

Worksheet
Chapter 3 & some 4

1. Zinc metal reacts with hydrochloric acid to produce zinc(II) chloride and hydrogen gas. You have 400 g of hydrochloric acid and 150 g of zinc.
 - a. What is the balanced reaction?
 - b. What is the limiting reagent?
 - c. How much excess is left over?
 - d. What mass of hydrogen gas can be produced? (assume 100% yield)
 - e. How many molecules of zinc(II) chloride can be produced? (assume 100% yield)
 - f. If you have a 67.8 % yield, how much zinc(II) chloride did you make?
2. 45 mL of a 0.45 M solution of sodium oxide is mixed with 75 mL of a 0.278 M solution of iron(II) nitrate.
 - a. What is the balanced reaction?
 - b. What is the limiting reagent?
 - c. If there is a reaction, what is the mass of each product produced?
3. 750 mL of a 0.1 M solution of sulfuric acid reacts with 5.0 g of sodium hydroxide to create water and sodium sulfate. Calculate the pH of the solution that is produced? (USE ALL THE NUMBERS IS THE CALCULATION!)
$$\text{pH} = -\log [\text{H}^+]$$
where $[\text{H}^+] =$ the concentration (molarity) of H^+ ion in solution

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 - i. If there is a reaction, what is the mass of each product produced?
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