

Limestone and marble are rocks that are made mainly of a chemical called calcium carbonate. You are going to carry out a set of reactions that will change limestone into limewater.

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Apparatus

- Eye protection • Bunsen burner • Tripod
- Gauze • Heatproof mat • Tongs
- Beaker • Test tube • Straw
- Filter paper • Funnel • Conical flask
- Stirring rod • Piece of marble or limestone (1–2 cm³)



Wear eye protection.

Method

- 1 Put the piece of limestone on a tripod and gauze, and heat it strongly for 5 minutes.
- 2 Turn the Bunsen burner off and allow the limestone to cool for 5 minutes. Do not touch it.
- 3 Half fill the beaker with water, and use the tongs to put the piece of limestone into it. Stir the limestone in the water.
- 4 Filter the water. The solution you have made is limewater.
- 5 Use the straw to blow gently into the limewater. What do you see?
- 6 Filter the liquid that you have blown into. What do you find on the filter paper?

Considering your results

When you heat limestone strongly, the calcium carbonate **decomposes** into carbon dioxide gas (which escapes into the air) and calcium hydroxide. You can show this change using a **word equation**.



The piece of limestone you heated had calcium oxide on the outside. When you added water you changed the calcium oxide to calcium hydroxide. Some of the calcium hydroxide dissolved in the water to make limewater.

When you blow carbon dioxide through limewater, some of the calcium hydroxide changes to calcium carbonate again. Calcium carbonate is insoluble.

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- 1 Write a word equation showing what happened in step 3 of the method.
- 2 Why did you filter the mixture in step 4?
- 3 Write a word equation for the reaction that happened in step 5 of the method.
- 4 Explain why you can see the calcium carbonate but not the calcium hydroxide.
- 5 What substance do you find on the filter paper after step 6?



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