

Molarity Quiz #2

1. What is the molarity of a solution that was prepared by dissolving 14.2 g of NaNO_3 in enough water to make 350 mL of solution?

$$\frac{14.2\text{g NaNO}_3}{1} \times \frac{1\text{ mol NaNO}_3}{69\text{g NaNO}_3} = \frac{.167\text{ mol}}{.350\text{ L}} = \boxed{.477\text{ M NaNO}_3} \quad (4)$$

2. What is the molarity of 5.00 g of NaOH in 750.0 mL of solution?

$$\frac{5.00\text{g NaOH}}{1} \times \frac{1\text{ mol NaOH}}{40\text{g NaOH}} = \frac{.125\text{ mol}}{.750\text{ L}} = \boxed{0.167\text{ M NaOH}} \quad (4)$$

3. What is the molarity of a solution that contains 5.5 g of HCl dissolved in enough water to make 250 mL of solution?

$$\frac{5.5\text{g HCl}}{1} \times \frac{1\text{ mol HCl}}{36.5\text{g HCl}} = \frac{.151\text{ mol}}{.250\text{ L}} = \boxed{0.603\text{ M HCl}} \quad (4)$$

4. How many grams of NaBr would be needed to prepare 700 ml of 0.230 M NaBr solution?

$$\frac{.700\text{ L NaBr}}{1} \times \frac{.230\text{ mol NaBr}}{1\text{ L NaBr}} \times \frac{103\text{g NaBr}}{1\text{ mol NaBr}} = \boxed{16.55\text{g NaBr}} \quad (4)$$

5. A reagent bottle is labeled 0.450 M K_2CO_3 .

- a) How many moles of K_2CO_3 are present in 45.6 mL of this solution?

$$\frac{.0456\text{ L}}{1} \times \frac{.450\text{ mol K}_2\text{CO}_3}{1\text{ L K}_2\text{CO}_3} = \boxed{0.0205\text{ mol K}_2\text{CO}_3} \quad (4)$$

- b) How many milliliters of this solution are required to furnish 0.800 mol of K_2CO_3 ?

$$\frac{.800\text{ mol K}_2\text{CO}_3}{1} \times \frac{1\text{ L K}_2\text{CO}_3}{.450\text{ mol K}_2\text{CO}_3} \times \frac{1000\text{ mL}}{1\text{ L K}_2\text{CO}_3} = \boxed{1777.8\text{ mL}} \quad (4)$$

- c) If 50.0 mL of this solution is added to enough water to make 125 mL of solution, what is the molarity of the diluted solution?

$$\frac{.050\text{ L}}{1} \times \frac{.450\text{ mol K}_2\text{CO}_3}{1\text{ L K}_2\text{CO}_3} = \frac{.0225\text{ mol K}_2\text{CO}_3}{.125\text{ L}} = \boxed{.18\text{ M K}_2\text{CO}_3} \quad (4)$$