

Different metals have different levels of reactivity.

We can investigate this by immersing different metals in acid.

To do this we will need:

A test tube rack containing 4 test tubes.

Dilute hydrochloric acid.

Samples of metals.

We are using:

A copper strip.

An iron nail.

A strip of zinc and a strip of magnesium.

You will also need safety goggles and gloves as the acid is corrosive.

First, carefully fill each test tube with the dilute hydrochloric acid.

Start with the least reactive metal copper.

We add the copper into the test tube filled with acid.

Copper is unreactive with the acid.

No evidence of a chemical reaction is observed.

Do the same with iron.

Initially there is no discernible reaction, but let's examine the iron nail again later.

Repeat with the zinc.

Very quickly after immersion we can see effervescence as bubbles begin to form around the edges of the zinc strip.

These are hydrogen bubbles.

There is a steady reaction of the zinc with the acid.

This reaction can be shown the equation: Zinc plus hydrochloric acid produces zinc chloride plus hydrogen.

Finally, we can add the strip of magnesium to the test tube.

We can see there is an instant reaction with the acid, with hydrogen bubbles causing effervescence.

This reaction can be shown by the equation: Magnesium plus hydrochloric acid produces magnesium chloride plus hydrogen.

Magnesium had the most vigorous reaction with the acid.

Zinc was less vigorous but also fast.

We can now see small bubbles of hydrogen gas around the iron nail, showing this reaction takes place more slowly.

This reaction can be shown by the equation: Iron plus hydrochloric acid produces iron chloride plus hydrogen.

Copper showed no reaction with the acid during the experiment window.

We can produce a table of the results, listing the metals used, and what we observed.

These results confirm that different metals have different levels of reactivity and react differently with acid.