wwPDB EM Validation Summary Report ⓘ

Jun 16, 2025 – 01:23 PM JST

PDB ID	:	9KM0 / pdb_00009km0
EMDB ID	:	EMD-62419
Title	:	Cryo-EM structure of a tri-heme cytochrome-associated RC-LH1 complex from a marine photoheterotrophic bacterium, purified with EDTA-2Na-containing solutions
Authors	:	Chen, J.H.
Deposited on	:	2024-11-15
Resolution	:	2.78 Å(reported)

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

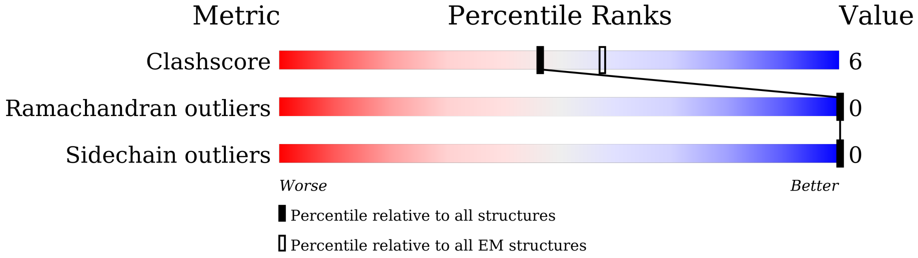
EMDB validation analysis	:	FAILED
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.0rc1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

1 Overall quality at a glance

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

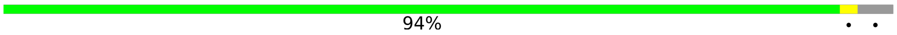
The reported resolution of this entry is 2.78 Å.

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)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5%

Mol	Chain	Length	Quality of chain
1	1	53	
1	A	53	
1	B	53	
1	D	53	
1	E	53	
1	F	53	
1	G	53	
1	I	53	
1	J	53	

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Mol	Chain	Length	Quality of chain
1	K	53	
1	N	53	
1	P	53	
1	Q	53	
1	R	53	
1	S	53	
1	T	53	
1	V	53	
2	O	239	
3	2	49	
3	a	49	
3	b	49	
3	d	49	
3	e	49	
3	f	49	
3	g	49	
3	i	49	
3	j	49	
3	k	49	
3	n	49	
3	p	49	
3	q	49	
3	r	49	
3	s	49	
3	t	49	

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Mol	Chain	Length	Quality of chain
3	v	49	
4	M	330	
5	L	279	
6	H	256	
7	C	360	

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
9	A1EFU	2	102	-	X	-	-

2 Entry composition ⓘ

There are 16 unique types of molecules in this entry. The entry contains 28252 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 Antenna pigment protein alpha chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	P	51	Total 425	C 291	N 68	O 64	S 2	0	0
1	V	51	Total 422	C 289	N 68	O 64	S 1	0	0
1	S	51	Total 422	C 289	N 68	O 64	S 1	0	0
1	T	51	Total 422	C 289	N 68	O 64	S 1	0	0
1	Q	51	Total 422	C 289	N 68	O 64	S 1	0	0
1	R	51	Total 422	C 289	N 68	O 64	S 1	0	0
1	1	50	Total 417	C 286	N 67	O 63	S 1	0	0
1	N	51	Total 422	C 289	N 68	O 64	S 1	0	0
1	K	51	Total 422	C 289	N 68	O 64	S 1	0	0
1	J	50	Total 417	C 286	N 67	O 63	S 1	0	0
1	I	51	Total 422	C 289	N 68	O 64	S 1	0	0
1	G	51	Total 422	C 289	N 68	O 64	S 1	0	0
1	F	51	Total 422	C 289	N 68	O 64	S 1	0	0
1	E	51	Total 422	C 289	N 68	O 64	S 1	0	0
1	D	51	Total 422	C 289	N 68	O 64	S 1	0	0
1	B	51	Total 422	C 289	N 68	O 64	S 1	0	0
1	A	51	Total 422	C 289	N 68	O 64	S 1	0	0

- Molecule 2 is a protein called Reaction center protein O chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	O	52	Total 371	C 249	N 56	O 59	S 7	0	0

- Molecule 3 is a protein called Antenna pigment protein beta chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	v	40	Total 325	C 217	N 52	O 55	S 1	0	0
3	t	43	Total 350	C 235	N 55	O 59	S 1	0	0
3	s	44	Total 358	C 239	N 56	O 62	S 1	0	0
3	r	43	Total 350	C 235	N 55	O 59	S 1	0	0
3	q	44	Total 358	C 239	N 56	O 62	S 1	0	0
3	p	44	Total 358	C 239	N 56	O 62	S 1	0	0
3	2	44	Total 358	C 239	N 56	O 62	S 1	0	0
3	n	44	Total 358	C 239	N 56	O 62	S 1	0	0
3	k	43	Total 350	C 235	N 55	O 59	S 1	0	0
3	j	43	Total 350	C 235	N 55	O 59	S 1	0	0
3	i	43	Total 350	C 235	N 55	O 59	S 1	0	0
3	g	44	Total 358	C 239	N 56	O 62	S 1	0	0
3	f	44	Total 358	C 239	N 56	O 62	S 1	0	0
3	e	44	Total 358	C 239	N 56	O 62	S 1	0	0
3	d	44	Total 358	C 239	N 56	O 62	S 1	0	0
3	b	44	Total 358	C 239	N 56	O 62	S 1	0	0
3	a	44	Total 358	C 239	N 56	O 62	S 1	0	0

- Molecule 4 is a protein called Reaction center protein M chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	M	325	2633	1752	421	452	8	0	0

- Molecule 5 is a protein called Reaction center protein L chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	L	274	2178	1469	346	354	9	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
L	278	ASP	GLY	conflict	UNP A8LQ16
L	279	CYS	LEU	conflict	UNP A8LQ16

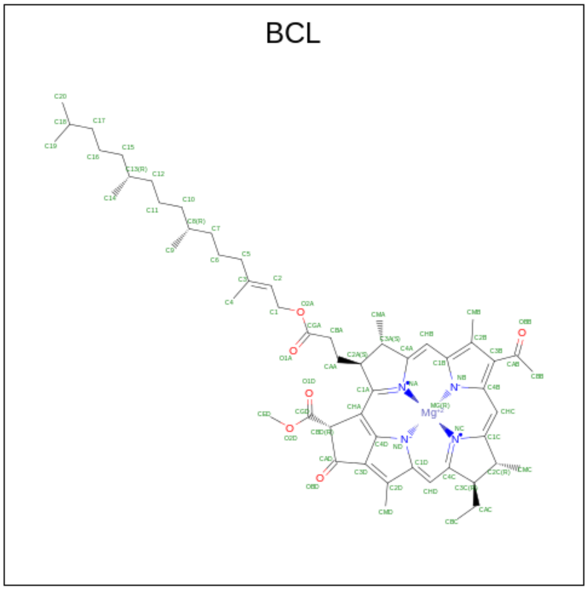
- Molecule 6 is a protein called Reaction center protein H chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	H	256	2022	1283	345	385	9	0	0

- Molecule 7 is a protein called Photosynthetic reaction center cytochrome c subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	C	352	2741	1732	455	540	14	0	0

- Molecule 8 is BACTERIOCHLOROPHYLL A (CCD ID: BCL) (formula: $C_{55}H_{74}MgN_4O_6$).



Mol	Chain	Residues	Atoms	AltConf
8	P	1	Total C Mg N O 66 55 1 4 6	0
8	P	1	Total C Mg N O 66 55 1 4 6	0
8	V	1	Total C Mg N O 66 55 1 4 6	0
8	v	1	Total C Mg N O 66 55 1 4 6	0
8	S	1	Total C Mg N O 66 55 1 4 6	0
8	t	1	Total C Mg N O 66 55 1 4 6	0
8	s	1	Total C Mg N O 66 55 1 4 6	0
8	s	1	Total C Mg N O 66 55 1 4 6	0
8	Q	1	Total C Mg N O 66 55 1 4 6	0
8	r	1	Total C Mg N O 66 55 1 4 6	0
8	R	1	Total C Mg N O 66 55 1 4 6	0
8	q	1	Total C Mg N O 66 55 1 4 6	0
8	2	1	Total C Mg N O 66 55 1 4 6	0
8	1	1	Total C Mg N O 66 55 1 4 6	0

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Mol	Chain	Residues	Atoms	AltConf
8	n	1	Total C Mg N O 66 55 1 4 6	0
8	N	1	Total C Mg N O 66 55 1 4 6	0
8	k	1	Total C Mg N O 66 55 1 4 6	0
8	K	1	Total C Mg N O 66 55 1 4 6	0
8	j	1	Total C Mg N O 66 55 1 4 6	0
8	J	1	Total C Mg N O 66 55 1 4 6	0
8	i	1	Total C Mg N O 66 55 1 4 6	0
8	I	1	Total C Mg N O 66 55 1 4 6	0
8	G	1	Total C Mg N O 66 55 1 4 6	0
8	G	1	Total C Mg N O 66 55 1 4 6	0
8	F	1	Total C Mg N O 66 55 1 4 6	0
8	F	1	Total C Mg N O 66 55 1 4 6	0
8	e	1	Total C Mg N O 66 55 1 4 6	0
8	E	1	Total C Mg N O 66 55 1 4 6	0
8	d	1	Total C Mg N O 66 55 1 4 6	0
8	D	1	Total C Mg N O 66 55 1 4 6	0
8	b	1	Total C Mg N O 66 55 1 4 6	0
8	B	1	Total C Mg N O 66 55 1 4 6	0
8	a	1	Total C Mg N O 66 55 1 4 6	0
8	A	1	Total C Mg N O 66 55 1 4 6	0
8	M	1	Total C Mg N O 66 55 1 4 6	0

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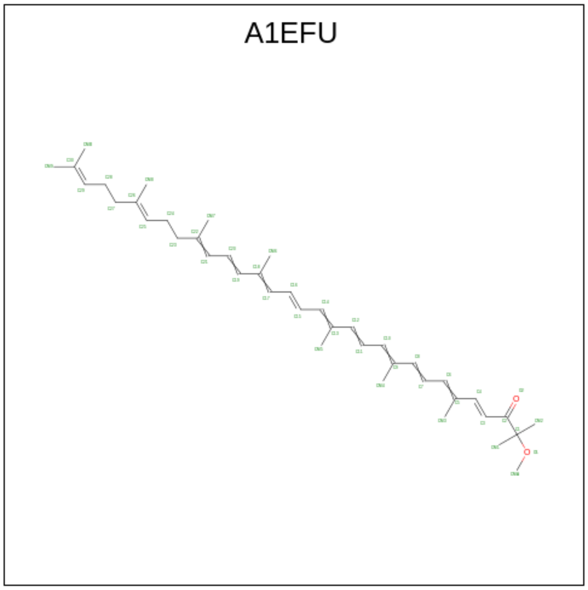
Mol	Chain	Residues	Atoms	AltConf
8	M	1	Total C Mg N O 66 55 1 4 6	0
8	L	1	Total C Mg N O 66 55 1 4 6	0
8	L	1	Total C Mg N O 66 55 1 4 6	0

- Molecule 9 is (4 {E},16 {E},26 {E})-2-methoxy-2,6,10,14,19,23,27,31-octamethyl-dotriaconta-4,6,8,10,12,14,16,18,20,22,26,30-dodecaen-3-one (CCD ID: A1EFU) (formula: $C_{41}H_{58}O_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	AltConf
9	P	1	Total C O 43 41 2	0
9	v	1	Total C O 43 41 2	0
9	v	1	Total C O 43 41 2	0
9	T	1	Total C O 43 41 2	0
9	s	1	Total C O 43 41 2	0
9	s	1	Total C O 43 41 2	0
9	s	1	Total C O 43 41 2	0

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Mol	Chain	Residues	Atoms	AltConf
9	r	1	Total C O 43 41 2	0
9	R	1	Total C O 43 41 2	0
9	q	1	Total C O 43 41 2	0
9	p	1	Total C O 43 41 2	0
9	2	1	Total C O 43 41 2	0
9	2	1	Total C O 43 41 2	0
9	2	1	Total C O 43 41 2	0
9	N	1	Total C O 43 41 2	0
9	k	1	Total C O 43 41 2	0
9	K	1	Total C O 43 41 2	0
9	j	1	Total C O 43 41 2	0
9	j	1	Total C O 43 41 2	0
9	J	1	Total C O 43 41 2	0
9	J	1	Total C O 43 41 2	0
9	I	1	Total C O 43 41 2	0
9	G	1	Total C O 43 41 2	0
9	G	1	Total C O 43 41 2	0
9	f	1	Total C O 43 41 2	0
9	F	1	Total C O 43 41 2	0
9	E	1	Total C O 43 41 2	0
9	E	1	Total C O 43 41 2	0

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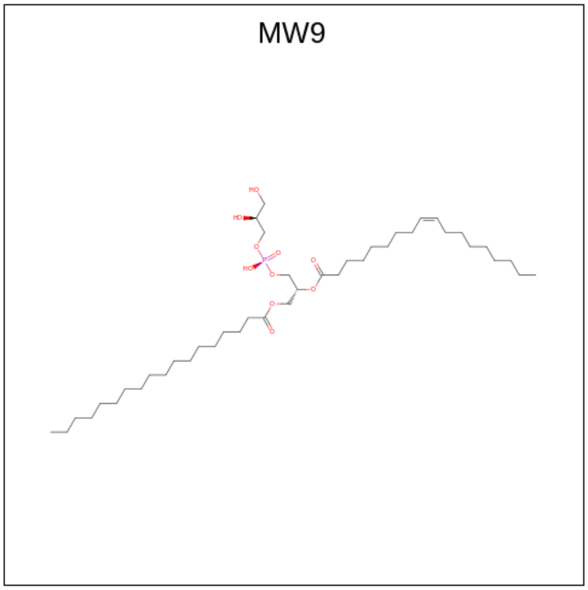
Mol	Chain	Residues	Atoms	AltConf
9	D	1	Total C O 43 41 2	0
9	D	1	Total C O 43 41 2	0
9	B	1	Total C O 43 41 2	0
9	B	1	Total C O 43 41 2	0
9	a	1	Total C O 43 41 2	0
9	A	1	Total C O 43 41 2	0
9	M	1	Total C O 43 41 2	0

- Molecule 10 is (21R,24R,27S)-24,27,28-trihydroxy-18,24-dioxo-19,23,25-trioxa-24lambda 5 -phosphaoctacosan-21-yl (9Z)-octadec-9-enoate (CCD ID: MW9) (formula: $C_{42}H_{81}O_{10}P$).



Mol	Chain	Residues	Atoms	AltConf
10	R	1	Total C O P 45 34 10 1	0
10	G	1	Total C O P 49 38 10 1	0
10	G	1	Total C O P 40 29 10 1	0
10	F	1	Total C O P 43 32 10 1	0

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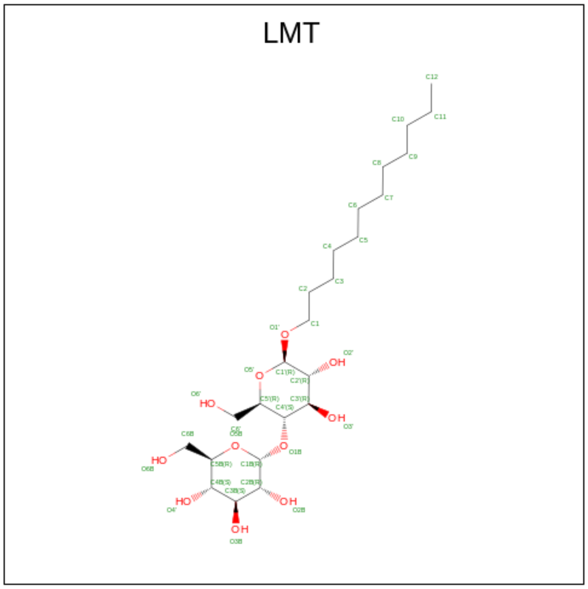
Mol	Chain	Residues	Atoms				AltConf
10	D	1	Total 53	C 42	O 10	P 1	0
10	M	1	Total 49	C 38	O 10	P 1	0
10	M	1	Total 53	C 42	O 10	P 1	0
10	L	1	Total 37	C 26	O 10	P 1	0
10	H	1	Total 48	C 37	O 10	P 1	0
10	H	1	Total 37	C 28	O 8	P 1	0

- Molecule 11 is DODECYL-BETA-D-MALTOSIDE (CCD ID: LMT) (formula: $C_{24}H_{46}O_{11}$).

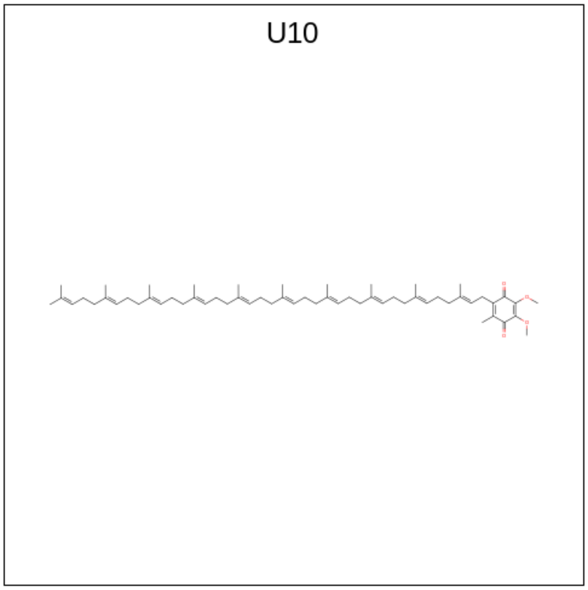


Mol	Chain	Residues	Atoms			AltConf
11	D	1	Total 35	C 24	O 11	0
11	L	1	Total 24	C 18	O 6	0
11	L	1	Total 24	C 19	O 5	0
11	H	1	Total 24	C 18	O 6	0
11	C	1	Total 24	C 18	O 6	0

- Molecule 12 is FE (III) ION (CCD ID: FE) (formula: Fe).

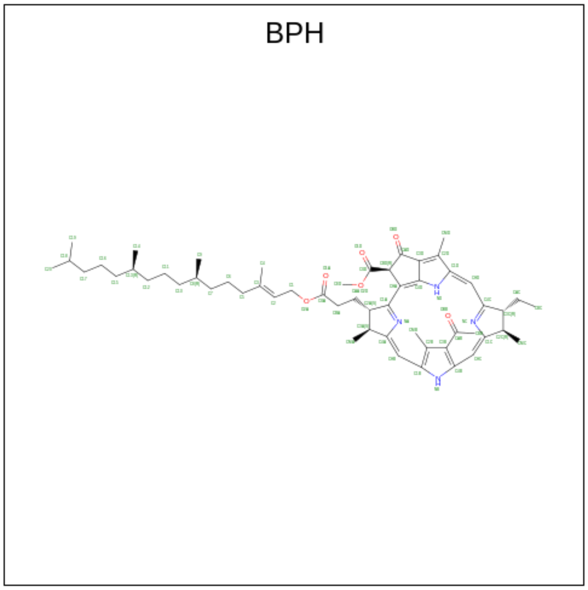
Mol	Chain	Residues	Atoms		AltConf
			Total	Fe	
12	M	1	1	1	0

- Molecule 13 is UBIQUINONE-10 (CCD ID: U10) (formula: $C_{59}H_{90}O_4$) (labeled as "Ligand of Interest" by depositor).



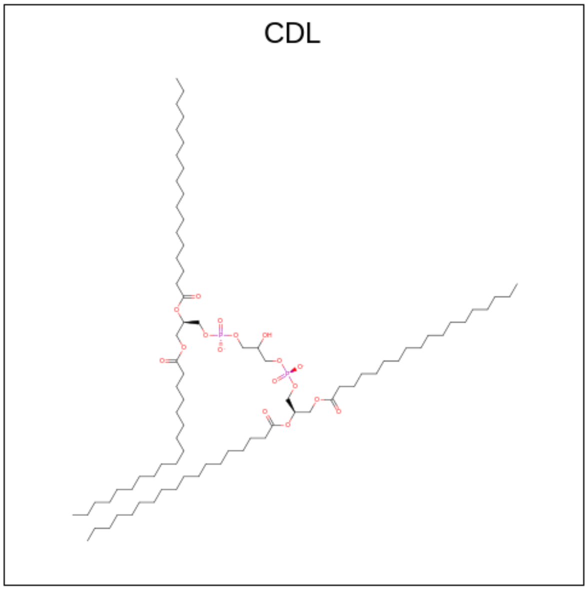
Mol	Chain	Residues	Atoms			AltConf
			Total	C	O	
13	M	1	63	59	4	0
			Total	C	O	
13	L	1	48	44	4	0

- Molecule 14 is BACTERIOPHEOPHYTIN A (CCD ID: BPH) (formula: $C_{55}H_{76}N_4O_6$).



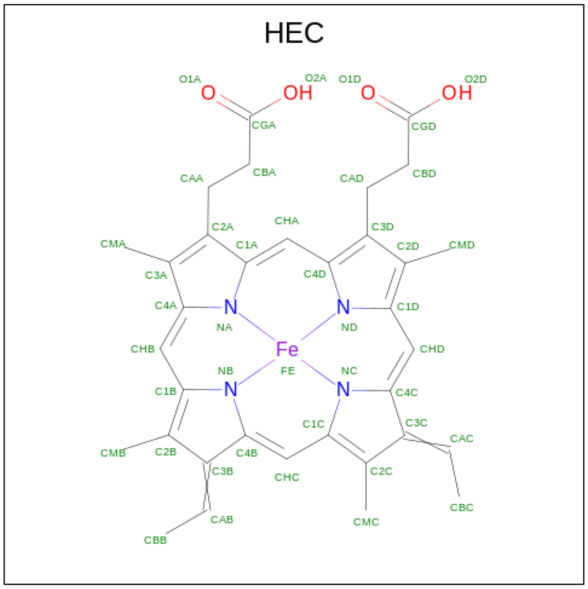
Mol	Chain	Residues	Atoms	AltConf
14	M	1	Total C N O 65 55 4 6	0
14	L	1	Total C N O 65 55 4 6	0

- Molecule 15 is CARDIOLIPIN (CCD ID: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).



Mol	Chain	Residues	Atoms	AltConf
15	L	1	Total C O P 67 48 17 2	0
15	H	1	Total C O P 91 72 17 2	0

- Molecule 16 is HEME C (CCD ID: HEC) (formula: $C_{34}H_{34}FeN_4O_4$) (labeled as "Ligand of Interest" by depositor).



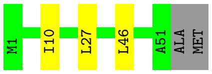
Mol	Chain	Residues	Atoms	AltConf
16	C	1	Total C Fe N O 43 34 1 4 4	0
16	C	1	Total C Fe N O 43 34 1 4 4	0
16	C	1	Total C Fe N O 43 34 1 4 4	0

3 Residue-property plots ⓘ

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. 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. 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: Antenna pigment protein alpha chain

Chain P:

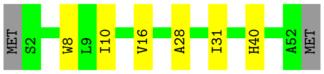


- Molecule 1: Antenna pigment protein alpha chain

Chain V:

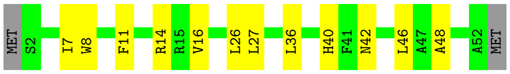
- Molecule 1: Antenna pigment protein alpha chain

Chain S:



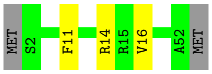
- Molecule 1: Antenna pigment protein alpha chain

Chain T:



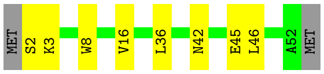
- Molecule 1: Antenna pigment protein alpha chain

Chain Q:



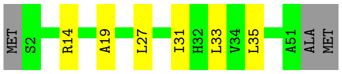
- Molecule 1: Antenna pigment protein alpha chain

Chain R:



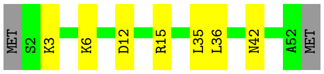
- Molecule 1: Antenna pigment protein alpha chain

Chain 1:



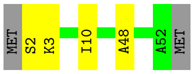
- Molecule 1: Antenna pigment protein alpha chain

Chain N:



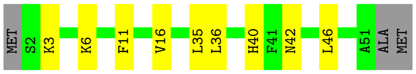
- Molecule 1: Antenna pigment protein alpha chain

Chain K:



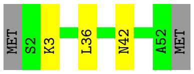
- Molecule 1: Antenna pigment protein alpha chain

Chain J:



- Molecule 1: Antenna pigment protein alpha chain

Chain I:

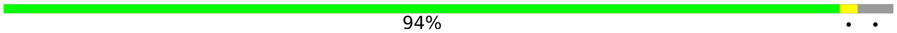


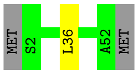
- Molecule 1: Antenna pigment protein alpha chain

Chain G:

- Molecule 1: Antenna pigment protein alpha chain

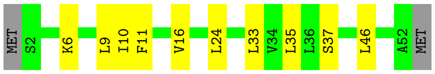
Chain F:





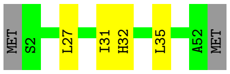
- Molecule 1: Antenna pigment protein alpha chain

Chain E:



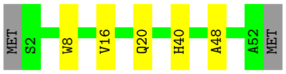
- Molecule 1: Antenna pigment protein alpha chain

Chain D:



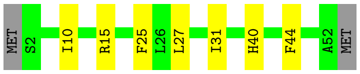
- Molecule 1: Antenna pigment protein alpha chain

Chain B:



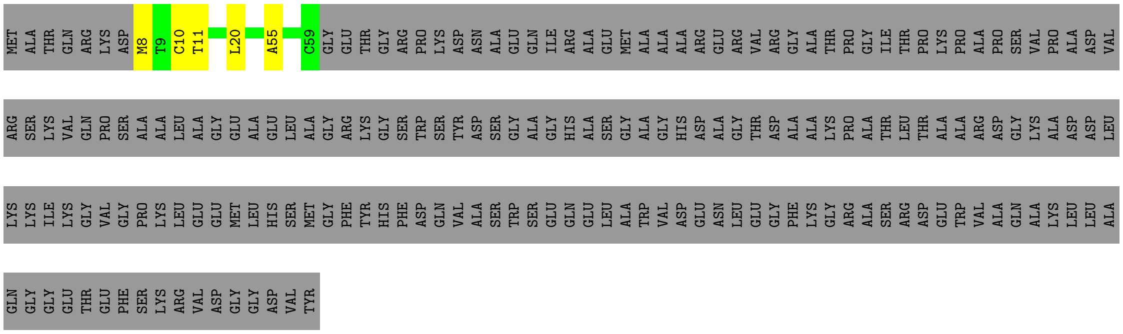
- Molecule 1: Antenna pigment protein alpha chain

Chain A:



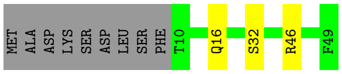
- Molecule 2: Reaction center protein O chain

Chain O:



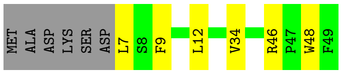
- Molecule 3: Antenna pigment protein beta chain

Chain v:



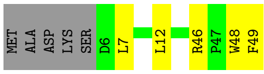
- Molecule 3: Antenna pigment protein beta chain

Chain t:



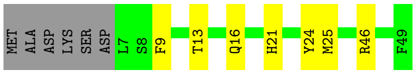
- Molecule 3: Antenna pigment protein beta chain

Chain s:



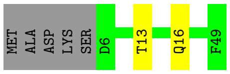
- Molecule 3: Antenna pigment protein beta chain

Chain r:



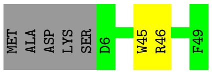
- Molecule 3: Antenna pigment protein beta chain

Chain q:



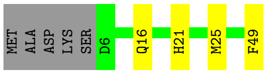
- Molecule 3: Antenna pigment protein beta chain

Chain p:



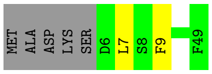
- Molecule 3: Antenna pigment protein beta chain

Chain 2:



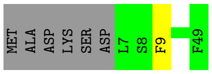
- Molecule 3: Antenna pigment protein beta chain

Chain n:



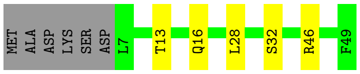
- Molecule 3: Antenna pigment protein beta chain

Chain k:



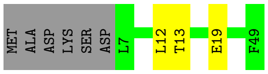
- Molecule 3: Antenna pigment protein beta chain

Chain j:



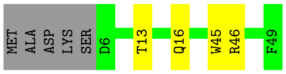
- Molecule 3: Antenna pigment protein beta chain

Chain i:



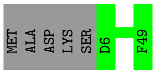
- Molecule 3: Antenna pigment protein beta chain

Chain g:



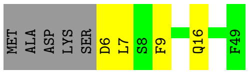
- Molecule 3: Antenna pigment protein beta chain

Chain f:



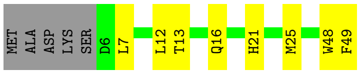
- Molecule 3: Antenna pigment protein beta chain

Chain e:



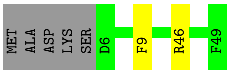
- Molecule 3: Antenna pigment protein beta chain

Chain d:



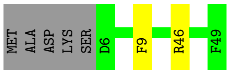
- Molecule 3: Antenna pigment protein beta chain

Chain b:



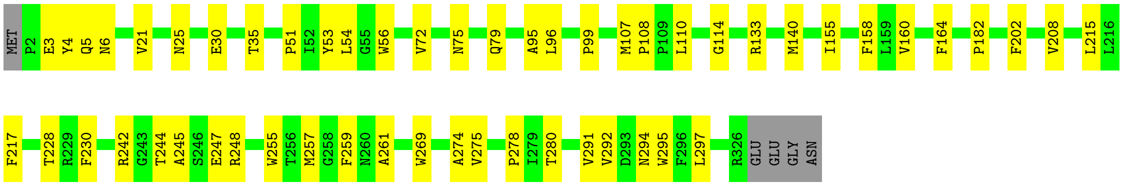
- Molecule 3: Antenna pigment protein beta chain

Chain a:



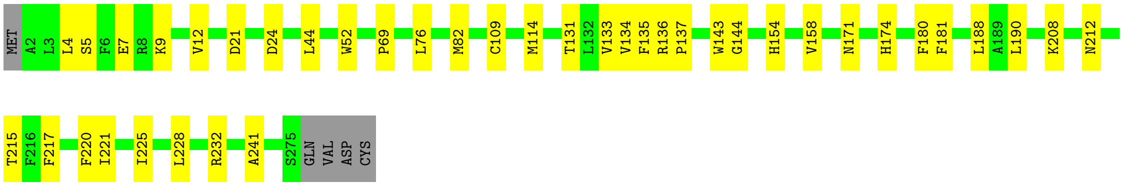
- Molecule 4: Reaction center protein M chain

Chain M:



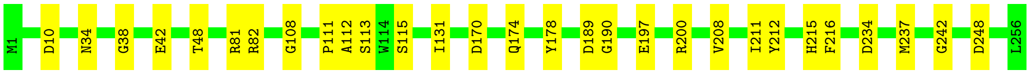
- Molecule 5: Reaction center protein L chain

Chain L:



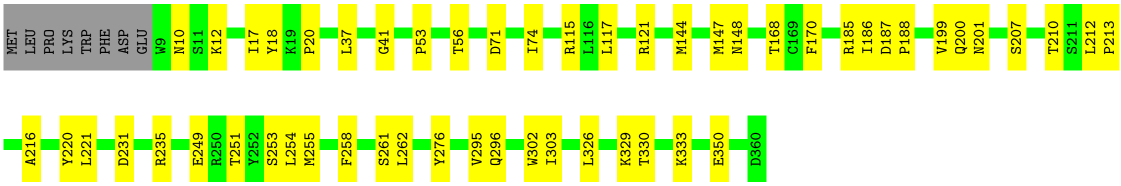
- Molecule 6: Reaction center protein H chain

Chain H:



- Molecule 7: Photosynthetic reaction center cytochrome c subunit

Chain C:


MET
LEU
PRO
LYS
TRP
PHE
ASP
GLU
W9
N10
S11
K12
I17
Y18
K19
P20
L37
G41
P53
T56
D71
I74
R115
L116
L117
R121
M144
M147
N148
T168
C169
F170
R185
I186
D187
P188
V199
Q200
N201
S207
T210
S211
L212
P213
A216
Y220
L221
D231
R235
E249
R250
T251
Y252
S253
L254
M255
F258
S261
L262
Y276
V295
Q296
W302
I303
L326
K329
T330
K333
E350
D360

4 Experimental information ⓘ

Property	**Value**	**Source**
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	230375	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	50	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor

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: A1EFU, LMT, U10, HEC, FE, MW9, CDL, BPH, BCL

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	1	0.13	0/431	0.23	0/585
1	A	0.11	0/436	0.22	0/592
1	B	0.13	0/436	0.22	0/592
1	D	0.14	0/436	0.23	0/592
1	E	0.16	0/436	0.24	0/592
1	F	0.14	0/436	0.21	0/592
1	G	0.14	0/436	0.24	0/592
1	I	0.14	0/436	0.26	0/592
1	J	0.13	0/431	0.23	0/585
1	K	0.13	0/436	0.32	0/592
1	N	0.14	0/436	0.28	0/592
1	P	0.12	0/439	0.25	0/595
1	Q	0.11	0/436	0.20	0/592
1	R	0.11	0/436	0.21	0/592
1	S	0.12	0/436	0.24	0/592
1	T	0.12	0/436	0.23	0/592
1	V	0.10	0/436	0.21	0/592
2	O	0.11	0/378	0.24	0/516
3	2	0.12	0/371	0.21	0/508
3	a	0.09	0/371	0.18	0/508
3	b	0.12	0/371	0.19	0/508
3	d	0.14	0/371	0.21	0/508
3	e	0.13	0/371	0.16	0/508
3	f	0.13	0/371	0.20	0/508
3	g	0.12	0/371	0.17	0/508
3	i	0.12	0/363	0.24	0/497
3	j	0.12	0/363	0.24	0/497
3	k	0.11	0/363	0.22	0/497
3	n	0.11	0/371	0.18	0/508
3	p	0.11	0/371	0.28	0/508
3	q	0.11	0/371	0.21	0/508
3	r	0.11	0/363	0.21	0/497

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
3	s	0.12	0/371	0.25	0/508
3	t	0.09	0/363	0.17	0/497
3	v	0.08	0/337	0.15	0/462
4	M	0.16	0/2731	0.27	0/3735
5	L	0.16	0/2267	0.28	0/3105
6	H	0.13	0/2072	0.23	0/2804
7	C	0.15	0/2819	0.31	0/3869
All	All	0.13	0/23905	0.25	0/32617

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 ⓘ

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	1	417	0	419	5	0
1	A	422	0	426	9	0
1	B	422	0	426	4	0
1	D	422	0	426	4	0
1	E	422	0	426	9	0
1	F	422	0	425	2	0
1	G	422	0	426	3	0
1	I	422	0	426	2	0
1	J	417	0	421	7	0
1	K	422	0	426	3	0
1	N	422	0	426	4	0
1	P	425	0	433	3	0
1	Q	422	0	426	2	0
1	R	422	0	426	6	0
1	S	422	0	426	6	0
1	T	422	0	426	9	0
1	V	422	0	426	8	0
2	O	371	0	395	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	2	358	0	338	5	0
3	a	358	0	338	2	0
3	b	358	0	338	2	0
3	d	358	0	338	9	0
3	e	358	0	338	5	0
3	f	358	0	338	0	0
3	g	358	0	338	2	0
3	i	350	0	334	2	0
3	j	350	0	334	5	0
3	k	350	0	334	1	0
3	n	358	0	338	5	0
3	p	358	0	338	2	0
3	q	358	0	338	2	0
3	r	350	0	334	6	0
3	s	358	0	338	4	0
3	t	350	0	334	9	0
3	v	325	0	309	4	0
4	M	2633	0	2524	42	0
5	L	2178	0	2118	36	0
6	H	2022	0	1971	23	0
7	C	2741	0	2584	40	0
8	1	66	0	74	0	0
8	2	66	0	74	4	0
8	A	66	0	74	5	0
8	B	66	0	74	4	0
8	D	66	0	74	2	0
8	E	66	0	74	2	0
8	F	132	0	146	4	0
8	G	132	0	146	4	0
8	I	66	0	74	1	0
8	J	66	0	74	3	0
8	K	66	0	74	2	0
8	L	132	0	143	8	0
8	M	132	0	144	5	0
8	N	66	0	74	2	0
8	P	132	0	146	2	0
8	Q	66	0	74	1	0
8	R	66	0	74	6	0
8	S	66	0	74	0	0
8	V	66	0	72	3	0
8	a	66	0	74	2	0
8	b	66	0	74	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	d	66	0	74	8	0
8	e	66	0	74	4	0
8	i	66	0	74	2	0
8	j	66	0	74	7	0
8	k	66	0	74	1	0
8	n	66	0	74	3	0
8	q	66	0	74	2	0
8	r	66	0	74	4	0
8	s	132	0	147	8	0
8	t	66	0	73	9	0
8	v	66	0	74	5	0
9	2	129	0	0	0	0
9	A	43	0	0	0	0
9	B	86	0	0	0	0
9	D	86	0	0	0	0
9	E	86	0	0	0	0
9	F	43	0	0	0	0
9	G	86	0	0	0	0
9	I	43	0	0	0	0
9	J	86	0	0	0	0
9	K	43	0	0	0	0
9	M	43	0	0	0	0
9	N	43	0	0	0	0
9	P	43	0	0	0	0
9	R	43	0	0	0	0
9	T	43	0	0	0	0
9	a	43	0	0	0	0
9	f	43	0	0	0	0
9	j	86	0	0	0	0
9	k	43	0	0	0	0
9	p	43	0	0	0	0
9	q	43	0	0	0	0
9	r	43	0	0	0	0
9	s	129	0	0	1	0
9	v	86	0	0	0	0
10	D	53	0	0	0	0
10	F	43	0	0	0	0
10	G	89	0	0	0	0
10	H	85	0	0	0	0
10	L	37	0	0	0	0
10	M	102	0	0	0	0
10	R	45	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
11	C	24	0	34	2	0
11	D	35	0	45	1	0
11	H	24	0	34	0	0
11	L	48	0	65	1	0
12	M	1	0	0	0	0
13	L	48	0	63	5	0
13	M	63	0	90	7	0
14	L	65	0	76	0	0
14	M	65	0	73	2	0
15	H	91	0	135	3	0
15	L	67	0	78	1	0
16	C	129	0	88	5	0
All	All	28252	0	26099	322	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 6.

The worst 5 of 322 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)
7:C:144:MET:SD	16:C:401:HEC:NC	2.37	0.98
5:L:131:THR:HA	5:L:135:PHE:HB2	1.63	0.81
7:C:144:MET:SD	16:C:401:HEC:FE	1.73	0.80
7:C:144:MET:SD	16:C:401:HEC:NB	2.58	0.77
3:d:48:TRP:CE2	8:d:101:BCL:HHC	2.22	0.74

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 PDB entries followed by that with respect to all EM entries.

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	1	48/53 (91%)	48 (100%)	0	0	100	100
1	A	49/53 (92%)	48 (98%)	1 (2%)	0	100	100
1	B	49/53 (92%)	48 (98%)	1 (2%)	0	100	100
1	D	49/53 (92%)	49 (100%)	0	0	100	100
1	E	49/53 (92%)	48 (98%)	1 (2%)	0	100	100
1	F	49/53 (92%)	49 (100%)	0	0	100	100
1	G	49/53 (92%)	49 (100%)	0	0	100	100
1	I	49/53 (92%)	49 (100%)	0	0	100	100
1	J	48/53 (91%)	48 (100%)	0	0	100	100
1	K	49/53 (92%)	48 (98%)	1 (2%)	0	100	100
1	N	49/53 (92%)	49 (100%)	0	0	100	100
1	P	49/53 (92%)	49 (100%)	0	0	100	100
1	Q	49/53 (92%)	49 (100%)	0	0	100	100
1	R	49/53 (92%)	49 (100%)	0	0	100	100
1	S	49/53 (92%)	49 (100%)	0	0	100	100
1	T	49/53 (92%)	48 (98%)	1 (2%)	0	100	100
1	V	49/53 (92%)	49 (100%)	0	0	100	100
2	O	50/239 (21%)	46 (92%)	4 (8%)	0	100	100
3	2	42/49 (86%)	41 (98%)	1 (2%)	0	100	100
3	a	42/49 (86%)	42 (100%)	0	0	100	100
3	b	42/49 (86%)	42 (100%)	0	0	100	100
3	d	42/49 (86%)	42 (100%)	0	0	100	100
3	e	42/49 (86%)	41 (98%)	1 (2%)	0	100	100
3	f	42/49 (86%)	42 (100%)	0	0	100	100
3	g	42/49 (86%)	41 (98%)	1 (2%)	0	100	100
3	i	41/49 (84%)	41 (100%)	0	0	100	100
3	j	41/49 (84%)	41 (100%)	0	0	100	100
3	k	41/49 (84%)	41 (100%)	0	0	100	100
3	n	42/49 (86%)	42 (100%)	0	0	100	100
3	p	42/49 (86%)	41 (98%)	1 (2%)	0	100	100
3	q	42/49 (86%)	42 (100%)	0	0	100	100
3	r	41/49 (84%)	41 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	s	42/49 (86%)	40 (95%)	2 (5%)	0	100	100
3	t	41/49 (84%)	41 (100%)	0	0	100	100
3	v	38/49 (78%)	38 (100%)	0	0	100	100
4	M	323/330 (98%)	312 (97%)	11 (3%)	0	100	100
5	L	272/279 (98%)	266 (98%)	6 (2%)	0	100	100
6	H	254/256 (99%)	250 (98%)	4 (2%)	0	100	100
7	C	350/360 (97%)	330 (94%)	20 (6%)	0	100	100
All	All	2785/3198 (87%)	2729 (98%)	56 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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	1	42/44 (96%)	42 (100%)	0	100	100
1	A	42/44 (96%)	42 (100%)	0	100	100
1	B	42/44 (96%)	42 (100%)	0	100	100
1	D	42/44 (96%)	42 (100%)	0	100	100
1	E	42/44 (96%)	42 (100%)	0	100	100
1	F	42/44 (96%)	42 (100%)	0	100	100
1	G	42/44 (96%)	42 (100%)	0	100	100
1	I	42/44 (96%)	42 (100%)	0	100	100
1	J	42/44 (96%)	42 (100%)	0	100	100
1	K	42/44 (96%)	42 (100%)	0	100	100
1	N	42/44 (96%)	42 (100%)	0	100	100
1	P	43/44 (98%)	43 (100%)	0	100	100
1	Q	42/44 (96%)	42 (100%)	0	100	100
1	R	42/44 (96%)	42 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	S	42/44 (96%)	42 (100%)	0	100	100
1	T	42/44 (96%)	42 (100%)	0	100	100
1	V	42/44 (96%)	42 (100%)	0	100	100
2	O	39/174 (22%)	39 (100%)	0	100	100
3	2	37/41 (90%)	37 (100%)	0	100	100
3	a	37/41 (90%)	37 (100%)	0	100	100
3	b	37/41 (90%)	37 (100%)	0	100	100
3	d	37/41 (90%)	37 (100%)	0	100	100
3	e	37/41 (90%)	37 (100%)	0	100	100
3	f	37/41 (90%)	37 (100%)	0	100	100
3	g	37/41 (90%)	37 (100%)	0	100	100
3	i	36/41 (88%)	36 (100%)	0	100	100
3	j	36/41 (88%)	36 (100%)	0	100	100
3	k	36/41 (88%)	36 (100%)	0	100	100
3	n	37/41 (90%)	37 (100%)	0	100	100
3	p	37/41 (90%)	37 (100%)	0	100	100
3	q	37/41 (90%)	37 (100%)	0	100	100
3	r	36/41 (88%)	36 (100%)	0	100	100
3	s	37/41 (90%)	37 (100%)	0	100	100
3	t	36/41 (88%)	36 (100%)	0	100	100
3	v	33/41 (80%)	33 (100%)	0	100	100
4	M	266/270 (98%)	266 (100%)	0	100	100
5	L	218/223 (98%)	218 (100%)	0	100	100
6	H	214/214 (100%)	214 (100%)	0	100	100
7	C	299/307 (97%)	299 (100%)	0	100	100
All	All	2371/2633 (90%)	2371 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

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

Mol	Chain	Res	Type
6	H	34	ASN

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Mol	Chain	Res	Type
7	C	42	GLN
7	C	321	ASN
7	C	201	ASN
6	H	174	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 98 ligands modelled in this entry, 1 is monoatomic - leaving 97 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	A1EFU	G	105	-	40,42,42	1.69	8 (20%)	45,52,52	3.57	19 (42%)
9	A1EFU	r	102	-	40,42,42	1.70	9 (22%)	45,52,52	3.78	19 (42%)
8	BCL	R	102	-	64,74,74	1.72	12 (18%)	78,115,115	2.24	27 (34%)
13	U10	L	303	-	48,48,63	0.17	0	58,61,79	0.44	1 (1%)
8	BCL	t	101	-	64,74,74	1.76	13 (20%)	78,115,115	2.09	25 (32%)
10	MW9	F	103	-	42,42,52	1.43	6 (14%)	45,48,58	1.46	3 (6%)
8	BCL	P	102	-	64,74,74	1.73	13 (20%)	78,115,115	2.20	24 (30%)
9	A1EFU	K	102	-	40,42,42	1.70	9 (22%)	45,52,52	3.65	20 (44%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
8	BCL	K	101	-	64,74,74	1.73	11 (17%)	78,115,115	2.31	27 (34%)
11	LMT	H	302	-	24,24,36	1.04	2 (8%)	29,29,47	1.07	2 (6%)
9	A1EFU	M	407	-	40,42,42	1.68	8 (20%)	45,52,52	3.56	20 (44%)
11	LMT	L	306	-	24,24,36	1.04	2 (8%)	29,29,47	1.18	2 (6%)
9	A1EFU	B	103	-	40,42,42	1.68	8 (20%)	45,52,52	3.68	20 (44%)
8	BCL	s	102	-	64,74,74	1.73	14 (21%)	78,115,115	2.34	28 (35%)
8	BCL	q	102	-	64,74,74	1.72	12 (18%)	78,115,115	2.26	29 (37%)
9	A1EFU	E	103	-	40,42,42	1.68	7 (17%)	45,52,52	3.82	20 (44%)
8	BCL	P	101	-	64,74,74	1.71	11 (17%)	78,115,115	2.24	26 (33%)
9	A1EFU	N	102	-	40,42,42	1.69	9 (22%)	45,52,52	3.69	20 (44%)
8	BCL	2	103	-	64,74,74	1.72	13 (20%)	78,115,115	2.30	28 (35%)
8	BCL	s	103	-	64,74,74	1.72	11 (17%)	78,115,115	2.24	26 (33%)
10	MW9	M	406	-	52,52,52	1.45	6 (11%)	55,58,58	1.47	3 (5%)
9	A1EFU	j	101	-	40,42,42	1.68	9 (22%)	45,52,52	3.99	20 (44%)
8	BCL	e	101	-	64,74,74	1.72	12 (18%)	78,115,115	2.26	27 (34%)
8	BCL	1	101	-	64,74,74	1.72	12 (18%)	78,115,115	2.30	27 (34%)
8	BCL	E	101	-	64,74,74	1.73	12 (18%)	78,115,115	2.30	29 (37%)
10	MW9	H	301	-	47,47,52	1.39	6 (12%)	50,53,58	1.45	4 (8%)
9	A1EFU	q	101	-	40,42,42	1.69	9 (22%)	45,52,52	3.70	21 (46%)
9	A1EFU	P	103	-	40,42,42	1.69	9 (22%)	45,52,52	3.73	20 (44%)
8	BCL	L	301	-	64,74,74	1.71	12 (18%)	78,115,115	2.38	29 (37%)
8	BCL	G	101	-	64,74,74	1.72	11 (17%)	78,115,115	2.27	27 (34%)
9	A1EFU	s	105	-	40,42,42	1.68	9 (22%)	45,52,52	3.80	20 (44%)
14	BPH	M	408	-	51,70,70	0.82	2 (3%)	52,101,101	0.66	1 (1%)
9	A1EFU	2	102	-	40,42,42	1.69	9 (22%)	45,52,52	3.66	20 (44%)
11	LMT	D	102	-	36,36,36	1.17	5 (13%)	47,47,47	0.96	2 (4%)
8	BCL	i	101	-	64,74,74	1.73	11 (17%)	78,115,115	2.32	27 (34%)
8	BCL	G	102	-	64,74,74	1.73	12 (18%)	78,115,115	2.30	27 (34%)
8	BCL	I	101	-	64,74,74	1.73	11 (17%)	78,115,115	2.33	26 (33%)
9	A1EFU	D	104	-	40,42,42	1.69	9 (22%)	45,52,52	3.63	20 (44%)
9	A1EFU	f	101	-	40,42,42	1.68	8 (20%)	45,52,52	3.79	19 (42%)
8	BCL	B	101	-	64,74,74	1.70	11 (17%)	78,115,115	2.29	26 (33%)
9	A1EFU	J	102	-	40,42,42	1.70	9 (22%)	45,52,52	3.56	20 (44%)
8	BCL	L	304	-	64,74,74	1.72	12 (18%)	78,115,115	2.37	29 (37%)
10	MW9	R	103	-	44,44,52	1.47	5 (11%)	47,50,58	1.52	3 (6%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\lvert Z\rvert > 2$	Counts	RMSZ	$\#\lvert Z\rvert > 2$
16	HEC	C	402	7	32,50,50	2.04	4 (12%)	24,82,82	2.30	10 (41%)
8	BCL	a	101	-	64,74,74	1.73	12 (18%)	78,115,115	2.29	28 (35%)
9	A1EFU	R	101	-	40,42,42	1.68	8 (20%)	45,52,52	3.67	20 (44%)
9	A1EFU	v	102	-	40,42,42	1.69	9 (22%)	45,52,52	3.73	20 (44%)
9	A1EFU	s	101	-	40,42,42	1.68	7 (17%)	45,52,52	3.88	20 (44%)
8	BCL	F	101	-	64,74,74	1.72	10 (15%)	78,115,115	2.23	29 (37%)
13	U10	M	404	-	63,63,63	0.17	0	76,79,79	0.41	1 (1%)
9	A1EFU	v	103	-	40,42,42	1.67	8 (20%)	45,52,52	3.69	19 (42%)
9	A1EFU	p	101	-	40,42,42	1.69	9 (22%)	45,52,52	3.91	20 (44%)
8	BCL	r	101	-	64,74,74	1.73	12 (18%)	78,115,115	2.25	26 (33%)
9	A1EFU	J	103	-	40,42,42	1.68	9 (22%)	45,52,52	3.93	20 (44%)
8	BCL	D	101	-	64,74,74	1.71	11 (17%)	78,115,115	2.26	27 (34%)
9	A1EFU	j	103	-	40,42,42	1.69	8 (20%)	45,52,52	3.79	20 (44%)
10	MW9	L	307	-	36,36,52	1.47	5 (13%)	39,42,58	1.54	3 (7%)
8	BCL	S	101	-	64,74,74	1.71	12 (18%)	78,115,115	2.25	26 (33%)
10	MW9	G	103	-	48,48,52	1.49	6 (12%)	51,54,58	1.48	4 (7%)
10	MW9	D	103	-	52,52,52	1.45	6 (11%)	55,58,58	1.46	3 (5%)
9	A1EFU	B	102	-	40,42,42	1.69	9 (22%)	45,52,52	3.69	20 (44%)
9	A1EFU	D	105	-	40,42,42	1.68	8 (20%)	45,52,52	3.91	20 (44%)
8	BCL	v	101	-	64,74,74	1.72	12 (18%)	78,115,115	2.25	26 (33%)
8	BCL	Q	101	-	64,74,74	1.72	11 (17%)	78,115,115	2.25	26 (33%)
9	A1EFU	A	102	-	40,42,42	1.70	9 (22%)	45,52,52	3.77	19 (42%)
15	CDL	H	304	-	90,90,99	0.91	8 (8%)	96,102,111	1.14	4 (4%)
8	BCL	M	402	-	64,74,74	1.72	10 (15%)	78,115,115	2.23	24 (30%)
14	BPH	L	302	-	51,70,70	0.52	1 (1%)	52,101,101	0.71	1 (1%)
11	LMT	C	404	-	24,24,36	1.05	2 (8%)	29,29,47	1.06	1 (3%)
16	HEC	C	401	7	32,50,50	2.01	4 (12%)	24,82,82	2.25	11 (45%)
9	A1EFU	2	101	-	40,42,42	1.68	9 (22%)	45,52,52	3.77	20 (44%)
8	BCL	k	102	-	64,74,74	1.73	11 (17%)	78,115,115	2.26	26 (33%)
10	MW9	H	303	-	36,36,52	1.56	7 (19%)	39,41,58	1.88	3 (7%)
8	BCL	N	101	-	64,74,74	1.72	12 (18%)	78,115,115	2.31	26 (33%)
15	CDL	L	308	-	66,66,99	1.05	8 (12%)	72,78,111	1.16	4 (5%)
8	BCL	F	102	-	64,74,74	1.73	12 (18%)	78,115,115	2.30	28 (35%)
9	A1EFU	E	102	-	40,42,42	1.69	7 (17%)	45,52,52	3.67	19 (42%)
8	BCL	V	101	-	64,74,74	1.69	11 (17%)	78,115,115	2.27	29 (37%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
8	BCL	b	101	-	64,74,74	1.72	11 (17%)	78,115,115	2.26	28 (35%)
11	LMT	L	305	-	24,24,36	1.05	2 (8%)	29,29,47	1.10	2 (6%)
8	BCL	M	403	-	64,74,74	1.72	13 (20%)	78,115,115	2.30	28 (35%)
9	A1EFU	T	101	-	40,42,42	1.69	9 (22%)	45,52,52	3.72	20 (44%)
9	A1EFU	F	104	-	40,42,42	1.68	7 (17%)	45,52,52	3.74	19 (42%)
9	A1EFU	I	102	-	40,42,42	1.68	7 (17%)	45,52,52	3.98	20 (44%)
9	A1EFU	G	106	-	40,42,42	1.67	7 (17%)	45,52,52	4.00	19 (42%)
8	BCL	J	101	-	64,74,74	1.73	11 (17%)	78,115,115	2.30	27 (34%)
8	BCL	n	101	-	64,74,74	1.73	13 (20%)	78,115,115	2.25	27 (34%)
10	MW9	M	405	-	48,48,52	1.48	6 (12%)	51,54,58	1.51	3 (5%)
9	A1EFU	s	104	-	40,42,42	1.69	9 (22%)	45,52,52	3.26	20 (44%)
10	MW9	G	104	-	39,39,52	1.42	5 (12%)	42,45,58	1.18	3 (7%)
9	A1EFU	k	101	-	40,42,42	1.69	9 (22%)	45,52,52	3.98	20 (44%)
8	BCL	d	101	-	64,74,74	1.74	11 (17%)	78,115,115	2.26	23 (29%)
9	A1EFU	2	104	-	40,42,42	1.69	9 (22%)	45,52,52	3.48	21 (46%)
8	BCL	j	102	-	64,74,74	1.73	12 (18%)	78,115,115	2.28	27 (34%)
8	BCL	A	101	-	64,74,74	1.73	13 (20%)	78,115,115	2.18	26 (33%)
9	A1EFU	a	102	-	40,42,42	1.70	9 (22%)	45,52,52	4.01	20 (44%)
16	HEC	C	403	7	32,50,50	2.02	4 (12%)	24,82,82	2.32	12 (50%)

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
9	A1EFU	G	105	-	-	25/50/51/51	-
9	A1EFU	r	102	-	-	21/50/51/51	-
8	BCL	R	102	-	-	9/37/137/137	-
13	U10	L	303	-	-	13/45/69/87	0/1/1/1
8	BCL	t	101	-	-	12/37/137/137	-
10	MW9	F	103	-	-	33/47/47/57	-
8	BCL	P	102	-	-	16/37/137/137	-
9	A1EFU	K	102	-	-	21/50/51/51	-
8	BCL	K	101	-	-	10/37/137/137	-
11	LMT	H	302	-	-	6/15/35/61	0/1/1/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
9	A1EFU	M	407	-	-	17/50/51/51	-
11	LMT	L	306	-	-	8/15/35/61	0/1/1/2
9	A1EFU	B	103	-	-	19/50/51/51	-
8	BCL	s	102	-	-	10/37/137/137	-
8	BCL	q	102	-	-	14/37/137/137	-
9	A1EFU	E	103	-	-	19/50/51/51	-
8	BCL	P	101	-	-	14/37/137/137	-
9	A1EFU	N	102	-	-	23/50/51/51	-
8	BCL	2	103	-	-	20/37/137/137	-
8	BCL	s	103	-	-	19/37/137/137	-
10	MW9	M	406	-	-	34/57/57/57	-
9	A1EFU	j	101	-	-	25/50/51/51	-
8	BCL	e	101	-	-	11/37/137/137	-
8	BCL	1	101	-	-	13/37/137/137	-
8	BCL	E	101	-	-	10/37/137/137	-
10	MW9	H	301	-	-	27/52/52/57	-
9	A1EFU	q	101	-	-	24/50/51/51	-
9	A1EFU	P	103	-	-	22/50/51/51	-
8	BCL	L	301	-	-	17/37/137/137	-
8	BCL	G	101	-	-	13/37/137/137	-
9	A1EFU	s	105	-	-	24/50/51/51	-
14	BPH	M	408	-	-	10/37/105/105	0/5/6/6
9	A1EFU	2	102	-	-	29/50/51/51	-
11	LMT	D	102	-	-	7/21/61/61	0/2/2/2
8	BCL	i	101	-	-	21/37/137/137	-
8	BCL	G	102	-	-	15/37/137/137	-
8	BCL	I	101	-	-	11/37/137/137	-
9	A1EFU	D	104	-	-	17/50/51/51	-
9	A1EFU	f	101	-	-	18/50/51/51	-
8	BCL	B	101	-	-	15/37/137/137	-
9	A1EFU	J	102	-	-	14/50/51/51	-
8	BCL	L	304	-	-	17/37/137/137	-
10	MW9	R	103	-	-	34/49/49/57	-
16	HEC	C	402	7	-	4/10/54/54	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	BCL	a	101	-	-	19/37/137/137	-
9	A1EFU	R	101	-	-	19/50/51/51	-
9	A1EFU	v	102	-	-	23/50/51/51	-
9	A1EFU	s	101	-	-	20/50/51/51	-
8	BCL	F	101	-	-	16/37/137/137	-
13	U10	M	404	-	-	10/63/87/87	0/1/1/1
9	A1EFU	v	103	-	-	24/50/51/51	-
9	A1EFU	p	101	-	-	19/50/51/51	-
8	BCL	r	101	-	-	11/37/137/137	-
9	A1EFU	J	103	-	-	20/50/51/51	-
8	BCL	D	101	-	-	9/37/137/137	-
9	A1EFU	j	103	-	-	19/50/51/51	-
10	MW9	L	307	-	-	15/41/41/57	-
8	BCL	S	101	-	-	13/37/137/137	-
10	MW9	G	103	-	-	27/53/53/57	-
10	MW9	D	103	-	-	29/57/57/57	-
9	A1EFU	B	102	-	-	16/50/51/51	-
9	A1EFU	D	105	-	-	19/50/51/51	-
8	BCL	v	101	-	-	19/37/137/137	-
8	BCL	Q	101	-	-	21/37/137/137	-
9	A1EFU	A	102	-	-	19/50/51/51	-
15	CDL	H	304	-	-	46/101/101/110	-
8	BCL	M	402	-	-	14/37/137/137	-
14	BPH	L	302	-	-	8/37/105/105	0/5/6/6
11	LMT	C	404	-	-	5/15/35/61	0/1/1/2
16	HEC	C	401	7	-	3/10/54/54	-
9	A1EFU	2	101	-	-	20/50/51/51	-
8	BCL	k	102	-	-	10/37/137/137	-
10	MW9	H	303	-	-	22/38/38/57	-
8	BCL	N	101	-	-	10/37/137/137	-
15	CDL	L	308	-	-	41/77/77/110	-
8	BCL	F	102	-	-	10/37/137/137	-
9	A1EFU	E	102	-	-	18/50/51/51	-
8	BCL	V	101	-	-	7/37/137/137	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	BCL	b	101	-	-	11/37/137/137	-
11	LMT	L	305	-	-	5/15/35/61	0/1/1/2
8	BCL	M	403	-	-	20/37/137/137	-
9	A1EFU	T	101	-	-	21/50/51/51	-
9	A1EFU	F	104	-	-	21/50/51/51	-
9	A1EFU	I	102	-	-	20/50/51/51	-
9	A1EFU	G	106	-	-	24/50/51/51	-
8	BCL	J	101	-	-	12/37/137/137	-
8	BCL	n	101	-	-	11/37/137/137	-
10	MW9	M	405	-	-	30/53/53/57	-
9	A1EFU	s	104	-	-	22/50/51/51	-
10	MW9	G	104	-	-	27/44/44/57	-
9	A1EFU	k	101	-	-	25/50/51/51	-
8	BCL	d	101	-	-	25/37/137/137	-
9	A1EFU	2	104	-	-	22/50/51/51	-
8	BCL	j	102	-	-	14/37/137/137	-
8	BCL	A	101	-	-	14/37/137/137	-
9	A1EFU	a	102	-	-	18/50/51/51	-
16	HEC	C	403	7	-	2/10/54/54	-

The worst 5 of 843 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	C	402	HEC	C3C-C2C	-6.54	1.33	1.40
16	C	403	HEC	C3C-C2C	-6.44	1.34	1.40
16	C	401	HEC	C2B-C3B	-6.28	1.34	1.40
16	C	402	HEC	C2B-C3B	-6.27	1.34	1.40
16	C	401	HEC	C3C-C2C	-6.20	1.34	1.40

The worst 5 of 1801 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
9	j	101	A1EFU	C11-C10-C9	-11.21	111.31	127.31
9	k	101	A1EFU	C7-C6-C5	-10.60	112.18	127.31
9	a	102	A1EFU	C7-C6-C5	-10.56	112.24	127.31
9	a	102	A1EFU	C15-C14-C13	-10.54	112.27	127.31
9	I	102	A1EFU	C7-C6-C5	-10.35	112.53	127.31

There are no chirality outliers.

5 of 1706 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	P	101	BCL	C1A-C2A-CAA-CBA
8	P	101	BCL	C3A-C2A-CAA-CBA
8	P	101	BCL	C4C-C3C-CAC-CBC
8	P	102	BCL	O1A-CGA-O2A-C1
8	P	102	BCL	C1-C2-C3-C4

There are no ring outliers.

46 monomers are involved in 134 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	R	102	BCL	6	0
13	L	303	U10	5	0
8	t	101	BCL	9	0
8	P	102	BCL	2	0
8	K	101	BCL	2	0
8	s	102	BCL	7	0
8	q	102	BCL	2	0
8	2	103	BCL	4	0
8	s	103	BCL	2	0
8	e	101	BCL	4	0
8	E	101	BCL	2	0
8	L	301	BCL	3	0
8	G	101	BCL	2	0
14	M	408	BPH	2	0
11	D	102	LMT	1	0
8	i	101	BCL	2	0
8	G	102	BCL	2	0
8	I	101	BCL	1	0
8	B	101	BCL	4	0
8	L	304	BCL	6	0
10	R	103	MW9	1	0
8	a	101	BCL	2	0
8	F	101	BCL	4	0
13	M	404	U10	7	0
8	r	101	BCL	4	0
8	D	101	BCL	2	0
8	v	101	BCL	5	0
8	Q	101	BCL	1	0
15	H	304	CDL	3	0
8	M	402	BCL	3	0

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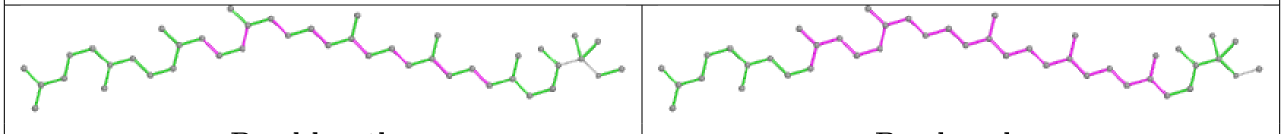
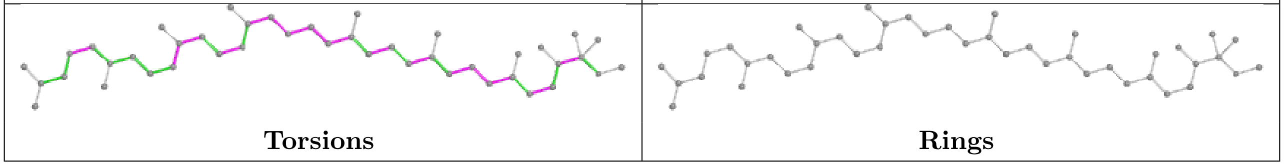
Mol	Chain	Res	Type	Clashes	Symm-Clashes
11	C	404	LMT	2	0
16	C	401	HEC	5	0
8	k	102	BCL	1	0
8	N	101	BCL	2	0
15	L	308	CDL	1	0
8	F	102	BCL	1	0
8	V	101	BCL	3	0
8	b	101	BCL	2	0
11	L	305	LMT	1	0
8	M	403	BCL	3	0
8	J	101	BCL	3	0
8	n	101	BCL	3	0
9	s	104	A1EFU	1	0
8	d	101	BCL	8	0
8	j	102	BCL	7	0
8	A	101	BCL	5	0

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

Ligand A1EFU G 105

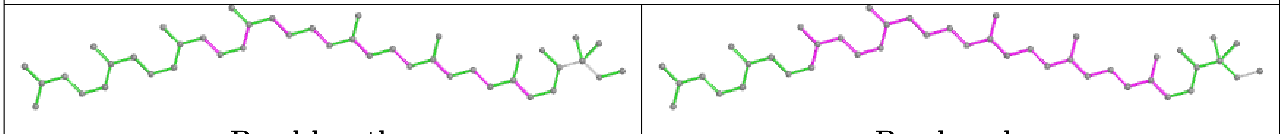


Bond lengths **Bond angles**

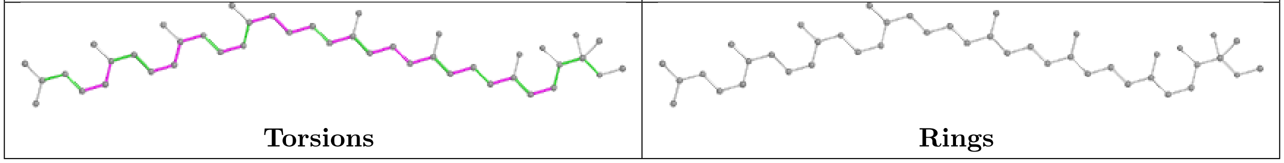


Torsions **Rings**

Ligand A1EFU r 102

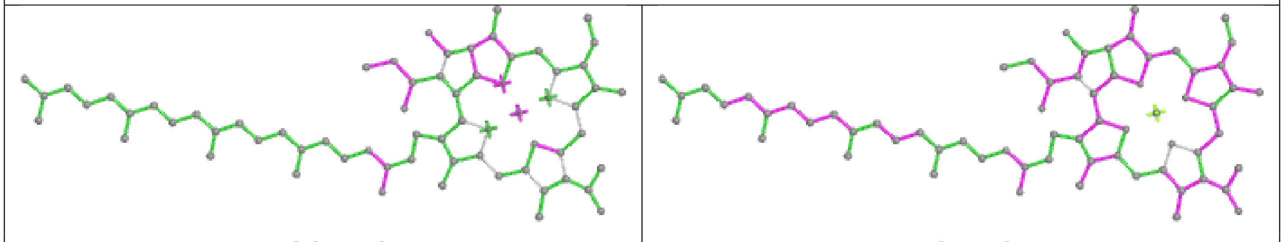


Bond lengths Bond angles

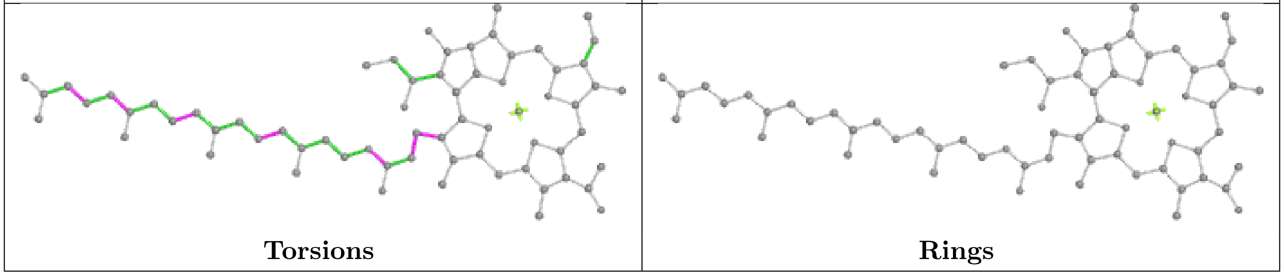


Torsions Rings

Ligand BCL R 102

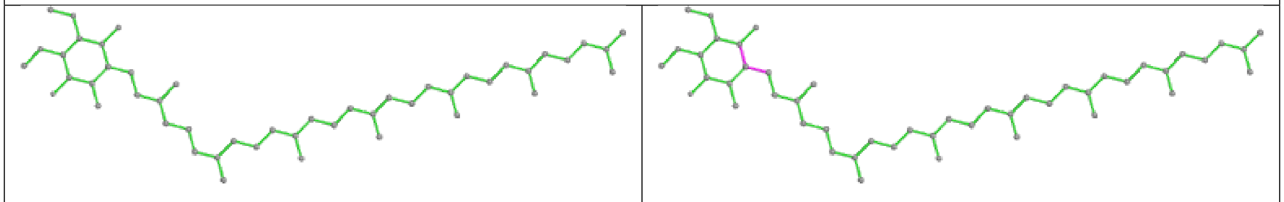


Bond lengths Bond angles

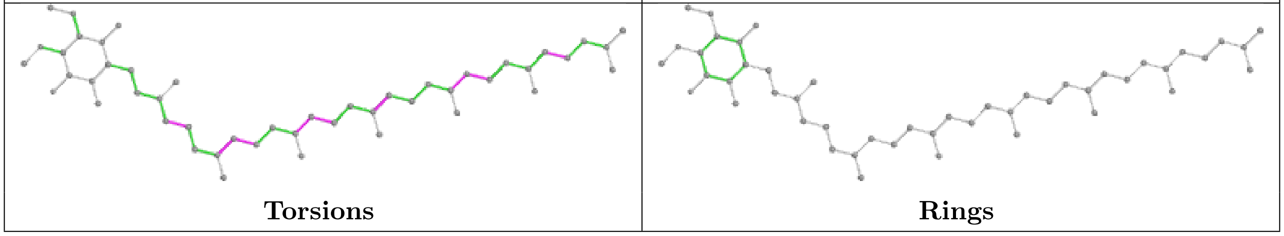


Torsions Rings

Ligand U10 L 303

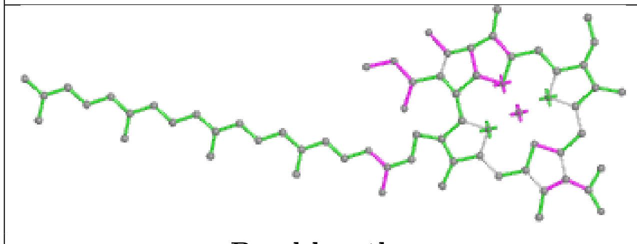


Bond lengths Bond angles

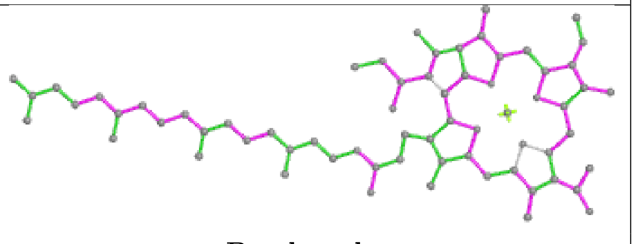


Torsions Rings

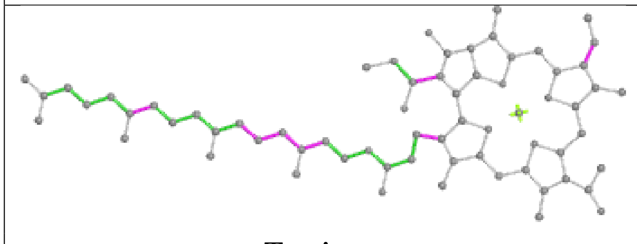
Ligand BCL t 101



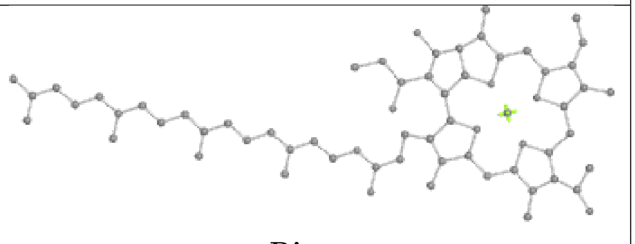
Bond lengths



Bond angles

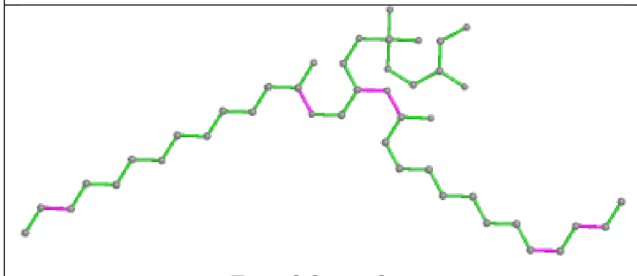


Torsions

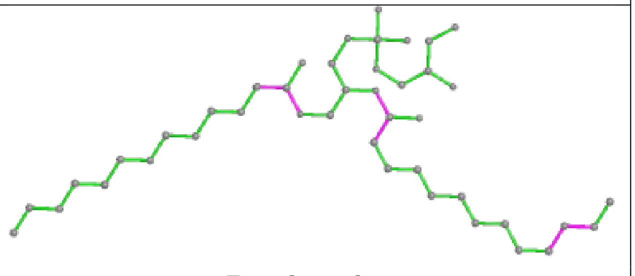


Rings

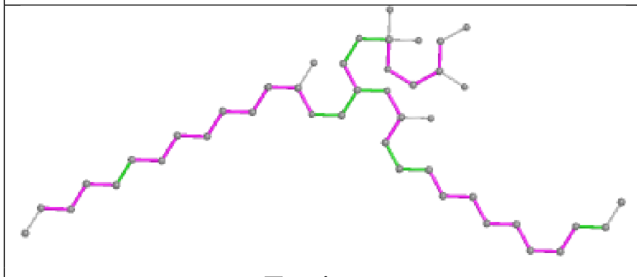
Ligand MW9 F 103



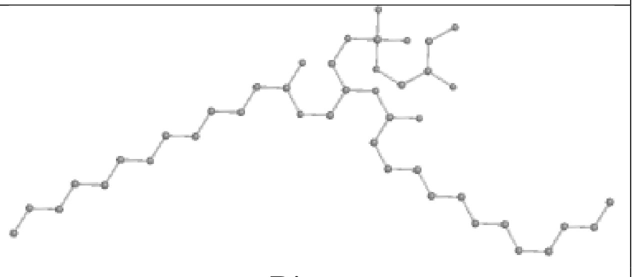
Bond lengths



Bond angles

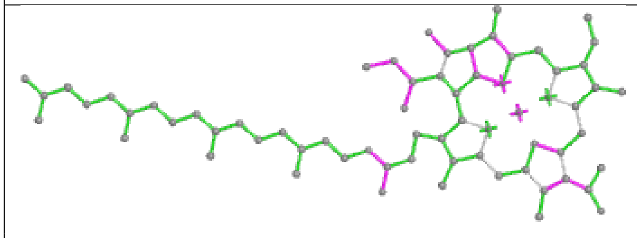


Torsions



Rings

Ligand BCL P 102



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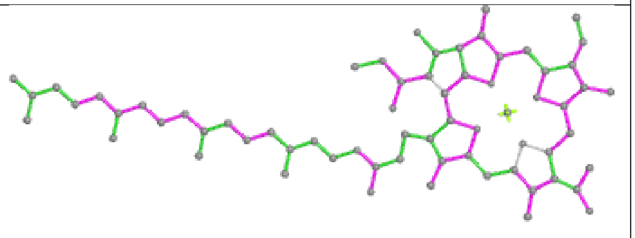

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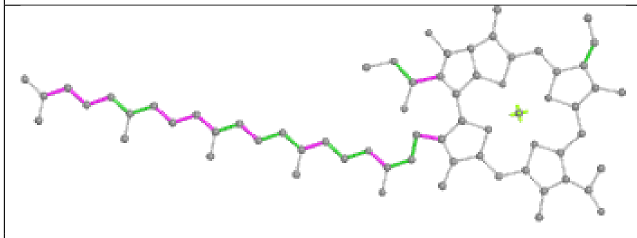
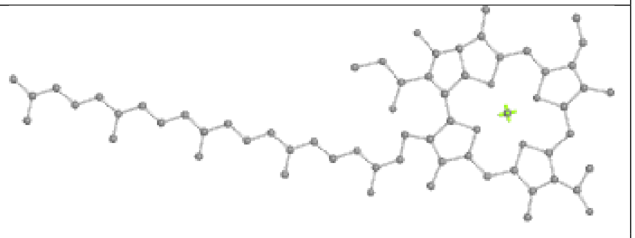
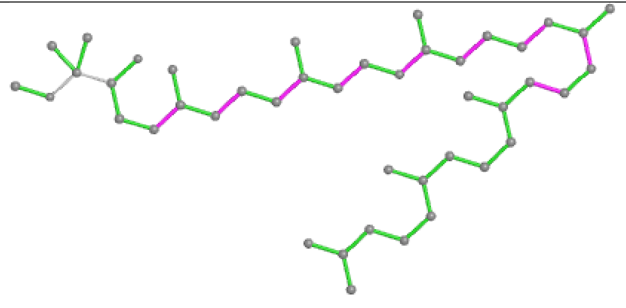


Torsions



Rings

Ligand A1EFU K 102



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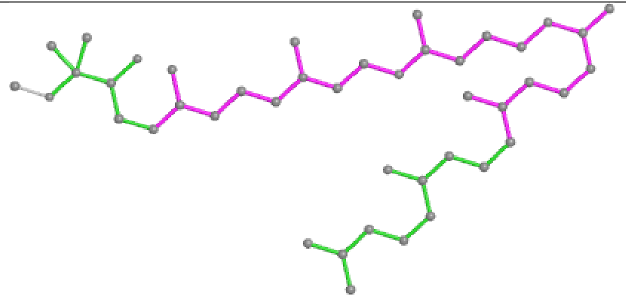

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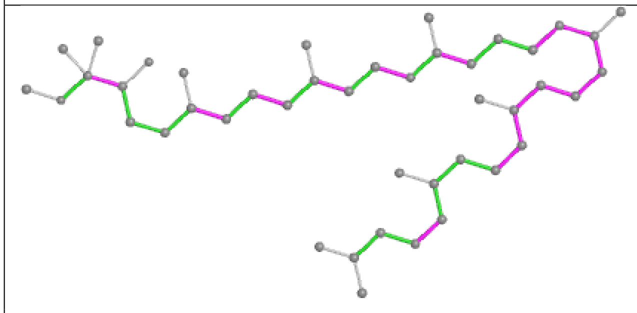

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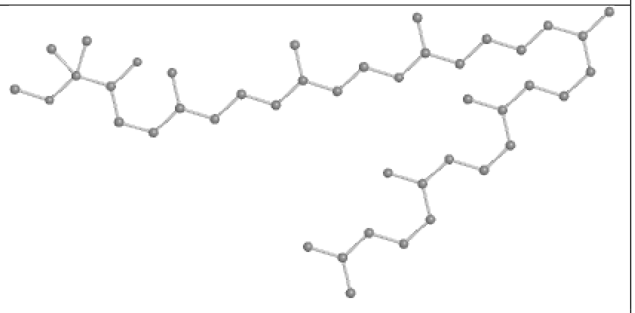
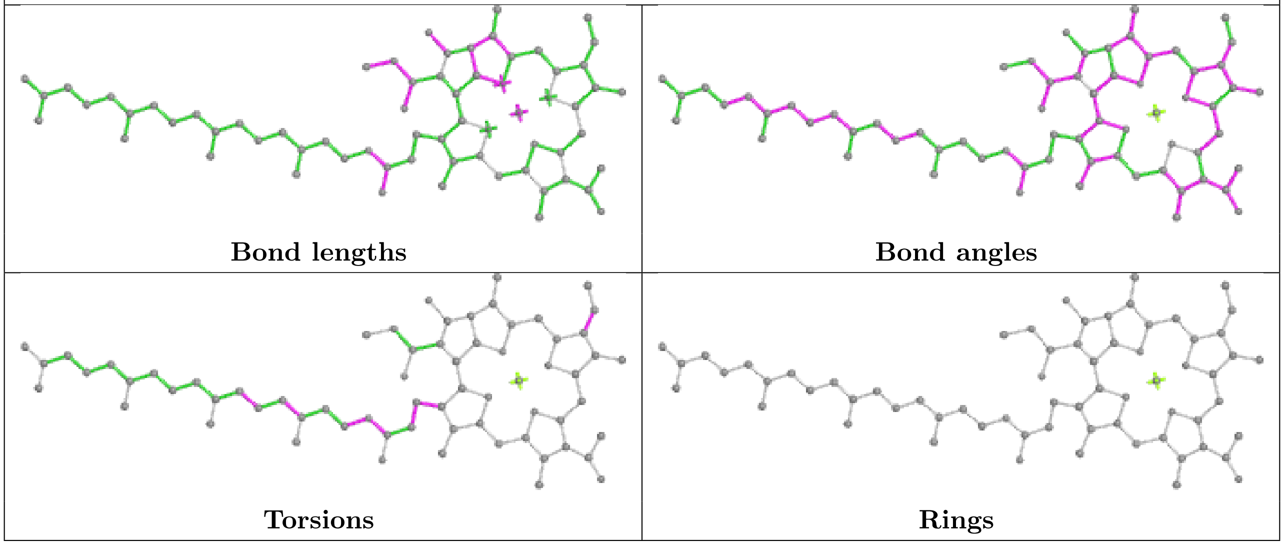


Rings

Ligand BCL K 101



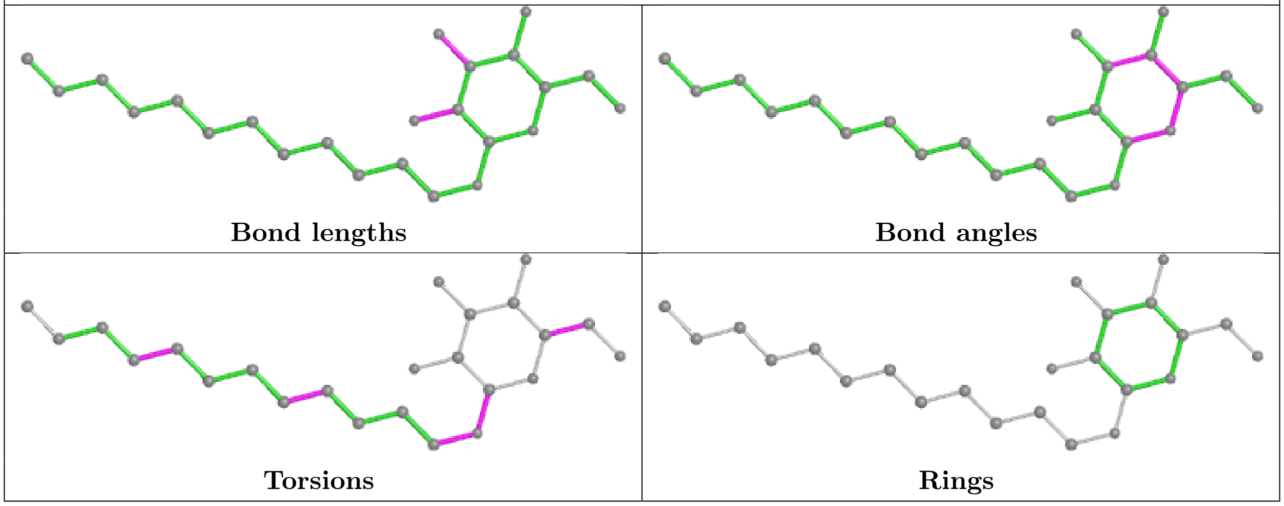
Bond lengths

Bond angles

Torsions

Rings

Ligand LMT H 302



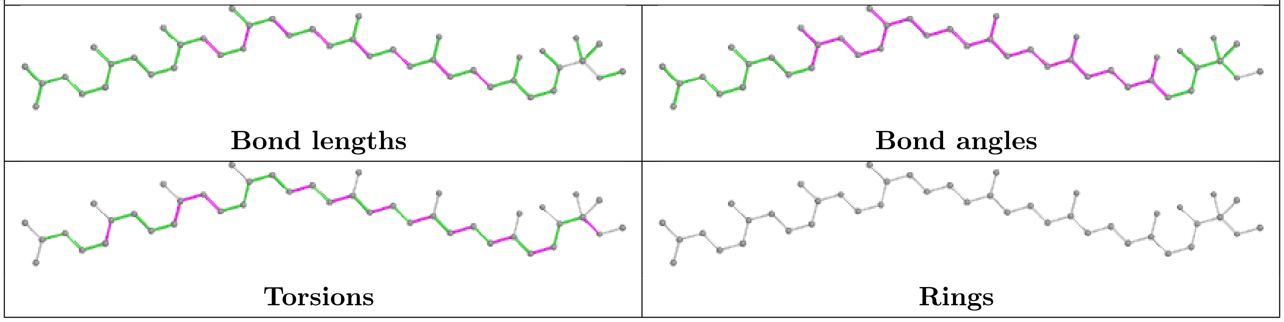
Bond lengths

Bond angles

Torsions

Rings

Ligand A1EFU M 407



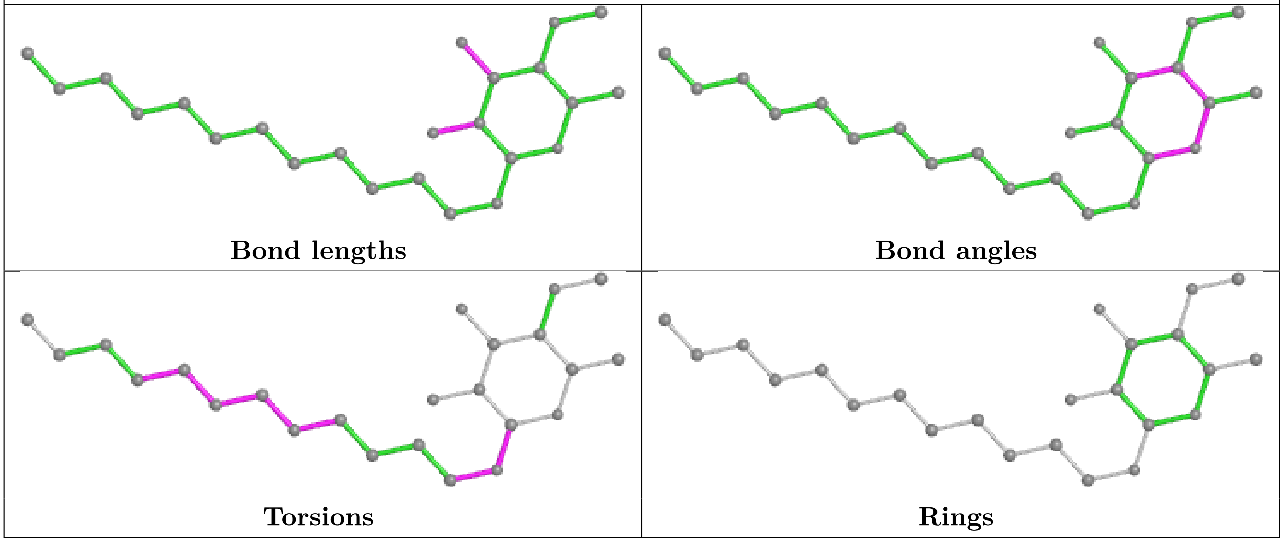
Bond lengths

Bond angles

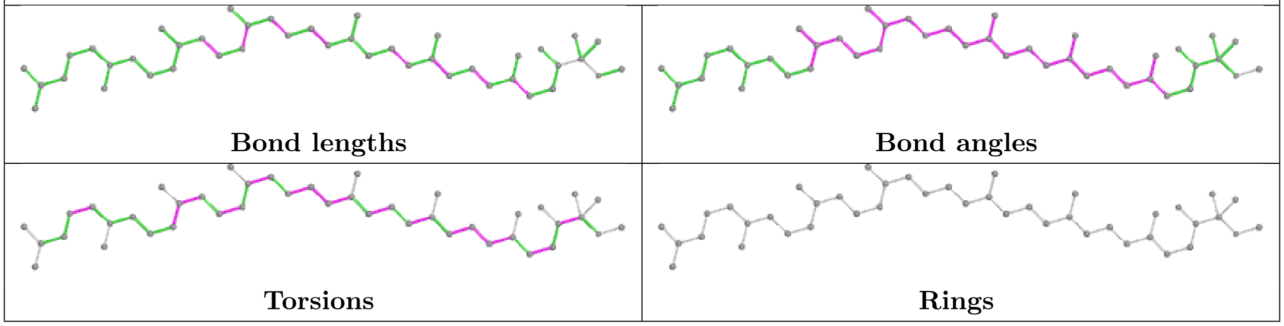
Torsions

Rings

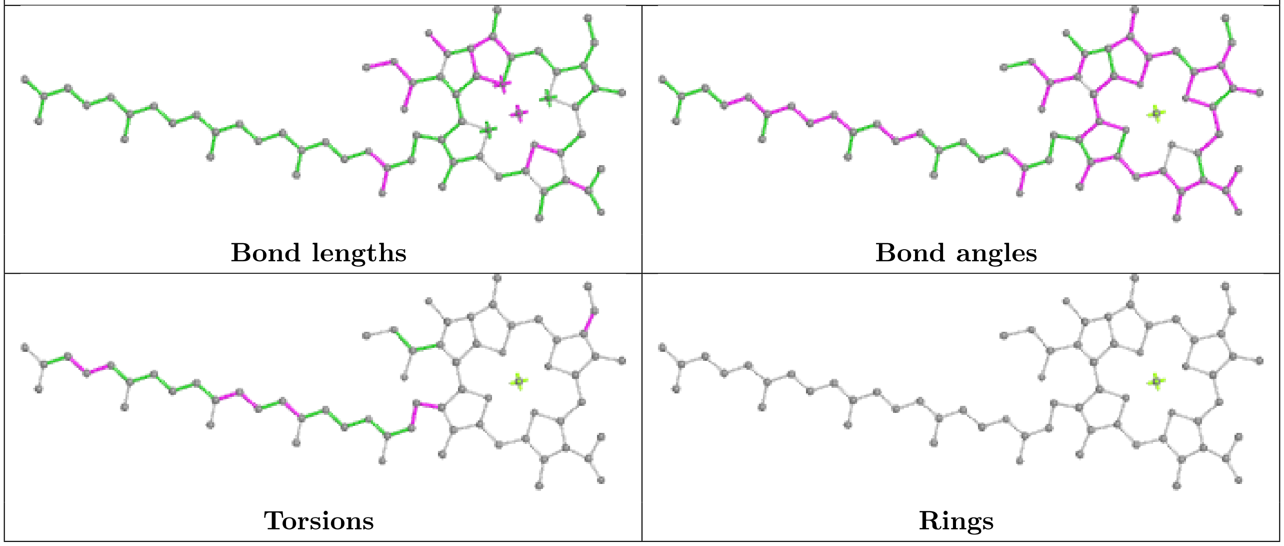
Ligand LMT L 306


Bond lengths
Bond angles
Torsions
Rings

Ligand A1EFU B 103


Bond lengths
Bond angles
Torsions
Rings

Ligand BCL s 102


Bond lengths
Bond angles
Torsions
Rings

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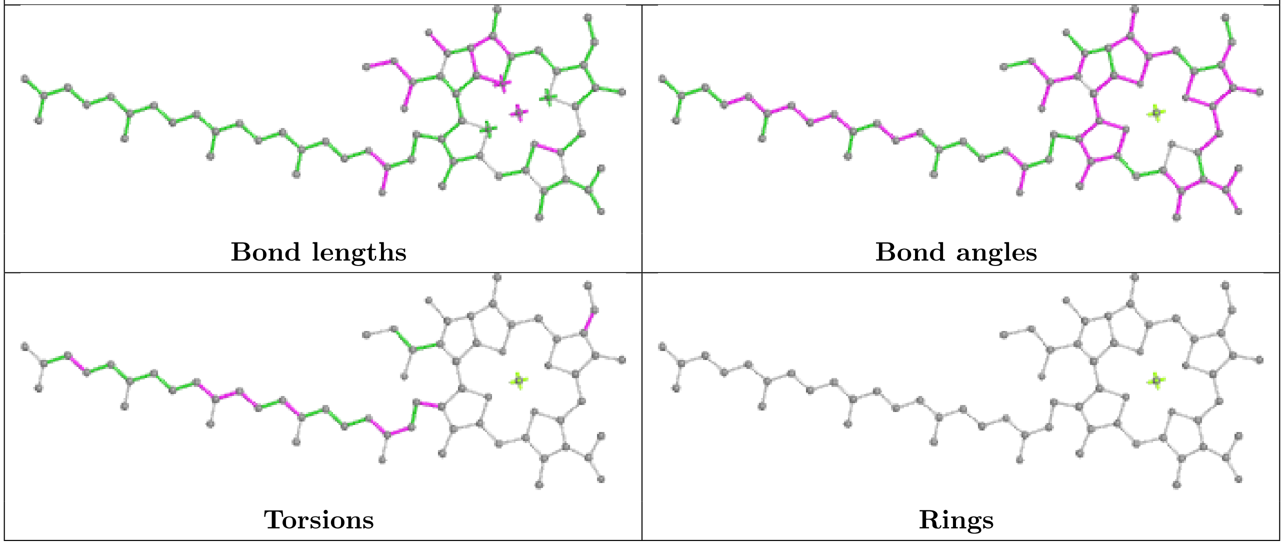


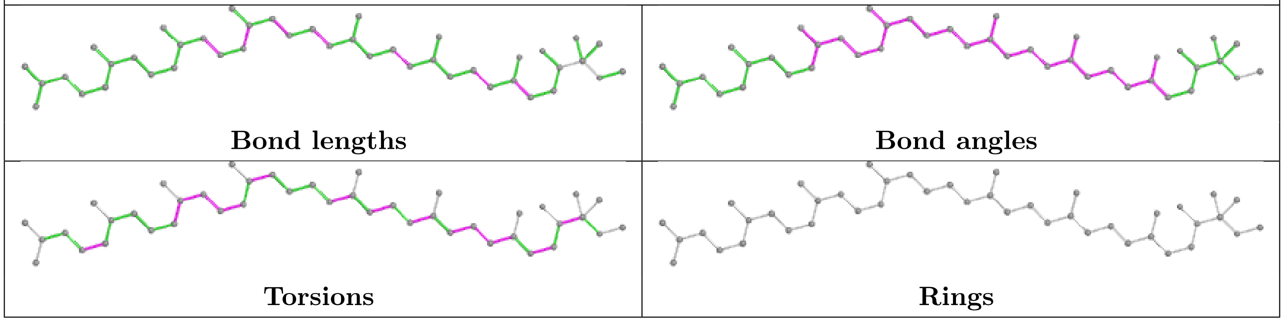
Bond lengths

Bond angles

Torsions

Rings

Ligand A1EFU E 103



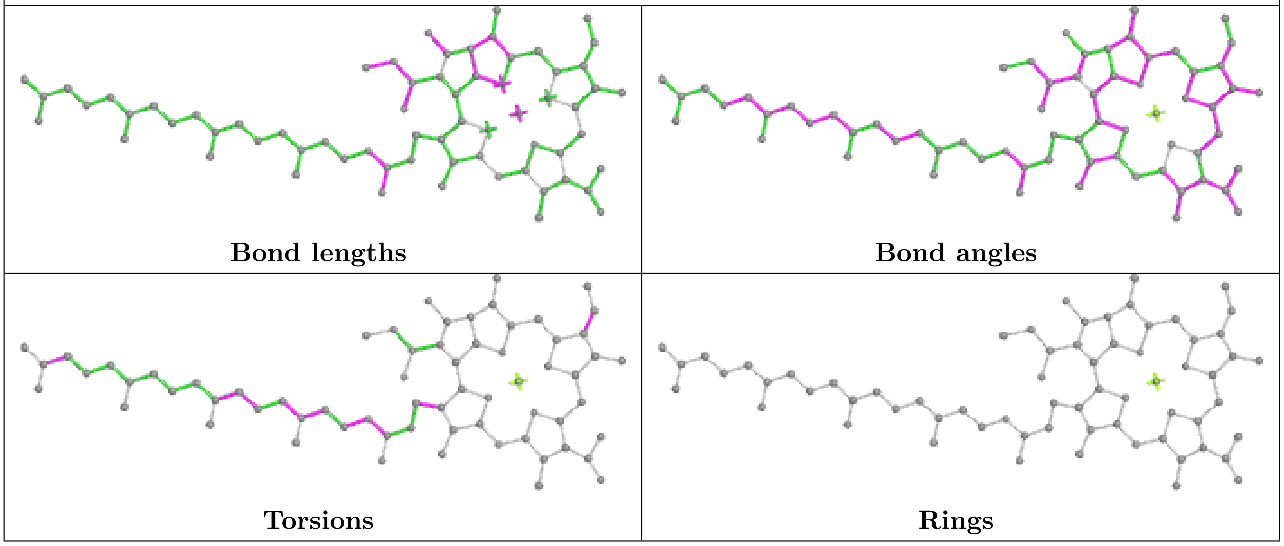
Bond lengths

Bond angles

Torsions

Rings

Ligand BCL P 101



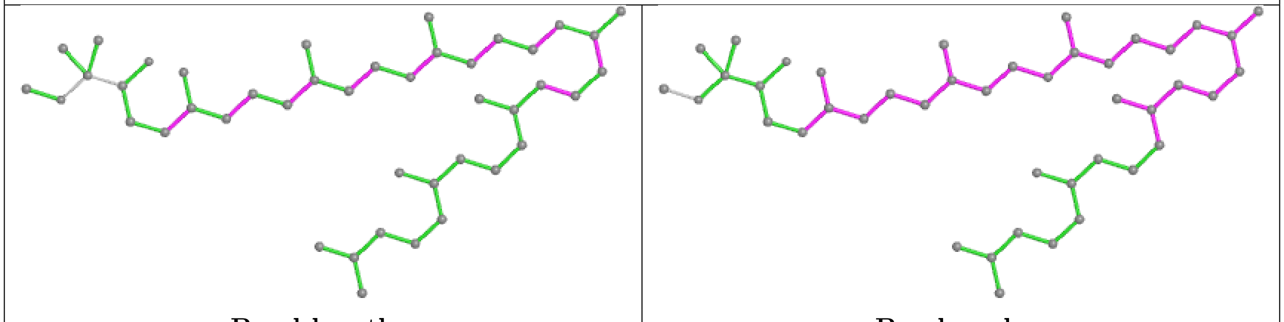
Bond lengths

Bond angles

Torsions

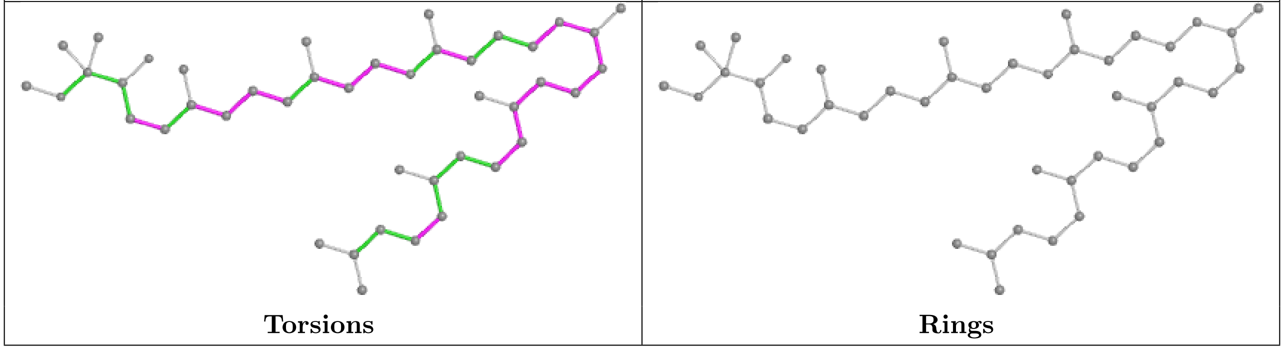
Rings

Ligand A1EFU N 102



Bond lengths

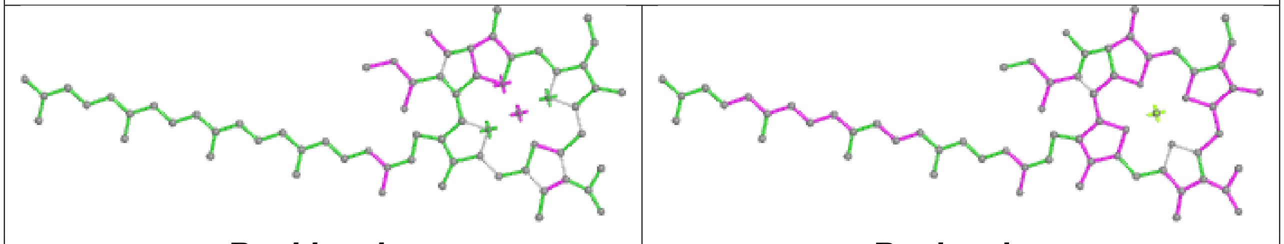
Bond angles



Torsions

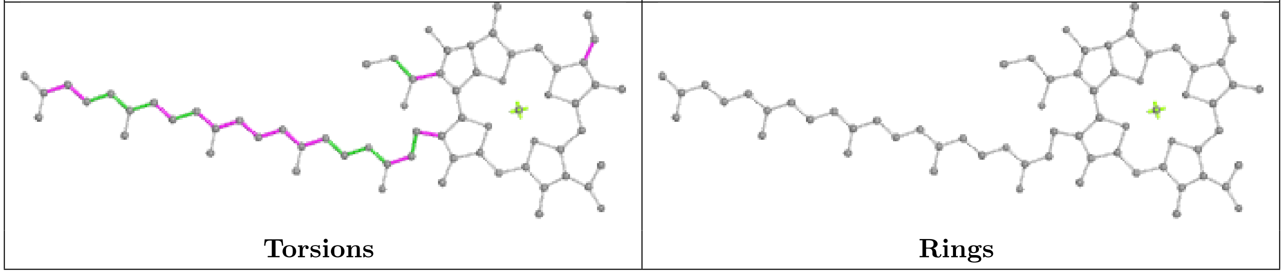
Rings

Ligand BCL 2 103



Bond lengths

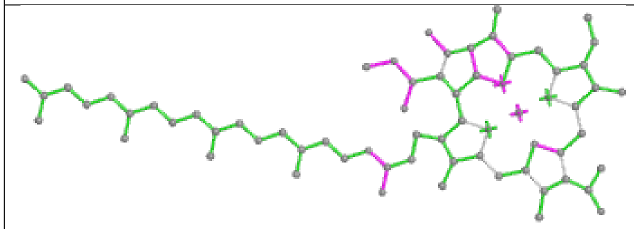
Bond angles



Torsions

Rings

Ligand BCL s 103



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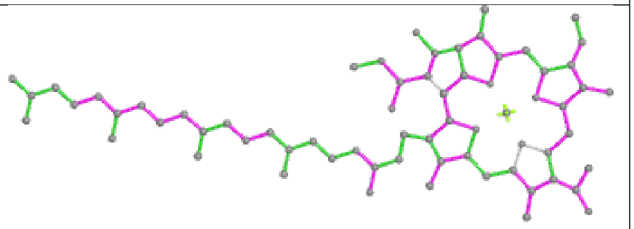

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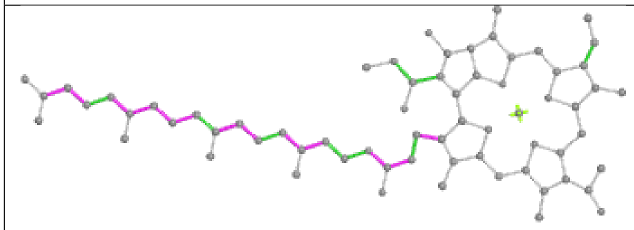
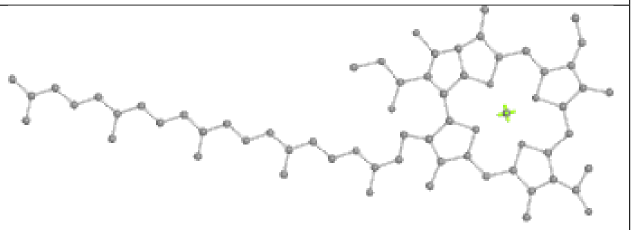
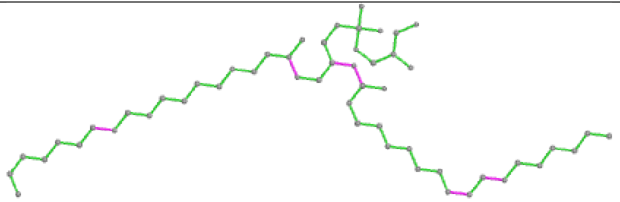


Torsions

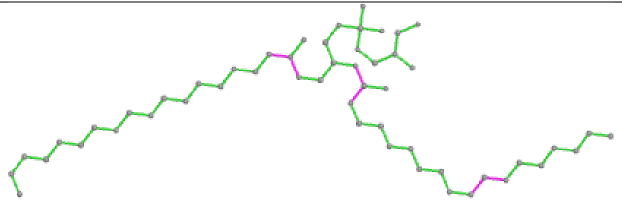


Rings

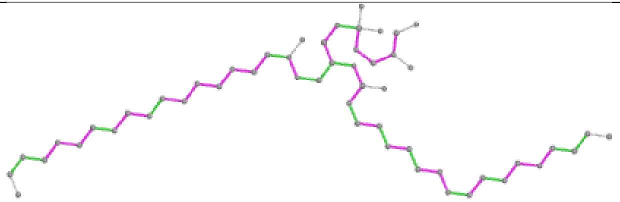
Ligand MW9 M 406



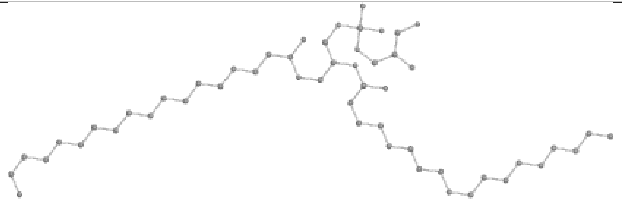
Bond lengths



Bond angles

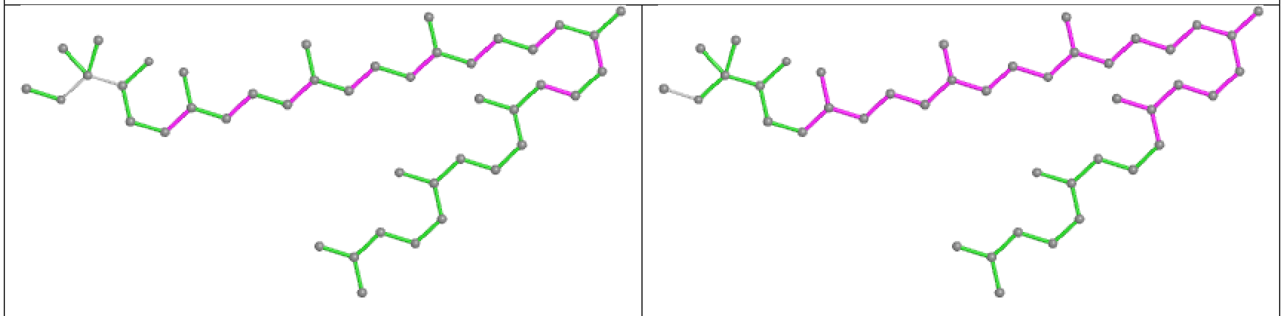


Torsions



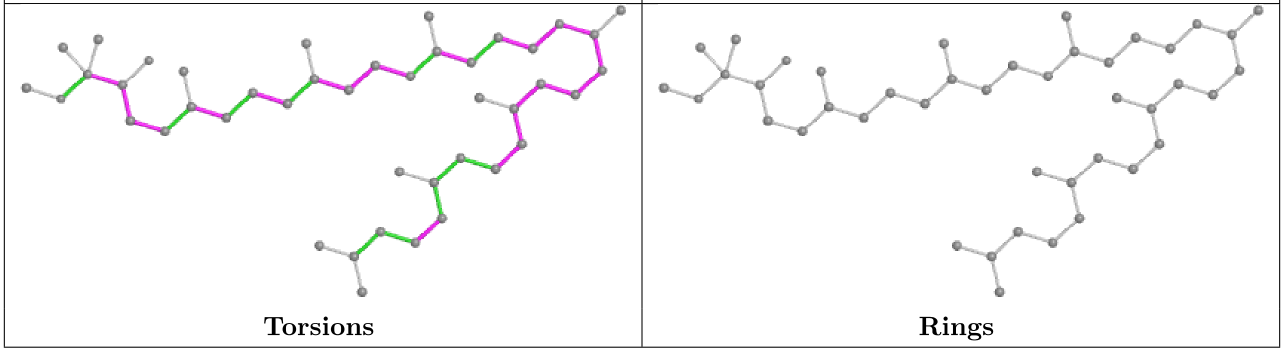
Rings

Ligand A1EFU j 101



Bond lengths

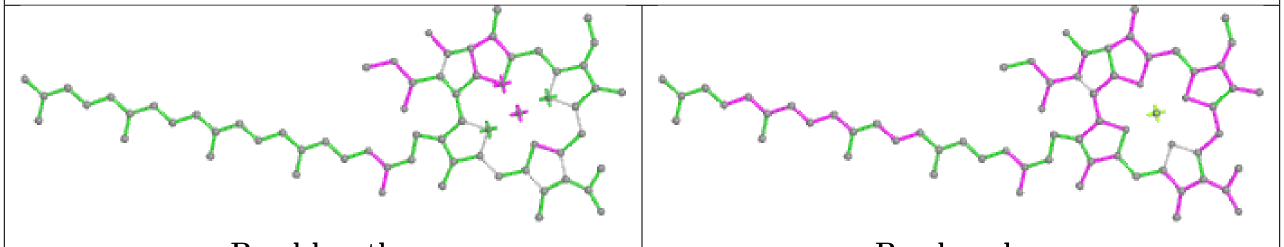
Bond angles



Torsions

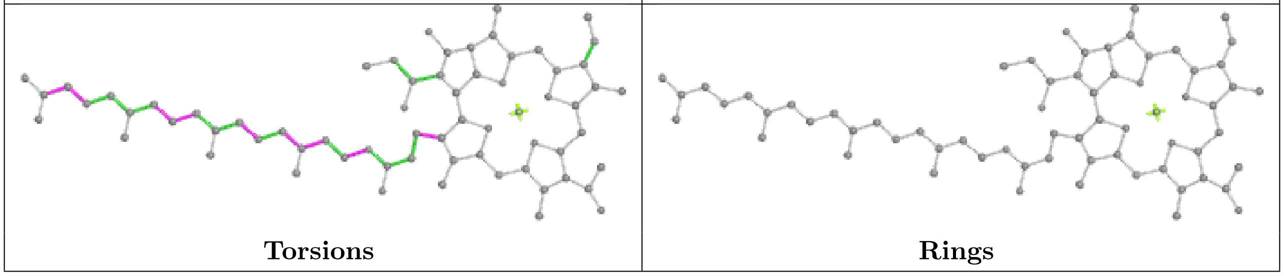
Rings

Ligand BCL e 101



Bond lengths

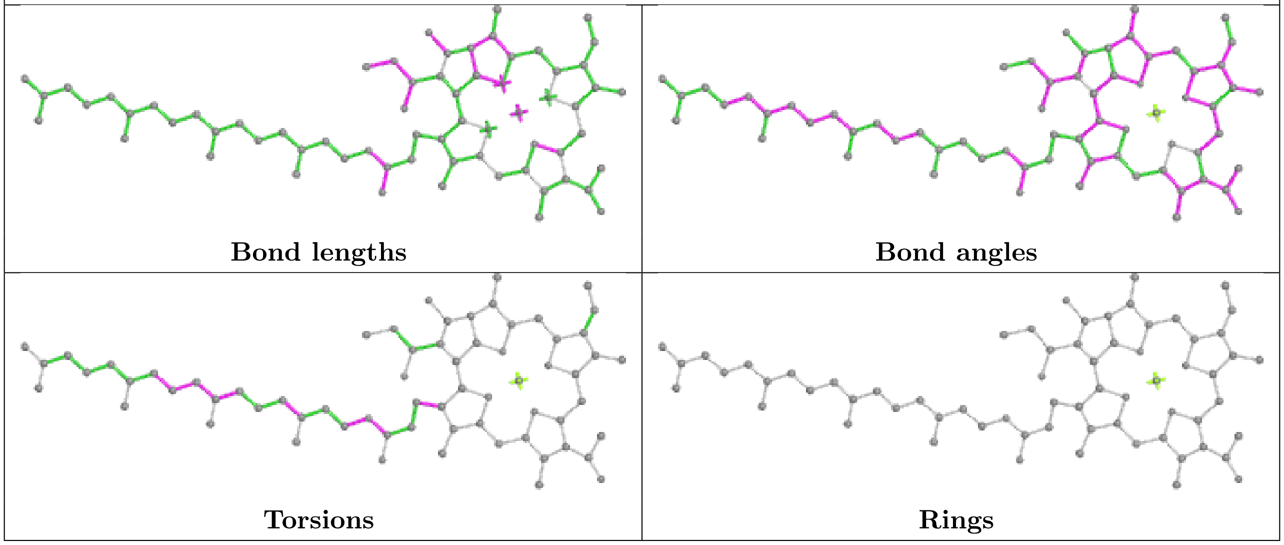
Bond angles



Torsions

Rings

Ligand BCL 1 101



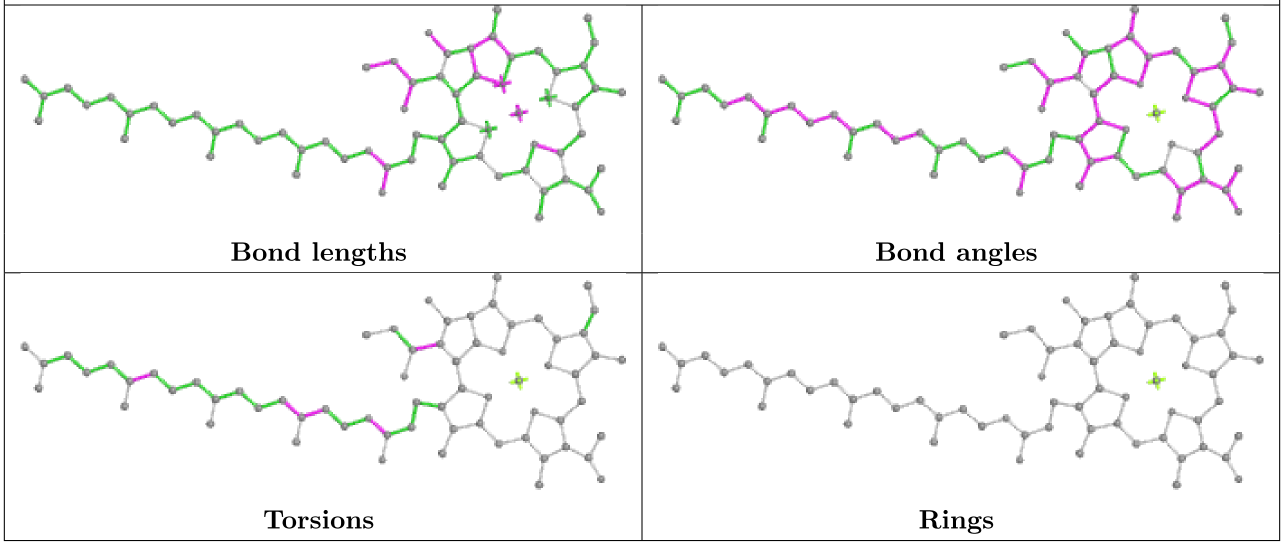
Bond lengths

Bond angles

Torsions

Rings

Ligand BCL E 101



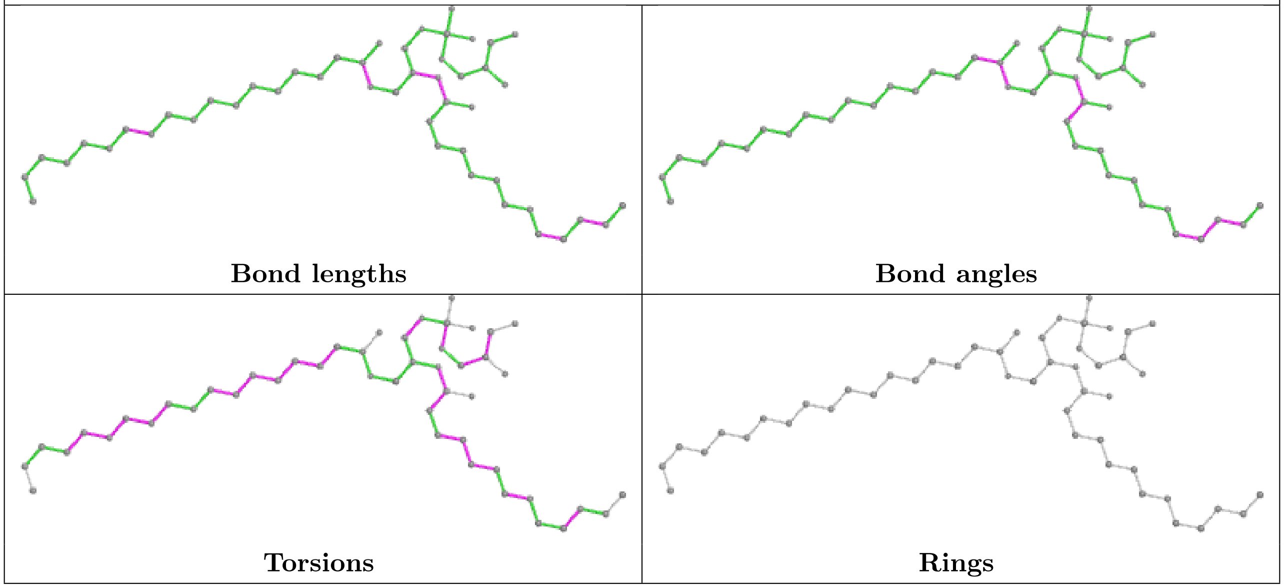
Bond lengths

Bond angles

Torsions

Rings

Ligand MW9 H 301



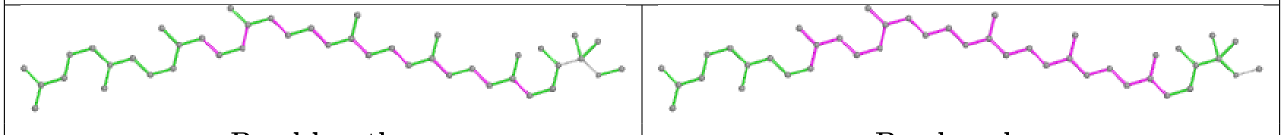
Bond lengths

Bond angles

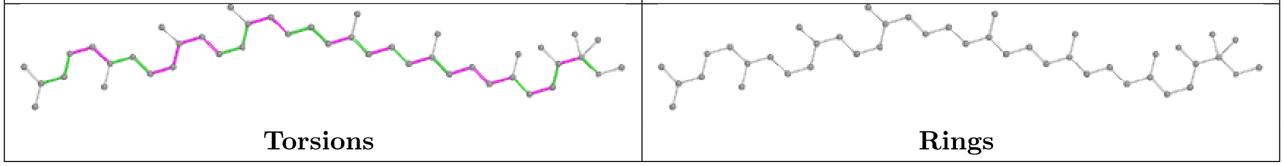
Torsions

Rings

Ligand A1EFU q 101

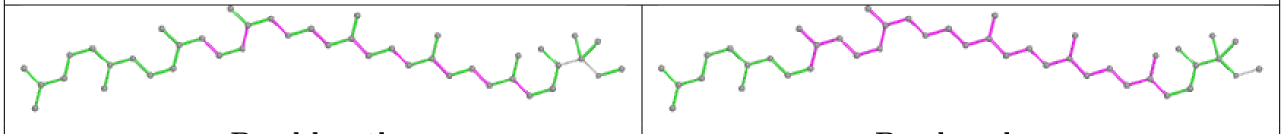


Bond lengths Bond angles

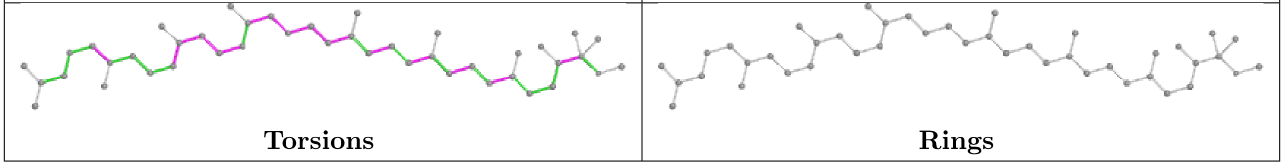


Torsions Rings

Ligand A1EFU P 103

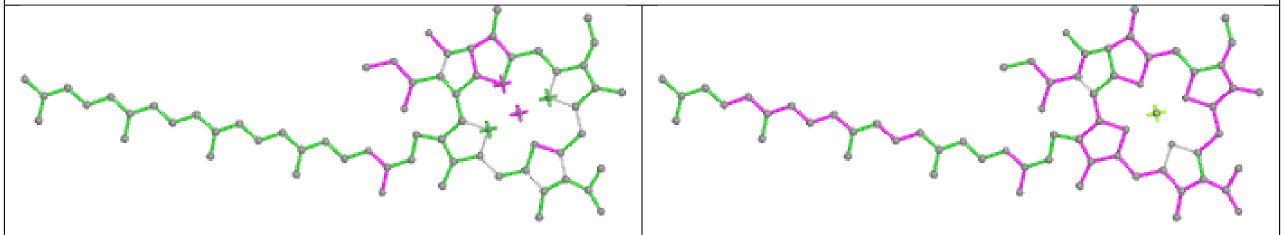


Bond lengths Bond angles

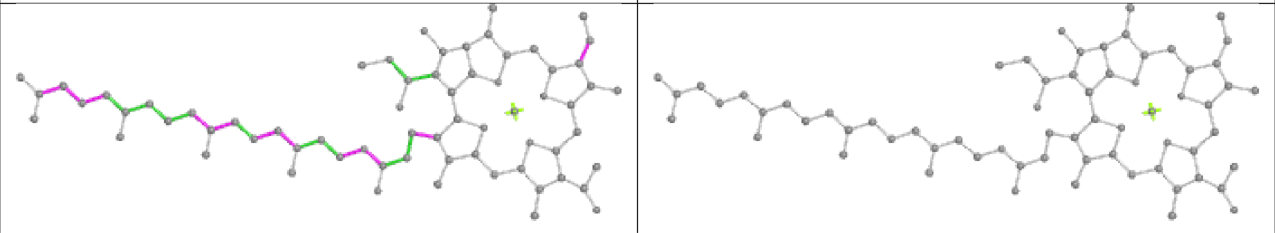


Torsions Rings

Ligand BCL L 301

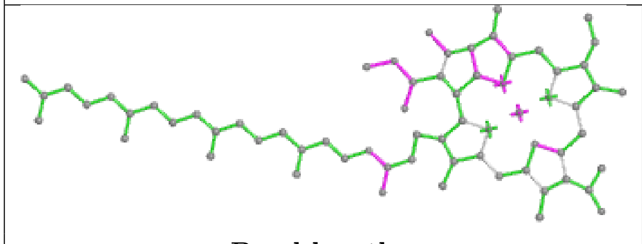


Bond lengths Bond angles

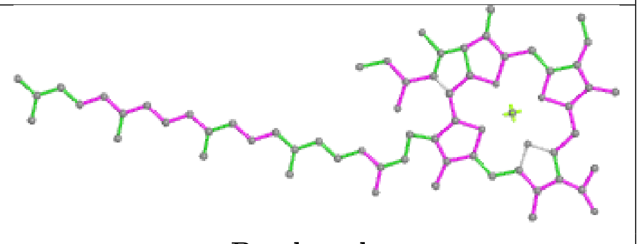


Torsions Rings

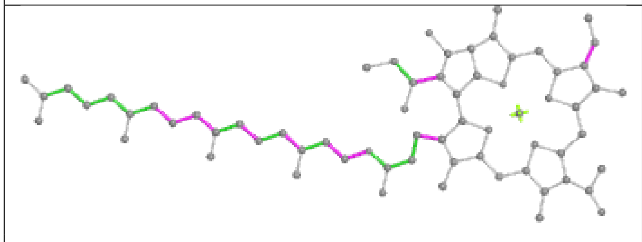
Ligand BCL G 101



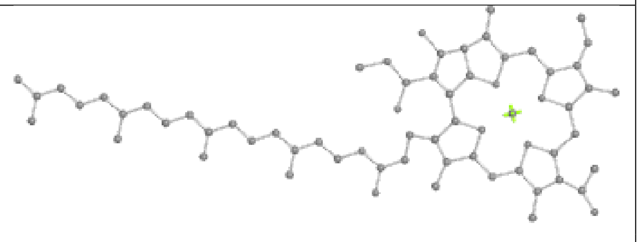
Bond lengths



Bond angles

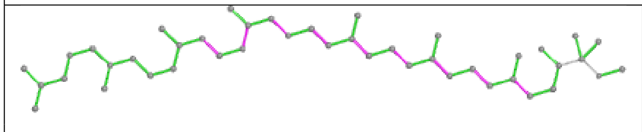


Torsions

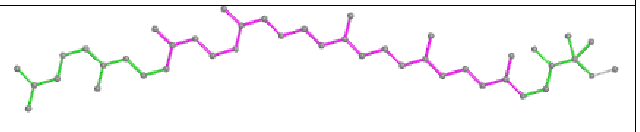


Rings

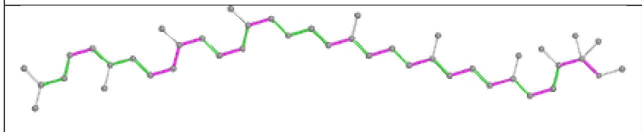
Ligand A1EFU s 105



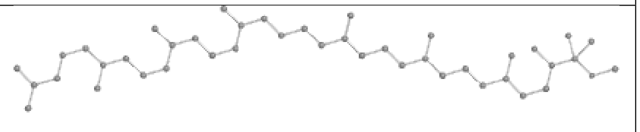
Bond lengths



Bond angles

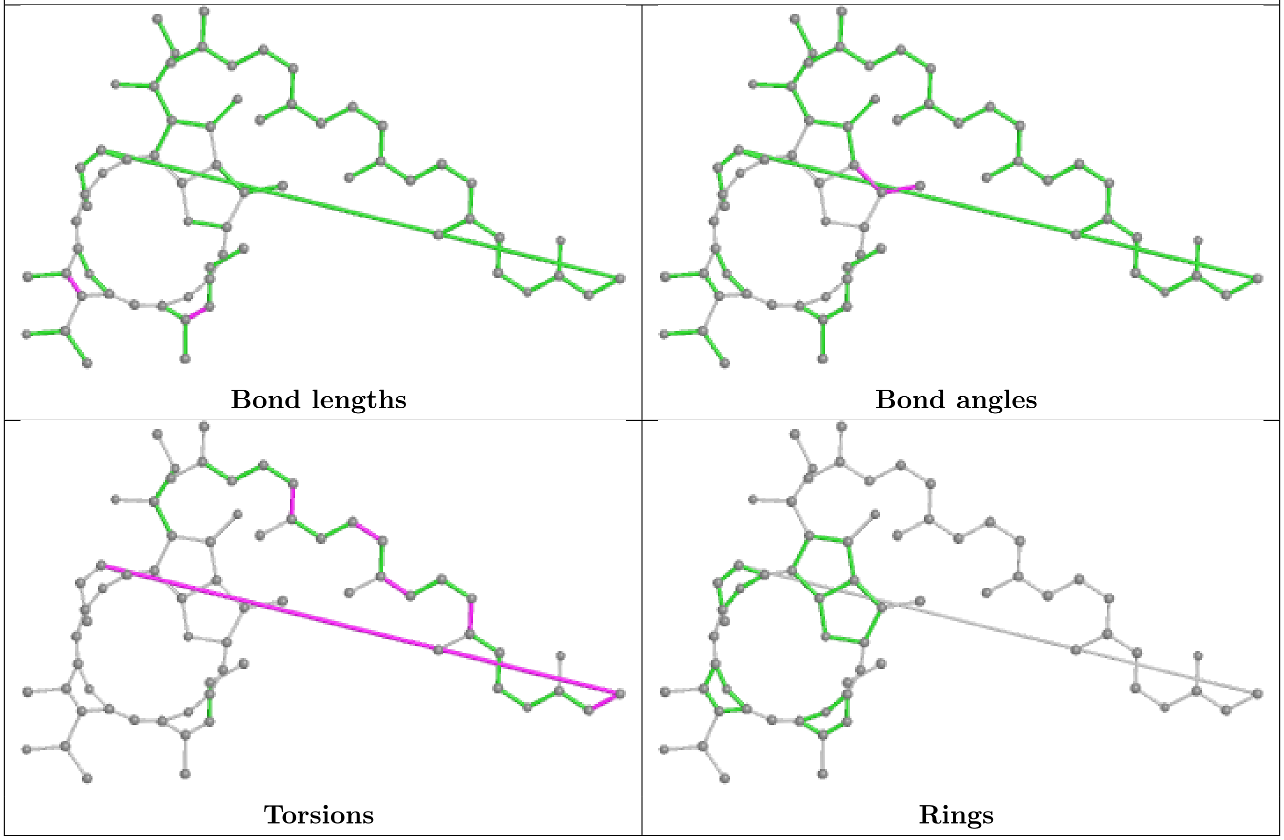


Torsions



Rings

Ligand BPH M 408



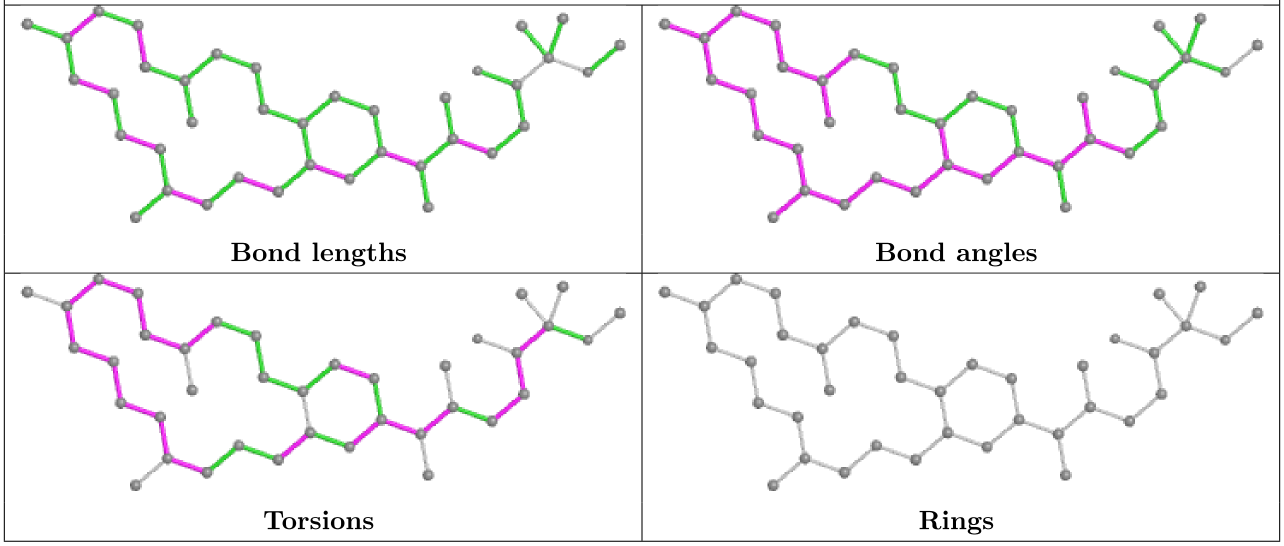
Bond lengths

Bond angles

Torsions

Rings

Ligand A1EFU 2 102



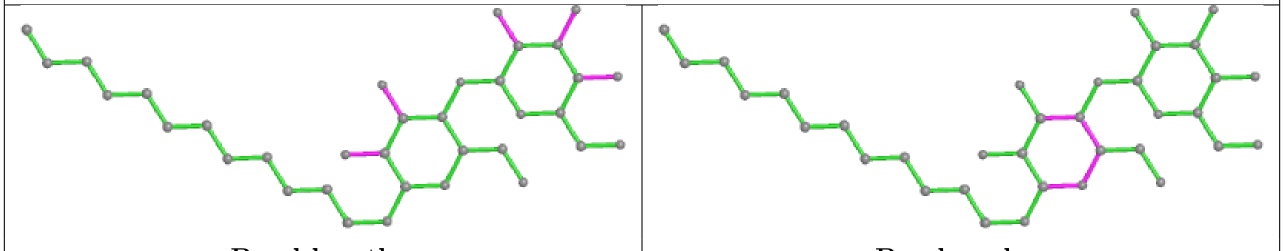
Bond lengths

Bond angles

Torsions

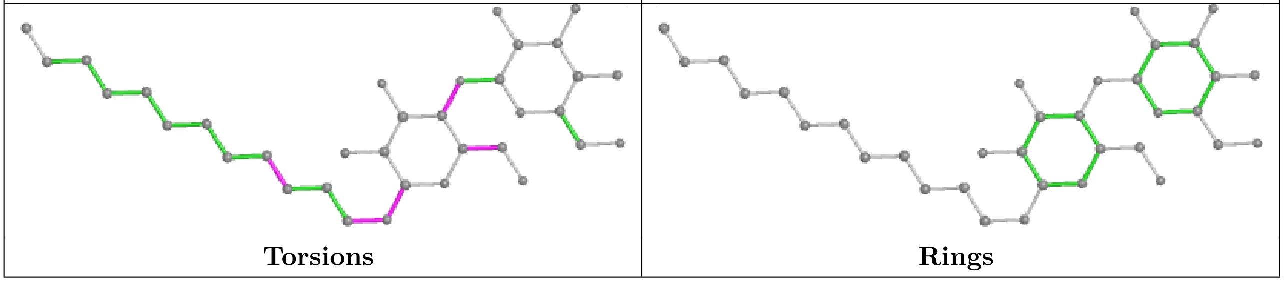
Rings

Ligand LMT D 102



Bond lengths

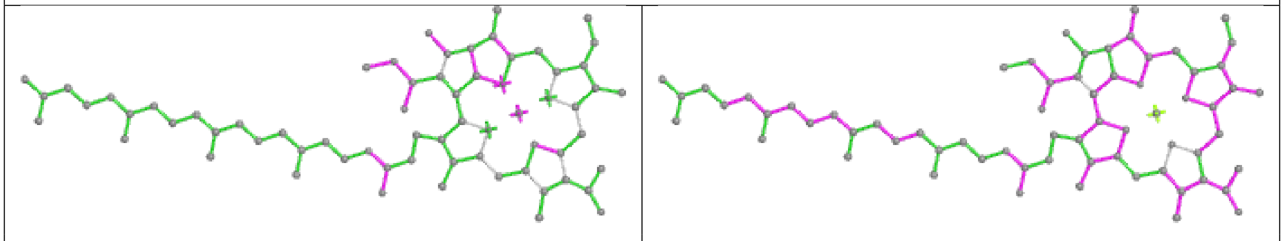
Bond angles



Torsions

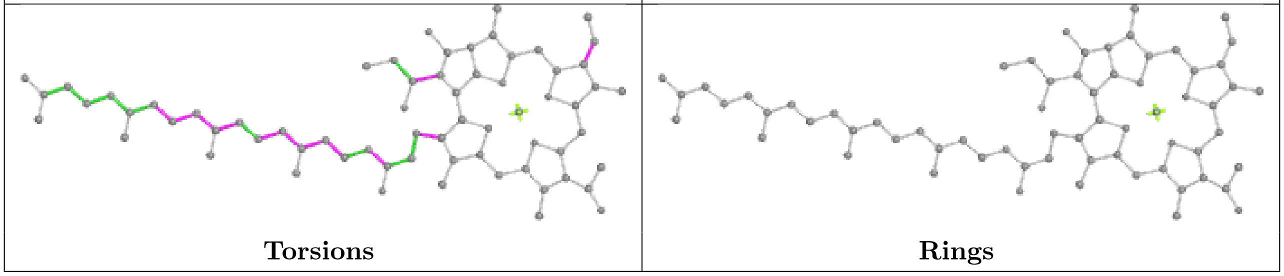
Rings

Ligand BCL i 101



Bond lengths

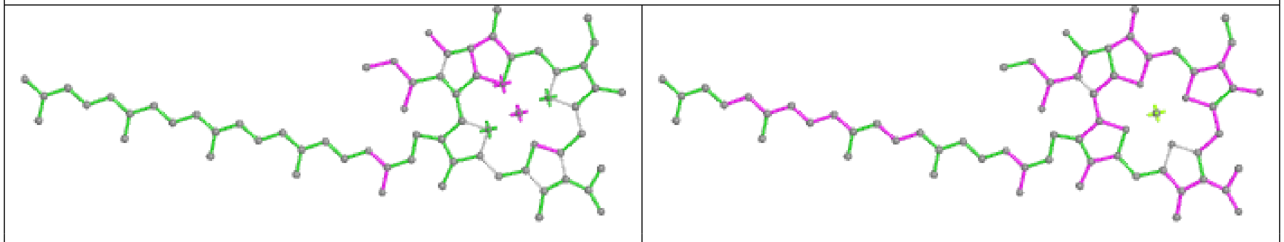
Bond angles



Torsions

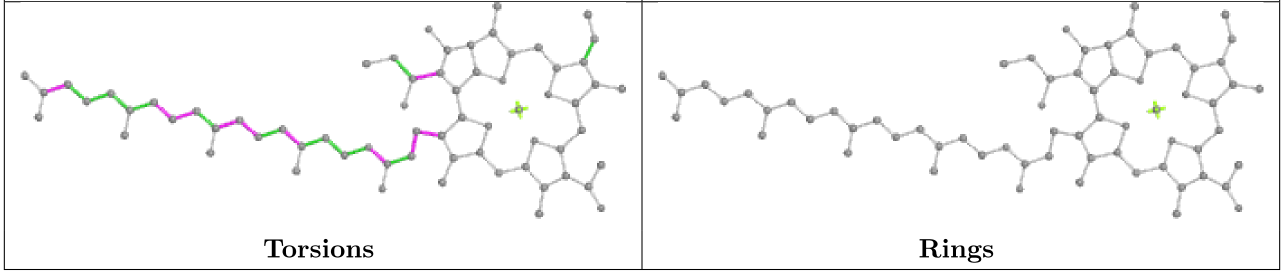
Rings

Ligand BCL G 102



Bond lengths

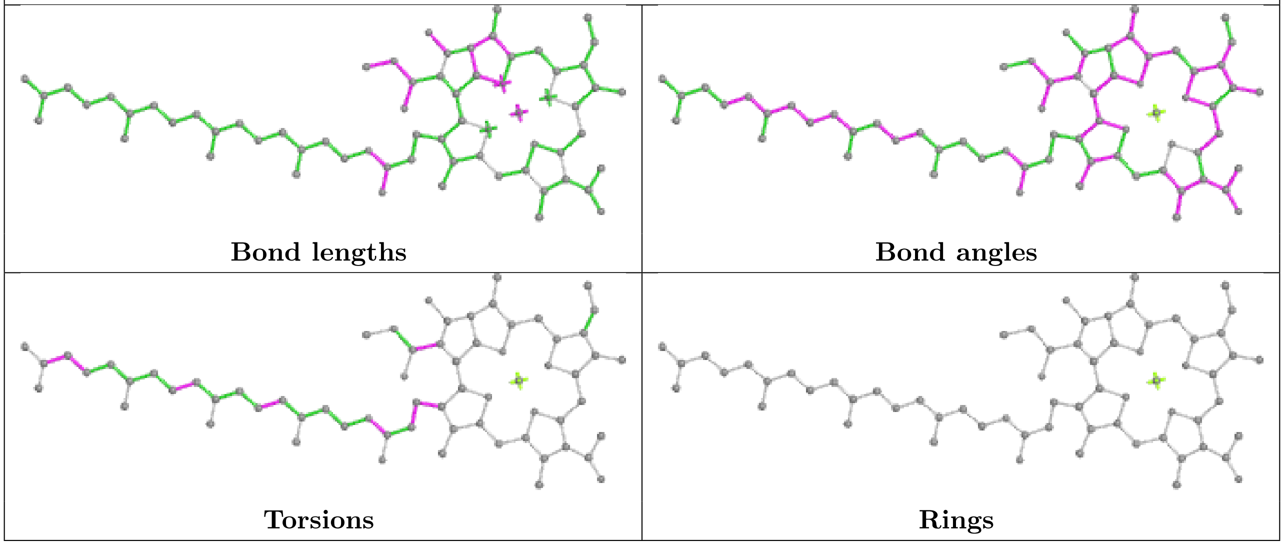
Bond angles



Torsions

Rings

Ligand BCL I 101



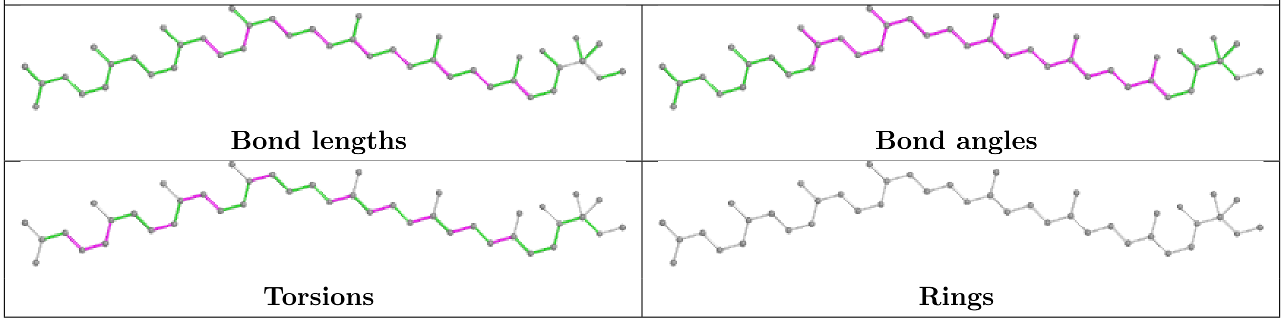
Bond lengths

Bond angles

Torsions

Rings

Ligand A1EFU D 104



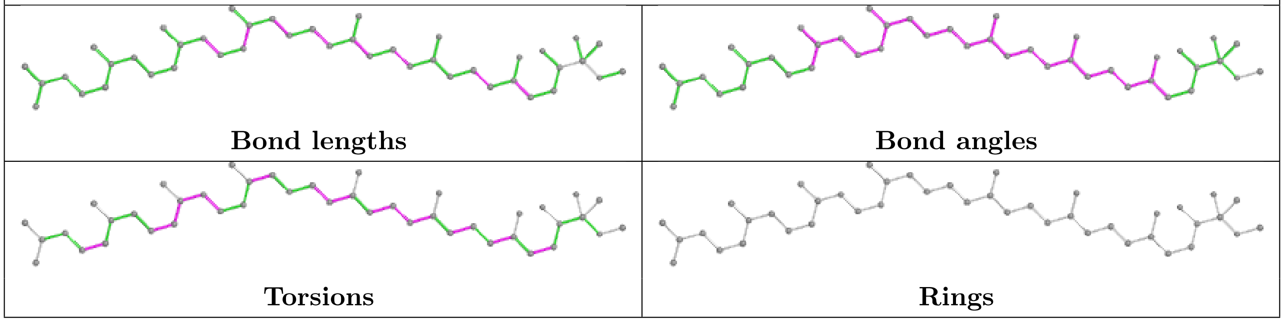
Bond lengths

Bond angles

Torsions

Rings

Ligand A1EFU f 101



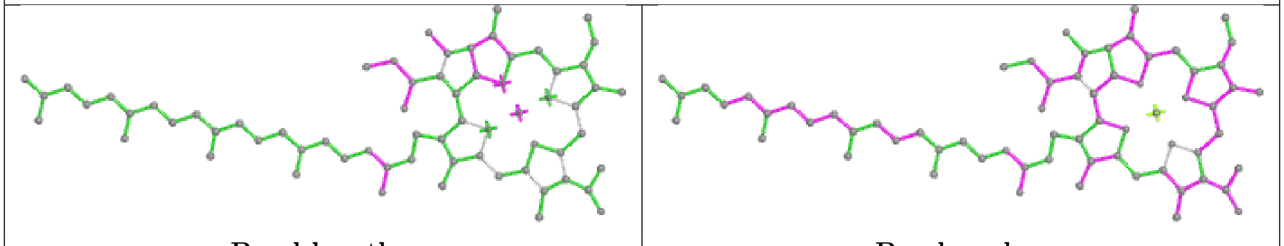
Bond lengths

Bond angles

Torsions

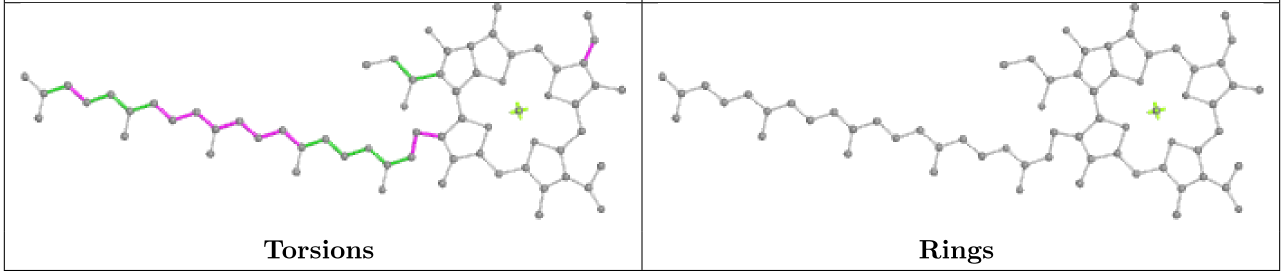
Rings

Ligand BCL B 101



Bond lengths

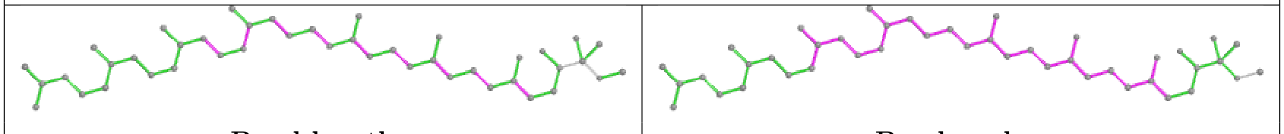
Bond angles



Torsions

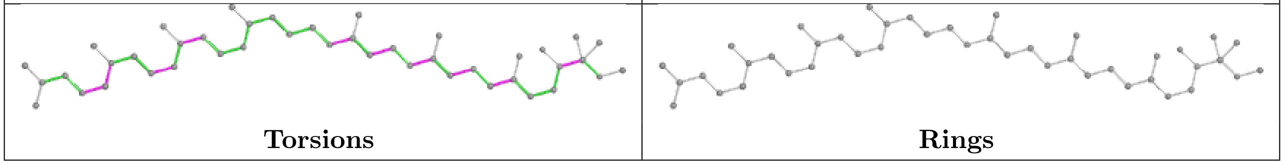
Rings

Ligand A1EFU J 102



Bond lengths

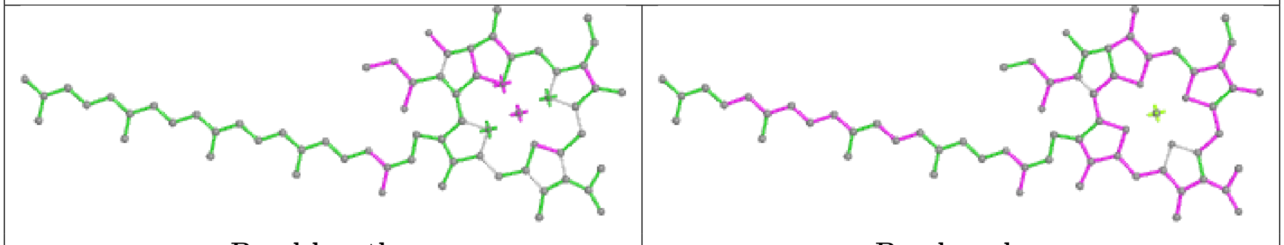
Bond angles



Torsions

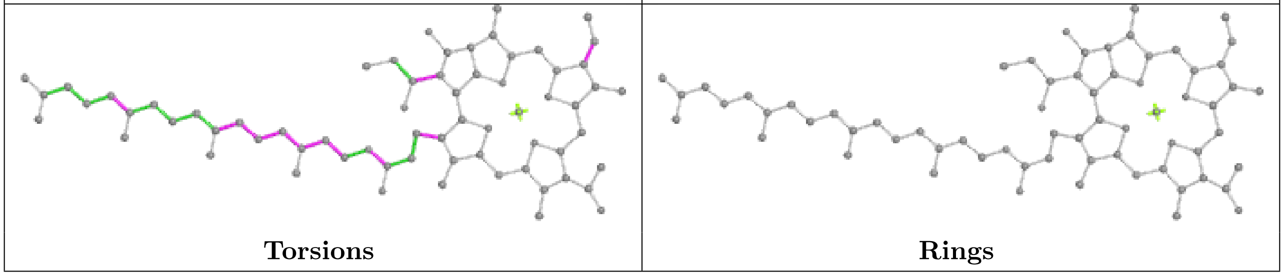
Rings

Ligand BCL L 304



Bond lengths

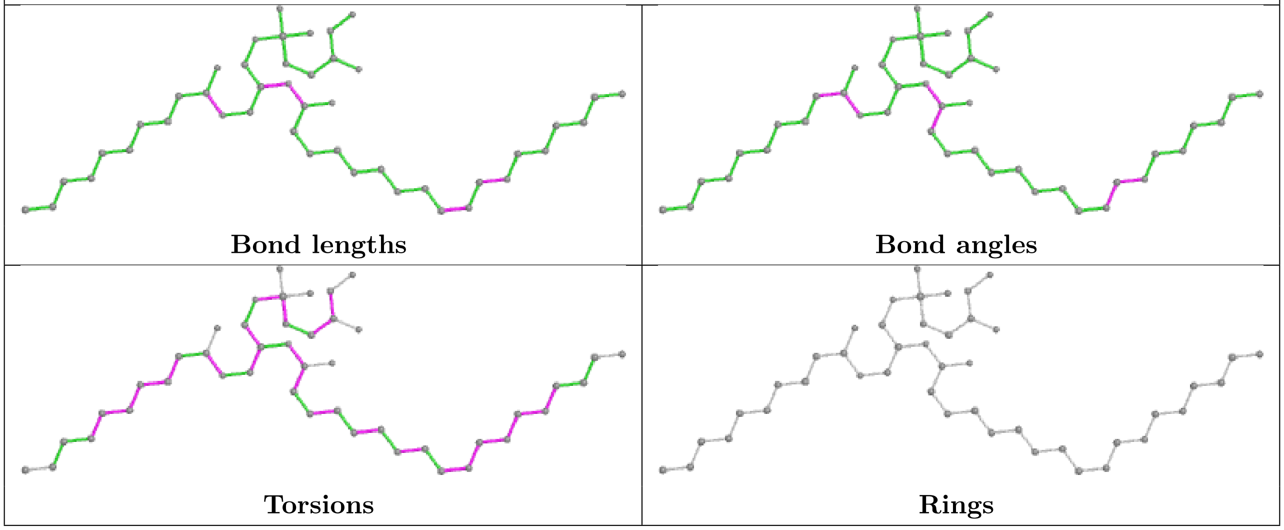
Bond angles



Torsions

Rings

Ligand MW9 R 103



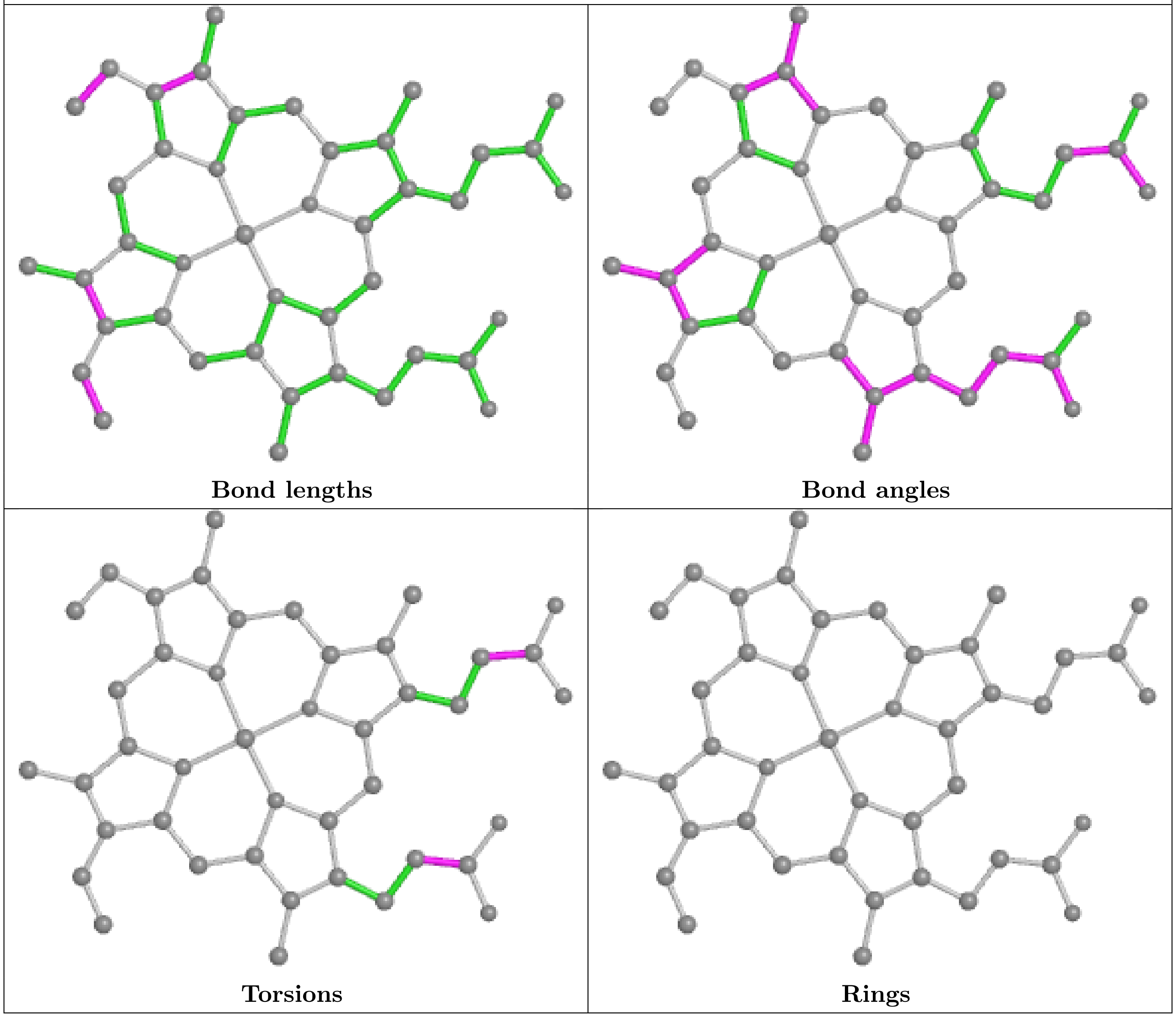
Bond lengths

Bond angles

Torsions

Rings

Ligand HEC C 402



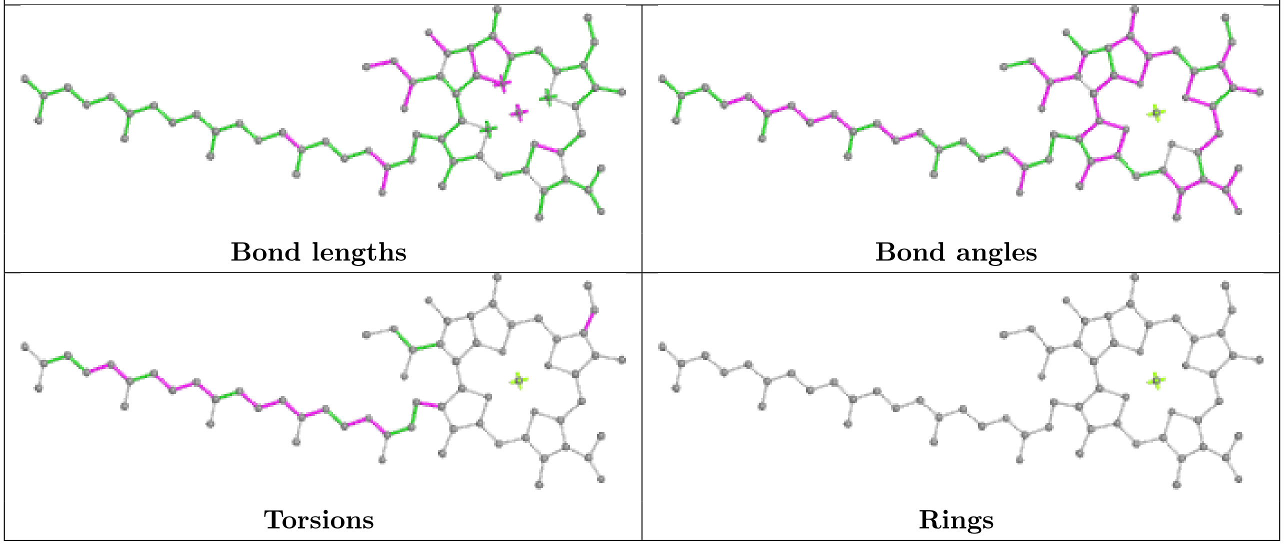
Bond lengths

Bond angles

Torsions

Rings

Ligand BCL a 101



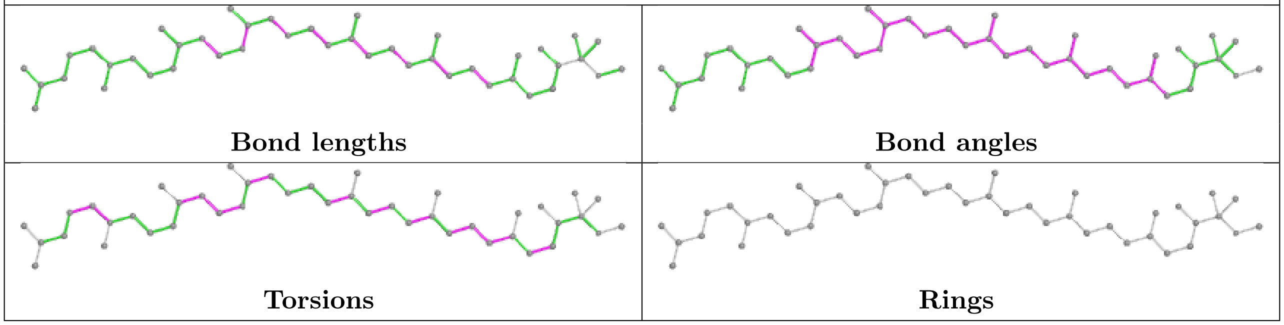
Bond lengths

Bond angles

Torsions

Rings

Ligand A1EFU R 101



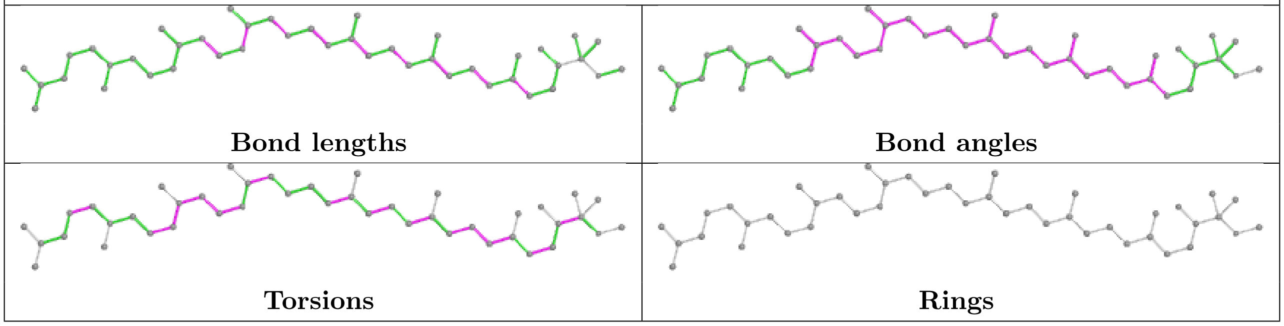
Bond lengths

Bond angles

Torsions

Rings

Ligand A1EFU v 102



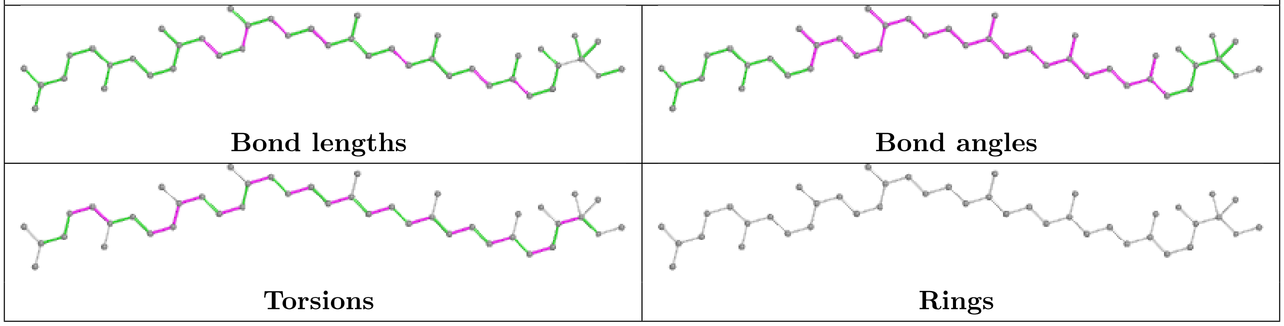
Bond lengths

Bond angles

Torsions

Rings

Ligand A1EFU s 101



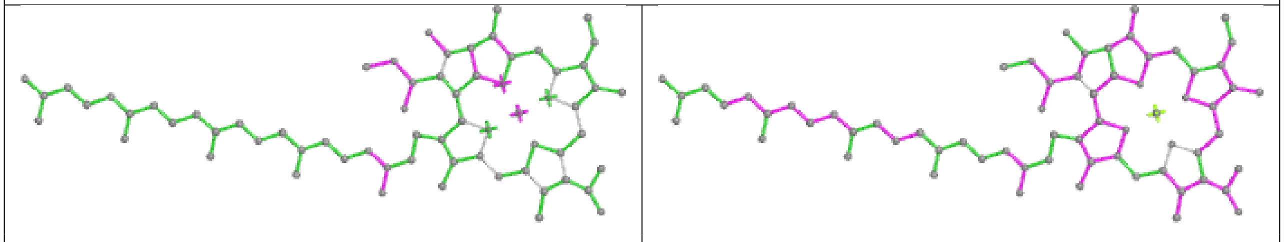
Bond lengths

Bond angles

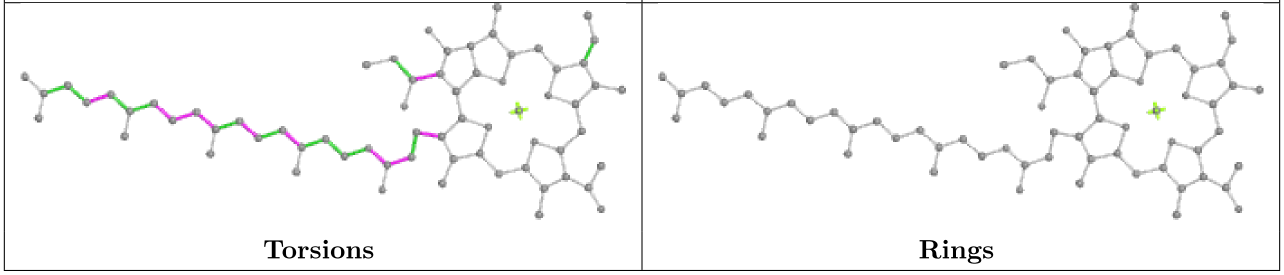
Torsions

Rings

Ligand BCL F 101

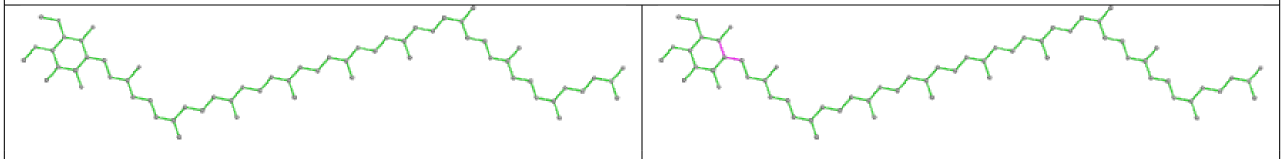


Bond lengths Bond angles

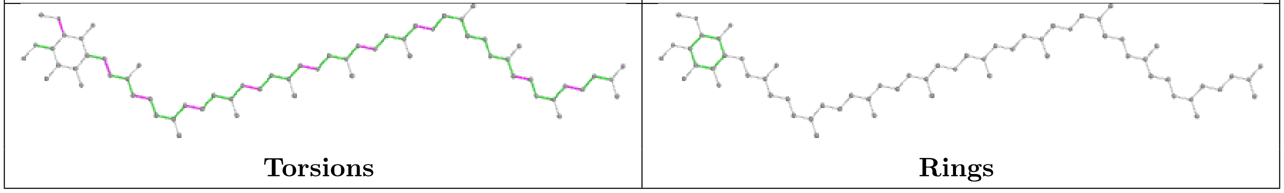


Torsions Rings

Ligand U10 M 404

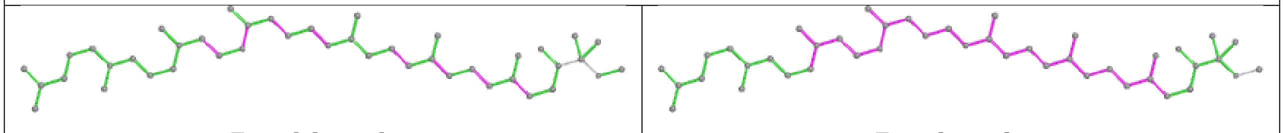


Bond lengths Bond angles

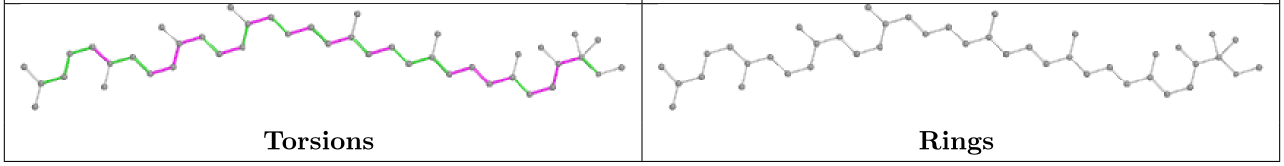


Torsions Rings

Ligand A1EFU v 103

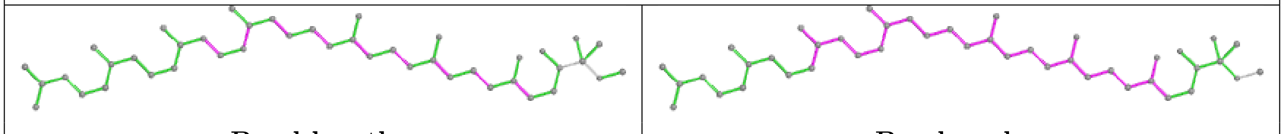


Bond lengths Bond angles

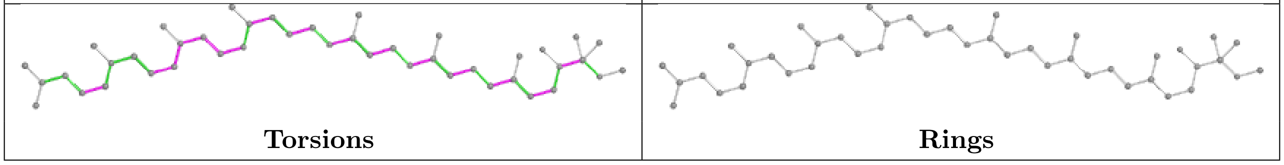


Torsions Rings

Ligand A1EFU p 101

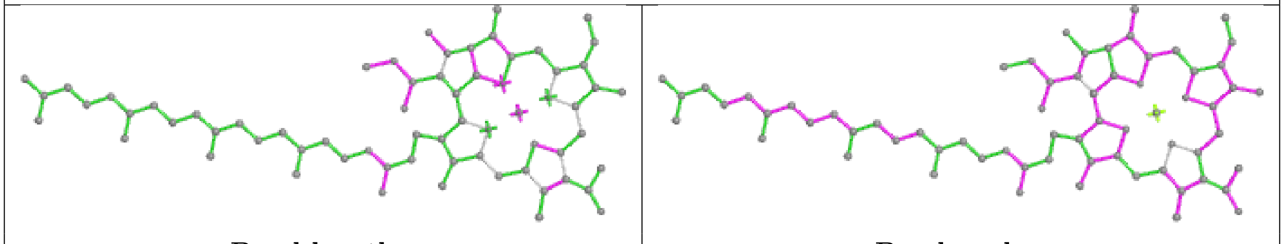


Bond lengths Bond angles

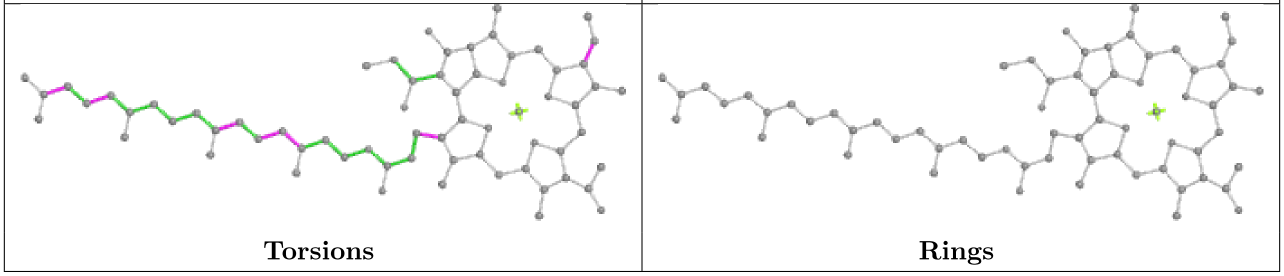


Torsions Rings

Ligand BCL r 101

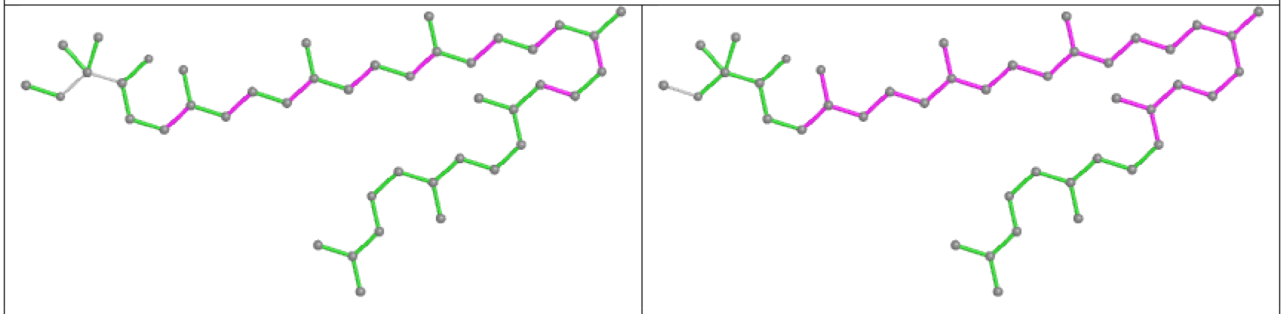


Bond lengths Bond angles

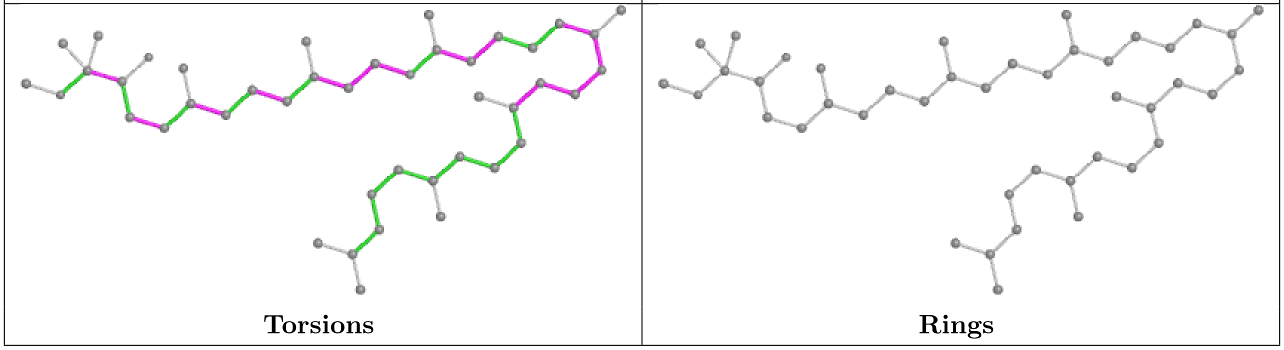


Torsions Rings

Ligand A1EFU J 103

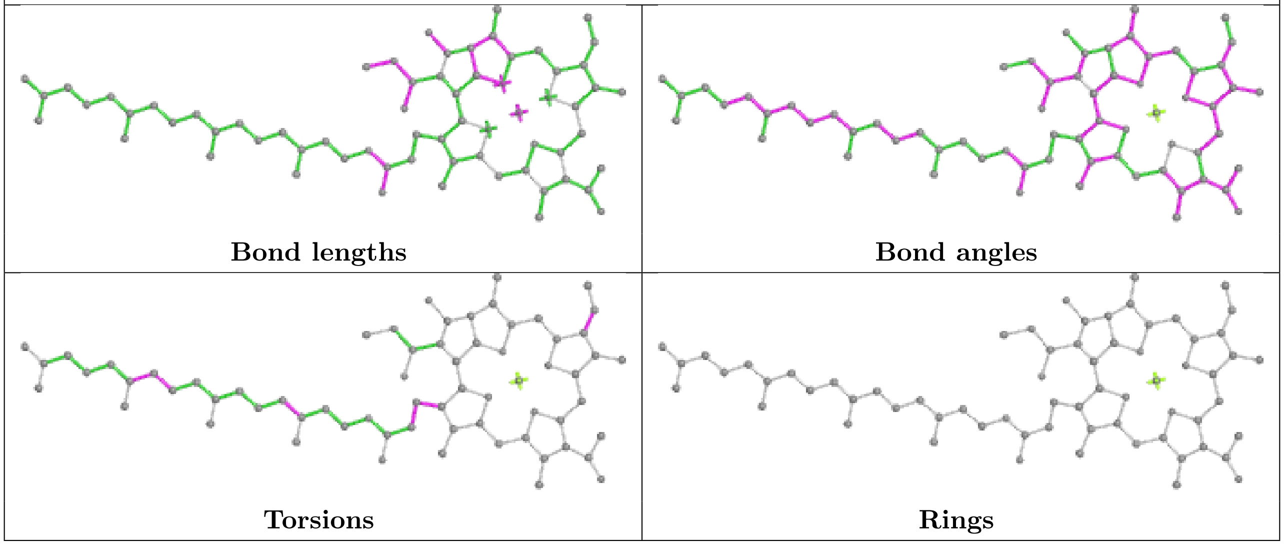


Bond lengths Bond angles



Torsions Rings

Ligand BCL D 101



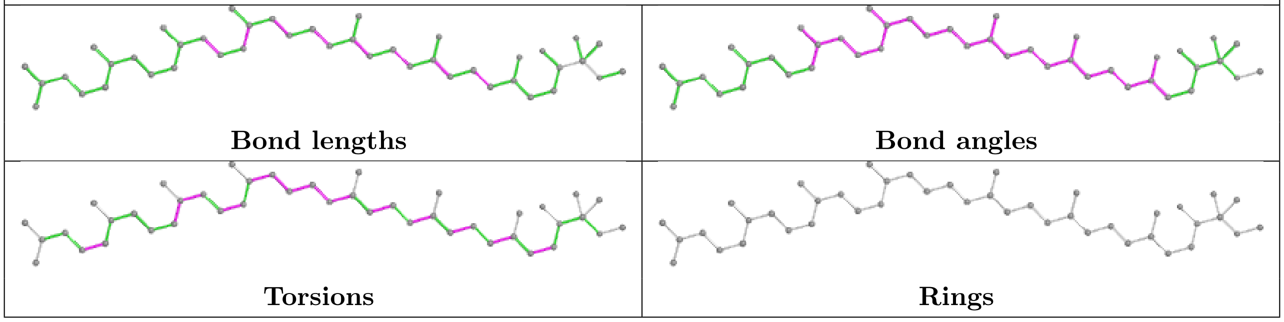
Bond lengths

Bond angles

Torsions

Rings

Ligand A1EFU j 103



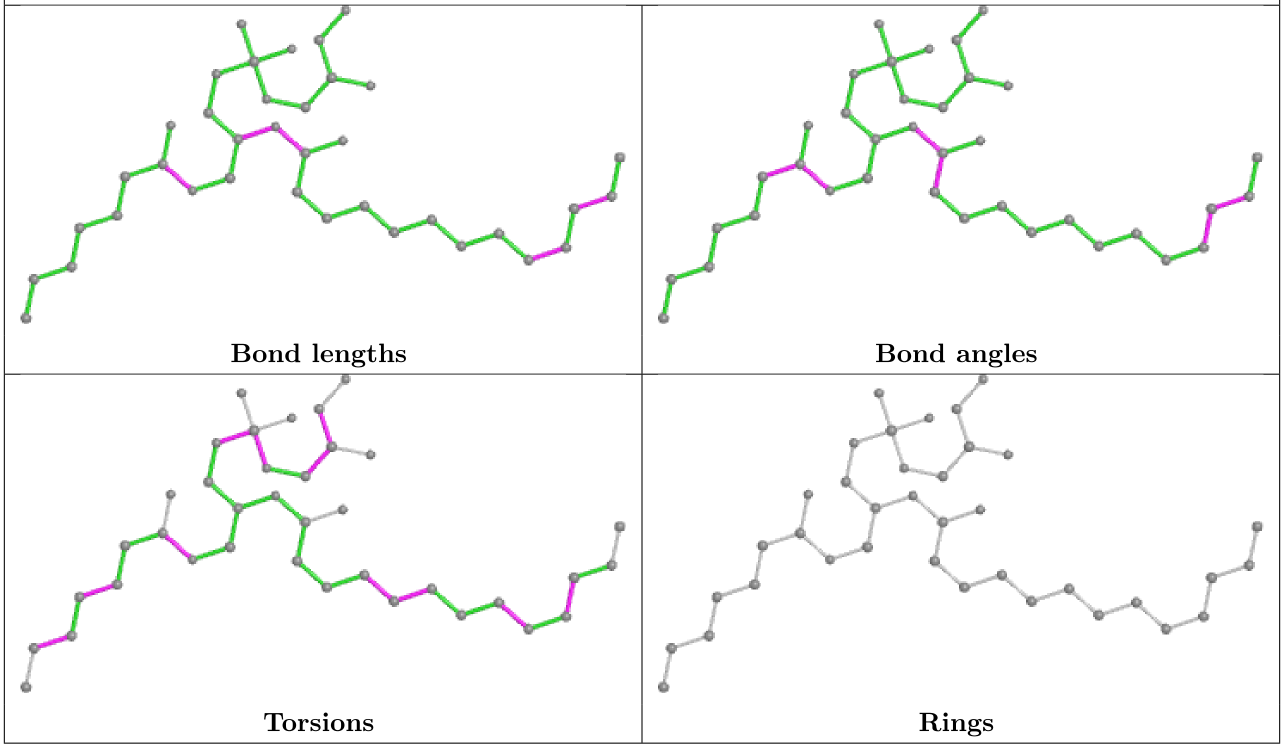
Bond lengths

Bond angles

Torsions

Rings

Ligand MW9 L 307



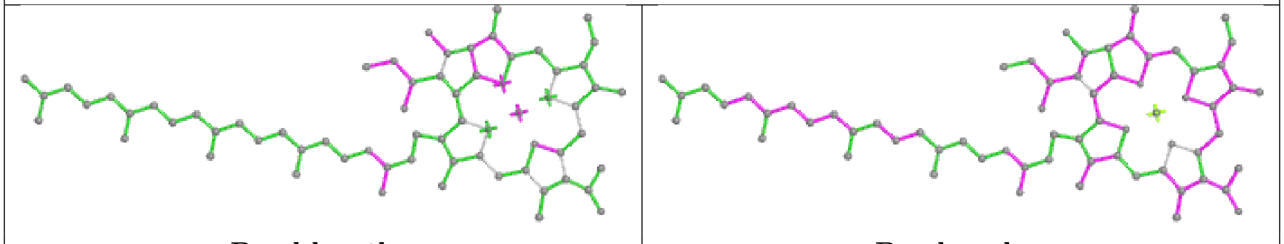
Bond lengths

Bond angles

Torsions

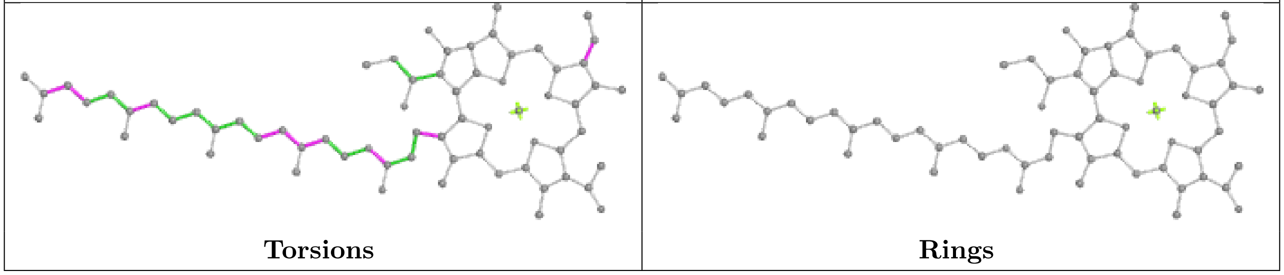
Rings

Ligand BCL S 101



Bond lengths

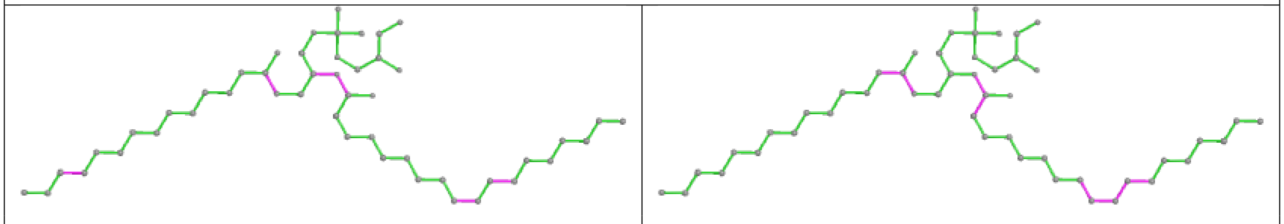
Bond angles



Torsions

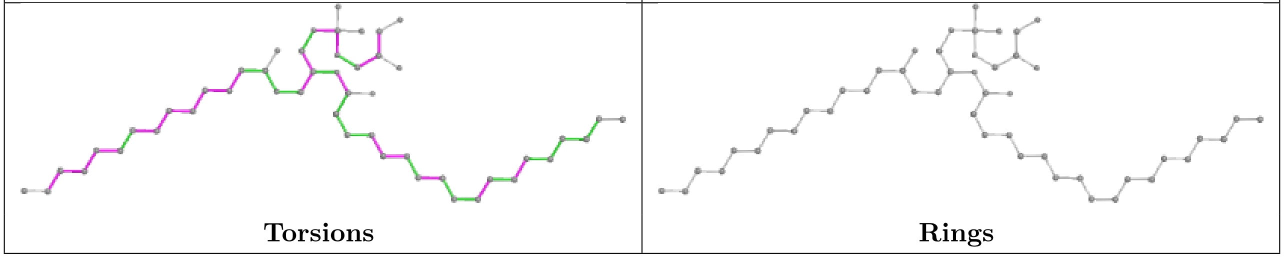
Rings

Ligand MW9 G 103



Bond lengths

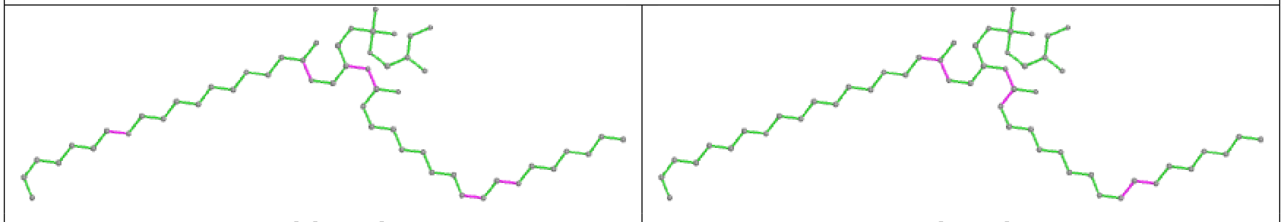
Bond angles



Torsions

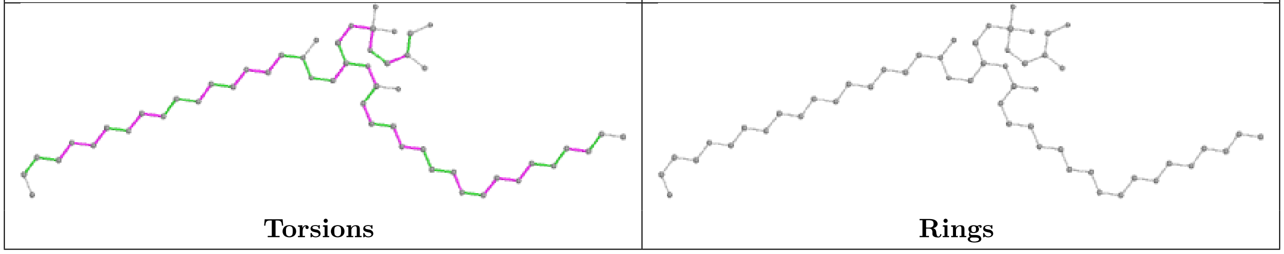
Rings

Ligand MW9 D 103



Bond lengths

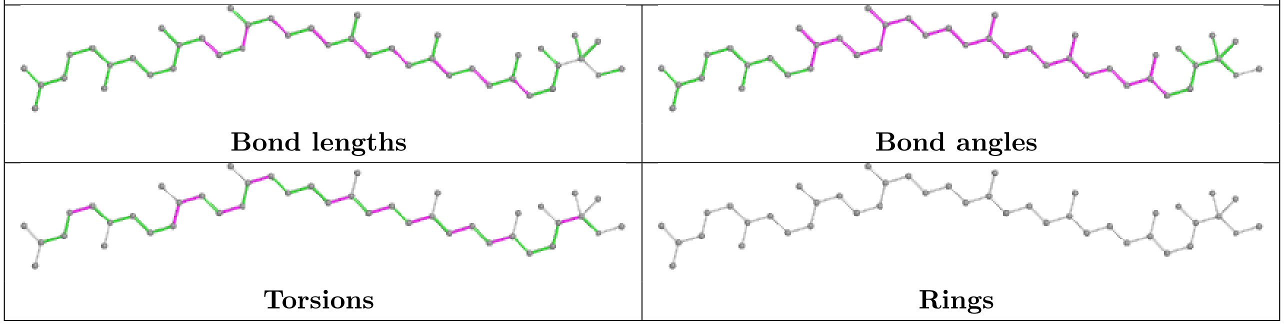
Bond angles



Torsions

Rings

Ligand A1EFU B 102



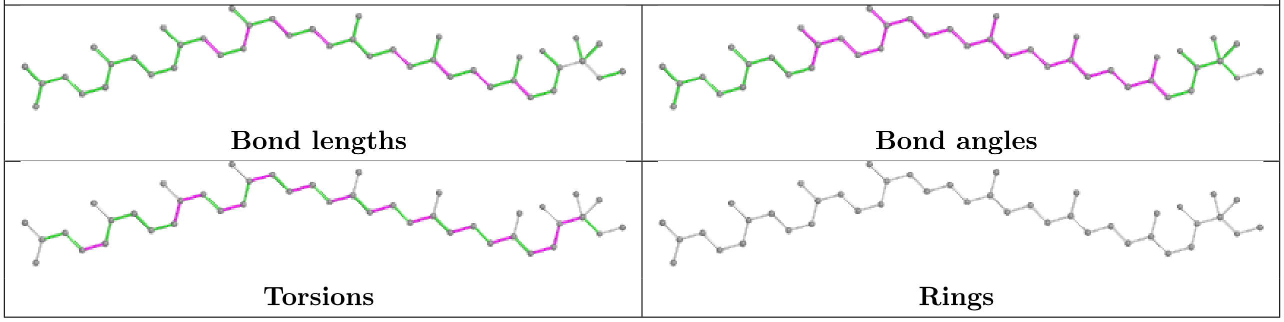
Bond lengths

Bond angles

Torsions

Rings

Ligand A1EFU D 105



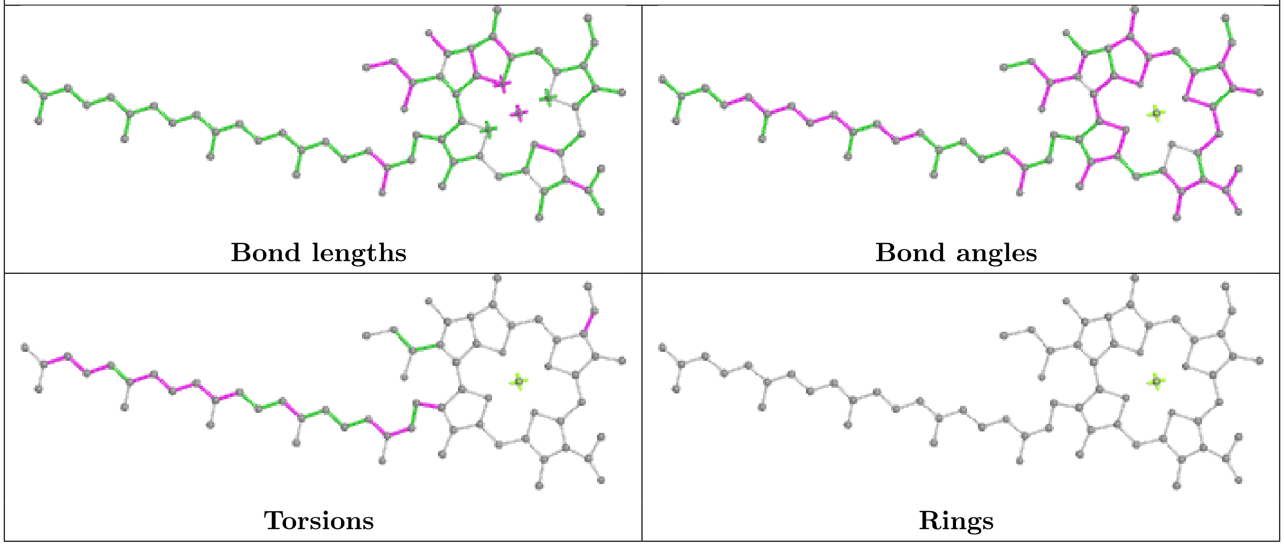
Bond lengths

Bond angles

Torsions

Rings

Ligand BCL v 101



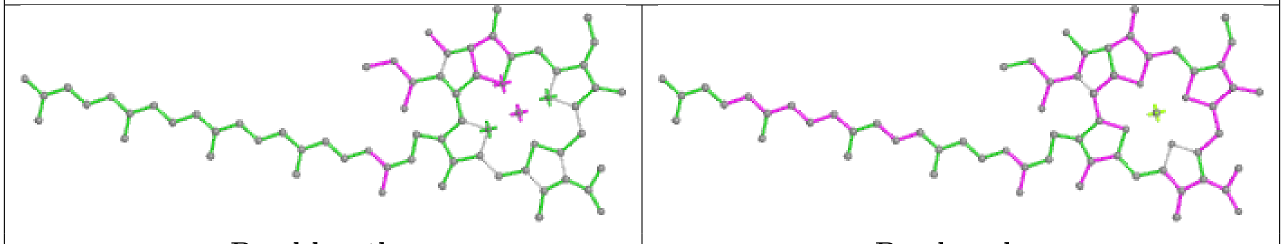
Bond lengths

Bond angles

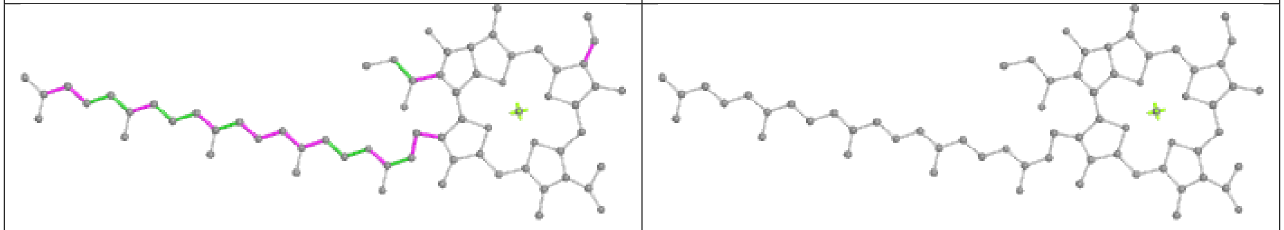
Torsions

Rings

Ligand BCL Q 101

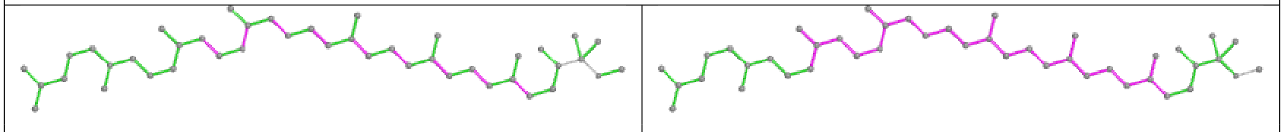


Bond lengths **Bond angles**

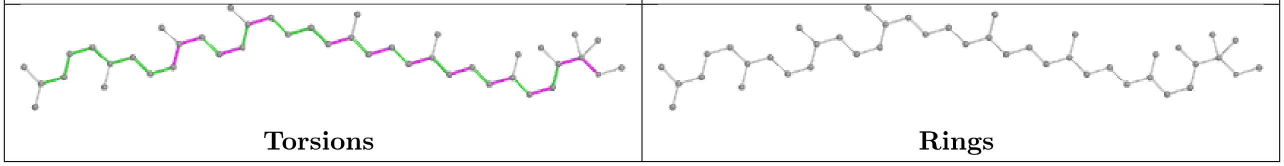


Torsions **Rings**

Ligand A1EFU A 102

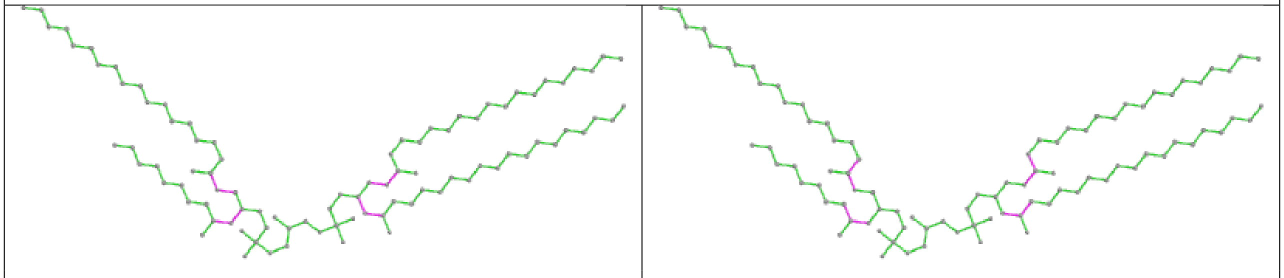


Bond lengths **Bond angles**

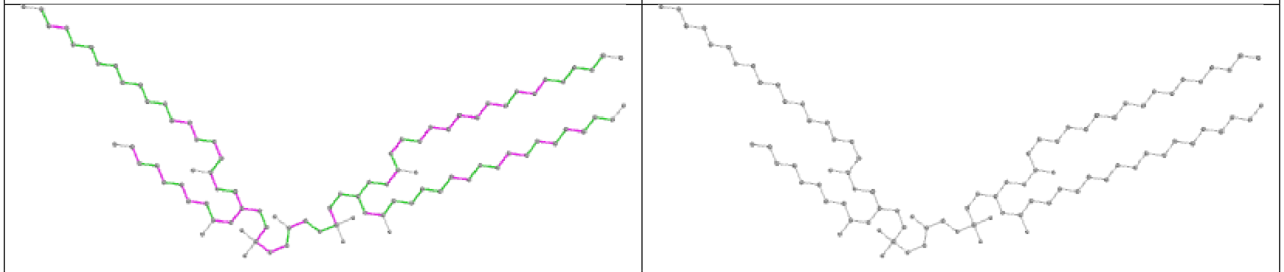


Torsions **Rings**

Ligand CDL H 304

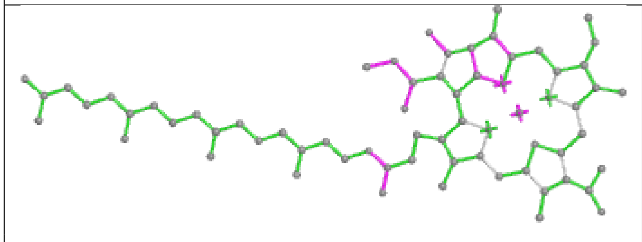


Bond lengths **Bond angles**

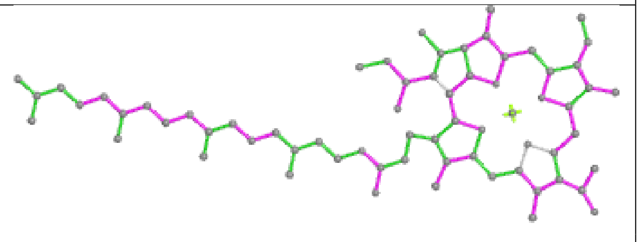


Torsions **Rings**

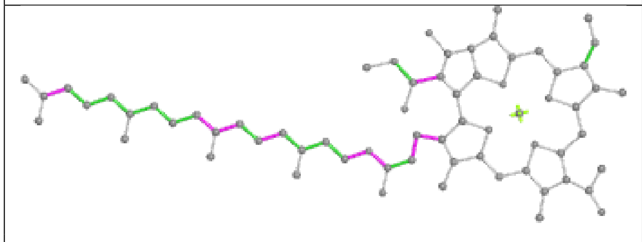
Ligand BCL M 402



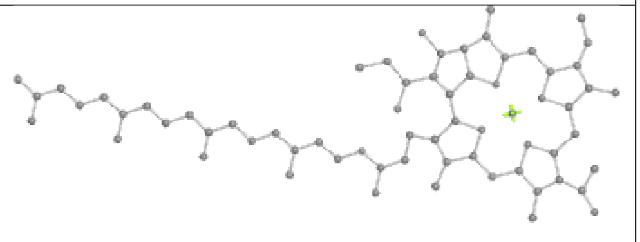
Bond lengths



Bond angles

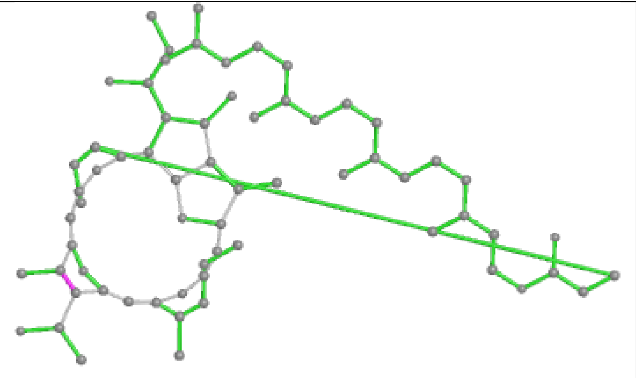


Torsions

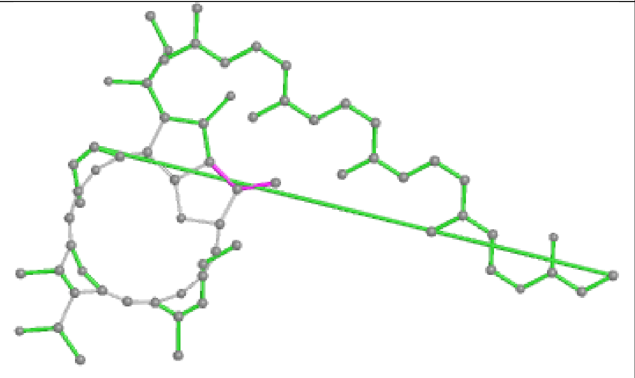


Rings

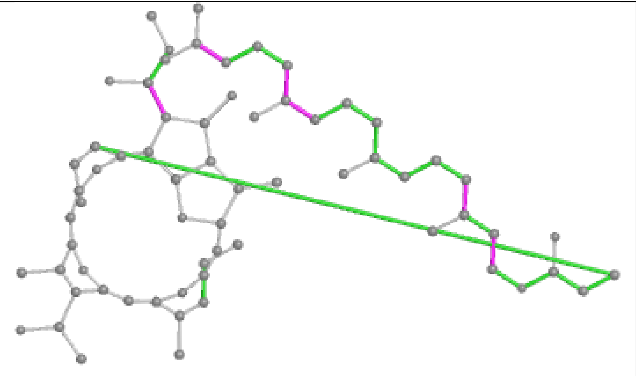
Ligand BPH L 302



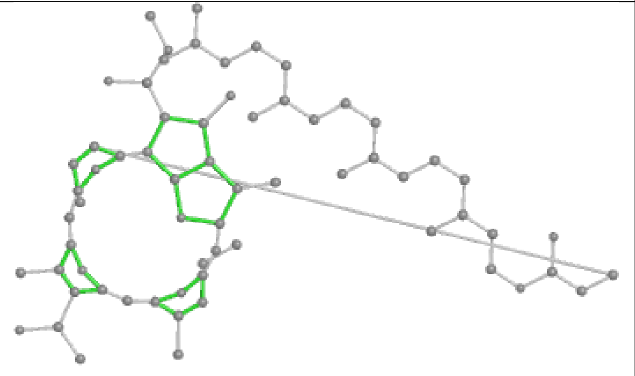
Bond lengths



Bond angles

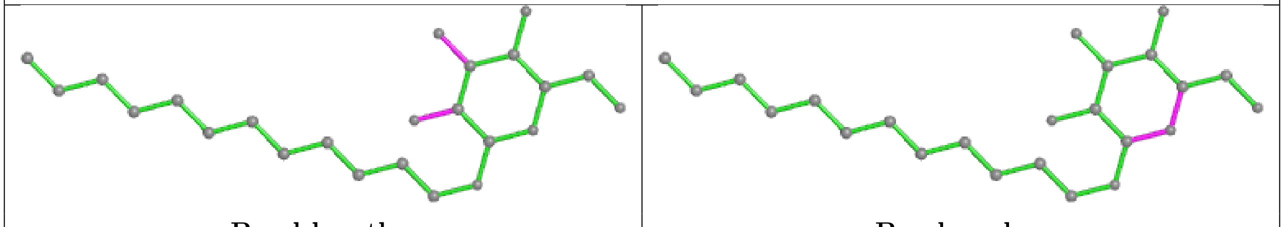


Torsions

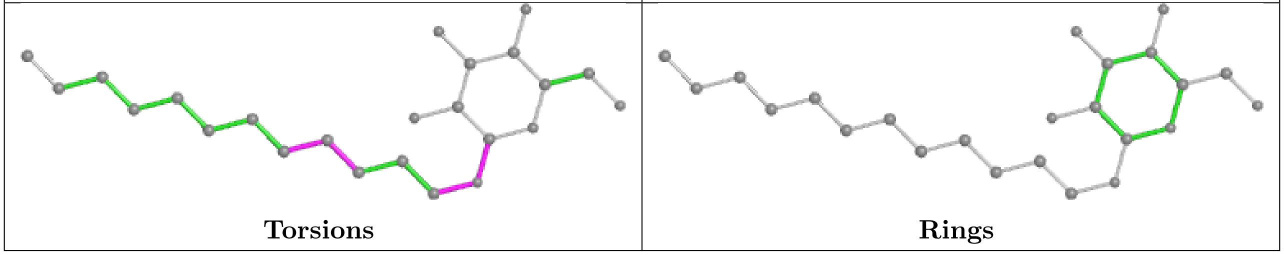


Rings

Ligand LMT C 404

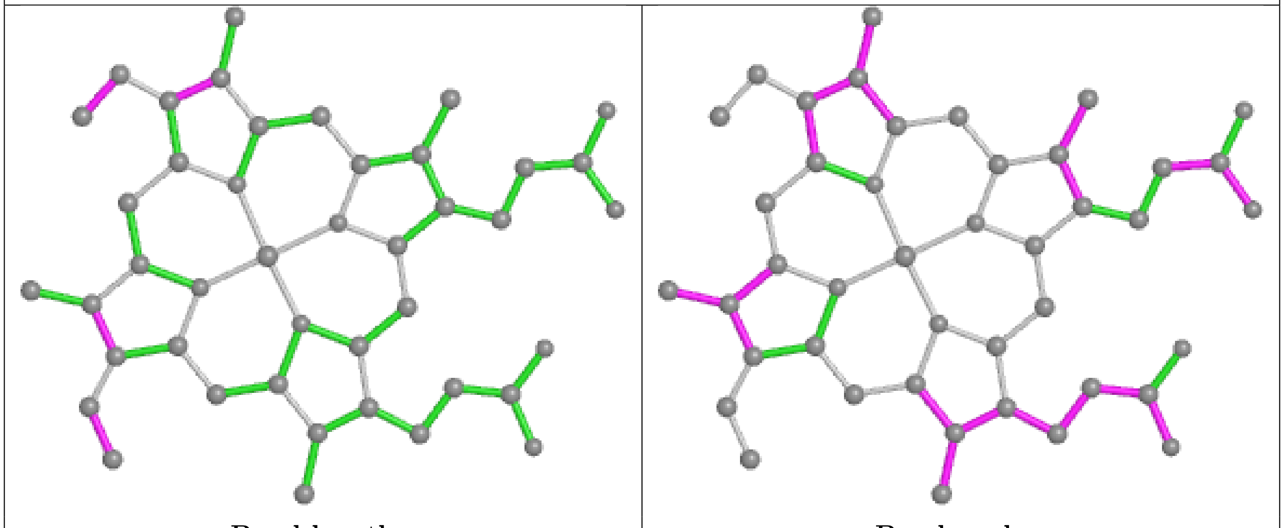


Bond lengths **Bond angles**

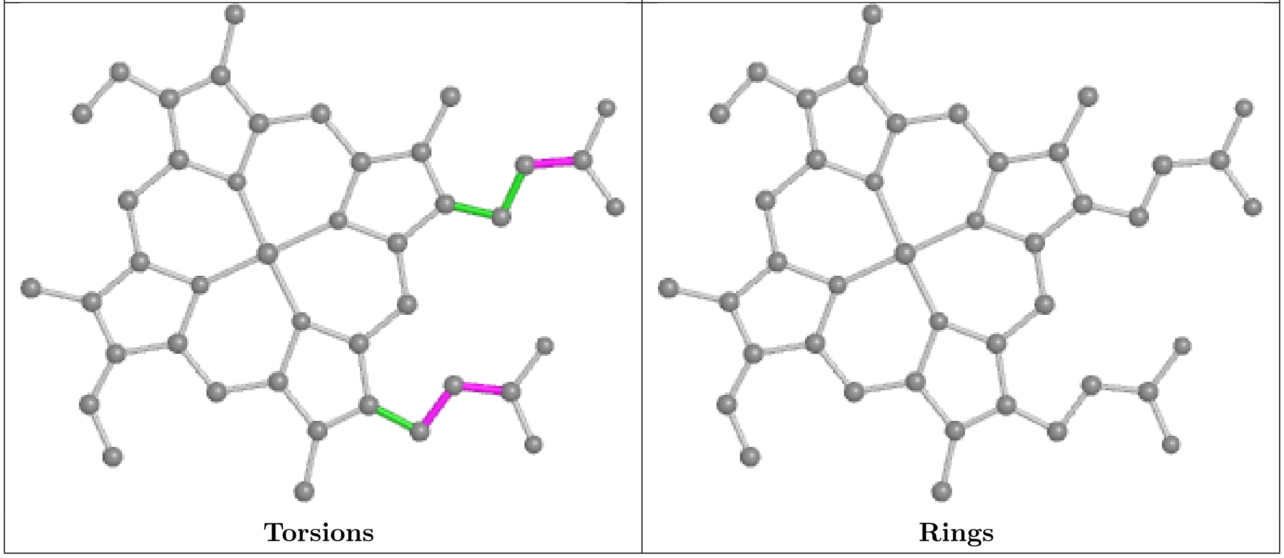


Torsions **Rings**

Ligand HEC C 401

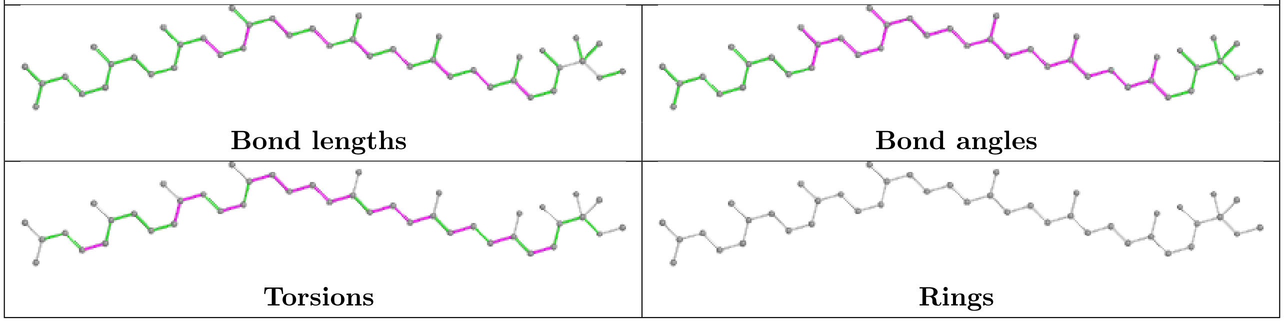


Bond lengths **Bond angles**

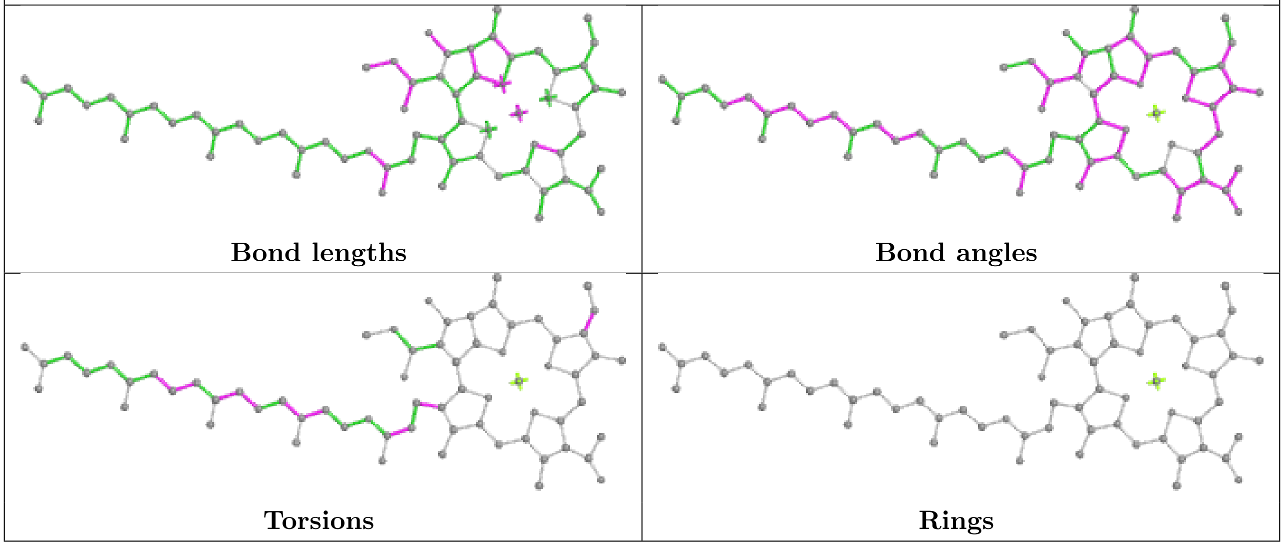


Torsions **Rings**

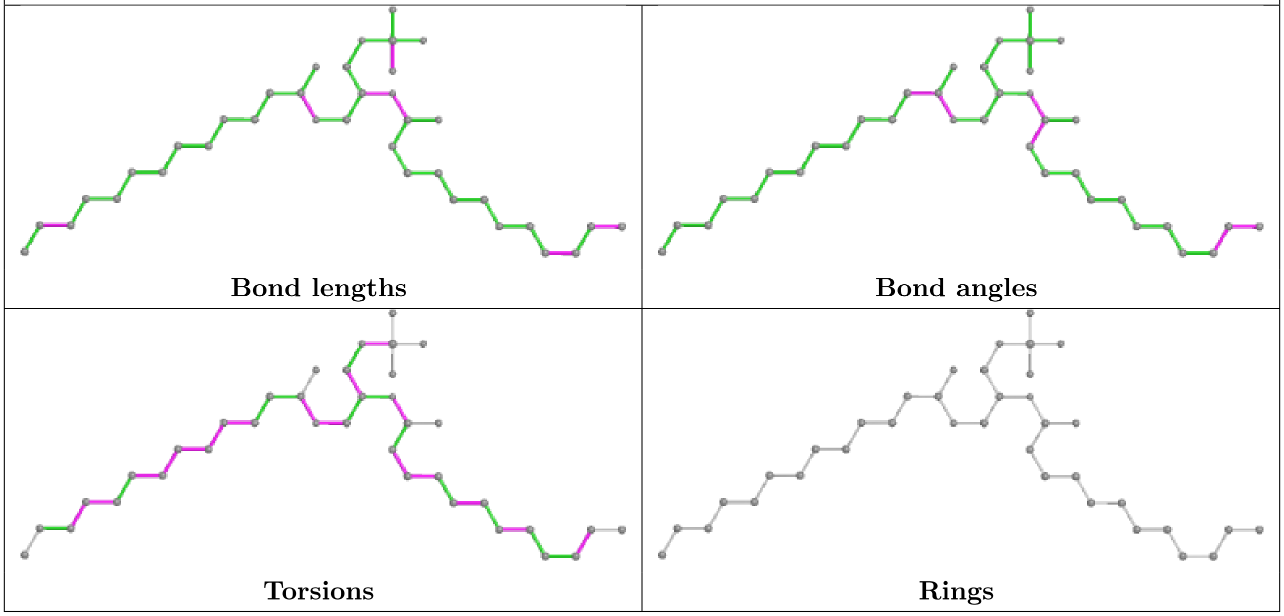
Ligand A1EFU 2 101


Bond lengths
Bond angles
Torsions
Rings

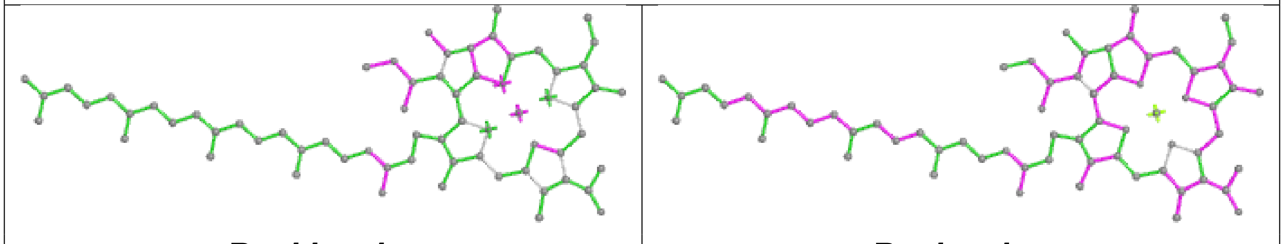
Ligand BCL k 102


Bond lengths
Bond angles
Torsions
Rings

Ligand MW9 H 303

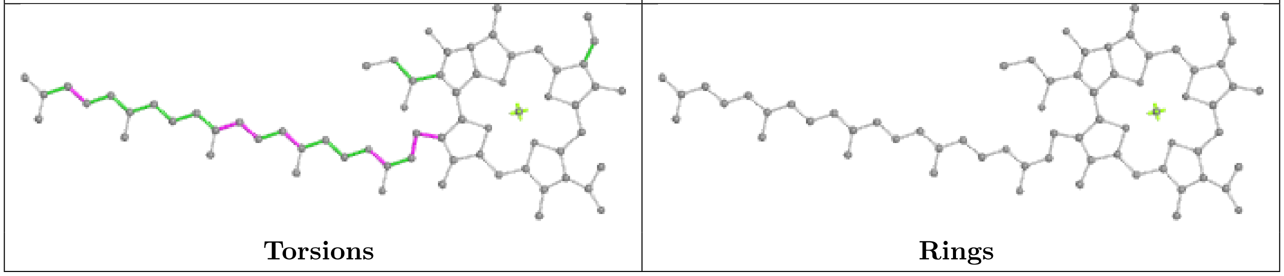

Bond lengths
Bond angles
Torsions
Rings

Ligand BCL N 101



Bond lengths

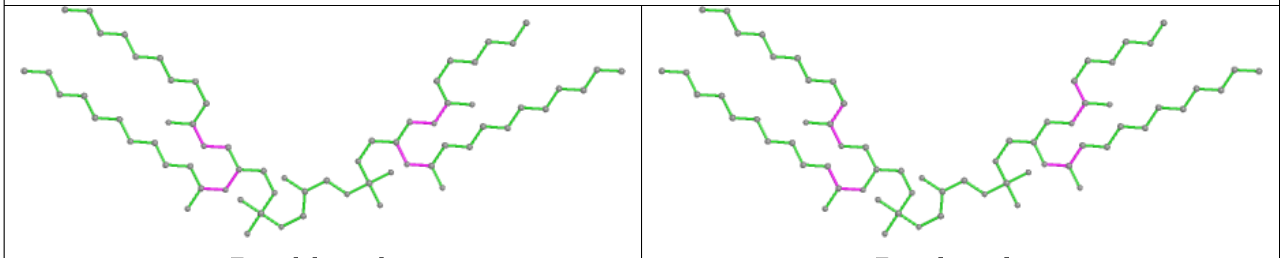
Bond angles



Torsions

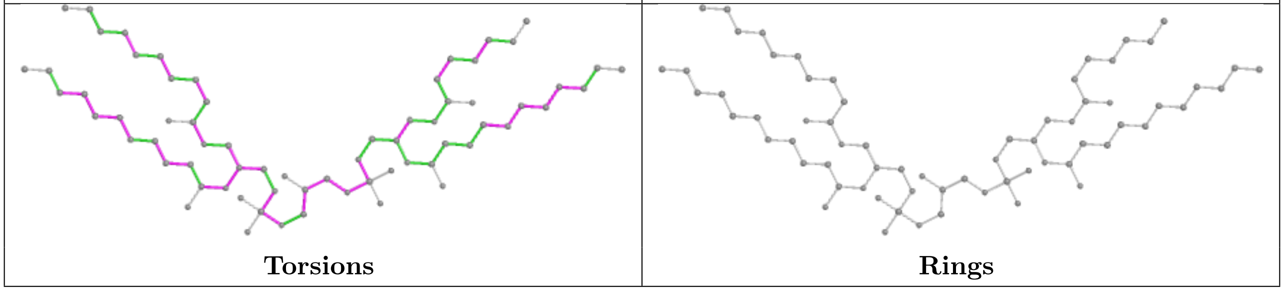
Rings

Ligand CDL L 308



Bond lengths

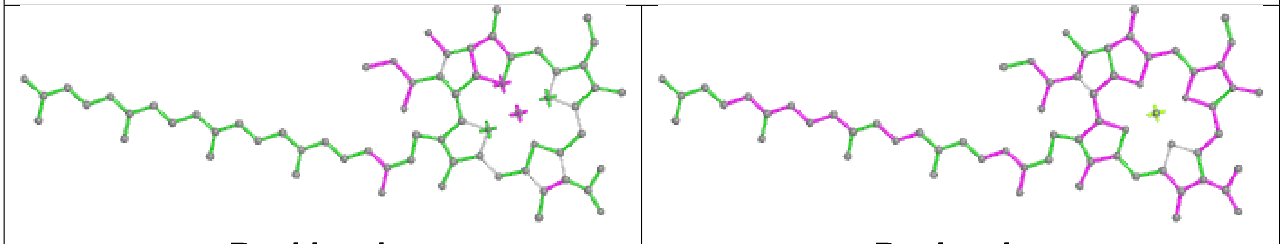
Bond angles



Torsions

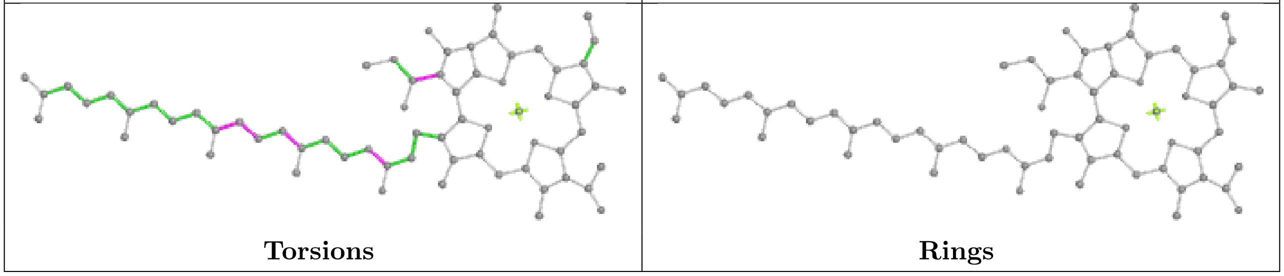
Rings

Ligand BCL F 102



Bond lengths

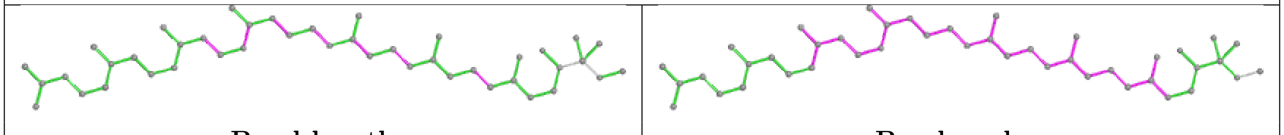
Bond angles

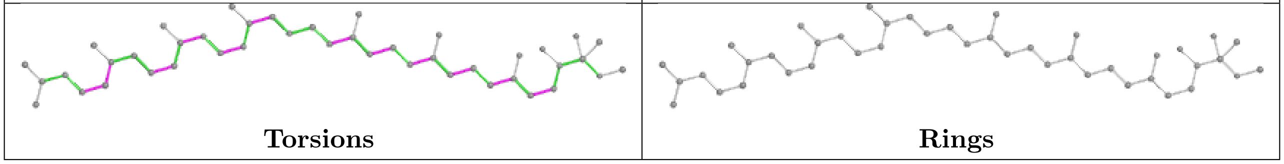


Torsions

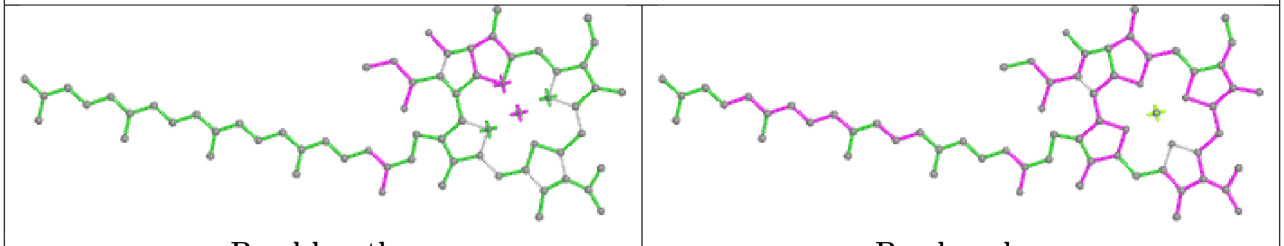
Rings

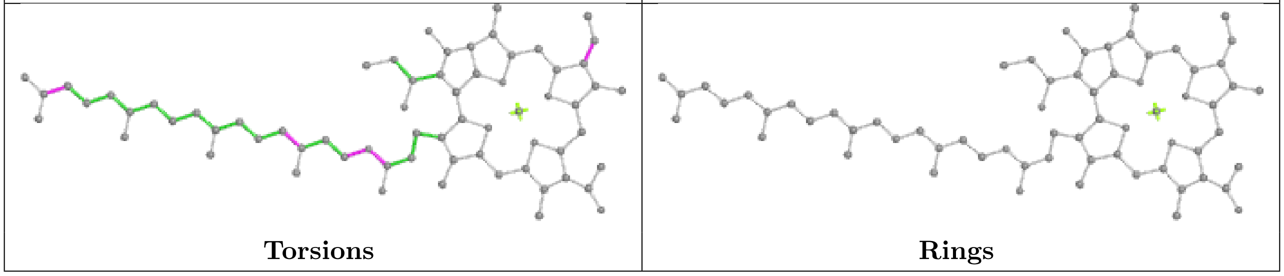
Ligand A1EFU E 102


Bond lengths Bond angles

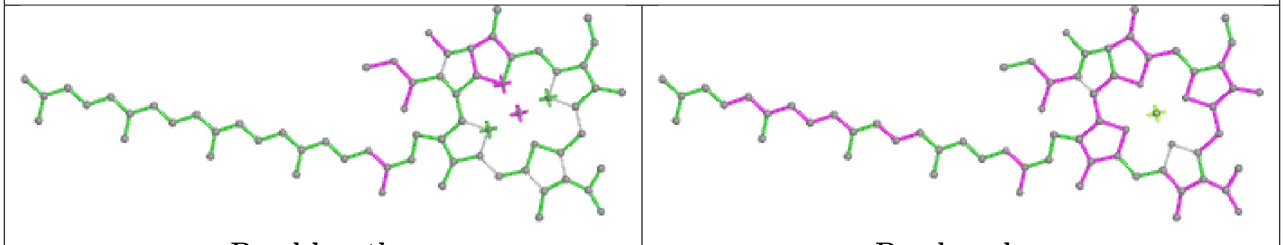

Torsions Rings

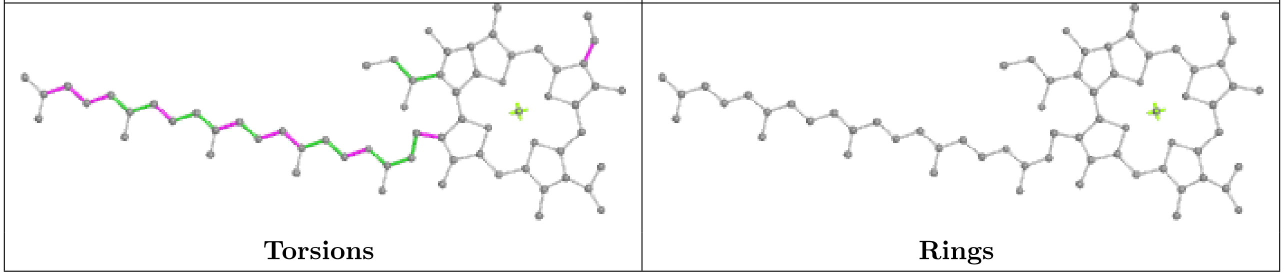
Ligand BCL V 101


Bond lengths Bond angles

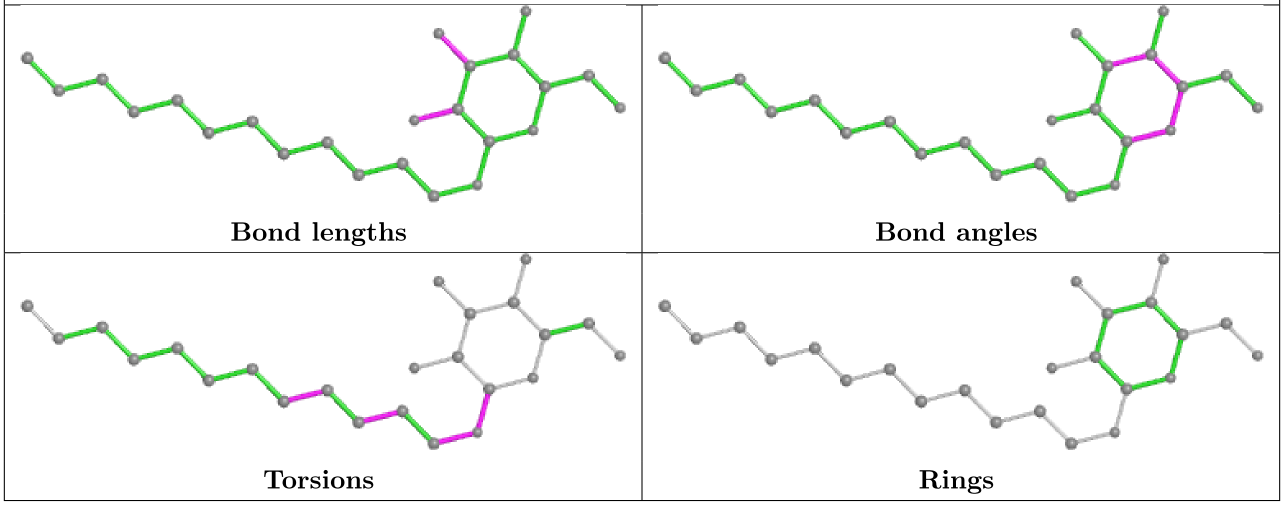

Torsions Rings

Ligand BCL b 101


Bond lengths Bond angles


Torsions Rings

Ligand LMT L 305



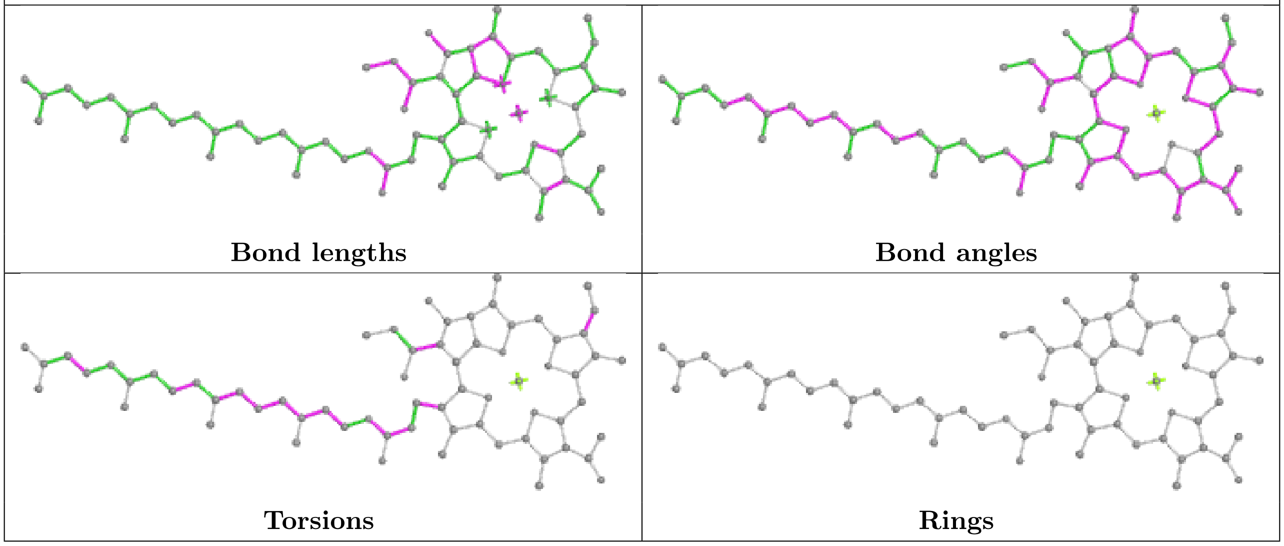
Bond lengths

Bond angles

Torsions

Rings

Ligand BCL M 403



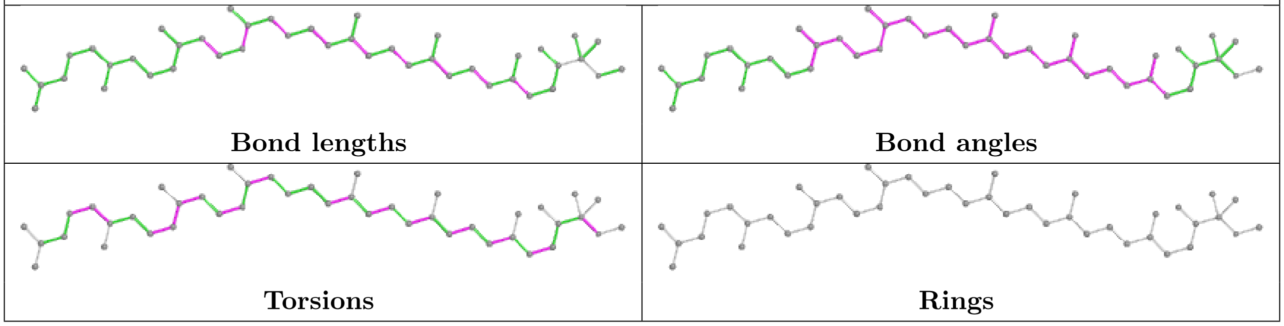
Bond lengths

Bond angles

Torsions

Rings

Ligand A1EFU T 101



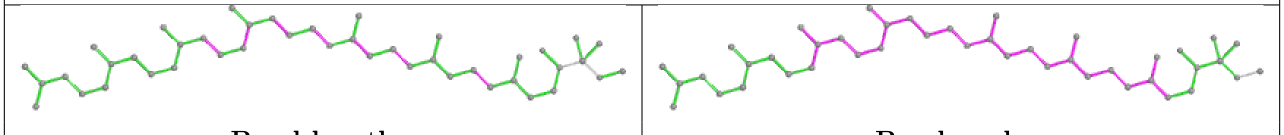
Bond lengths

Bond angles

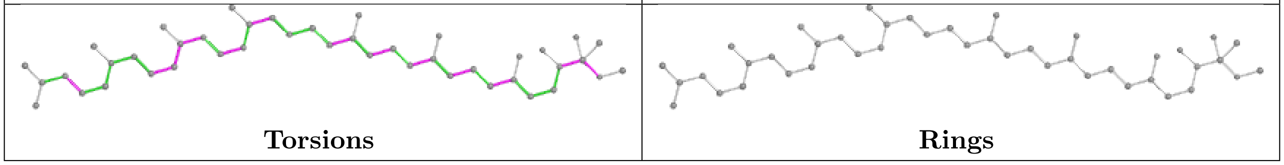
Torsions

Rings

Ligand A1EFU F 104

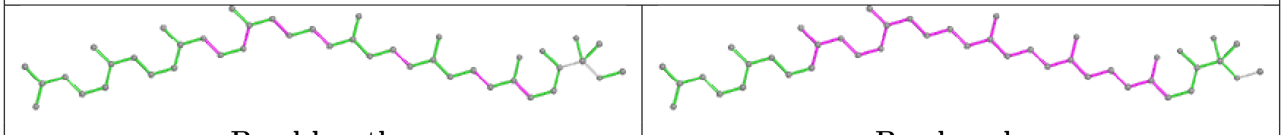


Bond lengths Bond angles

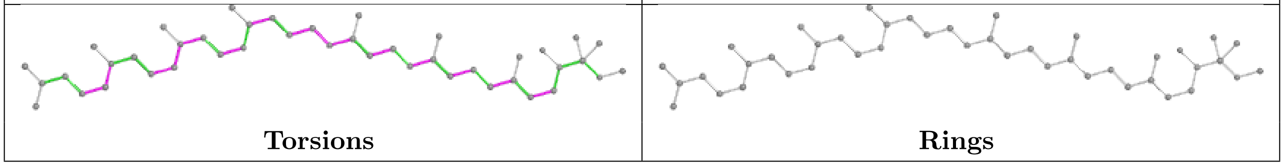


Torsions Rings

Ligand A1EFU I 102

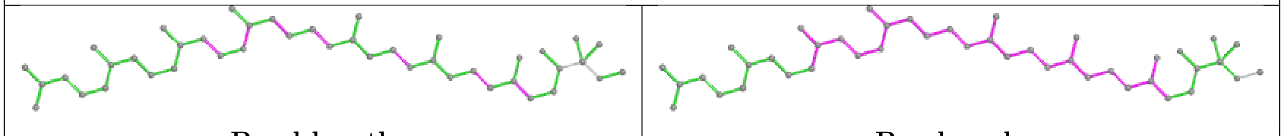


Bond lengths Bond angles

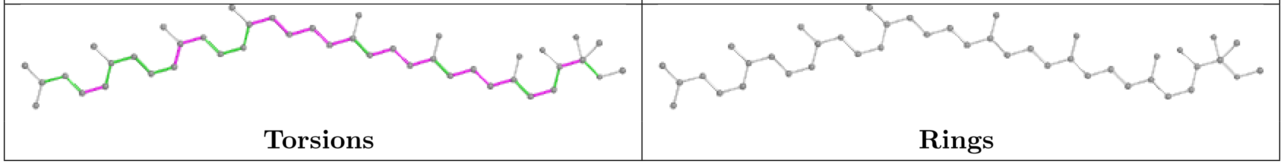


Torsions Rings

Ligand A1EFU G 106

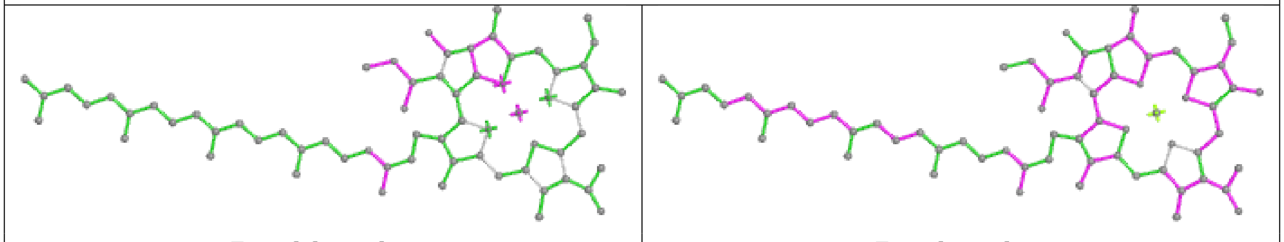


Bond lengths Bond angles

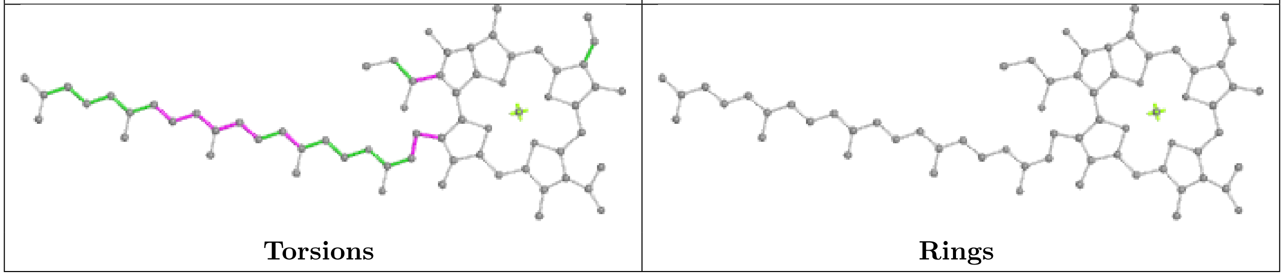


Torsions Rings

Ligand BCL J 101

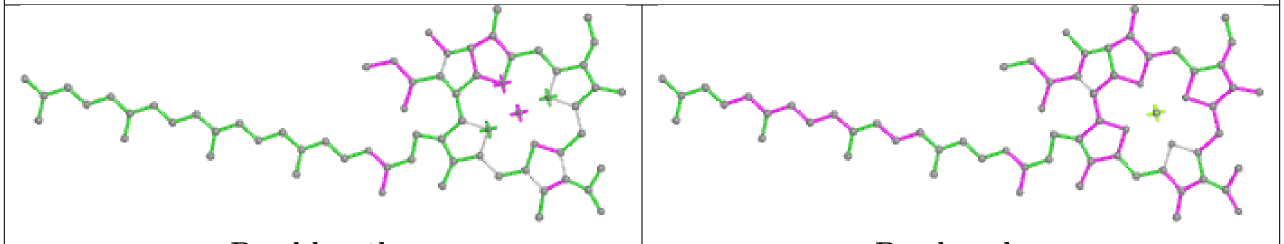


Bond lengths Bond angles



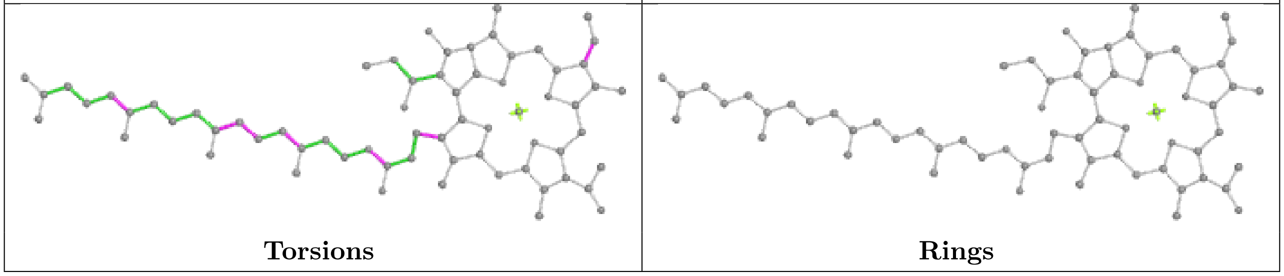
Torsions Rings

Ligand BCL n 101



Bond lengths

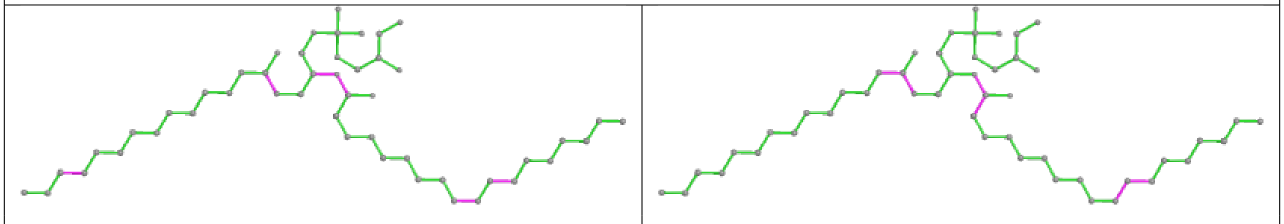
Bond angles



Torsions

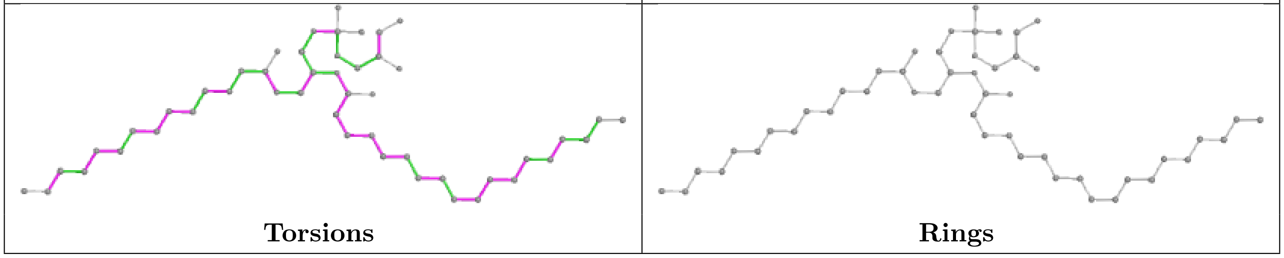
Rings

Ligand MW9 M 405



Bond lengths

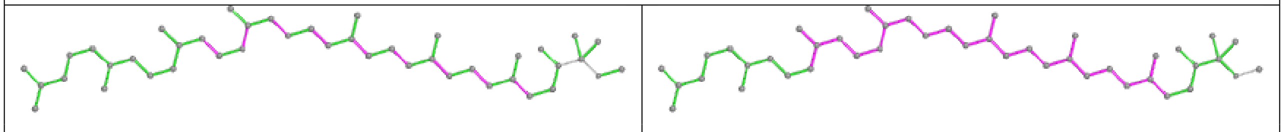
Bond angles



Torsions

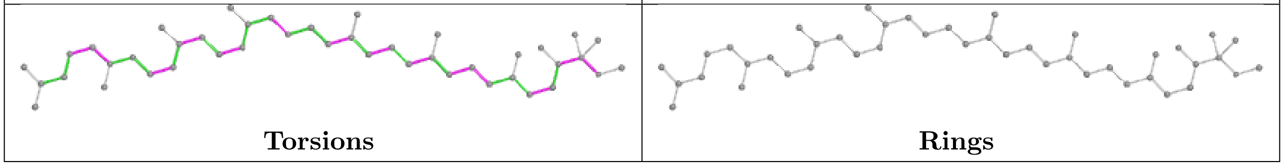
Rings

Ligand A1EFU s 104



Bond lengths

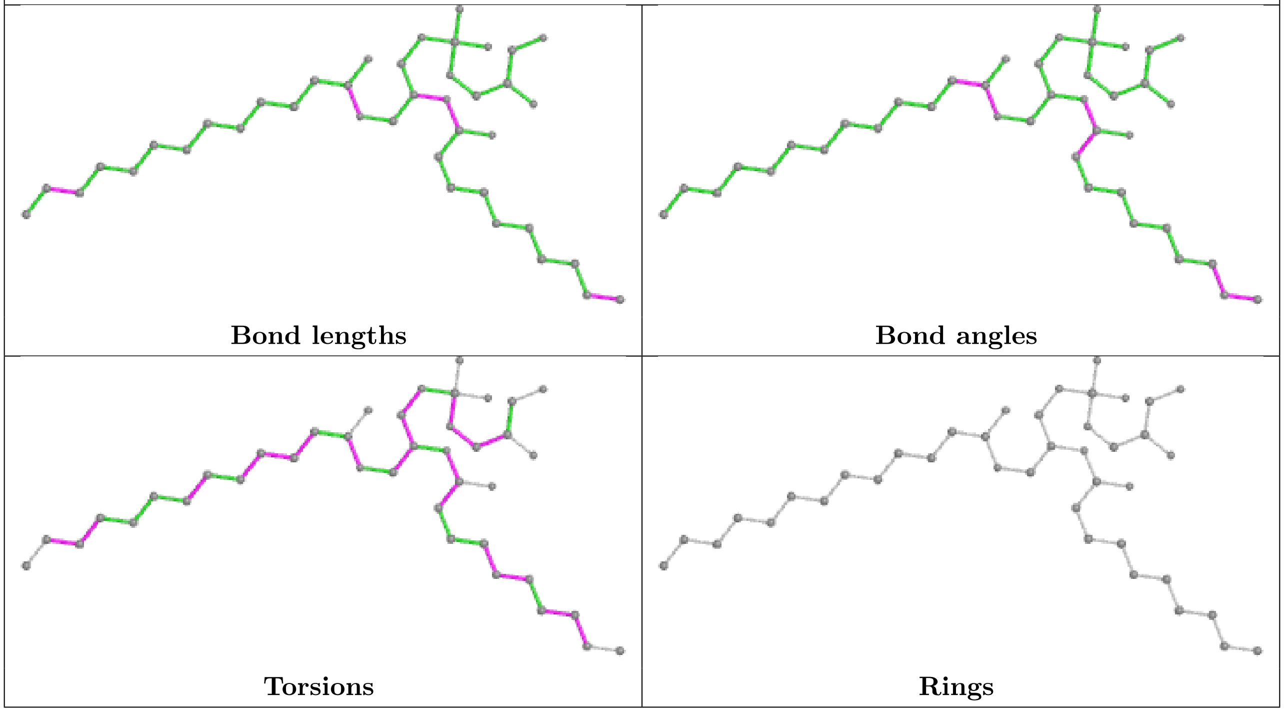
Bond angles



Torsions

Rings

Ligand MW9 G 104



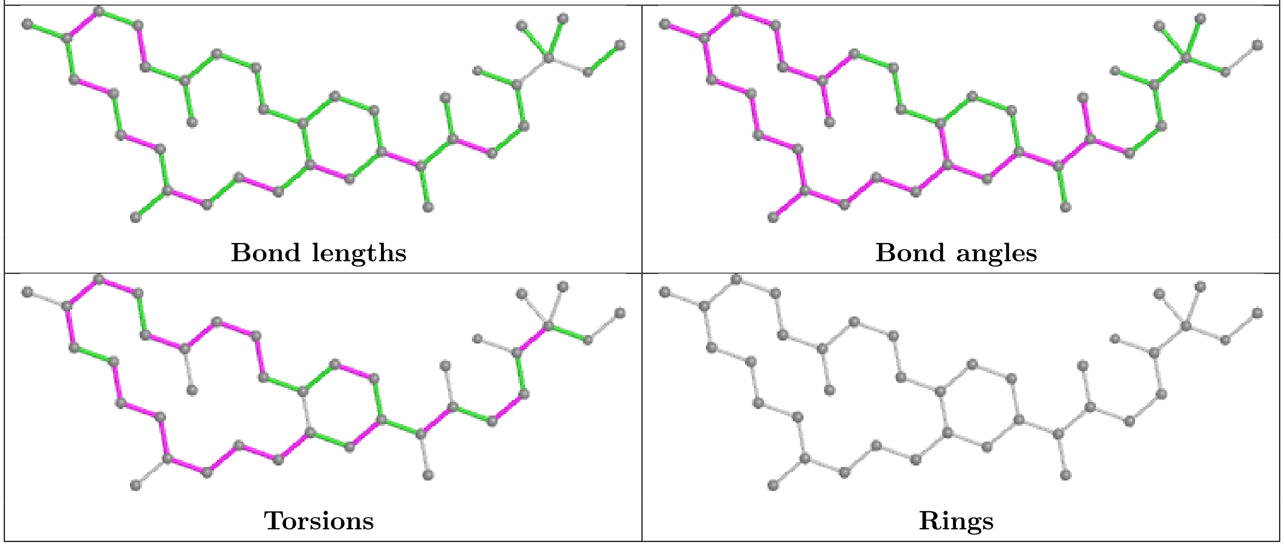
Bond lengths

Bond angles

Torsions

Rings

Ligand A1EFU k 101



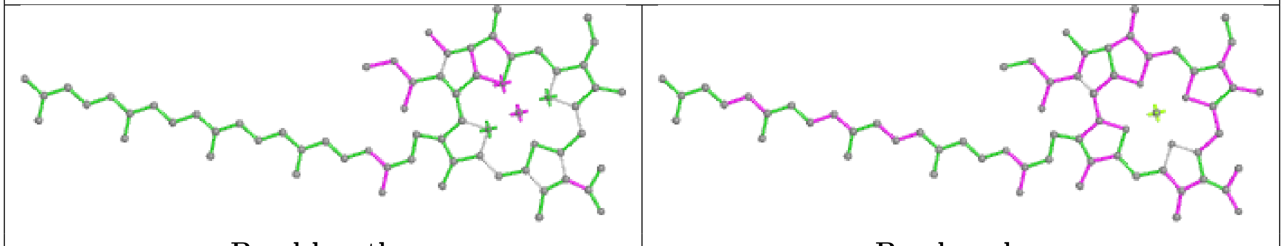
Bond lengths

Bond angles

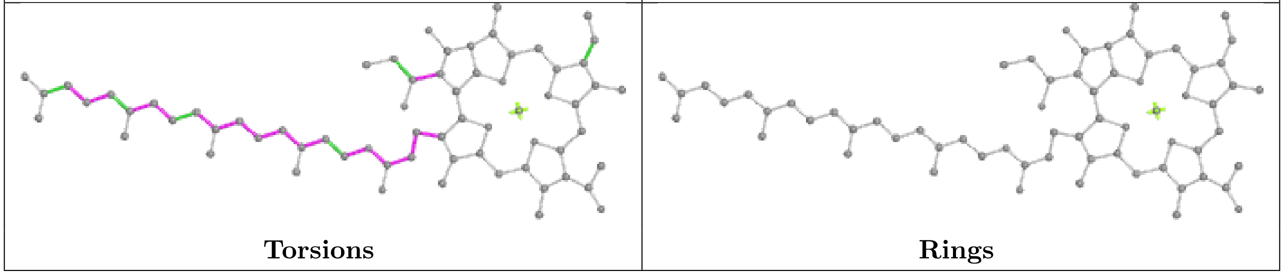
Torsions

Rings

Ligand BCL d 101

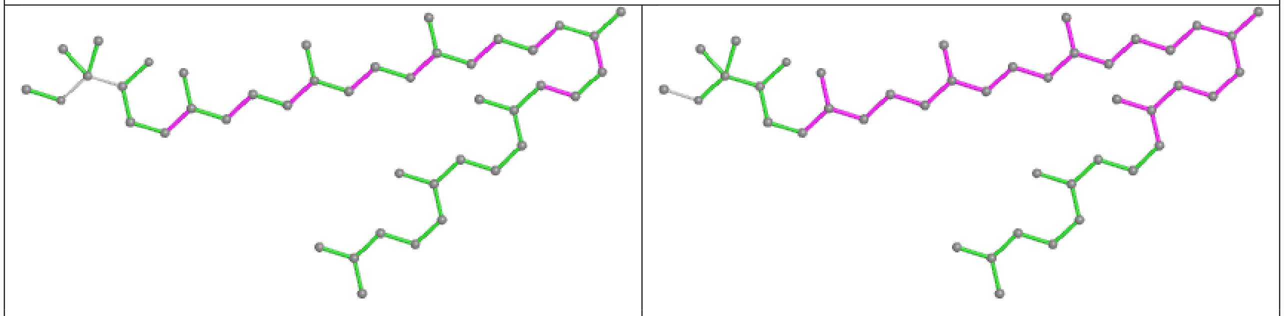


Bond lengths Bond angles

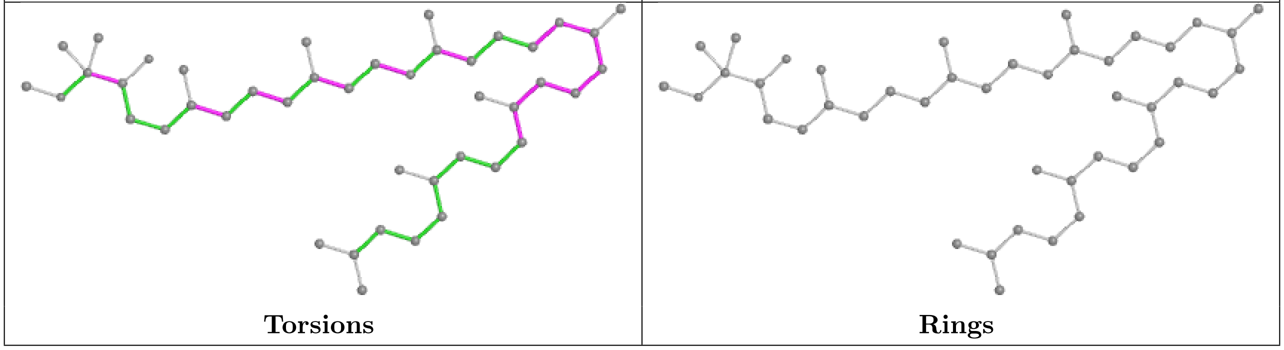


Torsions Rings

Ligand A1EFU 2 104

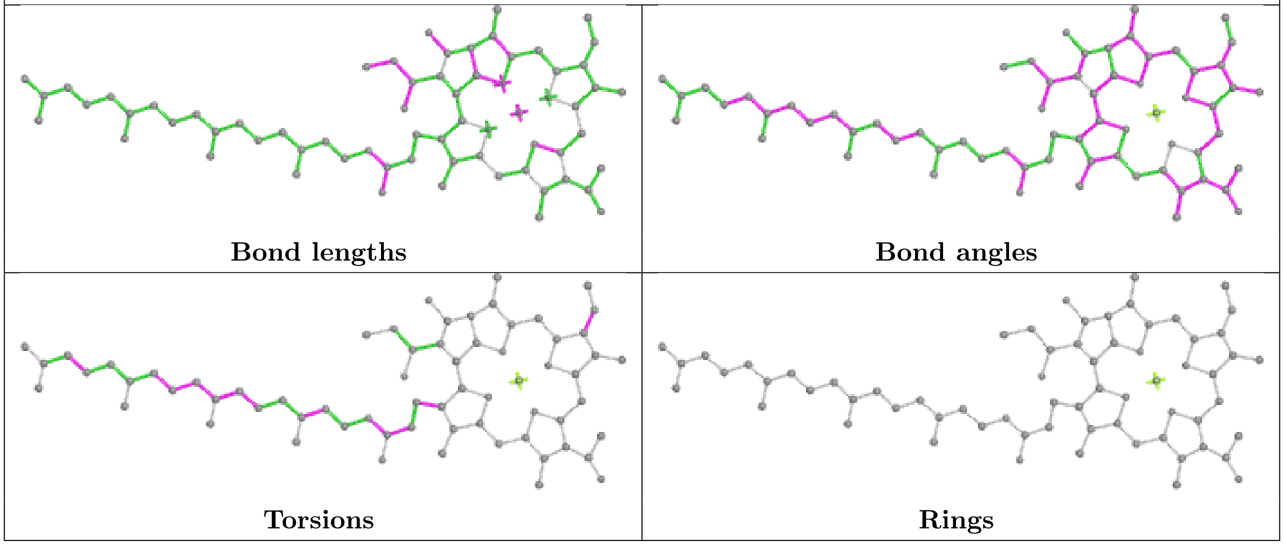


Bond lengths Bond angles



Torsions Rings

Ligand BCL j 102



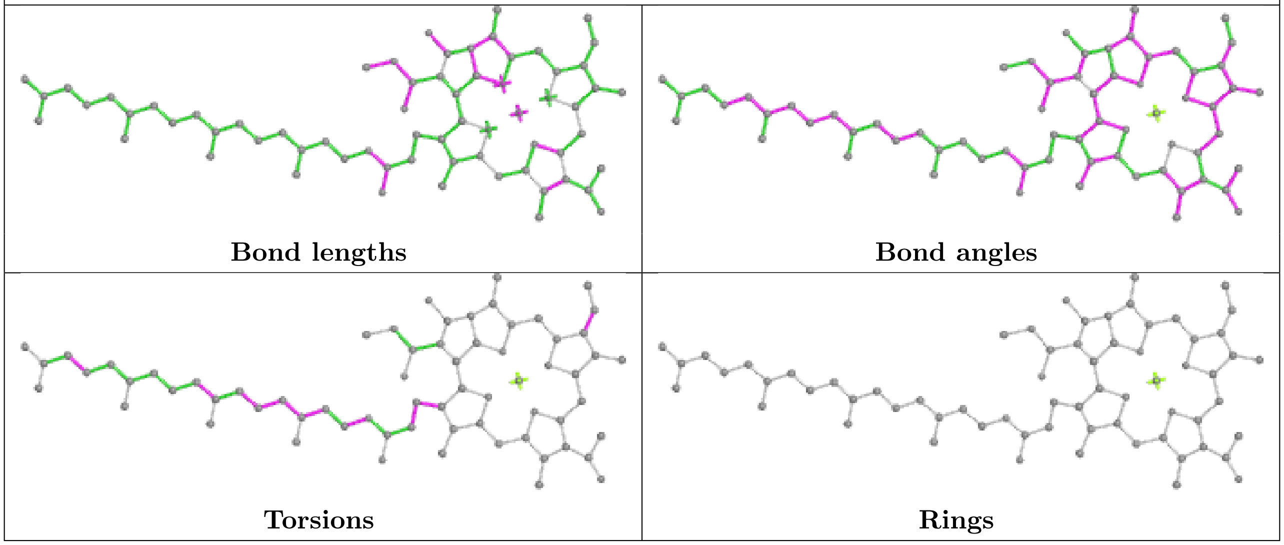
Bond lengths

Bond angles

Torsions

Rings

Ligand BCL A 101



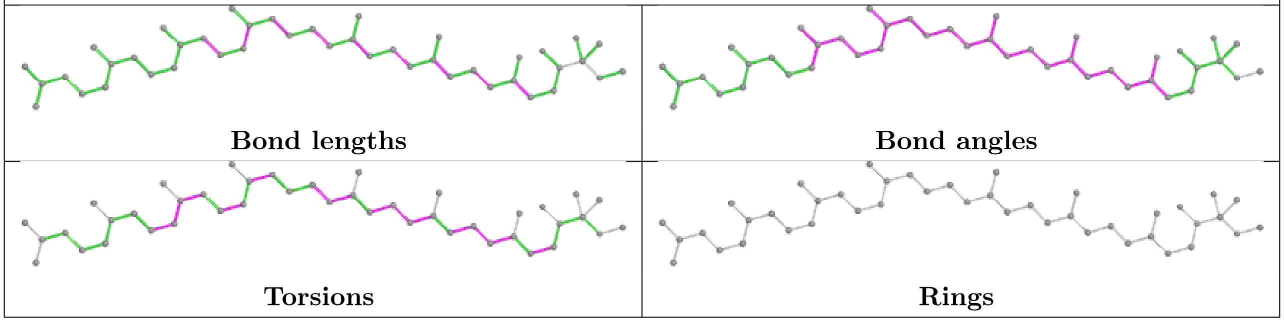
Bond lengths

Bond angles

Torsions

Rings

Ligand A1EFU a 102

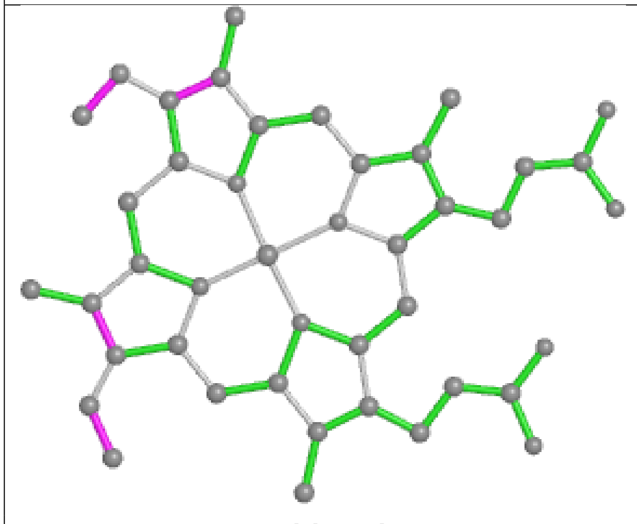
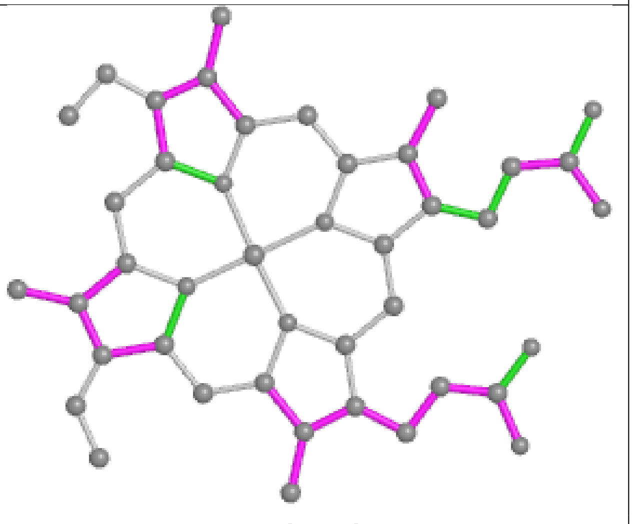
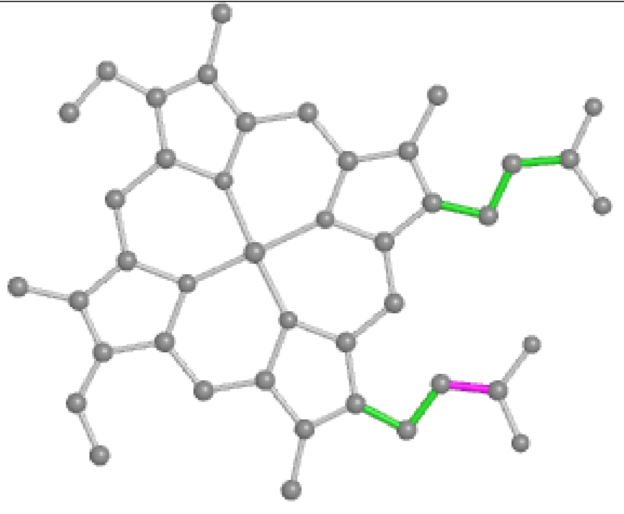
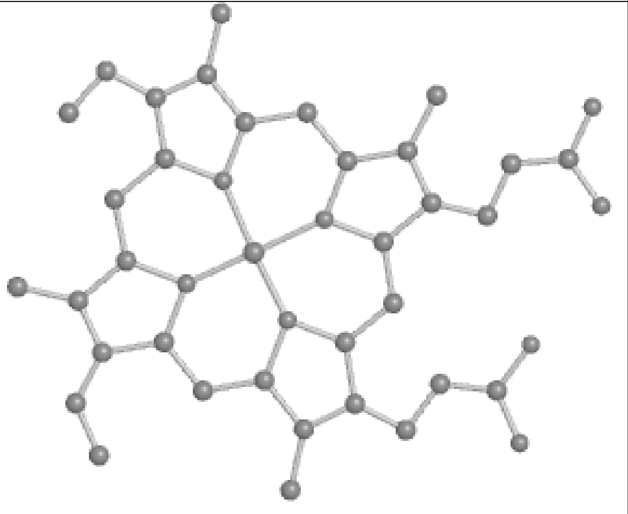


Bond lengths

Bond angles

Torsions

Rings

Ligand HEC C 403	
 Bond lengths	 Bond angles
 Torsions	 Rings

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.