# **Electronic Supplementary Information (ESI)**

# 1. Job's plots



Fig. S1 Job's plots of the interaction between INH and cucurbiturils

# 2.<sup>1</sup>H NMR titrations



Fig. S2  $^1\text{H}$  NMR titrations of interactions between INH and Qs at pD  $\approx 2$ 

### 3. UV-vis titrations



**Fig. S3** Electronic absorption spectra of **INH** in the presence of increasing concentrations of **A**) Q[6] and **B**) Q[7] at pH = 2, and corresponding absorbance vs NQ[6]/N**INH** curve (inset) at  $\lambda_{max} = 264$  nm.

#### **Competition titration experimentation**

Q[7] and the glutamic acid (Glu) was dissolved in water with a 1:1 host:guest ratio, and adjusted to pH=2 by the addition of HCl to give solution A. **INH** solutions were prepared with a fixed concentration of  $5.0 \times 10^{-5} \text{ mol} \cdot \text{L}^{-1}$ , and the samples of these solutions with the solution A to give solutions with a solution A:**INH** ratio of 0, 0.25, 0.5, 0.8, 1.0 and so on. The competition titration has been recorded at  $\lambda_{max} = 264$  nm.



Fig. S4 Electronic absorption spectra of INH in the presence of increasing concentrations of the solution A at pH = 2

# 4. Potential energy curves



**Fig. S5** Potential energy curves of interactions between the protonated **INH** and Qs. The infinite distance between the protonated **INH** and Qs has been considered as the null potential energy.

# 5. Kinetics plots of acetylation of INH in the absence and presence of

### Qs

5.1. Kinetics plots of acetylation of **INH** with compound **1** a) in the absence of Qs, b) in the presence 0.8 eq. Q[6], c) in the presence 0.8 eq. Q[7], d) in the presence 1.0 eq. Q[6] and e) in the presence 1.0 eq. Q[7].



5.2. Kinetics plots of acylation of **INH** with compound **2** a) in the absence of Qs, b) in the presence 0.8 eq. Q[6], c) in the presence 0.8 eq. Q[7], d) in the presence 1.0 eq. Q[6] and e) in the presence 1.0 eq. Q[7].



5.3. Kinetics plots of acylation of **INH** with compound **3** a) in the absence of Qs, b) in the presence 0.8 eq. Q[6] and c) in the presence 0.8 eq. Q[7].



5.4. Kinetics plots of acylation of **INH** with compound **4** a) in the absence of Qs, b) in the presence 0.8 eq. Q[6], c) in the presence 0.8 eq. Q[7], d) in the presence 1.0 eq. Q[6] and e) in the presence 1.0 eq. Q[7].



5.5. Kinetics plots of acylation of **INH** with compound **5** a) without Qs, and with Q[6] in a ratio of b) 0.2:1, c) 0.4:1, d) 0.6:1, e) 0.8:1, f) 1:1 ( $C_{Q[6]}:C_{INH}$ ) at 40 °C.



5.6. Kinetics plots of acylation of **INH** with compound **5** with Q[7] in a ratio of a) 0.2:1, b) 0.4:1, c) 0.6:1, d) 0.8:1, e) 1:1 ( $C_{Q[7]}$ :  $C_{INH}$ ) at 40 °C.



5.7. Kinetics plots of acylation of **INH** with compound **6** a) without Qs, and with Q[6] in a ratio of b) 0.2:1, c) 0.4:1, d) 0.6:1, e) 0.8:1, f) 1:1 ( $C_{Q[6]}:C_{INH}$ ) at 40 °C.



5.8. Kinetics plots of acylation of **INH** with compound **6** with Q[7] in a ratio of a) 0.2:1, b) 0.4:1, c) 0.6:1, d) 0.8:1, e) 1:1 ( $C_{Q[7]}$ :  $C_{INH}$ ) at 40 °C.



## 6. Calculation of kinetics parameters

The wavelength at 262 nm with the max absorbance of INH was tracked, and the initial rates (k) have been achieved by linear fitting of above kinetics plots in the first 50 minutes. The reaction hydrolysis of the acylating agents have been considered nearly similar for the fixed initial working concentration, so the kinetics parameters have been considered as observed initial rates ( $k_{obs}$ ), which includes the background hydrolysis. Then  $p_{k_{obs}}$  was calculated as following:

#### $pk_{obs} = -log(k_{obs})$

The calculated values have been collected in Table S1~2

Table S1 Initial rates  $(pk_{obs})$  of INH with acylating agents 1~4

| in the absence and presence of Q [6 or 7] |      |      |      |      |
|---|------|------|------|------|
| Species of acylating agents               | 1    | 2    | 3    | 4    |
| In the absence of Qs                      | 2.94 | 2.55 | 2.78 | 2.73 |
| In the presence of Q[6]                   | 4.04 | 3.29 | 3.63 | 4.36 |
| In the presence of Q[7]                   | 3.83 | 3.36 | 3.79 | 4.62 |

**Table S2** Initial reaction rates  $(pk_{obs})$  of **INH** with thioester **5** and **6** in the presence of different mole ratio of Q[6 or 7] to **INH** at 40 °C.

| Different systems of Qs, INH<br>Mole ratio of and thioester<br>Qs to INH | Q[6]- <b>INH-5</b> | Q[7] <b>-INH-5</b> | Q[6]- <b>INH-6</b> | Q[7] <b>-INH-6</b> |
|--|--------------------|--------------------|--------------------|--------------------|
| 0.0  | 1.20               | 1.20               | 1.27               | 1.27               |
| 0.2  | 2.99               | 2.46               | 2.74               | 2.44               |
| 0.4  | 3.01               | 2.90               | 2.94               | 2.93               |
| 0.6  | 3.11               | 3.00               | 3.67               | 3.02               |
| 0.8  | 3.51               | 3.17               | 3.51               | 3.05               |
| <sup>a</sup> 1.0   | N                  | N                  | N                  | N                  |

<sup>a</sup> The addition of Q[6,7] in ratio of 1:1 to **INH** causes complete resistance to **INH** acetylation.

# 7. Coordinates of the optimized structures

# (1) Q[6]@INH

| Atomia Symbol | Coordinates (Angstroms) |         |         |  |
|---------------|-------------------------|---------|---------|--|
| Atomic Symbol | Х                       | Y       | Ζ       |  |
| С             | 0.0000                  | 0.0000  | 0.0000  |  |
| Ν             | 0.0000                  | 1.3919  | 0.0000  |  |
| С             | 1.2747                  | 1.9508  | 0.0000  |  |
| С             | 2.4882                  | 1.2324  | 0.0194  |  |
| С             | 2.4222                  | -0.1810 | 0.0319  |  |
| С             | 1.1541                  | -0.8080 | 0.0065  |  |
| С             | 3.6855                  | -1.0152 | 0.0261  |  |
| Ν             | 4.8541                  | -0.5022 | 0.7039  |  |
| Ν             | 5.8575                  | -1.6048 | 0.5446  |  |
| 0             | 3.8395                  | -2.1329 | -0.6033 |  |
| Н             | -0.9984                 | -0.4689 | -0.0090 |  |
| Н             | 1.2930                  | 3.0537  | -0.0221 |  |
| Н             | 3.4741                  | 1.7530  | -0.0163 |  |
| Н             | 1.0729                  | -1.9039 | -0.0028 |  |
| Н             | 4.6785                  | -0.0909 | 1.7251  |  |
| Н             | 6.7329                  | -1.2460 | -0.0621 |  |
| Н             | 6.1644                  | -2.1343 | 1.4889  |  |
| С             | 4.3629                  | 1.1785  | 3.9520  |  |
| С             | 4.6699                  | 2.0922  | 6.1766  |  |
| Н             | 3.9958                  | 2.2716  | 7.0477  |  |
| С             | 4.7108                  | 3.2856  | 5.1360  |  |
| Н             | 3.8250                  | 3.9611  | 5.1943  |  |
| С             | 6.8535                  | 3.1834  | 6.2869  |  |
| С             | 4.1321                  | 3.3330  | 2.6156  |  |
| Н             | 3.3805                  | 4.0548  | 3.0118  |  |
| Н             | 3.6305                  | 2.5932  | 1.9583  |  |
| С             | 6.4492                  | 5.1955  | 4.7626  |  |
| Н             | 7.3688                  | 5.5106  | 5.3043  |  |
| С             | 5.5462                  | 3.5274  | 0.5001  |  |
| С             | 5.8955                  | 5.2322  | 2.2353  |  |
| С             | 6.8244                  | 5.5573  | 0.9823  |  |
| С             | 8.2324                  | 5.2824  | 2.9735  |  |
| С             | 6.9103                  | 4.5001  | -1.3962 |  |
| Н             | 6.0843                  | 3.9775  | -1.9276 |  |
| Н             | 6.9372                  | 5.5773  | -1.6713 |  |
| С             | 9.4239                  | 5.6860  | 0.7692  |  |
| Н             | 10.2484                 | 5.8420  | 1.5009  |  |
| Н             | 9.3970                  | 6.5102  | 0.0230  |  |
| С             | 8.2638                  | -0.4884 | 7.1097  |  |

| С | 6.9324  | -2.5380 | 7.0449  |
|---|---------|---------|---------|
| Н | 7.0695  | -3.1989 | 7.9340  |
| С | 5.9731  | -1.3012 | 7.3264  |
| Н | 5.2957  | -1.4525 | 8.2012  |
| С | 5.2046  | -2.4631 | 5.3108  |
| С | 3.9404  | -0.4020 | 5.9227  |
| Н | 3.2977  | -0.9577 | 5.2034  |
| Н | 3.4275  | -0.2876 | 6.9033  |
| С | 6.4976  | 1.2102  | 7.8216  |
| Н | 7.3895  | 1.7447  | 8.2192  |
| Н | 5.6712  | 1.2147  | 8.5671  |
| Ν | 4.1354  | 0.9668  | 5.3593  |
| Ν | 4.7225  | 2.5796  | 3.7880  |
| Ν | 6.1000  | 1.9596  | 6.5885  |
| Ν | 5.9451  | 4.0058  | 5.4972  |
| Ν | 5.0992  | 4.0595  | 1.7700  |
| Ν | 6.6410  | 4.3801  | 0.0743  |
| Ν | 6.8515  | 4.9510  | 3.3441  |
| Ν | 8.1765  | 5.7187  | 1.5827  |
| Ν | 8.1527  | 3.8400  | -1.8708 |
| Ν | 6.9212  | -0.1970 | 7.5971  |
| Ν | 6.2142  | -3.2950 | 5.9716  |
| Ν | 5.1818  | -1.2103 | 6.0509  |
| 0 | 4.2078  | 0.2830  | 3.0717  |
| 0 | 5.0588  | 2.5675  | -0.1423 |
| 0 | 9.2630  | 0.2539  | 7.1353  |
| 0 | 7.9952  | 3.4767  | 6.6875  |
| 0 | 9.2278  | 5.2693  | 3.7223  |
| 0 | 4.4656  | -2.7764 | 4.3559  |
| С | 12.3537 | 0.0350  | 1.3490  |
| С | 11.4395 | -0.5732 | -0.8495 |
| Н | 12.0072 | -0.8756 | -1.7621 |
| С | 11.1976 | -1.7734 | 0.1705  |
| Н | 11.6759 | -2.7327 | -0.1423 |
| С | 9.0391  | -0.9639 | -0.6531 |
| С | 12.2334 | -2.2413 | 2.4966  |
| Н | 12.7216 | -3.1151 | 2.0042  |
| Н | 12.9704 | -1.6754 | 3.1089  |
| С | 9.0445  | -3.1022 | 0.8005  |
| Н | 8.0069  | -3.1610 | 0.4129  |
| Н | 9.5999  | -4.0232 | 0.5027  |
| С | 11.0825 | -2.1855 | 4.7944  |
| С | 10.1281 | -3.6625 | 3.1008  |
| С | 9.4547  | -4.0055 | 4.5047  |

| С | 7.7234  | -3.2237 | 2.9797  |
|---|---------|---------|---------|
| С | 9.5117  | -2.6482 | 6.7466  |
| Н | 10.2631 | -1.9625 | 7.1992  |
| Н | 9.3671  | -3.5499 | 7.3827  |
| С | 6.9016  | -4.3118 | 5.1407  |
| Н | 6.1132  | -4.7464 | 4.4877  |
| Н | 7.3427  | -5.0967 | 5.7906  |
| С | 8.0874  | 2.4284  | -2.2215 |
| С | 9.5136  | 4.2511  | -1.4072 |
| Н | 9.8141  | 5.1918  | -1.9284 |
| С | 10.4400 | 3.0051  | -1.7882 |
| Н | 11.2311 | 3.2624  | -2.5330 |
| С | 10.7703 | 3.5533  | 0.5756  |
| С | 12.3429 | 1.8467  | -0.4396 |
| Н | 12.9659 | 2.3001  | 0.3644  |
| Н | 12.8545 | 1.9222  | -1.4244 |
| С | 9.7824  | 0.5910  | -2.5265 |
| Н | 8.8678  | 0.1470  | -2.9786 |
| Н | 10.6629 | 0.4427  | -3.1897 |
| Ν | 12.2214 | 0.4098  | -0.0553 |
| Ν | 11.7412 | -1.2911 | 1.4574  |
| Ν | 10.0574 | -0.1524 | -1.2452 |
| Ν | 9.7048  | -1.9384 | 0.1620  |
| Ν | 11.2136 | -2.7392 | 3.4500  |
| Ν | 10.1009 | -3.0480 | 5.4430  |
| Ν | 8.9868  | -3.0493 | 2.2997  |
| Ν | 7.9996  | -3.8029 | 4.2508  |
| Ν | 8.2214  | -1.8861 | 6.6437  |
| Ν | 9.4832  | 2.0282  | -2.3896 |
| Ν | 9.6893  | 4.3917  | 0.0693  |
| Ν | 11.0524 | 2.5941  | -0.4915 |
| 0 | 12.9383 | 0.6663  | 2.2487  |
| 0 | 11.7505 | -1.2698 | 5.3082  |
| 0 | 7.0754  | 1.7451  | -2.4726 |
| 0 | 7.7988  | -0.8267 | -0.8977 |
| 0 | 6.5470  | -2.9473 | 2.5819  |
| 0 | 11.3354 | 3.6325  | 1.6834  |
| Н | 5.6741  | 5.9947  | 4.8052  |
| Н | 10.5145 | -4.5571 | 2.5567  |
| Н | 9.6264  | -5.0584 | 4.8337  |
| Н | 6.5303  | 6.4952  | 0.4524  |
| Н | 5.2099  | 6.0713  | 2.5058  |
| Н | 5.1355  | -2.2356 | -0.1067 |

total electronic energies: -4030.4616919 (a.u.) in gas -4030.4626283 (a.u.) in water

BSSE-corrected energy: -4030.4114595 (a.u.)

### (2) Q[7]@INH

| Atomic Symbol |         | Coordinates | (Angstroms) |
|---------------|---------|-------------|-------------|
| Atomic Symbol | Х       | Y           | Z           |
| С             | 0.0000  | 0.0000      | 0.0000      |
| Ν             | 0.0000  | 1.3926      | 0.0000      |
| С             | 1.2729  | 1.9616      | 0.0000      |
| С             | 2.4794  | 1.2351      | 0.0362      |
| С             | 2.4180  | -0.1796     | 0.0407      |
| С             | 1.1526  | -0.8122     | -0.0037     |
| С             | 3.6316  | -1.0560     | 0.1612      |
| Ν             | 4.8894  | -0.5807     | 0.5339      |
| Ν             | 5.7563  | -1.7824     | 0.6473      |
| 0             | 3.5622  | -2.3768     | 0.0288      |
| Н             | -0.9994 | -0.4698     | 0.0118      |
| Н             | 1.2883  | 3.0680      | -0.0324     |
| Н             | 3.4429  | 1.7617      | 0.0429      |
| Н             | 1.0882  | -1.9209     | -0.0270     |
| Н             | 5.3356  | 0.4824      | 0.5181      |
| Н             | 6.5687  | -1.6782     | -0.0235     |
| Н             | 6.0959  | -1.8390     | 1.7133      |
| С             | -2.7990 | -2.3366     | 3.1761      |
| Ν             | -1.7017 | -3.2445     | 3.5464      |
| Ν             | -3.3232 | -2.8444     | 1.9154      |
| 0             | -3.2322 | -1.3819     | 3.8498      |
| С             | -1.6203 | -4.4073     | 2.6047      |
| С             | -2.4914 | -3.9404     | 1.3577      |
| С             | -4.1838 | -1.9761     | 1.0672      |
| С             | -1.4913 | -3.4565     | 5.0143      |
| Ν             | -0.2812 | -4.6413     | 2.0016      |
| Ν             | -1.4684 | -3.5209     | 0.3364      |
| Ν             | -3.4618 | -1.1704     | 0.0265      |
| Н             | -1.9921 | -5.3445     | 3.0839      |
| Н             | -3.1422 | -4.7484     | 0.9462      |
| Н             | -4.6495 | -1.2432     | 1.7643      |
| Н             | -4.9622 | -2.6094     | 0.5837      |
| Ν             | -0.1117 | -3.2270     | 5.5064      |
| Н             | -2.1271 | -2.7003     | 5.5270      |
| Н             | -1.8030 | -4.4890     | 5.2983      |
| С             | -0.1289 | -3.9576     | 0.7312      |
| С             | -3.4615 | -1.6516     | -1.3978     |

| С | -1.8073 | -3.6512 | -1.1278 |
|---|---------|---------|---------|
| С | -3.6957 | 0.2834  | 0.0779  |
| С | 1.0352  | -4.1027 | 5.1835  |
| С | 0.2782  | -1.9719 | 6.1244  |
| С | 0.9085  | -5.0790 | 2.7721  |
| Ν | -2.2545 | -2.4145 | -1.8005 |
| С | -3.3709 | -0.3179 | -2.2722 |
| Ν | -3.3929 | 0.7744  | -1.2559 |
| Н | -4.3830 | -2.2479 | -1.6054 |
| 0 | 0.9307  | -3.7938 | 0.0831  |
| 0 | -4.0681 | 0.9448  | 1.0667  |
| Н | -0.8743 | -3.9494 | -1.6555 |
| Н | -2.5888 | -4.4380 | -1.2437 |
| Ν | 1.6678  | -2.1893 | 6.5201  |
| С | 2.2565  | -3.4329 | 5.9650  |
| 0 | -0.4320 | -0.9822 | 6.3839  |
| Ν | 1.4742  | -4.0879 | 3.7444  |
| Н | 0.6500  | -6.0210 | 3.3082  |
| Н | 1.7110  | -5.2618 | 2.0231  |
| Н | 0.8263  | -5.1512 | 5.5073  |
| С | -1.3345 | -1.6464 | -2.6301 |
| Ν | -2.1028 | -0.4820 | -3.0297 |
| С | -3.8011 | 2.1675  | -1.6031 |
| Н | -4.2247 | -0.1994 | -2.9837 |
| Ν | 3.2964  | -3.2446 | 4.9122  |
| С | 2.8860  | -3.7592 | 3.6089  |
| Н | 2.6607  | -4.0746 | 6.7853  |
| С | 2.4579  | -1.1044 | 7.1245  |
| Ν | -2.6992 | 3.1163  | -1.8927 |
| С | -1.5191 | 0.5610  | -3.9030 |
| 0 | -0.1953 | -1.9845 | -3.0093 |
| Н | -4.3158 | 2.5704  | -0.7019 |
| Н | -4.4931 | 2.1435  | -2.4758 |
| 0 | 3.6095  | -3.8816 | 2.5986  |
| С | 4.7357  | -3.1474 | 5.2332  |
| Ν | 3.3697  | -0.3651 | 6.1708  |
| Н | 3.0629  | -1.5002 | 7.9728  |
| Н | 1.7168  | -0.3549 | 7.4844  |
| С | -1.8197 | 3.0141  | -3.0823 |
| Ν | -0.9856 | 1.7704  | -3.1984 |
| С | -2.1246 | 3.9275  | -0.8256 |
| Н | -0.6462 | 0.0839  | -4.4031 |
| Н | -2.2802 | 0.8748  | -4.6545 |
| Ν | 5.2909  | -1.7496 | 5.2328  |

| С | 3.1669  | 1.0925  | 6.1180  |
|---|---------|---------|---------|
| С | 4.8340  | -0.6795 | 6.1740  |
| Н | 4.9374  | -3.5995 | 6.2292  |
| Н | 5.3048  | -3.6749 | 4.4352  |
| С | 0.4255  | 2.0822  | -3.4022 |
| С | -0.7420 | 4.1694  | -2.8507 |
| Ν | -1.0104 | 4.6118  | -1.4633 |
| Н | -2.4237 | 3.1562  | -4.0118 |
| 0 | -2.5624 | 4.1054  | 0.3266  |
| С | 5.4951  | 0.6343  | 5.5739  |
| С | 5.8490  | -1.2177 | 4.0268  |
| Ν | 4.4341  | 1.6466  | 5.6455  |
| 0 | 2.1374  | 1.7226  | 6.4203  |
| Н | 5.1944  | -0.9262 | 7.2021  |
| Ν | 0.5674  | 3.4892  | -3.0538 |
| С | -0.3067 | 5.7186  | -0.8026 |
| Н | -0.8444 | 5.0220  | -3.5667 |
| 0 | 1.3244  | 1.3120  | -3.7977 |
| Ν | 5.8667  | 0.2137  | 4.1712  |
| 0 | 6.3372  | -1.9342 | 3.0976  |
| Н | 6.4114  | 0.9654  | 6.1206  |
| С | 4.7357  | 3.0949  | 5.7832  |
| Ν | 1.1224  | 5.4076  | -0.4033 |
| Ν | 4.8922  | 3.8345  | 4.5058  |
| Н | -0.8548 | 5.9145  | 0.1464  |
| Н | -0.3151 | 6.6259  | -1.4535 |
| С | 1.7946  | 4.2236  | -3.4398 |
| С | 6.6722  | 1.1045  | 3.2939  |
| Н | 5.6573  | 3.2258  | 6.3962  |
| Н | 3.8594  | 3.5607  | 6.2881  |
| С | 2.2196  | 5.7872  | -1.3703 |
| Ν | 2.6419  | 4.7207  | -2.3125 |
| С | 1.4808  | 5.8560  | 0.9565  |
| С | 3.8101  | 4.6642  | 3.9899  |
| С | 5.9640  | 3.6102  | 3.5295  |
| Ν | 5.9039  | 2.2890  | 2.7655  |
| Н | 2.4322  | 3.5056  | -4.0024 |
| Н | 1.5294  | 5.0970  | -4.0788 |
| Н | 7.5587  | 1.4907  | 3.8534  |
| Н | 7.0182  | 0.4929  | 2.4341  |
| Ν | 2.8862  | 6.2586  | 0.8885  |
| С | 3.4861  | 5.9619  | -0.4309 |
| С | 3.7643  | 3.9588  | -1.8214 |
| Ν | 4.2512  | 5.0867  | 2.6585  |

| С | 5.8595 | 2.5385  | 1.3475  |
|---|--------|---------|---------|
| Н | 1.9546 | 6.7132  | -1.9348 |
| С | 5.6676 | 4.7005  | 2.4082  |
| Н | 6.9724 | 3.7077  | 3.9978  |
| 0 | 0.7306 | 5.9196  | 1.9483  |
| 0 | 2.7680 | 4.9958  | 4.5837  |
| Ν | 4.1762 | 4.6288  | -0.5640 |
| Ν | 5.9008 | 3.9427  | 1.1350  |
| С | 3.6814 | 6.3752  | 2.1324  |
| Н | 4.1637 | 6.7923  | -0.7444 |
| Н | 6.3561 | 5.5786  | 2.4402  |
| 0 | 5.8458 | 1.6973  | 0.3793  |
| 0 | 4.3325 | 2.9767  | -2.3396 |
| С | 5.6182 | 4.5089  | -0.2314 |
| Н | 4.5002 | 7.1120  | 1.9733  |
| Н | 2.9753 | 6.7328  | 2.9150  |
| Н | 6.1426 | 5.4887  | -0.2907 |
| Н | 6.0498 | 3.7816  | -0.9554 |
| Н | 4.6933 | -2.5326 | 0.2833  |

total electronic energies:-4624.3838038 (a.u.) in gas

-4624.3903157 (a.u.) in water

BSSE- corrected energy: -4624.3411171 (a.u.)

### (3) Q[6]

| Atomio Symbol | Co      | ordinates (Angstron | ms)     |
|---------------|---------|---------------------|---------|
| Atomic Symbol | Х       | Y                   | Ζ       |
| С             | 0.0000  | 0.0000              | 0.0000  |
| Ν             | 0.0000  | 1.4512              | 0.0000  |
| Ν             | -1.4039 | -0.3677             | 0.0000  |
| Ο             | 0.9860  | -0.7610             | -0.0682 |
| С             | -1.3549 | 2.0575              | -0.0282 |
| С             | -2.3336 | 0.7896              | -0.0283 |
| С             | -1.8207 | -1.7841             | -0.1347 |
| С             | 1.2647  | 2.2135              | -0.1340 |
| Ν             | -1.7684 | 2.8160              | 1.1792  |
| Ν             | -3.1722 | 0.9970              | 1.1791  |
| Ν             | -2.2703 | -2.4507             | 1.1111  |
| Ν             | 1.7963  | 2.8156              | 1.1123  |
| Н             | -1.4670 | 2.6984              | -0.9381 |
| Н             | -2.9821 | 0.7354              | -0.9382 |
| Н             | -0.9098 | -2.3364             | -0.4595 |
| Н             | -2.6247 | -1.8595             | -0.9029 |
| Н             | 2.0296  | 1.4727              | -0.4602 |

| Н | 1.1335  | 3.0113  | -0.9010 |
|---|---------|---------|---------|
| С | -2.8661 | 2.2120  | 1.9115  |
| С | -3.6481 | -2.3712 | 1.6586  |
| С | -4.3401 | 0.1603  | 1.5453  |
| С | -1.4089 | -3.3881 | 1.8077  |
| С | 2.9190  | 2.2163  | 1.8097  |
| С | 1.3708  | 4.1273  | 1.6628  |
| С | -1.2537 | 4.1571  | 1.5464  |
| Ν | -4.0392 | -1.0858 | 2.2904  |
| С | -3.6242 | -3.4006 | 2.8857  |
| Ν | -2.2362 | -3.9276 | 2.8710  |
| Ν | 3.2307  | 3.1503  | 2.8758  |
| С | 2.3710  | 4.3606  | 2.8920  |
| Ν | 0.0273  | 4.1801  | 2.2928  |
| Н | -4.3891 | -2.6481 | 0.8677  |
| Н | 1.4529  | 4.9161  | 0.8741  |
| 0 | -3.4668 | 2.6755  | 2.9016  |
| 0 | -0.2433 | -3.7169 | 1.5089  |
| 0 | 3.5320  | 1.1722  | 1.5095  |
| Н | -4.9522 | 0.7835  | 2.2360  |
| Н | -4.9151 | -0.0918 | 0.6244  |
| Н | -1.1541 | 4.7773  | 0.6259  |
| Н | -2.0119 | 4.5919  | 2.2366  |
| С | -4.2747 | -1.1754 | 3.7195  |
| Ν | -4.0039 | -2.5621 | 4.0507  |
| С | -1.7474 | -5.0319 | 3.7311  |
| С | 4.4207  | 2.9528  | 3.7378  |
| Ν | 1.4623  | 4.5137  | 4.0560  |
| С | 0.0525  | 4.4276  | 3.7225  |
| Н | -4.3525 | -4.2414 | 2.7676  |
| Н | 3.0014  | 5.2775  | 2.7773  |
| Ν | -1.3090 | -4.6488 | 5.0946  |
| С | -4.2667 | -3.0855 | 5.4128  |
| С | 1.9002  | 4.8978  | 5.4194  |
| Ν | 4.1571  | 2.4289  | 5.0996  |
| 0 | -4.6951 | -0.2796 | 4.4790  |
| 0 | -0.9212 | 4.6081  | 4.4810  |
| Н | -0.8389 | -5.4288 | 3.2237  |
| Н | -2.5350 | -5.8171 | 3.8046  |
| Н | 4.9826  | 3.9122  | 3.8152  |
| Н | 5.0341  | 2.1745  | 3.2297  |
| С | -2.2176 | -4.4941 | 6.2586  |
| Ν | -3.0761 | -3.2829 | 6.2740  |
| С | 0.1008  | -4.5622 | 5.4278  |

| С | 4.4281  | 1.0422  | 5.4306  |
|---|---------|---------|---------|
| С | 3.7777  | 3.2672  | 6.2649  |
| Ν | 2.3897  | 3.7942  | 6.2800  |
| Н | -4.8797 | -2.3070 | 5.9211  |
| Н | -4.8288 | -4.0449 | 5.3362  |
| Н | 0.9914  | 5.2943  | 5.9266  |
| Н | 2.6873  | 5.6835  | 5.3457  |
| С | -2.7645 | -2.3493 | 7.3405  |
| С | -1.2171 | -4.2609 | 7.4875  |
| Ν | 0.1263  | -4.3141 | 6.8573  |
| Ν | 4.1923  | 0.9522  | 6.8597  |
| С | 1.5625  | 3.2544  | 7.3433  |
| Н | -2.8488 | -5.4103 | 6.3739  |
| С | 3.8018  | 2.2376  | 7.4918  |
| Н | 4.5059  | 4.1080  | 6.3829  |
| 0 | 1.0744  | -4.7428 | 4.6691  |
| 0 | 4.8487  | 0.1466  | 4.6710  |
| Ν | -1.6421 | -2.9490 | 8.0380  |
| С | 1.4074  | -4.2907 | 7.6034  |
| Ν | 2.4242  | 2.3173  | 8.0399  |
| С | 4.4938  | -0.2939 | 7.6045  |
| Н | -1.2993 | -5.0496 | 8.2764  |
| Н | 4.5431  | 2.5143  | 8.2824  |
| 0 | 0.3969  | 3.5829  | 7.6421  |
| 0 | -3.3772 | -1.3051 | 7.6407  |
| Ν | 1.9218  | -2.9494 | 7.9703  |
| Ν | 3.3262  | -1.1309 | 7.9710  |
| С | 1.9748  | 1.6502  | 9.2855  |
| Н | 2.1655  | -4.7254 | 6.9131  |
| Н | 1.3083  | -4.9108 | 8.5241  |
| Н | 5.0691  | -0.0418 | 8.5252  |
| Н | 5.1058  | -0.9169 | 6.9134  |
| С | -1.1106 | -2.3473 | 9.2846  |
| С | 1.5090  | -2.1914 | 9.1784  |
| Ν | 0.1541  | -1.5851 | 9.1512  |
| С | 3.0197  | -2.3455 | 7.2382  |
| С | 2.4877  | -0.9235 | 9.1785  |
| Ν | 1.5580  | 0.2338  | 9.1503  |
| Н | 2.7790  | 1.7252  | 10.0535 |
| Н | 1.0640  | 2.2023  | 9.6107  |
| Н | -1.8756 | -1.6066 | 9.6110  |
| Н | -0.9796 | -3.1454 | 10.0513 |
| С | 0.1541  | -0.1339 | 9.1509  |
| Н | 1.6216  | -2.8327 | 10.0879 |

| Н | 3.1362  | -0.8694 | 10.0883 |
|---|---------|---------|---------|
| 0 | 3.6201  | -2.8089 | 6.2479  |
| 0 | -0.8319 | 0.6272  | 9.2195  |

total electronic energies: -3563. 6519915 (a.u.) in gas -3563.6519881 (a.u.) in water

### (4) Q[7]

| Atomio Sympol |         | Coordinates (Angstroms) |         |
|---------------|---------|-------------------------|---------|
| Atomic Symbol | Х       | Y                       | Ζ       |
| С             | 0.0000  | 0.0000                  | 0.0000  |
| Ν             | 0.0000  | 1.4519                  | 0.0000  |
| Ν             | -1.4043 | -0.3684                 | 0.0000  |
| Ο             | 0.9865  | -0.7612                 | -0.0592 |
| С             | -1.3546 | 2.0553                  | -0.0719 |
| С             | -2.3318 | 0.7886                  | -0.0724 |
| С             | -1.8230 | -1.7751                 | -0.2103 |
| С             | 1.2547  | 2.2137                  | -0.2089 |
| Ν             | -1.7884 | 2.8312                  | 1.1173  |
| Ν             | -3.1931 | 1.0112                  | 1.1162  |
| Ν             | -2.4052 | -2.4539                 | 0.9724  |
| Н             | -1.4457 | 2.6835                  | -0.9932 |
| Н             | -2.9619 | 0.7175                  | -0.9942 |
| Н             | -0.8932 | -2.3363                 | -0.4568 |
| Н             | -2.5486 | -1.8217                 | -1.0568 |
| Ν             | 1.7627  | 2.9495                  | 0.9738  |
| Н             | 2.0335  | 1.4564                  | -0.4542 |
| Н             | 1.1171  | 2.9269                  | -1.0561 |
| С             | -2.9174 | 2.2500                  | 1.8213  |
| С             | -3.8268 | -2.3264                 | 1.3814  |
| С             | -4.4154 | 0.2241                  | 1.4078  |
| С             | -1.6913 | -3.5245                 | 1.6448  |
| С             | 1.2779  | 4.2924                  | 1.3813  |
| С             | 2.9812  | 2.5334                  | 1.6448  |
| С             | -1.3382 | 4.2132                  | 1.4097  |
| Ν             | -4.1941 | -1.0740                 | 2.0892  |
| С             | -3.9992 | -3.4561                 | 2.5010  |
| Ν             | -2.6530 | -4.0769                 | 2.5816  |
| Н             | -4.4949 | -2.4764                 | 0.4966  |
| О             | -3.5540 | 2.7406                  | 2.7753  |
| О             | -0.5320 | -3.9256                 | 1.4182  |
| Н             | -5.0140 | 0.8416                  | 2.1152  |
| Н             | -4.9785 | 0.0521                  | 0.4598  |
| Ν             | 3.2711  | 3.6052                  | 2.5802  |

| С | 2.3274  | 4.7486  | 2.4990 |
|---|---------|---------|--------|
| 0 | 3.6648  | 1.5148  | 1.4185 |
| Ν | -0.0261 | 4.3297  | 2.0903 |
| Н | -1.3160 | 4.8027  | 0.4624 |
| Н | -2.0873 | 4.6342  | 2.1181 |
| Н | 1.2515  | 4.9750  | 0.4953 |
| С | -4.6096 | -1.2741 | 3.4659 |
| Ν | -4.4425 | -2.6975 | 3.6978 |
| С | -2.3665 | -5.3315 | 3.3180 |
| Н | -4.7622 | -4.2296 | 2.2337 |
| Ν | 1.4824  | 4.9855  | 3.6965 |
| С | 0.0632  | 4.7847  | 3.4663 |
| Н | 2.8807  | 5.6831  | 2.2301 |
| С | 4.5580  | 3.6488  | 3.3154 |
| Ν | -2.1358 | -5.1815 | 4.7750 |
| С | -4.9564 | -3.3346 | 4.9341 |
| 0 | -5.0731 | -0.4238 | 4.2521 |
| Н | -1.4124 | -5.7217 | 2.8967 |
| Н | -3.1983 | -6.0560 | 3.1494 |
| 0 | -0.8763 | 5.0179  | 4.2531 |
| С | 1.9689  | 5.6464  | 4.9315 |
| Ν | 4.4734  | 3.3892  | 4.7727 |
| Н | 5.0470  | 4.6371  | 3.1446 |
| Н | 5.1775  | 2.8246  | 2.8946 |
| С | -3.2259 | -5.1068 | 5.7802 |
| Ν | -3.9250 | -3.8017 | 5.8914 |
| С | -0.8179 | -5.3890 | 5.3478 |
| Н | -5.5324 | -2.5449 | 5.4676 |
| Н | -5.6189 | -4.1897 | 4.6600 |
| Ν | 2.6843  | 4.7693  | 5.8893 |
| С | 5.0103  | 2.1684  | 5.3464 |
| С | 4.1243  | 4.4254  | 5.7772 |
| Н | 2.6262  | 6.5049  | 4.6559 |
| Н | 1.0588  | 6.0022  | 5.4655 |
| С | -3.7363 | -3.1381 | 7.1689 |
| С | -2.4597 | -5.2440 | 7.1777 |
| Ν | -1.0346 | -5.3790 | 6.7834 |
| Н | -3.9680 | -5.9248 | 5.6018 |
| 0 | 0.2515  | -5.5987 | 4.7409 |
| С | 4.4535  | 3.7210  | 7.1752 |
| С | 2.0918  | 4.4195  | 7.1678 |
| Ν | 4.9466  | 2.3769  | 6.7818 |
| 0 | 5.4851  | 1.1869  | 4.7402 |
| Н | 4.7259  | 5.3513  | 5.5966 |

| Ν | -2.8237 | -3.9988 | 7.8998  |
|---|---------|---------|---------|
| С | 0.0475  | -5.7659 | 7.7204  |
| Н | -2.7792 | -6.1376 | 7.7703  |
| 0 | -4.2895 | -2.0963 | 7.5745  |
| Ν | 3.1572  | 3.7569  | 7.8984  |
| 0 | 0.9439  | 4.6897  | 7.5743  |
| Н | 5.2368  | 4.2582  | 7.7665  |
| С | 5.5968  | 1.4300  | 7.7193  |
| Ν | 0.6110  | -4.6655 | 8.5389  |
| Ν | 4.6764  | 0.6054  | 8.5386  |
| Н | 0.8849  | -6.1322 | 7.0842  |
| Н | -0.3201 | -6.5760 | 8.3941  |
| С | -2.5436 | -3.7669 | 9.3373  |
| С | 3.0056  | 3.4283  | 9.3363  |
| Н | 6.2863  | 1.9926  | 8.3925  |
| Н | 6.1646  | 0.7131  | 7.0838  |
| С | -0.0008 | -4.1787 | 9.8010  |
| Ν | -1.1776 | -3.2855 | 9.6549  |
| С | 1.9622  | -4.1844 | 8.3142  |
| С | 4.5541  | -0.8237 | 8.3138  |
| С | 4.0501  | 1.0736  | 9.8007  |
| Ν | 2.8872  | 1.9851  | 9.6548  |
| Н | -3.2349 | -2.9538 | 9.6551  |
| Н | -2.7468 | -4.7038 | 9.9085  |
| Н | 3.8610  | 3.8629  | 9.9060  |
| Н | 2.0441  | 3.8908  | 9.6551  |
| Ν | 2.2258  | -3.2923 | 9.4289  |
| С | 1.1229  | -3.2232 | 10.4204 |
| С | -0.9556 | -1.9335 | 10.1351 |
| Ν | 3.7580  | -1.3051 | 9.4285  |
| С | 1.6360  | 1.4269  | 10.1352 |
| Н | -0.2573 | -5.0449 | 10.4611 |
| С | 3.4113  | -0.2560 | 10.4202 |
| Н | 4.8227  | 1.5413  | 10.4610 |
| 0 | 2.7476  | -4.5179 | 7.4042  |
| 0 | 5.0763  | -1.4987 | 7.4040  |
| Ν | 0.4370  | -1.9124 | 10.5453 |
| Ν | 1.9694  | 0.0747  | 10.5456 |
| С | 3.5874  | -2.7578 | 9.6714  |
| Н | 1.4871  | -3.5618 | 11.4226 |
| Н | 3.8315  | -0.5226 | 11.4223 |
| 0 | 0.5349  | 2.0039  | 10.2385 |
| 0 | -1.7933 | -1.0150 | 10.2382 |
| С | 0.9943  | -0.7578 | 11.2902 |

| Н | 3.8967 | -2.9962 | 10.7168 |
|---|--------|---------|---------|
| Н | 4.2508 | -3.2696 | 8.9379  |
| Н | 1.4640 | -1.1202 | 12.2354 |
| Н | 0.1298 | -0.0912 | 11.5104 |

total electronic energies: -4157.5974559 (a.u.) in gas -4157.597456 (a.u.) in water

### (5) **INH**

|               | Coordinates (Angstroms) |         |         |
|---------------|-------------------------|---------|---------|
| Atomic Symbol | Х                       | Ŷ       | Z       |
| С             | 0.0000                  | 0.0000  | 0.0000  |
| Ν             | 0.0000                  | 1.3950  | 0.0000  |
| С             | 1.2724                  | 1.9703  | 0.0000  |
| С             | 2.4847                  | 1.2536  | -0.0062 |
| С             | 2.4275                  | -0.1669 | -0.0092 |
| С             | 1.1570                  | -0.8055 | -0.0023 |
| С             | 3.6462                  | -1.0159 | -0.0103 |
| Ν             | 4.9706                  | -0.4986 | -0.0768 |
| Ν             | 5.8880                  | -1.6513 | -0.1891 |
| 0             | 3.6233                  | -2.3373 | 0.1108  |
| Н             | -0.9991                 | -0.4702 | 0.0030  |
| Н             | 1.2868                  | 3.0742  | 0.0066  |
| Н             | 3.4393                  | 1.7978  | 0.0084  |
| Н             | 1.0833                  | -1.9036 | -0.0011 |
| Н             | 5.2076                  | 0.4074  | -0.5574 |
| Н             | 6.6150                  | -1.5815 | 0.5806  |
| Н             | 4.7396                  | -2.4878 | -0.0004 |
| Н             | 6.3871                  | -1.6374 | -1.1263 |

total electronic energies: -466. 2120888 (a.u.) in gas -466.2121576 (a.u.) in water