Vocabulary: Reaction Energy

Vocabulary

- Calorimeter – a device that is used to measure the amount of heat energy that transfers from one system to another.
    - Most calorimeters are well-insulated containers filled with water. The amount of heat produced is measured by finding the temperature change of the water.
- Chemical bond – an attraction between atoms that leads to the formation of a molecule or compound.
    - Types of chemical bonds include ionic, covalent, and metallic bonds.
        - Ionic bonds form between positively-charged atoms, or ions, and negatively-charged atoms.
        - Covalent bonds form when atoms share electrons.
        - Metallic bonds form when a "sea" of free-flowing electrons forms around positively-charged metal ions.
- Endothermic – a process that absorbs heat energy.
    - In an endothermic reaction, the temperature of the system decreases.
    - In an endothermic reaction, the enthalpy of the system increases because energy is absorbed into the system.
- Enthalpy – a measurement of the energy contained in a system.
    - Enthalpy (H) is equal to the internal energy of a system (U) plus the product of the pressure and volume of the system: $H = U + PV$.
    - In most cases, it is not possible to measure the enthalpy of a system directly. However, changes in enthalpy (ΔH) can be found by measuring changes in temperature, pressure, and volume.
    - If a system absorbs heat, its enthalpy increases ($\Delta H > 0$). If a system emits heat, its enthalpy decreases ($\Delta H < 0$).
- Exothermic – a process that releases heat energy.
    - In an exothermic reaction, the temperature of the system increases.
    - In an exothermic reaction, the enthalpy of the system decreases because energy is emitted from the system.
- Hess's law – a law that states that the change in enthalpy of a system during a chemical reaction is independent of the order of steps in which the reaction takes place.
    - If a chemical change could happen in several different ways, the total enthalpy change will be the same no matter which sequence is taken.