

\* 1. 50% m/m  
 $m_{\text{sol'n}} = 188\text{g}$   
 $m_{\text{solute}} = ?$

$$\% \text{ m/m} = \frac{m_{\text{solute}}}{m_{\text{sol'n}}} \times 100\%$$

$$0.50 = \frac{m_{\text{solute}}}{188\text{g}}$$

$$m_{\text{solute}} = 94\text{g}$$

2. a)  $C = ?$   
 $V = 1.0\text{L}$   
 $n = 0.26\text{ mol}$

$$C = \frac{n}{V}$$

$$C = \frac{0.26\text{ mol}}{1.0\text{ L}}$$

$$C = 0.26\text{ mol/L}$$

b)  $C = ?$   
 $n = 0.070\text{ mol}$   
 $V = 50\text{ mL}$   
 $= 0.050\text{ L}$

$$C = \frac{n}{V}$$

$$C = \frac{0.070\text{ mol}}{0.050\text{ L}}$$

$$C = 1.4\text{ mol/L}$$

c)  $C = ?$   
 $V = 600\text{ mL}$   
 $m = 1.50\text{ g}$   
 $\text{CaCO}_3$

$$1.50\text{ g} \times \frac{1\text{ mol}}{100.09\text{ g}} = 0.015\text{ mol}$$

$$C = \frac{n}{V} = \frac{0.015\text{ mol}}{0.600\text{ L}} = 0.0250\text{ mol/L}$$

\* 3.  $n = ?$   
 $V = 350\text{ mL}$   
 $C = 0.250\text{ mol/L}$

$$C = \frac{n}{V}$$

$$n = (0.250\text{ mol/L})(0.350\text{ L})$$

$$n = 0.088\text{ mol}$$

4.  $n = ?$

$$V = 55.0 \text{ mL}$$

$$C = 1.30 \times 10^{-3} \text{ mol/L}$$

$$C = \frac{n}{V}$$

$$n = (1.30 \times 10^{-3} \text{ mol/L})(0.0550 \text{ L})$$

$$n = 7.15 \times 10^{-5} \text{ mol}$$

5.  $V_i = 20 \text{ mL}$

$$C_i = 0.75 \text{ mol/L}$$

$$V_f = 90 \text{ mL}$$

$$C_f = ?$$

$$V_i C_i = V_f C_f$$

$$(20 \text{ mL})(0.75 \text{ mol/L}) = (90 \text{ mL}) C_f$$

$$C_f = 0.17 \text{ mol/L}$$

6.  $V_i = 0.050 \text{ mL}$

$$C_i = 0.20 \text{ mol/L}$$

$$V_f = 100.050 \text{ mL}$$

$$C_f = ?$$

$$V_i C_i = V_f C_f$$

$$(0.050 \text{ mL})(0.20 \text{ mol/L}) = (100.050 \text{ mL}) C_f$$

$$C_f = 1.0 \times 10^{-4} \text{ mol/L}$$

7.  $m = ?$

$$V = 225 \text{ mL}$$

$$C = 0.0350 \text{ mol/L}$$



$$C = \frac{n}{V}$$

$$n = (0.0350 \text{ mol/L})(0.225 \text{ L})$$

$$n = 0.007875 \text{ mol}$$

$$0.007875 \text{ mol CaCl}_2 \times \frac{110.98 \text{ g CaCl}_2}{1 \text{ mol CaCl}_2} = 0.874 \text{ g CaCl}_2$$

9.  $m_{\text{solute}} = ?$

$$m_{\text{sol'n}} = 575 \text{ g}$$

$$13.7\% \text{ m/m}$$

$$\% \text{ m/m} = \frac{m_{\text{solute}}}{m_{\text{sol'n}}} \times 100\%$$

$$0.137 = \frac{m_{\text{solute}}}{575 \text{ g}}$$

$$m_{\text{solute}} = (0.137)(575 \text{ g})$$

$$m_{\text{solute}} = 78.8 \text{ g}$$

\*10.  $V_i = ?$   
 $C_i = 0.879 M$   
 $V_f = 150 mL$   
 $C_f = 0.250 M$

$$V_i C_i = V_f C_f$$

$$V_i (0.879 M) = (150 mL)(0.250 M)$$

$$V_i = 42.7 mL$$

\*11.  $V_{sol'n} = 250 mL$   
 $8.8\% v/v$   
 $V_{solute} = ?$

$$\% v = \frac{V_{solute}}{V_{sol'n}} \times 100\%$$

$$0.088 = \frac{V_{solute}}{250 mL}$$

$$V_{solute} = 22 mL$$

\*12.  $m = ?$   
 $V = 275 mL$   
 $C = 0.925 M$   
 $C_{12H_{22}O_{11}}$

$$C = \frac{n}{V}$$

$$n = (0.925 \text{ mol/L})(0.275 L)$$

$$n = 0.254 \text{ mol}$$

$$0.254 \text{ mol } C_{12H_{22}O_{11}} \times \frac{342.34 \text{ g } C_{12H_{22}O_{11}}}{1 \text{ mol } C_{12H_{22}O_{11}}} = 87.0 g$$

\*13.  $m = 2.8 g$   
 $CuSO_4$   
 $V = 750 mL$   
 $C = ?$

$$2.8 g CuSO_4 \times \frac{1 \text{ mol } CuSO_4}{159.61 g CuSO_4} = 0.0175 \text{ mol } CuSO_4$$

$$C = \frac{n}{V} = \frac{0.0175 \text{ mol}}{0.750 L} = 0.023 \text{ mol/L}$$

