Chem20 Solutions Cheat Sheet

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Definitions

Dissociation	when highly soluble ionic compounds break apart/-dissociate into their components in solutions
Dissolving	when the substance doesn't break apart into its components
Ionization	the process by which an atom or molecule acquires a charge by gaining or losing electrons
Electrolyte	the aqueous solution conducts electricity, highly soluble ionic hydroxides (bases) and acids (molecular)
Non-Electrolyte	the aqueous solutions doesn't conduct electr-icity, most molecular compounds (except acids)

Bonds & Energy

Breaking bonds absorbs energy & forming new bonds releases energy

Energy is absorbed to break ionic bonds and overcome the intermolecular forces among the water molecules

Energy is released to form bonds between water and ions

Types of Concentration

Percent volume by volume (%V/V)	generally when a liquid is dissolved in a liquid
Percent weight by volume (%W/V)	generally when a solid is dissolved in a liquid
Percent weight by weight (%W/W)	generally a solid in solid

Types of Concentration (cont)

Parts per million (ppm)	1ppm = 1mg/kg (for dilute aqueous solutions, 1ppm = 1mg/1L)
Amount concentration (M)	moles/L

Ion Concentration

The dissociation or ionization equations for compounds allows you to determine the amount concentration of either the ions or the compounds in solution

The ion concentration is always equal to a whole number multiple of the compound concentration (the coefficient in the chemical equation)

Solubility

Saturated: maximum amount of solute dissolved in a solvent as a specific temper-ature

Unsaturated: solution can dissolve more solute

Super Saturated: can dissolve more with an increase in temperature

Solubility Variables of Gases

Temperature	as temperature increases, the solubility of a gas decreases
Pressure	the solubility of a gas increases as the partial pressure of the gas above a solution increase

Solubility Variables of Liquids & Solids

Temperature	solubility increases with temperature
Pressure	very little effect on the solubility of liquids and gases

Techniques to Separate Solutions

Chromatography: a technique that can be used to separate out, most commonly, different coloured solutes (pigments) in a solutions

Distillation: a technique use to separate solutions of 2 or more liquids by using their differential boiling points

Fractional Distillation: when multiple liquids (fractions) are mixed in a solution or the boiling points are very similar, they use many different condensation plates to condense and re-vaporize to allow a more pure solution to rise through the column

Dynamic Equilibrium

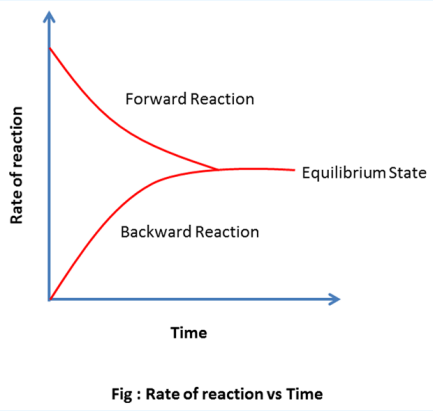

Fig : Rate of reaction vs Time

Dynamic Equilibrium: both dissolving and crystallizing out of solution are occurring at the same rate which maintains a balance in the solution

Beer-Lambert Law

$$A = \varepsilon c l$$

A	Absorbance	
ε	Molar absorption coefficient	$M^{-1}cm^{-1}$
c	Molar concentration	M
l	optical path length	cm

Beer-Lambert Law: a linear relationship between the absorbance and the concentra-tion, molar absorption coefficient and optical coefficient of a solution

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