A Short, Descriptive Title

**Author Name**

*Western Carolina University*

*Email address*

Date (long form)

*Graphical Abstract*

*Insert your reaction scheme in this space. All chemical structures must be computer-drawn (10pts).   
To insert abstract graphic, delete this text and paste the drawing inside the frame – it should be no larger than the size of this box. Text should be limited to the labeling of compounds, reaction arrows, and diagrams.*

**AbstraCT** No More than 75 words. The abstract should briefly state what was done, the significant result(s), and the conclusions. Be sure to state product yield and purity when applicable.

Introduction

Start with 2-3 paragraphs of introduction and background, briefly explaining the relevance of the experiment, what work is to be done, and its wider significance. You should site a couple of general sources from the internet or from the chemical literature as references.

For this lab, include background material about the use of redox reactions in organic chemistry generally, and sodium borohydride reductions of aldehydes and ketones more specifically. Also, briefly explain the use of TLC in reaction monitoring and principles behind TLC separations. End with a statement of the purpose of the experiment.

Do NOT include any experimental details in the introduction section!

Results and Discussion

Paragraph 1: Give a brief description of how the reaction was performed, and how the reaction progress was monitored. Briefly state how the product was isolated and purified. Do not include amounts of reagents used.

Paragraph 2: Explain/report the results of your TLC. Make specific reference to your TLC plate (included in the supplemental materials section). Report and discuss *Rf* values.

Paragraph 3: Report the theoretical yield, actual yield, and percent yield. Give the limiting reagent. Was the reaction successful?

Paragraph 4 Give the melting point range, and what it says about purity, and include the literature melting point. Give possible reasons for low yield or low melting point.

Paragraph 5: Report results of your IR spectrum. Explain specifically in words how your IR data prove you have made the desired product. You should explicitly mention which peaks in your IR confirm that you made an alcohol. Also, mention the peaks of the starting material that are absent from the IR spectrum of the product. You should compare your spectrum to the literature spectra for fluorenol and fluorenone. Assign specific IR absorptions to the major functional groups.

Conclusion

In a few sentences, tie all this stuff together; summarize the results. Did the reaction work? How well? What was learned?

Experimental

This section is a detailed summary of how the experiment was carried out. Write in grammatically correct and complete senetnces, using ***passive voice***. Include enough detail so that another student could repeat your work in lab. Assume the reader is familiar with all standard laboratory techniques. You should report the mass, actual yield, percent yield, Rf value and IR data for your product.

Paragraph1: Reaction set up-include amounts(mass, vol, moles, eqv) of each reagent in brackets.

Paragraph 1 Example:

Fluorneone( 0.58g, ?? mmol, 1 eqv) was combined with sodium borohydride (0.103g, ??mmol, 1.5eqv) in a 50 mL Erylenmeyer flask and dissolve in 10 mL of THF. The reaction was stirred at RT for… .

Paragraph 2: Provide details on how the reaction was monitored. Report the Rf values of the starting material and product. Report the TLC solvent used to develop the plate and how the plates were visualized.

Paragraph 3:Work-up. Explain how the reaction was stopped and the product was purified. (Be ***brief*** when describing the extraction steps.)

Paragraph 4: characterization. Report actual yield, percent yield and melting point range. List the important infrared bands that you used to identify the product. (Do not list every peak. If you can’t identify a peak, it shouldn’t be listed.)

References

List any scholarly sources here in ACS format. The lab handout is NOT a valid reference.

Supplemental Materials

Create a diagram of your TLC plate in PowerPoint, CorelDraw, Illustrator, or equivalent at the end of the report. Include *Rf* values.

Staple the following to the end of your report:

* **IR spectra:** Draw the structure of each compound on its IR spectrum, indicate which functional groups appear in the spectrum and the bands used to confirm the presence of each functional group.
* **Literature spectra**: Attach copies of the literature spectra for fluorenone and fluorenol. Draw structures on each spectrum.
* Lab notebook pages

Chem 241 Lab *Reduction of Fluorenone*

**Notebook**

Purpose/Table \_\_\_/ 5 pts

Observations/Conclusion \_\_\_/ 5 pts

**Formal Lab Report**

Abstract and Figures \_\_\_/10 pts

Background and Intro \_\_\_/10 pts

Results and Discussion

TLC monitoring \_\_\_/10 pts

yield – theoretical, percent \_\_\_/10 pts

melting point/purity \_\_\_/ 5 pts

IR interpretation \_\_\_/10 pts

Conclusion \_\_\_/ 5 pts

Experimental \_\_\_/15 pts

IR spectra / TLC plate \_\_\_/10 pts

Spelling/Grammar/Format \_\_\_/ 5 pts

# days late \_\_\_  5% – \_\_\_ pts

**Total points \_\_\_\_\_\_ /100**