WODSS SCIENCE
SCH 3UI

Name: _____
Date: _____

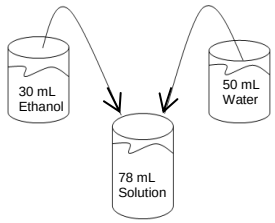
Concentration

Concentration – is the amount of _____ per quantity of _____

A. Percentage Concentrations

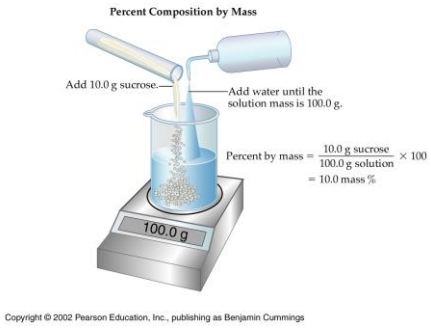
1. **volume/volume (V/V) percent** = volume of solute (mL) x 100
   volume of solution (mL)

Volume is not additive



Example: vinegar is 5% V/V acetic acid, which means that in a 100 mL solution of vinegar, there are _____ mL of acetic acid.

2. **Weight/weight (W/W) percent** = weight of solute (g) x 100
   weight of solution (g)

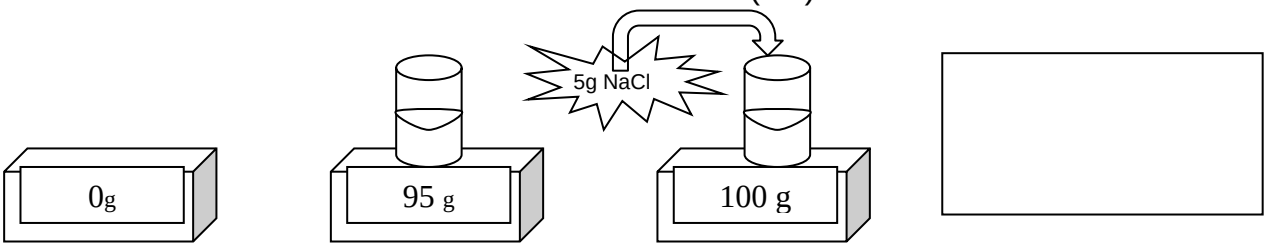


Example: In a 200 g tube of toothpaste, there are 0.486 g of dissolved sodium fluoride.

W/W concentration of NaF =

Mass is Additive:

3. Weight/volume (W/V) percent = mass solute (g) x 100
   volume of solution (mL)



Example: A salt solution has 12.8 g of salt in 1 L of solution.
W/V concentration of NaCl =

B. Parts per Million

- concentrations of very _____ can be expressed in parts per million (ppm)

ppm = mass of solute (mg)
volume of solution (L)

Example: In a 0.25 L sample of pond water, 2.2 mg of dissolved oxygen are measured.
Concentration of O_2 in ppm=

C. **Molar Concentration** (**Molarity**)– the number of moles of solute that can dissolve in 1 L of solution (mol/L or M)

Molar concentration(mol/L) = $\frac{\text{amount of solute (mol)}}{\text{volume of solution (L)}}$

Example 1: A solution contains 5.85 g of sodium chloride dissolved in 5000 mL of water. What is the concentration of the sodium chloride in mol/L?

Example 2: What is the concentration in mol/L of a solution that contains 49 g of sulfuric acid in 3.0 L of solution?

Example 3: What mass of potassium hydroxide is required to prepare 600 mL of a 0.225 mol/L solution?

Example 4: A solution containing 0.125 mol/L of magnesium chloride is required for an experiment. If 87.8 g of solid magnesium chloride is available, what is the maximum volume of solution that can be prepared?

Home Work: #1 page 373, #11 page 375, #22 page 376, #31 page 378, #41,42,44,46 (tricky think of # of atoms) page 381