

Organic Chemistry Research Notebook

Of all the costly items that constitute a research lab, the most valuable is arguably your research notebook. If properly kept, it is a complete record of scientific activities in which you, no doubt, have invested many hours. The sound of a fire alarm has caused more than a few graduate students to grab their research notebooks before fleeing the building. When it is time to describe your scientific activities in a report, you will discover that these notebooks are indispensable. The human mind simply cannot remember every detail of so many experiments. Additionally, it is not uncommon to attempt to reinterpret experimental results years after the original observations were made. Without careful records, we are all doomed to constantly repeat our own work. This handout is designed to aid you in establishing an efficient method of recording your experiments and their results.

You must use a notebook with bound pages and with page numbers. The reason is that in time pages in 3 ring binders will rip loose.

Do not use water soluble ink or pencil.

Handwriting must be legible!

Each bound notebook must have a Table of Contents at the beginning of the book (on the inside of the front cover is OK). You should update the Table of Contents as you fill out the notebook.

On the inside cover of the lab book you must place a safety map of the lab you are working in.

The recordings of each day of research should include a date.

Start the notebook description of a new experiment with the chemical reaction being carried out (when appropriate), a list of all chemicals that will be used along with their structures. A sketch of each apparatus must be provided as well. For simple operations such as heating an Erlenmeyer flask on a steam bath or filtration through a Buchner funnel, sketch the device the first time it is used. You don't have to sketch it again if you use the technique in a subsequent lab. For more complicated set-ups, i.e. distillation, refluxing, etc., sketch the apparatus each time you use it.

You must record your observations within minutes of making them. If you are collecting recorder output data, you can jot down some specifics about the experiment (i.e. how much enzyme, inhibitor, chart speed, etc.) on the output, and you should assemble the data into your notebook with a day or two after the experiment. The details of the design and components of the experiment should be recorded in your notebook as you set-up the experiment.

All experiments, regardless of whether they "worked" or not, regardless of whether you are pleased or displeased with the results, must be recorded. Often the details of failures are most informative.

TLC: Draw a picture of the stained plate in your notebook indicate the solvent and stain used, the color of the spots, and the measured R_f values.

List the physical state of the synthetic product. If solid, measure the melting point.

Draw the structures of molecules, with correct stereochemistry, if they are not obvious.

These are the following guidelines that I will use when grading your notebook:

1. The first notebook page of each new day should have a date.
2. The writing must be with water-insoluble ink.
3. The writing must be legible.
4. The structures and amounts used of all reagents must be stated.
5. The protocol used should be described in the notebook along with a drawing of the apparatus (eg distillation set-up). The detail and clarity should be such that someone with a background in chemistry could reproduce the work.