wwPDB EM Validation Summary Report

Dec 18, 2022 – 08:54 am GMT

PDB ID	:	6YNX
EMDB ID	:	EMD-10859
Title	:	Cryo-EM structure of Tetrahymena thermophila mitochondrial ATP synthase - Fo-subcomplex
Authors	:	Kock Flygaard, R.; Muhleip, A.; Amunts, A.
Deposited on	:	2020-04-14
Resolution	:	2.50 Å(reported)

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:

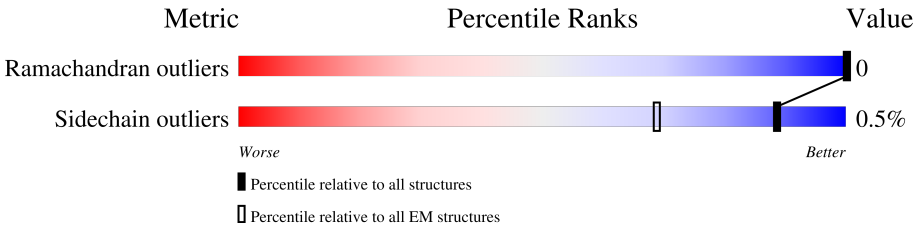
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.3

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 2.50 Å.

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



Metric	Whole archive (#Entries)	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	A	446	97%
1	a	446	96%
2	B	381	42% 58%
2	b	381	42% 58%
3	D	234	47% 53%
3	d	234	47% 53%
4	F	204	98%
4	f	204	98%
5	I	209	99%

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Mol	Chain	Length	Quality of chain
5	i	209	100%
6	K	179	99%
6	k	179	99%
7	C	100	95%
7	c	100	94%
8	G	286	89% 10%
8	g	286	89% 10%
9	H	268	86% 14%
9	h	268	86% 14%
10	J	273	99%
10	j	273	99%
11	L	247	99%
11	l	247	99%
12	M	221	100%
12	m	221	100%
13	N	179	66% 34%
13	n	179	66% 34%
14	O	154	64% 36%
14	o	154	64% 36%
15	P	152	99%
15	p	152	99%
16	Q	152	71% 29%
16	q	152	71% 29%
17	R	149	93% 6%
17	r	149	97%

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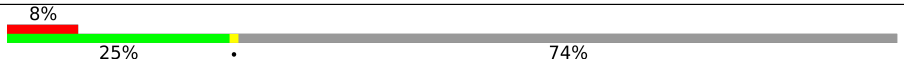
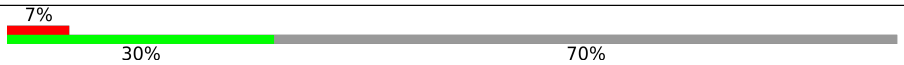
Mol	Chain	Length	Quality of chain
18	S	145	
18	s	145	
19	E	480	
19	e	480	
20	i1	108	
20	i2	108	
21	t	460	

2 Entry composition (i)

There are 29 unique types of molecules in this entry. The entry contains 139915 atoms, of which 70075 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 subunit a.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	a	433	Total	C	H	N	O	S	0	0
			7157	2453	3529	526	633	16		
1	A	433	Total	C	H	N	O	S	0	0
			7157	2453	3529	526	633	16		

- Molecule 2 is a protein called subunit b.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	b	161	Total	C	H	N	O	S	0	0
			2678	903	1310	223	232	10		
2	B	161	Total	C	H	N	O	S	0	0
			2675	903	1307	223	232	10		

- Molecule 3 is a protein called subunit d.

Mol	Chain	Residues	Atoms						AltConf	Trace
3	d	110	Total	C	H	N	O	S	0	0
			1764	591	846	147	176	4		
3	D	110	Total	C	H	N	O	S	0	0
			1764	591	846	147	176	4		

- Molecule 4 is a protein called subunit f.

Mol	Chain	Residues	Atoms						AltConf	Trace
4	f	200	Total	C	H	N	O	S	0	0
			3373	1095	1691	299	278	10		
4	F	200	Total	C	H	N	O	S	0	0
			3374	1095	1692	299	278	10		

- Molecule 5 is a protein called subunit i/j.

Mol	Chain	Residues	Atoms						AltConf	Trace
5	i	209	Total	C	H	N	O	S	0	0
			3461	1121	1741	304	285	10		
5	I	209	Total	C	H	N	O	S	0	0
			3461	1121	1741	304	285	10		

- Molecule 6 is a protein called subunit k.

Mol	Chain	Residues	Atoms						AltConf	Trace
6	k	179	Total	C	H	N	O	S	0	0
			2903	939	1430	257	266	11		
6	K	179	Total	C	H	N	O	S	0	0
			2903	939	1430	257	266	11		

- Molecule 7 is a protein called subunit 8.

Mol	Chain	Residues	Atoms						AltConf	Trace
7	c	96	Total	C	H	N	O	S	0	0
			1671	565	830	131	143	2		
7	C	96	Total	C	H	N	O	S	0	0
			1671	565	830	131	143	2		

- Molecule 8 is a protein called ATPTT3.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	g	256	Total	C	H	N	O	S	0	0
			4338	1474	2118	348	388	10		
8	G	256	Total	C	H	N	O	S	0	0
			4338	1474	2118	348	388	10		

- Molecule 9 is a protein called ATPTT4.

Mol	Chain	Residues	Atoms						AltConf	Trace
9	h	231	Total	C	H	N	O	S	0	0
			3836	1236	1883	361	350	6		
9	H	231	Total	C	H	N	O	S	0	0
			3836	1236	1883	361	350	6		

- Molecule 10 is a protein called ATPTT5.

Mol	Chain	Residues	Atoms						AltConf	Trace
10	j	269	Total	C	H	N	O	S	0	0
			4346	1381	2147	406	404	8		

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Mol	Chain	Residues	Atoms						AltConf	Trace
10	J	269	Total	C	H	N	O	S	0	0
			4344	1381	2145	406	404	8		

- Molecule 11 is a protein called ATPTT6.

Mol	Chain	Residues	Atoms						AltConf	Trace
11	l	246	Total	C	H	N	O	S	0	0
			4070	1344	1999	360	361	6		
11	L	246	Total	C	H	N	O	S	0	0
			4070	1344	1999	360	361	6		

- Molecule 12 is a protein called ATPTT7.

Mol	Chain	Residues	Atoms						AltConf	Trace
12	m	221	Total	C	H	N	O	S	0	0
			3696	1205	1835	313	336	7		
12	M	221	Total	C	H	N	O	S	0	0
			3696	1205	1835	313	336	7		

- Molecule 13 is a protein called ATPTT8.

Mol	Chain	Residues	Atoms						AltConf	Trace
13	n	119	Total	C	H	N	O	S	0	0
			1960	655	962	164	173	6		
13	N	119	Total	C	H	N	O	S	0	0
			1960	655	962	164	173	6		

- Molecule 14 is a protein called ATPTT9.

Mol	Chain	Residues	Atoms						AltConf	Trace
14	o	99	Total	C	H	N	O	S	0	0
			1599	507	794	145	147	6		
14	O	99	Total	C	H	N	O	S	0	0
			1599	507	794	145	147	6		

- Molecule 15 is a protein called ATPTT10.

Mol	Chain	Residues	Atoms						AltConf	Trace
15	p	150	Total	C	H	N	O	S	0	0
			2413	788	1196	204	224	1		
15	P	150	Total	C	H	N	O	S	0	0
			2413	788	1196	204	224	1		

- Molecule 16 is a protein called ATPTT11.

Mol	Chain	Residues	Atoms						AltConf	Trace
16	q	108	Total	C	H	N	O	S	0	0
			1749	556	874	149	169	1		
16	Q	108	Total	C	H	N	O	S	0	0
			1749	556	874	149	169	1		

- Molecule 17 is a protein called ATPTT12.

Mol	Chain	Residues	Atoms						AltConf	Trace
17	r	145	Total	C	H	N	O	S	0	0
			2373	776	1180	201	212	4		
17	R	140	Total	C	H	N	O	S	0	0
			2288	750	1134	194	206	4		

- Molecule 18 is a protein called ATPTT13.

Mol	Chain	Residues	Atoms						AltConf	Trace
18	s	105	Total	C	H	N	O	S	0	0
			1714	552	849	148	160	5		
18	S	106	Total	C	H	N	O	S	0	0
			1728	556	856	149	162	5		

- Molecule 19 is a protein called ATPTT1.

Mol	Chain	Residues	Atoms						AltConf	Trace
19	e	417	Total	C	H	N	O	S	0	0
			6681	2171	3286	602	614	8		
19	E	417	Total	C	H	N	O	S	0	0
			6681	2171	3286	602	614	8		

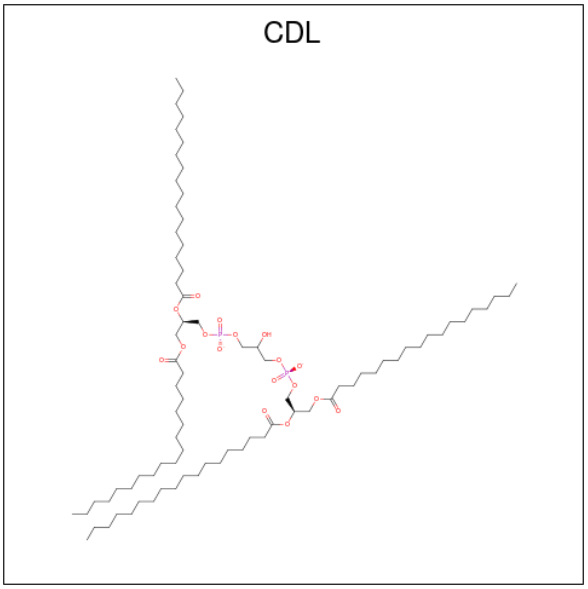
- Molecule 20 is a protein called Inhibitor of F1 (IF1).

Mol	Chain	Residues	Atoms					AltConf	Trace
20	i1	28	Total	C	H	N	O	0	0
			474	154	236	39	45		
20	i2	32	Total	C	H	N	O	0	0
			529	171	262	45	51		

- Molecule 21 is a protein called ATPTT2.

Mol	Chain	Residues	Atoms						AltConf	Trace
21	t	365	Total	C	H	N	O	S	0	0
			5889	1925	2876	533	544	11		

- Molecule 22 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).



Mol	Chain	Residues	Atoms					AltConf
22	a	1	Total	C	H	O	P	0
			256	81	156	17	2	
22	b	1	Total	C	H	O	P	0
			512	162	312	34	4	
22	b	1	Total	C	H	O	P	0
			512	162	312	34	4	
22	f	1	Total	C	H	O	P	0
			768	243	468	51	6	
22	f	1	Total	C	H	O	P	0
			768	243	468	51	6	
22	f	1	Total	C	H	O	P	0
			768	243	468	51	6	
22	i	1	Total	C	H	O	P	0
			256	81	156	17	2	
22	k	1	Total	C	H	O	P	0
			768	243	468	51	6	
22	k	1	Total	C	H	O	P	0
			768	243	468	51	6	
22	k	1	Total	C	H	O	P	0
			768	243	468	51	6	
22	j	1	Total	C	H	O	P	0
			512	162	312	34	4	

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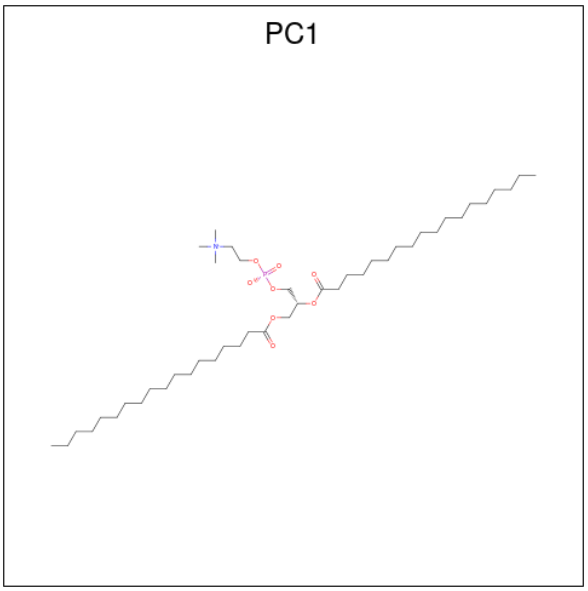
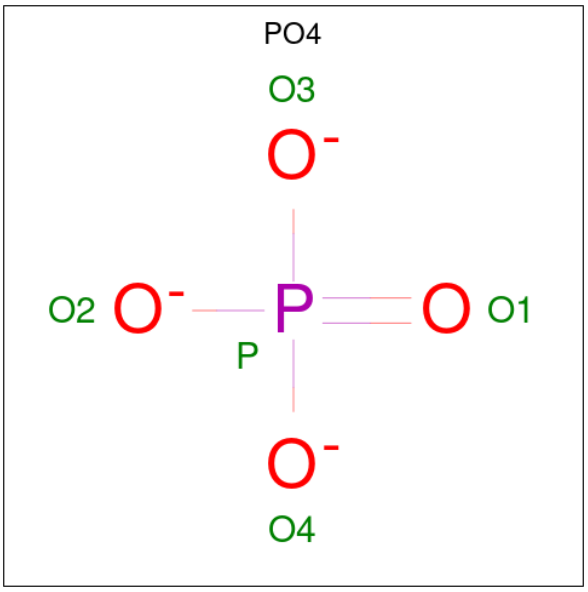
Mol	Chain	Residues	Atoms					AltConf
22	j	1	Total	C	H	O	P	0
			512	162	312	34	4	
22	l	1	Total	C	H	O	P	0
			512	162	312	34	4	
22	l	1	Total	C	H	O	P	0
			512	162	312	34	4	
22	p	1	Total	C	H	O	P	0
			256	81	156	17	2	
22	r	1	Total	C	H	O	P	0
			256	81	156	17	2	
22	A	1	Total	C	H	O	P	0
			256	81	156	17	2	
22	B	1	Total	C	H	O	P	0
			1280	405	780	85	10	
22	B	1	Total	C	H	O	P	0
			1280	405	780	85	10	
22	B	1	Total	C	H	O	P	0
			1280	405	780	85	10	
22	B	1	Total	C	H	O	P	0
			1280	405	780	85	10	
22	B	1	Total	C	H	O	P	0
			1280	405	780	85	10	
22	I	1	Total	C	H	O	P	0
			512	162	312	34	4	
22	I	1	Total	C	H	O	P	0
			512	162	312	34	4	
22	K	1	Total	C	H	O	P	0
			512	162	312	34	4	
22	K	1	Total	C	H	O	P	0
			512	162	312	34	4	
22	J	1	Total	C	H	O	P	0
			512	162	312	34	4	
22	J	1	Total	C	H	O	P	0
			512	162	312	34	4	
22	L	1	Total	C	H	O	P	0
			256	81	156	17	2	
22	P	1	Total	C	H	O	P	0
			256	81	156	17	2	

- Molecule 23 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOCHOLINE (three-letter code: PC1) (formula: $C_{44}H_{88}NO_8P$).



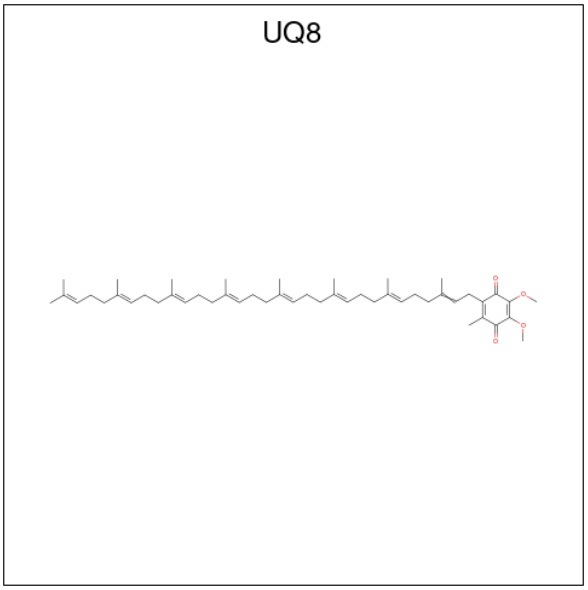
Mol	Chain	Residues	Atoms						AltConf
23	d	1	Total	C	H	N	O	P	0
			142	44	88	1	8	1	
23	i	1	Total	C	H	N	O	P	0
			142	44	88	1	8	1	
23	g	1	Total	C	H	N	O	P	0
			142	44	88	1	8	1	
23	D	1	Total	C	H	N	O	P	0
			142	44	88	1	8	1	
23	G	1	Total	C	H	N	O	P	0
			284	88	176	2	16	2	
23	G	1	Total	C	H	N	O	P	0
			284	88	176	2	16	2	

- Molecule 24 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).



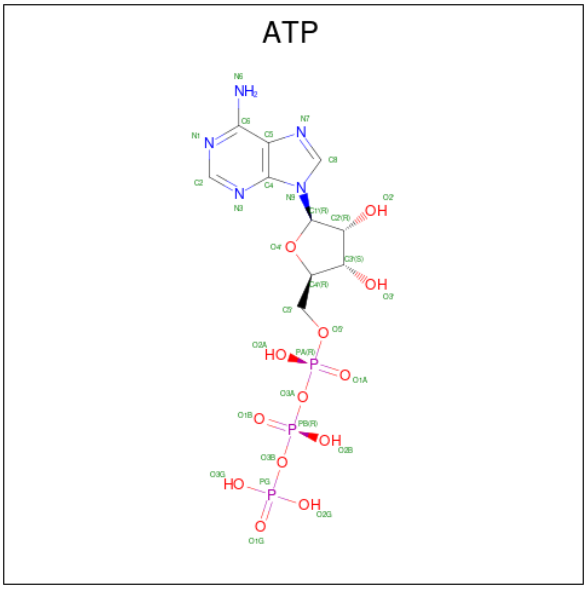
Mol	Chain	Residues	Atoms			AltConf
24	f	1	Total 5	O 4	P 1	0
24	F	1	Total 5	O 4	P 1	0

- Molecule 25 is Ubiquinone-8 (three-letter code: UQ8) (formula: $C_{49}H_{74}O_4$).



Mol	Chain	Residues	Atoms				AltConf
25	i	1	Total 127	C 49	H 74	O 4	0
25	I	1	Total 127	C 49	H 74	O 4	0

- Molecule 26 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$).

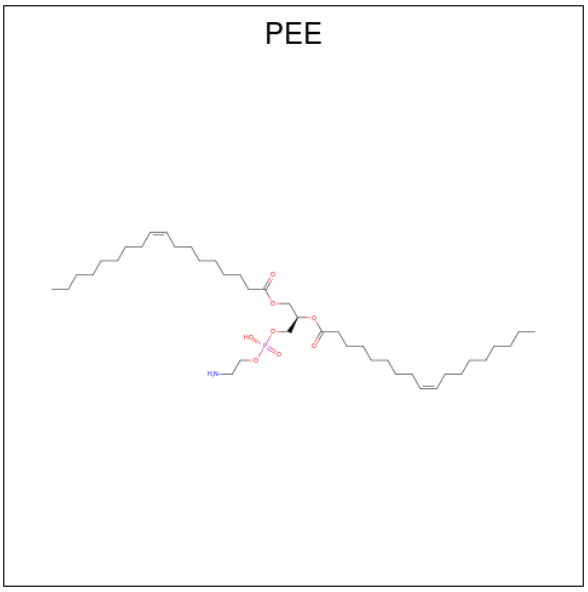


Mol	Chain	Residues	Atoms						AltConf
26	g	1	Total	C	H	N	O	P	0
			42	10	11	5	13	3	
26	G	1	Total	C	H	N	O	P	0
			42	10	11	5	13	3	

- Molecule 27 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

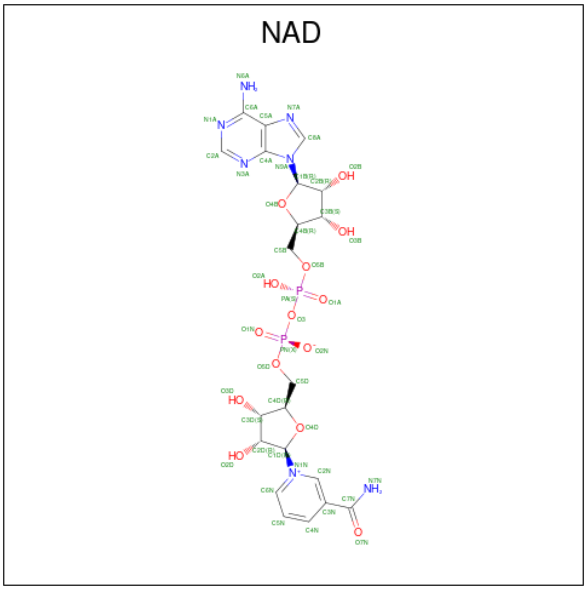
Mol	Chain	Residues	Atoms		AltConf
27	g	1	Total	Mg	0
			1	1	
27	G	1	Total	Mg	0
			1	1	

- Molecule 28 is 1,2-Dioleoyl-sn-glycero-3-phosphoethanolamine (three-letter code: PEE) (formula: $C_{41}H_{78}NO_8P$).



Mol	Chain	Residues	Atoms						AltConf
28	l	1	Total	C	H	N	O	P	0
			256	79	157	2	16	2	
28	l	1	Total	C	H	N	O	P	0
			256	79	157	2	16	2	
28	J	1	Total	C	H	N	O	P	0
			256	79	157	2	16	2	
28	J	1	Total	C	H	N	O	P	0
			256	79	157	2	16	2	

- Molecule 29 is NICOTINAMIDE-ADENINE-DINUCLEOTIDE (three-letter code: NAD) (formula: $C_{21}H_{27}N_7O_{14}P_2$).



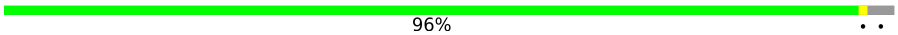
Mol	Chain	Residues	Atoms						AltConf
29	e	1	Total	C	H	N	O	P	0
			70	21	26	7	14	2	
29	E	1	Total	C	H	N	O	P	0
			70	21	26	7	14	2	

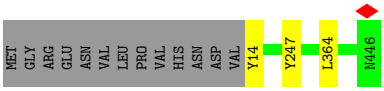
3 Residue-property plots (i)

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: subunit a

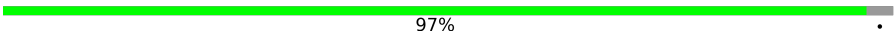
Chain a:





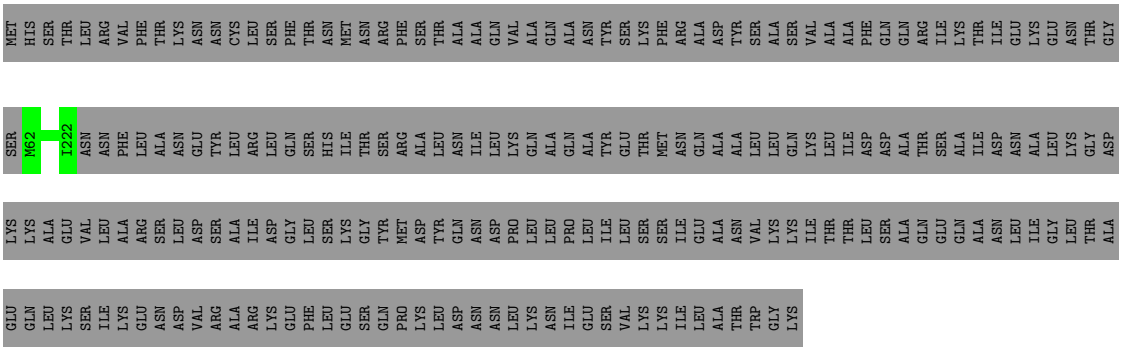
- Molecule 1: subunit a

Chain A:



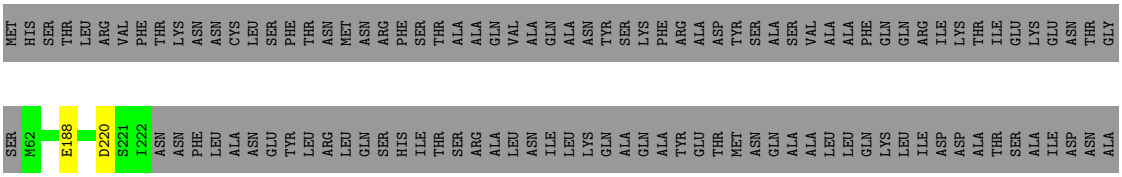
- Molecule 2: subunit b

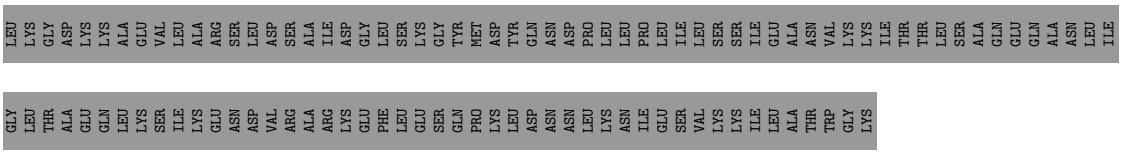
Chain b:



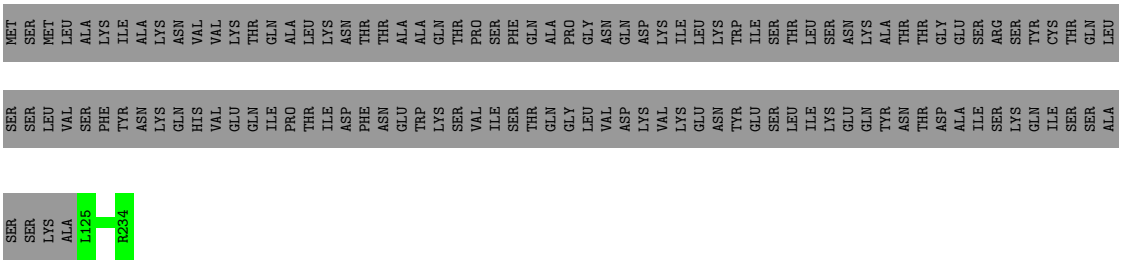
- Molecule 2: subunit b

Chain B:

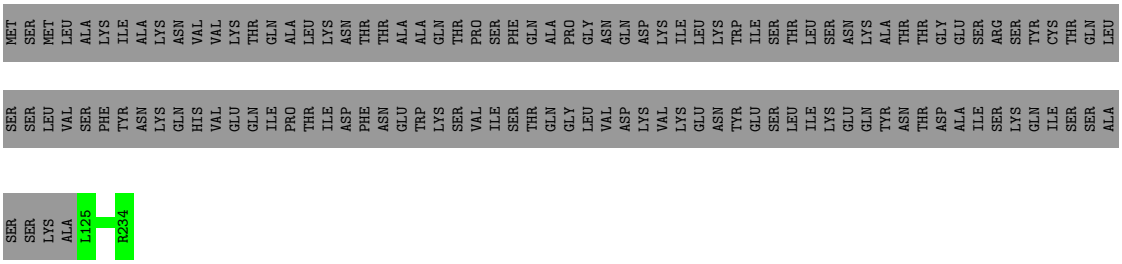




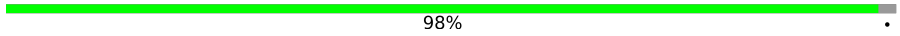
• Molecule 3: subunit d

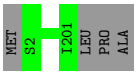


• Molecule 3: subunit d

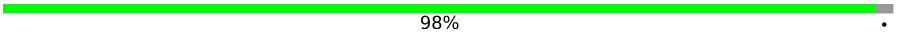


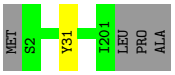
• Molecule 4: subunit f



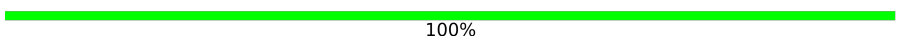


• Molecule 4: subunit f



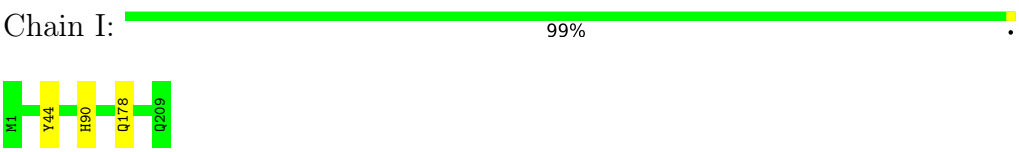


• Molecule 5: subunit i/j



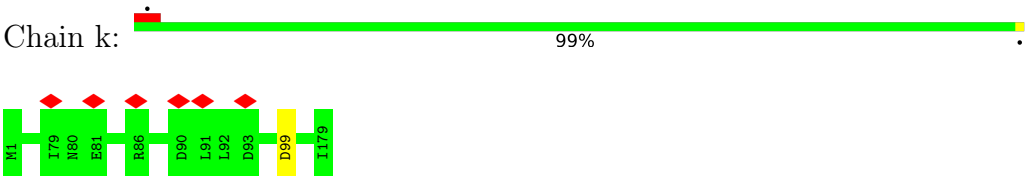
• Molecule 5: subunit i/j

Chain I:



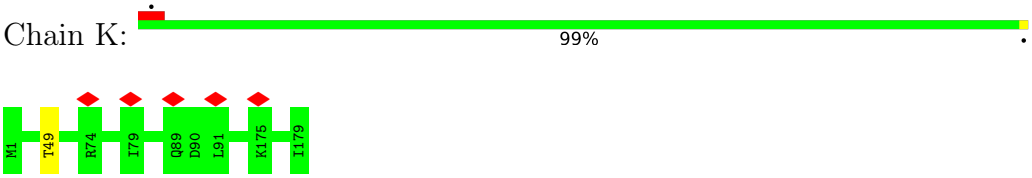
• Molecule 6: subunit k

Chain k:



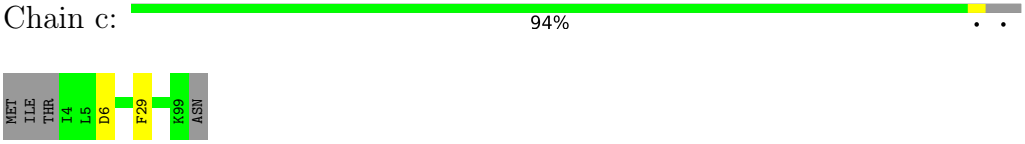
• Molecule 6: subunit k

Chain K:



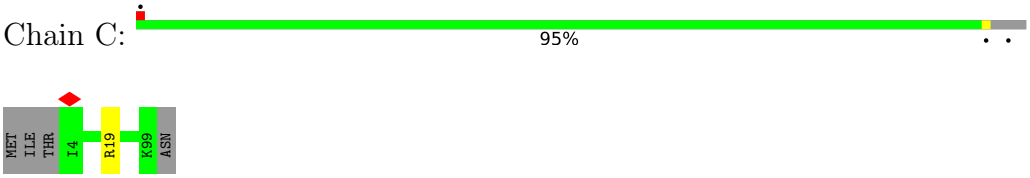
• Molecule 7: subunit 8

Chain c:



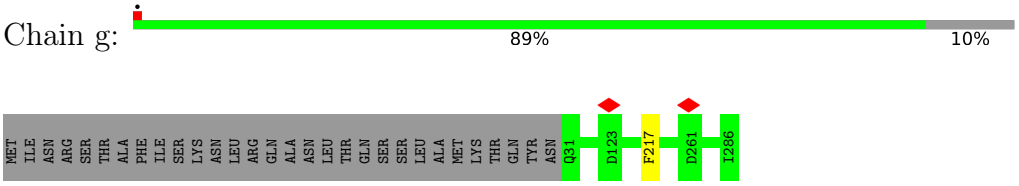
• Molecule 7: subunit 8

Chain C:



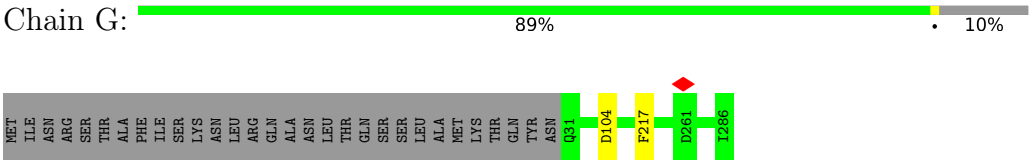
• Molecule 8: ATPTT3

Chain g:



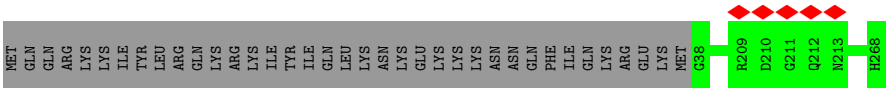
• Molecule 8: ATPTT3

Chain G:



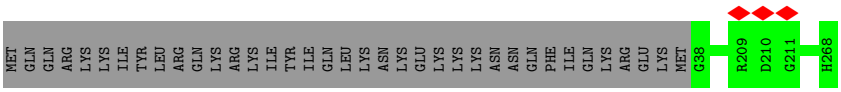
• Molecule 9: ATPTT4

Chain h:



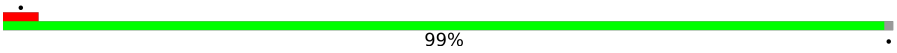
• Molecule 9: ATPTT4

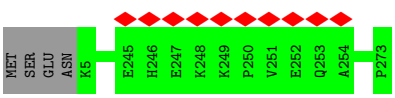
Chain H:



• Molecule 10: ATPTT5

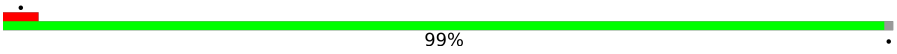
Chain j:

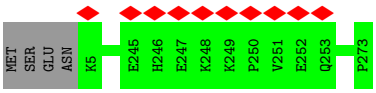




• Molecule 10: ATPTT5

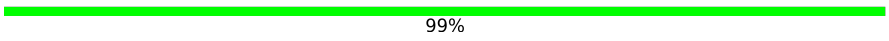
Chain J:





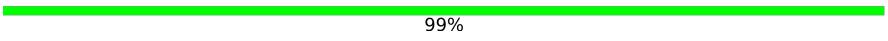
• Molecule 11: ATPTT6

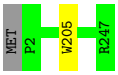
Chain l:



• Molecule 11: ATPTT6

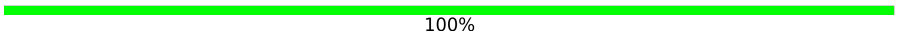
Chain L:





• Molecule 12: ATPTT7

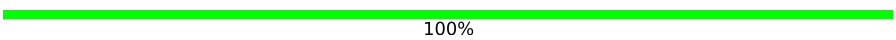
Chain m:



There are no outlier residues recorded for this chain.

• Molecule 12: ATPTT7

Chain M:



• Molecule 13: ATPTT8

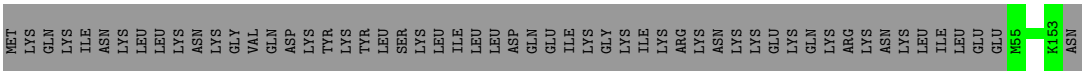
Chain n:

• Molecule 13: ATPTT8

Chain N:

• Molecule 14: ATPTT9

Chain o:

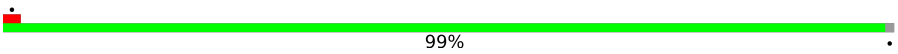


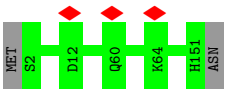
• Molecule 14: ATPTT9

Chain O:

• Molecule 15: ATPTT10

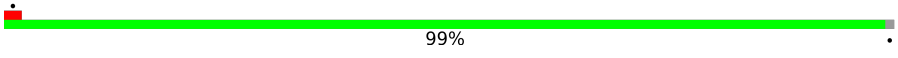
Chain p:

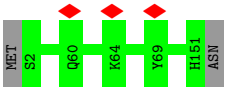




• Molecule 15: ATPTT10

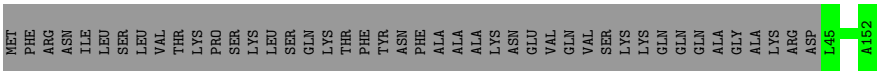
Chain P:





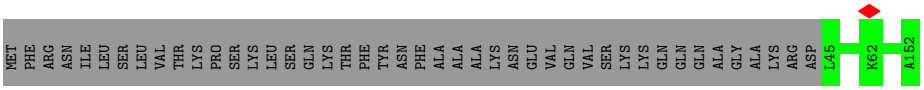
• Molecule 16: ATPTT11

Chain q:



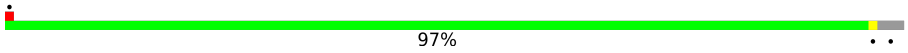
• Molecule 16: ATPTT11

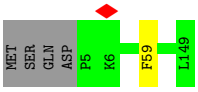
Chain Q:



• Molecule 17: ATPTT12

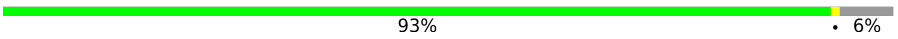
Chain r:





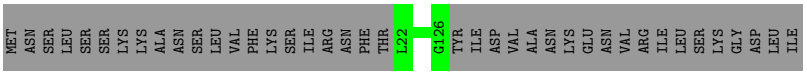
• Molecule 17: ATPTT12

Chain R:



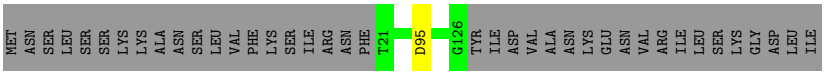
• Molecule 18: ATPTT13

Chain s:



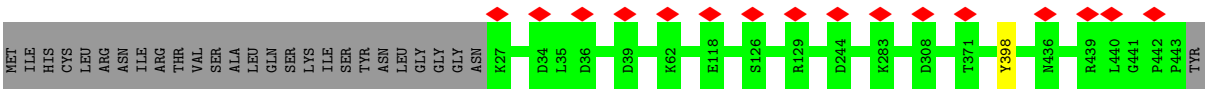
• Molecule 18: ATPTT13

Chain S:



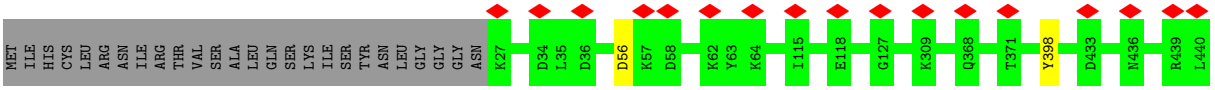
• Molecule 19: ATPTT1

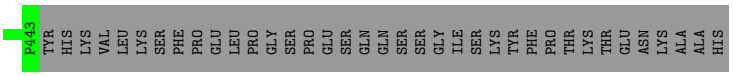
Chain e:



• Molecule 19: ATPTT1

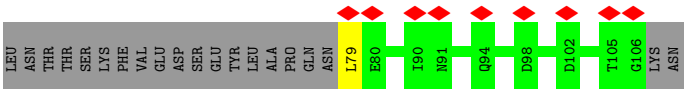
Chain E:





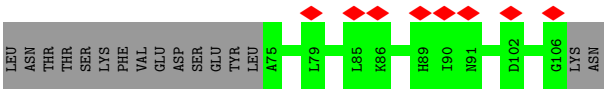
• Molecule 20: Inhibitor of F1 (IF1)

Chain i1:



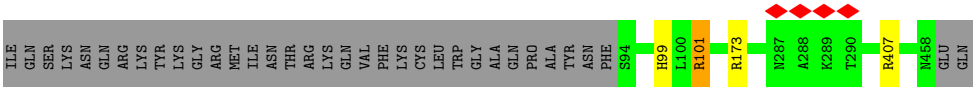
• Molecule 20: Inhibitor of F1 (IF1)

Chain i2:



• Molecule 21: ATPTT2

Chain t:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	61157	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	30.9	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	165000	Depositor
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	0.159	Depositor
Minimum map value	-0.056	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.018	Depositor
Map size (Å)	498.0, 498.0, 498.0	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.83, 0.83, 0.83	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: PO4, ATP, PC1, UQ8, MG, NAD, PEE, CDL

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|>5$	RMSZ	#$\|Z\|>5$
1	A	0.40	0/3752	0.41	0/5109
1	a	0.40	0/3752	0.41	0/5109
2	B	0.41	0/1417	0.42	0/1915
2	b	0.41	0/1417	0.40	0/1915
3	D	0.40	0/944	0.40	0/1278
3	d	0.39	0/944	0.41	0/1278
4	F	0.40	0/1733	0.44	0/2327
4	f	0.40	0/1733	0.43	0/2327
5	I	0.39	0/1771	0.43	0/2394
5	i	0.39	0/1771	0.44	0/2394
6	K	0.33	0/1508	0.42	0/2024
6	k	0.33	0/1508	0.41	0/2024
7	C	0.39	0/866	0.43	0/1176
7	c	0.40	0/866	0.43	0/1176
8	G	0.39	0/2302	0.44	0/3115
8	g	0.39	0/2302	0.43	0/3115
9	H	0.38	0/2006	0.43	0/2704
9	h	0.37	0/2006	0.42	0/2704
10	J	0.38	0/2256	0.43	0/3069
10	j	0.38	0/2256	0.44	0/3069
11	L	0.40	0/2140	0.42	0/2903
11	l	0.39	0/2140	0.42	0/2903
12	M	0.40	0/1912	0.40	0/2598
12	m	0.40	0/1912	0.40	0/2598
13	N	0.42	0/1030	0.44	0/1393
13	n	0.42	0/1030	0.45	0/1393
14	O	0.34	0/821	0.42	0/1104
14	o	0.33	0/821	0.43	0/1104
15	P	0.31	0/1249	0.39	0/1695
15	p	0.31	0/1249	0.40	0/1695
16	Q	0.35	0/888	0.41	0/1200
16	q	0.35	0/888	0.42	0/1200

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
17	R	0.40	0/1185	0.41	0/1594
17	r	0.40	0/1225	0.41	0/1649
18	S	0.37	0/892	0.45	0/1209
18	s	0.38	0/885	0.45	0/1199
19	E	0.29	0/3492	0.42	0/4720
19	e	0.30	0/3492	0.42	0/4720
20	i1	0.45	0/242	0.50	0/328
20	i2	0.25	0/272	0.36	0/370
21	t	0.37	0/3103	0.44	1/4200 (0.0%)
All	All	0.38	0/67978	0.42	1/91997 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
21	t	101	ARG	NE-CZ-NH2	5.96	123.28	120.30

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	A	431/446 (97%)	425 (99%)	6 (1%)	0	100	100
1	a	431/446 (97%)	425 (99%)	6 (1%)	0	100	100
2	B	159/381 (42%)	153 (96%)	6 (4%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	b	159/381 (42%)	154 (97%)	5 (3%)	0	100	100
3	D	108/234 (46%)	106 (98%)	2 (2%)	0	100	100
3	d	108/234 (46%)	107 (99%)	1 (1%)	0	100	100
4	F	198/204 (97%)	197 (100%)	1 (0%)	0	100	100
4	f	198/204 (97%)	196 (99%)	2 (1%)	0	100	100
5	I	207/209 (99%)	201 (97%)	6 (3%)	0	100	100
5	i	207/209 (99%)	201 (97%)	6 (3%)	0	100	100
6	K	177/179 (99%)	169 (96%)	8 (4%)	0	100	100
6	k	177/179 (99%)	168 (95%)	9 (5%)	0	100	100
7	C	94/100 (94%)	90 (96%)	4 (4%)	0	100	100
7	c	94/100 (94%)	91 (97%)	3 (3%)	0	100	100
8	G	254/286 (89%)	246 (97%)	8 (3%)	0	100	100
8	g	254/286 (89%)	243 (96%)	11 (4%)	0	100	100
9	H	229/268 (85%)	223 (97%)	6 (3%)	0	100	100
9	h	229/268 (85%)	227 (99%)	2 (1%)	0	100	100
10	J	267/273 (98%)	259 (97%)	8 (3%)	0	100	100
10	j	267/273 (98%)	259 (97%)	8 (3%)	0	100	100
11	L	244/247 (99%)	239 (98%)	5 (2%)	0	100	100
11	l	244/247 (99%)	240 (98%)	4 (2%)	0	100	100
12	M	219/221 (99%)	217 (99%)	2 (1%)	0	100	100
12	m	219/221 (99%)	218 (100%)	1 (0%)	0	100	100
13	N	117/179 (65%)	113 (97%)	4 (3%)	0	100	100
13	n	117/179 (65%)	114 (97%)	3 (3%)	0	100	100
14	O	97/154 (63%)	95 (98%)	2 (2%)	0	100	100
14	o	97/154 (63%)	96 (99%)	1 (1%)	0	100	100
15	P	148/152 (97%)	142 (96%)	6 (4%)	0	100	100
15	p	148/152 (97%)	143 (97%)	5 (3%)	0	100	100
16	Q	106/152 (70%)	104 (98%)	2 (2%)	0	100	100
16	q	106/152 (70%)	103 (97%)	3 (3%)	0	100	100
17	R	138/149 (93%)	135 (98%)	3 (2%)	0	100	100
17	r	143/149 (96%)	141 (99%)	2 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
18	S	104/145 (72%)	101 (97%)	3 (3%)	0	100	100
18	s	103/145 (71%)	100 (97%)	3 (3%)	0	100	100
19	E	415/480 (86%)	408 (98%)	7 (2%)	0	100	100
19	e	415/480 (86%)	406 (98%)	9 (2%)	0	100	100
20	i1	26/108 (24%)	26 (100%)	0	0	100	100
20	i2	30/108 (28%)	30 (100%)	0	0	100	100
21	t	363/460 (79%)	356 (98%)	7 (2%)	0	100	100
All	All	7847/9594 (82%)	7667 (98%)	180 (2%)	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	A	397/409 (97%)	395 (100%)	2 (0%)	88	96
1	a	397/409 (97%)	394 (99%)	3 (1%)	81	93
2	B	143/331 (43%)	141 (99%)	2 (1%)	67	86
2	b	143/331 (43%)	143 (100%)	0	100	100
3	D	95/206 (46%)	95 (100%)	0	100	100
3	d	95/206 (46%)	95 (100%)	0	100	100
4	F	175/178 (98%)	174 (99%)	1 (1%)	86	95
4	f	175/178 (98%)	175 (100%)	0	100	100
5	I	182/182 (100%)	179 (98%)	3 (2%)	62	84
5	i	182/182 (100%)	181 (100%)	1 (0%)	88	96
6	K	152/152 (100%)	151 (99%)	1 (1%)	84	94
6	k	152/152 (100%)	151 (99%)	1 (1%)	84	94
7	C	93/97 (96%)	92 (99%)	1 (1%)	73	89
7	c	93/97 (96%)	91 (98%)	2 (2%)	52	77

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
8	G	235/262 (90%)	233 (99%)	2 (1%)	78 92
8	g	235/262 (90%)	234 (100%)	1 (0%)	91 97
9	H	208/245 (85%)	208 (100%)	0	100 100
9	h	208/245 (85%)	208 (100%)	0	100 100
10	J	235/239 (98%)	235 (100%)	0	100 100
10	j	235/239 (98%)	235 (100%)	0	100 100
11	L	219/220 (100%)	218 (100%)	1 (0%)	88 96
11	l	219/220 (100%)	218 (100%)	1 (0%)	88 96
12	M	202/202 (100%)	201 (100%)	1 (0%)	88 96
12	m	202/202 (100%)	202 (100%)	0	100 100
13	N	104/162 (64%)	104 (100%)	0	100 100
13	n	104/162 (64%)	104 (100%)	0	100 100
14	O	89/142 (63%)	89 (100%)	0	100 100
14	o	89/142 (63%)	89 (100%)	0	100 100
15	P	131/133 (98%)	131 (100%)	0	100 100
15	p	131/133 (98%)	131 (100%)	0	100 100
16	Q	97/135 (72%)	97 (100%)	0	100 100
16	q	97/135 (72%)	97 (100%)	0	100 100
17	R	120/129 (93%)	119 (99%)	1 (1%)	81 93
17	r	125/129 (97%)	124 (99%)	1 (1%)	81 93
18	S	95/131 (72%)	94 (99%)	1 (1%)	73 89
18	s	94/131 (72%)	94 (100%)	0	100 100
19	E	359/414 (87%)	357 (99%)	2 (1%)	86 95
19	e	359/414 (87%)	358 (100%)	1 (0%)	92 97
20	i1	26/101 (26%)	25 (96%)	1 (4%)	33 58
20	i2	29/101 (29%)	29 (100%)	0	100 100
21	t	325/414 (78%)	321 (99%)	4 (1%)	71 88
All	All	7046/8554 (82%)	7012 (100%)	34 (0%)	89 96

5 of 34 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
19	E	398	TYR

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Mol	Chain	Res	Type
20	i1	79	LEU
21	t	173	ARG
1	A	247	TYR
1	A	14	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 9 such sidechains are listed below:

Mol	Chain	Res	Type
21	t	170	ASN
21	t	234	GLN
9	H	136	HIS
10	J	130	GLN
12	M	74	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 50 ligands modelled in this entry, 2 are monoatomic - leaving 48 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	$\#\|Z\|>2$
22	CDL	i	302	-	99,99,99	0.89	8 (8%)	105,111,111	0.94	4 (3%)
22	CDL	B	403	2	99,99,99	0.87	7 (7%)	105,111,111	1.09	4 (3%)
28	PEE	l	302	-	47,47,50	1.18	6 (12%)	50,52,55	1.09	3 (6%)
29	NAD	e	900	-	42,48,48	3.83	19 (45%)	50,73,73	2.17	7 (14%)
23	PC1	d	301	3	53,53,53	0.93	4 (7%)	59,61,61	1.08	3 (5%)
22	CDL	B	402	-	99,99,99	0.88	8 (8%)	105,111,111	1.06	4 (3%)
22	CDL	l	304	-	99,99,99	0.89	7 (7%)	105,111,111	1.04	4 (3%)
22	CDL	B	404	-	99,99,99	0.89	8 (8%)	105,111,111	0.95	4 (3%)
25	UQ8	i	303	-	53,53,53	1.80	7 (13%)	64,67,67	1.60	15 (23%)
22	CDL	r	201	-	99,99,99	0.87	5 (5%)	105,111,111	0.97	4 (3%)
22	CDL	a	501	-	99,99,99	0.89	7 (7%)	105,111,111	1.02	3 (2%)
22	CDL	j	302	-	99,99,99	0.87	7 (7%)	105,111,111	1.02	4 (3%)
22	CDL	f	304	4	99,99,99	0.88	8 (8%)	105,111,111	1.05	4 (3%)
22	CDL	b	401	-	99,99,99	0.88	8 (8%)	105,111,111	0.98	4 (3%)
22	CDL	K	201	-	99,99,99	0.89	8 (8%)	105,111,111	1.01	4 (3%)
25	UQ8	I	303	-	53,53,53	1.81	7 (13%)	64,67,67	1.57	13 (20%)
28	PEE	l	303	-	50,50,50	1.15	6 (12%)	53,55,55	1.13	3 (5%)
22	CDL	L	301	-	99,99,99	0.89	8 (8%)	105,111,111	0.99	4 (3%)
22	CDL	I	302	-	99,99,99	0.89	8 (8%)	105,111,111	0.99	4 (3%)
22	CDL	p	201	-	99,99,99	0.88	8 (8%)	105,111,111	1.00	4 (3%)
23	PC1	g	303	8	53,53,53	0.97	3 (5%)	59,61,61	1.04	2 (3%)
22	CDL	B	405	2	99,99,99	0.88	8 (8%)	105,111,111	1.10	5 (4%)
22	CDL	f	302	4	99,99,99	0.88	8 (8%)	105,111,111	1.07	4 (3%)
23	PC1	G	303	-	53,53,53	0.97	4 (7%)	59,61,61	0.94	2 (3%)
23	PC1	G	304	8	53,53,53	0.97	3 (5%)	59,61,61	1.04	2 (3%)
22	CDL	J	302	-	99,99,99	0.87	7 (7%)	105,111,111	0.99	4 (3%)
26	ATP	G	301	27	26,33,33	4.75	7 (26%)	31,52,52	2.46	7 (22%)
22	CDL	P	201	-	99,99,99	0.88	8 (8%)	105,111,111	1.03	5 (4%)
22	CDL	b	402	-	99,99,99	0.89	7 (7%)	105,111,111	0.93	4 (3%)
22	CDL	J	301	-	99,99,99	0.89	6 (6%)	105,111,111	1.07	4 (3%)
22	CDL	K	202	-	99,99,99	0.88	7 (7%)	105,111,111	1.07	5 (4%)
22	CDL	k	203	-	99,99,99	0.89	7 (7%)	105,111,111	0.99	4 (3%)
28	PEE	J	304	-	50,50,50	1.16	6 (12%)	53,55,55	1.12	3 (5%)
24	PO4	F	900	-	4,4,4	1.06	0	6,6,6	0.46	0
22	CDL	A	501	-	99,99,99	0.88	7 (7%)	105,111,111	1.01	5 (4%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
22	CDL	j	301	-	99,99,99	0.89	7 (7%)	105,111,111	1.07	4 (3%)
22	CDL	l	301	-	99,99,99	0.88	7 (7%)	105,111,111	1.02	4 (3%)
22	CDL	k	202	-	99,99,99	0.89	7 (7%)	105,111,111	1.04	5 (4%)
26	ATP	g	301	27	26,33,33	4.76	7 (26%)	31,52,52	2.45	7 (22%)
22	CDL	k	201	-	99,99,99	0.89	8 (8%)	105,111,111	1.08	5 (4%)
23	PC1	D	301	3	53,53,53	0.95	4 (7%)	59,61,61	1.10	2 (3%)
22	CDL	f	303	-	99,99,99	0.89	8 (8%)	105,111,111	1.12	5 (4%)
29	NAD	E	900	-	42,48,48	3.83	19 (45%)	50,73,73	2.10	6 (12%)
24	PO4	f	301	-	4,4,4	1.06	0	6,6,6	0.42	0
22	CDL	B	401	-	99,99,99	0.89	8 (8%)	105,111,111	0.99	5 (4%)
28	PEE	J	303	10	47,47,50	1.18	6 (12%)	50,52,55	1.13	4 (8%)
22	CDL	I	301	5	99,99,99	0.88	6 (6%)	105,111,111	0.95	3 (2%)
23	PC1	i	301	-	53,53,53	0.96	4 (7%)	59,61,61	0.96	2 (3%)

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
22	CDL	i	302	-	-	41/110/110/110	-
22	CDL	B	403	2	-	43/110/110/110	-
28	PEE	l	302	-	-	26/51/51/54	-
29	NAD	e	900	-	-	8/26/62/62	0/5/5/5
23	PC1	d	301	3	-	17/57/57/57	-
22	CDL	B	402	-	-	53/110/110/110	-
22	CDL	l	304	-	-	41/110/110/110	-
22	CDL	B	404	-	-	40/110/110/110	-
25	UQ8	i	303	-	-	8/51/75/75	0/1/1/1
22	CDL	r	201	-	-	47/110/110/110	-
22	CDL	a	501	-	-	47/110/110/110	-
22	CDL	j	302	-	-	37/110/110/110	-
22	CDL	f	304	4	-	59/110/110/110	-
22	CDL	b	401	-	-	55/110/110/110	-
22	CDL	K	201	-	-	33/110/110/110	-
25	UQ8	I	303	-	-	11/51/75/75	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
28	PEE	l	303	-	-	24/54/54/54	-
22	CDL	L	301	-	-	44/110/110/110	-
22	CDL	I	302	-	-	41/110/110/110	-
22	CDL	p	201	-	-	34/110/110/110	-
23	PC1	g	303	8	-	17/57/57/57	-
22	CDL	B	405	2	-	40/110/110/110	-
22	CDL	f	302	4	-	43/110/110/110	-
23	PC1	G	303	-	-	16/57/57/57	-
23	PC1	G	304	8	-	19/57/57/57	-
22	CDL	J	302	-	-	36/110/110/110	-
26	ATP	G	301	27	-	0/18/38/38	0/3/3/3
22	CDL	P	201	-	-	39/110/110/110	-
22	CDL	b	402	-	-	43/110/110/110	-
22	CDL	J	301	-	-	35/110/110/110	-
22	CDL	K	202	-	-	39/110/110/110	-
22	CDL	k	203	-	-	45/110/110/110	-
28	PEE	J	304	-	-	24/54/54/54	-
26	ATP	g	301	27	-	0/18/38/38	0/3/3/3
22	CDL	A	501	-	-	51/110/110/110	-
22	CDL	j	301	-	-	41/110/110/110	-
22	CDL	l	301	-	-	37/110/110/110	-
22	CDL	k	202	-	-	44/110/110/110	-
22	CDL	k	201	-	-	35/110/110/110	-
23	PC1	D	301	3	-	14/57/57/57	-
22	CDL	f	303	-	-	42/110/110/110	-
29	NAD	E	900	-	-	7/26/62/62	0/5/5/5
22	CDL	B	401	-	-	52/110/110/110	-
28	PEE	J	303	10	-	23/51/51/54	-
22	CDL	I	301	5	-	50/110/110/110	-
23	PC1	i	301	-	-	16/57/57/57	-

The worst 5 of 333 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
26	g	301	ATP	C2'-C1'	-17.21	1.27	1.53
26	G	301	ATP	C2'-C1'	-17.05	1.27	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
26	G	301	ATP	O4'-C1'	11.06	1.56	1.41
26	g	301	ATP	O4'-C1'	10.92	1.56	1.41
29	e	900	NAD	O4D-C1D	-9.81	1.27	1.41

The worst 5 of 207 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
29	e	900	NAD	C1B-N9A-C4A	-8.37	111.94	126.64
29	E	900	NAD	C1B-N9A-C4A	-8.11	112.38	126.64
29	e	900	NAD	C5A-C6A-N6A	8.10	132.67	120.35
29	E	900	NAD	C5A-C6A-N6A	7.92	132.39	120.35
26	G	301	ATP	C5-C6-N6	7.45	131.68	120.35

There are no chirality outliers.

5 of 1517 torsion outliers are listed below:

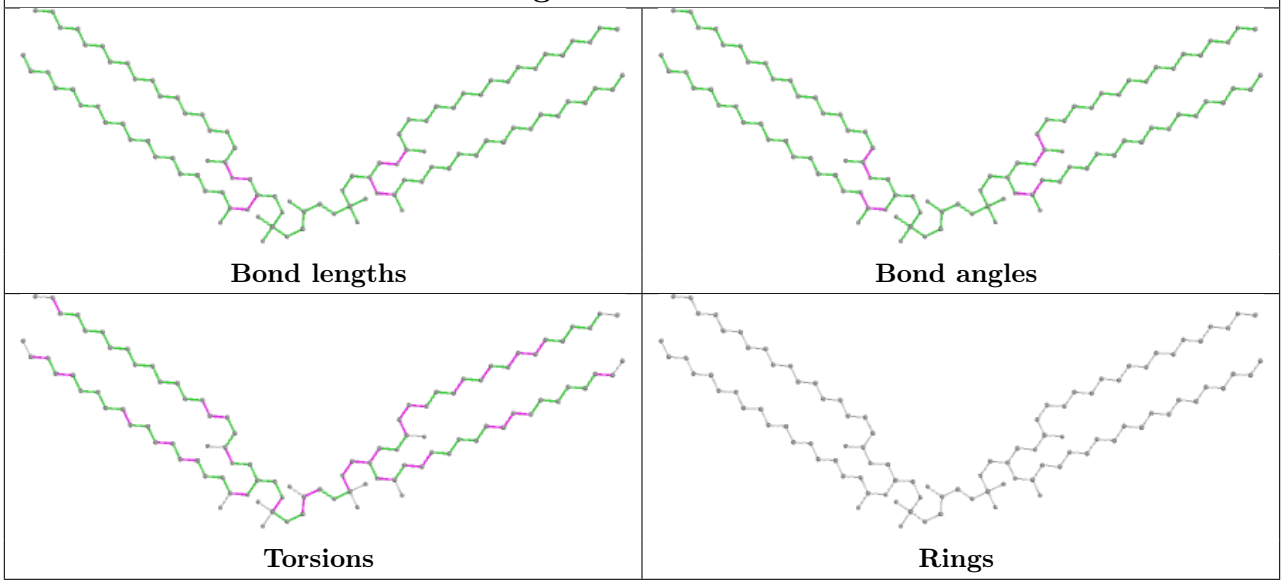
Mol	Chain	Res	Type	Atoms
22	a	501	CDL	CB3-OB5-PB2-OB3
22	a	501	CDL	CB3-OB5-PB2-OB4
22	a	501	CDL	OB7-CB5-OB6-CB4
22	a	501	CDL	C51-CB5-OB6-CB4
22	b	401	CDL	C1-CA2-OA2-PA1

There are no ring outliers.

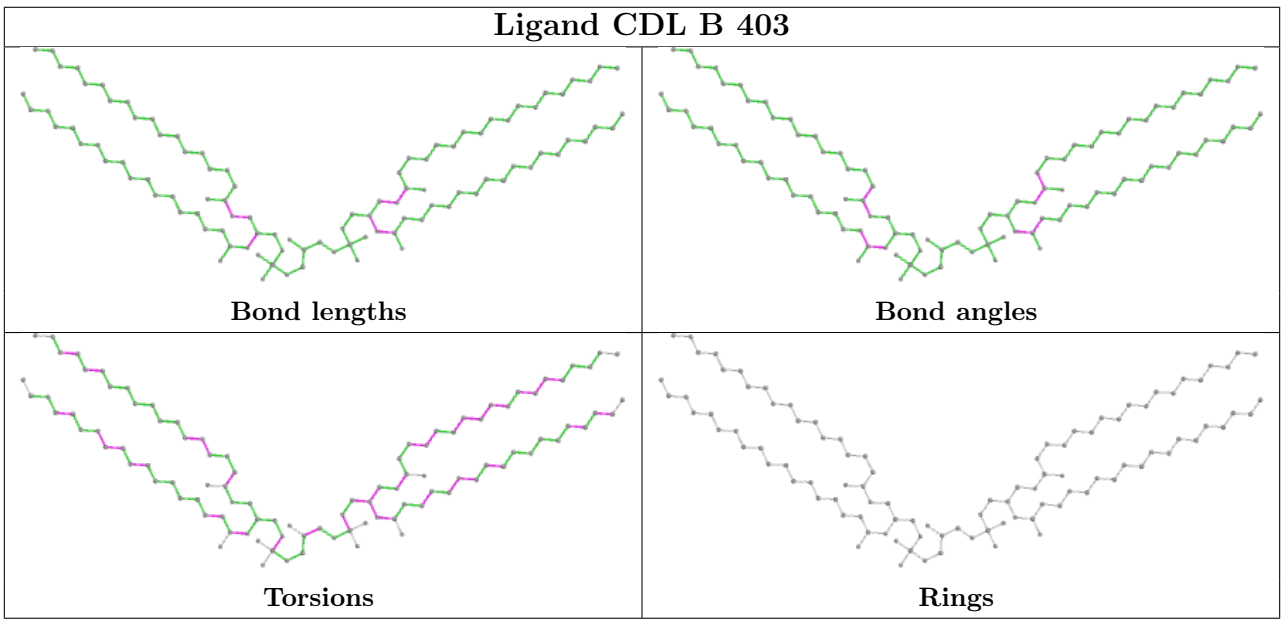
No monomer is involved in short contacts.

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.

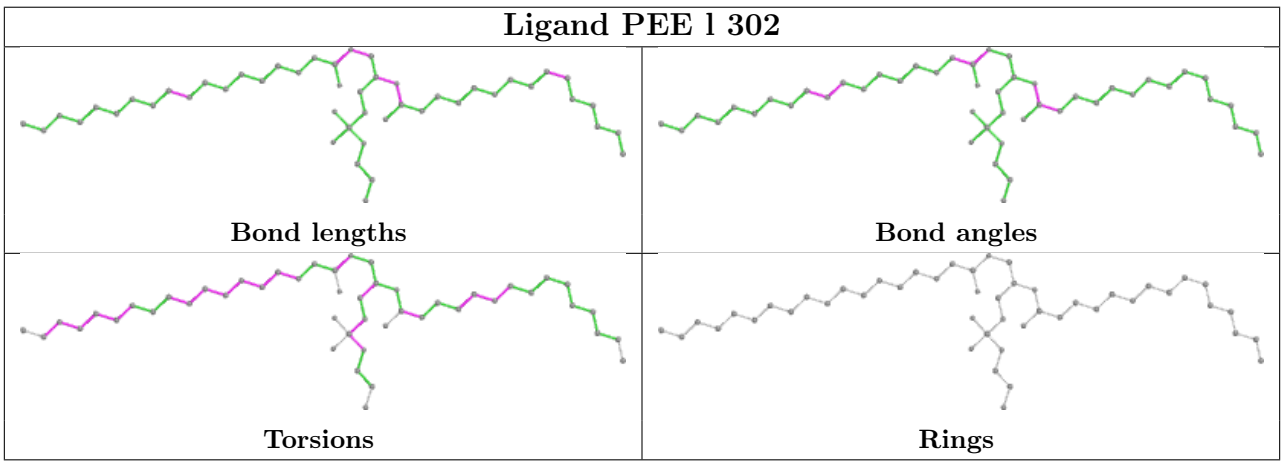
Ligand CDL i 302



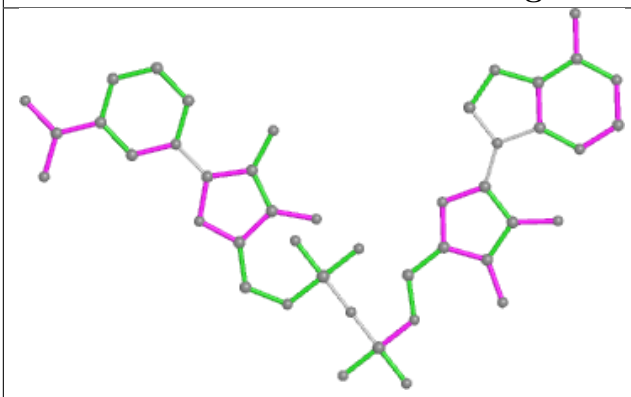
Ligand CDL B 403



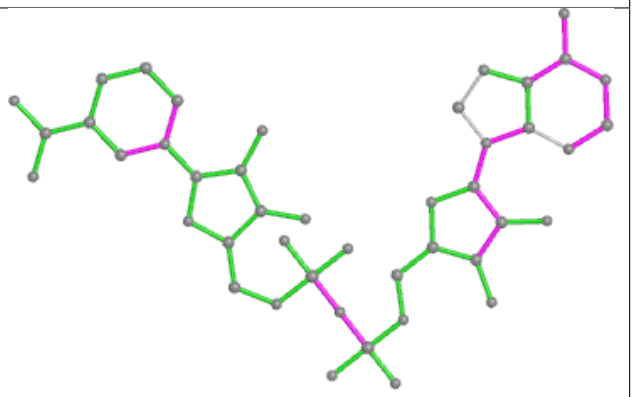
Ligand PEE l 302



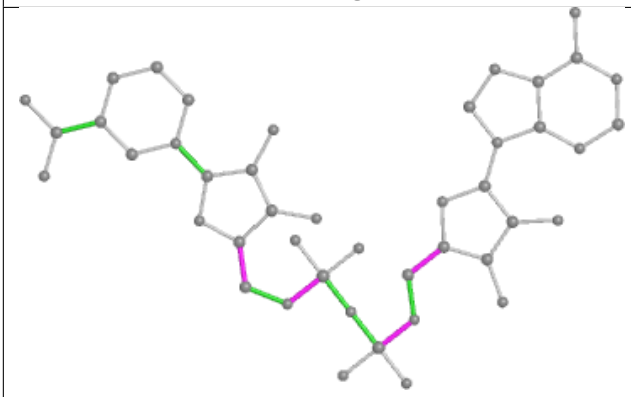
Ligand NAD e 900



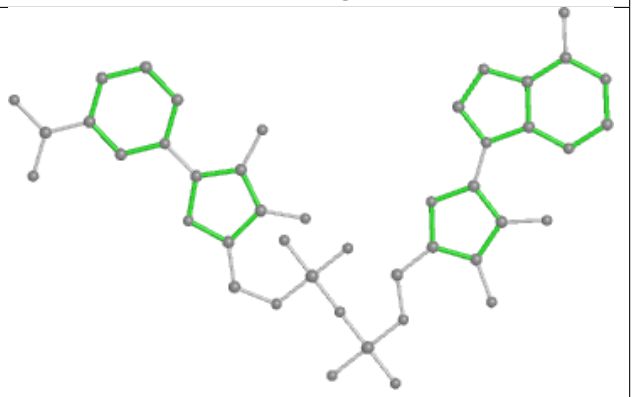
Bond lengths



Bond angles

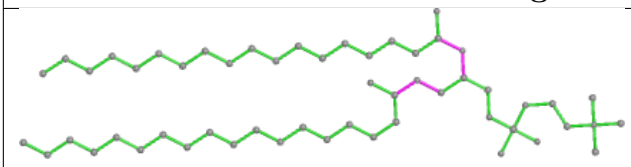


Torsions

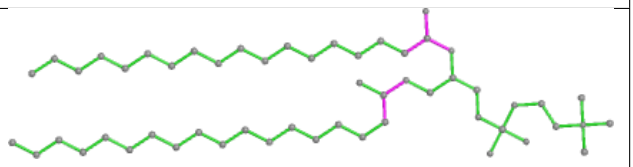


Rings

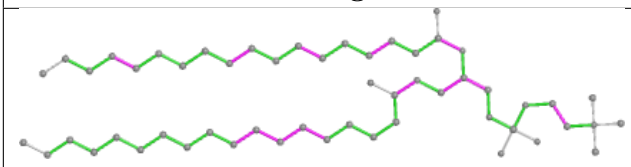
Ligand PC1 d 301



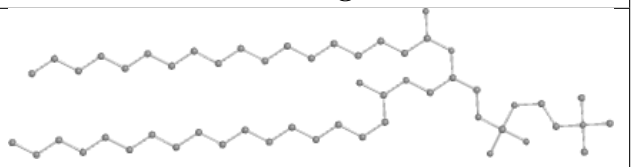
Bond lengths



Bond angles

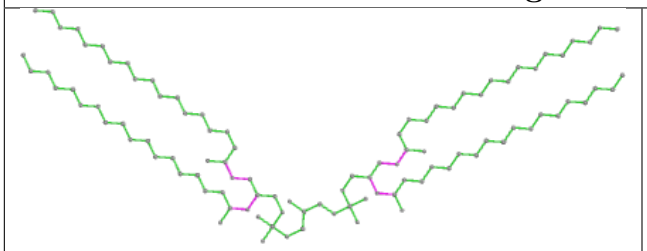


Torsions

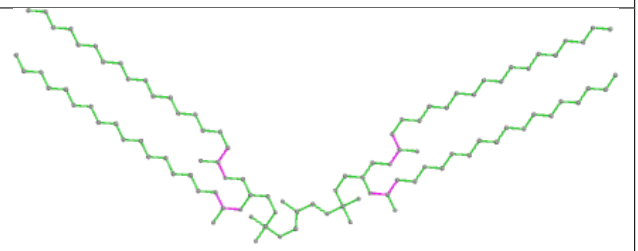


Rings

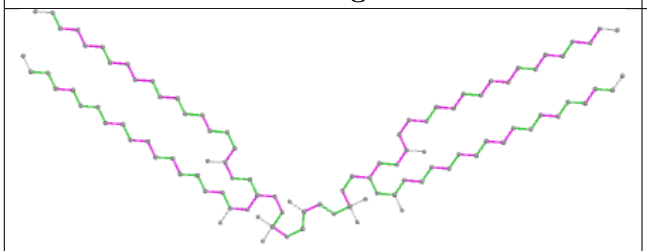
Ligand CDL B 402



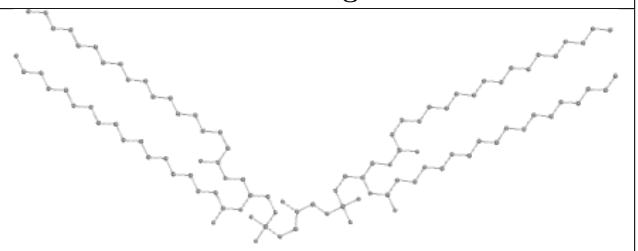
Bond lengths



Bond angles

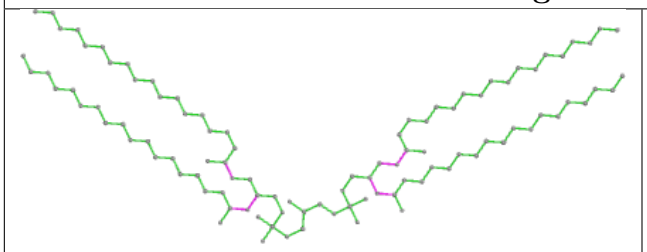


Torsions

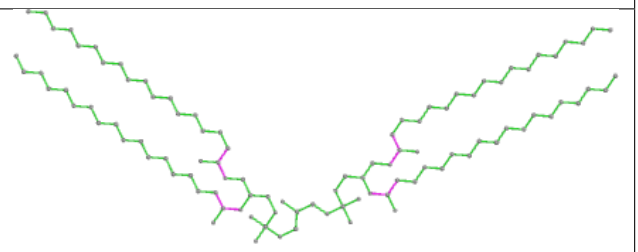


Rings

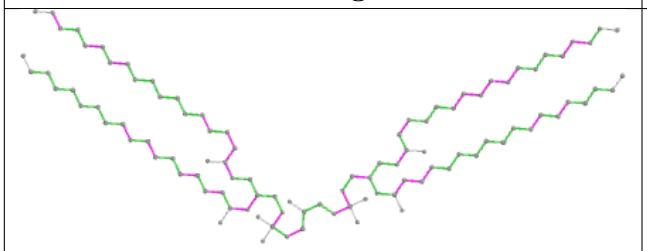
Ligand CDL l 304



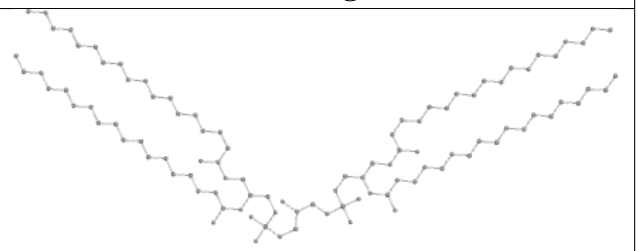
Bond lengths



Bond angles

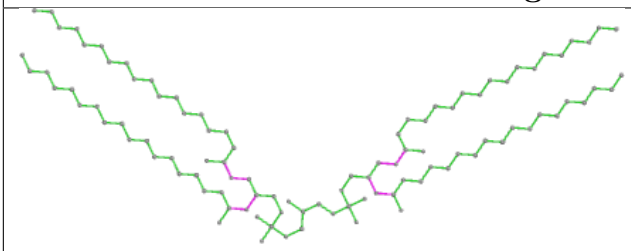


Torsions

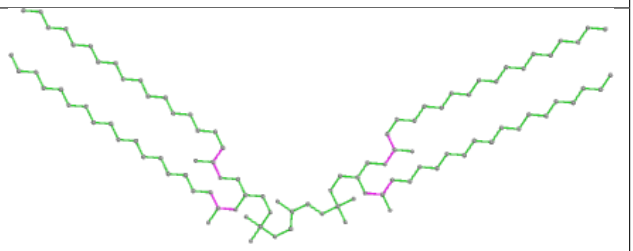


Rings

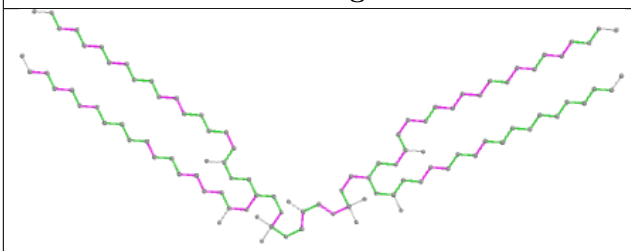
Ligand CDL B 404



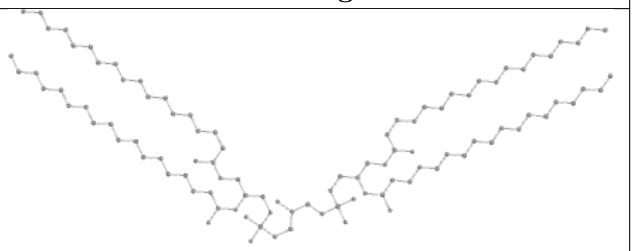
Bond lengths



Bond angles

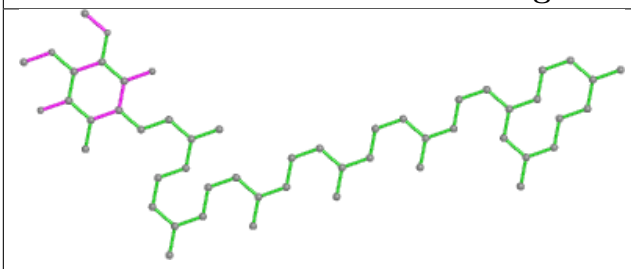


Torsions

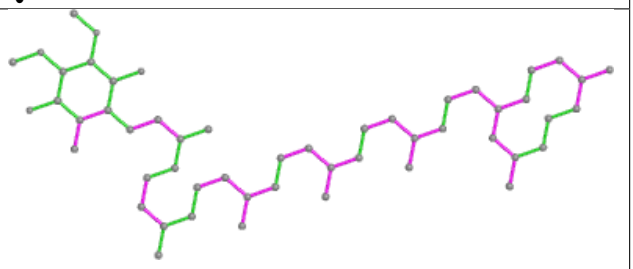


Rings

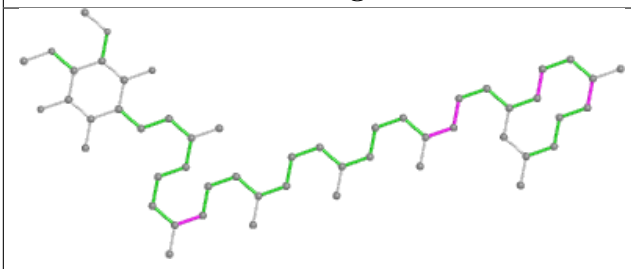
Ligand UQ8 i 303



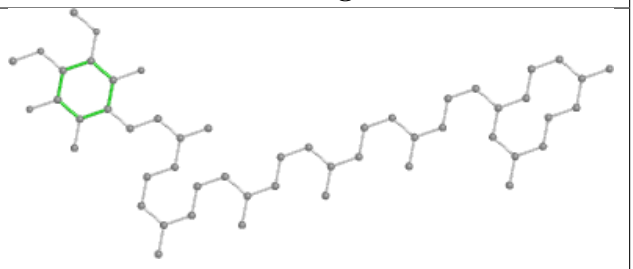
Bond lengths



Bond angles

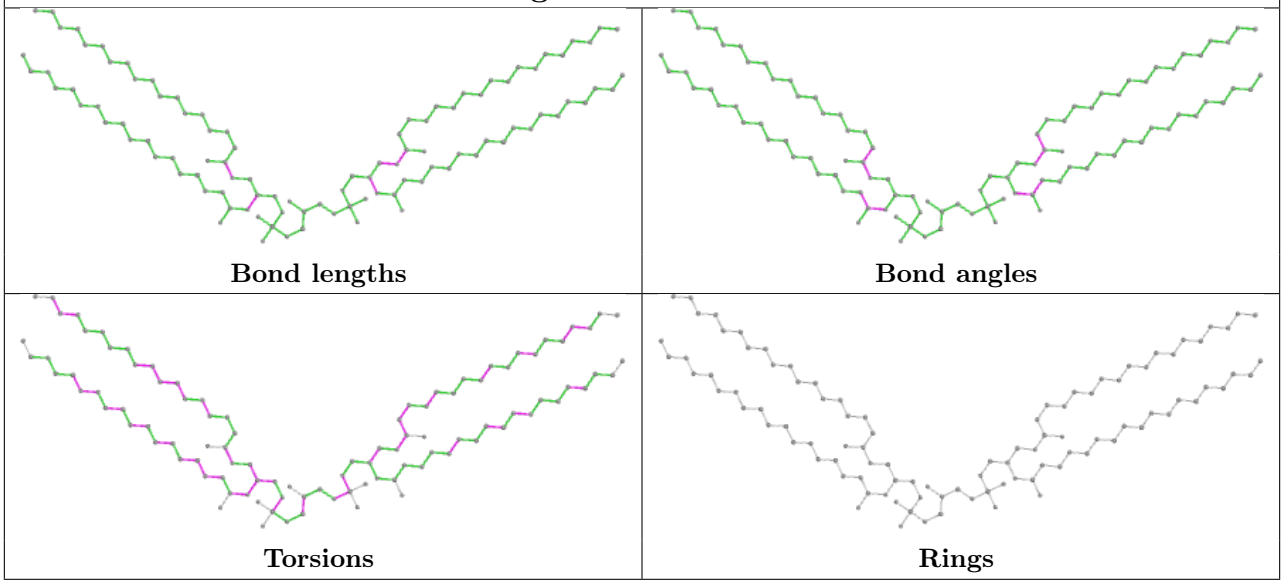


Torsions

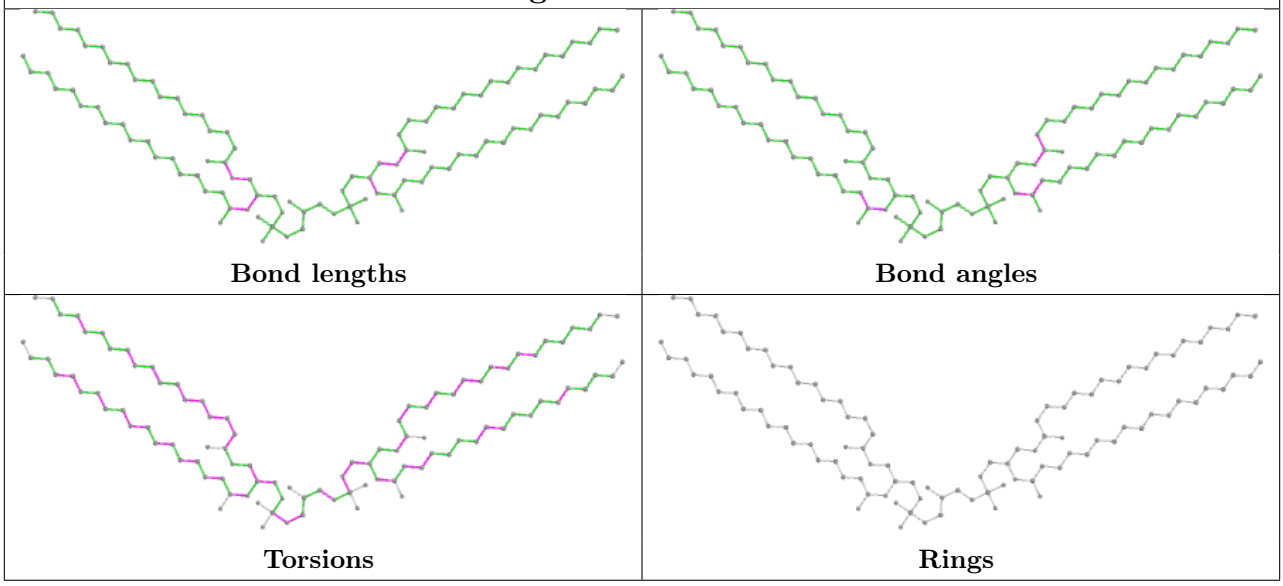


Rings

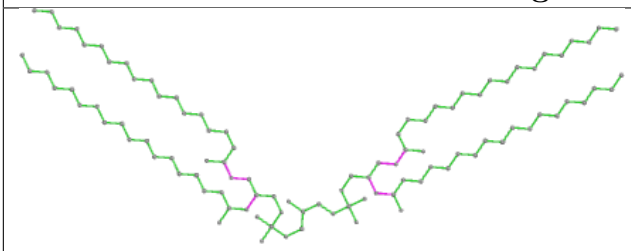
Ligand CDL r 201



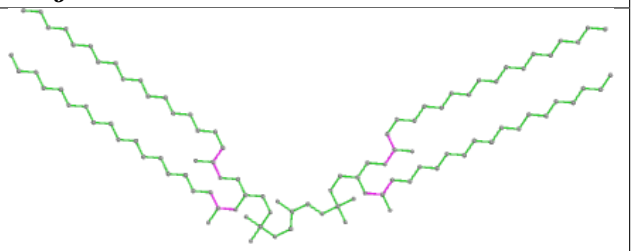
Ligand CDL a 501



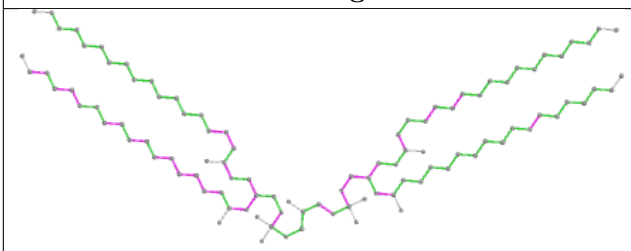
Ligand CDL j 302



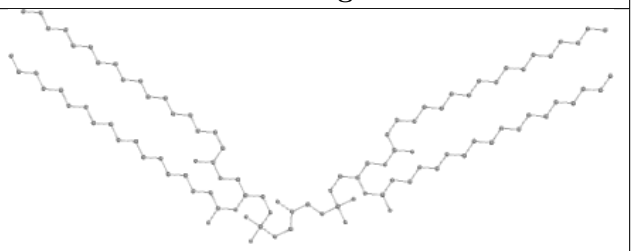
Bond lengths



Bond angles

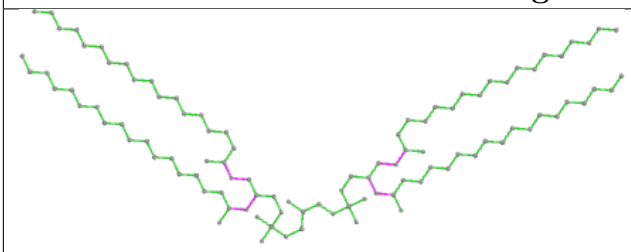


Torsions

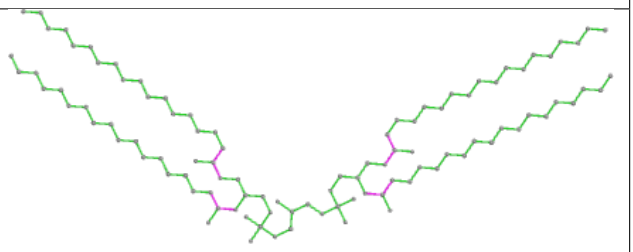


Rings

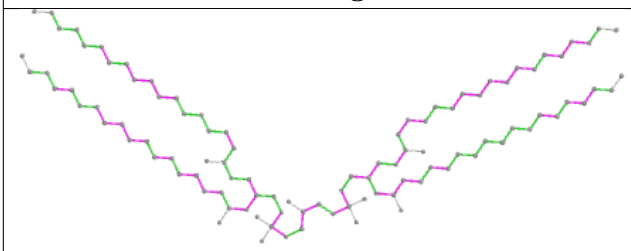
Ligand CDL f 304



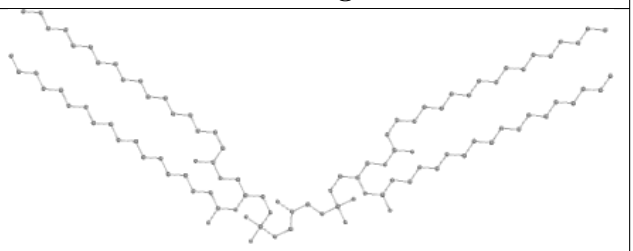
Bond lengths



Bond angles

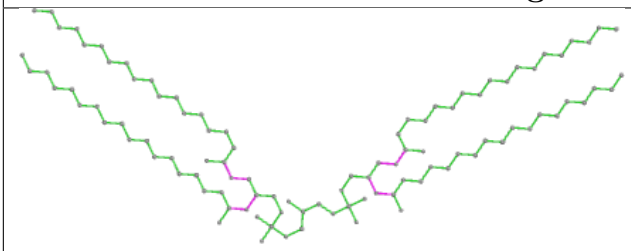


Torsions

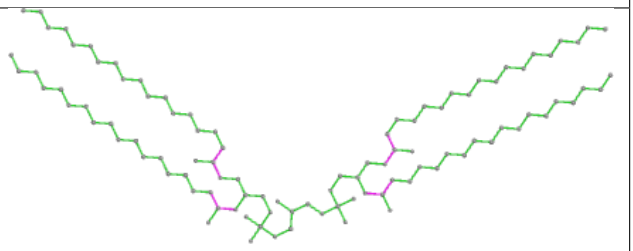


Rings

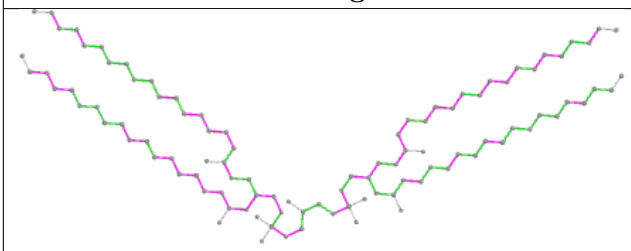
Ligand CDL b 401



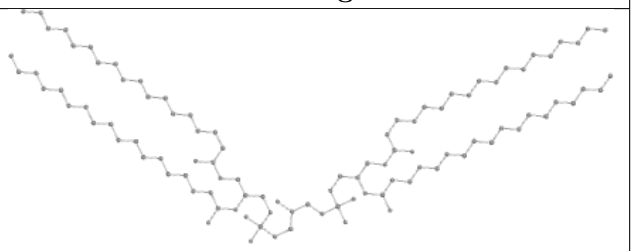
Bond lengths



Bond angles

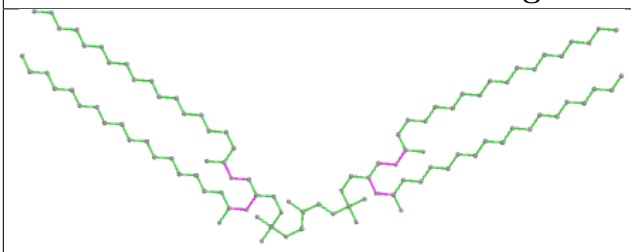


Torsions

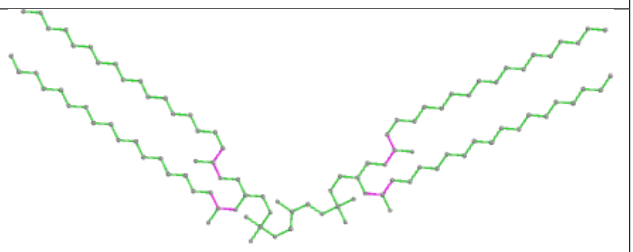


Rings

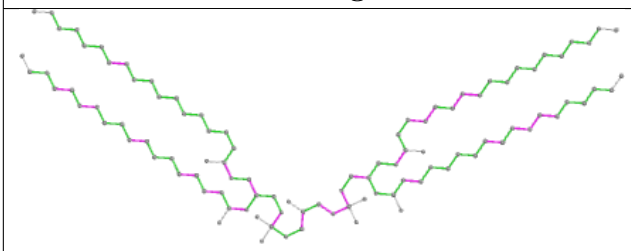
Ligand CDL K 201



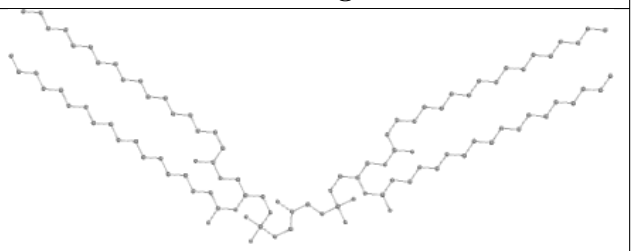
Bond lengths



Bond angles

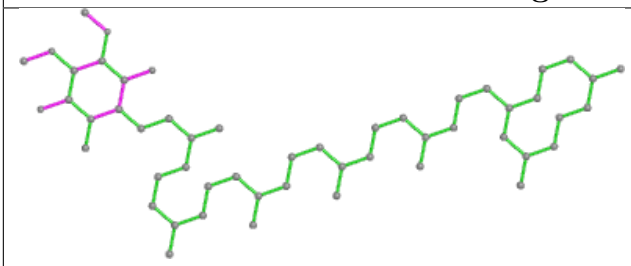


Torsions

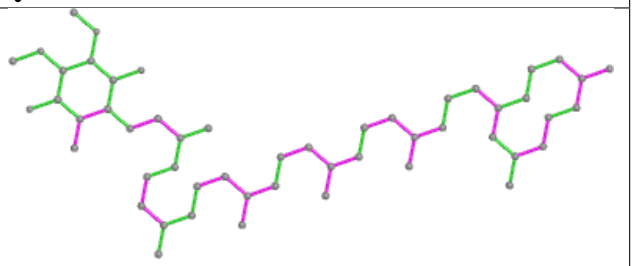


Rings

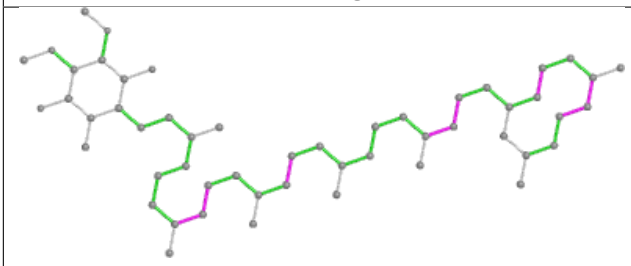
Ligand UQ8 I 303



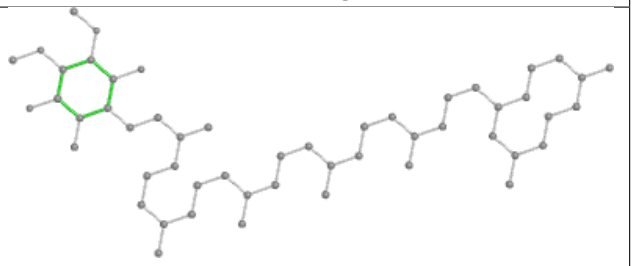
Bond lengths



Bond angles

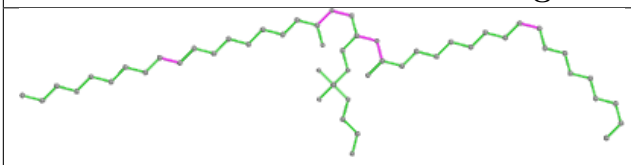


Torsions

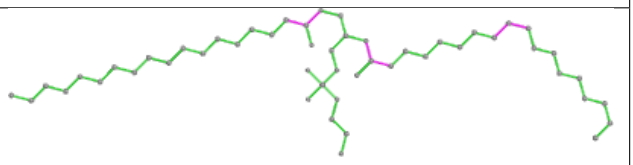


Rings

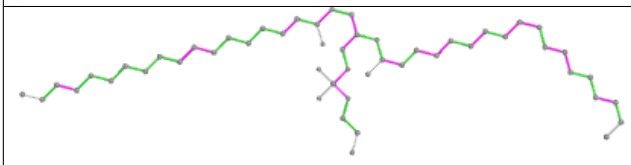
Ligand PEE l 303



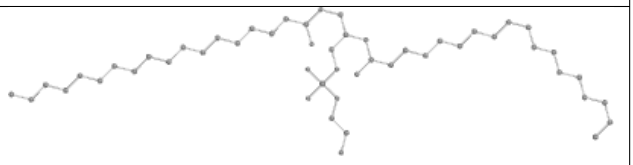
Bond lengths



Bond angles

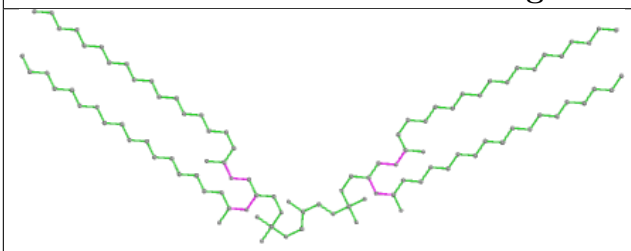


Torsions

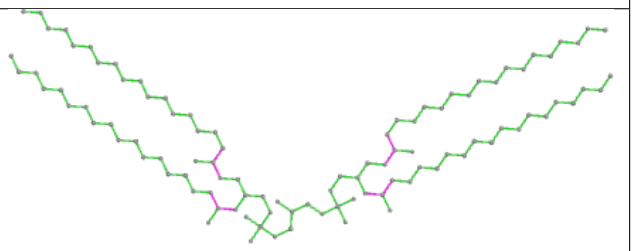


Rings

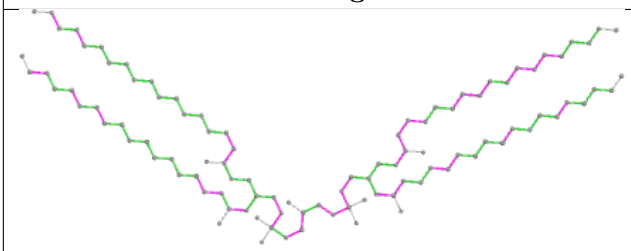
Ligand CDL L 301



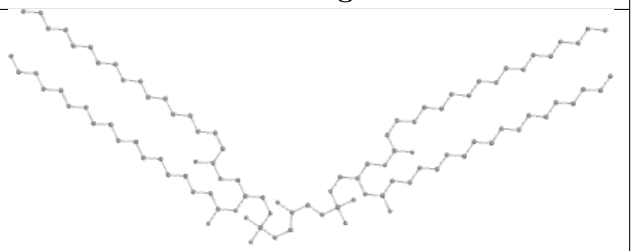
Bond lengths



Bond angles

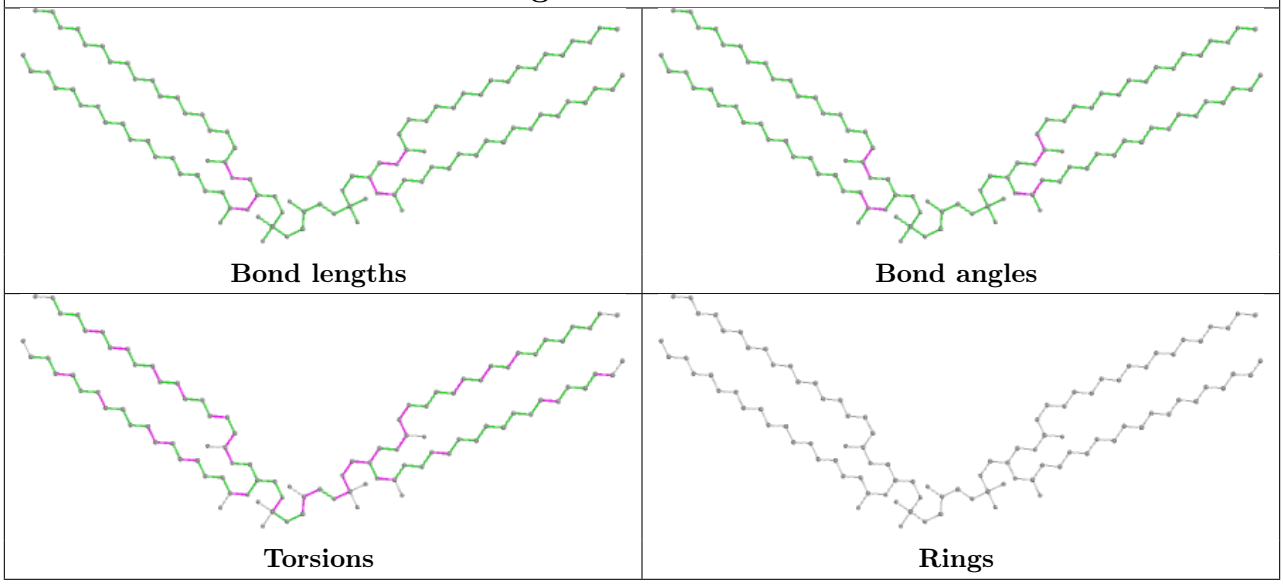


Torsions

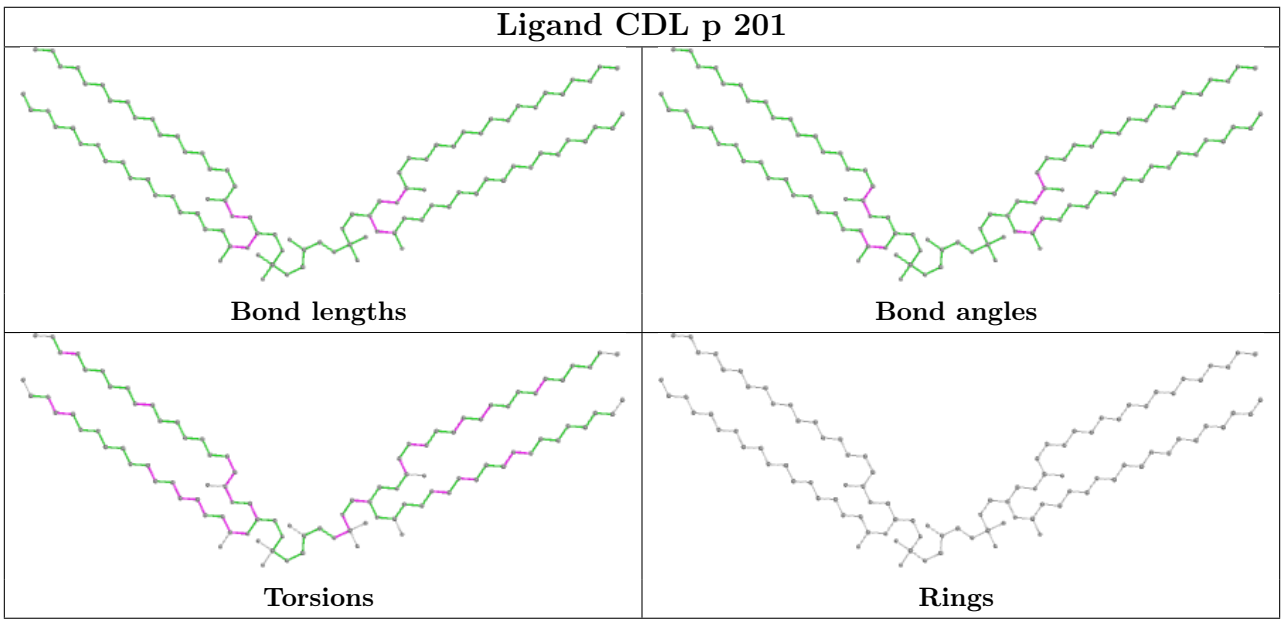


Rings

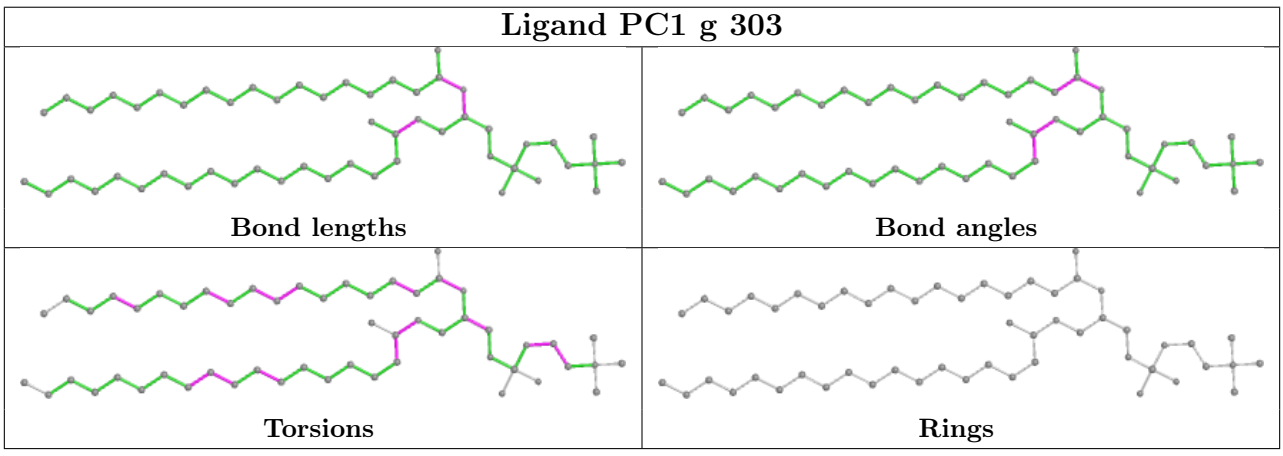
Ligand CDL I 302



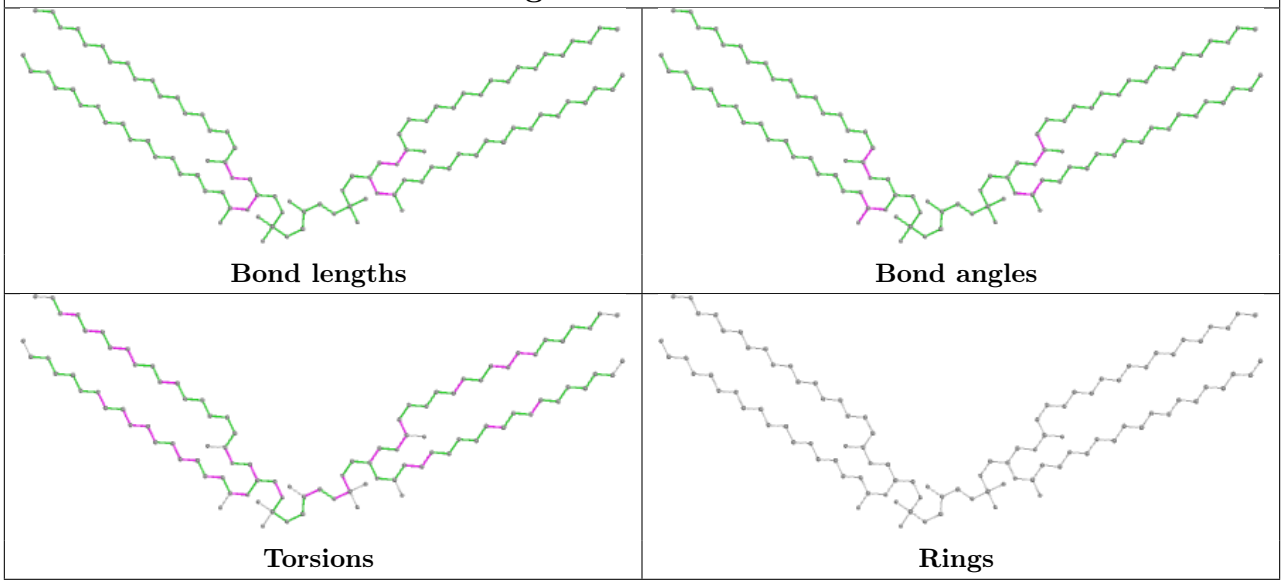
Ligand CDL p 201



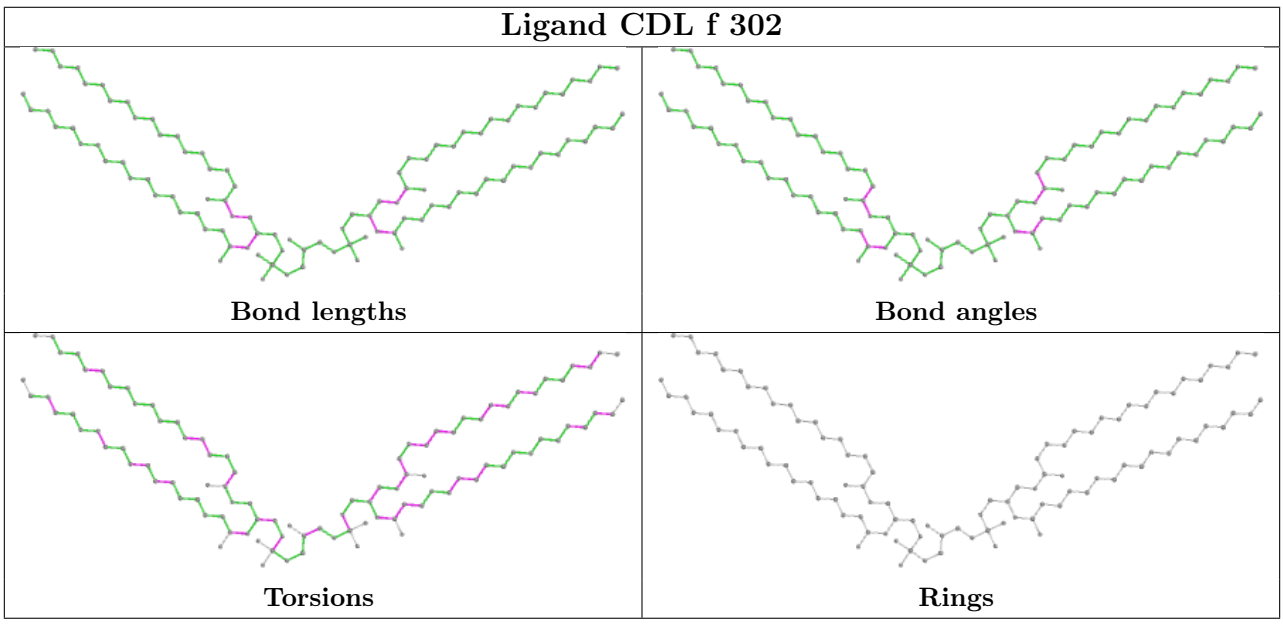
Ligand PC1 g 303



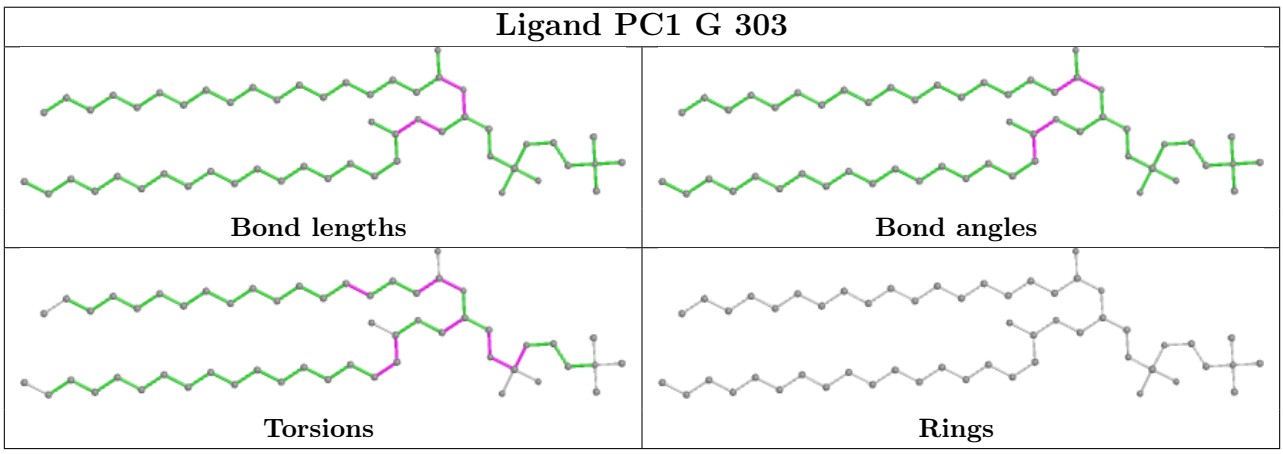
Ligand CDL B 405



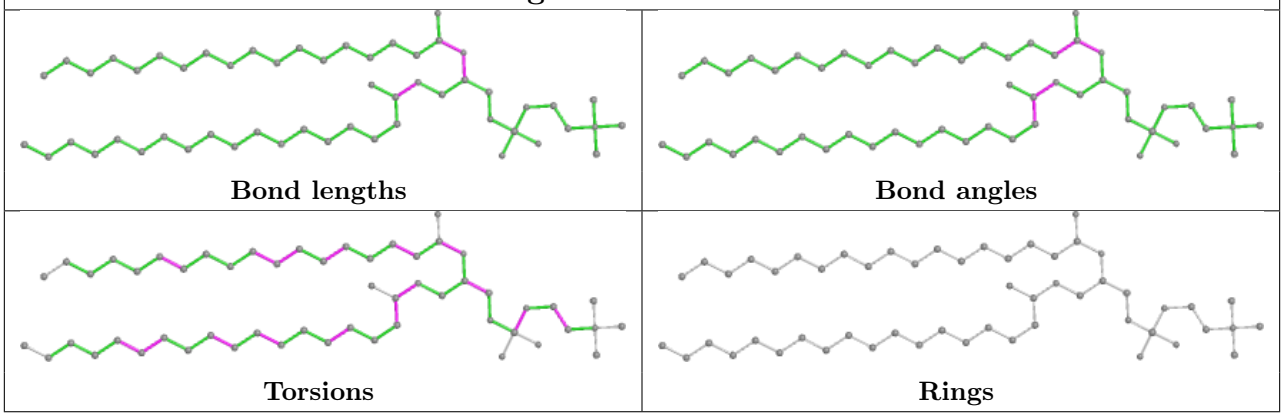
Ligand CDL f 302



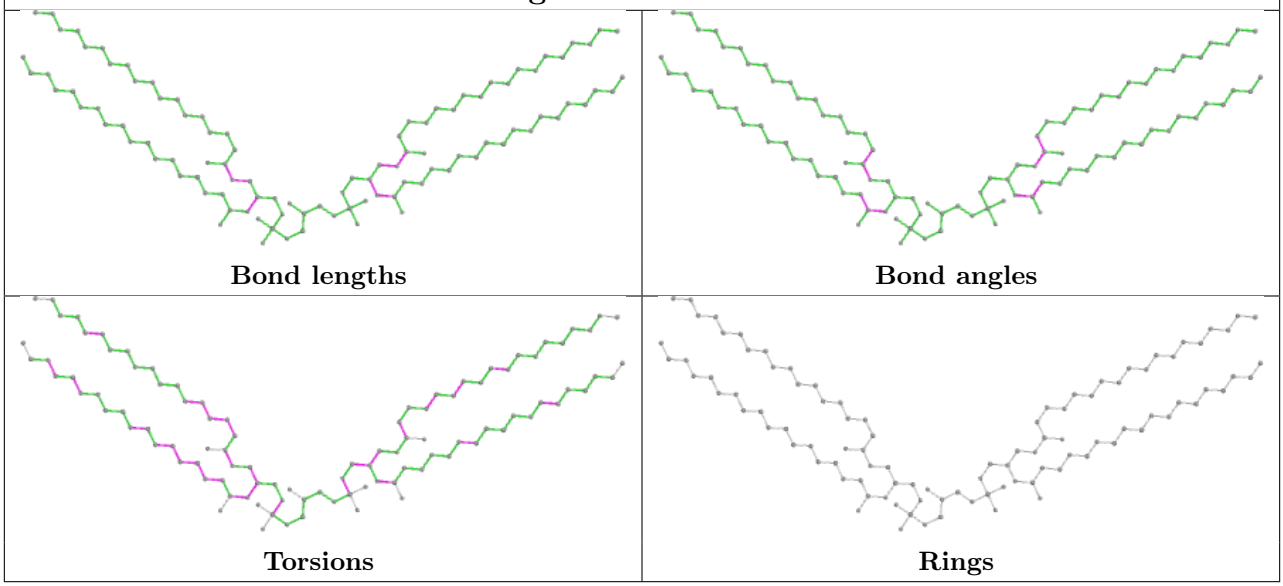
Ligand PC1 G 303



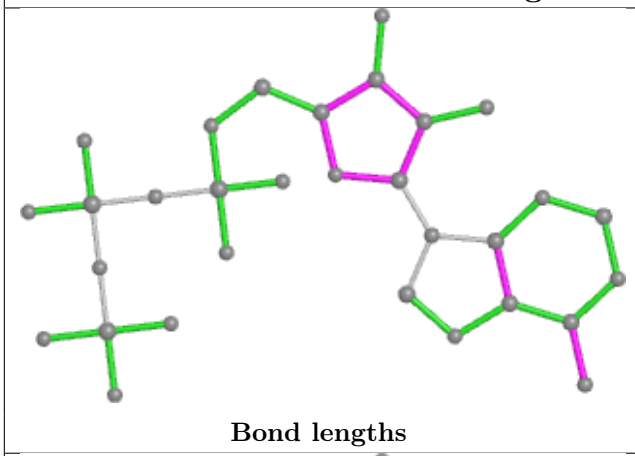
Ligand PC1 G 304



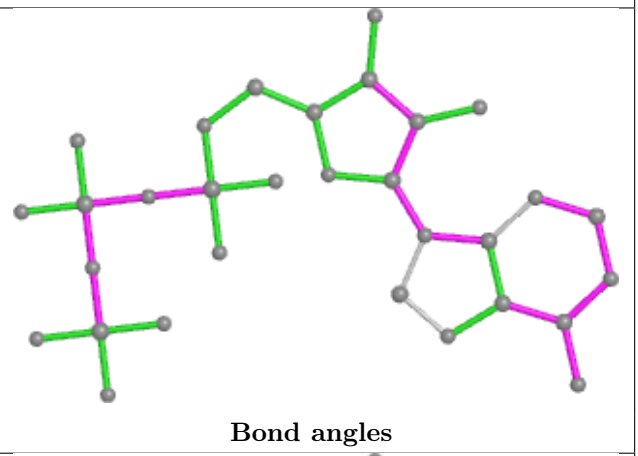
Ligand CDL J 302



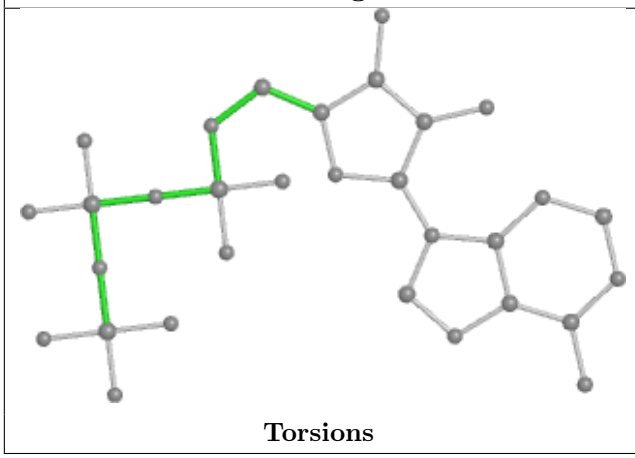
Ligand ATP G 301



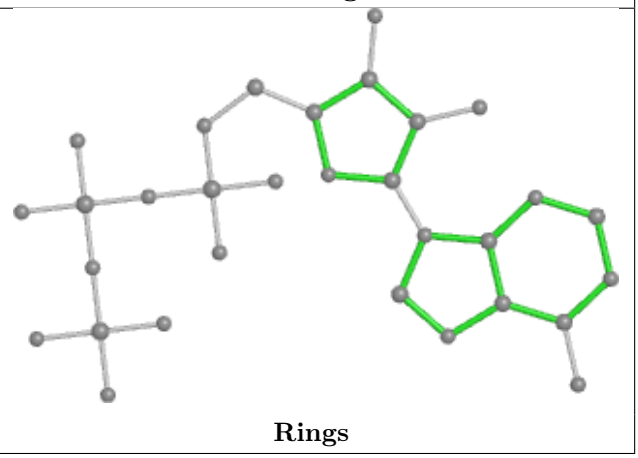
Bond lengths



Bond angles

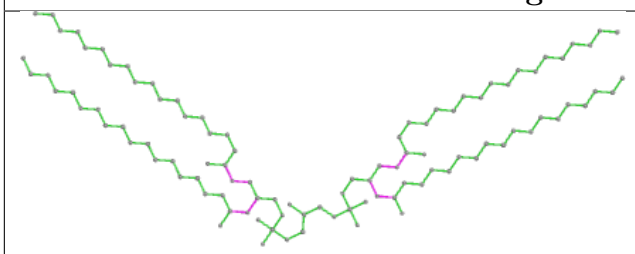


Torsions

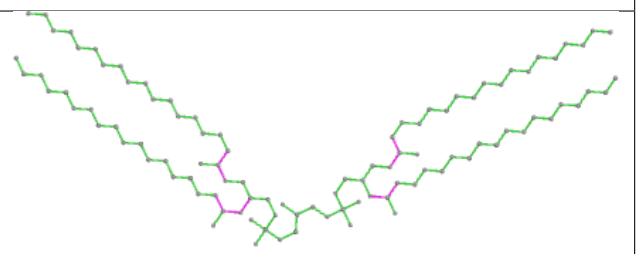


Rings

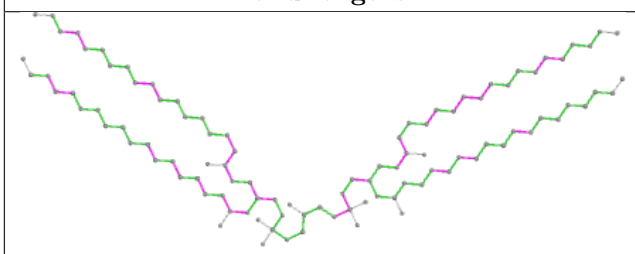
Ligand CDL P 201



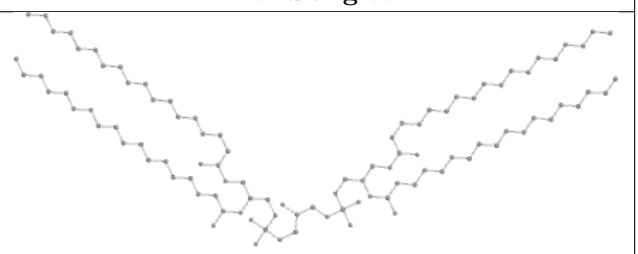
Bond lengths



Bond angles

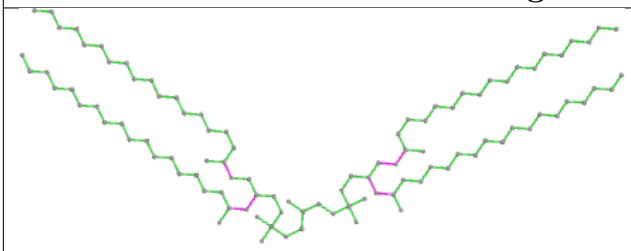


Torsions

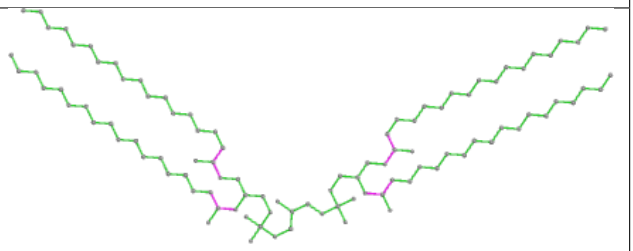


Rings

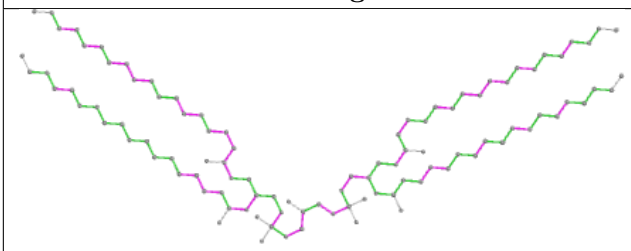
Ligand CDL b 402



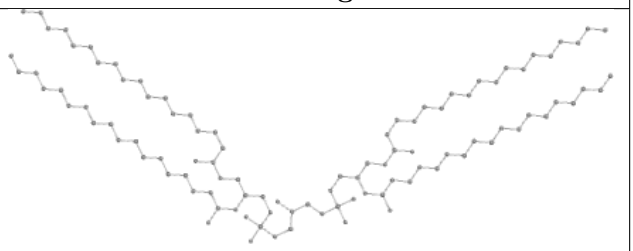
Bond lengths



Bond angles

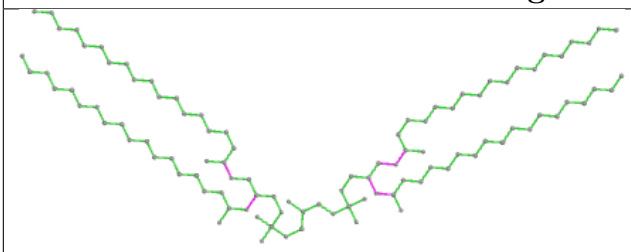


Torsions

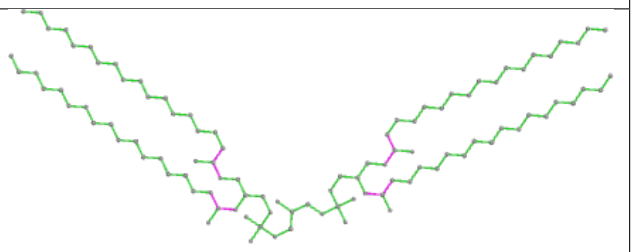


Rings

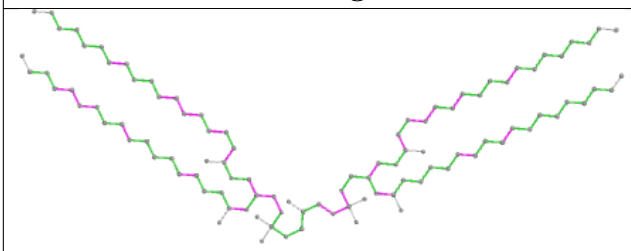
Ligand CDL J 301



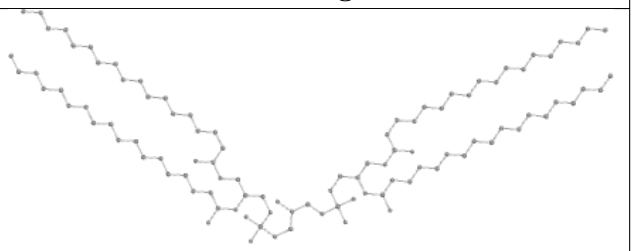
Bond lengths



Bond angles

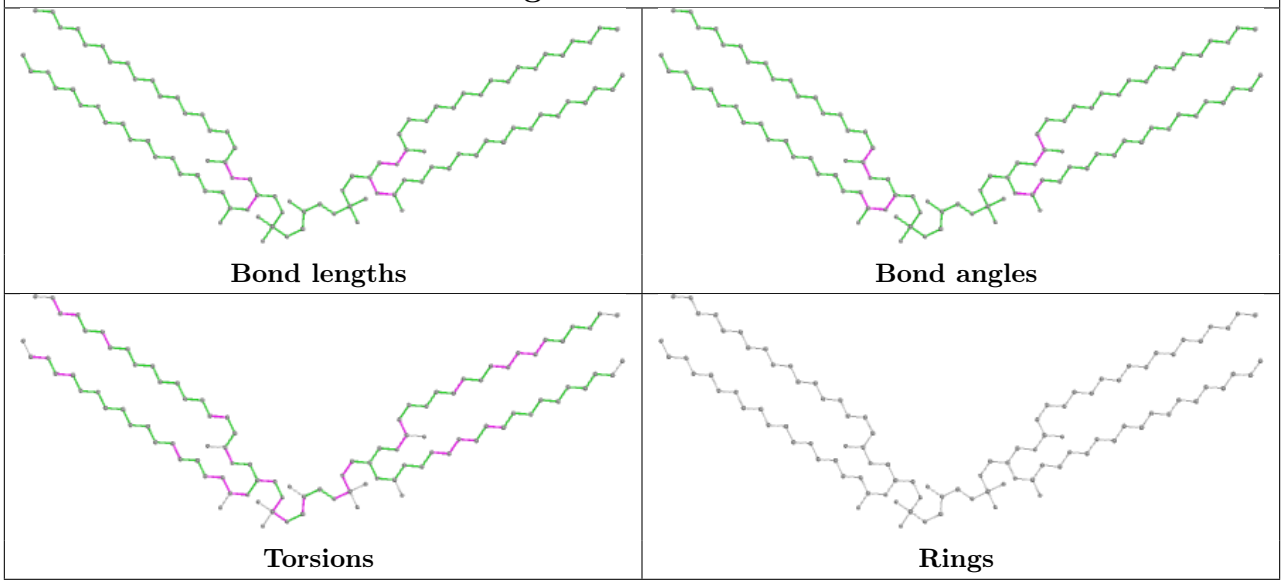


Torsions

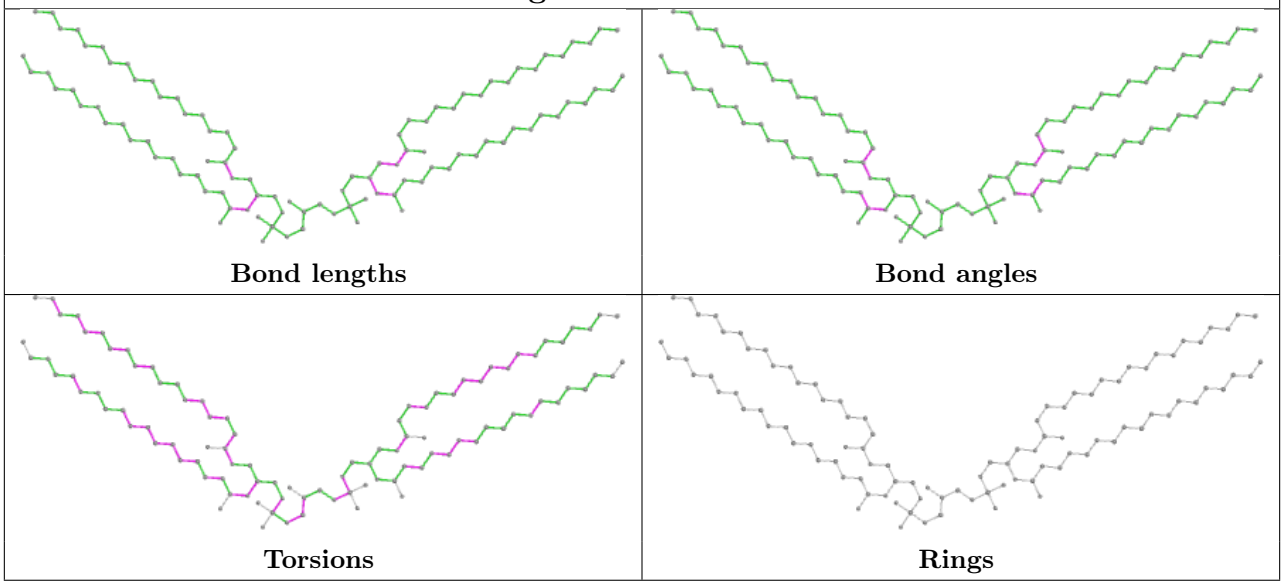


Rings

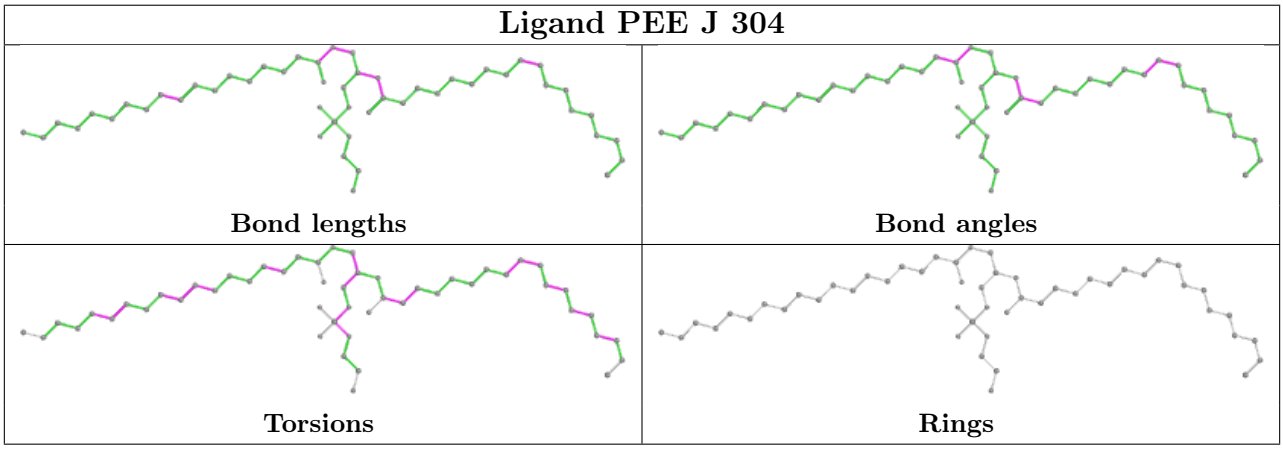
Ligand CDL K 202



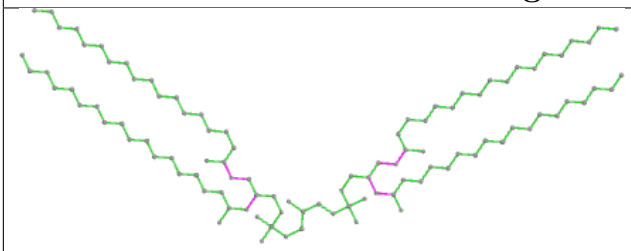
Ligand CDL k 203



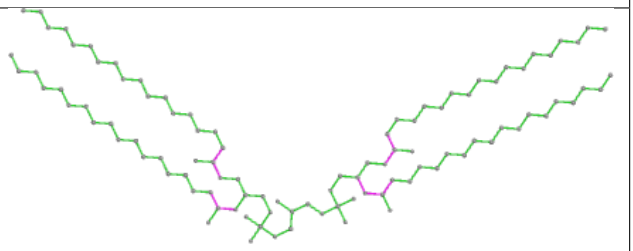
Ligand PEE J 304



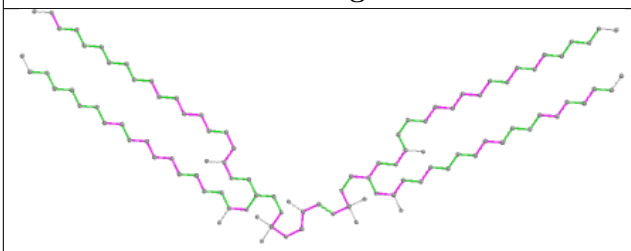
Ligand CDL A 501



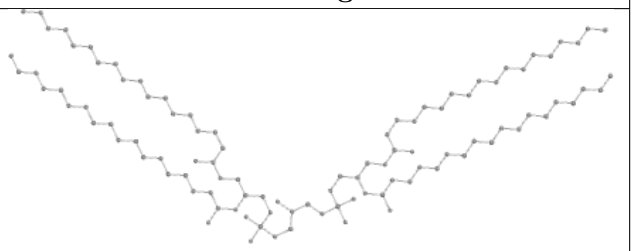
Bond lengths



Bond angles

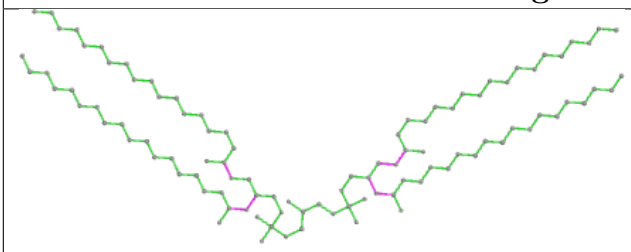


Torsions

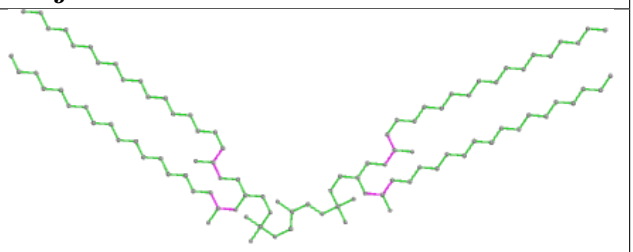


Rings

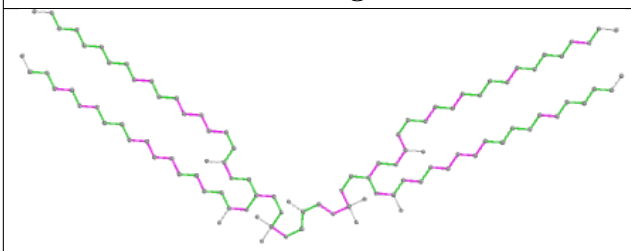
Ligand CDL j 301



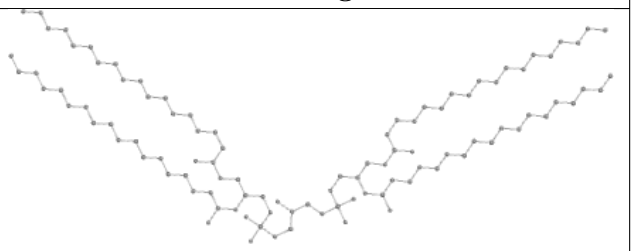
Bond lengths



Bond angles

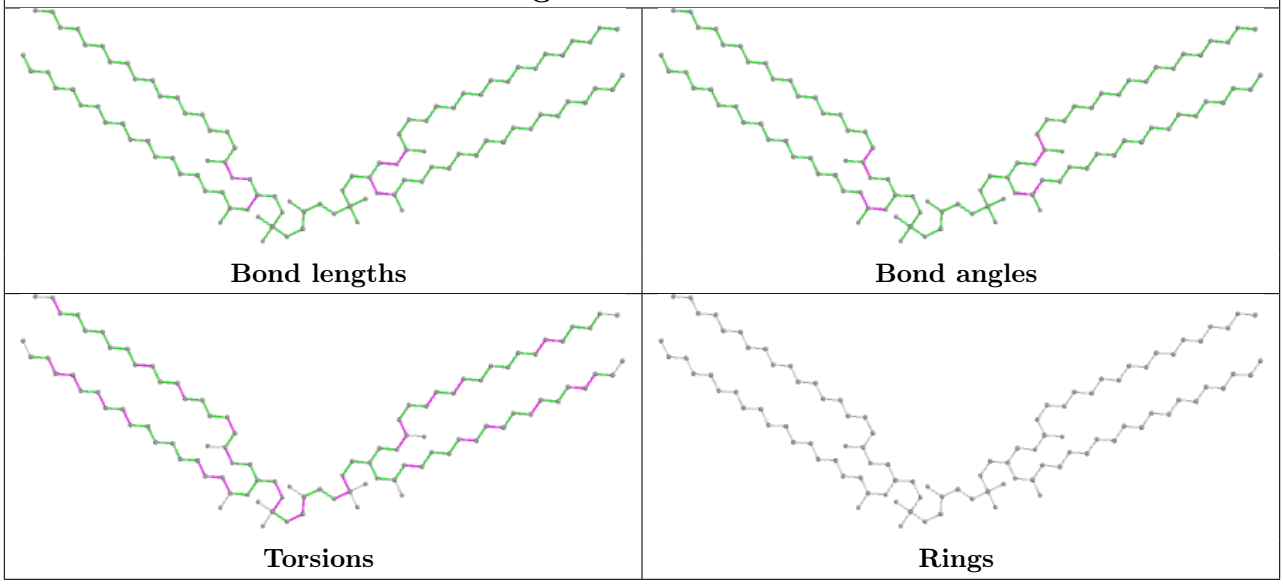


Torsions

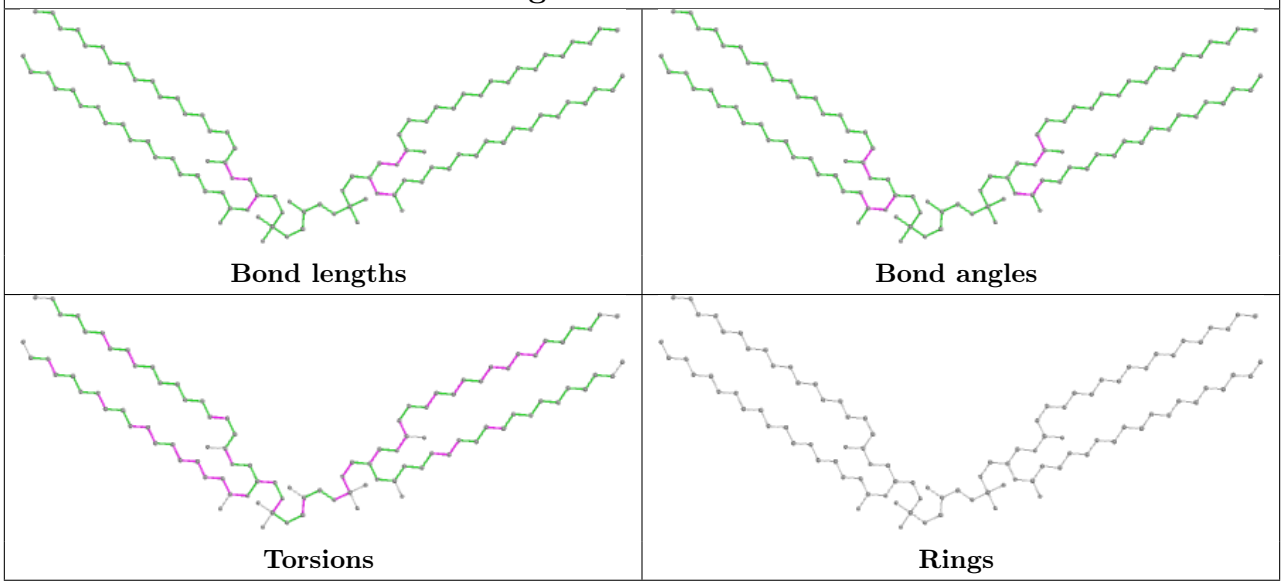


Rings

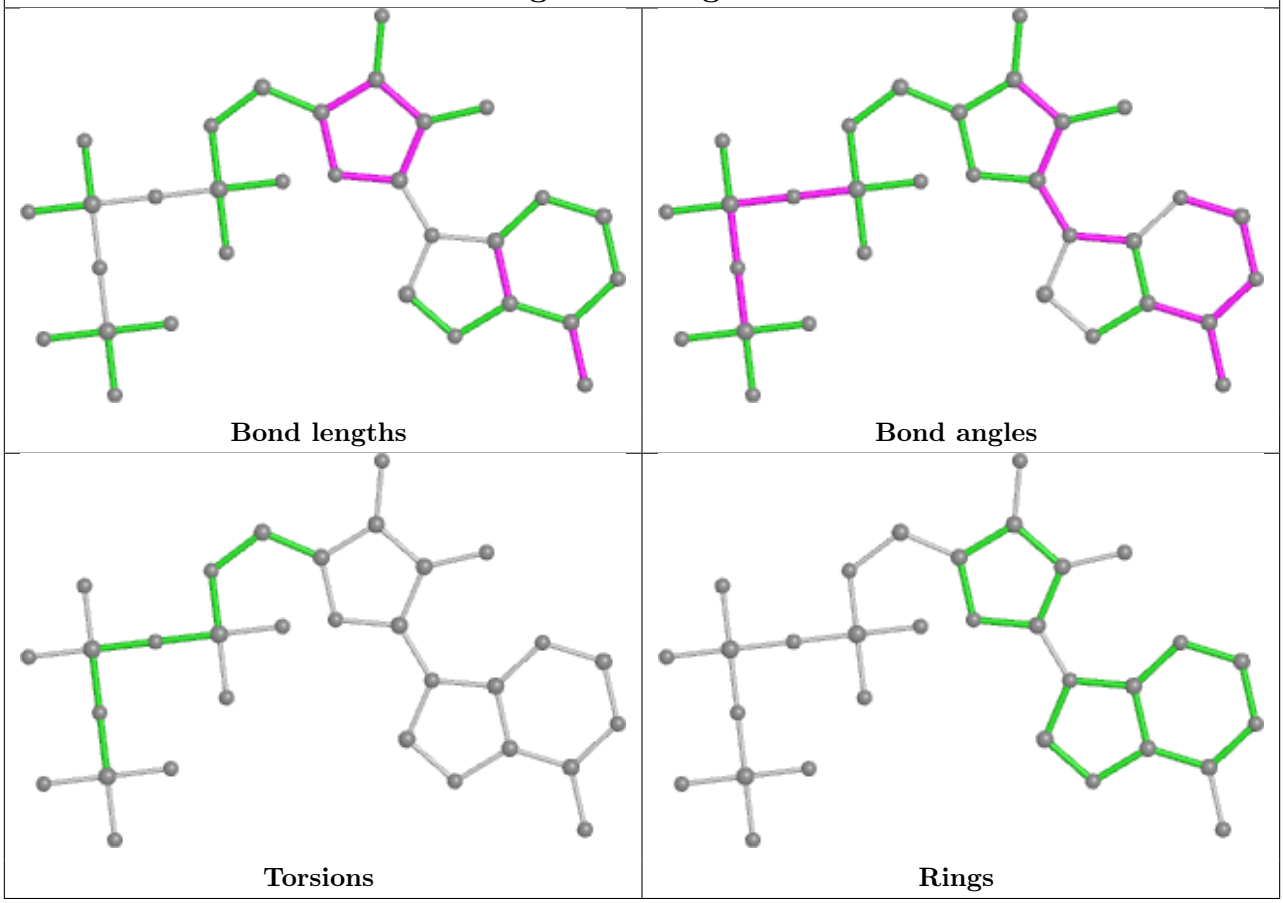
Ligand CDL l 301



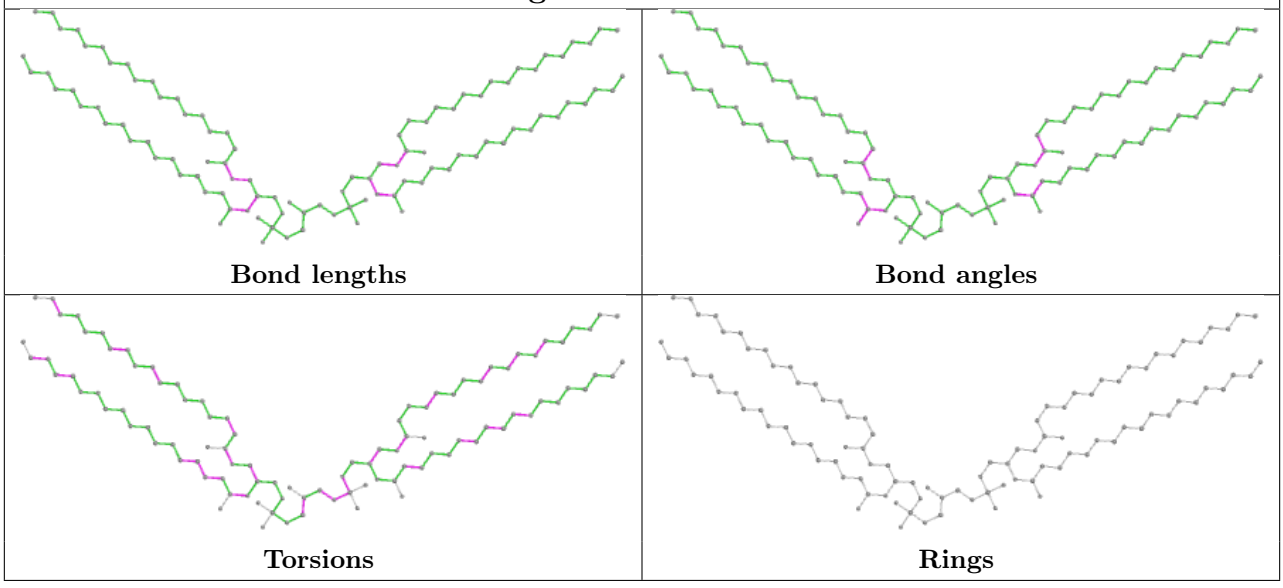
Ligand CDL k 202



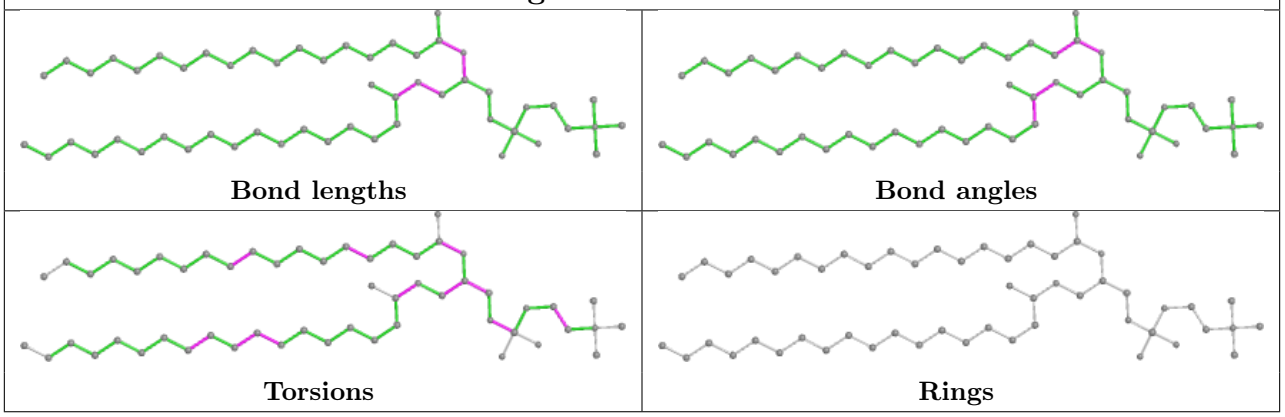
Ligand ATP g 301



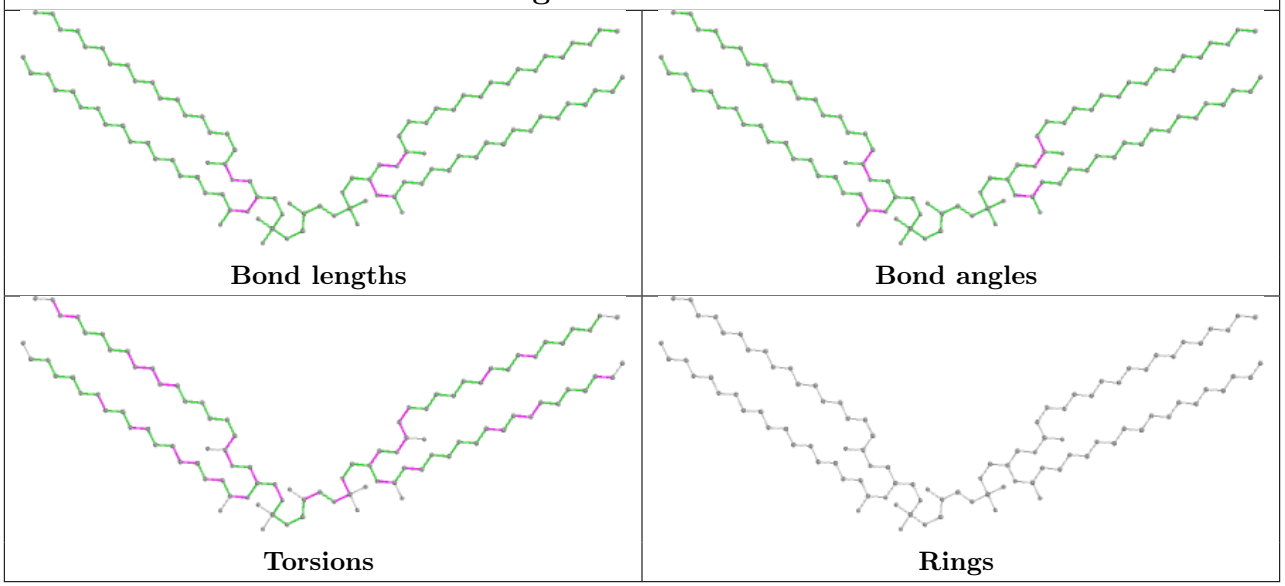
Ligand CDL k 201



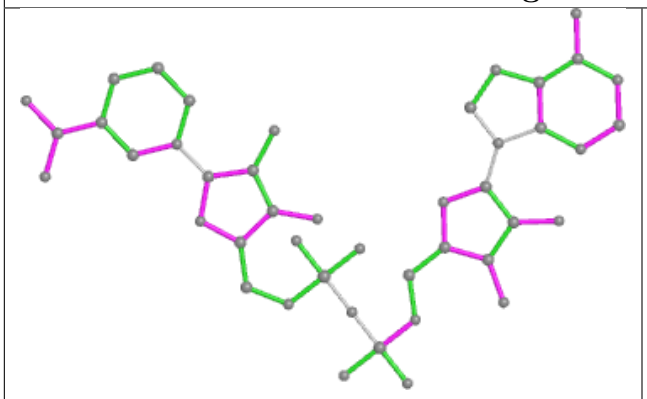
Ligand PC1 D 301



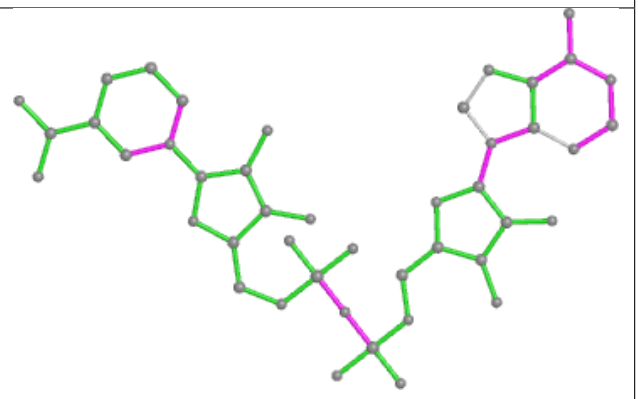
Ligand CDL f 303



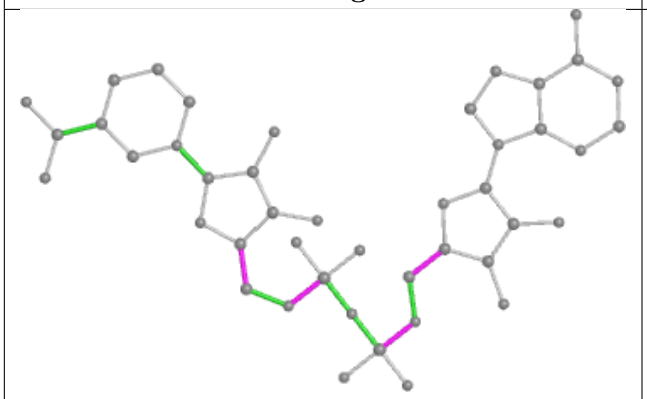
Ligand NAD E 900



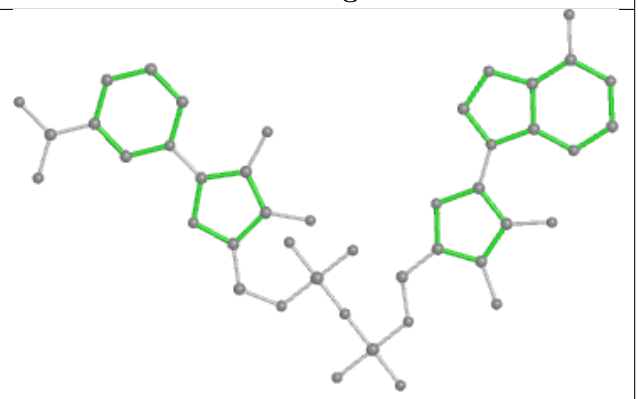
Bond lengths



Bond angles

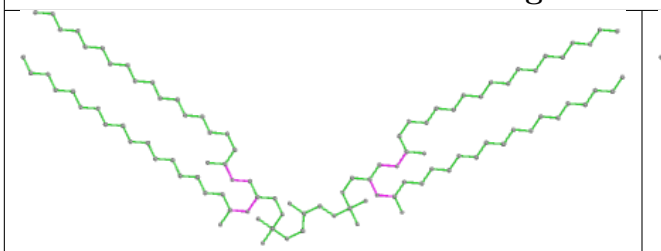


Torsions

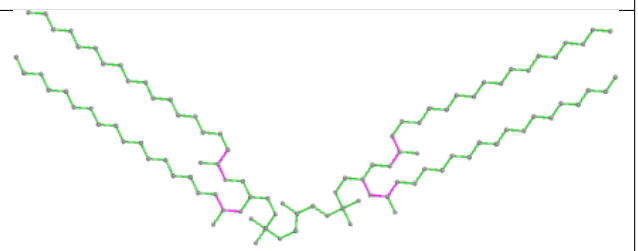


Rings

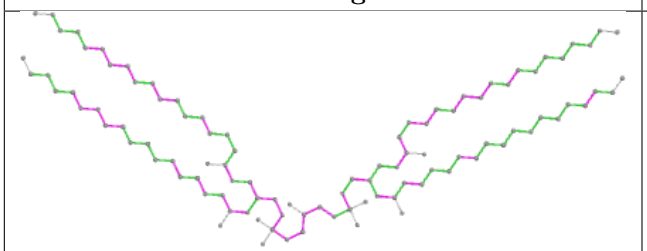
Ligand CDL B 401



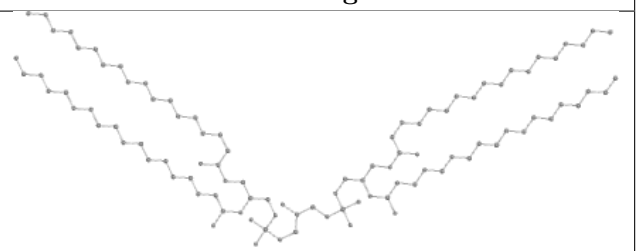
Bond lengths



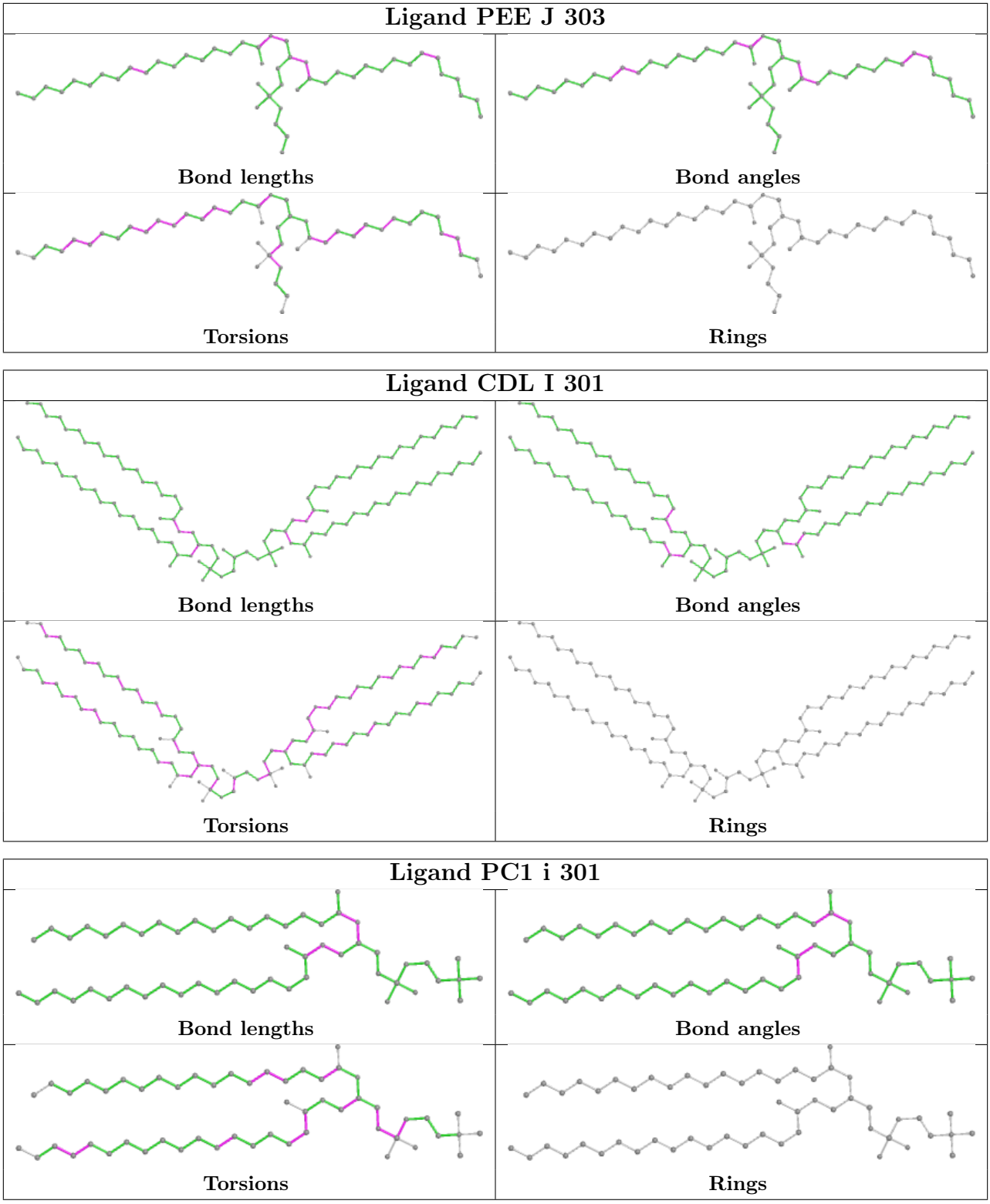
Bond angles



Torsions



Rings



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

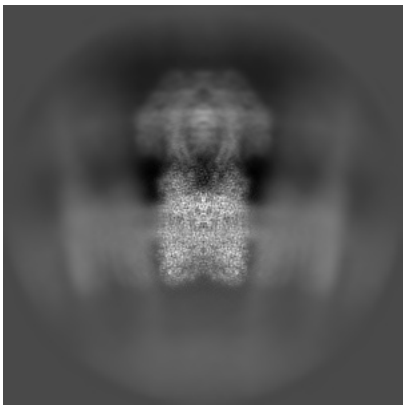
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-10859. These allow visual inspection of the internal detail of the map and identification of artifacts.

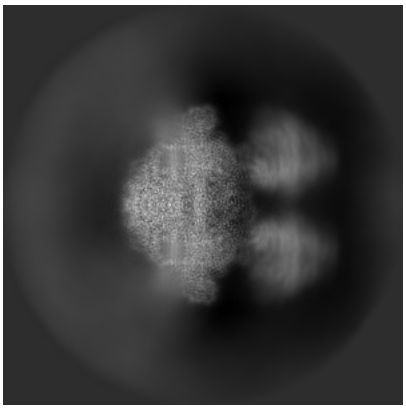
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

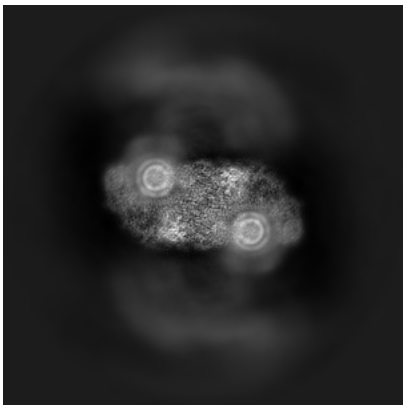
6.1.1 Primary map



X

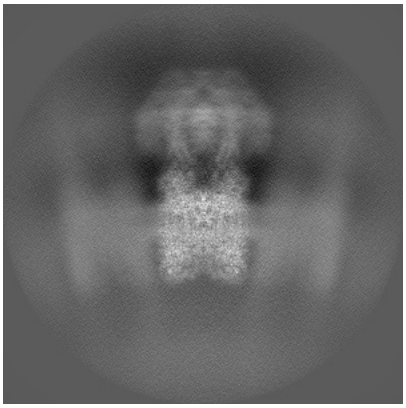


Y

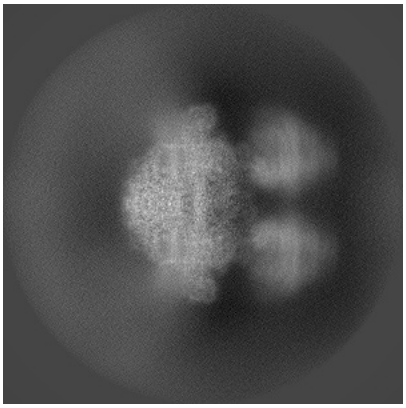


Z

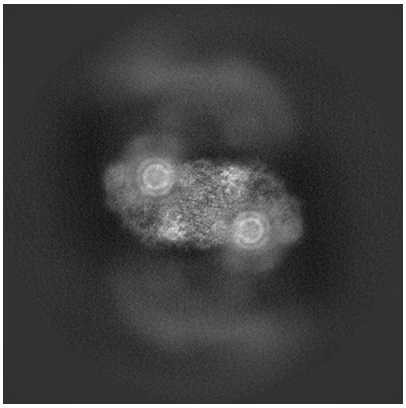
6.1.2 Raw map



X



Y

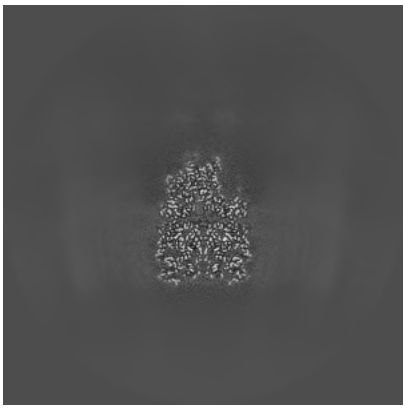


Z

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

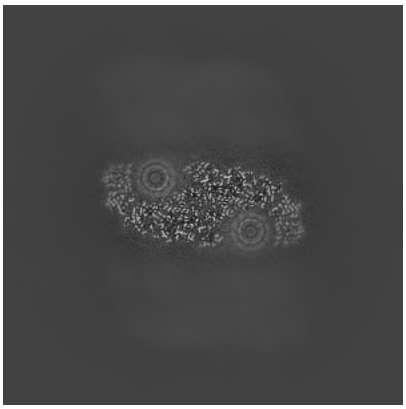
6.2 Central slices (i)

6.2.1 Primary map



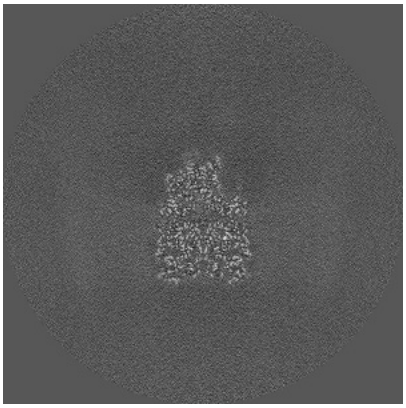
X Index: 300

Y Index: 300

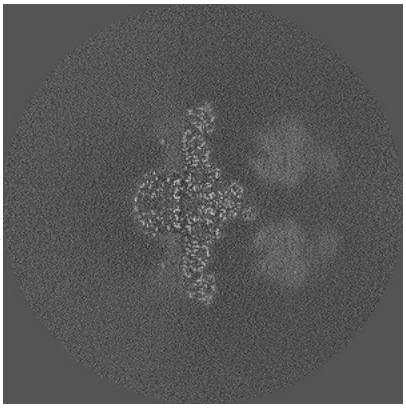


Z Index: 300

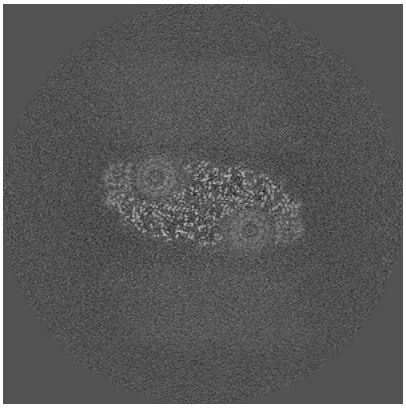
6.2.2 Raw map



X Index: 300



Y Index: 300

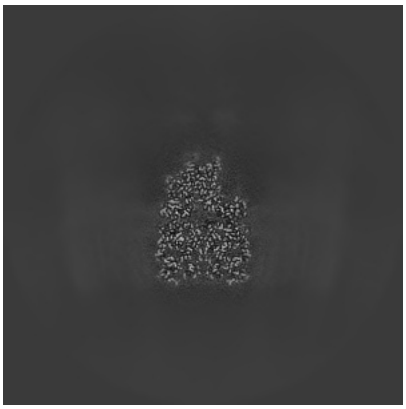


Z Index: 300

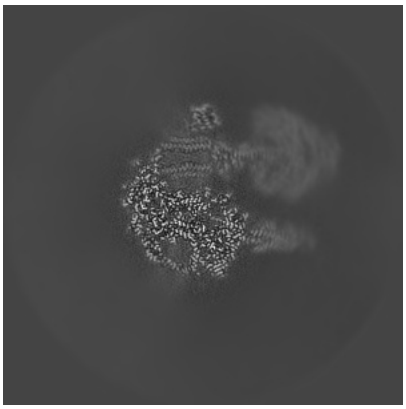
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

6.3.1 Primary map



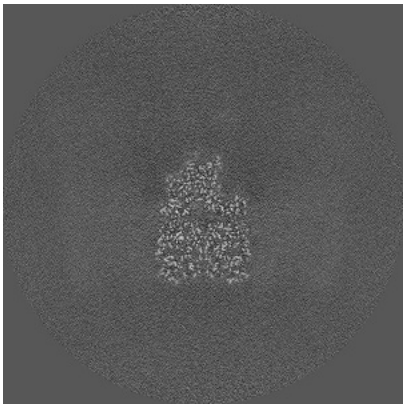
X Index: 299



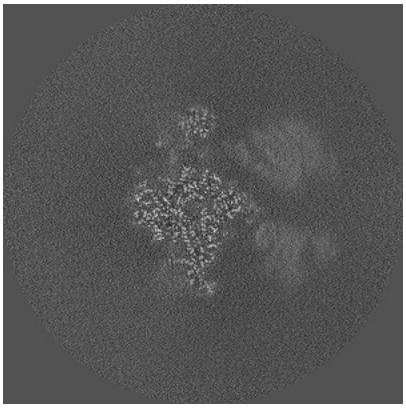
Y Index: 259

Z Index: 292

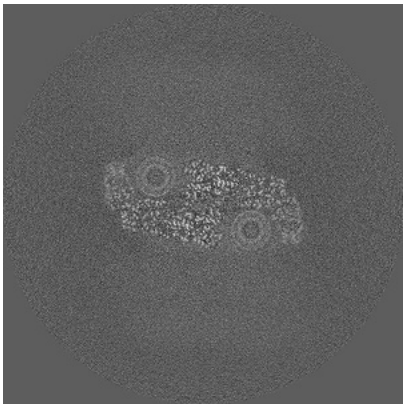
6.3.2 Raw map



X Index: 299



Y Index: 290

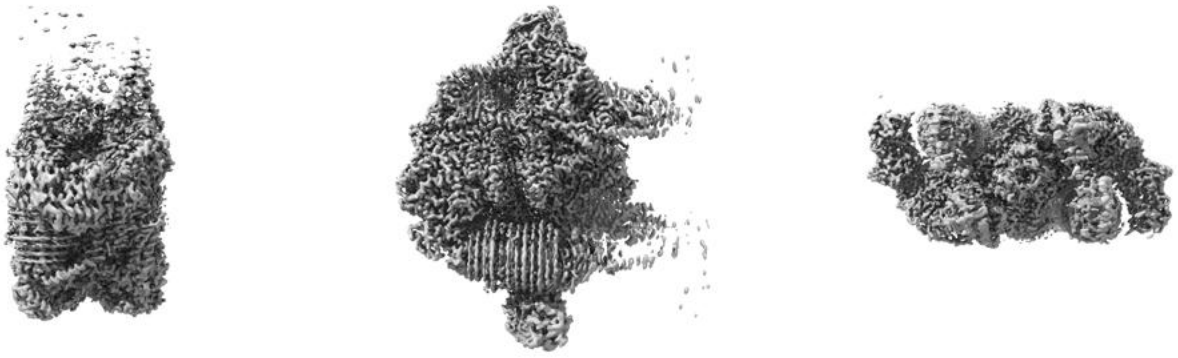


Z Index: 292

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

6.4 Orthogonal surface views (i)

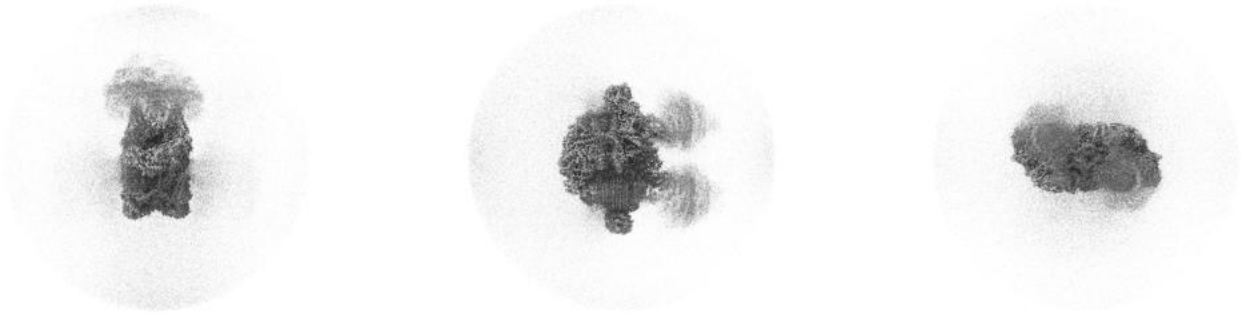
6.4.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.018. 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.

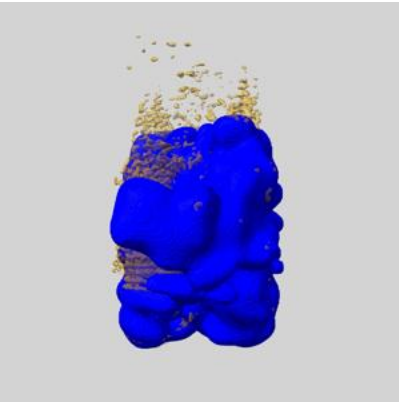
6.5 Mask visualisation (i)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

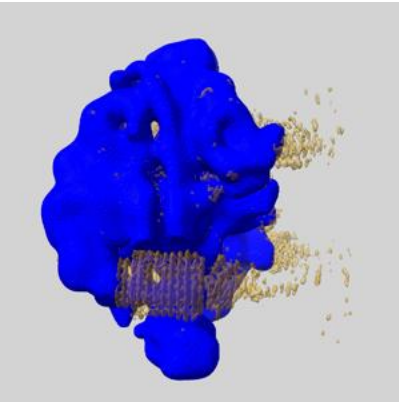
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

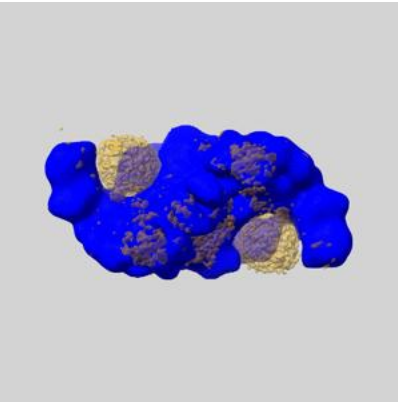
6.5.1 emd_10859_msk_1.map (i)



X



Y

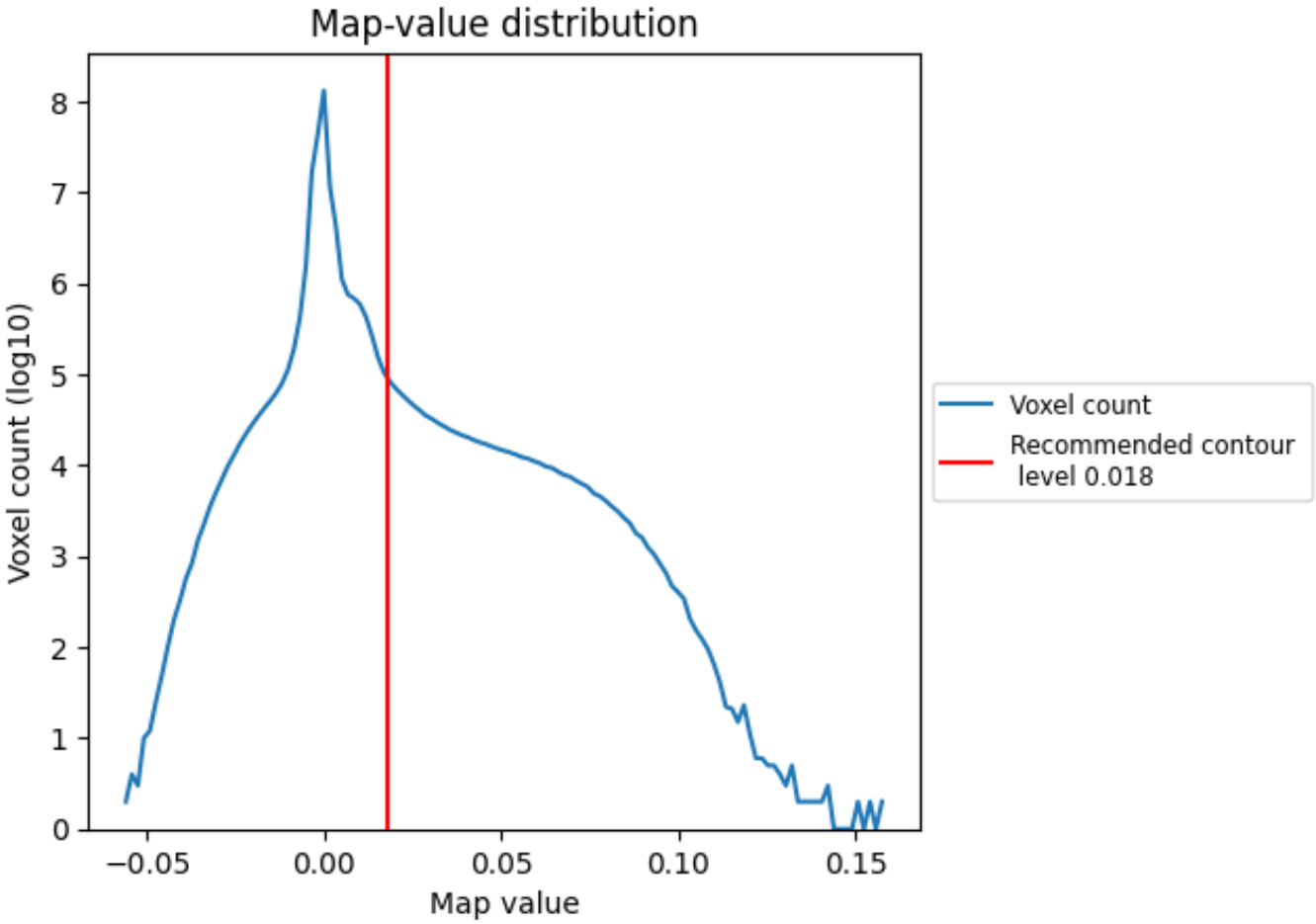


Z

7 Map analysis

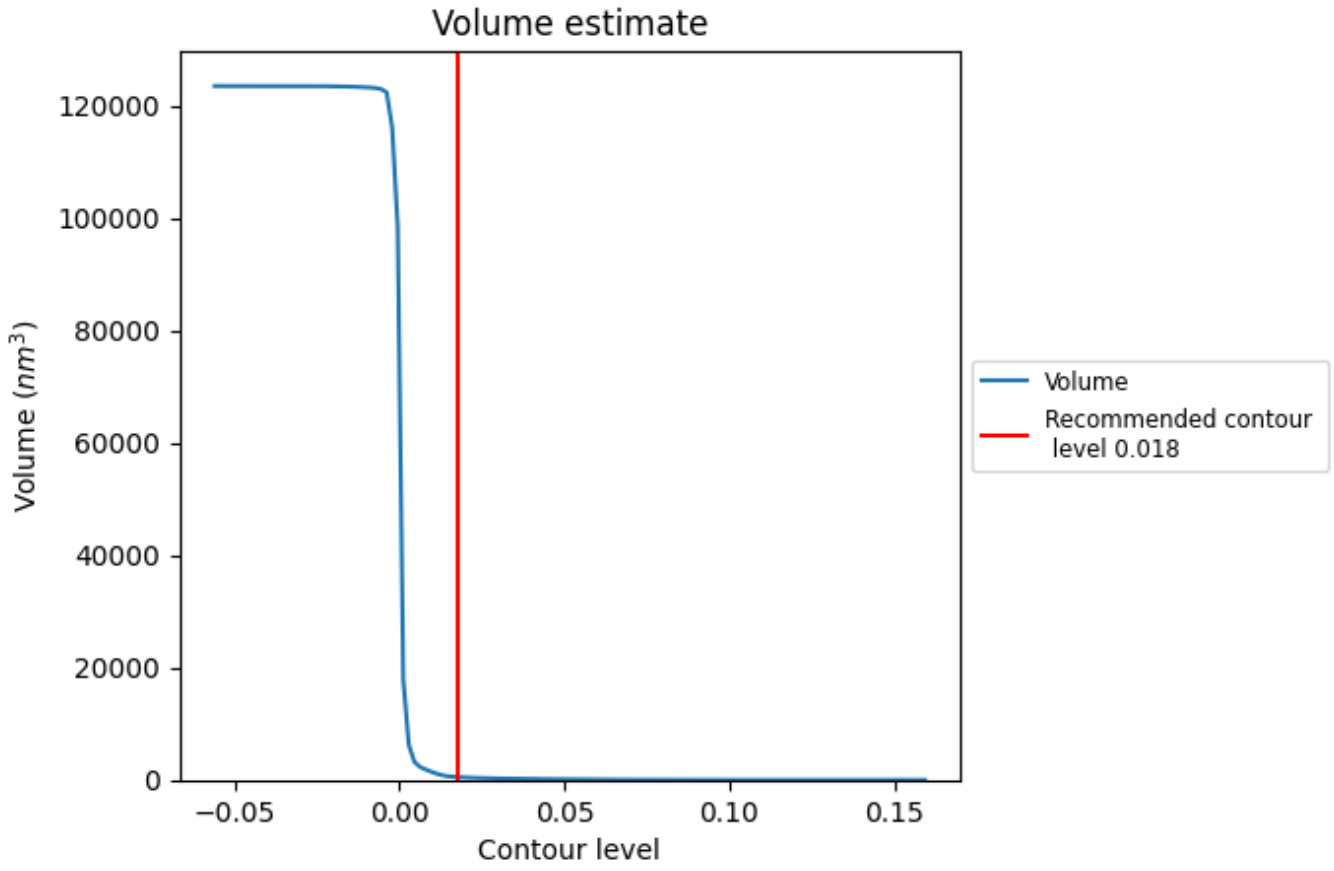
This section contains the results of statistical analysis of the map.

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.

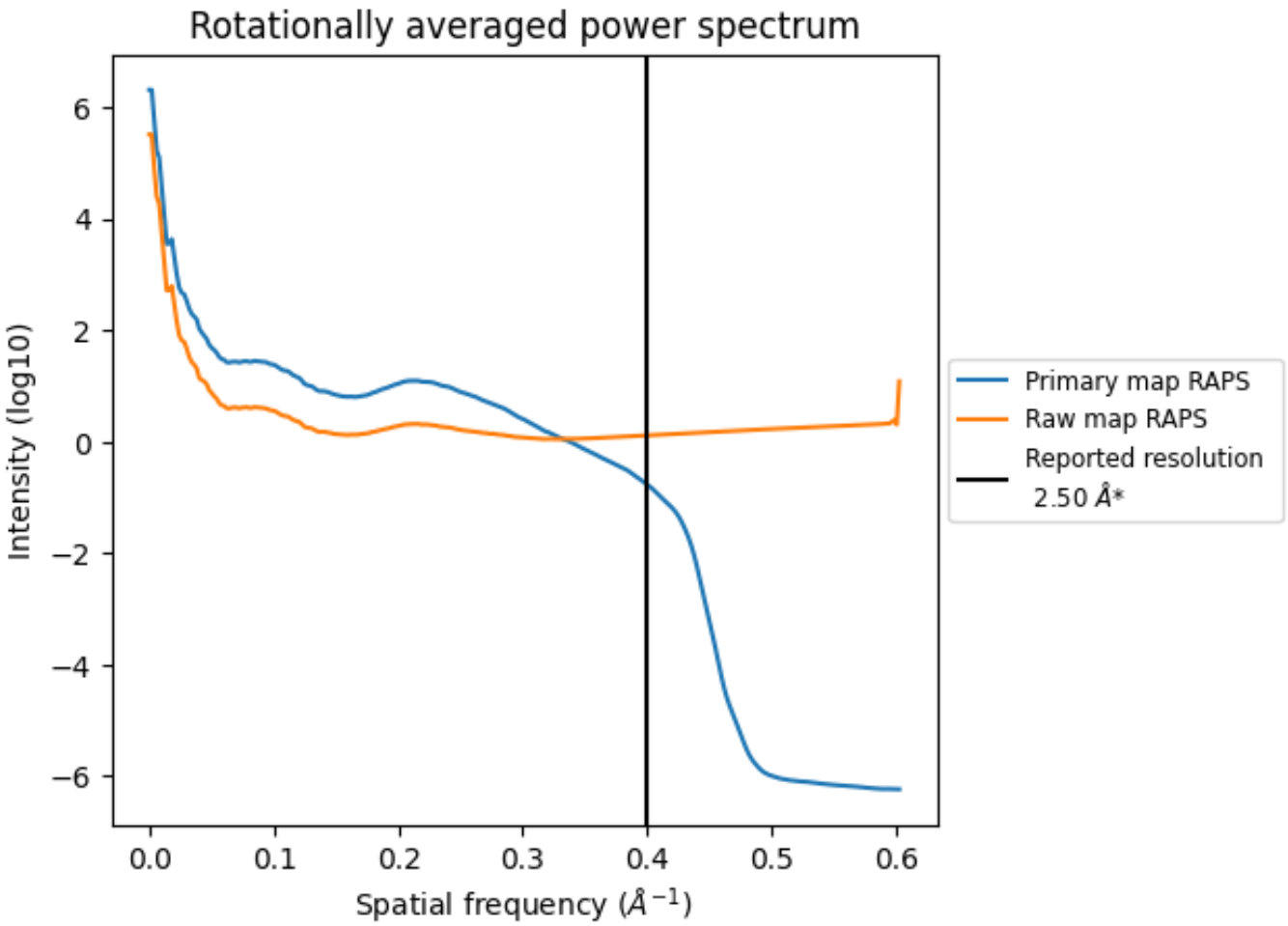
7.2 Volume estimate (i)



The volume at the recommended contour level is 494 nm^3; this corresponds to an approximate mass of 446 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)

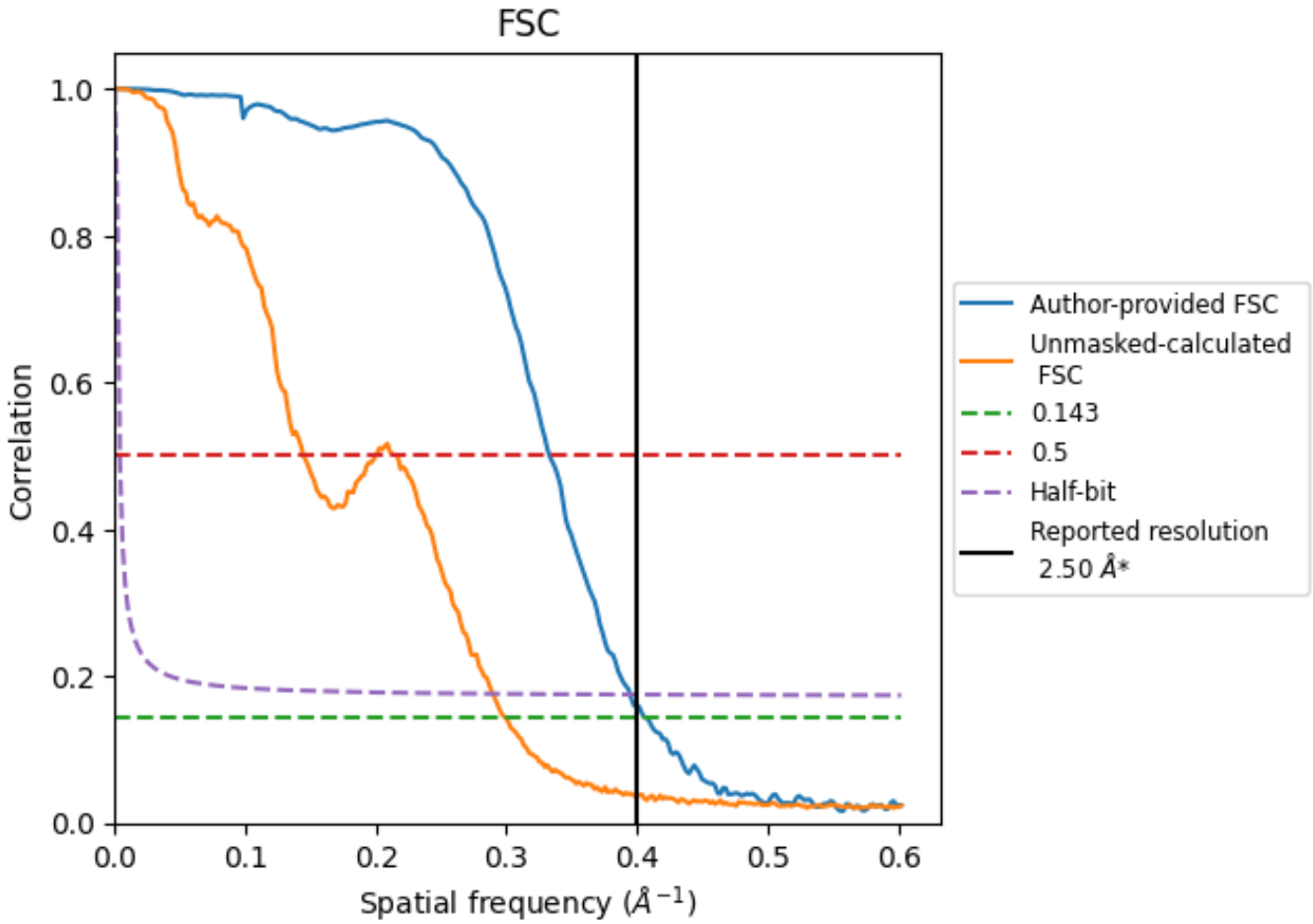


*Reported resolution corresponds to spatial frequency of 0.400 Å^{-1}

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 0.400 Å^{-1}

8.2 Resolution estimates (i)

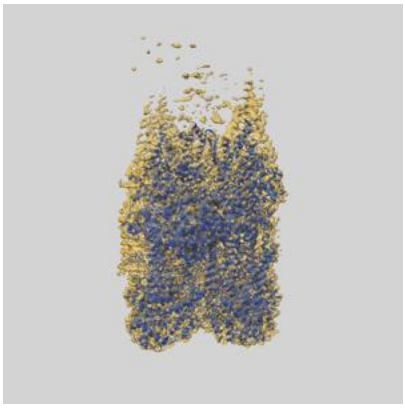
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.50	-	-
Author-provided FSC curve	2.46	3.00	2.53
Unmasked-calculated*	3.34	6.92	3.45

*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 3.34 differs from the reported value 2.5 by more than 10 %

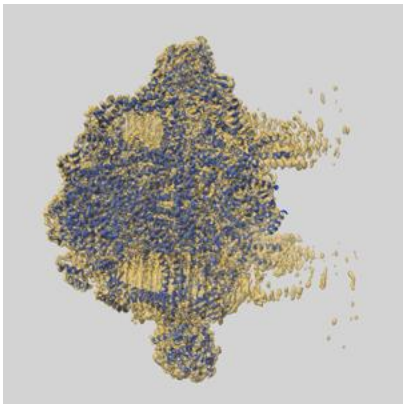
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-10859 and PDB model 6YNX. Per-residue inclusion information can be found in section 3 on page 16.

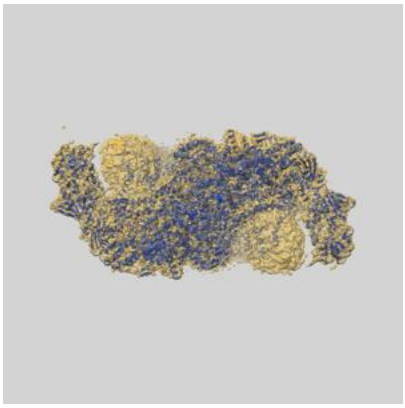
9.1 Map-model overlay



X



Y



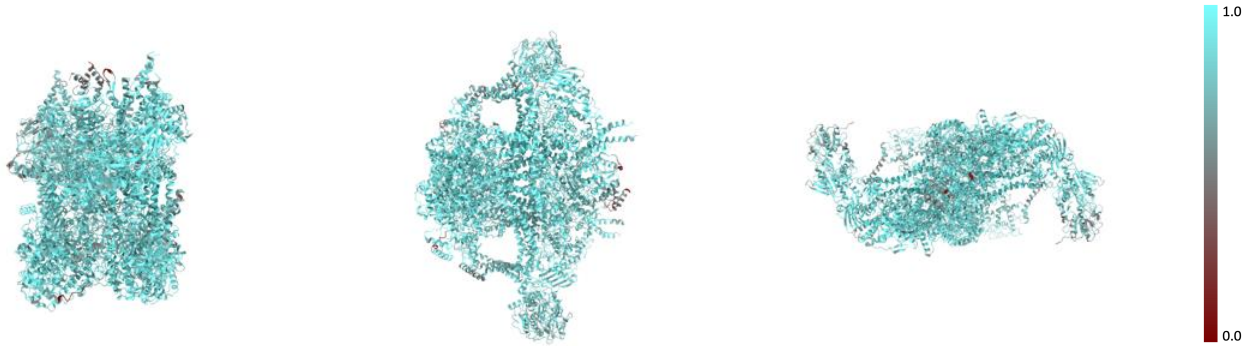
Z

The images above show the 3D surface view of the map at the recommended contour level 0.018 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)

This section was not generated.

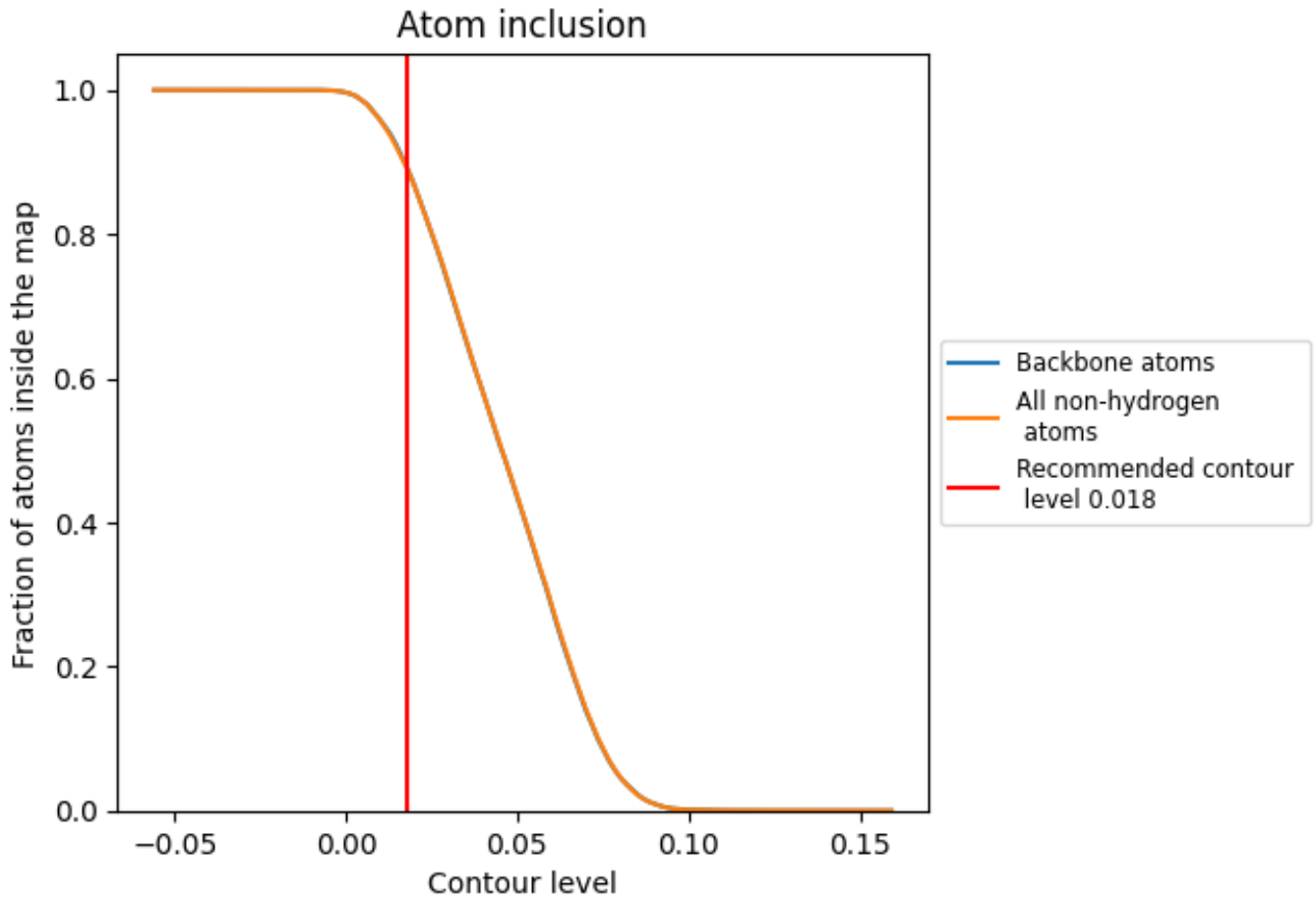
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.018).

9.4 Atom inclusion (i)



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

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.018) and Q-score for the entire model and for each chain.

Chain	Atom inclusion
All	0.8898
A	0.9409
B	0.8592
C	0.9720
D	0.9465
E	0.7793
F	0.9695
G	0.9027
H	0.9172
I	0.8917
J	0.8583
K	0.8166
L	0.9282
M	0.9642
N	0.9632
O	0.9305
P	0.7832
Q	0.9062
R	0.9354
S	0.9269
a	0.9428
b	0.8967
c	0.9708
d	0.9507
e	0.7882
f	0.9217
g	0.9173
h	0.9235
i	0.8894
i1	0.5451
i2	0.5305
j	0.8643
k	0.7809
l	0.9024
m	0.9681

Continued on next page...

Continued from previous page...

Chain	Atom inclusion
n	0.9551
o	0.9216
p	0.7932
q	0.9178
r	0.9275
s	0.9132
t	0.9228