

A Single Site mutation (F429H) Converts the Enzyme CYP 2B4 into a Heme Oxygenase: A QM/MM Study

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Supporting Information

Table of Contents:

1. Computational Details.....	S2-S8
(a) Setup of the system	
(b) Molecular dynamics and topology of benzphetamine	
(c) Substrate docking	
(d) Snapshots details	
(e) The QM region	
(f) The QM/MM region	
(g) QM/MM methodology and software	
(h) Intrinsic Protein Electric Field Calculations	
(i) Full references	
2. Proton delivery mechanism of 2B4 wild (WT) and F429H mutant (MT) type in various snapshots.....	S9-S20
(a) QM and QM/MM relative energies	
(b) Spin density distributions of key intermediates	
(c) Geometries of key intermediates	
3. Cartesian coordinates of the QM region.....	S21-S57

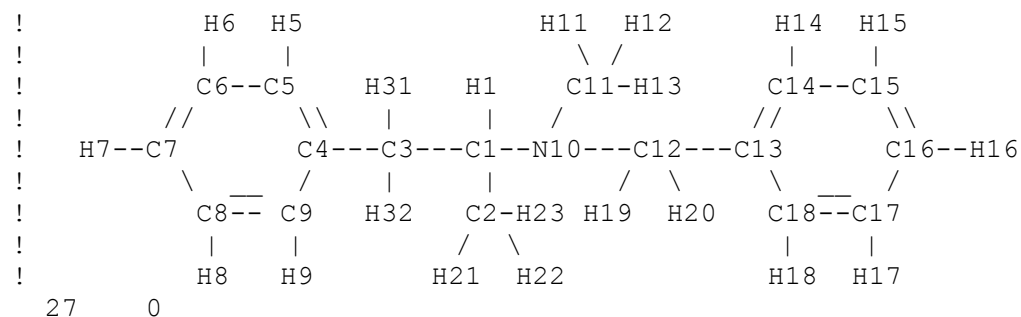
1. Computational Details:

(a) Setup of the system: Following the QM/MM protocols developed in previous studies,¹ the initial structure of CYP 2B4 is taken from the PDB file 1SUO. We first added the missing hydrogen atoms and determined the protonation states for all acidic, basic and His residues using Propka 2.0² and by careful inspection of the environment. All acidic and basic residues were deprotonated. Except His252, all remaining histidines (His226, His285, His335, His354, His269, His397, His412, His429, His231, His284, His319) were singly protonated. Cpd 0 model was built by replacing the inhibitor in 1SUO by O-OH.

After adding the hydrogen atoms, the protein structure was minimized by the adopted Newton Raphson method implemented in CHARMM.³ Benzphetamine was then docked into the protein. Subsequently, a 16Å solvent layer was added to the substrate-free and the substrate-docked CYP 2B4 wild type (WT) proteins. These solvated enzymes were then relaxed¹ by a series of energy minimizations and molecular dynamics of the inner solvent layer with the CHARMM force field⁴ using CHARMM.

(b) Molecular dynamics: Initially we performed a short molecular dynamics (MD) run of 300ps, for the WT protein (with and without substrate) by keeping the coordinates of Cpd 0 and the outer 8Å water layer fixed. To ascertain the substrate conformations, the MD run of the docked substrate 2B4 was extended to 1ns. The single residue replacement of Phe429 to His from these short MD run snapshots did not impart quantitative differences on the O-OH cleavage mechanisms. Hence, we also performed a long time MD simulations, wherein we propagated the trajectory up to 60 ns for both WT and the F429H mutant (MT) enzyme without substrate. Here we started from the 46ps snapshot, of the short MD, and gradually heated the protein from 50K to 298K in a canonical (i.e. NVT) ensemble applying an integration step of 2 fs. The trajectories were relaxed all degrees of freedom using Gromacs⁵ and Gromos96 force field,⁶ we then analyzed two classical trajectories in physiological conditions with the aim to characterize local conformational changes occurring in the WT and MT reaction pocket.

Topology of the benzphetamine substrate: As benzphetamine is not among the predefined residues of the CHARMM library we assigned atom types according to CHARMM conventions, which implicitly define most of the force field terms. The missing parameters assigned from corresponding predefined parameters in CHARMM library.



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RESI RES      0.00000
GROUP
ATOM H6  HP    0.120436      ATOM H20 HA    0.077670
ATOM C1  CT1  0.424968      ATOM C7  CA   -0.134031      ATOM C13 CA    0.028623
ATOM H1  HA    0.033312      ATOM H7  HP    0.122021      ATOM C14 CA   -0.121855
ATOM C2  CT3  -0.539023      ATOM C8  CA   -0.124445      ATOM H14 HP    0.110189
ATOM H21 HA    0.125235      ATOM H8  HP    0.121176      ATOM C15 CA   -0.130338
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ATOM C3  CT2  -0.345261      ATOM N10 NC2 -0.349897      ATOM H16 HP    0.121427
ATOM H31 HA    0.111527      ATOM C11 CT3 -0.229267      ATOM C17 CA   -0.177701
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ATOM C6  CA   -0.118449      ATOM H19 HA    0.139233
BOND N10 C1    N10 C11    N10 C12    C1 H1    C1 C2
BOND C1 C3    C2 H21    C2 H22    C2 H23    C3 H31
BOND C3 H32    C3 C4    C4 C9    C5 H5
BOND C5 C6    C6 H6    C7 H7    C7 C8
BOND C8 H8    C9 H9    C11 H11    C11 H12
BOND C11 H13    C12 H19    C12 H20    C12 C13
BOND C13 C18    C14 H14    C14 C15    C15 H15
BOND C16 H16    C16 C17    C17 H17    C18 H18
DOUBLE C4 C5    C6 C7    C8 C9
DOUBLE C13 C14    C15 C16    C17 C18
IMPH C4 C9 C5 C3    C5 C4 C6 H5    C6 C5 C7 H6
IMPH C7 C6 C8 H7    C8 C7 C9 H8    C9 C4 C8 H9
IMPH C13 C18 C14 C12    C14 C13 C15 H14    C15 C14 C16 H15
IMPH C16 C15 C17 H16    C17 C16 C18 H17    C18 C13 C17 H18
ICC11 N10 C1 C2    1.4599 114.1780 -66.7054 110.6907 1.5245
ICC11 N10 C1 H1    1.4599 114.1780 177.9939 105.1699 1.0955
ICC11 N10 C1 C3    1.4599 114.1780 60.4650 114.9139 1.5446
ICC12 N10 C1 H1    1.4644 113.1008 51.6286 105.1699 1.0955
ICC12 N10 C11 H13  1.4644 109.6850 -177.0580 110.2011 1.0911
ICC1 N10 C11 H11   1.4734 114.1780 172.7082 108.5559 1.0941
ICC1 N10 C11 H12   1.4734 114.1780 -67.3615 113.7243 1.1034
ICC1 N10 C12 C13   1.4734 113.1008 -56.2535 111.9207 1.5066
ICC1 N10 C12 H19   1.4734 113.1008 -175.9631 106.6729 1.0991
ICC1 N10 C12 H20   1.4734 113.1008 67.7559 113.0755 1.1065
ICC3 C1 C2 H23    1.5446 111.3326 63.4023 109.9333 1.0934

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IC N10 C1 C2 H21 1.4734 110.6907 -47.6900 109.7321 1.0931
 IC N10 C1 C2 H22 1.4734 110.6907 73.0695 112.0356 1.0946
 IC N10 C1 C3 C4 1.4734 114.9139 165.6758 111.3702 1.5056
 IC N10 C1 C3 H31 1.4734 114.9139 44.8708 109.5807 1.0981
 IC N10 C1 C3 H32 1.4734 114.9139 -72.3088 109.9556 1.0976
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 IC C1 C3 C4 C9 1.5446 111.3702 -70.3912 119.7435 1.4037
 IC C5 C9 *C4 C3 1.3997 118.5974 178.0201 119.7435 1.5056
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 IC C3 C4 C9 H9 1.5056 119.7435 -2.0891 119.4182 1.0897
 IC C8 C4 *C9 H9 1.3953 120.6934 179.5642 119.4182 1.0897
 IC C4 C5 C6 C7 1.3997 120.8560 0.2478 120.0493 1.3962
 IC C4 C5 C6 H6 1.3997 120.8560 -179.7411 119.7998 1.0872
 IC C7 C5 *C6 H6 1.3962 120.0493 -179.9888 119.7998 1.0872
 IC C5 C6 C7 C8 1.3976 120.0493 -0.1717 119.5998 1.3969
 IC C5 C6 C7 H7 1.3976 120.0493 -179.9595 120.1440 1.0872
 IC C8 C6 *C7 H7 1.3969 119.5998 -179.7878 120.1440 1.0872
 IC C6 C7 C8 C9 1.3962 119.5998 0.1778 120.2030 1.3953
 IC C6 C7 C8 H8 1.3962 119.5998 -179.8605 120.0247 1.0877
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 IC C4 C9 C8 C7 1.4037 120.6934 -0.2588 120.2030 1.3969
 IC N10 C12 C13 C14 1.4644 111.9207 126.8237 121.2254 1.3994
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 IC C14 C18 *C13 C12 1.3994 118.9963 -179.7504 119.7779 1.5066
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 IC C15 C13 *C14 H14 1.3976 120.6655 -179.5833 119.5147 1.0897
 IC C12 C13 C18 C17 1.5066 119.7779 -179.7848 120.4528 1.3940
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 IC C17 C13 *C18 H18 1.3940 120.4528 -178.8222 118.7870 1.0877
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 IC C16 C14 *C15 H15 1.3963 119.9409 179.8385 119.9840 1.0876
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 IC C15 C16 C17 H17 1.3963 119.7274 179.9840 119.9361 1.0881
 IC C18 C16 *C17 H17 1.3940 120.2166 -179.9849 119.9361 1.0881
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PATCHING FIRS NONE LAST NONE

!BONDS

CT1 NC2 235.000 1.4540 ! trimethylamine,

!ANGLES

CT1 NC2 CT3 53.000 110.90 ! trimethylamine, admjr.

CT1 NC2 CT2 53.000 110.90 ! trimethylamine, admjr.

CT3 NC2 CT2 53.000 110.90 ! trimethylamine, admjr.

```

NC2 CT1 HA 51.50 107.50 ! ALLOW ALI POL !arg, (DS)
NC2 CT1 CT3 67.70 107.50 ! ALLOW ALI POL !arg, (DS)
NC2 CT1 CT2 67.70 107.50 ! ALLOW ALI POL !arg, (DS)
NC2 CT2 CA 67.70 107.50 ! ALLOW ALI POL !arg, (DS)
!DIHEDRALS
HA CT1 NC2 CT3 2.2500 2 180.00 ! ALLOW PEP POL ARO
! 9.0->2.25 GUANIDINIUM (KK)
HA CT1 NC2 CT2 2.2500 2 180.00 ! ALLOW PEP POL ARO
! 9.0->2.25 GUANIDINIUM (KK)
CT3 CT1 NC2 CT3 0.0000 6 180.00 ! ALLOW ALI POL
! methylguanidinium, admjr., 3/26/92
CT3 CT1 NC2 CT2 0.0000 6 180.00 ! ALLOW ALI POL
! methylguanidinium, admjr., 3/26/92
CT2 CT1 NC2 CT3 0.0000 6 180.00 ! ALLOW ALI POL
! methylguanidinium, admjr., 3/26/92
CT2 CT1 NC2 CT2 0.0000 6 180.00 ! ALLOW ALI POL
! methylguanidinium, admjr., 3/26/92
!IMPROPER
CA CACA CT2 90.0000 0 0.0000 ! ALLOW HEM
! Heme (6-liganded): substituents (KK 05/13/91)
CA CACA HP 20.0000 0 0.0000 ! ALLOW HEM
end

```

(c) Substrate docking: We used Autodock 4.02^{7a} to dock benzphetamine into (a) the WT enzyme (PDB: 1SUO), and (b) the structures of the WT and F429H mutant snapshots from the long MD. Firstly, the substrate and the protein inputs were prepared using ADT tools.^{7b} A grid of 70X70X66Å³ was then defined with the proximal oxygen of Cpd 0 as the grid centre, and 50 docked substrate conformations were searched based on Lamarckian genetic algorithm⁸ for all the snapshots. All other docking and grid parameters were maintained at their default settings. The substrate conformation with the lowest docked energy in the cluster was chosen for further QM/MM study. In the case of the long MD run-snapshots of LW2 and LM4, the benzphetamine could not be fitted into pocket because of the hindrance of the Arg98/Phe206 residues.

(d) Snapshots details: From the short MD run, we selected three snapshots labeled as S that signifies short MD: (a) Conf S (without the substrate at 46ps), (b) Conf S1 at 93ps, and (c) Conf S2 at 251ps with the substrate in different orientations. These snapshots were used then for the QM/MM study of the WT enzyme. Subsequently, we replaced the Phe429 residue in these snapshots with His and generated the F429H mutated (MT) snapshots.

In the long MD run (60 ns), we used an essential dynamics analysis, taking into account the Cpd0 complex and its protein host environment (Ala298, Gly299, Thr300, Glu301, Thr302; Pro428, Phe429/His in the F429H mutant, Ser430; Cys436, Leu437, Gly438, Glu439). [It is](#)

worth to note that such a technique is largely applied in literature for addressing the mechanical behavior of large and flexible molecular systems in different contexts (see Ref. 6b of the manuscript and the references cited therein). The essential dynamics consists of building the covariance matrix of the atomic positional fluctuations obtained from MD simulations; after its diagonalization, an orthonormal set of eigenvectors then defines a new set of internal (generalized) coordinates along which the fluctuations occur. In particular, the eigenvectors with the largest eigenvalues allow us to define the essential subspace where to search for the relevant conformational transitions. After carrying out essential dynamics analysis, the classical MD trajectories were then projected onto the respective planes defined by the first two essential eigenvectors. In so doing, we find that in the simulated conditions the reactive pocket, modeled in terms of Cpd 0 and its surrounding environment, mainly exhibits either for WT or MT four different conformational basins (see Figure S1). These are labeled as L to signify long MD, W for the WT enzyme and M for the MT, i for the number of the conformational basin.

Looking at the occurrence frequency within the first essential plane we find that the WT enzyme prefers LW3 (most sampled) and LW1 conformations, with the latter resembling the crystallographic structure. Similarly, in the F429H mutant LM3 represents the most recurring conformational rearrangement under physiological condition, and secondly LM1. Interestingly, we have also observed that the less sampled basin, labeled as LM2, spontaneously decays to LM3 and, to a lesser extent, to LM1. This analysis also reveals that LM4 and LW4 conformations always switch to their most sampled (i.e., LM3 and LW3) local counterparts, respectively. We explored without substrate Conf LW1-LW3 for WT, and LM1-LM4 for the MT enzymes and with substrate LW1 and LW3 and LM1-LM3.

(e) The QM region: All the above snapshots were minimized using CHARMM force field in CHARMM before being subjected to subsequent QM/MM study. For the protein delivery pathways Conf S included Cpd 0, the crucial Thr302, Glu301, and three water molecules that may be involved in the proton shuttle. In all other snapshots, we included also the Phe/His429 residues and additional water molecules. For the investigation of electronic structural features of Cpd 0 we considered only the Cpd 0 complex.

(f) The optimized QM/MM region: The MM region that is relaxed during QM/MM geometry optimization comprises of all the residues within 6 Å around Cpd 0 (Arg98, Ile114, Phe115, Trp121, Arg125, Ile179, Leu295, Phe297, Glu301, Thr302, Gln357, Ile363, Val367, Phe429,

Ser430, Arg434, Cys436 (including Cpd 0), Leu437, Glu438, Glu439, Ile441, Ala442, Glu445, and 30 surrounding water molecules). In the substrate containing snapshots, the benzphetamine is also relaxed during optimization.

(g) QM/MM Methodology and software: All QM/MM calculations were performed using ChemShell⁹ interfaced QM part: Turbomole and MM part: DL_POLY(MM part).¹⁰ The electronic embedding scheme¹¹ was used to account for the polarization effect of the QM part induced by the protein environment and to treat QM/MM boundary, we used hydrogen link atoms and the charge shift model.¹² QM subsystem was computed with the unrestricted B3LYP functional with two basis sets; a split valence LACVP basis set (B1) was used for geometry optimization, while the energy was corrected by use of a larger, triple-zeta valence polarized (TZVP) basis set (B2).

(h) Intrinsic Protein Electric Field Calculation: The intrinsic electric field generated by the MM charges of the protein¹³ at any position was computed using the built in feature of ChemShell 3.1. We evaluated the electric field at the location of iron and its surrounding ligand atoms and computed their average in magnitude and direction. The vector is projected on the iron atom. The direction of the electric field defined in the Chemshell is from + to -. This procedure is similar to our earlier published report.¹³

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3. Proton delivery mechanism of 2B4 wild (WT) and F429H mutant (MT) types in various snapshots of the short and long MD runs

Note the small differences in the TS_{OO} barriers for heterolytic cleavage between the **WT** and **MT** enzymes in the snapshots of the short MD.

Table S1. Relative energies (kcal/mol) of 2B4 **WT** and **MT** short MD snapshots at UB3LYP/CHARMM level (B1- LACVP, B2-def-TZVP basis set).^a

Without substrate				
Conf S-WT	QM(B1)	QM/MM(B1)	QM(B2)	QM/MM(B2)
RC	0.0	0.0	0.0	0.0
TS_{OO}	8.7	11.0	11.4	13.8
TShooh	4.3	4.4	6.2	6.3
Cpd I	-15.2	-12.7	-27.5	-25.0
Fe RS	-0.8	1.2	-5.1	-3.1
Conf S-MT	QM(B1)	QM/MM(B1)	QM(B2)	QM/MM(B2)
RC	0.0	0.0	0.0	0.0
TS_{OO}	11.7	11.7	10.7	10.6
Cpd I	-11.2	-9.7	-28.1	-26.6
With substrate				
Conf S1-WT	QM(B1)	QM/MM(B1)	QM(B2)	QM/MM(B2)
RC	0.0	0.0	0.0	0.0
TS_{OO}	13.7	12.2	13.0	11.6
IC1	8.2	5.1	8.4	5.2
Cpd I	-24.2	-19.7	-36.6	-32.0
Conf S1-MT	QM(B1)	QM/MM(B1)	QM(B2)	QM/MM(B2)
RC	0.0	0.0	0.0	0.0
TS_{OO}	13.9	13.4	13.5	12.9
IC1	8.5	6.4	9.2	7.1
Cpd I	-17.7	-14.4	-30.6	-27.3
Conf S2-WT	QM(B1)	QM/MM(B1)	QM(B2)	QM/MM(B2)
RC	0.0	0.0	0.0	0.0
TS_{OO}	12.6	12.6	12.6	12.7
Cpd I	-26.0	-24.5	-39.3	-37.9
Conf S2-MT	QM(B1)	QM/MM(B1)	QM(B2)	QM/MM(B2)
RC	0.0	0.0	0.0	0.0
TS_{OO}	12.1	11.4	13.2	12.5
IC1	2.3	0.9	4.8	3.4
Cpd I	-30.2	-23.3	-40.8	-33.9

^aRC is Cpd 0. TS_{OO} is the O-OH cleavage TS. TShooh is the TS for uncoupling, Fe RS is the resting state. IC1 is an intermediate along the O-OH cleavage coordinate that is observed in some snapshots and has a tiny barrier to collapse to Cpd I. The same terminology is used in other tables.

Note from **Table S2** that the differences in the TS_{OO} barriers for heterolytic cleavage of the WT enzyme are somewhat lower than those in the MT enzyme, during the snapshots of the long MD in the absence of the substrate. But the differences are not sufficiently consistent to suggest a longer living Cpd 0 in the MT.

Table S2. Relative energies (kcal/mol) of 2B4 **WT** and **MT** long MD snapshots in the absence of substrate at UB3LYP /CHARMM level (B1- LACVP, B2-def-TZVP basis set)

Conf LW1	QM(B1)	QM/MM(B1)	QM(B2)	QM/MM(B2)
RC	0.0	0.0	0.0	0.0
TS_{OO}	12.3	12.2	13.1	13.0
Cpd I	-35.7	-33.4	-39.3	-37.0
Conf LW2	QM(B1)	QM/MM(B1)	QM(B2)	QM/MM(B2)
RC	0.0	0.0	0.0	0.0
TS_{OO}	9.7	11.1	9.3	10.7
Cpd I	-31.2	-19.4	-35.5	-23.7
Conf LW3	QM(B1)	QM/MM(B1)	QM(B2)	QM/MM(B2)
RC	0.0	0.0	0.0	0.0
TS_{OO}	13.4	12.1	13.6	12.3
IC1	0.3	4.7	-2.9	1.4
Cpd I	-9.6	-5.2	-19.8	-15.5
RC1	0.0	0.0	0.0	0.0
TShooh	10.5	12.1	13.4	15.1
Fe RS	7.2	9.6	5.5	8.0
Conf LM1	QM(B1)	QM/MM(B1)	QM(B2)	QM/MM(B2)
RC	0.0	0.0	0.0	0.0
TS_{OO}	12.6	15.9	11.8	15.1
Cpd I	-26.6	-9.3	-33.4	-16.0
Conf LM2	QM(B1)	QM/MM(B1)	QM(B2)	QM/MM(B2)
RC	0.0	0.0	0.0	0.0
TS_{OO}	14.5	14.4	16.3	16.3
IC1	12.2	12.4	14.2	14.4
Cpd I	-16.0	-7.1	-27.4	-18.6
Conf LM3	QM(B1)	QM/MM(B1)	QM(B2)	QM/MM(B2)
RC	0.0	0.0	0.0	0.0
TShooh	9.1	9.1	12.4	12.3
Fe RS	8.5	9.0	9.6	10.0
Conf LM4	QM(B1)	QM/MM(B1)	QM(B2)	QM/MM(B2)
RC	0.0	0.0	0.0	0.0
TS_{OO}	17.3	17.3	18.0	18.1
Cpd I	-20.4	-9.2	-24.2	-12.9

Table S3. Mulliken spin density distribution for 2B4 **WT** and **MT** short MD snapshots in the presence and absence of substrate at QM/MM B1 level.

Without substrate		Conf S-WT				Conf S-MT			
Spin	RC	TS ₀₀	TShooh	Cpd I	Fe RS	RC	TS ₀₀	Cpd I	
Fe	1.07	1.54	1.10	1.42	1.20	1.08	1.48	1.41	
Op	0.05	0.10	0.03	0.73	0.01	0.05	0.15	0.74	
OH	0.00	-0.42	0.00	0.01	0.00	0.00	-0.42	0.01	
SH	-0.04	-0.10	-0.05	-0.25	-0.11	-0.04	-0.09	-0.23	
Por	-0.08	-0.12	-0.08	-0.91	-0.10	-0.08	-0.11	-0.93	
Glu301	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Thr302	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
rest	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
With substrate Conf S1-WT					Conf S2-WT				
Spin	RC	TS ₀₀	IC1	Cpd I	RC	TS ₀₀	IC1	Cpd I	
Fe	1.00	1.28	1.35	1.26	1.01	1.27	1.23		
Op	0.09	0.39	0.77	0.86	0.08	0.40	0.89		
OH	0.00	-0.52	-0.77	0.00	0.00	-0.52	0.00		
SH	-0.02	-0.06	-0.10	-0.22	-0.03	-0.06	-0.24		
Por	-0.07	-0.09	-0.26	-0.90	-0.07	-0.08	-0.88		
Glu301	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Thr302	0.00	0.00	0.01	0.00	0.00	-0.01	0.00		
Phe429	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
rest	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
With substrate Conf S1-MT					Conf S2-MT				
Spin	RC	TS ₀₀	IC1	Cpd I	RC	TS ₀₀	IC1	Cpd I	
Fe	1.01	1.34	1.38	1.25	1.01	1.19	1.43	1.19	
Op	0.09	0.42	0.74	0.87	0.09	0.42	0.68	0.93	
OH	0.00	-0.61	-0.86	0.00	0.00	-0.47	-0.99	0.00	
SH	-0.03	-0.07	-0.08	-0.22	-0.03	-0.05	-0.04	-0.23	
Por	-0.07	-0.09	-0.19	-0.90	-0.07	-0.08	-0.09	-0.88	
Glu301	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Thr302	0.00	0.00	0.01	0.00	0.00	-0.01	0.01	0.00	
His429	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
rest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Table S4. Mulliken spin density distribution for 2B4 WT long MD snapshots in the absence of substrate at QM/MM B1 level.

Without substrate		Conf LW1			Conf LW2		
Spin	RC	TS _{OO}	Cpd I		RC	TS _{OO}	Cpd I
Fe	1.19	1.63	1.54		1.07	1.56	1.53
Op	0.02	0.00	0.62		0.01	-0.08	0.61
OH	0.00	-0.41	0.00		0.00	-0.36	0.00
SH	-0.13	-0.11	-0.26		-0.01	-0.03	-0.33
Por	-0.07	-0.12	-0.91		-0.06	-0.09	-0.82
Glu301	0.00	0.00	0.00		0.00	0.00	0.00
Thr302	0.00	0.00	0.00		0.00	0.00	0.00
Phe429	0.00	0.00	0.00		0.00	0.00	0.00
rest	0.00	0.01	0.01		0.00	0.00	0.01

Without substrate		Conf LW3					
Spin	RC	TS _{OO}	IC1	Cpd I	RC1	TShooh	Fe RS
Fe	1.03	1.35	1.21	1.37	1.05	1.11	1.14
Op	0.01	0.13	0.85	0.73	0.01	-0.01	-0.01
OH	0.00	-0.39	0.03	0.01	0.00	0.00	0.00
SH	0.02	-0.01	-0.18	-0.18	0.01	-0.03	-0.05
Por	-0.06	-0.09	-0.90	-0.92	-0.07	-0.08	-0.09
Glu301	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thr302	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe429	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rest	0.00	0.01	0.00	0.00	0.00	0.00	0.00

Table S5. Mulliken spin density distribution for 2B4 MT long MD snapshots in the absence of substrate at QM/MM B1 level.

Without substrate		Conf LM1		Conf LM2			
Spin	RC	TS _{OO}	Cpd I	RC	TS _{OO}	IC1	Cpd I
Fe	1.12	1.67	1.45	1.12	1.81	1.79	1.54
Op	0.03	0.27	0.69	0.03	0.26	0.35	0.60
OH	0.00	-0.61	0.00	0.00	-0.83	-0.98	0.01
SH	-0.08	-0.15	-0.18	-0.08	-0.11	-0.04	-0.21
Por	-0.07	-0.19	-0.96	-0.07	-0.15	-0.13	-0.93
Glu301	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thr302	0.00	-0.01	0.00	0.00	0.01	0.00	-0.01
His429	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rest	0.00	0.02	0.01	0.00	0.02	0.02	0.01
Without substrate		Conf LM3		Conf LM4			
Spin	RC	TShooh	Fe RS	RC	TS _{OO}	Cpd I	
Fe	1.07	1.08	1.09	1.11	1.25	1.37	
Op	-0.02	-0.01	-0.01	0.02	0.28	0.75	
OH	0.01	0.00	0.00	-0.01	-0.39	0.01	
SH	-0.01	-0.02	-0.02	-0.05	-0.06	-0.30	
Por	-0.06	-0.06	-0.06	-0.07	-0.08	-0.82	
Glu301	0.00	0.00	0.00	0.00	0.00	0.00	
Thr302	0.00	0.00	0.00	0.00	0.00	0.00	
His429	0.00	0.00	0.00	0.00	0.00	-0.01	
rest	0.00	0.00	0.00	0.00	0.00	0.00	

Table S6. Mulliken spin density distribution for 2B4 **WT** and **MT** long MD snapshots in the presence of substrate at QM/MM B1 level.

With substrate Conf LW1				Conf LW3			
Spin	RC	TS _{OO}	Cpd I	RC	TS _{OO}	IC1	Cpd I
Fe	1.11	1.53	1.46	1.01	1.48	1.58	1.47
Op	0.04	0.04	0.69	0.04	0.25	0.46	0.65
OH	0.00	-0.39	0.01	0.00	-0.61	-0.87	0.01
SH	-0.08	-0.08	-0.30	0.02	-0.03	-0.04	-0.17
Por	-0.06	-0.11	-0.84	0.07	-0.10	-0.15	-0.95
Glu301	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thr302	0.00	0.00	-0.01	0.00	0.00	0.00	0.00
Phe429	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rest	0.00	0.01	0.00	0.00	0.01	0.01	0.00
With substrate Conf LM2				Conf LM1			
Spin	RC	TS _{OO}	Cpd I	RC	TS _{OO}	I _H	Heme-OH
Fe	1.05	1.54	1.35	1.07	1.58	1.53	1.56
Op	0.07	0.24	0.77	0.05	0.35	0.59	0.57
OH	-0.01	-0.51	0.01	-0.01	-0.61	-0.52	-0.02
SH	-0.06	-0.08	-0.27	-0.06	-0.09	-0.07	-0.07
Por	-0.06	-0.18	-0.85	-0.06	-0.23	-0.54	-1.04
Glu301	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thr302	0.00	-0.01	-0.01	0.00	-0.01	0.01	0.00
His429	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rest	0.00	0.00	0.00	0.00	0.01	0.01	0.00
With substrate Conf LM3							
Spin	RC	TS _{OO}	I _H	Heme-OH			
Fe	1.10	1.50	1.58	1.51			
Op	0.05	0.46	0.54	0.62			
OH	0.00	-0.77	-0.99	-0.02			
SH	-0.08	-0.07	-0.05	-0.09			
Por	-0.06	-0.13	-0.14	-1.04			
Glu301	0.00	0.00	0.00	0.00			
Thr302	0.00	0.01	0.01	0.00			
His 429	0.00	0.00	0.00	0.00			
rest	0.00	0.01	0.01	0.01			

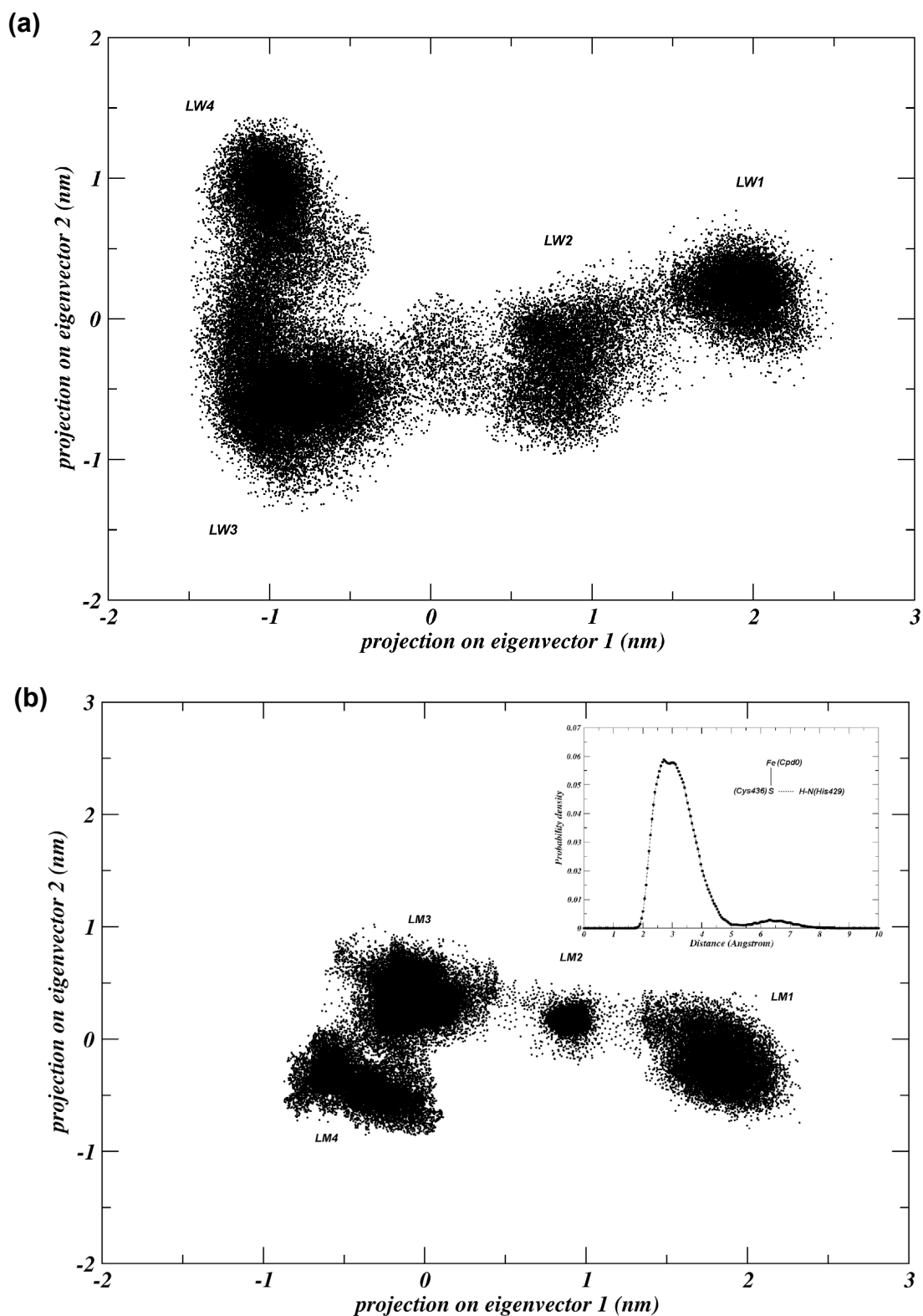


Figure S1. Projection of the trajectory of the active site residues and Cpd 0 species onto the essential plane as obtained from the diagonalization of the related covariance matrix extracted from the 60 ns MD sampling of (a) WT and (b) MT enzymes in physiological conditions (i.e. wet CYP 2B4 enzymes at 298 K).

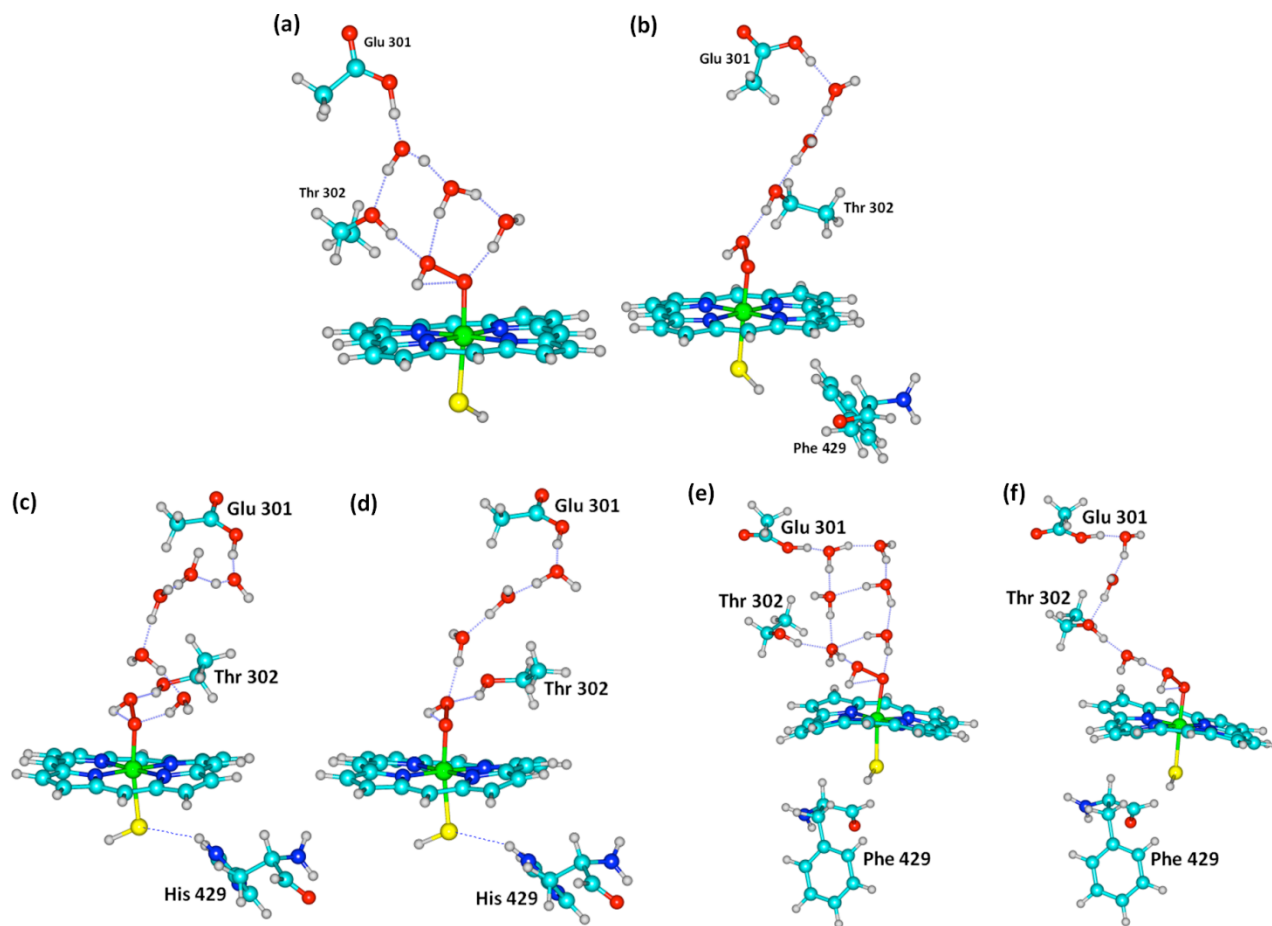


Figure S2. Water cluster arrangement of 2B4 **WT** and **MT** snapshots in Conf S (a), Conf S1 (b), Conf LM2 (c), Conf LM2 with substrate (d), Conf LW3 (e) and Conf LW3 with substrate (f). Only the QM region is shown. Note that water structure of the active site in the presence of substrate prefers the protonation of the distal OH group. On the other hand in the absence of the substrate, waters are close also to the proximal oxygen, thus prepared for uncoupling and H₂O₂ production.

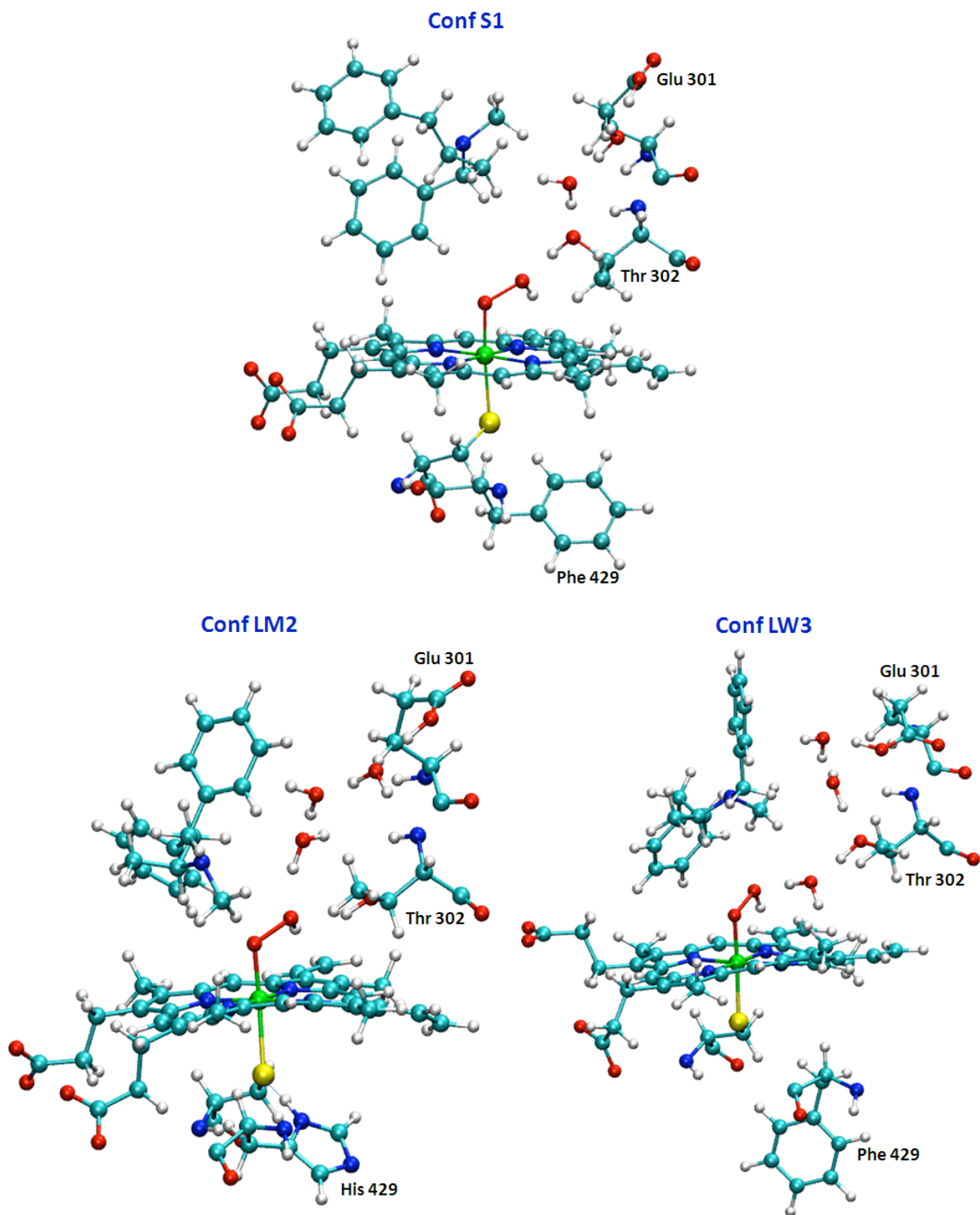


Figure S3. Benzphetamine in the active site region of WT and MT 2B4 enzymes

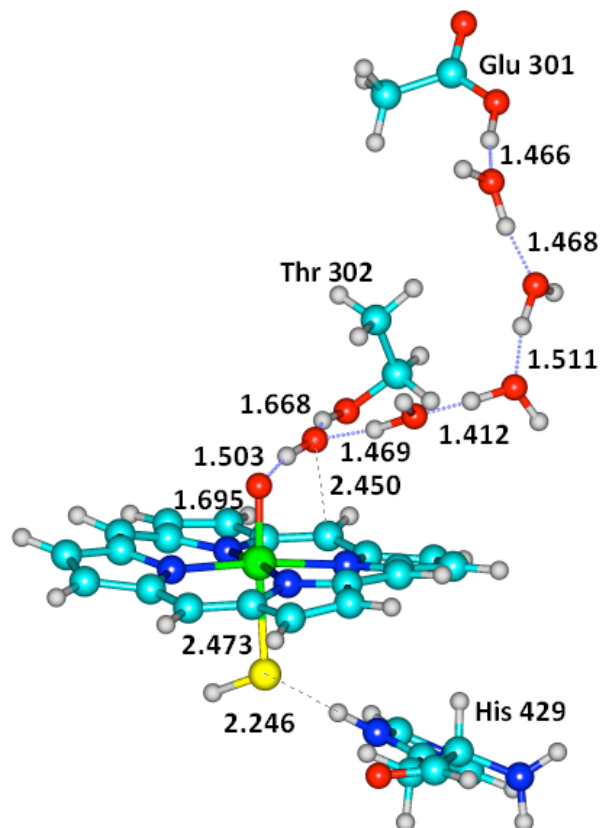


Figure S4. Key bond distances (in Å) in the I_H LM1 of 2B4 enzyme at (UB3LYP/B1/CHARMM) level. Only the QM region is shown. The spin density of the nascent OH is -0.52 (See Table S6).

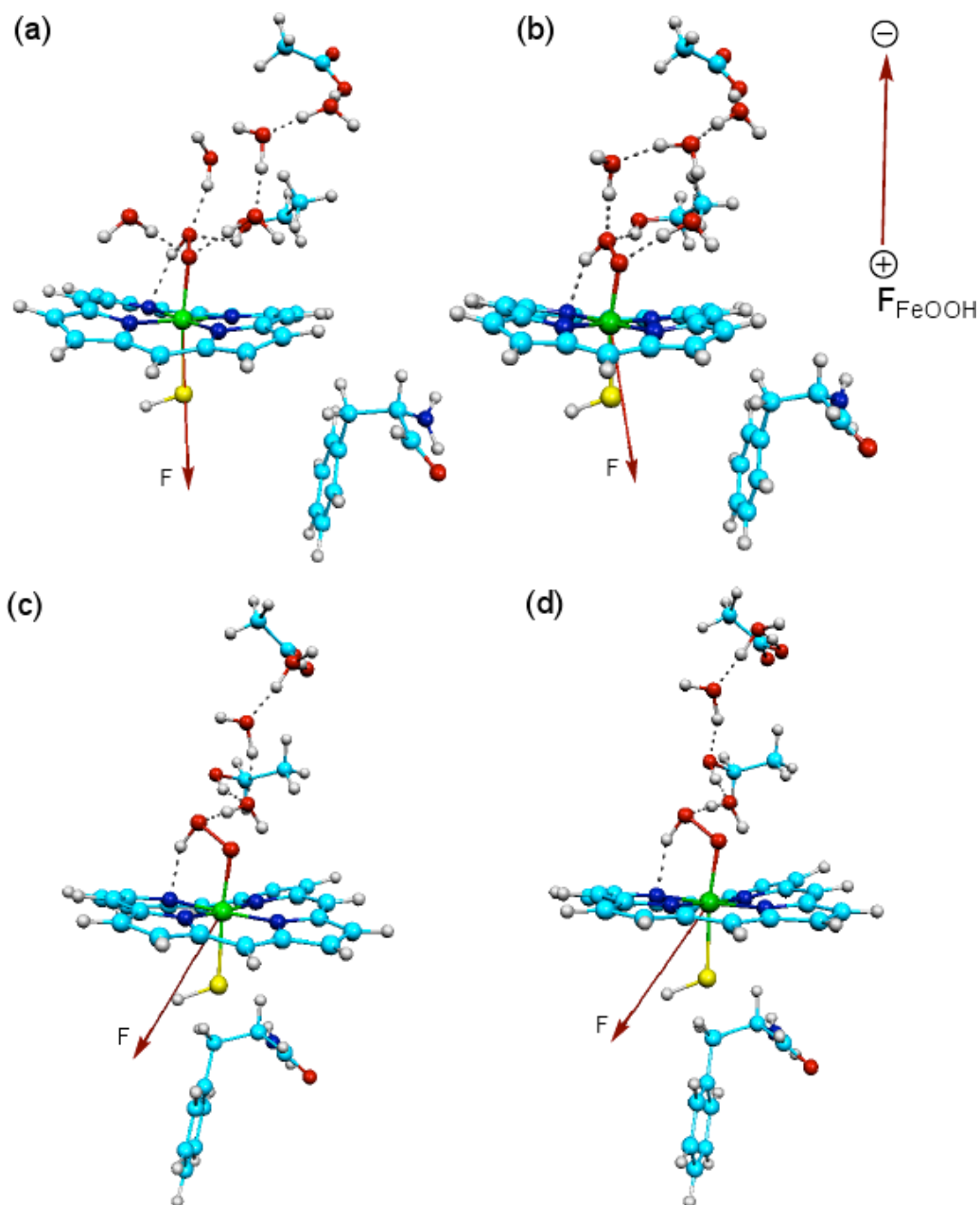


Figure S5: The protein electrical field closest to S-Fe-OOH axis, in various CYP 2B4 WT snapshots Conf LW1 (a), Conf LW1 with substrate (b) Conf LW3 (c), Conf LW3 with substrate (d). The conventional direction of electric field is also represented. In all WT cases the negative pole is away from the FeOOH moiety.

Figure S6 shows the intrinsic electric field vector for the mutant conformations LM1-LM3. It is apparent that in LM1 and LM3, in the presence of substrate the intrinsic field switches direction: Now, the negative pole is pointing towards OOH group. This will retard the electron flow from the heme to the nascent OH radical and will retard the PCET step thus preferring meso hydroxylation by the $\text{OH}\cdot$. Note also, that in the unimportant LM2 conformation this change does not occur.

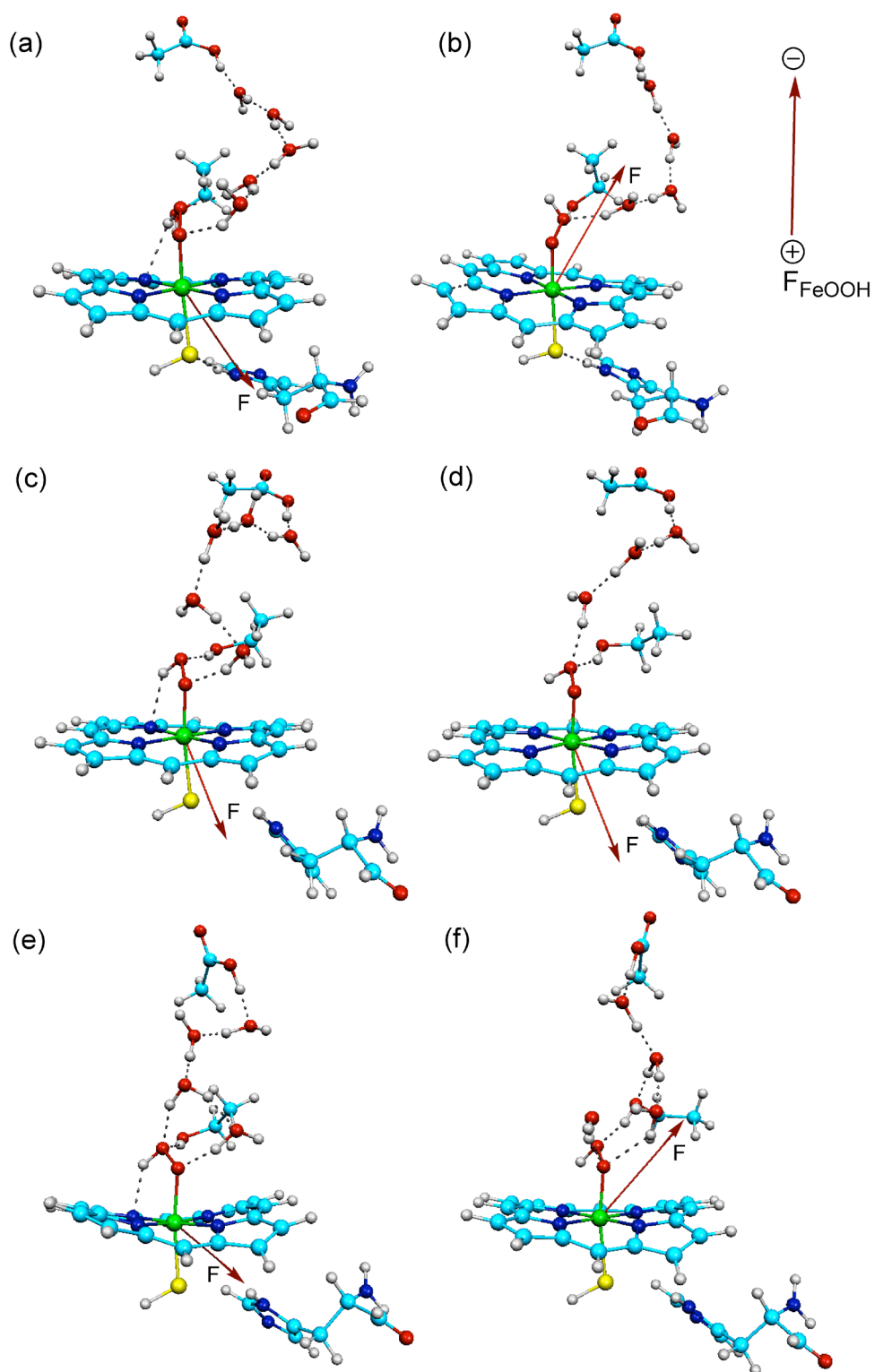


Figure S6: The protein electrical field or its component closest to S-Fe-OOH axis, various CYP 2B4 MT snapshots Conf LM1 (a), Conf LM1 with substrate (b) Conf LM2 (c), Conf LM2 with substrate (d) Conf LM3 (e), Conf LM3 with substrate (f) are shown. The conventional direction of electric field is also represented.

3. Cartesian coordinates of the QM region

Conf LW1-²Cpd 0

N -2.444071 -8.312338 -0.168943
H -3.121662 -8.975618 0.163945
C -1.238758 -8.090481 0.605464
H -0.521548 -7.504482 0.005819
C -1.480462 -7.224346 1.914967
H -0.659771 -7.404929 2.623602
H -1.405090 -6.171583 1.628351
C -2.814726 -7.448584 2.581778
C -3.022739 -8.485235 3.506489
H -2.203992 -9.156853 3.749876
C -4.264134 -8.639510 4.134325
H -4.412883 -9.427158 4.865232
C -5.318223 -7.772339 3.828753
H -6.281687 -7.891958 4.310734
C -3.882637 -6.587131 2.279792
H -3.736242 -5.776979 1.572572
C -5.127081 -6.753946 2.890468
H -5.941401 -6.090057 2.628187
C -0.516815 -9.423802 0.895946
O -1.091453 -10.520290 0.742846
S -0.525713 -3.521057 5.371785
H 0.710267 0.540111 3.012833
O 1.900858 -0.978020 2.787590
O 1.184481 0.230626 2.204047
FE 0.814790 -1.972236 4.018546
N 1.697958 -3.655402 3.371063
N -0.642160 -2.118653 2.654233
N -0.037362 -0.256954 4.707838
N 2.259818 -1.832288 5.401821
C 2.639945 -4.436083 4.018741
C 2.975266 -5.604638 3.197365
C 2.254867 -5.472316 2.029243
C 1.408849 -4.286189 2.180585
C -0.652656 -2.999008 1.595355
C -1.888631 -2.845348 0.822192
C -2.625031 -1.839642 1.423876
C -1.818792 -1.395617 2.580302
C -1.318709 0.206212 4.428983
C -1.595748 1.414254 5.198796
C -0.451781 1.709933 5.925739
C 0.509232 0.637286 5.621462
C 2.553819 -0.700530 6.143820
C 3.687015 -0.961639 7.028296
C 3.999115 -2.298658 6.883334
C 3.136708 -2.823369 5.826782
C 3.251404 -4.071048 5.215910
H 3.935603 -4.787465 5.654796
C 0.355373 -3.931832 1.333892
H 0.256251 -4.518532 0.425612
C -2.133864 -0.349515 3.448067
H -3.083976 0.141473 3.283278

C 1.766707 0.449403 6.198477
H 2.139866 1.233747 6.849956
h -0.776239 -2.941534 6.598870
h 3.690351 -6.381588 3.467677
h 2.273034 -6.068681 1.117056
h -2.123636 -3.489959 -0.024753
h -3.561130 -1.352539 1.150898
h -2.531822 1.968760 5.132811
h -0.205400 2.523180 6.608375
h 4.167769 -0.192298 7.632495
h 4.705659 -2.874248 7.481296
h -2.609597 -7.898878 -1.064278
h 0.530028 -9.355143 1.191703

Conf LW1-⁴Cpd 0

N -2.447651 -8.310790 -0.167305
H -3.126748 -8.973462 0.163892
C -1.244379 -8.091925 0.610768
H -0.526984 -7.501710 0.015628
C -1.490758 -7.231485 1.922356
H -0.663498 -7.401937 2.625791
H -1.430363 -6.177924 1.635065
C -2.817287 -7.469188 2.600109
C -3.001265 -8.488433 3.548903
H -2.170199 -9.141875 3.799875
C -4.232231 -8.643475 4.196731
H -4.359244 -9.413224 4.950545
C -5.301627 -7.797576 3.885038
H -6.256418 -7.918142 4.384028
C -3.900627 -6.629467 2.292418
H -3.773369 -5.832409 1.566952
C -5.135386 -6.798622 2.921388
H -5.959582 -6.148935 2.654357
C -0.520729 -9.425325 0.896860
O -1.093531 -10.521802 0.738037
S -0.656760 -3.602097 5.422810
H 0.815671 0.594816 2.924464
O 2.019534 -0.890658 2.559509
O 1.247967 0.330406 2.081087
FE 0.860315 -1.991161 3.993917
N 1.728568 -3.677663 3.332650
N -0.595127 -2.137120 2.617298
N 0.045174 -0.244037 4.658306
N 2.307147 -1.842932 5.365951
C 2.665721 -4.459024 3.987597
C 2.992326 -5.630929 3.172953
C 2.272459 -5.501798 2.002216
C 1.433972 -4.313303 2.143677
C -0.623901 -3.024821 1.565870
C -1.868728 -2.870279 0.810067
C -2.590015 -1.853328 1.412165
C -1.763965 -1.400260 2.550354

C -1.229187 0.229943 4.367491
C -1.490622 1.451281 5.118672
C -0.341599 1.743815 5.842385
C 0.602445 0.655072 5.559522
C 2.620032 -0.708602 6.100601
C 3.745183 -0.984590 6.985258
C 4.030155 -2.330020 6.854761
C 3.167091 -2.847332 5.797643
C 3.273040 -4.096477 5.188006
H 3.947742 -4.816824 5.633900
C 0.378418 -3.962556 1.299762
H 0.271096 -4.555064 0.396507
C -2.056295 -0.333933 3.400499
H -2.995962 0.173592 3.227459
C 1.856186 0.455089 6.141828
H 2.242671 1.240098 6.783857
h -0.871667 -3.017605 6.654285
h 3.702335 -6.410197 3.449892
h 2.285888 -6.104934 1.094410
h -2.121652 -3.521685 -0.026453
h -3.531518 -1.369966 1.151397
h -2.423750 2.010610 5.051665
h -0.081620 2.564562 6.510854
h 4.237935 -0.222164 7.588556
h 4.723122 -2.911805 7.462535
h -2.610525 -7.898537 -1.063681
h 0.525552 -9.356991 1.194673

Conf LM1-²Cpd 0

N -3.781801 -5.025591 4.007525
H -4.564263 -5.044218 4.655731
C -2.503266 -4.470957 4.495931
H -1.864613 -4.214314 3.637387
C -2.759745 -3.167121 5.306089
H -3.221571 -3.463763 6.257325
H -1.777527 -2.774659 5.579575
N -3.116729 -0.743317 4.718386
H -2.128146 -0.498439 4.875186
C -3.582130 -2.055004 4.713979
C -4.136103 0.087993 4.341671
H -4.020776 1.155150 4.250949
N -5.253779 -0.606460 4.099266
C -4.903438 -1.941384 4.318568
H -5.594111 -2.719280 4.076547
C -1.687157 -5.441241 5.416828
O -1.103349 -4.973796 6.415871
S 0.093084 -0.637594 5.235126
H 2.080538 0.967852 0.963473
O 2.914017 -0.514137 1.948548
O 2.535804 0.158916 0.635166
FE 1.605812 -0.400823 3.323203
N 1.881895 -2.353109 3.645904

N	-0.030236	-0.758376	2.142599	O	-1.088369	-4.967750	6.403878	O	0.353193	1.189199	-1.873611
N	1.315527	1.606694	3.011894	S	0.008345	-0.657297	5.327678	H	0.554963	0.822983	-0.969176
N	3.164476	-0.006074	4.504160	H	2.312476	0.893390	0.670895	C	-1.818964	0.146895	-2.437339
C	2.677844	-2.954943	4.610853	O	3.164787	-0.490668	1.794663	H	-1.391497	-0.294791	-3.345054
C	2.499629	-4.409934	4.560427	O	2.762915	0.057265	0.426084	H	-2.887918	0.326535	-2.603836
C	1.634796	-4.667505	3.523595	FE	1.603676	-0.380058	3.246597	H	-1.739121	-0.574236	-1.621018
C	1.219658	-3.370866	2.993855	N	1.880261	-2.343528	3.572584	S	-1.010929	-0.924642	5.076340
C	-0.461795	-2.010209	1.760858	N	-0.012966	-0.757380	2.069629	H	1.100222	1.166635	1.465517
C	-1.742517	-1.918446	1.066155	N	1.323398	1.619681	2.954873	O	1.543336	-0.744887	1.579056
C	-2.097850	-0.581642	1.020476	N	3.170367	0.023770	4.434330	O	1.379144	0.549121	0.746176
C	-1.011485	0.136561	1.715046	C	2.673928	-2.931466	4.548974	FE	0.434073	-0.873923	3.167615
C	0.176768	2.194998	2.484153	C	2.496522	-4.387153	4.515201	N	0.428774	-2.863031	2.807438
C	0.304035	3.644772	2.492992	C	1.637297	-4.658353	3.475963	N	-1.224070	-0.598039	2.017011
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C	4.929337	1.113745	5.530749	C	-2.097725	-0.580788	0.988441	C	0.980145	-5.131899	2.703468
C	4.923565	-0.182030	6.008229	C	-1.005488	0.138701	1.664559	C	-0.152557	-4.955620	1.943001
C	3.840607	-0.885401	5.335039	C	0.177622	2.199454	2.437330	C	-0.494547	-3.535859	2.024574
C	3.565620	-2.253604	5.418747	C	0.295172	3.648938	2.452575	C	-1.939510	-1.600794	1.390028
H	4.156334	-2.832816	6.121009	C	1.540725	3.958182	2.988597	C	-3.096937	-1.040898	0.685501
C	0.185154	-3.200230	2.079883	C	2.172406	2.674016	3.317965	C	-3.079244	0.327350	0.900444
H	-0.218221	-4.107168	1.645135	C	3.819787	1.244646	4.529415	C	-1.896989	0.580569	1.754839
C	-0.911446	1.502538	1.948570	C	4.937422	1.135140	5.458712	C	-0.440351	2.092196	3.123733
H	-1.752461	2.126193	1.696297	C	4.913999	-0.156479	5.952518	C	-0.137420	3.389073	3.718689
C	3.374114	2.420587	4.030479	C	3.834232	-0.857687	5.274004	C	0.981350	3.222437	4.520953
H	4.059964	3.247270	4.151431	C	3.554268	-2.224802	5.359981	C	1.359504	1.802722	4.399413
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h	5.544974	-0.605775	6.797126	h	2.925594	-5.096939	5.222425	C	-1.515436	1.815805	2.280538
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h	-1.675361	-6.510855	5.207418	h	-2.285969	-2.792348	0.667154	C	2.396800	1.165596	5.083316
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				h	5.613983	1.955791	5.697172	H	2.927323	0.686031	-0.427929
				h	5.526937	-0.576994	6.749727	O	3.405816	-1.938220	0.173106
				h	-3.852470	-5.641662	3.222166	H	3.206802	-2.859036	-0.061915
				h	-1.678674	-6.506440	5.207518	H	2.710699	-1.571485	0.811021
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								h	-0.715302	-5.688827	1.365254
								h	-3.774105	-1.658707	0.095738
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								h	-0.735763	4.279662	3.526587
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Conf LM1-4Cpd 0			
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WT Conf S -RC			
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Conf S -TSoo

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Conf S -TShooH

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Conf S -Cpdl

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Conf S –Fe RS

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h 1.507841 3.938446 5.199349
h 4.455738 -0.179570 6.576240

h 4.388549 -2.880960 6.153991
h 2.186747 3.771580 -5.343770
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MT Conf S –RC

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H -2.865456 0.377625 -2.455493
H -1.660524 -0.529686 -1.550926
S -1.204592 -0.998757 5.011104
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H -2.258615 -3.597489 0.838505
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H -2.143431 2.689625 2.034369
C 2.346785 1.156542 5.141156
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H 3.581659 -0.832407 -0.699792
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O	3.321342	-2.063487	0.280107	C	3.722693	-0.808722	5.956685	N	1.932387	-1.238391	4.681167
H	3.084197	-2.984851	0.086544	C	3.697230	-2.166520	5.712658	C	1.234995	-3.863770	3.415244
H	2.653219	-1.646349	0.918783	C	2.615785	-2.384980	4.749764	C	0.924320	-5.146632	2.804529
O	2.476787	0.758045	-3.151951	C	2.281200	-3.602553	4.179073	C	-0.197166	-4.956143	2.027560
H	1.540221	0.963277	-2.844514	H	2.864731	-4.462993	4.480889	C	-0.551481	-3.549648	2.150251
H	3.051074	0.443543	-2.287069	C	-1.623191	-2.944832	1.361530	C	-1.914191	-1.580040	1.449840
h	-1.460889	-2.293583	5.413700	H	-2.274342	-3.623358	0.822125	C	-3.022118	-0.979006	0.707381
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h	-3.787909	-1.605379	0.076932	C	2.337689	1.144323	5.135172	C	-0.361007	2.047193	3.261092
h	-3.746382	1.172726	0.579142	H	2.971039	1.768968	5.757449	C	-0.037983	3.359606	3.815522
h	-0.703899	4.310951	3.499375	O	3.496662	0.210623	-1.016729	C	1.031204	3.179429	4.674787
h	1.543841	3.926628	5.151099	H	3.618431	-0.737790	-0.692551	C	1.314761	1.733966	4.660346
h	4.418283	-0.227995	6.593334	H	2.869544	0.616961	-0.345036	C	2.619379	-0.275476	5.396951
h	4.362859	-2.920256	6.143025	O	3.316982	-1.995923	0.314464	C	3.722095	-0.872281	6.138945
h	2.232280	3.662456	-4.970124	H	3.020933	-2.889789	0.073871	C	3.706303	-2.224194	5.854049
h	-1.188006	2.283762	-2.695170	H	2.663815	-1.585394	0.960549	C	2.598310	-2.431921	4.930475

Conf S -TSoo

C	1.899198	3.013054	-5.796328
H	1.567198	3.636646	-6.631111
H	1.031741	2.445048	-5.435656
C	2.944130	2.036131	-6.322124
O	3.362615	2.191110	-7.515375
O	3.321429	1.057592	-5.536483
H	2.830400	0.889982	-4.147470
C	-1.056463	1.518497	-1.970508
H	-1.411738	1.906132	-1.009667
O	0.382092	1.275673	-1.833758
H	0.625408	0.973026	-0.899815
C	-1.786782	0.230219	-2.357819
H	-1.404206	-0.165553	-3.306424
H	-2.866938	0.389496	-2.457732
H	-1.640479	-0.522792	-1.580838
S	-1.184796	-1.010144	5.007882
H	1.189526	1.317452	1.305615
O	1.513268	-0.751577	1.804896
O	1.436339	0.736605	0.553913
FE	0.414926	-0.861736	3.129448
N	0.365519	-2.870104	2.807475
N	-1.237939	-0.598790	1.991012
N	0.431125	1.113225	3.585424
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C	0.945619	-5.125762	2.674014
C	-0.175099	-4.946689	1.893418
C	-0.531597	-3.534788	1.989340
C	-1.956053	-1.595010	1.349699
C	-3.113202	-1.022255	0.657488
C	-3.092402	0.342675	0.890167
C	-1.906789	0.585038	1.739116
C	-0.465326	2.073953	3.131578
C	-0.136202	3.382293	3.690336
C	0.973122	3.210724	4.502664
C	1.314365	1.777325	4.432838
C	2.651625	-0.210181	5.157751

Conf S -CpdI

C	1.850863	3.226362	-6.106360
H	1.608990	3.980126	-6.863632
H	0.924022	2.699580	-5.844445
C	2.807613	2.213129	-6.737690
O	3.318216	2.491750	-7.878786
O	2.996913	1.089510	-6.111730
H	2.708806	0.787877	-4.451826
C	-1.063543	1.463138	-2.138107
H	-1.342246	1.823264	-1.139438
O	0.339425	1.110259	-2.126910
H	0.769549	1.172124	-1.194416
C	-1.896611	0.237230	-2.534407
H	-1.585885	-0.133434	-3.518105
H	-2.973019	0.448692	-2.565524
H	-1.734361	-0.557042	-1.801774
S	-1.372000	-0.992170	5.102220
H	1.556509	0.655980	0.795507
O	1.555067	-0.695087	2.068142
O	1.673612	1.248428	0.021793
FE	0.453278	-0.900757	3.302556
N	0.331477	-2.893802	2.991238
N	-1.173655	-0.609062	2.105537
N	0.446241	1.070024	3.800741

WT-Conf S1 -RC

C	2.855527	3.380949	-5.250311
H	2.048109	2.661831	-5.100134
H	3.786079	2.794764	-5.256956
C	2.733215	4.034702	-6.611606
O	3.097912	5.184936	-6.921188
O	2.226623	3.225098	-7.574440
H	1.729053	2.380684	-7.241154
C	-0.866901	1.609147	-2.031624
H	-1.167262	1.981077	-1.047245

O	0.566237	1.257462	-1.962764	H	-2.060636	2.821584	1.928242	H	-8.920658	-2.144240	3.916259
H	0.807049	0.892633	-1.053771	C	2.437552	1.237072	5.004325	C	-3.268423	-6.274156	4.105193
C	-1.678155	0.375213	-2.435529	H	3.085259	1.851029	5.624658	O	-2.414894	-5.975328	4.963613
H	-1.325869	-0.017861	-3.396330	O	0.833346	1.190596	-6.765519	S	-1.020476	-0.820760	5.028323
H	-2.748811	0.593959	-2.514542	H	0.956664	0.850653	-5.808638	H	0.785594	1.333159	1.065253
H	-1.563700	-0.397368	-1.671966	H	0.854299	0.488403	-7.441632	O	1.472456	-0.661358	1.675309
N	-5.169558	-5.639488	2.547888	O	1.257796	0.419121	-4.333307	O	1.308200	0.809814	0.417308
H	-6.055130	-5.949745	2.924640	H	1.008331	0.774044	-3.405334	Fe	0.463573	-0.739886	3.066089
C	-4.140273	-5.135485	3.476138	H	1.886991	-0.316579	-4.221688	N	0.397617	-2.760810	2.748693
H	-3.453340	-4.452454	2.956248	h	-1.349919	-2.104838	5.391952	N	-1.205667	-0.459469	1.963923
C	-4.825685	-4.326759	4.625436	h	1.466974	-5.963859	2.803262	N	0.492431	1.229748	3.548760
H	-4.022907	-4.004579	5.296248	h	-0.748333	-5.546359	1.223991	N	2.090996	-1.081726	4.308125
H	-5.458002	-5.012756	5.203533	h	-3.743811	-1.460368	-0.031088	C	1.276250	-3.735467	3.198532
C	-5.655825	-3.150547	4.152133	h	-3.623165	1.328461	0.392351	C	0.920300	-5.036160	2.634541
C	-5.047084	-2.005586	3.606210	h	-0.771416	4.364185	3.644580	C	-0.193617	-4.833708	1.852091
H	-3.965142	-1.943699	3.530045	h	1.571135	3.979424	5.159539	C	-0.520702	-3.410352	1.948479
C	-5.822831	-0.925292	3.169034	h	4.593176	-0.142580	6.331203	C	-1.925243	-1.445398	1.317642
H	-5.327639	-0.059334	2.742108	h	4.467496	-2.846372	5.931768	C	-3.049577	-0.854511	0.585516
C	-7.219996	-0.968617	3.276868	h	-5.087079	-5.625941	1.551402	C	-2.989552	0.514925	0.781468
H	-7.821307	-0.121927	2.954858	h	-3.480988	-7.287028	3.766030	C	-1.830723	0.737157	1.674831
C	-7.058568	-3.182252	4.255221	h	2.900602	4.030986	-4.376533	C	-0.416103	2.192267	3.138152
H	-7.541732	-4.053963	4.690571	h	-0.941965	2.419769	-2.756416	C	-0.116474	3.478870	3.765847
C	-7.837490	-2.101025	3.822647					C	1.015319	3.295477	4.542931
H	-8.918254	-2.139982	3.917887					C	1.379079	1.871002	4.403296
C	-3.267785	-6.273356	4.105265	Conf S1 –TSoo				C	2.784212	-0.114879	5.005369
O	-2.414973	-5.974938	4.964482	C	2.866219	3.377042	-5.250016	C	3.883872	-0.719363	5.762986
S	-1.018476	-0.817408	5.021796	H	2.074263	2.640790	-5.098096	C	3.829236	-2.077343	5.530749
H	0.948151	1.279545	1.316281	H	3.809046	2.810203	-5.261401	C	2.710812	-2.287018	4.607102
O	1.468788	-0.629755	1.497984	C	2.733387	4.028570	-6.610949	C	2.328438	-3.510776	4.077136
O	1.220178	0.622935	0.635813	O	3.098764	5.179098	-6.921660	H	2.904351	-4.377820	4.377594
Fe	0.436805	-0.757047	3.073345	O	2.227291	3.218760	-7.571768	C	-1.611627	-2.802241	1.334998
N	0.411377	-2.758266	2.720184	H	1.725331	2.370507	-7.243136	H	-2.276954	-3.472863	0.803766
N	-1.226202	-0.458790	1.958274	C	-0.860960	1.600583	-2.086036	C	-1.444156	1.958622	2.226909
N	0.496272	1.244010	3.500275	H	-1.130815	1.963653	-1.088659	H	-2.025776	2.821867	1.931105
N	2.096999	-1.083049	4.266933	O	0.559650	1.224422	-2.063102	C	2.446578	1.233657	5.035466
C	1.287088	-3.735431	3.168538	H	0.849452	0.915373	-1.125651	H	3.102633	1.850979	5.642832
C	0.924215	-5.038125	2.612227	C	-1.705203	0.384837	-2.478543	O	0.837745	1.185870	-6.801350
C	-0.192573	-4.834439	1.834209	H	-1.389405	-0.002700	-3.453992	H	0.953496	0.825685	-5.845905
C	-0.515553	-3.408359	1.928707	H	-2.774908	0.618394	-2.519775	H	0.855389	0.499480	-7.493709
C	-1.938270	-1.445810	1.309056	H	-1.573056	-0.398669	-1.728970	O	1.220516	0.374471	-4.398415
C	-3.063600	-0.859496	0.572511	N	-5.170206	-5.639279	2.547931	H	0.974899	0.743897	-3.465776
C	-3.011369	0.510161	0.772034	H	-6.055650	-5.950702	2.924073	H	1.829485	-0.376799	-4.279885
C	-1.854669	0.735682	1.668479	C	-4.141743	-5.136254	3.477110	h	-1.362581	-2.104377	5.402004
C	-0.428722	2.205074	3.111316	H	-3.455230	-4.451815	2.958646	h	1.466069	-5.960843	2.822060
C	-0.132947	3.486867	3.748202	C	-4.827820	-4.329416	4.627487	h	-0.744699	-5.544113	1.235894
C	1.001187	3.301856	4.523828	H	-4.025244	-4.008210	5.299067	h	-3.736228	-1.452741	-0.013398
C	1.373325	1.881127	4.369264	H	-5.460087	-5.016474	5.204289	h	-3.598073	1.335355	0.401121
C	2.778747	-0.111839	4.972364	C	-5.657902	-3.152510	4.155857	h	-0.752444	4.357706	3.659759
C	3.873854	-0.711777	5.742427	C	-5.049001	-2.005264	3.614866	h	1.587777	3.976679	5.172473
C	3.829179	-2.070200	5.509660	H	-3.966879	-1.942120	3.541915	h	4.611572	-0.152851	6.344004
C	2.720409	-2.284705	4.575083	C	-5.824660	-0.924459	3.178810	h	4.466842	-2.856751	5.947941
C	2.341612	-3.510272	4.046028	H	-5.329482	-0.056354	2.756133	h	-5.087258	-5.625886	1.551481
H	2.917019	-4.376911	4.349564	C	-7.222071	-0.969527	3.282774	h	-3.481655	-7.287771	3.765806
C	-1.612472	-2.801797	1.322312	H	-7.823476	-0.122787	2.961260	h	2.905937	4.027333	-4.376168
H	-2.277571	-3.475051	0.793602	C	-7.060885	-3.185697	4.255569	h	-0.944502	2.424947	-2.794210
C	-1.469034	1.961795	2.215636	H	-7.544337	-4.059011	4.687289				
				C	-7.839713	-2.104008	3.824026				

Conf S1 –IC1

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H 1.852481 2.745935 -5.243428
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Conf S1 –Cpdl

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MT-Conf S1 –RC

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Conf S1 –TSoo

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Conf S1 –IC1

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Conf S1 –CpdI

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WT-Conf S2 -RC-

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Conf S2 -TSoo

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Conf S2 -Cpd1

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MT-Conf S2 -RC

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C	1.277900	1.851044	4.524641	N	-4.666079	-1.936101	3.809638	h	4.416913	-0.184907	6.587333
C	2.631847	-0.147894	5.211819	H	-3.677520	-1.758688	3.992456	h	4.288046	-2.883685	6.189219
C	3.709425	-0.747632	6.005249	C	-5.384338	-3.102182	4.082302	h	-5.096232	-5.854176	1.670205
C	3.667537	-2.106804	5.774228	C	-5.539221	-1.017638	3.276851	h	-3.569510	-7.461282	4.015197
C	2.576541	-2.322597	4.821796	H	-5.225808	-0.040647	2.952600	h	2.537308	3.743953	-4.461646
C	2.231302	-3.541966	4.258297	N	-6.776141	-1.517746	3.186823	h	-1.167866	2.363389	-2.729330
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C	-1.679416	-2.844733	1.470373	H	-7.546645	-3.455544	3.760501	C	2.343862	3.103734	-5.378079
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H	-2.109420	2.788855	2.023405	S	-1.260589	-0.938423	5.121062	C	2.410936	3.783167	-6.735292
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h	-0.724122	4.378910	3.575985	C	-3.164286	-0.915869	0.726323	C	-4.132870	-5.291152	3.580717
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h	4.306449	-2.879681	6.201451	C	-0.484874	2.163308	3.193627	H	-5.592386	-4.906188	5.144884
h	-5.096191	-5.854008	1.670235	C	-0.161146	3.466019	3.773847	H	-4.038626	-4.142137	5.401391
h	-3.573890	-7.464991	4.013945	C	0.927281	3.279678	4.608622	N	-4.643686	-1.931900	3.791201
h	2.523234	3.736571	-4.466132	C	1.259721	1.842158	4.525605	H	-3.656937	-1.757751	3.985160
h	-1.169108	2.359021	-2.720987	C	2.618114	-0.147683	5.207836	C	-5.373403	-3.089199	4.070934
Conf S2–TSoo				C	3.697385	-0.750026	5.994892	C	-5.506633	-1.010111	3.247164
C	2.381565	3.105866	-5.331505	C	3.649460	-2.109097	5.764616	H	-5.182754	-0.037506	2.918966
H	1.429735	2.576235	-5.216498	C	2.554550	-2.321080	4.815246	N	-6.747295	-1.500968	3.156502
H	3.156523	2.326674	-5.311793	C	2.205854	-3.539981	4.253737	C	-6.666133	-2.795247	3.675220
C	2.416099	3.767824	-6.697374	H	2.782624	-4.404491	4.556707	H	-7.537645	-3.425943	3.743161
O	2.704978	4.951341	-6.936919	C	-1.700087	-2.853085	1.457399	C	-3.338708	-6.431239	4.309843
O	2.102370	2.944578	-7.738111	H	-2.362046	-3.530692	0.930515	O	-2.492289	-6.102130	5.163803
H	1.816825	1.996270	-7.482117	C	-1.526565	1.917674	2.301727	S	-1.271390	-0.912742	5.169426
C	-1.050275	1.520807	-2.047939	H	-2.119060	2.777487	2.016156	H	1.537878	0.055686	0.643351
H	-1.245569	1.865182	-1.027359	C	2.293045	1.203991	5.210473	O	1.499649	-0.457143	2.029144
O	0.371474	1.115286	-2.128025	H	2.931516	1.823160	5.833954	O	1.680544	0.389340	-0.354897
H	0.691681	0.812446	-1.215215	O	1.288314	0.547258	-7.102033	Fe	0.483684	-0.748543	3.333456
C	-1.938297	0.328001	-2.405226	H	1.121652	0.372743	-6.110748	N	0.404016	-2.744525	2.992447
H	-1.685727	-0.046551	-3.403909	H	0.579619	0.200740	-7.679023	N	-1.147785	-0.457584	2.146127
H	-3.003584	0.581550	-2.383675	O	0.830460	0.059874	-4.542299	N	0.474980	1.221923	3.857881
H	-1.781366	-0.469016	-1.674858	H	0.738878	0.542460	-3.649429	N	1.997717	-1.090438	4.680582
N	-5.170851	-5.791635	2.665439	H	0.838468	-0.895402	-4.354686	C	1.291870	-3.715250	3.435211
H	-6.089403	-5.982922	3.034937	h	-1.496036	-2.234177	5.533290	C	0.966855	-5.006938	2.839070
C	-4.130515	-5.295503	3.580810	h	1.439058	-5.968594	2.916857	C	-0.155995	-4.814358	2.066950
H	-3.386431	-4.703525	3.029025	h	-0.780383	-5.590410	1.345370	C	-0.505179	-3.398772	2.179382
C	-4.794679	-4.356944	4.642966	h	-3.877537	-1.515562	0.160897	C	-1.886080	-1.437190	1.511923
				h	-3.738264	1.269811	0.561719				

N	-2.599786	-8.397314	-0.255755	O	2.702871	-0.646554	-4.201191	C	2.221598	-8.213840	2.361647
H	-3.065064	-9.243906	0.025288	H	3.428018	-0.704454	-2.744499	H	1.329516	-7.879510	1.843491
C	-1.356425	-8.067315	0.394719	H	2.223067	-1.472741	-4.391662	C	2.116340	-9.139869	3.403852
H	-0.663555	-7.574906	-0.312255	O	4.371617	-1.063892	2.344150	H	1.146425	-9.531114	3.692476
C	-1.508783	-7.053825	1.605541	H	4.801636	-1.689767	2.955085	C	5.108454	-8.139155	-0.764846
H	-0.572752	-7.043628	2.186028	H	3.446366	-0.864208	2.696964	O	5.252366	-9.380259	-0.749330
H	-1.614194	-6.056828	1.168848	O	3.823193	-0.669773	-1.820020	S	5.076078	-3.438612	3.508767
C	-2.686805	-7.304735	2.515060	H	3.371272	0.565865	-1.037875	H	3.856080	-0.776787	-0.337143
C	-2.677469	-8.322683	3.483875	H	3.595818	-1.428968	-1.210284	O	4.539620	0.245075	1.202619
H	-1.809137	-8.969111	3.580151	O	3.087170	1.396419	-0.513552	O	4.458613	0.005008	-0.319763
C	-3.764439	-8.488625	4.349143	H	3.772641	2.093711	-0.608492	Fe	4.824242	-1.457398	2.253388
H	-3.738170	-9.255825	5.115052	H	2.061119	1.232259	0.582744	N	6.263805	-2.174659	1.051974
C	-4.887121	-7.661297	4.238896	h	-0.762123	-2.769337	6.722078	N	3.443389	-2.345151	1.075460
H	-5.732596	-7.808391	4.901296	h	3.708579	-6.324688	3.603148	N	3.378736	-0.703863	3.425114
C	-3.820000	-6.480929	2.413244	h	2.322256	-6.015079	1.244717	N	6.185497	-0.485711	3.319985
H	-3.845597	-5.692657	1.666181	h	-2.046411	-3.415791	-0.039003	C	7.611819	-2.264509	1.368710
C	-4.915778	-6.662348	3.261051	h	-3.478548	-1.301594	1.132273	C	8.337947	-2.924322	0.278921
H	-5.786465	-6.028111	3.148502	h	-2.465771	2.065468	5.020681	C	7.420803	-3.138262	-0.729862
C	-0.653794	-9.375056	0.809074	h	-0.139216	2.675289	6.511266	C	6.115691	-2.739348	-0.202032
O	-1.270168	-10.459255	0.794773	h	4.068987	-0.195362	7.872101	C	3.635846	-2.920611	-0.174051
S	-0.584428	-3.318242	5.468494	h	4.662638	-2.865534	7.647790	C	2.387294	-3.502893	-0.654209
H	1.474549	0.454964	1.939821	h	-2.975730	-7.895301	-1.034613	C	1.461790	-3.389445	0.373665
O	1.857850	-0.919802	3.037099	h	0.398045	-9.315866	1.088713	C	2.126974	-2.606217	1.430442
O	1.275560	1.102061	1.221351	h	2.272764	3.314597	-3.413715	C	2.071690	-1.149445	3.463572
Fe	0.894664	-1.856756	4.055724	h	-1.310657	0.907205	-1.818687	C	1.313017	-0.401992	4.468249
N	1.689280	-3.613272	3.488673					C	2.162121	0.564160	4.983223
N	-0.585501	-2.069334	2.691540	Conf LW2 –RC				C	3.475785	0.321017	4.354423
N	-0.025535	-0.232919	4.804864	C	-0.565605	4.256094	-4.224035	C	5.954242	0.546577	4.215114
N	2.227110	-1.799771	5.561942	H	-1.274943	4.944052	-4.689026	C	7.223590	1.052140	4.723358
C	2.630693	-4.396710	4.156383	H	0.448685	4.645569	-4.375459	C	8.213643	0.248104	4.193441
C	2.981745	-5.555936	3.340852	C	-0.686079	2.924682	-4.934893	C	7.554963	-0.706028	3.302213
C	2.275632	-5.430319	2.163383	O	-1.674302	2.621850	-5.625434	C	8.191183	-1.624785	2.462020
C	1.437159	-4.248832	2.298847	O	0.358728	2.059790	-4.847478	H	9.251592	-1.790349	2.615239
C	-0.597106	-2.964752	1.630597	H	1.194222	2.355230	-4.288371	C	4.885453	-3.020294	-0.799057
C	-1.813281	-2.801852	0.830938	C	-0.673071	-0.341232	-1.088855	H	4.910251	-3.457112	-1.792557
C	-2.537800	-1.777528	1.408943	H	-0.821948	-1.419040	-0.927543	C	1.527909	-2.079336	2.575291
C	-1.735696	-1.322483	2.562487	O	-0.488265	0.350687	0.176612	H	0.487013	-2.332304	2.742373
C	-1.242994	0.290148	4.409927	H	0.480298	0.373655	0.440351	C	4.690538	0.941827	4.656333
C	-1.516900	1.537865	5.117352	C	0.540774	-0.165894	-2.018084	H	4.675706	1.766443	5.363614
C	-0.401799	1.821972	5.885993	H	1.414844	-0.640654	-1.562261	O	4.040138	2.161701	-1.735790
C	0.511109	0.683261	5.696874	H	0.381640	-0.628387	-2.999908	H	4.920794	2.568563	-1.863334
C	2.508426	-0.682447	6.329316	H	0.768040	0.892590	-2.185696	H	4.147092	1.294992	-1.224693
C	3.608545	-0.955288	7.240775	N	2.685307	-8.499796	-0.834679	O	2.457747	2.787389	-3.740892
C	3.934061	-2.288847	7.077989	H	2.789950	-9.405528	-0.389420	H	3.000382	2.520206	-2.937324
C	3.097087	-2.792089	5.993545	C	3.714110	-7.504059	-0.607896	H	2.988255	3.246482	-4.438801
C	3.218676	-4.035056	5.363020	H	3.658432	-6.708295	-1.365469	O	1.998145	0.991315	0.714341
H	3.883797	-4.762008	5.816692	C	3.569320	-6.762719	0.790860	H	2.293937	1.623691	0.033710
C	0.405713	-3.897882	1.415841	H	4.410328	-6.070092	0.927266	H	2.817517	0.647846	1.178127
H	0.346248	-4.489768	0.510325	H	2.667558	-6.147826	0.717610	h	4.682255	-3.268760	4.820407
C	-2.026559	-0.235430	3.388415	C	3.472675	-7.705286	1.964940	h	9.370664	-3.270979	0.316225
H	-2.926370	0.320045	3.158447	C	4.620329	-8.118393	2.666148	h	7.587009	-3.447756	-1.761683
C	1.733018	0.474854	6.338646	H	5.594001	-7.718320	2.397578	h	2.280225	-3.883826	-1.669834
H	2.097644	1.265900	6.985238	C	4.516773	-9.038130	3.719285	h	0.460018	-3.801376	0.495456
O	3.263813	-2.275708	0.192852	H	5.407951	-9.341261	4.259254	h	0.286377	-0.664486	4.723538
H	3.829426	-1.874568	0.916761	C	3.268132	-9.564636	4.079329	h	1.989852	1.406957	5.652614
H	2.335017	-2.211356	0.483380	H	3.191273	-10.296649	4.875820	h	7.303959	1.927453	5.367899

C	-2.470031	-3.021861	3.043456	H	-2.013336	-7.019280	-0.830050	O	5.737422	1.502979	0.015067
C	-2.147450	-2.984118	4.389300	C	-3.719346	-7.697984	0.310743	H	5.018535	0.955227	0.528412
C	-0.926801	-3.789532	4.532211	H	-3.127048	-7.427344	1.187962	H	6.645735	1.134982	0.150425
C	0.542052	-5.308626	5.838015	H	-4.332306	-6.822996	0.060838	h	-1.655848	-7.171256	3.467723
C	0.887850	-5.967329	7.090991	C	-4.605216	-8.885491	0.620654	h	4.740605	-9.451046	2.940961
C	1.738360	-7.002904	6.767047	C	-4.320177	-9.732149	1.706603	h	4.784008	-8.586273	0.344423
C	1.898818	-6.992776	5.318878	H	-3.440316	-9.552019	2.316193	h	2.220207	-4.768526	-2.367437
C	2.675465	-7.884985	4.586481	C	-5.149477	-10.814812	2.013954	h	-0.179239	-3.603064	-2.068707
H	3.126636	-8.716913	5.110947	H	-4.916773	-11.442080	2.867899	h	-3.257860	-2.809477	2.303653
C	2.791949	-6.266500	0.025993	C	-6.278624	-11.079087	1.231989	h	-2.494155	-2.549769	5.014548
H	3.391518	-6.475176	-0.853056	H	-6.926733	-11.913723	1.479324	h	0.535950	-5.668862	7.881695
C	-1.245562	-3.787723	0.979112	C	-5.745622	-9.161795	-0.152542	h	2.362612	-7.696724	7.331857
H	-2.077708	-3.414491	0.404318	H	-5.978689	-8.515457	-0.989326	h	-3.677087	-7.172150	-2.681499
C	-0.379994	-4.269579	5.718284	C	-6.570337	-10.252649	0.140238	h	-1.146519	-9.275330	0.102462
H	-0.788705	-3.889861	6.649424	H	-7.442425	-10.447491	-0.477760	h	3.830785	4.429699	-0.157934
O	2.117149	-1.895754	1.219375	C	-1.836920	-9.141117	-0.730244	h	0.749792	1.304173	-1.556370
H	2.047716	-2.169457	2.242167	O	-1.922494	-10.044383	-1.587403				
H	1.755258	-2.608366	0.656227	S	-0.565345	-7.356965	2.642700				
O	3.800385	0.134253	1.401482	H	1.234096	-2.633490	3.692181	Conf LW3 -CpdI			
H	3.259827	-0.668213	1.147925	O	2.513419	-4.612155	2.800556	C	4.558884	4.634359	-1.014705
H	3.169462	0.845233	1.662566	O	2.117796	-2.224010	3.690964	H	4.454202	5.655388	-1.390416
O	5.624859	1.418470	0.093525	Fe	1.166119	-5.595036	2.687349	H	5.536239	4.537332	-0.530095
H	4.929909	0.852981	0.563753	N	2.450298	-7.076291	2.234583	C	4.500312	3.657732	-2.184999
H	6.536829	1.055136	0.233084	N	0.956735	-5.195452	0.715399	O	3.941123	4.016842	-3.274315
h	-1.620156	-7.134343	3.463841	N	-0.339607	-4.292073	3.082705	O	5.067751	2.495685	-2.022722
h	4.665395	-9.304232	3.002368	N	1.251414	-6.058400	4.626539	H	6.011240	2.324927	-0.853324
h	4.636419	-8.466281	0.404729	C	3.015518	-7.979577	3.119794	C	0.792179	0.206840	-0.953286
h	2.072929	-4.597401	-2.220915	C	4.059699	-8.753575	2.453141	H	-0.077476	-0.018523	-0.322553
h	-0.324822	-3.470654	-1.918985	C	4.126025	-8.282572	1.158605	O	1.918196	0.118215	-0.051252
h	-3.369797	-2.690643	2.525012	C	3.121373	-7.232565	1.042074	H	2.757094	-0.207507	-0.531265
h	-2.610672	-2.478737	5.236697	C	1.893728	-5.497593	-0.260624	C	0.898730	-0.827740	-2.080677
h	0.464558	-5.659845	8.047204	C	1.557308	-4.816006	-1.503505	H	1.040582	-1.818207	-1.643193
h	2.344978	-7.619916	7.429902	C	0.345581	-4.172010	-1.301288	H	-0.007274	-0.852682	-2.698115
h	-3.676593	-7.171723	-2.679623	C	-0.007444	-4.423610	0.100882	H	1.754987	-0.625243	-2.735222
h	-1.148520	-9.254181	0.125109	C	-1.283739	-3.857166	2.164345	N	-3.348469	-7.971912	-2.178235
h	3.835779	4.433274	-0.144155	C	-2.363773	-3.139434	2.832617	H	-3.334826	-8.870225	-2.637953
h	0.751646	1.294823	-1.541428	C	-2.028849	-3.063865	4.173560	C	-2.712432	-7.870531	-0.879260
				C	-2.028849	-3.063865	4.173560	H	-2.026498	-7.007027	-0.820763
Conf LW3 -IC1				C	-0.796475	-3.855037	4.315960	C	-3.738093	-7.688361	0.312764
C	4.605536	4.532659	-0.917689	C	0.644888	-5.375724	5.667908	H	-3.154055	-7.410826	1.193641
H	4.622322	5.575268	-1.238599	C	0.965359	-6.008120	6.939051	H	-4.353639	-6.817475	0.055362
H	5.550565	4.304378	-0.412693	C	1.789179	-7.073806	6.645407	C	-4.620211	-8.879878	0.618783
C	4.472271	3.654050	-2.144377	C	1.952577	-7.100741	5.197595	C	-4.331561	-9.732267	1.699555
O	3.999658	4.095588	-3.219678	C	2.722881	-8.017182	4.476867	H	-3.452254	-9.554281	2.310181
O	4.900178	2.398430	-2.062139	H	3.184475	-8.824845	5.028618	C	-5.156632	-10.819462	2.001462
H	5.338464	2.019303	-1.115979	C	2.895349	-6.445922	-0.091277	H	-4.920656	-11.450521	2.851635
C	0.970162	0.291664	-1.218242	H	3.551956	-6.628041	-0.934313	C	-6.285264	-11.083367	1.218774
H	0.218294	-0.405257	-1.627107	C	-1.140993	-3.976451	0.788473	H	-6.929943	-11.921705	1.462044
O	0.916024	0.328933	0.222680	H	-1.980934	-3.646683	0.195789	C	-5.760004	-9.156297	-0.155040
H	1.399212	-0.471714	0.630500	C	-0.238228	-4.312463	5.511388	H	-5.996712	-8.506014	-0.987636
C	2.330985	-0.153148	-1.777469	H	-0.615549	-3.878085	6.431814	C	-6.580568	-10.251868	0.131886
H	2.552418	-1.170871	-1.442592	O	2.419627	-1.599976	1.133039	H	-7.452267	-10.446163	-0.486738
H	2.332790	-0.159599	-2.874216	H	2.290521	-1.972722	2.724781	C	-1.846075	-9.128731	-0.705715
H	3.146393	0.491975	-1.440192	H	2.223351	-2.323751	0.508511	O	-1.932185	-10.041732	-1.553191
N	-3.348431	-7.974076	-2.182627	O	3.986650	0.279063	1.327133	S	-0.553754	-7.286193	2.678506
H	-3.330087	-8.868852	-2.649413	H	3.410366	-0.584445	1.091000	H	1.916456	-2.309401	2.412375
C	-2.702919	-7.879975	-0.888468	H	3.346466	0.953126	1.650694	O	2.106521	-4.116327	3.118150

O	2.392189	-1.497143	2.143212	H	5.566695	4.265090	-0.361935	C	1.747563	-7.004355	6.790654
Fe	1.020751	-5.356194	2.854255	C	4.484182	3.613699	-2.090762	C	1.922056	-6.968835	5.343722
N	2.432396	-6.728096	2.422350	O	4.036127	4.043206	-3.177270	C	2.703595	-7.852927	4.603886
N	0.792992	-5.005081	0.882310	O	4.868099	2.337136	-1.986305	H	3.146123	-8.693834	5.121770
N	-0.577365	-4.205564	3.223951	H	5.269984	1.961422	-1.065206	C	2.848099	-6.219098	0.049591
N	1.101826	-5.868648	4.775606	C	0.956472	0.258753	-1.200548	H	3.443117	-6.436464	-0.830384
C	2.964412	-7.683541	3.273747	H	0.212639	-0.429098	-1.627484	C	-1.170073	-3.705969	1.020054
C	4.014738	-8.441378	2.600208	O	0.841934	0.306371	0.250006	H	-1.997756	-3.319337	0.448602
C	4.122105	-7.908700	1.331344	H	1.023615	-0.589962	0.632691	C	-0.379896	-4.269151	5.764012
C	3.122636	-6.851186	1.236518	C	2.336049	-0.226376	-1.652981	H	-0.808428	-3.916819	6.697441
C	1.743511	-5.259765	-0.084153	H	2.491140	-1.248375	-1.284116	O	7.613523	-0.089249	0.896973
C	1.301955	-4.750258	-1.373579	H	2.415656	-0.262764	-2.745395	H	7.137771	-0.599924	1.618886
C	0.006980	-4.279639	-1.208410	H	3.145470	0.407938	-1.281365	H	8.299943	-0.613300	0.436099
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C	-2.576435	-3.032114	2.966845	C	-2.697374	-7.859206	-0.880088	H	5.163605	-0.501790	2.483802
C	-2.214815	-2.911646	4.298789	H	-2.007627	-6.998432	-0.832416	O	4.452638	-3.153185	1.659781
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C	0.789661	-5.860902	7.081263	H	-4.323295	-6.789675	0.065700	O	5.665178	1.350624	0.115837
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C	1.815612	-6.908392	5.336820	C	-4.316327	-9.694253	1.722292	H	6.550094	0.866907	0.300007
C	2.617877	-7.793833	4.611866	H	-3.442695	-9.507041	2.338529	h	-1.598279	-7.103877	3.470161
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C	2.852505	-6.081908	0.105626	H	-4.907699	-11.408619	2.879870	h	4.688065	-8.425195	0.432731
H	3.521126	-6.213090	-0.737909	C	-6.262593	-11.054979	1.236149	h	2.090472	-4.597842	-2.218301
C	-1.406906	-3.980616	0.926656	H	-6.906311	-11.894374	1.479181	h	-0.305092	-3.478220	-1.907240
H	-2.276173	-3.704240	0.354416	C	-5.733731	-9.134805	-0.145900	h	-3.318205	-2.627901	2.557694
C	-0.434963	-4.164521	5.651152	H	-5.964471	-8.491583	-0.985636	h	-2.599951	-2.460272	5.282379
H	-0.824975	-3.737977	6.570435	C	-6.553885	-10.230078	0.143173	h	0.453606	-5.690086	8.079964
O	4.202659	-0.646705	-0.974601	H	-7.421649	-10.430411	-0.479335	h	2.360241	-7.620429	7.448791
H	1.971763	-0.991235	1.406562	C	-1.839267	-9.122435	-0.700736	h	-3.675990	-7.171515	-2.678999
H	4.416119	-0.305786	-1.872447	O	-1.939267	-10.041494	-1.541565	h	-1.145600	-9.247754	0.130641
O	4.702442	0.745062	1.095903	S	-0.500241	-7.234018	2.644496	h	3.845078	4.422790	-0.123823
H	4.574345	-0.062554	-0.218290	H	1.190051	-3.150516	3.933972	h	0.755926	1.277120	-1.533377
H	3.816454	1.028183	1.397855	O	2.595609	-4.258275	3.108802	Conf LW3 -TShooh			
O	6.423964	2.197683	0.081599	O	2.157616	-2.955565	3.821309	C	4.605491	4.511392	-0.926058
H	5.356517	1.500608	0.792227	Fe	1.043142	-5.493355	2.870026	H	4.622719	5.542103	-1.286451
H	7.235675	1.635598	0.118206	N	2.473184	-6.818033	2.395402	H	5.554629	4.304337	-0.416524
h	-1.668940	-7.163340	3.482005	N	0.941202	-4.929982	0.919225	C	4.473167	3.560370	-2.112809
h	4.676893	-9.165682	3.074550	N	-0.401743	-4.117601	3.326428	O	4.036505	4.013553	-3.220575
h	4.795467	-8.184267	0.519733	N	1.198653	-5.911408	4.814547	O	4.831059	2.319929	-1.936095
h	1.980011	-4.697892	-2.225380	C	3.006669	-7.765330	3.251452	H	5.512149	1.760040	-0.699416
h	-0.598824	-3.907068	-2.034399	C	4.010810	-8.568986	2.553796	C	0.989470	0.310695	-1.367003
h	-3.478122	-2.707927	2.447298	C	4.064669	-8.090375	1.261790	H	0.262259	-0.374704	-1.826431
h	-2.649739	-2.351165	5.126296	C	3.099179	-6.996882	1.174964	O	0.881525	0.254815	0.090488
h	0.360933	-5.544902	8.032264	C	1.845569	-5.261328	-0.082179	H	1.133165	-0.660281	0.372918
h	2.208772	-7.546711	7.450693	C	1.464295	-4.611031	-1.326228	C	2.377799	-0.080214	-1.869583
h	-3.676988	-7.171841	-2.680165	C	0.248176	-3.974826	-1.110156	H	2.606497	-1.105366	-1.552185
h	-1.156427	-9.253552	0.129073	C	-0.064203	-4.178086	0.311518	H	2.412734	-0.073299	-2.964819
h	3.824014	4.493693	-0.222086	C	-1.324655	-3.641246	2.400301	H	3.167725	0.589972	-1.518266
h	0.703213	1.209323	-1.371831	C	-2.420620	-2.958886	3.080051	N	-3.346299	-7.970825	-2.176035
				C	-2.124269	-2.951052	4.433305	H	-3.333779	-8.870645	-2.632866
Conf LW3 -RC1-				C	-0.909530	-3.760615	4.580705	C	-2.699839	-7.865436	-0.881596
C	4.629092	4.503001	-0.876787	C	0.548607	-5.305182	5.874529	H	-2.012062	-7.003083	-0.830327
H	4.666867	5.540726	-1.210294	C	0.886301	-5.980297	7.122562	C	-3.716868	-7.678238	0.317674

H	-3.125606	-7.404093	1.194998	H	3.509967	-3.641653	2.529927	O	2.550524	-3.861851	3.230369
H	-4.328359	-6.803140	0.065971	O	5.790860	1.291468	0.177768	O	1.775245	-2.553742	3.110152
C	-4.602687	-8.865468	0.630268	H	4.987015	0.898260	0.589470	Fe	0.976124	-5.506419	2.855066
C	-4.323885	-9.706158	1.722376	H	6.969136	0.458212	0.596149	N	2.484683	-6.753689	2.419840
H	-3.451859	-9.518930	2.341006	h	-1.587789	-7.117763	3.472907	N	0.913208	-4.939631	0.916027
C	-5.150275	-10.791948	2.026964	h	4.696878	-9.262122	3.074860	N	-0.442199	-4.106961	3.279818
H	-4.922110	-11.415309	2.884898	h	4.708536	-8.416923	0.480399	N	1.188599	-5.853045	4.792753
C	-6.271934	-11.064027	1.237090	h	2.107847	-4.635717	-2.219593	C	3.015861	-7.707117	3.274975
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C	-5.736392	-9.149344	-0.150195	h	-3.372839	-2.706577	2.489174	C	4.069002	-8.044996	1.286899
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C	-1.838827	-9.127354	-0.706483	h	-3.676180	-7.172110	-2.679229	C	0.249953	-3.959937	-1.111411
O	-1.940448	-10.047375	-1.544700	h	-1.140595	-9.251028	0.121312	C	-0.091512	-4.197235	0.295961
S	-0.484655	-7.258708	2.655855	h	3.834546	4.434724	-0.159356	C	-1.403767	-3.689350	2.347839
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O	2.575244	-4.005387	3.225188					C	-2.190508	-2.967648	4.373566
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C	3.025223	-7.733249	3.291153	O	4.016021	4.034141	-3.221821	H	3.139990	-8.633093	5.147869
C	4.026819	-8.543997	2.602226	O	4.843485	2.334450	-1.965411	C	2.853823	-6.190527	0.063155
C	4.084881	-8.075722	1.306658	H	5.600652	1.783985	-0.740962	H	3.459100	-6.405359	-0.809596
C	3.125413	-6.981542	1.210753	C	1.003975	0.318582	-1.413581	C	-1.233528	-3.766176	0.974130
C	1.854622	-5.290097	-0.078280	H	0.258862	-0.364592	-1.846475	H	-2.066557	-3.426010	0.379389
C	1.479761	-4.650201	-1.328883	O	0.967022	0.236430	0.046520	C	-0.406909	-4.208924	5.720995
C	0.263062	-4.009494	-1.117611	H	1.272978	-0.671102	0.295389	H	-0.834919	-3.844779	6.649737
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C	1.907235	-6.935114	5.358653	C	-3.718038	-7.676526	0.318589	H	3.390397	-3.609728	2.653191
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H	3.140968	-8.658566	5.164065	H	-4.329219	-6.801310	0.066432	H	5.123917	0.923576	0.555567
C	2.871279	-6.227551	0.073056	C	-4.603749	-8.863427	0.632393	H	7.140952	0.510962	0.543805
H	3.478740	-6.450852	-0.795526	C	-4.325634	-9.701772	1.726415	h	-1.592051	-7.114256	3.478746
C	-1.202460	-3.780196	0.981034	H	-3.454781	-9.512164	2.346195	h	4.685688	-9.234635	3.052984
H	-2.035806	-3.439523	0.386825	C	-5.150813	-10.788364	2.031504	h	4.694024	-8.379980	0.459131
C	-0.411806	-4.240077	5.733840	H	-4.922940	-11.409904	2.890864	h	2.100892	-4.569637	-2.211607
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O	7.513731	-0.268744	1.098214	H	-6.915984	-11.900854	1.485001	h	-3.405994	-2.712944	2.493850
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Conf LM1-RC-

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Conf LM1 -TSoo

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Conf LM1 -Cpdl

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Conf LM2-RC-

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O	2.472583	0.530035	0.432984					C	6.018951	3.355843	-0.191183
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C	5.980988	3.353984	-0.260629	H	1.639167	0.162743	7.263356	O	1.416443	-3.677781	-2.468752
C	6.452304	2.949962	0.975605	C	1.164596	2.092875	8.162912	H	1.862053	-4.044632	-3.267605
C	5.287254	2.554406	1.758831	H	0.878930	2.433451	9.164654	H	2.075896	-2.812734	-1.739429
C	5.303176	2.047989	3.057256	H	2.182667	2.467929	7.982210	h	2.527981	5.173695	2.677355
H	6.239119	2.106779	3.602023	N	0.399638	2.724384	5.808632	h	5.138322	0.793721	5.721419
C	1.076227	-0.236881	3.586302	H	1.247448	2.508807	5.304902	h	3.159807	-1.153220	5.534266
H	0.690740	-1.017385	4.235937	C	0.192881	2.653027	7.186164	h	-1.656971	-0.711707	3.321283
C	-0.856712	2.929740	0.455265	C	-0.718912	3.257820	5.229264	h	-2.901013	1.256861	1.940457

h	-0.896074	4.637057	-1.754239	C	-1.222366	0.140265	2.793949	H	-0.315501	0.283349	2.223718
h	1.707395	5.011502	-2.848748	C	-1.823082	1.145927	2.056146	C	0.625393	-2.346752	2.046933
h	6.590107	3.609769	-1.084138	C	-0.720579	1.968251	1.524162	H	1.420076	-1.712122	2.451215
h	7.507241	2.864683	1.403980	C	0.240470	3.480874	-0.224676	H	0.705000	-3.327596	2.531407
h	-0.595887	-0.684570	7.841149	C	0.086041	4.316251	-1.408698	H	0.811454	-2.468951	0.978220
h	3.184527	-0.060668	9.264448	C	1.359421	4.518722	-1.940808	N	6.440598	2.253696	6.771388
h	-0.976909	-4.456789	-4.938199	C	2.292071	3.843778	-1.029426	H	6.873394	2.525531	7.641895
h	-2.560922	-1.745808	-1.312246	C	4.558589	3.307614	-0.131848	C	7.081987	2.691216	5.560775

Conf LM3 –Fe RS

C	-1.322928	-5.455331	-4.668120
H	-1.799778	-5.395357	-3.683331
H	-2.079686	-5.755720	-5.401299
C	-0.229069	-6.535128	-4.640871
O	-0.066458	-7.271281	-5.666738
O	0.477436	-6.643320	-3.542822
H	0.068038	-6.010519	-2.285400
C	-1.885770	-1.286399	-0.592369
H	-2.440621	-1.039784	0.322118
O	-1.367092	-0.063051	-1.201778
H	-0.467253	0.108765	-0.851248
C	-0.754795	-2.253318	-0.238118
H	-0.135192	-1.810599	0.551166
H	-1.128493	-3.219655	0.118189
H	-0.118770	-2.435829	-1.106049
N	-0.094754	-0.054786	8.434993
H	-0.502187	0.104062	9.342232
C	1.214479	0.510460	8.208848
H	1.638947	0.162659	7.264334
C	1.164861	2.093394	8.164269
H	0.879361	2.433029	9.166395
H	2.183256	2.467817	7.983365
N	0.399529	2.723525	5.810156
H	1.247111	2.506180	5.307030
C	0.193057	2.653499	7.187708
C	-0.718986	3.257384	5.230549
H	-0.797646	3.442174	4.174512
N	-1.637721	3.527072	6.160036
C	-1.072847	3.160925	7.383684
H	-1.595662	3.298467	8.314450
C	2.122772	0.145887	9.399381
O	1.611749	0.150391	10.540311
S	1.966060	4.000372	3.130034
H	1.577713	1.448264	-0.827417
O	2.682061	0.564091	0.470987
O	1.713577	0.467086	-0.704689
Fe	2.318056	2.272619	1.639568
N	3.059650	1.189122	3.125140
N	0.494065	1.518754	2.035362
N	1.586576	3.203696	-0.006007
N	4.153694	2.814164	1.104409
C	4.271251	1.441896	3.751659
C	4.379595	0.628209	4.957434
C	3.308938	-0.240987	4.952186
C	2.447845	0.176600	3.846059
C	0.209467	0.416458	2.823734

C	-1.222366	0.140265	2.793949
C	-1.823082	1.145927	2.056146
C	-0.720579	1.968251	1.524162
C	0.240470	3.480874	-0.224676
C	0.086041	4.316251	-1.408698
C	1.359421	4.518722	-1.940808
C	2.292071	3.843778	-1.029426
C	4.558589	3.307614	-0.131848
C	6.018105	3.356924	-0.189783
C	6.479692	2.978960	1.058432
C	5.305475	2.643097	1.858022
C	5.315780	2.142036	3.160734
H	6.255236	2.188247	3.700316
C	1.138247	-0.244907	3.631799
H	0.770329	-1.054007	4.254949
C	-0.807434	2.906336	0.498907
H	-1.791105	3.105731	0.103112
C	3.688646	3.789380	-1.107958
H	4.161238	4.193080	-1.997647
O	-0.115222	-5.391909	-1.440521
H	0.680945	-4.291211	-2.087359
H	0.529384	-5.562133	-0.704208
O	2.690910	-2.104413	-1.197611
H	2.660268	-2.114453	0.165628
H	2.449861	-1.182171	-1.428604
O	2.625523	-1.770285	1.198915
H	2.575089	-0.422917	0.935369
H	1.923287	-2.132622	1.760990
O	1.404393	-3.684509	-2.480723
H	1.853538	-4.059992	-3.273123
H	2.088180	-2.803878	-1.744508
h	2.526734	5.177668	2.678410
h	5.138047	0.795799	5.722110
h	3.159339	-1.151345	5.532646
h	-1.656418	-0.709331	3.321065
h	-2.901022	1.258393	1.940109
h	-0.896215	4.638422	-1.754307
h	1.707666	5.012134	-2.848187
h	6.589146	3.610213	-1.082993
h	7.506799	2.865340	1.405143
h	-0.595770	-0.684461	7.841306
h	3.184422	-0.061309	9.265089
h	-0.978480	-4.457424	-4.939421
h	-2.561555	-1.747811	-1.312425

Conf LM4 –RC

C	-0.931816	-4.469177	-2.917540
H	-1.610892	-5.147840	-3.438592
H	-0.092145	-4.265446	-3.599679
C	-0.366784	-5.209967	-1.726092
O	-0.498305	-6.448945	-1.625039
O	0.343079	-4.525722	-0.814275
H	0.671491	-3.526122	-1.051237
C	-0.733980	-1.698234	2.321815
H	-0.851885	-1.579376	3.408808
O	-0.824793	-0.377250	1.689220

H	-0.315501	0.283349	2.223718
C	0.625393	-2.346752	2.046933
H	1.420076	-1.712122	2.451215
H	0.705000	-3.327596	2.531407
H	0.811454	-2.468951	0.978220
N	6.440598	2.253696	6.771388
H	6.873394	2.525531	7.641895
C	7.081987	2.691216	5.560775
H	7.114801	1.902975	4.793723
C	6.379587	3.973147	4.894607
H	6.955537	4.859862	5.183177
H	6.469889	3.894716	3.804117
N	3.910148	4.133689	4.338099
H	4.003820	3.957608	3.349283
C	4.948040	4.198966	5.266167
C	2.741408	4.474020	4.965850
H	1.798458	4.527873	4.453532
N	2.963465	4.753341	6.251156
C	4.334416	4.577394	6.446906
H	4.790617	4.729857	7.409840
C	8.541608	3.039164	5.927953
O	8.848895	3.143411	7.132919
S	2.363438	5.823272	1.754513
H	1.665649	1.012480	-0.835672
O	2.252161	2.816529	-1.458785
O	2.555530	1.367923	-1.096210
FE	2.266464	4.157489	0.023746
N	4.221066	3.807848	0.360265
N	1.809990	2.787353	1.445744
N	0.306207	4.553078	-0.276110
N	2.741173	5.488562	-1.370595
C	5.267574	4.665687	0.041549
C	6.527057	4.129282	0.563372
C	6.232299	2.898676	1.116977
C	4.779436	2.740496	1.044585
C	2.674136	1.884872	2.037151
C	2.000662	1.192716	3.128614
C	0.725695	1.743797	3.241528
C	0.597248	2.683307	2.111169
C	-0.720086	4.100644	0.527133
C	-1.995845	4.646758	0.067812
C	-1.730764	5.453625	-1.026911
C	-0.275072	5.363609	-1.243997
C	1.875799	6.078177	-2.274534
C	2.605149	7.024019	-3.115061
C	3.899300	7.056405	-2.634543
C	3.983874	6.083306	-1.549300
C	5.128989	5.755467	-0.816859
H	6.026535	6.335353	-1.000509
C	4.040345	1.795374	1.753546
H	4.601561	1.019860	2.262673
C	-0.576391	3.260639	1.628924
H	-1.499806	2.987417	2.122069
C	0.485299	5.965466	-2.245521
H	-0.034567	6.424628	-3.075035
O	4.859421	0.593183	-3.791852

H	4.150690	1.317697	-3.854042	N	2.960544	4.741840	6.221982	h	2.560934	0.468161	3.693062
H	4.816594	-0.011409	-4.549916	C	4.330462	4.566387	6.423844	h	0.129580	1.584126	4.054510
O	2.947458	2.414510	-3.863758	H	4.782463	4.718407	7.388823	h	-2.911862	4.423927	0.582327
H	2.230870	2.032491	-4.403706	C	8.543553	3.035903	5.925152	h	-2.480268	6.046088	-1.548100
H	2.603115	2.627124	-2.887886	O	8.849202	3.141885	7.130327	h	2.148053	7.649848	-3.914805
O	1.311536	-2.326848	-1.333203	S	2.354489	5.828303	1.733995	h	4.719138	7.737011	-2.989888
H	2.357993	-2.374122	-1.248743	H	1.664564	0.923404	-0.976034	h	5.838809	1.455917	6.797726
H	0.947687	-1.427117	-1.173898	O	2.291362	3.060968	-1.427028	h	9.293043	3.213020	5.153815
O	4.801685	-0.086339	-1.233106	O	2.531841	1.111106	-1.417642	h	-1.427192	-3.504809	-2.762090
H	4.119849	0.530209	-0.859790	FE	2.284126	4.126716	-0.050715	h	-1.550122	-2.318738	1.944759
H	4.795675	0.058148	-2.226852	N	4.236589	3.847371	0.333238				
O	3.777112	-2.428956	-1.096573	N	1.836634	2.790538	1.385329				
H	4.295453	-1.554867	-1.050335	N	0.317583	4.565442	-0.285087				
H	4.299551	-3.243368	-0.942645	N	2.752931	5.553057	-1.361004				
h	1.792049	7.012525	1.350115	C	5.279196	4.716227	0.026328				
h	7.478571	4.660843	0.574816	C	6.539541	4.170147	0.533715				
h	6.895593	2.133272	1.519797	C	6.250002	2.926510	1.060068				
h	2.510290	0.481319	3.778430	C	4.799659	2.762427	0.982639				
h	0.061635	1.578067	4.089834	C	2.704429	1.876312	1.953619				
h	-2.928476	4.435617	0.590962	C	2.044923	1.183203	3.052349				
h	-2.487411	6.036616	-1.551956	C	0.778257	1.745326	3.193523				
h	2.150109	7.624144	-3.903004	C	0.631763	2.687276	2.070455				
h	4.719615	7.684614	-2.981681	C	-0.704464	4.103081	0.513542				
h	5.838553	1.455708	6.798347	C	-1.981772	4.645936	0.059154				
h	9.290393	3.215743	5.155808	C	-1.720228	5.461255	-1.030049				
h	-1.433477	-3.512816	-2.769971	C	-0.263884	5.379785	-1.248900				
h	-1.549668	-2.310522	1.937338	C	1.881910	6.124332	-2.268815				

Conf LM4 –TSoo

C	-0.923992	-4.459490	-2.915187
H	-1.597217	-5.134644	-3.447978
H	-0.078648	-4.245381	-3.587097
C	-0.367153	-5.209199	-1.725079
O	-0.507346	-6.448666	-1.631339
O	0.343042	-4.533403	-0.809820
H	0.680366	-3.526168	-1.041252
C	-0.733369	-1.711106	2.334330
H	-0.853232	-1.596022	3.421620
O	-0.822317	-0.388110	1.706548
H	-0.284186	0.263394	2.221691
C	0.622481	-2.366862	2.058234
H	1.422430	-1.746365	2.473421
H	0.690756	-3.354074	2.531517
H	0.813176	-2.478372	0.989176
N	6.440999	2.253737	6.769058
H	6.876816	2.524582	7.638537
C	7.084494	2.685287	5.556873
H	7.118440	1.894119	4.792510
C	6.383875	3.964671	4.883694
H	6.956080	4.853135	5.175022
H	6.481816	3.884592	3.793770
N	3.916386	4.123666	4.312476
H	4.015142	3.951423	3.323443
C	4.949811	4.188898	5.245917
C	2.744407	4.463581	4.935500
H	1.803837	4.517865	4.418821

N	2.960544	4.741840	6.221982
C	4.330462	4.566387	6.423844
H	4.782463	4.718407	7.388823
C	8.543553	3.035903	5.925152
O	8.849202	3.141885	7.130327
S	2.354489	5.828303	1.733995
H	1.664564	0.923404	-0.976034
O	2.291362	3.060968	-1.427028
O	2.531841	1.111106	-1.417642
FE	2.284126	4.126716	-0.050715
N	4.236589	3.847371	0.333238
N	1.836634	2.790538	1.385329
N	0.317583	4.565442	-0.285087
N	2.752931	5.553057	-1.361004
C	5.279196	4.716227	0.026328
C	6.539541	4.170147	0.533715
C	6.250002	2.926510	1.060068
C	4.799659	2.762427	0.982639
C	2.704429	1.876312	1.953619
C	2.044923	1.183203	3.052349
C	0.778257	1.745326	3.193523
C	0.631763	2.687276	2.070455
C	-0.704464	4.103081	0.513542
C	-1.981772	4.645936	0.059154
C	-1.720228	5.461255	-1.030049
C	-0.263884	5.379785	-1.248900
C	1.881910	6.124332	-2.268815
C	2.606617	7.068957	-3.114585
C	3.899890	7.111868	-2.634789
C	3.991610	6.145342	-1.543874
C	5.138880	5.816548	-0.815483
H	6.034639	6.399888	-0.996143
C	4.067032	1.791393	1.660131
H	4.630342	1.000333	2.140990
C	-0.549604	3.261648	1.611221
H	-1.465295	2.985574	2.116725
C	0.493474	5.995986	-2.243352
H	-0.029509	6.454625	-3.071107
O	5.011489	0.645579	-3.902269
H	4.272014	1.330372	-3.928696
H	5.060052	0.144650	-4.731923
O	2.946113	2.358569	-3.913665
H	2.263602	1.840247	-4.379338
H	2.645948	2.501296	-2.949777
O	1.313546	-2.344693	-1.312935
H	2.362413	-2.383489	-1.238653
H	0.940854	-1.443721	-1.174268
O	4.814106	-0.123964	-1.341456
H	4.029714	0.443237	-1.066866
H	4.887211	-0.006620	-2.330486
O	3.775552	-2.447662	-1.105429
H	4.309743	-1.580099	-1.115301
H	4.293724	-3.264367	-0.949226
h	1.785867	7.026223	1.351890
h	7.491306	4.701046	0.552600
h	6.913705	2.157296	1.454877

Conf LM4 –Cpd I

C	-1.018969	-4.587892	-2.879965
H	-1.745369	-5.246977	-3.364743
H	-0.201158	-4.439335	-3.603780
C	-0.410654	-5.334303	-1.690557
O	-0.500778	-6.605760	-1.696566
O	0.242255	-4.658162	-0.785629
H	0.950141	-3.344721	-1.152951
C	-0.704042	-1.752180	2.320726
H	-0.804341	-1.645798	3.411222
O	-0.788144	-0.417839	1.707025
H	-0.260010	0.220810	2.234700
C	0.634877	-2.422394	2.005672
H	1.453464	-1.822554	2.418038
H	0.695422	-3.417652	2.461559
H	0.805143	-2.529136	0.932300
N	6.443889	2.252715	6.771595
H	6.885203	2.512815	7.642209
C	7.092586	2.686335	5.563480
H	7.125765	1.899292	4.794995
C	6.401620	3.974823	4.895095
H	6.997368	4.855014	5.163535
H	6.474836	3.884007	3.804358
N	3.936755	4.222297	4.358079
H	4.027181	4.089247	3.363418
C	4.979379	4.226208	5.284253
C	2.775427	4.559383	5.007345
H	1.828659	4.649786	4.507867
N	3.010175	4.782431	6.299319
C	4.377904	4.570243	6.481669
H	4.841037	4.674252	7.447202
C	8.553036	3.032739	5.935198
O	8.854925	3.140014	7.140484
S	2.172339	6.038601	1.996025
H	2.747936	2.143906	-1.766579
O	1.708860	2.958223	-0.873654
O	3.411978	1.796384	-2.422613
FE	1.962664	4.178700	0.218815
N	3.924356	3.833578	0.514535
N	1.548021	2.958852	1.771202
N	0.036126	4.733085	0.094626
N	2.456485	5.531014	-1.153724
C	4.994945	4.617472	0.120424
C	6.251186	4.040576	0.592014
C	5.929647	2.826288	1.167456

C	2.163317	-5.663742	2.156036	C	-1.026510	0.344591	-0.950088	H	0.234458	-4.794369	0.536609
C	1.298787	-4.490295	2.272448	H	-1.777002	-0.455176	-0.958001	C	-2.075354	-0.386407	3.238463
C	-0.685707	-3.151048	1.560850	O	-1.036055	0.960602	0.359726	H	-2.965638	0.175105	2.989540
C	-1.865591	-2.935258	0.715289	H	-0.118111	0.967202	0.788451	C	1.669576	0.361896	6.186149
C	-2.596940	-1.909648	1.291271	C	0.321733	-0.283055	-1.309012	H	2.035963	1.170442	6.809501
C	-1.822449	-1.483141	2.473713	H	0.591105	-1.035518	-0.563970	O	2.600178	-2.315557	0.289797
C	-1.305543	0.155699	4.274383	H	0.291324	-0.768681	-2.292210	H	1.825547	-2.905968	0.314353
C	-1.578009	1.398875	4.986589	H	1.136981	0.444530	-1.328142	H	2.549735	-1.764812	1.110127
C	-0.452067	1.697026	5.737582	N	-2.776512	-8.186727	-0.178844	O	2.403455	-0.505013	-4.205673
C	0.479378	0.577323	5.529382	H	-3.280039	-9.007014	0.115965	H	1.809912	-1.266298	-4.345875
C	2.474048	-0.776121	6.152255	C	-1.533832	-7.902668	0.487215	H	3.047336	-0.631869	-2.662748
C	3.588457	-1.030640	7.058568	H	-0.821272	-7.412325	-0.200785	O	3.438422	0.994092	0.081202
C	3.893068	-2.370496	6.942777	C	-1.683863	-6.923823	1.721766	H	4.290376	1.075998	0.541050
C	3.036267	-2.907565	5.882410	H	-0.755040	-6.943423	2.310908	H	2.101852	1.016333	0.988645
C	3.133035	-4.174374	5.310404	H	-1.770311	-5.916409	1.309679	O	3.421700	-0.732580	-1.738744
H	3.811361	-4.883032	5.771925	C	-2.879349	-7.176824	2.605864	H	3.494146	0.349088	-0.727694
C	0.287942	-4.134740	1.375950	C	-2.866517	-8.132018	3.635567	H	3.059168	-1.472786	-1.191797
H	0.197793	-4.763819	0.497089	H	-1.979530	-8.739116	3.798150	h	-0.850477	-2.806798	6.758531
C	-2.114106	-0.394890	3.289330	C	-3.976540	-8.288542	4.473479	h	3.642025	-6.505042	3.668884
H	-3.028279	0.144312	3.079265	H	-3.947977	-9.003539	5.288460	h	2.302982	-6.233235	1.278374
C	1.704645	0.382587	6.164526	C	-5.128173	-7.522351	4.267373	h	-2.006394	-3.522971	-0.218792
H	2.064595	1.174004	6.813544	H	-5.994342	-7.667166	4.902761	h	-3.458027	-1.410587	0.931240
O	2.580598	-2.292193	0.289747	C	-4.039455	-6.409020	2.413236	h	-2.527257	1.927360	4.841504
H	1.939178	-3.026818	0.264165	H	-4.066948	-5.667920	1.619727	h	-0.212228	2.554239	6.335485
H	2.422951	-1.831321	1.163731	C	-5.159983	-6.590069	3.225933	h	4.020731	-0.253623	7.708556
O	2.500485	-0.297718	-3.909078	H	-6.051129	-6.006941	3.033836	h	4.609033	-2.926213	7.577967
H	1.883501	-1.048894	-4.009346	C	-0.882491	-9.238510	0.877352	h	-3.107648	-7.731191	-1.005166
H	2.880444	-0.327129	-2.900198	O	-1.532095	-10.302156	0.808085	h	0.160365	-9.237011	1.194391
O	3.248891	0.914063	0.613730	S	-0.720205	-3.399482	5.519135	h	2.137479	3.488654	-3.763417
H	4.096626	0.860293	1.090307	H	1.355137	0.255813	2.204883	h	-1.288700	1.070636	-1.719620
H	2.470713	0.624753	1.219272	O	1.812438	-1.297054	2.883238				
O	3.287181	-0.530415	-1.559477	O	1.265686	0.988745	1.550627				
H	3.338849	0.187590	-0.852397	FE	0.807529	-2.057057	3.986434	Conf LW3 –RC			
H	3.028182	-1.344908	-1.032579	N	1.546186	-3.860361	3.511266	C	4.061287	5.052025	-1.300355
h	-0.775691	-2.796076	6.688741	N	-0.664420	-2.272601	2.616564	H	3.931697	6.040854	-1.745266
h	3.623794	-6.498704	3.612851	N	-0.078474	-0.373251	4.657083	H	5.067310	5.002938	-0.873492
h	2.267579	-6.230026	1.230553	N	2.138420	-1.943562	5.490985	C	3.929624	4.014139	-2.397355
h	-2.068973	-3.502718	-0.192836	C	2.511721	-4.600225	4.185619	O	3.233120	4.188314	-3.412811
h	-3.527419	-1.419162	1.005438	C	2.894353	-5.763123	3.388510	O	4.607606	2.859421	-2.234778
h	-2.528838	1.925585	4.905553	C	2.184663	-5.675362	2.207269	H	5.093739	2.708263	-1.293874
h	-0.194243	2.550302	6.364889	C	1.310679	-4.516365	2.328356	C	0.842482	0.412494	-1.467609
h	4.064178	-0.255510	7.659341	C	-0.661554	-3.177621	1.563395	H	0.019023	-0.290914	-1.655684
h	4.622642	-2.932870	7.525464	C	-1.819057	-2.955733	0.692917	O	1.159360	0.380574	-0.046391
h	-3.108218	-7.730350	-1.004466	C	-2.541626	-1.912469	1.241707	H	1.280137	-0.594264	0.284659
h	0.156203	-9.223590	1.211569	C	-1.779516	-1.487352	2.431866	C	2.055434	-0.032265	-2.293871
h	2.194760	3.522559	-3.702011	C	-1.300172	0.145025	4.257840	H	2.338735	-1.049842	-2.004446
h	-1.291879	1.063305	-1.692425	C	-1.580185	1.398874	4.950243	H	1.847243	-0.032451	-3.370649
				C	-1.580185	1.398874	4.950243	H	2.916579	0.620354	-2.121916
				C	-0.468881	1.693035	5.718620	N	-3.388949	-7.962215	-2.121861
				C	0.448082	0.555296	5.541473	H	-3.381337	-8.855524	-2.591162
				C	2.438412	-0.797137	6.205932	C	-2.790808	-7.906788	-0.799433
				C	3.551753	-1.035898	7.111755	H	-2.093442	-7.058718	-0.697757
				C	3.868400	-2.374253	6.999288	C	-3.849293	-7.741297	0.368412
				C	3.011489	-2.920603	5.948692	H	-3.294611	-7.442405	1.262277
				C	3.119017	-4.186361	5.367676	H	-4.485261	-6.892748	0.089361
				H	3.804678	-4.888161	5.829223	C	-4.692797	-8.964028	0.661876
				C	0.302776	-4.165388	1.416880	C	-4.392993	-9.793197	1.757727
Conf LW1 –Cpd I											
C	2.380876	3.257894	-4.800515								
H	2.631245	4.202697	-5.290591								
H	3.282040	2.633027	-4.776519								
C	1.292160	2.576946	-5.616002								
O	0.639421	3.288075	-6.444220								
O	1.089778	1.291208	-5.448908								
H	1.929358	0.332487	-4.591110								

H	-3.534700	-9.571026	2.382470	h	1.832267	-4.725856	-2.099478	C	2.943005	-7.957250	3.259664	
C	-5.169670	-10.917581	2.049295	h	-0.590476	-3.568651	-1.778623	C	3.927231	-8.738310	2.507998	
H	-4.922070	-11.532083	2.908867	h	-3.495157	-2.733604	2.757303	C	3.885238	-8.273288	1.211785	
C	-6.261930	-11.242727	1.239329	h	-2.696060	-2.661340	5.467774	C	2.883730	-7.213485	1.173908	
H	-6.871236	-12.107726	1.478291	h	0.493502	-5.956739	8.176477	C	1.522261	-5.535253	-0.036198	
C	-5.791534	-9.306994	-0.144555	h	2.388091	-7.778708	7.482102	C	1.135392	-4.850709	-1.258965	
H	-6.035026	-8.681393	-0.994362	h	-3.677849	-7.151831	-2.631553	C	-0.074269	-4.210944	-1.011945	
C	-6.564640	-10.439435	0.132874	h	-1.288144	-9.334140	0.218264	C	-0.379728	-4.469492	0.407797	
H	-7.408412	-10.680491	-0.507628	h	3.366424	4.954077	-0.466306	C	-1.535228	-3.901474	2.534562	
C	-1.966881	-9.197454	-0.623579	h	0.540530	1.425682	-1.732828	C	-2.553697	-3.157852	3.268253	
O	-2.087760	-10.110727	-1.468874					C	-2.180064	-3.154831	4.603151	
S	-0.692085	-7.457576	2.796632					C	-0.987447	-4.010366	4.694292	
H	0.803309	-3.171027	3.411594	Conf LW3 –TSoo	C	4.070923	5.046096	-1.284713	C	0.520463	-5.546166	5.953291
O	2.246005	-4.373856	2.877937	H	3.949304	6.034821	-1.732271	C	0.915538	-6.217527	7.189814	
O	1.746497	-2.949809	3.163559	H	5.073654	4.995053	-0.849980	C	1.792395	-7.217890	6.826783	
FE	0.840926	-5.691694	2.915425	C	3.946185	4.007442	-2.380937	C	1.919564	-7.181245	5.379038	
N	2.311423	-6.998881	2.416005	O	3.271293	4.188897	-3.409612	C	2.722239	-8.032255	4.628493	
N	0.588604	-5.229262	0.954828	O	4.606349	2.843443	-2.202646	H	3.244379	-8.824551	5.150296	
N	-0.605316	-4.330387	3.414598	H	5.013189	2.655185	-1.230542	C	2.560769	-6.453300	0.059689	
N	1.124933	-6.090412	4.863686	C	0.829891	0.423144	-1.574455	H	3.151861	-6.620947	-0.834235	
C	2.944874	-7.899372	3.254928	H	0.045601	-0.277568	-1.897996	C	-1.457445	-3.985317	1.150159	
C	3.909005	-8.707203	2.501741	O	0.982393	0.317798	-0.131479	H	-2.298935	-3.588960	0.603154	
C	3.844195	-8.270648	1.196830	H	1.168975	-0.673899	0.160645	C	-0.421083	-4.523175	5.858512	
C	2.852955	-7.200235	1.158607	C	2.129349	0.035442	-2.291143	H	-0.829479	-4.169065	6.799432	
C	1.498713	-5.510152	-0.047569	H	2.413428	-0.981000	-1.999472	O	1.647405	-2.005781	0.564064	
C	1.143602	-4.788215	-1.256911	H	2.016361	0.054826	-3.381921	H	1.629636	-2.243087	1.578544	
C	-0.064420	-4.140783	-1.014426	H	2.953890	0.705271	-2.029978	H	1.254225	-2.724060	0.027661	
C	-0.392230	-4.425155	0.397357	N	-3.385421	-7.967203	-2.118689	O	3.009461	1.603608	0.681923	
C	-1.563597	-3.842646	2.524121	H	-3.384710	-8.861232	-2.586591	H	2.287614	0.976406	0.318116	
C	-2.607703	-3.128087	3.252152	C	-2.781878	-7.912705	-0.798718	H	2.611966	2.116485	1.419147	
C	-2.262116	-3.149128	4.594950	H	-2.080152	-7.067699	-0.700932	O	5.352632	2.248945	0.058547	
C	-1.057056	-3.986031	4.691082	C	-3.835407	-7.742963	0.373004	H	4.487891	1.829092	0.408345	
C	0.480269	-5.508735	5.943532	H	-3.275381	-7.450044	1.265627	H	6.135633	1.670856	0.107574	
C	0.884582	-6.171913	7.182081	H	-4.467562	-6.890322	0.097873	h	-1.770452	-7.323097	3.604894	
C	1.784419	-7.154340	6.823458	C	-4.685588	-8.961424	0.665428	h	4.652811	-9.434495	2.928626	
C	1.918149	-7.112420	5.375353	C	-4.384088	-9.801002	1.752767	h	4.458452	-8.599476	0.343975	
C	2.731141	-7.958666	4.626940	H	-3.520364	-9.589742	2.373811	h	1.804268	-4.811225	-2.118681	
H	3.259482	-8.743901	5.154359	C	-5.166051	-10.922828	2.040385	h	-0.615564	-3.643304	-1.768814	
C	2.525354	-6.444647	0.041899	H	-4.916708	-11.545389	2.893664	h	-3.445263	-2.761474	2.782391	
H	3.105589	-6.621080	-0.858211	C	-6.265470	-11.234797	1.234917	h	-2.587985	-2.639891	5.472923	
C	-1.466940	-3.924282	1.139709	H	-6.878696	-12.097825	1.470810	h	0.528504	-5.999064	8.185075	
H	-2.299896	-3.517925	0.586813	C	-5.792066	-9.290729	-0.136045	h	2.392832	-7.847182	7.483695	
C	-0.487536	-4.506590	5.851899	H	-6.037660	-8.656487	-0.978757	h	-3.673022	-7.156062	-2.627912	
H	-0.913302	-4.176525	6.794648	C	-6.570293	-10.420728	0.136947	h	-1.280193	-9.344070	0.215322	
O	1.653100	-2.009226	0.690561	H	-7.419445	-10.651330	-0.500257	h	3.368758	4.951525	-0.456409	
H	1.674531	-2.315172	1.658971	C	-1.962188	-9.206032	-0.623662	h	0.539020	1.444347	-1.820635	
H	1.219698	-2.686332	0.129393	O	-2.090829	-10.120807	-1.466020					
O	3.277217	1.604939	0.697816	S	-0.662621	-7.478125	2.796796	Conf LW3 –IC1	C	4.103177	5.032877	-1.239711
H	2.557247	1.010114	0.301494	H	0.807363	-2.941493	3.345450	C	4.004821	6.029083	-1.676200	
H	2.847167	2.125075	1.409567	O	2.191681	-4.520995	2.973294	H	5.095769	4.961517	-0.784501	
O	5.558366	2.351504	-0.029581	O	1.670262	-2.550128	3.063820	C	3.989855	4.007909	-2.350740	
H	4.733300	1.906234	0.376314	FE	0.915343	-5.653687	2.937855	O	3.347652	4.217680	-3.396569	
H	6.348415	1.779506	-0.049997	N	2.315469	-7.049783	2.423739	O	4.621813	2.831386	-2.172520	
h	-1.798473	-7.294335	3.605090	N	0.620675	-5.243160	0.970816	H	5.032023	2.636784	-1.194434	
h	4.638486	-9.399427	2.922158	N	-0.574306	-4.390972	3.417640	C	0.820435	0.462890	-1.559195	
h	4.384195	-8.630156	0.320919	N	1.142004	-6.146058	4.873554					

H	0.024809	-0.240044	-1.851173	C	-1.368391	-4.108056	1.084942	H	-6.904985	-12.135842	1.455979
O	0.995674	0.397546	-0.118855	H	-2.228635	-3.780088	0.522234	C	-5.803545	-9.332010	-0.146974
H	1.100914	-0.601864	0.195977	C	-0.325780	-4.503062	5.789365	H	-6.045970	-8.696522	-0.989663
C	2.105030	0.043395	-2.284052	H	-0.732888	-4.127668	6.722399	C	-6.587229	-10.458508	0.124934
H	2.376985	-0.971475	-1.974573	O	1.408962	-1.951840	0.623313	H	-7.436185	-10.685117	-0.513557
H	1.981405	0.044022	-3.373987	H	1.133245	-2.112910	1.621133	C	-1.963769	-9.242458	-0.624321
H	2.941689	0.705612	-2.042886	H	1.043949	-2.651740	0.044022	O	-2.098978	-10.163310	-1.456807
N	-3.380971	-7.984761	-2.111593	O	3.065984	1.581473	0.753024	S	-0.638660	-7.524418	2.785556
H	-3.382162	-8.878123	-2.580484	H	2.336001	0.995888	0.342411	H	1.576356	-2.816070	3.287875
C	-2.783366	-7.932623	-0.788291	H	2.648980	2.094387	1.478689	O	2.220473	-4.553312	3.134377
H	-2.084027	-7.086318	-0.686237	O	5.371714	2.263654	0.081193	O	1.216008	-1.977410	2.929780
C	-3.844007	-7.765170	0.377685	H	4.514385	1.841108	0.457162	FE	1.029808	-5.713214	2.953043
H	-3.289063	-7.471920	1.272918	H	6.175164	1.721105	0.170651	N	2.407031	-7.123564	2.449954
H	-4.474600	-6.912122	0.099489	h	-1.740862	-7.312965	3.576134	N	0.750506	-5.311041	0.984143
C	-4.698166	-8.982003	0.666376	h	4.755662	-9.460709	2.969221	N	-0.503800	-4.503877	3.400841
C	-4.405882	-9.819591	1.757950	h	4.657508	-8.557078	0.406340	N	1.172772	-6.263720	4.869459
H	-3.546521	-9.608099	2.385044	h	1.975079	-4.793327	-2.124693	C	3.017653	-8.050668	3.286223
C	-5.194433	-10.937458	2.044380	h	-0.505453	-3.793760	-1.837137	C	4.041713	-8.792168	2.555810
H	-4.950609	-11.559259	2.899906	h	-3.375050	-2.866588	2.684578	C	4.045660	-8.289006	1.271034
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H	-6.910056	-12.107485	1.467966	h	0.527786	-6.019476	8.150262	C	1.651793	-5.605005	-0.025057
C	-5.803540	-9.307598	-0.138289	h	2.296763	-7.943120	7.497279	C	1.238334	-4.981119	-1.269855
H	-6.043146	-8.674116	-0.983297	h	-3.669160	-7.171490	-2.617072	C	0.018498	-4.360501	-1.030337
C	-6.588984	-10.432715	0.134585	h	-1.278168	-9.355447	0.230778	C	-0.261747	-4.575588	0.398453
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S	-0.637181	-7.458004	2.760537	Conf LW3 –Cpd I				C	-0.879175	-4.057311	4.653711
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O	0.912738	-2.303510	3.095584	H	5.104786	4.827522	-0.651028	C	1.744749	-7.359383	6.830323
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Conf LM1 –RC

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Conf LM1 –TSoo

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O	1.219797	1.021802	-6.723556	S	0.068573	-0.638963	5.290441	h	2.100743	4.392969	-6.415416
H	0.589711	0.532271	-6.056000	H	1.951584	0.634994	0.993717	h	-0.713713	2.433463	-3.012336
H	2.152461	0.830137	-6.496111	O	2.655857	-0.153867	2.061303				
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H	1.227319	-0.271385	-0.534145	FE	1.644369	-0.330845	3.410044	C	2.442489	4.614491	-7.454146
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O	-0.633239	-1.358328	-2.978920	N	0.046706	-0.875733	2.284878	H	3.502143	4.335805	-7.528182
H	-0.009890	-1.187089	-2.167444	N	1.163590	1.653260	3.258790	C	1.757932	3.959976	-8.641190
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h	3.194104	-4.901494	5.345103	C	2.820945	-4.286752	4.686989	H	1.132036	2.180802	-7.682803
h	1.603916	-5.550253	3.200182	C	1.972930	-4.629626	3.657325	C	-0.122393	1.939620	-2.303522
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h	-0.639210	4.259072	1.887447	C	-1.482696	-2.103618	1.023049	H	0.649736	2.469313	-0.561818
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h	5.452450	2.248119	5.789297	C	-0.840663	-0.025296	1.669830	H	1.858922	1.060180	-2.190941
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h	-4.101993	-5.663391	3.399936	C	0.231102	3.603370	2.395203	H	1.832321	2.634182	-2.989675
h	-1.877197	-6.594467	5.357934	C	1.291837	3.999127	3.192468	N	-3.944796	-5.206613	4.275535
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				C	4.829789	1.374314	5.713481	H	-2.082196	-4.366513	3.694169
Conf LM1 –IH				C	4.918836	0.071387	6.161798	C	-2.797426	-3.275983	5.396369
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Conf LM3-TSoo

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Conf LM3 -IH

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