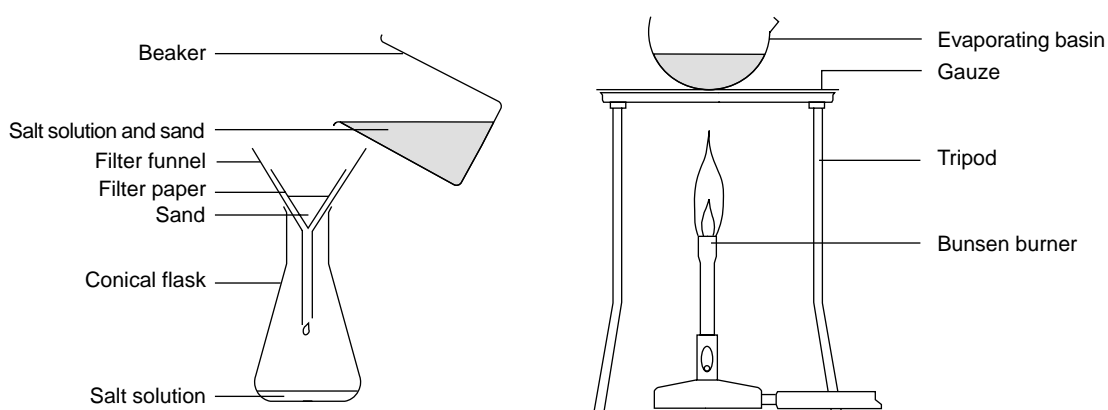


# Separating a sand and salt mixture

## Introduction

In this experiment simple processes are used to separate salt from a sand and salt mixture.



## What to do

1. Mix about 5 g of the mixture with 50 cm<sup>3</sup> of water in a 250 cm<sup>3</sup> beaker. Stir gently.
2. Filter the mixture into a conical flask and pour the filtrate into an evaporating basin.
3. Heat the salt solution gently until it starts to 'spit'. **Care:** do not get too close.
4. Turn off the Bunsen burner and let the damp salt dry.

## Safety

Wear eye protection.

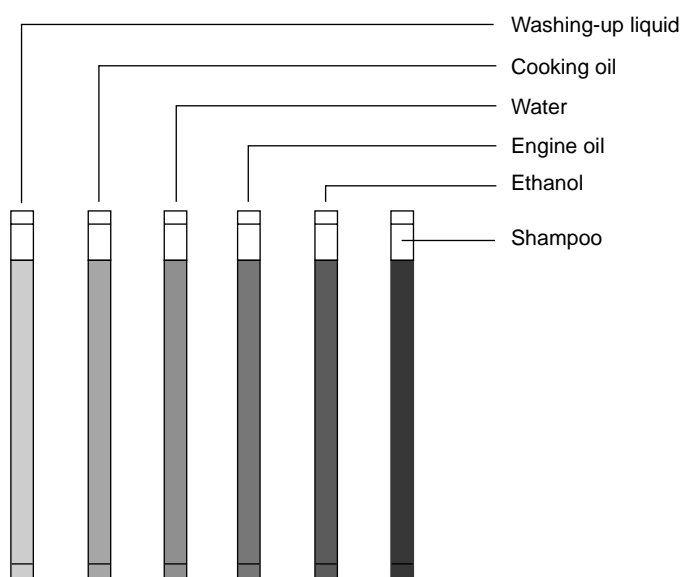
## Questions

1. Why is the salt, sand and water mixture stirred in step 1?
2. What happens when this mixture is filtered in the step 2?
3. Why is the salt heated in step 3?

# Viscosity

## Introduction

The viscosity of a liquid is another term for the thickness of a liquid. Thick treacle-like liquids are viscous, runny liquids like water are less viscous. Gases exhibit viscosity in the same way. In this experiment, the viscosity of various liquids are compared.



## What to record

Complete a table like this:

Liquid	Time taken /s
Washing up liquid	
Water	

## What to do

1. Take one of the tubes provided.
2. Ensure the bubble is at the top and the tube is held vertical.
3. Quickly invert the tube and measure the time it takes for the bubble to reach the top.
4. Repeat this measurement for all the samples.

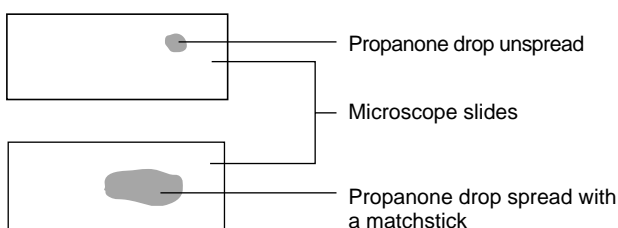
## Questions

1. Which liquid is the most viscous?
2. Which liquid is the least viscous?
3. Design a different experiment for comparing the viscosity of liquids.

# Rate of evaporation

## Introduction

Evaporation is the conversion of a liquid into vapour, without necessarily reaching the boiling point. In this experiment the rate of evaporation is measured and compared under various different conditions.



## What to record

Complete the following table.

Condition	Evaporation time (s)
Unspread, cool, air movement	
Unspread, cool, no air movement	
Spread out, cool, no air movement	
Spread out, warm, no air movement	
Unspread, warm, air movement	
Spread out, cool, air movement	
Spread out, warm, air movement	
Unspread, warm, no air movement	

## What to do

1. Consider the following conditions for the evaporation of a drop of propanone on a microscope slide.

Condition	How achieved
Warm	Warm slide in hands and hold on a flat palm. Alternatively, place the slide in warm water then dry the slide.
Cool	Room temperature.
Spread out drop	Spread the drop of propanone on the slide with a matchstick.
Unspread	Drop left as one drop on the slide.
Cool air flow	Fan with book.
Warm air flow	Blow across drop.

2. Place a microscope slide in one of the conditions listed.
3. Add the single drop of propanone.
4. Measure the time for the drop to evaporate.
5. Repeat the experiment using different conditions.



## Safety

Ensure there are no sources of ignition nearby. Wear eye protection.

## Questions

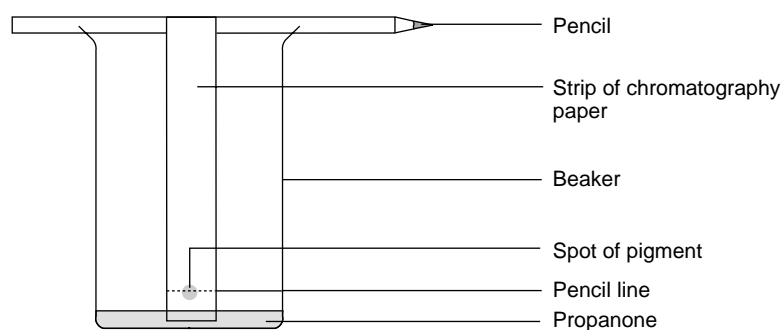
1. Name three factors that effect the rate of evaporation.
2. Why does evaporation produce a cooling effect?

RS•C

# Chromatography of leaves

## Introduction

Most leaves are green due to chlorophyll. This substance is important in photosynthesis (the process by which plants make their food). In this experiment, the different pigments present in a leaf are separated using paper chromatography.



## What to record

The chromatogram produced in this experiment can be dried and kept.

## What to do

1. Finely cut up some leaves and fill a mortar to about 2 cm depth.
2. Add a pinch of sand and six drops of propanone from the teat pipette.
3. Grind the mixture for at least three minutes.
4. On a strip of chromatography paper, draw a pencil line 3 cm from the bottom.
5. Use a fine glass tube to put liquid from the leaf extract onto the centre of the line. Keep the spot as small as possible.
6. Allow the spot to dry, then add another spot on top. Add five more drops of solution, letting each one dry before putting on the next. The idea is to build up a very concentrated small spot on the paper.
7. Put a small amount of propanone in a beaker and hang the paper so it dips in the propanone. Ensure the propanone level is below the spot.
8. Leave until the propanone has soaked near to the top.
9. Mark how high the propanone gets on the paper with a pencil and let the chromatogram dry.

## Safety

Propanone is highly flammable. Wear eye protection.

## Questions

1. How many substances are on the chromatogram?
2. What colours are they?
3. Which colour moved furthest?







Metals used	Which metal forms the positive terminal (+ve)	Which metal forms the negative terminal (-ve)	Voltage (V)
Zinc and copper			
Copper and lead			
Lead and iron			
Zinc and lead			
Iron and magnesium			
Zinc and iron			
Zinc and magnesium			
Lead and magnesium			
Copper and magnesium			
Copper and iron			

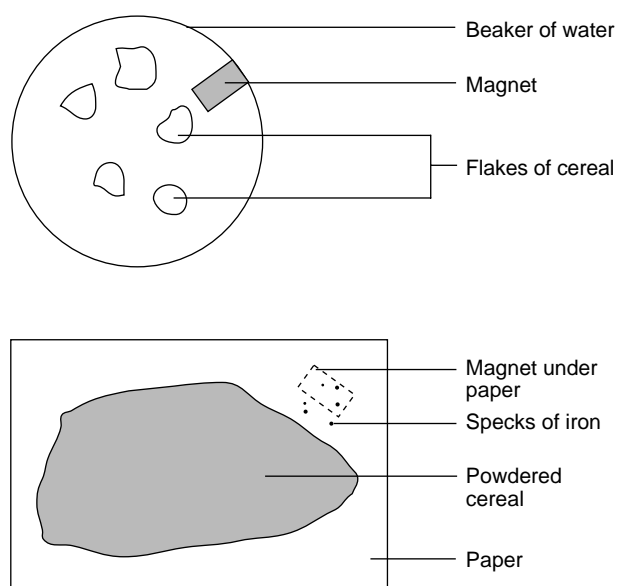
## Questions

1. Place zinc, magnesium, copper, lead, and iron in order of reactivity.

# Iron in breakfast cereal

## Introduction

Many breakfast cereals are fortified with iron. This iron is metallic and is added to the cereal as tiny particles of food grade iron before packaging. This experiment involves extracting the iron.



## What to do

1. Float four to six pieces of cereal on the surface of a beaker of water.
2. Hold a magnet close to the cereal and see if this can cause a piece to move.
3. Put some cereal into a mortar and use a pestle to produce a very fine powder.
4. Spread the powder on a piece of paper.
5. Put a magnet under the paper and move the paper over the magnet.
6. Observe closely in the region of the magnet as the cereal moves over it.

## Questions

1. Are all metals attracted to a magnet?
2. What are the symptoms of iron deficiency in the diet?

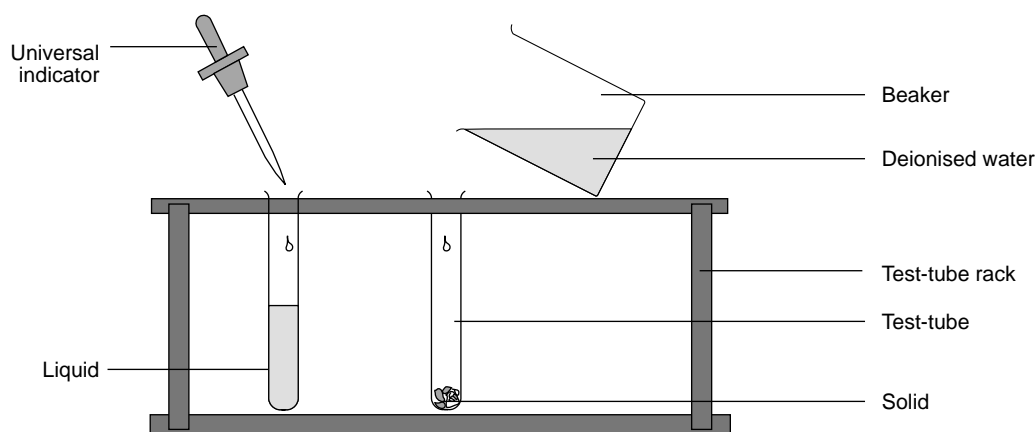




# The pH scale

## Introduction

The pH of a substance can be found by dissolving a small amount of the substance in deionised water and adding a few drops of Universal Indicator solution. The colour produced is compared with a pH chart.



## What to record

Prepare a table for your results

Solution	Colour with Universal Indicator	pH

## What to do

1. Place one spatula measure of solid, or pour a few drops of liquid into a test-tube.
2. Half-fill the test-tube with deionised water from a small beaker, and shake to dissolve the solid or mix the liquid.
3. Add a few drops of Universal Indicator to the test-tube. Make a note of the colour in the table. Compare it against the pH colour chart and record the pH of the nearest colour in the table.

## Safety

Wear eye protection.

## Questions

1. List the substances that were acidic, substances that were alkaline and substances that were neutral.
2. Why might a scientist prefer to use Universal Indicator rather than a different indicator like litmus?
3. What would happen if equal amounts of vinegar and limewater were mixed?