Chem 36B Project Assignment

The project assignment is designed to improve your problem solving skills and independence in the organic laboratory. You will utilize all the techniques that you have learned during the first half of the semester and apply them to an assigned research problem. The two research problems involve synthesis, isolation/purification, and structural analysis. Your group has been assigned one of the projects and will begin doing the preliminary work over the next few weeks.

It is important that everyone in the group contribute equally to the project. If at anytime one of the members of the group is not contributing equally I need to know as soon as possible. The two research problems are described briefly below:

1. You examine the effect of solvent in ketoester reductions. The reducing agent in this case will be baker’s yeast and the solvents must include water and water/hexane solvent mixtures. The ketoesters you can choose to investigate are the following: ethyl pyruvate, and or ethyl acetate, or methyl acetoacetate. You must determine the % yield and the enantioselectivity for the reactions using NMR and polarimetry.

2. You will examine the effect of solvent in ketoester reductions. The reducing agent in this case will be baker’s yeast and the solvents must include water and toluene. The ketoesters you can choose to investigate are the following: ethyl pyruvate, and or ethyl acetate, or methyl acetoacetate. You must determine the % yield and the enantioselectivity for the reactions using NMR and polarimetry.

Work to be completed by the end of the project:

Literature Search-
Everyone must locate at least 5 key articles for your project. Each person in the group carries out this search independently and must have a personal copy of these articles. You will pool these search articles when discussing the project with your group and you can use any of these as references for your proposal, poster and final paper. Three key articles for the projects are: North, M., J.Chem. Ed. 1998, 75, 630-631; Pohl, N., Clague, A., and Schwarz, K., J. Chem. Ed. 2002, 79, 727-728; and Patterson, J., and Sigurdsson, S., J. Chem. Ed., 2005, 1049-1050. Download and read all three of these articles from J. Chem. Ed. using the Chem 36B link. I suggest that you use the Journal of Chemical Education link on the Chem 36B web link to begin your search. When searching the Journal of Chemical Education using this link you will be able to download the articles and any supplementary materials that are available with the article. You will know if an article has supplementary material if it has a “W” in the upper right hand corner of the article. The supplementary material contains a more detailed description of the experimental procedure than what is found in the article. You are also encouraged to search other E-journals (ACS Journals Online) but it is not required.
Article Summaries-
Everyone must complete a one-paragraph summary for each of the 5 key articles. The summary should highlight why the articles are relevant to your assigned project. The summary form is found on the Chem 36B web link from the Chem 36 web page and is entitled, “Reference Article Review Sheet.” It is a Word document that you can download and use to write out your summary. The article summaries must be handed in before or with the proposal. You must also show your TA the copies of your 5 articles. Altogether you are responsible for 5 literature summaries; three from the key articles and two additional from your literature search. This is an individual assignment and is the only individual assignment for the project work. Your completed summaries are to be submitted to your TA before you begin working on your proposal with your group.

You cannot begin working at the bench until your group proposal has been approved by your TA.

1. Proposal- 12 point Times Font, 1.5 line spacing, 1” margins. It is highly recommended that you submit a rough draft to your TA at least two lab periods before the final proposal is due. The Proposal Grade Sheet can be downloaded by clicking on the Team Project link from the Chem 36B link and then click on the Proposal Grade Sheet. You must attach a copy of this grade sheet to your proposal. Your draft and final proposal must include:
   - Introduction-hypothesis, goals, relevance of project
   - Procedure-detailed description of procedure, diagrams if necessary, list and source of materials (a copy of materials list must also be given to Michele Brown in the stockroom). Use the supplementary material from J. Chem. Ed. articles as a guide when writing this section. I expect the same amount of detail.
   - Instrumental Section-analytical techniques, justification for these techniques and any special materials needed for the analyses
   - References (Use J. Chem. Ed. style)
   - A work schedule including the tasks to be completed and the dates of completion for all group members.

2. Progress Reports: 50 points each. Use the Formal Report Grade Sheet as a guide you when writing these progress reports.
   - Progress Report 1: A revised version of the Introduction, Procedure, and Instrumental sections of your proposal that will ultimately become part of your final report
   - Progress Report 2: A draft of your results and discussion conclusion sections of your final paper

3. Thought Question Quizzes: 25 points each
   - 4- Thought Question Quizzes, 1 quiz per assigned paper to be completed by the entire research group in approximately 20
minutes at the start of lab. You can use any texts or references books you choose to help answer the question.

4. Completing the proposed experimental work and the associated analyses. You should be working on your experiments and analyses every lab period.

5. Poster Presentation
   - A group poster 34” X 40” prepared as one large Power Point slide. A rough draft of the poster on 81/2” X 11” sheets of paper is to be presented to TA prior to printing on poster plotter. Posters must be submitted for printing by April 21st, 2006. Group members will be taking turns presenting the poster and evaluating other posters at the poster session. See grading rubric for detailed information on content.

6. A group final report is due on April 27th by 5:00 pm. No exceptions!! The final report should be in J. Chem. Ed. Style, 12 point font, 1.5 line spacing, 1” margins. Primary spectra, chromatograms or other analytical data is presented in the body of the paper and supporting data is to be placed in an Appendix. All figures and tables are to be numbered, annotated, and titled. Follow the reference style of J. Chem. Ed. For all referencing of journal sources. See Final Report Grading Sheet for detailed information on grading.