

Analytical Chemistry Laboratory Notebook Guidelines

I. Preliminaries

- A. You will be doing your lab work in pairs (or groups of three) all semester. On the cover of your notebooks, write your name and the name of your lab partner(s).
- B. You must use a bound laboratory notebook for recording all data and observations. You will present all analysis and discussion in your notebook as well.
- C. Always write in ink. Make any corrections by drawing a single line through the incorrect information. You should never white out or otherwise obliterate anything you write in your notebook.
- D. Leave the first page blank for a **Table of Contents** which lists each of the experiments and the pages the documentation for each occupies. Keep this Table of Contents updated!
- E. If your notebook does not already have page numbers, you need to add them to the upper right corner of each page. You should also write the date (including the year) you start writing on **every** page. If you write on a given page over more than one day, be sure to add a separate date for those additional comments.

Note that you will lose points if any of the above mechanics is neglected.

II. Specifics

A. Before and during lab:

- (1) At the top of a blank page, write the experiment's **Title** and a brief statement of its **Objective**.
- (2) You and your lab partner(s) should think about how to divide up the labor so that your time in lab can be spent as efficiently as possible.
- (3) Write down what each person actually does (not necessarily what it says in the lab instructions). Your notes should be detailed enough that another lab group could do the experiment from the notebook alone, without referring to the lab handout.
- (4) You should also record your qualitative and quantitative observations along with your description of the experimental procedure. I expect you to write down observations like changes in colors and (qualitative) changes in temperature. Do not just write down numbers! Do not write down data on scraps of paper, paper towels, or Kimwipes! Try to record data in tables whenever appropriate.
- (5) Write down each number to as many significant figures as justified by the instrument you are using. It is prudent to write down one additional, non-significant figure as well, if possible. (This will often involve interpolation.) Always note the (estimated) uncertainty in that number as well as its units.
- (6) You should "think in writing" during the experiment. Write down any questions, insights, or suspicions in your notebook.
- (7) **Each lab team will present all of the in-lab documentation for a given experiment in one notebook. However, each person should have a lab**

notebook. That way, I can grade one notebook for a past experiment while the lab team uses the other notebook for the current experiment.

B. After lab:

You and your lab partner(s) are encouraged to collaborate completely on your post-lab work. If you choose to do this, your Data Analysis and Discussion should appear in the same notebook that contains your in-lab documentation. However, note that you are always free to turn in separate Data Analysis and Discussions as well.

- (8) Document your **Data Analysis**. This will always include a determination of uncertainties. If you are performing the same set of calculations on a data set, you should write out one set of sample calculations (only).
- (9) If you are performing linear regressions, you must use Excel or another spreadsheet program. Print out copies of all tables and graphs, and tape each table or graph on a separate page into your notebook. (This makes it a lot easier for me to write comments.) You will lose points if you don't do this. (You should also e-mail me your Excel file.) Your spreadsheets and graphs should not just contain numbers! You should clearly label columns of data on spreadsheets, and provide a title and axis labels for all graphs. In your notebook, you should also provide a brief explanation of the calculations you did with the spreadsheet. (You will see examples of this when we cover calibration.)
- (10) Write a **Discussion** of your results. Indicate if the **Objective** has been achieved. You should always discuss the possible sources of both systematic and random error in the experiment, and judge what the dominant source may be. You must identify and explain the sign of each systematic error, and you should try to estimate the magnitude of each systematic and random error. You should also include a comparison with the "accepted" value, if one is available. Other reporting requirements for each experiment will be detailed on your handouts.

When you are done with your write-up, remember to update your **Table of Contents!**

III. Grading

Up to **25 points** per experiment (typically), earned in the following ways:

8 points: Quality of your in-lab record-keeping and other notebook mechanics

5 points: Accuracy and precision of your results

12 points: Quality of your data analysis and discussion

Note that you and your partner will always receive the same score for the "quality of your in-lab record-keeping and other notebook mechanics" and the "accuracy and precision of your results." If you choose to do your data analysis and discussion together, you will share that score as well.

Just as with problem sets, there will be a 20% per day penalty if your notebook is late.