Chemistry 342

2012 Laboratory Research Project

You will be carrying out a three week research project, with the aim of developing a viable lab procedure for converting *p*-anisaldehyde to *p*-anisyl alcohol. The project will take place over three weeks, and will consist of the following:

Week of March 5th: Literature search, and method selection (in the LTEC classroom in the main Library)
Week of March 19th: Run a series experiments in the lab to make p-anisyl alcohol from anisaldehyde via the selected method.
Week of March 26th: Analyze the product purity, yield, etc., and use results as a basis for writing up the best-choice procedure for converting *p*-anisaldehyde to *p*-anisyl alcohol.
Writing up: There are several reports described below, but the main written assignments are the literature report (due by week of March 26th) and the two drafts of the paper (due weeks of April 16th and 30th).

Learning objectives – students should be able to:

- Perform a search of the chemical literature, and identify relevant sources in primary, secondary and tertiary literature.
- Analyze results from a literature search and identify the most useful sources.
- Using the literature as a starting point, design and perform a coherent series of experiments for optimizing a chemical procedure.
- Analyze laboratory results from the above and identify the optimal method.
- Write up results using the format appropriate for a scientific report, including a full paper.

Activities

Week of March 5th: You will divide up the work, and as a group search the literature to find practicable methods for the assigned reaction. Then the group will organize and share those methods, and decide (in a two-stage process) which two method are the most appropriate to use. By the end of the lab session you will provide the instructor with your top two choices for a method, and an outline proposal for experiments to optimize those methods. Within two weeks, you will write up the literature search as a formal literature report.

[The instructor will write up your results & proposal, ready for the next lab period.]

Week of March 19th:

You will work in pairs to evaluate your selected method, as written up by the instructor. As a group you will test minor changes to the process – previously agreed with the instructor – such as changes in reaction temperature, solvent, reaction time, etc. Each pair should isolate a sample of anisyl alcohol, ideally in pure form, by the end of the session, unless agreed otherwise with the instructor.

Week of March 26th:

You will (as an individual) submit a full report on the group's literature search and the method selection.

You will work with your partner from the previous week, to purify your sample (if needed), measure yield and analyze the product for identity and purity. You will share your results with the group and (as a group) agree on the optimal procedure.

During April:

You will submit an online assignment and write up the group's results as a formal paper, by the dates shown in the section below.

Reports

Literature search and method selection	Literature search report	Mar 26	90
Laboratory test of the chosen method	Short report	Mar 26	40
Purification and analysis	Short report	Apr 9	40
Research project (all parts)	Online assignment	Apr 9	50
Research project (all parts)	Paper #2, first draft	Apr 16	40
Research project (all parts)	Paper #2, final draft	Apr 30	80