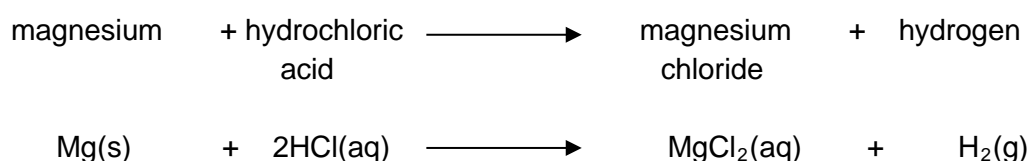


Investigation of the factors that affect the rate of reaction using a gas collection method

Introduction

Magnesium reacts with dilute hydrochloric acid to produce hydrogen. The equation for the reaction is as follows:



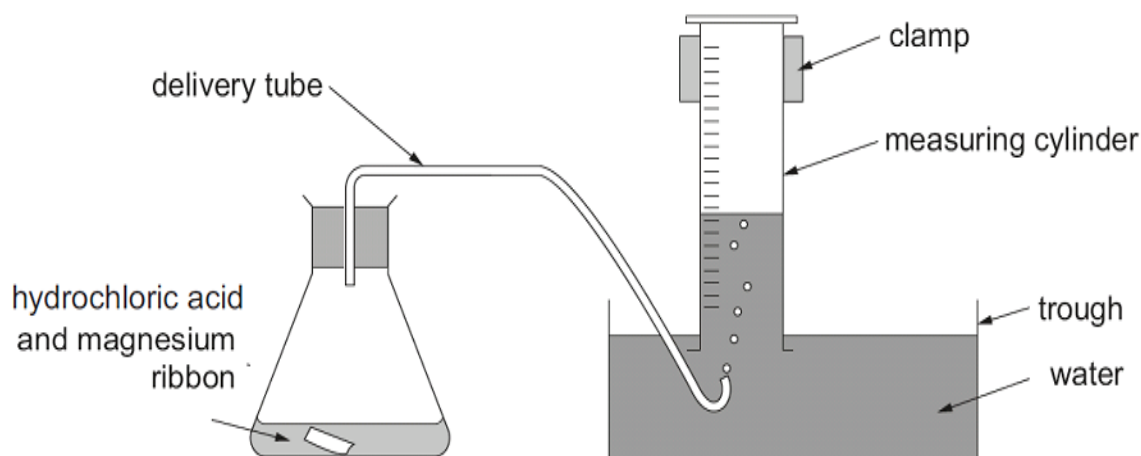
The rate at which the hydrogen gas is produced can be used to determine the rate of the reaction.

In this experiment you will study the effect of changing the concentration of the hydrochloric acid on the rate of the reaction.

Apparatus

250 cm³ conical flask
 single-holed rubber bung
 delivery tube to fit conical flask
 trough or plastic washing-up bowl
 100 cm³ measuring cylinder
 250 cm³ measuring cylinder
 clamp stand, boss and clamp
 stopwatch
 magnesium ribbon in 3 cm lengths
 1 mol/dm³ hydrochloric acid

Diagram of Apparatus



Method

1. Set up the apparatus as shown in the diagram.
2. Measure 20 cm^3 of 1 mol/dm^3 hydrochloric acid using the 25 cm^3 measuring cylinder. Pour the acid into the 250 cm^3 conical flask.
3. Fill the other measuring cylinder with water, make sure that it stays filled with water when you turn it upside down and clamp above the trough.
4. Add a 3cm strip of magnesium ribbon to the flask, put the bung into the flask and start the stopwatch.
5. Record the volume of hydrogen gas given off every ten seconds. Continue timing until no more gas appears to be given off.
6. Repeat steps 2-5 using 10 cm^3 of the hydrochloric acid and 10 cm^3 of water to make the total volume used 20 cm^3 .

Analysis

1. Plot a graph of volume of hydrogen gas (y -axis) against time (x -axis), for both concentrations of hydrochloric acid and label the lines appropriately.