

## Appendix V

# Using a Laboratory Notebook

**NOTE:** Consider this appendix as only a supplement. Follow your laboratory course syllabus and ask instructor specific questions prior to turning in work for grading.

### General Laboratory Notebook Skills

Keeping a neat, detailed, and accurate laboratory notebook is one of the most important skills to learn as a chemist. Laboratory notebooks are used in industry, by governmental agencies, and by academicians to provide a basis for further investigations, regulatory limits, court decisions, and patent rights. In each instance, decisions are made based on data recorded in a standard fashion in a laboratory notebook. In the CHEM 180 series, the results recorded in your notebook will not be used as evidence in a criminal trial, but as evidence that you have:

- followed a safety protocol for proper laboratory technique
- applied a consistent and reproducible laboratory procedures
- evaluated and reported out data in a consistent and fair manner
- understand the chemistry content
- a record of information that you will use to write a report of your findings to your client (in this case your instructor).

In reality, the laboratory notebook needs to be legally defensible. Standards have been set which, if followed, make the notebook a legal document. The first and most important “rule” is to record all data in your notebook as you collect it, in chronological order. Your lab notebook should be a first-hand account of everything that happened in lab, as well as a record of all calculations that were necessary to report the results of an experiment. **Do not** record data directly to your report sheet or on other loose sheets of paper that can easily be lost or put out of place in your notebook. The report sheets contained in the manual are designed to give your instructor a clean and neat summary of what you did in lab, **not** as a place to record data collected in lab. It should not include all the trials gone bad, or calculations that were necessary to arrive at the final results of an experiment.

You will be required to purchase a notebook which will record carbonless copies of everything you write. These copies will be submitted along with your final report to constitute part of your lab grade. Laboratory notebooks should be a permanent, documented, and primary record of laboratory observations. Therefore, the notebook must be a bound journal with pages numbered in advance and never torn out. The required notebooks satisfy these criteria with the pages already pre-numbered.

The following guidelines should be followed when using a lab notebook:

1. Your name and contact information, phone and e-mail, should be placed on the inside cover of the lab notebook.
2. Each page of the notebook should be filled out completely including all the header information. Do not leave blank spaces in your notebook.

3. Record data chronologically. If you are working on a new day, start a new page and put a big “Z” through any space that was left on the previous page. This indicates that you have intentionally started a new page and do not intend to record data in that space at a later date.
4. Sign the bottom of each page in the signature space.
5. If you make a mistake while recording data, do not erase. Place a single line through the error, initial it, and record the correct information. You may want to include a brief explanatory note for the change.
6. Never copy data into a lab notebook from another source without clear acknowledgement of the source. This includes referencing any procedures you follow. If you are following a procedure exactly as written, reference the source. If you are adding to the procedure or changing it in any way, record your exact procedure in your notebook. Another person should be able to read your notebook as a sole source of information and be able to duplicate your experiment exactly without referring to another source of information for supplement.
7. You should carry out all calculations in your notebook so that they will be a part of your permanent record. Some scientists use the columns in the notebook with one labeled “data collected” and the other, “calculations.” Others like to record all the data and then do the calculations. Look to your primary instructor and your syllabus to offer you guidance on what they will require for this section of general chemistry lab.
8. The required notebooks will have a Table of Contents. This should be kept up to date. For some instructors, there will be additional requirements for the lab notebook. For example, some instructors will require you to use subheadings in your table of contents such as “purpose,” “data,” “calculations,” and “Interpretations/Conclusions.” That way you or your instructor can quickly reference needed information.
9. Some instructors require you to maintain a “Materials Safety Data Sheets-Section” throughout the entire CHEM 180 laboratory series. This section should follow the Table of Contents section. This section is for you to look up, either through hard copy or online, the safety protocol for each of the chemicals that you will be using in the laboratory. You should set aside approximately 8-10 pages of laboratory notebook pages for this “MSDS-Section.”

### **Course Requirements for the Laboratory Notebook**

In addition to following the general laboratory notebook skills given above, you will be required to include specific items for each experiment you perform:

- Header/Report Information – Lab Title, date of turn in, name, lab partner’s name
- Purpose Statement or Abstract – (refer to your syllabus and instructor)
- Procedure and Observations – (refer to syllabus and instructor)
- Data Section (this can be a compilation of information from computer data tables and hand drawn graphs within your notebook or computer generated graphs that are properly labeled and stapled/taped into your notebook)
- Calculations – (show all your work)
- Interpretations/Conclusions – (refer to syllabus and instructor)

**NOTE:** Each of the Laboratory Instructor for the CHEM 180 Series may adjust the components and headings in the notebook requirements as they see fit. Please be sure to follow the specific guidelines outlined in the syllabus, as interpreted by your primary laboratory instructor and teaching assistant.