المستوى الرابع كيمياء ونبات - الكيمياء التناسقية وكيمياء العناصر الانتقالية (٣) ك ع ٤٢٥
كيمياء حيوان

Mansoura University **Faculty of Science** **Chemistry Department** **Subject: Chemistry** **Course(s): Inorganic Chem.(425)**	كلية العلوم جامعة المنصورة	**Second Term** **Fourth Year Chem. Students** **Time Allowed: 2 hours** **Full Mark: 80 Marks** **Date:** Jun, 2014

Answer The Following Questions

1. Comment on the following statements: **[28 Marks]**

i) The trace amounts of some lanthanide elements could be separated on synthetic ion – exchange resins

ii) The experimental values of heat of hydration for divalent ions of the first row transition elements are irregular

iii) Cobalt (III) ion is more stable in ammonia solution than in aqueous solution

iv) The $[Ni(CN)_4]^{2-}$ is diamagnetic while $[NiCl_4]^{2-}$ is paramagnetic

v) Lanthanide (II) compounds can be prepared by several methods and some of it's show metallic character and electricity conduct.

vi) The magnitude of Δ are influenced by many factors.

vii) The geometry of complexes depend on the coordination number.

2.a) On the basis of VBT and CFT, explain the following : **[26 Marks]**

i) All complexes of Ti^{3+} are paramagnetic

ii) The structures : $[Fe(CN)_6]^{4-}$ and $[Fe(CN)_6]^{3-}$

iii) The structure : $[Cu(NH_3)_4]^{2+}$

b) The heat of hydration for Cr^{2+} is 460 K.Cal./mol the value of Δo of $[Cr(H_2O)_6]^{2+}$ is 13900 cm^{-1} calculate the heat of hydration if there is no crystal field stabilization energy.

c) Write the lanthanide series with their electronic structures and oxidation state.

d) Complex formation, solvent extraction and valcncy change, three methods are used in the lanthanide elements separation. Discuss .

3. The Δ_o value of or Co(II), Fe(II), Ni(II) and Mn(II) ions an aqueous medium are 9300, 13700, 8500 and 21000 cm^{-1}, respectively. **[26 Marks]**

i) Calculate the magnetic moment and CFSE for the complexes.

ii) Discuss the stability of the complexes.

iii) Which complex ions are regular geometry and calculate the Jahn-Teller stabilization energy for irregular complex ions

Mansoura University
Faculty of Science
Chemistry Department
El- Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم الكيمياء
المنصورة – مصر

Second Semester: Final Exam. 2014

Educational Year: Fourth Year
Course (s): Carbohydrates Chemistry
Date: 7 June/ 2014
Course Code: Chemistry 434

Subject: Chemistry
Full Mark: 80
Time: 2 Hours

Answer the following questions:

1-Starch is a natural polysaccharides isolated from plant skeletal (1 & 2)
a- Describe the glycosidic bond in starch. [6 Marks]
b- What the effect of both phenyl hydrazine and HNO_3 on monosaccharide units in starch. [7Marks]
c- Discuss the effect of Periodic acid on furanose and pyranose Monosaccharide. [7Marks]

2- Raffinose is a trisaccharide is found in legumes and vegetables (3) .
a- Describe the glycosidic bond[linkage] in it. [6 Marks]
b- How can you elucidate the ring structure of monosaccharide? [7 Marks]
c- Sucrose(4) and maltose are disaccharides; which of them does not undergoes Mutarotation? [7 Marks]

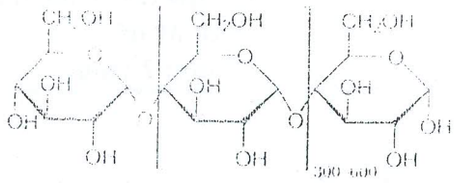
3- a- Explain by equation, how you can proof of glucose stereochemistry. [7 Marks]
b- Formation of osatriazole from D-Fructose. [7 Marks]
c- Convert of the following: [6 Marks]
i - Glucose to Fructose
ii- ribose to arabinose

4- Lactose (5) is disaccharides consisting of two monosaccharide units:
a- Draw the Fisher projection and Haworth formulation of the hydrolyzed monosaccarides of this compound. [5Marks]
b- Determine the structure of lactose. [5Marks]

P.T.O

e- Elucidate the Point of attachment in compound. [5Marks]

d- Describe the type and point of attachment of each glycosidic bond in (4 & 5) disaccharides. [5Marks]



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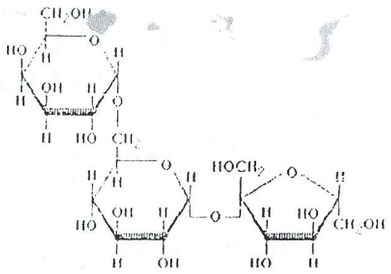

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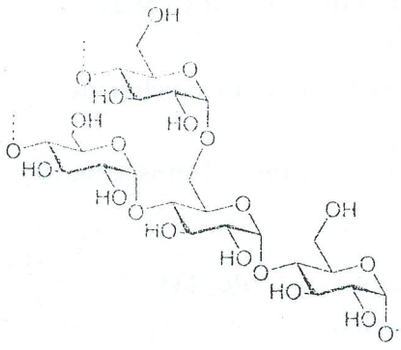

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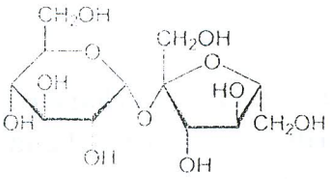

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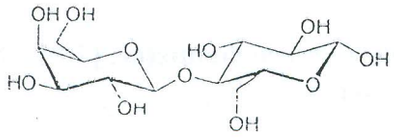

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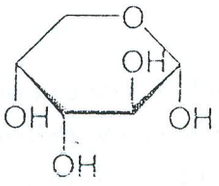

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Best regards,

Prof. Dr. Wafaa S. Hamama & Dr. Eman Helmy

المستوى الرابع كيمياء نبات كيمياء حيوان
الحضر الفريات لـ ٤٤٦

Mansoura University
Faculty of Science
Chemistry Department
Chem446 (Catalysis&Colloids)

May 2014
4th Level,Chem-Zoology&Chem-Botany
Time Allowed: 2 hrs
Full Mark: 80Marks

Section A (Catalysis): **(Prof.Dr. Salem E. Samra)** *(40 Marks)*

Q1- Choose the correct answer *(5 Marks)*

i. Predict the kinetics of a catalyzed reaction which has a $\Delta Go = -60$ kJ/mol?

a- It will exhibit very rapid kinetics.

b- It will exhibit very slow kinetics.

c- The kinetics of the reaction cannot be predicted.

d- The kinetics depends on the nature of the reactants and/or products.

ii. Nucleophilic catalysis is catalysis by

a- General base b- Electrophile c- Proton

iii. Lewis base

a- accept proton

b- gives hydroxyl ion

c- is an oxidizing agent

d- All previous answers are wrong

iv. In autocatalysis, the reaction is catalyzed by

a- One of its reactants

b- One of its reactants and/or products

c- One of its products

d- Adding an external catalyst

v. The effect of catalyst on a reversible reaction

a- Increases the equilibrium constant value

b- Shifts the equilibrium to the right direction

c- Increases the free energy

d- Keeps the same heat content

Q2- Discuss the kinetics of a homogeneous bimolecular reaction (one mechanism). *(5Marks)*

Q3- V_m for an enzymatic reaction is 5×10^{-6}mol per minute when 2×10^{-6}g of an enzyme whose molecular weight is 27,000g is present. What is the turnover number? *(5Marks)*

Q4- Explain the protolytic mechanism. *(5Marks)*

Q5- Discuss only two processes contribute to the loss of catalytic activity *(5Marks)*

Q6- What are the Factors that determine choice of catalysts. *(5Marks)*

Q7- Interpret the role of catalyst modifiers. *(5Marks)*

Q8- Predict the effect of pH on K_{obs} for the specific acid catalysis. *(5Marks)*

بقية الاختبار خلف الصفحة

Section B (Colloids): **(Prof.Dr. Hanem A. Mostafa)** *(40 Marks)*

I) i- Illustrate the role of protecting colloid for stabilizing colloidal solution. *(4Marks)*

ii- Discuss three condensation methods for preparation of sols. *(3Marks)*

iii- Write on the sedimentation by gravity. *(3Marks)*

II) Give a reason,

i- Addition of an emulsifying agent to an emulsion. *(4Marks)*

ii- Agglomeration of sols. *(3Marks)*

iii- Many colloidal solutions are colored. *(3Marks)*

III) Write on each of the following:- *(20Marks, 5 for each)*

i) Purification of sols.

ii) Determination of the gold number.

iii) Two colligative properties of sols.

iv) Sedimentation equilibrium.

مع أطيب التمنيات بالتفوق،،،

المستوى الرابع- كيمياء نبات - تكنولوجيا حيوية (ب ٤٢١)

Mansoura University
Faculty of Science
Botany Department

جامعة المنصورة
كلية العلوم
قسم النبات

Final Examination in Botany
Second-Term: May 2014

Educational Year: Fourth Level | Program (Branch): Chemistry/Botany
Subject: B (421) | Course(s): Biotechnology
Time: 2 h | Date: 31 / 5 /2014 | Total Marks: 60 marks

Answer the following questions:

Q1: Answer the following questions: (20 marks)

a- Differentiate between organic farming and conventional farming? (6 marks)

b- Write short notes on the production of bioplastics from starch. (7 marks)

c- What is a bioreactor? Differentiate between the types of bioreactors. (7 marks)

Q2: A- Complete the following sentences with the suitable words: (10 marks)

1- The cell theory stated that...

2- Green manures are............. while compost is..........................

3- Advantages of rooftop farming are...

4- Baffles are...

5- Advantages of drum-rotating reactor are..................................

B- Mention if the sentence is true or false and why? (10 marks)

1- In stirred tank bioreactor, gas bubbles in a column, comes in contact with liquid.

2- Biobutanol is more similar to bioethanol.

3- Probes are not required for bioreactors.

4- Biogas is similar to natural gas.

5- Particle bombardment involves transfer of DNA under electric shock.

Q3: Answer the following questions: (20 marks, 5 marks each)

1- From what you have studied, what is meant by ethanol fuel?

2- What is crop rotation?

3- From what you have studied about the bioreactor, what are the functions of agitators and spargers?

4- Write what you know about biodiesel and biopetroleum from algae?

Best Wishes

Prof. Mohammed N. A. Hasaneen　　*Dr. Heba M. M. Abdel-Aziz*