

Chemistry 346 - Laboratory Notebook Guidelines

One of the most important and useful things you can learn in this course is how to keep an accurate, up-to-date laboratory notebook. The importance of a well-documented scientific notebook is often not appreciated until one begins doing research. An accurate, dated, and properly witnessed notebook is extremely important, in many cases crucial, in establishing primary development and/or ownership of a process or invention. While the exact format of a laboratory notebook may vary from instructor to instructor and company to company, several guidelines are generally followed.

1. ***A laboratory notebook has a binding and numbered pages.*** Preferably this is a sewn binding, but a spiral binding will generally suffice in the teaching laboratory. Some laboratory notebooks have duplicate numbered pages (one white and one yellow), one of which is perforated for easy removal. This kind of notebook is convenient for the teaching laboratory since, by using carbon paper, a copy of the notebook can be prepared for the instructor and the student can retain the original. Loose-leaf notebooks are not acceptable.
2. ***All data and observations are recorded in the notebook using a permanent pen as they occur.*** A laboratory notebook is supposed to be an accurate record of all observations and measurements of events in the laboratory. The content should be such that another person could repeat the experiment exactly as it was carried out originally. In a properly maintained notebook all entries, e.g., weights of chemicals, temperature, are made directly in the notebook. Recording data on scraps of paper for later transcription is a bad practice and is not allowed. All recorded data should be accompanied by the appropriate units.
3. ***Erasure of any entries in the notebook is not allowed.*** If any entry needs to be corrected, the correction is made by lining out the erroneous entry with single line. The correct entry is entered next to the old entry.
4. Since the data is collected as experiments are being carried out, a laboratory notebook is not, as a rule, impeccably neat. However, the collected data should be organized in an orderly fashion. The exact format for your laboratory notebook is largely a matter of personal taste tempered by any requirements your laboratory instructor may impose. The following suggestions are offered as a guide for keeping a laboratory notebook.
5. ***No pages of a laboratory notebook are left blank.*** The only exception to this rule is 4-5 blank pages at the beginning of the notebook reserved for a table of contents. The table of contents is simply a list of the experiments in the notebook with the corresponding page numbers.
6. ***The left-hand page can be used for calculations.*** Since many of the notebooks used in the teaching laboratories, particularly the ones with duplicate pages, are

designed so that only one side of a page is used, it is convenient and efficient to use the right-handed page for recording the experiment and the left-handed page for miscellaneous calculations.

7. ***Every page is dated and the first page of an experiment has a title.*** It is recommended that continuation pages also have a title or some reference to the experiment, e.g. "continued from page 21" or "Diels-Alder Reaction (cont.)".
8. ***A balanced equation showing the main reaction and any major side reactions is included.***
9. ***A table of the important physical properties of the reactants and the products is useful to have in your notebook.*** This table includes properties that are pertinent to the experiment, e.g., molecular weights, densities of liquids, melting points and boiling points. Properties that are not relevant to the experiment are not included. Two examples of the types of data not needed are the density of sodium and the refractive index of a solid.
10. ***The section describing the procedure contains all the information that would be needed to permit someone else to repeat the experiment in the same way.*** If completed references are given, it is not necessary to duplicate information that is conveniently available, e.g., a laboratory manual, a laboratory handout, or a scientific journal article. A concise, yet detailed, accounts, times, temperatures, etc., is sufficient for this section. Data from observations are recorded in the notebook as they occur during the experiment. The clearest method for recording a series of observations, e.g., boiling point versus volume of distillate, is in tabular form.
11. ***A short statement is included at the end of the experiment to summarize any conclusion and results.***
12. ***Products and unknowns are labeled and numbered by a rational scheme keyed to their appearance in the laboratory notebook.*** The sample number includes the page number and an identifier for that sample. The important thing is that once a system is established, all samples are numbered consistently. An example of one sample numbering system might be:

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name	notebook #	page #	sample #
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This sample number refers to the fourth sample on page 29 of Bucky Badger's second notebook.

13. ***Data from instruments, e.g. infrared spectra and gas chromatograms, are fastened to the notebook pages.*** The spectra are identified by using sample

numbers or other schemes that reference the spectra to their location in the laboratory notebook. For example:

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sample #	spectrum #
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