**STANDARD OPERATING PROCEDURE (SOP)**

**Procedure Title:** [Keeping a Proper Laboratory Notebook](https://www.ruf.rice.edu/~bioslabs/tools/notebook/notebook.html)

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Last Revision (Reviewer):

The SOP outlines the necessary steps in keeping a proper lab notebook in **Jin Group**.

New group members should not conduct any laboratory research until they have read and fully understand these procedures.

**1. Laboratory notebook set up**

1) Blank laboratory notebooks should be acquired. They should already have page numbers clearly defined. You should have your name on the cover.

2) Each laboratory notebook should be numbered starting with 01 (e.g., Kailong Jin – 01) and proceeding numerically as new notebooks are started throughout research tenure. Starting with A and proceeding alphabetically is also acceptable.

3) Laboratory notebooks are LEGAL documents. They are UNIVERSITY PROPERTY and must remain the department at all times.

**2. General writing procedure**

1) Writing should be performed with a PERMANENT PEN ONLY. No other pens and no pencils should be utilized.

2) Start a NEW page for each new experiment performed. Date each page at the top.

Continue writing new dates throughout the page if the experiment extended through multiple days.

3) Write slowly and legibly. Make sure other labmates can READ and UNDERSTAND it.

4) Sign or initial on each notebook page.

5) A good way to keep samples organized and ensure easy referencing is to number them as follows: (Initials\_Book # - Page # - Sample description). For example, KJ\_02-046-PE15k refers to Kailong Jin notebook number 02, page 46, and sample PE15k on that page.

6) Error correcting: Any error made while writing should be corrected by crossing through the mistake with a SINGLE LINE. Initials are highly recommended above it. DO NOT COLOR OVER ERRORS.

**3. When you are conducting synthesis experiments**

1) Notebook should be updated during the course of an experiment.

2) Before your experiment, write down the equations of starting materials on the left and expected products on the right. Calculate carefully how many reactants you should add and write it down in a chart. During the experiment, also write the exact amount you added in.

3) When working with a reagent for the first time, it is highly recommended to write down the full name of the chemical, vendor, purity, formula weight, density, boiling/melting point and any other pertinent information. It will aid the writing of **experimental manuscript section** and proper waste disposal.

4) Indicate the sources of your reagents (suppliers and any purification that you carried out).

5) Note exact times when reactions are started, when reagents are added and when the reaction are quenched.

6) Indicate any color changes, formation of precipitates, gas evolution, exotherms, or other observation in your notebook. It can prove relevant for someone performing your experiment in the future.

7) Carefully describe how you isolate and purify your products. Indicate any steps that you have conducted including the solvent volumes, temperature, stirring speed, vacuum.

8) If you are running a synthesis repeatedly, reference the relevant notebook page. Indicate any difference or condition change.

**4. When you are conducting processing experiments**

1) Any steps in part 3 is also applicable here.

2) Before your experiment, write down the purpose of this processing. Also, design and write down your ideal processing conditions (temperature, pressure, processing time and so on).

During the experiments also write down the actual processing conditions. If you changed the preset conditions, explain the reason.

3) Write down your procedure and recipe and indicate its resource (reference, notebook from former group members). Also note the actual amount of reagents you added in. If the reagents are former products, write down the legal sample name as 2\_5 as well.

4) If there is anything wrong with the equipment before your session, jot down details of the situation to indicate any possible changes to the equipment.

**5. Data collection from Instrument**

1) When data is collected on an instrument, write down the important parameters you set. For instance, in NMR, the number of scans, temperature and other acquisition parameters.

2) It is highly recommended to paste a printout of the collected data into your lab notebook especially when the data is important. This should be done using a glue stick or tape. The edge of the pasted printout should have the legal sample name as 2\_5.

3) Electronic data saving: Make sure to save and backup your data! (e.g. through external hard drive or google drive); Although not required, the electronic data are supposed to saved according to the sample name; Write down the file name or the storage path on the same page of your experiments as reference.

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SOP. Part of the regulations are from their SOP.