CONCEPT: PERCENT CONCENTRATIONS

- **Recall:** Mass Percent is the percentage of a given solute (grams) within a solution (grams).
    - □ Additionally, we can use *mass/volume* and *volume percent* formulas to express solution concentrations.

Mass/Volume (m/v) Percent Concentration

- Represents a percentage of given solute (_____) dissolved in given volume (_____) of solution.

Mass/Volume % Formula

$$\text{(m/v) Percent} = \frac{\text{solute}}{\text{solution}} \times 100\%$$

EXAMPLE: A solution was prepared by dissolving 13.5 g of KNO_3 in sufficient water to produce 85.0 mL of solution. What is the (m/v) % of this solution?

Volume (v/v) Percent Concentration

- Represents a percentage of given solute (_____) dissolved in a given volume (_____) of solution.

Volume % Formula

$$\text{(v/v) Percent} = \frac{\text{solute}}{\text{solution}} \times 100\%$$

EXAMPLE: A 750.0 mL bottle of Listerine contains 150 mL of ethanol. What is the (v/v) % of this Listerine cleaning solution?

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PRACTICE: How many mL of ethanol are contained in a 750.0 mL bottle of wine that contains 11.0% (v/v) of ethanol?

a. 1.5 mL b. 68.2 mL c. 82.5 mL d. 11.0 mL

PRACTICE: Calculate the grams of solute needed to prepare the following: 450 mL of a 2.0% m/v KOH solution.

a. 1.1 g b. 9.0 g c. 4.5 g d. 2.3 g

PRACTICE: What is the mass/volume percent concentration of the following solutions: 0.075 mol sucrose ($C_{12}H_{22}O_{11}$) in 270 mL of solution.

a. 5.0 m/v % b. 2.8 m/v % c. 6.7 m/v % d. 9.5 m/v %

PRACTICE: The pain reliever ibuprofen is sold as an oral suspension for children 2-11 years of age. How many milligrams would you obtain in a 2.7 tsp dose if it contains 100 mg per 5 mL? (1 tsp = 5 mL)

a. 1.0×10^2 mg b. 67 mg c. 2.7×10^2 mg d. 54 mg