


المستوى الثالث كيمياء/ميكرو

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	FINAL EXAMINATION FOR ALL DOUBLE MAJOR THIRD LEVEL STUDENTS			
COURSE TITLE:	(Coordination Chemistry)		COURSE CODE: CH3246	
DATE:	1, JUNE 2017	TERM: SECOND	TOTAL ASSESSMENT MARKS 50	TIME ALLOWED: 2 HOURS

Answer the following Questions:

1-) For each complex define the following: (Total marks 20)

- | | |
|---|--|
| 1- Name | 2- The type of isomerism |
| 3- The type of hybridization | 4- Calculate the magnetic moment |
| I-) $[\text{Mn}(\text{H}_2\text{O})_6]\text{Cl}_2$ (5marks) | II-) $\text{K}_2[\text{Zn}(\text{CN})_4]$ (5marks) |
| III-) $\text{K}_2[\text{Ni}(\text{NO}_2)_4]$ (5marks) | IV-) $\text{Na}_3[\text{CoCl}_6]$ (5marks) |

2-) A-) Iron ion forms an inner diamagnetic complex ion containing the cyano ligand.

Derive the formulae of the complex. (4marks)

B-) Discuss the effect of central metal ion and its charge on Δ_o value. (4marks)

C-) Manganese (II) ion forms inner complex ion with cyano ligands. Calculate the magnetic moment value of the complex. (4marks)

D-) Discuss the hydration isomerism with example. (3marks) (Total marks 15)

3-) A-) Write full account on Jahn-Teller effect with examples (5marks)

B-) What is the formula of the following complex: (2marks)
Tetrammine copper (II) hexachloro copperate (II)

C-) For the two complexes: 1-) Hexammine cobalt(III) chloride (8marks)

2-) Potassium hexacyano ferrate (II)


a-) Draw the d-orbital splitting indicate the number of electrons in t_{2g} and e_g

b-) Calculate the CFSE value and magnetic moment for each complex. (Total marks 15)

Note : (Atomic number for Mn 25, Fe 26, Co 27, Ni 28, Cu 29 & Zn 30)

Good Luck

Examiners: Prof. Dr : Kamal Elbaradie, Prof. Dr: Ekhlas Abd Elhay

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY INORGANIC CHEMISTRY		
	COURSE TITLE:	Coordination Chemistry	COURSE CODE: CH 3210
DATE:	4 JUN , 2017	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

Answer the following Questions

- I) a- Pt(IV) ion form an ionic octahedral complex (A) containing 5H₂O molecules, bromide and sulphate ions. This complex reacts with BaCl₂ and give complex (B) and white precipitate.

What are the formulae of complexes A and B (10 MARKS)

b- Draw the splitting of d⁵ and d⁷ of octahedral complex (10 MARKS)

c- For complex K₃[Mn(CN)₆], $\mu = 2.82$ BM . Define the type of complex (Mn 25). (10 MARKS)

- II) a- Define the ambidentate ligands (6 MARKS)

b- What are the formula of the following complexes: (9 MARKS)

1- μ - hydroxo-bis {penta-amine nickel(II) } bromide.

2- Tetra amine copper(II) hexa-chloro copperate(III).

3- Dinitro Tetra amine manganese (III) ion

c- Nickel ion forms diamagnetic complex ion with cyano ligands (Ni 28)

Derive the formula and the geometry of the complex. (15 MARKS)

- III) For Fe²⁺ the electron pairing energy (P) is 210 KJ/mol. The values of Δ_0 for the complexes [Fe(H₂O)₆]Cl₂ and K₄[Fe(CN)₆] are 120 and 390 KJ/mol., respectively.

i- What is the name of each complex? (4 MARKS)

ii- Calculate the CFSE for the outer complex (Fe=26). (13 MARKS)

iii- Calculate the magnetic moment value for the inner complex. (13 MARKS)

- IV) For the complex Di Nitrito tetra aqua iron(III) sulphate

1- What are: a) Formula b) Isomers c) types of Isomerism (25 Degree)

2- Calculate the EAN (Fe 26) (5 MARKS)

- V) Discuss the following:

a- The important uses of CFSE values. (15 MARKS)

b- The factors affecting the value of Δ_0 . Give examples. (15 MARKS)

Examiners

Prof. Dr. Mohamed Gaber Abu-Elazm

Prof. Dr. Kamal El-Baradie

