Chemical Equations and Reactions

Nature of Reactions

Reversible Reactions

- In the world around us and in our bodies, literally millions of chemical reactions are taking place.
- Can chemical reactions be reversed? Can the product of a reaction become a reactant?
- Many reactions are not reversible. For example, digesting food, fuel burning, paint hardening.
- Many reactions can change direction. For example, the reactions that happen in a car battery are **reversible reactions.**

Equilibrium

- When a chemical reaction automatically reverses and there is no net change we use the term **equilibrium.**
- When the amount of reactants and products form at the same rate, we call that **dynamic equilibrium.**
- **Neither case means there are equal amounts of reactants and products**

Le Chatelier's Principle

- If a reaction reaches equilibrium, how can you obtain large quantities of a wanted product?
- Add stress as Le Chatelier's principle states: "If stress is applied to a system at equilibrium, the system shifts in the direction to relieve the stress.
- In other words, remove the product so more is produced.

Activation Energy

For a reaction to occur between two substances, particles of those substances must **collide.**

Activation energy is what is the amount of energy needed for particles to collide in a reaction.

Rate of Reaction

- How fast a reaction occurs (products form) can be influenced by these factors:
- Temperature-most reactions go faster at higher temperatures(baking a cake)
- Concentration- adding reactants speeds up reactions
- Catalysts enzymes)-speeds up reactions by lowering activation energy

The End