a

Define a pure substance.

How can you distinguish a pure substance from an impure substance?

What will happen to the above if there are impurities in the sample?

b

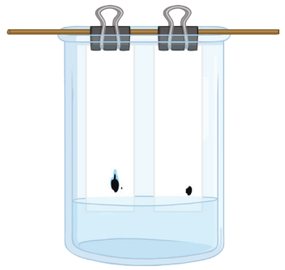
What is a formulation?

Give some everyday examples of where formulations are used.

1.
2.
3.
4.
5.
6.

c

What does chromatography separate?



Describe how the process works. Use the diagram to help.

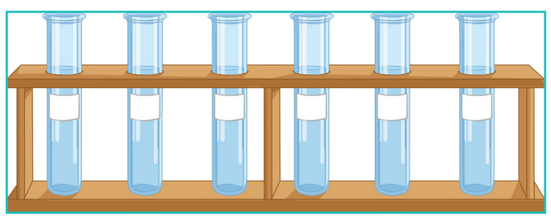
Complete the word equation for calculating the Rf value.

Rf =

How does the Rf value allow you to identify a substance?

d

What colour does litmus go if chlorine is present?



e

What is the Rf value of the following chromatogram?

The distance moved by substance B is 30mm and the distance moved by solvent A is 52mm.

f

What are the 2 phases of chromatography?

1.
2.

g

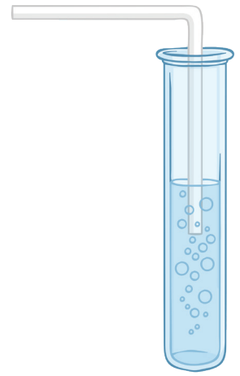
Describe the test for oxygen.

h

What gas does this experiment test for?

i

What gas does this experiment test for?



What colour does the limewater go if the gas is present?

j

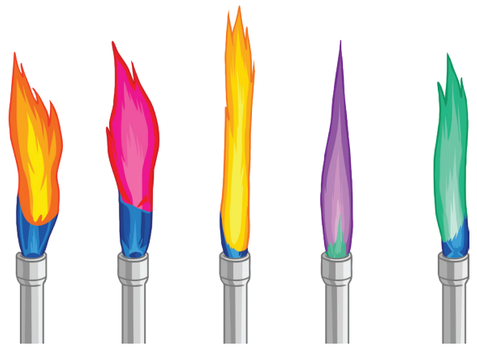
I understand the following topic...

I need to work on the following topic...

a

Match the metal to the colour flame it produces by connecting with a straight line.

lithium sodium potassium calcium copper



b

Transition metal compounds produce coloured precipitates when mixed with sodium hydroxide solution. Complete the table to show the colour of the different precipitates.

Transition Metal Ion	Precipitate Colour
Al^{3+}, Ca^{2+}, Mg^{2+}	white
Cu^{2+}	_____
Fe^{2+}	_____
Fe^{3+}	_____

c

$NaHCO_{3\,(aq)} + HCl_{(aq)} \rightarrow$ _____ $_{(aq)}$ + _____ $_{(g)}$ + _____ $_{(l)}$

d

When mixed with a solution of silver nitrate and dilute nitric acid, halide ions form coloured precipitates.

- Silver _____ produces a white precipitate.
- Silver _____ produces a cream precipitate.
- Silver _____ produces a yellow precipitate.

e

Why are instrumental methods, e.g. spectroscopy, more useful than chemical analysis methods?

_____

f

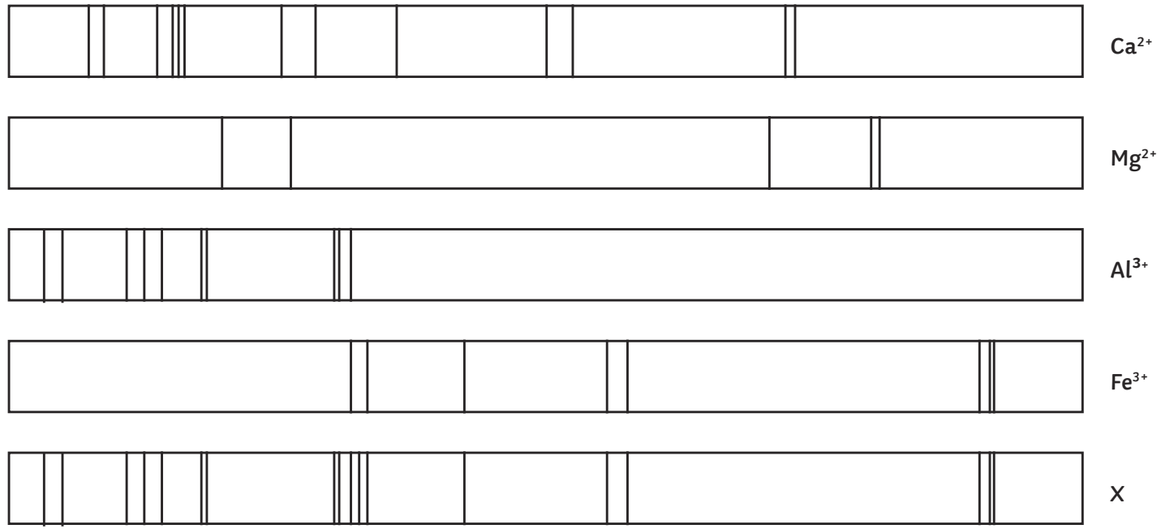
Explain how flame emission spectroscopy can be used to identify the elements in an unknown sample.

_____

_____

g

Look at the spectroscopy results below.



Which metal ions are contained in sample X? _____

a

Define a pure substance.

When nothing has been added to a substance.

How can you distinguish a pure substance from an impure substance?

The melting and boiling points of substances allow you to distinguish one substance from another. e.g. pure water boils at 100°C.

What will happen to the above if there are impurities in the sample?

They will lower the melting point.

They will increase the boiling point.

b

What is a formulation?

Useful mixtures that have a particular use.

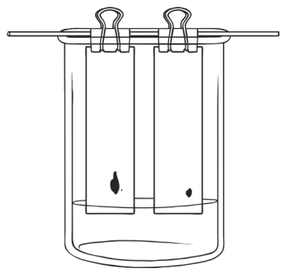
Give some everyday examples of where formulations are used.

paint, fertilisers, cleaning products, fuels, cosmetics, nail polish, perfume, medicine, pesticides, inks.

c

What does chromatography separate?

It separates 2 or more soluble substances in a mixture.



Describe how the process works. Use the diagram to help.

The solvent moves up the paper. As it moves, it takes the mixture with it.

The more soluble the substance, the farther it moves up the paper.

Some are not as soluble so do not travel as far. They separate into different spots.

Complete the word equation for calculating the Rf value.

$$\text{Rf} = \frac{\textbf{distance moved by substance (B)}}{\textbf{distance moved by solvent (A)}}$$

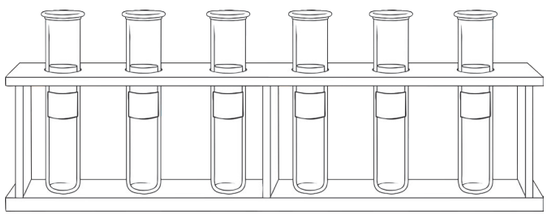
How does the Rf value allow you to identify a substance?

Each solvent has a different Rf value.

d

What colour does litmus go if chlorine is present?

It turns white.



e

What is the Rf value of the following chromatogram?

The distance moved by substance B is 30mm and the distance moved by solvent A is 52mm.

$$\text{Rf} = \frac{30}{52} = 0.58$$

f

What are the 2 phases of chromatography?

1. **Mobile phase**
   Where the molecules can move.
2. **Stationary phase**
   Where the molecules can not move.

g

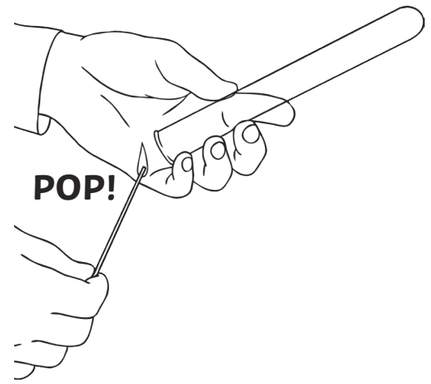
Describe the test for oxygen.

If a glowing splint is put into a test tube filled with oxygen, the splint will relight.

h

What gas does this experiment test for?

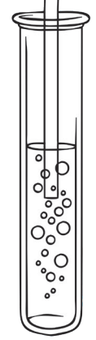
It is the test for hydrogen gas.



i

What gas does this experiment test for?

It is the test for carbon dioxide



What colour does the limewater go if the gas is present?

Cloudy white.

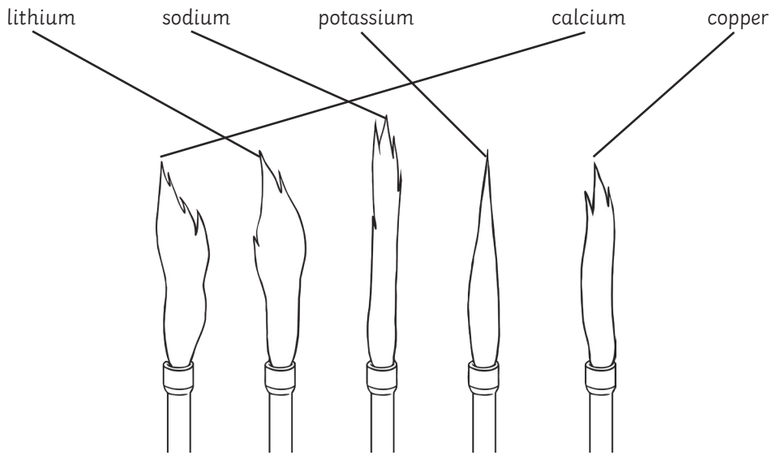
j

I understand the following topic...

I need to work on the following topic...

a

Match the metal to the colour flame it produces by connecting with a straight line.



b

Transition metal compounds produce coloured precipitates when mixed with sodium hydroxide solution. Complete the table to show the colour of the different precipitates.

Transition Metal Ion	Precipitate Colour
Al^{3+}, Ca^{2+}, Mg^{2+}	white
Cu^{2+}	**blue**
Fe^{2+}	**green**
Fe^{3+}	**brown**

c

$NaHCO_{3\,(aq)} + HCl_{(aq)} \rightarrow \mathbf{NaCl}_{(aq)} + \mathbf{CO_{2\,(g)}} + \mathbf{H_2O}_{(l)}$

d

When mixed with a solution of silver nitrate and dilute nitric acid, halide ions form coloured precipitates.

- Silver **chloride** produces a white precipitate.
- Silver **bromide** produces a cream precipitate.
- Silver **iodide** produces a yellow precipitate.

e

Why are instrumental methods, e.g. spectroscopy, more useful than chemical analysis methods?

More accurate, more sensitive and rapid.

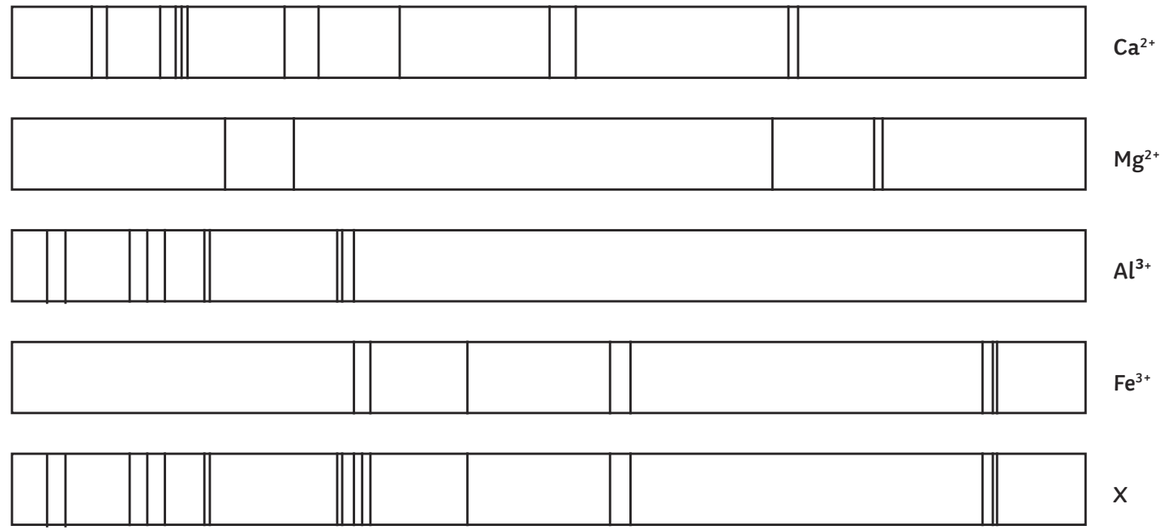
f

Explain how flame emission spectroscopy can be used to identify the elements in an unknown sample.

The light emitted from a flame containing a sample being analysed is measured. Each element produces a specific spectrum, which can be matched to the spectra of the sample.

g

Look at the spectroscopy results below.



Which metal ions are contained in sample X?

Al^{3+} and Fe^{3+}