

## Common Bond Strengths

| Bond | Energy (kJ/mole) | Distance (pm) | Strength Relative to 1 C-C Bond | Number of Bonds Required to Equal 1 C-C Bond |
|------|------------------|---------------|---------------------------------|--|
| C-C  | 346              | 154           | 1.0                             |  |
| C=C  | 602              | 134           | 1.7                             |  |
| C≡C  | 835              | 120           | 2.4                             |  |

|     |     |     |     |  |
|-----|-----|-----|-----|--|
| H-C | 411 | 109 | 1.2 |  |
| H-H | 432 | 74  | 1.2 |  |

|     |     |     |     |  |
|-----|-----|-----|-----|--|
| C-N | 305 | 147 | 0.9 |  |
| C=N | 615 | 129 | 1.8 |  |
| C≡N | 887 | 116 | 2.6 |  |

|     |     |     |     |  |
|-----|-----|-----|-----|--|
| C-O | 358 | 143 | 1.0 |  |
| C=O | 799 | 120 | 2.3 |  |

|     |     |     |     |  |
|-----|-----|-----|-----|--|
| O-O | 142 | 148 | 0.4 |  |
| O=O | 494 | 121 | 1.4 |  |

### H-Bonds

|                       |       |  |  |    |
|-----------------------|-------|--|--|----|
| FH...F                | 161.5 |  |  | 2  |
| OH...N                | 29    |  |  | 12 |
| OH...O                | 21    |  |  | 16 |
| NH...N                | 13    |  |  | 27 |
| NH...O                | 8     |  |  | 43 |
| HOH...OH <sub>2</sub> | 7.9   |  |  | 44 |