

Laboratory Notebooks

See for Example: [1] "Experiments in Physical Chemistry", D. P. Shoemaker, C. W. Garland, J. I. Steinfeld, McGraw Hill, 1974.

- 1) Lab Notebook is the "ultimate record of what took place in the laboratory" [1].
- 2) It is the source of the information in reports, publications and patents and is a record for others interested in your work, sometimes years later, to recreate your results.
- 3) It is required that you record everything relevant to your investigation in the notebook. Everything relevant means everything. A partial list of "everything" includes notes from class, notes on references with citations, data, calculations, comments on work, graphs, your feelings/views on the experiment. In some sense the notebook is partly a diary of the experimental progress, but it should be kept in mind that the notebook is a public record which is often used in court to support patent claims, and is the property of your employer. The notebook is a legal record of scientific progress which needs to include a record of the development of your ideas on the subject of investigation.
- 4) The notebook should be a bound notebook with numbered pages so that it would be extremely difficult to alter it at a later date.
- 5) Each entry in the notebook **must be dated**.
- 6) It is convention to leave space at the start of the notebook for a table of contents which will be filled out later.
- 7) It is also conventional to write on only one side of pages so you can write notes on the back side at a later date. If you add notes only add them on the back of the pages and **they must be dated**.
- 8) The notebook should have a title which usually involves a numbering scheme and a date of inception, for instance "Barney Rubble 24, 5/3/22" is Barney's 24'th notebook which he started on May 3'rd of 1922.
- 9) For lab partners multiple copies of the data etc. should be made.
- 10) Never record data on loose pieces of paper.
- 11) Notebooks should be written with permanent ink.
- 12) When you make a mistake draw a single line through the error so the erroneous results can be read at a later date.
- 13) If you get numbers from some outside source you need to reference the source.
- 14) If you have taken bad data, cross out the bad sections and write an explanation (if there is one) on the face page and date it.
- 15) It is nice if you are neat in the notebook but this is not a requirement. The top consideration is completeness and legibility.
- 16) Never worry about wasting pages or compressing your writing in a lab notebook. The more you write and the more pages you use the better.

- 17) When starting a new day or a new experiment use a new page.
- 18) Write a heading for the page, "Measurement of Bragg Diffraction from Spherulitic Bands Experiment 1"
- 19) Write your name and the names of your lab partners involved in the experiment. (These will be the co-inventors if you discover something of value that day).
- 20) Write in a brief but concise way what you are up to, "Measurement uses a laser and a cast film of the polyester PHB"
- 21) If this is a continuation of some earlier work include a page/notebook/date reference to the earlier work you are continuing, "Previous measurements were pp. 34/ Barney Rubble 21, 1/30/19".
- 22) You need to record all information necessary to duplicate the experiment as best you can. This includes equations, references to papers, books, tables, etc.
- 23) Recording of the make/model of an instrument or a sketch of the experimental design is usually included in the notebook. You usually record the relevant data for the materials you use, i.e. chemicals if appropriate, source, code #, purity etc.
- 24) Usually record units with all numbers that have units.
- 25) Experimental results that are on a printed sheet such as diffraction patterns can be stapled or taped into the notebook or they could be stored in a separate location and reference in the notebook by file name etc. All experimental results of this type should be signed and dated with cross reference to the Laboratory notebook.
- 26) In a company you usually will sign and date each page and each entry in your notebook. Periodically you will have a witness, not involved in the work, sign and date each page of your notebook. The witness can not be a co-inventor on a patent application so it is important to pick your witness carefully. (*Many* people have lost patentee status by being witnesses on relevant notebooks.) If you are at a company, get the secretary to be a witness, not an engineer, scientist or technician.
- 27) Don't worry too much about notebooks, i.e. so that they interfere with your work or interest in the experiment inordinately, but try and get into the habit of keeping good notebooks and careful records. The skill of keeping a good notebook will take a number of years to develop.
- 28) **GRADING for XRD.** Lab Notebooks will be collected at the end of the quarter and will be given a grade based on this description. This grade will be counted as lab in your final grade.