Equilibrium

$A \rightarrow B$ | $B \rightarrow A$

rate of A becoming B (FORWARD RXN) = rate of B becoming A (REVERSE RXN)

write as a single equation

$A \rightleftharpoons B$

Reverisble Reaction

Dynamic Equilibrium

State of balance when the rate of the forward reaction EQUALS the rate of the reverse reaction

- At equilibrium, the concentration (amounts) of reactants & products does NOT change!
- If the forward rxn is exothermic, the reverse reaction is endothermic & vice versa.

Le Châtlier's Principle

The position of equilibrium will shift to oppose a change in reaction conditions.
(Heat is treated as a reactant (endothermic) or product (exothermic))

1) Remove a product → equilibrium will shift right to make more product
2) Add a product → equilibrium will shift left to get rid of extra product
3) Remove a reactant → equilibrium will shift left to make more reactant
4) Add more reactant → equilibrium will shift right to get rid of extra reactant

5) Add heat to an exothermic reaction → A + B → C + heat

shift equilibrium to the left to remove excess heat

6) Remove/cool down an exothermic reaction → A + B → C + heat

shift equilibrium to the right to make heat.

7) Add heat to an endothermic reaction → A + B + heat → C

shift equilibrium to the right to remove excess heat

8) Remove/cool down an endothermic reaction → A + B + heat → C

shift equilibrium to the left to make heat

9) Reaction involves gases?

Increasing Pressure will change equilibrium to the side that has smaller volume of gases

Decreasing Pressure will shift equilibrium to the side with a larger volume of gases.