

Department of Chemistry
The University of Texas at El Paso
Physical Chemistry Laboratory

CHEM 3152 (CRN 20662, 25788)

Spring 2023

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Introduction

Prelab meeting will be held on Wednesdays from 1:30-2:20 pm in PSCI 314. There will be a prelab quiz every session. Following the quiz, the experiment will be reviewed, and questions will be answered. For questions about the laboratory experiments and guidelines, talk to the teaching assistants. Following prelab, the Wednesday laboratory session will be held in PSCI 302 from 2:30-5:20. The Friday laboratory session will be held in PSCI 302 from 12:30-3:20.

Course Description

The objective of this course is to present and perform complementary experimental work to the Physical Chemistry laboratory, CHEM 3352, that focuses mainly on quantum theory, kinetics, spectroscopy, and magnetism from a chemical standpoint.

Textbook

No textbook will be required. An E-Book of all experiment handouts will be posted to Blackboard. If extra handouts are required, they will be posted to Blackboard at least one week before the practice.

Grading

The grade for this course will consist of cumulative points obtained by individual laboratory reports divided by the total number of report points possible (each lab report is out of 100 points). The same will be done for quiz grades. The grade distribution will be:

- 60% Lab reports
- 20% Pre-lab quizzes
- 10% Laboratory performance
- 10% Laboratory notebook

Laboratory performance includes attendance, successful execution of the experiment, and proper safety behavior. Laboratory notebooks will be required and will be quickly graded before the practice. In these notebooks, you should write a summary of the experiment to be performed. You will need to state the purpose of the laboratory practice (it can be in the form of a hypothesis), list the required materials needed throughout the practice, and list the proper procedure to be followed. The laboratory notebook shall be shown to the TA or instructor at the beginning of every laboratory practice and a grade of 0, 1 or 2 will be given (0 for unacceptable procedures, 1 for acceptable but limited discussions, and 2 for satisfactory work). Students who are not well prepared will not be allowed to perform the experiment that week and will have their grades affected.

Reports are due one week after the completion of the laboratory practice. Reports will be submitted through the appropriate drop box in Blackboard. If you are unsure when a report is due, check the schedule written at the end of this document.

Late reports may be accepted with a penalty of 20% per late day. If the report is not submitted at the beginning of the lab, the report will be considered late. It is your responsibility to make sure that your report was received.

Laboratory report format

The format of the experimental reports must follow the ACS style that can be found in any journal of the American Chemical Society. The format of JACS, Physical Chemistry A or Physical Chemistry B is recommended. Each individual report will be graded based on the quality of the following sections:

1) Abstract: An abstract is a **brief and concise** summary of the experiment described in the report. It should include the general idea of the experiment, results obtained, and the conclusions drawn from those results.

2) Introduction: This section includes the background to the experiment. It must include the necessary theoretical framework required to understand the experimental work, and it must end with a clear statement of what will be investigated during the experimental practice.

3) Experimental Information. This section can be separated in two parts. a) A clear description of the experimental apparatuses, chemicals, or specialized computational programs utilized, and b) The exact experimental procedure followed during the practice. This section should be written in the past tense, since this is a report of what was observed.

4) Results and discussion. A clear description of the results and any observations recorded during the experiment. Discussion of these results and how they fit into the whole theoretical background should be discussed in the Introduction.

5) Conclusion. This includes conclusions drawn from the experiment.

6) References. These should conform to the ACS style. Please refer to any JACS, Physical Chemistry A or Physical Chemistry B journals for further information. These journals can be accessed through any UTEP connection (including VPN connections from home) at <http://pubs.acs.org>.

View the laboratory report rubric to see how your lab reports will be graded.

Disability

If you believe you may qualify for special accommodations due to disability, contact the Center for Accommodations and Support Services: <https://www.utep.edu/student-affairs/cass/>; 915-747-5148.

Safety

A safety agreement is included in your E-Book. You will be required to always follow these laboratory rules. Use of appropriate eyewear protection compliant to university rules is always mandatory during laboratory practice.

COVID Considerations

Currently, all pre-laboratories and experiments are planned to be conducted on-campus. If the course needs to transition to online, computational experiments are prepared for the entire semester. Pre-laboratory meetings would be held virtually via Microsoft Teams at the scheduled time and all office hours would transition to virtual, scheduled meetings. While we are prepared to transition to online classes, we hope to remain in-person. Currently, masks are not mandated in the state of Texas, but wearing one is strongly recommended. Disposable masks will be available in the laboratory if you wish to wear one. As always, **if you are sick, stay home**. Talk to your TAs regarding missed laboratories. Data can be sent virtually to complete the laboratory reports; do not worry about falling behind if you become ill. If you test positive for COVID, you can email covidaction@utep.edu to report your case to the university and receive further guidance.

Week	Experiment	E-Book pg.	Style of Experiment	Report Due
1. 1/17-1/20	No Lab			
2. 1/23-1/27	Introduction & Safety	2		
3. 1/30-2/3	Introduction to Electrochemistry Quiz #1	TBD	In-Person	2/8
4. 2/6-2/10	Introduction to Gaussian Quiz #2	146	Computational- Gaussian	2/16 (Worksheet, page 184)
5. 2/13-2/17	Particle in a Ring Quiz #3	156	Computational- Gaussian	2/22
6. 2/20-2/24	Particle in a Box Quiz #4	67	In-Person	3/1
7. 2/27-3/3	Quantum Dots: Group 1 Quiz #5	72	In-Person	3/8
8. 3/6-3/10	Quantum Dots: Group 2 Quiz #5	72	In-Person	3/15
9. 3/13-3/17	Spring Break- No Lab			
10. 3/20-3/24	Gouy Balance Quiz #6	89	In-Person	4/7
11. 3/27-3/31	No Lab		C. Chavez Day	
12. 4/3-4/7	No Lab		Spring study day	
13. 4/10-4/14	IR Spectroscopy Quiz #7	132	Computational- Gaussian	4/19
14. 4/17-4/21	Raman Spectroscopy Quiz #8	113	In-Person	4/26
15. 4/24-4/28	Absorption of I ₂ Quiz #9	104	In-Person	5/3
16. 5/1-5/5	Atoms and Simple Molecules Quiz #10	126	Computational- Gaussian	5/10
17. 5/8-5/11	No Lab – final week		N/A	N/A