

# UNIT 6 REVIEW SOLUTIONS

## Unit 5 Review

1. What mass of  $\text{KClO}_3$  can dissolve in 400 g of water at  $60^\circ\text{C}$ ? See chart.

$$\frac{x}{400} = \frac{28}{100} = \boxed{112 \text{ g}}$$

2. How much ammonium chloride can be dissolved in 725 g of water at  $60^\circ\text{C}$ ?

$$\frac{x}{725} = \frac{66}{100} \quad \boxed{x = 479 \text{ g}}$$

3. How many grams of sodium sulfate will 2000g of water dissolve at  $20^\circ\text{C}$ ?

$$\frac{x}{2000} = \frac{55}{100} \quad \boxed{1100 \text{ g}}$$

4. At a temperature of  $10^\circ\text{C}$  a gas has a solubility of 7.3 g/L in water at a pressure of 100 kPa. What pressure is necessary to produce an aqueous solution containing 10.1 g/L of the same gas at the same temperature?

$$\frac{7.3 \frac{\text{g}}{\text{L}}}{100} = \frac{10.1}{x} \quad x = 138 \text{ kPa}$$

5. What is the molarity of a solution having 67.3 g of phosphoric acid in 500 mL of solution?

$$67.3 \text{ g} \left| \frac{1}{97.99} \right. = 0.687 \text{ mol} \quad M = \frac{n}{L} = \frac{0.687}{0.5} = \boxed{1.37 \text{ M}}$$

6. Calculate the molarity of a solution containing 21 g of  $\text{LiBr}$  in 500 mL of solution.

$$21 \text{ g LiBr} \left| \frac{1}{86.845} \right. = 0.242 \quad \frac{0.242}{0.500} = \boxed{1.21 \text{ M}}$$

7. What mass, in grams, would be needed to prepare 2.5 L of a 0.45 M sodium hydroxide solution.

$$M = \frac{n}{L} \quad n = 1.125 \text{ mol NaOH} \left| \frac{40.09}{1 \text{ mol}} \right. = \boxed{45.09 \text{ g NaOH}}$$

$$n = 0.45(2.5) = 1.125$$

8. Calculate the mass of NaOH needed to prepare 480 mL of a 1.5 M solution.

$$n = MV \quad 0.72 \text{ mol} \left| \frac{40.09 \text{ g NaOH}}{1 \text{ mol}} \right. = \boxed{28.8 \text{ g NaOH}}$$

$$1.5(0.480) = 0.72 \text{ mol}$$

9. Calculation the concentration (% m/m) of a solution composed of 12 g of glucose in 785 g of solution.

10. Calculation the concentration (% v/v) of a solution composed of 45 mL of ethanol and 689 mL of solution.

11. Calculate the mass of NaCl needed to prepare 200 mL of a 2.6 M solution.

$$n = MV = 2.6(0.200) = 0.52 \text{ mol} \quad \left| \frac{58.44}{1} \right. = \boxed{30.39 \text{ g}}$$

12. How many moles of solute are in 500 mL of a 2.6 M solution of NaNO<sub>3</sub>?

$$2.6(0.500) = \boxed{1.30 \text{ mol}}$$

13. Calculate the number of grams of solute needed in problem #13?

$$1.30 \text{ g NaNO}_3 \left| \frac{84.997 \text{ g}}{1} \right. = \boxed{110.5 \text{ g NaNO}_3}$$

14. How many grams of CuSO<sub>4</sub> would you need to prepare 2.5 L of a 1.6 M solution?

$$n = 2.5(1.6) = 4 \text{ mol} \quad \left| \frac{159.55}{1} \right. = 638.2 \text{ g CuSO}_4$$

15. A salt solution has a volume of 650 mL and contains 0.5 moles of CaCl<sub>2</sub>. What is its molarity?

$$M = \frac{\text{mol}}{L} = \frac{0.5}{0.650} = 0.769$$

16. An aqueous solution has a volume of 6.0 L and contains 105 g of glucose (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>). What is the molarity?

$$105 \text{ g} \left| \frac{1}{180} \right. = 0.583 \text{ mol} \quad \left| \frac{1}{6.0 \text{ L}} \right. = \boxed{9.7 \times 10^{-2} \text{ M}}$$

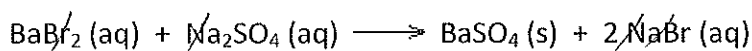
17. How many grams of solute are in 500 mL of a 3.0 M solution of sulfuric acid?

$$n = 3(0.500) = 1.5 \text{ mol} \quad \left| \frac{98.016}{1} \right. = \boxed{147.0 \text{ g H}_2\text{SO}_4}$$

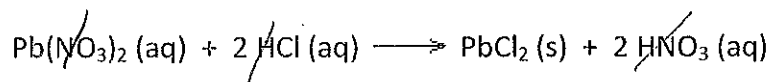
18. How many grams of sodium hydroxide are needed to make a 6 M solution? \* Assume 1L.

$$n = 6(1) = 6 \text{ mol NaOH} \quad \left| \frac{40.01}{1} \right. = \boxed{240 \text{ g NaOH}}$$

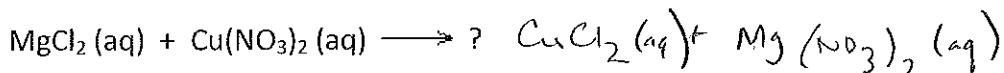
19. Write the net ionic equation for the reaction:



20. Write the net ionic equation for the reaction:



21. Predict the products and write the net ionic equation for:



No Rxn