

## Solutions

- Making solutions
  - Simple calculations
  - Concentration problems ( $n=m/\text{molar mass}$ ,  $c=n/v$ ) (how to make solutions) (ex: what mass is required to make this solution when this concentration and this volume?)
  - 2 mark questions
  - E.g. 30.0 g of  $\text{CH}_3\text{COOH}_{(\text{aq})}$ , what is the concentration of a 100.0 mL solution?
- Dilution problems
  - $C_1V_1=C_2V_2$
  - 2 mark questions

## Definition of Solubility

- Intermolecular attractions  $\rightarrow$  dissolving solutions
  - Dipole-ion interaction to break lattice structure and form hydration sphere
  - 4 main steps
  - Energy changes involved (lattice E and hydration E)
  - Equations involved in the process of dissolving an ionic compound
- Solubility rule and net ionic equations, predicting the precipitate
  - Dissociation of an equation
  - Total equation (determine the products of a reactions and determine the precipitate- explain why it's a precipitate)
  - Net ionic equations
  - Group I hydroxides and in Group II: Strontium and down the Group = strong bases
  - The strong acids are: HCl, HBr, HI,  $\text{H}_2\text{SO}_4$ ,  $\text{HNO}_3$ ,  $\text{HClO}_4$
  - $\text{NO}_3^-$ ,  $\text{ClO}_4^-$ ,  $\text{CH}_3\text{COO}^-$ ,  $\text{NH}_4^+$ ,  $\text{H}^+$ , and all Group I compounds are soluble
- Determine which is L.R. (Stoichiometry Problems)
  - Calculation % yield of precipitate

## Acid Base

- Bronsted-Lowry  $\rightarrow$  label equation
- Lewis Acid Base definition
- Will have equations and need to label the type of model it goes with
- Properties of acids and bases: Reactions of following: to predict balanced equations
  - Acid + Base
  - Acid + Metal
  - Acid + Metal Oxide
  - Acid + Metal Carbonate
  - (and their net ionic equations)'
  - E.g.  $\text{Mg}_{(\text{s})} + \text{HCl}_{(\text{aq})} \rightarrow \text{MgCl}_{2(\text{aq})} + \text{H}_{2(\text{g})}$
  - Stoichiometry and L.R. with those equations
  - Gas laws (and collection over water)
- Electrolytes: Strong and Weak Definitions, (ex: have 0.1M of acetic acid and 0.1M of HCl, how do you know experimentally which is the stronger electrolyte) (answer: light bulb experiment (which is brighter, more dim), rate of reaction with metal and metal carbonate for acids, measurement of pH)

- Titration problems
  - pH curves - be able to calculate the pH when adding a certain amount of base to that acid.
  - Know how to draw the ideal pH curve for a strong acid-strong base titration and explain the three main points (first flat section: excess acid- steep middle (at neutral): one drop contains so much base that change is drastic- last flat section: excess base)
  - Which indicator do you use and why? (must be active in the equalized point)
  - pH/ pOH problems.