Year 7 Science
Chemical Sciences
Separation Techniques - Chromatography and Crystallisation

- Set up the following activities.
- Record your observations for each activity.
- Labelled photographs would be perfect.

Try the following inks.

- Permanent pen - blue, black, red.
- White board marker - blue, black, red, green.
- Food colouring - red, blue, green, pink, yellow.

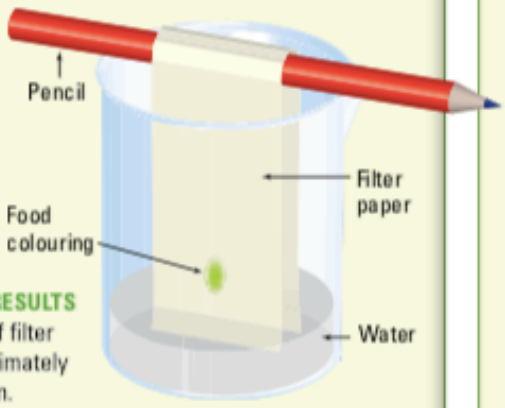
INVESTIGATION 5.6

Separating colours

AIM To use paper chromatography to separate substances in food colouring

Materials:

food colouring
toothpick
filter paper
scissors
250 mL beaker
pencil
ruler



METHOD AND RESULTS

- Cut a piece of filter paper approximately 10 cm by 3 cm.
- Rule a pencil line 2 cm from the end of the paper.
- Use the flat end of a toothpick to place a small dot of food colouring in the centre of the pencil line on the filter paper.
- Pour tap water into the beaker to a depth of 1 cm.
- Stand the filter paper so that the end just dips into the water. Make sure that you keep the dot of food colouring out of the water.
- Fix the filter paper to a pencil to hold it in the beaker.
- Leave the filter paper to stand until the water has risen almost to the top.
- Repeat the experiment with different food colourings.

1. What colours were in the first food colouring tested?
2. List the different food colourings that you tested. For each one, write down the colours that made up the food colouring.

DISCUSS AND EXPLAIN

3. How do you think the colours are actually separated using this method?

INVESTIGATION 5.7

Crystallisation

AIM To observe separation by crystallisation

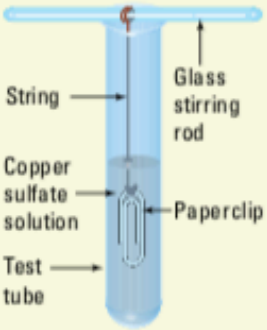
This activity must be done in class with your teacher.

Materials:

test tube
solid copper sulfate (or alum)
a balance
150 mL beaker
glass stirring rod
hot water
string
test-tube rack
piece of filter paper
filter funnel
conical flask or beaker
paperclip

METHOD AND RESULTS

- Weigh 28 g of the copper sulfate in the beaker.
- Prepare a hot concentrated solution of the copper sulfate by pouring 20 mL of hot water into the beaker. Stir the solution until no more solid will dissolve.
- Pour the blue copper sulfate solution through the filter paper into the conical flask or beaker. The undissolved copper sulfate will remain on the paper.
- Quickly pour the solution into a test tube.
- Tie the string to the glass rod. Attach the paperclip to the end of the string and arrange it as shown at right.
- Leave to cool overnight in the test-tube rack.



1. Describe the changes that have taken place in the test tube.

DISCUSS AND EXPLAIN

2. Identify the solid substance that has formed.
3. What do you think was the purpose of the paperclip?

Activity 5.6 - Chromatography

Observations

Question: How do you think the colours are separated?

Activity 5.7 - Crystallisation

Observations

Question: How successful is this technique in recovering the solute?