

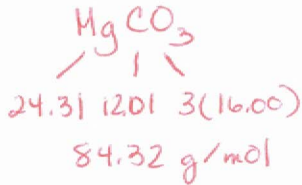
* using dimensional analysis *
 → best to know how to do this way!

EST-4
 Practice

Name:

Molar Concentration

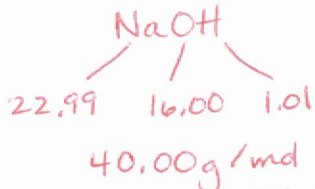
1. How many moles of MgCO_3 are in ^{→ 3 sig figs} 10.0g of the substance? (0.119mol)



$$10.0 \text{ g MgCO}_3 \times \frac{1 \text{ mol MgCO}_3}{84.32 \text{ g MgCO}_3} \rightarrow 0.11859 \text{ mol MgCO}_3$$

↓
0.119 mol

2. How many moles of NaOH are in ^{→ 4 sig figs} 300.0g of the substance? (7.500mol)



$$300.0 \text{ g NaOH} \times \frac{1 \text{ mol NaOH}}{40.00 \text{ g NaOH}} \rightarrow 7.5 \rightarrow \boxed{7.500 \text{ mol}}$$

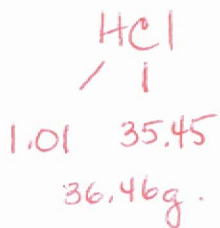
3. What volume of a 1.5 mol/L solution of KOH contains 2.24g of solute? (0.027L)



$$2.24 \text{ g KOH} \times \frac{1 \text{ mol KOH}}{56.11 \text{ g KOH}} \times \frac{1 \text{ L KOH}}{1.5 \text{ mol KOH}} \rightarrow 0.0266 \text{ L KOH}$$

↓
0.027 L

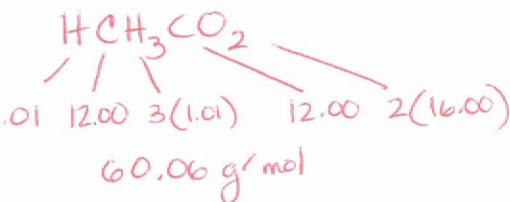
4. What mass of solute must be used to prepare 350.0mL of an HCl solution at a concentration of 0.75 mol/L? (9.6g)



$$350.0 \text{ mL HCl} \times \frac{0.75 \text{ mol HCl}}{1000 \text{ mL HCl}} \times \frac{36.46 \text{ g HCl}}{1 \text{ mol HCl}} \rightarrow 9.5796 \text{ g HCl}$$

↓
9.6 g

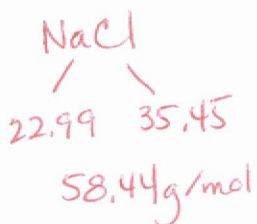
5. How much HCH_3CO_2 is required to make 500.0mL of a 0.25mol/L solution? (7.5g)



$$500.0 \text{ mL HCH}_3\text{CO}_2 \times \frac{0.25 \text{ mol HCH}_3\text{CO}_2}{1000 \text{ mL HCH}_3\text{CO}_2} \times \frac{60.06 \text{ g HCH}_3\text{CO}_2}{1 \text{ mol HCH}_3\text{CO}_2} \rightarrow 7.5075 \text{ g}$$

↓
7.5 g

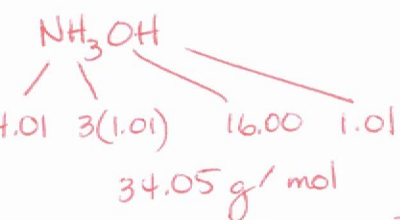
6. What mass of NaCl must be used in order to make 100.0mL of a 0.20mol/L solution? (1.2g)



$$100.0 \text{ mL NaCl} \times \frac{0.20 \text{ mol NaCl}}{1000 \text{ mL NaCl}} \times \frac{58.44 \text{ g NaCl}}{1 \text{ mol NaCl}} \rightarrow 1.1688 \text{ g NaCl}$$

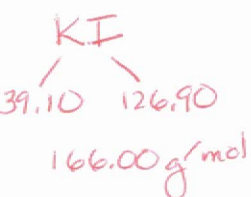
↓
1.2 g

7. Calculate the mass of NH_3OH in 200.0 mL of a 0.40 mol/L solution. (2.7g)



$$200.0 \text{ mL } \text{NH}_3\text{OH} \times \frac{0.40 \text{ mol } \text{NH}_3\text{OH}}{1000 \text{ mL } \text{NH}_3\text{OH}} \times \frac{34.05 \text{ g } \text{NH}_3\text{OH}}{1 \text{ mol } \text{NH}_3\text{OH}} = 2.724 \text{ g} \rightarrow \boxed{2.7 \text{ g}}$$

8. How much potassium iodide is needed to make 250.0 mL of a 0.25 mol/L solution? (10g)



$$250.0 \text{ mL } \text{KI} \times \frac{0.25 \text{ mol } \text{KI}}{1000 \text{ mL } \text{KI}} \times \frac{166.00 \text{ g } \text{KI}}{1 \text{ mol } \text{KI}} = 10.375 \text{ g } \text{KI} \rightarrow \boxed{10 \text{ g}}$$

9. How many moles of solute are needed to prepare 50.0 mL of a 10.0 mol/L solution? (0.500 mol)

general question, no need for molar mass.

$$50.0 \text{ mL } \text{solute} \times \frac{10.0 \text{ mol } \text{solute}}{1000 \text{ mL } \text{solute}} = 0.5 \rightarrow \boxed{0.500 \text{ mol}}$$