



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 5, 2026 – 07:48 AM JST

PDB ID : 5XAA / pdb_00005xaa
Title : Complete structure factors and an atomic model of the calcium pump (SERCA1A) and associated phospholipids in the E2-ALF-(TG) crystals of P21212 symmetry
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Deposited on : 2017-03-11
Resolution : 3.20 Å(reported)

This is a Full wwPDB X-ray Structure 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/XrayValidationReportHelp>

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:

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.50

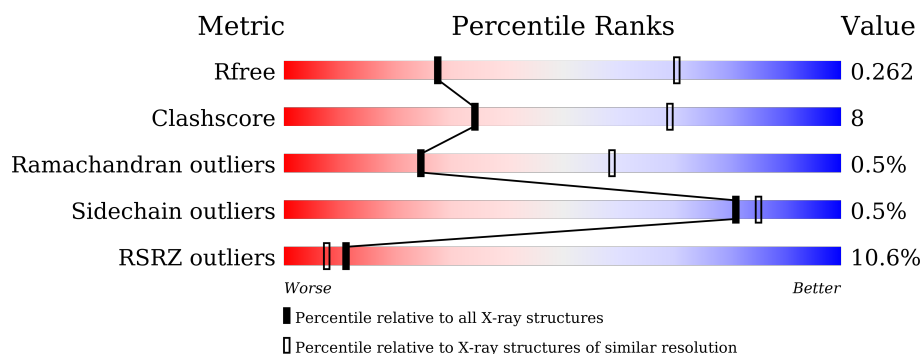
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.20 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)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1466 (3.20-3.20)
Clashscore	190562	1573 (3.20-3.20)
Ramachandran outliers	187476	1548 (3.20-3.20)
Sidechain outliers	187428	1547 (3.20-3.20)
RSRZ outliers	180081	1466 (3.20-3.20)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower 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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	995	11% 82% 17%

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 8665 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 Sarcoplasmic/endoplasmic reticulum calcium ATPase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	995	Total	C	N	O	S	0	0	0
			7674	4878	1287	1452	57			

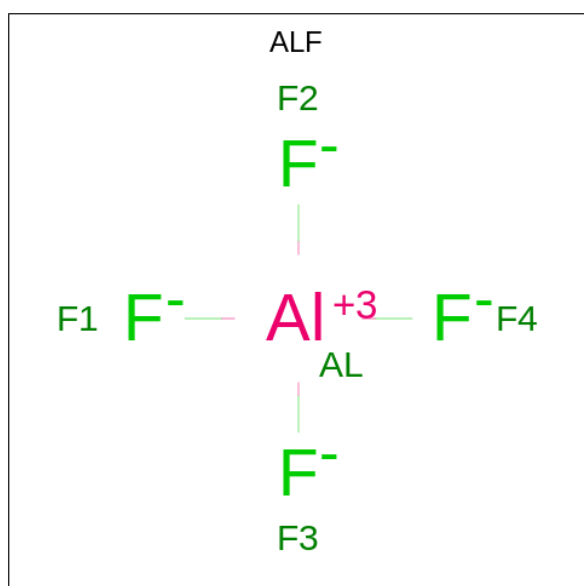
There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	ACE	-	acetylation	UNP P04191

- Molecule 2 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

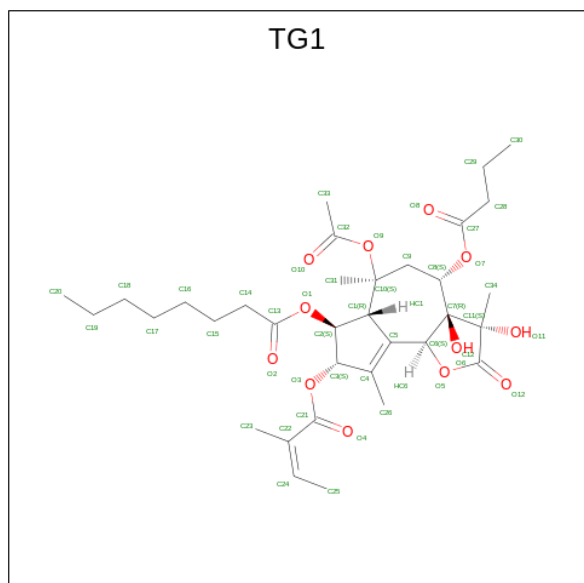
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Mg	0	0
			1	1		

- Molecule 3 is TETRAFLUOROALUMINATE ION (CCD ID: ALF) (formula: AlF_4^-).



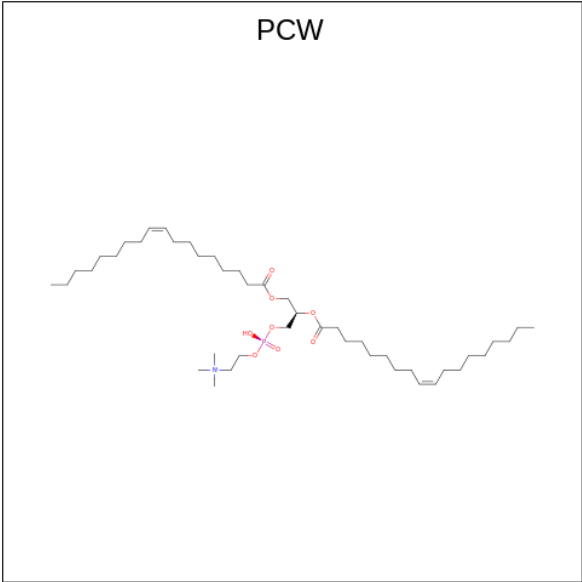
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	Al	F	0	0
			5	1	4		

- Molecule 4 is OCTANOIC ACID [3S-[3ALPHA, 3ABETA, 4ALPHA, 6BETA, 6ABETA, 7BETA, 8ALPHA(Z), 9B]ALPHA]]-6-(ACETYLOXY)-2,3,-3A,4,5,6,6A,7,8,9B-DECAHYDRO-3,3A-DIHYDROXY-3,6,9-TRIMETHYL-8-[(2-METHYL-1-OXO-2-BUTENYL)OXY]-2-OXO-4-(1-OXOBUTOXY)-AZULENO[4,5-B]FURAN-7-YL ESTER (CCD ID: TG1) (formula: C₃₄H₅₀O₁₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			46	34	12		

- Molecule 5 is 1,2-DIOLEOYL-SN-GLYCERO-3-PHOSPHOCHOLINE (CCD ID: PCW) (formula: C₄₄H₈₅NO₈P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			22	12	1	8	1		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	213	Total 213	O 213	0	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 electron 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 dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). 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: Sarcoplasmic/endoplasmic reticulum calcium ATPase 1



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	120.90Å 87.70Å 140.20Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	91.56 – 3.20 91.56 – 3.20	Depositor EDS
% Data completeness (in resolution range)	100.0 (91.56-3.20) 100.0 (91.56-3.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	7.06 (at 3.19Å)	Xtriage
Refinement program	PHENIX 1.9_1692	Depositor
R, R_{free}	0.227 , 0.260 0.235 , 0.262	Depositor DCC
R_{free} test set	1197 reflections (4.73%)	wwPDB-VP
Wilson B-factor (Å ²)	93.1	Xtriage
Anisotropy	0.053	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.25 , 82.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.28$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.88	EDS
Total number of atoms	8665	wwPDB-VP
Average B, all atoms (Å ²)	140.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.57% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: TG1, PCW, ALF, ACE, MG

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	0.37	0/7813	0.76	11/10594 (0.1%)

There are no bond length outliers.

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	A	242	THR	N-CA-C	-13.45	88.67	109.25
1	A	879	ASP	CB-CA-C	-9.12	99.04	112.09
1	A	879	ASP	N-CA-C	8.91	126.29	107.67
1	A	243	GLU	N-CA-C	-8.86	102.39	113.55
1	A	87	ALA	N-CA-C	7.55	119.41	111.03
1	A	194	VAL	CA-C-N	6.20	126.38	119.32
1	A	194	VAL	C-N-CA	6.20	126.38	119.32
1	A	880	HIS	N-CA-C	6.14	123.39	109.81
1	A	880	HIS	N-CA-CB	-5.95	99.78	110.37
1	A	339	VAL	CB-CA-C	-5.57	104.53	112.22
1	A	242	THR	CB-CA-C	5.03	118.53	110.29

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	7674	0	7767	123	0
2	A	1	0	0	0	0
3	A	5	0	0	0	0
4	A	46	0	50	3	0
5	A	726	0	594	6	0
6	A	213	0	0	1	0
All	All	8665	0	8411	128	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 8.

All (128) 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)
1:A:245:ASP:OD1	1:A:246:LYS:N	1.75	1.18
1:A:486:GLU:N	1:A:486:GLU:OE1	1.99	0.94
1:A:343:GLY:O	6:A:1101:HOH:O	1.92	0.88
1:A:245:ASP:CG	1:A:246:LYS:H	1.83	0.84
1:A:341:THR:HG22	1:A:716:ILE:HD11	1.60	0.84
1:A:336:LEU:O	1:A:339:VAL:HG23	1.78	0.83
1:A:247:THR:CG2	1:A:340:GLU:OE1	2.30	0.79
1:A:326:MET:HE1	1:A:339:VAL:HG13	1.71	0.73
1:A:950:VAL:HG12	1:A:952:PRO:HD2	1.73	0.70
1:A:239:MET:HG2	1:A:712:LYS:HD2	1.77	0.67
1:A:247:THR:HG22	1:A:249:LEU:H	1.60	0.66
1:A:769:VAL:HG21	4:A:1003:TG1:H332	1.78	0.66
1:A:329:LYS:O	1:A:330:ASN:HB2	1.95	0.64
1:A:769:VAL:HA	4:A:1003:TG1:H231	1.78	0.64
1:A:260:LEU:HD11	1:A:306:ALA:HB1	1.82	0.60
1:A:366:MET:HE2	1:A:384:ILE:HD11	1.83	0.60
1:A:712:LYS:HG3	1:A:730:ALA:HB1	1.84	0.59
1:A:646:GLU:OE2	1:A:651:ARG:NH1	2.37	0.58
1:A:85:ILE:HG23	1:A:86:THR:HG23	1.85	0.58
1:A:247:THR:HG21	1:A:340:GLU:OE1	2.02	0.58
1:A:810:ASN:OD1	1:A:930:ASN:ND2	2.37	0.58
1:A:491:ARG:NH1	1:A:588:GLU:OE1	2.33	0.58
1:A:276:ILE:O	1:A:278:HIS:N	2.36	0.58
1:A:604:ARG:HB2	1:A:607:VAL:HG23	1.88	0.56
1:A:928:TRP:HA	1:A:934:LEU:HD11	1.87	0.56
1:A:926:PRO:HB2	1:A:929:VAL:HG23	1.88	0.55
1:A:283:VAL:O	1:A:285:GLY:N	2.31	0.55
1:A:342:LEU:HD22	1:A:733:MET:HE1	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:203:ASP:OD1	1:A:678:ARG:NH1	2.40	0.55
1:A:341:THR:CG2	1:A:716:ILE:HD11	2.35	0.55
1:A:572:LYS:HB2	1:A:575:GLU:HG2	1.89	0.54
1:A:247:THR:HG23	1:A:248:PRO:HD2	1.88	0.54
1:A:326:MET:HE1	1:A:339:VAL:CG1	2.38	0.54
1:A:759:GLN:NE2	1:A:915:SER:O	2.37	0.53
1:A:865:VAL:HG13	1:A:869:GLN:HG3	1.90	0.53
1:A:816:ILE:HG23	1:A:817:MET:HG2	1.91	0.53
1:A:684:LYS:NZ	1:A:707:ASP:OD1	2.37	0.52
1:A:512:MET:HB2	1:A:567:ARG:HB3	1.91	0.52
1:A:80:GLU:HG3	1:A:82:GLU:HG2	1.91	0.52
1:A:114:ASN:ND2	1:A:117:GLU:HG2	2.25	0.52
1:A:844:VAL:HG22	1:A:907:ILE:HG21	1.92	0.51
1:A:757:MET:HA	1:A:760:PHE:CE2	2.45	0.51
1:A:342:LEU:HD22	1:A:733:MET:SD	2.51	0.51
1:A:483:PHE:HE2	1:A:485:LEU:HD21	1.75	0.51
1:A:311:LEU:HD13	1:A:764:LEU:HD12	1.92	0.50
1:A:319:LEU:HD23	1:A:336:LEU:HB3	1.93	0.50
1:A:721:GLY:N	1:A:738:ASP:OD1	2.45	0.50
1:A:737:ASP:OD2	1:A:739:ASN:ND2	2.44	0.50
1:A:926:PRO:HB3	1:A:928:TRP:CE2	2.47	0.50
1:A:283:VAL:O	1:A:283:VAL:HG13	2.12	0.49
1:A:283:VAL:C	1:A:285:GLY:H	2.19	0.49
1:A:563:ALA:HA	1:A:596:VAL:HG22	1.95	0.49
1:A:512:MET:HG3	1:A:570:PRO:HB3	1.94	0.48
1:A:82:GLU:HG3	1:A:83:GLU:HG3	1.95	0.48
1:A:89:VAL:HG11	1:A:956:ILE:HB	1.96	0.48
1:A:545:ILE:O	1:A:549:ILE:HG12	2.13	0.48
1:A:853:ALA:HB1	1:A:857:MET:HE2	1.96	0.48
1:A:639:ILE:HG13	1:A:641:ILE:HG13	1.96	0.48
1:A:773:VAL:HG11	1:A:842:GLY:HA2	1.96	0.48
1:A:271:VAL:HG12	1:A:271:VAL:O	2.14	0.48
1:A:567:ARG:NH1	1:A:587:TYR:O	2.43	0.47
1:A:637:ARG:NH1	1:A:643:GLY:O	2.47	0.47
1:A:239:MET:CG	1:A:712:LYS:HD2	2.43	0.47
1:A:179:ILE:HG13	1:A:180:LEU:HG	1.97	0.47
1:A:397:LYS:HB3	1:A:402:ILE:HD12	1.97	0.47
1:A:777:LEU:HB2	1:A:849:VAL:HG21	1.97	0.47
1:A:130:TYR:CZ	1:A:137:VAL:HB	2.51	0.46
1:A:342:LEU:HD22	1:A:733:MET:CE	2.45	0.46
1:A:879:ASP:OD1	1:A:879:ASP:O	2.33	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:653:TYR:OH	1:A:672:ARG:NH1	2.49	0.46
1:A:529:ARG:NH2	1:A:568:ASP:OD2	2.49	0.45
1:A:690:TYR:O	1:A:693:SER:OG	2.24	0.45
1:A:762:ARG:HG2	1:A:829:ILE:HD11	1.98	0.45
1:A:925:MET:HE3	1:A:926:PRO:HD2	1.99	0.45
1:A:887:ASP:OD1	1:A:888:CYS:N	2.44	0.45
1:A:285:GLY:O	1:A:290:ARG:NH1	2.50	0.45
1:A:483:PHE:CE2	1:A:485:LEU:HD21	2.52	0.45
1:A:760:PHE:HA	1:A:763:TYR:HB3	1.97	0.45
1:A:895:GLU:H	1:A:896:PRO:HD2	1.81	0.45
1:A:955:MET:HE1	5:A:1026:PCW:C11	2.47	0.45
1:A:244:GLN:O	1:A:244:GLN:HG3	2.16	0.45
1:A:13:LEU:HD23	1:A:222:ILE:HD12	1.98	0.44
1:A:756:ASN:HB3	1:A:808:GLY:HA2	1.98	0.44
1:A:302:LEU:HD11	1:A:772:VAL:HG13	2.00	0.44
1:A:52:LEU:CD1	1:A:110:ARG:HB2	2.48	0.44
1:A:527:TYR:CG	1:A:534:ARG:HD3	2.53	0.44
1:A:486:GLU:O	1:A:491:ARG:NH2	2.47	0.44
1:A:518:PRO:HA	1:A:563:ALA:HB2	2.00	0.44
1:A:528:VAL:HG21	1:A:541:VAL:HG11	2.00	0.44
1:A:799:THR:HG21	1:A:905:VAL:HG22	2.00	0.43
1:A:529:ARG:HH22	1:A:568:ASP:CG	2.26	0.43
1:A:863:PRO:HG3	1:A:890:ILE:HG21	2.00	0.43
1:A:357:THR:HA	1:A:603:PRO:HA	2.01	0.43
1:A:473:SER:O	1:A:477:GLN:HG2	2.19	0.43
1:A:479:MET:HB3	1:A:498:CYS:HB3	2.00	0.43
1:A:910:CYS:HB3	1:A:978:ILE:HD11	1.99	0.43
5:A:1026:PCW:H62	5:A:1026:PCW:H41	1.85	0.43
1:A:283:VAL:C	1:A:285:GLY:N	2.77	0.42
1:A:783:LEU:HD21	1:A:853:ALA:HB2	2.00	0.42
1:A:828:LEU:HD12	4:A:1003:TG1:H302	2.01	0.42
1:A:25:THR:HA	1:A:132:ALA:HB3	2.00	0.42
1:A:260:LEU:HA	1:A:263:VAL:HG12	2.02	0.42
1:A:342:LEU:CD2	1:A:733:MET:HE1	2.48	0.42
1:A:876:CYS:O	1:A:880:HIS:NE2	2.53	0.42
1:A:802:LEU:HB2	1:A:803:PRO:HD3	2.02	0.42
1:A:391:PRO:HB3	1:A:450:GLU:HB3	2.01	0.42
1:A:412:GLU:OE1	1:A:529:ARG:HD2	2.20	0.42
1:A:174:ARG:HB3	1:A:186:SER:HB3	2.02	0.42
1:A:161:ALA:HA	1:A:210:SER:HB2	2.01	0.41
1:A:284:HIS:O	1:A:284:HIS:CG	2.72	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:517:ALA:HA	1:A:518:PRO:HD3	1.94	0.41
5:A:1023:PCW:H73	5:A:1023:PCW:H42	1.85	0.41
5:A:1016:PCW:H73	5:A:1016:PCW:H42	1.86	0.41
5:A:1035:PCW:H73	5:A:1035:PCW:H42	1.87	0.41
1:A:243:GLU:HG2	1:A:244:GLN:N	2.35	0.41
1:A:390:ALA:HA	1:A:391:PRO:HD3	1.88	0.41
1:A:485:LEU:N	1:A:485:LEU:HD23	2.36	0.41
1:A:600:LEU:O	1:A:602:PRO:HD3	2.21	0.41
1:A:811:PRO:HA	1:A:812:PRO:HD2	1.97	0.41
1:A:245:ASP:OD1	1:A:246:LYS:CA	2.63	0.41
1:A:570:PRO:HA	1:A:571:PRO:HD3	1.93	0.41
1:A:758:LYS:HG3	1:A:828:LEU:HD22	2.03	0.41
1:A:202:GLN:OE1	1:A:202:GLN:N	2.54	0.41
1:A:400:LYS:HA	1:A:401:PRO:HD3	1.93	0.40
1:A:421:ASN:OD1	1:A:442:GLU:HB3	2.21	0.40
1:A:559:LEU:HD22	1:A:600:LEU:HB2	2.03	0.40
1:A:758:LYS:HE2	1:A:762:ARG:NH2	2.37	0.40
5:A:1017:PCW:H42	5:A:1017:PCW:H73	1.87	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

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	993/995 (100%)	929 (94%)	59 (6%)	5 (0%)	24 59

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	277	GLY
1	A	278	HIS
1	A	284	HIS

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Mol	Chain	Res	Type
1	A	283	VAL
1	A	271	VAL

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

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	840/840 (100%)	836 (100%)	4 (0%)	81 85

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	137	VAL
1	A	266	LEU
1	A	491	ARG
1	A	544	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	114	ASN
1	A	259	GLN
1	A	612	GLN
1	A	869	GLN
1	A	919	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 36 ligands modelled in this entry, 1 is monoatomic - leaving 35 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$
5	PCW	A	1024	-	21,21,53	0.61	0	27,29,61	1.04	1 (3%)
5	PCW	A	1034	-	21,21,53	0.75	0	27,29,61	1.02	1 (3%)
5	PCW	A	1028	-	21,21,53	0.76	0	27,29,61	1.03	1 (3%)
5	PCW	A	1007	-	21,21,53	0.61	0	27,29,61	1.25	2 (7%)
5	PCW	A	1010	-	21,21,53	0.61	0	27,29,61	1.03	1 (3%)
5	PCW	A	1014	-	21,21,53	0.61	0	27,29,61	1.03	1 (3%)
5	PCW	A	1026	-	21,21,53	0.61	0	27,29,61	1.03	1 (3%)
5	PCW	A	1009	-	21,21,53	0.63	0	27,29,61	1.03	1 (3%)
5	PCW	A	1006	-	21,21,53	0.63	0	27,29,61	1.03	1 (3%)
5	PCW	A	1030	-	21,21,53	0.63	0	27,29,61	1.02	1 (3%)
4	TG1	A	1003	-	43,48,48	5.05	10 (23%)	44,72,72	3.71	11 (25%)
5	PCW	A	1032	-	21,21,53	0.62	0	27,29,61	1.02	1 (3%)
5	PCW	A	1023	-	21,21,53	0.61	0	27,29,61	1.03	1 (3%)
5	PCW	A	1008	-	21,21,53	0.61	0	27,29,61	1.03	1 (3%)
5	PCW	A	1016	-	21,21,53	0.75	0	27,29,61	1.03	1 (3%)
5	PCW	A	1021	-	21,21,53	0.77	0	27,29,61	1.06	2 (7%)
3	ALF	A	1002	6,1	0,4,4	-	-	-	-	-
5	PCW	A	1012	-	21,21,53	0.62	0	27,29,61	1.03	1 (3%)
5	PCW	A	1013	-	21,21,53	0.63	0	27,29,61	1.02	1 (3%)
5	PCW	A	1019	-	21,21,53	0.62	0	27,29,61	1.02	1 (3%)
5	PCW	A	1036	-	21,21,53	0.61	0	27,29,61	1.03	1 (3%)
5	PCW	A	1029	-	21,21,53	0.75	0	27,29,61	1.04	1 (3%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	PCW	A	1025	-	21,21,53	0.75	0	27,29,61	1.03	1 (3%)
5	PCW	A	1022	-	21,21,53	0.62	0	27,29,61	1.02	1 (3%)
5	PCW	A	1035	-	21,21,53	0.62	0	27,29,61	1.02	1 (3%)
5	PCW	A	1011	-	21,21,53	0.76	0	27,29,61	1.03	1 (3%)
5	PCW	A	1031	-	21,21,53	0.75	0	27,29,61	1.02	1 (3%)
5	PCW	A	1020	-	21,21,53	0.76	0	27,29,61	1.03	1 (3%)
5	PCW	A	1004	-	21,21,53	0.77	0	27,29,61	1.05	1 (3%)
5	PCW	A	1027	-	21,21,53	0.61	0	27,29,61	1.02	1 (3%)
5	PCW	A	1005	-	21,21,53	0.62	0	27,29,61	1.02	1 (3%)
5	PCW	A	1018	-	21,21,53	0.62	0	27,29,61	1.03	1 (3%)
5	PCW	A	1033	-	21,21,53	0.75	0	27,29,61	1.02	1 (3%)
5	PCW	A	1017	-	21,21,53	0.76	0	27,29,61	1.03	1 (3%)
5	PCW	A	1015	-	21,21,53	0.76	0	27,29,61	1.03	1 (3%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	PCW	A	1024	-	-	4/23/23/57	-
5	PCW	A	1034	-	-	8/23/23/57	-
5	PCW	A	1028	-	-	4/23/23/57	-
5	PCW	A	1007	-	-	6/23/23/57	-
5	PCW	A	1010	-	-	6/23/23/57	-
5	PCW	A	1014	-	-	9/23/23/57	-
5	PCW	A	1026	-	-	6/23/23/57	-
5	PCW	A	1009	-	-	4/23/23/57	-
5	PCW	A	1006	-	-	8/23/23/57	-
5	PCW	A	1030	-	-	6/23/23/57	-
4	TG1	A	1003	-	-	19/33/99/99	0/3/3/3
5	PCW	A	1032	-	-	6/23/23/57	-
5	PCW	A	1023	-	-	5/23/23/57	-
5	PCW	A	1008	-	-	8/23/23/57	-
5	PCW	A	1016	-	-	5/23/23/57	-
5	PCW	A	1021	-	-	9/23/23/57	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	PCW	A	1012	-	-	8/23/23/57	-
5	PCW	A	1013	-	-	8/23/23/57	-
5	PCW	A	1019	-	-	6/23/23/57	-
5	PCW	A	1036	-	-	3/23/23/57	-
5	PCW	A	1029	-	-	5/23/23/57	-
5	PCW	A	1025	-	-	4/23/23/57	-
5	PCW	A	1022	-	-	3/23/23/57	-
5	PCW	A	1035	-	-	11/23/23/57	-
5	PCW	A	1011	-	-	5/23/23/57	-
5	PCW	A	1031	-	-	8/23/23/57	-
5	PCW	A	1020	-	-	9/23/23/57	-
5	PCW	A	1004	-	-	5/23/23/57	-
5	PCW	A	1027	-	-	11/23/23/57	-
5	PCW	A	1005	-	-	10/23/23/57	-
5	PCW	A	1018	-	-	7/23/23/57	-
5	PCW	A	1033	-	-	5/23/23/57	-
5	PCW	A	1017	-	-	8/23/23/57	-
5	PCW	A	1015	-	-	6/23/23/57	-

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	1003	TG1	C4-C5	30.08	1.59	1.34
4	A	1003	TG1	O12-C12	7.22	1.37	1.20
4	A	1003	TG1	C11-C7	4.58	1.61	1.55
4	A	1003	TG1	O5-C12	4.39	1.42	1.35
4	A	1003	TG1	C1-C5	4.18	1.58	1.51
4	A	1003	TG1	C3-C4	3.75	1.55	1.50
4	A	1003	TG1	C24-C22	3.60	1.54	1.31
4	A	1003	TG1	O3-C21	2.93	1.41	1.34
4	A	1003	TG1	C9-C8	2.70	1.55	1.52
4	A	1003	TG1	O7-C8	-2.22	1.42	1.46

All (46) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	1003	TG1	O12-C12-C11	-16.87	111.33	128.28
4	A	1003	TG1	O5-C12-O12	-11.62	106.21	121.62

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	1003	TG1	C10-O9-C32	7.16	138.54	121.53
4	A	1003	TG1	C23-C22-C24	-4.25	105.71	123.20
4	A	1003	TG1	O9-C32-C33	-3.96	103.46	110.68
4	A	1003	TG1	C26-C4-C5	-3.93	120.02	129.82
4	A	1003	TG1	C10-C1-C5	3.90	119.93	115.26
4	A	1003	TG1	O3-C21-O4	-3.47	116.71	123.32
4	A	1003	TG1	O9-C32-O10	-3.42	117.32	123.61
4	A	1003	TG1	C11-C7-C6	-3.28	96.71	103.03
4	A	1003	TG1	C23-C22-C21	-2.66	109.44	116.09
5	A	1011	PCW	P-O3P-C1	-2.55	106.74	121.68
5	A	1004	PCW	P-O3P-C1	-2.54	106.77	121.68
5	A	1026	PCW	P-O3P-C1	-2.53	106.82	121.68
5	A	1028	PCW	P-O3P-C1	-2.53	106.87	121.68
5	A	1020	PCW	P-O3P-C1	-2.52	106.93	121.68
5	A	1029	PCW	P-O3P-C1	-2.51	106.94	121.68
5	A	1024	PCW	P-O3P-C1	-2.51	106.96	121.68
5	A	1023	PCW	P-O3P-C1	-2.51	106.96	121.68
5	A	1018	PCW	P-O3P-C1	-2.51	106.98	121.68
5	A	1036	PCW	P-O3P-C1	-2.50	107.00	121.68
5	A	1015	PCW	P-O3P-C1	-2.50	107.00	121.68
5	A	1007	PCW	P-O3P-C1	-2.50	107.02	121.68
5	A	1017	PCW	P-O3P-C1	-2.49	107.06	121.68
5	A	1030	PCW	P-O3P-C1	-2.49	107.06	121.68
5	A	1010	PCW	P-O3P-C1	-2.49	107.06	121.68
5	A	1021	PCW	P-O3P-C1	-2.49	107.08	121.68
5	A	1005	PCW	P-O3P-C1	-2.49	107.08	121.68
5	A	1016	PCW	P-O3P-C1	-2.49	107.09	121.68
5	A	1008	PCW	P-O3P-C1	-2.48	107.12	121.68
5	A	1009	PCW	P-O3P-C1	-2.48	107.14	121.68
5	A	1013	PCW	P-O3P-C1	-2.48	107.14	121.68
5	A	1034	PCW	P-O3P-C1	-2.48	107.16	121.68
5	A	1035	PCW	P-O3P-C1	-2.48	107.16	121.68
5	A	1012	PCW	P-O3P-C1	-2.48	107.16	121.68
5	A	1019	PCW	P-O3P-C1	-2.47	107.18	121.68
5	A	1014	PCW	P-O3P-C1	-2.47	107.18	121.68
5	A	1031	PCW	P-O3P-C1	-2.46	107.23	121.68
5	A	1025	PCW	P-O3P-C1	-2.46	107.28	121.68
5	A	1032	PCW	P-O3P-C1	-2.46	107.28	121.68
5	A	1006	PCW	P-O3P-C1	-2.45	107.33	121.68
5	A	1027	PCW	P-O3P-C1	-2.45	107.34	121.68
5	A	1033	PCW	P-O3P-C1	-2.43	107.44	121.68
5	A	1022	PCW	P-O3P-C1	-2.42	107.48	121.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	1007	PCW	C8-N-C7	2.31	114.90	108.97
5	A	1021	PCW	C2-O2-C31	2.00	121.63	117.90

There are no chirality outliers.

All (235) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1003	TG1	C9-C10-O9-C32
4	A	1003	TG1	C1-C10-O9-C32
4	A	1003	TG1	C31-C10-O9-C32
4	A	1003	TG1	C22-C21-O3-C3
4	A	1003	TG1	O3-C21-C22-C24
4	A	1003	TG1	O10-C32-O9-C10
4	A	1003	TG1	C33-C32-O9-C10
5	A	1005	PCW	C32-C31-O2-C2
5	A	1006	PCW	C32-C31-O2-C2
5	A	1007	PCW	C1-O3P-P-O2P
5	A	1007	PCW	C1-O3P-P-O4P
5	A	1008	PCW	C32-C31-O2-C2
5	A	1009	PCW	O4P-C4-C5-N
5	A	1010	PCW	O4P-C4-C5-N
5	A	1011	PCW	O4P-C4-C5-N
5	A	1012	PCW	C32-C31-O2-C2
5	A	1014	PCW	C32-C31-O2-C2
5	A	1015	PCW	C1-O3P-P-O4P
5	A	1017	PCW	C32-C31-O2-C2
5	A	1017	PCW	O31-C31-O2-C2
5	A	1018	PCW	O4P-C4-C5-N
5	A	1020	PCW	C32-C31-O2-C2
5	A	1020	PCW	C1-O3P-P-O1P
5	A	1021	PCW	C32-C31-O2-C2
5	A	1021	PCW	O31-C31-O2-C2
5	A	1024	PCW	O4P-C4-C5-N
5	A	1026	PCW	C1-O3P-P-O1P
5	A	1026	PCW	C1-O3P-P-O2P
5	A	1026	PCW	C1-O3P-P-O4P
5	A	1027	PCW	O3P-C1-C2-O2
5	A	1027	PCW	C32-C31-O2-C2
5	A	1027	PCW	O31-C31-O2-C2
5	A	1027	PCW	C1-O3P-P-O1P
5	A	1027	PCW	C1-O3P-P-O2P
5	A	1028	PCW	O4P-C4-C5-N

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Mol	Chain	Res	Type	Atoms
5	A	1030	PCW	O4P-C4-C5-N
5	A	1031	PCW	C32-C31-O2-C2
5	A	1032	PCW	O4P-C4-C5-N
5	A	1033	PCW	C32-C31-O2-C2
5	A	1035	PCW	C32-C31-O2-C2
5	A	1035	PCW	C1-O3P-P-O1P
5	A	1035	PCW	C1-O3P-P-O2P
5	A	1005	PCW	O31-C31-O2-C2
5	A	1006	PCW	O31-C31-O2-C2
5	A	1008	PCW	O31-C31-O2-C2
5	A	1012	PCW	O31-C31-O2-C2
5	A	1014	PCW	O31-C31-O2-C2
5	A	1020	PCW	O31-C31-O2-C2
5	A	1031	PCW	O31-C31-O2-C2
5	A	1033	PCW	O31-C31-O2-C2
5	A	1014	PCW	C12-C11-O3-C3
5	A	1016	PCW	C12-C11-O3-C3
5	A	1005	PCW	O11-C11-O3-C3
5	A	1027	PCW	O11-C11-O3-C3
5	A	1014	PCW	O11-C11-O3-C3
5	A	1005	PCW	C12-C11-O3-C3
5	A	1027	PCW	C12-C11-O3-C3
5	A	1035	PCW	O31-C31-O2-C2
5	A	1017	PCW	C12-C11-O3-C3
5	A	1013	PCW	O11-C11-O3-C3
5	A	1016	PCW	O11-C11-O3-C3
5	A	1034	PCW	C12-C11-O3-C3
5	A	1035	PCW	C12-C11-O3-C3
4	A	1003	TG1	O4-C21-O3-C3
5	A	1013	PCW	C12-C11-O3-C3
4	A	1003	TG1	C23-C22-C24-C25
5	A	1034	PCW	O11-C11-O3-C3
5	A	1035	PCW	O11-C11-O3-C3
5	A	1017	PCW	O11-C11-O3-C3
4	A	1003	TG1	C21-C22-C24-C25
5	A	1027	PCW	C1-O3P-P-O4P
5	A	1032	PCW	C1-O3P-P-O4P
5	A	1035	PCW	C1-O3P-P-O4P
4	A	1003	TG1	C16-C17-C18-C19
4	A	1003	TG1	C15-C16-C17-C18
4	A	1003	TG1	C14-C13-O1-C2
5	A	1035	PCW	O3P-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
4	A	1003	TG1	O2-C13-O1-C2
5	A	1020	PCW	C1-O3P-P-O4P
5	A	1005	PCW	O3P-C1-C2-C3
5	A	1027	PCW	O3P-C1-C2-C3
5	A	1034	PCW	O3P-C1-C2-C3
4	A	1003	TG1	O4-C21-C22-C24
5	A	1008	PCW	C1-C2-C3-O3
5	A	1015	PCW	C1-C2-C3-O3
5	A	1031	PCW	C12-C11-O3-C3
5	A	1006	PCW	O3P-C1-C2-O2
5	A	1018	PCW	O3P-C1-C2-O2
5	A	1010	PCW	O2-C2-C3-O3
5	A	1030	PCW	O2-C2-C3-O3
5	A	1004	PCW	O3P-C1-C2-C3
5	A	1006	PCW	O3P-C1-C2-C3
5	A	1021	PCW	O3P-C1-C2-C3
5	A	1035	PCW	O3P-C1-C2-C3
5	A	1007	PCW	C1-C2-C3-O3
5	A	1018	PCW	C1-C2-C3-O3
5	A	1021	PCW	C1-C2-C3-O3
5	A	1008	PCW	C1-O3P-P-O4P
5	A	1020	PCW	O3P-C1-C2-O2
5	A	1034	PCW	O3P-C1-C2-O2
4	A	1003	TG1	C17-C18-C19-C20
5	A	1005	PCW	O2-C2-C3-O3
5	A	1015	PCW	O2-C2-C3-O3
5	A	1018	PCW	O2-C2-C3-O3
5	A	1019	PCW	O2-C2-C3-O3
5	A	1021	PCW	O2-C2-C3-O3
4	A	1003	TG1	C14-C15-C16-C17
5	A	1023	PCW	O3P-C1-C2-C3
5	A	1005	PCW	C1-C2-C3-O3
5	A	1019	PCW	C1-C2-C3-O3
5	A	1013	PCW	O3P-C1-C2-O2
5	A	1021	PCW	O3P-C1-C2-O2
5	A	1022	PCW	C1-O3P-P-O4P
5	A	1015	PCW	C1-O3P-P-O1P
5	A	1020	PCW	C1-O3P-P-O2P
5	A	1032	PCW	C1-O3P-P-O2P
5	A	1018	PCW	O3P-C1-C2-C3
5	A	1004	PCW	O3P-C1-C2-O2
5	A	1005	PCW	O3P-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
5	A	1004	PCW	O4P-C4-C5-N
5	A	1005	PCW	O4P-C4-C5-N
5	A	1006	PCW	O4P-C4-C5-N
5	A	1007	PCW	O4P-C4-C5-N
5	A	1008	PCW	O4P-C4-C5-N
5	A	1012	PCW	O4P-C4-C5-N
5	A	1013	PCW	O4P-C4-C5-N
5	A	1014	PCW	O4P-C4-C5-N
5	A	1015	PCW	O4P-C4-C5-N
5	A	1016	PCW	O4P-C4-C5-N
5	A	1017	PCW	O4P-C4-C5-N
5	A	1019	PCW	O4P-C4-C5-N
5	A	1020	PCW	O4P-C4-C5-N
5	A	1021	PCW	O4P-C4-C5-N
5	A	1022	PCW	O4P-C4-C5-N
5	A	1023	PCW	O4P-C4-C5-N
5	A	1025	PCW	O4P-C4-C5-N
5	A	1026	PCW	O4P-C4-C5-N
5	A	1027	PCW	O4P-C4-C5-N
5	A	1029	PCW	O4P-C4-C5-N
5	A	1030	PCW	C1-C2-C3-O3
5	A	1031	PCW	O4P-C4-C5-N
5	A	1033	PCW	O4P-C4-C5-N
5	A	1034	PCW	O4P-C4-C5-N
5	A	1035	PCW	O4P-C4-C5-N
5	A	1036	PCW	O4P-C4-C5-N
5	A	1007	PCW	O2-C2-C3-O3
5	A	1008	PCW	O2-C2-C3-O3
5	A	1029	PCW	O2-C2-C3-O3
5	A	1031	PCW	O11-C11-O3-C3
5	A	1023	PCW	O3P-C1-C2-O2
5	A	1004	PCW	C1-O3P-P-O4P
5	A	1004	PCW	C4-O4P-P-O3P
5	A	1005	PCW	C4-O4P-P-O3P
5	A	1006	PCW	C1-O3P-P-O4P
5	A	1006	PCW	C4-O4P-P-O3P
5	A	1007	PCW	C4-O4P-P-O3P
5	A	1008	PCW	C4-O4P-P-O3P
5	A	1009	PCW	C1-O3P-P-O4P
5	A	1009	PCW	C4-O4P-P-O3P
5	A	1010	PCW	C1-O3P-P-O4P
5	A	1010	PCW	C4-O4P-P-O3P

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Mol	Chain	Res	Type	Atoms
5	A	1011	PCW	C1-O3P-P-O4P
5	A	1011	PCW	C4-O4P-P-O3P
5	A	1012	PCW	C1-O3P-P-O4P
5	A	1012	PCW	C4-O4P-P-O3P
5	A	1013	PCW	C1-O3P-P-O4P
5	A	1013	PCW	C4-O4P-P-O3P
5	A	1014	PCW	C1-O3P-P-O4P
5	A	1014	PCW	C4-O4P-P-O3P
5	A	1015	PCW	C4-O4P-P-O3P
5	A	1016	PCW	C1-O3P-P-O4P
5	A	1016	PCW	C4-O4P-P-O3P
5	A	1017	PCW	C1-O3P-P-O4P
5	A	1017	PCW	C4-O4P-P-O3P
5	A	1018	PCW	C1-O3P-P-O4P
5	A	1018	PCW	C4-O4P-P-O3P
5	A	1019	PCW	C1-O3P-P-O4P
5	A	1019	PCW	C4-O4P-P-O3P
5	A	1020	PCW	C4-O4P-P-O3P
5	A	1021	PCW	C1-O3P-P-O4P
5	A	1021	PCW	C4-O4P-P-O3P
5	A	1022	PCW	C4-O4P-P-O3P
5	A	1023	PCW	C1-O3P-P-O4P
5	A	1023	PCW	C4-O4P-P-O3P
5	A	1024	PCW	C1-O3P-P-O4P
5	A	1024	PCW	C4-O4P-P-O3P
5	A	1025	PCW	C1-O3P-P-O4P
5	A	1025	PCW	C4-O4P-P-O3P
5	A	1026	PCW	C4-O4P-P-O3P
5	A	1027	PCW	C4-O4P-P-O3P
5	A	1028	PCW	C1-O3P-P-O4P
5	A	1028	PCW	C4-O4P-P-O3P
5	A	1029	PCW	C1-O3P-P-O4P
5	A	1029	PCW	C4-O4P-P-O3P
5	A	1030	PCW	C1-O3P-P-O4P
5	A	1030	PCW	C4-O4P-P-O3P
5	A	1031	PCW	C1-O3P-P-O4P
5	A	1031	PCW	C4-O4P-P-O3P
5	A	1032	PCW	C4-O4P-P-O3P
5	A	1033	PCW	C1-O3P-P-O4P
5	A	1033	PCW	C4-O4P-P-O3P
5	A	1034	PCW	C1-O3P-P-O4P
5	A	1034	PCW	C4-O4P-P-O3P

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Mol	Chain	Res	Type	Atoms
5	A	1035	PCW	C4-O4P-P-O3P
5	A	1036	PCW	C4-O4P-P-O3P
5	A	1010	PCW	C1-C2-C3-O3
5	A	1020	PCW	O3P-C1-C2-C3
5	A	1014	PCW	C1-C2-C3-O3
5	A	1029	PCW	C1-C2-C3-O3
5	A	1008	PCW	O3P-C1-C2-O2
5	A	1026	PCW	C12-C11-O3-C3
5	A	1025	PCW	O2-C2-C3-O3
4	A	1003	TG1	O1-C13-C14-C15
5	A	1012	PCW	C1-C2-C3-O3
5	A	1011	PCW	O3P-C1-C2-C3
5	A	1013	PCW	O3P-C1-C2-C3
5	A	1012	PCW	O2-C2-C3-O3
5	A	1032	PCW	O2-C2-C3-O3
4	A	1003	TG1	O2-C13-C14-C15
5	A	1006	PCW	C1-O3P-P-O2P
5	A	1009	PCW	C1-O3P-P-O2P
5	A	1010	PCW	C1-O3P-P-O2P
5	A	1011	PCW	C1-O3P-P-O2P
5	A	1012	PCW	C1-O3P-P-O2P
5	A	1013	PCW	C1-O3P-P-O2P
5	A	1014	PCW	C1-O3P-P-O2P
5	A	1017	PCW	C1-O3P-P-O2P
5	A	1019	PCW	C1-O3P-P-O2P
5	A	1024	PCW	C1-O3P-P-O2P
5	A	1028	PCW	C1-O3P-P-O2P
5	A	1030	PCW	C1-O3P-P-O2P
5	A	1032	PCW	C1-O3P-P-O1P
5	A	1034	PCW	C1-O3P-P-O2P
5	A	1036	PCW	C1-O3P-P-O2P
5	A	1031	PCW	O3P-C1-C2-O2

There are no ring outliers.

6 monomers are involved in 9 short contacts:

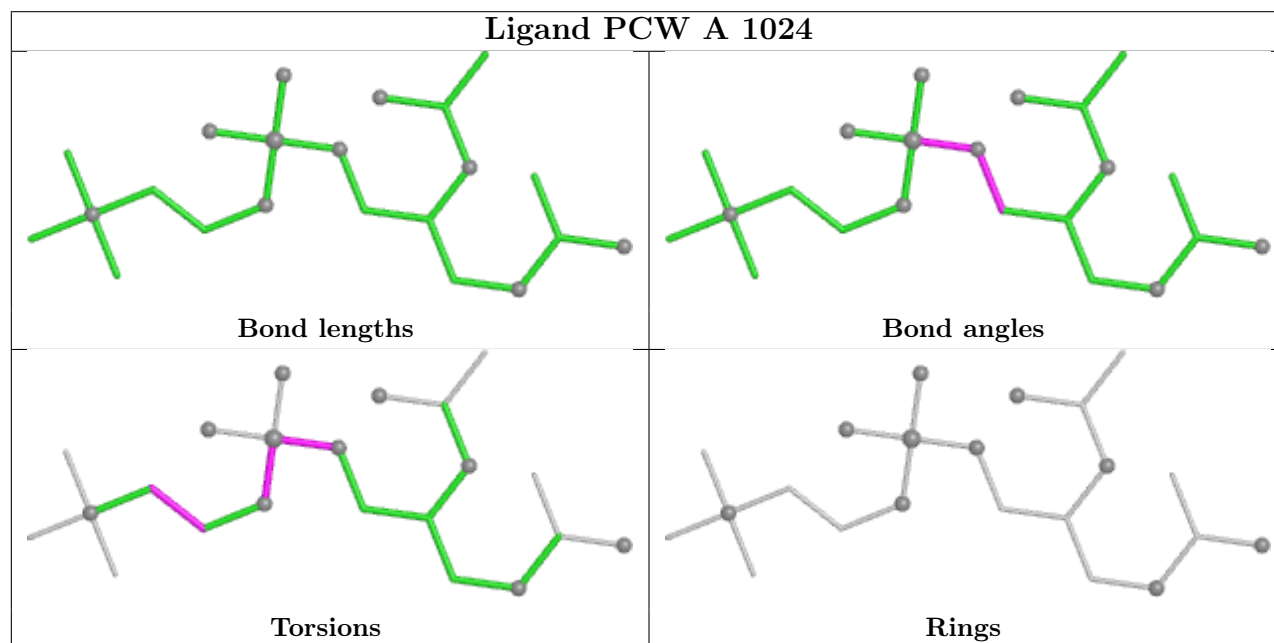
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1026	PCW	2	0
4	A	1003	TG1	3	0
5	A	1023	PCW	1	0
5	A	1016	PCW	1	0
5	A	1035	PCW	1	0

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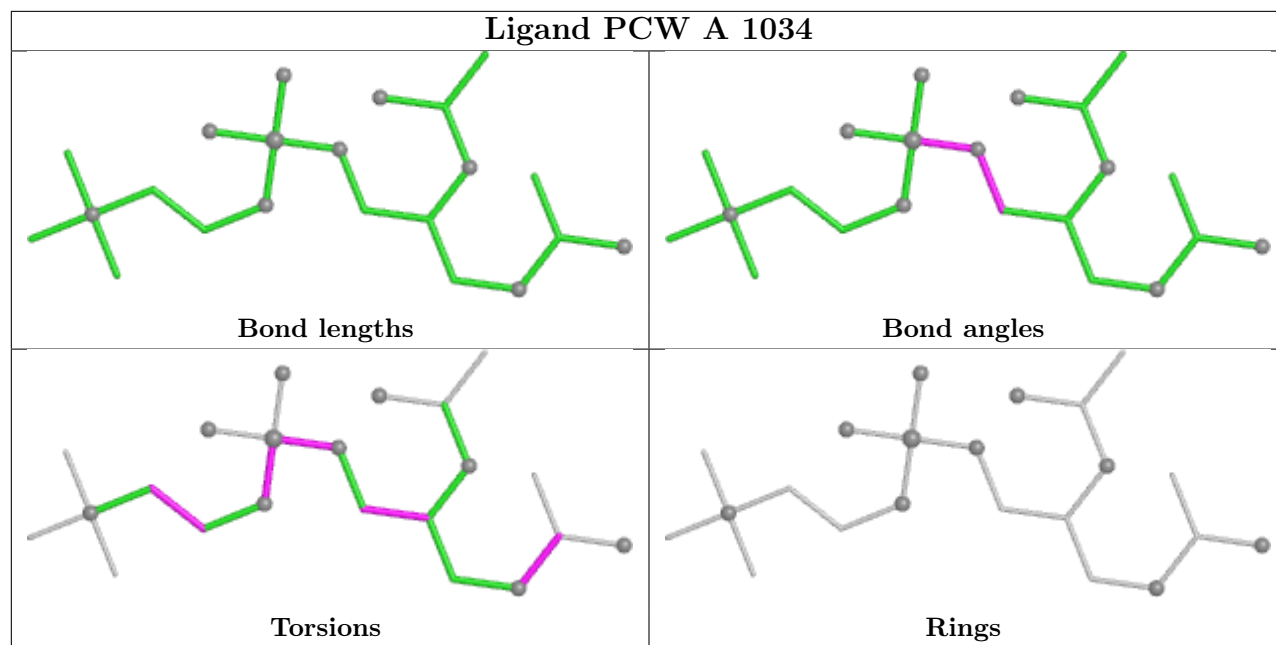
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Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1017	PCW	1	0

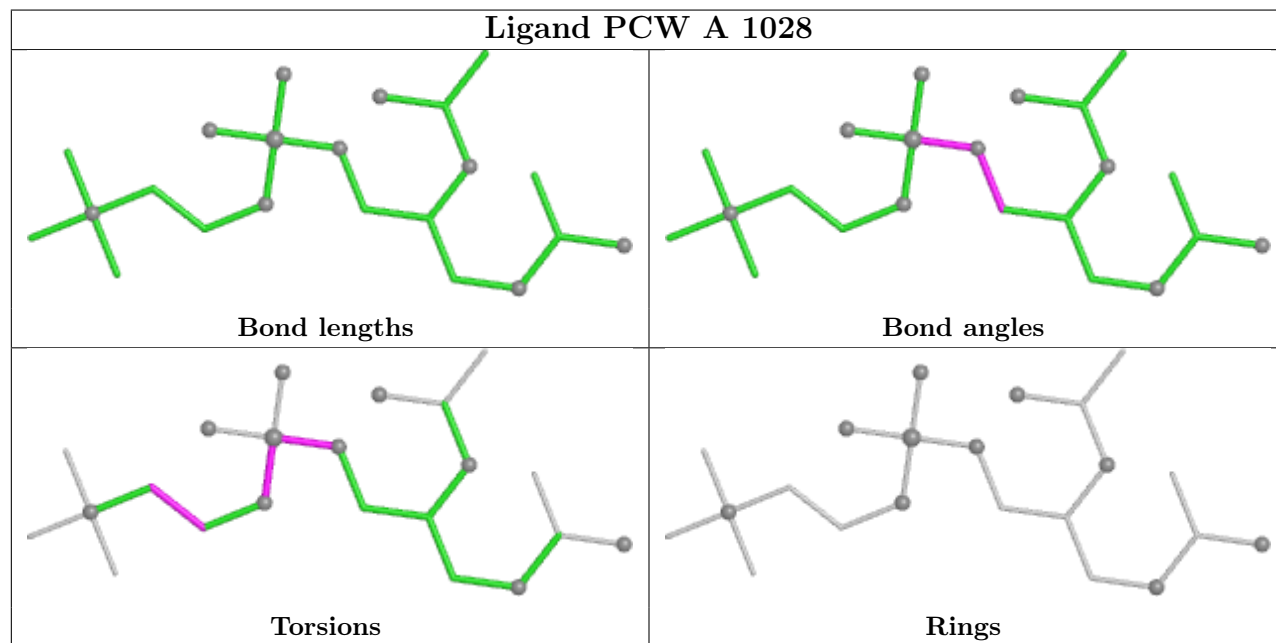
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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



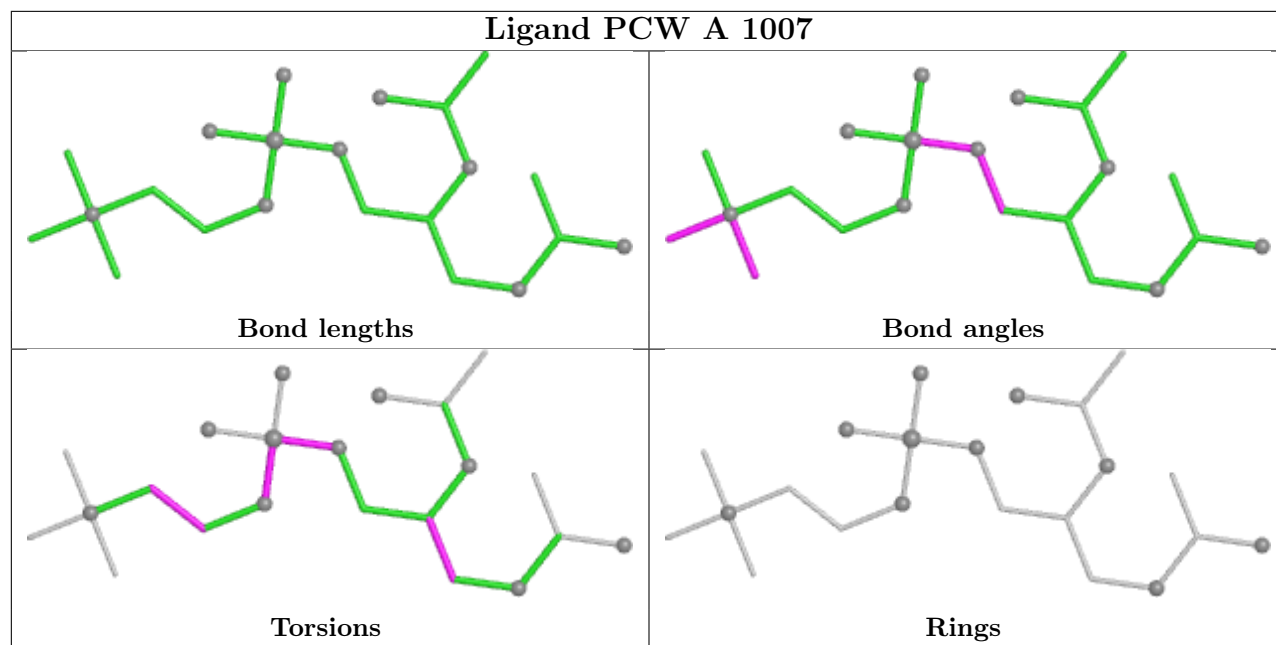
Ligand PCW A 1034



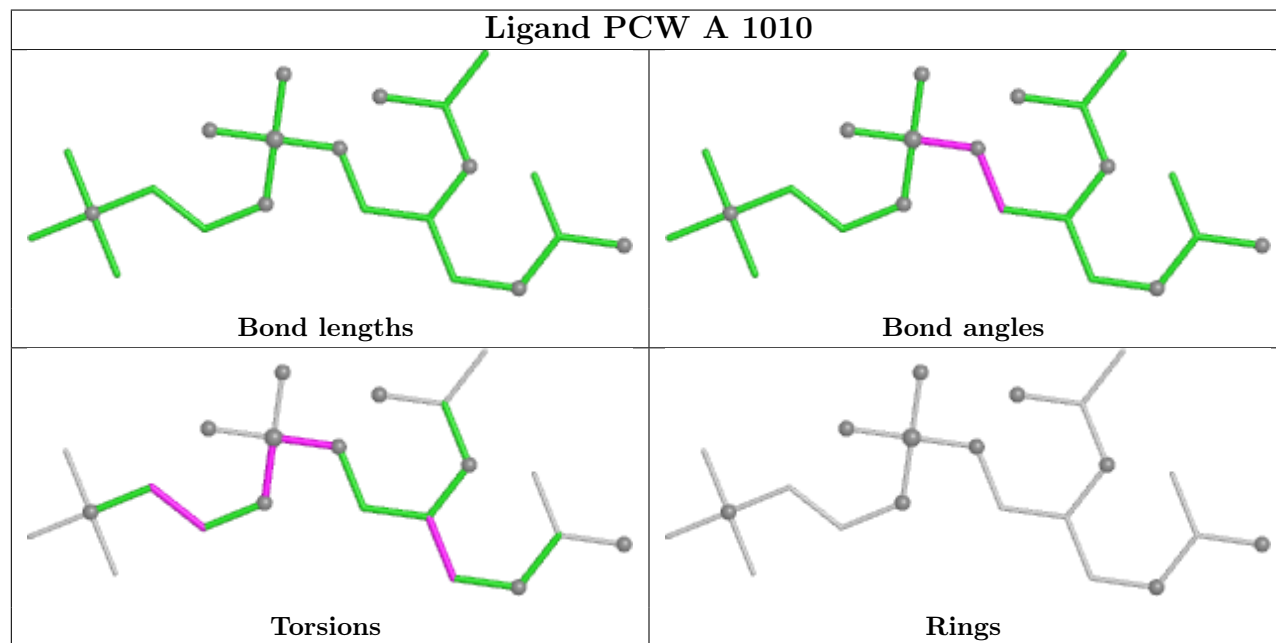
Ligand PCW A 1028



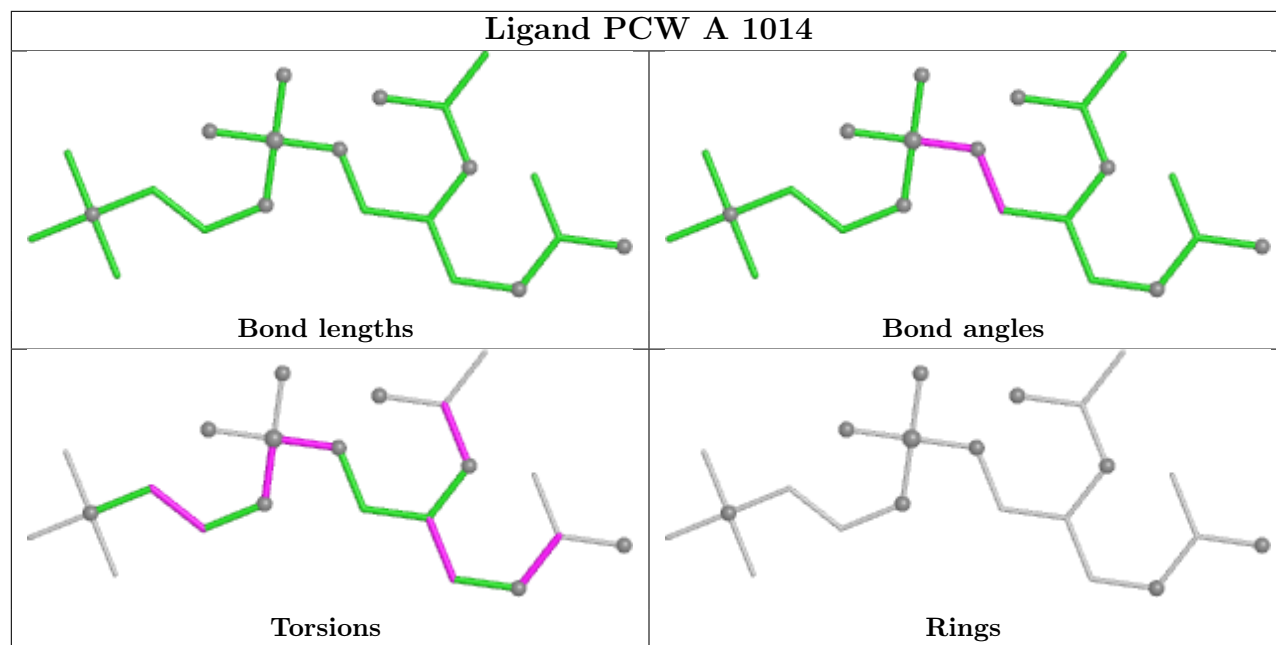
Ligand PCW A 1007



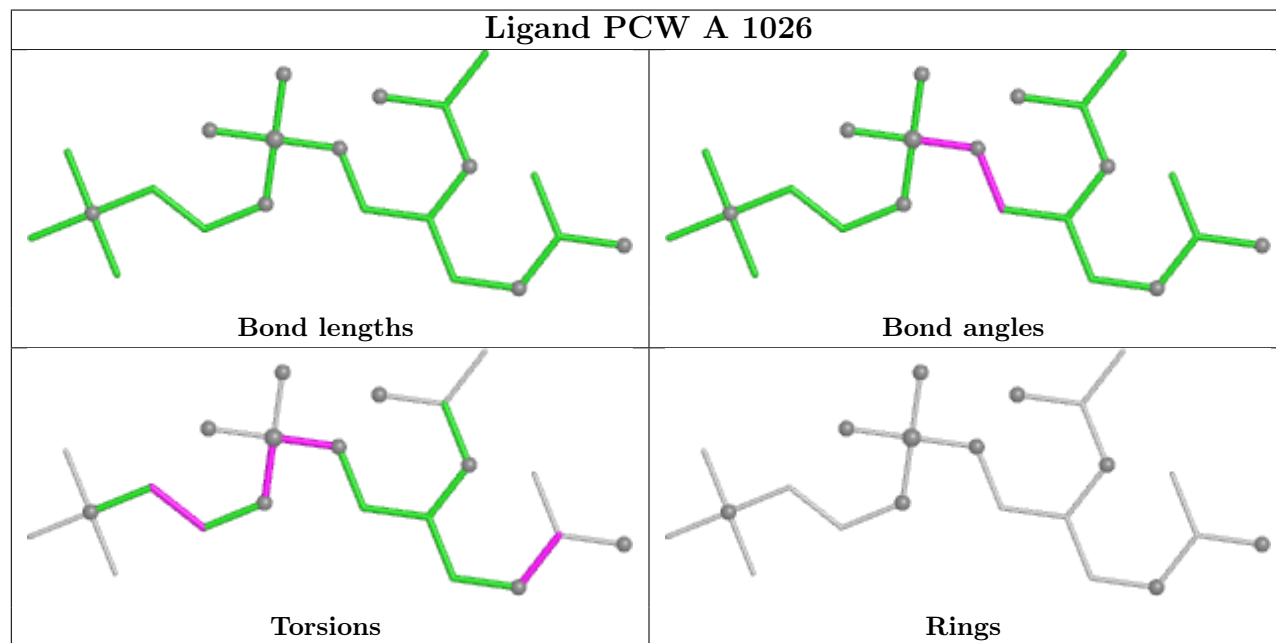
Ligand PCW A 1010



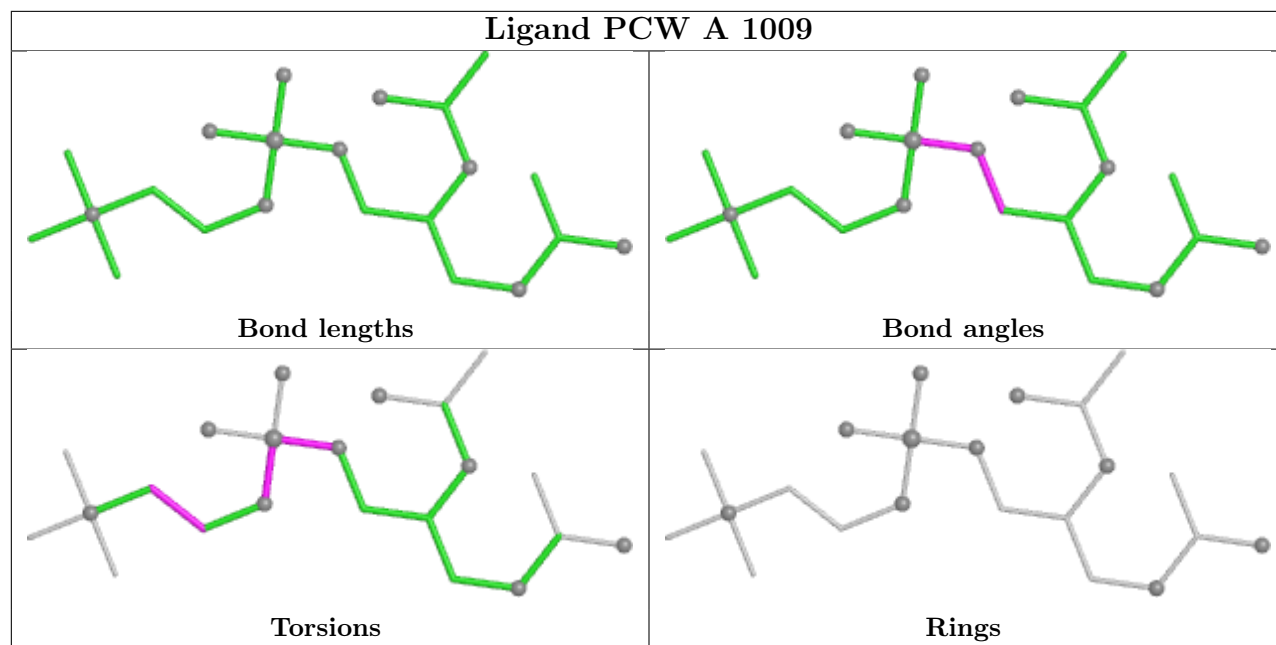
Ligand PCW A 1014



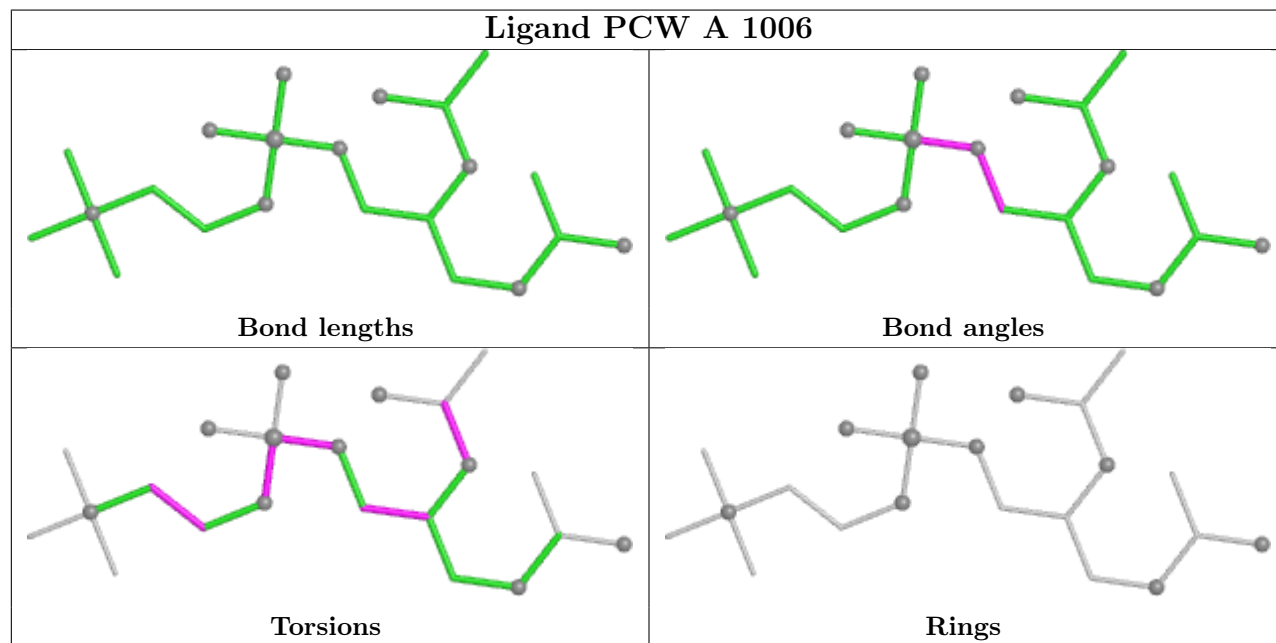
Ligand PCW A 1026



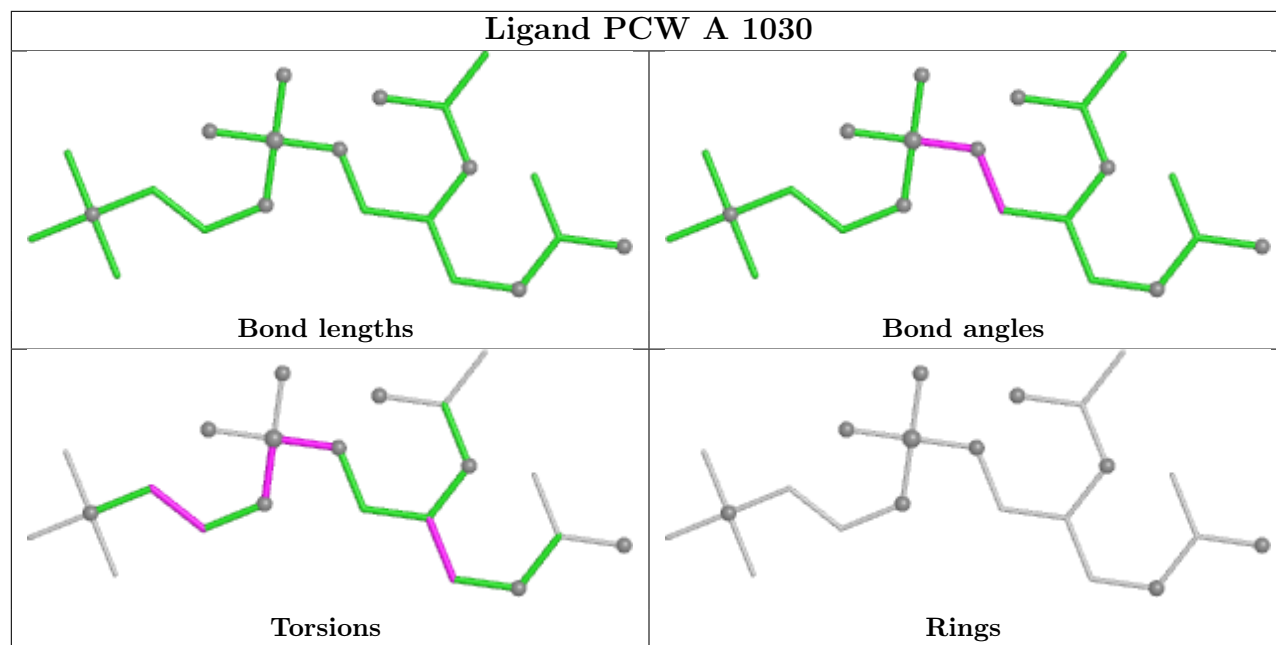
Ligand PCW A 1009



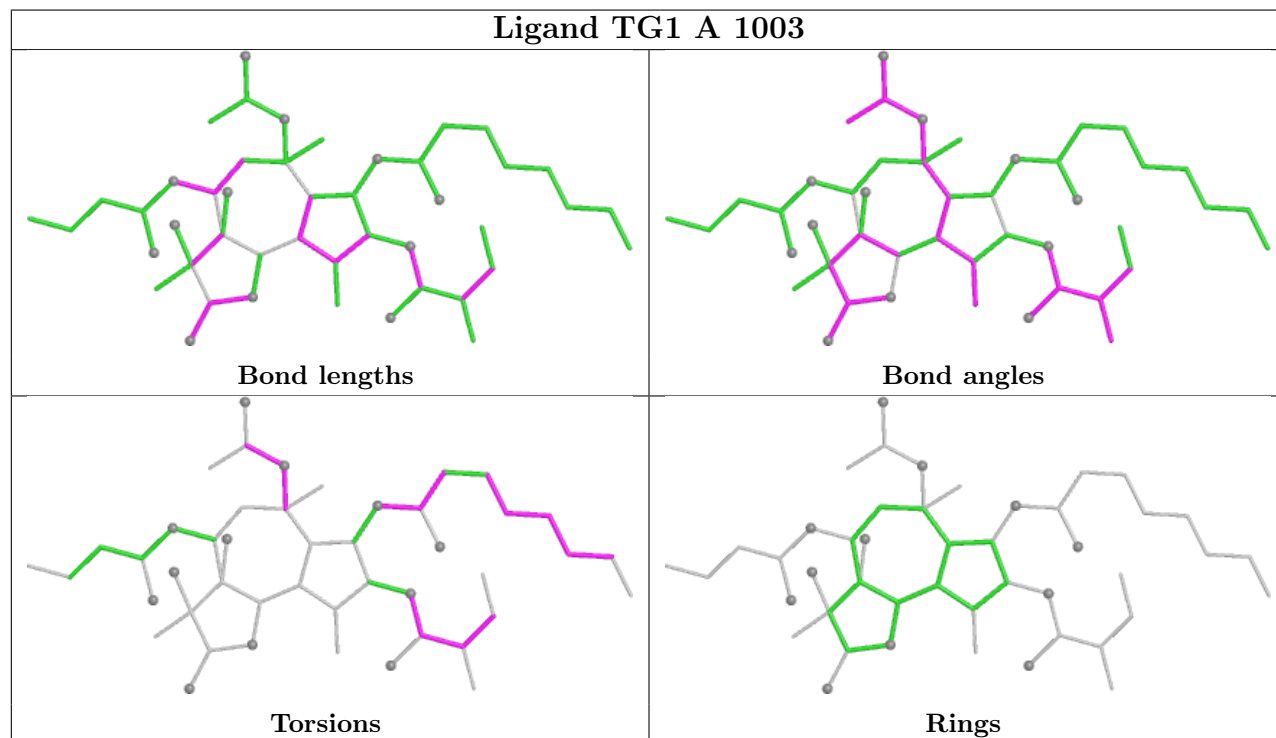
Ligand PCW A 1006

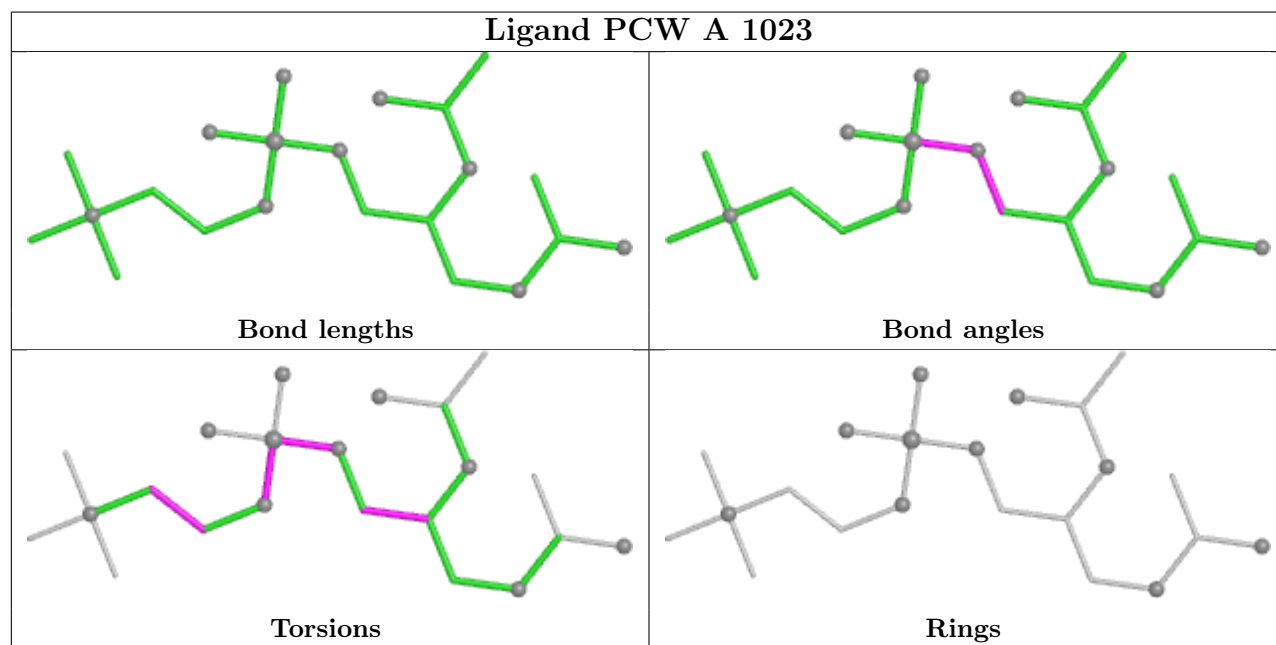
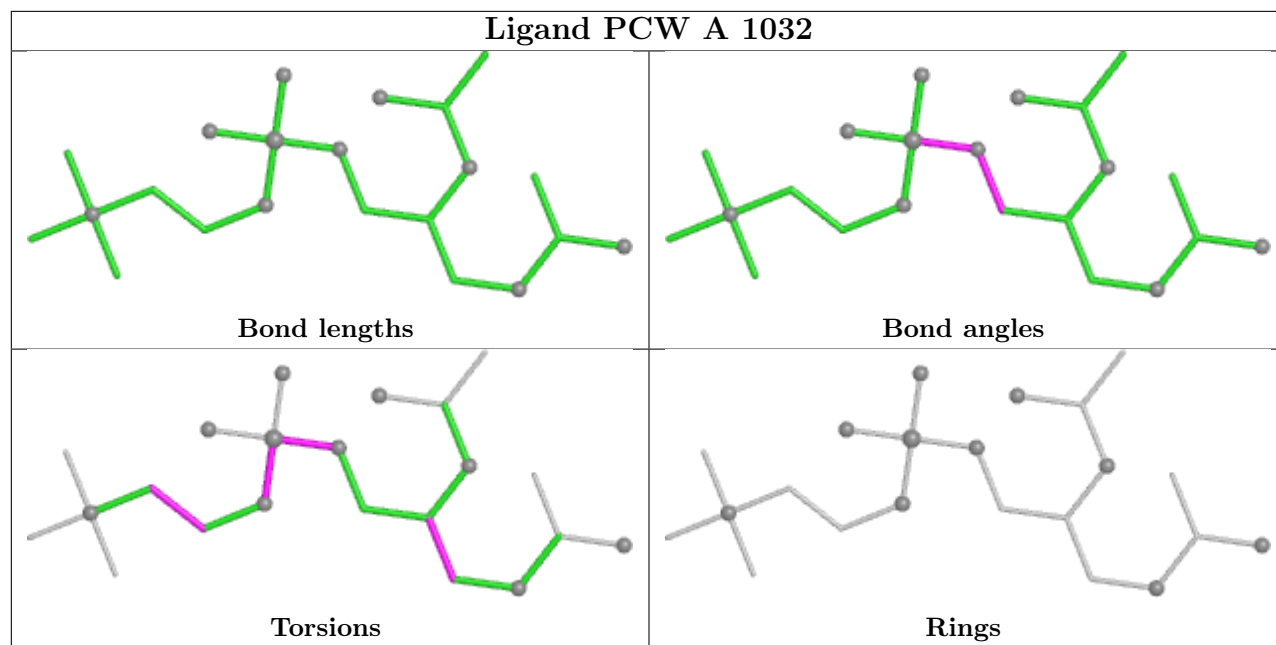


Ligand PCW A 1030

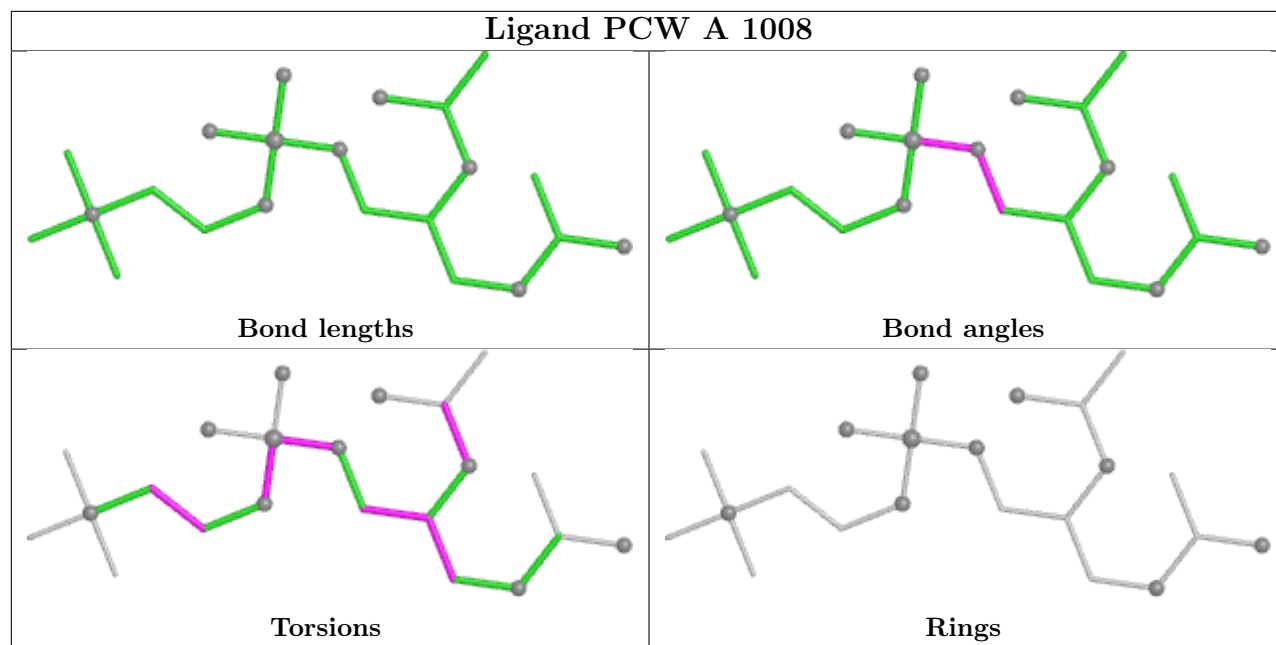


Ligand TG1 A 1003

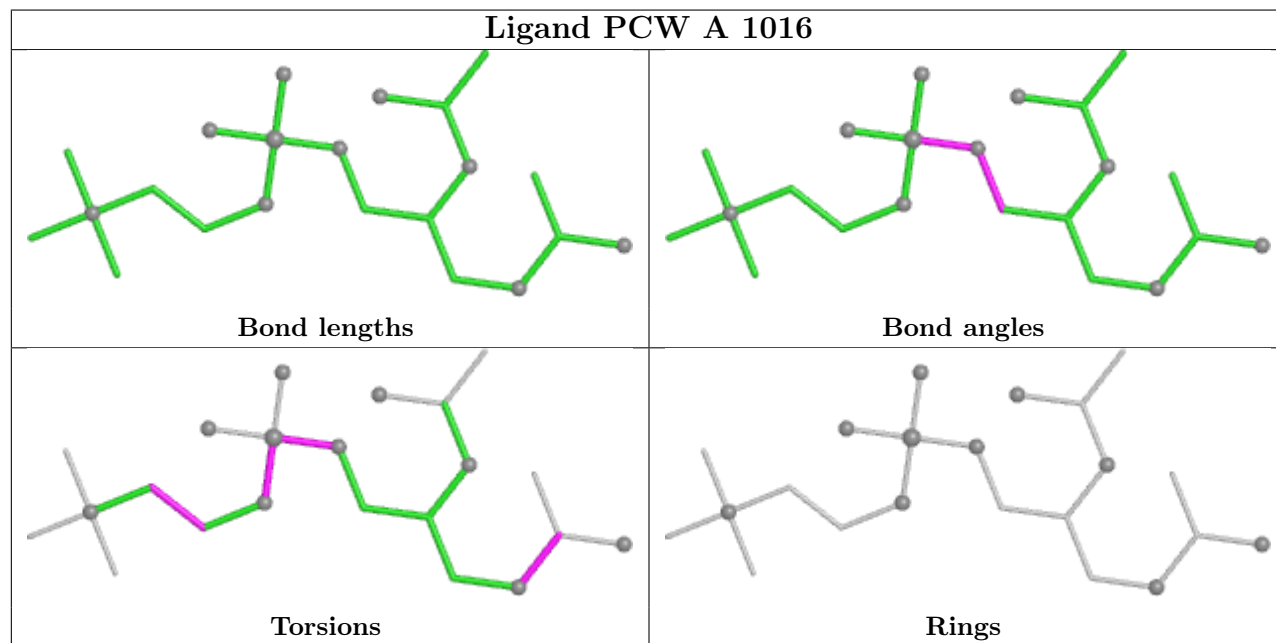




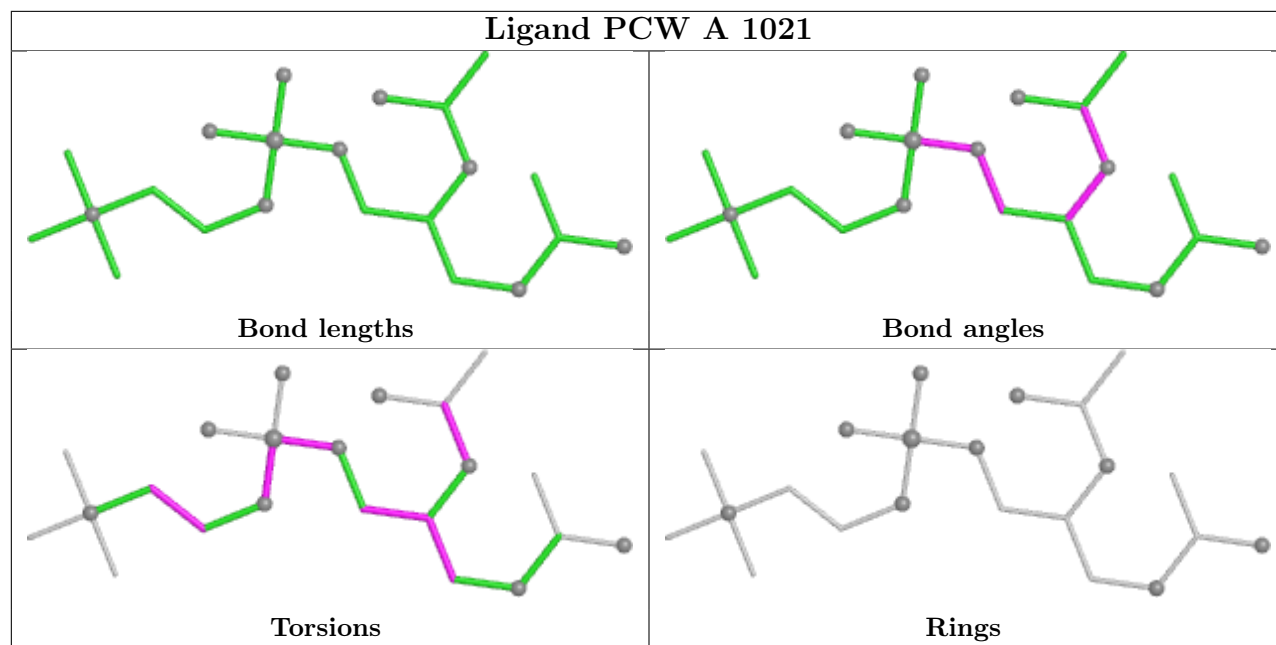
Ligand PCW A 1008



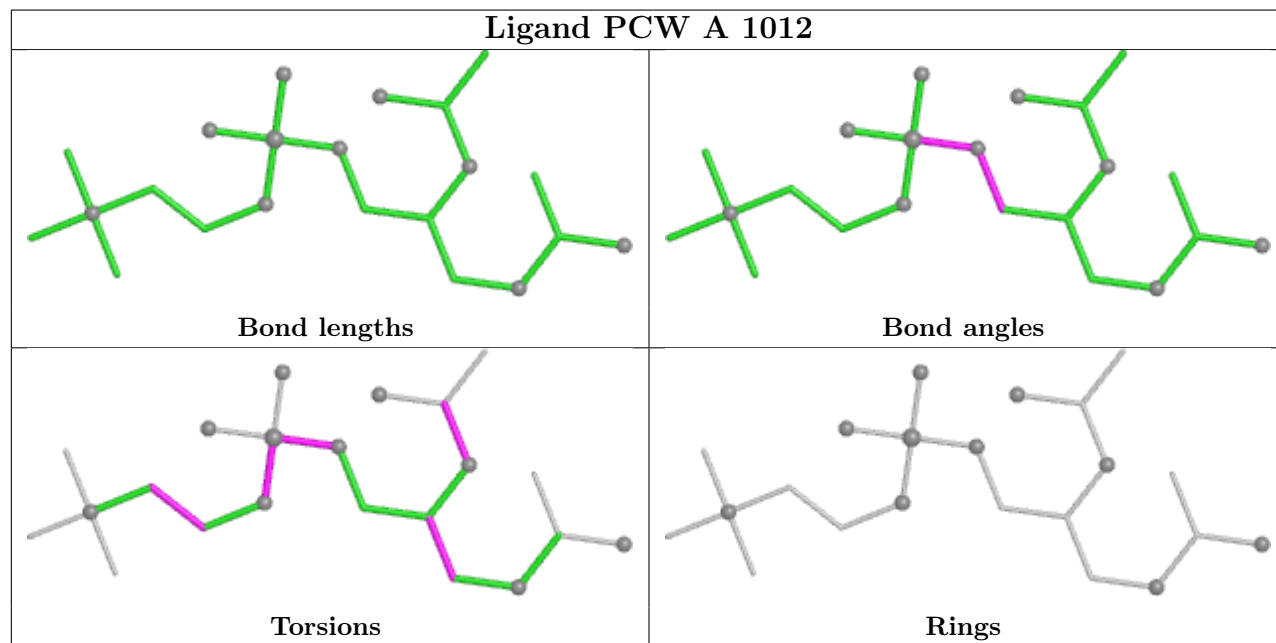
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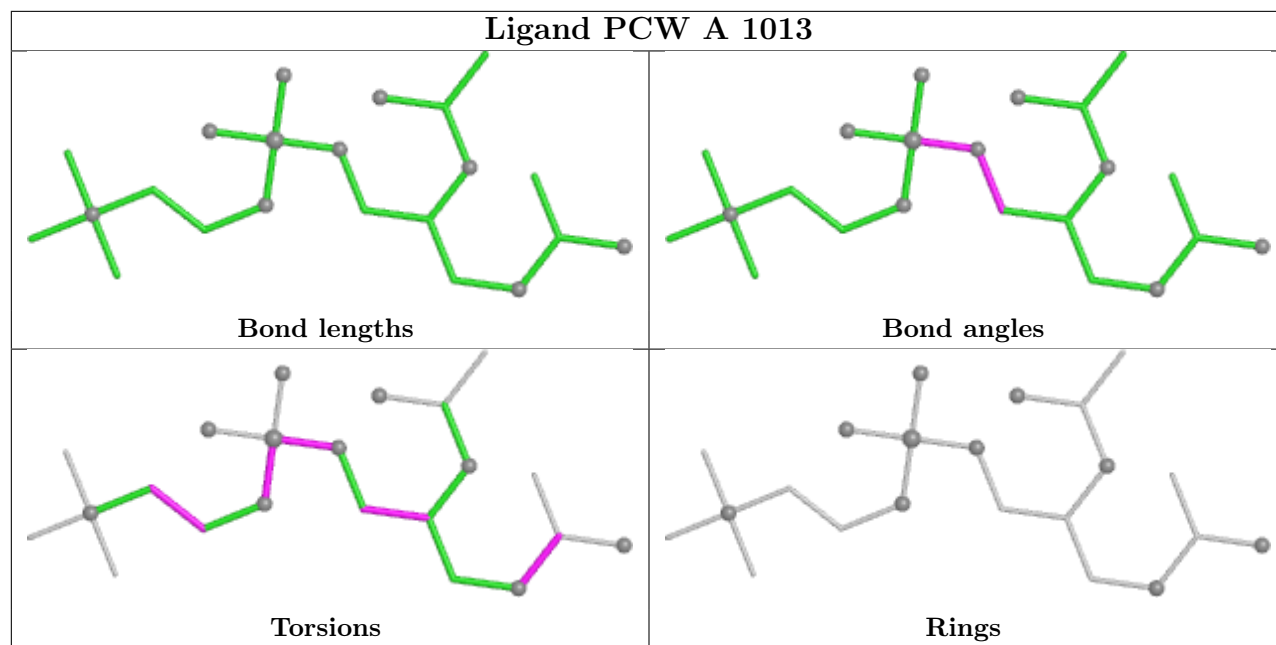
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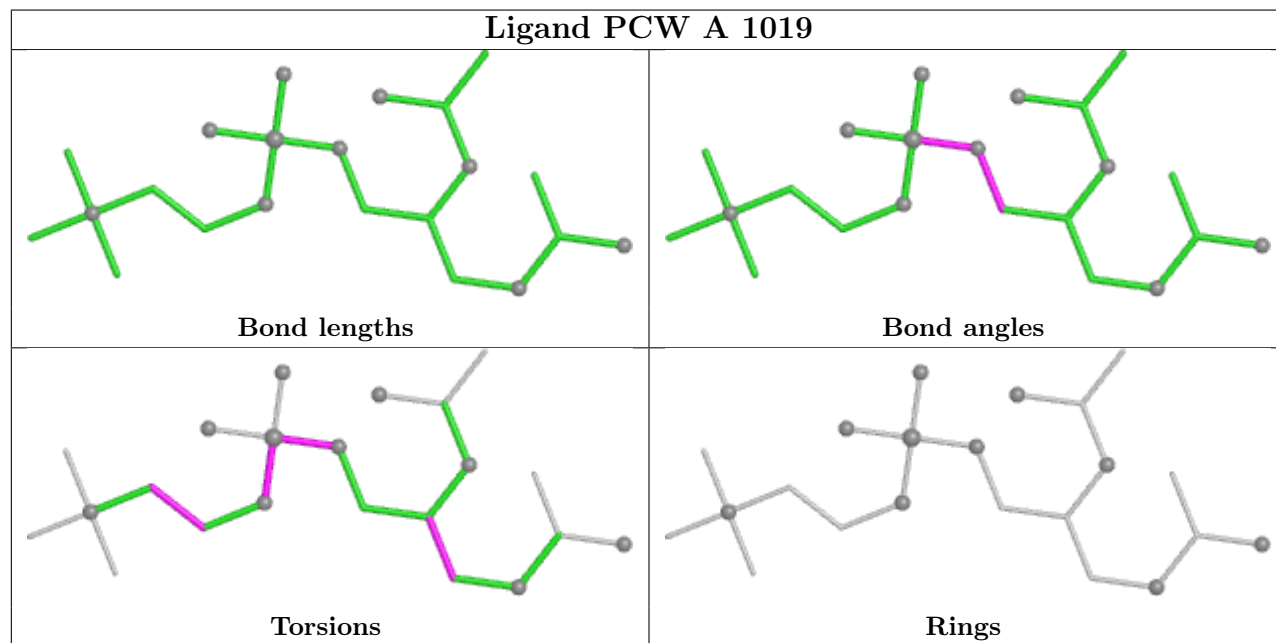
Ligand PCW A 1012



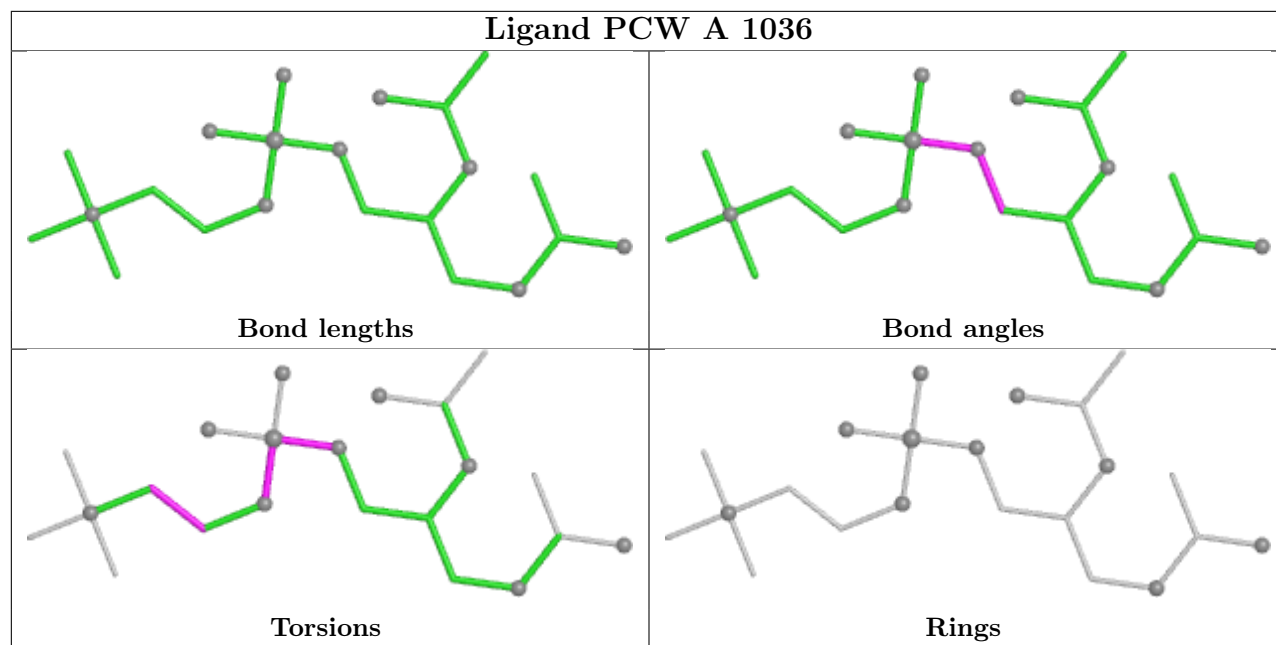
Ligand PCW A 1013



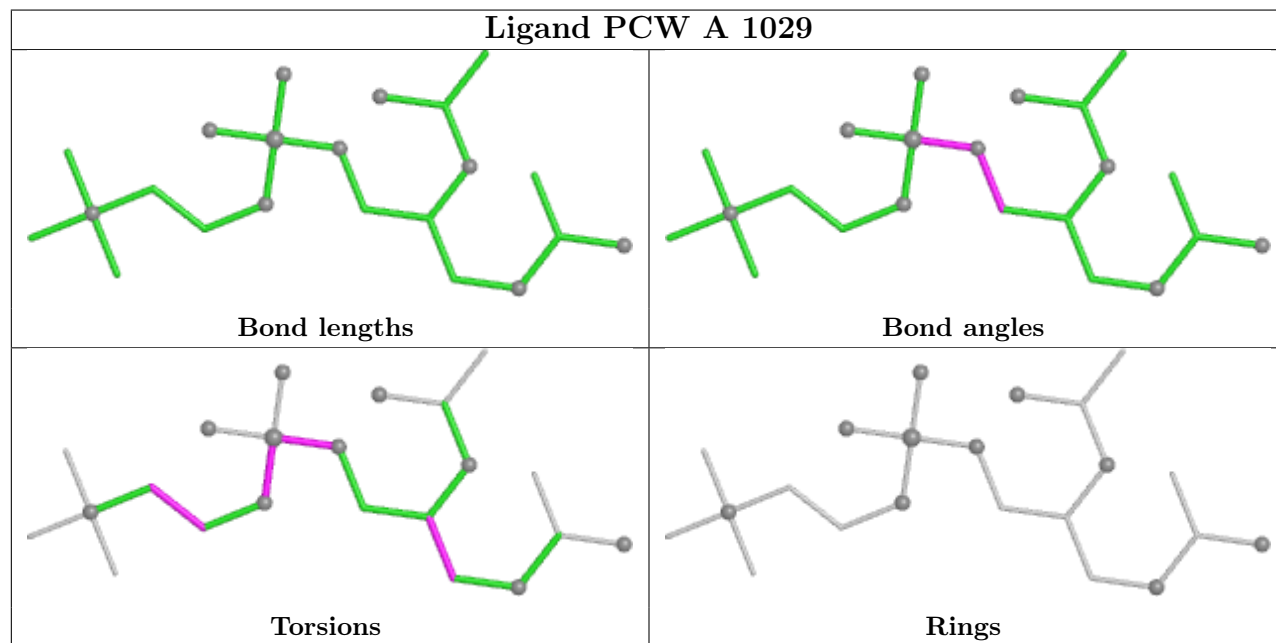
Ligand PCW A 1019



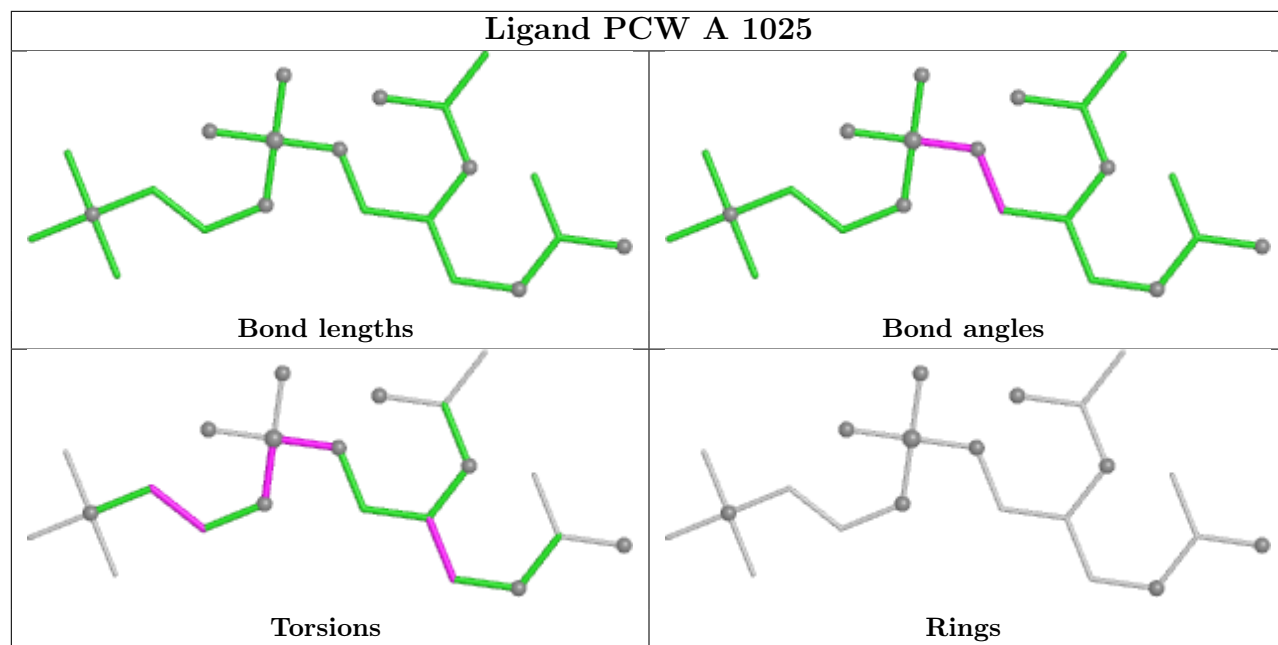
Ligand PCW A 1036



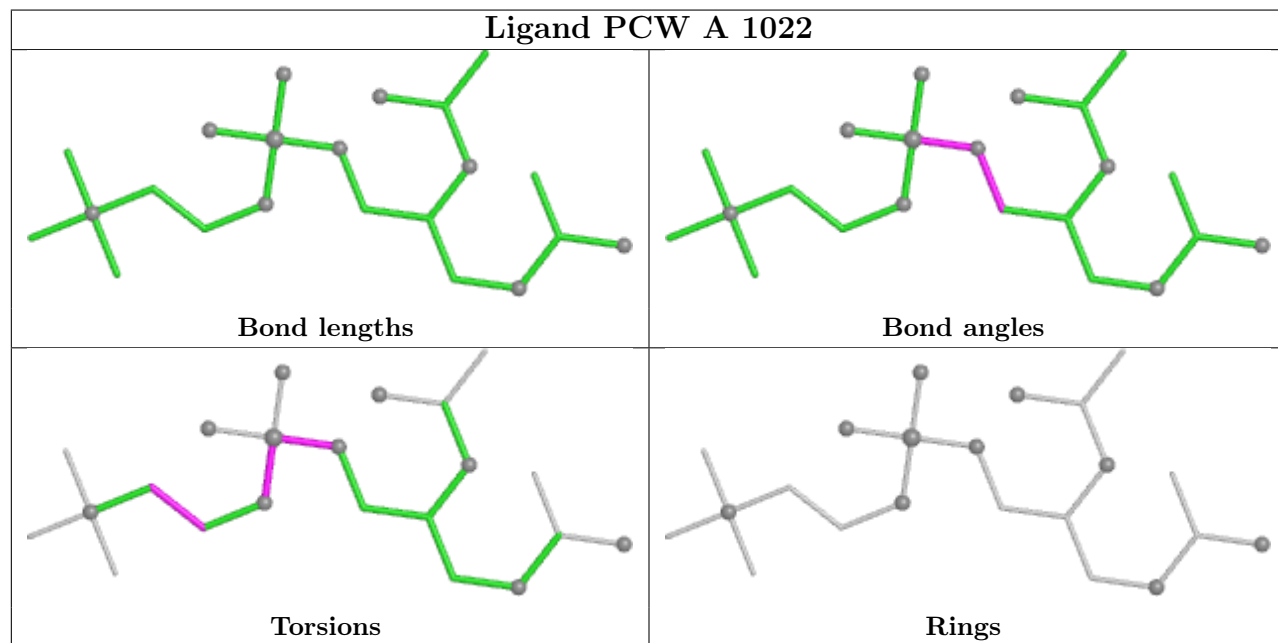
Ligand PCW A 1029



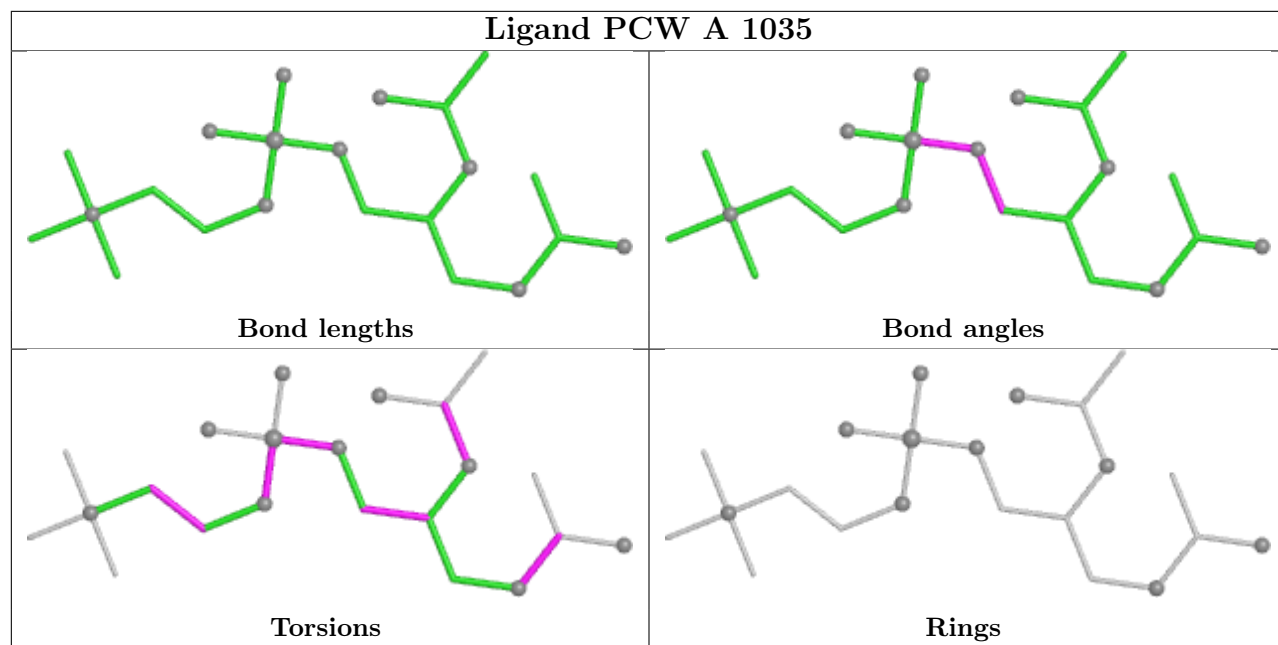
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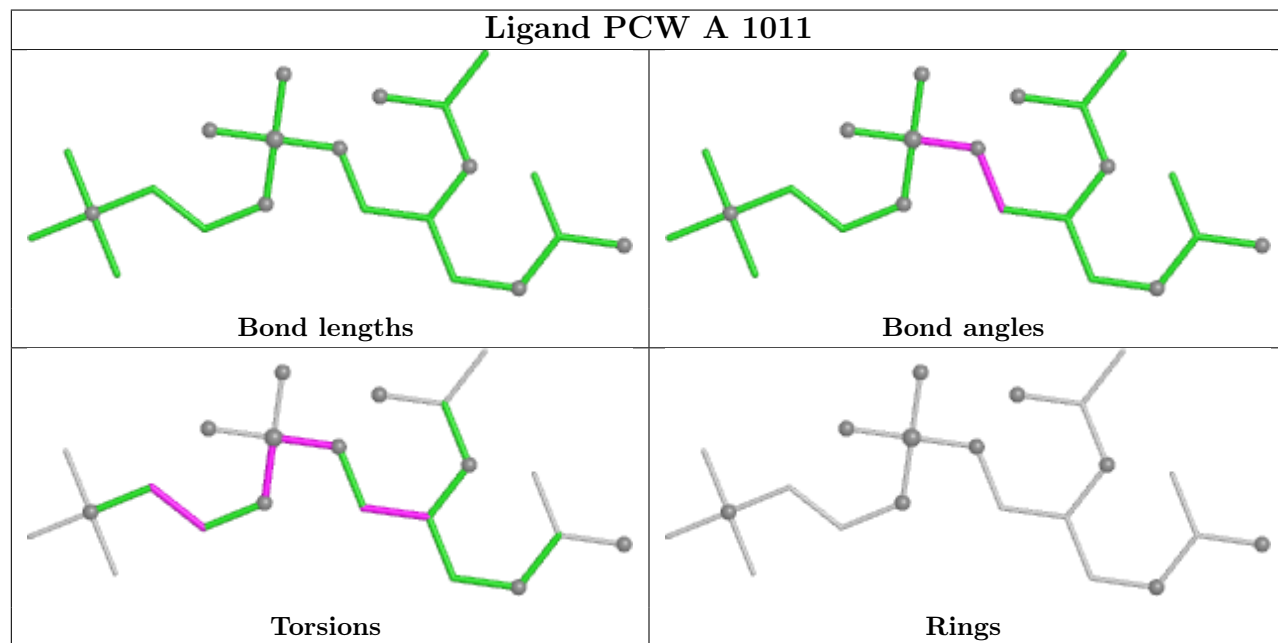
Ligand PCW A 1022



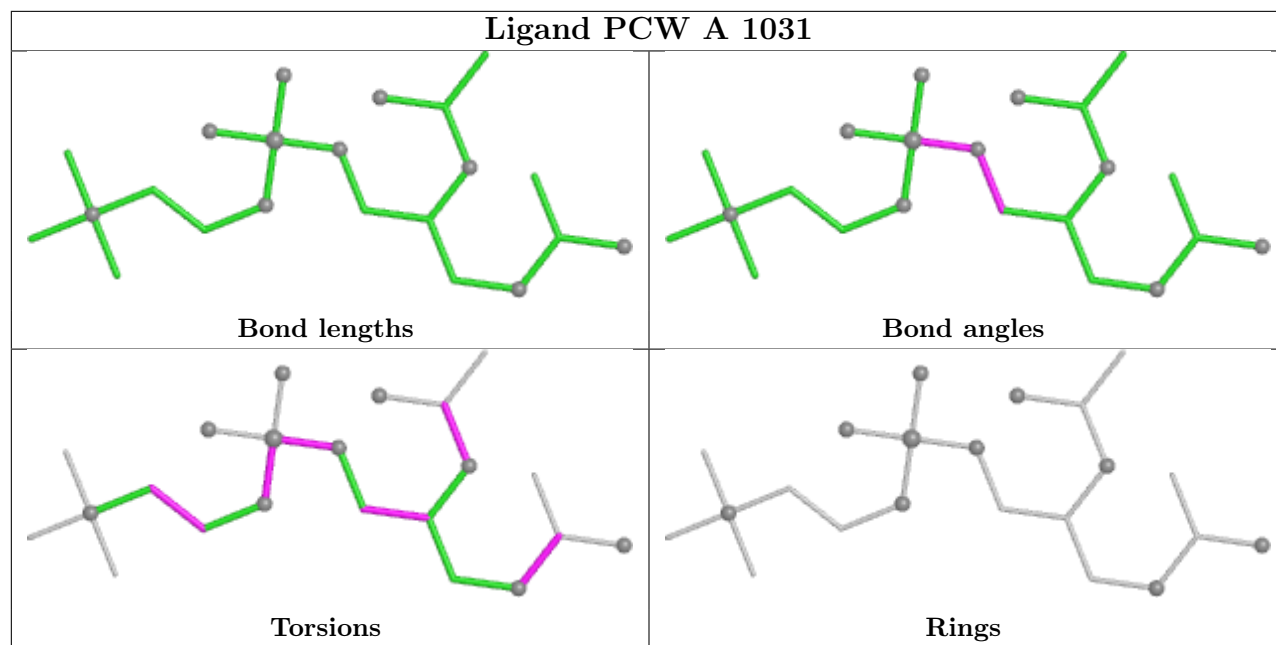
Ligand PCW A 1035



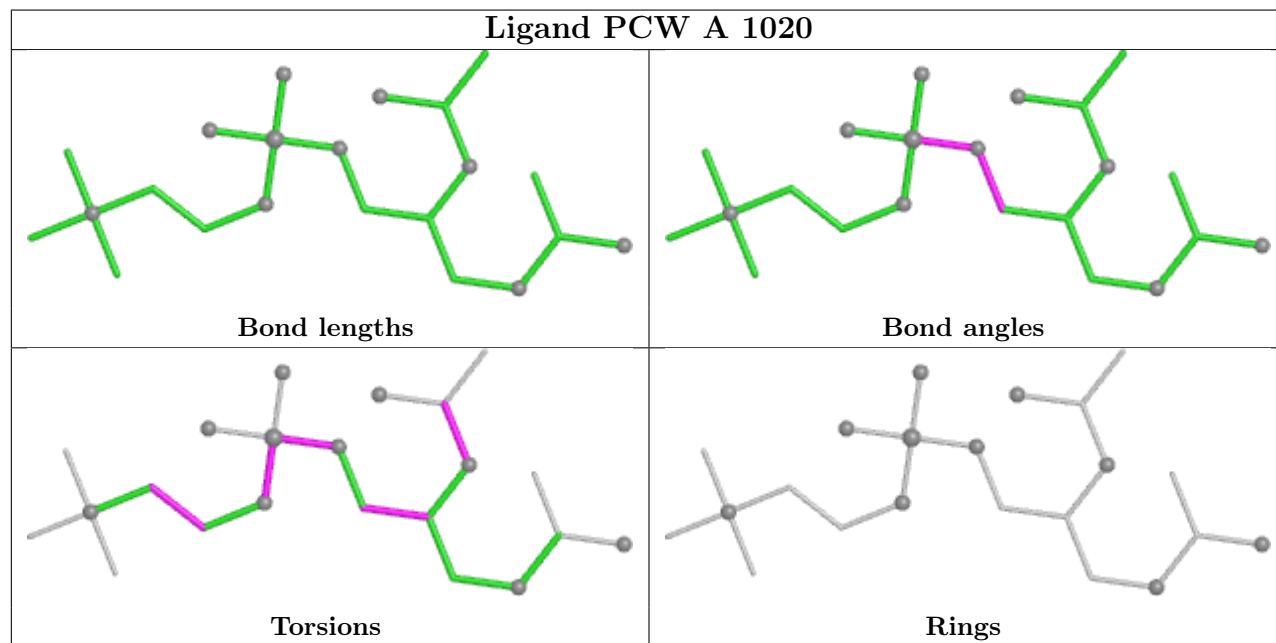
Ligand PCW A 1011

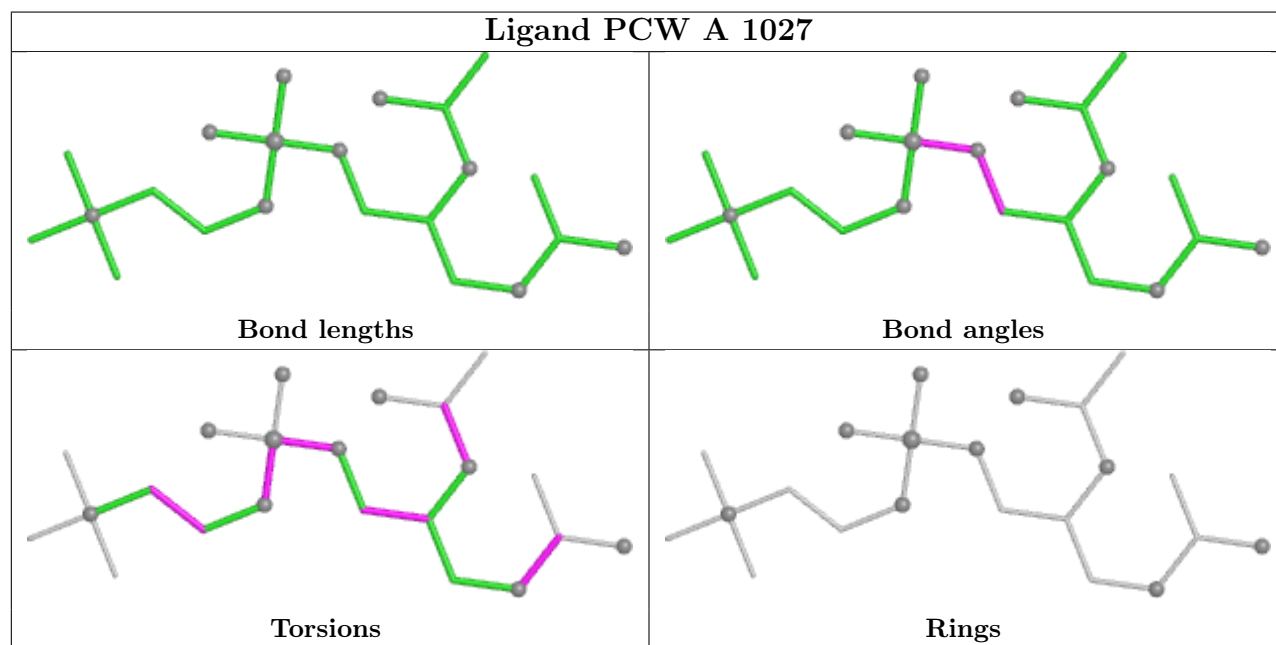
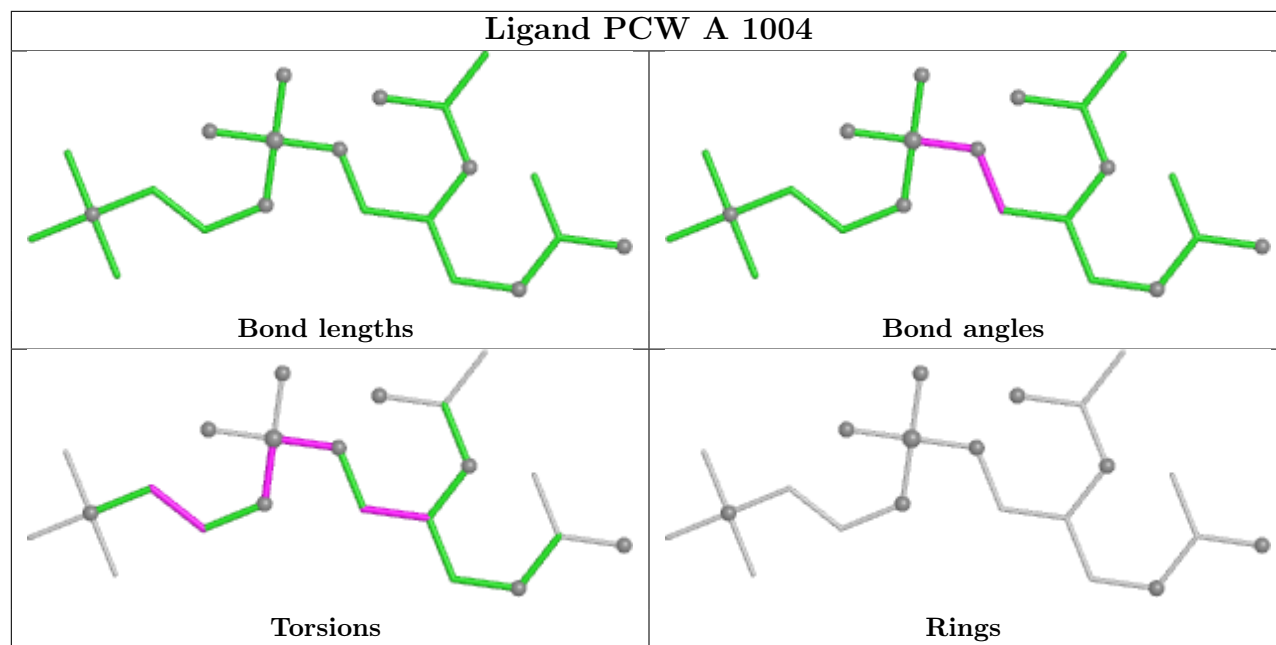


Ligand PCW A 1031

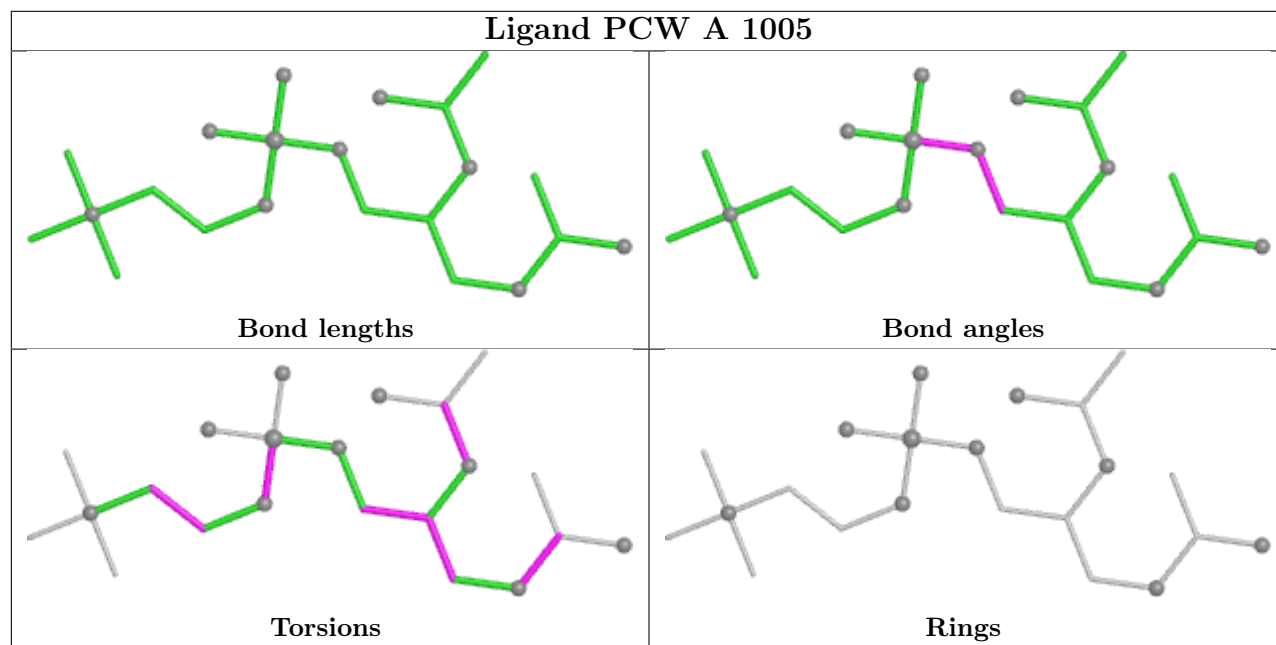


Ligand PCW A 1020

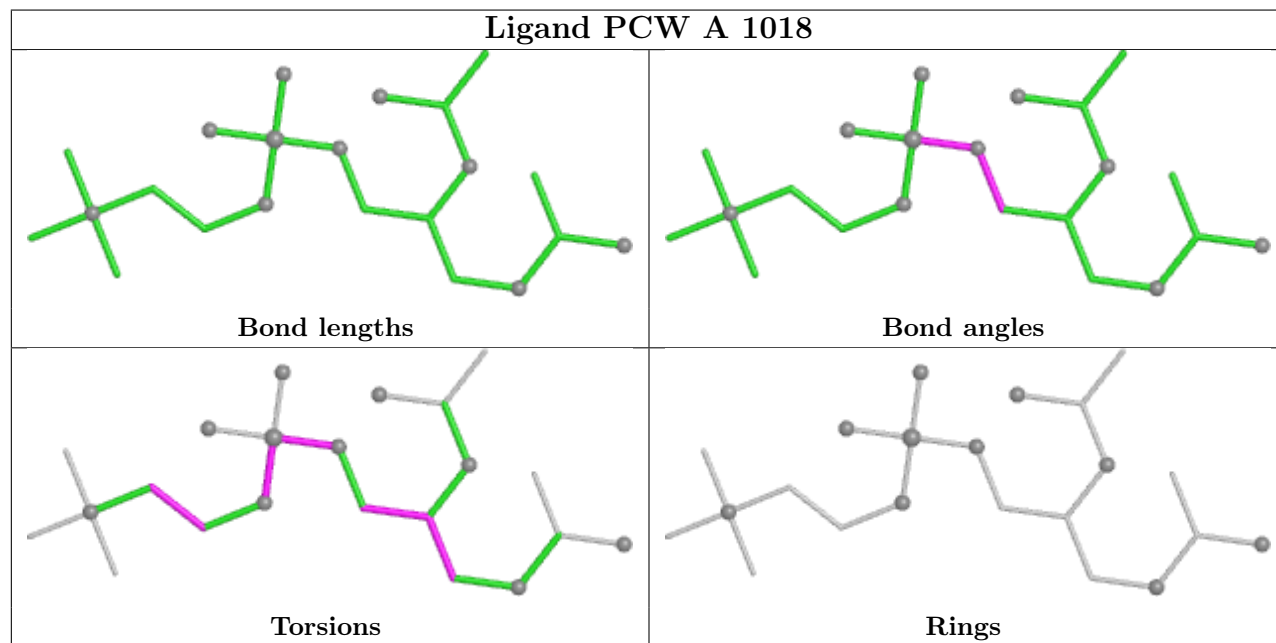




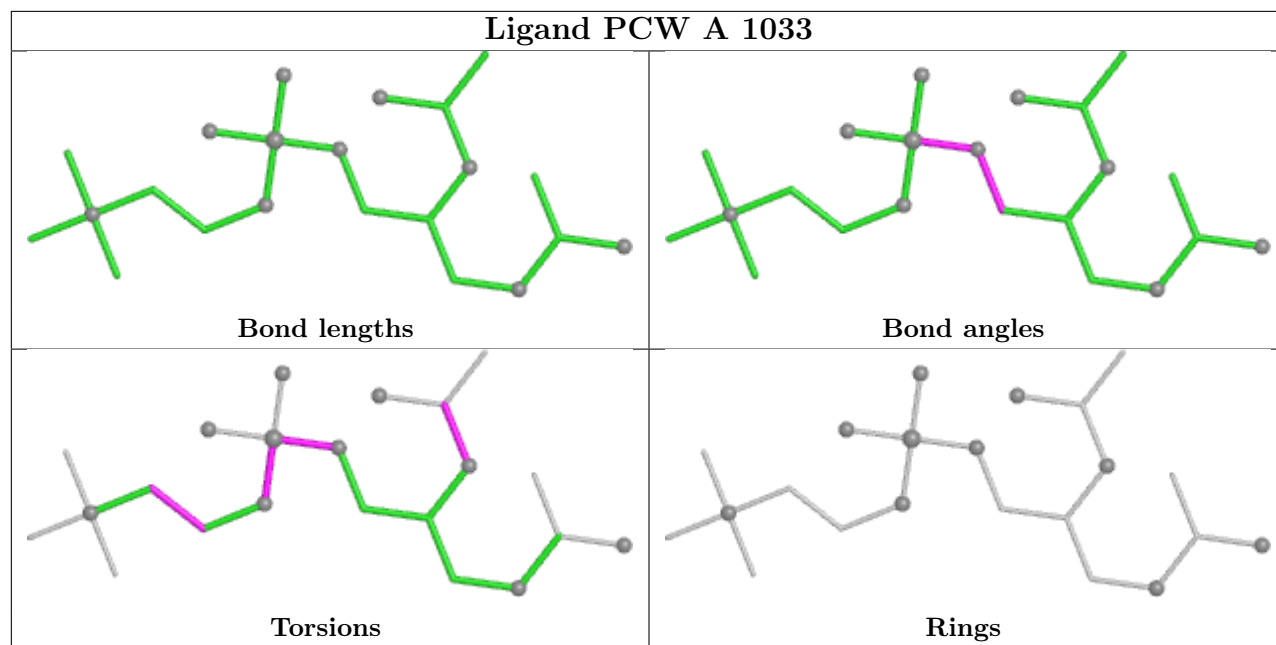
Ligand PCW A 1005



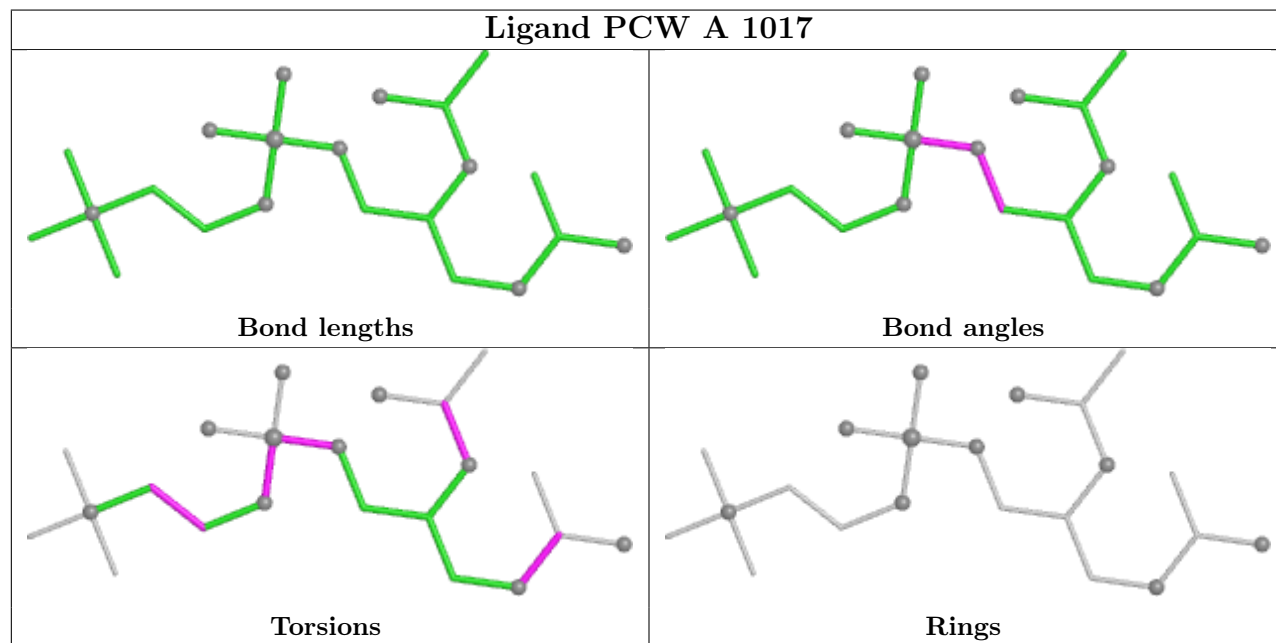
Ligand PCW A 1018

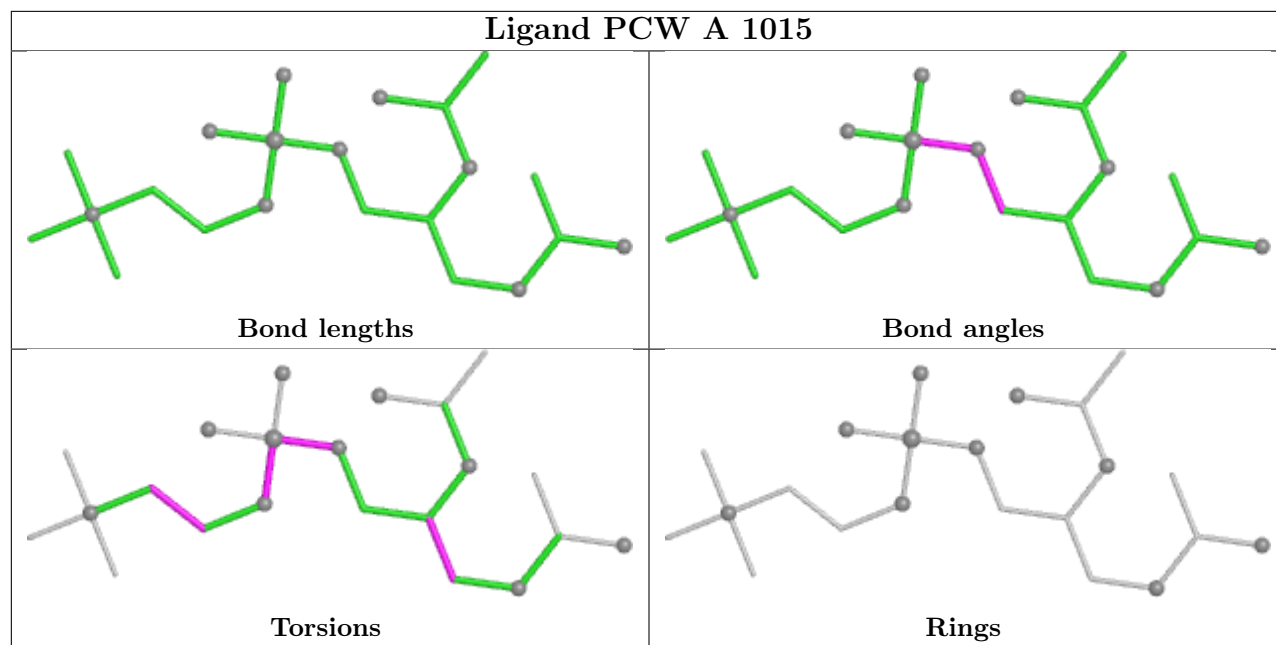


Ligand PCW A 1033



Ligand PCW A 1017





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 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	994/995 (99%)	0.35	105 (10%) 11 8	49, 104, 248, 333	0

All (105) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	338	SER	7.3
1	A	321	LEU	6.6
1	A	382	PHE	6.6
1	A	319	LEU	6.4
1	A	733	MET	5.9
1	A	244	GLN	5.5
1	A	339	VAL	5.5
1	A	243	GLU	5.2
1	A	111	ASN	5.1
1	A	112	ALA	5.0
1	A	247	THR	5.0
1	A	332	ILE	4.9
1	A	395	VAL	4.9
1	A	402	ILE	4.9
1	A	335	SER	4.5
1	A	554	THR	4.4
1	A	113	GLU	4.4
1	A	281	ASP	4.1
1	A	560	ARG	4.1
1	A	188	ILE	4.1
1	A	994	GLY	4.0
1	A	597	VAL	3.9
1	A	337	PRO	3.8
1	A	417	CYS	3.8
1	A	340	GLU	3.7
1	A	396	LEU	3.7
1	A	333	VAL	3.7

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Mol	Chain	Res	Type	RSRZ
1	A	421	ASN	3.6
1	A	882	HIS	3.6
1	A	326	MET	3.6
1	A	341	THR	3.6
1	A	825	LYS	3.6
1	A	248	PRO	3.5
1	A	336	LEU	3.5
1	A	401	PRO	3.5
1	A	445	LEU	3.5
1	A	824	PRO	3.5
1	A	407	PHE	3.4
1	A	485	LEU	3.4
1	A	486	GLU	3.4
1	A	487	PHE	3.4
1	A	456	ASN	3.3
1	A	574	GLU	3.3
1	A	599	MET	3.3
1	A	44	GLU	3.3
1	A	400	LYS	3.2
1	A	344	CYS	3.2
1	A	245	ASP	3.1
1	A	323	THR	3.1
1	A	363	VAL	3.1
1	A	397	LYS	3.1
1	A	168	ILE	3.1
1	A	242	THR	3.0
1	A	950	VAL	3.0
1	A	866	THR	3.0
1	A	441	THR	3.0
1	A	398	ASN	2.9
1	A	553	GLY	2.9
1	A	324	ARG	2.8
1	A	749	GLU	2.8
1	A	484	THR	2.7
1	A	952	PRO	2.7
1	A	598	GLY	2.7
1	A	509	GLY	2.7
1	A	334	ARG	2.6
1	A	572	LYS	2.6
1	A	322	GLY	2.6
1	A	514	VAL	2.6
1	A	515	LYS	2.6

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Mol	Chain	Res	Type	RSRZ
1	A	282	PRO	2.6
1	A	483	PHE	2.6
1	A	695	ASP	2.6
1	A	328	LYS	2.6
1	A	964	LEU	2.5
1	A	422	ASP	2.5
1	A	366	MET	2.5
1	A	246	LYS	2.5
1	A	331	ALA	2.5
1	A	474	VAL	2.5
1	A	174	ARG	2.5
1	A	454	VAL	2.5
1	A	752	ALA	2.5
1	A	488	SER	2.4
1	A	890	ILE	2.4
1	A	949	TYR	2.4
1	A	584	PHE	2.4
1	A	562	LEU	2.4
1	A	329	LYS	2.3
1	A	404	SER	2.3
1	A	169	LYS	2.3
1	A	552	TRP	2.3
1	A	273	LEU	2.3
1	A	472	ASN	2.3
1	A	403	ARG	2.2
1	A	939	LEU	2.2
1	A	924	ARG	2.2
1	A	508	VAL	2.2
1	A	753	ILE	2.2
1	A	315	ILE	2.1
1	A	814	LEU	2.1
1	A	318	CYS	2.1
1	A	383	SER	2.1
1	A	70	CYS	2.1
1	A	754	TYR	2.1
1	A	452	MET	2.0

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.3 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

6.4 Ligands ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
5	PCW	A	1014	22/54	0.22	0.17	262,263,263,263	0
5	PCW	A	1006	22/54	0.24	0.19	262,263,263,263	0
5	PCW	A	1032	22/54	0.26	0.16	271,273,273,273	0
5	PCW	A	1023	22/54	0.33	0.15	265,269,271,271	0
5	PCW	A	1012	22/54	0.33	0.16	231,234,234,234	0
5	PCW	A	1031	22/54	0.34	0.16	332,332,332,332	0
5	PCW	A	1011	22/54	0.38	0.18	242,244,244,244	0
5	PCW	A	1004	22/54	0.39	0.18	276,277,277,277	0
5	PCW	A	1019	22/54	0.41	0.15	283,284,284,284	0
5	PCW	A	1007	22/54	0.44	0.15	266,268,268,268	0
5	PCW	A	1015	22/54	0.44	0.15	269,270,270,270	0
5	PCW	A	1013	22/54	0.47	0.14	255,255,255,255	0
5	PCW	A	1025	22/54	0.48	0.15	269,269,269,269	0
5	PCW	A	1005	22/54	0.49	0.13	255,255,255,255	0
5	PCW	A	1030	22/54	0.51	0.13	293,293,293,293	0
5	PCW	A	1036	22/54	0.51	0.14	287,289,289,289	0
5	PCW	A	1018	22/54	0.52	0.13	291,292,292,292	0
5	PCW	A	1009	22/54	0.52	0.14	254,256,256,256	0
5	PCW	A	1017	22/54	0.53	0.14	280,283,283,283	0
5	PCW	A	1024	22/54	0.58	0.16	264,264,264,264	0
5	PCW	A	1016	22/54	0.58	0.13	262,263,263,263	0
5	PCW	A	1027	22/54	0.62	0.11	264,264,264,264	0
5	PCW	A	1035	22/54	0.63	0.13	292,296,296,296	0
5	PCW	A	1026	22/54	0.69	0.13	257,258,258,258	0
5	PCW	A	1029	22/54	0.71	0.14	234,236,237,237	0
5	PCW	A	1020	22/54	0.71	0.18	310,310,310,310	0
5	PCW	A	1033	22/54	0.72	0.15	281,281,281,281	0
5	PCW	A	1008	22/54	0.73	0.13	253,254,254,254	0
5	PCW	A	1021	22/54	0.73	0.17	256,257,257,257	0
5	PCW	A	1034	22/54	0.75	0.14	314,316,316,316	0
5	PCW	A	1010	22/54	0.79	0.14	251,252,252,252	0
5	PCW	A	1028	22/54	0.81	0.12	238,239,240,240	0

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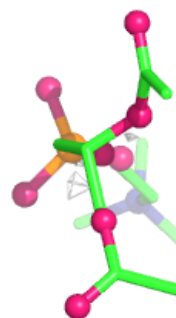
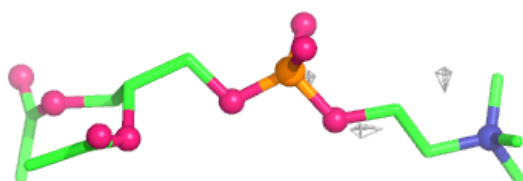
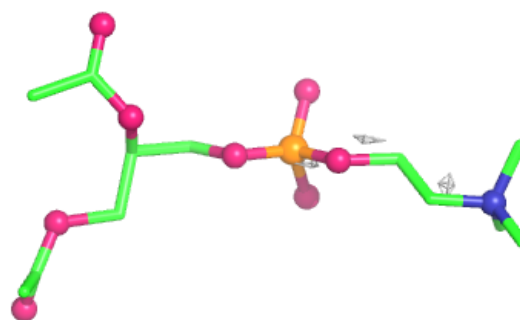
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
5	PCW	A	1022	22/54	0.84	0.17	222,225,227,227	0
4	TG1	A	1003	46/46	0.89	0.13	156,156,156,156	0
3	ALF	A	1002	5/5	0.98	0.08	45,47,61,64	0
2	MG	A	1001	1/1	0.99	0.06	47,47,47,47	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

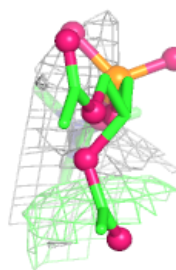
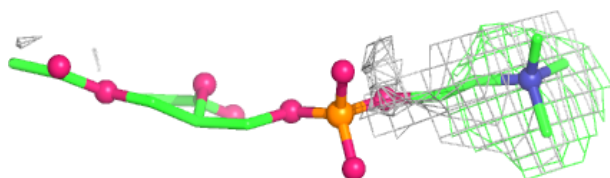
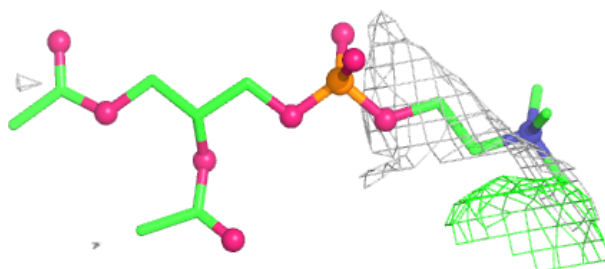
Electron density around PCW A 1014:

2mF_o-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

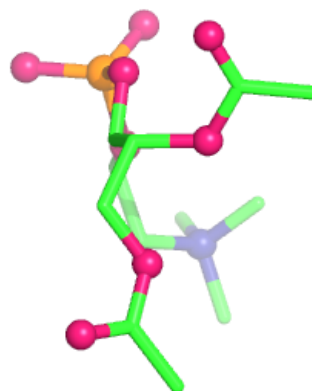
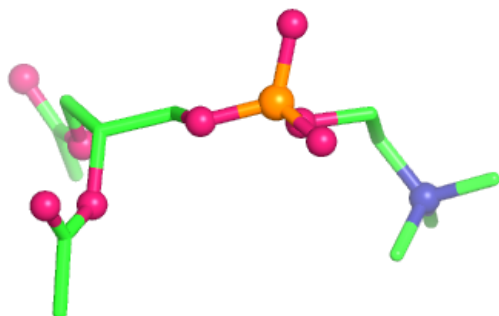
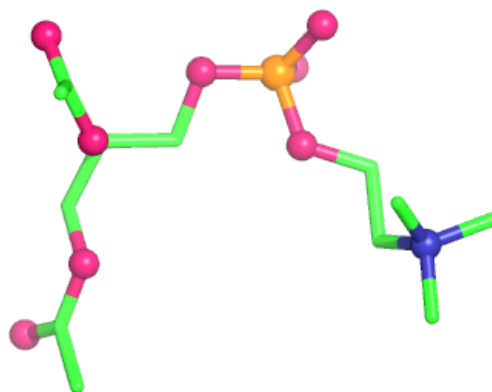


Electron density around PCW A 1006:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

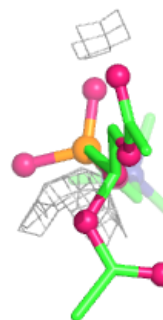
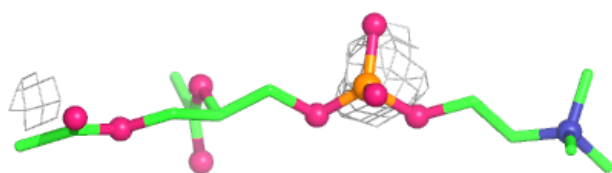
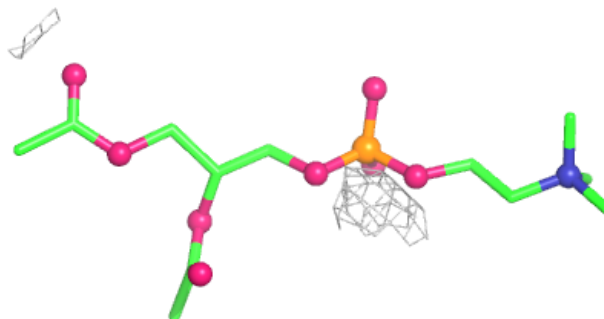
**Electron density around PCW A 1032:**

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

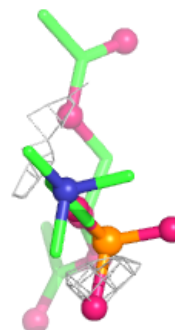
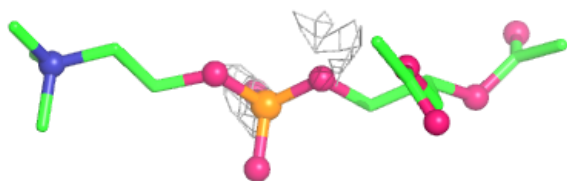
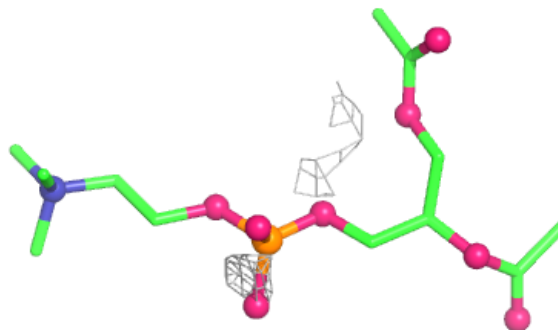


Electron density around PCW A 1023:

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and green (positive)

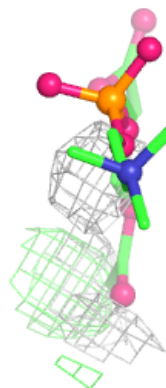
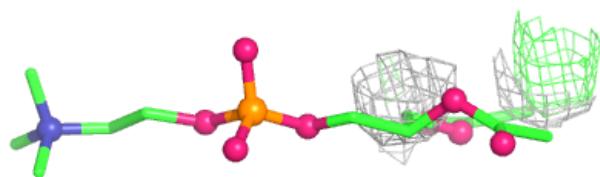
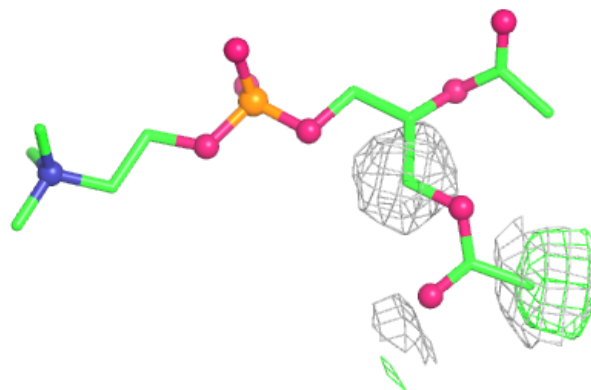
**Electron density around PCW A 1012:**

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

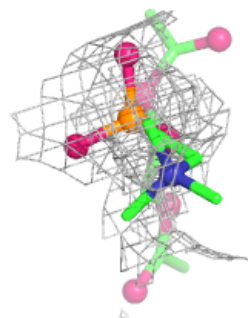
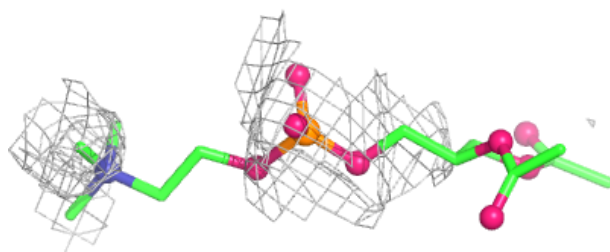
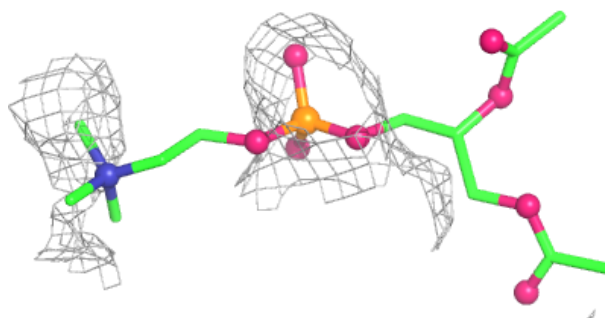


Electron density around PCW A 1031:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

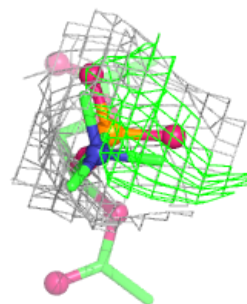
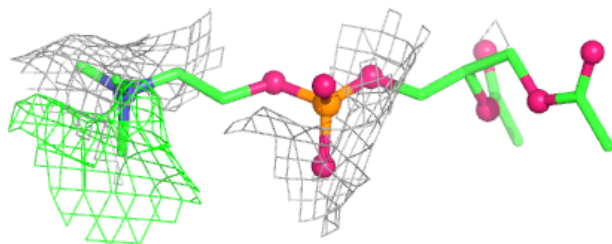
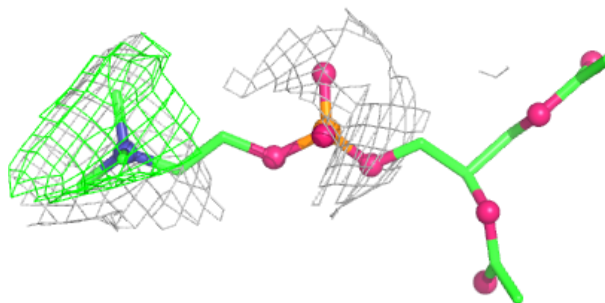
**Electron density around PCW A 1011:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

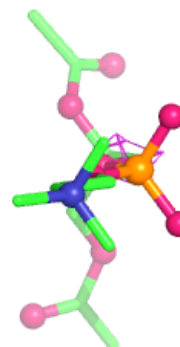
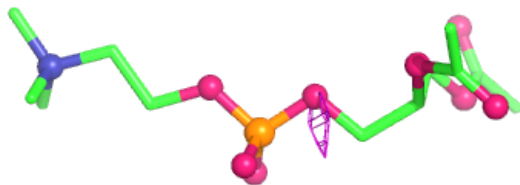
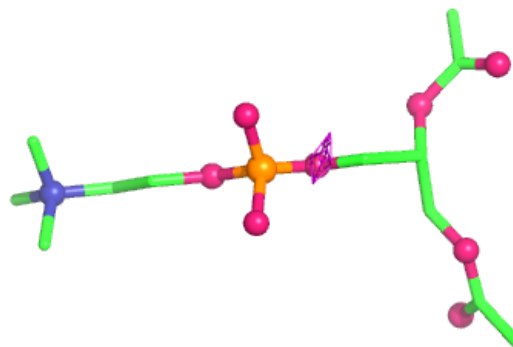


Electron density around PCW A 1004:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

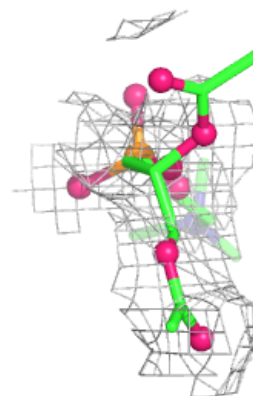
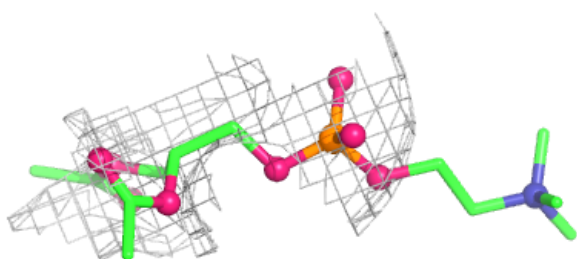
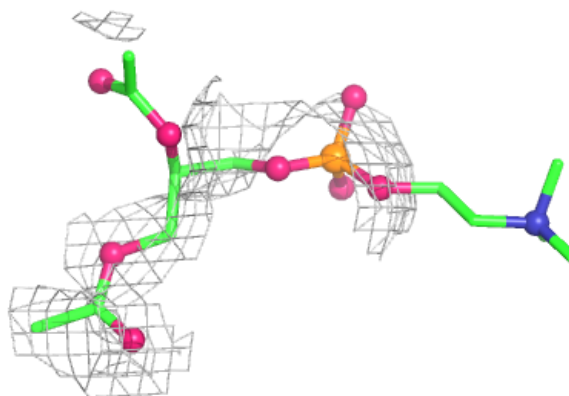
**Electron density around PCW A 1019:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

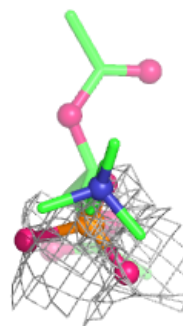
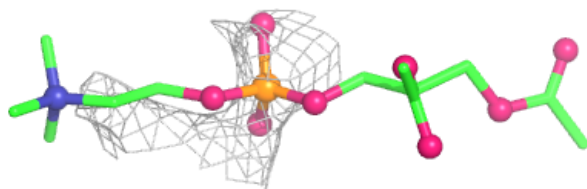
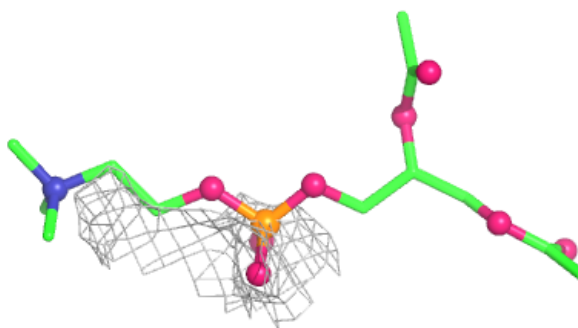


Electron density around PCW A 1007:

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and green (positive)

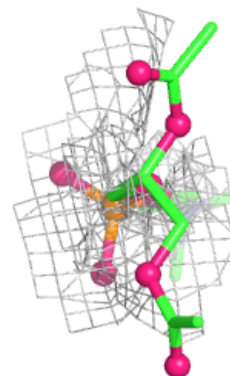
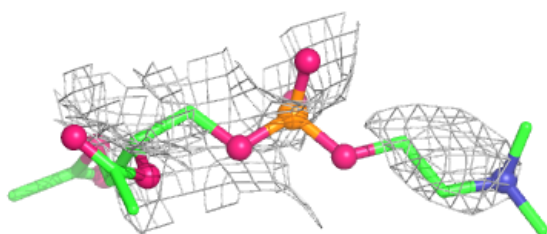
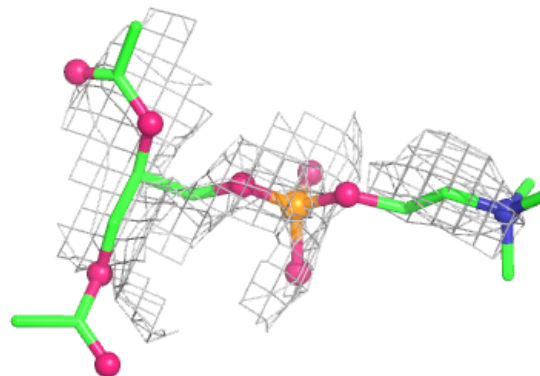
**Electron density around PCW A 1015:**

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and green (positive)

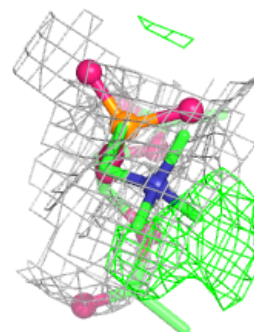
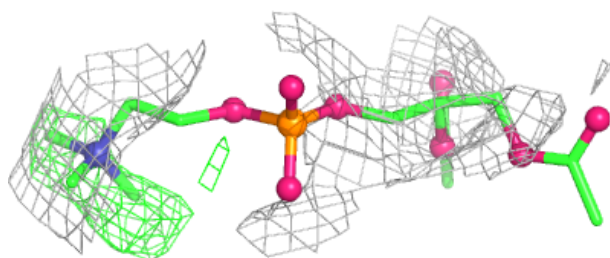
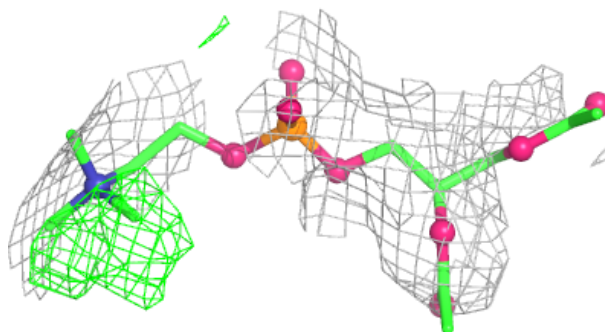


Electron density around PCW A 1013:

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and green (positive)

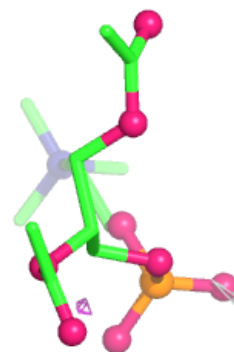
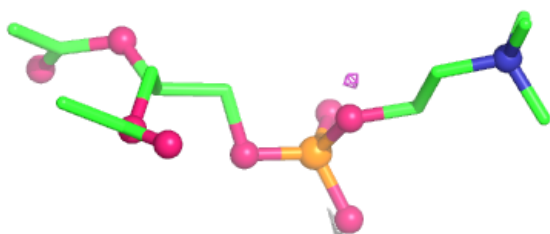
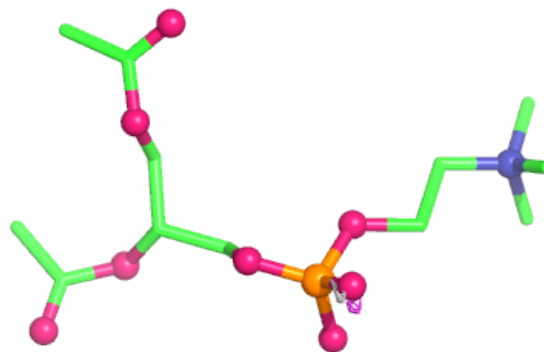
**Electron density around PCW A 1025:**

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



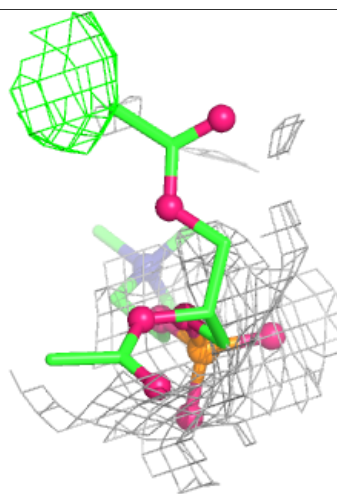
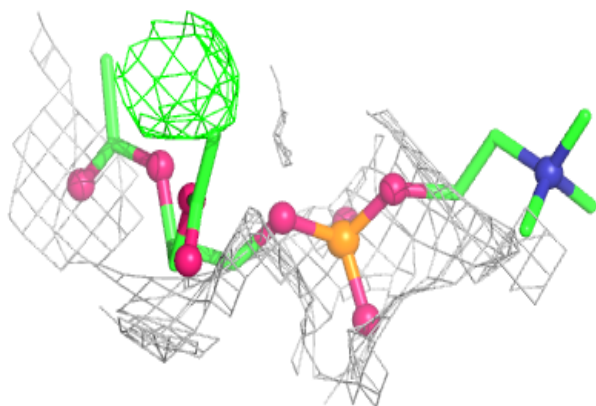
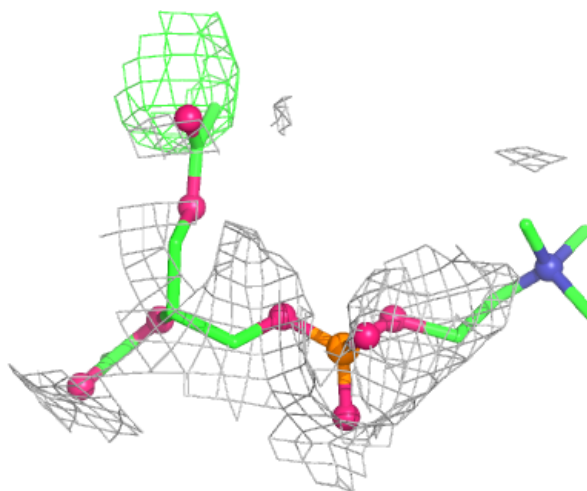
Electron density around PCW A 1005:

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 $mF_o - DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)



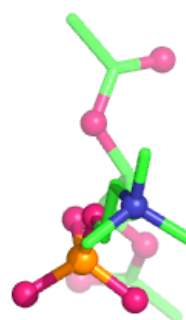
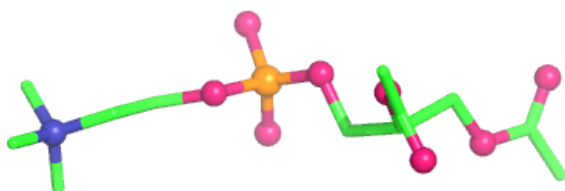
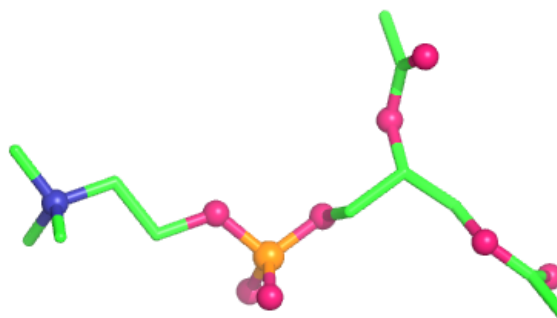
Electron density around PCW A 1030:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

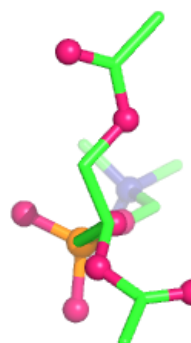
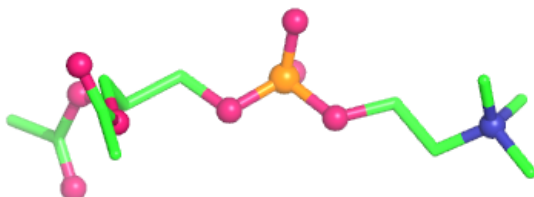
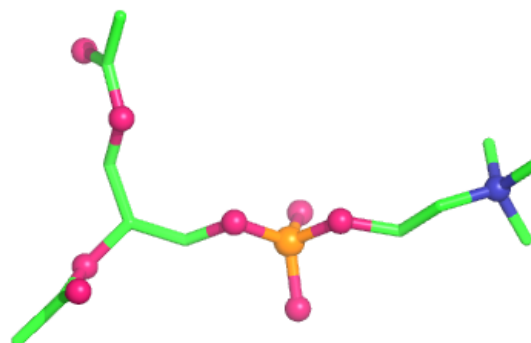


Electron density around PCW A 1036:

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and green (positive)

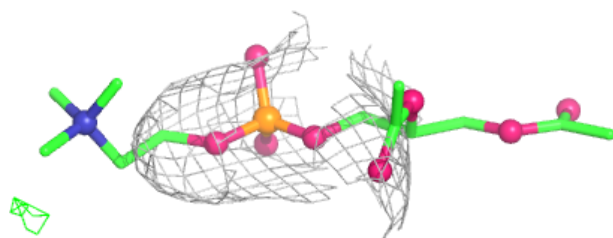
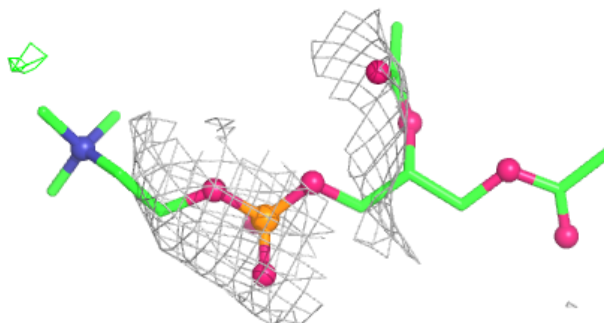
**Electron density around PCW A 1018:**

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and green (positive)

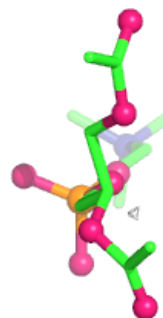
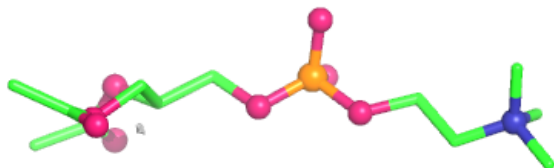
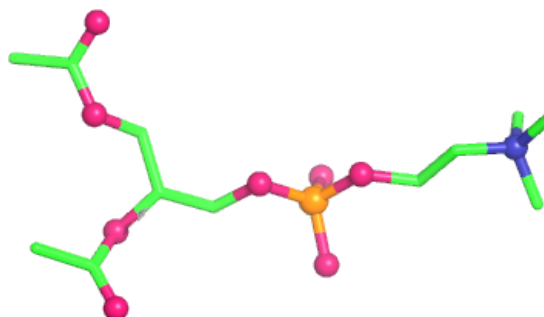


Electron density around PCW A 1009:

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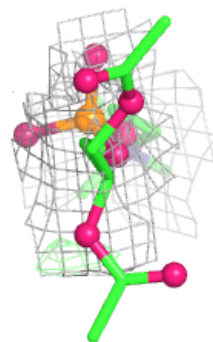
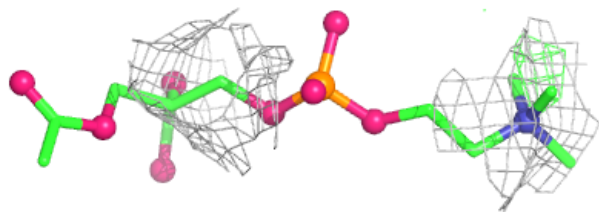
**Electron density around PCW A 1017:**

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and green (positive)

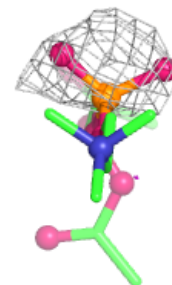
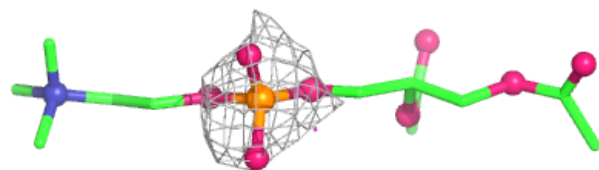
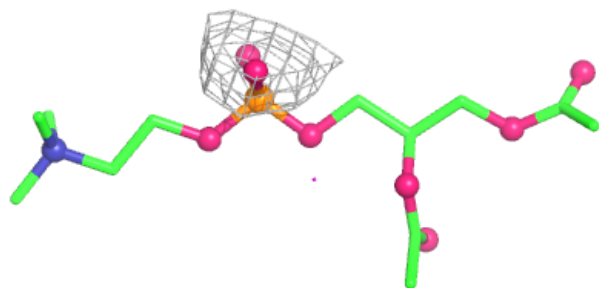


Electron density around PCW A 1024:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

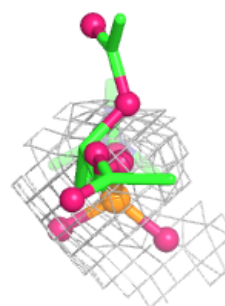
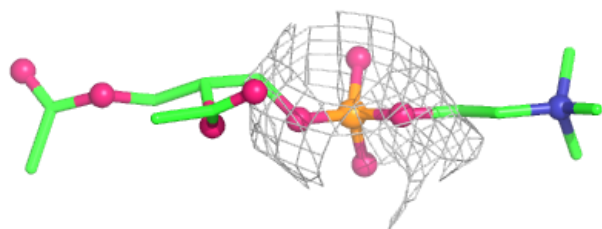
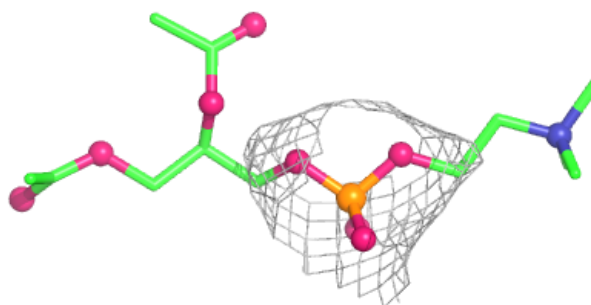
**Electron density around PCW A 1016:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

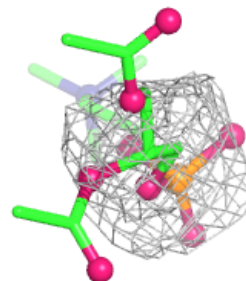
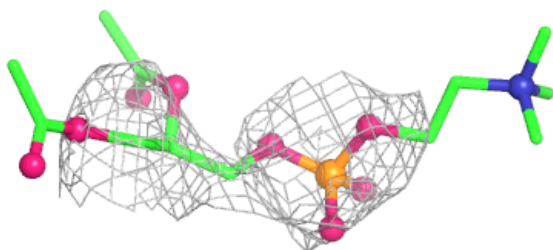
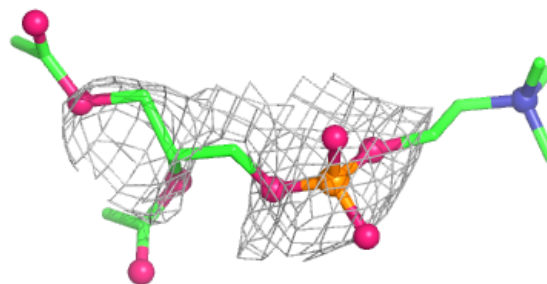


Electron density around PCW A 1027:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

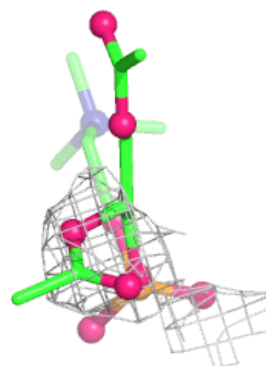
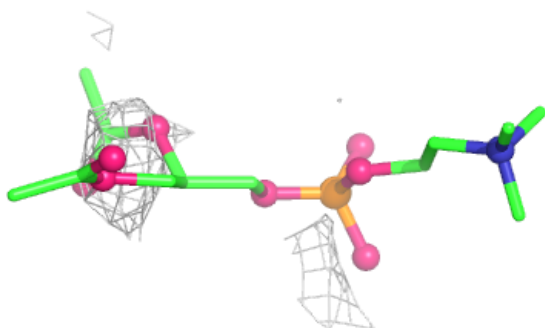
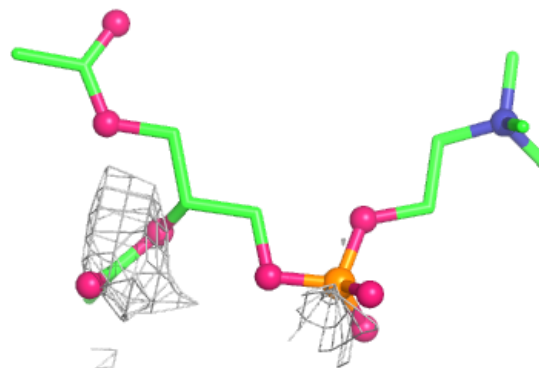
**Electron density around PCW A 1035:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

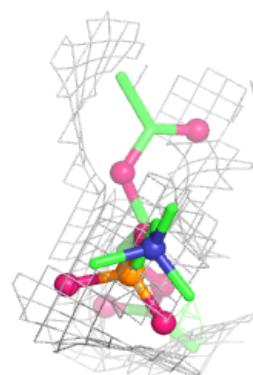
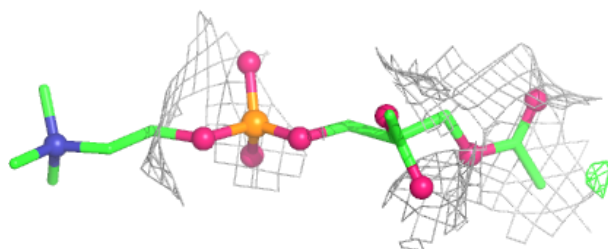
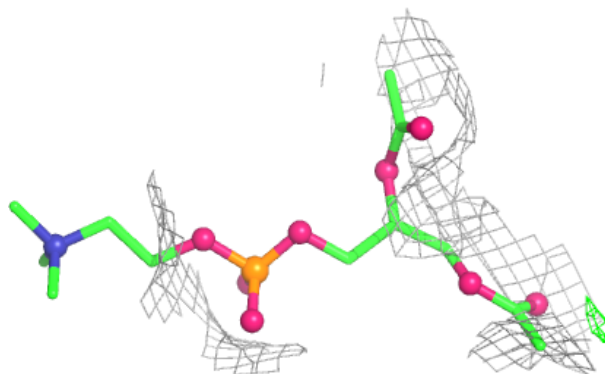


Electron density around PCW A 1026:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

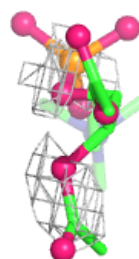
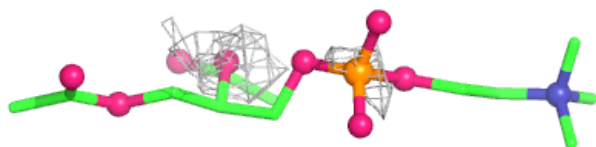
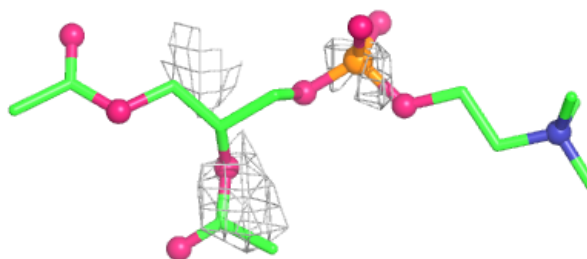
**Electron density around PCW A 1029:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

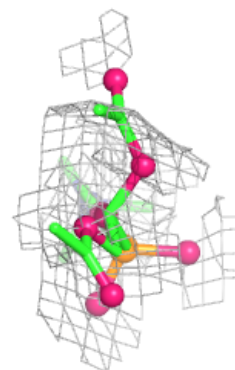
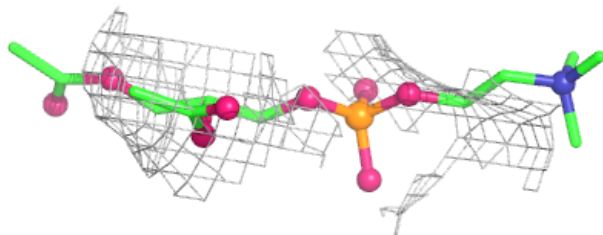
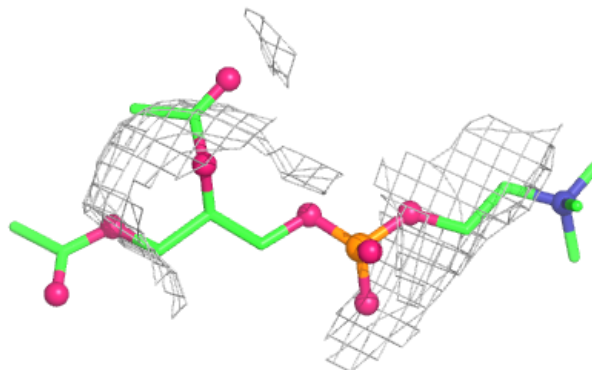


Electron density around PCW A 1020:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

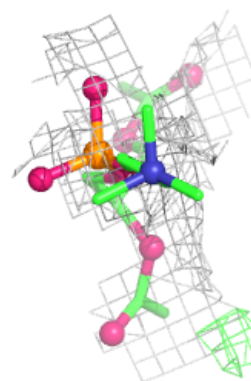
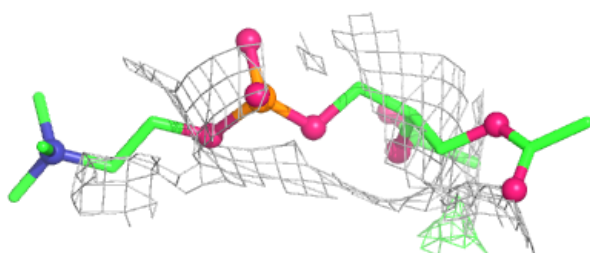
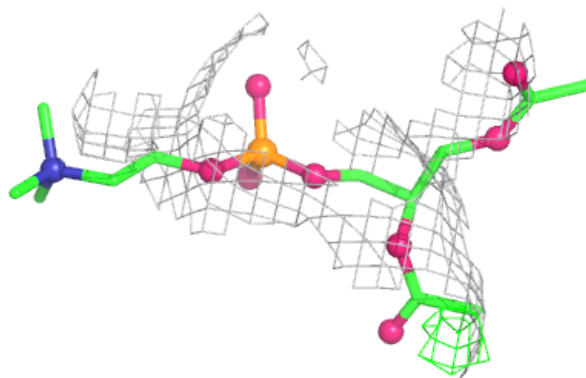
**Electron density around PCW A 1033:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

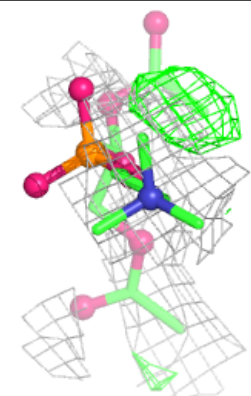
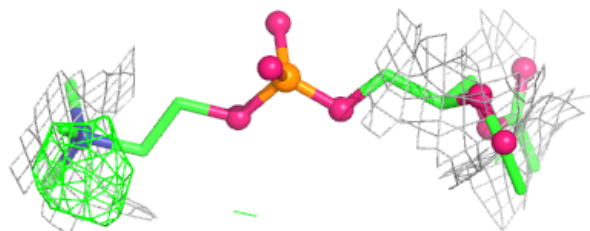
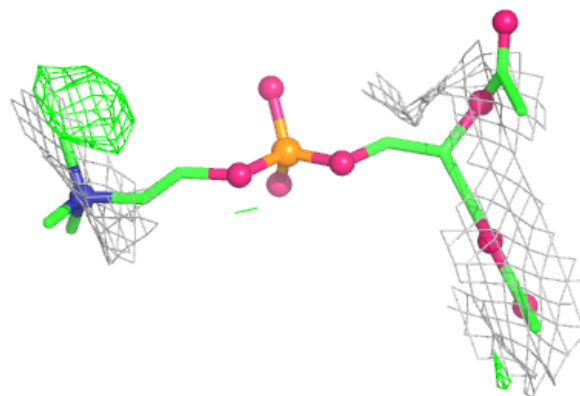


Electron density around PCW A 1008:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

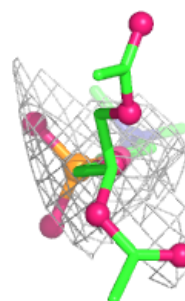
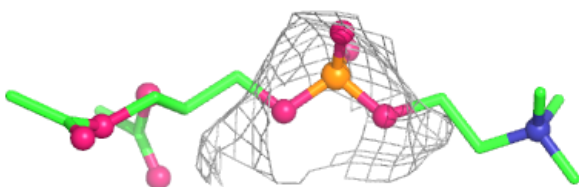
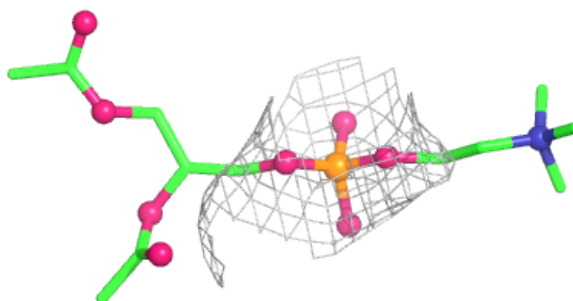
**Electron density around PCW A 1021:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

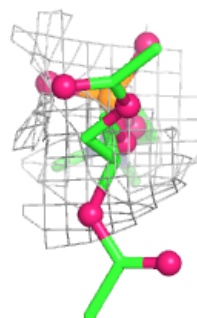
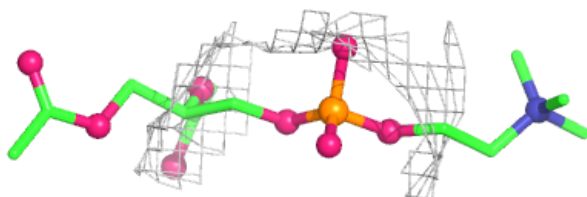
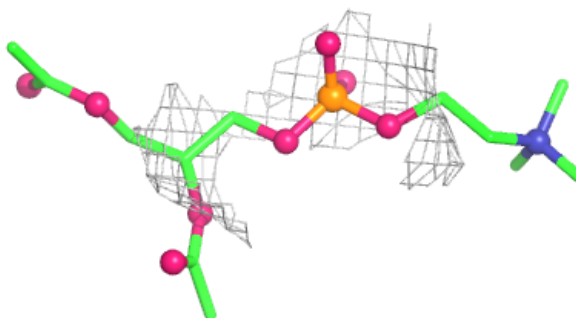


Electron density around PCW A 1034:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

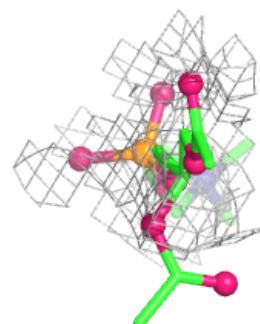
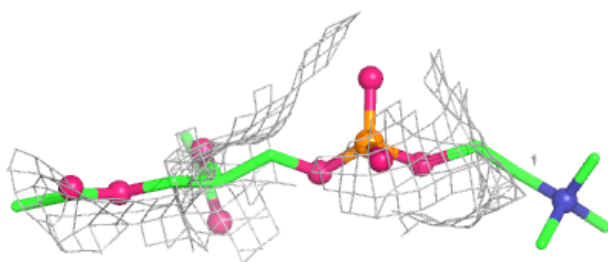
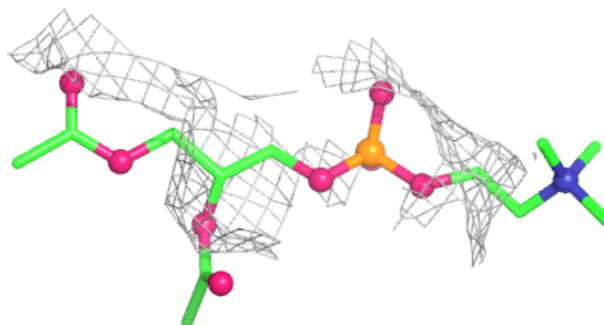
**Electron density around PCW A 1010:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

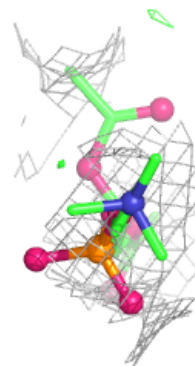
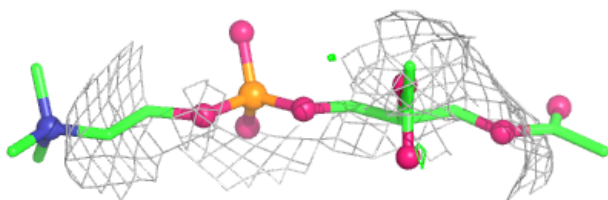
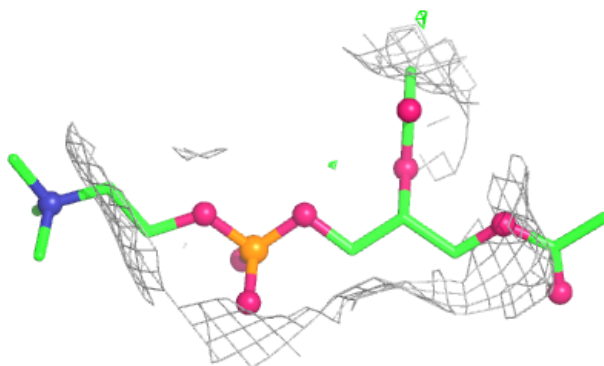


Electron density around PCW A 1028:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

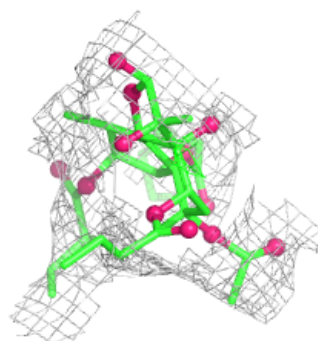
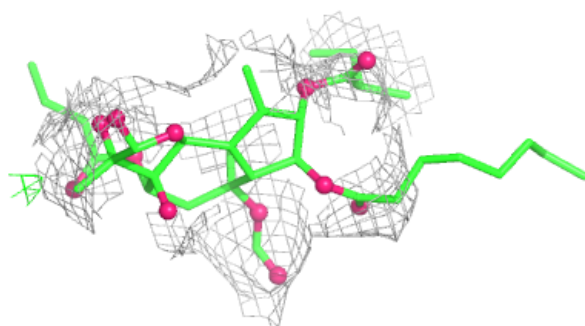
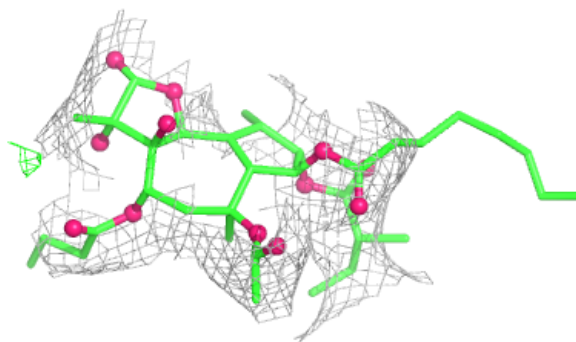
**Electron density around PCW A 1022:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around TG1 A 1003:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



6.5 Other polymers [i](#)

There are no such residues in this entry.