151-06 Physiological Chemistry Lab

Mariacristina Bom

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Overview of course: This is a laboratory course, which will serve to exemplify concepts in General, Organic and Biological chemistry that are covered in the lecture class. CHEM 150 is a pre- and co-requisite. Class meets on Wednesdays 9:00-10:50am.

Student Learning Outcomes: At the end of this course the student will be able to: Recognize and manipulate basic laboratory equipment. Analyze and interpret quantitative and qualitative data. Recognize the societal, ethical and moral dimension of science and technology. Be effective communicators in writing and orally.

**Wednesday** | **EXPERIMENT** | **PAGE**
---|---|---
08/27 | Check-In, Lab safety. | 
09/03 | 1. Density (Problems #1-6, p.4) | 3 
09/03 | also 4. Separation of a Mixture (Prob. #1-5, p.12) | 10 
09/10 | 3. Physical Changes and Chemical Reactions (Prob. #3-5, p.9) | 7 
09/17 | 2. Thin Layer Chromatography (Prob. #1-4, p.6) | 5 
09/24 | 5. Acids and Bases (Prob. #1-4, p.15); also 6. Buffers (Prob. #1-2, p.17) | 13, 16 
10/01 | 7. Hydrocarbon Models (Prob. #2, p.20) | 18 
10/08 | No Class: Autumn Holiday | 
10/15 | Lab Quiz I | 
10/22 | 8. Hydrocarbons (Prob. #2-3, p.23); also 9. Alcohols and Phenols (Prob. #1-4, p.26) | 21, 24 
10/29 | 10. Aldehydes and Ketones (Prob. #1, 4, 5, p.29) | 27 
11/05 | 11. Carboxylic Acids, Esters, Amines and Amides (Prob. #1-6, p.32) | 30 
11/08 | also 12. Preparation of Aspirin (Prob. #2-3, p.33), and Preparation of Esters Handout, 24 | 
11/12 | 13. Carbohydrates (Prob. #2-5, p.36) | 34 
11/19 | 14. Lipids (Prob. #2, 4, 6, p.39) | 37 
11/26 | No Class: Thanksgiving Holiday | 
12/03 | 15. Aminoacids and Proteins (Prob. #3-5, p.42) | 40 
12/10 | also 16. Protein Denaturation (Prob. #1-3, p.44) | 43 
12/10 | Check-Out, Lab Quiz II | 

**TEXT AND SAFETY GOGGLES ARE REQUIRED FOR THE COURSE.**

A simple calculator is recommended.

Grade Determination (Possible points for lab quizzes and lab reports):
Lab Quizzes - 150 points (2 @ 75 pts. each); Lab reports - 550 points (11 @ 50 pts. each);

Grading Scale (% of Possible Points)

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<th>93-100</th>
<th>A</th>
<th>90-92</th>
<th>A-</th>
<th>87-89</th>
<th>B+</th>
<th>83-86</th>
<th>B</th>
<th>80-82</th>
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<th>77-79</th>
<th>C+</th>
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<td>90-72</td>
<td>C-</td>
<td>67-69</td>
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<td>60-62</td>
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Note: According to the Xavier University Catalog, a grade of “A” is earned for “EXCEPTIONAL” performance. This is also the agreed grading policy of the faculty in the Chemistry Dept."

For more information, go to the website www.xavier.edu/chemistry/dept_policies_grading.cfm
CHEM 151

Class Policies

Due Dates:
Lab reports are due the next lab period following completion of an experiment. Late reports will not be accepted. Timely submission of pre-lab and post lab work, as well as consultation of documents posted on the class website is the responsibility of the student.

Attendance:
Students are required to perform all assigned experiments and at the scheduled times. Missed labs cannot be made up. In the case of an emergency, an absence-justification request must be delivered by e-mail, by phone or in person before 9:00 am on class day. Un-excused, missed labs receive zero points. Students may receive up to 30-points for one excused missed lab by submitting the required pre-lab write up and the document, signed by appropriate authority, that justifies the absence. Make-up exams will only be given when the absence is documented and excused, and if arrangements can be made to make-up the exam within the same week as originally scheduled.

Attire and Lab Safety:
Laboratory safety is very important. Safety glasses/goggles, long pants and fully covered feet (shoes or sneakers only) are required. Please tie back long hair. No food, drink, or gum is permitted in lab. Lab aprons are available, as are gloves. A zero will be assessed for any lab in which a safety infraction is committed. Cellular phones, pagers, MP3 players etc. need to be turned off during class time unless the instructor has been notified of a personal emergency situation.

Equipment-storage drawer:
The key will be made available, but it needs to be surrendered at the end of each class time and it cannot leave the classroom.

Special Accommodations:
Anyone who feels he/she may need an academic accommodation based on the impact of a disability (e.g.: sensory, learning, psychological, medical, mobility) should inform the instructor at the beginning of the semester. Also, the student needs to contact the Disability Services Office at 513-745-3280 (Fifth Floor of the Conaton Learning Commons, Room 514) for assistance in verifying his/her eligibility, and to coordinate reasonable accommodations.

Academic Misconduct Policy:
A grade of zero will be given to any student violating the University Academic Honesty Policy. The student may appeal according to normal University procedures as stated in the University Catalog.
CHEM 151 THE LABORATORY REPORT

For each experiment, a laboratory report is required. Typed reports printed on both sides are preferable (14 points font, 1" margin all sides). If the report is handwritten please use loose-leaf paper, permanent ink, large and readable print and leave every other line blank to allow space for comments. The report is individual. Unless otherwise specified, each report should include the following:

1. PRE-LAB
   The pre-lab must be completed before coming to class. These sections will be checked, initialed and dated by the instructor, before you are allowed to begin any laboratory work. Please type items a) through d).
   a) Cover Page. In the middle of the page include, centered,
      Line 1 Experiment’s Number and Title (as by schedule).
      Line 2: Your name.
      Line 3: Course and section number.
      Line 4: Date of the experiment.
   b) Purpose. In no more than three sentences, tell the specific objective(s) of the experiment. What principle is to be learned or confirmed? What main parameter will be determined, or what chemical properties or characteristics are to be investigated? Will an unknown sample be identified? How?
   c) Procedure and Waste Disposal Note. Briefly but exhaustively indicate, in paragraph format, the main experimental steps to be followed. Do glance at the “Report/Data Sheet” for a better understanding. Do not mention the mathematical manipulation of the data in this section. Rather write the actions to be accomplished, the chemicals (name, formula, concentration, amount) as well as the type of equipment (size of glassware) used to obtain those data. If a procedure is repeated many times propose a typical example, then list the individual differences. In a separate paragraph mention how each chemical used during the experiment is to be disposed in our laboratory.
   d) List of Equipment needed from the drawer. This page has to bear your name and the title of the experiment. It must be typed and turned in at the end of class time.
   e) Exercises assigned in the schedule of experiments.

2. DATA and OBSERVATION SHEET (Report Sheet)
   All work should be recorded in permanent ink. The use of white-out or erasable pens is not accepted. Erasures are to be avoided. Errors may be negated by simply drawing a single line through a mistake, or by using an X to omit a mistake of 3 lines or more. For example: The thermometer read 35 degrees F 40 degrees C. Initial and date the correction as well. As dictated by the data sheet provided in the manual for each experiment, record quantitative data (weights, densities, time, temperatures, unknown sample number, ect.), as well as unique or distinctive experimental occurrences (qualitative characteristics such as color, odor, physical state, differences in execution of
the experiment from what was stated in the procedure, etc.) in the manipulation of an unknown sample. NOTE: Observations and data are not to be recorded on separate sheets of paper, but rather, directly onto the data sheet when the data is first acquired or observed. Most of the times the data sheet will prompt the mathematical manipulation of data. Since the calculations you make justify any quantitative answers you may report, you should write all calculations, even if basic, used to determine your results. Calculations should be done during lab, as time permits. Don’t forget to mention all units of measurement.

3. RESULTS and CONCLUSIONS
Please type it. Limit the length to two pages. Do not use first person (singular or plural). This section should review the experimental purpose (what was expected) and report the key results (what was observed). Explain and give an example of the mathematical manipulation (if any) of the data. If repetitive calculation were involved, show only one case. Further discussion may briefly explain why things did, or did not work as expected, discuss how theory was supported by experimental results, and evaluate the experiment as fulfilling or not fulfilling the objectives. Experimental data and/or results should be cited to support conclusions. Sources of error pertinent to the experiment should be mentioned as well as possible improvements. Report all consulted literature, authors, edition, title and pages for textbooks and journal articles, or websites: the original sentence needs to be reported in quotation marks. An explanation in your own words is required.

4. Post-Experiment Questions: available on Canvas, if assigned.

PLEASE NOTE:
The lab report must be stapled and should include items 1 through 4 in order. Only prelabs and data sheets initialized by the instructor can be submitted as part of the complete laboratory report.