## ENTHALPY OF DILUTION OF ACIDS

The quantity given in this table is $-\Delta_{\text {dii }} H$, the negative of the enthalpy (heat) of dilution to infinite dilution for aqueous solutions of several common acids; i.e., the negative of the enthalphy change when a solution of molality $m$ at a temperature of $25^{\circ} \mathrm{C}$ is diluted with an infinite amount of water. The tabulated numbers thus represent the heat produced (or, if the value is negative, the heat absorbed) when the acid is diluted. The initial molality $m$ is given in the first column. The second column gives the dilution ratio, which is the number of moles of water that must be added
to one mole of the acid to produce a solution of the molality in the first column.

## Reference

Parker, V. B., Thermal Properties of Aqueous Uni-Univalent Electrolytes, Natl. Stand. Ref. Data Ser. - Natl. Bur. Stand. (U.S.) 2, U.S. Government Printing Office, 1965.

| $-\Delta_{\text {dil }} H$ in kJ/mol at $25^{\circ} \mathrm{C}$ |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| m | Dil. ratio | HF | HCl | $\mathrm{HClO}_{4}$ | HBr | HI | $\mathrm{HNO}_{3}$ | $\mathrm{CH}_{2} \mathrm{O} 2$ | $\mathrm{C}_{2} \mathrm{H}_{4} \mathrm{O}_{2}$ |
| 55.506 | 1.0 |  | 45.61 |  | 48.83 |  | 19.73 | 0.046 | 2.167 |
| 20 | 2.775 | 14.88 | 19.87 | 13.81 | 19.92 | 21.71 | 9.498 | 0.038 | 2.075 |
| 15 | 3.700 | 14.34 | 15.40 | 7.920 | 14.29 | 14.02 | 6.883 | 0.109 | 1.962 |
| 10 | 5.551 | 13.87 | 10.24 | 2.013 | 8.694 | 7.615 | 3.933 | 0.205 | 1.824 |
| 9 | 6.167 | 13.81 | 9.213 | 1.280 | 7.719 | 6.569 | 3.368 | 0.230 | 1.782 |
| 8 | 6.938 | 13.77 | 8.201 | 0.611 | 6.786 | 5.607 | 2.791 | 0.255 | 1.724 |
| 7 | 7.929 | 13.73 | 7.217 | 0.046 | 5.925 | 4.728 | 2.251 | 0.272 | 1.648 |
| 6 | 9.251 | 13.69 | 6.268 | -0.351 | 5.004 | 3.975 | 1.749 | 0.280 | 1.540 |
| 5.5506 | 10 | 13.66 | 5.841 | -0.490 | 4.590 | 3.577 | 1.540 | 0.285 | 1.477 |
| 5 | 11.10 | 13.62 | 5.318 | -0.628 | 4.113 | 3.197 | 1.310 | 0.289 | 1.393 |
| 4.5 | 12.33 | 13.58 | 4.899 | -0.732 | 3.711 | 2.828 | 1.109 | 0.289 | 1.310 |
| 4 | 13.88 | 13.53 | 4.402 | -0.787 | 3.330 | 2.460 | 0.958 | 0.289 | 1.218 |
| 3.5 | 15.86 | 13.47 | 3.958 | -0.820 | 2.966 | 2.105 | 0.791 | 0.289 | 1.121 |
| 3 | 18.50 | 13.45 | 3.506 | -0.782 | 2.611 | 1.787 | 0.665 | 0.289 | 1.025 |
| 2.5 | 22.20 | 13.43 | 3.063 | -0.724 | 2.301 | 1.527 | 0.582 | 0.285 | 0.912 |
| 2 | 27.75 | 13.40 | 2.623 | -0.623 | 1.996 | 1.318 | 0.527 | 0.276 | 0.803 |
| 1.5 | 37.00 | 13.36 | 2.167 | -0.431 | 1.665 | 1.125 | 0.506 | 0.259 | 0.678 |
| 1 | 55.51 | 13.30 | 1.695 | -0.201 | 1.314 | 0.933 | 0.506 | 0.226 | 0.544 |
| 0.5551 | 100 | 13.22 | 1.234 | 0.050 | 0.983 | 0.736 | 0.502 | 0.184 | 0.423 |
| 0.5 | 111.0 | 13.20 | 1.172 | 0.075 | 0.941 | 0.711 | 0.498 | 0.176 | 0.406 |
| 0.2 | 277.5 | 13.09 | 0.761 | 0.247 | 0.649 | 0.536 | 0.439 | 0.146 | 0.331 |
| 0.1 | 555.1 | 12.80 | 0.556 | 0.272 | 0.498 | 0.439 | 0.372 | 0.134 | 0.289 |
| 0.0925 | 600 | 12.79 | 0.540 | 0.272 | 0.481 | 0.427 | 0.368 | 0.134 | 0.285 |
| 0.0793 | 700 | 12.70 | 0.502 | 0.272 | 0.452 | 0.402 | 0.351 | 0.134 | 0.285 |
| 0.0694 | 800 | 12.61 | 0.473 | 0.268 | 0.427 | 0.385 | 0.339 | 0.130 | 0.280 |
| 0.0617 | 900 | 12.50 | 0.448 | 0.264 | 0.406 | 0.368 | 0.326 | 0.126 | 0.276 |
| 0.05551 | 1000 | 12.42 | 0.427 | 0.259 | 0.385 | 0.351 | 0.318 | 0.121 | 0.272 |
| 0.05 | 1110 | 12.24 | 0.406 | 0.259 | 0.372 | 0.339 | 0.305 | 0.121 | 0.272 |
| 0.02775 | 2000 | 11.29 | 0.310 | 0.226 | 0.285 | 0.264 | 0.247 | 0.117 | 0.264 |
| 0.01850 | 3000 | 10.66 | 0.251 | 0.197 | 0.234 | 0.218 | 0.213 | 0.117 | 0.259 |
| 0.01388 | 4000 | 10.25 | 0.226 | 0.180 | 0.205 | 0.192 | 0.192 | 0.113 | 0.259 |
| 0.01110 | 5000 | 9.874 | 0.197 | 0.167 | 0.184 | 0.172 | 0.176 | 0.109 | 0.255 |
| 0.00555 | 10000 | 8.912 | 0.142 | 0.126 | 0.130 | 0.121 | 0.130 | 0.105 | 0.243 |
| 0.00278 | 20000 | 7.531 | 0.105 | 0.092 | 0.092 | 0.084 | 0.096 | 0.096 | 0.230 |
| 0.00111 | 50000 | 5.439 | 0.067 | 0.059 | 0.054 | 0.050 | 0.063 | 0.084 | 0.222 |
| 0.000555 | 100000 | 3.766 | 0.042 | 0.042 | 0.038 | 0.038 | 0.046 | 0.054 | 0.209 |
| 0.000111 | 500000 | 1.255 | 0.021 | 0.021 | 0.021 | 0.021 | 0.021 | 0.038 | 0.167 |
| 0 | $\infty$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

