



قسم الكيمياء



كلية العلوم



جامعة سوهاج

١- موضوعات البحث الخاصة بمقررات قسم الكيمياء (شعبة اللاعضوية) لطلاب كلية العلوم لفرق النقل

الفرقة	الشعبة	المقرر	القائم بالتدريس	المصادر التي يمكن الاستعانة بها	الموضوعات
الأولي	العلوم الطبيعية	الكيمياء العامة ١٠٢ ك	أ.د. عبدالموجود مصطفى أ.د. عبدالرحمن السيد أ.د. علي شاكر أ.د. فاروق رشوان أ.د. كمال سيد د. عماد نووير	الكتاب الجامعي بنك المعرفة شبكة الانترنت	<ul style="list-style-type: none"> • خواص الغازات وقوانينها، استنتاج القانون العام للغازات من نظرية الحركة. • حيود الغازات عن قوانينها، أنواع قوي التجاذب بين السوائل. • استخدامات الكيمياء الحرارية في حساب المكافئ الغذائي لأنواع الطعام المختلفة. • أنواع الوقود الناشئة عن الاحتراق الكيميائي والطاقة الناتجة عنها. • خواص المحاليل محدودة الامتزاج وتأثير درجة الحرارة عليها مع الأمثلة. • العوامل المؤثرة علي ثابت سرعة التفاعل مع الاشارة الي الاتزان في الأنظمة المتجانسة.
	العلوم البيولوجية				
	العلوم الجيولوجية				
الثانية	الفيزياء والكيمياء	الكيمياء الفيزيائية ٢٢٢ ك	أ.د. حسنية مهران أ.د. لبنى عبدالمحسن أ.د. طارق طه	الكتاب الجامعي بنك المعرفة شبكة الانترنت	<p>First Model</p> <p>(1) The relation between chemistry and thermodynamics is a big story. What do you know about it?</p> <p>(2) Discuss first order reactions and second order reactions.</p> <p>(3) Write on parallel reactions and series reactions.</p> <p>(4) <i>C</i> and <i>D</i> are two partly miscible liquids. <i>E</i> is a substance, which dissolves without chemical reaction in both <i>C</i> and <i>D</i>.</p> <p>(a) By means of diagrams show the possible effect of temperature changes on an equilibrium mixture of <i>C</i> and <i>D</i>.</p> <p>(b) Describe what you would expect to occur when varying amounts of <i>E</i> are shaken with a mixture of <i>C</i> and <i>D</i>.</p> <p>Apply the Phase Rule to the resulting mixtures of <i>C</i>, <i>D</i> and <i>E</i></p>

Second Model

- (1) Why are chemists interested in studying Thermochemistry?
- (2) Discuss first order reactions and third order reactions.
- (3) Illustrate the relations between temperature, reaction rate and activation energy.
- (4) Derive the Phase Rule and explain the terms involved. Sketch a phase diagram for thallium and mercury using the following facts. Label each area, line and point. [M.P. of Thallium = 303°C , M.P. of mercury = -39°C , M.P. of Tl_2Hg_5 = 15°C , Eutectic for $\text{Tl}/\text{Tl}_2\text{Hg}_5$ = 0.4°C , at 41 % Tl by weight. Thallium lowers the M.P. of Mercury to a minimum of -60°C at 8 % Tl]. ($Hg = 200.6$, $Tl = 204.4$).

Third Model

- (1) What thermochemical processes are observed every day?
- (2) Discuss first order reactions and zero order reactions.
- (3) Explain two methods to determine the reaction order.
- (4) Draw and discuss the phase diagrams (temperature – composition) for the following condensed systems, labeling each region to show phases in equilibrium within them: (a) Magnesium (M.P. 651°C) and lead (327°C) form PbMg_2 , which melts at 530°C ; (b) Magnesium and Nickel (1452°C) form a compound MgNi_2 that melts at 1145°C and a compound Mg_2Ni that decomposes at 770°C into a liquid containing 50% (*by weight*) of Ni and the other compound. The eutectic are at 23% Ni and 510°C and at 89% Ni and 1080°C .

<p><u>Write one report includes one Item from each part of the following:</u></p>					
<p style="text-align: center;">Part (I): Electrochemistry</p> <ol style="list-style-type: none"> Electrochemical cells and applications <ul style="list-style-type: none"> Electromotive and Electrode potential Determination of E. M. F. from electrode potential according to European system Concentration cells with diffusion and without diffusion Some thermodynamic relations of cells and electrodes <ul style="list-style-type: none"> Activity and activity coefficient Storages batteries or secondary cells Displacement equilibrium <ul style="list-style-type: none"> Composition, chemical reaction and potential of standard cell Oxidation/reduction systems <p style="text-align: center;">Part (II): Molecular Spectroscopy</p> <ol style="list-style-type: none"> Write a short note on: <ul style="list-style-type: none"> Translation Spectra Rotational Spectra Vibrational Spectra Write a short note on ‘Raman Spectroscopy’ <ul style="list-style-type: none"> Background and definition Selection Rules Rotational Raman Vibrational Raman Uses <p style="text-align: center;">Part (III): Quantum Chemistry</p> <ol style="list-style-type: none"> Quantum mechanics theory <ul style="list-style-type: none"> Write brief accounts on the reasons for developing the quantum mechanics theory Refer to the postulates of Quantum theory One Dimensional motion and excitation, considering translation of tiny particle in one dimension, <ul style="list-style-type: none"> Write the conditions that make this motion possible What is the energy relation that gives the total energy of the motion? What are the energy dependent variables? specify the relations How can the energy relation be used to estimate the excitation? 	<p>الكتاب الجامعي</p> <p>بنك المعرفة</p> <p>شبكة الانترنت</p>	<p>أ.د. عبدالرحمن السيد</p> <p>أ.د. علي شاكر</p> <p>د. محمد اسماعيل</p>	<p>الكيمياء الفيزيائية</p> <p>٣٢٢ ك</p>	<p>الكيمياء الخاص</p>	<p>الثالثة</p>

<p><u>Choose only one Item from each part of the following:</u></p>					الثالثة
<p>Part (I): Molecular Spectroscopy</p> <p>1. Give an account of fluorescence and phosphorescence:</p> <ul style="list-style-type: none"> - Definition - Comparison - Example - Schematic Diagram <p>2. Write a short note on ‘Raman Spectroscopy’</p> <ul style="list-style-type: none"> - Background and definition - Selection Rules - Rotational Raman - Vibrational Raman - Uses <p>Part (II): Electrochemistry</p> <p>1. Electrochemical cells and applications</p> <ul style="list-style-type: none"> - Types of electrochemical cells with examples - Discuss the types of electrodes - Discuss the movement mechanism of ions in the cells - How the cell voltage depends on the concentration of electrolyte. - What is the application of different cells? <p>2. Battery as energy device.</p> <ul style="list-style-type: none"> - What is battery - Kind of batteries - Why are the voltages of watch and car batteries different? - Why battery potential is not constant? - Future prospective for energy storage devices. <p>Part (III): Quantum Chemistry</p> <p>3. Quantum mechanics theory</p> <ul style="list-style-type: none"> - Write brief accounts on the reasons for developing the quantum mechanics theory - Refer to the postulates of Quantum theory <p>4. One Dimensional motion and excitation, considering translation of tiny particle in one dimension,</p> <ul style="list-style-type: none"> - Write the conditions that make this motion possible - What is the energy relation that gives the total energy of the motion? - What are the energy dependent variables? specify the relations - How can the energy relation be used to estimate the excitation? 	<p>الكتاب الجامعي</p> <p>بنك المعرفة</p> <p>شبكة الانترنت</p>	<p>د. حاتم محمود</p> <p>د. محمد اسماعيل</p> <p>د. محمد خيرى</p>	<p>الكيمياء الفيزيائية</p> <p>٣٢٤ ك</p>	<p>الكيمياء والميكرو-بيولوجي</p> <p>الكيمياء والنبات</p> <p>الكيمياء والحيوان</p> <p>الكيمياء والجيولوجيا</p> <p>الفيزياء والكيمياء</p>	

٢- موضوعات البحث الخاصة بمقررات قسم الكيمياء (شعبة العضوية) لطلاب كلية العلوم لفرق النقل

الموضوعات	المصادر التي يمكن الاستعانة بها	القائم بالتدريس	المقرر	الشعبة	الفرقة
<p><u>Search No. 1</u></p> <p>write on:</p> <p>(i) Rearrangement with change in Carbon Skeleton and resonance.</p> <p>(ii) Aromaticity and electrophilic substitution in aromatic compounds.</p> <p><u>Search No. 2</u></p> <p>Write on:</p> <p>(i) Possible mechanism of elimination reactions and hyperconjugation.</p> <p>(ii) Acidic and basic character of organic compounds.</p> <p><u>Search No. 3</u></p> <p>Write on:</p> <p>(i) Possible mechanism of nucleophilic substitution reactions, showing methods for its determine and their electronic effects.</p> <p>(ii) Nucleophilic substitution reaction in aromatic compounds.</p> <p><u>Search No. 4</u></p> <p>Write on:</p> <p>(i) Orientation in addition reactions to alkenes, its rearrangements.</p> <p>(ii) Industrial applications of aromatic compounds: Aromatic amines, reactions and applications.</p>	<p>الكتاب الجامعي</p> <p>بنك المعرفة</p> <p>شبكة الانترنت</p>	<p>د.أحمد خضير</p> <p>د.عمران</p> <p>عبدالله</p>	<p>Organic Chemistry</p> <p>٢٤٢ ك</p>	<p>الفيزياء والكيمياء</p>	<p>الثانية</p>

<p>Model 1: (A) Factors affecting distribution and mobility of electrons in bonds and at individual atom. (B) Electrophilic aromatic substitution reactions of benzene.</p> <p>Model 2: (A) Substitution Reactions and its types. (B) Geometrical isomerism (E and Z system)</p> <p>Model 3: (A) Addition reaction and its types. (B) Enantiomers</p> <p>Model 4: (A) Elimination reaction and its types. (B) Effect of Substituents on Reactivity of substituted benzene towards electrophilic substitution reactions.</p>	<p>الكتاب الجامعي</p> <p>بنك المعرفة</p> <p>شبكة الانترنت</p>	<p>د.إيمان عبد الله</p> <p>د. عمر الحادي</p>	<p>Organic Chemistry</p> <p>(Code: 262 Ch)</p>	<p>شعبة البيولوجي والجيولوجيا</p>	<p>الثانية</p>
<p>1- As the demand for motor gasoline increased attention was directed to manufacture of gasoline of high-octane number via polymerization and alkylation processes.</p> <p>2- Sulphur compounds have bad effects on the different fractions of petroleum oil. So, sweetening and desulphurization are important treating processes for oil refinery</p> <p>3- Pesticides are chemical agents stop or kill pests and plant diseases</p> <p>4- Methanol is a chemical compound widely used for industrial purposes and prevalent in our everyday lives.</p>	<p>الكتاب الجامعي</p> <p>بنك المعرفة</p> <p>شبكة الانترنت</p>	<p>أ.د. حسام عبدالغني</p> <p>أ.د. أممية عبدالعزيز</p>	<p>Industrial Chemistry and Petrol) (366Ch</p>	<p>Geology & Geophysics (Groups</p>	<p>الثالثة</p>
<p>1. Chemistry of five-membered ring heterocycles with one hetero atom: Synthesis, reactions and applications.</p> <p>2. Chemistry of six-membered ring heterocycles with one hetero atom: Synthesis, reactions and applications.</p> <p>3. Chemistry of five-membered ring heterocycles with two hetero atoms: Synthesis, reactions and applications.</p> <p>4. Chemistry of six-membered ring heterocycles with two hetero atoms: Synthesis, reactions and applications.</p>	<p>الكتاب الجامعي</p> <p>بنك المعرفة</p> <p>شبكة الانترنت</p>	<p>أ.د. عبدالبدیع غطاس</p> <p>أ.د. طاهر الوسيمي</p> <p>أ.د. أحمد الصغير</p>	<p>Chemistry of Heterocyclic compounds -I, Chemistry of Heterocyclic compounds -II, Organic Spectroscopy (342-Ch)</p>	<p>كيمياء خاص</p>	<p>الثالثة</p>

<p>Model 1</p> <p>(A) Ketone bodies and ketolysis</p> <p>(B) Isolated systems in polynuclear hydrocarbons (synthesis and properties of three examples).</p> <p>(C) Electrophilic aromatic substitution in pyridine and pyrrole.</p> <p>(D) Oxidation- reduction reactions of monosaccharides (aldoses and ketosis)</p> <p>Model 2</p> <p>(A) Diabetes mellitus</p> <p>(B) Naphthalene (structure and synthesis).</p> <p>(C) Electrophilic and nucleophilic aromatic substitution in pyridine.</p> <p>(D) Cyclic structure of monosaccharide.</p> <p>Model 3</p> <p>(A) Variations in normal blood glucose</p> <p>(B) Naphthols (synthesis and properties of 1- and 2-naphthol).</p> <p>(C) Similarities and differences between pyrrole and furan (reactions, reactivity)</p> <p>(D) Reactions of monosaccharide (glucose).</p> <p>Model 4</p> <p>(A) Gluconeogenesis</p> <p>(B) Substitution reactions of naphthalene.</p> <p>(C) Basic properties of pyrrole and pyridine</p> <p>(D) Disaccharides</p>	<p>الكتاب الجامعي</p> <p>بنك المعرفة</p> <p>شبكة الانترنت</p>	<p>أ.د. نجوي الصاوي</p> <p>د.إيمان عبد الله</p> <p>د.عبد الرحيم محمد</p>	<p>(362 -Ch)</p>	<p>كيمياء وميكروبيولوجي</p> <p>كيمياء وحيوان</p> <p>كيمياء ونبات</p> <p>كيمياء وفيزياء</p> <p>كيمياء وجولوجيا</p>	<p>الثالثة</p>
<ol style="list-style-type: none"> Optical Activity "Chirality" of Organic Molecules. Stereochemistry of cyclohexane derivatives. Utility of Ethyl acetoacetate (EAA) in Organic synthesis. As the demand for motor gasoline increased attention with directed to manufacture of gasoline of high-octane number via polymerization and alkylation processes. Sulfur compounds have bad effects on the different fractions of petroleum oil, so sweetening and desulfurization are important treating processes for oil refinery. 	<p>الكتاب الجامعي</p> <p>بنك المعرفة</p> <p>شبكة الانترنت</p>	<p>أ.د. عبدالبديع غطاس</p> <p>أ.د. حسام عبدالغني</p> <p>أ.د. أحمد الصغير</p>	<p>Organic Chemistry (344-Ch)</p>	<p>كيمياء خاص</p>	<p>الثالثة</p>