

# C4.2.2 Detecting Cations

## Previous knowledge:

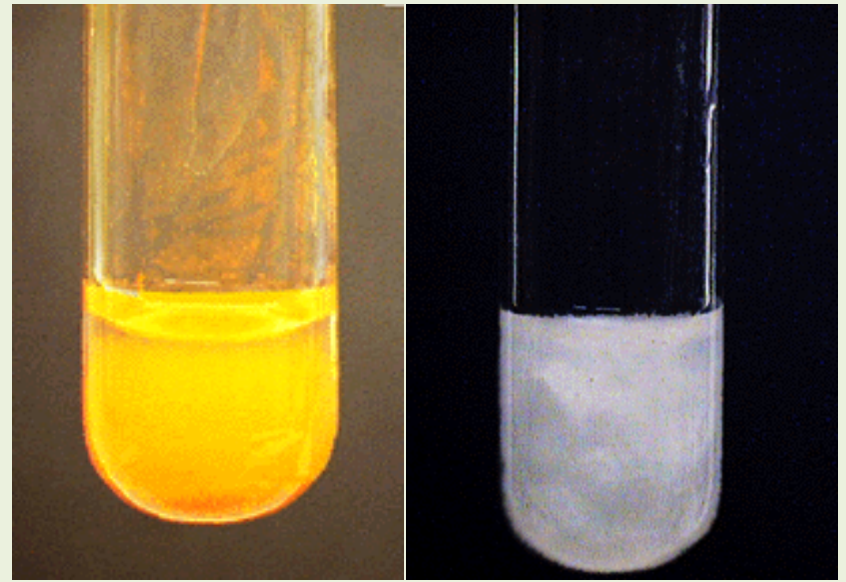
- An ion is an atom that has gained or lost electrons, thus becoming a charged particle
- A cation is a positive ion
- Hydroxide is  $\text{OH}^-$
- A precipitate is an insoluble solid that forms from a solution

Answer the quiz questions

# Learning Objectives

- Describe how to carry out flame tests
- Describe how to carry out hydroxide precipitate tests
- Interpret the results of these tests to identify an unknown

**Test 1:** Add sodium hydroxide solution and observe the colour of the precipitate



Calcium + zinc = white precipitate

Copper = blue precipitate

Iron (II) /  $\text{Fe}^{2+}$  = green precipitate

Iron (III) /  $\text{Fe}^{3+}$  = orange/brown precipitate

**Test 2:** Place the chemical in a blue flame and observe the colour

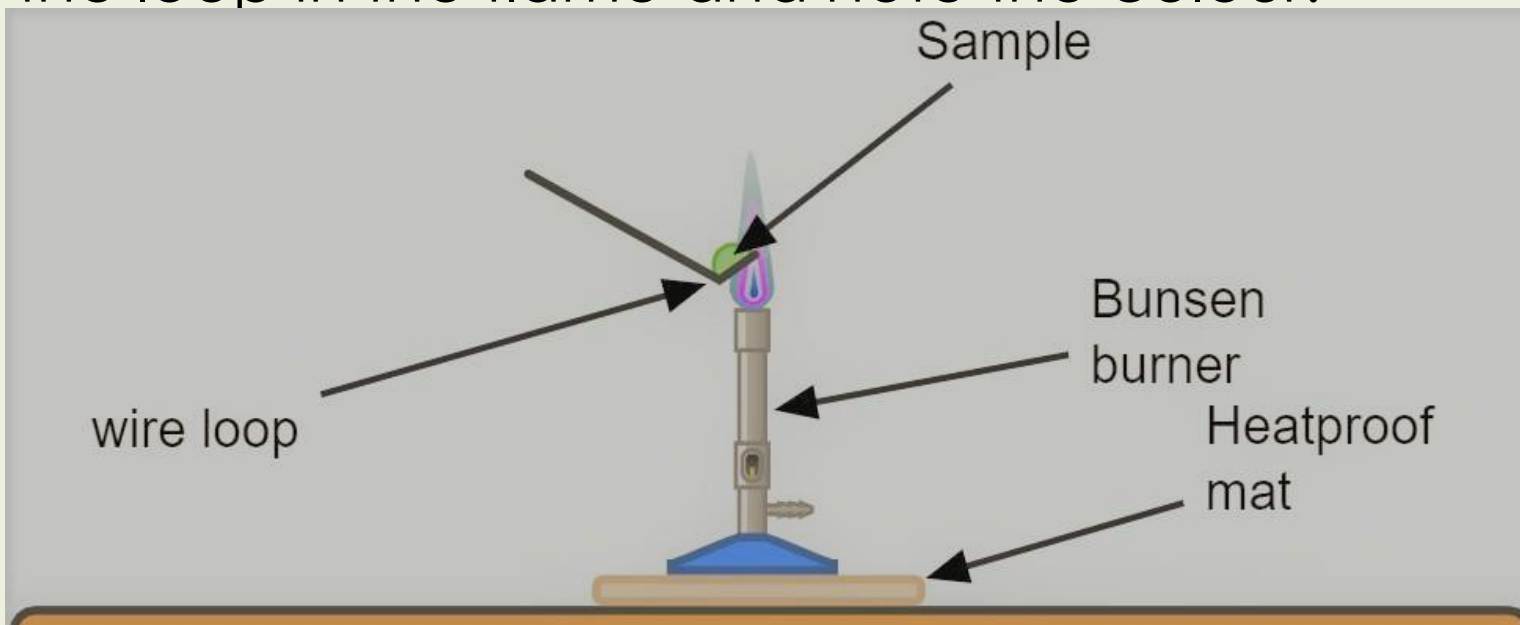
- Metal compounds emit a colour when they are placed in a flame
- Different metals will give different colours

**Extension task:** Find out how electrons are linked to the colour being emitted. Draw a diagram to help explain it.

# Flame tests in more detail

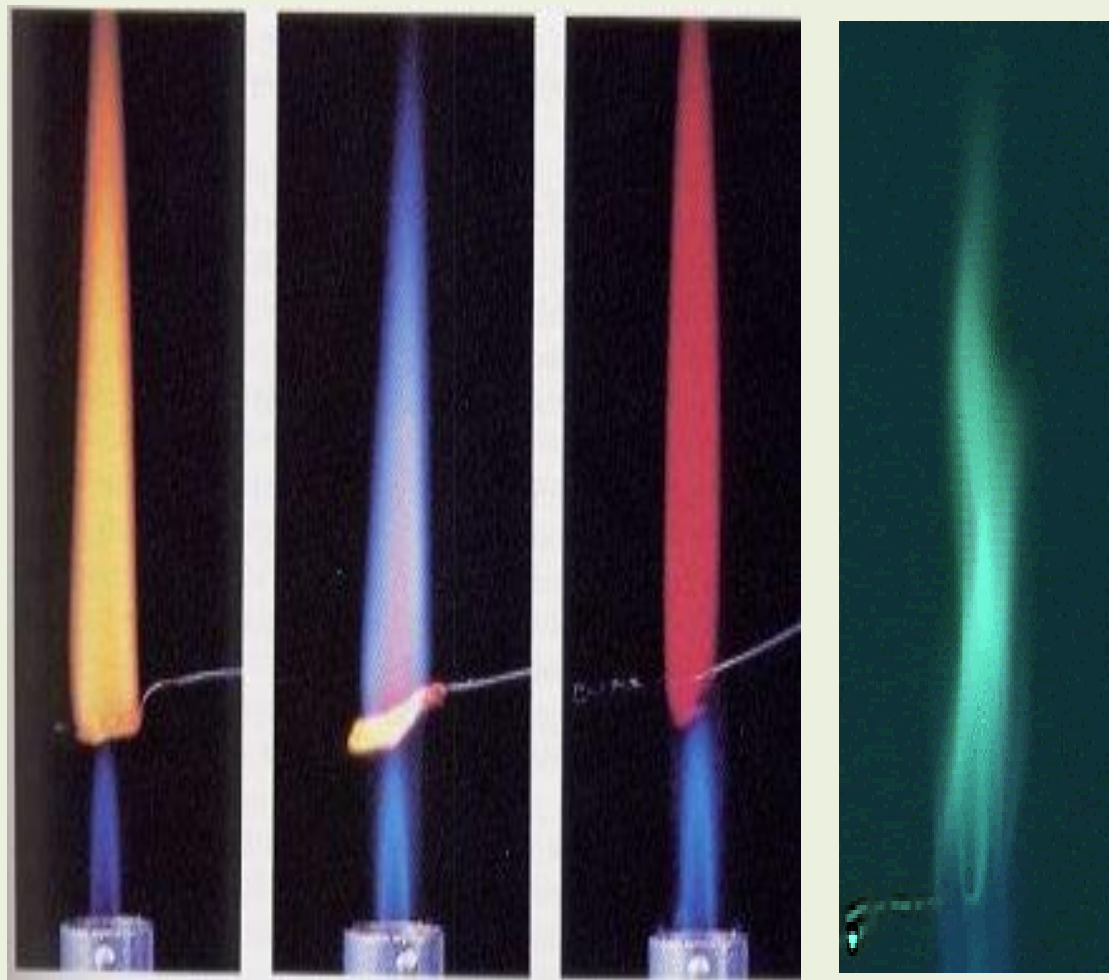


- Put goggles on
- Clean the loop by dipping into acid
- Burn the acid off in the flame until the colour does not change.
- Dip the loop into acid to moisten it
- Dip the loop in the metal salt solution.
- Put the loop in the flame and note the colour.



<b>Metal</b>	<b>Ion</b>	<b>Colour of flame</b>
Lithium	Li <sup>+</sup>	Red
Sodium	Na <sup>+</sup>	Yellow
Potassium	K <sup>+</sup>	Lilac
Calcium	Ca <sup>2+</sup>	Orange-red
Copper	Cu <sup>2+</sup>	Green-blue

**TASK 1:** List the names of each metal.



A

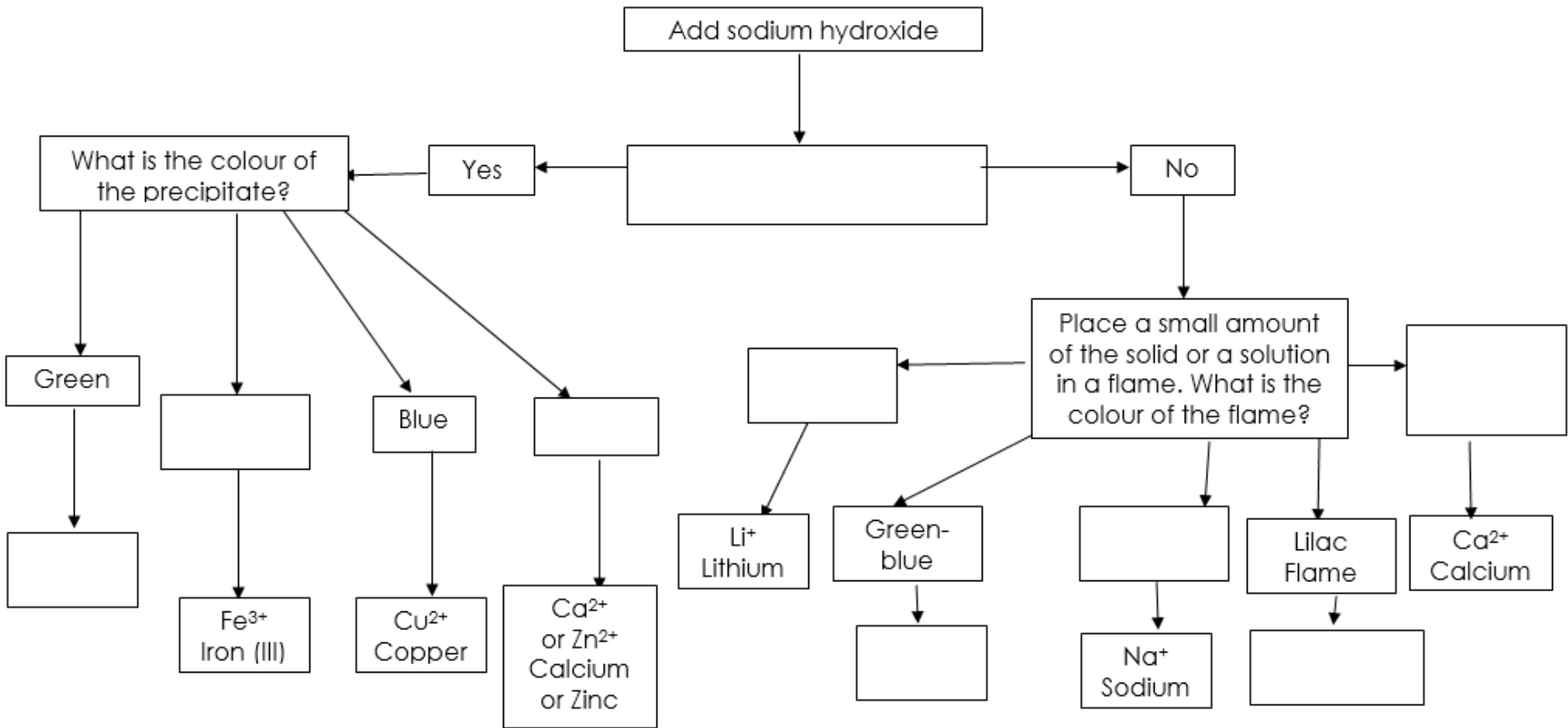
B

C

D



# TASK 2: Copy the flow chart and fill in the blanks



Answer the quiz questions