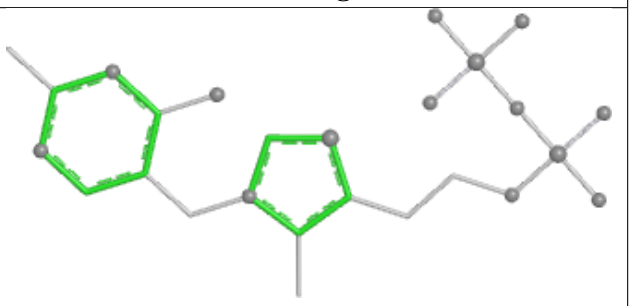
Bond lengths



Bond angles

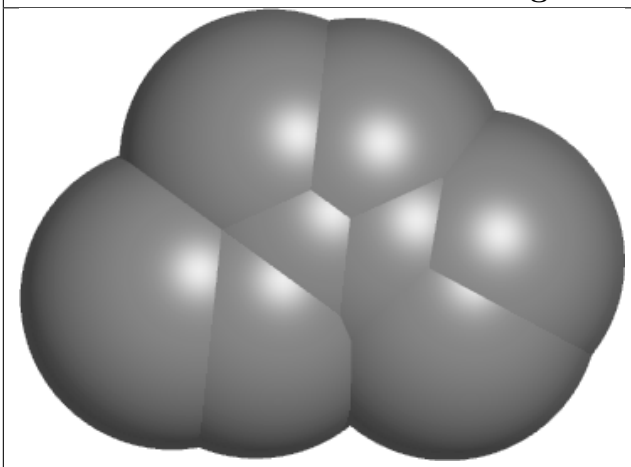


Torsions

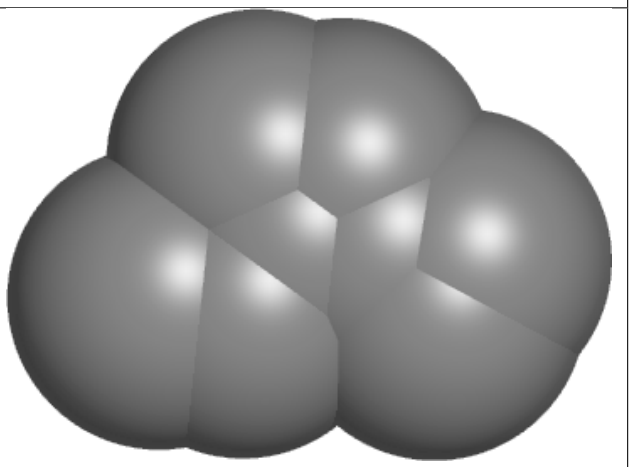


Rings

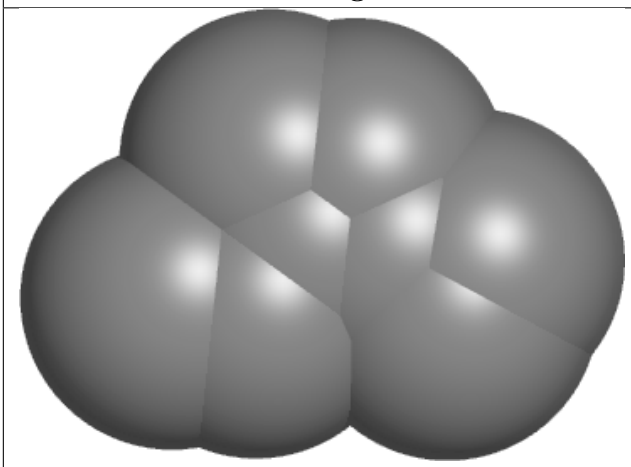
Ligand SF4 H 901



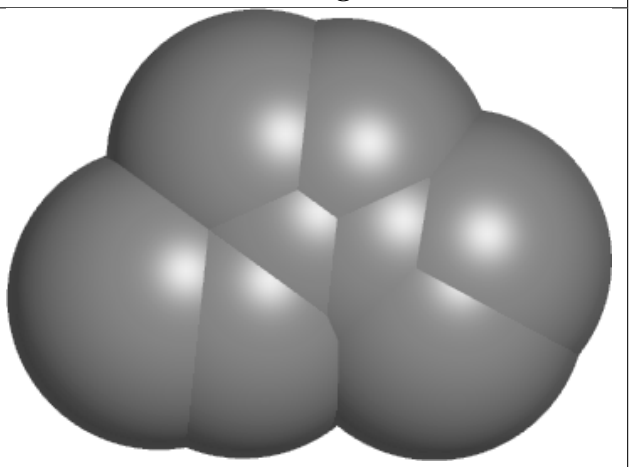
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

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	402/403 (99%)	-1.59	0	100	100	10, 15, 27, 43	0
1	B	402/403 (99%)	-1.59	0	100	100	10, 15, 28, 47	0
2	C	291/296 (98%)	-1.50	0	100	100	10, 17, 34, 49	0
2	D	291/296 (98%)	-1.51	0	100	100	11, 17, 34, 51	0
3	G	85/85 (100%)	-1.28	0	100	100	17, 23, 43, 76	0
3	H	83/85 (97%)	-1.33	0	100	100	16, 22, 41, 47	0
4	E	170/182 (93%)	-1.15	0	100	100	16, 34, 66, 86	0
4	F	170/182 (93%)	-1.16	0	100	100	16, 34, 64, 73	0
All	All	1894/1932 (98%)	-1.46	0	100	100	10, 18, 45, 86	0

There are no RSRZ outliers to report.

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

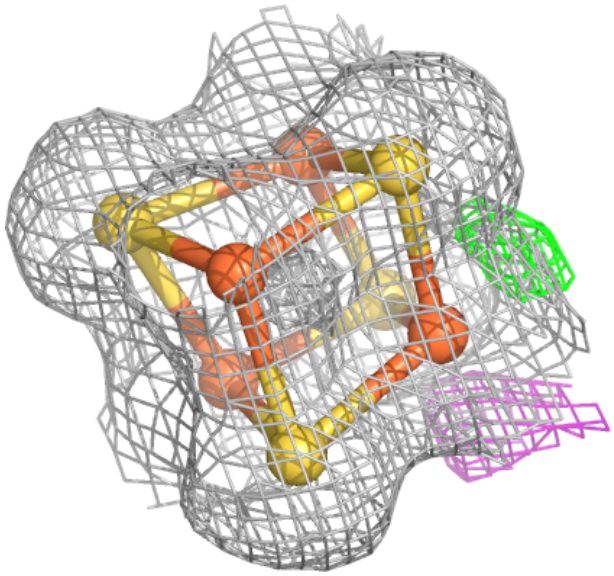
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

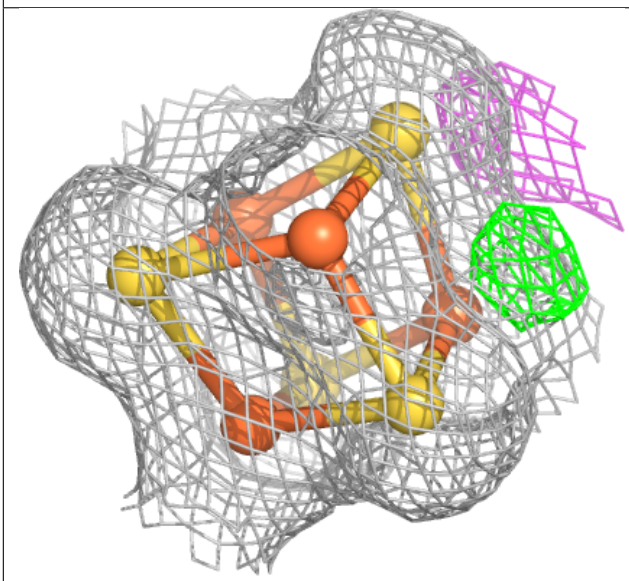
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	SF4	C	301	8/8	1.00	0.01	13,14,15,15	0
5	SF4	D	301	8/8	1.00	0.01	13,14,15,15	0
5	SF4	G	900	8/8	1.00	0.01	16,16,17,17	0
5	SF4	G	901	8/8	1.00	0.01	21,22,23,23	0
5	SF4	H	900	8/8	1.00	0.01	16,17,17,18	0
5	SF4	H	901	8/8	1.00	0.01	20,21,23,23	0
6	TPP	C	302	26/26	1.00	0.02	12,13,16,18	0
6	TPP	D	302	26/26	1.00	0.02	12,14,17,18	0
7	MG	C	303	1/1	1.00	0.02	11,11,11,11	0
7	MG	D	303	1/1	1.00	0.02	11,11,11,11	0

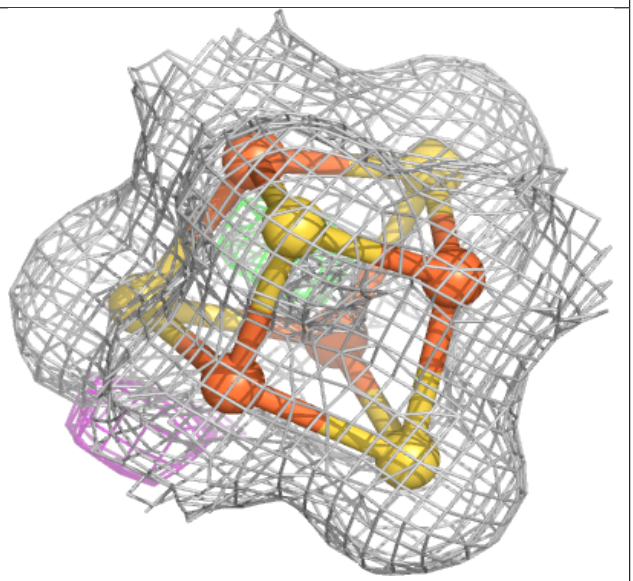
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around SF4 C 301:

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

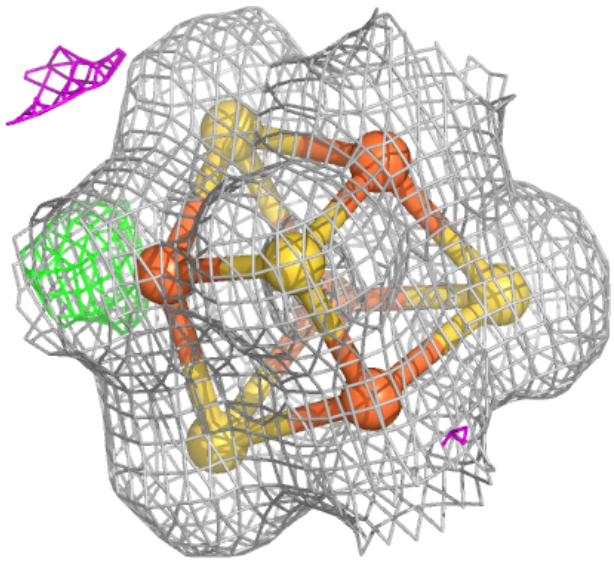


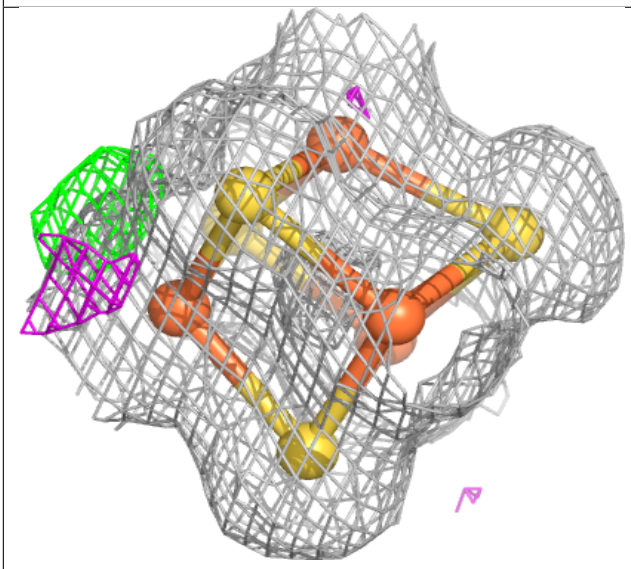


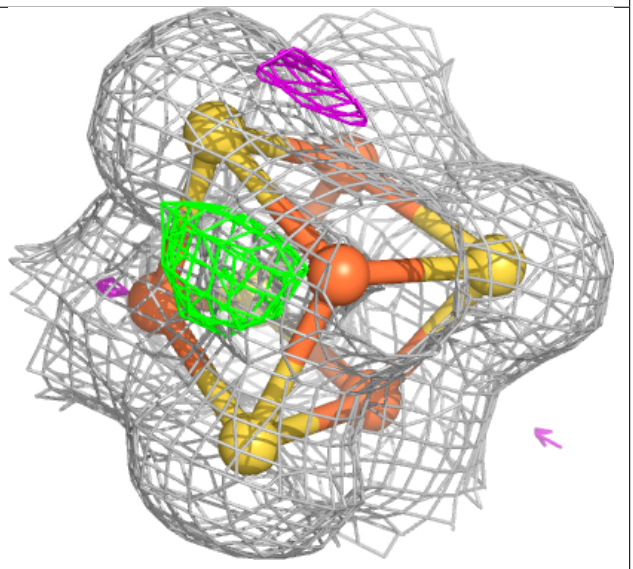


Electron density around SF4 D 301:

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

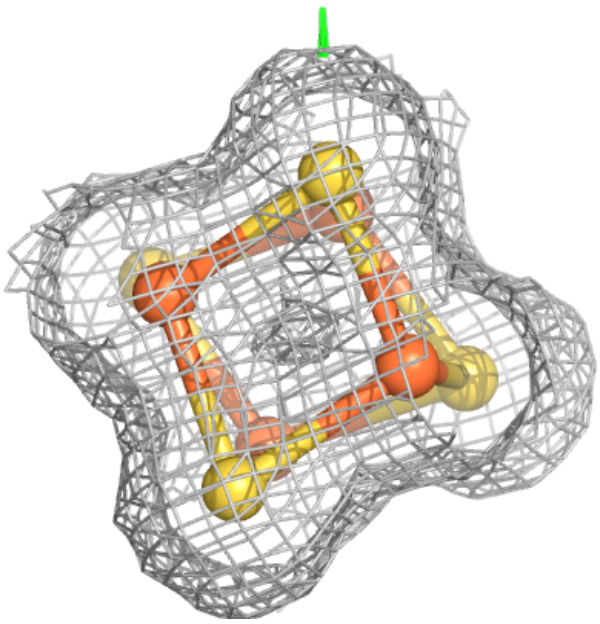


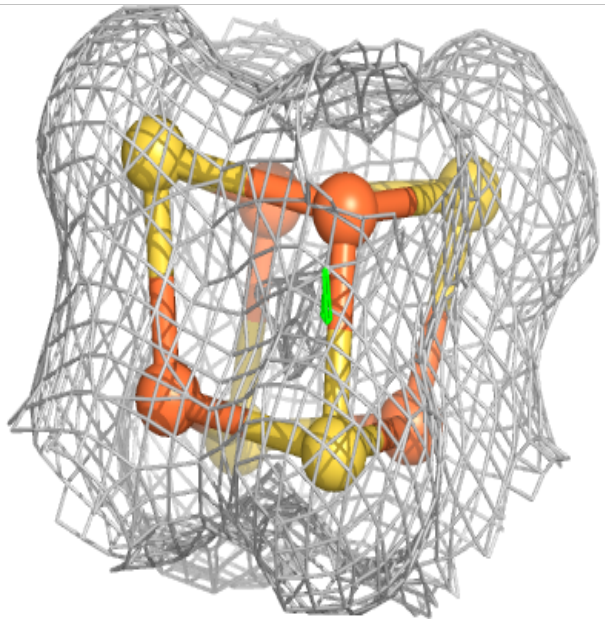


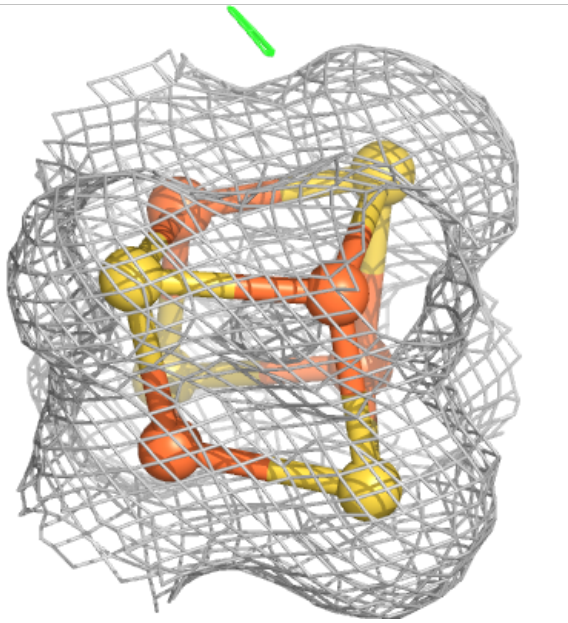


Electron density around SF4 G 900:

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

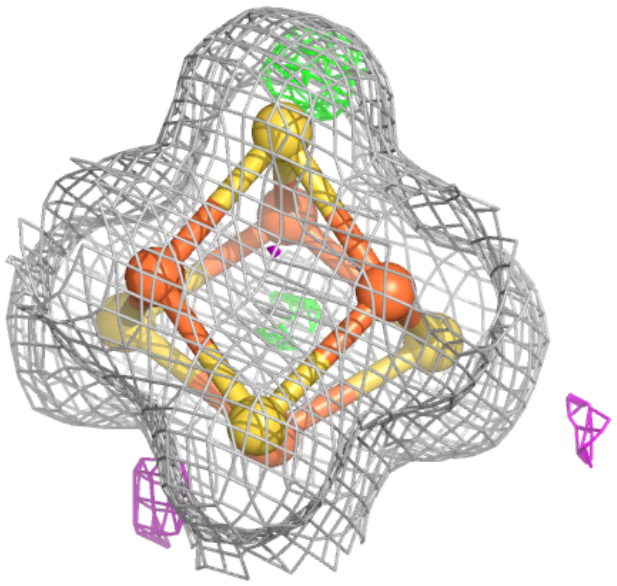


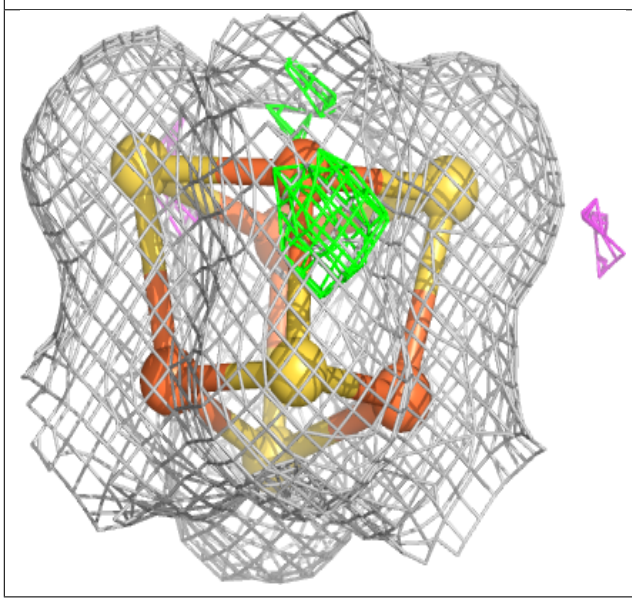


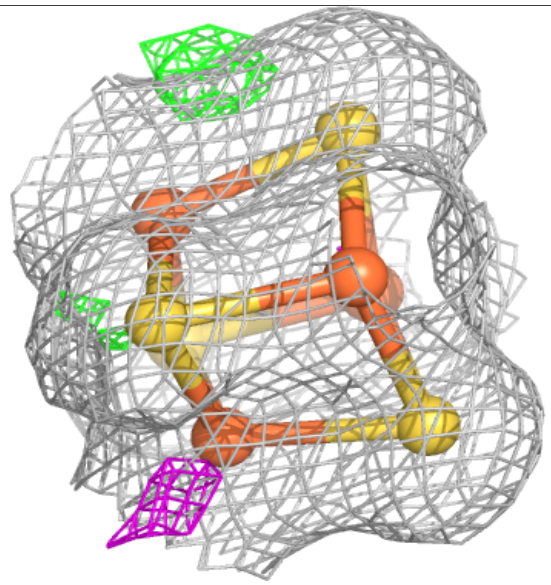


Electron density around SF4 G 901:

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

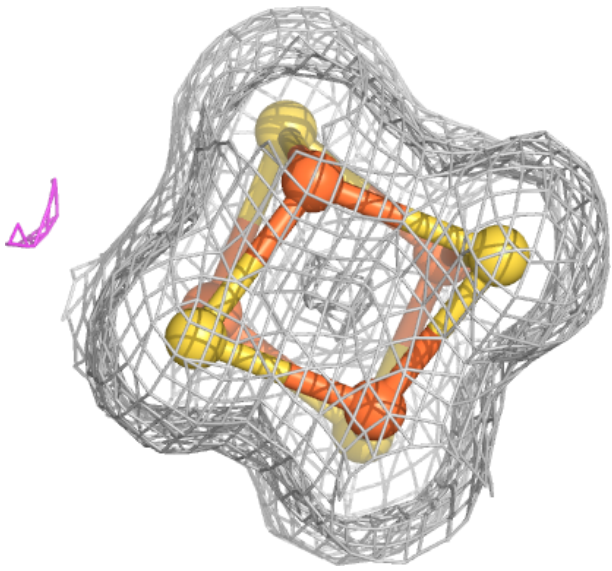


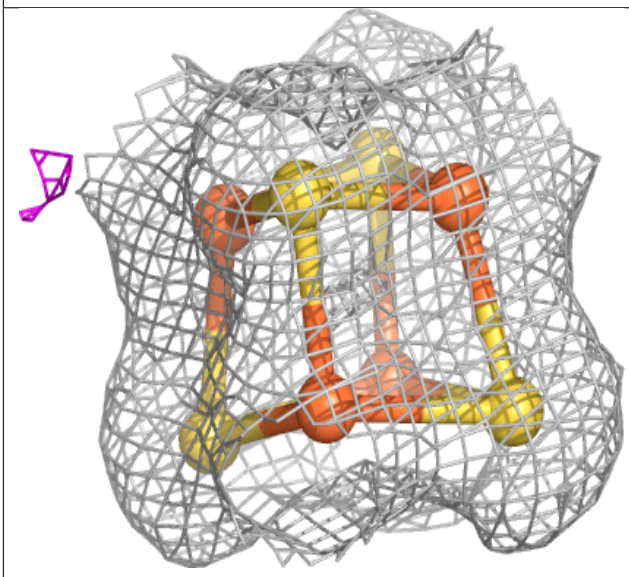


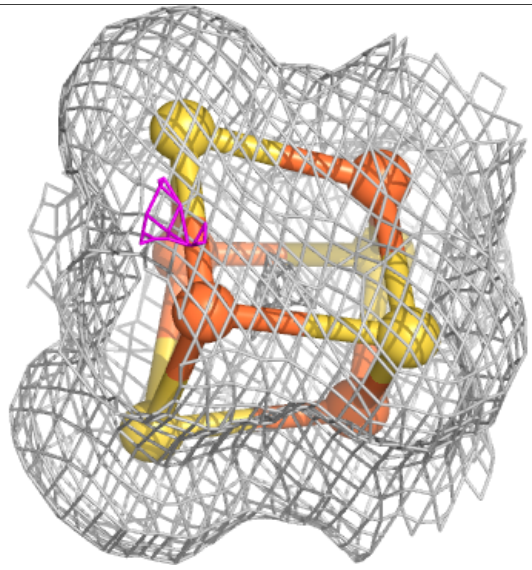


Electron density around SF4 H 900:

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

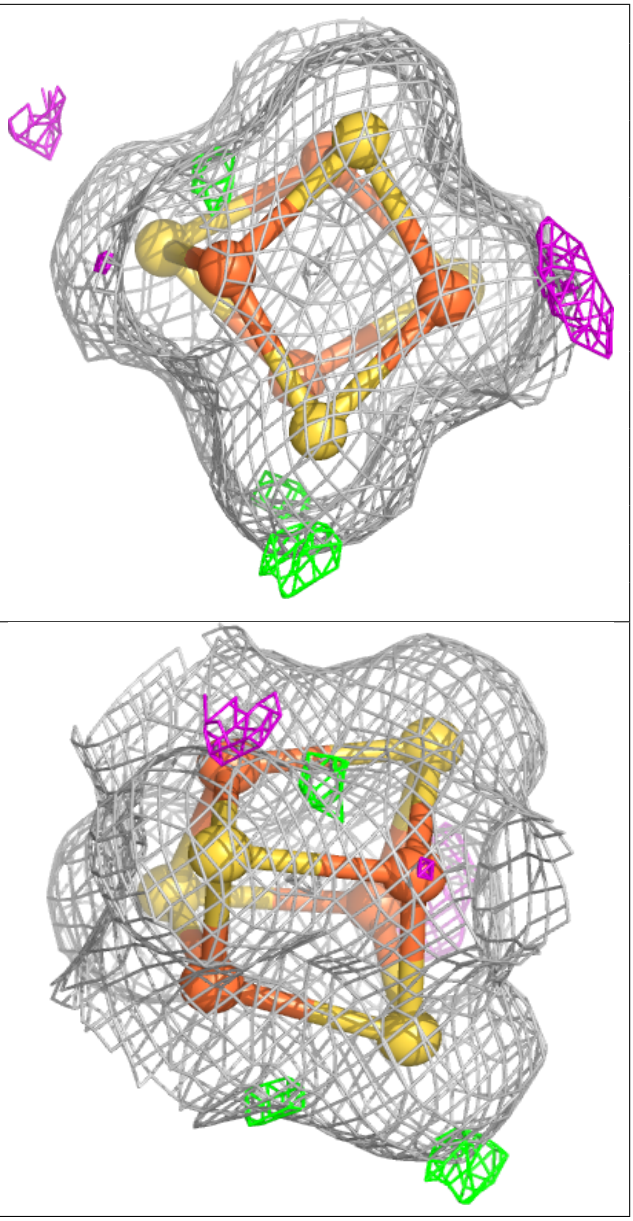


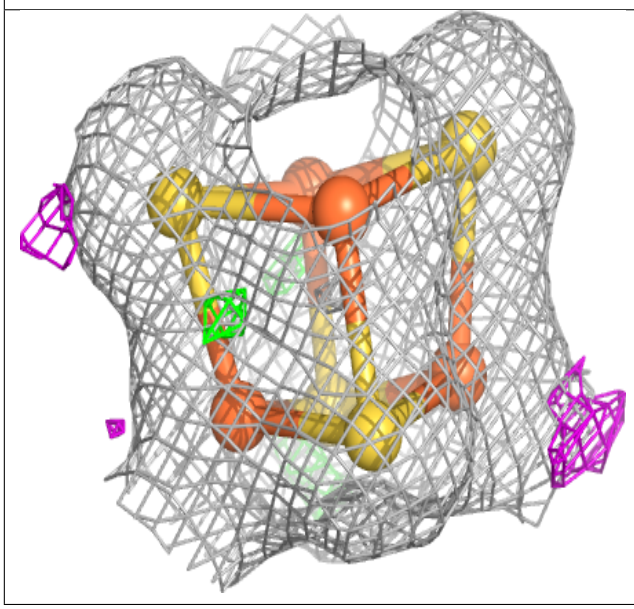




Electron density around SF4 H 901:

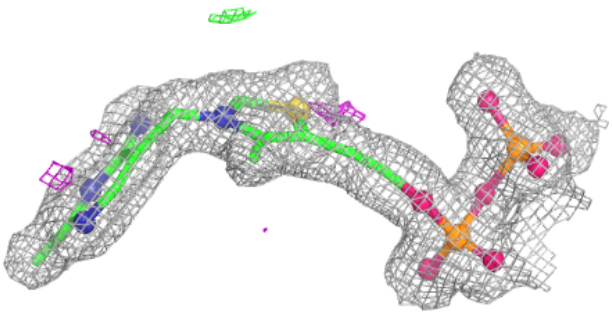
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

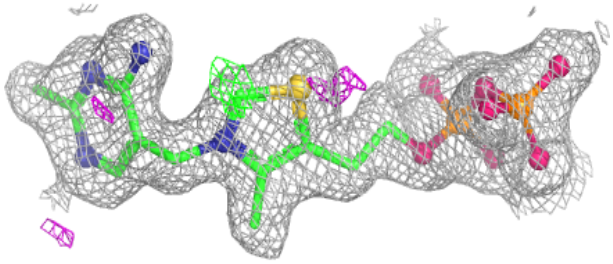


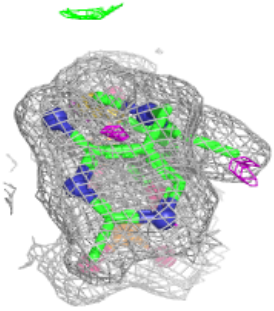


Electron density around TPP C 302:

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

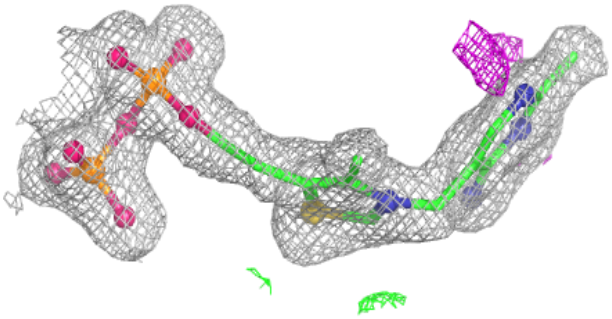


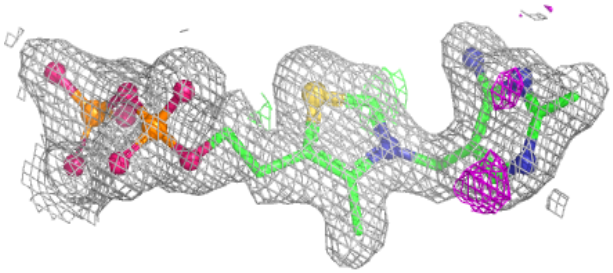


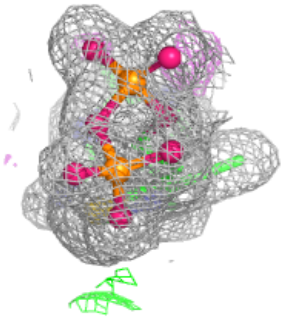


Electron density around TPP D 302:

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

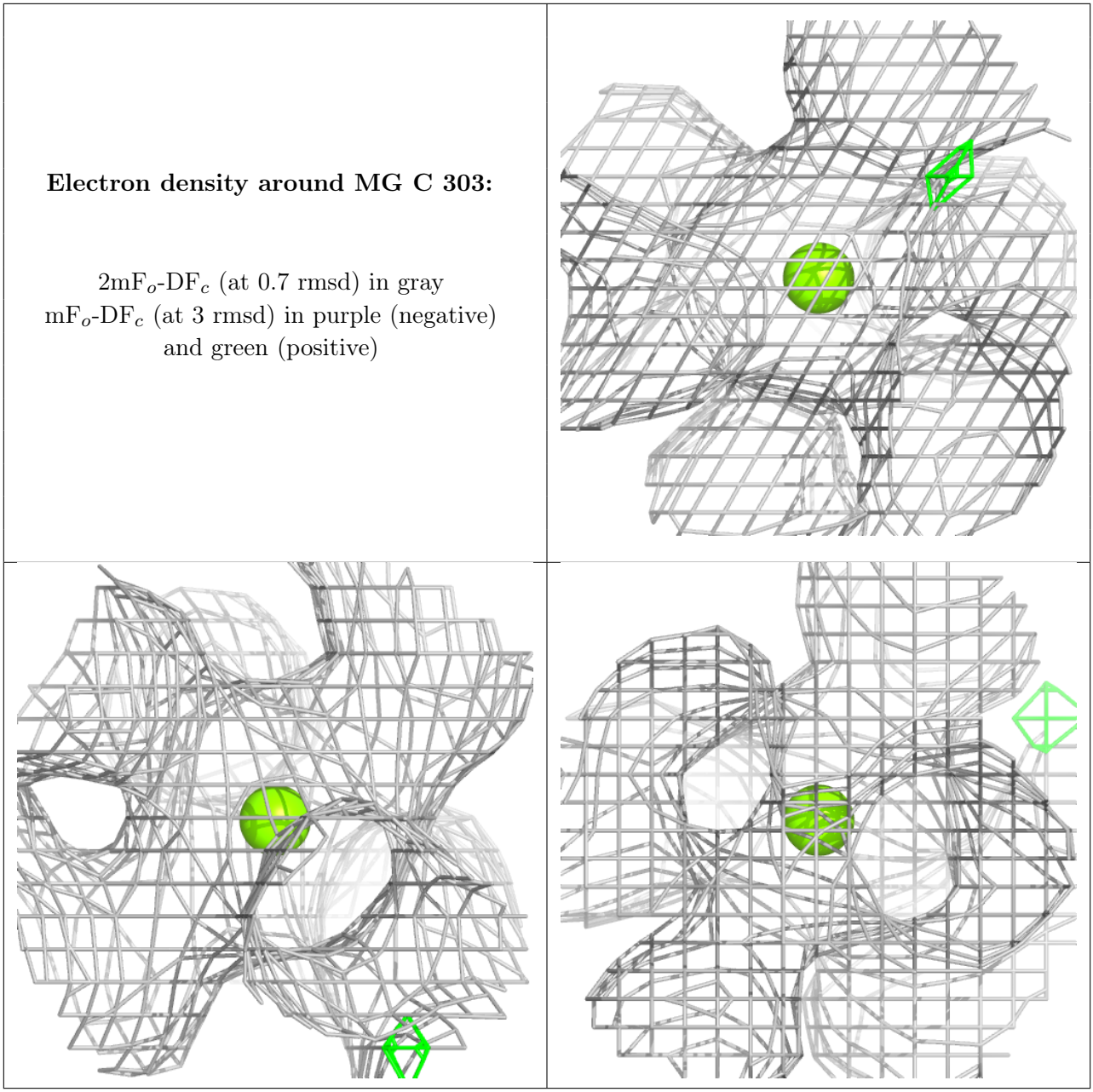






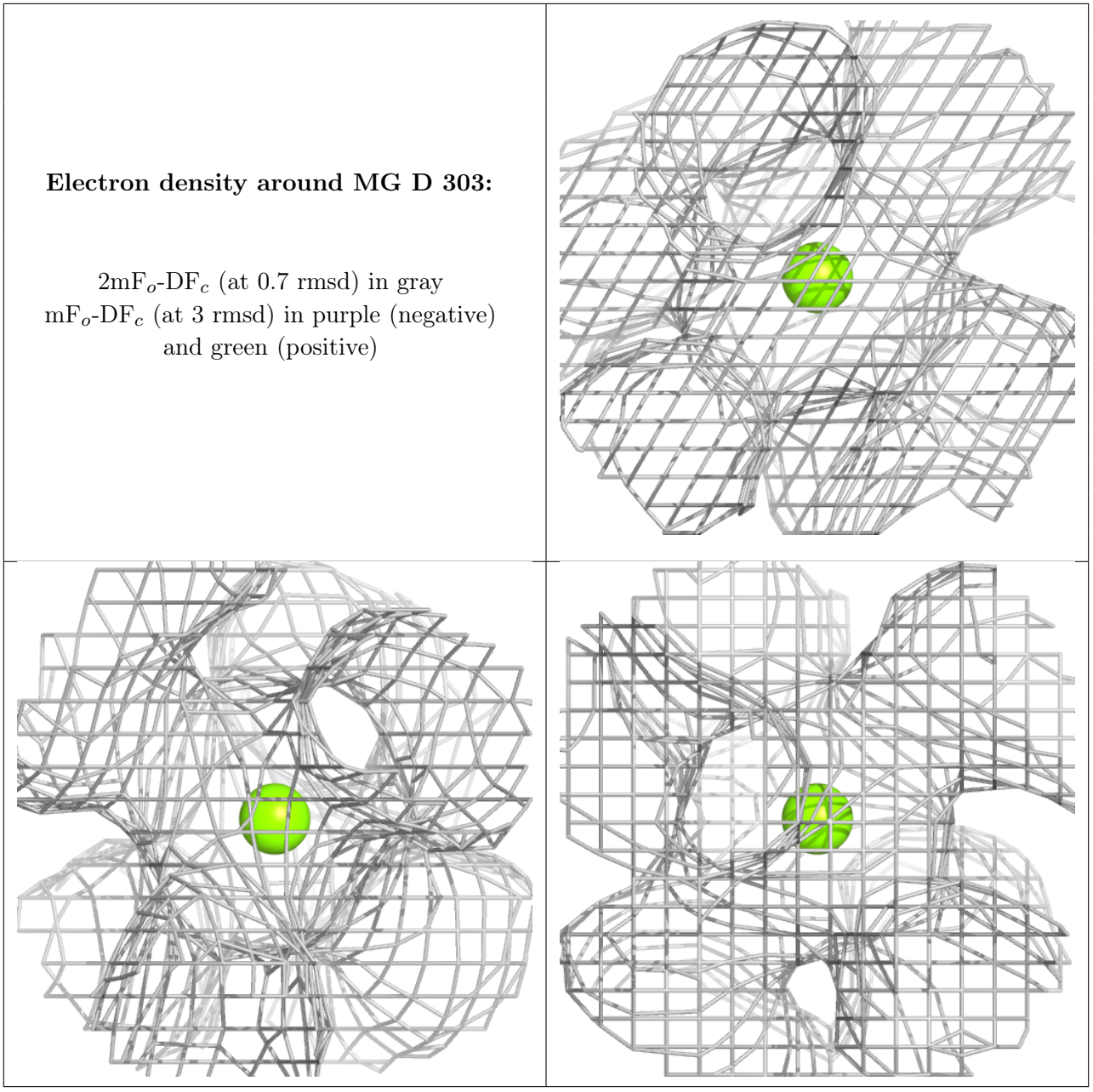
Electron density around MG C 303:

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



Electron density around MG D 303:

$2mF_o$-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.