



DIVISION OF SCIENCE CCNY

JOIN THE MINDS THAT MAKE THE FUTURE



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PHYSICAL CHEMISTRY LABORATORY

REQUIRED PREPARATION

A considerable amount of preparation is required BEFORE beginning an experiment. This includes:

- Studying the handouts, references, and text relevant to the experiment.
- Preparing an outline of the experiment: purpose, experimental protocol, a list of results you expect to obtain, plan for error analysis procedure.

RECORDING DATA

Each group must have a looseleaf 8 ½" X 11" notebook, QUAD RULED paper is highly recommended. The grid will provide a template for data tables and you can use the same paper to draw graphs. The notebook should be complemented with two sheets of carbon paper to make duplicate datasheets so the instructor will have a copy of the data.

REPORT DUE DATES/GRADING

- There is no right or wrong answer to the question posed.
- Grades will be based on student's ability to use concepts learned in class and retrieved from the literature as well as presentation of convincing arguments and calculations.
- Reports will also be graded by the quality of: ABSTRACT /INTRODUCTION/ METHODS/ DATA/ CALCULATIONS/ DISCUSSION.
- The due date of each laboratory report will be announced after the completion of each experiment. Reports are usually due TWO weeks after the experiment is completed.
- The grade range for reports handed in by their due date is 60 to 100. The grade range for reports handed in late is 60 to 90. This means that it is impossible to get a grade of 90+ for a report submitted late no matter how good it looks.
- All reports are weighted equally.
- EACH STUDENT SUBMITS HIS/HER OWN LAB REPORT.

ADDITIONAL INFORMATION

- The Lab manual is available at: <http://jr.stryker.tripod.com/physchem/main.html>
- Check the UPDATES section of this webpage for any changes in schedule and to see what you have to do next time you come to the lab.
- Lab work should end 10 minutes before schedule for all to clean up their workstations.
- If you miss a lab, talk to the lab instructor, THAT 'S ME.
- I will try to make things as difficult as possible. If there is a way to make things more difficult for you, let me know.

THE LABORATORY REPORT

Start the report with a small block of information:

CHE 335 Physical Chemistry <---[Class Number]

Gamma - The Adiabatic Expansion Method <---[Title]

Your Name, Other's <---[Group members, you as the first author]

i. ABSTRACT

Should be prepared after the entire report has been written. Should be brief summarize the experiment and the results. A decent abstract includes:

- the purpose of the experiment.
- a description of the system studied.
- principal methods, new techniques that improved the original methods.
- principal results, for example:
...the heat capacity with the corresponding 95% confidence limit is $4.18 \pm 0.01 \text{ J/}^\circ\text{C}$.
- discuss possible sources of error.

ii. INTRODUCTION

Should include the hypothesis behind the experiment state the problem and/or give a predictions. It should include enough background to inform a reader who is unfamiliar with the laboratory experiment. Relevant chemical equations should be numbered consecutively in the right margin and be integrated into the narrative of the introduction. Make sure to include some background on the instrumental method being used and cite references for background information.

iii. MATERIALS AND METHODS

Most of the Materials and Methods section should be ready before you actually perform the experiment, remember that you have an outline of the experimental procedure before you come into the lab. Briefly describe the method, chemicals, glassware, and other equipment used. The narrative here uses the third person and past tense. The experimental detail should be such that the experiment could be reproduced.

iv. DATA, CALCULATIONS, AND RESULTS

Includes the datashhets recorded during the experiment. You might want to make all these into an appendix. At least one set of data should be worked out and include:

- Formula in symbols.
- Formula with all values and units substituted.
- Unit cancelling steps.
- Final result including units.

v. DISCUSSION

Should include interpretation of the data and calculated results, say whether the hypothesis has been proved, or whether the prediction was correct. Talk about how the results agree (or don't agree) with your expectations and prior scientific knowledge. What might have gone wrong? (analysis of the error involved in the experiment). How the experiment could be improved?

vi. REFERENCE FORMAT

Books: Author, Title of book, publisher, place of publication, (date of publication), page number(s)

Articles: Author, "Title of article", Title of journal, volume number, page number(s), (year of publication)