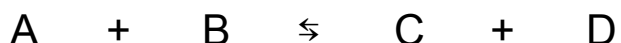


## 7.1 Introduction to Equilibrium

- Chemical systems studied in a closed system
- Scenarios that involves reactants forming products and products forming reactants at the same time
- The term reactants and products no longer applies except to distinguish the right and left sides of an equation.



- Forward reaction is a reaction going from the left to the right
- Reverse reaction is a reaction going from the right to the left
- When both the forward reaction and the reverse reaction are occurring at the same rate the system is at dynamic equilibrium

- Examples:
  - solubility equilibrium (solid in a saturated solution)
  - phase equilibrium (solid and liquid present at the freezing/melting point)
  - chemical equilibrium (rate of forward reaction equals rate of reverse reaction)
- Double headed arrow is used ( $\rightleftharpoons$  or  $\leftrightarrow$ )
- Dynamic - particles are still moving and rearranging
- Equilibrium - balance of forward and reverse rates

## Percent Reaction

- Describes the amount of product present at equilibrium compared to the amount of reactants
- Percentage describes if it is a reactant or product favoured event

## Solving Equilibrium Problems

- Use an ICE table
- Initial amounts, change of amounts and equilibrium amounts
- Write the balanced chemical equation
- Changes to the system are associated with the mole ratio
- Values of reactants and products describe their concentrations in mol/L
- Gases will be in a defined volume
- Solids and liquids are not included in the equilibrium analysis
- Use equilibrium values to analyze the chemical system

	2A	+	B	$\leftrightarrow$	3C	+	2D
Initial							
Change							
Equilibrium							