

## Supplementary material

### Unexpected rapid aerobic transformation of 2,2,6,6-tetraethyl-4-oxo(piperidin-1-ylloxy) radical by cytochrome P450 in the presence of NADPH: evidence against a simple reduction of the nitroxide moiety to the hydroxylamine.

Nikola Babić <sup>1</sup>, Maylis Orio <sup>2</sup>, and Fabienne Peyrot <sup>1,3,\*</sup>

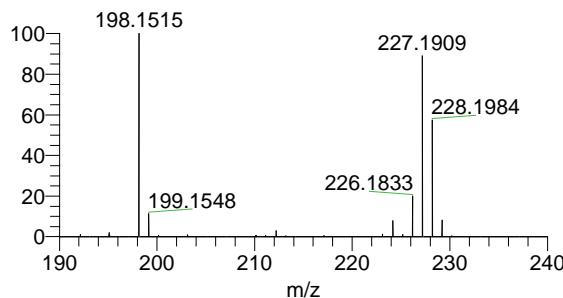
<sup>1</sup> Université de Paris, Laboratoire de Chimie et Biochimie Pharmacologiques et Toxicologiques, UMR 8601, CNRS, F-75006 Paris, France

<sup>2</sup> Aix-Marseille Univ., CNRS, Centrale Marseille, iSm2, Marseille, France

<sup>3</sup> Sorbonne Université, Institut National Supérieur du Professorat et de l'Éducation (INSPE) de l'Académie de Paris, F-75016 Paris, France

#### 1. HRMS analysis of pure TEEPONE and TEEPOL

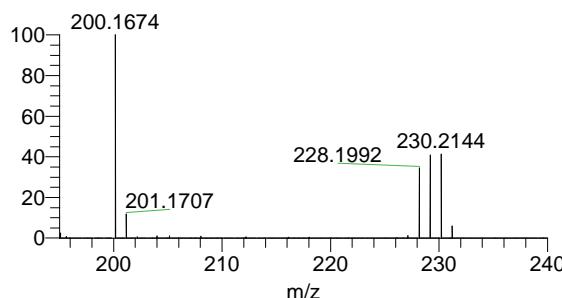
**Supplementary Figure S1:** HRMS spectrum of TEEPONE (peak eluted at 16.4 min, Figure 4A). The corresponding observed and calculated m/z values for the indicated elemental composition are reported in Supplementary Table T1.



**Supplementary table T1:** HRMS characteristics of TEEPONE as observed in Supplementary Figure S1.

| m/z (Da) |            | chemical formula  |
|----------|------------|---|
| observed | calculated |   |
| 198.1515 | 198.1489   | C <sub>11</sub> H <sub>20</sub> NO <sub>2</sub> <sup>+</sup> [MH <sup>+</sup> -C <sub>2</sub> H <sub>5</sub> ·] |
| 226.1833 | 226.1802   | C <sub>13</sub> H <sub>24</sub> NO <sub>2</sub> <sup>+</sup> [M <sup>+</sup> ]                                  |
| 227.1909 | 227.1880   | C <sub>13</sub> H <sub>25</sub> NO <sub>2</sub> <sup>+</sup> [MH <sup>+</sup> ]                                 |
| 228.1984 | 228.1958   | C <sub>13</sub> H <sub>26</sub> NO <sub>2</sub> <sup>+</sup> [MH <sub>2</sub> <sup>+</sup> ]                    |

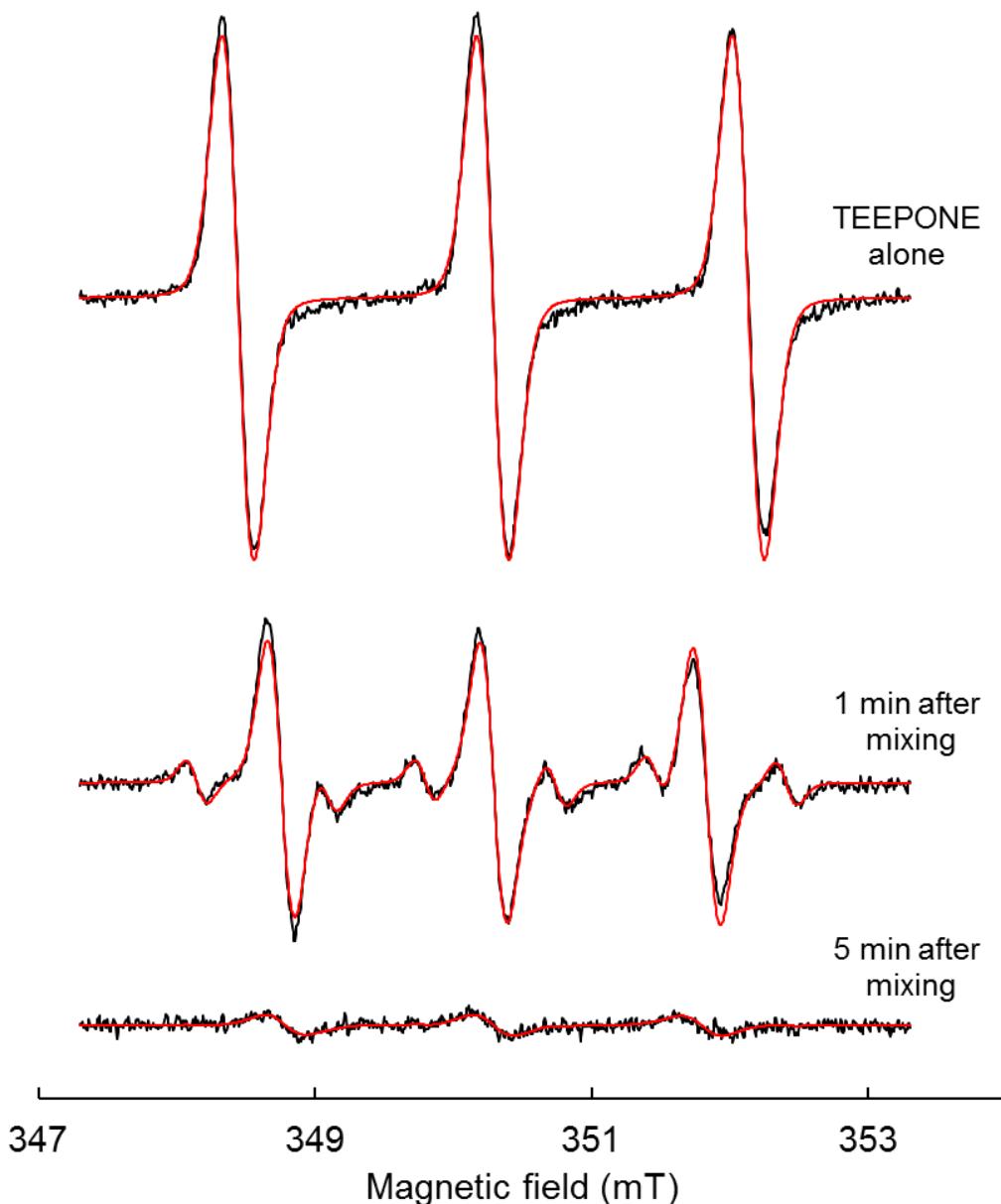
**Supplementary Figure S2:** HRMS spectrum of TEEPOL (peak eluted at 15.6 min, Figure 4B). The corresponding observed and calculated m/z values for the indicated elemental composition are reported in Supplementary Table T2.



**Supplementary Table T2:** HRMS characteristics of TEEPOL as observed in Supplementary Figure S2.

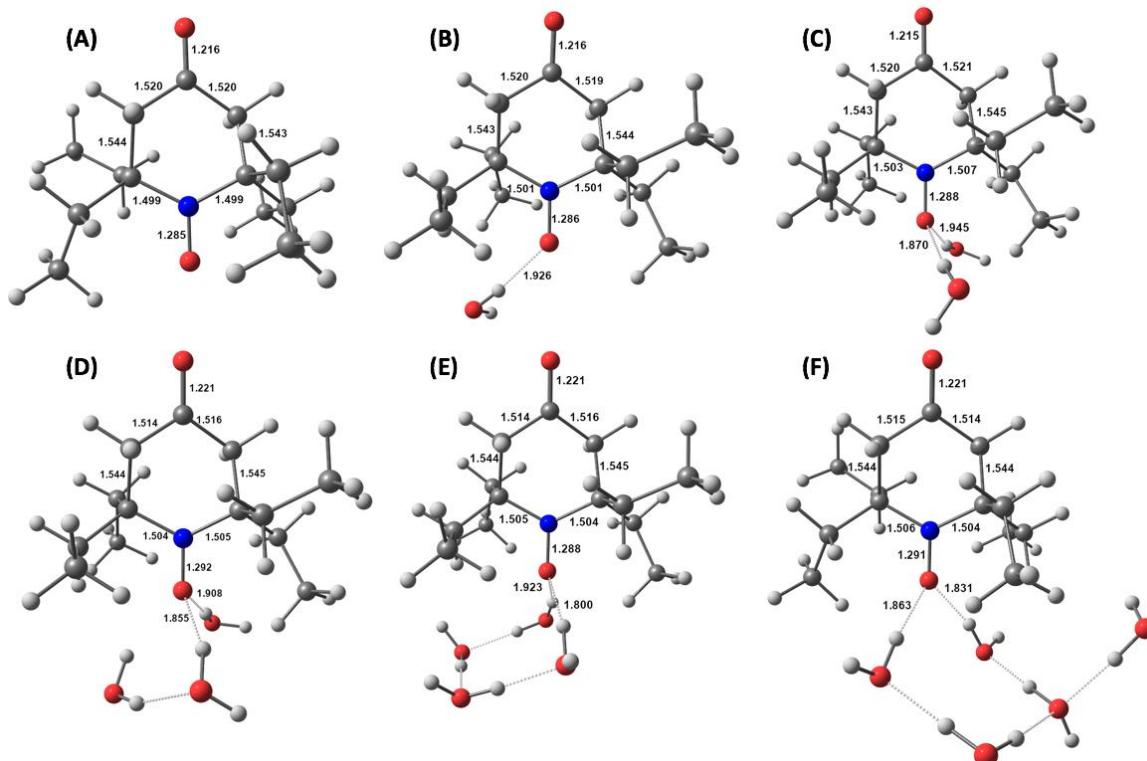
| <b>m/z (Da)</b> |                   | <b>chemical formula</b>            |
|-----------------|-------------------|------------------------------------|
| <b>observed</b> | <b>calculated</b> |                                    |
| 200.1674        | 200.1645          | $C_{11}H_{22}NO_2^+ [MH^+-C_2H_5]$ |
| 228.1992        | 228.1958          | $C_{13}H_{26}NO_2^+ [M^+]$         |
| 229.2067        | 229.2036          | $C_{13}H_{27}NO_2^{++} [MH^+]$     |
| 230.2144        | 230.2115          | $C_{13}H_{28}NO_2^+ [MH_2^+]$      |

## 2. EasySpin simulations



**Supplementary Figure S3:** Superimposition of experimental (black) and calculated (red) spectra of TEEPONE alone and 1 or 5 min after mixing with RLM and NADPH. The parameters used in the simulation are given in Table 1. See legend of Figure 2 and experimental section for experimental details.

### 3. DFT calculations



**Supplementary Figure S4:** DFT-optimized structures with selected metrical parameters ( $\text{\AA}$ ) for TEEPONE without (A) and with 1 (B), 2 (C), 3 (D), 4 (E), and 5 (F) water molecules.

**Supplementary Table T3:** DFT-calculated  $^{14}\text{N}$  hyperfine coupling constants (hfc, MHz) for the geometry-optimized TEEPONE with explicit solvent molecules.

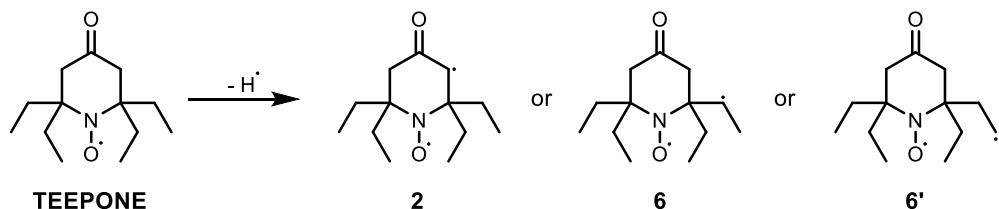
| Model                   | $A_{\min}$ | $A_{\text{mid}}$ | $A_{\max}$ | $A_{\text{iso}}$ |
|-------------------------|------------|------------------|------------|------------------|
| No $\text{H}_2\text{O}$ | 11.8       | 12.5             | 82.9       | 35.7             |
| 1 $\text{H}_2\text{O}$  | 13.7       | 13.9             | 90.6       | 39.4             |
| 2 $\text{H}_2\text{O}$  | 15.6       | 15.6             | 97.4       | 42.9             |
| 3 $\text{H}_2\text{O}$  | 16.5       | 16.5             | 101.1      | 44.7             |
| 4 $\text{H}_2\text{O}$  | 16.1       | 16.1             | 98.5       | 43.6             |
| 5 $\text{H}_2\text{O}$  | 16.0       | 16.1             | 99.0       | 43.7             |
| Experimental            | -          | -                | -          | 43.2             |

**Supplementary Table T4:** DFT-calculated hyperfine coupling constants (hfc, MHz) for the geometry-optimized structure **3'** + 4  $\text{H}_2\text{O}$ . (The proton hfc refers to atom 24 in Figure 9C.)

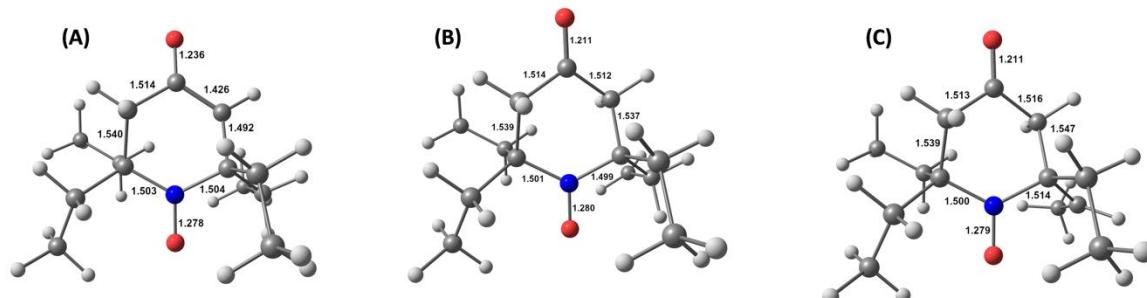
|                   | $A_{\min}$ | $A_{\text{mid}}$ | $A_{\max}$ | $A_{\text{iso}}$ |
|-------------------|------------|------------------|------------|------------------|
| $^{14}\text{N} A$ | 16.7       | 16.9             | 99.0       | 44.2             |
| $^1\text{H} A$    | 35.9       | 37.6             | 49.6       | 41.0             |

**Supplementary Table T5:** DFT-calculated hyperfine coupling constants (hfc, MHz) for the geometry-optimized structure **3' + 4 H<sub>2</sub>O**. (The proton hfc refers to atom 32 in Figure 9F.)

|                   | A <sub>min</sub> | A <sub>mid</sub> | A <sub>max</sub> | A <sub>iso</sub> |
|-------------------|------------------|------------------|------------------|------------------|
| <sup>14</sup> N A | 8.3              | 8.9              | 62.5             | 26.5             |
| <sup>1</sup> H A  | -11.3            | -27.3            | -38.0            | -25.5            |



**Supplementary Figure S5:** Structures **2**, **6** and **6'** resulting of H-abstraction at different positions on TEEPONE.



**Supplementary Figure S6:** DFT-optimized structures for **2** (A), **6** (B), and **6'** (C) with selected metrical parameters (Å).

**Supplementary Table T6:** Gibbs free energy calculations for the H-atom abstraction.

|                           | G (E <sub>h</sub> ) | ΔG (kcal.mol <sup>-1</sup> ) | ΔΔG (kcal.mol <sup>-1</sup> ) |
|---------------------------|---------------------|------------------------------|-------------------------------|
| TEEPONE                   | -714.87235996       | 0                            | -                             |
| <b>2</b>                  | -714.23765823       | -                            | -                             |
| <b>6</b>                  | -714.22389014       | -                            | -                             |
| <b>6'</b>                 | -714.21846439       | -                            | -                             |
| H <sup>•</sup>            | -0.5                | -                            | -                             |
| <b>2 + H<sup>•</sup></b>  | -714.73765823       | +84.5                        | 0                             |
| <b>6 + H<sup>•</sup></b>  | -714.72389014       | +93.2                        | 8.7                           |
| <b>6' + H<sup>•</sup></b> | -714.71846439       | +96.6                        | 12.1                          |

**Supplementary Table T7:** Cartesian coordinates for the DFT-optimized structure of TEEPONE

Atomic number / X / Y / Z

|   |              |              |              |
|---|--------------|--------------|--------------|
| 6 | -2.903959000 | 1.334763000  | 2.185364000  |
| 6 | -3.026805000 | 1.391378000  | 0.658763000  |
| 1 | -2.945422000 | 2.349299000  | 2.597182000  |
| 1 | -1.958090000 | 0.888584000  | 2.507494000  |
| 1 | -3.712074000 | 0.749638000  | 2.633424000  |
| 6 | -3.072383000 | 0.022349000  | -0.089766000 |
| 1 | -2.180750000 | 1.955459000  | 0.242403000  |
| 1 | -3.922916000 | 1.969672000  | 0.398792000  |
| 6 | -3.357016000 | 0.279991000  | -1.584188000 |
| 6 | -5.842631000 | 0.328318000  | -0.894771000 |
| 6 | -5.547581000 | -0.940276000 | -0.065039000 |
| 7 | -4.158593000 | -0.832886000 | 0.488367000  |
| 6 | -1.713418000 | -0.704068000 | 0.078354000  |
| 6 | -1.591534000 | -2.094789000 | -0.553491000 |
| 1 | -1.502834000 | -0.793962000 | 1.145655000  |
| 1 | -0.949851000 | -0.037845000 | -0.345212000 |
| 1 | -2.327668000 | -2.781773000 | -0.127702000 |
| 1 | -0.595674000 | -2.504868000 | -0.348951000 |
| 1 | -1.713269000 | -2.081387000 | -1.643163000 |
| 6 | -5.604655000 | -2.230749000 | -0.929248000 |
| 6 | -6.946579000 | -2.528837000 | -1.610797000 |
| 1 | -5.322026000 | -3.063533000 | -0.276855000 |
| 1 | -4.824942000 | -2.173930000 | -1.699038000 |
| 1 | -7.772296000 | -2.592471000 | -0.894322000 |
| 1 | -6.891544000 | -3.490220000 | -2.133759000 |
| 1 | -7.207157000 | -1.770150000 | -2.356902000 |
| 8 | -3.857591000 | -1.568590000 | 1.497618000  |
| 6 | -6.572460000 | -0.967444000 | 1.108673000  |
| 6 | -6.746974000 | -2.263077000 | 1.910335000  |
| 1 | -7.113077000 | -3.087700000 | 1.289215000  |
| 1 | -7.488567000 | -2.101504000 | 2.701704000  |
| 1 | -5.806674000 | -2.568374000 | 2.369311000  |
| 1 | -6.296721000 | -0.155180000 | 1.792176000  |
| 1 | -7.543934000 | -0.685314000 | 0.681543000  |
| 8 | -5.046003000 | 1.335648000  | -2.917979000 |
| 6 | -4.776996000 | 0.716783000  | -1.906627000 |
| 1 | -3.175988000 | -0.632230000 | -2.167369000 |
| 1 | -2.666072000 | 1.033192000  | -1.977427000 |
| 1 | -5.957455000 | 1.180584000  | -0.208580000 |
| 1 | -6.797323000 | 0.235624000  | -1.419303000 |

**Supplementary Table T8:** Cartesian coordinates for the DFT-optimized structure of **2**

Atomic number / X / Y / Z

|   |              |             |             |
|---|--------------|-------------|-------------|
| 6 | -2.732057277 | 1.290342425 | 2.296580591 |
| 6 | -3.034841112 | 1.422137681 | 0.805301986 |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 1 | -2.785449367 | 2.276766950  | 2.762857183  |
| 1 | -1.733002163 | 0.896977362  | 2.482366479  |
| 1 | -3.445153879 | 0.637725261  | 2.797604877  |
| 6 | -3.111632179 | 0.079218213  | -0.010175780 |
| 1 | -2.274803939 | 2.046461919  | 0.327037183  |
| 1 | -3.983774587 | 1.946430697  | 0.676347073  |
| 6 | -3.409763220 | 0.445225455  | -1.425028655 |
| 6 | -5.845218715 | 0.291652869  | -0.954151464 |
| 6 | -5.575145282 | -0.927984829 | -0.052966280 |
| 7 | -4.211226496 | -0.774371122 | 0.558389342  |
| 6 | -1.764289834 | -0.673929783 | 0.078123455  |
| 6 | -1.677162781 | -1.954987971 | -0.746401832 |
| 1 | -1.567830046 | -0.907550614 | 1.121339256  |
| 1 | -0.992407980 | 0.031185915  | -0.244736556 |
| 1 | -2.397027746 | -2.695096654 | -0.397495738 |
| 1 | -0.681845338 | -2.393984577 | -0.651591308 |
| 1 | -1.856226312 | -1.778219931 | -1.809613305 |
| 6 | -5.562170405 | -2.243831229 | -0.868646114 |
| 6 | -6.857812598 | -2.596486676 | -1.600364967 |
| 1 | -5.291495245 | -3.046444252 | -0.181573819 |
| 1 | -4.751506601 | -2.186605429 | -1.600660545 |
| 1 | -7.714541426 | -2.655006548 | -0.927269173 |
| 1 | -6.755133252 | -3.571896662 | -2.079853824 |
| 1 | -7.096329687 | -1.878579192 | -2.386035398 |
| 8 | -3.909011918 | -1.529440261 | 1.544758449  |
| 6 | -6.645663283 | -0.921433252 | 1.071413781  |
| 6 | -6.839770900 | -2.178085744 | 1.919276078  |
| 1 | -7.163361169 | -3.032153490 | 1.322524990  |
| 1 | -7.619225248 | -1.993281571 | 2.662367237  |
| 1 | -5.927724425 | -2.454333163 | 2.440688973  |
| 1 | -6.415579590 | -0.076996120 | 1.726303541  |
| 1 | -7.597334548 | -0.674103172 | 0.591747693  |
| 8 | -4.953670179 | 0.926125465  | -3.105424149 |
| 6 | -4.732798937 | 0.581521667  | -1.938866477 |
| 1 | -2.585476314 | 0.694895474  | -2.082888333 |
| 1 | -5.982623587 | 1.176918815  | -0.323772202 |
| 1 | -6.773793253 | 0.156208789  | -1.504157047 |

**Supplementary Table T9:** Cartesian coordinates for the DFT-optimized structure of **3**

| Atomic number / X / Y / Z |              |              |              |
|---------------------------|--------------|--------------|--------------|
| 6                         | -2.328023000 | -1.350385000 | 2.840040000  |
| 6                         | -1.697375000 | -0.305376000 | 1.904352000  |
| 1                         | -1.962480000 | -2.362375000 | 2.634885000  |
| 1                         | -3.418924000 | -1.367636000 | 2.756924000  |
| 1                         | -2.079546000 | -1.117744000 | 3.880307000  |
| 6                         | -1.912515000 | -0.566485000 | 0.390451000  |
| 1                         | -0.615846000 | -0.258459000 | 2.089240000  |
| 1                         | -2.090467000 | 0.688067000  | 2.134763000  |
| 6                         | -3.404030000 | -0.710868000 | -0.011557000 |
| 6                         | -4.343801000 | 0.431367000  | 0.410412000  |
| 1                         | -3.766521000 | -1.658184000 | 0.407821000  |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 1 | -3.431049000 | -0.823476000 | -1.101176000 |
| 1 | -4.407280000 | 0.529111000  | 1.498955000  |
| 1 | -5.354909000 | 0.236753000  | 0.037336000  |
| 1 | -4.006015000 | 1.390477000  | 0.011416000  |
| 6 | -1.084897000 | -1.777706000 | -0.106656000 |
| 6 | 0.158024000  | -1.210246000 | -0.776793000 |
| 1 | -1.623789000 | -2.333873000 | -0.882721000 |
| 1 | -0.802990000 | -2.475351000 | 0.684719000  |
| 6 | -0.128874000 | 0.234240000  | -1.207698000 |
| 7 | -1.286050000 | 0.579594000  | -0.363797000 |
| 8 | 1.217208000  | -1.789642000 | -0.916479000 |
| 6 | -0.380283000 | 0.357215000  | -2.749592000 |
| 1 | 0.706942000  | 0.891114000  | -0.941600000 |
| 6 | 0.978088000  | 0.111066000  | -3.483948000 |
| 6 | 0.878354000  | -0.635503000 | -4.828987000 |
| 1 | 1.636254000  | -0.470288000 | -2.833165000 |
| 1 | 1.463230000  | 1.082955000  | -3.634902000 |
| 1 | 0.506969000  | -1.653696000 | -4.682984000 |
| 1 | 1.871094000  | -0.709163000 | -5.283237000 |
| 1 | 0.227933000  | -0.132043000 | -5.551541000 |
| 6 | -0.987770000 | 1.744452000  | -3.069526000 |
| 6 | -1.257794000 | 2.029546000  | -4.558741000 |
| 1 | -0.311317000 | 2.512378000  | -2.676501000 |
| 1 | -1.920456000 | 1.843951000  | -2.508682000 |
| 1 | -0.339025000 | 2.051660000  | -5.151746000 |
| 1 | -1.740035000 | 3.006362000  | -4.663110000 |
| 1 | -1.936587000 | 1.294574000  | -5.009968000 |
| 8 | -1.334694000 | -0.686220000 | -3.033653000 |
| 1 | -1.569128000 | -0.632578000 | -3.966867000 |
| 8 | -1.506912000 | 1.795307000  | -0.029530000 |

**Supplementary Table T10:** Cartesian coordinates for the DFT-optimized structure of **4**

| Atomic number / X / Y / Z |              |              |              |
|---------------------------|--------------|--------------|--------------|
| 6                         | 0.051975381  | 3.727317112  | 1.995550684  |
| 6                         | 0.977846556  | 2.509403362  | 1.834392904  |
| 1                         | 0.646656549  | 4.607090043  | 2.261952331  |
| 1                         | -0.689772429 | 3.578889203  | 2.785158647  |
| 1                         | -0.487617199 | 3.951089435  | 1.071345878  |
| 6                         | 0.312407663  | 1.179767453  | 1.362644926  |
| 1                         | 1.464966339  | 2.290405307  | 2.792428357  |
| 1                         | 1.783310502  | 2.760646314  | 1.134880257  |
| 6                         | 1.404868973  | 0.102385220  | 1.194675210  |
| 6                         | 1.733723459  | 0.949654059  | -1.152101241 |
| 6                         | 0.427932980  | 1.393310513  | -1.161776743 |
| 7                         | -0.321568617 | 1.427926350  | 0.011008894  |
| 6                         | -0.778956093 | 0.725649281  | 2.359041560  |
| 6                         | -1.500663758 | -0.594596369 | 2.033603713  |
| 1                         | -1.524475245 | 1.518129473  | 2.440498980  |
| 1                         | -0.287893665 | 0.644993855  | 3.336537887  |
| 1                         | -1.972644351 | -0.554556672 | 1.048472004  |
| 1                         | -2.289728847 | -0.771459432 | 2.770805400  |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 1 | -0.830544214 | -1.458962479 | 2.063695200  |
| 6 | -0.256921195 | 1.885029867  | -2.416086151 |
| 6 | -0.399326871 | 3.422880284  | -2.475934266 |
| 1 | -1.249583747 | 1.428430787  | -2.473492767 |
| 1 | 0.326929712  | 1.533890177  | -3.271714846 |
| 1 | -1.017891071 | 3.788426664  | -1.653031124 |
| 1 | -0.876550383 | 3.716894584  | -3.416081487 |
| 1 | 0.579816899  | 3.910063571  | -2.425762062 |
| 8 | -1.541349609 | 1.817301164  | -0.026861030 |
| 8 | 3.550849344  | 0.060240160  | 0.083458425  |
| 6 | 2.362389224  | 0.373616775  | 0.037796364  |
| 1 | 0.945015649  | -0.870920140 | 0.984666544  |
| 1 | 1.982412599  | 0.004327544  | 2.117861799  |
| 1 | 2.321842796  | 0.995068906  | -2.062950899 |

**Supplementary Table T11:** Cartesian coordinates for the DFT-optimized structure of **6**

Atomic number / X / Y / Z

|   |              |              |              |
|---|--------------|--------------|--------------|
| 6 | -2.886410044 | 1.350551007  | 2.177993887  |
| 6 | -3.042042987 | 1.419500376  | 0.660710379  |
| 1 | -2.928796979 | 2.357011003  | 2.599088649  |
| 1 | -1.934304929 | 0.912558206  | 2.478141021  |
| 1 | -3.677011520 | 0.759010517  | 2.639109274  |
| 6 | -3.073584358 | 0.066773850  | -0.102212540 |
| 1 | -2.221584209 | 2.005604864  | 0.234223418  |
| 1 | -3.951981245 | 1.978533007  | 0.426308086  |
| 6 | -3.372868550 | 0.319659226  | -1.587989100 |
| 6 | -5.840284326 | 0.311178462  | -0.884443921 |
| 6 | -5.522352314 | -0.950378171 | -0.061894968 |
| 7 | -4.126518910 | -0.830123748 | 0.476257926  |
| 6 | -1.691577112 | -0.640078092 | 0.021341421  |
| 6 | -1.570021773 | -1.950902171 | -0.667276930 |
| 1 | -1.487166077 | -0.775769892 | 1.085308441  |
| 1 | -0.949694499 | 0.063210851  | -0.364882562 |
| 1 | -2.123803162 | -2.805793414 | -0.306316126 |
| 1 | -0.869725763 | -2.102302999 | -1.477472963 |
| 6 | -5.574638023 | -2.234845665 | -0.927290494 |
| 6 | -6.912181580 | -2.539040297 | -1.603033848 |
| 1 | -5.284658087 | -3.065847555 | -0.283055062 |
| 1 | -4.799959595 | -2.171893985 | -1.695664491 |
| 1 | -7.735198089 | -2.604389285 | -0.890044097 |
| 1 | -6.854133076 | -3.498728917 | -2.120333567 |
| 1 | -7.177003679 | -1.789472198 | -2.350442577 |
| 8 | -3.787615023 | -1.609606081 | 1.433039551  |
| 6 | -6.532040464 | -0.987642377 | 1.119624617  |
| 6 | -6.691924301 | -2.278440365 | 1.921788195  |
| 1 | -7.060707176 | -3.103190695 | 1.309950415  |
| 1 | -7.424333905 | -2.118742171 | 2.716818510  |
| 1 | -5.754368856 | -2.585007056 | 2.376262110  |
| 1 | -6.258215224 | -0.175372980 | 1.797681834  |
| 1 | -7.506257923 | -0.712399432 | 0.705042988  |
| 8 | -5.088540954 | 1.313432622  | -2.916215243 |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 6 | -4.797595426 | 0.712305876  | -1.905589144 |
| 1 | -3.160826405 | -0.592242621 | -2.156992644 |
| 1 | -2.705808302 | 1.086348903  | -1.985445799 |
| 1 | -5.955392887 | 1.161074495  | -0.202059017 |
| 1 | -6.797412053 | 0.206788502  | -1.392631430 |

**Supplementary Table T12:** Cartesian coordinates for the DFT-optimized structure of **6'**

Atomic number / X / Y / Z

|   |              |              |              |
|---|--------------|--------------|--------------|
| 6 | -2.891843075 | 1.297147323  | 2.127934481  |
| 6 | -3.039062863 | 1.383097352  | 0.611602137  |
| 1 | -2.852800656 | 2.300606477  | 2.556228389  |
| 1 | -1.981333217 | 0.773640761  | 2.421619772  |
| 1 | -3.727530647 | 0.767629329  | 2.584692514  |
| 6 | -3.080657137 | 0.027087721  | -0.142732873 |
| 1 | -2.201029486 | 1.948034196  | 0.190705184  |
| 1 | -3.934486378 | 1.961344387  | 0.370293138  |
| 6 | -3.397843674 | 0.272228173  | -1.636586704 |
| 6 | -5.860486689 | 0.314047630  | -0.896604295 |
| 6 | -5.563210647 | -0.950941334 | -0.071227150 |
| 7 | -4.156409798 | -0.863599372 | 0.440982420  |
| 6 | -1.758364744 | -0.670953839 | -0.020367919 |
| 6 | -1.464693792 | -1.999011227 | -0.617076545 |
| 1 | -0.954220249 | -0.139674123 | 0.472357889  |
| 1 | -2.368038082 | -2.589081082 | -0.777344293 |
| 1 | -0.806781423 | -2.579827812 | 0.034641412  |
| 1 | -0.947170344 | -1.917631731 | -1.584569964 |
| 6 | -5.662947842 | -2.236278134 | -0.931132731 |
| 6 | -7.022131810 | -2.518096908 | -1.572444463 |
| 1 | -5.370089714 | -3.071211350 | -0.293236016 |
| 1 | -4.909526105 | -2.185698356 | -1.721992494 |
| 1 | -7.826816570 | -2.571162119 | -0.838047376 |
| 1 | -6.993437117 | -3.477743568 | -2.092242812 |
| 1 | -7.293987425 | -1.762655386 | -2.311403849 |
| 8 | -3.814899228 | -1.645933121 | 1.393924551  |
| 6 | -6.555159400 | -0.956339663 | 1.125514419  |
| 6 | -6.725266571 | -2.235435625 | 1.944155835  |
| 1 | -7.115479285 | -3.060844083 | 1.346615599  |
| 1 | -7.444281880 | -2.055143828 | 2.746929773  |
| 1 | -5.786488252 | -2.552164435 | 2.388949890  |
| 1 | -6.255964353 | -0.142204136 | 1.790593184  |
| 1 | -7.530691740 | -0.667433251 | 0.723243545  |
| 8 | -5.123314539 | 1.243778618  | -2.968440156 |
| 6 | -4.828147538 | 0.670476949  | -1.943523433 |
| 1 | -3.197978075 | -0.637562194 | -2.210194386 |
| 1 | -2.732544548 | 1.036136476  | -2.041089490 |
| 1 | -5.930667630 | 1.171688111  | -0.218161225 |
| 1 | -6.831599377 | 0.237883613  | -1.382609268 |

**Supplementary Table T13:** Cartesian coordinates for the DFT-optimized structure of TEEPONE + 1H<sub>2</sub>O

Atomic number / X / Y / Z

|   |              |              |              |
|---|--------------|--------------|--------------|
| 1 | -2.367048440 | 3.454889807  | -0.265019794 |
| 8 | -2.558650732 | 4.409770250  | -0.314110243 |
| 1 | -2.928361875 | 4.620229722  | 0.556327439  |
| 6 | -0.012031022 | 3.681200208  | 2.147859348  |
| 6 | 0.940632626  | 2.514078432  | 1.861310385  |
| 1 | 0.575804495  | 4.555716678  | 2.448791542  |
| 1 | -0.698233680 | 3.454365964  | 2.970572589  |
| 1 | -0.608061689 | 3.971229998  | 1.277389139  |
| 6 | 0.311234544  | 1.169277981  | 1.390333054  |
| 1 | 1.513834365  | 2.285324614  | 2.769496545  |
| 1 | 1.677089925  | 2.825910694  | 1.110855217  |
| 6 | 1.435672341  | 0.135933823  | 1.182743818  |
| 6 | 1.666421239  | 1.013426919  | -1.152975887 |
| 6 | 0.352009758  | 1.409817130  | -1.132206762 |
| 7 | -0.362000826 | 1.413873483  | 0.058303806  |
| 6 | -0.736157946 | 0.659676089  | 2.403072499  |
| 6 | -1.438429459 | -0.661129303 | 2.065740832  |
| 1 | -1.496051107 | 1.431441262  | 2.536679845  |
| 1 | -0.210383351 | 0.564558756  | 3.362094197  |
| 1 | -1.961901644 | -0.596141999 | 1.107333412  |
| 1 | -2.185263611 | -0.885478694 | 2.835293725  |
| 1 | -0.749446067 | -1.511968039 | 2.030161372  |
| 6 | -0.361410828 | 1.888247489  | -2.371312509 |
| 6 | -0.250576314 | 3.411523124  | -2.583452567 |
| 1 | -1.413657442 | 1.598646422  | -2.311311210 |
| 1 | 0.080312517  | 1.367503452  | -3.227139543 |
| 1 | -0.726633454 | 3.971995985  | -1.774988984 |
| 1 | -0.747923502 | 3.689851814  | -3.518792724 |
| 1 | 0.798483264  | 3.719035681  | -2.653597623 |
| 8 | -1.603294215 | 1.737806951  | 0.072052702  |
| 8 | 3.540471376  | 0.162893771  | 0.005178640  |
| 6 | 2.348430487  | 0.446074130  | 0.003787055  |
| 1 | 1.003426725  | -0.853677655 | 0.987808425  |
| 1 | 2.039067523  | 0.051992529  | 2.091191218  |
| 1 | 2.227040852  | 1.085299790  | -2.079399392 |

**Supplementary Table T14:** Cartesian coordinates for the DFT-optimized structure of TEEPONE + 2H<sub>2</sub>O

Atomic number / X / Y / Z

|   |              |              |              |
|---|--------------|--------------|--------------|
| 6 | -0.565925000 | 1.565997000  | -3.040064000 |
| 6 | -0.124889000 | 0.266546000  | -2.359042000 |
| 1 | -0.500911000 | 1.440328000  | -4.127438000 |
| 1 | 0.072366000  | 2.412792000  | -2.771108000 |
| 1 | -1.598488000 | 1.832485000  | -2.804374000 |
| 6 | 0.007270000  | 0.262529000  | -0.801225000 |
| 1 | 0.862856000  | -0.025514000 | -2.739764000 |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 1 | -0.806805000 | -0.538053000 | -2.659562000 |
| 6 | 0.318602000  | -1.180282000 | -0.351725000 |
| 6 | -2.232172000 | -1.541511000 | -0.434956000 |
| 6 | -2.342705000 | -0.219759000 | 0.357304000  |
| 7 | -1.281147000 | 0.710452000  | -0.170524000 |
| 6 | 1.146676000  | 1.222610000  | -0.372737000 |
| 6 | 1.453999000  | 1.322838000  | 1.126640000  |
| 1 | 0.912498000  | 2.219942000  | -0.750629000 |
| 1 | 2.044994000  | 0.886150000  | -0.906803000 |
| 1 | 0.600870000  | 1.695980000  | 1.701434000  |
| 1 | 2.283721000  | 2.023223000  | 1.277898000  |
| 1 | 1.767480000  | 0.365801000  | 1.558456000  |
| 6 | -2.085531000 | -0.426492000 | 1.878202000  |
| 6 | -3.031290000 | -1.414178000 | 2.575542000  |
| 1 | -2.137420000 | 0.550676000  | 2.367117000  |
| 1 | -1.056259000 | -0.773907000 | 2.023504000  |
| 1 | -4.084815000 | -1.141632000 | 2.453365000  |
| 1 | -2.818196000 | -1.425857000 | 3.650116000  |
| 1 | -2.904947000 | -2.438931000 | 2.209545000  |
| 8 | -1.468226000 | 1.980548000  | -0.069889000 |
| 6 | -3.749686000 | 0.381805000  | 0.064860000  |
| 6 | -4.317788000 | 1.436483000  | 1.025896000  |
| 1 | -4.489811000 | 1.037189000  | 2.029813000  |
| 1 | -5.289664000 | 1.776003000  | 0.647732000  |
| 1 | -3.664159000 | 2.303688000  | 1.129387000  |
| 1 | -3.727784000 | 0.799940000  | -0.947599000 |
| 1 | -4.447721000 | -0.464543000 | 0.033892000  |
| 8 | -0.668891000 | -3.348106000 | -0.631429000 |
| 6 | -0.841054000 | -2.153604000 | -0.490847000 |
| 1 | 0.618051000  | -1.195420000 | 0.702688000  |
| 1 | 1.169478000  | -1.570300000 | -0.918907000 |
| 1 | -2.550183000 | -1.359947000 | -1.471442000 |
| 1 | -2.921512000 | -2.289057000 | -0.034543000 |
| 1 | -2.751852000 | 2.896170000  | -1.208995000 |
| 8 | -3.415750000 | 3.148181000  | -1.877403000 |
| 1 | -4.220594000 | 3.309347000  | -1.363696000 |
| 8 | -1.446602000 | 2.905390000  | 2.612151000  |
| 1 | -0.970617000 | 3.746789000  | 2.671981000  |
| 1 | -1.452517000 | 2.692912000  | 1.658747000  |

**Supplementary Table T15:** Cartesian coordinates for the DFT-optimized structure of TEEPONE + 3H<sub>2</sub>O

| Atomic number / X / Y / Z |              |              |              |
|---------------------------|--------------|--------------|--------------|
| 6                         | -0.761978000 | 1.380504000  | -3.163543000 |
| 6                         | -0.282364000 | 0.107147000  | -2.459517000 |
| 1                         | -0.793837000 | 1.199486000  | -4.244177000 |
| 1                         | -0.089289000 | 2.227658000  | -2.994566000 |
| 1                         | -1.767678000 | 1.674004000  | -2.850970000 |
| 6                         | -0.064245000 | 0.167503000  | -0.914032000 |
| 1                         | 0.682775000  | -0.197342000 | -2.883101000 |
| 1                         | -0.981978000 | -0.704994000 | -2.689319000 |
| 6                         | 0.312047000  | -1.246351000 | -0.422048000 |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 6 | -2.220886000 | -1.696730000 | -0.326887000 |
| 6 | -2.338604000 | -0.332014000 | 0.388233000  |
| 7 | -1.337925000 | 0.599528000  | -0.240710000 |
| 6 | 1.069498000  | 1.169023000  | -0.576559000 |
| 6 | 1.461927000  | 1.309254000  | 0.899024000  |
| 1 | 0.793955000  | 2.154526000  | -0.954912000 |
| 1 | 1.941844000  | 0.842334000  | -1.155377000 |
| 1 | 0.626363000  | 1.653857000  | 1.515799000  |
| 1 | 2.259442000  | 2.055568000  | 0.987888000  |
| 1 | 1.844276000  | 0.377011000  | 1.327492000  |
| 6 | -2.000216000 | -0.428451000 | 1.903814000  |
| 6 | -2.884562000 | -1.383790000 | 2.716335000  |
| 1 | -2.062126000 | 0.579617000  | 2.329395000  |
| 1 | -0.956145000 | -0.738947000 | 2.020074000  |
| 1 | -3.946936000 | -1.126340000 | 2.654953000  |
| 1 | -2.591642000 | -1.338189000 | 3.770857000  |
| 1 | -2.771030000 | -2.423238000 | 2.390439000  |
| 8 | -1.565435000 | 1.868530000  | -0.162115000 |
| 6 | -3.781213000 | 0.195101000  | 0.129556000  |
| 6 | -4.344972000 | 1.314387000  | 1.016190000  |
| 1 | -4.369754000 | 1.033215000  | 2.073136000  |
| 1 | -5.378070000 | 1.519425000  | 0.712461000  |
| 1 | -3.780352000 | 2.245047000  | 0.930942000  |
| 1 | -3.836903000 | 0.499805000  | -0.922438000 |
| 1 | -4.442790000 | -0.673380000 | 0.225550000  |
| 8 | -0.612635000 | -3.450668000 | -0.582056000 |
| 6 | -0.817127000 | -2.253632000 | -0.458402000 |
| 1 | 0.658963000  | -1.209894000 | 0.617482000  |
| 1 | 1.150633000  | -1.628041000 | -1.011789000 |
| 1 | -2.619917000 | -1.600484000 | -1.346298000 |
| 1 | -2.849257000 | -2.440293000 | 0.170117000  |
| 1 | -2.929653000 | 2.719395000  | -1.190231000 |
| 8 | -3.553642000 | 3.162851000  | -1.794284000 |
| 1 | -4.413264000 | 3.085925000  | -1.351586000 |
| 8 | -1.267729000 | 3.407800000  | 2.148902000  |
| 1 | -2.115572000 | 3.783722000  | 2.437918000  |
| 1 | -1.503896000 | 2.737515000  | 1.475241000  |
| 8 | -0.335020000 | 4.596864000  | -0.265561000 |

**Supplementary Table T16:** Cartesian coordinates for the DFT-optimized structure of TEEPONE + 4H<sub>2</sub>O

| Atomic number / X / Y / Z |              |              |              |
|---------------------------|--------------|--------------|--------------|
| 6                         | -0.826079000 | 1.367076000  | -3.089579000 |
| 6                         | -0.449761000 | 0.062284000  | -2.379149000 |
| 1                         | -1.030169000 | 1.154989000  | -4.145053000 |
| 1                         | -0.007900000 | 2.094778000  | -3.058006000 |
| 1                         | -1.715038000 | 1.843303000  | -2.666211000 |
| 6                         | -0.233368000 | 0.124528000  | -0.833757000 |
| 1                         | 0.488090000  | -0.316125000 | -2.805207000 |
| 1                         | -1.209257000 | -0.695815000 | -2.600734000 |
| 6                         | 0.279830000  | -1.247535000 | -0.347281000 |
| 6                         | -2.193545000 | -1.963917000 | -0.336195000 |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 6 | -2.480928000 | -0.630305000 | 0.390000000  |
| 7 | -1.540946000 | 0.413059000  | -0.147218000 |
| 6 | 0.781535000  | 1.241151000  | -0.488217000 |
| 6 | 1.187181000  | 1.382725000  | 0.983043000  |
| 1 | 0.367977000  | 2.193806000  | -0.824844000 |
| 1 | 1.673026000  | 1.047492000  | -1.097302000 |
| 1 | 0.320489000  | 1.573165000  | 1.622942000  |
| 1 | 1.871615000  | 2.232678000  | 1.090925000  |
| 1 | 1.710253000  | 0.501434000  | 1.368177000  |
| 6 | -2.223596000 | -0.735909000 | 1.920991000  |
| 6 | -3.087118000 | -1.756545000 | 2.672439000  |
| 1 | -2.374578000 | 0.258960000  | 2.353317000  |
| 1 | -1.168080000 | -0.980946000 | 2.086981000  |
| 1 | -4.158220000 | -1.555848000 | 2.566668000  |
| 1 | -2.846130000 | -1.718698000 | 3.740504000  |
| 1 | -2.901570000 | -2.781490000 | 2.333229000  |
| 8 | -1.844886000 | 1.648558000  | 0.051936000  |
| 6 | -3.949992000 | -0.236901000 | 0.051493000  |
| 6 | -4.653195000 | 0.849891000  | 0.875745000  |
| 1 | -4.689552000 | 0.602009000  | 1.941686000  |
| 1 | -5.688817000 | 0.941047000  | 0.528418000  |
| 1 | -4.175116000 | 1.825061000  | 0.773162000  |
| 1 | -3.977769000 | 0.034347000  | -1.011152000 |
| 1 | -4.534973000 | -1.160247000 | 0.138957000  |
| 8 | -0.402354000 | -3.533263000 | -0.573411000 |
| 6 | -0.735181000 | -2.366866000 | -0.434265000 |
| 1 | 0.576608000  | -1.188305000 | 0.707324000  |
| 1 | 1.177430000  | -1.531442000 | -0.904641000 |
| 1 | -2.572135000 | -1.902326000 | -1.366226000 |
| 1 | -2.751350000 | -2.777696000 | 0.134354000  |
| 1 | -2.297420000 | 4.158352000  | -1.530488000 |
| 8 | -3.137151000 | 3.640390000  | -1.536721000 |
| 1 | -2.888819000 | 2.848290000  | -1.028977000 |
| 8 | -1.910501000 | 3.180695000  | 2.352486000  |
| 1 | -1.511423000 | 2.711327000  | 3.103195000  |
| 1 | -1.943241000 | 2.526315000  | 1.620238000  |
| 8 | -0.706784000 | 5.010656000  | -1.392476000 |
| 1 | -0.034367000 | 4.490473000  | -1.859361000 |
| 1 | -0.452438000 | 4.951664000  | -0.433358000 |
| 8 | -0.080092000 | 4.908192000  | 1.259975000  |
| 1 | -0.727957000 | 4.305293000  | 1.706511000  |
| 1 | 0.784050000  | 4.485197000  | 1.387137000  |

**Supplementary Table T17:** Cartesian coordinates for the DFT-optimized structure of TEEPONE + 5H<sub>2</sub>O

Atomic number / X / Y / Z

|   |              |             |              |
|---|--------------|-------------|--------------|
| 6 | -0.805499000 | 1.802249000 | -2.543996000 |
| 6 | -0.385398000 | 0.407604000 | -2.064428000 |
| 1 | -0.971209000 | 1.767902000 | -3.627115000 |
| 1 | -0.029663000 | 2.551128000 | -2.355838000 |
| 1 | -1.734243000 | 2.145635000 | -2.082730000 |
| 6 | -0.224454000 | 0.184294000 | -0.526102000 |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 1 | 0.585033000  | 0.155723000  | -2.510699000 |
| 1 | -1.095013000 | -0.333910000 | -2.450612000 |
| 6 | 0.281412000  | -1.255728000 | -0.292063000 |
| 6 | -2.187703000 | -1.967258000 | -0.420175000 |
| 6 | -2.473933000 | -0.783276000 | 0.529164000  |
| 7 | -1.561897000 | 0.350847000  | 0.141672000  |
| 6 | 0.785844000  | 1.199287000  | 0.060157000  |
| 6 | 1.049308000  | 1.121034000  | 1.569040000  |
| 1 | 0.454055000  | 2.208087000  | -0.190437000 |
| 1 | 1.724960000  | 1.042935000  | -0.484700000 |
| 1 | 0.131263000  | 1.253763000  | 2.150967000  |
| 1 | 1.747467000  | 1.913993000  | 1.860824000  |
| 1 | 1.503181000  | 0.171237000  | 1.869176000  |
| 6 | -2.174243000 | -1.122425000 | 2.017326000  |
| 6 | -2.949623000 | -2.314708000 | 2.593581000  |
| 1 | -2.385843000 | -0.222093000 | 2.603762000  |
| 1 | -1.102367000 | -1.314005000 | 2.137080000  |
| 1 | -4.033659000 | -2.200941000 | 2.486742000  |
| 1 | -2.728935000 | -2.407872000 | 3.662568000  |
| 1 | -2.661831000 | -3.259017000 | 2.119425000  |
| 8 | -1.943916000 | 1.545352000  | 0.446691000  |
| 6 | -3.958298000 | -0.367326000 | 0.306336000  |
| 6 | -4.664655000 | 0.483626000  | 1.370753000  |
| 1 | -4.720826000 | -0.031509000 | 2.334543000  |
| 1 | -5.693144000 | 0.676724000  | 1.045654000  |
| 1 | -4.173513000 | 1.445032000  | 1.525468000  |
| 1 | -4.014884000 | 0.134315000  | -0.667311000 |
| 1 | -4.523012000 | -1.299528000 | 0.187023000  |
| 8 | -0.390775000 | -3.468708000 | -0.914996000 |
| 6 | -0.729643000 | -2.344802000 | -0.579792000 |
| 1 | 0.583993000  | -1.392086000 | 0.753767000  |
| 1 | 1.177124000  | -1.433091000 | -0.894056000 |
| 1 | -2.561910000 | -1.717759000 | -1.423638000 |
| 1 | -2.748082000 | -2.850911000 | -0.105177000 |
| 1 | -3.310557000 | 2.496766000  | -0.389310000 |
| 8 | -3.972634000 | 3.091563000  | -0.798928000 |
| 1 | -4.494314000 | 2.516930000  | -1.382597000 |
| 8 | -0.951038000 | 4.014667000  | 1.301321000  |
| 1 | -0.227479000 | 3.936478000  | 1.944244000  |
| 1 | -1.166756000 | 3.095416000  | 1.034753000  |
| 8 | 1.970101000  | 4.101568000  | -1.955835000 |
| 1 | 2.347402000  | 3.654978000  | -1.182963000 |
| 1 | 1.198011000  | 4.594354000  | -1.592455000 |
| 8 | -0.275311000 | 5.371075000  | -0.940020000 |
| 1 | -0.501178000 | 4.919767000  | -0.082500000 |
| 1 | -0.134648000 | 6.305157000  | -0.711672000 |

**Supplementary Table T18:** Cartesian coordinates for the DFT-optimized structure of **3 + 1H<sub>2</sub>O**

Atomic number / X / Y / Z

|   |              |             |              |
|---|--------------|-------------|--------------|
| 6 | -0.965384000 | 1.556682000 | -2.861786000 |
| 6 | -0.201235000 | 0.375127000 | -2.254560000 |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 1 | -0.871667000 | 1.531455000  | -3.953869000 |
| 1 | -0.592630000 | 2.521957000  | -2.508457000 |
| 1 | -2.031913000 | 1.507367000  | -2.617469000 |
| 6 | -0.109015000 | 0.321577000  | -0.696049000 |
| 1 | 0.832103000  | 0.376237000  | -2.625698000 |
| 1 | -0.646590000 | -0.558640000 | -2.621740000 |
| 6 | 0.366027000  | -1.085265000 | -0.274643000 |
| 6 | -2.114701000 | -1.754126000 | -0.467582000 |
| 6 | -2.435107000 | -0.467011000 | 0.323185000  |
| 7 | -1.456791000 | 0.592120000  | -0.094369000 |
| 6 | 0.909473000  | 1.381742000  | -0.199733000 |
| 6 | 1.043031000  | 1.551546000  | 1.317813000  |
| 1 | 0.671878000  | 2.351422000  | -0.641477000 |
| 1 | 1.879701000  | 1.083441000  | -0.619372000 |
| 1 | 0.097466000  | 1.871348000  | 1.763552000  |
| 1 | 1.789808000  | 2.323271000  | 1.533876000  |
| 1 | 1.370948000  | 0.635137000  | 1.822586000  |
| 6 | -2.276050000 | -0.669486000 | 1.856246000  |
| 6 | -3.174383000 | -1.739571000 | 2.488820000  |
| 1 | -2.457678000 | 0.300317000  | 2.331110000  |
| 1 | -1.229866000 | -0.917687000 | 2.073263000  |
| 1 | -4.238295000 | -1.547187000 | 2.314528000  |
| 1 | -3.017884000 | -1.759566000 | 3.573280000  |
| 1 | -2.947998000 | -2.743127000 | 2.112274000  |
| 8 | -1.800184000 | 1.813817000  | 0.115576000  |
| 6 | -3.876486000 | -0.029818000 | -0.074625000 |
| 6 | -4.605780000 | 1.010714000  | 0.785336000  |
| 1 | -4.758710000 | 0.664892000  | 1.813185000  |
| 1 | -5.598039000 | 1.198757000  | 0.359059000  |
| 1 | -4.056974000 | 1.951882000  | 0.817383000  |
| 1 | -3.828604000 | 0.328898000  | -1.110206000 |
| 1 | -4.482207000 | -0.945021000 | -0.103227000 |
| 8 | -0.340193000 | -3.364410000 | -0.501917000 |
| 6 | -0.661823000 | -2.194676000 | -0.425062000 |
| 1 | 0.671032000  | -1.082527000 | 0.779229000  |
| 1 | 1.257960000  | -1.361978000 | -0.846728000 |
| 1 | -2.370735000 | -1.593220000 | -1.525184000 |
| 1 | -2.739289000 | -2.583359000 | -0.126241000 |
| 1 | -1.089412000 | 3.528456000  | -0.403822000 |
| 8 | -0.702631000 | 4.341749000  | -0.781699000 |
| 1 | -1.370289000 | 4.642907000  | -1.415594000 |

**Supplementary Table T19:** Cartesian coordinates for the DFT-optimized structure of **3 + 2H<sub>2</sub>O**

| Atomic number / X / Y / Z |              |              |              |
|---------------------------|--------------|--------------|--------------|
| 6                         | -2.512242000 | -0.544474000 | 2.361328000  |
| 6                         | -1.945222000 | 0.535168000  | 1.431968000  |
| 1                         | -2.012496000 | -1.510961000 | 2.230386000  |
| 1                         | -3.584864000 | -0.697500000 | 2.203836000  |
| 1                         | -2.371039000 | -0.240206000 | 3.404538000  |
| 6                         | -1.995543000 | 0.177697000  | -0.073887000 |
| 1                         | -0.896518000 | 0.727831000  | 1.694184000  |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 1 | -2.481964000 | 1.472531000  | 1.598138000  |
| 6 | -3.412848000 | -0.173412000 | -0.594664000 |
| 6 | -4.516110000 | 0.864650000  | -0.364797000 |
| 1 | -3.698683000 | -1.121454000 | -0.122772000 |
| 1 | -3.317258000 | -0.376689000 | -1.666849000 |
| 1 | -4.674403000 | 1.072364000  | 0.698821000  |
| 1 | -5.461479000 | 0.487898000  | -0.770416000 |
| 1 | -4.292616000 | 1.809875000  | -0.868240000 |
| 6 | -0.990123000 | -0.946443000 | -0.423994000 |
| 6 | 0.156728000  | -0.309153000 | -1.183266000 |
| 1 | -1.437875000 | -1.693314000 | -1.090755000 |
| 1 | -0.610348000 | -1.474015000 | 0.454159000  |
| 6 | -0.279974000 | 1.059601000  | -1.708082000 |
| 7 | -1.438402000 | 1.340066000  | -0.850418000 |
| 8 | 1.257640000  | -0.799657000 | -1.337384000 |
| 6 | -0.587542000 | 1.017947000  | -3.246848000 |
| 1 | 0.479797000  | 1.826258000  | -1.528024000 |
| 6 | 0.777812000  | 0.911621000  | -3.994988000 |
| 6 | 0.758722000  | 0.063901000  | -5.275292000 |
| 1 | 1.520951000  | 0.472876000  | -3.322170000 |
| 1 | 1.124184000  | 1.927771000  | -4.219037000 |
| 1 | 0.480725000  | -0.971551000 | -5.053341000 |
| 1 | 1.759846000  | 0.050854000  | -5.720616000 |
| 1 | 0.068079000  | 0.446067000  | -6.034282000 |
| 6 | -1.395173000 | 2.267479000  | -3.658456000 |
| 6 | -1.718448000 | 2.389430000  | -5.153517000 |
| 1 | -0.835862000 | 3.152742000  | -3.333413000 |
| 1 | -2.332505000 | 2.263737000  | -3.093893000 |
| 1 | -0.820437000 | 2.530699000  | -5.762605000 |
| 1 | -2.367559000 | 3.257009000  | -5.316997000 |
| 1 | -2.255550000 | 1.512197000  | -5.535677000 |
| 8 | -1.376454000 | -0.171868000 | -3.405190000 |
| 1 | -1.674692000 | -0.223802000 | -4.327672000 |
| 8 | -1.804266000 | 2.551754000  | -0.621392000 |
| 1 | -2.956921000 | 3.328580000  | 0.666500000  |
| 8 | -3.528343000 | 3.775321000  | 1.321059000  |
| 1 | -4.425024000 | 3.519774000  | 1.053387000  |
| 8 | 0.244332000  | 4.434263000  | -1.276599000 |
| 1 | -0.522263000 | 3.871217000  | -1.044205000 |
| 1 | -0.133308000 | 5.112442000  | -1.859085000 |

**Supplementary Table T20:** Cartesian coordinates for the DFT-optimized structure of **3 + 3H<sub>2</sub>O**

| Atomic number / X / Y / Z |              |              |              |
|---------------------------|--------------|--------------|--------------|
| 6                         | -2.728921000 | -0.719429000 | 2.366593000  |
| 6                         | -2.138353000 | 0.403544000  | 1.505130000  |
| 1                         | -2.200943000 | -1.669984000 | 2.228643000  |
| 1                         | -3.788219000 | -0.889139000 | 2.147792000  |
| 1                         | -2.648875000 | -0.448946000 | 3.425466000  |
| 6                         | -2.100380000 | 0.095454000  | -0.011903000 |
| 1                         | -1.109605000 | 0.608622000  | 1.829511000  |
| 1                         | -2.705280000 | 1.322515000  | 1.673089000  |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 6 | -3.482837000 | -0.256291000 | -0.619885000 |
| 6 | -4.610723000 | 0.762281000  | -0.424304000 |
| 1 | -3.781905000 | -1.219535000 | -0.188922000 |
| 1 | -3.327376000 | -0.430651000 | -1.690180000 |
| 1 | -4.823024000 | 0.947761000  | 0.633796000  |
| 1 | -5.529664000 | 0.380937000  | -0.882768000 |
| 1 | -4.376718000 | 1.720663000  | -0.897482000 |
| 6 | -1.062022000 | -1.004011000 | -0.343223000 |
| 6 | 0.094576000  | -0.337553000 | -1.062958000 |
| 1 | -1.474329000 | -1.756222000 | -1.026378000 |
| 1 | -0.695535000 | -1.529943000 | 0.541822000  |
| 6 | -0.332461000 | 1.046886000  | -1.550488000 |
| 7 | -1.518540000 | 1.289004000  | -0.719768000 |
| 8 | 1.198291000  | -0.823860000 | -1.212745000 |
| 6 | -0.593531000 | 1.053454000  | -3.099583000 |
| 1 | 0.429358000  | 1.806316000  | -1.329295000 |
| 6 | 0.795795000  | 0.999300000  | -3.805122000 |
| 6 | 0.829468000  | 0.241180000  | -5.140341000 |
| 1 | 1.512767000  | 0.515982000  | -3.135158000 |
| 1 | 1.149491000  | 2.028067000  | -3.938128000 |
| 1 | 0.543854000  | -0.807141000 | -5.003219000 |
| 1 | 1.849175000  | 0.254223000  | -5.541967000 |
| 1 | 0.173970000  | 0.675776000  | -5.901617000 |
| 6 | -1.421598000 | 2.297108000  | -3.491738000 |
| 6 | -1.710423000 | 2.466070000  | -4.989330000 |
| 1 | -0.899789000 | 3.189025000  | -3.124024000 |
| 1 | -2.373813000 | 2.248938000  | -2.954939000 |
| 1 | -0.802644000 | 2.659935000  | -5.568257000 |
| 1 | -2.384471000 | 3.317226000  | -5.137350000 |
| 1 | -2.207447000 | 1.585979000  | -5.416154000 |
| 8 | -1.352233000 | -0.145869000 | -3.328040000 |
| 1 | -1.594464000 | -0.183142000 | -4.267600000 |
| 8 | -1.914713000 | 2.485958000  | -0.461864000 |
| 1 | -3.161164000 | 3.198563000  | 0.771394000  |
| 8 | -3.781882000 | 3.621762000  | 1.395613000  |
| 1 | -4.654374000 | 3.415074000  | 1.025714000  |
| 8 | -0.379194000 | 4.795070000  | -0.947965000 |
| 1 | -0.959705000 | 4.010933000  | -0.828135000 |
| 1 | -0.707616000 | 5.227831000  | -1.752864000 |
| 8 | 1.995474000  | 3.444584000  | -1.375747000 |
| 1 | 1.197690000  | 4.011686000  | -1.251441000 |
| 1 | 2.307234000  | 3.286543000  | -0.470047000 |

**Supplementary Table T21:** Cartesian coordinates for the DFT-optimized structure of **3 + 4H<sub>2</sub>O**

Atomic number / X / Y / Z

|   |              |              |              |
|---|--------------|--------------|--------------|
| 6 | -2.623330000 | 0.047480000  | 2.211205000  |
| 6 | -2.155323000 | 1.027080000  | 1.129263000  |
| 1 | -1.959115000 | -0.819592000 | 2.297712000  |
| 1 | -3.635864000 | -0.322620000 | 2.020080000  |
| 1 | -2.635084000 | 0.550913000  | 3.184493000  |
| 6 | -2.012081000 | 0.404137000  | -0.279381000 |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 1 | -1.177369000 | 1.442735000  | 1.394040000  |
| 1 | -2.848210000 | 1.871454000  | 1.081572000  |
| 6 | -3.315588000 | -0.239157000 | -0.819916000 |
| 6 | -4.557733000 | 0.655721000  | -0.866241000 |
| 1 | -3.521702000 | -1.118323000 | -0.196745000 |
| 1 | -3.096691000 | -0.614641000 | -1.825075000 |
| 1 | -4.849886000 | 1.006613000  | 0.130130000  |
| 1 | -5.404080000 | 0.091075000  | -1.272556000 |
| 1 | -4.405747000 | 1.529268000  | -1.508249000 |
| 6 | -0.839836000 | -0.604204000 | -0.341786000 |
| 6 | 0.211871000  | -0.045419000 | -1.282826000 |
| 1 | -1.154751000 | -1.578991000 | -0.730241000 |
| 1 | -0.381144000 | -0.775910000 | 0.635530000  |
| 6 | -0.338497000 | 1.188672000  | -2.003302000 |
| 7 | -1.546847000 | 1.478335000  | -1.225213000 |
| 8 | 1.318986000  | -0.516759000 | -1.442291000 |
| 6 | -0.585959000 | 0.912615000  | -3.525430000 |
| 1 | 0.347221000  | 2.034248000  | -1.902534000 |
| 6 | 0.807517000  | 0.863279000  | -4.227213000 |
| 6 | 0.927857000  | -0.144551000 | -5.378571000 |
| 1 | 1.568300000  | 0.605803000  | -3.485205000 |
| 1 | 1.045447000  | 1.873427000  | -4.582749000 |
| 1 | 0.761863000  | -1.166753000 | -5.022043000 |
| 1 | 1.938738000  | -0.101367000 | -5.799132000 |
| 1 | 0.225938000  | 0.048264000  | -6.195999000 |
| 6 | -1.515076000 | 1.990663000  | -4.125710000 |
| 6 | -1.795103000 | 1.864971000  | -5.629685000 |
| 1 | -1.078248000 | 2.976702000  | -3.924540000 |
| 1 | -2.465733000 | 1.956232000  | -3.585627000 |
| 1 | -0.899130000 | 2.035702000  | -6.235001000 |
| 1 | -2.539838000 | 2.611646000  | -5.926686000 |
| 1 | -2.204136000 | 0.882088000  | -5.895486000 |
| 8 | -1.233638000 | -0.371021000 | -3.534814000 |
| 1 | -1.453005000 | -0.599280000 | -4.452588000 |
| 8 | -2.026067000 | 2.672524000  | -1.205944000 |
| 1 | -2.243451000 | 4.160567000  | 2.799639000  |
| 8 | -2.230633000 | 4.823837000  | 2.091080000  |
| 1 | -2.977750000 | 4.570439000  | 1.492200000  |
| 8 | -0.235582000 | 4.369052000  | 0.251876000  |
| 1 | -0.790684000 | 3.959685000  | -0.441048000 |
| 1 | -0.879906000 | 4.536944000  | 0.986421000  |
| 8 | -4.040419000 | 4.039643000  | 0.184750000  |
| 1 | -4.787481000 | 3.498170000  | 0.485913000  |
| 1 | -3.463500000 | 3.431327000  | -0.326796000 |
| 8 | 1.171721000  | 2.045941000  | 0.702889000  |
| 1 | 0.702233000  | 2.914112000  | 0.633291000  |
| 1 | 1.199782000  | 1.862894000  | 1.654954000  |

**Supplementary Table T22:** Cartesian coordinates for the DFT-optimized structure of **4 + 1H<sub>2</sub>O**

Atomic number / X / Y / Z

|   |              |             |              |
|---|--------------|-------------|--------------|
| 1 | -2.367048000 | 3.454890000 | -0.265020000 |
|---|--------------|-------------|--------------|

|   |              |              |              |
|---|--------------|--------------|--------------|
| 8 | -2.558651000 | 4.409770000  | -0.314110000 |
| 1 | -2.928362000 | 4.620230000  | 0.556327000  |
| 6 | -0.012031000 | 3.681200000  | 2.147859000  |
| 6 | 0.940633000  | 2.514078000  | 1.861310000  |
| 1 | 0.575804000  | 4.555717000  | 2.448792000  |
| 1 | -0.698234000 | 3.454366000  | 2.970573000  |
| 1 | -0.608062000 | 3.971230000  | 1.277389000  |
| 6 | 0.311235000  | 1.169278000  | 1.390333000  |
| 1 | 1.513834000  | 2.285325000  | 2.769497000  |
| 1 | 1.677090000  | 2.825911000  | 1.110855000  |
| 6 | 1.435672000  | 0.135934000  | 1.182744000  |
| 6 | 1.666421000  | 1.013427000  | -1.152976000 |
| 6 | 0.352010000  | 1.409817000  | -1.132207000 |
| 7 | -0.362001000 | 1.413873000  | 0.058304000  |
| 6 | -0.736158000 | 0.659676000  | 2.403072000  |
| 6 | -1.438429000 | -0.661129000 | 2.065741000  |
| 1 | -1.496051000 | 1.431441000  | 2.536680000  |
| 1 | -0.210383000 | 0.564559000  | 3.362094000  |
| 1 | -1.961902000 | -0.596142000 | 1.107333000  |
| 1 | -2.185264000 | -0.885479000 | 2.835294000  |
| 1 | -0.749446000 | -1.511968000 | 2.030161000  |
| 6 | -0.361411000 | 1.888247000  | -2.371313000 |
| 6 | -0.250576000 | 3.411523000  | -2.583453000 |
| 1 | -1.413657000 | 1.598646000  | -2.311311000 |
| 1 | 0.080313000  | 1.367503000  | -3.227140000 |
| 1 | -0.726633000 | 3.971996000  | -1.774989000 |
| 1 | -0.747924000 | 3.689852000  | -3.518793000 |
| 1 | 0.798483000  | 3.719036000  | -2.653598000 |
| 8 | -1.603294000 | 1.737807000  | 0.072053000  |
| 8 | 3.540471000  | 0.162894000  | 0.005179000  |
| 6 | 2.348430000  | 0.446074000  | 0.003787000  |
| 1 | 1.003427000  | -0.853678000 | 0.987808000  |
| 1 | 2.039068000  | 0.051993000  | 2.091191000  |
| 1 | 2.227041000  | 1.085300000  | -2.079399000 |

**Supplementary Table T23:** Cartesian coordinates for the DFT-optimized structure of **4 + 2H<sub>2</sub>O**

| Atomic number / X / Y / Z |              |             |              |
|---------------------------|--------------|-------------|--------------|
| 1                         | -3.169670000 | 2.088779000 | 1.763985000  |
| 8                         | -3.437491000 | 2.864525000 | 2.279646000  |
| 1                         | -3.182617000 | 3.598438000 | 1.686959000  |
| 6                         | 0.119516000  | 3.692538000 | 2.081054000  |
| 6                         | 1.030976000  | 2.460414000 | 2.087712000  |
| 1                         | 0.644675000  | 4.529137000 | 2.555515000  |
| 1                         | -0.816848000 | 3.536049000 | 2.624026000  |
| 1                         | -0.136110000 | 4.008983000 | 1.066339000  |
| 6                         | 0.418917000  | 1.110087000 | 1.607462000  |
| 1                         | 1.390673000  | 2.274275000 | 3.107682000  |
| 1                         | 1.924601000  | 2.673420000 | 1.487368000  |
| 6                         | 1.545171000  | 0.063700000 | 1.495188000  |
| 6                         | 1.911239000  | 0.863716000 | -0.852310000 |
| 6                         | 0.600301000  | 1.266970000 | -0.916944000 |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 7 | -0.174977000 | 1.319128000  | 0.231052000  |
| 6 | -0.681264000 | 0.634140000  | 2.581215000  |
| 6 | -1.408059000 | -0.668172000 | 2.221332000  |
| 1 | -1.417957000 | 1.429334000  | 2.710229000  |
| 1 | -0.184031000 | 0.515353000  | 3.552305000  |
| 1 | -1.904557000 | -0.594600000 | 1.248871000  |
| 1 | -2.179367000 | -0.873477000 | 2.971524000  |
| 1 | -0.740074000 | -1.536418000 | 2.201565000  |
| 6 | -0.050016000 | 1.681178000  | -2.213598000 |
| 6 | -0.037494000 | 3.202409000  | -2.462137000 |
| 1 | -1.079928000 | 1.312707000  | -2.224766000 |
| 1 | 0.488956000  | 1.179345000  | -3.023358000 |
| 1 | -0.641466000 | 3.745206000  | -1.730136000 |
| 1 | -0.446617000 | 3.415272000  | -3.455961000 |
| 1 | 0.983475000  | 3.597298000  | -2.428875000 |
| 8 | -1.413267000 | 1.656600000  | 0.150883000  |
| 8 | 3.710992000  | 0.038922000  | 0.430833000  |
| 6 | 2.523235000  | 0.328674000  | 0.360264000  |
| 1 | 1.119159000  | -0.931684000 | 1.314897000  |
| 1 | 2.096943000  | 0.012050000  | 2.438189000  |
| 1 | 2.522317000  | 0.895500000  | -1.748331000 |
| 8 | -2.505281000 | 4.272294000  | -0.055523000 |
| 1 | -3.285082000 | 4.239107000  | -0.631572000 |
| 1 | -2.103608000 | 3.384172000  | -0.132582000 |

**Supplementary Table T24:** Cartesian coordinates for the DFT-optimized structure of **4 + 3H<sub>2</sub>O**

| Atomic number / X / Y / Z |              |              |              |
|---------------------------|--------------|--------------|--------------|
| 1                         | -2.281893000 | 3.200113000  | 0.987369000  |
| 8                         | -2.734116000 | 4.044852000  | 0.822143000  |
| 1                         | -3.220054000 | 3.874914000  | -0.019980000 |
| 6                         | 0.338486000  | 3.424435000  | 2.637142000  |
| 6                         | 1.293451000  | 2.274454000  | 2.299124000  |
| 1                         | 0.925553000  | 4.291583000  | 2.959296000  |
| 1                         | -0.344043000 | 3.168489000  | 3.453470000  |
| 1                         | -0.262958000 | 3.737234000  | 1.779008000  |
| 6                         | 0.663358000  | 0.931930000  | 1.821396000  |
| 1                         | 1.891183000  | 2.027758000  | 3.185199000  |
| 1                         | 2.005284000  | 2.612602000  | 1.536286000  |
| 6                         | 1.795947000  | -0.066990000 | 1.512398000  |
| 6                         | 1.880812000  | 0.917567000  | -0.792974000 |
| 6                         | 0.556703000  | 1.272698000  | -0.688742000 |
| 7                         | -0.088736000 | 1.194560000  | 0.533691000  |
| 6                         | -0.308552000 | 0.365818000  | 2.877119000  |
| 6                         | -0.985050000 | -0.971083000 | 2.549460000  |
| 1                         | -1.079321000 | 1.111836000  | 3.078220000  |
| 1                         | 0.277058000  | 0.264516000  | 3.799172000  |
| 1                         | -1.560599000 | -0.912798000 | 1.620093000  |
| 1                         | -1.681160000 | -1.231598000 | 3.354553000  |
| 1                         | -0.269112000 | -1.795152000 | 2.460832000  |
| 6                         | -0.229818000 | 1.784979000  | -1.867349000 |
| 6                         | -0.417520000 | 3.314942000  | -1.868903000 |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 1 | -1.208155000 | 1.297026000  | -1.888125000 |
| 1 | 0.302194000  | 1.479456000  | -2.772442000 |
| 1 | -1.023979000 | 3.651080000  | -1.023223000 |
| 1 | -0.921461000 | 3.616965000  | -2.794176000 |
| 1 | 0.549122000  | 3.827902000  | -1.833362000 |
| 8 | -1.342635000 | 1.469931000  | 0.617139000  |
| 8 | 3.823432000  | 0.037345000  | 0.211289000  |
| 6 | 2.624146000  | 0.306416000  | 0.298492000  |
| 1 | 1.377998000  | -1.059998000 | 1.304534000  |
| 1 | 2.446625000  | -0.165294000 | 2.385592000  |
| 1 | 2.391311000  | 1.054619000  | -1.740562000 |
| 8 | -4.096035000 | 3.315158000  | -1.494956000 |
| 1 | -3.991399000 | 2.339482000  | -1.358111000 |
| 1 | -3.529293000 | 3.518524000  | -2.256120000 |
| 8 | -3.630006000 | 0.685667000  | -0.858757000 |
| 1 | -2.769948000 | 0.785636000  | -0.400660000 |
| 1 | -3.448903000 | 0.106494000  | -1.617289000 |

**Supplementary Table T25:** Cartesian coordinates for the DFT-optimized structure of **4 + 4H<sub>2</sub>O**

Atomic number / X / Y / Z

|   |              |              |              |
|---|--------------|--------------|--------------|
| 1 | -3.299716000 | 3.253921000  | 1.578945000  |
| 8 | -3.560627000 | 2.818460000  | 2.421661000  |
| 1 | -3.701125000 | 1.896376000  | 2.134623000  |
| 6 | -0.007944000 | 3.626525000  | 1.938101000  |
| 6 | 1.035255000  | 2.515581000  | 2.087057000  |
| 1 | 0.392757000  | 4.552967000  | 2.364137000  |
| 1 | -0.948603000 | 3.401735000  | 2.448894000  |
| 1 | -0.236775000 | 3.826733000  | 0.886736000  |
| 6 | 0.619131000  | 1.076832000  | 1.652462000  |
| 1 | 1.338072000  | 2.429683000  | 3.137508000  |
| 1 | 1.937980000  | 2.801176000  | 1.532781000  |
| 6 | 1.859040000  | 0.163649000  | 1.710969000  |
| 6 | 2.374904000  | 0.906157000  | -0.628581000 |
| 6 | 1.037818000  | 1.142287000  | -0.846914000 |
| 7 | 0.148861000  | 1.135157000  | 0.213585000  |
| 6 | -0.517526000 | 0.539276000  | 2.545564000  |
| 6 | -0.947357000 | -0.914732000 | 2.305815000  |
| 1 | -1.384318000 | 1.196180000  | 2.449218000  |
| 1 | -0.163536000 | 0.643025000  | 3.578447000  |
| 1 | -1.199023000 | -1.103816000 | 1.257161000  |
| 1 | -1.836031000 | -1.137189000 | 2.906001000  |
| 1 | -0.171620000 | -1.630276000 | 2.596075000  |
| 6 | 0.480098000  | 1.423022000  | -2.217804000 |
| 6 | 0.189829000  | 2.912908000  | -2.484929000 |
| 1 | -0.438254000 | 0.841896000  | -2.346782000 |
| 1 | 1.208055000  | 1.058718000  | -2.948354000 |
| 1 | -0.598724000 | 3.298195000  | -1.832411000 |
| 1 | -0.142543000 | 3.037330000  | -3.520838000 |
| 1 | 1.088370000  | 3.522471000  | -2.341344000 |
| 8 | -1.102301000 | 1.324117000  | -0.019599000 |
| 8 | 4.109713000  | 0.328737000  | 0.859284000  |

|   |              |              |              |
|---|--------------|--------------|--------------|
| 6 | 2.904157000  | 0.489185000  | 0.661179000  |
| 1 | 1.569976000  | -0.881261000 | 1.541067000  |
| 1 | 2.308818000  | 0.218389000  | 2.706484000  |
| 1 | 3.066105000  | 0.982273000  | -1.461367000 |
| 8 | -2.832648000 | 3.657019000  | -0.186067000 |
| 1 | -3.597202000 | 3.202167000  | -0.623650000 |
| 1 | -2.123184000 | 2.989342000  | -0.218344000 |
| 8 | -3.690697000 | 0.472862000  | 0.776526000  |
| 1 | -2.754761000 | 0.501843000  | 0.490344000  |
| 1 | -3.926957000 | -0.468970000 | 0.819761000  |
| 8 | -4.883566000 | 2.078863000  | -1.125204000 |
| 1 | -4.591434000 | 1.379722000  | -0.492058000 |
| 1 | -4.655070000 | 1.727457000  | -2.001446000 |