Full wwPDB EM Validation Report ⓘ

Jan 31, 2023 – 08:15 pm GMT

PDB ID	:	7R48
EMDB ID	:	EMD-14287
Title	:	Bovine complex I in the presence of IM1761092, deactive class iv (Composite map)
Authors	:	Bridges, H.R.; Blaza, J.N.; Yin, Z.; Chung, I.; Hirst, J.
Deposited on	:	2022-02-08
Resolution	:	2.30 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/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:

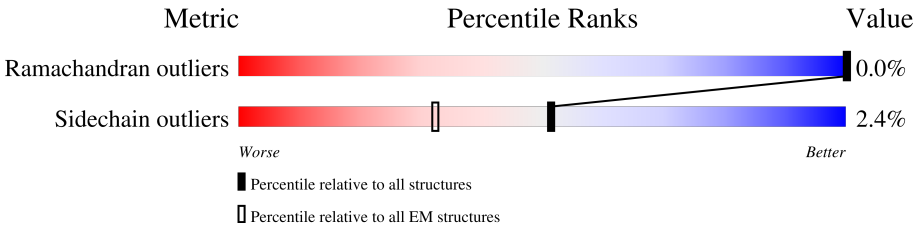
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.32.1

1 Overall quality at a glance

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

The reported resolution of this entry is 2.30 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	115	10%, 90%, 10%
2	B	216	71%, 28%
3	C	266	77%, 23%
4	D	463	88%, 10%
5	E	249	84%, 14%
6	F	464	92%, 7%
7	G	727	92%, 5%
8	H	318	5%, 95%
9	I	212	82%, 17%

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Mol	Chain	Length	Quality of chain
10	J	175	9% 97%
11	K	98	97%
12	L	606	98%
13	M	459	99%
14	N	347	99%
15	O	343	92% 7%
16	P	380	76% 22%
17	Q	175	70% 29%
18	R	124	73% 23%
19	S	99	6% 85% 13%
20	T	156	12% 46% 51%
20	U	156	53% 46%
21	V	116	97%
22	W	128	88% 11%
23	X	172	97%
24	Y	141	28% 94% 6%
25	Z	144	5% 98%
26	a	70	99%
27	b	84	93% 6%
28	c	76	62% 37%
29	d	120	5% 93% 7%
30	e	106	9% 88% 10%
31	f	57	12% 86% 11%
32	g	154	61% 36%
33	h	189	72% 27%

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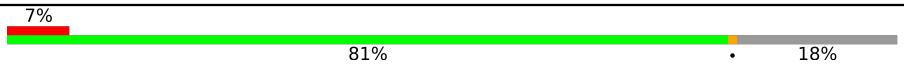
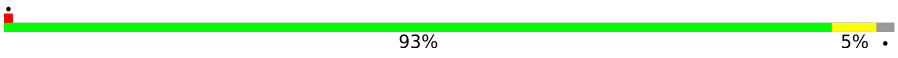
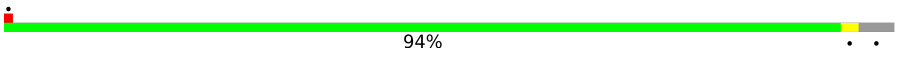
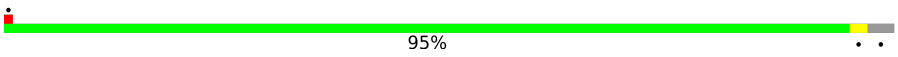
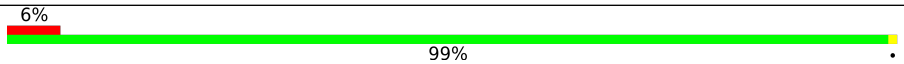
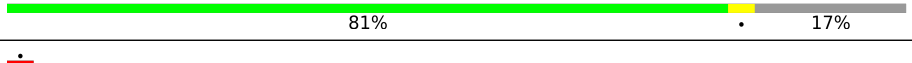
Mol	Chain	Length	Quality of chain
34	i	127	
35	j	108	
36	k	98	
37	l	186	
38	m	129	
39	n	179	
40	o	136	
41	p	176	
42	q	145	
43	r	113	
44	s	109	

2 Entry composition

There are 60 unique types of molecules in this entry. The entry contains 69247 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 NADH-ubiquinone oxidoreductase chain 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	104	836	568	122	141	5	0	0

- Molecule 2 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 7, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	156	1247	795	225	213	14	0	0

- Molecule 3 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 3, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	206	1714	1107	295	309	3	0	0

- Molecule 4 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 2, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	419	3373	2156	579	613	25	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	129	ARG	GLN	variant	UNP P17694

- Molecule 5 is a protein called NADH dehydrogenase [ubiquinone] flavoprotein 2, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	213	Total	C	N	O	S	0	0
			1655	1057	277	311	10		

- Molecule 6 is a protein called NADH dehydrogenase [ubiquinone] flavoprotein 1, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	431	Total	C	N	O	S	0	0
			3319	2091	593	615	20		

- Molecule 7 is a protein called NADH-ubiquinone oxidoreductase 75 kDa subunit, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	688	Total	C	N	O	S	0	0
			5279	3307	920	1013	39		

- Molecule 8 is a protein called NADH-ubiquinone oxidoreductase chain 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	311	Total	C	N	O	S	0	0
			2457	1648	377	409	23		

- Molecule 9 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 8, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	176	Total	C	N	O	S	0	0
			1414	889	243	270	12		

- Molecule 10 is a protein called NADH-ubiquinone oxidoreductase chain 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	174	Total	C	N	O	S	0	0
			1337	902	189	234	12		

- Molecule 11 is a protein called NADH-ubiquinone oxidoreductase chain 4L.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	98	Total	C	N	O	S	0	0
			745	486	112	131	16		

- Molecule 12 is a protein called NADH-ubiquinone oxidoreductase chain 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	606	Total	C	N	O	S	0	0
			4786	3184	735	824	43		

- Molecule 13 is a protein called NADH-ubiquinone oxidoreductase chain 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	M	459	Total	C	N	O	S	0	0
			3654	2436	570	609	39		

- Molecule 14 is a protein called NADH-ubiquinone oxidoreductase chain 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	347	Total	C	N	O	S	0	0
			2733	1817	416	457	43		

- Molecule 15 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 10, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	O	320	Total	C	N	O	S	0	0
			2589	1662	429	488	10		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
O	255	LYS	ASN	variant	UNP P34942

- Molecule 16 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 9, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	P	295	Total	C	N	O	S	0	0
			2353	1507	424	417	5		

- Molecule 17 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 4, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	Q	125	Total	C	N	O	S	0	0
			1016	641	181	191	3		

- Molecule 18 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 6, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	R	95	Total	C	N	O	S	0	0
			730	448	137	142	3		

- Molecule 19 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	S	86	Total	C	N	O	S	0	0
			691	434	129	126	2		

- Molecule 20 is a protein called Acyl carrier protein, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	T	76	Total	C	N	O	S	0	0
			612	393	90	124	5		
20	U	84	Total	C	N	O	S	0	0
			681	439	100	137	5		

- Molecule 21 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	V	114	Total	C	N	O	S	0	0
			923	597	156	167	3		

- Molecule 22 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	W	114	Total	C	N	O	S	0	0
			971	622	180	165	4		

- Molecule 23 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	X	171	Total	C	N	O	S	0	0
			1402	887	253	252	10		

- Molecule 24 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	Y	140	Total	C	N	O	S	0	0
			1030	657	176	191	6		

- Molecule 25 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	Z	141	Total	C	N	O	S	0	0
			1152	740	201	202	9		

- Molecule 26 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	a	69	Total	C	N	O	S	0	0
			561	361	103	92	5		

- Molecule 27 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	b	83	Total	C	N	O	S	0	0
			651	425	109	115	2		

- Molecule 28 is a protein called NADH dehydrogenase [ubiquinone] 1 subunit C1, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
28	c	48	Total	C	N	O	0	0
			405	268	69	68		

- Molecule 29 is a protein called NADH dehydrogenase [ubiquinone] 1 subunit C2.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	d	112	Total	C	N	O	S	0	0
			934	613	157	161	3		

- Molecule 30 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	e	95	Total	C	N	O	S	0	0
			799	506	150	137	6		

- Molecule 31 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	f	51	Total	C	N	O	S	0	0
			444	291	78	74	1		

- Molecule 32 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 11, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	g	98	Total	C	N	O	S	0	0
			824	529	137	154	4		

- Molecule 33 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 5, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	h	138	Total	C	N	O	S	0	0
			1154	759	196	197	2		

- Molecule 34 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	i	104	Total	C	N	O	S	0	0
			892	588	151	152	1		

- Molecule 35 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 2, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	j	67	Total	C	N	O	S	0	0
			580	381	95	103	1		

- Molecule 36 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	k	79	Total	C	N	O	S	0	0
			638	418	107	111	2		

- Molecule 37 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 8, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	l	155	Total	C	N	O	S	0	0
			1304	844	213	239	8		

- Molecule 38 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 4.

Mol	Chain	Residues	Atoms				AltConf	Trace
38	m	126	Total	C	N	O	0	0
			1050	672	186	192		

- Molecule 39 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 9.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	n	171	Total	C	N	O	S	0	0
			1487	952	272	256	7		

- Molecule 40 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	o	120	Total	C	N	O	S	0	0
			1035	645	199	183	8		

- Molecule 41 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	p	170	Total	C	N	O	S	0	0
			1435	900	265	262	8		

- Molecule 42 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	q	145	Total	C	N	O	S	0	0
			1209	778	216	210	5		

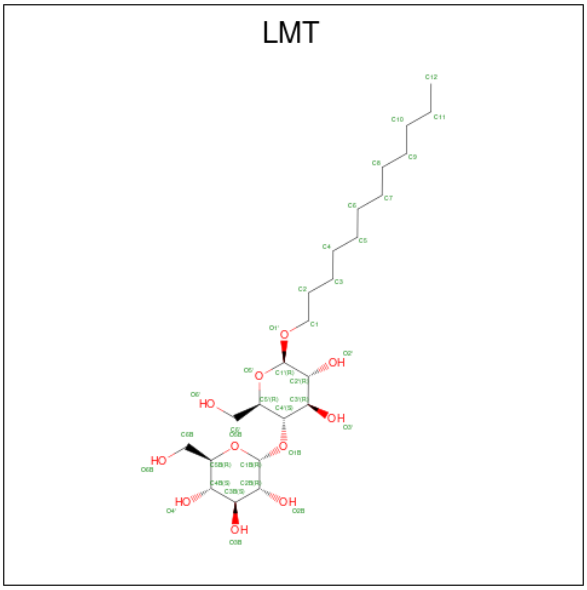
- Molecule 43 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	r	94	Total	C	N	O	S	0	0
			767	485	143	136	3		

- Molecule 44 is a protein called NADH dehydrogenase [ubiquinone] flavoprotein 3, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	s	44	Total	C	N	O	S	0	0
			371	233	66	71	1		

- Molecule 45 is DODECYL-BETA-D-MALTOSIDE (three-letter code: LMT) (formula: $C_{24}H_{46}O_{11}$).



Mol	Chain	Residues	Atoms			AltConf
45	A	1	Total	C	O	0
			35	24	11	
45	A	1	Total	C	O	0
			35	24	11	
45	B	1	Total	C	O	0
			35	24	11	
45	J	1	Total	C	O	0
			35	24	11	
45	L	1	Total	C	O	0
			35	24	11	
45	M	1	Total	C	O	0
			35	24	11	
45	M	1	Total	C	O	0
			35	24	11	

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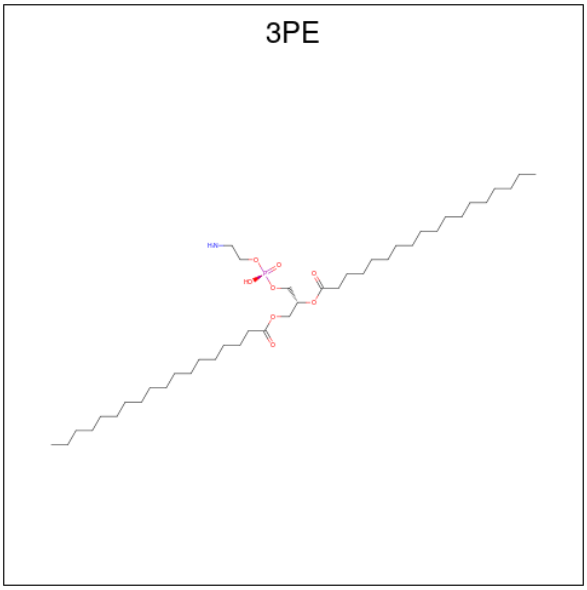
Mol	Chain	Residues	Atoms	AltConf
45	M	1	Total C O 35 24 11	0
45	N	1	Total C O 35 24 11	0
45	Y	1	Total C O 35 24 11	0
45	f	1	Total C O 35 24 11	0
45	h	1	Total C O 35 24 11	0
45	k	1	Total C O 35 24 11	0
45	l	1	Total C O 35 24 11	0
45	m	1	Total C O 35 24 11	0

- Molecule 46 is 1,2-Distearoyl-sn-glycerophosphoethanolamine (three-letter code: 3PE) (formula: $C_{41}H_{82}NO_8P$).



Mol	Chain	Residues	Atoms	AltConf
46	A	1	Total C N O P 48 38 1 8 1	0
46	H	1	Total C N O P 44 34 1 8 1	0
46	H	1	Total C N O P 34 24 1 8 1	0

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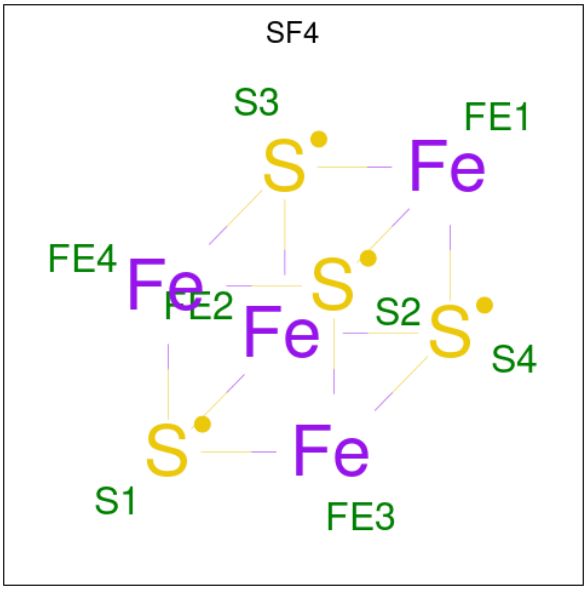
Mol	Chain	Residues	Atoms					AltConf
46	I	1	Total	C	N	O	P	0
			51	41	1	8	1	
46	L	1	Total	C	N	O	P	0
			49	39	1	8	1	
46	L	1	Total	C	N	O	P	0
			45	35	1	8	1	
46	L	1	Total	C	N	O	P	0
			29	19	1	8	1	
46	M	1	Total	C	N	O	P	0
			46	36	1	8	1	
46	M	1	Total	C	N	O	P	0
			51	41	1	8	1	
46	N	1	Total	C	N	O	P	0
			41	31	1	8	1	
46	Y	1	Total	C	N	O	P	0
			35	25	1	8	1	
46	d	1	Total	C	N	O	P	0
			47	37	1	8	1	
46	m	1	Total	C	N	O	P	0
			41	31	1	8	1	

- Molecule 47 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe_4S_4).



Mol	Chain	Residues	Atoms			AltConf
47	B	1	Total	Fe	S	0
			8	4	4	

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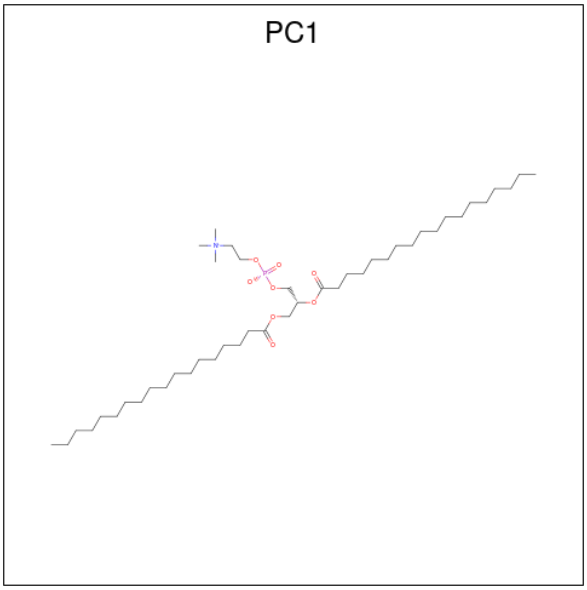
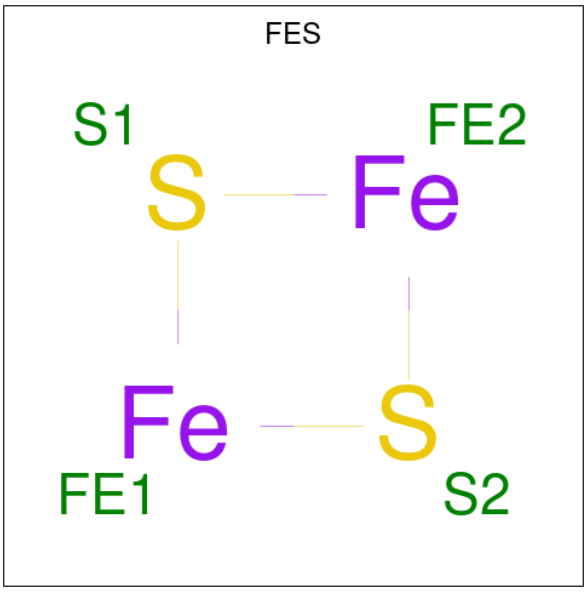
Mol	Chain	Residues	Atoms	AltConf
47	F	1	Total Fe S 8 4 4	0
47	G	1	Total Fe S 8 4 4	0
47	G	1	Total Fe S 8 4 4	0
47	I	1	Total Fe S 8 4 4	0
47	I	1	Total Fe S 8 4 4	0

- Molecule 48 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOCHOLINE (three-letter code: PC1) (formula: $C_{44}H_{88}NO_8P$).



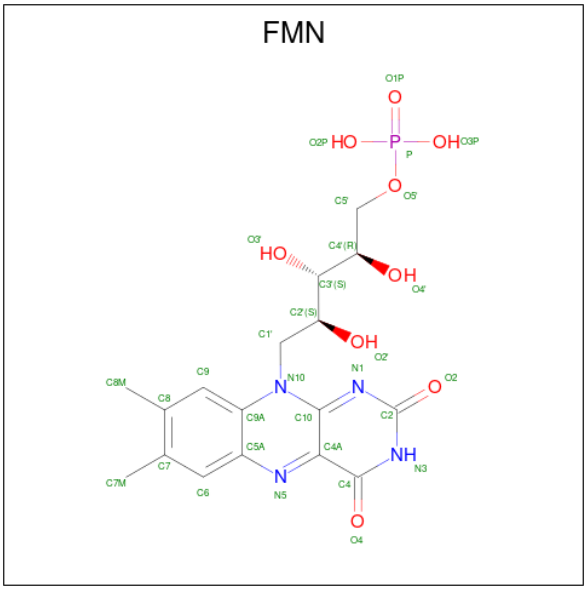
Mol	Chain	Residues	Atoms	AltConf
48	B	1	Total C N O P 35 25 1 8 1	0
48	g	1	Total C N O P 49 39 1 8 1	0

- Molecule 49 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe_2S_2).



Mol	Chain	Residues	Atoms			AltConf
49	E	1	Total	Fe	S	0
			4	2	2	
49	G	1	Total	Fe	S	0
			4	2	2	

- Molecule 50 is FLAVIN MONONUCLEOTIDE (three-letter code: FMN) (formula: $C_{17}H_{21}N_4O_9P$).

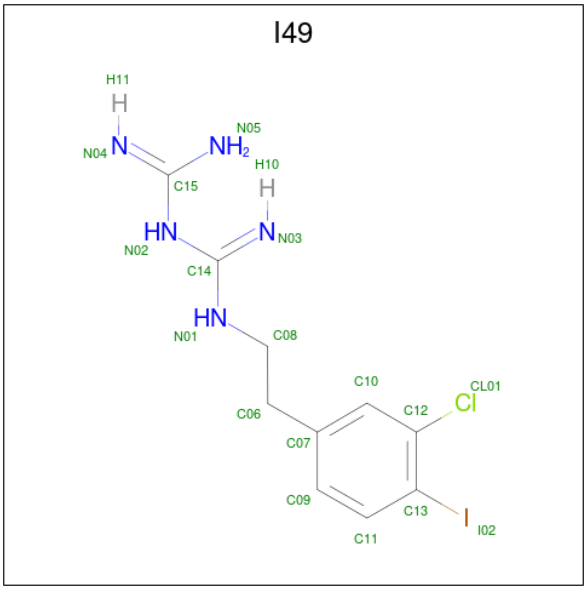


Mol	Chain	Residues	Atoms					AltConf
50	F	1	Total	C	N	O	P	0
			31	17	4	9	1	

- Molecule 51 is POTASSIUM ION (three-letter code: K) (formula: K).

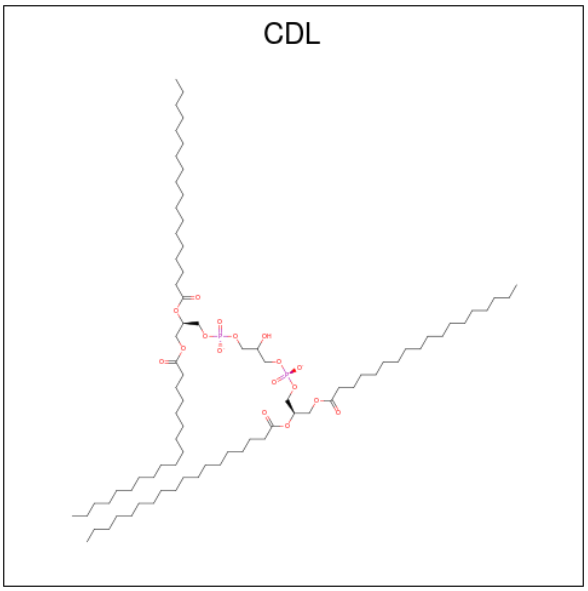
Mol	Chain	Residues	Atoms	AltConf
51	G	1	Total K 1 1	0

- Molecule 52 is 1-carbamimidoyl-3-[2-(3-chloranyl-4-iodanyl-phenyl)ethyl]guanidine (three-letter code: I49) (formula: $C_{10}H_{13}ClIN_5$) (labeled as "Ligand of Interest" by depositor).



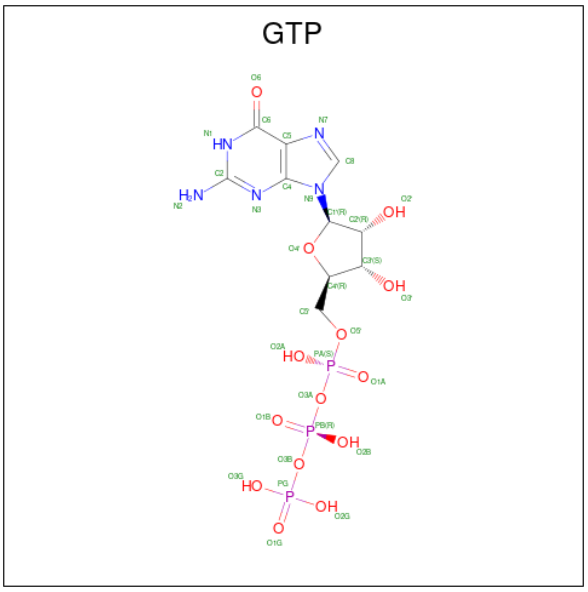
Mol	Chain	Residues	Atoms	AltConf
52	H	1	Total C Cl I N 17 10 1 1 5	0
52	N	1	Total C Cl I N 17 10 1 1 5	0

- Molecule 53 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).



Mol	Chain	Residues	Atoms				AltConf
53	J	1	Total	C	O	P	0
			71	52	17	2	
53	L	1	Total	C	O	P	0
			69	50	17	2	
53	N	1	Total	C	O	P	0
			65	46	17	2	
53	d	1	Total	C	O	P	0
			73	54	17	2	
53	h	1	Total	C	O	P	0
			67	48	17	2	
53	q	1	Total	C	O	P	0
			76	57	17	2	

- Molecule 54 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).

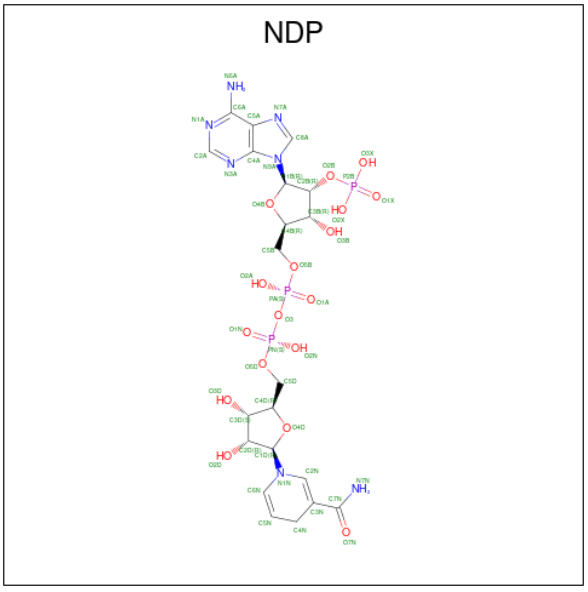


Mol	Chain	Residues	Atoms					AltConf
54	O	1	Total	C	N	O	P	0
			32	10	5	14	3	

- Molecule 55 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
55	O	1	Total	Mg	0
			1	1	

- Molecule 56 is NADPH DIHYDRO-NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NDP) (formula: $C_{21}H_{30}N_7O_{17}P_3$).

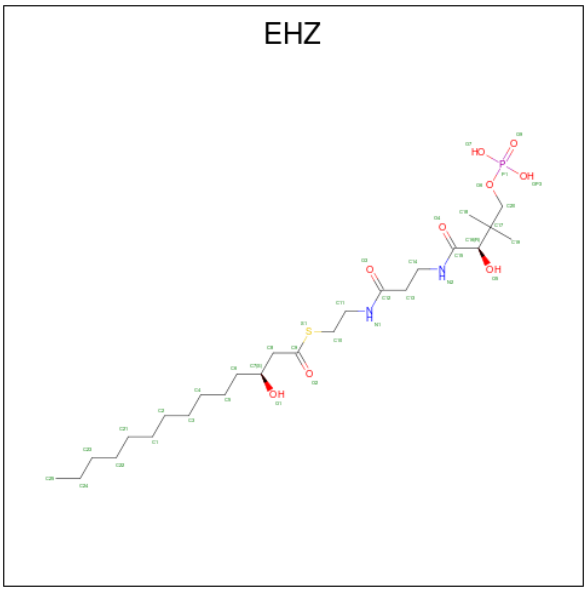


Mol	Chain	Residues	Atoms					AltConf
56	P	1	Total	C	N	O	P	0
			48	21	7	17	3	

- Molecule 57 is ZINC ION (three-letter code: ZN) (formula: Zn).

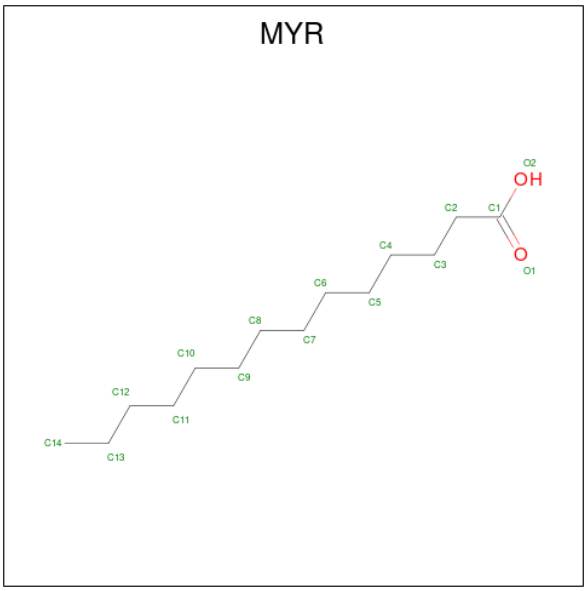
Mol	Chain	Residues	Atoms		AltConf
57	R	1	Total	Zn	0
			1	1	

- Molecule 58 is {S}-[2-[3-[[(2 {R})-3,3-dimethyl-2-oxidanyl-4-phosphonooxy-butanoyl]amino]propanoylamino]ethyl] (3 {S})-3-oxidanyltetradecanethioate (three-letter code: EHZ) (formula: $C_{25}H_{49}N_2O_9PS$).



Mol	Chain	Residues	Atoms						AltConf
58	T	1	Total	C	N	O	P	S	0
			37	25	2	8	1	1	
58	U	1	Total	C	N	O	P	S	0
			37	25	2	8	1	1	

- Molecule 59 is MYRISTIC ACID (three-letter code: MYR) (formula: $C_{14}H_{28}O_2$).



Mol	Chain	Residues	Atoms	AltConf
59	o	1	Total C O 15 14 1	0

- Molecule 60 is water.

Mol	Chain	Residues	Atoms	AltConf
60	A	15	Total O 15 15	0
60	B	63	Total O 63 63	0
60	C	113	Total O 113 113	0
60	D	184	Total O 184 184	0
60	E	38	Total O 38 38	0
60	F	92	Total O 92 92	0
60	G	248	Total O 248 248	0
60	H	61	Total O 61 61	0
60	I	111	Total O 111 111	0
60	J	20	Total O 20 20	0
60	K	14	Total O 14 14	0

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Mol	Chain	Residues	Atoms	AltConf
60	L	100	Total O 100 100	0
60	M	110	Total O 110 110	0
60	N	61	Total O 61 61	0
60	O	36	Total O 36 36	0
60	P	67	Total O 67 67	0
60	Q	98	Total O 98 98	0
60	R	53	Total O 53 53	0
60	S	3	Total O 3 3	0
60	T	2	Total O 2 2	0
60	U	22	Total O 22 22	0
60	V	20	Total O 20 20	0
60	W	26	Total O 26 26	0
60	X	44	Total O 44 44	0
60	Y	3	Total O 3 3	0
60	Z	30	Total O 30 30	0
60	a	22	Total O 22 22	0
60	b	13	Total O 13 13	0
60	d	16	Total O 16 16	0
60	e	30	Total O 30 30	0
60	f	10	Total O 10 10	0
60	g	30	Total O 30 30	0

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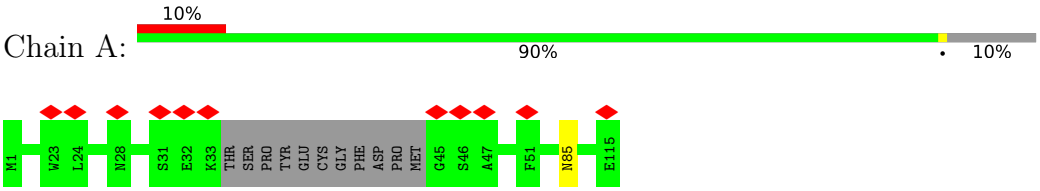
Mol	Chain	Residues	Atoms	AltConf
60	h	34	Total O 34 34	0
60	i	19	Total O 19 19	0
60	j	4	Total O 4 4	0
60	k	17	Total O 17 17	0
60	l	42	Total O 42 42	0
60	m	26	Total O 26 26	0
60	n	52	Total O 52 52	0
60	o	35	Total O 35 35	0
60	p	55	Total O 55 55	0
60	q	41	Total O 41 41	0
60	r	34	Total O 34 34	0
60	s	10	Total O 10 10	0

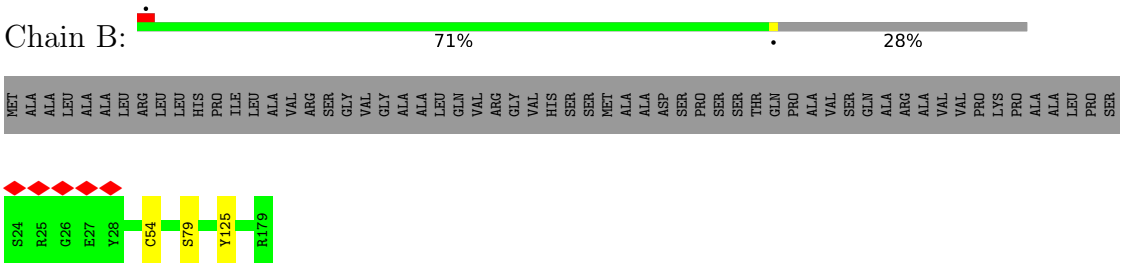
3 Residue-property plots (i)

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.

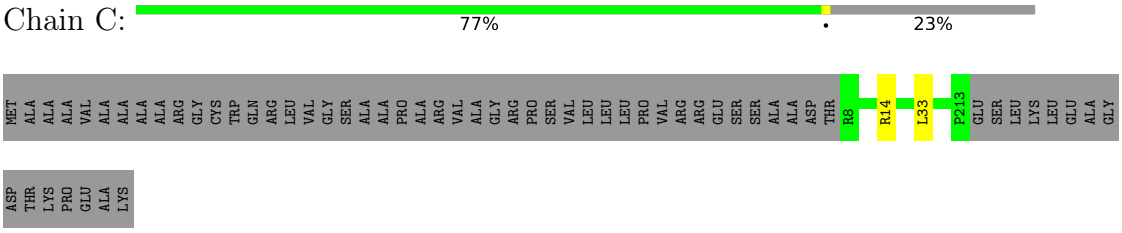
• Molecule 1: NADH-ubiquinone oxidoreductase chain 3



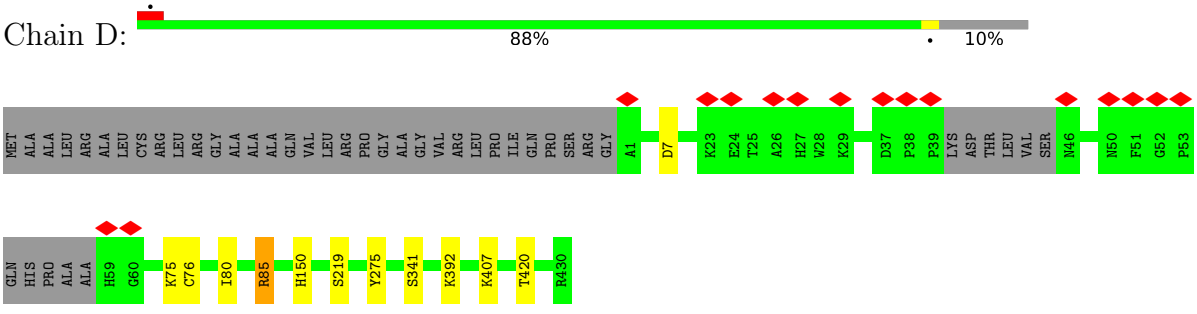
• Molecule 2: NADH dehydrogenase [ubiquinone] iron-sulfur protein 7, mitochondrial



• Molecule 3: NADH dehydrogenase [ubiquinone] iron-sulfur protein 3, mitochondrial

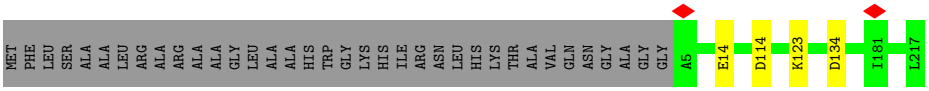


• Molecule 4: NADH dehydrogenase [ubiquinone] iron-sulfur protein 2, mitochondrial



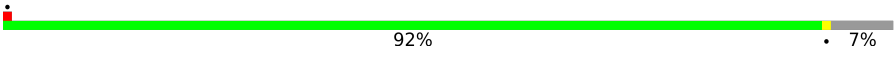
• Molecule 5: NADH dehydrogenase [ubiquinone] flavoprotein 2, mitochondrial

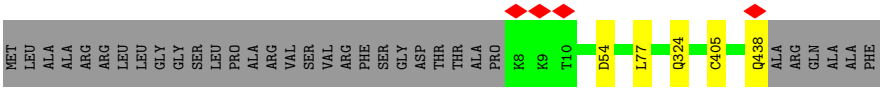
Chain E:



• Molecule 6: NADH dehydrogenase [ubiquinone] flavoprotein 1, mitochondrial

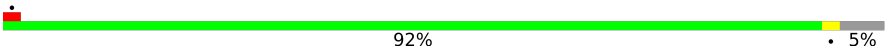
Chain F:

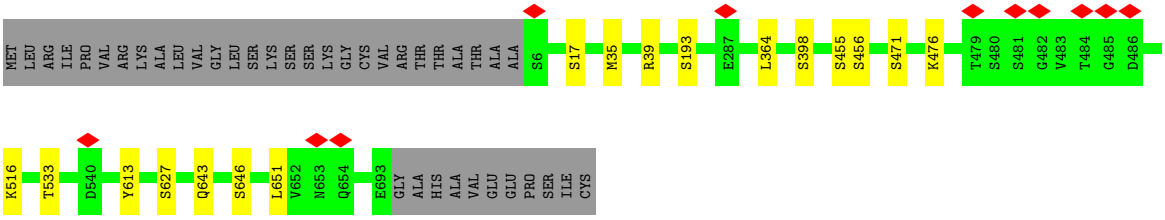




• Molecule 7: NADH-ubiquinone oxidoreductase 75 kDa subunit, mitochondrial

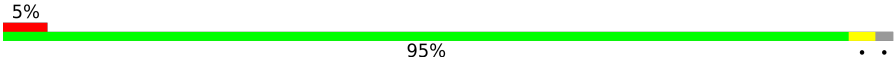
Chain G:

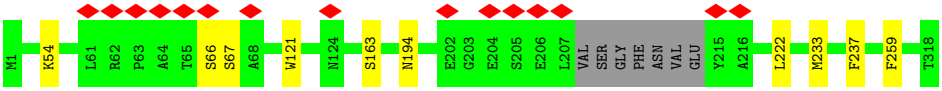




• Molecule 8: NADH-ubiquinone oxidoreductase chain 1

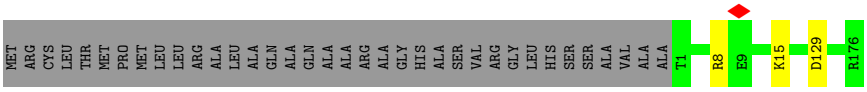
Chain H:





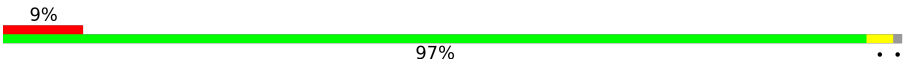
• Molecule 9: NADH dehydrogenase [ubiquinone] iron-sulfur protein 8, mitochondrial

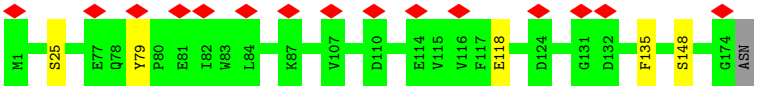
Chain I:



• Molecule 10: NADH-ubiquinone oxidoreductase chain 6

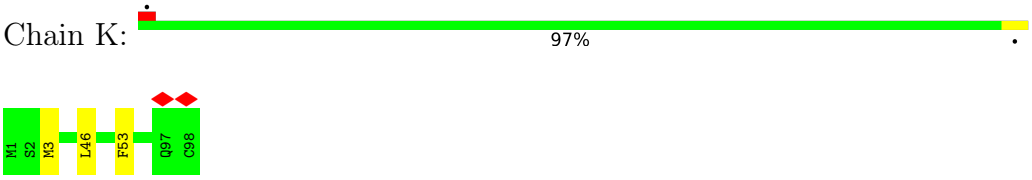
Chain J:





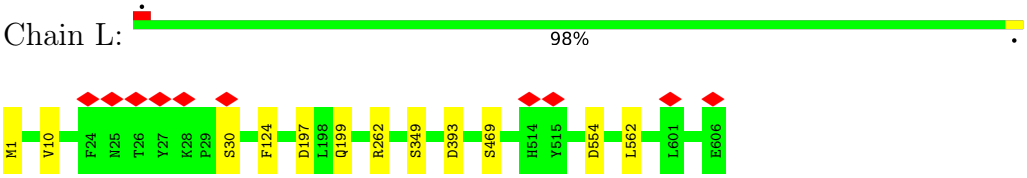
• Molecule 11: NADH-ubiquinone oxidoreductase chain 4L

Chain K:



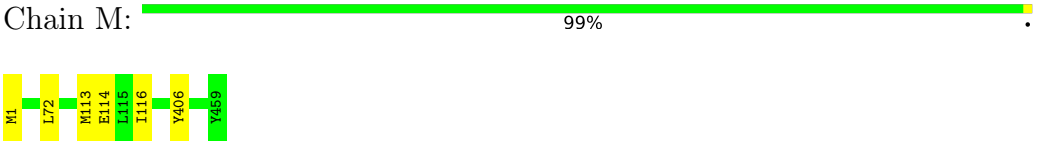
• Molecule 12: NADH-ubiquinone oxidoreductase chain 5

Chain L:



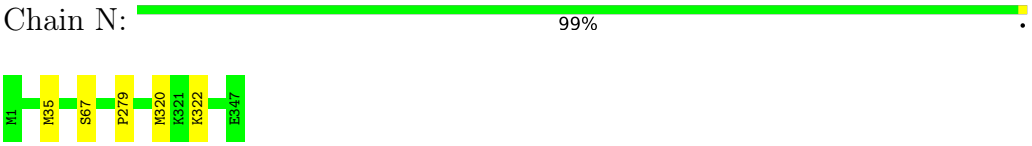
• Molecule 13: NADH-ubiquinone oxidoreductase chain 4

Chain M:



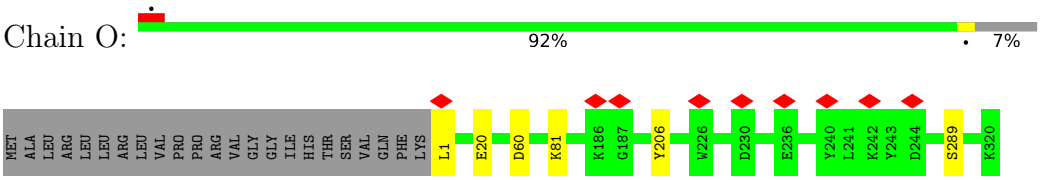
• Molecule 14: NADH-ubiquinone oxidoreductase chain 2

Chain N:



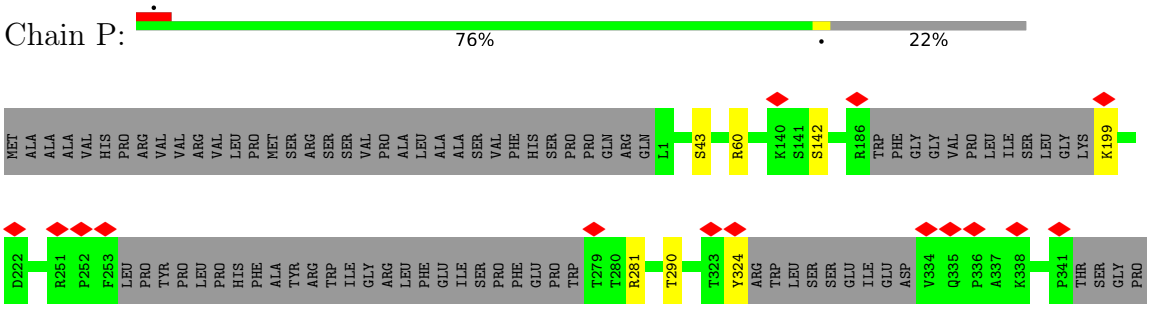
• Molecule 15: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 10, mitochondrial

Chain O:



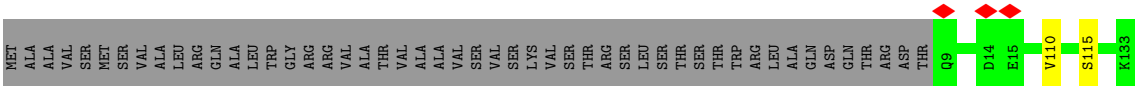
• Molecule 16: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 9, mitochondrial

Chain P:



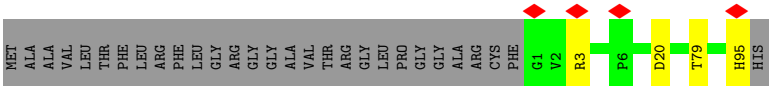
• Molecule 17: NADH dehydrogenase [ubiquinone] iron-sulfur protein 4, mitochondrial

Chain Q:



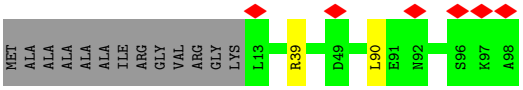
• Molecule 18: NADH dehydrogenase [ubiquinone] iron-sulfur protein 6, mitochondrial

Chain R:



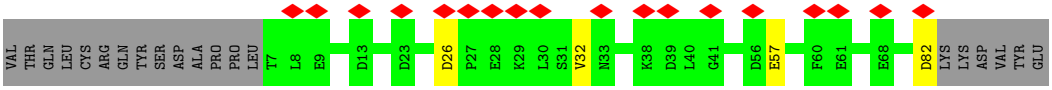
• Molecule 19: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2

Chain S:



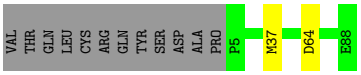
• Molecule 20: Acyl carrier protein, mitochondrial

Chain T:



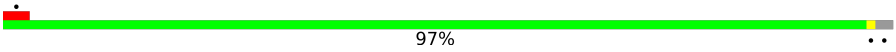
• Molecule 20: Acyl carrier protein, mitochondrial

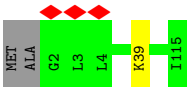
Chain U:



• Molecule 21: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 5

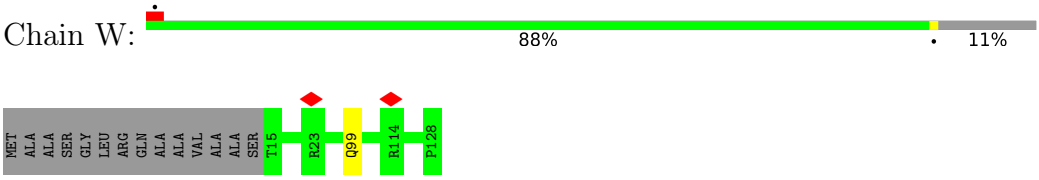
Chain V:





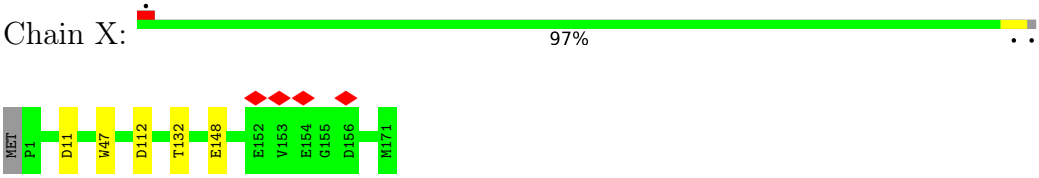
• Molecule 22: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 6

Chain W:



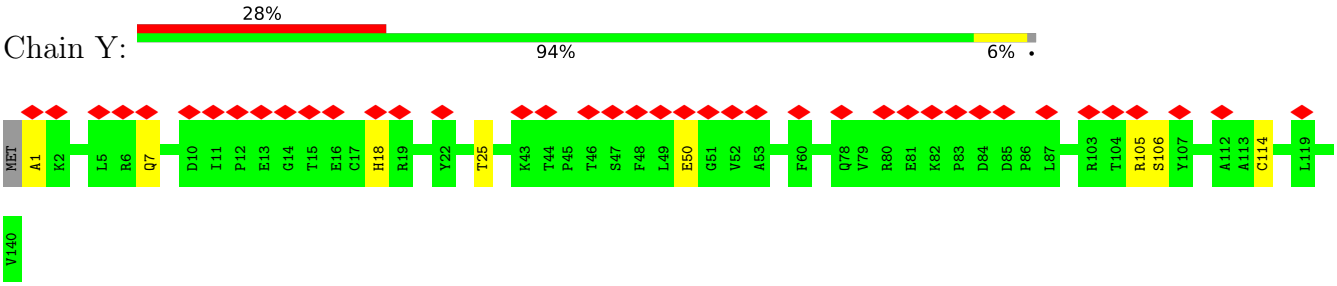
• Molecule 23: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 8

Chain X:



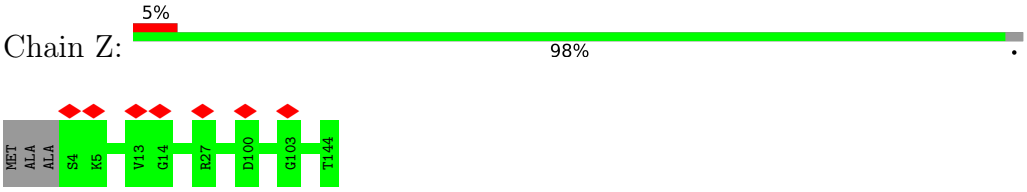
• Molecule 24: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 11

Chain Y:



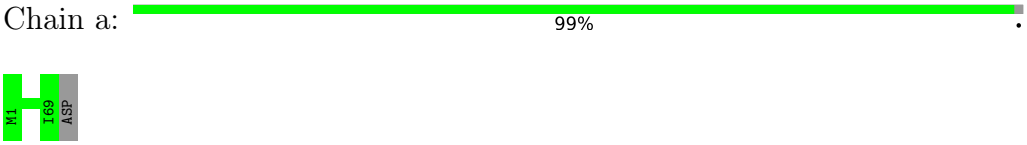
• Molecule 25: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 13

Chain Z:



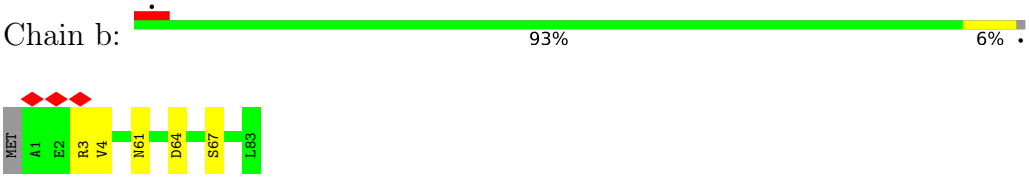
• Molecule 26: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 1

Chain a:



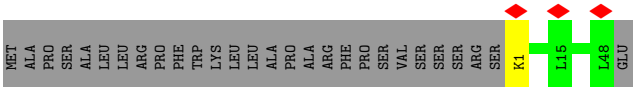
• Molecule 27: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 3

Chain b:



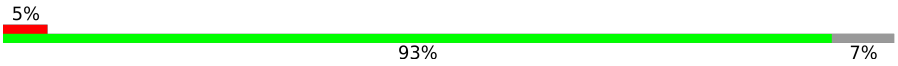
• Molecule 28: NADH dehydrogenase [ubiquinone] 1 subunit C1, mitochondrial

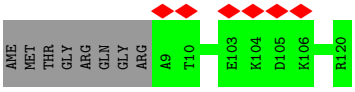
Chain c:



• Molecule 29: NADH dehydrogenase [ubiquinone] 1 subunit C2

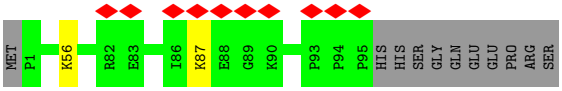
Chain d:





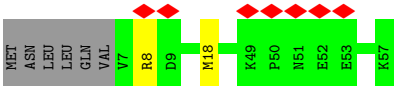
• Molecule 30: NADH dehydrogenase [ubiquinone] iron-sulfur protein 5

Chain e:



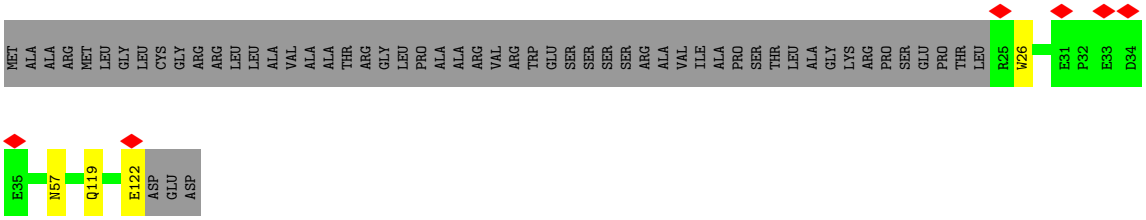
• Molecule 31: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 1

Chain f:



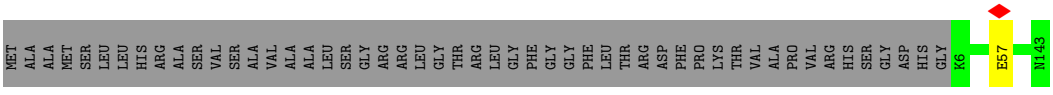
• Molecule 32: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 11, mitochondrial

Chain g:



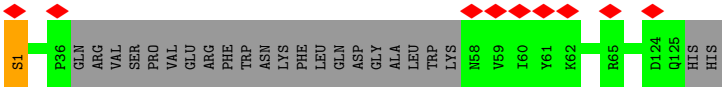
• Molecule 33: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 5, mitochondrial

Chain h:



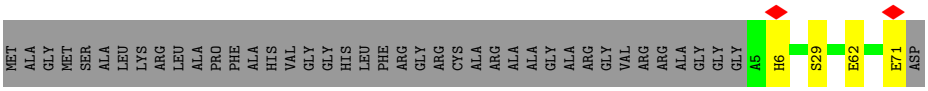
• Molecule 34: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 6

Chain i:



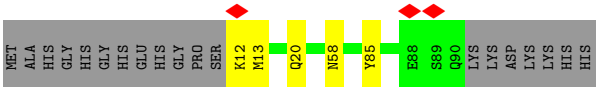
• Molecule 35: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 2, mitochondrial

Chain j:



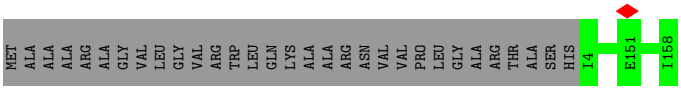
• Molecule 36: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 3

Chain k:



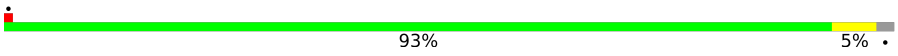
• Molecule 37: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 8, mitochondrial

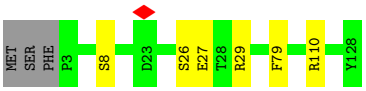
Chain l:



• Molecule 38: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 4

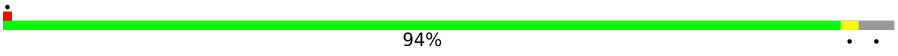
Chain m:

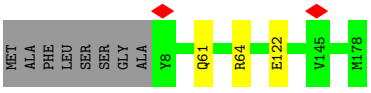




• Molecule 39: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 9

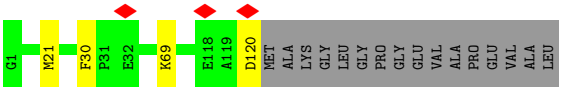
Chain n:





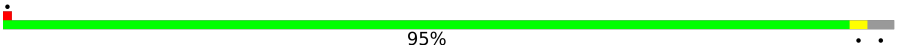
• Molecule 40: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7

Chain o:



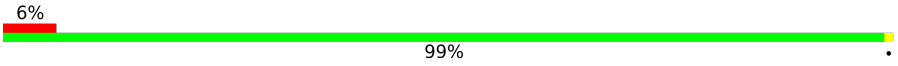
• Molecule 41: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 10

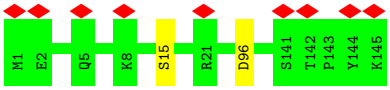
Chain p:



• Molecule 42: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 12

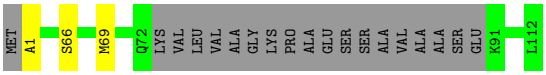
Chain q:





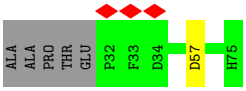
• Molecule 43: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 7

Chain r:



• Molecule 44: NADH dehydrogenase [ubiquinone] flavoprotein 3, mitochondrial

Chain s:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	111066	Depositor
Resolution determination method	OTHER	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2400	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	44.750	Depositor
Minimum map value	-19.725	Depositor
Average map value	0.010	Depositor
Map value standard deviation	1.076	Depositor
Recommended contour level	6.5	Depositor
Map size (Å)	482.46, 482.46, 482.46	wwPDB
Map dimensions	660, 660, 660	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.731, 0.731, 0.731	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: EHZ, 3PE, GTP, I49, FES, 2MR, FMN, SAC, MG, PC1, SF4, LMT, FME, K, MYR, ZN, CDL, NDP, AYA

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	0.30	0/846	0.43	0/1156
2	B	0.38	0/1278	0.45	0/1728
3	C	0.37	0/1765	0.45	0/2403
4	D	0.35	0/3446	0.46	0/4666
5	E	0.35	0/1695	0.44	0/2307
6	F	0.34	0/3393	0.45	0/4584
7	G	0.33	0/5367	0.48	0/7274
8	H	0.34	0/2517	0.44	0/3438
9	I	0.37	0/1445	0.48	0/1956
10	J	0.34	0/1362	0.43	0/1848
11	K	0.30	0/745	0.42	0/1008
12	L	0.35	0/4903	0.43	0/6672
13	M	0.34	0/3738	0.43	0/5097
14	N	0.32	0/2792	0.44	0/3800
15	O	0.36	0/2651	0.42	0/3587
16	P	0.32	0/2406	0.46	0/3252
17	Q	0.33	0/1039	0.45	0/1404
18	R	0.36	0/742	0.46	0/999
19	S	0.31	0/702	0.46	0/945
20	T	0.29	0/621	0.41	0/837
20	U	0.40	0/692	0.41	0/932
21	V	0.31	0/943	0.38	0/1277
22	W	0.32	0/995	0.42	0/1337
23	X	0.33	0/1439	0.42	0/1942
24	Y	0.28	0/1042	0.42	0/1414
25	Z	0.33	0/1181	0.44	0/1592
26	a	0.35	0/576	0.44	0/775
27	b	0.33	0/672	0.41	0/923
28	c	0.33	0/418	0.37	0/567
29	d	0.38	0/964	0.41	0/1305
30	e	0.31	0/818	0.42	0/1093

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
31	f	0.34	0/457	0.41	0/616
32	g	0.38	0/850	0.40	0/1154
33	h	0.36	0/1188	0.42	0/1607
34	i	0.38	0/912	0.44	0/1241
35	j	0.38	0/607	0.41	0/833
36	k	0.37	0/657	0.42	0/887
37	l	0.42	0/1358	0.43	0/1858
38	m	0.39	0/1076	0.43	0/1455
39	n	0.39	0/1540	0.40	0/2085
40	o	0.39	0/1060	0.42	0/1420
41	p	0.38	0/1468	0.44	0/1979
42	q	0.34	0/1250	0.45	0/1698
43	r	0.34	0/780	0.45	0/1056
44	s	0.32	0/383	0.43	0/518
All	All	0.35	0/66779	0.44	0/90525

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
4	D	0	2
34	i	0	1
All	All	0	3

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	D	275	TYR	Peptide
4	D	85	2MR	Mainchain
34	i	1	SAC	Mainchain

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	100/115 (87%)	98 (98%)	2 (2%)	0	100	100
2	B	154/216 (71%)	149 (97%)	5 (3%)	0	100	100
3	C	204/266 (77%)	198 (97%)	6 (3%)	0	100	100
4	D	412/463 (89%)	400 (97%)	11 (3%)	1 (0%)	47	58
5	E	211/249 (85%)	207 (98%)	4 (2%)	0	100	100
6	F	429/464 (92%)	422 (98%)	7 (2%)	0	100	100
7	G	686/727 (94%)	672 (98%)	14 (2%)	0	100	100
8	H	307/318 (96%)	294 (96%)	13 (4%)	0	100	100
9	I	174/212 (82%)	171 (98%)	3 (2%)	0	100	100
10	J	172/175 (98%)	162 (94%)	10 (6%)	0	100	100
11	K	96/98 (98%)	95 (99%)	1 (1%)	0	100	100
12	L	604/606 (100%)	583 (96%)	20 (3%)	1 (0%)	47	58
13	M	457/459 (100%)	451 (99%)	6 (1%)	0	100	100
14	N	345/347 (99%)	341 (99%)	4 (1%)	0	100	100
15	O	318/343 (93%)	314 (99%)	4 (1%)	0	100	100
16	P	287/380 (76%)	283 (99%)	4 (1%)	0	100	100
17	Q	123/175 (70%)	123 (100%)	0	0	100	100
18	R	93/124 (75%)	91 (98%)	2 (2%)	0	100	100
19	S	84/99 (85%)	80 (95%)	4 (5%)	0	100	100
20	T	74/156 (47%)	73 (99%)	1 (1%)	0	100	100
20	U	82/156 (53%)	81 (99%)	1 (1%)	0	100	100
21	V	112/116 (97%)	110 (98%)	2 (2%)	0	100	100
22	W	112/128 (88%)	110 (98%)	2 (2%)	0	100	100
23	X	169/172 (98%)	165 (98%)	4 (2%)	0	100	100
24	Y	138/141 (98%)	134 (97%)	4 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
25	Z	139/144 (96%)	135 (97%)	4 (3%)	0	100	100
26	a	67/70 (96%)	67 (100%)	0	0	100	100
27	b	81/84 (96%)	79 (98%)	2 (2%)	0	100	100
28	c	46/76 (60%)	46 (100%)	0	0	100	100
29	d	110/120 (92%)	110 (100%)	0	0	100	100
30	e	93/106 (88%)	91 (98%)	2 (2%)	0	100	100
31	f	49/57 (86%)	49 (100%)	0	0	100	100
32	g	96/154 (62%)	93 (97%)	3 (3%)	0	100	100
33	h	136/189 (72%)	136 (100%)	0	0	100	100
34	i	100/127 (79%)	97 (97%)	3 (3%)	0	100	100
35	j	65/108 (60%)	65 (100%)	0	0	100	100
36	k	77/98 (79%)	77 (100%)	0	0	100	100
37	l	153/186 (82%)	147 (96%)	6 (4%)	0	100	100
38	m	124/129 (96%)	122 (98%)	2 (2%)	0	100	100
39	n	169/179 (94%)	165 (98%)	4 (2%)	0	100	100
40	o	118/136 (87%)	113 (96%)	5 (4%)	0	100	100
41	p	168/176 (96%)	167 (99%)	1 (1%)	0	100	100
42	q	143/145 (99%)	142 (99%)	1 (1%)	0	100	100
43	r	90/113 (80%)	88 (98%)	2 (2%)	0	100	100
44	s	42/109 (38%)	42 (100%)	0	0	100	100
All	All	8009/9211 (87%)	7838 (98%)	169 (2%)	2 (0%)	100	100

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
12	L	562	LEU
4	D	80	ILE

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	90/100 (90%)	89 (99%)	1 (1%)	73	86
2	B	132/175 (75%)	129 (98%)	3 (2%)	50	67
3	C	187/228 (82%)	185 (99%)	2 (1%)	73	86
4	D	360/392 (92%)	351 (98%)	9 (2%)	47	65
5	E	183/205 (89%)	179 (98%)	4 (2%)	52	69
6	F	345/368 (94%)	340 (99%)	5 (1%)	67	81
7	G	578/608 (95%)	561 (97%)	17 (3%)	42	58
8	H	268/274 (98%)	258 (96%)	10 (4%)	34	48
9	I	151/175 (86%)	148 (98%)	3 (2%)	55	72
10	J	140/141 (99%)	135 (96%)	5 (4%)	35	49
11	K	85/85 (100%)	82 (96%)	3 (4%)	36	50
12	L	529/533 (99%)	519 (98%)	10 (2%)	57	73
13	M	412/412 (100%)	407 (99%)	5 (1%)	71	84
14	N	315/315 (100%)	310 (98%)	5 (2%)	62	78
15	O	283/303 (93%)	277 (98%)	6 (2%)	53	70
16	P	254/327 (78%)	247 (97%)	7 (3%)	43	60
17	Q	112/153 (73%)	110 (98%)	2 (2%)	59	75
18	R	78/97 (80%)	74 (95%)	4 (5%)	24	33
19	S	76/82 (93%)	74 (97%)	2 (3%)	46	63
20	T	70/135 (52%)	66 (94%)	4 (6%)	20	28
20	U	78/135 (58%)	76 (97%)	2 (3%)	46	63
21	V	101/102 (99%)	100 (99%)	1 (1%)	76	87
22	W	107/114 (94%)	106 (99%)	1 (1%)	78	89
23	X	154/155 (99%)	149 (97%)	5 (3%)	39	54
24	Y	101/102 (99%)	94 (93%)	7 (7%)	15	20
25	Z	120/121 (99%)	120 (100%)	0	100	100
26	a	58/59 (98%)	58 (100%)	0	100	100
27	b	71/72 (99%)	66 (93%)	5 (7%)	15	19
28	c	44/68 (65%)	43 (98%)	1 (2%)	50	67
29	d	100/105 (95%)	100 (100%)	0	100	100
30	e	86/96 (90%)	84 (98%)	2 (2%)	50	67

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
31	f	48/54 (89%)	46 (96%)	2 (4%)	30 42
32	g	89/131 (68%)	85 (96%)	4 (4%)	27 39
33	h	121/158 (77%)	120 (99%)	1 (1%)	81 91
34	i	99/120 (82%)	99 (100%)	0	100 100
35	j	61/84 (73%)	57 (93%)	4 (7%)	16 22
36	k	61/76 (80%)	56 (92%)	5 (8%)	11 14
37	l	139/159 (87%)	139 (100%)	0	100 100
38	m	112/115 (97%)	106 (95%)	6 (5%)	22 30
39	n	156/161 (97%)	153 (98%)	3 (2%)	57 73
40	o	109/119 (92%)	105 (96%)	4 (4%)	34 48
41	p	154/157 (98%)	151 (98%)	3 (2%)	57 73
42	q	131/131 (100%)	129 (98%)	2 (2%)	65 79
43	r	84/97 (87%)	82 (98%)	2 (2%)	49 66
44	s	43/92 (47%)	42 (98%)	1 (2%)	50 67
All	All	7075/7891 (90%)	6907 (98%)	168 (2%)	51 66

All (168) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	85	ASN
2	B	54	CYS
2	B	79	SER
2	B	125	TYR
3	C	14	ARG
3	C	33	LEU
4	D	7	ASP
4	D	75	LYS
4	D	76	CYS
4	D	150	HIS
4	D	219	SER
4	D	341	SER
4	D	392	LYS
4	D	407	LYS
4	D	420	THR
5	E	14	GLU
5	E	114	ASP
5	E	123	LYS

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Mol	Chain	Res	Type
5	E	134	ASP
6	F	54	ASP
6	F	77	LEU
6	F	324	GLN
6	F	405	CYS
6	F	438	GLN
7	G	17	SER
7	G	35	MET
7	G	39	ARG
7	G	193	SER
7	G	364	LEU
7	G	398	SER
7	G	455	SER
7	G	456	SER
7	G	471	SER
7	G	476	LYS
7	G	516	LYS
7	G	533	THR
7	G	613	TYR
7	G	627	SER
7	G	643	GLN
7	G	646	SER
7	G	651	LEU
8	H	54	LYS
8	H	66	SER
8	H	67	SER
8	H	121	TRP
8	H	163	SER
8	H	194	ASN
8	H	222	LEU
8	H	233	MET
8	H	237	PHE
8	H	259	PHE
9	I	8	ARG
9	I	15	LYS
9	I	129	ASP
10	J	25	SER
10	J	79	TYR
10	J	118	GLU
10	J	135	PHE
10	J	148	SER
11	K	3	MET

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Mol	Chain	Res	Type
11	K	46	LEU
11	K	53	PHE
12	L	10	VAL
12	L	30	SER
12	L	124	PHE
12	L	197	ASP
12	L	199	GLN
12	L	262	ARG
12	L	349	SER
12	L	393	ASP
12	L	469	SER
12	L	554	ASP
13	M	72	LEU
13	M	113	MET
13	M	114	GLU
13	M	116	ILE
13	M	406	TYR
14	N	35	MET
14	N	67	SER
14	N	279	PRO
14	N	320	MET
14	N	322	LYS
15	O	1	LEU
15	O	20	GLU
15	O	60	ASP
15	O	81	LYS
15	O	206	TYR
15	O	289	SER
16	P	43	SER
16	P	60	ARG
16	P	142	SER
16	P	199	LYS
16	P	281	ARG
16	P	290	THR
16	P	324	TYR
17	Q	110	VAL
17	Q	115	SER
18	R	3	ARG
18	R	20	ASP
18	R	79	THR
18	R	95	HIS
19	S	39	ARG

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Mol	Chain	Res	Type
19	S	90	LEU
20	T	26	ASP
20	T	32	VAL
20	T	57	GLU
20	T	82	ASP
20	U	37	MET
20	U	64	ASP
21	V	39	LYS
22	W	99	GLN
23	X	11	ASP
23	X	47	TRP
23	X	112	ASP
23	X	132	THR
23	X	148	GLU
24	Y	7	GLN
24	Y	18	HIS
24	Y	25	THR
24	Y	50	GLU
24	Y	105	ARG
24	Y	106	SER
24	Y	114	CYS
27	b	3	ARG
27	b	4	VAL
27	b	61	ASN
27	b	64	ASP
27	b	67	SER
28	c	1	LYS
30	e	56	LYS
30	e	87	LYS
31	f	8	ARG
31	f	18	MET
32	g	26	TRP
32	g	57	ASN
32	g	119	GLN
32	g	122	GLU
33	h	57	GLU
35	j	6	HIS
35	j	29	SER
35	j	62	GLU
35	j	71	GLU
36	k	12	LYS
36	k	13	MET

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Mol	Chain	Res	Type
36	k	20	GLN
36	k	58	ASN
36	k	85	TYR
38	m	8	SER
38	m	26	SER
38	m	27	GLU
38	m	29	ARG
38	m	79	PHE
38	m	110	ARG
39	n	61	GLN
39	n	64	ARG
39	n	122	GLU
40	o	21	MET
40	o	30	PHE
40	o	69	LYS
40	o	120	ASP
41	p	119	SER
41	p	121	ARG
41	p	134	VAL
42	q	15	SER
42	q	96	ASP
43	r	66	SER
43	r	69	MET
44	s	57	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
29	d	97	HIS
35	j	6	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)

11 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	$\#\|Z\| > 2$
11	FME	K	1	11	8,9,10	0.90	0	7,9,11	0.77	0
13	FME	M	1	13	8,9,10	1.01	1 (12%)	7,9,11	1.01	1 (14%)
34	SAC	i	1	34	7,8,9	1.86	1 (14%)	8,9,11	1.63	1 (12%)
1	FME	A	1	1	8,9,10	0.99	0	7,9,11	0.87	0
10	FME	J	1	10	8,9,10	0.94	0	7,9,11	0.86	0
8	FME	H	1	8	8,9,10	0.97	0	7,9,11	0.83	0
12	FME	L	1	12	8,9,10	0.98	1 (12%)	7,9,11	0.94	0
43	AYA	r	1	43	6,7,8	1.80	2 (33%)	5,8,10	1.24	1 (20%)
14	FME	N	1	14	8,9,10	0.99	0	7,9,11	0.80	0
4	2MR	D	85	4	10,12,13	2.65	3 (30%)	5,13,15	1.30	1 (20%)
24	AYA	Y	1	24	6,7,8	1.83	2 (33%)	5,8,10	1.25	1 (20%)

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
11	FME	K	1	11	-	1/7/9/11	-
13	FME	M	1	13	-	0/7/9/11	-
34	SAC	i	1	34	-	3/7/8/10	-
1	FME	A	1	1	-	3/7/9/11	-
10	FME	J	1	10	-	2/7/9/11	-
8	FME	H	1	8	-	2/7/9/11	-
12	FME	L	1	12	-	1/7/9/11	-
43	AYA	r	1	43	-	0/4/6/8	-
14	FME	N	1	14	-	2/7/9/11	-
4	2MR	D	85	4	-	0/10/13/15	-
24	AYA	Y	1	24	-	0/4/6/8	-

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	85	2MR	CZ-NH2	5.03	1.44	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	85	2MR	CZ-NE	4.67	1.44	1.34
34	i	1	SAC	O-C	4.20	1.36	1.19
4	D	85	2MR	O-C	3.84	1.35	1.19
24	Y	1	AYA	CT-N	3.27	1.45	1.34
43	r	1	AYA	CT-N	3.14	1.45	1.34
13	M	1	FME	CA-N	-2.24	1.43	1.46
24	Y	1	AYA	OT-CT	-2.14	1.18	1.23
43	r	1	AYA	OT-CT	-2.05	1.18	1.23
12	L	1	FME	CA-N	-2.04	1.43	1.46

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
34	i	1	SAC	O-C-CA	-3.78	114.88	124.78
4	D	85	2MR	NE-CZ-NH2	-2.62	117.08	119.48
24	Y	1	AYA	CM-CT-N	2.29	119.97	116.10
43	r	1	AYA	CM-CT-N	2.19	119.81	116.10
13	M	1	FME	C-CA-N	2.12	113.55	109.73

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	1	FME	N-CA-CB-CG
1	A	1	FME	C-CA-CB-CG
1	A	1	FME	O-C-CA-CB
10	J	1	FME	N-CA-CB-CG
14	N	1	FME	O1-CN-N-CA
14	N	1	FME	N-CA-CB-CG
12	L	1	FME	CA-CB-CG-SD
8	H	1	FME	CB-CG-SD-CE
8	H	1	FME	N-CA-CB-CG
11	K	1	FME	CB-CG-SD-CE
34	i	1	SAC	N-CA-CB-OG
34	i	1	SAC	C-CA-N-C1A
34	i	1	SAC	CB-CA-N-C1A
10	J	1	FME	C-CA-CB-CG

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 55 ligands modelled in this entry, 3 are monoatomic - leaving 52 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	$\#\|Z\| > 2$
45	LMT	f	1801	-	36,36,36	1.15	3 (8%)	47,47,47	1.14	5 (10%)
45	LMT	l	201	-	36,36,36	1.21	3 (8%)	47,47,47	0.90	0
46	3PE	L	704	-	44,44,50	0.91	3 (6%)	47,49,55	1.12	2 (4%)
49	FES	G	803	7	0,4,4	-	-	-		
52	I49	H	403	-	15,17,17	1.55	2 (13%)	21,22,22	2.21	6 (28%)
45	LMT	A	303	-	36,36,36	1.19	3 (8%)	47,47,47	1.05	3 (6%)
46	3PE	L	701	-	48,48,50	0.89	2 (4%)	51,53,55	1.00	2 (3%)
46	3PE	M	601	-	45,45,50	0.89	4 (8%)	48,50,55	1.15	2 (4%)
47	SF4	B	201	2	0,12,12	-	-	-		
53	CDL	d	1202	-	72,72,99	1.02	7 (9%)	78,84,111	1.22	5 (6%)
59	MYR	o	201	40	14,14,15	0.90	0	13,13,15	0.69	0
46	3PE	m	202	-	40,40,50	0.96	4 (10%)	43,45,55	1.12	2 (4%)
47	SF4	G	801	7	0,12,12	-	-	-		
45	LMT	L	702	-	36,36,36	1.18	3 (8%)	47,47,47	0.90	2 (4%)
46	3PE	d	1201	-	46,46,50	0.90	4 (8%)	49,51,55	1.12	2 (4%)
53	CDL	q	201	-	75,75,99	0.99	8 (10%)	81,87,111	1.07	4 (4%)
58	EHZ	T	101	20	29,36,37	1.64	4 (13%)	35,44,47	1.32	4 (11%)
47	SF4	F	502	6	0,12,12	-	-	-		
47	SF4	I	202	9	0,12,12	-	-	-		
46	3PE	Y	401	-	34,34,50	1.04	3 (8%)	37,39,55	1.07	2 (5%)
45	LMT	J	201	-	36,36,36	1.21	3 (8%)	47,47,47	0.95	1 (2%)
48	PC1	g	1501	-	48,48,53	1.00	3 (6%)	54,56,61	0.98	2 (3%)
45	LMT	Y	402	-	36,36,36	1.18	3 (8%)	47,47,47	1.01	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
54	GTP	O	401	55	26,34,34	2.91	10 (38%)	32,54,54	1.76	11 (34%)
45	LMT	k	101	-	36,36,36	1.18	3 (8%)	47,47,47	0.84	0
46	3PE	H	402	-	33,33,50	1.37	4 (12%)	34,37,55	1.11	2 (5%)
45	LMT	B	202	-	36,36,36	1.18	2 (5%)	47,47,47	0.82	0
45	LMT	h	1002	-	36,36,36	1.24	4 (11%)	47,47,47	1.19	4 (8%)
50	FMN	F	501	-	33,33,33	1.11	2 (6%)	48,50,50	1.25	6 (12%)
53	CDL	L	703	-	68,68,99	1.03	6 (8%)	74,80,111	1.10	4 (5%)
46	3PE	L	705	-	28,28,50	1.12	4 (14%)	31,33,55	1.20	2 (6%)
46	3PE	A	302	-	47,47,50	0.87	4 (8%)	50,52,55	1.09	2 (4%)
53	CDL	J	202	-	70,70,99	1.03	8 (11%)	76,82,111	1.03	4 (5%)
47	SF4	G	802	7	0,12,12	-	-	-		
53	CDL	N	503	-	64,64,99	1.08	8 (12%)	70,76,111	1.14	5 (7%)
49	FES	E	301	5	0,4,4	-	-	-		
46	3PE	I	201	-	50,50,50	0.87	4 (8%)	53,55,55	0.95	2 (3%)
45	LMT	M	603	-	36,36,36	1.16	2 (5%)	47,47,47	1.30	4 (8%)
46	3PE	M	604	-	50,50,50	0.87	3 (6%)	53,55,55	1.14	2 (3%)
46	3PE	N	502	-	40,40,50	0.95	4 (10%)	43,45,55	1.11	2 (4%)
45	LMT	N	501	-	36,36,36	1.15	3 (8%)	47,47,47	0.96	0
52	I49	N	504	-	15,17,17	1.54	2 (13%)	21,22,22	1.82	6 (28%)
56	NDP	P	501	-	45,52,52	2.13	7 (15%)	53,80,80	1.66	11 (20%)
45	LMT	A	301	-	36,36,36	1.20	2 (5%)	47,47,47	0.94	1 (2%)
45	LMT	M	602	-	36,36,36	1.18	2 (5%)	47,47,47	0.94	0
47	SF4	I	203	9	0,12,12	-	-	-		
45	LMT	M	605	-	36,36,36	1.24	4 (11%)	47,47,47	1.00	2 (4%)
53	CDL	h	1001	-	66,66,99	1.05	7 (10%)	72,78,111	1.23	4 (5%)
48	PC1	B	203	-	34,34,53	1.15	4 (11%)	40,42,61	1.18	2 (5%)
45	LMT	m	201	-	36,36,36	1.24	3 (8%)	47,47,47	1.31	5 (10%)
46	3PE	H	401	-	43,43,50	0.91	4 (9%)	46,48,55	1.11	2 (4%)
58	EHZ	U	101	20	29,36,37	1.65	6 (20%)	35,44,47	1.50	4 (11%)

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
45	LMT	f	1801	-	-	9/21/61/61	0/2/2/2
45	LMT	l	201	-	-	10/21/61/61	0/2/2/2
46	3PE	L	704	-	-	23/48/48/54	-
52	I49	H	403	-	-	8/10/10/10	0/1/1/1
49	FES	G	803	7	-	-	0/1/1/1
45	LMT	A	303	-	-	7/21/61/61	0/2/2/2
46	3PE	L	701	-	-	25/52/52/54	-
46	3PE	M	601	-	-	22/49/49/54	-
53	CDL	d	1202	-	-	37/83/83/110	-
59	MYR	o	201	40	-	5/11/12/13	-
47	SF4	B	201	2	-	-	0/6/5/5
46	3PE	m	202	-	-	21/44/44/54	-
47	SF4	G	801	7	-	-	0/6/5/5
45	LMT	L	702	-	-	2/21/61/61	0/2/2/2
46	3PE	d	1201	-	-	24/50/50/54	-
53	CDL	q	201	-	-	41/86/86/110	-
58	EHZ	T	101	20	-	12/42/44/45	-
47	SF4	F	502	6	-	-	0/6/5/5
47	SF4	I	202	9	-	-	0/6/5/5
46	3PE	Y	401	-	-	18/38/38/54	-
45	LMT	J	201	-	-	8/21/61/61	0/2/2/2
48	PC1	g	1501	-	-	22/52/52/57	-
45	LMT	Y	402	-	-	11/21/61/61	0/2/2/2
54	GTP	O	401	55	-	5/18/38/38	0/3/3/3
45	LMT	k	101	-	-	5/21/61/61	0/2/2/2
46	3PE	H	402	-	-	11/36/36/54	-
45	LMT	B	202	-	-	9/21/61/61	0/2/2/2
45	LMT	h	1002	-	-	4/21/61/61	0/2/2/2
50	FMN	F	501	-	-	3/18/18/18	0/3/3/3
53	CDL	L	703	-	-	30/79/79/110	-
46	3PE	L	705	-	-	14/32/32/54	-
46	3PE	A	302	-	-	19/51/51/54	-
53	CDL	J	202	-	-	30/81/81/110	-
53	CDL	N	503	-	-	36/75/75/110	-
47	SF4	G	802	7	-	-	0/6/5/5
49	FES	E	301	5	-	-	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
46	3PE	I	201	-	-	20/54/54/54	-
45	LMT	M	603	-	-	4/21/61/61	0/2/2/2
46	3PE	M	604	-	-	24/54/54/54	-
46	3PE	N	502	-	-	18/44/44/54	-
45	LMT	N	501	-	-	9/21/61/61	0/2/2/2
52	I49	N	504	-	-	3/10/10/10	0/1/1/1
56	NDP	P	501	-	-	6/30/77/77	0/5/5/5
45	LMT	A	301	-	-	11/21/61/61	0/2/2/2
45	LMT	M	602	-	-	11/21/61/61	0/2/2/2
47	SF4	I	203	9	-	-	0/6/5/5
45	LMT	M	605	-	-	9/21/61/61	0/2/2/2
53	CDL	h	1001	-	-	30/77/77/110	-
48	PC1	B	203	-	-	14/38/38/57	-
45	LMT	m	201	-	-	9/21/61/61	0/2/2/2
46	3PE	H	401	-	-	16/47/47/54	-
58	EHZ	U	101	20	-	9/42/44/45	-

All (174) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
56	P	501	NDP	P2B-O2B	11.64	1.81	1.59
54	O	401	GTP	O6-C6	8.12	1.39	1.23
54	O	401	GTP	O4'-C1'	5.35	1.48	1.41
58	U	101	EHZ	C15-N2	5.28	1.45	1.33
46	H	402	3PE	O21-C2	-5.23	1.40	1.46
58	T	101	EHZ	C15-N2	5.09	1.44	1.33
58	T	101	EHZ	C12-N1	5.01	1.44	1.33
58	U	101	EHZ	C12-N1	4.86	1.44	1.33
54	O	401	GTP	C2-N1	4.80	1.49	1.37
52	N	504	I49	C15-N02	-4.73	1.31	1.37
52	H	403	I49	C15-N02	-4.70	1.31	1.37
54	O	401	GTP	C2-N3	4.66	1.44	1.33
54	O	401	GTP	C2-N2	4.45	1.44	1.34
45	m	201	LMT	O5'-C1'	3.57	1.50	1.41
45	h	1002	LMT	O5B-C1B	3.54	1.50	1.41
45	m	201	LMT	O5B-C1B	3.54	1.50	1.41
45	Y	402	LMT	O5B-C1B	3.53	1.50	1.41
50	F	501	FMN	C4A-N5	3.49	1.37	1.30
45	A	303	LMT	O5B-C1B	3.48	1.50	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
45	B	202	LMT	O5B-C1B	3.45	1.50	1.41
45	l	201	LMT	O5B-C1B	3.44	1.50	1.41
45	J	201	LMT	O5B-C1B	3.42	1.50	1.41
56	P	501	NDP	PN-O5D	3.41	1.73	1.59
54	O	401	GTP	C2'-C1'	-3.40	1.48	1.53
45	M	605	LMT	O5B-C1B	3.37	1.50	1.41
45	L	702	LMT	O5B-C1B	3.37	1.50	1.41
45	k	101	LMT	O5B-C1B	3.34	1.50	1.41
45	A	301	LMT	O5B-C1B	3.33	1.50	1.41
45	M	602	LMT	O5B-C1B	3.33	1.50	1.41
45	N	501	LMT	O5B-C1B	3.31	1.50	1.41
45	M	605	LMT	O5'-C1'	3.29	1.50	1.41
45	f	1801	LMT	O5B-C1B	3.28	1.50	1.41
45	h	1002	LMT	O5'-C1'	3.28	1.50	1.41
56	P	501	NDP	O2B-C2B	-3.25	1.32	1.44
45	M	603	LMT	O5B-C1B	3.25	1.50	1.41
45	l	201	LMT	O5'-C1'	3.18	1.49	1.41
54	O	401	GTP	C5-C6	-3.17	1.41	1.47
46	H	402	3PE	O21-C21	3.15	1.40	1.33
52	H	403	I49	C14-N03	3.15	1.38	1.29
45	k	101	LMT	O5'-C1'	3.14	1.49	1.41
45	Y	402	LMT	O5'-C1'	3.14	1.49	1.41
45	A	301	LMT	O5'-C1'	3.14	1.49	1.41
45	M	602	LMT	O5'-C1'	3.11	1.49	1.41
45	A	303	LMT	O5'-C1'	3.10	1.49	1.41
52	N	504	I49	C14-N03	3.09	1.38	1.29
45	M	603	LMT	O5'-C1'	3.08	1.49	1.41
45	J	201	LMT	O5'-C1'	3.00	1.49	1.41
45	N	501	LMT	O5'-C1'	2.98	1.49	1.41
45	f	1801	LMT	O5'-C1'	2.91	1.49	1.41
53	h	1001	CDL	OA6-CA4	-2.91	1.39	1.46
45	L	702	LMT	O5'-C1'	2.89	1.49	1.41
45	B	202	LMT	O5'-C1'	2.89	1.49	1.41
53	d	1202	CDL	OB6-CB4	-2.86	1.39	1.46
46	L	701	3PE	O21-C2	-2.76	1.39	1.46
53	L	703	CDL	OB6-CB4	-2.72	1.39	1.46
53	d	1202	CDL	OA6-CA4	-2.70	1.39	1.46
48	g	1501	PC1	O21-C2	-2.69	1.39	1.46
46	L	704	3PE	O21-C2	-2.68	1.39	1.46
46	d	1201	3PE	O21-C2	-2.67	1.39	1.46
53	L	703	CDL	OA6-CA4	-2.67	1.39	1.46
46	I	201	3PE	O21-C2	-2.66	1.40	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
46	L	701	3PE	O31-C3	-2.65	1.39	1.45
46	M	604	3PE	O21-C2	-2.65	1.40	1.46
53	q	201	CDL	OB6-CB4	-2.64	1.40	1.46
53	N	503	CDL	OA6-CA4	-2.63	1.40	1.46
53	h	1001	CDL	OB6-CB4	-2.62	1.40	1.46
46	Y	401	3PE	O21-C2	-2.60	1.40	1.46
46	N	502	3PE	O21-C2	-2.59	1.40	1.46
53	q	201	CDL	OA6-CA4	-2.58	1.40	1.46
46	I	201	3PE	O31-C3	-2.57	1.39	1.45
53	J	202	CDL	OA6-CA4	-2.57	1.40	1.46
58	T	101	EHZ	O4-C15	-2.55	1.18	1.23
46	L	705	3PE	O21-C2	-2.54	1.40	1.46
53	N	503	CDL	OB6-CB4	-2.54	1.40	1.46
58	U	101	EHZ	O4-C15	-2.53	1.18	1.23
46	m	202	3PE	O21-C2	-2.51	1.40	1.46
46	Y	401	3PE	O31-C31	2.47	1.40	1.33
53	d	1202	CDL	OB8-CB7	2.47	1.40	1.33
58	T	101	EHZ	O3-C12	-2.47	1.18	1.23
53	h	1001	CDL	OB8-CB6	-2.47	1.39	1.45
53	N	503	CDL	OB8-CB7	2.46	1.40	1.33
53	N	503	CDL	OA8-CA6	-2.46	1.39	1.45
53	q	201	CDL	OA8-CA6	-2.45	1.39	1.45
53	d	1202	CDL	OA8-CA7	2.45	1.40	1.33
53	J	202	CDL	OB8-CB7	2.44	1.40	1.33
46	A	302	3PE	O31-C31	2.43	1.40	1.33
53	J	202	CDL	OB6-CB4	-2.42	1.40	1.46
58	U	101	EHZ	O3-C12	-2.42	1.18	1.23
46	H	401	3PE	O21-C2	-2.40	1.40	1.46
46	L	704	3PE	O31-C3	-2.39	1.39	1.45
46	m	202	3PE	O31-C31	2.38	1.40	1.33
48	g	1501	PC1	O31-C31	2.37	1.40	1.33
48	B	203	PC1	O21-C2	-2.37	1.40	1.46
46	M	604	3PE	O31-C31	2.37	1.40	1.33
53	L	703	CDL	OB8-CB7	2.37	1.40	1.33
46	L	705	3PE	O31-C3	-2.36	1.39	1.45
46	M	604	3PE	O31-C3	-2.35	1.39	1.45
53	q	201	CDL	OB8-CB7	2.35	1.40	1.33
53	q	201	CDL	OB8-CB6	-2.34	1.39	1.45
46	N	502	3PE	O31-C3	-2.33	1.39	1.45
54	O	401	GTP	PG-O2G	-2.33	1.45	1.54
53	L	703	CDL	OA8-CA7	2.32	1.40	1.33
54	O	401	GTP	PG-O3G	-2.31	1.46	1.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
53	J	202	CDL	OA8-CA6	-2.29	1.39	1.45
48	g	1501	PC1	O31-C3	-2.29	1.39	1.45
48	B	203	PC1	O21-C21	2.28	1.40	1.34
53	h	1001	CDL	OA8-CA6	-2.28	1.40	1.45
46	H	401	3PE	O31-C31	2.27	1.40	1.33
46	M	601	3PE	O21-C2	-2.27	1.40	1.46
53	N	503	CDL	OB8-CB6	-2.25	1.40	1.45
48	B	203	PC1	O31-C3	-2.25	1.40	1.45
45	m	201	LMT	O5B-C5B	2.25	1.49	1.44
46	H	402	3PE	O31-C31	2.25	1.39	1.33
46	d	1201	3PE	O31-C31	2.25	1.39	1.33
46	N	502	3PE	O31-C31	2.24	1.39	1.33
46	L	704	3PE	O31-C31	2.23	1.39	1.33
54	O	401	GTP	C2'-C3'	-2.23	1.47	1.53
46	m	202	3PE	O31-C3	-2.23	1.40	1.45
46	H	401	3PE	O31-C3	-2.22	1.40	1.45
46	A	302	3PE	O21-C2	-2.21	1.41	1.46
53	J	202	CDL	OB6-CB5	2.21	1.40	1.34
46	A	302	3PE	O21-C21	2.21	1.40	1.34
53	J	202	CDL	OA8-CA7	2.21	1.39	1.33
46	H	402	3PE	O31-C3	-2.21	1.40	1.45
46	d	1201	3PE	O31-C3	-2.19	1.40	1.45
53	L	703	CDL	OA8-CA6	-2.19	1.40	1.45
45	M	605	LMT	O5'-C5'	2.18	1.49	1.44
53	d	1202	CDL	OB8-CB6	-2.18	1.40	1.45
46	L	705	3PE	O31-C31	2.18	1.39	1.33
46	M	601	3PE	O31-C31	2.17	1.39	1.33
46	H	401	3PE	O21-C21	2.17	1.40	1.34
45	h	1002	LMT	O5'-C5'	2.16	1.49	1.44
53	h	1001	CDL	OB8-CB7	2.16	1.39	1.33
45	l	201	LMT	O5B-C5B	2.16	1.49	1.44
48	B	203	PC1	O31-C31	2.15	1.39	1.33
46	M	601	3PE	O31-C3	-2.15	1.40	1.45
53	d	1202	CDL	OA8-CA6	-2.14	1.40	1.45
46	M	601	3PE	O21-C21	2.14	1.40	1.34
46	m	202	3PE	O21-C21	2.14	1.40	1.34
45	J	201	LMT	O5B-C5B	2.13	1.49	1.44
53	d	1202	CDL	OA6-CA5	2.13	1.40	1.34
45	M	605	LMT	O5B-C5B	2.12	1.49	1.44
53	q	201	CDL	OB6-CB5	2.12	1.40	1.34
45	L	702	LMT	O5B-C5B	2.12	1.49	1.44
56	P	501	NDP	O2D-C2D	-2.12	1.38	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
53	N	503	CDL	OA6-CA5	2.12	1.40	1.34
46	I	201	3PE	O31-C31	2.12	1.39	1.33
45	f	1801	LMT	O5B-C5B	2.12	1.49	1.44
53	h	1001	CDL	OB6-CB5	2.10	1.40	1.34
53	J	202	CDL	OA6-CA5	2.10	1.40	1.34
56	P	501	NDP	O5D-C5D	-2.08	1.36	1.44
45	A	303	LMT	O5'-C5'	2.08	1.49	1.44
53	q	201	CDL	OA6-CA5	2.08	1.40	1.34
53	N	503	CDL	OA8-CA7	2.07	1.39	1.33
53	L	703	CDL	OB8-CB6	-2.07	1.40	1.45
53	h	1001	CDL	OA8-CA7	2.06	1.39	1.33
56	P	501	NDP	C7N-N7N	2.06	1.38	1.33
46	d	1201	3PE	O21-C21	2.06	1.40	1.34
45	Y	402	LMT	O5B-C5B	2.06	1.49	1.44
53	q	201	CDL	OA8-CA7	2.05	1.39	1.33
45	N	501	LMT	O5B-C5B	2.05	1.49	1.44
45	h	1002	LMT	O5B-C5B	2.04	1.49	1.44
46	L	705	3PE	O21-C21	2.04	1.40	1.34
46	I	201	3PE	O21-C21	2.04	1.40	1.34
46	Y	401	3PE	O31-C3	-2.03	1.40	1.45
45	k	101	LMT	O5B-C5B	2.03	1.49	1.44
53	J	202	CDL	OB8-CB6	-2.03	1.40	1.45
46	A	302	3PE	O31-C3	-2.03	1.40	1.45
50	F	501	FMN	C10-N1	2.02	1.37	1.33
58	U	101	EHZ	C9-S1	2.02	1.81	1.76
56	P	501	NDP	O5B-C5B	-2.01	1.37	1.44
58	U	101	EHZ	O6-C20	-2.01	1.39	1.44
46	N	502	3PE	O21-C21	2.00	1.40	1.34
53	N	503	CDL	OB6-CB5	2.00	1.40	1.34

All (131) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
56	P	501	NDP	PN-O3-PA	-6.53	110.43	132.83
58	U	101	EHZ	C8-C9-S1	6.19	121.29	113.63
52	H	403	I49	C14-N02-C15	-5.93	115.32	125.21
52	H	403	I49	N01-C14-N03	5.06	129.74	120.26
52	N	504	I49	N01-C14-N03	4.87	129.39	120.26
53	h	1001	CDL	OB6-CB5-C51	4.63	121.48	111.50
48	B	203	PC1	O21-C21-C22	4.48	121.15	111.50
58	T	101	EHZ	C8-C9-S1	4.39	119.06	113.63
46	L	705	3PE	O21-C21-C22	4.26	120.69	111.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
46	M	604	3PE	O21-C21-C22	4.23	120.63	111.50
46	L	704	3PE	O21-C21-C22	4.18	120.52	111.50
46	A	302	3PE	O21-C21-C22	4.12	120.39	111.50
46	d	1201	3PE	O21-C21-C22	4.12	120.38	111.50
46	N	502	3PE	O21-C21-C22	4.11	120.35	111.50
53	N	503	CDL	OA6-CA5-C11	4.09	120.32	111.50
53	d	1202	CDL	OB6-CB5-C51	4.07	120.28	111.50
45	M	603	LMT	C1'-C2'-C3'	4.07	118.46	110.00
46	H	401	3PE	O21-C21-C22	3.99	120.10	111.50
53	h	1001	CDL	OA6-CA5-C11	3.97	120.06	111.50
53	L	703	CDL	OB6-CB5-C51	3.90	119.90	111.50
46	m	202	3PE	O21-C21-C22	3.89	119.88	111.50
53	q	201	CDL	OA6-CA5-C11	3.87	119.84	111.50
46	M	601	3PE	O21-C21-C22	3.85	119.79	111.50
53	q	201	CDL	OB6-CB5-C51	3.83	119.76	111.50
53	d	1202	CDL	OA6-CA5-C11	3.82	119.74	111.50
46	H	402	3PE	O21-C21-O22	-3.81	120.71	125.57
48	g	1501	PC1	O21-C21-C22	3.78	119.66	111.50
45	m	201	LMT	O5'-C1'-C2'	3.77	118.33	110.35
53	L	703	CDL	OA6-CA5-C11	3.73	119.53	111.50
46	L	701	3PE	O21-C21-C22	3.71	119.49	111.50
53	J	202	CDL	OA6-CA5-C11	3.59	119.24	111.50
45	m	201	LMT	C1'-C2'-C3'	3.51	117.30	110.00
56	P	501	NDP	O2B-P2B-O1X	-3.46	96.04	109.39
53	N	503	CDL	OB6-CB5-C51	3.45	120.42	110.80
46	Y	401	3PE	O21-C21-C22	3.40	118.83	111.50
53	J	202	CDL	OB6-CB5-C51	3.35	118.72	111.50
50	F	501	FMN	C4-N3-C2	-3.34	119.47	125.64
54	O	401	GTP	C2-N1-C6	-3.32	118.98	125.10
53	d	1202	CDL	OB8-CB7-C71	3.29	122.24	111.91
52	N	504	I49	C14-N02-C15	-3.26	119.77	125.21
46	I	201	3PE	O21-C21-C22	3.24	118.48	111.50
54	O	401	GTP	C5-C6-N1	3.18	119.57	113.95
45	m	201	LMT	O1B-C4'-C3'	3.11	115.55	107.28
46	Y	401	3PE	O31-C31-C32	3.08	121.59	111.91
46	M	601	3PE	O31-C31-C32	3.06	121.51	111.91
53	d	1202	CDL	OA8-CA7-C31	3.06	121.51	111.91
54	O	401	GTP	C3'-C2'-C1'	3.06	105.58	100.98
46	H	401	3PE	O31-C31-C32	3.04	121.46	111.91
45	h	1002	LMT	O5'-C5'-C4'	2.95	115.98	109.75
54	O	401	GTP	O2G-PG-O3B	2.95	114.52	104.64
48	B	203	PC1	O31-C31-C32	2.95	121.16	111.91

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
45	f	1801	LMT	C1'-O5'-C5'	-2.94	107.92	113.69
54	O	401	GTP	PA-O3A-PB	-2.89	122.90	132.83
46	M	604	3PE	O31-C31-C32	2.89	120.97	111.91
45	h	1002	LMT	C1B-O1B-C4'	-2.88	110.83	117.96
54	O	401	GTP	PB-O3B-PG	-2.88	122.94	132.83
50	F	501	FMN	C4A-C10-N10	2.88	120.69	116.48
46	m	202	3PE	O31-C31-C32	2.87	120.92	111.91
46	H	402	3PE	O31-C31-C32	2.82	120.77	111.91
56	P	501	NDP	PA-O5B-C5B	-2.82	105.15	121.68
53	h	1001	CDL	OB8-CB7-C71	2.78	120.62	111.91
46	A	302	3PE	O31-C31-C32	2.77	120.60	111.91
54	O	401	GTP	O3G-PG-O3B	2.75	113.85	104.64
53	N	503	CDL	OB8-CB7-C71	2.74	120.51	111.91
45	M	603	LMT	C2'-C3'-C4'	2.73	115.92	109.68
53	h	1001	CDL	OA8-CA7-C31	2.72	120.45	111.91
50	F	501	FMN	C4A-C4-N3	2.71	120.08	113.19
46	d	1201	3PE	O31-C31-C32	2.70	120.39	111.91
52	N	504	I49	N05-C15-N04	-2.66	112.07	120.26
53	J	202	CDL	OB8-CB7-C71	2.65	120.23	111.91
53	q	201	CDL	OB8-CB7-C71	2.65	120.22	111.91
56	P	501	NDP	PN-O5D-C5D	-2.62	106.33	121.68
45	A	303	LMT	C1B-C2B-C3B	2.59	115.38	110.00
48	g	1501	PC1	O31-C31-C32	2.54	119.88	111.91
56	P	501	NDP	O3X-P2B-O2X	2.54	117.33	107.64
52	N	504	I49	N05-C15-N02	2.54	127.87	117.44
45	J	201	LMT	O5'-C5'-C4'	2.53	115.10	109.75
56	P	501	NDP	O4B-C4B-C3B	2.53	110.13	105.11
52	H	403	I49	N05-C15-N04	-2.51	112.54	120.26
46	L	705	3PE	O31-C31-C32	2.50	119.74	111.91
45	f	1801	LMT	O5B-C5B-C4B	2.49	114.21	109.69
50	F	501	FMN	O4-C4-C4A	-2.48	120.03	126.60
46	L	704	3PE	O31-C31-C32	2.48	119.67	111.91
45	M	605	LMT	O5B-C5B-C4B	2.45	114.14	109.69
45	h	1002	LMT	C1'-O5'-C5'	2.44	118.48	113.69
45	A	303	LMT	O5'-C5'-C4'	2.43	114.87	109.75
45	f	1801	LMT	C3B-C4B-C5B	2.41	114.54	110.24
46	N	502	3PE	O31-C31-C32	2.41	119.47	111.91
54	O	401	GTP	C2'-C3'-C4'	2.41	107.32	102.64
53	L	703	CDL	OB8-CB7-C71	2.40	119.45	111.91
53	d	1202	CDL	CB4-OB6-CB5	-2.40	111.88	117.79
50	F	501	FMN	C10-C4A-N5	-2.39	119.79	124.86
58	T	101	EHZ	C13-C12-N1	2.39	120.44	116.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
45	M	605	LMT	C3B-C4B-C5B	2.38	114.48	110.24
52	H	403	I49	C12-C13-I02	-2.37	119.22	121.72
45	m	201	LMT	O5B-C5B-C4B	2.37	113.99	109.69
56	P	501	NDP	O5D-PN-O1N	-2.36	99.86	109.07
45	m	201	LMT	C1'-O5'-C5'	2.35	118.31	113.69
45	f	1801	LMT	C1'-C2'-C3'	2.34	114.87	110.00
53	L	703	CDL	OA8-CA7-C31	2.33	119.23	111.91
52	H	403	I49	N02-C14-N01	-2.33	112.07	118.08
46	I	201	3PE	O31-C31-C32	2.33	119.21	111.91
56	P	501	NDP	C2A-N1A-C6A	-2.31	114.81	118.75
53	N	503	CDL	OA8-CA7-C31	2.30	119.12	111.91
46	L	701	3PE	O31-C31-C32	2.29	119.08	111.91
53	J	202	CDL	OA8-CA7-C31	2.28	119.07	111.91
53	q	201	CDL	OA8-CA7-C31	2.27	119.02	111.91
54	O	401	GTP	O2B-PB-O1B	-2.26	101.08	112.24
45	M	603	LMT	O2'-C2'-C3'	-2.25	105.15	110.35
52	N	504	I49	C09-C07-C10	2.24	121.68	118.54
52	H	403	I49	C06-C07-C10	-2.24	116.86	120.54
50	F	501	FMN	C4A-C10-N1	-2.24	119.53	124.73
54	O	401	GTP	O2A-PA-O1A	-2.23	101.23	112.24
58	T	101	EHZ	O2-C9-S1	-2.21	119.74	122.61
56	P	501	NDP	O2N-PN-O1N	2.19	123.08	112.24
56	P	501	NDP	C5B-C4B-C3B	-2.19	106.98	115.18
45	f	1801	LMT	C2'-C3'-C4'	2.18	114.66	109.68
58	U	101	EHZ	C13-C12-N1	2.17	120.08	116.42
58	T	101	EHZ	C13-C14-N2	-2.16	107.53	111.90
58	U	101	EHZ	O2-C9-S1	-2.15	119.82	122.61
56	P	501	NDP	O7N-C7N-N7N	-2.14	117.89	122.88
45	M	603	LMT	C1B-O5B-C5B	-2.13	109.51	113.69
53	N	503	CDL	CA4-OA6-CA5	-2.12	112.56	117.79
45	L	702	LMT	O1'-C1'-C2'	2.11	111.60	108.30
52	N	504	I49	N02-C14-N01	-2.11	112.65	118.08
45	A	301	LMT	O1B-C4'-C3'	2.09	112.83	107.28
54	O	401	GTP	O6-C6-C5	-2.06	120.36	124.37
45	L	702	LMT	C1B-O1B-C4'	-2.04	112.91	117.96
45	A	303	LMT	C1B-O1B-C4'	-2.03	112.95	117.96
45	h	1002	LMT	C6B-C5B-C4B	-2.02	108.28	113.00
58	U	101	EHZ	C11-N1-C12	-2.01	119.10	122.84

There are no chirality outliers.

All (664) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
45	A	301	LMT	C2'-C1'-O1'-C1
45	A	301	LMT	O5'-C1'-O1'-C1
45	A	303	LMT	C2'-C1'-O1'-C1
45	A	303	LMT	O5'-C1'-O1'-C1
45	J	201	LMT	O5'-C1'-O1'-C1
45	J	201	LMT	C2-C1-O1'-C1'
45	M	602	LMT	C2'-C1'-O1'-C1
45	M	602	LMT	O5'-C1'-O1'-C1
45	M	602	LMT	C2-C1-O1'-C1'
45	Y	402	LMT	C2-C1-O1'-C1'
45	f	1801	LMT	O5'-C1'-O1'-C1
45	k	101	LMT	O5'-C1'-O1'-C1
46	A	302	3PE	O13-C11-C12-N
46	A	302	3PE	O21-C2-C3-O31
46	A	302	3PE	O22-C21-O21-C2
46	H	402	3PE	O13-C11-C12-N
46	H	402	3PE	C1-C2-O21-C21
46	H	402	3PE	O22-C21-O21-C2
46	I	201	3PE	C1-O11-P-O12
46	I	201	3PE	C1-O11-P-O14
46	L	701	3PE	C1-O11-P-O14
46	L	704	3PE	C11-O13-P-O12
46	L	704	3PE	C11-O13-P-O14
46	L	704	3PE	O22-C21-O21-C2
46	L	704	3PE	C22-C21-O21-C2
46	L	705	3PE	C11-O13-P-O14
46	L	705	3PE	C22-C21-O21-C2
46	M	601	3PE	C1-O11-P-O12
46	M	601	3PE	C1-O11-P-O14
46	M	601	3PE	O13-C11-C12-N
46	M	604	3PE	O13-C11-C12-N
46	N	502	3PE	O13-C11-C12-N
46	N	502	3PE	O21-C2-C3-O31
46	d	1201	3PE	C1-O11-P-O12
46	d	1201	3PE	O13-C11-C12-N
46	d	1201	3PE	C22-C21-O21-C2
46	m	202	3PE	C1-O11-P-O12
46	m	202	3PE	C1-O11-P-O13
46	m	202	3PE	C1-O11-P-O14
46	m	202	3PE	C11-O13-P-O14
46	m	202	3PE	O13-C11-C12-N
46	m	202	3PE	C22-C21-O21-C2
48	g	1501	PC1	C11-O13-P-O12

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Mol	Chain	Res	Type	Atoms
48	g	1501	PC1	C11-O13-P-O14
48	g	1501	PC1	C11-O13-P-O11
48	g	1501	PC1	C1-O11-P-O12
48	g	1501	PC1	C1-O11-P-O14
48	g	1501	PC1	O13-C11-C12-N
52	H	403	I49	C07-C06-C08-N01
52	H	403	I49	N05-C15-N02-C14
52	N	504	I49	C07-C06-C08-N01
52	N	504	I49	N01-C14-N02-C15
52	N	504	I49	N03-C14-N02-C15
53	L	703	CDL	CB2-OB2-PB2-OB3
53	L	703	CDL	CB2-OB2-PB2-OB4
53	N	503	CDL	O1-C1-CA2-OA2
53	N	503	CDL	CA2-OA2-PA1-OA4
53	N	503	CDL	CA3-OA5-PA1-OA2
53	N	503	CDL	CA3-OA5-PA1-OA3
53	N	503	CDL	CA3-OA5-PA1-OA4
53	N	503	CDL	C11-CA5-OA6-CA4
53	N	503	CDL	CB3-OB5-PB2-OB4
53	N	503	CDL	OB7-CB5-OB6-CB4
53	d	1202	CDL	OA7-CA5-OA6-CA4
53	d	1202	CDL	C11-CA5-OA6-CA4
53	h	1001	CDL	CA2-C1-CB2-OB2
53	h	1001	CDL	CA2-OA2-PA1-OA3
53	h	1001	CDL	CA2-OA2-PA1-OA4
53	h	1001	CDL	CA2-OA2-PA1-OA5
53	h	1001	CDL	CB3-OB5-PB2-OB3
53	h	1001	CDL	OB7-CB5-OB6-CB4
53	q	201	CDL	CA2-OA2-PA1-OA3
53	q	201	CDL	CA2-OA2-PA1-OA5
53	q	201	CDL	CA3-OA5-PA1-OA3
53	q	201	CDL	CA3-OA5-PA1-OA4
53	q	201	CDL	CB2-OB2-PB2-OB4
53	q	201	CDL	CB3-OB5-PB2-OB3
54	O	401	GTP	C5'-O5'-PA-O3A
54	O	401	GTP	C5'-O5'-PA-O1A
58	T	101	EHZ	C5-C6-C7-C8
58	T	101	EHZ	N2-C15-C16-O5
58	T	101	EHZ	C16-C17-C20-O6
58	U	101	EHZ	C16-C17-C20-O6
58	U	101	EHZ	C18-C17-C20-O6
58	U	101	EHZ	C19-C17-C20-O6

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Mol	Chain	Res	Type	Atoms
45	M	605	LMT	O5B-C1B-O1B-C4'
53	d	1202	CDL	OB9-CB7-OB8-CB6
45	M	605	LMT	C2B-C1B-O1B-C4'
45	m	201	LMT	C3'-C4'-O1B-C1B
53	L	703	CDL	CB4-CB6-OB8-CB7
45	m	201	LMT	O5B-C1B-O1B-C4'
53	d	1202	CDL	C71-CB7-OB8-CB6
46	H	401	3PE	O32-C31-O31-C3
46	L	704	3PE	O32-C31-O31-C3
46	L	705	3PE	O32-C31-O31-C3
46	M	604	3PE	O32-C31-O31-C3
46	Y	401	3PE	O32-C31-O31-C3
46	d	1201	3PE	O32-C31-O31-C3
53	d	1202	CDL	OA9-CA7-OA8-CA6
53	h	1001	CDL	OB9-CB7-OB8-CB6
45	m	201	LMT	C2B-C1B-O1B-C4'
46	L	705	3PE	O22-C21-O21-C2
46	d	1201	3PE	O22-C21-O21-C2
46	m	202	3PE	O22-C21-O21-C2
53	N	503	CDL	OA7-CA5-OA6-CA4
46	L	704	3PE	C32-C31-O31-C3
46	L	705	3PE	C32-C31-O31-C3
46	M	604	3PE	C32-C31-O31-C3
46	Y	401	3PE	C32-C31-O31-C3
46	d	1201	3PE	C32-C31-O31-C3
45	A	301	LMT	C3'-C4'-O1B-C1B
46	A	302	3PE	C22-C21-O21-C2
53	N	503	CDL	C51-CB5-OB6-CB4
53	h	1001	CDL	C51-CB5-OB6-CB4
46	H	401	3PE	C32-C31-O31-C3
53	L	703	CDL	C71-CB7-OB8-CB6
53	d	1202	CDL	C31-CA7-OA8-CA6
53	h	1001	CDL	C71-CB7-OB8-CB6
45	A	301	LMT	O5'-C5'-C6'-O6'
45	L	702	LMT	O5'-C5'-C6'-O6'
45	M	603	LMT	O5B-C5B-C6B-O6B
45	m	201	LMT	O5B-C5B-C6B-O6B
46	N	502	3PE	O32-C31-O31-C3
53	N	503	CDL	OB9-CB7-OB8-CB6
45	Y	402	LMT	O5B-C5B-C6B-O6B
45	l	201	LMT	C4'-C5'-C6'-O6'
45	N	501	LMT	C3'-C4'-O1B-C1B

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Mol	Chain	Res	Type	Atoms
53	h	1001	CDL	O1-C1-CB2-OB2
53	N	503	CDL	C71-CB7-OB8-CB6
45	N	501	LMT	O5'-C5'-C6'-O6'
45	M	603	LMT	C4B-C5B-C6B-O6B
46	N	502	3PE	C22-C21-O21-C2
45	A	301	LMT	O5B-C5B-C6B-O6B
45	B	202	LMT	O5'-C5'-C6'-O6'
45	A	301	LMT	C4B-C5B-C6B-O6B
45	A	301	LMT	C4'-C5'-C6'-O6'
45	m	201	LMT	C4B-C5B-C6B-O6B
45	M	605	LMT	C5'-C4'-O1B-C1B
46	N	502	3PE	C32-C31-O31-C3
45	M	602	LMT	O5'-C5'-C6'-O6'
45	L	702	LMT	C4'-C5'-C6'-O6'
45	A	303	LMT	O5'-C5'-C6'-O6'
45	Y	402	LMT	O5'-C5'-C6'-O6'
53	L	703	CDL	OB9-CB7-OB8-CB6
45	f	1801	LMT	C4'-C5'-C6'-O6'
48	B	203	PC1	C32-C31-O31-C3
45	J	201	LMT	O5B-C5B-C6B-O6B
45	N	501	LMT	C4'-C5'-C6'-O6'
53	q	201	CDL	C11-CA5-OA6-CA4
45	Y	402	LMT	C4B-C5B-C6B-O6B
45	B	202	LMT	C3'-C4'-O1B-C1B
45	A	303	LMT	C4'-C5'-C6'-O6'
45	Y	402	LMT	C4'-C5'-C6'-O6'
48	B	203	PC1	O32-C31-O31-C3
48	g	1501	PC1	C32-C31-O31-C3
45	l	201	LMT	O5'-C5'-C6'-O6'
53	N	503	CDL	O1-C1-CB2-OB2
53	q	201	CDL	O1-C1-CA2-OA2
45	m	201	LMT	C2'-C1'-O1'-C1
45	J	201	LMT	C4'-C5'-C6'-O6'
45	J	201	LMT	O5'-C5'-C6'-O6'
45	f	1801	LMT	O5B-C5B-C6B-O6B
45	f	1801	LMT	O5'-C5'-C6'-O6'
46	N	502	3PE	O22-C21-O21-C2
45	h	1002	LMT	C2-C3-C4-C5
45	M	602	LMT	C4'-C5'-C6'-O6'
46	m	202	3PE	C21-C22-C23-C24
53	h	1001	CDL	C31-CA7-OA8-CA6
46	M	604	3PE	C31-C32-C33-C34

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Mol	Chain	Res	Type	Atoms
46	H	401	3PE	C31-C32-C33-C34
46	I	201	3PE	C21-C22-C23-C24
46	L	701	3PE	C31-C32-C33-C34
46	M	601	3PE	C21-C22-C23-C24
53	J	202	CDL	CA5-C11-C12-C13
53	d	1202	CDL	CA5-C11-C12-C13
58	T	101	EHZ	C5-C6-C7-O1
58	U	101	EHZ	C5-C6-C7-O1
53	q	201	CDL	OA7-CA5-OA6-CA4
46	H	402	3PE	C2-C1-O11-P
46	Y	401	3PE	C22-C21-O21-C2
48	g	1501	PC1	O32-C31-O31-C3
45	B	202	LMT	C4'-C5'-C6'-O6'
45	B	202	LMT	O5'-C1'-O1'-C1
53	q	201	CDL	C31-CA7-OA8-CA6
53	h	1001	CDL	CB5-C51-C52-C53
45	m	201	LMT	C4'-C5'-C6'-O6'
46	L	701	3PE	C22-C21-O21-C2
53	h	1001	CDL	C11-CA5-OA6-CA4
46	I	201	3PE	C1-O11-P-O13
46	I	201	3PE	C11-O13-P-O11
46	L	701	3PE	C1-O11-P-O13
46	L	704	3PE	C1-O11-P-O13
46	L	704	3PE	C11-O13-P-O11
46	M	601	3PE	C1-O11-P-O13
46	N	502	3PE	C11-O13-P-O11
48	g	1501	PC1	C1-O11-P-O13
53	J	202	CDL	CB3-OB5-PB2-OB2
53	L	703	CDL	CB2-OB2-PB2-OB5
53	N	503	CDL	CA2-OA2-PA1-OA5
53	N	503	CDL	CB2-OB2-PB2-OB5
53	N	503	CDL	CB3-OB5-PB2-OB2
53	q	201	CDL	CA3-OA5-PA1-OA2
53	q	201	CDL	CB2-OB2-PB2-OB5
45	f	1801	LMT	O5B-C1B-O1B-C4'
46	L	705	3PE	C21-C22-C23-C24
48	B	203	PC1	C31-C32-C33-C34
53	N	503	CDL	CA7-C31-C32-C33
53	N	503	CDL	CB2-C1-CA2-OA2
46	Y	401	3PE	O22-C21-O21-C2
53	h	1001	CDL	OA7-CA5-OA6-CA4
53	h	1001	CDL	OA9-CA7-OA8-CA6

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Mol	Chain	Res	Type	Atoms
46	N	502	3PE	C29-C2A-C2B-C2C
48	g	1501	PC1	C2C-C2D-C2E-C2F
45	M	602	LMT	C5-C6-C7-C8
46	d	1201	3PE	C33-C34-C35-C36
53	L	703	CDL	C55-C56-C57-C58
53	q	201	CDL	C59-C60-C61-C62
46	L	704	3PE	C3C-C3D-C3E-C3F
46	L	701	3PE	O22-C21-O21-C2
53	J	202	CDL	OA7-CA5-OA6-CA4
46	L	704	3PE	C21-C22-C23-C24
53	d	1202	CDL	CB7-C71-C72-C73
46	M	604	3PE	C3A-C3B-C3C-C3D
46	H	402	3PE	C35-C36-C37-C38
46	L	701	3PE	C22-C23-C24-C25
46	M	604	3PE	C22-C23-C24-C25
53	N	503	CDL	C33-C34-C35-C36
53	q	201	CDL	C57-C58-C59-C60
53	d	1202	CDL	O1-C1-CB2-OB2
46	A	302	3PE	C2A-C2B-C2C-C2D
53	d	1202	CDL	C57-C58-C59-C60
46	L	704	3PE	C25-C26-C27-C28
46	M	601	3PE	C37-C38-C39-C3A
53	N	503	CDL	C73-C74-C75-C76
53	h	1001	CDL	C20-C21-C22-C23
58	U	101	EHZ	C3-C4-C5-C6
59	o	201	MYR	C9-C10-C11-C12
53	q	201	CDL	C52-C53-C54-C55
46	d	1201	3PE	C21-C22-C23-C24
46	A	302	3PE	C35-C36-C37-C38
46	A	302	3PE	C28-C29-C2A-C2B
46	Y	401	3PE	C37-C38-C39-C3A
53	N	503	CDL	C31-C32-C33-C34
59	o	201	MYR	C2-C3-C4-C5
45	k	101	LMT	O5'-C5'-C6'-O6'
53	L	703	CDL	C13-C14-C15-C16
53	d	1202	CDL	C56-C57-C58-C59
53	J	202	CDL	C11-CA5-OA6-CA4
46	H	401	3PE	C37-C38-C39-C3A
46	L	704	3PE	C32-C33-C34-C35
46	N	502	3PE	C34-C35-C36-C37
53	q	201	CDL	C11-C12-C13-C14
53	q	201	CDL	CB5-C51-C52-C53

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Mol	Chain	Res	Type	Atoms
46	I	201	3PE	C2C-C2D-C2E-C2F
46	M	601	3PE	C39-C3A-C3B-C3C
46	m	202	3PE	C33-C34-C35-C36
48	g	1501	PC1	C29-C2A-C2B-C2C
53	J	202	CDL	C12-C13-C14-C15
53	h	1001	CDL	C17-C18-C19-C20
45	A	303	LMT	C6-C7-C8-C9
45	h	1002	LMT	C4-C5-C6-C7
46	H	401	3PE	O13-C11-C12-N
46	Y	401	3PE	O13-C11-C12-N
53	q	201	CDL	OA9-CA7-OA8-CA6
53	L	703	CDL	C34-C35-C36-C37
53	d	1202	CDL	C15-C16-C17-C18
53	h	1001	CDL	C72-C73-C74-C75
45	M	605	LMT	C3'-C4'-O1B-C1B
45	Y	402	LMT	C3-C4-C5-C6
46	I	201	3PE	C3A-C3B-C3C-C3D
46	I	201	3PE	C33-C34-C35-C36
46	L	704	3PE	C38-C39-C3A-C3B
46	L	705	3PE	C33-C34-C35-C36
48	g	1501	PC1	C2E-C2F-C2G-C2H
53	N	503	CDL	C32-C33-C34-C35
46	N	502	3PE	C33-C34-C35-C36
53	q	201	CDL	CB3-CB4-CB6-OB8
53	q	201	CDL	C31-C32-C33-C34
46	M	604	3PE	C2E-C2F-C2G-C2H
53	d	1202	CDL	CA2-C1-CB2-OB2
46	L	701	3PE	C29-C2A-C2B-C2C
46	M	604	3PE	C26-C27-C28-C29
53	d	1202	CDL	C11-C12-C13-C14
59	o	201	MYR	C11-C10-C9-C8
46	L	705	3PE	C31-C32-C33-C34
46	Y	401	3PE	C31-C32-C33-C34
53	q	201	CDL	C71-CB7-OB8-CB6
53	L	703	CDL	C51-CB5-OB6-CB4
46	L	705	3PE	C32-C33-C34-C35
46	d	1201	3PE	C3B-C3C-C3D-C3E
53	J	202	CDL	C36-C37-C38-C39
48	g	1501	PC1	C32-C33-C34-C35
58	U	101	EHZ	C1-C2-C3-C4
45	l	201	LMT	C4-C5-C6-C7
46	L	701	3PE	C32-C31-O31-C3

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Mol	Chain	Res	Type	Atoms
46	H	401	3PE	C3B-C3C-C3D-C3E
46	M	604	3PE	C2B-C2C-C2D-C2E
53	q	201	CDL	C37-C38-C39-C40
46	A	302	3PE	C3E-C3F-C3G-C3H
45	N	501	LMT	C1-C2-C3-C4
45	B	202	LMT	C3-C4-C5-C6
45	Y	402	LMT	C2-C3-C4-C5
46	M	604	3PE	C22-C21-O21-C2
53	d	1202	CDL	C51-CB5-OB6-CB4
53	q	201	CDL	OB5-CB3-CB4-OB6
45	A	303	LMT	C11-C10-C9-C8
53	q	201	CDL	OB9-CB7-OB8-CB6
46	H	401	3PE	C35-C36-C37-C38
53	N	503	CDL	C76-C77-C78-C79
48	g	1501	PC1	O21-C2-C3-O31
53	q	201	CDL	OB6-CB4-CB6-OB8
46	A	302	3PE	C26-C27-C28-C29
46	M	604	3PE	C3D-C3E-C3F-C3G
53	L	703	CDL	CA5-C11-C12-C13
53	h	1001	CDL	C12-C13-C14-C15
53	h	1001	CDL	C71-C72-C73-C74
46	M	601	3PE	C2A-C2B-C2C-C2D
46	M	604	3PE	O22-C21-O21-C2
53	L	703	CDL	OB7-CB5-OB6-CB4
46	d	1201	3PE	C1-O11-P-O13
53	J	202	CDL	CA3-OA5-PA1-OA2
53	J	202	CDL	CB2-OB2-PB2-OB5
53	h	1001	CDL	CB3-OB5-PB2-OB2
45	N	501	LMT	O5B-C5B-C6B-O6B
46	Y	401	3PE	C2-C1-O11-P
45	M	602	LMT	C4B-C5B-C6B-O6B
46	L	704	3PE	O11-C1-C2-C3
53	h	1001	CDL	CA7-C31-C32-C33
46	d	1201	3PE	C37-C38-C39-C3A
48	B	203	PC1	C32-C33-C34-C35
45	Y	402	LMT	C5'-C4'-O1B-C1B
46	L	701	3PE	C24-C25-C26-C27
46	N	502	3PE	C23-C24-C25-C26
48	g	1501	PC1	C26-C27-C28-C29
46	A	302	3PE	C2C-C2D-C2E-C2F
53	q	201	CDL	C72-C73-C74-C75
58	T	101	EHZ	O4-C15-C16-O5

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Mol	Chain	Res	Type	Atoms
46	L	701	3PE	C34-C35-C36-C37
46	m	202	3PE	C35-C36-C37-C38
53	L	703	CDL	C57-C58-C59-C60
46	M	601	3PE	C22-C21-O21-C2
45	l	201	LMT	C1-C2-C3-C4
58	T	101	EHZ	C18-C17-C20-O6
58	T	101	EHZ	C19-C17-C20-O6
46	A	302	3PE	C1-C2-O21-C21
53	d	1202	CDL	OB7-CB5-OB6-CB4
45	J	201	LMT	C4B-C5B-C6B-O6B
50	F	501	FMN	C5'-O5'-P-O1P
53	h	1001	CDL	C21-C22-C23-C24
53	N	503	CDL	OA5-CA3-CA4-OA6
46	M	601	3PE	C31-C32-C33-C34
45	Y	402	LMT	C3'-C4'-O1B-C1B
46	L	701	3PE	O32-C31-O31-C3
46	I	201	3PE	C23-C24-C25-C26
46	L	701	3PE	C37-C38-C39-C3A
46	A	302	3PE	C3C-C3D-C3E-C3F
46	A	302	3PE	C32-C31-O31-C3
54	O	401	GTP	PG-O3B-PB-O1B
53	q	201	CDL	C51-C52-C53-C54
59	o	201	MYR	C11-C12-C13-C14
45	f	1801	LMT	C5'-C4'-O1B-C1B
45	f	1801	LMT	C3'-C4'-O1B-C1B
45	B	202	LMT	C5'-C4'-O1B-C1B
46	I	201	3PE	C27-C28-C29-C2A
53	h	1001	CDL	C24-C25-C26-C27
46	m	202	3PE	C2A-C2B-C2C-C2D
53	L	703	CDL	OB5-CB3-CB4-CB6
53	d	1202	CDL	OB5-CB3-CB4-CB6
46	Y	401	3PE	C21-C22-C23-C24
59	o	201	MYR	C4-C5-C6-C7
45	m	201	LMT	O5'-C5'-C6'-O6'
53	J	202	CDL	CB4-CB3-OB5-PB2
53	q	201	CDL	CA4-CA3-OA5-PA1
45	M	603	LMT	C2-C1-O1'-C1'
45	M	605	LMT	C2-C1-O1'-C1'
45	h	1002	LMT	C2-C1-O1'-C1'
53	N	503	CDL	C42-C43-C44-C45
53	d	1202	CDL	C72-C73-C74-C75
46	H	402	3PE	C33-C34-C35-C36

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Mol	Chain	Res	Type	Atoms
46	A	302	3PE	C1-C2-C3-O31
46	L	701	3PE	C1-C2-C3-O31
46	N	502	3PE	C1-C2-C3-O31
48	B	203	PC1	C1-C2-C3-O31
48	g	1501	PC1	C1-C2-C3-O31
53	d	1202	CDL	CB3-CB4-CB6-OB8
46	L	701	3PE	C32-C33-C34-C35
58	T	101	EHZ	C21-C22-C23-C24
46	L	701	3PE	C36-C37-C38-C39
46	L	701	3PE	C2F-C2G-C2H-C2I
53	h	1001	CDL	C16-C17-C18-C19
46	L	705	3PE	C11-O13-P-O11
45	M	602	LMT	O5B-C5B-C6B-O6B
46	L	704	3PE	O11-C1-C2-O21
53	L	703	CDL	OB5-CB3-CB4-OB6
46	d	1201	3PE	C31-C32-C33-C34
46	L	701	3PE	C2B-C2C-C2D-C2E
46	H	402	3PE	C3C-C3D-C3E-C3F
53	L	703	CDL	C54-C55-C56-C57
46	H	401	3PE	O21-C2-C3-O31
46	M	601	3PE	O21-C2-C3-O31
48	B	203	PC1	O21-C2-C3-O31
53	d	1202	CDL	OB6-CB4-CB6-OB8
46	M	601	3PE	O22-C21-O21-C2
46	M	604	3PE	C39-C3A-C3B-C3C
46	M	601	3PE	C28-C29-C2A-C2B
46	A	302	3PE	O32-C31-O31-C3
53	N	503	CDL	C75-C76-C77-C78
53	d	1202	CDL	C20-C21-C22-C23
53	h	1001	CDL	C73-C74-C75-C76
58	U	101	EHZ	O2-C9-S1-C10
46	m	202	3PE	C2D-C2E-C2F-C2G
46	Y	401	3PE	O11-C1-C2-C3
53	q	201	CDL	OB5-CB3-CB4-CB6
45	N	501	LMT	C5'-C4'-O1B-C1B
45	l	201	LMT	C5'-C4'-O1B-C1B
46	I	201	3PE	C32-C31-O31-C3
53	J	202	CDL	C31-CA7-OA8-CA6
45	A	301	LMT	C1-C2-C3-C4
46	A	302	3PE	C21-C22-C23-C24
46	N	502	3PE	C32-C33-C34-C35
46	M	601	3PE	C3-C2-O21-C21

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Mol	Chain	Res	Type	Atoms
58	U	101	EHZ	C8-C9-S1-C10
45	l	201	LMT	C3'-C4'-O1B-C1B
46	M	601	3PE	C1-C2-C3-O31
46	Y	401	3PE	C1-C2-C3-O31
46	d	1201	3PE	C2-C1-O11-P
48	g	1501	PC1	C2-C1-O11-P
52	H	403	I49	N01-C14-N02-C15
53	J	202	CDL	CA3-CA4-CA6-OA8
53	d	1202	CDL	CA3-CA4-CA6-OA8
46	I	201	3PE	O32-C31-O31-C3
53	J	202	CDL	OA9-CA7-OA8-CA6
46	I	201	3PE	C25-C26-C27-C28
53	J	202	CDL	C18-C19-C20-C21
53	h	1001	CDL	C32-C33-C34-C35
58	T	101	EHZ	O1-C7-C8-C9
53	J	202	CDL	C14-C15-C16-C17
46	L	701	3PE	O21-C2-C3-O31
46	Y	401	3PE	O21-C2-C3-O31
53	d	1202	CDL	OA6-CA4-CA6-OA8
48	g	1501	PC1	C37-C38-C39-C3A
56	P	501	NDP	C2B-O2B-P2B-O3X
45	B	202	LMT	C7-C8-C9-C10
45	l	201	LMT	C4B-C5B-C6B-O6B
46	H	401	3PE	C23-C24-C25-C26
53	J	202	CDL	C71-C72-C73-C74
54	O	401	GTP	PB-O3A-PA-O1A
46	m	202	3PE	C23-C24-C25-C26
45	Y	402	LMT	C1-C2-C3-C4
46	H	402	3PE	C37-C38-C39-C3A
52	H	403	I49	N03-C14-N02-C15
45	l	201	LMT	O1'-C1-C2-C3
46	m	202	3PE	C11-O13-P-O11
53	J	202	CDL	C52-C53-C54-C55
46	L	701	3PE	C21-C22-C23-C24
53	d	1202	CDL	CB4-CB3-OB5-PB2
53	q	201	CDL	C1-CA2-OA2-PA1
46	H	402	3PE	C11-O13-P-O14
46	I	201	3PE	C11-O13-P-O12
46	L	701	3PE	C11-O13-P-O14
46	L	704	3PE	C1-O11-P-O12
46	L	704	3PE	C1-O11-P-O14
46	N	502	3PE	C11-O13-P-O12

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Mol	Chain	Res	Type	Atoms
46	d	1201	3PE	C1-O11-P-O14
48	B	203	PC1	C11-O13-P-O14
53	J	202	CDL	CA3-OA5-PA1-OA3
53	J	202	CDL	CA3-OA5-PA1-OA4
53	J	202	CDL	CB2-OB2-PB2-OB4
53	J	202	CDL	CB3-OB5-PB2-OB3
53	N	503	CDL	CA2-OA2-PA1-OA3
53	N	503	CDL	CB2-OB2-PB2-OB3
53	N	503	CDL	CB2-OB2-PB2-OB4
54	O	401	GTP	C5'-O5'-PA-O2A
58	T	101	EHZ	C6-C7-C8-C9
53	J	202	CDL	OB5-CB3-CB4-CB6
53	N	503	CDL	OA5-CA3-CA4-CA6
53	J	202	CDL	C20-C21-C22-C23
46	L	701	3PE	C2E-C2F-C2G-C2H
53	q	201	CDL	C39-C40-C41-C42
45	N	501	LMT	C4-C5-C6-C7
46	M	601	3PE	C36-C37-C38-C39
46	M	601	3PE	C12-C11-O13-P
46	M	604	3PE	C12-C11-O13-P
46	m	202	3PE	C12-C11-O13-P
46	H	402	3PE	C3D-C3E-C3F-C3G
53	N	503	CDL	OB5-CB3-CB4-OB6
53	d	1202	CDL	OB5-CB3-CB4-OB6
53	q	201	CDL	OA5-CA3-CA4-OA6
45	M	603	LMT	C1-C2-C3-C4
46	M	604	3PE	C36-C37-C38-C39
53	d	1202	CDL	C53-C54-C55-C56
46	m	202	3PE	C27-C28-C29-C2A
53	d	1202	CDL	C54-C55-C56-C57
45	N	501	LMT	C3-C4-C5-C6
46	L	705	3PE	C1-C2-C3-O31
46	d	1201	3PE	C1-C2-C3-O31
46	L	705	3PE	O21-C2-C3-O31
46	d	1201	3PE	O21-C2-C3-O31
45	M	602	LMT	C2-C3-C4-C5
53	J	202	CDL	C1-CB2-OB2-PB2
53	N	503	CDL	C38-C39-C40-C41
52	H	403	I49	C08-C06-C07-C10
52	H	403	I49	C08-C06-C07-C09
46	A	302	3PE	C2B-C2C-C2D-C2E
53	d	1202	CDL	C52-C51-CB5-OB6

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Mol	Chain	Res	Type	Atoms
46	H	401	3PE	C24-C25-C26-C27
48	g	1501	PC1	C2B-C2C-C2D-C2E
53	J	202	CDL	C33-C34-C35-C36
46	m	202	3PE	O11-C1-C2-C3
53	N	503	CDL	OB5-CB3-CB4-CB6
46	M	601	3PE	C25-C26-C27-C28
46	H	401	3PE	C27-C28-C29-C2A
53	d	1202	CDL	C18-C19-C20-C21
53	q	201	CDL	C13-C14-C15-C16
53	q	201	CDL	C35-C36-C37-C38
48	g	1501	PC1	C2A-C2B-C2C-C2D
58	T	101	EHZ	C21-C1-C2-C3
46	A	302	3PE	C2-C1-O11-P
46	Y	401	3PE	O11-C1-C2-O21
46	m	202	3PE	O11-C1-C2-O21
53	J	202	CDL	C16-C17-C18-C19
53	q	201	CDL	C15-C16-C17-C18
46	M	604	3PE	C33-C34-C35-C36
46	M	604	3PE	C37-C38-C39-C3A
45	A	301	LMT	O1'-C1-C2-C3
46	Y	401	3PE	C3B-C3C-C3D-C3E
46	L	705	3PE	C1-O11-P-O13
46	Y	401	3PE	C1-O11-P-O13
48	B	203	PC1	C11-O13-P-O11
53	L	703	CDL	CA2-OA2-PA1-OA5
46	H	401	3PE	C1-C2-C3-O31
45	M	605	LMT	C5-C6-C7-C8
46	H	402	3PE	C32-C33-C34-C35
46	H	401	3PE	C32-C33-C34-C35
46	M	601	3PE	C2E-C2F-C2G-C2H
56	P	501	NDP	PN-O3-PA-O1A
46	N	502	3PE	C22-C23-C24-C25
53	J	202	CDL	C40-C41-C42-C43
48	B	203	PC1	C2-C1-O11-P
53	L	703	CDL	C60-C61-C62-C63
53	N	503	CDL	C44-C45-C46-C47
52	H	403	I49	N04-C15-N02-C14
53	L	703	CDL	CA2-C1-CB2-OB2
53	q	201	CDL	CB2-C1-CA2-OA2
56	P	501	NDP	C2D-C1D-N1N-C6N
56	P	501	NDP	O4D-C1D-N1N-C6N
46	L	701	3PE	O13-C11-C12-N

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Mol	Chain	Res	Type	Atoms
46	L	705	3PE	O13-C11-C12-N
45	N	501	LMT	C11-C10-C9-C8
46	M	604	3PE	O11-C1-C2-O21
53	d	1202	CDL	C19-C20-C21-C22
46	L	701	3PE	C2A-C2B-C2C-C2D
45	M	605	LMT	C9-C10-C11-C12
45	B	202	LMT	O5B-C5B-C6B-O6B
53	L	703	CDL	C33-C34-C35-C36
53	h	1001	CDL	C31-C32-C33-C34
46	L	704	3PE	C35-C36-C37-C38
53	L	703	CDL	OA7-CA5-OA6-CA4
45	A	301	LMT	C5'-C4'-O1B-C1B
46	M	604	3PE	C23-C24-C25-C26
46	d	1201	3PE	C3D-C3E-C3F-C3G
46	L	704	3PE	C3B-C3C-C3D-C3E
45	M	602	LMT	C6-C7-C8-C9
45	B	202	LMT	C5-C6-C7-C8
45	M	605	LMT	C7-C8-C9-C10
46	M	601	3PE	O11-C1-C2-C3
53	q	201	CDL	OA5-CA3-CA4-CA6
46	I	201	3PE	C32-C33-C34-C35
45	M	602	LMT	O1'-C1-C2-C3
45	A	301	LMT	C2-C3-C4-C5
58	T	101	EHZ	C11-C10-S1-C9
46	H	401	3PE	C38-C39-C3A-C3B
53	J	202	CDL	OA6-CA4-CA6-OA8
46	I	201	3PE	C31-C32-C33-C34
45	A	303	LMT	C2-C3-C4-C5
45	Y	402	LMT	O5'-C1'-O1'-C1
53	N	503	CDL	CA2-C1-CB2-OB2
46	Y	401	3PE	C39-C3A-C3B-C3C
45	J	201	LMT	O5B-C1B-O1B-C4'
56	P	501	NDP	PN-O3-PA-O2A
46	d	1201	3PE	C38-C39-C3A-C3B
45	J	201	LMT	C2B-C1B-O1B-C4'
45	k	101	LMT	O5B-C1B-O1B-C4'
52	H	403	I49	C06-C08-N01-C14
45	h	1002	LMT	C3-C4-C5-C6
46	M	601	3PE	C26-C27-C28-C29
53	J	202	CDL	OB5-CB3-CB4-OB6
53	d	1202	CDL	C75-C76-C77-C78
46	M	604	3PE	C3F-C3G-C3H-C3I

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Mol	Chain	Res	Type	Atoms
46	A	302	3PE	C27-C28-C29-C2A
46	d	1201	3PE	C3A-C3B-C3C-C3D
46	L	704	3PE	C28-C29-C2A-C2B
53	h	1001	CDL	C22-C23-C24-C25
46	I	201	3PE	C37-C38-C39-C3A
46	N	502	3PE	O31-C31-C32-C33
53	q	201	CDL	C52-C51-CB5-OB6
46	m	202	3PE	O21-C21-C22-C23
53	h	1001	CDL	C15-C16-C17-C18
46	L	704	3PE	C29-C2A-C2B-C2C
45	k	101	LMT	C2B-C1B-O1B-C4'
46	L	701	3PE	O21-C21-C22-C23
46	Y	401	3PE	C22-C23-C24-C25
53	L	703	CDL	C52-C51-CB5-OB6
46	M	601	3PE	C23-C24-C25-C26
53	J	202	CDL	O1-C1-CB2-OB2
46	d	1201	3PE	C34-C35-C36-C37
46	d	1201	3PE	O21-C21-C22-C23
53	q	201	CDL	C32-C31-CA7-OA8
45	l	201	LMT	O5B-C5B-C6B-O6B
46	M	604	3PE	O21-C21-C22-C23
53	d	1202	CDL	CA7-C31-C32-C33
53	N	503	CDL	C52-C51-CB5-OB6
56	P	501	NDP	O4B-C4B-C5B-O5B
46	L	704	3PE	O21-C21-C22-C23
53	L	703	CDL	C11-CA5-OA6-CA4
46	m	202	3PE	O22-C21-C22-C23
46	d	1201	3PE	C35-C36-C37-C38
45	f	1801	LMT	C4B-C5B-C6B-O6B
46	L	701	3PE	O22-C21-C22-C23
46	M	604	3PE	C35-C36-C37-C38
53	L	703	CDL	CB3-CB4-CB6-OB8
48	g	1501	PC1	C23-C24-C25-C26
46	N	502	3PE	C2-C1-O11-P
53	q	201	CDL	C32-C31-CA7-OA9
46	H	401	3PE	C1-O11-P-O14
46	I	201	3PE	C11-O13-P-O14
46	M	604	3PE	C1-O11-P-O14
46	N	502	3PE	C11-O13-P-O14
46	d	1201	3PE	C11-O13-P-O14
53	L	703	CDL	CA3-OA5-PA1-OA3
53	L	703	CDL	CB3-OB5-PB2-OB3

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Mol	Chain	Res	Type	Atoms
53	d	1202	CDL	CB2-OB2-PB2-OB3
46	d	1201	3PE	O22-C21-C22-C23
48	B	203	PC1	O21-C21-C22-C23
46	I	201	3PE	C38-C39-C3A-C3B
53	L	703	CDL	C35-C36-C37-C38
53	q	201	CDL	C52-C51-CB5-OB7
45	M	605	LMT	O5'-C5'-C6'-O6'
46	m	202	3PE	C24-C25-C26-C27
45	f	1801	LMT	C5-C6-C7-C8
48	B	203	PC1	C22-C23-C24-C25
45	k	101	LMT	C4-C5-C6-C7
53	d	1202	CDL	C12-C11-CA5-OA6
46	H	401	3PE	C12-C11-O13-P
46	I	201	3PE	C12-C11-O13-P
46	M	604	3PE	O22-C21-C22-C23
53	L	703	CDL	O1-C1-CB2-OB2
48	B	203	PC1	O31-C31-C32-C33
48	g	1501	PC1	O31-C31-C32-C33
53	d	1202	CDL	C32-C31-CA7-OA8
58	U	101	EHZ	C1-C21-C22-C23
50	F	501	FMN	C4'-C5'-O5'-P
50	F	501	FMN	N10-C1'-C2'-O2'
53	L	703	CDL	C52-C51-CB5-OB7
53	L	703	CDL	C32-C31-CA7-OA8
53	J	202	CDL	C52-C51-CB5-OB6
46	Y	401	3PE	C23-C24-C25-C26
48	B	203	PC1	O32-C31-C32-C33
53	d	1202	CDL	C32-C31-CA7-OA9
45	m	201	LMT	C2-C3-C4-C5
46	L	704	3PE	O22-C21-C22-C23
45	l	201	LMT	O5B-C1B-O1B-C4'
48	B	203	PC1	O22-C21-C22-C23
53	d	1202	CDL	C12-C11-CA5-OA7

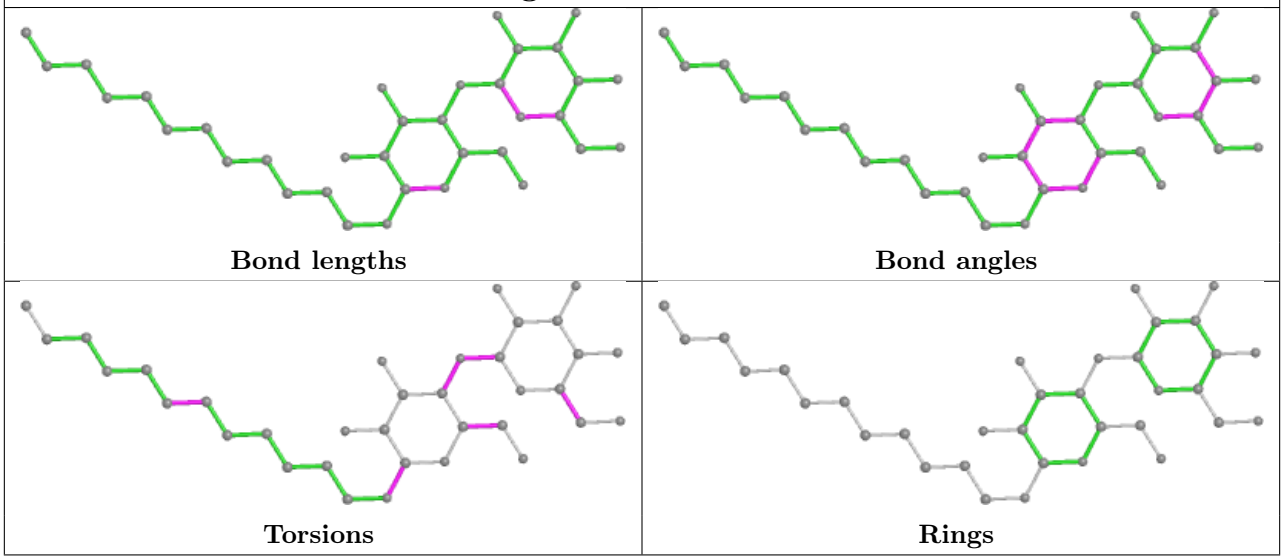
There are no ring outliers.

No monomer is involved in short contacts.

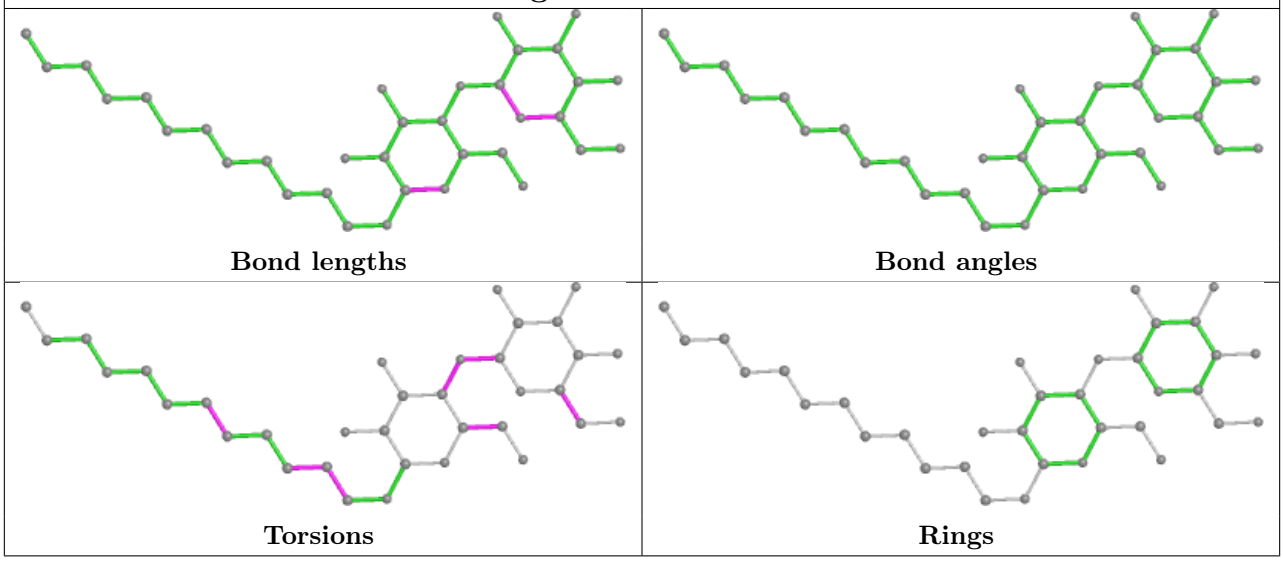
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

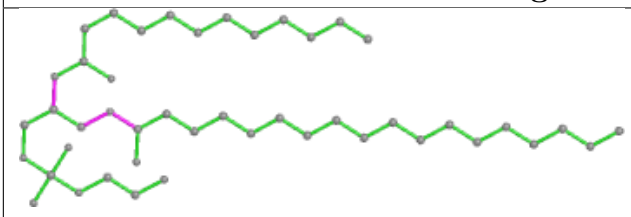
Ligand LMT f 1801



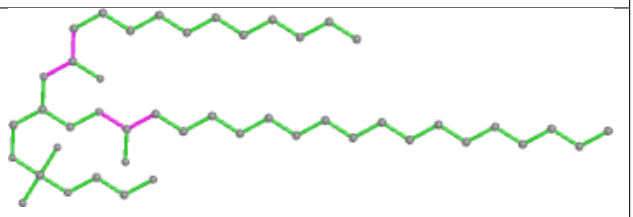
Ligand LMT l 201



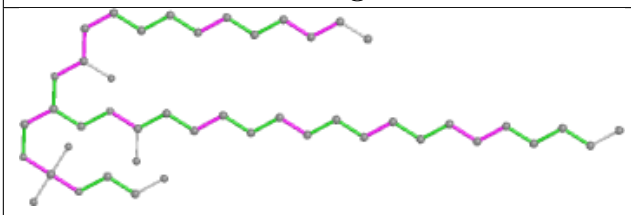
Ligand 3PE L 704



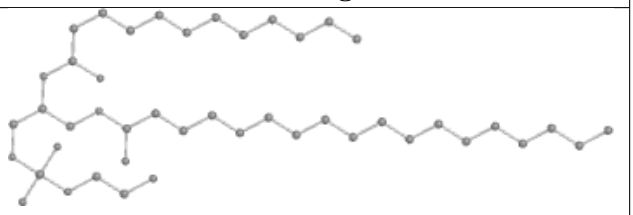
Bond lengths



Bond angles

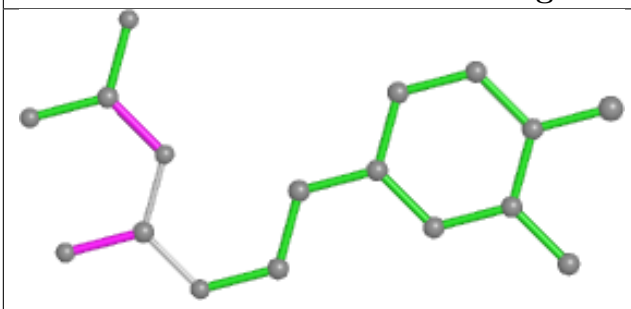


Torsions



Rings

Ligand I49 H 403



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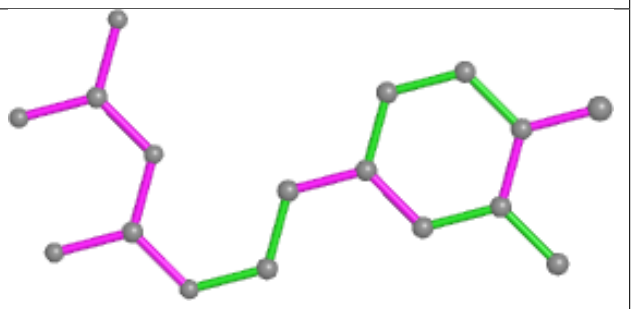

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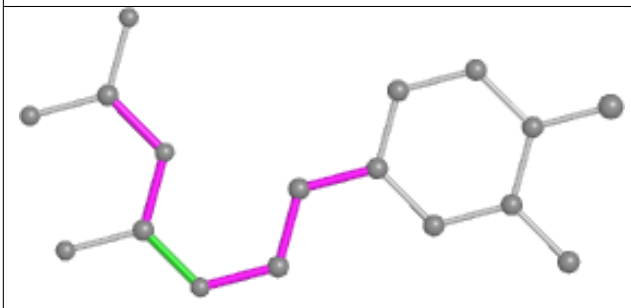

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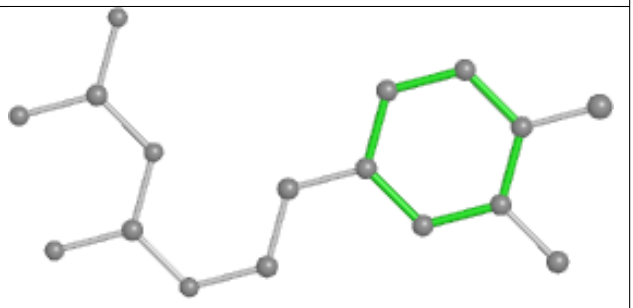
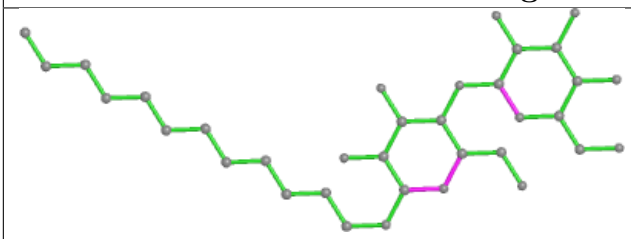


Rings

Ligand LMT A 303



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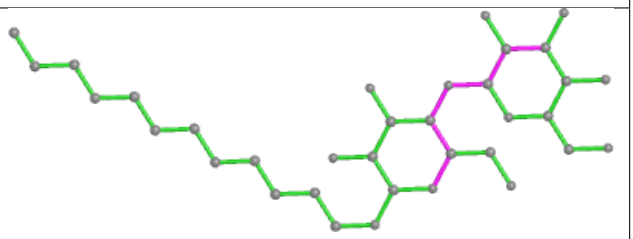
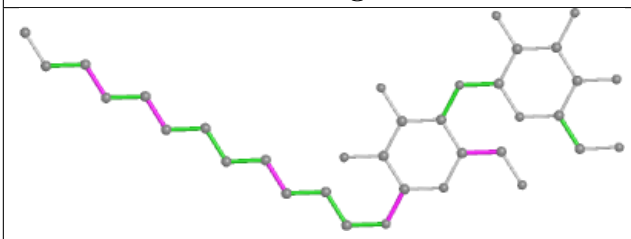


Bond angles



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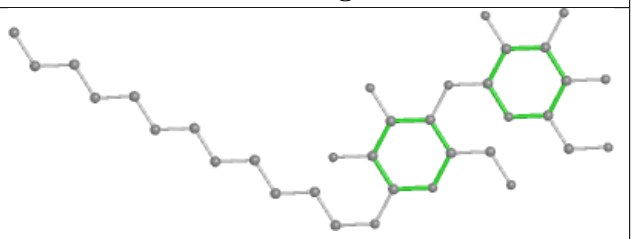
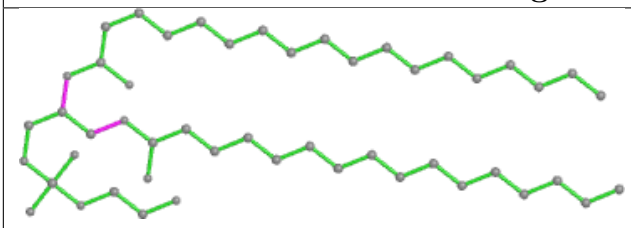


Rings

Ligand 3PE L 701



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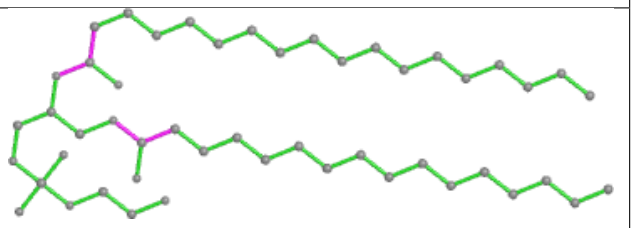
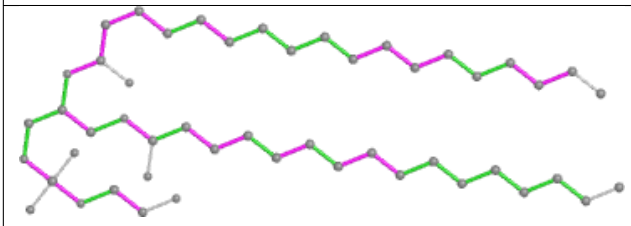


Bond angles



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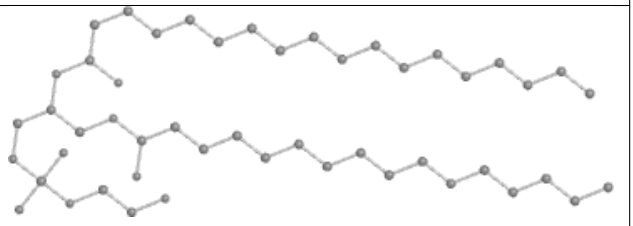
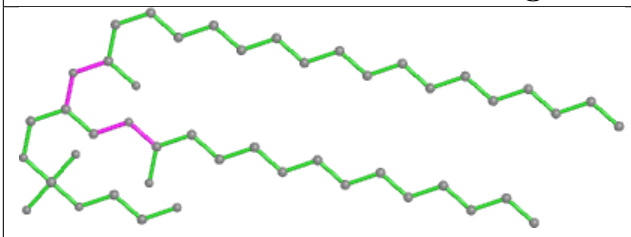


Rings

Ligand 3PE M 601



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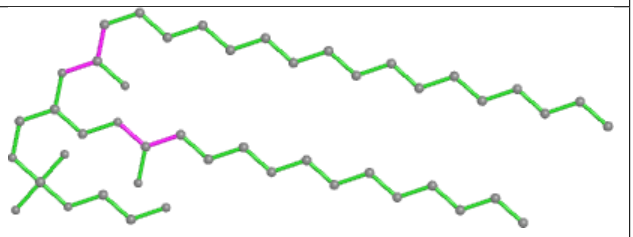
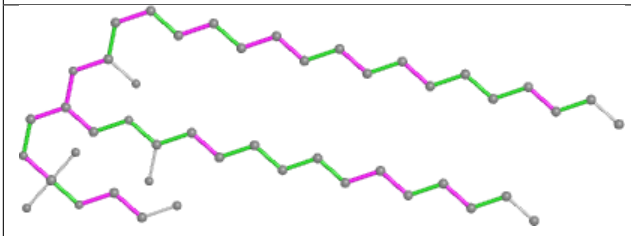


Bond angles



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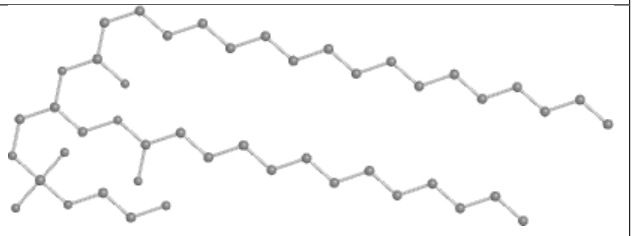
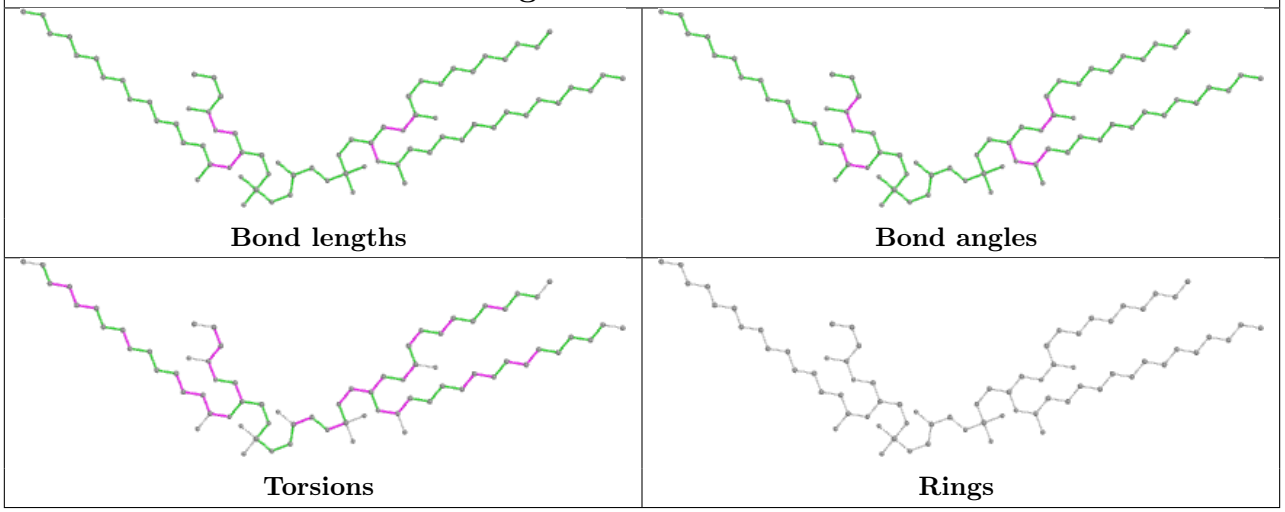
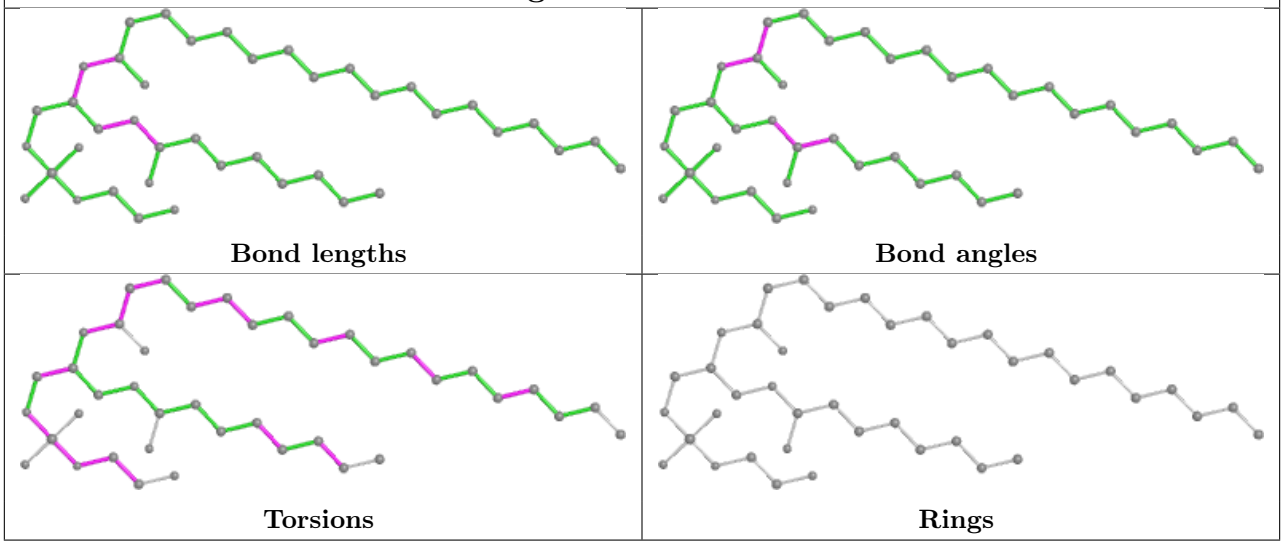


Rings

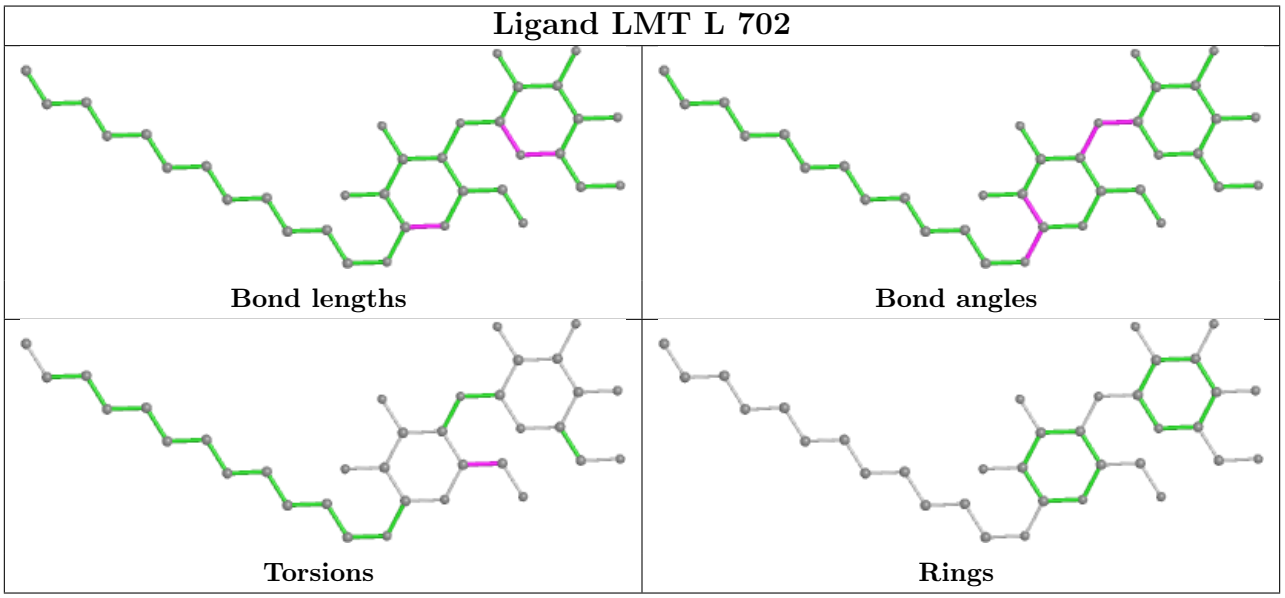
Ligand CDL d 1202



Ligand 3PE m 202



Ligand LMT L 702



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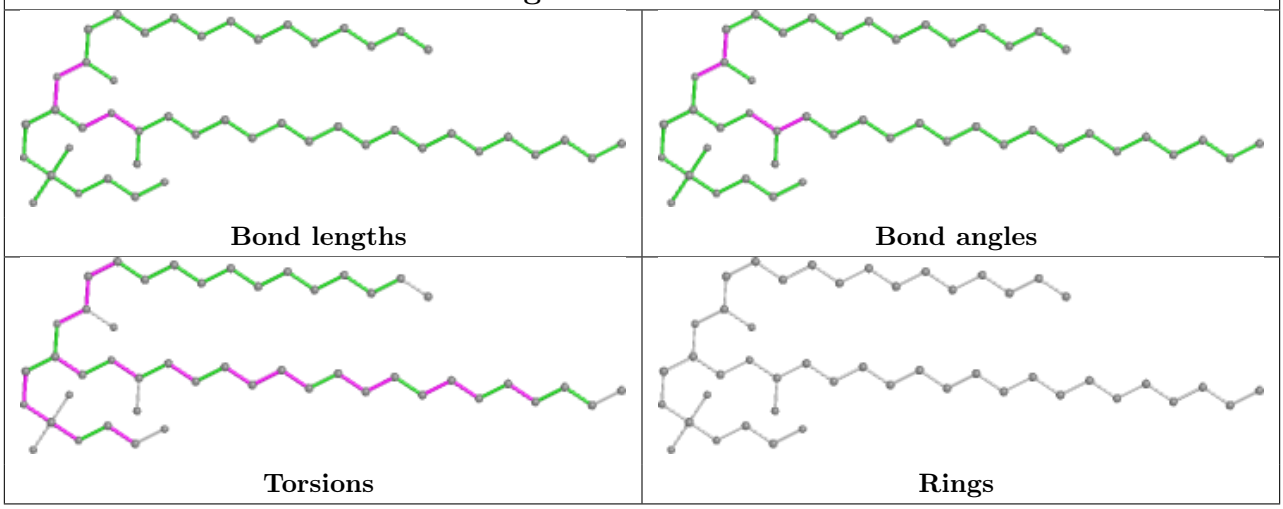
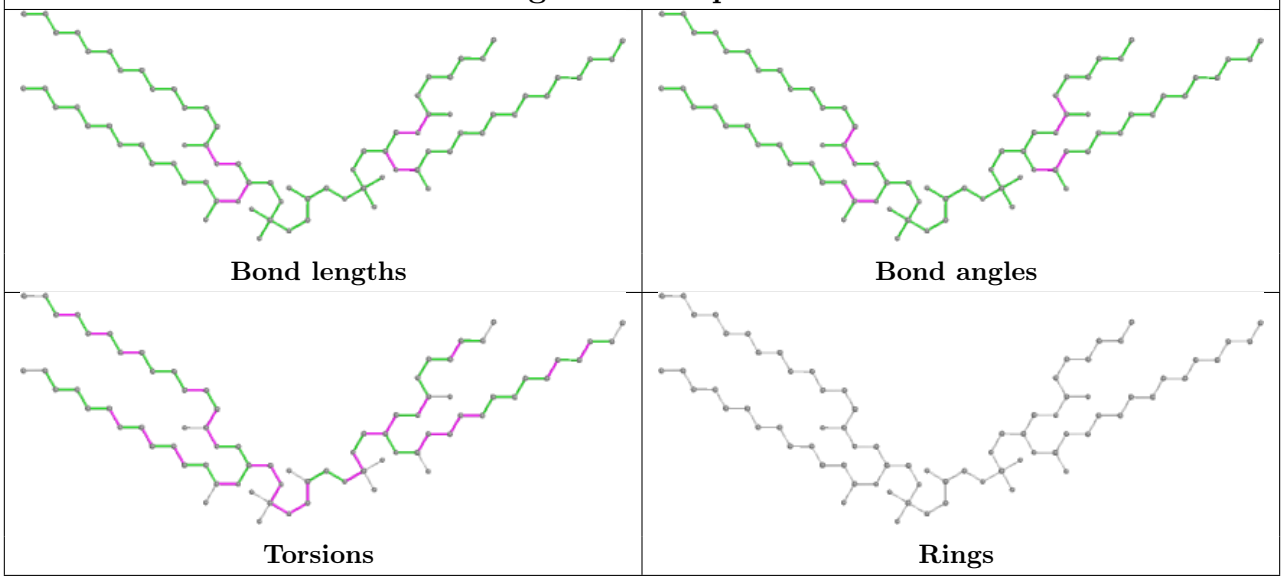
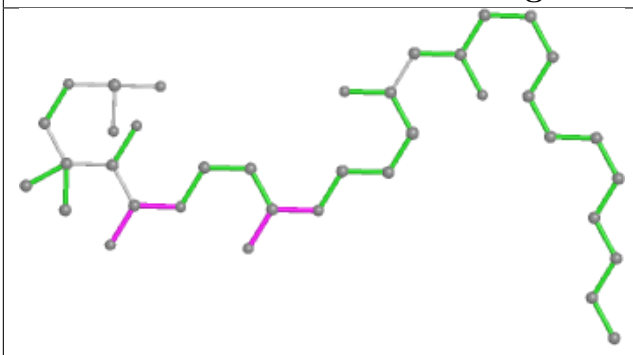


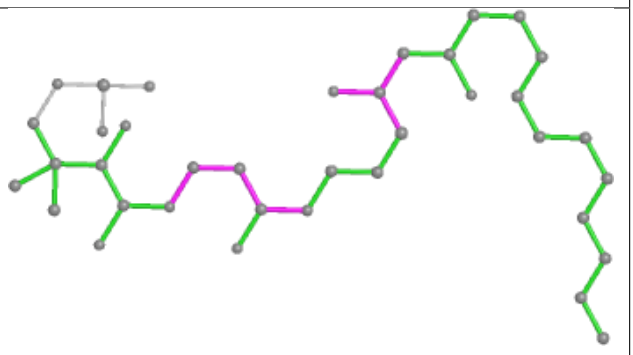
Ligand CDL q 201



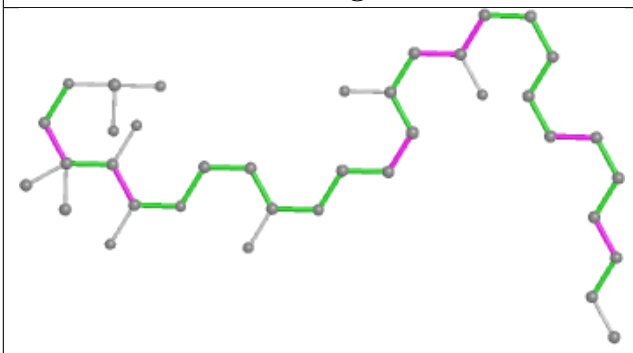
Ligand EHZ T 101



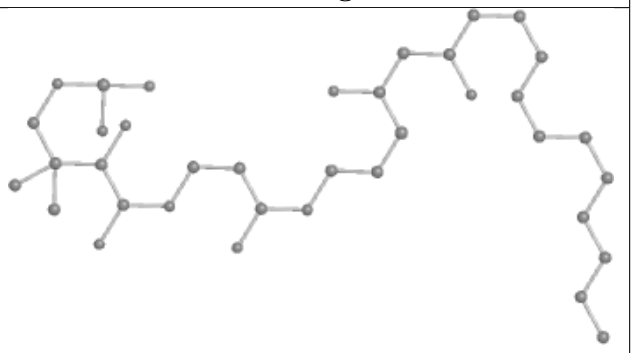
Bond lengths



Bond angles

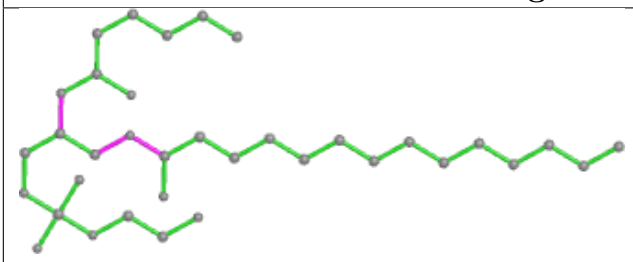


Torsions



Rings

Ligand 3PE Y 401



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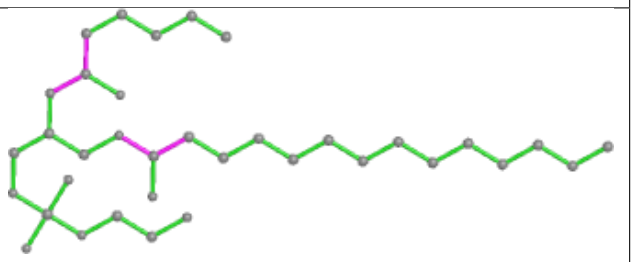
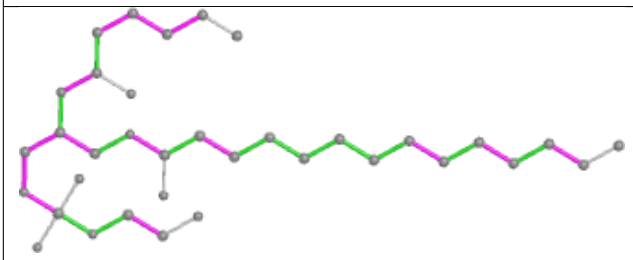


Bond angles



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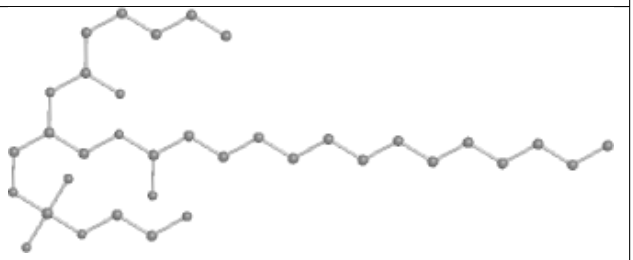
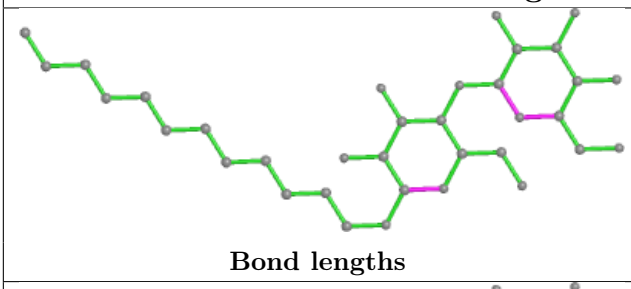
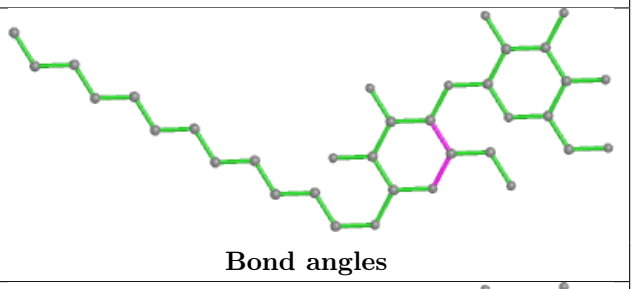
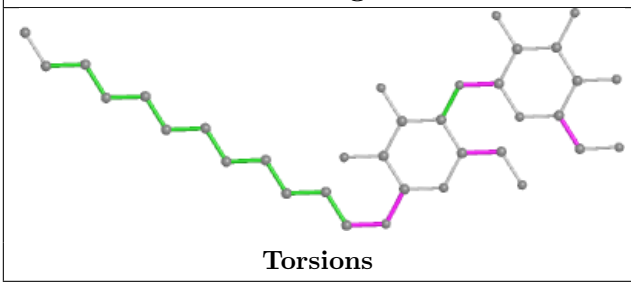


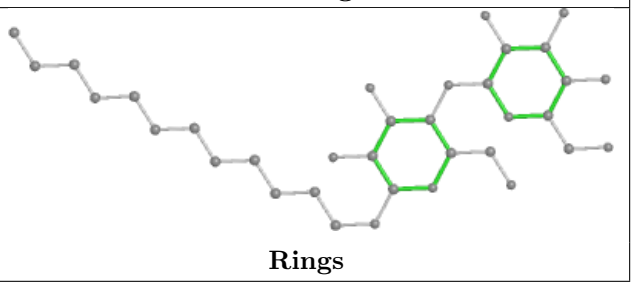
Rings

Ligand LMT J 201

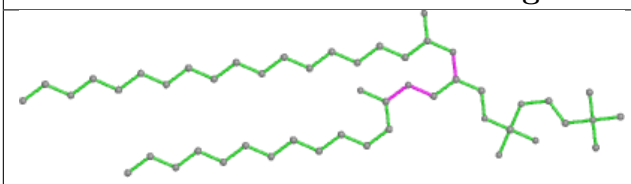

Bond lengths

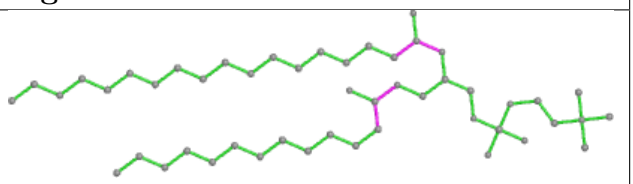

Bond angles

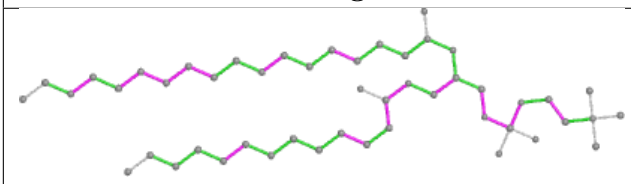

Torsions


Rings

Ligand PC1 g 1501


Bond lengths


Bond angles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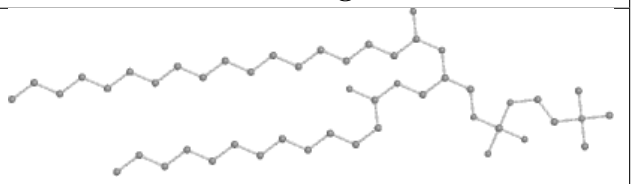
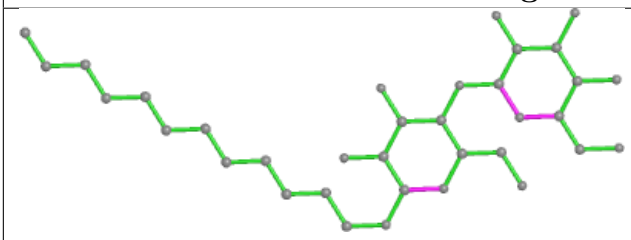

Rings

Ligand LMT Y 402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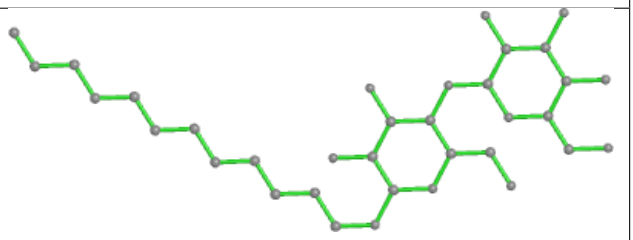
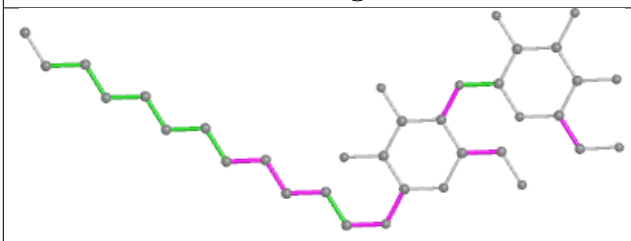

Bond angles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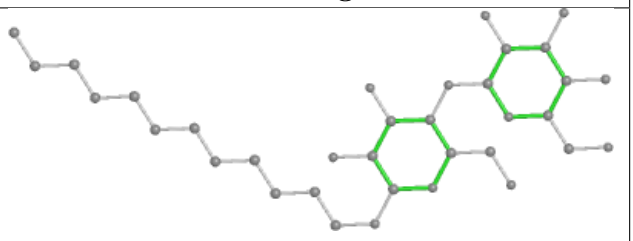
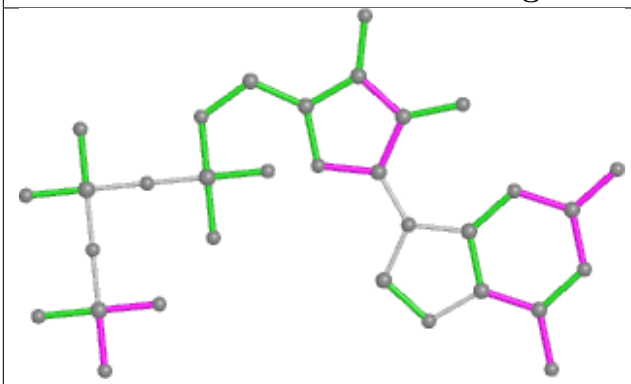

Rings

Ligand GTP O 401



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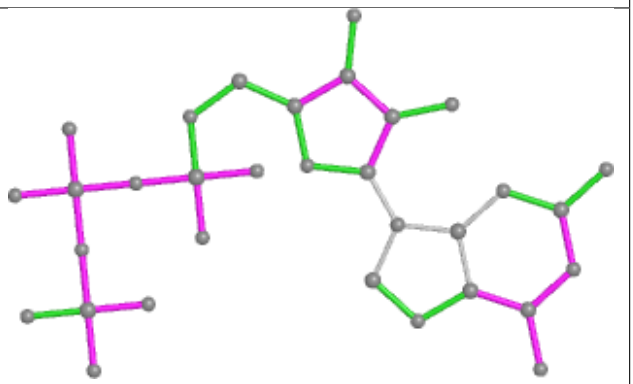
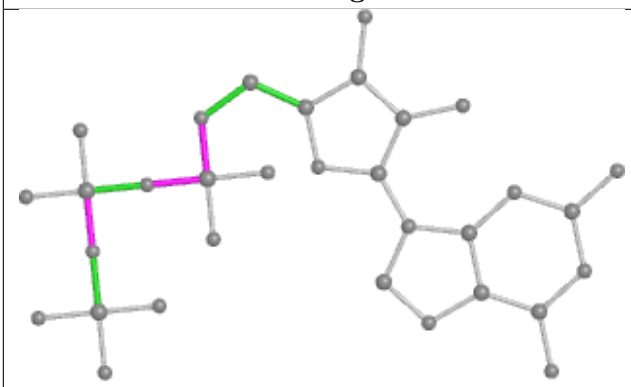


Bond angles



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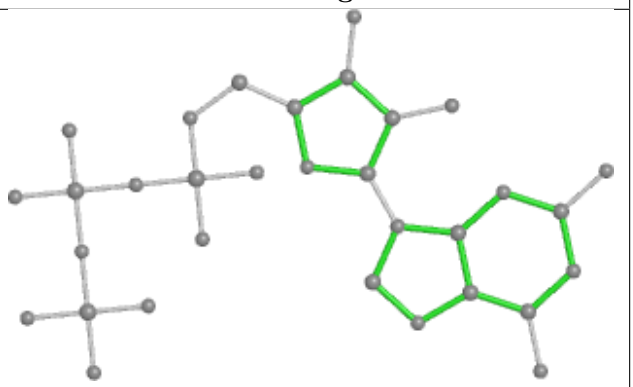
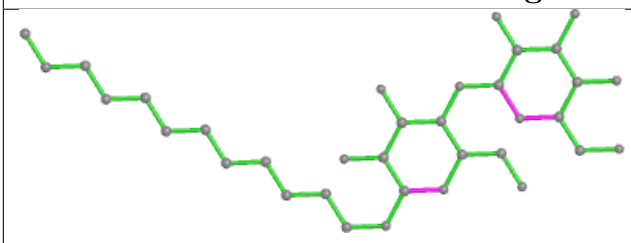
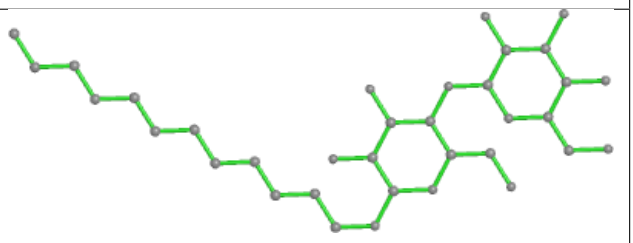


Rings

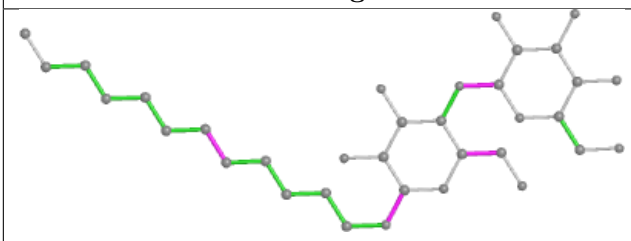
Ligand LMT k 101



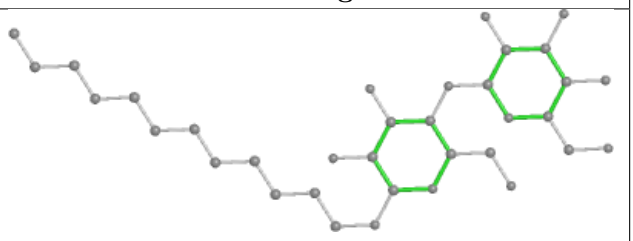
Bond lengths



Bond angles

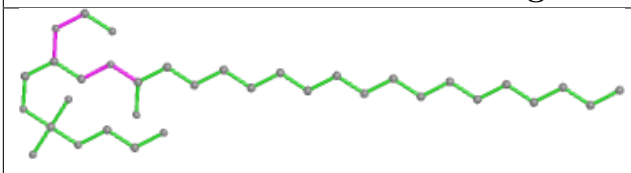


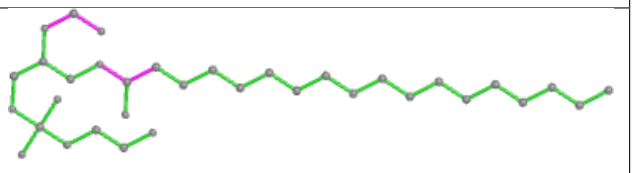
Torsions

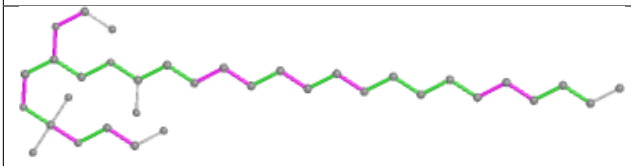


Rings

Ligand 3PE H 402


Bond lengths


Bond angles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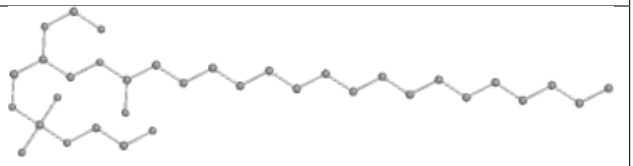
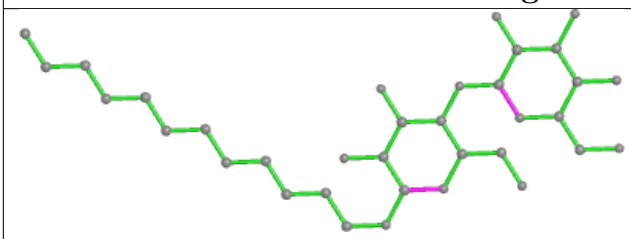
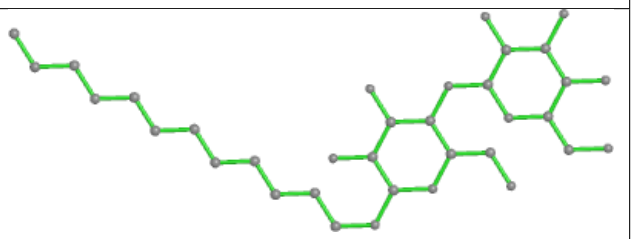
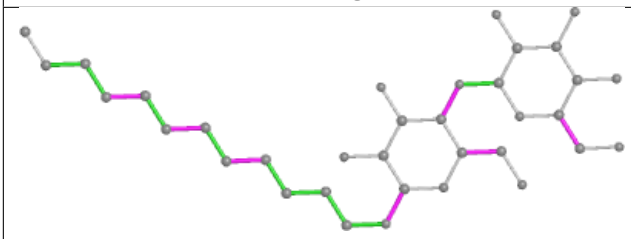
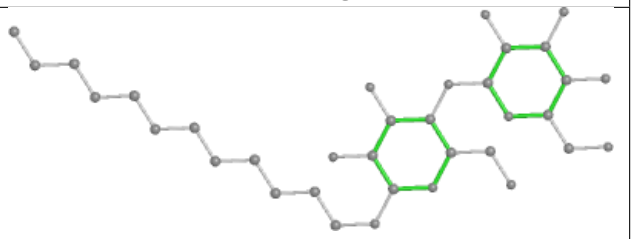

Rings

Ligand LMT B 202

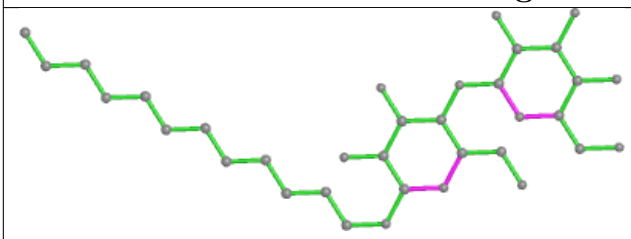

Bond lengths

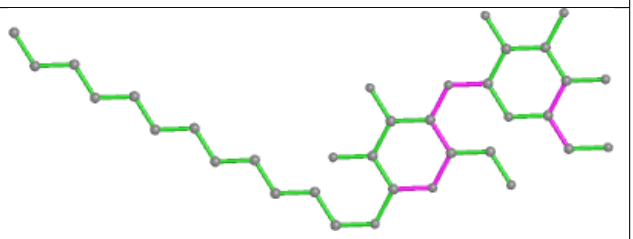

Bond angles

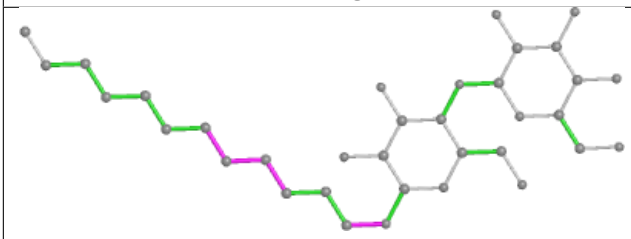

Torsions

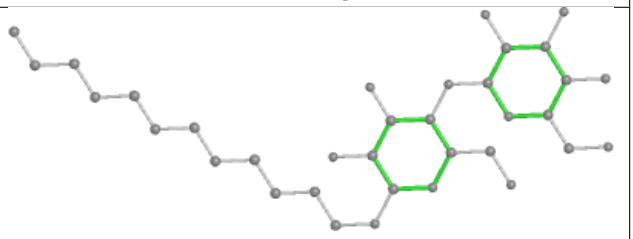

Rings

Ligand LMT h 1002

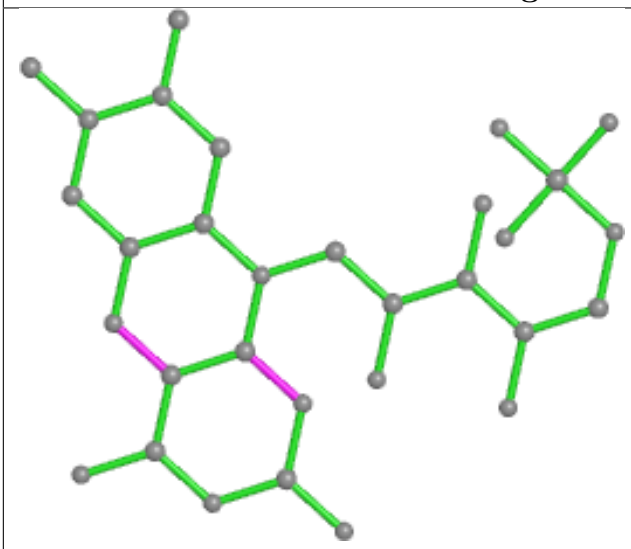

Bond lengths


Bond angles

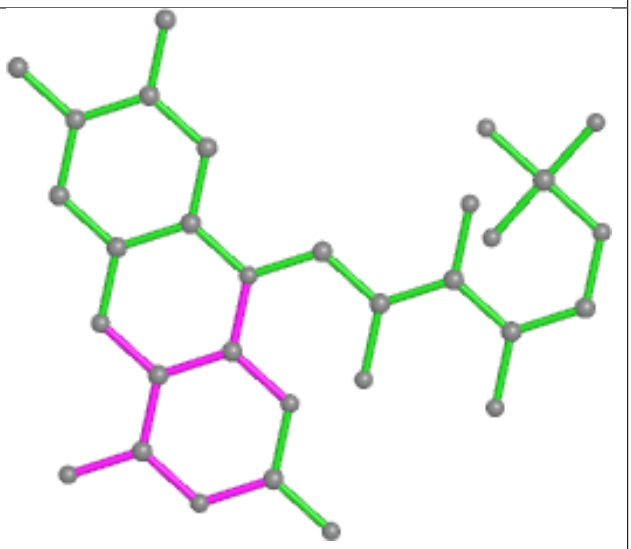

Torsions


Rings

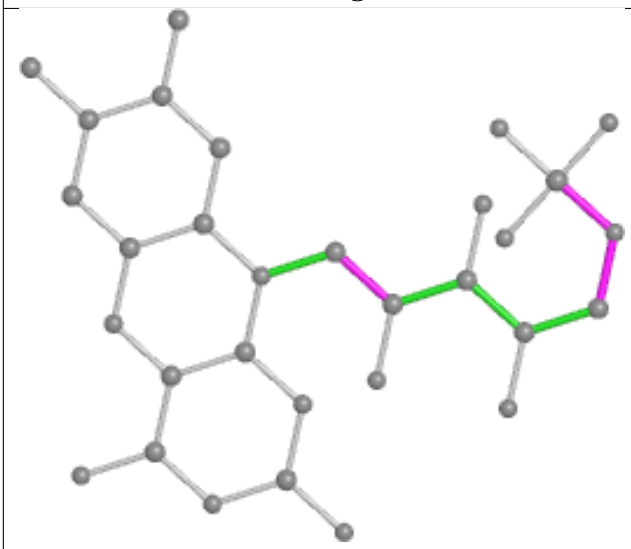
Ligand FMN F 501



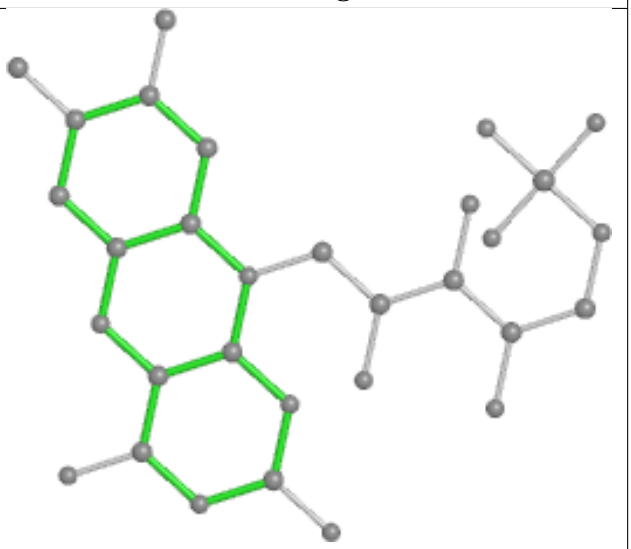
Bond lengths



Bond angles

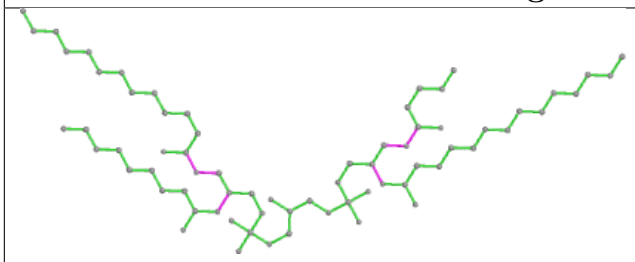


Torsions



Rings

Ligand CDL L 703



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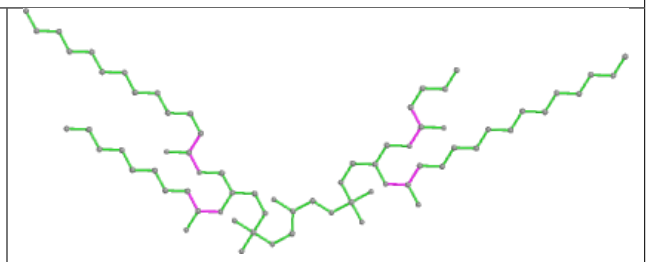
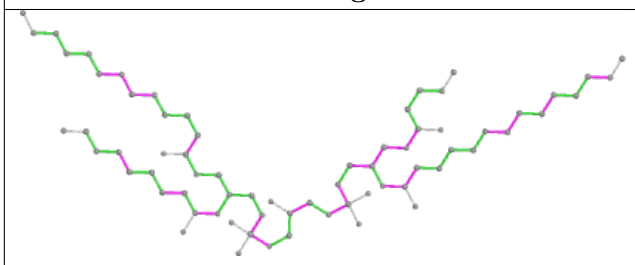
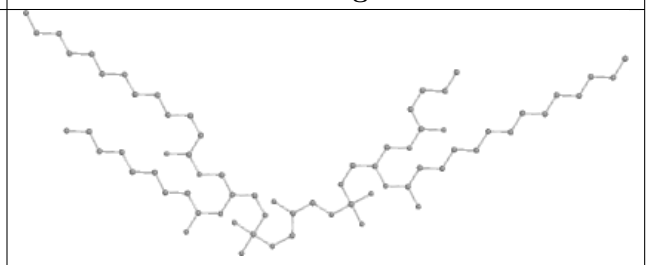


Bond angles

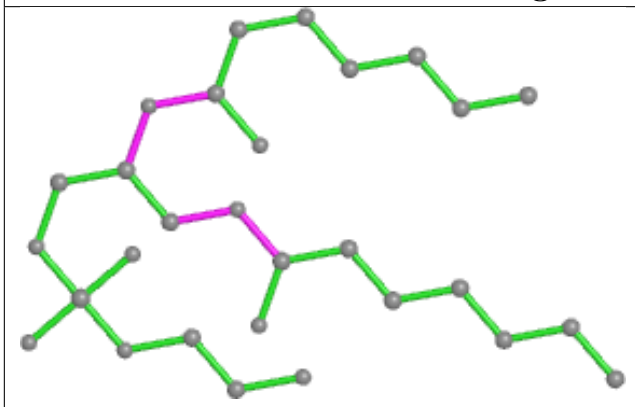


Torsions

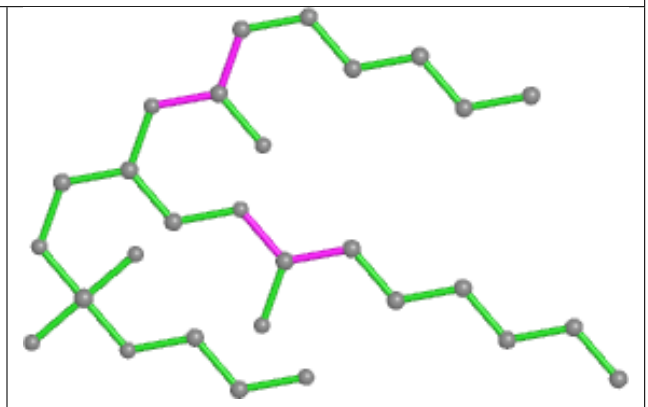


Rings

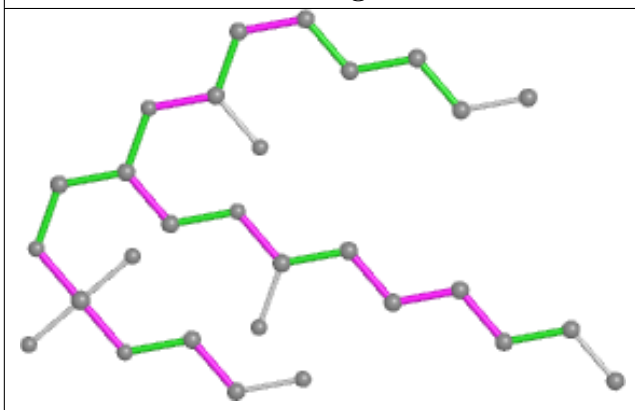
Ligand 3PE L 705



Bond lengths



Bond angles



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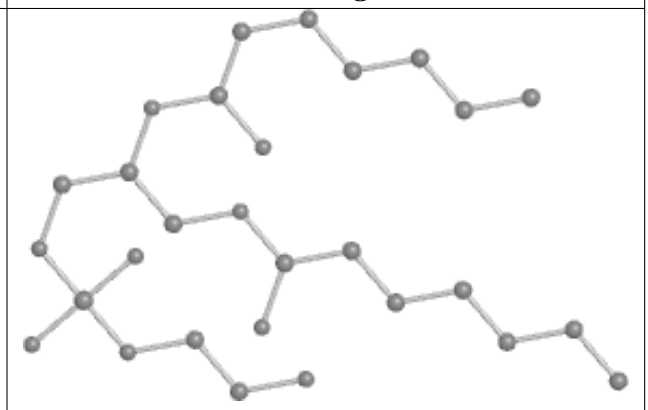
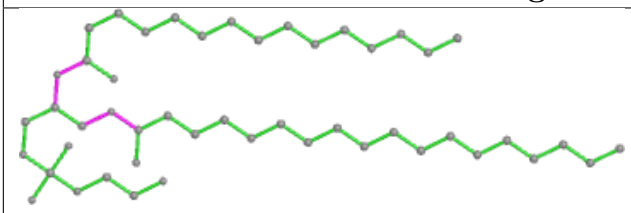
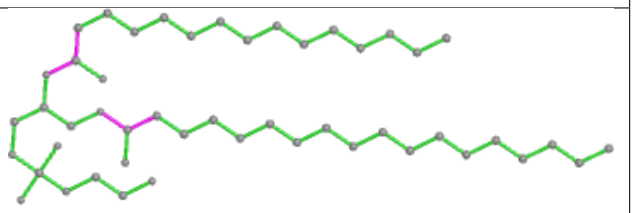


Rings

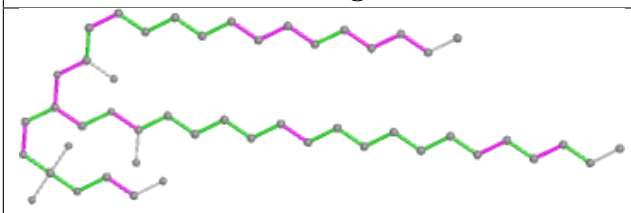
Ligand 3PE A 302



Bond lengths



Bond angles



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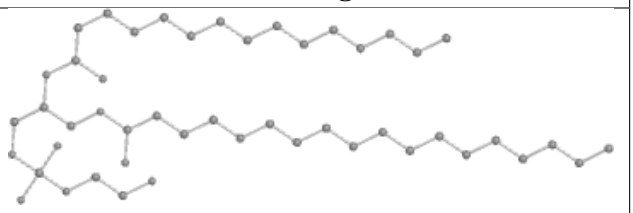
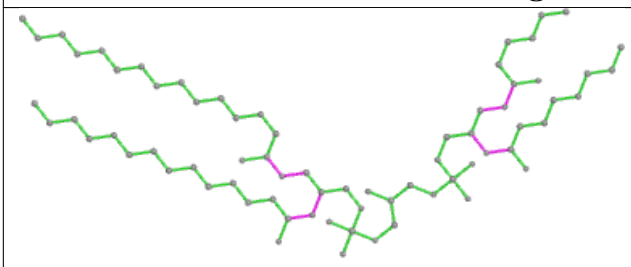


Rings

Ligand CDL J 202



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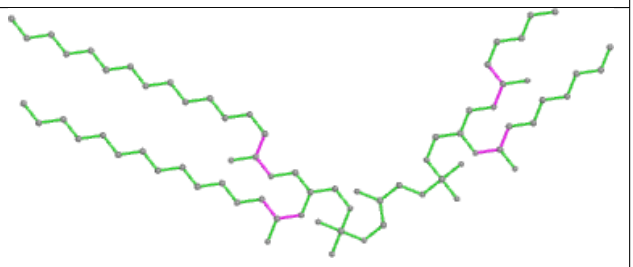
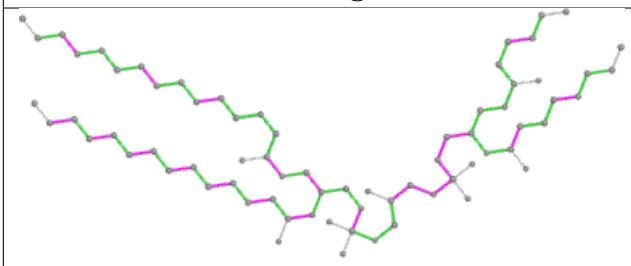


Bond angles



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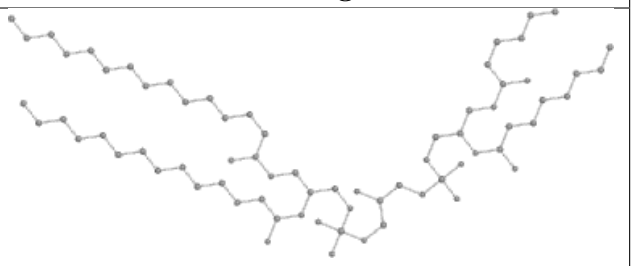
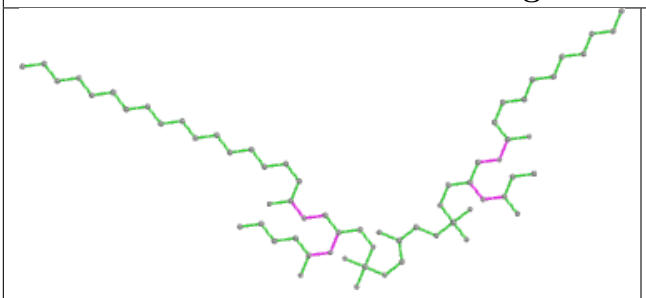
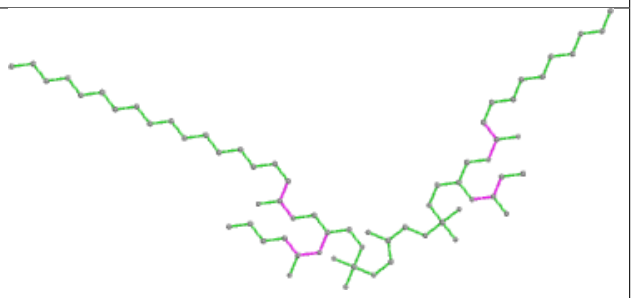


Rings

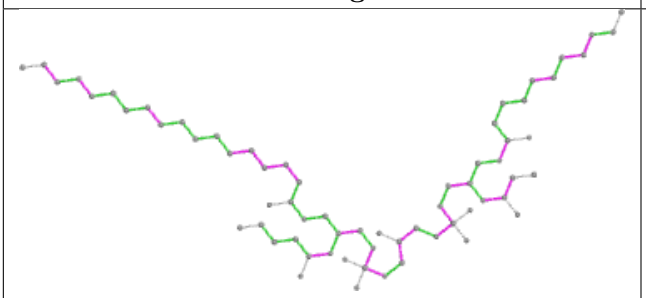
Ligand CDL N 503



Bond lengths



Bond angles



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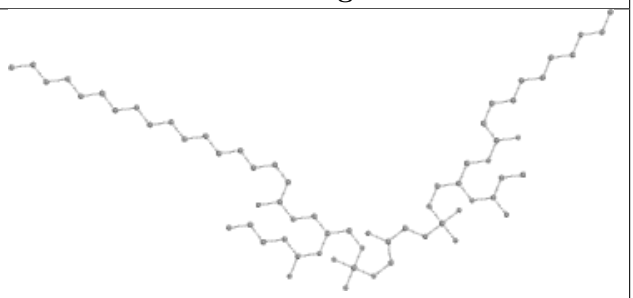
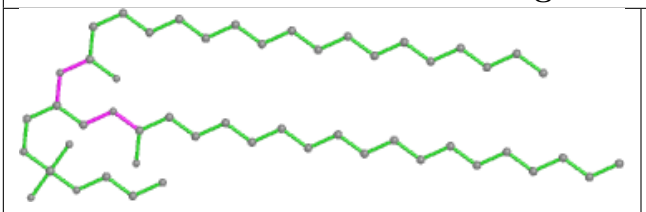
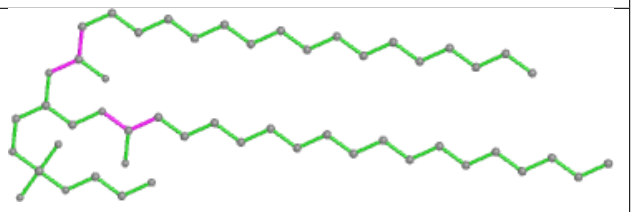


Rings

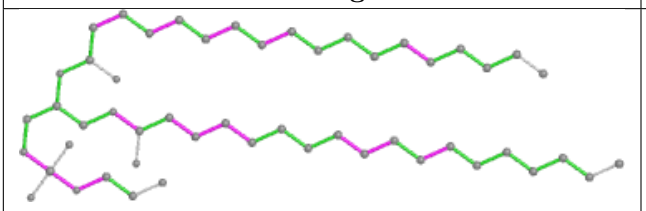
Ligand 3PE I 201



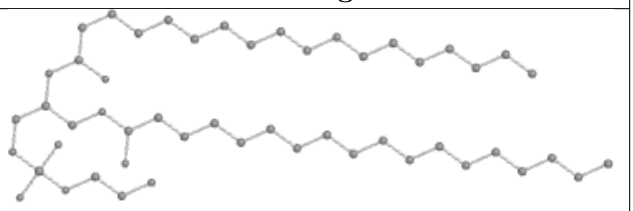
Bond lengths



Bond angles

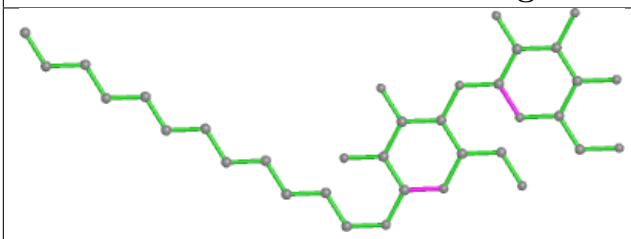


Torsions

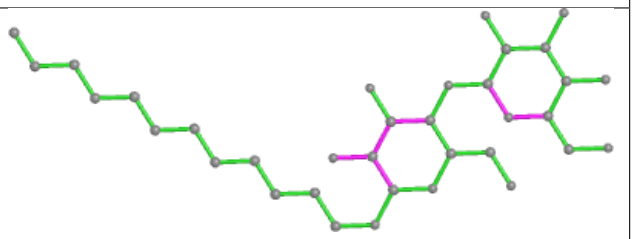


Rings

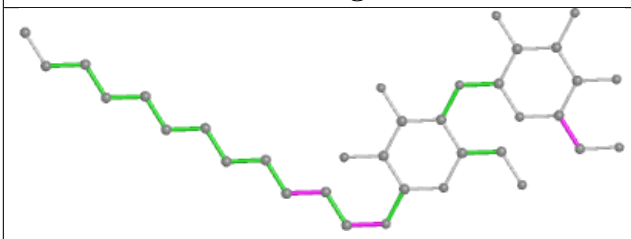
Ligand LMT M 603



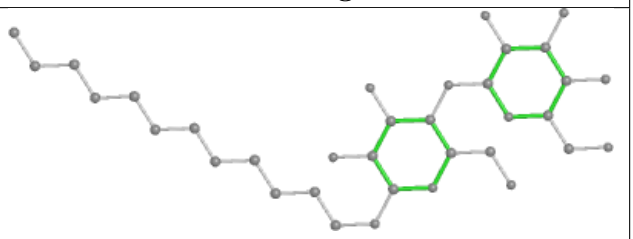
Bond lengths



Bond angles

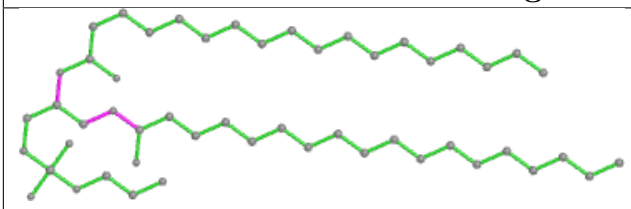


Torsions

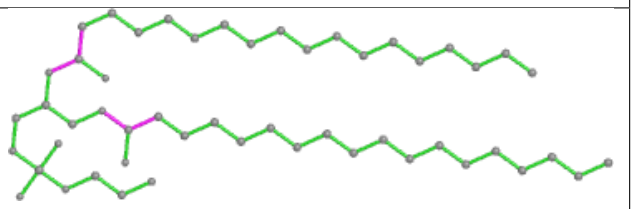


Rings

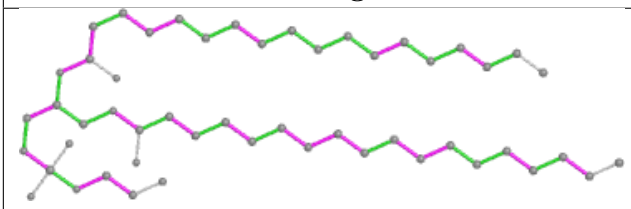
Ligand 3PE M 604



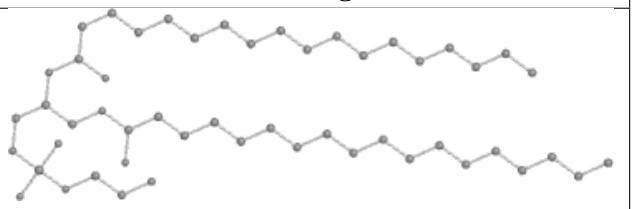
Bond lengths



Bond angles

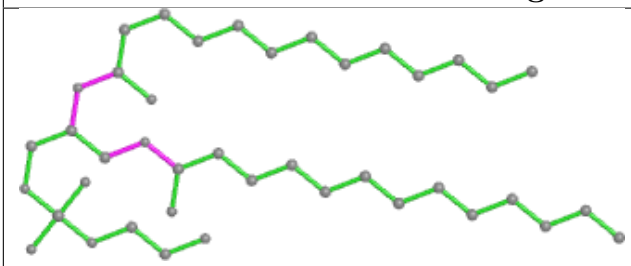


Torsions

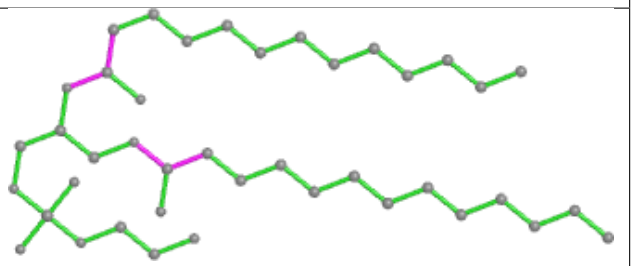


Rings

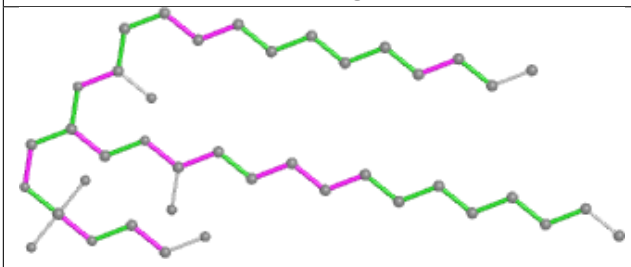
Ligand 3PE N 502



Bond lengths



Bond angles



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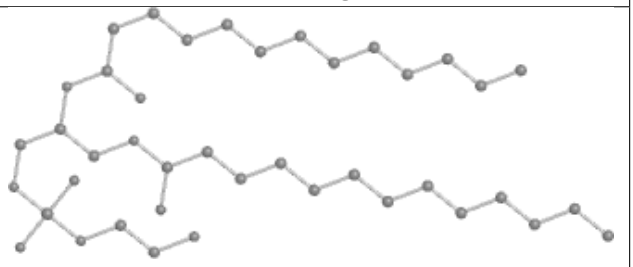
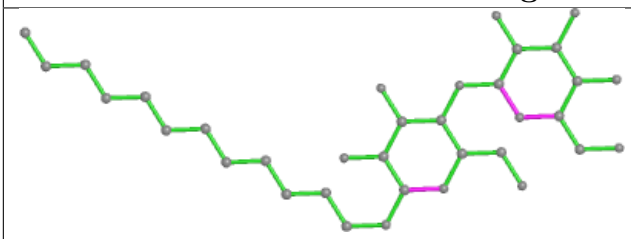
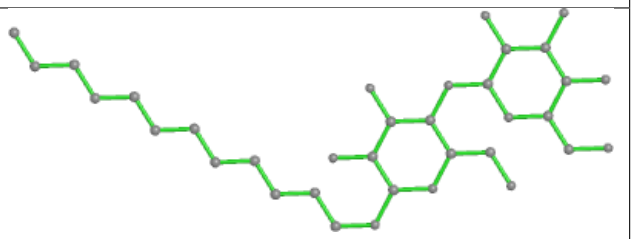


Rings

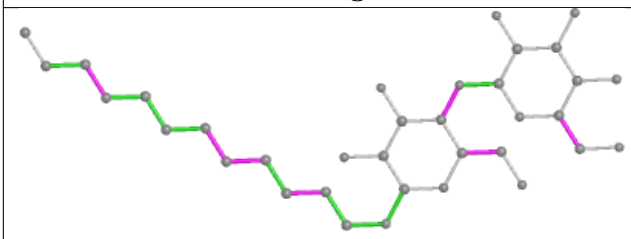
Ligand LMT N 501



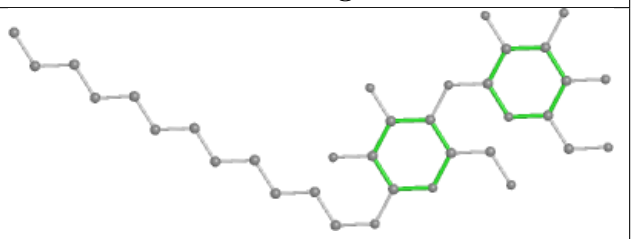
Bond lengths



Bond angles

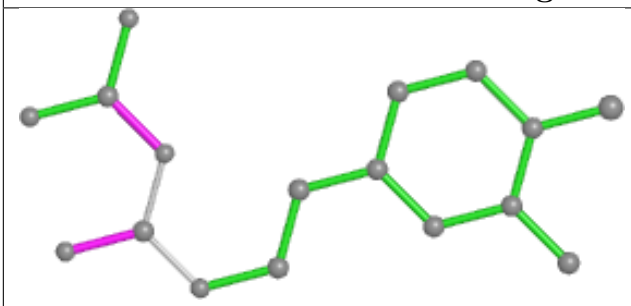


Torsions

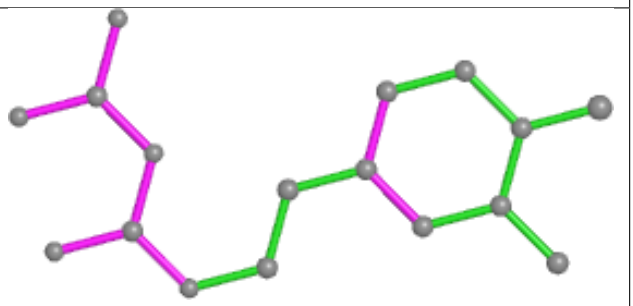


Rings

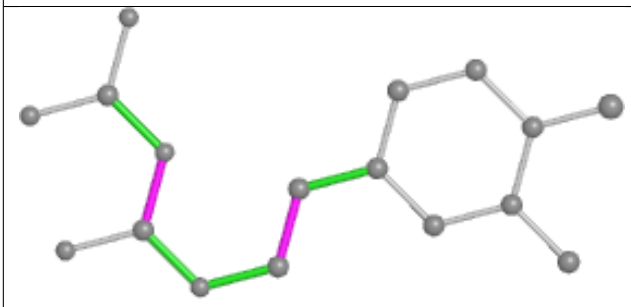
Ligand I49 N 504



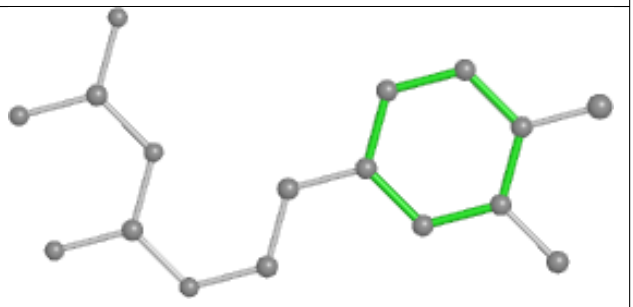
Bond lengths



Bond angles

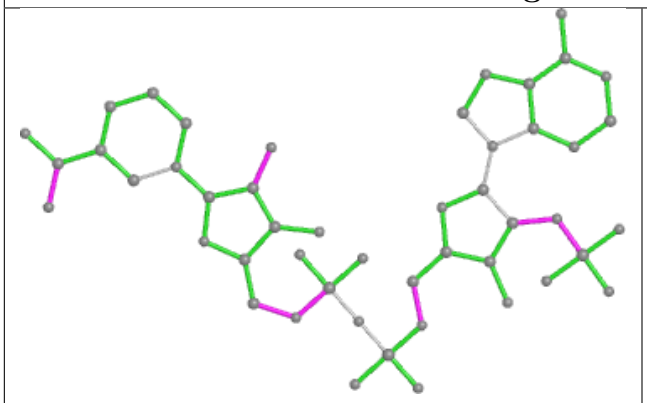


Torsions

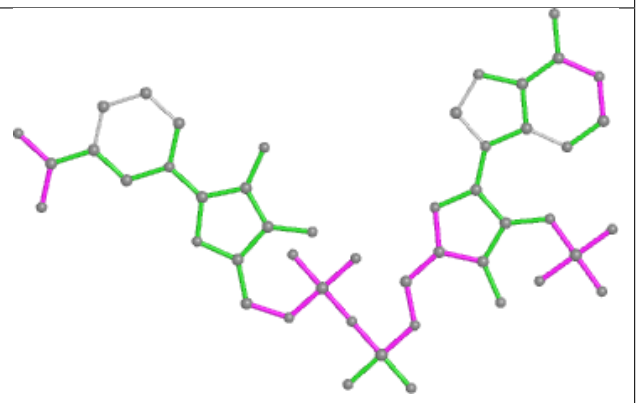


Rings

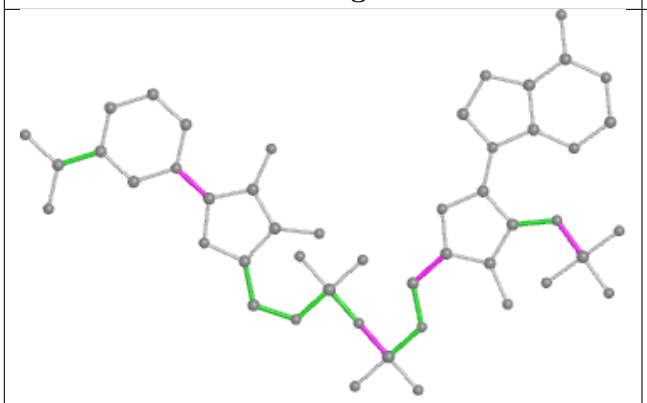
Ligand NDP P 501



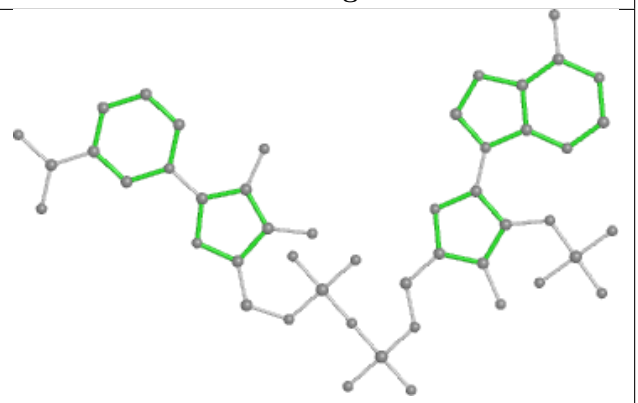
Bond lengths



Bond angles

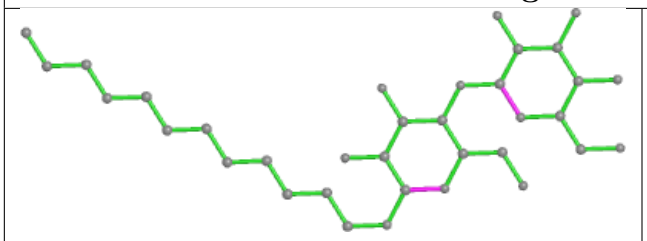


Torsions

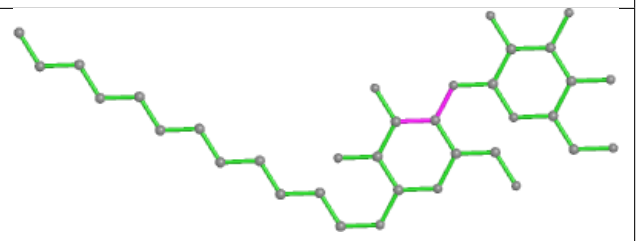


Rings

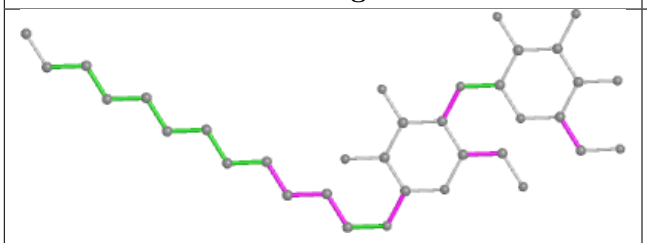
Ligand LMT A 301



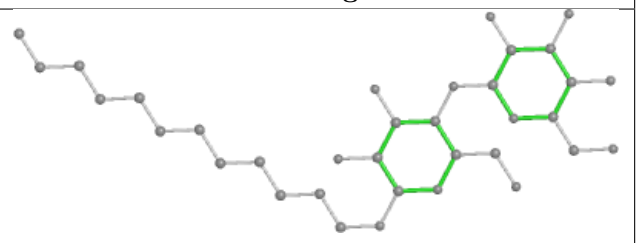
Bond lengths



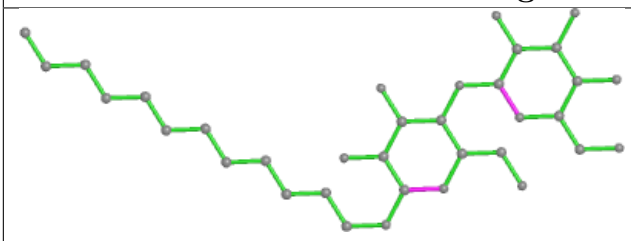
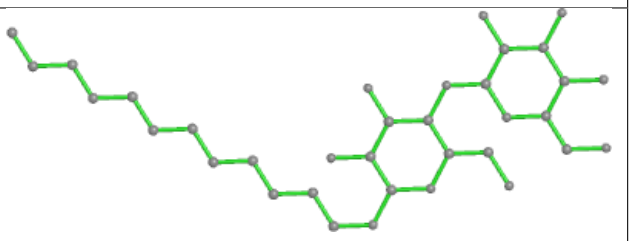
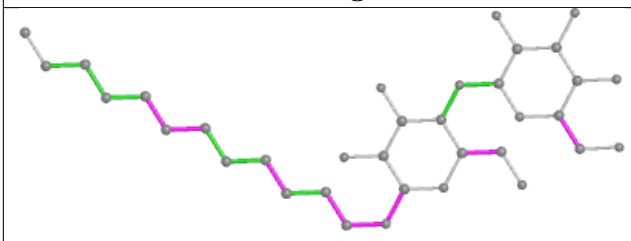
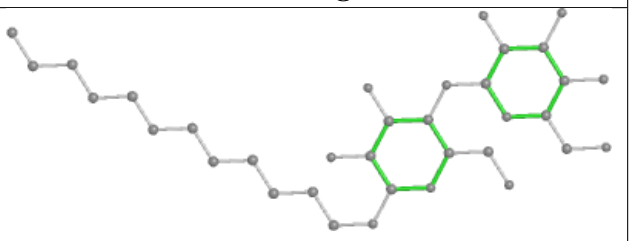
Bond angles

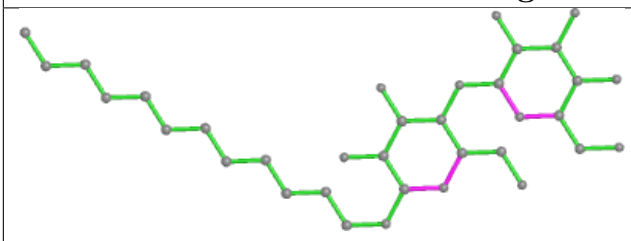
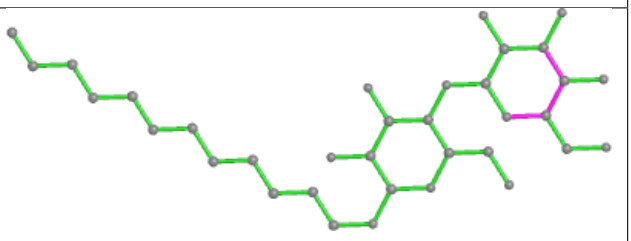
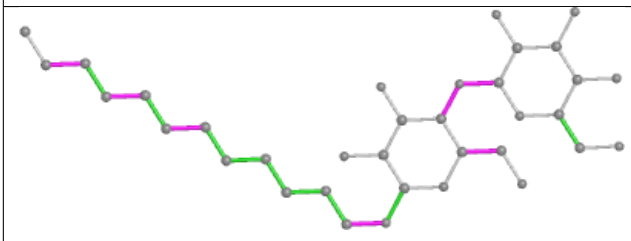
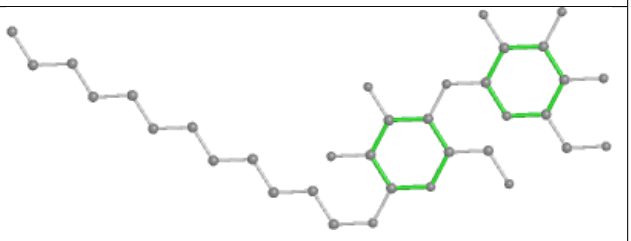


Torsions

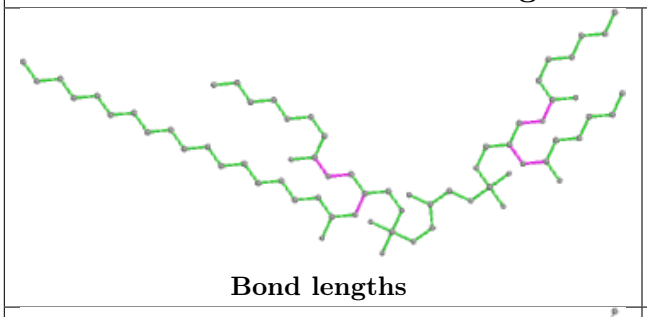


Rings

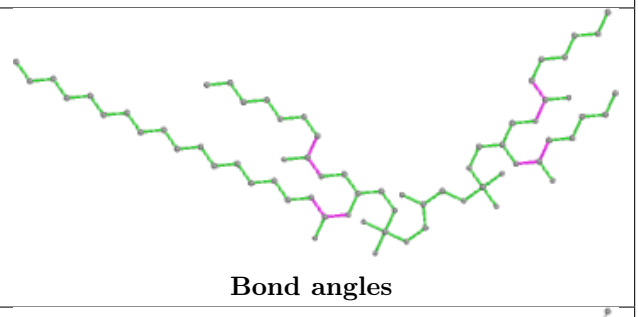
Ligand LMT M 602	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand LMT M 605	
 Bond lengths	 Bond angles
 Torsions	 Rings

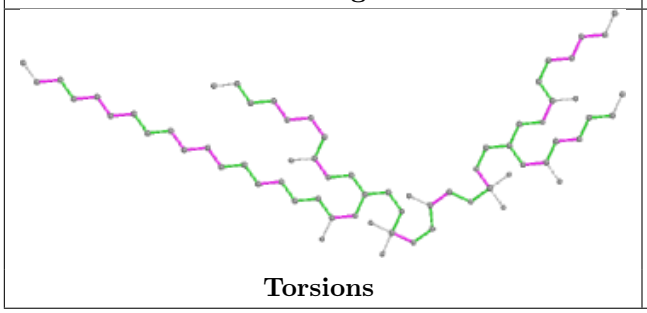
Ligand CDL h 1001



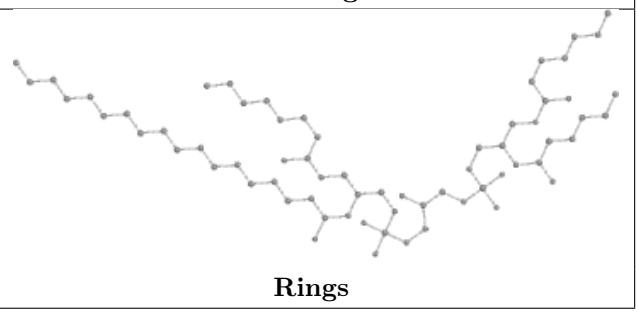
Bond lengths



Bond angles

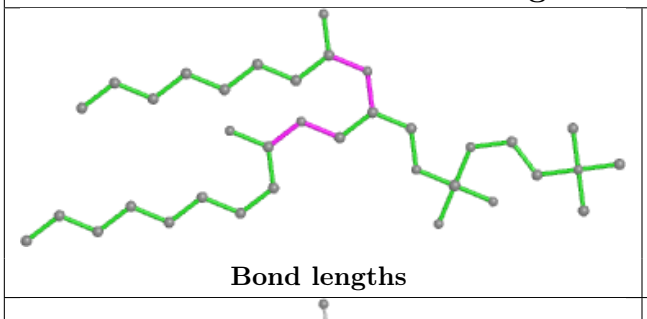


Torsions

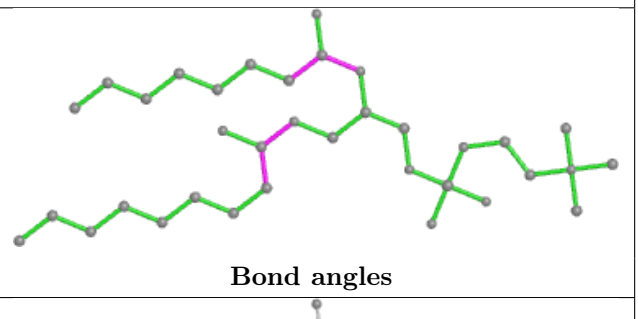


Rings

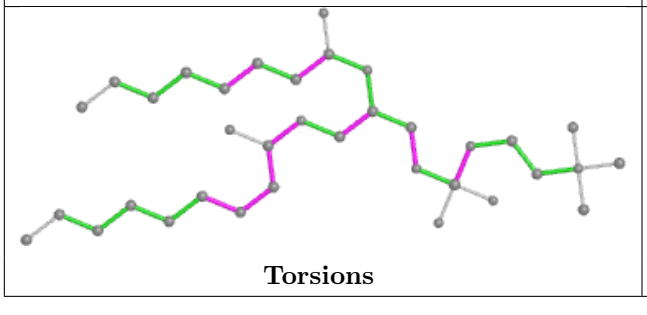
Ligand PC1 B 203



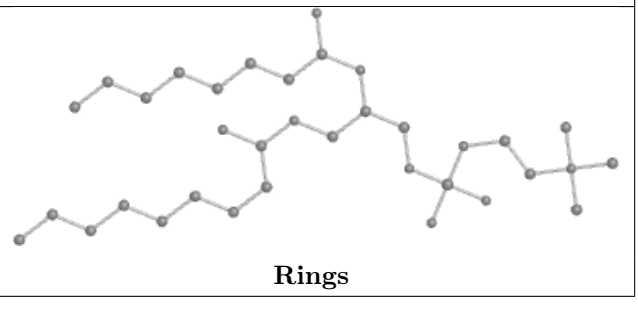
Bond lengths



Bond angles

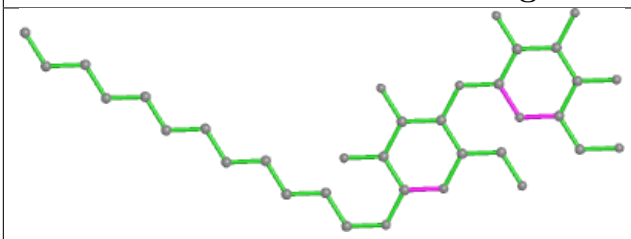


Torsions

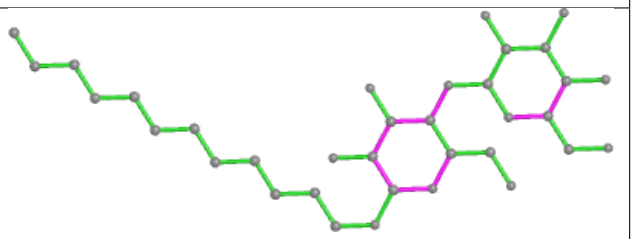


Rings

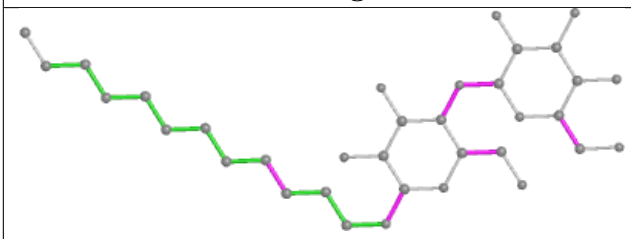
Ligand LMT m 201



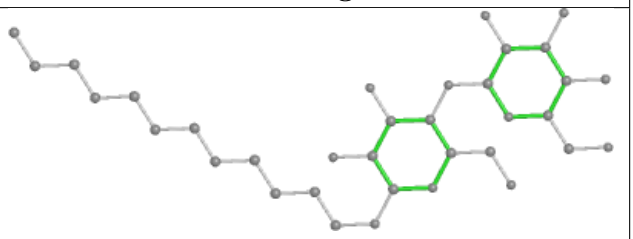
Bond lengths



Bond angles

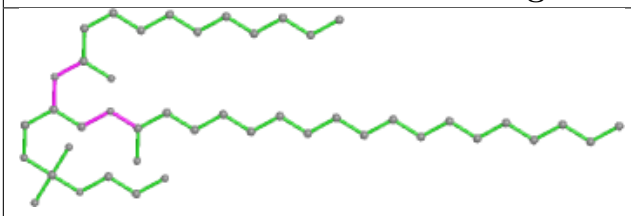


Torsions

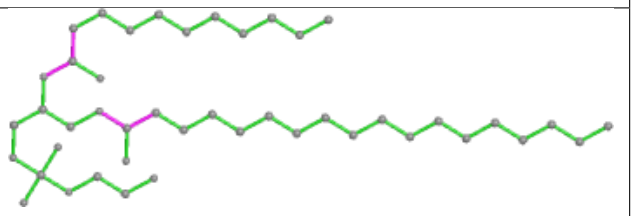


Rings

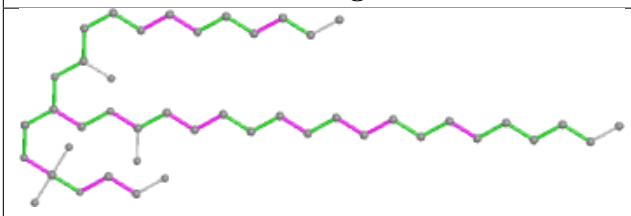
Ligand 3PE H 401



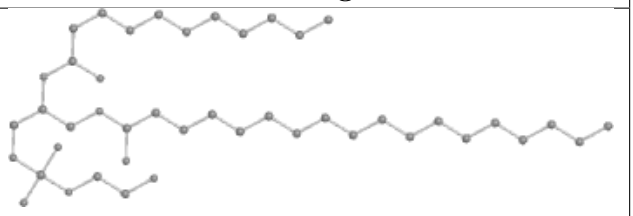
Bond lengths



Bond angles

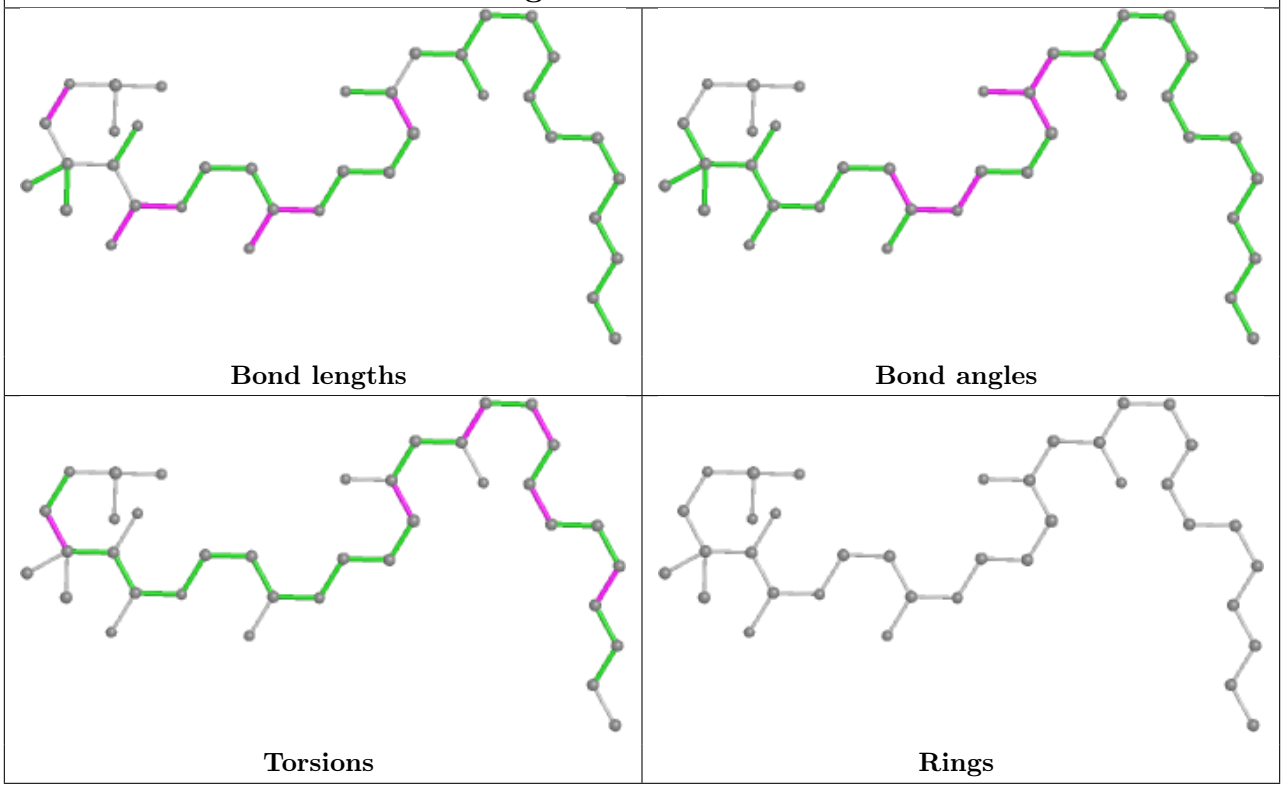


Torsions



Rings

Ligand EHZ U 101



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.

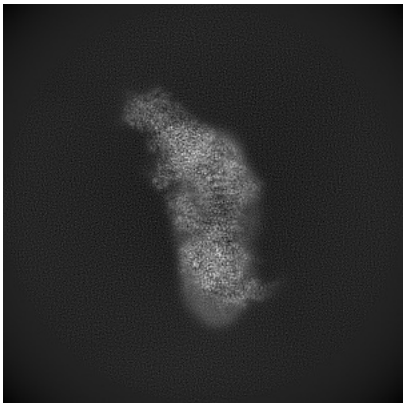
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-14287. These allow visual inspection of the internal detail of the map and identification of artifacts.

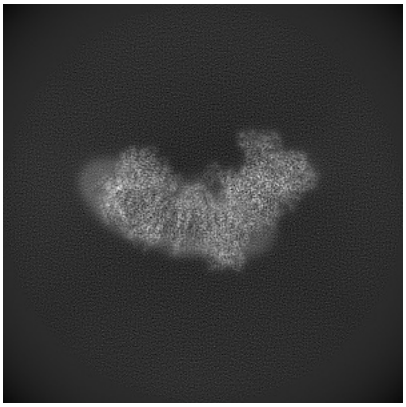
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

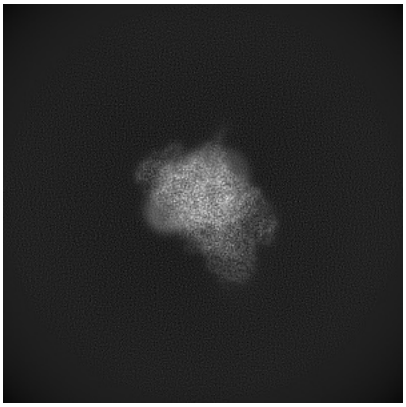
6.1.1 Primary map



X



Y

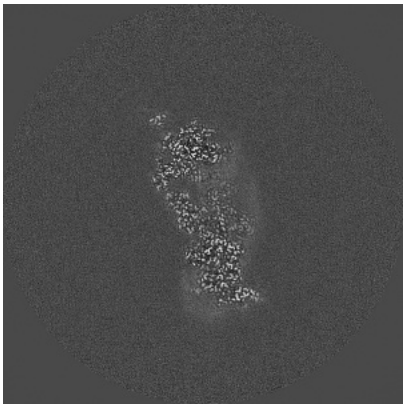


Z

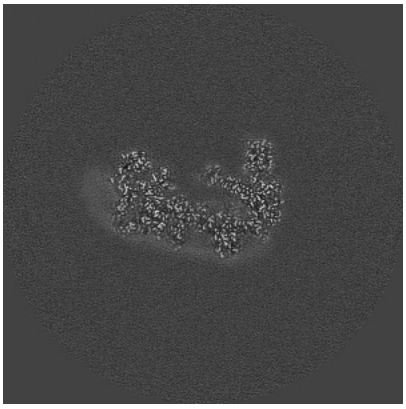
The images above show the map projected in three orthogonal directions.

6.2 Central slices

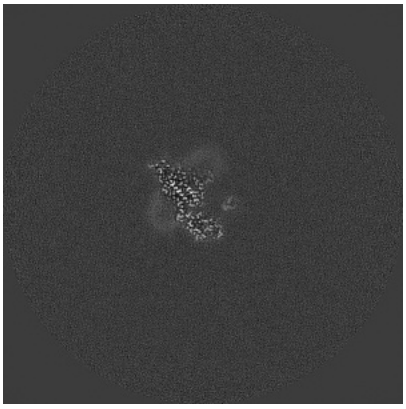
6.2.1 Primary map



X Index: 330



Y Index: 330

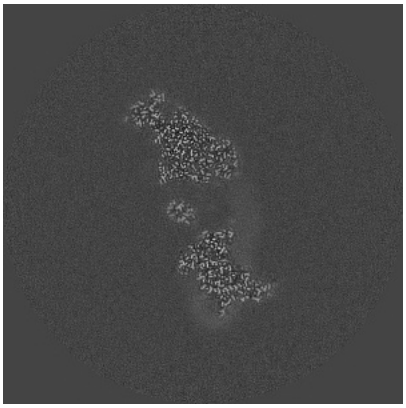


Z Index: 330

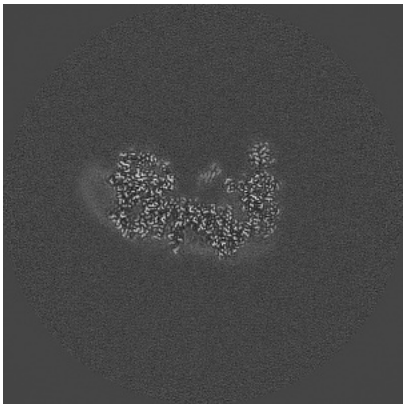
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

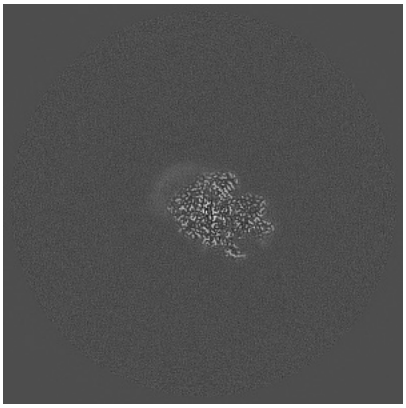
6.3.1 Primary map



X Index: 356



Y Index: 338



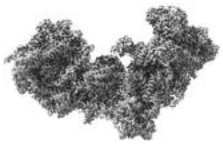
Z Index: 422

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 6.5. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

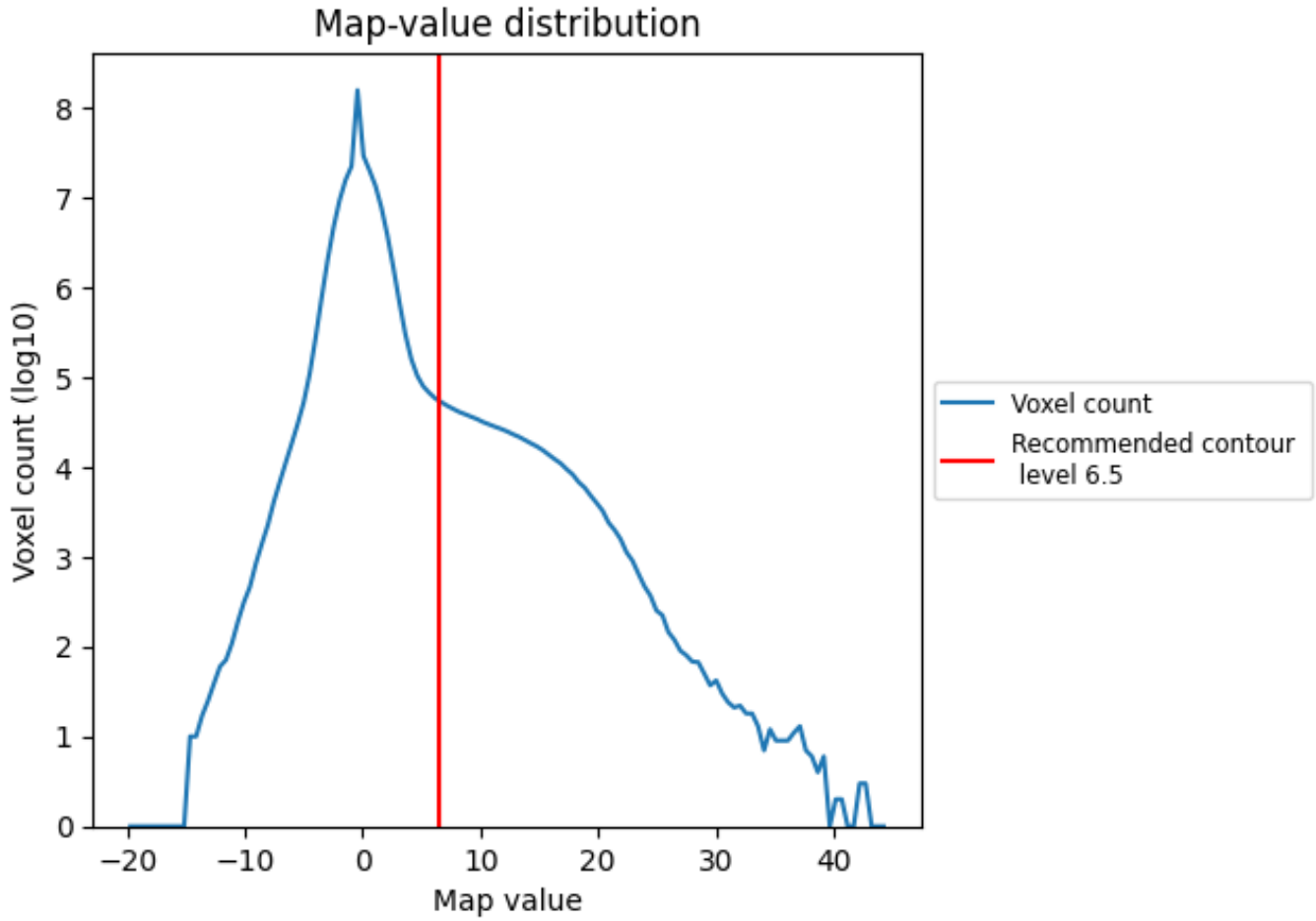
6.5 Mask visualisation (i)

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

7 Map analysis

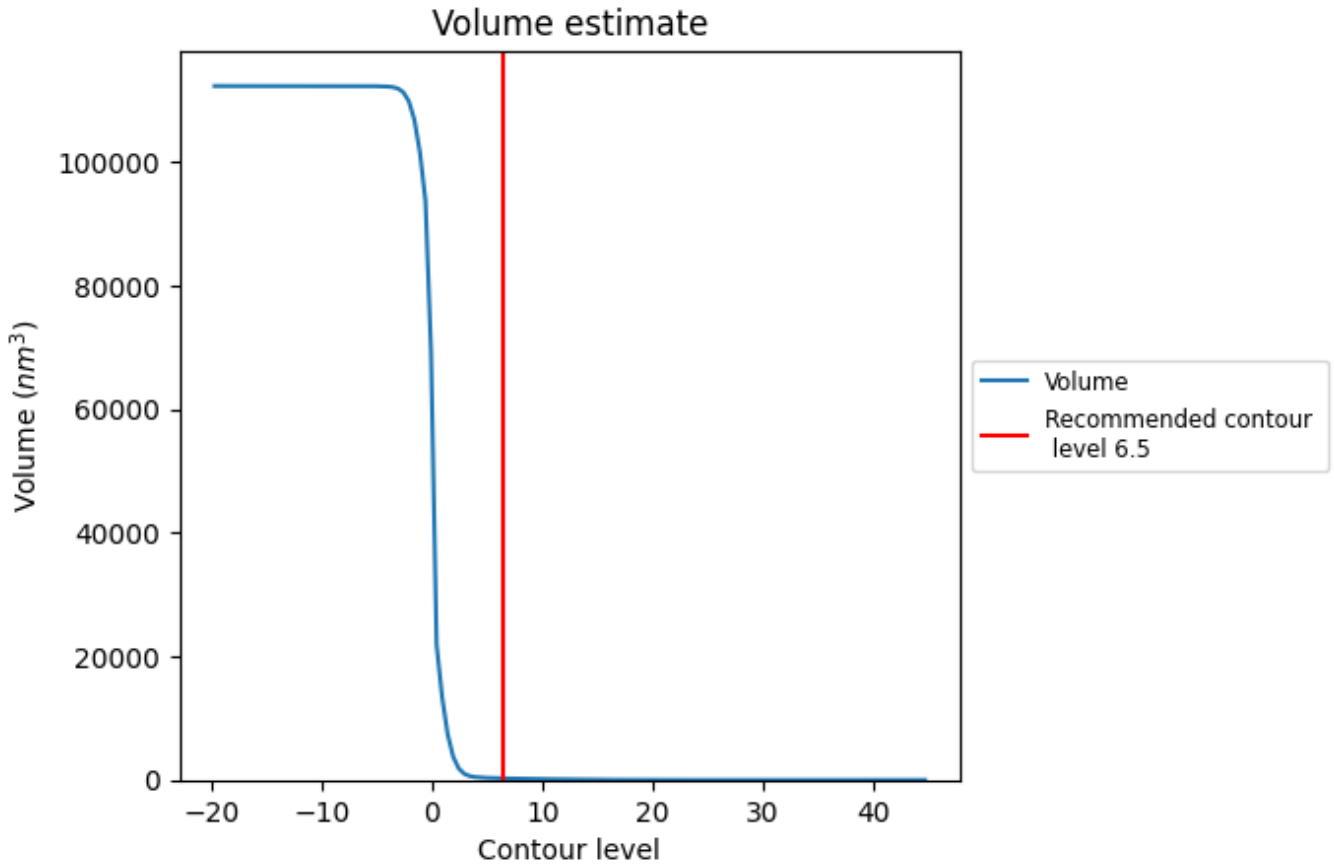
This section contains the results of statistical analysis of the map.

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.

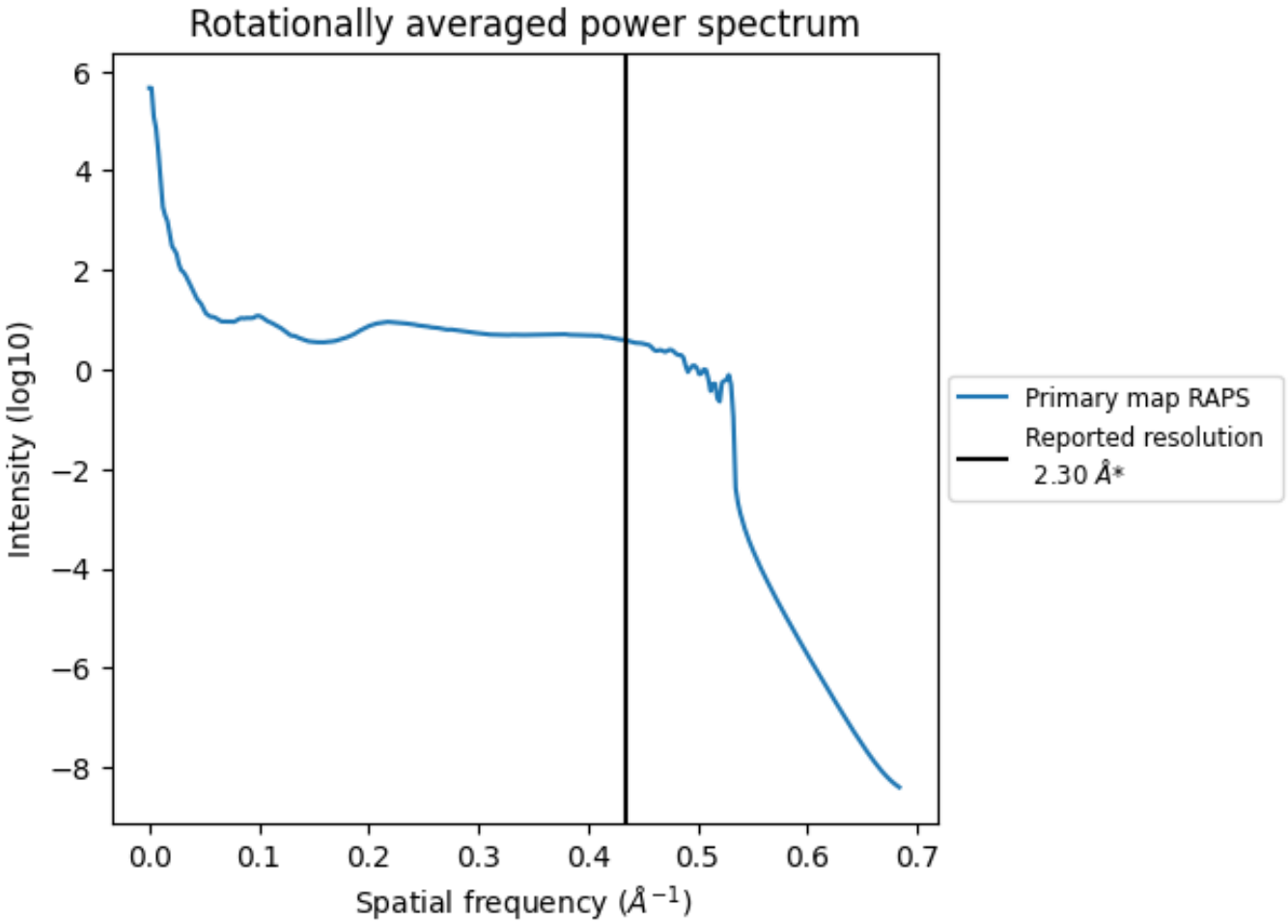
7.2 Volume estimate



The volume at the recommended contour level is 257 nm^3; this corresponds to an approximate mass of 232 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 0.435 Å^{-1}

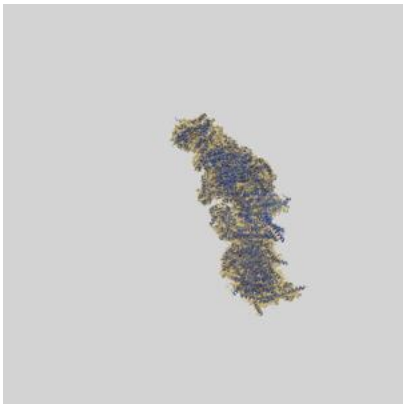
8 Fourier-Shell correlation (i)

This section was not generated. No FSC curve or half-maps provided.

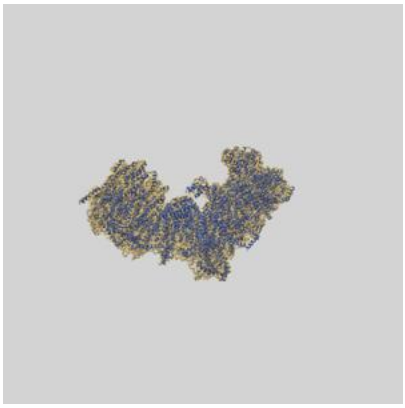
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-14287 and PDB model 7R48. Per-residue inclusion information can be found in section 3 on page 24.

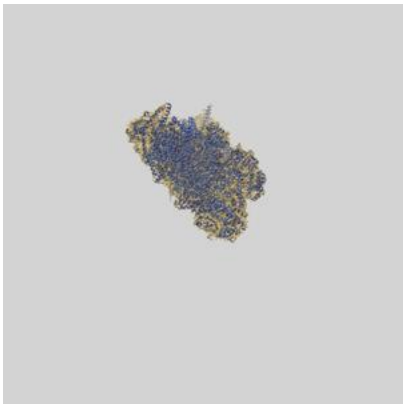
9.1 Map-model overlay



X



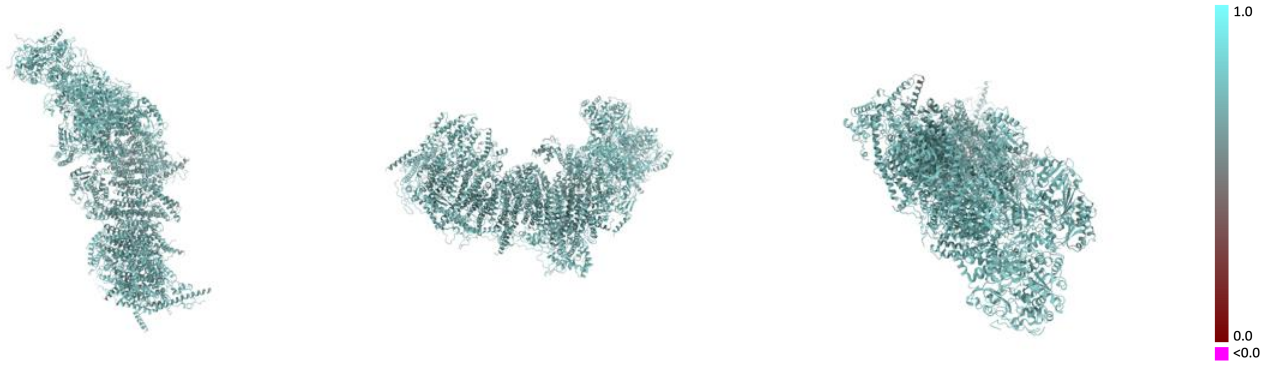
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 6.5 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.

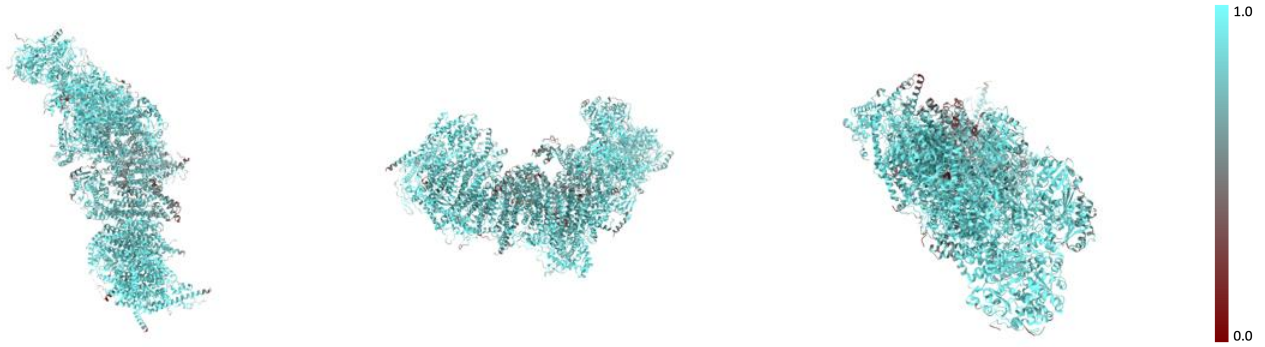
9.2 Q-score mapped to coordinate model (i)



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.

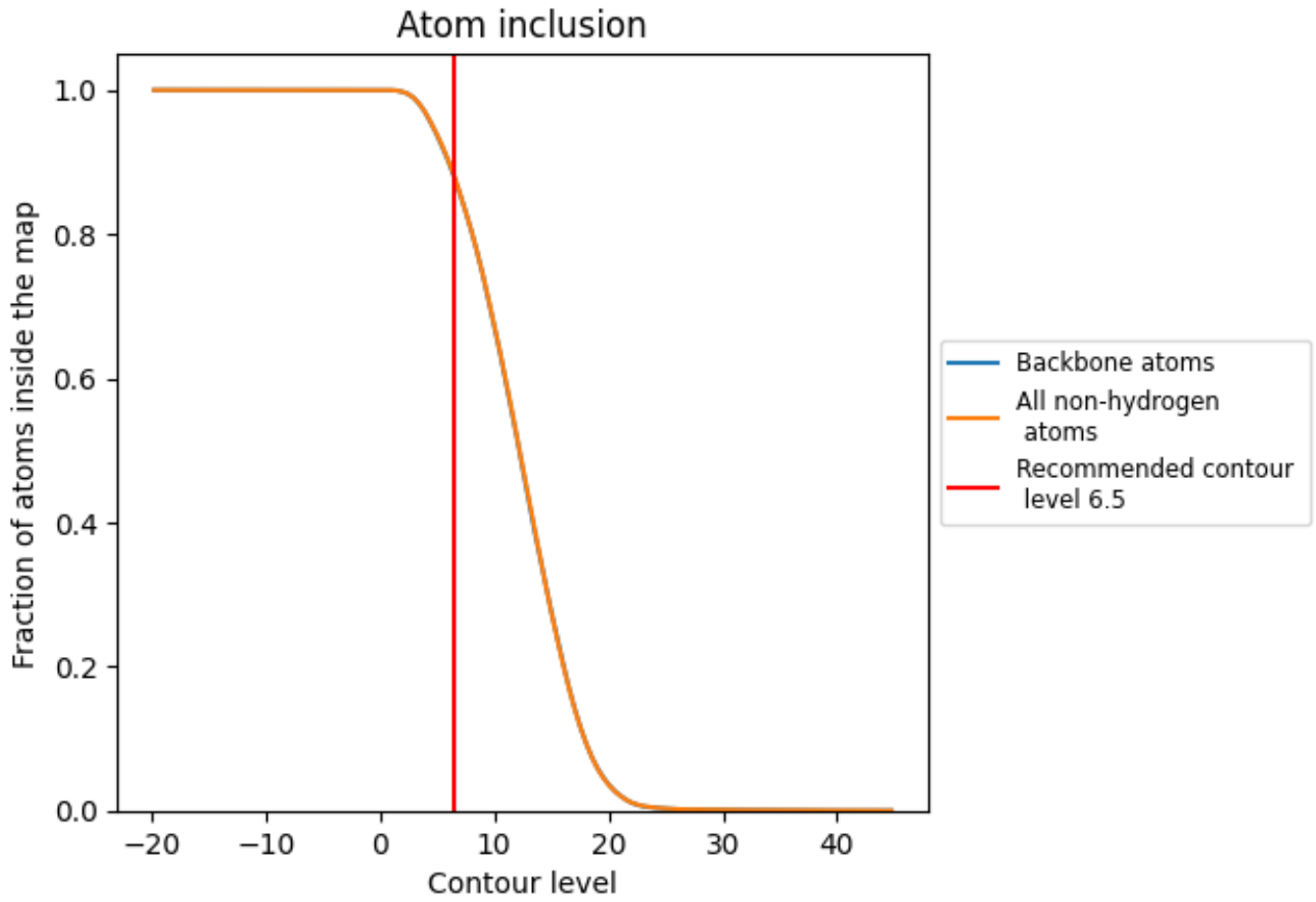
9.3 Atom inclusion mapped to coordinate model (i)



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 (6.5).

9.4 Atom inclusion (i)



At the recommended contour level, 88% of all backbone atoms, 88% 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 (6.5) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8812	0.7110
A	0.7481	0.6800
B	0.8890	0.7340
C	0.9628	0.7490
D	0.9243	0.7420
E	0.8856	0.7050
F	0.9232	0.7190
G	0.9154	0.7270
H	0.9069	0.7160
I	0.9659	0.7530
J	0.7849	0.6910
K	0.9432	0.7280
L	0.9220	0.7060
M	0.9464	0.7240
N	0.9383	0.7260
O	0.8541	0.6910
P	0.8513	0.7070
Q	0.9154	0.7390
R	0.8864	0.7280
S	0.8199	0.6920
T	0.6102	0.6370
U	0.9340	0.7010
V	0.8436	0.7140
W	0.8641	0.7180
X	0.8734	0.6950
Y	0.5515	0.6600
Z	0.8510	0.7020
a	0.9409	0.7120
b	0.8509	0.6850
c	0.7652	0.6780
d	0.8267	0.6970
e	0.8312	0.6930
f	0.7446	0.6750
g	0.8612	0.6980
h	0.8922	0.7050

Continued on next page...

Continued from previous page...

Chain	Atom inclusion	Q-score
i	0.8443	0.6760
j	0.8796	0.6790
k	0.8265	0.6680
l	0.9041	0.7000
m	0.8415	0.6850
n	0.9184	0.7040
o	0.8840	0.6760
p	0.9122	0.7030
q	0.8273	0.7180
r	0.8720	0.7260
s	0.8564	0.6990