

The Reaction of Hydrochloric Acid and Magnesium

Introduction

When 2 elements react together a new compound is formed.

For a chemical reaction to take place, particles from each element must collide together.

When the particles collide they must also have enough energy.



For an acid to react with a metal, the metal must be higher than copper in the reactivity series.

We can describe acids as being dilute (less particles per unit volume) or concentrated (more particles per unit volume).

This can be measured in a scale where the units are known as molars. A dilute acid will have a value of 1 molar, while a concentrated acid will have a value of 4 molar.

Plan

Aim

To find out if the reaction of hydrochloric acid and magnesium changes if the molar of the hydrochloric acid

Variables

The variables in this experiment are:

- The molar of hydrochloric acid used
- The amount of hydrochloric acid used
- The amount of magnesium used
- Whether or not the reaction will take place in an airtight test tube
- The temperature in which the reaction takes place in
- The number of times a test is repeated of samples with equal values

The variables I will keep the same are:

- The amount of hydrochloric acid used
- The amount of magnesium used
- The tops of the test tubes will be open
- The temperature in which the reaction takes place
- The number of times a test is repeated

The variables I will alter are:

- The molar of hydrochloric acid used

So, I will use 15cm³ of hydrochloric acid and 1cm strip of magnesium. I will use molars 1-4 of hydrochloric acid in my experiment and test each molar 4 times. The units I will measure are seconds as in the time it takes for the hydrochloric acid and the magnesium to have fully reacted.

I think this will make my test fair and it should have a positive outcome.

The readings that I will take are the amount of seconds it takes from when the magnesium touches the hydrochloric acid to the time it stops reacting.

Method

Equipment: Test tube rack, measuring cylinder, 4 test tubes, safety glasses, stopwatch, hydrochloric acid, magnesium

I put 15 cm³ of hydrochloric acid (measured using the measuring cylinder) in 4 different test tubes with a different molar of hydrochloric acid in each:

- 1 molar hydrochloric acid in tube 1
- 2 molar hydrochloric acid in tube 2
- 3 molar hydrochloric acid in tube 3
- 4 molar hydrochloric acid in tube 4

I put the tubes next to each other in a test tube rack. I then tested tube 1 first. I added a 3 cm strip of magnesium to it and timed from when the reaction started to when it stopped using the stopwatch. When the reaction had finished I emptied out the tube, washed it, added another 15 cm³ of hydrochloric acid and then repeated the same things. I did this 4 times and also did the same with the other test tubes.

Results