

-----Identifying Cations-----

There are two ways of testing for cations:

A. By using sodium hydroxide or aqueous ammonia solution.

B. Flame test

A: By using sodium hydroxide or aqueous ammonia solution.

Procedure:

- 1.Put a small amount of solution you want to identify into a test tube.
- 2.Add a few drops of aqueous sodium hydroxide.
- Observe the colour of the precipitate formed.
- Add excess sodium hydroxide and shake the test tube.
- Record whether or not the precipitate dissolves and any colour change.

Note :

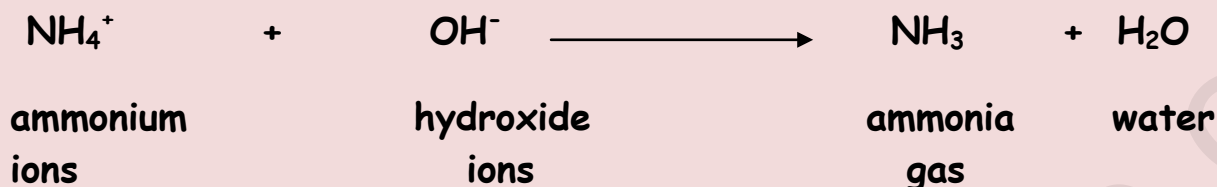
- Sodium hydroxide and ammonia react in a similar way with some of the ions. However we use these two alkalis to distinguish between the colourless solutions containing the aluminum and zinc ions.
- If the alkalis are not in excess, the precipitates formed are metal hydroxides.

Identifying Cations

Metal cation	Result with aqueous NaOH	Result with aqueous ammonia
Al^{3+}	White precipitate	White precipitate
	Soluble in excess (Colourless solution)	Insoluble in excess
Ca^{2+}	White precipitate	No precipitate or very slight white precipitate
	Insoluble in excess (Colourless solution)	
Cu^{2+}	Light blue precipitate	Light blue precipitate
	Insoluble in excess	Soluble in excess (Dark blue solution)
Cr^{3+}	Grey-green precipitate	Grey-green precipitate
	Soluble in excess , green solution	Soluble in excess , green solution, partly dissolves on standing to form a violet solution
Fe^{2+}	Grey-green precipitate	Grey-green precipitate
	Insoluble in excess	Insoluble in excess
Fe^{3+}	Reddish brown precipitate	Reddish brown precipitate
	Insoluble in excess	Insoluble in excess
Zn^{2+}	White precipitate	White precipitate
	Soluble in excess (Colourless solution)	Soluble in excess (Colourless solution)

Test for ammonium ions:

Heat the solution with sodium hydroxide solution. If the solution contains ammonium ions, then ammonia gas will be given off which will turn damp red litmus paper blue.



Flame tests for cations:

A flame test can be used to identify some cations especially those in compounds containing elements from Group 1 and 2.

Procedure:

- Clean a platinum or a nichrome wire by dipping it in concentrated hydrochloric acid.
- Place a sample of a compound on the end of the wire.
- Hold the wire on the edge of a non-luminous (blue) Bunsen flame.
- Note any change in the colour of the flame.

Metal ion	Flame colour
Li^+	Red/Bright red
Na^+	Golden yellow/orange
K^+	Purple/lilac
Cu^{2+}	Blue-green
Ba^{2+}	Apple green
Ca^{2+}	Brick red