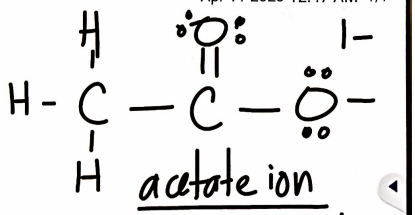
3C: $Fe(CH_3COO)_2 \cdot 3H_2O$

1 Fe, 2C, 6H, 2C, 2O, 2O



acetate ion

$C_2H_3O_2^{1-}$

Fe: 1 × 55.85g

C: 4 × 12.01g

H: 6 × 1.01g

O: 4 × 16.00g

173.95g

H: 6 × 1.0 g

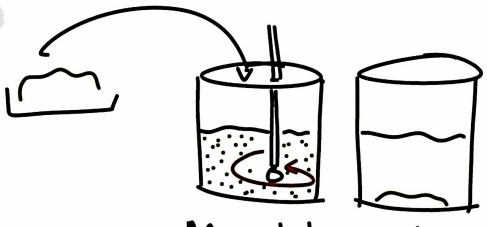
O: 3 × 16.00g

3 × 18.02g = 54.06g

= 173.95g + 54.06g = 228.01g/mol

Mixtures and Solutions

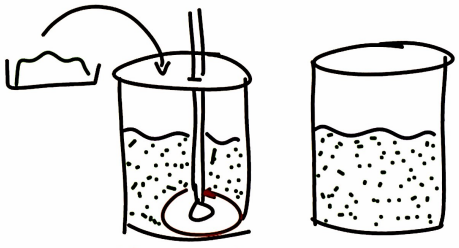
Mixture (Heterogenous)



Mix while stirring (agitation)

Not mixed w/o agitation

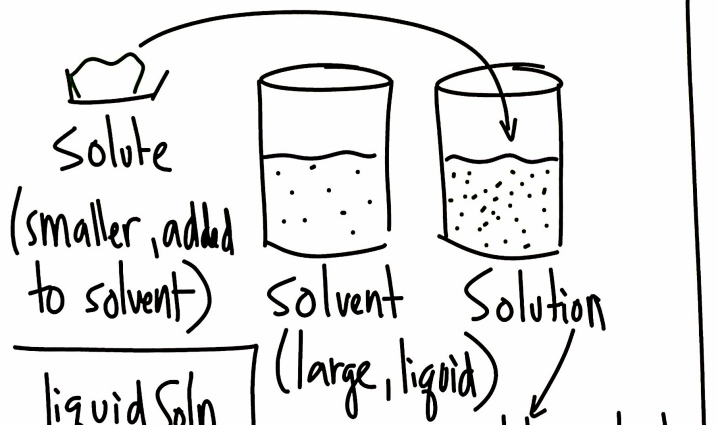
Solution (Homogenous)



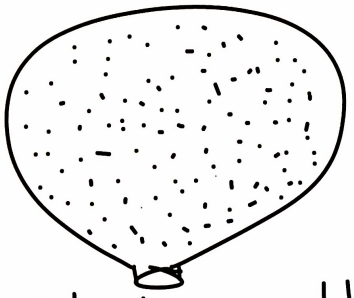
Mix while agitating

Remains mixed w/o agitation

Parts of a Solution



liquid Soln.



o Solvent o solute
o + o solution

gas solution

Concentration of a solution

Common

Molar Mass

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

← convert mass solute (g)

← convert mL (mL)

1 L = 1000 mL

$$\text{Molality (m) [solid]} = \frac{\text{mol solute}}{\text{kg solvent}}$$

Rare

← easier to measure for a solid solvent

Find: molarity (concentration)

1.5 mol NaCl (solute), dissolve in water (solvent) to make 0.75 L soln (solution)

$$\text{Molarity (M)} = \frac{\text{mol}_{NaCl}}{\text{L}_{soln}} = \frac{1.5\ \text{mol}}{0.75\ \text{L}} = 2.00\ \text{mol/L} = 2.00\ \text{M}$$

"molar"

(Questions 1 and 2)

Conversions in Molarity

(Questions 5 and 6)

130.0 g NaCl (solute)

$$130.0\ \text{g} \left| \frac{1\ \text{mol}}{58.44\ \text{g}} \right. = 2.22\ \text{mol NaCl}$$

($MM_{NaCl} = 58.44$ g/mol) (mol solute)

(Questions 3 and 4)

875.0 mL solution (soln)

$$875.0\ \text{mL} \left| \frac{1\ \text{L}}{1000\ \text{mL}} \right. = 0.875\ \text{L}\ (V_{soln})$$

(1 L = 1000 mL)

130.0 g NaCl dissolved to make 875 mL soln. Molarity? (M)

2.22 mol NaCl

0.875 L soln

$$\text{Molarity} = \frac{\text{mol NaCl}}{\text{L soln}} = \frac{2.22\ \text{mol}}{0.875\ \text{L}} = 2.53\ \text{mol/L}$$

$$= 2.53\ \text{M}$$

"molar"