

**B.Sc.(H) Chemistry**  
**Semester - IV**  
**Core Course - VIII (CC-VIII)**  
**Inorganic Chemistry - III**



## **I. Coordination Chemistry**

### **13. IUPAC Nomenclature of Coordination Compounds-II**



**Dr. Rajeev Ranjan**  
**University Department of Chemistry**  
**Dr. Shyama Prasad Mukherjee University, Ranchi**

## **Coordination Chemistry: 20 Lectures**

Werner's theory, valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding. Crystal field theory, measurement of  $10 Dq$  ( $\Delta_o$ ), CFSE in weak and strong fields, pairing energies, factors affecting the magnitude of  $10 Dq$  ( $\Delta_o$ ,  $\Delta_t$ ). Octahedral vs. tetrahedral coordination, tetragonal distortions from octahedral geometry Jahn-Teller theorem, square planar geometry. Qualitative aspect of Ligand field and MO Theory.

IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelate effect, polynuclear complexes, Labile and inert complexes.

### **Coverage:**

1. IUPAC Nomenclature of Coordination Compounds-III : Examples

## IUPAC Nomenclature of Coordination Compounds-III



1. **Cation is named before the anion.**  
“chloride” goes last (the counterion)
2. **Ligands are named before the metal ion.**  
ammonia (ammine) and chlorine  
(chloro) named before cobalt

## IUPAC Nomenclature of Coordination Compounds-III



3. For negatively charged ligands, an “o” is added to the root name of an anion (such as fluoro, bromo, chloro, etc.).
4. The prefixes mono-, di-, tri-, etc., are used to denote the number of simple ligands.

**penta ammine**

## IUPAC Nomenclature of Coordination Compounds-III



5. The oxidation state of the central metal ion is designated by a Roman numeral:

**cobalt (III)**

6. When more than one type of ligand is present, they are named alphabetically:

**pentaamminechloro**

## IUPAC Nomenclature of Coordination Compounds-III



7. If the complex ion has a negative charge, the suffix “ate” is added to the name of the metal.

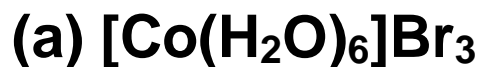
The correct name is:

**pentaamminechlorocobalt(III) chloride**

## IUPAC Nomenclature of Coordination Compounds-III

### Exercise

Qu. Name the following coordination compounds.



Ans. (a) Hexaaquacobalt(III) bromide

(b) Sodium tetrachloroplatinate(II)

**THANK YOU**