***LAB REPORTS***

Reports may be computer generated or neatly hand written in ink\*, single sided. Plots / graphs may be computer generated using a suitable plotting application **or** hand written on graph paper. Ensure that all pages of your report are securely bound before submission. Lost work cannot be graded. Submit lab reports at the beginning of your scheduled lab, in the box provided.

Lab reports will be written in either an **informal, modified formal, or formal** lab report style as indicated at the beginning of each experiment. The following is a general guide to the format for your lab report. Review the marking scheme and/or consult your TA for specific instructions or deviations from the general guide.

**Data Sheets:** All reports must include a signed data sheet, written in ink\*. During the experiment, record original observations such as mass, volume, temperature, colour, state, changes etc. neatly on the data sheet.

**Informal Lab Report Format**

An **Informal Lab Report** consists of neatly written report sheets\*\* and a data sheet(s), written in ink\*, signed by the teaching assistant. Have the teaching assistant sign the data sheet when you are finished with the experiment. For each calculation required, show a sample calculation. If there has not been enough room provided for sample calculations include them on a separate piece of paper. Informal lab reports are due at the end of the lab period in which you are performing the experiment.

**Modified Formal Lab Report Format**

A **Modified Formal Lab Report** contains one portion of a formal lab report; an introduction, discussion or conclusion. The majority of the report however is similar to an informal report and consists of neatly written report sheets\*\* and original data sheets, both written in ink\*. Transfer data from your data sheet neatly to the report sheets\*\* after the lab experiment. Modified formal reports are due at the beginning of your next scheduled lab period, allowing two weeks to complete the report.

\* Marks are deducted for reports written in pencil or containing “white out”, also these reports cannot be reviewed if you are unhappy with the original grade.

\*\* The report you hand should be your best work, and it will be graded accordingly. Do not use the report sheets for rough work!

**Formal Lab Report Format**

**A properly written formal lab report consists of the following sections:**

**Cover Page**

* Give your experiment a good, descriptive title
* Include the date, your name, ID#, TA’s name and partner’s name and section #

**Introduction and / or Purpose**

* Introduce the background material your reader will need to understand the experiment and all parts of your report.
* Summarize the underlying theory of the experiment and any equations used.
* Identify the purpose; what you are trying to accomplish or prove?

**Experimental Procedure**

* If the procedure in the lab manual was followed exactly, state: "The experimental procedure used for this experiment was outlined in the CHEM 123L lab manual, Experiment #2. All steps were followed without deviation.") Include your lab manual in your reference section if you use this technique.
* If the procedure was not followed exactly, you must explain the deviations.
* Marks are not assigned for the procedure, but will be deducted if you do not include it in your report.

**Experimental Observations**

* Present all experimental observations; what did you see / hear / feel happening as the experiment was proceeding?
* Enter original observations such as mass, volume, temperature etc. with units.
* Tabulate data (present your data in a table) when possible, this helps the reader quickly compare your data. Include appropriate table titles, labels and units.
* In some reports you may be asked to combine observations and results.

**Results & Calculations**

* Show one sample calculation to illustrate how each type of calculation was performed. Use appropriate units and significant figures.
* Tabulate calculated results, whenever possible. Tables must have appropriate titles, labels and proper units.
* Refer to Appendix B: Data Analysis, for information on preparing graph/plots

**Discussion**

* Generally describe what was accomplished by the experiment. What concepts or ideas did the experiment prove, show, reinforce, etc.
* Compare experimental results with values found in the literature (if any). If your values do not agree with literature values, discuss why this may be.
* Briefly discuss possible sources of observed errors, explain what may account for the observed results. (This is **not** a discussion of possible errors that may / may not have occurred!)

**Questions**

* Answer all questions given in the lab manual in a separate section within your report, unless you are instructed otherwise.

**Conclusions**

* Restate purpose and/or objectives of the experiment and give conclusions as to whether or not they were achieved.
* State all experimental findings regarding unknowns
* Comments regarding the effectiveness or reliability of experimental methods can be made here as well

**References**

* List any books or articles that were used in writing the lab report (including those used to answer questions) in alphabetical order by author(s) or editor(s) name. Include full reference information for each source.
* Acceptable references are peer-reviewed, published sources, ie. text books, reference books (CRC, Merck Index, etc.) and journal articles, not web-sites
* Always cite references within the body of your lab report. The preferred citation style for Chem 123L is ACS format (search “ACS Style Guide” for samples)
* Once again, marks are generally not assigned for the references, but will be deducted if you do not include them in your report.

**Clarity and Understanding**

* A mark is assigned for overall clarity and understanding of the experiment. Present your findings in a way that shows you understand what you did and why. This includes neatness and organization. Don’t make it difficult for your TA to mark your report!

**Lab Report Marking Schemes**

A full summary of how marks are allotted for each experiment is available on the Waterloo LEARN, CHEM 123L site. Knowing which portions of the report are weighted most heavily will allow you to budget your time accordingly. Also, if you think you will be unable to complete a report by the due date, you can complete those sections which will earn you the most marks and submit this partial report for part marks. Remember, late reports are not accepted and are assigned a grade of zero.