Full wwPDB X-ray Structure Validation Report ⓘ

Oct 5, 2023 – 09:17 AM EDT

PDB ID : 6VVV
Title : Crystal structure of a Mycobacterium smegmatis transcription initiation complex with Rifampicin-resistant RNA polymerase
Authors : Lilic, M.; Darst, S.A.; Campbell, E.A.
Deposited on : 2020-02-18
Resolution : 3.20 Å(reported)

The following versions of software and data (see references ⓘ) were used in the production of this report:

MolProbity	:	FAILED
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	FAILED
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.20 Å.

There are no overall percentile quality scores available for this entry.

MolProbity and EDS failed to run properly - the sequence quality summary graphics cannot be shown.

2 Entry composition (i)

There are 11 unique types of molecules in this entry. The entry contains 22970 atoms, of which 16 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 RNA polymerase-binding protein RbpA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	J	88	678	425	122	129	2	0	0	0

- Molecule 2 is a protein called DNA-directed RNA polymerase subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	A	223	1645	1038	284	320	3	0	0	0
2	B	235	1643	1037	293	312	1	0	0	0
2	T	53	374	236	65	72	1	0	0	0

- Molecule 3 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	790	5774	3620	1008	1121	25	0	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	447	LEU	SER	conflict	UNP P60281

- Molecule 4 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	D	1174	8679	5438	1548	1654	39	0	0	0

- Molecule 5 is a protein called DNA-directed RNA polymerase subunit omega.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf	Trace
5	E	77	Total 586 C 372 N 100 O 114	0	0	0

- Molecule 6 is a protein called RNA polymerase sigma factor SigA.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf	Trace
6	F	302	Total 2349 C 1474 N 423 O 445 S 7	0	0	0

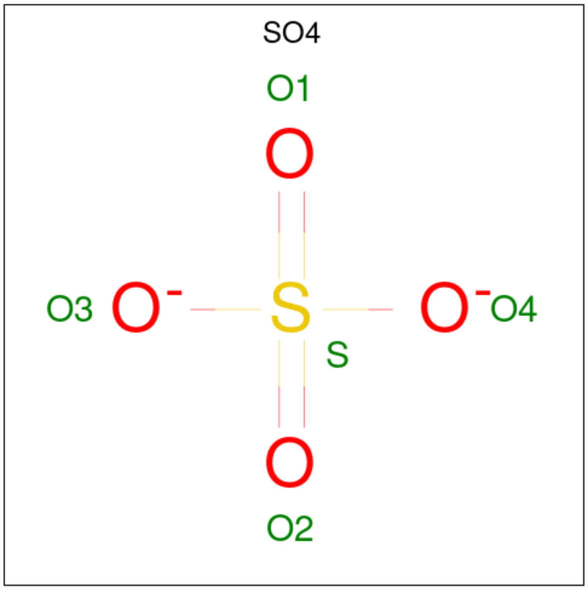
- Molecule 7 is a DNA chain called DNA (31-MER).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf	Trace
7	O	31	Total 635 C 306 N 114 O 185 P 30	0	0	0

- Molecule 8 is a DNA chain called DNA (26-MER).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf	Trace
8	P	26	Total 526 C 254 N 94 O 153 P 25	0	0	0

- Molecule 9 is SULFATE ION (three-letter code: SO4) (formula: O_4S) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	D	1	Total 3 O 3	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	D	1	Total O S 2 1 1	0	0
9	D	1	Total O S 5 4 1	0	0
9	D	1	Total O S 5 4 1	0	0
9	D	1	Total O S 5 4 1	0	0
9	D	1	Total O S 5 4 1	0	0
9	D	1	Total O S 5 4 1	0	0
9	D	1	Total O S 5 4 1	0	0
9	F	1	Total O S 5 4 1	0	0
9	F	1	Total O S 5 4 1	0	0
9	F	1	Total O S 5 4 1	0	0
9	F	1	Total O S 5 4 1	0	0

- Molecule 10 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	D	2	Total Zn 2 2	0	0

- Molecule 11 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
11	C	1	Total H O 3 2 1	0	0
11	D	3	Total H O 9 6 3	0	0
11	F	3	Total H O 9 6 3	0	0
11	P	1	Total H O 3 2 1	0	0

MolProbity and EDS failed to run properly - this section is therefore empty.

3 Data and refinement statistics ⓘ

EDS failed to run properly - this section is therefore incomplete.

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	129.75Å 162.34Å 137.16Å 90.00° 111.27° 90.00°	Depositor
Resolution (Å)	49.83 – 3.20	Depositor
% Data completeness (in resolution range)	95.5 (49.83-3.20)	Depositor
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.03 (at 3.19Å)	Xtriage
Refinement program	PHENIX v0	Depositor
R, R_{free}	0.234 , 0.262	Depositor
Wilson B-factor (Å^2)	119.1	Xtriage
Anisotropy	0.081	Xtriage
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	22970	wwPDB-VP
Average B, all atoms (Å^2)	117.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.80% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

4 Model quality

4.1 Standard geometry

MolProbity failed to run properly - this section is therefore empty.

4.2 Too-close contacts

MolProbity failed to run properly - this section is therefore empty.

4.3 Torsion angles

4.3.1 Protein backbone

MolProbity failed to run properly - this section is therefore empty.

4.3.2 Protein sidechains

MolProbity failed to run properly - this section is therefore empty.

4.3.3 RNA

MolProbity failed to run properly - this section is therefore empty.

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

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

4.5 Carbohydrates

There are no monosaccharides in this entry.

4.6 Ligand geometry

Of 14 ligands modelled in this entry, 2 are monoatomic - leaving 12 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	$\#\|Z\| > 2$
9	SO4	D	1408	-	4,4,4	0.14	0	6,6,6	0.07	0
9	SO4	D	1403	-	4,4,4	0.15	0	6,6,6	0.07	0
9	SO4	F	1202	-	4,4,4	0.14	0	6,6,6	0.04	0
9	SO4	D	1405	-	4,4,4	0.14	0	6,6,6	0.06	0
9	SO4	D	1407	-	4,4,4	0.15	0	6,6,6	0.05	0
9	SO4	D	1406	-	4,4,4	0.14	0	6,6,6	0.04	0
9	SO4	F	1204	-	4,4,4	0.13	0	6,6,6	0.09	0
9	SO4	D	1402	-	0,1,4	-	-	-		
9	SO4	F	1203	-	4,4,4	0.14	0	6,6,6	0.05	0
9	SO4	F	1201	-	4,4,4	0.15	0	6,6,6	0.06	0
9	SO4	D	1404	-	4,4,4	0.14	0	6,6,6	0.04	0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

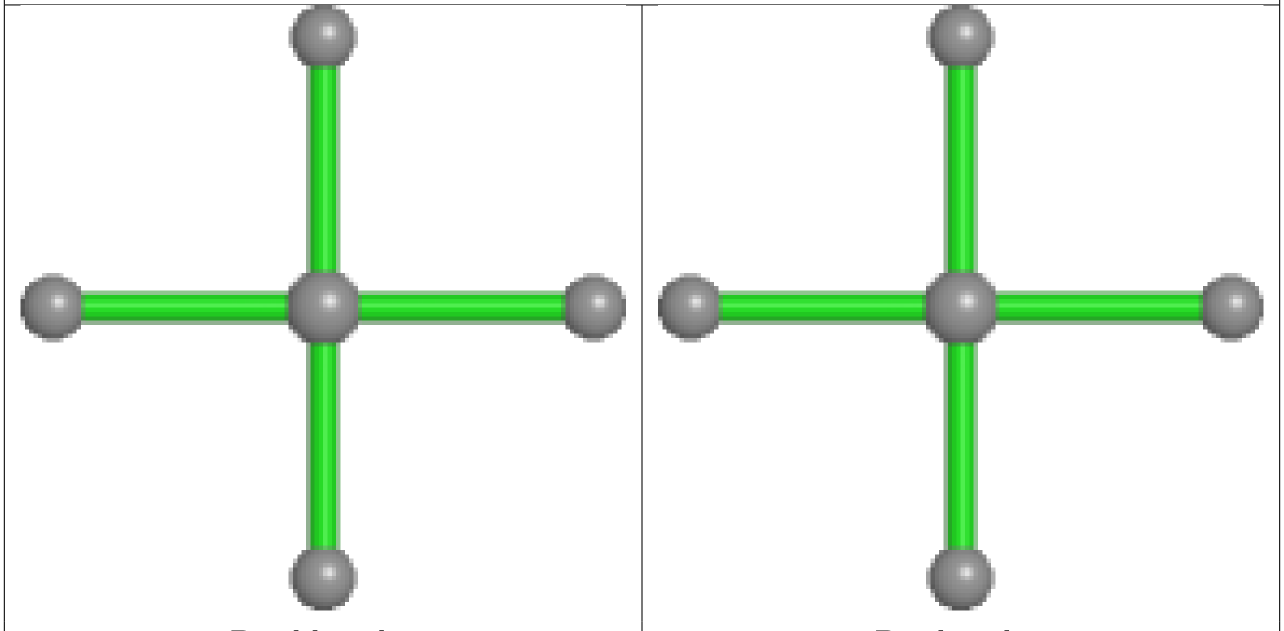
There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
9	F	1201	SO4	0	1

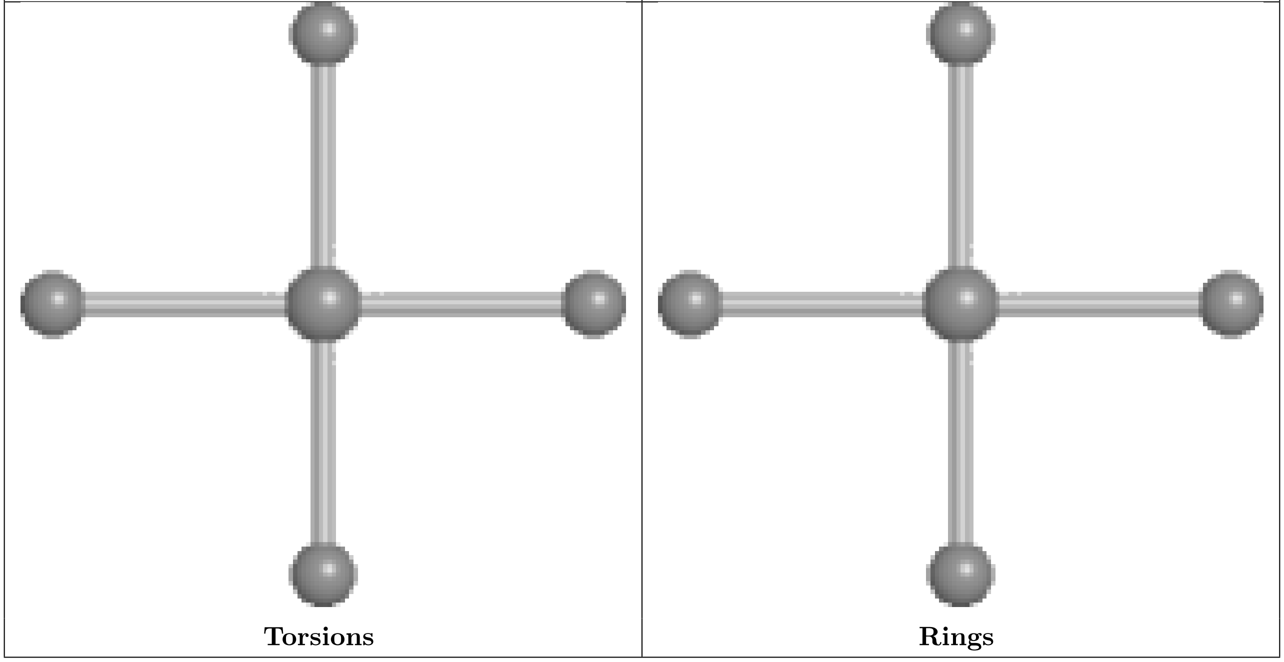
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

Ligand SO4 D 1408



Bond lengths

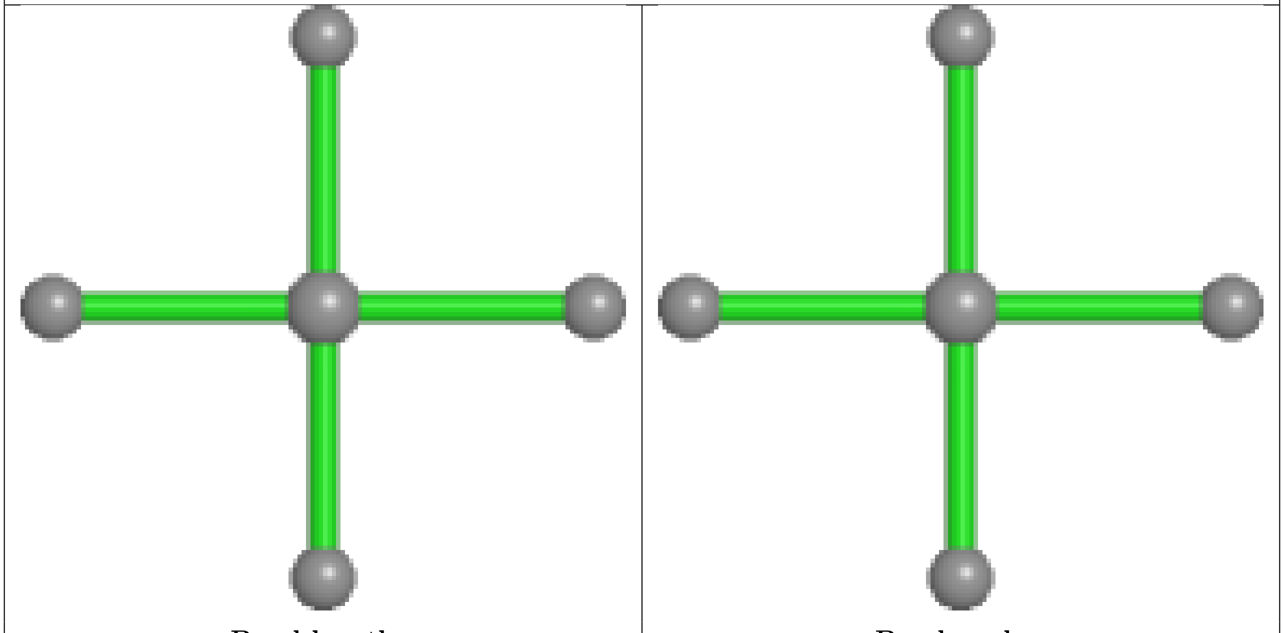
Bond angles



Torsions

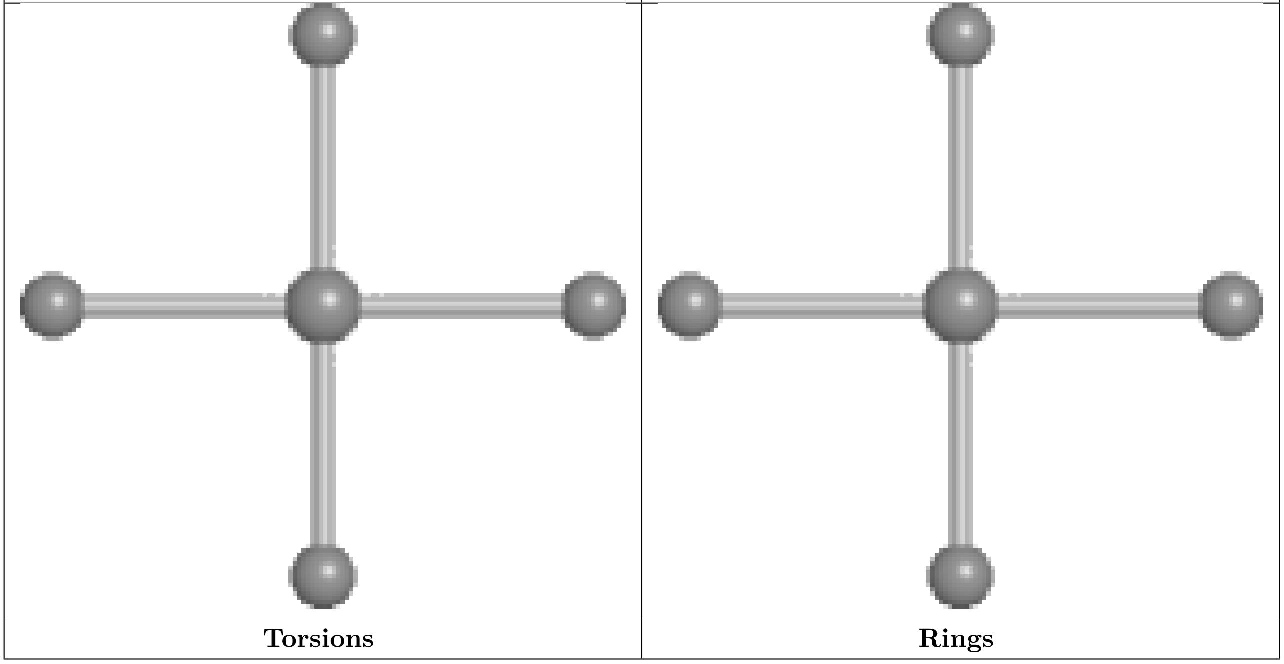
Rings

Ligand SO4 D 1403



Bond lengths

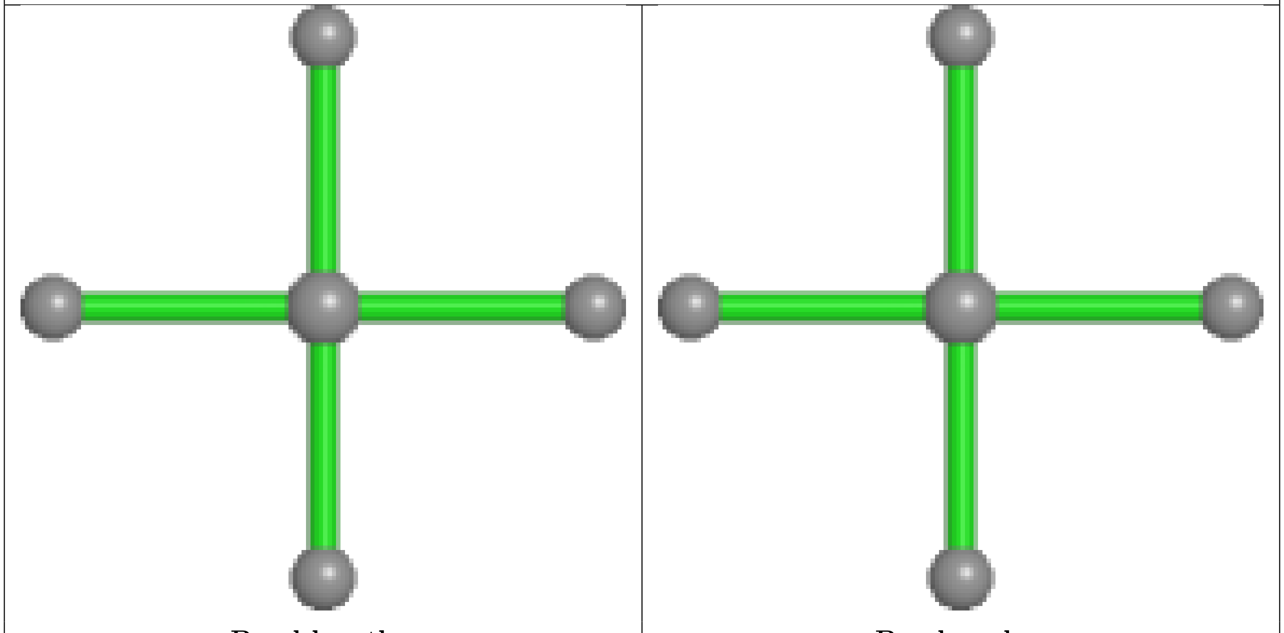
Bond angles



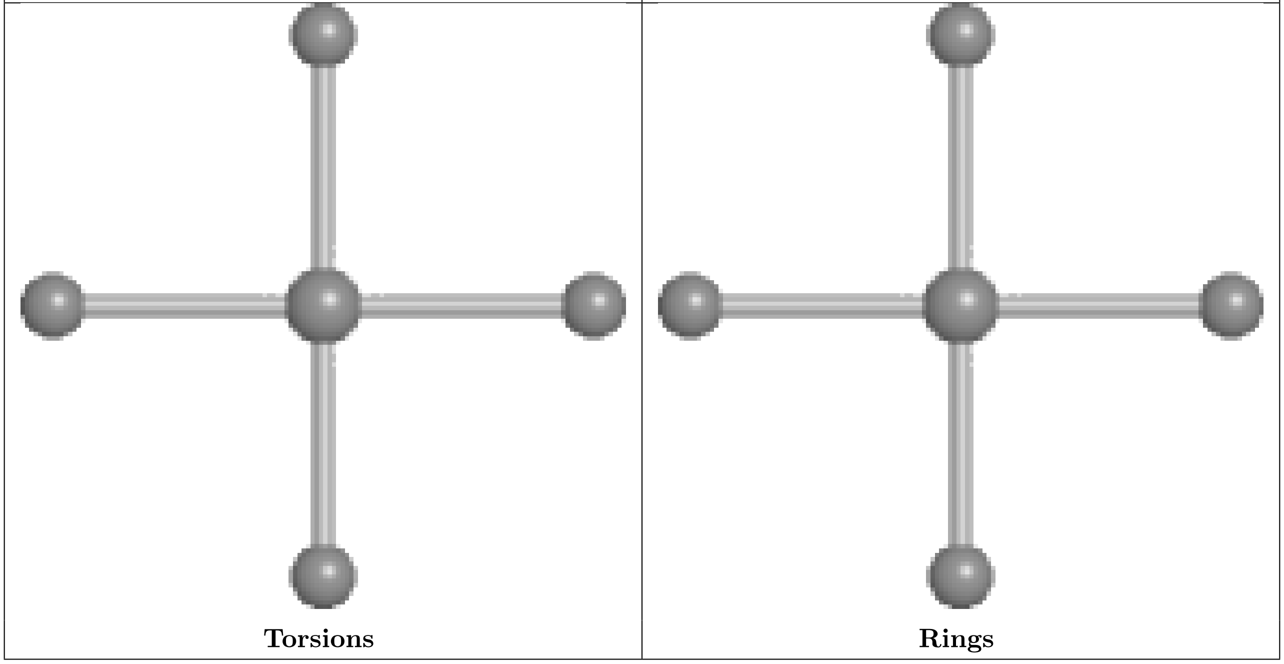
Torsions

Rings

Ligand SO4 F 1202

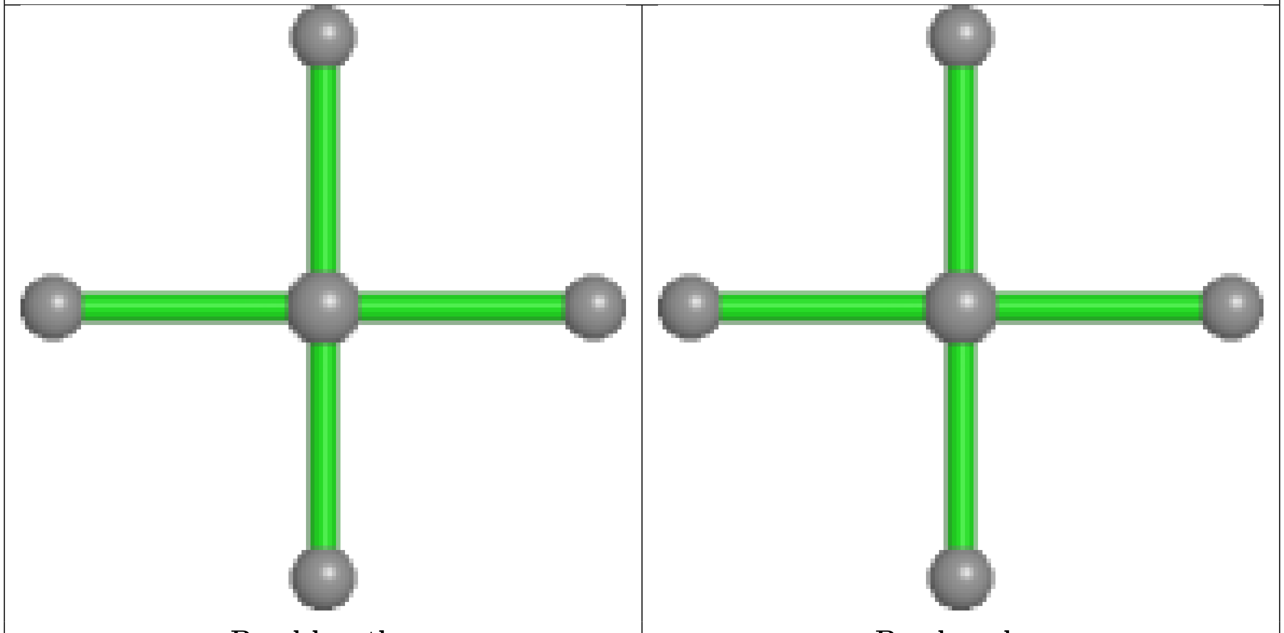


Bond lengths **Bond angles**



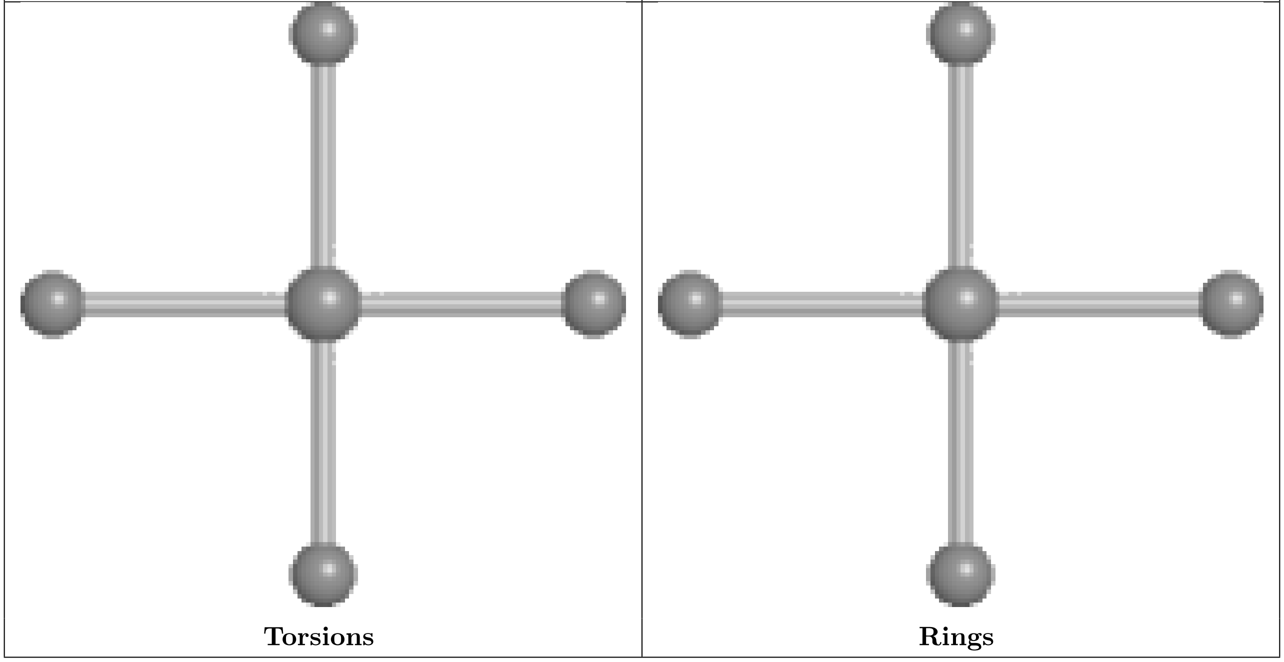
Torsions **Rings**

Ligand SO4 D 1405



Bond lengths

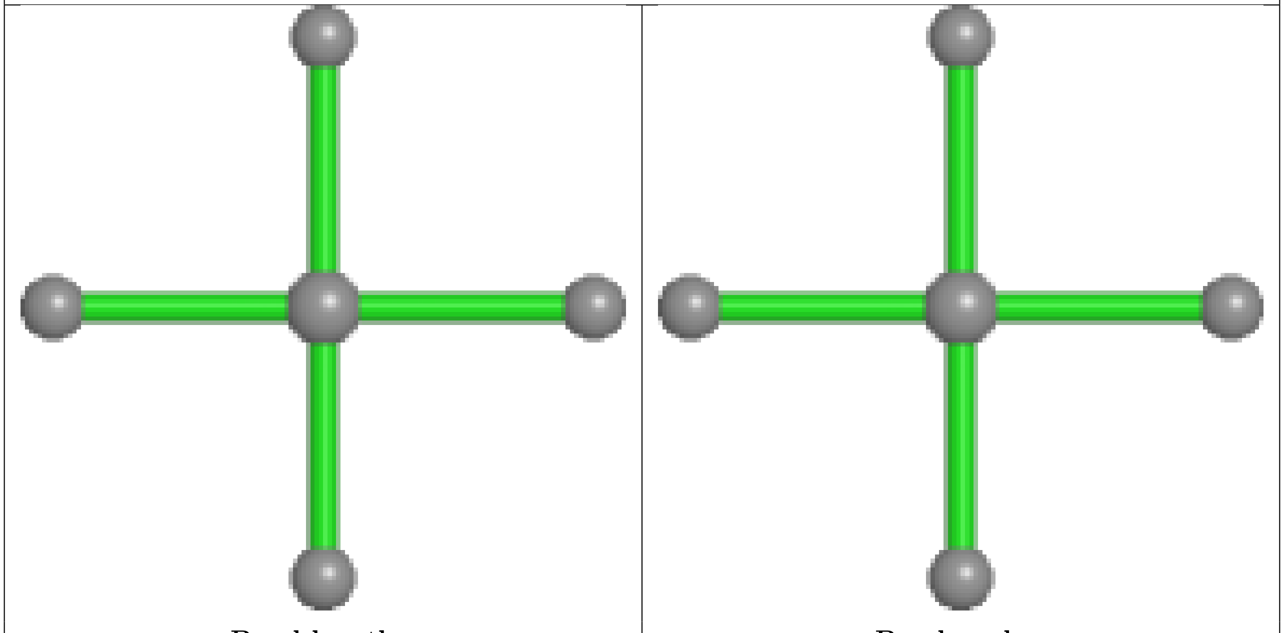
Bond angles



Torsions

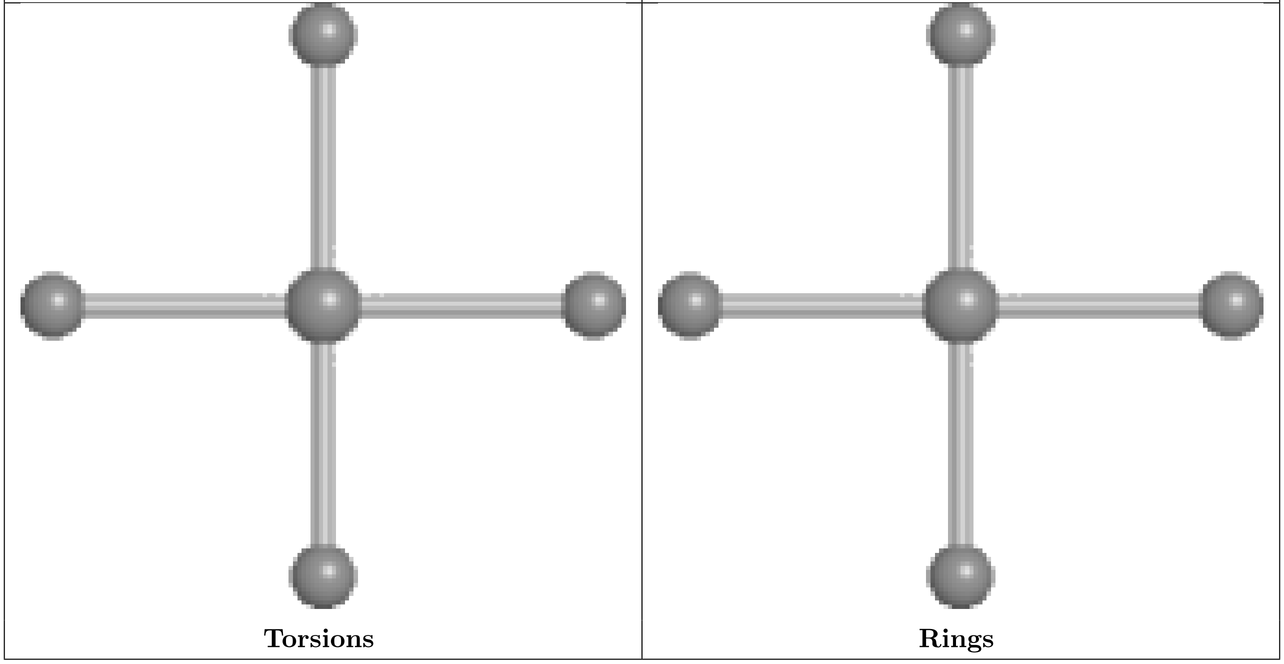
Rings

Ligand SO4 D 1407



Bond lengths

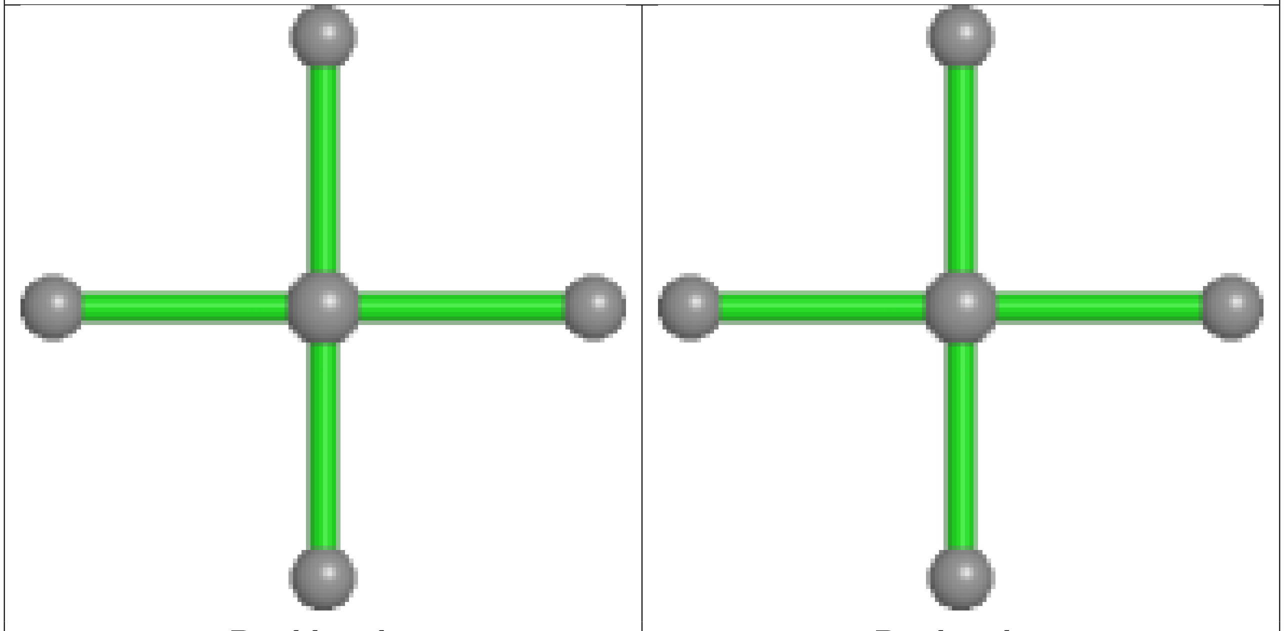
Bond angles



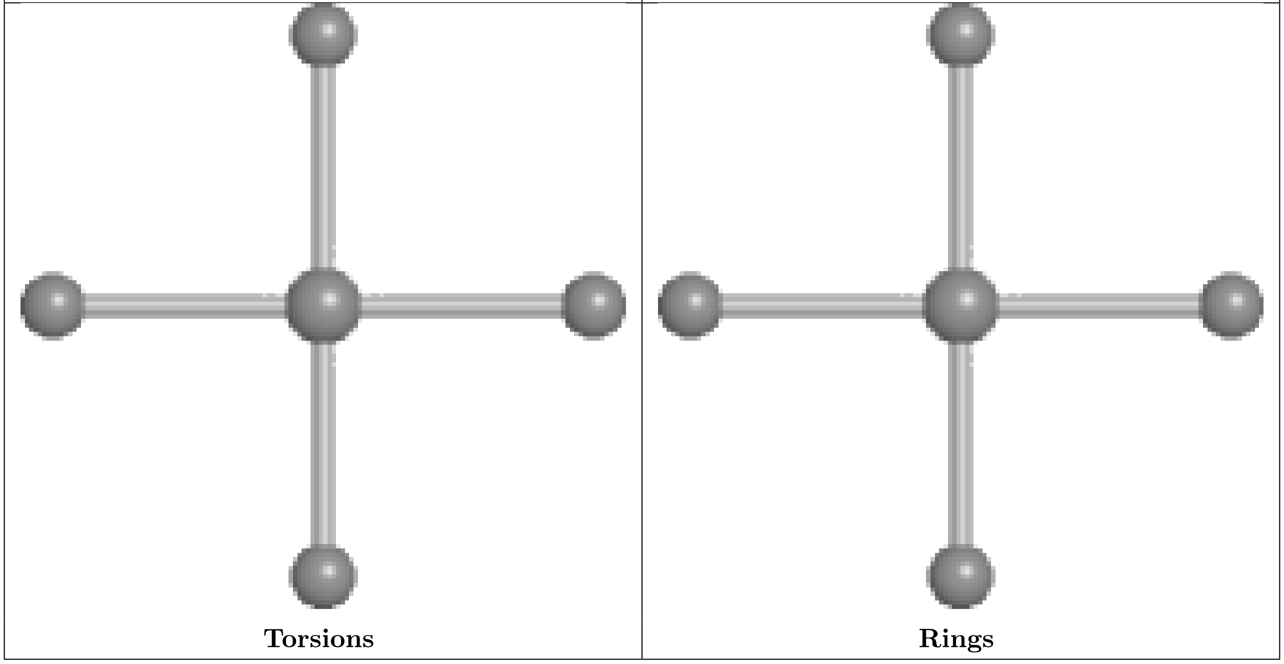
Torsions

Rings

Ligand SO4 D 1406

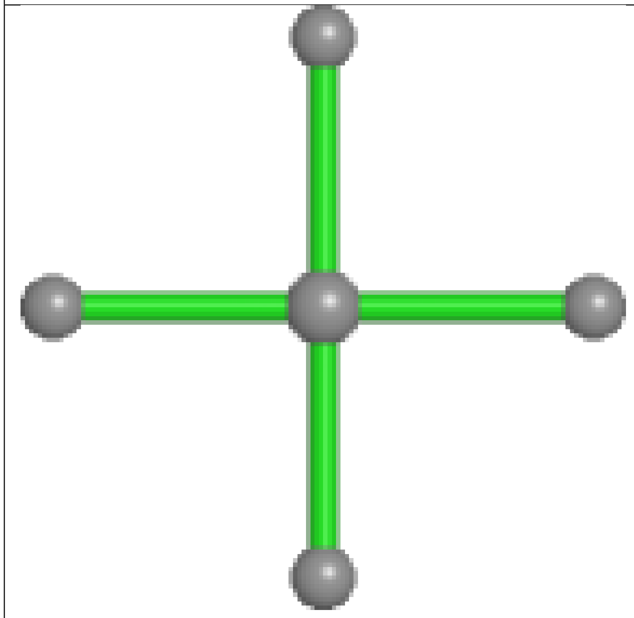


Bond lengths **Bond angles**

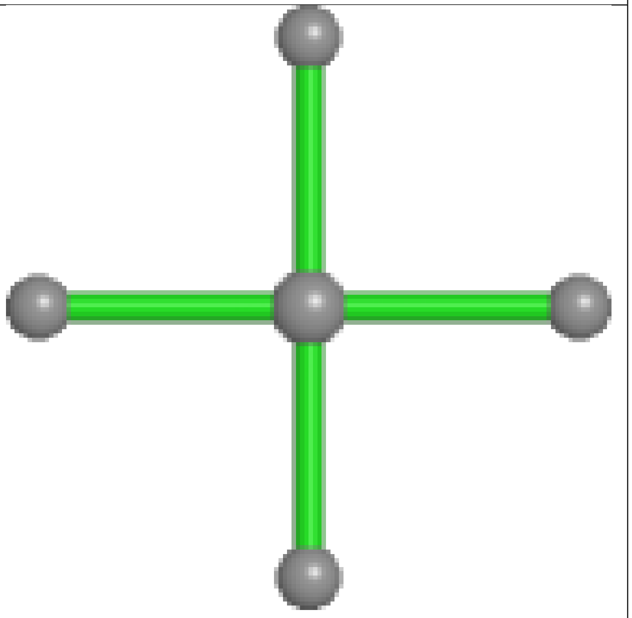


Torsions **Rings**

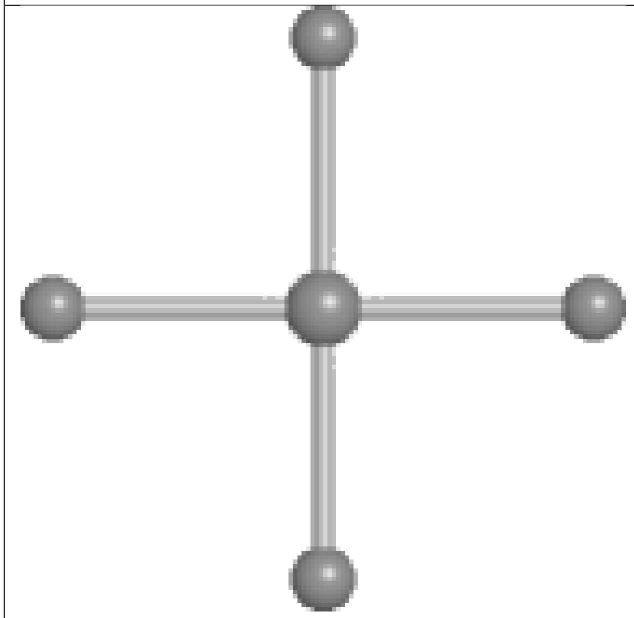
Ligand SO4 F 1204



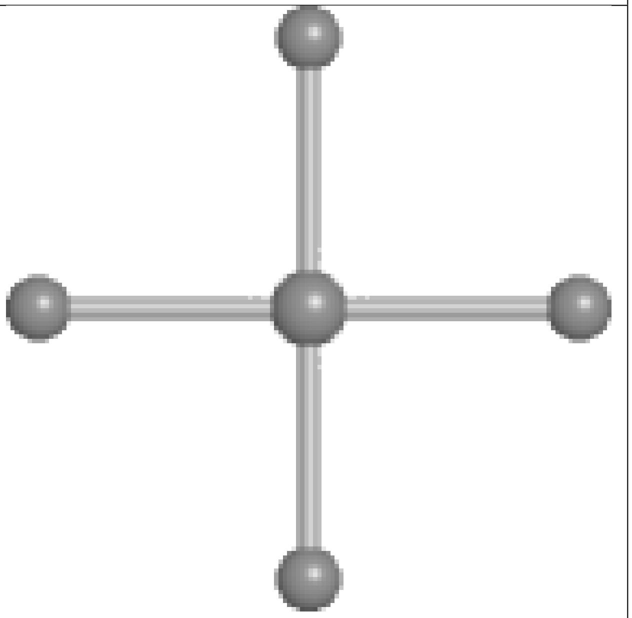
Bond lengths



Bond angles

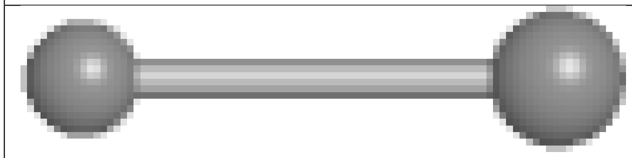


Torsions

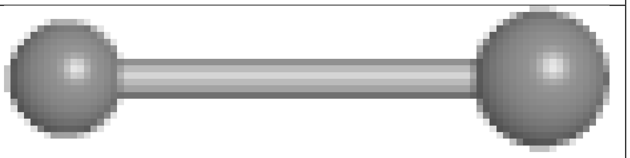


Rings

Ligand SO4 D 1402



Bond lengths

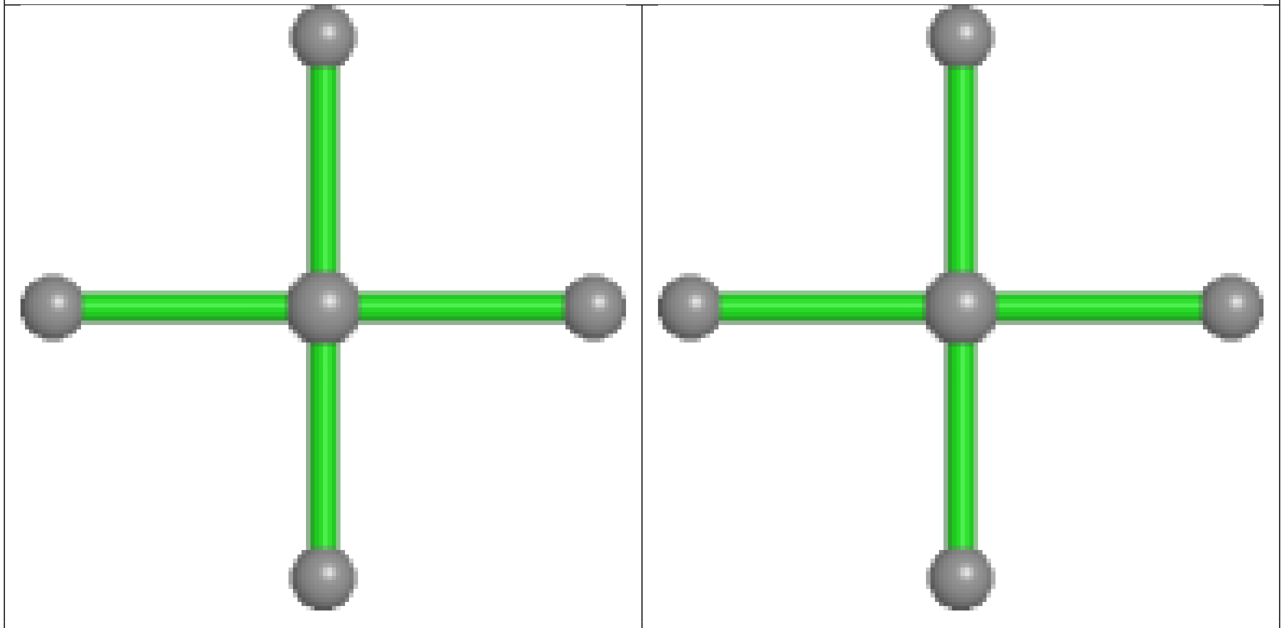


Bond angles

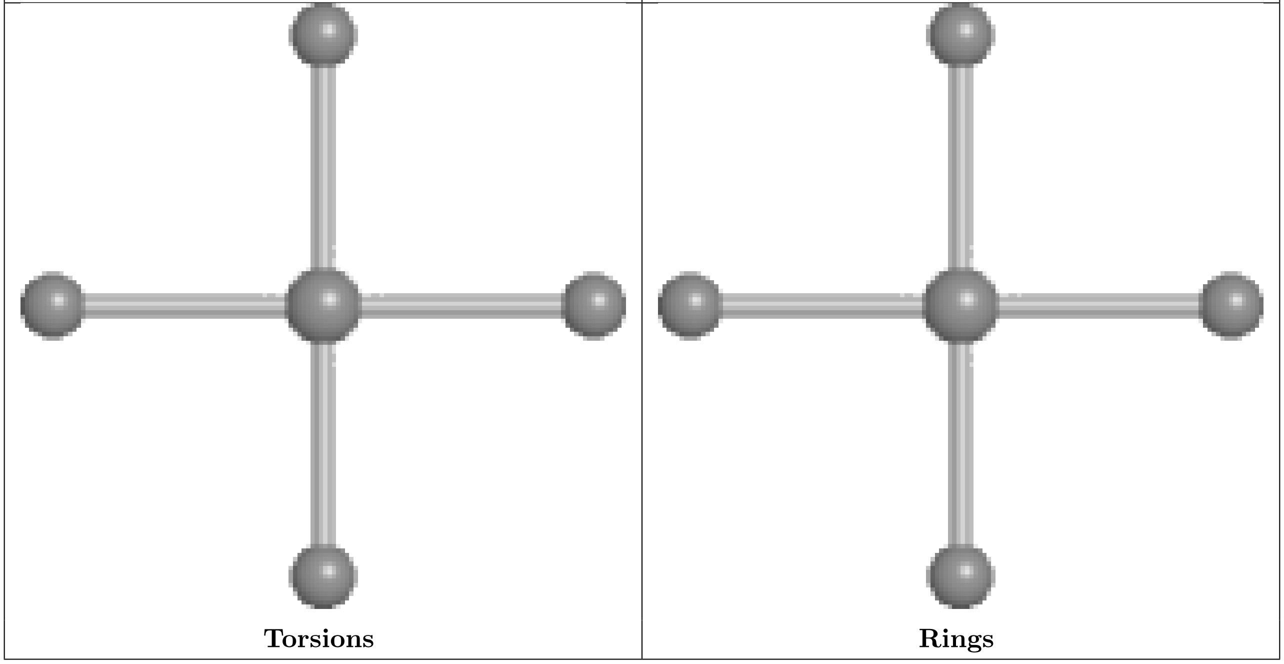
Torsions

Rings

Ligand SO4 F 1203

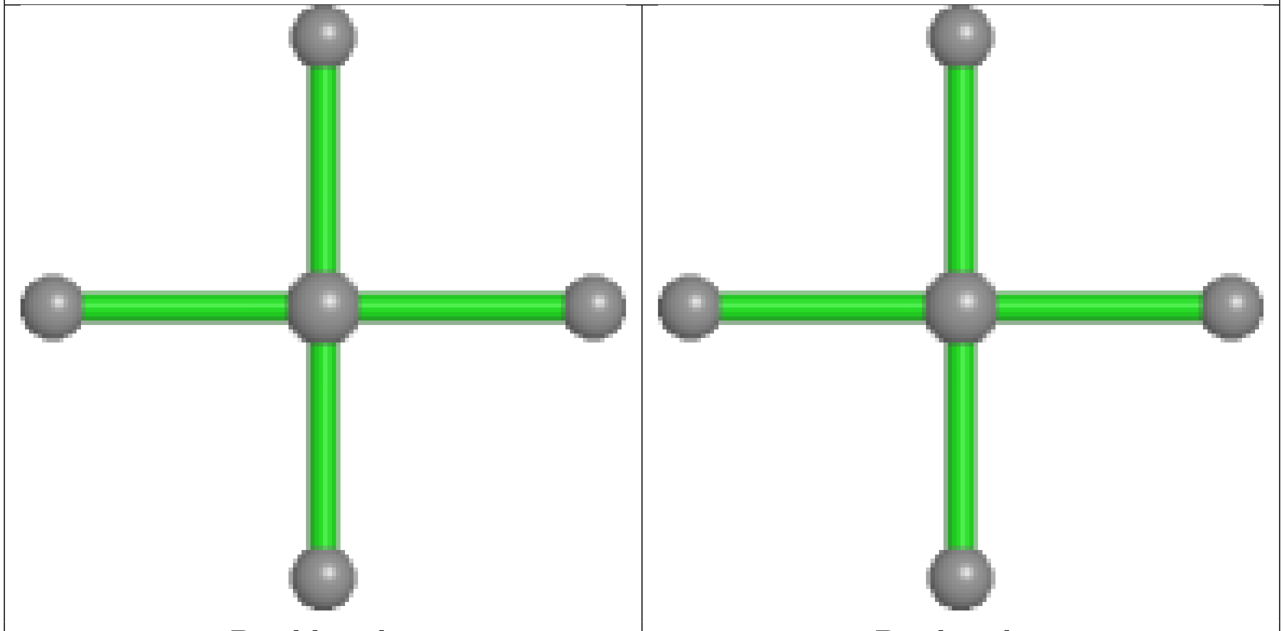


Bond lengths Bond angles



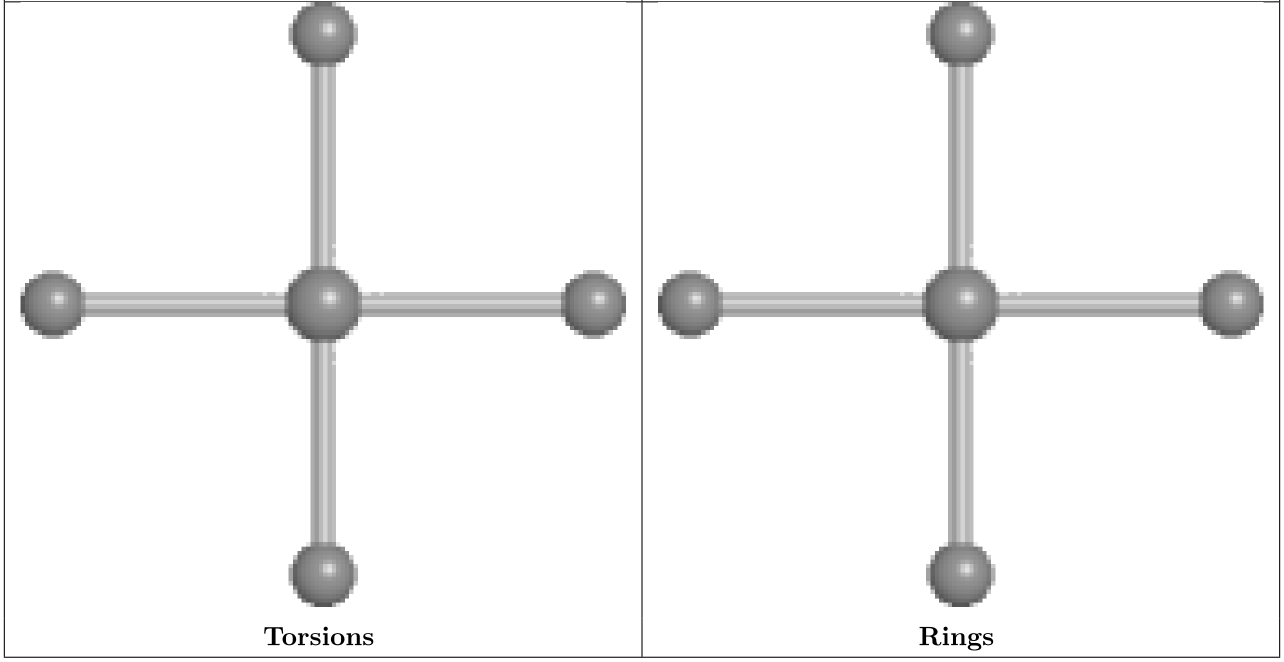
Torsions Rings

Ligand SO4 F 1201



Bond lengths

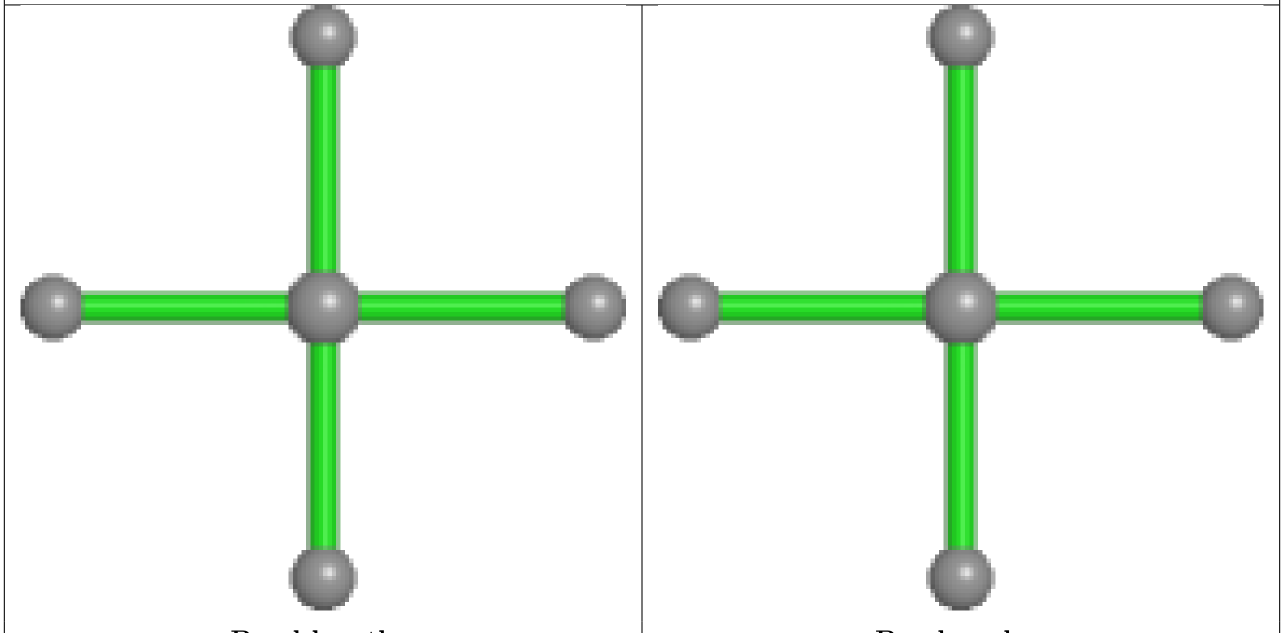
Bond angles



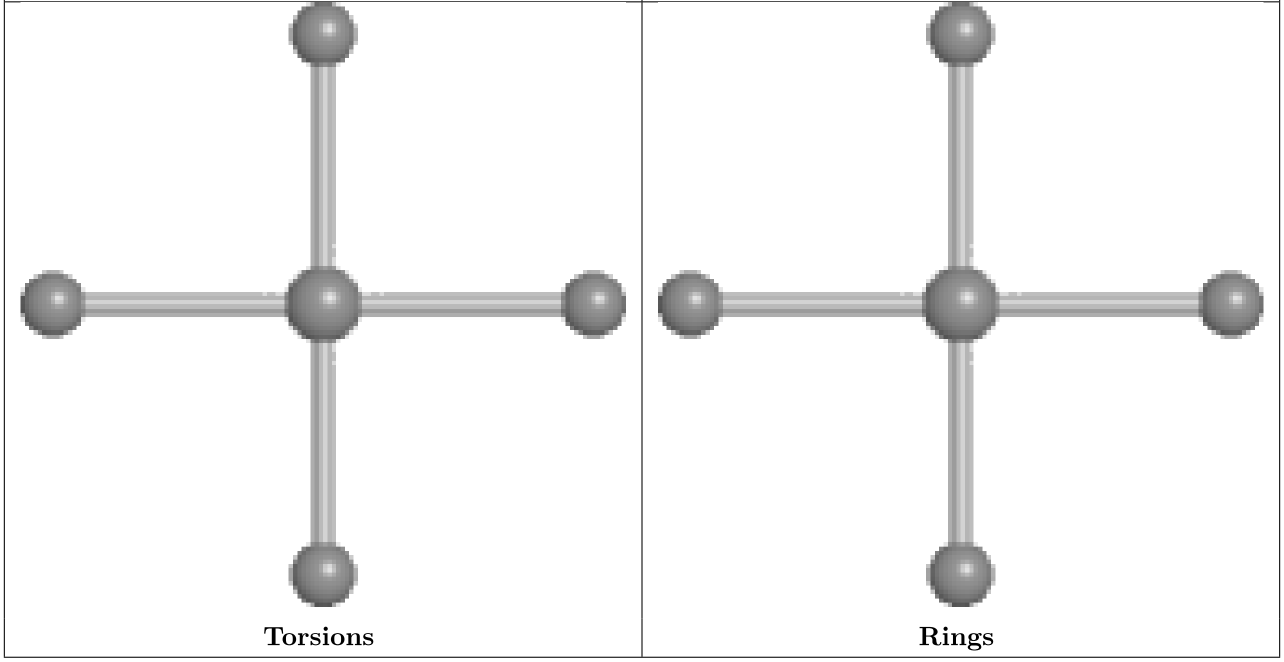
Torsions

Rings

Ligand SO4 D 1404

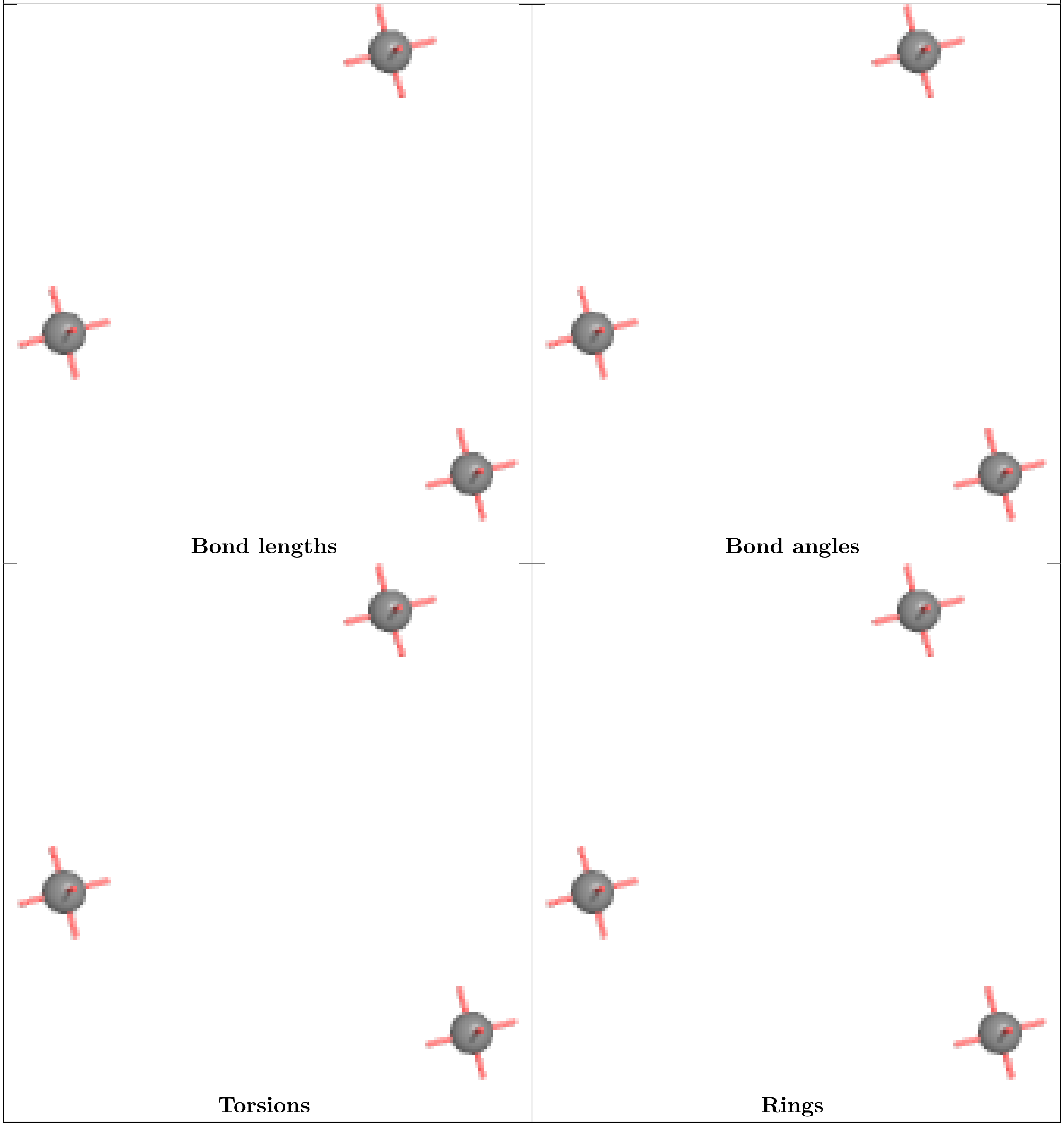


Bond lengths **Bond angles**



Torsions **Rings**

Ligand SO4 D 1401



Bond lengths

Bond angles

Torsions

Rings

4.7 Other polymers ⓘ

There are no such residues in this entry.

4.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

5 Fit of model and data ⓘ

5.1 Protein, DNA and RNA chains ⓘ

EDS failed to run properly - this section is therefore empty.

5.2 Non-standard residues in protein, DNA, RNA chains ⓘ

EDS failed to run properly - this section is therefore empty.

5.3 Carbohydrates ⓘ

EDS failed to run properly - this section is therefore empty.

5.4 Ligands ⓘ

EDS failed to run properly - this section is therefore empty.

5.5 Other polymers ⓘ

EDS failed to run properly - this section is therefore empty.