

# المستوى الثانى

## كيمياء



Tanta University  
Faculty of Science  
Department of Chemistry

Exam for Level Two, chemistry section

CH 2204

Chemistry of Transition Elements

Term: Second

June 2017

Total Assessment Marks: 100

Time Allowed: 2 h

**Answer the following questions:-**

1) Comment on each of the following: (25 marks)

- The melting point and boiling points of the transition elements are high.
- Compounds of transition elements are usually paramagnetic.
- Many transition elements and their compounds have catalytic properties.
- The high density of transition elements.

2) Discuss the followings: (25 marks)

- Extraction of titanium.
- Compare and contrast the chemistry of Fe, Ru and Os.
- The chemical properties of Sc group.

3) Write on: (25 marks)

- The assumptions of the crystal field theory.
- Draw energy level diagram and indicate the type of hybridization of:  
 $d^4$ ,  $d^5$ ,  $d^6$ ,  $d^7$  and  $d^8$  square planar, octahedral and tetrahedral.


4) Explain: (25 marks)

- The electronic configuration and The variable valency of d-block elements.
- The general properties of the transition elements comparing with the main elements.

**(Good luck)**

Examiners: Prof. Dr. Gad El-Hefnawy



	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY		
	Final Examination For Second Level Students (Special Chemistry)		
	COURSE TITLE: The Phase Rule		COURSE CODE: CH2208
	DATE: 24/5/2017	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

**Answer the following questions** (label each area line and point in your diagram):

1- a) What is the phase rule ? For what systems it is applied? What is the phase equilibrium diagram? (15 marks)

b) Evaluate P, C and F for the following systems: (15 marks)

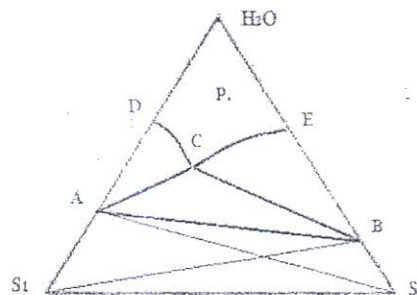
- i) A mixture of four gases enclosed in a cylinder.
- ii) Ice/water/vapor.
- iii) Hydrogen, oxygen and water enclosed in a vessel at room temperature.
- iv)  $2\text{H}_2\text{O} \leftrightarrow 2\text{H}_2 + \text{O}_2$  at  $1800^\circ\text{C}$  starting from water.
- v)  $S_{\text{Rubic}}, S_{\text{Monoclinic}}, S_{\text{Liquid}}$  and  $S_{\text{Vapor}}$ .

2- Draw the vapor pressure composition phase diagram at constant temperature and the temperature composition phase diagram at constant pressure for two liquids which forms zeotropic mixture, azeotropic mixture, partially miscible liquids and immiscible liquids.

(20marks)

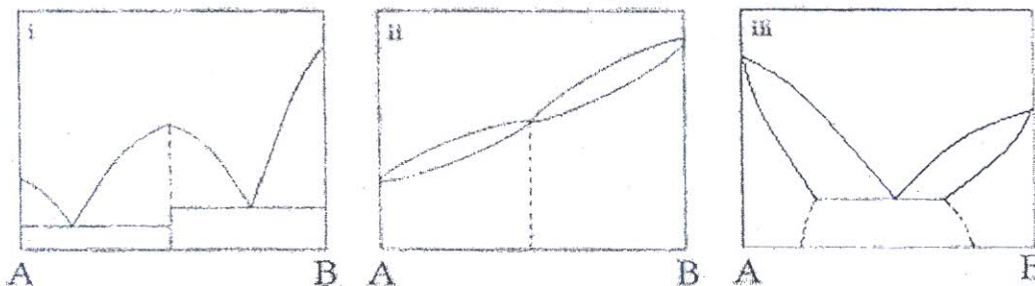
3- Discuss the following phase diagram of aqueous salt solution, apply the phase rule at each area and point in your phase diagram. Show the product of isothermal dehydration of solution P.

(20marks)





4- Define the following phase diagrams of a binary condensed system, apply the phase rule at each region, line and point in your phase diagrams.

(30marks)



(Good luck)

	<b>TANTA UNIVERSITY</b> <b>FACULTY OF SCIENCE</b> <b>CHEMISTRY DEPARTMENT</b>			
	<b>Examination of Second level students of Special Chemistry</b>			
	<b>Course title:</b>	<b>Organic Chemistry (4)</b>	<b>Course code: CH 2216</b>	
	<b>27/5/2017</b>	<b>Total Marks: 150</b>	<b>Time allowed: 2 hrs.</b>	

**Answer the following questions:**

**1- Answer by mechanism the following:**

- a- Addition of water to C=O group. Discuss the mechanism and factors affecting such reaction.
- b- Effect of acid on 1,2-diols.
- c- Explain in details the Benzyne mechanism.
- d- Hoffmann hypobromide reaction. Show the mechanism.

**2- Explain by mechanism the following reactions:**

- a- Transformation of cumene to phenol and acetone. Show mechanism.
- b- Diazo coupling mechanism. Explain in details.
- c- Explain by mechanism how cyanide ion can be used as ambident nucleophiles.
- d- Addition of HCl to 3,3-dimethyl-1-butene. Show mechanism.

**3- Answer the following reaction:**

- a- Reaction of Bromine with benzene ring. Show the mechanism.
- b- Discuss in details the factors affecting of aliphatic nucleophilic substitution reaction.
- c- Explain the both Saytzeu and Hoffmann rules in elimination.
- d- 1,2-chlorohydrin can act as neighbouring group participation. Explain the mechanism.

**4- Answer the following reactions:**

- a- Correlate between the mechanism of both SN1 and SN2 mechanism.
- b- Addition of Br<sub>2</sub> to alkenes is Trans addition. Explain the mechanism.
- c- Explain the mechanism of Elimination reaction.
- d- Show the mechanism of S<sub>N</sub>i and S<sub>N</sub>i<sup>-</sup>.

Kind regards ...

Prof. Dr. Mahmoud Fahmy

