

## How to maintain your lab journal

For the Organic Chemistry Laboratory, maintenance of a coherent laboratory notebook is critical. Unlike laboratory courses in General Chemistry or Physical Chemistry, where a significant percentage of the work involves data analysis and report writing, Organic Chemistry involves a dominance of laboratory work. The focus is on the preparation or isolation of specific organic compounds. Thus, you are required to maintain an up-to-date lab notebook for this course. This should be a hardbound journal with all notes written in ink. Additionally, each page of the journal should be numbered. Each page should be dated and initialed. And, your laboratory instructor should sign off on your work before you leave the lab. This journal should contain the following information.

### Table of Contents

Make sure you leave space for a Table of Contents at the front of your lab book. Your Table of Contents should contain the following information for each experiment performed:

Pg. Number for the Start of the Experiment

Title of the Experiment

Date the Experiment was Performed

### Experimental Entry

**Date:** Every entry should be dated. If an experiment takes multiple weeks to complete, each day's entry should be dated appropriately.

\_\_\_\_\_ (To Be Completed Before Lab) \_\_\_\_\_

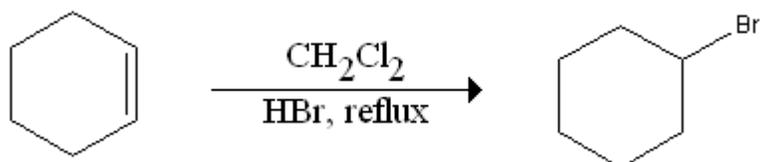
**Title:** Every entry should be prefaced with a Title. This should be the same title found in the Table of Contents.

**Purpose:** You should include a short description of what you intend to do. If you will be carrying out a synthesis, this should include the desired chemical reaction and the name of the compound you intend to synthesize. If you are studying a laboratory method, the purpose should include a description of the methodology. (Include a reference for the experimental procedure, if it is not your laboratory manual.)

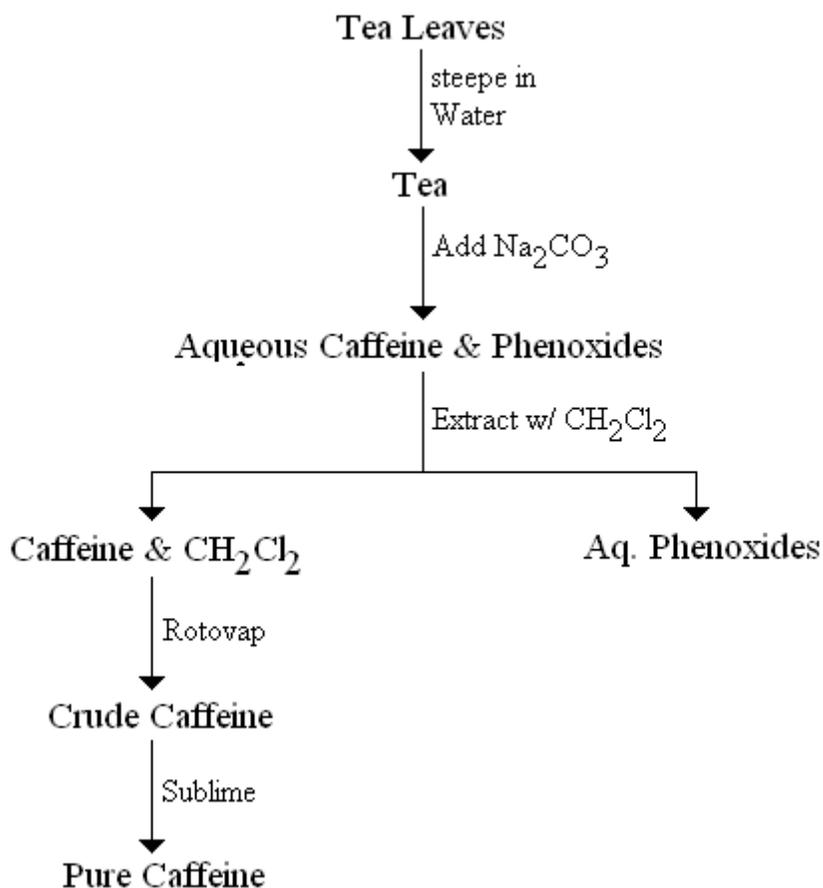
**Experimental Procedure:** A short bullet point list of the steps to be performed should be included at this point. These list items should be concise. For example, you may have something like:

- Assemble fractional distillation apparatus.
- Use glass beads or Copper turnings to pack the fractionating column.
- Add 50:50 mix of Cyclohexane/Toluene to the distilling pot.
- etc.

This should be followed by a reaction/isolation scheme. An example scheme for a reaction is:



For an isolation scheme, you might try:



**Reference Table:** This Table should include relevant physical and chemical properties for each reagent, product and solvent. This should appear as:

Reagent	MW [g/mol]	equivalents	mass/vol.	d [g/mL]	mp/bp [°C]	Special Precautions
 Benzene	78.11	0.0500	4.45 mL	0.8765	bp = 80.15	Carcinogenic Flammable
CH <sub>2</sub> Cl <sub>2</sub> Dichloro - methane	84.93	solvent	150 mL	1.3266	bp = 40	Flammable

Typical "Precautions" might involve:

Flammable, Carcinogenic, Corrosive, Lachrymator, Toxic, Noxious

\_\_\_\_\_ (To Be Completed During Lab) \_\_\_\_\_

**Notes & Observations:** This should be a detailed description of the procedure completed. This may include:

Observations Concerning Reagents and Solvents  
 Mass/Volume of Reagents/Solvents Used  
 Sketch or Photo of Experimental Set-Up  
 Description of What Happens During the Reaction/Isolation  
 Reaction Start and Stop Times  
 Description of What Happens During the Work-Up  
 Observations Concerning Product Isolated  
 Mass/Volume Product Isolated  
 Confirmatory Data (mp, bp, ref. index, spectra) for Product

You should also include a description of how solvents and by-products are disposed of.

No chemicals or products may stored your laboratory drawer. When the laboratory exercise is completed, turn-in a sample of your product in a labeled 3-dram vial. If you will be working with your product, or with an intermediate, during another laboratory period, your laboratory instructor will provide instructions on how and where to store your sample(s). Again, the sample(s) must be labeled appropriately. All labels will include the following information:

Name  
 Name of Compound  
 Formula of Compound  
 Date  
 Weight of Product

Record everything you do as you do it. Your laboratory instructor will consult your journal at some point during the lab and it is expected that your notebook will be up to date.

\_\_\_\_\_ (To Be Completed After The Lab) \_\_\_\_\_

**Report Yields:** You should calculate the Theoretical, Actual and Percentage Yields or Percentage Recovery for the experiment. Any additional data analysis indicated in the laboratory manual should be performed.

**Conclusion:** You should draw appropriate conclusions from your observations. Does the evidence support your claim to have synthesized the desired product, etc.? Analyze the physical data, chromatograms and spectra. Do not include phrases like; “I liked this lab because ...”, “I learned a lot ...”, or “This was a stinky experiment ..”.

**Literature Citations:** If applicable, cite any literature sources consulted.

**Post Lab Questions:** Answer, at this point, any post lab questions posed in the laboratory handout.