wwPDB EM Validation Summary Report (i)

Feb 1, 2023 – 07:34 pm GMT

PDB ID	:	7R41
EMDB ID	:	EMD-14251
Title	:	Bovine complex I in the presence of IM1761092, active class i (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 wwPDB EM Validation Summary Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the (i) 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 (i)) were used in the production of this report:

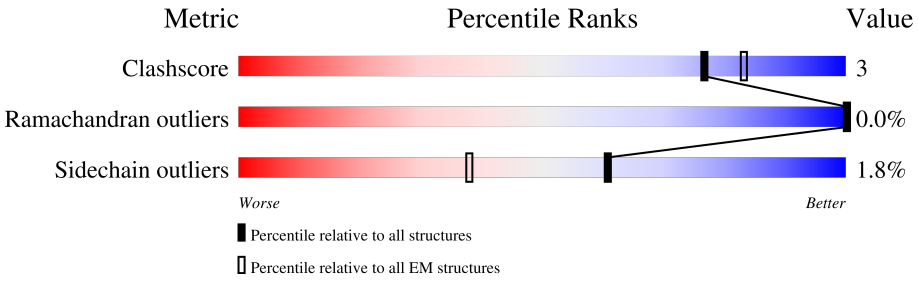
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)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

1 Overall quality at a glance (i)

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.



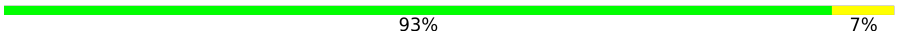
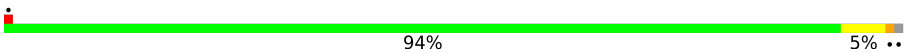
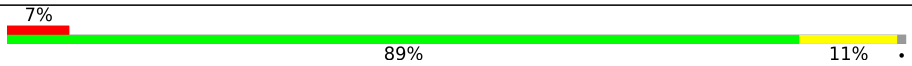
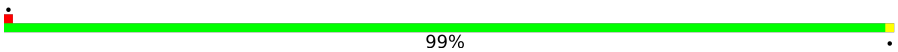
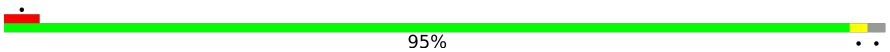
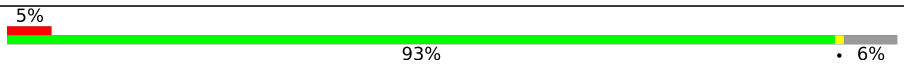
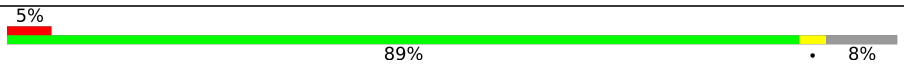
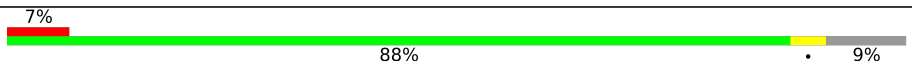
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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	95% 5%
2	B	216	65% 6% 28%
3	C	266	74% 22%
4	D	463	85% 8% 7%
5	E	249	77% 9% 14%
6	F	464	86% 7% 7%
7	G	727	88% 6% 5%
8	H	318	90% 10%

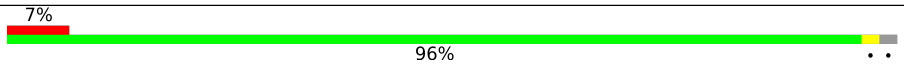
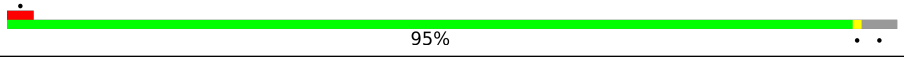
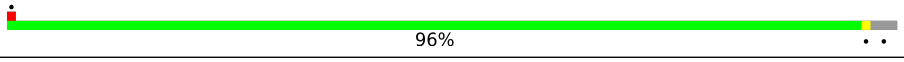
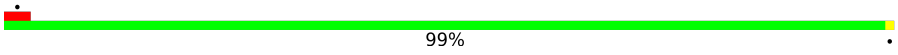
Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
9	I	212	
10	J	175	
11	K	98	
12	L	606	
13	M	459	
14	N	347	
15	O	343	
16	P	380	
17	Q	175	
18	R	124	
19	S	99	
20	T	156	
20	U	156	
21	V	116	
22	W	128	
23	X	172	
24	Y	141	
25	Z	144	
26	a	70	
27	b	84	
28	c	76	
29	d	120	
30	e	106	
31	f	57	
32	g	154	

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
33	h	189	
34	i	127	
35	j	108	
36	k	98	
37	l	186	
38	m	129	
39	n	179	
40	o	137	
41	p	176	
42	q	145	
43	r	113	
44	s	109	

2 Entry composition (i)

There are 60 unique types of molecules in this entry. The entry contains 69138 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	115	921	622	133	159	7	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	155	1241	792	224	211	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	207	1721	1111	296	311	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	430	3459	2209	596	629	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	430	Total	C	N	O	S	0	0
			3310	2086	591	613	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	318	Total	C	N	O	S	0	0
			2509	1681	385	420	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
			4791	3186	736	826	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	341	Total	C	N	O	S	0	0
			2747	1777	486	479	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	84	Total	C	N	O	S	0	0
			677	425	126	124	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	86	Total	C	N	O	S	0	0
			693	447	102	139	5		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
21	V	112	Total	C	N	O	S	0	0
			911	589	154	165	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	140	Total	C	N	O	S	0	0
			1146	737	200	200	9		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
26	a	70	Total	C	N	O	S	0	0
			569	365	104	95	5		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
27	b	82	Total	C	N	O	S	0	0
			646	422	108	114	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	113	Total	C	N	O	S	0	0
			945	619	161	162	3		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
30	e	97	Total	C	N	O	S	0	0
			819	518	156	139	6		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
31	f	52	Total	C	N	O	S	0	0
			451	296	79	75	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	102	Total	C	N	O	S	0	0
			879	579	150	149	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	127	Total	C	N	O	0	0
			1061	681	187	193		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
39	n	172	Total	C	N	O	S	0	0
			1492	955	273	257	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	171	Total	C	N	O	S	0	0
			1443	904	266	265	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		

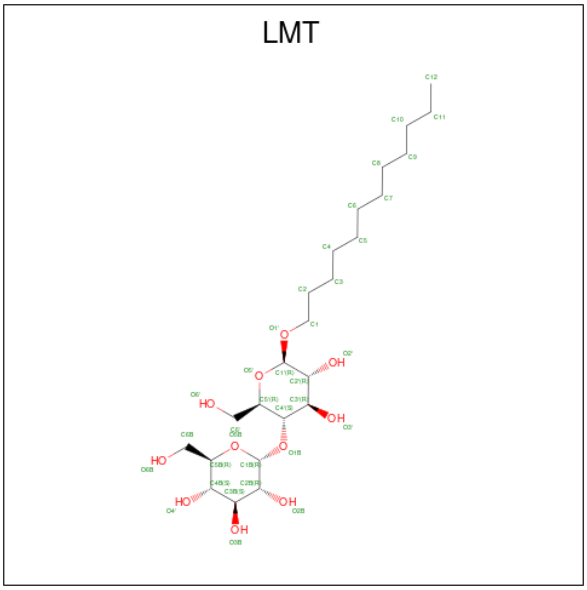
- Molecule 43 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 7.

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: $C_{24}H_{46}O_{11}$).



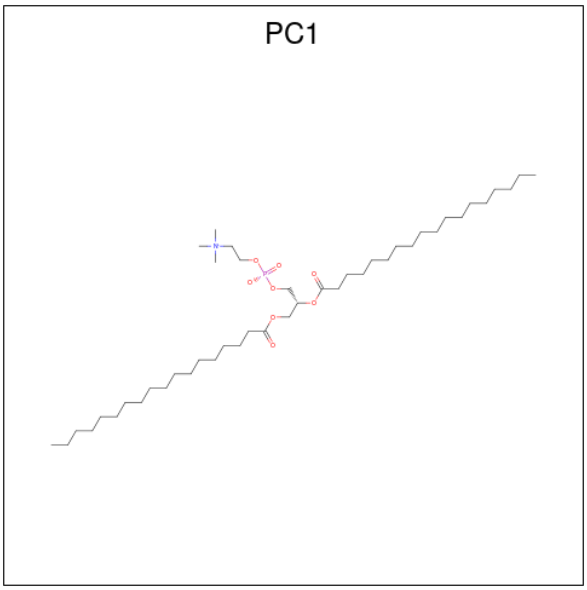
Mol	Chain	Residues	Atoms			AltConf
45	A	1	Total	C	O	0
			35	24	11	
45	A	1	Total	C	O	0
			35	24	11	
45	J	1	Total	C	O	0
			35	24	11	
45	L	1	Total	C	O	0
			35	24	11	
45	L	1	Total	C	O	0
			35	24	11	
45	L	1	Total	C	O	0
			35	24	11	
45	M	1	Total	C	O	0
			35	24	11	

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms	AltConf
45	M	1	Total C O 35 24 11	0
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	Y	1	Total C O 35 24 11	0
45	Y	1	Total C O 35 24 11	0
45	h	1	Total C O 35 24 11	0
45	j	1	Total C O 35 24 11	0
45	l	1	Total C O 35 24 11	0

- Molecule 46 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOCHOLINE (three-letter code: PC1) (formula: $C_{44}H_{88}NO_8P$).



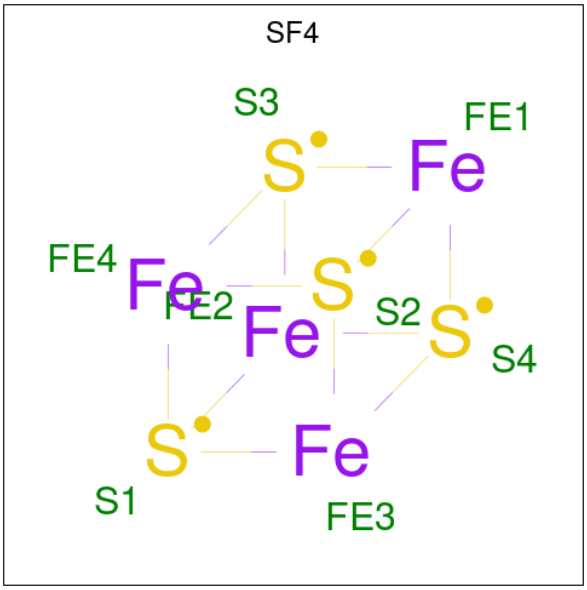
Mol	Chain	Residues	Atoms	AltConf
46	A	1	Total C N O P 21 11 1 8 1	0
46	B	1	Total C N O P 54 44 1 8 1	0

Continued on next page...

Continued from previous page...

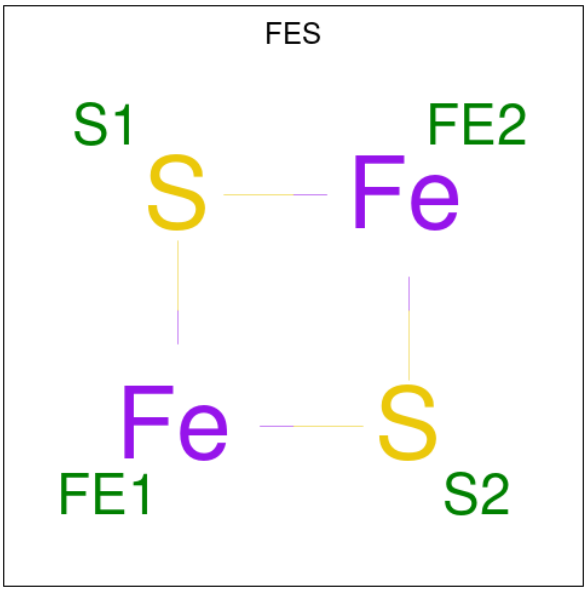
Mol	Chain	Residues	Atoms					AltConf
46	B	1	Total	C	N	O	P	0
			35	25	1	8	1	
46	L	1	Total	C	N	O	P	0
			49	39	1	8	1	

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



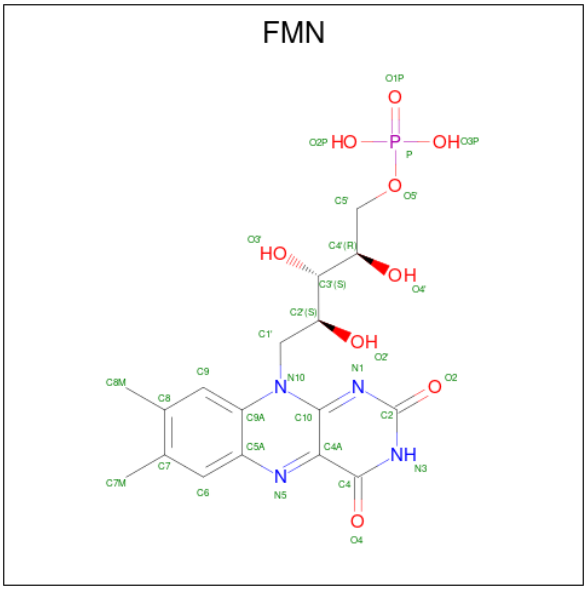
Mol	Chain	Residues	Atoms			AltConf
47	B	1	Total	Fe	S	0
			8	4	4	
47	F	1	Total	Fe	S	0
			8	4	4	
47	G	1	Total	Fe	S	0
			8	4	4	
47	G	1	Total	Fe	S	0
			8	4	4	
47	I	1	Total	Fe	S	0
			8	4	4	
47	I	1	Total	Fe	S	0
			8	4	4	

- Molecule 48 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe_2S_2).



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

- Molecule 49 is FLAVIN MONONUCLEOTIDE (three-letter code: FMN) (formula: $C_{17}H_{21}N_4O_9P$).

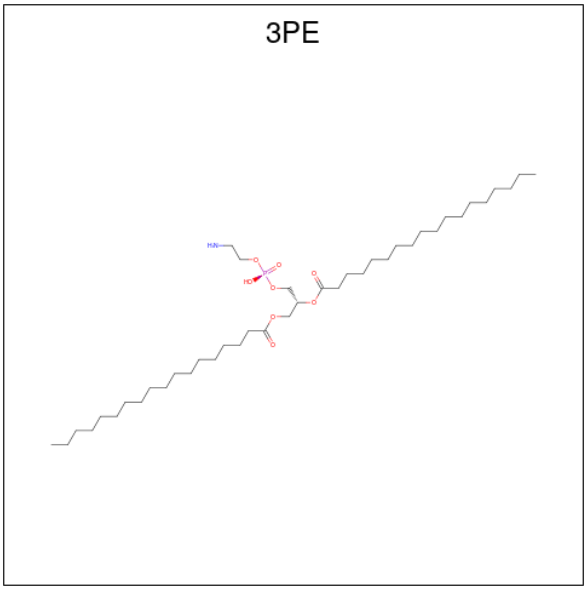


Mol	Chain	Residues	Atoms					AltConf
49	F	1	Total	C	N	O	P	0
			31	17	4	9	1	

- Molecule 50 is POTASSIUM ION (three-letter code: K) (formula: K).

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

- Molecule 51 is 1,2-Distearoyl-sn-glycerophosphoethanolamine (three-letter code: 3PE) (formula: $C_{41}H_{82}NO_8P$).



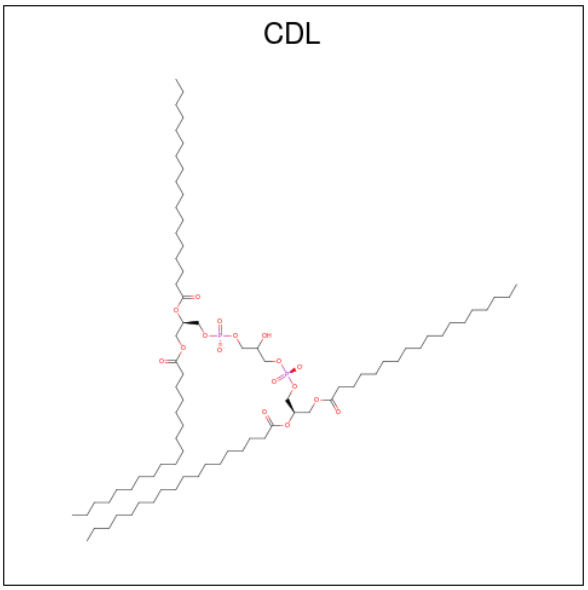
Mol	Chain	Residues	Atoms	AltConf
51	H	1	Total C N O P 44 34 1 8 1	0
51	H	1	Total C N O P 34 24 1 8 1	0
51	I	1	Total C N O P 51 41 1 8 1	0
51	L	1	Total C N O P 49 39 1 8 1	0
51	L	1	Total C N O P 45 35 1 8 1	0
51	M	1	Total C N O P 46 36 1 8 1	0
51	M	1	Total C N O P 51 41 1 8 1	0
51	N	1	Total C N O P 51 41 1 8 1	0
51	N	1	Total C N O P 41 31 1 8 1	0
51	N	1	Total C N O P 29 19 1 8 1	0

Continued on next page...

Continued from previous page...

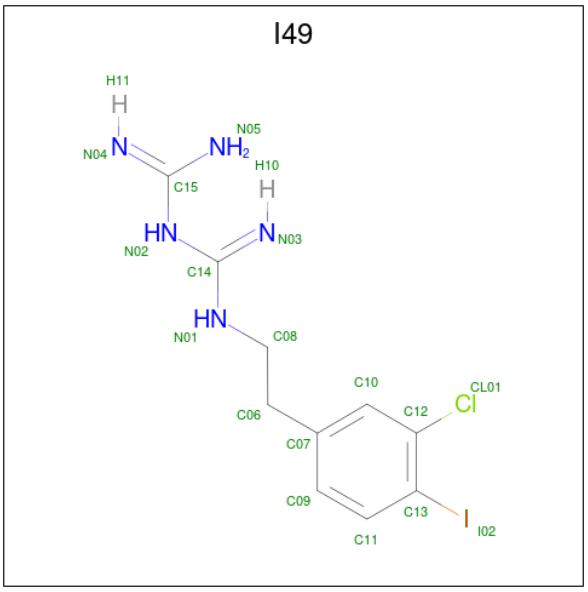
Mol	Chain	Residues	Atoms					AltConf
51	P	1	Total	C	N	O	P	0
			37	27	1	8	1	
51	X	1	Total	C	N	O	P	0
			51	41	1	8	1	
51	Y	1	Total	C	N	O	P	0
			35	25	1	8	1	
51	d	1	Total	C	N	O	P	0
			51	41	1	8	1	

- Molecule 52 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).



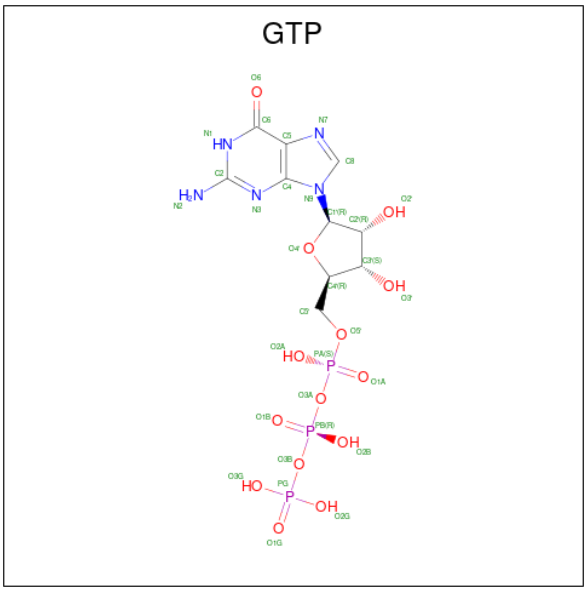
Mol	Chain	Residues	Atoms				AltConf
52	J	1	Total	C	O	P	0
			62	43	17	2	
52	K	1	Total	C	O	P	0
			71	52	17	2	
52	L	1	Total	C	O	P	0
			69	50	17	2	
52	h	1	Total	C	O	P	0
			67	48	17	2	
52	q	1	Total	C	O	P	0
			76	57	17	2	

- Molecule 53 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
53	N	1	Total	C	Cl	I	N	0
			17	10	1	1	5	

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

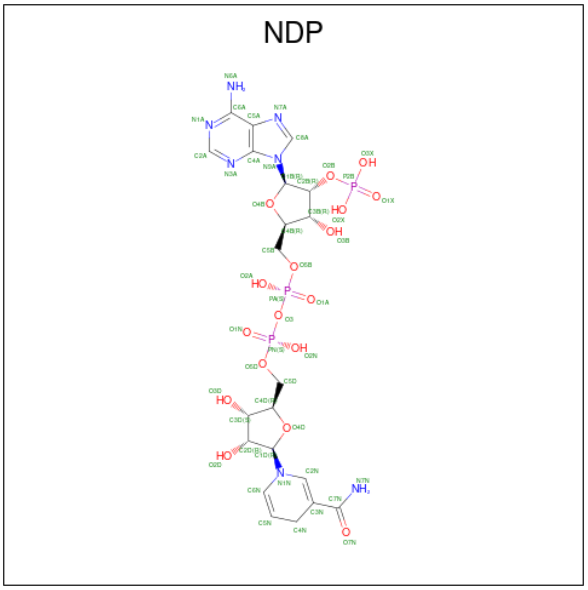


Mol	Chain	Residues	Atoms					AltConf
54	O	1	Total	C	N	O	P	0
			32	10	5	14	3	

- 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: $C_{21}H_{30}N_7O_{17}P_3$).

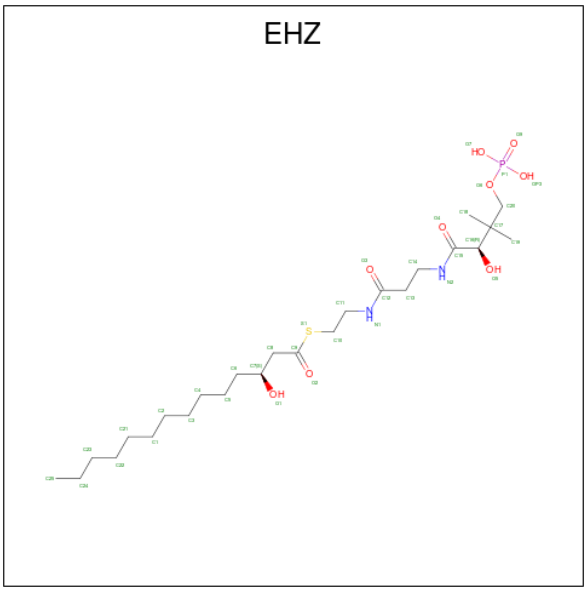


Mol	Chain	Residues	Atoms					AltConf
56	P	1	Total	C	N	O	P	0
			48	21	7	17	3	

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

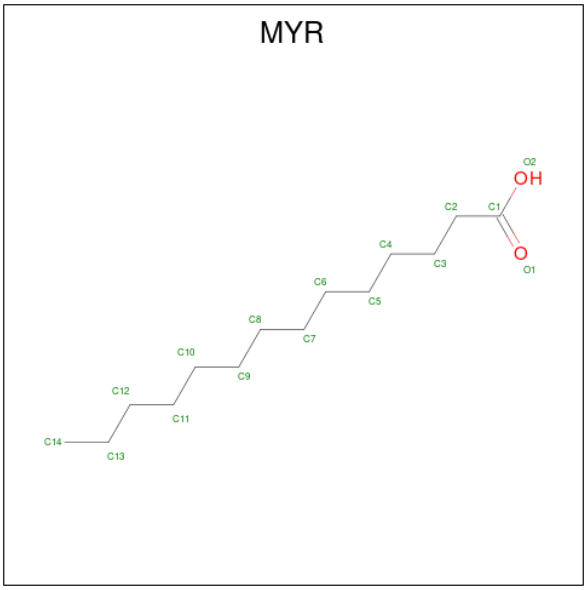
Mol	Chain	Residues	Atoms		AltConf
57	R	1	Total	Zn	0
			1	1	

- 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	0
			6	5	1	

- Molecule 60 is water.

Mol	Chain	Residues	Atoms	AltConf
60	A	21	Total O 21 21	0
60	B	62	Total O 62 62	0
60	C	83	Total O 83 83	0
60	D	155	Total O 155 155	0
60	E	13	Total O 13 13	0
60	F	59	Total O 59 59	0
60	G	183	Total O 183 183	0
60	H	61	Total O 61 61	0
60	I	91	Total O 91 91	0
60	J	21	Total O 21 21	0
60	K	15	Total O 15 15	0
60	L	31	Total O 31 31	0
60	M	49	Total O 49 49	0
60	N	49	Total O 49 49	0
60	O	21	Total O 21 21	0
60	P	58	Total O 58 58	0
60	Q	59	Total O 59 59	0
60	R	39	Total O 39 39	0
60	S	2	Total O 2 2	0
60	V	15	Total O 15 15	0
60	W	10	Total O 10 10	0
60	X	23	Total O 23 23	0

Continued on next page...

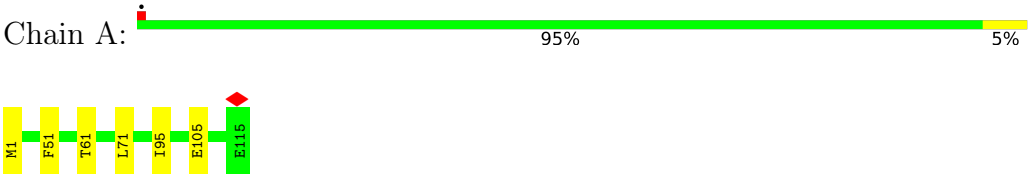
Continued from previous page...

Mol	Chain	Residues	Atoms	AltConf
60	Y	3	Total O 3 3	0
60	Z	24	Total O 24 24	0
60	a	11	Total O 11 11	0
60	b	7	Total O 7 7	0
60	d	9	Total O 9 9	0
60	e	15	Total O 15 15	0
60	f	1	Total O 1 1	0
60	g	4	Total O 4 4	0
60	h	15	Total O 15 15	0
60	i	2	Total O 2 2	0
60	j	1	Total O 1 1	0
60	k	2	Total O 2 2	0
60	l	3	Total O 3 3	0
60	m	7	Total O 7 7	0
60	n	9	Total O 9 9	0
60	p	10	Total O 10 10	0
60	q	35	Total O 35 35	0
60	r	25	Total O 25 25	0
60	s	4	Total O 4 4	0

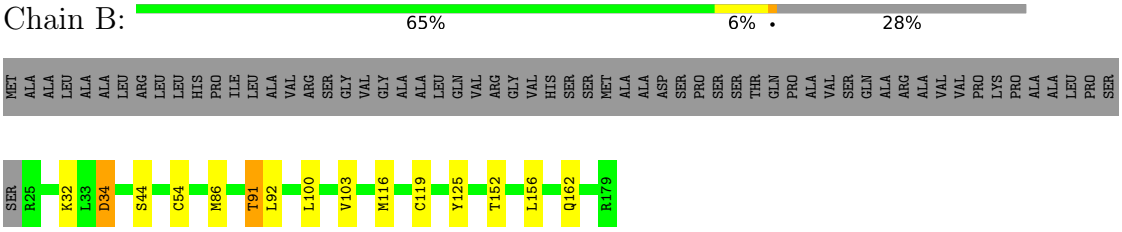
3 Residue-property plots (i)

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.

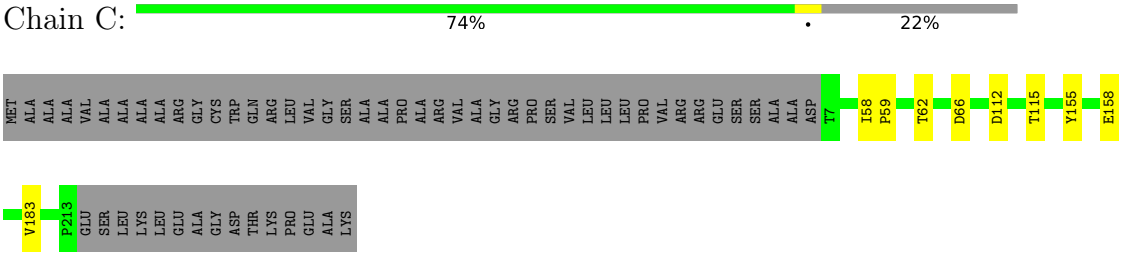
• Molecule 1: NADH-ubiquinone oxidoreductase chain 3



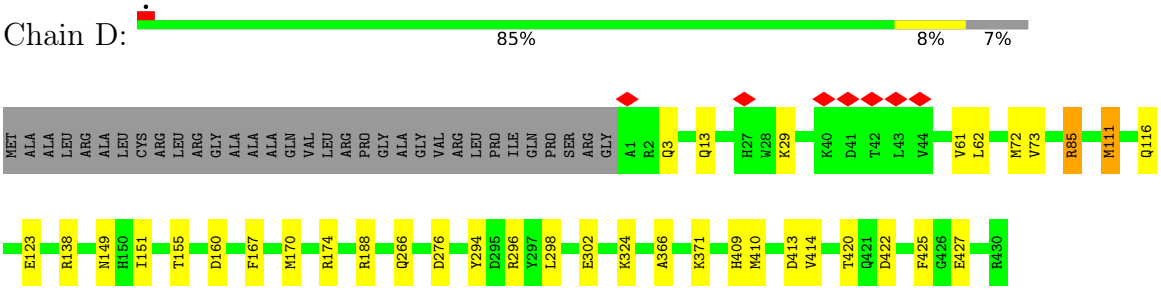
• Molecule 2: NADH dehydrogenase [ubiquinone] iron-sulfur protein 7, mitochondrial



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

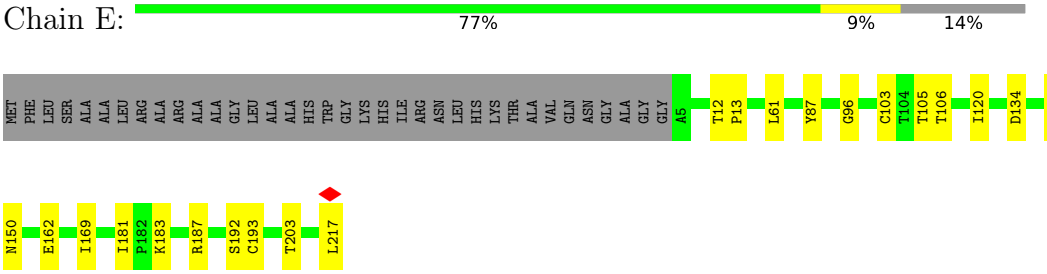


• Molecule 4: NADH dehydrogenase [ubiquinone] iron-sulfur protein 2, mitochondrial



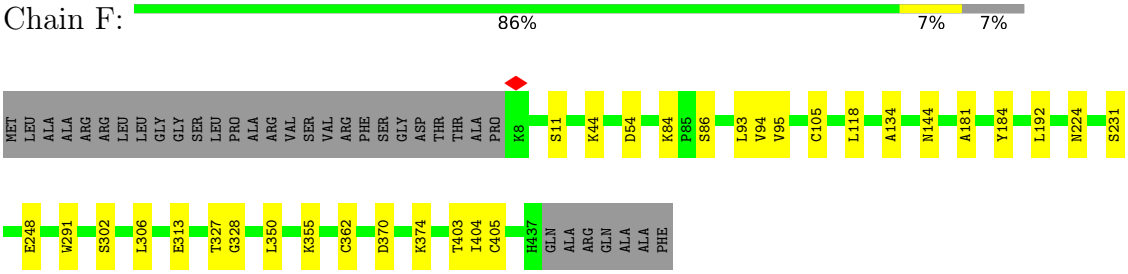
• Molecule 5: NADH dehydrogenase [ubiquinone] flavoprotein 2, mitochondrial

Chain E:



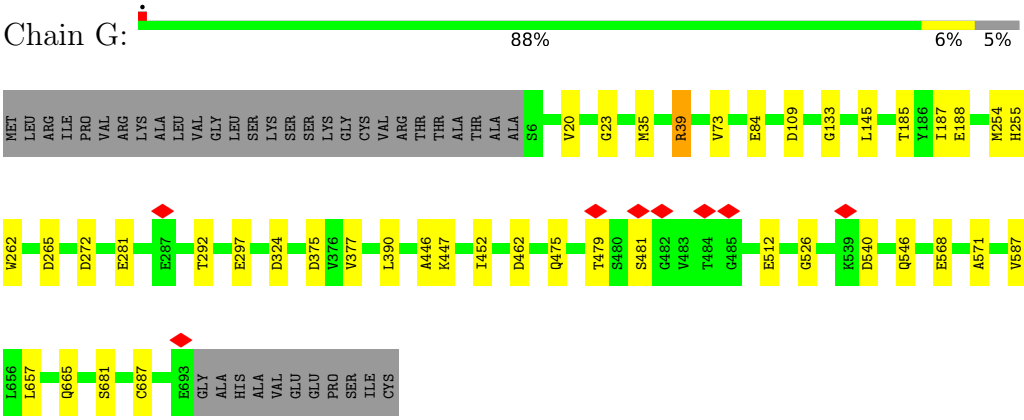
• Molecule 6: NADH dehydrogenase [ubiquinone] flavoprotein 1, mitochondrial

Chain F:



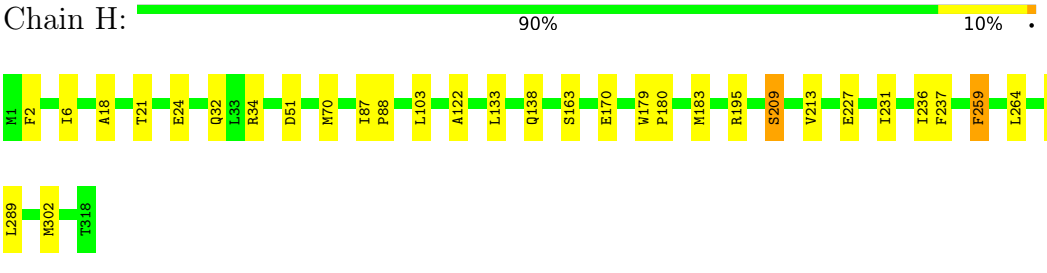
• Molecule 7: NADH-ubiquinone oxidoreductase 75 kDa subunit, mitochondrial

Chain G:



• Molecule 8: NADH-ubiquinone oxidoreductase chain 1

Chain H:

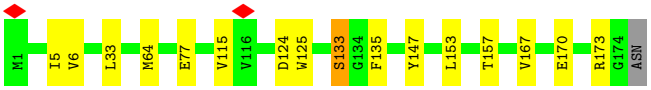


• Molecule 9: NADH dehydrogenase [ubiquinone] iron-sulfur protein 8, mitochondrial

Chain I:

• Molecule 10: NADH-ubiquinone oxidoreductase chain 6

Chain J:

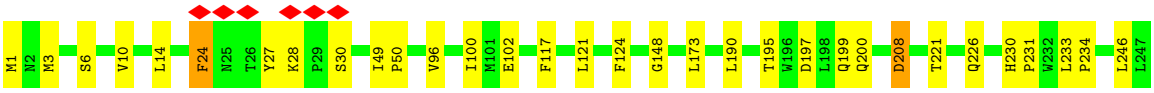


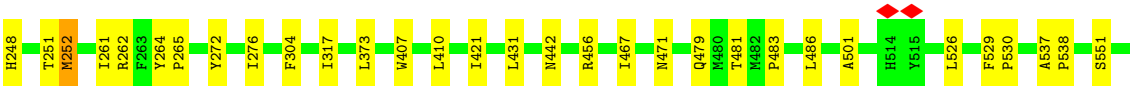
• Molecule 11: NADH-ubiquinone oxidoreductase chain 4L

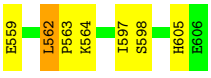
Chain K:

• Molecule 12: NADH-ubiquinone oxidoreductase chain 5

Chain L:

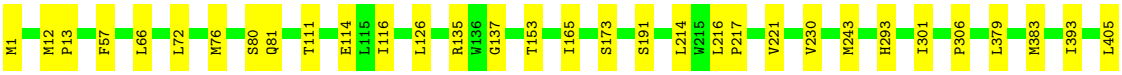






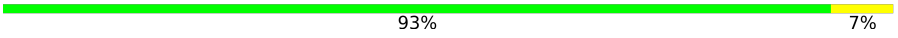
• Molecule 13: NADH-ubiquinone oxidoreductase chain 4

Chain M:



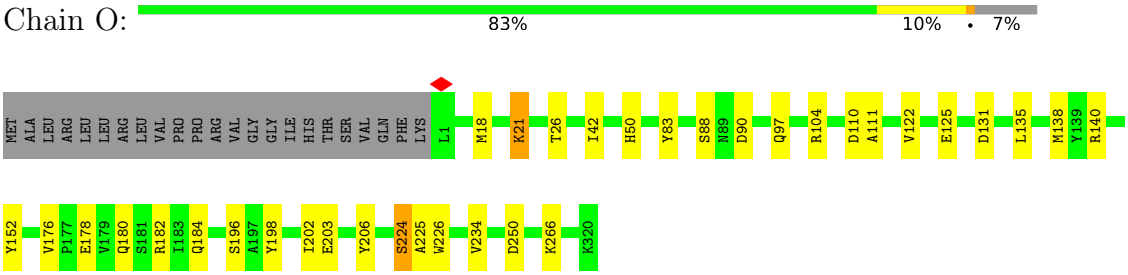
• Molecule 14: NADH-ubiquinone oxidoreductase chain 2

Chain N:



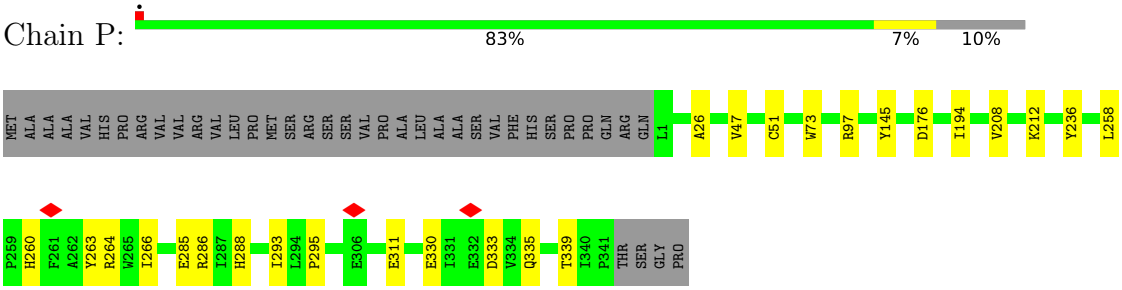
• Molecule 15: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 10, mitochondrial

Chain O:



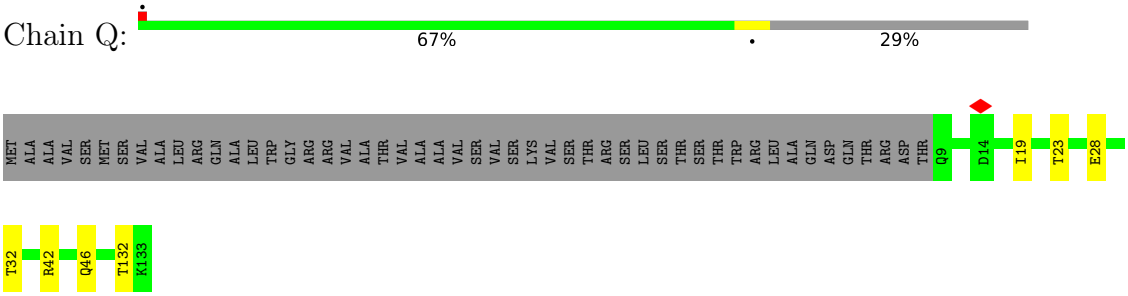
• Molecule 16: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 9, mitochondrial

Chain P:



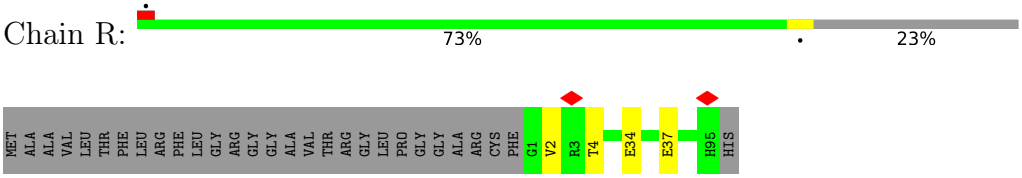
• Molecule 17: NADH dehydrogenase [ubiquinone] iron-sulfur protein 4, mitochondrial

Chain Q:



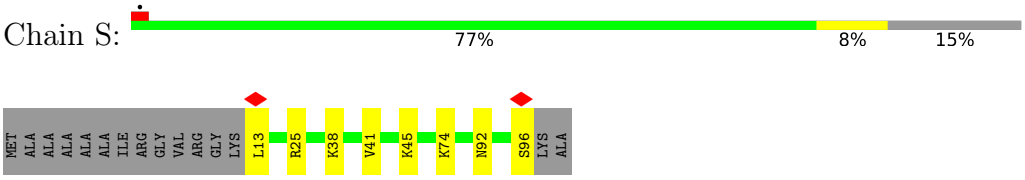
• Molecule 18: NADH dehydrogenase [ubiquinone] iron-sulfur protein 6, mitochondrial

Chain R:

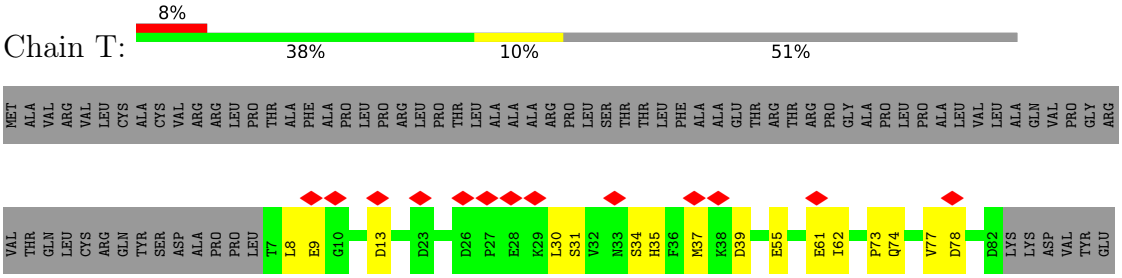


• Molecule 19: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2

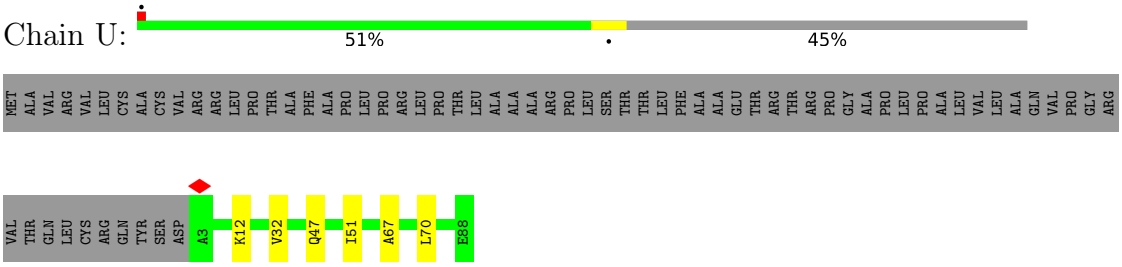
Chain S:



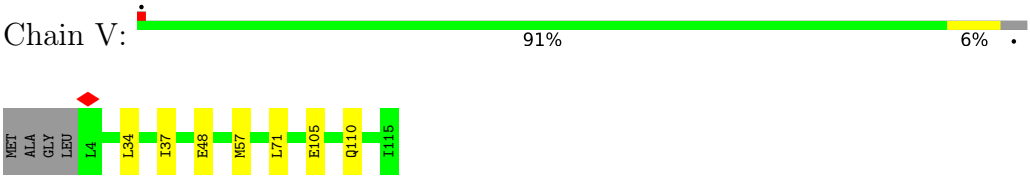
• Molecule 20: Acyl carrier protein, mitochondrial



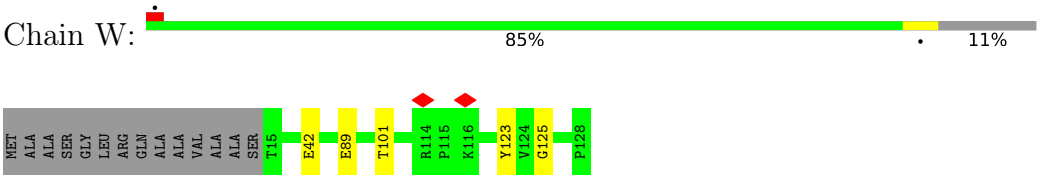
• Molecule 20: Acyl carrier protein, mitochondrial



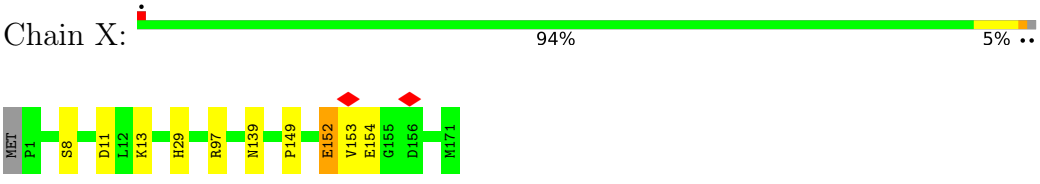
• Molecule 21: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 5



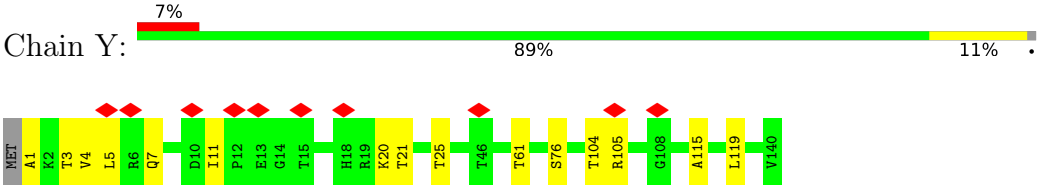
• Molecule 22: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 6



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

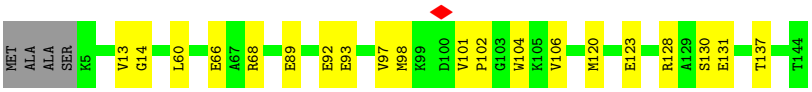


• Molecule 24: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 11



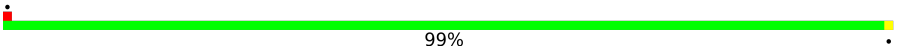
• Molecule 25: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 13

Chain Z:



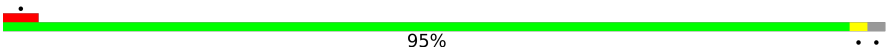
• Molecule 26: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 1

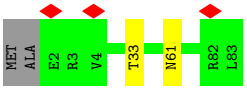
Chain a:



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

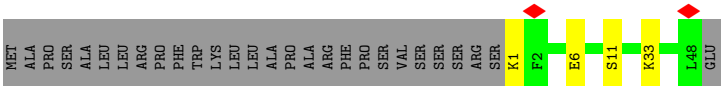
Chain b:





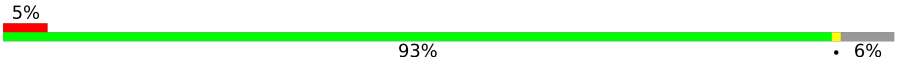
• Molecule 28: NADH dehydrogenase [ubiquinone] 1 subunit C1, mitochondrial

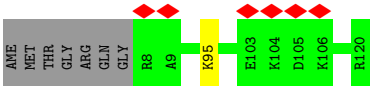
Chain c:



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

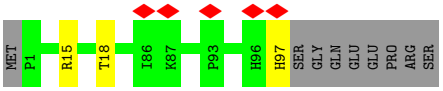
Chain d:





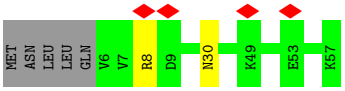
• Molecule 30: NADH dehydrogenase [ubiquinone] iron-sulfur protein 5

Chain e:



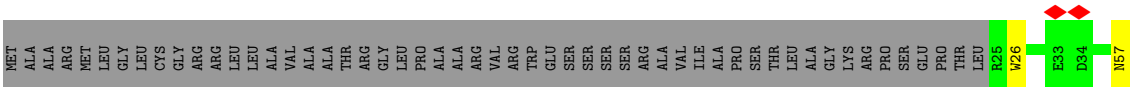
• Molecule 31: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 1

Chain f:



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

Chain g:

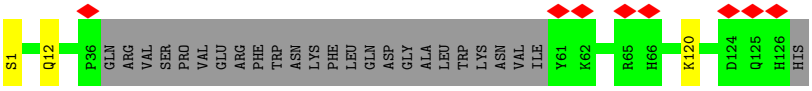


• Molecule 33: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 5, mitochondrial

Chain h:

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

Chain i:

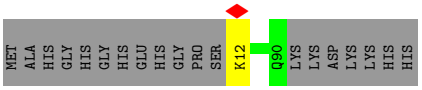


• Molecule 35: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 2, mitochondrial

Chain j:

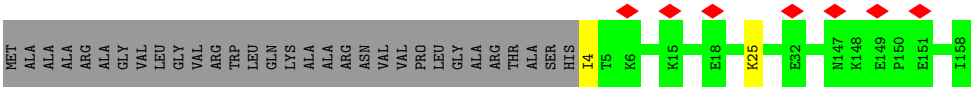
• Molecule 36: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 3

Chain k:



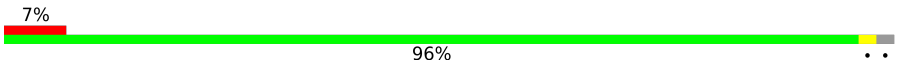
• Molecule 37: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 8, mitochondrial

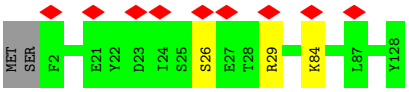
Chain l:



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

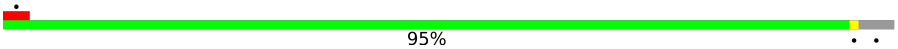
Chain m:

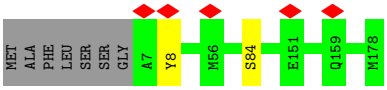




• Molecule 39: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 9

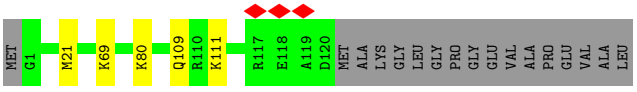
Chain n:





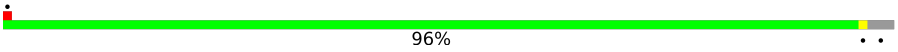
• Molecule 40: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7

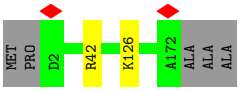
Chain o:



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

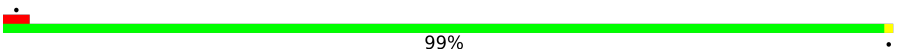
Chain p:

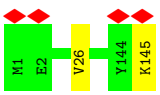




• Molecule 42: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 12

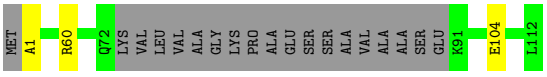
Chain q:





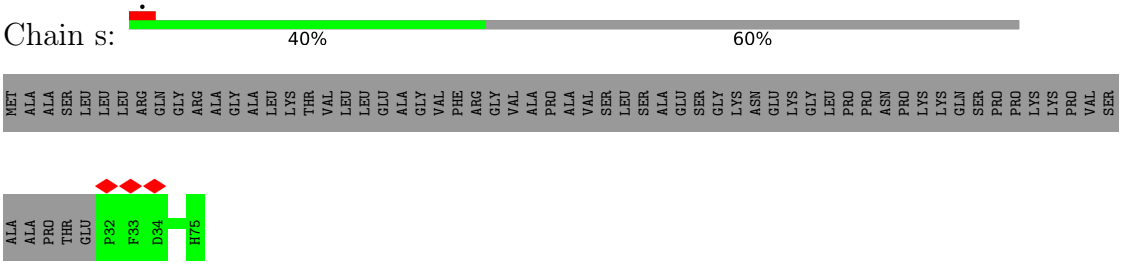
• Molecule 43: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 7

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	48367	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	34.153	Depositor
Minimum map value	-13.918	Depositor
Average map value	0.004	Depositor
Map value standard deviation	1.021	Depositor
Recommended contour level	5.0	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: FME, LMT, SAC, FES, NDP, MG, PC1, FMN, AYA, EHZ, 2MR, SF4, CDL, K, I49, ZN, 3PE, GTP, MYR

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	0.32	0/936	0.42	0/1281
2	B	0.42	0/1272	0.46	0/1720
3	C	0.37	0/1772	0.46	0/2413
4	D	0.37	0/3537	0.45	0/4794
5	E	0.34	0/1695	0.46	0/2307
6	F	0.35	0/3384	0.45	0/4572
7	G	0.34	0/5367	0.46	0/7274
8	H	0.35	0/2571	0.44	0/3513
9	I	0.38	0/1445	0.48	0/1956
10	J	0.34	0/1362	0.43	0/1848
11	K	0.29	0/745	0.43	0/1008
12	L	0.33	0/4908	0.42	0/6679
13	M	0.34	0/3738	0.43	0/5097
14	N	0.32	0/2792	0.44	0/3800
15	O	0.35	0/2651	0.42	0/3587
16	P	0.34	0/2824	0.45	0/3831
17	Q	0.33	0/1039	0.46	0/1404
18	R	0.38	0/742	0.46	0/999
19	S	0.31	0/688	0.46	0/927
20	T	0.30	0/621	0.41	0/837
20	U	0.37	0/705	0.43	0/952
21	V	0.31	0/931	0.38	0/1261
22	W	0.32	0/995	0.42	0/1337
23	X	0.32	0/1439	0.42	0/1942
24	Y	0.28	0/1042	0.44	0/1414
25	Z	0.34	0/1175	0.45	0/1584
26	a	0.35	0/584	0.44	0/786
27	b	0.31	0/667	0.43	0/916
28	c	0.33	0/418	0.37	0/567
29	d	0.38	0/975	0.40	0/1319
30	e	0.32	0/840	0.42	0/1123

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
31	f	0.32	0/464	0.43	0/626
32	g	0.35	0/850	0.39	0/1154
33	h	0.35	0/1188	0.41	0/1607
34	i	0.34	0/900	0.44	0/1224
35	j	0.34	0/607	0.39	0/833
36	k	0.34	0/657	0.42	0/887
37	l	0.35	0/1358	0.42	0/1858
38	m	0.34	0/1088	0.42	0/1472
39	n	0.37	0/1545	0.40	0/2092
40	o	0.36	0/1060	0.42	0/1420
41	p	0.36	0/1476	0.41	0/1990
42	q	0.35	0/1250	0.45	0/1698
43	r	0.35	0/780	0.45	0/1056
44	s	0.31	0/383	0.41	0/518
All	All	0.34	0/67466	0.44	0/91483

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	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	D	85	2MR	Mainchain

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	921	0	952	4	0
2	B	1241	0	1251	9	0
3	C	1721	0	1675	7	0
4	D	3459	0	3404	25	0
5	E	1655	0	1661	13	0
6	F	3310	0	3266	16	0
7	G	5279	0	5301	26	0
8	H	2509	0	2621	20	0
9	I	1414	0	1370	5	0
10	J	1337	0	1346	15	0
11	K	745	0	785	5	0
12	L	4791	0	4942	43	0
13	M	3654	0	3852	21	0
14	N	2733	0	2912	17	0
15	O	2589	0	2566	19	0
16	P	2747	0	2766	16	0
17	Q	1016	0	1014	4	0
18	R	730	0	707	1	0
19	S	677	0	688	3	0
20	T	612	0	604	10	0
20	U	693	0	688	3	0
21	V	911	0	950	7	0
22	W	971	0	989	4	0
23	X	1402	0	1383	8	0
24	Y	1030	0	1039	7	0
25	Z	1146	0	1146	14	0
26	a	569	0	568	0	0
27	b	646	0	654	0	0
28	c	405	0	409	0	0
29	d	945	0	932	0	0
30	e	819	0	821	0	0
31	f	451	0	453	0	0
32	g	824	0	772	0	0
33	h	1154	0	1168	0	0
34	i	879	0	892	0	0
35	j	580	0	519	0	0
36	k	638	0	621	0	0
37	l	1304	0	1203	0	0
38	m	1061	0	1059	0	0
39	n	1492	0	1438	0	0
40	o	1035	0	1003	0	0
41	p	1443	0	1415	0	0
42	q	1209	0	1182	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
43	r	767	0	776	0	0
44	s	371	0	344	0	0
45	A	70	0	92	1	0
45	J	35	0	46	1	0
45	L	105	0	138	1	0
45	M	105	0	138	4	0
45	N	35	0	46	0	0
45	Y	105	0	138	4	0
45	h	35	0	46	0	0
45	j	35	0	46	0	0
45	l	35	0	46	0	0
46	A	21	0	18	1	0
46	B	89	0	132	2	0
46	L	49	0	75	0	0
47	B	8	0	0	1	0
47	F	8	0	0	1	0
47	G	16	0	0	0	0
47	I	16	0	0	0	0
48	E	4	0	0	0	0
48	G	4	0	0	0	0
49	F	31	0	19	2	0
50	G	1	0	0	0	0
51	H	78	0	112	1	0
51	I	51	0	82	0	0
51	L	94	0	142	0	0
51	M	97	0	151	4	0
51	N	121	0	170	2	0
51	P	37	0	48	0	0
51	X	51	0	82	4	0
51	Y	35	0	44	0	0
51	d	51	0	82	0	0
52	J	62	0	68	1	0
52	K	71	0	86	0	0
52	L	69	0	82	0	0
52	h	67	0	81	0	0
52	q	76	0	96	0	0
53	N	17	0	0	1	0
54	O	32	0	12	3	0
55	O	1	0	0	0	0
56	P	48	0	26	1	0
57	R	1	0	0	0	0
58	T	37	0	0	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
58	U	37	0	0	0	0
59	o	6	0	6	0	0
60	A	21	0	0	0	0
60	B	62	0	0	2	0
60	C	83	0	0	3	0
60	D	155	0	0	9	0
60	E	13	0	0	1	0
60	F	59	0	0	3	0
60	G	183	0	0	7	0
60	H	61	0	0	2	0
60	I	91	0	0	3	0
60	J	21	0	0	1	0
60	K	15	0	0	0	0
60	L	31	0	0	2	0
60	M	49	0	0	3	0
60	N	49	0	0	3	0
60	O	21	0	0	2	0
60	P	58	0	0	1	0
60	Q	59	0	0	1	0
60	R	39	0	0	0	0
60	S	2	0	0	0	0
60	V	15	0	0	2	0
60	W	10	0	0	1	0
60	X	23	0	0	3	0
60	Y	3	0	0	0	0
60	Z	24	0	0	2	0
60	a	11	0	0	0	0
60	b	7	0	0	0	0
60	d	9	0	0	0	0
60	e	15	0	0	0	0
60	f	1	0	0	0	0
60	g	4	0	0	0	0
60	h	15	0	0	0	0
60	i	2	0	0	0	0
60	j	1	0	0	0	0
60	k	2	0	0	0	0
60	l	3	0	0	0	0
60	m	7	0	0	0	0
60	n	9	0	0	0	0
60	p	10	0	0	0	0
60	q	35	0	0	0	0
60	r	25	0	0	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
60	s	4	0	0	0	0
All	All	69138	0	68457	313	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

The worst 5 of 313 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:L:479:GLN:NE2	12:L:481:THR:O	2.08	0.87
16:P:51:CYS:O	60:P:601:HOH:O	1.96	0.83
21:V:105:GLU:O	60:V:201:HOH:O	1.94	0.83
4:D:72:MET:SD	60:D:653:HOH:O	2.35	0.82
2:B:44:SER:OG	8:H:51:ASP:OD1	1.97	0.82

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	113/115 (98%)	111 (98%)	2 (2%)	0	100	100
2	B	153/216 (71%)	146 (95%)	7 (5%)	0	100	100
3	C	205/266 (77%)	200 (98%)	5 (2%)	0	100	100
4	D	427/463 (92%)	415 (97%)	12 (3%)	0	100	100
5	E	211/249 (85%)	206 (98%)	5 (2%)	0	100	100
6	F	428/464 (92%)	420 (98%)	8 (2%)	0	100	100
7	G	686/727 (94%)	668 (97%)	18 (3%)	0	100	100
8	H	316/318 (99%)	303 (96%)	13 (4%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
9	I	174/212 (82%)	169 (97%)	5 (3%)	0	100	100
10	J	172/175 (98%)	161 (94%)	11 (6%)	0	100	100
11	K	96/98 (98%)	95 (99%)	1 (1%)	0	100	100
12	L	604/606 (100%)	580 (96%)	23 (4%)	1 (0%)	47	58
13	M	457/459 (100%)	451 (99%)	6 (1%)	0	100	100
14	N	345/347 (99%)	339 (98%)	6 (2%)	0	100	100
15	O	318/343 (93%)	313 (98%)	5 (2%)	0	100	100
16	P	339/380 (89%)	332 (98%)	7 (2%)	0	100	100
17	Q	123/175 (70%)	123 (100%)	0	0	100	100
18	R	93/124 (75%)	90 (97%)	3 (3%)	0	100	100
19	S	82/99 (83%)	80 (98%)	2 (2%)	0	100	100
20	T	74/156 (47%)	73 (99%)	1 (1%)	0	100	100
20	U	84/156 (54%)	83 (99%)	1 (1%)	0	100	100
21	V	110/116 (95%)	109 (99%)	1 (1%)	0	100	100
22	W	112/128 (88%)	109 (97%)	3 (3%)	0	100	100
23	X	169/172 (98%)	168 (99%)	1 (1%)	0	100	100
24	Y	138/141 (98%)	134 (97%)	4 (3%)	0	100	100
25	Z	138/144 (96%)	135 (98%)	2 (1%)	1 (1%)	22	26
26	a	68/70 (97%)	66 (97%)	2 (3%)	0	100	100
27	b	80/84 (95%)	76 (95%)	4 (5%)	0	100	100
28	c	46/76 (60%)	46 (100%)	0	0	100	100
29	d	111/120 (92%)	110 (99%)	1 (1%)	0	100	100
30	e	95/106 (90%)	93 (98%)	2 (2%)	0	100	100
31	f	50/57 (88%)	49 (98%)	1 (2%)	0	100	100
32	g	96/154 (62%)	91 (95%)	5 (5%)	0	100	100
33	h	136/189 (72%)	135 (99%)	1 (1%)	0	100	100
34	i	98/127 (77%)	95 (97%)	3 (3%)	0	100	100
35	j	65/108 (60%)	65 (100%)	0	0	100	100
36	k	77/98 (79%)	76 (99%)	1 (1%)	0	100	100
37	l	153/186 (82%)	149 (97%)	4 (3%)	0	100	100
38	m	125/129 (97%)	121 (97%)	4 (3%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
39	n	170/179 (95%)	165 (97%)	5 (3%)	0	100	100
40	o	118/137 (86%)	113 (96%)	5 (4%)	0	100	100
41	p	169/176 (96%)	167 (99%)	2 (1%)	0	100	100
42	q	143/145 (99%)	142 (99%)	1 (1%)	0	100	100
43	r	90/113 (80%)	86 (96%)	4 (4%)	0	100	100
44	s	42/109 (38%)	41 (98%)	1 (2%)	0	100	100
All	All	8099/9212 (88%)	7899 (98%)	198 (2%)	2 (0%)	100	100

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
12	L	562	LEU
25	Z	102	PRO

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	100/100 (100%)	100 (100%)	0	100	100
2	B	131/175 (75%)	127 (97%)	4 (3%)	40	55
3	C	188/228 (82%)	188 (100%)	0	100	100
4	D	370/392 (94%)	367 (99%)	3 (1%)	81	91
5	E	183/205 (89%)	182 (100%)	1 (0%)	88	95
6	F	344/368 (94%)	335 (97%)	9 (3%)	46	63
7	G	578/608 (95%)	570 (99%)	8 (1%)	67	81
8	H	274/274 (100%)	268 (98%)	6 (2%)	52	69
9	I	151/175 (86%)	150 (99%)	1 (1%)	84	92
10	J	140/141 (99%)	138 (99%)	2 (1%)	67	81
11	K	85/85 (100%)	82 (96%)	3 (4%)	36	50
12	L	531/533 (100%)	523 (98%)	8 (2%)	65	79

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
13	M	412/412 (100%)	404 (98%)	8 (2%)	57 73
14	N	315/315 (100%)	312 (99%)	3 (1%)	76 87
15	O	283/303 (93%)	274 (97%)	9 (3%)	39 54
16	P	295/327 (90%)	292 (99%)	3 (1%)	76 87
17	Q	112/153 (73%)	112 (100%)	0	100 100
18	R	78/97 (80%)	76 (97%)	2 (3%)	46 63
19	S	75/82 (92%)	72 (96%)	3 (4%)	31 44
20	T	70/135 (52%)	67 (96%)	3 (4%)	29 40
20	U	79/135 (58%)	79 (100%)	0	100 100
21	V	100/102 (98%)	100 (100%)	0	100 100
22	W	107/114 (94%)	106 (99%)	1 (1%)	78 89
23	X	154/155 (99%)	151 (98%)	3 (2%)	57 73
24	Y	101/102 (99%)	98 (97%)	3 (3%)	41 57
25	Z	119/121 (98%)	117 (98%)	2 (2%)	60 76
26	a	59/59 (100%)	58 (98%)	1 (2%)	60 76
27	b	71/72 (99%)	69 (97%)	2 (3%)	43 60
28	c	44/68 (65%)	40 (91%)	4 (9%)	9 11
29	d	101/105 (96%)	100 (99%)	1 (1%)	76 87
30	e	88/96 (92%)	85 (97%)	3 (3%)	37 51
31	f	49/54 (91%)	47 (96%)	2 (4%)	30 43
32	g	89/131 (68%)	82 (92%)	7 (8%)	12 15
33	h	121/158 (77%)	120 (99%)	1 (1%)	81 91
34	i	97/120 (81%)	95 (98%)	2 (2%)	53 70
35	j	61/84 (73%)	57 (93%)	4 (7%)	16 22
36	k	61/76 (80%)	60 (98%)	1 (2%)	62 78
37	l	139/159 (87%)	137 (99%)	2 (1%)	67 81
38	m	113/115 (98%)	110 (97%)	3 (3%)	44 61
39	n	156/161 (97%)	154 (99%)	2 (1%)	69 82
40	o	109/120 (91%)	104 (95%)	5 (5%)	27 38
41	p	155/157 (99%)	153 (99%)	2 (1%)	69 82
42	q	131/131 (100%)	129 (98%)	2 (2%)	65 79

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
43	r	84/97 (87%)	82 (98%)	2 (2%)	49 66
44	s	43/92 (47%)	43 (100%)	0	100 100
All	All	7146/7892 (90%)	7015 (98%)	131 (2%)	61 75

5 of 131 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
38	m	26	SER
39	n	84	SER
43	r	104	GLU
13	M	114	GLU
13	M	80	SER

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

Mol	Chain	Res	Type
16	P	87	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	$\#\|Z\| > 2$
34	SAC	i	1	34	7,8,9	0.97	0	8,9,11	1.29	2 (25%)
1	FME	A	1	1	8,9,10	0.92	0	7,9,11	1.13	1 (14%)
10	FME	J	1	10	8,9,10	0.96	0	7,9,11	0.99	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
8	FME	H	1	8	8,9,10	0.96	0	7,9,11	0.78	0
14	FME	N	1	14	8,9,10	0.93	0	7,9,11	1.05	0
4	2MR	D	85	4	10,12,13	2.62	4 (40%)	5,13,15	1.15	1 (20%)
43	AYA	r	1	43	6,7,8	1.80	2 (33%)	5,8,10	1.28	1 (20%)
11	FME	K	1	11	8,9,10	0.93	0	7,9,11	0.86	0
12	FME	L	1	12	8,9,10	0.99	1 (12%)	7,9,11	0.75	0
13	FME	M	1	13	8,9,10	0.99	1 (12%)	7,9,11	1.01	1 (14%)
24	AYA	Y	1	24	6,7,8	1.79	2 (33%)	5,8,10	1.38	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
34	SAC	i	1	34	-	2/7/8/10	-
1	FME	A	1	1	-	0/7/9/11	-
10	FME	J	1	10	-	3/7/9/11	-
8	FME	H	1	8	-	4/7/9/11	-
14	FME	N	1	14	-	3/7/9/11	-
4	2MR	D	85	4	-	0/10/13/15	-
43	AYA	r	1	43	-	0/4/6/8	-
11	FME	K	1	11	-	1/7/9/11	-
12	FME	L	1	12	-	2/7/9/11	-
13	FME	M	1	13	-	0/7/9/11	-
24	AYA	Y	1	24	-	0/4/6/8	-

The worst 5 of 10 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	85	2MR	CZ-NH2	4.86	1.44	1.33
4	D	85	2MR	CZ-NE	4.54	1.44	1.34
4	D	85	2MR	O-C	3.94	1.35	1.19
24	Y	1	AYA	CT-N	3.26	1.45	1.34
43	r	1	AYA	CT-N	3.13	1.45	1.34

The worst 5 of 7 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
34	i	1	SAC	C-CA-N	2.55	114.33	109.73

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	1	FME	C-CA-N	2.47	114.18	109.73
24	Y	1	AYA	CM-CT-N	2.37	120.11	116.10
4	D	85	2MR	NE-CZ-NH2	-2.31	117.36	119.48
43	r	1	AYA	CM-CT-N	2.27	119.94	116.10

There are no chirality outliers.

5 of 15 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	H	1	FME	C-CA-CB-CG
8	H	1	FME	CA-CB-CG-SD
10	J	1	FME	O1-CN-N-CA
12	L	1	FME	O1-CN-N-CA
14	N	1	FME	O1-CN-N-CA

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 57 ligands modelled in this entry, 3 are monoatomic - leaving 54 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	$\#\|Z\| > 2$
52	CDL	K	401	-	70,70,99	1.03	8 (11%)	76,82,111	1.04	4 (5%)
45	LMT	M	602	-	36,36,36	1.13	2 (5%)	47,47,47	0.93	1 (2%)
51	3PE	N	1301	-	50,50,50	0.87	3 (6%)	53,55,55	1.07	2 (3%)
51	3PE	N	1303	-	40,40,50	0.96	4 (10%)	43,45,55	1.08	2 (4%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
51	3PE	Y	802	-	34,34,50	1.04	3 (8%)	37,39,55	1.20	2 (5%)
47	SF4	F	502	6	0,12,12	-	-	-		
58	EHZ	T	101	20	29,36,37	1.68	6 (20%)	35,44,47	1.88	6 (17%)
59	MYR	o	201	40	5,5,15	0.85	0	4,4,15	1.01	0
45	LMT	M	603	-	36,36,36	1.16	2 (5%)	47,47,47	0.89	1 (2%)
45	LMT	L	702	-	36,36,36	1.18	2 (5%)	47,47,47	0.94	1 (2%)
45	LMT	J	702	-	36,36,36	1.22	3 (8%)	47,47,47	1.12	2 (4%)
49	FMN	F	501	-	33,33,33	1.11	2 (6%)	48,50,50	1.24	6 (12%)
53	I49	N	1305	-	15,17,17	1.46	2 (13%)	21,22,22	2.11	4 (19%)
52	CDL	J	701	-	61,61,99	1.08	8 (13%)	67,73,111	1.28	4 (5%)
47	SF4	G	802	7	0,12,12	-	-	-		
51	3PE	L	701	-	48,48,50	0.90	4 (8%)	51,53,55	1.13	2 (3%)
51	3PE	M	601	-	45,45,50	0.91	3 (6%)	48,50,55	1.04	2 (4%)
51	3PE	M	605	-	50,50,50	0.85	3 (6%)	53,55,55	1.06	2 (3%)
51	3PE	L	705	-	44,44,50	0.91	3 (6%)	47,49,55	1.24	3 (6%)
46	PC1	A	303	-	20,20,53	1.86	3 (15%)	24,27,61	1.14	1 (4%)
45	LMT	j	101	-	36,36,36	1.22	4 (11%)	47,47,47	0.88	1 (2%)
45	LMT	Y	803	-	36,36,36	1.19	3 (8%)	47,47,47	1.00	1 (2%)
56	NDP	P	501	-	45,52,52	2.15	4 (8%)	53,80,80	1.69	12 (22%)
47	SF4	I	203	9	0,12,12	-	-	-		
45	LMT	A	301	-	36,36,36	1.15	2 (5%)	47,47,47	1.01	2 (4%)
52	CDL	L	703	-	68,68,99	1.04	5 (7%)	74,80,111	1.09	4 (5%)
46	PC1	L	707	-	48,48,53	0.98	4 (8%)	54,56,61	1.07	2 (3%)
48	FES	G	803	7	0,4,4	-	-	-		
45	LMT	M	604	-	36,36,36	1.21	3 (8%)	47,47,47	0.90	0
51	3PE	N	1304	-	28,28,50	1.14	4 (14%)	31,33,55	1.13	2 (6%)
45	LMT	L	706	-	36,36,36	1.17	2 (5%)	47,47,47	1.04	2 (4%)
45	LMT	N	1302	-	36,36,36	1.18	3 (8%)	47,47,47	0.93	0
45	LMT	L	704	-	36,36,36	1.25	4 (11%)	47,47,47	1.01	2 (4%)
47	SF4	B	201	2	0,12,12	-	-	-		
46	PC1	B	203	-	34,34,53	1.16	4 (11%)	40,42,61	1.12	2 (5%)
51	3PE	X	401	-	50,50,50	0.86	4 (8%)	53,55,55	1.11	2 (3%)
54	GTP	O	401	55	26,34,34	2.90	11 (42%)	32,54,54	1.64	9 (28%)
51	3PE	I	201	-	50,50,50	0.87	4 (8%)	53,55,55	1.09	2 (3%)
45	LMT	Y	801	-	36,36,36	1.19	3 (8%)	47,47,47	0.99	0
58	EHZ	U	101	20	29,36,37	1.65	6 (20%)	35,44,47	1.42	3 (8%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
46	PC1	B	202	-	53,53,53	0.93	3 (5%)	59,61,61	1.01	2 (3%)
51	3PE	P	502	-	36,36,50	1.03	4 (11%)	39,41,55	1.10	2 (5%)
47	SF4	G	801	7	0,12,12	-	-	-		
51	3PE	d	301	-	50,50,50	0.83	3 (6%)	53,55,55	1.18	4 (7%)
45	LMT	h	1002	-	36,36,36	1.13	2 (5%)	47,47,47	1.04	1 (2%)
52	CDL	h	1001	-	66,66,99	1.05	7 (10%)	72,78,111	1.20	4 (5%)
45	LMT	l	201	-	36,36,36	1.20	3 (8%)	47,47,47	1.00	2 (4%)
48	FES	E	301	5	0,4,4	-	-	-		
51	3PE	H	402	-	33,33,50	1.35	3 (9%)	34,37,55	1.15	2 (5%)
47	SF4	I	202	9	0,12,12	-	-	-		
52	CDL	q	201	-	75,75,99	0.99	6 (8%)	81,87,111	1.11	4 (4%)
45	LMT	Y	804	-	36,36,36	1.20	3 (8%)	47,47,47	1.11	3 (6%)
51	3PE	H	401	-	43,43,50	0.93	3 (6%)	46,48,55	1.08	2 (4%)
45	LMT	A	302	-	36,36,36	1.14	2 (5%)	47,47,47	1.64	7 (14%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
52	CDL	K	401	-	-	29/81/81/110	-
45	LMT	M	602	-	-	8/21/61/61	0/2/2/2
51	3PE	N	1301	-	-	20/54/54/54	-
51	3PE	N	1303	-	-	22/44/44/54	-
51	3PE	Y	802	-	-	17/38/38/54	-
58	EHZ	T	101	20	-	11/42/44/45	-
47	SF4	F	502	6	-	-	0/6/5/5
59	MYR	o	201	40	-	2/2/3/13	-
45	LMT	M	603	-	-	13/21/61/61	0/2/2/2
45	LMT	L	702	-	-	10/21/61/61	0/2/2/2
45	LMT	J	702	-	-	10/21/61/61	0/2/2/2
49	FMN	F	501	-	-	1/18/18/18	0/3/3/3
53	I49	N	1305	-	-	5/10/10/10	0/1/1/1
52	CDL	J	701	-	-	37/71/71/110	-
51	3PE	L	701	-	-	28/52/52/54	-
47	SF4	G	802	7	-	-	0/6/5/5

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
51	3PE	M	601	-	-	19/49/49/54	-
51	3PE	M	605	-	-	24/54/54/54	-
51	3PE	L	705	-	-	20/48/48/54	-
46	PC1	A	303	-	-	4/22/22/57	-
45	LMT	j	101	-	-	4/21/61/61	0/2/2/2
45	LMT	Y	803	-	-	8/21/61/61	0/2/2/2
56	NDP	P	501	-	-	7/30/77/77	0/5/5/5
47	SF4	I	203	9	-	-	0/6/5/5
45	LMT	A	301	-	-	5/21/61/61	0/2/2/2
52	CDL	L	703	-	-	34/79/79/110	-
46	PC1	L	707	-	-	25/52/52/57	-
48	FES	G	803	7	-	-	0/1/1/1
45	LMT	M	604	-	-	8/21/61/61	0/2/2/2
51	3PE	N	1304	-	-	17/32/32/54	-
45	LMT	L	706	-	-	8/21/61/61	0/2/2/2
45	LMT	N	1302	-	-	9/21/61/61	0/2/2/2
45	LMT	L	704	-	-	10/21/61/61	0/2/2/2
51	3PE	X	401	-	-	25/54/54/54	-
46	PC1	B	203	-	-	17/38/38/57	-
47	SF4	B	201	2	-	-	0/6/5/5
54	GTP	O	401	55	-	4/18/38/38	0/3/3/3
51	3PE	I	201	-	-	16/54/54/54	-
45	LMT	Y	801	-	-	8/21/61/61	0/2/2/2
58	EHZ	U	101	20	-	7/42/44/45	-
46	PC1	B	202	-	-	20/57/57/57	-
51	3PE	P	502	-	-	21/40/40/54	-
47	SF4	G	801	7	-	-	0/6/5/5
51	3PE	d	301	-	-	23/54/54/54	-
45	LMT	h	1002	-	-	8/21/61/61	0/2/2/2
52	CDL	h	1001	-	-	39/77/77/110	-
45	LMT	l	201	-	-	9/21/61/61	0/2/2/2
51	3PE	H	402	-	-	19/36/36/54	-
48	FES	E	301	5	-	-	0/1/1/1
47	SF4	I	202	9	-	-	0/6/5/5
52	CDL	q	201	-	-	36/86/86/110	-

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
45	LMT	Y	804	-	-	6/21/61/61	0/2/2/2
51	3PE	H	401	-	-	18/47/47/54	-
45	LMT	A	302	-	-	11/21/61/61	0/2/2/2

The worst 5 of 170 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
56	P	501	NDP	P2B-O2B	11.88	1.81	1.59
54	O	401	GTP	O6-C6	8.07	1.39	1.23
46	A	303	PC1	O21-C2	-5.79	1.40	1.46
54	O	401	GTP	O4'-C1'	5.41	1.48	1.41
58	T	101	EHZ	C12-N1	5.12	1.45	1.33

The worst 5 of 124 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
58	T	101	EHZ	C8-C9-S1	7.27	122.62	113.63
56	P	501	NDP	PN-O3-PA	-6.84	109.37	132.83
58	U	101	EHZ	C8-C9-S1	5.82	120.83	113.63
53	N	1305	I49	C14-N02-C15	-5.66	115.78	125.21
45	A	302	LMT	C1-O1'-C1'	5.27	122.58	113.84

There are no chirality outliers.

5 of 702 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
45	A	302	LMT	C2'-C1'-O1'-C1
45	L	702	LMT	C2-C1-O1'-C1'
45	L	704	LMT	C2'-C1'-O1'-C1
45	L	706	LMT	C2'-C1'-O1'-C1
45	L	706	LMT	O5'-C1'-O1'-C1

There are no ring outliers.

21 monomers are involved in 32 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
45	M	602	LMT	4	0
51	N	1301	3PE	2	0
47	F	502	SF4	1	0
45	J	702	LMT	1	0

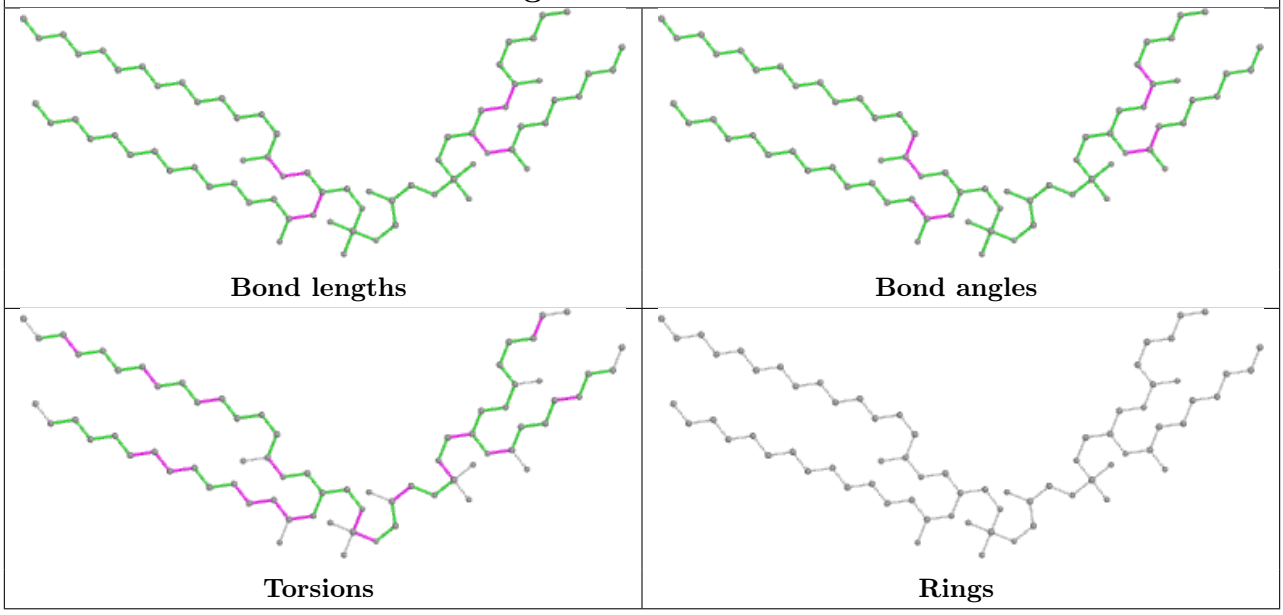
Continued on next page...

Continued from previous page...

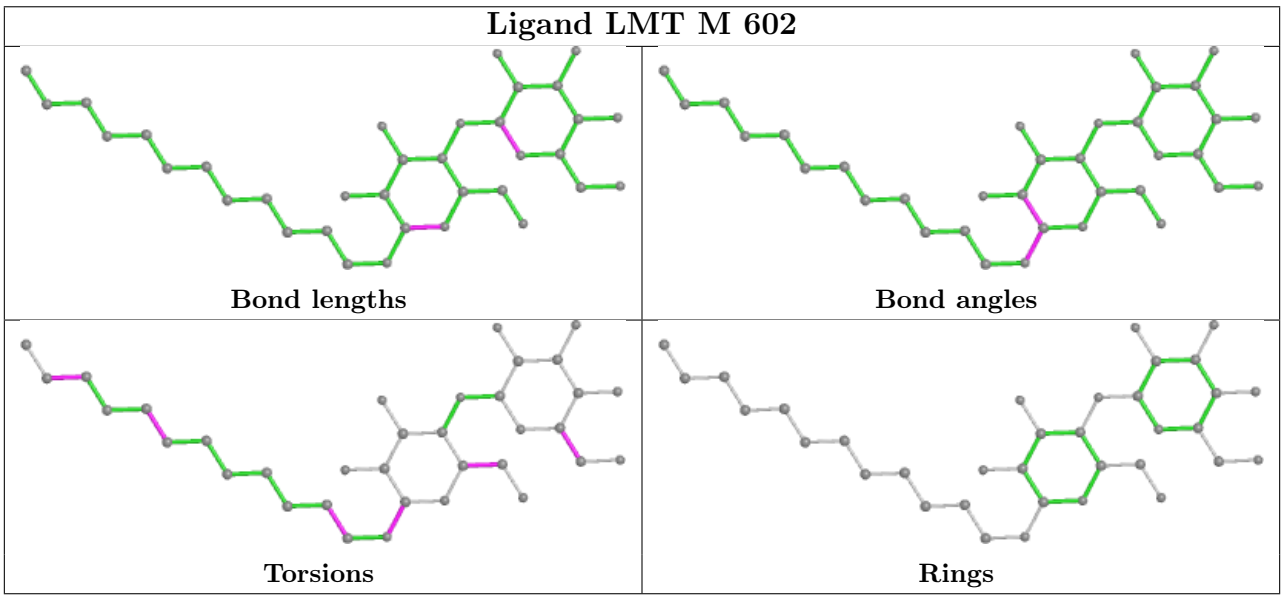
Mol	Chain	Res	Type	Clashes	Symm-Clashes
49	F	501	FMN	2	0
53	N	1305	I49	1	0
52	J	701	CDL	1	0
51	M	601	3PE	3	0
51	M	605	3PE	1	0
46	A	303	PC1	1	0
56	P	501	NDP	1	0
45	L	706	LMT	1	0
47	B	201	SF4	1	0
46	B	203	PC1	1	0
51	X	401	3PE	4	0
54	O	401	GTP	3	0
45	Y	801	LMT	2	0
46	B	202	PC1	1	0
45	Y	804	LMT	2	0
51	H	401	3PE	1	0
45	A	302	LMT	1	0

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

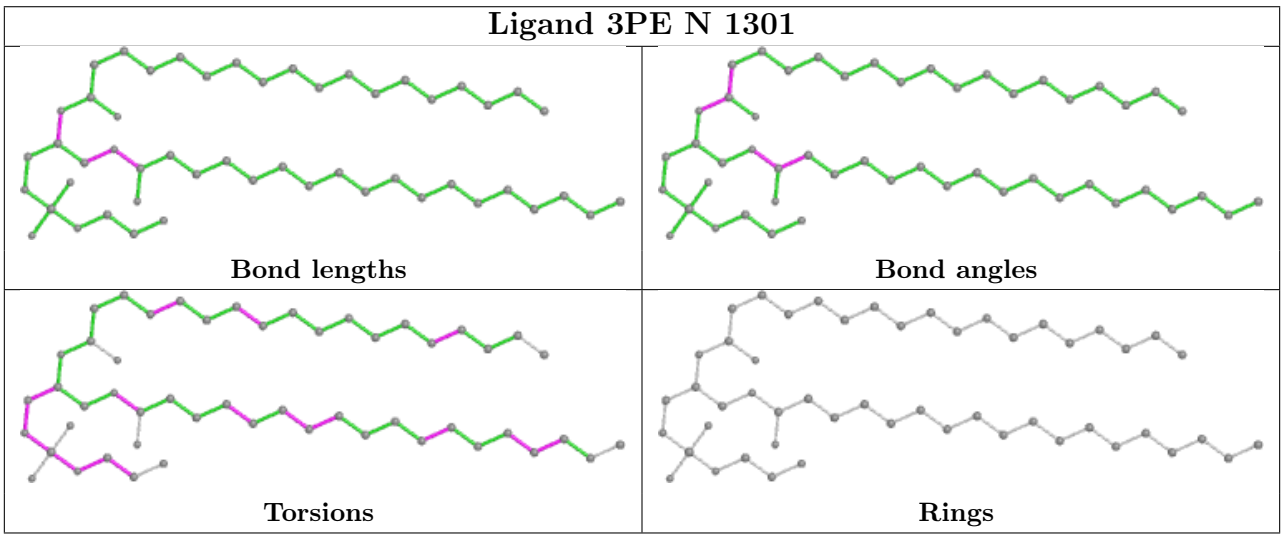
Ligand CDL K 401



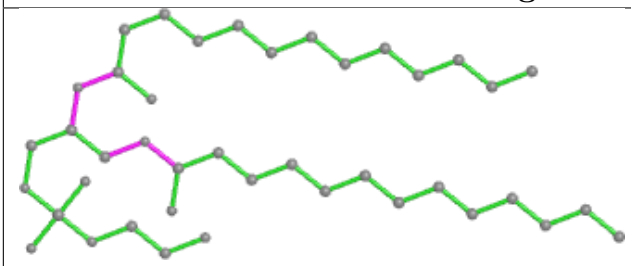
Ligand LMT M 602



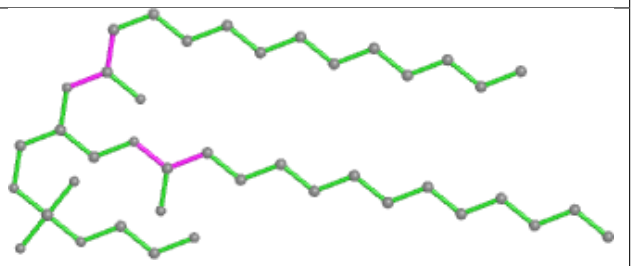
Ligand 3PE N 1301



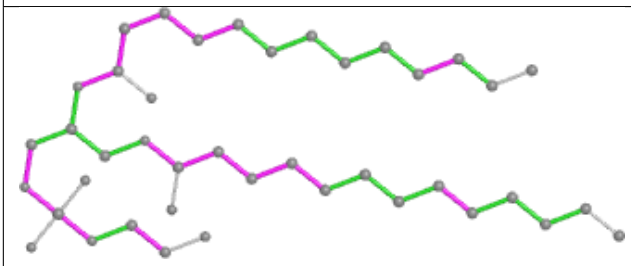
Ligand 3PE N 1303



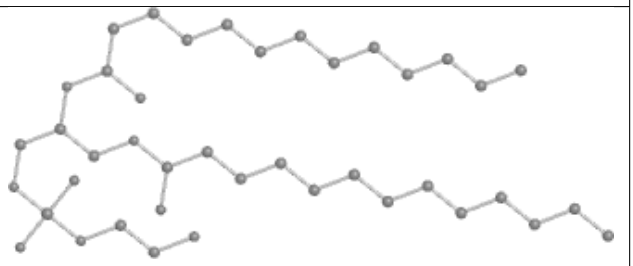
Bond lengths



Bond angles

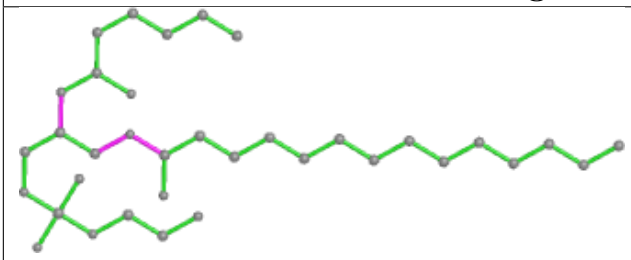


Torsions

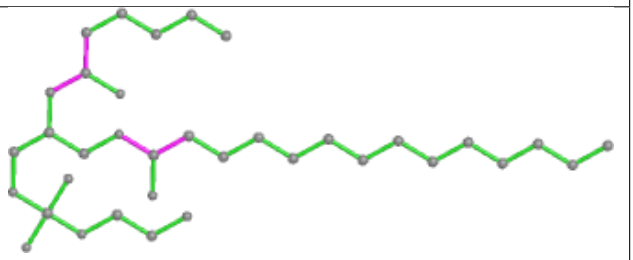


Rings

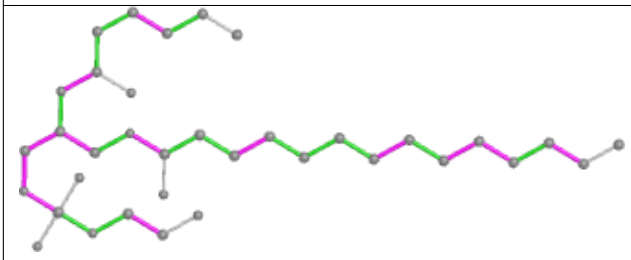
Ligand 3PE Y 802



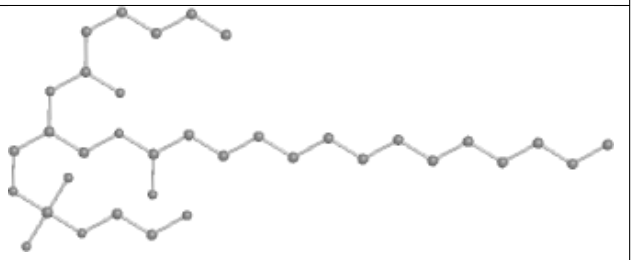
Bond lengths



Bond angles

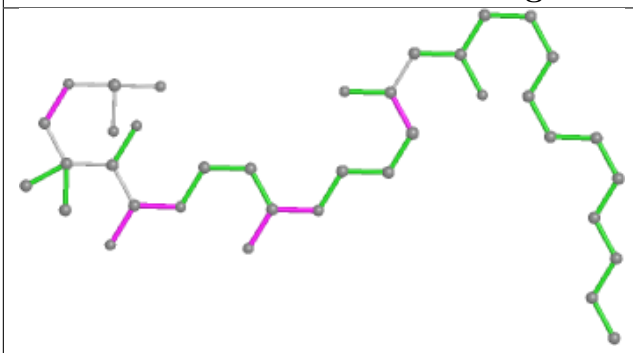


Torsions

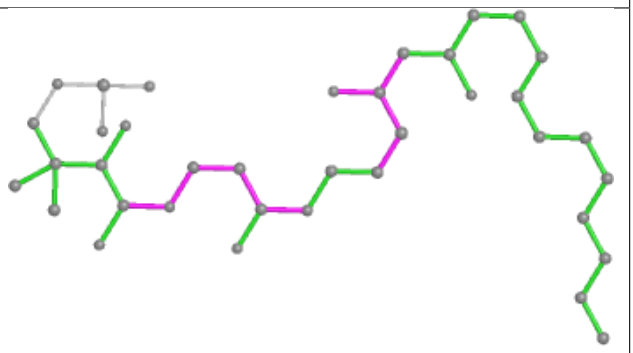


Rings

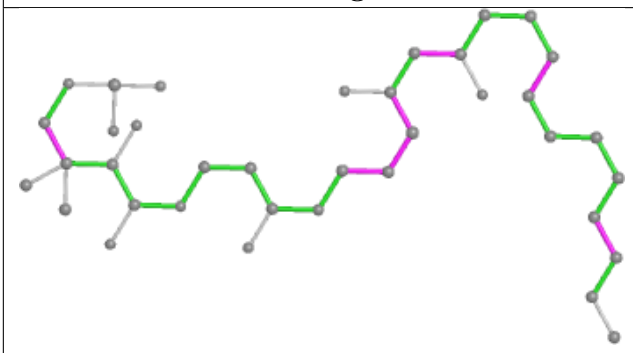
Ligand EHZ T 101



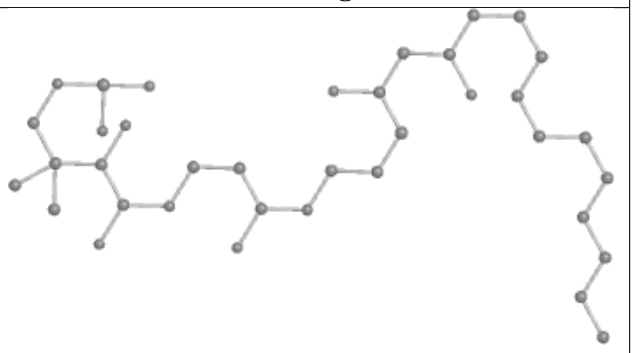
Bond lengths



Bond angles

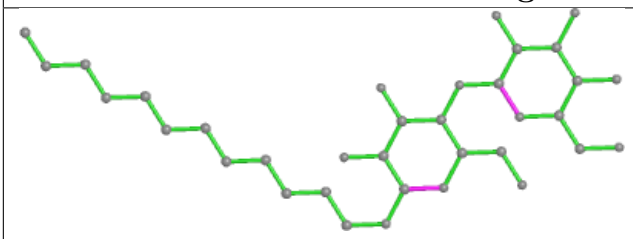


Torsions

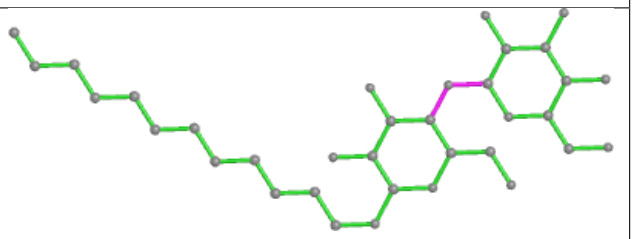


Rings

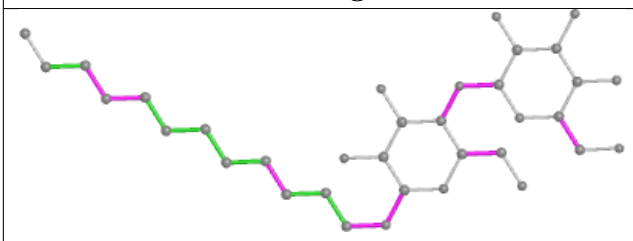
Ligand LMT M 603



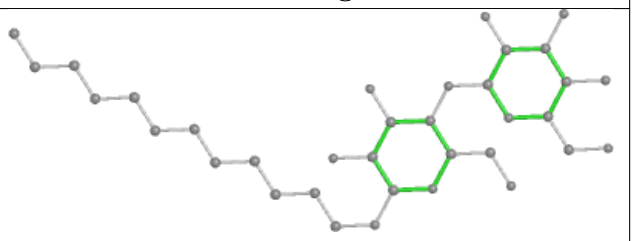
Bond lengths



Bond angles

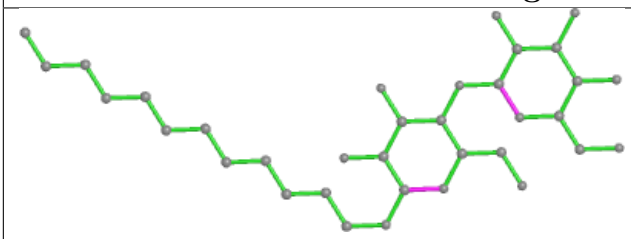


Torsions

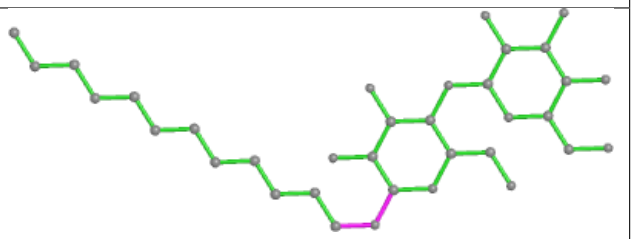


Rings

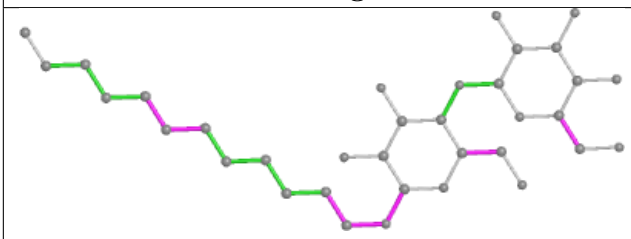
Ligand LMT L 702



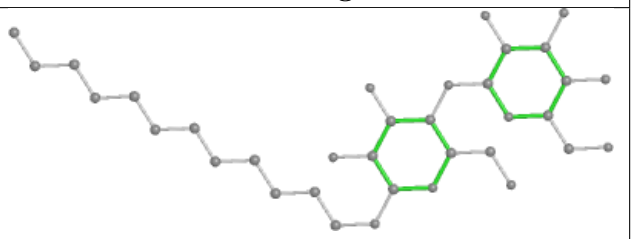
Bond lengths



Bond angles

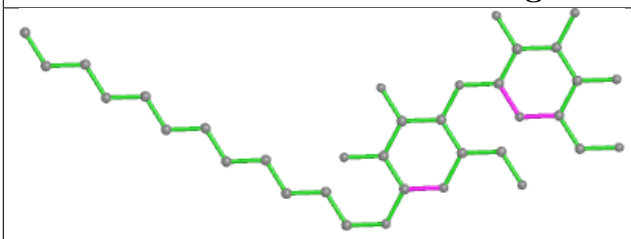


Torsions

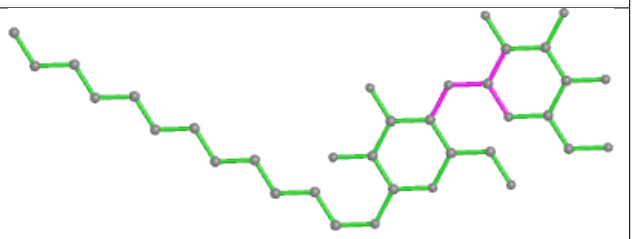


Rings

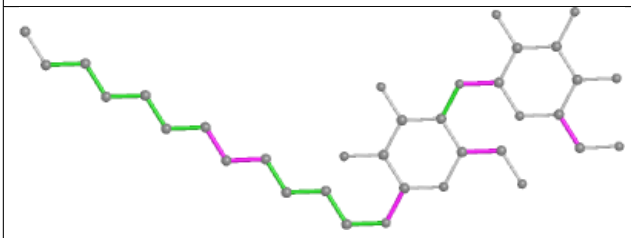
Ligand LMT J 702



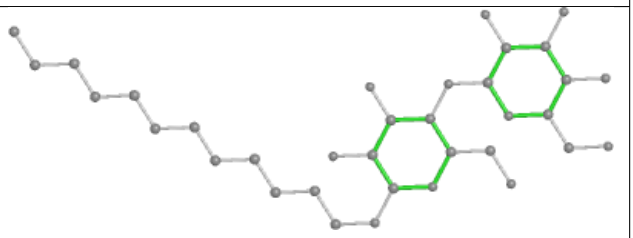
Bond lengths



Bond angles

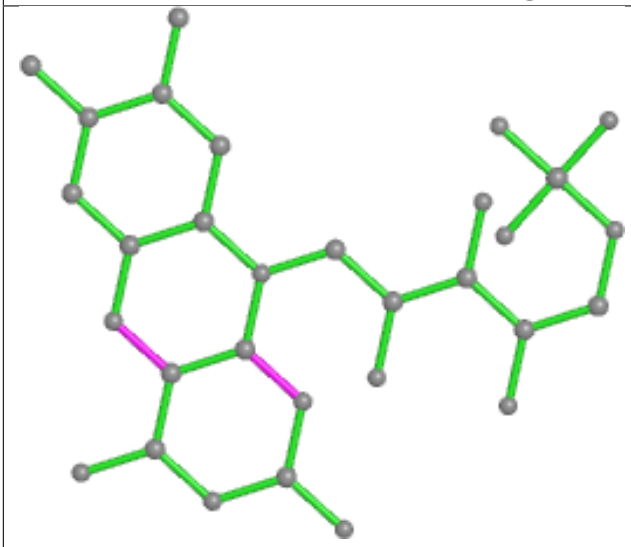


Torsions

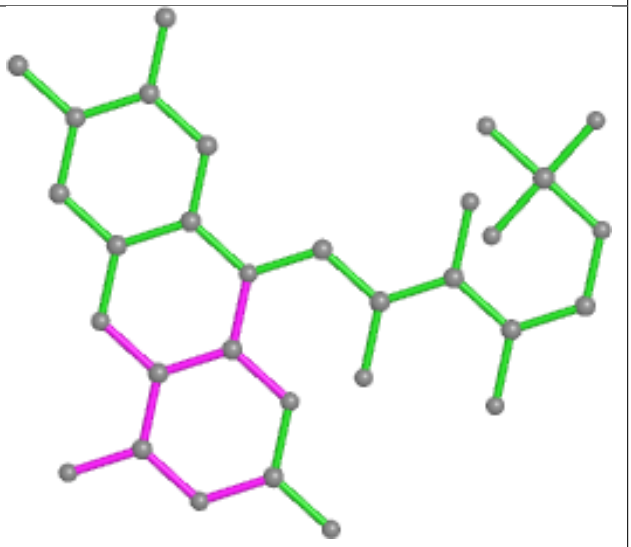


Rings

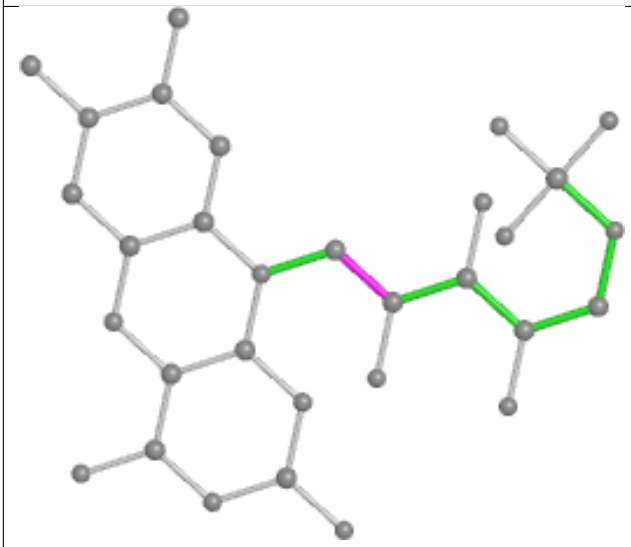
Ligand FMN F 501



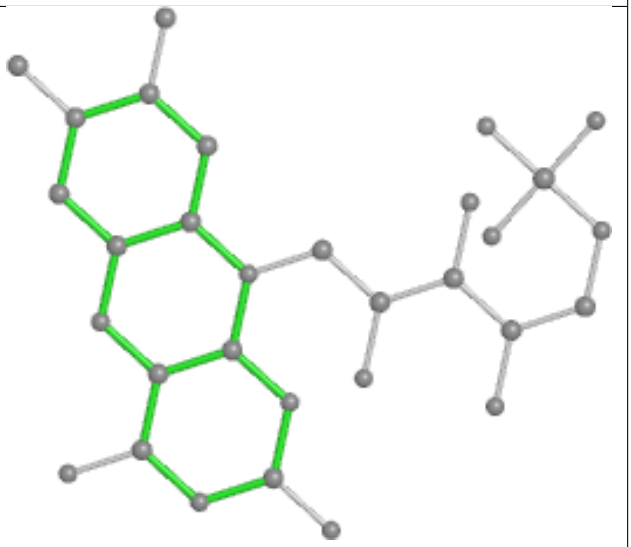
Bond lengths



Bond angles

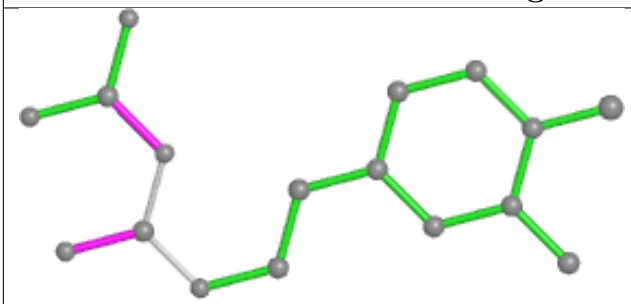


Torsions

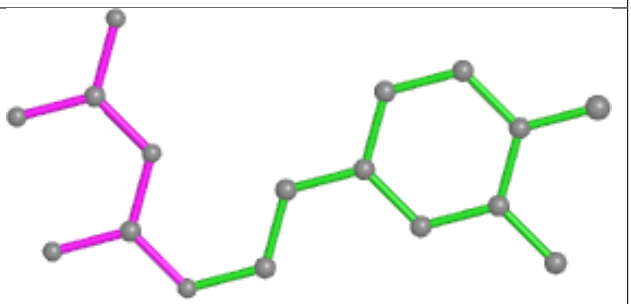


Rings

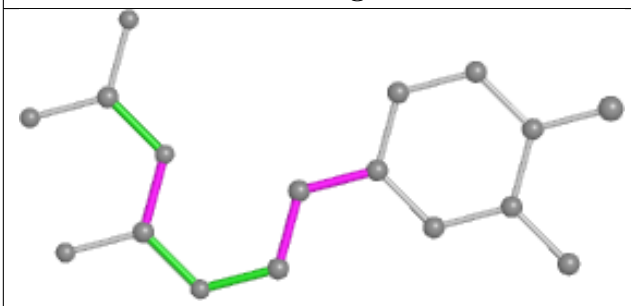
Ligand I49 N 1305



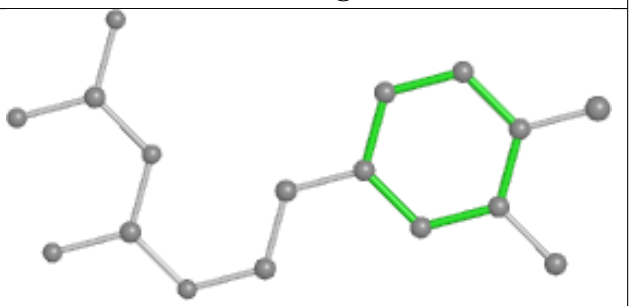
Bond lengths



Bond angles

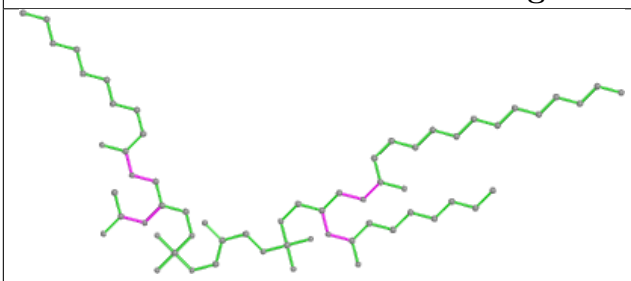


Torsions

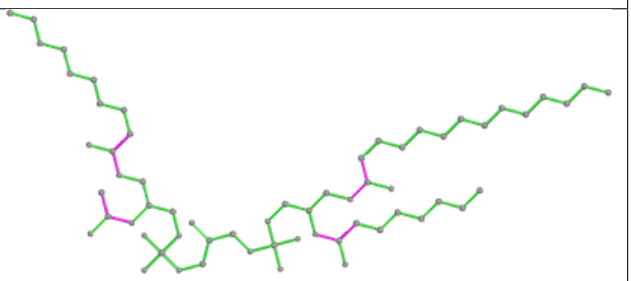


Rings

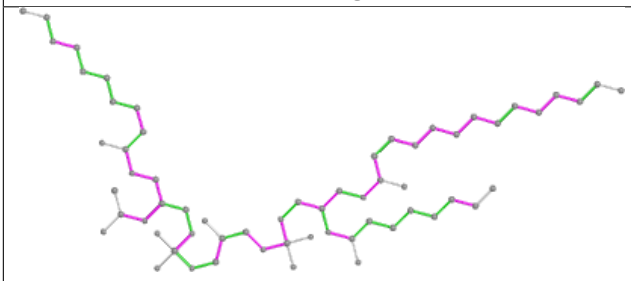
Ligand CDL J 701



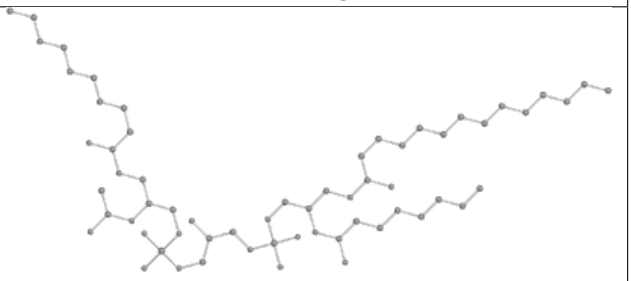
Bond lengths



Bond angles

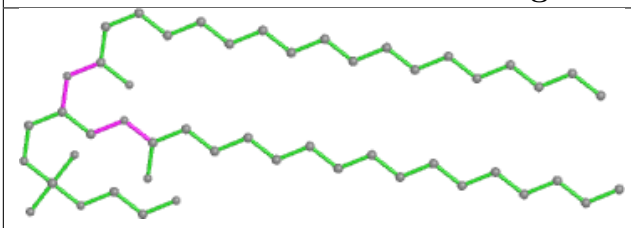


Torsions

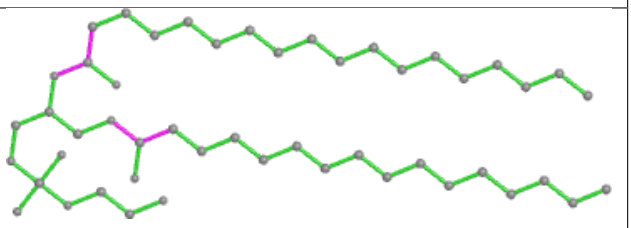


Rings

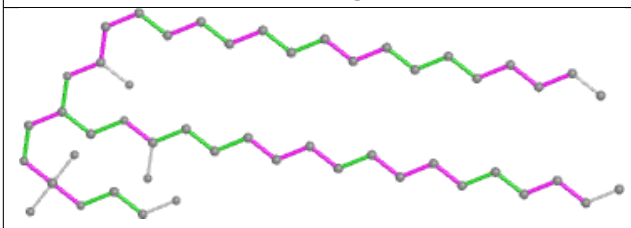
Ligand 3PE L 701



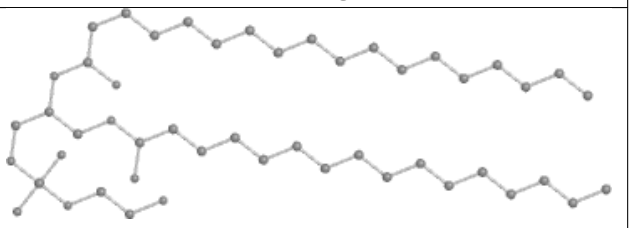
Bond lengths



Bond angles

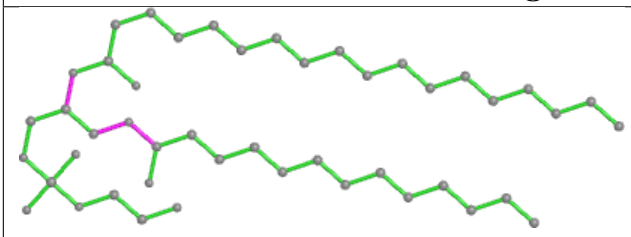


Torsions

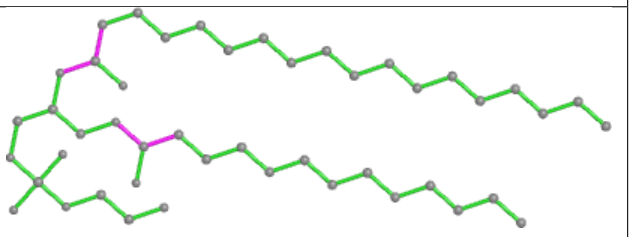


Rings

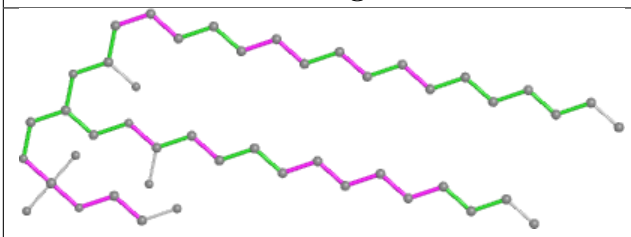
Ligand 3PE M 601



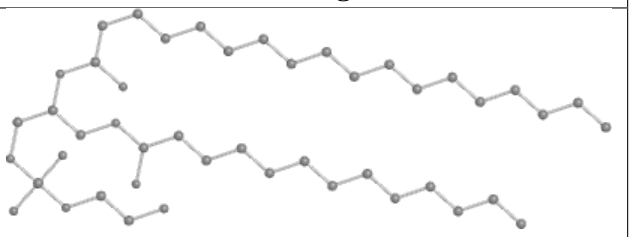
Bond lengths



Bond angles

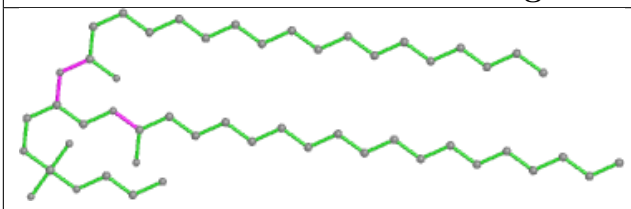


Torsions

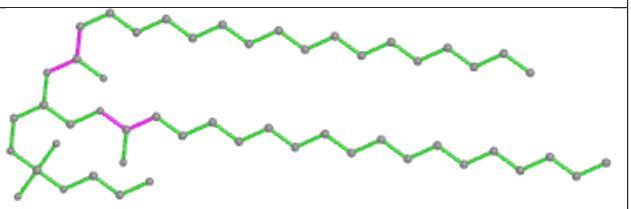


Rings

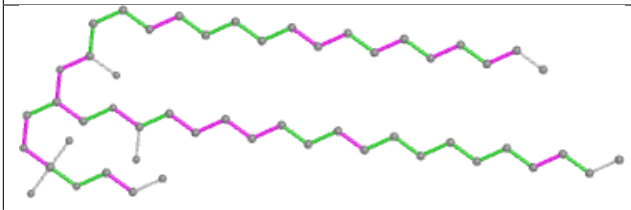
Ligand 3PE M 605



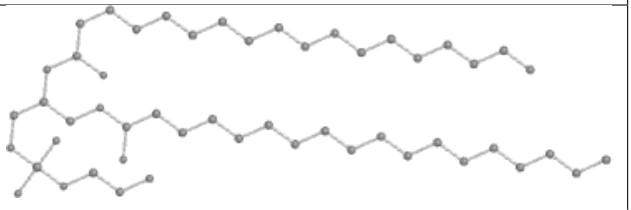
Bond lengths



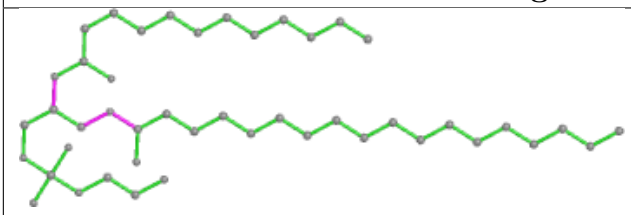
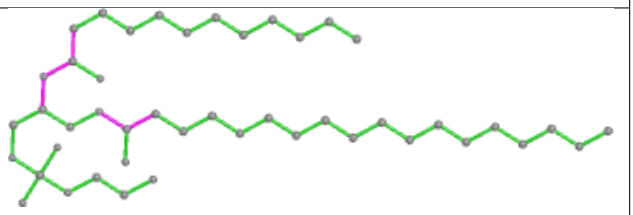
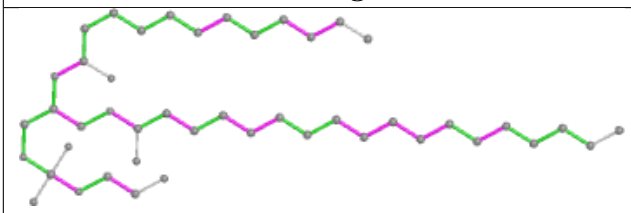
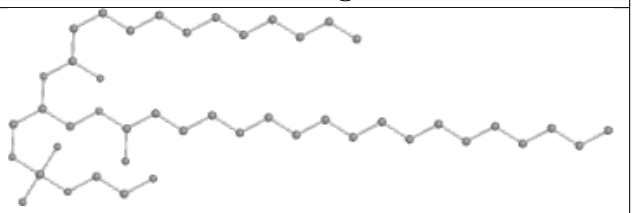
Bond angles

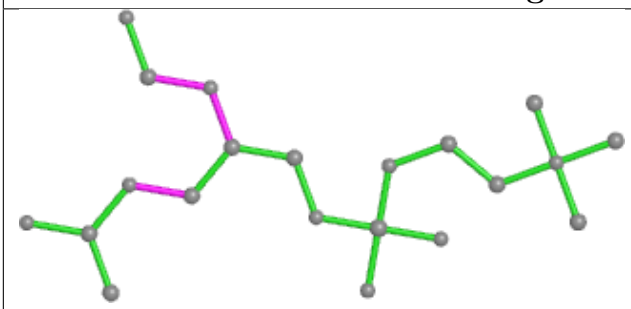
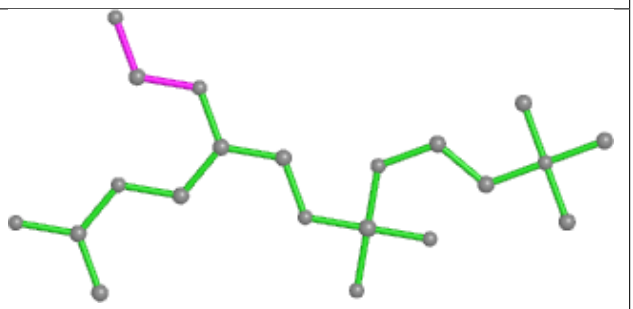
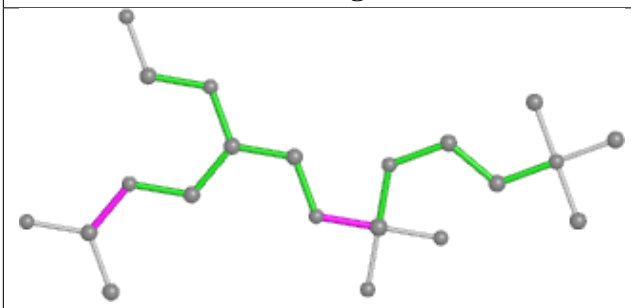
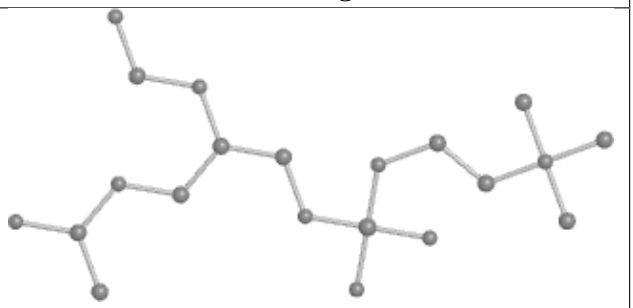


Torsions

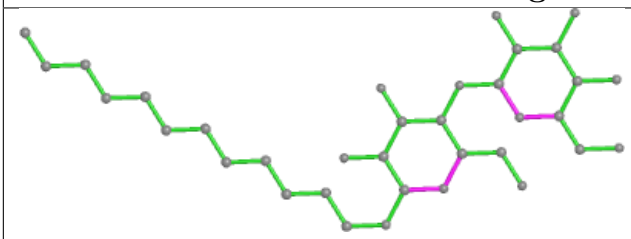


Rings

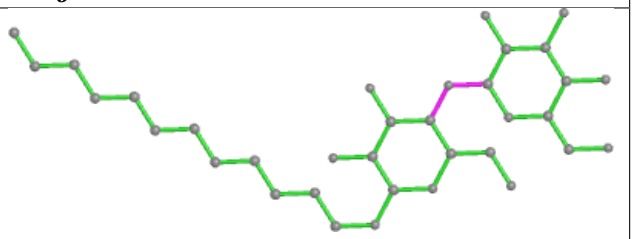
Ligand 3PE L 705	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand PC1 A 303	
 Bond lengths	 Bond angles
 Torsions	 Rings

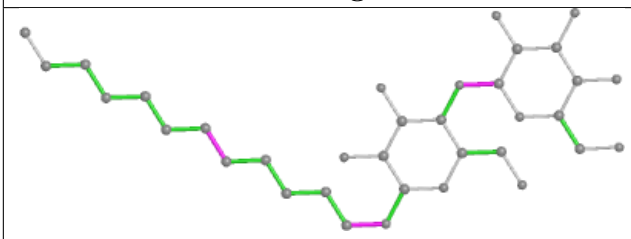
Ligand LMT j 101



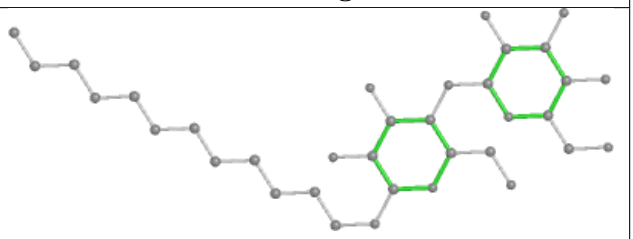
Bond lengths



Bond angles

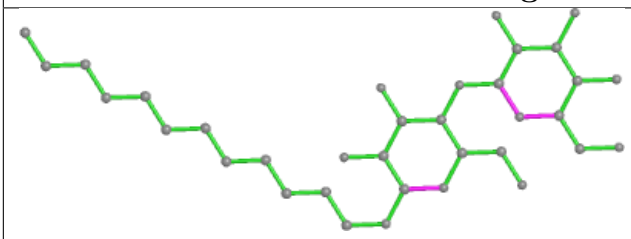


Torsions

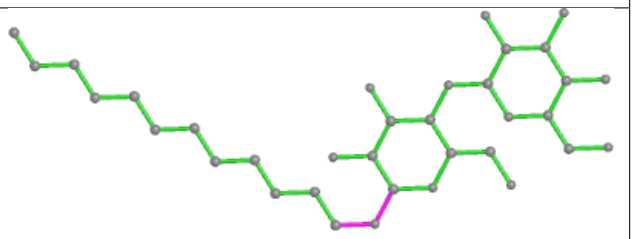


Rings

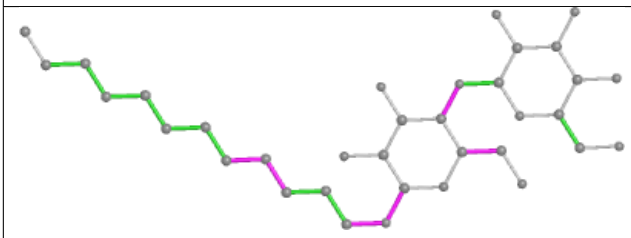
Ligand LMT Y 803



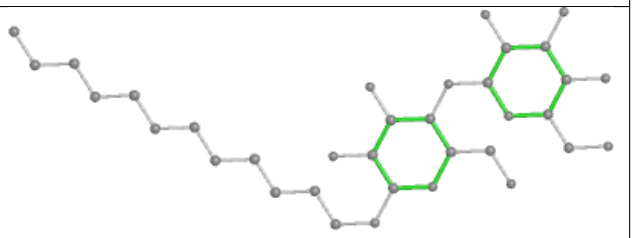
Bond lengths



Bond angles

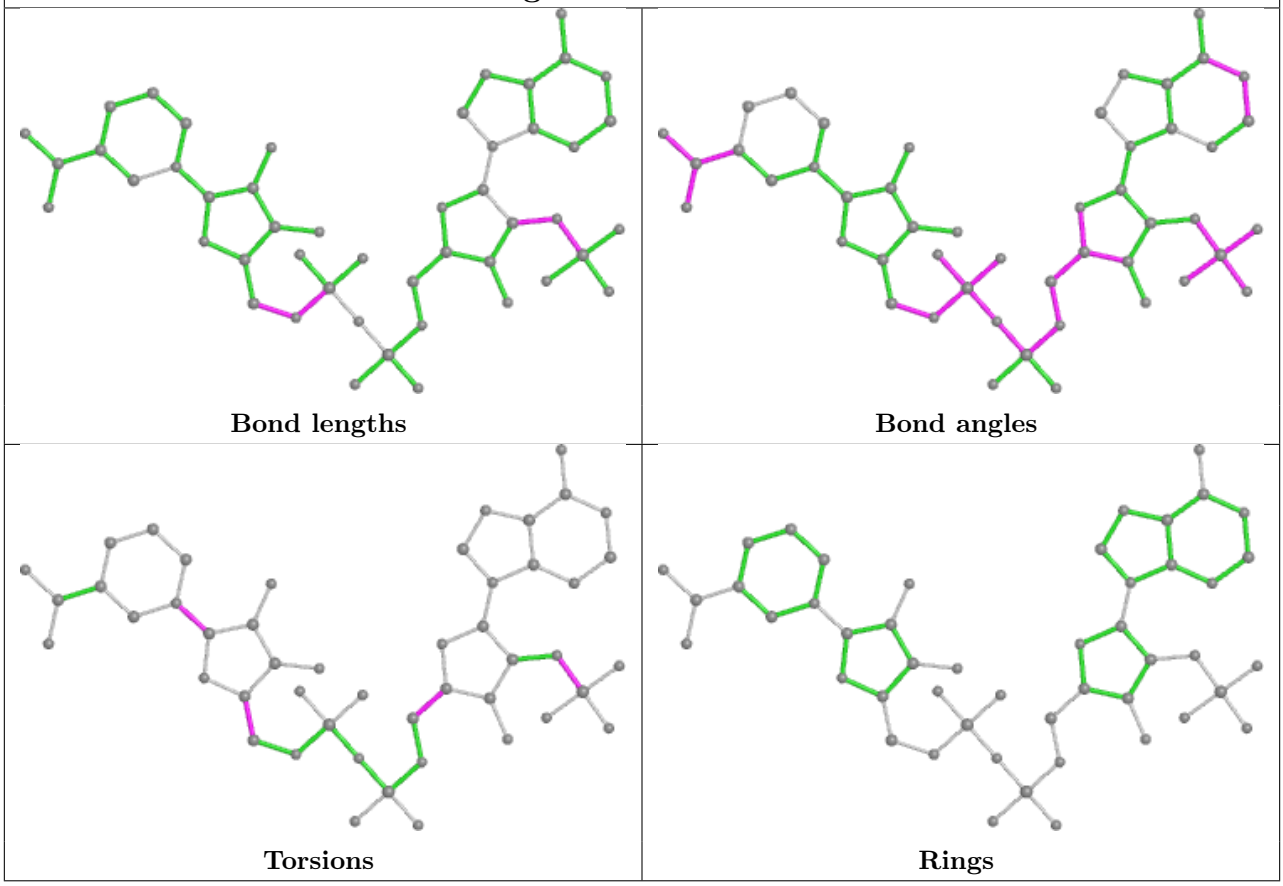


Torsions

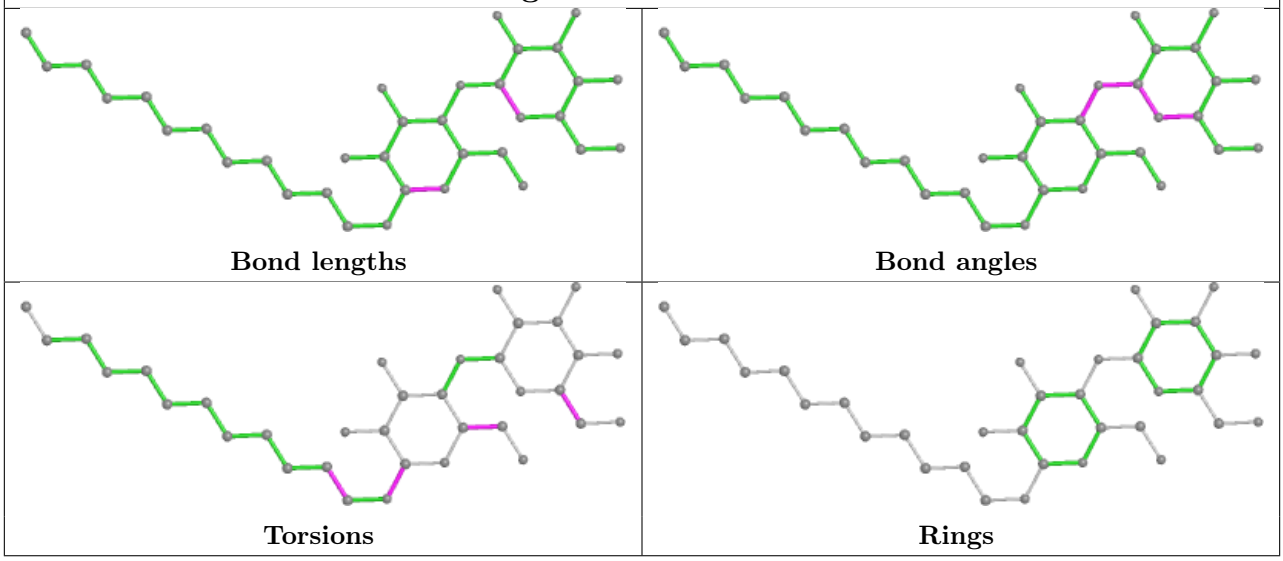


Rings

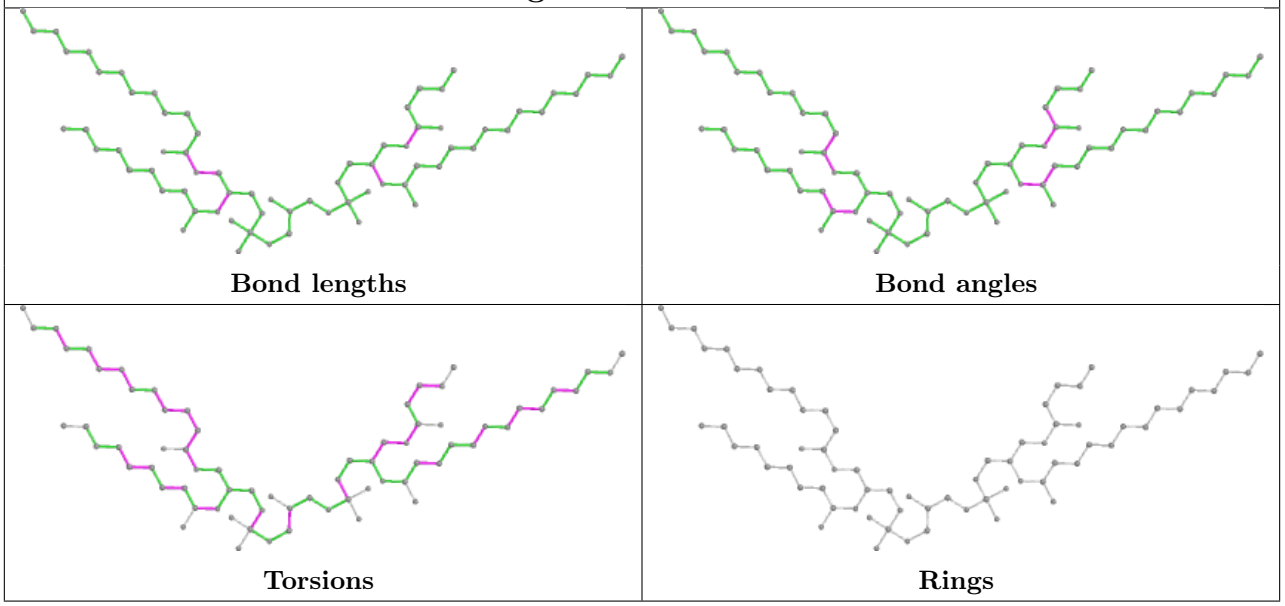
Ligand NDP P 501



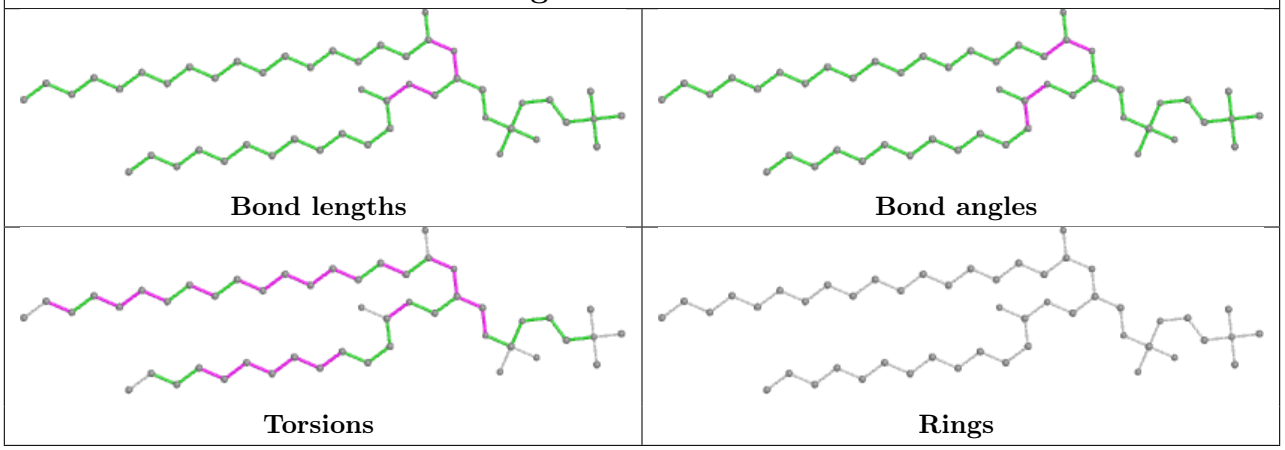
Ligand LMT A 301



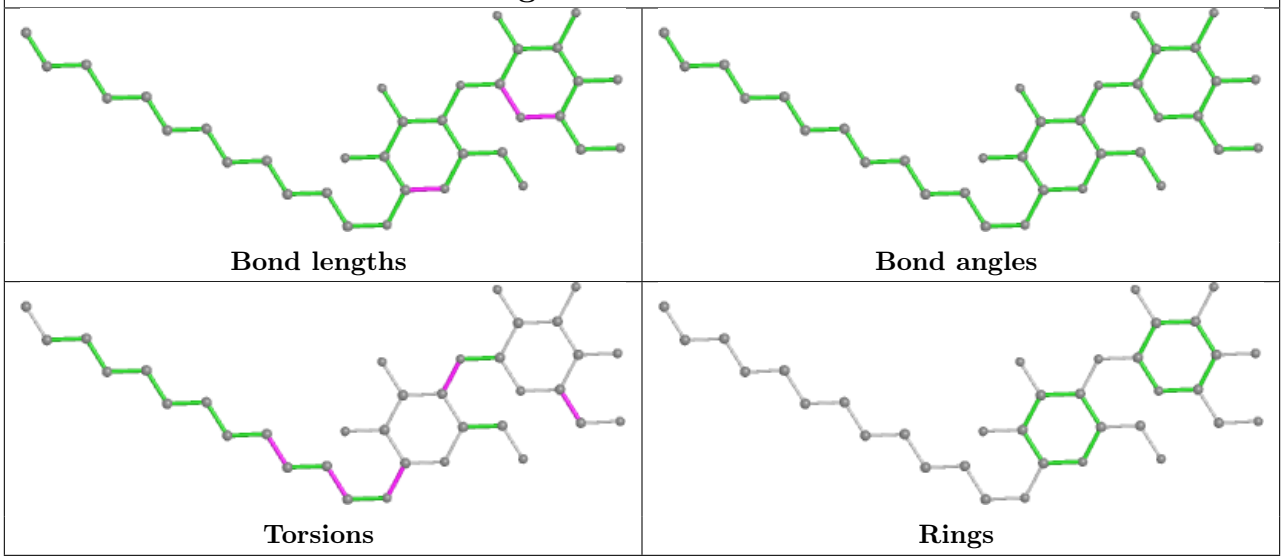
Ligand CDL L 703



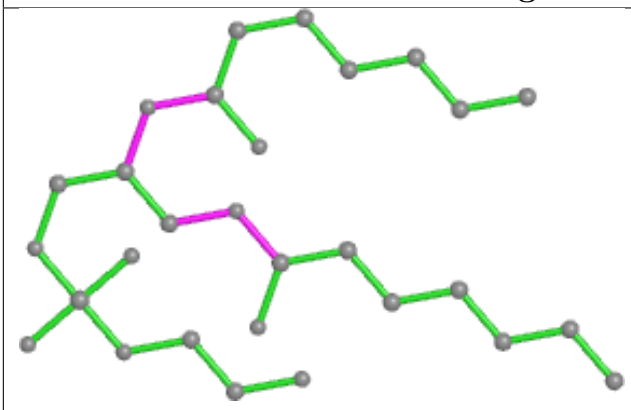
Ligand PC1 L 707



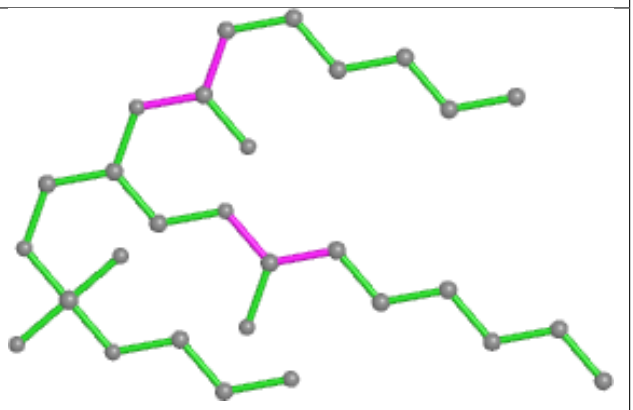
Ligand LMT M 604



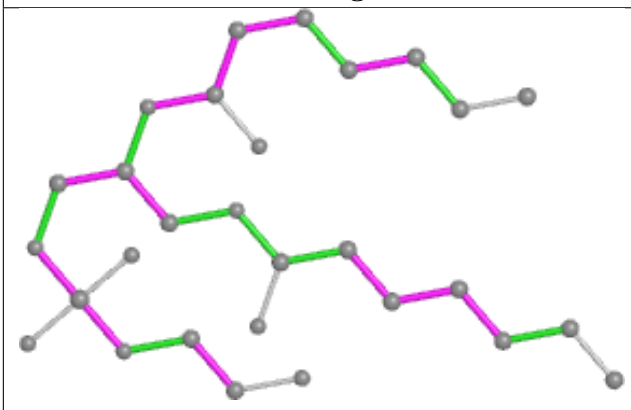
Ligand 3PE N 1304



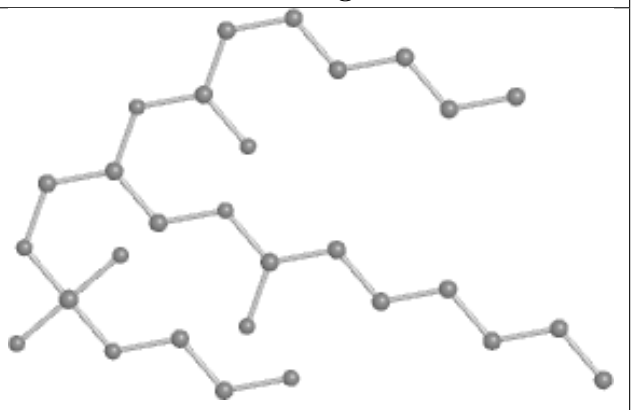
Bond lengths



Bond angles

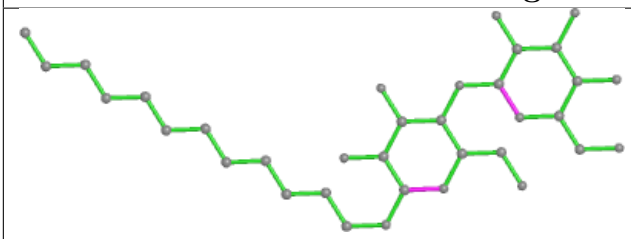


Torsions

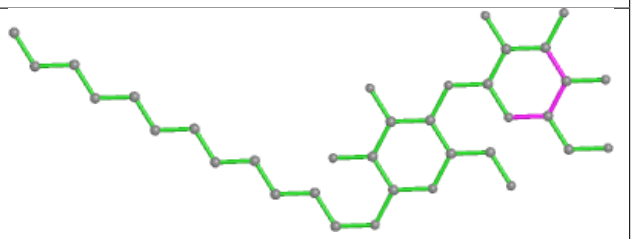


Rings

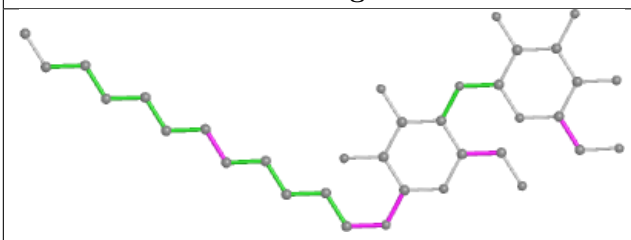
Ligand LMT L 706



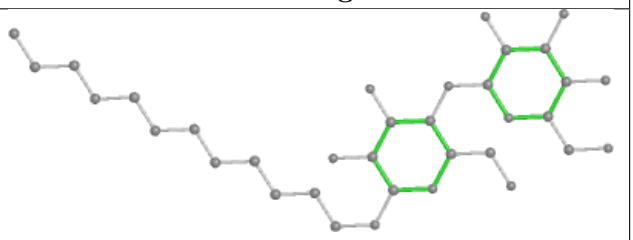
Bond lengths



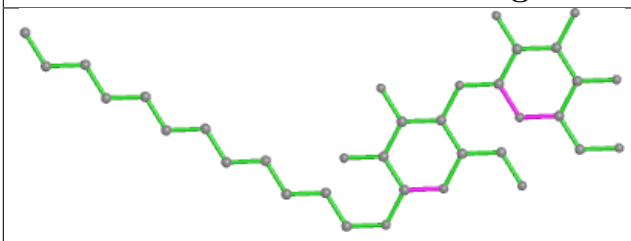
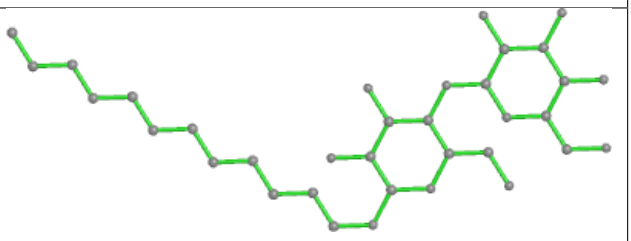
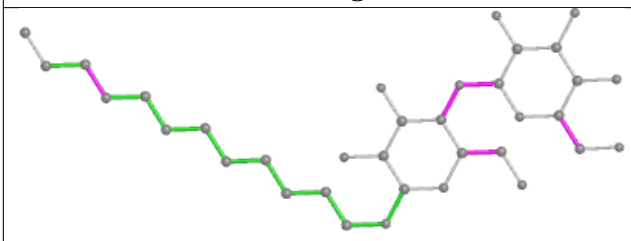
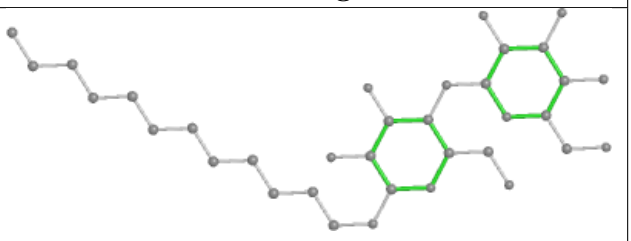
Bond angles

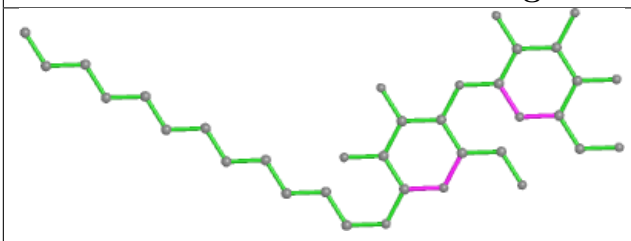
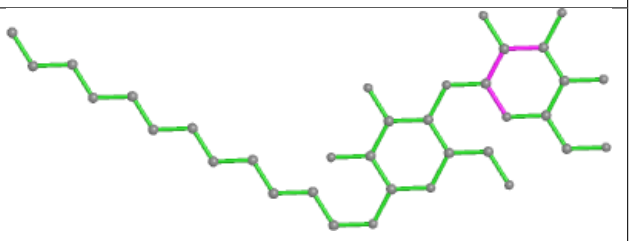
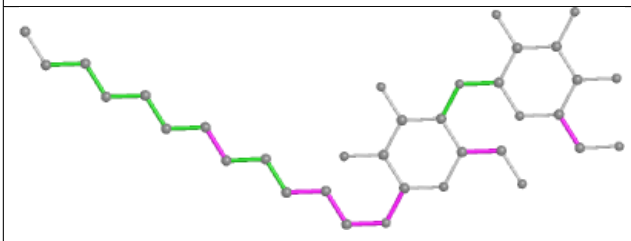
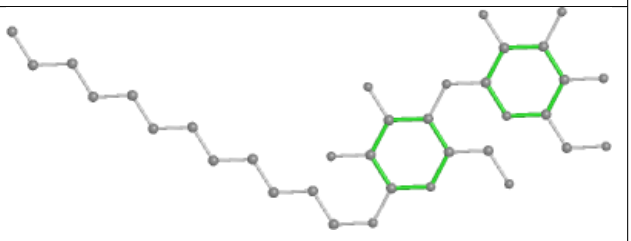


Torsions

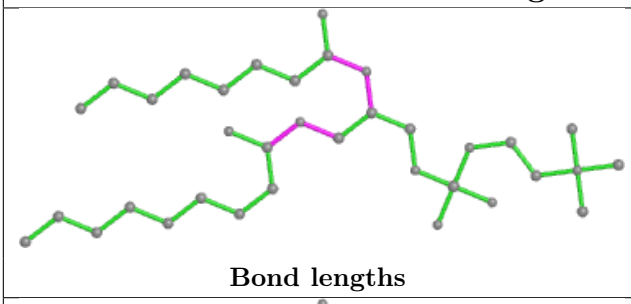


Rings

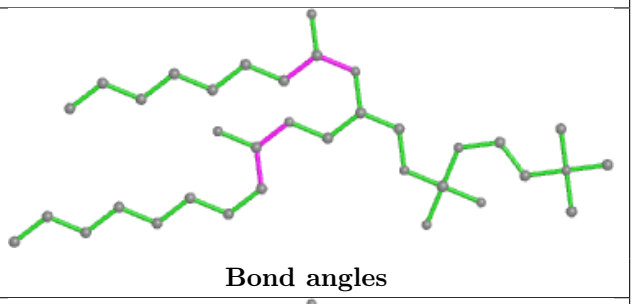
Ligand LMT N 1302	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand LMT L 704	
 Bond lengths	 Bond angles
 Torsions	 Rings

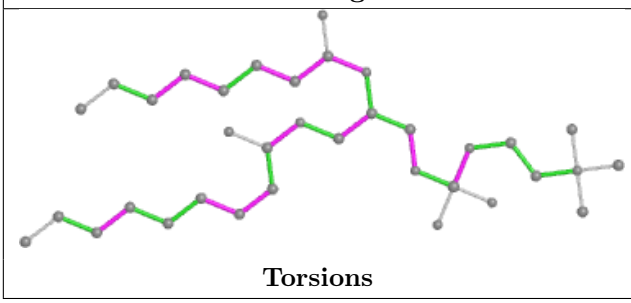
Ligand PC1 B 203



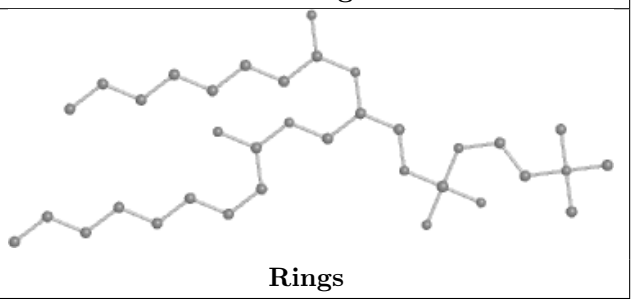
Bond lengths



Bond angles

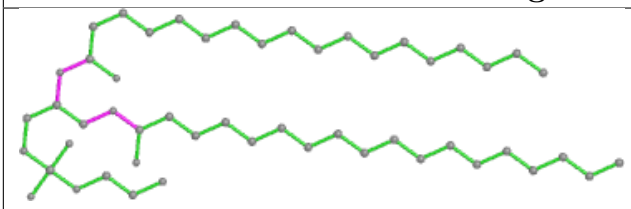


Torsions

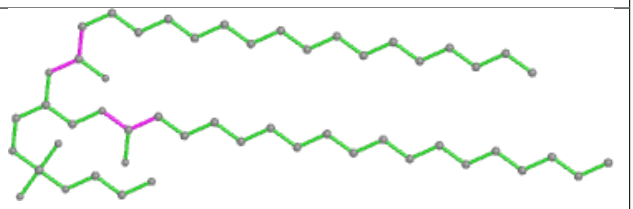


Rings

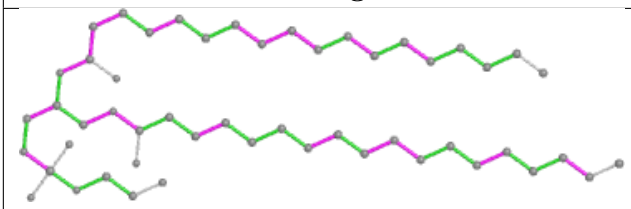
Ligand 3PE X 401



Bond lengths



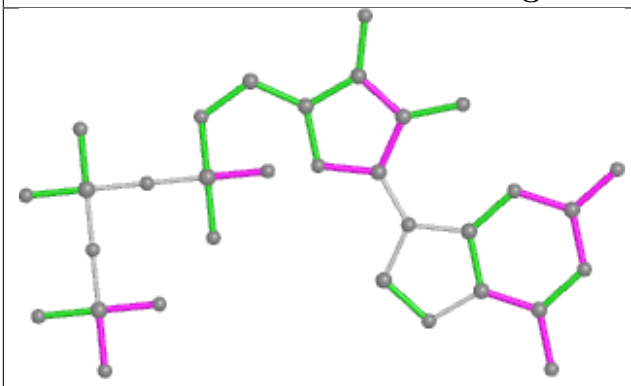
Bond angles



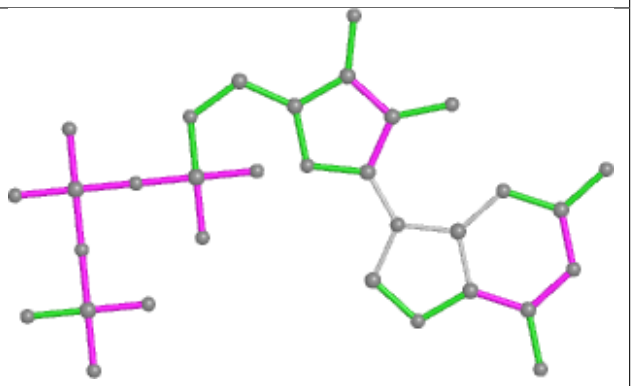
Torsions

Rings

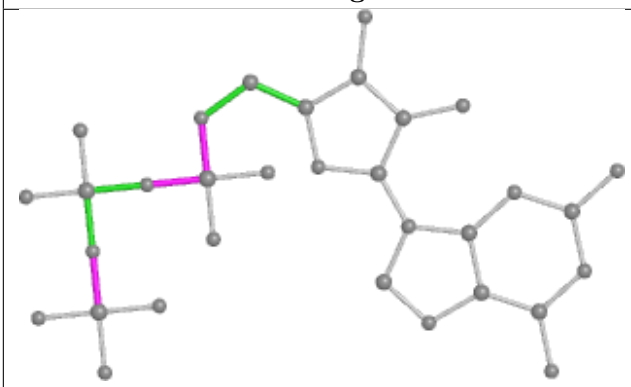
Ligand GTP O 401



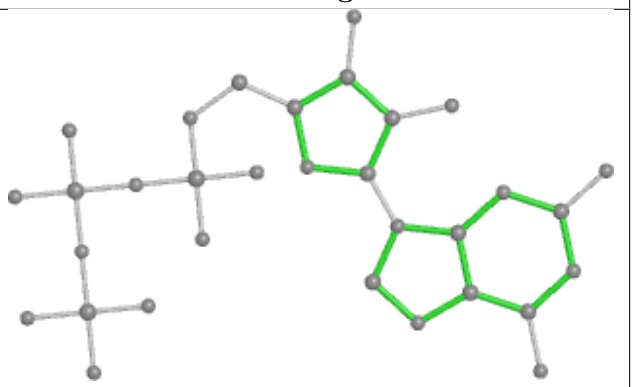
Bond lengths



Bond angles

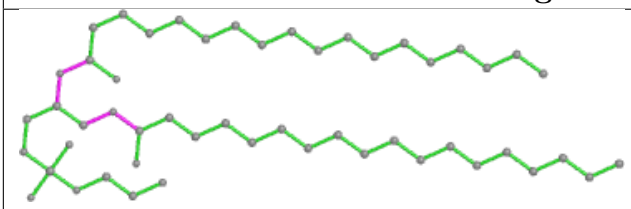


Torsions

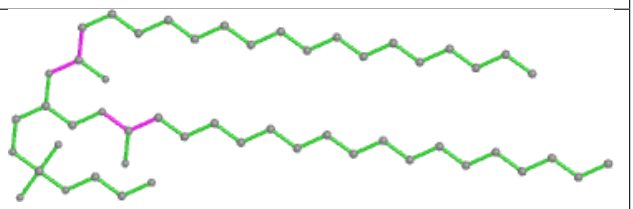


Rings

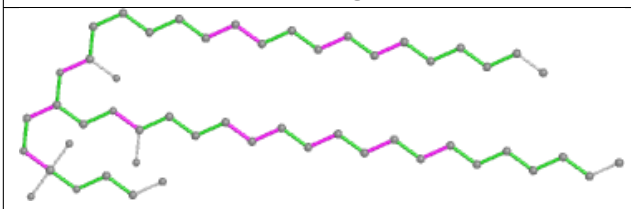
Ligand 3PE I 201



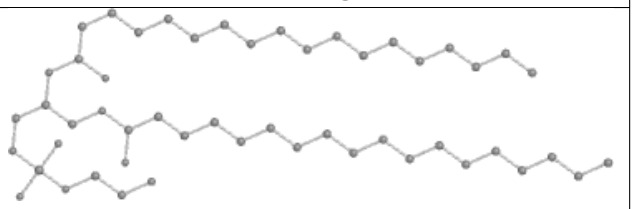
Bond lengths



Bond angles

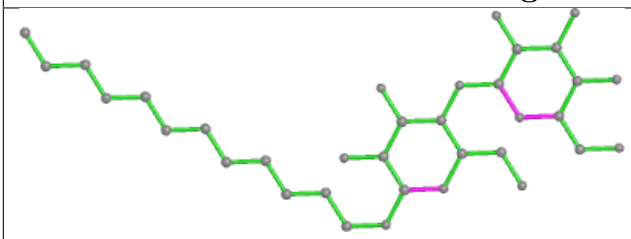


Torsions

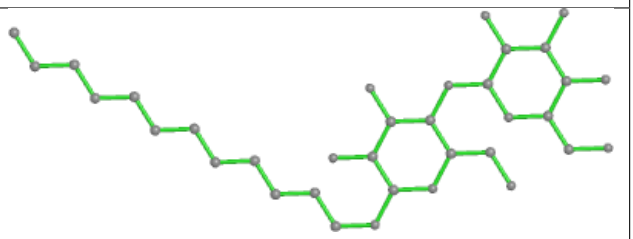


Rings

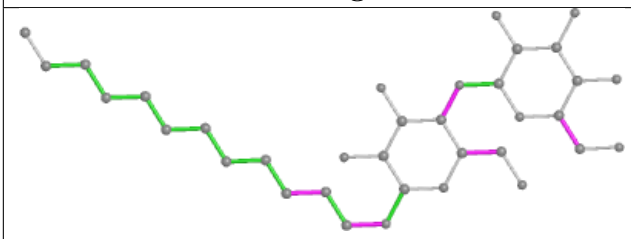
Ligand LMT Y 801



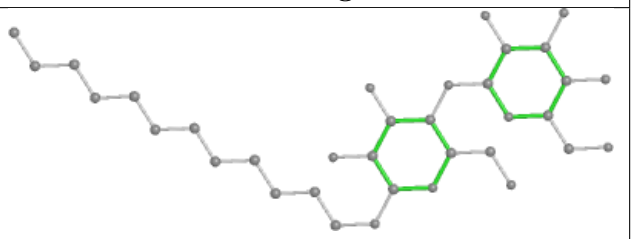
Bond lengths



Bond angles

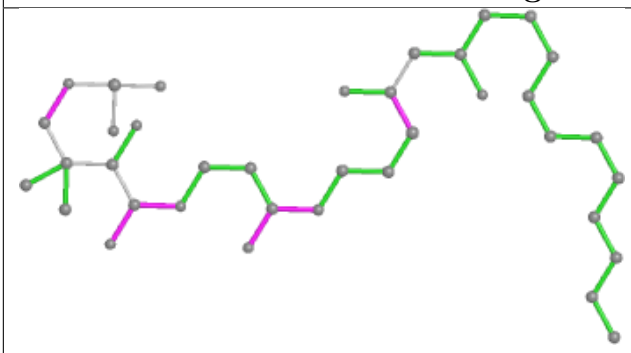


Torsions

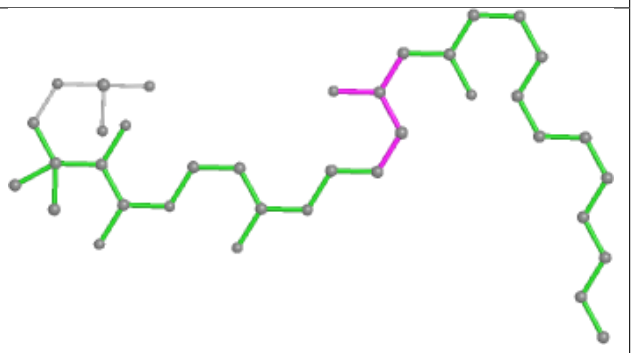


Rings

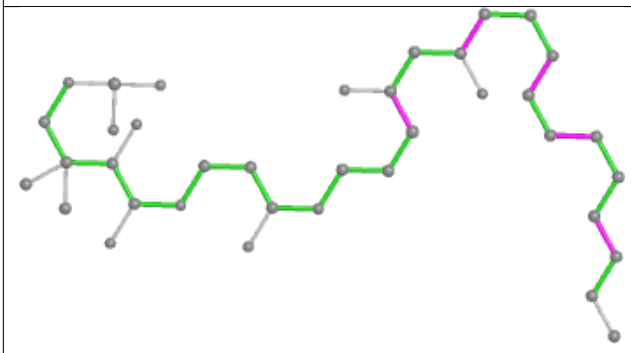
Ligand EHZ U 101



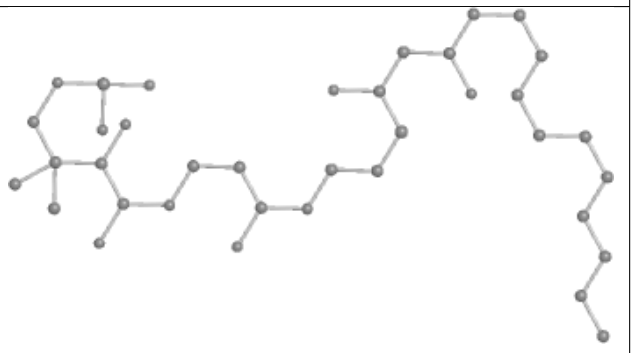
Bond lengths



Bond angles

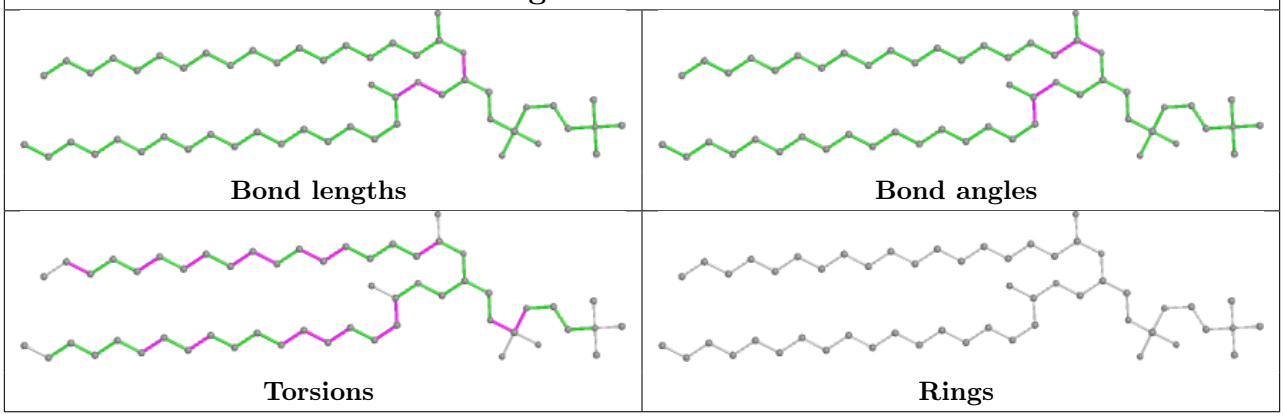


Torsions

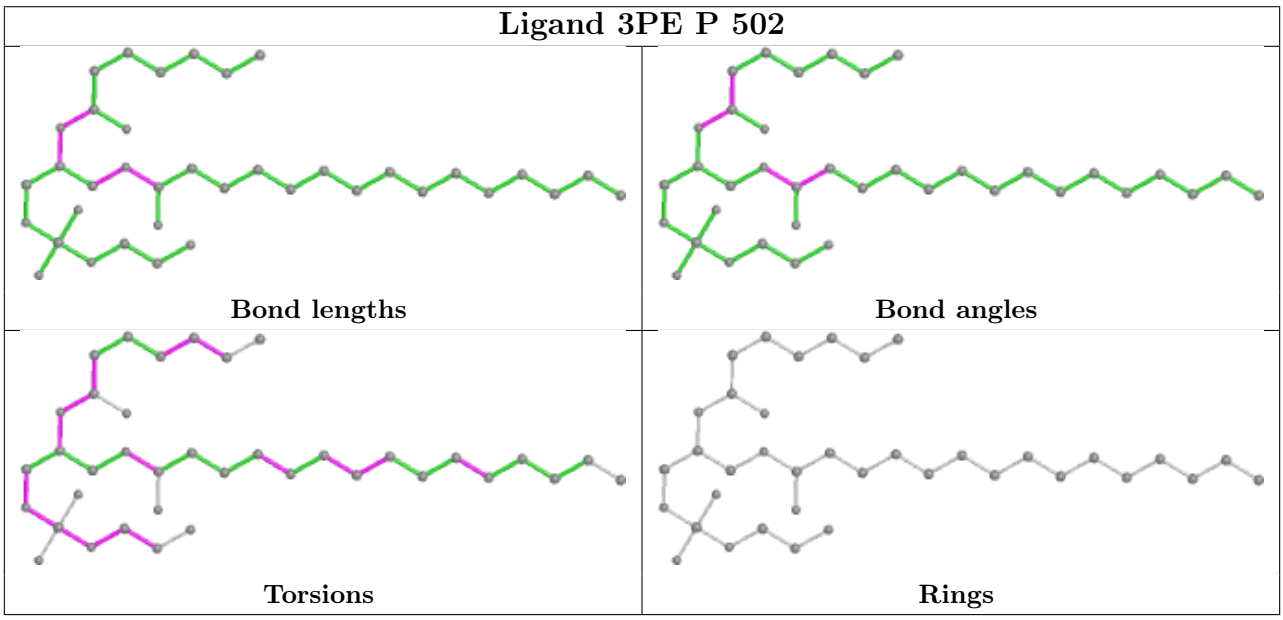


Rings

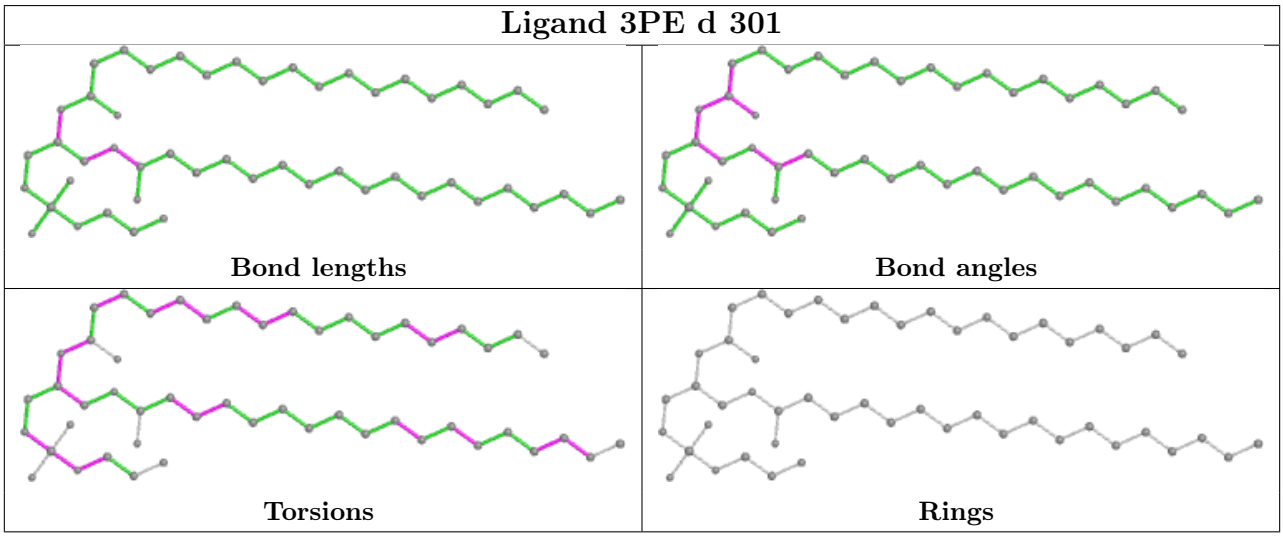
Ligand PC1 B 202



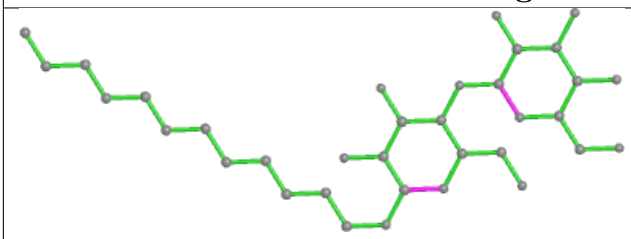
Ligand 3PE P 502



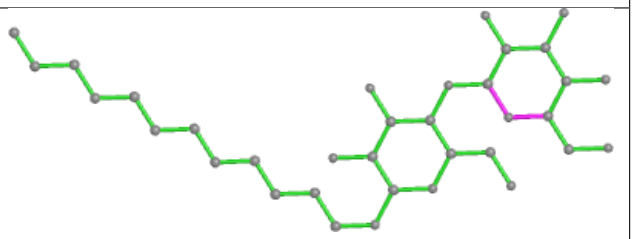
Ligand 3PE d 301



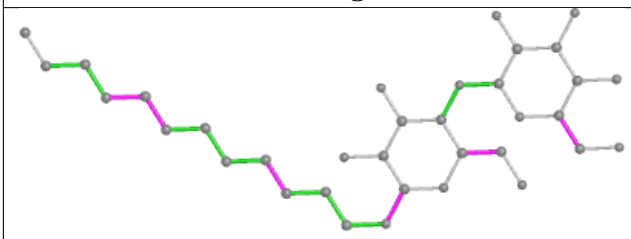
Ligand LMT h 1002



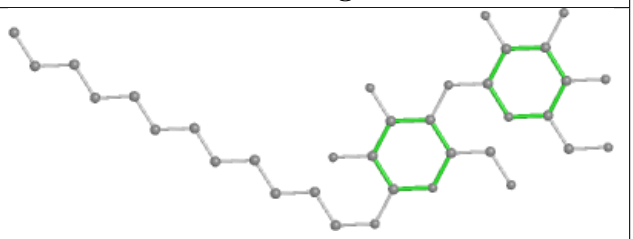
Bond lengths



Bond angles

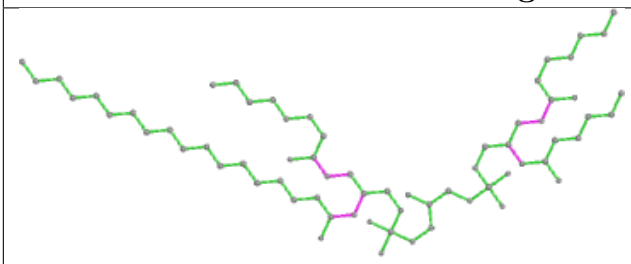


Torsions

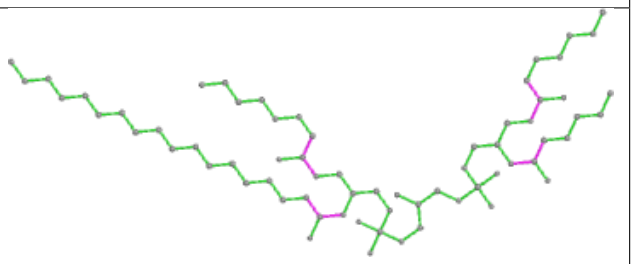


Rings

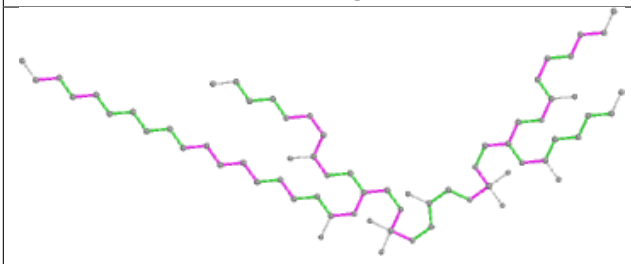
Ligand CDL h 1001



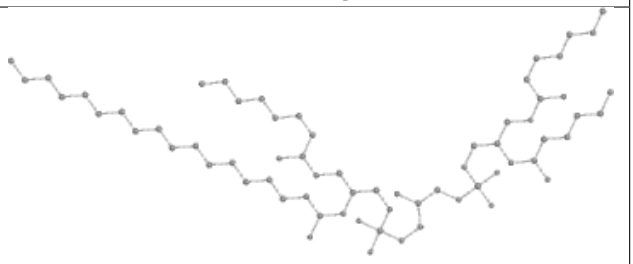
Bond lengths



Bond angles

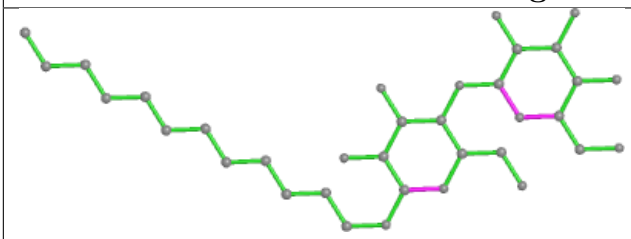


Torsions

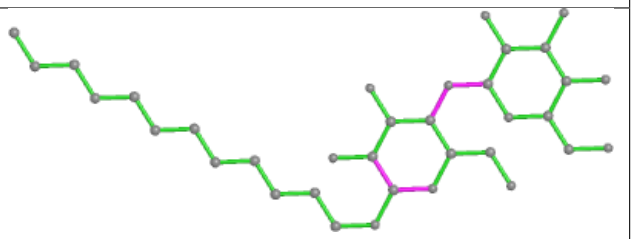


Rings

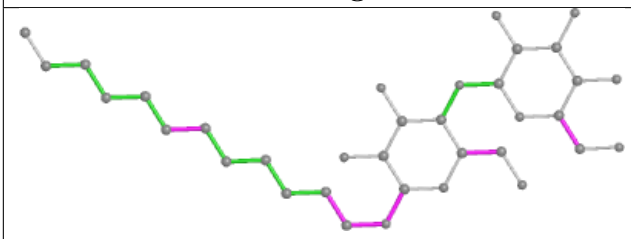
Ligand LMT l 201



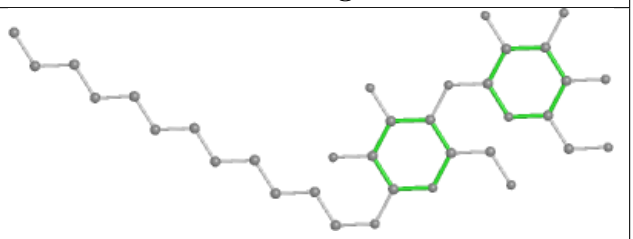
Bond lengths



Bond angles

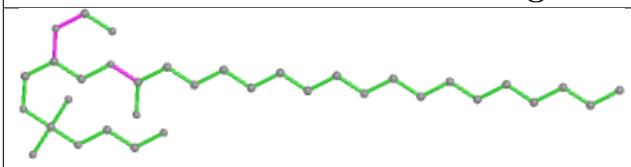


Torsions

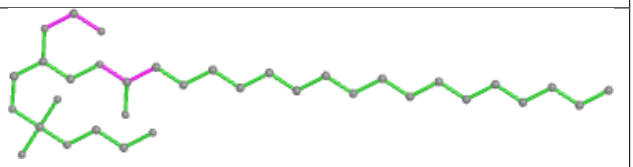


Rings

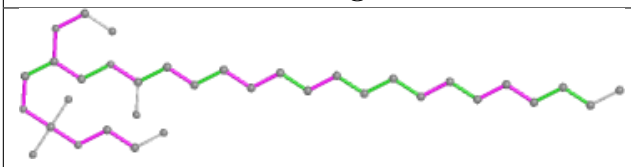
Ligand 3PE H 402



Bond lengths



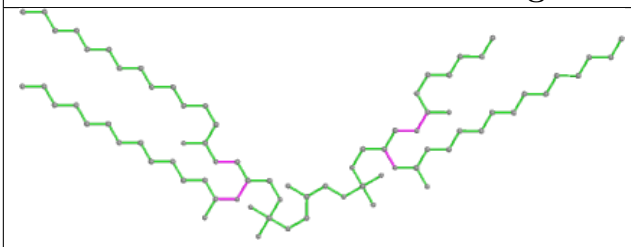
Bond angles



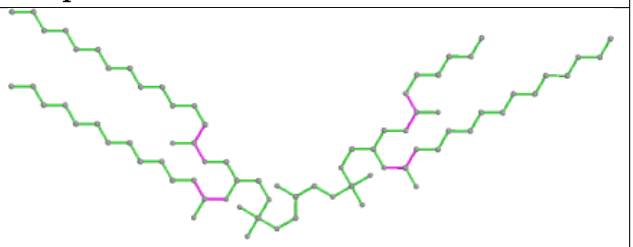
Torsions

Rings

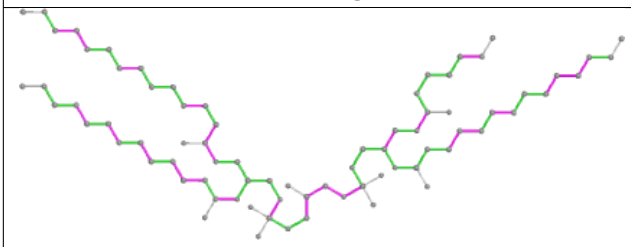
Ligand CDL q 201



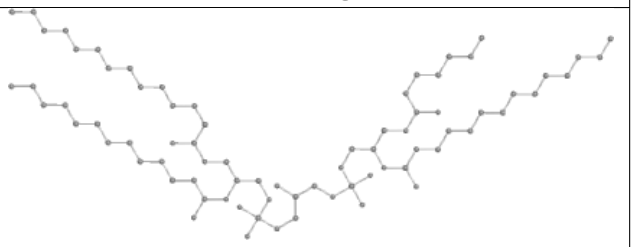
Bond lengths



Bond angles

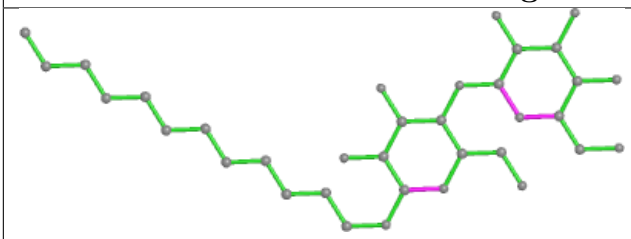


Torsions

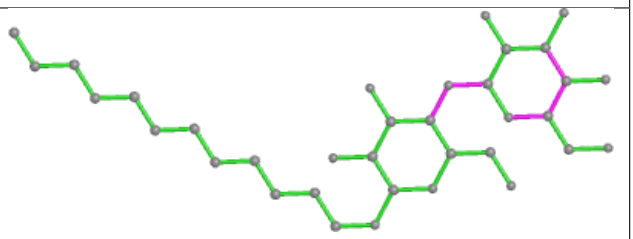


Rings

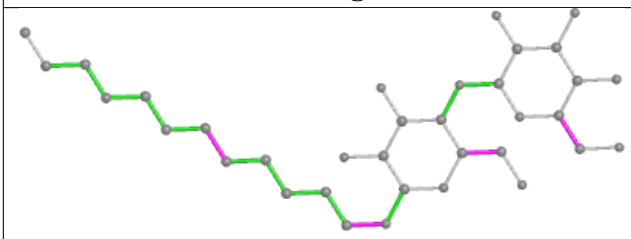
Ligand LMT Y 804



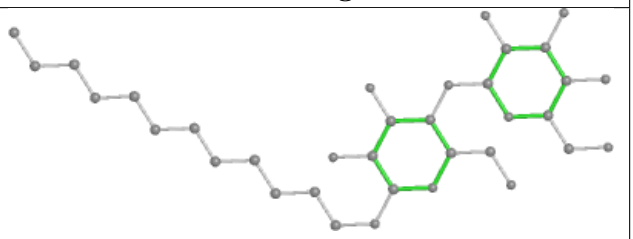
Bond lengths



Bond angles

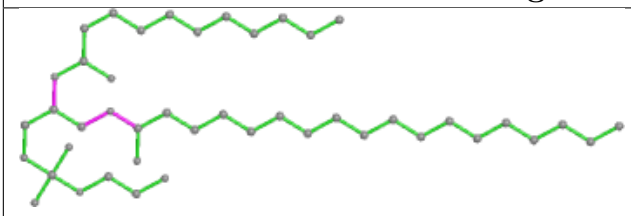


Torsions

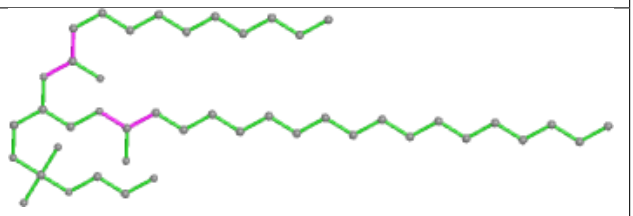


Rings

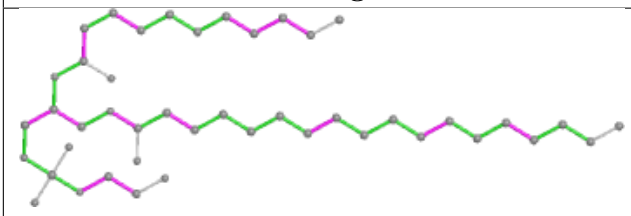
Ligand 3PE H 401



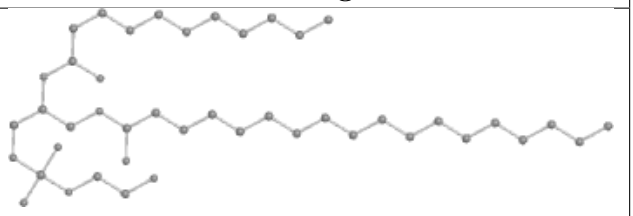
Bond lengths



Bond angles

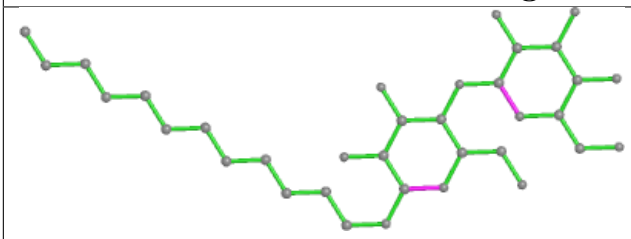


Torsions

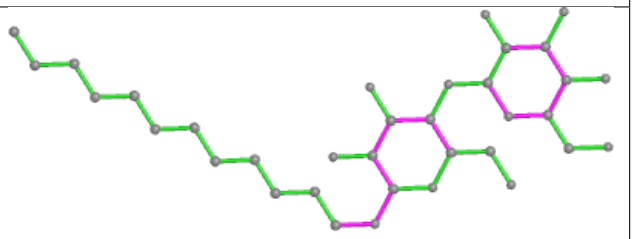


Rings

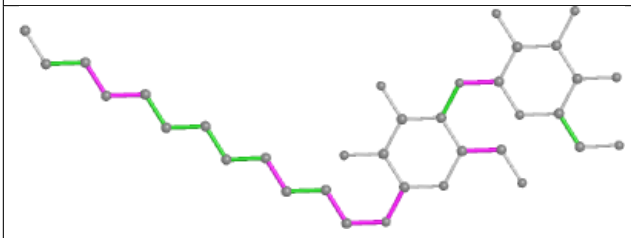
Ligand LMT A 302



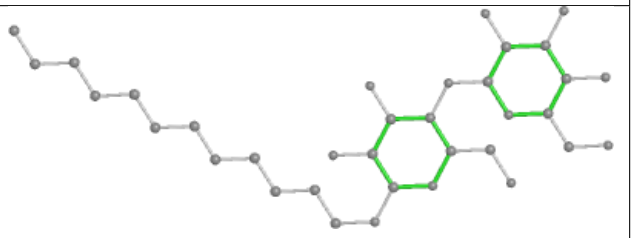
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

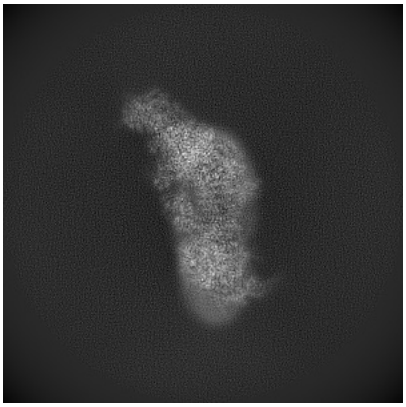
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-14251. These allow visual inspection of the internal detail of the map and identification of artifacts.

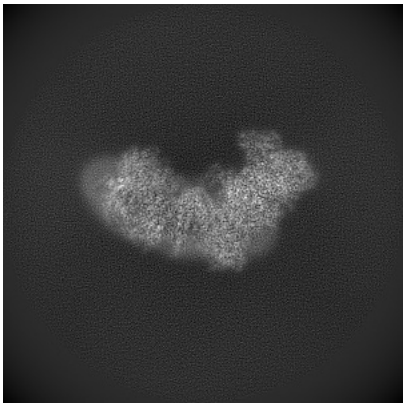
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

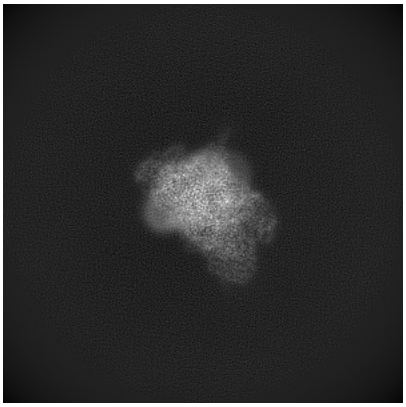
6.1.1 Primary map



X



Y

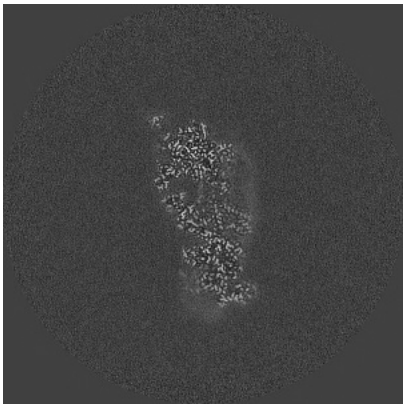


Z

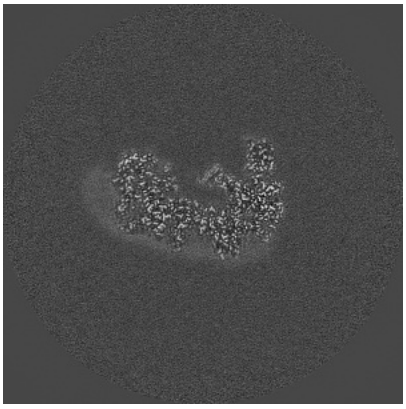
The images above show the map projected in three orthogonal directions.

6.2 Central slices

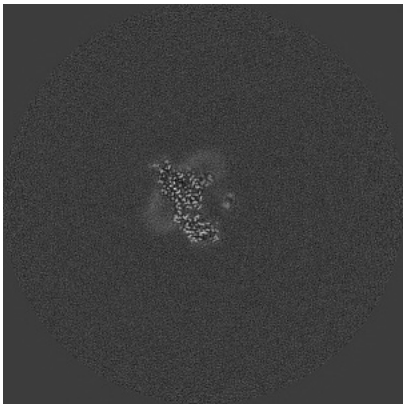
6.2.1 Primary map



X Index: 330



Y Index: 330

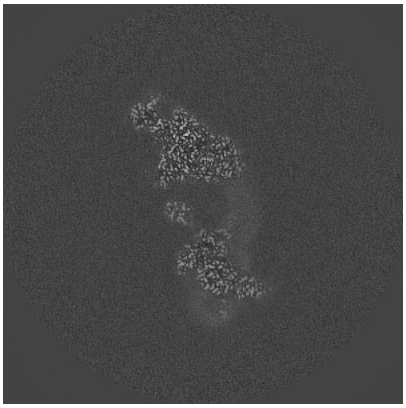


Z Index: 330

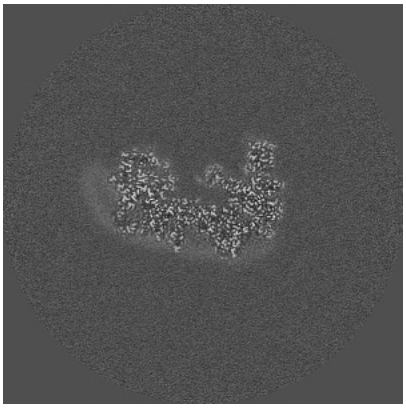
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

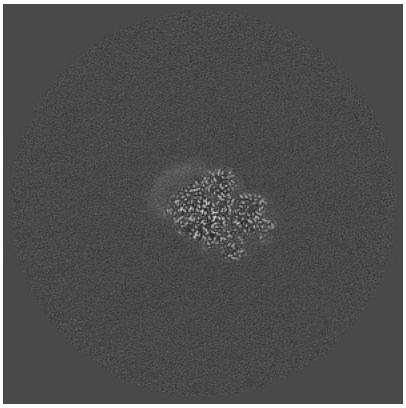
6.3.1 Primary map



X Index: 353



Y Index: 333

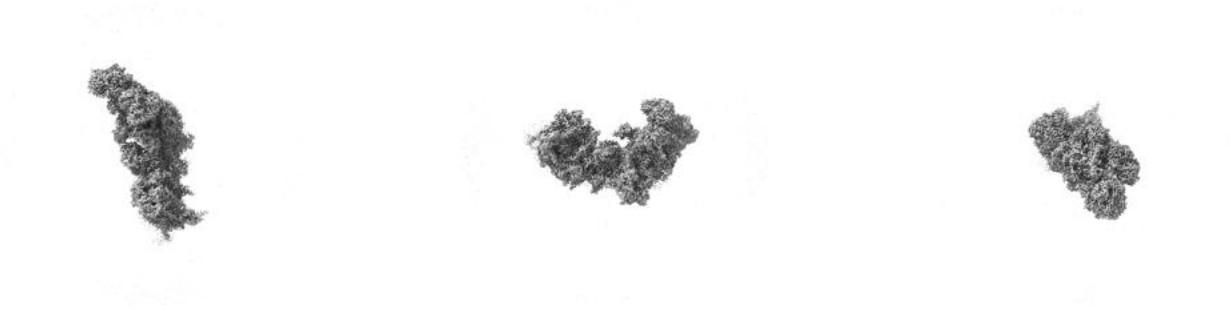


Z Index: 423

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

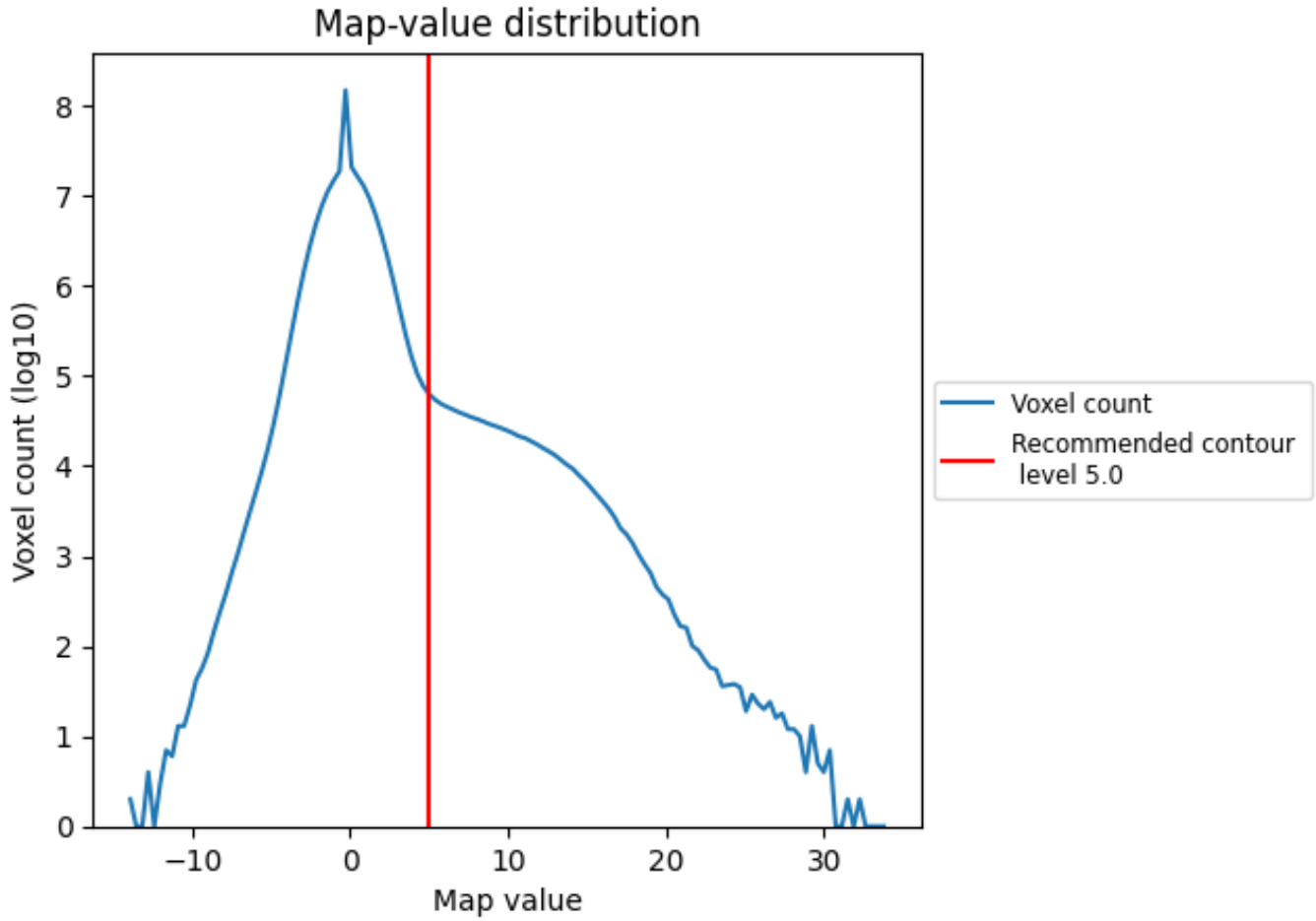
6.5 Mask visualisation (i)

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

7 Map analysis

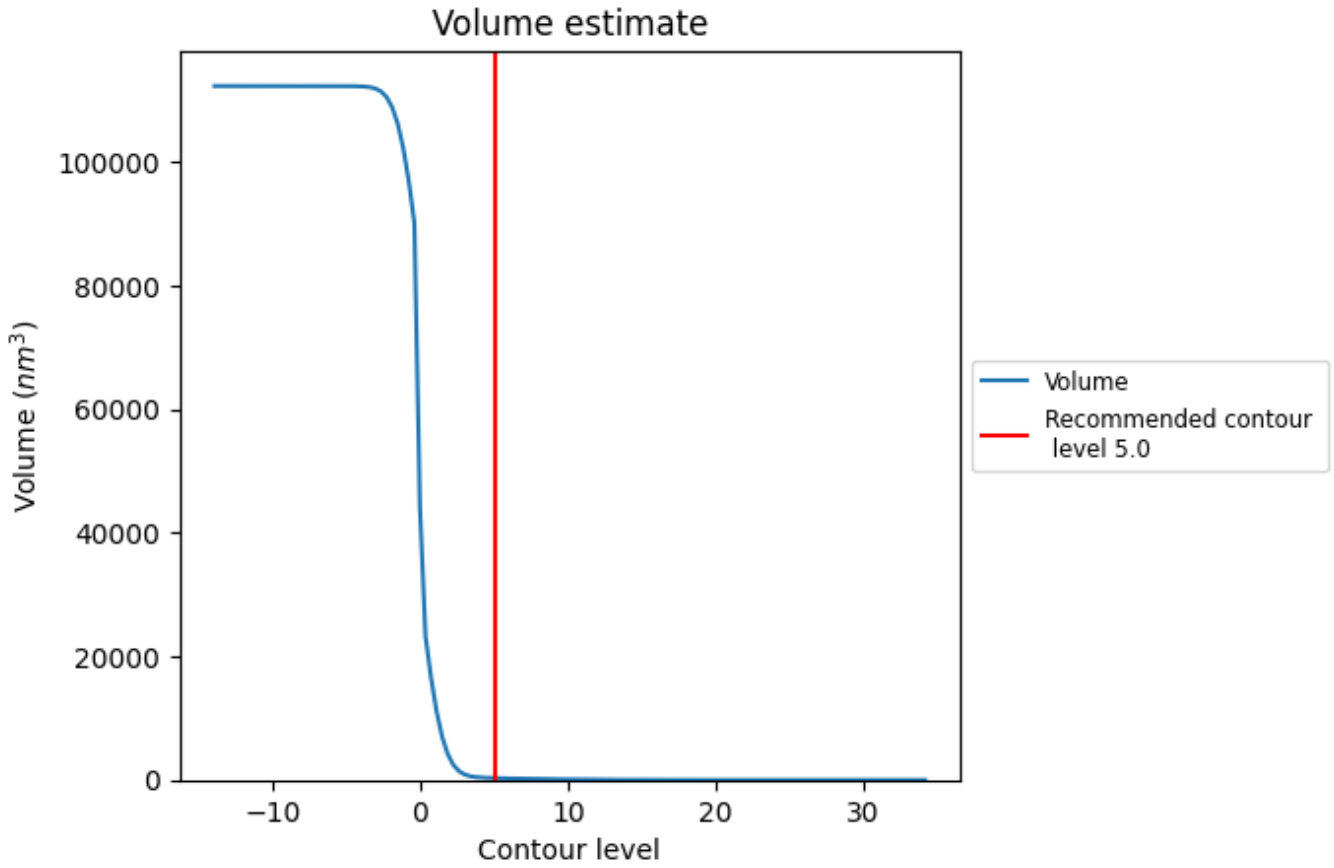
This section contains the results of statistical analysis of the map.

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.

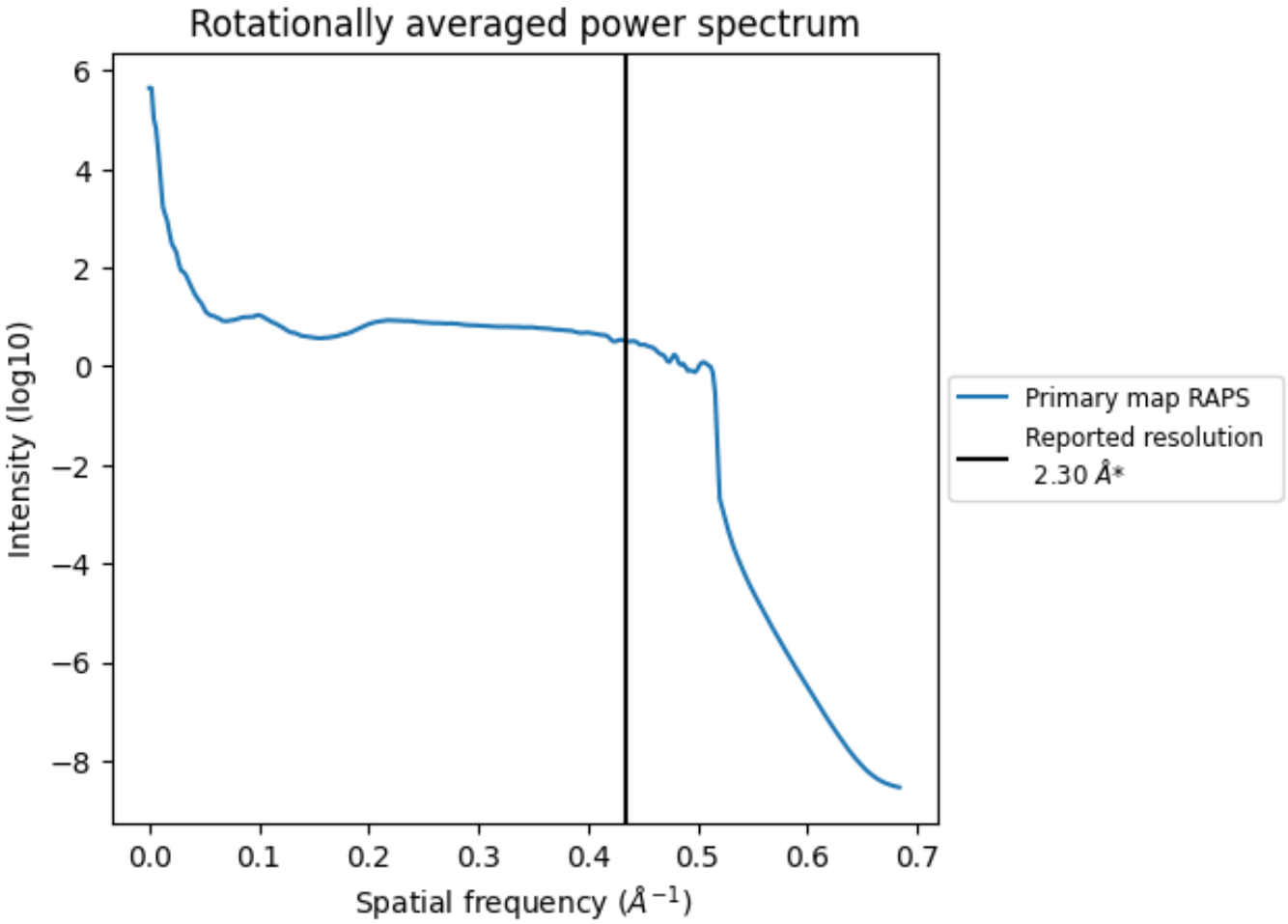
7.2 Volume estimate (i)



The volume at the recommended contour level is 299 nm^3; this corresponds to an approximate mass of 270 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}

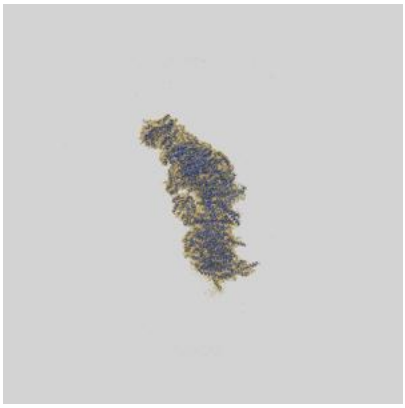
8 Fourier-Shell correlation

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

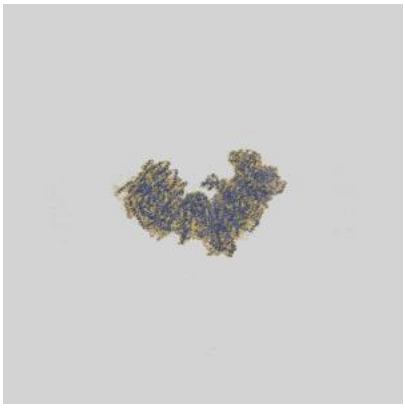
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-14251 and PDB model 7R41. Per-residue inclusion information can be found in section 3 on page 23.

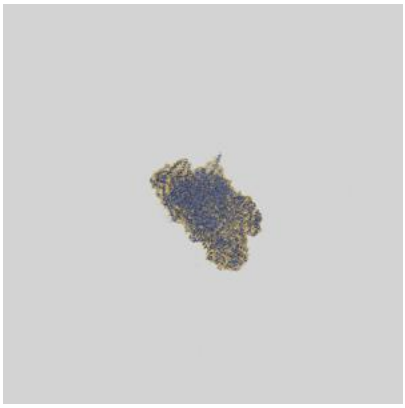
9.1 Map-model overlay



X



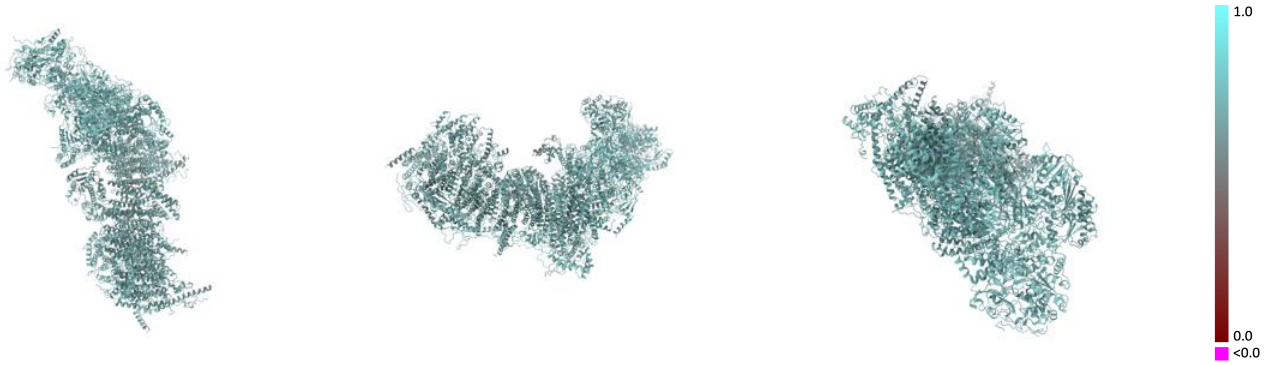
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 5.0 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.

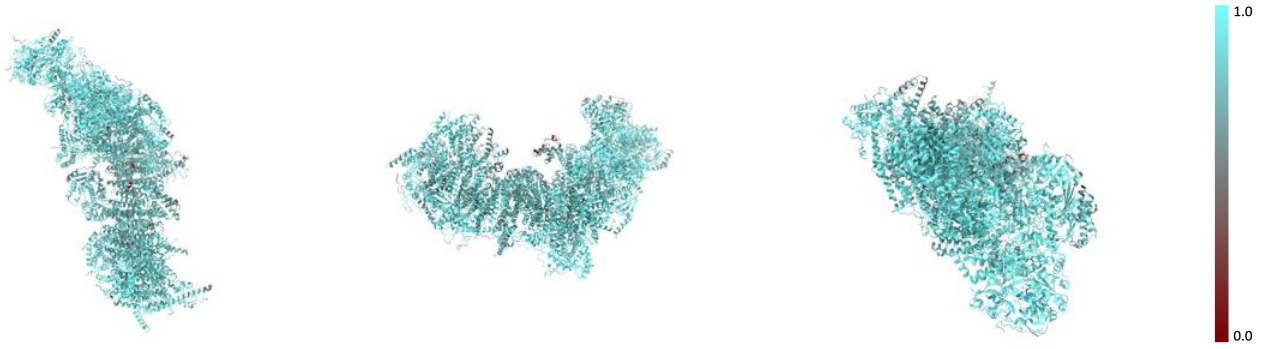
9.2 Q-score mapped to coordinate model



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.

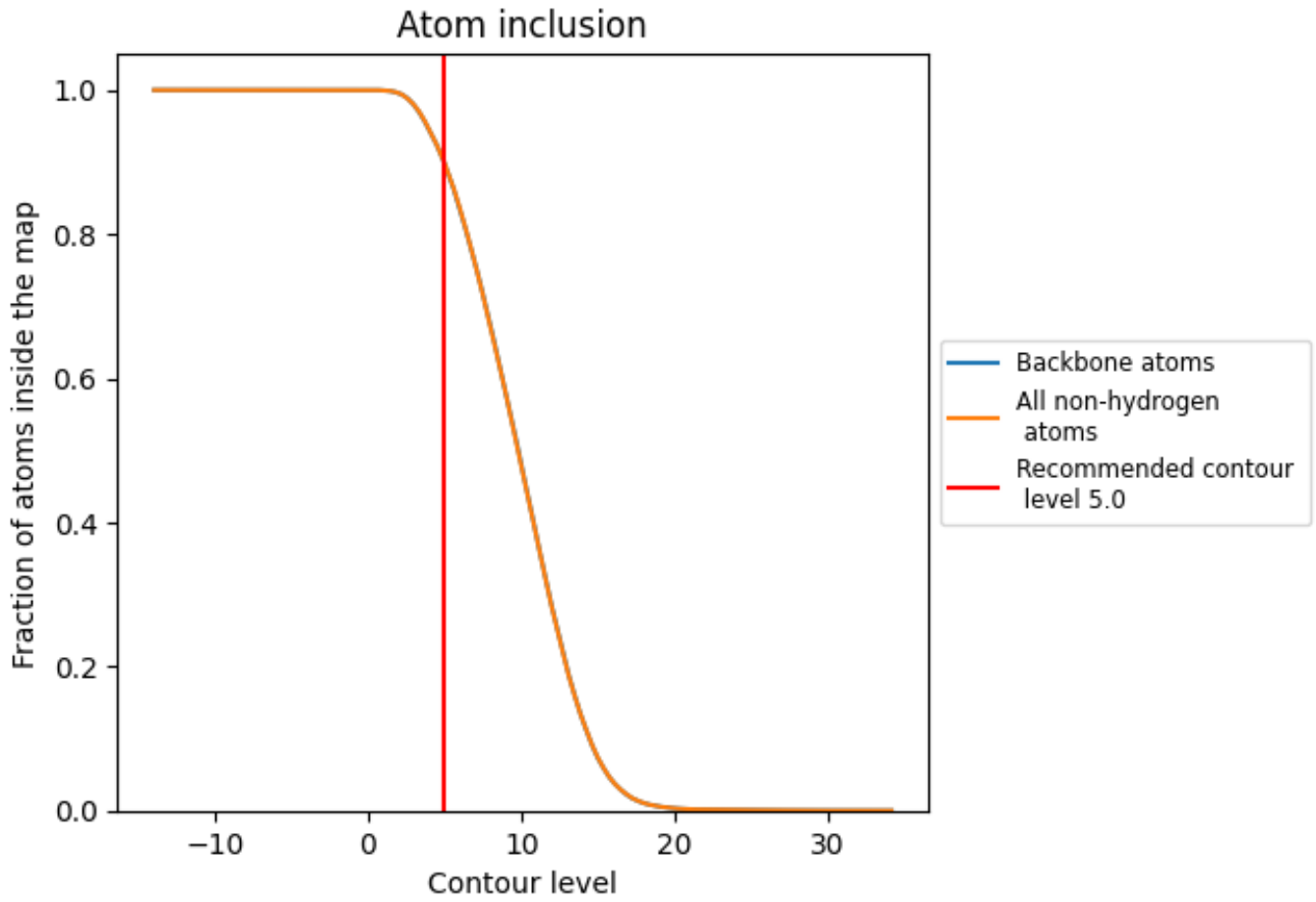
9.3 Atom inclusion mapped to coordinate model



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 (5.0).

9.4 Atom inclusion (i)



At the recommended contour level, 90% of all backbone atoms, 90% 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 (5.0) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8992	0.6860
A	0.8863	0.6930
B	0.9519	0.7230
C	0.9636	0.7270
D	0.9526	0.7240
E	0.8923	0.6780
F	0.9478	0.6960
G	0.9283	0.7030
H	0.9635	0.7150
I	0.9708	0.7290
J	0.8836	0.6840
K	0.9198	0.7050
L	0.8983	0.6670
M	0.9519	0.6950
N	0.9472	0.7040
O	0.8972	0.6720
P	0.8970	0.6960
Q	0.9315	0.7130
R	0.9046	0.7040
S	0.8647	0.6730
T	0.6273	0.5950
U	0.9116	0.6660
V	0.8884	0.6930
W	0.8917	0.6960
X	0.8834	0.6700
Y	0.6975	0.6350
Z	0.8827	0.6780
a	0.9435	0.6960
b	0.8623	0.6590
c	0.7551	0.6470
d	0.8810	0.6790
e	0.8379	0.6660
f	0.8014	0.6470
g	0.8940	0.6700
h	0.9053	0.6820

Continued on next page...

Continued from previous page...

Chain	Atom inclusion	Q-score
i	0.8232	0.6480
j	0.8083	0.6350
k	0.8682	0.6390
l	0.8058	0.6420
m	0.7777	0.6540
n	0.8839	0.6670
o	0.8730	0.6420
p	0.8890	0.6650
q	0.8873	0.6950
r	0.9245	0.7040
s	0.8702	0.6780