



Coordination compounds

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**At the end of this presentations
you will be able to :**

01

**Define the Coordination
Compound**

02

**Describe the structure of
Coordination Compound**



03

**List types of
Coordination
Compound**

04

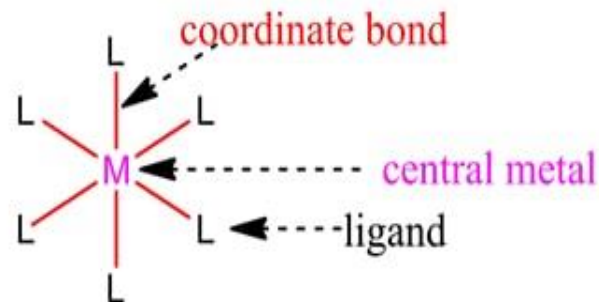


**Discuss Application of
Coordination Compound**

Introduction

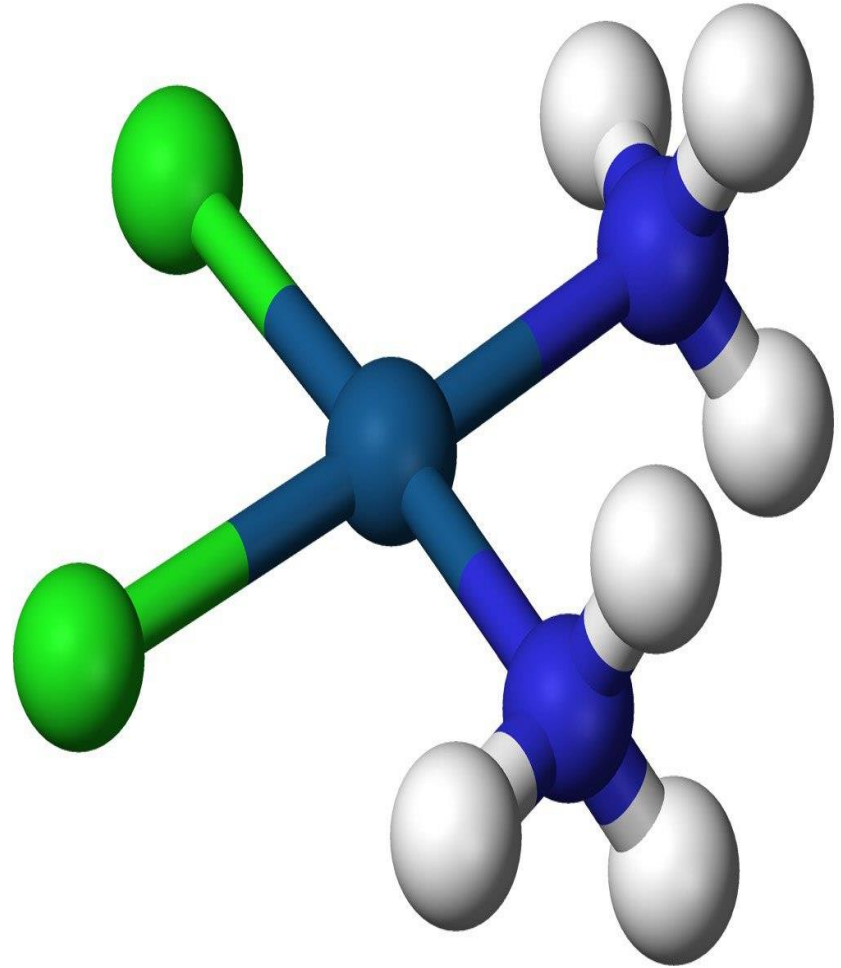
- A Coordination Compound is a species formed between a central metal ion and one or more surrounding ligands, molecules or ions that contain at least one lone pair of electrons
- Small, highly charged metal ions have the greatest tendency to act as Lewis acids and form complex ions.

metal complex



01

Define the Coordination Compound .

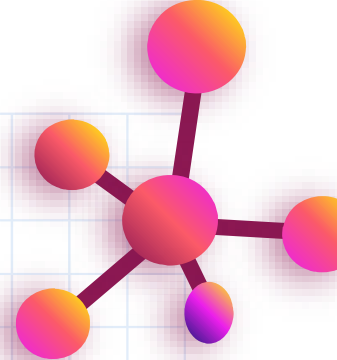


What is the mean of the Coordination Compound ?

- Coordination Compounds are formed when transition metal compounds are present in a solution.
- A Coordination Compound is a central metal ion surrounded by ligands.

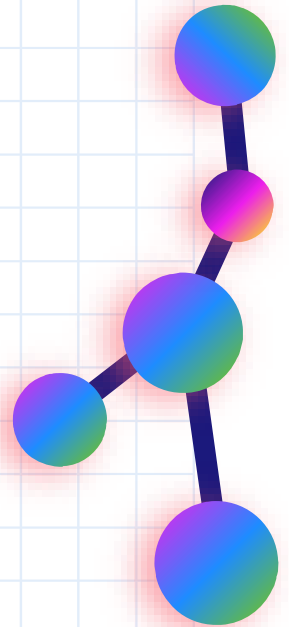
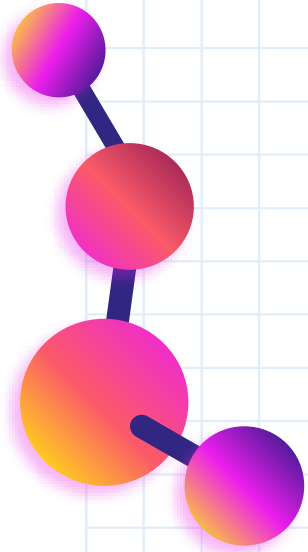
• The coordination number is the total number of sigma bonds through which the ligands are bound to the coordination center.

• A ligand is molecule or ion which can donate a pair of lone electrons to the metal ion to form a dative covalent bond.



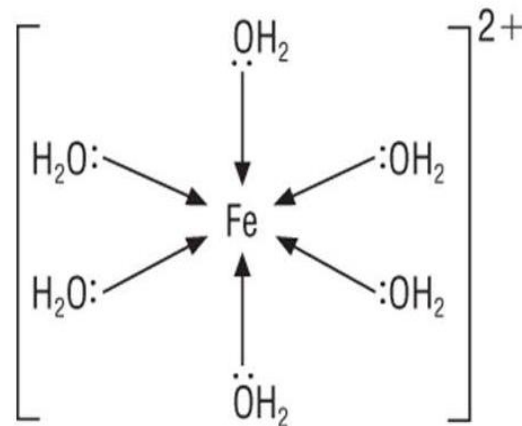
02

Structure of
Coordination
Compound



Structure of Coordination Compound :

- **Fe 2+** is the **metal ion**.
- **Ligands** are the **water molecules**.
- **Coordination number** is the number of coordinate bonds to the central metal ion = **6**.
- **Square brackets** groups the species and the **overall charge** is written outside the brackets.
- **Overall charge** is the sum of the charges of the metal ion and the ligands (if the ligands have charge).





03

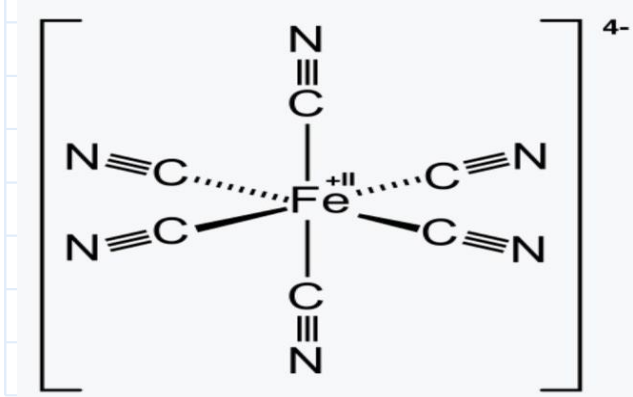
Types of Coordination Compound



Types of Coordination Compound :

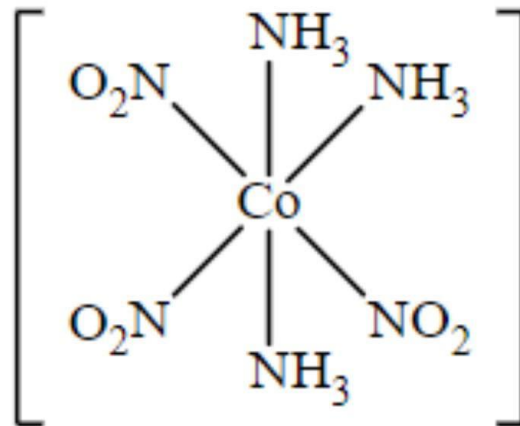
Homoleptic compound:

The complex consist of a similar type of ligands .



Heterolytic compound:

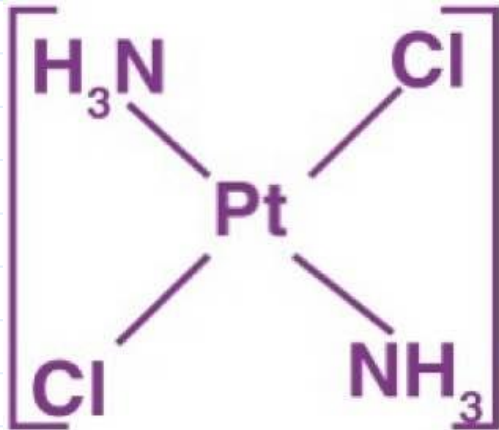
These consists of different type of ligands.



Types of Coordination Compound :

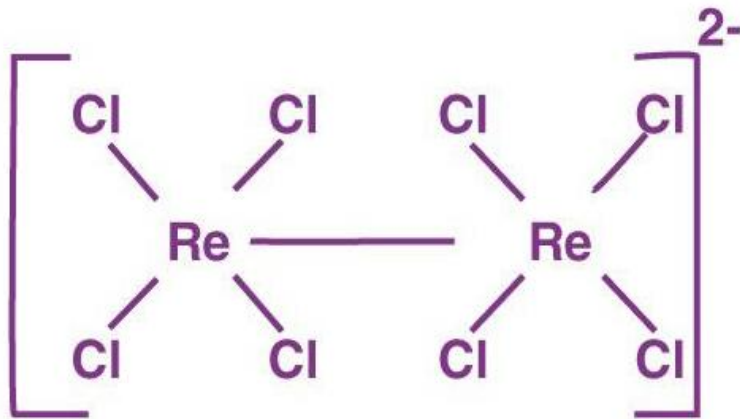
Mononuclear compound:

In this co-ordination sphere has single transition metal ion.



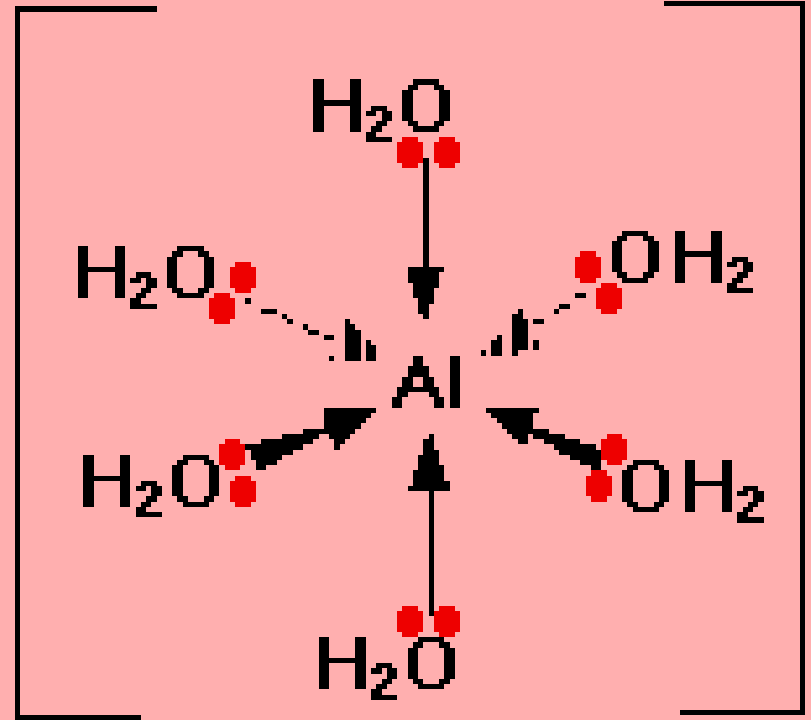
Polynuclear compound:

More than one transition metal ion is present.



04

Applications of Coordination Compound .



Applications of Coordination Compound :

Resolving optical isomers.

Increasing or decreasing reactivity.

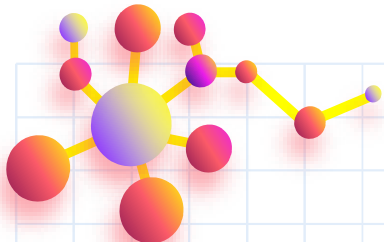
Preparing sustained-release dose.

Removing calcium ions from hard water.

Masking undesirable taste.

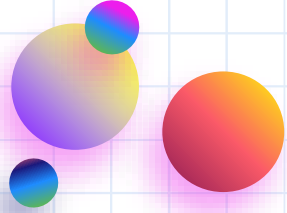
Hemoglobin, vitamin B12 and chlorophyll.

Preparing warfarin solution.



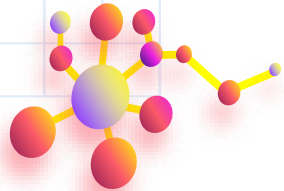
Summary :

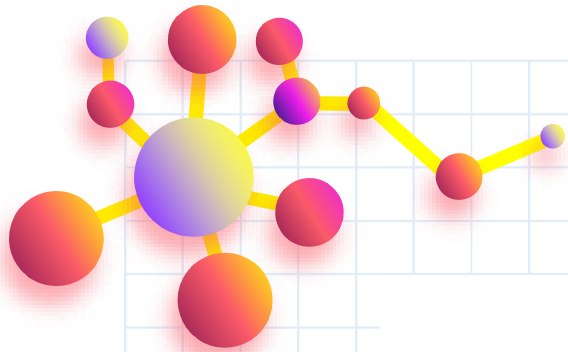
- Coordination Compounds are formed when transition metal compounds are present in a solution.
- A Coordination Compound is a central metal ion surrounded by ligands.
- A Coordination Compound has a metal ion at its center with a number of other molecules or ions surrounding it.
- Types of Coordination Complexes like , Homoleptic complex, Mononuclear complexes, Polynuclear complexes.
- Applications of Complexion ion like: increasing or decreasing reactivity hemoglobin, vitamin B12 and chlorophyll. masking undesirable taste.



Reference :

- <https://byjus.com/jee/coordination-compounds/>.
- [https://chem.libretexts.org/Bookshelves/Inorganic_Chemistry/Supplemental_Modules_and_Websites_\(Inorganic_Chemistry\)/Coordination_Chemistry/Structure_and_Nomenclature_of_Coordination_Compounds/Introduction_to_Coordination_Chemistry](https://chem.libretexts.org/Bookshelves/Inorganic_Chemistry/Supplemental_Modules_and_Websites_(Inorganic_Chemistry)/Coordination_Chemistry/Structure_and_Nomenclature_of_Coordination_Compounds/Introduction_to_Coordination_Chemistry).
- <https://www.sciencedirect.com/science/article/pii/B9780080453293000019>.





THANK YOU

