

Dilution & Titration

Solution Concentration

Molarity

- A unit of solution concentration

$$M = \frac{\text{Moles of Solute}}{\text{Liters of Solution}}$$

Solution Concentration

Expressing Concentration

- Can be expressed two ways
 - The concentration of solute
 - 1M NaCl
 - 1M CaCl₂
 - The concentration of particles
 - 1M Na⁺ and 1M Cl⁻
 - 1M Ca²⁺ and 2M Cl⁻

Solution Concentration

Solution Preparation Problems

- Dilutions
 - Most routinely used in lab as solutions are bought in concentrated form and diluted for use.
 - Dilution ratios can be calculated using:
 - $M_i \times V_i = M_f \times V_f$
 - Stock sulfuric acid solution is 18.0 molar. How would you use this solution to create 500 ml of 0.100M H₂SO₄?

Solution Concentration

Titration

- Strategies for solving titration problems
 - 1) Always write a balanced equation
 - 2) Clearly identify your starting point and goal
 - 3) Generally require a mole to mole stoichiometric ratio
 - 4) At times, you may need to make “external” calculations to fine-tune your starting point or goal

Solution Concentration

Titration

- How many grams of chloride ion are in a sample of water if 20.2ml of 0.100 M Ag^+ is required to react with all the chloride in the sample?

Solution Concentration

Homework

- 4.59, 64, 74, 80, 85