wwPDB EM Validation Summary Report ⓘ

Nov 15, 2022 – 08:43 PM JST

PDB ID	:	7XXF
EMDB ID	:	EMD-33501
Title	:	Structure of photosynthetic LH1-RC super-complex of Rhodopila globiformis
Authors	:	Tani, K.; Kanno, R.; Kurosawa, K.; Takaichi, S.; Nagashima, K.V.P.; Hall, M.; Yu, L.-J.; Kimura, Y.; Madigan, M.T.; Mizoguchi, A.; Humbel, B.M.; Wang-Otomo, Z.-Y.
Deposited on	:	2022-05-30
Resolution	:	2.24 Å(reported)
Based on initial model	:	5Y5S

This is a wwPDB EM Validation Summary Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

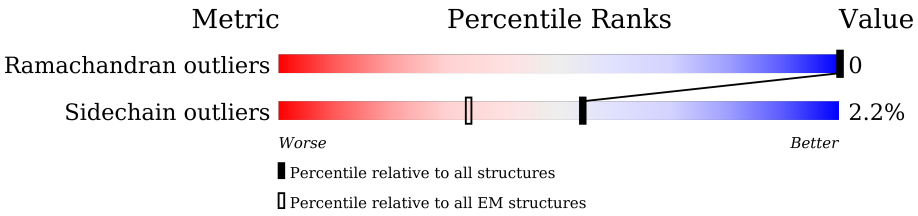
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.24 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)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	C	344	99%
2	L	275	98%
3	M	326	97%
4	H	258	99%
5	1	61	74% 25%
5	3	61	92% 7%
5	5	61	70% 26%
5	7	61	70% 26%
5	9	61	72% 26%

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Mol	Chain	Length	Quality of chain
5	A	61	72% 26%
5	D	61	72% 26%
5	F	61	72% 26%
5	I	61	74% 25%
5	K	61	70% 26%
5	O	61	70% 26%
5	Q	61	69% 5% 26%
5	S	61	93% 5%
5	U	61	85% 13%
5	W	61	7% 92% 7%
5	Y	61	70% 26%
6	0	73	67% 32%
6	2	73	5% 66% 32%
6	4	73	5% 64% 32%
6	6	73	67% 32%
6	8	73	67% 32%
6	B	73	67% 32%
6	E	73	5% 67% 32%
6	G	73	5% 67% 32%
6	J	73	67% 32%
6	N	73	7% 66% 32%
6	P	73	67% 32%
6	R	73	67% 32%
6	T	73	8% 67% 32%
6	V	73	10% 67% 32%

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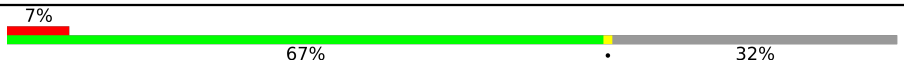
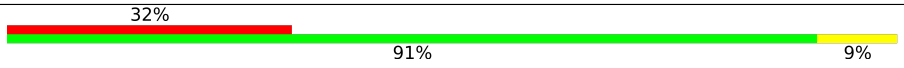
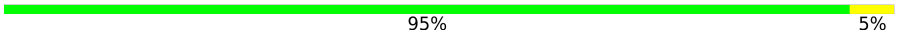
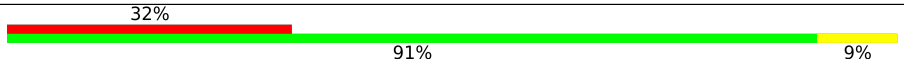
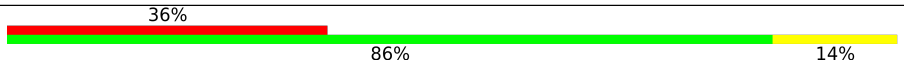
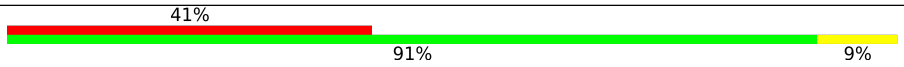
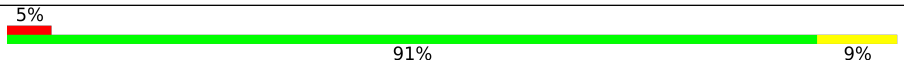
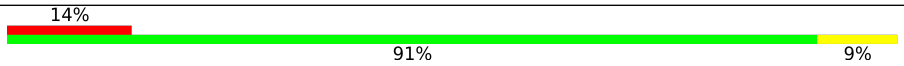
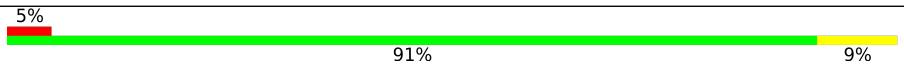
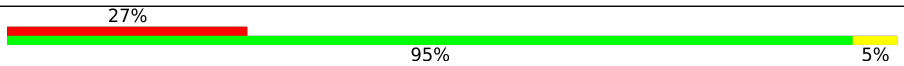
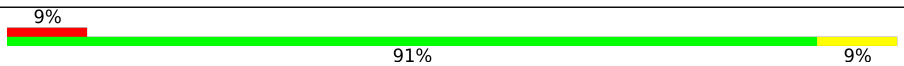
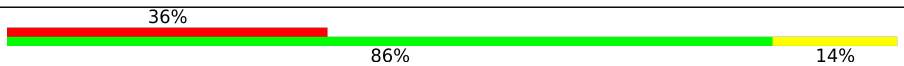
Mol	Chain	Length	Quality of chain
6	X	73	
6	Z	73	
7	a	22	
7	b	22	
7	c	22	
7	d	22	
7	e	22	
7	f	22	
7	g	22	
7	h	22	
7	i	22	
7	j	22	
7	k	22	

2 Entry composition (i)

There are 19 unique types of molecules in this entry. The entry contains 29826 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 Photosynthetic reaction center cytochrome c subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	C	343	Total	C	N	O	S	0	0
			2655	1683	471	481	20		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
2	L	274	Total	C	N	O	S	0	0
			2177	1469	353	347	8		

- Molecule 3 is a protein called Reaction center protein M chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	M	320	Total	C	N	O	S	1	0
			2550	1714	421	404	11		

- Molecule 4 is a protein called Photosynthetic reaction center H subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	H	258	Total	C	N	O	S	0	0
			2000	1284	332	376	8		

- Molecule 5 is a protein called Light-harvesting protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	A	45	Total	C	N	O	S	0	0
			384	264	63	55	2		
5	D	45	Total	C	N	O	S	0	0
			384	264	63	55	2		
5	F	45	Total	C	N	O	S	0	0
			384	264	63	55	2		
5	I	46	Total	C	N	O	S	0	0
			394	270	66	56	2		

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Mol	Chain	Residues	Atoms					AltConf	Trace
5	K	45	Total	C	N	O	S	0	0
			384	264	63	55	2		
5	O	45	Total	C	N	O	S	0	0
			389	267	65	55	2		
5	Q	45	Total	C	N	O	S	0	0
			389	267	65	55	2		
5	S	58	Total	C	N	O	S	0	0
			475	321	82	69	3		
5	U	53	Total	C	N	O	S	0	0
			443	299	77	64	3		
5	W	57	Total	C	N	O	S	0	0
			470	318	81	68	3		
5	Y	45	Total	C	N	O	S	0	0
			384	264	63	55	2		
5	1	46	Total	C	N	O	S	0	0
			395	270	67	56	2		
5	3	57	Total	C	N	O	S	0	0
			472	321	79	69	3		
5	5	45	Total	C	N	O	S	0	0
			389	267	65	55	2		
5	7	45	Total	C	N	O	S	0	0
			389	267	65	55	2		
5	9	45	Total	C	N	O	S	1	0
			392	270	64	56	2		

- Molecule 6 is a protein called Light-harvesting protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
6	B	50	Total	C	N	O	0	0
			396	268	62	66		
6	E	50	Total	C	N	O	0	0
			396	268	62	66		
6	G	50	Total	C	N	O	0	0
			396	268	62	66		
6	J	50	Total	C	N	O	0	0
			396	268	62	66		
6	N	50	Total	C	N	O	0	0
			396	268	62	66		
6	P	50	Total	C	N	O	0	0
			396	268	62	66		
6	R	50	Total	C	N	O	0	0
			396	268	62	66		

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Mol	Chain	Residues	Atoms				AltConf	Trace
6	T	50	Total 396	C 268	N 62	O 66	0	0
6	V	50	Total 396	C 268	N 62	O 66	0	0
6	X	50	Total 396	C 268	N 62	O 66	0	0
6	Z	50	Total 396	C 268	N 62	O 66	0	0
6	2	50	Total 396	C 268	N 62	O 66	0	0
6	4	50	Total 396	C 268	N 62	O 66	0	0
6	6	50	Total 396	C 268	N 62	O 66	0	0
6	8	50	Total 396	C 268	N 62	O 66	0	0
6	0	50	Total 396	C 268	N 62	O 66	0	0

- Molecule 7 is a protein called Light-harvesting protein LH1 Gamma-like.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	a	22	Total 177	C 120	N 28	O 26	S 3	0	0
7	b	22	Total 177	C 120	N 28	O 26	S 3	0	0
7	c	22	Total 177	C 120	N 28	O 26	S 3	0	0
7	d	22	Total 177	C 120	N 28	O 26	S 3	0	0
7	e	22	Total 177	C 120	N 28	O 26	S 3	0	0
7	f	22	Total 177	C 120	N 28	O 26	S 3	0	0
7	g	22	Total 177	C 120	N 28	O 26	S 3	0	0
7	h	22	Total 177	C 120	N 28	O 26	S 3	0	0
7	i	22	Total 177	C 120	N 28	O 26	S 3	0	0
7	j	22	Total 177	C 120	N 28	O 26	S 3	0	0

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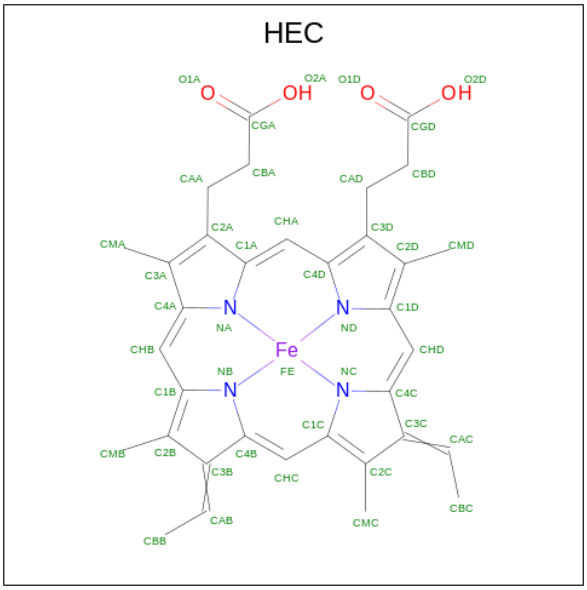
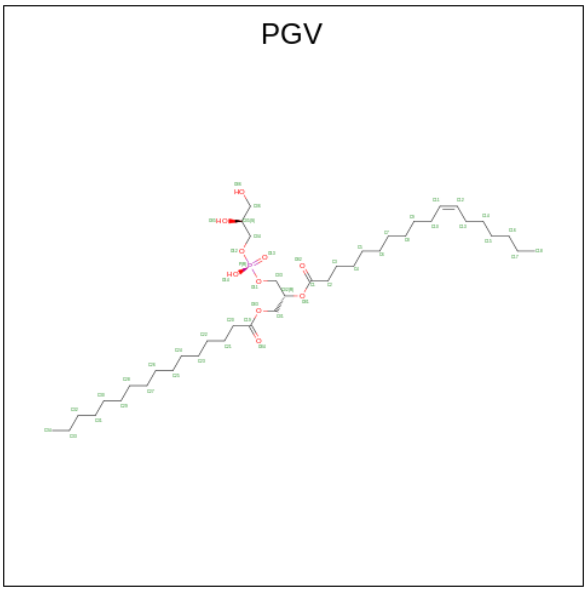
Mol	Chain	Residues	Atoms					AltConf	Trace
7	k	22	Total	C	N	O	S	0	0
			177	120	28	26	3		

- Molecule 8 is HEME C (three-letter code: HEC) (formula: $C_{34}H_{34}FeN_4O_4$).



Mol	Chain	Residues	Atoms					AltConf
8	C	1	Total	C	Fe	N	O	0
			172	136	4	16	16	
8	C	1	Total	C	Fe	N	O	0
			172	136	4	16	16	
8	C	1	Total	C	Fe	N	O	0
			172	136	4	16	16	
8	C	1	Total	C	Fe	N	O	0
			172	136	4	16	16	

- Molecule 9 is (1R)-2-{[{[(2S)-2,3-DIHYDROXYPROPYL]OXY}(HYDROXY)PHOSPHORYL]OXY}-1-[(PALMITOYLOXY)METHYL]ETHYL (11E)-OCTADEC-11-ENOATE (three-letter code: PGV) (formula: $C_{40}H_{77}O_{10}P$).



Mol	Chain	Residues	Atoms				AltConf
9	C	1	Total	C	O	P	0
			124	93	28	3	
9	C	1	Total	C	O	P	0
			124	93	28	3	
9	C	1	Total	C	O	P	0
			124	93	28	3	
9	L	1	Total	C	O	P	0
			191	136	50	5	
9	L	1	Total	C	O	P	0
			191	136	50	5	
9	L	1	Total	C	O	P	0
			191	136	50	5	
9	L	1	Total	C	O	P	0
			191	136	50	5	
9	L	1	Total	C	O	P	0
			191	136	50	5	
9	M	1	Total	C	O	P	0
			84	62	20	2	
9	M	1	Total	C	O	P	0
			84	62	20	2	
9	H	1	Total	C	O	P	0
			72	50	20	2	
9	H	1	Total	C	O	P	0
			72	50	20	2	
9	D	1	Total	C	O	P	0
			33	22	10	1	
9	F	1	Total	C	O	P	0
			39	29	9	1	

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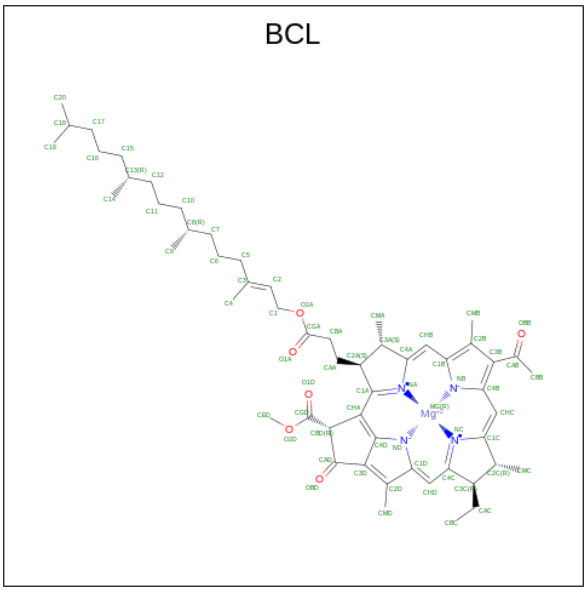
Mol	Chain	Residues	Atoms	AltConf
9	K	1	Total C O P 39 28 10 1	0
9	5	1	Total C O P 111 82 26 3	0
9	5	1	Total C O P 111 82 26 3	0
9	5	1	Total C O P 111 82 26 3	0

- Molecule 10 is BACTERIOCHLOROPHYLL A (three-letter code: BCL) (formula: $C_{55}H_{74}MgN_4O_6$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	AltConf
10	L	1	Total C Mg N O 132 110 2 8 12	0
10	L	1	Total C Mg N O 132 110 2 8 12	0
10	M	1	Total C Mg N O 132 110 2 8 12	0
10	M	1	Total C Mg N O 132 110 2 8 12	0
10	A	1	Total C Mg N O 66 55 1 4 6	0
10	B	1	Total C Mg N O 66 55 1 4 6	0
10	D	1	Total C Mg N O 66 55 1 4 6	0

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Mol	Chain	Residues	Atoms					AltConf
10	E	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	F	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	G	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	I	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	J	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	K	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	N	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	O	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	P	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	Q	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	R	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	S	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	T	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	U	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	V	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	W	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	X	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	Y	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	Z	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	1	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	2	1	Total	C	Mg	N	O	0
			66	55	1	4	6	

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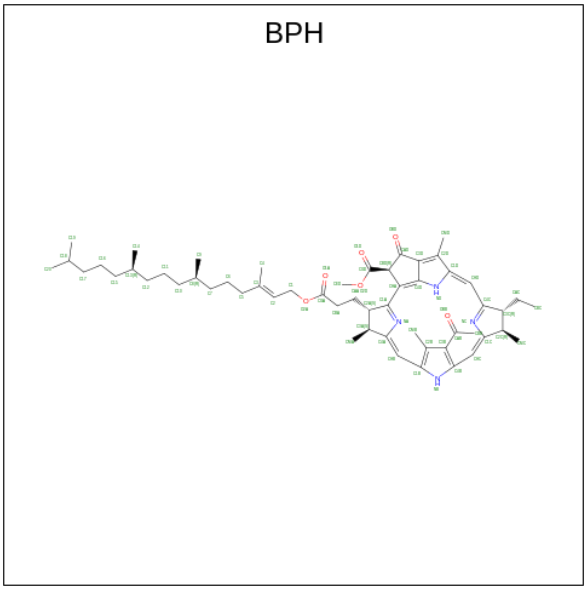
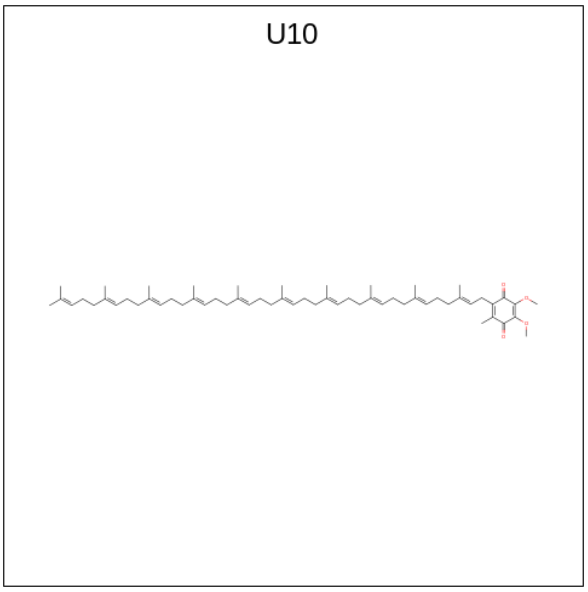
Mol	Chain	Residues	Atoms					AltConf
10	3	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	4	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	5	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	6	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	7	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	8	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	9	1	Total	C	Mg	N	O	0
			66	55	1	4	6	
10	0	1	Total	C	Mg	N	O	0
			66	55	1	4	6	

- Molecule 11 is BACTERIOPHEOPHYTIN A (three-letter code: BPH) (formula: $C_{55}H_{76}N_4O_6$).



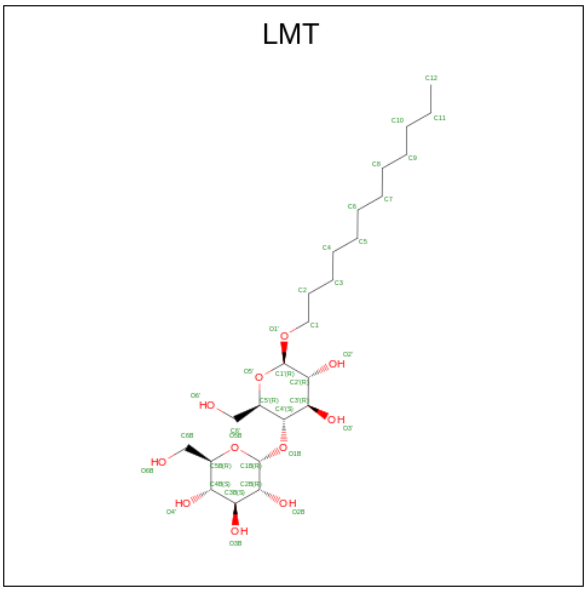
Mol	Chain	Residues	Atoms				AltConf
11	L	1	Total	C	N	O	0
			65	55	4	6	
11	M	1	Total	C	N	O	0
			65	55	4	6	

- Molecule 12 is UBIQUINONE-10 (three-letter code: U10) (formula: $C_{59}H_{90}O_4$).



Mol	Chain	Residues	Atoms			AltConf
12	L	1	Total 86	C 74	O 12	0
12	L	1	Total 86	C 74	O 12	0
12	L	1	Total 86	C 74	O 12	0
12	7	1	Total 63	C 59	O 4	0

- Molecule 13 is DODECYL-BETA-D-MALTOSIDE (three-letter code: LMT) (formula: $C_{24}H_{46}O_{11}$).

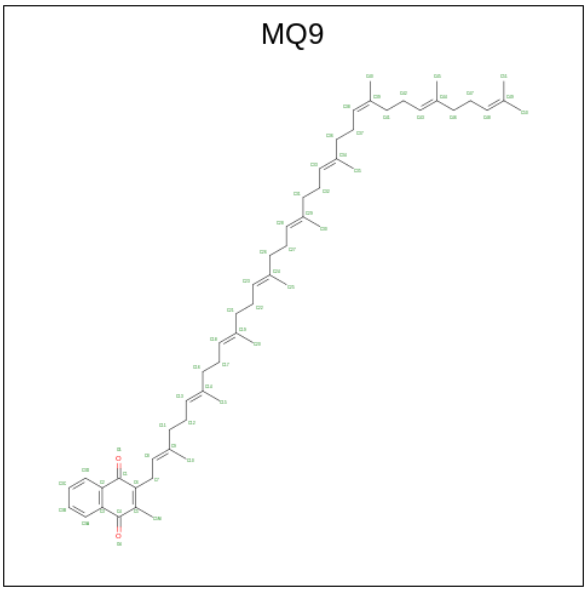


Mol	Chain	Residues	Atoms	AltConf
13	L	1	Total C O 65 43 22	0
13	L	1	Total C O 65 43 22	0
13	I	1	Total C O 33 22 11	0
13	1	1	Total C O 35 24 11	0
13	3	1	Total C O 31 20 11	0

- Molecule 14 is FE (III) ION (three-letter code: FE) (formula: Fe).

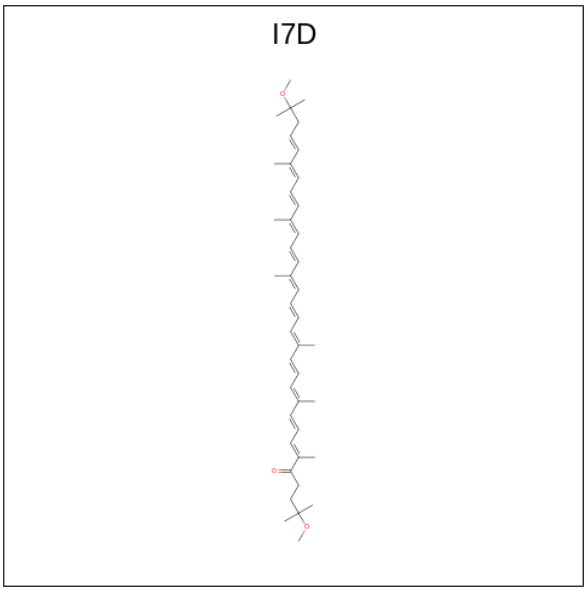
Mol	Chain	Residues	Atoms	AltConf
14	M	1	Total Fe 1 1	0

- Molecule 15 is MENAQUINONE-9 (three-letter code: MQ9) (formula: $C_{56}H_{80}O_2$).



Mol	Chain	Residues	Atoms	AltConf
15	M	1	Total C O 39 37 2	0

- Molecule 16 is (6 {E},8 {E},10 {E},12 {E},14 {E},16 {E},18 {E},20 {E},22 {E},24 {E},26 {E},28 {E})-2,31-dimethoxy-2,6,10,14,19,23,27,31-octamethyl-dotriaconta-6,8,10,12,14,16,18,20,22,24,26,28-dodecaen-5-one (three-letter code: I7D) (formula: $C_{42}H_{60}O_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	AltConf
16	M	1	Total C O 45 42 3	0
16	A	1	Total C O 45 42 3	0
16	D	1	Total C O 45 42 3	0
16	E	1	Total C O 45 42 3	0
16	I	1	Total C O 45 42 3	0
16	K	1	Total C O 45 42 3	0
16	N	1	Total C O 45 42 3	0
16	Q	1	Total C O 45 42 3	0
16	R	1	Total C O 45 42 3	0
16	T	1	Total C O 45 42 3	0
16	V	1	Total C O 45 42 3	0
16	X	1	Total C O 45 42 3	0
16	1	1	Total C O 45 42 3	0
16	3	1	Total C O 45 42 3	0

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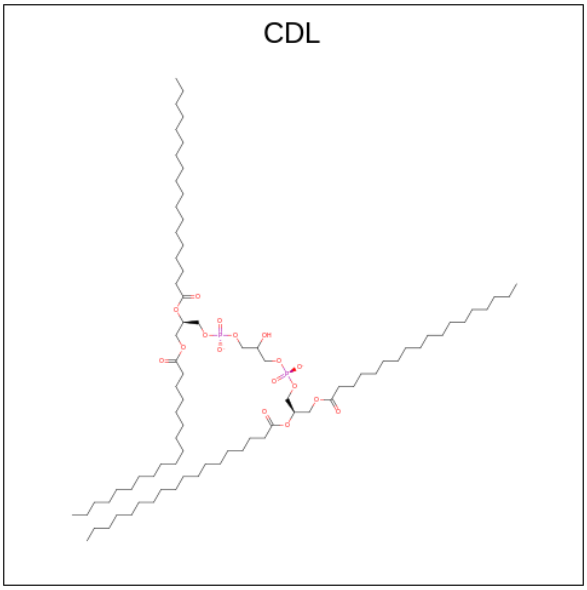
Mol	Chain	Residues	Atoms	AltConf
16	4	1	Total C O 45 42 3	0
16	6	1	Total C O 45 42 3	0
16	8	1	Total C O 45 42 3	0

- Molecule 17 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).



Mol	Chain	Residues	Atoms	AltConf
17	M	1	Total C O P 104 67 33 4	0
17	M	1	Total C O P 104 67 33 4	0
17	H	1	Total C O P 72 53 17 2	0
17	A	1	Total C O P 58 39 17 2	0
17	T	1	Total C O P 72 53 17 2	0
17	2	1	Total C O P 72 53 17 2	0
17	6	1	Total C O P 132 94 34 4	0
17	6	1	Total C O P 132 94 34 4	0

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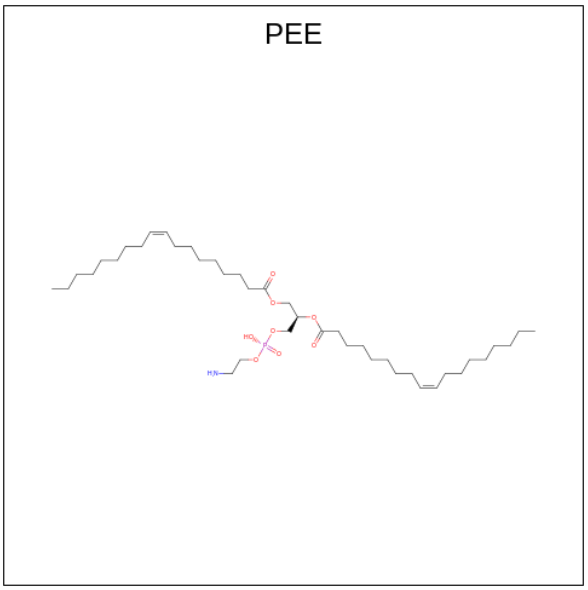
Mol	Chain	Residues	Atoms				AltConf
17	0	1	Total	C	O	P	0
			63	44	17	2	

- Molecule 18 is 1,2-dioleoyl-sn-glycero-3-phosphoethanolamine (three-letter code: PEE) (formula: $C_{41}H_{78}NO_8P$).



Mol	Chain	Residues	Atoms					AltConf
18	M	1	Total	C	N	O	P	0
			44	34	1	8	1	

- Molecule 19 is water.

Mol	Chain	Residues	Atoms		AltConf
19	C	136	Total	O	0
			136	136	
19	L	65	Total	O	0
			65	65	
19	M	81	Total	O	0
			81	81	
19	H	81	Total	O	0
			81	81	
19	A	4	Total	O	0
			4	4	
19	B	7	Total	O	0
			7	7	
19	D	3	Total	O	0
			3	3	

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Mol	Chain	Residues	Atoms	AltConf
19	E	3	Total O 3 3	0
19	F	4	Total O 4 4	0
19	G	2	Total O 2 2	0
19	I	6	Total O 6 6	0
19	J	3	Total O 3 3	0
19	K	3	Total O 3 3	0
19	N	4	Total O 4 4	0
19	O	7	Total O 7 7	0
19	P	5	Total O 5 5	0
19	Q	9	Total O 9 9	0
19	R	12	Total O 12 12	0
19	S	16	Total O 16 16	0
19	T	6	Total O 6 6	0
19	U	8	Total O 8 8	0
19	V	5	Total O 5 5	0
19	W	11	Total O 11 11	0
19	X	3	Total O 3 3	0
19	Y	6	Total O 6 6	0
19	Z	3	Total O 3 3	0
19	1	2	Total O 2 2	0
19	2	4	Total O 4 4	0

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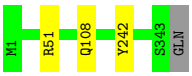
Mol	Chain	Residues	Atoms	AltConf
19	3	7	Total O 7 7	0
19	4	7	Total O 7 7	0
19	5	3	Total O 3 3	0
19	6	4	Total O 4 4	0
19	7	7	Total O 7 7	0
19	8	2	Total O 2 2	0
19	9	7	Total O 7 7	0
19	0	1	Total O 1 1	0
19	b	1	Total O 1 1	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). 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.

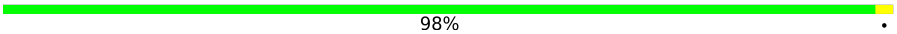
• Molecule 1: Photosynthetic reaction center cytochrome c subunit

Chain C:



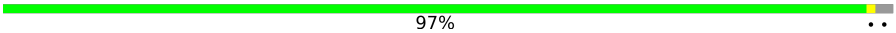
• Molecule 2: Reaction center protein L chain

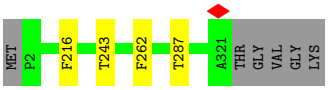
Chain L:



• Molecule 3: Reaction center protein M chain

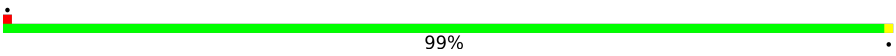
Chain M:





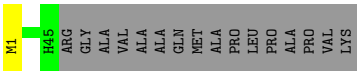
• Molecule 4: Photosynthetic reaction center H subunit

Chain H:



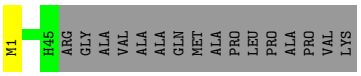
• Molecule 5: Light-harvesting protein

Chain A:



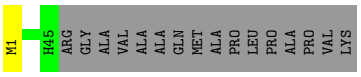
• Molecule 5: Light-harvesting protein

Chain D:



• Molecule 5: Light-harvesting protein

Chain F:

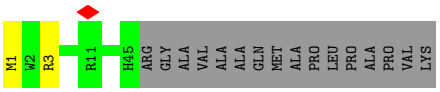


• Molecule 5: Light-harvesting protein

Chain I:

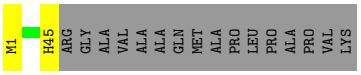
• Molecule 5: Light-harvesting protein

Chain K:



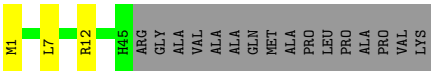
• Molecule 5: Light-harvesting protein

Chain O:



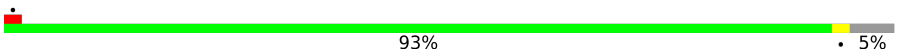
• Molecule 5: Light-harvesting protein

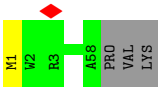
Chain Q:



• Molecule 5: Light-harvesting protein

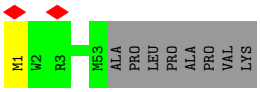
Chain S:





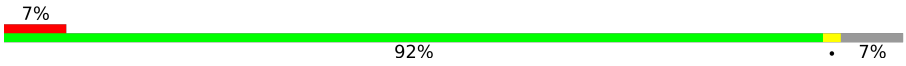
• Molecule 5: Light-harvesting protein

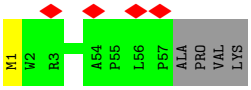
Chain U:



• Molecule 5: Light-harvesting protein

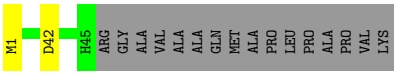
Chain W:





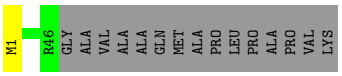
• Molecule 5: Light-harvesting protein

Chain Y:



• Molecule 5: Light-harvesting protein

Chain 1:

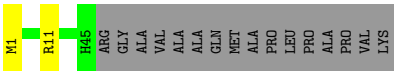


• Molecule 5: Light-harvesting protein

Chain 3:

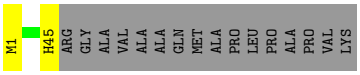
• Molecule 5: Light-harvesting protein

Chain 5:



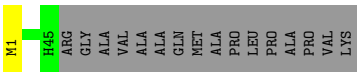
• Molecule 5: Light-harvesting protein

Chain 7:



• Molecule 5: Light-harvesting protein

Chain 9:

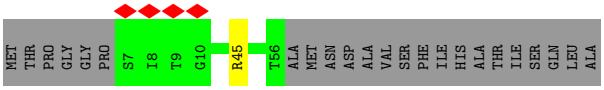


• Molecule 6: Light-harvesting protein

Chain B:

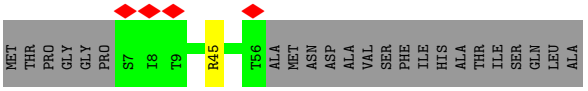
• Molecule 6: Light-harvesting protein

Chain E:



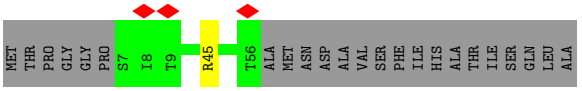
• Molecule 6: Light-harvesting protein

Chain G:



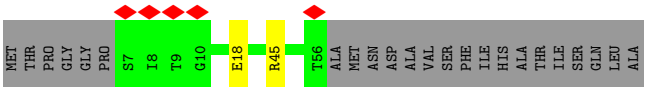
• Molecule 6: Light-harvesting protein

Chain J:



• Molecule 6: Light-harvesting protein

Chain N:

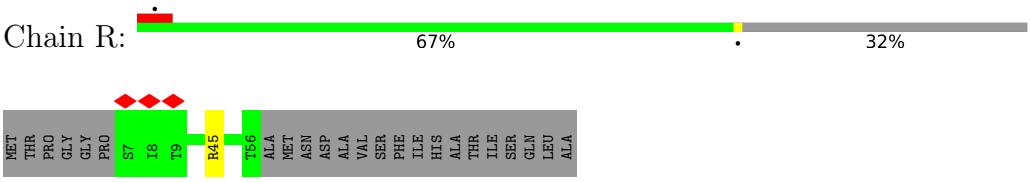


• Molecule 6: Light-harvesting protein

Chain P:

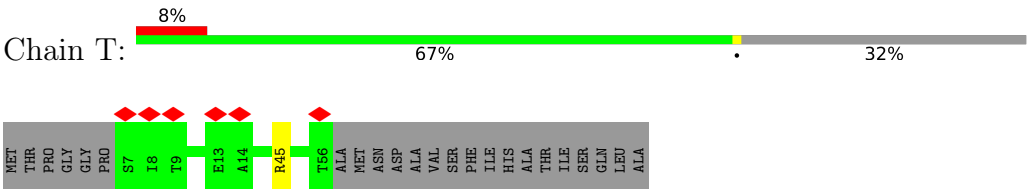
• Molecule 6: Light-harvesting protein

Chain R:



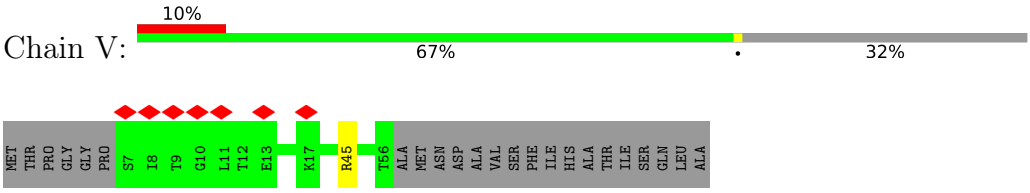
• Molecule 6: Light-harvesting protein

Chain T:



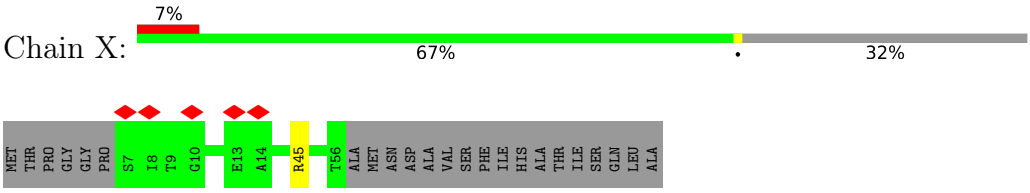
• Molecule 6: Light-harvesting protein

Chain V:



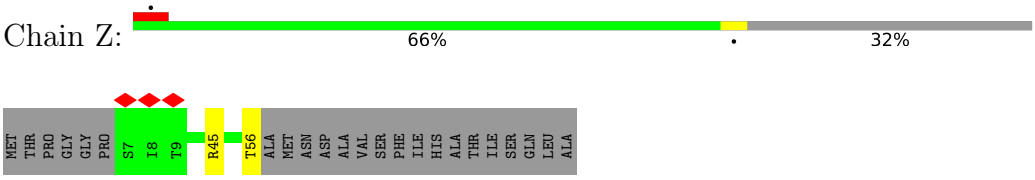
• Molecule 6: Light-harvesting protein

Chain X:



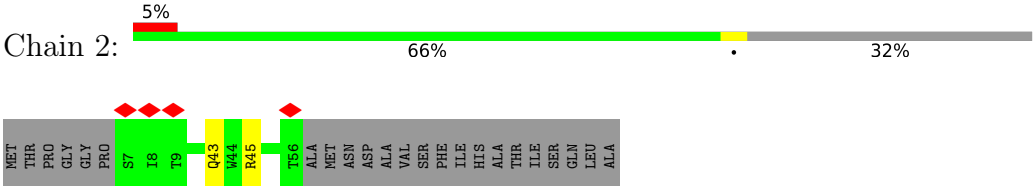
• Molecule 6: Light-harvesting protein

Chain Z:



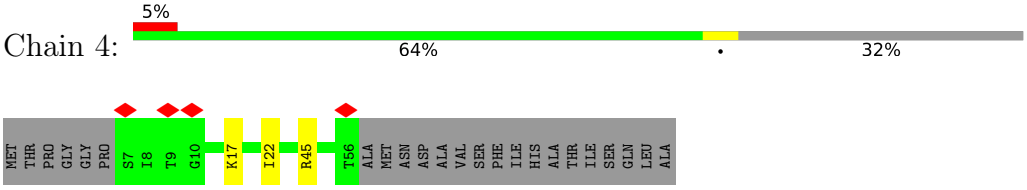
• Molecule 6: Light-harvesting protein

Chain 2:



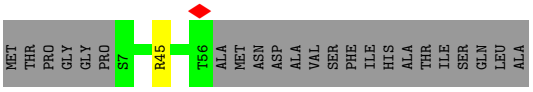
• Molecule 6: Light-harvesting protein

Chain 4:



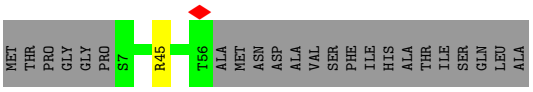
• Molecule 6: Light-harvesting protein

Chain 6:



• Molecule 6: Light-harvesting protein

Chain 8:

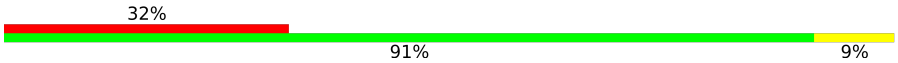


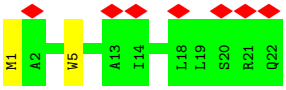
• Molecule 6: Light-harvesting protein

Chain 0:

• Molecule 7: Light-harvesting protein LH1 Gamma-like

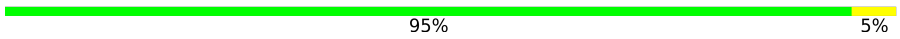
Chain a:





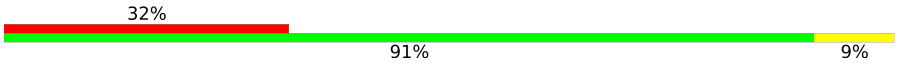
• Molecule 7: Light-harvesting protein LH1 Gamma-like

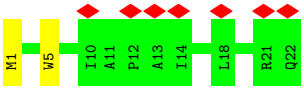
Chain b:



• Molecule 7: Light-harvesting protein LH1 Gamma-like

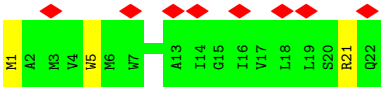
Chain c:





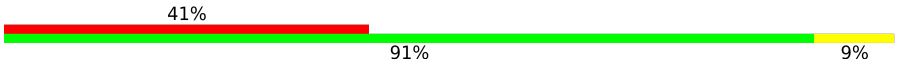
• Molecule 7: Light-harvesting protein LH1 Gamma-like

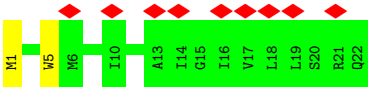
Chain d:



• Molecule 7: Light-harvesting protein LH1 Gamma-like

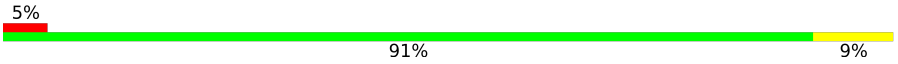
Chain e:

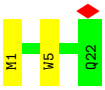




• Molecule 7: Light-harvesting protein LH1 Gamma-like

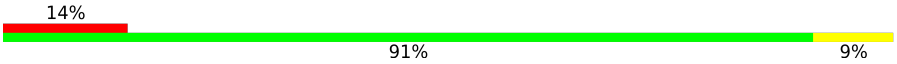
Chain f:

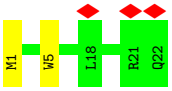




• Molecule 7: Light-harvesting protein LH1 Gamma-like

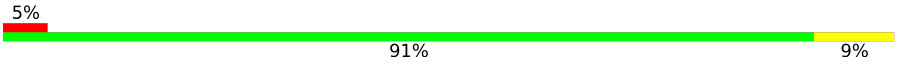
Chain g:

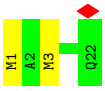




• Molecule 7: Light-harvesting protein LH1 Gamma-like

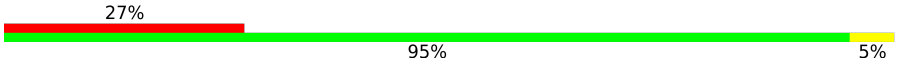
Chain h:

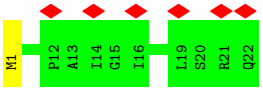




• Molecule 7: Light-harvesting protein LH1 Gamma-like

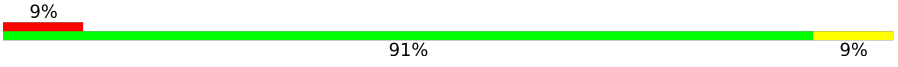
Chain i:

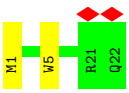




• Molecule 7: Light-harvesting protein LH1 Gamma-like

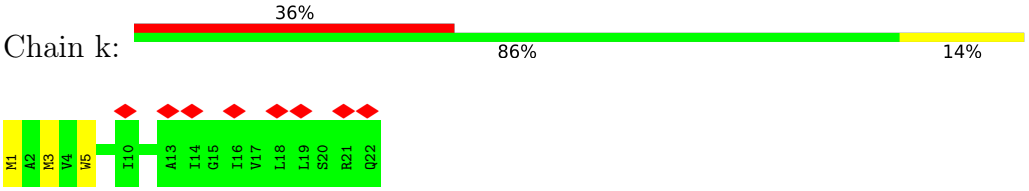
Chain j:





• Molecule 7: Light-harvesting protein LH1 Gamma-like

Chain k:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	128119	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	2800	Depositor
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.316	Depositor
Minimum map value	-0.105	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.007	Depositor
Recommended contour level	0.03	Depositor
Map size (Å)	328.0, 328.0, 328.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.82, 0.82, 0.82	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: LMT, I7D, BCL, PEE, CDL, PGV, MQ9, HEC, FE, BPH, U10, FME

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	C	0.26	0/2730	0.46	0/3730
2	L	0.26	0/2266	0.44	0/3102
3	M	0.26	0/2652	0.45	0/3624
4	H	0.26	0/2053	0.49	0/2800
5	1	0.24	0/398	0.46	0/542
5	3	0.24	0/478	0.44	0/651
5	5	0.25	0/393	0.45	0/536
5	7	0.24	0/393	0.44	0/536
5	9	0.25	0/395	0.48	0/539
5	A	0.24	0/387	0.46	0/528
5	D	0.24	0/387	0.45	0/528
5	F	0.24	0/387	0.44	0/528
5	I	0.24	0/398	0.45	0/543
5	K	0.24	0/387	0.45	0/528
5	O	0.24	0/393	0.44	0/536
5	Q	0.25	0/393	0.47	0/536
5	S	0.25	0/481	0.47	0/657
5	U	0.25	0/447	0.48	0/608
5	W	0.24	0/476	0.47	0/650
5	Y	0.24	0/387	0.46	0/528
6	0	0.24	0/410	0.40	0/563
6	2	0.24	0/410	0.40	0/563
6	4	0.24	0/410	0.39	0/563
6	6	0.25	0/410	0.39	0/563
6	8	0.25	0/410	0.39	0/563
6	B	0.24	0/410	0.40	0/563
6	E	0.25	0/410	0.39	0/563
6	G	0.24	0/410	0.41	0/563
6	J	0.25	0/410	0.40	0/563
6	N	0.25	0/410	0.40	0/563
6	P	0.24	0/410	0.40	0/563
6	R	0.24	0/410	0.39	0/563

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
6	T	0.25	0/410	0.40	0/563
6	V	0.24	0/410	0.40	0/563
6	X	0.24	0/410	0.39	0/563
6	Z	0.24	0/410	0.40	0/563
7	a	0.22	0/171	0.44	0/232
7	b	0.21	0/171	0.43	0/232
7	c	0.22	0/171	0.44	0/232
7	d	0.22	0/171	0.47	0/232
7	e	0.22	0/171	0.45	0/232
7	f	0.22	0/171	0.42	0/232
7	g	0.22	0/171	0.42	0/232
7	h	0.22	0/171	0.44	0/232
7	i	0.22	0/171	0.46	0/232
7	j	0.22	0/171	0.41	0/232
7	k	0.23	0/171	0.45	0/232
All	All	0.25	0/24722	0.44	0/33790

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

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	C	341/344 (99%)	332 (97%)	9 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	L	272/275 (99%)	268 (98%)	4 (2%)	0	100	100
3	M	319/326 (98%)	313 (98%)	6 (2%)	0	100	100
4	H	256/258 (99%)	248 (97%)	8 (3%)	0	100	100
5	1	44/61 (72%)	43 (98%)	1 (2%)	0	100	100
5	3	53/61 (87%)	52 (98%)	1 (2%)	0	100	100
5	5	43/61 (70%)	42 (98%)	1 (2%)	0	100	100
5	7	43/61 (70%)	42 (98%)	1 (2%)	0	100	100
5	9	44/61 (72%)	43 (98%)	1 (2%)	0	100	100
5	A	43/61 (70%)	41 (95%)	2 (5%)	0	100	100
5	D	43/61 (70%)	42 (98%)	1 (2%)	0	100	100
5	F	43/61 (70%)	42 (98%)	1 (2%)	0	100	100
5	I	44/61 (72%)	43 (98%)	1 (2%)	0	100	100
5	K	43/61 (70%)	42 (98%)	1 (2%)	0	100	100
5	O	43/61 (70%)	42 (98%)	1 (2%)	0	100	100
5	Q	43/61 (70%)	42 (98%)	1 (2%)	0	100	100
5	S	56/61 (92%)	55 (98%)	1 (2%)	0	100	100
5	U	51/61 (84%)	49 (96%)	2 (4%)	0	100	100
5	W	55/61 (90%)	53 (96%)	2 (4%)	0	100	100
5	Y	43/61 (70%)	42 (98%)	1 (2%)	0	100	100
6	0	48/73 (66%)	45 (94%)	3 (6%)	0	100	100
6	2	48/73 (66%)	46 (96%)	2 (4%)	0	100	100
6	4	48/73 (66%)	45 (94%)	3 (6%)	0	100	100
6	6	48/73 (66%)	46 (96%)	2 (4%)	0	100	100
6	8	48/73 (66%)	46 (96%)	2 (4%)	0	100	100
6	B	48/73 (66%)	46 (96%)	2 (4%)	0	100	100
6	E	48/73 (66%)	46 (96%)	2 (4%)	0	100	100
6	G	48/73 (66%)	46 (96%)	2 (4%)	0	100	100
6	J	48/73 (66%)	46 (96%)	2 (4%)	0	100	100
6	N	48/73 (66%)	45 (94%)	3 (6%)	0	100	100
6	P	48/73 (66%)	46 (96%)	2 (4%)	0	100	100
6	R	48/73 (66%)	46 (96%)	2 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
6	T	48/73 (66%)	46 (96%)	2 (4%)	0	100	100
6	V	48/73 (66%)	46 (96%)	2 (4%)	0	100	100
6	X	48/73 (66%)	46 (96%)	2 (4%)	0	100	100
6	Z	48/73 (66%)	46 (96%)	2 (4%)	0	100	100
7	a	20/22 (91%)	20 (100%)	0	0	100	100
7	b	20/22 (91%)	20 (100%)	0	0	100	100
7	c	20/22 (91%)	20 (100%)	0	0	100	100
7	d	20/22 (91%)	19 (95%)	1 (5%)	0	100	100
7	e	20/22 (91%)	20 (100%)	0	0	100	100
7	f	20/22 (91%)	20 (100%)	0	0	100	100
7	g	20/22 (91%)	20 (100%)	0	0	100	100
7	h	20/22 (91%)	19 (95%)	1 (5%)	0	100	100
7	i	20/22 (91%)	20 (100%)	0	0	100	100
7	j	20/22 (91%)	20 (100%)	0	0	100	100
7	k	20/22 (91%)	20 (100%)	0	0	100	100
All	All	2910/3589 (81%)	2827 (97%)	83 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all 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	C	283/284 (100%)	280 (99%)	3 (1%)	73	80
2	L	214/215 (100%)	209 (98%)	5 (2%)	50	57
3	M	251/254 (99%)	247 (98%)	4 (2%)	62	70
4	H	212/212 (100%)	210 (99%)	2 (1%)	78	84
5	1	40/50 (80%)	40 (100%)	0	100	100
5	3	48/50 (96%)	48 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
5	5	40/50 (80%)	39 (98%)	1 (2%)	47 54
5	7	40/50 (80%)	39 (98%)	1 (2%)	47 54
5	9	40/50 (80%)	40 (100%)	0	100 100
5	A	39/50 (78%)	39 (100%)	0	100 100
5	D	39/50 (78%)	39 (100%)	0	100 100
5	F	39/50 (78%)	39 (100%)	0	100 100
5	I	40/50 (80%)	40 (100%)	0	100 100
5	K	39/50 (78%)	38 (97%)	1 (3%)	46 52
5	O	40/50 (80%)	39 (98%)	1 (2%)	47 54
5	Q	40/50 (80%)	38 (95%)	2 (5%)	24 24
5	S	47/50 (94%)	47 (100%)	0	100 100
5	U	44/50 (88%)	44 (100%)	0	100 100
5	W	47/50 (94%)	47 (100%)	0	100 100
5	Y	39/50 (78%)	38 (97%)	1 (3%)	46 52
6	0	40/57 (70%)	39 (98%)	1 (2%)	47 54
6	2	40/57 (70%)	38 (95%)	2 (5%)	24 24
6	4	40/57 (70%)	37 (92%)	3 (8%)	13 10
6	6	40/57 (70%)	39 (98%)	1 (2%)	47 54
6	8	40/57 (70%)	39 (98%)	1 (2%)	47 54
6	B	40/57 (70%)	39 (98%)	1 (2%)	47 54
6	E	40/57 (70%)	39 (98%)	1 (2%)	47 54
6	G	40/57 (70%)	39 (98%)	1 (2%)	47 54
6	J	40/57 (70%)	39 (98%)	1 (2%)	47 54
6	N	40/57 (70%)	38 (95%)	2 (5%)	24 24
6	P	40/57 (70%)	39 (98%)	1 (2%)	47 54
6	R	40/57 (70%)	39 (98%)	1 (2%)	47 54
6	T	40/57 (70%)	39 (98%)	1 (2%)	47 54
6	V	40/57 (70%)	39 (98%)	1 (2%)	47 54
6	X	40/57 (70%)	39 (98%)	1 (2%)	47 54
6	Z	40/57 (70%)	38 (95%)	2 (5%)	24 24
7	a	17/17 (100%)	16 (94%)	1 (6%)	19 17

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
7	b	17/17 (100%)	17 (100%)	0	100 100
7	c	17/17 (100%)	16 (94%)	1 (6%)	19 17
7	d	17/17 (100%)	15 (88%)	2 (12%)	5 2
7	e	17/17 (100%)	16 (94%)	1 (6%)	19 17
7	f	17/17 (100%)	16 (94%)	1 (6%)	19 17
7	g	17/17 (100%)	16 (94%)	1 (6%)	19 17
7	h	17/17 (100%)	16 (94%)	1 (6%)	19 17
7	i	17/17 (100%)	17 (100%)	0	100 100
7	j	17/17 (100%)	16 (94%)	1 (6%)	19 17
7	k	17/17 (100%)	15 (88%)	2 (12%)	5 2
All	All	2448/2864 (86%)	2395 (98%)	53 (2%)	54 59

5 of 53 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
6	X	45	ARG
6	4	22	ILE
7	h	3	MET
5	Y	42	ASP
6	2	43	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 12 such sidechains are listed below:

Mol	Chain	Res	Type
6	8	43	GLN
7	c	22	GLN
7	k	22	GLN
7	g	22	GLN
6	G	43	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

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

27 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
5	FME	D	1	5	8,9,10	0.50	0	7,9,11	1.19	1 (14%)
5	FME	Y	1	5	8,9,10	0.53	0	7,9,11	0.91	1 (14%)
5	FME	3	1	5	8,9,10	0.51	0	7,9,11	0.99	1 (14%)
7	FME	e	1	7	8,9,10	0.53	0	7,9,11	0.99	1 (14%)
7	FME	b	1	7	8,9,10	0.52	0	7,9,11	0.93	1 (14%)
7	FME	h	1	7	8,9,10	0.50	0	7,9,11	0.98	1 (14%)
5	FME	K	1	5	8,9,10	0.50	0	7,9,11	1.11	1 (14%)
5	FME	F	1	5	8,9,10	0.52	0	7,9,11	0.97	1 (14%)
7	FME	a	1	7	8,9,10	0.51	0	7,9,11	0.99	1 (14%)
7	FME	d	1	7	8,9,10	0.52	0	7,9,11	0.93	1 (14%)
5	FME	Q	1	5	8,9,10	0.46	0	7,9,11	1.22	1 (14%)
7	FME	k	1	7	8,9,10	0.53	0	7,9,11	0.95	1 (14%)
5	FME	7	1	5	8,9,10	0.51	0	7,9,11	1.09	1 (14%)
5	FME	W	1	5	8,9,10	0.51	0	7,9,11	0.92	1 (14%)
5	FME	U	1	5	8,9,10	0.53	0	7,9,11	0.93	1 (14%)
7	FME	c	1	7	8,9,10	0.52	0	7,9,11	1.18	1 (14%)
5	FME	9	1	5	8,9,10	0.49	0	7,9,11	0.94	1 (14%)
5	FME	1	1	5	8,9,10	0.50	0	7,9,11	1.08	1 (14%)
5	FME	A	1	5	8,9,10	0.49	0	7,9,11	0.98	1 (14%)
5	FME	5	1	5	8,9,10	0.52	0	7,9,11	0.91	1 (14%)
7	FME	j	1	7	8,9,10	0.51	0	7,9,11	1.04	1 (14%)
7	FME	i	1	7	8,9,10	0.51	0	7,9,11	1.08	1 (14%)
7	FME	g	1	7	8,9,10	0.51	0	7,9,11	0.95	1 (14%)
5	FME	O	1	5	8,9,10	0.53	0	7,9,11	0.98	1 (14%)
5	FME	S	1	5	8,9,10	0.49	0	7,9,11	0.97	1 (14%)
5	FME	I	1	5	8,9,10	0.51	0	7,9,11	1.16	1 (14%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
7	FME	f	1	7	8,9,10	0.50	0	7,9,11	0.96	1 (14%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	FME	D	1	5	-	1/7/9/11	-
5	FME	Y	1	5	-	2/7/9/11	-
5	FME	3	1	5	-	0/7/9/11	-
7	FME	e	1	7	-	1/7/9/11	-
7	FME	b	1	7	-	3/7/9/11	-
7	FME	h	1	7	-	2/7/9/11	-
5	FME	K	1	5	-	3/7/9/11	-
5	FME	F	1	5	-	1/7/9/11	-
7	FME	a	1	7	-	3/7/9/11	-
7	FME	d	1	7	-	2/7/9/11	-
5	FME	Q	1	5	-	1/7/9/11	-
7	FME	k	1	7	-	0/7/9/11	-
5	FME	7	1	5	-	4/7/9/11	-
5	FME	W	1	5	-	2/7/9/11	-
5	FME	U	1	5	-	1/7/9/11	-
7	FME	c	1	7	-	2/7/9/11	-
5	FME	9	1	5	-	1/7/9/11	-
5	FME	1	1	5	-	2/7/9/11	-
5	FME	A	1	5	-	1/7/9/11	-
5	FME	5	1	5	-	3/7/9/11	-
7	FME	j	1	7	-	1/7/9/11	-
7	FME	i	1	7	-	0/7/9/11	-
7	FME	g	1	7	-	4/7/9/11	-
5	FME	O	1	5	-	0/7/9/11	-
5	FME	S	1	5	-	1/7/9/11	-
5	FME	I	1	5	-	0/7/9/11	-
7	FME	f	1	7	-	1/7/9/11	-

There are no bond length outliers.

The worst 5 of 27 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	Q	1	FME	O-C-CA	-2.84	117.33	124.78
5	D	1	FME	O-C-CA	-2.76	117.54	124.78
5	I	1	FME	O-C-CA	-2.75	117.58	124.78
5	K	1	FME	O-C-CA	-2.67	117.79	124.78
5	1	1	FME	O-C-CA	-2.64	117.86	124.78

There are no chirality outliers.

5 of 42 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	K	1	FME	O1-CN-N-CA
5	K	1	FME	CB-CA-N-CN
5	U	1	FME	O1-CN-N-CA
5	Y	1	FME	O1-CN-N-CA
5	Y	1	FME	CB-CA-N-CN

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

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	$\#\|Z\| > 2$
16	I7D	A	103	-	43,44,44	1.97	10 (23%)	51,56,56	1.89	11 (21%)
8	HEC	C	401	1	32,50,50	1.60	4 (12%)	24,82,82	1.66	3 (12%)
10	BCL	E	102	-	58,74,74	1.63	10 (17%)	69,115,115	1.70	14 (20%)
16	I7D	X	101	-	43,44,44	2.03	10 (23%)	51,56,56	1.94	11 (21%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
13	LMT	3	103	-	32,32,36	0.40	0	43,43,47	0.85	1 (2%)
16	I7D	Q	101	-	43,44,44	1.97	10 (23%)	51,56,56	1.84	11 (21%)
10	BCL	8	102	-	58,74,74	1.63	10 (17%)	69,115,115	1.65	15 (21%)
9	PGV	H	302	-	35,35,50	1.08	2 (5%)	38,41,56	1.18	4 (10%)
9	PGV	5	101	-	36,36,50	1.08	2 (5%)	39,41,56	1.18	4 (10%)
17	CDL	T	103	-	71,71,99	1.08	4 (5%)	77,83,111	1.15	6 (7%)
10	BCL	X	102	-	58,74,74	1.64	10 (17%)	69,115,115	1.66	13 (18%)
9	PGV	C	405	-	43,43,50	1.00	2 (4%)	45,49,56	1.12	3 (6%)
17	CDL	6	104	-	62,62,99	1.16	4 (6%)	68,74,111	1.26	6 (8%)
10	BCL	K	102	-	58,74,74	1.66	8 (13%)	69,115,115	1.80	15 (21%)
10	BCL	O	101	-	58,74,74	1.65	8 (13%)	69,115,115	1.78	15 (21%)
16	I7D	N	101	-	43,44,44	1.98	10 (23%)	51,56,56	1.90	13 (25%)
9	PGV	M	411	-	32,32,50	1.14	2 (6%)	35,38,56	1.22	3 (8%)
16	I7D	M	406	-	43,44,44	1.95	11 (25%)	51,56,56	1.74	8 (15%)
10	BCL	J	101	-	58,74,74	1.62	10 (17%)	69,115,115	1.69	13 (18%)
9	PGV	H	301	-	35,35,50	1.10	2 (5%)	38,41,56	1.17	3 (7%)
16	I7D	3	101	-	43,44,44	1.98	10 (23%)	51,56,56	1.86	11 (21%)
11	BPH	M	404	-	51,70,70	0.53	1 (1%)	52,101,101	0.64	0
9	PGV	L	305	-	43,43,50	0.97	2 (4%)	46,49,56	1.01	2 (4%)
10	BCL	P	101	-	58,74,74	1.62	10 (17%)	69,115,115	1.70	14 (20%)
10	BCL	L	309	-	58,74,74	1.61	9 (15%)	69,115,115	1.67	15 (21%)
10	BCL	T	102	-	58,74,74	1.63	10 (17%)	69,115,115	1.66	14 (20%)
17	CDL	0	101	-	62,62,99	1.16	4 (6%)	68,74,111	1.18	6 (8%)
9	PGV	L	311	-	32,32,50	1.15	2 (6%)	35,38,56	1.27	4 (11%)
8	HEC	C	404	1	32,50,50	1.56	4 (12%)	24,82,82	1.30	2 (8%)
10	BCL	N	102	-	58,74,74	1.63	10 (17%)	69,115,115	1.69	14 (20%)
10	BCL	S	101	-	58,74,74	1.66	9 (15%)	69,115,115	1.75	15 (21%)
10	BCL	D	102	-	58,74,74	1.66	8 (13%)	69,115,115	1.71	15 (21%)
16	I7D	K	101	-	43,44,44	1.97	10 (23%)	51,56,56	1.85	11 (21%)
17	CDL	2	101	-	71,71,99	1.10	4 (5%)	77,83,111	1.08	5 (6%)
12	U10	L	306	-	15,15,63	1.15	2 (13%)	19,21,79	0.87	0
10	BCL	1	102	-	58,74,74	1.64	8 (13%)	69,115,115	1.75	18 (26%)
10	BCL	F	101	-	58,74,74	1.63	8 (13%)	69,115,115	1.82	16 (23%)
10	BCL	Y	101	-	58,74,74	1.66	9 (15%)	69,115,115	1.74	15 (21%)
10	BCL	M	403	-	58,74,74	1.63	10 (17%)	69,115,115	1.68	13 (18%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
16	I7D	1	101	-	43,44,44	2.03	10 (23%)	51,56,56	1.89	12 (23%)
10	BCL	I	102	-	58,74,74	1.64	10 (17%)	69,115,115	1.66	16 (23%)
10	BCL	9	101	-	58,74,74	1.66	10 (17%)	69,115,115	1.69	16 (23%)
12	U10	L	303	-	36,36,63	0.77	2 (5%)	43,46,79	0.58	0
10	BCL	W	101	-	58,74,74	1.65	10 (17%)	69,115,115	1.67	15 (21%)
10	BCL	L	301	-	58,74,74	1.63	9 (15%)	69,115,115	1.63	14 (20%)
9	PGV	L	312	-	33,33,50	1.11	2 (6%)	36,39,56	1.22	3 (8%)
10	BCL	7	402	-	58,74,74	1.64	11 (18%)	69,115,115	1.62	13 (18%)
10	BCL	A	102	-	58,74,74	1.66	10 (17%)	69,115,115	1.69	15 (21%)
8	HEC	C	402	1	32,50,50	1.56	4 (12%)	24,82,82	1.39	2 (8%)
10	BCL	3	102	-	58,74,74	1.65	10 (17%)	69,115,115	1.65	17 (24%)
9	PGV	D	103	-	32,32,50	1.13	2 (6%)	35,38,56	1.20	3 (8%)
10	BCL	Q	102	-	58,74,74	1.65	9 (15%)	69,115,115	1.74	15 (21%)
10	BCL	4	102	-	58,74,74	1.63	9 (15%)	69,115,115	1.67	14 (20%)
10	BCL	6	103	-	58,74,74	1.64	10 (17%)	69,115,115	1.66	13 (18%)
10	BCL	5	102	-	58,74,74	1.67	11 (18%)	69,115,115	1.65	15 (21%)
9	PGV	M	410	-	50,50,50	0.90	2 (4%)	53,56,56	1.06	3 (5%)
16	I7D	4	101	-	43,44,44	1.99	10 (23%)	51,56,56	1.85	12 (23%)
12	U10	7	401	-	63,63,63	0.59	2 (3%)	76,79,79	0.54	0
17	CDL	6	101	-	68,68,99	1.12	4 (5%)	74,80,111	1.11	5 (6%)
9	PGV	C	406	-	41,41,50	1.02	2 (4%)	44,47,56	1.20	3 (6%)
10	BCL	0	102	-	58,74,74	1.64	10 (17%)	69,115,115	1.67	14 (20%)
10	BCL	Z	101	-	58,74,74	1.64	10 (17%)	69,115,115	1.68	13 (18%)
11	BPH	L	302	-	51,70,70	0.52	0	52,101,101	0.64	0
13	LMT	L	308	-	31,31,36	0.38	0	42,42,47	0.68	0
9	PGV	C	407	-	37,37,50	1.09	2 (5%)	41,42,56	1.22	4 (9%)
10	BCL	M	402	-	58,74,74	1.64	9 (15%)	69,115,115	1.70	13 (18%)
10	BCL	U	101	-	58,74,74	1.66	11 (18%)	69,115,115	1.68	14 (20%)
9	PGV	L	304	-	42,42,50	0.96	2 (4%)	45,48,56	1.14	4 (8%)
13	LMT	1	103	-	36,36,36	0.37	0	47,47,47	0.74	1 (2%)
10	BCL	G	101	-	58,74,74	1.62	10 (17%)	69,115,115	1.67	14 (20%)
18	PEE	M	409	-	43,43,50	0.78	2 (4%)	46,48,55	0.57	0
15	MQ9	M	405	-	40,40,59	0.40	0	49,52,75	0.38	0
8	HEC	C	403	1	32,50,50	1.59	4 (12%)	24,82,82	1.36	2 (8%)
16	I7D	R	101	-	43,44,44	1.99	10 (23%)	51,56,56	1.86	12 (23%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
10	BCL	B	101	-	58,74,74	1.64	9 (15%)	69,115,115	1.69	14 (20%)
16	I7D	I	101	-	43,44,44	2.01	10 (23%)	51,56,56	1.87	11 (21%)
16	I7D	T	101	-	43,44,44	1.99	11 (25%)	51,56,56	1.91	12 (23%)
9	PGV	5	103	-	36,36,50	1.07	2 (5%)	39,41,56	1.10	3 (7%)
9	PGV	5	104	-	36,36,50	1.08	2 (5%)	39,42,56	1.01	2 (5%)
16	I7D	V	101	-	43,44,44	1.98	10 (23%)	51,56,56	1.84	11 (21%)
16	I7D	8	101	-	43,44,44	2.01	10 (23%)	51,56,56	2.27	14 (27%)
16	I7D	E	101	-	43,44,44	2.00	10 (23%)	51,56,56	1.88	11 (21%)
10	BCL	R	102	-	58,74,74	1.63	10 (17%)	69,115,115	1.71	14 (20%)
17	CDL	A	101	-	57,57,99	1.12	4 (7%)	63,69,111	1.27	7 (11%)
17	CDL	H	303	-	71,71,99	1.08	4 (5%)	77,83,111	1.08	5 (6%)
17	CDL	M	407	-	34,34,99	1.42	3 (8%)	39,45,111	1.49	5 (12%)
9	PGV	F	102	-	38,38,50	1.05	2 (5%)	41,43,56	1.01	2 (4%)
16	I7D	6	102	-	43,44,44	2.04	10 (23%)	51,56,56	2.00	13 (25%)
17	CDL	M	408	-	68,68,99	1.10	4 (5%)	74,80,111	1.09	4 (5%)
12	U10	L	307	-	35,35,63	0.79	2 (5%)	42,45,79	0.71	0
16	I7D	D	101	-	43,44,44	1.96	11 (25%)	51,56,56	1.84	11 (21%)
9	PGV	K	103	-	38,38,50	1.06	2 (5%)	41,44,56	1.04	2 (4%)
13	LMT	L	313	-	36,36,36	0.36	0	47,47,47	0.74	2 (4%)
9	PGV	L	310	-	36,36,50	1.07	2 (5%)	39,42,56	1.12	3 (7%)
10	BCL	V	102	-	58,74,74	1.63	9 (15%)	69,115,115	1.69	15 (21%)
13	LMT	I	103	-	34,34,36	0.38	0	45,45,47	0.74	1 (2%)
10	BCL	2	102	-	58,74,74	1.63	10 (17%)	69,115,115	1.71	15 (21%)

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
16	I7D	A	103	-	-	4/54/54/54	-
8	HEC	C	401	1	-	4/10/54/54	-
10	BCL	E	102	-	-	17/37/137/137	-
16	I7D	X	101	-	-	5/54/54/54	-
13	LMT	3	103	-	-	4/17/57/61	0/2/2/2
16	I7D	Q	101	-	-	4/54/54/54	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
10	BCL	8	102	-	-	16/37/137/137	-
9	PGV	H	302	-	-	13/40/40/55	-
9	PGV	5	101	-	-	13/40/40/55	-
17	CDL	T	103	-	-	25/82/82/110	-
10	BCL	X	102	-	-	13/37/137/137	-
9	PGV	C	405	-	-	6/48/48/55	-
17	CDL	6	104	-	-	28/73/73/110	-
10	BCL	K	102	-	-	8/37/137/137	-
10	BCL	O	101	-	-	15/37/137/137	-
16	I7D	N	101	-	-	8/54/54/54	-
9	PGV	M	411	-	-	11/37/37/55	-
16	I7D	M	406	-	-	3/54/54/54	-
10	BCL	J	101	-	-	15/37/137/137	-
9	PGV	H	301	-	-	10/40/40/55	-
16	I7D	3	101	-	-	5/54/54/54	-
11	BPH	M	404	-	-	1/37/105/105	0/5/6/6
9	PGV	L	305	-	-	10/48/48/55	-
10	BCL	P	101	-	-	12/37/137/137	-
10	BCL	L	309	-	-	15/37/137/137	-
10	BCL	T	102	-	-	8/37/137/137	-
17	CDL	0	101	-	-	32/73/73/110	-
9	PGV	L	311	-	-	12/37/37/55	-
8	HEC	C	404	1	-	2/10/54/54	-
10	BCL	N	102	-	-	14/37/137/137	-
10	BCL	S	101	-	-	11/37/137/137	-
10	BCL	D	102	-	-	13/37/137/137	-
16	I7D	K	101	-	-	6/54/54/54	-
17	CDL	2	101	-	-	22/82/82/110	-
12	U10	L	306	-	-	1/6/30/87	0/1/1/1
10	BCL	1	102	-	-	4/37/137/137	-
10	BCL	F	101	-	-	14/37/137/137	-
10	BCL	Y	101	-	-	13/37/137/137	-
10	BCL	M	403	-	-	5/37/137/137	-
16	I7D	1	101	-	-	4/54/54/54	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
10	BCL	I	102	-	-	11/37/137/137	-
10	BCL	9	101	-	-	13/37/137/137	-
12	U10	L	303	-	-	5/31/55/87	0/1/1/1
10	BCL	W	101	-	-	10/37/137/137	-
10	BCL	L	301	-	-	9/37/137/137	-
9	PGV	L	312	-	-	12/38/38/55	-
10	BCL	7	402	-	-	10/37/137/137	-
10	BCL	A	102	-	-	14/37/137/137	-
8	HEC	C	402	1	-	4/10/54/54	-
10	BCL	3	102	-	-	9/37/137/137	-
9	PGV	D	103	-	-	10/37/37/55	-
10	BCL	Q	102	-	-	8/37/137/137	-
10	BCL	4	102	-	-	17/37/137/137	-
10	BCL	6	103	-	-	8/37/137/137	-
10	BCL	5	102	-	-	12/37/137/137	-
9	PGV	M	410	-	-	15/55/55/55	-
16	I7D	4	101	-	-	5/54/54/54	-
12	U10	7	401	-	-	15/63/87/87	0/1/1/1
17	CDL	6	101	-	-	29/79/79/110	-
9	PGV	C	406	-	-	14/46/46/55	-
10	BCL	0	102	-	-	17/37/137/137	-
10	BCL	Z	101	-	-	15/37/137/137	-
11	BPH	L	302	-	-	4/37/105/105	0/5/6/6
13	LMT	L	308	-	-	4/16/56/61	0/2/2/2
9	PGV	C	407	-	-	7/39/39/55	-
10	BCL	M	402	-	-	6/37/137/137	-
10	BCL	U	101	-	-	10/37/137/137	-
9	PGV	L	304	-	-	15/47/47/55	-
13	LMT	1	103	-	-	2/21/61/61	0/2/2/2
10	BCL	G	101	-	-	14/37/137/137	-
18	PEE	M	409	-	-	9/47/47/54	-
15	MQ9	M	405	-	-	0/31/51/73	0/2/2/2
8	HEC	C	403	1	-	2/10/54/54	-
16	I7D	R	101	-	-	1/54/54/54	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
10	BCL	B	101	-	-	10/37/137/137	-
16	I7D	I	101	-	-	5/54/54/54	-
16	I7D	T	101	-	-	5/54/54/54	-
9	PGV	5	103	-	-	11/40/40/55	-
9	PGV	5	104	-	-	11/41/41/55	-
16	I7D	V	101	-	-	6/54/54/54	-
16	I7D	8	101	-	-	10/54/54/54	-
16	I7D	E	101	-	-	3/54/54/54	-
10	BCL	R	102	-	-	13/37/137/137	-
17	CDL	A	101	-	-	19/67/67/110	-
17	CDL	H	303	-	-	31/82/82/110	-
17	CDL	M	407	-	-	12/43/43/110	-
9	PGV	F	102	-	-	6/42/42/55	-
16	I7D	6	102	-	-	2/54/54/54	-
17	CDL	M	408	-	-	25/79/79/110	-
12	U10	L	307	-	-	3/30/54/87	0/1/1/1
16	I7D	D	101	-	-	3/54/54/54	-
9	PGV	K	103	-	-	7/43/43/55	-
13	LMT	L	313	-	-	4/21/61/61	0/2/2/2
9	PGV	L	310	-	-	8/41/41/55	-
10	BCL	V	102	-	-	13/37/137/137	-
13	LMT	I	103	-	-	9/19/59/61	0/2/2/2
10	BCL	2	102	-	-	15/37/137/137	-

The worst 5 of 615 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	X	101	I7D	C35-C36	7.06	1.50	1.32
16	6	102	I7D	C35-C36	7.02	1.50	1.32
16	8	101	I7D	C35-C36	6.94	1.50	1.32
16	I	101	I7D	C35-C36	6.92	1.50	1.32
16	E	101	I7D	C35-C36	6.91	1.50	1.32

The worst 5 of 836 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
16	8	101	I7D	C36-C35-C33	-8.98	112.33	125.89

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
16	T	101	I7D	C36-C35-C33	-8.58	112.92	125.89
16	K	101	I7D	C36-C35-C33	-8.39	113.22	125.89
16	6	102	I7D	C36-C35-C33	-8.35	113.27	125.89
16	3	101	I7D	C36-C35-C33	-8.35	113.28	125.89

There are no chirality outliers.

5 of 993 torsion outliers are listed below:

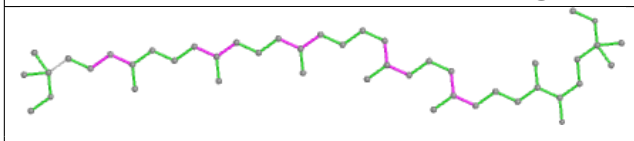
Mol	Chain	Res	Type	Atoms
9	C	405	PGV	C03-O11-P-O14
9	C	406	PGV	C2-C1-O01-C02
9	L	304	PGV	C03-O11-P-O12
9	L	304	PGV	C03-O11-P-O14
9	L	304	PGV	C04-O12-P-O11

There are no ring outliers.

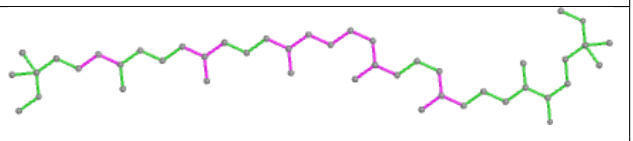
No monomer is involved in short contacts.

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.

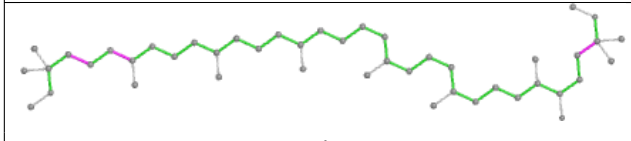
Ligand I7D A 103



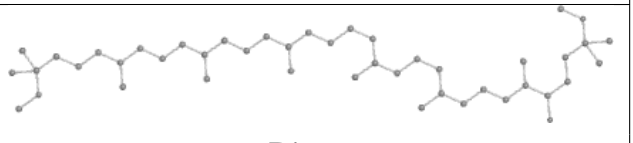
Bond lengths



Bond angles

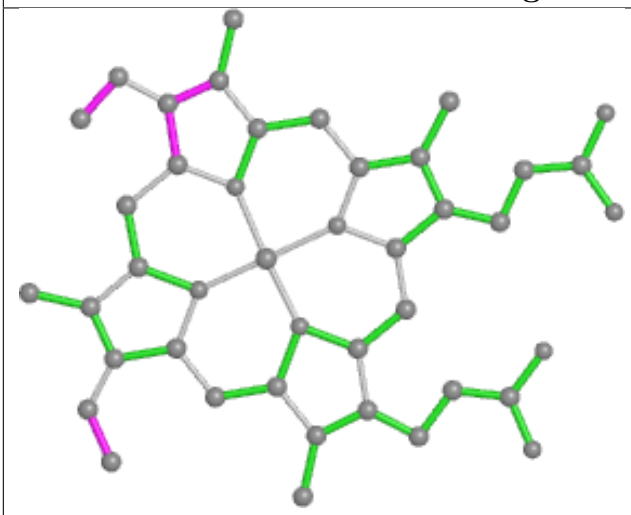


Torsions



Rings

Ligand HEC C 401



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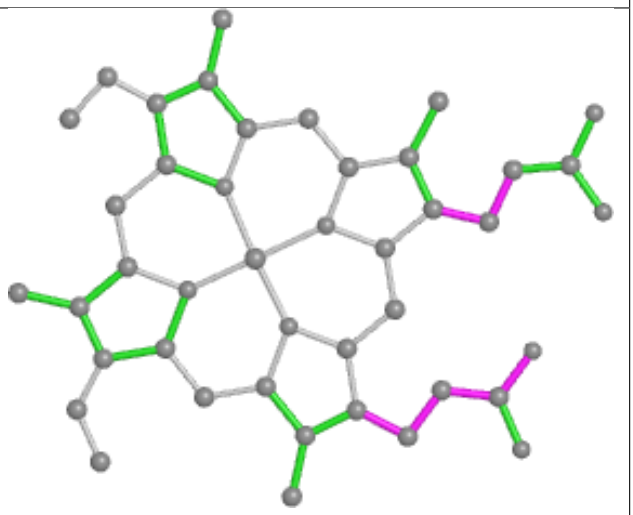
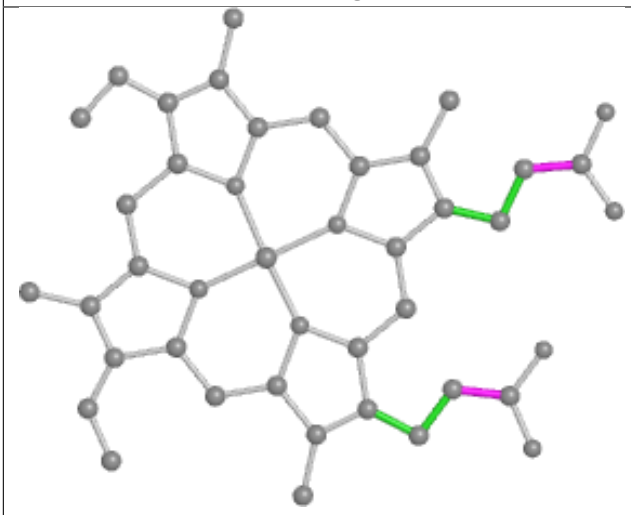


Bond angles



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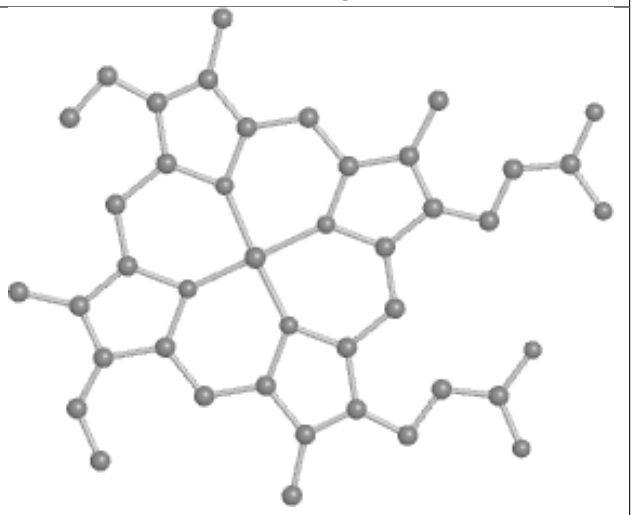
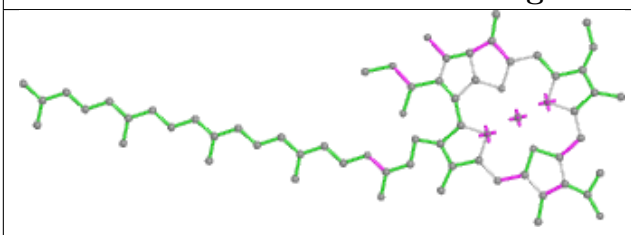


Rings

Ligand BCL E 102



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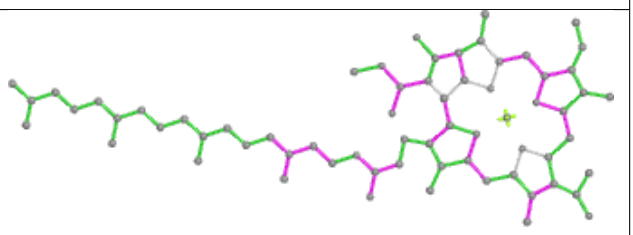
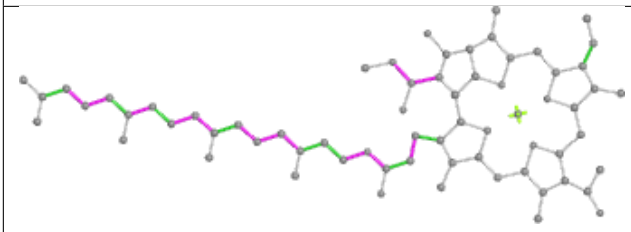


Bond angles



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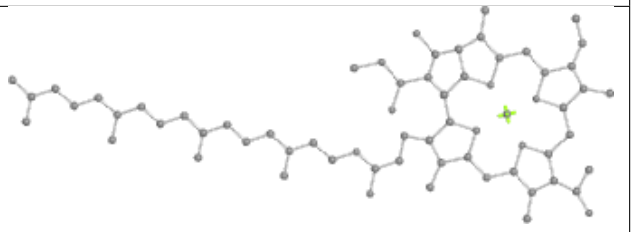
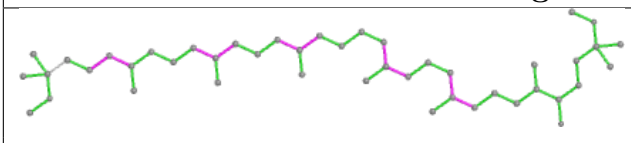


Rings

Ligand I7D X 101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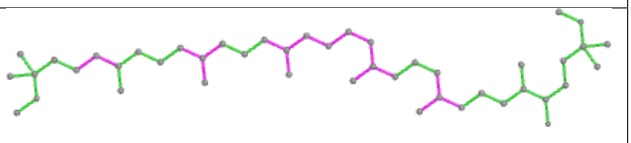
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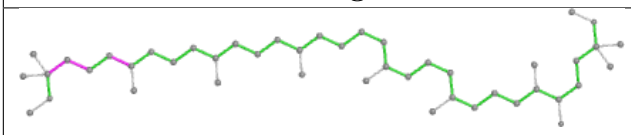
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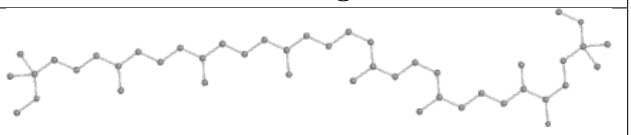
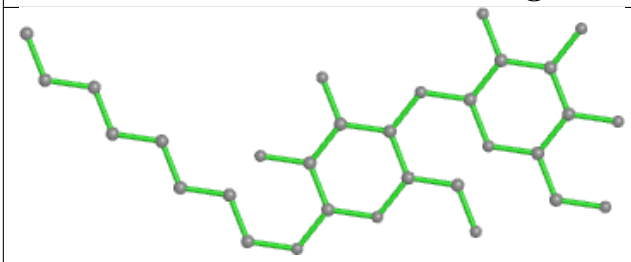

Rings

Ligand LMT 3 103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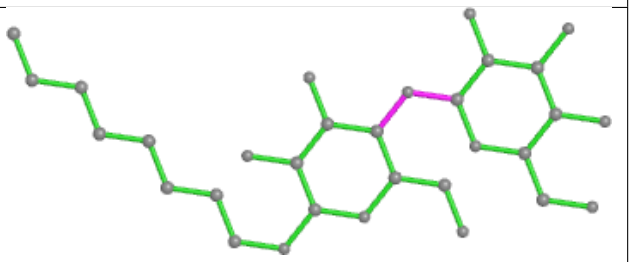
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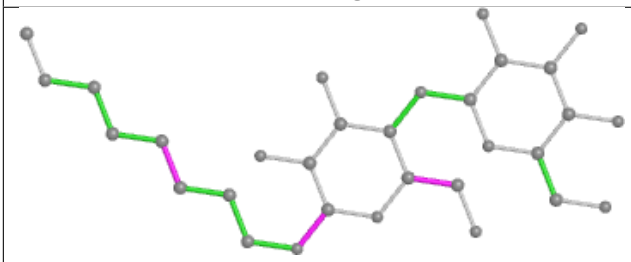
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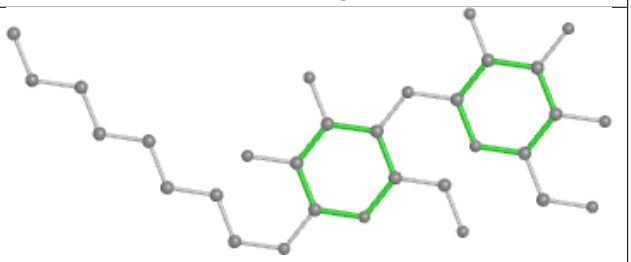
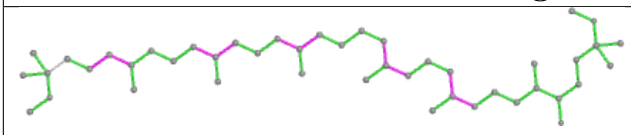

Rings

Ligand I7D Q 101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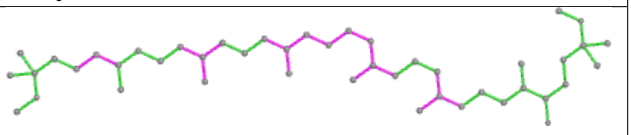
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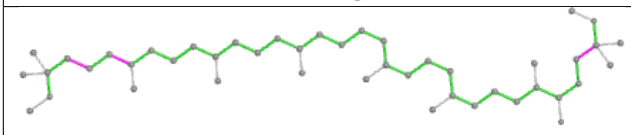
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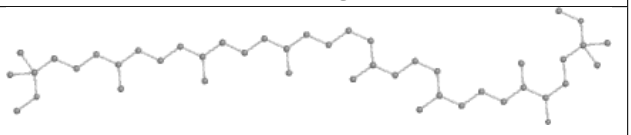
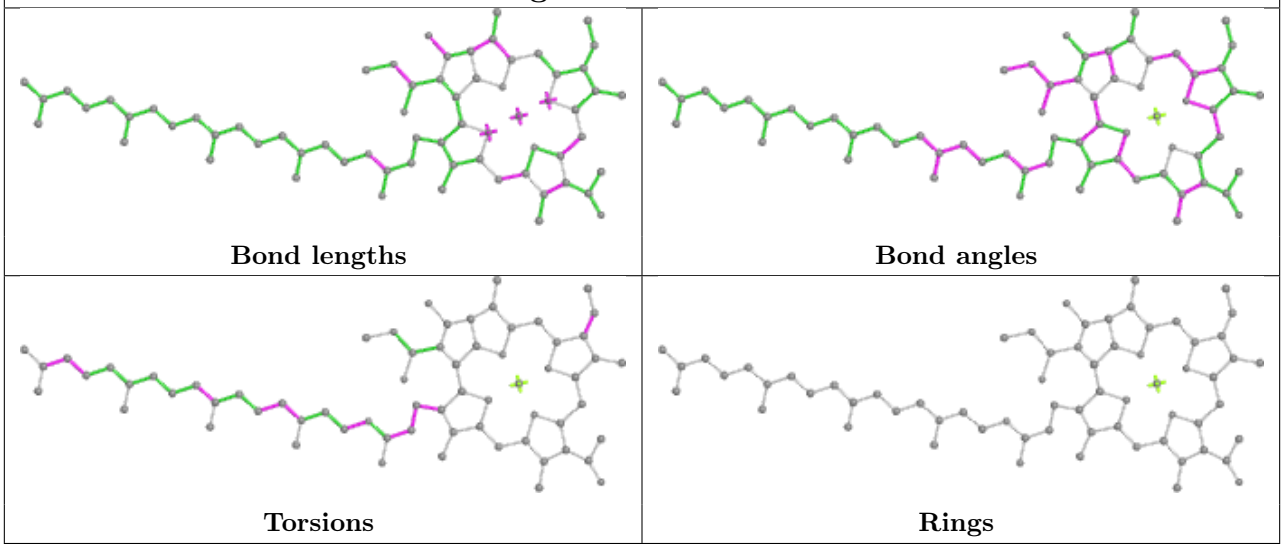

Rings

Ligand BCL 8 102



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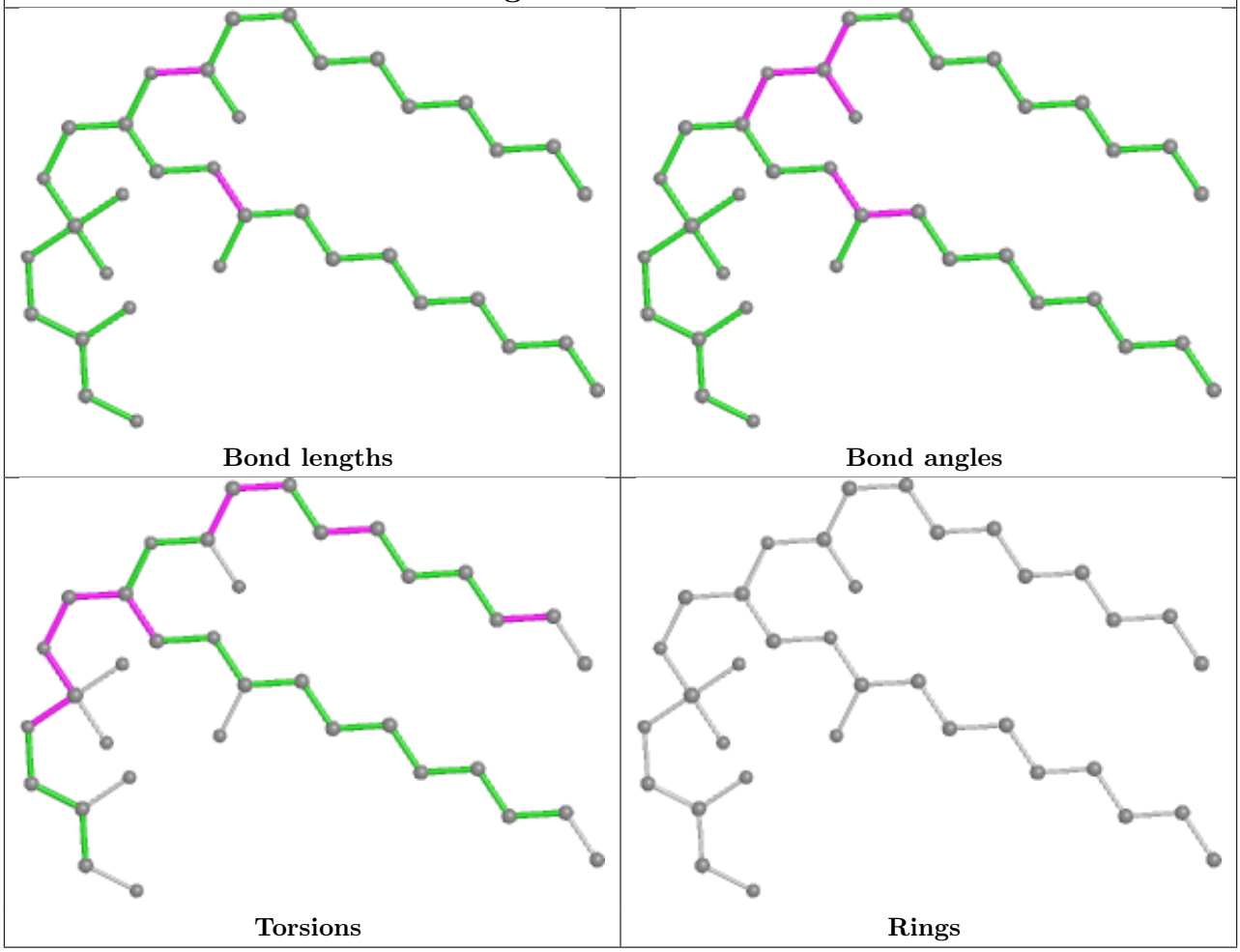

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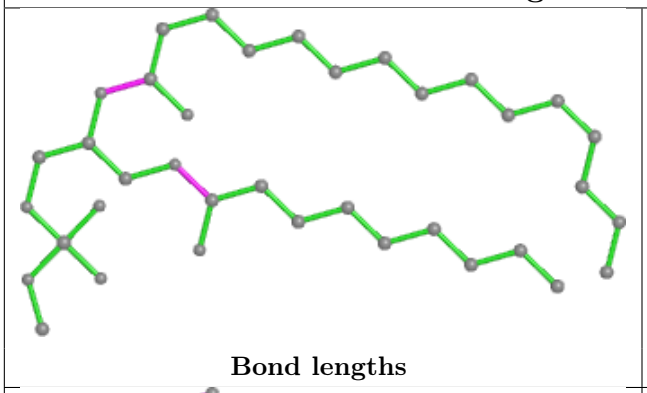

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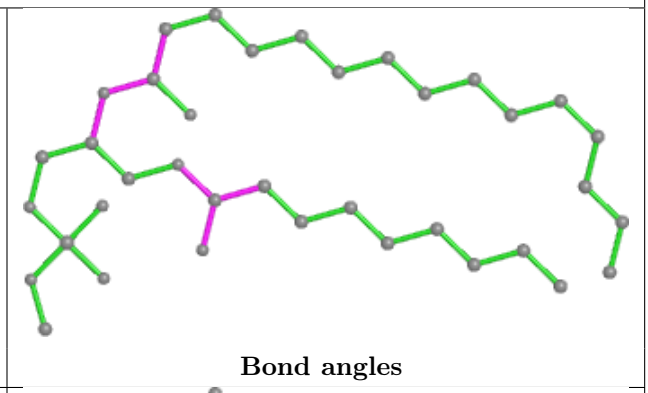

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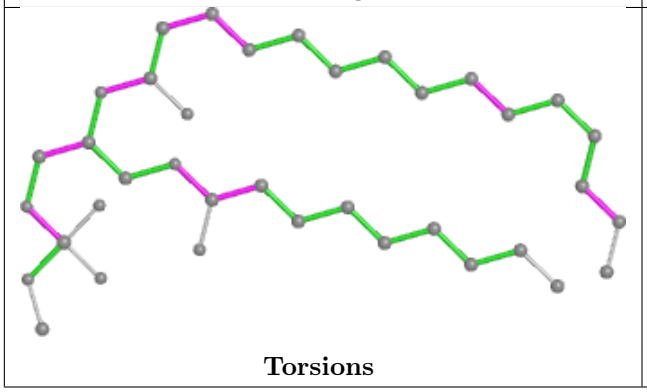

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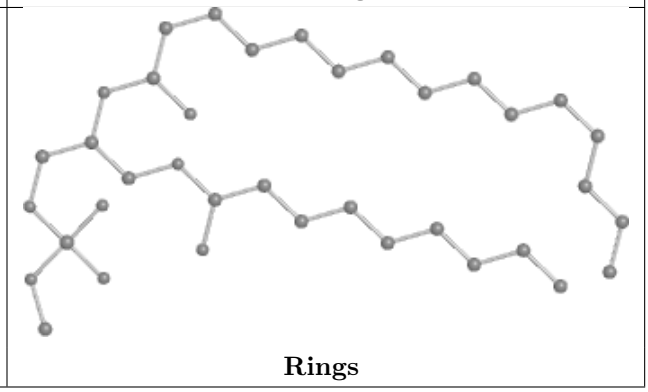
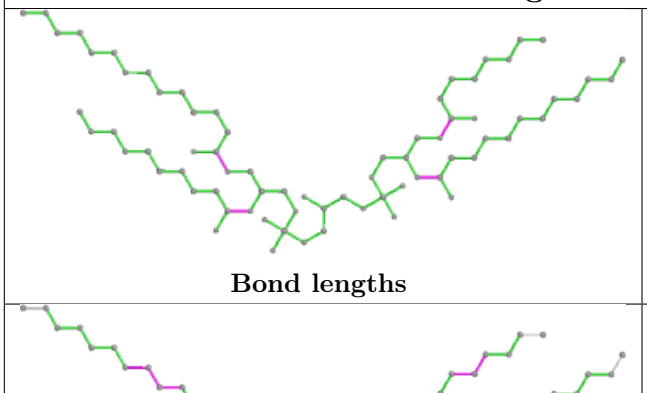


Rings

Ligand CDL T 103



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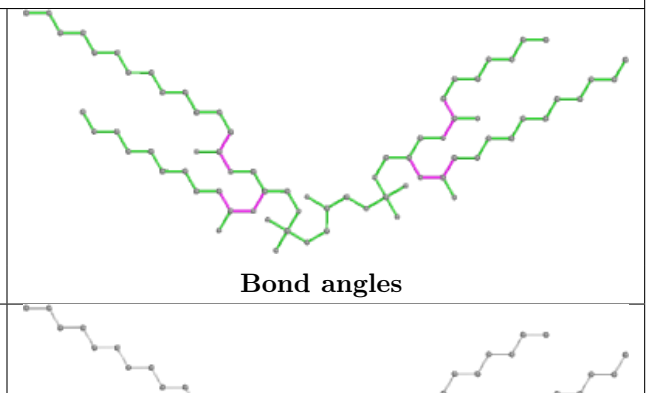

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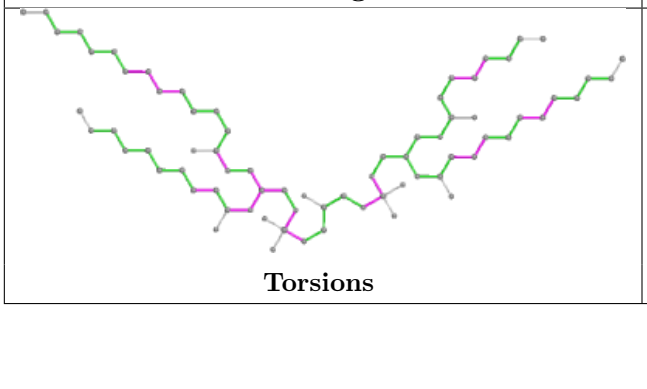

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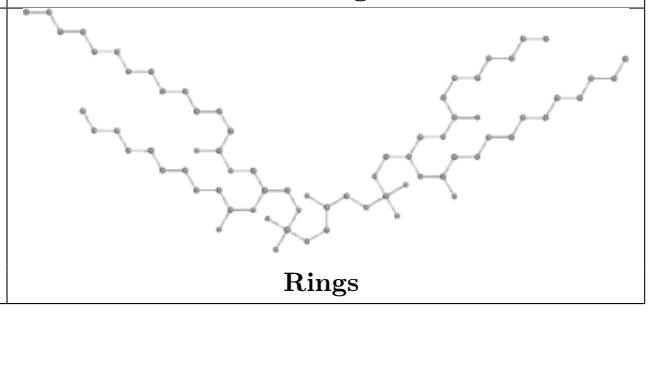
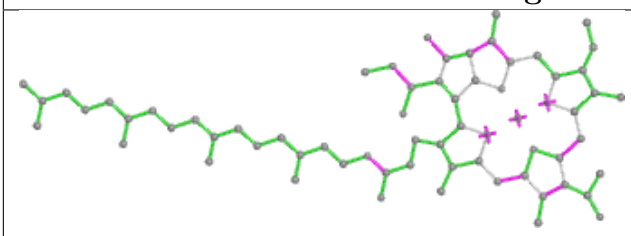


Rings

Ligand BCL X 102



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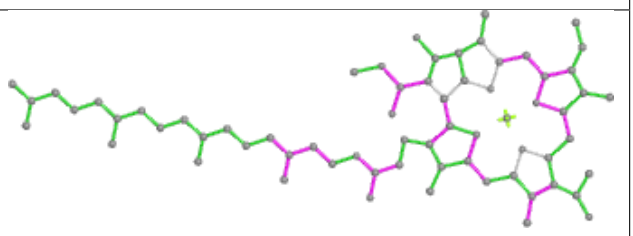
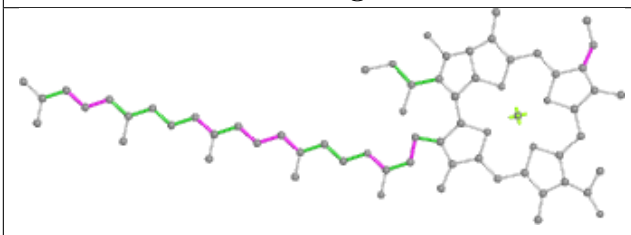


Bond angles



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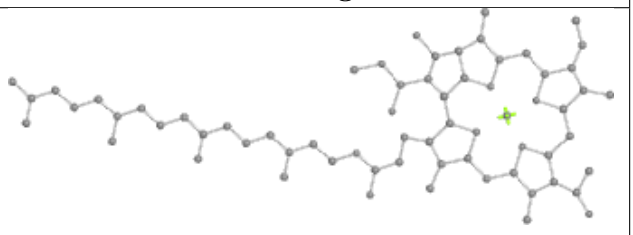
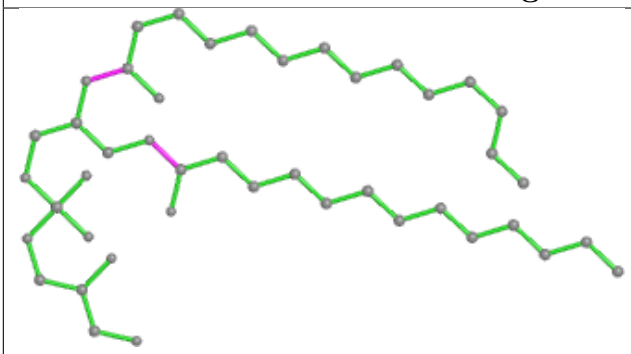
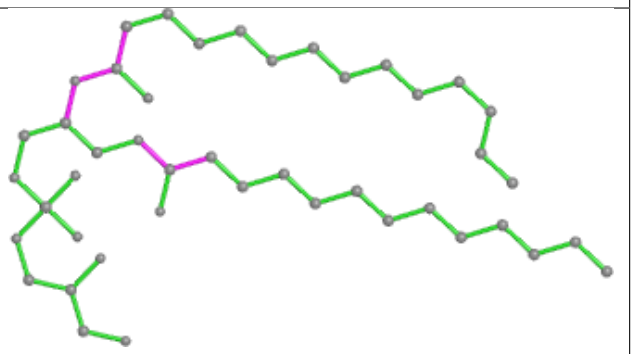


Rings

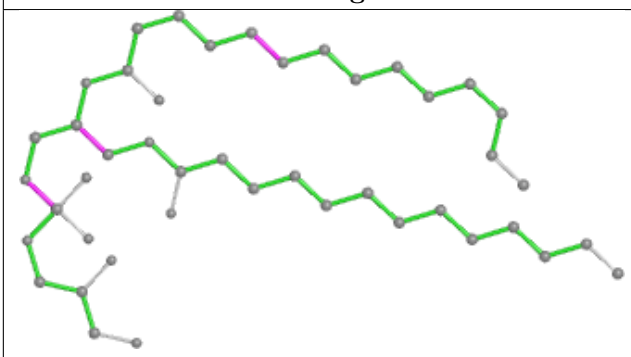
Ligand PGV C 405



Bond lengths



Bond angles



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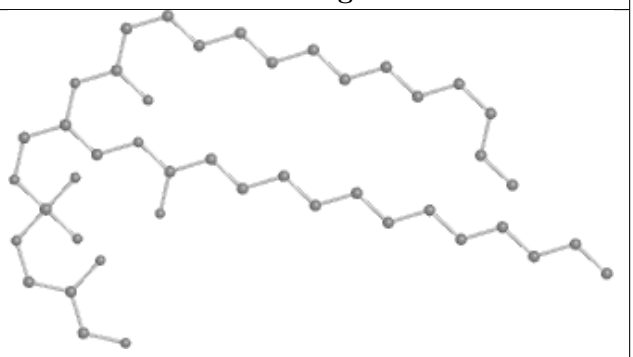
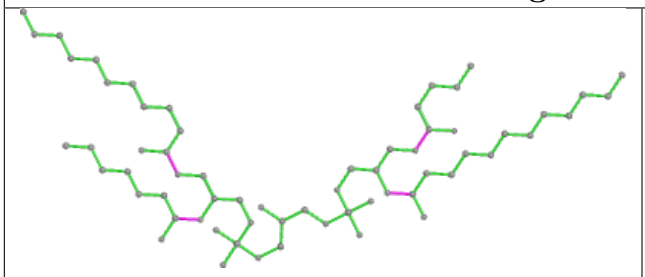


Rings

Ligand CDL 6 104



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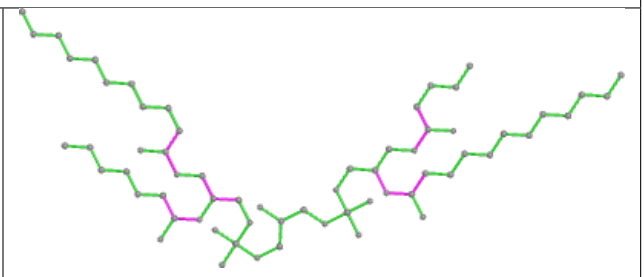

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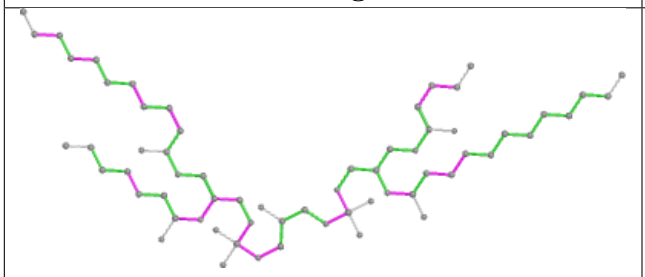

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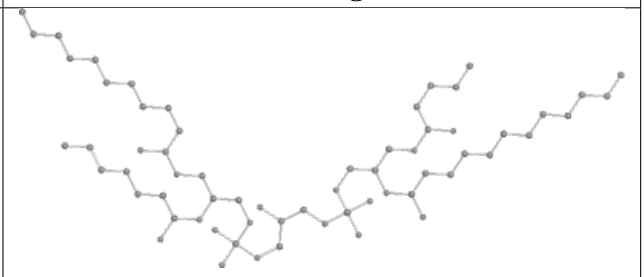
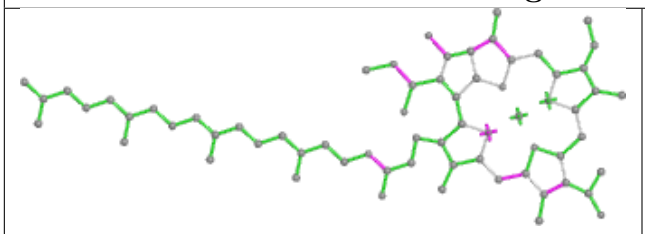


Rings

Ligand BCL K 102



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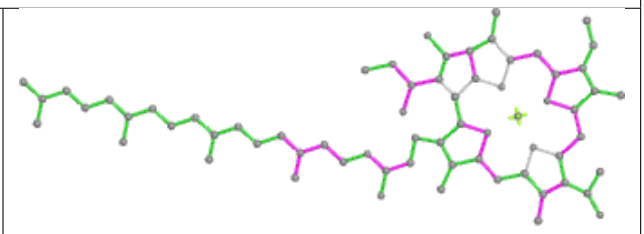
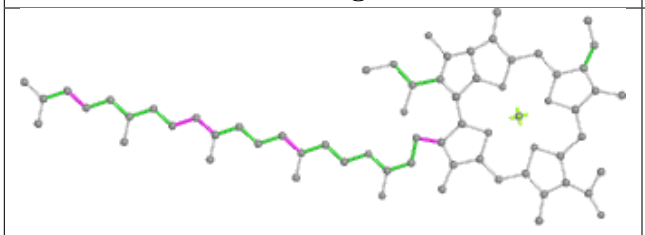
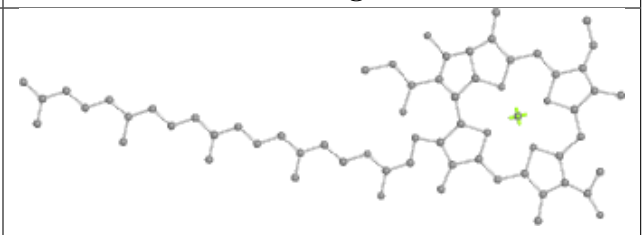


Bond angles

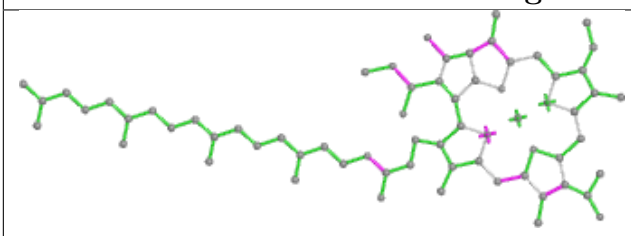


Torsions

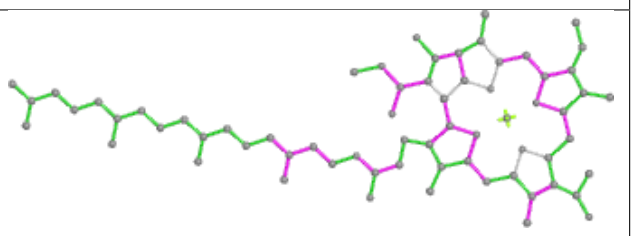


Rings

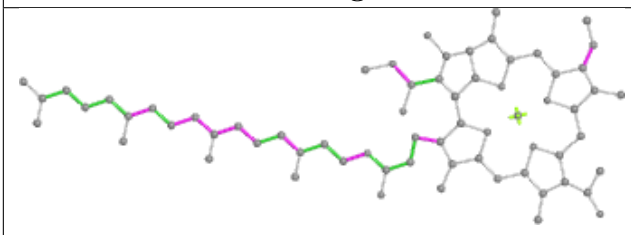
Ligand BCL O 101



Bond lengths



Bond angles



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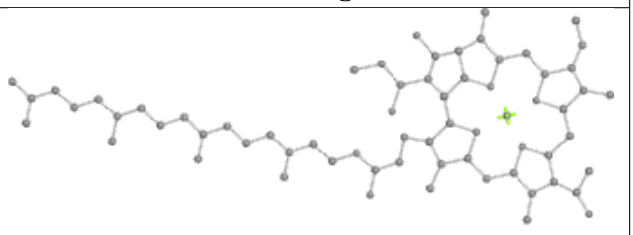
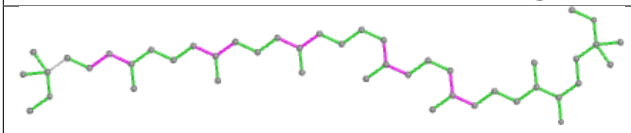
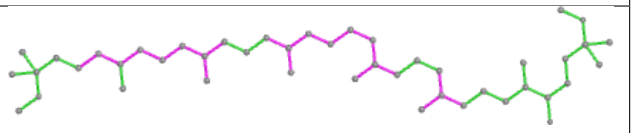


Rings

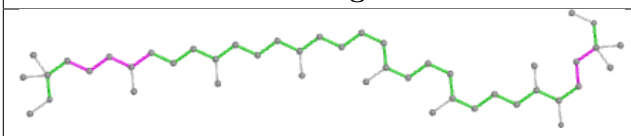
Ligand I7D N 101



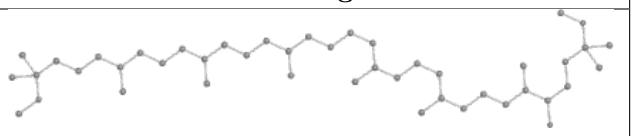
Bond lengths



Bond angles

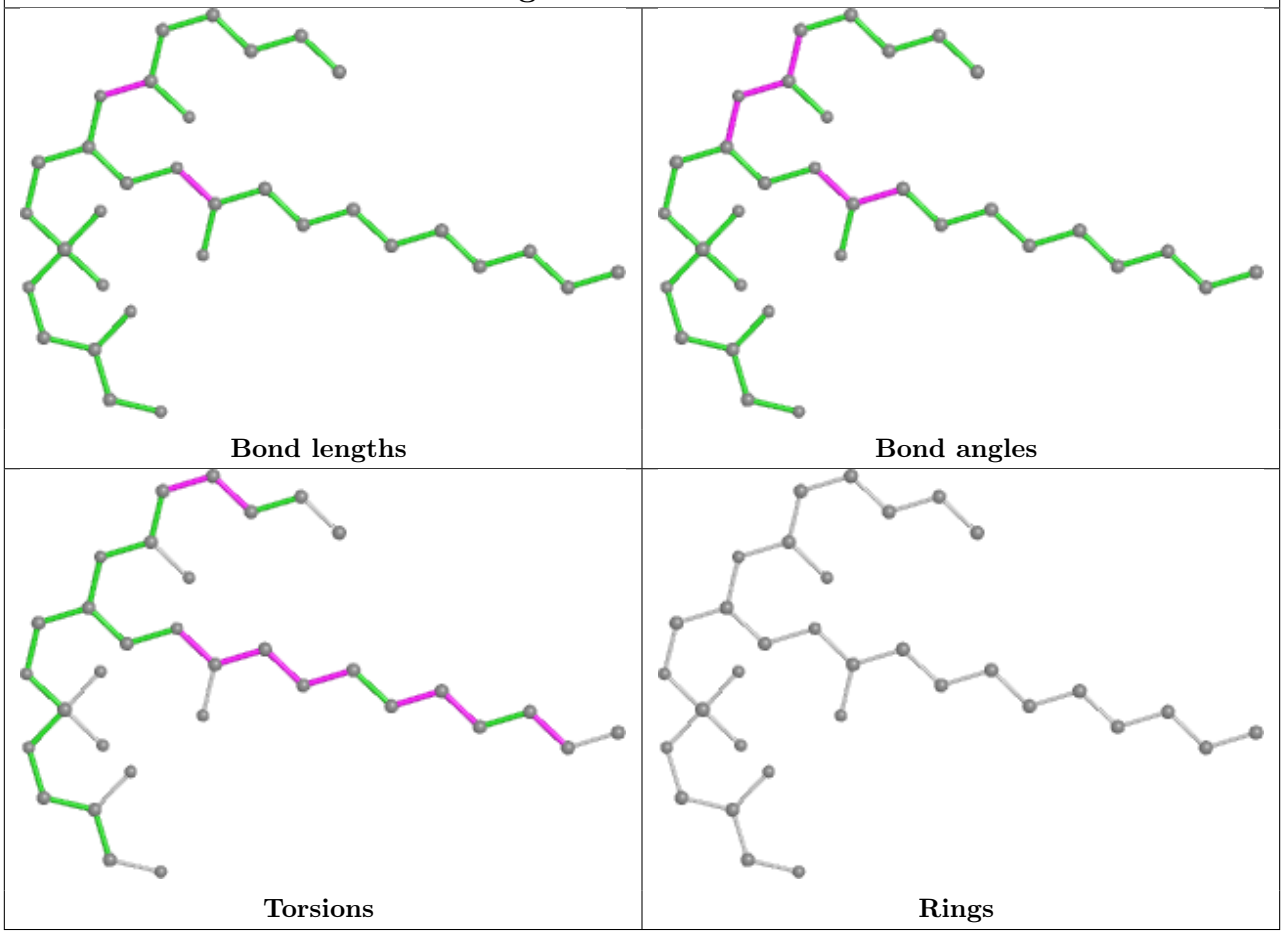


Torsions



Rings

Ligand PGV M 411



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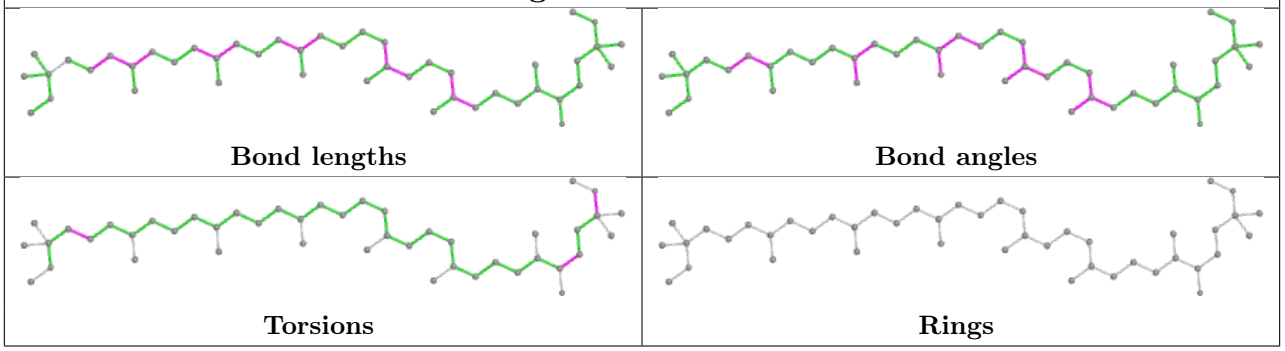
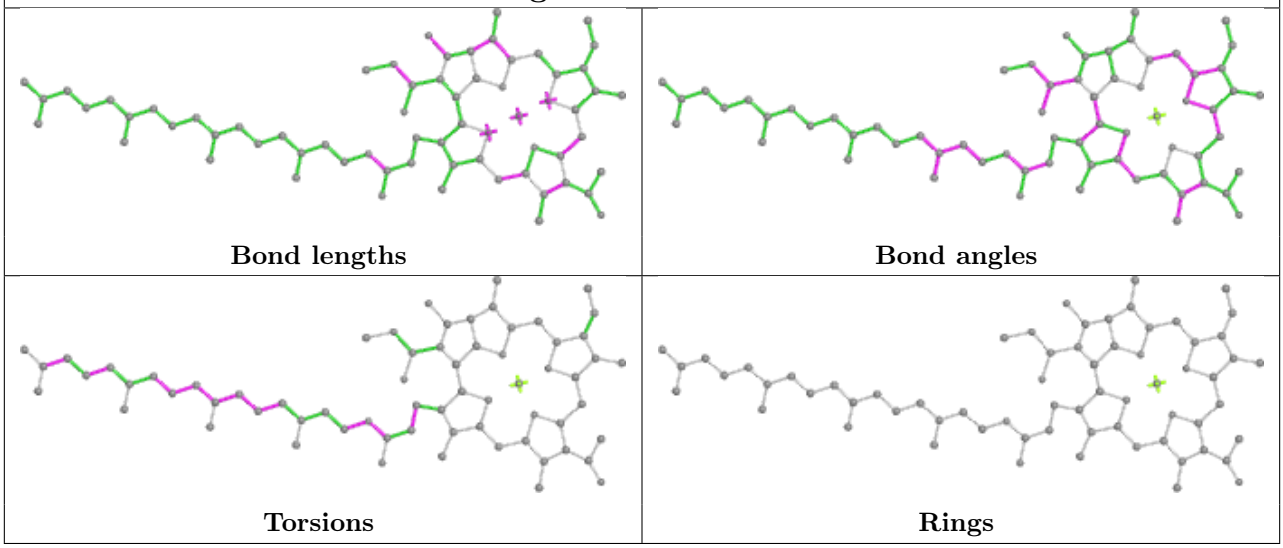


Ligand BCL J 101



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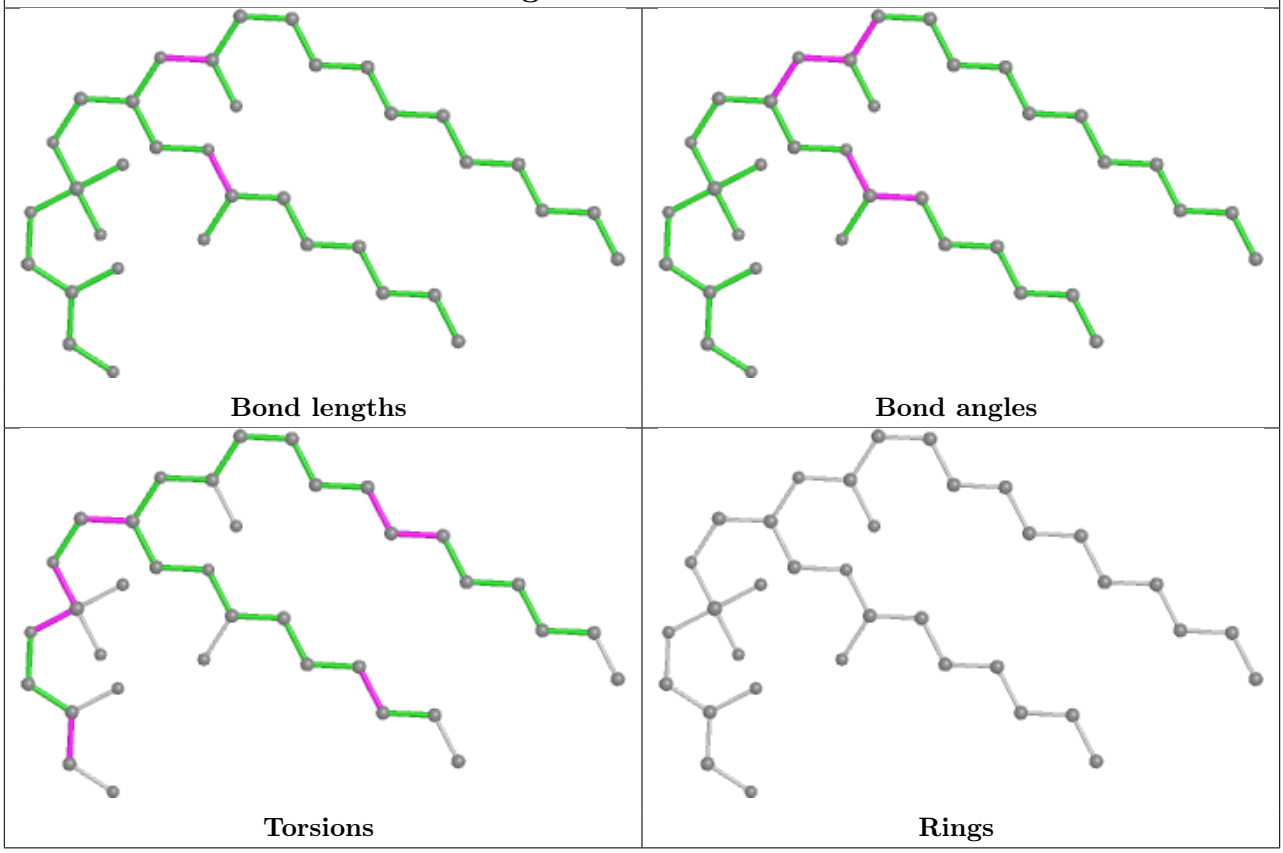
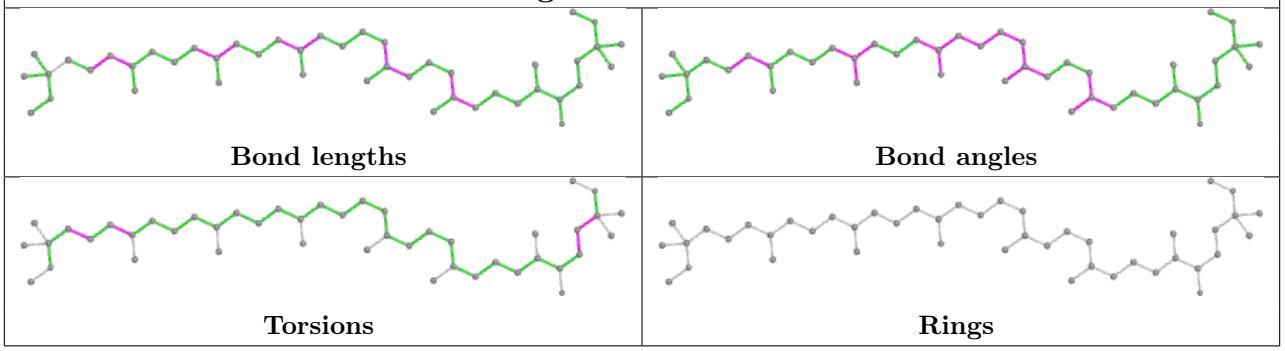


Ligand I7D 3 101



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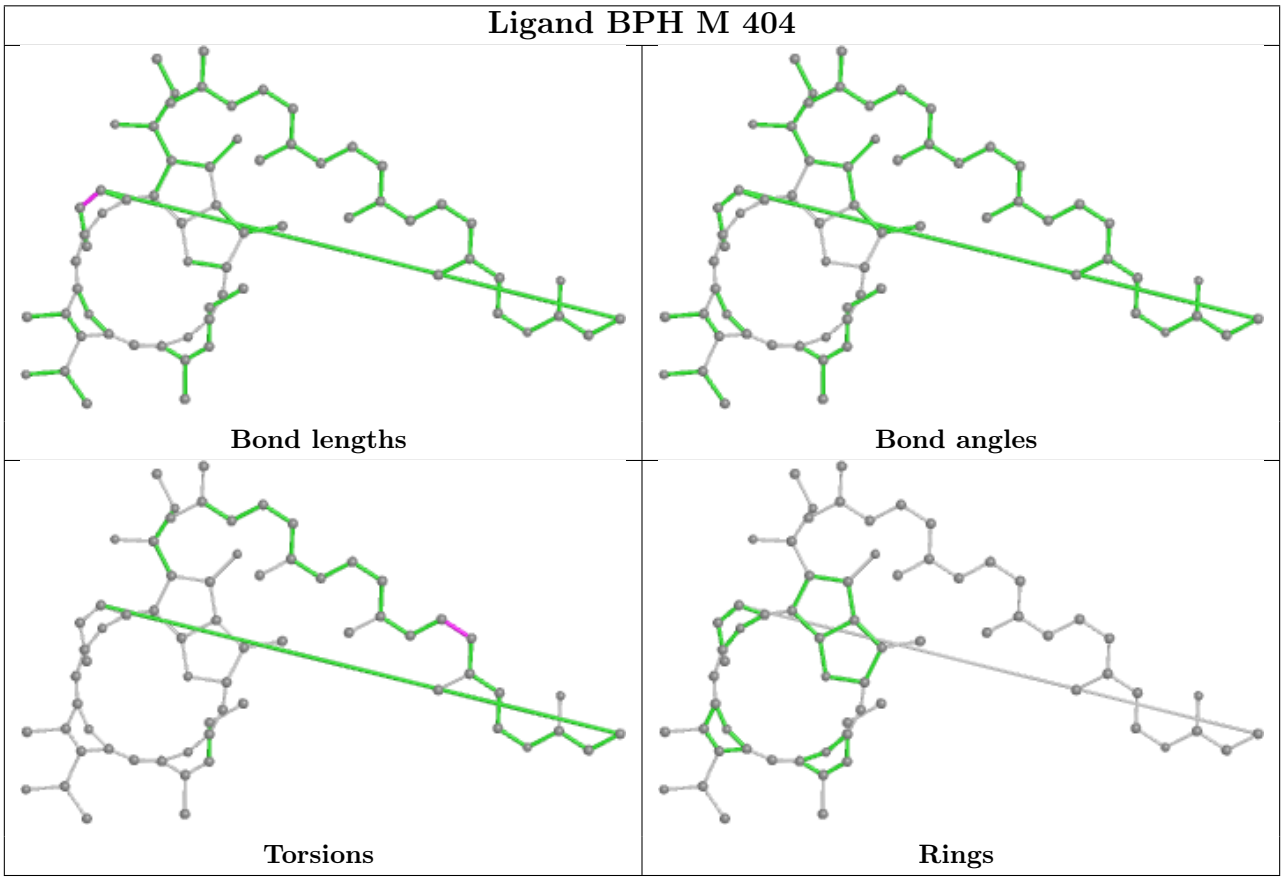
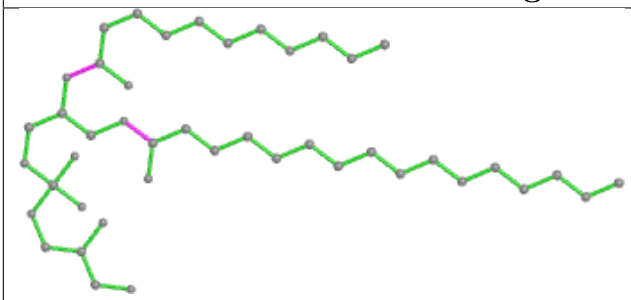
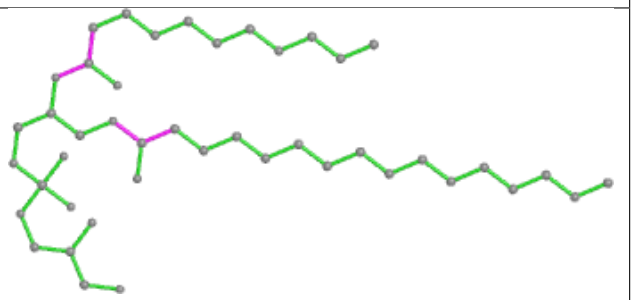


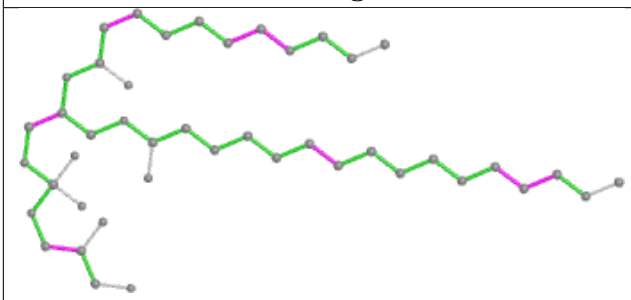
Ligand PGV L 305



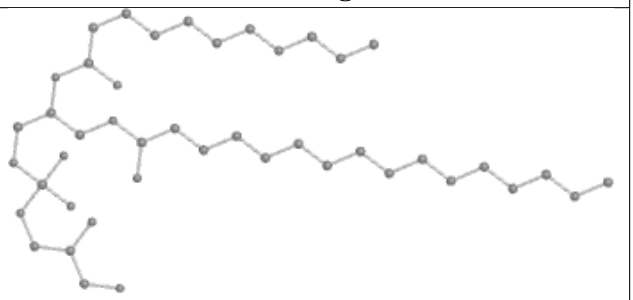
Bond lengths



Bond angles

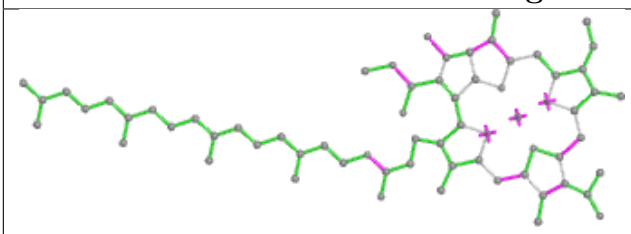


Torsions

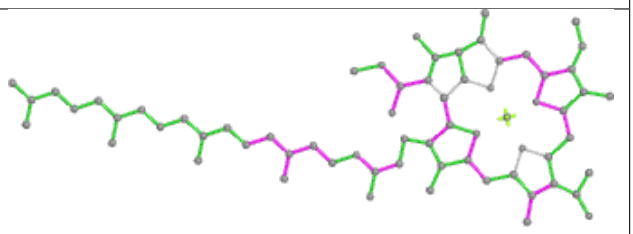


Rings

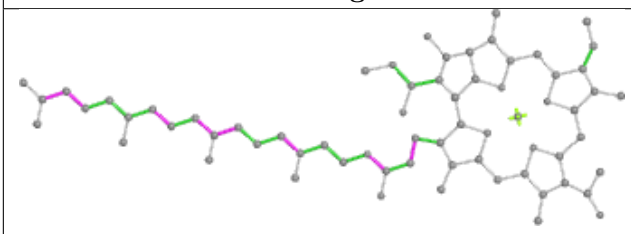
Ligand BCL P 101



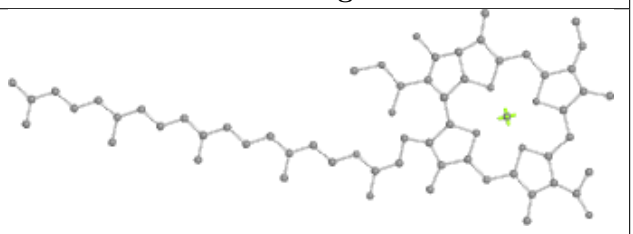
Bond lengths



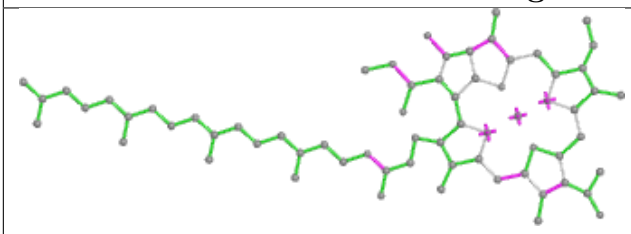
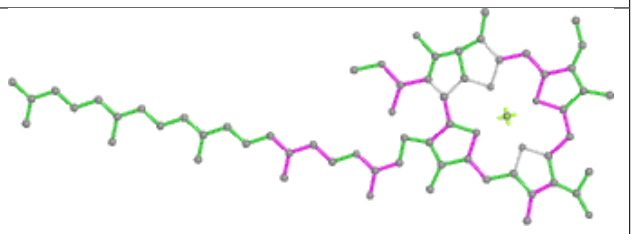
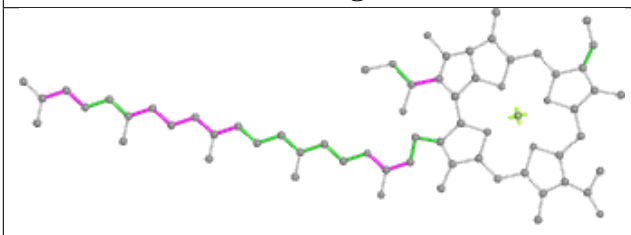
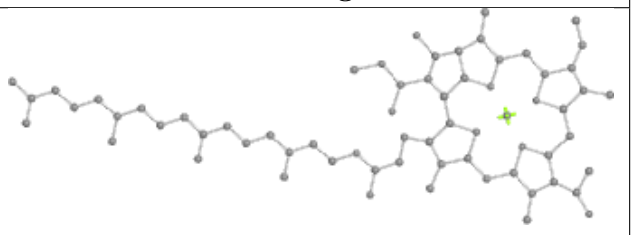
Bond angles

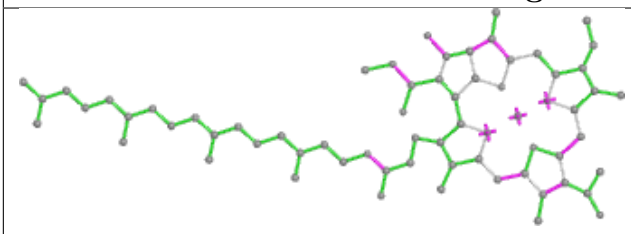
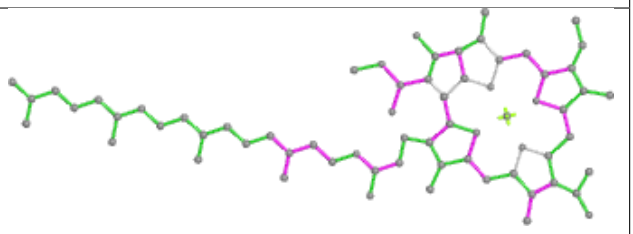
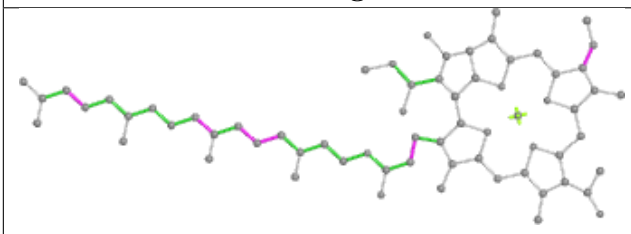
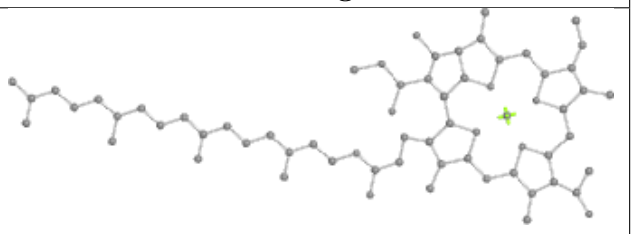


Torsions

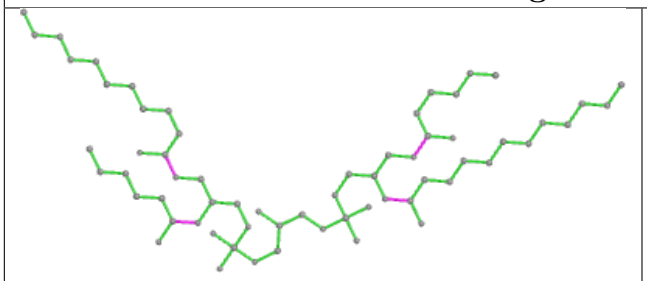


Rings

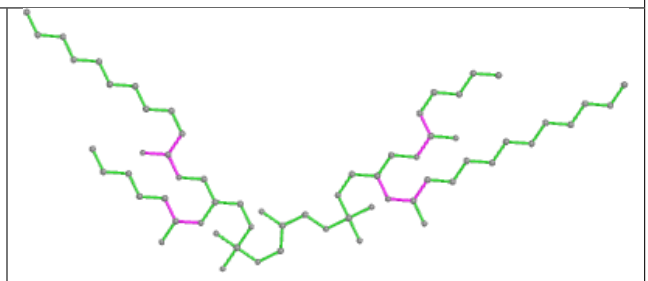
Ligand BCL L 309	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand BCL T 102	
 Bond lengths	 Bond angles
 Torsions	 Rings

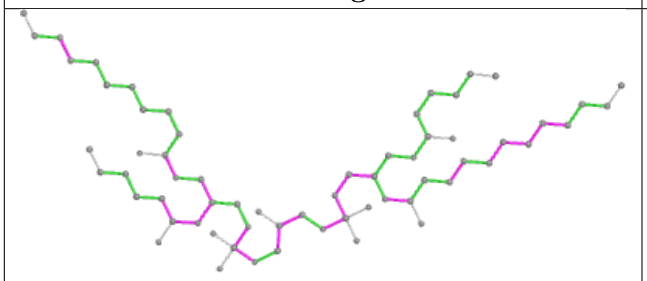
Ligand CDL 0 101



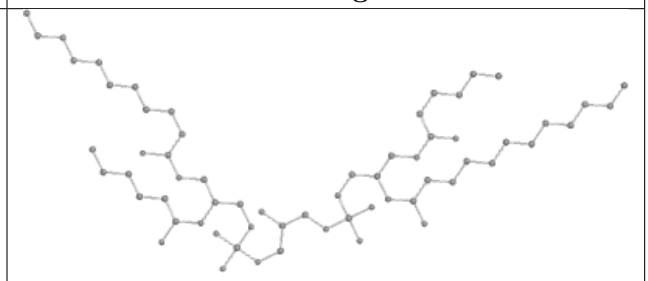
Bond lengths



Bond angles

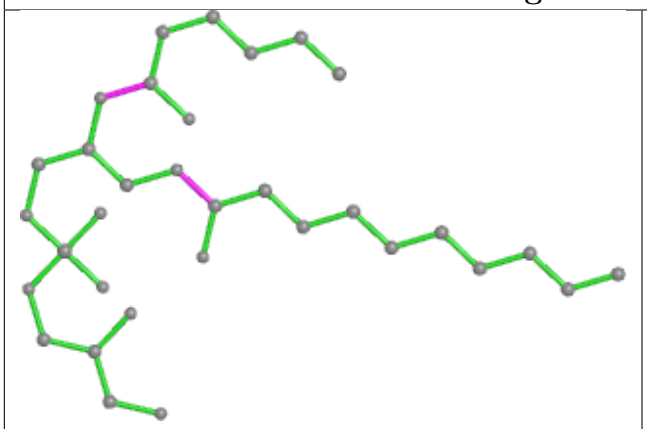


Torsions

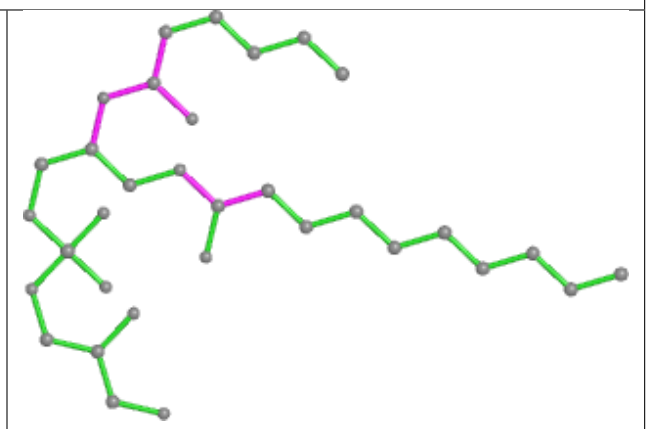


Rings

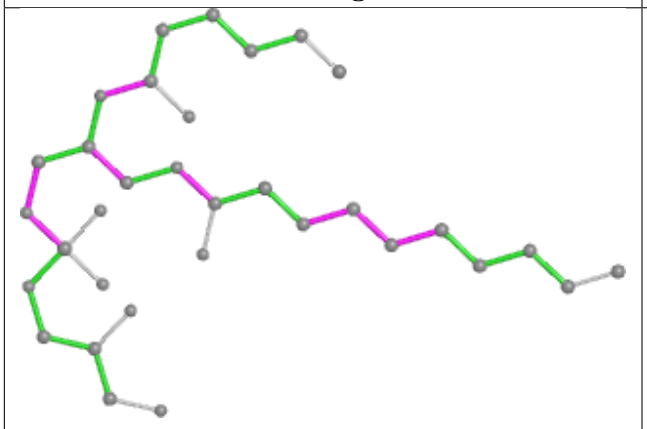
Ligand PGV L 311



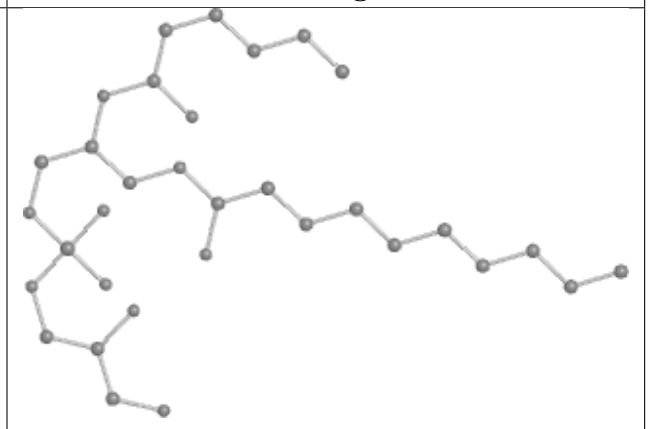
Bond lengths



Bond angles

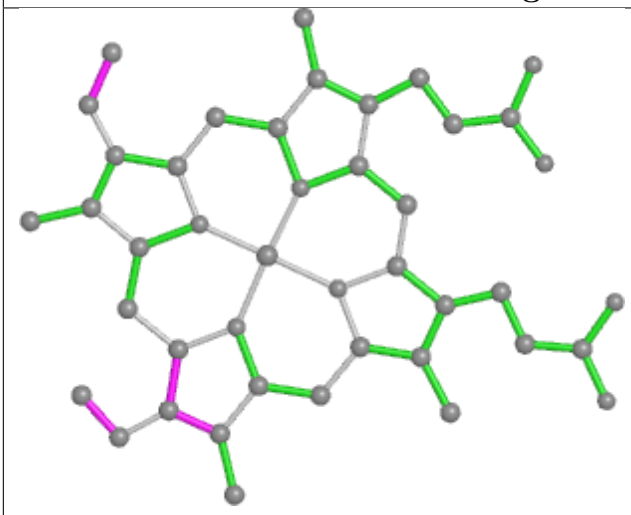


Torsions

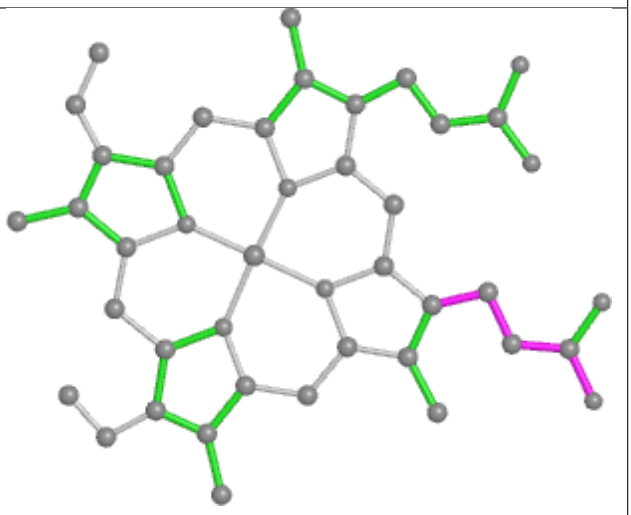


Rings

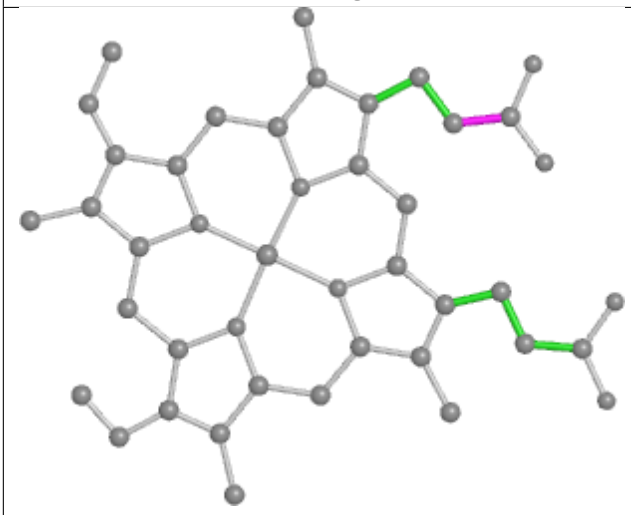
Ligand HEC C 404



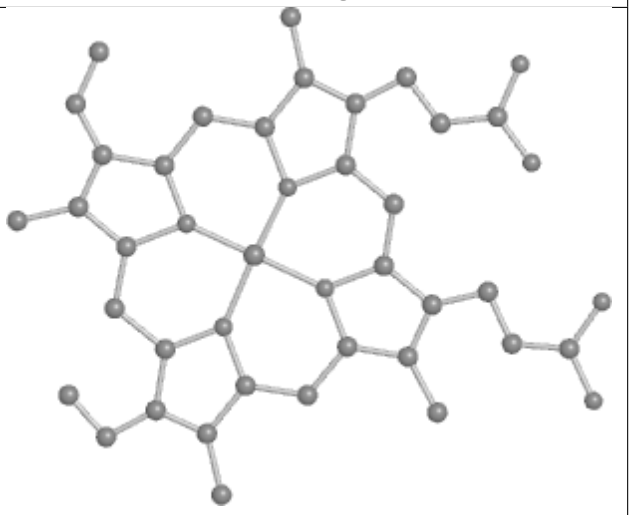
Bond lengths



Bond angles

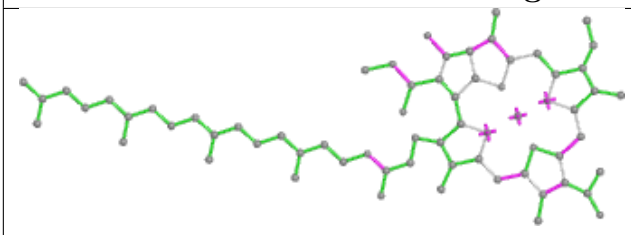


Torsions

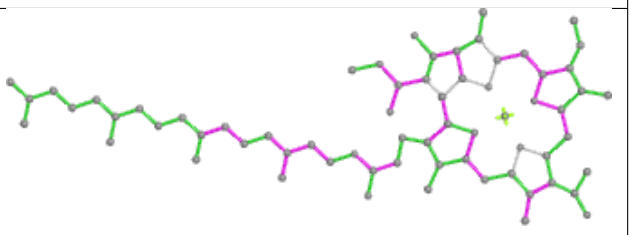


Rings

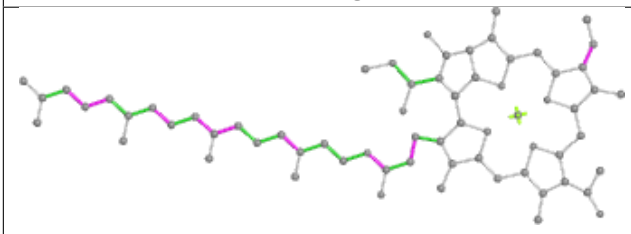
Ligand BCL N 102



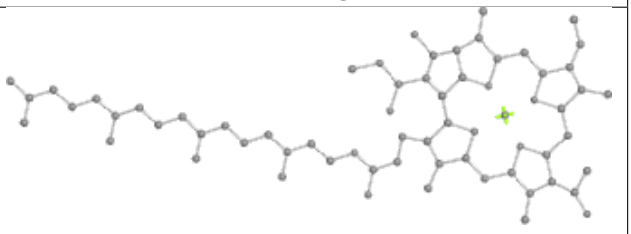
Bond lengths



Bond angles

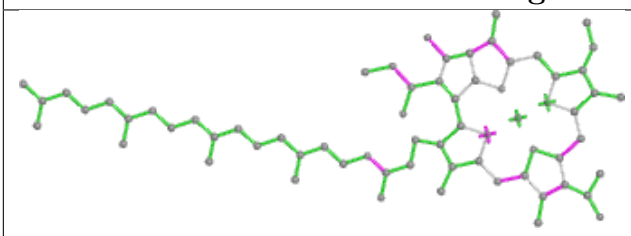


Torsions

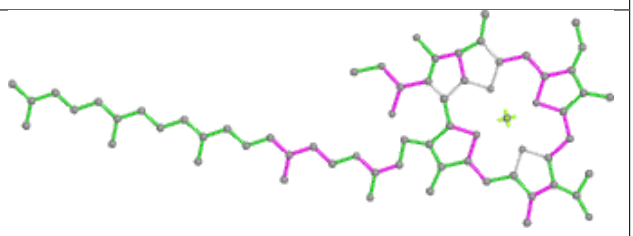


Rings

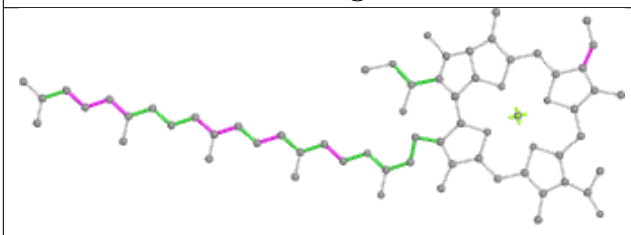
Ligand BCL S 101



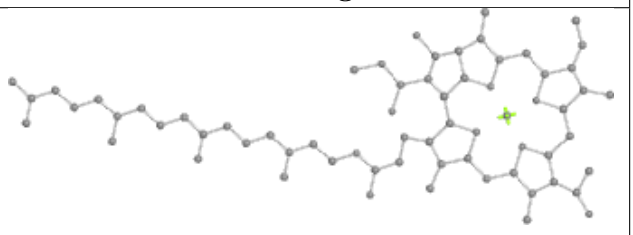
Bond lengths



Bond angles

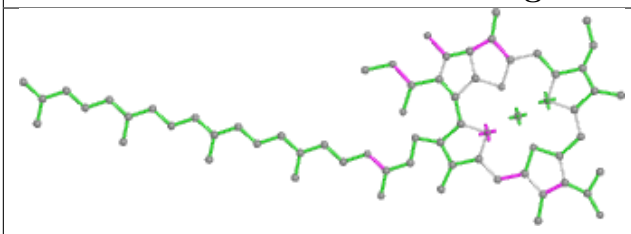


Torsions

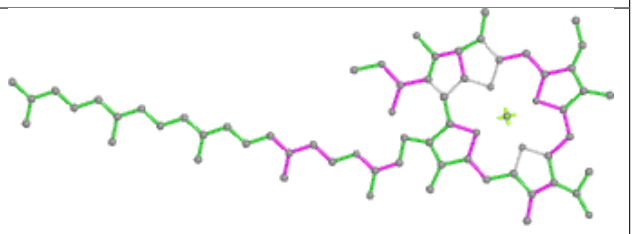


Rings

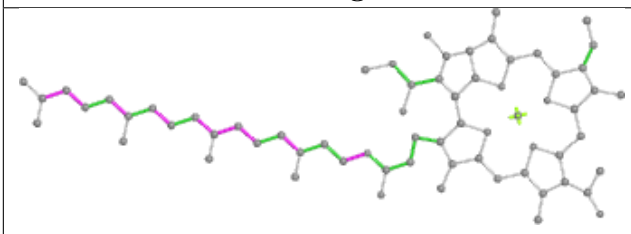
Ligand BCL D 102



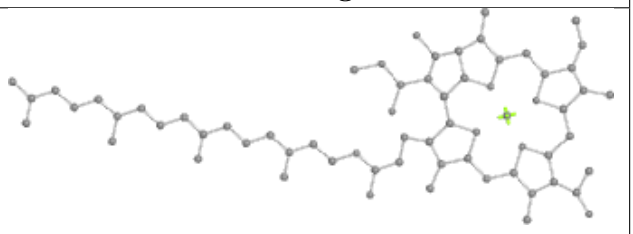
Bond lengths



Bond angles

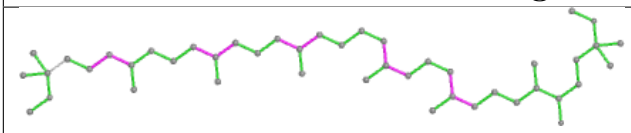


Torsions

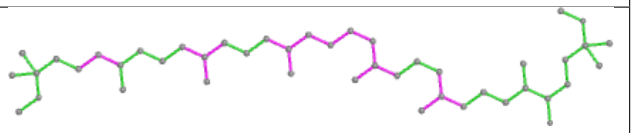


Rings

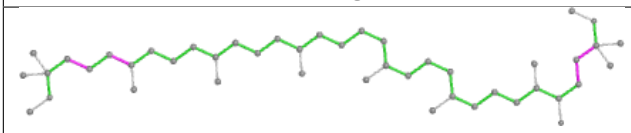
Ligand I7D K 101



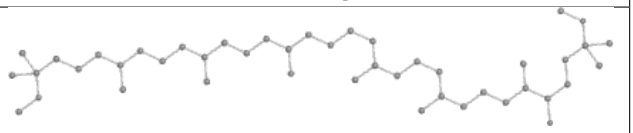
Bond lengths



Bond angles

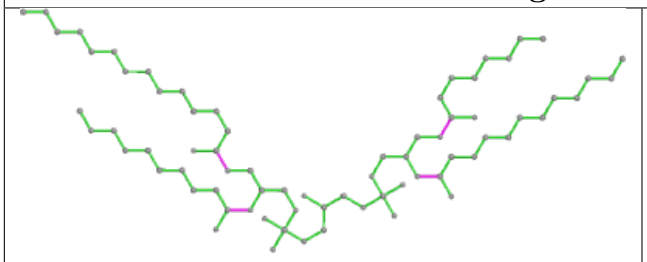


Torsions

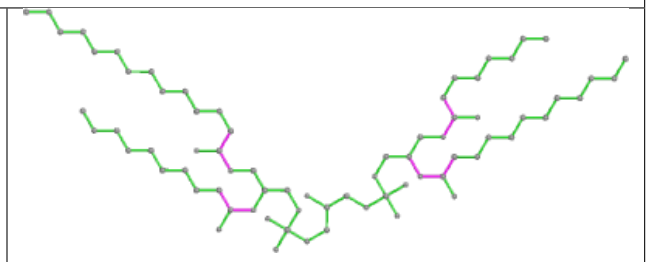


Rings

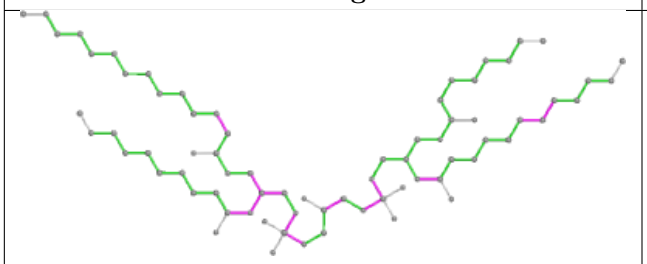
Ligand CDL 2 101



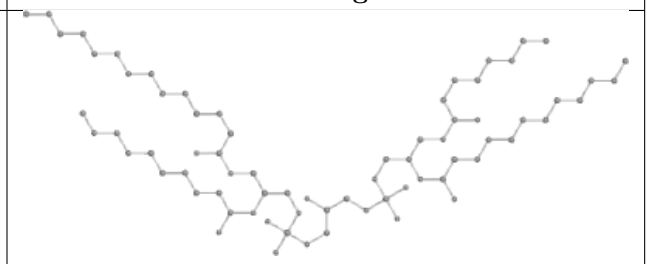
Bond lengths



Bond angles

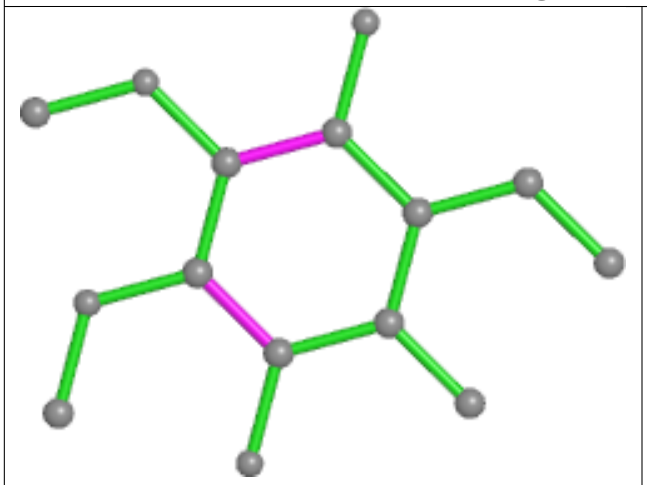


Torsions

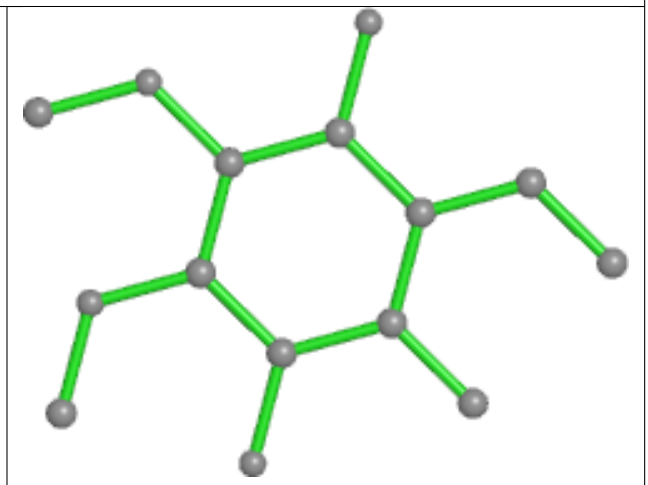


Rings

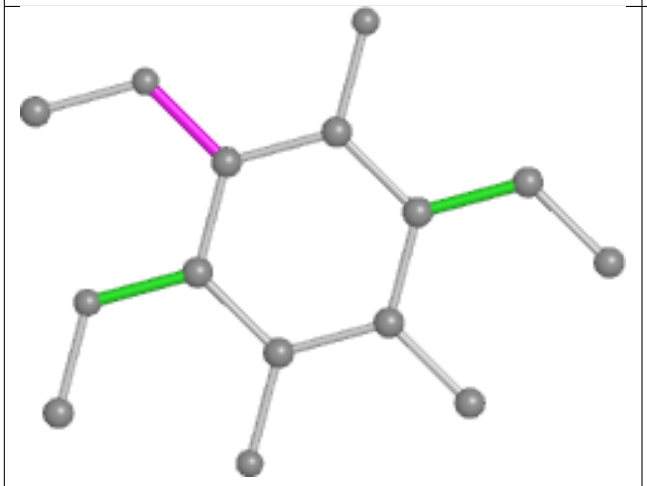
Ligand U10 L 306



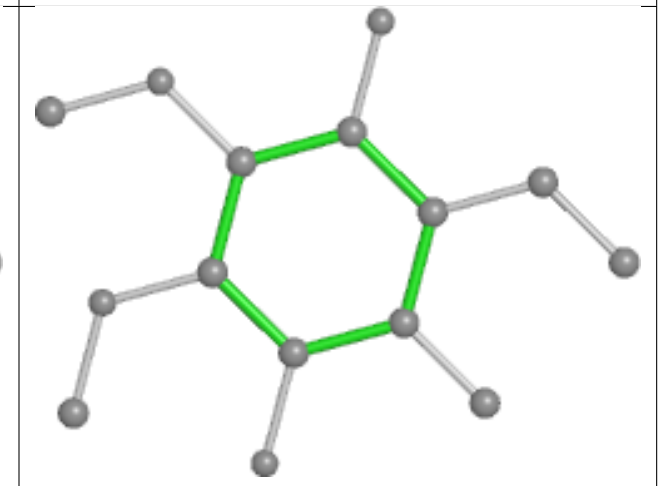
Bond lengths



Bond angles

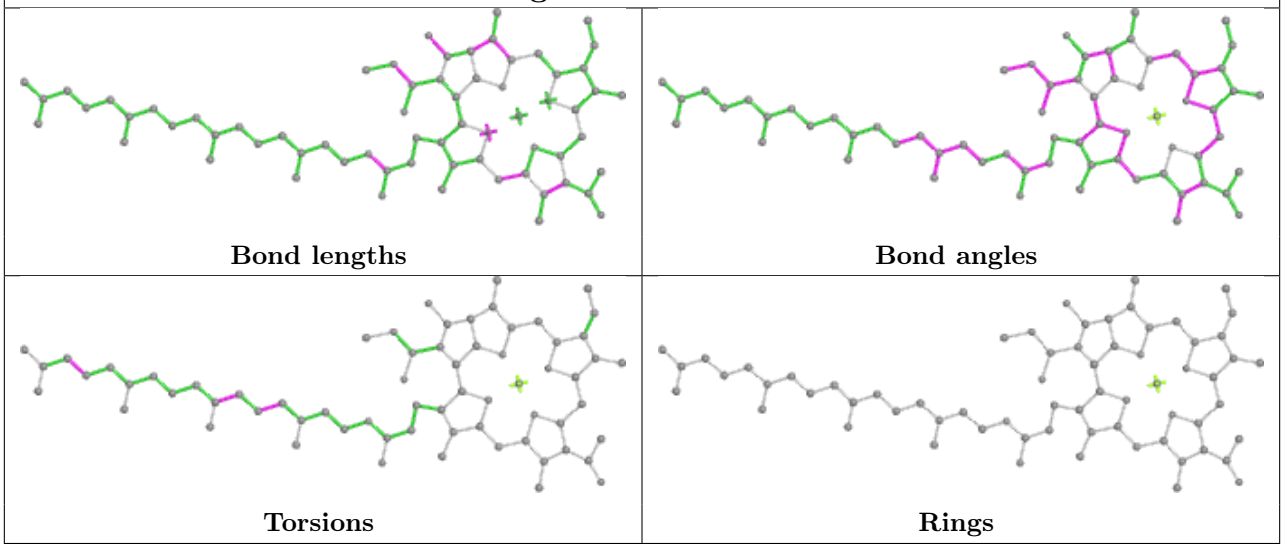


Torsions

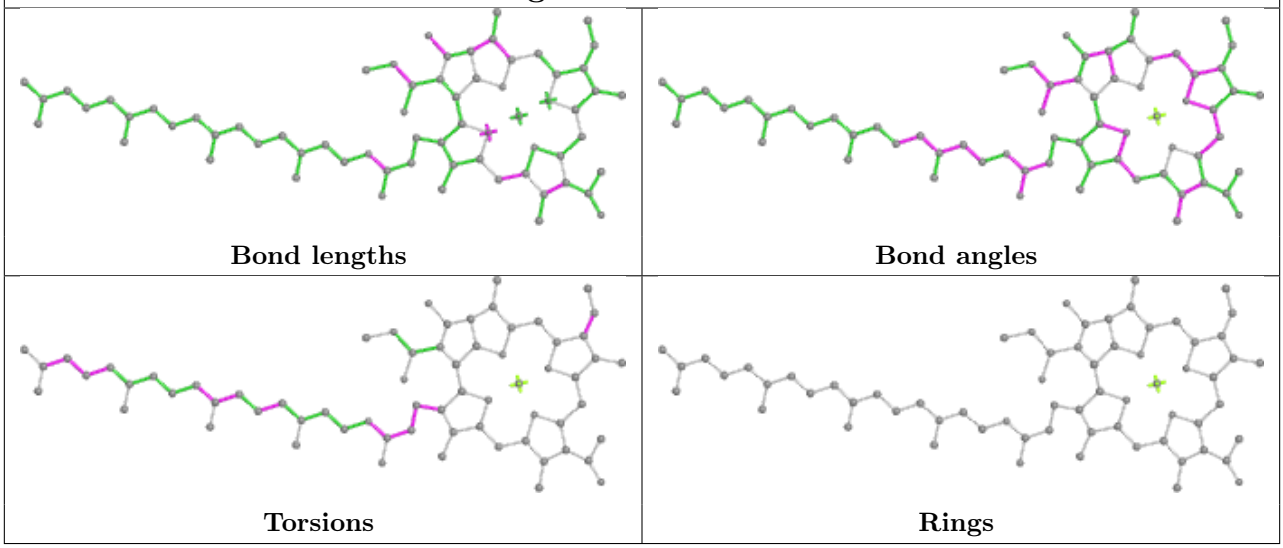


Rings

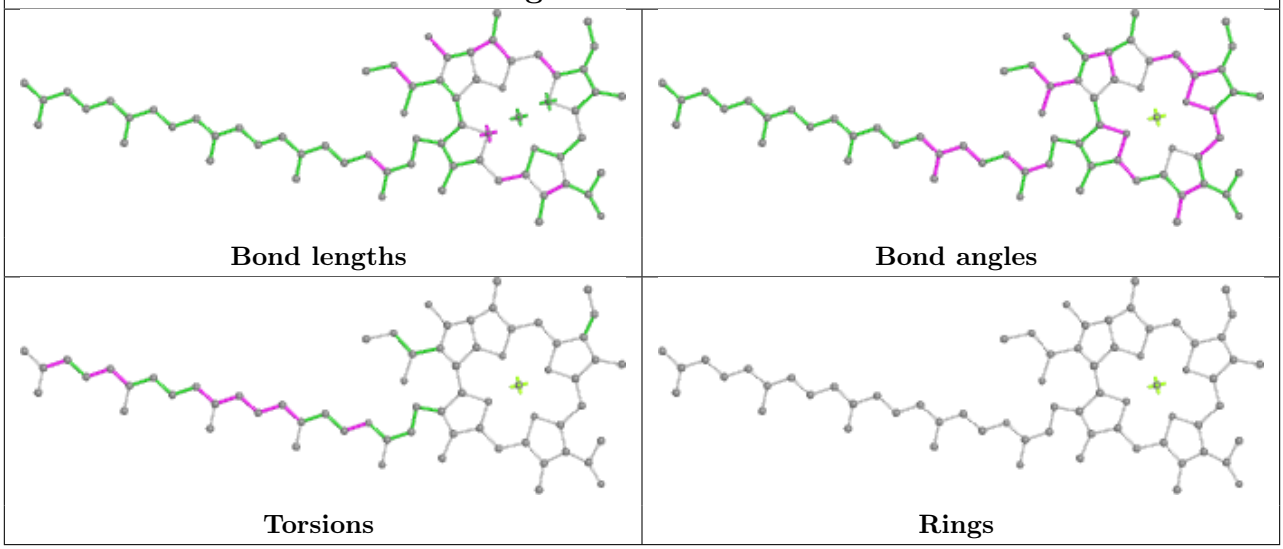
Ligand BCL 1 102



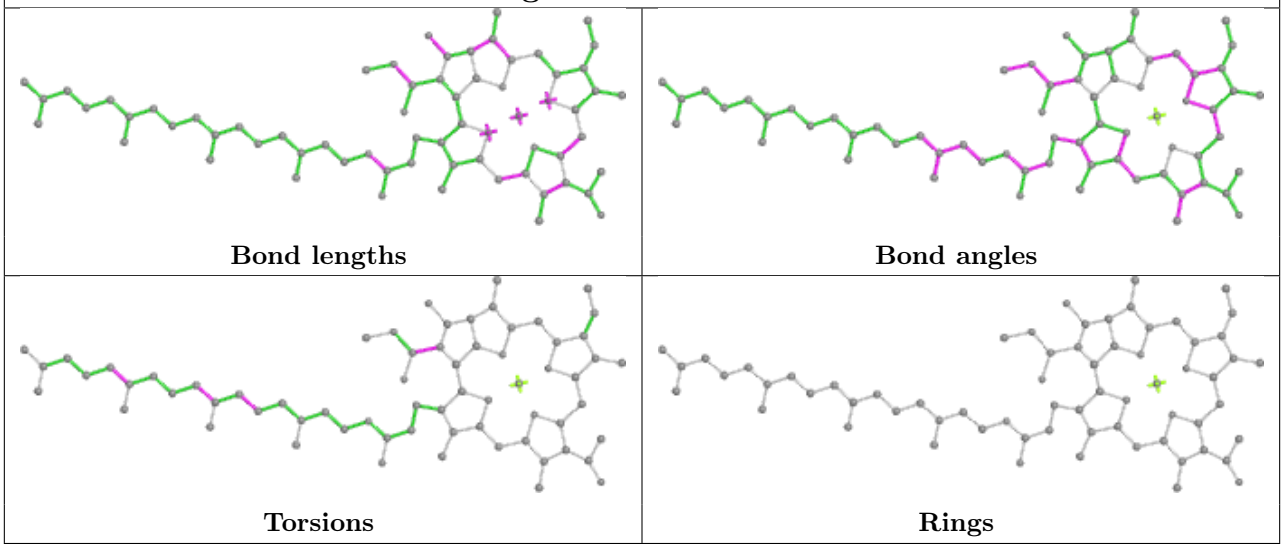
Ligand BCL F 101



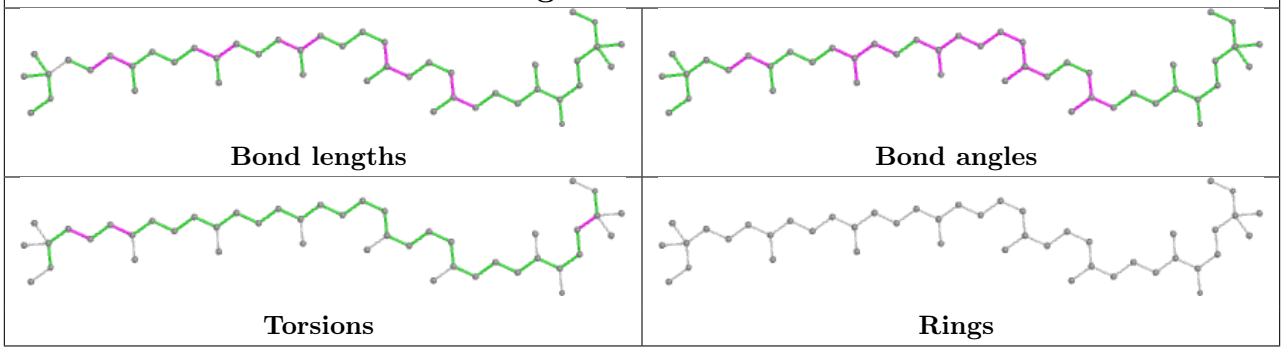
Ligand BCL Y 101



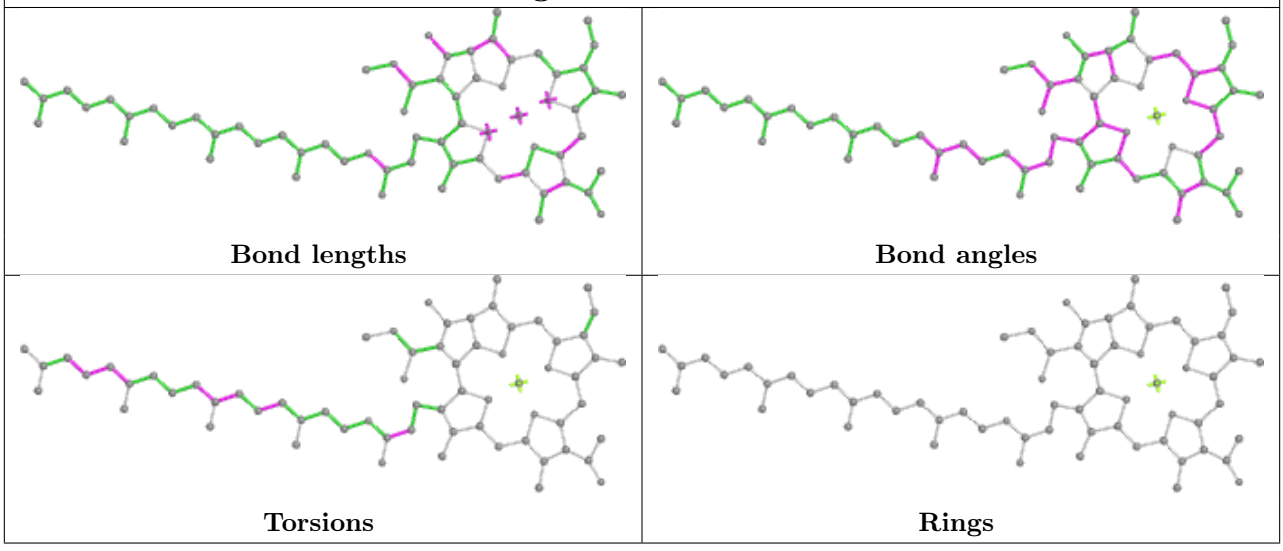
Ligand BCL M 403



Ligand I7D 1 101



Ligand BCL I 102



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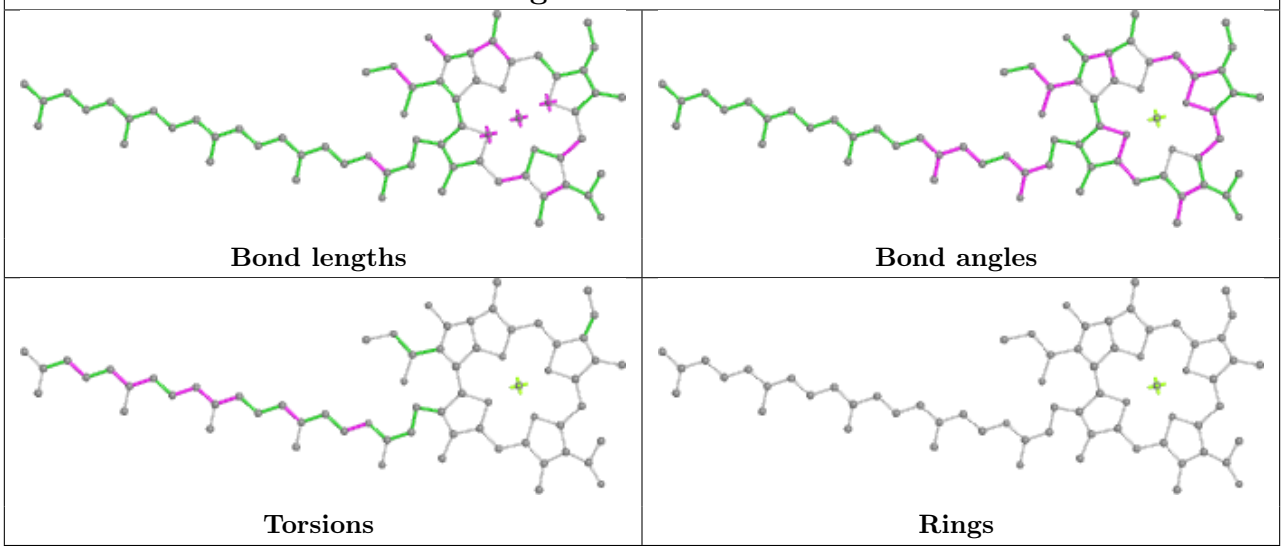
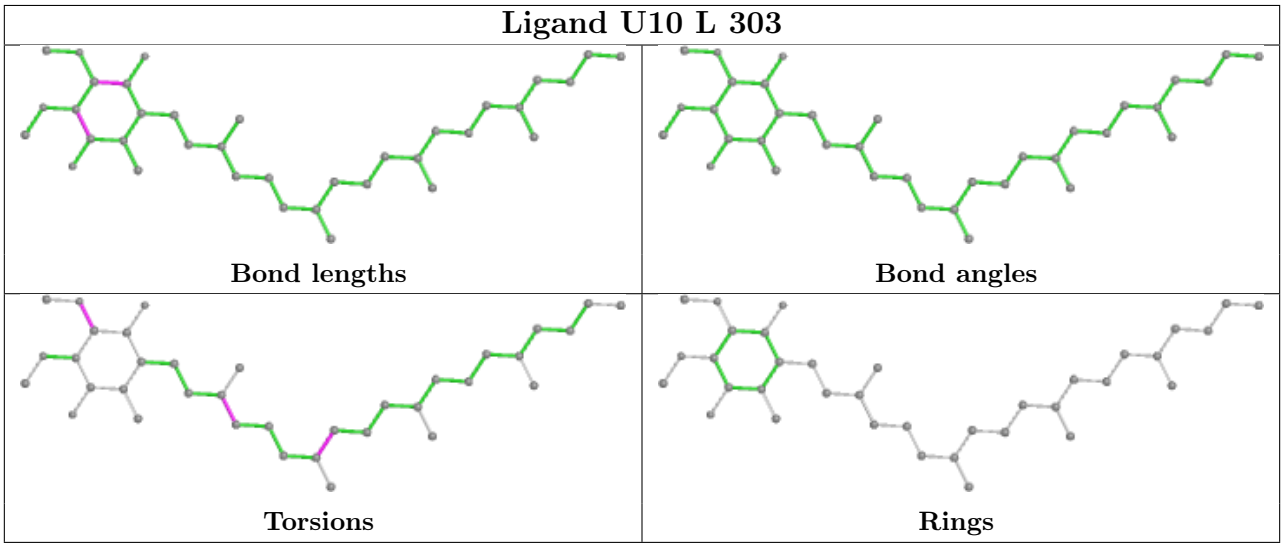
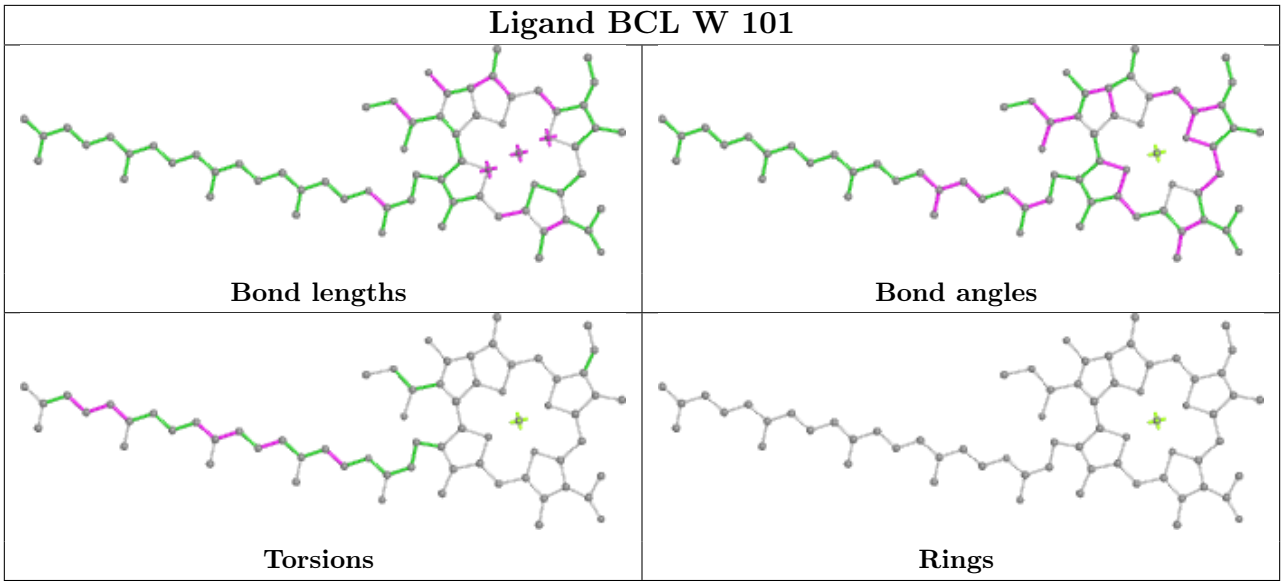


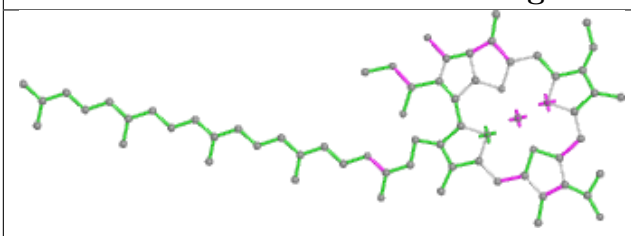
Ligand U10 L 303



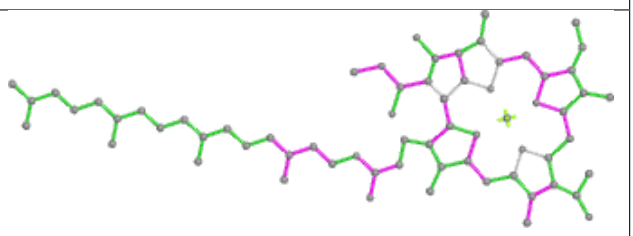
Ligand BCL W 101



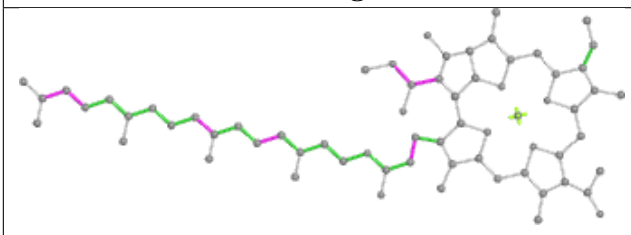
Ligand BCL L 301



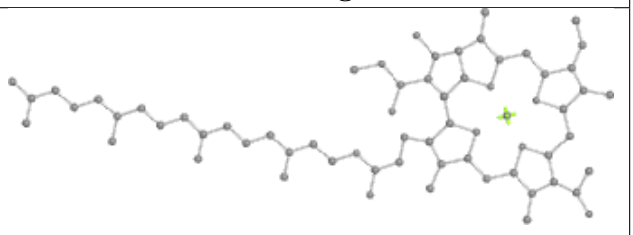
Bond lengths



Bond angles

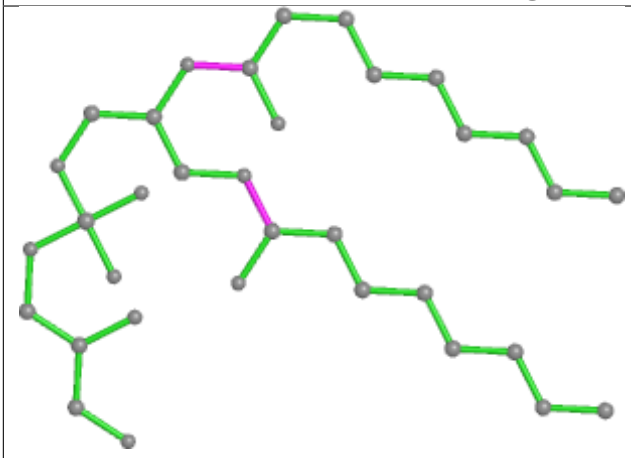


Torsions

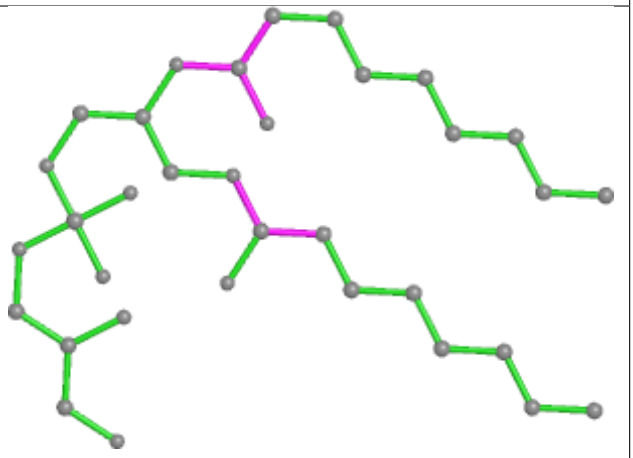


Rings

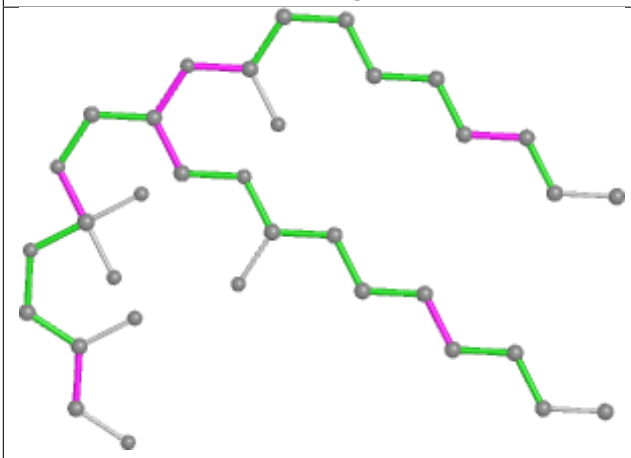
Ligand PGV L 312



Bond lengths



Bond angles



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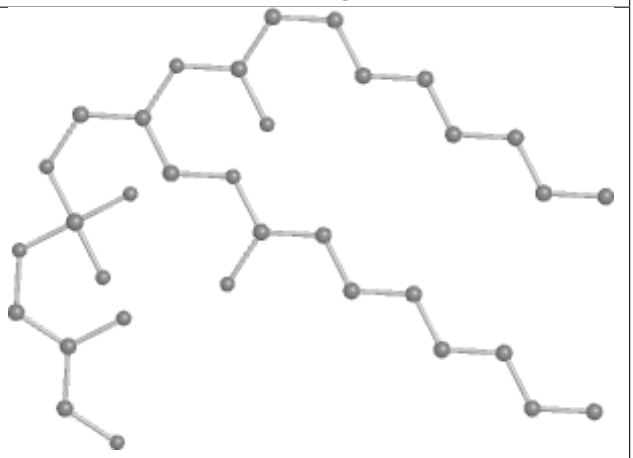
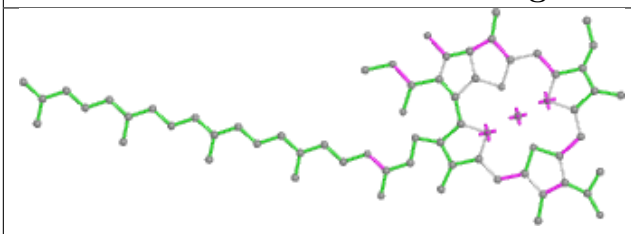
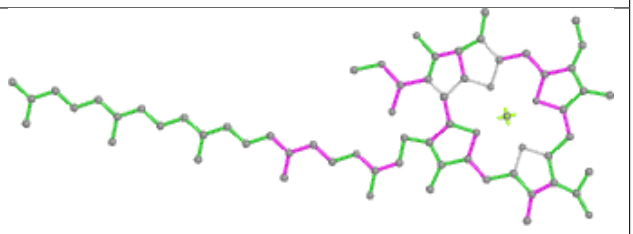
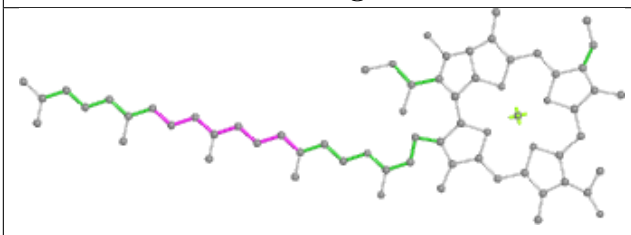
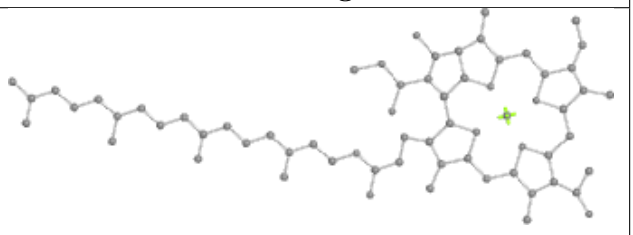
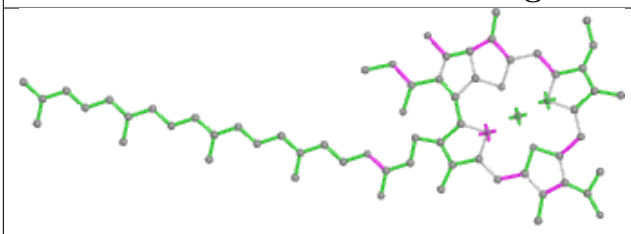
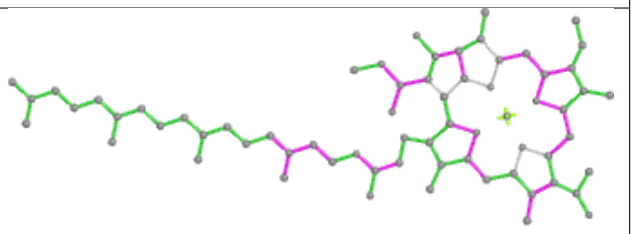
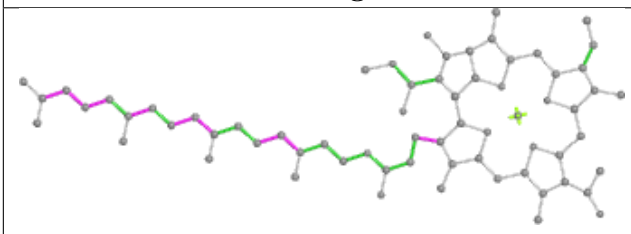
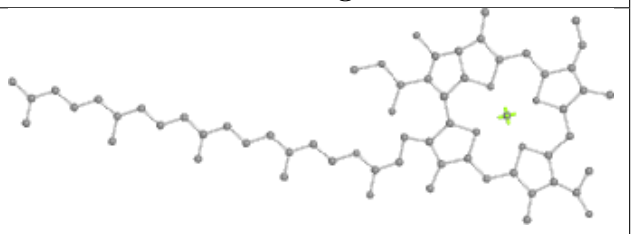
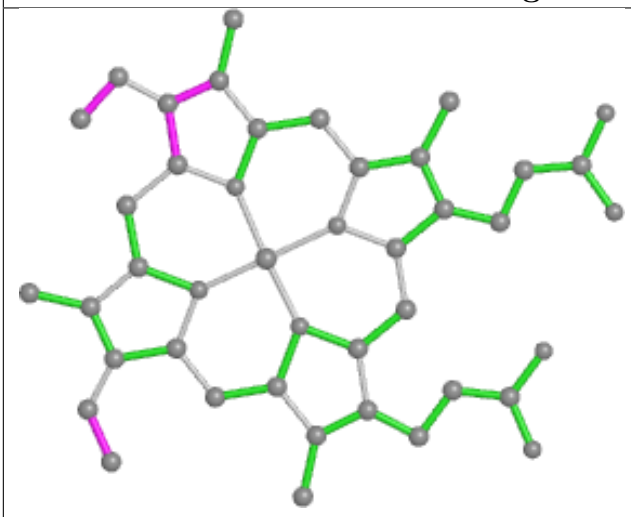


Rings

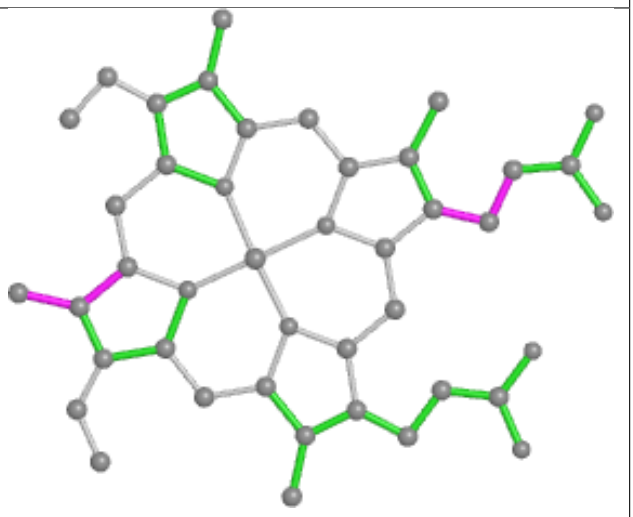
Ligand BCL 7 402	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand BCL A 102	
 Bond lengths	 Bond angles
 Torsions	 Rings

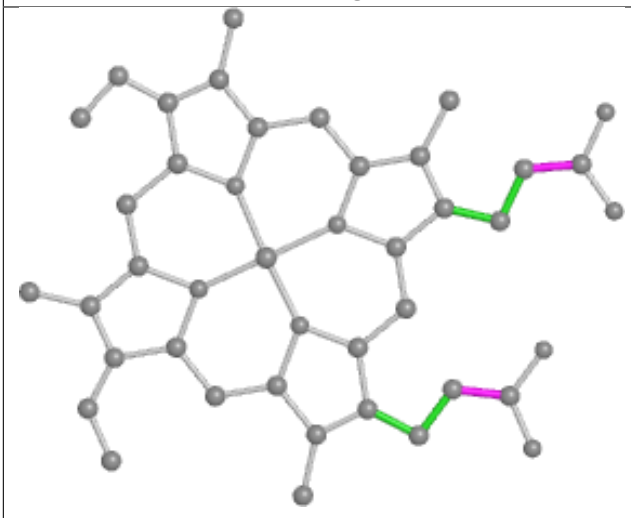
Ligand HEC C 402



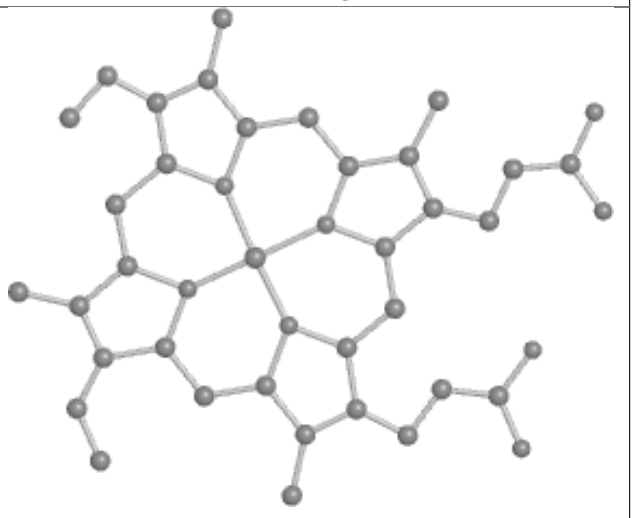
Bond lengths



Bond angles

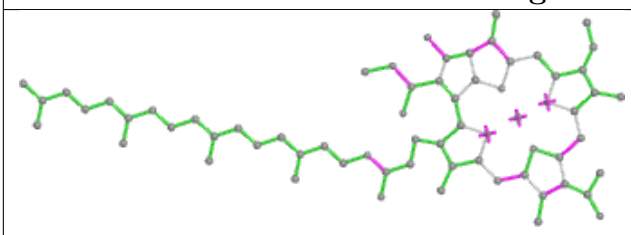


Torsions

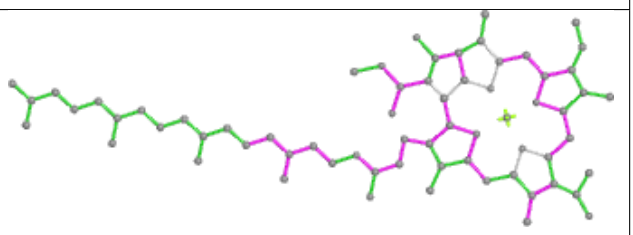


Rings

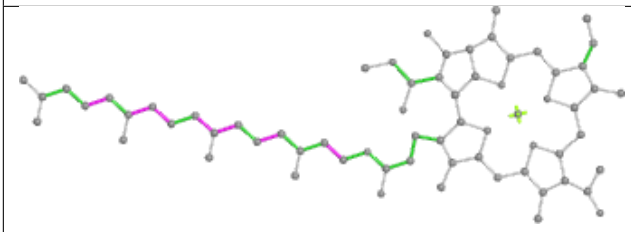
Ligand BCL 3 102



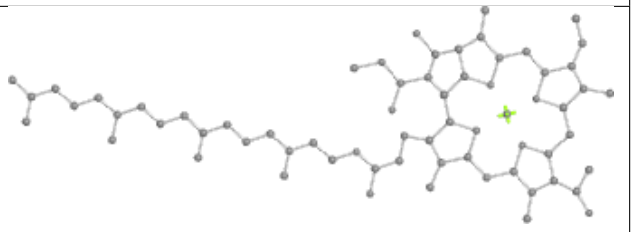
Bond lengths



Bond angles

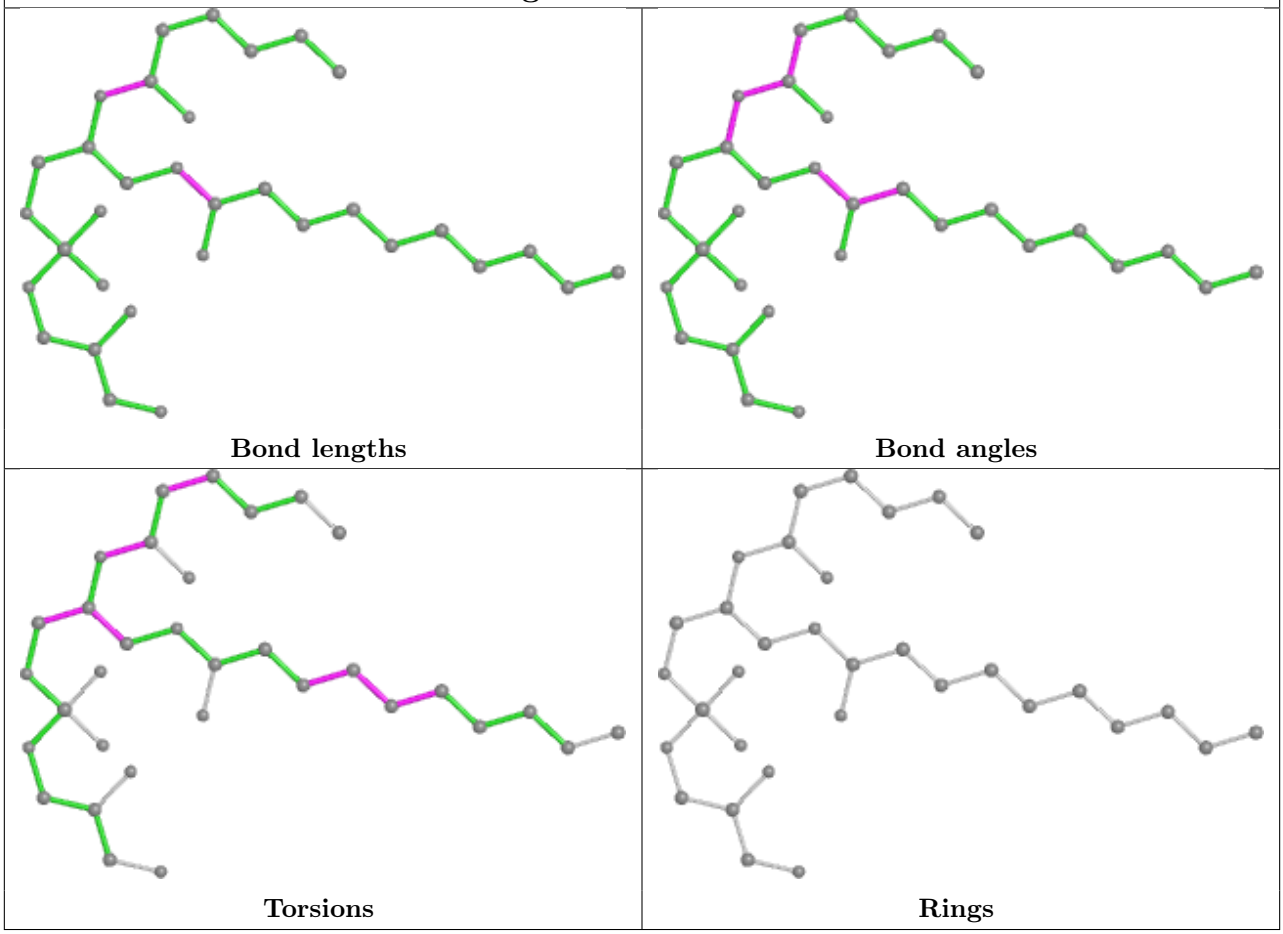


Torsions

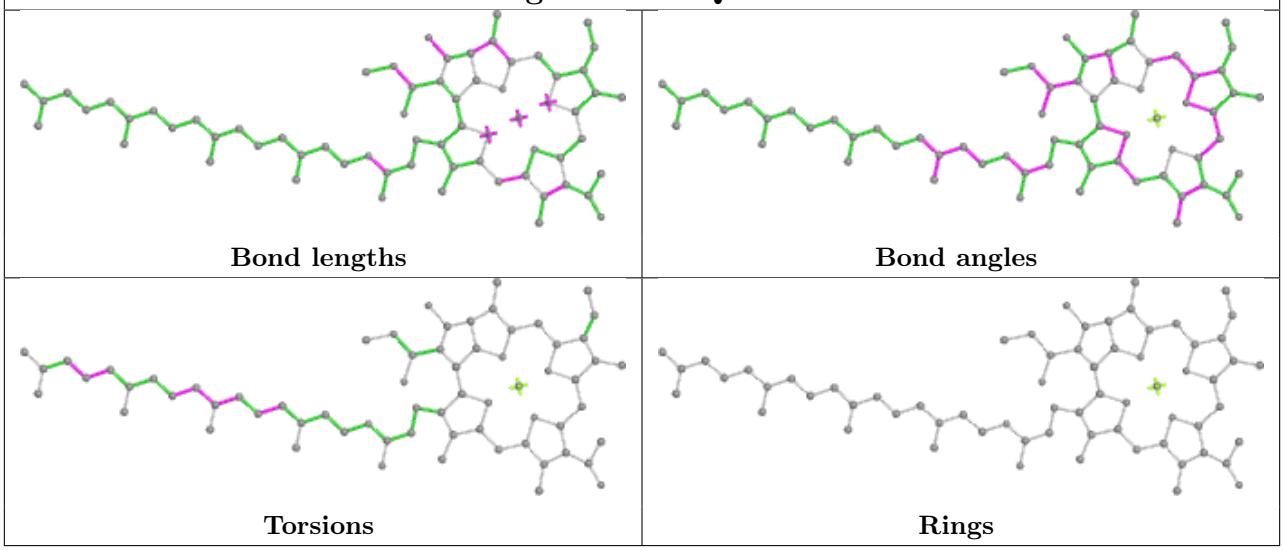


Rings

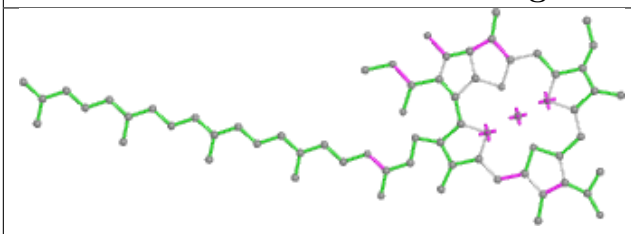
Ligand PGV D 103



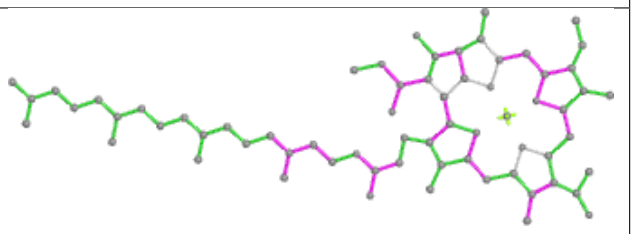
Ligand BCL Q 102



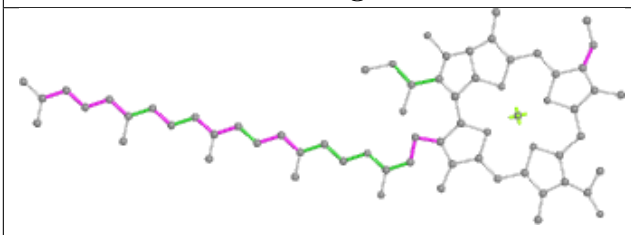
Ligand BCL 4 102



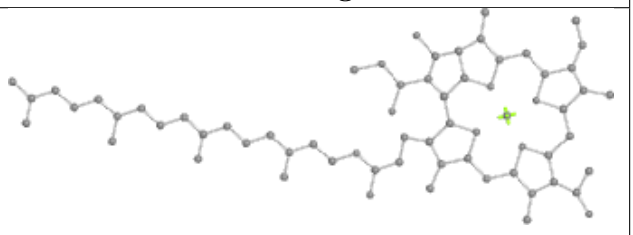
Bond lengths



Bond angles

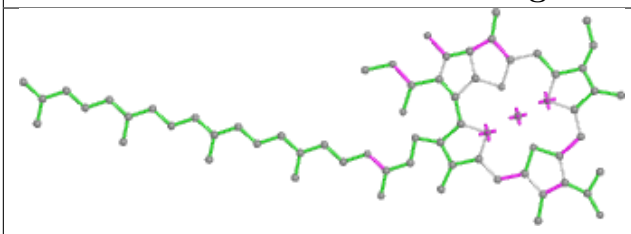


Torsions

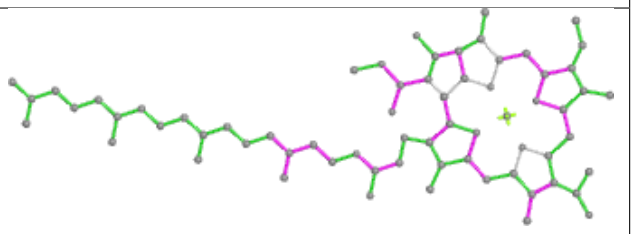


Rings

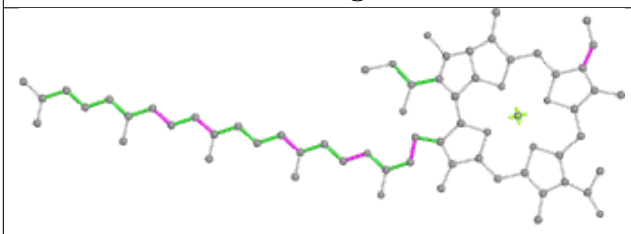
Ligand BCL 6 103



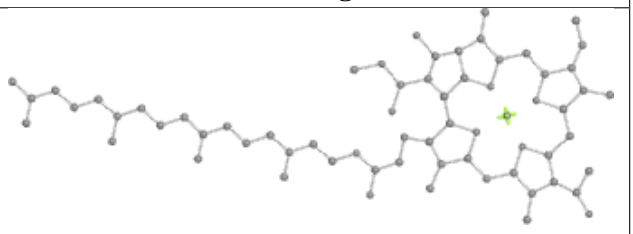
Bond lengths



Bond angles

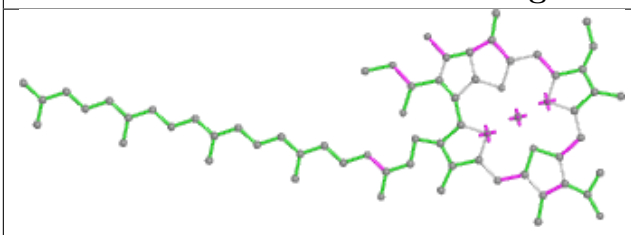


Torsions

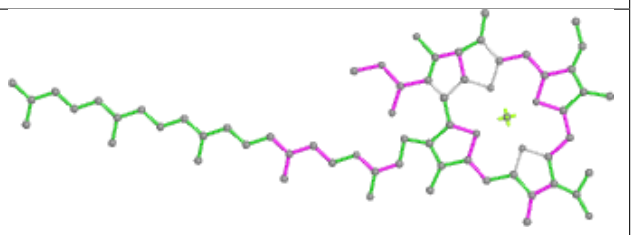


Rings

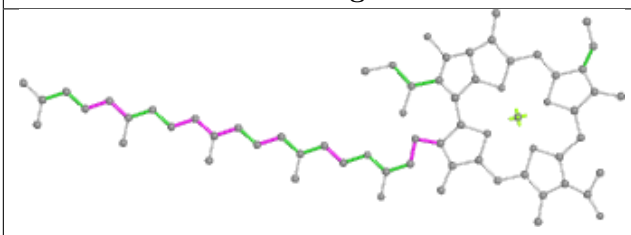
Ligand BCL 5 102



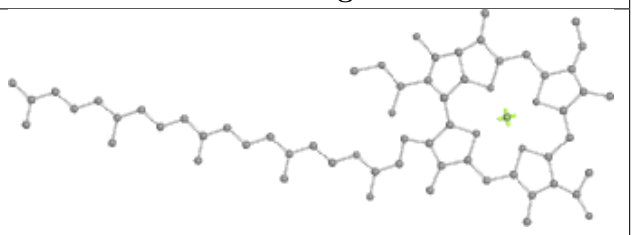
Bond lengths



Bond angles

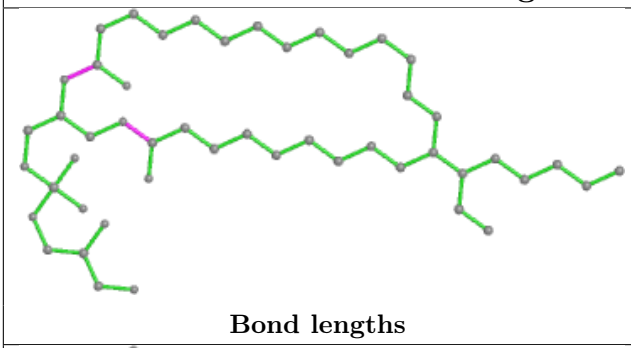


Torsions

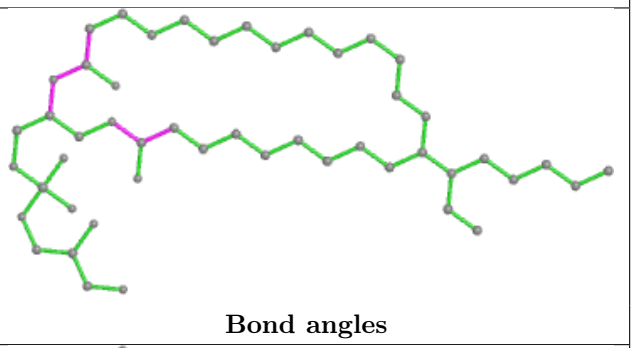


Rings

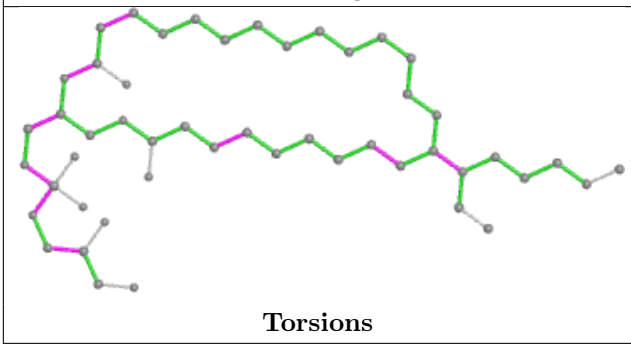
Ligand PGV M 410



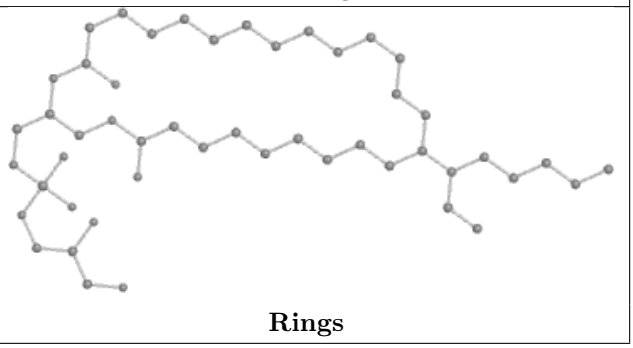
Bond lengths



Bond angles

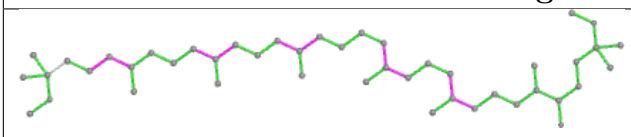


Torsions

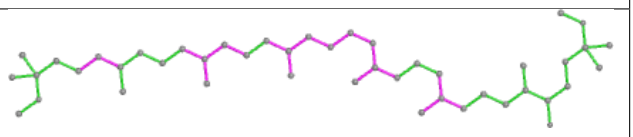


Rings

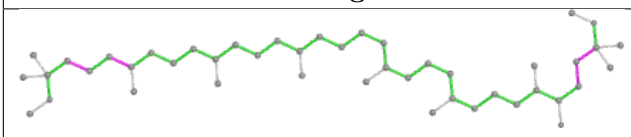
Ligand I7D 4 101



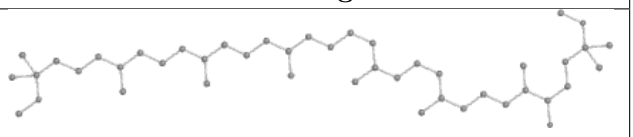
Bond lengths



Bond angles



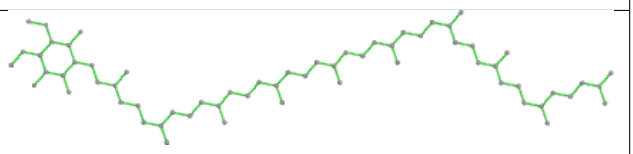
Torsions



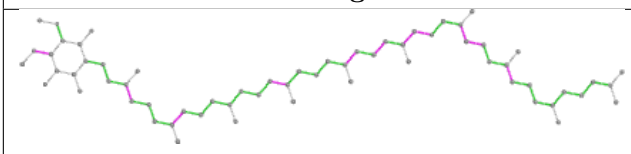
Rings

Ligand U10 7 401

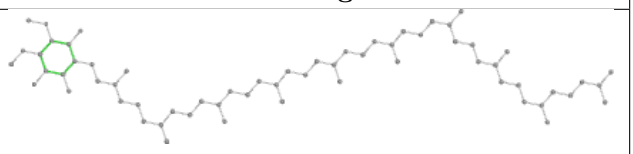
Bond lengths



Bond angles

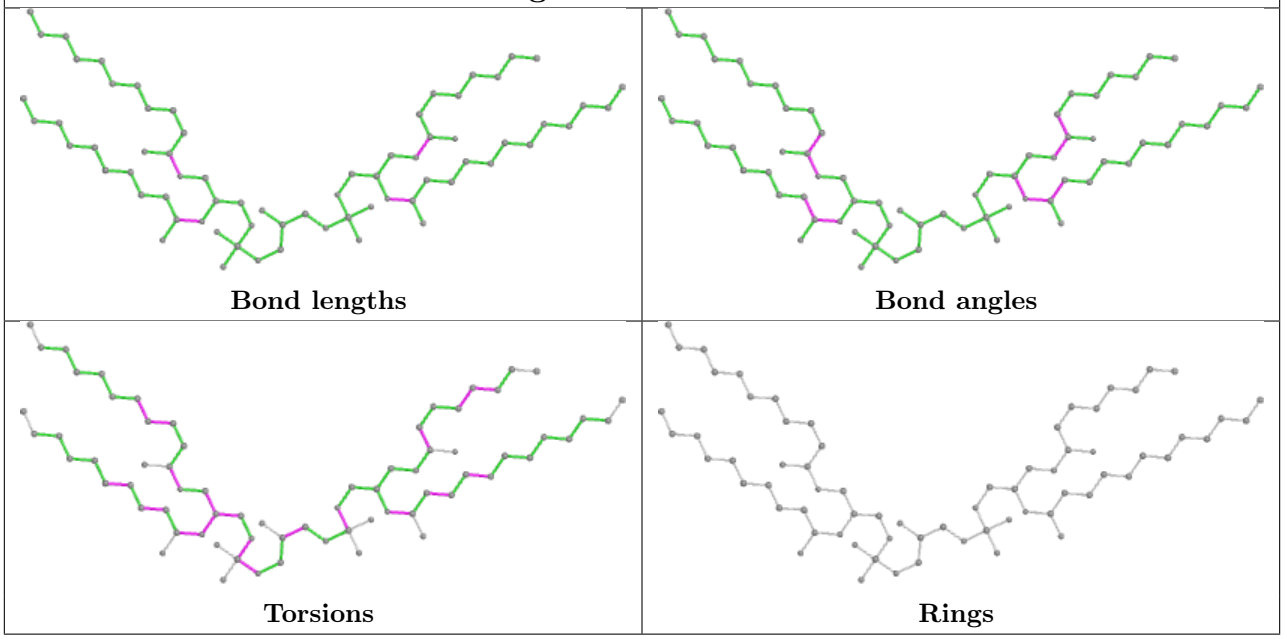


Torsions

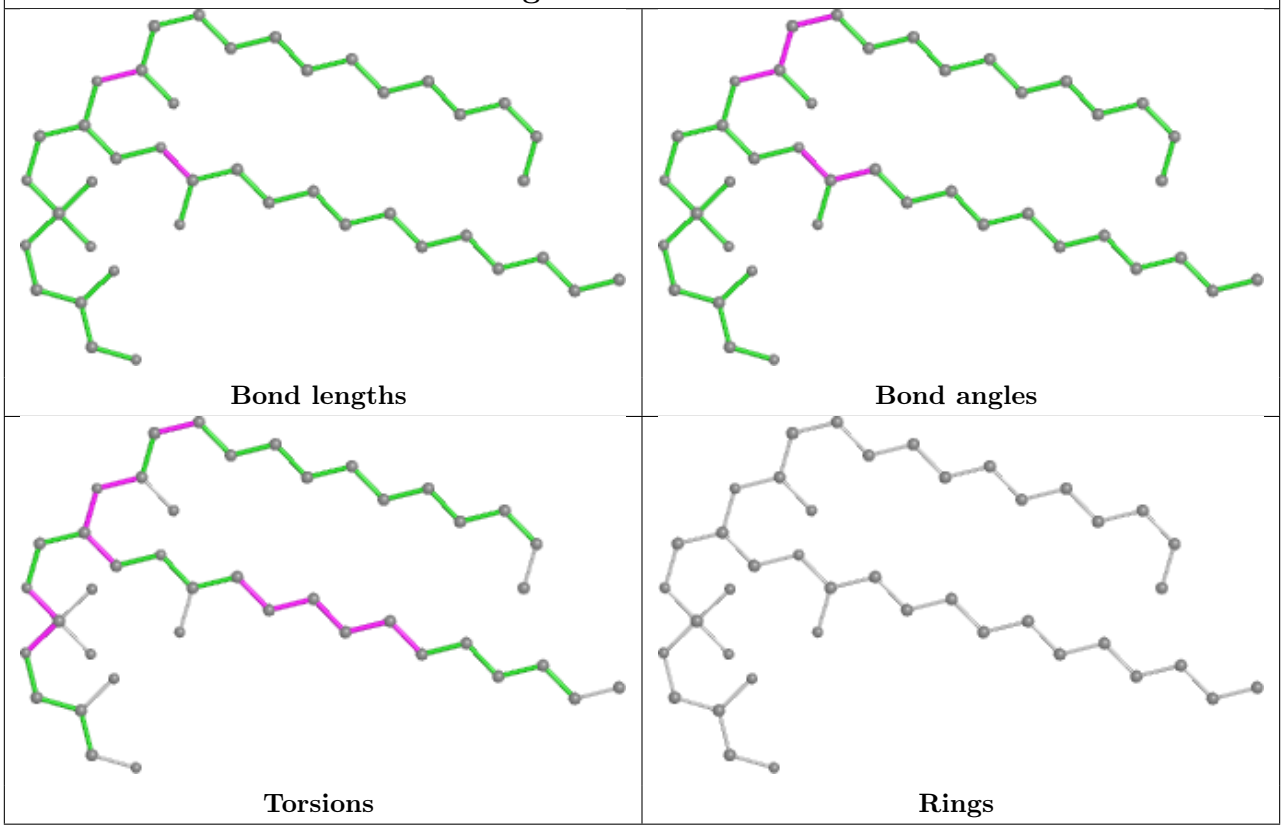


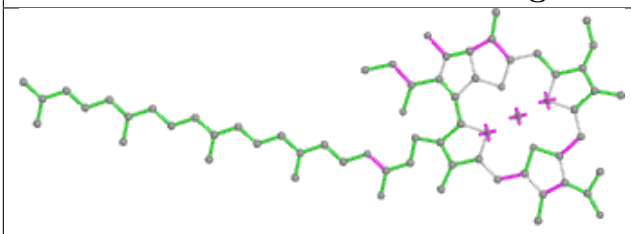
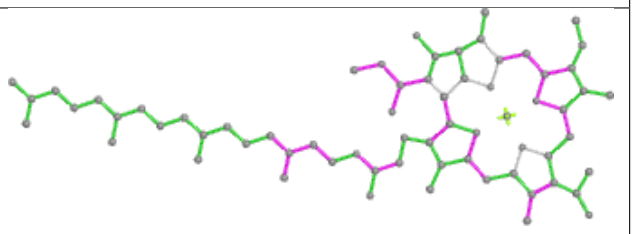
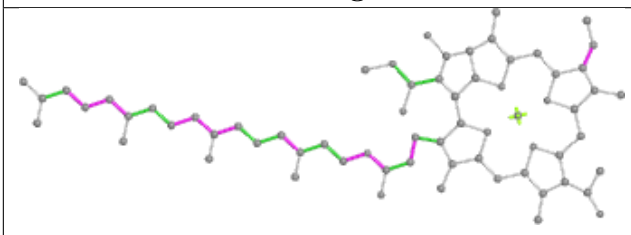
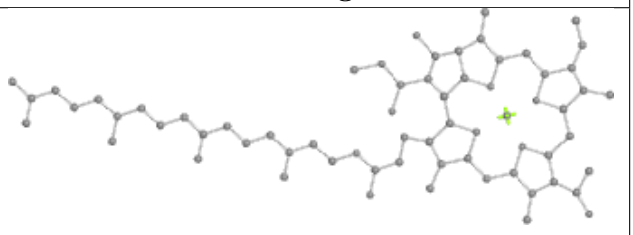
Rings

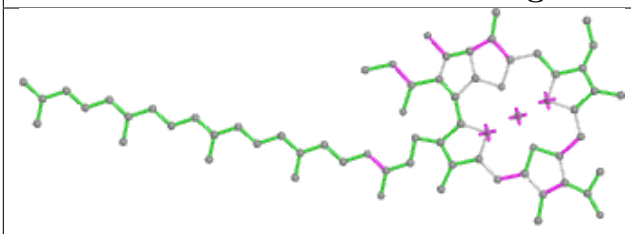
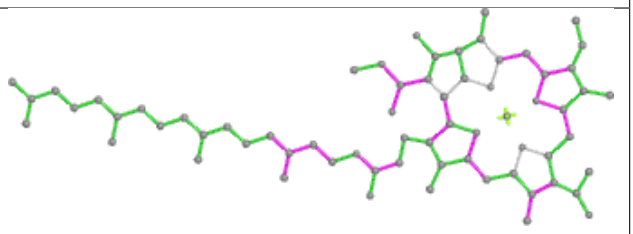
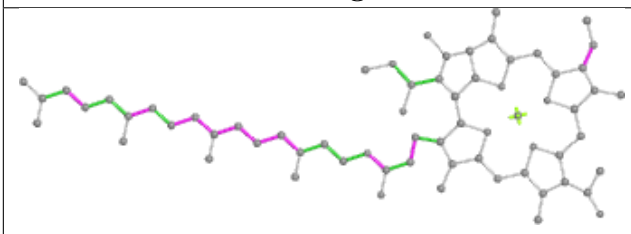
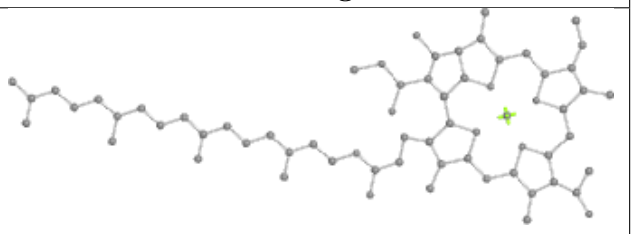
Ligand CDL 6 101



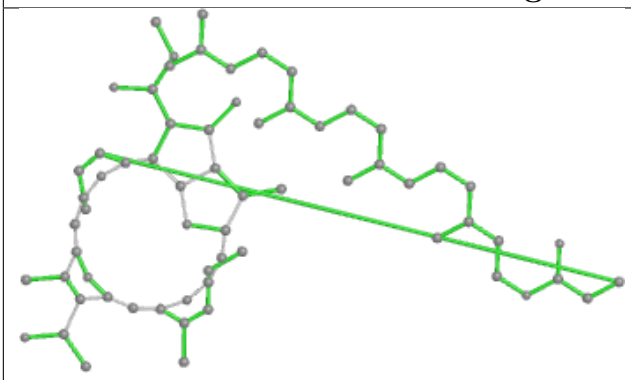
Ligand PGV C 406



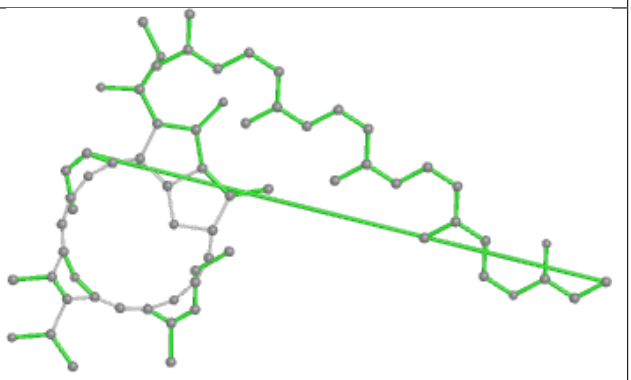
Ligand BCL 0 102	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand BCL Z 101	
 Bond lengths	 Bond angles
 Torsions	 Rings

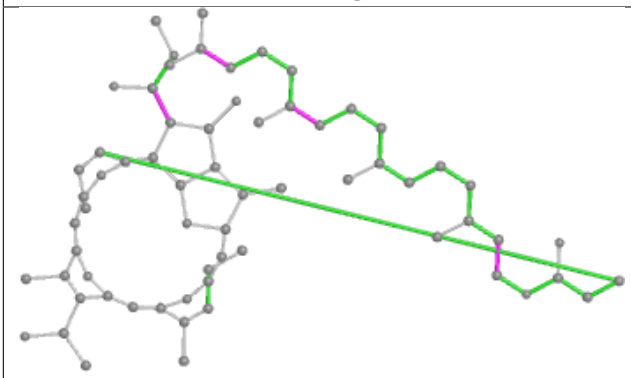
Ligand BPH L 302



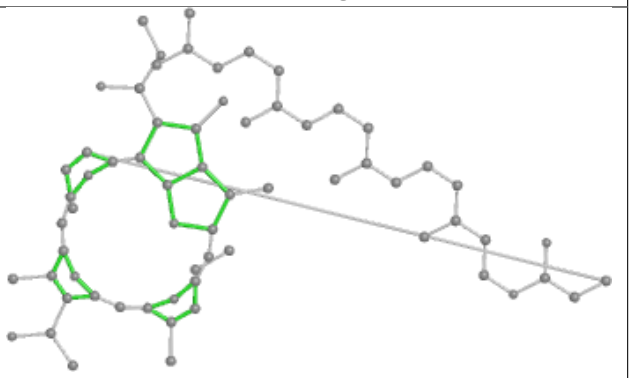
Bond lengths



Bond angles

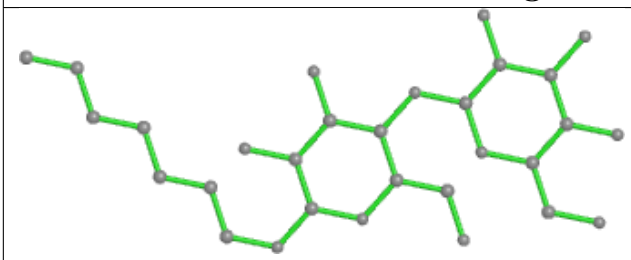


Torsions



Rings

Ligand LMT L 308



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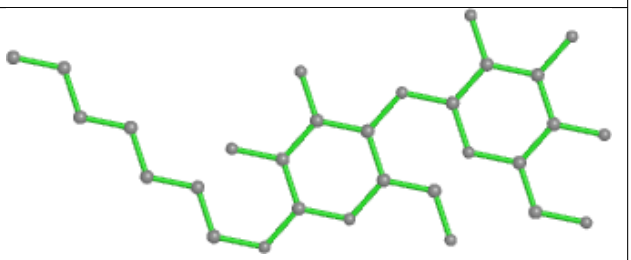
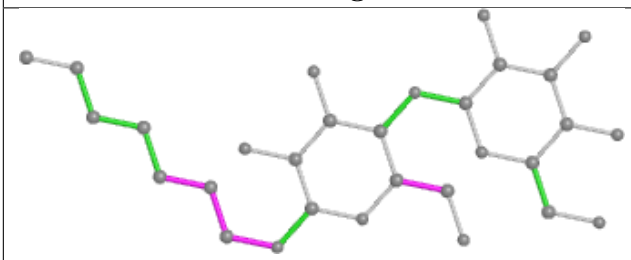


Bond angles



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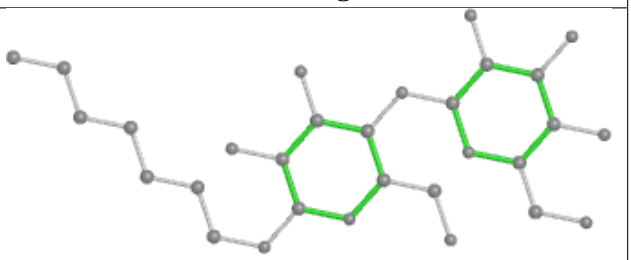
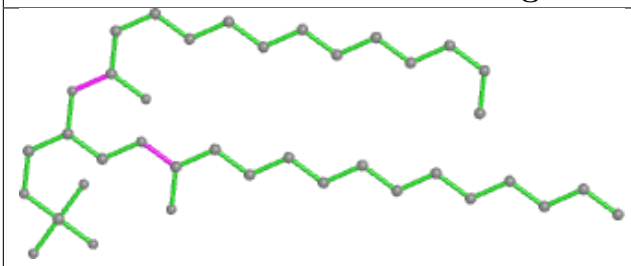


Rings

Ligand PGV C 407



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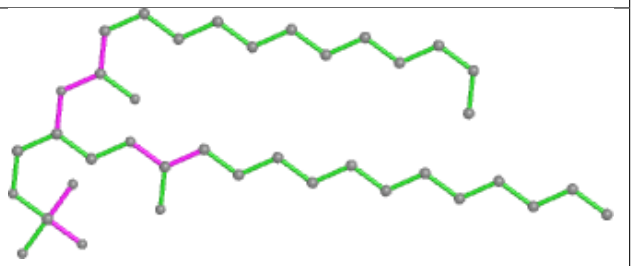
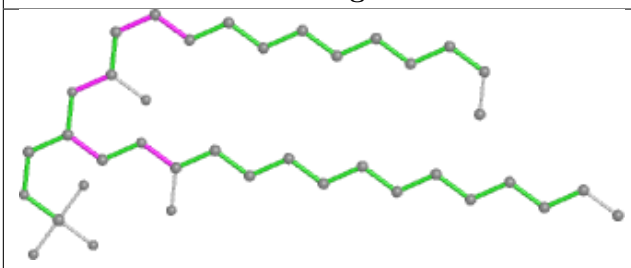
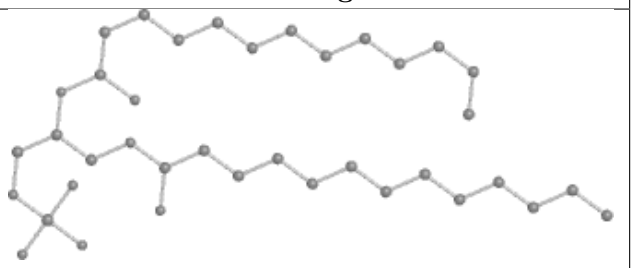


Bond angles

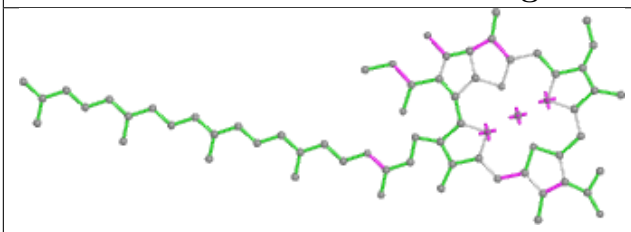


Torsions

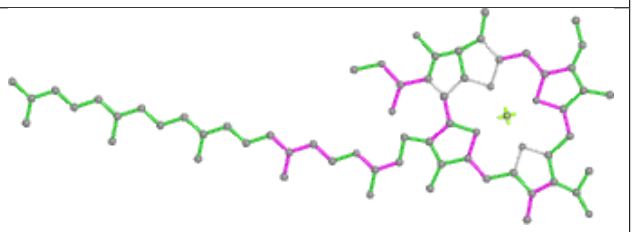


Rings

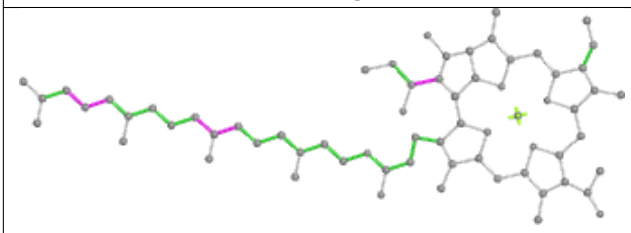
Ligand BCL M 402



Bond lengths



Bond angles



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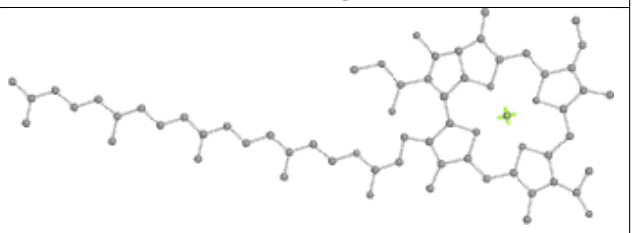
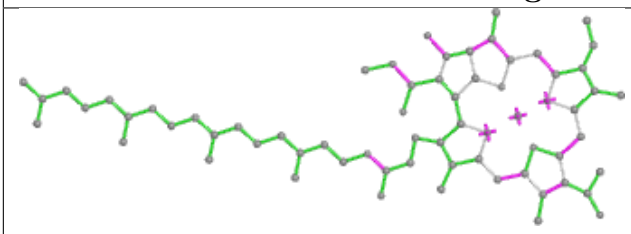


Rings

Ligand BCL U 101



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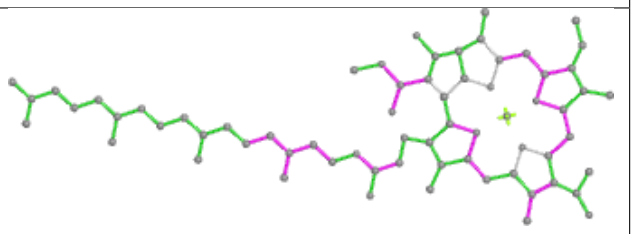
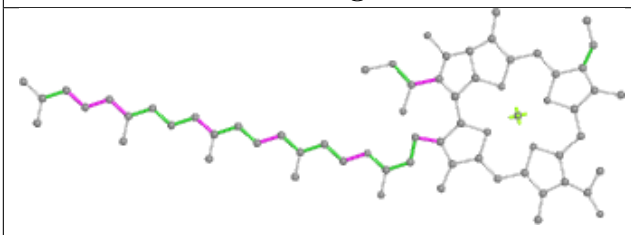


Bond angles



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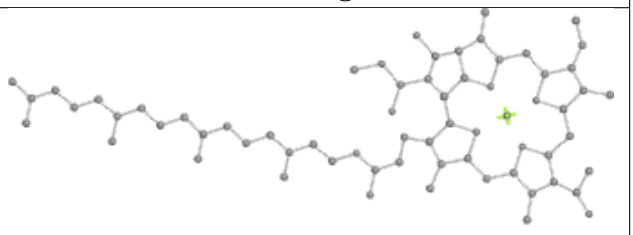
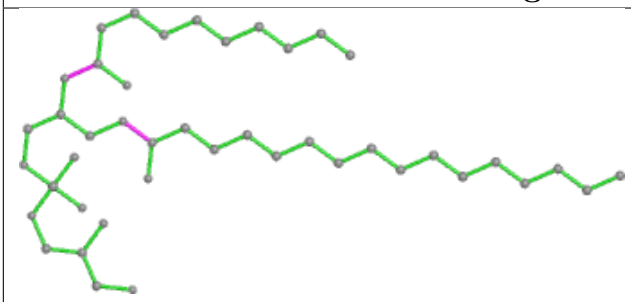
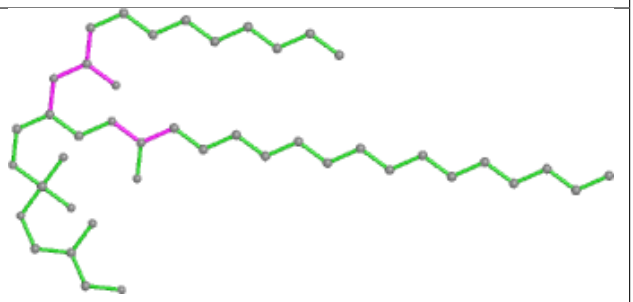


Rings

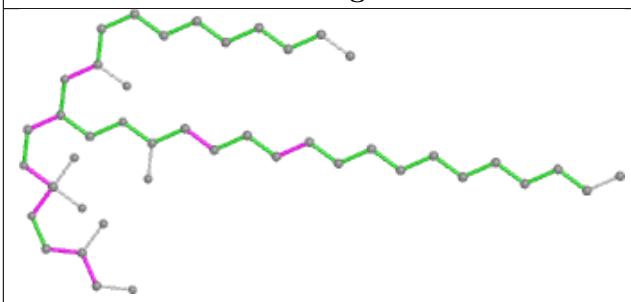
Ligand PGV L 304



Bond lengths



Bond angles



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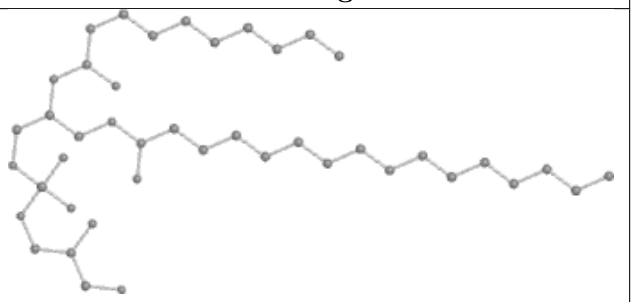
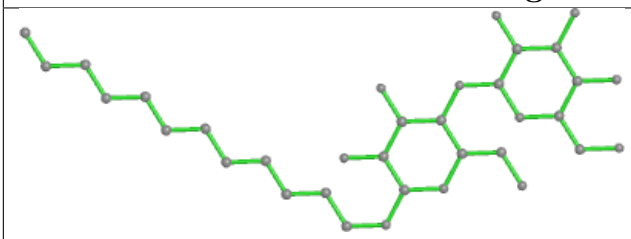
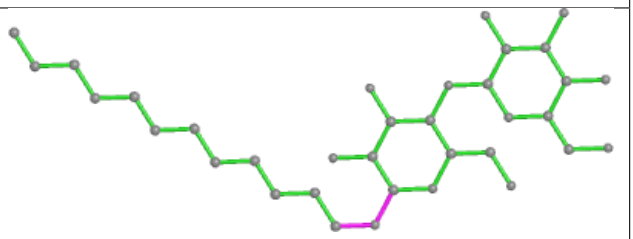


Rings

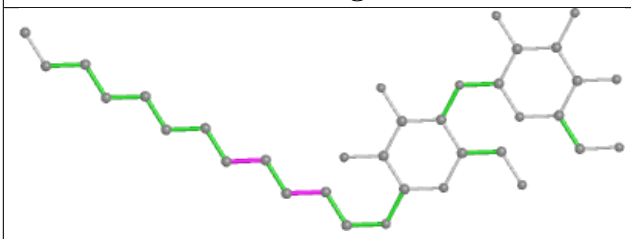
Ligand LMT 1 103



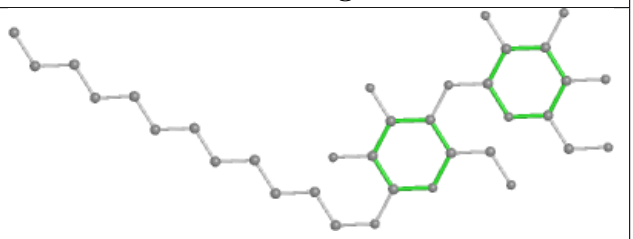
Bond lengths



Bond angles

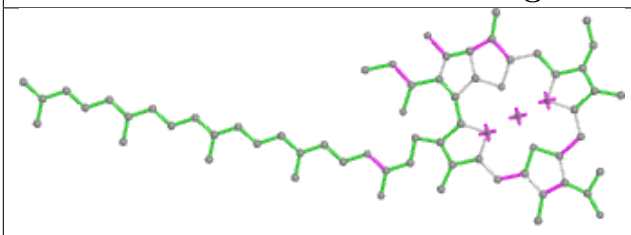


Torsions



Rings

Ligand BCL G 101



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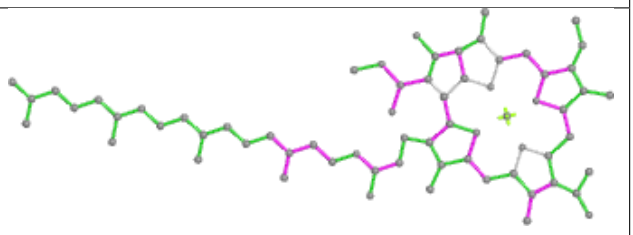
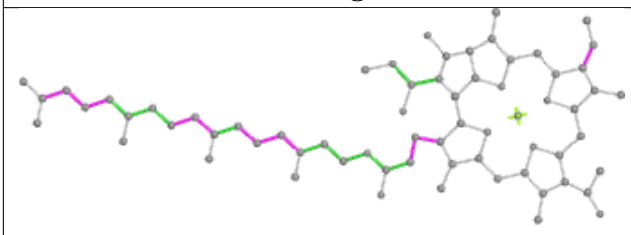


Bond angles



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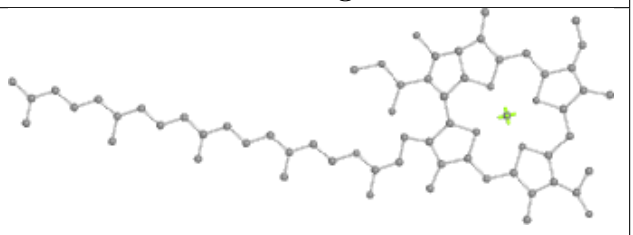
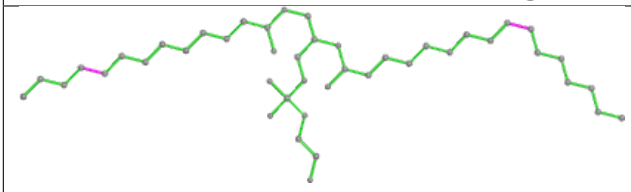


Rings

Ligand PEE M 409



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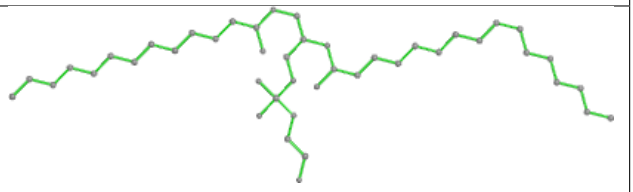
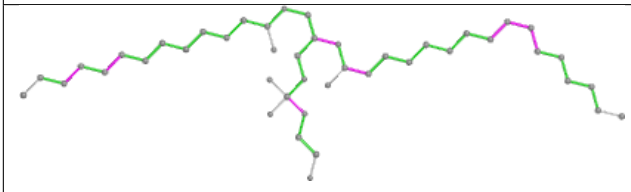


Bond angles



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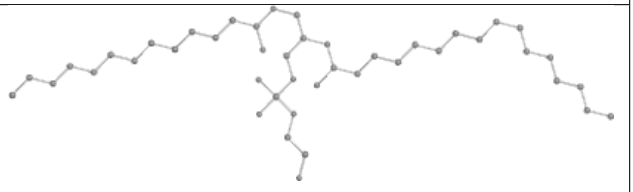
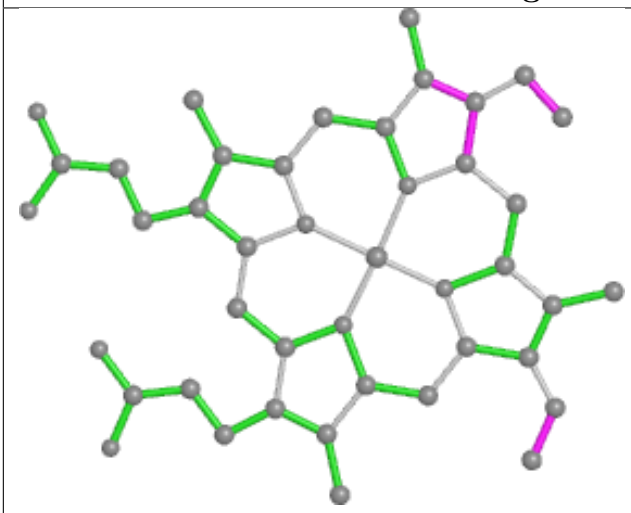
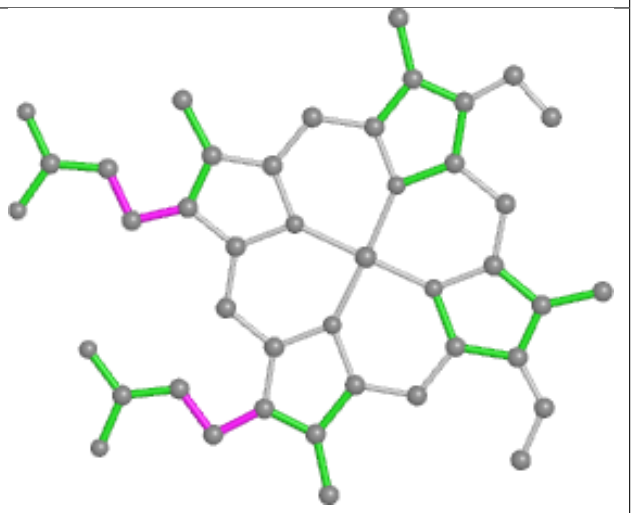


Rings

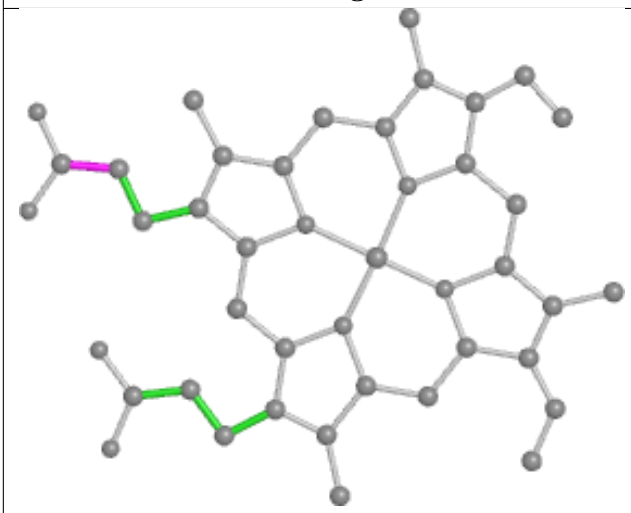
Ligand HEC C 403



Bond lengths



Bond angles



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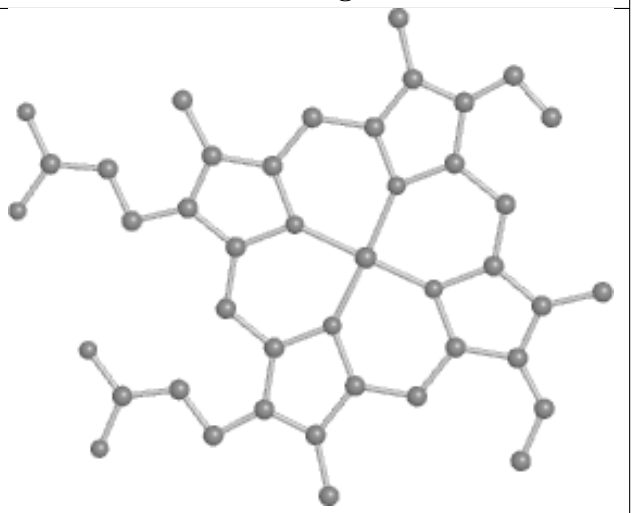
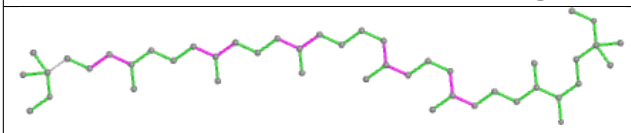
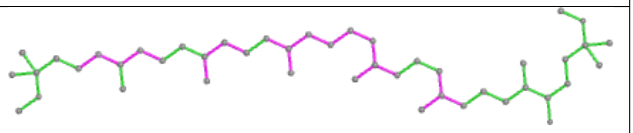


Rings

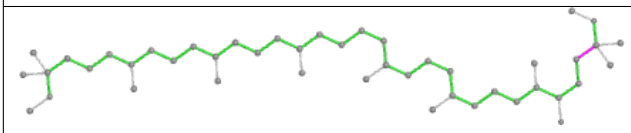
Ligand I7D R 101



Bond lengths



Bond angles



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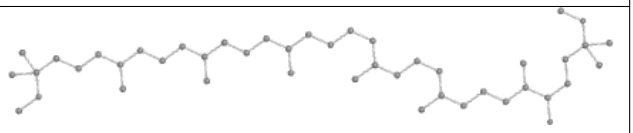
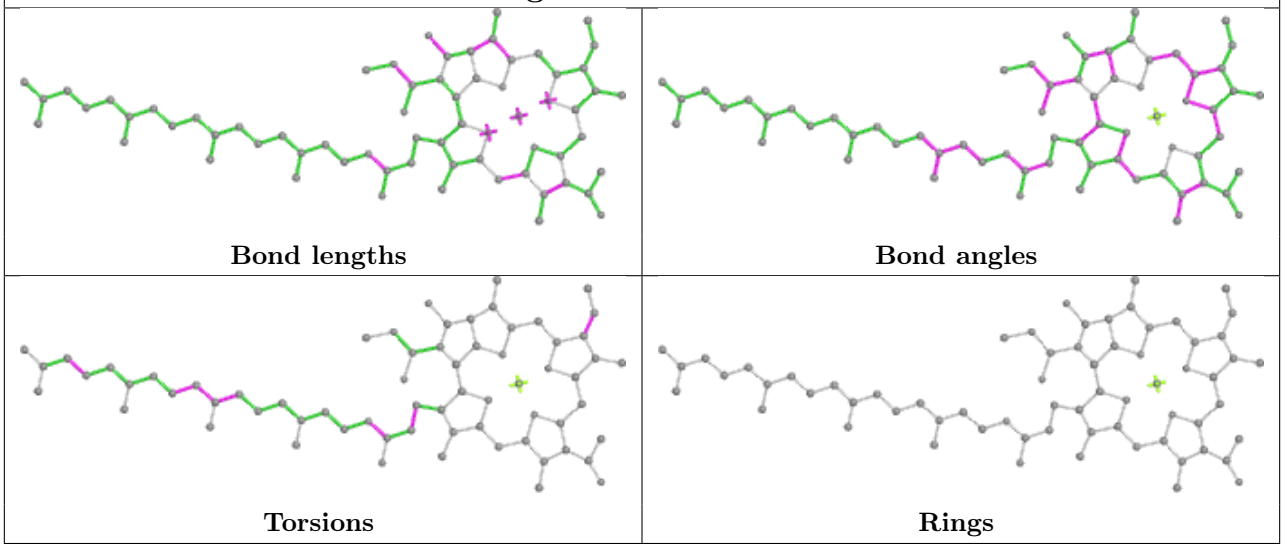
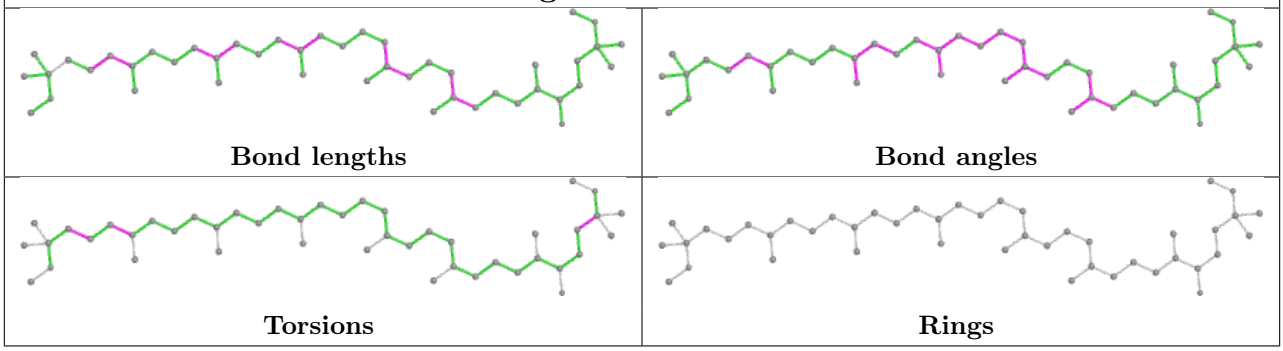


Rings

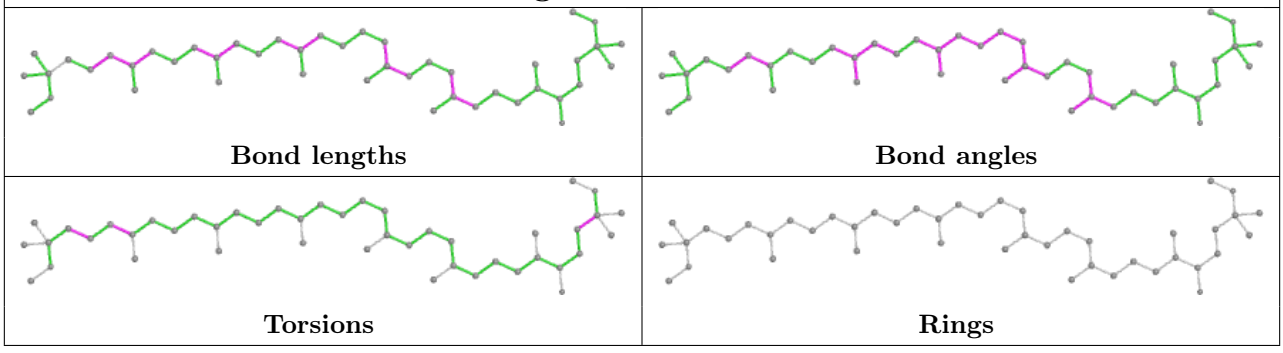
Ligand BCL B 101



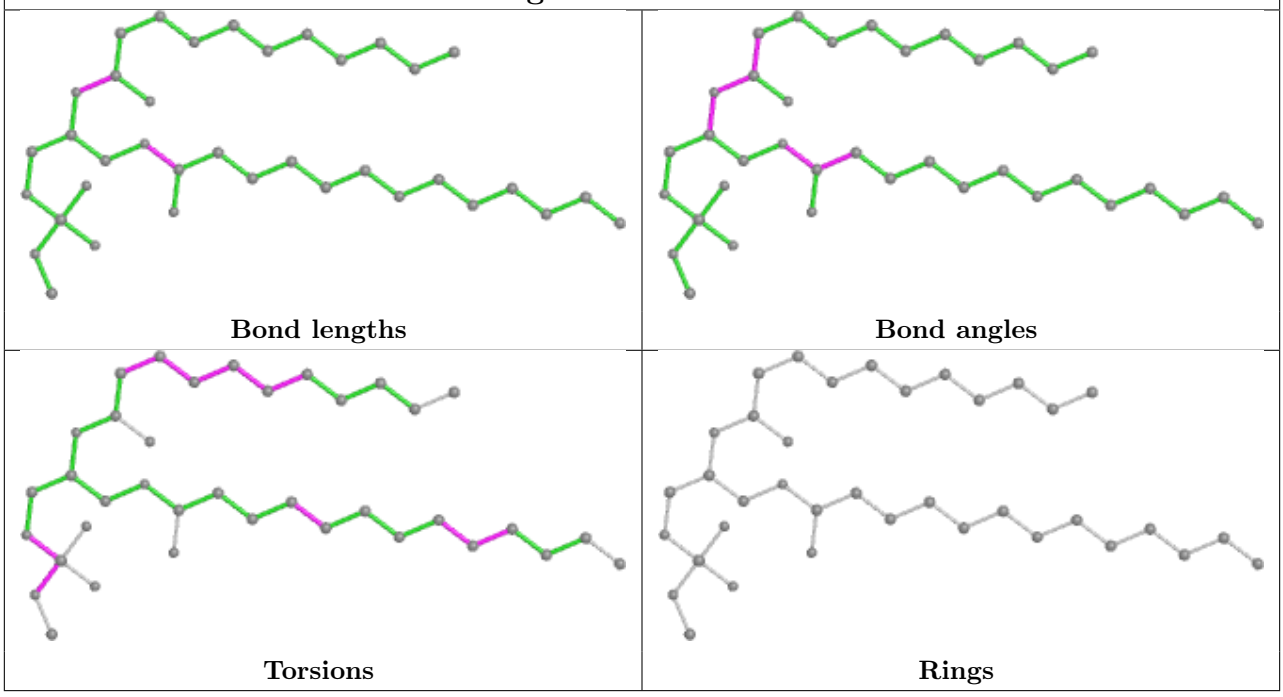
Ligand I7D I 101



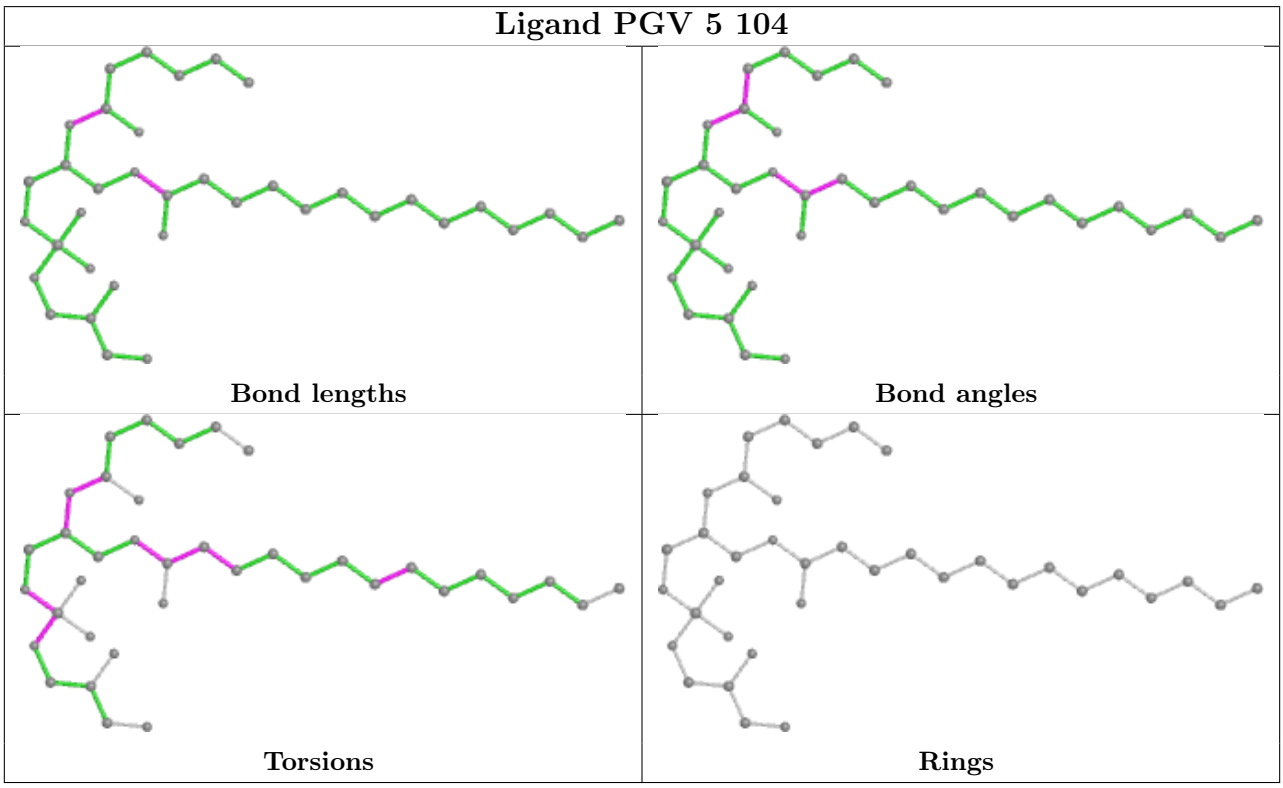
Ligand I7D T 101



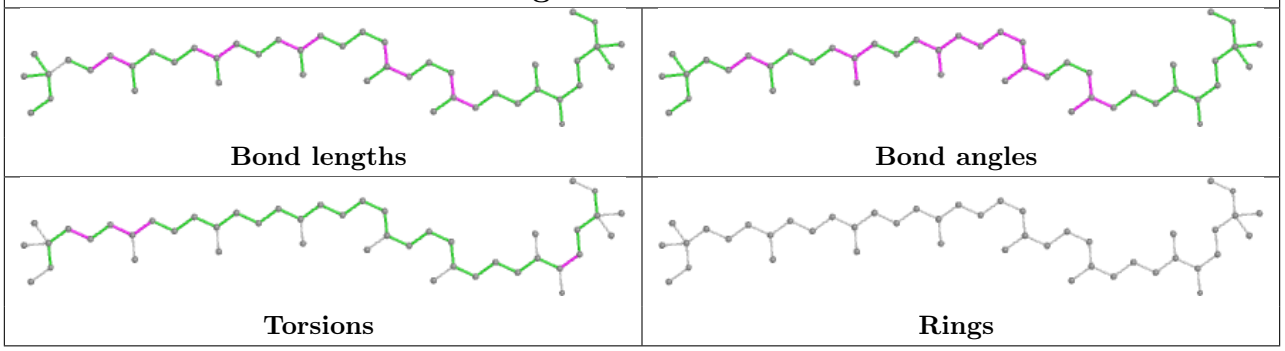
Ligand PGV 5 103



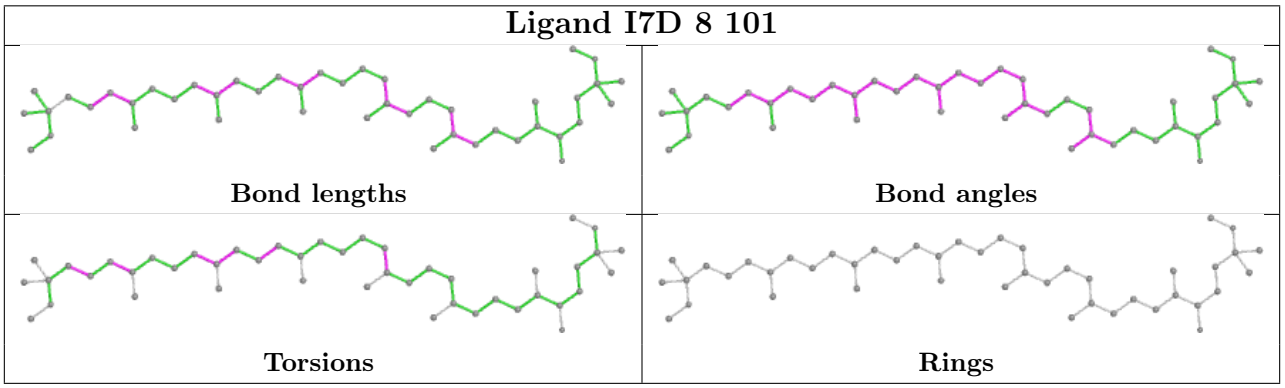
Ligand PGV 5 104



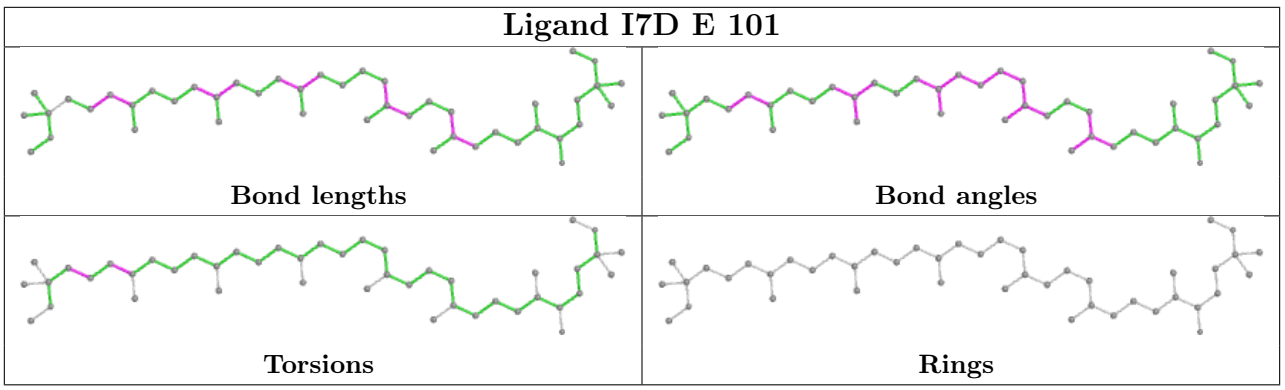
Ligand I7D V 101



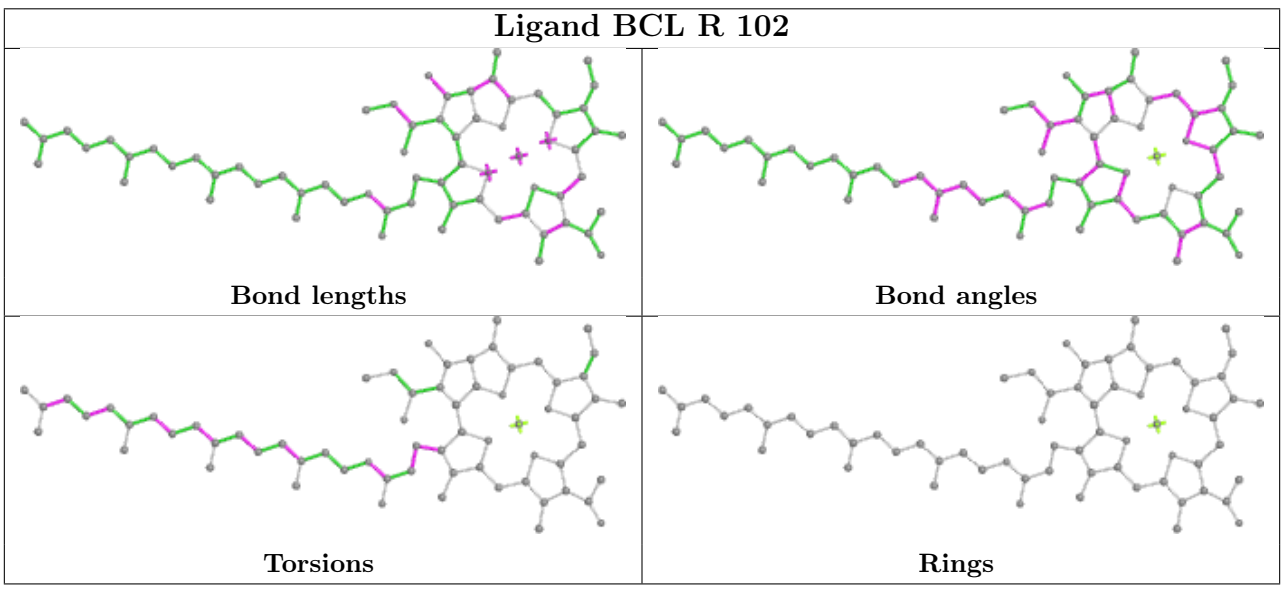
Ligand I7D 8 101



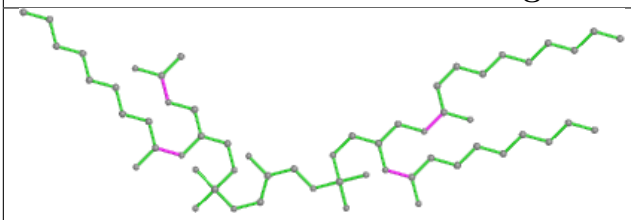
Ligand I7D E 101



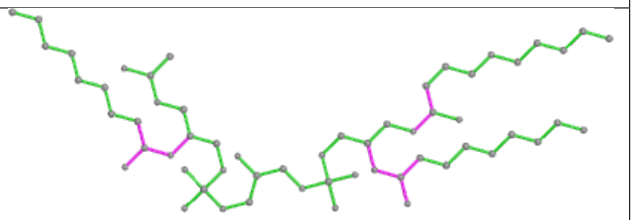
Ligand BCL R 102



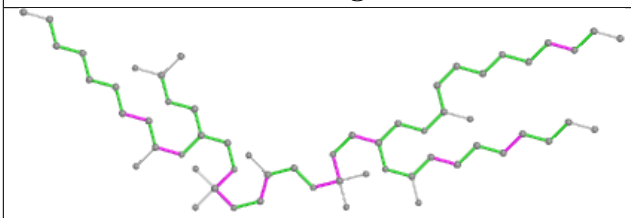
Ligand CDL A 101



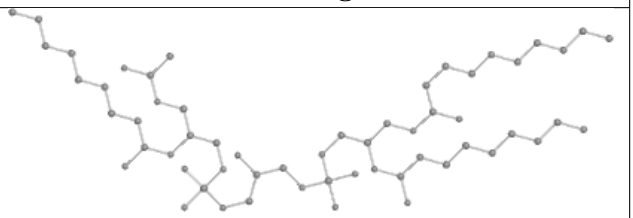
Bond lengths



Bond angles

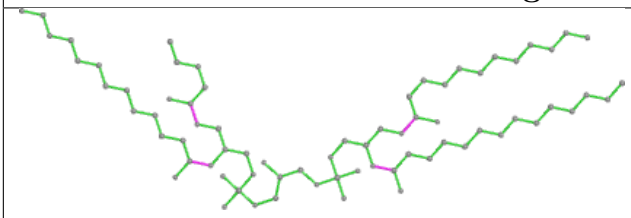


Torsions

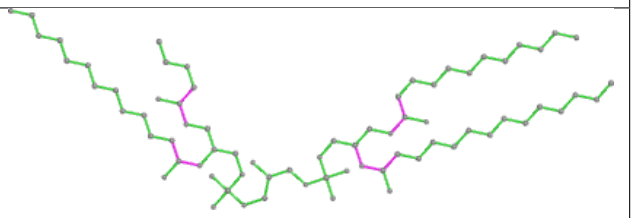


Rings

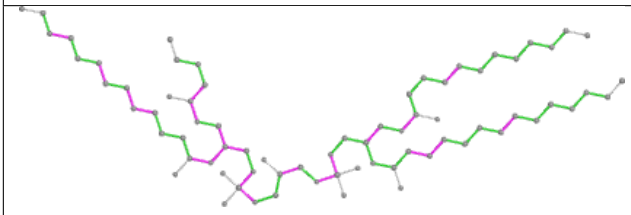
Ligand CDL H 303



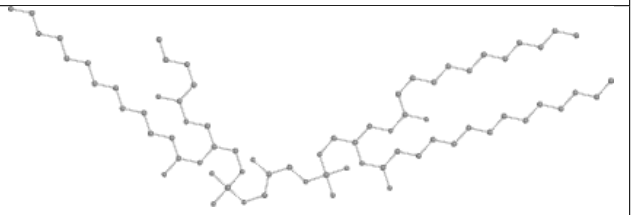
Bond lengths



Bond angles

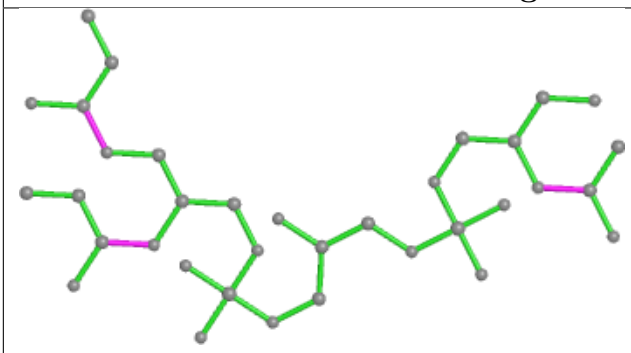


Torsions

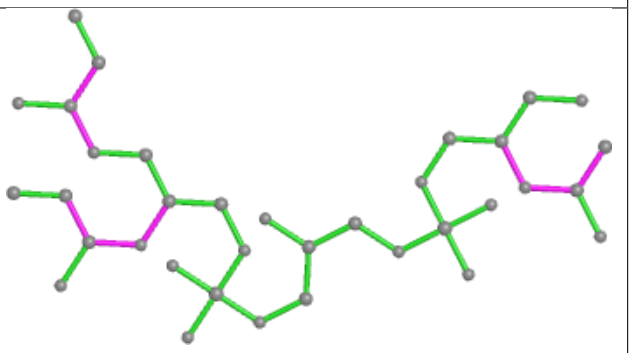


Rings

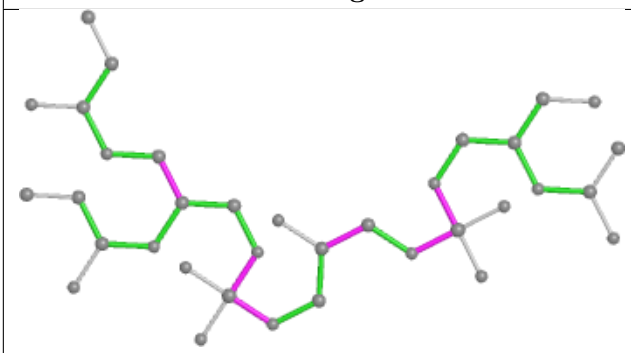
Ligand CDL M 407



Bond lengths



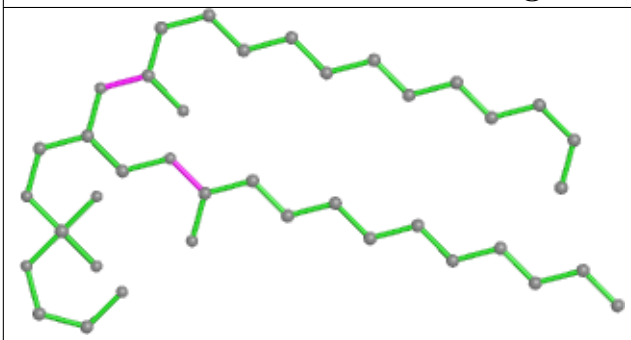
Bond angles



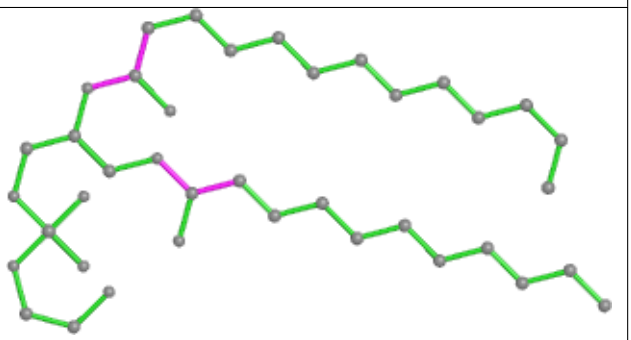
Torsions

Rings

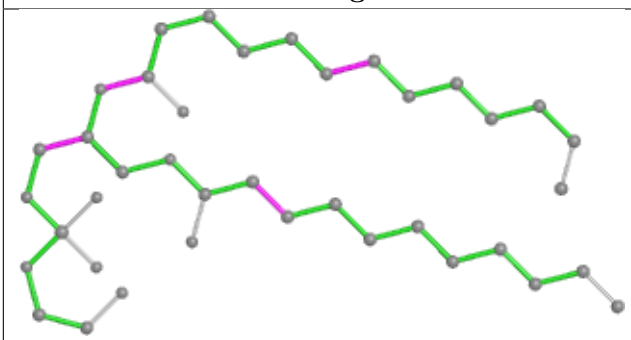
Ligand PGV F 102



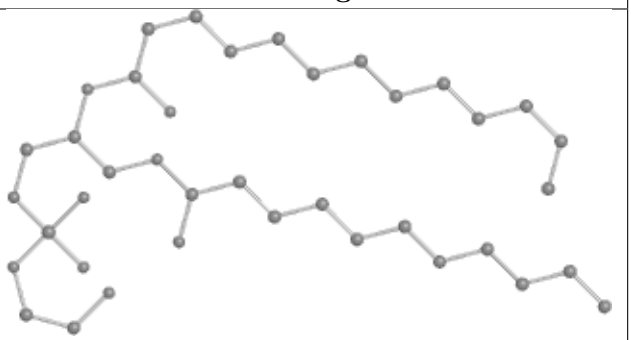
Bond lengths



Bond angles

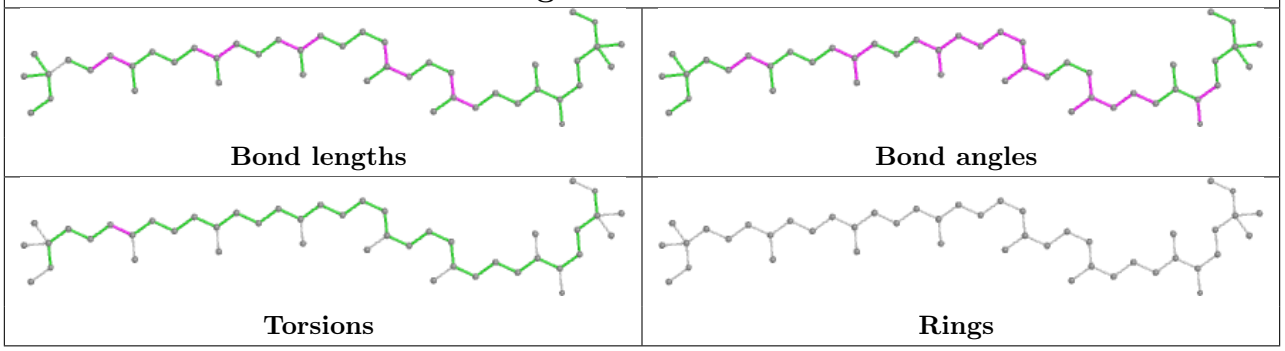


Torsions

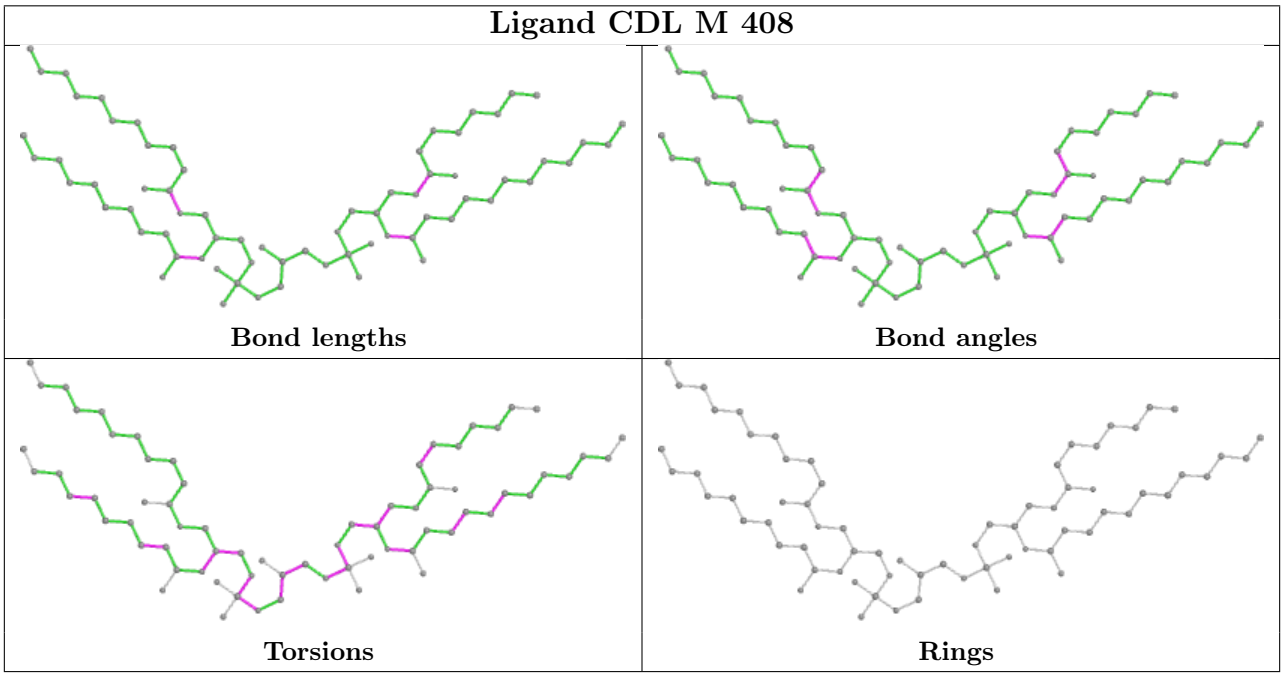


Rings

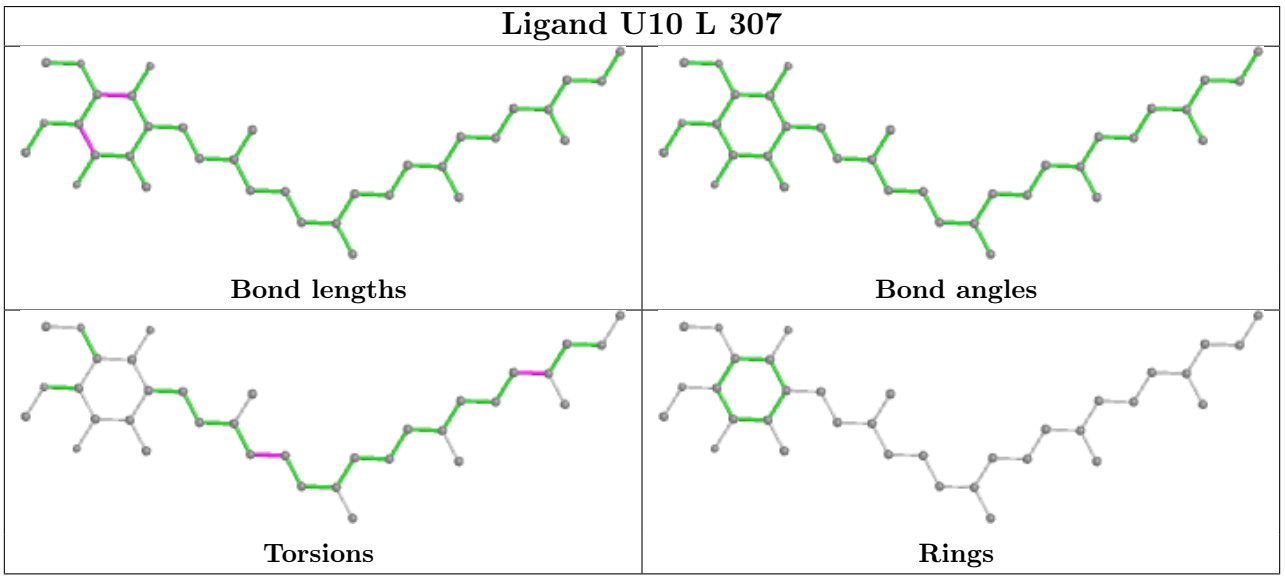
Ligand I7D 6 102



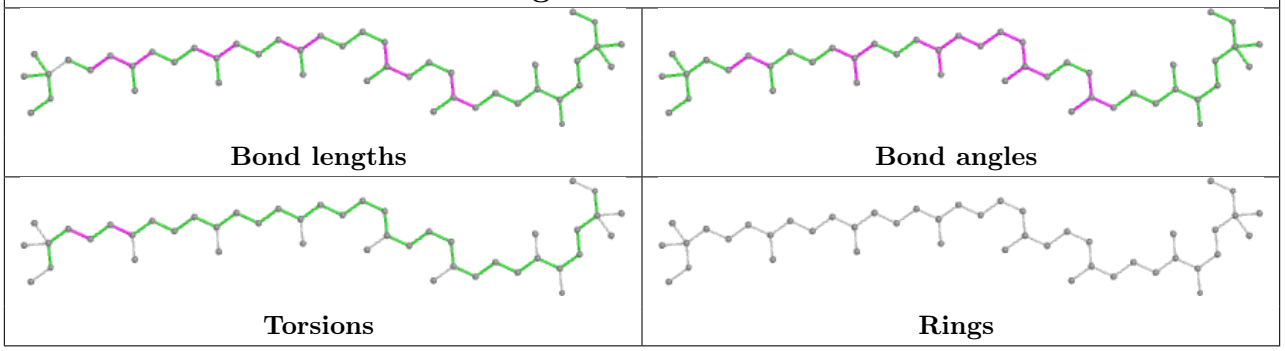
Ligand CDL M 408



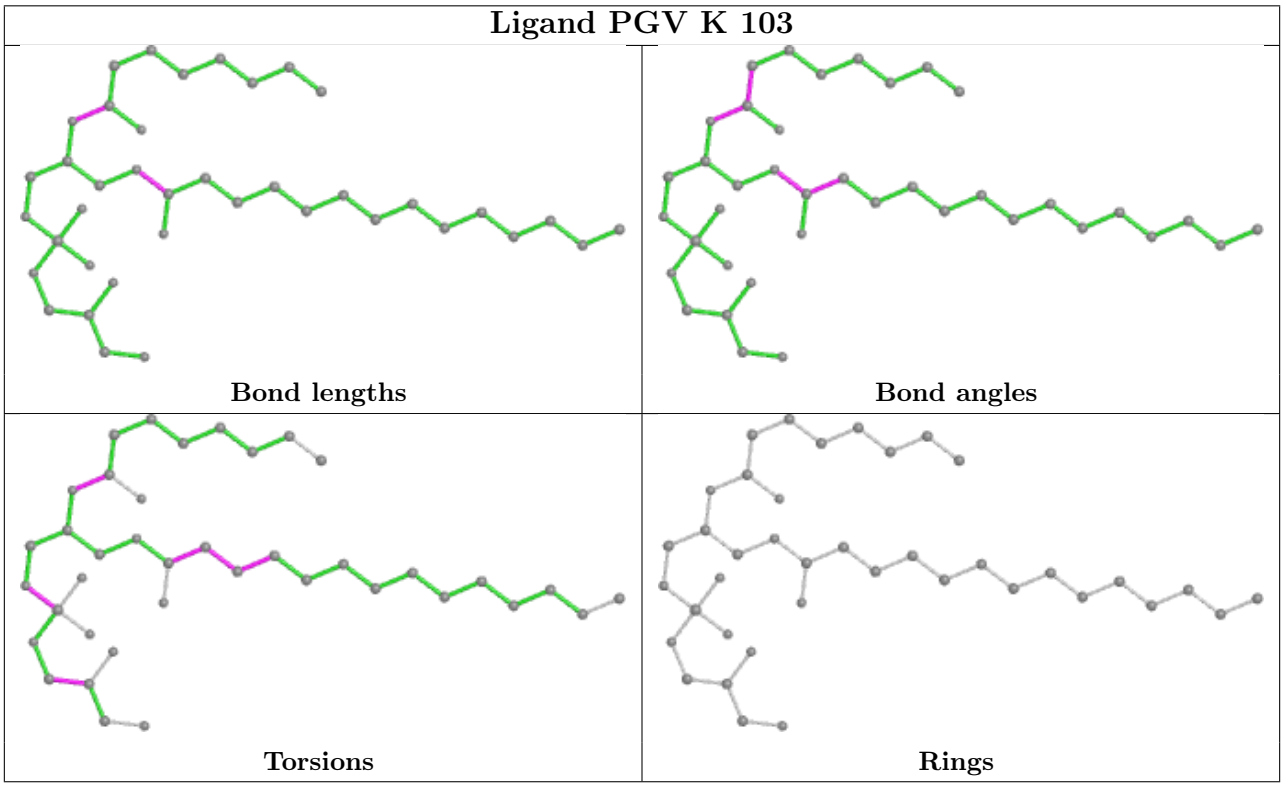
Ligand U10 L 307



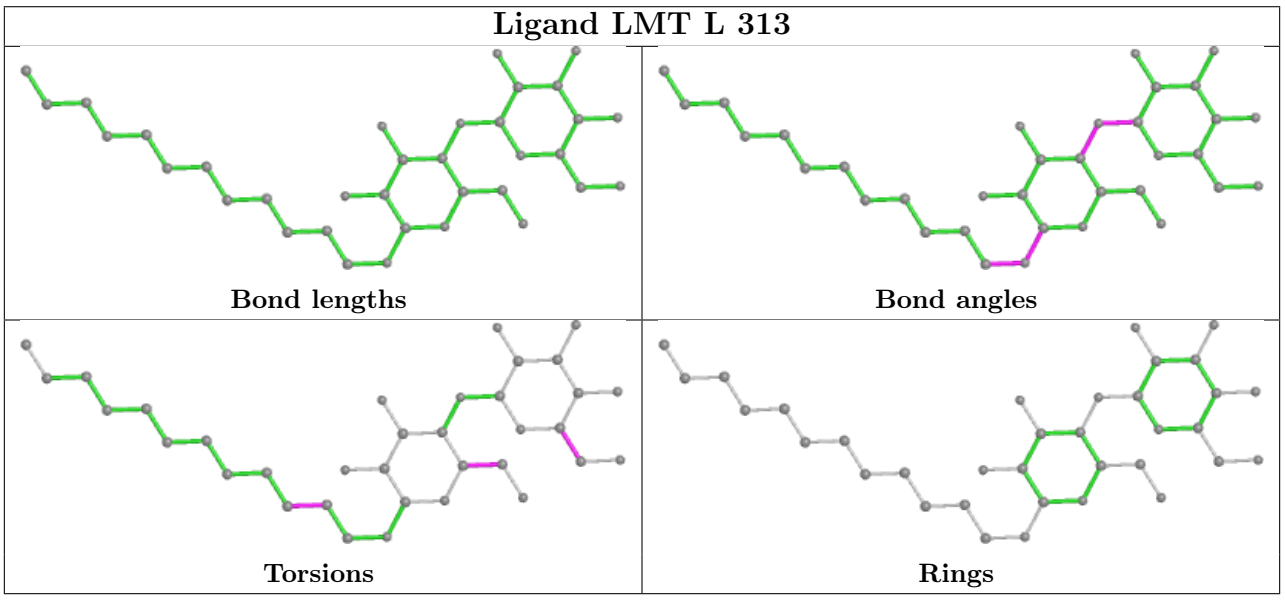
Ligand I7D D 101



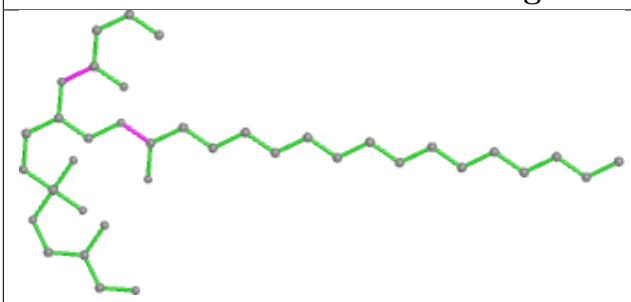
Ligand PGV K 103



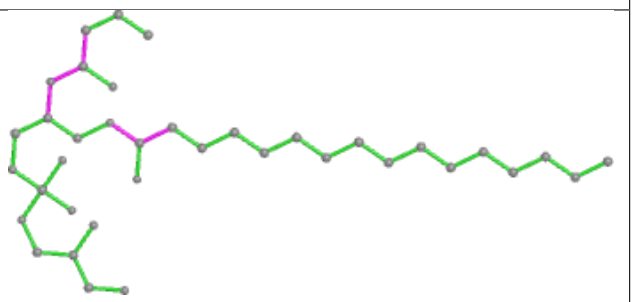
Ligand LMT L 313



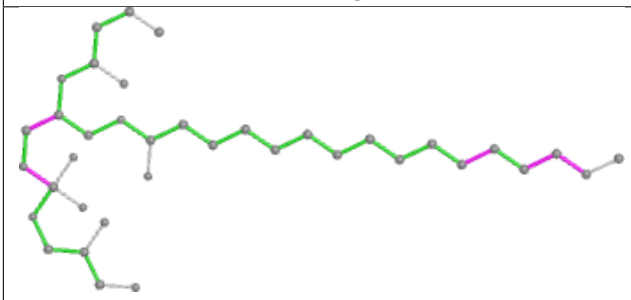
Ligand PGV L 310



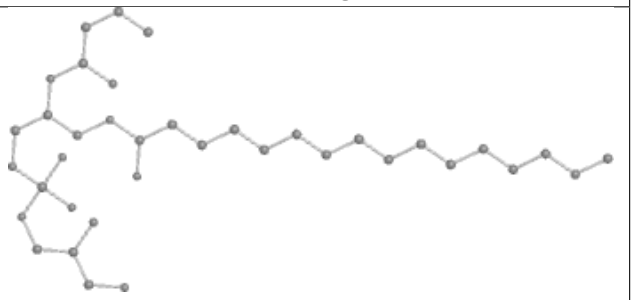
Bond lengths



Bond angles

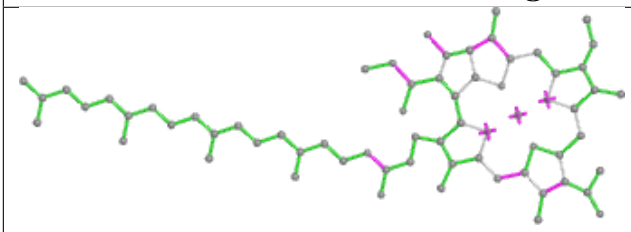


Torsions

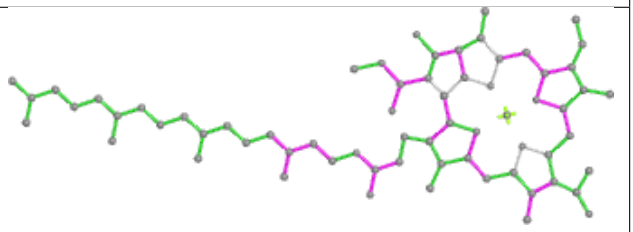


Rings

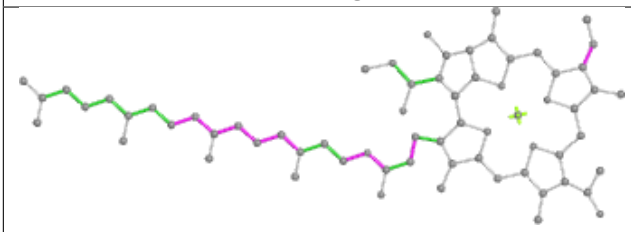
Ligand BCL V 102



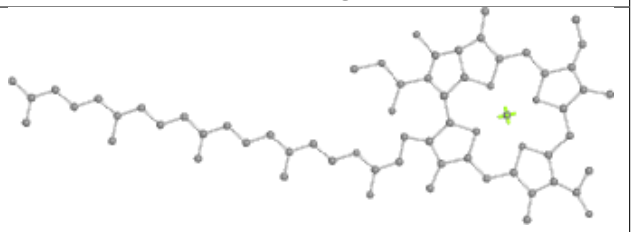
Bond lengths



Bond angles

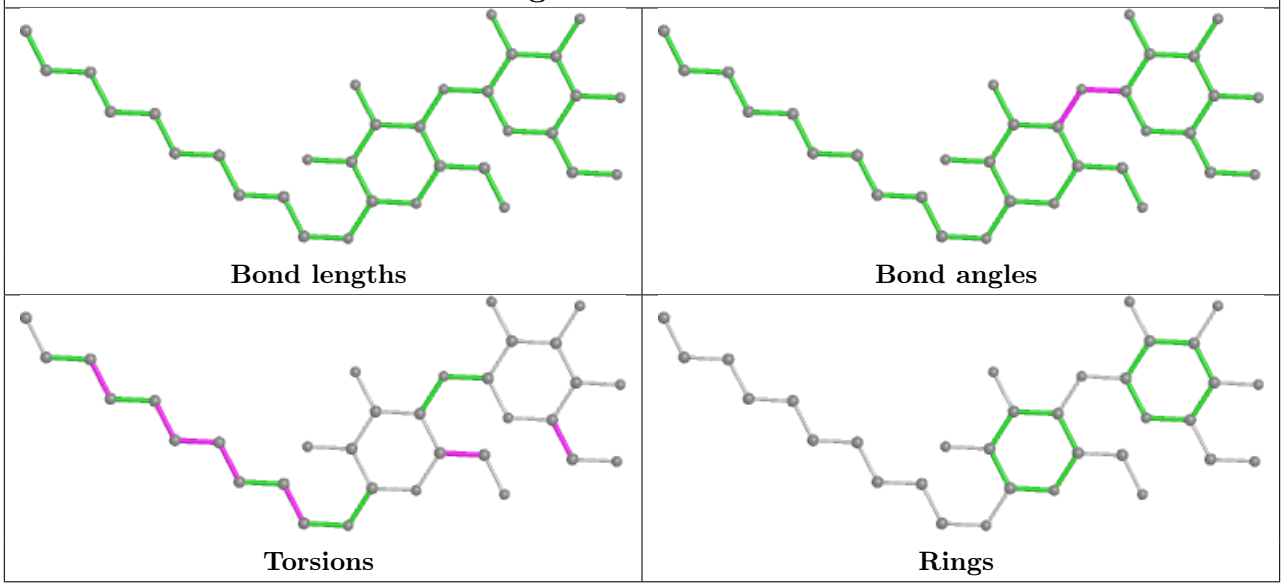


Torsions

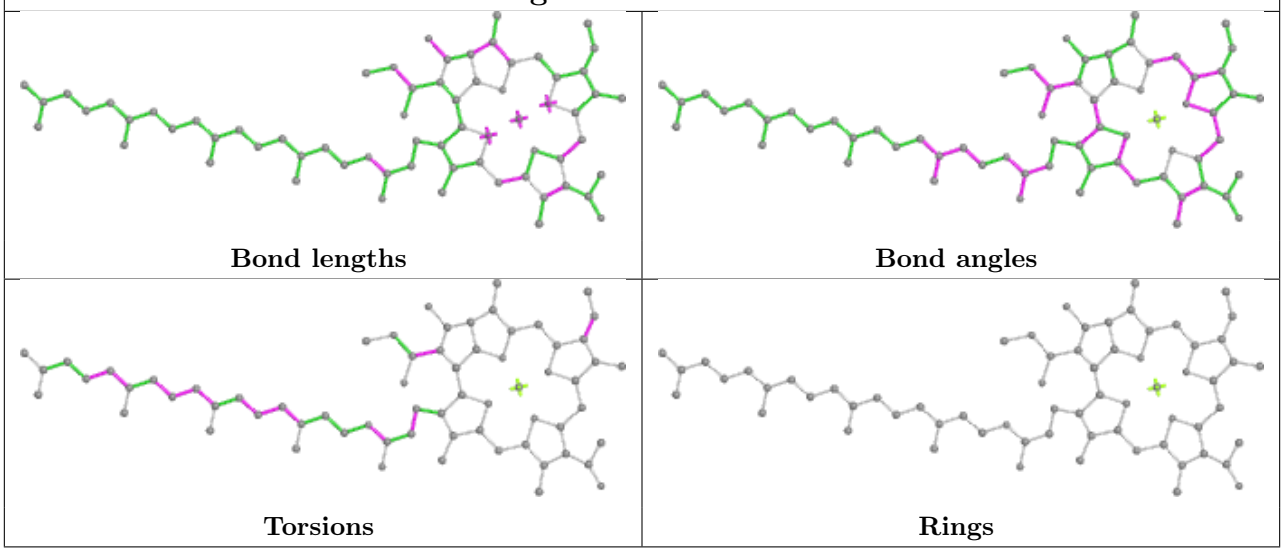


Rings

Ligand LMT I 103



Ligand BCL 2 102



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

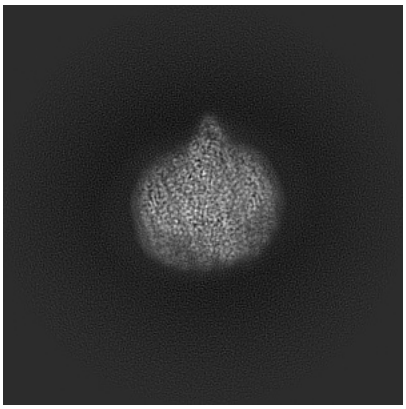
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-33501. These allow visual inspection of the internal detail of the map and identification of artifacts.

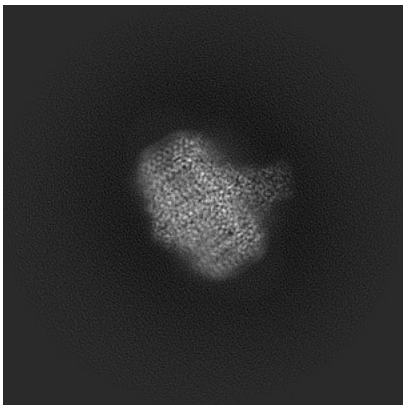
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

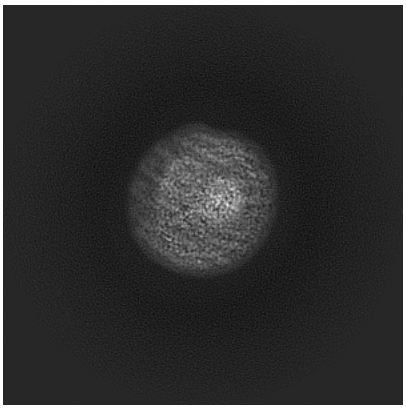
6.1.1 Primary map



X

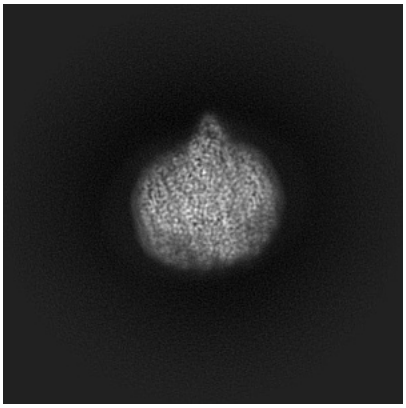


Y

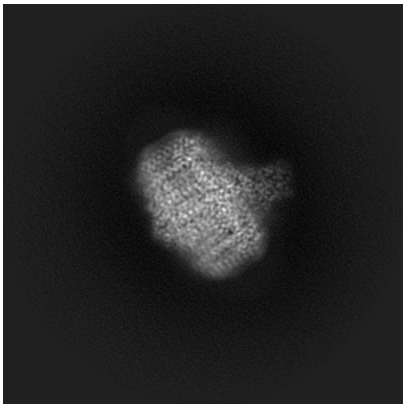


Z

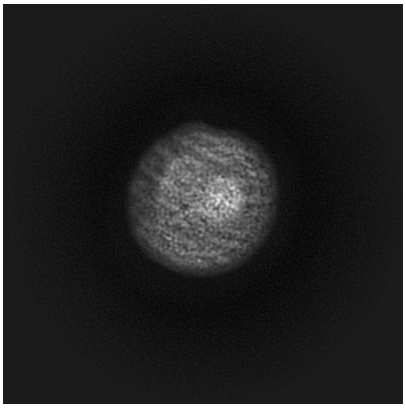
6.1.2 Raw map



X



Y

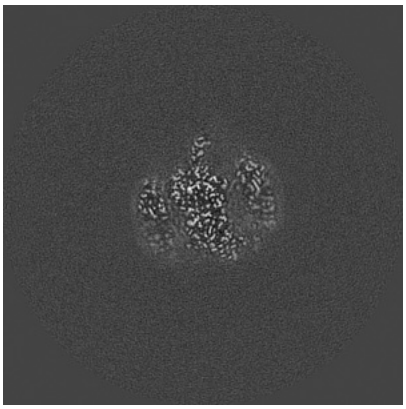


Z

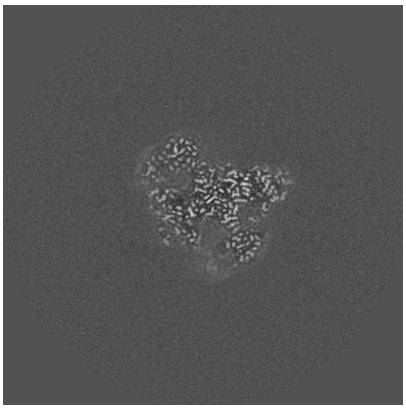
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

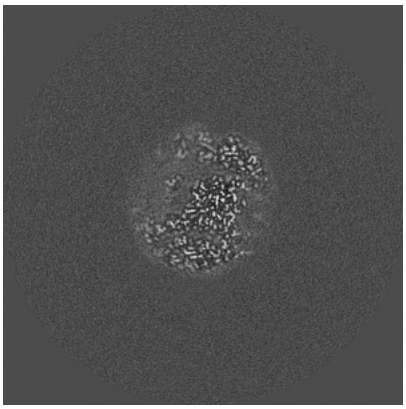
6.2.1 Primary map



X Index: 200

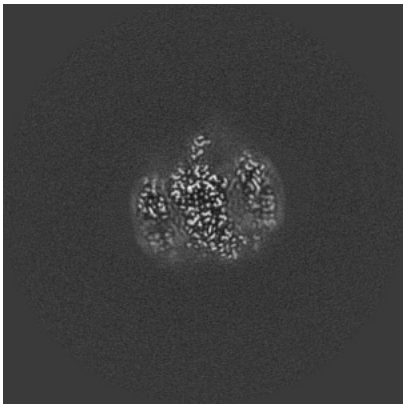


Y Index: 200

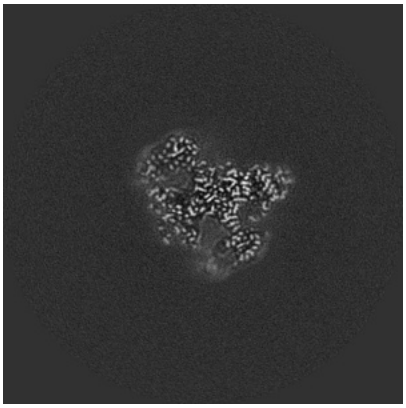


Z Index: 200

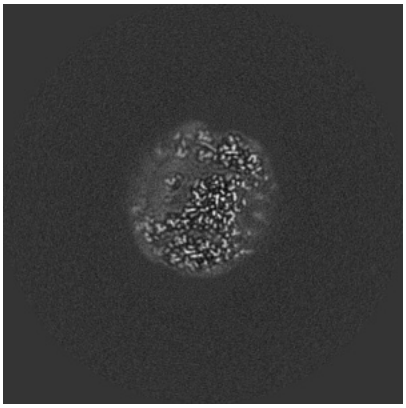
6.2.2 Raw map



X Index: 200



Y Index: 200

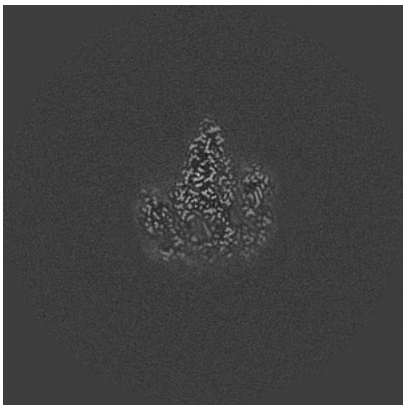


Z Index: 200

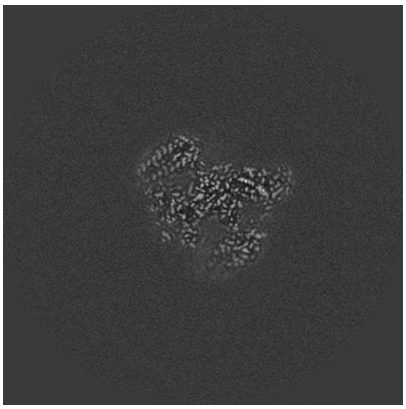
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

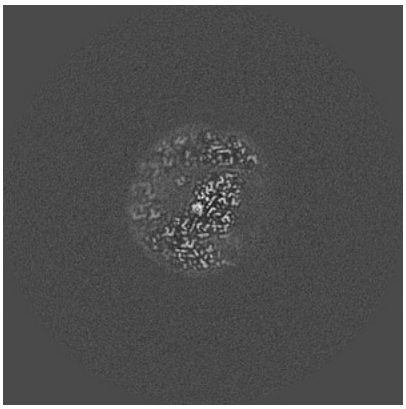
6.3.1 Primary map



X Index: 217

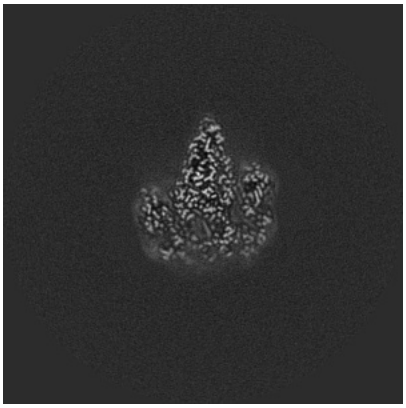


Y Index: 203

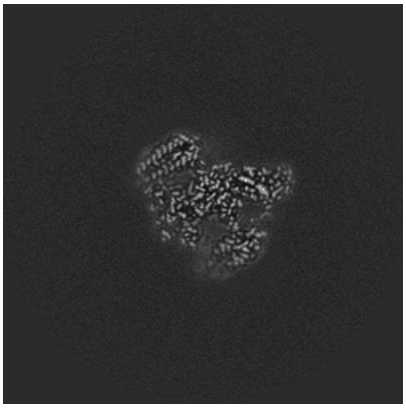


Z Index: 209

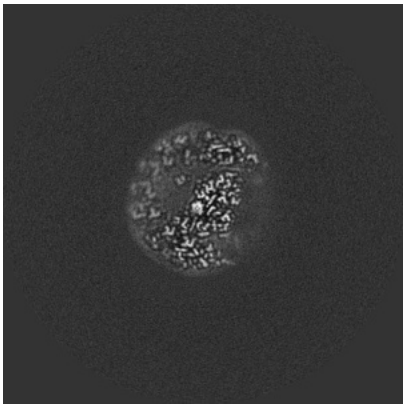
6.3.2 Raw map



X Index: 217



Y Index: 203



Z Index: 209

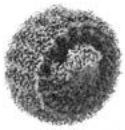
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views (i)

6.4.1 Primary map

X

Y

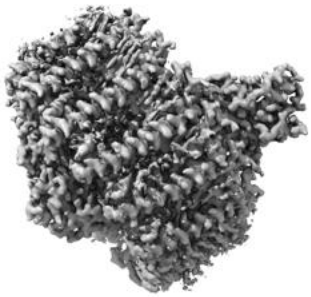


Z

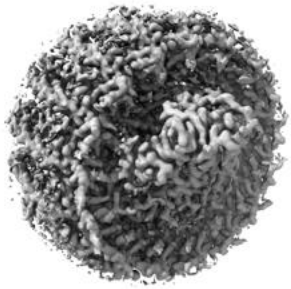
The images above show the 3D surface view of the map at the recommended contour level 0.03. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 Raw map

X



Y



Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

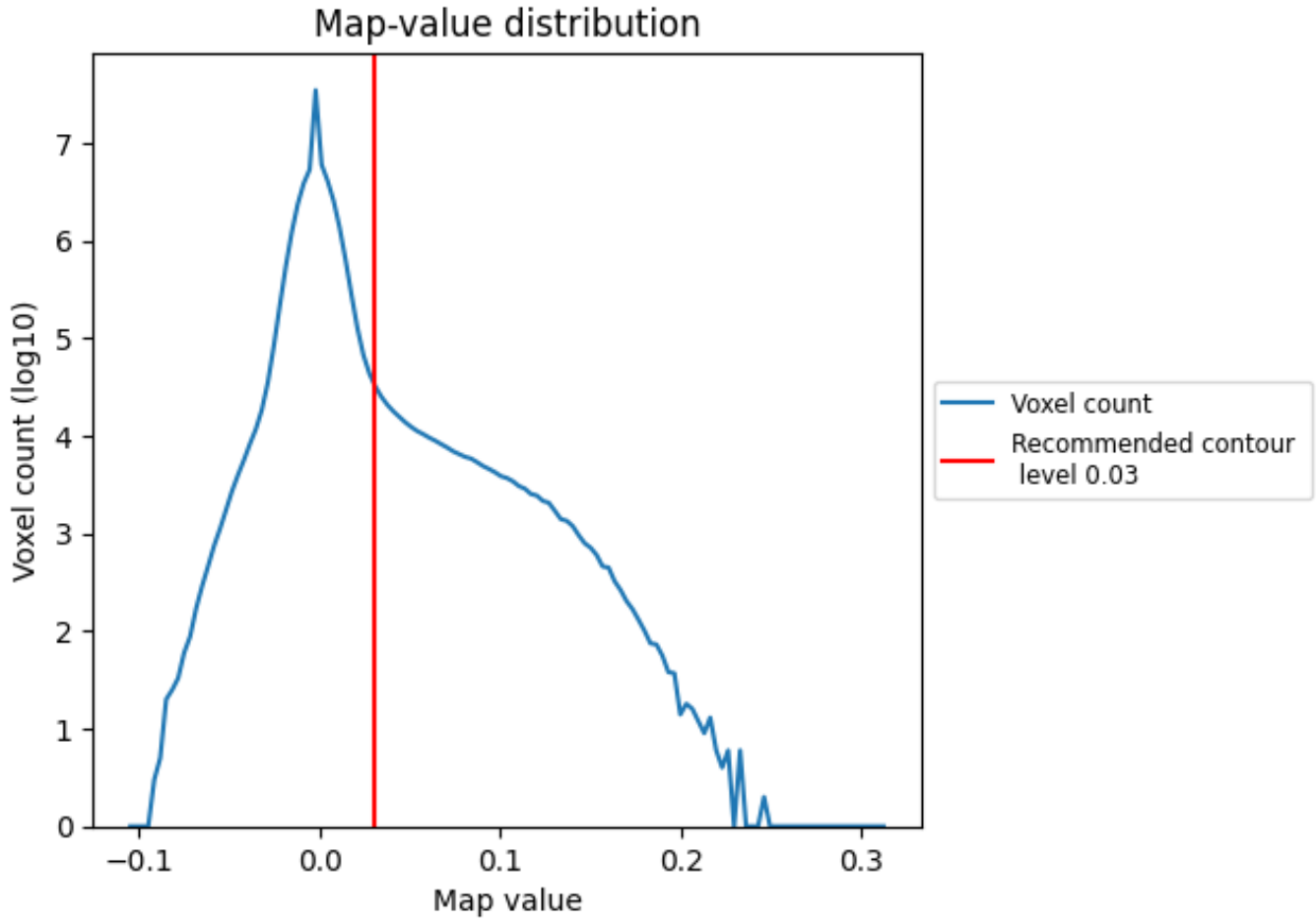
6.5 Mask visualisation (i)

This section was not generated. No masks/segmentation were deposited.

7 Map analysis

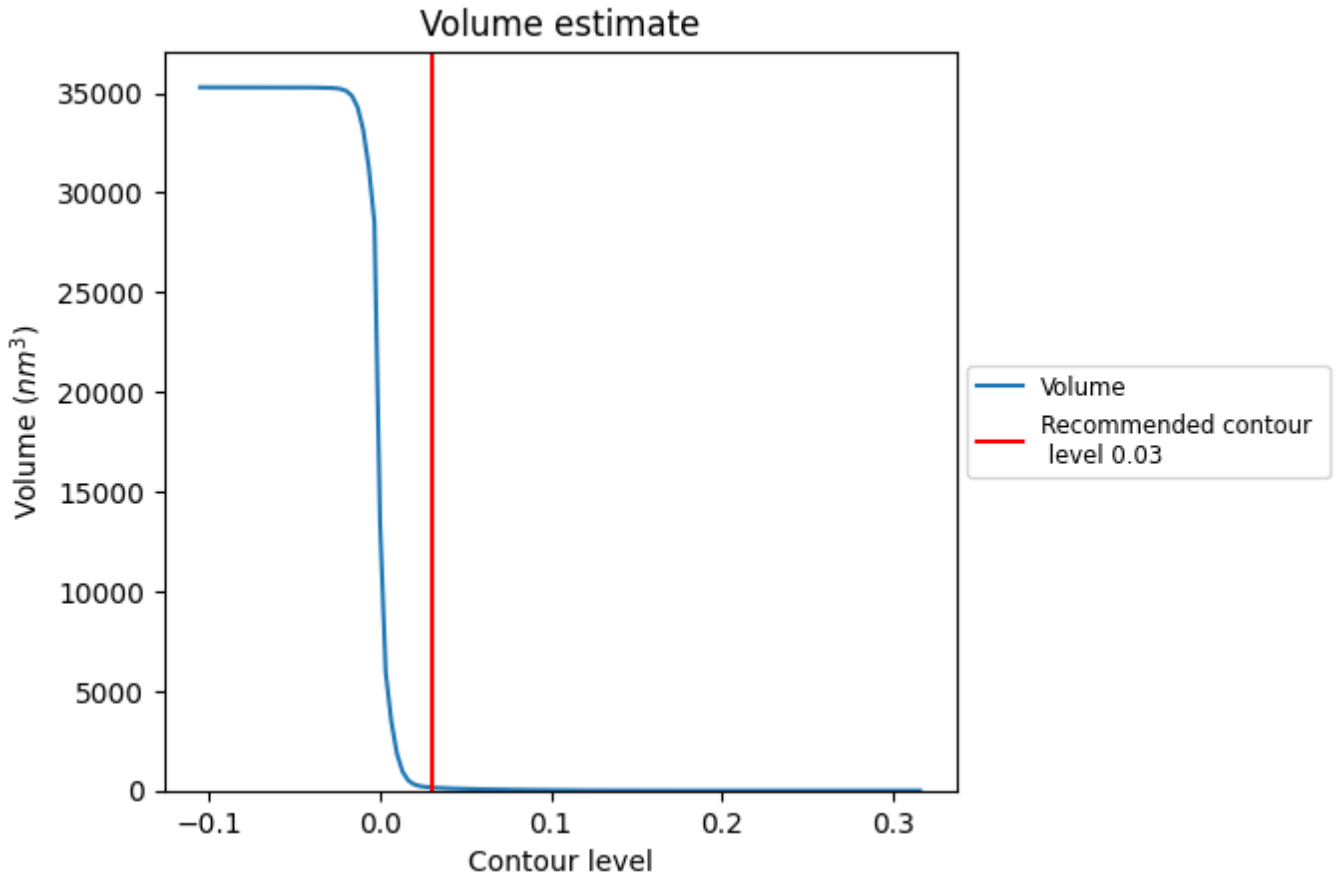
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

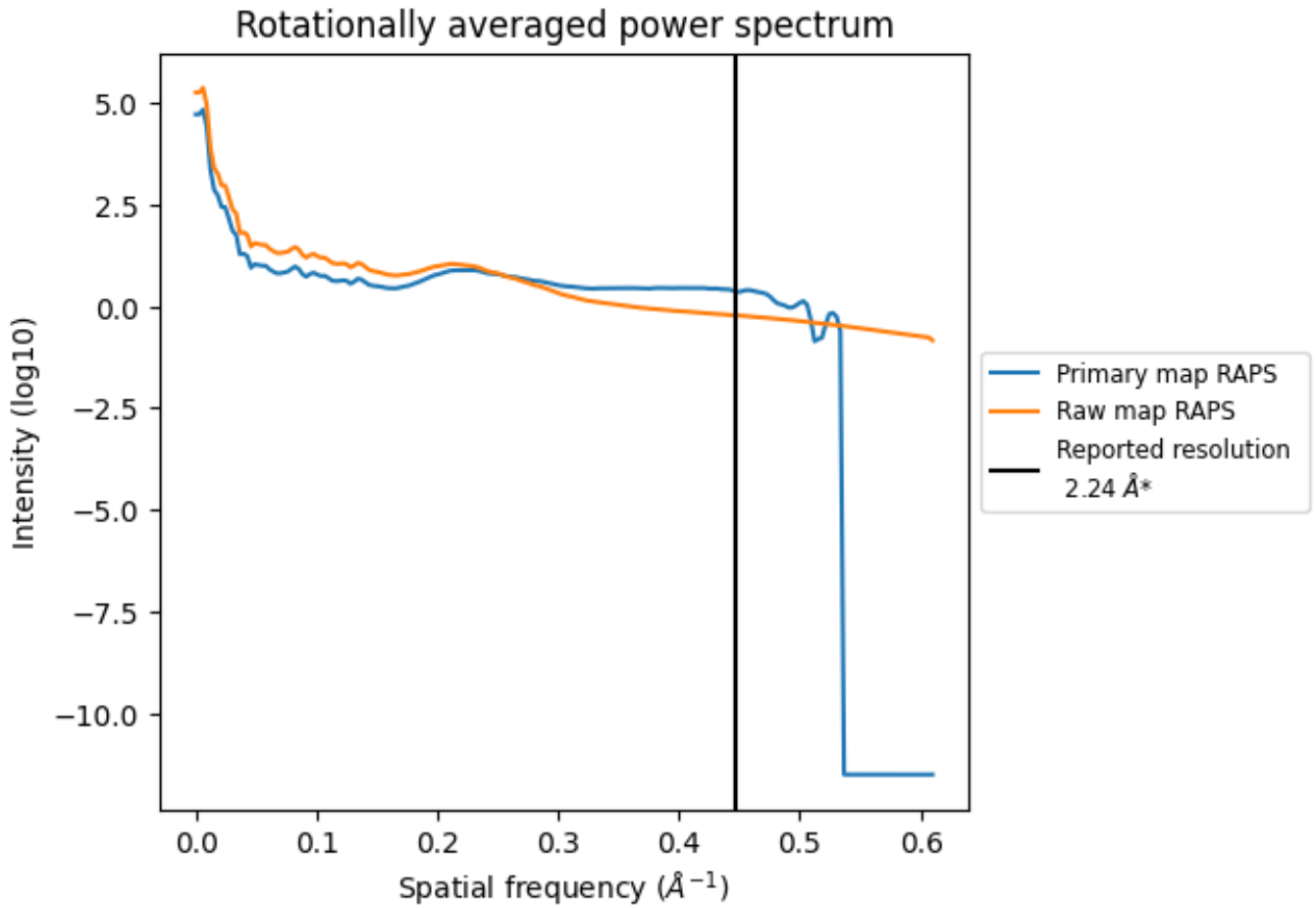
7.2 Volume estimate (i)



The volume at the recommended contour level is 157 nm^3; this corresponds to an approximate mass of 142 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum (i)

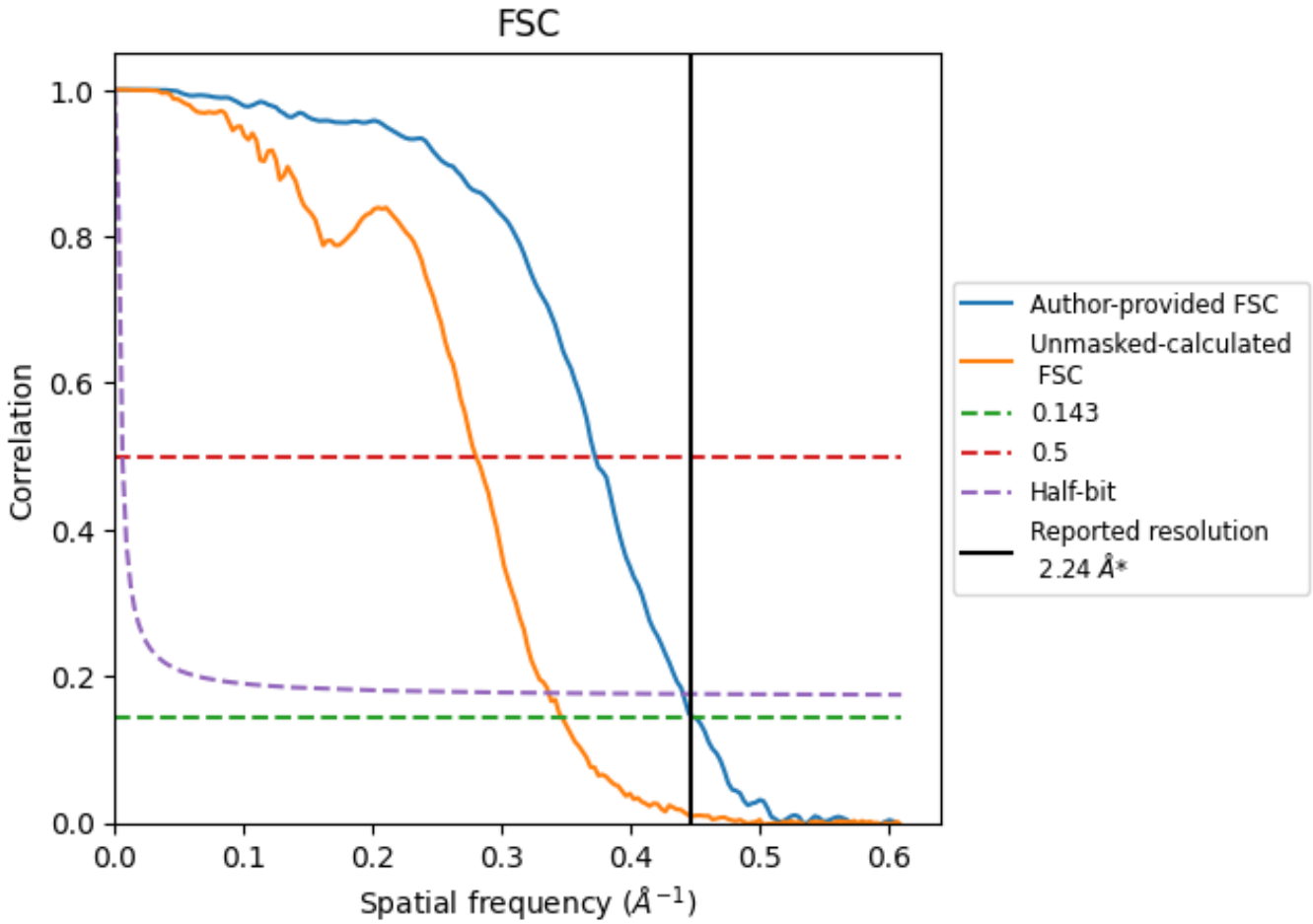


*Reported resolution corresponds to spatial frequency of 0.446 $Å^{-1}$

8 Fourier-Shell correlation

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.446 Å^{-1}

8.2 Resolution estimates (i)

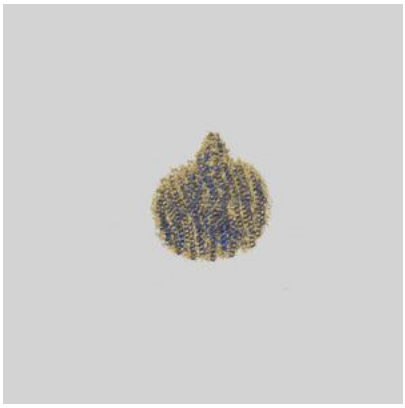
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.24	-	-
Author-provided FSC curve	2.22	2.69	2.27
Unmasked-calculated*	2.88	3.57	2.97

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 2.88 differs from the reported value 2.24 by more than 10 %

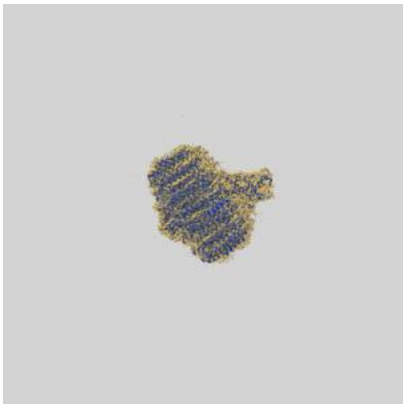
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-33501 and PDB model 7XXF. Per-residue inclusion information can be found in section 3 on page 20.

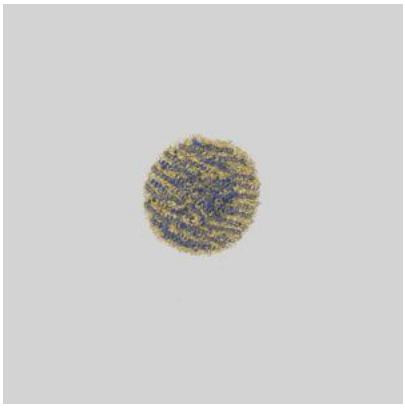
9.1 Map-model overlay



X



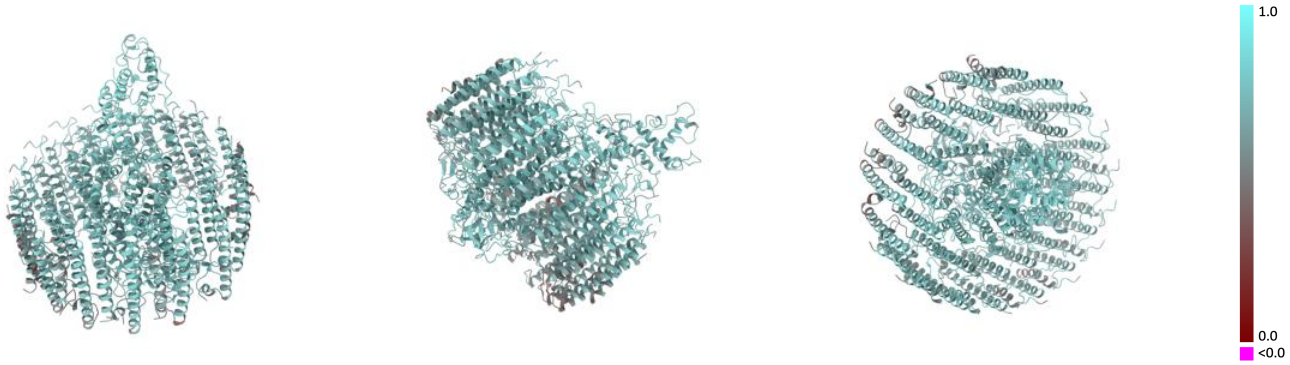
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.03 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

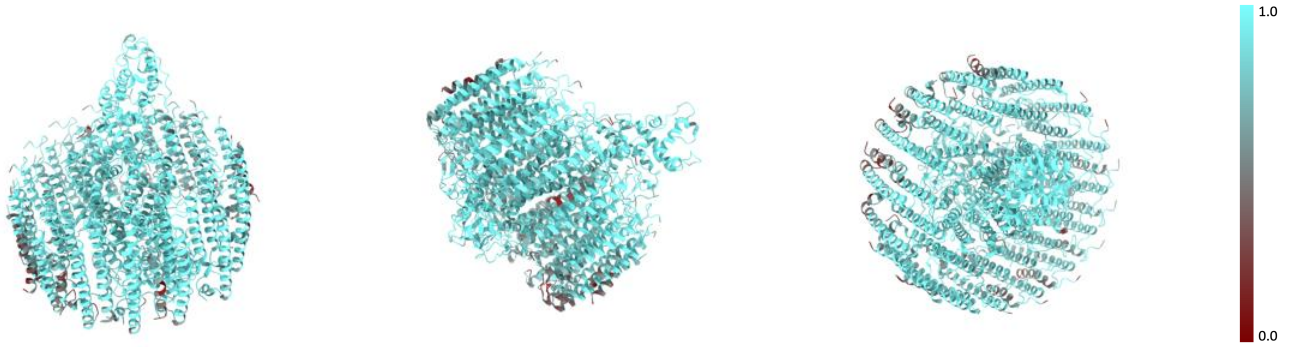
9.2 Q-score mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

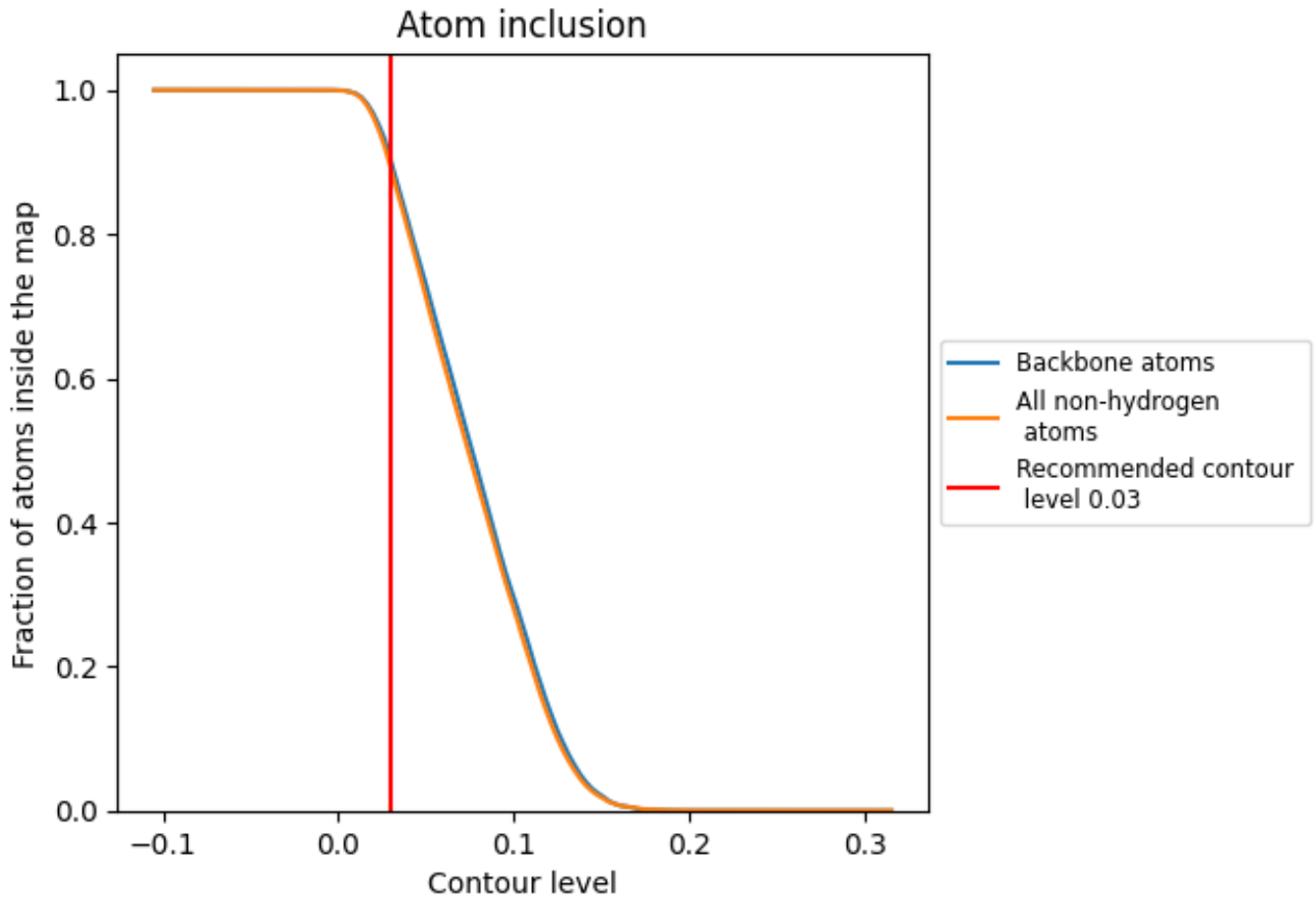
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.03).

9.4 Atom inclusion (i)



At the recommended contour level, 90% of all backbone atoms, 89% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.03) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8918	0.6760
0	0.8835	0.6580
1	0.8969	0.6610
2	0.7996	0.6200
3	0.8765	0.6530
4	0.8551	0.6490
5	0.9020	0.6750
6	0.8410	0.6380
7	0.9085	0.6750
8	0.8692	0.6580
9	0.9379	0.7020
A	0.8922	0.6700
B	0.9049	0.6820
C	0.9677	0.7240
D	0.9045	0.6730
E	0.8753	0.6610
F	0.9388	0.6820
G	0.8717	0.6590
H	0.9373	0.6960
I	0.8910	0.6690
J	0.8451	0.6430
K	0.8863	0.6530
L	0.9616	0.7280
M	0.9682	0.7290
N	0.8612	0.6580
O	0.9432	0.6890
P	0.9115	0.6720
Q	0.9299	0.6860
R	0.8954	0.6780
S	0.9084	0.6710
T	0.7891	0.6170
U	0.8659	0.6510
V	0.8129	0.6360
W	0.8632	0.6590
X	0.8189	0.6330

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Chain	Atom inclusion	Q-score
Y	0.8874	0.6590
Z	0.8562	0.6430
a	0.5780	0.5470
b	0.8150	0.6400
c	0.6012	0.5570
d	0.4509	0.5070
e	0.4971	0.5040
f	0.8208	0.6180
g	0.6879	0.5940
h	0.8266	0.6330
i	0.5665	0.5550
j	0.6474	0.5740
k	0.5145	0.4980