Intro to Compounds

What is a compound?

- A compound is a group of elements chemically bonded together.
- This is different from a mixture which is a group of elements physically mixed together.

What are some common compounds?

- Glucose
- Salt
- Water
- Carbon dioxide

What are some ways that we can figure out what compounds are?

- Look at physical and chemical properties.
    - **Physical** properties refer to the condition or quality of a substance that can be observed or measured **without changing the substance's composition.**
    - **Chemical** properties refer to the ability of a substance to undergo chemical reaction and to form a **new substance**.

What are some common physical properties?

- Melting point
- Boiling point
- Conductivity
- Solubility
- Density
- Texture
- Color

There are three kinds of compounds that we can classify based on properties

- Ionic
    - Electrons transferred
    - Particles held rigidly in place by alternating opposite charges in the solid state.
    - High melting point, brittle, conduct electricity if melted or dissolved in H_2O, usually crystalline and composed of metal an nonmetal
    - Examples: NaCl, $Zn_3(PO_4)_2$, chalk
- Covalent/Molecular
    - Electrons shared
    - Individual, neutral molecules with no set position relative to each other (unless there are H-bonds) – weak forces between the molecules
    - Low melting point, soft, waxy, do not conduct, insulators, often gases at room temperature usually composed of nonmetals
    - Examples: SO_2, H_2O, wax, aspirin, sugar

- Metallic
  - Electrons free to move from atom to atom
  - Highly ordered crystal structures, similar to ionic compounds but electrons are free to move
  - Softer than ionic compounds, ductile (can be stretched w/o breaking), conduct electricity in solid state, more malleable (can be pounded into thin sheet w/o breaking)
  - Examples: Iron, Copper, etc.