

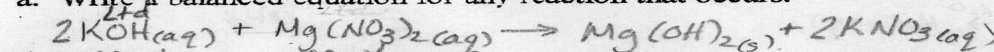
**Ppt/Molarity, Stoichiometry and Dilution** Ch 4 Sec 1-8 wkshf

1. Which of the following solutions contains the largest number of moles of chloride ions:

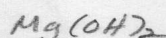
- a. 100.0 mL of 0.30M  $\text{AlCl}_3$   $100.0\text{ mL} \times \frac{1\text{ L}}{1000\text{ mL}} \times \frac{.30\text{ mol}}{1\text{ L}} \times \frac{3\text{ ions Cl}^-}{1\text{ mol}} = .090\text{ mol Cl}^-$   
 b. 50.0 mL of 0.60M  $\text{MgCl}_2$   $50.0\text{ mL} \times \frac{1\text{ L}}{1000\text{ mL}} \times \frac{.60\text{ mol}}{1\text{ L}} \times \frac{2\text{ ions Cl}^-}{1\text{ mol}} = .060\text{ mol Cl}^-$   
 c. 200.0 mL of 0.40M  $\text{NaCl}$   $200.0\text{ mL} \times \frac{1\text{ L}}{1000\text{ mL}} \times \frac{.40\text{ mol}}{1\text{ L}} \times \frac{1\text{ ion Cl}^-}{1\text{ mol}} = .080\text{ mol Cl}^-$

2. A 100.0 mL portion of 0.200M potassium hydroxide is mixed with 100.0 mL of 0.200M magnesium nitrate.

a. Write a balanced equation for any reaction that occurs.



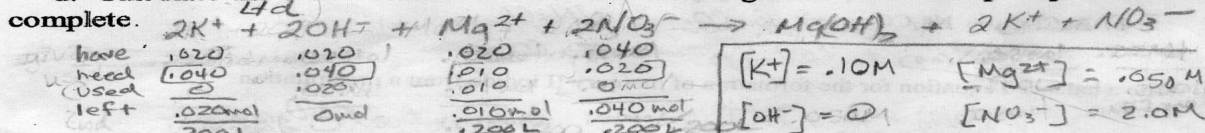
b. What precipitates forms?  
NEED .04



c. What mass of ppt is produced?

$100.0\text{ mL} \times \frac{1\text{ L}}{1000\text{ mL}} \times \frac{.200\text{ mol KOH}}{1\text{ L}} \times \frac{1\text{ mol Mg(OH)}_2}{2\text{ mol KOH}} \times \frac{58.33\text{ g}}{1\text{ mol}} = .583\text{ g}$

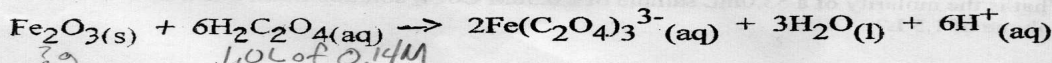
d. Calculate the concentration of each ion remaining in solution after precipitation is complete.



3. A 230. mL sample of a 0.275 M  $\text{CaCl}_2$  solution is left on a hotplate overnight; the following morning the solution is 1.10 M. What volume of water evaporated from the 0.275 M  $\text{CaCl}_2$  solution?

$.230\text{ L} \times 0.275\text{ M} = 1.10\text{ M} \times V_2$   
 $V = .0575\text{ L} = 57.5\text{ mL}$   
 $230.0\text{ mL} - 57.5\text{ mL} = 172.5\text{ mL}$   
173 mL evaporated

4. Rust stains can be removed by washing the surface with a dilute solution of oxalic acid, ( $\text{H}_2\text{C}_2\text{O}_4$ ). The reaction is:



Is this an oxidation-reduction reaction?

b. What mass of rust can be removed by 1.0L of a 0.14M solution of oxalic acid?

$1.0\text{ L} \times \frac{0.14\text{ mol H}_2\text{C}_2\text{O}_4}{1\text{ L}} \times \frac{1\text{ mol Fe}_2\text{O}_3}{6\text{ mol H}_2\text{C}_2\text{O}_4} \times \frac{159.7\text{ g Fe}_2\text{O}_3}{1\text{ mol Fe}_2\text{O}_3} = 3.726\text{ g}$   
3.7 g  $\text{Fe}_2\text{O}_3$