SCH 3U0 Summary Questions – Stoichiometry

Answers are in brackets

1. Iron ore, ferric oxide, is reacted with carbon monoxide in order to produce iron. Carbon dioxide is also produced in the process. What mass of iron can be formed from 425 g of ferric oxide? (297g)

2. Zinc and sulphur react to form zinc sulphide. If 6.00 g of zinc and 4.00 g of sulphur are available for the reaction,

   Zn + S □ ZnS

   a. Determine the limiting reactant? (Zn)
   b. What mass of ZnS will be formed? (8.94g)
   c. How many grams of excess reactant will remain after the reaction is over? (1.05 g)

3. The overall balanced equation for the production of ethanol from sugar is

   $$C_6H_{12}O_{6(aq)} \longrightarrow 2C_2H_5OH_{(aq)} + 2CO_{2(g)}$$

   a. What theoretical yield of ethanol will be produced by 10.0 g of sugar? (5.11 g)
   b. If the 10.0 g of sugar actually produced 0.644 g of ethanol, what was the percent yield? (12.9%)

4. A supervisor in a lab told a chemist to make 100.0 g of chlorobenzene with chlorine and to expect a yield of no higher than 65.0%. What is the **minimum** quantity of benzene that is required to give 100.0 g of chlorobenzene if that yield is 65.0%. The equation for the reaction is: (107 g)

   $$\underset{\text{Benzene}}{C_6H_6} + Cl_2 \longrightarrow \underset{\text{chlorobenzene}}{C_6H_5Cl} + HCl$$

5. In a **double displacement reaction**, 15.84 g of ammonium phosphate reacts with 23.75 g of lead (IV) nitrate.
   a. Write a balanced chemical equation for the reaction.
   b. Determine the limiting reactant. (lead (IV) nitrate)
   c. What mass of lead (IV) phosphate can be formed? (17.42 g)
   d. How many grams of the excess reactant will remain after the reaction is over? (5.474 g)