

Distillation and Gas Chromatography (GC) Guidelines

Pre-lab report is due at the beginning of the lab section. Pre-lab report **MUST** be written inside your lab notebook.

(I) On-line Technique Videos and Resources For This Experiment

Click on the title below to download the video (require [Real Player](#))

- (1) [Laboratory Safety](#) (this video was shown on the first day of the lab)
- (2) [Gas Chromatography \(GC\)](#)
- (3) [Simple Distillation](#)

If you have trouble downloading the videos, go to the following Web site and click on the appropriate title to download the video.

<http://oid.ucla.edu/Webcast/Chemistry/>

[Guides for Writing Lab Reports](#)

[Basic Theory on Gas Chromatography](#)

(II) Pre-lab Report

IMPORTANT: Make sure that you follow the proper laboratory safety protocol (refer to the course syllabus) BEFORE going to the lab. A laboratory safety check will be conducted at the beginning of the lab. You will be dismissed from the laboratory if you do not have the proper safety protocol. Please also make sure that you show up to the lab on time. Any pre-lab reports that are NOT turned in within the first ten minutes of the lab section will not be accepted for grading.

1. Introduction (for the **ENTIRE** experiment)
2. Procedure in Flowchart Format (for the **entire** experiment). Make sure you reference the procedures.
3. MSDS information (refer to the *MSDS* handout for details)

The following chemicals will require you to use the MSDS database on the Web:

Toluene and Ethyl Acetate

Note: For your MSDS information, select the site that gives you the MSDS information closest to the concentration listed above. You may have to convert the concentration units on MSDS before you decide which site to use since sometimes the unit may be reported as w/v%.

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3. MSDS information (Continue)

Record the following MSDS information in your notebook for the chemical listed on the previous page. **Printouts directly from Web pages will NOT be accepted for grading.**

Important: Reference the site (i.e. write down the URL address) that you used for each of the chemical.

- (a) Product Name
- (b) Chemical Formula
- (c) Formula Weight
- (d) Melting Point; Boiling Point and Density
- (e) Health Hazard Data (**summarize in your own words**)
- (f) Spill and Disposal procedures (**summarize in your own words**)

4. Complete **ALL** the pre-lab questions (see page 83-84).

Refer to the online resources listed above for the concepts in gas chromatography (GC).

For question #2, you may use any of the Web sites listed on the MSDS handout (the one you obtained from your TA during the first day of the lab). You MUST explain the ranking of the boiling points in terms of intermolecular forces.

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Refer to laboratory syllabus for the due date of the post-lab report. Post-lab report **MUST** be written inside your lab notebook.

(III) Post-lab (This is a GROUP Report)

Write the names of the group members on the report. Write down the responsibilities of each group member in writing this report as well as in performing the experiment.

(I) Abstract – outline the goals of the experiment as well as the technique that you used in achieving such goal(s). Also, summarize all experimental results.

(II) Record the temperature at which the first drop of condensate forms and the temperature ranges over which each of your fractions distilled.

(III) Label each of your gas chromatograms as to the sample injected. Calculate the % composition of each of your fractions from the gas chromatograms. Show ALL your work.

Make sure your group attach the ORIGINAL GC chromatograms for the various fractions that you obtained in the lab to this post-lab report.

(IV) Compare the retention time of the standard toluene/ethyl acetate mixture with your samples. What can you conclude? **Explain.**

(V) Conclusion

- Summarize your results (again)
- Justify the % composition results from the gas chromatograms. In other words, are they what you expected based on the theory of simple distillation?
- Discuss how you could have achieved a better separation in the distillation.

(VI) Sketch the GC chromatogram inside your lab notebook for your first distillate fraction based on the following conditions:

- (1) there had been twice as much toluene in the fraction
- (2) the GC column had been twice as long
- (3) the temperature of the column had been higher
- (4) the chart paper advance had not been turned on.

DO NOT DRAW ANY SKETCHES ON YOUR ORIGINAL GC CHROMATOGRAMS