Cations:

<table>
<tr><th>Salt Solution</th><th>Cation</th><th>Aqueous NaOH</th><th>Aqueous Ammonia</th></tr>
<tr><td>$FeSO_4$
Pale Green</td><td>Fe^{2+}</td><td>Dirty-green ppt formed, insoluble in excess aqueous NaOH. Ppt turned reddish brown on standing in air.</td><td>Dirty green ppt formed, insoluble in excess aqueous NH_3. Ppt turned reddish brown on standing in air.</td></tr>
<tr><td>$FeCl_3$
Yellow</td><td>Fe^{3+}</td><td>Reddish brown ppt was formed, insoluble in excess aqueous NaOH</td><td>Reddish brown ppt was formed, insoluble in excess aqueous NH_3.</td></tr>
<tr><td>$CuSO_4$
Blue</td><td>Cu^{2+}</td><td>Blue ppt formed, insoluble in excess aqueous NaOH</td><td>Blue ppt formed, soluble in excess aqueous NH_3 to form a dark blue solution</td></tr>
<tr><td>$CaCl_2$
Colourless</td><td>Ca^{2+}</td><td>White ppt formed, insoluble in excess aqueous NaOH</td><td>No visible reaction</td></tr>
<tr><td>$ZnSO_4$
Colourless</td><td>Zn^{2+}</td><td rowspan="3">White ppt formed, soluble in excess aqueous NaOH to form a colourless solution.</td><td>White ppt formed, soluble in excess aqueous NH_3 to form a colourless solution</td></tr>
<tr><td>$AlCl_3$
Colourless</td><td>Al^{3+}</td><td rowspan="2">White ppt formed, insoluble in excess aqueous NH_3</td></tr>
<tr><td>$Pb(NO_3)_2$
Colourless</td><td>Pb^{2+}</td></tr>
<tr><td>NaCl
Colourless</td><td>Na^+</td><td colspan="2" rowspan="2">No visible reaction</td></tr>
<tr><td>KNO_3
Colourless</td><td>K^+</td></tr>
<tr><td>NH_4Cl
Colourless.
Warm the solution after adding aq. NaOH and test for any gas evolved.</td><td>NH_4^+</td><td>No visible reaction. When warmed, a colourless and pungent gas evolved turned moist red litmus blue. NH_3 gas was liberated.</td><td>Not applicable</td></tr>
</table>

Anion:

Antion	Solution added	Observation
CO_3^{2-}	+ dilute acid	Effervescence, colourless odourless gas evolved, produces white ppt in limewater
SO_4^{2-}	+ BaCl/ $Ba(NO_3)_2$	White ppt, insoluble in dilute acid
Cl^-	+ $AgNO_3$	White ppt, soluble in NH_3
I^-	+ $Pb(NO_3)_2$ + $AgNO_3$	Yellow ppt, insoluble in NH_3 Pale yellow ppt, insoluble in NH_3
NO_3^-	+ Devarda's alloy + Heat	Vigorous effervescence, NH_3 produced (NH_3 test)

Difference between Al and Pb:

1. When KI is added
    a. Al: No visible reaction
    b. Pb: Yellow ppt formed
2. When added into water
    a. Al: Soluble
    b. Pb: Insoluble