



Full wwPDB X-ray Structure Validation Report ⓘ

Dec 17, 2023 – 02:33 PM EST

PDB ID : 1B0P
Title : CRYSTAL STRUCTURE OF PYRUVATE-FERREDOXIN OXIDOREDUCTASE FROM DESULFOVIBRIO AFRICANUS
Authors : Chabriere, E.; Charon, M.H.; Volbeda, A.
Deposited on : 1998-11-12
Resolution : 2.31 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 : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

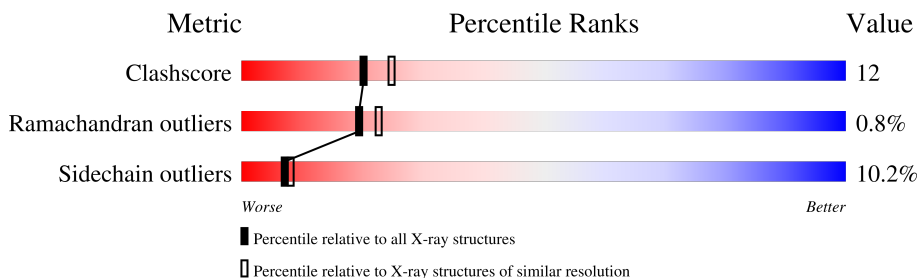
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.31 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))
Clashscore	141614	6604 (2.34-2.30)
Ramachandran outliers	138981	6523 (2.34-2.30)
Sidechain outliers	138945	6523 (2.34-2.30)

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 $\leq 5\%$

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	1231	
1	B	1231	

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 19411 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 PROTEIN (PYRUVATE-FERREDOXIN OXIDOREDUCTASE).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	1231	9382	5941	1599	1783	59	0	0	0
1	B	1231	9382	5941	1599	1783	59	0	0	0

- Molecule 2 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

- Molecule 3 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Ca		
3	A	1	1	1	0	0
3	B	1	1	1	0	0

- Molecule 4 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe₄S₄).



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

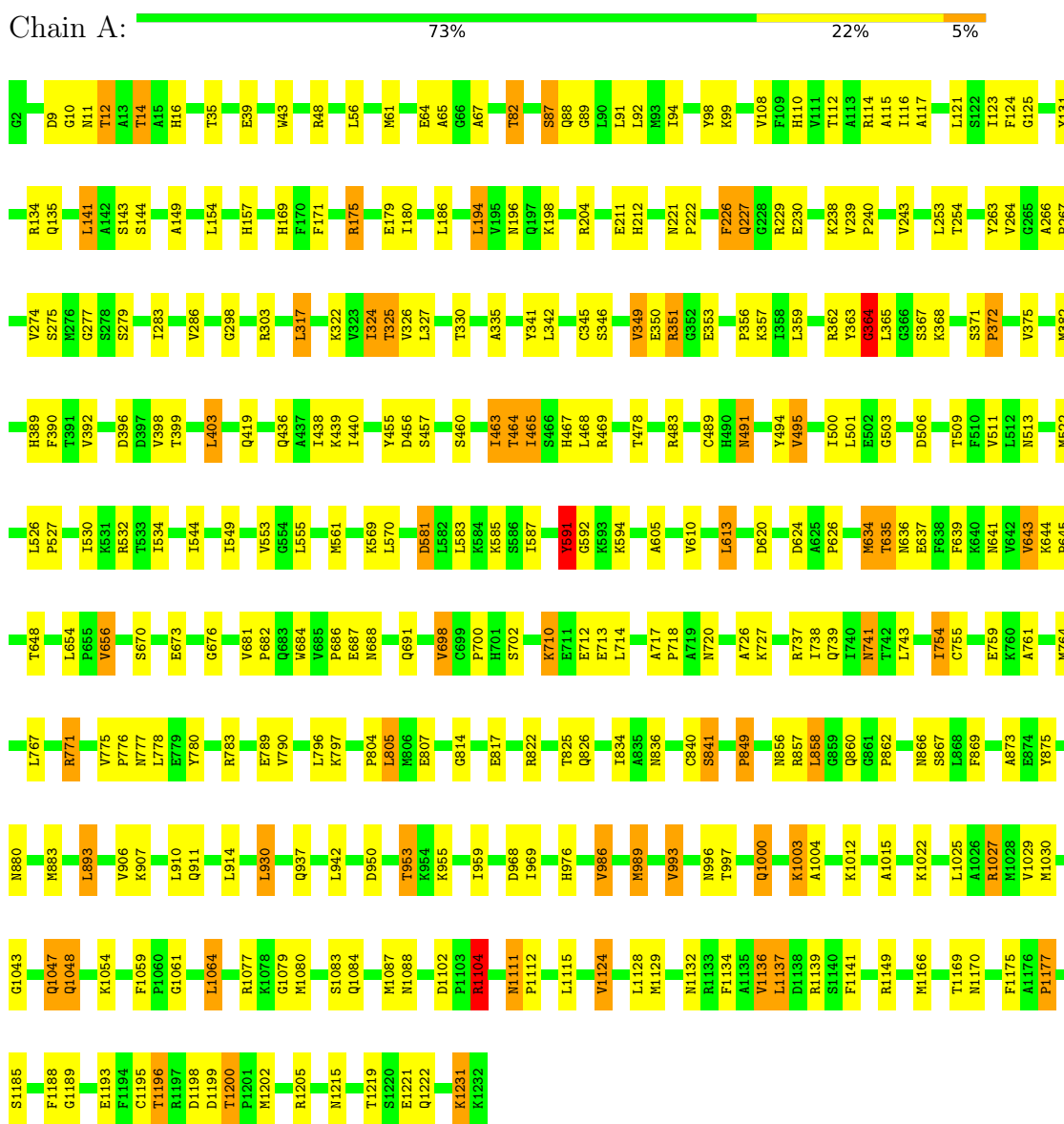
- Molecule 5 is THIAMINE DIPHOSPHATE (three-letter code: TPP) (formula: C₁₂H₁₉N₄O₇P₂S).

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. 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. 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.

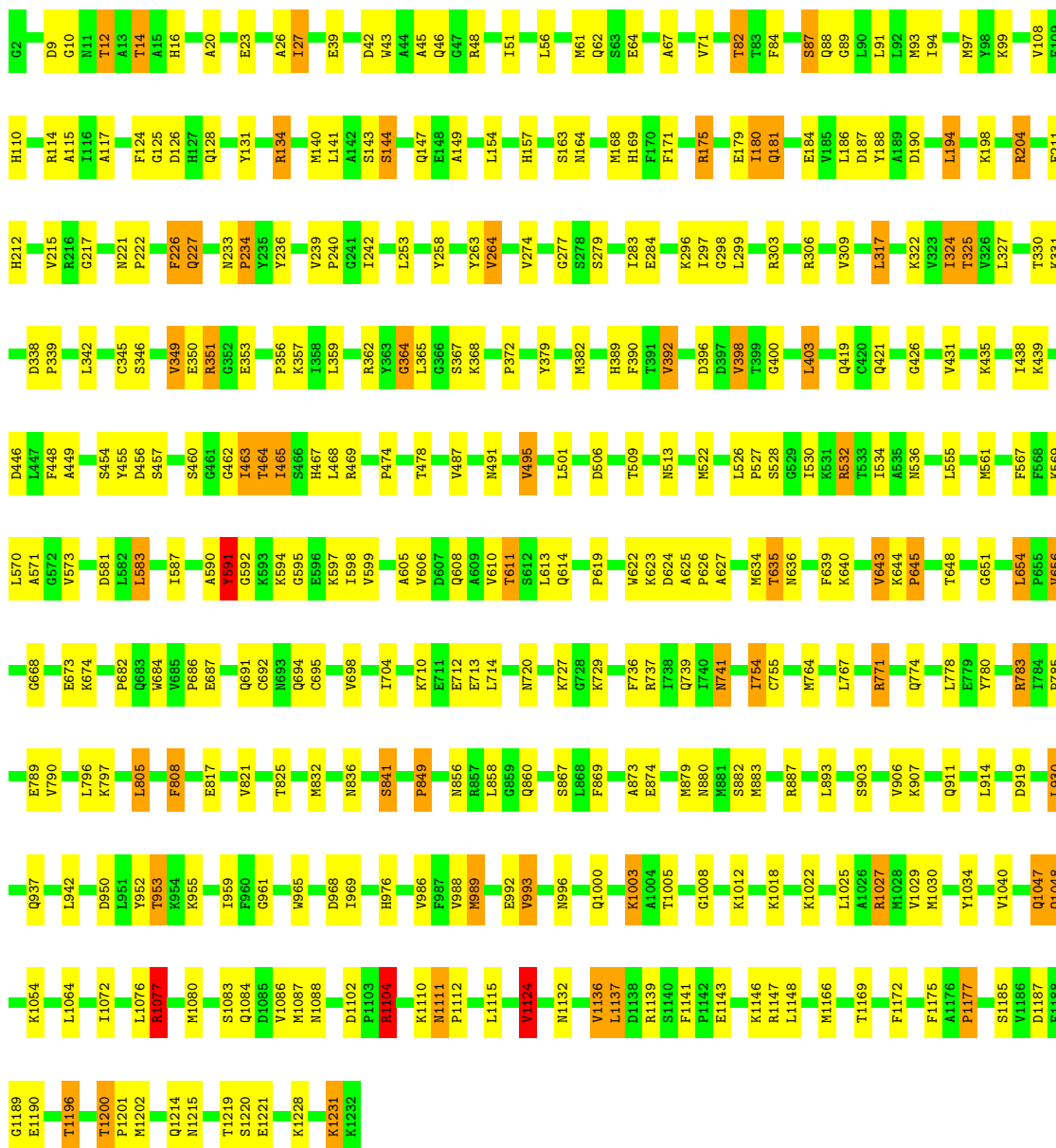
Note EDS was not executed.

- Molecule 1: PROTEIN (PYRUVATE-FERREDOXIN OXIDOREDUCTASE)



- Molecule 1: PROTEIN (PYRUVATE-FERREDOXIN OXIDOREDUCTASE)

Chain B:  71% 24% 5%



4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	84.80Å 144.90Å 203.00Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	6.00 – 2.31	Depositor
% Data completeness (in resolution range)	68.6 (6.00-2.31)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	0.08	Depositor
Refinement program	X-PLOR 3.854	Depositor
R, R_{free}	0.199 , 0.271	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	19411	wwPDB-VP
Average B, all atoms (Å ²)	6.0	wwPDB-VP

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: TPP, CA, MG, SF4

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	0.77	1/9584 (0.0%)	0.92	9/12954 (0.1%)
1	B	0.77	0/9584	0.92	14/12954 (0.1%)
All	All	0.77	1/19168 (0.0%)	0.92	23/25908 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	2
All	All	0	3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	489	CYS	CB-SG	-5.80	1.72	1.81

All (23) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	317	LEU	CA-CB-CG	6.78	130.90	115.30
1	A	822	ARG	NE-CZ-NH2	-6.65	116.98	120.30
1	B	317	LEU	CA-CB-CG	6.56	130.39	115.30
1	B	1077	ARG	NE-CZ-NH1	6.48	123.54	120.30
1	A	1104	ARG	NE-CZ-NH2	-6.24	117.18	120.30
1	B	125	GLY	N-CA-C	6.16	128.49	113.10
1	B	591	TYR	CA-CB-CG	-6.04	101.93	113.40
1	A	125	GLY	N-CA-C	6.01	128.14	113.10

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	1104	ARG	NE-CZ-NH1	5.91	123.26	120.30
1	A	56	LEU	CA-CB-CG	5.80	128.65	115.30
1	B	832	MET	N-CA-C	5.77	126.57	111.00
1	B	591	TYR	N-CA-C	5.65	126.25	111.00
1	A	141	LEU	CA-CB-CG	5.63	128.25	115.30
1	B	919	ASP	CB-CG-OD1	5.62	123.36	118.30
1	B	1110	LYS	CD-CE-NZ	5.57	124.51	111.70
1	A	1124	VAL	CB-CA-C	-5.44	101.06	111.40
1	B	668	GLY	N-CA-C	5.42	126.64	113.10
1	B	1124	VAL	CB-CA-C	-5.37	101.21	111.40
1	B	56	LEU	CA-CB-CG	5.36	127.64	115.30
1	B	613	LEU	CA-CB-CG	5.32	127.54	115.30
1	A	364	GLY	N-CA-C	5.20	126.09	113.10
1	B	1104	ARG	NE-CZ-NH2	-5.19	117.71	120.30
1	A	591	TYR	N-CA-C	5.07	124.69	111.00

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	591	TYR	Sidechain
1	B	1034	TYR	Sidechain
1	B	591	TYR	Sidechain

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	9382	0	9262	235	0
1	B	9382	0	9262	255	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	24	0	0	1	0
4	B	24	0	0	1	0
5	A	26	0	16	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	B	26	0	16	1	0
6	A	273	0	0	14	0
6	B	270	0	0	20	0
All	All	19411	0	18556	459	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 12.

All (459) 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:639:PHE:HA	1:A:643:VAL:HG13	1.41	1.00
1:A:64:GLU:HG3	1:A:89:GLY:HA2	1.46	0.95
1:B:635:THR:HG23	1:B:639:PHE:HB3	1.48	0.95
1:B:64:GLU:HG3	1:B:89:GLY:HA2	1.49	0.93
6:A:1639:HOH:O	1:B:874:GLU:HB3	1.76	0.85
1:B:737:ARG:HH11	1:B:739:GLN:NE2	1.72	0.85
1:B:1132:ASN:O	1:B:1136:VAL:HG22	1.77	0.85
1:B:351:ARG:HD2	1:B:353:GLU:HB2	1.59	0.84
1:B:64:GLU:HG3	1:B:89:GLY:CA	2.09	0.82
1:A:43:TRP:HB3	1:A:48:ARG:HD3	1.62	0.82
1:A:398:VAL:HG13	1:A:656:VAL:HG22	1.60	0.82
1:B:396:ASP:HA	1:B:656:VAL:HG13	1.62	0.81
1:B:639:PHE:HA	1:B:643:VAL:HG13	1.61	0.81
1:A:64:GLU:HG3	1:A:89:GLY:CA	2.10	0.81
1:A:1199:ASP:HB3	6:B:1784:HOH:O	1.82	0.80
1:A:841:SER:HB2	6:A:1543:HOH:O	1.82	0.79
1:B:841:SER:HB2	6:B:1666:HOH:O	1.81	0.78
1:B:198:LYS:HE2	1:B:198:LYS:H	1.49	0.77
1:B:144:SER:HB3	1:B:277:GLY:O	1.85	0.76
1:A:817:GLU:HB3	1:A:989:MET:CE	2.15	0.76
1:A:1102:ASP:OD1	1:A:1104:ARG:HD3	1.86	0.76
1:A:330:THR:O	1:A:362:ARG:HD3	1.86	0.75
1:A:561:MET:HE1	1:A:587:ILE:HD11	1.69	0.74
1:A:737:ARG:HH11	1:A:739:GLN:NE2	1.86	0.73
1:A:82:THR:HG22	1:A:108:VAL:O	1.88	0.73
1:B:110:HIS:HD2	1:B:169:HIS:HD2	1.34	0.73
1:B:398:VAL:HG13	1:B:656:VAL:HG22	1.70	0.73
1:A:817:GLU:HB3	1:A:989:MET:HE2	1.71	0.71
1:A:856:ASN:HD21	1:A:860:GLN:HE21	1.37	0.71
1:B:561:MET:HE2	1:B:587:ILE:HD11	1.73	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:643:VAL:HB	1:B:849:PRO:HB2	1.72	0.71
1:B:1166:MET:O	1:B:1169:THR:HG22	1.90	0.71
1:B:1132:ASN:ND2	1:B:1139:ARG:HH22	1.87	0.71
1:B:330:THR:O	1:B:362:ARG:HD3	1.91	0.70
1:A:1132:ASN:ND2	1:A:1139:ARG:HH22	1.89	0.70
1:B:856:ASN:HD21	1:B:860:GLN:HE21	1.39	0.70
1:A:110:HIS:HD2	1:A:169:HIS:HD2	1.37	0.70
1:A:676:GLY:HA2	6:A:1339:HOH:O	1.92	0.69
1:A:1132:ASN:O	1:A:1136:VAL:HG22	1.92	0.69
1:B:10:GLY:O	1:B:14:THR:HG23	1.91	0.69
1:B:43:TRP:HB3	1:B:48:ARG:HD3	1.72	0.69
1:A:635:THR:HG23	1:A:636:ASN:N	2.07	0.69
1:B:227:GLN:H	1:B:227:GLN:HE21	1.39	0.69
1:A:10:GLY:O	1:A:14:THR:HG23	1.93	0.69
1:B:82:THR:HG22	1:B:108:VAL:O	1.91	0.69
1:A:937:GLN:HG2	1:A:942:LEU:HB3	1.75	0.69
1:B:737:ARG:NH1	1:B:739:GLN:NE2	2.40	0.69
1:B:1147:ARG:HB3	6:B:1623:HOH:O	1.92	0.68
1:B:817:GLU:HB3	1:B:989:MET:CE	2.23	0.68
1:A:143:SER:OG	1:A:169:HIS:HE1	1.76	0.68
1:B:737:ARG:NH1	1:B:739:GLN:HE22	1.92	0.68
1:A:274:VAL:HG23	1:A:324:ILE:HD11	1.77	0.66
1:B:175:ARG:O	1:B:175:ARG:HD3	1.95	0.66
1:A:227:GLN:H	1:A:227:GLN:HE21	1.44	0.66
1:A:1200:THR:HG23	1:A:1202:MET:H	1.60	0.66
1:A:396:ASP:HA	1:A:656:VAL:HG13	1.78	0.65
1:B:110:HIS:HD2	1:B:169:HIS:CD2	2.14	0.65
1:A:325:THR:CG2	1:A:382:MET:SD	2.85	0.65
1:A:643:VAL:HB	1:A:849:PRO:HB2	1.76	0.65
1:B:274:VAL:HG23	1:B:324:ILE:HD11	1.78	0.65
1:A:873:ALA:HA	1:A:959:ILE:HD13	1.78	0.64
1:A:907:LYS:O	1:A:911:GLN:HG3	1.97	0.64
1:A:1189:GLY:HA3	1:A:1196:THR:HG21	1.79	0.64
1:B:274:VAL:HG23	1:B:324:ILE:CD1	2.26	0.64
1:A:398:VAL:HG13	1:A:656:VAL:CG2	2.27	0.64
1:B:817:GLU:HB3	1:B:989:MET:HE3	1.79	0.64
1:B:1102:ASP:OD1	1:B:1104:ARG:HD3	1.97	0.64
1:A:131:TYR:O	1:A:134:ARG:HB2	1.97	0.64
1:B:233:ASN:HB2	1:B:234:PRO:HD3	1.78	0.64
1:B:264:VAL:HG11	1:B:284:GLU:HG3	1.80	0.64
1:A:212:HIS:HE1	1:B:950:ASP:OD2	1.79	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:279:SER:O	1:B:283:ILE:HG13	1.98	0.63
1:B:635:THR:HG22	1:B:636:ASN:O	1.97	0.63
1:A:196:ASN:OD1	1:A:198:LYS:HE2	1.98	0.63
1:A:263:TYR:OH	1:A:298:GLY:HA3	1.99	0.63
1:B:635:THR:CG2	1:B:639:PHE:HB3	2.26	0.63
1:A:867:SER:O	1:B:99:LYS:HE3	1.99	0.63
1:B:364:GLY:HA2	1:B:368:LYS:HB3	1.81	0.62
1:B:1005:THR:HB	1:B:1018:LYS:HD3	1.81	0.62
1:B:131:TYR:O	1:B:134:ARG:HB2	2.00	0.62
1:B:14:THR:HG22	1:B:149:ALA:HB1	1.82	0.62
1:B:606:VAL:O	1:B:610:VAL:HG23	1.99	0.62
1:B:530:ILE:O	1:B:534:ILE:HG13	1.99	0.61
1:A:390:PHE:HB2	1:A:403:LEU:HD13	1.81	0.61
1:A:1189:GLY:CA	1:A:1196:THR:HG21	2.30	0.61
1:A:986:VAL:HG22	1:A:1064:LEU:HD23	1.81	0.61
1:B:907:LYS:O	1:B:911:GLN:HG3	2.00	0.61
1:B:1189:GLY:HA3	1:B:1196:THR:HG21	1.81	0.61
1:A:463:ILE:HG12	1:A:464:THR:N	2.16	0.61
1:B:1083:SER:O	1:B:1087:MET:HG3	2.01	0.60
1:A:325:THR:HG23	1:A:382:MET:SD	2.41	0.60
1:A:836:ASN:OD1	1:A:841:SER:HB3	2.01	0.60
1:A:227:GLN:H	1:A:227:GLN:NE2	2.00	0.60
1:A:64:GLU:CG	1:A:89:GLY:HA2	2.26	0.60
1:B:561:MET:HE1	1:B:583:LEU:HD21	1.83	0.60
1:A:1080:MET:H	1:B:1215:ASN:ND2	1.98	0.60
1:A:274:VAL:HG23	1:A:324:ILE:CD1	2.32	0.60
1:A:356:PRO:O	1:A:357:LYS:HB3	2.02	0.60
1:A:1215:ASN:ND2	1:B:1080:MET:H	2.00	0.60
1:B:163:SER:O	1:B:164:ASN:HB2	2.01	0.60
1:B:883:MET:CE	1:B:955:LYS:HG3	2.32	0.60
1:A:279:SER:O	1:A:283:ILE:HG13	2.02	0.59
1:A:636:ASN:HB3	1:A:639:PHE:H	1.67	0.59
1:B:465:ILE:HG13	1:B:467:HIS:CE1	2.37	0.59
1:A:634:MET:SD	1:A:635:THR:N	2.75	0.59
1:B:463:ILE:HG12	1:B:464:THR:N	2.16	0.59
1:B:1025:LEU:O	1:B:1029:VAL:HG13	2.03	0.59
1:A:61:MET:HG3	1:A:67:ALA:HA	1.83	0.59
1:A:1003:LYS:NZ	1:B:976:HIS:HD2	2.01	0.59
1:B:124:PHE:HB3	1:B:367:SER:HB2	1.84	0.59
1:A:221:ASN:HB3	1:A:222:PRO:CD	2.33	0.59
1:B:396:ASP:HA	1:B:656:VAL:CG1	2.32	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:968:ASP:OD1	1:B:1003:LYS:HB2	2.02	0.59
1:A:99:LYS:HE3	1:B:867:SER:O	2.03	0.58
1:A:221:ASN:HB3	1:A:222:PRO:HD2	1.85	0.58
1:A:817:GLU:HB3	1:A:989:MET:HE3	1.85	0.58
1:B:883:MET:HE1	1:B:955:LYS:HG3	1.86	0.58
1:A:710:LYS:HG2	1:A:713:GLU:OE1	2.04	0.57
1:B:456:ASP:OD2	1:B:463:ILE:HG22	2.04	0.57
1:A:326:VAL:HG11	1:A:341:TYR:HA	1.84	0.57
1:B:9:ASP:OD1	1:B:12:THR:HG23	2.04	0.57
1:A:14:THR:HG22	1:A:149:ALA:HB1	1.86	0.57
1:A:110:HIS:HD2	1:A:169:HIS:CD2	2.19	0.57
1:A:322:LYS:O	1:A:356:PRO:O	2.22	0.57
1:A:635:THR:HG23	1:A:636:ASN:H	1.68	0.57
1:B:419:GLN:OE1	1:B:469:ARG:NH1	2.37	0.57
1:A:698:VAL:HG22	1:A:1084:GLN:CD	2.25	0.57
1:B:64:GLU:CG	1:B:89:GLY:HA2	2.31	0.57
1:A:117:ALA:HB1	1:B:99:LYS:HE2	1.86	0.57
1:A:438:ILE:HD11	1:A:468:LEU:HD22	1.87	0.57
1:A:239:VAL:CG1	1:A:240:PRO:HD3	2.35	0.56
1:A:691:GLN:HE22	1:A:727:LYS:H	1.53	0.56
1:A:968:ASP:OD1	1:A:1003:LYS:HB2	2.05	0.56
1:A:1004:ALA:O	1:A:1022:LYS:HG3	2.05	0.56
1:A:1083:SER:O	1:A:1087:MET:HG3	2.05	0.56
1:B:9:ASP:HA	1:B:179:GLU:O	2.05	0.56
1:B:873:ALA:HA	1:B:959:ILE:HD13	1.87	0.56
1:A:682:PRO:HB3	1:A:764:MET:HE1	1.87	0.56
1:A:544:ILE:HD12	1:A:613:LEU:HD13	1.87	0.56
1:B:1137:LEU:HD22	1:B:1141:PHE:HD2	1.71	0.56
1:A:12:THR:HB	1:A:39:GLU:OE2	2.04	0.56
1:A:238:LYS:NZ	6:A:1773:HOH:O	2.39	0.56
1:A:9:ASP:HA	1:A:179:GLU:O	2.06	0.56
1:A:906:VAL:O	1:A:910:LEU:HB2	2.06	0.56
1:B:1027:ARG:HG3	1:B:1030:MET:HE3	1.87	0.56
1:B:698:VAL:HG22	1:B:1084:GLN:CD	2.27	0.55
1:B:396:ASP:O	1:B:400:GLY:HA2	2.05	0.55
1:B:61:MET:HG3	1:B:67:ALA:HA	1.88	0.55
1:B:1029:VAL:HG12	6:B:1629:HOH:O	2.06	0.55
1:B:91:LEU:HA	1:B:94:ILE:HD12	1.88	0.55
1:B:1132:ASN:HD22	1:B:1139:ARG:HH22	1.55	0.55
1:A:455:TYR:HB2	1:B:1201:PRO:HG3	1.89	0.54
1:B:227:GLN:H	1:B:227:GLN:NE2	2.05	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1000:GLN:HA	1:B:1012:LYS:HB2	1.88	0.54
1:B:1189:GLY:CA	1:B:1196:THR:HG21	2.38	0.54
1:B:619:PRO:HG2	1:B:622:TRP:CD1	2.42	0.54
1:A:436:GLN:O	1:A:440:ILE:HG13	2.07	0.54
1:A:691:GLN:NE2	1:A:727:LYS:H	2.06	0.54
1:A:1132:ASN:HD22	1:A:1139:ARG:HH22	1.55	0.53
1:B:1137:LEU:CD2	1:B:1141:PHE:HD2	2.20	0.53
1:A:1027:ARG:HG3	1:A:1030:MET:HE3	1.90	0.53
1:A:364:GLY:HA2	1:A:368:LYS:HB3	1.89	0.53
1:A:456:ASP:OD2	1:A:463:ILE:HG22	2.09	0.53
1:B:12:THR:HB	1:B:39:GLU:OE2	2.08	0.53
1:B:1047:GLN:NE2	6:B:1590:HOH:O	2.42	0.53
1:A:737:ARG:HH11	1:A:739:GLN:HE22	1.55	0.53
1:A:124:PHE:HB3	1:A:367:SER:HB2	1.91	0.53
1:A:755:CYS:SG	1:A:761:ALA:HB3	2.48	0.53
1:B:639:PHE:CD1	1:B:643:VAL:HG22	2.44	0.53
1:B:390:PHE:HB2	1:B:403:LEU:HD13	1.91	0.53
1:B:691:GLN:O	1:B:797:LYS:HE3	2.09	0.53
1:B:767:LEU:O	1:B:771:ARG:HG2	2.09	0.53
1:A:350:GLU:OE1	1:B:389:HIS:HE1	1.92	0.52
1:A:1137:LEU:CD2	1:A:1141:PHE:HD2	2.22	0.52
1:A:175:ARG:HD2	1:A:478:THR:HB	1.91	0.52
1:B:644:LYS:HB3	1:B:645:PRO:HD3	1.90	0.52
1:B:438:ILE:HD11	1:B:468:LEU:HD22	1.91	0.52
1:A:389:HIS:HE1	1:B:350:GLU:OE1	1.92	0.52
1:A:780:TYR:HA	1:A:783:ARG:HH11	1.75	0.52
1:A:1132:ASN:HD21	1:A:1139:ARG:HH12	1.58	0.52
1:A:1175:PHE:CZ	1:A:1177:PRO:HA	2.45	0.52
1:A:325:THR:HG21	6:A:1560:HOH:O	2.08	0.52
1:A:1202:MET:O	1:A:1205:ARG:NH2	2.42	0.52
1:B:639:PHE:CE1	1:B:643:VAL:HG22	2.45	0.52
1:B:780:TYR:O	1:B:783:ARG:HG3	2.10	0.52
1:B:1219:THR:HG22	1:B:1221:GLU:H	1.75	0.51
1:A:682:PRO:HB3	1:A:764:MET:CE	2.41	0.51
1:B:495:VAL:HG13	1:B:527:PRO:HD3	1.92	0.51
1:B:691:GLN:HE22	1:B:727:LYS:H	1.58	0.51
1:B:817:GLU:HB3	1:B:989:MET:HE2	1.91	0.51
1:B:1147:ARG:CB	6:B:1623:HOH:O	2.52	0.51
1:A:419:GLN:OE1	1:A:469:ARG:NH1	2.43	0.51
1:B:16:HIS:HE1	1:B:186:LEU:O	1.94	0.51
1:B:953:THR:HG22	6:B:1425:HOH:O	2.10	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:390:PHE:CD1	1:B:403:LEU:HD22	2.46	0.51
1:B:115:ALA:HB2	1:B:126:ASP:OD2	2.10	0.51
1:B:351:ARG:CD	1:B:353:GLU:HB2	2.36	0.51
1:B:555:LEU:HD12	1:B:605:ALA:HB2	1.93	0.51
1:B:684:TRP:CE3	1:B:686:PRO:HG3	2.45	0.51
1:B:869:PHE:CD2	1:B:969:ILE:HG21	2.46	0.51
1:A:227:GLN:HE21	1:A:227:GLN:N	2.07	0.51
1:A:1166:MET:O	1:A:1169:THR:HG22	2.11	0.51
1:B:1219:THR:HG22	1:B:1221:GLU:N	2.26	0.51
1:A:1025:LEU:O	1:A:1029:VAL:HG13	2.11	0.50
1:A:1111:ASN:HD22	1:A:1112:PRO:HD2	1.75	0.50
1:B:14:THR:HG21	1:B:171:PHE:CE1	2.46	0.50
1:A:691:GLN:HE22	1:A:726:ALA:HA	1.77	0.50
1:B:573:VAL:HG22	6:B:1532:HOH:O	2.11	0.50
1:B:140:MET:HG2	1:B:168:MET:HE3	1.93	0.50
1:B:1146:LYS:HD3	6:B:1649:HOH:O	2.10	0.50
1:A:702:SER:CB	1:A:807:GLU:HG2	2.42	0.50
1:A:976:HIS:HD2	1:B:1003:LYS:NZ	2.10	0.50
1:B:421:GLN:HE21	1:B:487:VAL:HG22	1.77	0.50
1:B:1008:GLY:HA2	1:B:1148:LEU:HD13	1.92	0.50
1:B:1200:THR:HG23	1:B:1202:MET:H	1.76	0.50
1:B:239:VAL:CG1	1:B:240:PRO:HD3	2.40	0.50
1:B:258:TYR:HD2	6:B:1635:HOH:O	1.94	0.50
1:B:23:GLU:OE1	1:B:204:ARG:NH2	2.45	0.50
1:B:754:ILE:HG12	6:B:1410:HOH:O	2.12	0.50
1:B:1132:ASN:HD21	1:B:1139:ARG:HH12	1.60	0.50
1:B:110:HIS:CD2	1:B:169:HIS:HD2	2.22	0.50
1:B:869:PHE:CE2	1:B:969:ILE:HG21	2.47	0.50
1:B:1175:PHE:CZ	1:B:1177:PRO:HA	2.47	0.49
1:A:254:THR:HG22	6:A:1738:HOH:O	2.12	0.49
1:B:992:GLU:O	1:B:993:VAL:HB	2.12	0.49
1:A:1000:GLN:HA	1:A:1012:LYS:HB2	1.92	0.49
1:B:522:MET:O	1:B:526:LEU:HB2	2.11	0.49
1:A:345:CYS:O	1:A:349:VAL:HG13	2.13	0.49
1:A:522:MET:O	1:A:526:LEU:HB2	2.13	0.49
1:A:1015:ALA:HB1	1:B:1185:SER:HB2	1.94	0.49
1:B:1040:VAL:HG12	1:B:1048:GLN:HE22	1.78	0.49
1:A:950:ASP:OD2	1:B:212:HIS:HE1	1.95	0.49
1:A:1215:ASN:HA	6:A:1641:HOH:O	2.11	0.49
1:B:20:ALA:HB2	1:B:188:TYR:CZ	2.47	0.49
1:A:230:GLU:OE2	1:B:331:LYS:HE3	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:448:PHE:CZ	1:B:474:PRO:HG3	2.47	0.49
1:B:571:ALA:HB3	6:B:1532:HOH:O	2.12	0.49
1:A:144:SER:HB3	1:A:277:GLY:O	2.12	0.49
1:B:595:GLY:C	1:B:597:LYS:H	2.16	0.49
1:A:194:LEU:HD21	1:A:253:LEU:HD12	1.94	0.48
1:A:239:VAL:HG13	1:A:240:PRO:HD3	1.94	0.48
1:A:867:SER:HB2	1:A:875:TYR:CD2	2.47	0.48
1:A:530:ILE:O	1:A:534:ILE:HG13	2.14	0.48
1:B:93:MET:O	1:B:97:MET:HG3	2.12	0.48
1:B:691:GLN:HG2	1:B:736:PHE:CD1	2.48	0.48
1:B:1147:ARG:CG	6:B:1623:HOH:O	2.61	0.48
1:A:390:PHE:CB	1:A:403:LEU:HD13	2.44	0.48
1:A:702:SER:OG	1:A:807:GLU:HG2	2.14	0.48
1:A:494:TYR:HB3	1:A:500:ILE:HD11	1.96	0.48
1:A:1129:MET:HE1	1:A:1149:ARG:NH1	2.28	0.48
1:B:345:CYS:O	1:B:349:VAL:HG13	2.14	0.48
1:A:1048:GLN:NE2	6:A:1370:HOH:O	2.47	0.48
1:A:691:GLN:O	1:A:797:LYS:HE3	2.13	0.47
1:A:644:LYS:HB3	1:A:645:PRO:HD3	1.95	0.47
1:A:99:LYS:HE2	1:B:117:ALA:HB1	1.95	0.47
1:B:147:GLN:HE22	1:B:184:GLU:H	1.62	0.47
1:A:1137:LEU:HD22	1:A:1141:PHE:HD2	1.79	0.47
1:B:961:GLY:HA3	1:B:965:TRP:CE3	2.49	0.47
1:A:16:HIS:HE1	1:A:186:LEU:O	1.97	0.47
1:B:755:CYS:HA	4:B:1233:SF4:S1	2.54	0.47
1:A:737:ARG:NH1	1:A:739:GLN:HE22	2.12	0.47
1:B:239:VAL:HG13	1:B:240:PRO:HD3	1.95	0.47
1:B:263:TYR:OH	1:B:298:GLY:HA3	2.15	0.47
1:B:836:ASN:OD1	1:B:841:SER:HB3	2.15	0.47
1:A:365:LEU:HD22	1:B:226:PHE:CD1	2.50	0.47
1:A:569:LYS:HD2	1:A:610:VAL:HG13	1.95	0.47
1:B:20:ALA:HB2	1:B:188:TYR:CE1	2.50	0.47
1:B:463:ILE:HG12	1:B:464:THR:H	1.78	0.47
1:B:1147:ARG:HD2	6:B:1689:HOH:O	2.14	0.47
5:B:1236:TPP:H2	5:B:1236:TPP:HN42	1.78	0.47
1:A:644:LYS:O	1:A:648:THR:HG23	2.15	0.47
1:A:1185:SER:HB3	1:B:45:ALA:HB1	1.96	0.47
1:B:695:CYS:HB2	1:B:704:ILE:HD13	1.97	0.47
1:A:483:ARG:HA	1:A:503:GLY:O	2.15	0.46
1:A:1185:SER:HB3	1:B:45:ALA:CB	2.44	0.46
1:B:426:GLY:N	1:B:462:GLY:O	2.49	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:713:GLU:OE1	1:B:785:PRO:HD2	2.16	0.46
1:A:620:ASP:HB3	6:A:1653:HOH:O	2.15	0.46
1:B:635:THR:HG21	1:B:639:PHE:HD2	1.81	0.46
1:B:1196:THR:HB	6:B:1583:HOH:O	2.14	0.46
1:A:143:SER:HB2	1:A:171:PHE:HB3	1.96	0.46
1:A:495:VAL:HG13	1:A:527:PRO:HD3	1.97	0.46
1:A:637:GLU:HG2	1:A:641:ASN:ND2	2.31	0.46
1:A:419:GLN:HG2	1:A:469:ARG:HG2	1.97	0.46
1:A:87:SER:HB2	1:A:116:ILE:HD13	1.96	0.46
1:A:114:ARG:HG2	1:A:115:ALA:N	2.31	0.46
1:A:110:HIS:HE1	1:A:157:HIS:NE2	2.13	0.46
1:B:1048:GLN:NE2	6:B:1507:HOH:O	2.48	0.46
1:A:266:ALA:HA	1:A:267:PRO:HD3	1.83	0.46
1:B:325:THR:CG2	1:B:382:MET:SD	3.04	0.46
1:A:1003:LYS:HZ2	1:B:976:HIS:HD2	1.64	0.46
1:B:163:SER:HB3	1:B:242:ILE:HD12	1.98	0.46
1:A:635:THR:CG2	1:A:636:ASN:N	2.74	0.45
1:A:1043:GLY:HA3	1:A:1084:GLN:O	2.15	0.45
1:A:857:ARG:HG3	1:A:858:LEU:HD13	1.98	0.45
1:B:42:ASP:O	1:B:46:GLN:HG3	2.15	0.45
1:A:286:VAL:HG21	1:A:372:PRO:HA	1.97	0.45
1:B:635:THR:CG2	1:B:636:ASN:N	2.79	0.45
1:A:739:GLN:NE2	1:A:777:ASN:HB3	2.32	0.45
1:A:636:ASN:HB2	1:A:639:PHE:HB2	1.99	0.45
1:A:805:LEU:HB2	1:A:825:THR:HB	1.98	0.45
1:B:431:VAL:CG1	1:B:435:LYS:HE3	2.46	0.45
1:A:365:LEU:HD22	1:B:226:PHE:CE1	2.52	0.45
1:B:26:ALA:HB3	1:B:71:VAL:HG23	1.99	0.45
1:B:651:GLY:O	1:B:654:LEU:HB2	2.17	0.45
1:B:712:GLU:CD	1:B:712:GLU:H	2.20	0.45
1:A:367:SER:HB2	1:B:222:PRO:HG3	1.97	0.45
1:A:1219:THR:HG22	1:A:1222:GLN:H	1.81	0.45
1:B:1077:ARG:HH22	1:B:1139:ARG:HH21	1.65	0.45
1:A:869:PHE:CD2	1:A:969:ILE:HG21	2.52	0.44
1:B:20:ALA:O	1:B:51:ILE:HG12	2.16	0.44
1:B:325:THR:HG21	6:B:1645:HOH:O	2.17	0.44
1:B:692:CYS:SG	1:B:694:GLN:HG3	2.57	0.44
1:B:887:ARG:NH2	1:B:952:TYR:O	2.48	0.44
1:A:555:LEU:HD12	1:A:605:ALA:HB2	1.98	0.44
1:B:1111:ASN:HD22	1:B:1112:PRO:HD2	1.83	0.44
1:B:180:ILE:HG13	1:B:181:GLN:N	2.30	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:879:MET:O	1:B:882:SER:HB3	2.18	0.44
1:B:1214:GLN:HG2	1:B:1214:GLN:O	2.18	0.44
1:A:229:ARG:HE	1:B:128:GLN:HE22	1.64	0.44
1:A:1200:THR:HG21	6:B:1702:HOH:O	2.17	0.44
1:A:134:ARG:HD2	6:A:1659:HOH:O	2.18	0.44
1:B:236:TYR:O	1:B:239:VAL:HG12	2.18	0.44
1:A:11:ASN:HD21	1:A:112:THR:HG21	1.83	0.44
1:B:10:GLY:O	1:B:14:THR:CG2	2.63	0.44
1:A:10:GLY:O	1:A:14:THR:CG2	2.64	0.44
1:B:390:PHE:CE1	1:B:403:LEU:HD22	2.52	0.44
1:B:1072:ILE:HA	6:B:1662:HOH:O	2.17	0.44
1:A:9:ASP:OD1	1:A:12:THR:CG2	2.66	0.44
1:A:738:ILE:HD13	1:A:738:ILE:HA	1.93	0.44
1:A:741:ASN:HA	1:A:778:LEU:HG	1.99	0.44
1:A:1047:GLN:H	1:A:1047:GLN:NE2	2.15	0.44
1:A:1198:ASP:OD1	1:A:1200:THR:HG22	2.16	0.44
1:B:883:MET:HE2	1:B:955:LYS:HG3	1.99	0.44
1:A:670:SER:HA	1:A:673:GLU:HG3	1.99	0.43
1:A:717:ALA:HA	1:A:718:PRO:HD3	1.91	0.43
1:A:866:ASN:HB3	1:B:217:GLY:O	2.18	0.43
1:B:23:GLU:CD	1:B:204:ARG:HH22	2.21	0.43
1:B:1076:LEU:HD13	1:B:1086:VAL:HG21	1.99	0.43
1:A:390:PHE:CD1	1:A:403:LEU:HD22	2.53	0.43
1:A:396:ASP:HA	1:A:656:VAL:CG1	2.48	0.43
1:B:322:LYS:O	1:B:356:PRO:O	2.35	0.43
1:B:1187:ASP:O	1:B:1190:GLU:HB2	2.18	0.43
1:A:997:THR:OG1	1:A:1000:GLN:NE2	2.49	0.43
1:B:640:LYS:HE2	1:B:640:LYS:HB2	1.79	0.43
1:A:356:PRO:O	1:A:357:LYS:CB	2.65	0.43
1:B:87:SER:OG	1:B:88:GLN:N	2.52	0.43
1:B:221:ASN:HB3	1:B:222:PRO:CD	2.48	0.43
1:B:1124:VAL:HG22	6:B:1263:HOH:O	2.18	0.43
1:B:937:GLN:HG2	1:B:942:LEU:HB3	2.00	0.43
1:A:561:MET:CE	1:A:587:ILE:HD11	2.45	0.43
1:A:739:GLN:HE22	1:A:777:ASN:HB3	1.84	0.43
1:B:930:LEU:HD12	1:B:930:LEU:HA	1.85	0.43
1:A:87:SER:OG	1:A:88:GLN:N	2.51	0.43
1:A:549:ILE:O	1:A:553:VAL:HG22	2.19	0.43
1:A:684:TRP:CE3	1:A:686:PRO:HG3	2.54	0.43
1:A:755:CYS:HA	4:A:1233:SF4:S1	2.59	0.43
1:B:569:LYS:HD2	1:B:610:VAL:HG13	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:808:PHE:CD1	1:B:808:PHE:N	2.86	0.43
1:A:121:LEU:HD23	1:A:121:LEU:C	2.39	0.43
1:A:325:THR:HG22	1:A:382:MET:SD	2.57	0.43
1:A:398:VAL:HG23	1:A:399:THR:HG23	2.01	0.43
1:A:1219:THR:HG22	1:A:1221:GLU:N	2.33	0.43
5:A:1236:TPP:H2	5:A:1236:TPP:N4'	2.34	0.43
1:B:390:PHE:CE1	1:B:392:VAL:HG22	2.54	0.43
1:A:953:THR:HG22	6:A:1288:HOH:O	2.18	0.43
1:A:1193:GLU:OE1	1:B:1077:ARG:HB2	2.18	0.43
1:B:14:THR:CG2	1:B:149:ALA:HB1	2.46	0.43
1:B:263:TYR:HA	1:B:299:LEU:O	2.19	0.43
1:A:513:ASN:HA	1:A:544:ILE:O	2.19	0.42
1:A:581:ASP:O	1:A:585:LYS:HG3	2.20	0.42
1:A:771:ARG:O	1:A:775:VAL:HG23	2.19	0.42
1:B:187:ASP:HB2	1:B:190:ASP:OD1	2.19	0.42
1:A:351:ARG:HD2	1:A:353:GLU:HB2	2.01	0.42
1:B:532:ARG:HD2	1:B:625:ALA:H	1.83	0.42
1:B:741:ASN:C	1:B:741:ASN:HD22	2.23	0.42
1:A:467:HIS:HE1	6:A:1671:HOH:O	2.02	0.42
1:B:194:LEU:HD21	1:B:253:LEU:HD12	2.01	0.42
1:A:9:ASP:OD1	1:A:12:THR:HG23	2.19	0.42
1:A:780:TYR:HA	1:A:783:ARG:HD2	2.01	0.42
1:A:930:LEU:HD12	1:A:930:LEU:HA	1.74	0.42
1:B:240:PRO:HB3	1:B:309:VAL:HG21	2.01	0.42
1:B:438:ILE:HG23	1:B:449:ALA:HB1	2.01	0.42
1:B:754:ILE:O	1:B:755:CYS:C	2.58	0.42
1:B:805:LEU:HB2	1:B:825:THR:HB	2.02	0.42
1:B:528:SER:HB3	1:B:626:PRO:O	2.20	0.42
1:A:35:THR:O	1:A:39:GLU:HG3	2.20	0.42
1:A:65:ALA:HB2	1:A:92:LEU:HB3	2.02	0.42
1:A:700:PRO:HG2	1:A:814:GLY:HA2	2.02	0.42
1:A:754:ILE:HD12	1:A:754:ILE:HA	1.76	0.42
1:B:454:SER:HB2	1:B:465:ILE:HG23	2.01	0.42
1:A:239:VAL:O	1:A:243:VAL:HG23	2.19	0.42
1:B:264:VAL:CG1	1:B:284:GLU:HG3	2.46	0.42
1:B:297:ILE:HB	1:B:379:TYR:CE1	2.55	0.42
1:A:684:TRP:CH2	1:A:737:ARG:HA	2.54	0.42
1:B:108:VAL:HG21	1:B:157:HIS:HA	2.02	0.42
1:B:114:ARG:HG2	1:B:115:ALA:N	2.35	0.42
1:B:739:GLN:OE1	1:B:774:GLN:NE2	2.53	0.42
1:A:1188:PHE:CE1	1:A:1196:THR:HG23	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:682:PRO:HB3	1:B:764:MET:CE	2.50	0.42
1:A:365:LEU:HB2	1:B:226:PHE:CG	2.55	0.41
1:A:555:LEU:CD1	1:A:605:ALA:HB2	2.50	0.41
1:A:775:VAL:N	1:A:776:PRO:HD2	2.35	0.41
1:B:536:ASN:ND2	1:B:623:LYS:HG2	2.35	0.41
1:A:226:PHE:CD1	1:B:365:LEU:HD22	2.55	0.41
1:B:296:LYS:HD3	1:B:296:LYS:HA	1.80	0.41
1:B:567:PHE:CD1	1:B:571:ALA:HB2	2.56	0.41
1:B:1219:THR:CG2	1:B:1220:SER:N	2.83	0.41
1:A:123:ILE:HD11	1:B:1201:PRO:HB2	2.03	0.41
1:A:229:ARG:HE	1:B:128:GLN:NE2	2.18	0.41
1:A:279:SER:HB3	1:A:363:TYR:HE2	1.85	0.41
1:A:910:LEU:HD12	1:A:930:LEU:HD21	2.01	0.41
1:A:1195:CYS:HB2	6:A:1541:HOH:O	2.19	0.41
1:B:9:ASP:OD1	1:B:12:THR:CG2	2.67	0.41
1:A:688:ASN:HB3	1:A:759:GLU:O	2.20	0.41
1:B:532:ARG:HG3	1:B:623:LYS:O	2.19	0.41
1:A:465:ILE:HG13	1:A:467:HIS:CE1	2.56	0.41
1:A:681:VAL:HG11	1:A:767:LEU:HD13	2.03	0.41
1:A:976:HIS:CG	1:B:62:GLN:HB3	2.56	0.41
1:B:20:ALA:HB2	1:B:188:TYR:CE2	2.55	0.41
1:B:274:VAL:CG2	1:B:324:ILE:HD11	2.49	0.41
1:A:91:LEU:HA	1:A:94:ILE:HD12	2.02	0.41
1:A:335:ALA:HA	1:B:306:ARG:NE	2.35	0.41
1:A:491:ASN:C	1:A:491:ASN:HD22	2.24	0.41
1:B:338:ASP:HB3	1:B:339:PRO:CD	2.50	0.41
1:A:858:LEU:HD12	1:A:858:LEU:HA	1.86	0.41
1:A:883:MET:CE	1:A:955:LYS:HG3	2.50	0.41
1:B:27:ILE:HD11	1:B:84:PHE:CD2	2.56	0.41
1:B:356:PRO:O	1:B:357:LYS:HB3	2.21	0.41
1:B:644:LYS:O	1:B:648:THR:HG23	2.20	0.41
1:B:673:GLU:O	1:B:674:LYS:C	2.59	0.41
1:B:992:GLU:HG2	1:B:1022:LYS:NZ	2.35	0.41
1:A:834:ILE:HD12	1:A:862:PRO:HB3	2.02	0.41
1:A:1129:MET:HE3	1:A:1149:ARG:HD3	2.03	0.41
1:A:1199:ASP:O	1:B:455:TYR:HB3	2.20	0.41
1:A:743:LEU:HA	1:A:743:LEU:HD23	1.75	0.41
1:A:1059:PHE:CE2	1:A:1061:GLY:HA3	2.55	0.41
1:A:1079:GLY:HA2	1:B:1215:ASN:HD21	1.85	0.41
1:B:131:TYR:CE1	1:B:339:PRO:HB2	2.56	0.41
1:B:227:GLN:HE21	1:B:227:GLN:N	2.11	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:338:ASP:HB3	1:B:339:PRO:HD2	2.03	0.41
1:B:695:CYS:HB2	1:B:704:ILE:CD1	2.51	0.41
1:A:227:GLN:HE22	1:B:368:LYS:HZ3	1.69	0.41
1:A:804:PRO:HA	1:A:826:GLN:HG3	2.03	0.41
1:A:1128:LEU:O	1:A:1134:PHE:HB2	2.21	0.41
1:B:608:GLN:HA	1:B:611:THR:OG1	2.20	0.41
1:B:1143:GLU:HB2	1:B:1147:ARG:NH2	2.36	0.41
1:B:961:GLY:O	1:B:988:VAL:HA	2.21	0.40
1:A:893:LEU:HA	1:A:893:LEU:HD12	1.84	0.40
1:B:175:ARG:HD2	1:B:478:THR:HB	2.03	0.40
1:B:639:PHE:CE1	1:B:643:VAL:CG2	3.05	0.40
1:A:98:TYR:OH	1:A:135:GLN:HG2	2.21	0.40
1:B:1012:LYS:HA	1:B:1012:LYS:HD2	1.76	0.40
1:A:14:THR:CG2	1:A:149:ALA:HB1	2.52	0.40
1:B:598:ILE:O	1:B:599:VAL:C	2.60	0.40
1:B:1111:ASN:HA	1:B:1172:PHE:CE1	2.56	0.40
1:A:61:MET:CE	6:A:1639:HOH:O	2.69	0.40
1:A:371:SER:O	1:A:375:VAL:HG23	2.21	0.40
1:B:903:SER:OG	1:B:906:VAL:HG23	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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	1229/1231 (100%)	1177 (96%)	43 (4%)	9 (1%)	22	26
1	B	1229/1231 (100%)	1184 (96%)	35 (3%)	10 (1%)	19	23
All	All	2458/2462 (100%)	2361 (96%)	78 (3%)	19 (1%)	19	23

All (19) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	87	SER
1	A	1231	LYS
1	B	87	SER
1	B	594	LYS
1	B	1231	LYS
1	A	594	LYS
1	A	1177	PRO
1	B	590	ALA
1	B	592	GLY
1	B	627	ALA
1	B	993	VAL
1	A	591	TYR
1	A	592	GLY
1	A	626	PRO
1	B	591	TYR
1	B	1177	PRO
1	B	364	GLY
1	A	364	GLY
1	A	993	VAL

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	978/978 (100%)	883 (90%)	95 (10%)	8	9
1	B	978/978 (100%)	873 (89%)	105 (11%)	6	7
All	All	1956/1956 (100%)	1756 (90%)	200 (10%)	7	8

All (200) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	12	THR
1	A	14	THR
1	A	82	THR
1	A	141	LEU
1	A	154	LEU

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Mol	Chain	Res	Type
1	A	175	ARG
1	A	180	ILE
1	A	194	LEU
1	A	204	ARG
1	A	211	GLU
1	A	226	PHE
1	A	227	GLN
1	A	264	VAL
1	A	275	SER
1	A	303	ARG
1	A	317	LEU
1	A	324	ILE
1	A	325	THR
1	A	327	LEU
1	A	342	LEU
1	A	346	SER
1	A	349	VAL
1	A	351	ARG
1	A	359	LEU
1	A	372	PRO
1	A	392	VAL
1	A	403	LEU
1	A	439	LYS
1	A	457	SER
1	A	460	SER
1	A	463	ILE
1	A	464	THR
1	A	465	ILE
1	A	491	ASN
1	A	495	VAL
1	A	501	LEU
1	A	506	ASP
1	A	509	THR
1	A	511	VAL
1	A	532	ARG
1	A	570	LEU
1	A	581	ASP
1	A	583	LEU
1	A	613	LEU
1	A	624	ASP
1	A	634	MET
1	A	635	THR

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Mol	Chain	Res	Type
1	A	643	VAL
1	A	654	LEU
1	A	656	VAL
1	A	687	GLU
1	A	698	VAL
1	A	710	LYS
1	A	712	GLU
1	A	714	LEU
1	A	720	ASN
1	A	741	ASN
1	A	754	ILE
1	A	771	ARG
1	A	789	GLU
1	A	790	VAL
1	A	796	LEU
1	A	805	LEU
1	A	840	CYS
1	A	841	SER
1	A	849	PRO
1	A	858	LEU
1	A	880	ASN
1	A	893	LEU
1	A	914	LEU
1	A	930	LEU
1	A	953	THR
1	A	986	VAL
1	A	989	MET
1	A	993	VAL
1	A	996	ASN
1	A	1000	GLN
1	A	1003	LYS
1	A	1027	ARG
1	A	1047	GLN
1	A	1048	GLN
1	A	1054	LYS
1	A	1064	LEU
1	A	1077	ARG
1	A	1088	ASN
1	A	1104	ARG
1	A	1111	ASN
1	A	1115	LEU
1	A	1124	VAL

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Mol	Chain	Res	Type
1	A	1136	VAL
1	A	1137	LEU
1	A	1170	ASN
1	A	1196	THR
1	A	1200	THR
1	A	1231	LYS
1	B	12	THR
1	B	14	THR
1	B	27	ILE
1	B	82	THR
1	B	134	ARG
1	B	141	LEU
1	B	143	SER
1	B	144	SER
1	B	154	LEU
1	B	175	ARG
1	B	180	ILE
1	B	181	GLN
1	B	194	LEU
1	B	204	ARG
1	B	211	GLU
1	B	215	VAL
1	B	226	PHE
1	B	227	GLN
1	B	234	PRO
1	B	264	VAL
1	B	303	ARG
1	B	317	LEU
1	B	324	ILE
1	B	325	THR
1	B	327	LEU
1	B	342	LEU
1	B	346	SER
1	B	349	VAL
1	B	351	ARG
1	B	359	LEU
1	B	372	PRO
1	B	392	VAL
1	B	398	VAL
1	B	403	LEU
1	B	439	LYS
1	B	446	ASP

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Mol	Chain	Res	Type
1	B	457	SER
1	B	460	SER
1	B	463	ILE
1	B	464	THR
1	B	465	ILE
1	B	491	ASN
1	B	495	VAL
1	B	501	LEU
1	B	506	ASP
1	B	509	THR
1	B	513	ASN
1	B	532	ARG
1	B	570	LEU
1	B	581	ASP
1	B	583	LEU
1	B	611	THR
1	B	614	GLN
1	B	624	ASP
1	B	634	MET
1	B	635	THR
1	B	643	VAL
1	B	645	PRO
1	B	654	LEU
1	B	656	VAL
1	B	687	GLU
1	B	710	LYS
1	B	714	LEU
1	B	720	ASN
1	B	729	LYS
1	B	741	ASN
1	B	754	ILE
1	B	771	ARG
1	B	778	LEU
1	B	783	ARG
1	B	789	GLU
1	B	790	VAL
1	B	796	LEU
1	B	805	LEU
1	B	808	PHE
1	B	821	VAL
1	B	841	SER
1	B	849	PRO

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Mol	Chain	Res	Type
1	B	858	LEU
1	B	880	ASN
1	B	893	LEU
1	B	914	LEU
1	B	930	LEU
1	B	953	THR
1	B	986	VAL
1	B	989	MET
1	B	996	ASN
1	B	1003	LYS
1	B	1027	ARG
1	B	1047	GLN
1	B	1048	GLN
1	B	1054	LYS
1	B	1064	LEU
1	B	1077	ARG
1	B	1088	ASN
1	B	1104	ARG
1	B	1111	ASN
1	B	1115	LEU
1	B	1124	VAL
1	B	1136	VAL
1	B	1137	LEU
1	B	1196	THR
1	B	1200	THR
1	B	1228	LYS
1	B	1231	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (89) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	11	ASN
1	A	16	HIS
1	A	96	ASN
1	A	110	HIS
1	A	128	GLN
1	A	147	GLN
1	A	164	ASN
1	A	169	HIS
1	A	212	HIS
1	A	220	GLN
1	A	227	GLN

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Mol	Chain	Res	Type
1	A	233	ASN
1	A	288	ASN
1	A	389	HIS
1	A	421	GLN
1	A	434	ASN
1	A	467	HIS
1	A	491	ASN
1	A	513	ASN
1	A	536	ASN
1	A	588	HIS
1	A	602	ASN
1	A	650	GLN
1	A	691	GLN
1	A	693	ASN
1	A	720	ASN
1	A	739	GLN
1	A	741	ASN
1	A	750	ASN
1	A	765	GLN
1	A	774	GLN
1	A	777	ASN
1	A	860	GLN
1	A	866	ASN
1	A	880	ASN
1	A	918	ASN
1	A	976	HIS
1	A	1000	GLN
1	A	1047	GLN
1	A	1048	GLN
1	A	1084	GLN
1	A	1088	ASN
1	A	1108	GLN
1	A	1111	ASN
1	A	1132	ASN
1	A	1215	ASN
1	B	11	ASN
1	B	16	HIS
1	B	110	HIS
1	B	128	GLN
1	B	147	GLN
1	B	169	HIS
1	B	212	HIS

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Mol	Chain	Res	Type
1	B	220	GLN
1	B	221	ASN
1	B	227	GLN
1	B	233	ASN
1	B	288	ASN
1	B	389	HIS
1	B	421	GLN
1	B	434	ASN
1	B	467	HIS
1	B	491	ASN
1	B	513	ASN
1	B	536	ASN
1	B	588	HIS
1	B	602	ASN
1	B	691	GLN
1	B	693	ASN
1	B	720	ASN
1	B	739	GLN
1	B	741	ASN
1	B	750	ASN
1	B	774	GLN
1	B	777	ASN
1	B	860	GLN
1	B	866	ASN
1	B	880	ASN
1	B	918	ASN
1	B	976	HIS
1	B	1000	GLN
1	B	1047	GLN
1	B	1048	GLN
1	B	1073	ASN
1	B	1084	GLN
1	B	1088	ASN
1	B	1111	ASN
1	B	1132	ASN
1	B	1215	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](#)

Of 12 ligands modelled in this entry, 4 are monoatomic - leaving 8 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
4	SF4	A	1235	1	0,12,12	-	-	-	-	-
5	TPP	A	1236	2	22,27,27	2.31	4 (18%)	29,40,40	1.79	7 (24%)
4	SF4	B	1235	1	0,12,12	-	-	-	-	-
4	SF4	A	1234	1	0,12,12	-	-	-	-	-
4	SF4	B	1234	1	0,12,12	-	-	-	-	-
5	TPP	B	1236	2	22,27,27	2.28	5 (22%)	29,40,40	1.64	7 (24%)
4	SF4	B	1233	1	0,12,12	-	-	-	-	-
4	SF4	A	1233	1	0,12,12	-	-	-	-	-

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	SF4	A	1235	1	-	-	0/6/5/5
5	TPP	A	1236	2	-	5/16/17/17	0/2/2/2
4	SF4	B	1235	1	-	-	0/6/5/5
4	SF4	A	1234	1	-	-	0/6/5/5
4	SF4	B	1234	1	-	-	0/6/5/5
5	TPP	B	1236	2	-	5/16/17/17	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	SF4	B	1233	1	-	-	0/6/5/5
4	SF4	A	1233	1	-	-	0/6/5/5

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	1236	TPP	C6-C5	-9.32	1.46	1.50
5	B	1236	TPP	C6-C5	-7.74	1.47	1.50
5	B	1236	TPP	PB-O3B	-3.70	1.40	1.54
5	B	1236	TPP	C4'-N3'	3.37	1.39	1.35
5	B	1236	TPP	C7'-N3	2.78	1.53	1.48
5	A	1236	TPP	C7'-N3	2.41	1.53	1.48
5	A	1236	TPP	PA-O2A	-2.39	1.44	1.55
5	B	1236	TPP	C2'-N1'	2.39	1.38	1.34
5	A	1236	TPP	PB-O3B	-2.23	1.46	1.54

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	1236	TPP	C7'-N3-C2	-3.70	118.67	125.35
5	A	1236	TPP	C7'-N3-C2	-3.62	118.81	125.35
5	A	1236	TPP	O3B-PB-O2B	3.55	121.19	107.64
5	A	1236	TPP	C5'-C7'-N3	-3.53	107.40	113.28
5	B	1236	TPP	O3B-PB-O2B	3.49	120.96	107.64
5	B	1236	TPP	C6-C5-C4	3.22	130.02	127.43
5	B	1236	TPP	CM2-C2'-N1'	2.91	120.34	117.14
5	A	1236	TPP	CM2-C2'-N1'	2.88	120.30	117.14
5	A	1236	TPP	N1'-C2'-N3'	-2.65	120.98	125.54
5	B	1236	TPP	PA-O7-C7	2.63	134.54	121.59
5	A	1236	TPP	C6-C5-C4	2.50	129.44	127.43
5	A	1236	TPP	PA-O7-C7	2.44	133.62	121.59
5	B	1236	TPP	N1'-C2'-N3'	-2.33	121.54	125.54
5	B	1236	TPP	O3A-PB-O1B	-2.12	99.43	111.19

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	1236	TPP	C5-C6-C7-O7
5	B	1236	TPP	C5-C6-C7-O7
5	B	1236	TPP	C7-O7-PA-O1A

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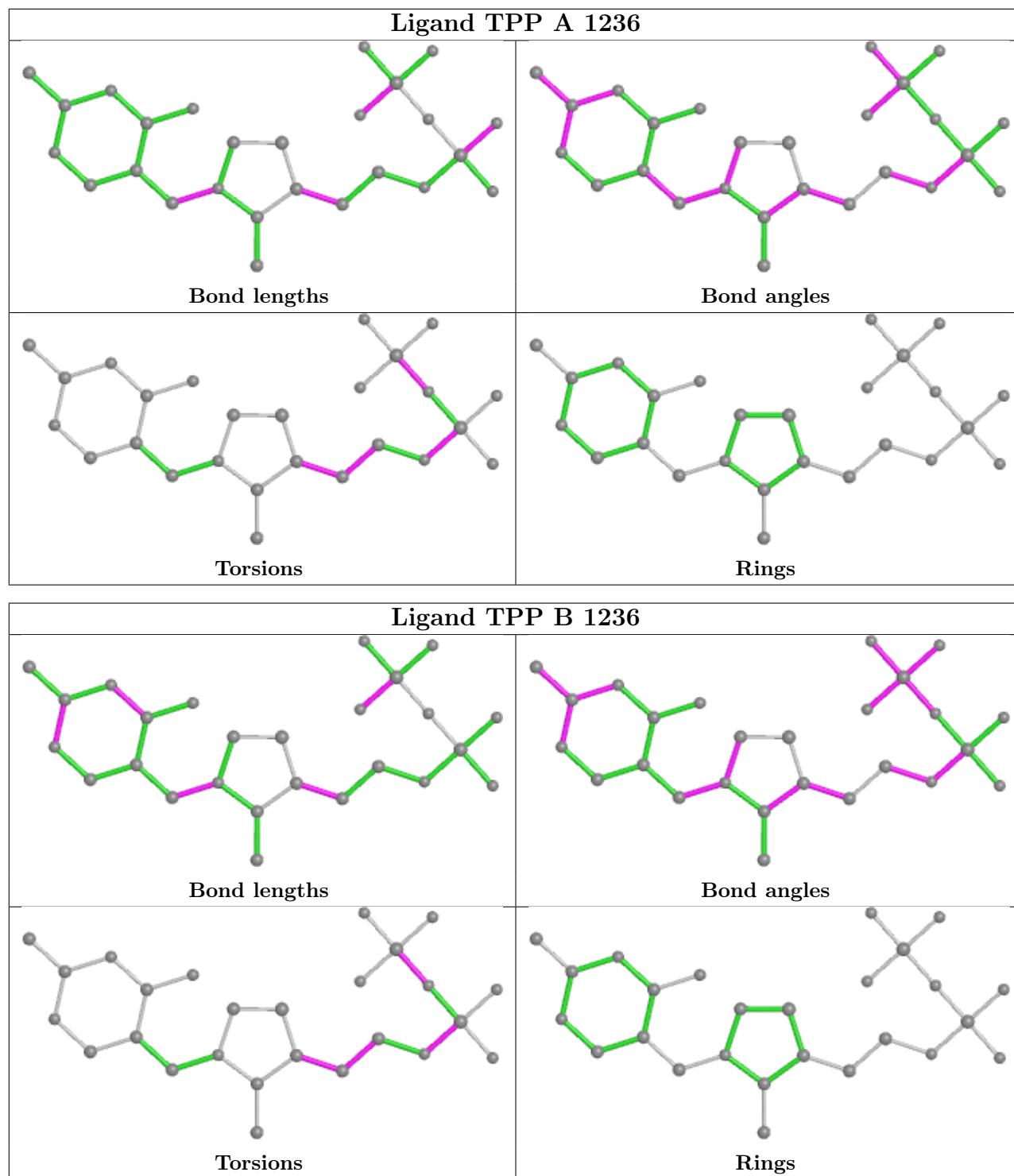
Mol	Chain	Res	Type	Atoms
5	A	1236	TPP	C7-O7-PA-O3A
5	B	1236	TPP	C7-O7-PA-O3A
5	A	1236	TPP	C4-C5-C6-C7
5	B	1236	TPP	C4-C5-C6-C7
5	A	1236	TPP	PA-O3A-PB-O2B
5	B	1236	TPP	PA-O3A-PB-O2B
5	A	1236	TPP	C7-O7-PA-O1A

There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1236	TPP	1	0
5	B	1236	TPP	1	0
4	B	1233	SF4	1	0
4	A	1233	SF4	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.



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

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.