

Reasoning:

Obtain sodium peroxide by mixing equal volume of about 1mL each of NaOH and H_2O_2

Iron forms a blue ppt(prussian blue) of $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$

Iron forms $[\text{Fe}(\text{CN})_6]^{3-}$ complex which is blood red coloured.

Aluminium forms a gelatinous white ppt of $\text{Al}(\text{OH})_3$

Analysis of the 4th group ppt

To the ppt add dil HCl and boil it	The ppt dissolves	Presence of zinc
i.)Test for zinc To the solution add about 1.5mL of dil. NaOH and boil it	A clear solution is obtained	Presence of zinc

Reasoning:

Zinc initially forms $\text{Zn}(\text{OH})_2$ ppt, and it dissolves in excess to form sodium zincate (Na_2ZnO_2)

Zinc forms white ppt of ZnS

Analysis of the 5th group ppt:

To the ppt add about 1mL of dil. acetic acid and gently heat it. The ppt dissolves. Divide the solution into two portions. i).To one portion add about 1mL of potassium chromate	A yellow ppt is obtained. Filter the ppt using a funnel and filter paper, and transfer the residue to a watch glass. Add a drop of Conc. HCl. Take a portion of the paste at the charred end of a splinter and introduce near the Bunsen flame. A transient green is imparted to the flame	Presence of barium.
ii). To an another portion add about 1mL of ammonium sulphate	A white ppt is obtained. Filter the ppt using a filter paper and funnel. Transfer the residue to a watch glass. Add a drop of Conc. HCl. Take the residue at the charred end of the splinter and introduce near the Bunsen flame. A crimson red colour is seen If no ppt is obtained, to the solution add about 1mL of potassium ferrocyanide and shake it. A pale yellow ppt appears.	Presence of calcium

Reasoning:

Barium forms a yellow BaCrO_4 ppt

The pale yellow ppt of calcium is due to $\text{Ca}_2[\text{Fe}(\text{CN})_6]$