Full wwPDB X-ray Structure Validation Report (i)

Jan 15, 2024 – 07:53 pm GMT

PDB ID	:	8OOQ
Title	:	Glutamine synthetase from Methanothermococcus thermolithotrophicus in complex with 2-oxoglutarate and Mg at 2.91 A resolution
Authors	:	Mueller, M.-C.; Wagner, T.
Deposited on	:	2023-04-05
Resolution	:	2.91 Å(reported)

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

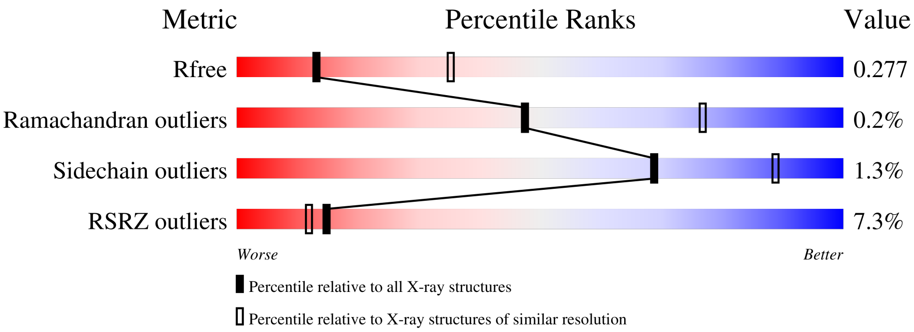
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
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 2.91 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	2307 (2.94-2.90)
Ramachandran outliers	138981	2462 (2.94-2.90)
Sidechain outliers	138945	2464 (2.94-2.90)
RSRZ outliers	127900	2248 (2.94-2.90)

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 <=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	448	6% 99% •
1	B	448	9% 98% •
1	C	448	12% 99% •
1	D	448	13% 98% •
1	E	448	10% 98% •
1	F	448	10% 98% •

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	G	448	7% 98% •
1	H	448	7% 98% •
1	I	448	14% 98% •
1	J	448	16% 98% •
1	K	448	13% 98% •
1	L	448	10% 98% •
1	P	448	3% 98% •
1	Q	448	5% 98% •
1	S	448	4% 99% •
1	T	448	4% 98% •
1	U	448	5% 98% •
1	V	448	5% 98% •
1	X	448	3% 98% •
1	Y	448	4% 98% •
1	Z	448	6% 98% •
1	a	448	3% 98% •
1	b	448	3% 99% •
1	c	448	3% 99% •

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 85163 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 Glutamine synthetase from Methanothermococcus thermolithotrophicus.

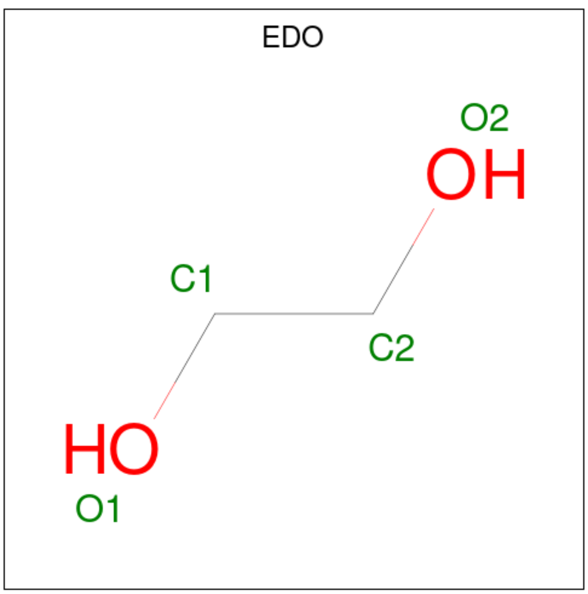
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	446	Total 3528	C 2261	N 586	O 665	S 16	0	0	0
1	B	446	Total 3528	C 2261	N 586	O 665	S 16	0	0	0
1	C	447	Total 3534	C 2264	N 587	O 667	S 16	0	0	0
1	D	447	Total 3534	C 2264	N 587	O 667	S 16	0	0	0
1	E	447	Total 3534	C 2264	N 587	O 667	S 16	0	0	0
1	F	447	Total 3534	C 2264	N 587	O 667	S 16	0	0	0
1	G	447	Total 3534	C 2264	N 587	O 667	S 16	0	0	0
1	H	447	Total 3534	C 2264	N 587	O 667	S 16	0	0	0
1	I	447	Total 3534	C 2264	N 587	O 667	S 16	0	0	0
1	J	447	Total 3534	C 2264	N 587	O 667	S 16	0	0	0
1	K	447	Total 3534	C 2264	N 587	O 667	S 16	0	0	0
1	L	447	Total 3534	C 2264	N 587	O 667	S 16	0	0	0
1	P	447	Total 3534	C 2264	N 587	O 667	S 16	0	0	0
1	Q	446	Total 3528	C 2261	N 586	O 665	S 16	0	0	0
1	S	447	Total 3534	C 2264	N 587	O 667	S 16	0	0	0
1	T	447	Total 3534	C 2264	N 587	O 667	S 16	0	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	U	447	3534	2264	587	667	16	0	0	0
1	V	447	3534	2264	587	667	16	0	0	0
1	X	447	3534	2264	587	667	16	0	0	0
1	Y	447	3534	2264	587	667	16	0	0	0
1	Z	447	3534	2264	587	667	16	0	0	0
1	a	446	3528	2261	586	665	16	0	0	0
1	b	447	3534	2264	587	667	16	0	0	0
1	c	447	3534	2264	587	667	16	0	0	0

- Molecule 2 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
2	A	1	4	2	2	0	0
2	E	1	4	2	2	0	0
2	F	1	4	2	2	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	G	1	Total C O 4 2 2	0	0
2	K	1	Total C O 4 2 2	0	0
2	P	1	Total C O 4 2 2	0	0
2	P	1	Total C O 4 2 2	0	0
2	S	1	Total C O 4 2 2	0	0
2	U	1	Total C O 4 2 2	0	0
2	U	1	Total C O 4 2 2	0	0
2	V	1	Total C O 4 2 2	0	0
2	V	1	Total C O 4 2 2	0	0
2	X	1	Total C O 4 2 2	0	0
2	X	1	Total C O 4 2 2	0	0
2	Y	1	Total C O 4 2 2	0	0
2	Y	1	Total C O 4 2 2	0	0
2	Z	1	Total C O 4 2 2	0	0
2	a	1	Total C O 4 2 2	0	0
2	a	1	Total C O 4 2 2	0	0
2	a	1	Total C O 4 2 2	0	0
2	b	1	Total C O 4 2 2	0	0
2	b	1	Total C O 4 2 2	0	0
2	c	1	Total C O 4 2 2	0	0
2	c	1	Total C O 4 2 2	0	0

Continued on next page...

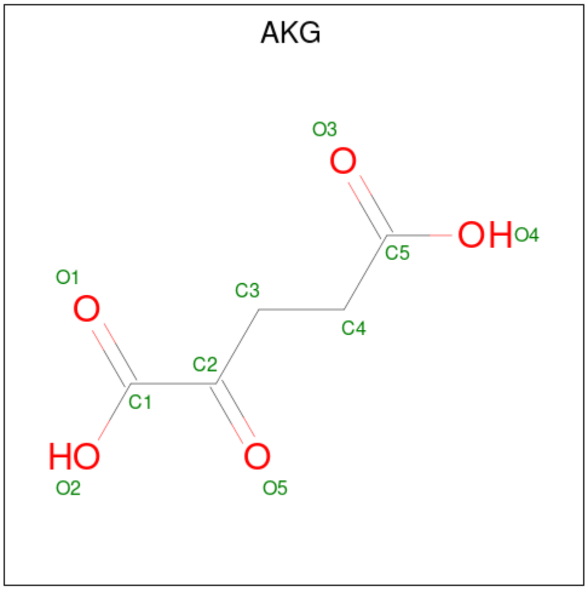
Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	c	1	Total C O 4 2 2	0	0

- Molecule 3 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Mg 1 1	0	0
3	B	2	Total Mg 2 2	0	0
3	F	1	Total Mg 1 1	0	0
3	H	1	Total Mg 1 1	0	0
3	J	1	Total Mg 1 1	0	0
3	K	1	Total Mg 1 1	0	0
3	P	1	Total Mg 1 1	0	0
3	Q	2	Total Mg 2 2	0	0
3	S	1	Total Mg 1 1	0	0
3	T	3	Total Mg 3 3	0	0
3	Y	1	Total Mg 1 1	0	0
3	b	2	Total Mg 2 2	0	0

- Molecule 4 is 2-OXOGLUTARIC ACID (three-letter code: AKG) (formula: $C_5H_6O_5$) (labeled as "Ligand of Interest" by depositor).



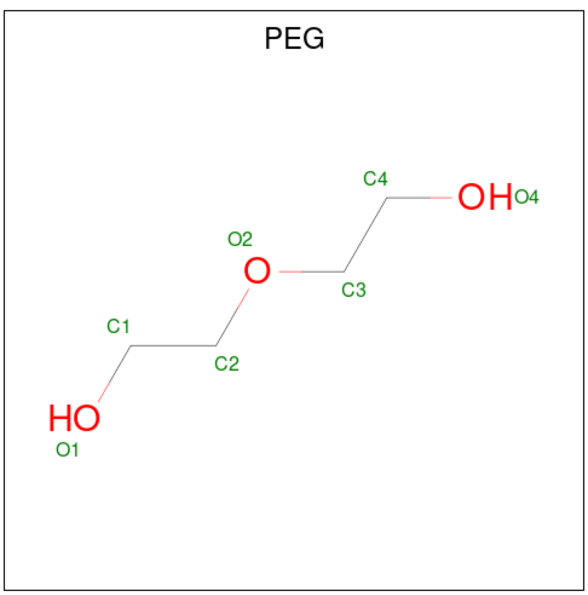
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 10 5 5	0	0
4	B	1	Total C O 10 5 5	0	0
4	C	1	Total C O 10 5 5	0	0
4	D	1	Total C O 10 5 5	0	0
4	E	1	Total C O 10 5 5	0	0
4	F	1	Total C O 10 5 5	0	0
4	G	1	Total C O 10 5 5	0	0
4	H	1	Total C O 10 5 5	0	0
4	I	1	Total C O 10 5 5	0	0
4	J	1	Total C O 10 5 5	0	0
4	K	1	Total C O 10 5 5	0	0
4	L	1	Total C O 10 5 5	0	0
4	P	1	Total C O 10 5 5	0	0
4	Q	1	Total C O 10 5 5	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	S	1	Total C O 10 5 5	0	0
4	T	1	Total C O 10 5 5	0	0
4	U	1	Total C O 10 5 5	0	0
4	V	1	Total C O 10 5 5	0	0
4	X	1	Total C O 10 5 5	0	0
4	Y	1	Total C O 10 5 5	0	0
4	Z	1	Total C O 10 5 5	0	0
4	a	1	Total C O 10 5 5	0	0
4	b	1	Total C O 10 5 5	0	0
4	c	1	Total C O 10 5 5	0	0

- Molecule 5 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	P	1	Total C O 7 4 3	0	0

Continued on next page...

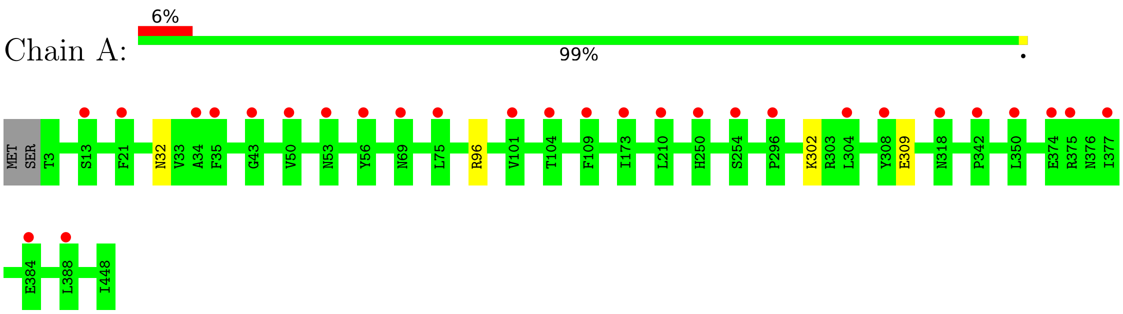
Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	Z	1	Total C O 7 4 3	0	0

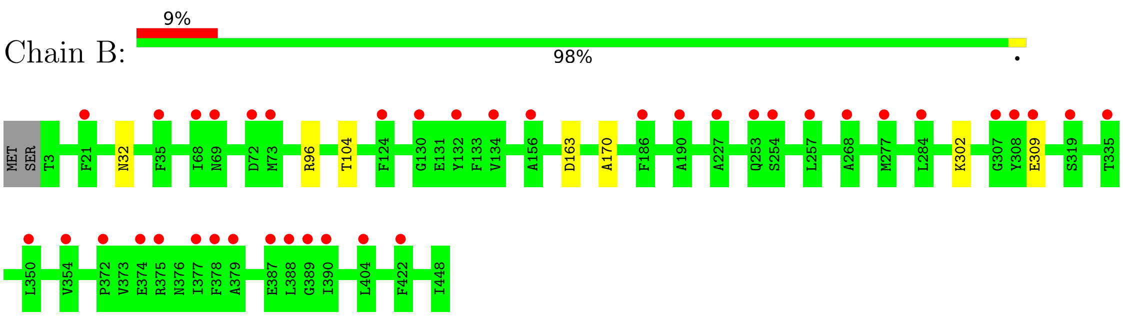
3 Residue-property plots

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.

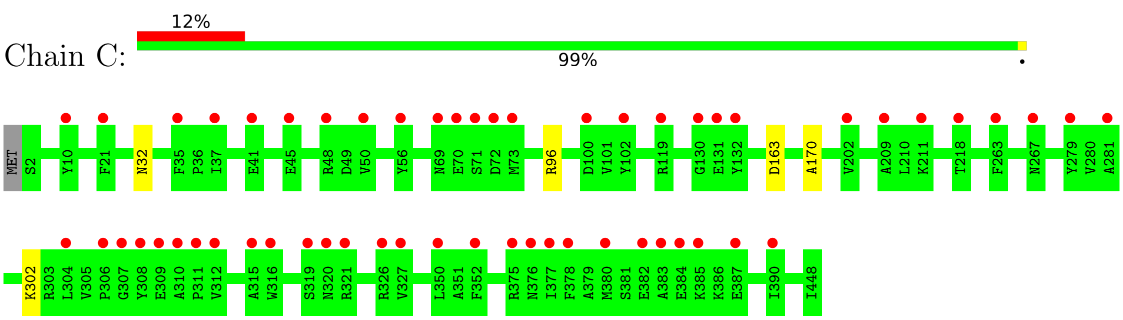
- Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus



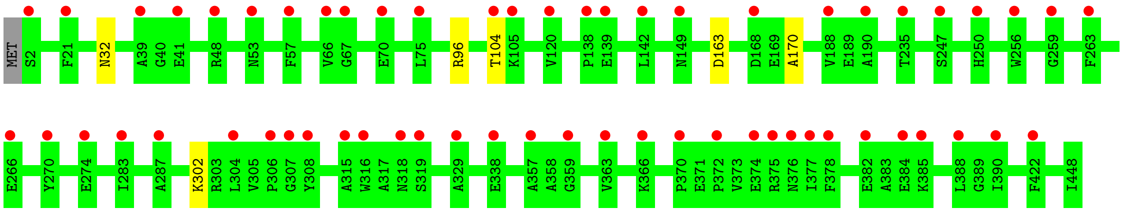
- Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus



- Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

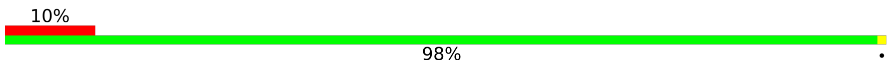


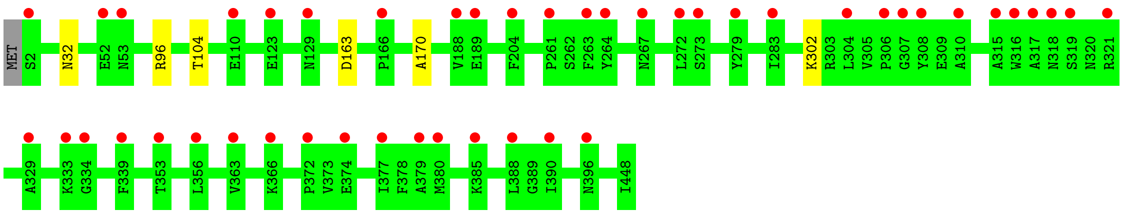
- Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus



• Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

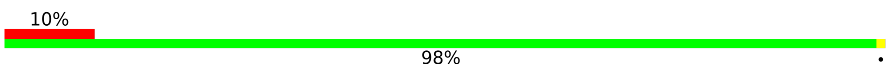
Chain E:

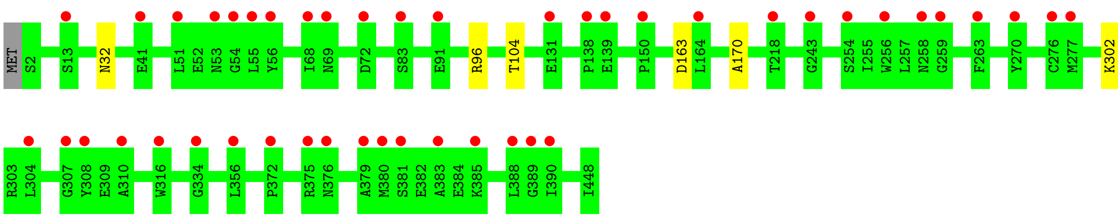




• Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

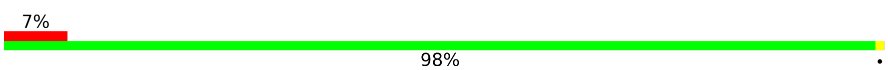
Chain F:

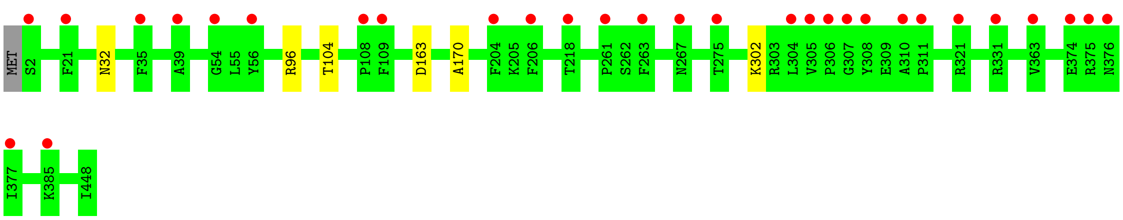




• Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

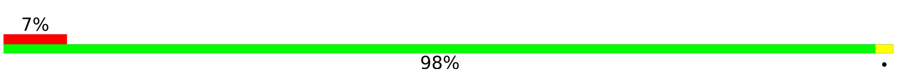
Chain G:

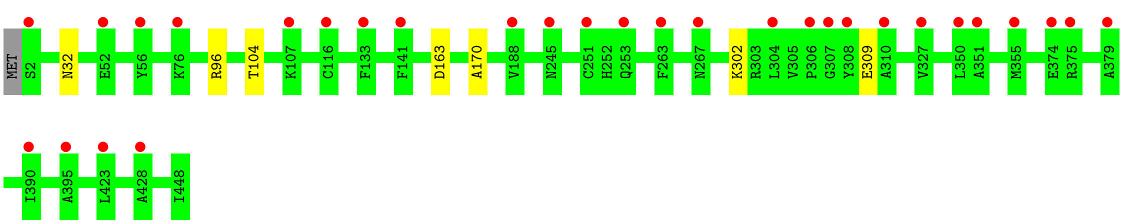




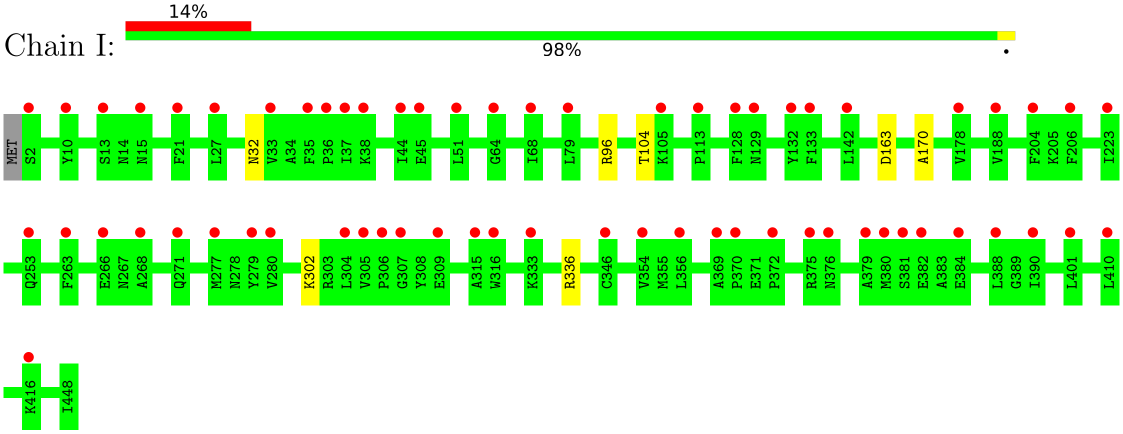
• Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

Chain H:

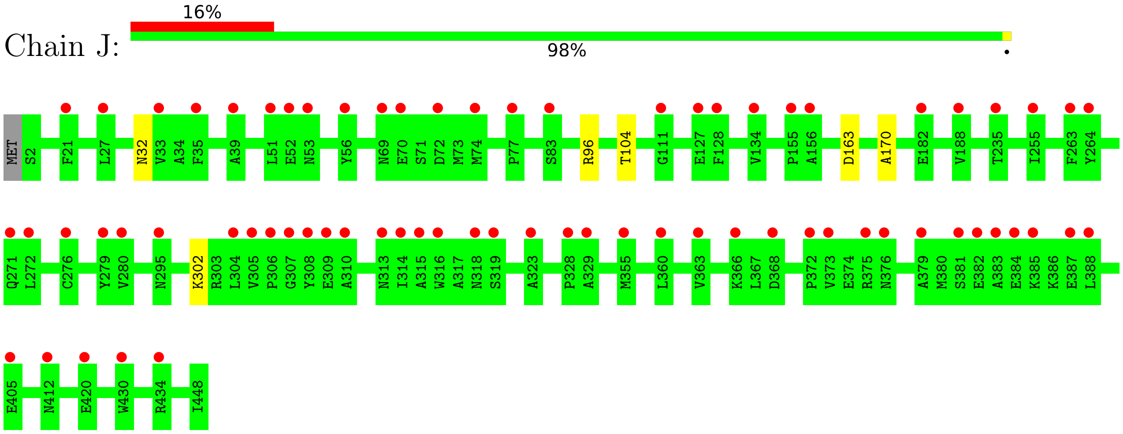




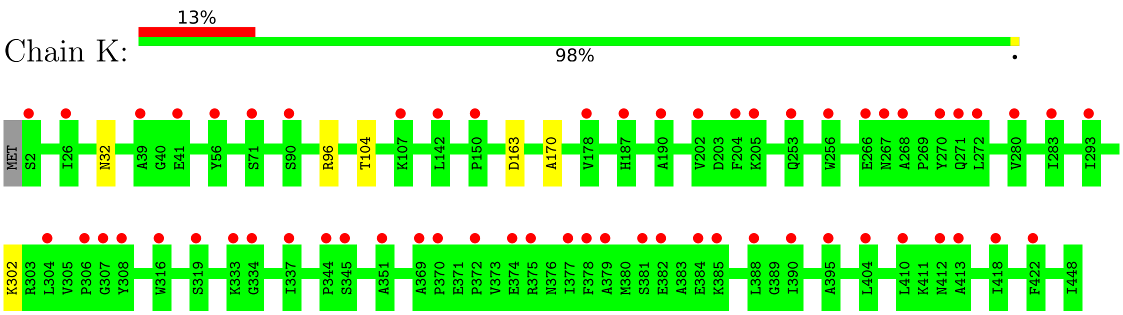
• Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus



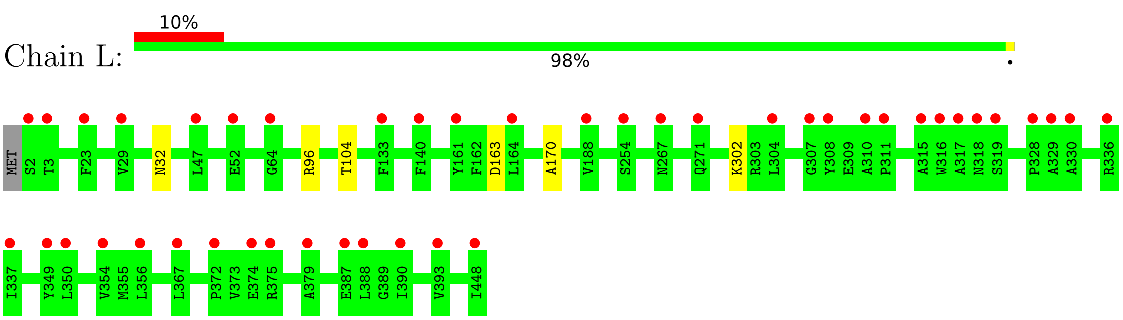
• Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus



• Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

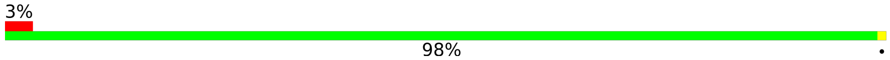


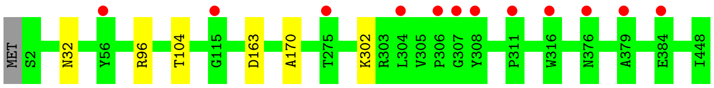
• Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus



- Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

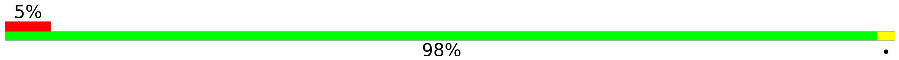
Chain P:

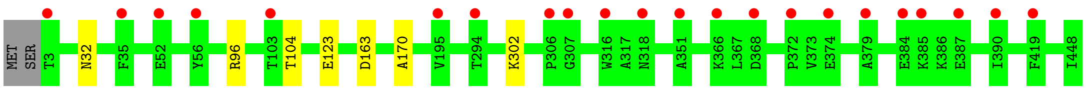




- Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

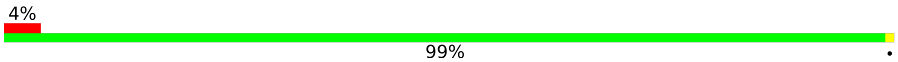
Chain Q:

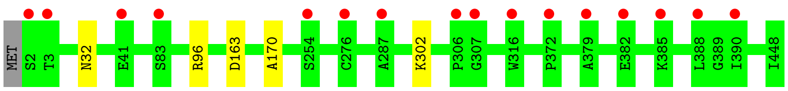




- Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

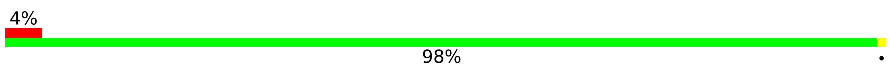
Chain S:

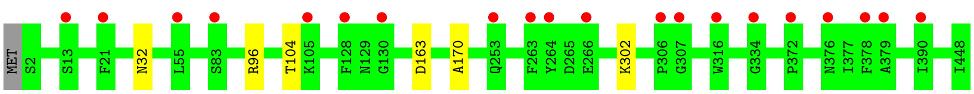




- Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

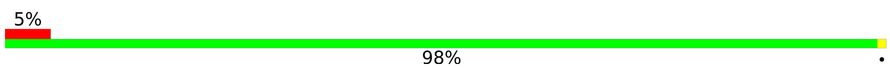
Chain T:

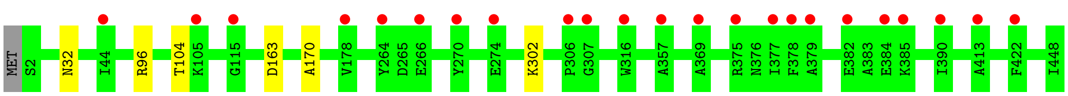




- Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

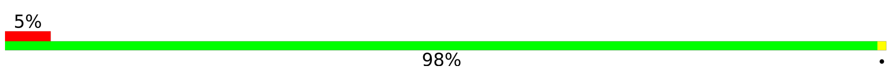
Chain U:

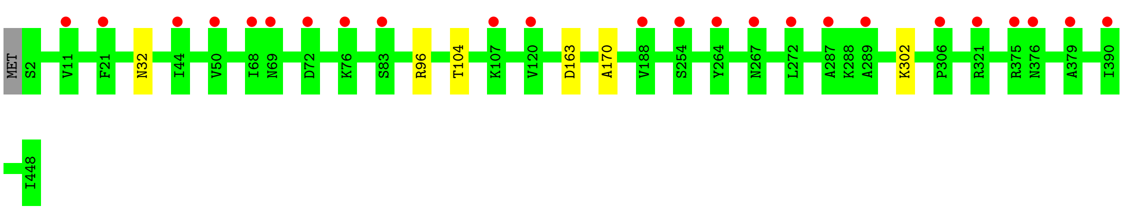




- Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

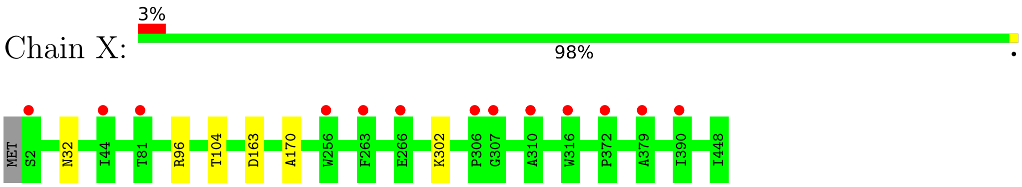
Chain V:





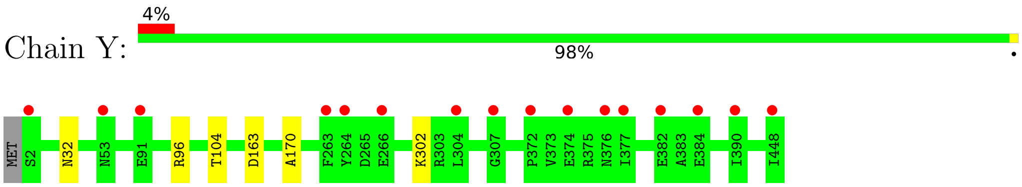
- Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

Chain X:



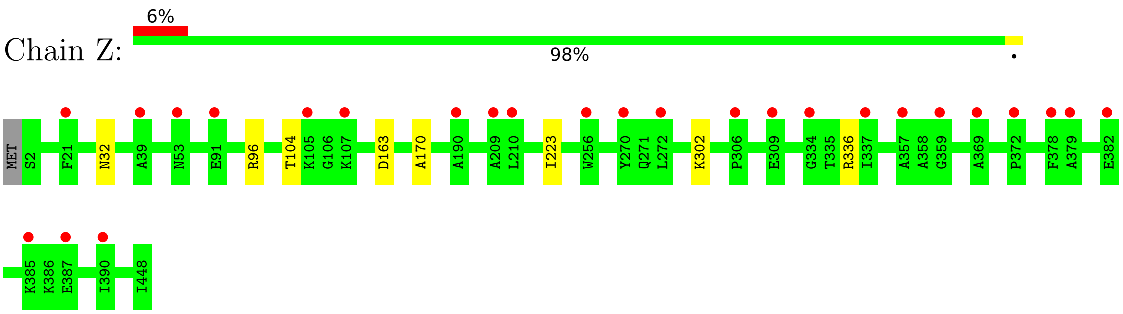
• Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

Chain Y:



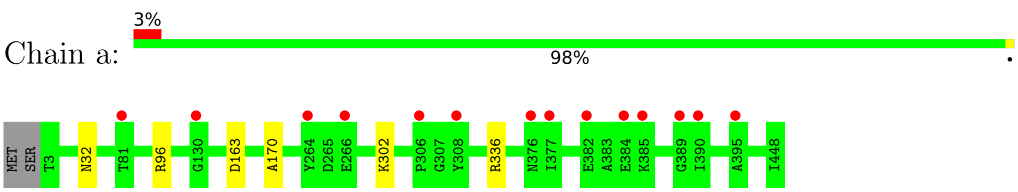
• Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

Chain Z:



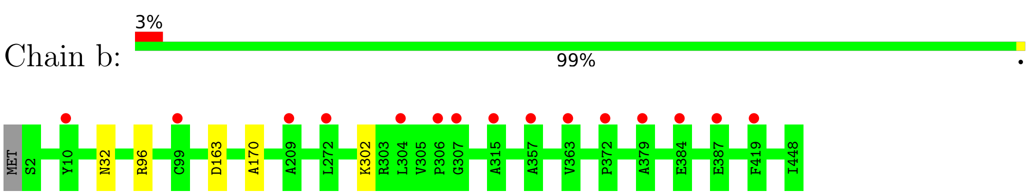
• Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

Chain a:



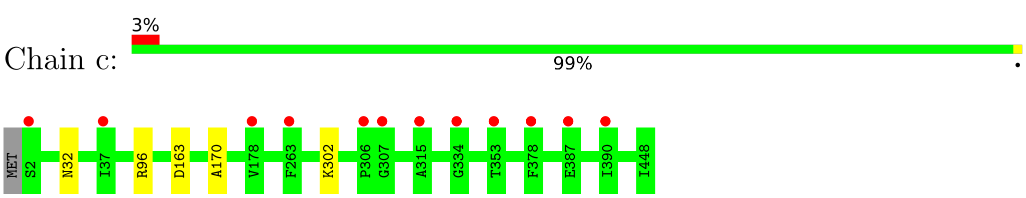
• Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

Chain b:



• Molecule 1: Glutamine synthetase from Methanothermococcus thermolithotrophicus

Chain c:



4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	131.81Å 131.93Å 203.54Å 89.95° 89.86° 60.05°	Depositor
Resolution (Å)	43.74 – 2.91 203.54 – 2.91	Depositor EDS
% Data completeness (in resolution range)	64.8 (43.74-2.91) 64.7 (203.54-2.91)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.67 (at 2.91Å)	Xtriage
Refinement program	PHENIX (1.20.1_4487: ???)	Depositor
R, R_{free}	0.254 , 0.278 0.255 , 0.277	Depositor DCC
R_{free} test set	8329 reflections (4.92%)	wwPDB-VP
Wilson B-factor (Å^2)	51.2	Xtriage
Anisotropy	0.128	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 9.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.39$, $< L^2 > = 0.22$	Xtriage
Estimated twinning fraction	0.247 for k,-h+k,l 0.247 for h-k,h,l 0.246 for -h+k,-h,l 0.246 for -k,h-k,l 0.247 for h,h-k,-l 0.247 for -h+k,k,-l 0.407 for -h,-k,l 0.260 for k,h,-l 0.267 for -k,-h,-l 0.248 for -h,-h+k,-l 0.248 for h-k,-k,-l	Xtriage
F_o,F_c correlation	0.86	EDS
Total number of atoms	85163	wwPDB-VP
Average B, all atoms (Å^2)	63.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 19.02% of the height of the origin peak. No significant pseudotranslation is detected.*

[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ 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: PEG, EDO, MG, AKG

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	0.31	0/3619	0.48	0/4902
1	B	0.30	0/3619	0.47	0/4902
1	C	0.31	0/3625	0.47	0/4910
1	D	0.30	0/3625	0.47	0/4910
1	E	0.30	0/3625	0.47	0/4910
1	F	0.30	0/3625	0.47	0/4910
1	G	0.31	0/3625	0.47	0/4910
1	H	0.31	0/3625	0.48	0/4910
1	I	0.31	0/3625	0.48	0/4910
1	J	0.30	0/3625	0.47	0/4910
1	K	0.31	0/3625	0.48	0/4910
1	L	0.30	0/3625	0.47	0/4910
1	P	0.31	0/3625	0.48	0/4910
1	Q	0.31	0/3619	0.48	1/4902 (0.0%)
1	S	0.31	0/3625	0.47	0/4910
1	T	0.30	0/3625	0.47	0/4910
1	U	0.30	0/3625	0.48	0/4910
1	V	0.31	0/3625	0.47	0/4910
1	X	0.30	0/3625	0.47	0/4910
1	Y	0.31	0/3625	0.48	0/4910
1	Z	0.31	0/3625	0.47	0/4910
1	a	0.32	0/3619	0.48	0/4902
1	b	0.30	0/3625	0.48	0/4910
1	c	0.30	0/3625	0.47	0/4910
All	All	0.31	0/86976	0.48	1/117808 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	Q	123	GLU	CA-CB-CG	5.33	125.13	113.40

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

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	444/448 (99%)	419 (94%)	24 (5%)	1 (0%)	47	77
1	B	444/448 (99%)	429 (97%)	13 (3%)	2 (0%)	29	60
1	C	445/448 (99%)	429 (96%)	15 (3%)	1 (0%)	47	77
1	D	445/448 (99%)	430 (97%)	14 (3%)	1 (0%)	47	77
1	E	445/448 (99%)	430 (97%)	14 (3%)	1 (0%)	47	77
1	F	445/448 (99%)	427 (96%)	17 (4%)	1 (0%)	47	77
1	G	445/448 (99%)	430 (97%)	14 (3%)	1 (0%)	47	77
1	H	445/448 (99%)	429 (96%)	14 (3%)	2 (0%)	34	65
1	I	445/448 (99%)	428 (96%)	16 (4%)	1 (0%)	47	77
1	J	445/448 (99%)	428 (96%)	16 (4%)	1 (0%)	47	77
1	K	445/448 (99%)	427 (96%)	17 (4%)	1 (0%)	47	77
1	L	445/448 (99%)	427 (96%)	17 (4%)	1 (0%)	47	77
1	P	445/448 (99%)	428 (96%)	16 (4%)	1 (0%)	47	77

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	Q	444/448 (99%)	428 (96%)	15 (3%)	1 (0%)	47	77
1	S	445/448 (99%)	429 (96%)	15 (3%)	1 (0%)	47	77
1	T	445/448 (99%)	430 (97%)	14 (3%)	1 (0%)	47	77
1	U	445/448 (99%)	429 (96%)	15 (3%)	1 (0%)	47	77
1	V	445/448 (99%)	429 (96%)	15 (3%)	1 (0%)	47	77
1	X	445/448 (99%)	430 (97%)	14 (3%)	1 (0%)	47	77
1	Y	445/448 (99%)	429 (96%)	15 (3%)	1 (0%)	47	77
1	Z	445/448 (99%)	429 (96%)	15 (3%)	1 (0%)	47	77
1	a	444/448 (99%)	425 (96%)	18 (4%)	1 (0%)	47	77
1	b	445/448 (99%)	429 (96%)	15 (3%)	1 (0%)	47	77
1	c	445/448 (99%)	429 (96%)	15 (3%)	1 (0%)	47	77
All	All	10676/10752 (99%)	10277 (96%)	373 (4%)	26 (0%)	47	77

All (26) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	309	GLU
1	B	309	GLU
1	H	309	GLU
1	B	170	ALA
1	C	170	ALA
1	D	170	ALA
1	E	170	ALA
1	F	170	ALA
1	G	170	ALA
1	H	170	ALA
1	I	170	ALA
1	J	170	ALA
1	K	170	ALA
1	L	170	ALA
1	P	170	ALA
1	Q	170	ALA
1	S	170	ALA
1	T	170	ALA
1	U	170	ALA
1	V	170	ALA
1	X	170	ALA
1	Y	170	ALA

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	Z	170	ALA
1	a	170	ALA
1	b	170	ALA
1	c	170	ALA

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	381/383 (100%)	378 (99%)	3 (1%)	81	93
1	B	381/383 (100%)	376 (99%)	5 (1%)	69	89
1	C	382/383 (100%)	378 (99%)	4 (1%)	76	91
1	D	382/383 (100%)	377 (99%)	5 (1%)	69	89
1	E	382/383 (100%)	377 (99%)	5 (1%)	69	89
1	F	382/383 (100%)	377 (99%)	5 (1%)	69	89
1	G	382/383 (100%)	377 (99%)	5 (1%)	69	89
1	H	382/383 (100%)	377 (99%)	5 (1%)	69	89
1	I	382/383 (100%)	376 (98%)	6 (2%)	62	85
1	J	382/383 (100%)	377 (99%)	5 (1%)	69	89
1	K	382/383 (100%)	377 (99%)	5 (1%)	69	89
1	L	382/383 (100%)	377 (99%)	5 (1%)	69	89
1	P	382/383 (100%)	377 (99%)	5 (1%)	69	89
1	Q	381/383 (100%)	376 (99%)	5 (1%)	69	89
1	S	382/383 (100%)	378 (99%)	4 (1%)	76	91
1	T	382/383 (100%)	377 (99%)	5 (1%)	69	89
1	U	382/383 (100%)	377 (99%)	5 (1%)	69	89
1	V	382/383 (100%)	377 (99%)	5 (1%)	69	89
1	X	382/383 (100%)	377 (99%)	5 (1%)	69	89
1	Y	382/383 (100%)	377 (99%)	5 (1%)	69	89

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	Z	382/383 (100%)	375 (98%)	7 (2%)	59	83
1	a	381/383 (100%)	376 (99%)	5 (1%)	69	89
1	b	382/383 (100%)	378 (99%)	4 (1%)	76	91
1	c	382/383 (100%)	378 (99%)	4 (1%)	76	91
All	All	9164/9192 (100%)	9047 (99%)	117 (1%)	69	89

All (117) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	32	ASN
1	A	96	ARG
1	A	302	LYS
1	B	32	ASN
1	B	96	ARG
1	B	104	THR
1	B	163	ASP
1	B	302	LYS
1	C	32	ASN
1	C	96	ARG
1	C	163	ASP
1	C	302	LYS
1	D	32	ASN
1	D	96	ARG
1	D	104	THR
1	D	163	ASP
1	D	302	LYS
1	E	32	ASN
1	E	96	ARG
1	E	104	THR
1	E	163	ASP
1	E	302	LYS
1	F	32	ASN
1	F	96	ARG
1	F	104	THR
1	F	163	ASP
1	F	302	LYS
1	G	32	ASN
1	G	96	ARG
1	G	104	THR
1	G	163	ASP
1	G	302	LYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	H	32	ASN
1	H	96	ARG
1	H	104	THR
1	H	163	ASP
1	H	302	LYS
1	I	32	ASN
1	I	96	ARG
1	I	104	THR
1	I	163	ASP
1	I	302	LYS
1	I	336	ARG
1	J	32	ASN
1	J	96	ARG
1	J	104	THR
1	J	163	ASP
1	J	302	LYS
1	K	32	ASN
1	K	96	ARG
1	K	104	THR
1	K	163	ASP
1	K	302	LYS
1	L	32	ASN
1	L	96	ARG
1	L	104	THR
1	L	163	ASP
1	L	302	LYS
1	P	32	ASN
1	P	96	ARG
1	P	104	THR
1	P	163	ASP
1	P	302	LYS
1	Q	32	ASN
1	Q	96	ARG
1	Q	104	THR
1	Q	163	ASP
1	Q	302	LYS
1	S	32	ASN
1	S	96	ARG
1	S	163	ASP
1	S	302	LYS
1	T	32	ASN
1	T	96	ARG

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	T	104	THR
1	T	163	ASP
1	T	302	LYS
1	U	32	ASN
1	U	96	ARG
1	U	104	THR
1	U	163	ASP
1	U	302	LYS
1	V	32	ASN
1	V	96	ARG
1	V	104	THR
1	V	163	ASP
1	V	302	LYS
1	X	32	ASN
1	X	96	ARG
1	X	104	THR
1	X	163	ASP
1	X	302	LYS
1	Y	32	ASN
1	Y	96	ARG
1	Y	104	THR
1	Y	163	ASP
1	Y	302	LYS
1	Z	32	ASN
1	Z	96	ARG
1	Z	104	THR
1	Z	163	ASP
1	Z	223	ILE
1	Z	302	LYS
1	Z	336	ARG
1	a	32	ASN
1	a	96	ARG
1	a	163	ASP
1	a	302	LYS
1	a	336	ARG
1	b	32	ASN
1	b	96	ARG
1	b	163	ASP
1	b	302	LYS
1	c	32	ASN
1	c	96	ARG
1	c	163	ASP

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	c	302	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 68 ligands modelled in this entry, 17 are monoatomic - leaving 51 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	$\#\|Z\| > 2$
2	EDO	a	502	-	3,3,3	0.16	0	2,2,2	0.20	0
2	EDO	K	501	-	3,3,3	0.15	0	2,2,2	0.20	0
4	AKG	Y	604	-	9,9,9	2.03	1 (11%)	11,11,11	1.33	1 (9%)
2	EDO	Z	501	-	3,3,3	0.17	0	2,2,2	0.20	0
2	EDO	a	501	-	3,3,3	0.17	0	2,2,2	0.20	0
4	AKG	V	503	-	9,9,9	2.02	1 (11%)	11,11,11	1.30	2 (18%)
2	EDO	G	501	-	3,3,3	0.16	0	2,2,2	0.21	0
4	AKG	b	505	-	9,9,9	2.04	1 (11%)	11,11,11	1.01	0
4	AKG	Z	503	-	9,9,9	2.00	1 (11%)	11,11,11	1.07	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
4	AKG	K	503	-	9,9,9	2.04	1 (11%)	11,11,11	1.27	1 (9%)
2	EDO	c	501	-	3,3,3	0.15	0	2,2,2	0.21	0
4	AKG	F	503	-	9,9,9	1.99	1 (11%)	11,11,11	1.06	0
2	EDO	U	502	-	3,3,3	0.15	0	2,2,2	0.21	0
4	AKG	D	501	-	9,9,9	2.00	1 (11%)	11,11,11	1.07	0
2	EDO	E	501	-	3,3,3	0.16	0	2,2,2	0.20	0
2	EDO	P	501	-	3,3,3	0.16	0	2,2,2	0.20	0
2	EDO	U	501	-	3,3,3	0.16	0	2,2,2	0.21	0
4	AKG	a	504	-	9,9,9	2.03	1 (11%)	11,11,11	1.04	0
5	PEG	P	502	-	6,6,6	0.12	0	5,5,5	0.07	0
4	AKG	Q	503	-	9,9,9	1.98	1 (11%)	11,11,11	1.33	2 (18%)
4	AKG	X	603	-	9,9,9	2.02	1 (11%)	11,11,11	1.27	1 (9%)
4	AKG	C	501	-	9,9,9	1.99	1 (11%)	11,11,11	1.27	1 (9%)
2	EDO	c	502	-	3,3,3	0.16	0	2,2,2	0.19	0
4	AKG	E	502	-	9,9,9	2.00	1 (11%)	11,11,11	1.09	0
2	EDO	X	602	-	3,3,3	0.16	0	2,2,2	0.20	0
2	EDO	Y	602	-	3,3,3	0.16	0	2,2,2	0.20	0
4	AKG	U	503	-	9,9,9	1.99	1 (11%)	11,11,11	1.30	1 (9%)
2	EDO	Y	601	-	3,3,3	0.15	0	2,2,2	0.20	0
2	EDO	V	501	-	3,3,3	0.16	0	2,2,2	0.21	0
2	EDO	P	503	-	3,3,3	0.16	0	2,2,2	0.18	0
4	AKG	B	503	-	9,9,9	2.02	1 (11%)	11,11,11	1.05	0
4	AKG	L	501	-	9,9,9	2.01	1 (11%)	11,11,11	1.04	0
2	EDO	X	601	-	3,3,3	0.17	0	2,2,2	0.20	0
4	AKG	G	502	-	9,9,9	2.00	1 (11%)	11,11,11	1.10	1 (9%)
4	AKG	c	504	-	9,9,9	1.98	1 (11%)	11,11,11	1.36	2 (18%)
4	AKG	I	501	-	9,9,9	1.99	1 (11%)	11,11,11	1.31	1 (9%)
4	AKG	P	505	-	9,9,9	2.02	1 (11%)	11,11,11	1.15	2 (18%)
2	EDO	b	501	-	3,3,3	0.16	0	2,2,2	0.20	0
5	PEG	Z	502	-	6,6,6	0.11	0	5,5,5	0.09	0
4	AKG	S	603	-	9,9,9	1.94	1 (11%)	11,11,11	1.11	0
2	EDO	b	502	-	3,3,3	0.17	0	2,2,2	0.20	0
4	AKG	A	503	-	9,9,9	2.03	1 (11%)	11,11,11	1.23	1 (9%)
2	EDO	F	501	-	3,3,3	0.17	0	2,2,2	0.20	0
2	EDO	S	601	-	3,3,3	0.16	0	2,2,2	0.20	0
2	EDO	a	503	-	3,3,3	0.15	0	2,2,2	0.20	0
2	EDO	V	502	-	3,3,3	0.16	0	2,2,2	0.20	0
2	EDO	A	501	-	3,3,3	0.17	0	2,2,2	0.19	0
4	AKG	T	504	-	9,9,9	1.98	1 (11%)	11,11,11	1.28	1 (9%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
4	AKG	H	502	-	9,9,9	2.00	1 (11%)	11,11,11	1.35	2 (18%)
2	EDO	c	503	-	3,3,3	0.16	0	2,2,2	0.19	0
4	AKG	J	502	-	9,9,9	2.04	1 (11%)	11,11,11	1.27	1 (9%)

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	EDO	a	502	-	-	1/1/1/1	-
2	EDO	K	501	-	-	0/1/1/1	-
4	AKG	Y	604	-	-	1/9/9/9	-
2	EDO	Z	501	-	-	1/1/1/1	-
2	EDO	a	501	-	-	0/1/1/1	-
4	AKG	V	503	-	-	2/9/9/9	-
2	EDO	G	501	-	-	1/1/1/1	-
4	AKG	b	505	-	-	4/9/9/9	-
4	AKG	Z	503	-	-	4/9/9/9	-
4	AKG	K	503	-	-	2/9/9/9	-
2	EDO	c	501	-	-	1/1/1/1	-
4	AKG	F	503	-	-	4/9/9/9	-
2	EDO	U	502	-	-	1/1/1/1	-
4	AKG	D	501	-	-	4/9/9/9	-
2	EDO	E	501	-	-	1/1/1/1	-
2	EDO	P	501	-	-	1/1/1/1	-
2	EDO	U	501	-	-	1/1/1/1	-
4	AKG	a	504	-	-	1/9/9/9	-
5	PEG	P	502	-	-	2/4/4/4	-
4	AKG	Q	503	-	-	3/9/9/9	-
4	AKG	X	603	-	-	3/9/9/9	-
4	AKG	C	501	-	-	1/9/9/9	-
2	EDO	c	502	-	-	1/1/1/1	-
4	AKG	E	502	-	-	4/9/9/9	-
2	EDO	X	602	-	-	1/1/1/1	-
2	EDO	Y	602	-	-	0/1/1/1	-
4	AKG	U	503	-	-	3/9/9/9	-
2	EDO	Y	601	-	-	1/1/1/1	-
2	EDO	V	501	-	-	0/1/1/1	-
2	EDO	P	503	-	-	1/1/1/1	-

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	AKG	B	503	-	-	2/9/9/9	-
4	AKG	L	501	-	-	3/9/9/9	-
2	EDO	X	601	-	-	0/1/1/1	-
4	AKG	G	502	-	-	4/9/9/9	-
4	AKG	c	504	-	-	5/9/9/9	-
4	AKG	I	501	-	-	3/9/9/9	-
4	AKG	P	505	-	-	4/9/9/9	-
2	EDO	b	501	-	-	1/1/1/1	-
5	PEG	Z	502	-	-	1/4/4/4	-
4	AKG	S	603	-	-	4/9/9/9	-
2	EDO	b	502	-	-	1/1/1/1	-
4	AKG	A	503	-	-	3/9/9/9	-
2	EDO	F	501	-	-	0/1/1/1	-
2	EDO	S	601	-	-	1/1/1/1	-
2	EDO	a	503	-	-	1/1/1/1	-
2	EDO	V	502	-	-	1/1/1/1	-
2	EDO	A	501	-	-	1/1/1/1	-
4	AKG	T	504	-	-	3/9/9/9	-
4	AKG	H	502	-	-	4/9/9/9	-
2	EDO	c	503	-	-	1/1/1/1	-
4	AKG	J	502	-	-	3/9/9/9	-

All (24) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	J	502	AKG	C2-C1	-5.39	1.46	1.53
4	b	505	AKG	C2-C1	-5.35	1.46	1.53
4	Y	604	AKG	C2-C1	-5.35	1.46	1.53
4	K	503	AKG	C2-C1	-5.34	1.46	1.53
4	V	503	AKG	C2-C1	-5.32	1.46	1.53
4	a	504	AKG	C2-C1	-5.31	1.46	1.53
4	A	503	AKG	C2-C1	-5.30	1.46	1.53
4	H	502	AKG	C2-C1	-5.29	1.46	1.53
4	B	503	AKG	C2-C1	-5.28	1.46	1.53
4	X	603	AKG	C2-C1	-5.27	1.46	1.53
4	P	505	AKG	C2-C1	-5.26	1.46	1.53
4	E	502	AKG	C2-C1	-5.22	1.46	1.53
4	L	501	AKG	C2-C1	-5.22	1.46	1.53
4	G	502	AKG	C2-C1	-5.22	1.46	1.53
4	U	503	AKG	C2-C1	-5.19	1.46	1.53

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	Z	503	AKG	C2-C1	-5.19	1.46	1.53
4	D	501	AKG	C2-C1	-5.19	1.46	1.53
4	c	504	AKG	C2-C1	-5.18	1.46	1.53
4	Q	503	AKG	C2-C1	-5.18	1.46	1.53
4	I	501	AKG	C2-C1	-5.17	1.46	1.53
4	F	503	AKG	C2-C1	-5.16	1.46	1.53
4	T	504	AKG	C2-C1	-5.16	1.46	1.53
4	C	501	AKG	C2-C1	-5.15	1.46	1.53
4	S	603	AKG	C2-C1	-4.99	1.46	1.53

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	P	505	AKG	O1-C1-C2	-2.30	118.65	121.72
4	Y	604	AKG	O4-C5-C4	2.24	121.22	114.03
4	T	504	AKG	O4-C5-C4	2.22	121.18	114.03
4	H	502	AKG	O4-C5-C4	2.21	121.13	114.03
4	c	504	AKG	O4-C5-C4	2.20	121.11	114.03
4	A	503	AKG	O4-C5-C4	2.19	121.06	114.03
4	Q	503	AKG	O4-C5-C4	2.18	121.05	114.03
4	V	503	AKG	O4-C5-C4	2.17	121.00	114.03
4	I	501	AKG	O4-C5-C4	2.16	120.98	114.03
4	U	503	AKG	O4-C5-C4	2.14	120.91	114.03
4	J	502	AKG	O4-C5-C4	2.14	120.90	114.03
4	X	603	AKG	O4-C5-C4	2.13	120.89	114.03
4	C	501	AKG	O4-C5-C4	2.13	120.86	114.03
4	c	504	AKG	O1-C1-C2	-2.10	118.92	121.72
4	V	503	AKG	O1-C1-C2	-2.09	118.93	121.72
4	P	505	AKG	O2-C1-C2	2.08	119.65	113.97
4	G	502	AKG	O1-C1-C2	-2.07	118.95	121.72
4	Q	503	AKG	O1-C1-C2	-2.04	118.99	121.72
4	K	503	AKG	O4-C5-C4	2.03	120.56	114.03
4	H	502	AKG	O1-C1-C2	-2.01	119.03	121.72

There are no chirality outliers.

All (96) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	b	502	EDO	O1-C1-C2-O2
4	A	503	AKG	O2-C1-C2-C3
4	C	501	AKG	O2-C1-C2-C3
4	D	501	AKG	O2-C1-C2-C3

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
4	E	502	AKG	O2-C1-C2-C3
4	F	503	AKG	O2-C1-C2-C3
4	H	502	AKG	O2-C1-C2-C3
4	I	501	AKG	O2-C1-C2-C3
4	J	502	AKG	O2-C1-C2-C3
4	K	503	AKG	O2-C1-C2-C3
4	L	501	AKG	O2-C1-C2-C3
4	P	505	AKG	O2-C1-C2-C3
4	Q	503	AKG	O2-C1-C2-C3
4	T	504	AKG	O2-C1-C2-C3
4	U	503	AKG	O2-C1-C2-C3
4	V	503	AKG	O2-C1-C2-C3
4	X	603	AKG	O2-C1-C2-C3
4	Y	604	AKG	O2-C1-C2-C3
4	Z	503	AKG	O2-C1-C2-C3
4	b	505	AKG	O2-C1-C2-C3
4	c	504	AKG	O1-C1-C2-C3
4	c	504	AKG	O2-C1-C2-O5
4	c	504	AKG	O2-C1-C2-C3
5	P	502	PEG	O2-C3-C4-O4
2	U	502	EDO	O1-C1-C2-O2
2	a	502	EDO	O1-C1-C2-O2
5	P	502	PEG	O1-C1-C2-O2
2	G	501	EDO	O1-C1-C2-O2
5	Z	502	PEG	C1-C2-O2-C3
4	D	501	AKG	O1-C1-C2-O5
4	F	503	AKG	O1-C1-C2-O5
4	G	502	AKG	O1-C1-C2-O5
4	L	501	AKG	O1-C1-C2-O5
4	S	603	AKG	O1-C1-C2-O5
4	Z	503	AKG	O1-C1-C2-O5
4	b	505	AKG	O1-C1-C2-O5
4	c	504	AKG	O1-C1-C2-O5
4	D	501	AKG	O1-C1-C2-C3
4	E	502	AKG	O1-C1-C2-C3
4	F	503	AKG	O1-C1-C2-C3
4	H	502	AKG	O1-C1-C2-C3
4	L	501	AKG	O1-C1-C2-C3
4	P	505	AKG	O1-C1-C2-C3
4	Z	503	AKG	O1-C1-C2-C3
4	b	505	AKG	O1-C1-C2-C3
2	Z	501	EDO	O1-C1-C2-O2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
4	B	503	AKG	O2-C1-C2-O5
4	D	501	AKG	O2-C1-C2-O5
4	E	502	AKG	O2-C1-C2-O5
4	F	503	AKG	O2-C1-C2-O5
4	G	502	AKG	O2-C1-C2-O5
4	H	502	AKG	O2-C1-C2-O5
4	P	505	AKG	O2-C1-C2-O5
4	S	603	AKG	O2-C1-C2-O5
4	Z	503	AKG	O2-C1-C2-O5
4	a	504	AKG	O2-C1-C2-O5
4	b	505	AKG	O2-C1-C2-O5
4	A	503	AKG	C3-C4-C5-O4
4	X	603	AKG	C3-C4-C5-O4
4	T	504	AKG	C3-C4-C5-O4
4	I	501	AKG	C3-C4-C5-O4
4	X	603	AKG	C3-C4-C5-O3
4	A	503	AKG	C3-C4-C5-O3
2	A	501	EDO	O1-C1-C2-O2
2	E	501	EDO	O1-C1-C2-O2
2	P	501	EDO	O1-C1-C2-O2
2	P	503	EDO	O1-C1-C2-O2
2	S	601	EDO	O1-C1-C2-O2
2	U	501	EDO	O1-C1-C2-O2
2	V	502	EDO	O1-C1-C2-O2
2	X	602	EDO	O1-C1-C2-O2
2	Y	601	EDO	O1-C1-C2-O2
2	a	503	EDO	O1-C1-C2-O2
2	b	501	EDO	O1-C1-C2-O2
2	c	501	EDO	O1-C1-C2-O2
2	c	502	EDO	O1-C1-C2-O2
2	c	503	EDO	O1-C1-C2-O2
4	I	501	AKG	C3-C4-C5-O3
4	B	503	AKG	O2-C1-C2-C3
4	G	502	AKG	O2-C1-C2-C3
4	S	603	AKG	O2-C1-C2-C3
4	T	504	AKG	C3-C4-C5-O3
4	U	503	AKG	C3-C4-C5-O4
4	U	503	AKG	C3-C4-C5-O3
4	J	502	AKG	C3-C4-C5-O4
4	Q	503	AKG	C3-C4-C5-O4
4	J	502	AKG	C3-C4-C5-O3
4	E	502	AKG	O1-C1-C2-O5

Continued on next page...

Continued from previous page...

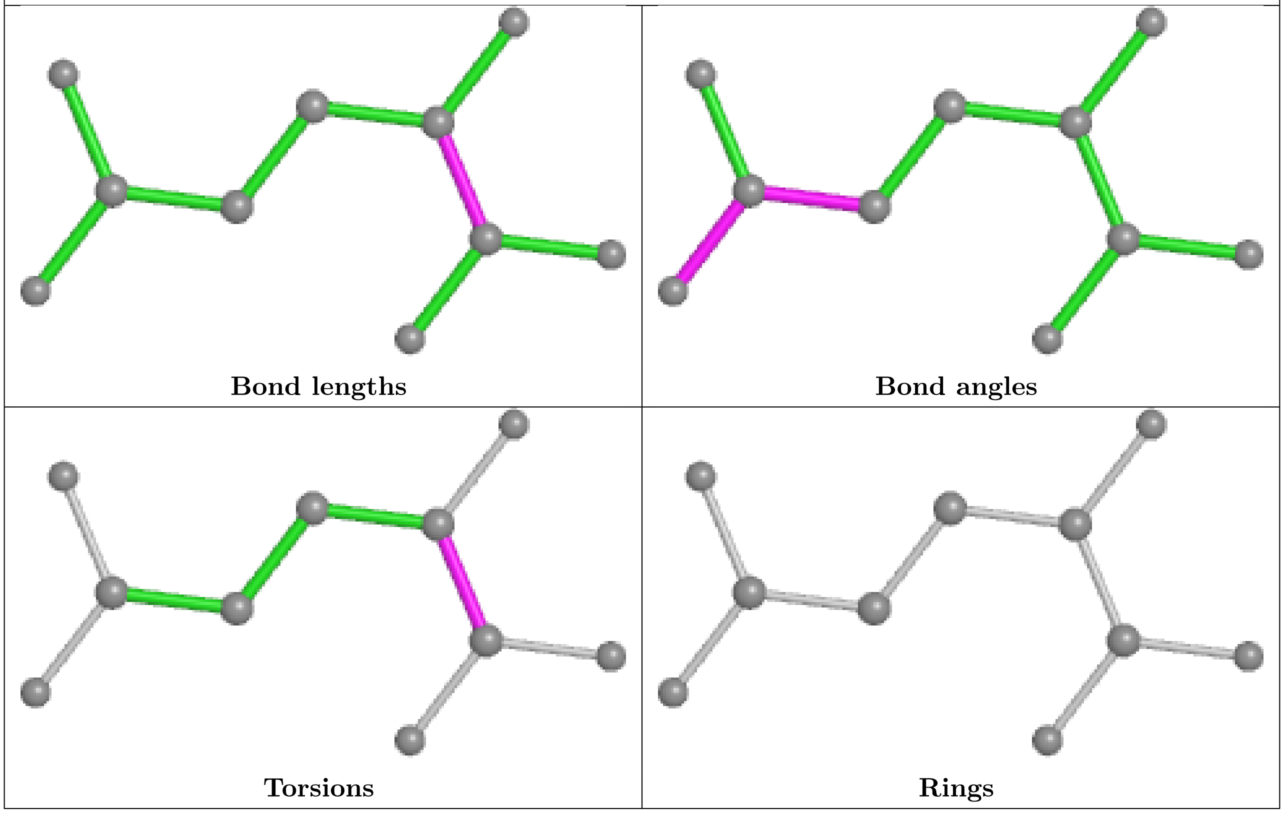
Mol	Chain	Res	Type	Atoms
4	H	502	AKG	O1-C1-C2-O5
4	P	505	AKG	O1-C1-C2-O5
4	Q	503	AKG	C3-C4-C5-O3
4	G	502	AKG	O1-C1-C2-C3
4	K	503	AKG	O1-C1-C2-C3
4	S	603	AKG	O1-C1-C2-C3
4	V	503	AKG	C3-C4-C5-O4
4	c	504	AKG	C3-C4-C5-O4

There are no ring outliers.

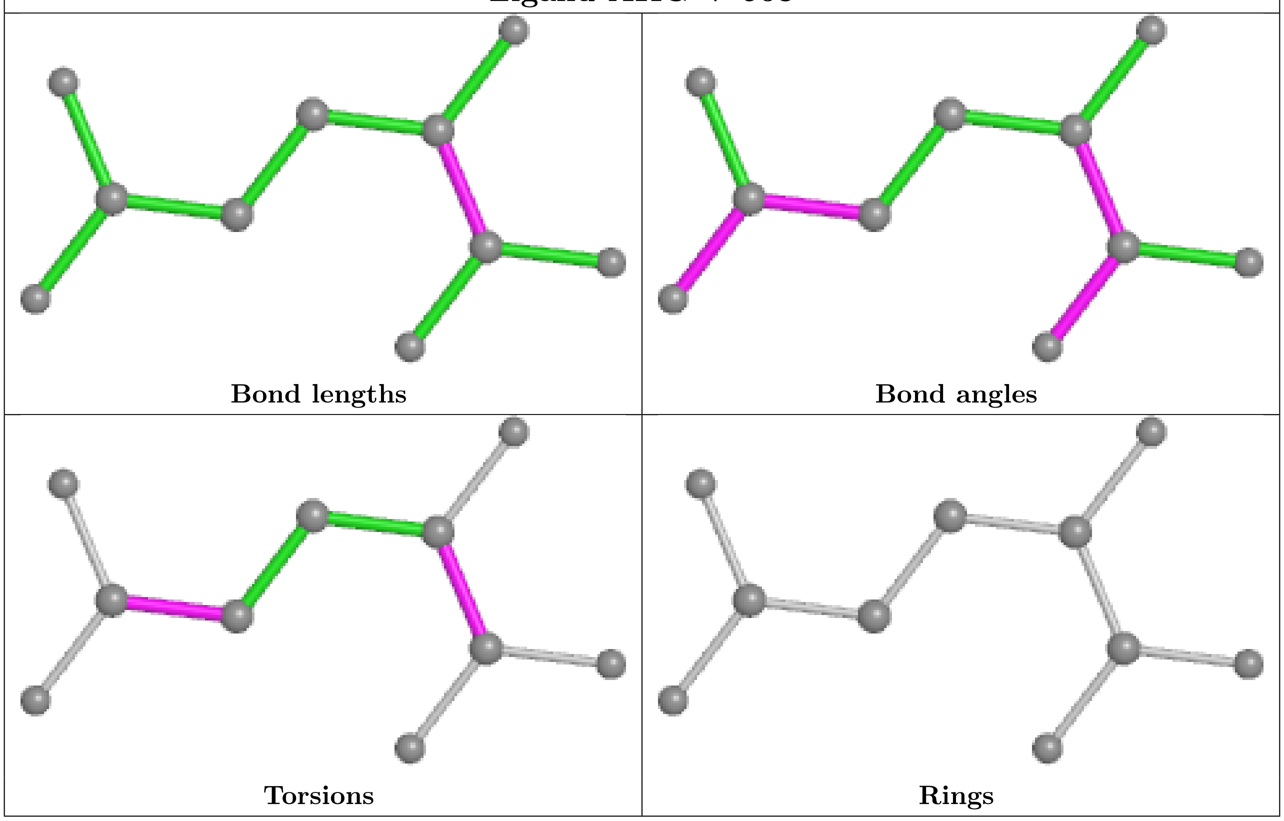
No monomer is involved in short contacts.

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

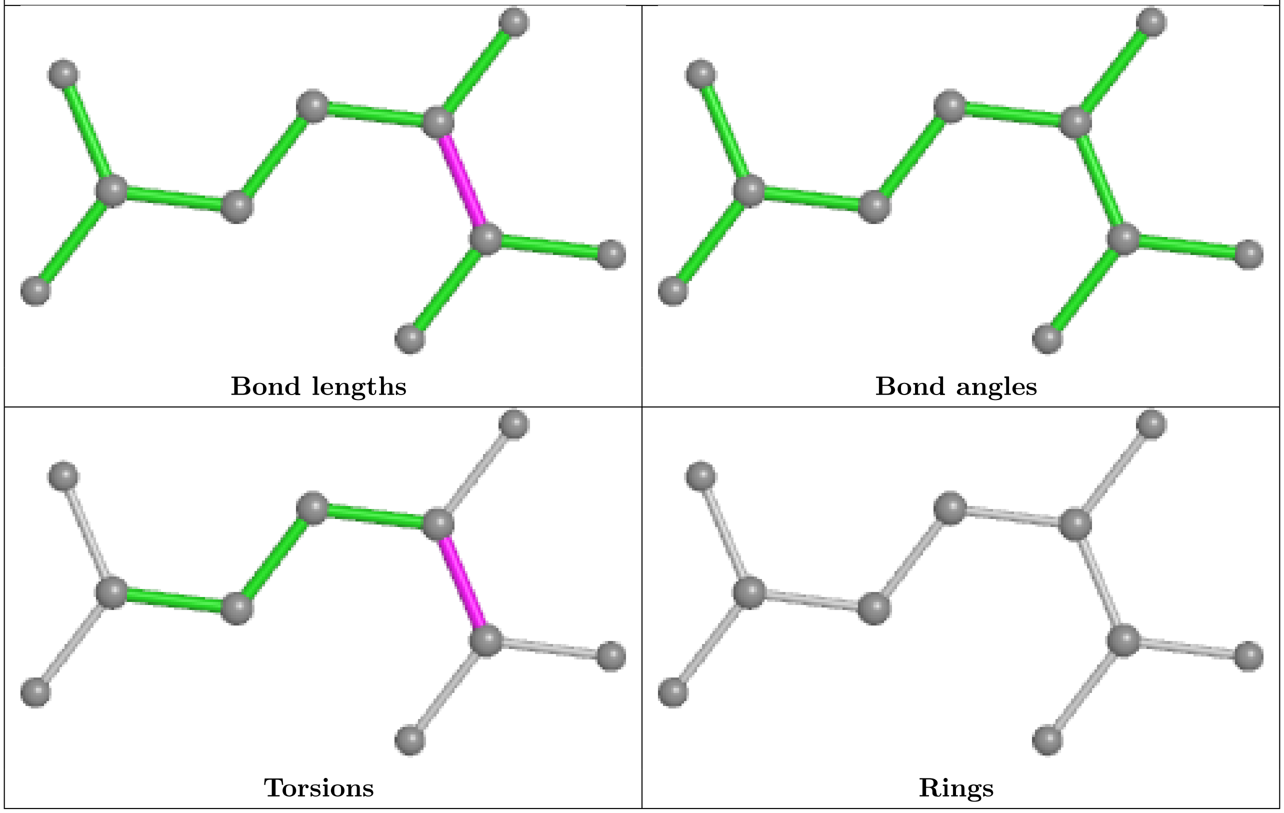
Ligand AKG Y 604



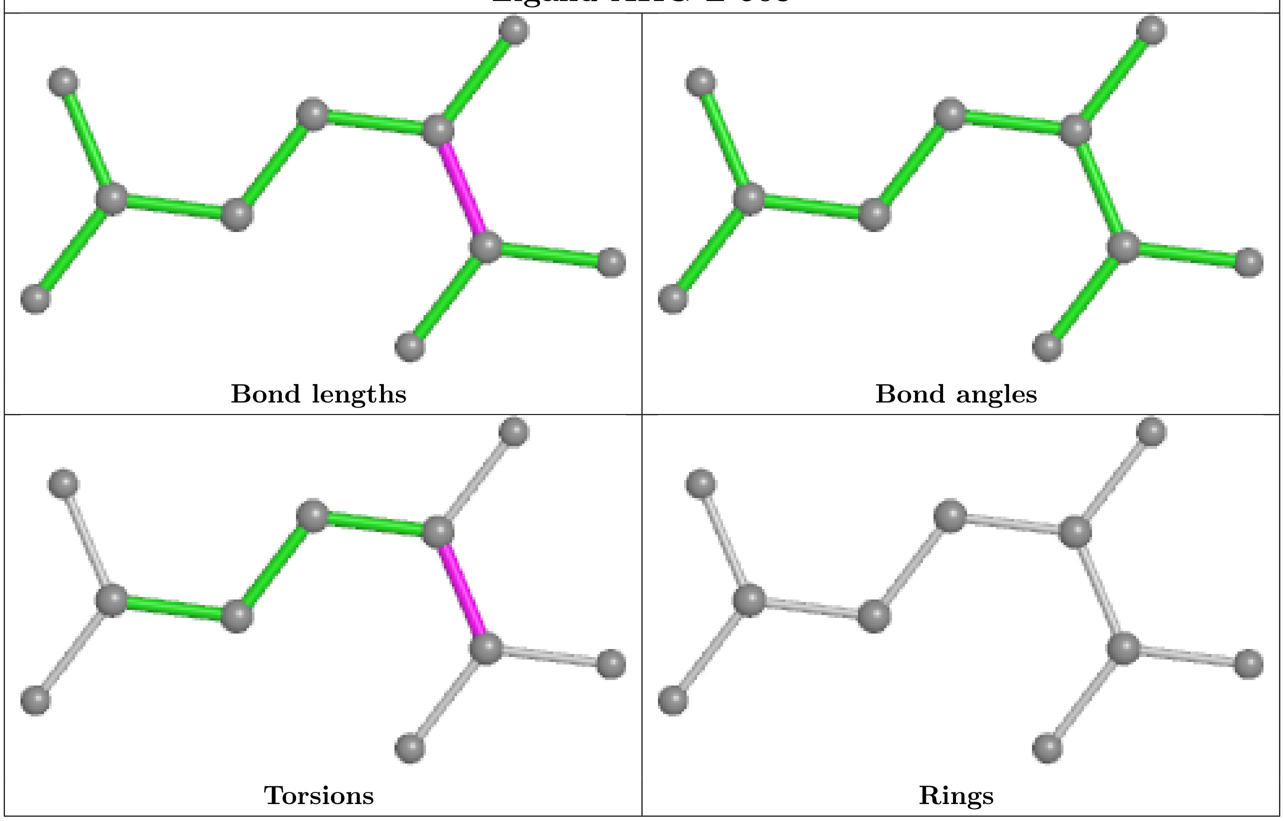
Ligand AKG V 503



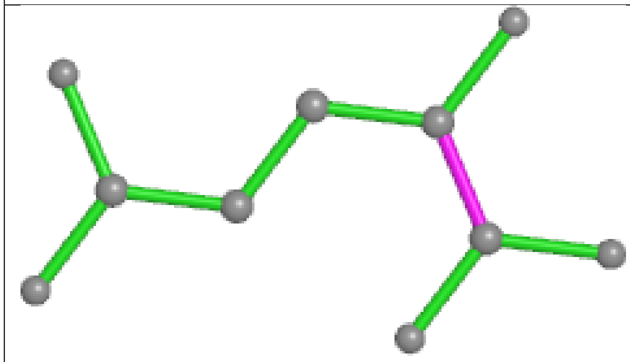
Ligand AKG b 505



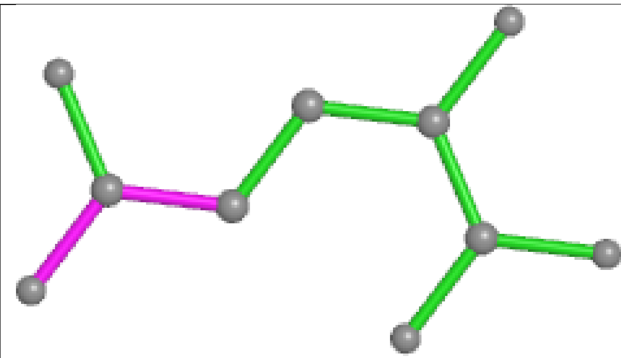
Ligand AKG Z 503



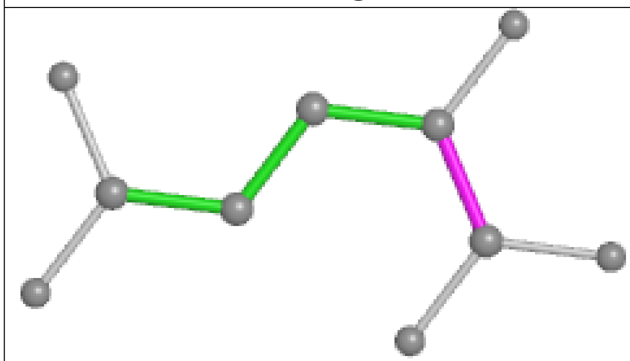
Ligand AKG K 503



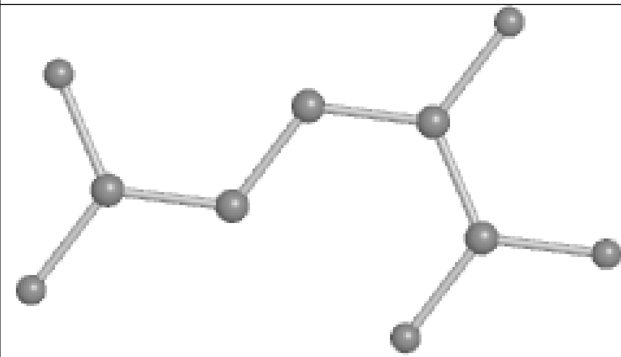
Bond lengths



Bond angles

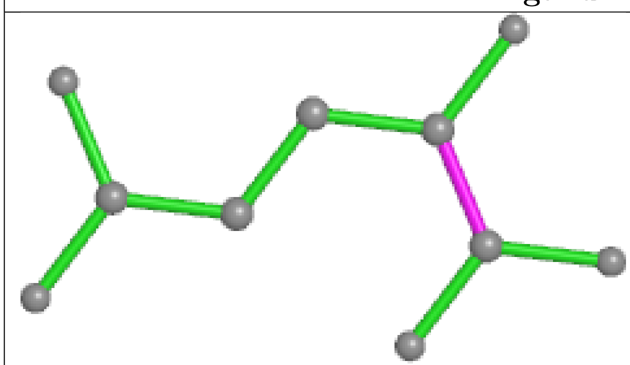


Torsions

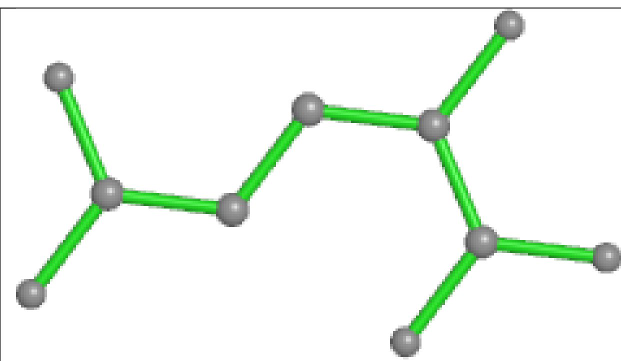


Rings

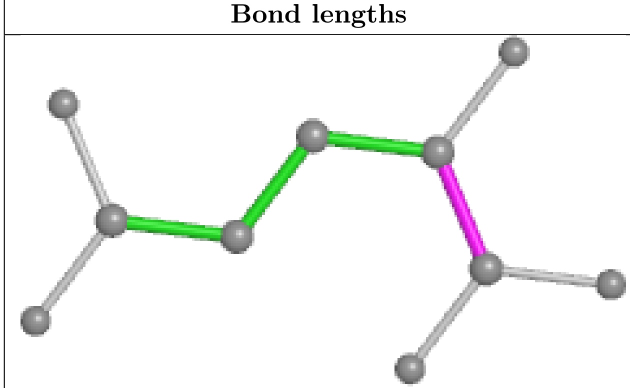
Ligand AKG F 503



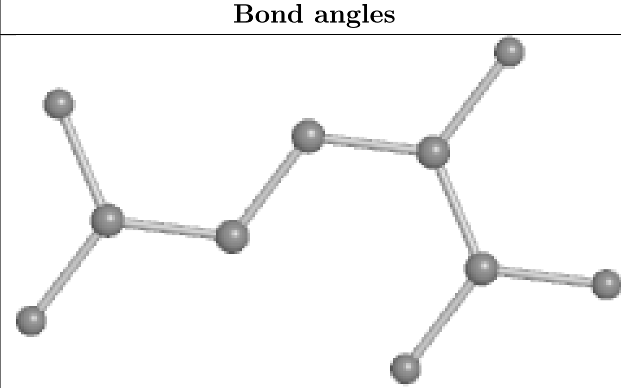
Bond lengths



Bond angles

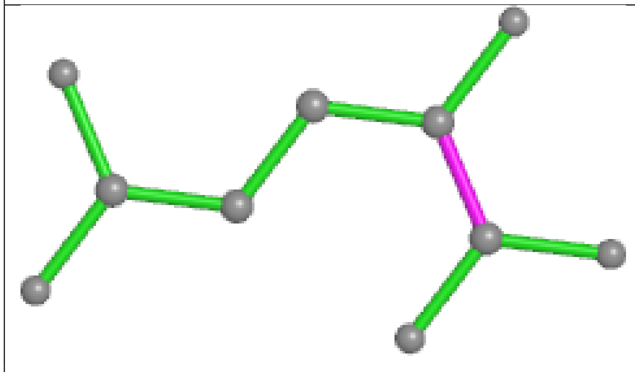


Torsions

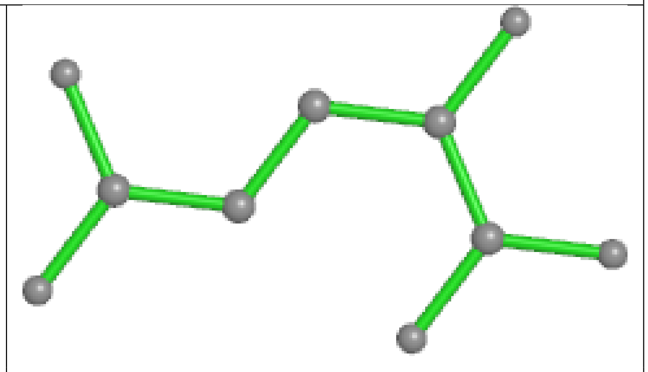


Rings

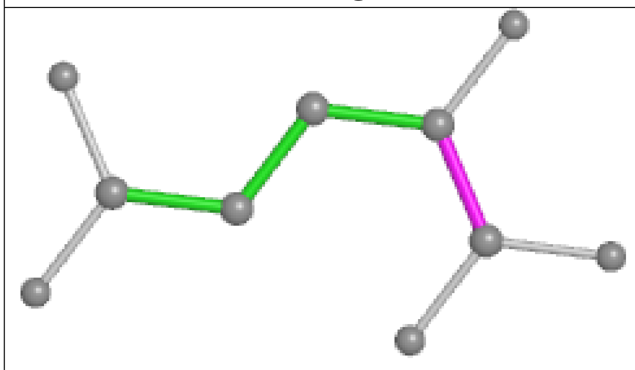
Ligand AKG D 501



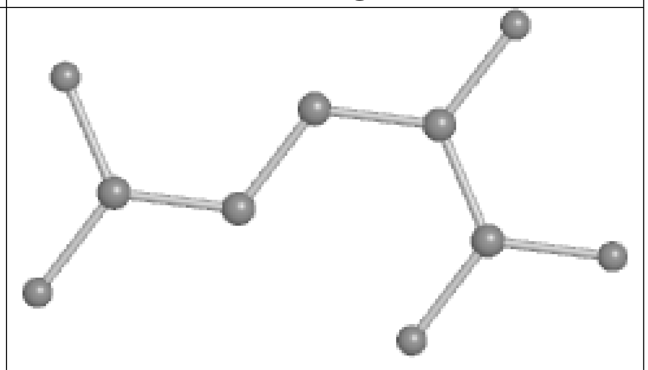
Bond lengths



Bond angles

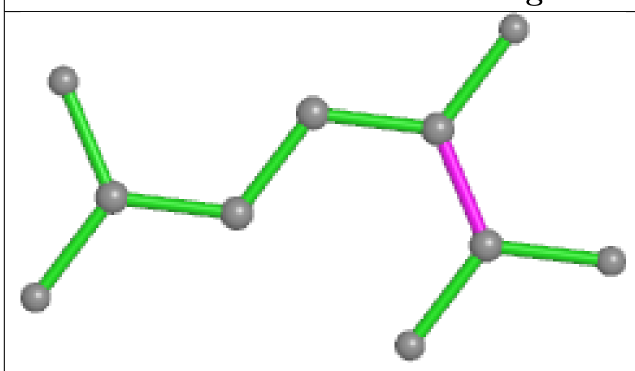


Torsions

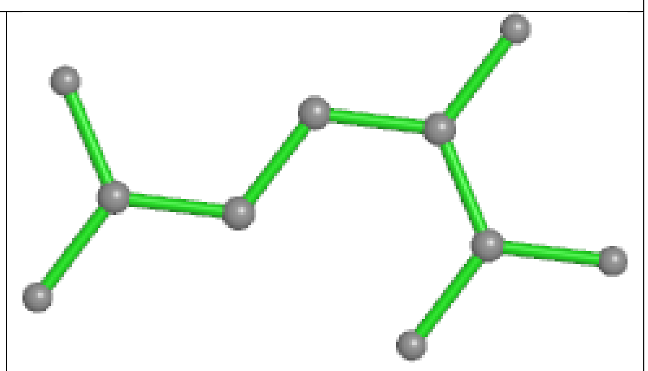


Rings

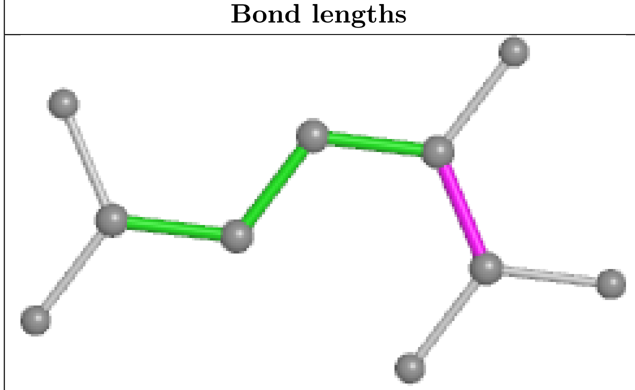
Ligand AKG a 504



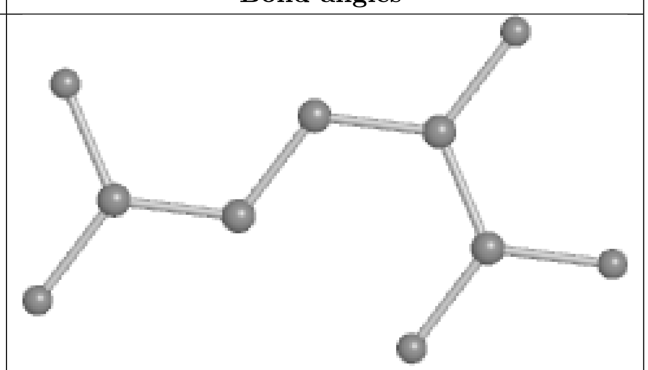
Bond lengths



Bond angles

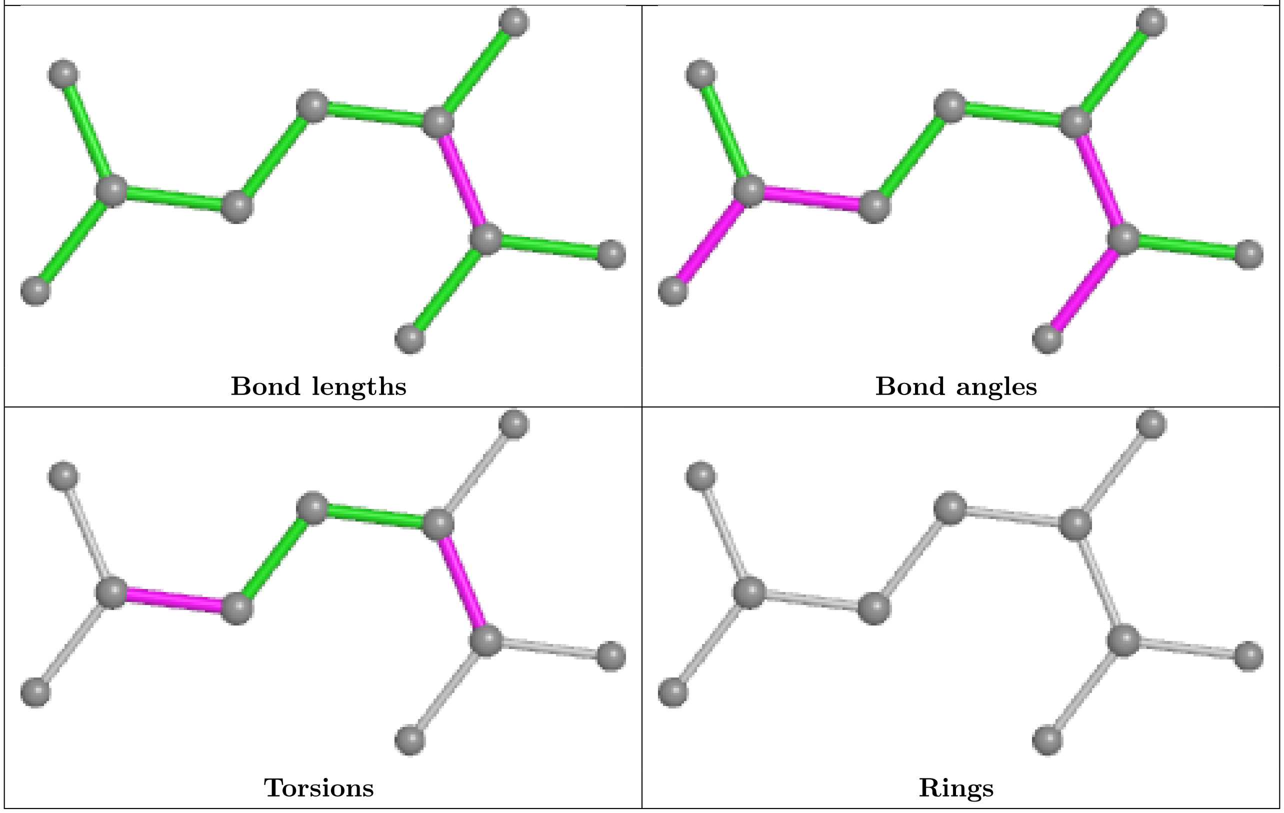


Torsions

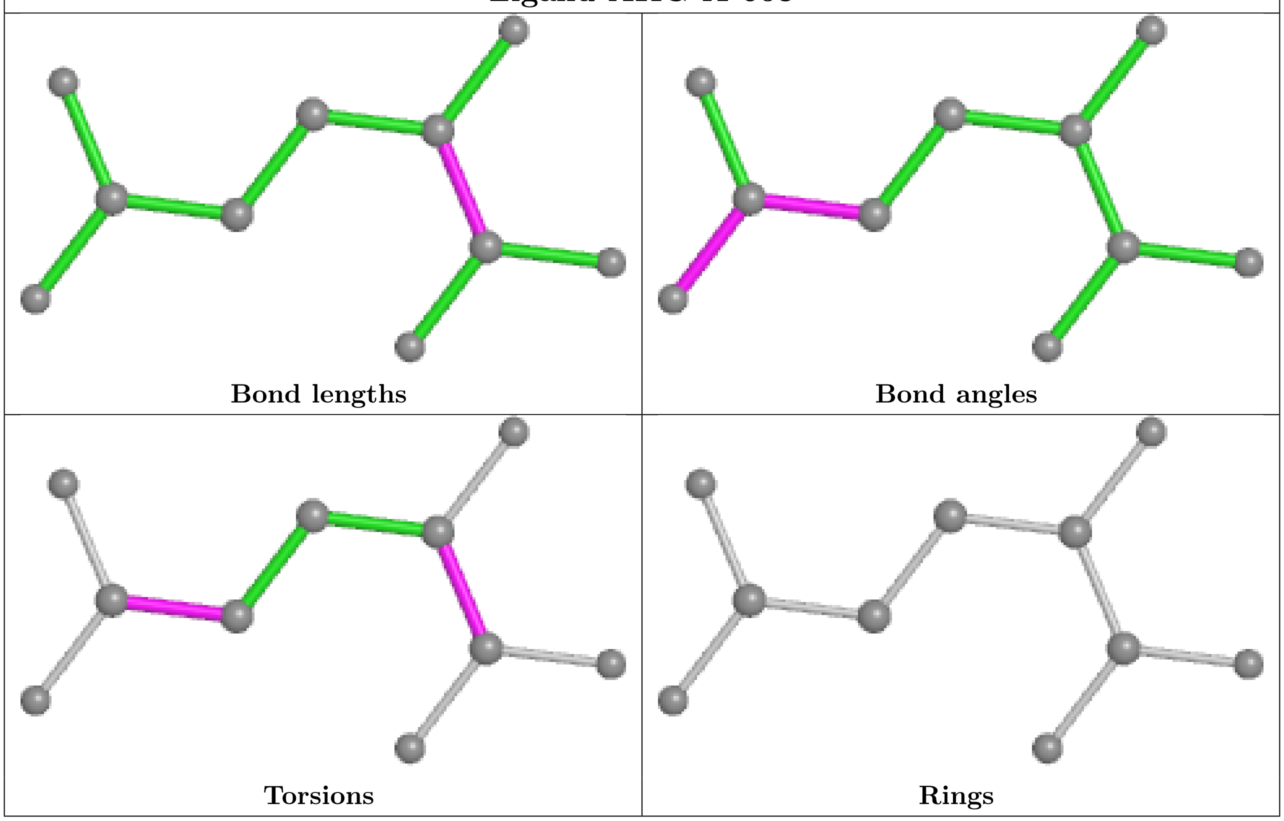


Rings

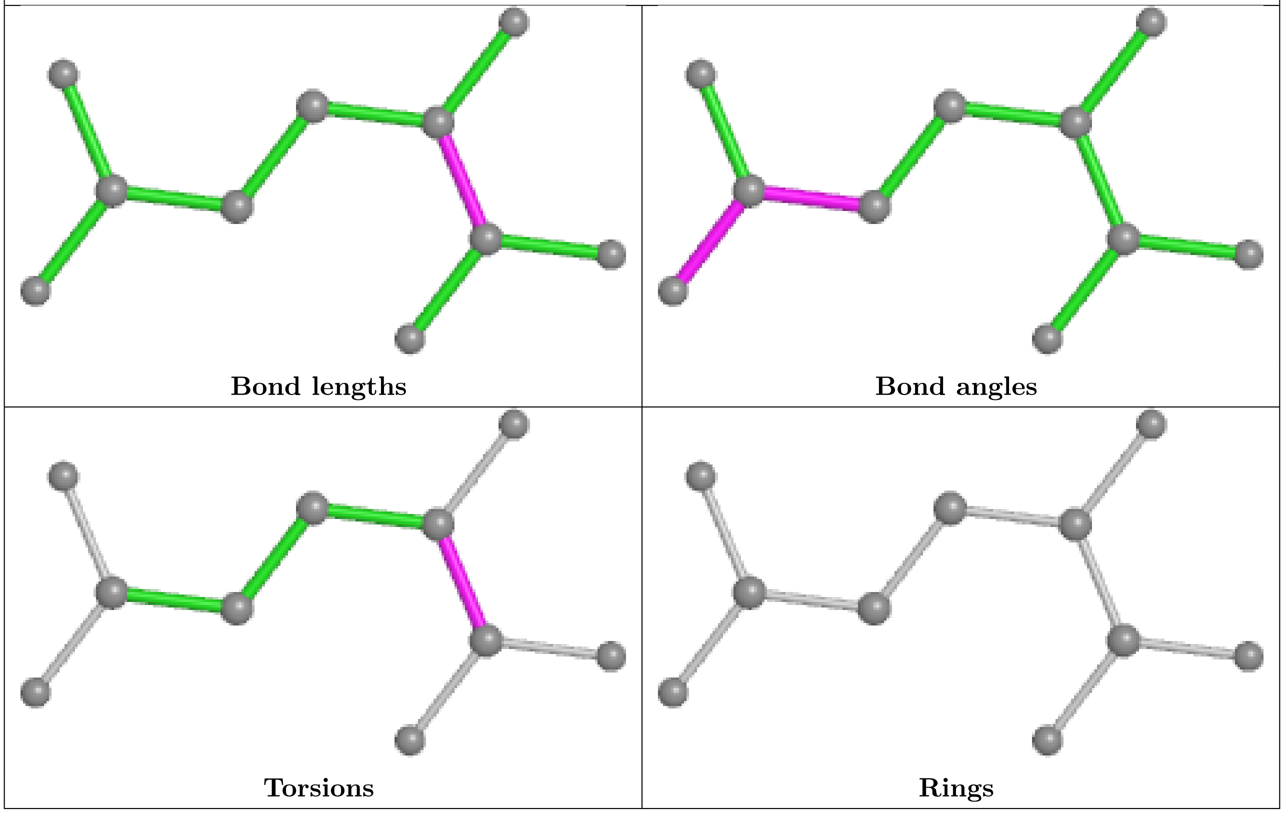
Ligand AKG Q 503



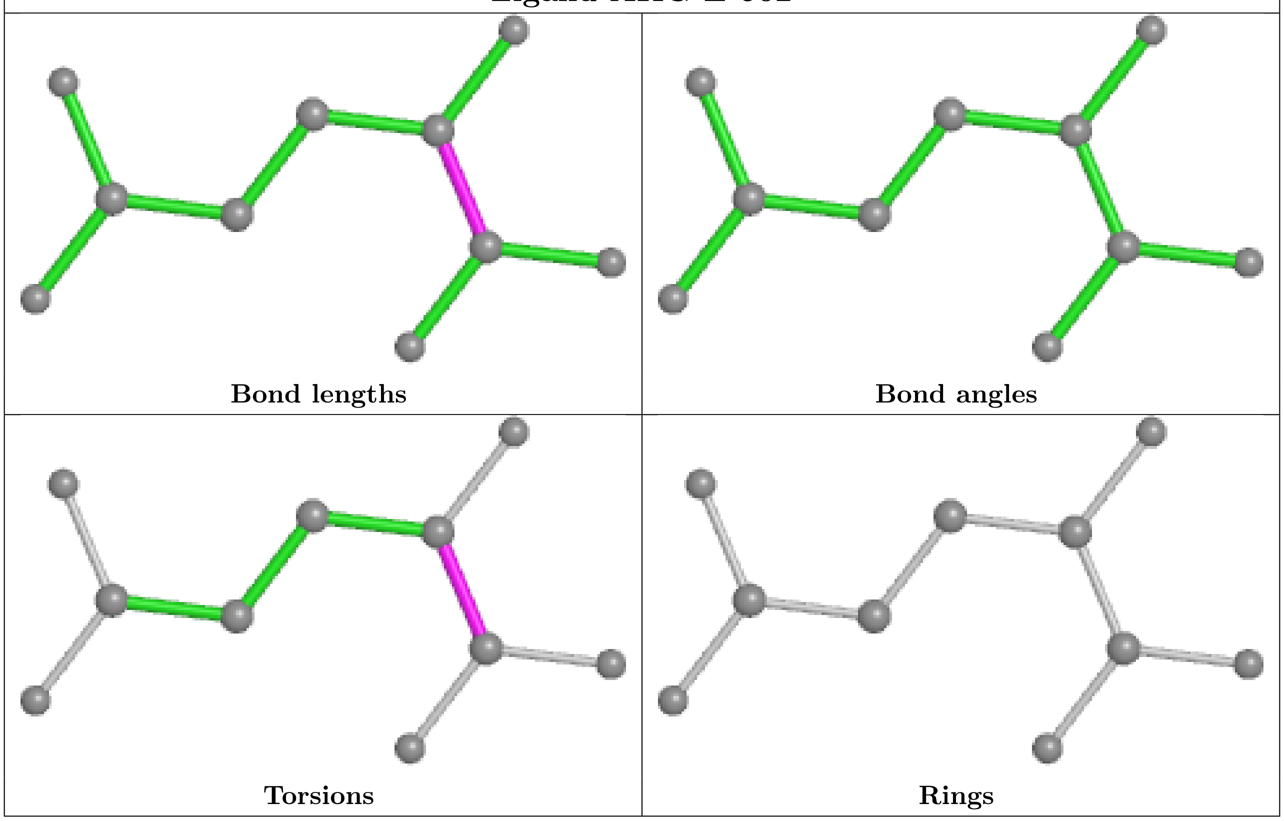
Ligand AKG X 603



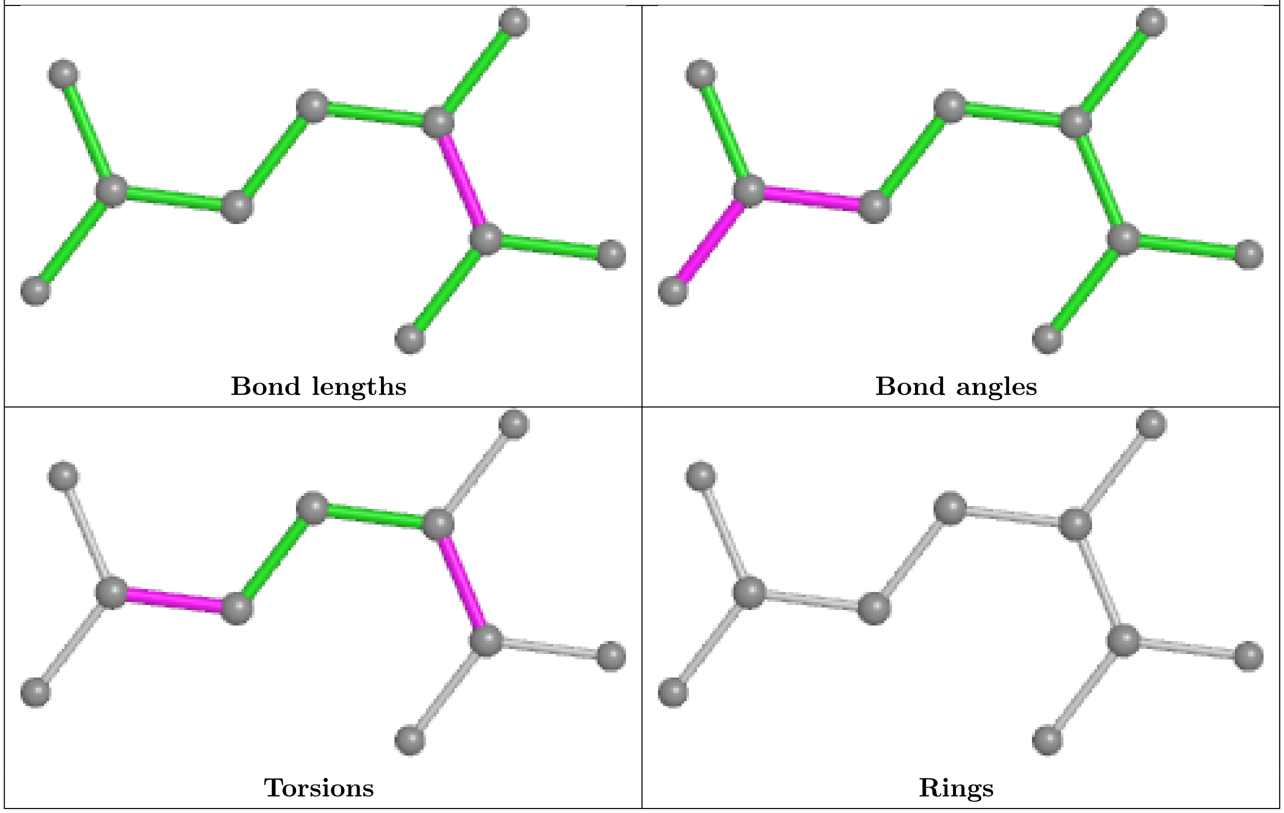
Ligand AKG C 501



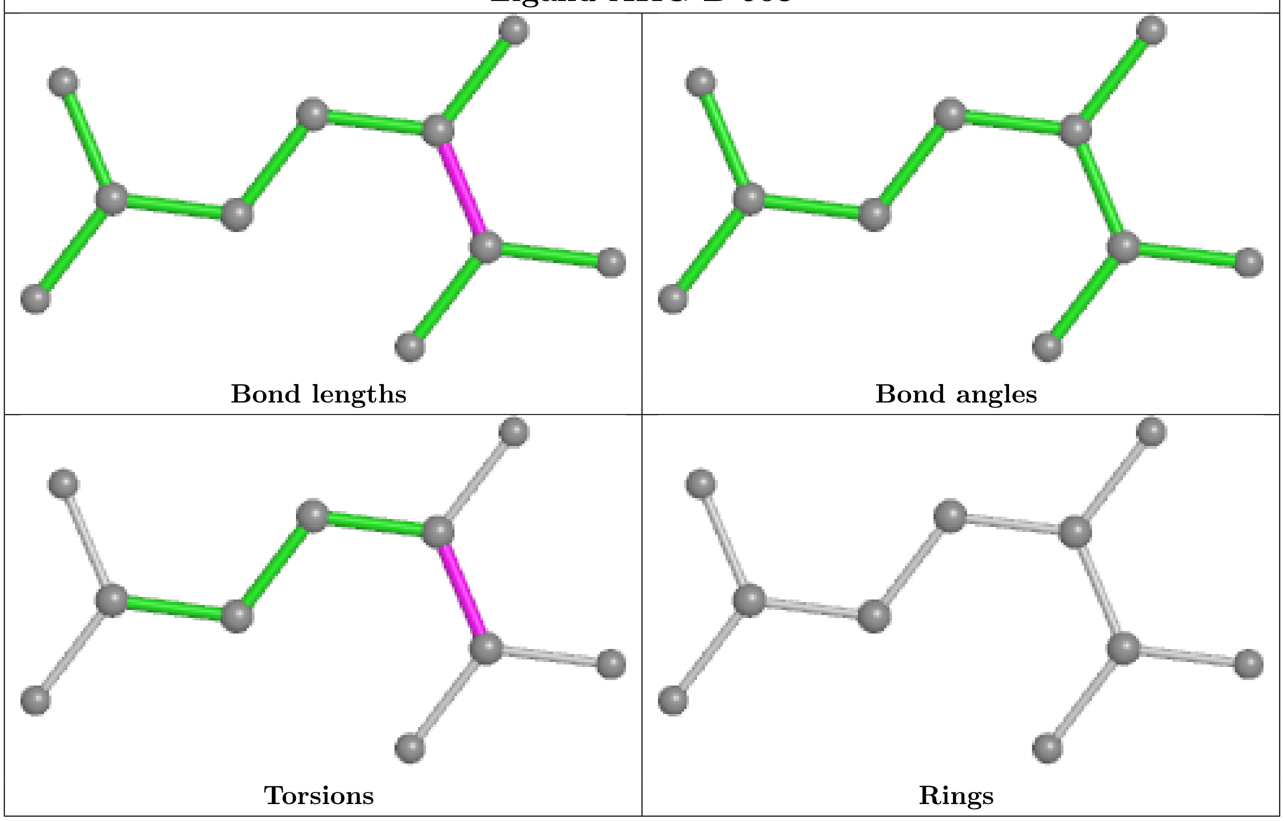
Ligand AKG E 502



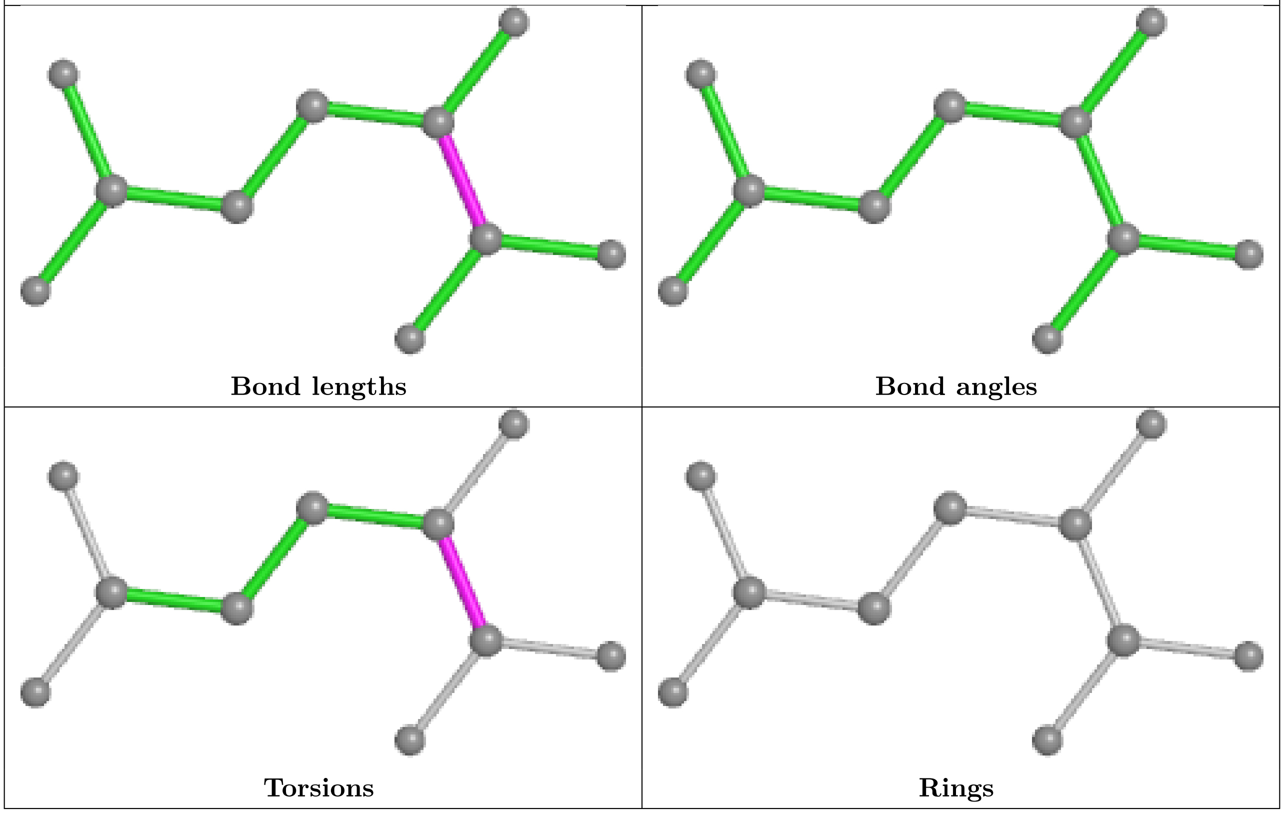
Ligand AKG U 503



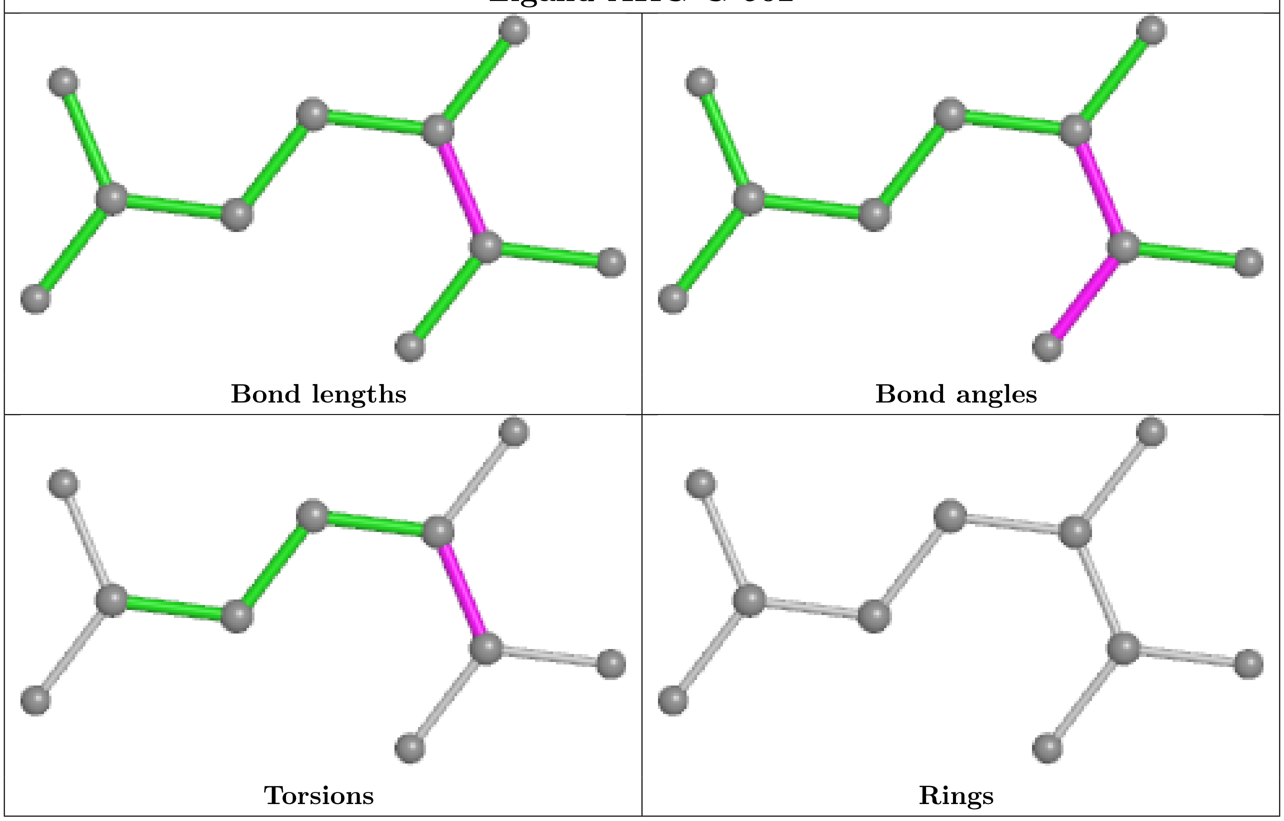
Ligand AKG B 503



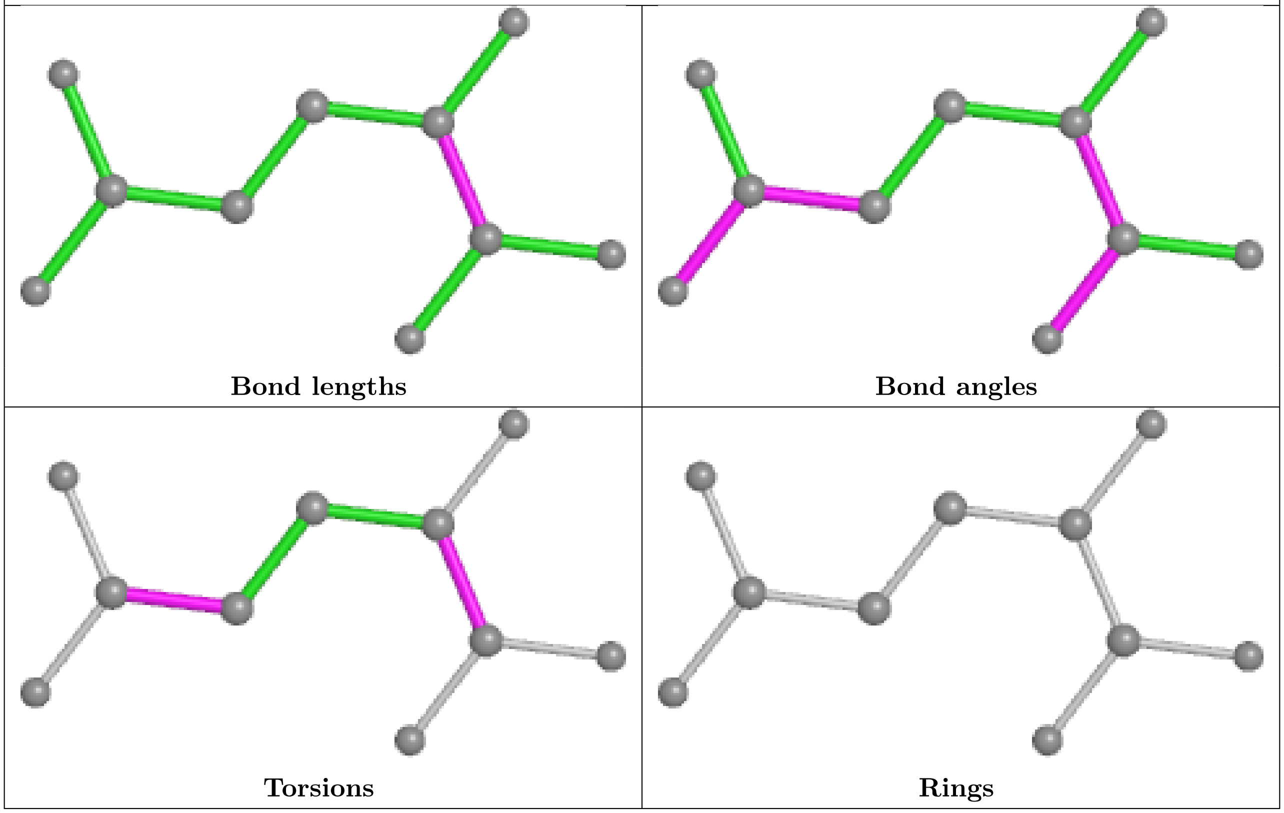
Ligand AKG L 501



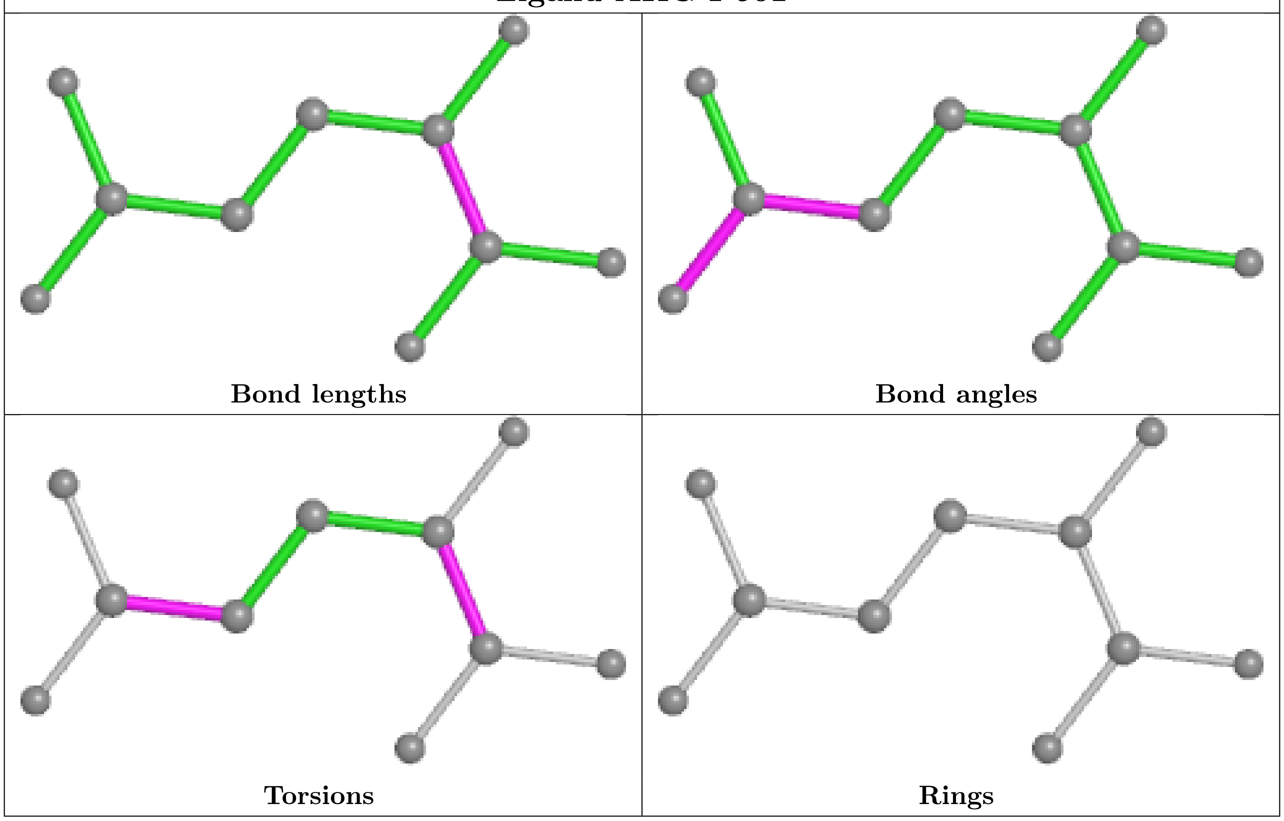
Ligand AKG G 502



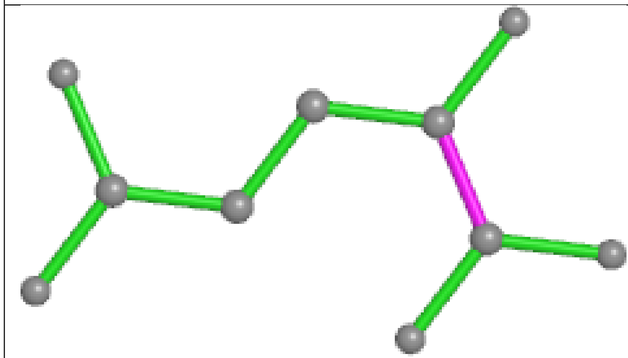
Ligand AKG c 504



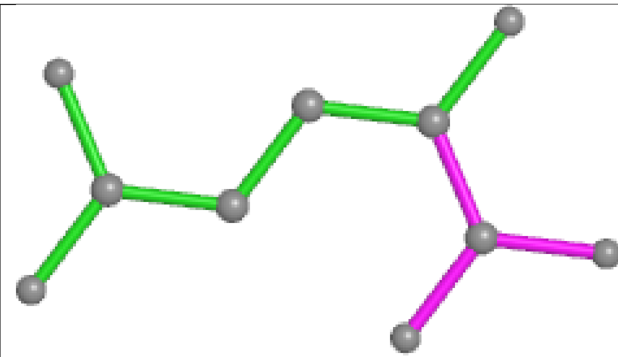
Ligand AKG I 501



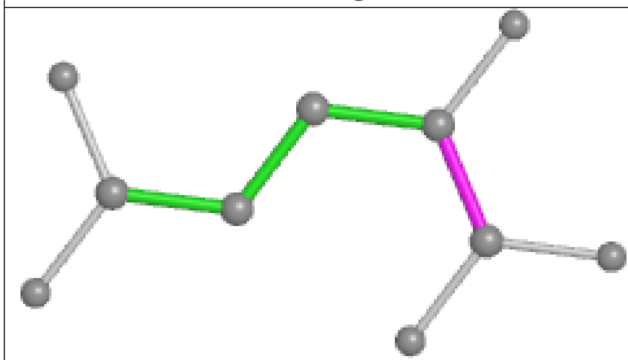
Ligand AKG P 505



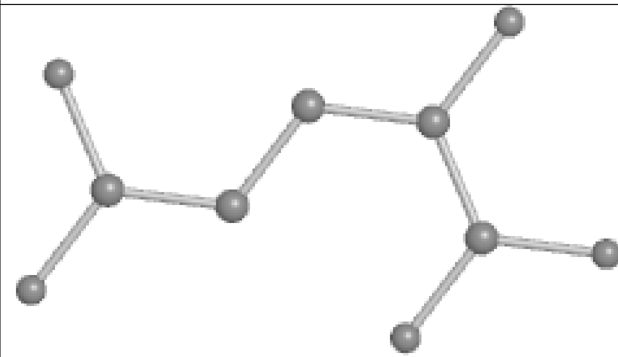
Bond lengths



Bond angles

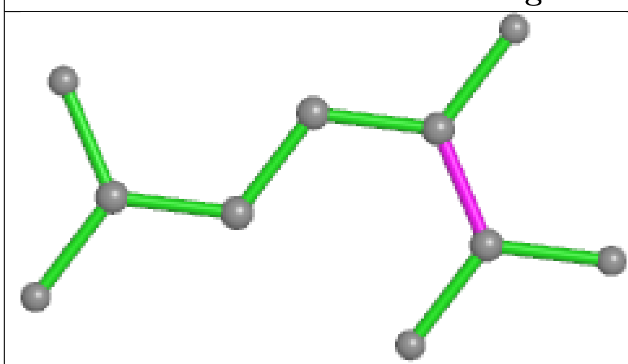


Torsions

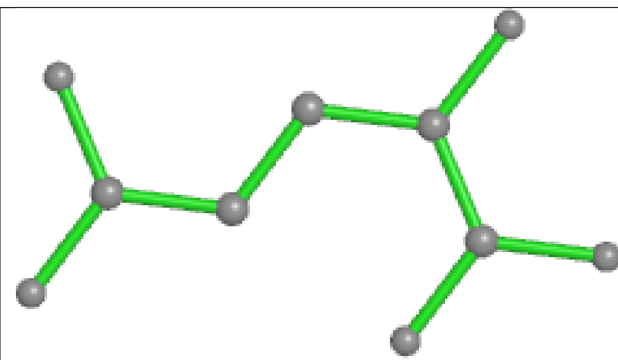


Rings

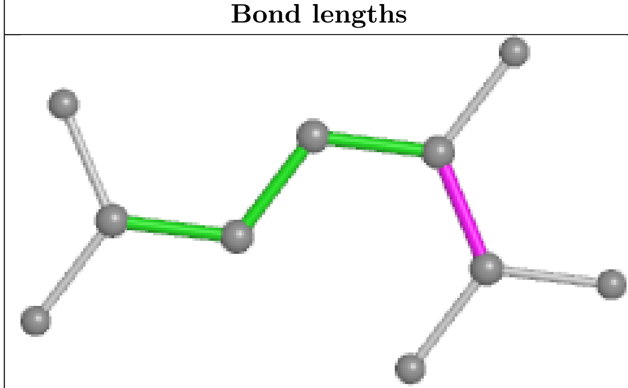
Ligand AKG S 603



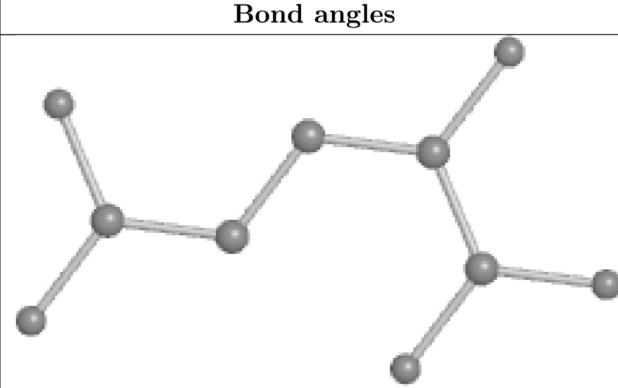
Bond lengths



Bond angles

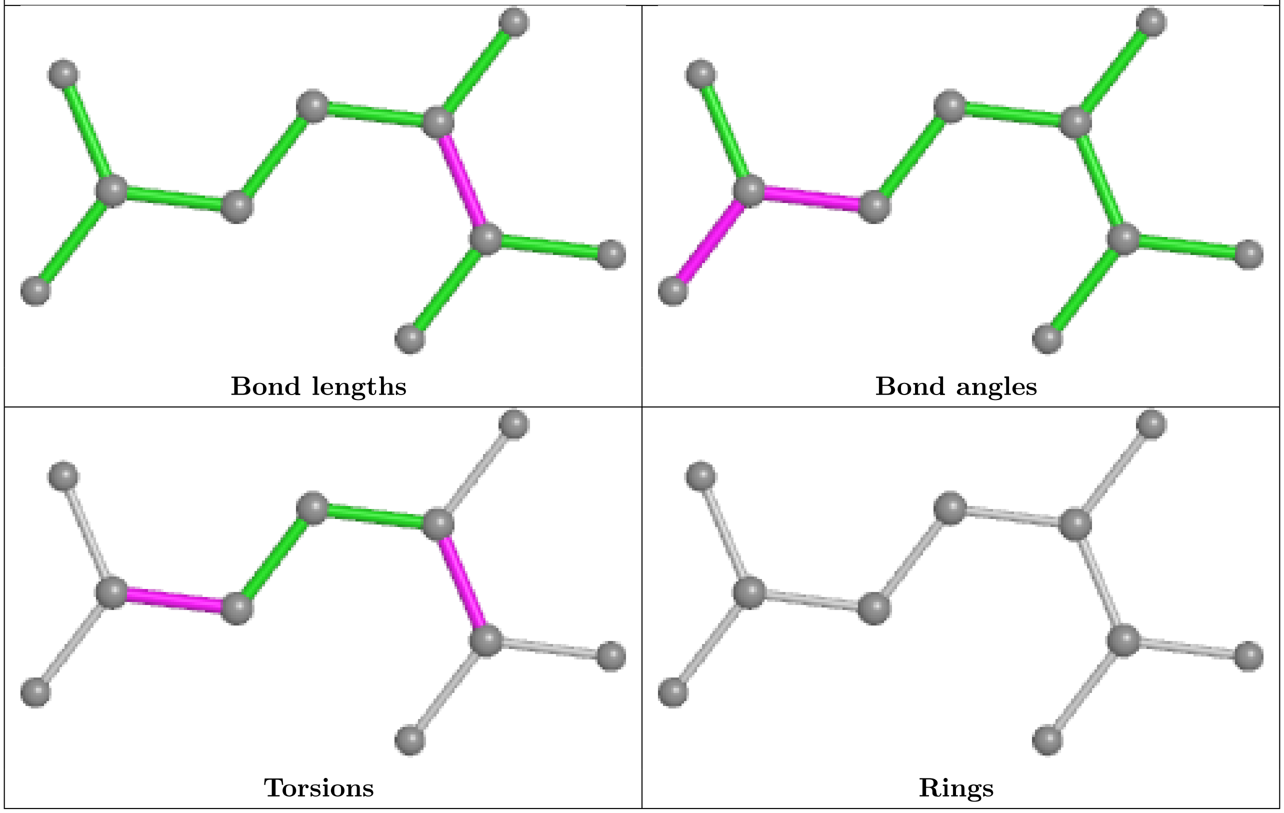


Torsions

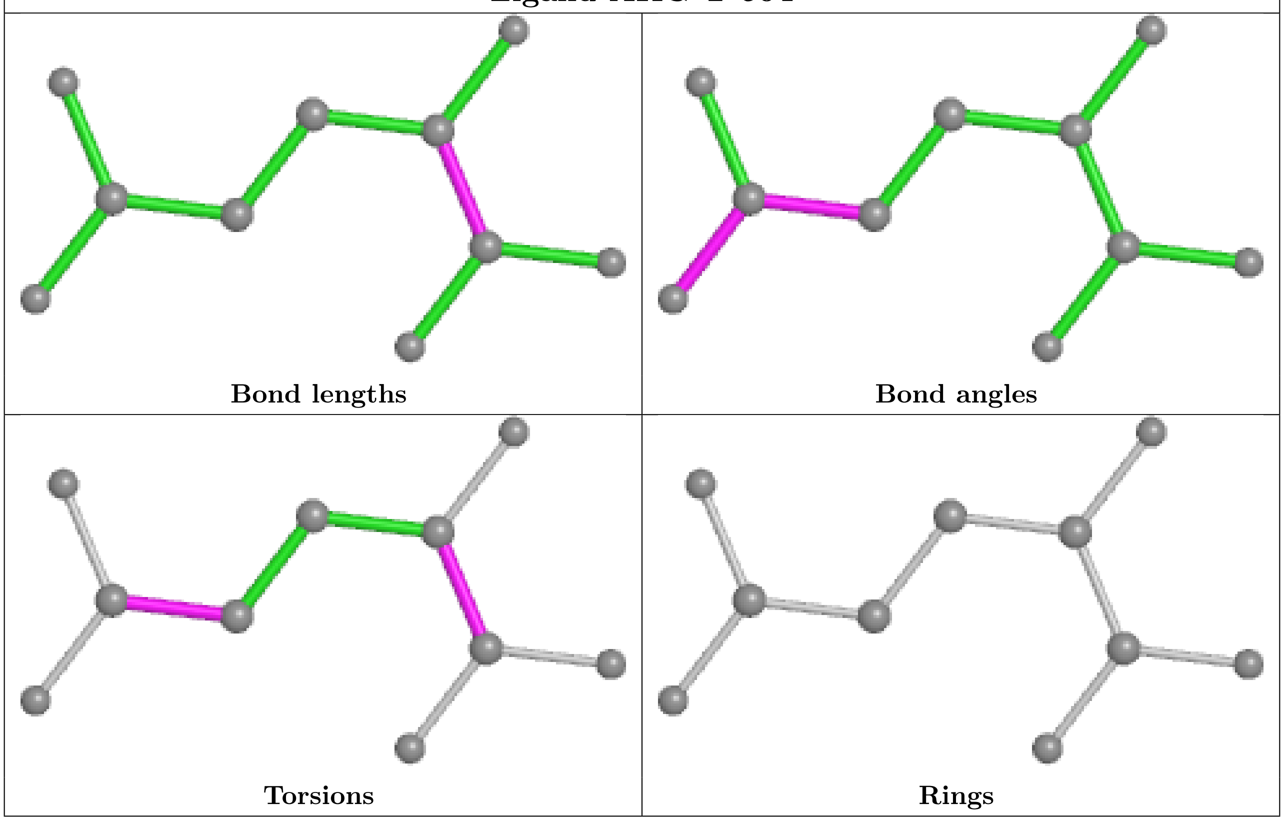


Rings

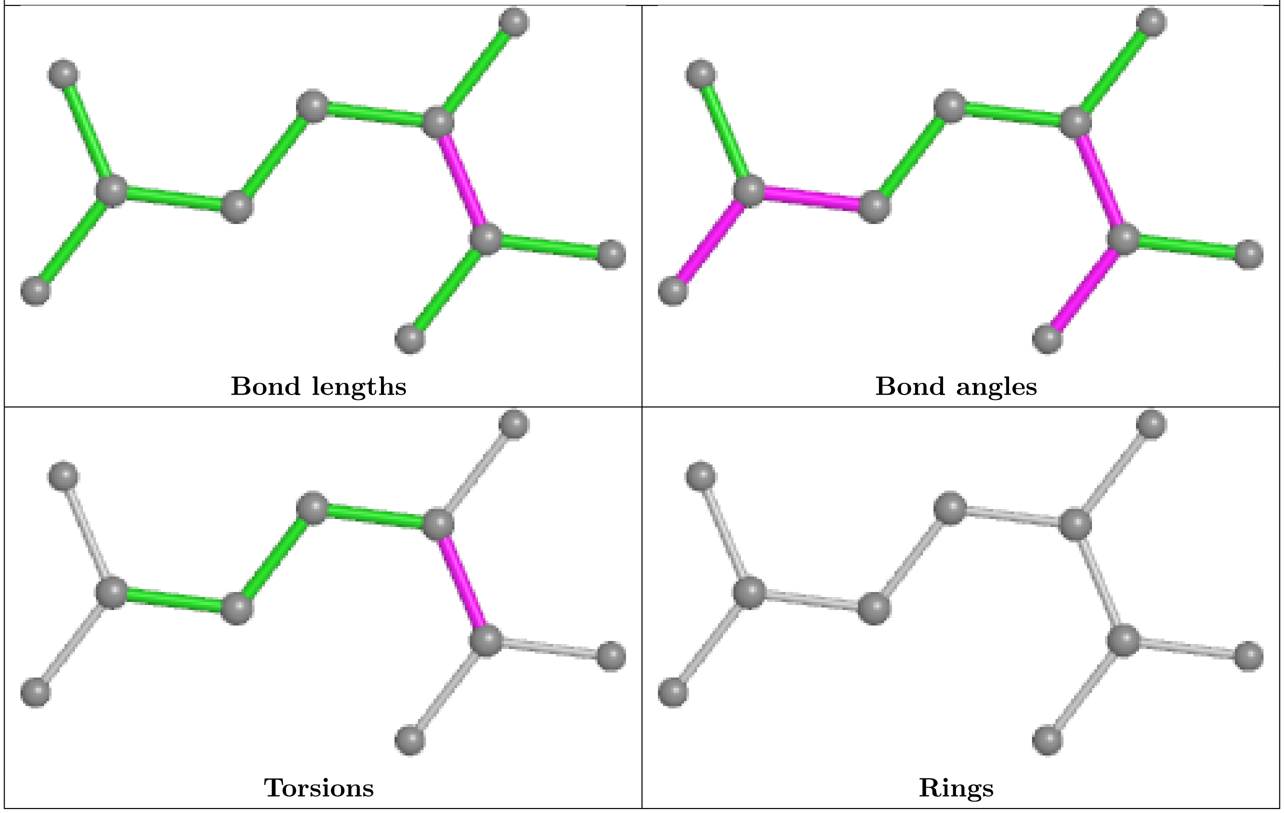
Ligand AKG A 503



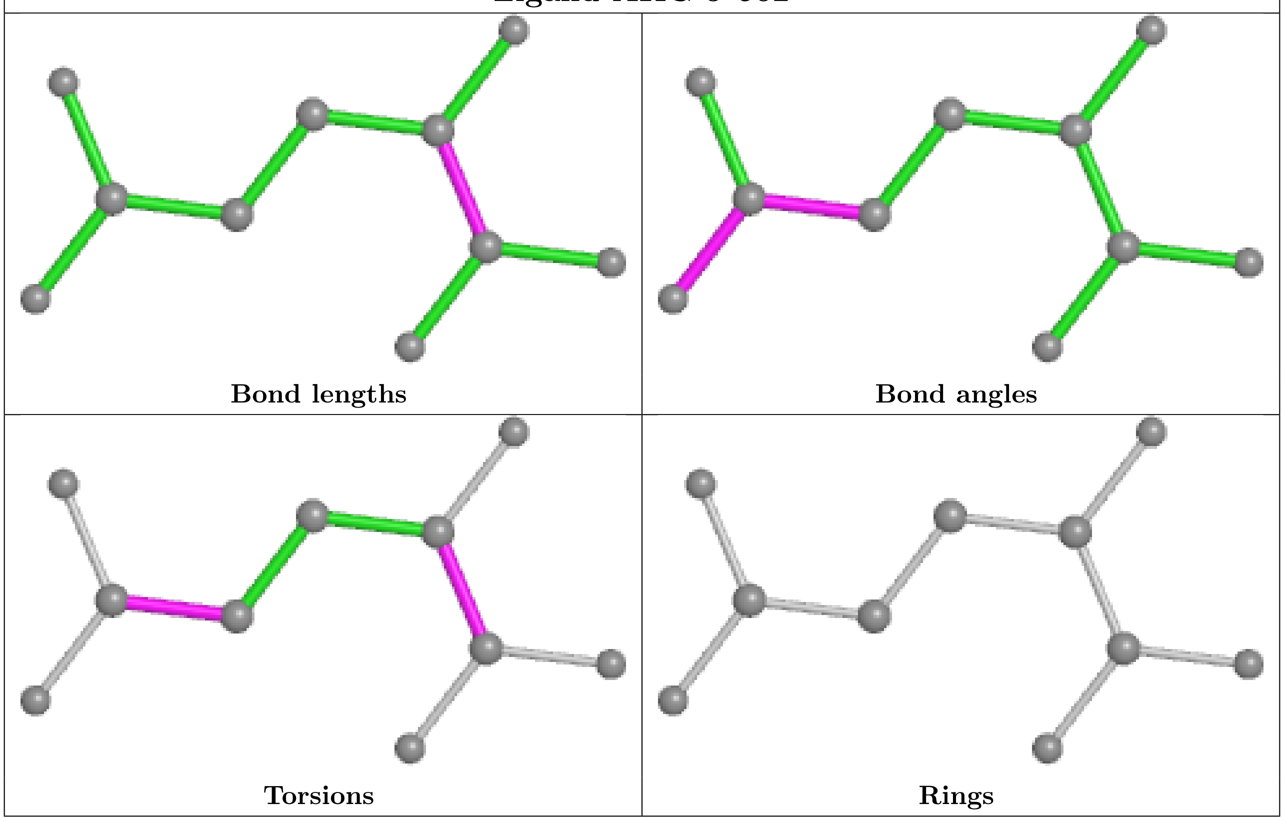
Ligand AKG T 504



Ligand AKG H 502



Ligand AKG J 502



5.7 Other polymers

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 (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^{th} 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	446/448 (99%)	0.51	28 (6%)	20	17	43, 66, 89, 107	0
1	B	446/448 (99%)	0.66	39 (8%)	10	8	46, 64, 101, 121	0
1	C	447/448 (99%)	0.83	56 (12%)	3	3	52, 71, 102, 125	0
1	D	447/448 (99%)	0.86	59 (13%)	3	2	51, 72, 109, 127	0
1	E	447/448 (99%)	0.73	46 (10%)	6	5	47, 67, 100, 126	0
1	F	447/448 (99%)	0.65	45 (10%)	7	5	48, 65, 98, 119	0
1	G	447/448 (99%)	0.53	30 (6%)	17	14	42, 61, 86, 104	0
1	H	447/448 (99%)	0.53	30 (6%)	17	14	46, 63, 91, 118	0
1	I	447/448 (99%)	0.87	63 (14%)	2	2	49, 72, 105, 129	0
1	J	447/448 (99%)	0.97	71 (15%)	1	1	53, 74, 112, 134	0
1	K	447/448 (99%)	0.88	60 (13%)	3	2	46, 67, 108, 143	0
1	L	447/448 (99%)	0.65	44 (9%)	7	6	47, 68, 103, 127	0
1	P	447/448 (99%)	0.28	12 (2%)	54	51	25, 48, 75, 101	0
1	Q	446/448 (99%)	0.43	22 (4%)	29	26	31, 58, 91, 112	0
1	S	447/448 (99%)	0.39	16 (3%)	42	39	31, 57, 90, 104	0
1	T	447/448 (99%)	0.38	20 (4%)	33	30	22, 52, 91, 128	0
1	U	447/448 (99%)	0.39	23 (5%)	28	24	29, 51, 89, 127	0
1	V	447/448 (99%)	0.41	24 (5%)	25	22	29, 56, 87, 114	0
1	X	447/448 (99%)	0.35	13 (2%)	51	48	26, 51, 92, 111	0
1	Y	447/448 (99%)	0.30	16 (3%)	42	39	19, 48, 80, 99	0
1	Z	447/448 (99%)	0.46	26 (5%)	23	19	27, 58, 95, 124	0
1	a	446/448 (99%)	0.28	14 (3%)	49	45	26, 48, 79, 107	0
1	b	447/448 (99%)	0.32	15 (3%)	45	41	27, 53, 84, 101	0
1	c	447/448 (99%)	0.27	12 (2%)	54	51	24, 49, 83, 106	0

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
All	All	10724/10752 (99%)	0.54	784 (7%)	15	12	19, 62, 97, 143	0

All (784) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	K	369	ALA	12.2
1	Z	372	PRO	10.2
1	D	315	ALA	8.9
1	J	304	LEU	8.8
1	T	379	ALA	8.6
1	K	307	GLY	8.6
1	E	315	ALA	8.1
1	E	319	SER	7.8
1	K	374	GLU	7.6
1	G	307	GLY	7.6
1	U	307	GLY	7.4
1	I	376	ASN	7.3
1	K	270	TYR	7.2
1	T	376	ASN	7.2
1	J	388	LEU	6.9
1	I	375	ARG	6.8
1	L	374	GLU	6.6
1	I	315	ALA	6.6
1	B	374	GLU	6.6
1	U	270	TYR	6.5
1	E	316	TRP	6.4
1	K	319	SER	6.4
1	G	308	TYR	6.4
1	H	374	GLU	6.4
1	J	319	SER	6.1
1	J	412	ASN	6.1
1	Z	379	ALA	6.0
1	K	379	ALA	6.0
1	E	263	PHE	5.9
1	S	379	ALA	5.9
1	F	138	PRO	5.9
1	K	390	ILE	5.8
1	Y	2	SER	5.8
1	C	72	ASP	5.7
1	J	382	GLU	5.6
1	K	271	GLN	5.6
1	J	372	PRO	5.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	254	SER	5.5
1	I	306	PRO	5.5
1	C	309	GLU	5.5
1	E	52	GLU	5.5
1	C	41	GLU	5.5
1	L	337	ILE	5.5
1	C	321	ARG	5.4
1	E	306	PRO	5.4
1	I	133	PHE	5.4
1	c	306	PRO	5.4
1	C	387	GLU	5.4
1	B	308	TYR	5.3
1	T	307	GLY	5.3
1	K	385	LYS	5.3
1	K	375	ARG	5.3
1	L	379	ALA	5.3
1	E	307	GLY	5.2
1	F	307	GLY	5.2
1	D	372	PRO	5.2
1	F	379	ALA	5.2
1	D	382	GLU	5.1
1	B	69	ASN	5.1
1	E	372	PRO	5.1
1	J	264	TYR	5.1
1	B	377	ILE	5.0
1	E	267	ASN	5.0
1	Z	306	PRO	5.0
1	C	327	VAL	5.0
1	J	376	ASN	5.0
1	V	376	ASN	5.0
1	F	388	LEU	4.9
1	J	387	GLU	4.9
1	C	390	ILE	4.9
1	G	306	PRO	4.8
1	I	369	ALA	4.8
1	J	308	TYR	4.8
1	K	266	GLU	4.8
1	b	306	PRO	4.7
1	T	390	ILE	4.7
1	Z	53	ASN	4.7
1	K	333	LYS	4.6
1	A	384	GLU	4.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	21	PHE	4.6
1	D	75	LEU	4.6
1	P	306	PRO	4.5
1	C	308	TYR	4.5
1	C	376	ASN	4.5
1	J	363	VAL	4.5
1	F	310	ALA	4.5
1	A	375	ARG	4.5
1	L	2	SER	4.5
1	U	105	LYS	4.5
1	J	316	TRP	4.4
1	Q	306	PRO	4.4
1	J	263	PHE	4.4
1	K	334	GLY	4.4
1	F	69	ASN	4.4
1	H	2	SER	4.4
1	I	379	ALA	4.3
1	X	316	TRP	4.3
1	D	266	GLU	4.3
1	K	388	LEU	4.3
1	I	390	ILE	4.3
1	U	378	PHE	4.3
1	D	283	ILE	4.3
1	C	375	ARG	4.3
1	J	280	VAL	4.3
1	K	370	PRO	4.3
1	C	307	GLY	4.2
1	D	363	VAL	4.2
1	b	307	GLY	4.2
1	T	306	PRO	4.2
1	E	317	ALA	4.2
1	B	375	ARG	4.2
1	F	316	TRP	4.2
1	B	354	VAL	4.2
1	Y	307	GLY	4.2
1	D	388	LEU	4.2
1	F	41	GLU	4.2
1	S	41	GLU	4.1
1	L	375	ARG	4.1
1	I	388	LEU	4.1
1	E	308	TYR	4.1
1	B	389	GLY	4.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	U	390	ILE	4.1
1	X	379	ALA	4.1
1	E	264	TYR	4.1
1	F	385	LYS	4.1
1	E	53	ASN	4.1
1	G	267	ASN	4.1
1	H	307	GLY	4.1
1	I	280	VAL	4.1
1	L	307	GLY	4.1
1	A	374	GLU	4.0
1	F	131	GLU	4.0
1	D	66	VAL	4.0
1	I	370	PRO	4.0
1	L	254	SER	4.0
1	D	306	PRO	4.0
1	I	105	LYS	4.0
1	I	206	PHE	4.0
1	S	390	ILE	4.0
1	T	372	PRO	3.9
1	C	71	SER	3.9
1	J	318	ASN	3.9
1	D	319	SER	3.9
1	J	52	GLU	3.9
1	b	372	PRO	3.9
1	C	279	TYR	3.9
1	Z	337	ILE	3.9
1	I	204	PHE	3.9
1	T	105	LYS	3.9
1	E	377	ILE	3.9
1	Z	385	LYS	3.8
1	C	100	ASP	3.8
1	E	388	LEU	3.8
1	C	304	LEU	3.8
1	V	390	ILE	3.8
1	C	385	LYS	3.8
1	H	308	TYR	3.8
1	Q	379	ALA	3.8
1	J	69	ASN	3.8
1	D	318	ASN	3.7
1	G	375	ARG	3.7
1	Q	318	ASN	3.7
1	E	321	ARG	3.7

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	S	372	PRO	3.7
1	K	2	SER	3.7
1	D	390	ILE	3.7
1	F	56	TYR	3.7
1	P	384	GLU	3.7
1	B	284	LEU	3.7
1	J	53	ASN	3.7
1	A	388	LEU	3.6
1	K	107	LYS	3.6
1	K	253	GLN	3.6
1	Q	387	GLU	3.6
1	D	287	ALA	3.6
1	U	274	GLU	3.6
1	a	385	LYS	3.6
1	E	374	GLU	3.6
1	a	266	GLU	3.6
1	C	315	ALA	3.6
1	V	287	ALA	3.6
1	A	35	PHE	3.5
1	K	308	TYR	3.5
1	J	379	ALA	3.5
1	F	376	ASN	3.5
1	Y	266	GLU	3.5
1	F	68	ILE	3.5
1	D	385	LYS	3.5
1	F	375	ARG	3.5
1	c	307	GLY	3.5
1	F	304	LEU	3.5
1	V	44	ILE	3.5
1	I	38	LYS	3.5
1	C	56	TYR	3.5
1	V	264	TYR	3.5
1	X	263	PHE	3.5
1	Z	21	PHE	3.5
1	G	376	ASN	3.4
1	K	304	LEU	3.4
1	V	379	ALA	3.4
1	Z	382	GLU	3.4
1	J	375	ARG	3.4
1	J	27	LEU	3.4
1	L	350	LEU	3.4
1	E	379	ALA	3.4

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	I	354	VAL	3.4
1	D	307	GLY	3.4
1	I	356	LEU	3.4
1	C	130	GLY	3.4
1	B	253	GLN	3.4
1	F	372	PRO	3.4
1	V	254	SER	3.4
1	a	382	GLU	3.4
1	S	306	PRO	3.4
1	H	52	GLU	3.4
1	L	319	SER	3.4
1	Q	390	ILE	3.4
1	X	310	ALA	3.4
1	I	380	MET	3.3
1	S	83	SER	3.3
1	D	376	ASN	3.3
1	F	308	TYR	3.3
1	A	101	VAL	3.3
1	E	363	VAL	3.3
1	J	306	PRO	3.3
1	J	310	ALA	3.3
1	Z	270	TYR	3.3
1	Q	35	PHE	3.3
1	a	308	TYR	3.3
1	E	334	GLY	3.3
1	J	188	VAL	3.3
1	K	395	ALA	3.3
1	K	412	ASN	3.3
1	L	308	TYR	3.3
1	X	390	ILE	3.3
1	I	372	PRO	3.3
1	K	316	TRP	3.3
1	F	54	GLY	3.3
1	I	2	SER	3.2
1	I	21	PHE	3.2
1	G	305	VAL	3.2
1	J	315	ALA	3.2
1	J	373	VAL	3.2
1	J	323	ALA	3.2
1	D	70	GLU	3.2
1	A	13	SER	3.2
1	S	385	LYS	3.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	F	277	MET	3.2
1	J	355	MET	3.2
1	E	310	ALA	3.2
1	V	69	ASN	3.2
1	D	53	ASN	3.2
1	G	54	GLY	3.2
1	F	164	LEU	3.2
1	H	390	ILE	3.2
1	D	256	TRP	3.2
1	I	10	TYR	3.1
1	A	75	LEU	3.1
1	P	304	LEU	3.1
1	D	374	GLU	3.1
1	I	316	TRP	3.1
1	J	255	ILE	3.1
1	Z	359	GLY	3.1
1	F	383	ALA	3.1
1	L	387	GLU	3.1
1	X	306	PRO	3.1
1	E	123	GLU	3.1
1	U	266	GLU	3.1
1	D	247	SER	3.1
1	Z	256	TRP	3.1
1	J	155	PRO	3.1
1	V	321	ARG	3.1
1	A	308	TYR	3.1
1	I	68	ILE	3.1
1	B	134	VAL	3.1
1	G	35	PHE	3.1
1	H	375	ARG	3.1
1	X	307	GLY	3.1
1	G	377	ILE	3.0
1	A	69	ASN	3.0
1	H	116	CYS	3.0
1	C	21	PHE	3.0
1	C	48	ARG	3.0
1	D	139	GLU	3.0
1	I	128	PHE	3.0
1	J	272	LEU	3.0
1	Y	304	LEU	3.0
1	Y	384	GLU	3.0
1	Z	387	GLU	3.0

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	C	384	GLU	3.0
1	E	353	THR	3.0
1	A	377	ILE	3.0
1	B	390	ILE	3.0
1	L	336	ARG	3.0
1	G	261	PRO	3.0
1	I	113	PRO	3.0
1	J	366	LYS	3.0
1	L	267	ASN	3.0
1	E	204	PHE	3.0
1	E	318	ASN	3.0
1	I	27	LEU	3.0
1	K	377	ILE	3.0
1	E	110	GLU	3.0
1	D	378	PHE	3.0
1	K	205	LYS	3.0
1	V	50	VAL	3.0
1	G	206	PHE	2.9
1	J	328	PRO	2.9
1	D	41	GLU	2.9
1	J	420	GLU	2.9
1	b	387	GLU	2.9
1	C	383	ALA	2.9
1	D	263	PHE	2.9
1	D	308	TYR	2.9
1	P	307	GLY	2.9
1	A	53	ASN	2.9
1	I	37	ILE	2.9
1	B	227	ALA	2.9
1	B	319	SER	2.9
1	Q	103	THR	2.9
1	G	21	PHE	2.9
1	L	161	TYR	2.9
1	G	218	THR	2.9
1	L	388	LEU	2.9
1	Z	39	ALA	2.9
1	P	311	PRO	2.9
1	Q	385	LYS	2.9
1	E	333	LYS	2.9
1	H	107	LYS	2.9
1	J	385	LYS	2.9
1	I	35	PHE	2.9

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	G	39	ALA	2.9
1	J	313	ASN	2.9
1	B	309	GLU	2.9
1	T	83	SER	2.9
1	X	2	SER	2.9
1	K	202	VAL	2.9
1	A	304	LEU	2.9
1	C	382	GLU	2.8
1	E	390	ILE	2.8
1	I	279	TYR	2.8
1	C	69	ASN	2.8
1	K	204	PHE	2.8
1	B	404	LEU	2.8
1	L	356	LEU	2.8
1	U	316	TRP	2.8
1	C	119	ARG	2.8
1	J	307	GLY	2.8
1	B	388	LEU	2.8
1	E	272	LEU	2.8
1	J	51	LEU	2.8
1	V	107	LYS	2.8
1	C	319	SER	2.8
1	K	382	GLU	2.8
1	c	390	ILE	2.8
1	C	312	VAL	2.8
1	F	270	TYR	2.8
1	K	378	PHE	2.8
1	P	379	ALA	2.8
1	D	259	GLY	2.8
1	a	377	ILE	2.8
1	C	378	PHE	2.8
1	V	72	ASP	2.8
1	H	304	LEU	2.8
1	I	384	GLU	2.8
1	K	413	ALA	2.8
1	c	2	SER	2.8
1	K	384	GLU	2.8
1	I	333	LYS	2.8
1	L	316	TRP	2.8
1	E	261	PRO	2.8
1	I	13	SER	2.8
1	L	372	PRO	2.8

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	Z	272	LEU	2.8
1	a	384	GLU	2.8
1	P	308	TYR	2.8
1	D	375	ARG	2.8
1	F	256	TRP	2.7
1	K	256	TRP	2.7
1	H	76	LYS	2.7
1	F	83	SER	2.7
1	D	235	THR	2.7
1	J	384	GLU	2.7
1	H	306	PRO	2.7
1	A	250	HIS	2.7
1	F	218	THR	2.7
1	I	307	GLY	2.7
1	G	363	VAL	2.7
1	K	272	LEU	2.7
1	D	329	ALA	2.7
1	K	351	ALA	2.7
1	U	379	ALA	2.7
1	Z	210	LEU	2.7
1	D	316	TRP	2.7
1	F	243	GLY	2.7
1	K	337	ILE	2.7
1	c	315	ALA	2.7
1	J	56	TYR	2.7
1	B	307	GLY	2.7
1	D	2	SER	2.7
1	U	375	ARG	2.7
1	P	376	ASN	2.7
1	D	48	ARG	2.7
1	P	316	TRP	2.6
1	Z	390	ILE	2.6
1	Z	105	LYS	2.6
1	C	70	GLU	2.6
1	K	71	SER	2.6
1	D	370	PRO	2.6
1	L	328	PRO	2.6
1	Q	366	LYS	2.6
1	Q	316	TRP	2.6
1	D	168	ASP	2.6
1	G	311	PRO	2.6
1	L	317	ALA	2.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	Z	369	ALA	2.6
1	P	56	TYR	2.6
1	F	259	GLY	2.6
1	A	342	PRO	2.6
1	D	190	ALA	2.6
1	H	141	PHE	2.6
1	C	380	MET	2.6
1	I	44	ILE	2.6
1	a	390	ILE	2.6
1	K	90	SER	2.6
1	I	309	GLU	2.6
1	L	52	GLU	2.6
1	C	352	PHE	2.6
1	J	128	PHE	2.6
1	V	272	LEU	2.6
1	C	202	VAL	2.6
1	K	178	VAL	2.6
1	K	381	SER	2.6
1	Z	91	GLU	2.6
1	A	34	ALA	2.6
1	C	306	PRO	2.6
1	I	129	ASN	2.6
1	L	390	ILE	2.6
1	L	23	PHE	2.6
1	C	316	TRP	2.6
1	D	138	PRO	2.6
1	A	104	THR	2.5
1	U	377	ILE	2.5
1	C	50	VAL	2.5
1	D	120	VAL	2.5
1	D	21	PHE	2.5
1	F	254	SER	2.5
1	L	318	ASN	2.5
1	X	372	PRO	2.5
1	L	64	GLY	2.5
1	C	218	THR	2.5
1	G	56	TYR	2.5
1	I	271	GLN	2.5
1	a	306	PRO	2.5
1	B	156	ALA	2.5
1	J	271	GLN	2.5
1	E	380	MET	2.5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	L	354	VAL	2.5
1	L	140	PHE	2.5
1	T	21	PHE	2.5
1	U	385	LYS	2.5
1	b	379	ALA	2.5
1	K	345	SER	2.5
1	J	77	PRO	2.5
1	S	307	GLY	2.5
1	H	350	LEU	2.5
1	J	309	GLU	2.5
1	Y	91	GLU	2.5
1	D	270	TYR	2.5
1	V	375	ARG	2.5
1	G	2	SER	2.5
1	Q	307	GLY	2.5
1	A	350	LEU	2.5
1	A	21	PHE	2.5
1	I	266	GLU	2.5
1	S	316	TRP	2.5
1	A	173	ILE	2.5
1	F	390	ILE	2.5
1	K	306	PRO	2.5
1	Y	372	PRO	2.5
1	I	188	VAL	2.5
1	F	276	CYS	2.5
1	Z	378	PHE	2.5
1	c	263	PHE	2.5
1	J	381	SER	2.5
1	G	321	ARG	2.5
1	I	382	GLU	2.5
1	G	109	PHE	2.5
1	J	21	PHE	2.5
1	J	235	THR	2.5
1	J	279	TYR	2.5
1	K	410	LEU	2.5
1	J	134	VAL	2.4
1	D	39	ALA	2.4
1	D	357	ALA	2.4
1	T	130	GLY	2.4
1	B	257	LEU	2.4
1	C	102	TYR	2.4
1	E	356	LEU	2.4

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	J	83	SER	2.4
1	B	422	PHE	2.4
1	I	416	LYS	2.4
1	V	21	PHE	2.4
1	I	268	ALA	2.4
1	C	377	ILE	2.4
1	K	26	ILE	2.4
1	L	448	ILE	2.4
1	Y	448	ILE	2.4
1	L	311	PRO	2.4
1	B	124	PHE	2.4
1	I	381	SER	2.4
1	I	277	MET	2.4
1	J	156	ALA	2.4
1	L	329	ALA	2.4
1	J	70	GLU	2.4
1	F	150	PRO	2.4
1	K	150	PRO	2.4
1	U	115	GLY	2.4
1	S	382	GLU	2.4
1	Z	209	ALA	2.4
1	Y	377	ILE	2.4
1	C	311	PRO	2.4
1	G	263	PHE	2.4
1	T	378	PHE	2.4
1	A	43	GLY	2.4
1	I	45	GLU	2.4
1	K	267	ASN	2.4
1	K	39	ALA	2.4
1	C	37	ILE	2.4
1	Y	390	ILE	2.4
1	B	372	PRO	2.4
1	H	133	PHE	2.4
1	J	111	GLY	2.4
1	T	334	GLY	2.4
1	Z	334	GLY	2.4
1	E	2	SER	2.4
1	J	434	ARG	2.4
1	U	422	PHE	2.4
1	I	36	PRO	2.4
1	V	306	PRO	2.4
1	b	209	ALA	2.4

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	K	372	PRO	2.4
1	c	334	GLY	2.4
1	C	73	MET	2.4
1	K	190	ALA	2.4
1	K	268	ALA	2.4
1	B	186	PHE	2.3
1	Y	263	PHE	2.3
1	Y	382	GLU	2.3
1	L	393	VAL	2.3
1	B	132	TYR	2.3
1	Y	264	TYR	2.3
1	B	277	MET	2.3
1	X	81	THR	2.3
1	C	281	ALA	2.3
1	I	51	LEU	2.3
1	D	274	GLU	2.3
1	K	41	GLU	2.3
1	E	339	PHE	2.3
1	I	178	VAL	2.3
1	Q	368	ASP	2.3
1	G	275	THR	2.3
1	H	379	ALA	2.3
1	A	109	PHE	2.3
1	J	35	PHE	2.3
1	D	366	LYS	2.3
1	J	305	VAL	2.3
1	F	380	MET	2.3
1	U	413	ALA	2.3
1	F	389	GLY	2.3
1	J	276	CYS	2.3
1	b	99	CYS	2.3
1	K	187	HIS	2.3
1	B	268	ALA	2.3
1	a	130	GLY	2.3
1	L	188	VAL	2.3
1	X	256	TRP	2.3
1	G	108	PRO	2.3
1	B	35	PHE	2.3
1	a	389	GLY	2.3
1	E	166	PRO	2.3
1	Q	372	PRO	2.3
1	I	79	LEU	2.3

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	L	310	ALA	2.3
1	b	315	ALA	2.3
1	G	204	PHE	2.3
1	L	29	VAL	2.3
1	B	387	GLU	2.3
1	J	127	GLU	2.3
1	Q	52	GLU	2.3
1	J	72	ASP	2.3
1	E	279	TYR	2.3
1	F	55	LEU	2.3
1	H	355	MET	2.3
1	b	10	TYR	2.3
1	E	129	ASN	2.3
1	E	329	ALA	2.3
1	Z	357	ALA	2.3
1	b	357	ALA	2.3
1	D	377	ILE	2.3
1	B	378	PHE	2.3
1	H	263	PHE	2.3
1	Q	384	GLU	2.3
1	U	384	GLU	2.3
1	J	33	VAL	2.2
1	F	381	SER	2.2
1	Q	294	THR	2.2
1	D	105	LYS	2.2
1	J	74	MET	2.2
1	L	330	ALA	2.2
1	a	264	TYR	2.2
1	F	53	ASN	2.2
1	Y	376	ASN	2.2
1	S	2	SER	2.2
1	c	353	THR	2.2
1	I	346	CYS	2.2
1	B	130	GLY	2.2
1	D	67	GLY	2.2
1	I	223	ILE	2.2
1	C	267	ASN	2.2
1	D	149	ASN	2.2
1	a	376	ASN	2.2
1	H	428	ALA	2.2
1	L	47	LEU	2.2
1	D	57	PHE	2.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	I	132	TYR	2.2
1	I	253	GLN	2.2
1	A	50	VAL	2.2
1	F	258	ASN	2.2
1	I	142	LEU	2.2
1	I	304	LEU	2.2
1	Q	419	PHE	2.2
1	H	253	GLN	2.2
1	E	385	LYS	2.2
1	G	385	LYS	2.2
1	E	304	LEU	2.2
1	B	190	ALA	2.2
1	C	209	ALA	2.2
1	K	344	PRO	2.2
1	A	56	TYR	2.2
1	K	56	TYR	2.2
1	H	188	VAL	2.2
1	I	33	VAL	2.2
1	C	45	GLU	2.2
1	B	72	ASP	2.2
1	H	245	ASN	2.2
1	J	368	ASP	2.2
1	L	304	LEU	2.2
1	B	379	ALA	2.2
1	b	419	PHE	2.2
1	c	378	PHE	2.2
1	F	91	GLU	2.2
1	C	263	PHE	2.2
1	V	120	VAL	2.2
1	P	115	GLY	2.2
1	D	142	LEU	2.2
1	F	72	ASP	2.2
1	F	356	LEU	2.2
1	E	283	ILE	2.2
1	I	15	ASN	2.2
1	I	263	PHE	2.2
1	K	422	PHE	2.2
1	J	314	ILE	2.2
1	Z	309	GLU	2.2
1	U	178	VAL	2.2
1	H	423	LEU	2.1
1	I	410	LEU	2.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	b	304	LEU	2.1
1	D	250	HIS	2.1
1	G	374	GLU	2.1
1	J	182	GLU	2.1
1	J	405	GLU	2.1
1	T	266	GLU	2.1
1	S	3	THR	2.1
1	C	132	TYR	2.1
1	T	264	TYR	2.1
1	U	264	TYR	2.1
1	C	35	PHE	2.1
1	L	133	PHE	2.1
1	C	211	LYS	2.1
1	Z	190	ALA	2.1
1	C	131	GLU	2.1
1	T	13	SER	2.1
1	F	334	GLY	2.1
1	I	64	GLY	2.1
1	P	275	THR	2.1
1	E	366	LYS	2.1
1	D	384	GLU	2.1
1	H	310	ALA	2.1
1	L	271	GLN	2.1
1	X	44	ILE	2.1
1	a	395	ALA	2.1
1	B	335	THR	2.1
1	D	104	THR	2.1
1	F	263	PHE	2.1
1	L	367	LEU	2.1
1	T	55	LEU	2.1
1	C	310	ALA	2.1
1	U	369	ALA	2.1
1	A	318	ASN	2.1
1	A	296	PRO	2.1
1	T	316	TRP	2.1
1	U	306	PRO	2.1
1	D	188	VAL	2.1
1	C	10	TYR	2.1
1	G	331	ARG	2.1
1	a	81	THR	2.1
1	L	349	TYR	2.1
1	G	310	ALA	2.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	J	329	ALA	2.1
1	V	68	ILE	2.1
1	H	251	CYS	2.1
1	J	295	ASN	2.1
1	E	188	VAL	2.1
1	H	327	VAL	2.1
1	D	304	LEU	2.1
1	D	338	GLU	2.1
1	L	3	THR	2.1
1	Y	374	GLU	2.1
1	H	351	ALA	2.1
1	H	395	ALA	2.1
1	c	178	VAL	2.1
1	J	430	TRP	2.1
1	I	401	LEU	2.1
1	T	128	PHE	2.1
1	T	263	PHE	2.1
1	H	56	TYR	2.1
1	K	283	ILE	2.1
1	Q	56	TYR	2.1
1	J	39	ALA	2.1
1	L	315	ALA	2.1
1	D	359	GLY	2.1
1	H	267	ASN	2.1
1	F	139	GLU	2.1
1	D	422	PHE	2.1
1	K	404	LEU	2.1
1	V	76	LYS	2.1
1	V	83	SER	2.1
1	Z	107	LYS	2.1
1	b	272	LEU	2.1
1	U	382	GLU	2.1
1	V	188	VAL	2.1
1	X	266	GLU	2.1
1	V	267	ASN	2.1
1	Y	53	ASN	2.1
1	b	363	VAL	2.1
1	c	387	GLU	2.1
1	C	320	ASN	2.1
1	A	210	LEU	2.0
1	L	164	LEU	2.0
1	S	388	LEU	2.0

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	S	287	ALA	2.0
1	U	44	ILE	2.0
1	V	289	ALA	2.0
1	E	189	GLU	2.0
1	Q	374	GLU	2.0
1	B	68	ILE	2.0
1	F	13	SER	2.0
1	K	293	ILE	2.0
1	S	254	SER	2.0
1	c	37	ILE	2.0
1	B	73	MET	2.0
1	E	396	ASN	2.0
1	F	51	LEU	2.0
1	J	360	LEU	2.0
1	K	418	ILE	2.0
1	Q	351	ALA	2.0
1	U	357	ALA	2.0
1	I	305	VAL	2.0
1	K	280	VAL	2.0
1	V	11	VAL	2.0
1	B	350	LEU	2.0
1	K	142	LEU	2.0
1	S	276	CYS	2.0
1	b	384	GLU	2.0
1	A	254	SER	2.0
1	E	273	SER	2.0
1	J	383	ALA	2.0
1	C	326	ARG	2.0
1	Q	3	THR	2.0
1	Q	195	VAL	2.0
1	C	350	LEU	2.0
1	G	304	LEU	2.0
1	T	253	GLN	2.0

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 (i)

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^{th} 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($Å^2$)	Q<0.9
3	MG	K	502	1/1	0.77	0.24	61,61,61,61	0
3	MG	F	502	1/1	0.85	0.27	50,50,50,50	0
2	EDO	A	501	4/4	0.89	0.19	36,44,49,55	0
3	MG	Y	603	1/1	0.89	0.18	35,35,35,35	0
2	EDO	U	502	4/4	0.90	0.24	34,37,41,42	0
2	EDO	Y	602	4/4	0.91	0.21	25,35,37,43	0
3	MG	b	503	1/1	0.91	0.10	39,39,39,39	0
4	AKG	G	502	10/10	0.91	0.21	40,55,62,63	0
4	AKG	I	501	10/10	0.91	0.33	52,66,69,69	0
2	EDO	b	502	4/4	0.92	0.17	24,32,37,38	0
3	MG	S	602	1/1	0.92	0.12	24,24,24,24	0
4	AKG	C	501	10/10	0.92	0.33	40,60,68,73	0
3	MG	T	501	1/1	0.92	0.18	36,36,36,36	0
3	MG	T	503	1/1	0.92	0.21	37,37,37,37	0
4	AKG	L	501	10/10	0.92	0.37	52,65,67,75	0
5	PEG	P	502	7/7	0.92	0.21	16,33,40,48	0
2	EDO	E	501	4/4	0.93	0.18	43,51,52,52	0
2	EDO	V	501	4/4	0.93	0.18	12,40,43,55	0
3	MG	Q	501	1/1	0.93	0.12	42,42,42,42	0
4	AKG	Z	503	10/10	0.93	0.33	39,50,57,82	0
4	AKG	D	501	10/10	0.93	0.55	51,57,61,62	0
2	EDO	c	503	4/4	0.94	0.21	29,30,32,46	0
4	AKG	E	502	10/10	0.94	0.31	44,51,60,64	0
4	AKG	F	503	10/10	0.94	0.29	40,48,64,66	0
2	EDO	V	502	4/4	0.94	0.20	31,36,37,42	0
2	EDO	X	602	4/4	0.94	0.27	26,43,44,50	0
4	AKG	K	503	10/10	0.94	0.35	43,52,62,72	0
2	EDO	K	501	4/4	0.94	0.18	39,40,43,47	0
4	AKG	S	603	10/10	0.94	0.32	28,34,45,46	0
4	AKG	V	503	10/10	0.94	0.26	31,39,51,52	0
4	AKG	X	603	10/10	0.94	0.24	27,50,55,75	0
4	AKG	A	503	10/10	0.94	0.38	48,57,60,62	0
2	EDO	U	501	4/4	0.94	0.20	30,34,39,50	0
5	PEG	Z	502	7/7	0.94	0.18	35,41,48,55	0
4	AKG	H	502	10/10	0.95	0.19	37,48,55,60	0
2	EDO	a	501	4/4	0.95	0.20	14,16,19,35	0
2	EDO	S	601	4/4	0.95	0.19	28,30,37,37	0

Continued on next page...

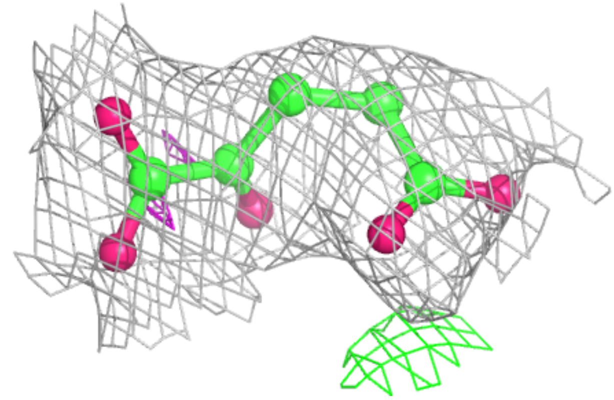
Continued from previous page...

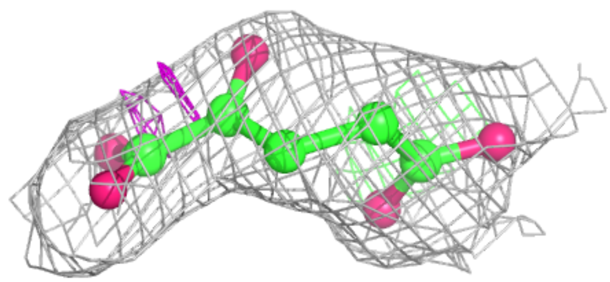
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($Å^2$)	Q<0.9
4	AKG	b	505	10/10	0.95	0.20	33,38,43,46	0
4	AKG	B	503	10/10	0.95	0.28	34,48,61,63	0
3	MG	H	501	1/1	0.95	0.73	48,48,48,48	0
4	AKG	P	505	10/10	0.96	0.21	22,39,46,46	0
4	AKG	Q	503	10/10	0.96	0.28	21,38,46,51	0
3	MG	b	504	1/1	0.96	0.14	40,40,40,40	0
4	AKG	T	504	10/10	0.96	0.24	35,46,51,58	0
2	EDO	G	501	4/4	0.96	0.15	27,32,34,39	0
2	EDO	X	601	4/4	0.96	0.18	27,36,37,38	0
4	AKG	Y	604	10/10	0.96	0.25	30,39,43,43	0
2	EDO	a	503	4/4	0.96	0.17	26,29,30,37	0
4	AKG	a	504	10/10	0.96	0.29	31,35,46,51	0
4	AKG	J	502	10/10	0.96	0.33	46,52,58,60	0
4	AKG	c	504	10/10	0.96	0.23	31,43,51,62	0
2	EDO	b	501	4/4	0.96	0.22	25,26,30,34	0
2	EDO	P	503	4/4	0.96	0.22	27,32,33,41	0
3	MG	T	502	1/1	0.97	0.16	27,27,27,27	0
3	MG	B	502	1/1	0.97	0.08	45,45,45,45	0
2	EDO	F	501	4/4	0.97	0.14	24,29,32,49	0
2	EDO	Z	501	4/4	0.97	0.17	17,33,44,44	0
2	EDO	Y	601	4/4	0.97	0.17	20,29,36,36	0
3	MG	P	504	1/1	0.97	0.18	33,33,33,33	0
2	EDO	c	501	4/4	0.97	0.18	14,18,20,22	0
3	MG	Q	502	1/1	0.97	0.21	25,25,25,25	0
2	EDO	c	502	4/4	0.97	0.26	26,28,32,36	0
2	EDO	a	502	4/4	0.97	0.22	12,26,28,36	0
3	MG	J	501	1/1	0.98	0.20	34,34,34,34	0
3	MG	A	502	1/1	0.98	0.20	23,23,23,23	0
4	AKG	U	503	10/10	0.98	0.22	27,38,42,57	0
3	MG	B	501	1/1	0.99	0.07	13,13,13,13	0
2	EDO	P	501	4/4	0.99	0.15	21,22,23,24	0

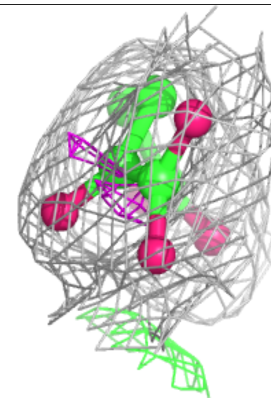
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around AKG G 502:

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

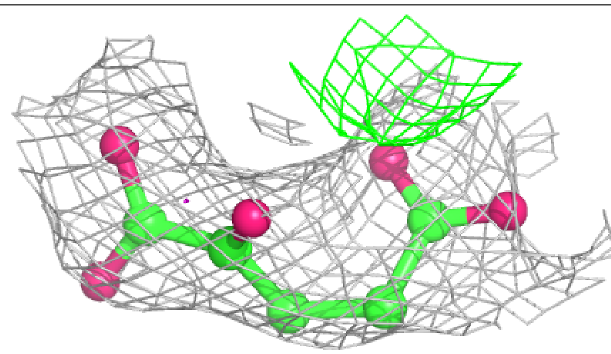


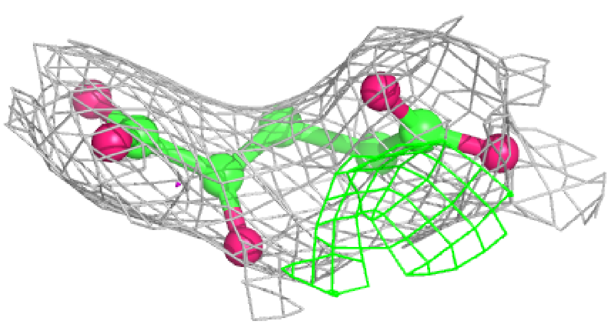


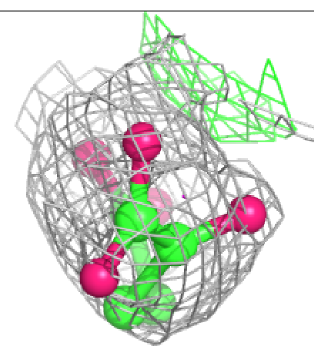


Electron density around AKG I 501:

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

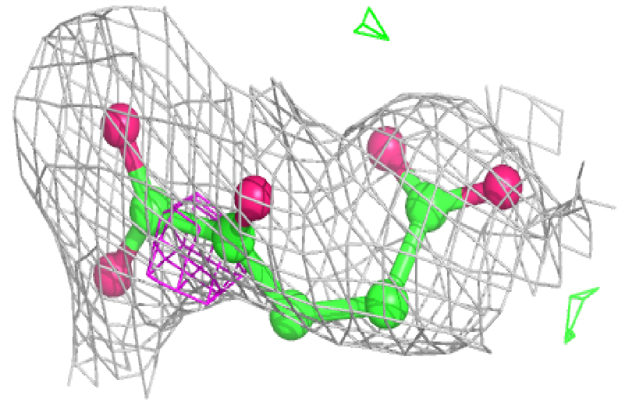


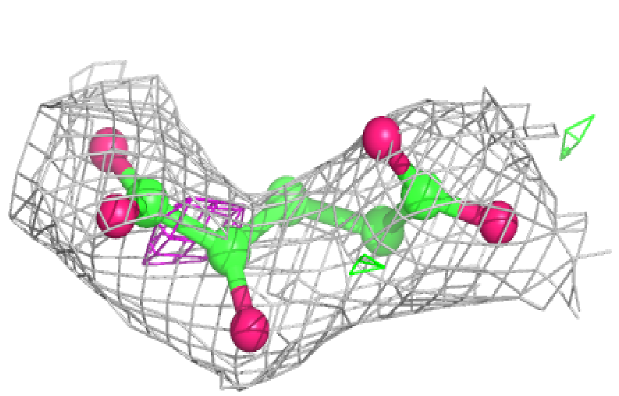


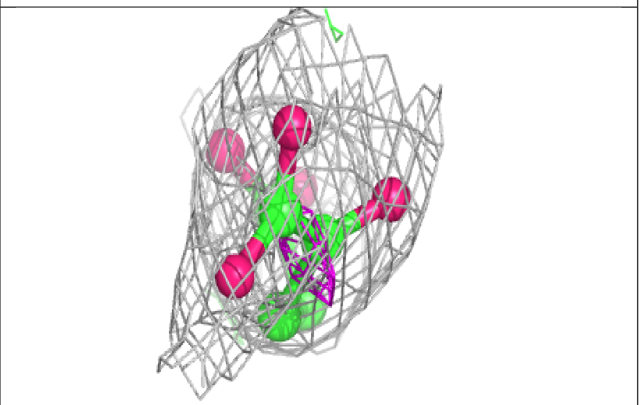


Electron density around AKG C 501:

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

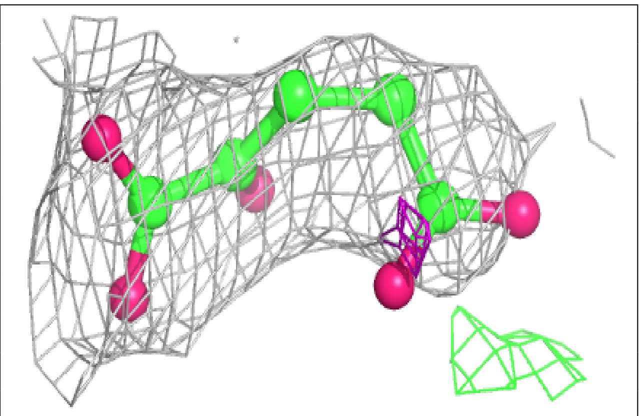


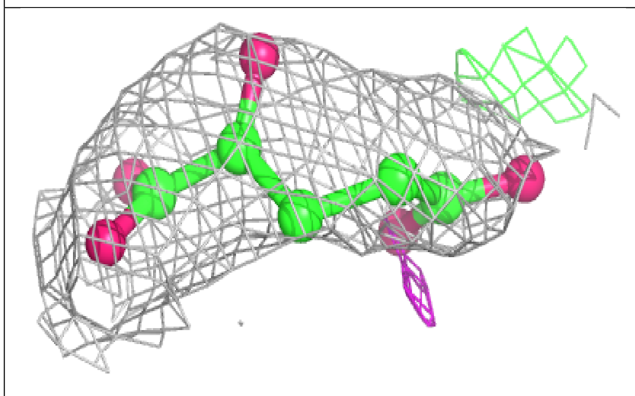


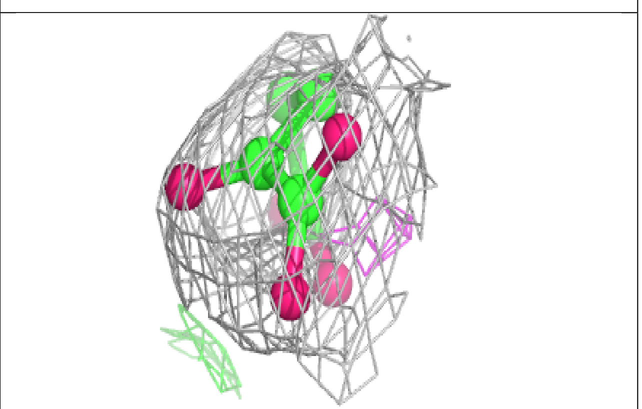


Electron density around AKG L 501:

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

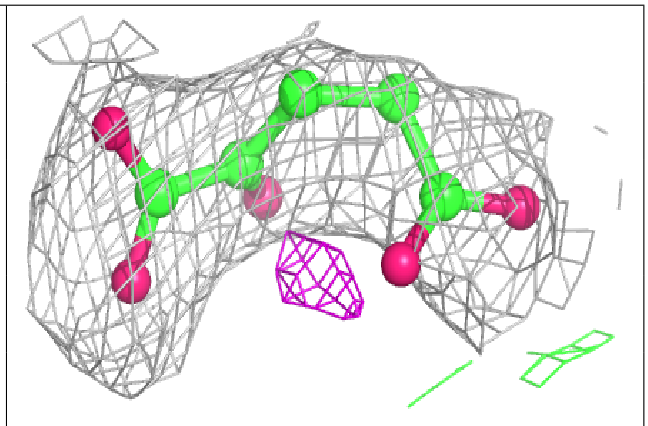


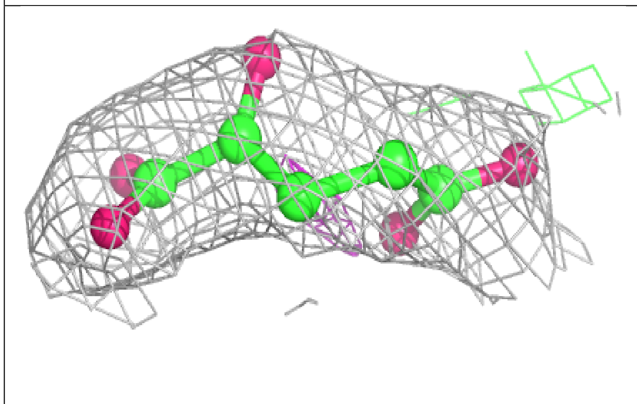


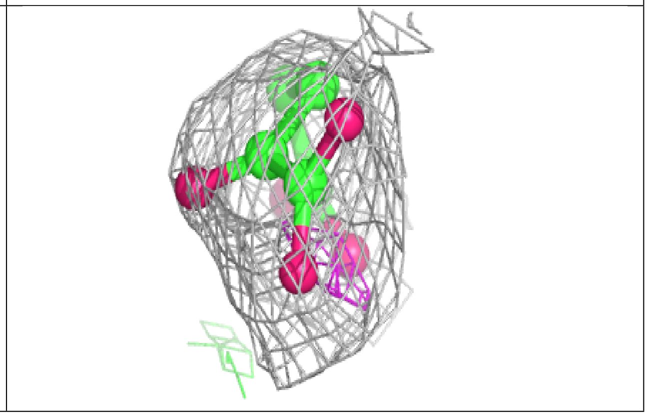


Electron density around AKG Z 503:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

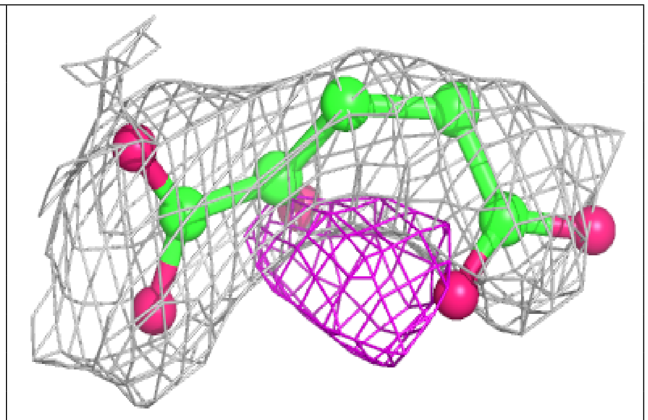


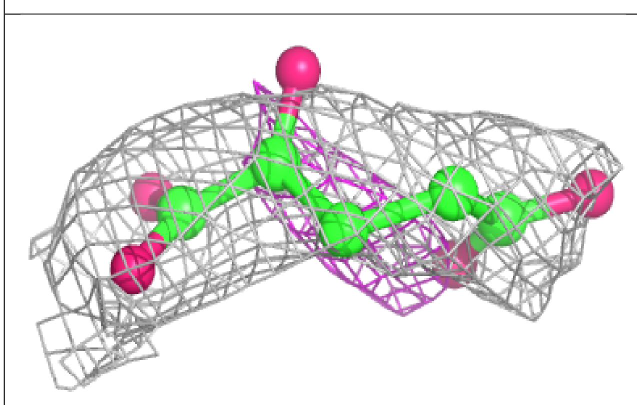


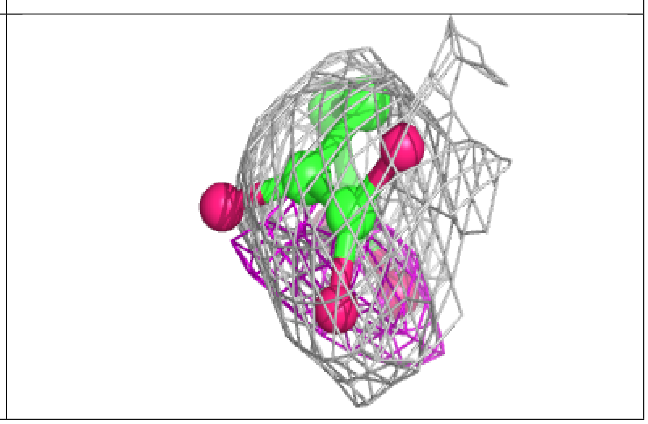


Electron density around AKG D 501:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

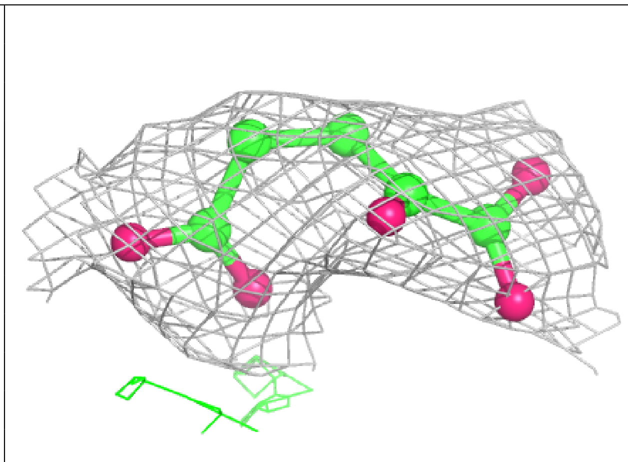


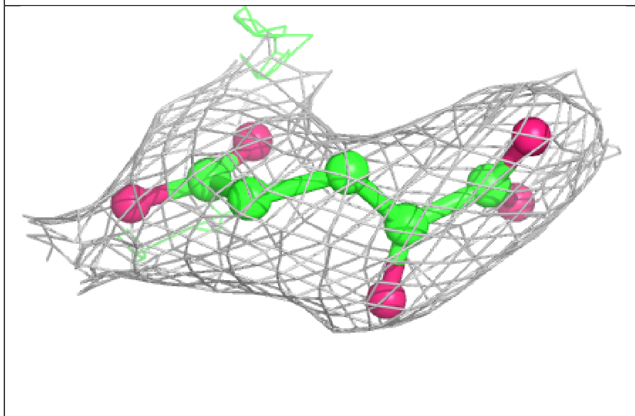


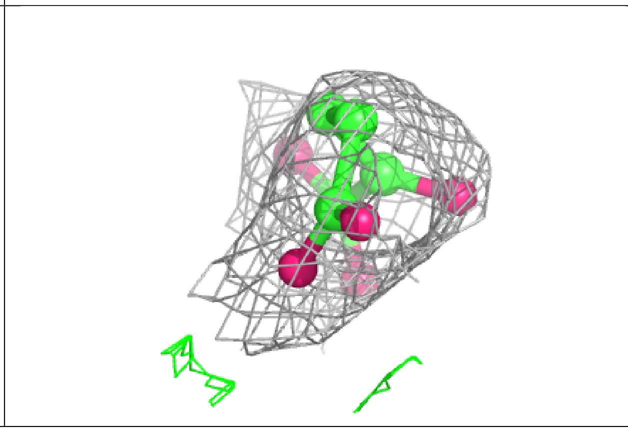


Electron density around AKG E 502:

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

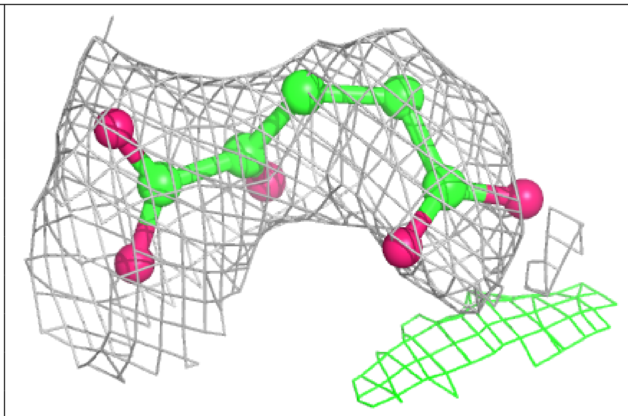


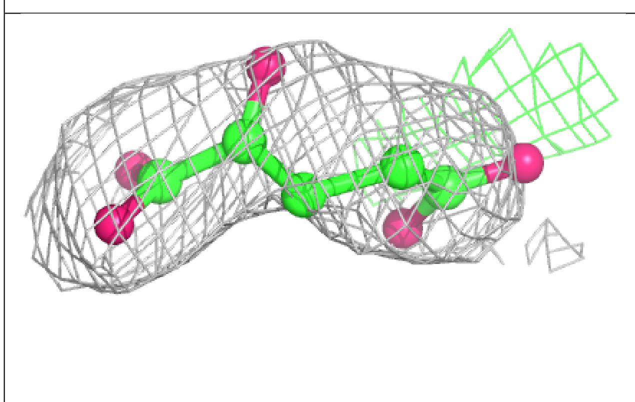


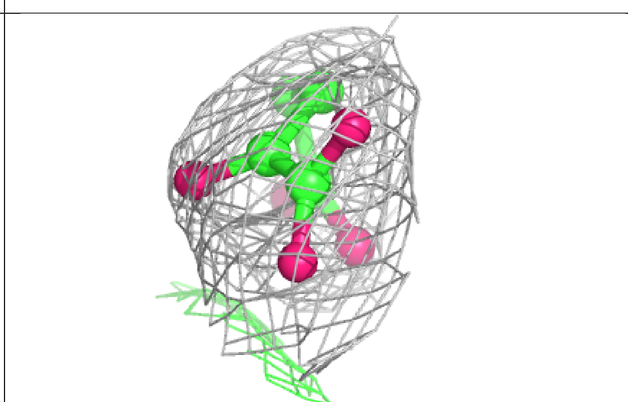


Electron density around AKG F 503:

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

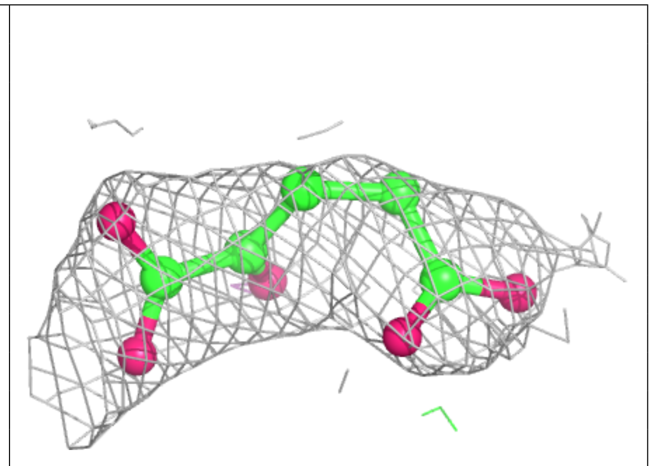


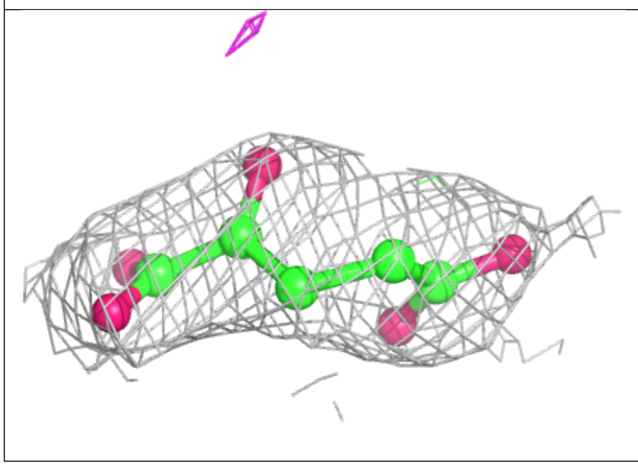


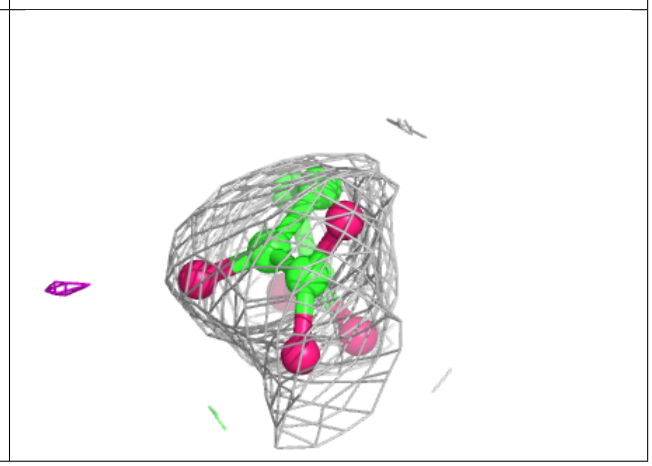


Electron density around AKG K 503:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

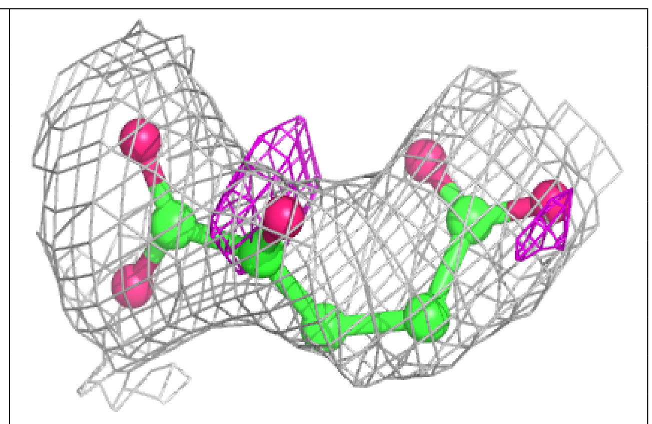


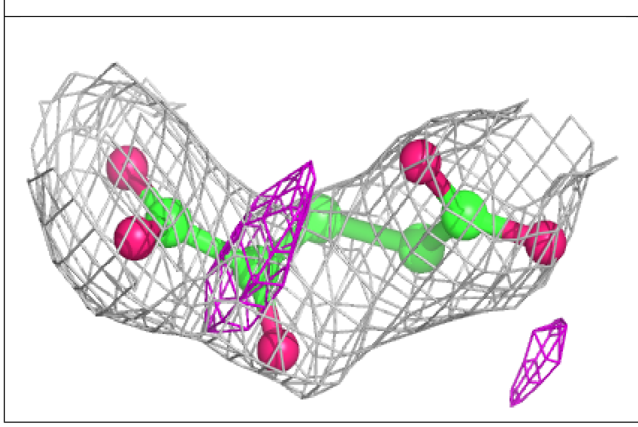


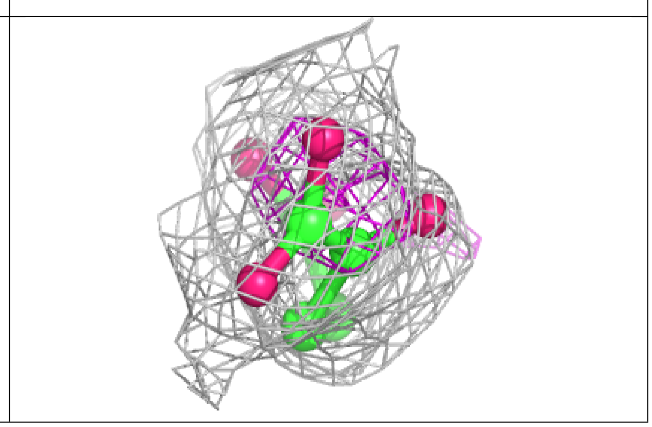


Electron density around AKG S 603:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

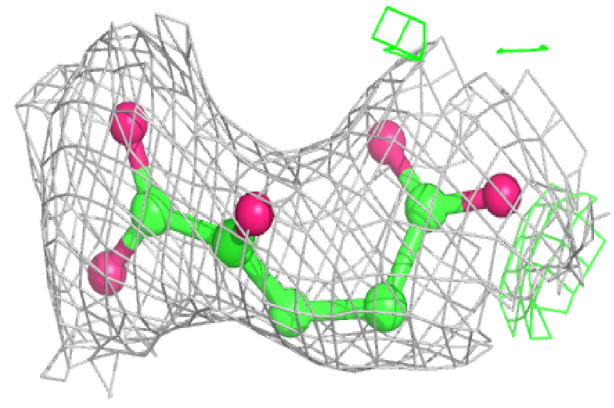


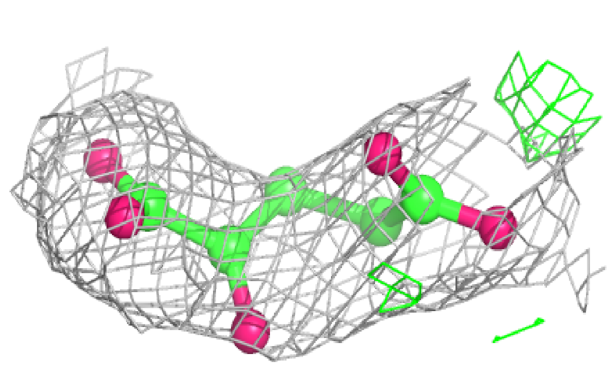


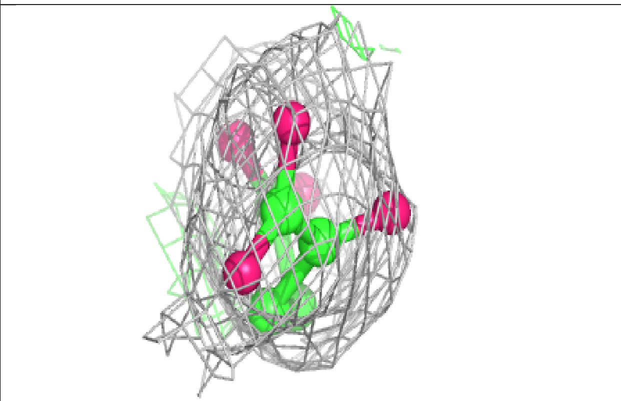


Electron density around AKG V 503:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

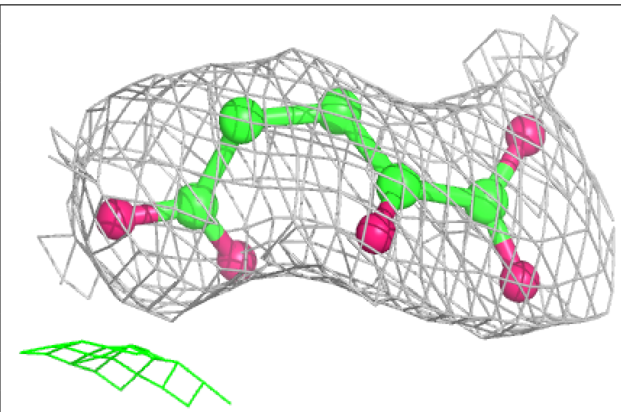


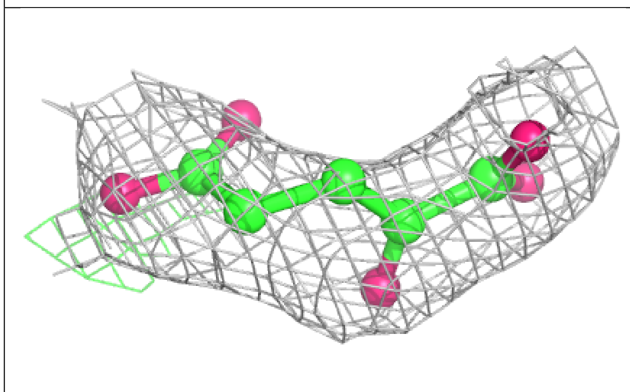


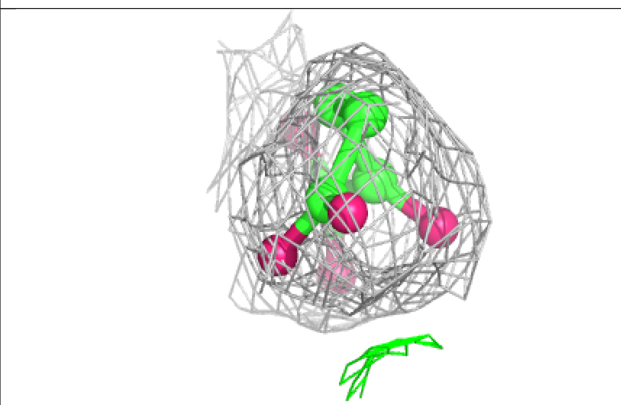


Electron density around AKG X 603:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

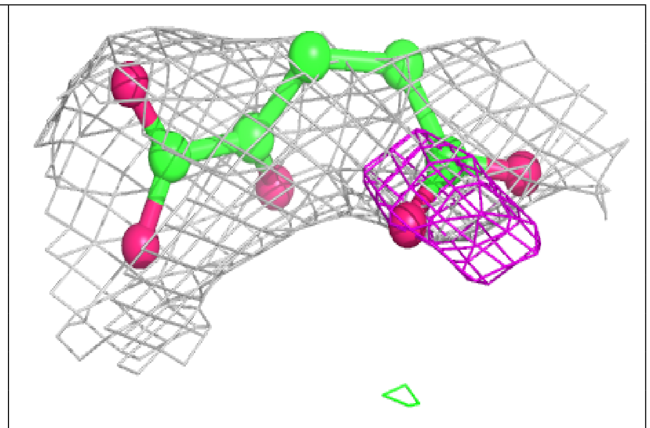


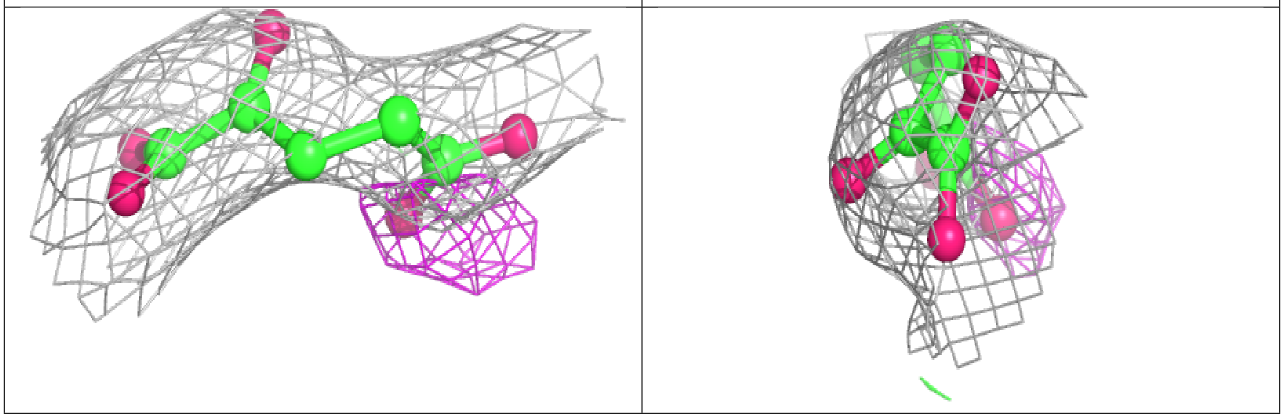




Electron density around AKG A 503:

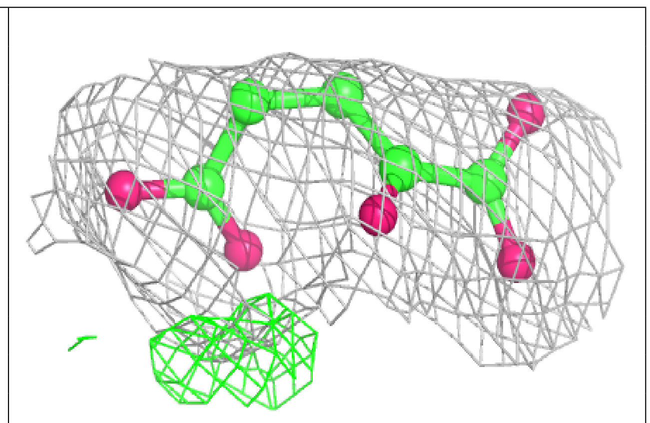
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

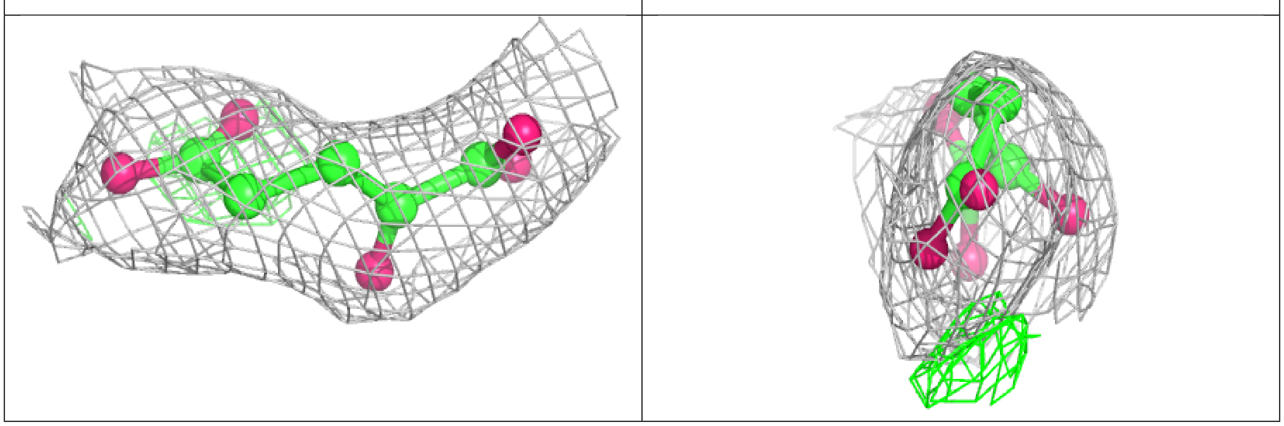




Electron density around AKG H 502:

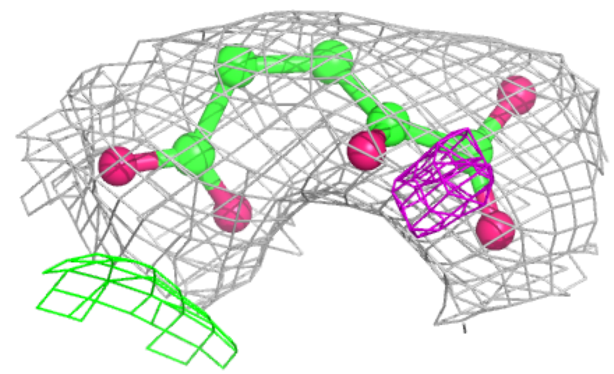
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

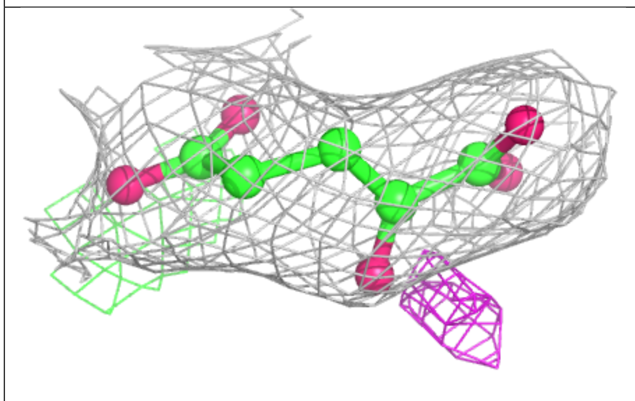


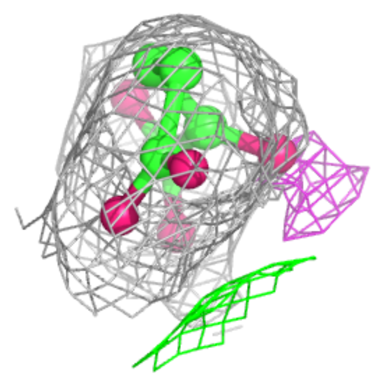


Electron density around AKG b 505:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

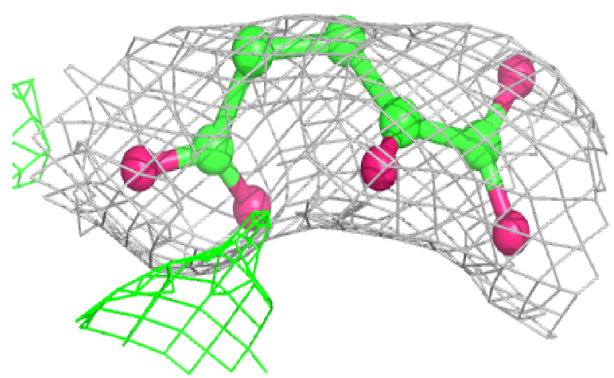


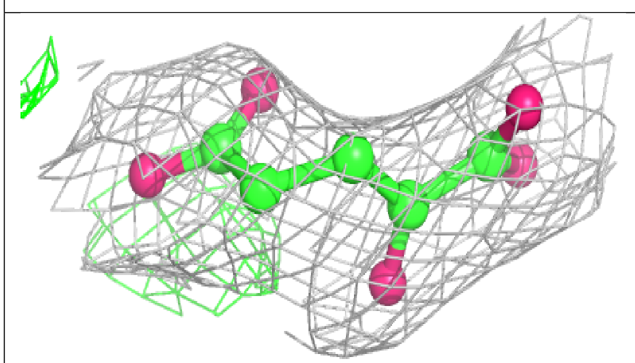


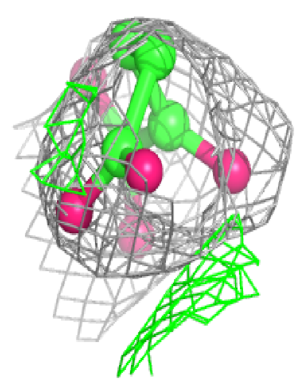


Electron density around AKG B 503:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

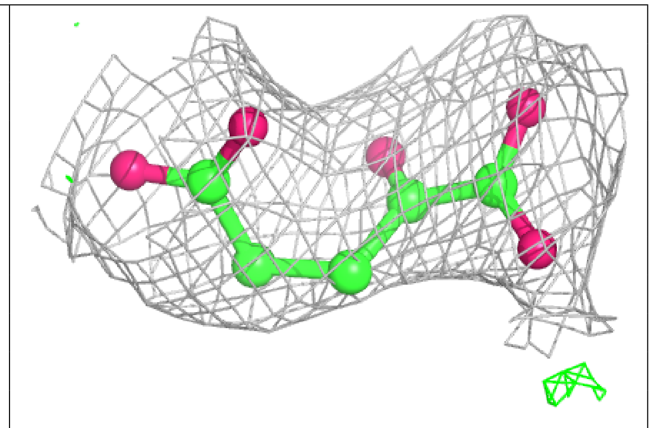


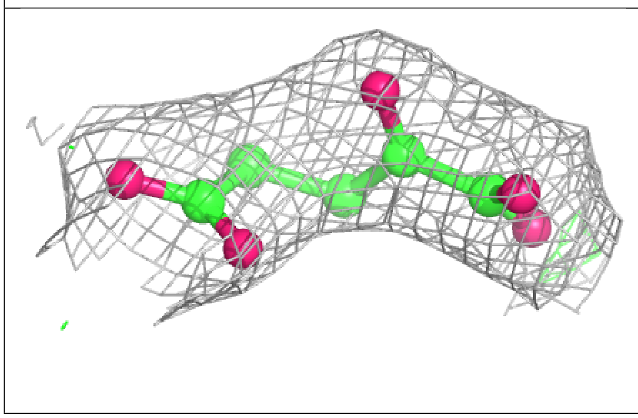


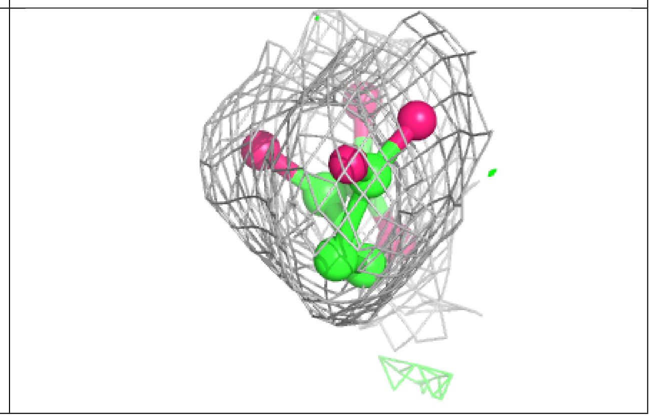


Electron density around AKG P 505:

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

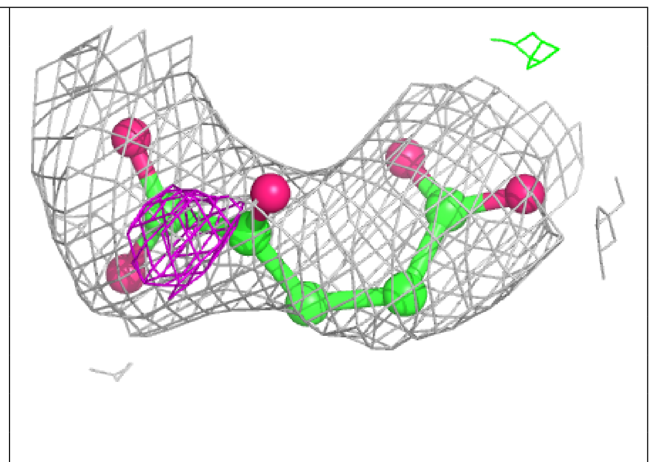


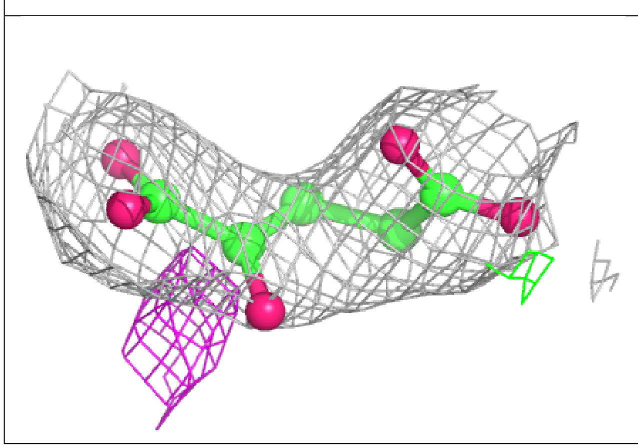


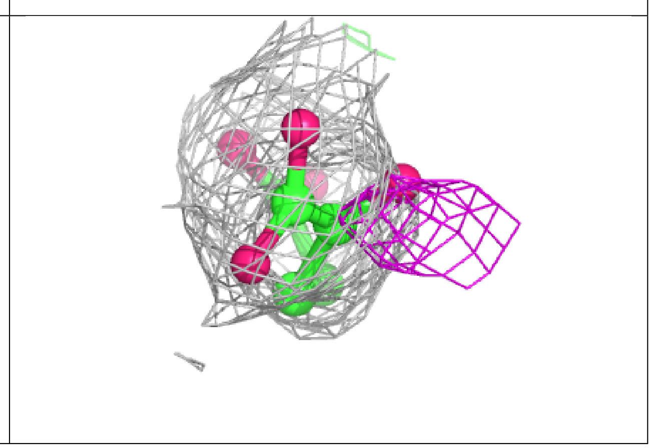


Electron density around AKG Q 503:

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

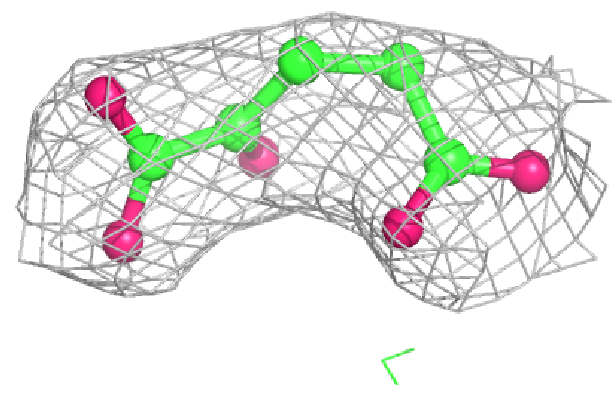


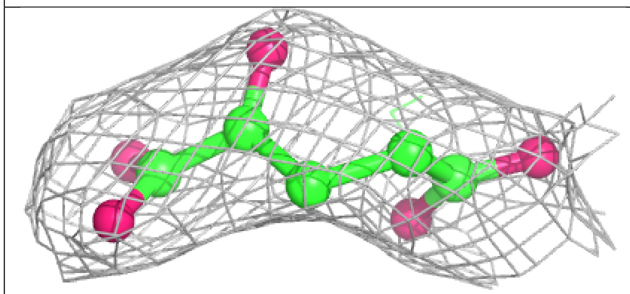


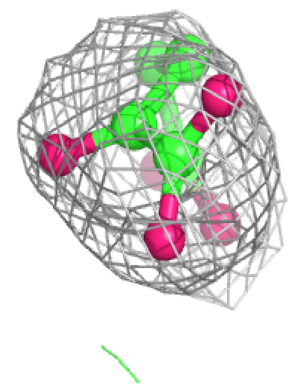


Electron density around AKG T 504:

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

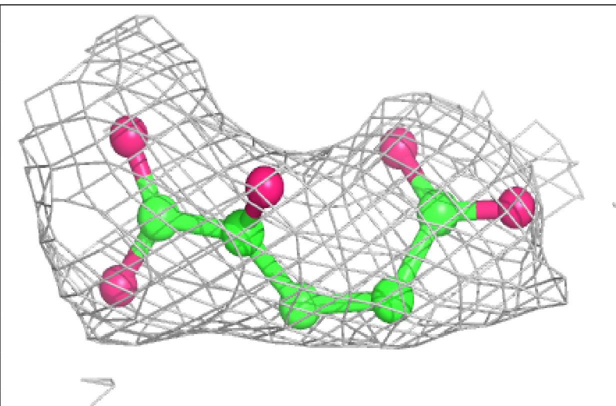


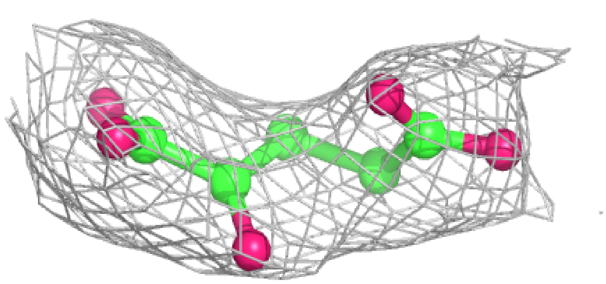


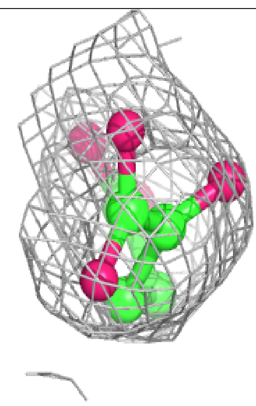


Electron density around AKG Y 604:

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

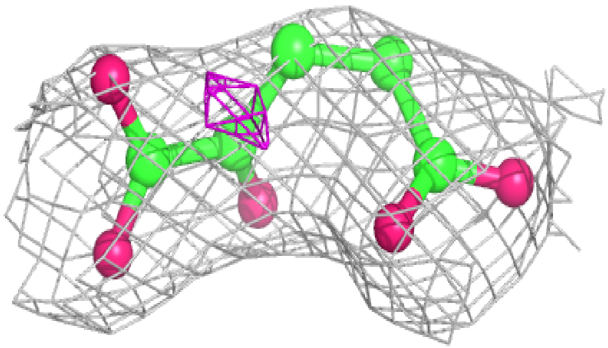


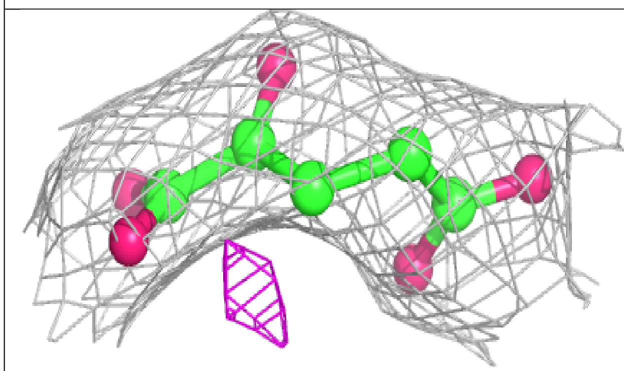


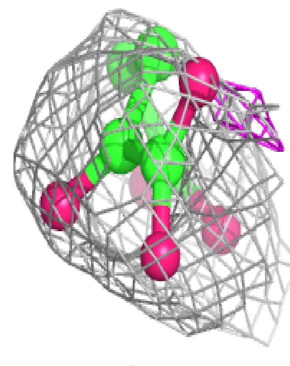


Electron density around AKG a 504:

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

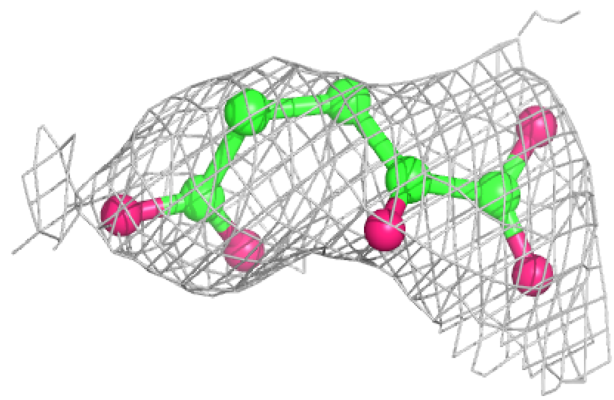


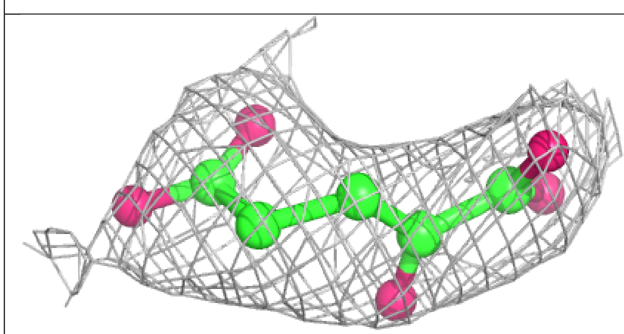


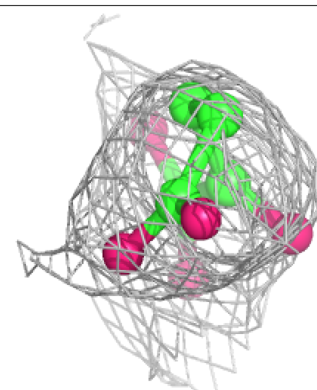


Electron density around AKG J 502:

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

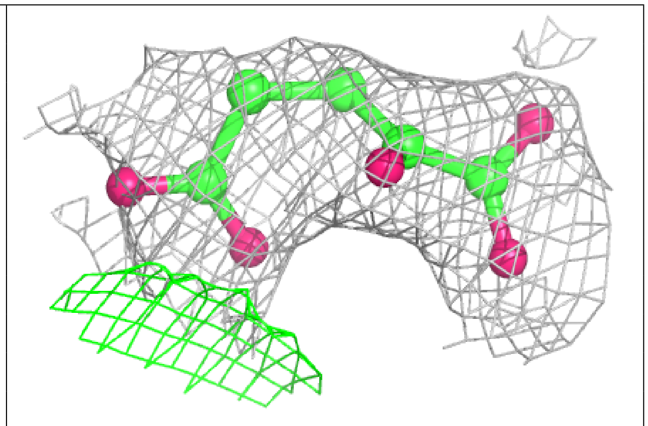


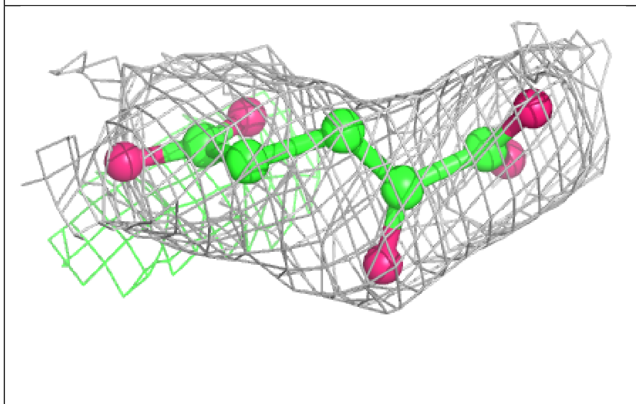


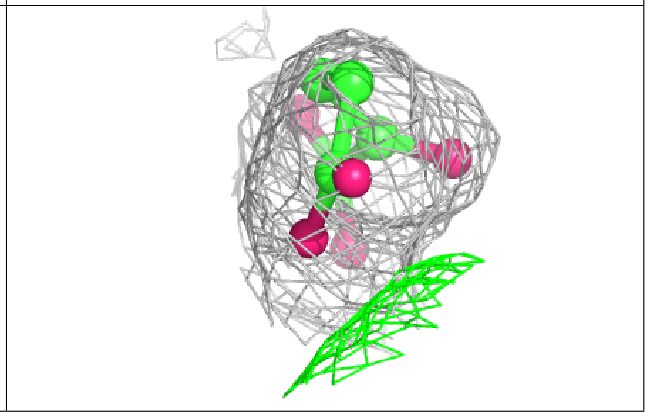


Electron density around AKG c 504:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

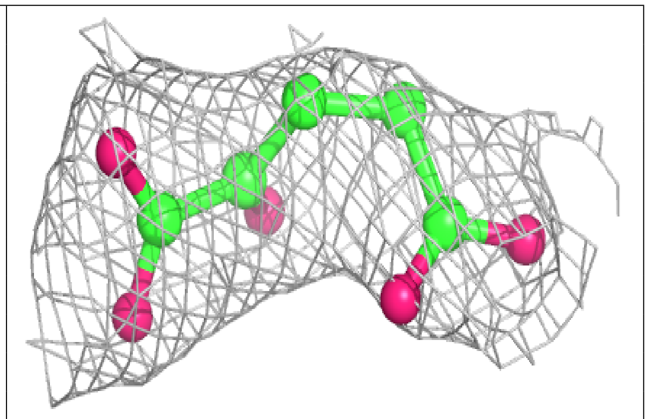


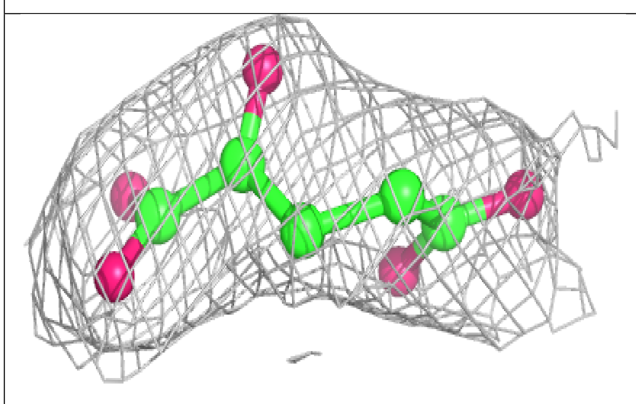


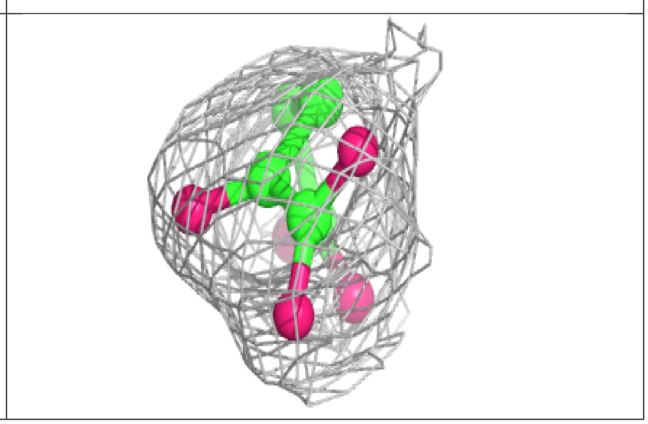


Electron density around AKG U 503:

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

There are no such residues in this entry.