wwPDB X-ray Structure Validation Summary Report (i)

Oct 15, 2025 – 02:23 pm BST

PDB ID	:	9R6Z / pdb_00009r6z
Title	:	Cubic state of the F420-reducing hydrogenase from Methanothermococcus thermolithotrophicus
Authors	:	Jespersen, M.; Lemaire, O.N.; Wagner, T.
Deposited on	:	2025-05-13
Resolution	:	2.85 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:

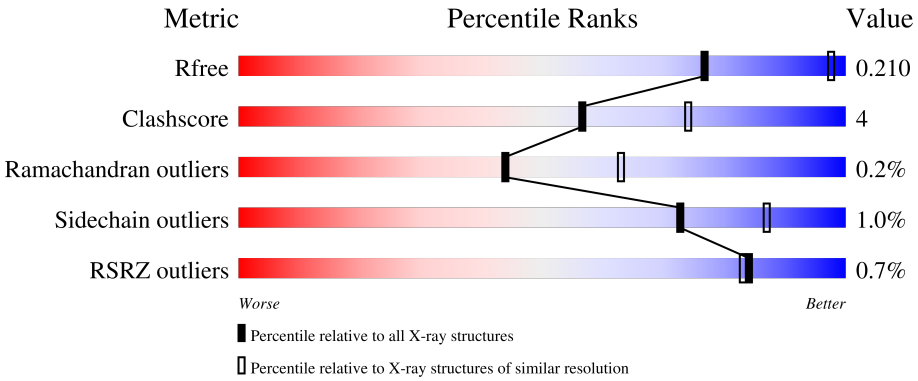
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.46

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 2.85 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	1268 (2.88-2.84)
Clashscore	180529	1351 (2.88-2.84)
Ramachandran outliers	177936	1318 (2.88-2.84)
Sidechain outliers	177891	1319 (2.88-2.84)
RSRZ outliers	164620	1269 (2.88-2.84)

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	410	84% 12% ·
1	D	410	84% 11% ·
1	G	410	85% 10% ·
1	J	410	88% 8% ·
2	B	282	87% 12% ·

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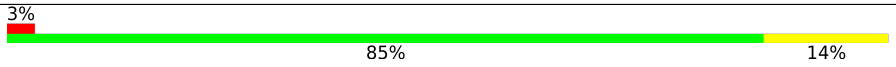
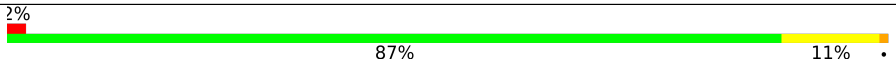
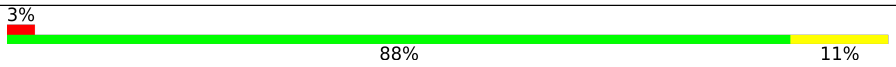
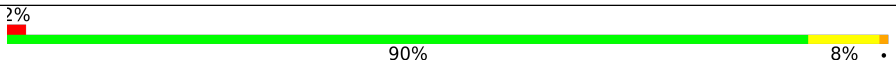
Mol	Chain	Length	Quality of chain
2	E	282	
2	H	282	
2	K	282	
3	C	241	
3	F	241	
3	I	241	
3	L	241	

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
5	NFU	D	511	-	-	X	-

2 Entry composition (i)

There are 9 unique types of molecules in this entry. The entry contains 28822 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 F420-reducing [NiFe]-hydrogenase subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	392	Total	C	N	O	S	0	0	0
			3070	1954	525	576	15			
1	D	392	Total	C	N	O	S	0	0	0
			3070	1954	525	576	15			
1	G	392	Total	C	N	O	S	0	0	0
			3070	1954	525	576	15			
1	J	392	Total	C	N	O	S	0	0	0
			3070	1954	525	576	15			

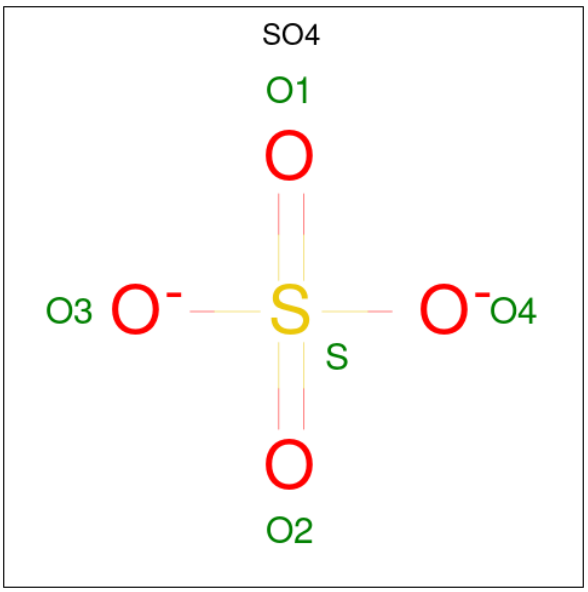
- Molecule 2 is a protein called F420-reducing [NiFe]-hydrogenase subunit beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	282	Total	C	N	O	S	0	0	0
			2177	1394	356	412	15			
2	E	282	Total	C	N	O	S	0	0	0
			2177	1394	356	412	15			
2	H	282	Total	C	N	O	S	0	0	0
			2177	1394	356	412	15			
2	K	282	Total	C	N	O	S	0	0	0
			2177	1394	356	412	15			

- Molecule 3 is a protein called F420-reducing [NiFe]-hydrogenase subunit gamma.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	240	Total	C	N	O	S	0	0	0
			1799	1130	299	349	21			
3	F	240	Total	C	N	O	S	0	0	0
			1799	1130	299	349	21			
3	I	240	Total	C	N	O	S	0	1	0
			1802	1132	299	349	22			
3	L	240	Total	C	N	O	S	0	1	0
			1802	1132	299	349	22			

- Molecule 4 is SULFATE ION (CCD ID: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total O S 5 4 1	0	0
4	A	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0
4	C	1	Total O S 5 4 1	0	0
4	D	1	Total O S 5 4 1	0	0
4	D	1	Total O S 5 4 1	0	0
4	D	1	Total O S 5 4 1	0	0
4	E	1	Total O S 5 4 1	0	0
4	E	1	Total O S 5 4 1	0	0
4	E	1	Total O S 5 4 1	0	0
4	G	1	Total O S 5 4 1	0	0
4	G	1	Total O S 5 4 1	0	0

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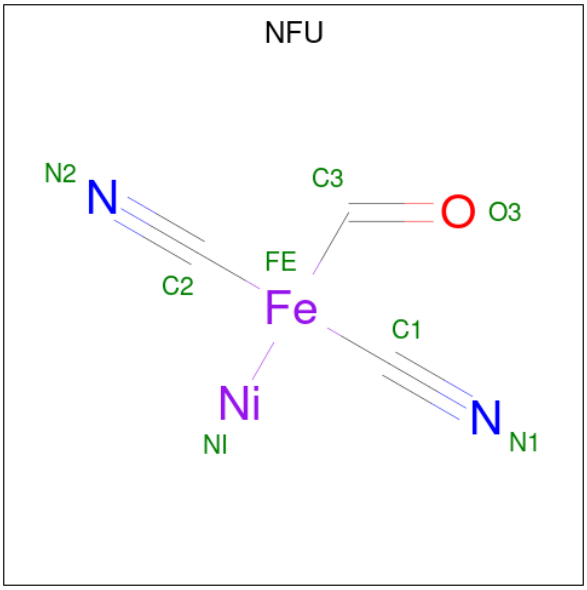
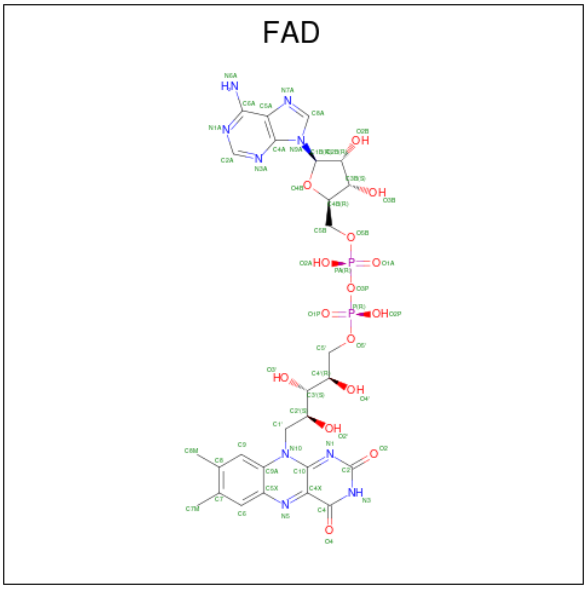
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	H	1	Total O S 5 4 1	0	0
4	J	1	Total O S 5 4 1	0	0
4	J	1	Total O S 5 4 1	0	0
4	J	1	Total O S 5 4 1	0	0
4	J	1	Total O S 5 4 1	0	0
4	J	1	Total O S 5 4 1	0	0
4	K	1	Total O S 5 4 1	0	0

- Molecule 5 is formyl[bis(hydrocyanato-1kappaC)]ironnickel(Fe-Ni) (CCD ID: NFU) (formula: C_3HFeN_2NiO) (labeled as "Ligand of Interest" by depositor).



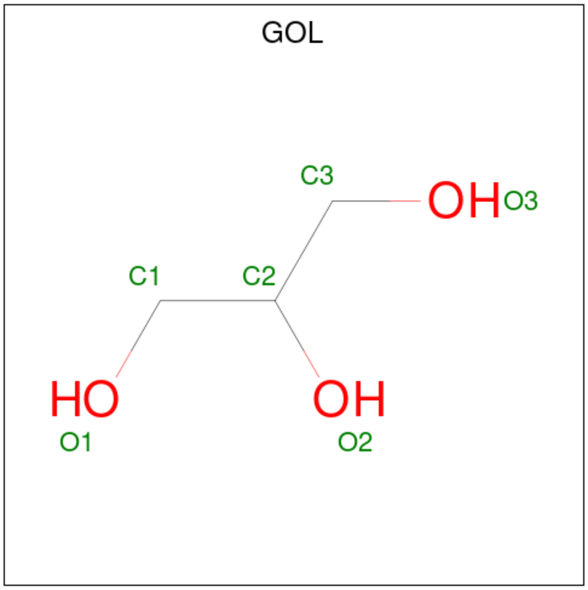
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C Fe N Ni O 8 3 1 2 1 1	0	0
5	D	1	Total C Fe N Ni O 8 3 1 2 1 1	0	0
5	G	1	Total C Fe N Ni O 8 3 1 2 1 1	0	0
5	J	1	Total C Fe N Ni O 8 3 1 2 1 1	0	0

- Molecule 6 is FLAVIN-ADENINE DINUCLEOTIDE (CCD ID: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
6	B	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
6	E	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
6	H	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
6	K	1	Total	C	N	O	P	0	0
			53	27	9	15	2		

- Molecule 7 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	B	1	Total C O 6 3 3	0	0
7	D	1	Total C O 6 3 3	0	0
7	D	1	Total C O 6 3 3	0	0
7	D	1	Total C O 6 3 3	0	0
7	D	1	Total C O 6 3 3	0	0
7	D	1	Total C O 6 3 3	0	0
7	D	1	Total C O 6 3 3	0	0
7	D	1	Total C O 6 3 3	0	0
7	G	1	Total C O 6 3 3	0	0
7	G	1	Total C O 6 3 3	0	0
7	G	1	Total C O 6 3 3	0	0
7	J	1	Total C O 6 3 3	0	0
7	J	1	Total C O 6 3 3	0	0
7	J	1	Total C O 6 3 3	0	0

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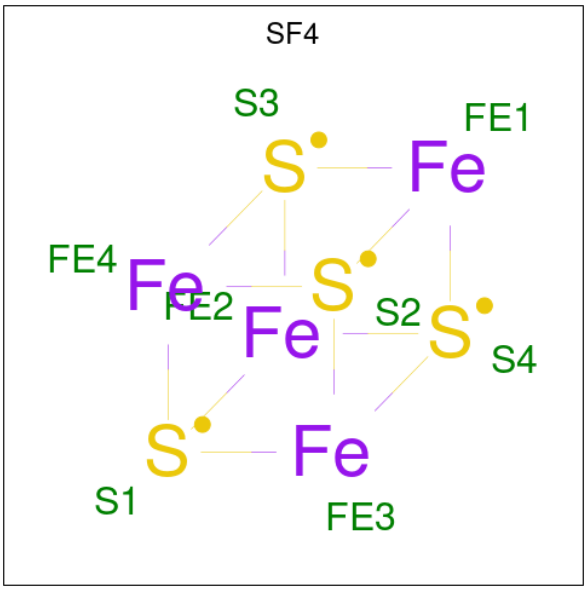
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	J	1	Total C O 6 3 3	0	0

- Molecule 8 is IRON/SULFUR CLUSTER (CCD ID: SF4) (formula: Fe_4S_4) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	B	1	Total Fe S 8 4 4	0	0
8	C	1	Total Fe S 8 4 4	0	0
8	C	1	Total Fe S 8 4 4	0	0
8	C	1	Total Fe S 8 4 4	0	0
8	E	1	Total Fe S 8 4 4	0	0
8	F	1	Total Fe S 8 4 4	0	0
8	F	1	Total Fe S 8 4 4	0	0
8	F	1	Total Fe S 8 4 4	0	0
8	H	1	Total Fe S 8 4 4	0	0
8	I	1	Total Fe S 8 4 4	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	I	1	Total Fe S 8 4 4	0	0
8	I	1	Total Fe S 8 4 4	0	0
8	K	1	Total Fe S 8 4 4	0	0
8	L	1	Total Fe S 8 4 4	0	0
8	L	1	Total Fe S 8 4 4	0	0
8	L	1	Total Fe S 8 4 4	0	0

- Molecule 9 is water.

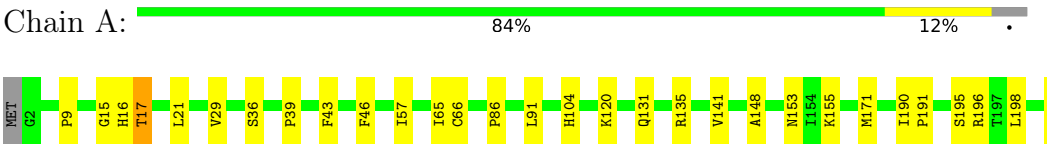
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	2	Total O 2 2	0	0
9	B	3	Total O 3 3	0	0
9	C	1	Total O 1 1	0	0
9	D	15	Total O 15 15	0	0
9	E	2	Total O 2 2	0	0
9	G	21	Total O 21 21	0	0
9	H	1	Total O 1 1	0	0
9	I	3	Total O 3 3	0	0
9	J	19	Total O 19 19	0	0
9	K	1	Total O 1 1	0	0
9	L	2	Total O 2 2	0	0

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.

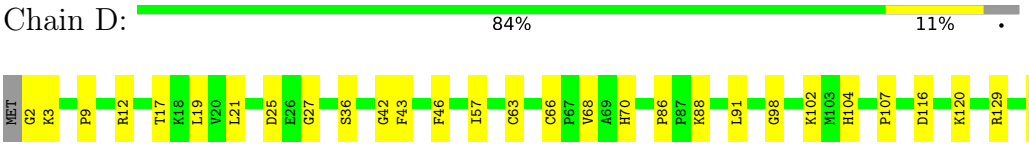
• Molecule 1: F420-reducing [NiFe]-hydrogenase subunit alpha

Chain A:



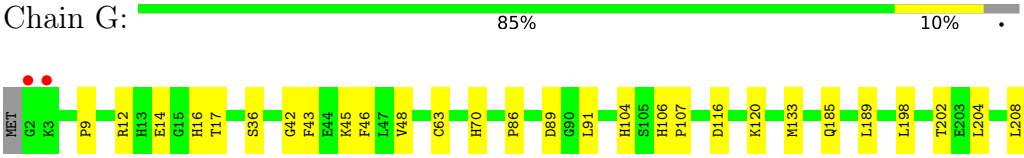
• Molecule 1: F420-reducing [NiFe]-hydrogenase subunit alpha

Chain D:



• Molecule 1: F420-reducing [NiFe]-hydrogenase subunit alpha

Chain G:



• Molecule 1: F420-reducing [NiFe]-hydrogenase subunit alpha

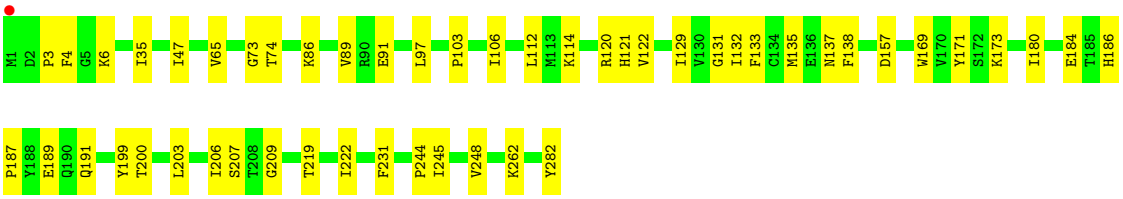
Chain J:

• Molecule 2: F420-reducing [NiFe]-hydrogenase subunit beta

Chain B:

• Molecule 2: F420-reducing [NiFe]-hydrogenase subunit beta

Chain E:

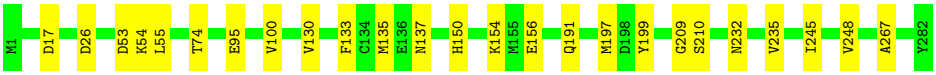


• Molecule 2: F420-reducing [NiFe]-hydrogenase subunit beta

Chain H:

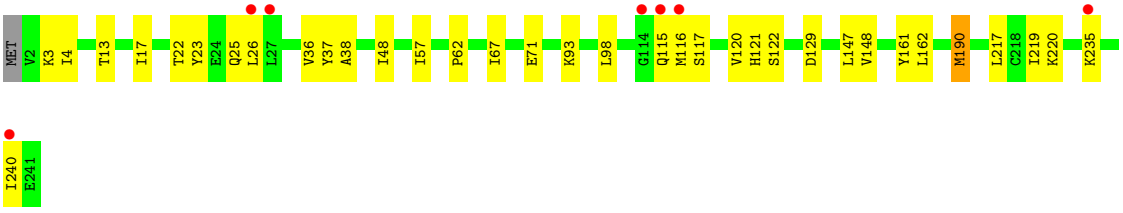
• Molecule 2: F420-reducing [NiFe]-hydrogenase subunit beta

Chain K:



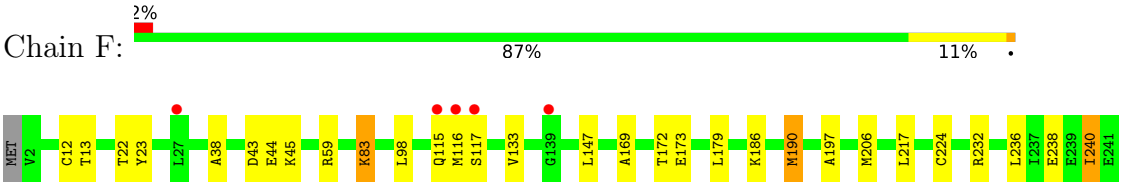
• Molecule 3: F420-reducing [NiFe]-hydrogenase subunit gamma

Chain C:



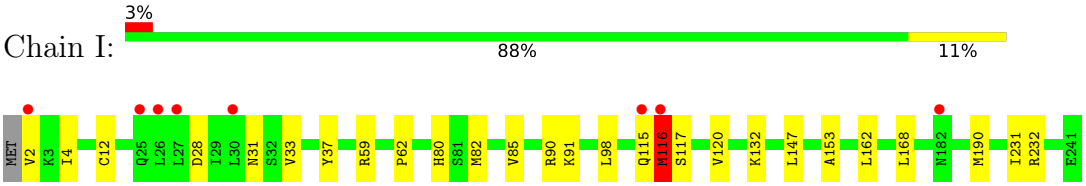
• Molecule 3: F420-reducing [NiFe]-hydrogenase subunit gamma

Chain F:



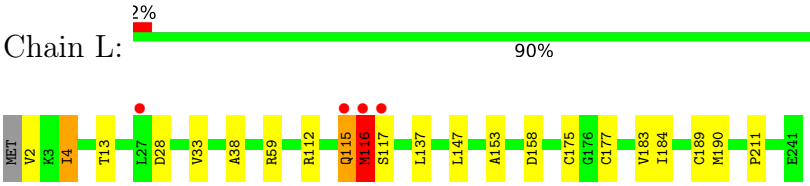
• Molecule 3: F420-reducing [NiFe]-hydrogenase subunit gamma

Chain I:



• Molecule 3: F420-reducing [NiFe]-hydrogenase subunit gamma

Chain L:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 3	Depositor
Cell constants a, b, c, α, β, γ	282.07Å 282.07Å 282.07Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	31.34 – 2.85 31.34 – 2.85	Depositor EDS
% Data completeness (in resolution range)	99.9 (31.34-2.85) 99.8 (31.34-2.85)	Depositor EDS
R_{merge}	0.22	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.39 (at 2.86Å)	Xtriage
Refinement program	PHENIX (1.20.1_4487: ???), BUSTER	Depositor
R, R_{free}	0.182 , 0.210 0.183 , 0.210	Depositor DCC
R_{free} test set	8771 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å^2)	73.7	Xtriage
Anisotropy	0.000	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 60.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.45$, $< L^2 > = 0.27$	Xtriage
Estimated twinning fraction	0.038 for l,-k,h	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	28822	wwPDB-VP
Average B, all atoms (Å^2)	81.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.49% 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: NFU, SF4, SO4, FAD, 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	0.34	0/3140	0.51	0/4251
1	D	0.31	0/3140	0.48	1/4251 (0.0%)
1	G	0.30	0/3140	0.46	0/4251
1	J	0.33	0/3140	0.50	0/4251
2	B	0.34	0/2219	0.56	0/2994
2	E	0.33	0/2219	0.54	0/2994
2	H	0.31	0/2219	0.50	0/2994
2	K	0.29	0/2219	0.46	0/2994
3	C	0.44	0/1821	0.61	0/2465
3	F	0.38	0/1821	0.53	0/2465
3	I	0.41	0/1827	0.60	1/2473 (0.0%)
3	L	0.40	1/1827 (0.1%)	0.54	1/2473 (0.0%)
All	All	0.35	1/28732 (0.0%)	0.52	3/38856 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	L	115	GLN	CA-C	-5.81	1.45	1.52

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	335	GLY	N-CA-C	7.33	121.38	110.97
3	L	116	MET	N-CA-C	-7.11	101.16	110.33
3	I	116	MET	N-CA-C	-5.48	103.25	110.43

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3070	0	3051	33	0
1	D	3070	0	3049	30	0
1	G	3070	0	3050	30	0
1	J	3070	0	3050	20	0
2	B	2177	0	2224	20	0
2	E	2177	0	2224	38	0
2	H	2177	0	2224	15	0
2	K	2177	0	2224	16	0
3	C	1799	0	1836	22	0
3	F	1799	0	1836	27	0
3	I	1802	0	1841	20	0
3	L	1802	0	1841	14	0
4	A	10	0	0	0	0
4	B	10	0	0	0	0
4	C	5	0	0	0	0
4	D	15	0	0	0	0
4	E	15	0	0	0	0
4	G	10	0	0	0	0
4	H	5	0	0	0	0
4	J	25	0	0	0	0
4	K	5	0	0	0	0
5	A	8	0	0	1	0
5	D	8	0	0	2	0
5	G	8	0	0	0	0
5	J	8	0	0	1	0
6	B	53	0	31	1	0
6	E	53	0	31	6	0
6	H	53	0	31	2	0
6	K	53	0	31	1	0
7	B	6	0	8	0	0
7	D	42	0	56	2	0
7	G	18	0	24	0	0
7	J	24	0	32	0	0
8	B	8	0	0	1	0
8	C	24	0	0	0	0
8	E	8	0	0	1	0
8	F	24	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	H	8	0	0	1	0
8	I	24	0	0	0	0
8	K	8	0	0	1	0
8	L	24	0	0	0	0
9	A	2	0	0	0	0
9	B	3	0	0	0	0
9	C	1	0	0	0	0
9	D	15	0	0	0	0
9	E	2	0	0	0	0
9	G	21	0	0	0	0
9	H	1	0	0	0	0
9	I	3	0	0	0	0
9	J	19	0	0	0	0
9	K	1	0	0	0	0
9	L	2	0	0	0	0
All	All	28822	0	28694	256	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 4.

The worst 5 of 256 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)
3:F:116:MET:HB3	3:F:117:SER:HA	1.71	0.73
1:G:17:THR:HG23	1:G:388:ILE:HG13	1.71	0.72
1:G:14:GLU:O	1:G:388:ILE:HG12	2.00	0.61
3:F:116:MET:CB	3:F:117:SER:HA	2.31	0.61
1:G:356:VAL:HG11	1:G:390:CYS:HB3	1.84	0.60

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	390/410 (95%)	375 (96%)	15 (4%)	0	100	100
1	D	390/410 (95%)	378 (97%)	12 (3%)	0	100	100
1	G	390/410 (95%)	383 (98%)	7 (2%)	0	100	100
1	J	390/410 (95%)	377 (97%)	13 (3%)	0	100	100
2	B	280/282 (99%)	266 (95%)	13 (5%)	1 (0%)	30	49
2	E	280/282 (99%)	268 (96%)	11 (4%)	1 (0%)	30	49
2	H	280/282 (99%)	268 (96%)	11 (4%)	1 (0%)	30	49
2	K	280/282 (99%)	270 (96%)	10 (4%)	0	100	100
3	C	238/241 (99%)	224 (94%)	12 (5%)	2 (1%)	16	32
3	F	238/241 (99%)	226 (95%)	11 (5%)	1 (0%)	30	49
3	I	239/241 (99%)	225 (94%)	14 (6%)	0	100	100
3	L	239/241 (99%)	225 (94%)	13 (5%)	1 (0%)	30	49
All	All	3634/3732 (97%)	3485 (96%)	142 (4%)	7 (0%)	44	63

5 of 7 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	C	38	ALA
3	C	122	SER
3	F	38	ALA
3	L	38	ALA
2	B	3	PRO

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	330/347 (95%)	327 (99%)	3 (1%)	75	88
1	D	330/347 (95%)	325 (98%)	5 (2%)	60	81
1	G	330/347 (95%)	328 (99%)	2 (1%)	84	92
1	J	330/347 (95%)	328 (99%)	2 (1%)	84	92

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
2	B	238/238 (100%)	236 (99%)	2 (1%)	79 90
2	E	238/238 (100%)	236 (99%)	2 (1%)	79 90
2	H	238/238 (100%)	238 (100%)	0	100 100
2	K	238/238 (100%)	238 (100%)	0	100 100
3	C	204/205 (100%)	200 (98%)	4 (2%)	50 73
3	F	204/205 (100%)	201 (98%)	3 (2%)	60 81
3	I	205/205 (100%)	201 (98%)	4 (2%)	50 73
3	L	205/205 (100%)	202 (98%)	3 (2%)	60 81
All	All	3090/3160 (98%)	3060 (99%)	30 (1%)	73 87

5 of 30 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	E	6	LYS
3	L	4	ILE
3	F	190	MET
3	L	190	MET
3	I	190	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 21 such sidechains are listed below:

Mol	Chain	Res	Type
1	G	353	ASN
1	J	353	ASN
3	L	25	GLN
1	J	379	HIS
1	J	307	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)

59 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
7	GOL	J	509	-	5,5,5	0.09	0	5,5,5	0.33	0
4	SO4	K	302	-	4,4,4	0.60	0	6,6,6	0.06	0
4	SO4	J	505	-	4,4,4	0.39	0	6,6,6	0.05	0
4	SO4	J	503	-	4,4,4	0.62	0	6,6,6	0.07	0
8	SF4	K	303	2	0,12,12	-	-	-		
7	GOL	G	505	-	5,5,5	0.08	0	5,5,5	0.32	0
4	SO4	B	303	-	4,4,4	0.61	0	6,6,6	0.05	0
5	NFU	J	510	1	2,7,7	1.06	0	-		
8	SF4	F	303	3	0,12,12	-	-	-		
8	SF4	C	303	3	0,12,12	-	-	-		
8	SF4	I	303	3	0,12,12	-	-	-		
7	GOL	B	304	-	5,5,5	0.09	0	5,5,5	0.32	0
4	SO4	A	501	-	4,4,4	0.61	0	6,6,6	0.07	0
7	GOL	D	505	-	5,5,5	0.09	0	5,5,5	0.34	0
4	SO4	J	501	-	4,4,4	0.62	0	6,6,6	0.07	0
7	GOL	D	510	-	5,5,5	0.09	0	5,5,5	0.33	0
7	GOL	D	507	-	5,5,5	0.09	0	5,5,5	0.32	0
7	GOL	D	508	-	5,5,5	0.09	0	5,5,5	0.32	0
7	GOL	G	503	-	5,5,5	0.34	0	5,5,5	0.30	0
4	SO4	G	501	-	4,4,4	0.59	0	6,6,6	0.14	0
7	GOL	J	508	-	5,5,5	0.08	0	5,5,5	0.32	0
5	NFU	D	511	1	2,7,7	1.33	0	-		
8	SF4	I	302	3	0,12,12	-	-	-		
8	SF4	C	304	3	0,12,12	-	-	-		
4	SO4	A	502	-	4,4,4	0.62	0	6,6,6	0.08	0
4	SO4	C	301	-	4,4,4	0.61	0	6,6,6	0.07	0
4	SO4	D	502	-	4,4,4	0.62	0	6,6,6	0.07	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
6	FAD	B	301	-	53,58,58	1.31	5 (9%)	68,89,89	1.27	9 (13%)
6	FAD	H	301	-	53,58,58	1.27	5 (9%)	68,89,89	1.32	9 (13%)
7	GOL	D	509	-	5,5,5	0.10	0	5,5,5	0.33	0
8	SF4	B	305	2	0,12,12	-	-	-		
7	GOL	D	504	-	5,5,5	0.08	0	5,5,5	0.32	0
8	SF4	C	302	3	0,12,12	-	-	-		
8	SF4	L	302	3	0,12,12	-	-	-		
8	SF4	L	301	3	0,12,12	-	-	-		
4	SO4	E	303	-	4,4,4	0.39	0	6,6,6	0.05	0
4	SO4	D	501	-	4,4,4	0.41	0	6,6,6	0.05	0
8	SF4	F	302	3	0,12,12	-	-	-		
4	SO4	D	503	-	4,4,4	0.62	0	6,6,6	0.06	0
8	SF4	E	305	2	0,12,12	-	-	-		
4	SO4	G	502	-	4,4,4	0.64	0	6,6,6	0.07	0
4	SO4	H	302	-	4,4,4	0.60	0	6,6,6	0.04	0
4	SO4	E	304	-	4,4,4	0.59	0	6,6,6	0.05	0
4	SO4	J	504	-	4,4,4	0.62	0	6,6,6	0.08	0
4	SO4	B	302	-	4,4,4	0.60	0	6,6,6	0.04	0
7	GOL	J	507	-	5,5,5	0.09	0	5,5,5	0.32	0
8	SF4	H	303	2	0,12,12	-	-	-		
6	FAD	E	301	-	53,58,58	1.27	6 (11%)	68,89,89	1.28	9 (13%)
6	FAD	K	301	-	53,58,58	1.26	6 (11%)	68,89,89	1.29	9 (13%)
7	GOL	D	506	-	5,5,5	0.08	0	5,5,5	0.34	0
4	SO4	E	302	-	4,4,4	0.60	0	6,6,6	0.07	0
7	GOL	J	506	-	5,5,5	0.29	0	5,5,5	0.35	0
5	NFU	G	506	1	2,7,7	0.76	0	-		
7	GOL	G	504	-	5,5,5	0.10	0	5,5,5	0.34	0
8	SF4	L	303	3	0,12,12	-	-	-		
4	SO4	J	502	-	4,4,4	0.62	0	6,6,6	0.06	0
5	NFU	A	503	1	2,7,7	0.91	0	-		
8	SF4	F	301	3	0,12,12	-	-	-		
8	SF4	I	301	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
7	GOL	J	509	-	-	4/4/4/4	-
8	SF4	K	303	2	-	-	0/6/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	GOL	G	505	-	-	0/4/4/4	-
8	SF4	F	303	3	-	-	0/6/5/5
8	SF4	C	303	3	-	-	0/6/5/5
8	SF4	I	303	3	-	-	0/6/5/5
7	GOL	B	304	-	-	2/4/4/4	-
7	GOL	D	505	-	-	2/4/4/4	-
7	GOL	D	510	-	-	2/4/4/4	-
7	GOL	D	507	-	-	2/4/4/4	-
7	GOL	D	508	-	-	3/4/4/4	-
7	GOL	J	508	-	-	2/4/4/4	-
7	GOL	G	503	-	-	1/4/4/4	-
8	SF4	I	302	3	-	-	0/6/5/5
8	SF4	C	304	3	-	-	0/6/5/5
6	FAD	B	301	-	-	3/30/50/50	0/6/6/6
7	GOL	D	509	-	-	3/4/4/4	-
6	FAD	H	301	-	-	3/30/50/50	0/6/6/6
8	SF4	C	302	3	-	-	0/6/5/5
8	SF4	B	305	2	-	-	0/6/5/5
7	GOL	D	504	-	-	1/4/4/4	-
8	SF4	L	302	3	-	-	0/6/5/5
8	SF4	L	301	3	-	-	0/6/5/5
8	SF4	F	302	3	-	-	0/6/5/5
8	SF4	E	305	2	-	-	0/6/5/5
8	SF4	H	303	2	-	-	0/6/5/5
7	GOL	J	507	-	-	0/4/4/4	-
7	GOL	D	506	-	-	2/4/4/4	-
6	FAD	E	301	-	-	1/30/50/50	0/6/6/6
6	FAD	K	301	-	-	3/30/50/50	0/6/6/6
7	GOL	J	506	-	-	2/4/4/4	-
7	GOL	G	504	-	-	4/4/4/4	-
8	SF4	L	303	3	-	-	0/6/5/5
8	SF4	F	301	3	-	-	0/6/5/5
8	SF4	I	301	3	-	-	0/6/5/5

The worst 5 of 22 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	B	301	FAD	C9A-C5X	5.06	1.49	1.41
6	H	301	FAD	C9A-C5X	4.97	1.49	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	E	301	FAD	C9A-C5X	4.94	1.49	1.41
6	K	301	FAD	C9A-C5X	4.93	1.49	1.41
6	B	301	FAD	C8-C7	3.40	1.49	1.40

The worst 5 of 36 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	K	301	FAD	P-O3P-PA	-3.42	121.09	132.83
6	E	301	FAD	P-O3P-PA	-3.38	121.23	132.83
6	H	301	FAD	C3B-C2B-C1B	3.29	105.94	100.98
6	B	301	FAD	P-O3P-PA	-3.27	121.61	132.83
6	E	301	FAD	N3A-C2A-N1A	-3.26	123.58	128.68

There are no chirality outliers.

5 of 40 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	D	505	GOL	O1-C1-C2-C3
7	D	506	GOL	O1-C1-C2-C3
7	D	507	GOL	O1-C1-C2-C3
7	G	504	GOL	C1-C2-C3-O3
7	J	509	GOL	C1-C2-C3-O3

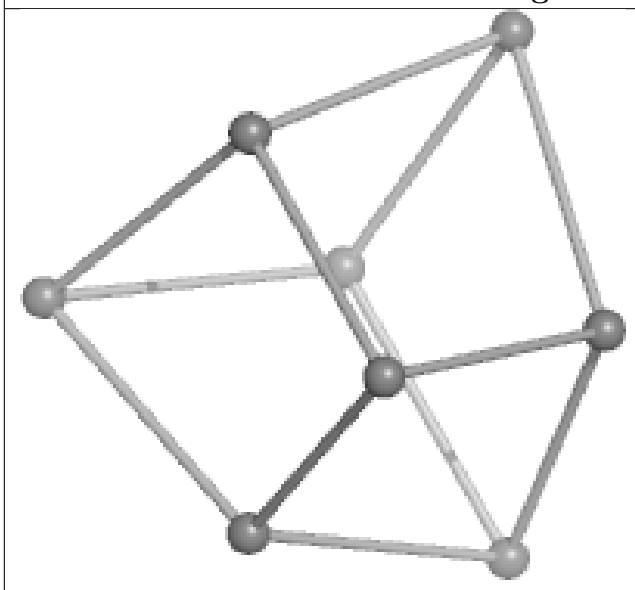
There are no ring outliers.

13 monomers are involved in 20 short contacts:

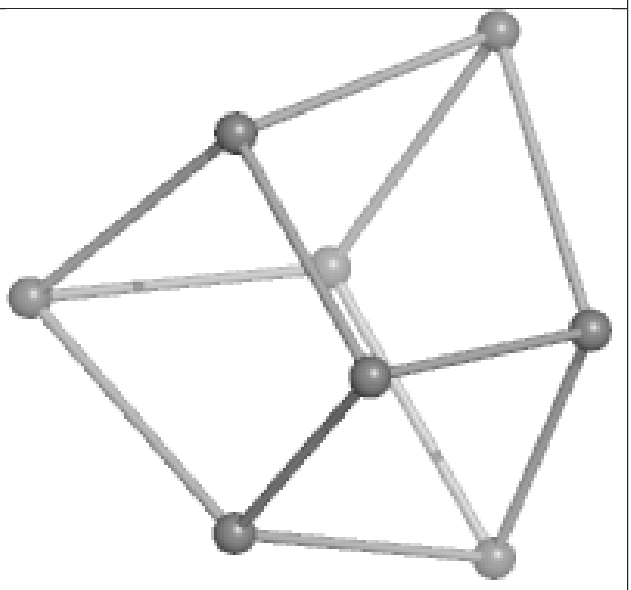
Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	K	303	SF4	1	0
5	J	510	NFU	1	0
5	D	511	NFU	2	0
6	B	301	FAD	1	0
6	H	301	FAD	2	0
7	D	509	GOL	1	0
8	B	305	SF4	1	0
8	E	305	SF4	1	0
8	H	303	SF4	1	0
6	E	301	FAD	6	0
6	K	301	FAD	1	0
7	D	506	GOL	1	0
5	A	503	NFU	1	0

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.

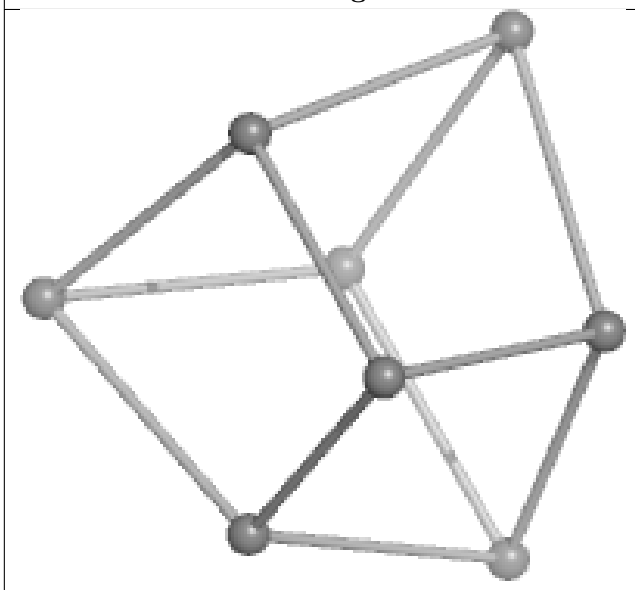
Ligand SF4 K 303



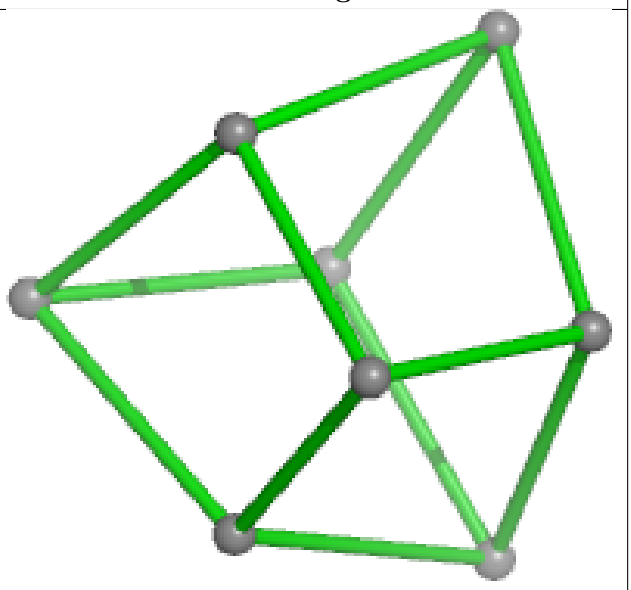
Bond lengths



Bond angles

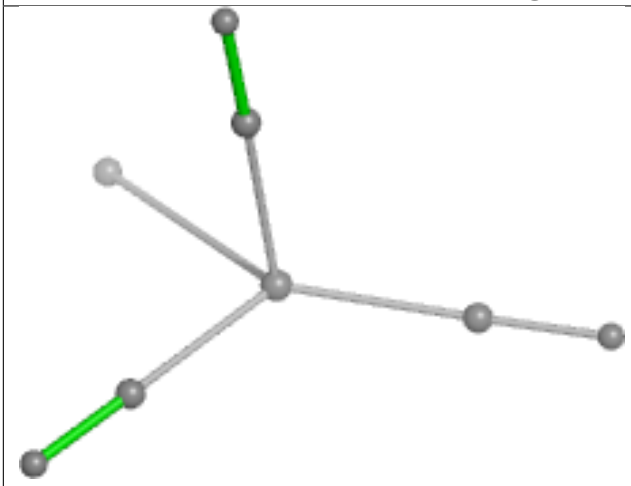


Torsions

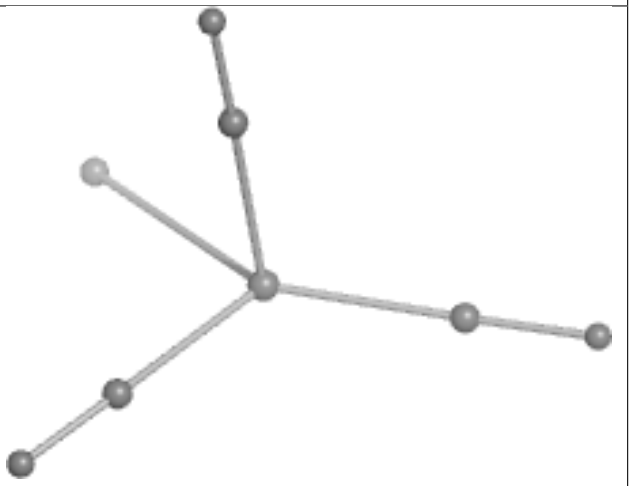


Rings

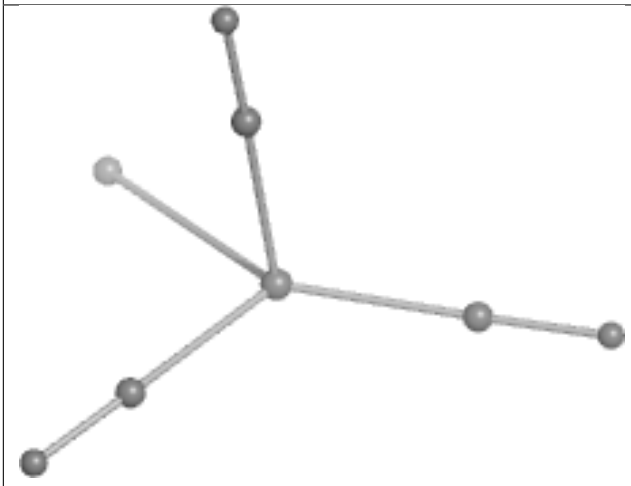
Ligand NFU J 510



Bond lengths



Bond angles



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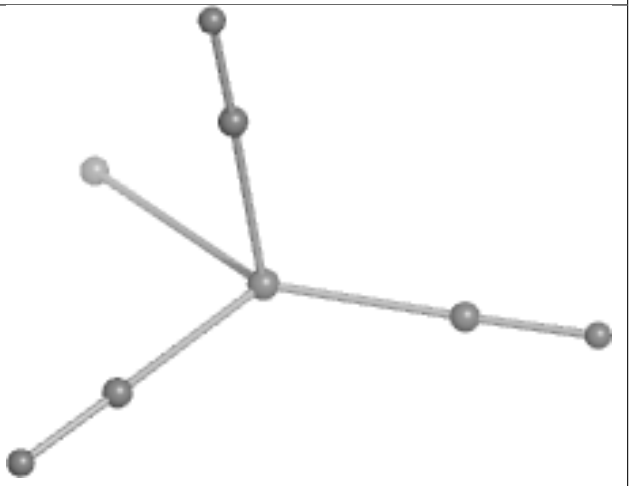
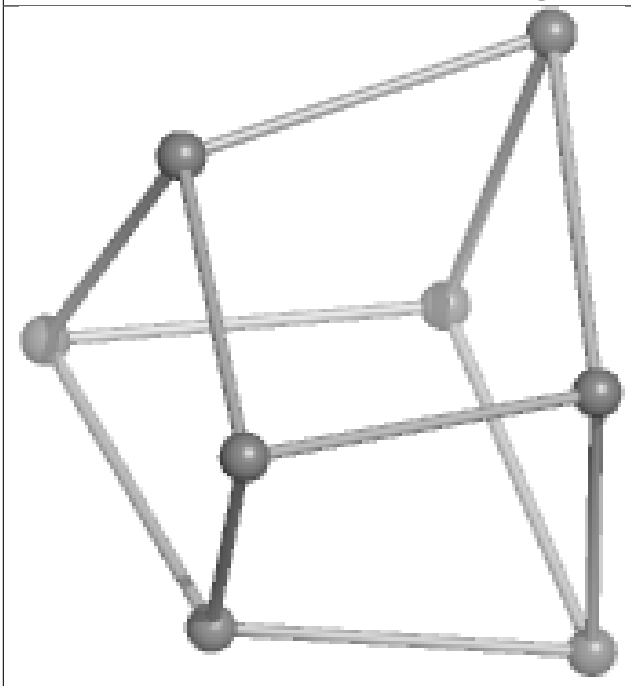
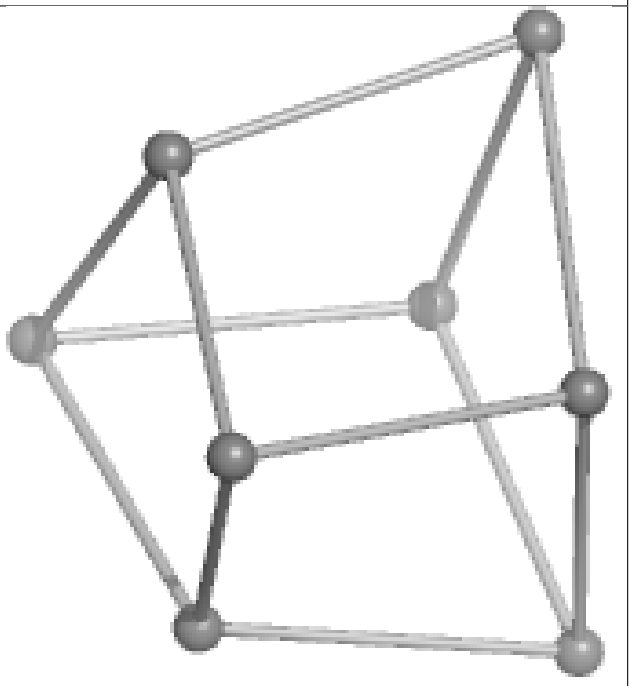


Rings

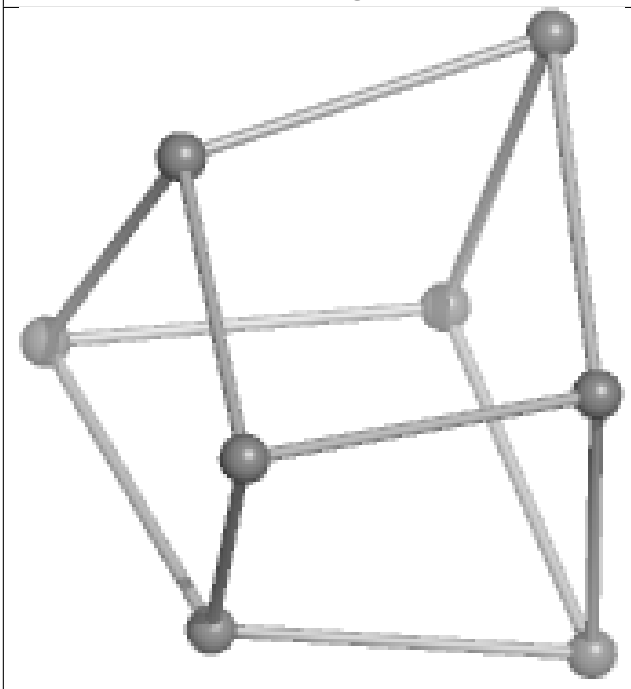
Ligand SF4 F 303



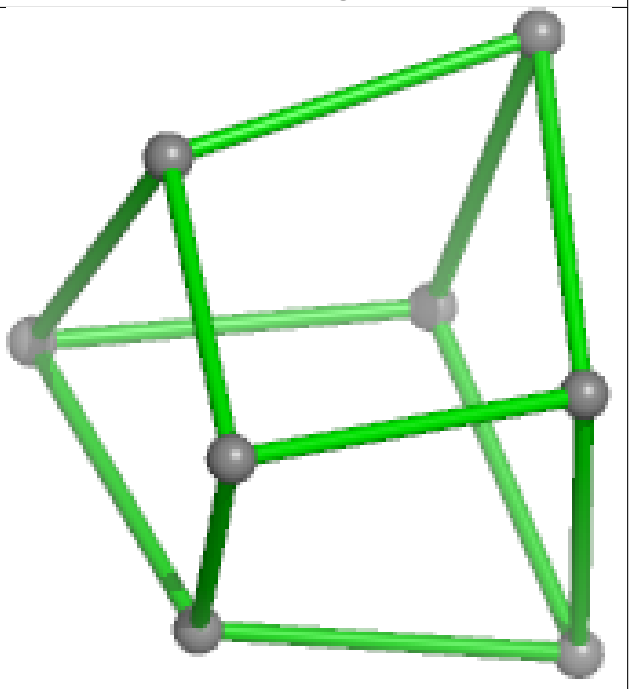
Bond lengths



Bond angles

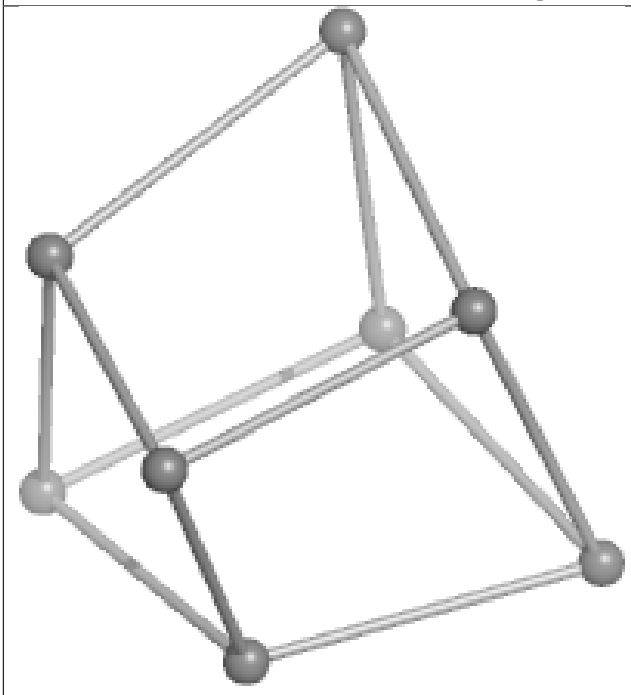


Torsions

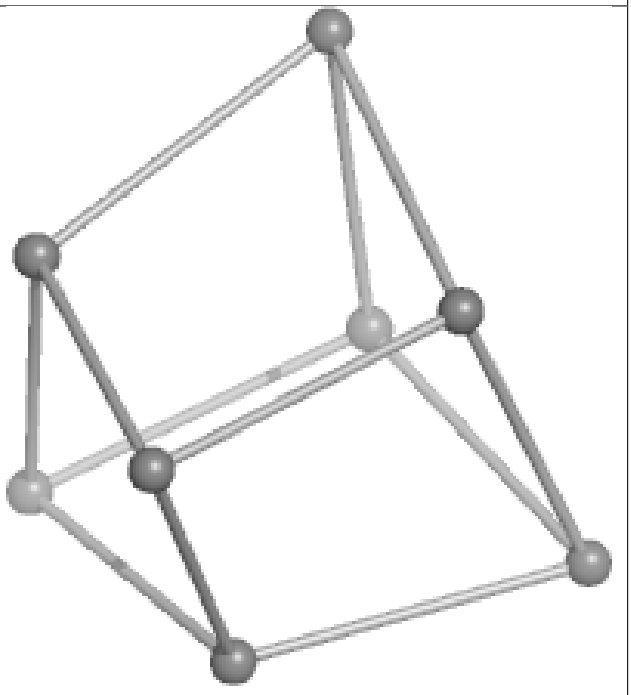


Rings

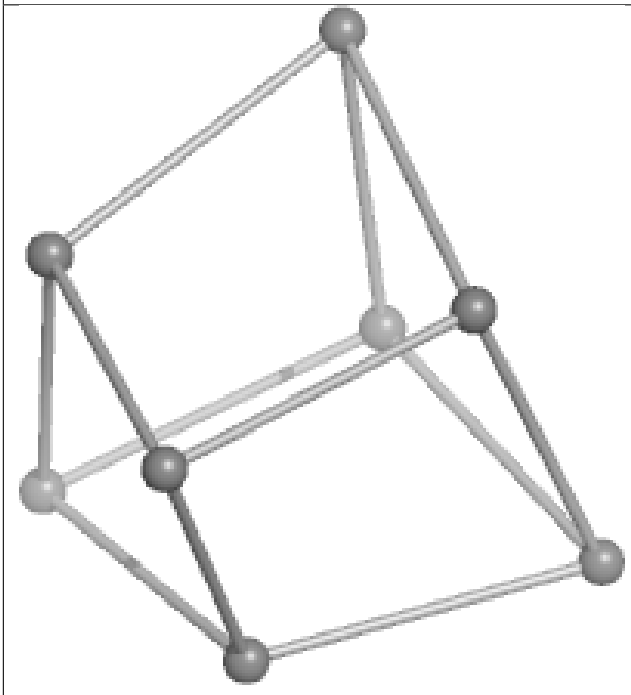
Ligand SF4 C 303



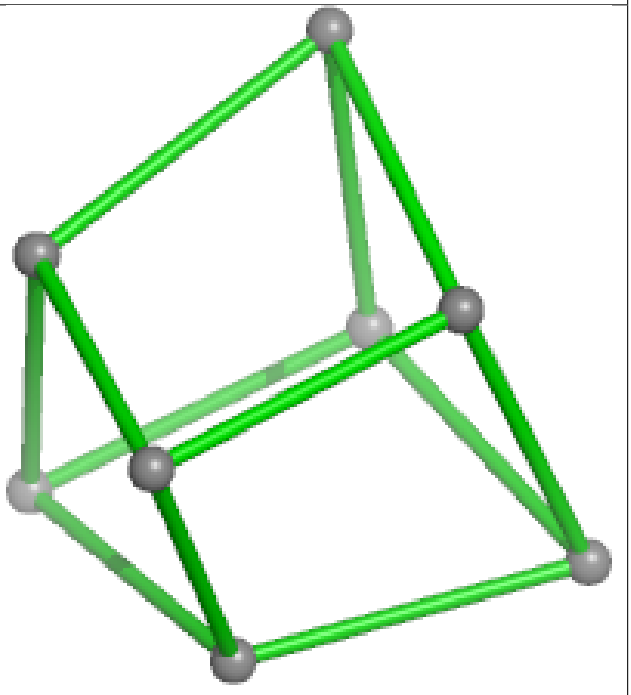
Bond lengths



Bond angles

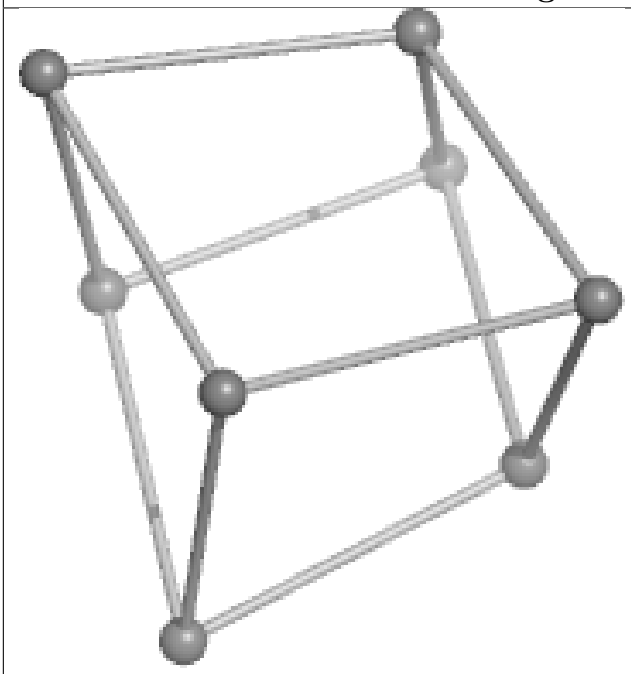


Torsions

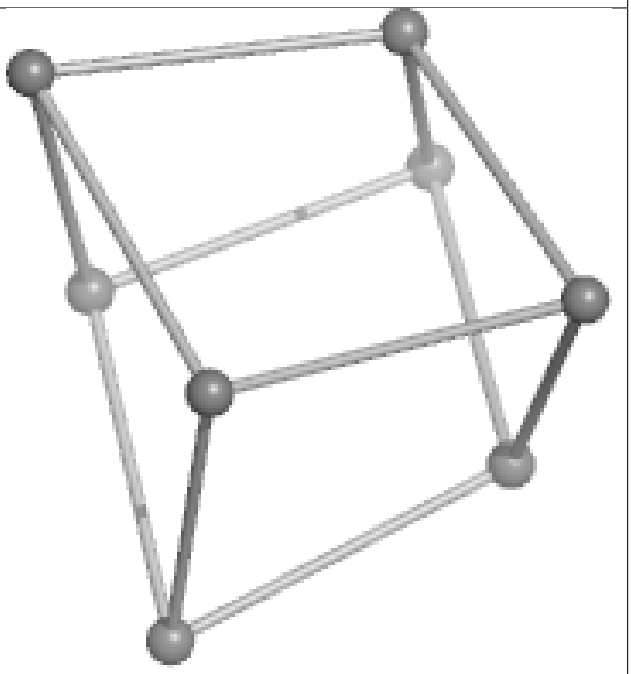


Rings

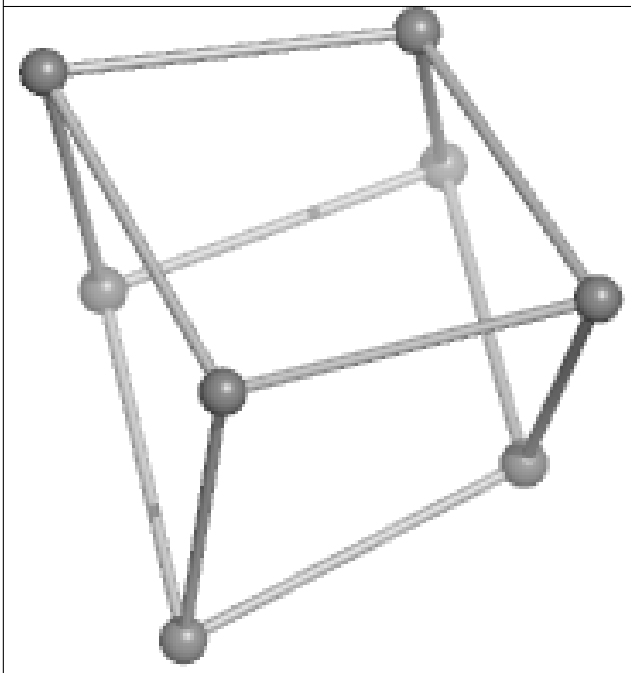
Ligand SF4 I 303



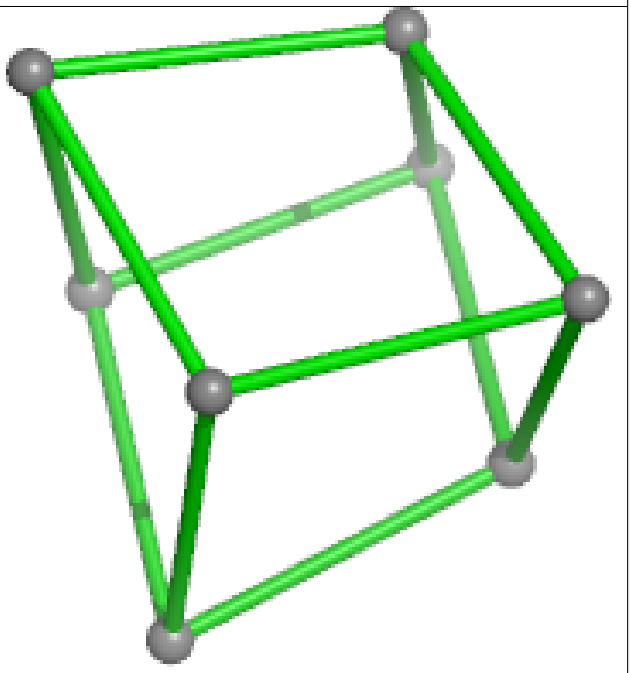
Bond lengths



Bond angles

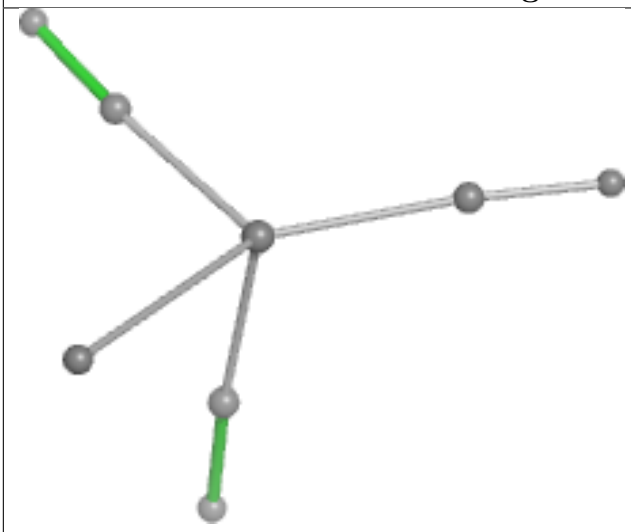


Torsions

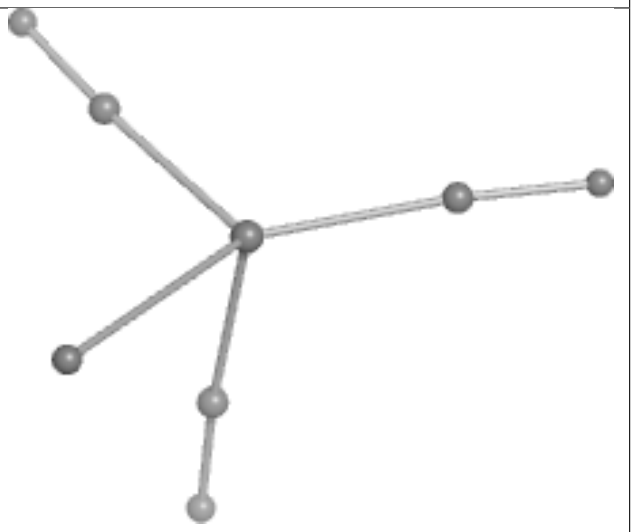


Rings

Ligand NFU D 511

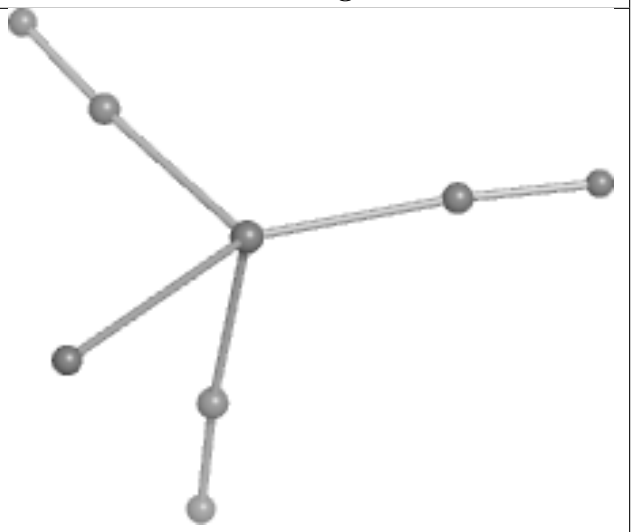


Bond lengths



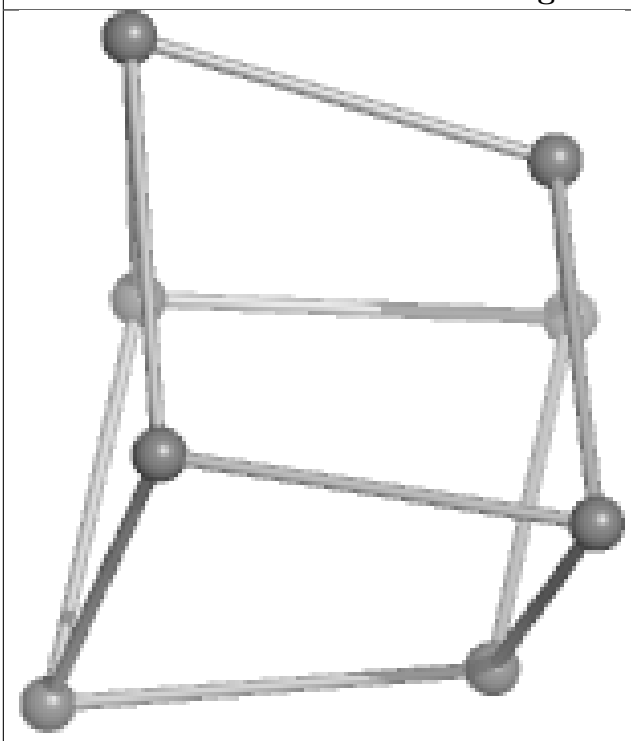
Bond angles

Torsions

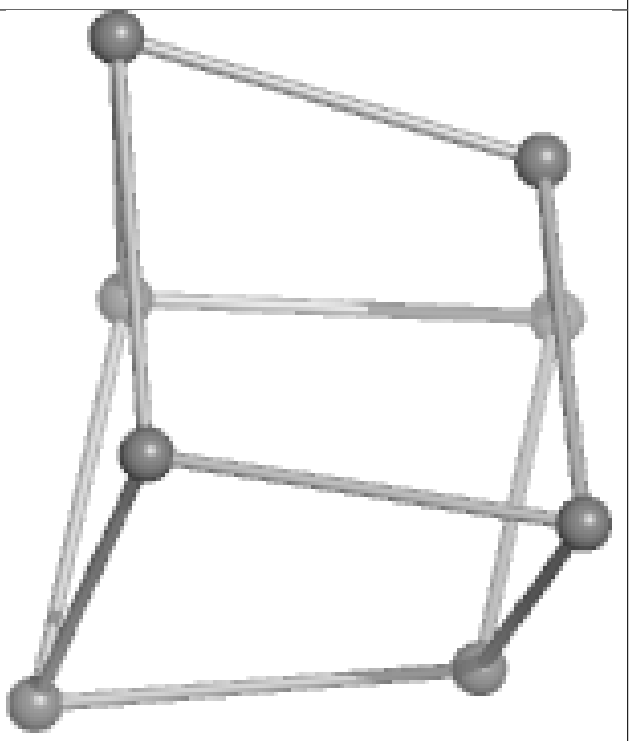


Rings

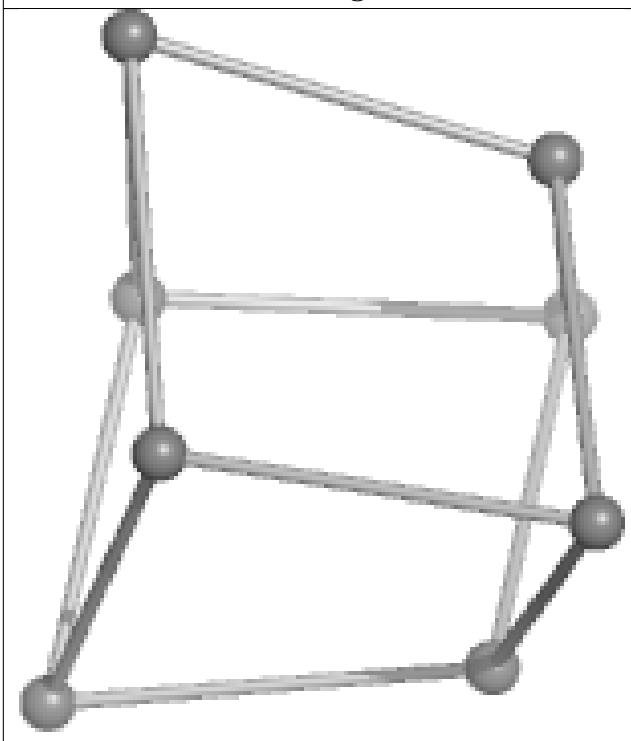
Ligand SF4 I 302



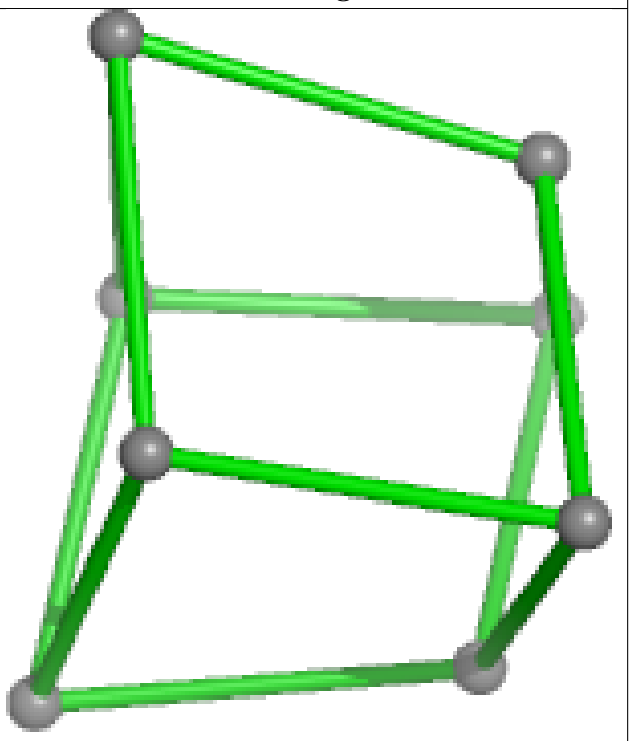
Bond lengths



Bond angles

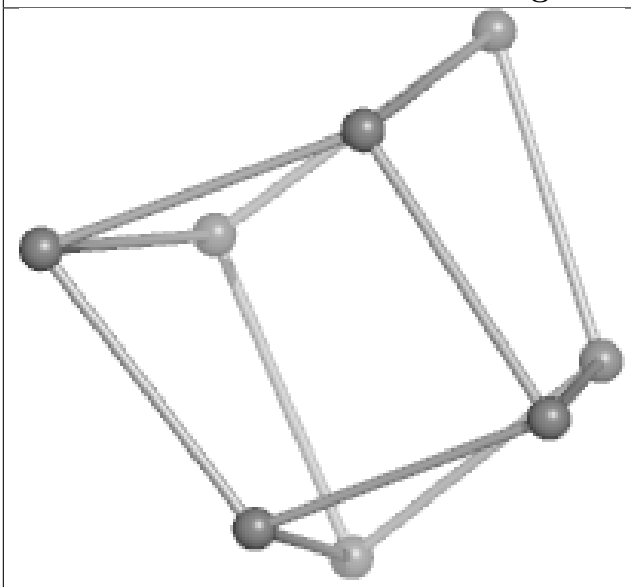


Torsions

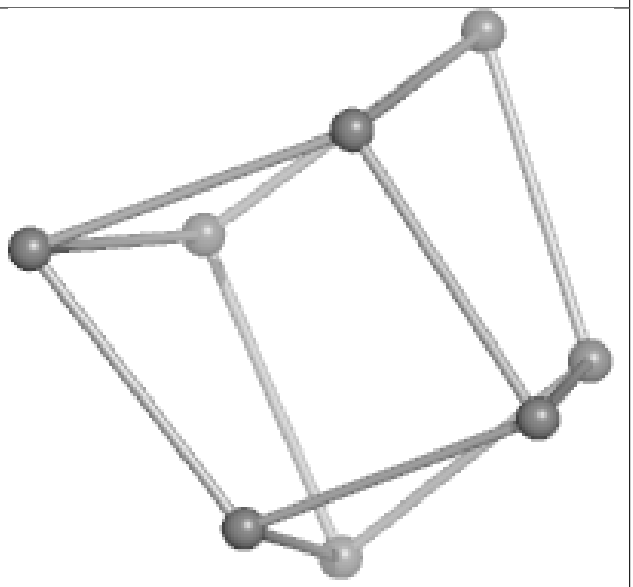


Rings

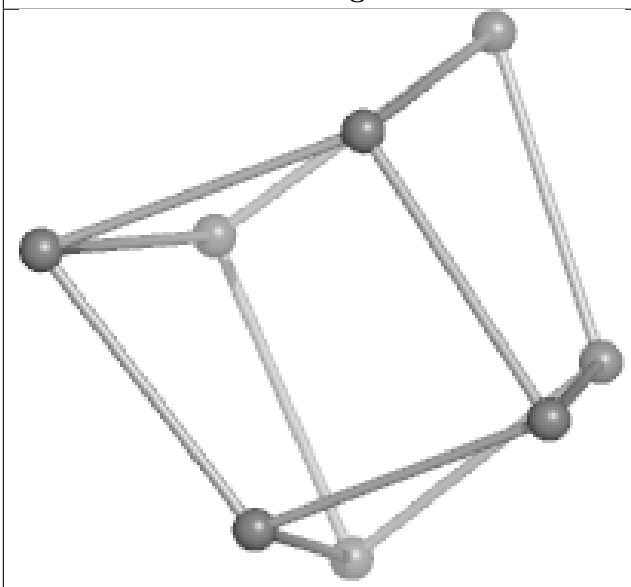
Ligand SF4 C 304



Bond lengths



Bond angles



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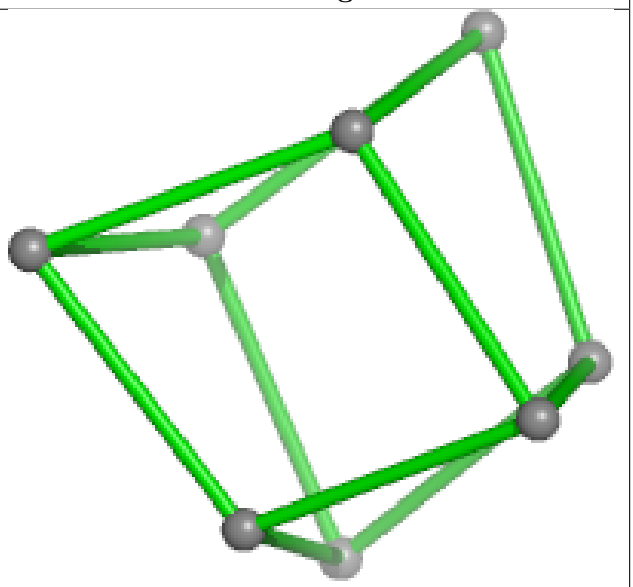
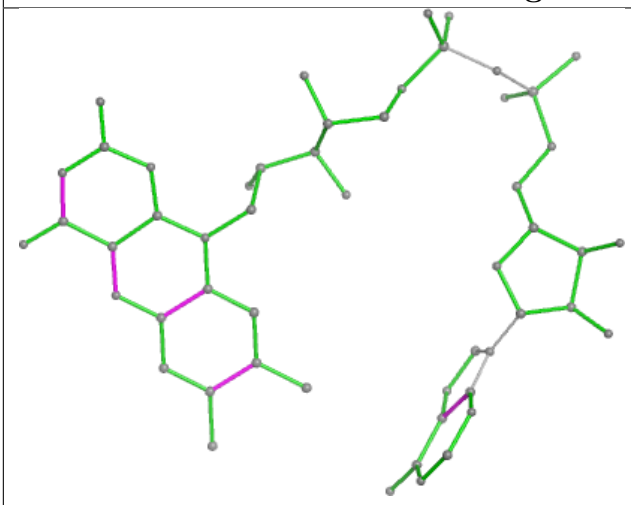
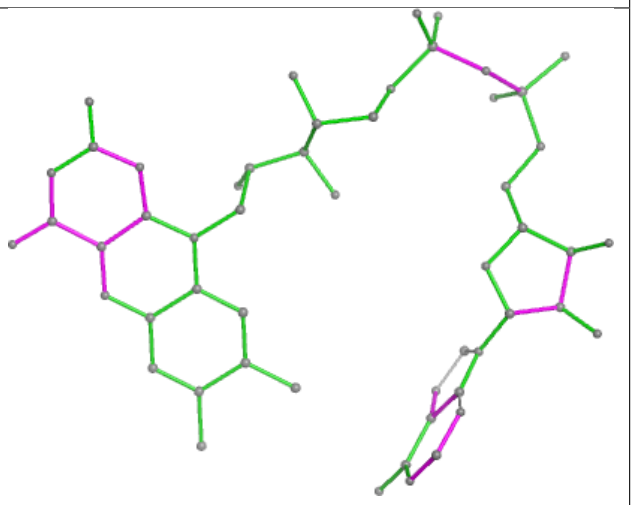


Rings

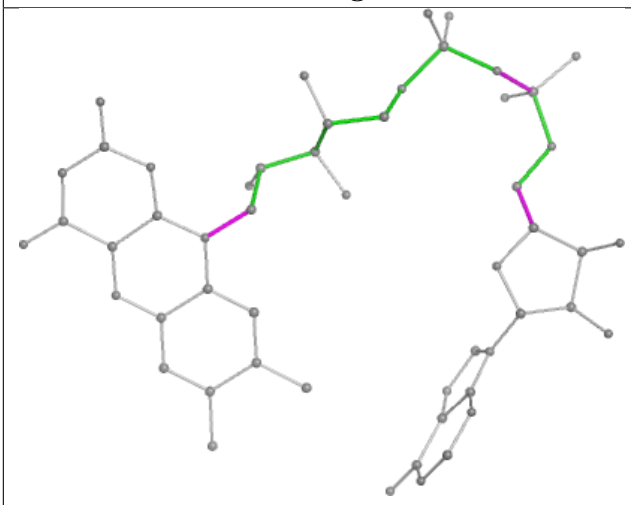
Ligand FAD B 301



Bond lengths



Bond angles



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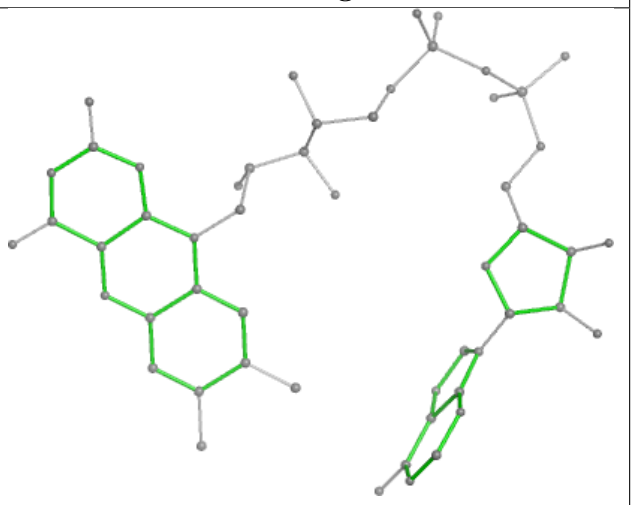
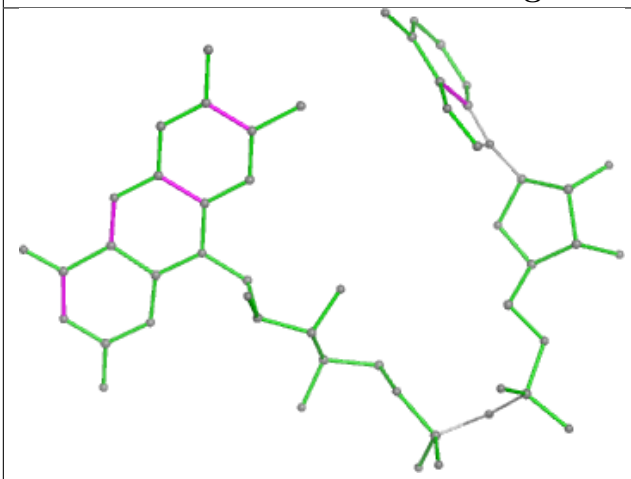
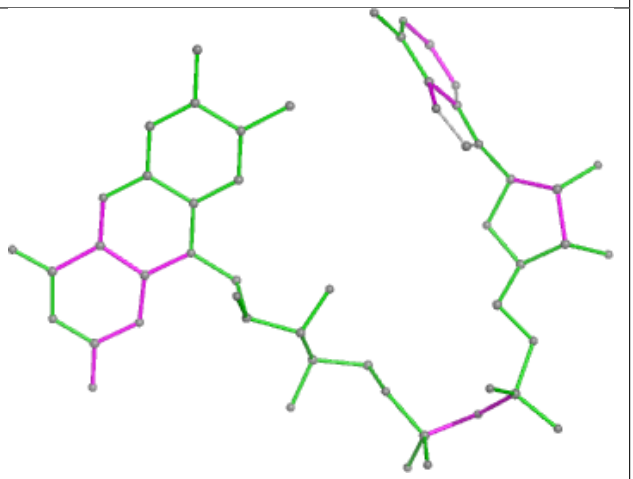


Rings

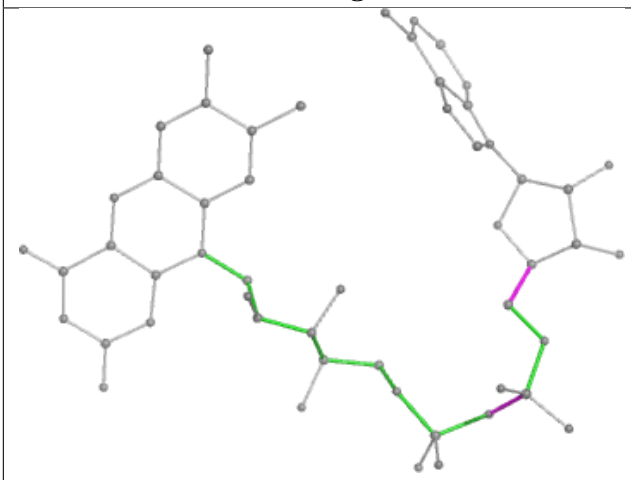
Ligand FAD H 301



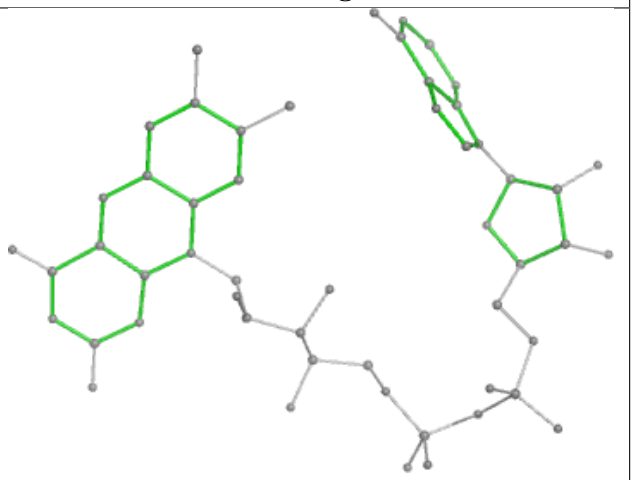
Bond lengths



Bond angles

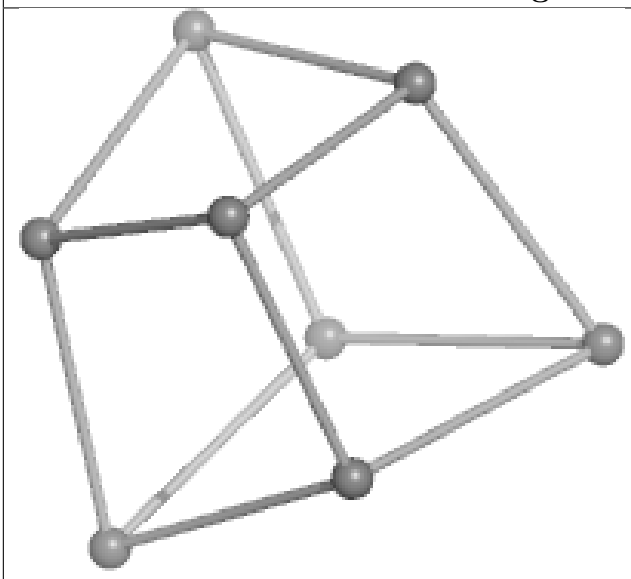


Torsions

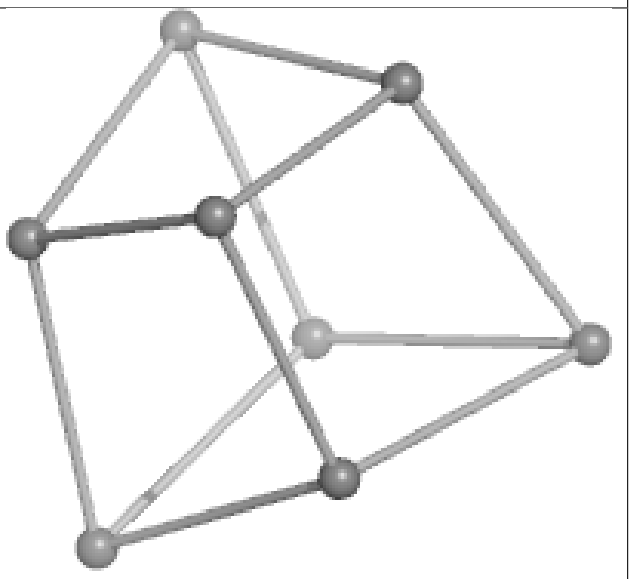


Rings

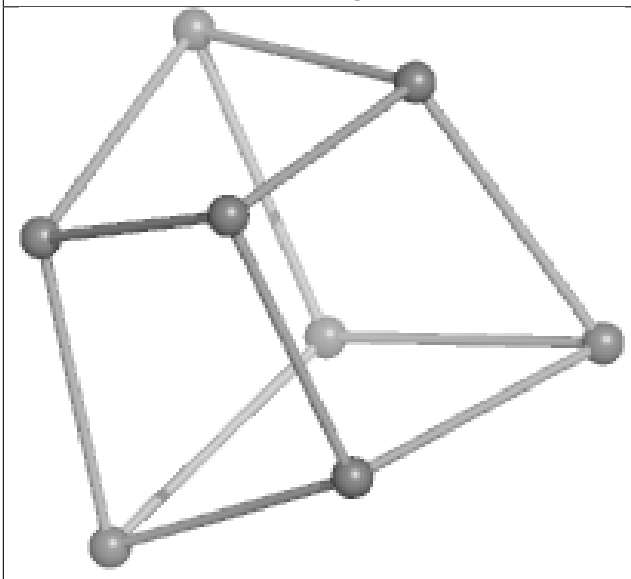
Ligand SF4 B 305



Bond lengths



Bond angles



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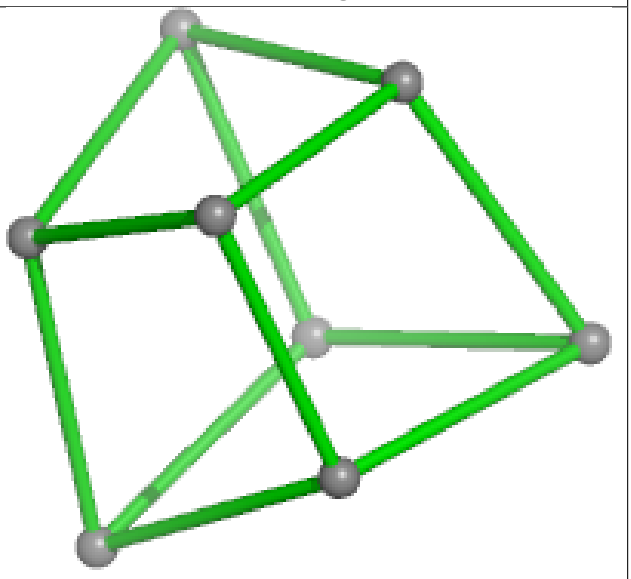
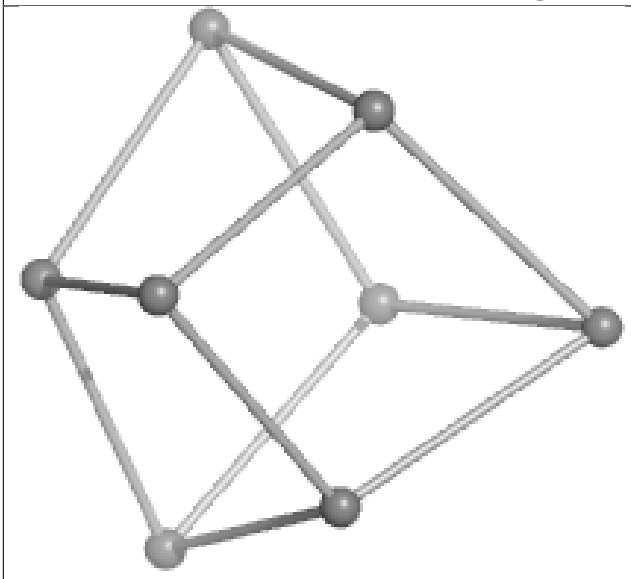
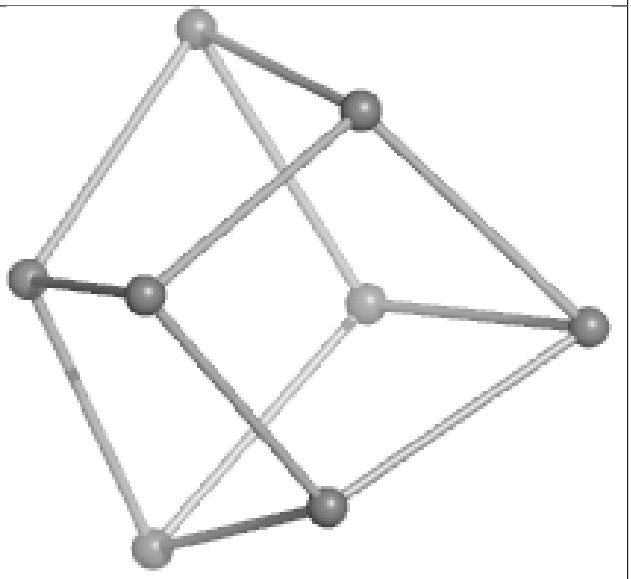


Rings

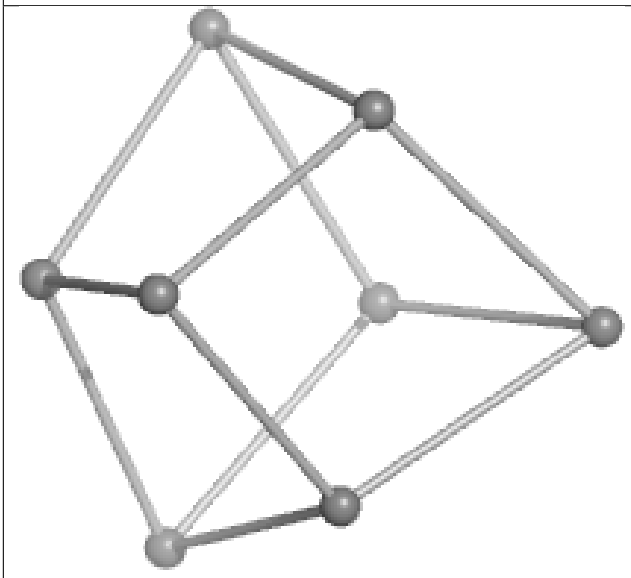
Ligand SF4 C 302



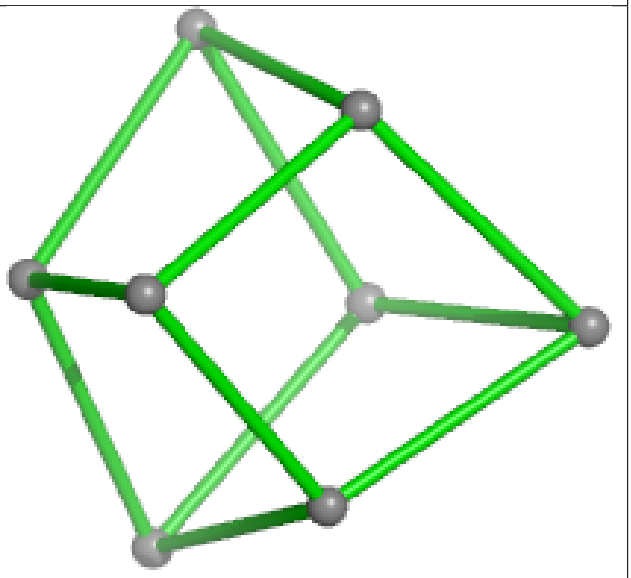
Bond lengths



Bond angles

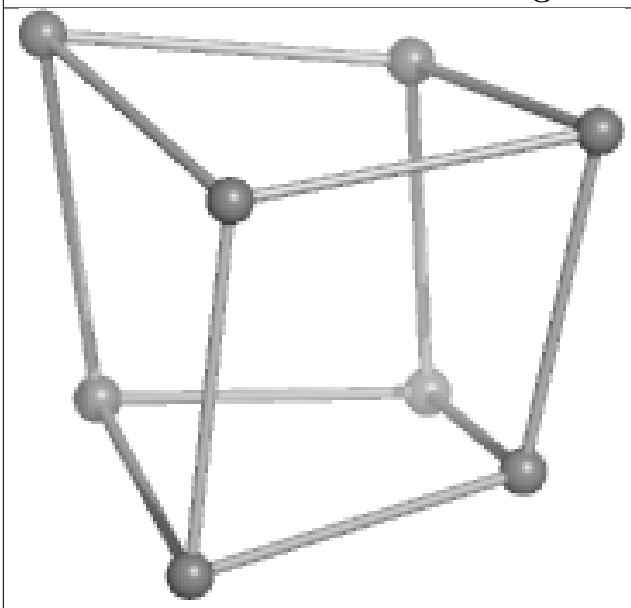


Torsions

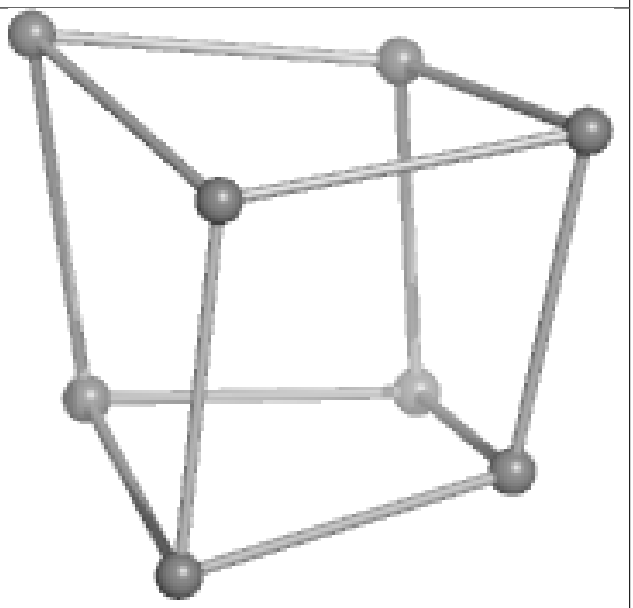


Rings

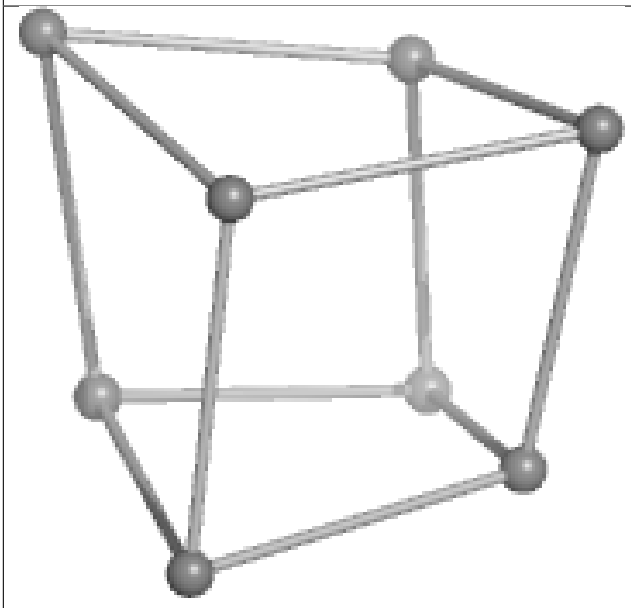
Ligand SF4 L 302



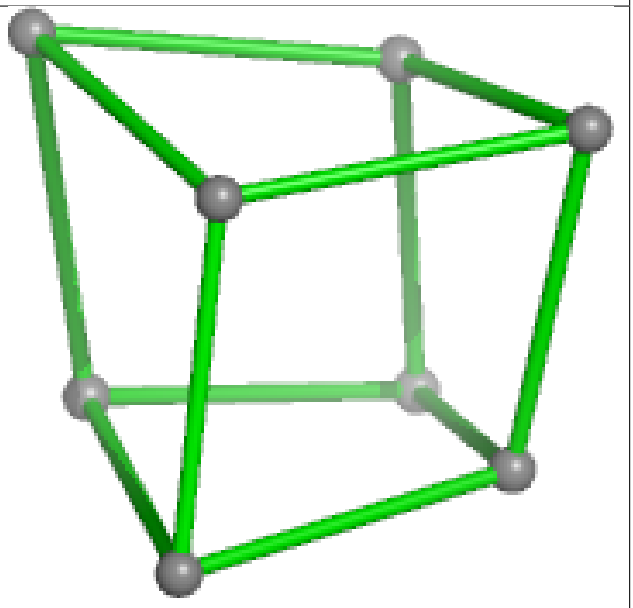
Bond lengths



Bond angles

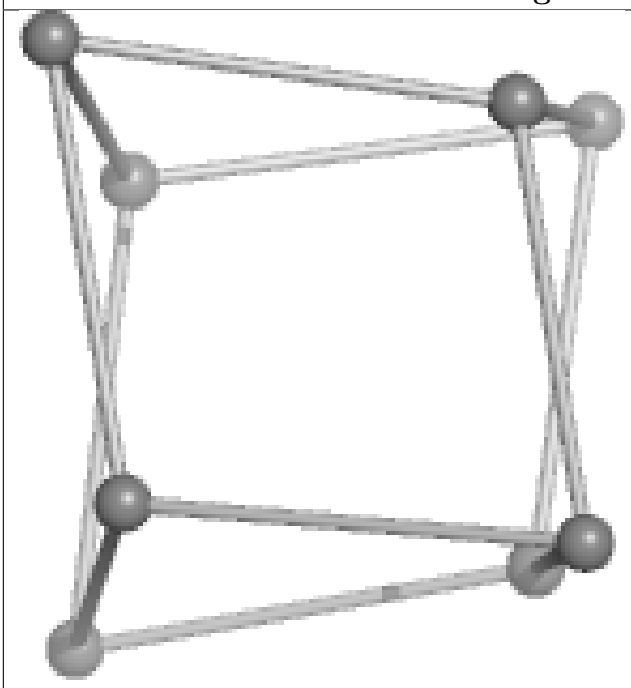


Torsions

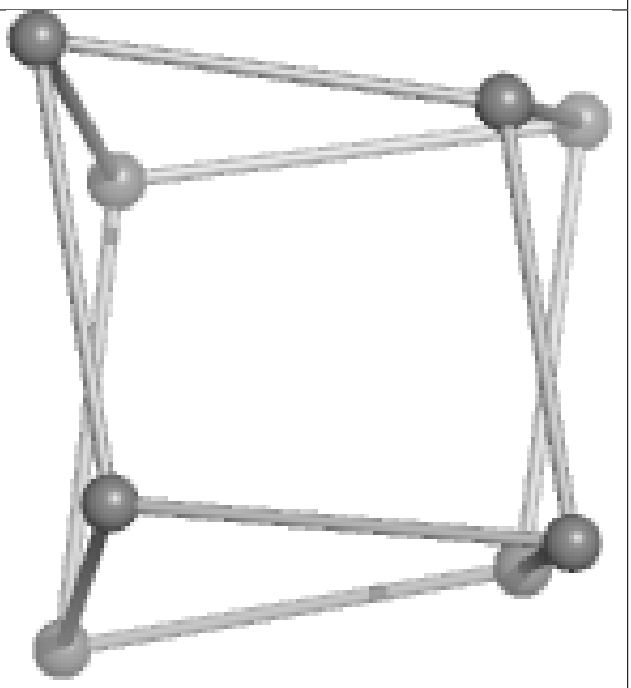


Rings

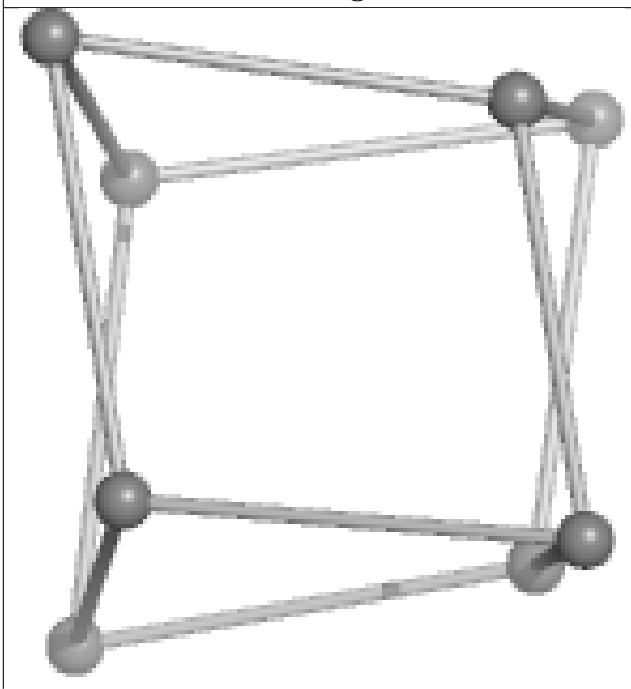
Ligand SF4 L 301



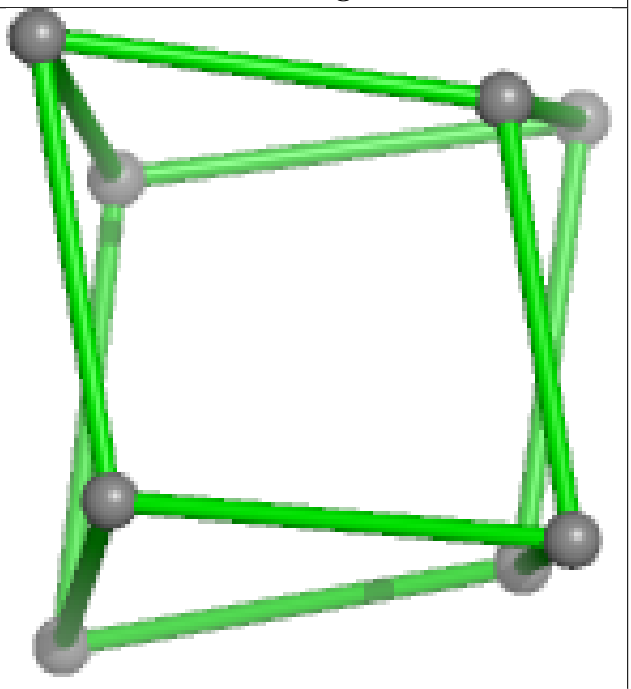
Bond lengths



Bond angles

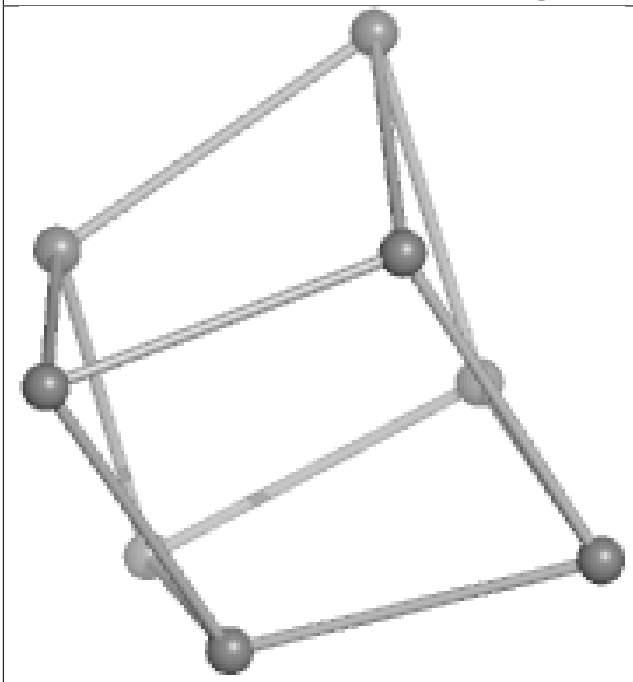


Torsions

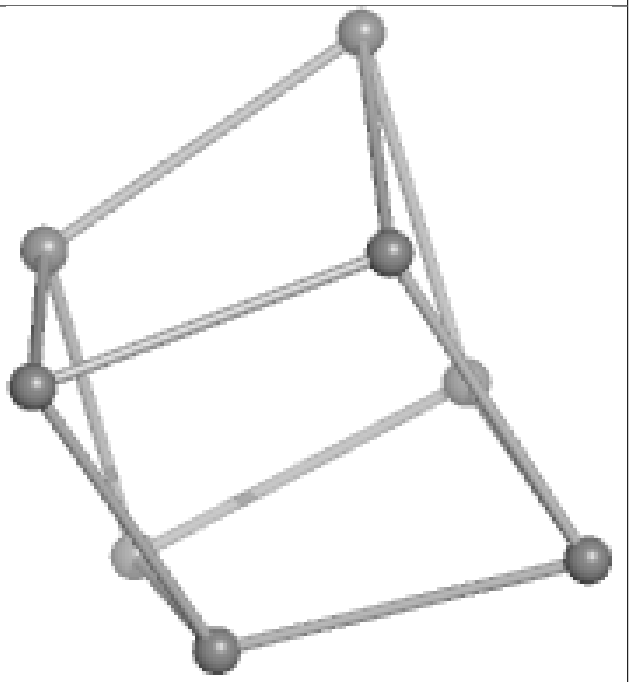


Rings

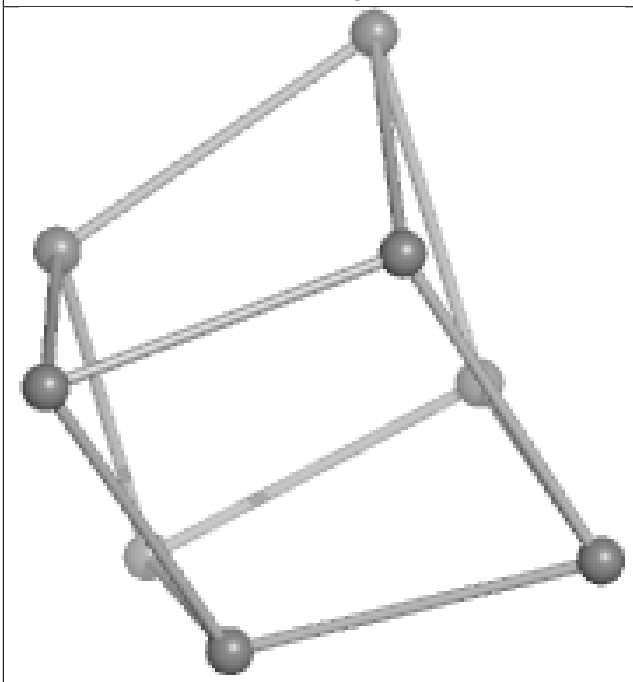
Ligand SF4 F 302



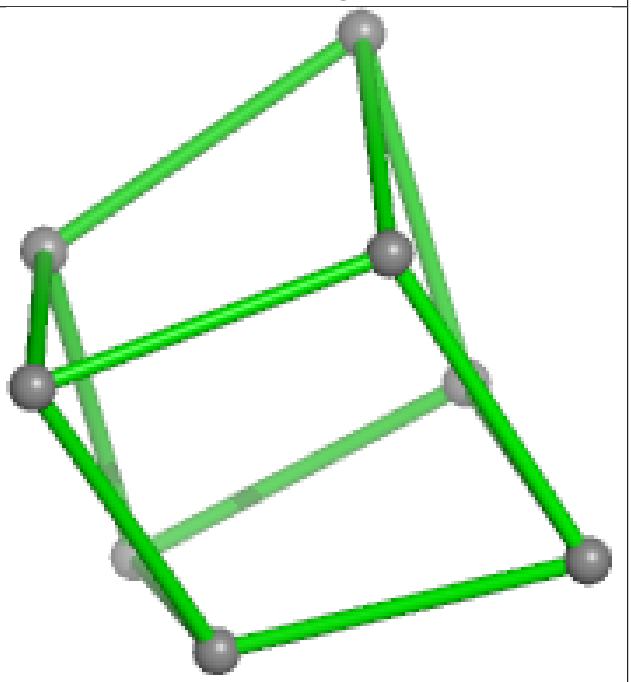
Bond lengths



Bond angles

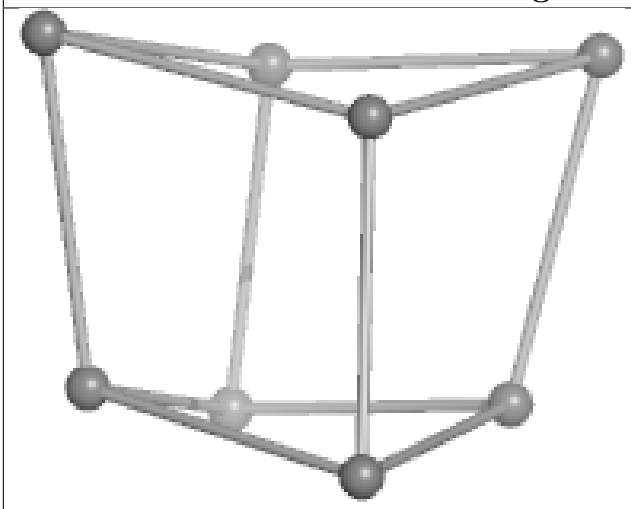


Torsions

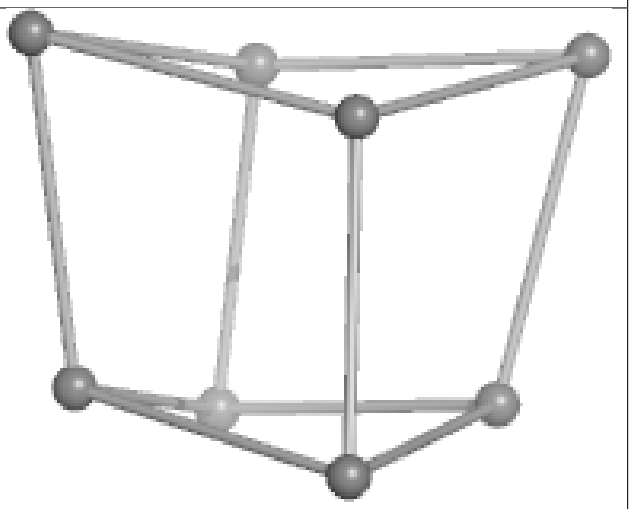


Rings

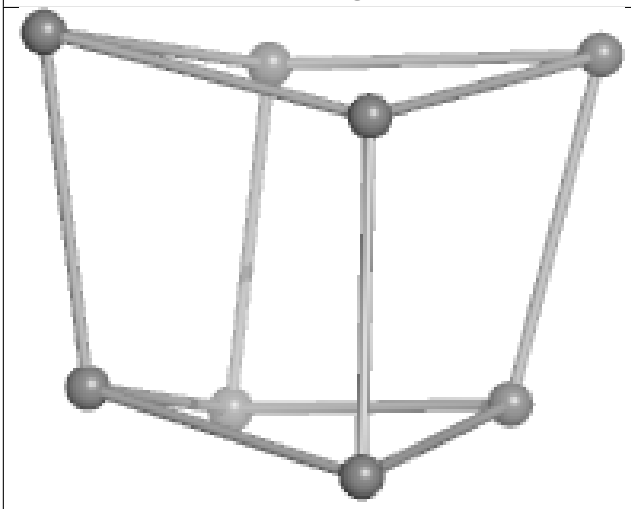
Ligand SF4 E 305



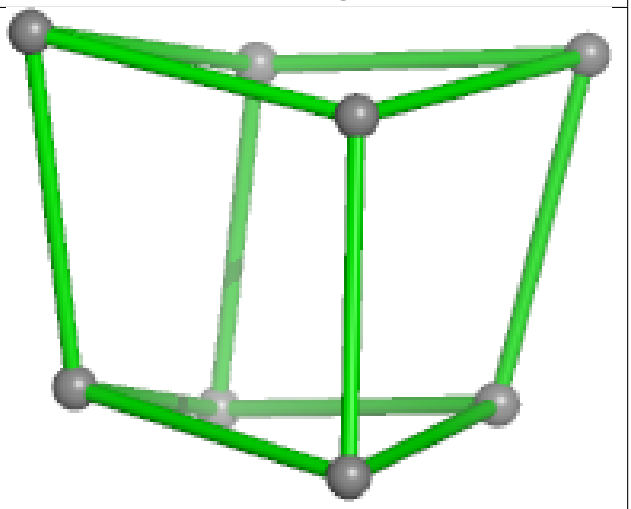
Bond lengths



Bond angles

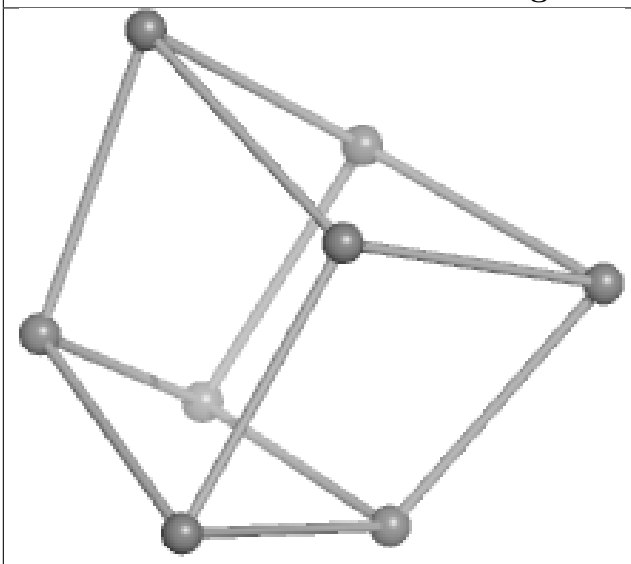


Torsions

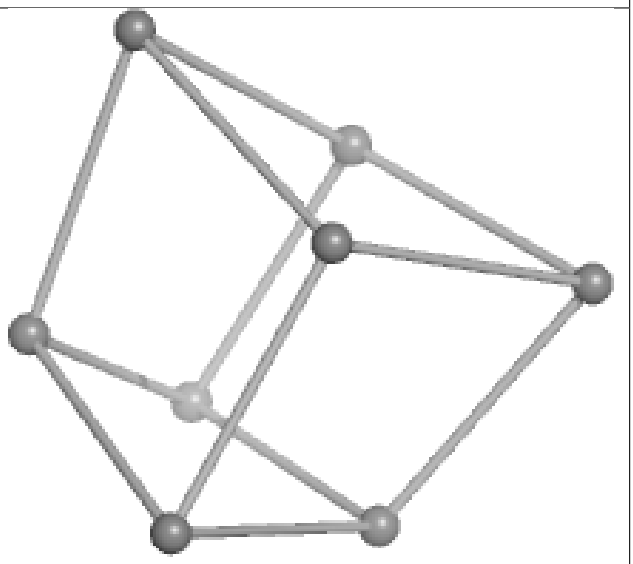


Rings

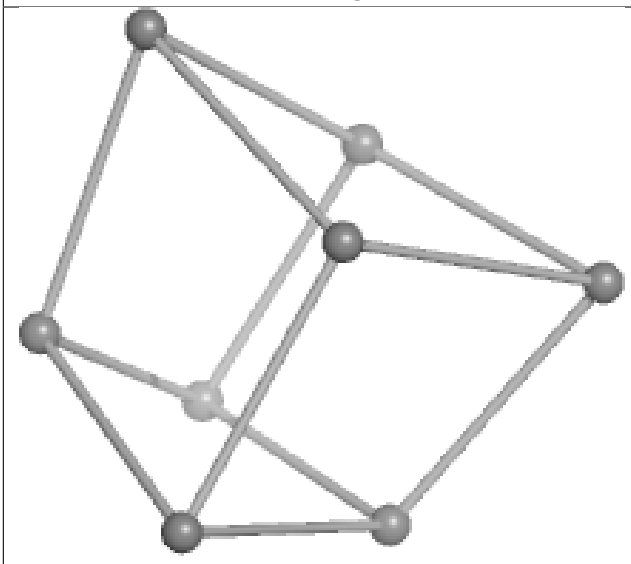
Ligand SF4 H 303



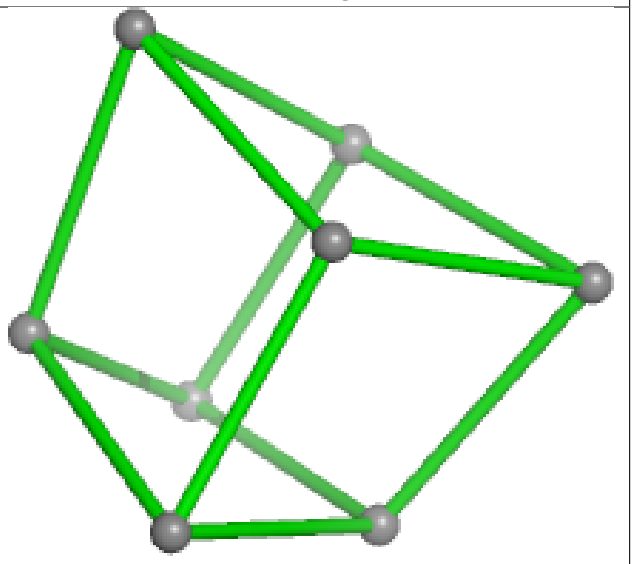
Bond lengths



Bond angles

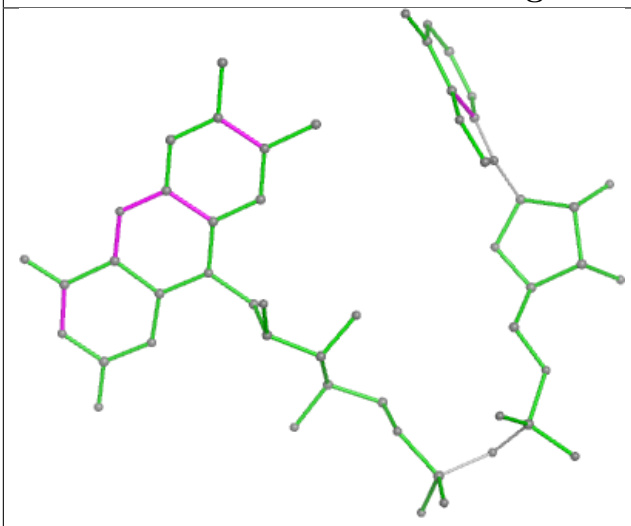


Torsions

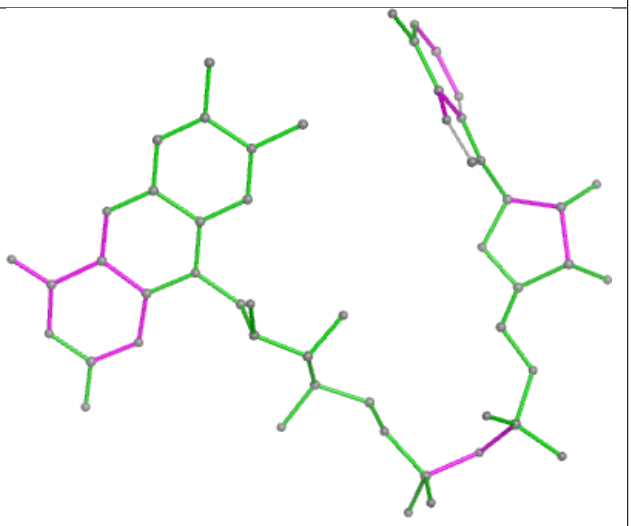


Rings

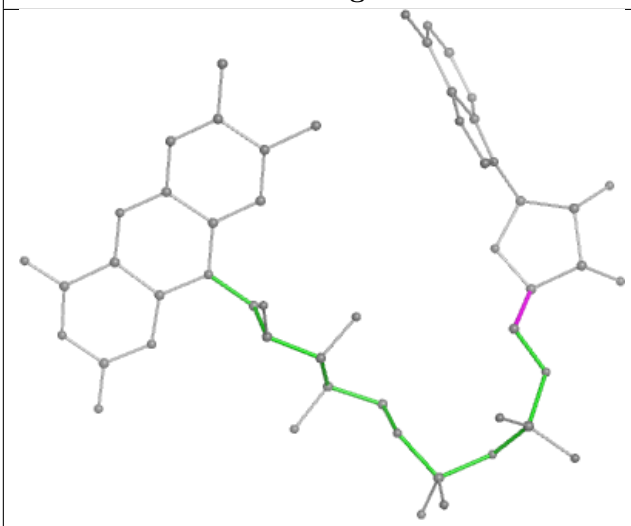
Ligand FAD E 301



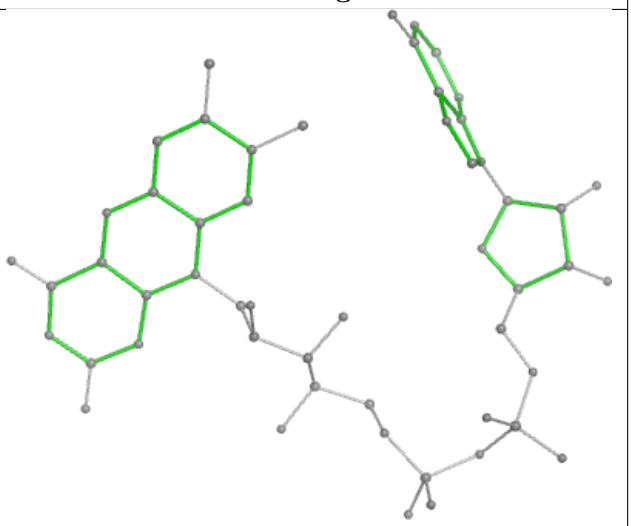
Bond lengths



Bond angles

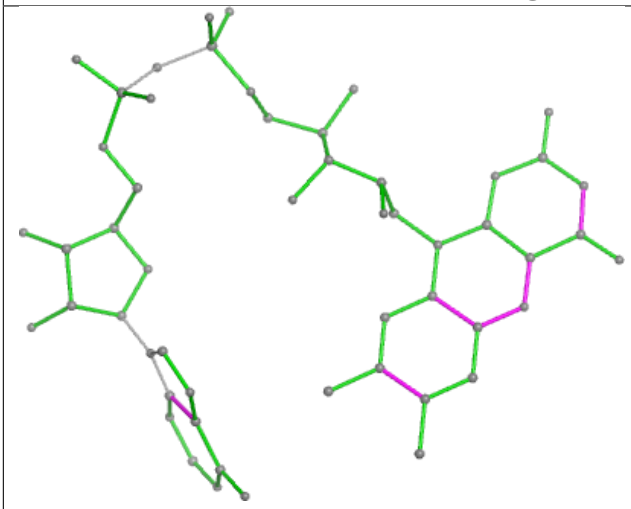


Torsions

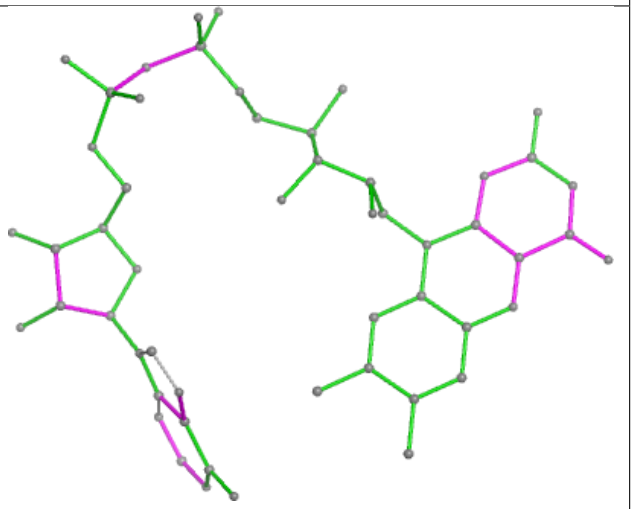


Rings

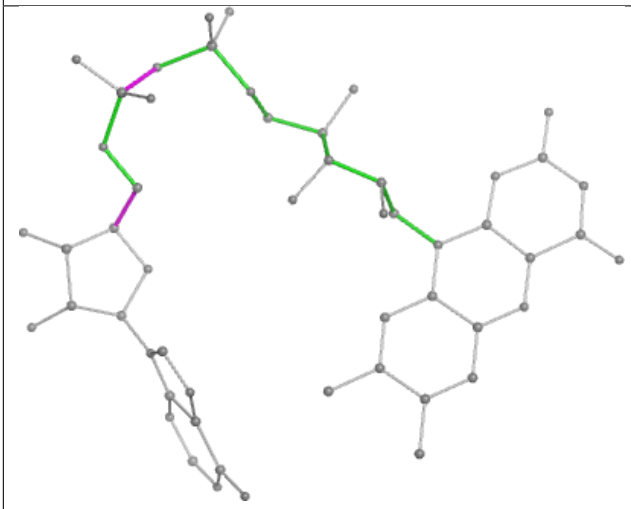
Ligand FAD K 301



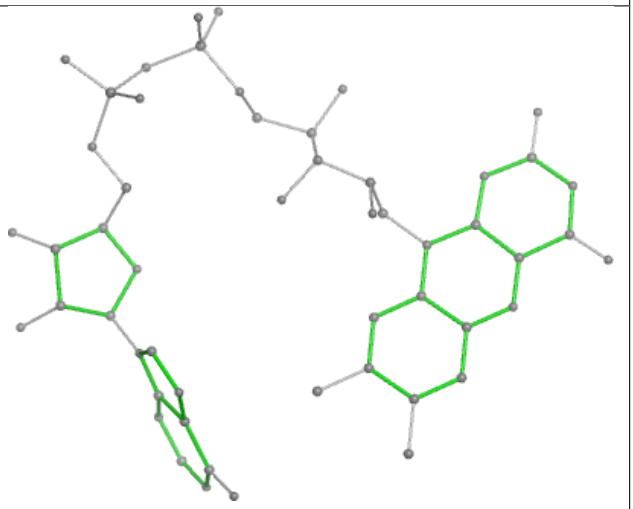
Bond lengths



Bond angles

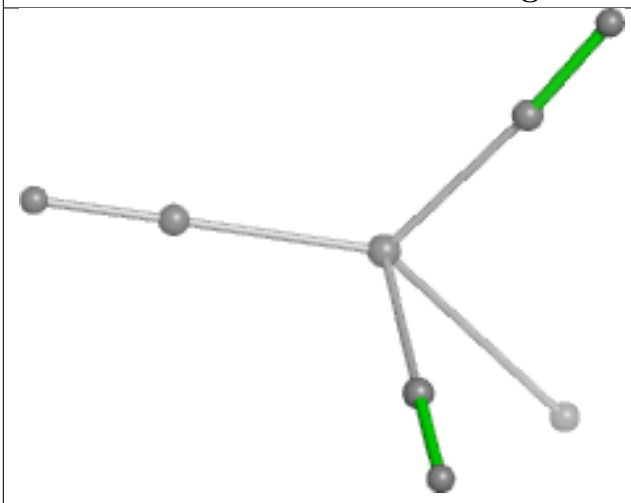


Torsions

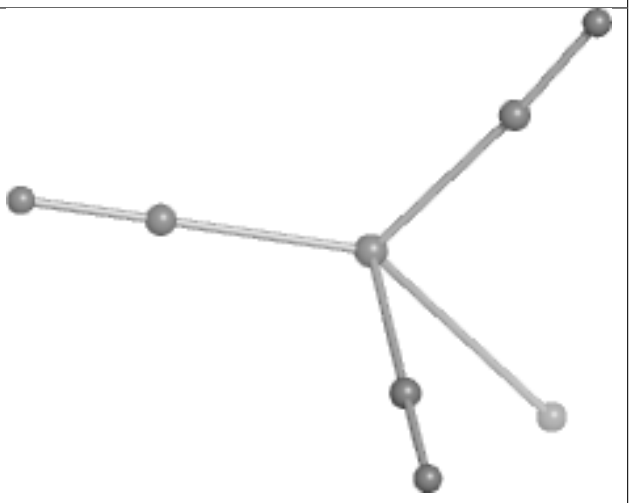


Rings

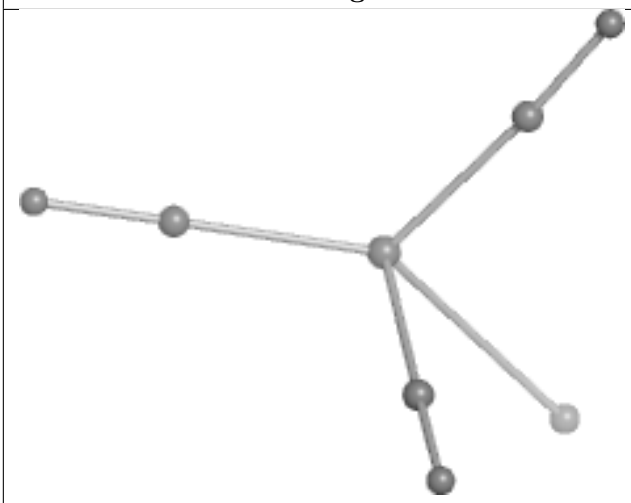
Ligand NFU G 506



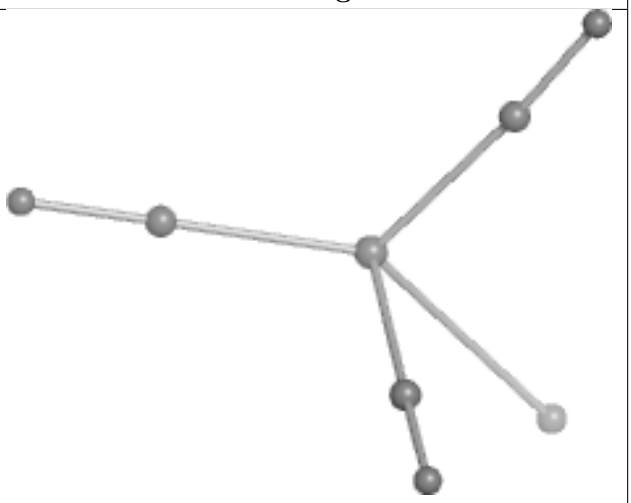
Bond lengths



Bond angles

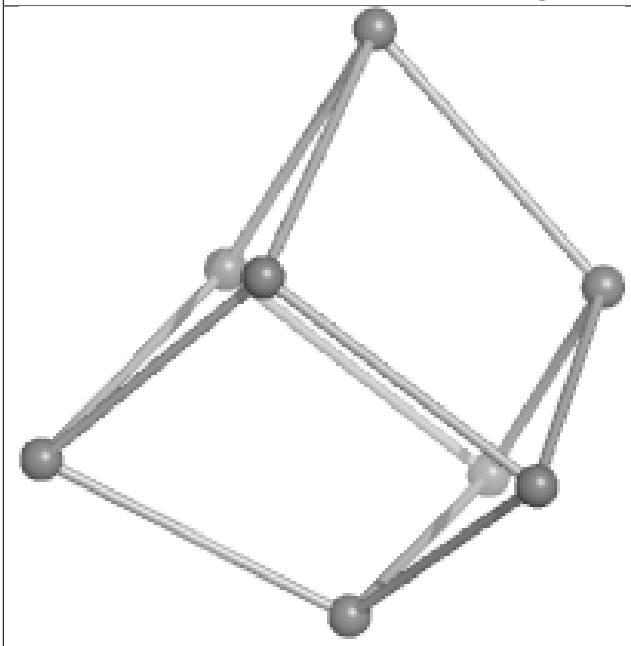


Torsions

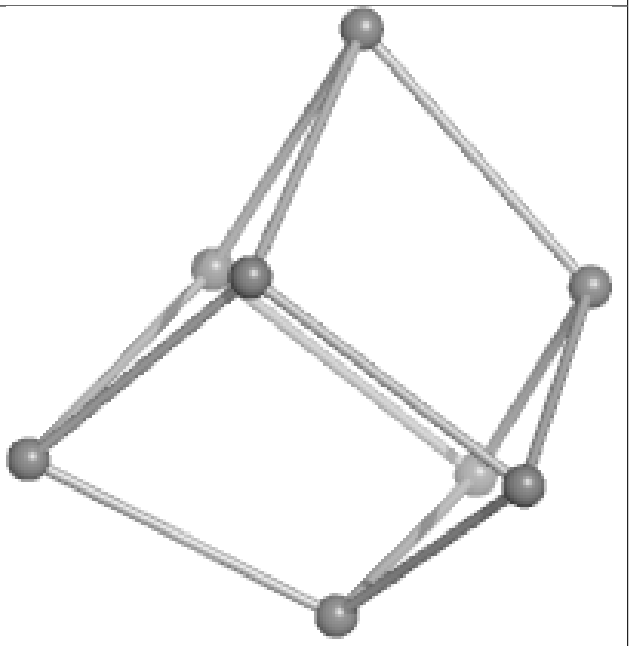


Rings

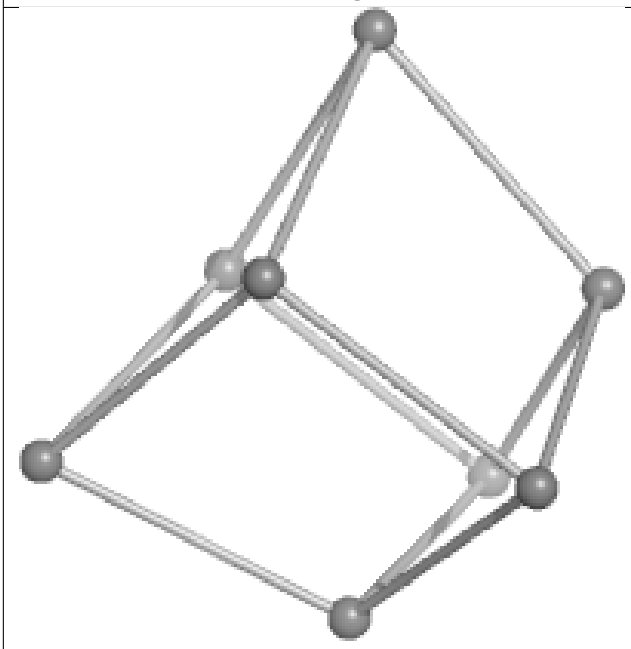
Ligand SF4 L 303



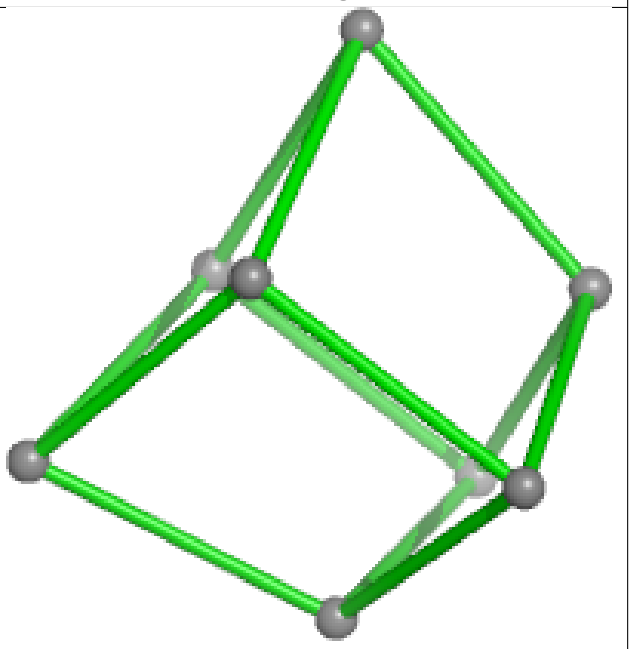
Bond lengths



Bond angles

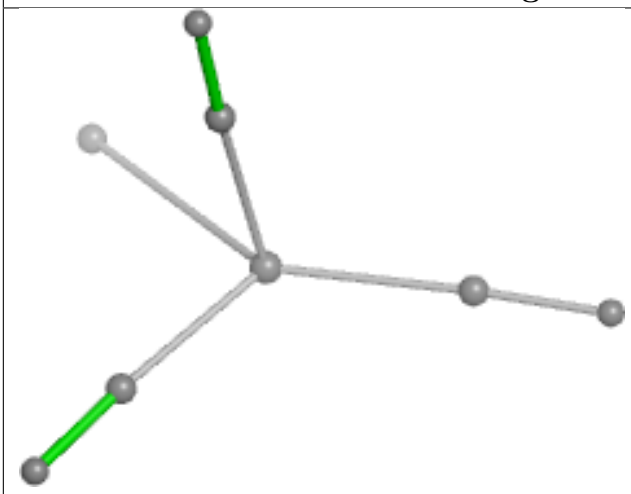


Torsions

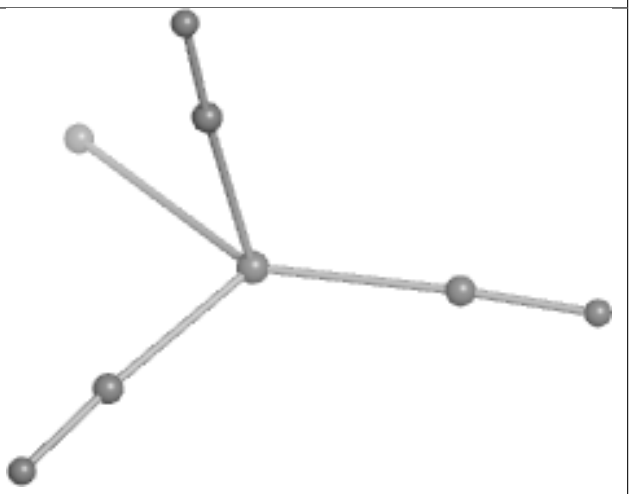


Rings

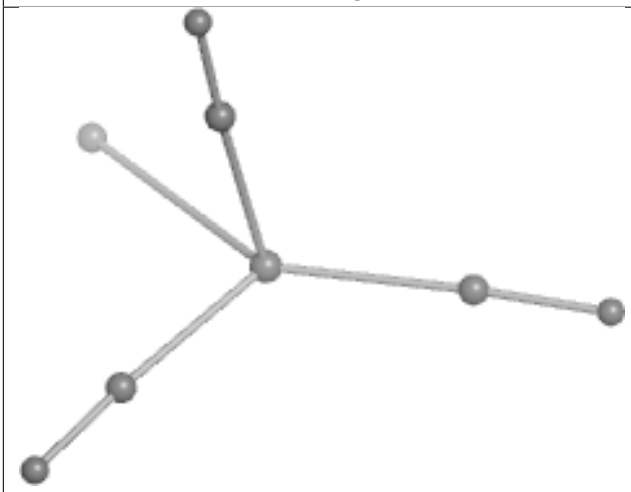
Ligand NFU A 503



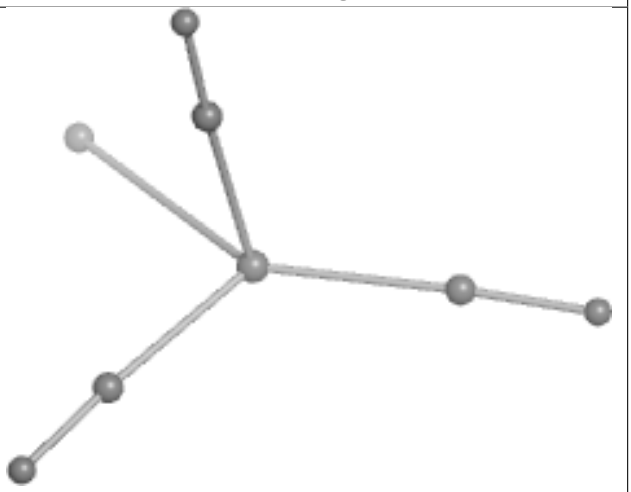
Bond lengths



Bond angles

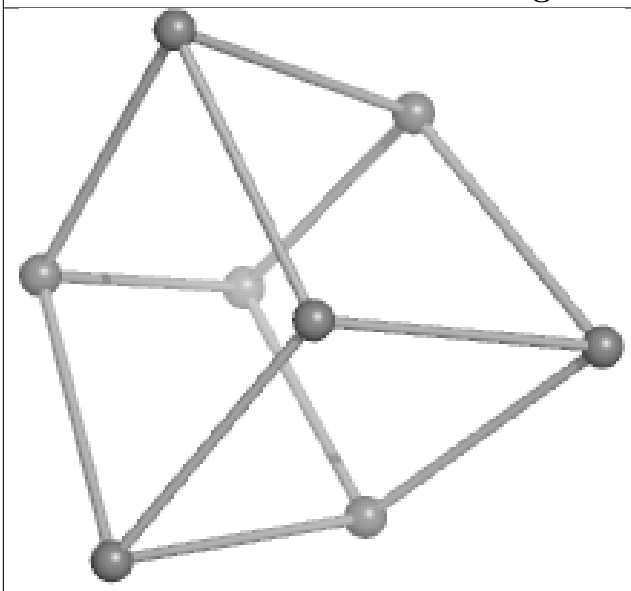


Torsions

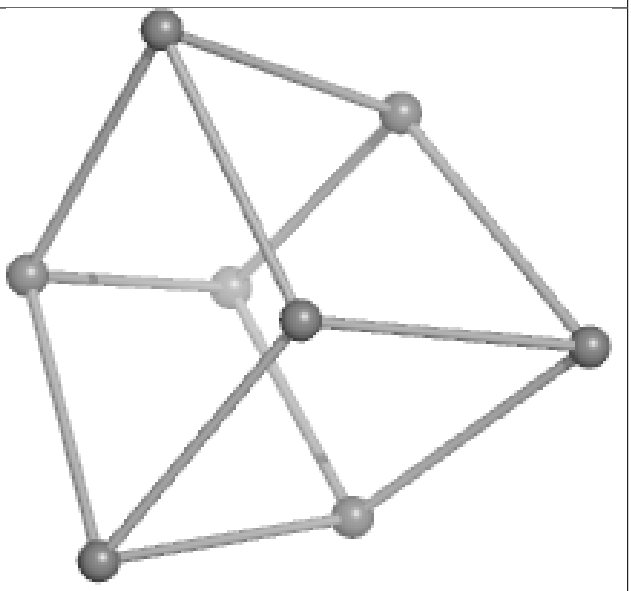


Rings

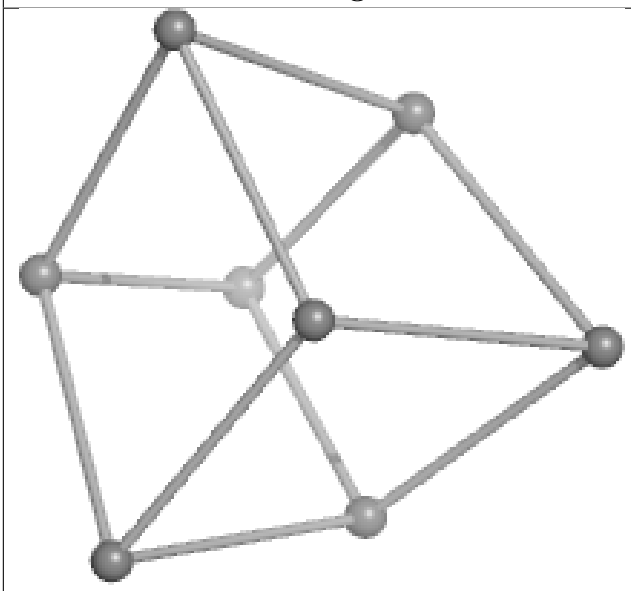
Ligand SF4 F 301



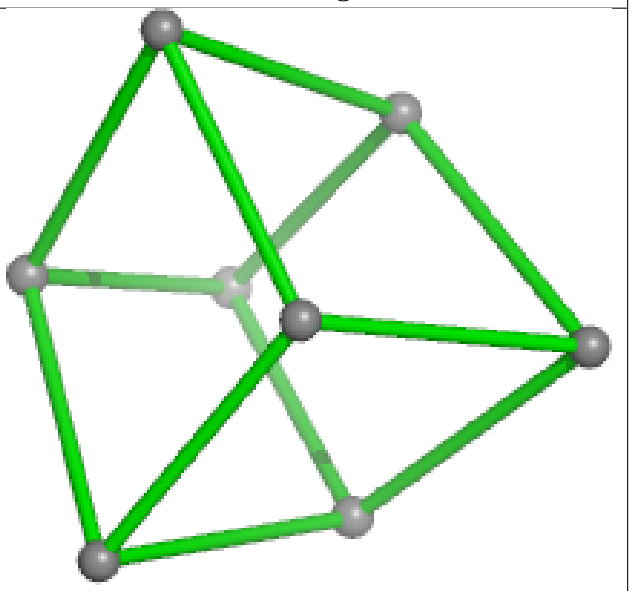
Bond lengths



Bond angles

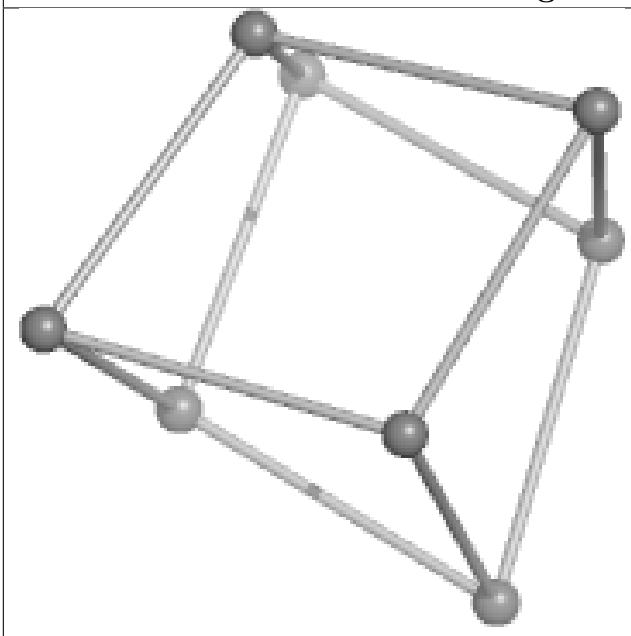


Torsions

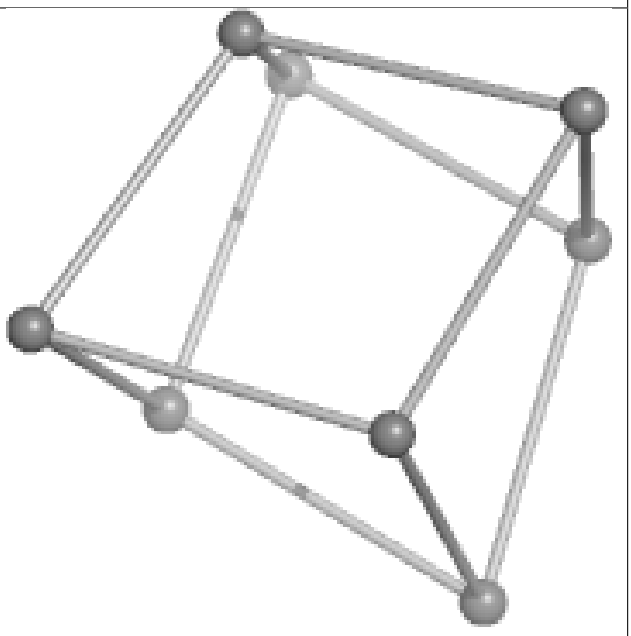


Rings

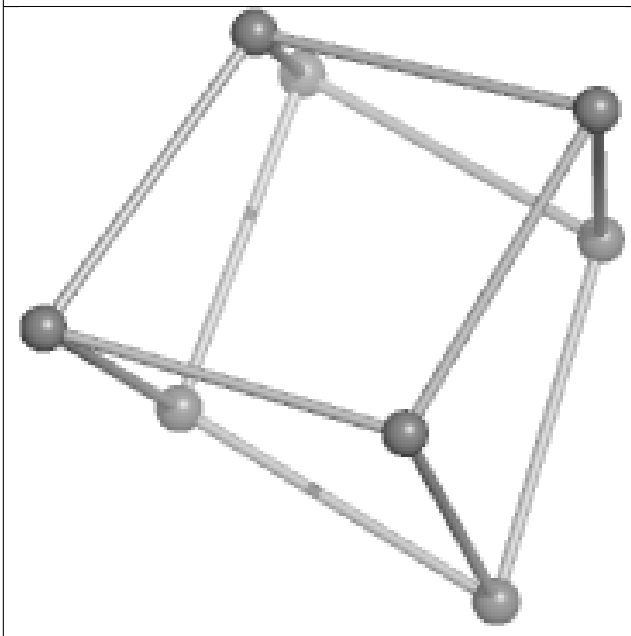
Ligand SF4 I 301



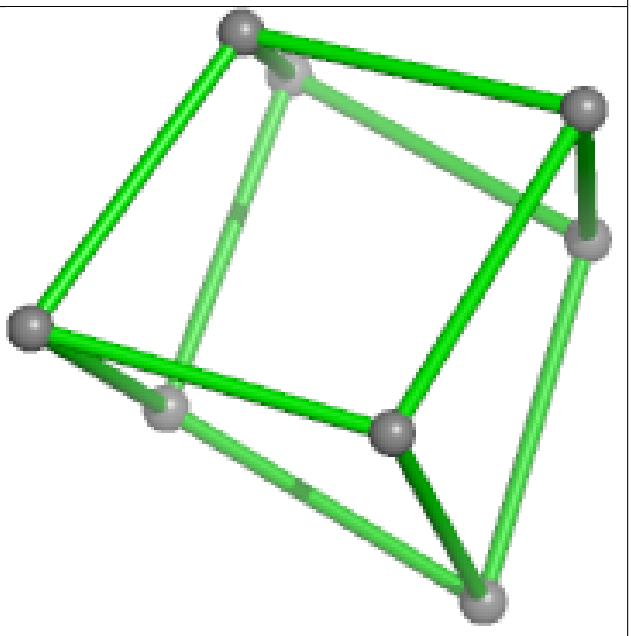
Bond lengths



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	392/410 (95%)	-0.32	0 100 100	65, 83, 116, 152	0
1	D	392/410 (95%)	-0.69	0 100 100	50, 66, 92, 111	0
1	G	392/410 (95%)	-0.75	2 (0%) 87 86	47, 63, 88, 125	0
1	J	392/410 (95%)	-0.71	0 100 100	48, 65, 96, 135	0
2	B	282/282 (100%)	-0.30	0 100 100	65, 87, 115, 135	0
2	E	282/282 (100%)	-0.18	1 (0%) 89 88	68, 96, 121, 158	0
2	H	282/282 (100%)	-0.45	0 100 100	59, 82, 106, 133	0
2	K	282/282 (100%)	-0.49	0 100 100	59, 81, 110, 137	0
3	C	240/241 (99%)	0.03	7 (2%) 54 50	70, 94, 138, 163	0
3	F	240/241 (99%)	-0.09	5 (2%) 63 60	66, 84, 124, 164	0
3	I	240/241 (99%)	-0.29	8 (3%) 49 44	58, 77, 122, 148	1 (0%)
3	L	240/241 (99%)	-0.30	4 (1%) 69 65	55, 79, 124, 153	1 (0%)
All	All	3656/3732 (97%)	-0.42	27 (0%) 84 83	47, 78, 115, 164	2 (0%)

The worst 5 of 27 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	C	115	GLN	5.9
3	F	27	LEU	5.8
3	F	116	MET	4.3
3	I	115	GLN	4.1
3	F	115	GLN	3.8

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 (i)

There are no oligosaccharides in this entry.

6.4 Ligands (i)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
7	GOL	G	503	6/6	0.39	0.19	100,117,133,138	0
4	SO4	B	303	5/5	0.48	0.11	139,139,179,193	0
4	SO4	J	504	5/5	0.53	0.13	122,123,142,159	0
4	SO4	E	303	5/5	0.56	0.10	149,168,179,191	0
4	SO4	J	502	5/5	0.59	0.11	131,143,178,180	0
7	GOL	J	509	6/6	0.59	0.21	92,109,113,117	0
7	GOL	D	504	6/6	0.65	0.26	89,98,105,110	0
4	SO4	K	302	5/5	0.68	0.07	149,152,176,182	0
4	SO4	E	302	5/5	0.68	0.12	125,132,148,151	0
4	SO4	E	304	5/5	0.69	0.07	144,162,167,176	0
4	SO4	A	501	5/5	0.71	0.13	118,134,161,168	0
4	SO4	J	505	5/5	0.71	0.15	132,133,153,165	0
7	GOL	B	304	6/6	0.72	0.16	85,98,102,108	0
4	SO4	B	302	5/5	0.72	0.07	136,139,156,163	0
4	SO4	D	503	5/5	0.73	0.08	131,133,169,175	0
7	GOL	D	505	6/6	0.73	0.21	84,101,105,107	0
7	GOL	D	508	6/6	0.75	0.21	94,109,111,116	0
7	GOL	D	510	6/6	0.75	0.13	103,106,121,125	0
7	GOL	D	509	6/6	0.76	0.17	102,104,107,114	0
7	GOL	D	506	6/6	0.76	0.17	78,93,101,111	0
7	GOL	G	504	6/6	0.77	0.23	86,88,104,106	0
4	SO4	H	302	5/5	0.78	0.06	126,139,150,151	0
4	SO4	D	502	5/5	0.80	0.15	101,104,137,137	0
4	SO4	C	301	5/5	0.82	0.10	122,128,144,162	0
7	GOL	J	508	6/6	0.82	0.12	97,110,114,116	0
4	SO4	J	501	5/5	0.82	0.15	94,106,119,122	0
4	SO4	A	502	5/5	0.85	0.19	98,111,130,133	0
7	GOL	D	507	6/6	0.86	0.22	95,102,117,132	0
7	GOL	J	506	6/6	0.86	0.15	78,90,100,103	0
7	GOL	G	505	6/6	0.87	0.15	77,90,95,101	0
7	GOL	J	507	6/6	0.87	0.15	86,92,97,102	0
4	SO4	G	502	5/5	0.88	0.16	103,118,123,136	0

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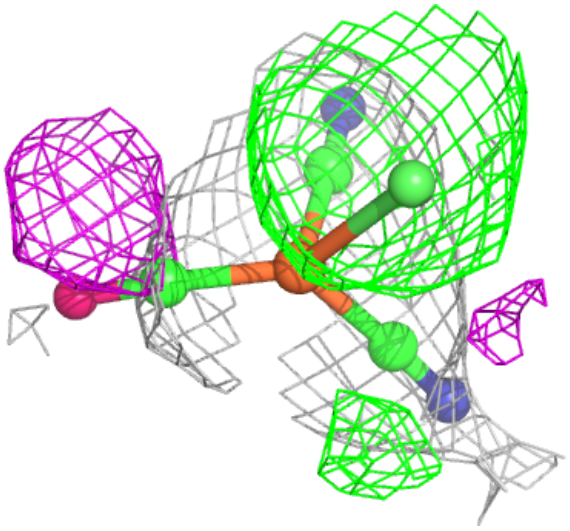
Continued from previous page...

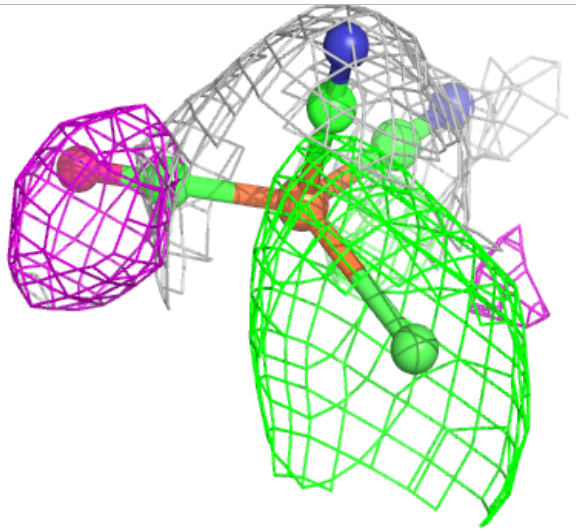
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	SO4	D	501	5/5	0.90	0.20	88,93,111,116	0
4	SO4	G	501	5/5	0.90	0.17	98,98,124,128	0
4	SO4	J	503	5/5	0.90	0.15	76,88,114,126	0
5	NFU	A	503	8/8	0.92	0.17	65,77,104,171	0
6	FAD	K	301	53/53	0.95	0.11	49,78,91,100	0
6	FAD	E	301	53/53	0.95	0.11	58,89,104,110	0
6	FAD	B	301	53/53	0.97	0.08	55,78,89,97	0
6	FAD	H	301	53/53	0.97	0.08	58,77,89,92	0
5	NFU	G	506	8/8	0.98	0.09	49,60,79,84	0
5	NFU	J	510	8/8	0.98	0.12	52,61,81,83	0
5	NFU	D	511	8/8	0.98	0.11	48,63,74,78	0
8	SF4	B	305	8/8	0.99	0.04	70,77,79,89	0
8	SF4	C	302	8/8	0.99	0.04	66,78,84,93	0
8	SF4	C	304	8/8	0.99	0.03	61,67,71,71	0
8	SF4	E	305	8/8	0.99	0.04	79,85,92,92	0
8	SF4	F	301	8/8	0.99	0.04	61,64,68,68	0
8	SF4	F	302	8/8	0.99	0.03	61,64,68,72	0
8	SF4	F	303	8/8	0.99	0.04	70,73,81,82	0
8	SF4	H	303	8/8	0.99	0.04	55,66,71,73	0
8	SF4	I	301	8/8	0.99	0.04	58,60,65,65	0
8	SF4	I	302	8/8	0.99	0.03	55,59,60,61	0
8	SF4	I	303	8/8	0.99	0.04	56,62,65,66	0
8	SF4	K	303	8/8	0.99	0.05	59,68,74,83	0
8	SF4	L	301	8/8	0.99	0.03	54,59,61,62	0
8	SF4	L	302	8/8	0.99	0.03	51,59,60,64	0
8	SF4	L	303	8/8	0.99	0.03	53,57,59,59	0
8	SF4	C	303	8/8	1.00	0.03	62,69,72,73	0

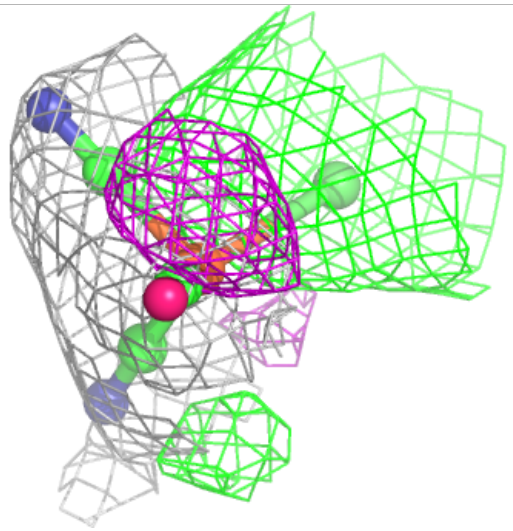
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around NFU A 503:

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

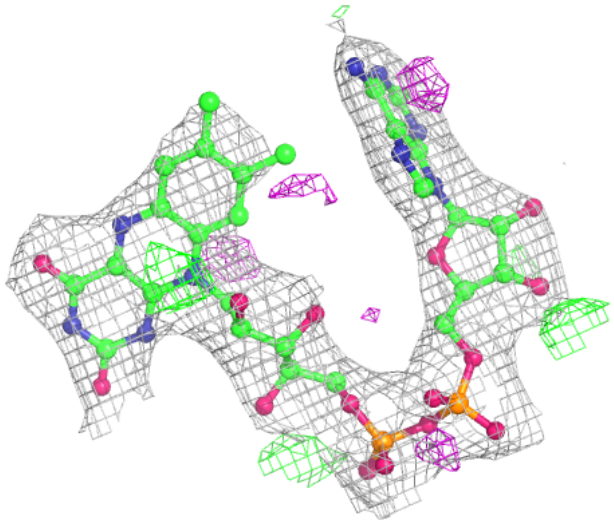


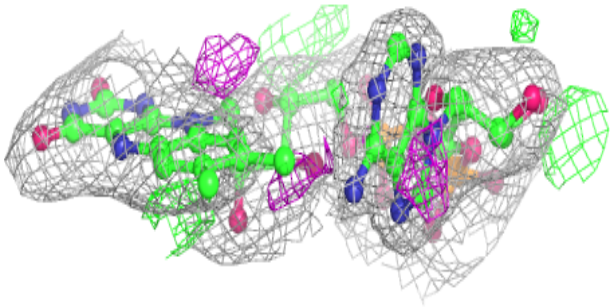


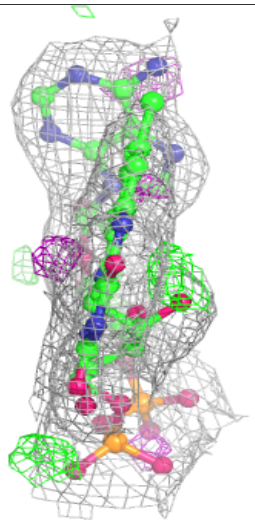


Electron density around FAD K 301:

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

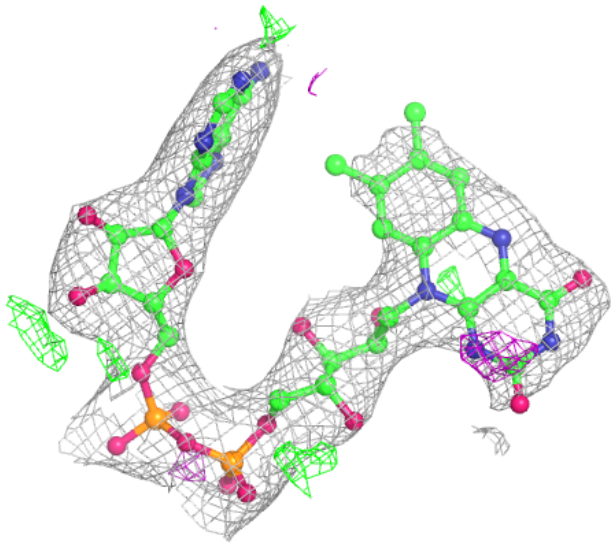


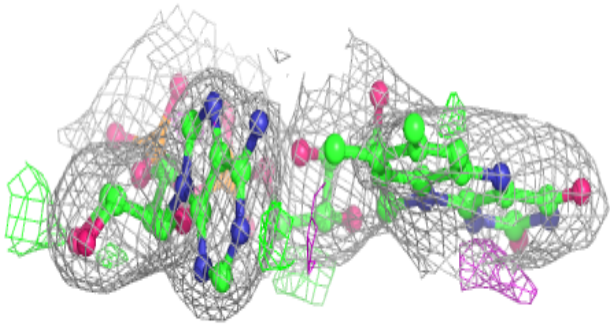


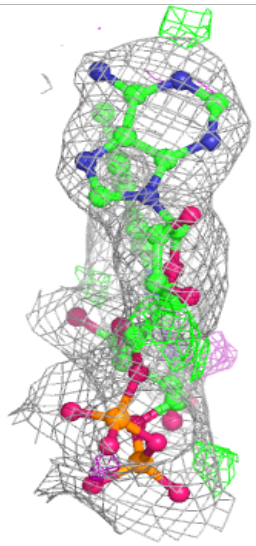


Electron density around FAD E 301:

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

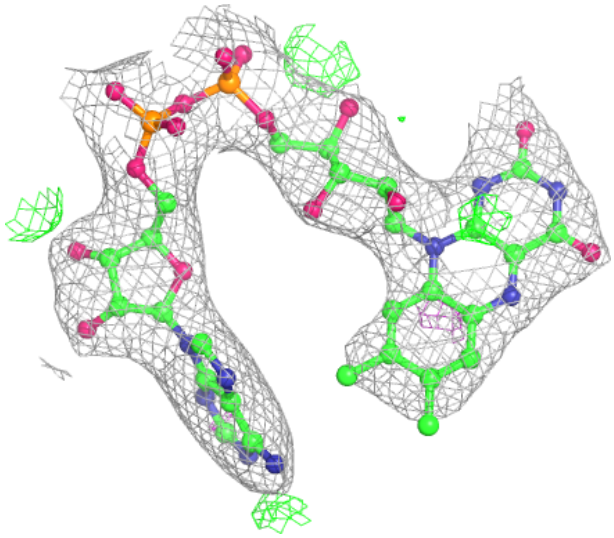


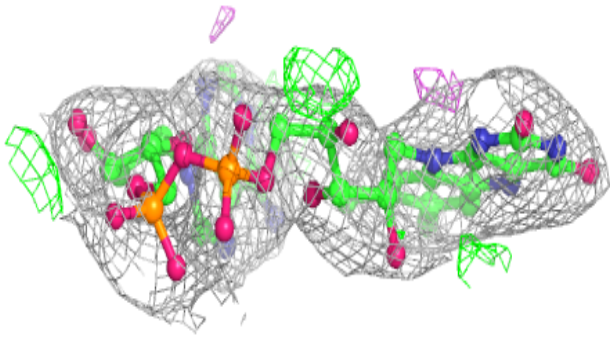


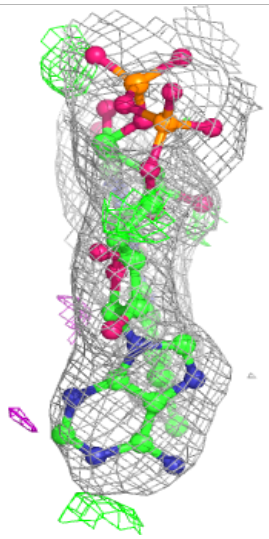


Electron density around FAD B 301:

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

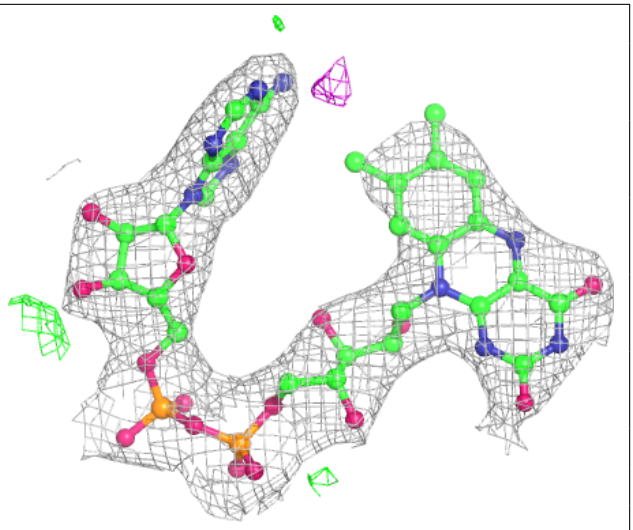


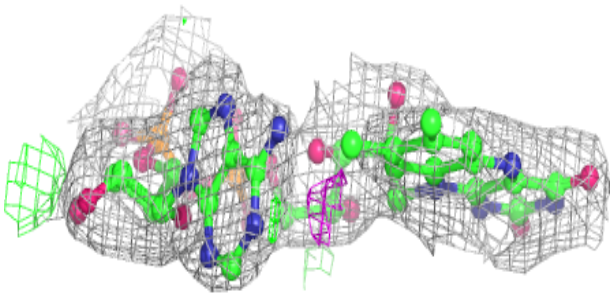


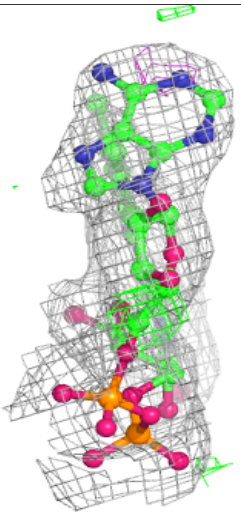


Electron density around FAD H 301:

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

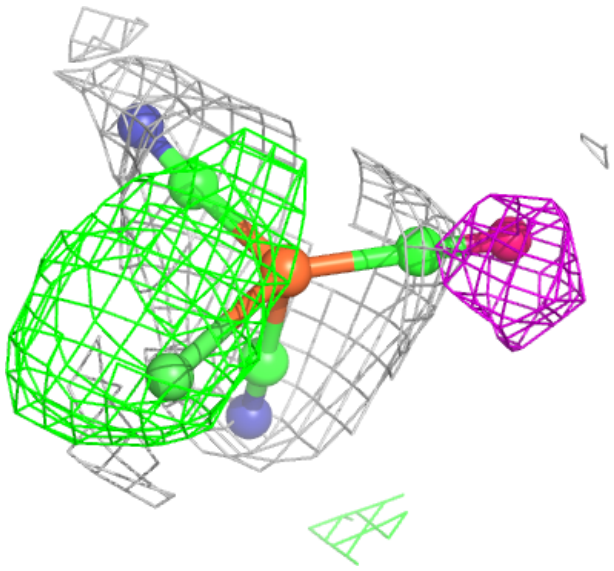


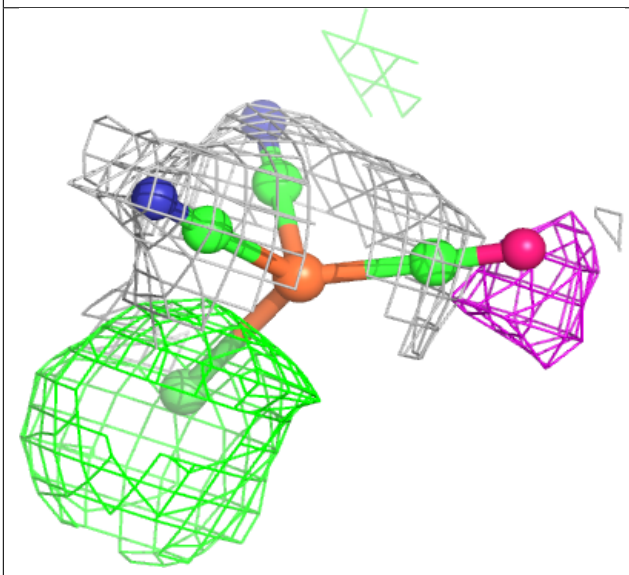


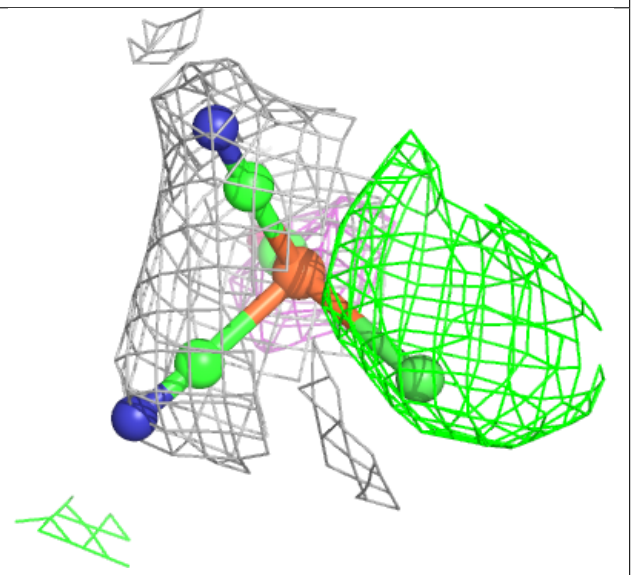


Electron density around NFU G 506:

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

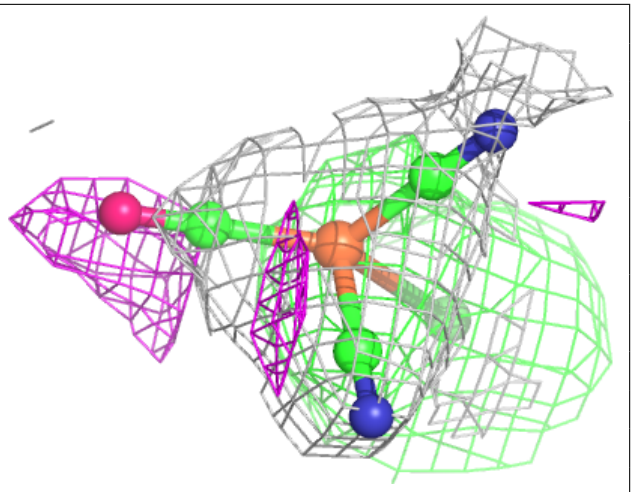


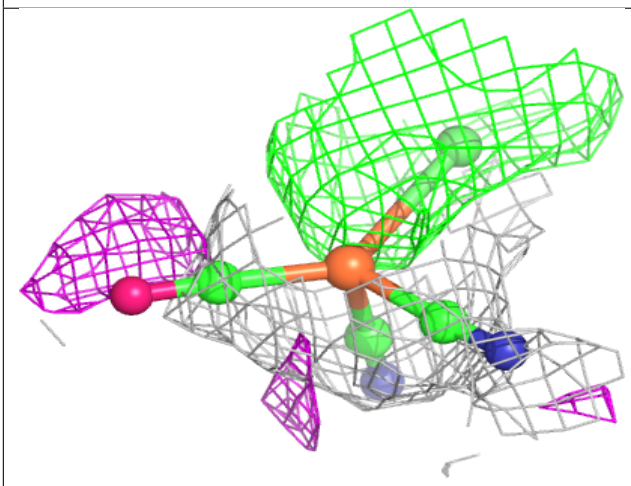


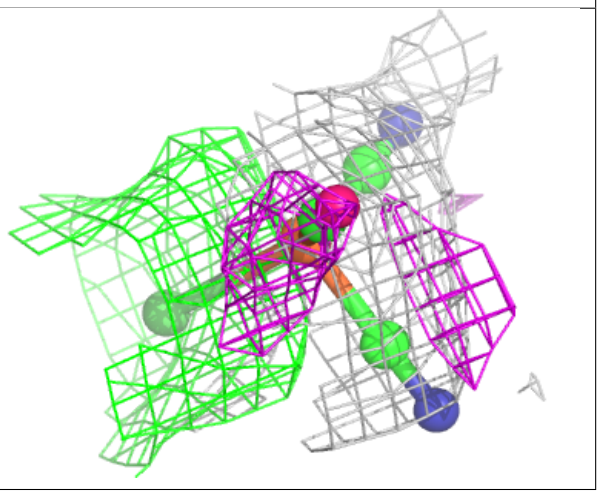


Electron density around NFU J 510:

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

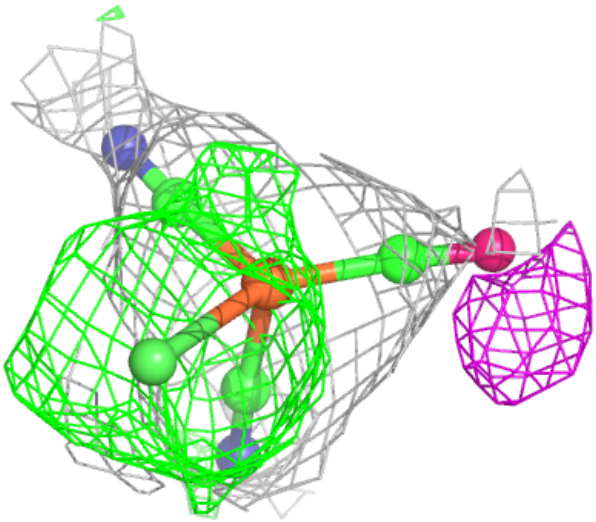


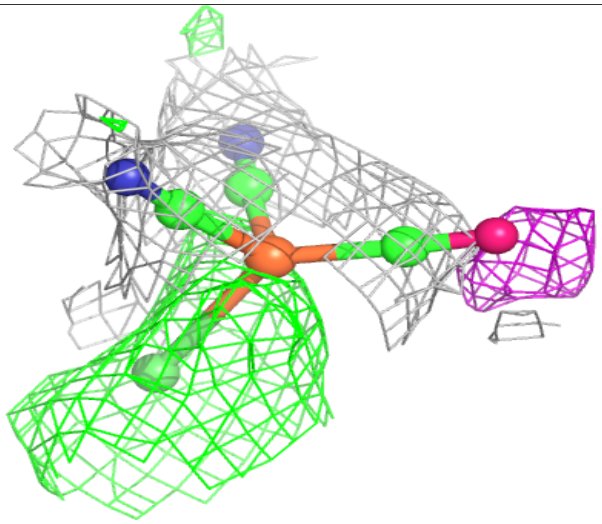


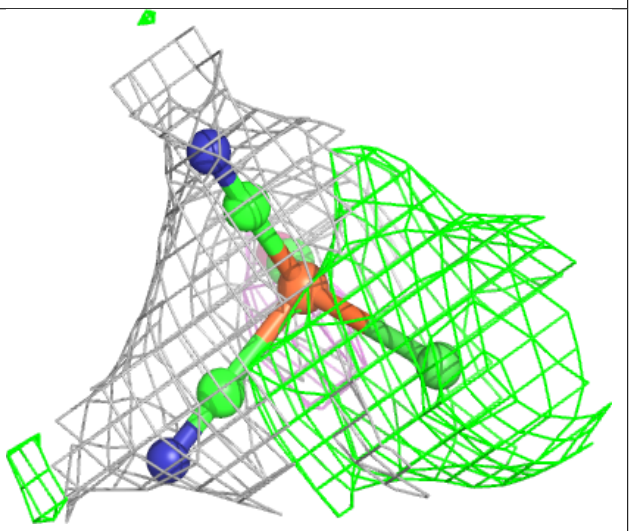


Electron density around NFU D 511:

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

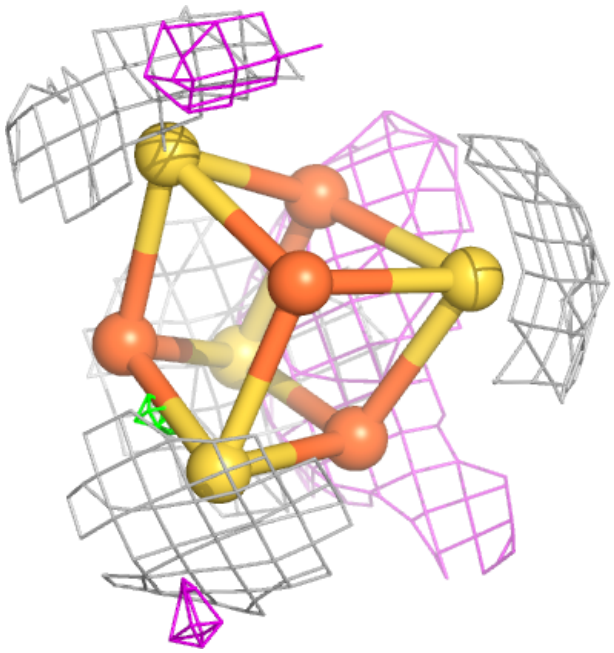


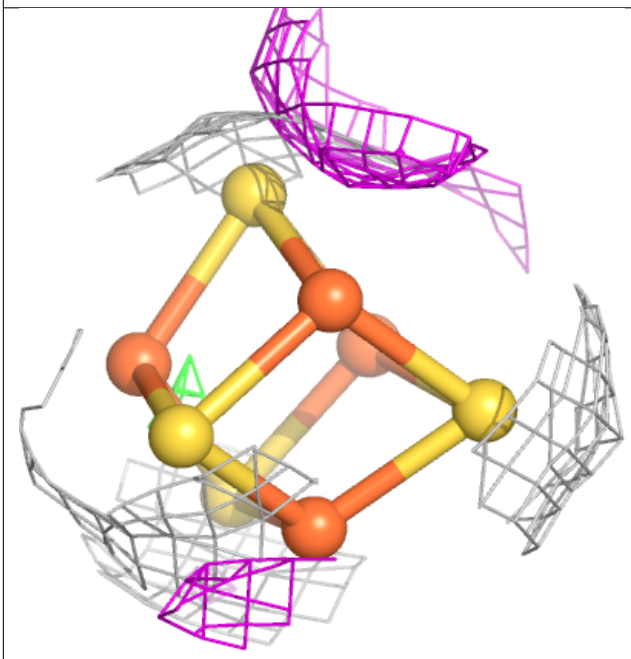


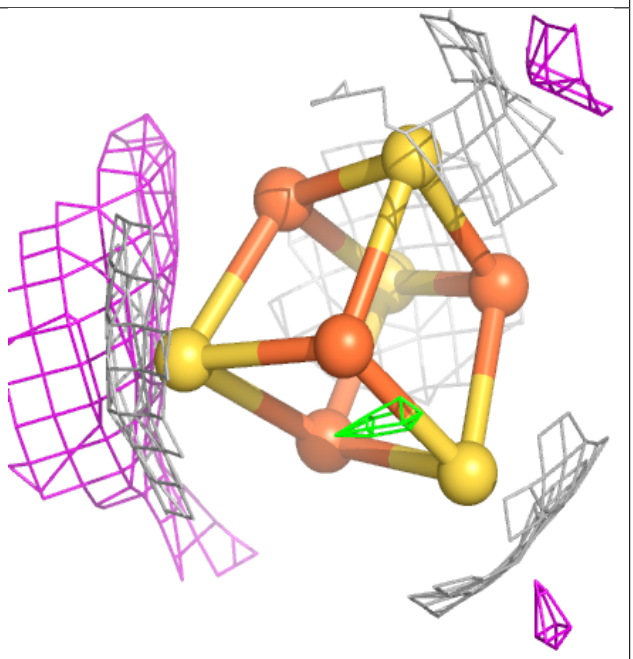


Electron density around SF4 B 305:

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

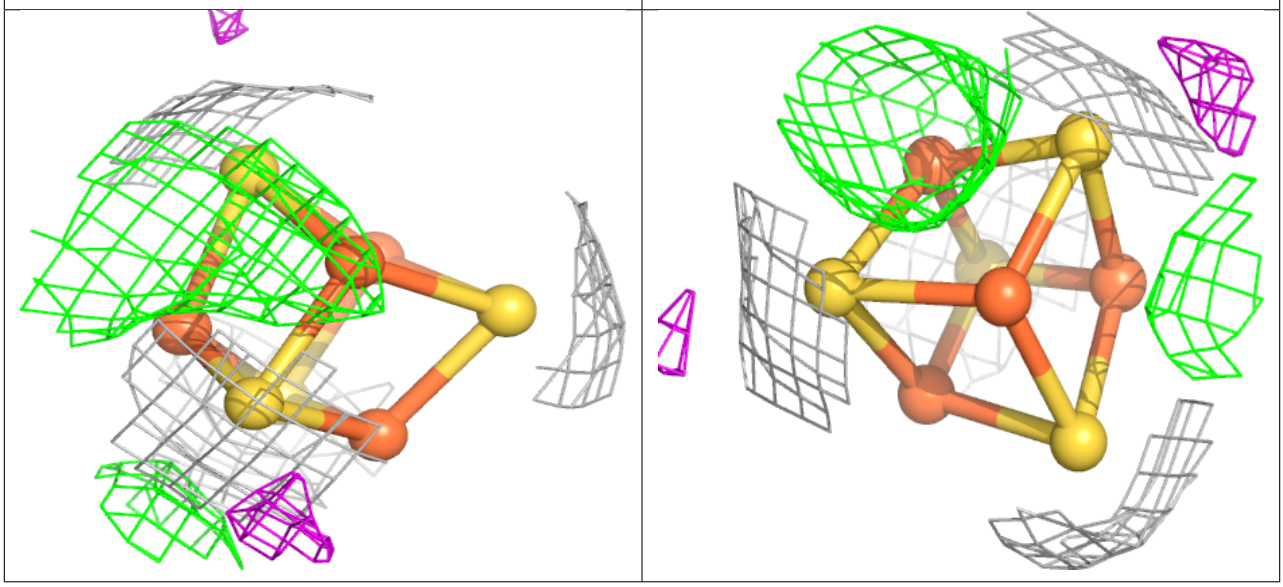






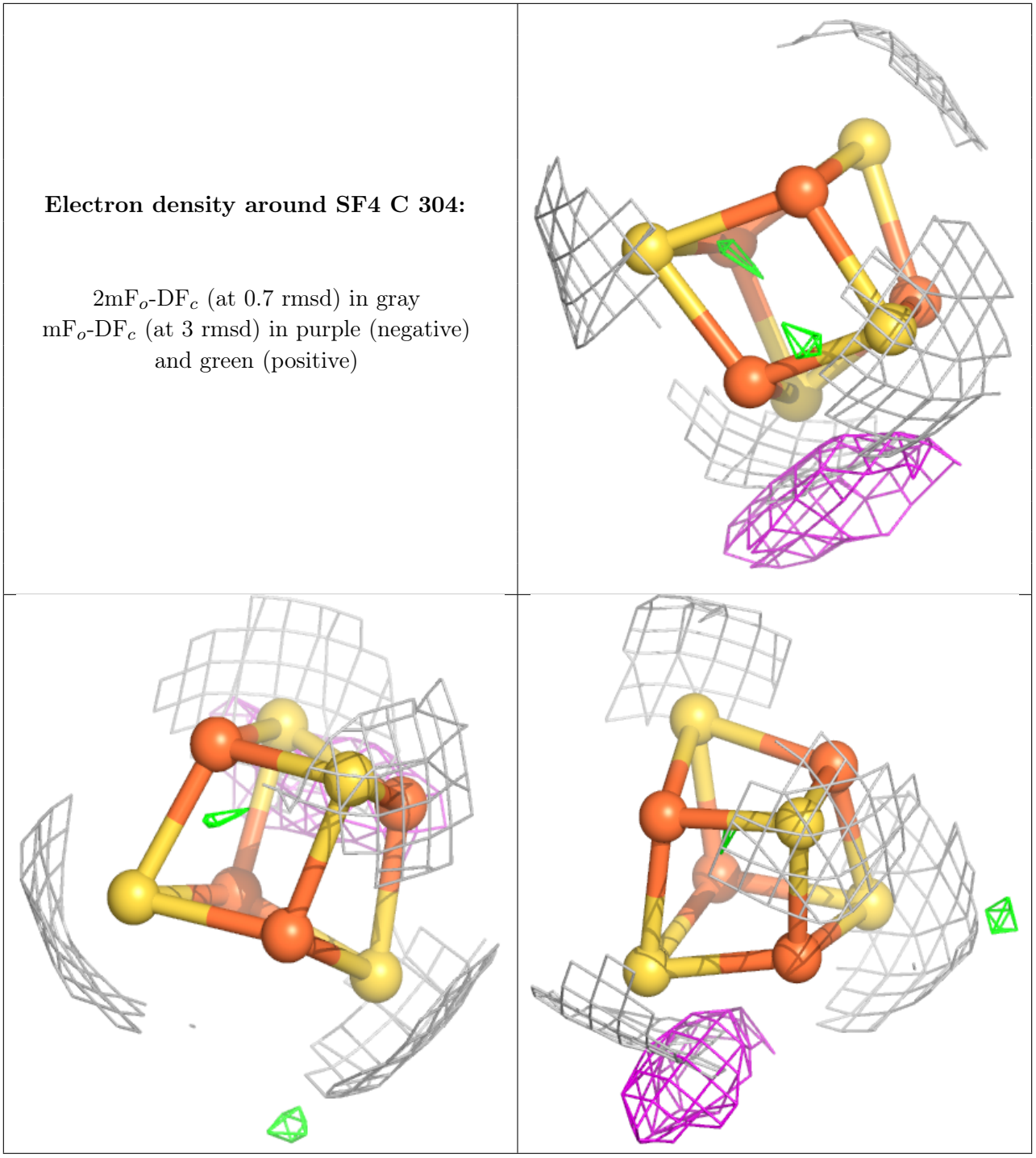
Electron density around SF4 C 302:

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



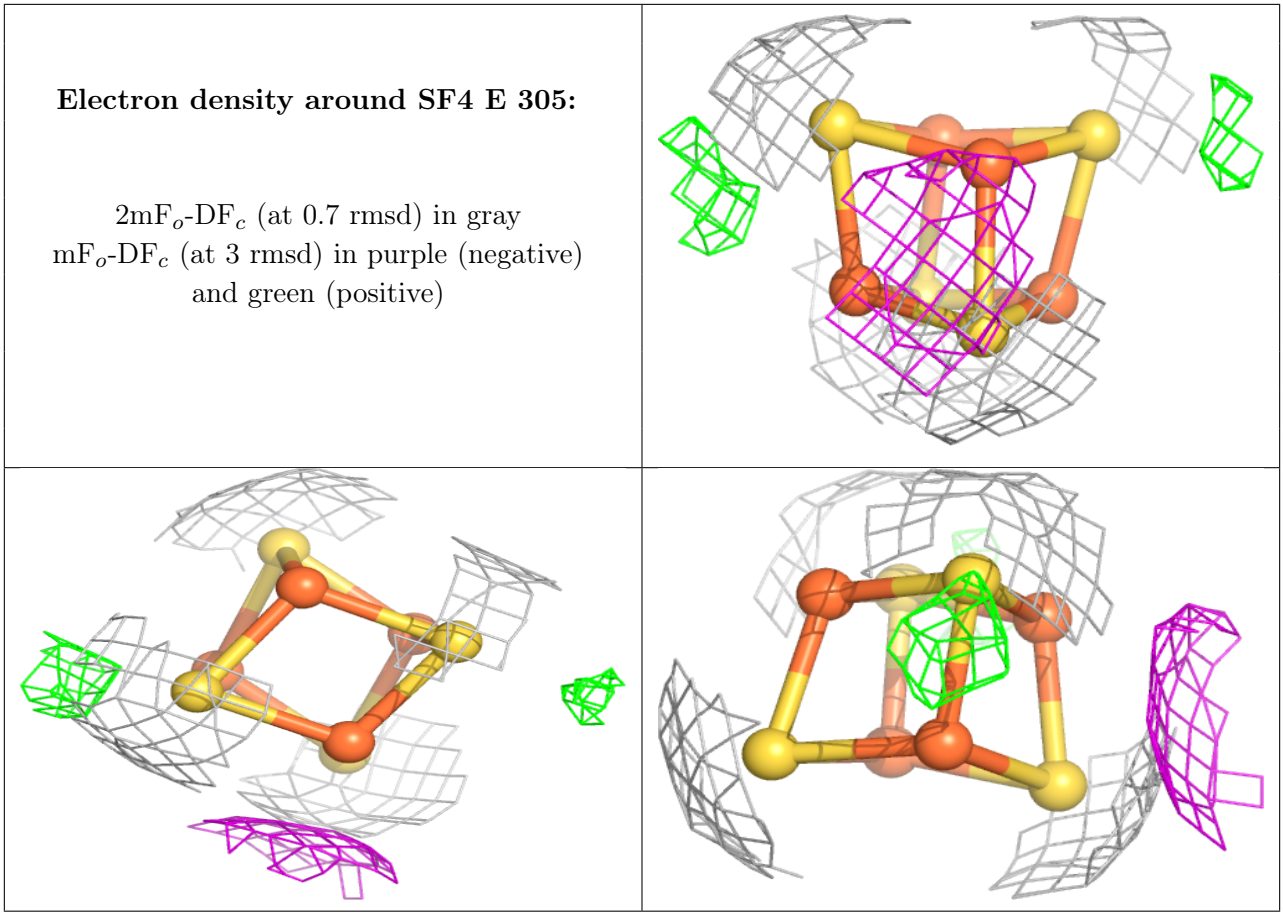
Electron density around SF4 C 304:

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



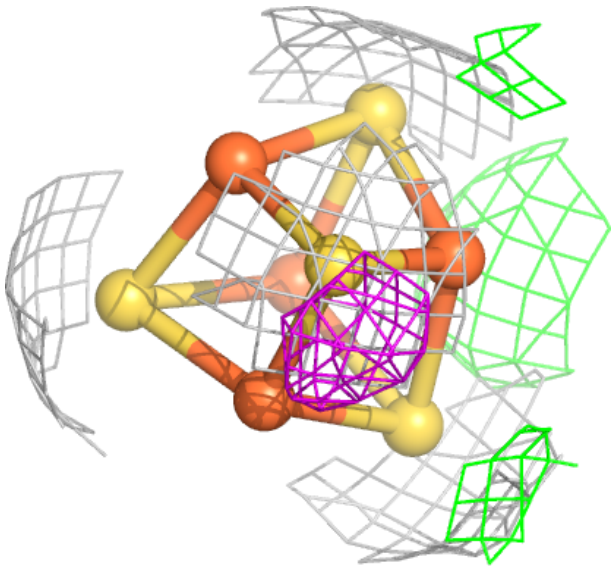
Electron density around SF4 E 305:

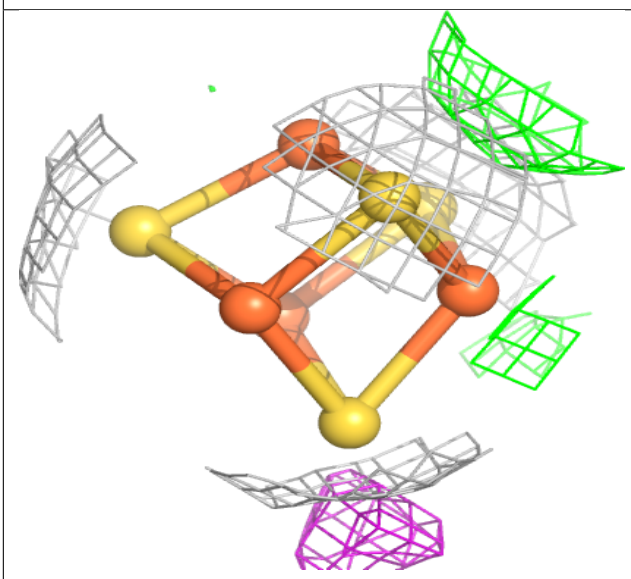
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

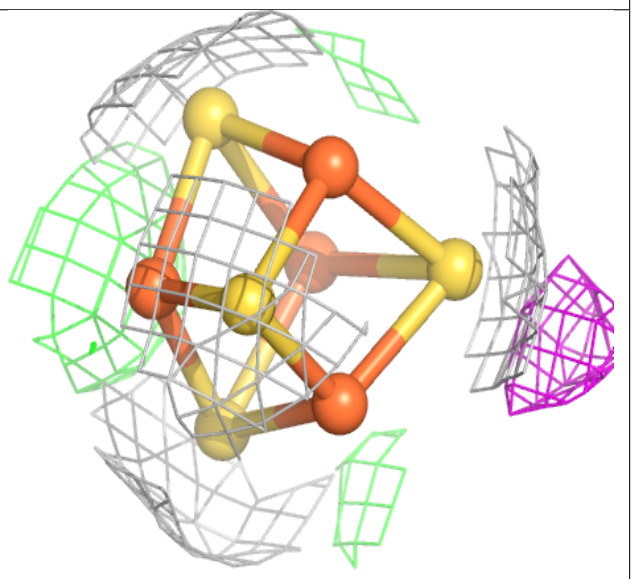


Electron density around SF4 F 301:

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

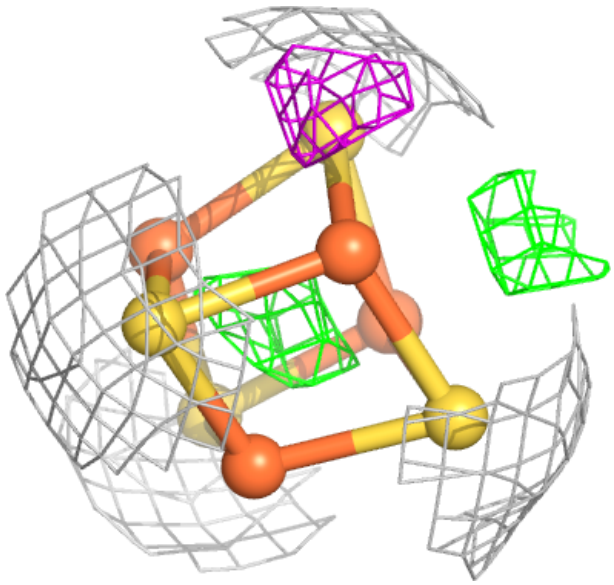


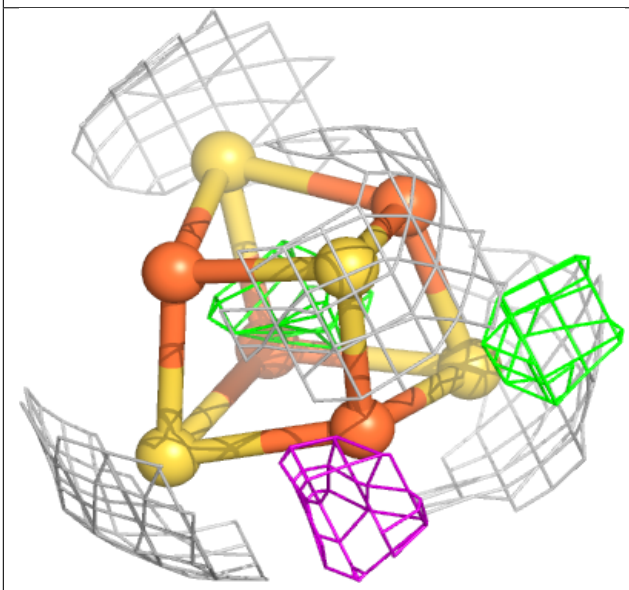


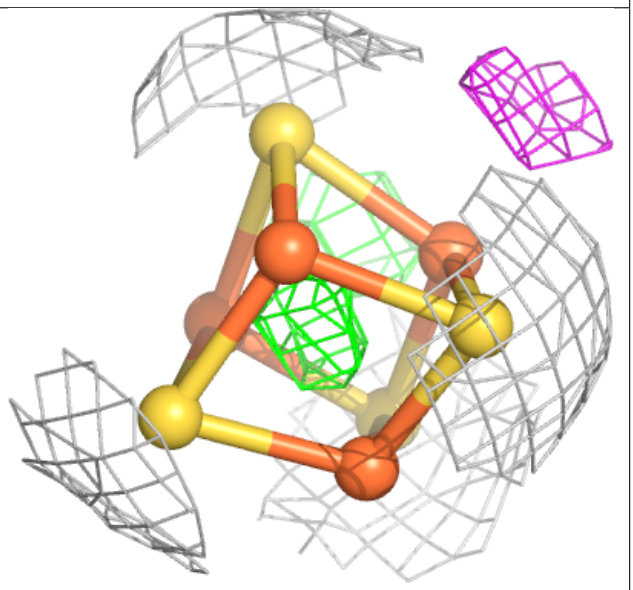


Electron density around SF4 F 302:

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

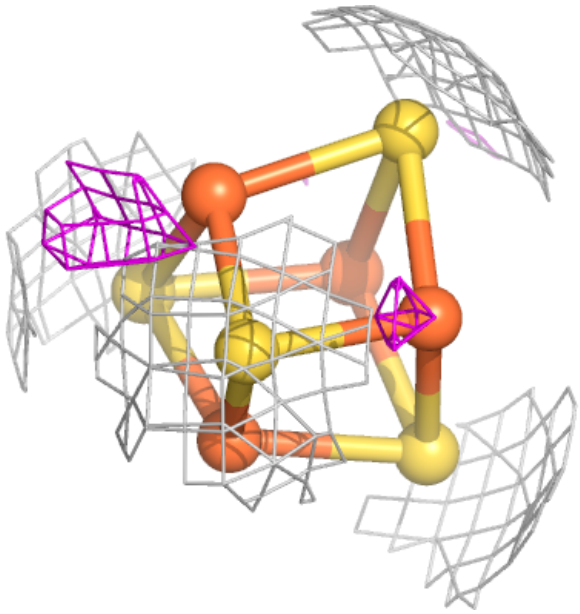


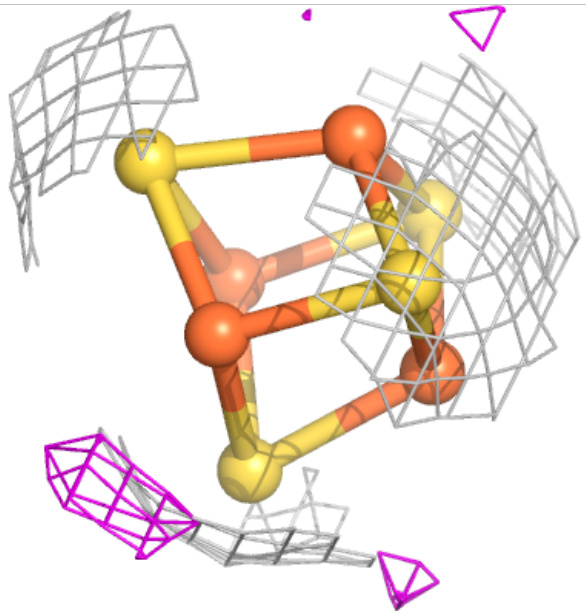


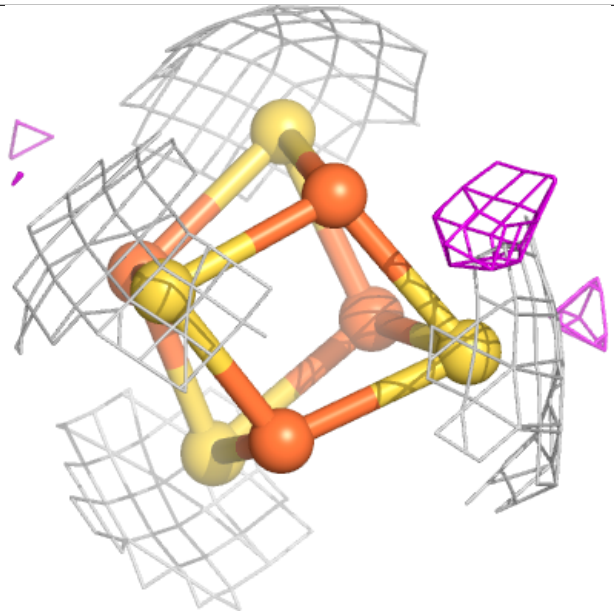


Electron density around SF4 F 303:

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

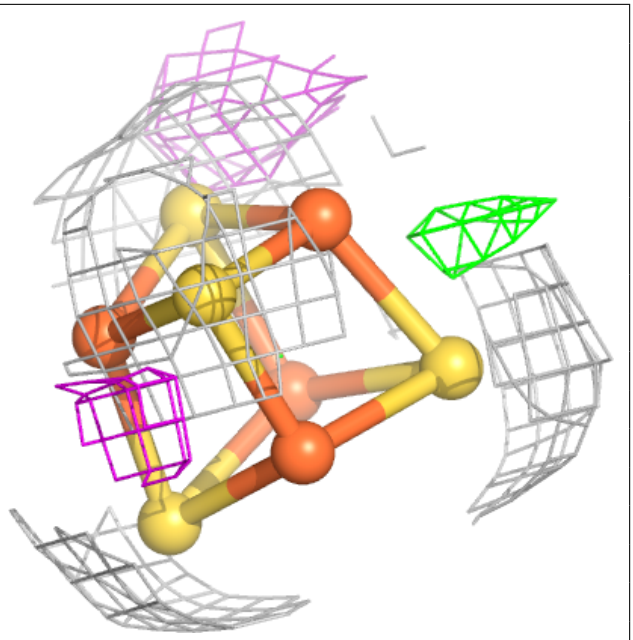


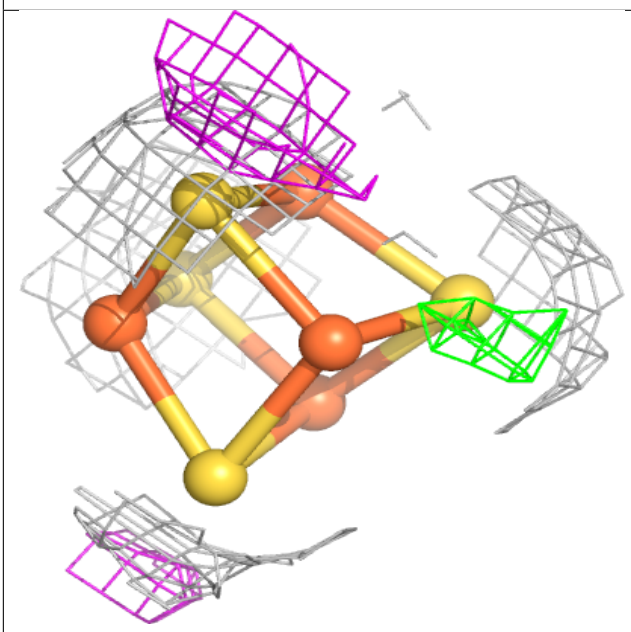


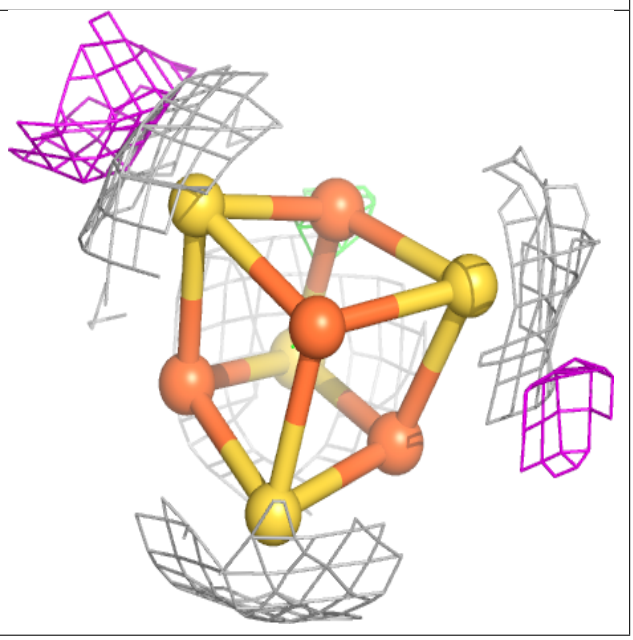


Electron density around SF4 H 303:

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

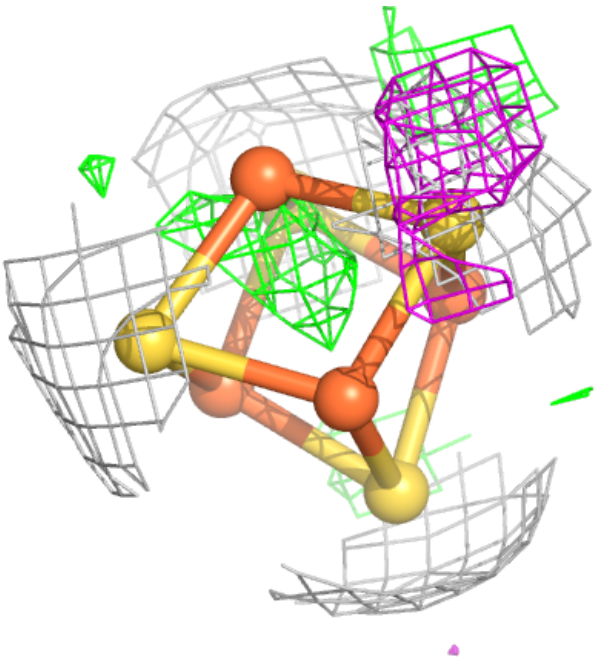


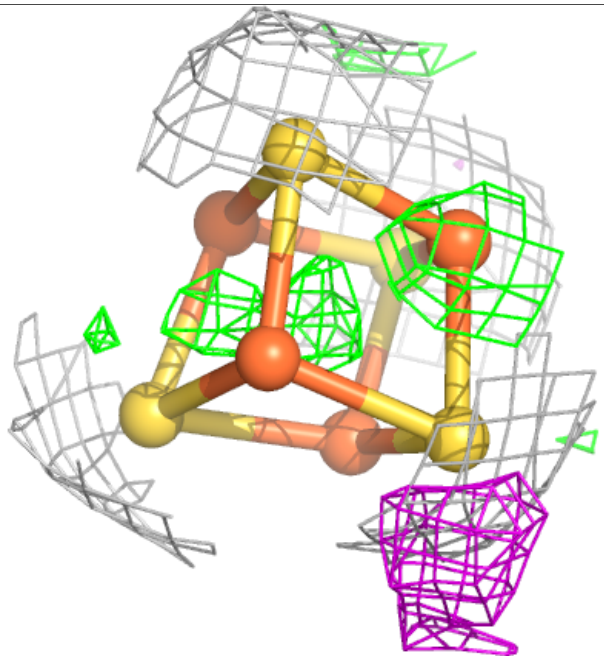


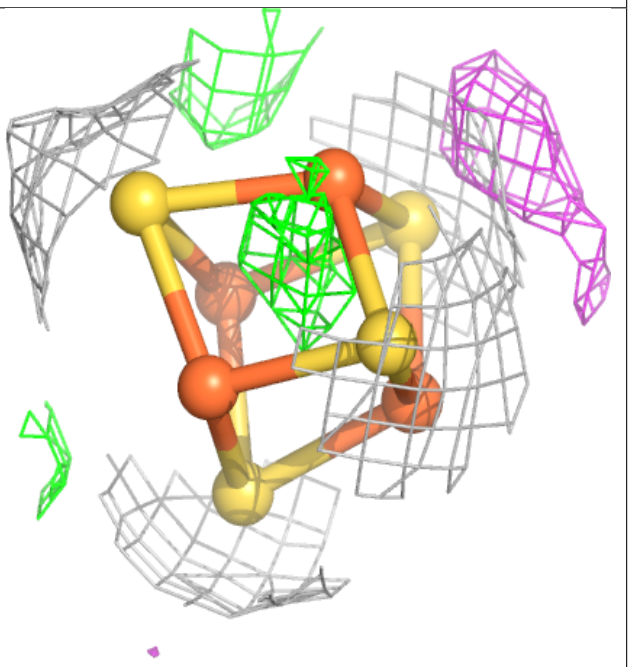


Electron density around SF4 I 301:

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

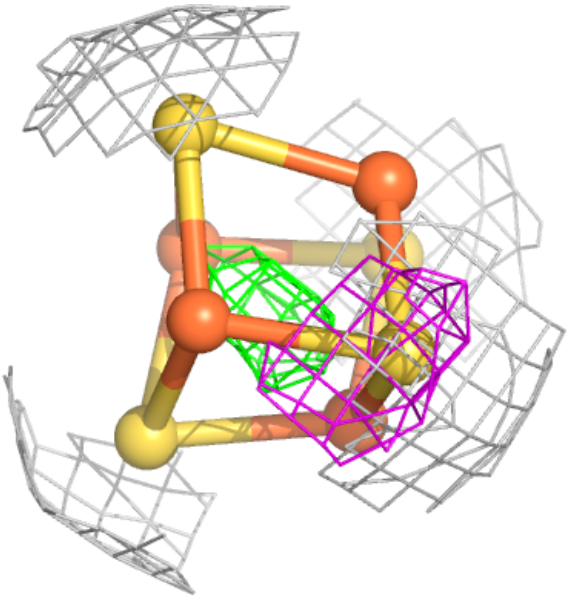


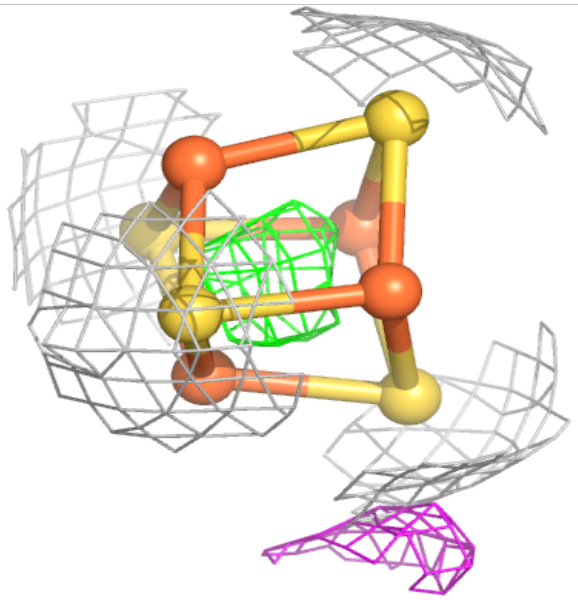


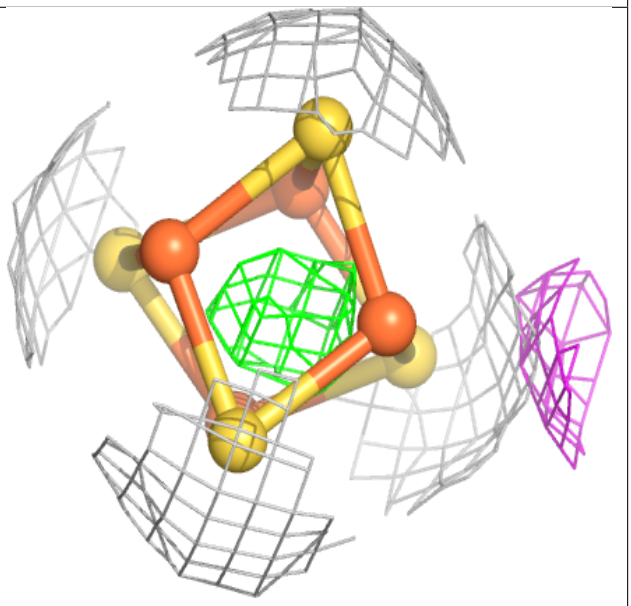


Electron density around SF4 I 302:

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

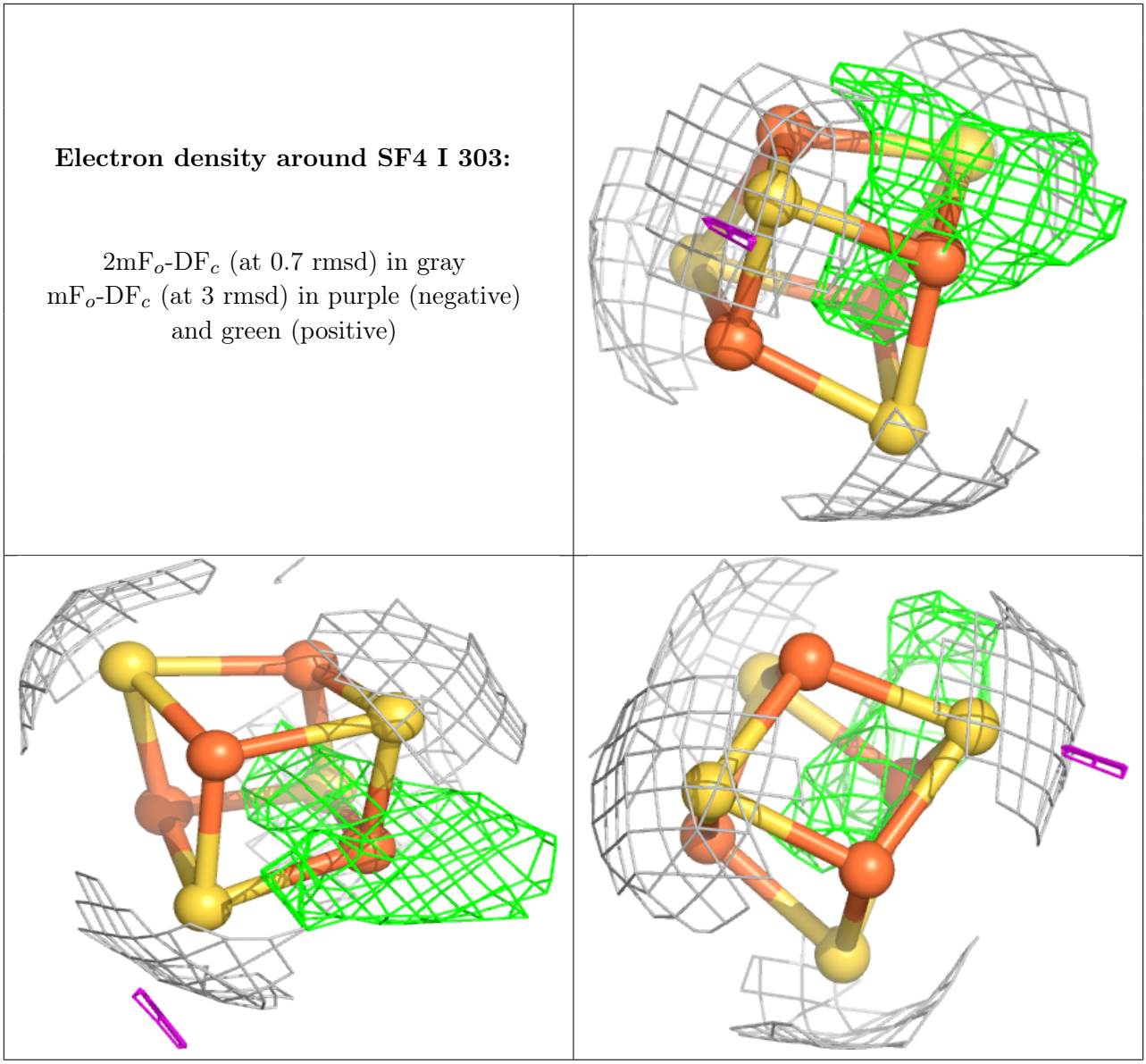






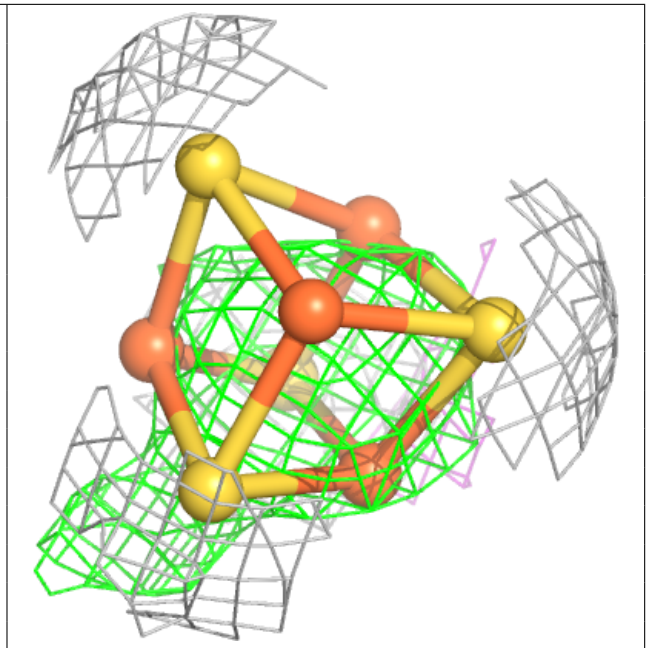
Electron density around SF4 I 303:

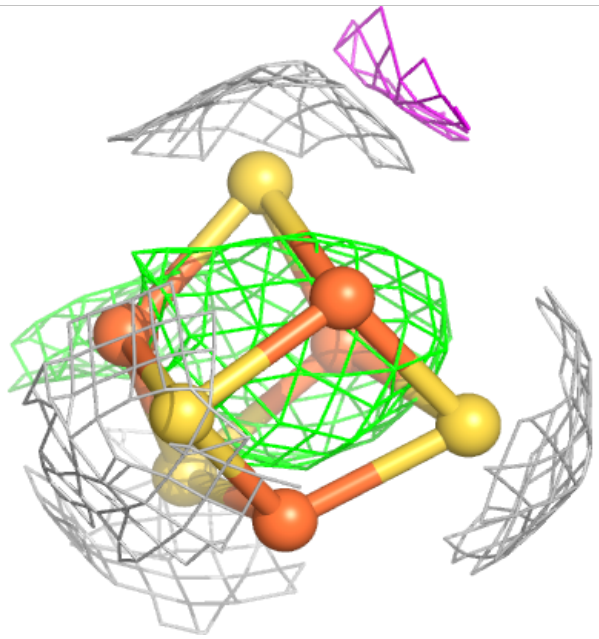
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

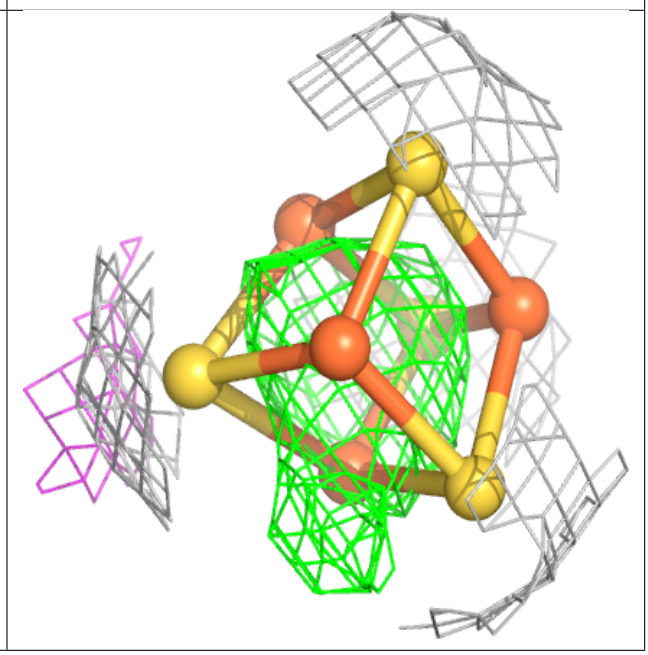


Electron density around SF4 K 303:

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

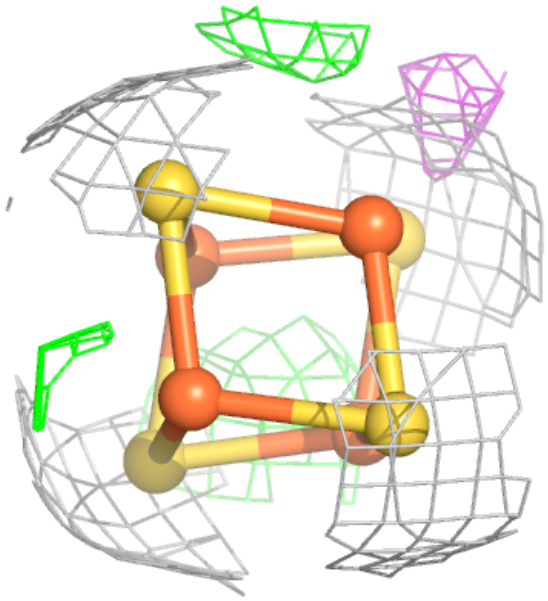


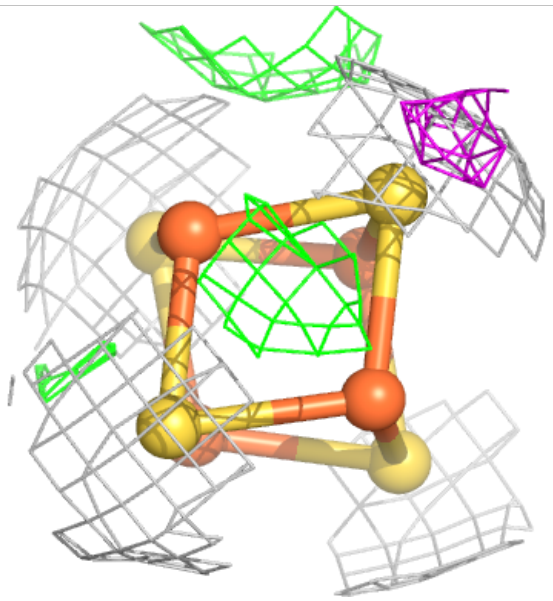


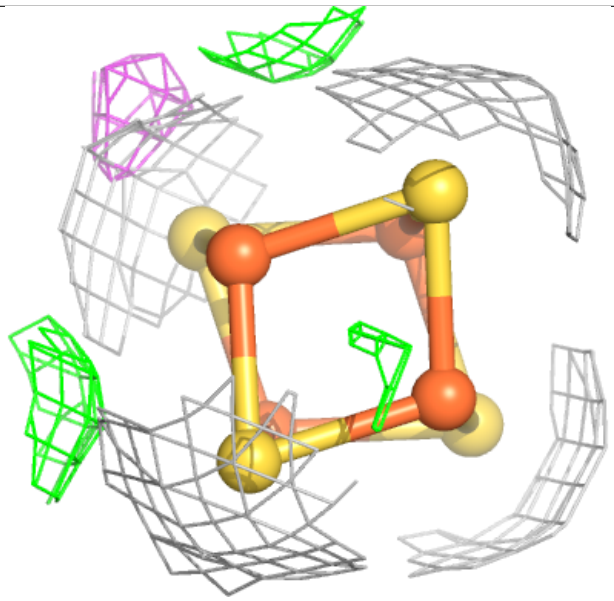


Electron density around SF4 L 301:

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

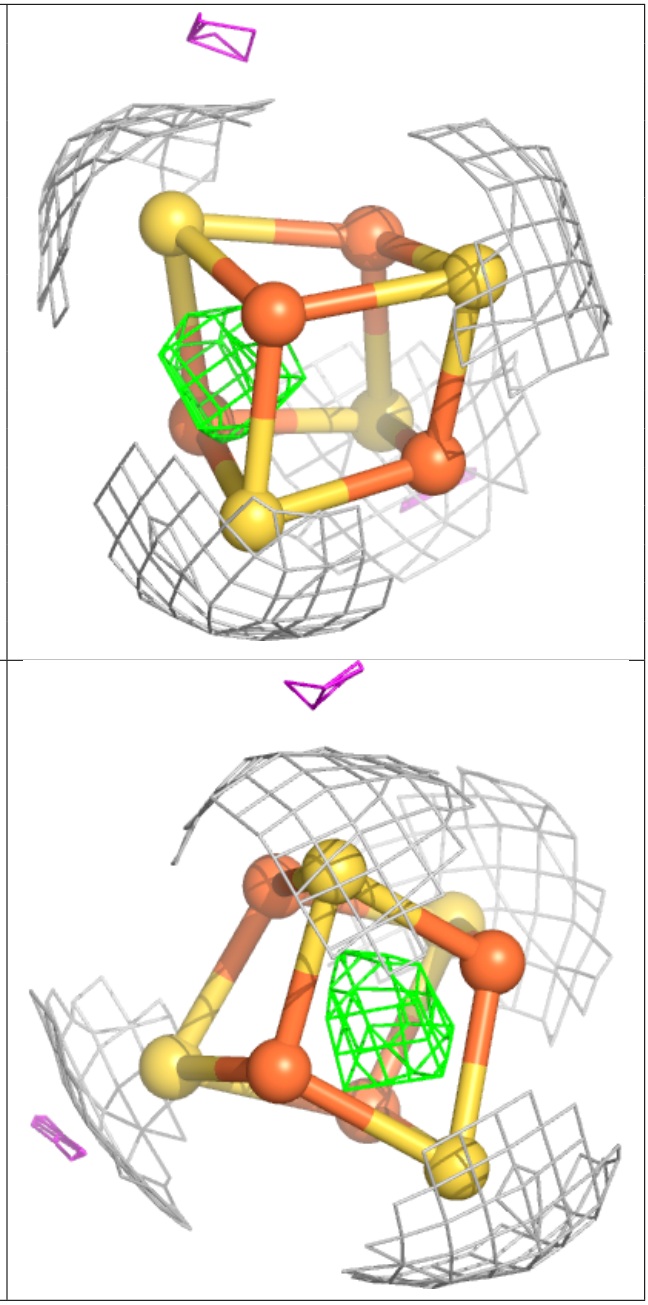






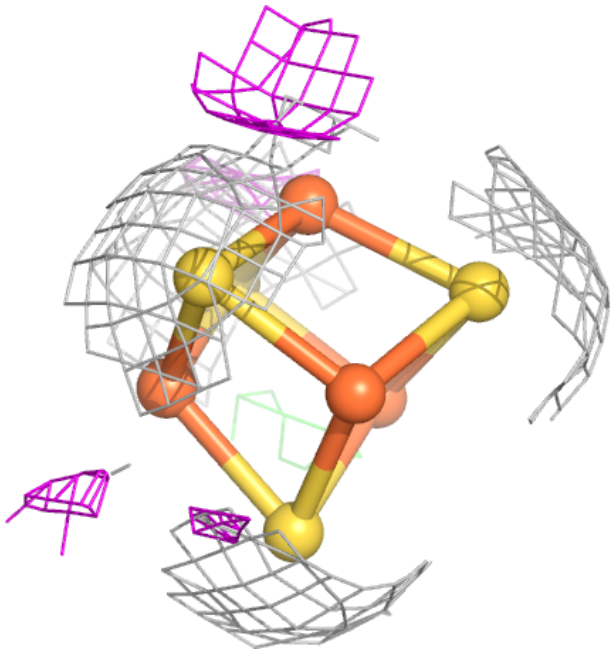
Electron density around SF4 L 302:

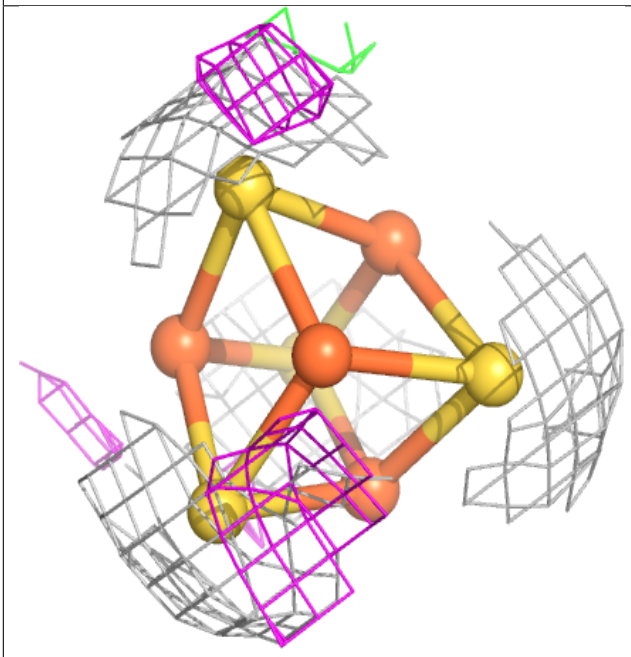
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

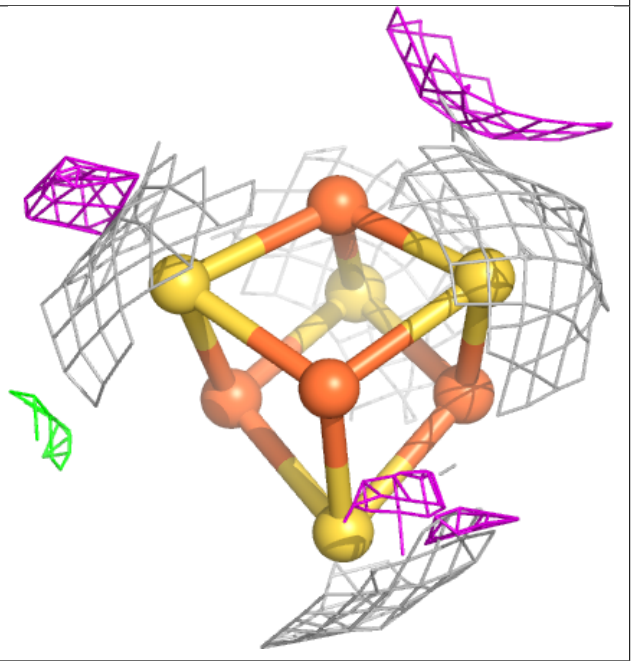


Electron density around SF4 L 303:

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

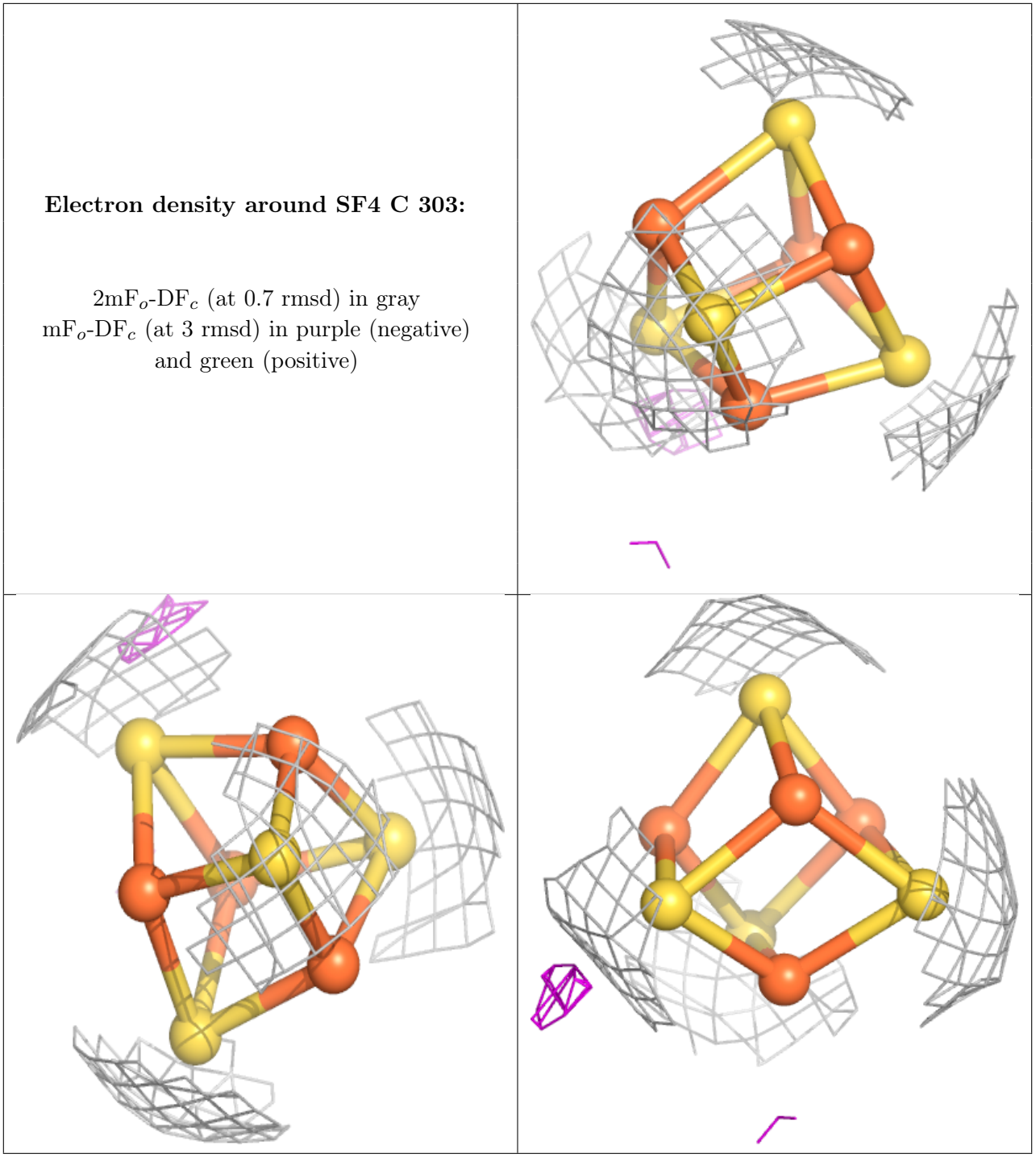






Electron density around SF4 C 303:

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



6.5 Other polymers (i)

There are no such residues in this entry.