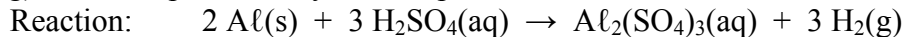


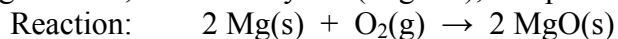
Name: _____ CHM150 Chap-4 Take Home (10 points) page 1 of 3

Directions: Show the **working equation/formula** when applied. For full credit **show all work** in a meaningful order. Use **conversion factor** method when implied. **Mark** the final answer.

1. You wanted to dissolve an aluminum block with a mass of 15.2 g in sulfuric acid according to the reaction below. What minimum mass of pure H_2SO_4 (in g) would you need? What mass of H_2 gas (in g) would be produced by the complete reaction of the aluminum block?



2. Magnesium oxide can be made by heating magnesium metal in the presence of the oxygen. When 10.1 g of Mg is allowed to react with 10.5 g O_2 , 11.9 g MgO is collected. Determine the limiting reactant, theoretical yield (in gram), and percent yield for the reaction.



3. How would you prepare a 250 mL of 3.50 M solution of ammonium nitrate from pure solid and water? Show the numbers by calculation and describe the process.

4. What volume of 0.160 M Li_2S solution is required to completely react with 120 mL of 0.200 M $\text{Co}(\text{NO}_3)_2$ according to the reaction $\text{Li}_2\text{S}(\text{aq}) + \text{Co}(\text{NO}_3)_2(\text{aq}) \rightarrow 2 \text{LiNO}_3(\text{aq}) + \text{CoS}(\text{s})$?

5. Fill in the blank cells with appropriate response.

a) Classify each of the following as a strong electrolyte or nonelectrolyte.			b) Determine whether each of the following compounds is soluble or insoluble.		
	Species	Classification		Species	Solubility
a)	MgBr_2		a)	AgI	
b)	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$		b)	$\text{Cu}_3(\text{PO}_4)_2$	
c)	Na_2CO_3		c)	CoCO_3	
d)	KOH		d)	K_3PO_4	

6. Write a balanced molecular equation for the precipitation reaction that occurs (if any) when the following solutions are mixed. If no reaction occurs, write NO REACTION explaining why.

a. sodium chloride and lead(II) acetate

b. potassium sulfate and strontium iodide

c. cesium chloride and calcium sulfide

d. chromium(III) nitrate and sodium phosphate

7. Write balanced complete ionic and net ionic equations for each of the following reactions.

a. $\text{AgNO}_3(\text{aq}) + \text{NaCl}(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{NaNO}_3(\text{aq})$

Complete ionic:

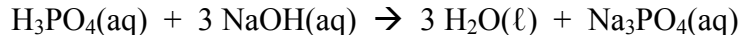
Net ionic:

b. $\text{HC}_2\text{H}_3\text{O}_2(\text{aq}) + \text{K}_2\text{CO}_3(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g}) + \text{KC}_2\text{H}_3\text{O}_2(\text{aq})$

Complete ionic:

Net ionic:

8. A 20.0-mL sample of an unknown H_3PO_4 solution is titrated with a 0.100 M NaOH solution. The equivalence point is reached when 18.45 mL of NaOH solution is added. What is the concentration of the unknown H_3PO_4 solution? The neutralization reaction is as follows:

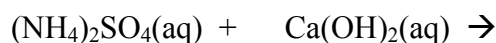


9. For the reaction between nitric acid and calcium hydroxide in aqueous medium write

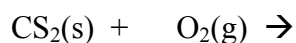
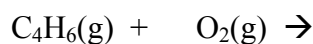
Balanced eqn:

Net ionic eqn:

Complete and balance the following gas evolution reactions:



Complete and balance the following combustion reactions:



10. Assign oxidation states to each atom of the following species.

Cl_2	$\text{Cl} \rightarrow$	
CuCl_2	$\text{Cu} \rightarrow$	$\text{Cl} \rightarrow$
$\text{Cr}_2\text{O}_7^{2-}$	$\text{Cr} \rightarrow$	$\text{O} \rightarrow$

Which of the following reactions are redox reactions? If it is a redox reaction, identify the oxidizing agent and the reducing agent. If it is not a redox reaction, explain why.

