



EASTERN UNIVERSITY, SRI LANKA
DEPARTMENT OF CHEMISTRY
SECOND YEAR IN SCIENCE 2004/2005 (1ST SEMESTER)
CH 201 CO-ORDINATION CHEMISTRY AND MAIN GROUP CHEMISTRY
(Proper)

Answer All Question

Time :01 hour

- 1)a) Give the molecular formulas of the following coordination compounds
- dichlorobis(ethylenediamine)platinum(IV) chloride
 - triamminetriaquachromium(III) chloride
 - pentaamminechlorocobalt(III) chloride
 - tetraammineaquacopper(II) sulfate
 - diamminesilver(I) dicyanoargentate(I)
- b) Give the IUPAC name of the following coordination compounds
- $(\text{NH}_4)_2[\text{Ni}(\text{C}_2\text{O}_4)_2(\text{H}_2\text{O})_2]$
 - $[\text{Co}(\text{H}_2\text{NCH}_2\text{CH}_2\text{NH}_2)_3]_2(\text{SO}_4)_3$
 - $\text{K}[\text{Cr}(\text{oxal})_2(\text{H}_2\text{O})_2] \cdot 3\text{H}_2\text{O}$
 - $\text{K}_4[\text{Fe}(\text{CN})_6]$
 - $\text{Pt}(\text{NH}_3)_2\text{Cl}_4$
- c) The hexaaquamanganese(II) ion contains five unpaired electrons, while the hexacyanomanganese(II) ion contains only one unpaired electron. Explain, using Crystal Field Theory.
- d) Discuss the advantages and disadvantages of using Valence Bond Theory to explain bonding in coordination complexes.
- 2)a) Give the Oxidation State, d-orbital occupation, co-ordination number, shape of the complex and expected magnetic moment of the central metal ion in the following complexes.
- $\text{K}_3[\text{Co}(\text{C}_2\text{O}_4)_3]$
 - $(\text{NH}_4)_2[\text{CoF}_4]$
- b) Identify the type of structural isomerism that is found in each of the following pairs of compounds.
- $[\text{Co}(\text{NH}_3)_5\text{Br}]\text{SO}_4$ and $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Br}$
 - $[\text{Cr}(\text{H}_2\text{O})_4\text{Cl}_2]\text{Cl} \cdot 2\text{H}_2\text{O}$ and $[\text{Cr}(\text{H}_2\text{O})_5\text{Cl}]\text{Cl}_2 \cdot \text{H}_2\text{O}$
 - $[\text{Fe}(\text{SCN})]^{2+}$ and $[\text{Fe}(\text{CNS})]^{2+}$
- c) i) Discuss the allotropic modification of phosphorous with their natural characteristics.
- ii) Give four uses of phosphorus
- d) Give a comparative account on Oxygen and Sulphur.