

# QUESTION 7 HUC5 SOLUTION STOICHIOMETRY FILTER ①

$$1. (26.8 \text{ g CaCl}_2) \left( \frac{1 \text{ mol}}{110.975} \right) = .24 \text{ mol CaCl}_2$$

$$\frac{.24 \text{ mol}}{.025 \text{ L}} = \underline{.96 \text{ mol/L}} = \underline{.96 \text{ M}}$$

$$2. (1.395 \text{ g KNO}_3) \left( \frac{1 \text{ mol}}{101.103} \right) = .0138 \text{ mol}$$

$$\frac{.0025 \text{ mol}}{.025 \text{ L}} = \underline{.101 \text{ M KNO}_3}$$

$$3. (126.5 \text{ g NaCl}) \left( \frac{1 \text{ mol}}{58.443} \right) = 2.16 \text{ mol NaCl}$$

$$\frac{2.16 \text{ mol}}{.793 \text{ L}} = \underline{2.724 \text{ M NaCl}}$$

$$4. 500 \text{ mL SOLID } 1 \text{ M NaNO}_3$$

$$(.5 \text{ L}) \left( \frac{1 \text{ mol}}{1 \text{ mol}} \right) = .5 \text{ mol NaNO}_3$$

$$\left( \frac{.05 \text{ mol}}{85.00 \text{ g}} \right) \left( \frac{1 \text{ mol}}{1 \text{ mol}} \right) = \underline{4.25 \text{ g NaNO}_3}$$

$$5. (101 \text{ L}) \left( \frac{1.1338 \text{ mol}}{1 \text{ L}} \right) = \underline{100.1338 \text{ mol NaCl}}$$

$$6. (1.025 \text{ L}) \left( \frac{485 \text{ mol}}{1 \text{ L}} \right) = .012125 \text{ mol Na}_2\text{SO}_4$$

$$\left( \frac{.012125 \text{ mol}}{142.045} \right) \left( \frac{1 \text{ mol}}{1 \text{ mol}} \right) = \underline{1.72 \text{ g Na}_2\text{SO}_4}$$

$$7. (.5 \text{ L}) \left( \frac{.02 \text{ mol}}{1 \text{ L}} \right) = .01 \text{ mol KNO}_3$$

$$\left( \frac{.01 \text{ mol}}{101.103} \right) \left( \frac{1 \text{ mol}}{1 \text{ mol}} \right) = \underline{1.53 \text{ g KNO}_3}$$

- PUT 1.53 g KNO<sub>3</sub> INTO 500 mL VOLUMETRIC FLASK  
THEN FILL FLASK TO MARK WITH WATER

39.10  
59.94

69





b.  $(5 \text{ mol AgCl}) \left( \frac{1 \text{ mol NiCl}_2}{2 \text{ mol AgCl}} \right) = \boxed{2.5 \text{ mol NiCl}_2}$

c.  $(5 \text{ mol NiCl}_2) \left( \frac{1 \text{ L}}{2 \text{ mol}} \right) = \boxed{2.5 \text{ L of NiCl}_2 \text{ soln}}$



b.  $3\text{g Zn} \left( \frac{1 \text{ mol}}{65.37 \text{ g}} \right) = \boxed{0.0459 \text{ mol Zn}}$

c.  $(3\text{g Zn}) \left( \frac{1 \text{ mol}}{65.37 \text{ g}} \right) = 0.0459 \text{ mol Zn}$   
 $(1.005 \text{ mol HNO}_3) \left( \frac{1 \text{ mol Zn}}{2 \text{ mol HNO}_3} \right) = 0.0025 \text{ mol Zn reacts}$

WHILE 0.0459 mol Zn, 0.0025 mol Zn REACTS SO WE WANT REACT ALL THE Zn GIVEN



b.  $(1.03 \text{ L} \times 2.8 \text{ mol/L}) = 0.084 \text{ mol Ca(NO}_3)_2$

$(0.084 \text{ mol Ca(NO}_3)_2) \left( \frac{1 \text{ mol Ca(OH)}_2}{1 \text{ mol Ca(NO}_3)_2} \right) = 0.084 \text{ mol Ca(OH)}_2$   
 $(0.084 \text{ mol Ca(OH)}_2) \left( \frac{1 \text{ mol Ca(NO}_3)_2}{74.11 \text{ g}} \right) = \boxed{6.23 \text{ g Ca(OH)}_2}$

$(0.084 \text{ mol Ca(NO}_3)_2) \left( \frac{2 \text{ mol HNO}_3}{1 \text{ mol Ca(NO}_3)_2} \right) = 0.168 \text{ mol HNO}_3$

$1.168 \text{ mol Ni}_2 \left( \frac{2.09 \text{ g}}{1 \text{ mol}} \right) = 3.86 \text{ g Ni}_2$   
 $1.168 \text{ mol Ni}_2 + 1.168 \text{ mol Ni}_2 = 2.336 \text{ mol Ni}_2$   
 $2.336 \text{ mol Ni}_2 \left( \frac{2.09 \text{ g}}{1 \text{ mol}} \right) = 4.88 \text{ g Ni}_2$