

## Quiz 9.1 – Solutions and Solubility

Name: Key

## Question 1

How many moles are in 5.12 g of  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$   $\rightarrow M = 249.68 \frac{\text{g}}{\text{mol}}$ 

$$\frac{5.12 \text{ g CuSO}_4 \cdot 5\text{H}_2\text{O}}{249.68 \text{ g CuSO}_4 \cdot 5\text{H}_2\text{O}} \times 1 \text{ mol CuSO}_4 \cdot 5\text{H}_2\text{O} = 0.0205 \text{ mol}$$

## Question 2

Water ( $\text{H}_2\text{O}$ ) and diethyl ether ( $\text{CH}_3\text{—CH}_2\text{—O—CH}_2\text{—CH}_3$ ) are both solvents used in a chemistry laboratory. Which of these solvents would you expect to dissolve wax ( $\text{C}_{45}\text{H}_{92}$ )?

diethyl ether

## Question 3

Find the molar concentration if 2.5 g of NaCl are dissolved to make 15.00 ml of solution

$$\frac{2.5 \text{ g NaCl}}{58.44 \text{ g NaCl}} \times 1 \text{ mol NaCl} = 0.0428 \text{ moles}$$

$$M = \frac{\text{moles}}{\text{L}} = \frac{0.0428 \text{ moles}}{0.015 \text{ L}} = 2.9 \text{ M}$$

## Question 4

Find the mass/mass % if 0.750 g of naphthalene are dissolved in 5.00 g of dichloromethane solvent

$$\text{Total mass: } 0.750 \text{ g} + 5.00 \text{ g} = 5.750 \text{ g}$$

$$\frac{0.750 \text{ g}}{5.750 \text{ g}} \times 100\% = 13.0\% \text{ naphthalene by mass}$$

## Question 5

Solvation of sodium hydroxide is an exothermic process. If you want to increase the solubility of sodium hydroxide, should you raise or lower the temperature?



Lower the temperature