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| **Bond Enthalpy (Bond Energy)** |  |

The **Bond Enthalpy** is the energy required to break a chemical bond. It is usually expressed in units of kJ mol-1, measured at 298 K. The exact bond enthalpy of a particular chemical bond depends upon the molecular environment in which the bond exists. Therefore, bond enthalpy values given in chemical data books are averaged values.



**ΔH = ∑ ΔH(bonds broken) - ∑ ΔH(bonds formed)**

This basically means that you add up all the energies of the broken bonds; add up all the energies of the bonds that are reformed and subtract one from the other.

EXAMPLE #1

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| **Bond** |   | **Bond Energy****(kJ/mol)** |
| H-H |  | 436 |
| O=O |  | 499 |
| O-H |  | 463 |

**FindH for the following reaction given the following bond energies:**

We have to figure out which bonds are broken and which bonds are formed.

**2 H-H bonds are broken**. **1 O=O bond is broken** 2 O-H bonds are formed per water molecule, and there are 2 water molecules formed, therefore **4 O-H bonds are formed**

**Now we can substitute the values given into the equation: ΔH = ∑ ΔH(bonds broken) - ∑ ΔH(bonds formed)**



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