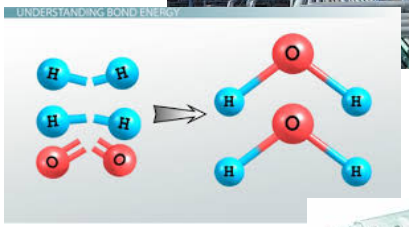
Chemical Bonds

- Determine how atoms and molecules combine
- Determine how hard it is to combine or separate chemical compounds
- Are critical to understand because ...
  - > Structure/Function: Chemical bonds determine what molecules look like and how they work
  - > Energy: It takes energy to make molecules. We can get energy from breaking molecules apart.
  - > Explain/Predict: Chemical bonds can explain how things work & predict how things would work if we made changes.

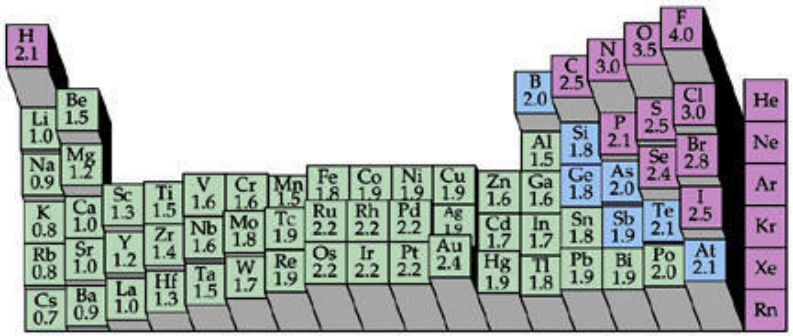


Objectives:

- Students will be able to explain what electronegativity is and how it influences the way in which electrons are shared or transferred between atoms
- Students will know what an ion is and be able to describe its electrostatic properties
- Students will understand what ionic and covalent bonds are and be able to compare and contrast the formation and strength of each bond

Electronegativity:

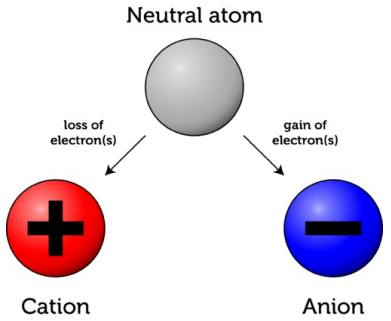
- Describes how much each element wants more electrons!



- Explains whether or not atoms will share electrons or take (lose) electrons

Ions:

Atoms that have gained or lost electrons. (charged atoms.)

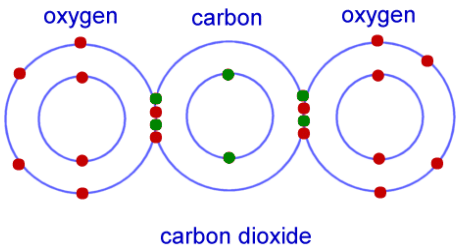


→ gain electrons? negative charge
→ lose electrons? positive charge

Two Types of Chemical Bonds (there are others...)

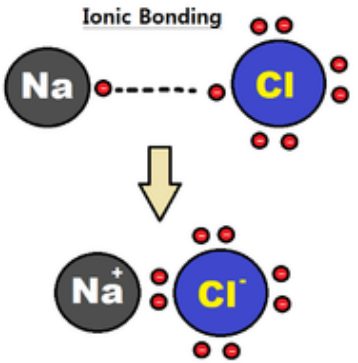
Covalent Bond:

Forms when two atoms that have similar electronegativity share electrons. Both want the electrons; these bonds are strong (hard to break).



Ionic Bond:

Occurs when a very electronegative atom steal electrons from another atom. This makes ions (charged atoms). These can stick together like magnets. They're easier to break because one atom has all the electrons.



Chemical Bond Models:

- Work with one partner
- Create physical models that illustrate one covalent and one ionic bond
- Make sure your models meet the following criteria:
  1. There should be something physical to represent atoms
  2. There should be something physical to represent electrons
  3. The covalent bond should imply that electrons are shared
  4. The ionic bond should imply that electrons have been transferred
  5. The covalent bond should be physically or visually stronger than the ionic bond
- Make sure you can each explain how your models demonstrate the concepts above!