

## 19: Eggsperiment

Use chemistry to find out what egg shells are made of.

### What you will need

#### A

2 egg shells  
pestle and mortar  
hydrochloric acid  
limewater  
spatula  
2 boiling tubes  
10 cm<sup>3</sup> measuring cylinder  
a dropper pipette

eye protection

#### C

dry crushed egg shell  
apparatus and materials for flame tests (see 12: Mystery Metal page 27)

eye protection

#### B

2 clean, dry egg shells  
pestle and mortar  
50 cm<sup>3</sup> measuring cylinder  
hydrochloric acid  
top pan balance  
apparatus for collecting a gas

eye protection

#### D

whole egg  
250 cm<sup>3</sup> glass beaker  
150 cm<sup>3</sup> hydrochloric acid



eye protection  
must be worn



IRRITANT  
hydrochloric acid

### What you do

#### A What are egg shells made of?

- 1 Wash 2 egg shells. Remove as much of the membrane attached to the inside as you can.
- 2 Crush the egg shells in the mortar and pestle.
- 3 Put one spatula of the crushed egg shell into the boiling tube. Measure 2 cm<sup>3</sup> hydrochloric acid into the measuring cylinder, then carefully pour the acid, very slowly, onto the egg shell. (Take care with the acid.) What happens? Is a gas given off?
- 4 Pour about 2 cm<sup>3</sup> of limewater into a second boiling tube.
- 5 Use a dropper pipette to take some of the gas from the first boiling tube and bubble it through the limewater. What happens?
- 6 What sort of compound would give off carbon dioxide when acid is added?

#### B How much gas?

- 1 Put two clean dry egg shells in the mortar and crush them up.
- 2 Plan a way of measuring how much gas is given off by 1 g of eggshell. There are several methods you could use. Discuss your ideas with your teacher.
- 3 Start with 1 g of crushed egg shells and 20 cm<sup>3</sup> hydrochloric acid and see how much gas you get.
- 4 Can you improve on the method?

**19: Eggsperiment (contd)**

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eye protection  
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IRRITANT  
hydrochloric acid

**C Are there any metals present in the eggshell compounds?**

You may have met the method in another Chemistry Club experiment, it uses flame tests (see 12: Mystery Metal).

**D The naked egg**

- 1 Place a whole egg in a 250 cm<sup>3</sup> beaker and cover it with hydrochloric acid (2 mol dm<sup>-3</sup>). Leave it for a few hours. What do you see?

There should be a lot of effervescence. The shell will dissolve, leaving the raw egg inside its membrane. Eventually you should be left with the naked egg!

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Eye protection must be worn.