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**Department of chemistry**

**College of Education**

**Salahaddin University-Erbil**

**Subject: Practical Organic Identification Course Book – *4th stage***

**Lecturer's name, *MSc, Mzgin Mohammed Ayoob***

**Academic Year: 2023/2024**

**Course Book**

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| **1. Course name** | **Practical organic Identification** | |
| **2. Lecturer in charge** | **Mzgin mohammed ayoob** | |
| **3. Department/ College** | **Chemistry/ education** | |
| **4. Contact** | **e-mail:mzgin.ayoob@su.edu.krd**  **Tel: 07504881549** | |
| **5. Time (in hours) per week** | **Practical: 2 hrs.** | |
| **6. Office hours** | **Wednesday 8.5am-2.5pm.** | |
| **7. Course code** |  | |
| **8. Teacher's academic profile** | **Education:**  **Assist. lecture.**, 18/1/2018  **M.Sc. in Organic Chemistry**, University of Salahaddin-Erbil, 11/2014 - 09/ 2016  *Thesis:* Design Synthesis and Spectroscopic Study of New Flavones Containing Two Azo Linkages.  ***Supervisor****:* asst. prof.Dr. farouq emam Hawaiz.  **Assist. Chemist.**, 24/10/2012  **B.Sc. in Chemistry**, Rank (2), June 2012.  **Teaching Experience:**  Organic chemistry *Lab.*, 2014 – Present  Laboratory instructor for undergraduate chemistry and Biology Dept.  Basic principle in organic chemistry for 1st stage of Biology departments.  Basic principle in organic chemistry for 1st stage of pharmacy department aynda private institute  practical Organic chemistry for 3rd stage of chemistry.   * practical Organic Identification 4th stage of chemistry.   **Conference Paper:**  Design Synthesis and Spectroscopic Study of New Flavones Containing Two Azo Linkages.  6th International Conference and work shop on basic and applied science ICOWOBAS-2017,  **No. of Presentations**: (1).  **Conference Paper:**  **No. of Publications:** (5). | |
| **9. Keywords** |  | |
| **10. Course overview:**  Instruction in the laboratory methods of organic chemistry has a purpose beyond the obvious one of providing practical training essential to the prospective chemist. In affording an opportunity for the student to become acquainted with a number of representative organic compounds, to observe their special properties and characteristic behaviours, and to have some experience with the methods of handling them, such work forms asupplement to a lecture course which is essential to a full understanding and appreciation of the subject. With thought and study much information regarding the general theory of the carbon compounds can be gained in the organic laboratory, and there is in addition ample opportunity for acquiring manipulative skill and dexterity. Organic compounds present such an interesting array of properties and reactions, and the methods of manipulation are so ingenious, that work in the organic laboratory is usually found to be a stimulating experience. For those who become particularly interested and who develop suitable proficiency there is a wide field even in an elementary course for special experimentation.  **Preparation for laboratory work:**  In order to work efficiently it is quite essential to study the experiments in advance and to lay definite plans for the utilization of the time available. Certain operations, such as the heating of a reaction mixture, often require definite, stated periods of time and it is obviously necessary to arrange for this. It often happens that there are periods in an experiment during which the operator's full attention is not required, and the intelligent worker makes good use of these periods by working on other experiments, cleaning apparatus, obtaining supplies for future operations or otherwise busying himself. | | |
| **11. Course objective:**  1. Solve complex reaction mechanisms.  2. Synthesize compounds starting with simple ingredients.  3. Determine the structure of organic compounds.  4. Name organic compounds based on their structure.  **The specific objectives of the study were:**  1. To evaluate the types of objectives of the selected activities  2. To assess the inquiry levels assigned to the laboratory tasks  3. To measure the relevance of the activities in terms of the recent concern, students  In order to achieve these objectives, the study posed the following research questions:  1. What types of objectives are served by the activities included in the course material.  2. What types of laboratory activities dominate the course Practical Organic  Chemistry?  3. How do students and laboratory instructors react to what should be the  objectives of the laboratory tasks?  4. What levels of inquiry are assigned to the laboratory tasks?  5. What are students actually doing and how well are their performance in  Practical Organic Chemistry laboratory sessions? | | |
| **12. Student's obligation**  *Chemistry laboratory activities* refer to the practical activities which students undertake using chemicals and equipment's in a chemistry laboratory. *Inquiry level* is a multifaceted activity that ***involves making reports, weekly quiz observations posing questions, planning investigations; reviewing what is already known in light of experimental evidence***; using tools to gather, analyze, and interpret data; proposing answers, explanations, and predictions; and communicating the results. | | |
| **13. Forms of teaching**  The principal learning outcome of demonstration activities is to help the student grasp the theoretical understanding of the course ***for this reason we use whit board for explanation of concepts and using chemicals, equipment's and apparatus for building product.*** | | |
| **14. Assessment scheme**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **The overall rank for Organic chemistry lab. Is divided in the following scheme** | | | | | | | **type Assessment** | **reports** | **Quizzes** | **Final exam** | **overall** | **activity** | | **degree** | **10** | **10** | **15** | **35** |  | | | |
| **15. Student learning outcome:**  To realize outcomes that focus on scientific method requires the provision of experience in real investigations. Students should have experiences in seeing  problems and seeking ways to solve them (when students themselves design experimental procedures), interpret data, make generalizations and build explanatory models to make sense of the findings, etc., which are nonexistent in the manual. In addition, observation in this study showed that the laboratory works were done in teams of three and four students. This framework of the group may allow the students for a variety of interactions such as  • Opportunity to discuss, to consult with one another and to criticize and be criticized  • Increased efficiency by division of labor.  • Opportunity to compare results and to interpret data within the group. | | |
| **16. Course Reading List and References‌:**   1. Organic chemistry by P.Y. Bruice, 4th edition. 2. Practical organic chemistry by B S. Furniss and etal. (vogel), 5th edition. 3. Experiments In Organic chemistry by L. F. FIESER, 2nd edition. 4. Practical Organic chemistry By F. G. MANN B.C.Saunder, 4th edition, Longman, 1974. | | |
| **17. The Topics:** | | **Lecturer's name** |
|  | | Lecturer's name  ex: (2 hrs) |
| **18. Practical Topics (If there is any)** | |  |
| **Course programmed**  **Week 1**  Sodium fusion and ignition test  **Week2**  Classificationtestsforfunctionalgroups  **Week3 and 4**  Test for aldehydes and ketones  **Week 5 and Week 6**  Test for carboxylic acid and derivatives  **Week 7,Week 8**  Preparation of derivatives  **Week 9 and Week 10**  Unknown No1  **Week 11 and Week 12**  Unknown No2  **Week 13 and Week 14**  Unknown No3  **Week 15 and Week 16**  Unknown No4 | | Mzgin Mohammed Ayoob  ex: (2 hrs) |
| **19. Examinations:**  **1-Deduce the structure for each of the following compounds.**  **a-the unknown compound (A) (C4H6O4) according to the following observation 1-Burn with blue flame 2- No color with KMnO4**  **3- Give a positive test with KI/KIO3 4- Has weak peaks at 2826cm-1 and 2955cm-1**  **Compound B**: insoluble in water; insoluble in sulfuric acid; sodium fusion, followed by silver nitrate treatment, gave a white precipitate.  **Compound C**: insoluble in water; quickly decolorized bromine; did not react with acetyl chloride; did not form a precipitate with 2,4-dinitrophenylhydrazine; did not form a precipitate when treated with excess iodine in aqueous sodium hydroxide solution.  **2- write role each of the following reagents? (With equation if required).**   1. KMnO4. 2. Tollens test.   **3- How you can distinguish each of pair compound (classically and instrumentally) 1- aldehyde and ketone.**   1. **Complete the following equations:**      1. **Prepare the derivative for each of the following compounds (just by one equation):** 2. Phenylacetic acid 3. nitrobenzene.   **10- An organic compound was found to contain 40.0% carbon, 6.7% hydrogen and 53.3% oxygen by mass. Calculate the empirical formula of the compound.** | | |
| **20. Extra notes:**  There are typical experiments in organic synthesis. You will encounter many observable changes throughout these experiments. It is very important to record all the observations accurately and in detail. Furthermore, when one makes an observation, it should be written down immediately.  In order to avoid any excess of a reagent that could decompose or cause decomposition and produce tar (byproduct), you need to weigh the quantities of solid reagent very carefully to the accuracy of 0.05 g or better.  In all experiments you will have to calculate for yourself some of the amounts of  needed reagents. After you have calculated them, confirm your results with the instructor before proceeding. | | |
| **21. Peer review پێداچوونه‌وه‌ی هاوه‌ڵ** | | |