

CHAPTER: COORDINATION CHEMISTRY- LESSON PLAN

Date:

Class:

Period Required:

Gist of Unit /Sub Unit	Activities(Individual or Group)/Demo/ E-class/PPT
<p>❖ Postulates of Werner's theory of coordination compounds,</p> <p>❖ Some basic terms: coordination entity, central atom/ion, ligand, coordination number, coordination sphere, coordination polyhedron, oxidation number, homoleptic & heteroleptic;</p> <p>❖ Nomenclature of coordination compounds;</p> <p>❖ Formulas and names of mononuclear coordination compounds;</p> <p>❖ Isomerism</p> <p>❖ Valence Bond and Crystal Field theories;</p> <p>❖ Stability of coordination compounds;</p> <p>❖ Importance and applications of coordination compounds in our day to day life</p>	<p>➤ WERNER'S THEORY :: Primary and secondary valences</p> <p>➤ A COMPLEX GENERALLY CONSISTS OF FOLLOWING UNITS</p> <p>➤ LIGANDS may be classified as follows Monodentate :: Cl⁻ ; H₂O Didentate :: C₂O₄²⁻ (ox); Polydentate :: (EDTA)⁴⁻</p> <p>➤ EXAMPLES regarding IUPAC Nomenclature :- [Cr(NH₃)₃(H₂O)₃]Cl₃ :: Triamminetriaquachromium(III) chloride [Co(H₂NCH₂CH₂NH₂)₃](SO₄)₃ :: Tris(ethane-1,2-diammine)cobalt(III) sulphate</p> <p>➤ ISOMERISM :: (A).STRUCTURAL SOMERISM i. Linkage isomerism ii. Hydrate isomerism iii. Ionisation isomerism iv. Coordination isomerism (B). STEREOISOMERISM i. Geometrical isomerism ii. Optical isomerism</p> <div style="text-align: center;"> </div> <p>➤ VALENCE BOND THEORY:</p> <p>➤ MAGNETIC PROPERTIES :: $\mu = \sqrt{n(n+2)}$</p> <p>➤ SPECTROCHEMICAL SERIES : I⁻ < Br⁻ < SCN⁻ < Cl⁻ < S²⁻ < F⁻ < OH⁻ < C₂O₄²⁻ < H₂O < NCS⁻ < EDTA⁴⁻ < NH₃ < en < CN⁻ < CO</p> <p>➤ CRYSTAL-FIELD THEORY:</p> <div style="text-align: center;"> </div> <p>➤ COLOUR IN COORDINATION COMPOUNDS:</p> <p>➤ SYNERGIC BONDING</p> <div style="text-align: center;"> </div> <p>➤ STABILITY OF COORDINATION COMPOUNDS: $\beta_n = K_1 \times K_2 \times K_3 \times K_4 \dots K_n$</p> <p>➤ APPLICATIONS OF COORDINATION COMPOUNDS :: <u>Analytical chemistry</u>, Metallurgy, Biological processes, Medical Field etc.</p>

Remarks/ Suggestion

Teacher Signature

<i>HOME ASSIGNMENT</i>	<i>HOTS AND MLL</i>	<i>CO-RELATION WITH OTHER SUBJECTS And extended learning</i>
<p>→ Students are given the Home assignment to solve all the in text question solved and unsolved exercises of NCERT.</p> <p>→ Exemplar problems for students preparing for competitive examinations.</p> <p>→ Compile all questions asked from the chapter in last five years in CBSE board examination.</p> <ol style="list-style-type: none"> Using IUPAC norms write the formula for the following: Tetrahydrozincate(II) . Using IUPAC norms write the systematic name of the following: [Pt(NH₃)₂Cl(NH₂CH₃)]Cl Give an example of organometallic compound that is used as a homogenous catalyst. Specify the oxidation number of metals in the following coordination entities: (a) [CrCl₃(NH₃)₃] (b) K₃[Fe(CN)₆] 	<p>Q. 1. A cationic complex has two isomers A & B. Each has one Co³⁺, five NH₃, one Br and one SO₄²⁻. A gives a white precipitate with BaCl₂ solution while B gives a yellow precipitate with AgNO₃ solution.</p> <p>(a)What are the possible structures of the complexes A and B ?</p> <p>(b)Will the two complexes have same colour ?</p> <p>Q.2 If to an aqueous solution of CuSO₄ in two tubes, we add ammonia solution in one tube and HCl (aq) to the other tube, how the colour of the solutions will change ? Explain with the help of reaction.</p> <ol style="list-style-type: none"> write the IUPAC name of [Co(en)₂(ONO)Cl]Cl which of two is more stable K₄[Fe(CN)₆] or K₃[Fe(CN)₆] and why? NH₃ has strong ligand but NH₄⁺ is not why? [Ti(H₂O)]³⁺ is colored but [Sc(H₂O)]³⁺ is colorless why? [Ni(CO)₄] has a tetrahedral structure while [Pt(NH₃)₂Cl₂] has a square planar structure. Explain. [Cr(NH₃)₆]³⁺ is paramagnetic while [Ni(CN)₄]²⁻ is diamagnetic. Explain why? Calculate the overall complex dissociation equilibrium constant for the [Cu(NH₃)₄]²⁺ ion, given that β₄ for this complex is 2.1 × 10¹³. What do you mean by CFSE? Represent it in the case of octahedral complex. The spin only magnetic moment of [MnBr₄]²⁻ is 5.9 BM. Predict the geometry of the complex ion? Draw the structure of optical isomers of: (a) [PtCl₂(en)₂(NH₃)₂]⁺ (b) [PtCl₂(en)₂]³⁺ <p>→ <u>Question numbers 11- 13 are SA question of three marks</u></p> <ol style="list-style-type: none"> Give a chemical test to distinguish between [Co(NH₃)₅Br]SO₄ and [Co(NH₃)₅SO₄]Br. Name the type of isomerism exhibited by these compounds. Draw all the isomers (geometrical and optical) of: (i) [CoCl₂(en)₂]⁺ (ii) [Co(NH₃)Cl(en)₂]²⁺ (iii) [Co(NH₃)₂Cl₂(en)]⁺ Discuss the nature of bonding in the following coordination entities on the basis of valence bond theory: (i) [Fe(CN)₆]⁴⁻ (ii) [FeF₆]³⁻ (iii) [Co(C₂O₄)₃]³⁻ (iv) [CoF₆]³⁻ 	<p>1. BIOLOGY : Haemoglobin and Chlophyll.</p> <p>2.MEDICAL FIELD :: Cis-Platin in Cancer and EDTA in Lead poisoning.</p>