

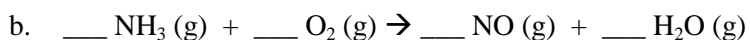
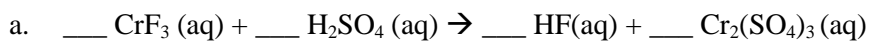
Name: _____

Section: _____

CHM 151 Exam 3: Chapters 3 and 4

You must show all work to receive credit. Clearly mark your final answer!

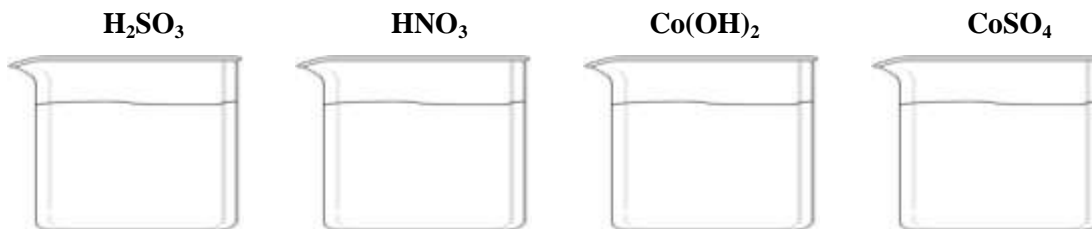
1. Balancing equations when products are given:



2. How many hydroxide ions are present in 22.6g of aluminum hydroxide?

3. List the 7 common strong acids. Give both the name and the formula of each acid

4. Draw what 1 formula unit of each compound would look like if placed in its beaker of water.



Name: _____

Section: _____

5. A student is asked to combine sodium sulfide and hydrochloric acid solutions in a lab experiment. Complete the molecular equation with reactants and products (including phases) and balancing. Then write the complete ionic and net ionic equations for this reaction. Identify the spectator ions.

Molecular: _____ → _____

Ionic: _____

Net Ionic: _____

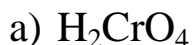
Spectators: _____

6. For the following reactants,

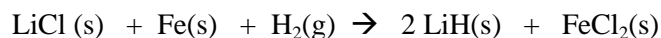
- Determine what type of reaction will occur, indicating all that apply
 - Combination (C), Decomposition (D), Single-replacement (SR), Combustion (B), Double-Replacement/Precipitation (P), Acid-Base Neutralization (AB), or No Reaction (NR)
- Predict the product(s) of the reaction
- Write correct phases of the product(s)
- Balance the equation

Reaction Type	Reactants	Products
_____	___ Cl ₂ (g) + ___ Ag(s) →	_____
_____	___ Zn(s) + ___ CrCl ₃ (aq) →	_____
_____	___ Zn(s) + ___ H ₂ O(aq) →	_____
_____	___ Hg(NO ₃) ₂ (aq) + ___ Na ₂ SO ₄ (aq) →	_____

7. Identify the oxidation number of **each element** in the following substances. Write each oxidation number above the element it corresponds to in the formula.



8. In the following equation, identify the a) species being reduced, b) species being oxidized, c) reducing agent, and d) oxidizing agent.



Oxidized: _____

Oxidizing agent: _____

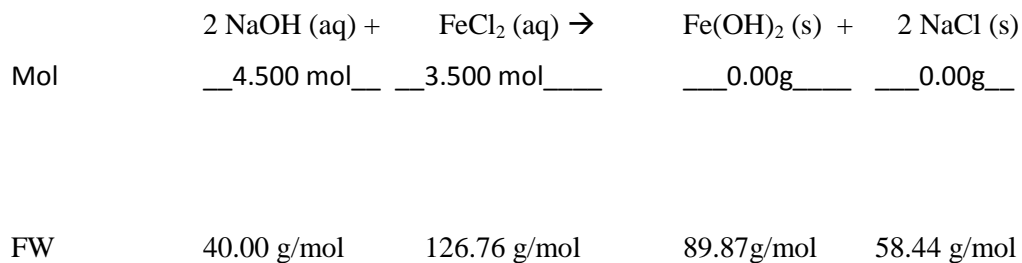
Reduced: _____

Reducing agent: _____

Name: _____

Section: _____

9. In lab you prepare aqueous solutions of NaOH and FeCl₂, mix them in a beaker and separate the precipitate. The formula weights of all reactants and products are given.



- a) Determine the theoretical mass of the precipitate formed if 4.500 mol of NaOH are reacted with 3.500 mol of FeCl₂. Show all work clearly. You do not need to figure out how much of the other product is formed or how much of the excess reagent is left over. You can do that if you want to show off.

b) Indicate which reagent is the limiting reagent. _____

Name: _____

Section: _____

10. Find the empirical formula of cyclohexane (just another really cool hydrocarbon) if it contains 83.625% carbon and also contains hydrogen.

Bonus. You place 50.0 mL of hydrochloric acid of unknown concentration in a beaker and add 23.6 mL of 0.1012 M calcium hydroxide to it to reach the endpoint of the reaction. Balance the equation. What is the concentration of the acid?