Full wwPDB EM Validation Report ⓘ

Oct 6, 2024 – 09:15 AM JST

PDB ID	:	8I5B
EMDB ID	:	EMD-35193
Title	:	Structure of human Nav1.7 in complex with bupivacaine
Authors	:	Wu, Q.R.; Yan, N.
Deposited on	:	2023-01-24
Resolution	:	2.70 Å(reported)

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

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

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

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

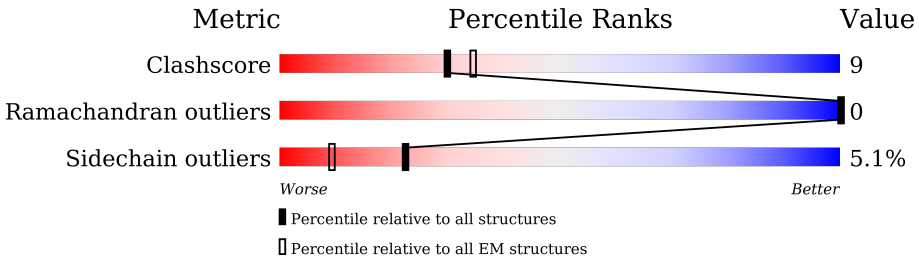
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance

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

The reported resolution of this entry is 2.70 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% 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	2028	9% 48% 14% 37%
2	B	218	61% 16% 22%
3	C	215	46% 40% 15% 44%
4	D	2	50% 50%
4	E	2	50% 50%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
10	OJ0	A	2021	-	-	X	-

2 Entry composition (i)

There are 10 unique types of molecules in this entry. The entry contains 13440 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 Sodium channel protein type 9 subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1272	10251	6795	1611	1768	77	0	0

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-39	TRP	-	expression tag	UNP Q15858
A	-38	SER	-	expression tag	UNP Q15858
A	-37	HIS	-	expression tag	UNP Q15858
A	-36	PRO	-	expression tag	UNP Q15858
A	-35	GLN	-	expression tag	UNP Q15858
A	-34	PHE	-	expression tag	UNP Q15858
A	-33	GLU	-	expression tag	UNP Q15858
A	-32	LYS	-	expression tag	UNP Q15858
A	-31	GLY	-	expression tag	UNP Q15858
A	-30	GLY	-	expression tag	UNP Q15858
A	-29	GLY	-	expression tag	UNP Q15858
A	-28	ALA	-	expression tag	UNP Q15858
A	-27	ARG	-	expression tag	UNP Q15858
A	-26	GLY	-	expression tag	UNP Q15858
A	-25	GLY	-	expression tag	UNP Q15858
A	-24	SER	-	expression tag	UNP Q15858
A	-23	GLY	-	expression tag	UNP Q15858
A	-22	GLY	-	expression tag	UNP Q15858
A	-21	GLY	-	expression tag	UNP Q15858
A	-20	SER	-	expression tag	UNP Q15858
A	-19	TRP	-	expression tag	UNP Q15858
A	-18	SER	-	expression tag	UNP Q15858
A	-17	HIS	-	expression tag	UNP Q15858
A	-16	PRO	-	expression tag	UNP Q15858
A	-15	GLN	-	expression tag	UNP Q15858
A	-14	PHE	-	expression tag	UNP Q15858
A	-13	GLU	-	expression tag	UNP Q15858
A	-12	LYS	-	expression tag	UNP Q15858

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-11	GLY	-	expression tag	UNP Q15858
A	-10	PHE	-	expression tag	UNP Q15858
A	-9	ASP	-	expression tag	UNP Q15858
A	-8	TYR	-	expression tag	UNP Q15858
A	-7	LYS	-	expression tag	UNP Q15858
A	-6	ASP	-	expression tag	UNP Q15858
A	-5	ASP	-	expression tag	UNP Q15858
A	-4	ASP	-	expression tag	UNP Q15858
A	-3	ASP	-	expression tag	UNP Q15858
A	-2	LYS	-	expression tag	UNP Q15858
A	-1	GLY	-	expression tag	UNP Q15858
A	0	THR	-	expression tag	UNP Q15858

- Molecule 2 is a protein called Sodium channel subunit beta-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	171	Total	C	N	O	S	0	0
			1404	895	230	269	10		

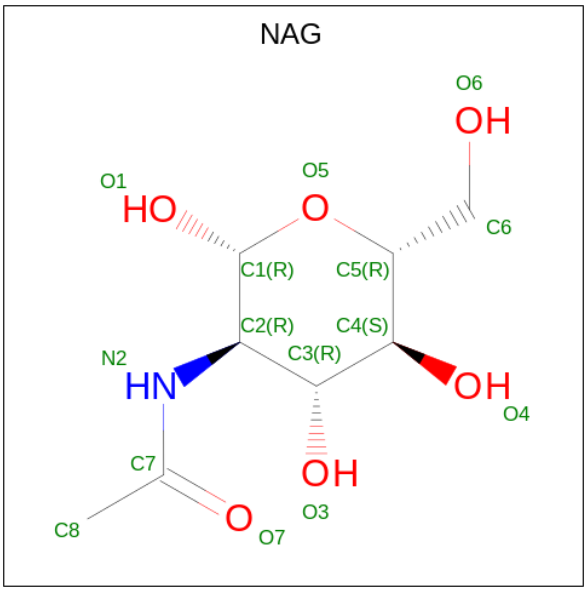
- Molecule 3 is a protein called Sodium channel subunit beta-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	120	Total	C	N	O	S	0	0
			980	614	173	182	11		

- Molecule 4 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

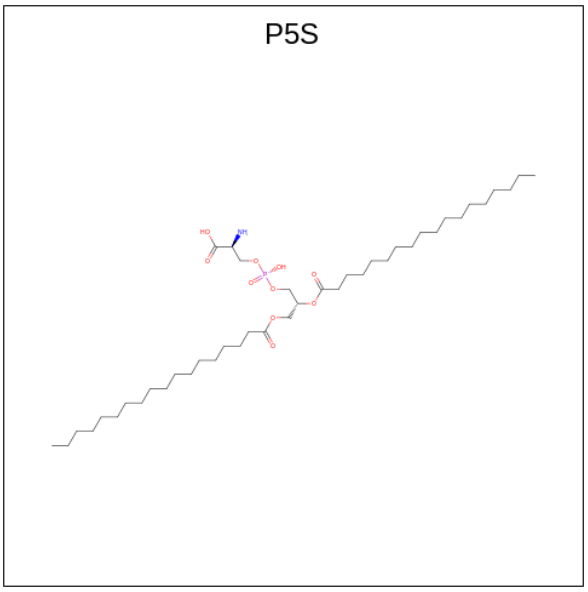
Mol	Chain	Residues	Atoms				AltConf	Trace
4	D	2	Total	C	N	O	0	0
			28	16	2	10		
4	E	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



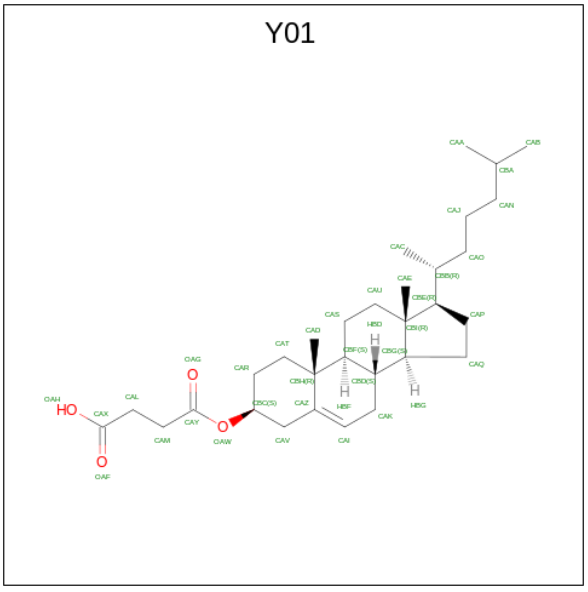
Mol	Chain	Residues	Atoms				AltConf
5	A	1	Total	C	N	O	0
			14	8	1	5	
5	A	1	Total	C	N	O	0
			14	8	1	5	
5	B	1	Total	C	N	O	0
			14	8	1	5	
5	B	1	Total	C	N	O	0
			14	8	1	5	
5	B	1	Total	C	N	O	0
			14	8	1	5	
5	B	1	Total	C	N	O	0
			14	8	1	5	
5	C	1	Total	C	N	O	0
			14	8	1	5	

- Molecule 6 is O-[(R)-{[(2R)-2,3-bis(octadecanoyloxy)propyl]oxy}(hydroxy)phosphoryl]-L-serine (three-letter code: P5S) (formula: $C_{42}H_{82}NO_{10}P$).



Mol	Chain	Residues	Atoms					AltConf
6	A	1	Total	C	N	O	P	0
			35	24	1	9	1	

- Molecule 7 is CHOLESTEROL HEMISUCCINATE (three-letter code: Y01) (formula: $C_{31}H_{50}O_4$).



Mol	Chain	Residues	Atoms			AltConf
7	A	1	Total	C	O	0
			35	31	4	
7	A	1	Total	C	O	0
			35	31	4	
7	A	1	Total	C	O	0
			35	31	4	

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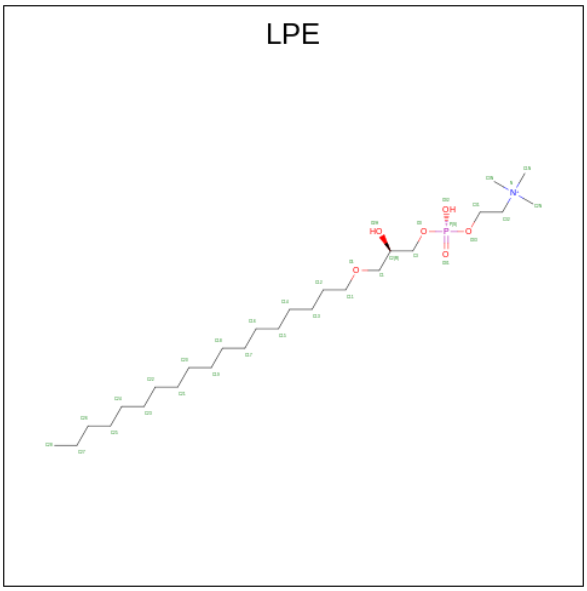
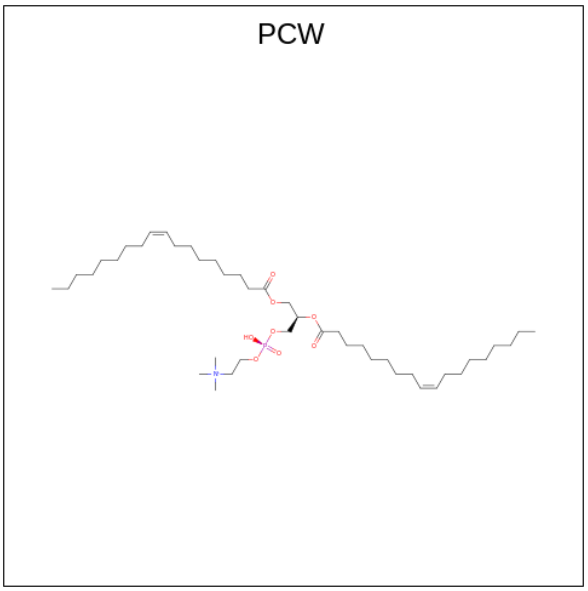
Mol	Chain	Residues	Atoms	AltConf
7	A	1	Total C O 35 31 4	0
7	A	1	Total C O 35 31 4	0
7	A	1	Total C O 35 31 4	0

- Molecule 8 is 1-O-OCTADECYL-SN-GLYCERO-3-PHOSPHOCHOLINE (three-letter code: LPE) (formula: $C_{26}H_{57}NO_6P$).



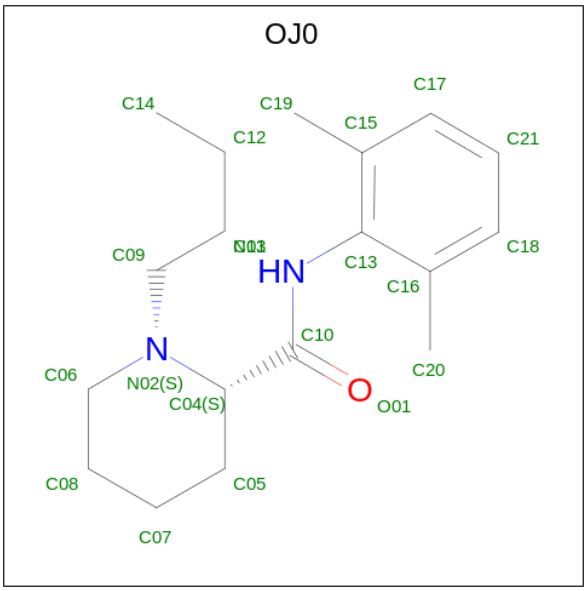
Mol	Chain	Residues	Atoms	AltConf
8	A	1	Total C N O P 25 17 1 6 1	0
8	A	1	Total C N O P 28 20 1 6 1	0
8	A	1	Total C N O P 25 17 1 6 1	0
8	A	1	Total C N O P 25 17 1 6 1	0
8	A	1	Total C N O P 25 17 1 6 1	0
8	A	1	Total C N O P 25 17 1 6 1	0

- Molecule 9 is 1,2-DIOLEOYL-SN-GLYCERO-3-PHOSPHOCHOLINE (three-letter code: PCW) (formula: $C_{44}H_{85}NO_8P$).



Mol	Chain	Residues	Atoms					AltConf
9	A	1	Total	C	N	O	P	0
			53	43	1	8	1	
9	A	1	Total	C	N	O	P	0
			47	37	1	8	1	
9	A	1	Total	C	N	O	P	0
			44	34	1	8	1	
9	A	1	Total	C	N	O	P	0
			44	34	1	8	1	
9	A	1	Total	C	N	O	P	0
			44	34	1	8	1	

- Molecule 10 is Levobupivacaine (three-letter code: OJ0) (formula: $C_{18}H_{28}N_2O$) (labeled as "Ligand of Interest" by depositor).



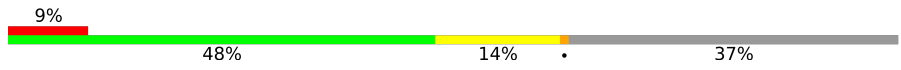
Mol	Chain	Residues	Atoms				AltConf
10	A	1	Total	C	N	O	0
			21	18	2	1	

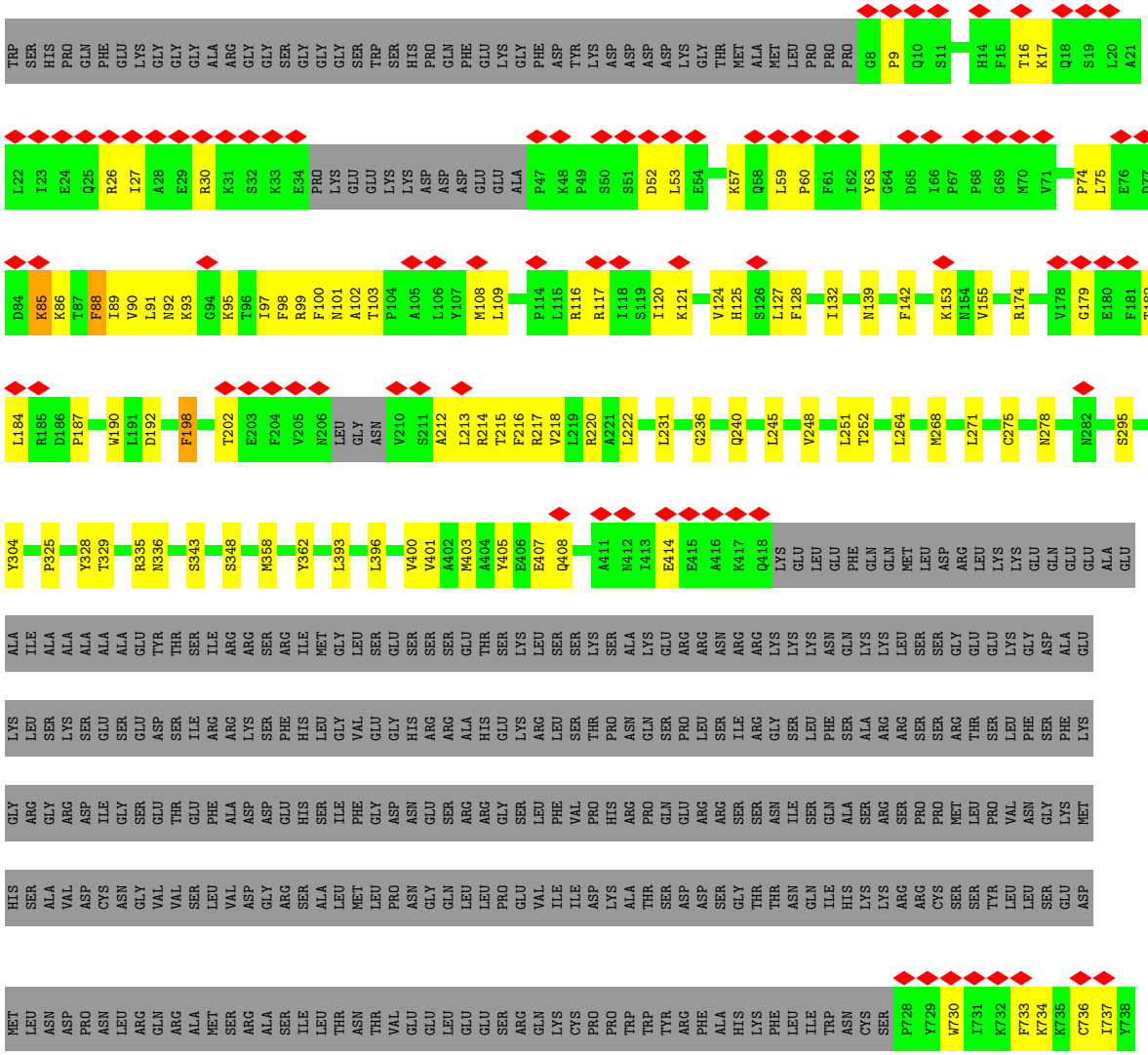
3 Residue-property plots (i)

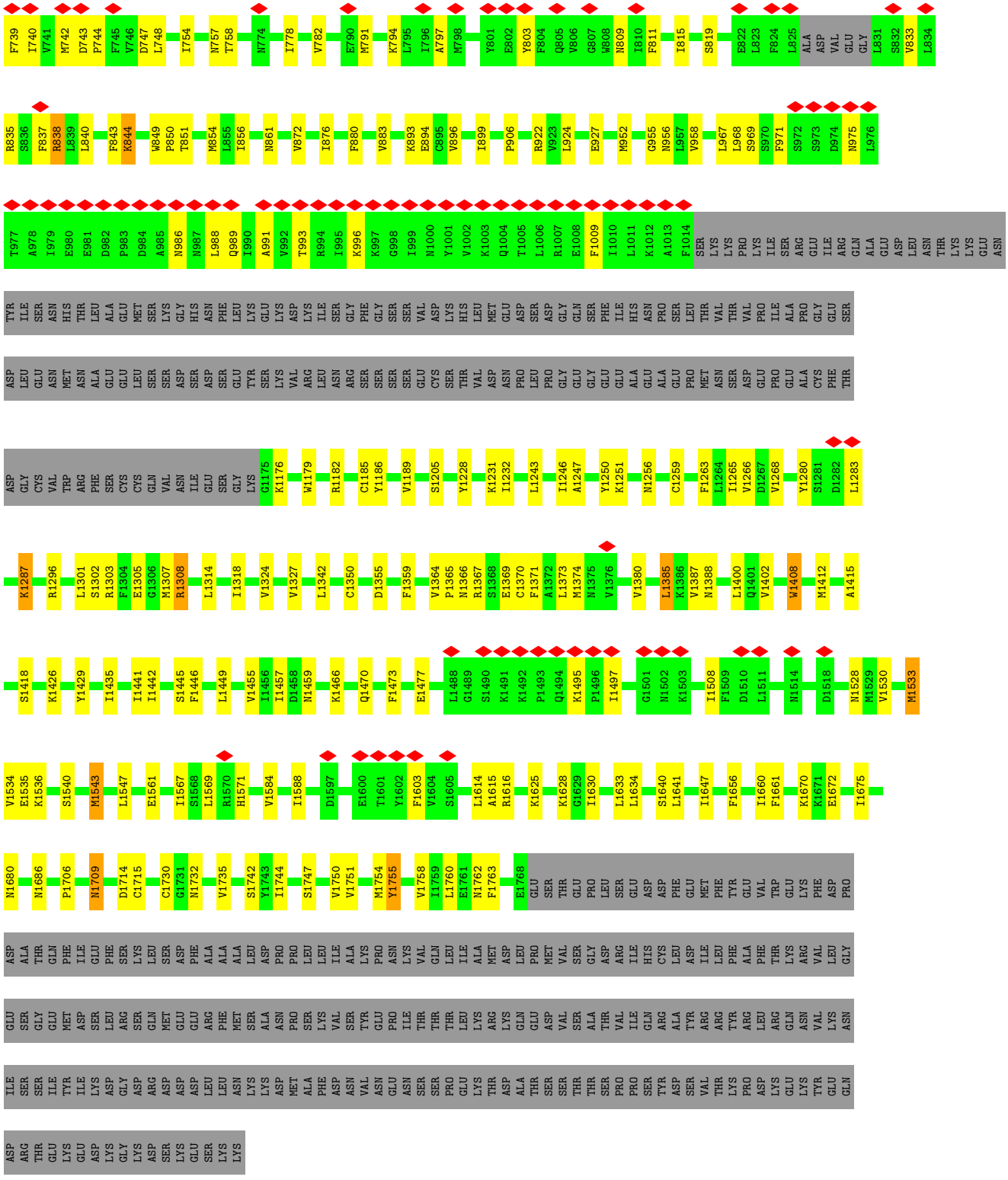
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Sodium channel protein type 9 subunit alpha

Chain A:

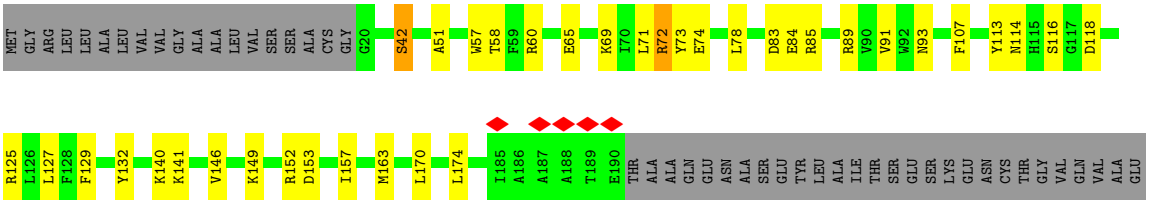






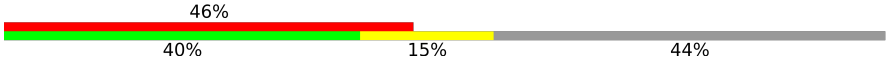
• Molecule 2: Sodium channel subunit beta-1

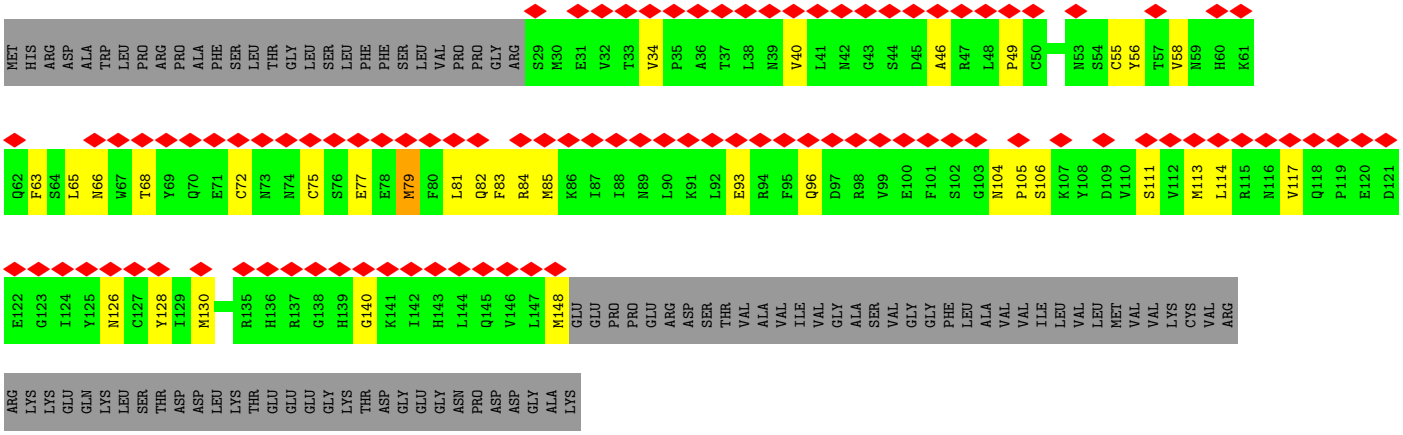
Chain B:



• Molecule 3: Sodium channel subunit beta-2

Chain C:





• Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D:

• Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain E:

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	492421	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	3.272	Depositor
Minimum map value	-2.064	Depositor
Average map value	0.010	Depositor
Map value standard deviation	0.077	Depositor
Recommended contour level	0.35	Depositor
Map size (Å)	249.12, 249.12, 249.12	wwPDB
Map dimensions	288, 288, 288	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.865, 0.865, 0.865	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, P5S, PCW, OJ0, LPE, Y01

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	0.26	0/10500	0.45	0/14224
2	B	0.24	0/1430	0.47	0/1932
3	C	0.26	0/1002	0.54	0/1354
All	All	0.26	0/12932	0.46	0/17510

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	10251	0	10483	187	0
2	B	1404	0	1368	27	0
3	C	980	0	941	24	0
4	D	28	0	25	1	0
4	E	28	0	25	1	0
5	A	28	0	26	0	0
5	B	56	0	52	0	0
5	C	14	0	13	0	0
6	A	35	0	45	1	0
7	A	210	0	294	8	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	A	153	0	213	5	0
9	A	232	0	323	10	0
10	A	21	0	0	11	0
All	All	13440	0	13808	242	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 9.

All (242) 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)
3:C:68:THR:HG22	3:C:79:MET:CE	1.94	0.96
3:C:68:THR:HG22	3:C:79:MET:HE3	1.51	0.92
1:A:125:HIS:CE1	1:A:127:LEU:HD13	2.05	0.92
1:A:739:PHE:O	1:A:742:MET:HG2	1.75	0.86
3:C:66:ASN:HB2	3:C:128:TYR:HB2	1.56	0.86
1:A:52:ASP:CG	1:A:60:PRO:HG3	1.96	0.84
1:A:348:SER:HB2	9:A:2013:PCW:H332	1.58	0.84
1:A:1760:LEU:CD1	10:A:2021:OJ0:C08	2.56	0.84
1:A:52:ASP:OD2	1:A:60:PRO:HG3	1.77	0.83
1:A:1231:LYS:HB2	2:B:163:MET:HE2	1.59	0.83
1:A:1228:TYR:HD1	2:B:163:MET:CE	1.97	0.78
2:B:116:SER:HB2	2:B:146:VAL:HG12	1.66	0.75
1:A:1760:LEU:HD11	10:A:2021:OJ0:C08	2.16	0.75
1:A:403:MET:SD	1:A:1763:PHE:HE2	2.10	0.75
1:A:248:VAL:HG21	1:A:400:VAL:HG21	1.70	0.74
1:A:1647:ILE:HD13	1:A:1754:MET:HB3	1.69	0.73
3:C:68:THR:HG22	3:C:79:MET:HE2	1.69	0.73
1:A:1457:ILE:HG22	10:A:2021:OJ0:C17	2.19	0.72
1:A:1760:LEU:HD13	10:A:2021:OJ0:C08	2.21	0.71
1:A:116:ARG:O	1:A:120:ILE:HD12	1.90	0.71
1:A:1758:VAL:O	1:A:1762:ASN:ND2	2.23	0.70
1:A:1672:GLU:HG2	1:A:1706:PRO:HB3	1.72	0.70
1:A:275:CYS:HB3	1:A:328:TYR:HB3	1.71	0.70
1:A:52:ASP:OD1	1:A:60:PRO:HG3	1.93	0.68
1:A:74:PRO:HG2	1:A:117:ARG:HH21	1.59	0.67
1:A:202:THR:HG22	1:A:213:LEU:HD21	1.74	0.67
1:A:1373:LEU:HG	1:A:1380:VAL:HG21	1.76	0.67
1:A:184:LEU:O	1:A:190:TRP:NE1	2.27	0.67
1:A:811:PHE:O	1:A:815:ILE:HD12	1.95	0.67
1:A:1709:ASN:HB2	1:A:1714:ASP:HB3	1.76	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:251:LEU:HD13	1:A:1630:ILE:HG23	1.79	0.65
1:A:1435:ILE:HD13	7:A:2007:Y01:HAO2	1.78	0.64
1:A:248:VAL:CG2	1:A:400:VAL:HG21	2.28	0.64
1:A:993:THR:HA	1:A:996:LYS:HE3	1.80	0.63
1:A:1228:TYR:HD1	2:B:163:MET:HE3	1.62	0.63
1:A:53:LEU:O	1:A:99:ARG:NH2	2.31	0.63
3:C:68:THR:OG1	3:C:126:ASN:HB3	2.00	0.62
1:A:1371:PHE:HA	1:A:1374:MET:HG3	1.81	0.62
1:A:1426:LYS:HB2	1:A:1429:TYR:HB2	1.80	0.62
2:B:153:ASP:OD1	2:B:153:ASP:N	2.34	0.61
2:B:65:GLU:OE2	2:B:65:GLU:N	2.34	0.61
1:A:403:MET:SD	1:A:1763:PHE:CE2	2.93	0.61
1:A:236:GLY:O	1:A:240:GLN:HG2	2.01	0.60
9:A:2014:PCW:H352	9:A:2020:PCW:H351	1.83	0.60
1:A:757:ASN:OD1	1:A:838:ARG:NH1	2.33	0.60
2:B:113:TYR:HA	2:B:146:VAL:HG11	1.83	0.60
1:A:1302:SER:O	1:A:1308:ARG:NH1	2.35	0.60
1:A:1350:CYS:HB3	1:A:1359:PHE:HD2	1.66	0.60
1:A:1415:ALA:O	1:A:1418:SER:OG	2.20	0.59
1:A:1634:LEU:HB3	9:A:2020:PCW:H322	1.83	0.59
1:A:849:TRP:HD1	1:A:850:PRO:HD2	1.68	0.59
1:A:216:PHE:CE1	7:A:2008:Y01:HAI	2.38	0.58
1:A:1497:ILE:HG21	1:A:1569:LEU:HD22	1.85	0.58
2:B:72:ARG:NH1	2:B:74:GLU:OE1	2.36	0.58
2:B:42:SER:OG	2:B:125:ARG:NH2	2.36	0.58
1:A:26:ARG:HB3	1:A:30:ARG:HH22	1.69	0.58
1:A:737:ILE:HG22	1:A:797:ALA:HB2	1.86	0.57
2:B:129:PHE:HB2	2:B:132:TYR:HB3	1.85	0.57
1:A:1350:CYS:SG	1:A:1364:VAL:HG11	2.44	0.57
1:A:278:ASN:OD1	1:A:329:THR:OG1	2.23	0.57
3:C:68:THR:CG2	3:C:79:MET:HE2	2.35	0.57
1:A:1228:TYR:HD1	2:B:163:MET:HE1	1.70	0.56
1:A:794:LYS:HB3	1:A:803:TYR:HE1	1.70	0.56
1:A:1584:VAL:O	1:A:1588:ILE:HD12	2.04	0.56
1:A:92:ASN:ND2	1:A:124:VAL:O	2.38	0.56
1:A:335:ARG:NH1	1:A:336:ASN:O	2.38	0.56
1:A:986:ASN:O	1:A:989:GLN:N	2.36	0.56
1:A:1205:SER:HB2	1:A:1296:ARG:HD3	1.87	0.56
1:A:1530:VAL:HA	1:A:1533:MET:HG3	1.86	0.56
1:A:1251:LYS:HG3	7:A:2005:Y01:HAR1	1.88	0.55
1:A:1402:VAL:HA	1:A:1408:TRP:HB3	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:215:THR:O	1:A:218:VAL:HG22	2.07	0.55
10:A:2021:OJ0:C11	10:A:2021:OJ0:C10	2.85	0.55
9:A:2014:PCW:H382	9:A:2019:PCW:H382	1.89	0.54
1:A:1457:ILE:HG21	10:A:2021:OJ0:C19	2.37	0.54
2:B:57:TRP:HB2	2:B:71:LEU:HG	1.88	0.54
1:A:748:LEU:HD22	1:A:991:ALA:HB1	1.89	0.54
2:B:85:ARG:HG2	2:B:114:ASN:HB3	1.90	0.54
10:A:2021:OJ0:C14	10:A:2021:OJ0:C20	2.85	0.54
1:A:1182:ARG:HD2	1:A:1246:ILE:O	2.07	0.54
1:A:1400:LEU:HD22	9:A:2011:PCW:H221	1.90	0.54
1:A:833:VAL:HG22	1:A:1342:LEU:HD21	1.90	0.54
1:A:1287:LYS:HD3	1:A:1287:LYS:N	2.24	0.53
3:C:40:VAL:HG21	3:C:46:ALA:HB2	1.91	0.53
1:A:851:THR:HB	1:A:1327:VAL:HG21	1.89	0.53
1:A:52:ASP:OD2	1:A:60:PRO:CG	2.51	0.53
1:A:90:VAL:HG21	1:A:120:ILE:HG21	1.92	0.52
1:A:1751:VAL:O	1:A:1755:TYR:HB2	2.08	0.52
1:A:730:TRP:O	1:A:734:LYS:HG2	2.09	0.52
1:A:1364:VAL:HG21	1:A:1373:LEU:HD22	1.91	0.52
2:B:84:GLU:OE1	2:B:84:GLU:N	2.37	0.52
2:B:152:ARG:HD3	2:B:157:ILE:HG12	1.90	0.52
1:A:737:ILE:HA	1:A:740:ILE:HD12	1.91	0.52
1:A:1228:TYR:CD1	2:B:163:MET:HE3	2.44	0.52
1:A:1367:ARG:CZ	1:A:1371:PHE:HZ	2.23	0.51
3:C:68:THR:CG2	3:C:79:MET:CE	2.80	0.51
1:A:971:PHE:HZ	1:A:1455:VAL:HG23	1.76	0.51
1:A:1287:LYS:HD3	1:A:1287:LYS:H	1.74	0.51
1:A:1385:LEU:O	1:A:1387:VAL:N	2.42	0.51
1:A:733:PHE:O	1:A:737:ILE:HG12	2.10	0.51
1:A:59:LEU:HB3	1:A:95:LYS:HD2	1.93	0.51
2:B:71:LEU:HD13	2:B:78:LEU:HD11	1.93	0.51
3:C:72:CYS:SG	3:C:75:CYS:N	2.84	0.51
3:C:83:PHE:O	3:C:84:ARG:HD3	2.12	0.50
1:A:1355:ASP:OD1	1:A:1355:ASP:N	2.44	0.50
7:A:2009:Y01:HAQ1	9:A:2011:PCW:H372	1.93	0.50
2:B:91:VAL:HG22	2:B:107:PHE:HB3	1.93	0.50
1:A:304:TYR:CD1	1:A:325:PRO:HG2	2.47	0.49
1:A:1750:VAL:O	1:A:1754:MET:HB2	2.12	0.49
3:C:65:LEU:H	3:C:84:ARG:HH12	1.57	0.49
1:A:1365:PRO:HD2	1:A:1369:GLU:HG3	1.94	0.49
1:A:1232:ILE:HD11	2:B:163:MET:HA	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1228:TYR:CD1	2:B:163:MET:CE	2.87	0.49
3:C:58:VAL:HG21	3:C:105:PRO:O	2.12	0.49
2:B:58:THR:HG22	2:B:69:LYS:HG3	1.94	0.48
1:A:231:LEU:HD22	1:A:872:VAL:HG23	1.94	0.48
3:C:58:VAL:HG11	3:C:105:PRO:HB2	1.95	0.48
1:A:967:LEU:O	1:A:971:PHE:HB2	2.14	0.48
2:B:60:ARG:NH1	2:B:118:ASP:OD2	2.46	0.48
3:C:65:LEU:H	3:C:84:ARG:NH1	2.11	0.48
1:A:894:GLU:HG3	3:C:55:CYS:SG	2.53	0.48
1:A:101:ASN:ND2	1:A:103:THR:OG1	2.47	0.48
1:A:1747:SER:O	1:A:1751:VAL:HG22	2.13	0.48
1:A:739:PHE:O	1:A:742:MET:CG	2.55	0.48
1:A:1373:LEU:HB3	1:A:1380:VAL:HG11	1.94	0.48
1:A:405:TYR:HD1	1:A:968:LEU:HD12	1.79	0.47
1:A:89:ILE:HD11	1:A:97:ILE:HG23	1.95	0.47
1:A:52:ASP:OD1	1:A:52:ASP:O	2.32	0.47
1:A:101:ASN:HD21	1:A:103:THR:CG2	2.28	0.47
1:A:88:PHE:CE1	1:A:100:PHE:HB2	2.49	0.47
1:A:1305:GLU:HG3	1:A:1308:ARG:HH21	1.80	0.47
1:A:1640:SER:HB2	1:A:1758:VAL:HG12	1.96	0.47
1:A:952:MET:O	1:A:956:ASN:HB2	2.14	0.47
1:A:778:ILE:O	1:A:782:VAL:HG23	2.15	0.46
1:A:1742:SER:HA	8:A:2010:LPE:H212	1.97	0.46
1:A:1408:TRP:O	1:A:1412:MET:HG3	2.15	0.46
1:A:1584:VAL:HG11	9:A:2014:PCW:H161	1.96	0.46
1:A:1535:GLU:HG2	1:A:1547:LEU:HD13	1.97	0.46
1:A:1656:PHE:O	1:A:1660:ILE:HG12	2.15	0.46
1:A:117:ARG:O	1:A:121:LYS:HG3	2.15	0.46
1:A:26:ARG:HB3	1:A:30:ARG:NH2	2.31	0.46
3:C:68:THR:HB	3:C:77:GLU:HB3	1.98	0.45
1:A:1457:ILE:CG2	10:A:2021:OJ0:C19	2.94	0.45
1:A:1243:LEU:HD11	2:B:174:LEU:HD11	1.98	0.45
1:A:86:LYS:HB2	1:A:102:ALA:HB3	1.98	0.45
1:A:1675:ILE:HG23	1:A:1680:ASN:HB3	1.97	0.45
8:A:2010:LPE:H121	9:A:2011:PCW:H172	1.99	0.45
4:E:1:NAG:O4	4:E:1:NAG:O6	2.33	0.45
1:A:1540:SER:HB2	1:A:1543:MET:HB2	1.99	0.45
1:A:109:LEU:HD12	1:A:116:ARG:HB2	1.98	0.45
1:A:396:LEU:HD13	1:A:1633:LEU:HD13	1.98	0.45
1:A:986:ASN:HD22	1:A:989:GLN:HB2	1.80	0.45
1:A:754:ILE:O	1:A:758:THR:HG22	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1228:TYR:CD1	2:B:163:MET:HE1	2.50	0.45
1:A:1265:ILE:O	1:A:1268:VAL:HG12	2.17	0.45
4:D:1:NAG:H61	4:D:2:NAG:C7	2.46	0.44
1:A:1301:LEU:HD23	1:A:1307:MET:HE3	1.99	0.44
1:A:187:PRO:O	1:A:190:TRP:HB2	2.17	0.44
1:A:1400:LEU:HD21	1:A:1744:ILE:HD11	1.98	0.44
1:A:179:GLY:H	1:A:182:THR:HG21	1.82	0.44
1:A:252:THR:HG23	1:A:393:LEU:HD13	1.99	0.44
3:C:104:ASN:ND2	3:C:106:SER:HB2	2.32	0.44
1:A:405:TYR:CD1	1:A:968:LEU:HD12	2.52	0.44
1:A:1250:TYR:CZ	6:A:2003:P5S:H51A	2.52	0.44
1:A:1256:ASN:HB3	1:A:1259:CYS:HB2	2.00	0.44
1:A:1588:ILE:HG22	1:A:1615:ALA:HB1	2.00	0.44
1:A:924:LEU:HD21	1:A:955:GLY:HA3	2.00	0.44
1:A:1530:VAL:O	1:A:1534:VAL:HG13	2.18	0.44
1:A:9:PRO:HA	1:A:63:TYR:HA	2.00	0.44
1:A:1732:ASN:HB3	1:A:1735:VAL:HB	1.99	0.44
1:A:811:PHE:HZ	1:A:840:LEU:HB3	1.83	0.43
1:A:876:ILE:HD12	1:A:958:VAL:HG21	2.01	0.43
1:A:245:LEU:HD21	1:A:401:VAL:HG23	1.99	0.43
1:A:98:PHE:CD2	1:A:124:VAL:HG12	2.53	0.43
1:A:1715:CYS:HB3	1:A:1730:CYS:HB3	1.95	0.43
1:A:212:ALA:HB2	7:A:2008:Y01:CAY	2.48	0.43
1:A:1536:LYS:HE2	1:A:1536:LYS:HB3	1.64	0.43
1:A:57:LYS:HB2	1:A:57:LYS:HZ3	1.82	0.43
1:A:811:PHE:CZ	1:A:815:ILE:HD11	2.53	0.43
10:A:2021:OJ0:C10	10:A:2021:OJ0:C19	2.96	0.43
3:C:34:VAL:HG21	3:C:140:GLY:HA3	2.00	0.43
1:A:791:MET:HE1	1:A:803:TYR:HE2	1.84	0.43
1:A:893:LYS:O	1:A:896:VAL:HG13	2.19	0.43
1:A:1473:PHE:HE1	1:A:1754:MET:HE2	1.82	0.43
1:A:218:VAL:HG11	1:A:883:VAL:HG23	2.00	0.42
1:A:264:LEU:O	1:A:268:MET:HB2	2.18	0.42
1:A:1280:TYR:HB3	1:A:1283:LEU:HD21	2.01	0.42
3:C:49:PRO:HA	3:C:111:SER:HB3	2.01	0.42
1:A:1263:PHE:HA	1:A:1266:VAL:HG12	2.01	0.42
1:A:1641:LEU:HD23	1:A:1641:LEU:HA	1.86	0.42
2:B:51:ALA:HB2	2:B:127:LEU:HD13	2.01	0.42
1:A:1508:ILE:HD11	1:A:1567:ILE:HG22	2.00	0.42
8:A:2010:LPE:H21	9:A:2011:PCW:H131	2.01	0.42
1:A:1457:ILE:HG22	10:A:2021:OJ0:C15	2.50	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:271:LEU:HD12	1:A:343:SER:HA	2.00	0.42
1:A:899:ILE:HD12	1:A:906:PRO:HG3	2.00	0.42
8:A:2016:LPE:H122	8:A:2016:LPE:H12	1.86	0.42
1:A:1466:LYS:HD2	1:A:1466:LYS:HA	1.78	0.42
1:A:1614:LEU:HD23	1:A:1614:LEU:HA	1.90	0.42
3:C:81:LEU:HD12	3:C:82:GLN:H	1.84	0.42
1:A:396:LEU:HD23	1:A:396:LEU:HA	1.89	0.41
1:A:1364:VAL:HA	1:A:1369:GLU:HB3	2.02	0.41
7:A:2009:Y01:HBC	7:A:2009:Y01:HAM1	1.51	0.41
1:A:75:LEU:HD12	1:A:91:LEU:HD12	2.03	0.41
1:A:849:TRP:CH2	7:A:2006:Y01:HAQ1	2.55	0.41
1:A:1324:VAL:HG21	1:A:1455:VAL:HG21	2.01	0.41
8:A:2015:LPE:H122	8:A:2015:LPE:H12	1.80	0.41
1:A:843:PHE:HD1	1:A:856:ILE:HD11	1.85	0.41
1:A:16:THR:OG1	1:A:17:LYS:N	2.53	0.41
1:A:198:PHE:O	1:A:202:THR:HG23	2.21	0.41
1:A:880:PHE:HE1	7:A:2008:Y01:HAC3	1.85	0.41
3:C:93:GLU:O	3:C:96:GLN:NE2	2.53	0.41
1:A:833:VAL:HG12	1:A:837:PHE:HE1	1.86	0.41
1:A:1314:LEU:O	1:A:1318:ILE:HG12	2.21	0.41
1:A:1470:GLN:OE1	1:A:1470:GLN:N	2.54	0.41
1:A:1634:LEU:CB	9:A:2020:PCW:H322	2.50	0.41
3:C:65:LEU:HD12	3:C:66:ASN:N	2.36	0.41
1:A:1186:TYR:HA	1:A:1247:ALA:HB1	2.03	0.41
1:A:1364:VAL:HA	1:A:1369:GLU:CB	2.50	0.41
10:A:2021:OJ0:C19	10:A:2021:OJ0:O01	2.69	0.41
1:A:27:ILE:HD11	1:A:85:LYS:HA	2.02	0.41
1:A:79:ASP:HB3	1:A:82:TYR:HD2	1.86	0.41
1:A:142:PHE:CE2	1:A:155:VAL:HG11	2.56	0.41
1:A:1185:CYS:O	1:A:1189:VAL:HG22	2.20	0.41
1:A:1709:ASN:O	1:A:1730:CYS:HB2	2.21	0.41
3:C:34:VAL:HG21	3:C:140:GLY:CA	2.51	0.41
1:A:1441:ILE:O	1:A:1445:SER:HB3	2.20	0.41
2:B:73:TYR:HB2	2:B:78:LEU:HD12	2.02	0.41
1:A:1350:CYS:HB3	1:A:1359:PHE:CD2	2.53	0.40
1:A:1445:SER:O	1:A:1449:LEU:HB2	2.20	0.40
1:A:1680:ASN:OD1	1:A:1686:ASN:ND2	2.49	0.40
1:A:101:ASN:ND2	1:A:103:THR:HG23	2.36	0.40
1:A:304:TYR:CG	1:A:325:PRO:HG2	2.57	0.40
1:A:743:ASP:HB2	1:A:744:PRO:HD3	2.02	0.40
1:A:1442:ILE:O	1:A:1446:PHE:HB3	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:128:PHE:O	1:A:132:ILE:HG12	2.22	0.40
1:A:922:ARG:HG2	1:A:927:GLU:HB2	2.03	0.40
2:B:170:LEU:HD23	2:B:170:LEU:HA	1.85	0.40
1:A:1301:LEU:HD23	1:A:1301:LEU:HA	1.96	0.40
1:A:222:LEU:HD23	1:A:222:LEU:HA	1.95	0.40
1:A:844:LYS:HB2	1:A:844:LYS:HE3	1.79	0.40
3:C:114:LEU:HD23	3:C:117:VAL:HG12	2.03	0.40

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	1260/2028 (62%)	1217 (97%)	43 (3%)	0	100	100
2	B	169/218 (78%)	167 (99%)	2 (1%)	0	100	100
3	C	118/215 (55%)	109 (92%)	9 (8%)	0	100	100
All	All	1547/2461 (63%)	1493 (96%)	54 (4%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	1134/1807 (63%)	1077 (95%)	57 (5%)	20 46
2	B	156/190 (82%)	148 (95%)	8 (5%)	20 45
3	C	113/193 (58%)	106 (94%)	7 (6%)	15 36
All	All	1403/2190 (64%)	1331 (95%)	72 (5%)	22 45

All (72) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	85	LYS
1	A	88	PHE
1	A	93	LYS
1	A	108	MET
1	A	139	ASN
1	A	153	LYS
1	A	174	ARG
1	A	192	ASP
1	A	198	PHE
1	A	214	ARG
1	A	217	ARG
1	A	220	ARG
1	A	295	SER
1	A	358	MET
1	A	362	TYR
1	A	407	GLU
1	A	408	GLN
1	A	414	GLU
1	A	736	CYS
1	A	747	ASP
1	A	809	ASN
1	A	819	SER
1	A	835	ARG
1	A	838	ARG
1	A	844	LYS
1	A	854	MET
1	A	861	ASN
1	A	969	SER
1	A	975	ASN
1	A	988	LEU
1	A	1009	PHE
1	A	1176	LYS
1	A	1179	TRP
1	A	1287	LYS

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Mol	Chain	Res	Type
1	A	1303	ARG
1	A	1308	ARG
1	A	1366	ASN
1	A	1370	CYS
1	A	1385	LEU
1	A	1388	ASN
1	A	1408	TRP
1	A	1459	ASN
1	A	1477	GLU
1	A	1495	LYS
1	A	1528	ASN
1	A	1533	MET
1	A	1543	MET
1	A	1561	GLU
1	A	1571	HIS
1	A	1603	PHE
1	A	1616	ARG
1	A	1625	LYS
1	A	1628	LYS
1	A	1661	PHE
1	A	1670	LYS
1	A	1709	ASN
1	A	1755	TYR
2	B	42	SER
2	B	72	ARG
2	B	83	ASP
2	B	89	ARG
2	B	93	ASN
2	B	140	LYS
2	B	141	LYS
2	B	149	LYS
3	C	56	TYR
3	C	63	PHE
3	C	79	MET
3	C	85	MET
3	C	113	MET
3	C	130	MET
3	C	148	MET

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

Mol	Chain	Res	Type
1	A	101	ASN
1	A	1753	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

4 monosaccharides 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	$\#\|Z\| > 2$
4	NAG	D	1	1,4	14,14,15	0.30	0	17,19,21	0.67	1 (5%)
4	NAG	D	2	4	14,14,15	0.31	0	17,19,21	0.70	0
4	NAG	E	1	1,4	14,14,15	0.46	0	17,19,21	1.82	1 (5%)
4	NAG	E	2	4	14,14,15	0.33	0	17,19,21	0.80	1 (5%)

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
4	NAG	D	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	D	2	4	-	0/6/23/26	0/1/1/1
4	NAG	E	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	E	2	4	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	E	1	NAG	C1-O5-C5	6.35	120.80	112.19
4	D	1	NAG	C1-O5-C5	2.21	115.19	112.19
4	E	2	NAG	C1-O5-C5	2.17	115.13	112.19

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	E	1	NAG	O5-C5-C6-O6
4	E	1	NAG	C4-C5-C6-O6

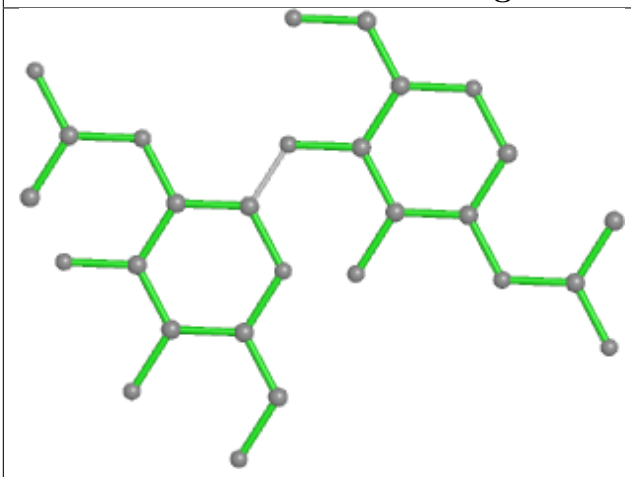
There are no ring outliers.

3 monomers are involved in 2 short contacts:

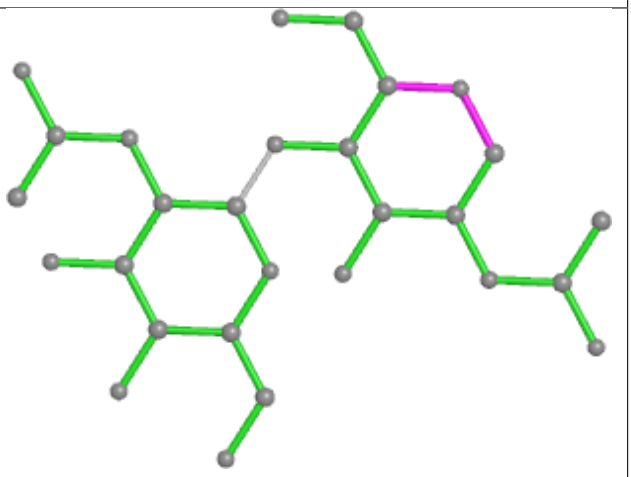
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	E	1	NAG	1	0
4	D	1	NAG	1	0
4	D	2	NAG	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

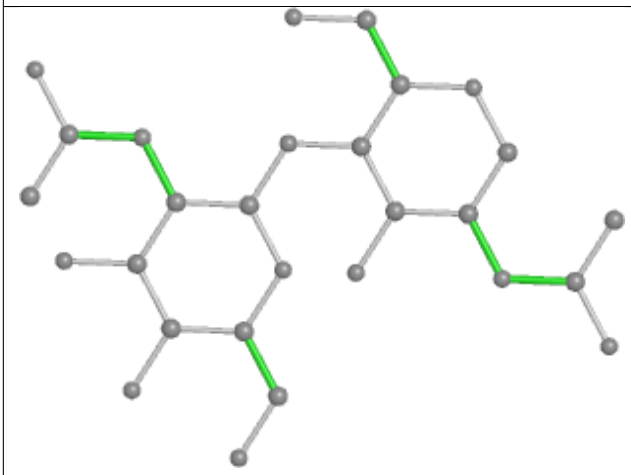
Oligosaccharide Chain D



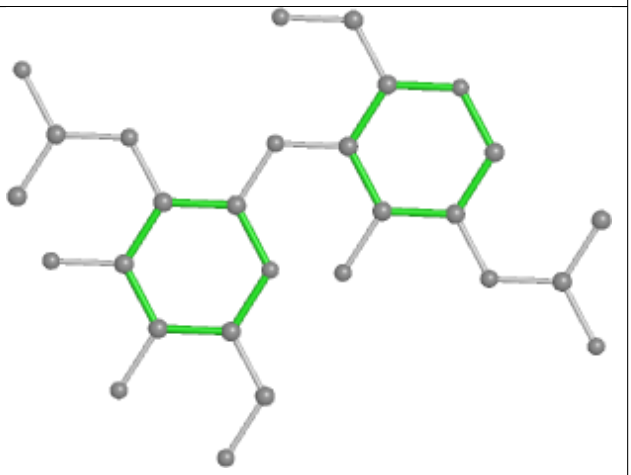
Bond lengths



Bond angles

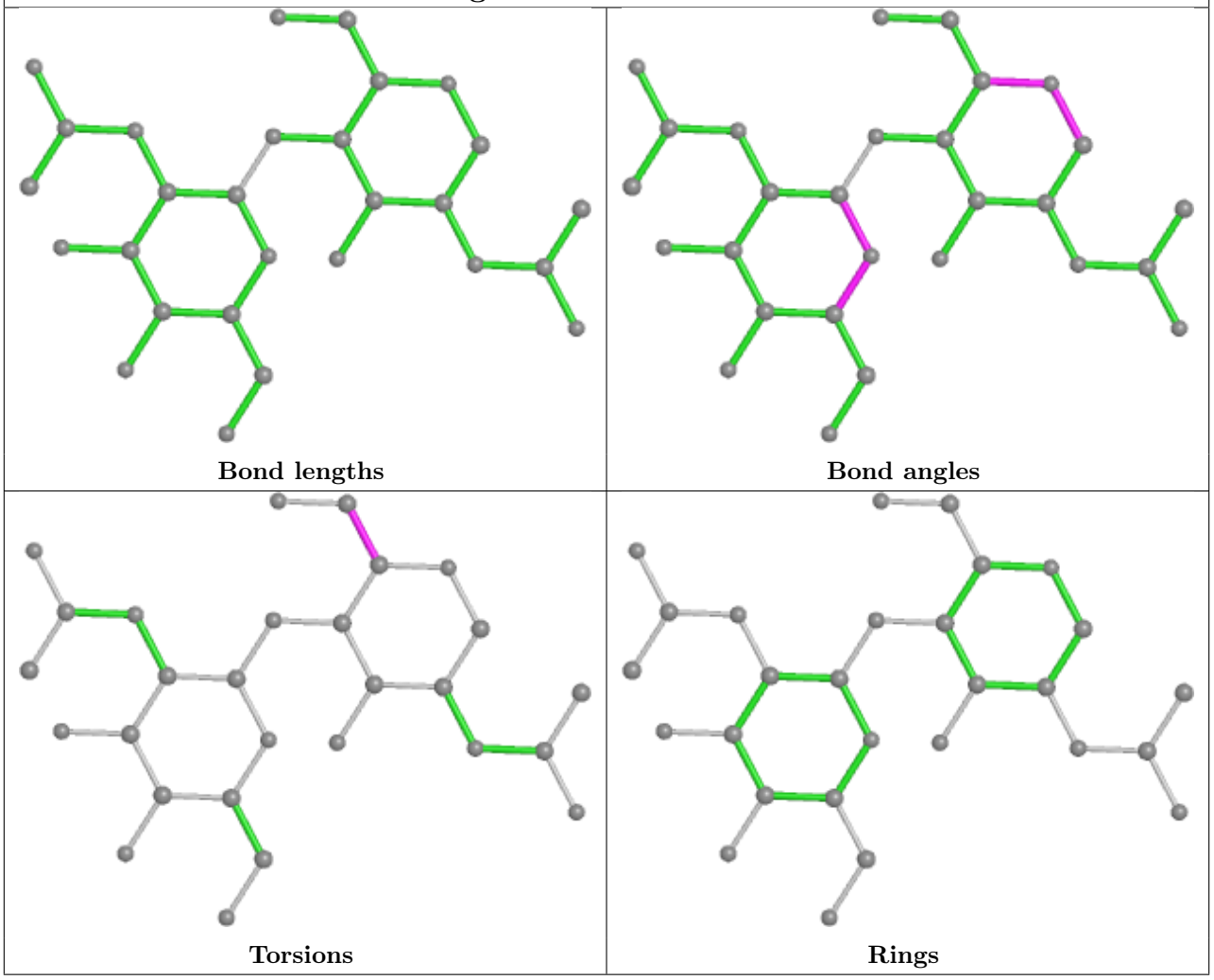


Torsions



Rings

Oligosaccharide Chain E



5.6 Ligand geometry (i)

26 ligands 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	$\#\|Z\| > 2$
7	Y01	A	2007	-	38,38,38	0.44	0	57,57,57	0.51	0
9	PCW	A	2019	-	43,43,53	0.31	0	49,51,61	0.31	0
5	NAG	B	302	2	14,14,15	0.31	0	17,19,21	0.69	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
5	NAG	C	301	3	14,14,15	0.44	0	17,19,21	1.18	1 (5%)
7	Y01	A	2006	-	38,38,38	0.44	0	57,57,57	0.49	0
5	NAG	A	2001	1	14,14,15	0.66	0	17,19,21	1.96	4 (23%)
10	OJ0	A	2021	-	22,22,22	3.90	8 (36%)	29,29,29	1.50	6 (20%)
8	LPE	A	2017	-	24,24,33	0.28	0	28,30,39	0.36	0
5	NAG	B	304	2	14,14,15	0.33	0	17,19,21	0.79	1 (5%)
8	LPE	A	2015	-	24,24,33	0.28	0	28,30,39	0.34	0
5	NAG	B	303	2	14,14,15	0.30	0	17,19,21	0.57	0
7	Y01	A	2004	-	38,38,38	0.45	0	57,57,57	0.47	0
9	PCW	A	2011	-	52,52,53	0.32	0	58,60,61	0.32	0
9	PCW	A	2013	-	46,46,53	0.32	0	52,54,61	0.36	0
7	Y01	A	2008	-	38,38,38	0.43	0	57,57,57	0.54	0
6	P5S	A	2003	-	33,34,53	0.44	0	36,40,60	0.51	0
9	PCW	A	2020	-	43,43,53	0.32	0	49,51,61	0.39	0
8	LPE	A	2018	-	24,24,33	0.27	0	28,30,39	0.34	0
5	NAG	B	301	2	14,14,15	0.24	0	17,19,21	0.76	0
8	LPE	A	2016	-	24,24,33	0.28	0	28,30,39	0.38	0
8	LPE	A	2010	-	24,24,33	0.31	0	25,27,39	0.42	0
7	Y01	A	2005	-	38,38,38	0.44	0	57,57,57	0.48	0
5	NAG	A	2002	1	14,14,15	0.37	0	17,19,21	0.76	0
9	PCW	A	2014	-	43,43,53	0.31	0	49,51,61	0.35	0
8	LPE	A	2012	-	27,27,33	0.26	0	31,33,39	0.34	0
7	Y01	A	2009	-	38,38,38	0.44	0	57,57,57	0.53	0

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
7	Y01	A	2007	-	-	1/19/77/77	0/4/4/4
9	PCW	A	2019	-	-	6/47/47/57	-
5	NAG	B	302	2	-	0/6/23/26	0/1/1/1
5	NAG	C	301	3	-	4/6/23/26	0/1/1/1
7	Y01	A	2006	-	-	8/19/77/77	0/4/4/4
5	NAG	A	2001	1	-	6/6/23/26	0/1/1/1
10	OJ0	A	2021	-	-	1/12/23/23	0/2/2/2
8	LPE	A	2017	-	-	5/25/25/34	-
5	NAG	B	304	2	-	0/6/23/26	0/1/1/1
8	LPE	A	2015	-	-	5/25/25/34	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	B	303	2	-	2/6/23/26	0/1/1/1
7	Y01	A	2004	-	-	0/19/77/77	0/4/4/4
9	PCW	A	2011	-	-	3/56/56/57	-
9	PCW	A	2013	-	-	9/50/50/57	-
7	Y01	A	2008	-	-	8/19/77/77	0/4/4/4
6	P5S	A	2003	-	-	4/39/39/59	-
9	PCW	A	2020	-	-	13/47/47/57	-
8	LPE	A	2018	-	-	5/25/25/34	-
5	NAG	B	301	2	-	3/6/23/26	0/1/1/1
8	LPE	A	2016	-	-	6/25/25/34	-
8	LPE	A	2010	-	-	4/25/25/34	-
7	Y01	A	2005	-	-	0/19/77/77	0/4/4/4
5	NAG	A	2002	1	-	2/6/23/26	0/1/1/1
9	PCW	A	2014	-	-	4/47/47/57	-
8	LPE	A	2012	-	-	4/28/28/34	-
7	Y01	A	2009	-	-	2/19/77/77	0/4/4/4

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	A	2021	OJ0	C04-N02	-10.53	1.34	1.48
10	A	2021	OJ0	C09-N02	-9.37	1.30	1.47
10	A	2021	OJ0	C06-N02	-8.91	1.29	1.47
10	A	2021	OJ0	C13-C16	-3.86	1.34	1.40
10	A	2021	OJ0	O01-C10	-3.80	1.15	1.23
10	A	2021	OJ0	C05-C04	2.78	1.59	1.53
10	A	2021	OJ0	C13-C15	-2.40	1.36	1.40
10	A	2021	OJ0	C10-N03	2.16	1.40	1.35

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	2001	NAG	C1-O5-C5	4.98	118.95	112.19
5	C	301	NAG	C1-O5-C5	3.58	117.05	112.19
5	A	2001	NAG	O5-C5-C6	3.54	112.75	107.20
5	A	2001	NAG	C1-C2-N2	-3.15	105.11	110.49
5	A	2001	NAG	O5-C1-C2	-3.01	106.54	111.29
10	A	2021	OJ0	C05-C04-N02	2.91	114.14	110.23
10	A	2021	OJ0	C09-N02-C06	2.42	116.32	111.17

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
10	A	2021	OJ0	C20-C16-C13	-2.35	118.41	121.44
10	A	2021	OJ0	C05-C04-C10	-2.29	107.96	112.12
10	A	2021	OJ0	C06-N02-C04	2.27	114.86	110.83
5	B	304	NAG	C1-O5-C5	2.23	115.22	112.19
10	A	2021	OJ0	O01-C10-N03	-2.15	119.30	123.93

There are no chirality outliers.

All (105) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	2001	NAG	C8-C7-N2-C2
5	A	2001	NAG	O7-C7-N2-C2
6	A	2003	P5S	O-C-CA-N
6	A	2003	P5S	N-CA-CB-OG
7	A	2009	Y01	OAG-CAY-OAW-CBC
7	A	2009	Y01	CAM-CAY-OAW-CBC
8	A	2010	LPE	C31-O33-P-O31
8	A	2010	LPE	C32-C31-O33-P
8	A	2015	LPE	C31-O33-P-O31
8	A	2017	LPE	C31-O33-P-O31
8	A	2017	LPE	C32-C31-O33-P
9	A	2019	PCW	C4-O4P-P-O2P
9	A	2020	PCW	C12-C11-O3-C3
9	A	2020	PCW	O11-C11-O3-C3
9	A	2020	PCW	C1-O3P-P-O2P
9	A	2020	PCW	C1-O3P-P-O4P
9	A	2020	PCW	C4-O4P-P-O2P
5	B	301	NAG	C8-C7-N2-C2
5	B	301	NAG	O7-C7-N2-C2
7	A	2006	Y01	CAJ-CAO-CBB-CBE
5	C	301	NAG	C8-C7-N2-C2
5	C	301	NAG	O7-C7-N2-C2
5	A	2001	NAG	O5-C5-C6-O6
5	A	2001	NAG	C4-C5-C6-O6
9	A	2014	PCW	C2-C1-O3P-P
7	A	2006	Y01	CAJ-CAO-CBB-CAC
5	A	2002	NAG	C8-C7-N2-C2
5	A	2002	NAG	O7-C7-N2-C2
5	B	301	NAG	C1-C2-N2-C7
6	A	2003	P5S	OXT-C-CA-N
5	C	301	NAG	C1-C2-N2-C7
6	A	2003	P5S	C2-C3-O16-P12

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Mol	Chain	Res	Type	Atoms
5	B	303	NAG	C8-C7-N2-C2
10	A	2021	OJ0	C09-C11-C12-C14
8	A	2012	LPE	C2-C3-O3-P
9	A	2013	PCW	C35-C36-C37-C38
5	C	301	NAG	C3-C2-N2-C7
5	B	303	NAG	O7-C7-N2-C2
9	A	2020	PCW	C2-C1-O3P-P
8	A	2016	LPE	C12-C11-O1-C1
7	A	2006	Y01	CAO-CBB-CBE-CBI
7	A	2006	Y01	CAO-CBB-CBE-CAP
7	A	2006	Y01	CAC-CBB-CBE-CBI
5	A	2001	NAG	C1-C2-N2-C7
7	A	2008	Y01	CAO-CBB-CBE-CBI
8	A	2010	LPE	C13-C14-C15-C16
8	A	2010	LPE	C31-O33-P-O3
8	A	2017	LPE	C31-O33-P-O3
9	A	2019	PCW	C4-O4P-P-O3P
7	A	2008	Y01	CAC-CBB-CBE-CBI
8	A	2015	LPE	C32-C31-O33-P
8	A	2016	LPE	C32-C31-O33-P
7	A	2006	Y01	CAC-CBB-CBE-CAP
8	A	2015	LPE	O33-C31-C32-N
8	A	2017	LPE	O33-C31-C32-N
8	A	2018	LPE	O33-C31-C32-N
9	A	2019	PCW	O4P-C4-C5-N
9	A	2020	PCW	O4P-C4-C5-N
8	A	2016	LPE	C12-C13-C14-C15
7	A	2008	Y01	CAO-CBB-CBE-CAP
7	A	2006	Y01	CAR-CBC-OAW-CAY
7	A	2008	Y01	CAV-CBC-OAW-CAY
8	A	2012	LPE	C3-O3-P-O33
8	A	2012	LPE	C31-O33-P-O3
8	A	2015	LPE	C31-O33-P-O3
8	A	2016	LPE	C3-O3-P-O33
8	A	2016	LPE	C31-O33-P-O3
8	A	2017	LPE	C3-O3-P-O33
8	A	2018	LPE	C3-O3-P-O33
8	A	2018	LPE	C31-O33-P-O3
9	A	2013	PCW	C1-O3P-P-O4P
9	A	2013	PCW	C4-O4P-P-O3P
9	A	2014	PCW	C1-O3P-P-O4P
9	A	2019	PCW	C1-O3P-P-O4P

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Mol	Chain	Res	Type	Atoms
9	A	2020	PCW	C4-O4P-P-O3P
8	A	2015	LPE	C12-C11-O1-C1
9	A	2013	PCW	C39-C40-C41-C42
9	A	2011	PCW	C2-C1-O3P-P
9	A	2020	PCW	C13-C14-C15-C16
7	A	2008	Y01	CAM-CAL-CAX-OAF
9	A	2020	PCW	C3-C2-O2-C31
7	A	2008	Y01	CAM-CAL-CAX-OAH
9	A	2020	PCW	C34-C35-C36-C37
9	A	2011	PCW	C17-C18-C19-C20
7	A	2008	Y01	CAC-CBB-CBE-CAP
7	A	2006	Y01	CAV-CBC-OAW-CAY
9	A	2013	PCW	C37-C38-C39-C40
9	A	2020	PCW	C17-C18-C19-C20
9	A	2013	PCW	C17-C18-C19-C20
7	A	2007	Y01	CAR-CBC-OAW-CAY
9	A	2014	PCW	O2-C31-C32-C33
9	A	2020	PCW	O2-C2-C3-O3
9	A	2013	PCW	C19-C20-C21-C22
9	A	2011	PCW	C19-C20-C21-C22
5	A	2001	NAG	C3-C2-N2-C7
7	A	2008	Y01	CAR-CBC-OAW-CAY
8	A	2012	LPE	C3-O3-P-O31
8	A	2016	LPE	C31-O33-P-O31
8	A	2018	LPE	C3-O3-P-O31
8	A	2018	LPE	C31-O33-P-O31
9	A	2013	PCW	C1-O3P-P-O2P
9	A	2019	PCW	C1-O3P-P-O2P
9	A	2019	PCW	C11-C12-C13-C14
9	A	2014	PCW	O31-C31-C32-C33
9	A	2013	PCW	O2-C31-C32-C33

There are no ring outliers.

15 monomers are involved in 32 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	A	2007	Y01	1	0
9	A	2019	PCW	1	0
7	A	2006	Y01	1	0
10	A	2021	OJ0	11	0
8	A	2015	LPE	1	0
9	A	2011	PCW	4	0

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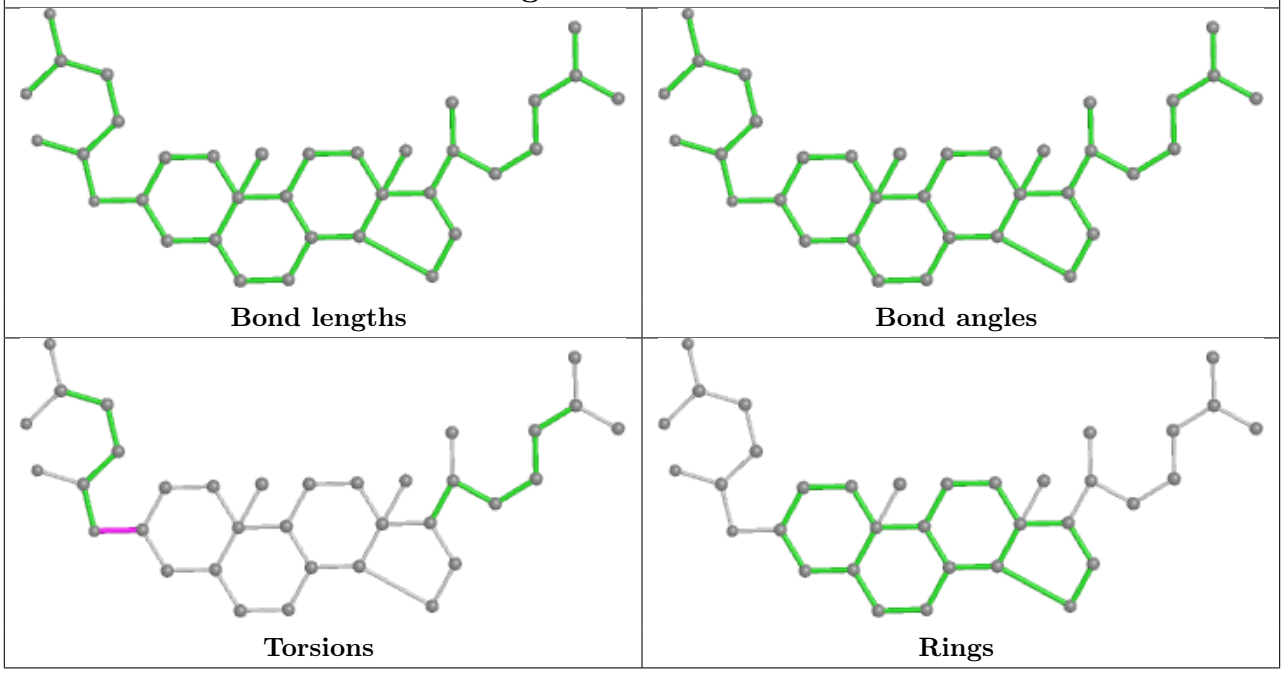
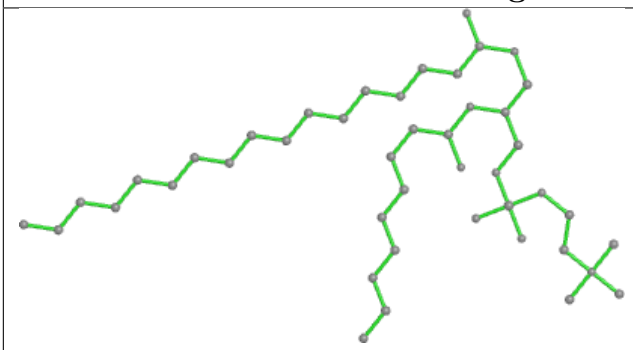
Mol	Chain	Res	Type	Clashes	Symm-Clashes
9	A	2013	PCW	1	0
7	A	2008	Y01	3	0
6	A	2003	P5S	1	0
9	A	2020	PCW	3	0
8	A	2016	LPE	1	0
8	A	2010	LPE	3	0
7	A	2005	Y01	1	0
9	A	2014	PCW	3	0
7	A	2009	Y01	2	0

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.

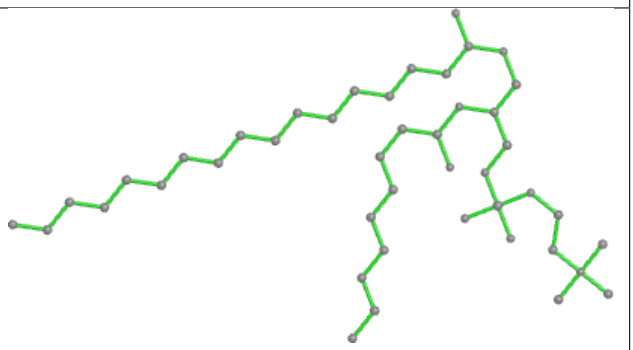
Ligand Y01 A 2007



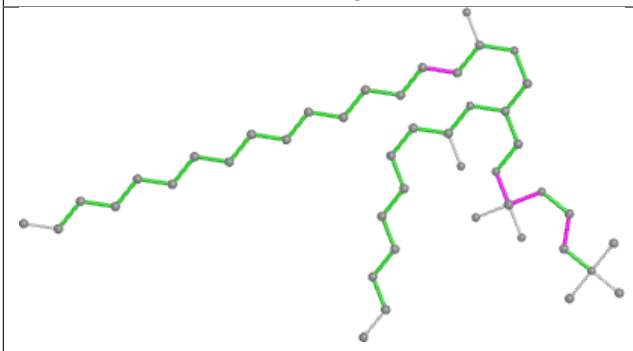
Ligand PCW A 2019



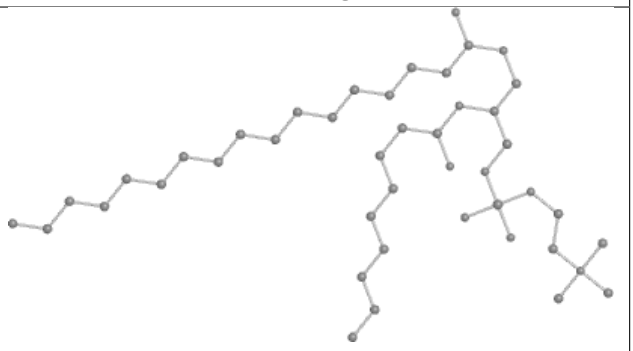
Bond lengths



Bond angles

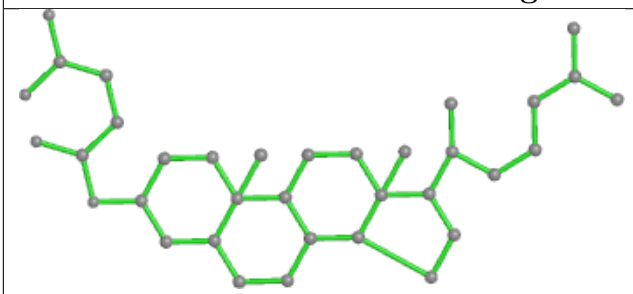


Torsions

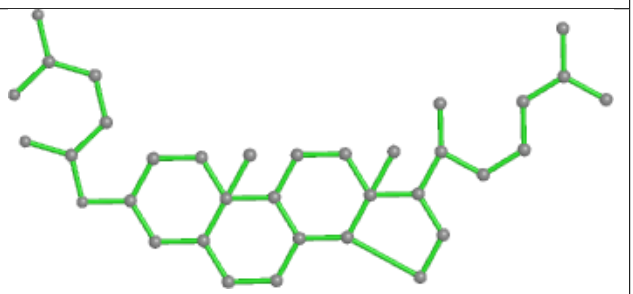


Rings

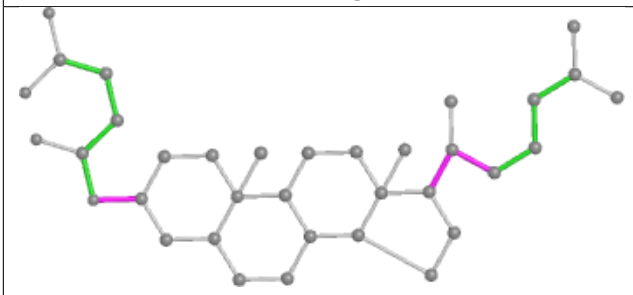
Ligand Y01 A 2006



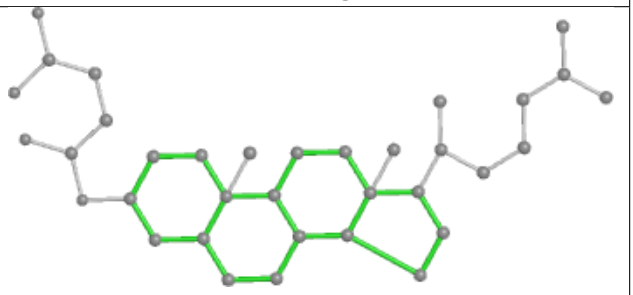
Bond lengths



Bond angles

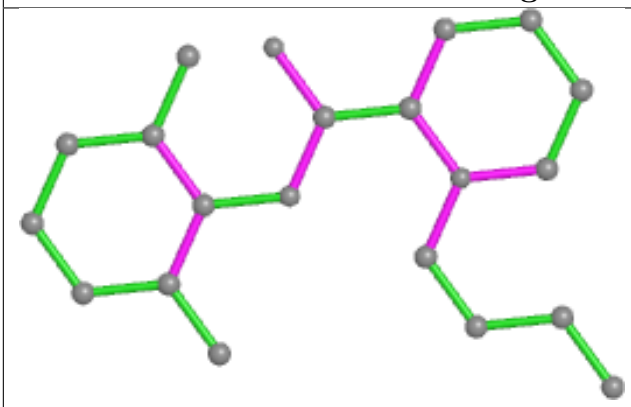


Torsions

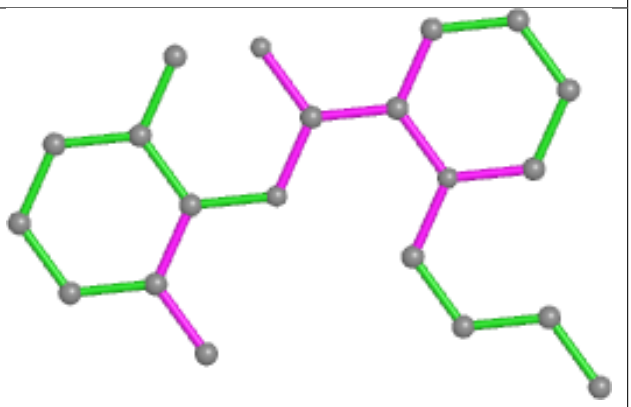


Rings

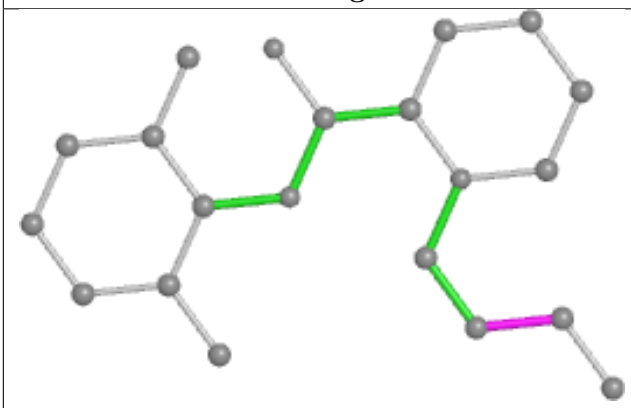
Ligand OJ0 A 2021



Bond lengths



Bond angles



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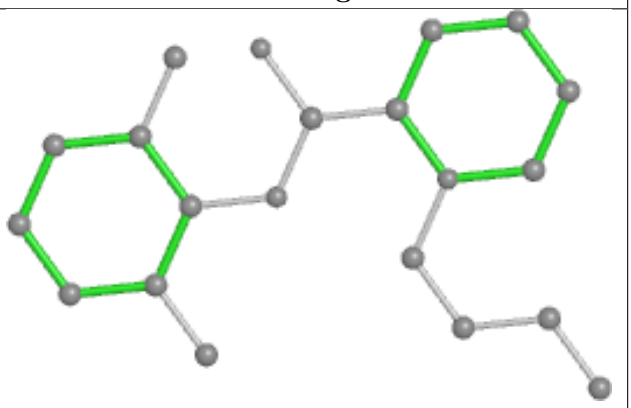
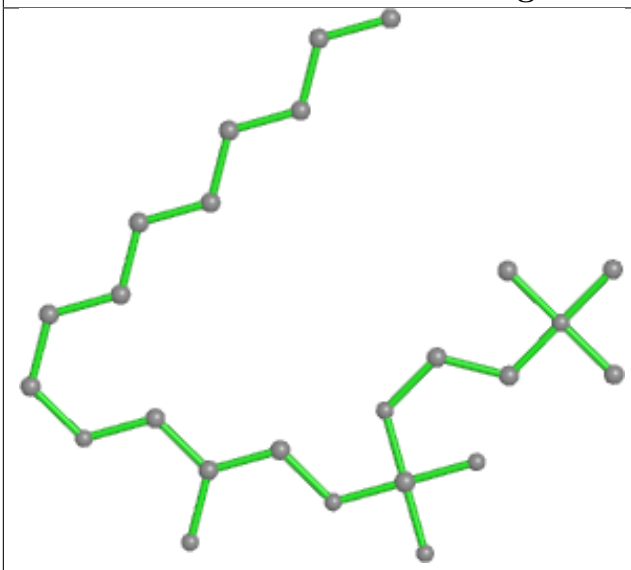
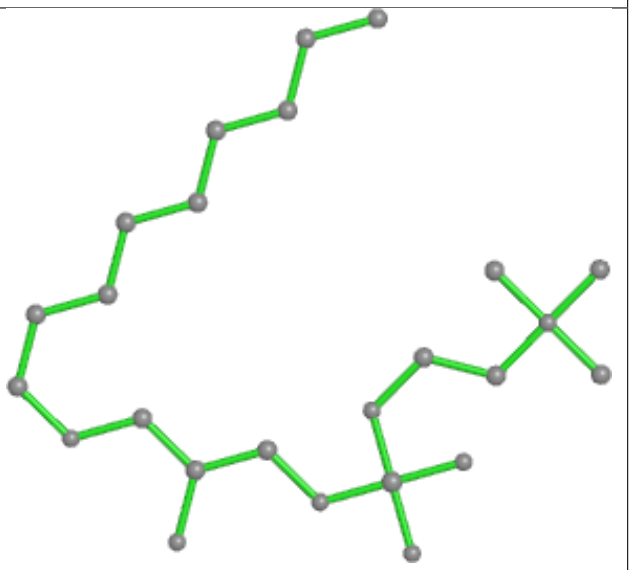


Rings

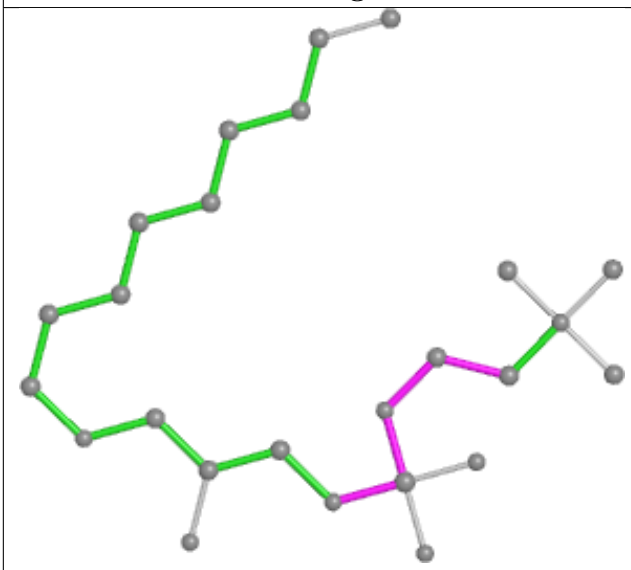
Ligand LPE A 2017



Bond lengths



Bond angles



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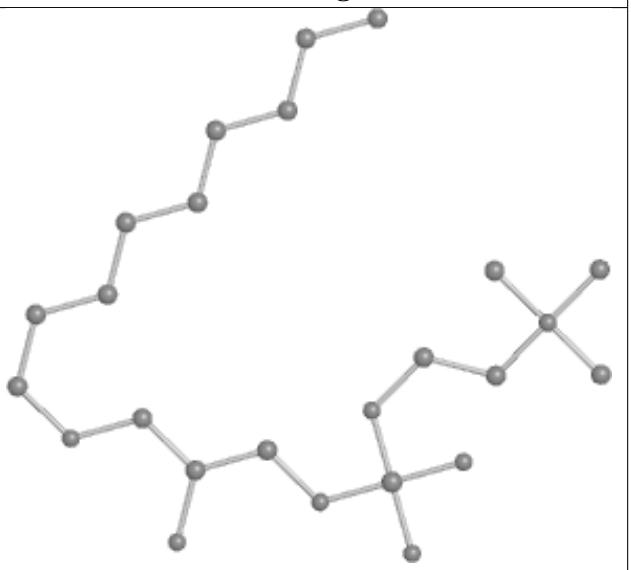
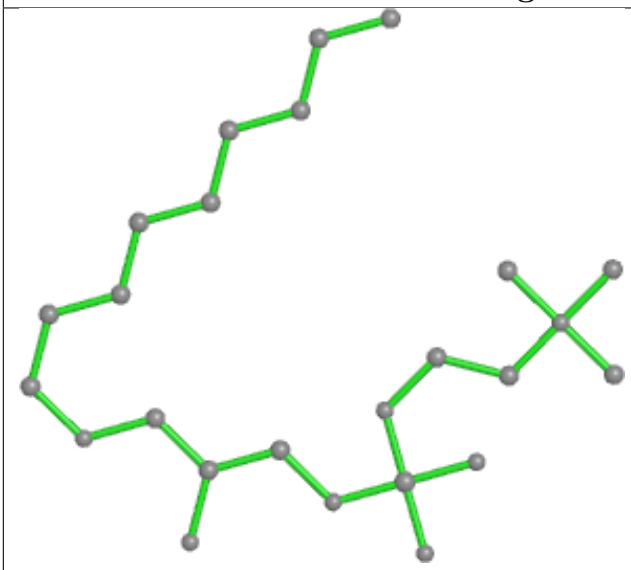
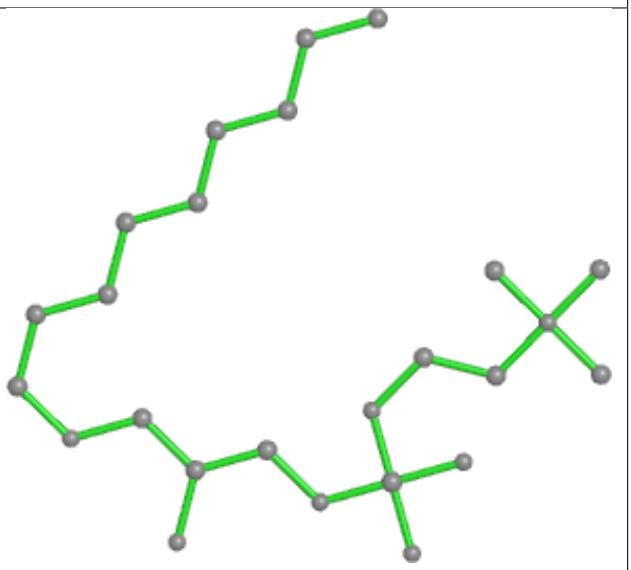


Rings

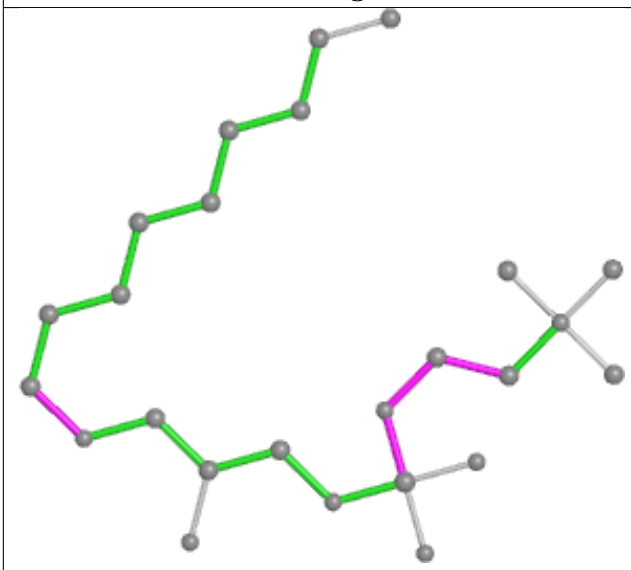
Ligand LPE A 2015



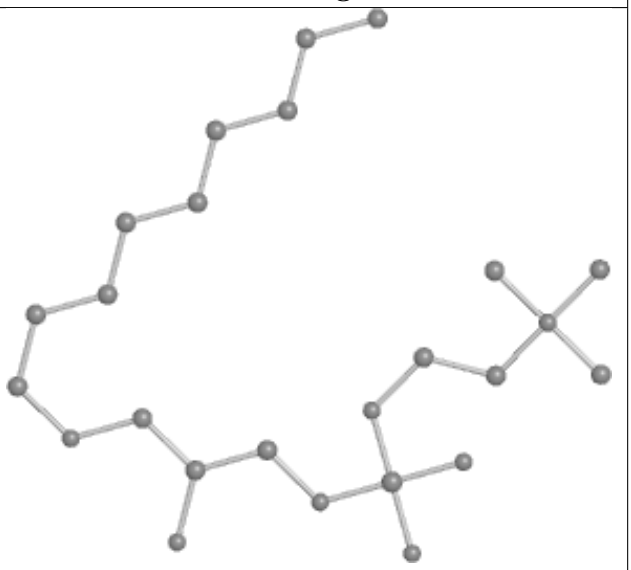
Bond lengths



Bond angles

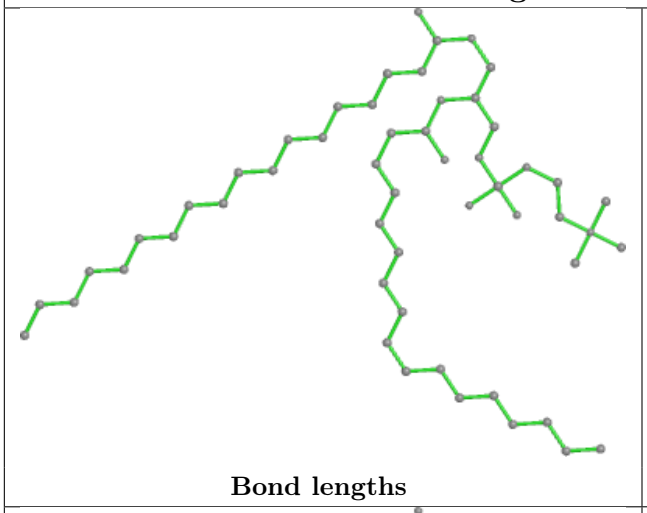


Torsions



Rings

Ligand PCW A 2011



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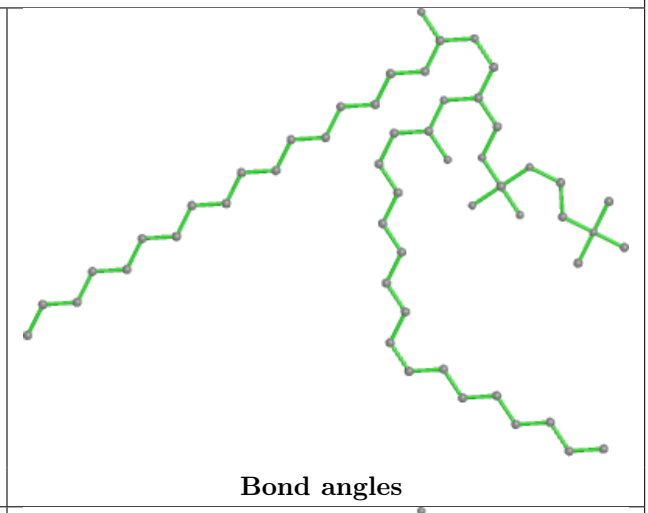
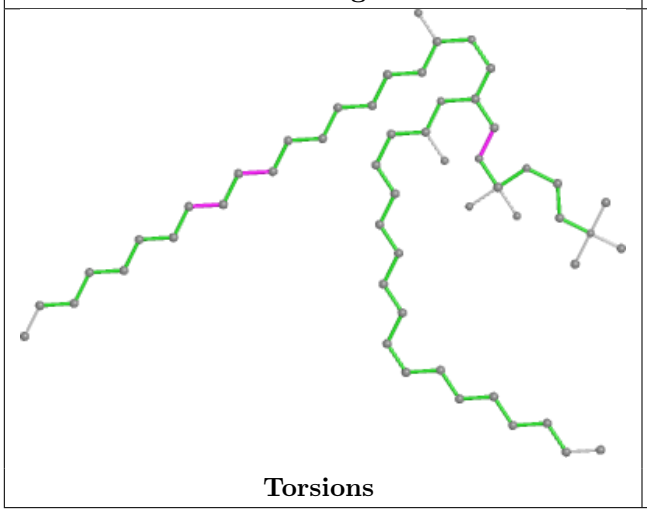
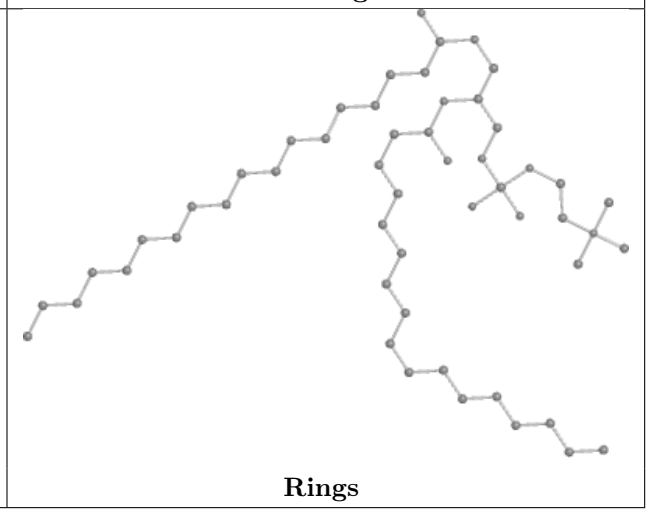


Bond angles

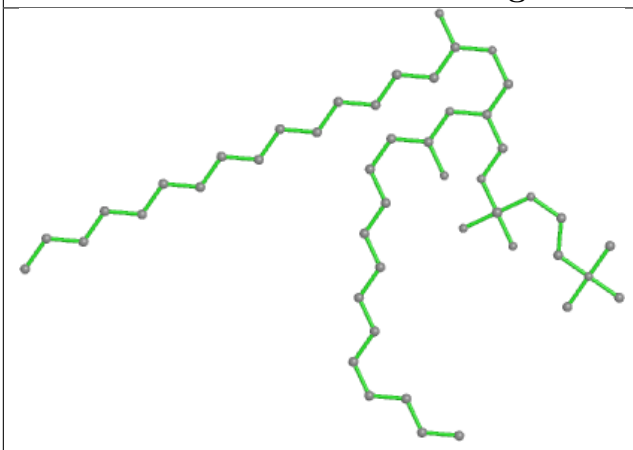


Torsions

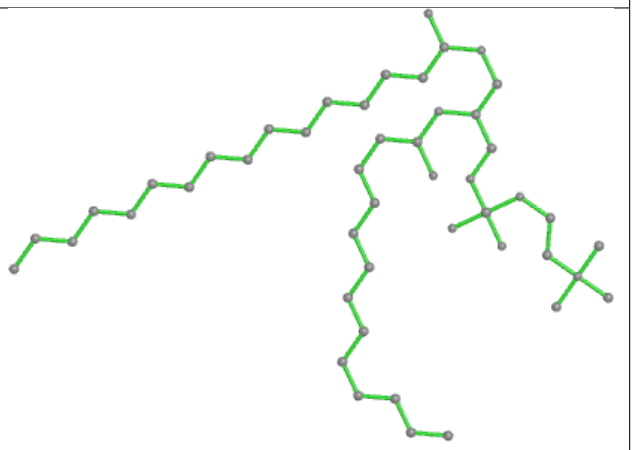


Rings

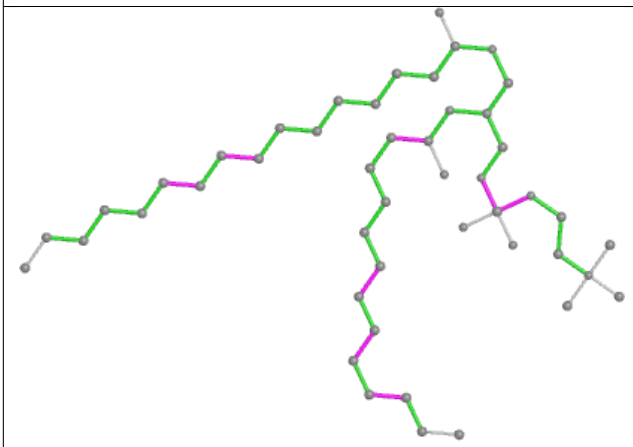
Ligand PCW A 2013



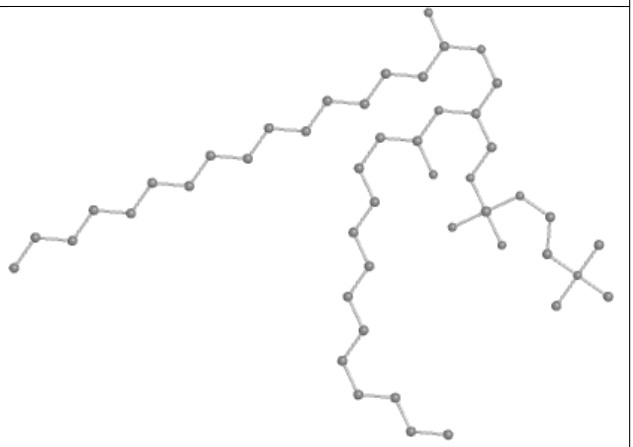
Bond lengths



Bond angles

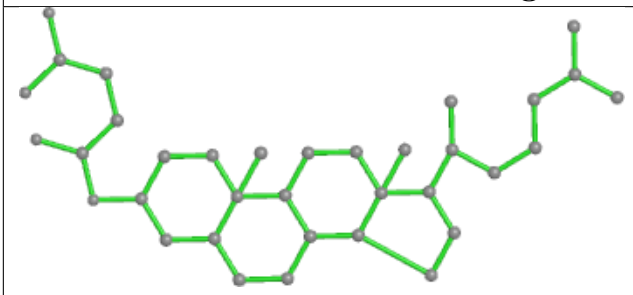


Torsions

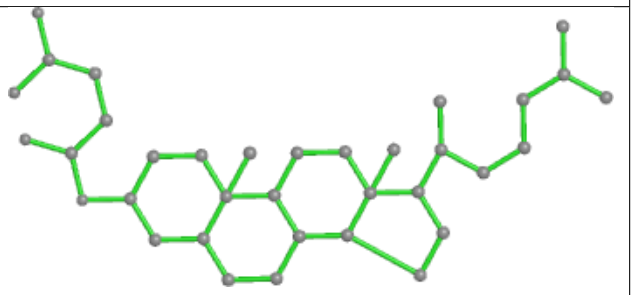


Rings

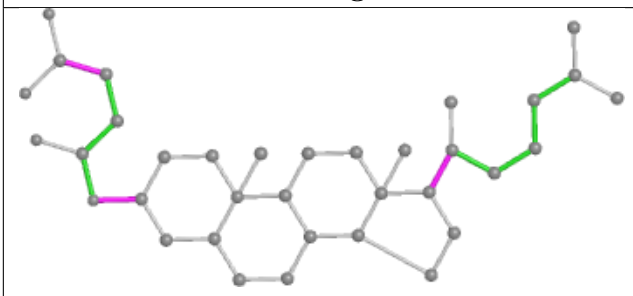
Ligand Y01 A 2008



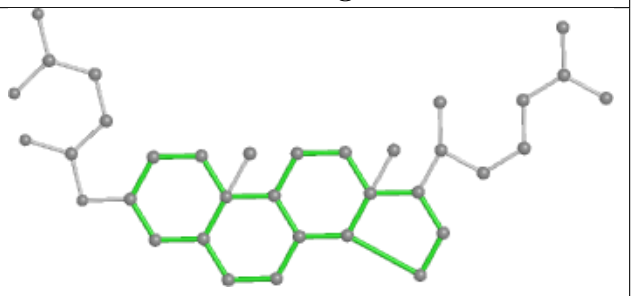
Bond lengths



Bond angles

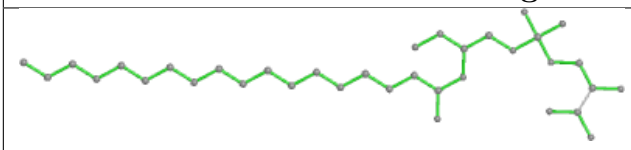


Torsions

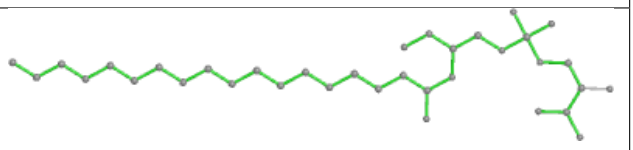


Rings

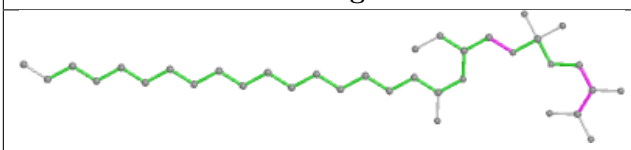
Ligand P5S A 2003



Bond lengths



Bond angles



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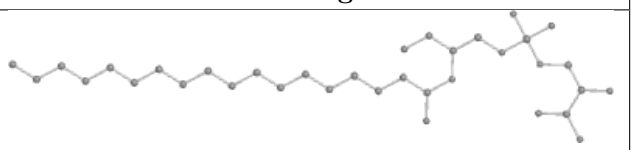
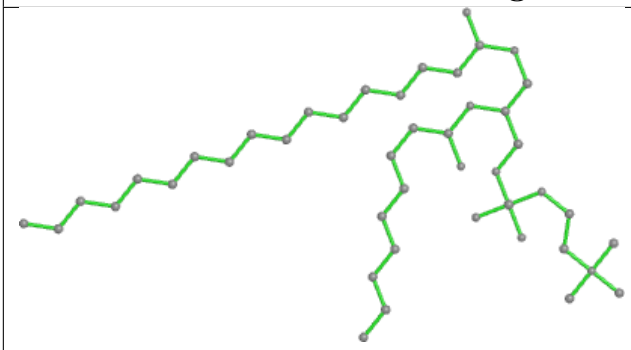
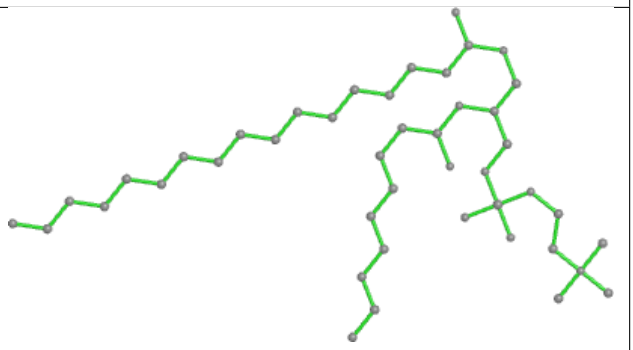


Rings

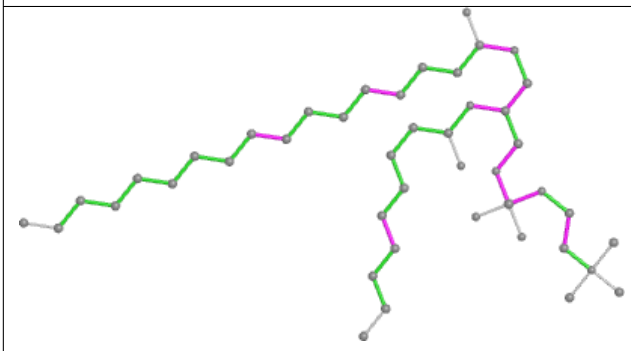
Ligand PCW A 2020



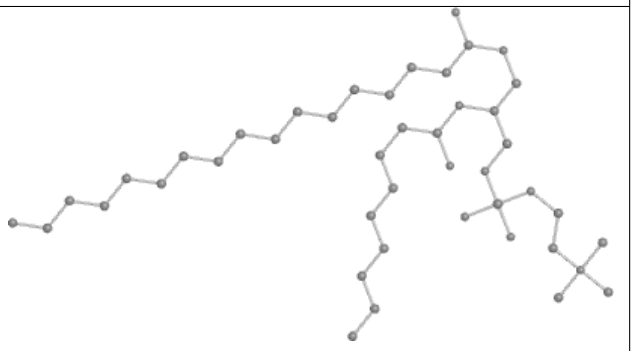
Bond lengths



Bond angles

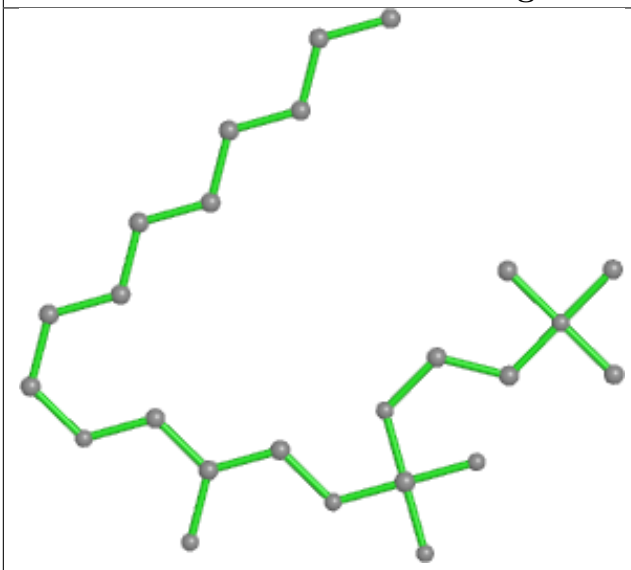


Torsions

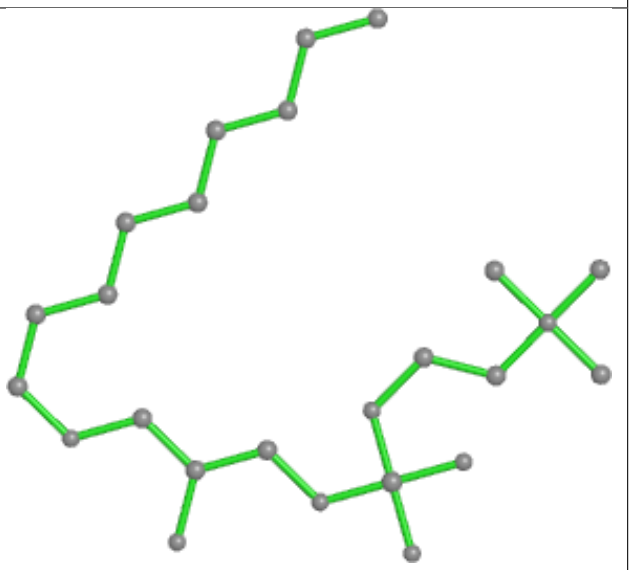


Rings

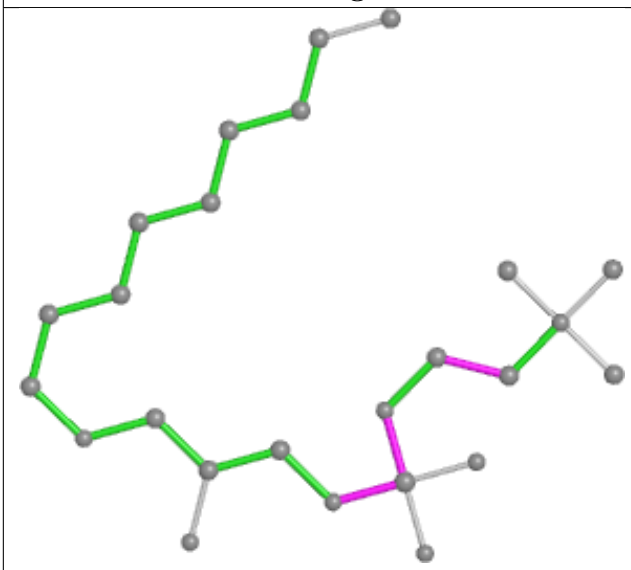
Ligand LPE A 2018



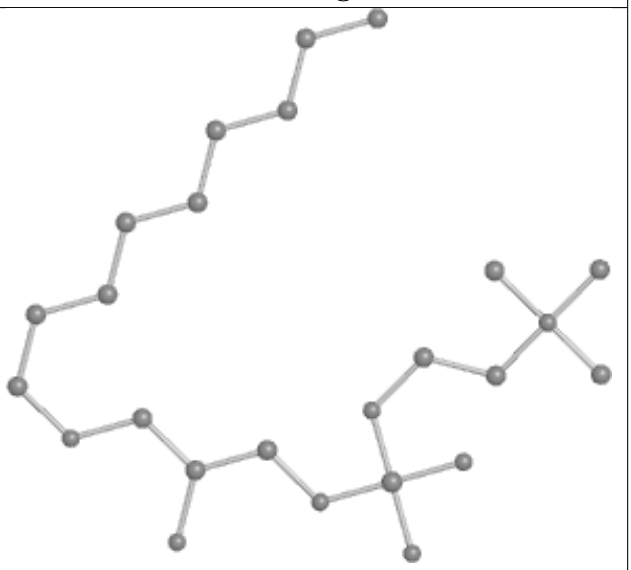
Bond lengths



Bond angles

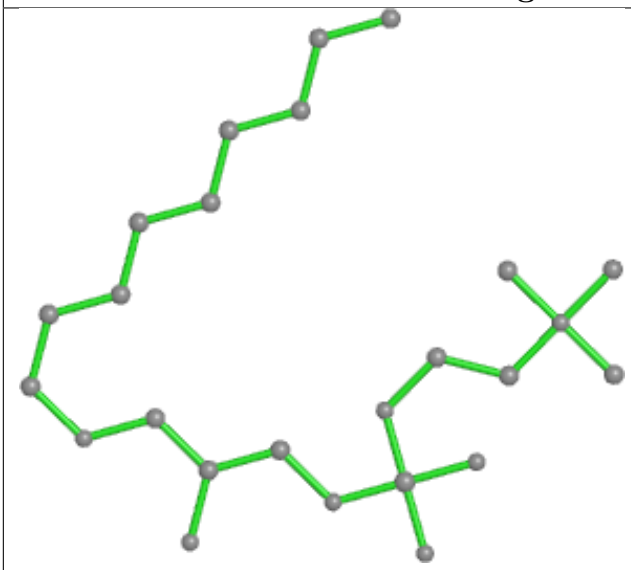


Torsions

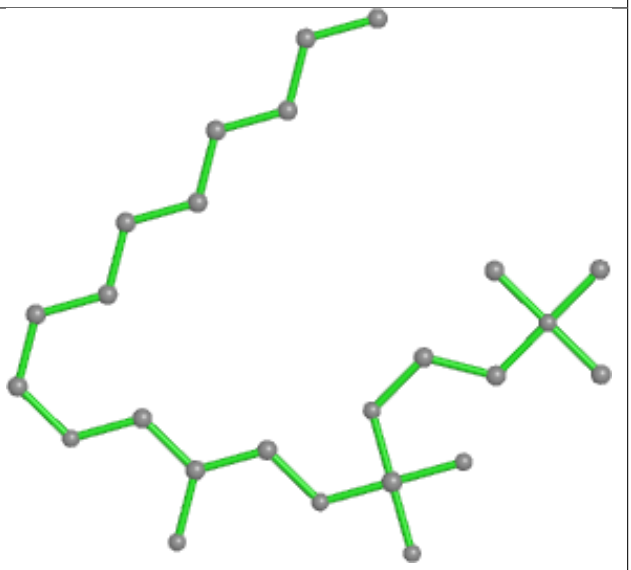


Rings

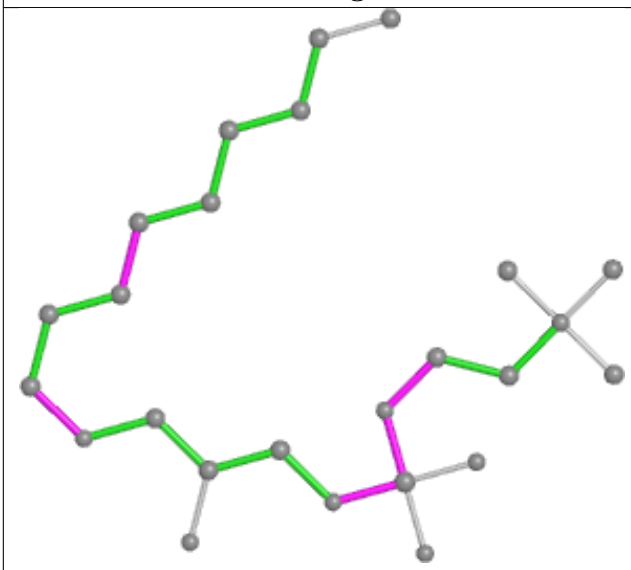
Ligand LPE A 2016



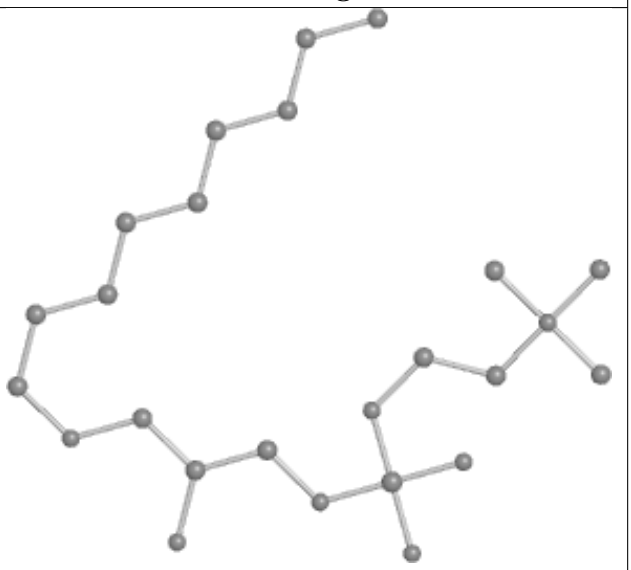
Bond lengths



Bond angles

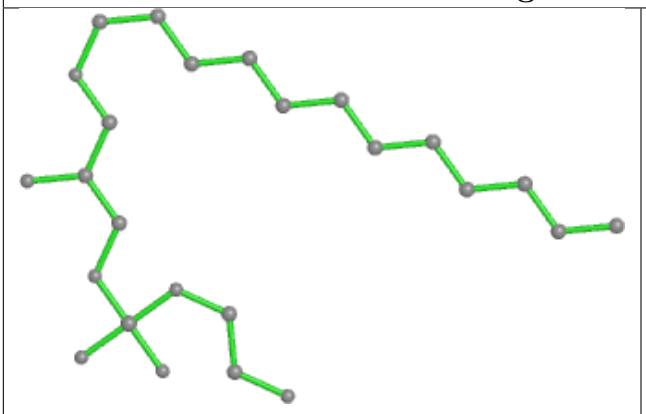


Torsions

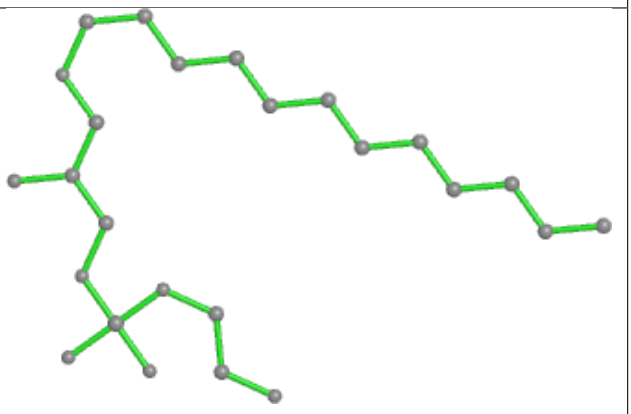


Rings

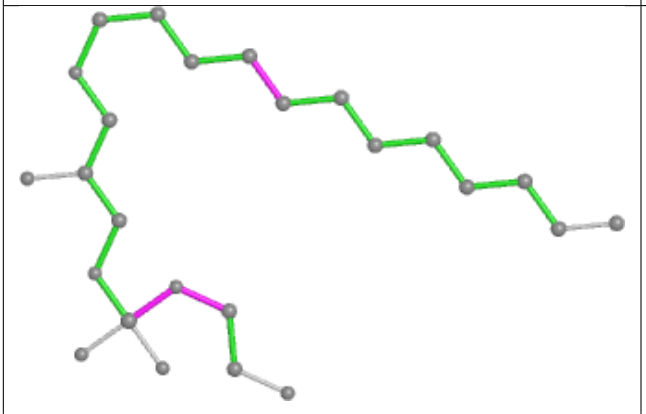
Ligand LPE A 2010



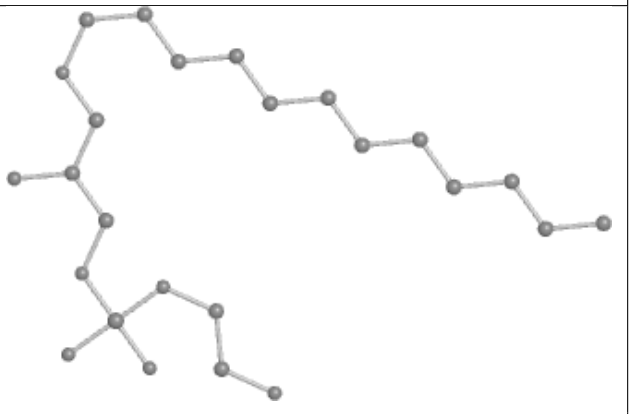
Bond lengths



Bond angles

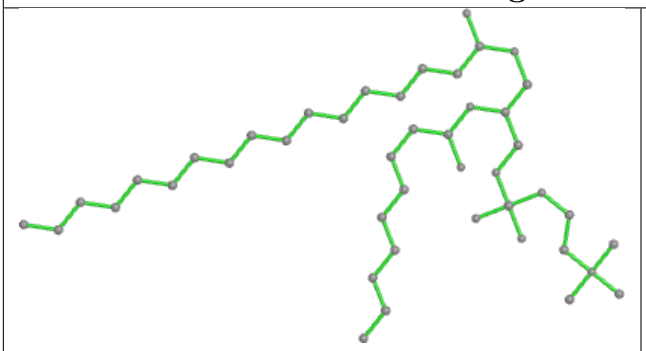


Torsions

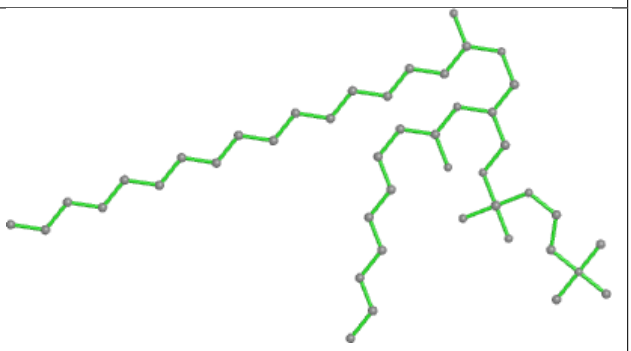


Rings

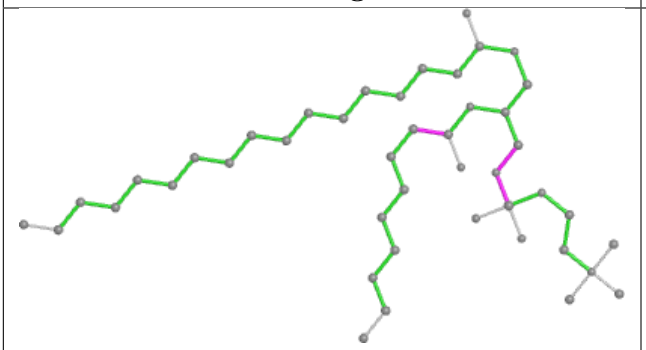
Ligand PCW A 2014



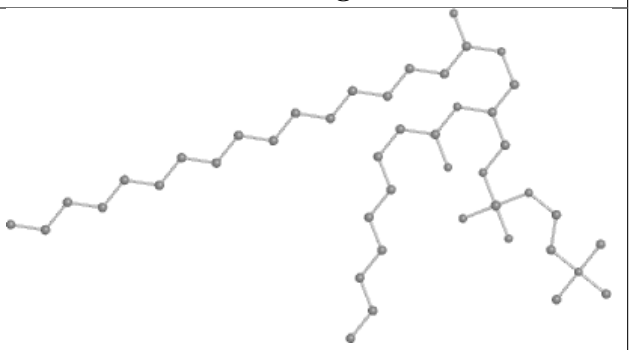
Bond lengths



Bond angles

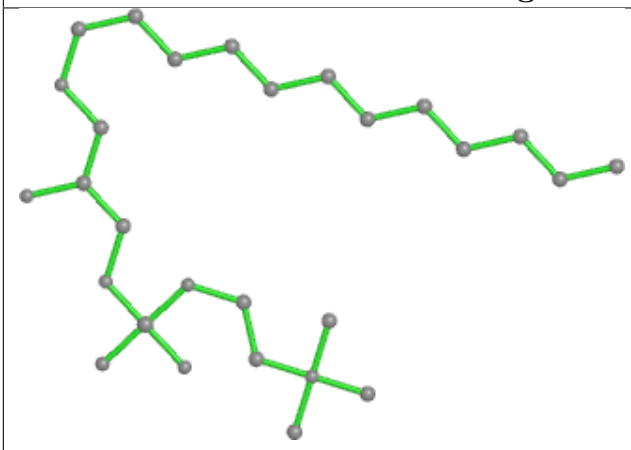


Torsions

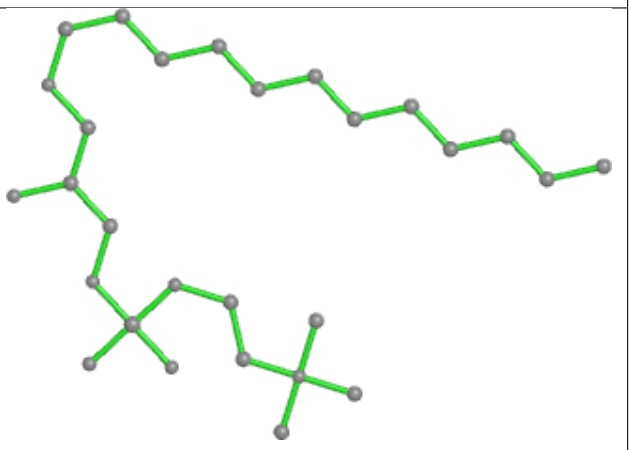


Rings

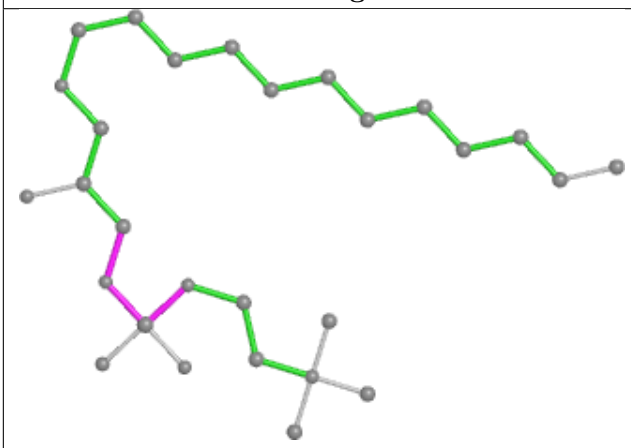
Ligand LPE A 2012



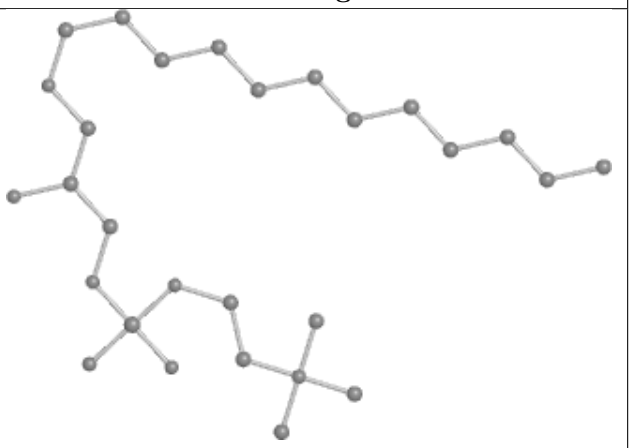
Bond lengths



Bond angles

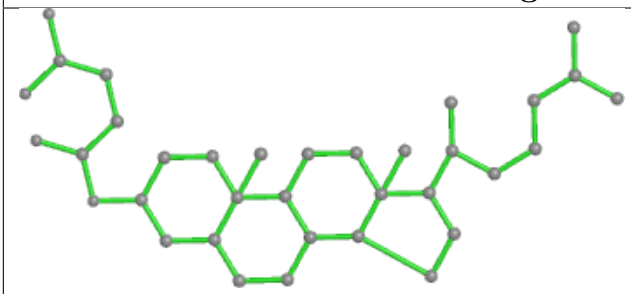


Torsions

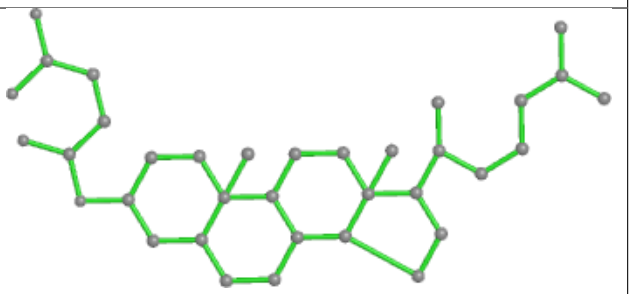


Rings

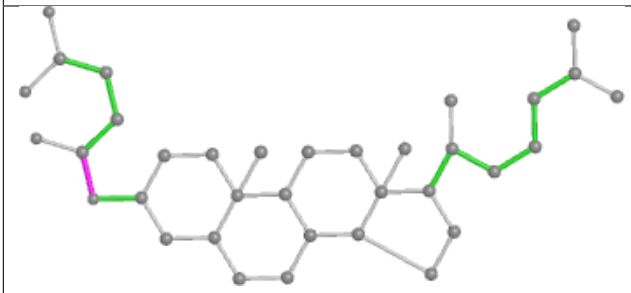
Ligand Y01 A 2009



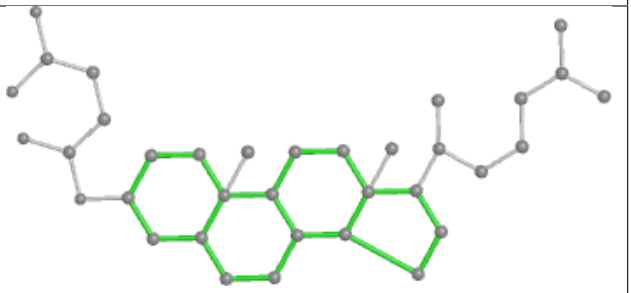
Bond lengths



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.

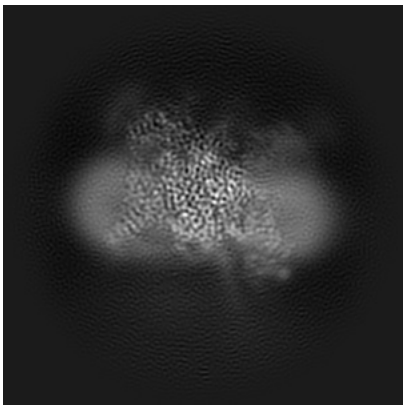
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-35193. These allow visual inspection of the internal detail of the map and identification of artifacts.

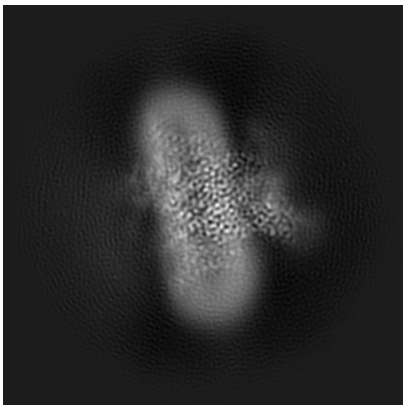
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

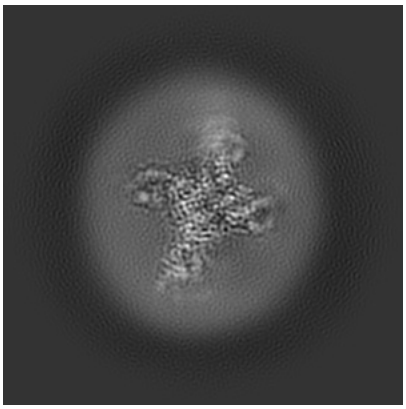
6.1.1 Primary map



X

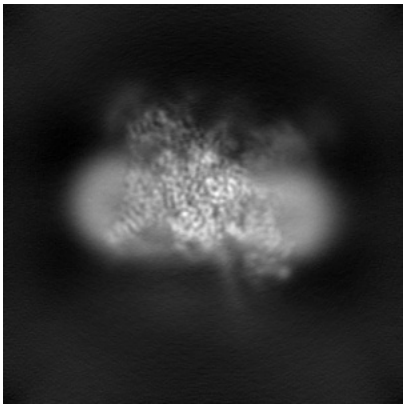


Y

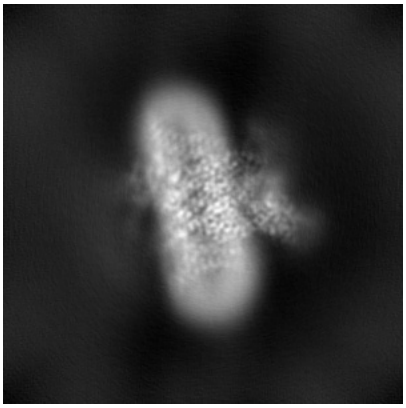


Z

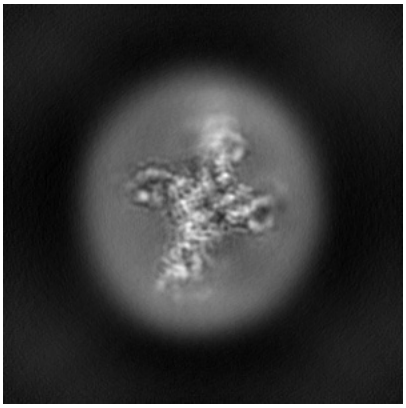
6.1.2 Raw map



X



Y

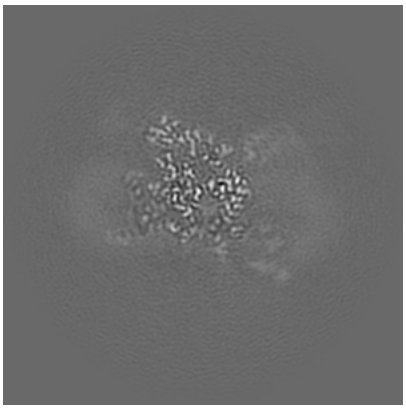


Z

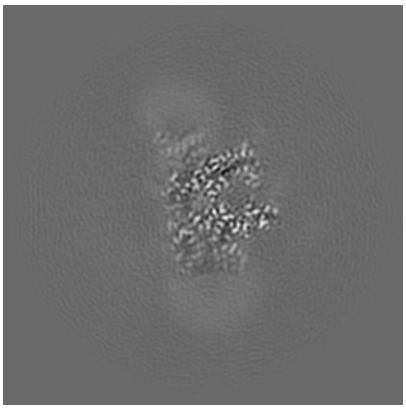
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

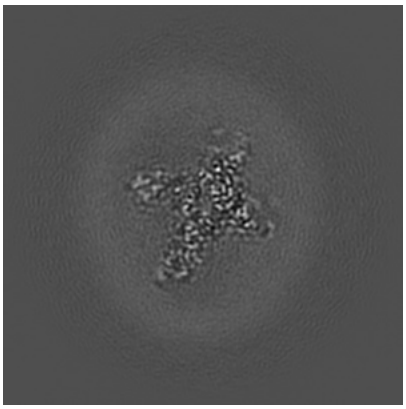
6.2.1 Primary map



X Index: 144

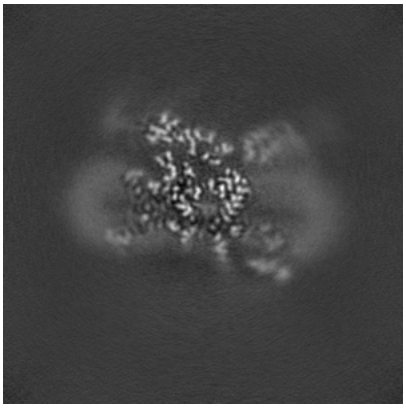


Y Index: 144

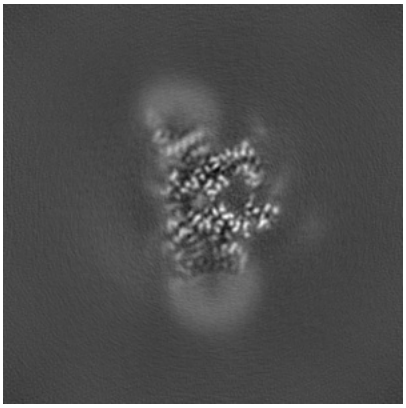


Z Index: 144

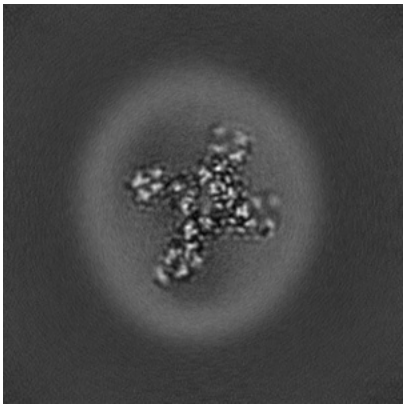
6.2.2 Raw map



X Index: 144



Y Index: 144

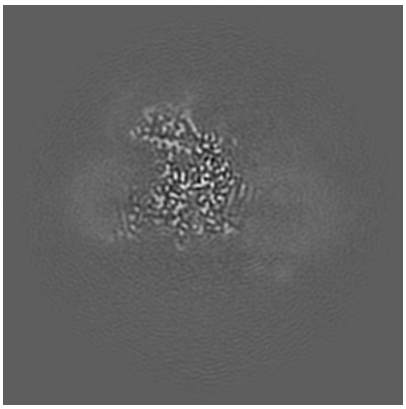


Z Index: 144

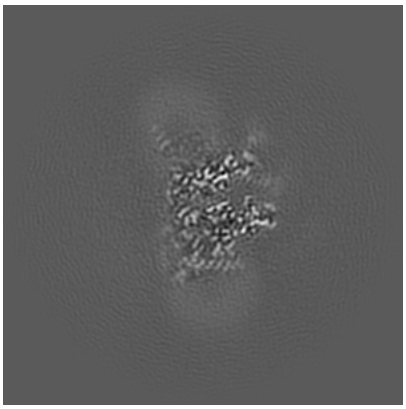
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

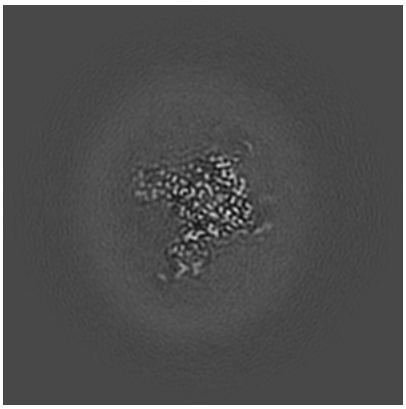
6.3.1 Primary map



X Index: 134

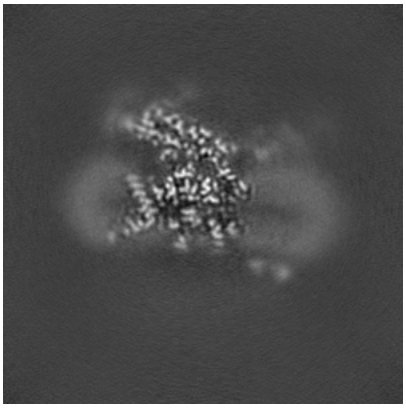


Y Index: 149

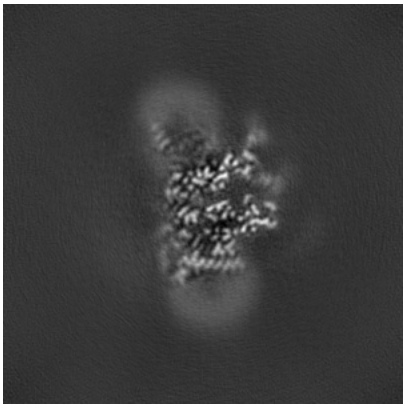


Z Index: 151

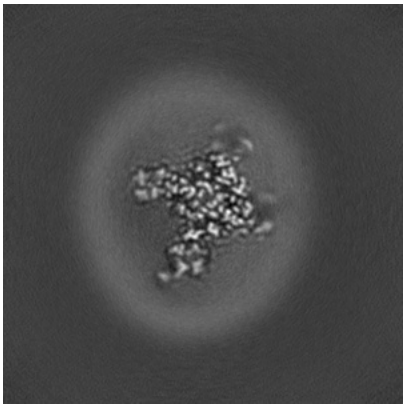
6.3.2 Raw map



X Index: 139



Y Index: 149

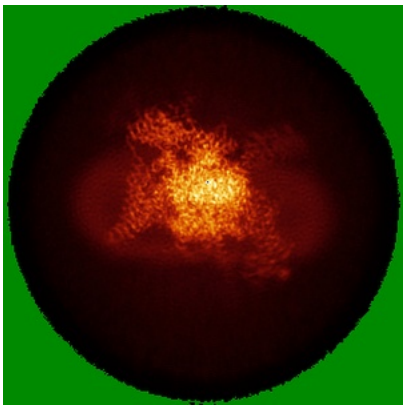


Z Index: 151

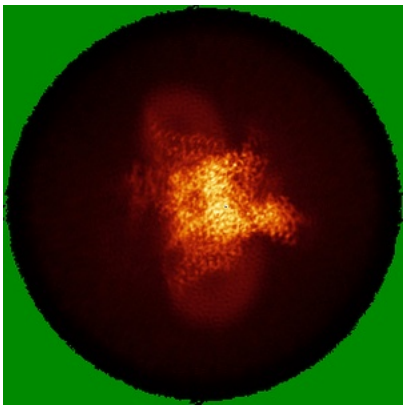
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

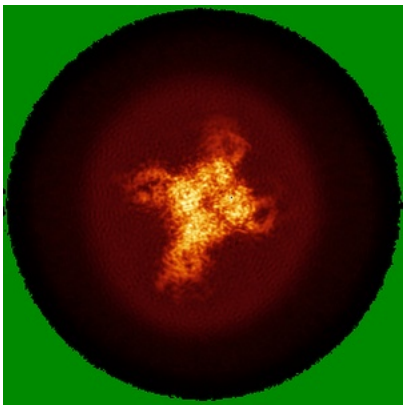
6.4.1 Primary map



X

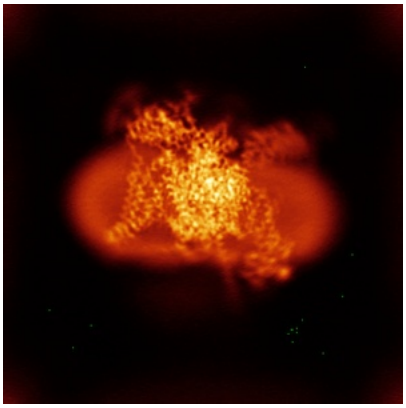


Y

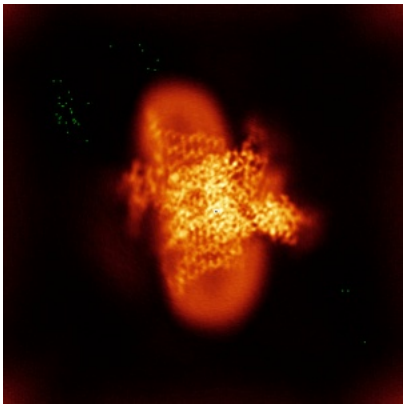


Z

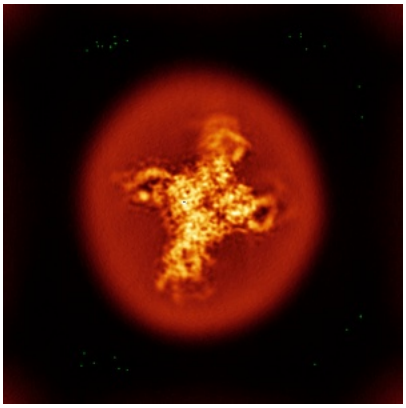
6.4.2 Raw map



X



Y



Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

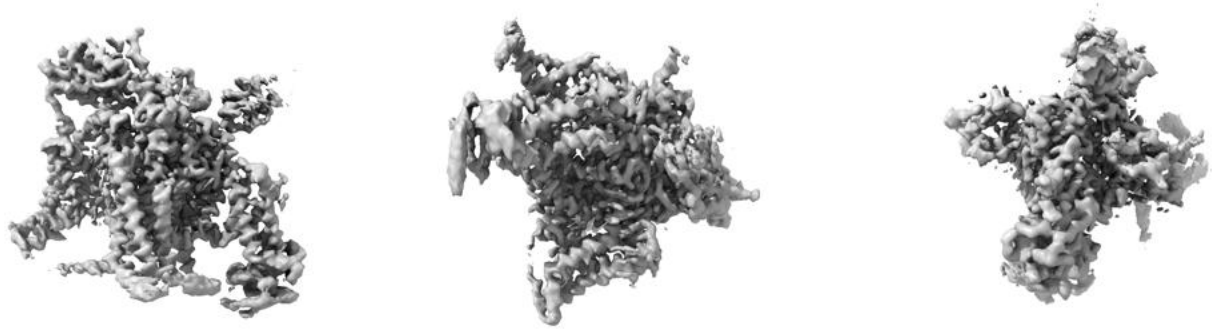
6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.35. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



X Y Z

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

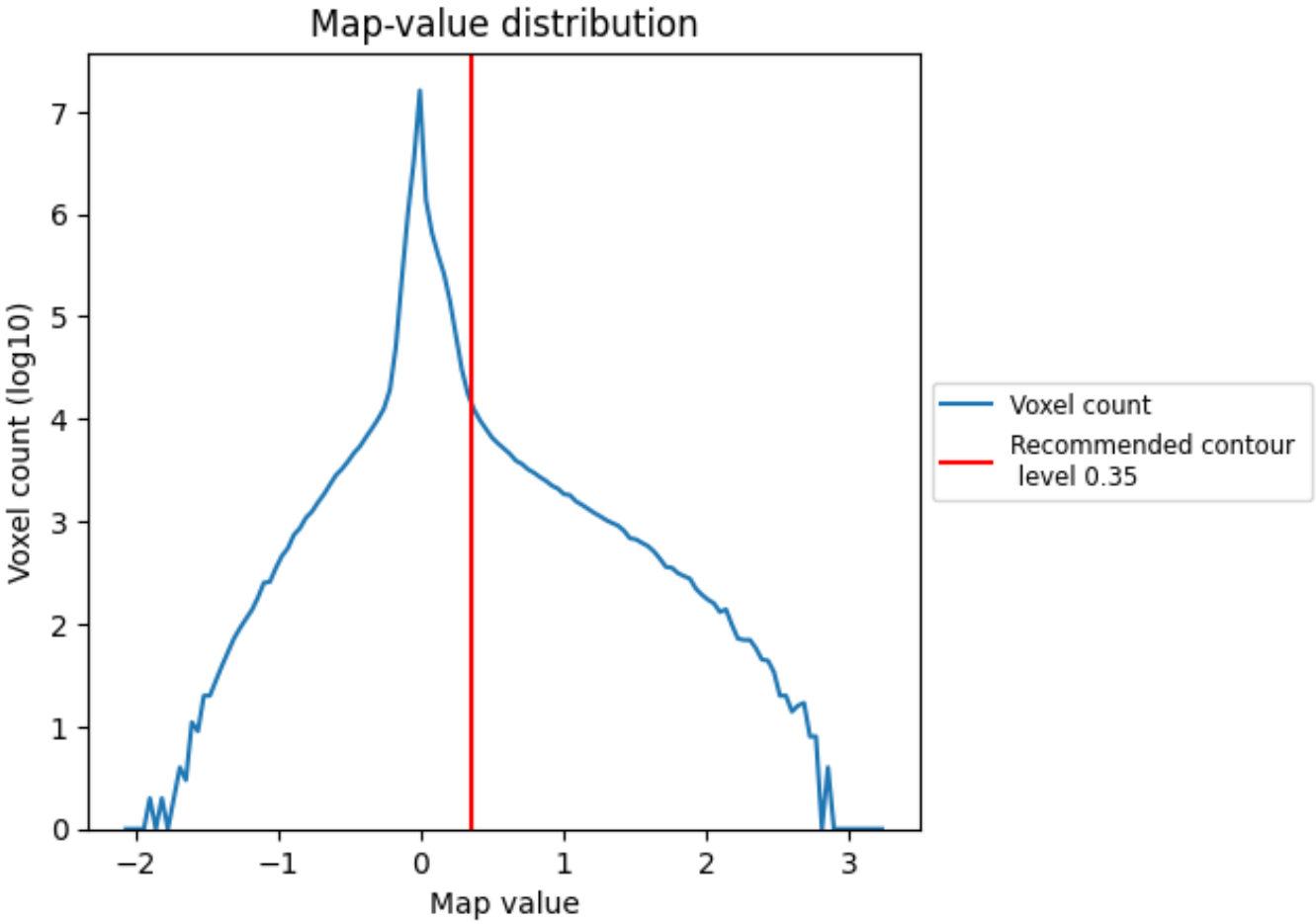
6.6 Mask visualisation (i)

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

7 Map analysis

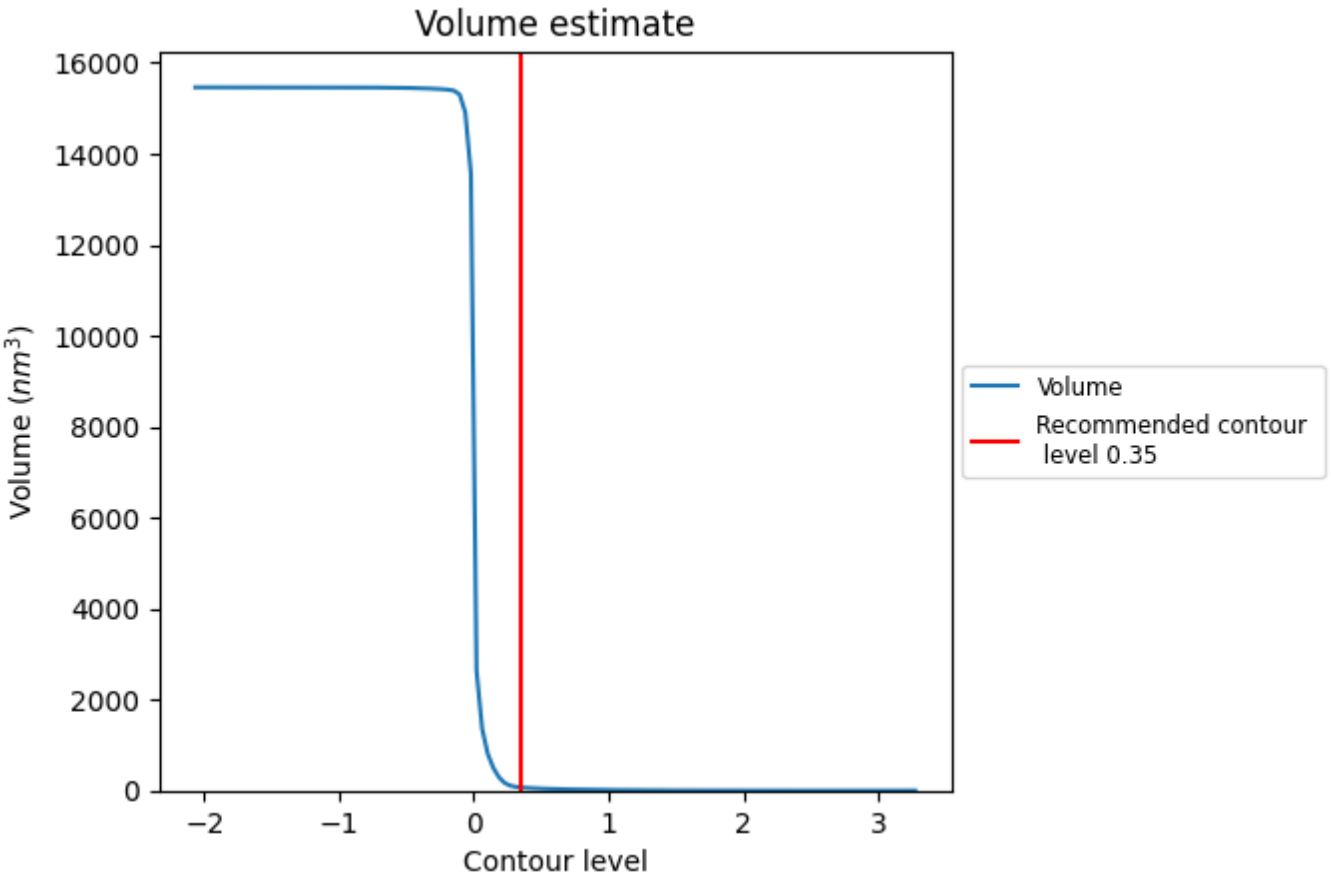
This section contains the results of statistical analysis of the map.

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.

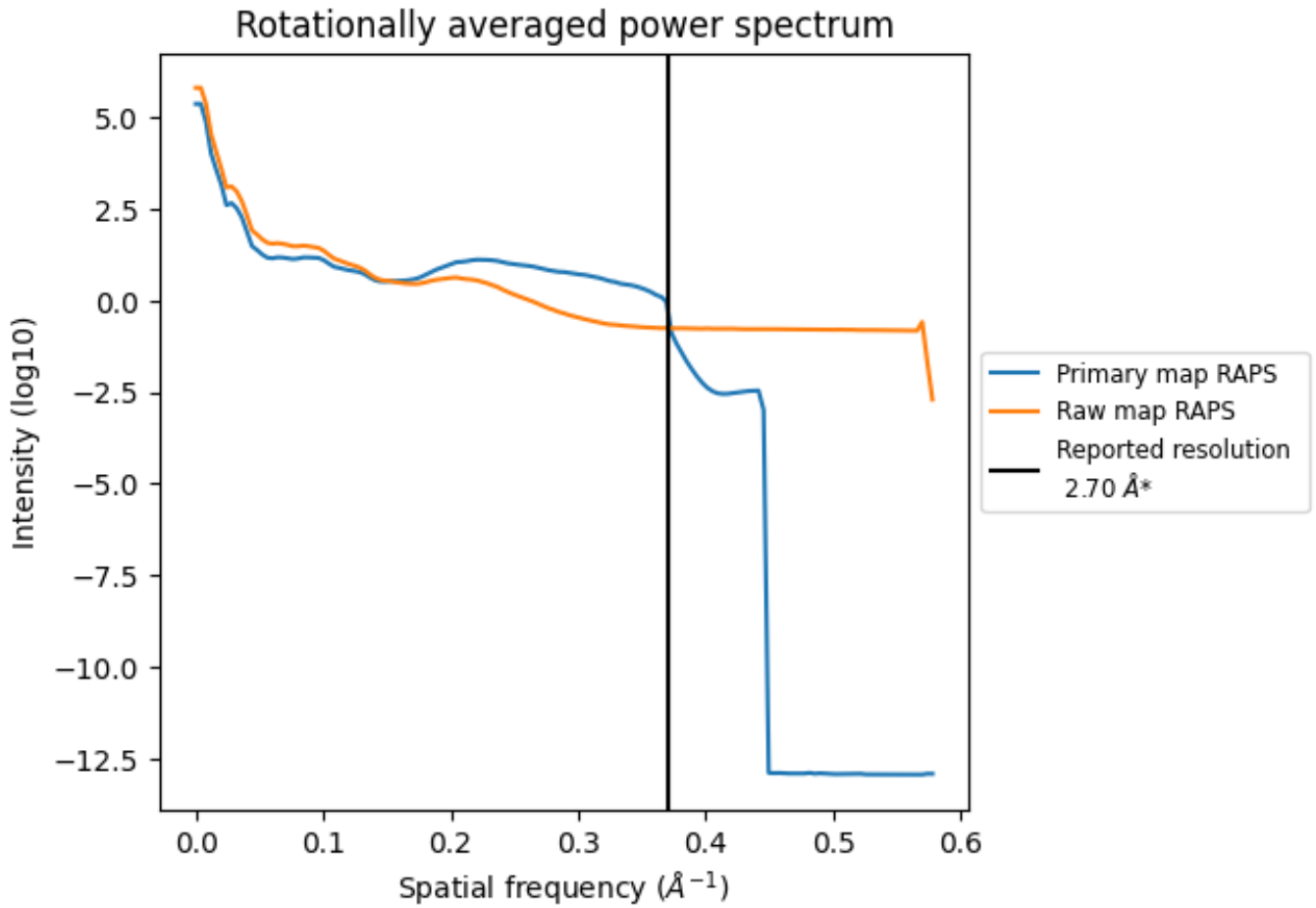
7.2 Volume estimate (i)



The volume at the recommended contour level is 69 nm^3; this corresponds to an approximate mass of 62 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)

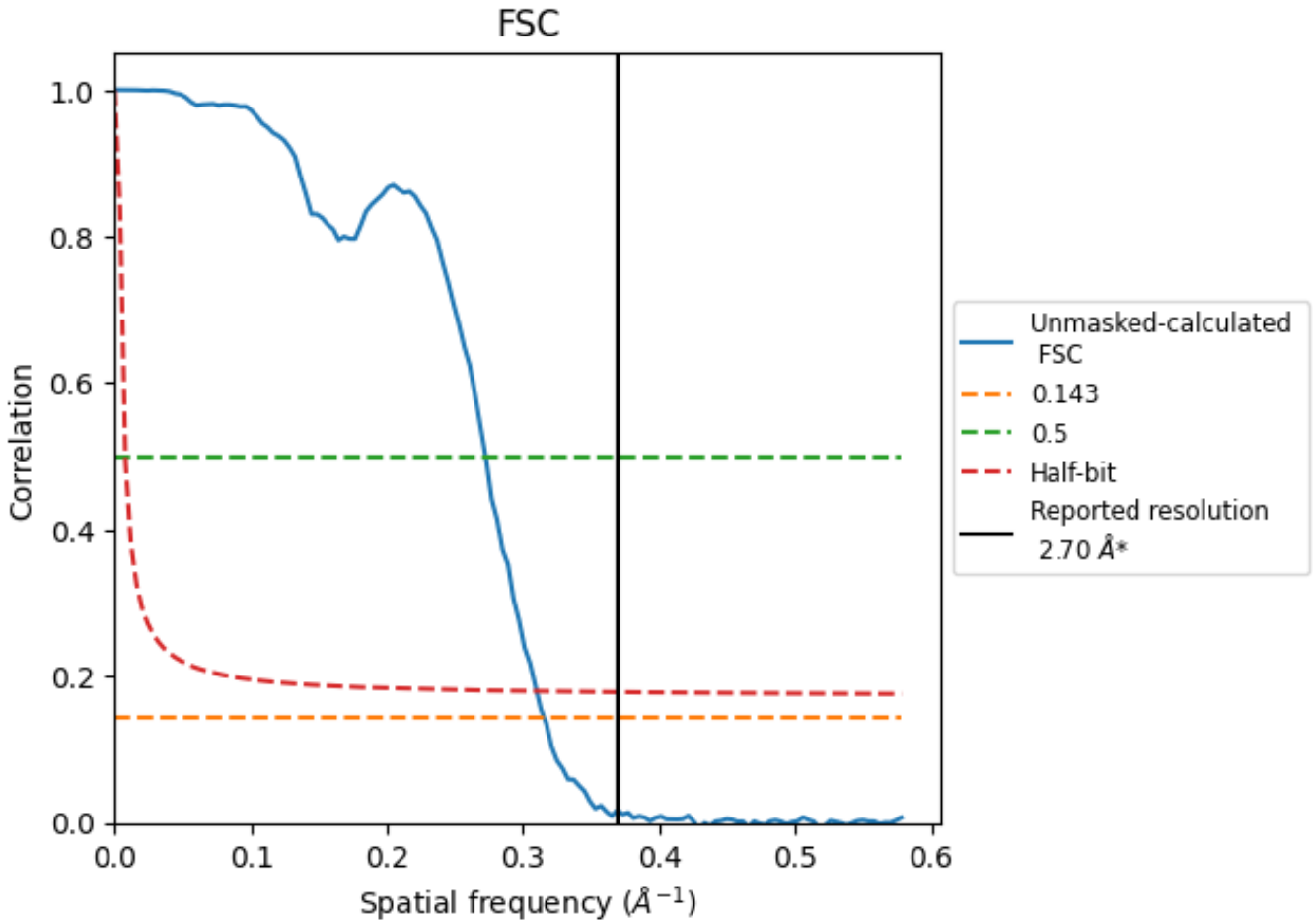


*Reported resolution corresponds to spatial frequency of 0.370 Å^{-1}

8 Fourier-Shell correlation

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

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.370 Å^{-1}

8.2 Resolution estimates (i)

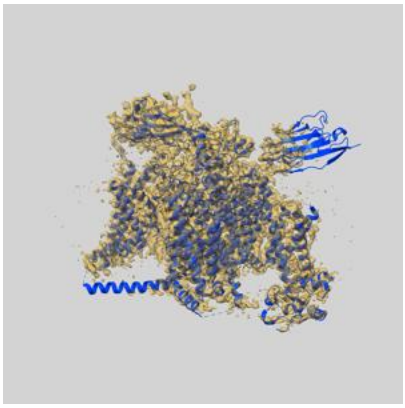
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.70	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.17	3.67	3.23

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.17 differs from the reported value 2.7 by more than 10 %

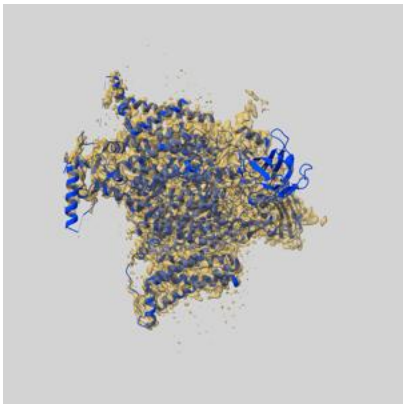
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-35193 and PDB model 8I5B. Per-residue inclusion information can be found in section 3 on page 11.

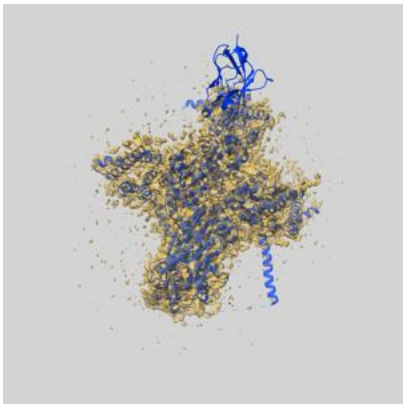
9.1 Map-model overlay



X



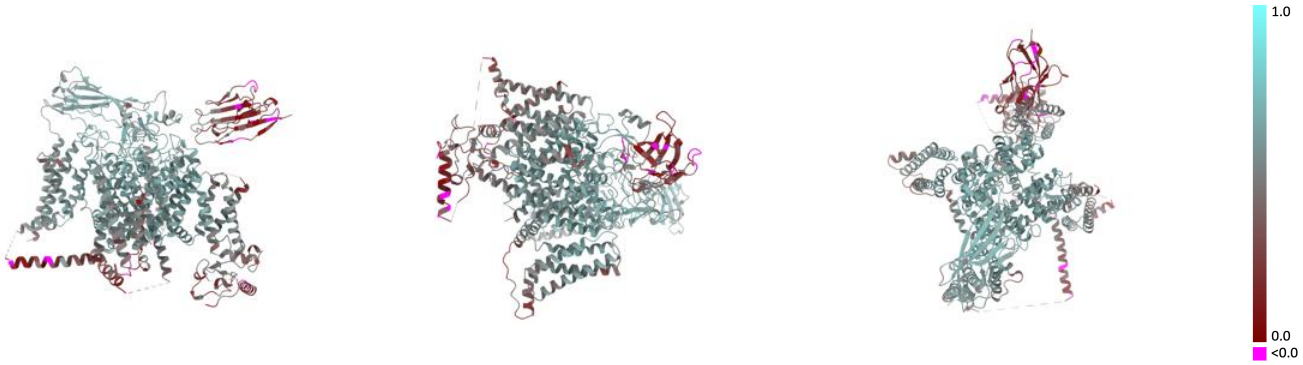
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.35 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

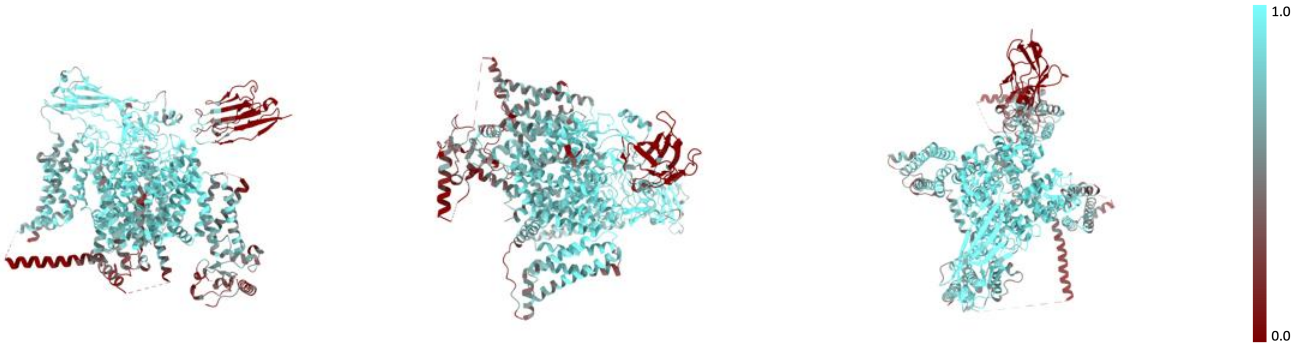
9.2 Q-score mapped to coordinate model (i)



X Y Z

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

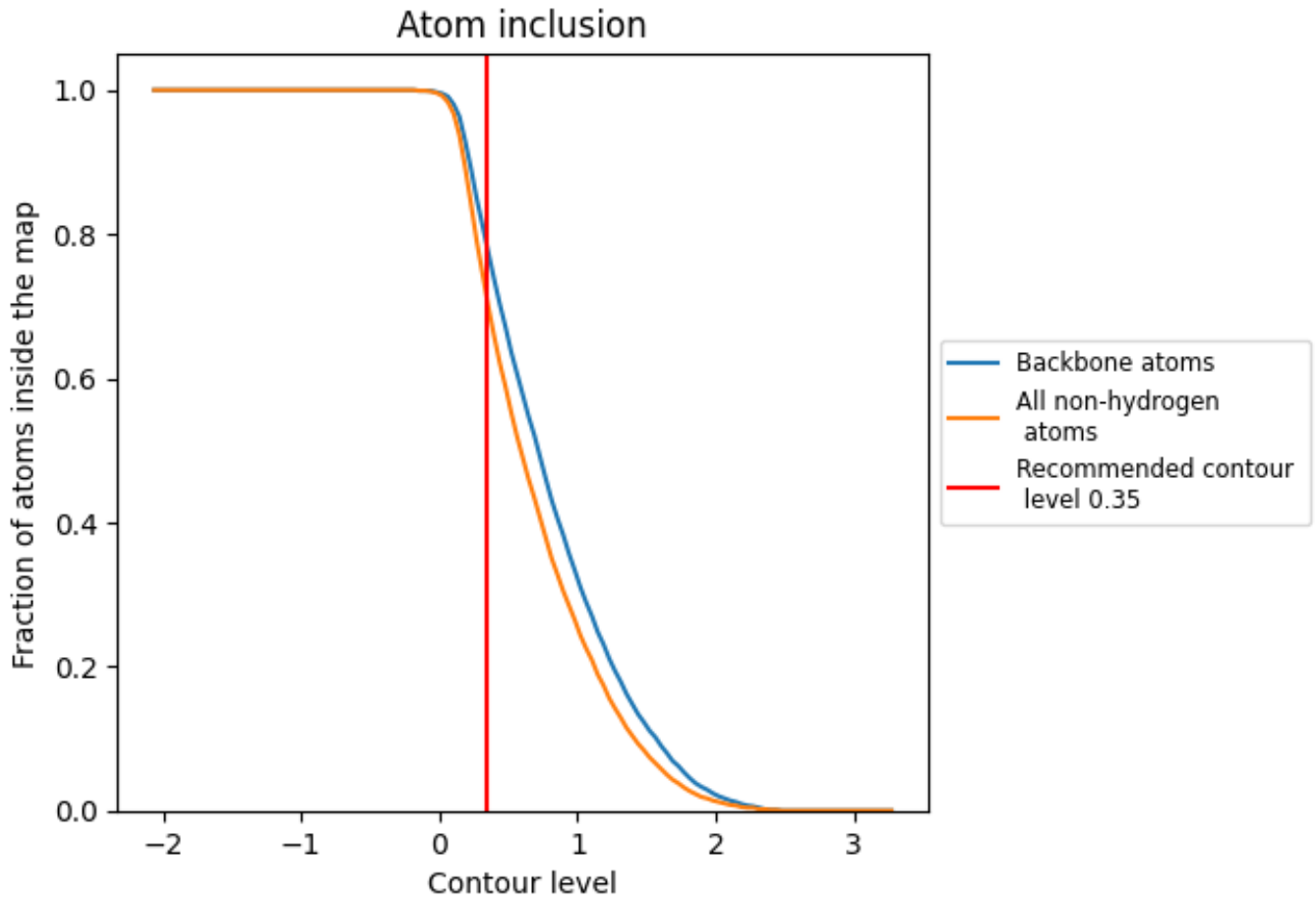
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.35).

9.4 Atom inclusion (i)



At the recommended contour level, 78% of all backbone atoms, 70% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.35) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7050	0.5070
A	0.7380	0.5240
B	0.8200	0.5740
C	0.1670	0.2220
D	0.6070	0.4390
E	0.7500	0.4570