Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Science and Technology
100 level 2nd Semester Examination – Jan./Feb. 2015
SCT 132-2 Inorganic Chemistry

Uva Wellassa University

Instructions to candidates
Duration: Two (02) hours
Number of questions: 4
Number of question to be answered: 4
Total mark allocation: 400 marks

Plank Constant = 6.623×10^{-34} Js
Velocity of light = 3×10^{8} ms^{-1}

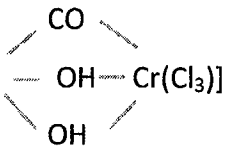
1. Name following chemical stuctures according to IUPAC nomenclature.

a. $[CoCl(NH_3)_5]^{2+}SO_4^{2}$

b. $[CoClCNNO_2(NH_3)_3]$

c. $Na_2[ZnCl_4]$

d. $Na_3[Ag(S_2O_3)_2]$

e. 

(50 Marks)

2. Draw following structures

a. Pentaamminechlorocobalt(III) chloride

b. Hexaaquairon(III) nitrate

c. cis-dichlorobis(ethylenediamine)ruthenium(II)

d. μ-Hydroxobis(pentaamminechromium(III)) chloride

e. Trans [bischlorobisethelenediammine cobolt (III)]

(50 Marks)

3. a. i.Write two major assumpions that you study under crystal field theory?

ii. What are the sub shells of M orbit in an atom?

iii. What are the co-sub shells of d sub shell?

iv. What will happen to the co-sub shells of a metal atom when six ligands bring toward the metal atom along the x,y,z axiss?

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v. Which co-sub shells of metal atom aquaire higher energy in Octahedral field?

vi. Diffine the crystal field spliting energy of an Octahedral metal complex, illustrating the diagram, with respect to the sperical field.

vii. What are the parameters that depend crystal field spliting energy?

viii. Write the equation for Crystal field stabilizing energy of a metal complex in an Octahedral field, and define all the terms in the equation.

ix. Write the equation for Crystal field stabilizing energy of a metal complex in a Tetrahedral field, and define all the terms in the equation.

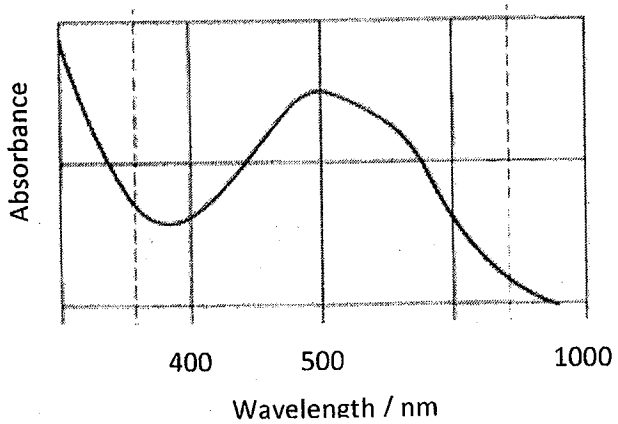
x. What is the relationship between Δ_{Oct} and Δ_{Tet} for metal complexes formed from same Ligands and same metal center.

(50 Marks)

b. i. What is the electron configaration of Ti atom?

ii. What is the electron configaration of Ti^{3+} ion?

iii. Absorption spectrum of $[Ti(H_2O)_6]^{3+}$ is given bellow, calculate the Crystal field stabilization enrgy of $[Ti(H_2O)_6]^{3+}$.



(100 Marks)

4. Explane why Au(II) is unstable than Cu(II) using Jahn-Teller effect.

(150 Marks)