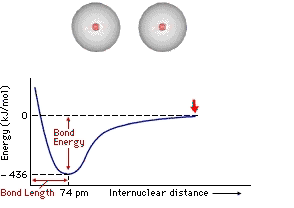
**Ch. 6 & 7 - Chemical Bonding**

**II. Molecular Compounds  
(p. 164 – 172, 211 – 213)**

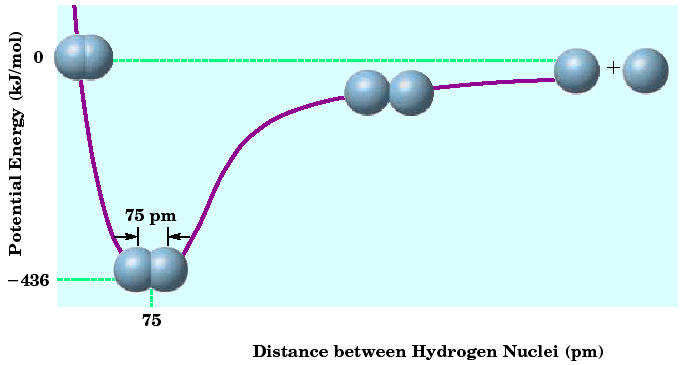
**Energy of Bond Formation**

**Potential Energy**

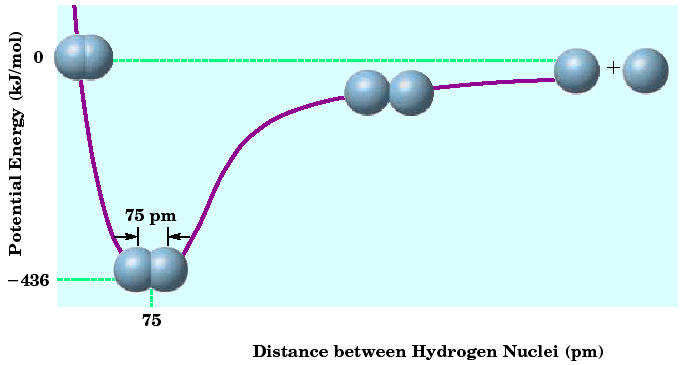
* based on position of an object
* low PE = high stability



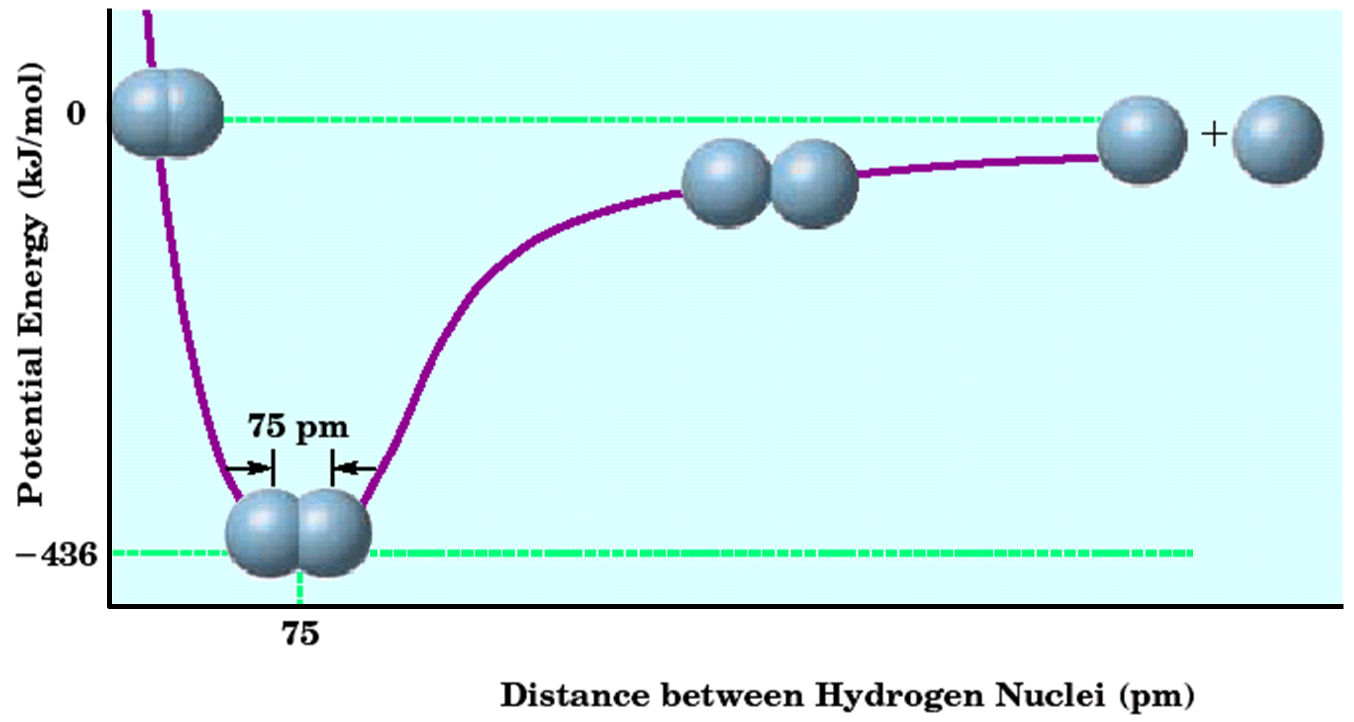
**Potential Energy Diagram 1 (Label the diagram)**



**Potential Energy Diagram 2 (Label the diagram!)**

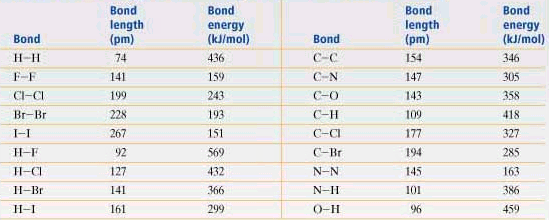


**Bond Energy (Label the diagram!)**



**Bond Energy**

**Short bond = high bond energy**



**Lewis Structures**

**Electron Dot Diagrams (Draw the pictures on this slide!)**

* show valence e- as dots
* distribute dots like arrows   
  in an orbital diagram
* 4 sides = 1 s-orbital, 3 p-orbitals
  + EX: oxygen

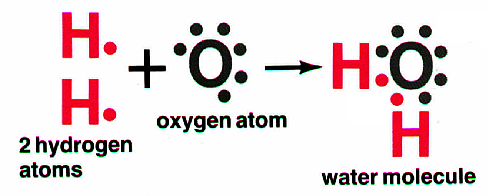
**Octet Rule (Draw the picture on this slide!)**

* Most atoms form bonds in order to obtain 8 valence e-
* Full energy level stability ~ Noble Gases

**Nonpolar Covalent** - no charges



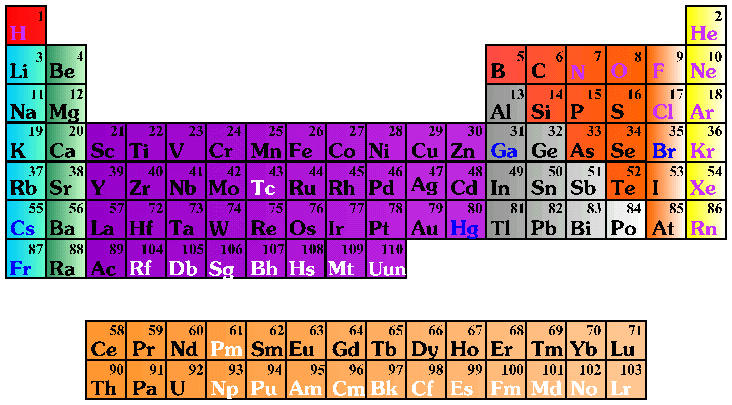
**Polar Covalent** - partial charges



**Molecular Nomenclatures (naming covalent molecules)**

**Prefix System** (binary compounds)

1. Less e-neg atom comes first.
2. Add prefixes to indicate # of atoms. Omit mono- prefix on first element.
3. Change the ending of the second element to -ide.



|  |  |
| --- | --- |
| **PREFIX** | **NUMBER** |
| Mono- | 1 |
| Di- | 2 |
| Tri- | 3 |
| Tetra- | 4 |
| Penta- | 5 |
| Hexa- | 6 |
| Septa- | 7 |
| Octa- | 8 |
| Nona- | 9 |
| Deca- | 10 |

**CCl4** Carbon tetrachloride **N2O** Dinitrogen monoxide

**SF6** Sulfur hexafluoride

**arsenic trichloride** AsCl3  **dinitrogen pentoxide** N2O5

**tetraphosphorus decoxide** P4O10

**The Seven Diatomic Elements**

**Br2 I2 N2 Cl2 H2 O2 F2**

**Ch. 6 & 7 - Chemical Bonding**

**III. Ionic Compounds  
(p. 176 – 180, 203 – 211)**

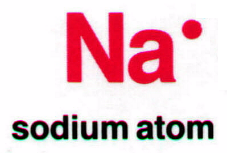
**Energy of Bond Formation**

**Lattice Energy**

* Energy released when one mole of an ionic crystalline compound is formed from gaseous ions

**Lewis Structures**

* **Covalent** – show sharing of e-
* **Ionic** – show transfer of e-

**Ionic Nomenclature (Naming Ionic compounds)**

**Ionic Formulas**

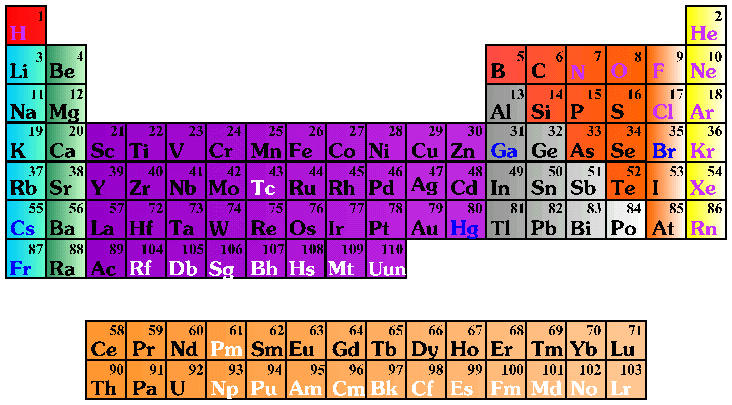
* **Write each ion, cation first. Don’t show charges in the final formula.**
* **Overall charge must equal zero.**
  + **If charges cancel, just write symbols.**
  + **If not, use subscripts to balance charges.**
* **Use parentheses to show more than one polyatomic ion.**
* **Stock System - Roman numerals indicate the ion’s charge.**

**Ionic Names**

* **Write the names of both ions, cation first.**
* **Change ending of monatomic ions to -ide.**
* **Polyatomic ions have special names.**
* **Stock System - Use Roman numerals to show the ion’s charge if more than one is possible. Overall charge must equal zero.**
* **Consider the following:**
  + **Does it contain a polyatomic ion?**
  + ***-ide*, 2 elements** ⇒ **no**
  + ***-ate*, *-ite*, 3+ elements** ⇒ **yes**
  + **Does it contain a Roman numeral?**
  + **Check the table for metals not in Groups 1 or 2.**
  + **No prefixes!**

**Common Ion Charges**

**(Label the picture with the charge!)**

****

**potassium chloride**

K+ + Cl- ⇒ KCl

**magnesium nitrate**

Mg2+ + NO3- ⇒ Mg(NO3)2

**copper(II) chloride**

Cu2+ + Cl- ⇒ CuCl2

**NaBr** Sodium bromide **Na2CO3** Sodium carbonate

**FeCl3** Iron (III) chloride