## Complex compounds:

- Two or more different compounds combine and exhibits the properties of all the components present in it, called double salt. Ex. Alums, Carnalite.
- Double salt ionises completely and respond positively to all the tests of constituent ions.
- Carnalite is formed by combining KCl and $MgCl_2$. It exhibits the properties of $K^+$, $Mg^{++}$, and $Cl^-$.
- $K_2SO_4$, $Al_2(SO_4)_3$ 24 $H_2O$ is formed by mixing $K_2SO_4$, $Al_2(SO_4)_3$.
- It exhibits the properties of $K^+$, $Al^{+++}$, $SO_4^{-2}$.
- In molecular compound two compounds combine and does not exhibit the properties of all the ions present in it is, called complex compound.

**$K_4Fe(CN)_6$ Potassium ferrocyanide** it is formed by mixing KCN, $Fe(CN)_2$. It does not exhibit the properties of $Fe^{++}$ or $CN^-$. It is complex compound.

- A complex compound is also known as coordination compound with coordinate covalent bonds.
- A complex compound doesn't ionise completely and retains it identity even in aqueous state.
- Cuprous-ammonium sulphate, $CuSO_4$, $4NH_3$ is another complex compound.

**Important characters of complex compounds:**

- They are formed by combining stable compounds or species :
- They contain a new species different from the parent compounds from which it is formed.
- $K_4Fe(CN)_6$ contains $[Fe(CN)_6]^{-4}$ which is not present either in KCN or in $Fe(CN)_2$ from which it is formed.
- Complex species do not dissociate in solution.
- The properties of complex species formed are different from those of the parent compounds.
- Ex. $[Cu(NH_3)_4]SO_4$ is dark blue, where as $CuSO_4$ is pale blue and $NH_3$ is colorless.
- The physical properties like color, conductivity etc. of the complexes are different from the substances from which it is formed.
- Alfred Werner explained how complexes are formed.