

Laboratory Notebook in the Inorganic Chemistry Lab

1. Purpose of lab notebooks

Individual lab notebooks should provide a complete and permanent record of all aspects of all experiments. Using the information contained within these notebooks it should be possible at any time in the future to replicate exactly what was done in any given experiment. The lab notebook should produce a record of a scientific endeavor that is understandable to a knowledgeable reader and which can be used to repeat the experiment and, presumably, get the same results.

2. Style of Notebook

The basic lab notebook should have three characteristics: 1) it should be bound and reasonably sturdy, 2) the paper should be of high quality (durable and long-lasting), and 3) pages should be numbered. There are a wide range of notebooks that meet these criteria available for purchase at the bookstore or equivalent.

3. Lab Notebooks

Here are some general rules:

1. Lab notebooks are not designed to be works of art but accurate records of everything you did (and you may find it helpful to include what you thought). Use it as a real-time log rather than a report written after the fact. Avoid writing data on scraps of paper for later inclusion into your notebook. This could lead to errors and to missing information. In certain cases, it may even raise questions regarding the accuracy of your records.
2. Notebooks should be numbered and have a clear indication on the cover and binding of your name and the inclusive dates (start and end dates).
3. Provide your current contact information as well as the name of the lab professor and their contact information. This can be placed on the outside or inside cover of the notebook.
4. One or two pages should be set aside at the beginning of each lab notebook to permit the creation of a table of contents. If different types of experiments are contained in the same notebook, an index grouping experiments by type is also of use.
5. All writing must be easily legible, both to you and others. Record all information in permanent blue or black ink. Never use pencil or brightly colored ink.

6. If corrections must be made, the incorrect information should be crossed out with a single, indelible line (~~wrong data~~), permitting the original entry to be read but making it clear that you wish to delete it. One should never erase or use white-out data.
7. All information should be entered in chronological order.
8. There should be no blank spaces except in so far as this is necessary to permit you to start a new experiment on a fresh page. In this case, a line should be drawn through the blank space.
9. No pages should ever be removed from a lab notebook. All pages should be consecutively numbered.

While entering information into your lab notebook, keep in mind that it may prove to be an important record for you (or in certain cases another person many years from now). Also remember that short-term memory is just that, short-term.

4. Entries for Individual Experiments

For each experiment, your entry should include the following:

1. A unique numerical designation and a descriptive title. This will enable you and the lab professor to find the right book and page for this experiment.
2. Date of entry. Each entry for a given experiment should be dated. If an experiment lasts several days, a new date should be added. If additional experiments are done in the interim, and you are keeping all experiments in a single notebook, pages should not be skipped but an indication of where a given experiment is continued should be provided at the end of a day's entry (e.g., "continued on page 23). The page the experiment is continued on should also reference the page the experiment was continued from (e.g., "continued from page 18).
3. Purpose. A few sentences summarizing what you hope to accomplish with this experiment written before you arrive to the lab to do the work.
4. Methods: Include all details needed to allow you or a fellow student replicate your procedure precisely. This includes which reagent bottles (company, catalogue number, purity, and lot number), solutions (date made, person making it), and pieces of equipment. In most cases you may wish to include sketches of your set up.

If you were assisted in any way by others, their names and description of assistance should be entered.

Note: You may be able to indicate that some additional details can be found in previous experimental write-ups. In that case it is not necessary to repeat the details.

However, be specific about where that information can be found, and be sure that the information is still accurate.

5. Results: *all* data, *all* experimental calculations, and *all* incidental observations go directly into your lab notebook. "Data" refers to *primary* data as well as any subsequent transformations or analyses. Since these are results that you observed, any words used to describe them are typically provided in the past tense.

All data should be entered whether or not you feel that some data should not be included in your subsequent data analysis. If you should have a clear reason for excluding the data from your analysis, provide a reason that is stated explicitly and would be generally accepted (e.g., >2 standard deviations from the mean or resulting from an obvious technical error such as an incorrect chemical, etc.).

There are several cases in which it is not practical to place the actual raw data in your bound notebook (see "Special Cases" below). However, even in those circumstances it is essential to provide an indication of where the data can be found.

6. Conclusions: A short paragraph stating your conclusions and, where appropriate, a discussion of possible future experiments.

5. Special Cases:

It is no longer practical to place output from some pieces of equipment into a notebook. Thus, it is acceptable to store certain forms of data in a loose leaf notebook and/or a disk with a clear indication of your name and the date. Be sure that information in your notebook is adequate to permit a reader to find these data and (in the case of a disk, CD, or DVD) to display the data.