



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

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-) $[Mn (H_2O)_6]Cl_2$

(5marks)

II-) K_2 [Zn(CN)₄]

(5marks)

III-) $K_2[Ni(NO_2)_4]$

(5marks)

IV-) Na₃[Co Cl₆]

(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_0 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-) Wite 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 BOTANY EXAMINATION FOR (3 RD YEAR) STUDENTS OF SPECIAL MICO COURSE TITLE: APPLIED MICROBIOLOGY COURSE CODE: MB 3202 TOTAL ASSESSMENT MARKS: 100 DATE: 6/6/2017 TERM: SECOND TIME ALLOWED: 2 H

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Answer	the	foll	owing	question	ns:

1- Write on the following: (30 Marks) a) Septic shock (With drawing). b) Classification of herbicide. c) Characters of perfect biological weapons. d) Method used to obtain solid wastes composting. 2- Complete the following: (25 Marks) d) The successful biodegradation to remove of petroleum hydrocarbons from sea depend on 3- Choose the correct answer: (25 Marks) a) Chedder ripened period about: 1- 2-3 months. 2-2-16 months. 3-2-3 days. b) Bacterial strain detoxify herbicide is: 1- Flavobacterium. 2- Pseudo monas. 3- Both. c) Chlore used for disinfecting the drinking water: 3-Both. 1- Inexpensive method. 2- Removing ammonia. d) The non linear ABS resistance to biodegradation causing:

- 1- Block of enzymes of micro organisms.
 - 2- Broken by micro organisms.
 - 3- Need genetic engineering process.
- e) Shiglla sp. Produce exotoxin which act on:
- - 1- ADP ribosylate. 2- Cleaves r-RNA of host cell.
 - 3- ADP ribosylate effect on CAMP.

4- Put true or false & correct the false:

(20 Marks)

- a) Membrane distrupting toxins are called cholesterol.
- b) Cow milk contain high content of caproic, caprylic & capric acid.
- c) Adjuvants help in production D-cell to form cytokines.
- d) Super antigen an common type of bacterial toxin.
- e) Starter M.O give milk texture and flavor.

EXAMINERS	DR. SAMIA SHABANA.	DR. WAGIH EL-SHOUNY

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY						
	INORGANIC CHEMISTRY						
1969		Coordination Chemistry	COURSE CODE: CH 3210				
DATE:	4 JUN , 2017	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS				

Answer the following Questions

 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 d^5 and d^7 of octahedral complex (10 MARKS)
- c- For complex $K_3[Mn(CN)_6]$, $\mu = 2.82$ 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 Fe ²⁺ 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.

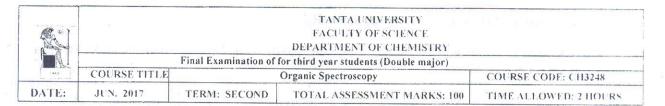
i-What is the name of each complex? (4 MARKS)

- 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



Answer the following questions:

(100 marks) (Each question 20 marks)

1] a) Discuss the chemical shift of hydrogen attached directly to a Π - bonded carbon and give the relative order of downfield shift of:

Acetylenic, vinylic, aldehydic and aryl hydrogen compared to alkyl hydrogens.

- b) Is the δ value of a given kind of hydrogen proton a constant value? Find the δ value and the observed shift from TMS in HZ of a signal in a 100- MHZ instrument? That is 162 HZ in a 60-MHZ instrument.
- 2] a) Draw the ¹HNMR spectra with multiplicity, peak accounting and showing relative chemical shifts for the following structures:

i) p- CH₃-C₆H₄-CH (CH₃)₂

ii) C₆H₅-O-CH₂-CH₂Cl

iii) o-CH₃-O-C₆H₄-COOH

iv) $CH \equiv C-CH_2-O-CH_3$

- b) Use ¹HNMR spectroscopy to distinguish between the following geometric isomers:
- i) Cis -stilbene and trans-stilbene.

ii)
$$\begin{array}{c} H \\ C = C \\ H \end{array}$$
 and $\begin{array}{c} Br \\ C = C \\ H \end{array}$

- 3] a) 4-Heptanone shows two important characteristic peaks in its mass spectrum due to ions at m/e = 86 and m/e = 58. Explain the fragmentation pattern of the compound.
- b) How do you explain that m/e = 57 and m/e = 44 ions is formed in the mass spectrum of pentanal.
- c) Give the typical fragmentation pattern in n-propyl benzene.
- 4] Explain the following by using the mentioned spectroscopic methods:
- a) o-Nitroacetanilide is deep yellow but the p- nitroacetanilide is yellow (UV & IR).
- b) The ketonic and enolic forms of ethyl benzoyl acetate (UV, IR and ¹HNMR).

- c) Benzamide and acetamide (IR & HNMR).
- d) How will you distinguish between benzaldehyde and cinnamaldehyde (UV, IR and ¹HNMR).
- e) The effect of solvent on the absorption spectro of propanal and propanone (UV & IR).
- f) How could you distinguish between the following compounds; propanoic acid, propanoic unhydride and propanamide.
- 5] An organic compound with molecular formula C₄H₈O, having the following spectroscopic data:

UV: λ_{max} 276(nm), ϵ 43 (n-hexane)

 λ_{max} 242(nm), ϵ 37 (ethyl alcohol)

IR: v in cm⁻¹ 1715 (s) and 2988(m) (solid phase).

¹HNMR: τ (tau) values in CDCl₃ and TMS as standard reference 7.52 (q), 7.88(s), 8.93(t), in the ratio 3:3:2 (J= 7.1 HZ).

Mass data: $M^+ = 72$ (61 %); m/e = 57 (100%); m/e = 29 (41%) and a broad peak at m/e = 14.75 (2.1%).

Find out the structure of the above compound, and explain all the given spectroscopic data.

Good Luck

Prof. Dr. Mohamed A. El-Borai & Ass. Prof. Dr. Sahar El-khalafy

TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY Final Examination of for third year students (Double major) COURSE TITLE Organic Spectroscopy COURSE CODE: CH3248 DATE: JUN. 2017 TERM: SECOND TOTAL ASSESSMENT MARKS: 100 TIME ALLOWED: 2 HOURS

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(100 marks) (Each question 20 marks)

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ii) C₆H₅-O-CH₂-CH₂Cl

iii) o-CH₃-O-C₆H₄-COOH

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- c) Give the typical fragmentation pattern in *n*-propyl benzene.
- 4] Explain the following by using the mentioned spectroscopic methods:
- a) o-Nitroacetanilide is deep yellow but the p- nitroacetanilide is yellow (UV & IR).
- b) The ketonic and enolic forms of ethyl benzoyl acetate (UV, IR and ¹HNMR).

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Final Examination of for third year students (Double major)

DATE: JUN. 2017 TERM: SECOND TOTAL ASSESSMENT MARKS: 100 TIME ALLOWED: 2 HOURS

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