

Noteset 5B (Part 3) - In Class Noteset

Solutions and Molarity

Mixtures and Solutions

Mixture

Combination of two or more forms of matter in a single system (container)

Solution

A mixture where the two forms (parts) appear as one combined substance.

Solvent

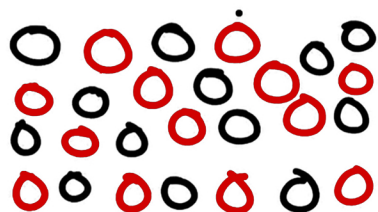
Larger part of solution that other matter is dissolved into.

Solute

Smaller Part of solution that is mixed with solvent.

Mixtures of Solutions

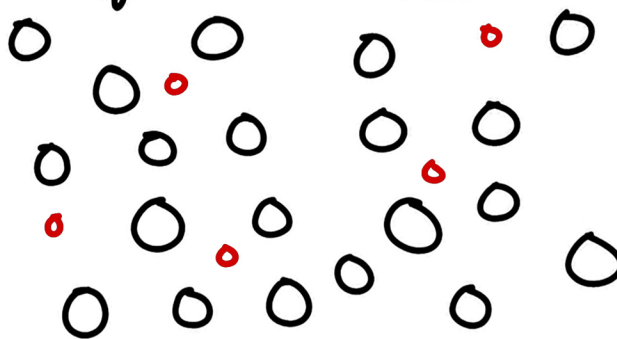
Solid Mixtures



Different compounds mixed together.

(Metal mixture is an alloy)

Liquid Mixtures



Solvent (larger #) Solute (smaller #)

Determining Amounts (mol) in solutions

Molarity (M)

The mol of the solute
in the overall solution
volume (size)

$$M = \frac{n \text{ (mol)}}{V \text{ (volume)}}$$

molarity

Units

$$\text{Molarity (M)} = \frac{\text{mol}}{\text{L}}$$

$$\text{Volume (V)} = \text{L}$$

$$\text{Amount (n)} = \text{mol}$$

Solving with Molarity

M = Molarity n = mol V = Volume

Solve for molarity

$$M = \frac{n}{V}$$

Solve for mol

$$n = M \cdot V$$

Solve for V

$$V = \frac{n}{M}$$

Units

$$M = \frac{\text{mol}}{\text{L}} \quad V = \text{L}$$
$$n = \text{mol}$$

To solve

① Find missing unit

② Pick equation

③ Plug in w/ units

④ Solve (round to two after)

Solving with Molarity

$$M = \frac{\text{mol}}{\text{L}}$$

$$n = 2.66 \text{ mol} \quad V = 1.32 \text{ L}$$

$$M = \frac{n}{V} = \frac{2.66 \text{ mol}}{1.32 \text{ L}}$$

$$\underline{M = 2.02 \text{ mol/L}}$$

$$n = \text{mol}$$

$$M = 0.97 \text{ mol/L} \quad V = 1.61 \text{ L}$$

$$n = M \cdot V = 0.97 \text{ mol/L} \cdot 1.61 \text{ L}$$

$$\underline{n = 1.56 \text{ mol}}$$

$$V = \text{L}$$

$$M = 3.62 \text{ mol/L} \quad n = 1.12 \text{ mol}$$

$$V = \frac{n}{M} = \frac{1.12 \text{ mol}}{3.62 \text{ mol/L}}$$

$$\underline{V = 0.31 \text{ L}}$$