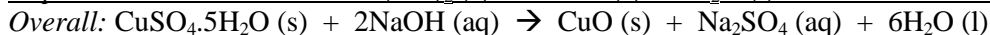
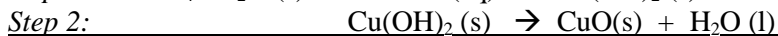
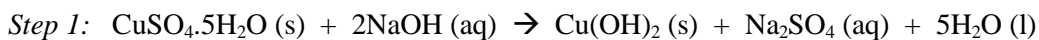


CHEM 101-080 Fall 2004
Problem-Solving Session 4a
Chapter 8
October 20, 2004

Ch. 8: Chemical Reactions - Example from Lab 14



Q1: Given 2.0 grams of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ (FW=249.68 g/mol) with an excess of NaOH, how much Cu(OH)_2 (FW=97.56 g/mol) will be produced?

S1:

$$2.0 \text{ g } \text{CuSO}_4 \cdot 5\text{H}_2\text{O} \times \frac{1 \text{ mol } \text{CuSO}_4 \cdot 5\text{H}_2\text{O}}{249.68 \text{ g } \text{CuSO}_4 \cdot 5\text{H}_2\text{O}} \times \frac{1 \text{ mol } \text{Cu(OH)}_2}{1 \text{ mol } \text{CuSO}_4 \cdot 5\text{H}_2\text{O}} \times \frac{97.56 \text{ g } \text{Cu(OH)}_2}{1 \text{ mol } \text{Cu(OH)}_2} = 0.781 \text{ g } \text{Cu(OH)}_2$$

Q2: Given Q1, how much Na_2SO_4 (FW=142.04 g/mol) will be produced?

Q3: Given Q1, how much H_2O (FW=18.02 g/mol) will be produced?

Q4: Given Q1, how much CuO (FW=79.55 g/mol) will be produced?

Q5: Suppose that 10% of the Cu(OH)_2 was accidentally lost. Now how much CuO (FW=79.55 g/mol) will be produced?

Q6: Suppose that 10.0 ml of 6M NaOH (i.e. 6.0 moles NaOH/liter) is used. How much CuO (FW=79.55 g/mol) will be produced? What is the limiting reactant?

Q7: What is the theoretical yield given Q1?

Q8: If 0.625 g CuO are produced, what is the actual and theoretical yields given Q1?