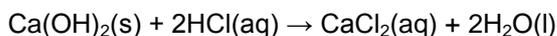


Your teacher may watch to see if you can...

- carry out an experiment appropriately
- use apparatus accurately and safely.

Aim

Powdered calcium hydroxide reacts with hydrochloric acid. Calcium chloride solution and water are produced:



You will investigate what happens to the pH of a fixed volume of dilute hydrochloric acid when you add calcium hydroxide to it.

Apparatus

- | | |
|---|-----------------------------|
| • eye protection | • white tile |
| • 100 cm ³ beaker | • universal indicator paper |
| • 50 cm ³ measuring cylinder | • pH colour chart |
| • ±0.1 g balance | • dilute hydrochloric acid |
| • spatula | • calcium hydroxide powder |
| • stirring rod | • graph paper |

! Safety

Wear eye protection.
Calcium hydroxide is an irritant with a risk of serious damage to eyes.
Dilute hydrochloric acid is an irritant.

Method

- Use the measuring cylinder to add 50 cm³ of dilute hydrochloric acid to the beaker.
- Estimate and record the pH of the contents of the beaker:
 - Put a piece of universal indicator paper onto the white tile.
 - Dip the end of the glass rod into the liquid, then tap it onto the universal indicator paper.
 - Wait 30 seconds, then match the colour to the appropriate pH on the pH colour chart.
 - Rinse the glass rod with water.
- Measure out 0.3 g of calcium hydroxide powder onto a piece of paper or a 'weighing boat'.
- Add the calcium hydroxide powder to the beaker, stir, then estimate and record the pH of the mixture.
- Repeat step **D** seven times so that you add a total of 2.4 g of calcium hydroxide powder to the acid.

Recording your results

- Make a table with columns for the mass of calcium hydroxide powder added, and the pH of the mixture. Remember to leave a row for the first pH measurement (before you have added any calcium hydroxide).

Considering your results

- Plot a line graph to show pH on the vertical axis and mass of calcium hydroxide added on the horizontal axis. Draw a curve of best fit.
- Describe what happens to the pH of the reaction mixture as calcium hydroxide continues to be added.
- Use your graph to determine the mass of calcium hydroxide that must be added to reach pH 7.

Evaluation

- Explain one way to improve the accuracy of the experiment.