

1. Sulfur dioxide is produced from zinc sulfide when it reacts with oxygen. If the typical yield is 86.78%, what mass of SO_2 should be expected if 4897 g of ZnS is used?
2. Aluminum reacts with excess copper II sulfate. If 1.85 g of Al reacts and the percent yield of Cu is 56.6%, what mass of copper is produced?
3. A 15 g sample of magnesium reacts with hydrochloric acid (HCl). 46.6 g of magnesium chloride was formed during the reaction. What was the percent yield?
4. Titanium IV oxide is used as a pigment in paints and as a whitener for paper. It is made by reacting titanium chloride with oxygen gas.
$$\text{TiCl}_4(\text{g}) + \text{O}_2(\text{g}) \longrightarrow \text{TiO}_2(\text{s}) + 2 \text{Cl}_2(\text{g})$$
 - a. If 3.5 mol of TiCl_4 reacts with 4.5 mol of O_2 , what mass of TiO_2 should be produced?
 - b. If 250.0 g of TiO_2 was produced, what was the percent yield?

5. Sodium chloride is produced by the reaction between sodium metal and chlorine gas. Suppose that 6.70 mol Na reacts with 3.20 mol Cl_2 .

a. What is the theoretical yield of sodium chloride? (in moles)

b. If 321.42 g of NaCl was actually produced, what is the percent yield of the reaction?

6. Calcium carbonate decomposes when heated to produce calcium oxide and carbon dioxide.

a. What is the theoretical yield of each product if 24.8 g CaCO_3 is heated?

b. What is the percent yield if 13.1 g CaO is produced?