

Co-ordination Compounds

When solution containing two or more salts in stoichiometric (simple Molar) proportions are allowed to evaporate then crystals of new compounds separate out. This separated new compounds is categorised into two classes.

(1) Double salts (2) Complex salt or Coordination Compounds.

1. Double salts :- Double salts are those compounds which exist only in crystal lattices, but break down into their constituent components when dissolved in water or any other solvent. Its physical and chemical properties remains essentially the same as those of the individual compounds.

Example of double salts :-

- (a) Potash alum :- $\text{Al}_2(\text{SO}_4)_3 \cdot \text{K}_2\text{SO}_4 \cdot 24\text{H}_2\text{O}$
- (b) Mohr's Salt :- $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$
- (c) Carnallite :- $\text{KCl} \cdot \text{MgCl}_2 \cdot 6\text{H}_2\text{O}$

These compounds are stable in solid state but when the lattice is disrupted on dissolution in water or any other solvent, they decompose into their individual components.

For example, :- A solution of Mohr's Salt shows the same physical and chemical properties as a mixture of the solution of ferrous sulphate and ammonium sulphate.

2. Complex Compounds or Co-ordination Compounds

Coordination Compounds are those Compounds which retain their identities only when dissolved in Water or any other solvent and their properties are completely different from those of the constituents.

It will be understood by an example when aqueous ammonia is added to green solution of Nickel chloride, the colour changes to Purple.

The Ni^{+2} ions almost disappear from solution. Ammonia enters into an intimate association with Ni^{+2} ion yielding a new ion of composition $[Ni(NH_3)_6]^{2+}$. Now ion $[Ni(NH_3)_6]^{2+}$ is known as Complex ion of the compound $[Ni(NH_3)_6]Cl_2$ is called Complex salt or Complex Compound or Coordination Compound.

The properties of Complex Compound $[Ni(NH_3)_6]Cl_2$ are entirely different from those of free Ni^{2+} ion or ammonia.

Ionisation of the Compound $[Ni(NH_3)_6]Cl_2$ occurs as: -

