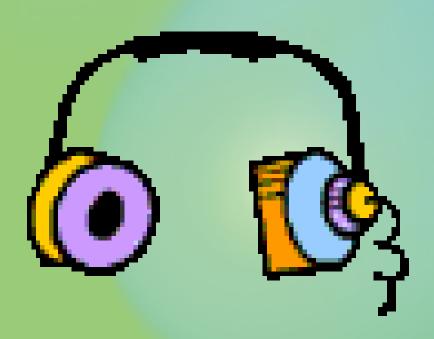
# Chemical Equations and Reactions Nature of Reactions



#### **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