"Independent" Projects
CHE 371: Fall 2007

The last few weeks of lab will be spent on "independent" projects. These projects will be **group** projects designed by your group. I anticipate that these projects will utilize some of the same equipment used in lab over the past few months (fluorimeter, bomb calorimeter, UV-Vis spectrometers, and/or computational software), but you have some freedom in your design – the only requirement is that the project can be justified as a physical chemistry project and that we have access to all equipment (instruments, glassware, etc) and most chemicals needed. All projects must be approved prior to conducting them.

You should consult a variety of resources when designing your project. (Some of these resources will be discussed below.) These resources can be used in two ways: 1) search for and use a pre-described lab or 2) design a lab and use resources to support your idea. The graded outcomes of the investigation will include a proposal, a detailed final report, a formal presentation (to be given during your lab section the last week of lab), and a detailed notebook entry. The notebook entry will be graded along with the rest of your notebook. The rest of the project is worth a total of 200 points (the point break-down is given in each section below).

Section 1: The work and associated graded pieces

Proposals:

Your proposal should be ~two pages and should include a) a title, b) a background section outlining previous work and rationale for the investigation with references (3-5) to the literature and c) a detailed experimental section including a timeline, a procedure (including data analysis), and a list of materials and equipment. Format your citations in the ACS Journal of the American Chemical Society format. The proposal will be due Nov 30th and is worth *50 points*.

Along with your proposal, you must provide separate sheet with catalog numbers, quantity, and pricing for necessary materials (after making sure that they are not available in the stockroom and checking with the instructor). This should be investigated **ASAP** to ensure you have the supplies for lab. Angie Archer in the stockroom can help you navigate the inventory.

Investigation:

The investigation will be completed in lab during the weeks of Nov 26th and Dec 3rd. Note that you can use your lab time during the week Nov 26th to finish your proposal and get it approved, but you should also plan on starting the laboratory work. The first week of laboratory work may just be organization of all of your supplies and testing of your experimental set-up. If you find changes must be made to your proposal based on this preliminary work, do so prior to turning it in on Nov 30th. All lab work should be completed by Dec 6th.

Final Report:

The final report will be written as all other lab reports, but may include more detail in the introduction and experimental sections as your lab instructor may not be completely familiar with the project. These will be group lab reports and are due the last week of lab (i.e., at the time of your presentation). The final report (which is supported by the work completed) is worth *100 points.*

Formal Presentation:
These presentations will be conducted in Nobel 106B (the "fishbowl" room) during the appropriate lab section. Presentations should be an extension of your lab report – it is the only chance you have to inform your classmates about your project. As such, all information in your report should be included as necessary (i.e., background, experimental set-up, results/discussion, etc). Presentations should be 20-30 minutes in length and are worth *50 points*.

Notebook Entry:
The notebook entries for your independent project are worth twice the typical notebook entry and therefore are expected to be more detailed. **I should be able to take your notebook and complete the project on my own (without any references or your report!).** Also, to be more formal (and more like industry), you are required to note the serial #s and location of all instruments used, the lot #s of all chemicals used, and detailed instructions on how to operate any instruments. Notebooks will be collected on the last day of class.

Section 2: Resources

The following lists some potential resources. As you read through the sites and the results of your searches, remember your timeframe and experimental constraints (i.e., choose a project that you will be able to set-up and complete!).

1. Dr. Smith's lab website has links to some resources and also a list of projects done past students (which you are entitled to repeat if desired). This can be found at: http://gustavus.edu/academics/chem/pchem/Thermo.html (you need to choose the "Independent Laboratory Investigation" link).
2. The Journal of Chemical Education has some great lab ideas. They now have a new way to search the journal just for lab projects; the database can be searched by area of chemistry. If you use this site, be careful about choosing a project that fits better into a quantum class than a thermo/kinetics class. The search site can be found at http://jchemed.chem.wisc.edu/JCEWWW/Features/Chemlab/ . [Search for mid or upper undergraduate projects only!]
3. ACS journals can be accessed through the Gustavus website and may provide some ideas and/or support for your idea. Another way to search for journal articles is SciFinder Scholar (see link "Literature and Reference Software" on our class lab handout site).
4. Halpern, Shoemaker, and other lab texts (as found in Nobel 106B) could also prove useful to you – most of the labs completed to date originated from such a source!
5. The University of Wisconsin – Madison has produced an on-line nano-related lab manual. Some of the projects on this site are not directly related to physical chemistry, but you may be able to develop a project from some of the labs discussed. Check out: http://www.mrsec.wisc.edu/Edetc/nanolab/index.html. (Note, if you are interested in a lab that is "New"; I know the "secret" way to log-in and can send you the info). These are pretty neat experiments, but you'd have to justify the relationship to p chem.