

## ***Total Energy of C Atom***

### ***Experimental***

|                       |          |                       |          |           | $\Delta E(\text{ev})$ |
|-----------------------|----------|-----------------------|----------|-----------|-----------------------|
| <b>C</b>              | <b>→</b> | <b>C<sup>+</sup></b>  | <b>+</b> | <b>e</b>  | <b>11.264</b>         |
| <b>C<sup>+</sup></b>  | <b>→</b> | <b>C<sup>+2</sup></b> | <b>+</b> | <b>e</b>  | <b>24.376</b>         |
| <b>C<sup>+2</sup></b> | <b>→</b> | <b>C<sup>+3</sup></b> | <b>+</b> | <b>e</b>  | <b>47.864</b>         |
| <b>C<sup>+3</sup></b> | <b>→</b> | <b>C<sup>+4</sup></b> | <b>+</b> | <b>e</b>  | <b>64.476</b>         |
| <b>C<sup>+4</sup></b> | <b>→</b> | <b>C<sup>+5</sup></b> | <b>+</b> | <b>e</b>  | <b>391.986</b>        |
| <b>C<sup>+5</sup></b> | <b>→</b> | <b>C<sup>+6</sup></b> | <b>+</b> | <b>e</b>  | <b>489.84</b>         |
| <b>C</b>              | <b>→</b> | <b>C<sup>+6</sup></b> | <b>+</b> | <b>6e</b> | <b>1029.806</b>       |

**using 1 au = 27.212 ev**

**Total Energy of C atom = -37.844 au**

**Hartree-Fock Energy of C Atom = -37.688 au**

**Difference (correlation energy) = 0.156 au or 4.25 ev 0.4%**