**Complex Ions**

* If a new chemical is added to a precipitate and the precipitate dissolves, a soluble complex ion is formed
* A complex ion is usually formed by molecules/ions combining with a central metal ion
* They are written in square brackets
* There are 7 complex ions that need to be remembered and memorized

**Testing for Zinc (Zn2+)**

**Test Equations Observations**

Add NaOH Zn2+ (aq) + 2OH- (aq) → Zn(OH)2 (s) white ppt

Add excess NaOH Zn2+ (aq) + 4OH- (aq) → [Zn(OH)4]2-(aq) ppt dissolves

Add NaOH Zn2+ (aq) + 2OH- (aq) → Zn(OH)2 (s) white ppt

Add excess NH3 Zn2+ (aq) + 4NH3 (aq) → [Zn(NH3)4]2+(aq) ppt dissolves

**Testing for Aluminium(Al3+)**

Add NaOH Al3+ (aq) + 3OH- (aq) → Al(OH)3 (s) white ppt

Add excess NaOH Al3+ (aq) + 4OH- (aq) → [Al(OH)4]-(aq) ppt dissolves

**Testing for Lead (Pb2+)**

Add NaOH Pb2+ (aq) + 2OH- (aq) → Pb(OH)2 (s) white ppt

Add excess NaOH Pb2+ (aq) + 4OH- (aq) → [Pb(OH)4]2-(aq) ppt dissolves

**Testing for Iron (III)**

Add NaOH Fe3+ (aq) + 3OH- (aq) → Fe(OH)3 (s) orange ppt

New Sample Fe3+ (aq) + SCN- (aq) → [FeSCN]2+(aq) Blood red

Add KSCN solution(not a ppt)

**Testing for Copper (Cu2+)**

Add NaOH Cu2+ (aq) + 2OH- (aq) → Cu(OH)2 (s) blue ppt

Add excess NH3 Cu2+ (aq) + 4NH3 (aq) → [Cu(NH3)4]2+(aq) ppt dissolves, blue

 solution forms

**Testing for Silver (Ag+) – or confirming chloride (Cl-)**

Add NaOH Ag+ (aq) + OH- (aq) → AgOH (s) Brown ppt

Add excess NH3 Ag+ (aq) + 2NH3 (aq) → [Ag(NH3)]+(aq) ppt dissolves to

 clear solution