



Full wwPDB X-ray Structure Validation Report ⓘ

May 8, 2023 – 10:14 PM EDT

PDB ID : 8FJC
Title : Structure of the catalytic domain of Streptococcus mutans GtfB complexed to acarbose in tetragonal space group P4322
Authors : Schormann, N.; Deivanayagam, C.
Deposited on : 2022-12-19
Resolution : 2.50 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ 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 ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : 2.32.2
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.32.2

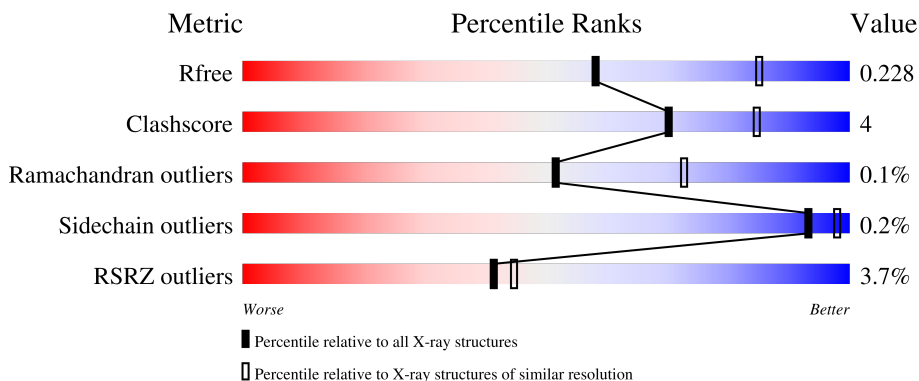
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

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 $\leq 5\%$. 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	869	
1	B	869	
2	C	3	
2	D	3	

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
2	GLC	C	1	-	-	-	X

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 13926 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 Glucosyltransferase-I.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	840	6624	4173	1135	1300	16	0	0	0
1	B	838	6602	4158	1131	1297	16	0	0	0

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1052	LEU	-	expression tag	UNP P08987
A	1053	GLU	-	expression tag	UNP P08987
A	1054	HIS	-	expression tag	UNP P08987
A	1055	HIS	-	expression tag	UNP P08987
A	1056	HIS	-	expression tag	UNP P08987
A	1057	HIS	-	expression tag	UNP P08987
A	1058	HIS	-	expression tag	UNP P08987
A	1059	HIS	-	expression tag	UNP P08987
B	1052	LEU	-	expression tag	UNP P08987
B	1053	GLU	-	expression tag	UNP P08987
B	1054	HIS	-	expression tag	UNP P08987
B	1055	HIS	-	expression tag	UNP P08987
B	1056	HIS	-	expression tag	UNP P08987
B	1057	HIS	-	expression tag	UNP P08987
B	1058	HIS	-	expression tag	UNP P08987
B	1059	HIS	-	expression tag	UNP P08987

- Molecule 2 is an oligosaccharide called 4,6-dideoxy-4-[[[(1S,4R,5S,6S)-4,5,6-trihydroxy-3-(hydroxymethyl)cyclohex-2-en-1-yl]amino]-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	C	3	44	25	1	18	0	0	0

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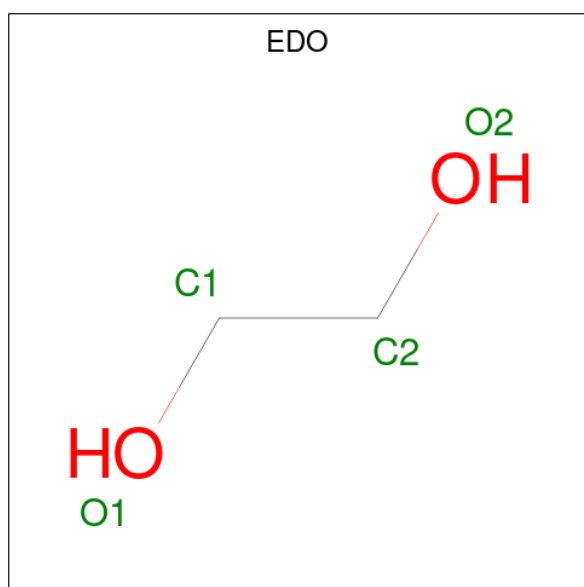
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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace	
			Total	C	N				O
2	D	3	44	25	1	18	0	0	0

- Molecule 3 is CALCIUM ION (three-letter code: CA) (formula: Ca) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Ca 1 1	0	0
3	B	1	Total Ca 1 1	0	0

- Molecule 4 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂) (labeled as "Ligand of Interest" by depositor).



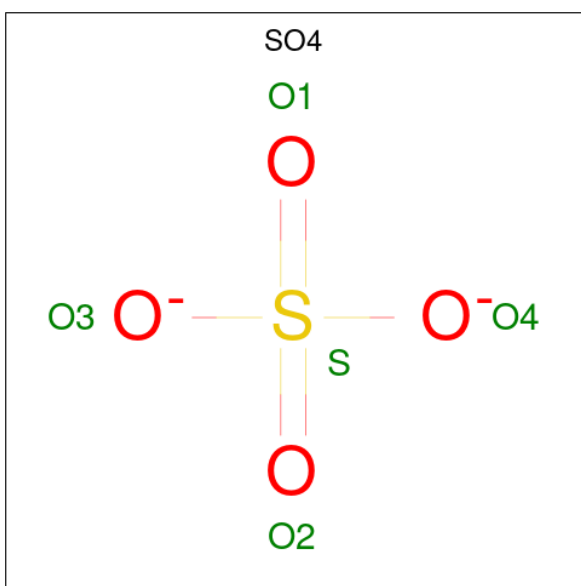
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 4 2 2	0	0
4	A	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0

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

- Molecule 5 is SULFATE ION (three-letter code: SO4) (formula: O₄S) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	O	S	0	0
			5	4	1		
5	A	1	Total	O	S	0	0
			5	4	1		
5	A	1	Total	O	S	0	0
			5	4	1		
5	A	1	Total	O	S	0	0
			5	4	1		
5	A	1	Total	O	S	0	0
			5	4	1		
5	A	1	Total	O	S	0	0
			5	4	1		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	B	1	Total	O	S	0	0
			5	4	1		

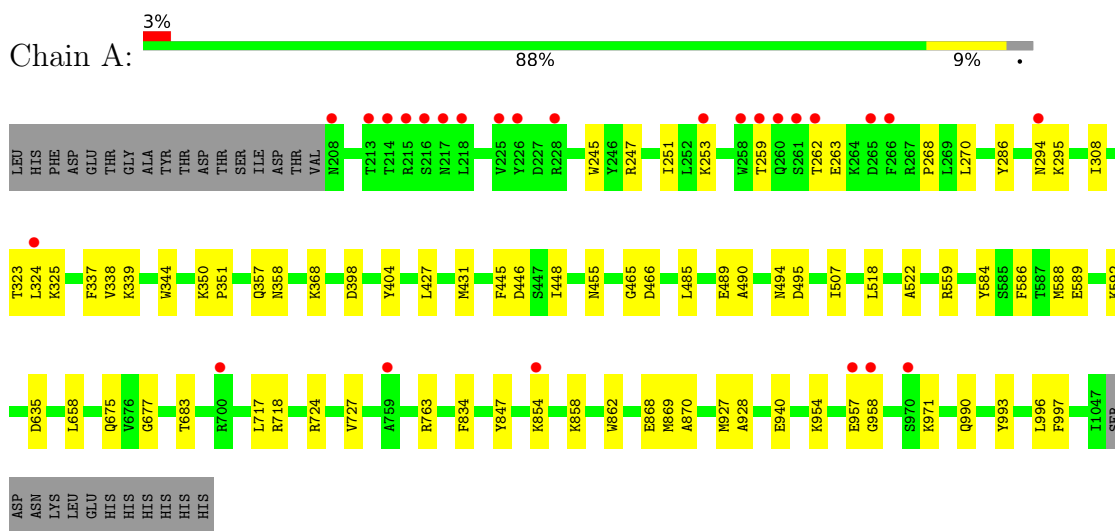
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	164	Total	O	0	0
			164	164		
6	B	159	Total	O	0	0
			159	159		

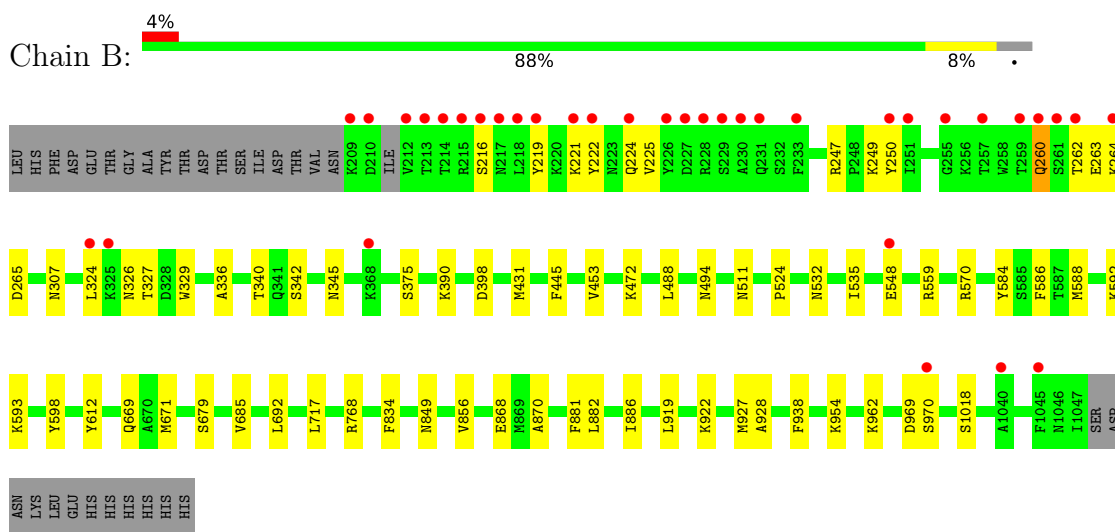
3 Residue-property plots [i](#)

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: Glucosyltransferase-I



- Molecule 1: Glucosyltransferase-I



- Molecule 2: 4,6-dideoxy-4-[(1S,4R,5S,6S)-4,5,6-trihydroxy-3-(hydroxymethyl)cyclohex-2-en-1-yl]amino}-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose



GLC1
GLC2
AC13

- Molecule 2: 4,6-dideoxy-4-[[[(1S,4R,5S,6S)-4,5,6-trihydroxy-3-(hydroxymethyl)cyclohex-2-en-1-yl]amino}-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose

Chain D:

67%

33%

GLC1
GLC2
AC13

4 Data and refinement statistics

Property	Value	Source
Space group	P 43 2 2	Depositor
Cell constants a, b, c, α , β , γ	149.55Å 149.55Å 303.08Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	83.72 – 2.50 83.72 – 2.50	Depositor EDS
% Data completeness (in resolution range)	99.9 (83.72-2.50) 99.9 (83.72-2.50)	Depositor EDS
R_{merge}	0.25	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.94 (at 2.51Å)	Xtrriage
Refinement program	PHENIX 1.16_3549	Depositor
R, R_{free}	0.186 , 0.228 0.187 , 0.228	Depositor DCC
R_{free} test set	6018 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å ²)	41.2	Xtrriage
Anisotropy	0.088	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 54.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	13926	wwPDB-VP
Average B, all atoms (Å ²)	45.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.96% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: AC1, SO4, GLC, CA, EDO

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	0.56	0/6763	0.70	0/9180
1	B	0.56	0/6740	0.68	0/9148
All	All	0.56	0/13503	0.69	0/18328

There are no bond length outliers.

There are no bond angle outliers.

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	6624	0	6440	52	0
1	B	6602	0	6404	51	0
2	C	44	0	30	1	0
2	D	44	0	30	1	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	8	0	12	0	0
4	B	24	0	36	1	0
5	A	130	0	0	2	0
5	B	125	0	0	2	0
6	A	164	0	0	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	B	159	0	0	2	0
All	All	13926	0	12952	96	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.

All (96) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:325:LYS:NZ	1:B:326:ASN:HD22	1.45	1.13
1:A:325:LYS:HZ1	1:B:326:ASN:HD22	1.20	0.90
1:B:324:LEU:HD11	1:B:329:TRP:CD1	2.07	0.89
1:A:325:LYS:NZ	1:B:326:ASN:ND2	2.20	0.89
1:A:325:LYS:HZ1	1:B:326:ASN:ND2	1.74	0.84
1:B:221:LYS:HD2	1:B:221:LYS:H	1.57	0.69
1:B:247:ARG:NH1	1:B:262:THR:O	2.29	0.66
1:B:398:ASP:HB3	1:B:494:ASN:ND2	2.12	0.64
1:B:250:TYR:CD2	1:B:260:GLN:O	2.49	0.64
1:A:518:LEU:HD12	1:A:522:ALA:HB3	1.83	0.59
1:A:247:ARG:NH1	1:A:262:THR:O	2.35	0.59
1:A:247:ARG:NH2	1:A:263:GLU:O	2.37	0.58
1:A:445:PHE:CG	1:A:928:ALA:HB2	2.39	0.57
1:A:717:LEU:O	1:A:718:ARG:HD3	2.05	0.56
1:A:339:LYS:NZ	6:A:1305:HOH:O	2.38	0.56
1:A:251:ILE:HG12	1:A:262:THR:HG22	1.87	0.55
1:A:993:TYR:OH	5:A:1211:SO4:O3	2.21	0.55
1:B:588:MET:HG3	1:B:592:LYS:HE2	1.87	0.54
1:A:325:LYS:HZ2	1:B:326:ASN:HD22	1.50	0.54
1:A:398:ASP:HB3	1:A:494:ASN:ND2	2.22	0.54
1:A:858:LYS:NZ	6:A:1307:HOH:O	2.41	0.54
1:B:511:ASN:ND2	2:D:1:GLC:O1	2.39	0.52
1:B:856:VAL:HG22	1:B:922:LYS:HG3	1.91	0.52
1:A:589:GLU:HG3	1:B:219:TYR:OH	2.09	0.52
1:B:856:VAL:HG23	1:B:919:LEU:HD23	1.91	0.52
1:B:324:LEU:CD1	1:B:326:ASN:OD1	2.58	0.51
1:A:490:ALA:HB1	1:A:495:ASP:OD2	2.10	0.51
1:B:262:THR:CG2	1:B:265:ASP:HB2	2.41	0.51
1:B:327:THR:HG23	5:B:1232:SO4:O1	2.11	0.51
1:B:431:MET:HE2	1:B:472:LYS:HE3	1.93	0.50
1:B:849:ASN:ND2	6:B:1306:HOH:O	2.41	0.50
1:A:675:GLN:N	5:A:1226:SO4:O2	2.38	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:324:LEU:HD11	1:B:329:TRP:NE1	2.26	0.50
1:B:224:GLN:OE1	1:B:249:LYS:HD2	2.11	0.49
1:A:308:ILE:HD11	1:B:593:LYS:HG3	1.93	0.49
1:B:247:ARG:NH2	1:B:263:GLU:O	2.47	0.48
1:A:990:GLN:HG2	1:A:997:PHE:CD1	2.49	0.48
1:A:559:ARG:HD3	1:A:635:ASP:OD1	2.14	0.47
1:A:868:GLU:HA	1:A:927:MET:HB3	1.95	0.47
1:A:683:THR:HG21	1:A:727:VAL:HG22	1.96	0.47
1:B:584:TYR:HB2	1:B:881:PHE:CE1	2.49	0.47
1:A:466:ASP:HB3	1:A:996:LEU:CD2	2.45	0.47
1:B:954:LYS:HA	1:B:954:LYS:HD3	1.73	0.46
1:A:245:TRP:CZ2	1:A:268:PRO:HG3	2.50	0.46
1:A:588:MET:O	1:A:592:LYS:HG3	2.16	0.46
1:B:336:ALA:O	1:B:340:THR:HG23	2.16	0.46
1:B:768:ARG:NH2	6:B:1312:HOH:O	2.48	0.46
1:A:338:VAL:HG13	1:A:344:TRP:CE3	2.50	0.46
1:A:294:ASN:O	1:A:295:LYS:HD3	2.17	0.45
1:A:940:GLU:HB2	1:A:971:LYS:HB2	1.97	0.45
1:A:368:LYS:HB3	1:A:368:LYS:HE3	1.74	0.45
1:B:342:SER:HA	1:B:345:ASN:OD1	2.17	0.45
1:A:466:ASP:HB3	1:A:996:LEU:HD22	1.98	0.45
1:B:938:PHE:HB2	1:B:969:ASP:O	2.17	0.45
1:A:323:THR:HG22	1:A:324:LEU:HD12	2.00	0.44
1:A:465:GLY:HA3	6:A:1331:HOH:O	2.17	0.44
1:A:954:LYS:HD3	1:A:954:LYS:HA	1.75	0.44
1:B:216:SER:HA	1:B:307:ASN:HD21	1.82	0.44
1:B:375:SER:HA	4:B:1205:EDO:H12	2.00	0.44
1:A:854:LYS:HG2	1:A:854:LYS:O	2.17	0.44
1:A:658:LEU:HD13	1:A:862:TRP:HB3	2.00	0.44
1:B:532:ASN:ND2	5:B:1229:SO4:O4	2.43	0.44
1:B:834:PHE:CG	1:B:870:ALA:HB2	2.53	0.43
1:B:453:VAL:HG21	1:B:488:LEU:HB3	1.98	0.43
1:B:445:PHE:CG	1:B:928:ALA:HB2	2.53	0.43
1:A:350:LYS:HB3	1:A:351:PRO:HA	2.01	0.43
1:B:868:GLU:HA	1:B:927:MET:HB3	2.01	0.43
1:B:970:SER:O	1:B:1018:SER:HA	2.18	0.43
1:B:669:GLN:HA	1:B:685:VAL:O	2.20	0.42
1:A:957:GLU:CD	1:A:958:GLY:H	2.23	0.42
1:A:869:MET:HB3	1:A:869:MET:HE2	1.72	0.42
1:B:224:GLN:HG2	1:B:225:VAL:N	2.35	0.42
1:B:264:LYS:O	1:B:264:LYS:HD2	2.18	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:222:TYR:HB3	1:B:250:TYR:HB2	2.02	0.42
1:A:427:LEU:CD1	1:A:448:ILE:HG21	2.50	0.42
1:A:834:PHE:CG	1:A:870:ALA:HB2	2.55	0.41
1:B:535:ILE:HG12	1:B:671:MET:HB3	2.02	0.41
1:A:584:TYR:HA	1:A:586:PHE:CE1	2.56	0.41
1:B:559:ARG:NH2	1:B:598:TYR:OH	2.52	0.41
1:A:489:GLU:OE1	2:C:3:AC1:O3	2.39	0.41
1:A:270:LEU:HD23	1:A:270:LEU:HA	1.86	0.41
1:A:357:GLN:O	1:A:358:ASN:HB2	2.20	0.41
1:A:763:ARG:HH11	1:A:763:ARG:HD2	1.68	0.41
1:B:882:LEU:O	1:B:886:ILE:HG13	2.21	0.41
1:A:286:TYR:CD1	1:A:337:PHE:HB2	2.55	0.41
1:B:570:ARG:HB2	1:B:586:PHE:HZ	1.85	0.41
1:A:404:TYR:O	1:A:455:ASN:HA	2.20	0.41
1:A:431:MET:HE1	1:A:446:ASP:O	2.21	0.41
1:A:485:LEU:HD11	1:A:507:ILE:HD13	2.03	0.41
1:A:677:GLY:HA3	1:A:718:ARG:O	2.21	0.41
1:B:398:ASP:HB3	1:B:494:ASN:HD21	1.84	0.41
1:B:548:GLU:OE1	1:B:692:LEU:HD11	2.20	0.41
1:A:253:LYS:HB2	1:A:259:THR:OG1	2.20	0.40
1:B:390:LYS:HZ2	1:B:390:LYS:HG2	1.76	0.40
1:B:524:PRO:HA	1:B:612:TYR:CE1	2.56	0.40
1:B:679:SER:HB3	1:B:717:LEU:HD13	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	838/869 (96%)	814 (97%)	24 (3%)	0	100 100
1	B	834/869 (96%)	807 (97%)	26 (3%)	1 (0%)	51 73

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	1672/1738 (96%)	1621 (97%)	50 (3%)	1 (0%)	51 73

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	260	GLN

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	708/738 (96%)	706 (100%)	2 (0%)	92 97
1	B	704/738 (95%)	703 (100%)	1 (0%)	93 98
All	All	1412/1476 (96%)	1409 (100%)	3 (0%)	93 98

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	724	ARG
1	A	847	TYR
1	B	962	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	326	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](#)

6 monosaccharides 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
2	GLC	C	1	2	12,12,12	0.37	0	17,17,17	1.09	1 (5%)
2	GLC	C	2	2	11,11,12	0.38	0	15,15,17	1.80	3 (20%)
2	AC1	C	3	2	21,22,23	0.40	0	22,32,34	1.11	3 (13%)
2	GLC	D	1	2	12,12,12	0.35	0	17,17,17	1.07	1 (5%)
2	GLC	D	2	2	11,11,12	0.43	0	15,15,17	1.85	3 (20%)
2	AC1	D	3	2	21,22,23	0.58	1 (4%)	22,32,34	1.21	3 (13%)

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
2	GLC	C	1	2	-	0/2/22/22	0/1/1/1
2	GLC	C	2	2	-	2/2/19/22	0/1/1/1
2	AC1	C	3	2	-	3/6/43/46	0/2/2/2
2	GLC	D	1	2	-	0/2/22/22	0/1/1/1
2	GLC	D	2	2	-	2/2/19/22	0/1/1/1
2	AC1	D	3	2	-	3/6/43/46	0/2/2/2

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	3	AC1	C1B-N4A	2.27	1.51	1.47

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	2	GLC	C1-O5-C5	5.29	119.36	112.19
2	D	2	GLC	O4-C4-C3	-4.30	100.41	110.35
2	D	2	GLC	C1-O5-C5	4.22	117.92	112.19
2	C	1	GLC	O4-C4-C3	-3.23	102.89	110.35
2	D	3	AC1	O4-C4A-C5B	-2.88	105.28	110.82
2	D	3	AC1	C7B-C1B-N4A	2.56	114.52	110.68
2	D	3	AC1	C1-O5-C5	2.55	118.56	112.78
2	C	3	AC1	C1-O5-C5	2.38	118.18	112.78
2	C	2	GLC	O2-C2-C1	2.38	114.02	109.15
2	D	2	GLC	O4-C4-C5	2.29	114.99	109.30
2	C	3	AC1	C7B-C1B-N4A	2.19	113.97	110.68
2	D	1	GLC	O4-C4-C3	-2.16	105.37	110.35
2	C	2	GLC	O4-C4-C3	-2.06	105.59	110.35
2	C	3	AC1	O4-C4A-C5B	-2.02	106.93	110.82

There are no chirality outliers.

All (10) torsion outliers are listed below:

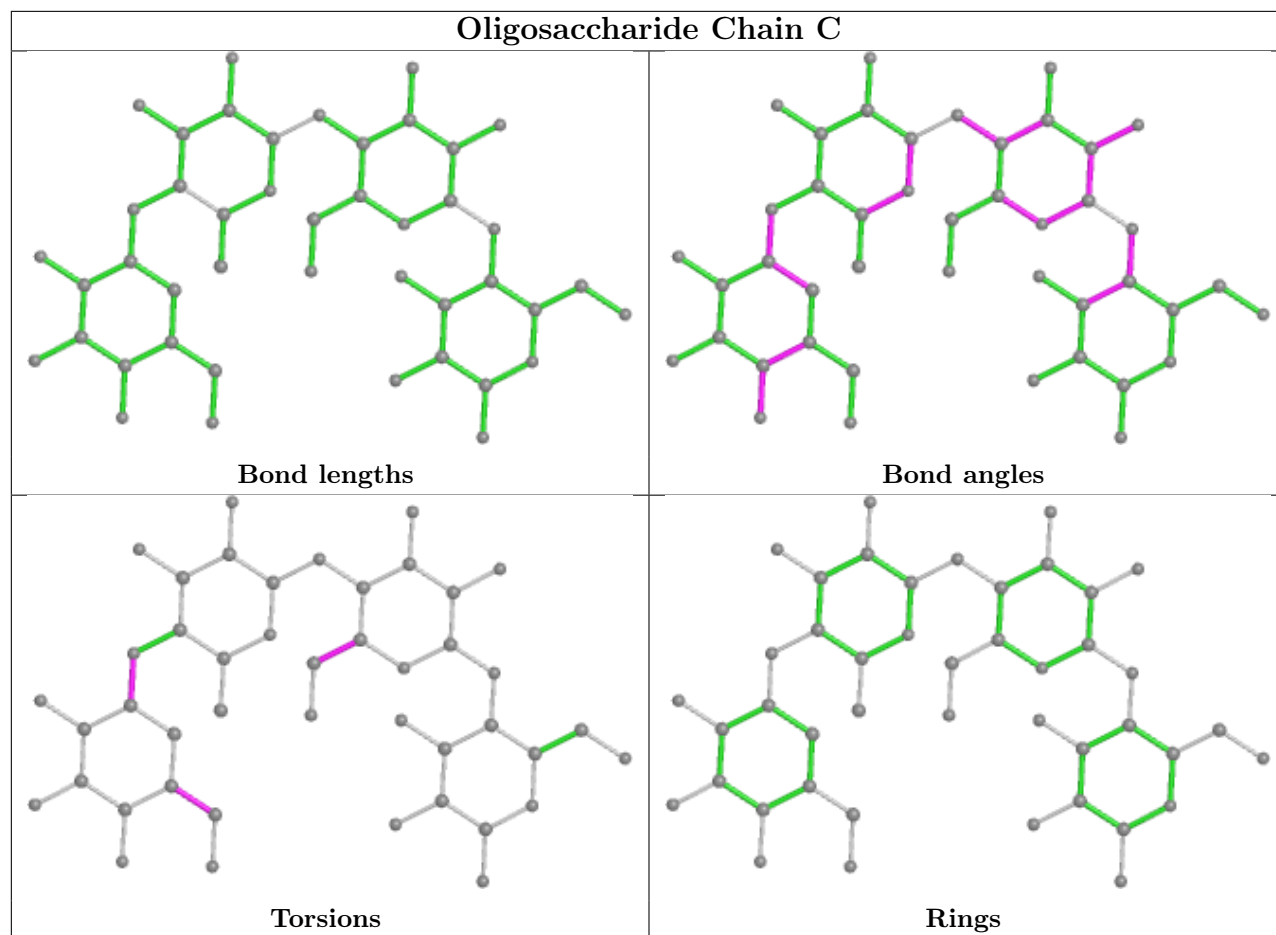
Mol	Chain	Res	Type	Atoms
2	C	3	AC1	C7B-C1B-N4A-C4
2	C	3	AC1	C7B-C5B-C6B-O6B
2	D	3	AC1	C7B-C1B-N4A-C4
2	D	3	AC1	C7B-C5B-C6B-O6B
2	C	2	GLC	O5-C5-C6-O6
2	D	2	GLC	O5-C5-C6-O6
2	C	2	GLC	C4-C5-C6-O6
2	D	2	GLC	C4-C5-C6-O6
2	C	3	AC1	C4A-C5B-C6B-O6B
2	D	3	AC1	C4A-C5B-C6B-O6B

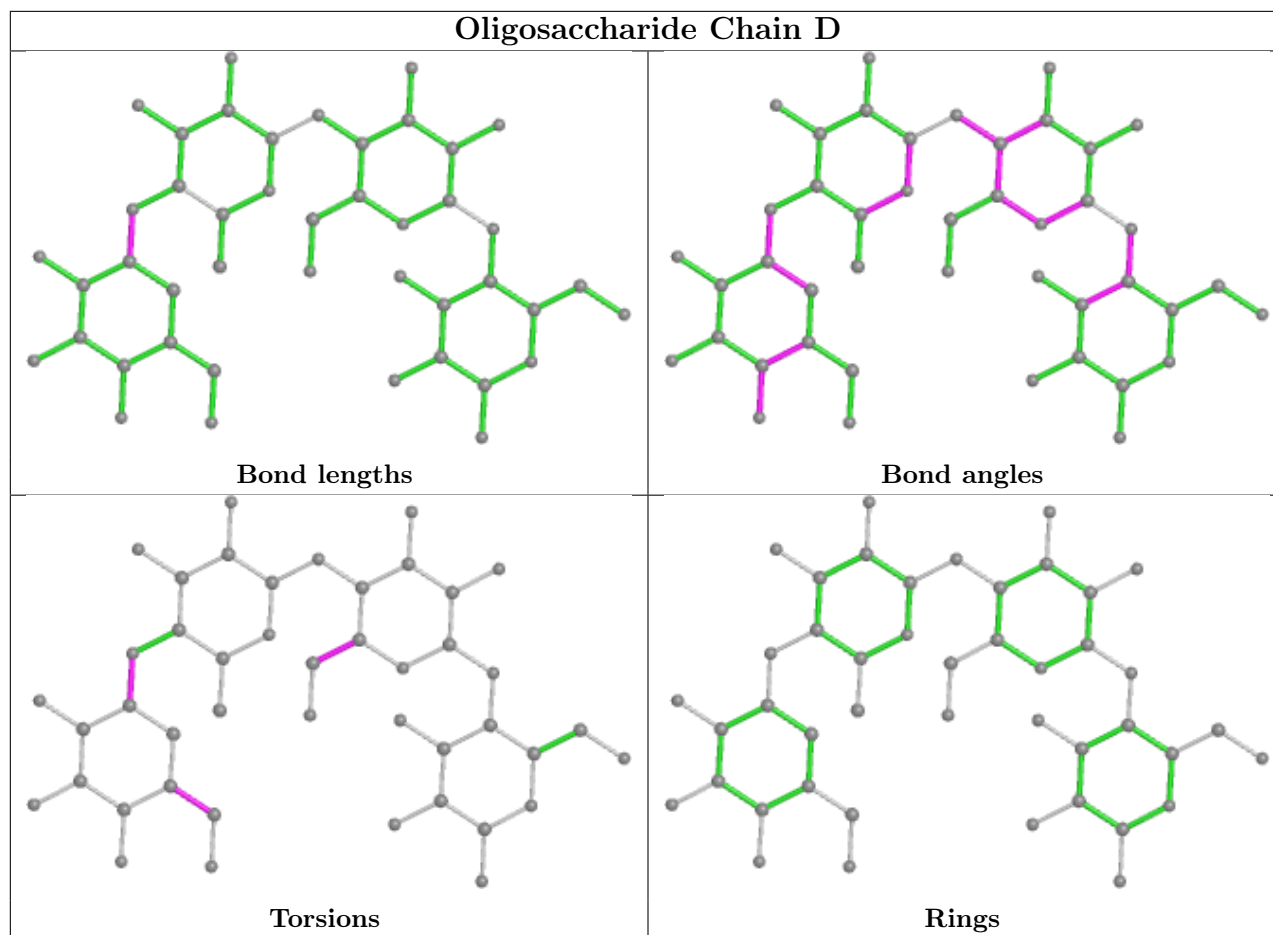
There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	1	GLC	1	0
2	C	3	AC1	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 oligosaccharide.





5.6 Ligand geometry [i](#)

Of 61 ligands modelled in this entry, 2 are monoatomic - leaving 59 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	SO4	B	1215	-	4,4,4	0.19	0	6,6,6	0.22	0
5	SO4	B	1222	-	4,4,4	0.16	0	6,6,6	0.56	0
5	SO4	A	1214	-	4,4,4	0.21	0	6,6,6	0.28	0
4	EDO	B	1202	-	3,3,3	0.40	0	2,2,2	0.72	0
5	SO4	A	1213	-	4,4,4	0.24	0	6,6,6	0.20	0
5	SO4	B	1208	-	4,4,4	0.14	0	6,6,6	0.34	0
5	SO4	B	1212	-	4,4,4	0.12	0	6,6,6	0.29	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	SO4	A	1219	-	4,4,4	0.24	0	6,6,6	0.23	0
4	EDO	A	1203	-	3,3,3	0.59	0	2,2,2	0.63	0
5	SO4	B	1211	-	4,4,4	0.26	0	6,6,6	0.45	0
5	SO4	B	1232	-	4,4,4	0.10	0	6,6,6	0.34	0
5	SO4	B	1218	-	4,4,4	0.22	0	6,6,6	0.70	0
5	SO4	B	1228	-	4,4,4	0.24	0	6,6,6	0.21	0
5	SO4	B	1221	-	4,4,4	0.40	0	6,6,6	0.49	0
5	SO4	A	1212	-	4,4,4	0.12	0	6,6,6	0.64	0
5	SO4	A	1217	-	4,4,4	0.15	0	6,6,6	0.19	0
5	SO4	A	1205	-	4,4,4	0.19	0	6,6,6	0.42	0
5	SO4	A	1225	-	4,4,4	0.11	0	6,6,6	0.35	0
5	SO4	B	1214	-	4,4,4	0.23	0	6,6,6	0.60	0
5	SO4	A	1220	-	4,4,4	0.15	0	6,6,6	0.16	0
4	EDO	B	1203	-	3,3,3	0.34	0	2,2,2	0.32	0
5	SO4	A	1211	-	4,4,4	0.32	0	6,6,6	0.62	0
5	SO4	A	1210	-	4,4,4	0.11	0	6,6,6	0.14	0
5	SO4	B	1213	-	4,4,4	0.11	0	6,6,6	0.34	0
5	SO4	A	1204	-	4,4,4	0.17	0	6,6,6	0.57	0
5	SO4	B	1225	-	4,4,4	0.17	0	6,6,6	0.35	0
5	SO4	A	1223	-	4,4,4	0.25	0	6,6,6	0.38	0
5	SO4	A	1221	-	4,4,4	0.74	0	6,6,6	0.08	0
5	SO4	B	1220	-	4,4,4	0.10	0	6,6,6	0.23	0
5	SO4	B	1227	-	4,4,4	0.23	0	6,6,6	0.22	0
5	SO4	A	1207	-	4,4,4	0.11	0	6,6,6	0.64	0
5	SO4	A	1206	-	4,4,4	0.26	0	6,6,6	0.56	0
5	SO4	A	1209	-	4,4,4	0.16	0	6,6,6	0.33	0
4	EDO	B	1207	-	3,3,3	0.33	0	2,2,2	0.45	0
5	SO4	A	1227	-	4,4,4	0.09	0	6,6,6	0.29	0
5	SO4	A	1229	-	4,4,4	0.29	0	6,6,6	0.35	0
5	SO4	B	1230	-	4,4,4	0.19	0	6,6,6	0.18	0
5	SO4	A	1226	-	4,4,4	0.56	0	6,6,6	0.07	0
4	EDO	B	1205	-	3,3,3	0.68	0	2,2,2	0.41	0
5	SO4	A	1215	-	4,4,4	0.17	0	6,6,6	0.35	0
5	SO4	A	1222	-	4,4,4	0.17	0	6,6,6	0.25	0
5	SO4	B	1210	-	4,4,4	0.60	0	6,6,6	0.27	0
4	EDO	B	1206	-	3,3,3	0.26	0	2,2,2	0.31	0
5	SO4	A	1216	-	4,4,4	0.25	0	6,6,6	0.37	0
5	SO4	B	1217	-	4,4,4	0.18	0	6,6,6	0.48	0
5	SO4	B	1223	-	4,4,4	0.22	0	6,6,6	0.26	0
5	SO4	A	1224	-	4,4,4	0.08	0	6,6,6	0.39	0
5	SO4	B	1231	-	4,4,4	0.27	0	6,6,6	0.62	0
5	SO4	B	1209	-	4,4,4	0.14	0	6,6,6	0.40	0
5	SO4	B	1219	-	4,4,4	0.25	0	6,6,6	0.23	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	SO4	B	1229	-	4,4,4	0.28	0	6,6,6	0.51	0
5	SO4	B	1226	-	4,4,4	0.53	0	6,6,6	0.06	0
4	EDO	A	1202	-	3,3,3	0.77	0	2,2,2	0.36	0
5	SO4	A	1208	-	4,4,4	0.17	0	6,6,6	0.31	0
5	SO4	B	1216	-	4,4,4	0.26	0	6,6,6	0.21	0
5	SO4	A	1218	-	4,4,4	0.15	0	6,6,6	0.41	0
5	SO4	B	1224	-	4,4,4	0.11	0	6,6,6	0.33	0
5	SO4	A	1228	-	4,4,4	0.23	0	6,6,6	0.39	0
4	EDO	B	1204	-	3,3,3	0.39	0	2,2,2	0.19	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	EDO	B	1202	-	-	0/1/1/1	-
4	EDO	B	1207	-	-	1/1/1/1	-
4	EDO	B	1203	-	-	1/1/1/1	-
4	EDO	A	1202	-	-	0/1/1/1	-
4	EDO	A	1203	-	-	0/1/1/1	-
4	EDO	B	1205	-	-	1/1/1/1	-
4	EDO	B	1206	-	-	1/1/1/1	-
4	EDO	B	1204	-	-	1/1/1/1	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (5) torsion outliers are listed below:

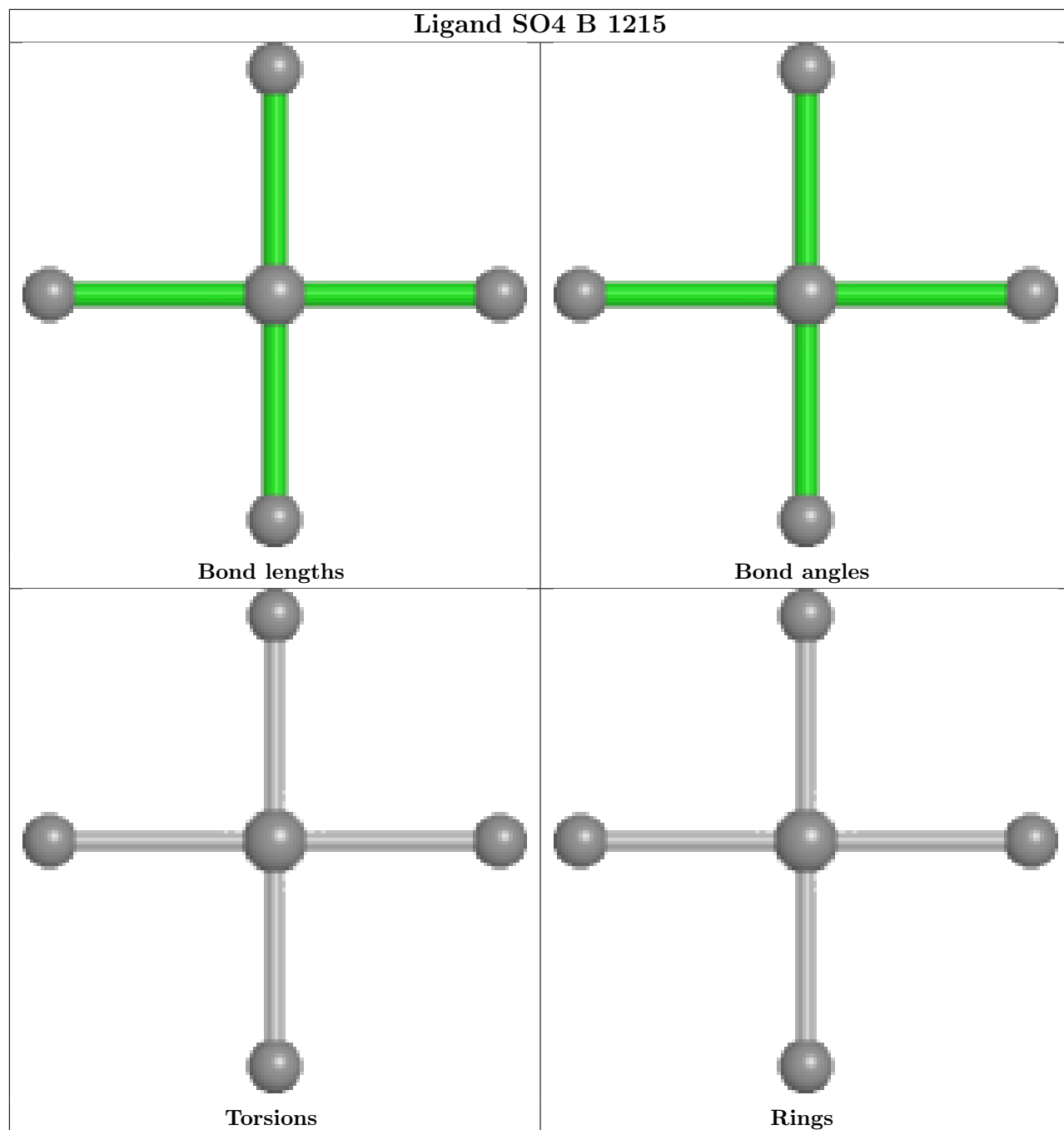
Mol	Chain	Res	Type	Atoms
4	B	1205	EDO	O1-C1-C2-O2
4	B	1204	EDO	O1-C1-C2-O2
4	B	1206	EDO	O1-C1-C2-O2
4	B	1207	EDO	O1-C1-C2-O2
4	B	1203	EDO	O1-C1-C2-O2

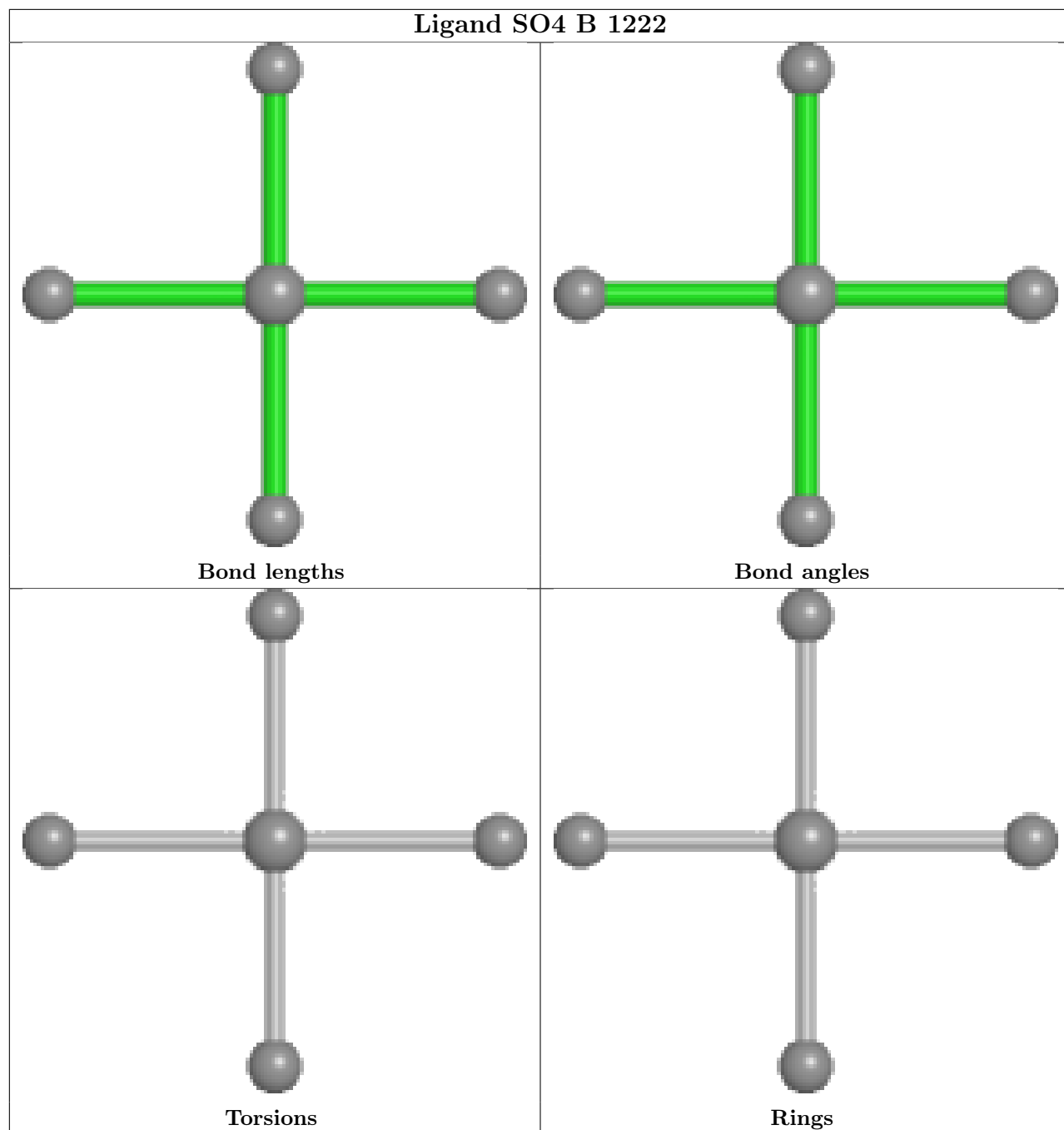
There are no ring outliers.

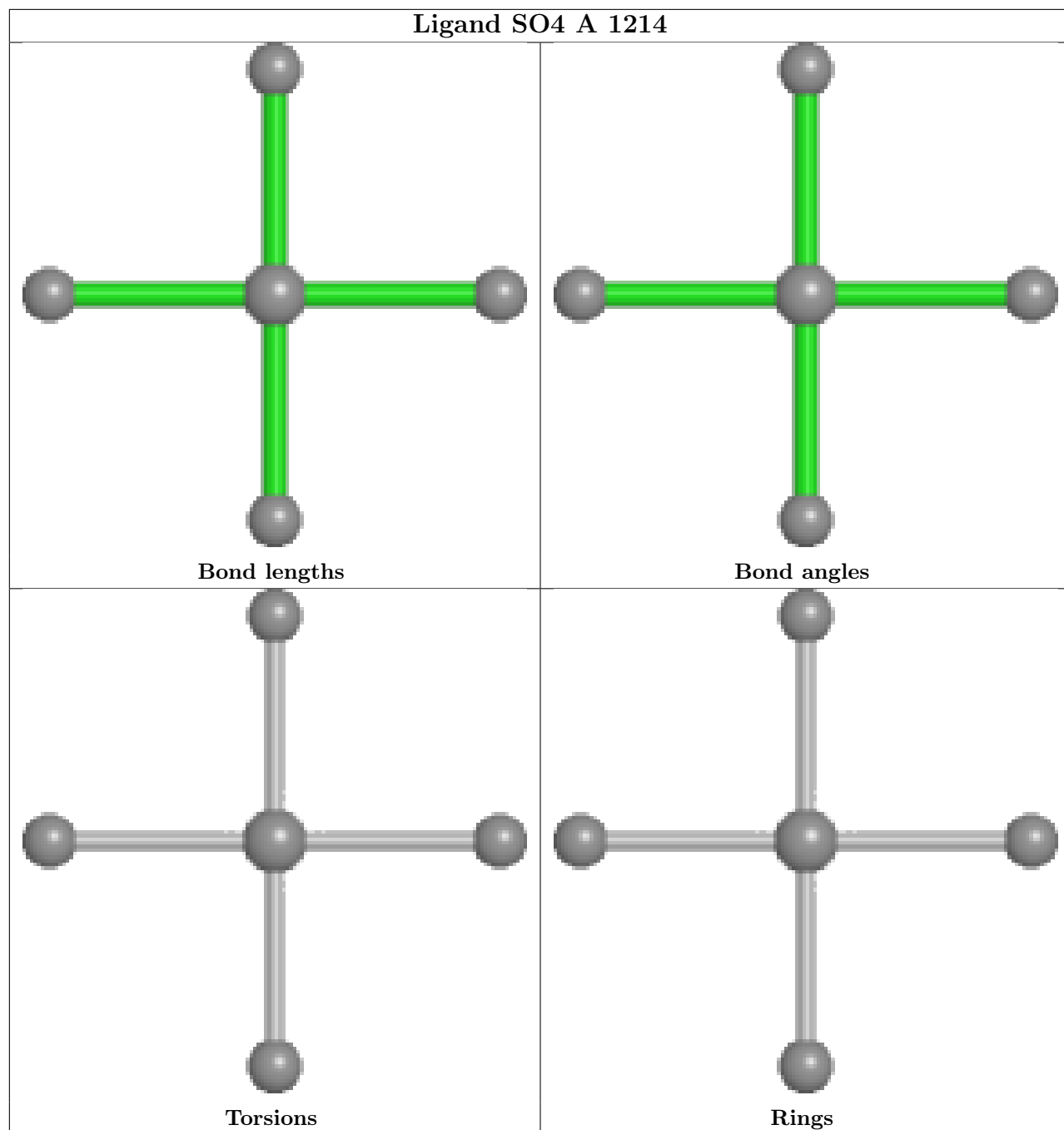
5 monomers are involved in 5 short contacts:

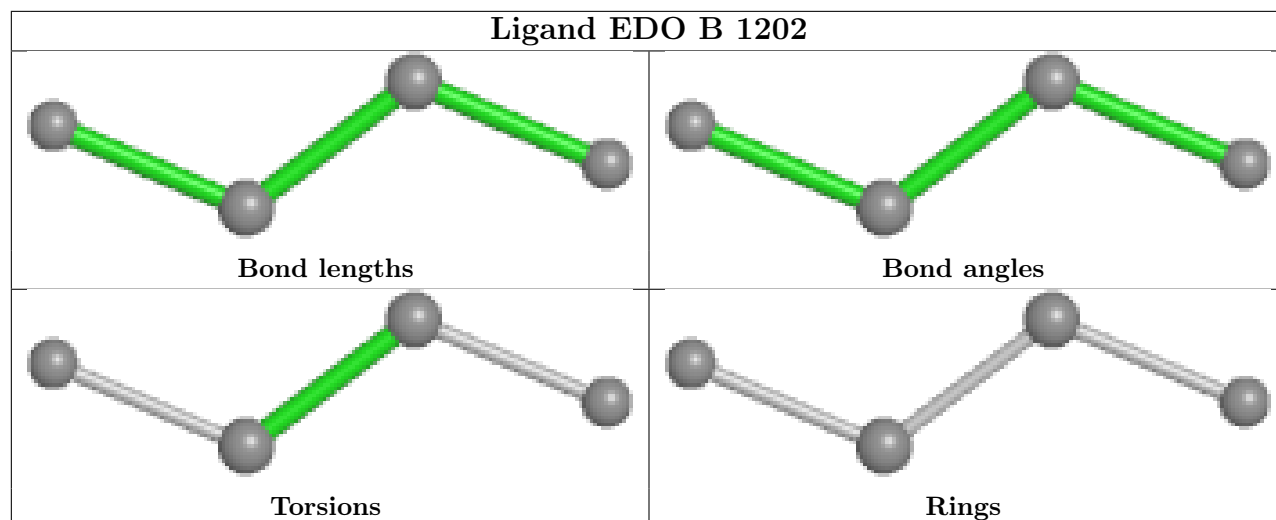
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	1232	SO4	1	0
5	A	1211	SO4	1	0
5	A	1226	SO4	1	0
4	B	1205	EDO	1	0
5	B	1229	SO4	1	0

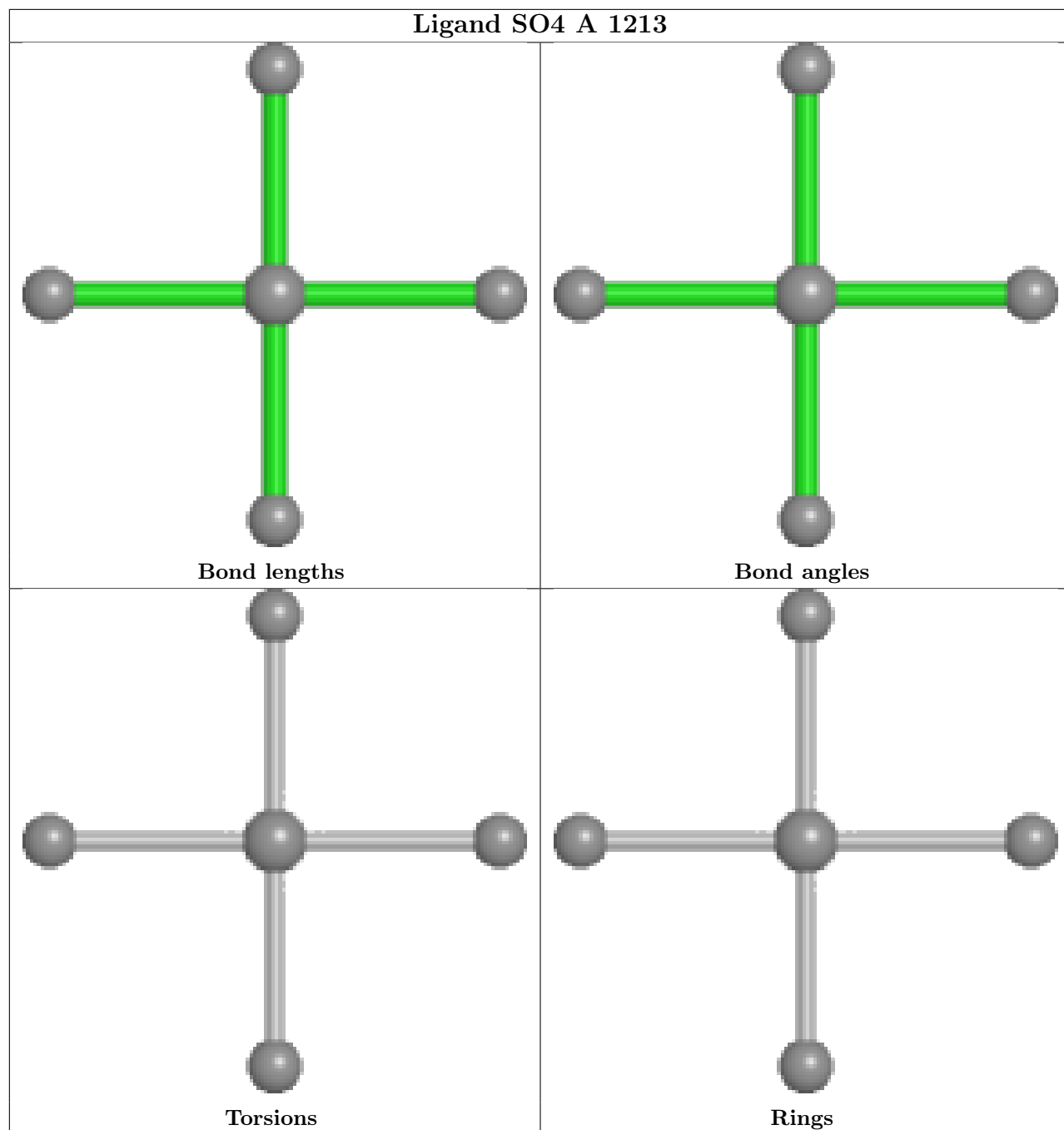
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 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.

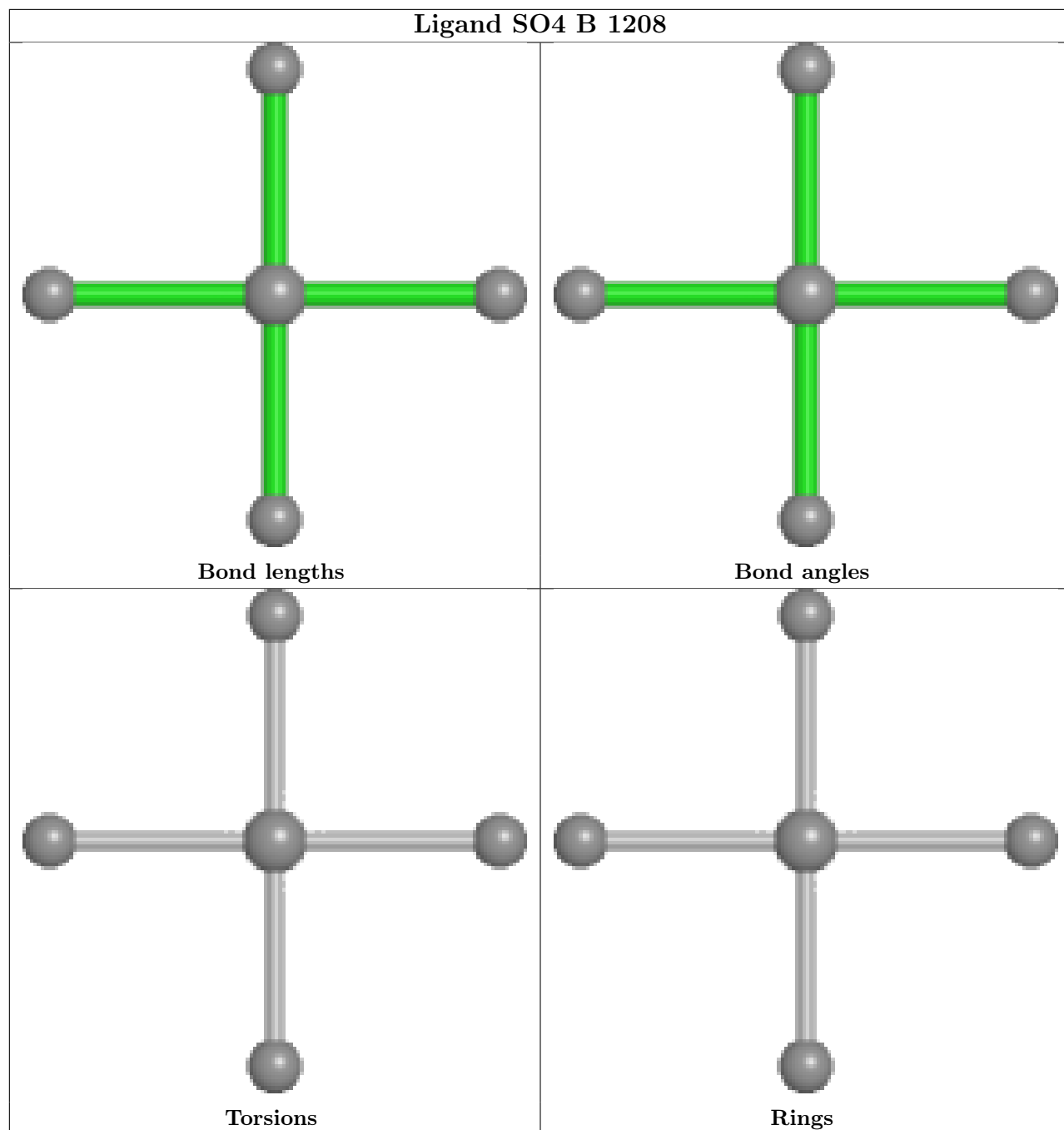


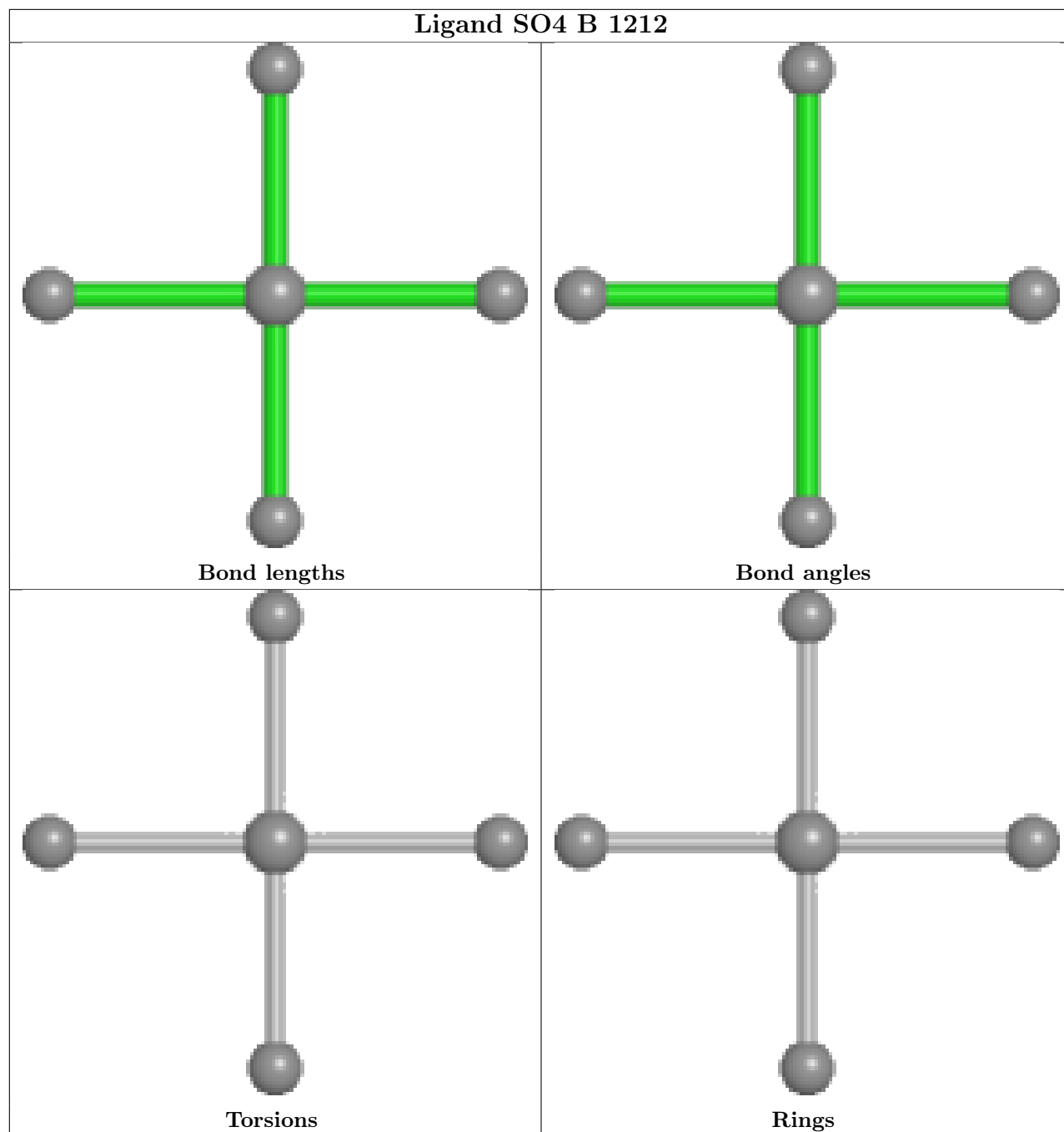


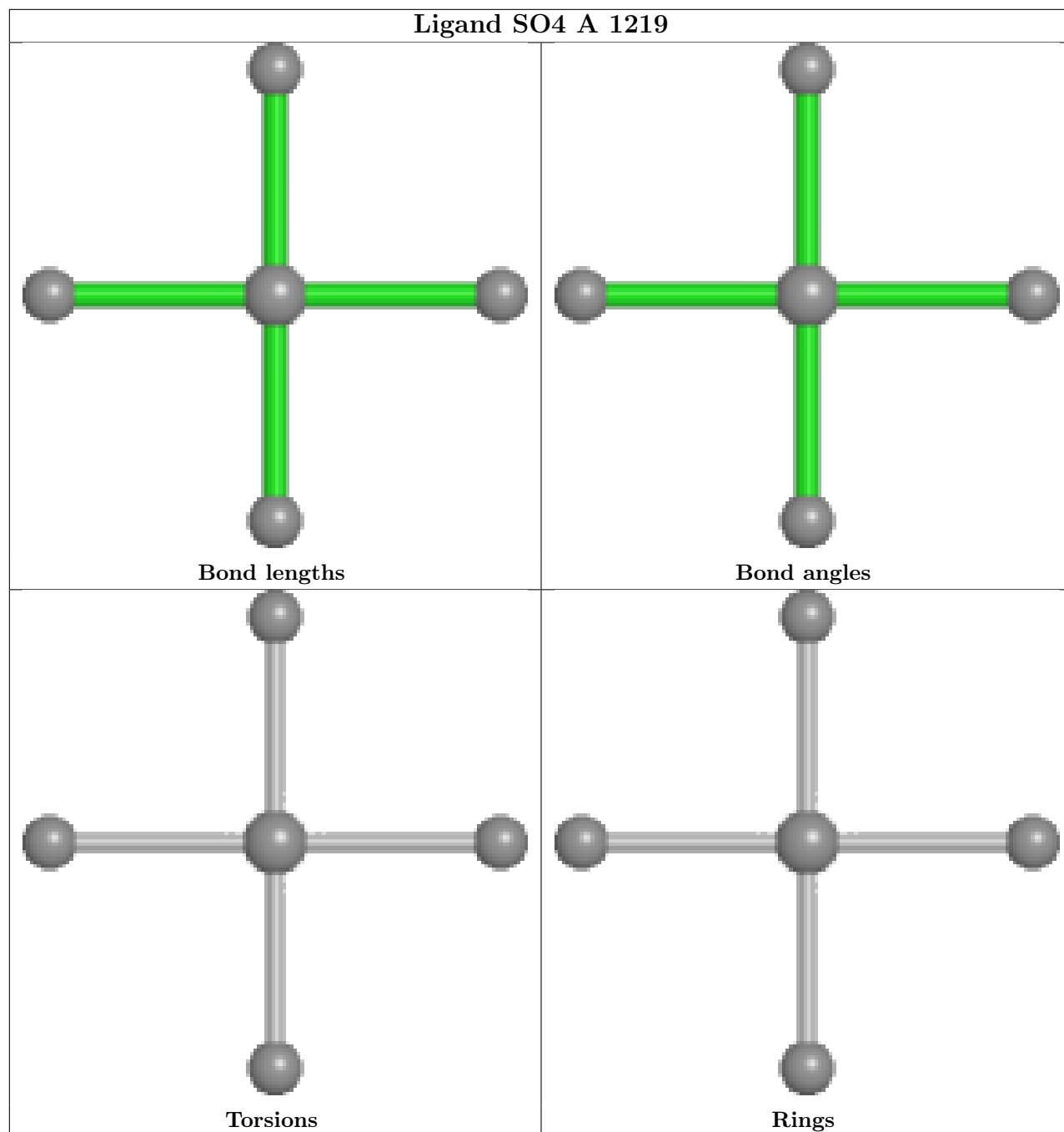


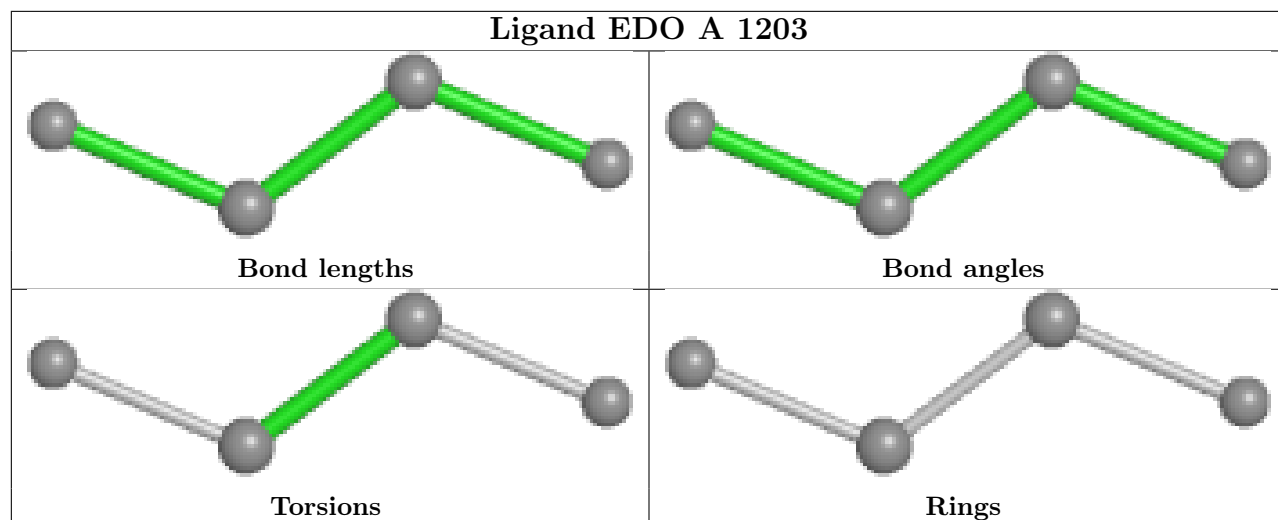


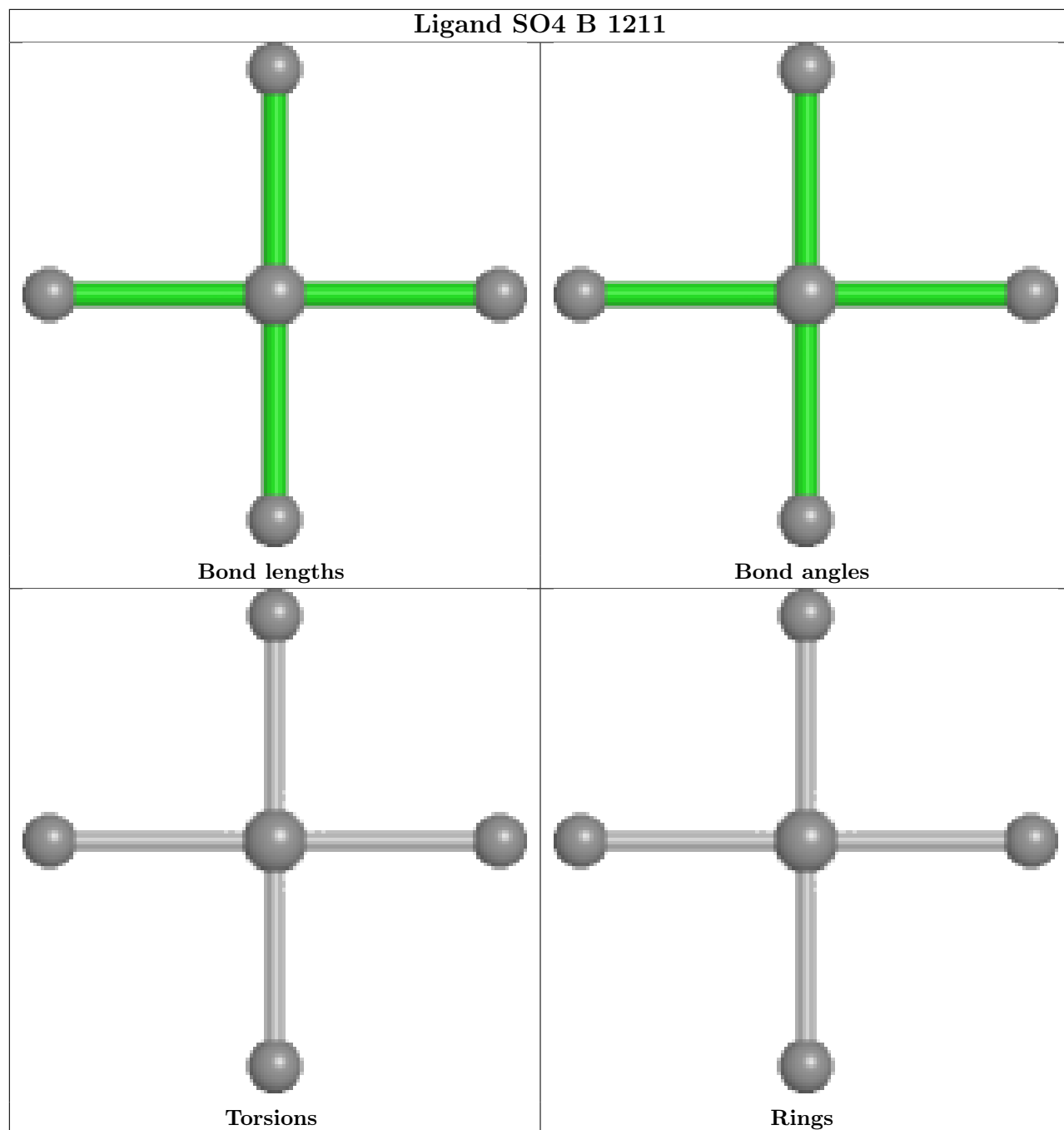


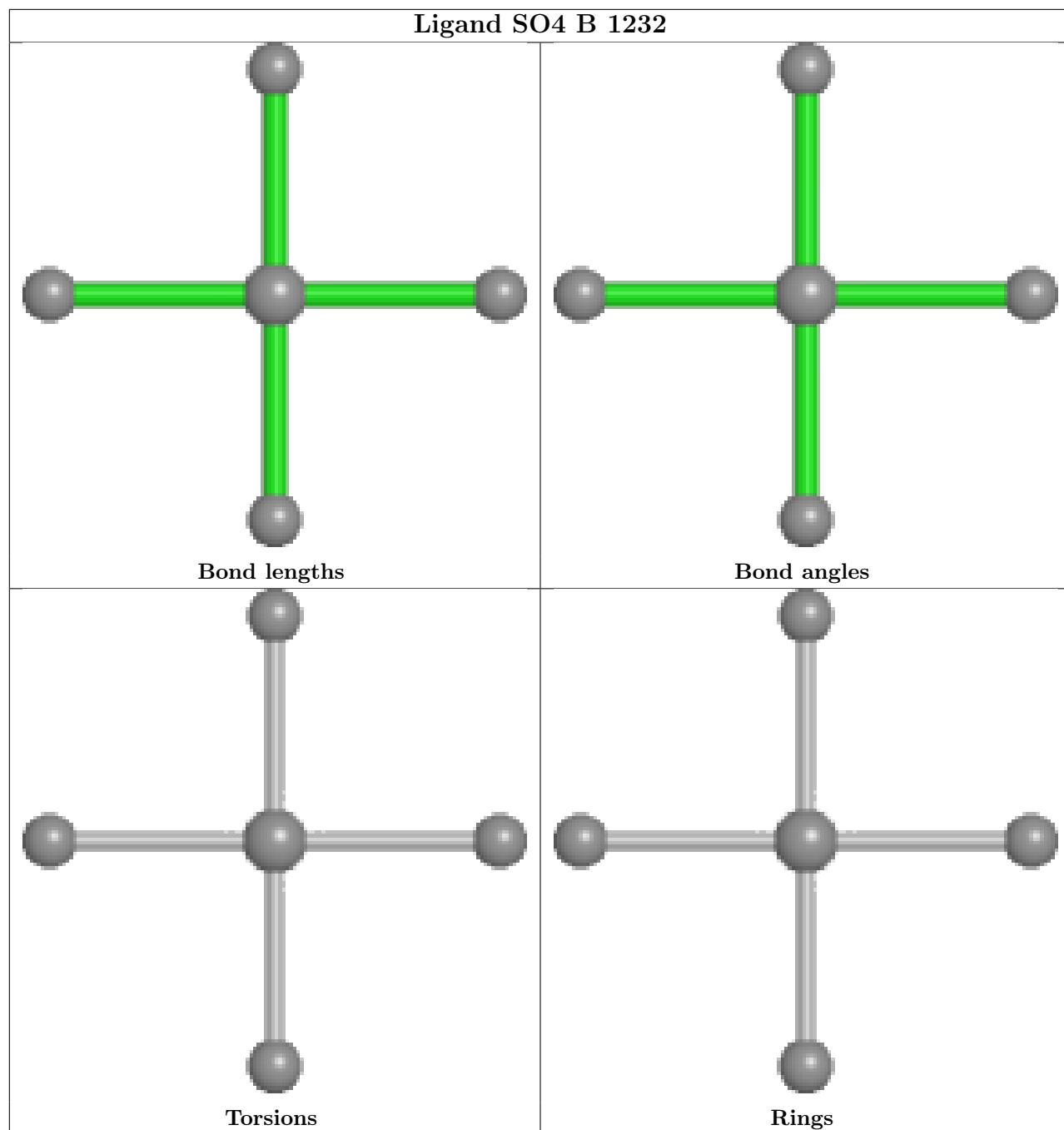


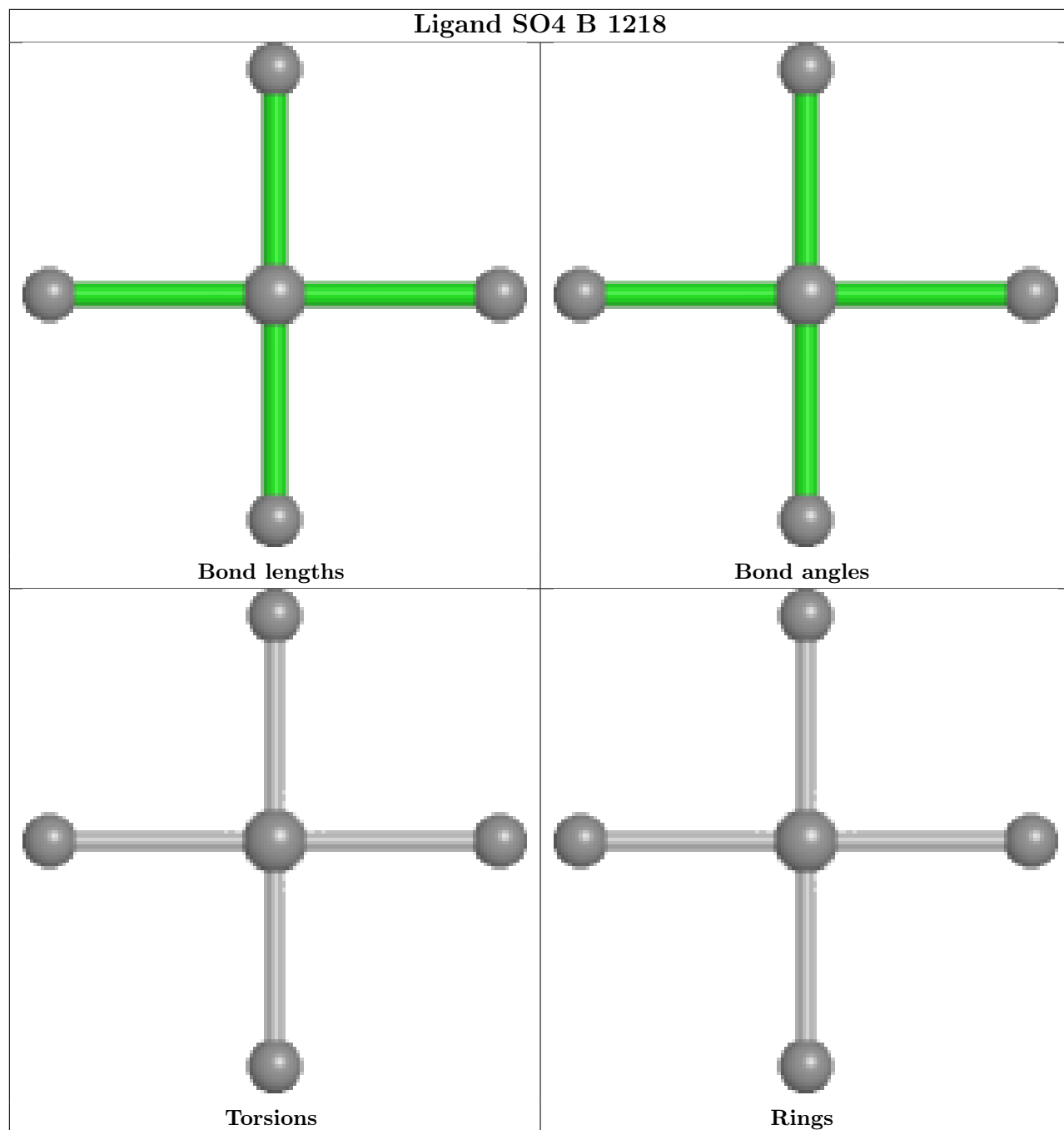


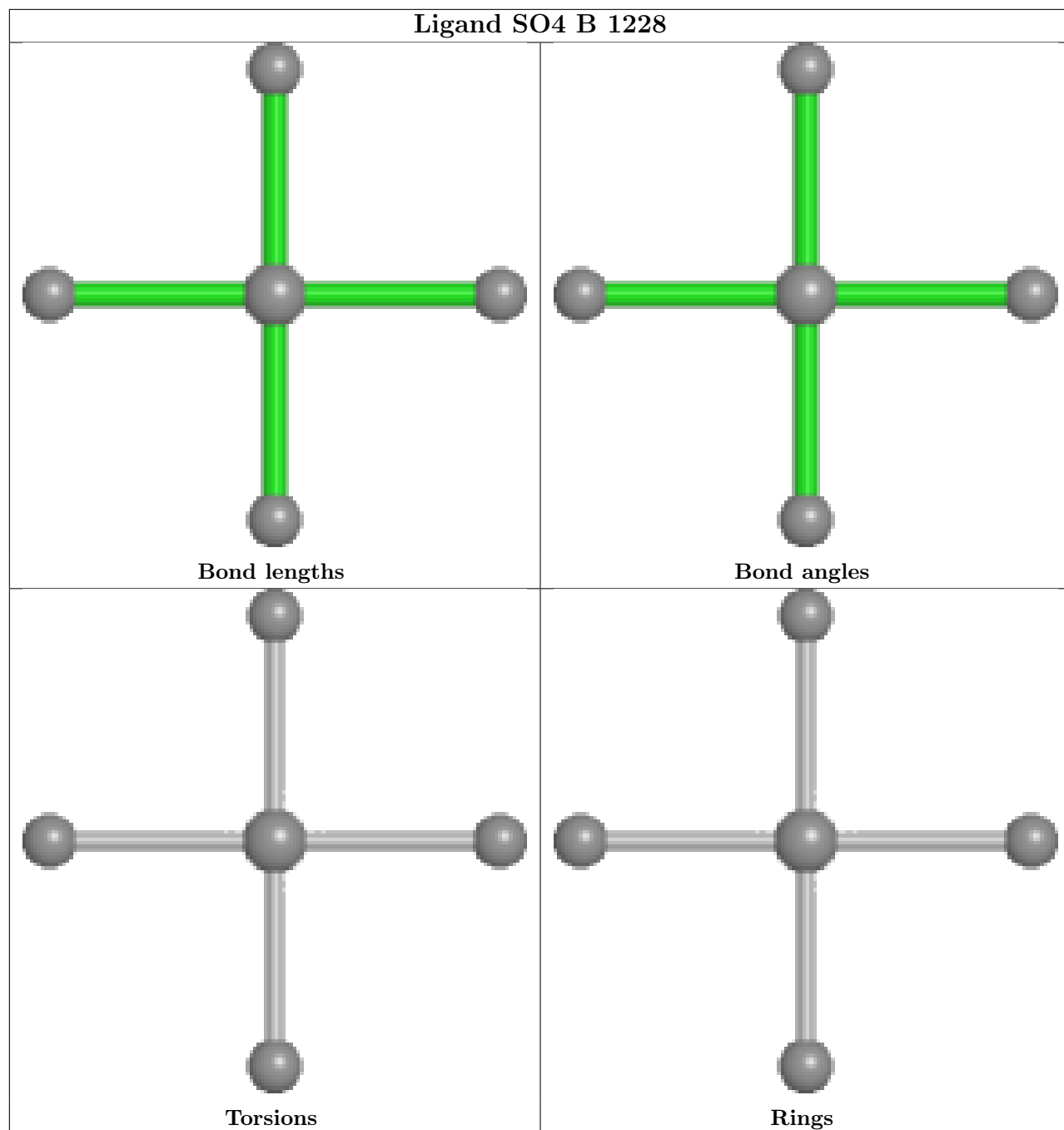


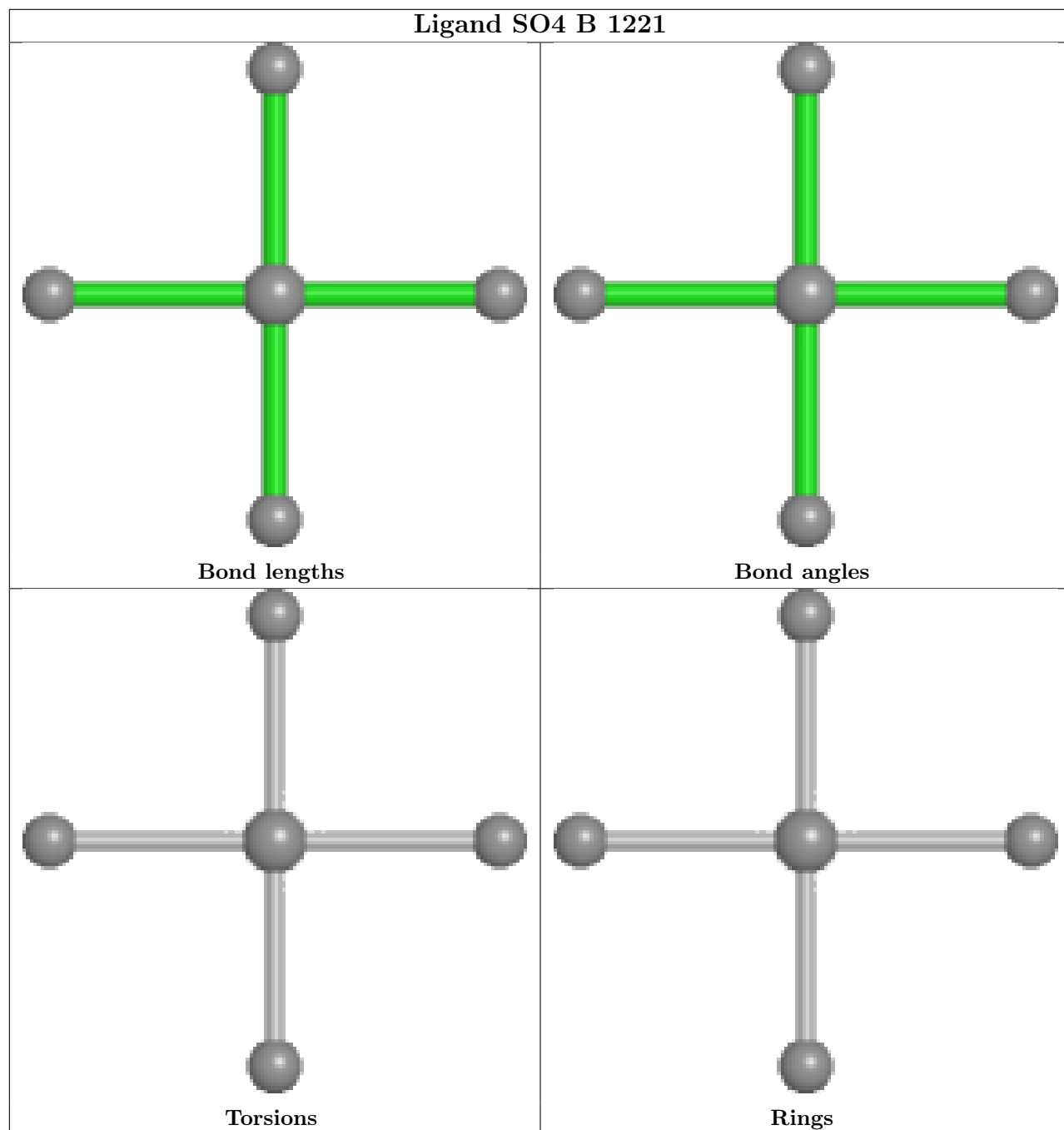


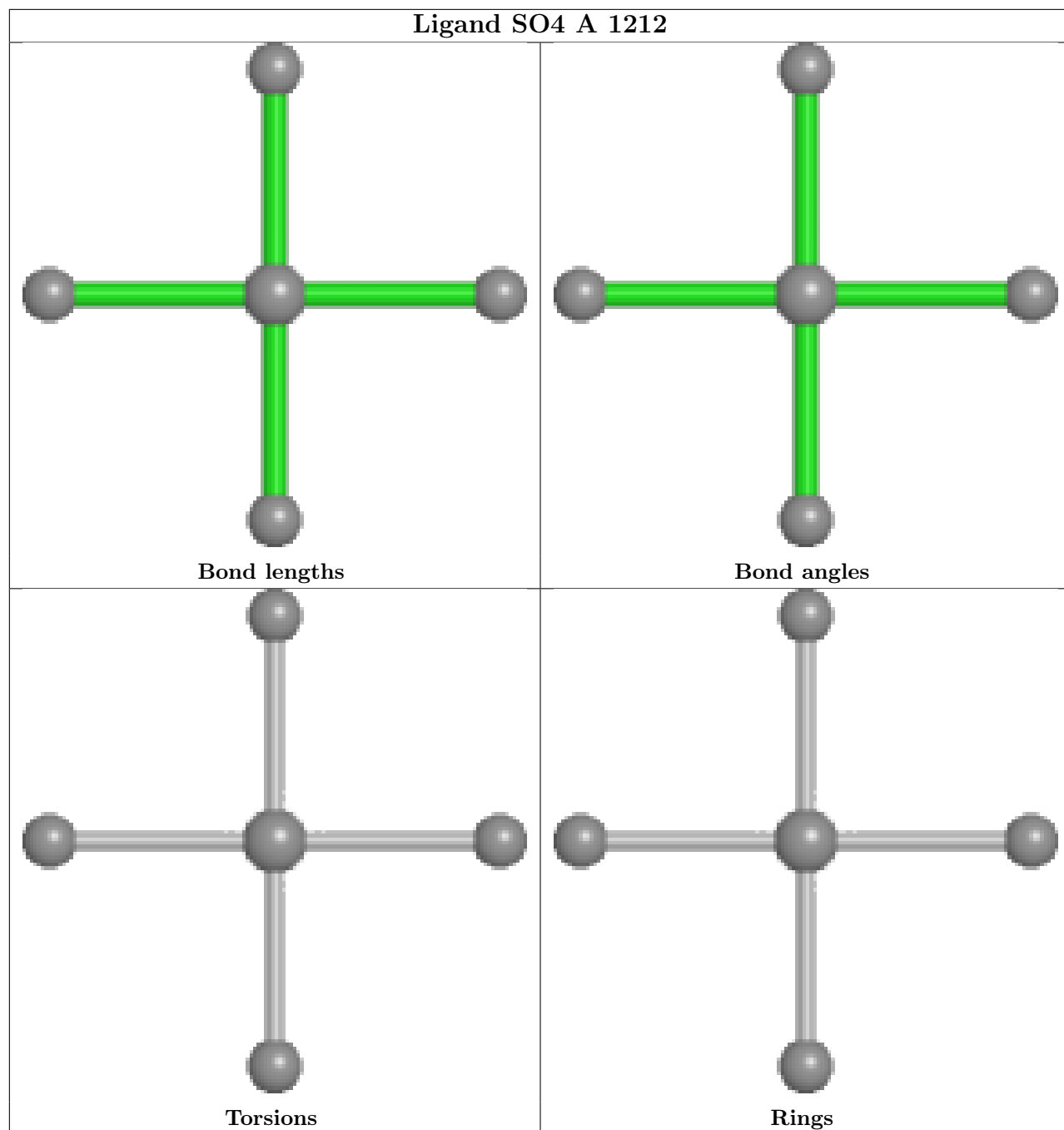


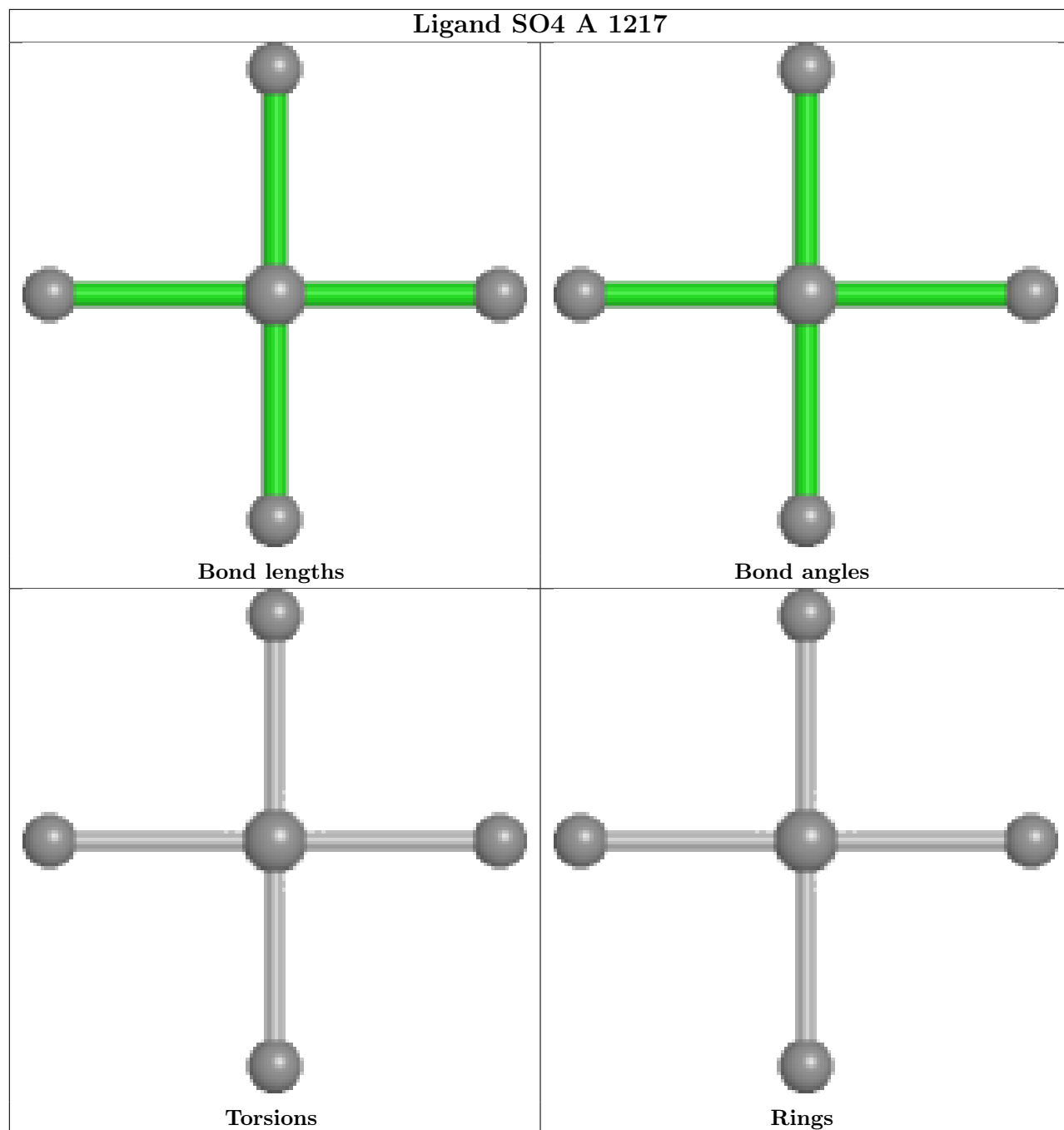


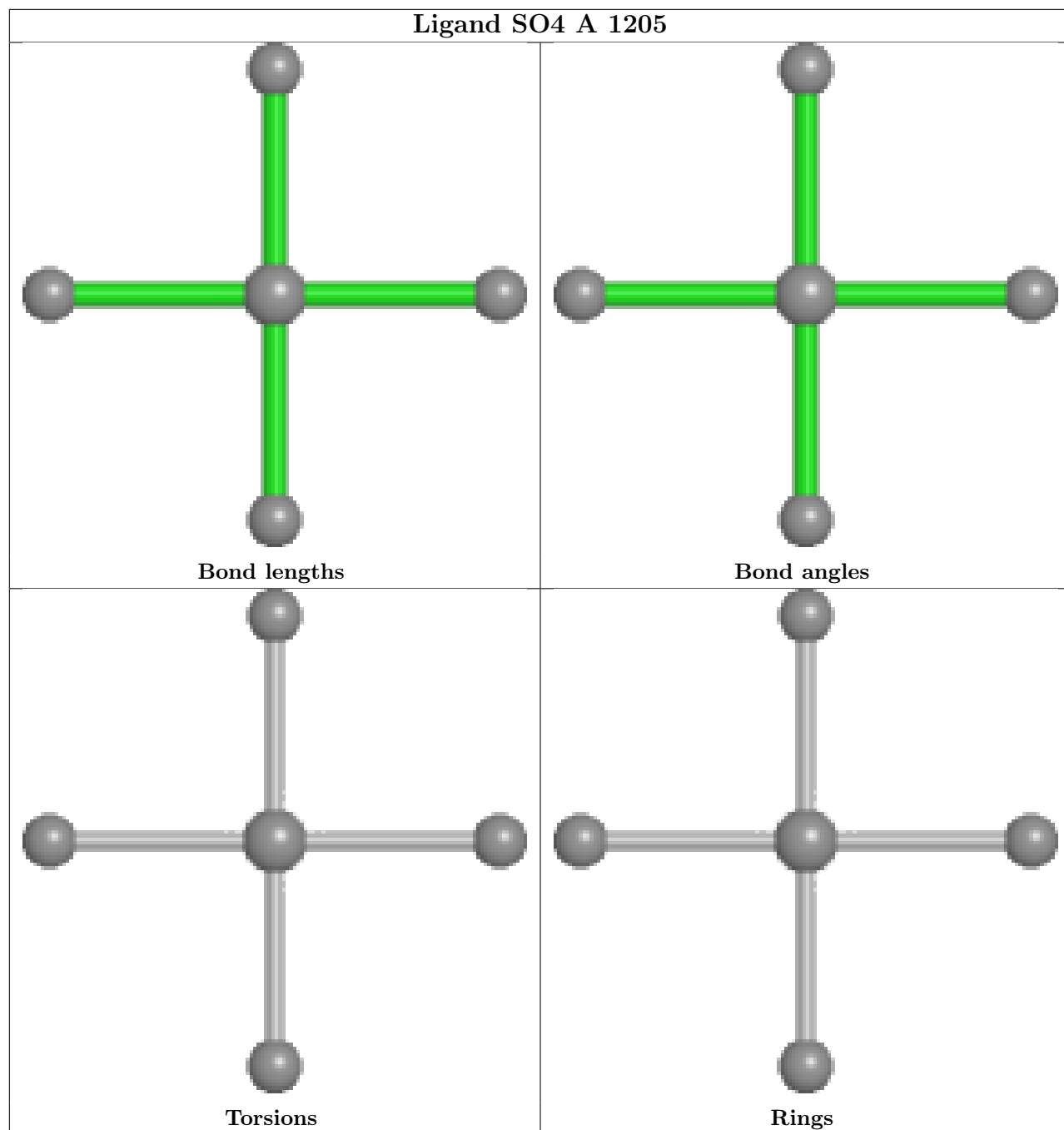


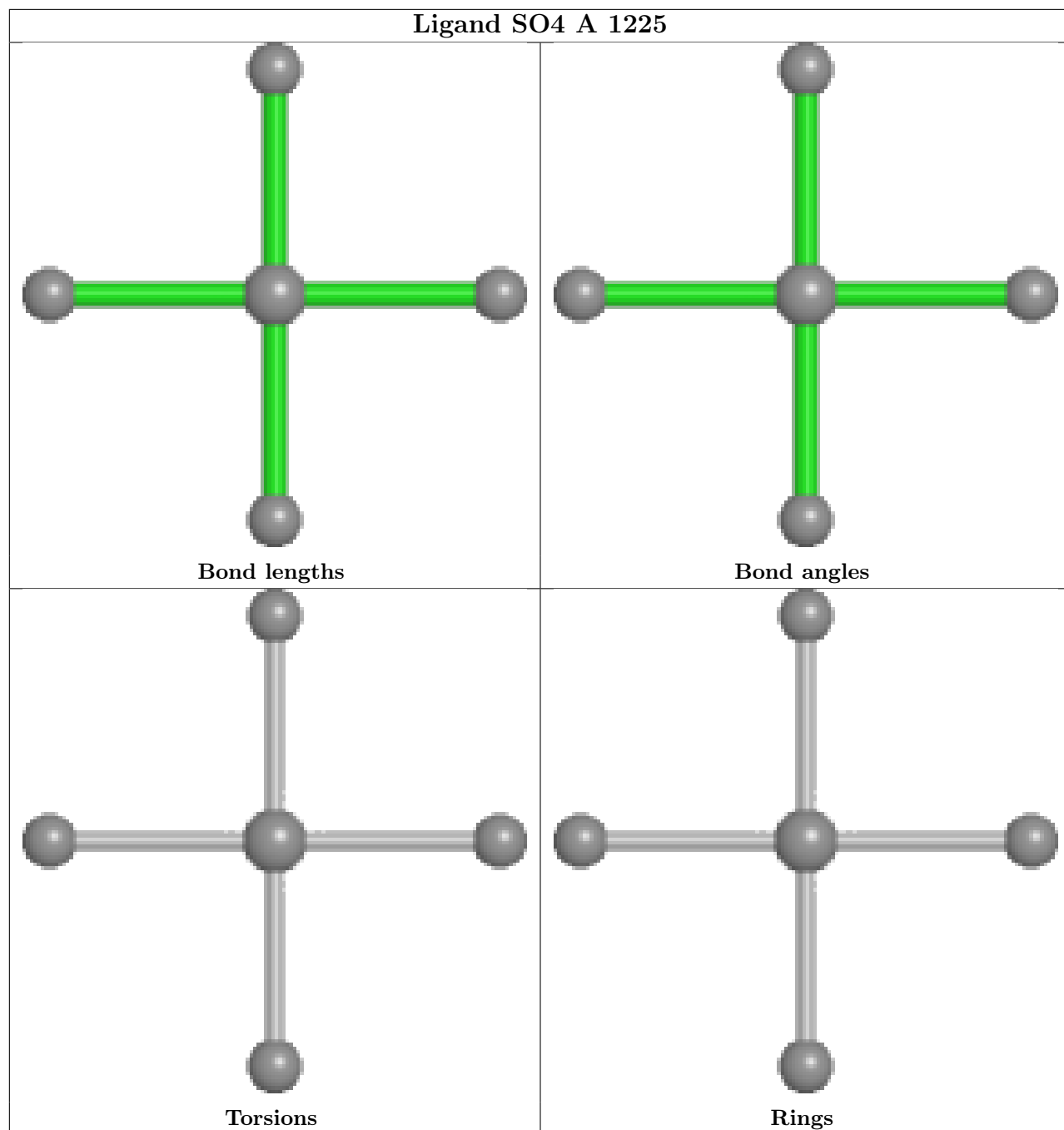


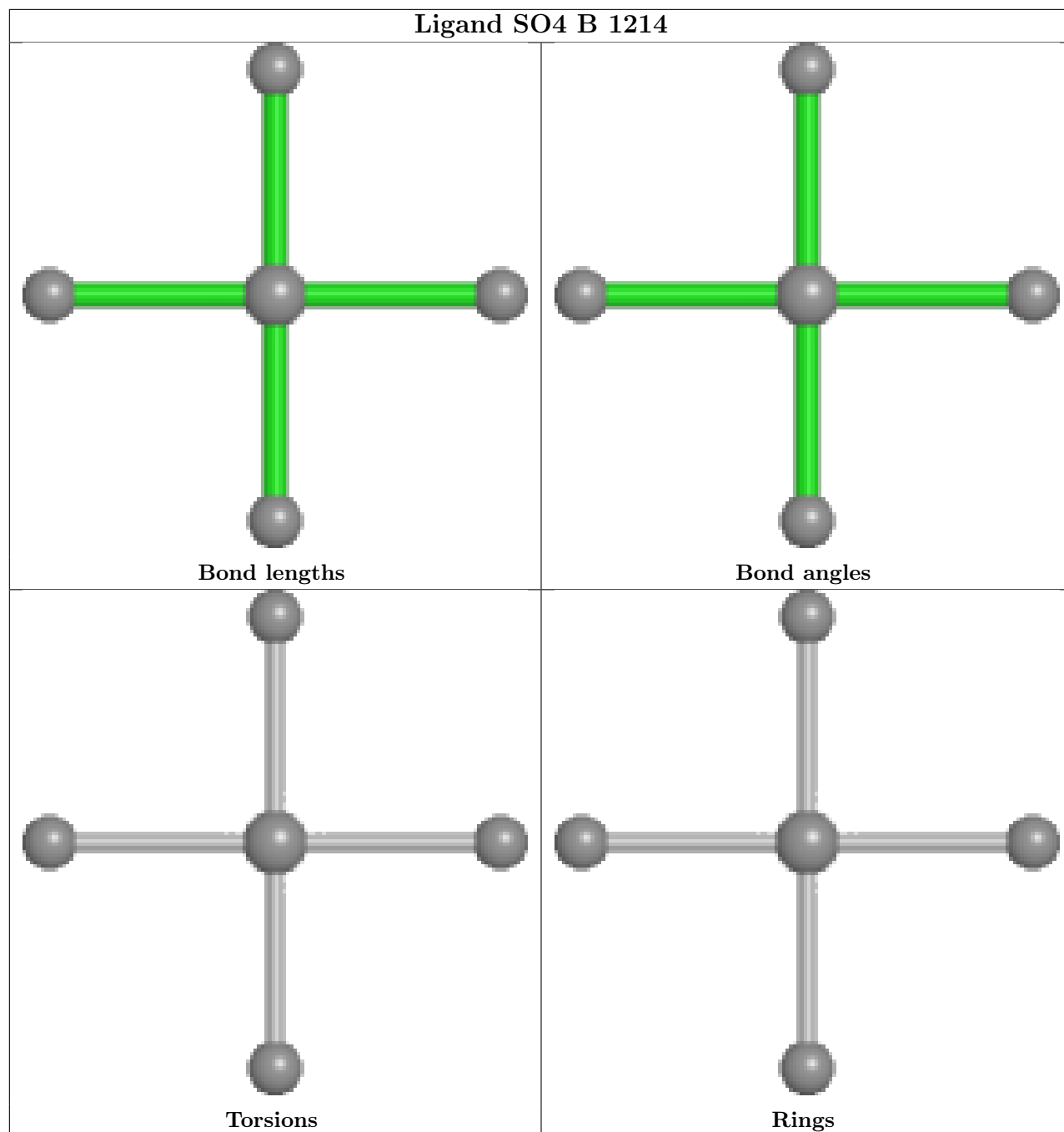


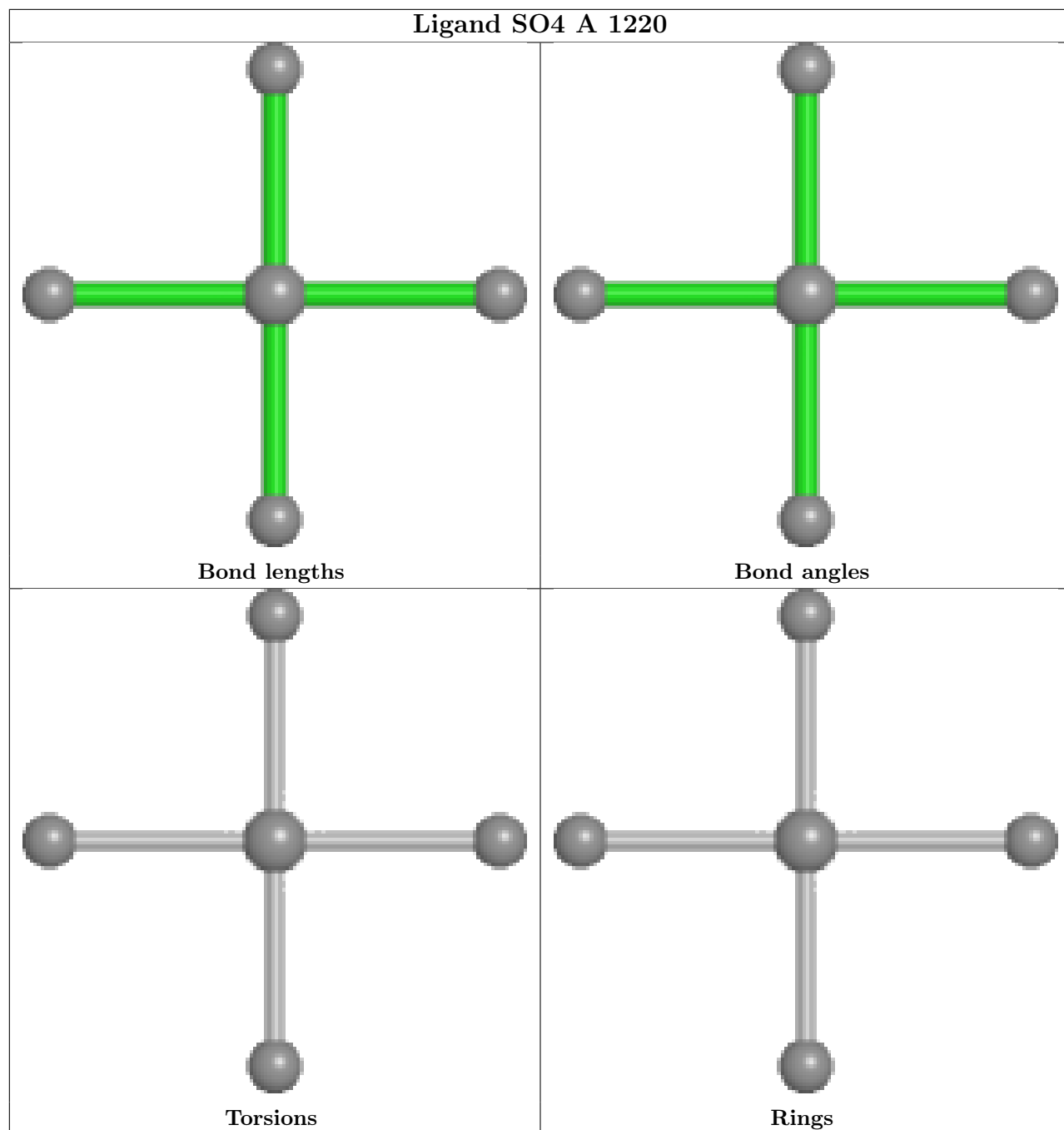


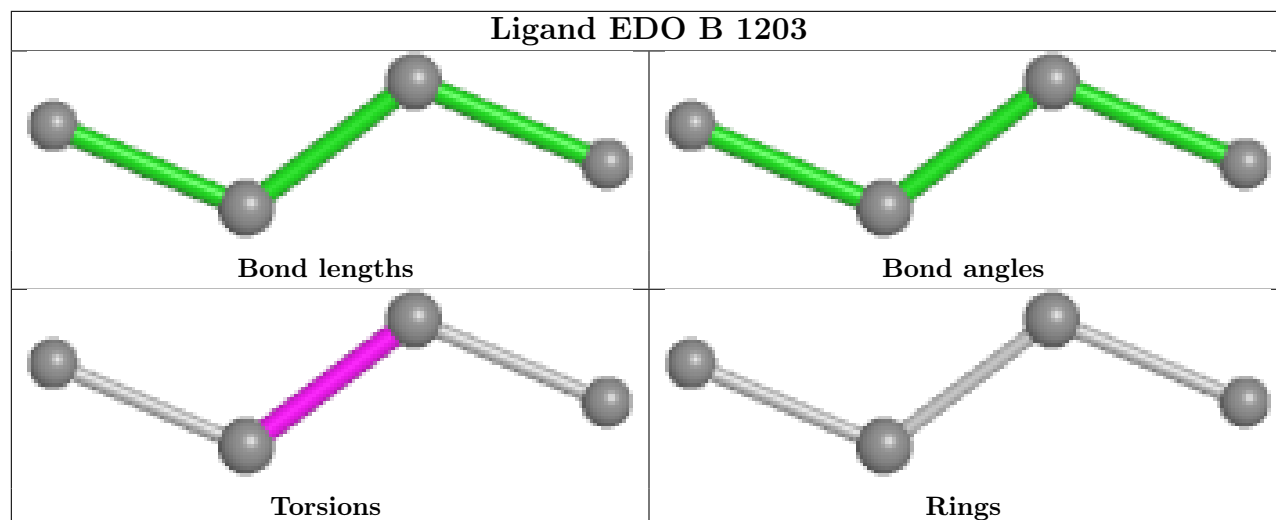


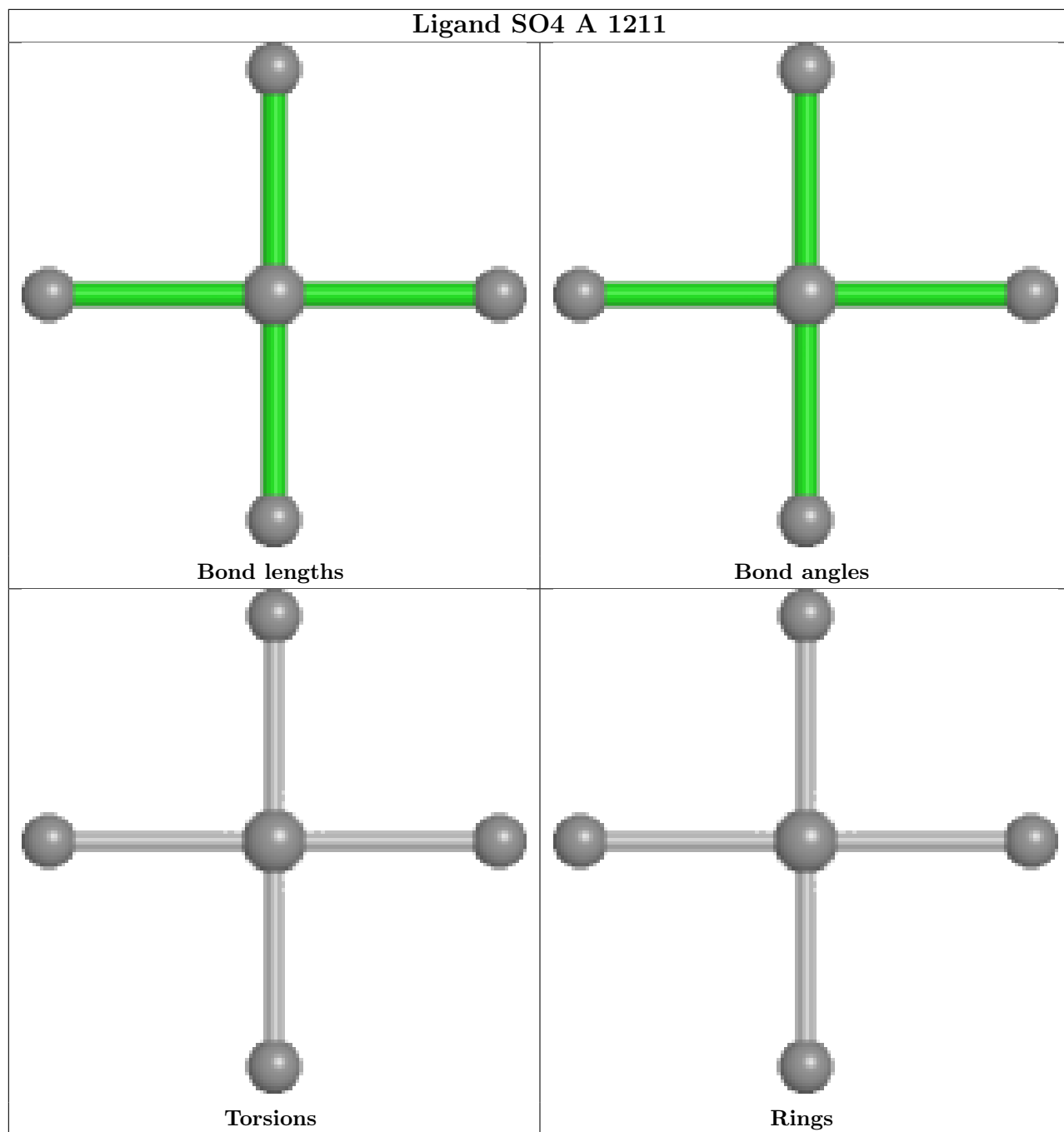


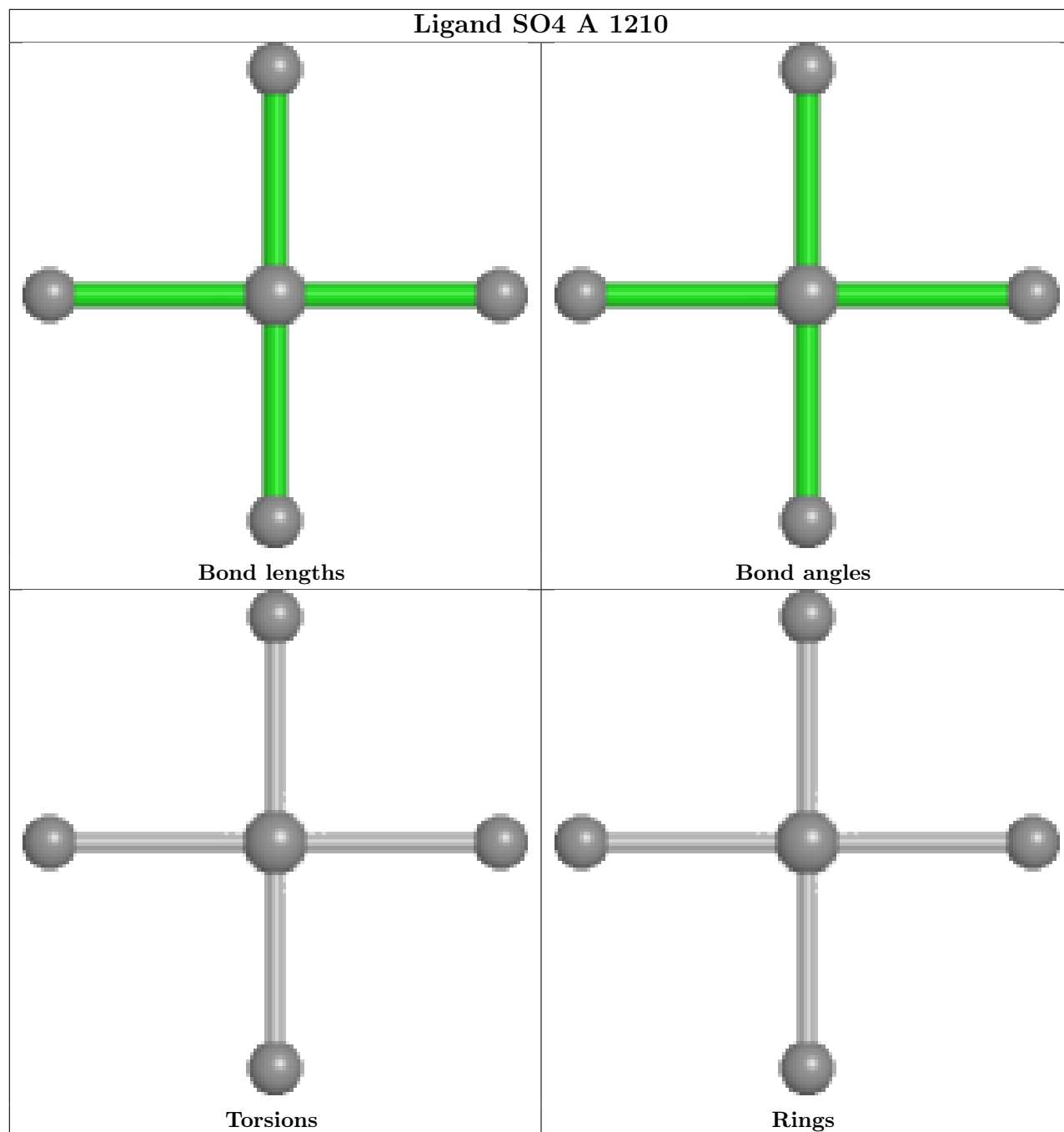


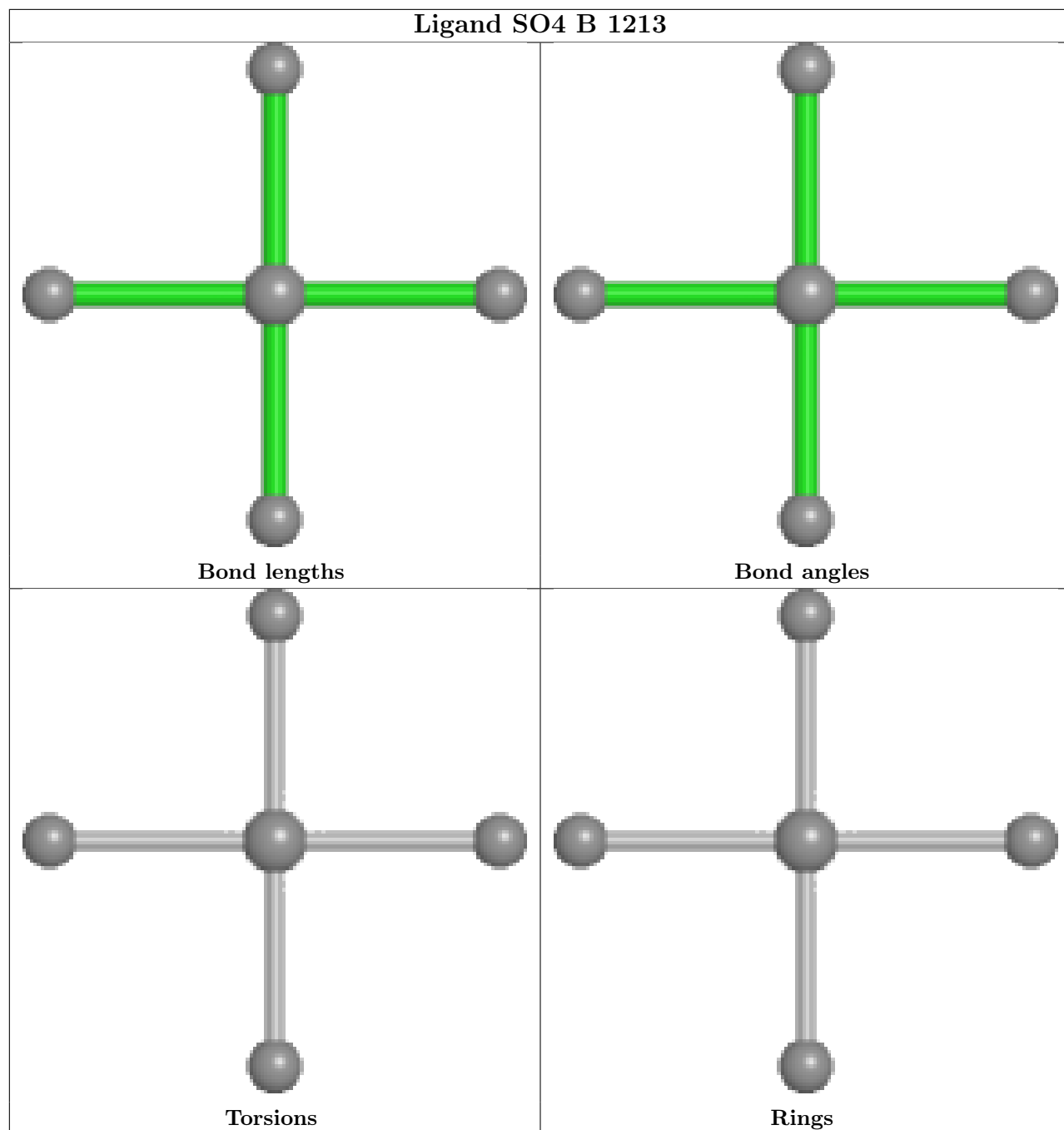


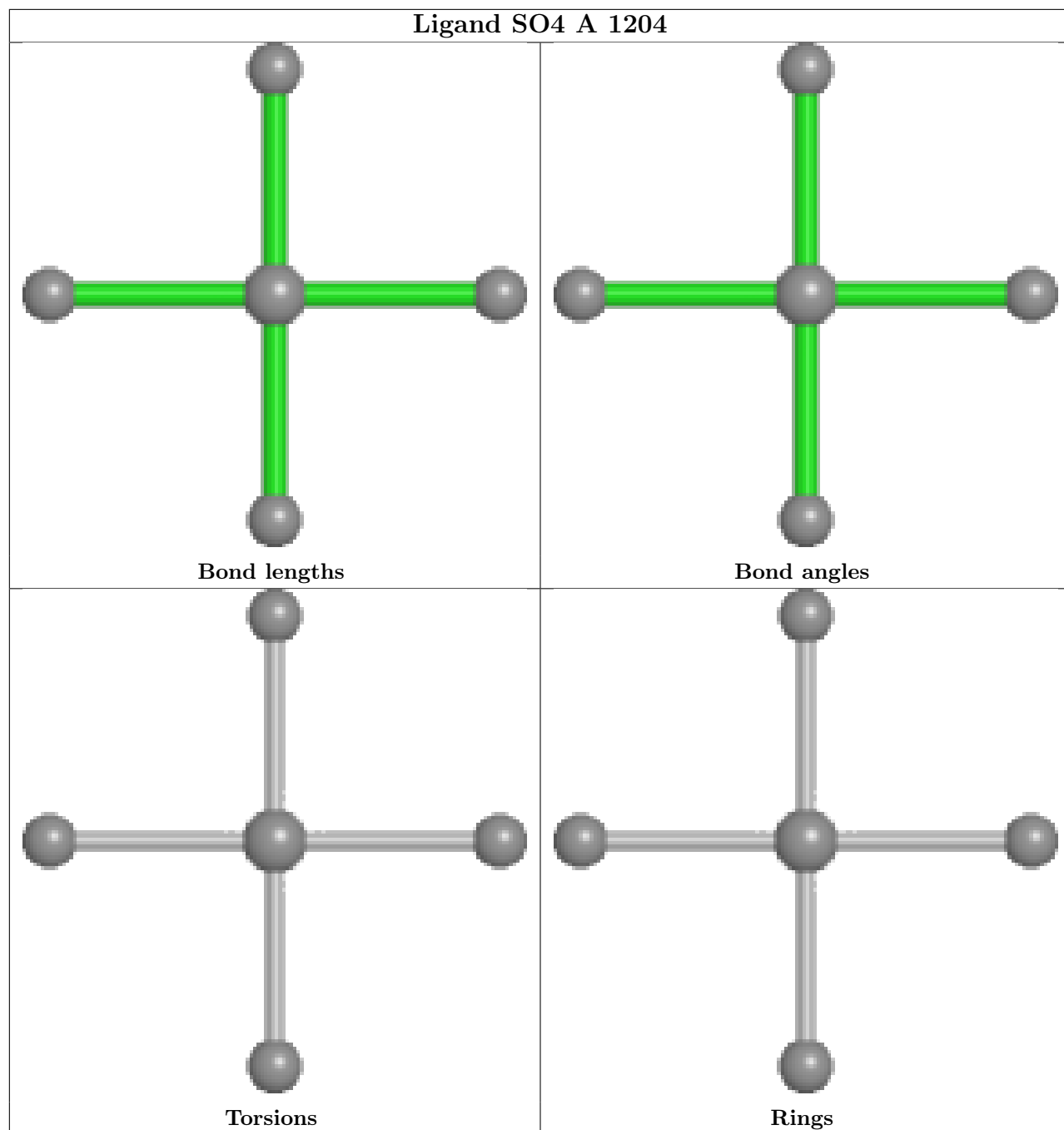


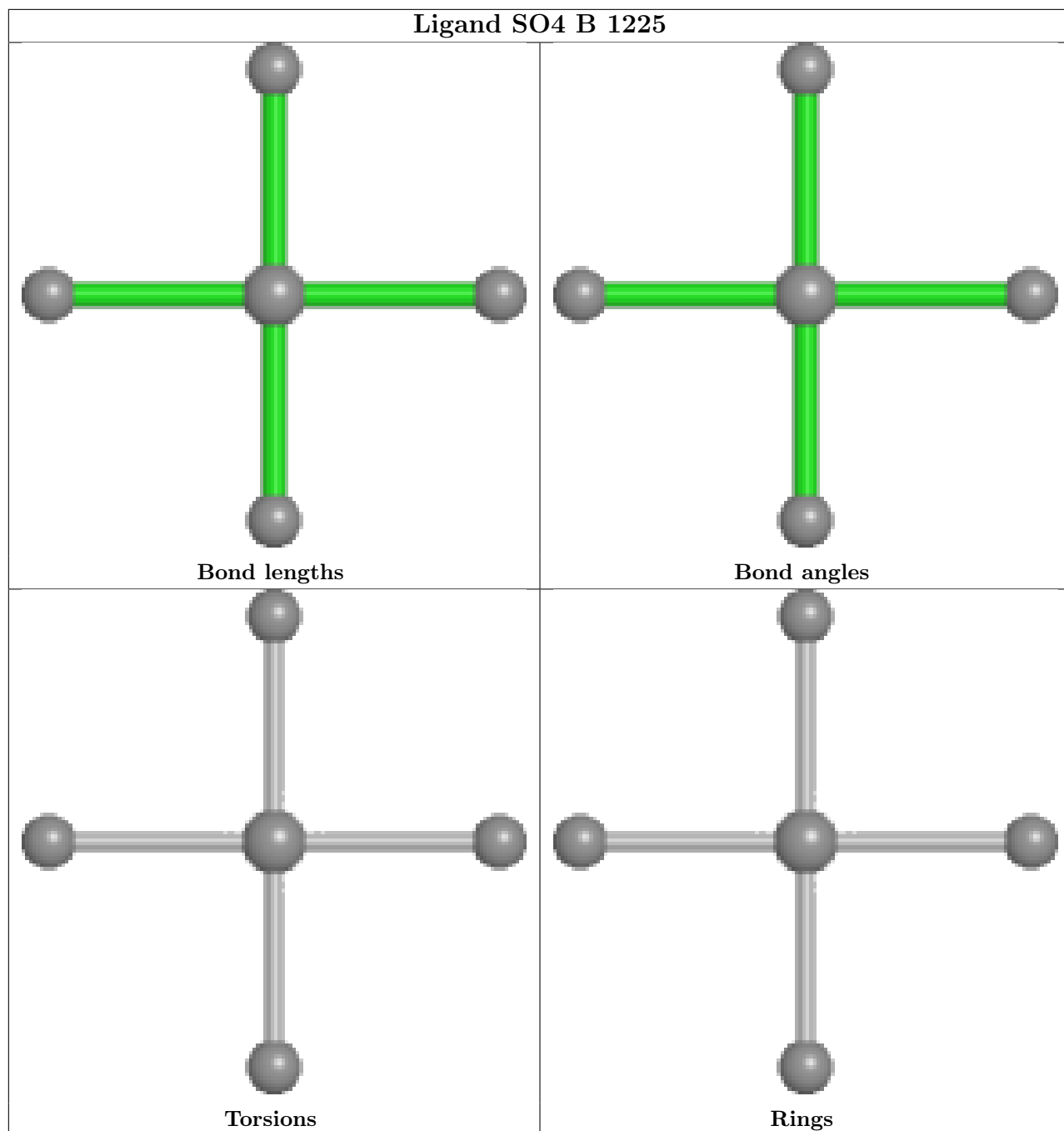


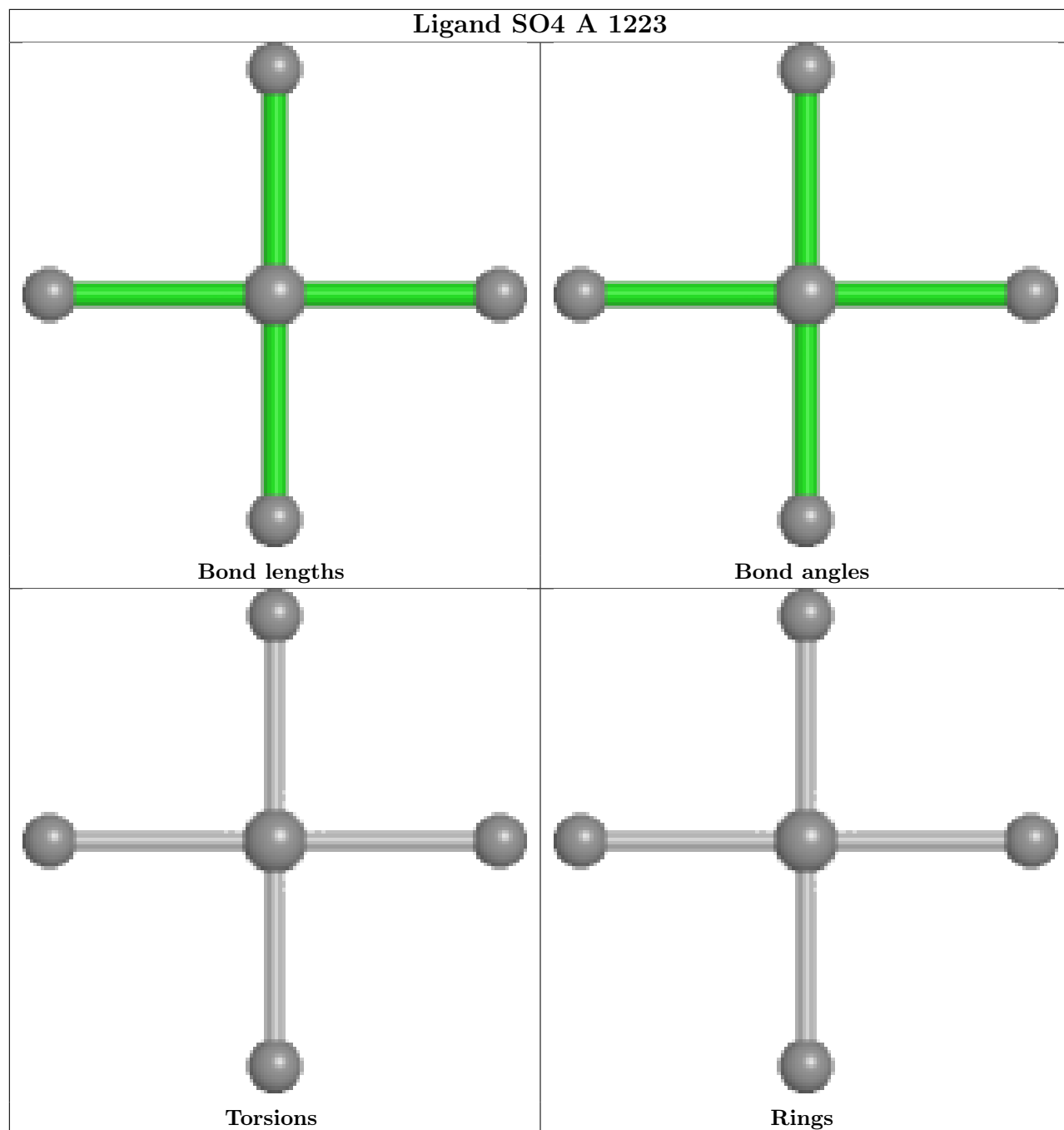


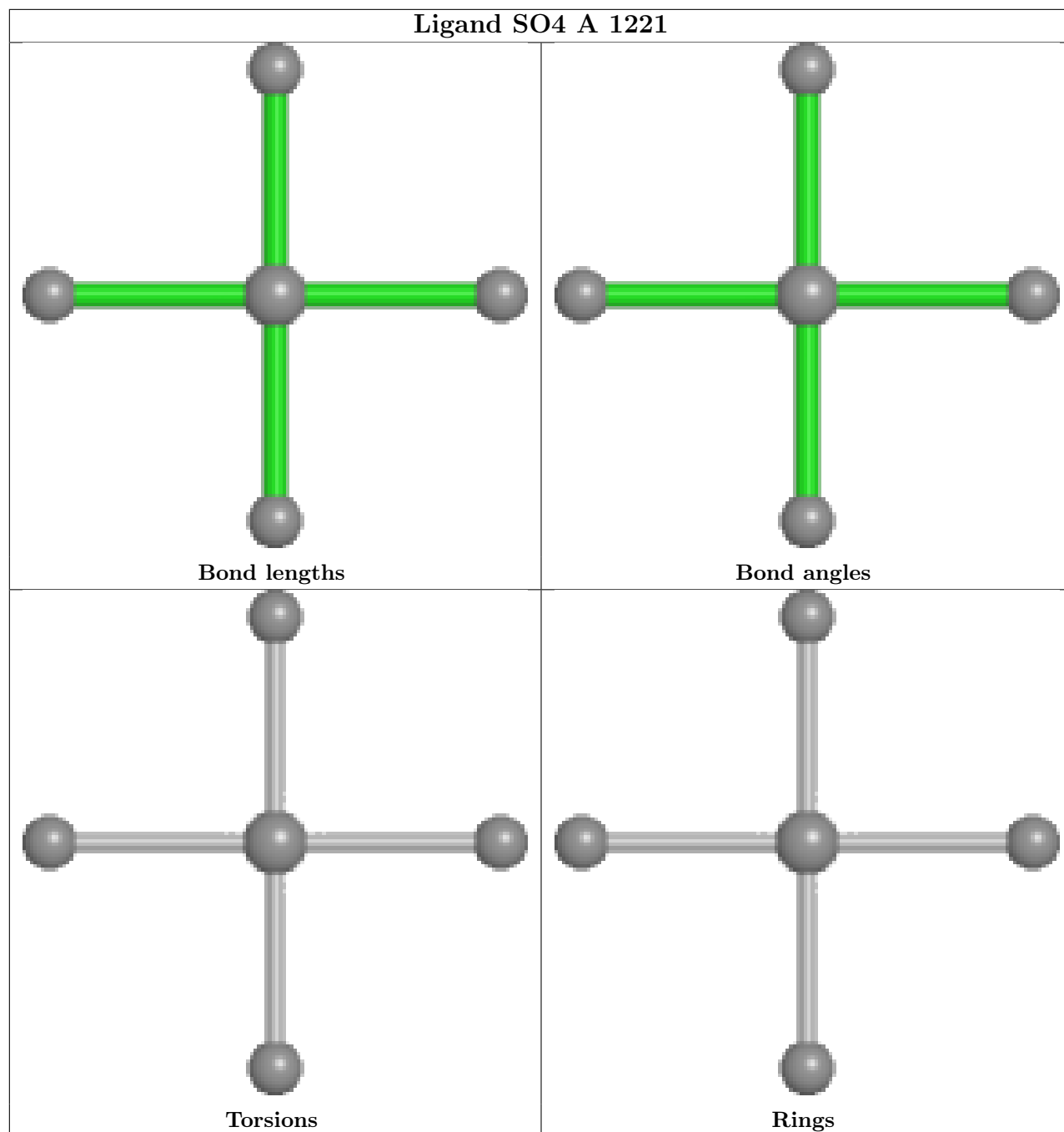


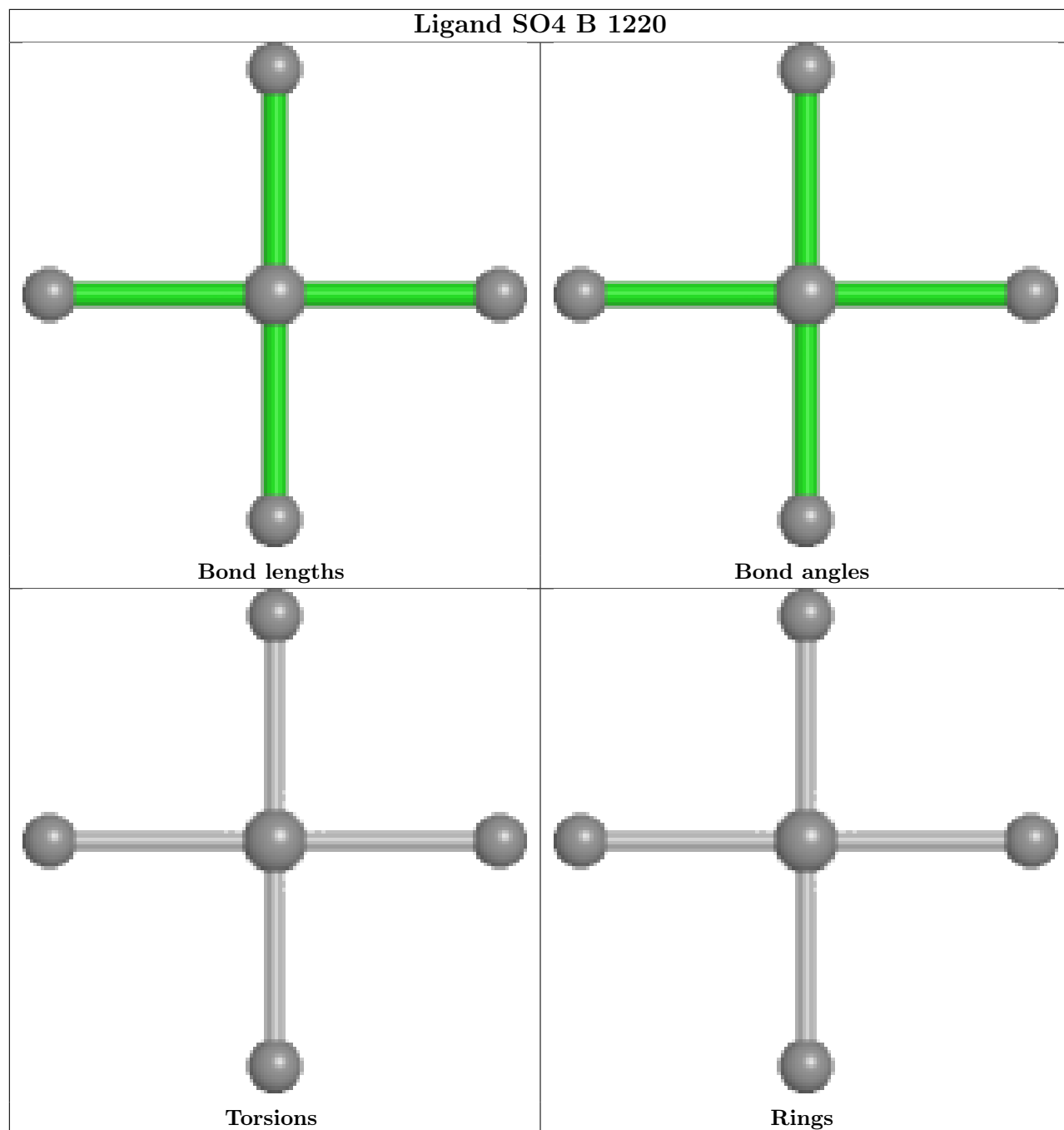


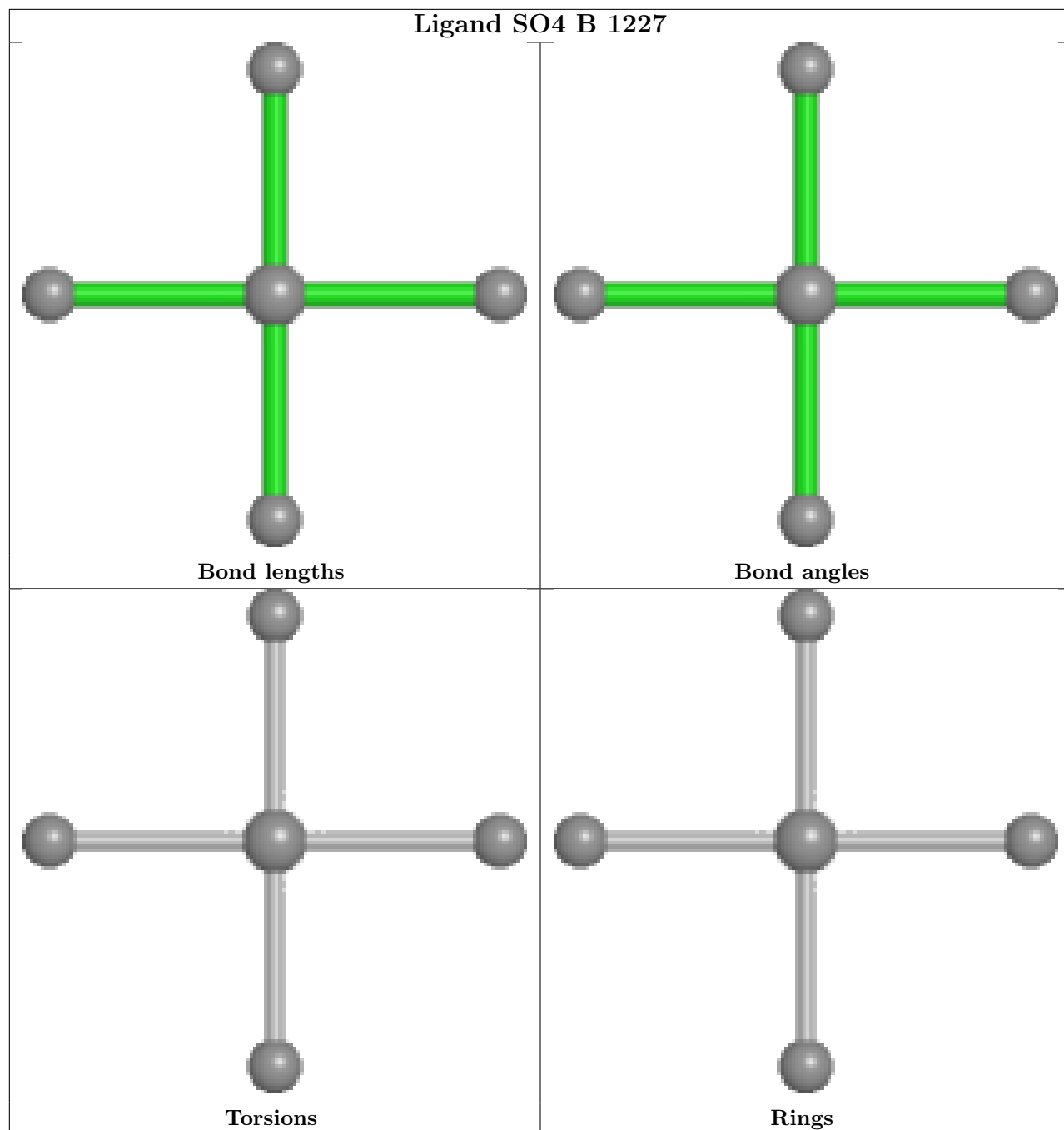


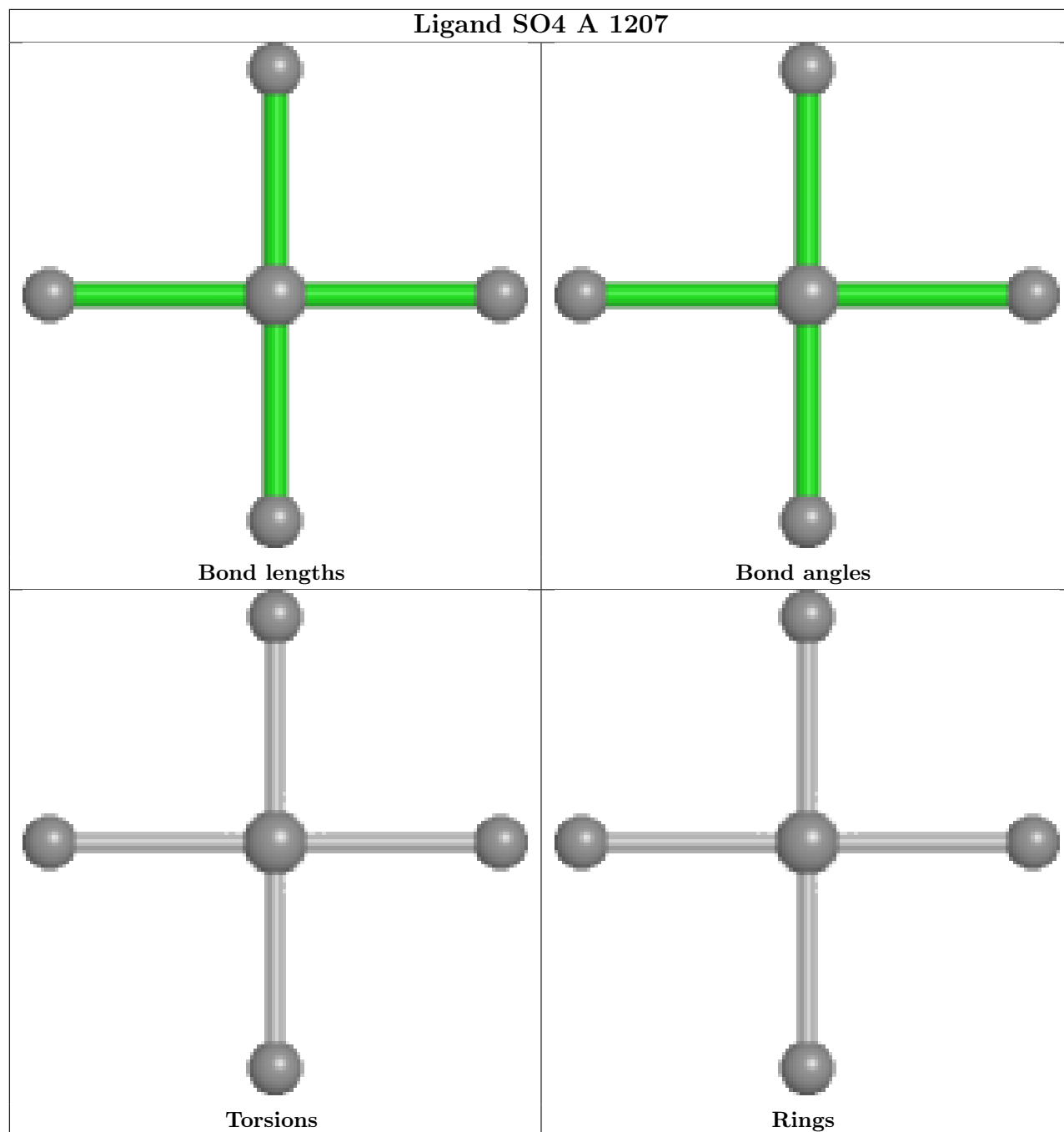


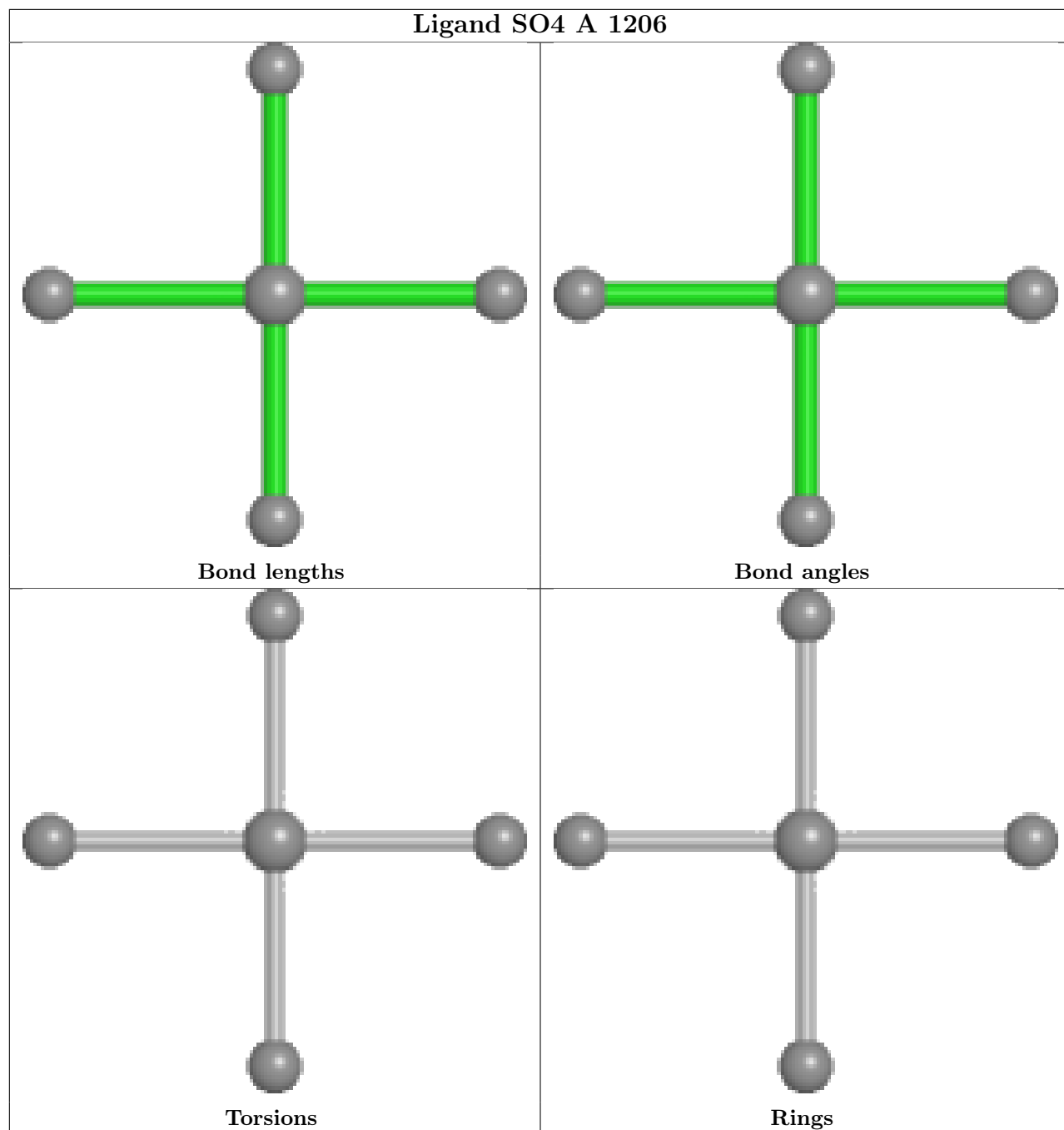


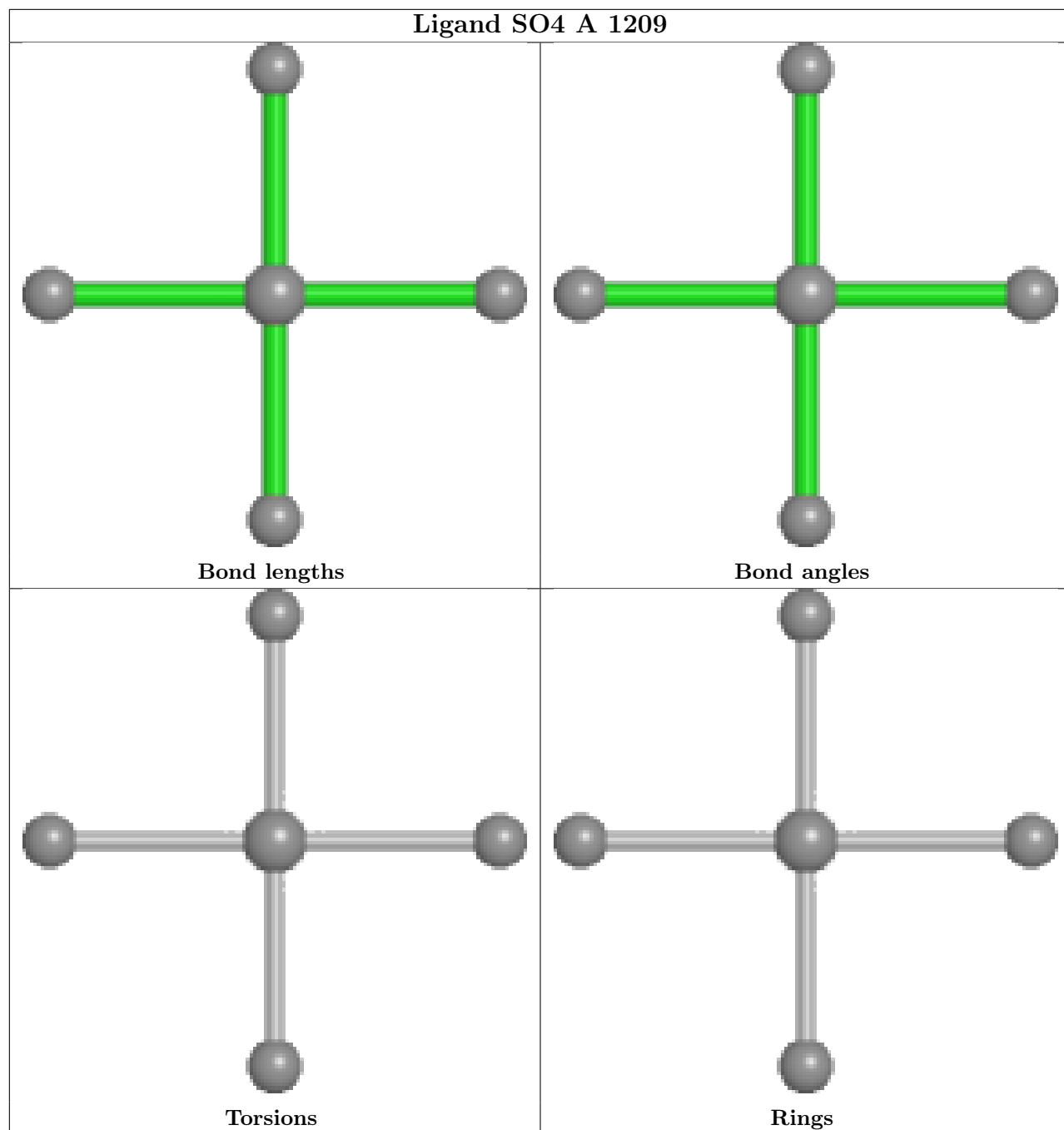


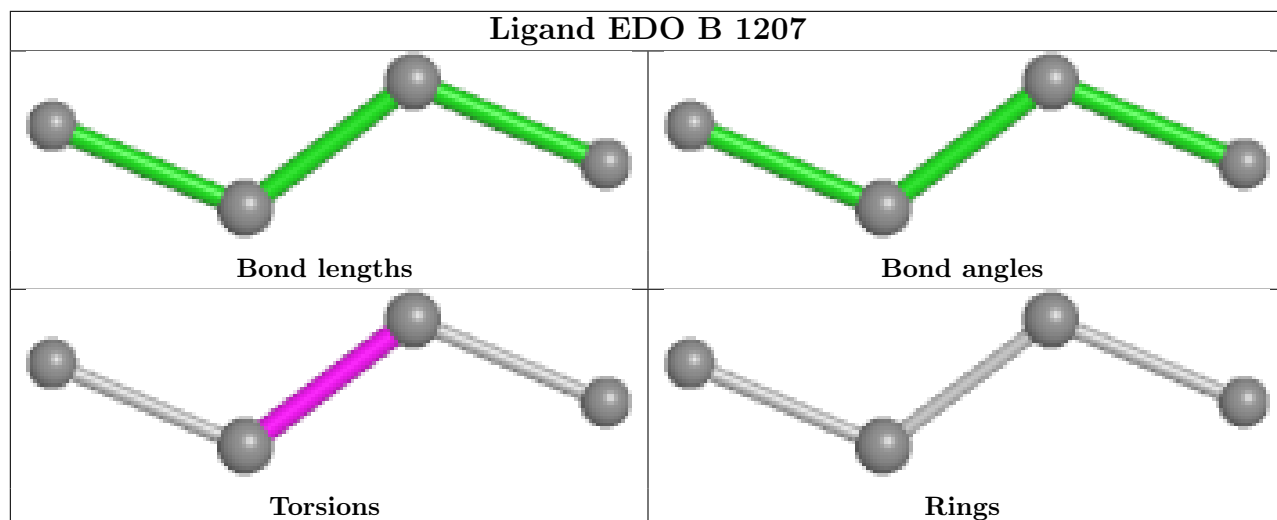


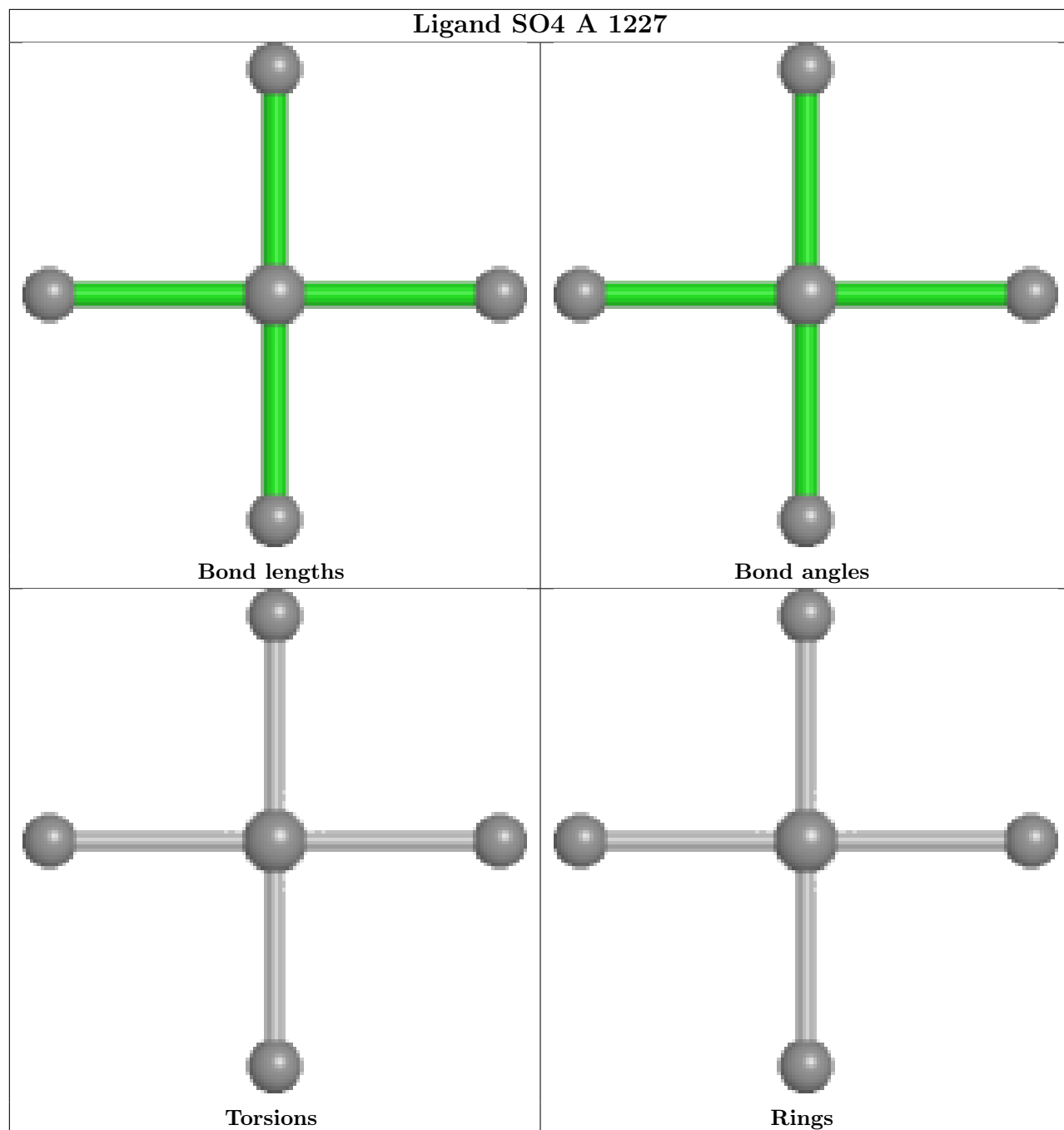


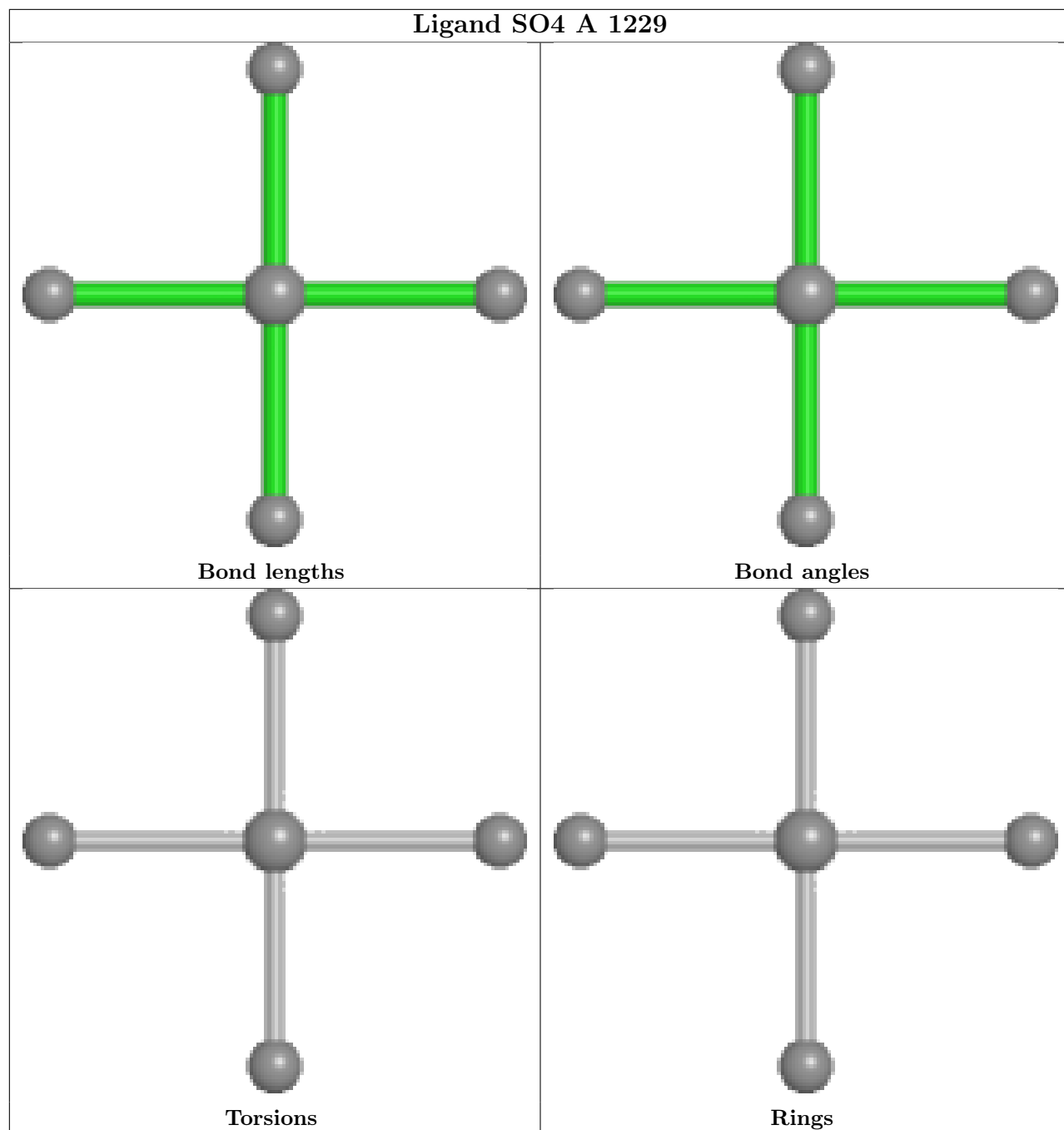


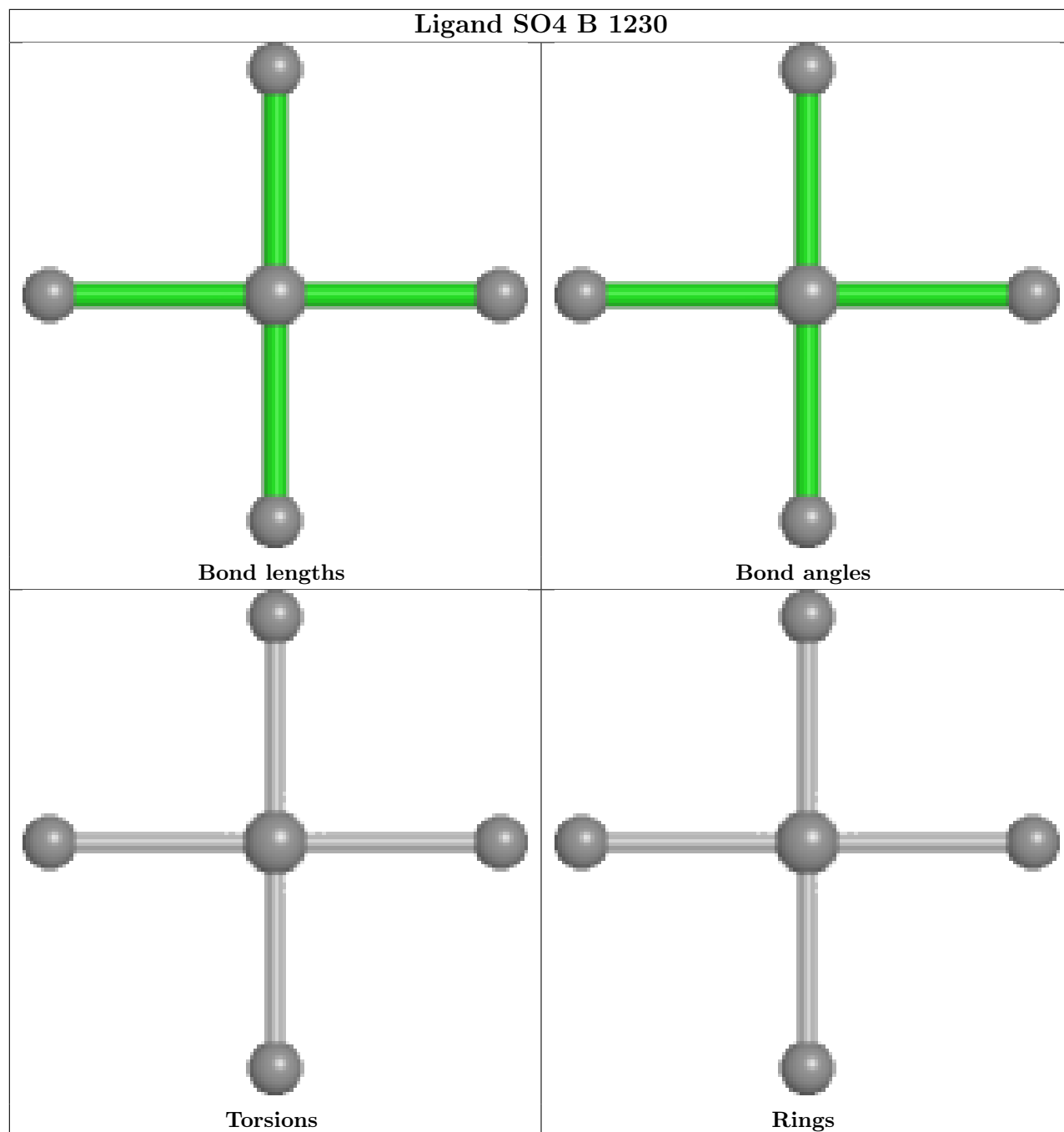


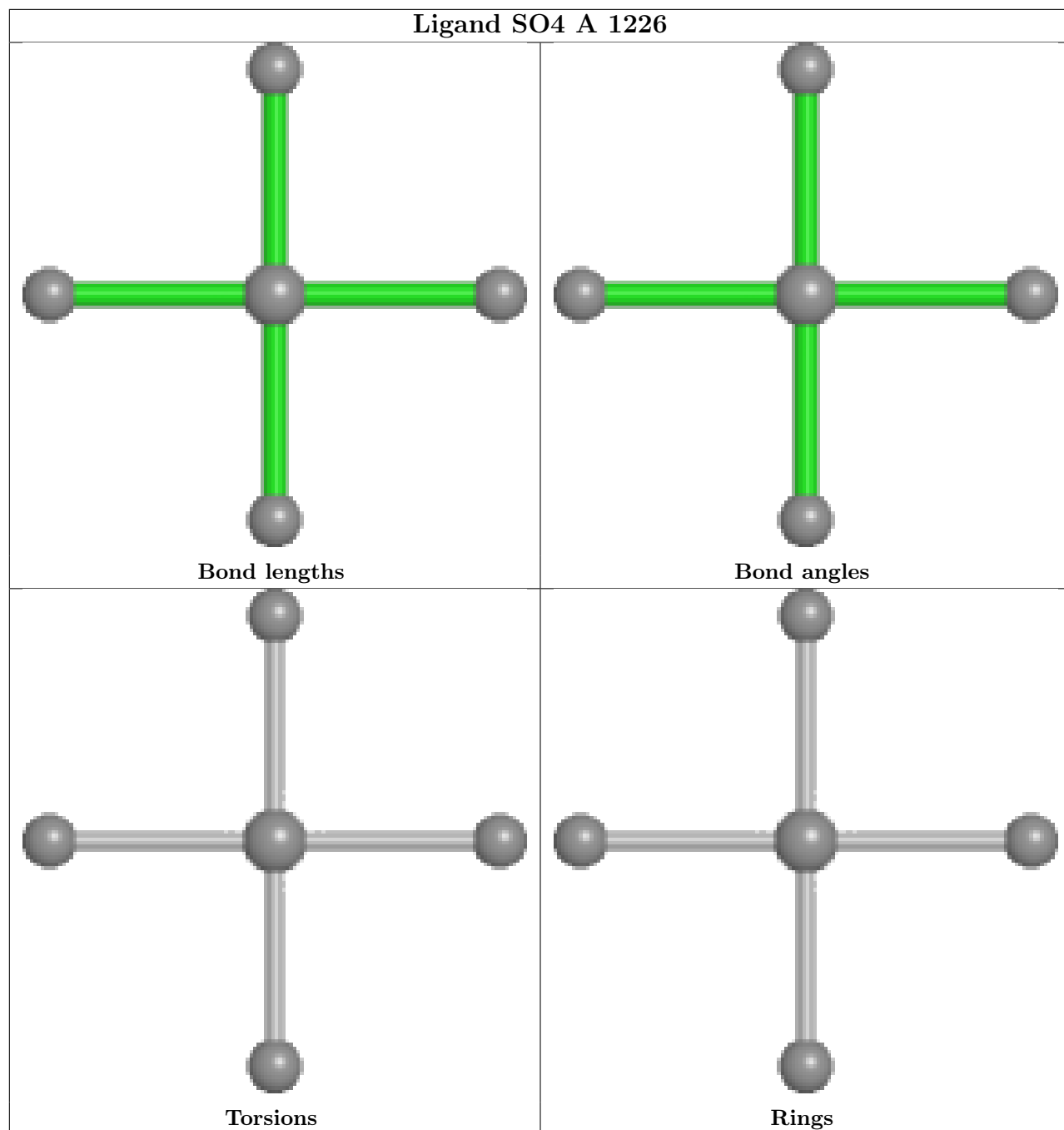


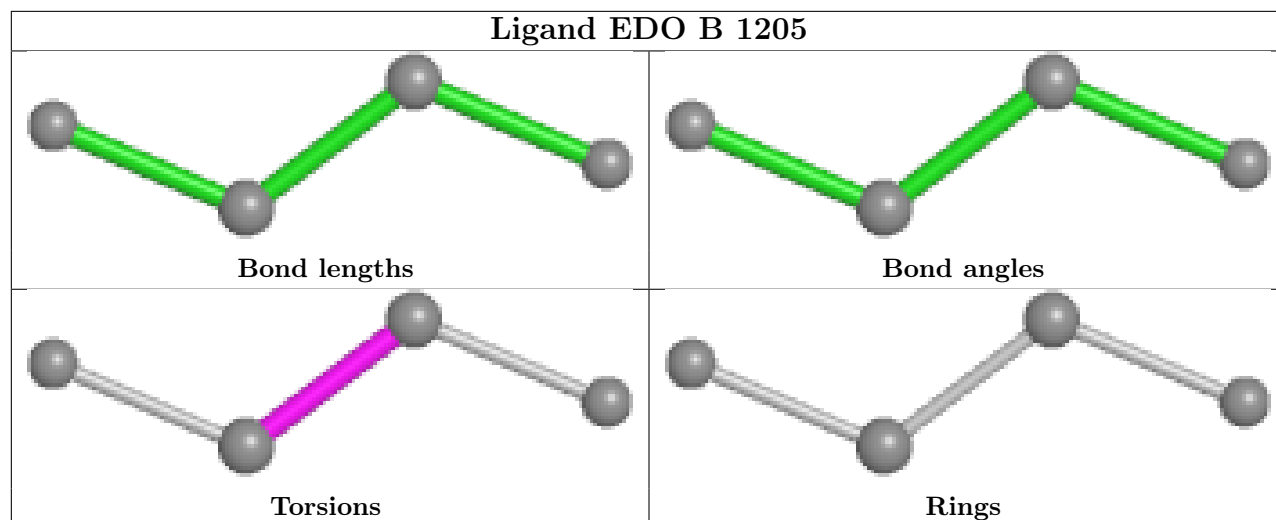


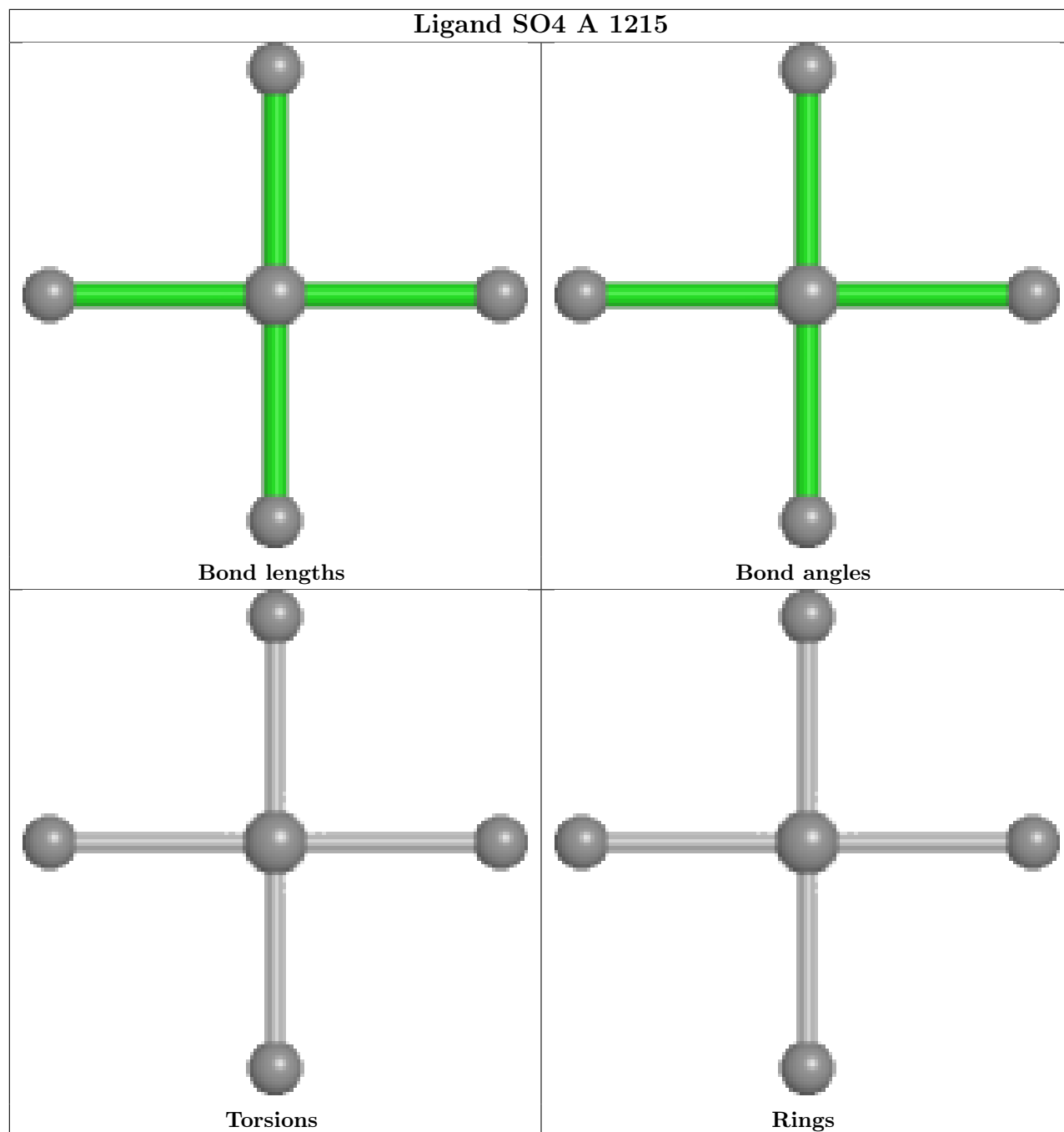


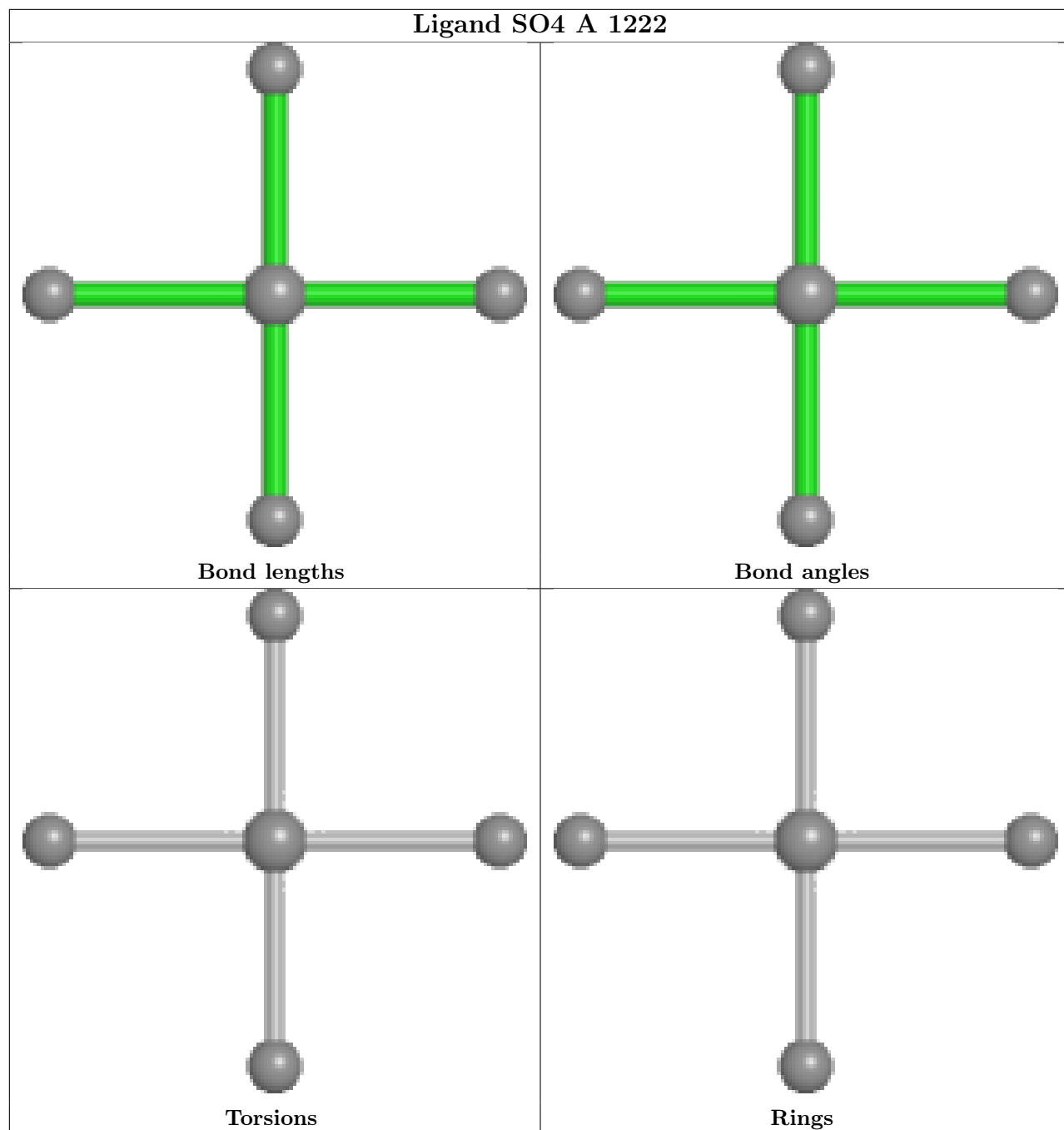


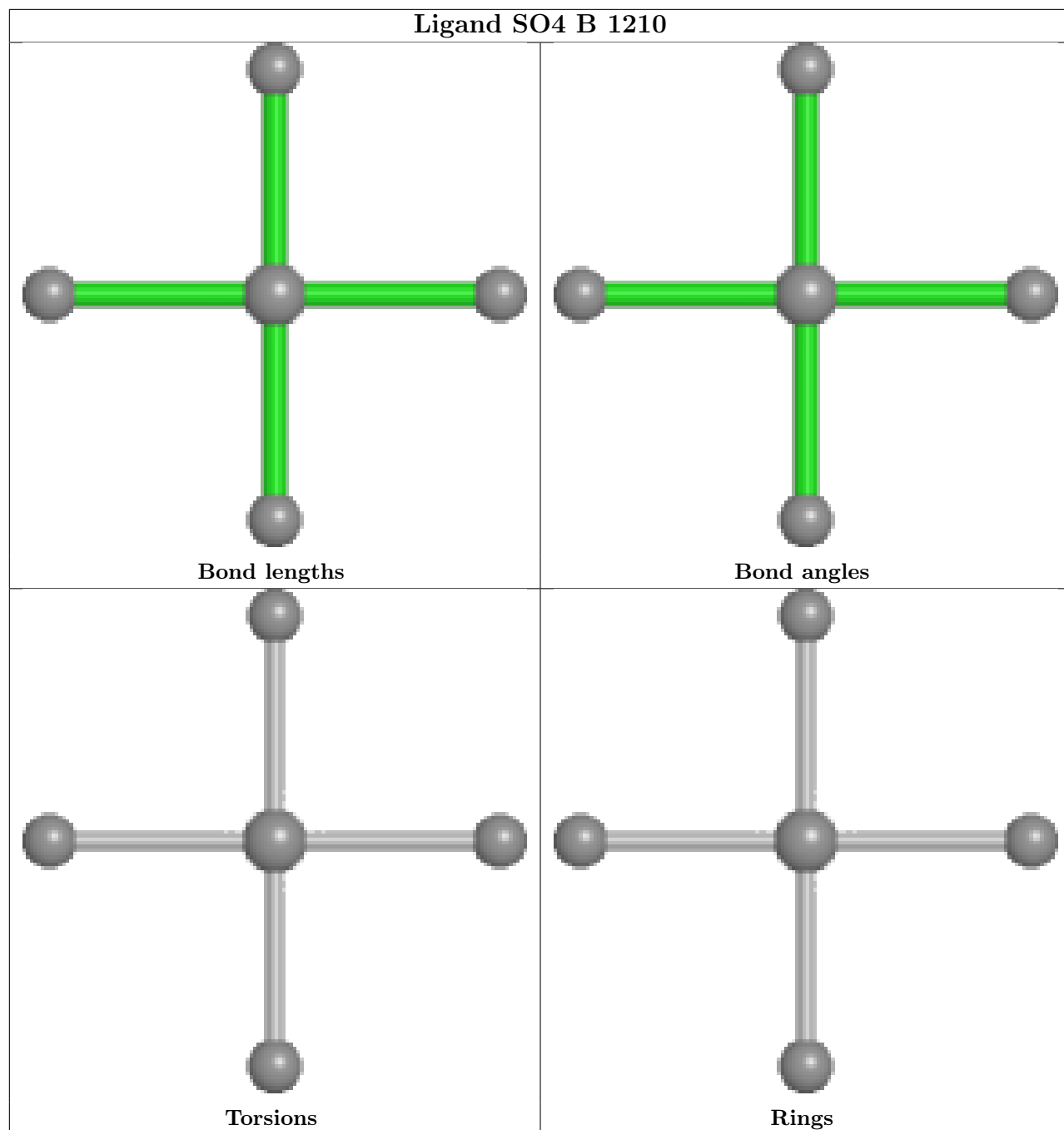


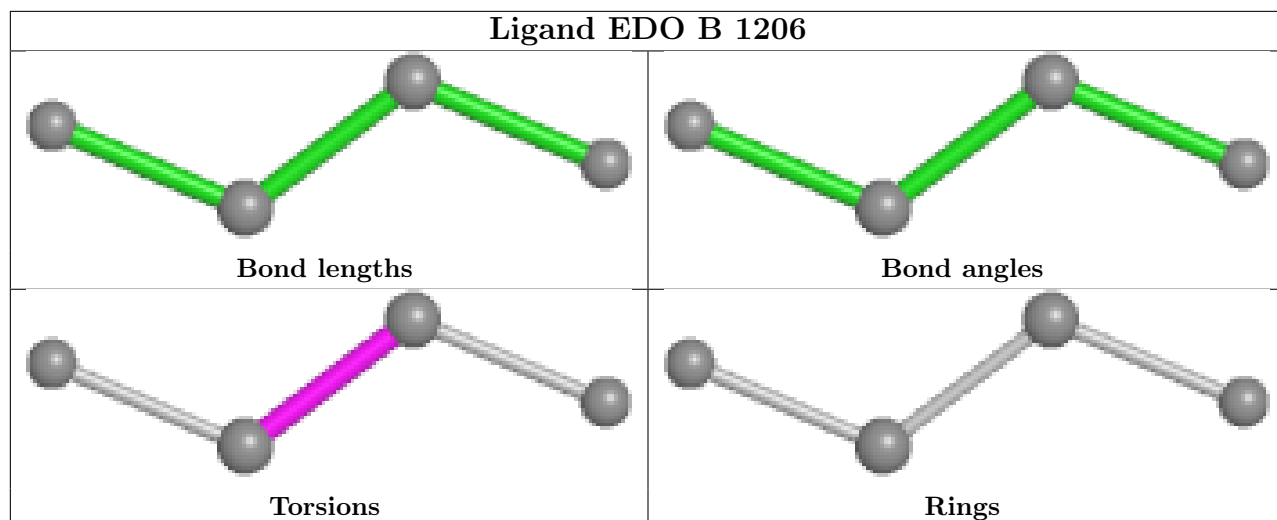


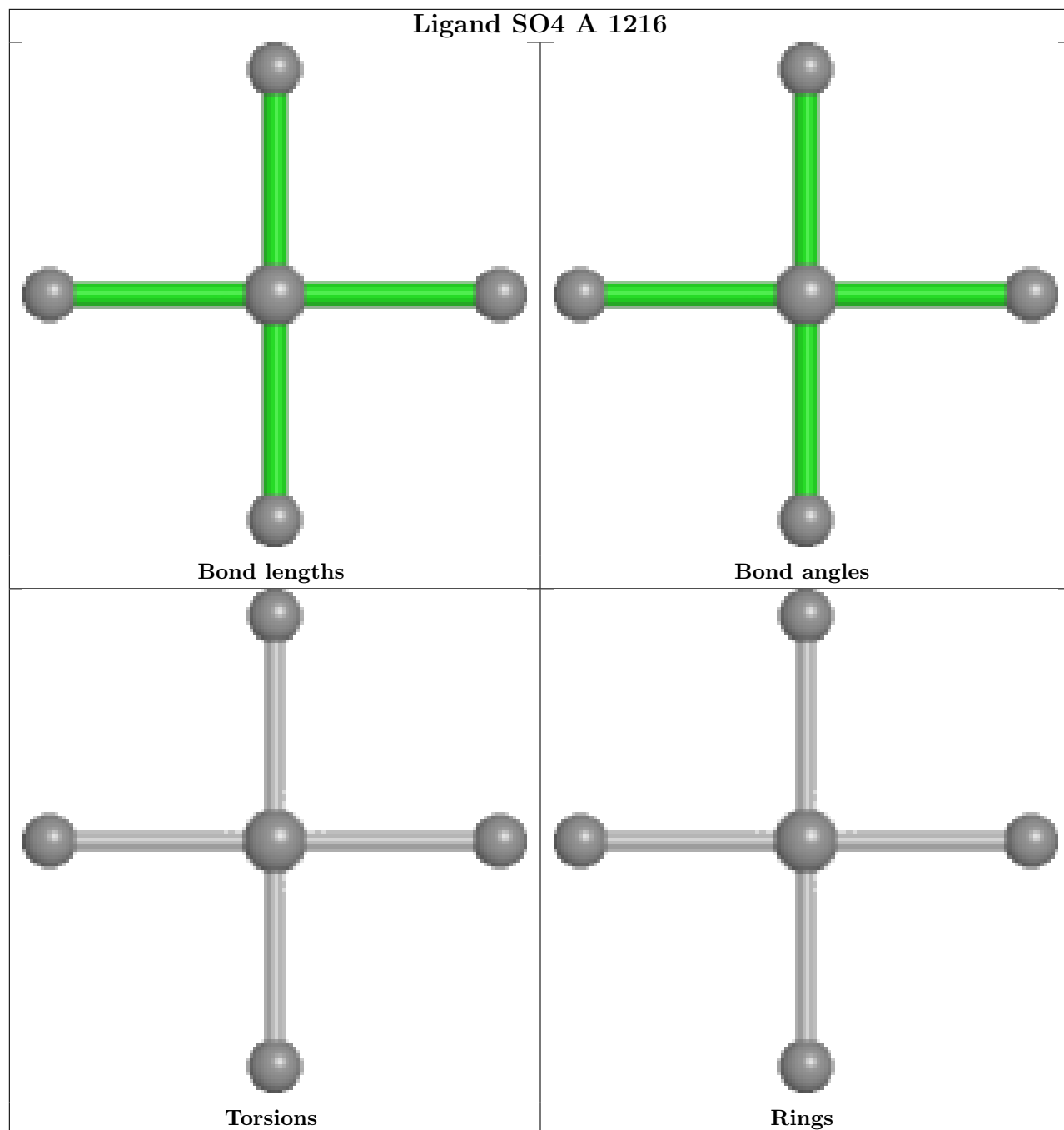


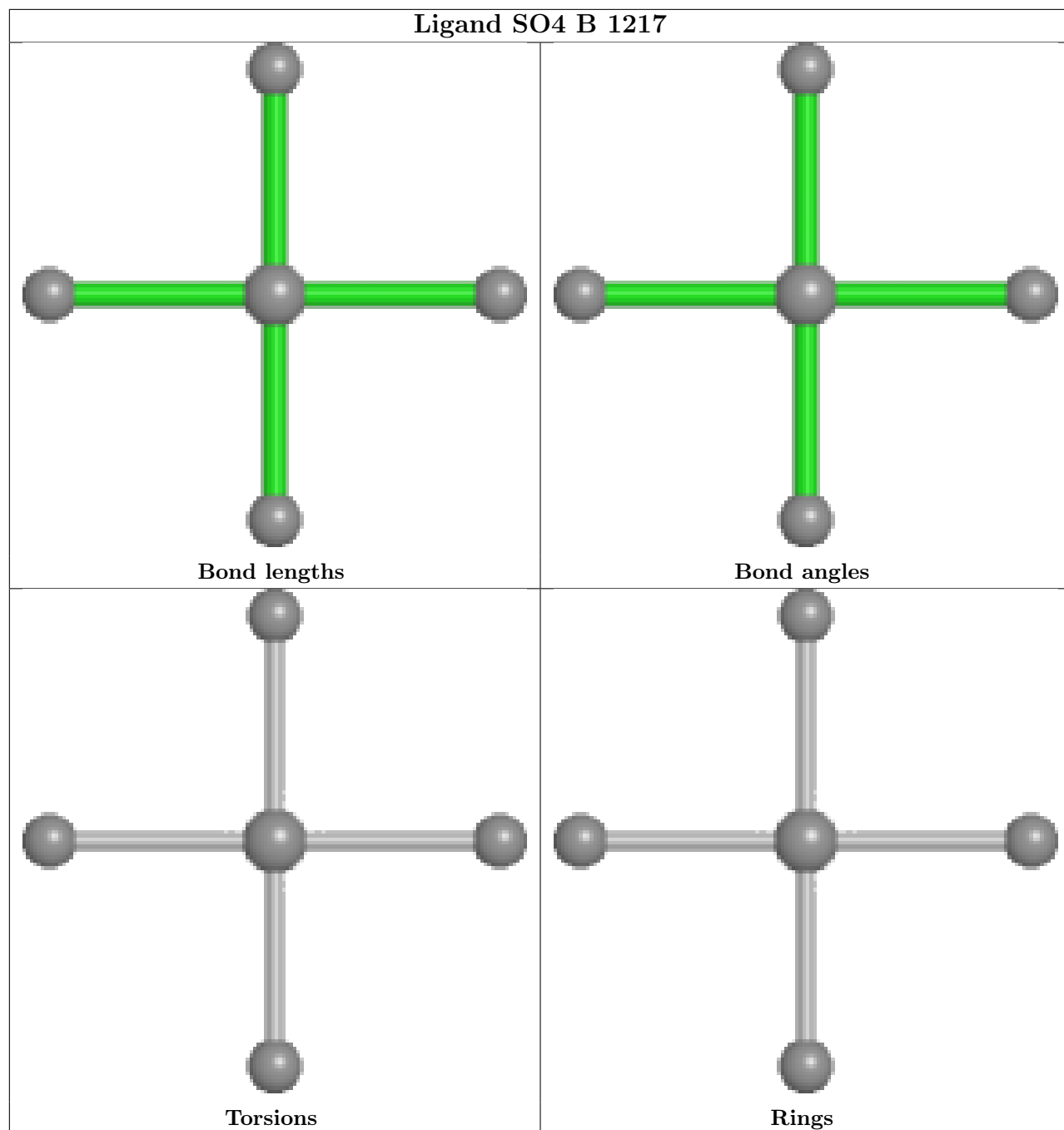


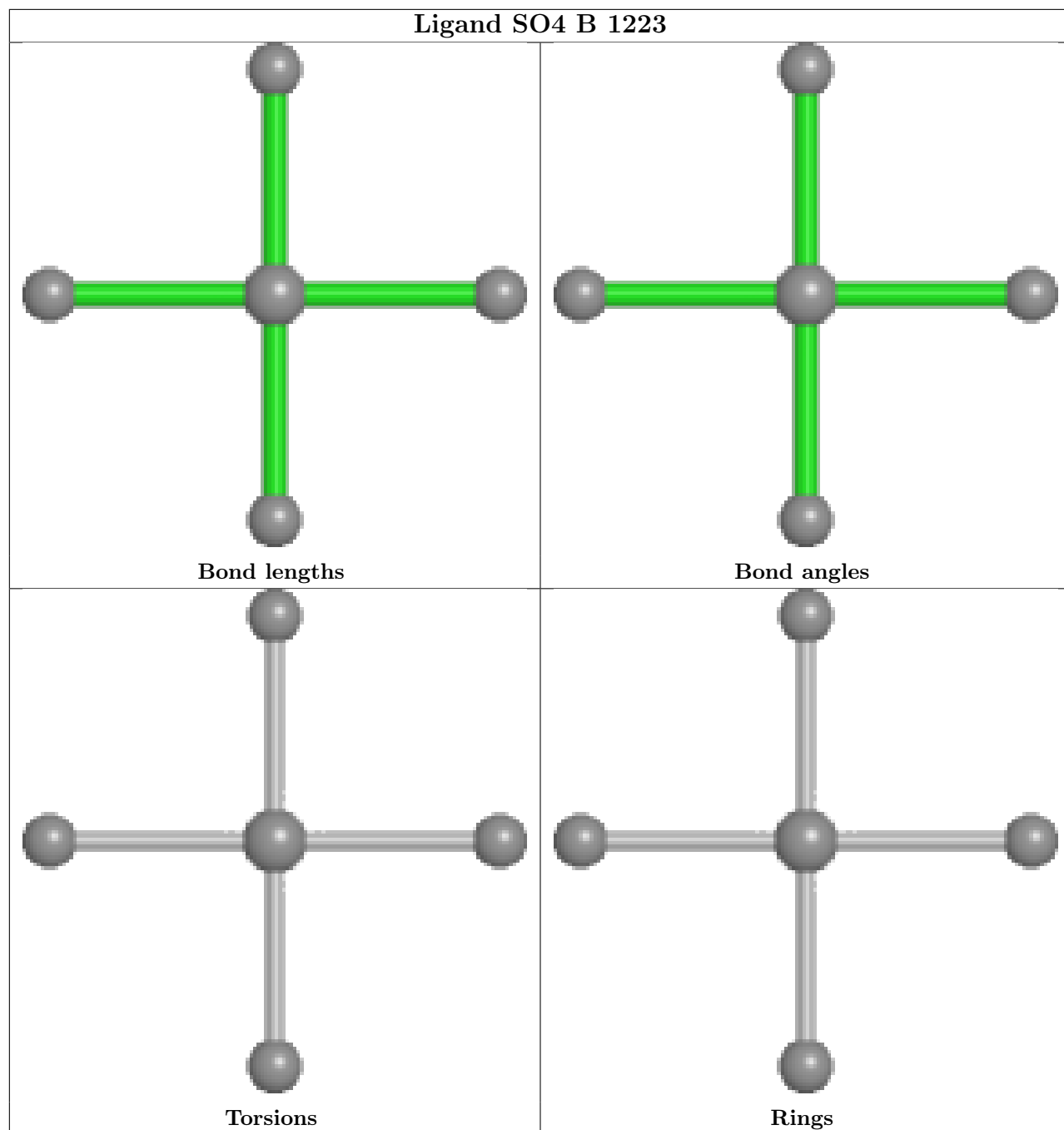


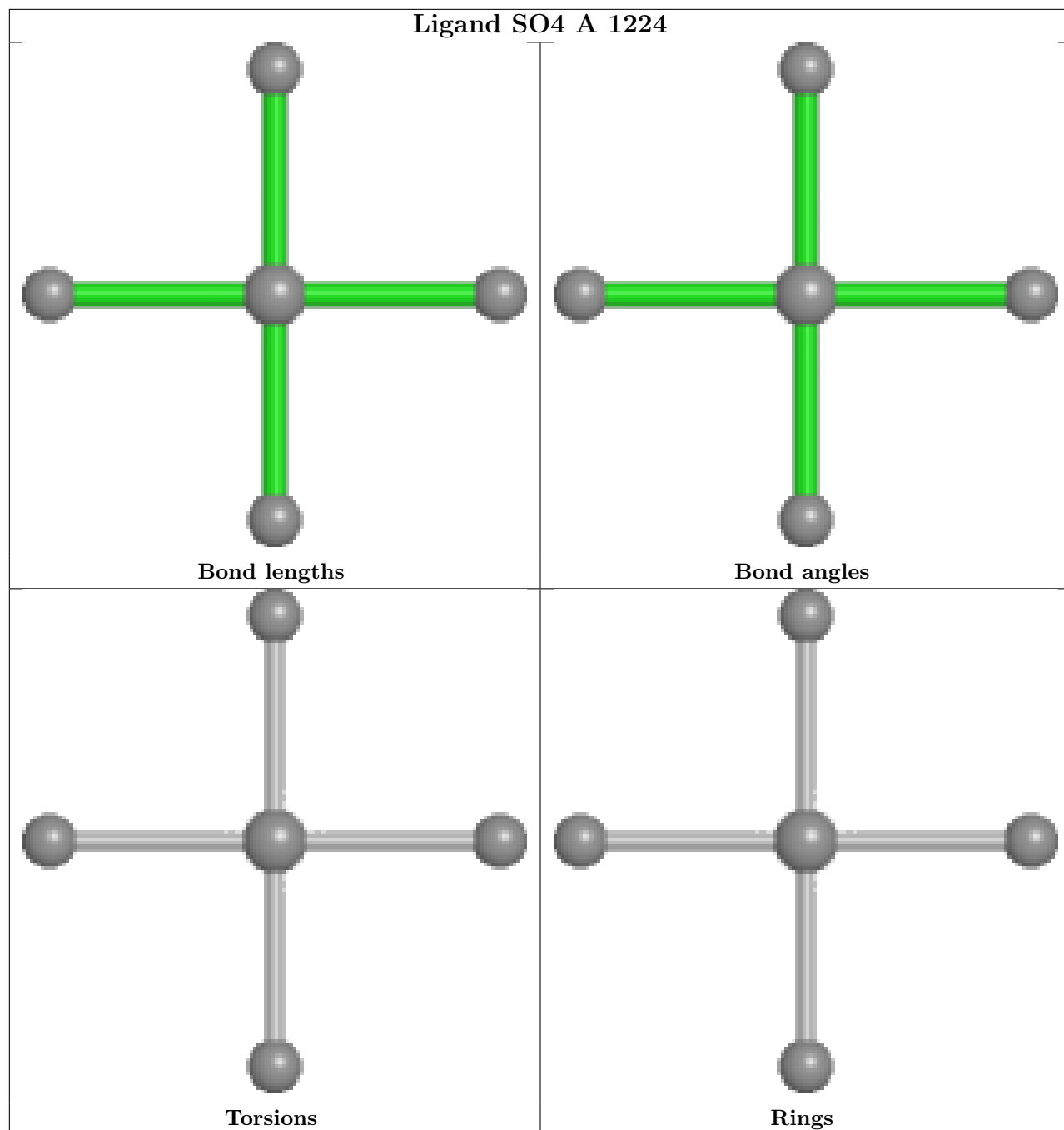


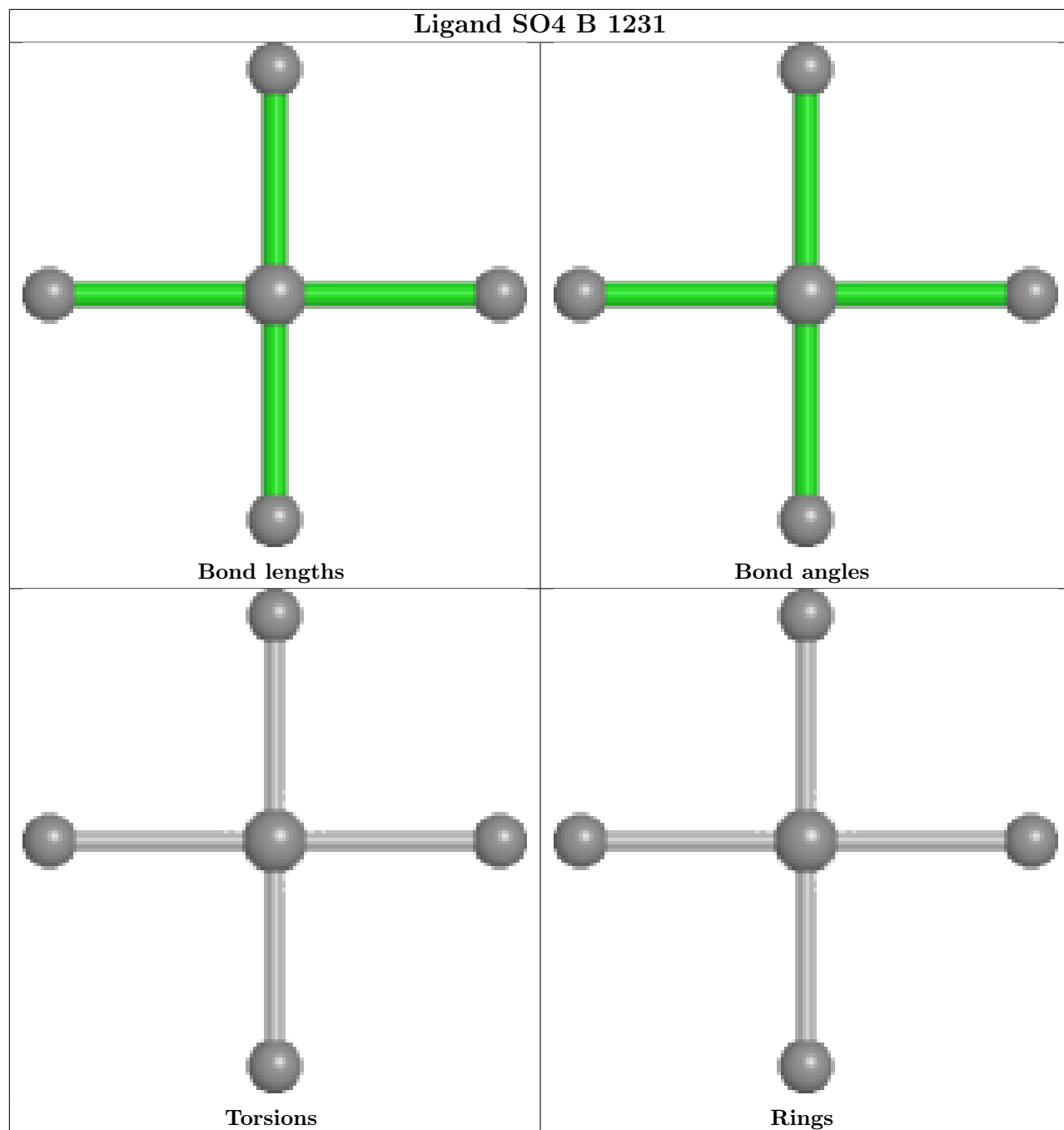


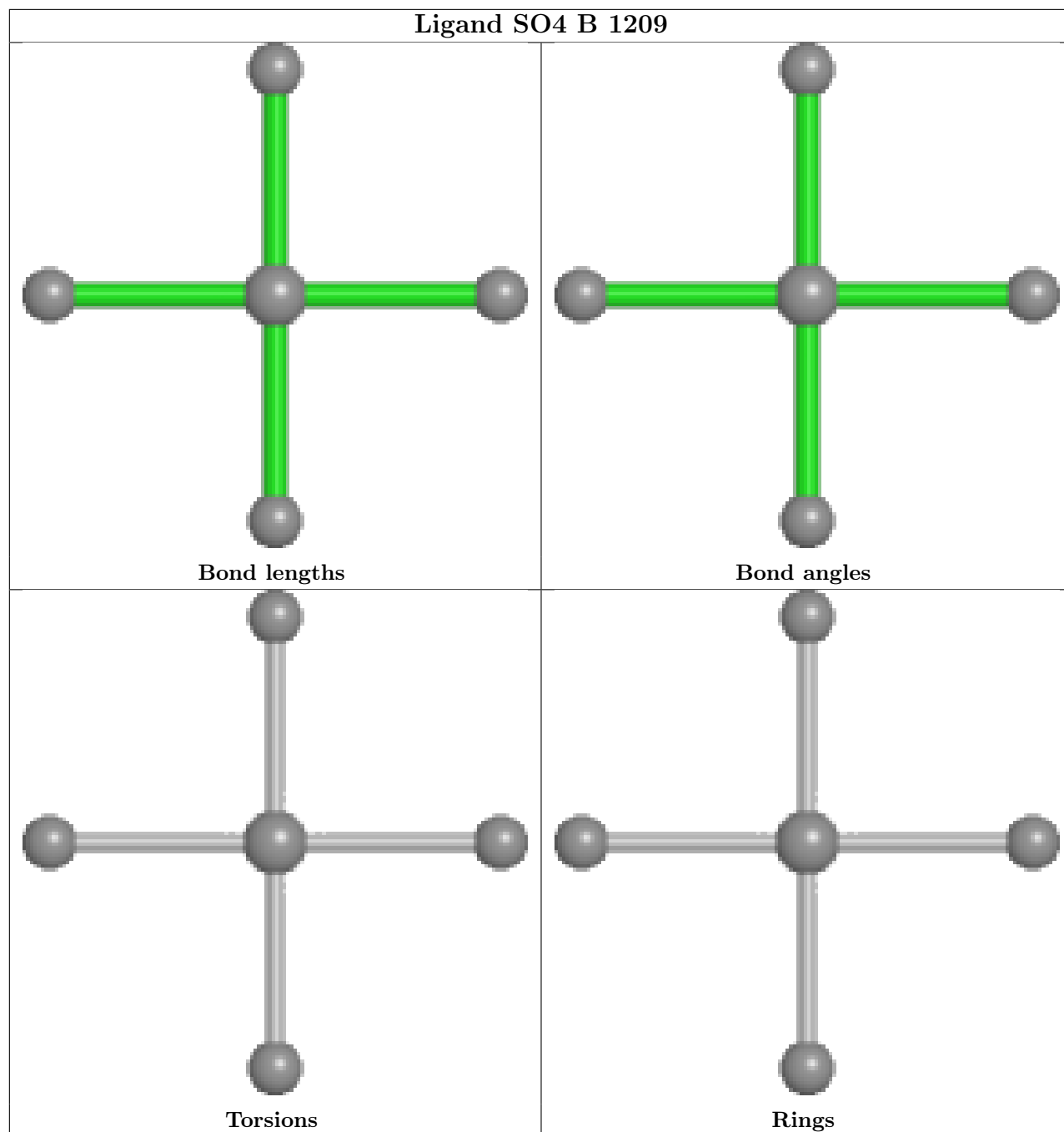


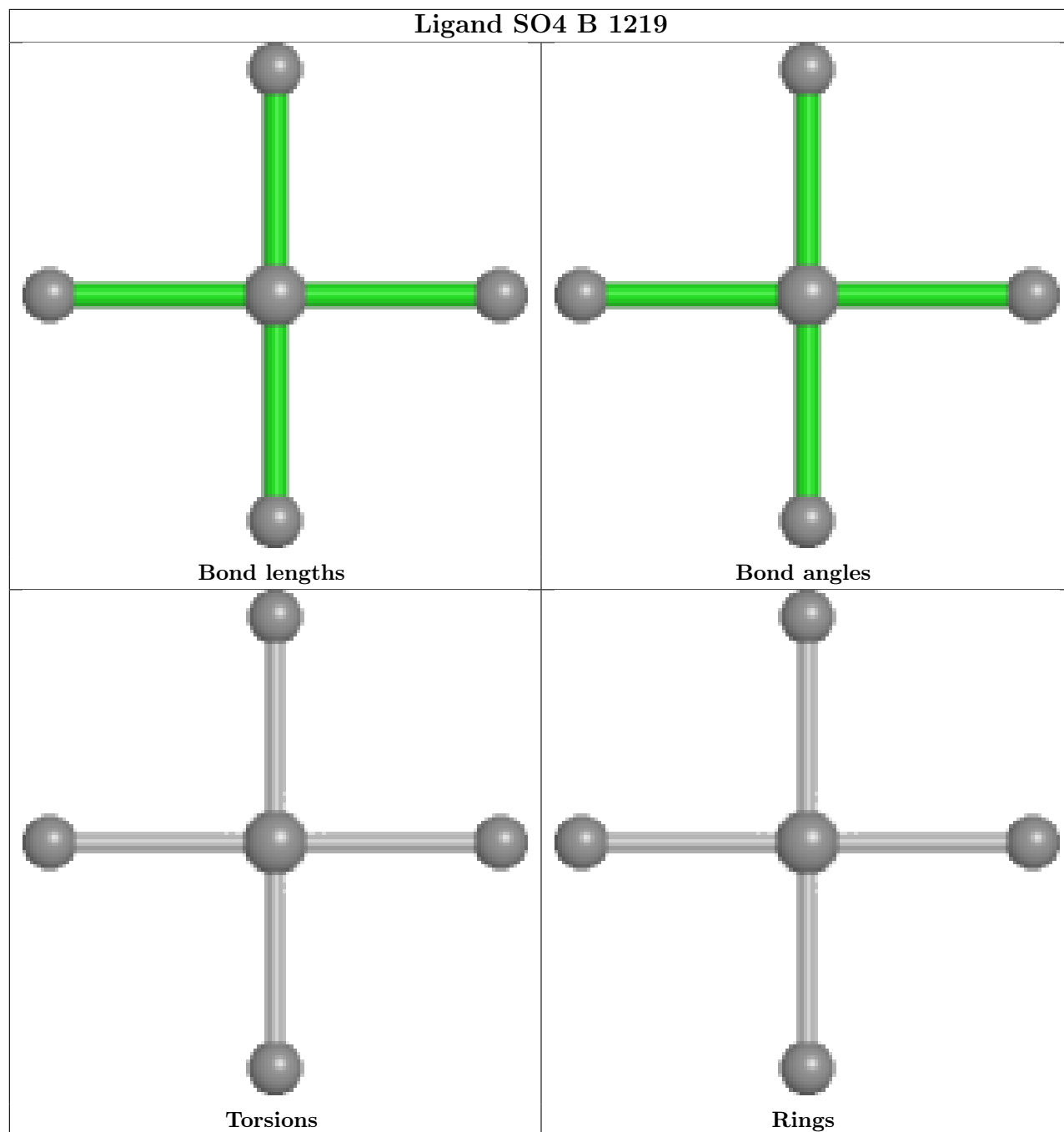


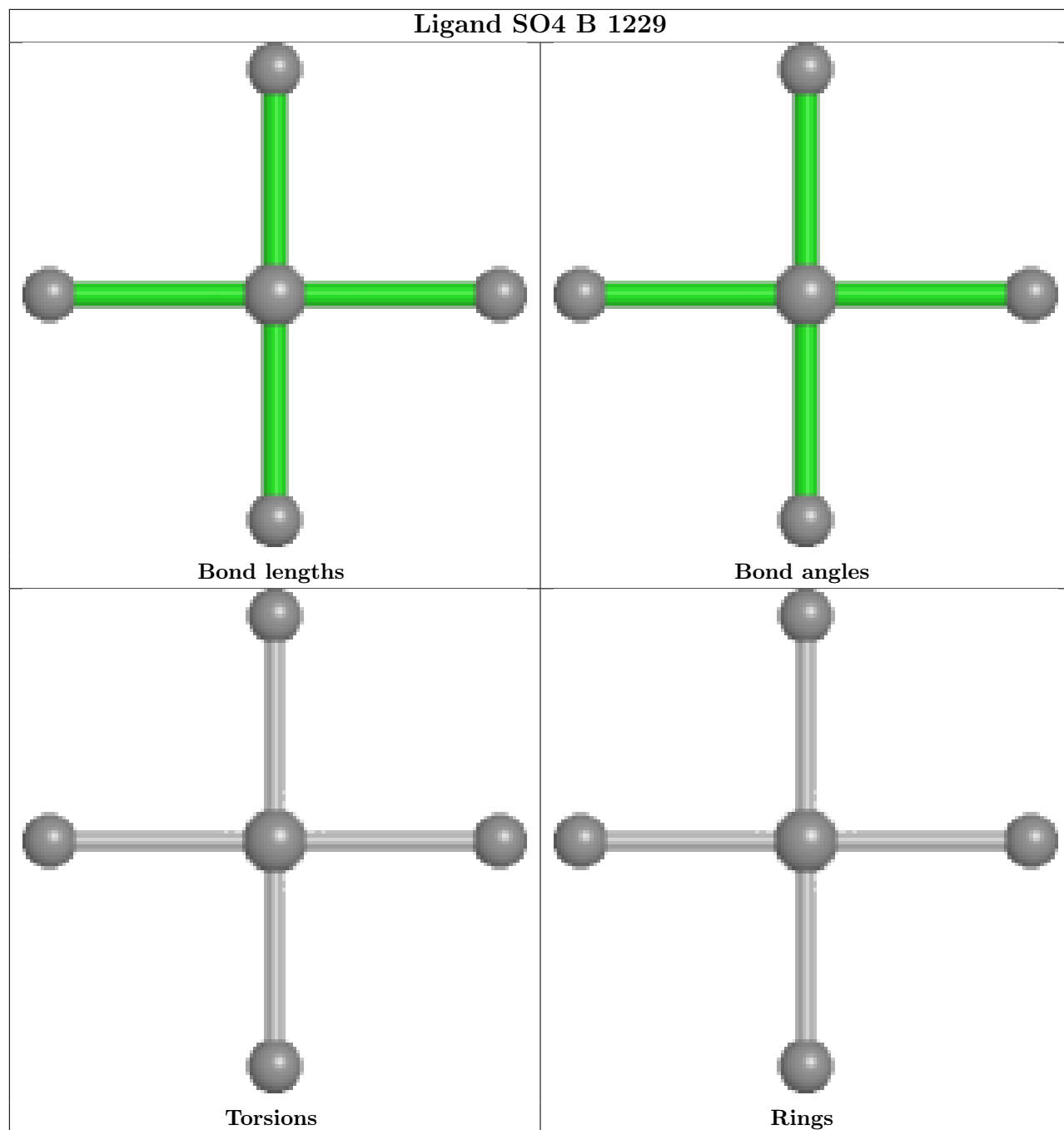


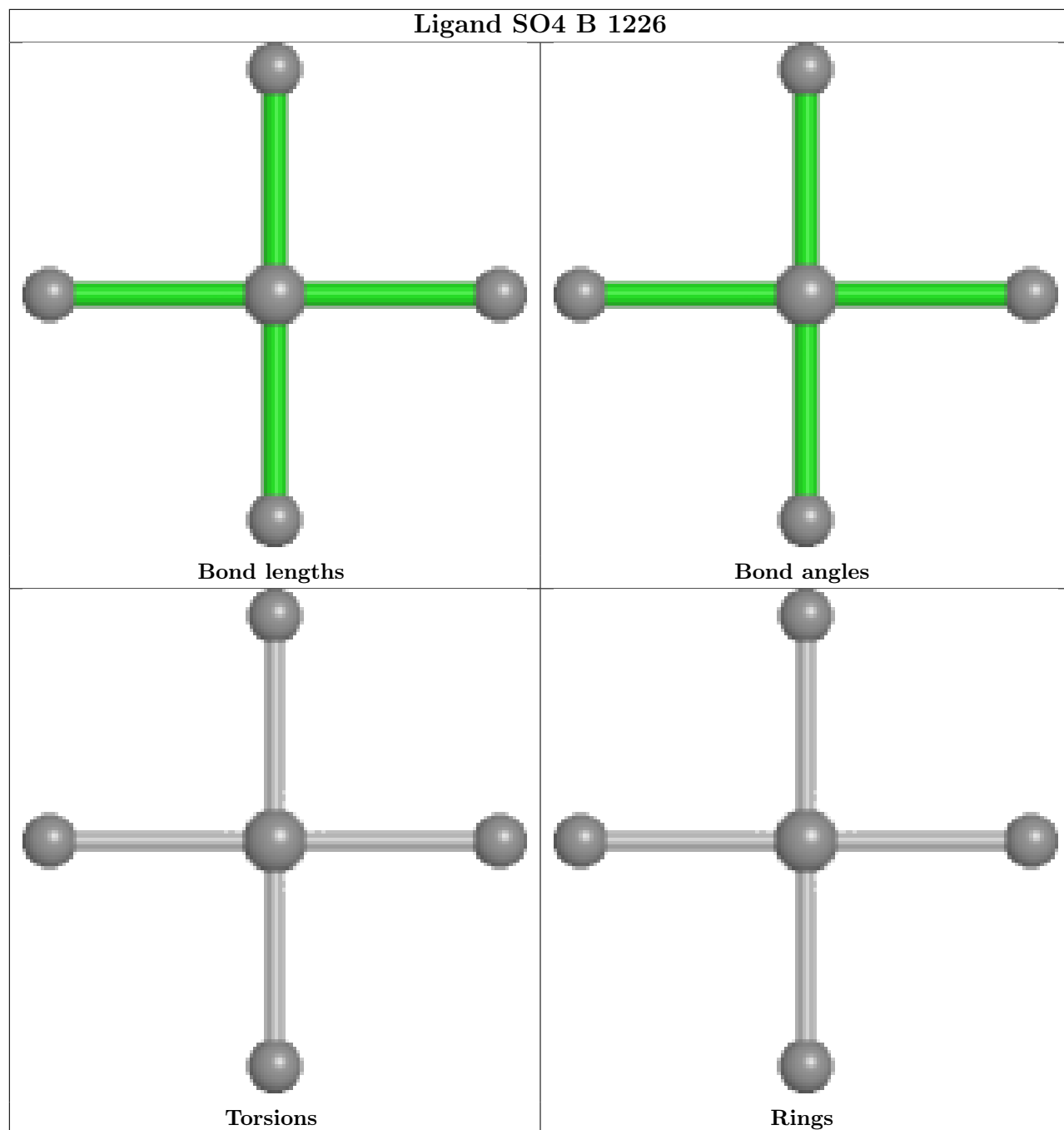


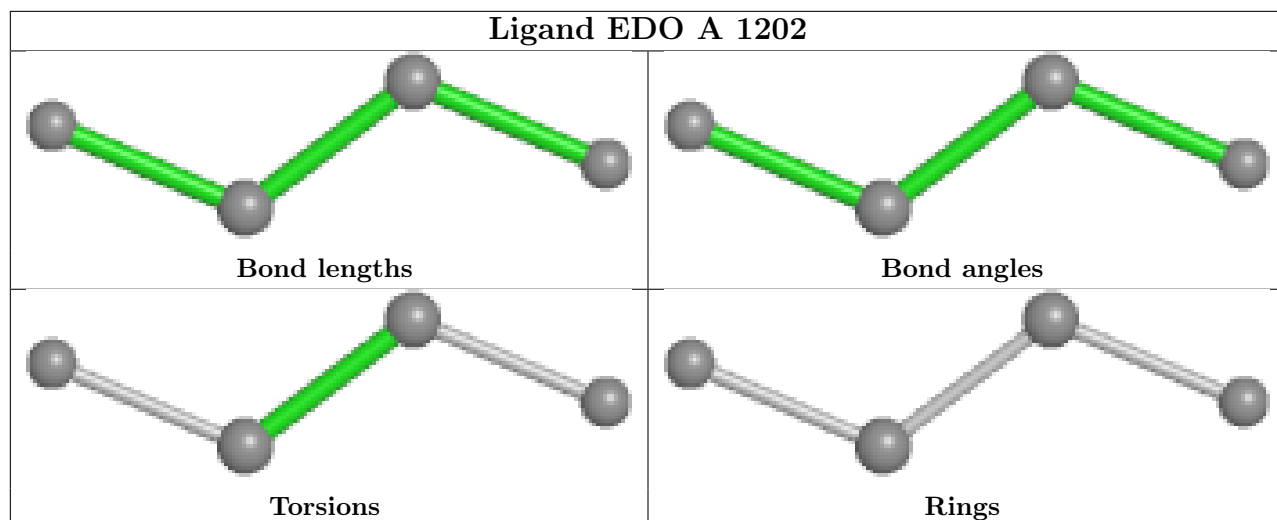


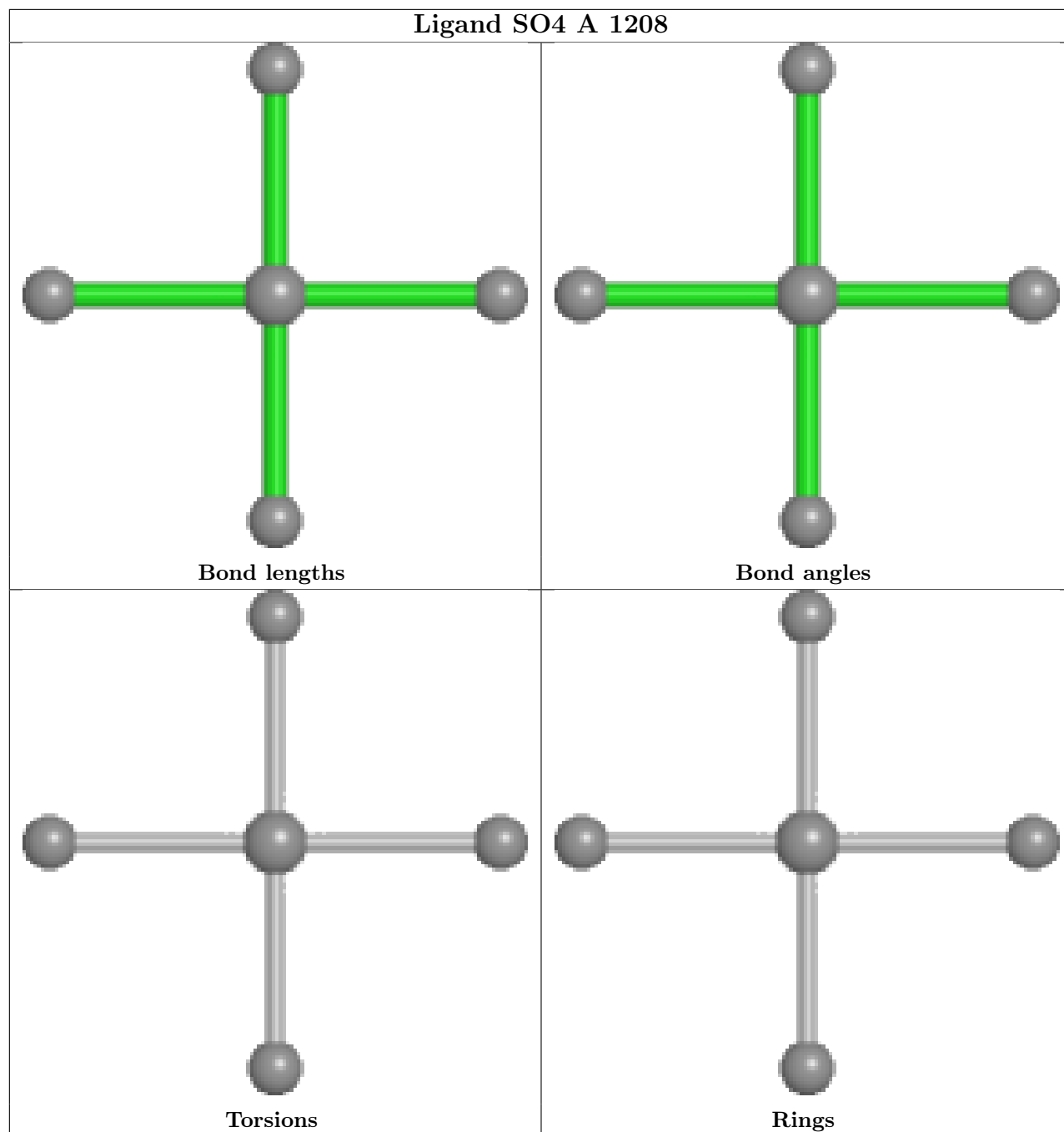


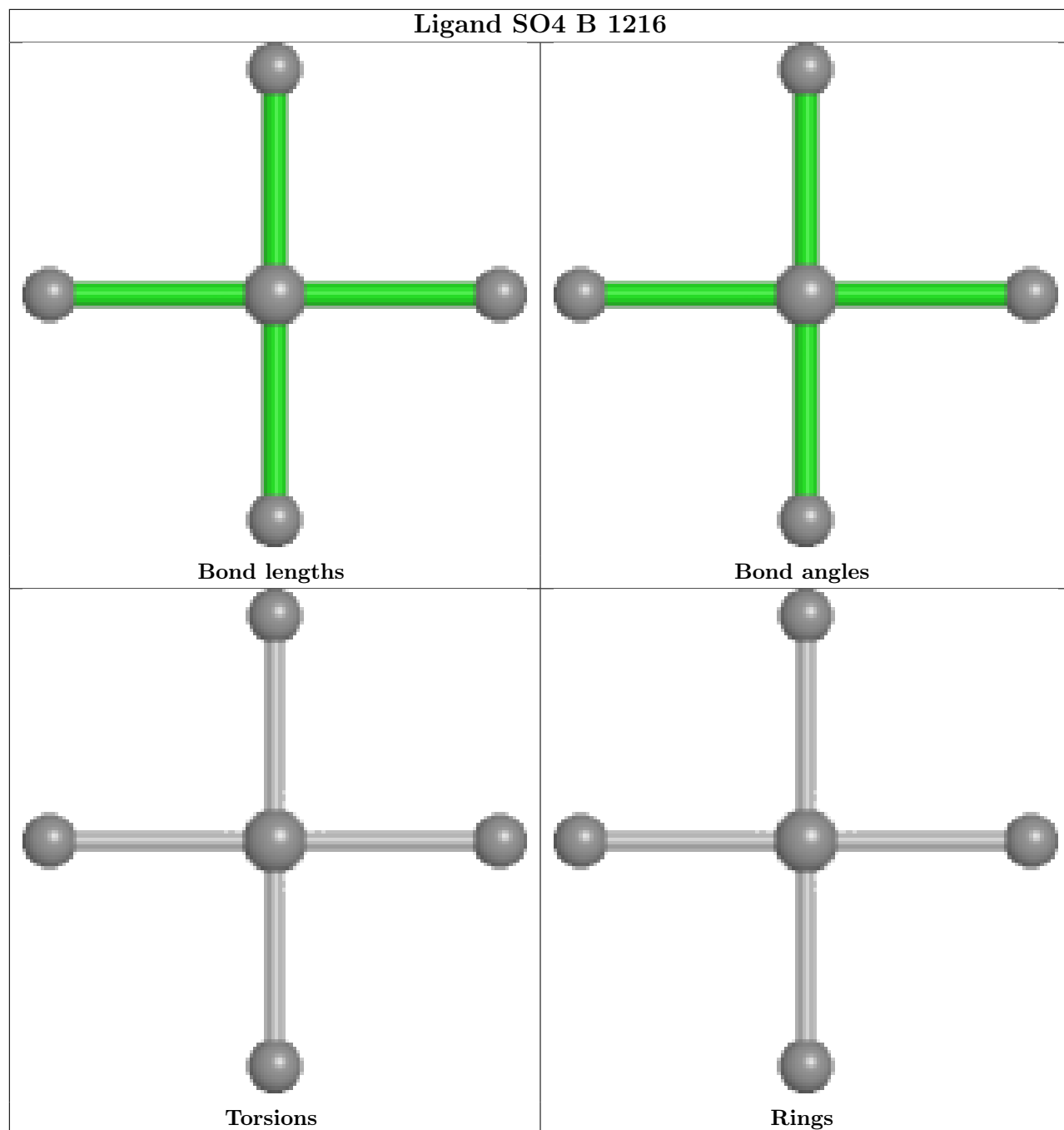


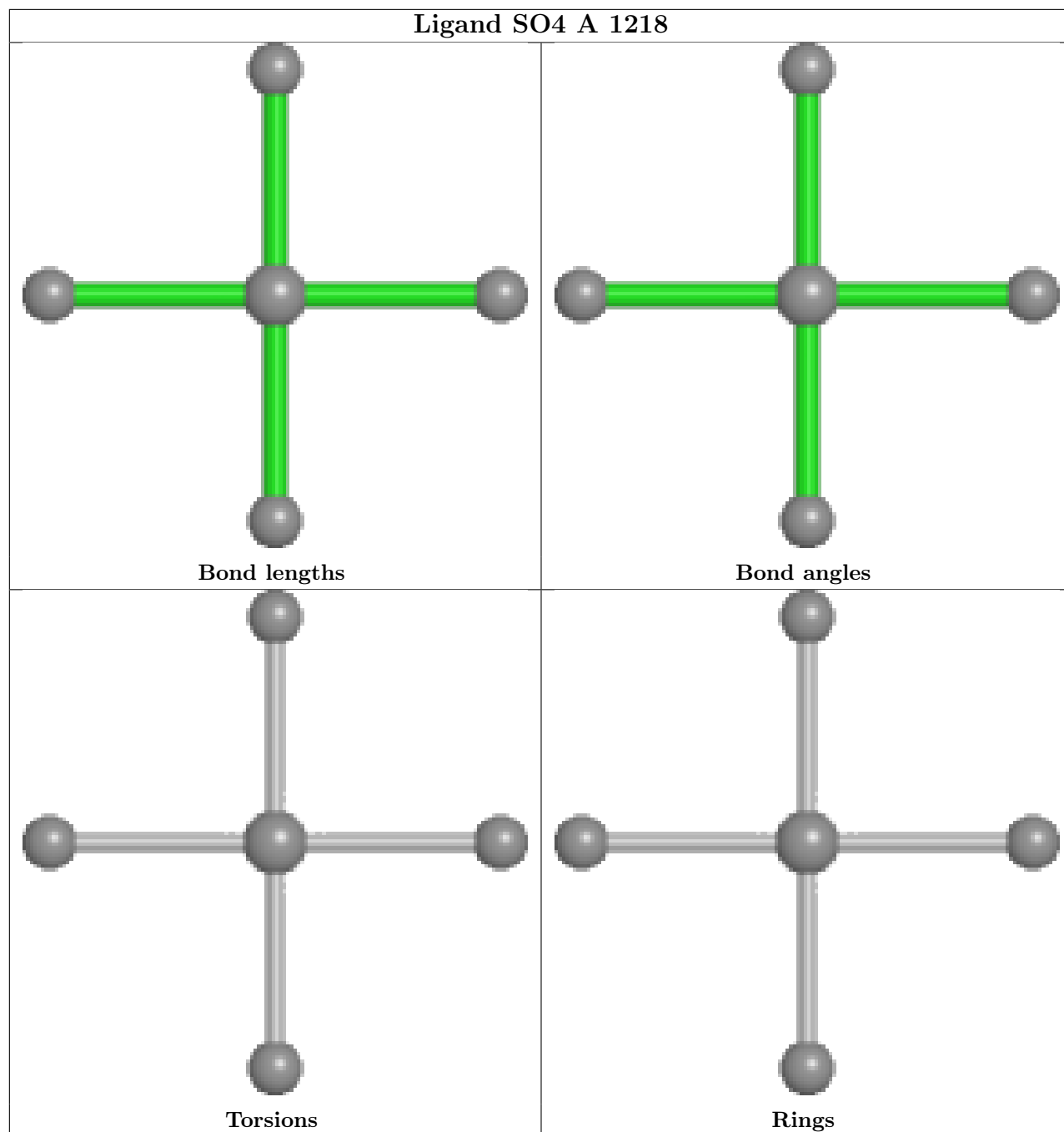


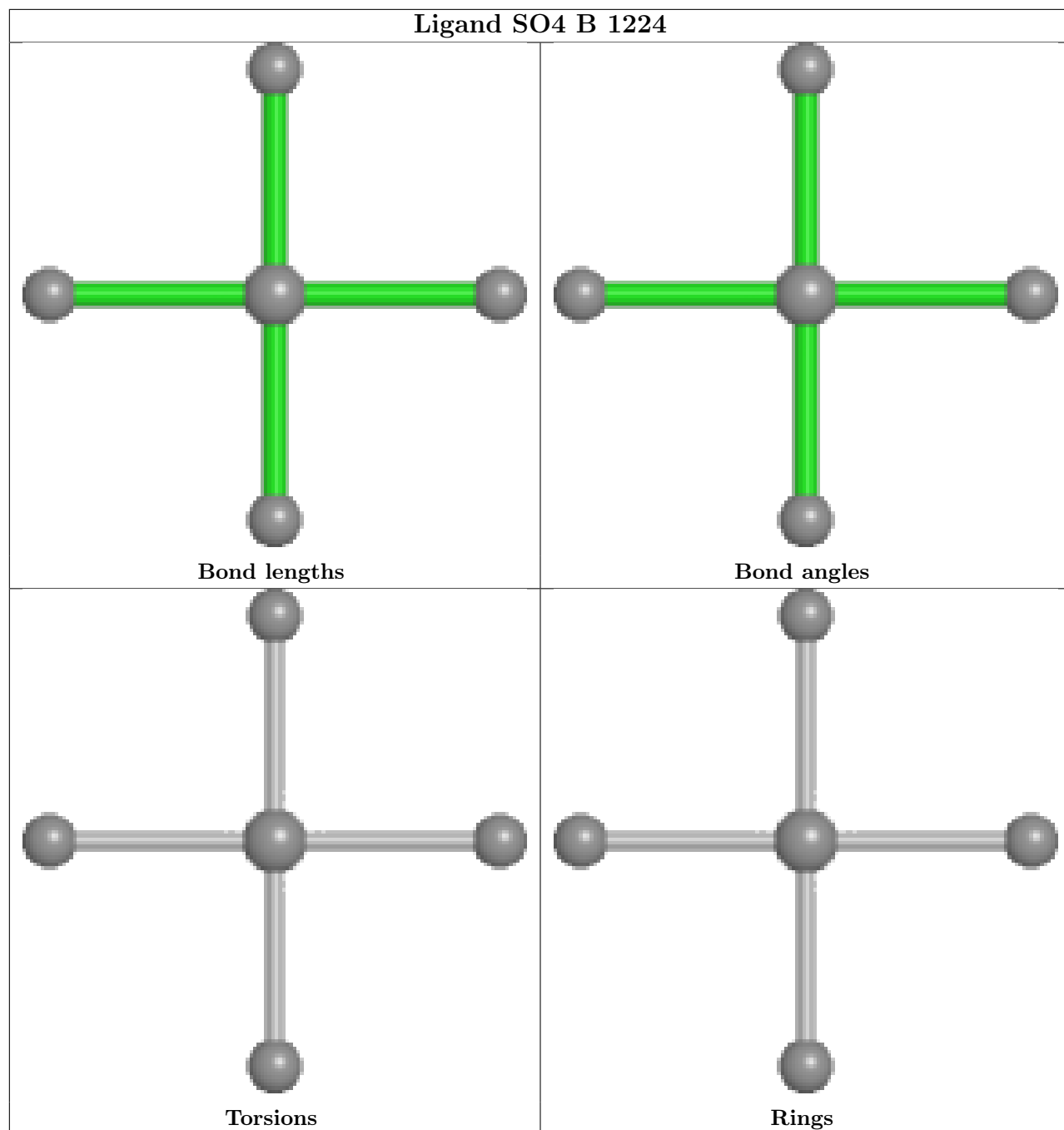


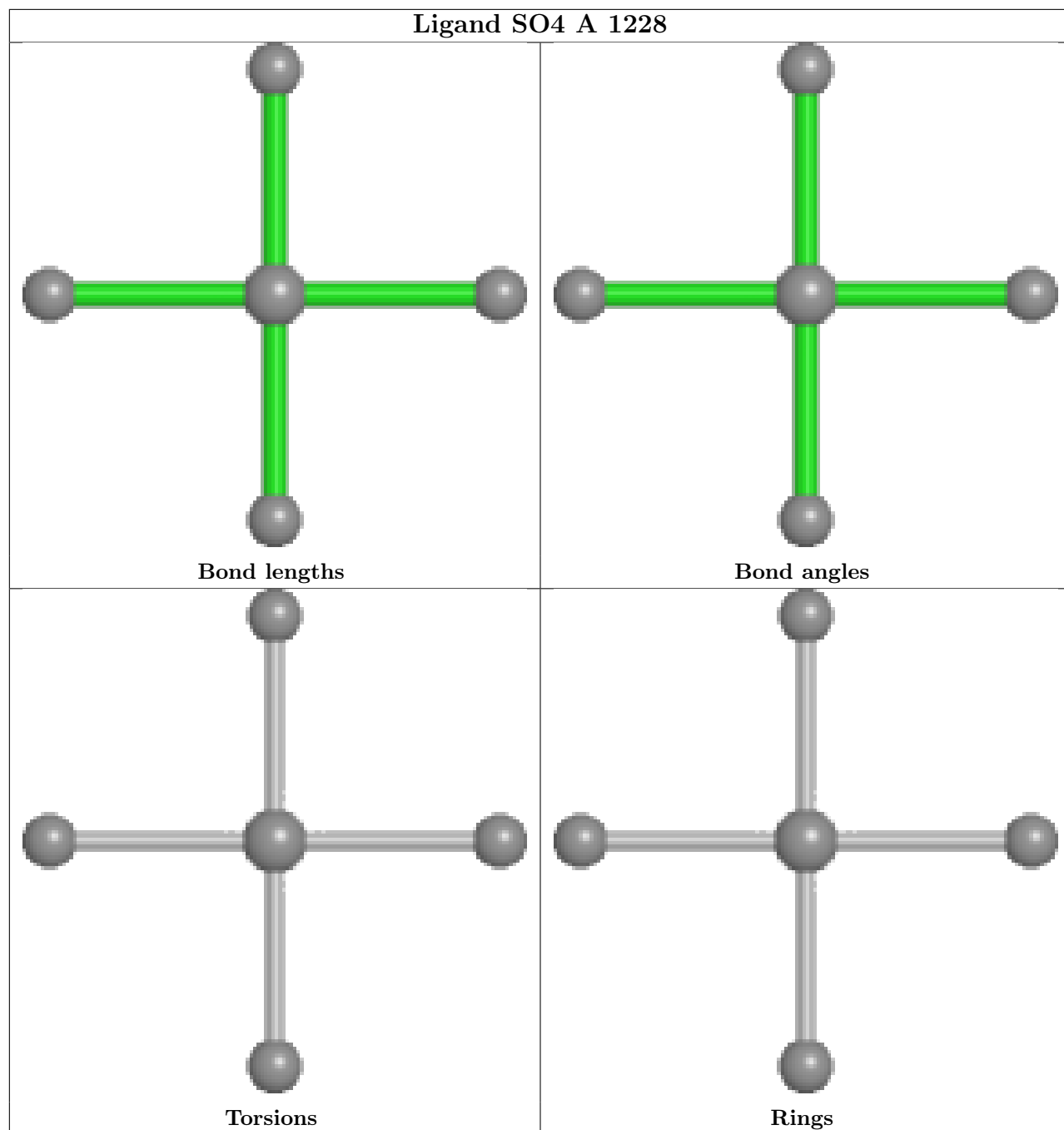


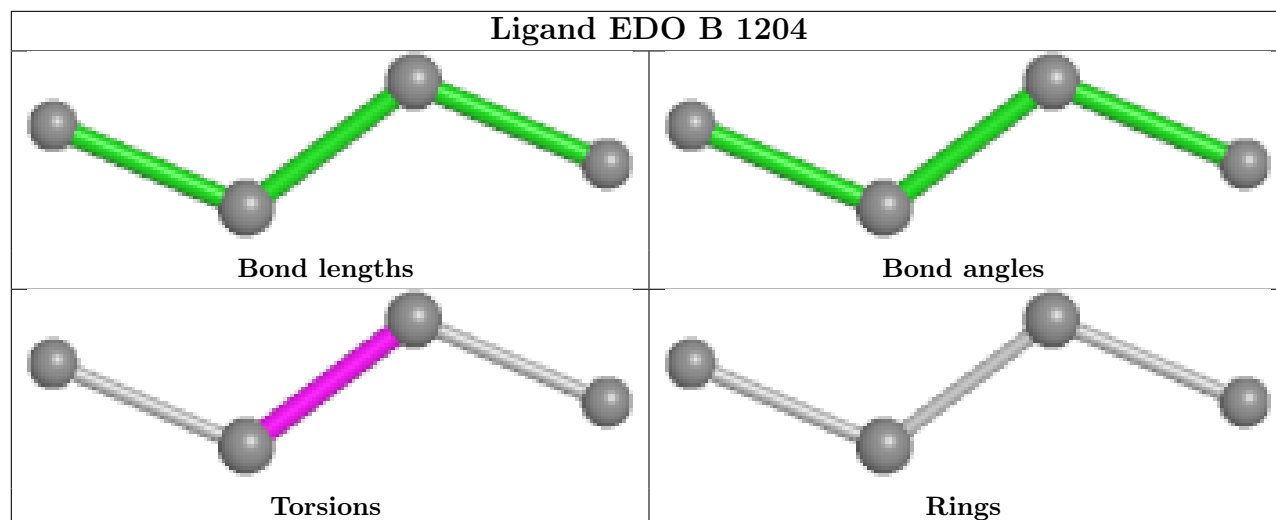












5.7 Other polymers [i](#)

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, 95th 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	840/869 (96%)	0.16	26 (3%) 49 52	27, 39, 75, 111	0
1	B	838/869 (96%)	0.20	36 (4%) 35 38	29, 41, 77, 107	0
All	All	1678/1738 (96%)	0.18	62 (3%) 41 45	27, 40, 76, 111	0

All (62) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	260	GLN	7.3
1	A	261	SER	6.2
1	B	217	ASN	5.5
1	B	214	THR	4.9
1	B	218	LEU	4.9
1	B	222	TYR	4.8
1	A	259	THR	4.4
1	A	228	ARG	4.4
1	B	215	ARG	4.4
1	A	260	GLN	4.2
1	B	219	TYR	3.9
1	B	261	SER	3.7
1	B	264	LYS	3.6
1	B	324	LEU	3.6
1	B	216	SER	3.5
1	A	214	THR	3.4
1	A	216	SER	3.3
1	B	226	TYR	3.3
1	A	262	THR	3.3
1	B	230	ALA	3.1
1	B	227	ASP	3.0
1	B	221	LYS	3.0
1	A	854	LYS	3.0
1	A	759	ALA	2.9

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Mol	Chain	Res	Type	RSRZ
1	B	259	THR	2.9
1	A	324	LEU	2.9
1	B	255	GLY	2.9
1	B	212	VAL	2.9
1	A	265	ASP	2.8
1	B	213	THR	2.8
1	B	210	ASP	2.7
1	A	700	ARG	2.7
1	A	258	TRP	2.7
1	B	970	SER	2.6
1	B	209	LYS	2.6
1	B	325	LYS	2.6
1	B	229	SER	2.5
1	B	548	GLU	2.5
1	A	213	THR	2.5
1	B	1040	ALA	2.4
1	B	231	GLN	2.4
1	A	217	ASN	2.4
1	A	958	GLY	2.4
1	A	226	TYR	2.3
1	B	250	TYR	2.3
1	B	1045	PHE	2.3
1	B	257	THR	2.3
1	A	208	ASN	2.3
1	A	970	SER	2.3
1	A	294	ASN	2.2
1	A	957	GLU	2.2
1	B	262	THR	2.2
1	B	368	LYS	2.2
1	A	253	LYS	2.1
1	B	233	PHE	2.1
1	A	215	ARG	2.1
1	A	218	LEU	2.0
1	A	225	VAL	2.0
1	B	228	ARG	2.0
1	B	251	ILE	2.0
1	A	266	PHE	2.0
1	B	224	GLN	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [\(i\)](#)

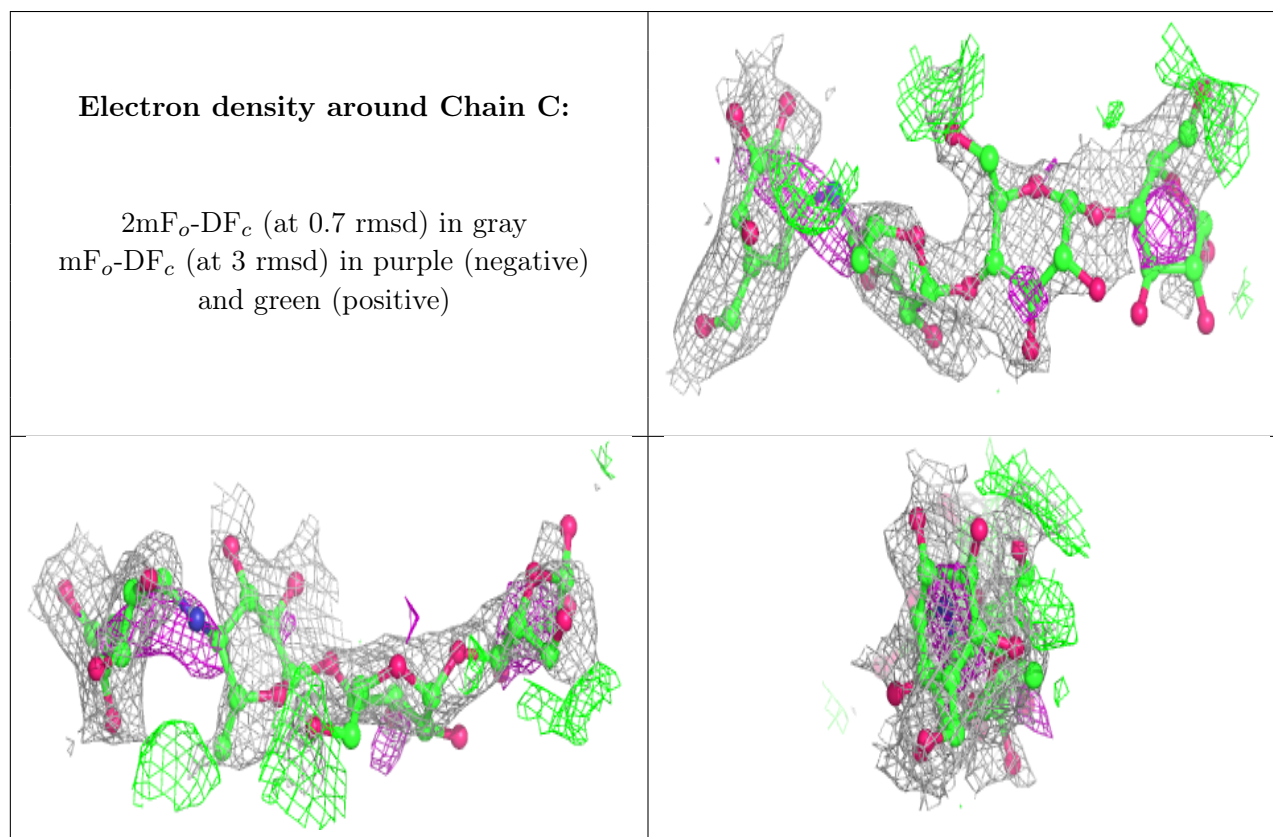
There are no non-standard protein/DNA/RNA residues in this entry.

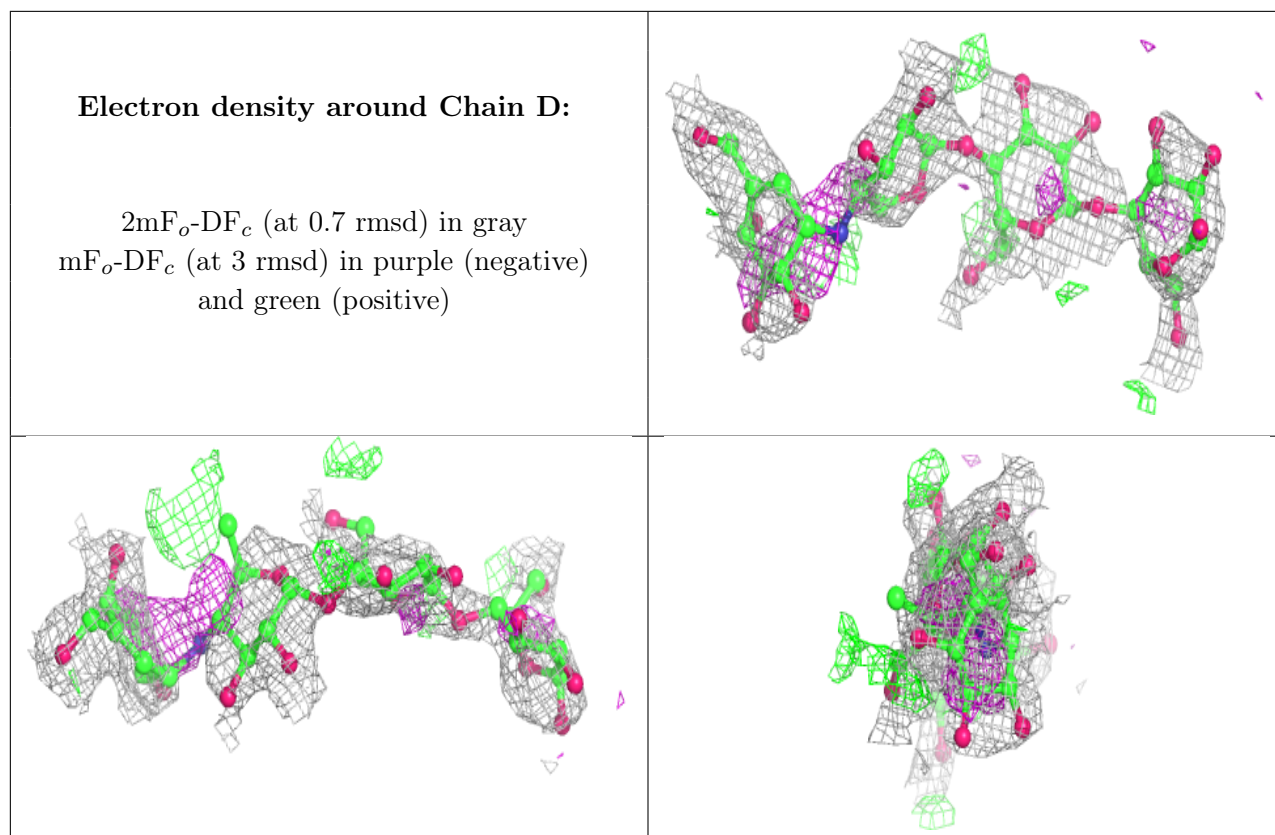
6.3 Carbohydrates [i](#)

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, 95th 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
2	GLC	C	1	12/12	0.61	0.41	78,107,119,121	0
2	GLC	D	2	11/12	0.65	0.31	84,93,100,100	0
2	GLC	D	1	12/12	0.69	0.29	68,84,107,109	0
2	GLC	C	2	11/12	0.71	0.33	85,102,118,119	0
2	AC1	C	3	21/22	0.80	0.34	48,66,95,100	0
2	AC1	D	3	21/22	0.83	0.31	40,67,79,84	0

The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.





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, 95th 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(\AA^2)	Q<0.9
5	SO4	A	1226	5/5	0.67	0.28	75,81,107,127	0
5	SO4	B	1210	5/5	0.78	0.28	42,50,100,114	0
5	SO4	A	1225	5/5	0.80	0.17	85,103,116,128	0
5	SO4	A	1216	5/5	0.81	0.20	91,92,100,112	0
5	SO4	B	1214	5/5	0.81	0.20	70,74,108,110	0
5	SO4	A	1206	5/5	0.85	0.18	50,64,94,107	0
5	SO4	B	1226	5/5	0.85	0.19	78,80,105,134	0
5	SO4	B	1227	5/5	0.85	0.19	73,77,112,120	0
4	EDO	B	1206	4/4	0.87	0.16	50,55,57,61	0
5	SO4	B	1219	5/5	0.87	0.29	76,80,84,107	0
5	SO4	A	1228	5/5	0.88	0.34	77,79,99,111	0
4	EDO	B	1205	4/4	0.88	0.17	47,51,55,56	0
5	SO4	A	1227	5/5	0.88	0.36	83,88,116,131	0
5	SO4	B	1232	5/5	0.88	0.20	94,95,101,121	0

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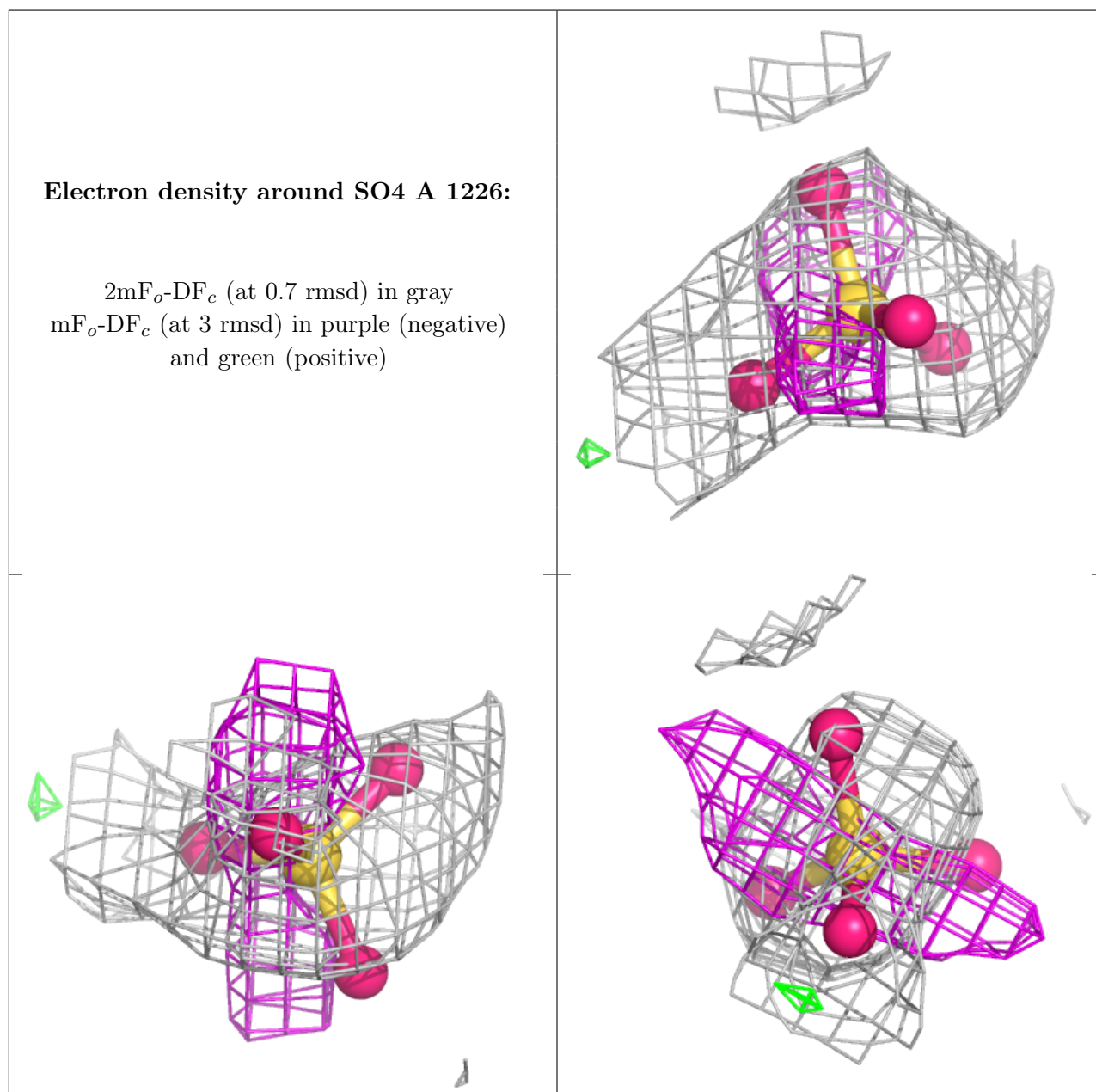
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
4	EDO	A	1202	4/4	0.89	0.30	44,45,49,60	0
5	SO4	B	1221	5/5	0.89	0.26	49,57,99,117	0
5	SO4	B	1224	5/5	0.89	0.17	78,82,109,119	0
5	SO4	A	1229	5/5	0.89	0.34	73,91,104,134	0
5	SO4	A	1213	5/5	0.89	0.23	75,92,109,126	0
4	EDO	B	1203	4/4	0.89	0.24	41,48,55,69	0
5	SO4	A	1209	5/5	0.90	0.32	58,69,107,117	0
5	SO4	B	1229	5/5	0.90	0.22	59,64,83,101	0
5	SO4	B	1231	5/5	0.90	0.25	72,78,112,117	0
4	EDO	B	1207	4/4	0.90	0.17	38,38,42,49	0
5	SO4	A	1223	5/5	0.91	0.20	57,67,91,108	0
5	SO4	B	1223	5/5	0.91	0.12	85,87,104,113	0
5	SO4	A	1224	5/5	0.91	0.17	89,98,108,117	0
5	SO4	A	1214	5/5	0.91	0.18	53,87,89,102	0
5	SO4	B	1211	5/5	0.91	0.16	60,61,83,97	0
5	SO4	B	1228	5/5	0.91	0.20	78,82,90,99	0
5	SO4	A	1218	5/5	0.91	0.20	55,74,104,112	0
5	SO4	B	1218	5/5	0.91	0.27	72,72,87,88	0
5	SO4	A	1219	5/5	0.91	0.16	76,90,102,108	0
5	SO4	A	1217	5/5	0.92	0.28	57,58,100,101	0
5	SO4	B	1222	5/5	0.92	0.15	67,80,86,90	0
5	SO4	B	1216	5/5	0.92	0.19	55,63,100,101	0
5	SO4	B	1230	5/5	0.92	0.27	58,83,86,117	0
4	EDO	B	1204	4/4	0.92	0.18	44,47,49,53	0
5	SO4	B	1213	5/5	0.92	0.20	66,91,101,106	0
4	EDO	A	1203	4/4	0.93	0.16	45,49,52,61	0
5	SO4	A	1207	5/5	0.93	0.17	54,74,87,88	0
5	SO4	A	1208	5/5	0.93	0.26	57,71,88,92	0
5	SO4	A	1215	5/5	0.93	0.17	76,89,91,92	0
5	SO4	A	1222	5/5	0.93	0.21	69,92,97,99	0
5	SO4	B	1225	5/5	0.94	0.15	79,82,98,100	0
5	SO4	B	1215	5/5	0.94	0.17	52,81,96,97	0
5	SO4	A	1211	5/5	0.95	0.24	63,74,78,80	0
5	SO4	B	1209	5/5	0.95	0.17	68,71,77,81	0
5	SO4	A	1212	5/5	0.95	0.13	61,64,74,85	0
4	EDO	B	1202	4/4	0.95	0.22	41,45,48,54	0
5	SO4	A	1205	5/5	0.95	0.11	58,61,73,82	0
5	SO4	B	1220	5/5	0.95	0.28	85,85,92,110	0
5	SO4	B	1217	5/5	0.96	0.13	57,61,84,85	0
5	SO4	A	1210	5/5	0.96	0.15	63,76,84,90	0
5	SO4	A	1220	5/5	0.96	0.25	61,75,95,115	0
5	SO4	A	1221	5/5	0.96	0.22	73,80,94,105	0

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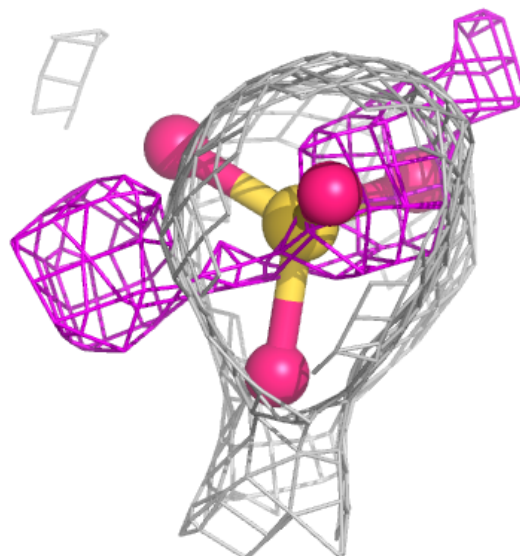
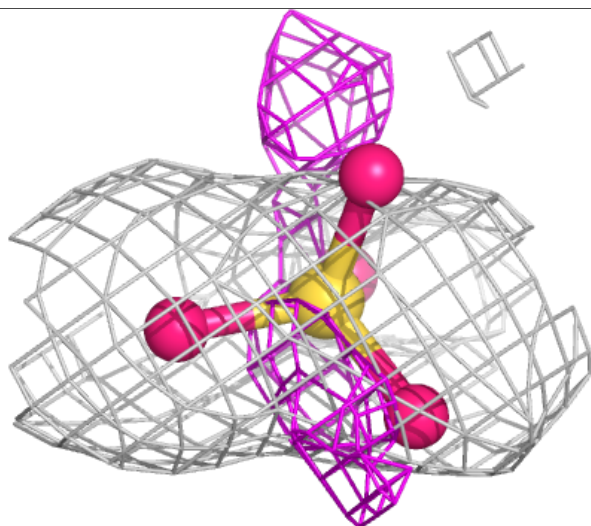
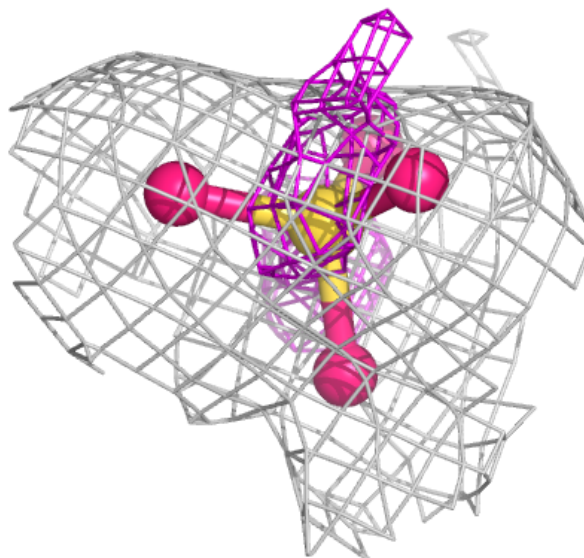
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
5	SO4	B	1208	5/5	0.97	0.11	42,60,64,78	0
5	SO4	B	1212	5/5	0.97	0.21	66,66,74,90	0
5	SO4	A	1204	5/5	0.98	0.15	43,53,56,64	0
3	CA	A	1201	1/1	0.99	0.08	36,36,36,36	0
3	CA	B	1201	1/1	1.00	0.13	37,37,37,37	0

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.



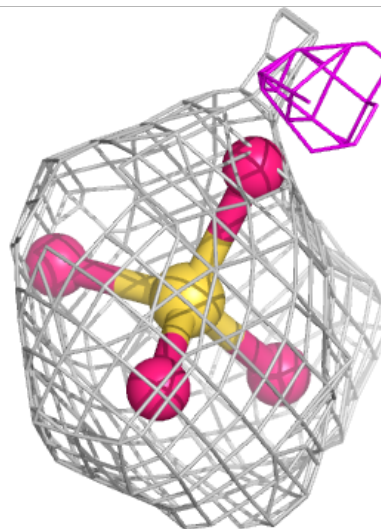
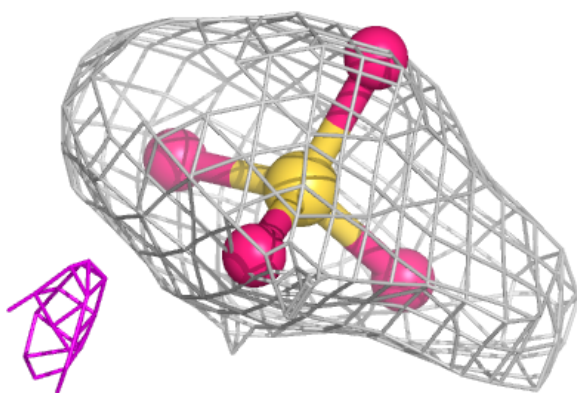
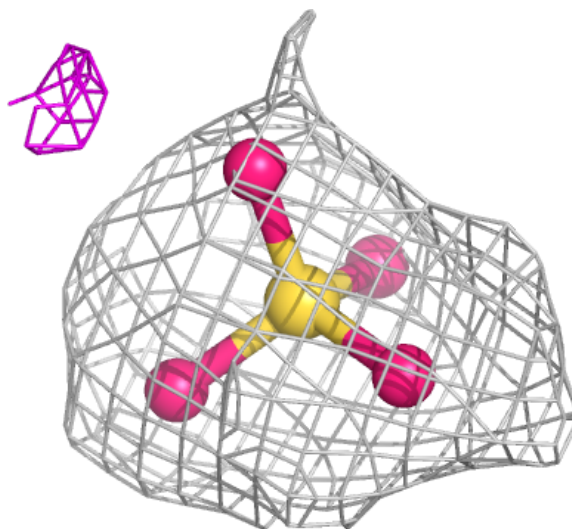
Electron density around SO4 B 1210:

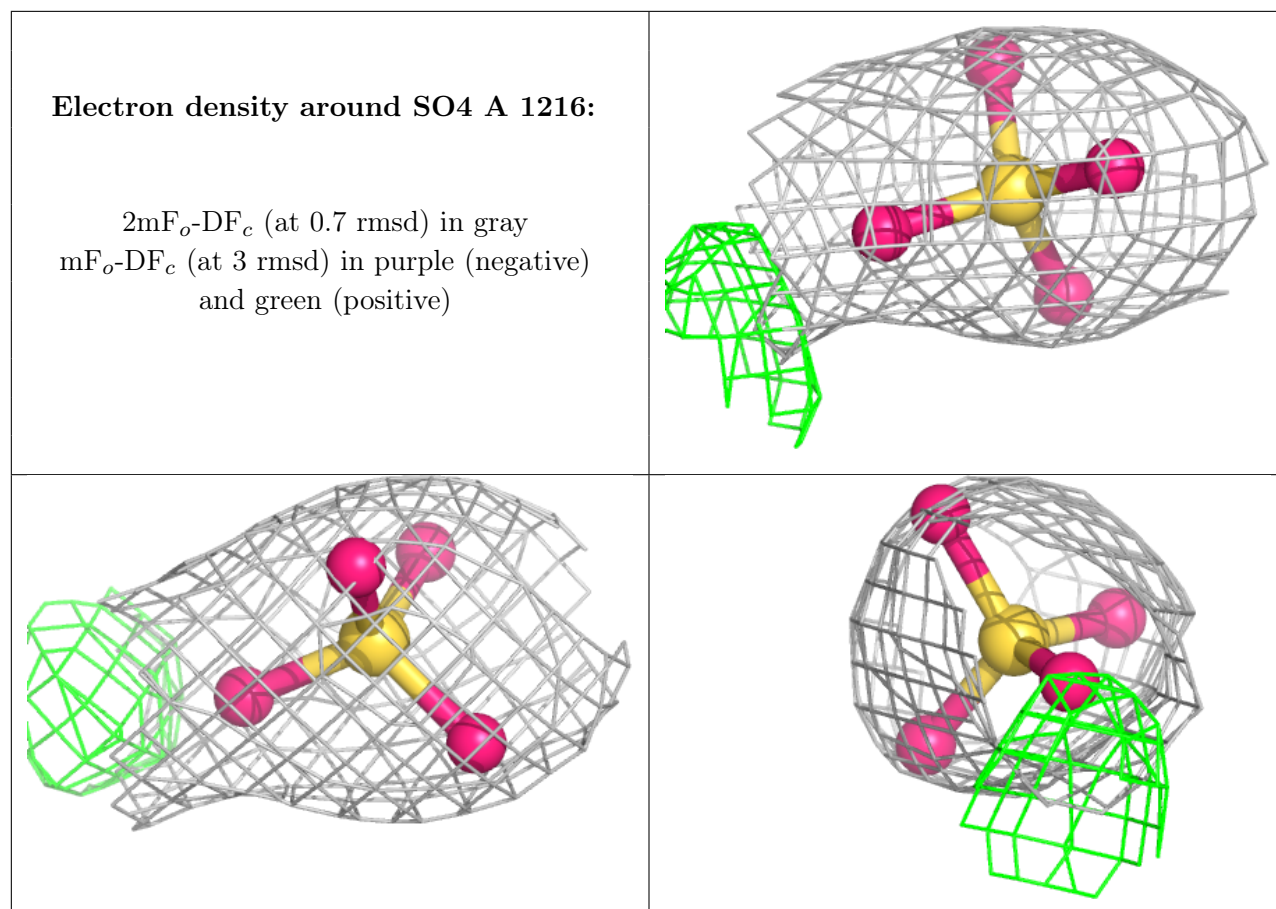
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around SO4 A 1225:

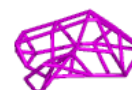
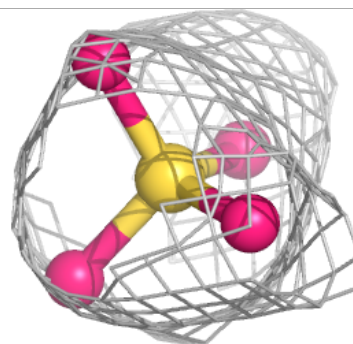
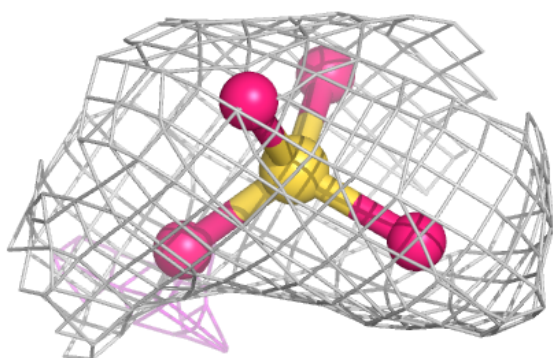
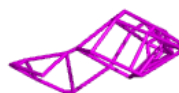
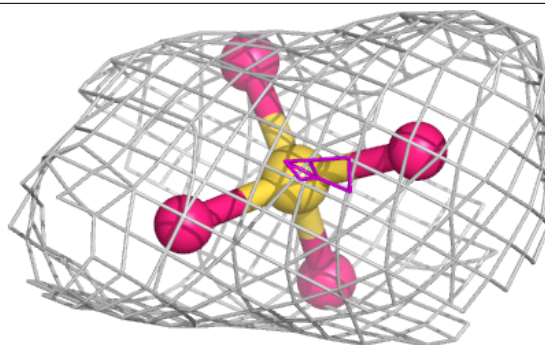
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)





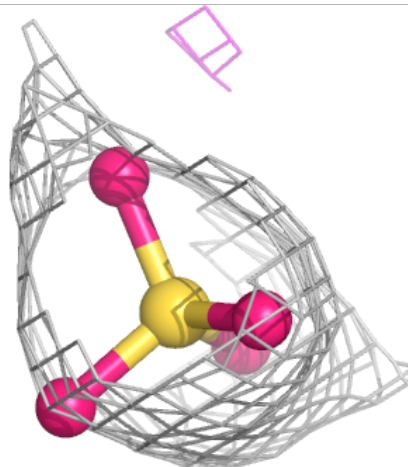
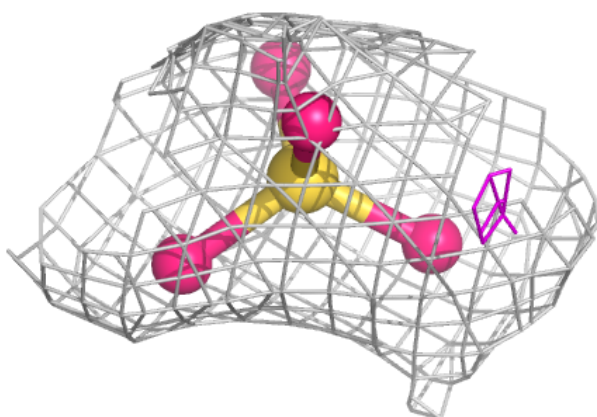
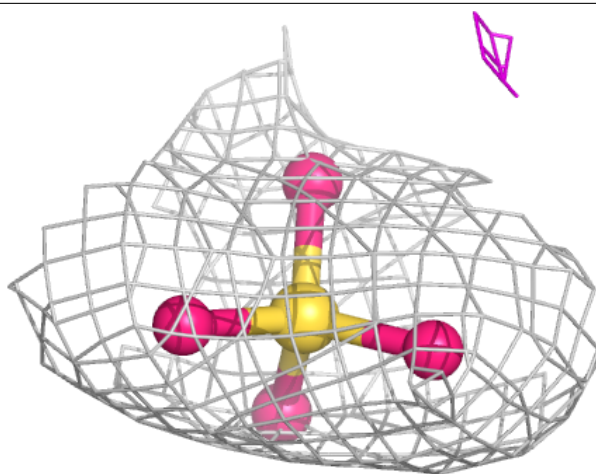
Electron density around SO4 B 1214:

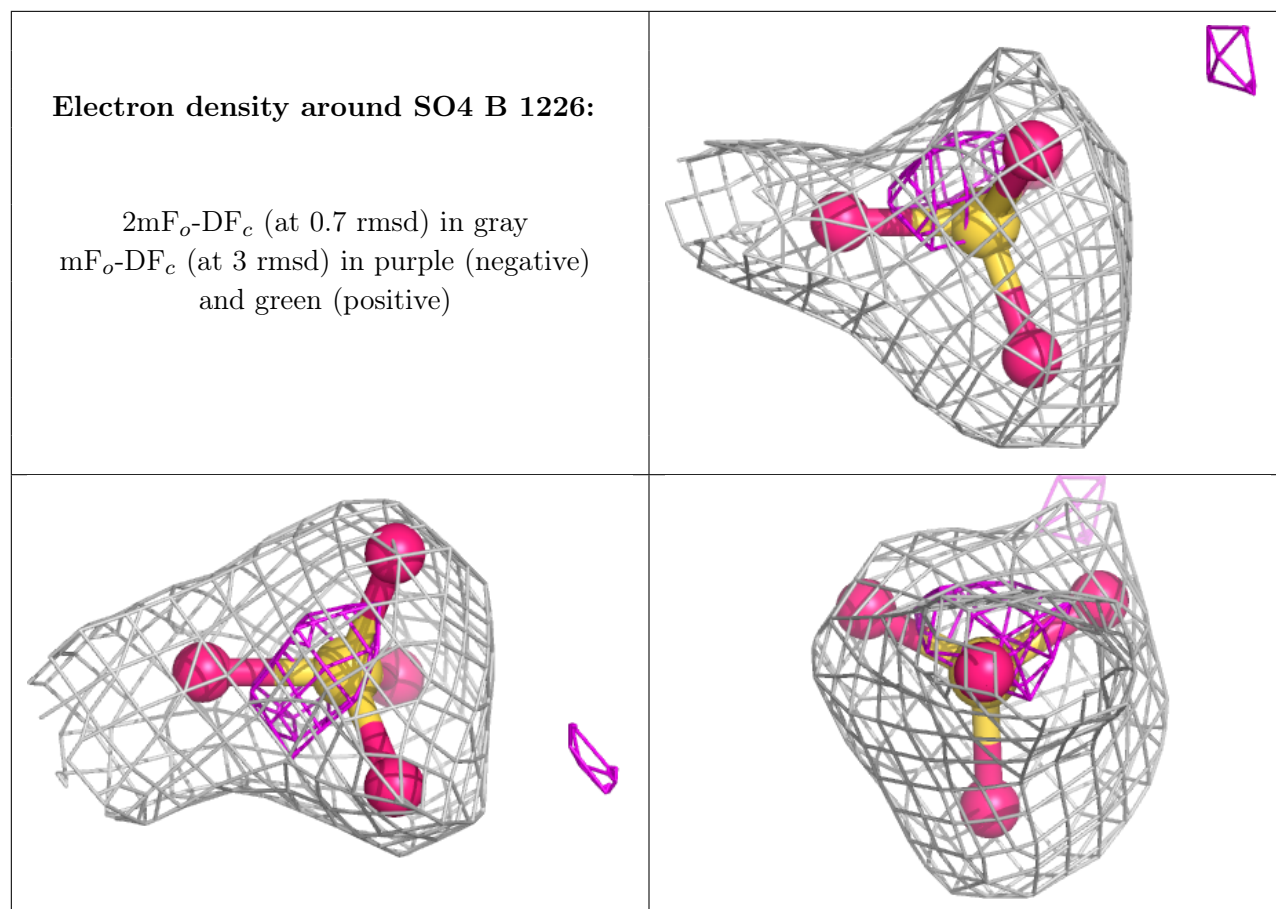
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around SO4 A 1206:

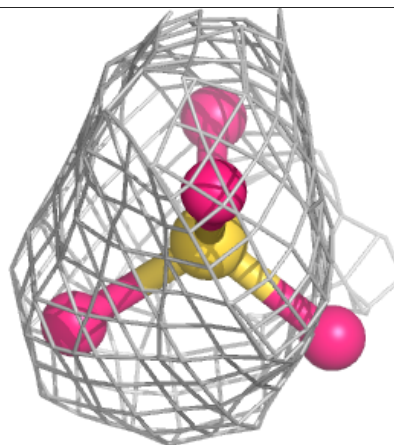
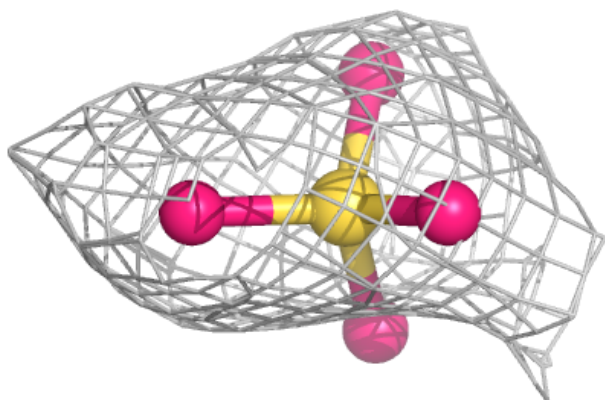
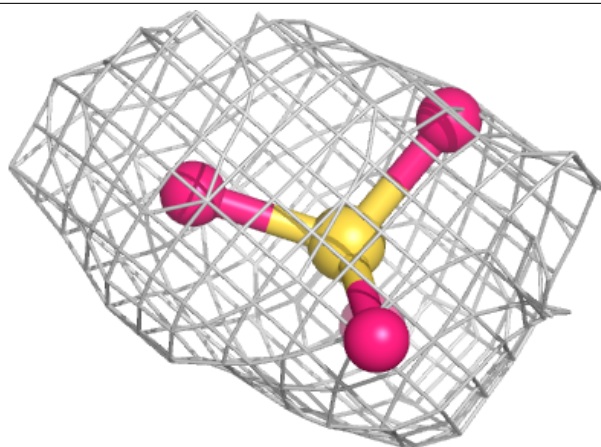
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)





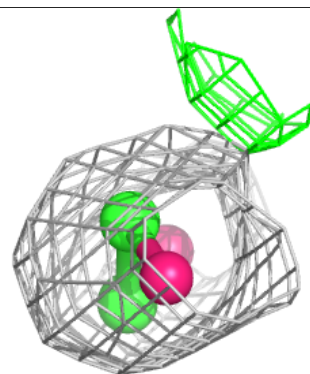
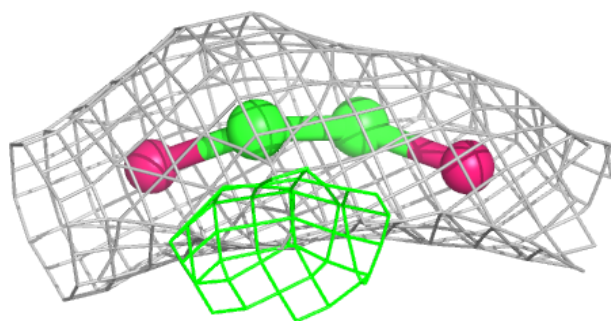
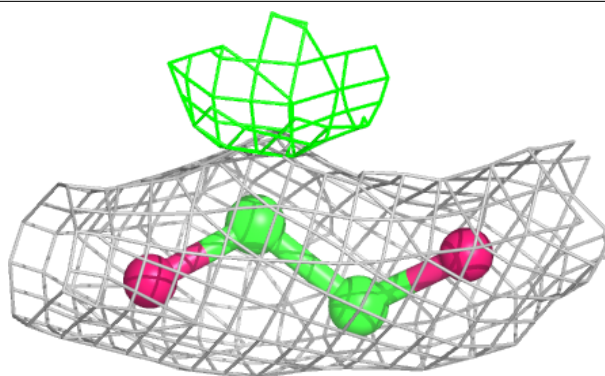
Electron density around SO4 B 1227:

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



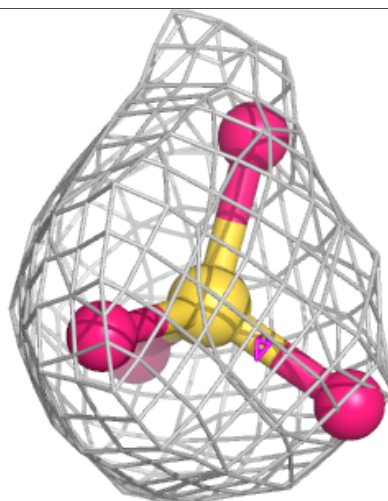
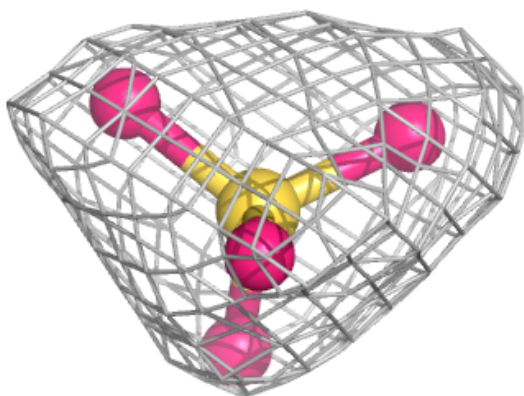
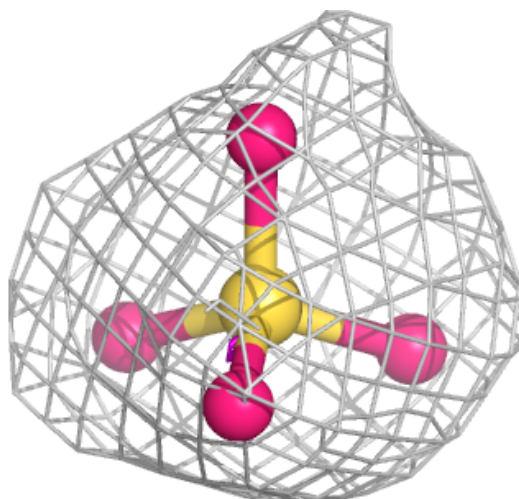
Electron density around EDO B 1206:

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



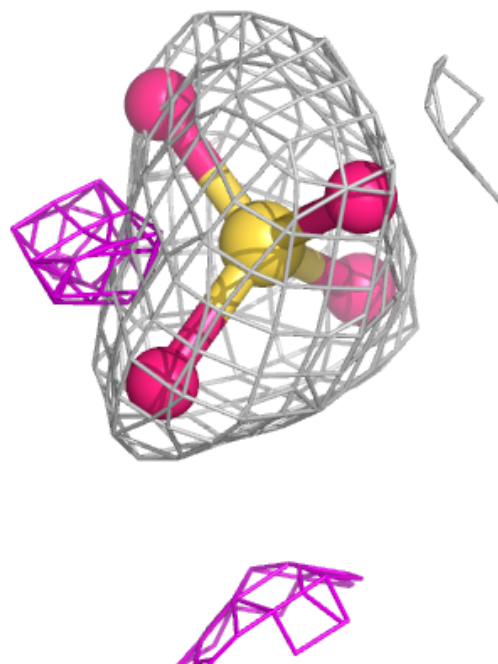
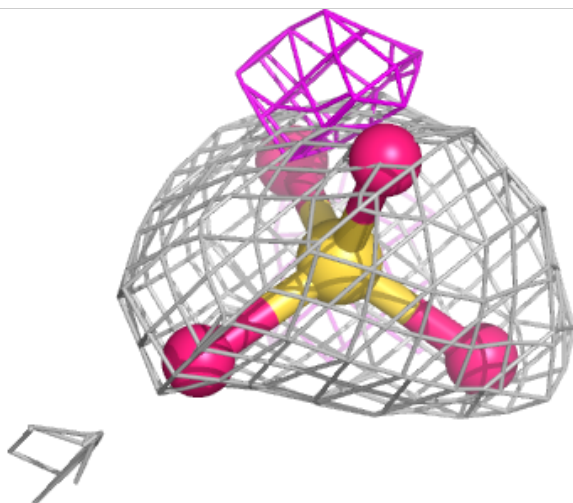
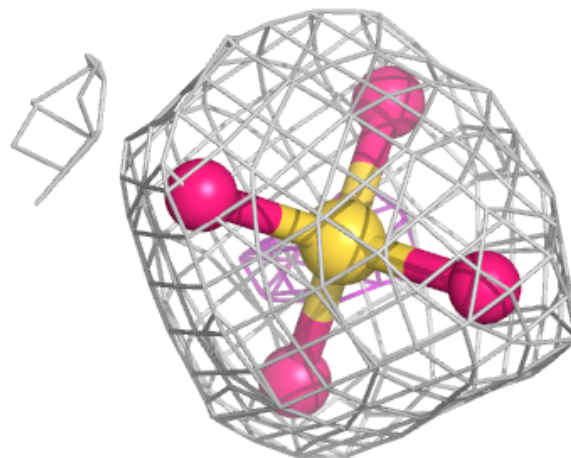
Electron density around SO4 B 1219:

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



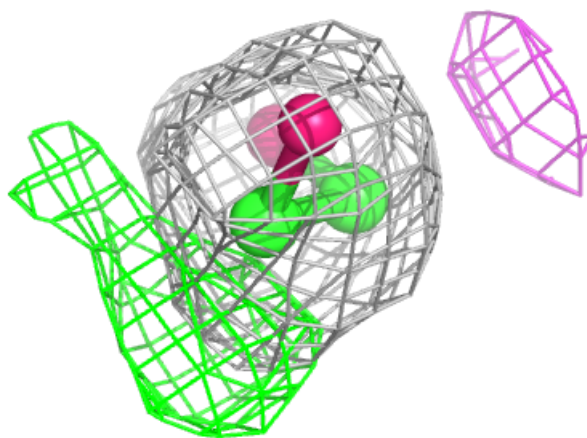
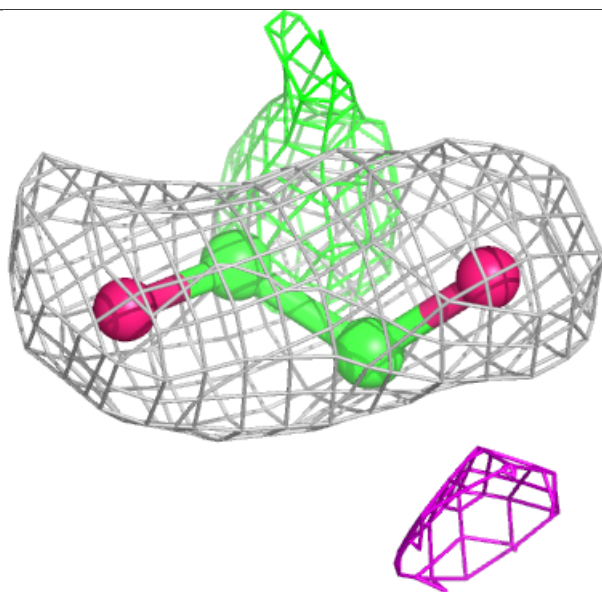
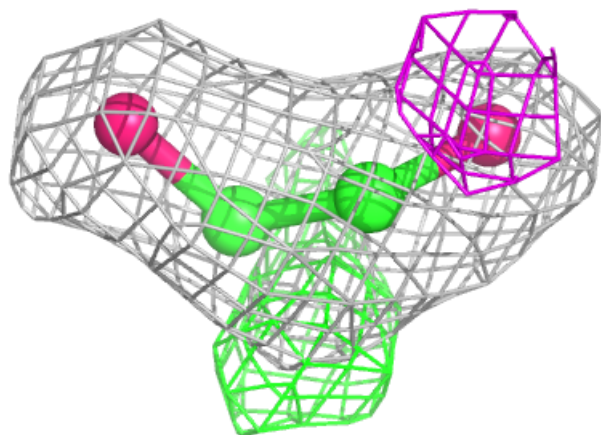
Electron density around SO4 A 1228:

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



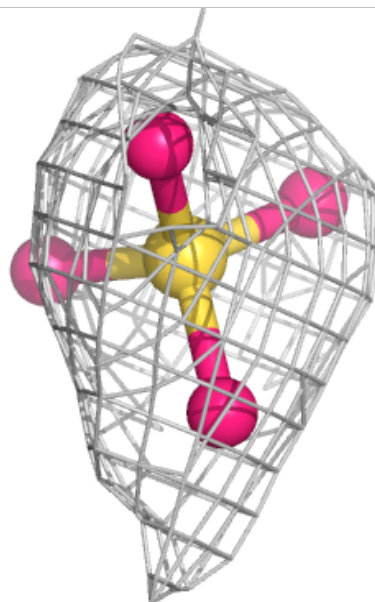
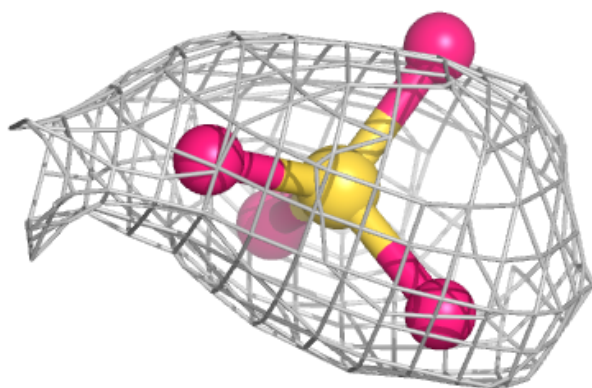
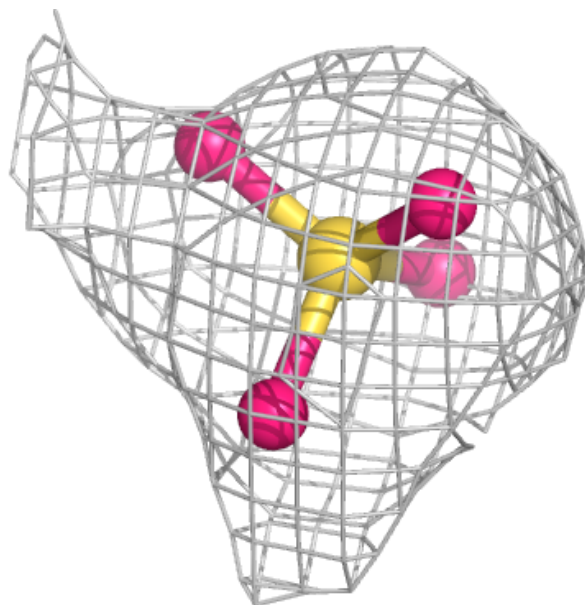
Electron density around EDO B 1205:

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



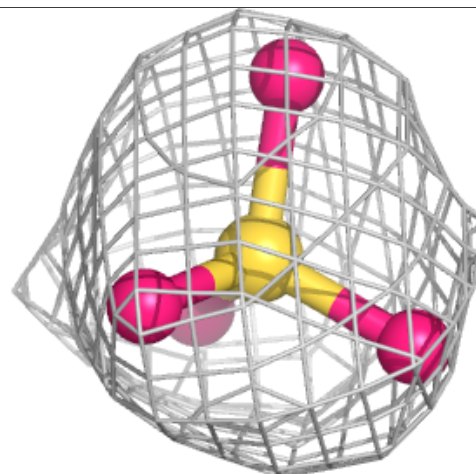
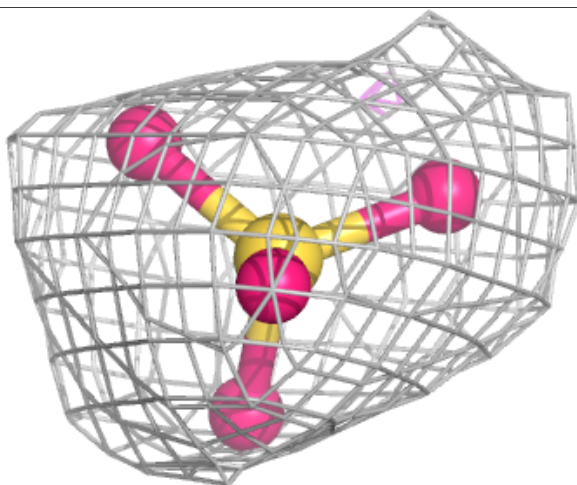
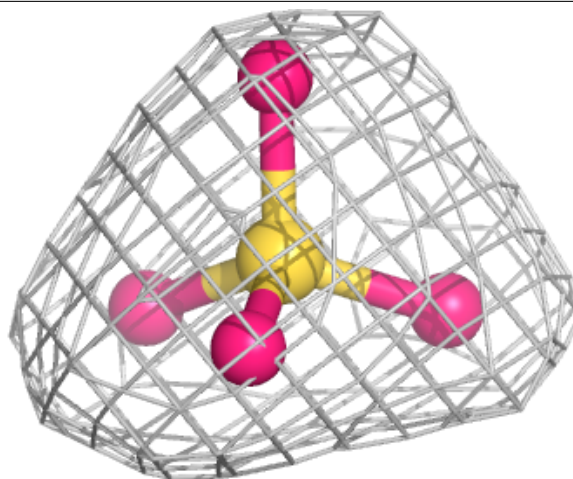
Electron density around SO4 A 1227:

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



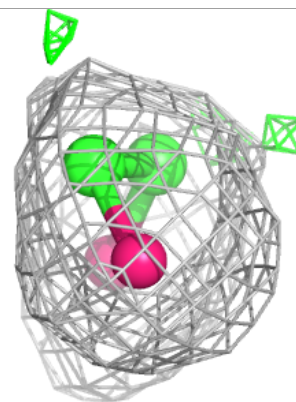
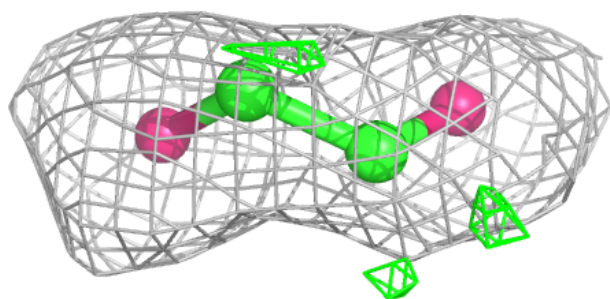
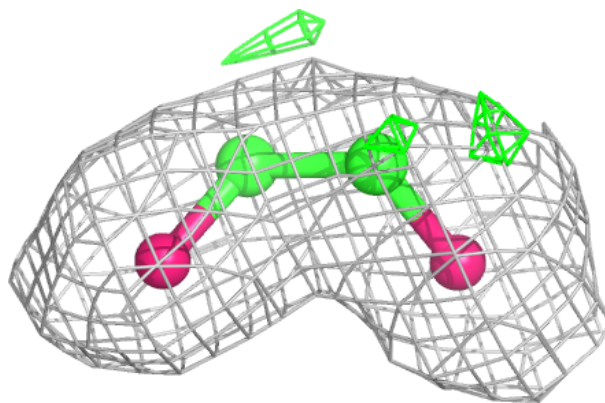
Electron density around SO4 B 1232:

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



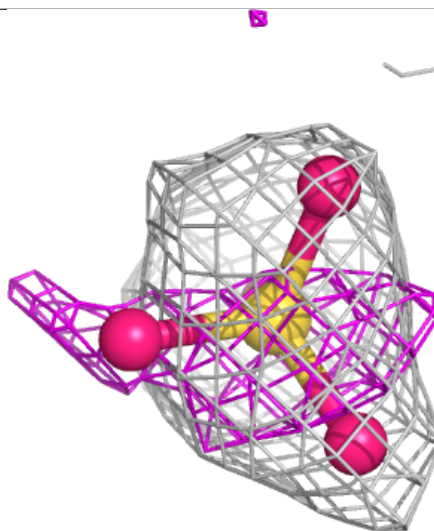
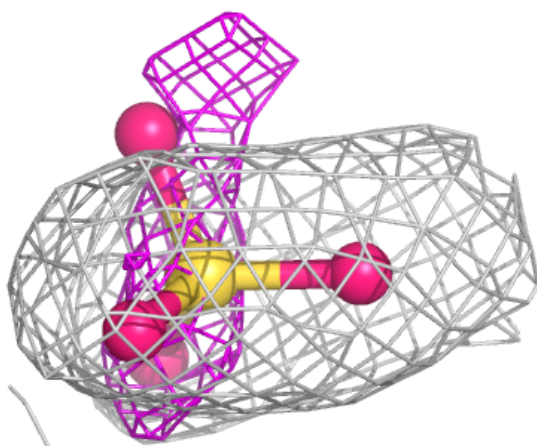
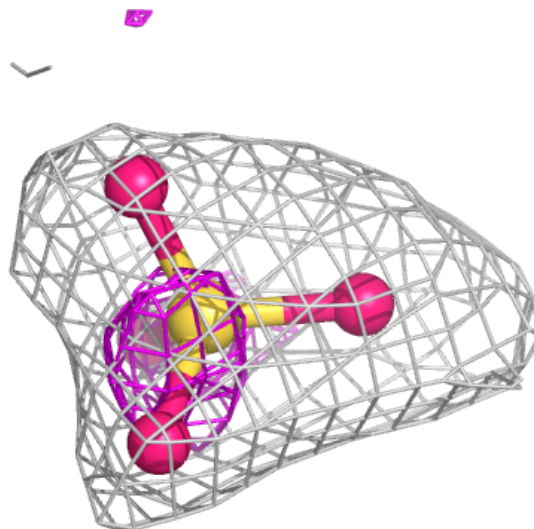
Electron density around EDO A 1202:

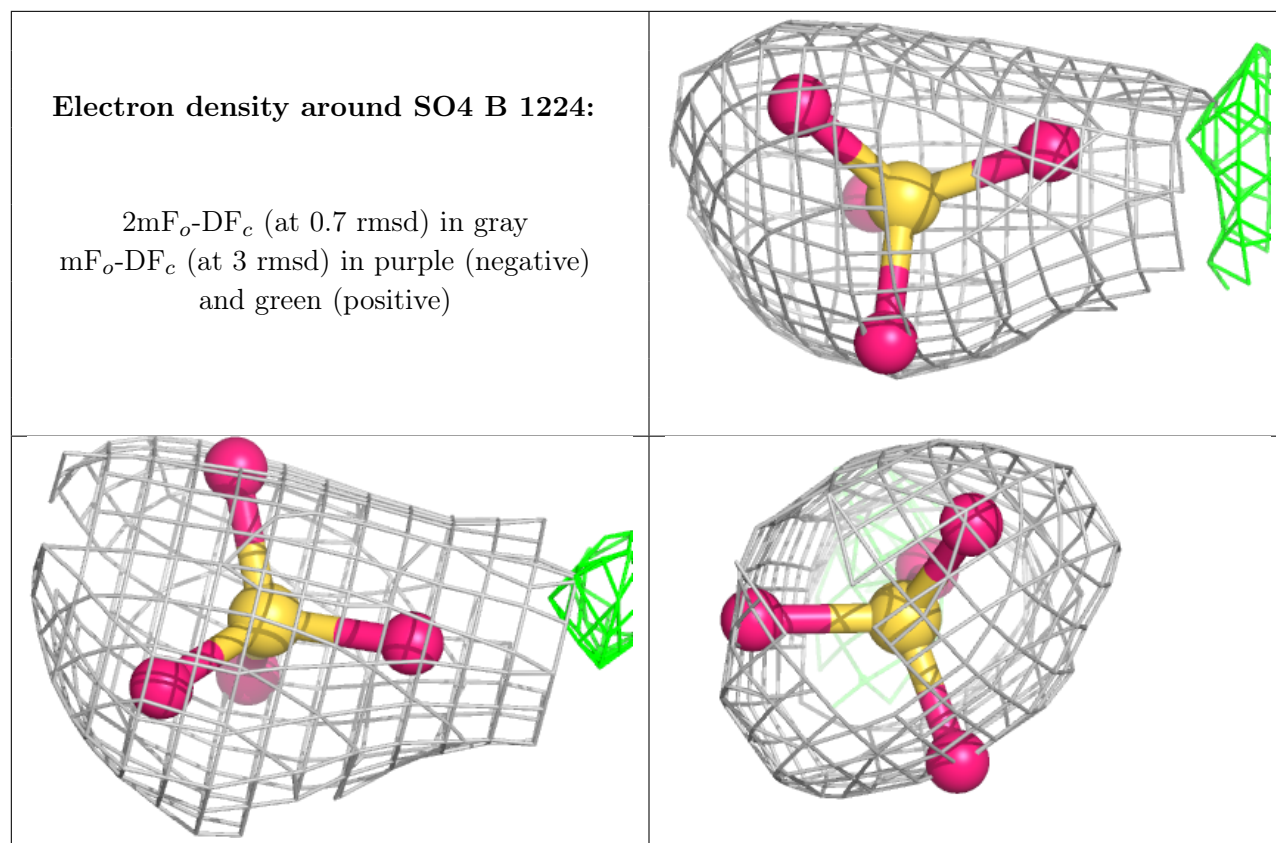
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around SO4 B 1221:

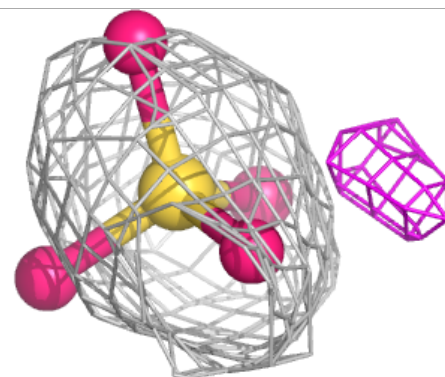
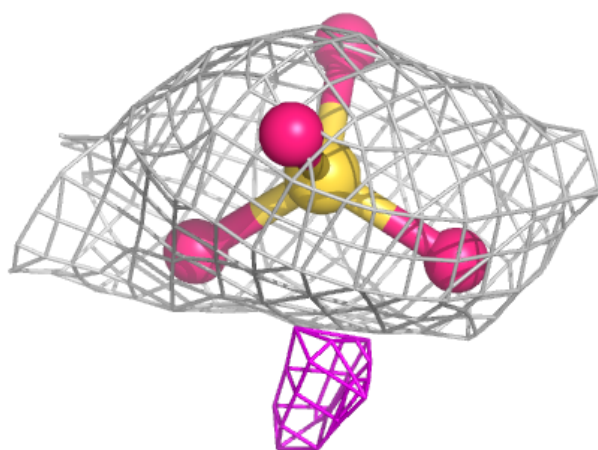
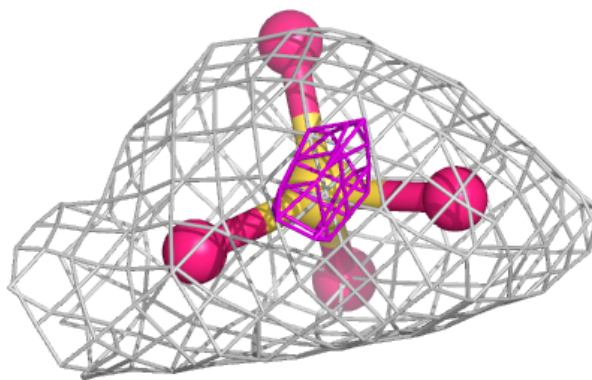
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)





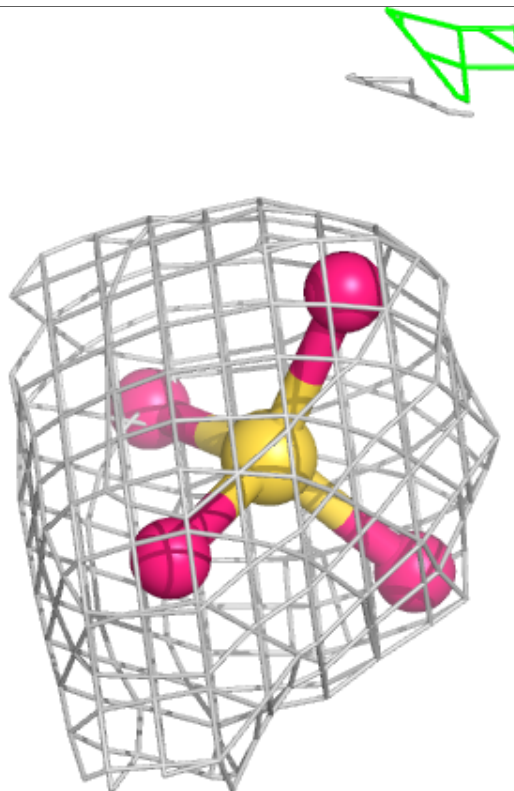
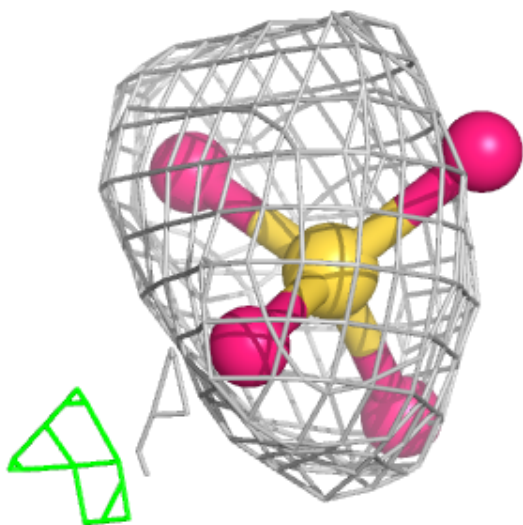
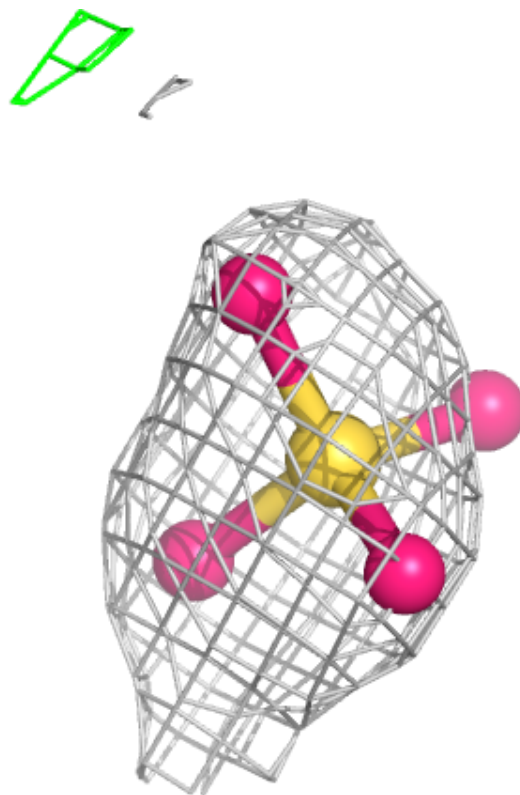
Electron density around SO4 A 1229:

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



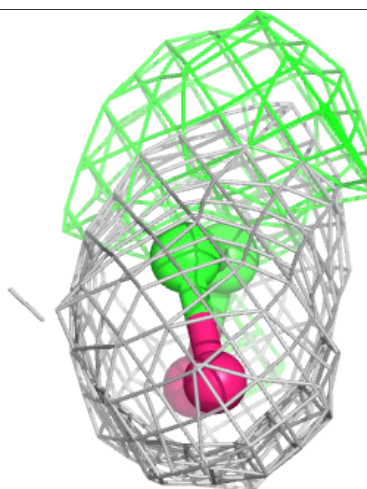
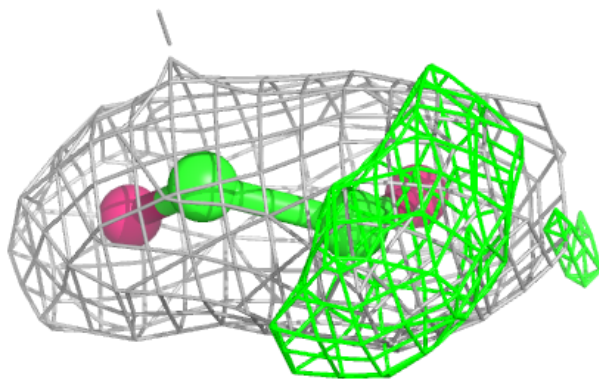
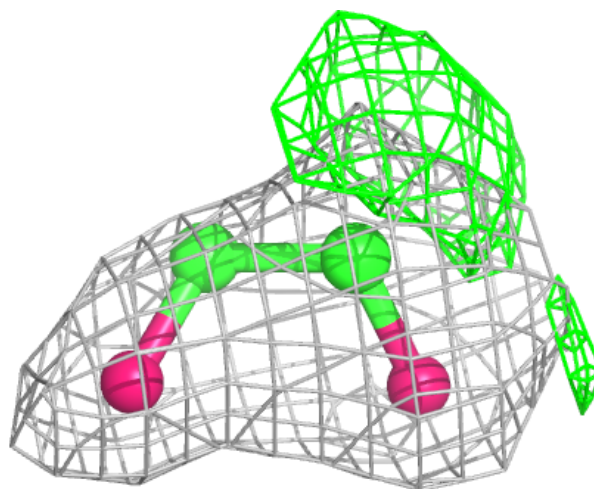
Electron density around SO4 A 1213:

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



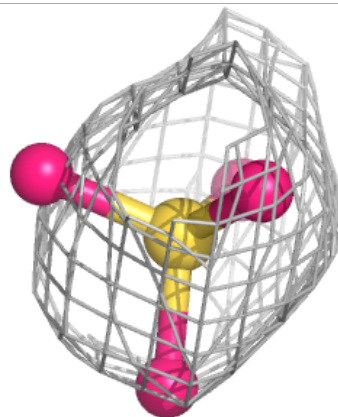
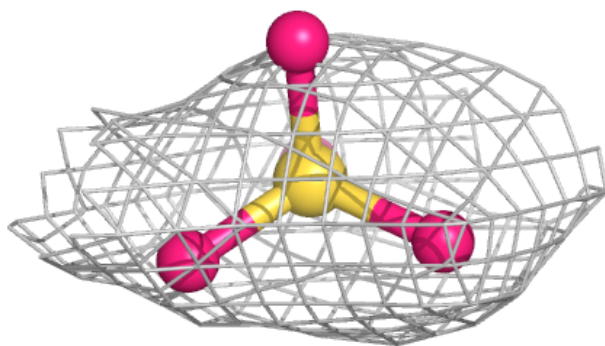
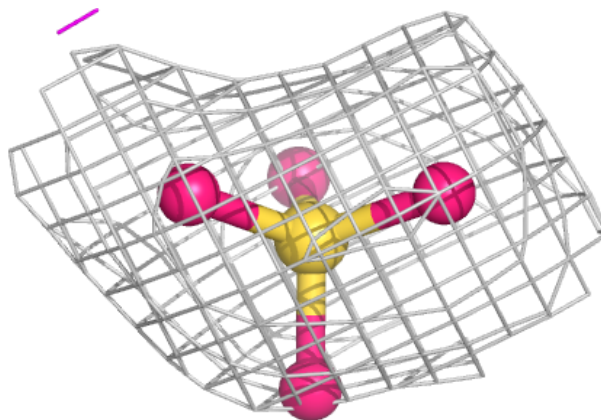
Electron density around EDO B 1203:

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



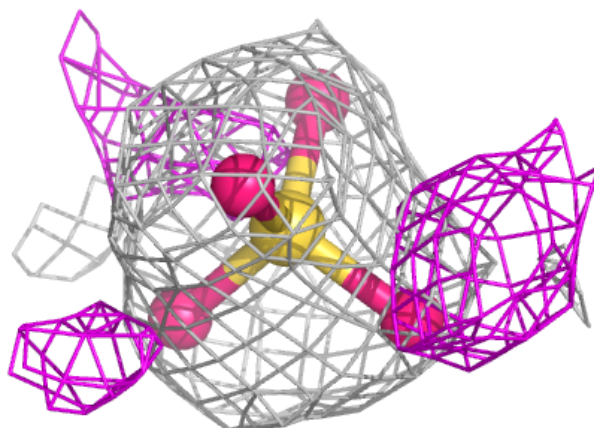
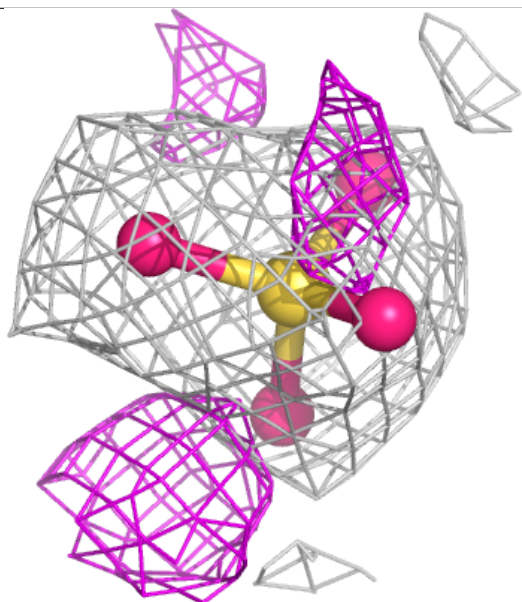
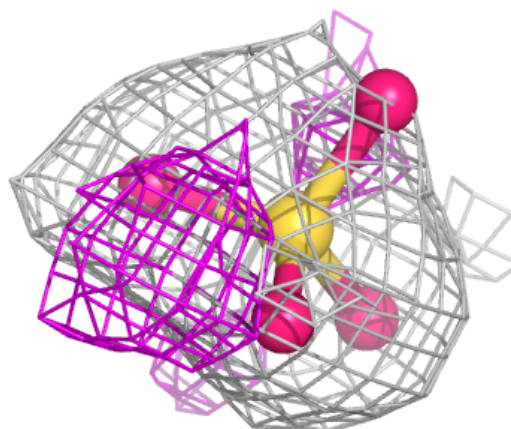
Electron density around SO4 A 1209:

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



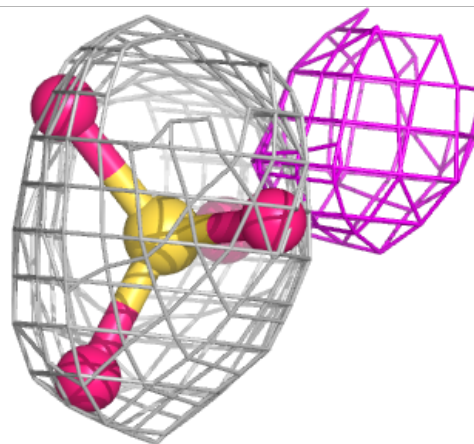
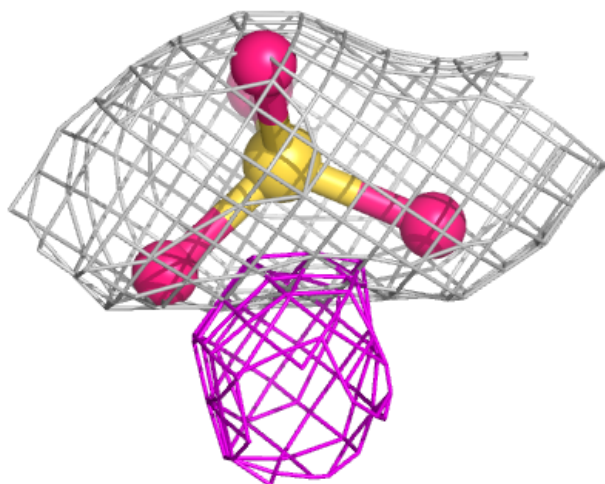
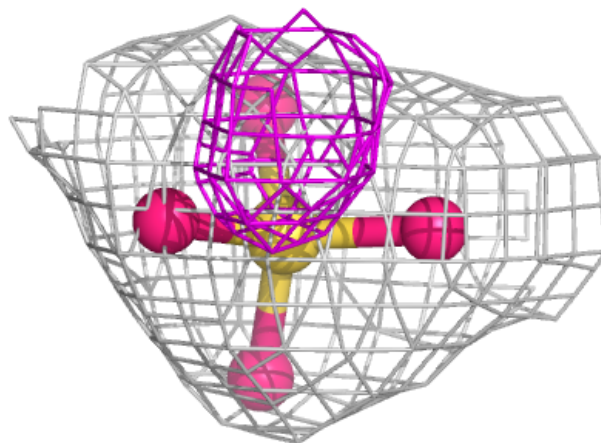
Electron density around SO4 B 1229:

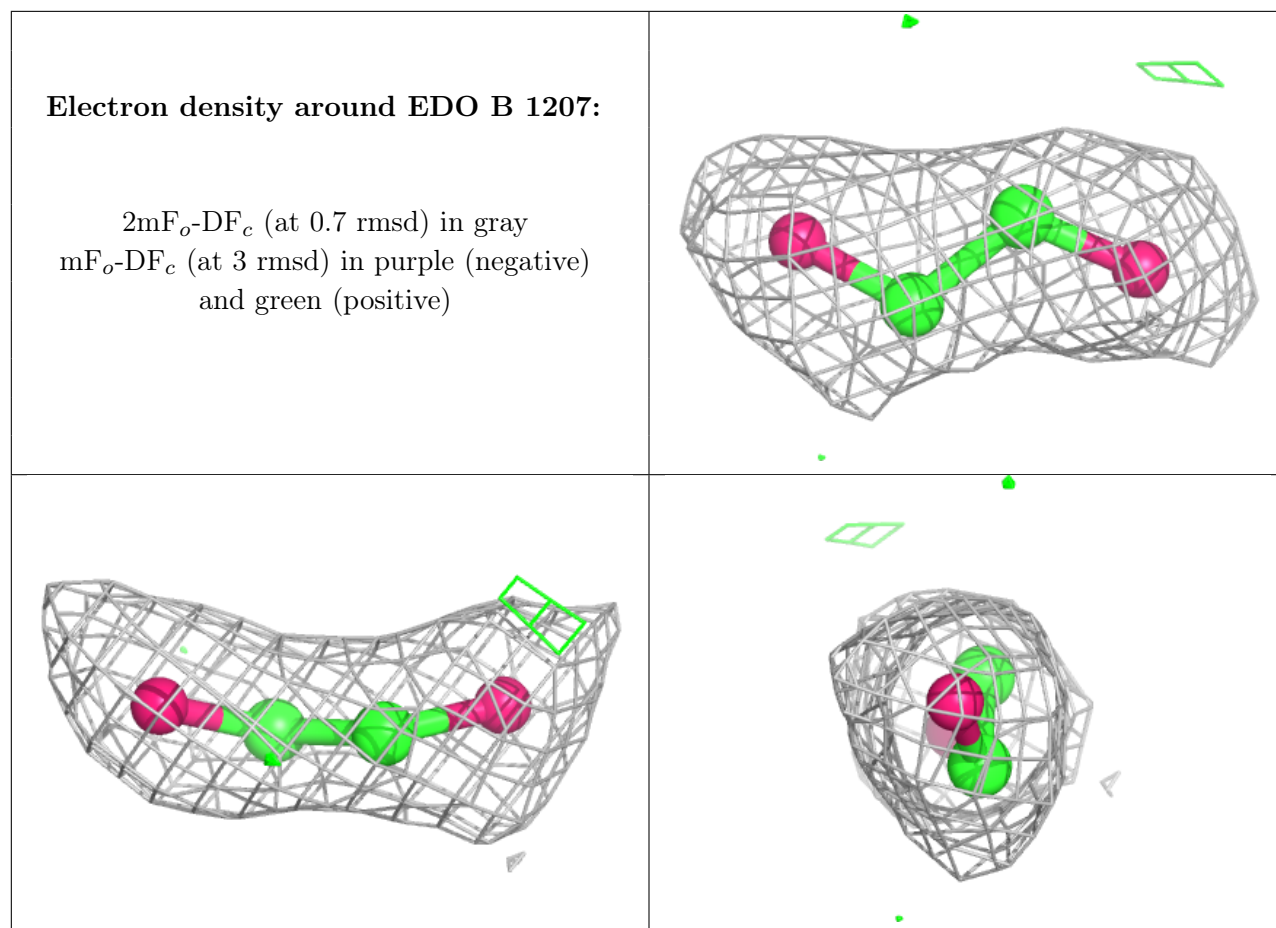
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around SO4 B 1231:

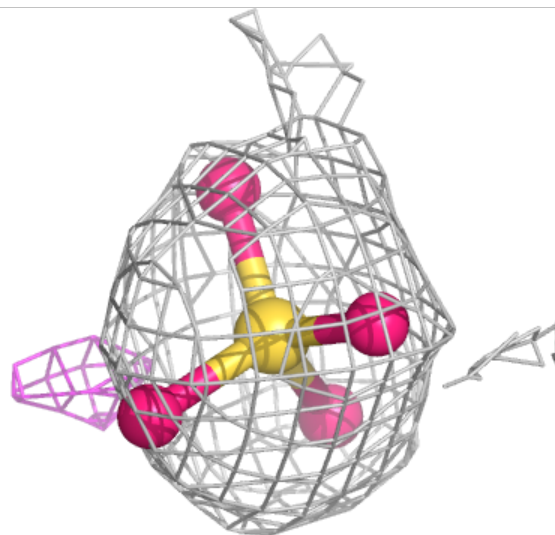
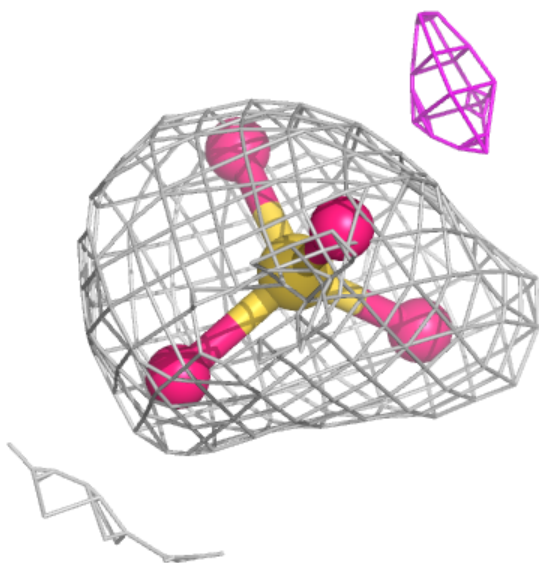
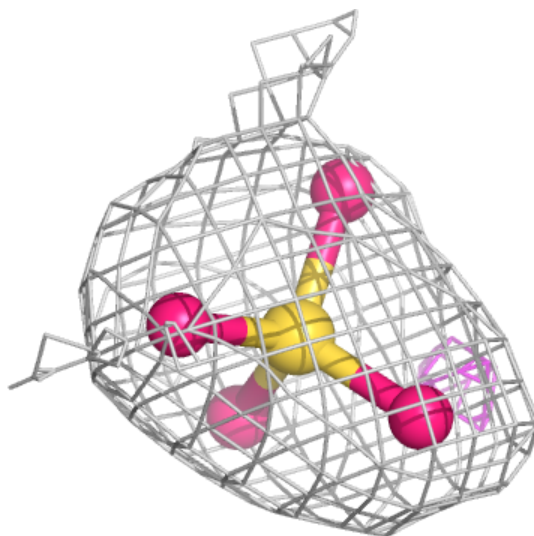
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)





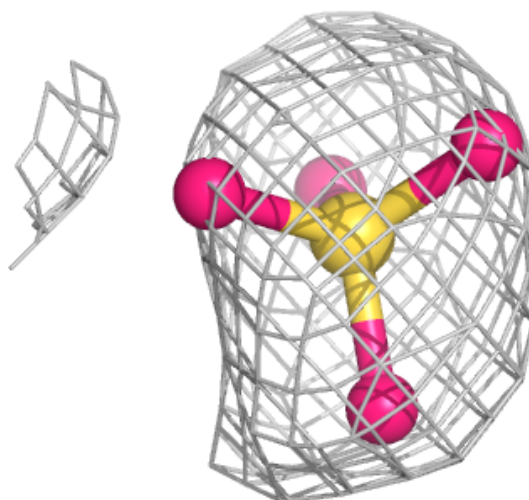
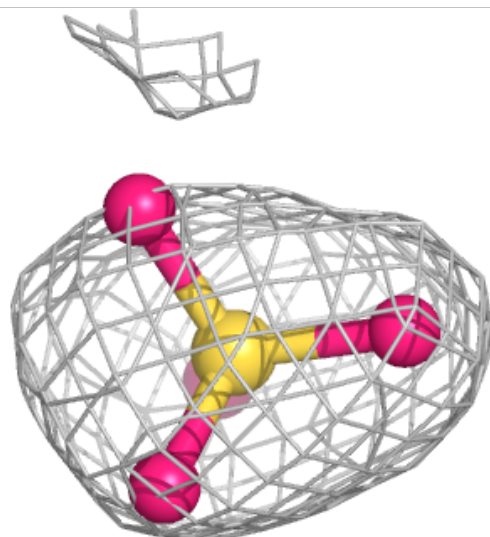
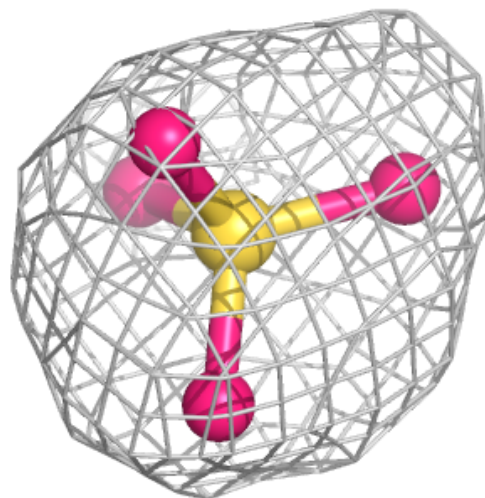
Electron density around SO4 A 1223:

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



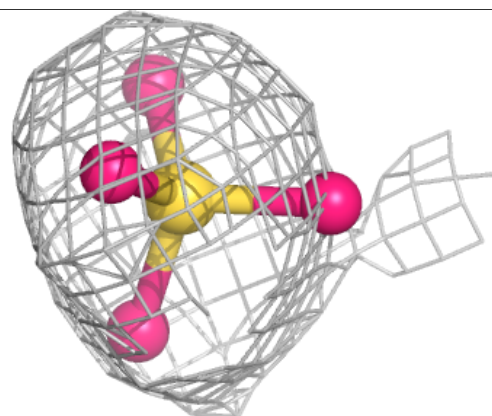
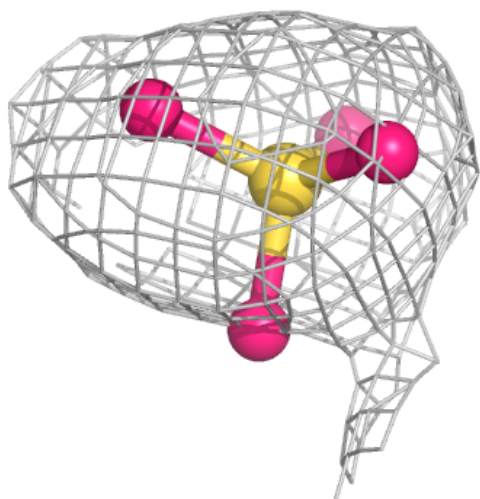
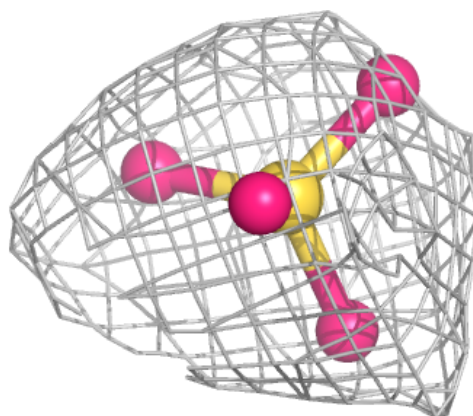
Electron density around SO4 B 1223:

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



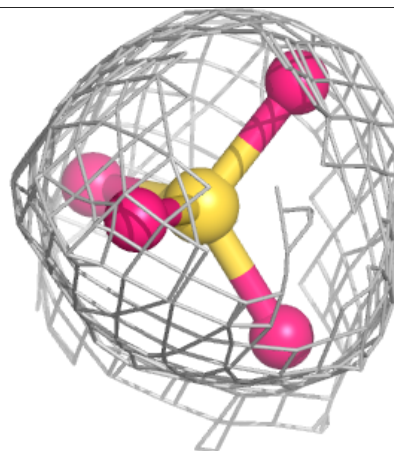
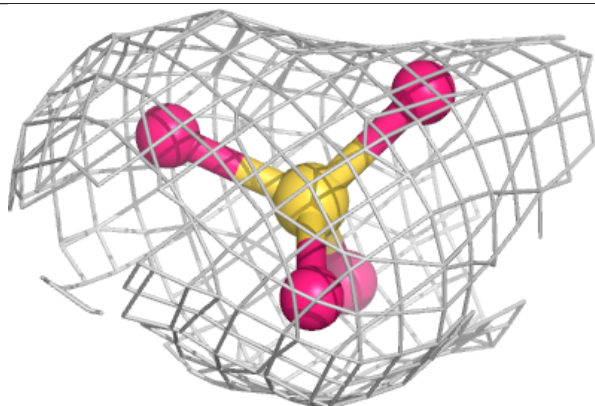
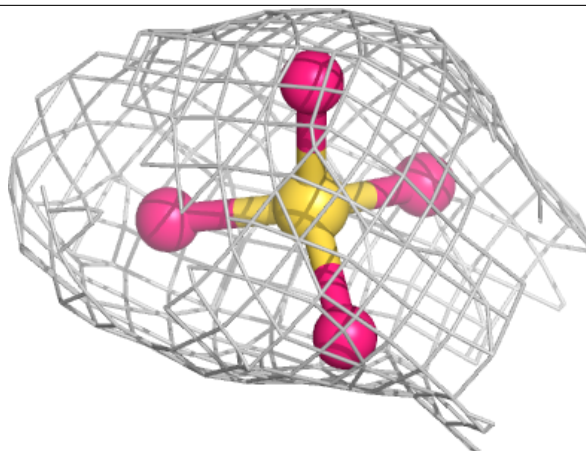
Electron density around SO4 A 1224:

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



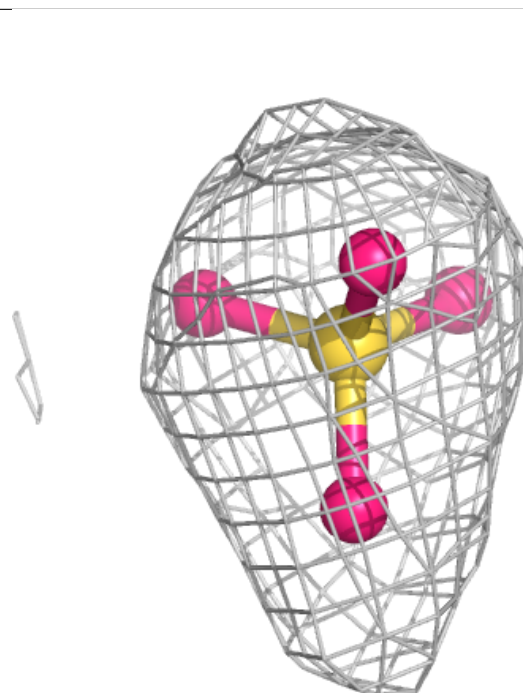
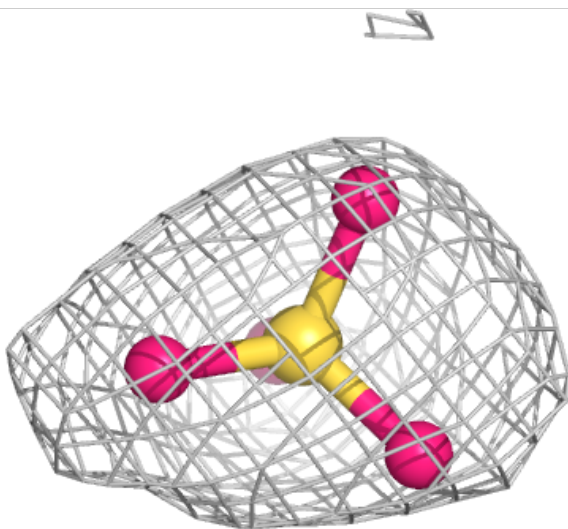
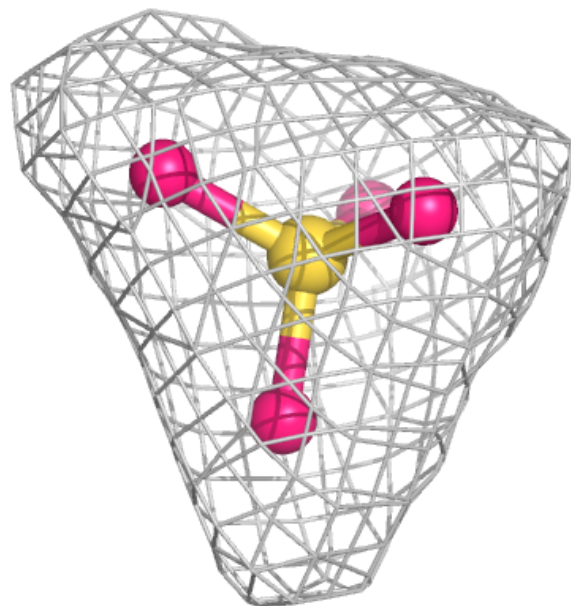
Electron density around SO4 A 1214:

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



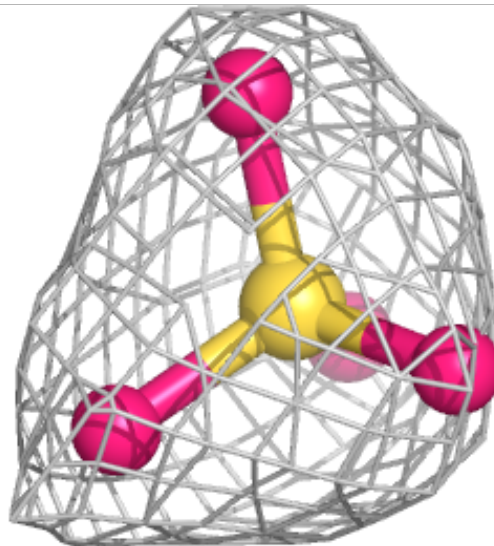
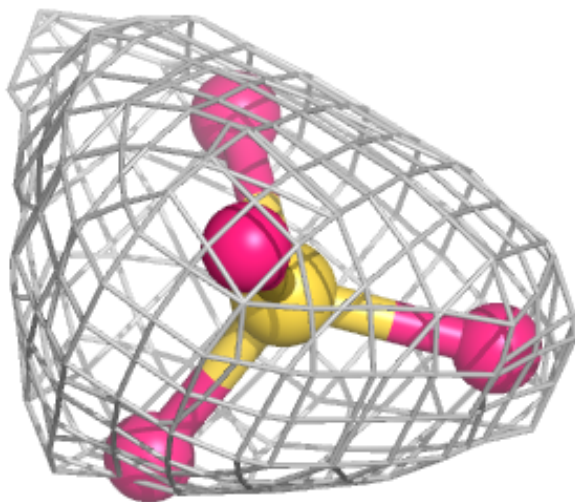
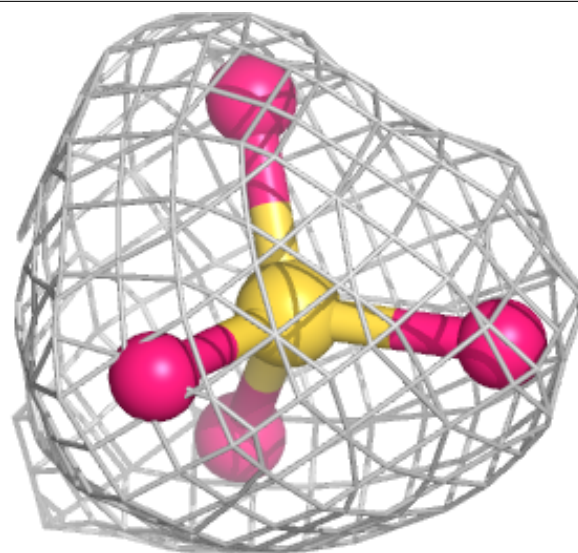
Electron density around SO4 B 1211:

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



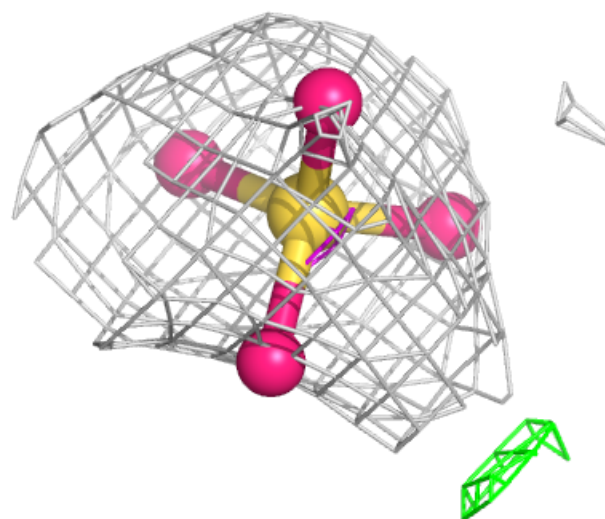
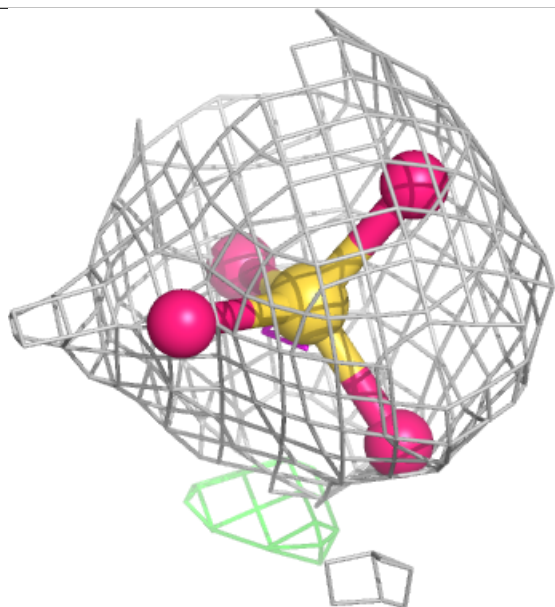
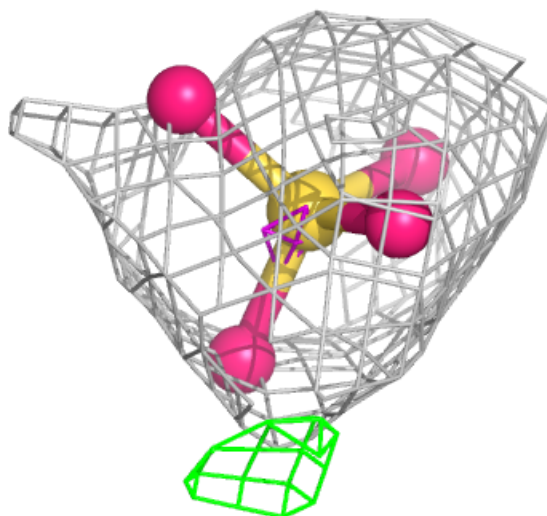
Electron density around SO4 B 1228:

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



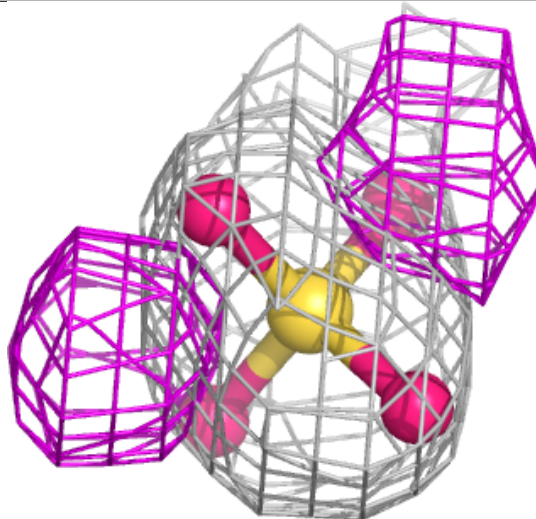
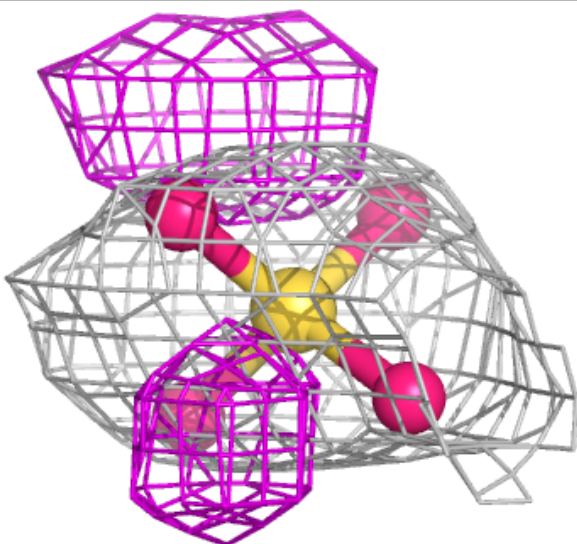
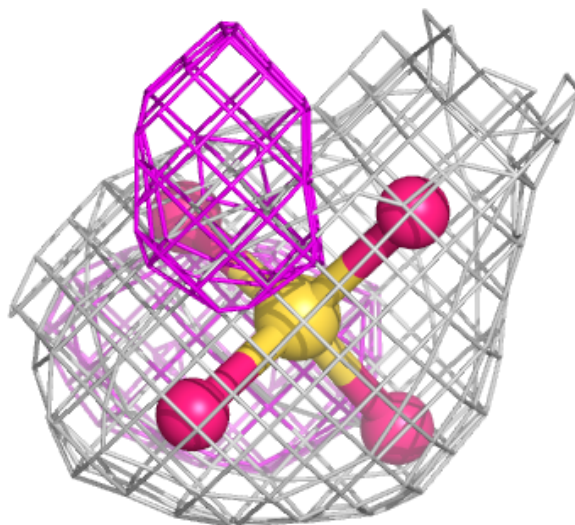
Electron density around SO4 A 1218:

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



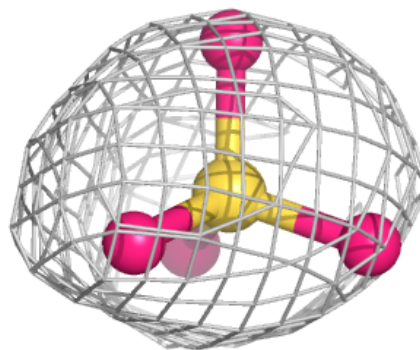
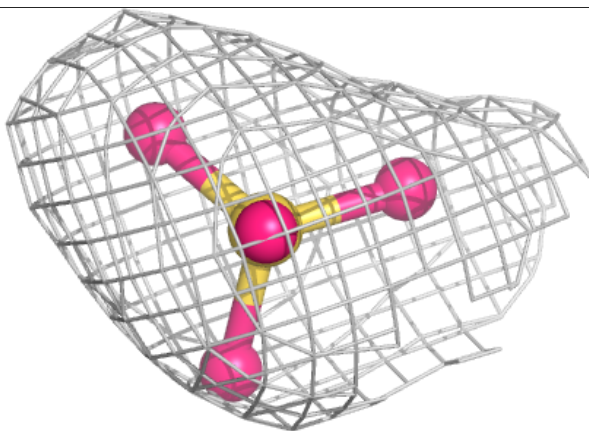
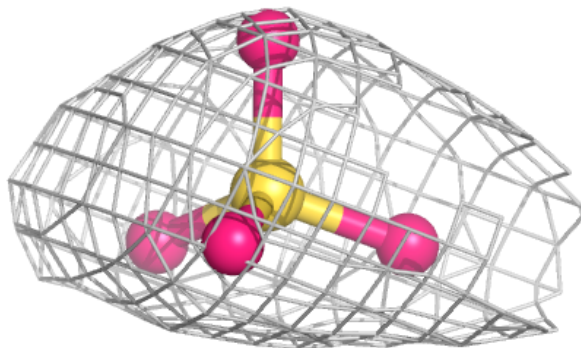
Electron density around SO4 B 1218:

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



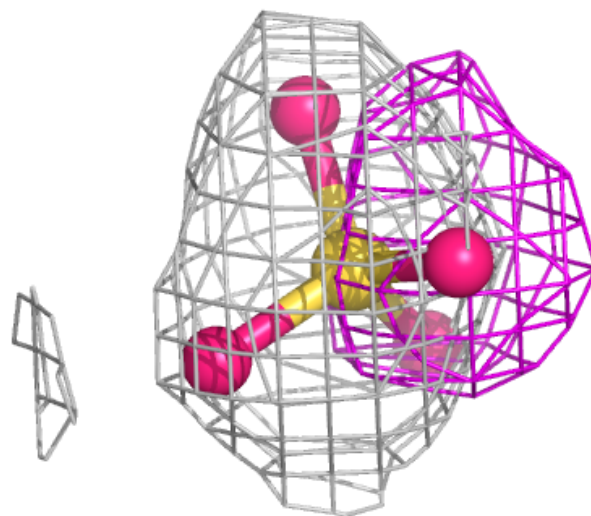
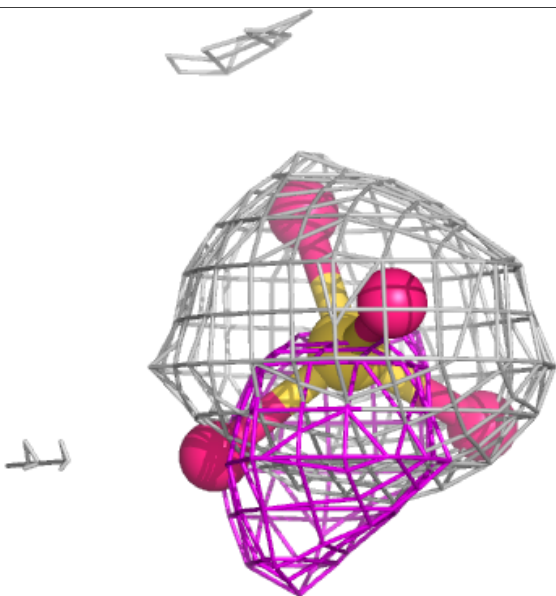
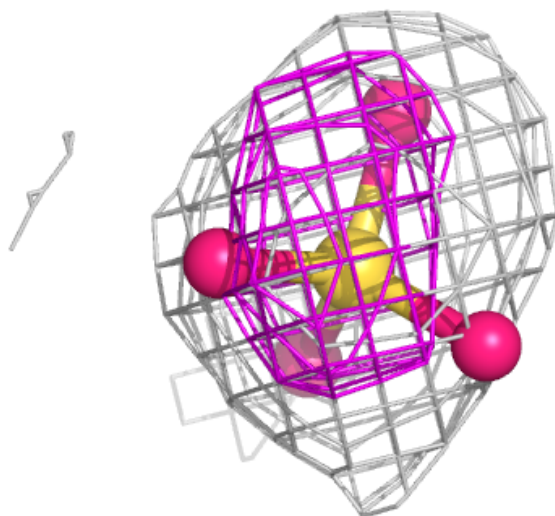
Electron density around SO4 A 1219:

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



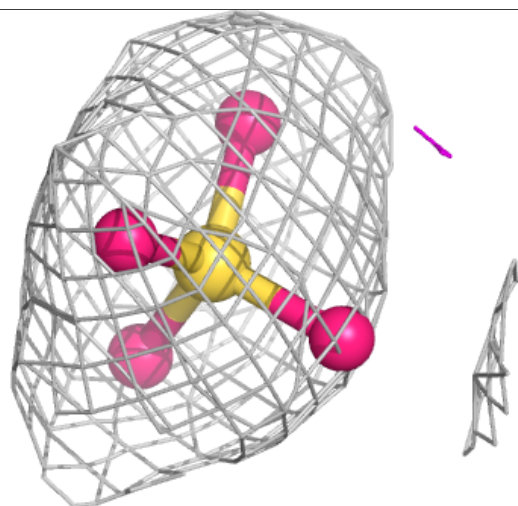
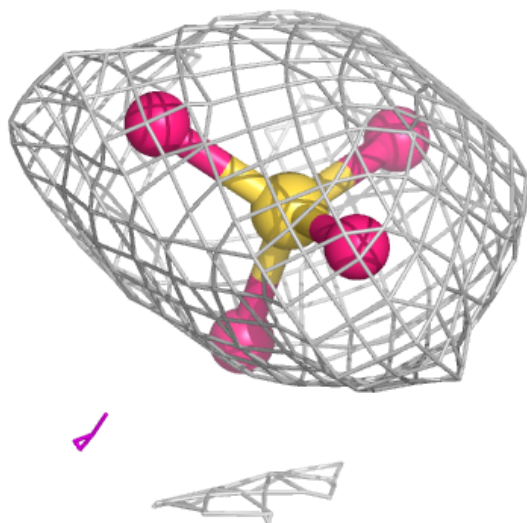
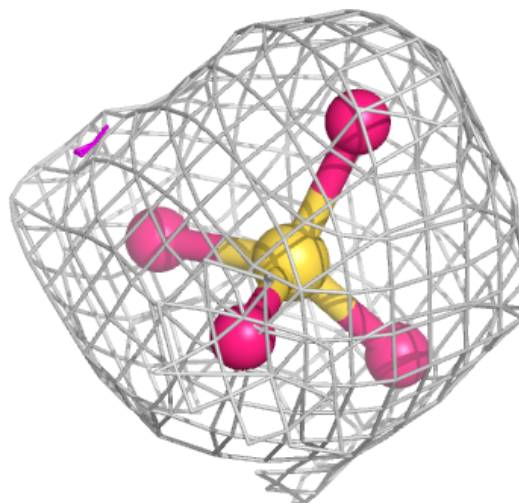
Electron density around SO4 A 1217:

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



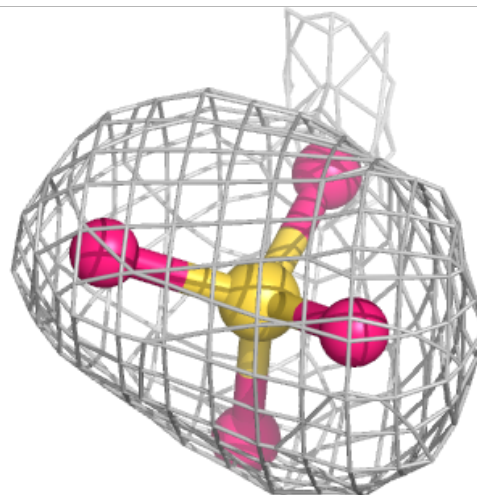
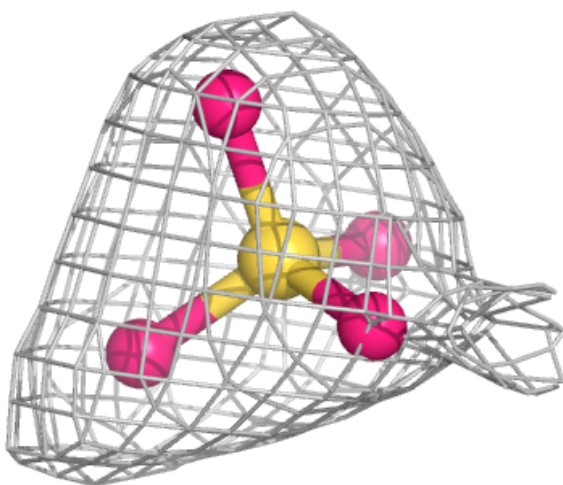
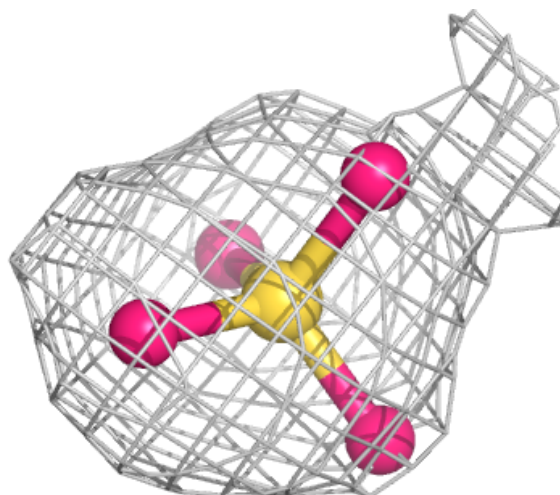
Electron density around SO4 B 1222:

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



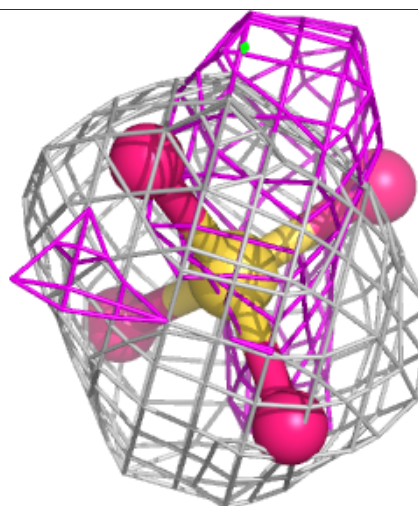
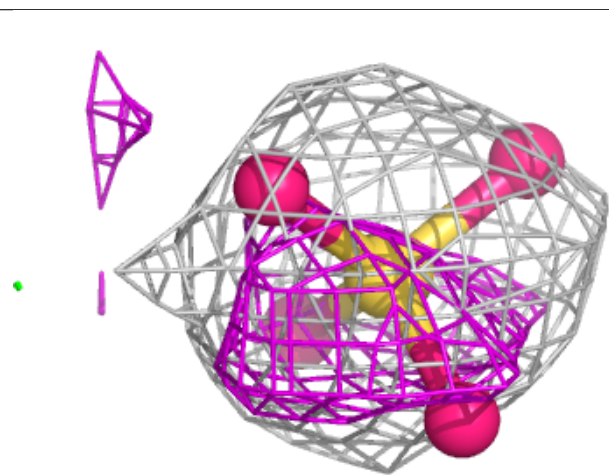
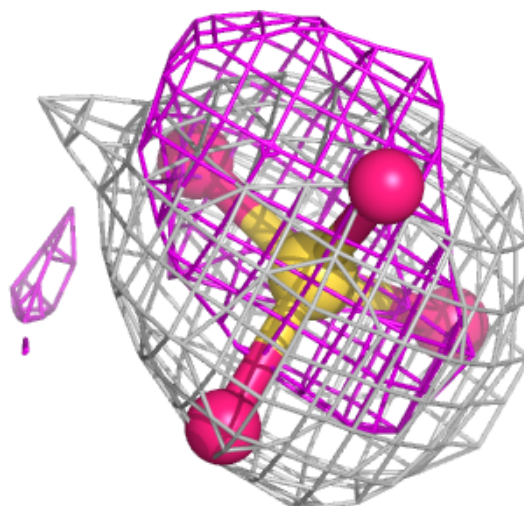
Electron density around SO4 B 1216:

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



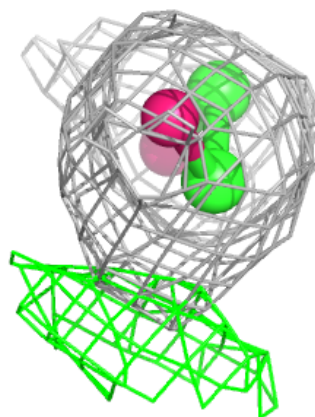
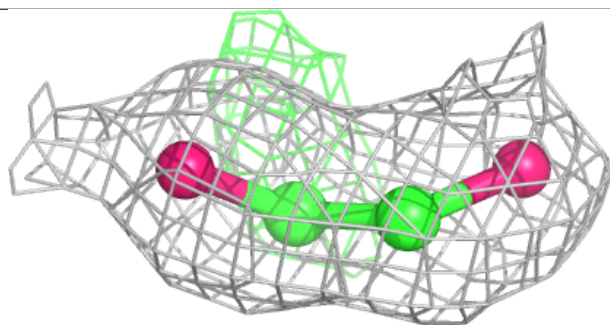
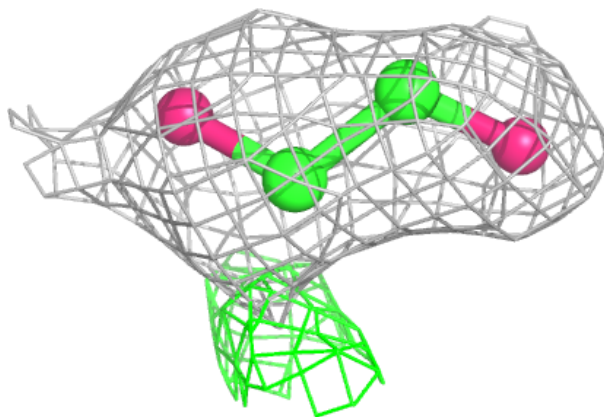
Electron density around SO4 B 1230:

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



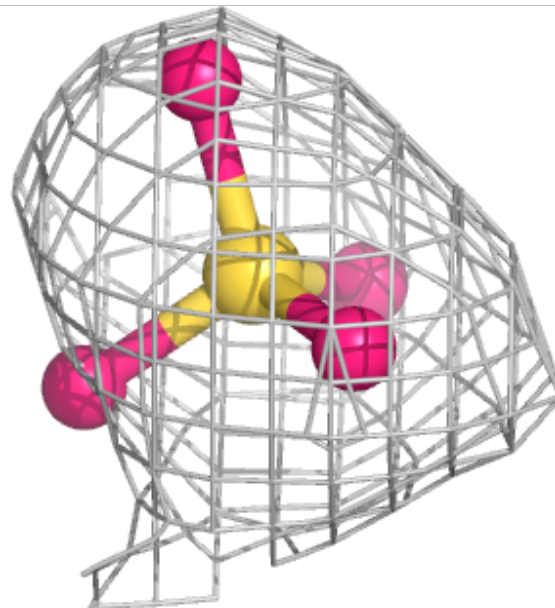
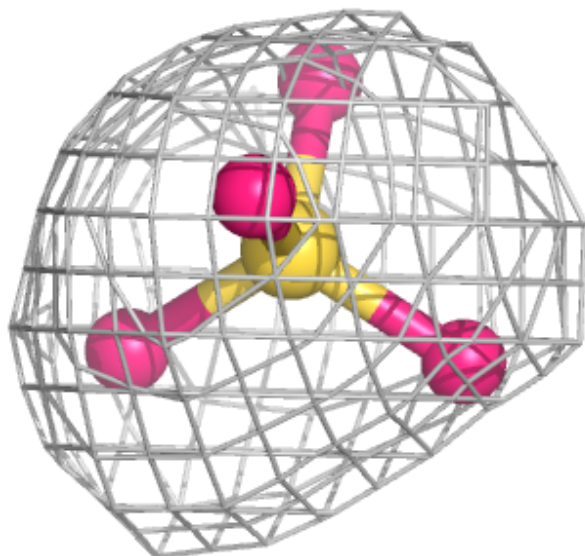
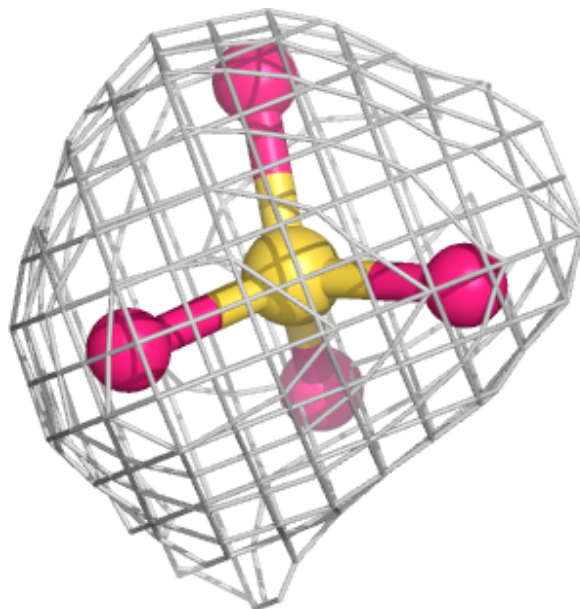
Electron density around EDO B 1204:

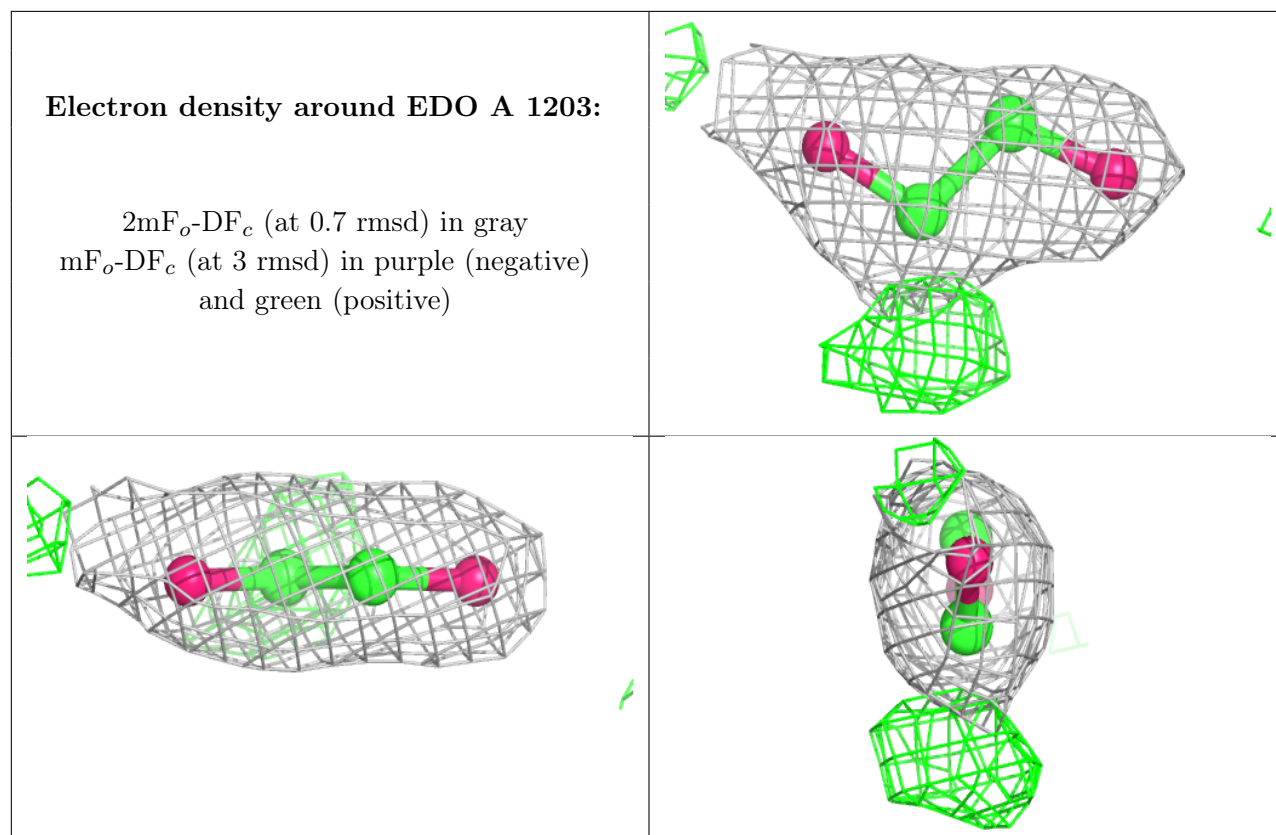
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around SO4 B 1213:

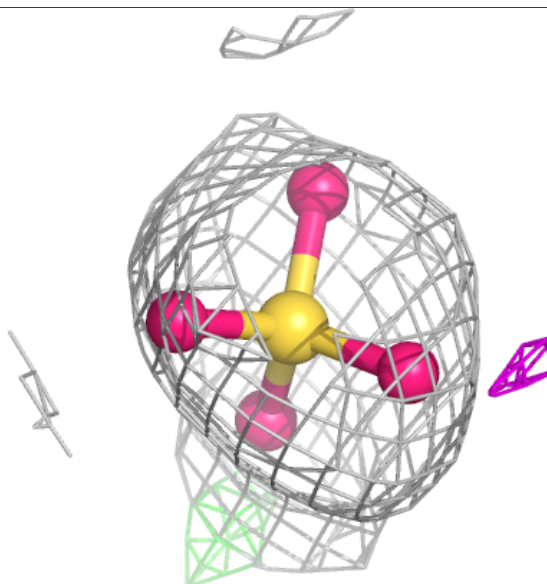
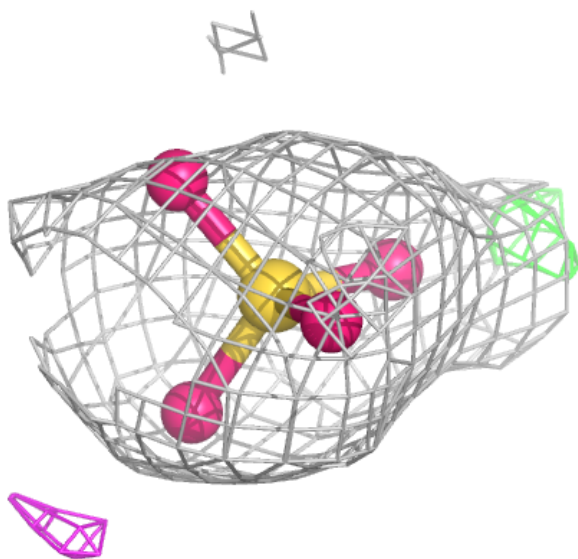
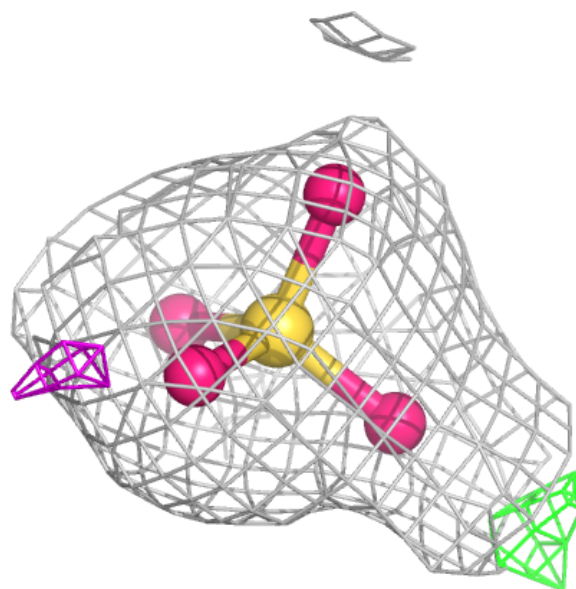
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)





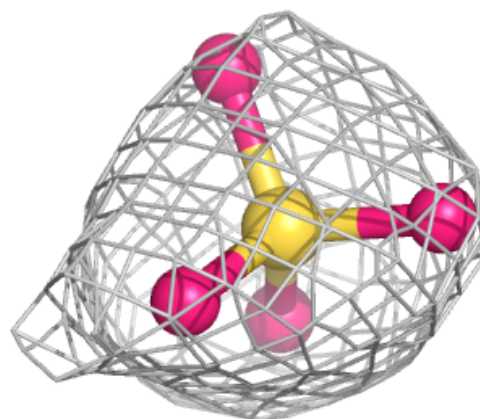
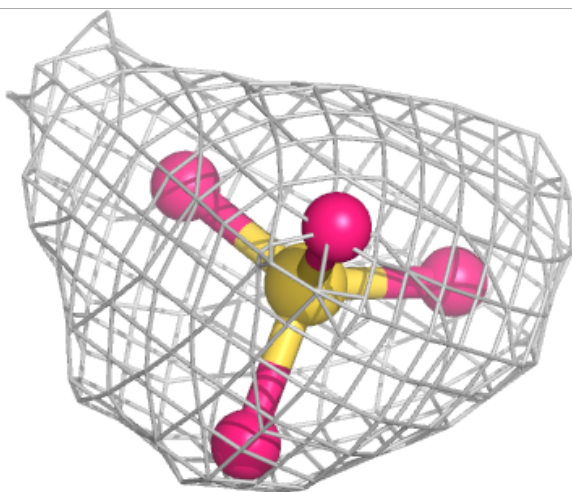
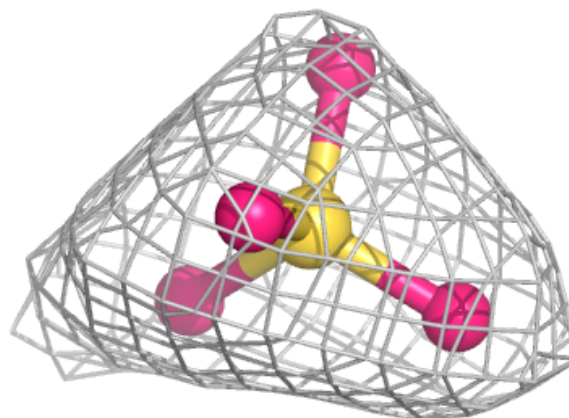
Electron density around SO4 A 1207:

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



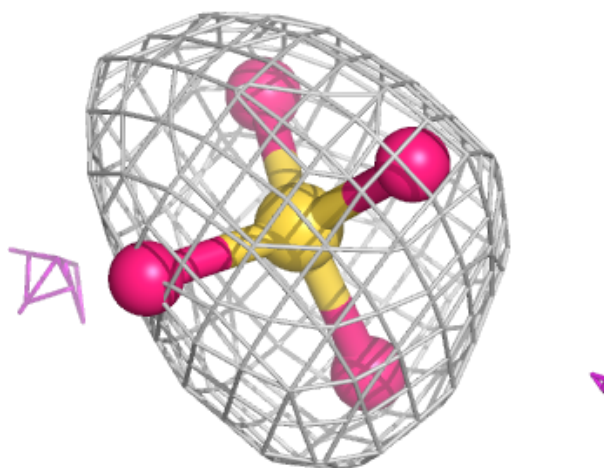
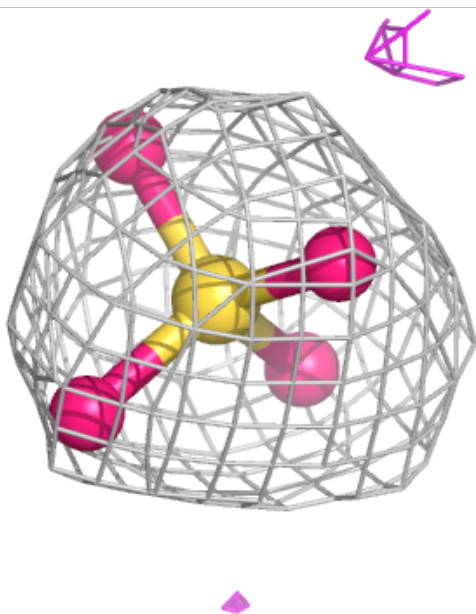
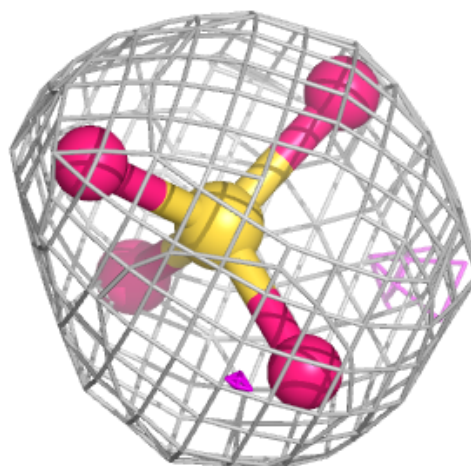
Electron density around SO4 A 1208:

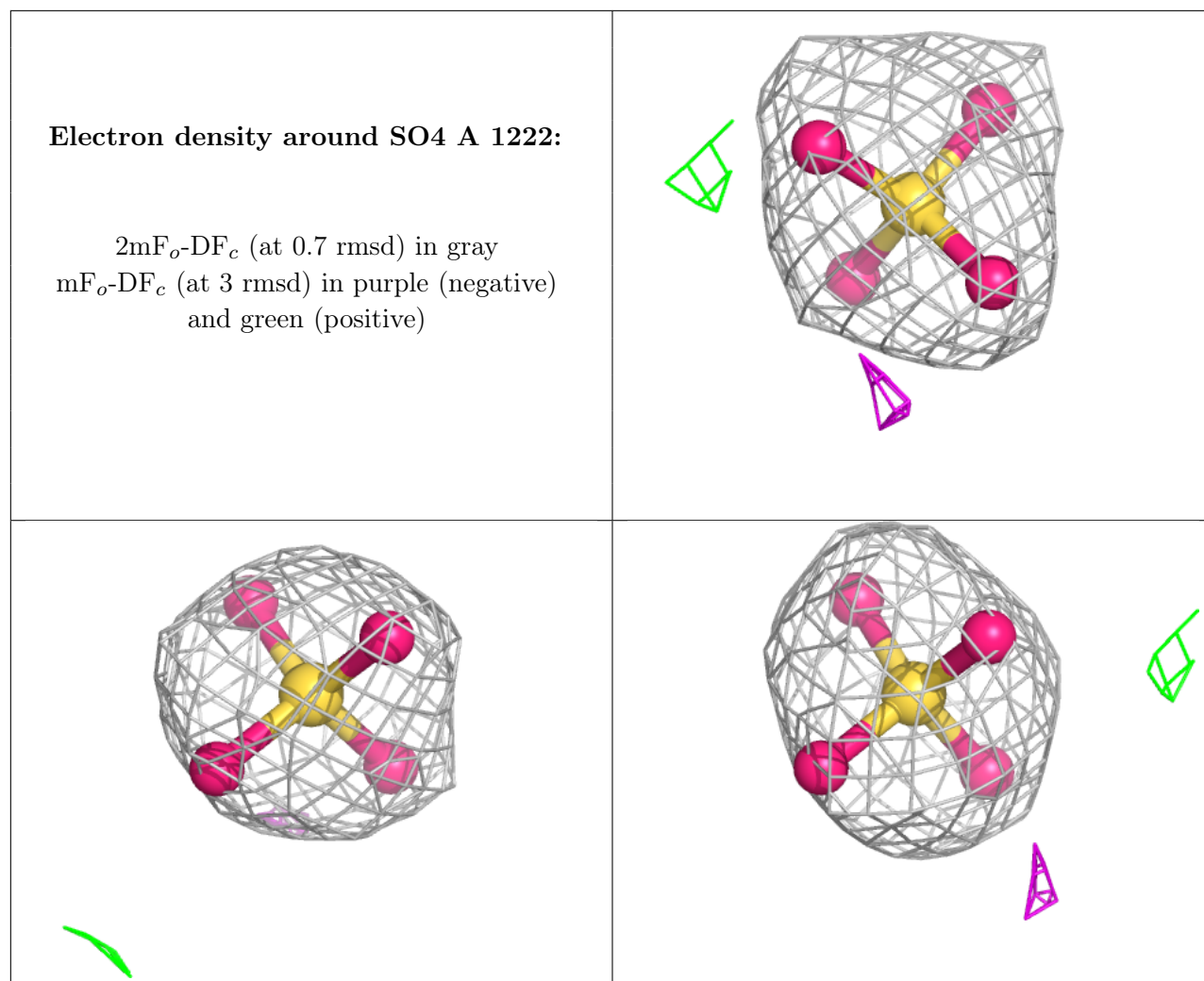
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around SO4 A 1215:

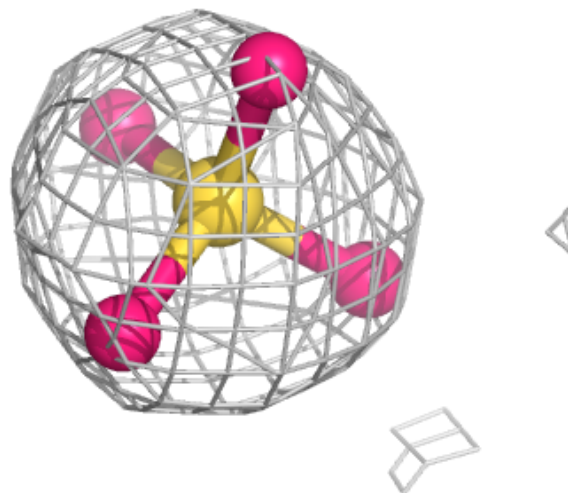
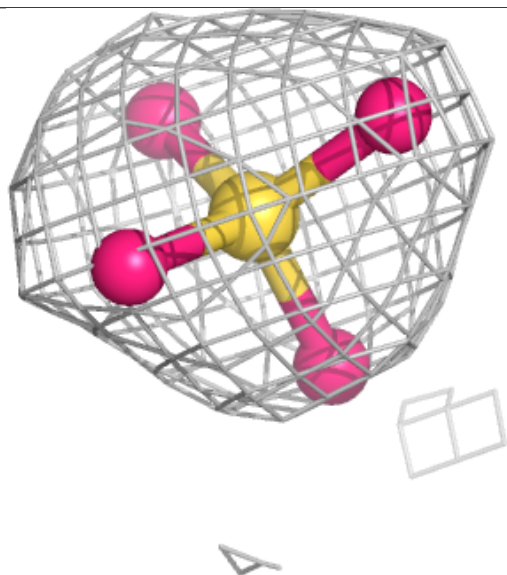
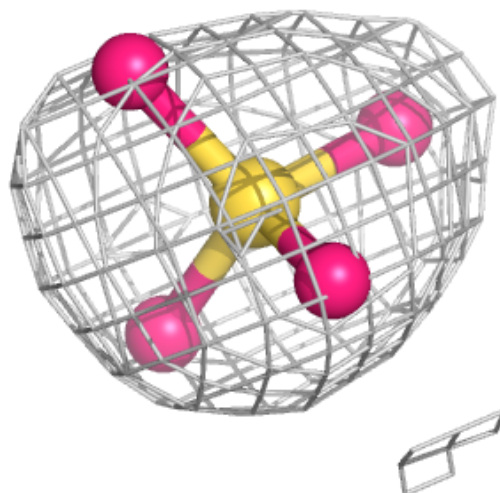
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)





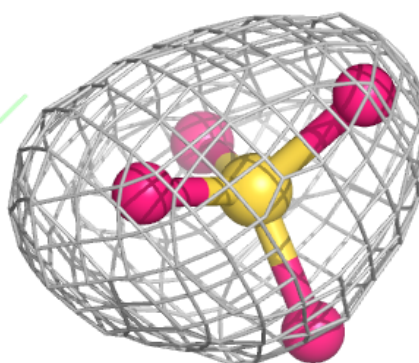
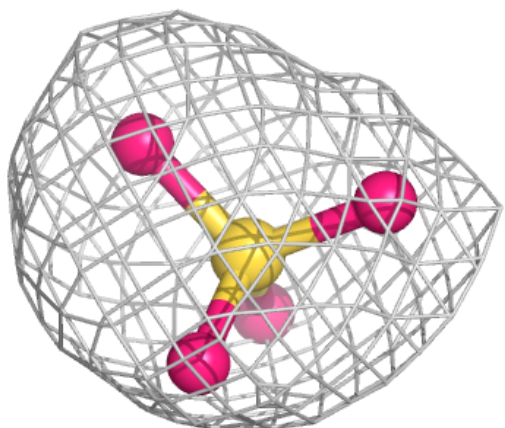
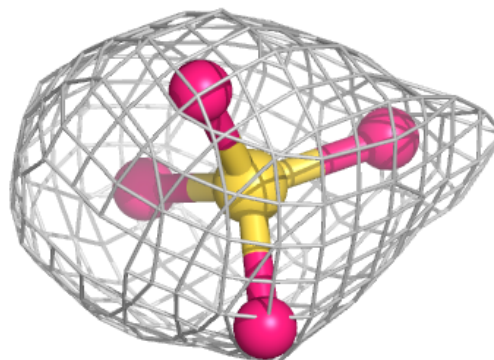
Electron density around SO4 B 1225:

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



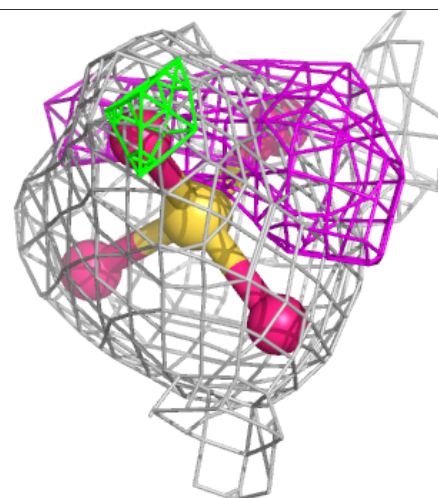
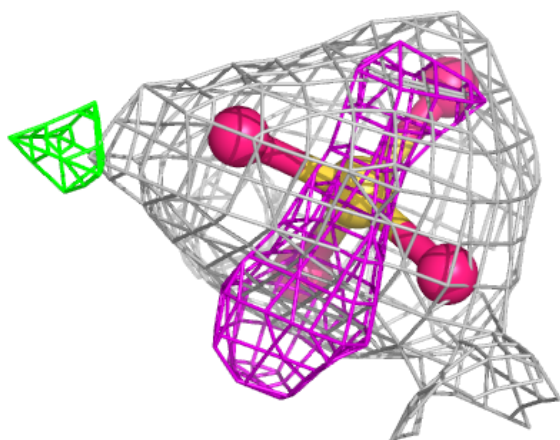
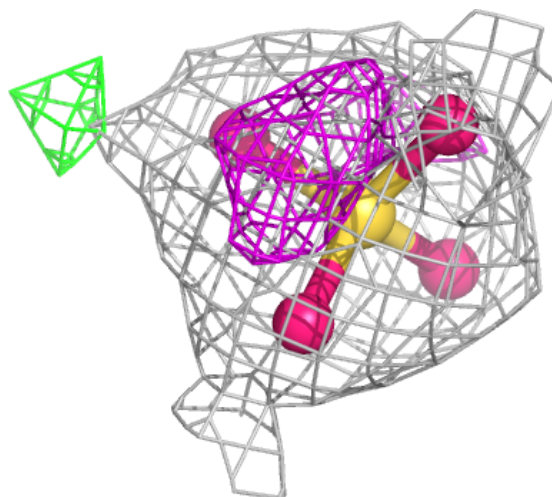
Electron density around SO4 B 1215:

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



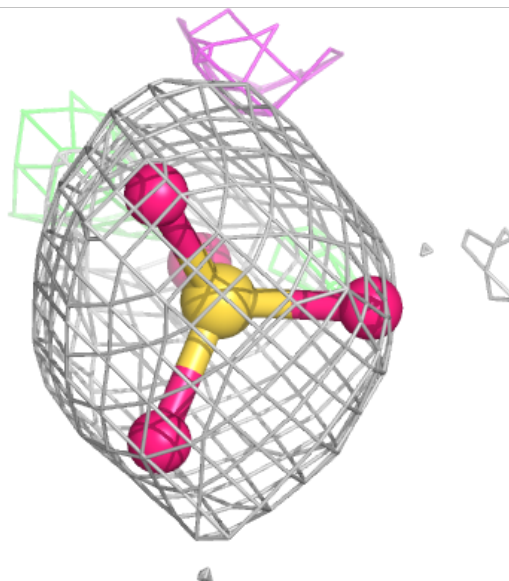
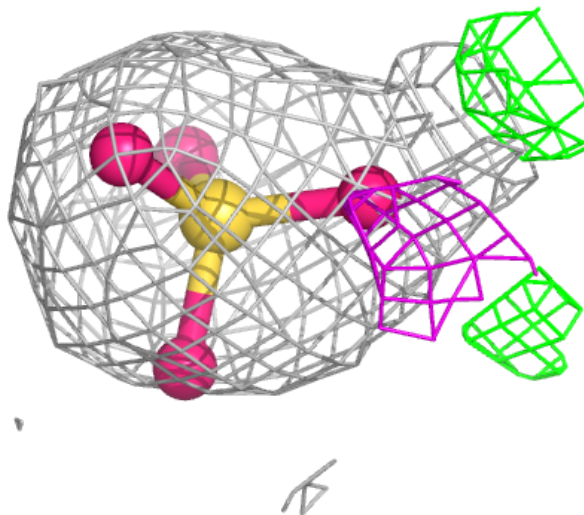
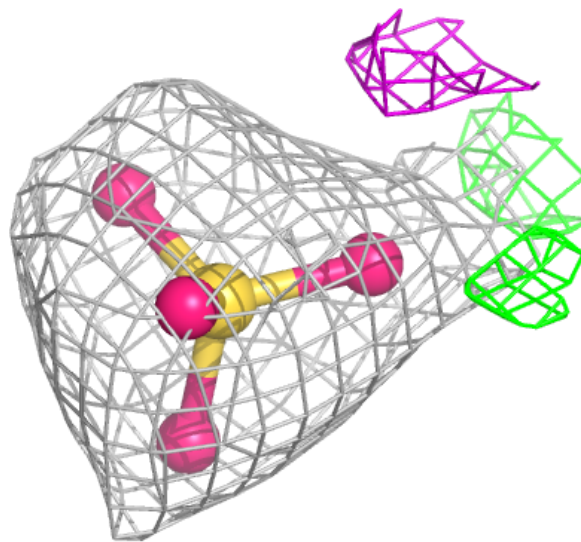
Electron density around SO4 A 1211:

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



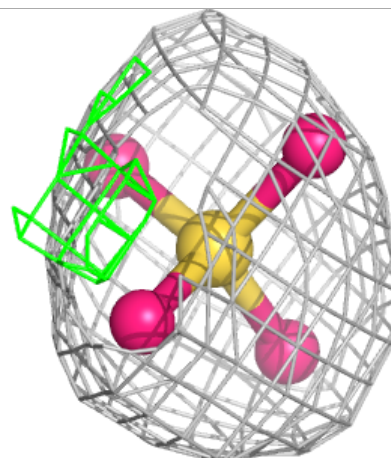
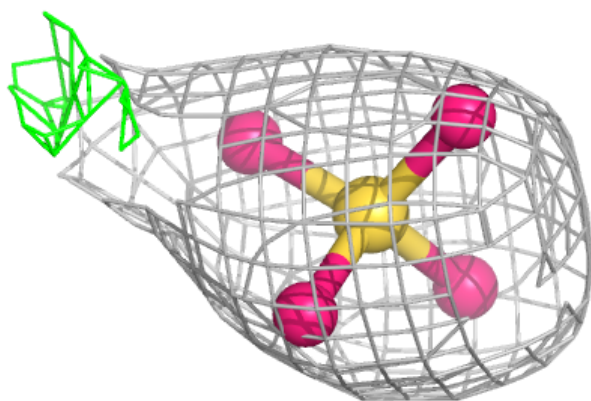
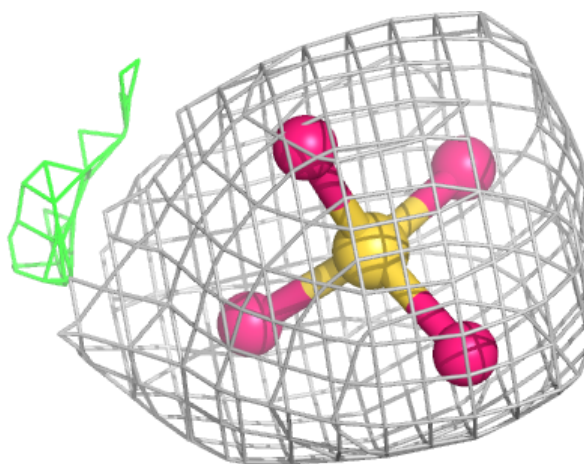
Electron density around SO4 B 1209:

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



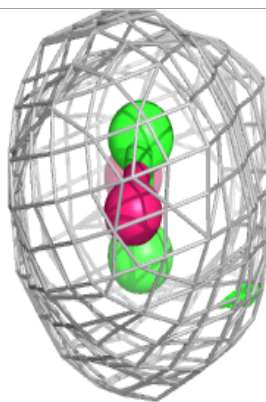
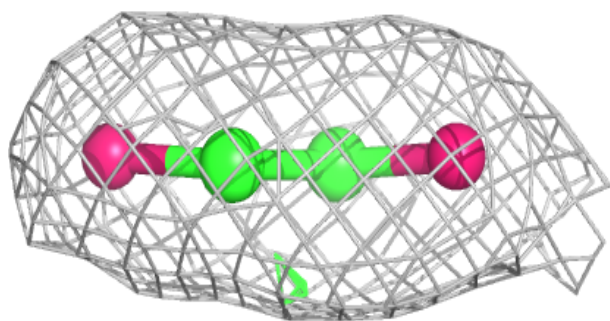
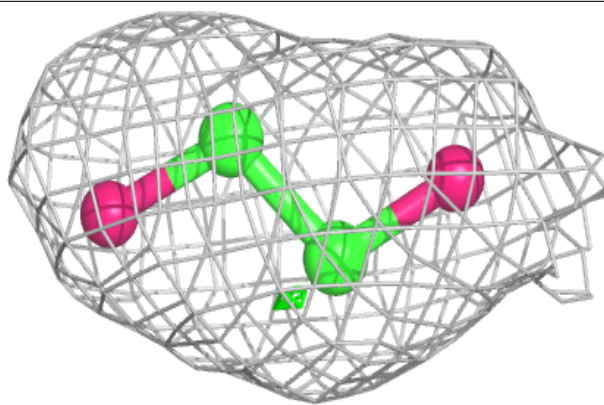
Electron density around SO4 A 1212:

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



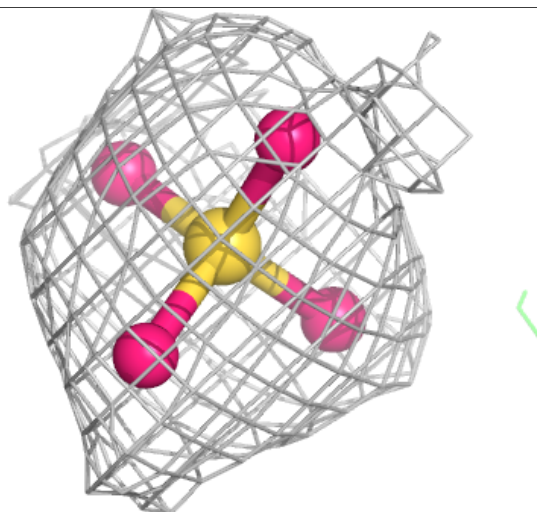
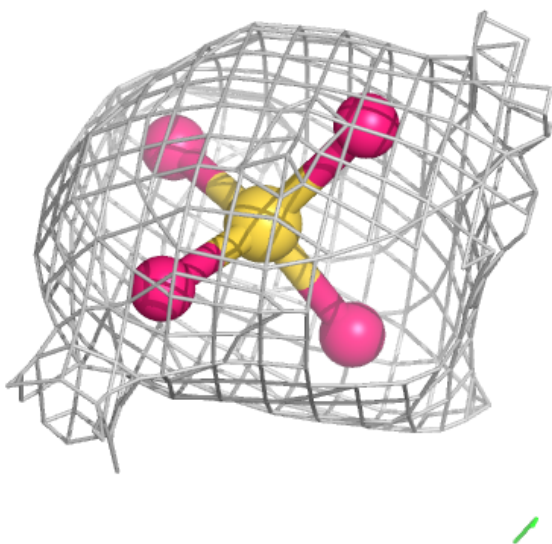
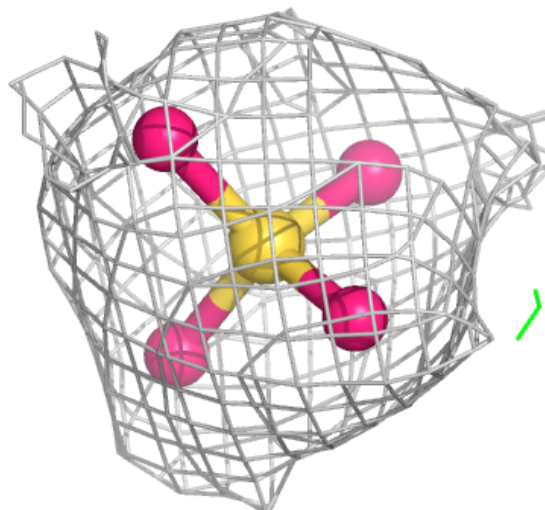
Electron density around EDO B 1202:

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



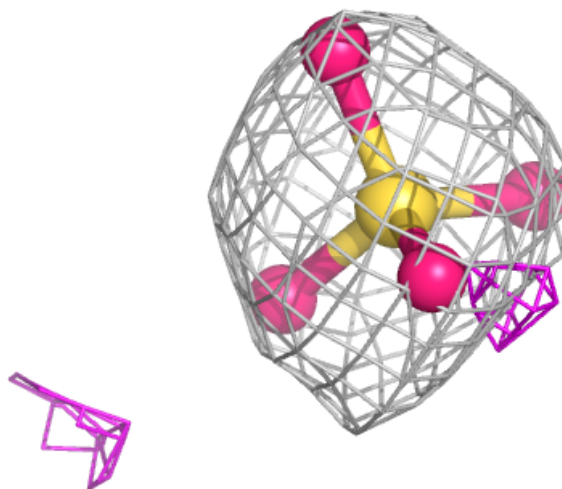
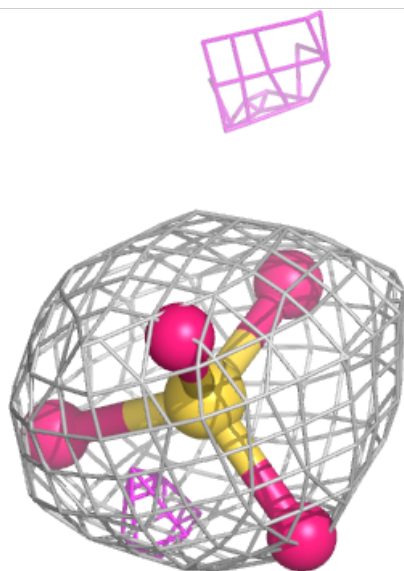
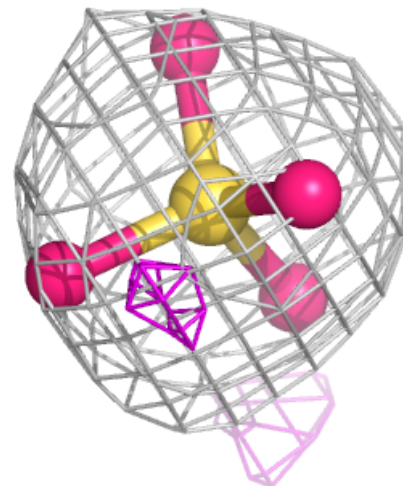
Electron density around SO4 A 1205:

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



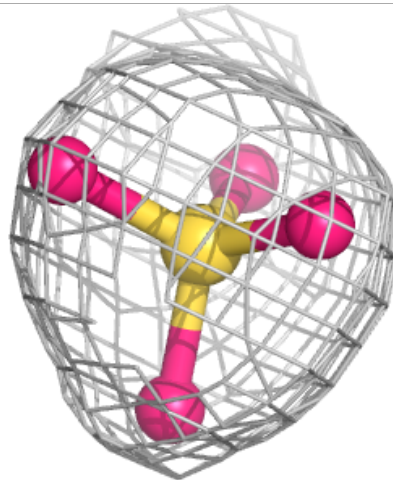
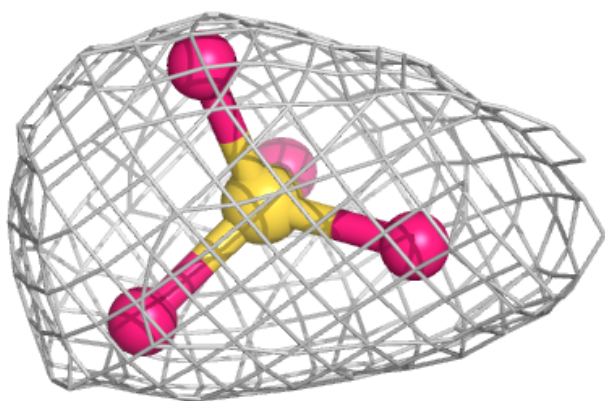
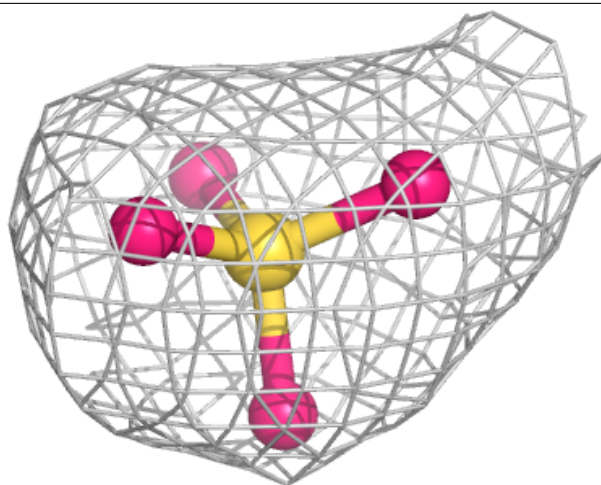
Electron density around SO4 B 1220:

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



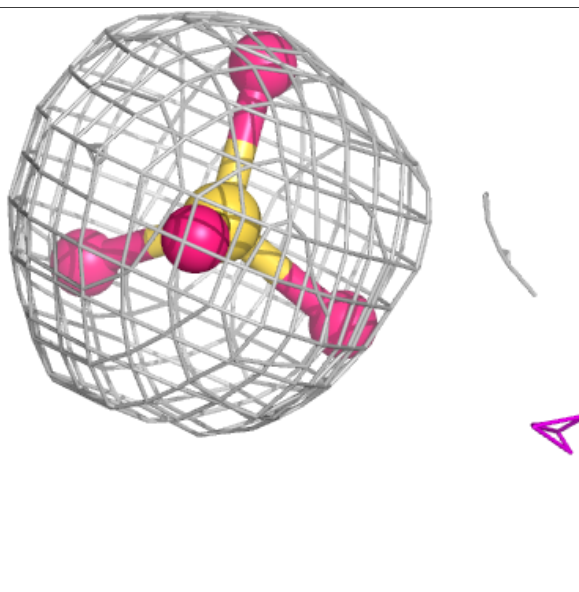
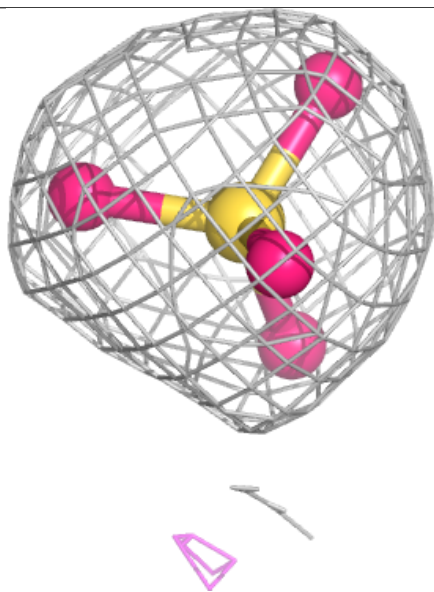
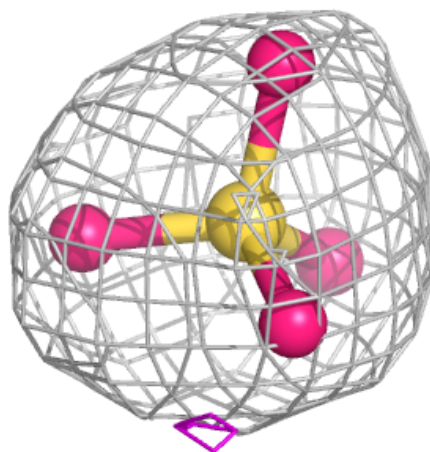
Electron density around SO4 B 1217:

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



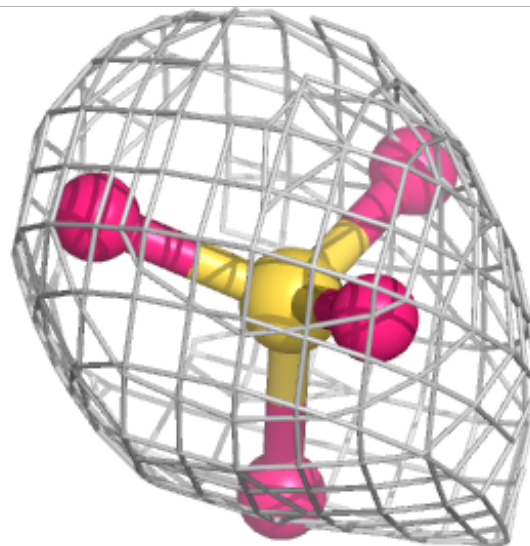
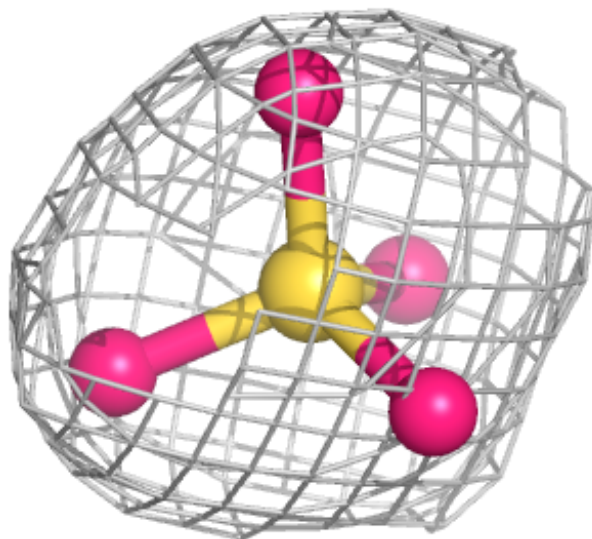
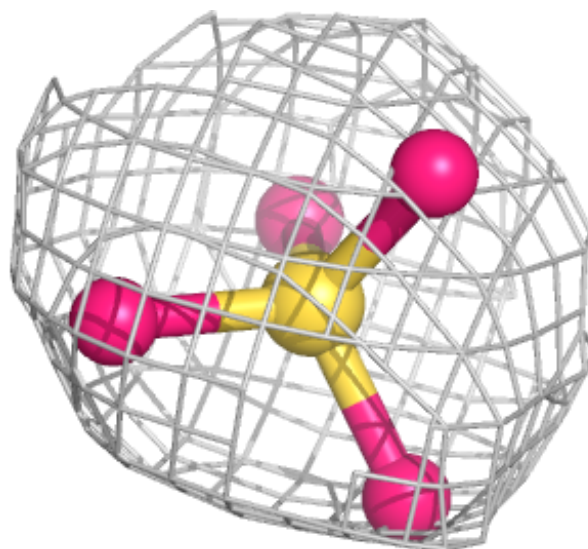
Electron density around SO4 A 1210:

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



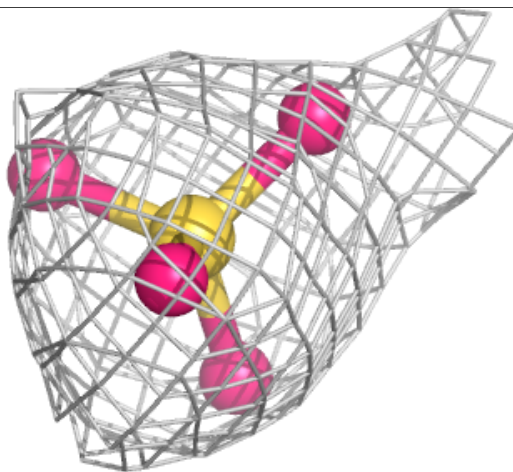
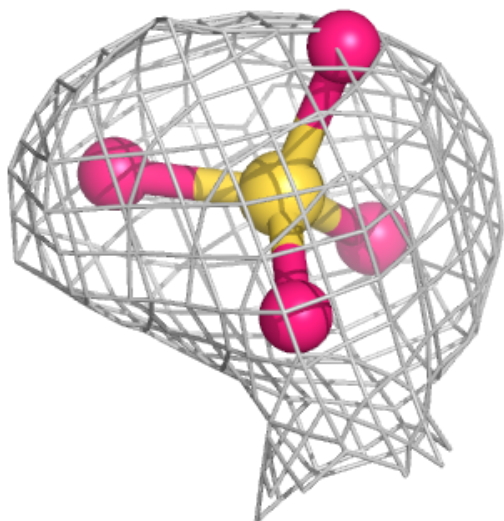
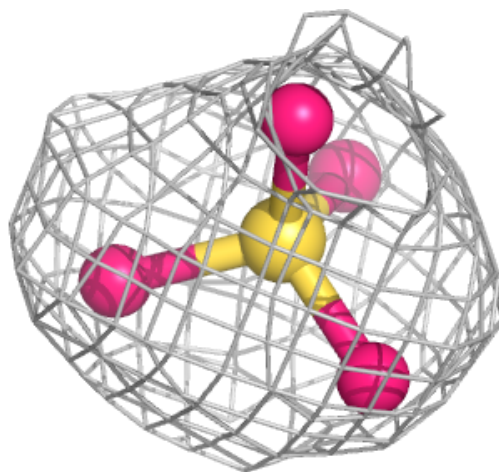
Electron density around SO4 A 1220:

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



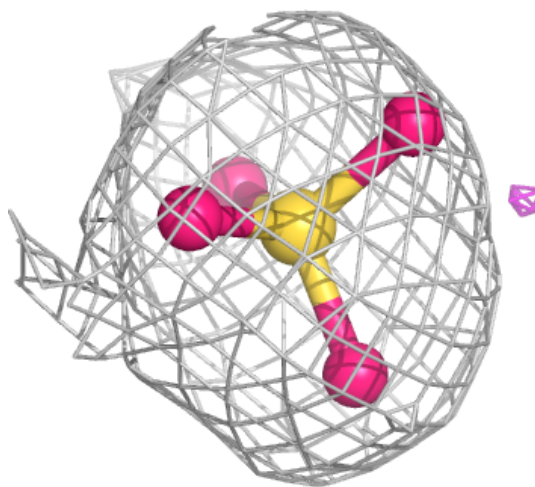
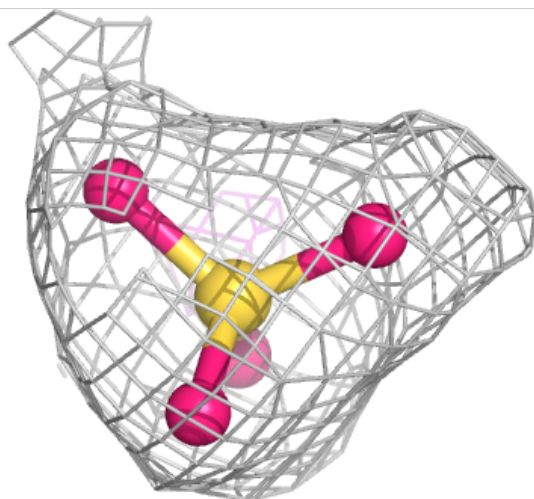
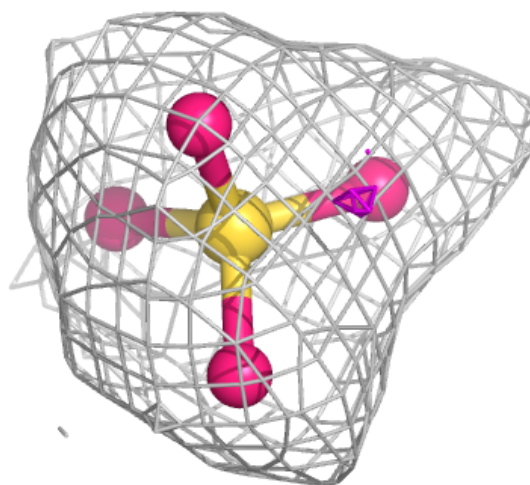
Electron density around SO4 A 1221:

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



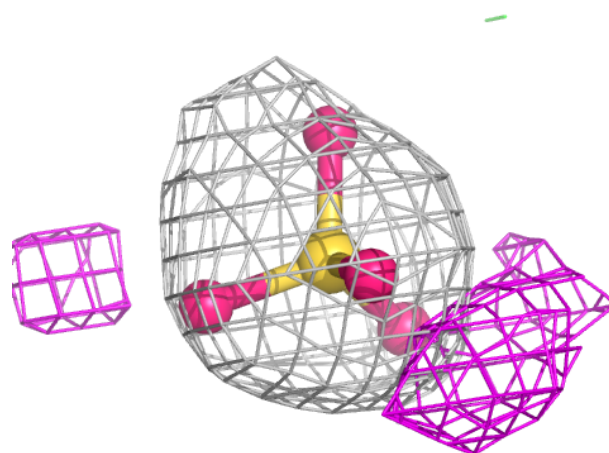
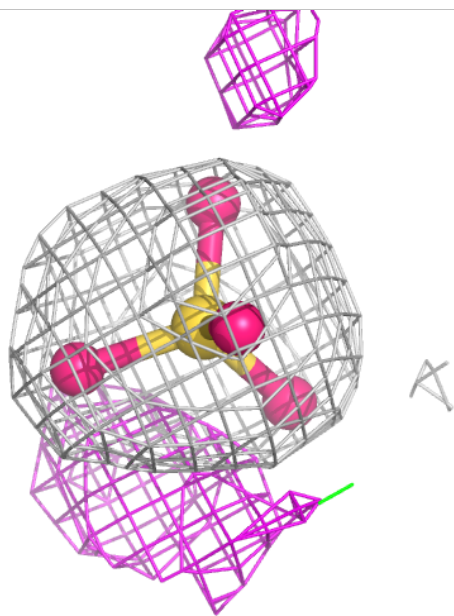
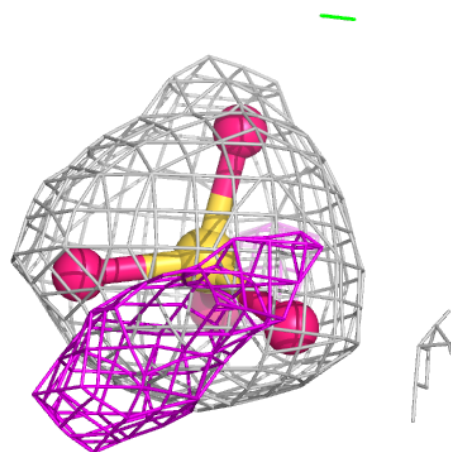
Electron density around SO4 B 1208:

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



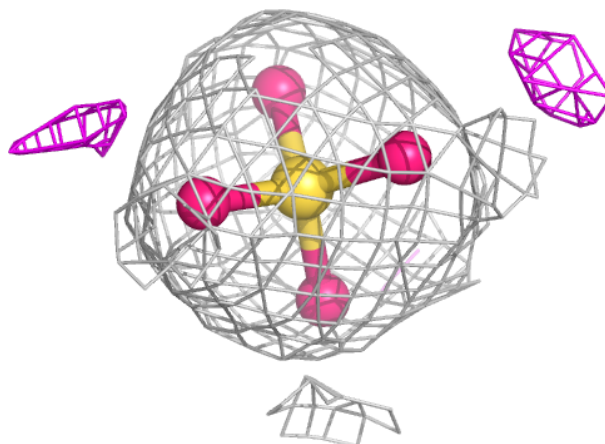
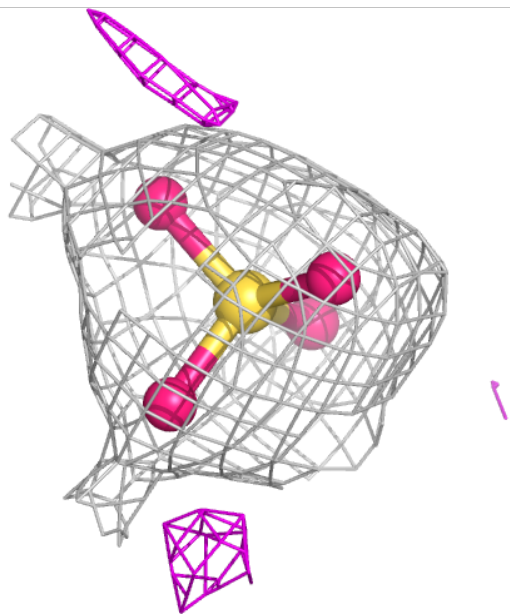
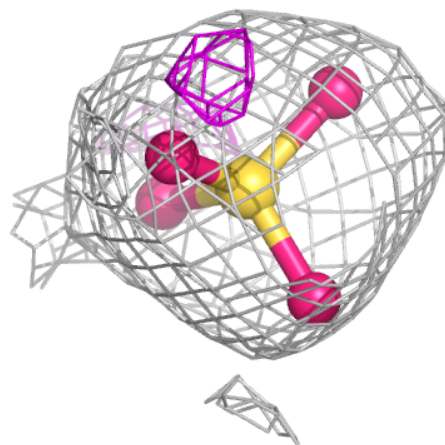
Electron density around SO4 B 1212:

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



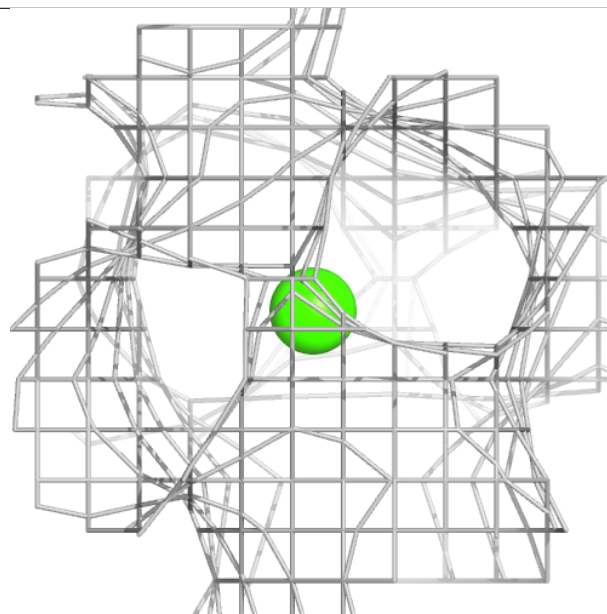
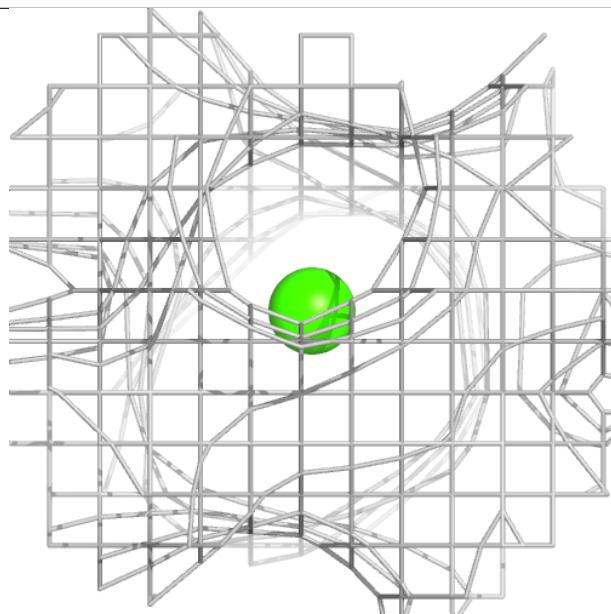
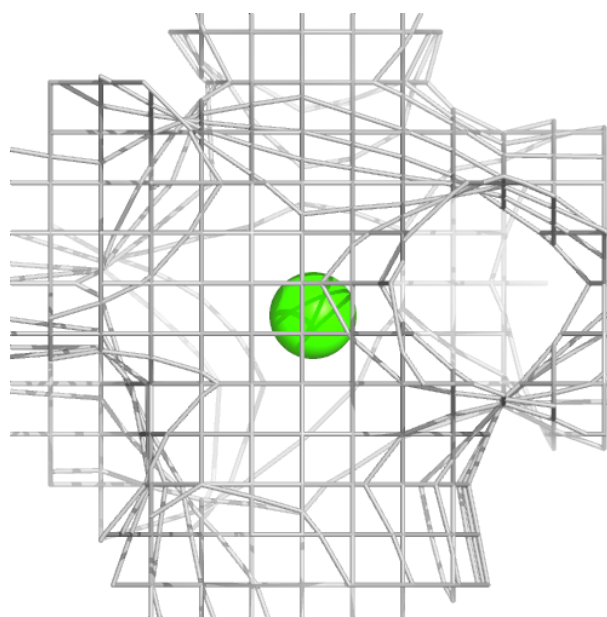
Electron density around SO4 A 1204:

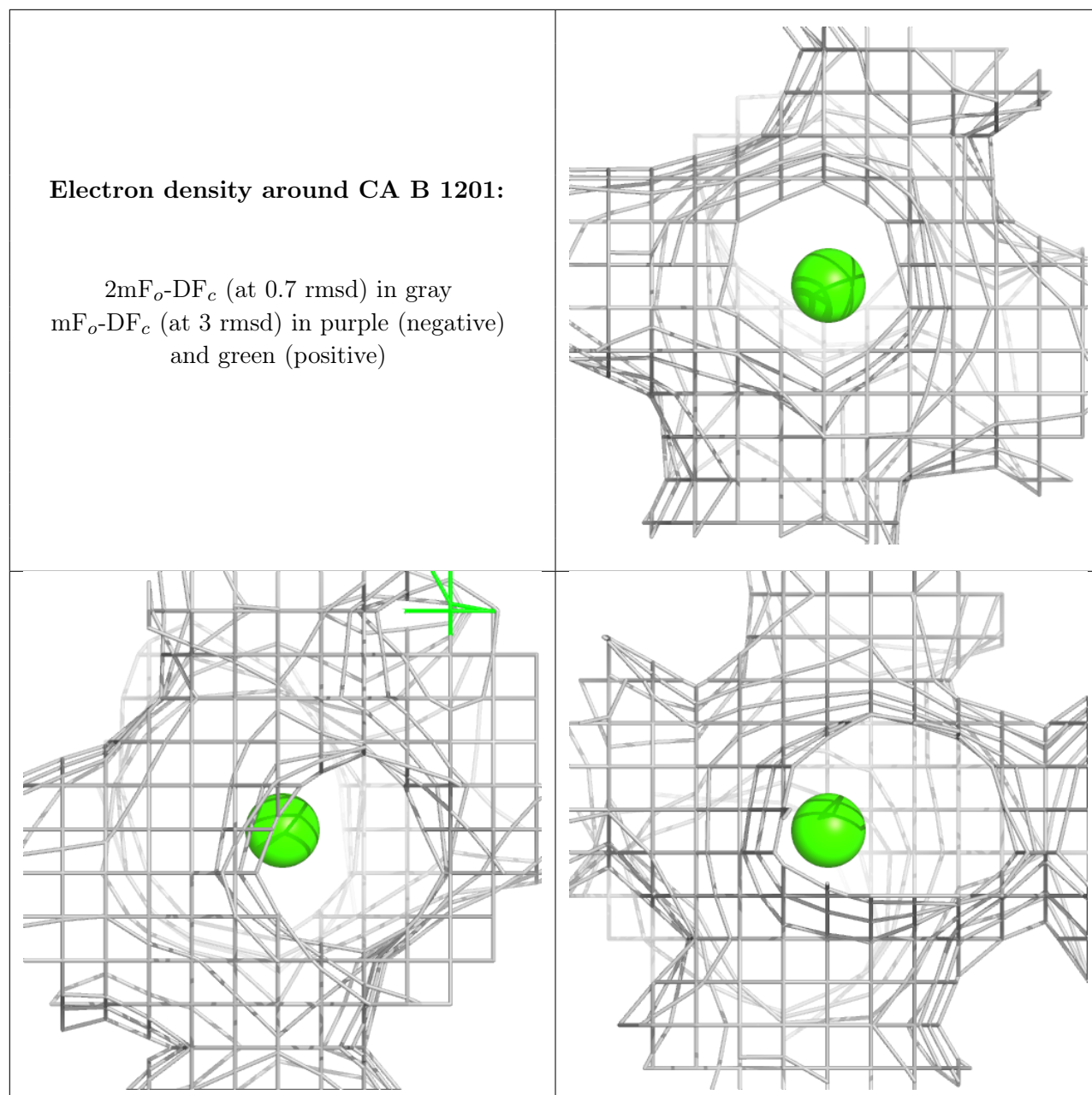
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around CA A 1201:

$2mF_o-DF_c$ (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.