

# Basic Concepts in Chemistry class 11

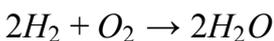
## SaitechAI

Here is a worksheet featuring 12 problems that focus on calculating the mass ratio and identifying the limiting reagent in chemical reactions. These exercises will help reinforce these important concepts.

### Mass Ratio and Limiting Reagent Worksheet

#### Problem 1:

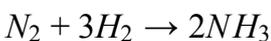
You have 50 g of hydrogen reacting with 200 g of oxygen. The balanced equation for the formation of water is:



What is the limiting reagent?

#### Problem 2:

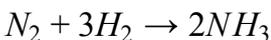
In the reaction:



Determine the limiting reagent if 28 g of nitrogen reacts with 6 g of hydrogen.

#### Problem 3:

For the production of ammonia by the Haber process:



If you start with 84 g of nitrogen and 30 g of hydrogen, calculate the limiting reagent.

#### Problem 4:

Calcium carbonate decomposes upon heating to form calcium oxide and carbon dioxide:



If 100 g of calcium carbonate is heated, what mass of carbon dioxide is produced?

#### Problem 5:

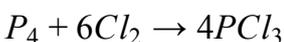
In the reaction to form sulfuric acid:



If you have 128 g of sulfur dioxide and 64 g of oxygen, which is the limiting reagent?

#### Problem 6:

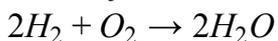
For the reaction:



If you have 124 g of phosphorus and 213 g of chlorine, identify the limiting reagent.

**Problem 7:**

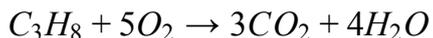
In the synthesis of water:



If 4 g of hydrogen reacts with 32 g of oxygen, determine the limiting reagent.

**Problem 8:**

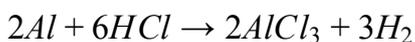
For the combustion of propane:



Calculate the limiting reagent if you start with 44 g of propane and 160 g of oxygen.

**Problem 9:**

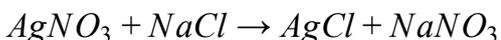
In a reaction where aluminum reacts with hydrochloric acid to produce hydrogen gas:



If 54 g of aluminum and 219 g of hydrochloric acid are used, which is the limiting reagent?

**Problem 10:**

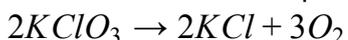
When silver nitrate reacts with sodium chloride, silver chloride and sodium nitrate are formed:



Determine the limiting reagent if 170 g of silver nitrate and 85 g of sodium chloride are mixed.

**Problem 11:**

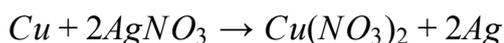
In the thermal decomposition of potassium chlorate:



Calculate the mass of oxygen produced from 245 g of potassium chlorate.

**Problem 12:**

For the reaction:



If 63.5 g of copper reacts with 340 g of silver nitrate, identify the limiting reagent.

**Answer Key:****Problem 1:**

Limiting reagent: Oxygen

**Problem 2:**

Limiting reagent: Hydrogen

**Problem 3:**

Limiting reagent: Hydrogen

**Problem 4:**

Mass of CO<sub>2</sub> produced: 44 g

**Problem 5:**

Limiting reagent: Oxygen

**Problem 6:**

Limiting reagent: Phosphorus

**Problem 7:**

Limiting reagent: Hydrogen

**Problem 8:**

Limiting reagent: Oxygen

**Problem 9:**

Limiting reagent: Aluminum

**Problem 10:**

Limiting reagent: Silver nitrate

**Problem 11:**

Mass of Oxygen produced: 96 g

**Problem 12:**

Limiting reagent: Copper

These problems are designed to test a variety of chemical equations, requiring the students to apply their understanding of stoichiometry to determine the limiting reagent and calculate the results based on the mass ratio.