



# wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 17, 2023 – 10:42 PM EDT

PDB ID : 2EJ2  
Title : Crystal Structure of T.th.HB8 Branched-Chain Amino Acid Aminotransferase  
Complexed with N-(5'-Phosphopyridoxyl)-L-Glutamate  
Authors : Goto, M.  
Deposited on : 2007-03-14  
Resolution : 2.00 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto: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 : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.36  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

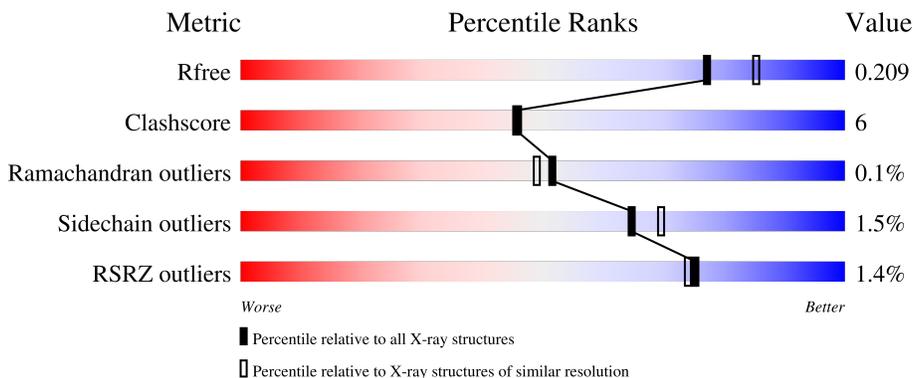
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.00 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))
$R_{free}$	130704	8085 (2.00-2.00)
Clashscore	141614	9178 (2.00-2.00)
Ramachandran outliers	138981	9054 (2.00-2.00)
Sidechain outliers	138945	9053 (2.00-2.00)
RSRZ outliers	127900	7900 (2.00-2.00)

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  $\geq 3$ , 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	308	81% 13% • 5%
1	B	308	85% 14% ••
1	C	308	84% 12% •
1	D	308	85% 12% ••
1	E	308	84% 11% ••

Continued on next page...

*Continued from previous page...*

Mol	Chain	Length	Quality of chain
1	F	308	 <p>A horizontal bar chart representing the quality of the chain. The bar is divided into segments: a small red segment at the start, followed by a large green segment labeled '81%', then a yellow segment labeled '14%', and finally a small grey segment at the end. Above the bar is a '%' symbol, and below the bar are two dots '..'. The bar is contained within a table cell.</p>

## 2 Entry composition [i](#)

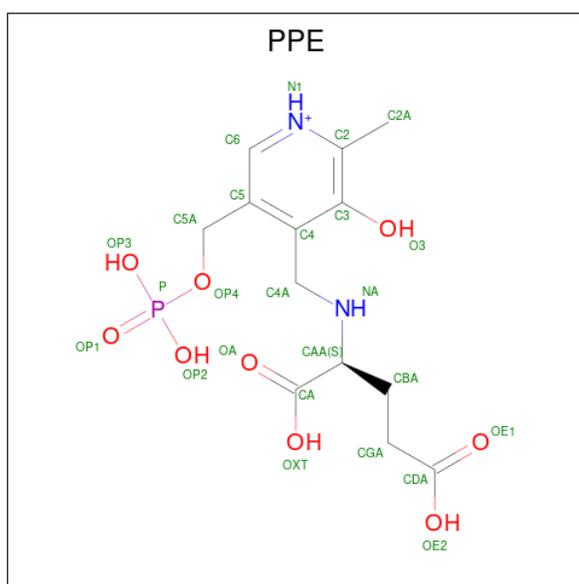
There are 4 unique types of molecules in this entry. The entry contains 15270 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Branched-chain amino acid aminotransferase.

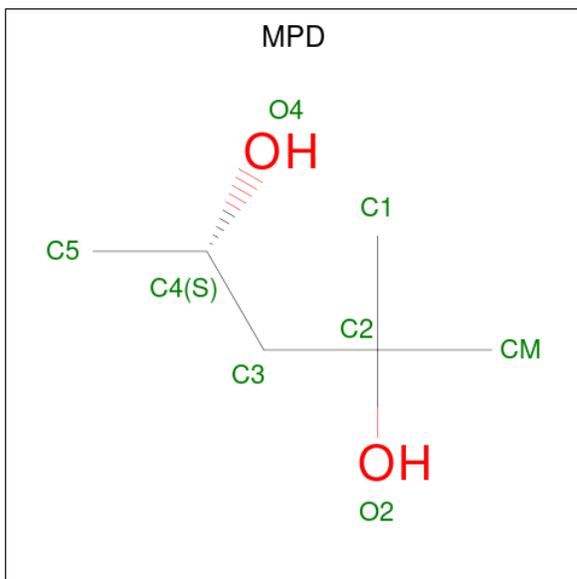
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	294	Total 2282	C 1460	N 397	O 415	S 10	0	0	0
1	B	305	Total 2369	C 1514	N 412	O 433	S 10	0	0	0
1	C	297	Total 2299	C 1470	N 399	O 420	S 10	0	0	0
1	D	301	Total 2326	C 1489	N 405	O 422	S 10	0	0	0
1	E	298	Total 2288	C 1464	N 396	O 418	S 10	0	0	0
1	F	298	Total 2304	C 1474	N 401	O 419	S 10	0	0	0

- Molecule 2 is 4-[(1,3-DICARBOXY-PROPYLAMINO)-METHYL]-3-HYDROXY-2-METHYL-5-PHOSPHONOXYMETHYL-PYRIDINIUM (three-letter code: PPE) (formula:  $C_{13}H_{20}N_2O_9P$ ).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			25	13	2	9	1		
2	B	1	Total	C	N	O	P	0	0
			25	13	2	9	1		
2	C	1	Total	C	N	O	P	0	0
			25	13	2	9	1		
2	D	1	Total	C	N	O	P	0	0
			25	13	2	9	1		
2	E	1	Total	C	N	O	P	0	0
			25	13	2	9	1		
2	F	1	Total	C	N	O	P	0	0
			25	13	2	9	1		

- Molecule 3 is (4S)-2-METHYL-2,4-PENTANEDIOL (three-letter code: MPD) (formula:  $C_6H_{14}O_2$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			8	6	2		
3	F	1	Total	C	O	0	0
			8	6	2		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	208	Total	O	0	0
			208	208		

Continued on next page...

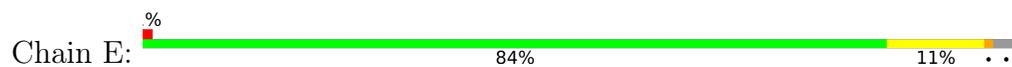
*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
4	B	205	Total 205	O 205	0	0
4	C	207	Total 207	O 207	0	0
4	D	213	Total 213	O 213	0	0
4	E	190	Total 190	O 190	0	0
4	F	213	Total 213	O 213	0	0

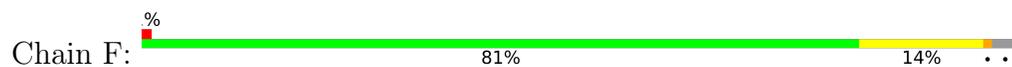




- Molecule 1: Branched-chain amino acid aminotransferase



- Molecule 1: Branched-chain amino acid aminotransferase



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	117.02Å 144.22Å 147.04Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.97 – 2.00 20.10 – 2.00	Depositor EDS
% Data completeness (in resolution range)	96.7 (19.97-2.00) 96.9 (20.10-2.00)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.26 (at 2.01Å)	Xtrriage
Refinement program	CNS 1.1	Depositor
R, $R_{free}$	0.190 , 0.216 0.183 , 0.209	Depositor DCC
$R_{free}$ test set	16164 reflections (9.96%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	21.3	Xtrriage
Anisotropy	0.325	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 60.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.35$	Xtrriage
Estimated twinning fraction	0.018 for -h,l,k	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	15270	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	23.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.68% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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 [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: PPE, MPD

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.32	0/2334	0.60	0/3169
1	B	0.31	0/2423	0.61	0/3289
1	C	0.31	0/2351	0.61	0/3194
1	D	0.31	0/2379	0.61	0/3232
1	E	0.32	0/2340	0.61	0/3181
1	F	0.32	0/2356	0.61	0/3200
All	All	0.32	0/14183	0.61	0/19265

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 [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2282	0	2264	35	0
1	B	2369	0	2352	26	0
1	C	2299	0	2270	27	0
1	D	2326	0	2299	24	0
1	E	2288	0	2247	30	0
1	F	2304	0	2282	37	0
2	A	25	0	15	0	0

*Continued on next page...*

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	25	0	15	0	0
2	C	25	0	15	0	0
2	D	25	0	15	0	0
2	E	25	0	15	0	0
2	F	25	0	15	0	0
3	A	8	0	14	1	0
3	F	8	0	14	2	0
4	A	208	0	0	2	0
4	B	205	0	0	1	0
4	C	207	0	0	2	0
4	D	213	0	0	5	0
4	E	190	0	0	1	0
4	F	213	0	0	5	0
All	All	15270	0	13832	178	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 6.

The worst 5 of 178 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:183:LEU:HD11	1:A:191:VAL:HG13	1.57	0.85
1:E:220:THR:O	1:E:224:VAL:HG23	1.84	0.77
1:A:52:ARG:HA	1:A:54:LYS:HE2	1.65	0.77
1:B:183:LEU:HD11	1:B:191:VAL:HG13	1.66	0.76
1:B:183:LEU:HD13	1:B:199:LEU:HD11	1.69	0.74

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 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	290/308 (94%)	281 (97%)	9 (3%)	0	100	100
1	B	303/308 (98%)	295 (97%)	7 (2%)	1 (0%)	41	37
1	C	293/308 (95%)	284 (97%)	9 (3%)	0	100	100
1	D	297/308 (96%)	289 (97%)	8 (3%)	0	100	100
1	E	294/308 (96%)	283 (96%)	11 (4%)	0	100	100
1	F	294/308 (96%)	286 (97%)	8 (3%)	0	100	100
All	All	1771/1848 (96%)	1718 (97%)	52 (3%)	1 (0%)	51	49

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	213	SER

### 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 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	229/241 (95%)	223 (97%)	6 (3%)	46	48
1	B	237/241 (98%)	234 (99%)	3 (1%)	69	74
1	C	230/241 (95%)	228 (99%)	2 (1%)	78	83
1	D	231/241 (96%)	229 (99%)	2 (1%)	78	83
1	E	226/241 (94%)	222 (98%)	4 (2%)	59	63
1	F	230/241 (95%)	226 (98%)	4 (2%)	60	65
All	All	1383/1446 (96%)	1362 (98%)	21 (2%)	65	69

5 of 21 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	120	MET
1	F	54	LYS
1	F	197	GLU
1	F	120	MET

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	E	197	GLU

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

Mol	Chain	Res	Type
1	E	306	ASN
1	F	62	ASN
1	C	62	ASN
1	D	62	ASN
1	E	62	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](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

8 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
2	PPE	C	1413	-	25,25,25	2.68	10 (40%)	31,35,35	3.73	16 (51%)
2	PPE	F	2913	-	25,25,25	2.72	11 (44%)	31,35,35	3.73	17 (54%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	PPE	A	3413	-	25,25,25	2.68	8 (32%)	31,35,35	3.68	16 (51%)
2	PPE	B	3913	-	25,25,25	2.63	8 (32%)	31,35,35	3.64	16 (51%)
3	MPD	A	1415	-	7,7,7	0.86	0	9,10,10	0.98	0
3	MPD	F	2914	-	7,7,7	0.88	0	9,10,10	0.97	0
2	PPE	E	2413	-	25,25,25	2.75	11 (44%)	31,35,35	3.71	17 (54%)
2	PPE	D	1913	-	25,25,25	2.62	8 (32%)	31,35,35	3.62	17 (54%)

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
2	PPE	C	1413	-	-	5/20/20/20	0/1/1/1
2	PPE	F	2913	-	-	3/20/20/20	0/1/1/1
2	PPE	A	3413	-	-	4/20/20/20	0/1/1/1
2	PPE	B	3913	-	-	3/20/20/20	0/1/1/1
3	MPD	A	1415	-	-	2/5/5/5	-
3	MPD	F	2914	-	-	1/5/5/5	-
2	PPE	E	2413	-	-	4/20/20/20	0/1/1/1
2	PPE	D	1913	-	-	3/20/20/20	0/1/1/1

The worst 5 of 56 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	3413	PPE	C3-C2	8.02	1.48	1.40
2	B	3913	PPE	C3-C2	7.84	1.48	1.40
2	C	1413	PPE	C3-C2	7.70	1.48	1.40
2	D	1913	PPE	C3-C2	7.61	1.48	1.40
2	F	2913	PPE	C3-C2	7.55	1.48	1.40

The worst 5 of 99 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	1413	PPE	C6-C5-C4	10.70	125.69	118.12
2	A	3413	PPE	C6-C5-C4	10.69	125.69	118.12
2	B	3913	PPE	C6-C5-C4	10.41	125.48	118.12
2	E	2413	PPE	C6-C5-C4	10.39	125.47	118.12
2	D	1913	PPE	C6-C5-C4	10.28	125.39	118.12

There are no chirality outliers.

5 of 25 torsion outliers are listed below:

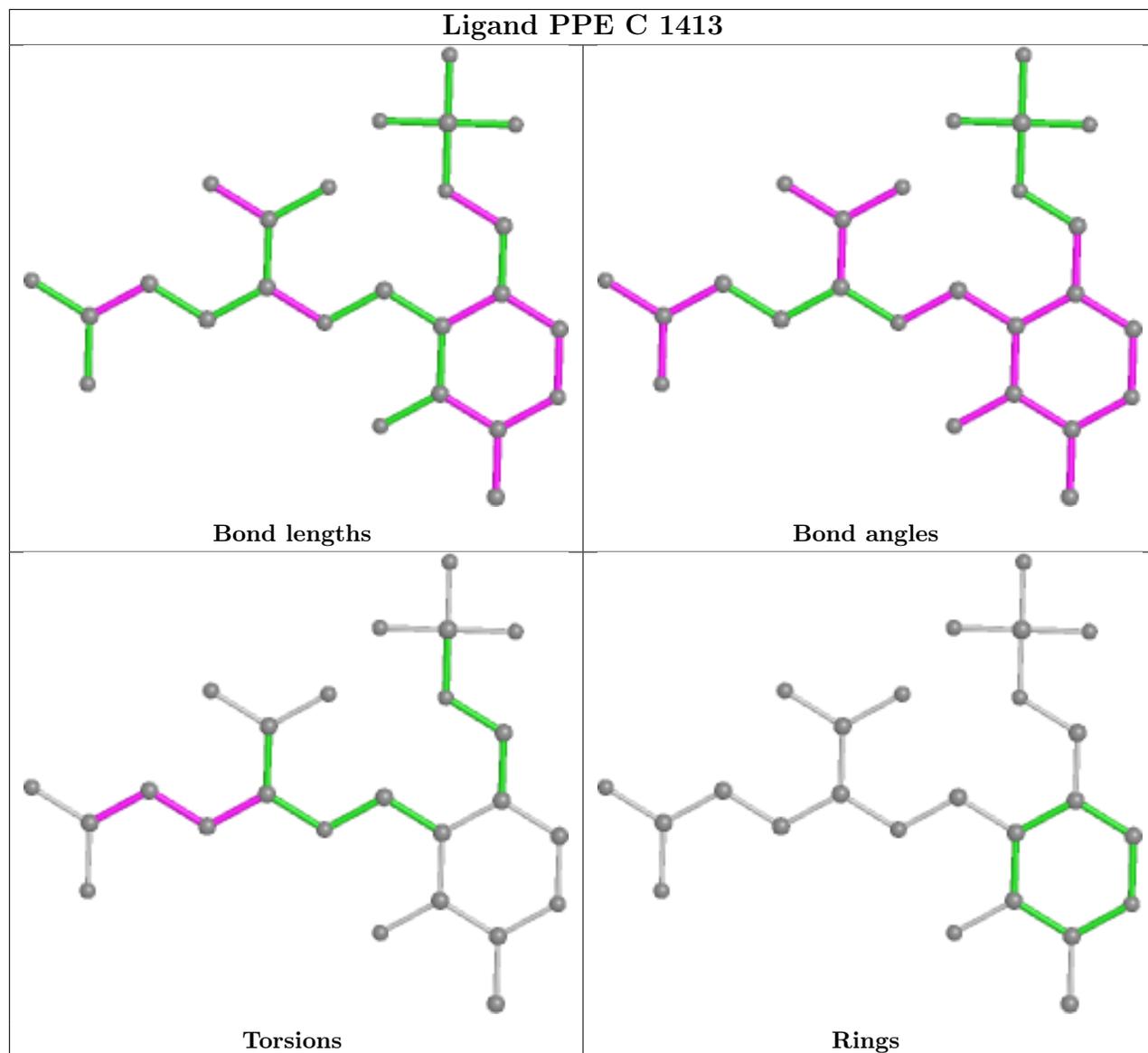
Mol	Chain	Res	Type	Atoms
2	F	2913	PPE	CA-CAA-CBA-CGA
2	E	2413	PPE	NA-CAA-CBA-CGA
2	E	2413	PPE	CA-CAA-CBA-CGA
2	F	2913	PPE	NA-CAA-CBA-CGA
2	B	3913	PPE	CAA-CBA-CGA-CDA

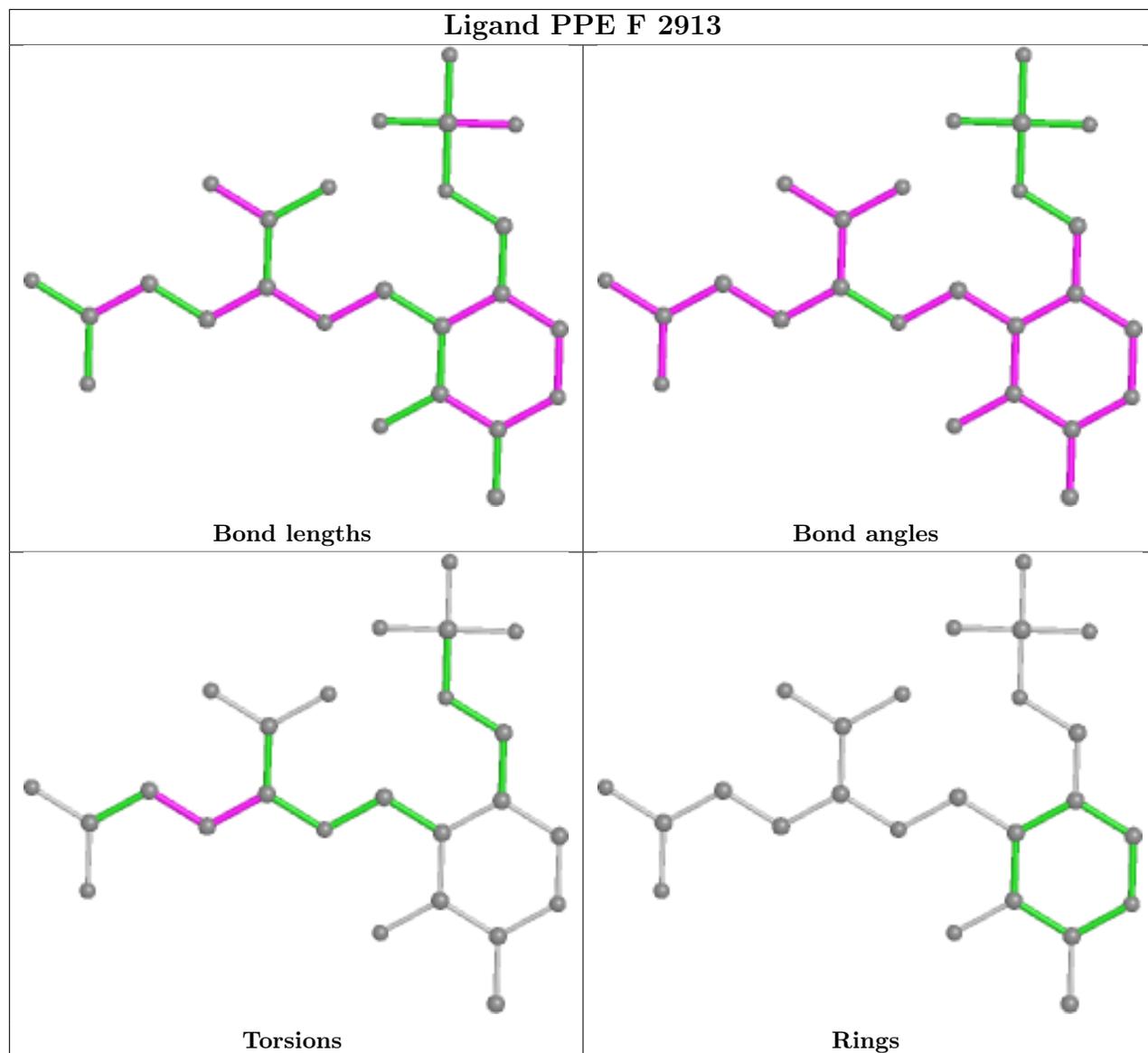
There are no ring outliers.

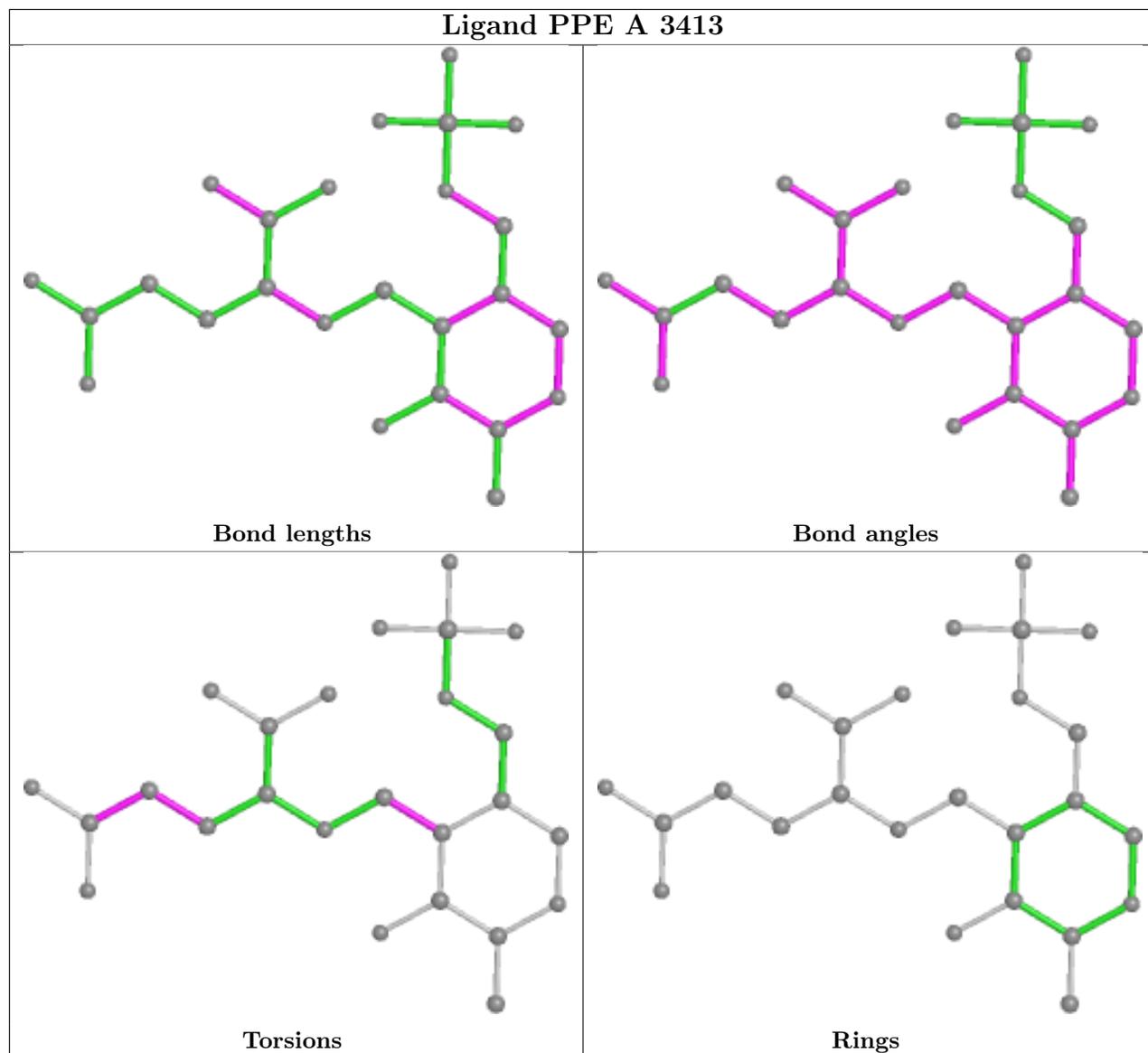
2 monomers are involved in 3 short contacts:

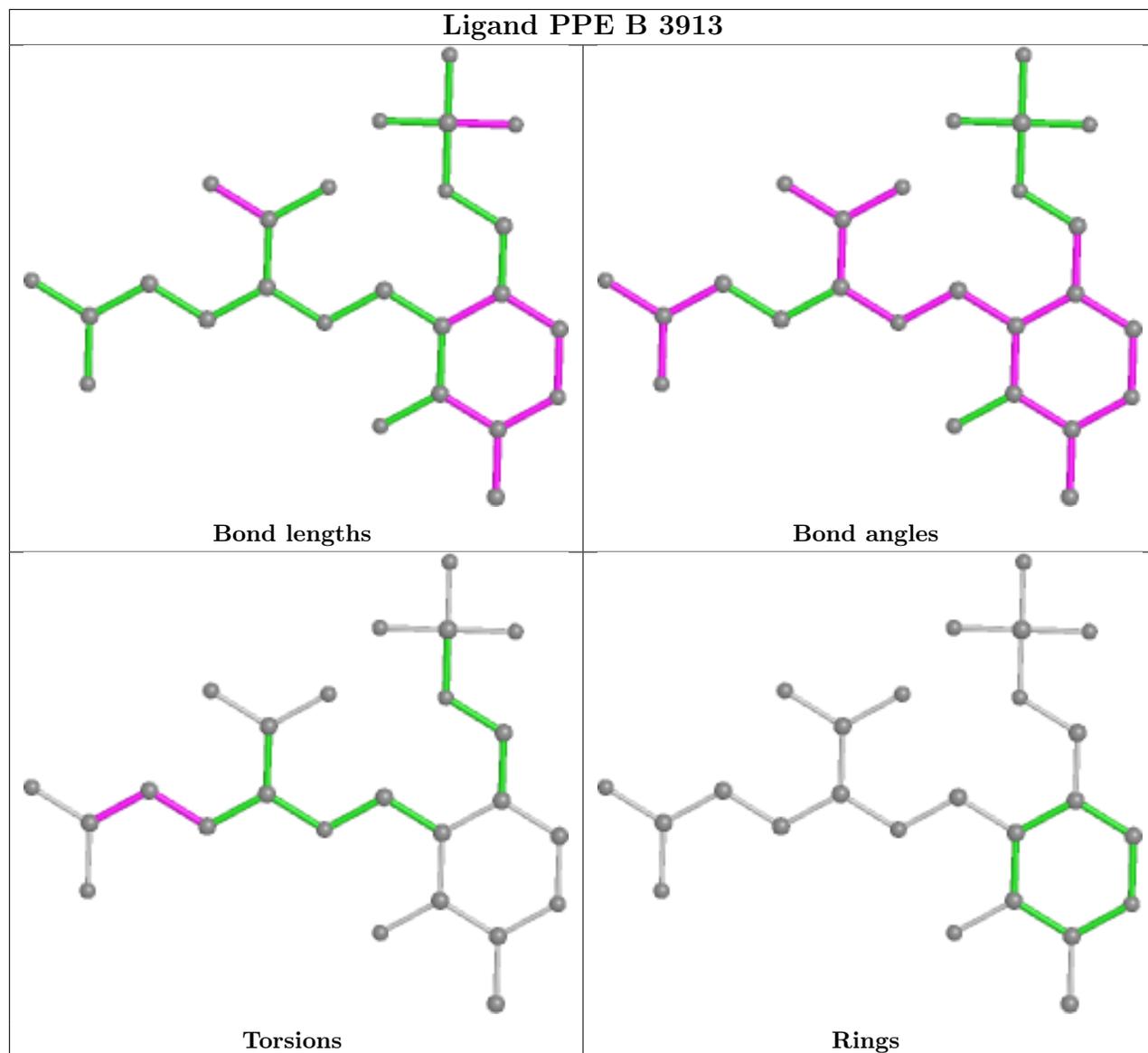
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1415	MPD	1	0
3	F	2914	MPD	2	0

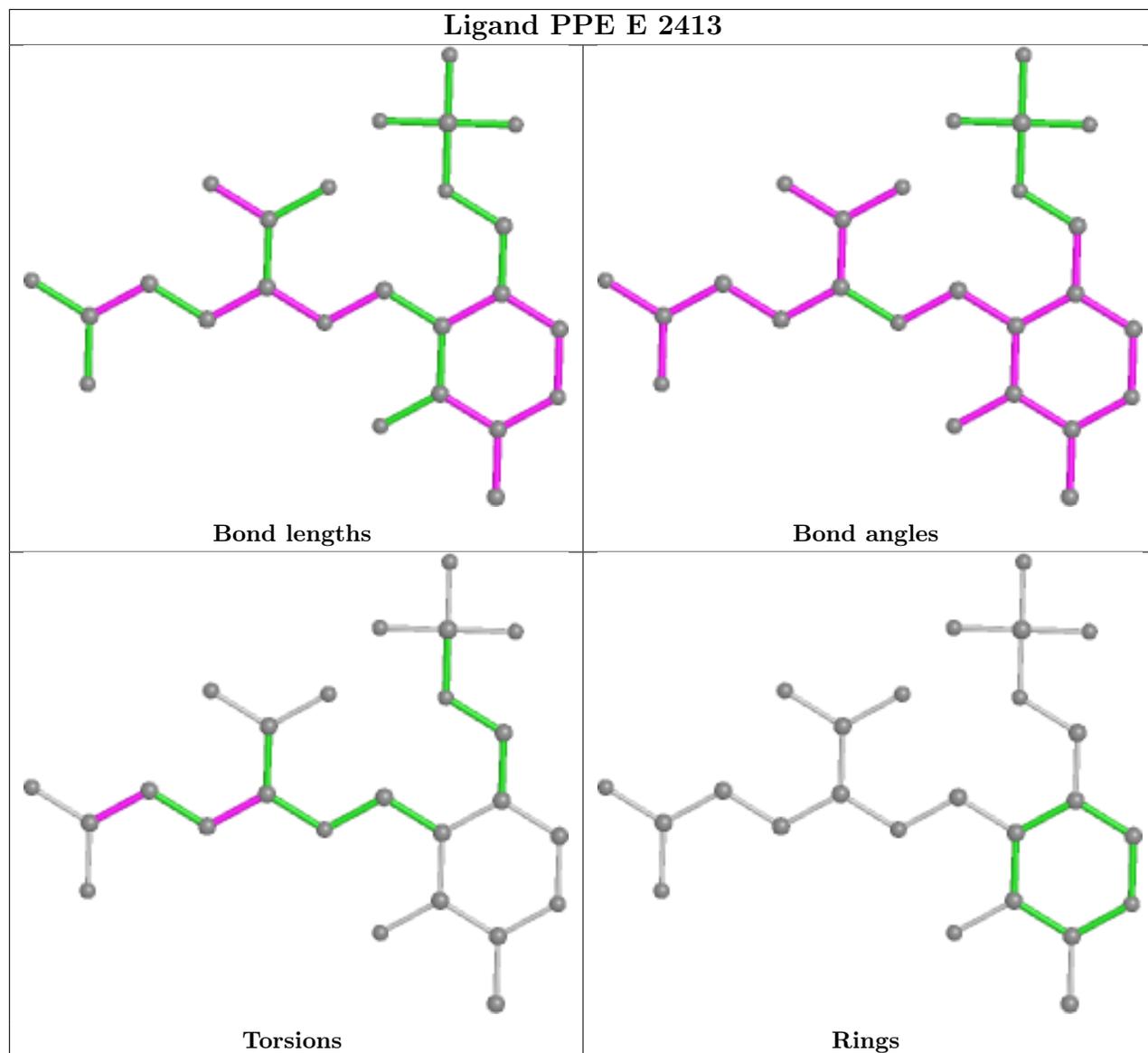
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

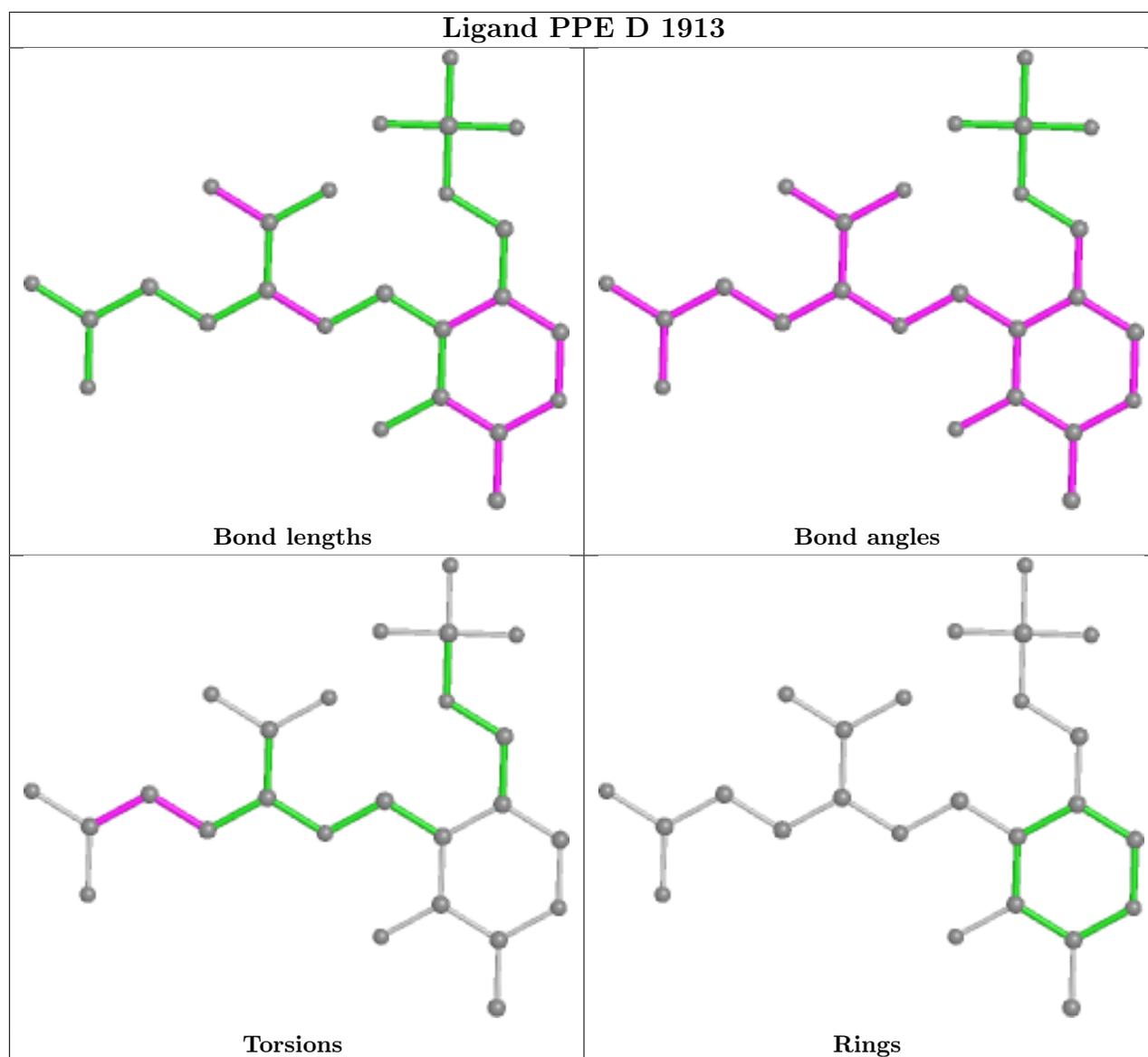












## 5.7 Other polymers [\(i\)](#)

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 [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	294/308 (95%)	-0.41	2 (0%) 87 87	13, 20, 34, 47	0
1	B	305/308 (99%)	-0.30	4 (1%) 77 76	13, 21, 34, 47	0
1	C	297/308 (96%)	-0.31	6 (2%) 65 63	13, 20, 35, 55	0
1	D	301/308 (97%)	-0.34	5 (1%) 70 68	12, 21, 33, 57	0
1	E	298/308 (96%)	-0.30	4 (1%) 77 76	13, 21, 35, 47	0
1	F	298/308 (96%)	-0.36	4 (1%) 77 76	13, 20, 33, 52	0
All	All	1793/1848 (97%)	-0.33	25 (1%) 75 74	12, 20, 34, 57	0

The worst 5 of 25 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	135	VAL	5.7
1	B	127	GLY	5.5
1	D	129	TYR	4.9
1	F	135	VAL	4.9
1	C	136	ARG	4.2

### 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

### 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.4 Ligands

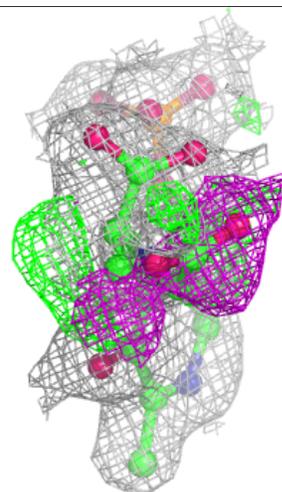
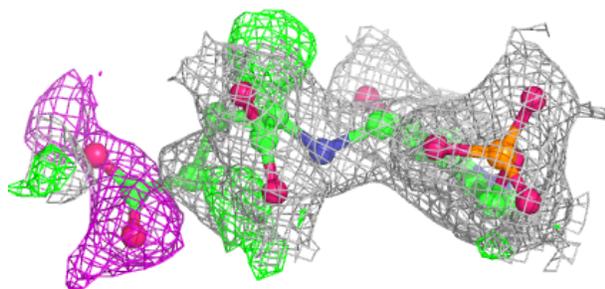
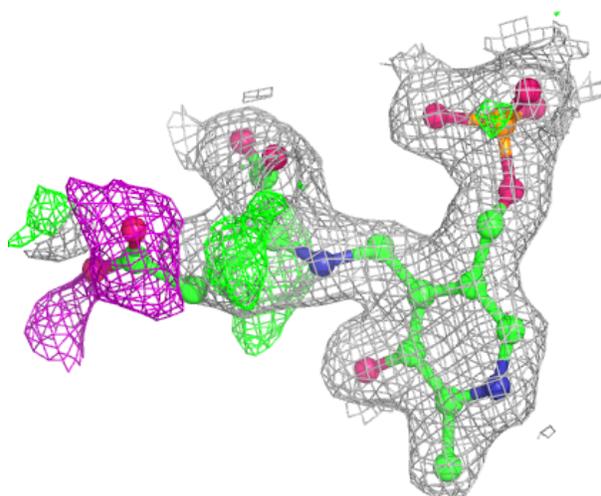
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 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
3	MPD	F	2914	8/8	0.70	0.26	37,39,42,43	0
3	MPD	A	1415	8/8	0.86	0.18	43,44,45,46	0
2	PPE	B	3913	25/25	0.91	0.15	16,23,54,56	0
2	PPE	A	3413	25/25	0.92	0.14	17,20,48,49	0
2	PPE	F	2913	25/25	0.93	0.13	17,20,44,47	0
2	PPE	C	1413	25/25	0.93	0.14	14,21,48,50	0
2	PPE	E	2413	25/25	0.93	0.14	16,21,49,50	0
2	PPE	D	1913	25/25	0.94	0.14	15,21,49,51	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.

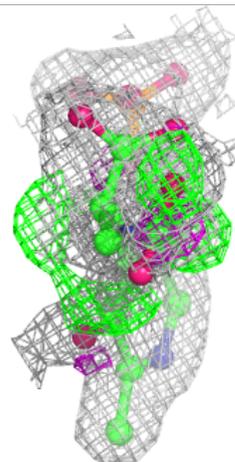
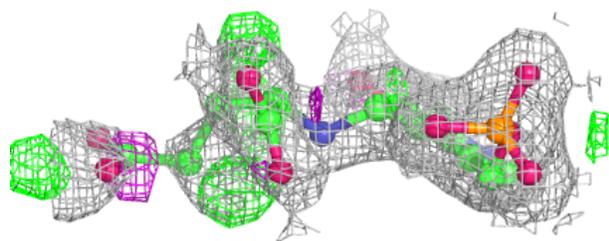
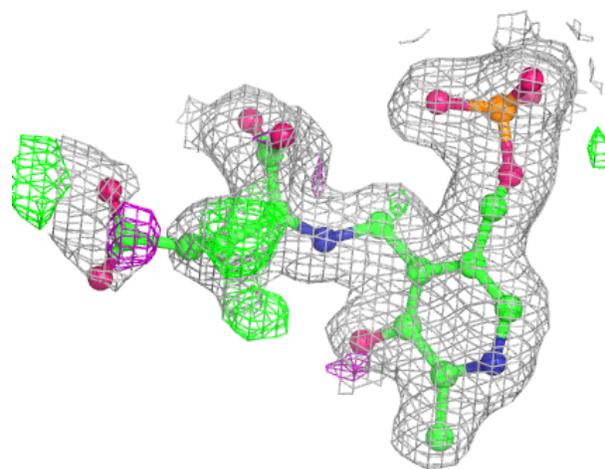
**Electron density around PPE B 3913:**

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



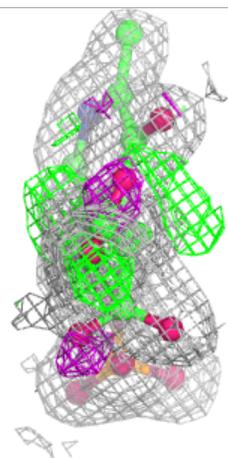
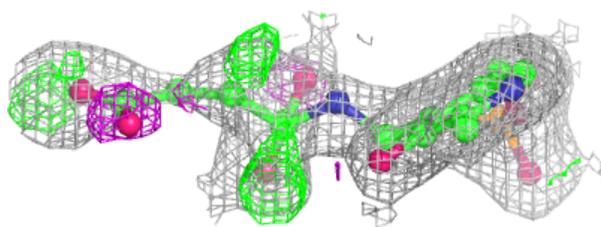
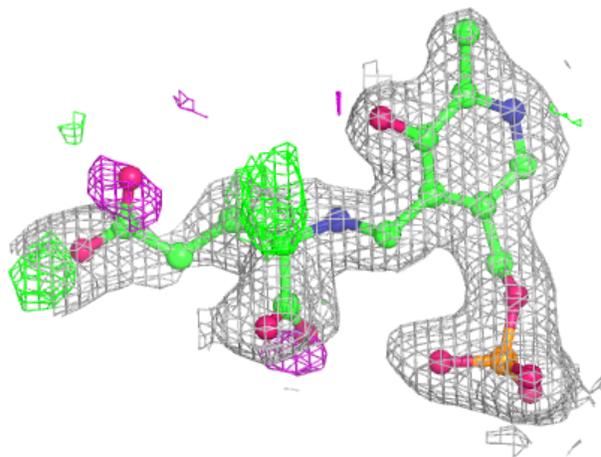
**Electron density around PPE A 3413:**

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



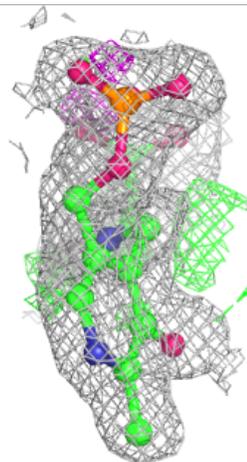
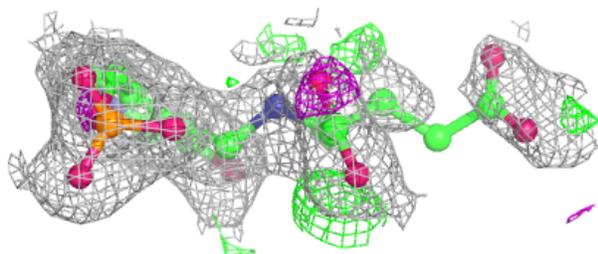
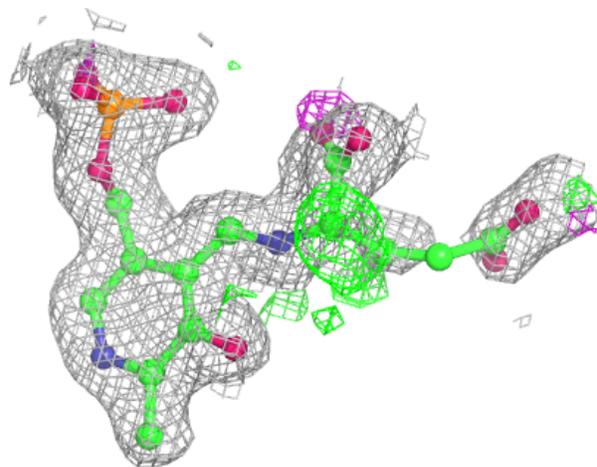
**Electron density around PPE F 2913:**

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



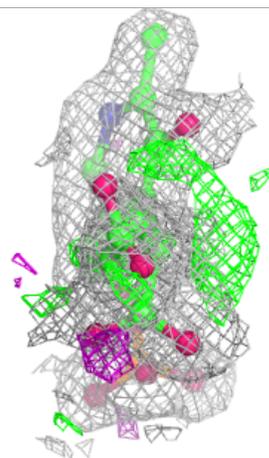
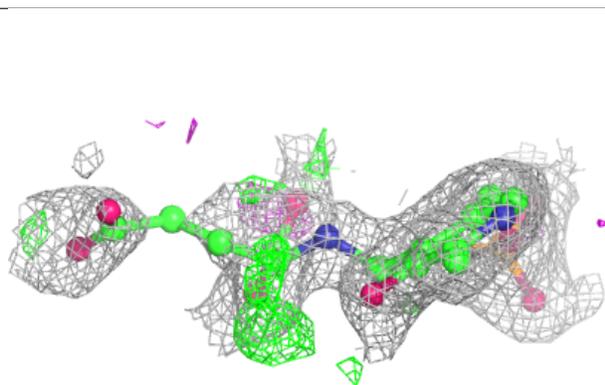
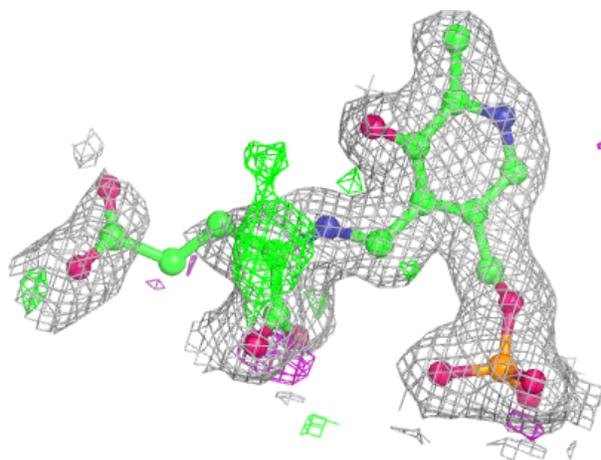
**Electron density around PPE C 1413:**

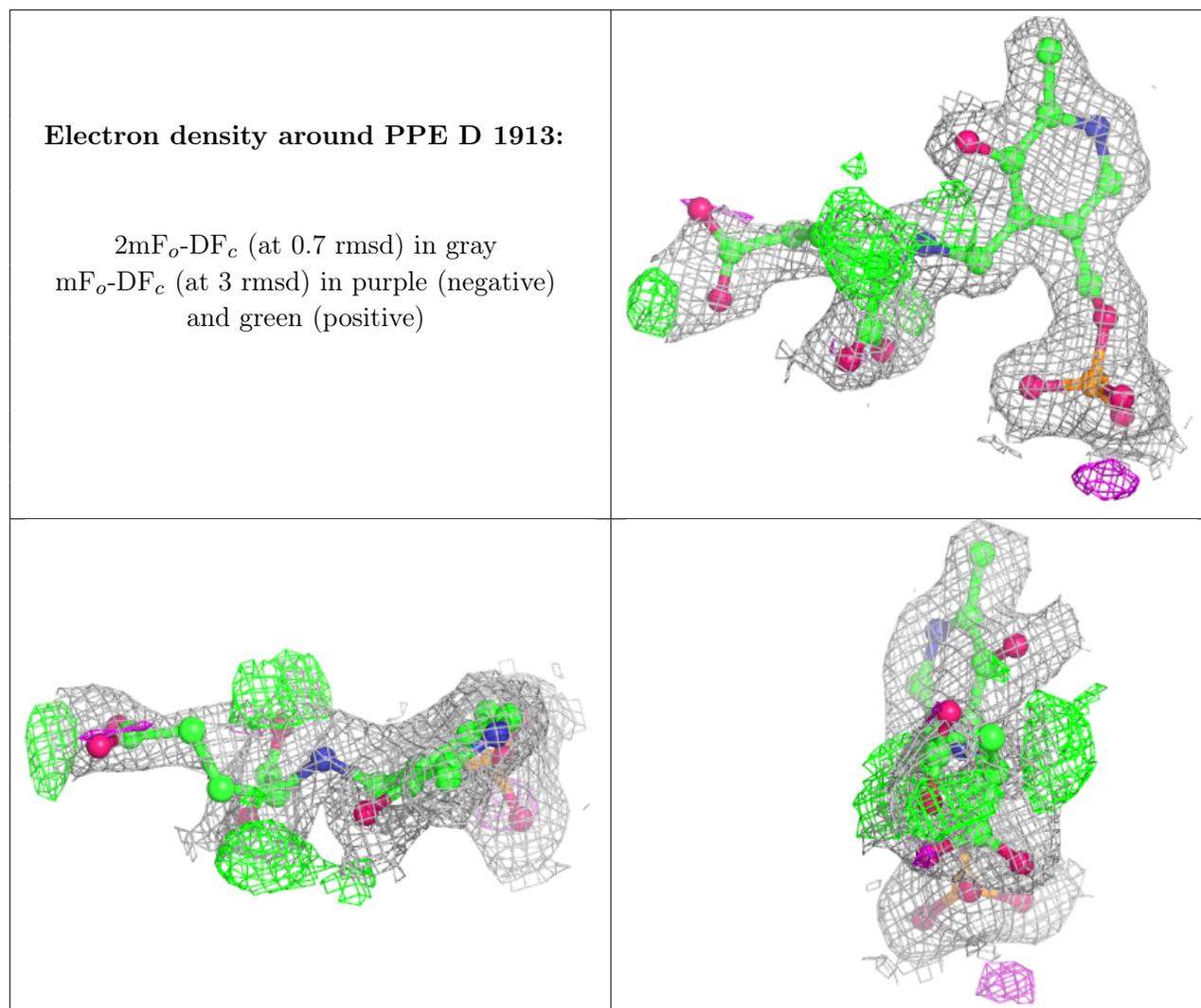
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around PPE E 2413:**

$2mF_o-DF_c$  (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.