

Table 1. Characteristic reactions of cations of Group III (↓ precipitate; → goes to)

	Co²⁺	Ni²⁺	Fe²⁺	Fe³⁺	Mn²⁺	Cr³⁺	Al³⁺	Zn²⁺
Color of ion	pink	green	colorless, in a higher concentration is pale green	yellow; the color comes from Fe(OH) ₃ (salt hydrolysis)	colorless, in a higher concentration is pale pink	from gray-green to blue-violet	colorless	colorless
AKT + ammonium buffer	↓CoS black, dissolved in concentrated HNO ₃	↓NiS black	↓FeS black	↓Fe ₂ S ₃ black (dissolved in diluted acid)	↓MnS dirty pink	↓Cr(OH) ₃ green gray	↓Al(OH) ₃ white	↓ZnS white
NaOH or KOH	↓Co(OH)Cl blue, after heating → Co(OH) ₂ dirty pink	↓Ni(OH) ₂ green	↓Fe(OH) ₂ green → brown	↓Fe(OH) ₃ brown	↓Mn(OH) ₂ white → brown	↓Cr(OH) ₃ green gray, dissolved in an excess of NaOH ([Cr(OH) ₄] ⁻)	↓Al(OH) ₃ white, dissolved in an excess of NaOH ([Al(OH) ₄] ⁻)	↓Zn(OH) ₂ white, dissolved in an excess of NaOH ([Zn(OH) ₄] ²⁻)
NH₃ aq	↓Co(OH)Cl pinky-red, dissolved in an excess of NH ₃ aq and heating → [Co(NH ₃) ₆] ²⁺	↓Ni(OH)Cl green, dissolved in an excess of NH ₃ aq → [Ni(NH ₃) ₆] ²⁺ blue	↓Fe(OH) ₂ green → brown	↓Fe(OH) ₃ brown	↓Mn(OH) ₂ white → brown	↓Cr(OH) ₃ green gray, dissolved in an excess of NH ₃ aq → [Cr(NH ₃) ₆] ³⁺	↓Al(OH) ₃ white	↓Zn(OH) ₂ white, dissolved in an excess of NH ₃ aq → [Zn(NH ₃) ₄] ²⁺
(NH₄)₂CO₃	↓Co ₈ O ₅ (CO ₃) ₃ pinky-red, dissolved in an excess of (NH ₄) ₂ CO ₃ → [Co(NH ₃) ₆] ²⁺	↓Ni ₅ (OH) ₆ (CO ₃) ₂ light green, dissolved in an excess of (NH ₄) ₂ CO ₃ → [Ni(NH ₃) ₆] ²⁺ blue	↓FeCO ₃ white	↓Fe(OH) ₃ brown	↓MnCO ₃ white	↓Cr(OH) ₃ green gray	↓Al(OH) ₃ white	↓ZnCO ₃ white, dissolved in an excess of (NH ₄) ₂ CO ₃ → [Zn(NH ₃) ₄] ²⁺
Na₂HPO₄	↓Co ₃ (PO ₄) ₂ ·7H ₂ O blue-violet	↓Ni ₃ (PO ₄) ₂ yellow-green	↓FeHPO ₄ + ↓Fe ₃ (PO ₄) ₂ white → blue	↓FePO ₄ creamy	↓Mn ₃ (PO ₄) ₂ white	↓CrPO ₄ green gray	↓AlPO ₄ white gelatinous	↓Zn ₃ (PO ₄) ₂ white gelatinous
K₄[Fe(CN)₆]	↓Co ₂ [Fe(CN) ₆] gray-green	↓Ni ₂ [Fe(CN) ₆] yellow-green	↓Fe ₂ [Fe(CN) ₆] blue	↓Fe ₄ [Fe(CN) ₆] ₃ dark blue	↓Mn ₂ [Fe(CN) ₆] dirty pink			↓Zn ₂ [Fe(CN) ₆] creamy