

## CHEMISTRY 343 - Spring 2008

Dr. Audrey Dell Hammerich

### Thermodynamic LabWorks Experiments: Thermochemistry and Gas Laws

During the first two days of the physical chemistry laboratory you will perform four relatively simple thermodynamic experiments from a package of computer-interfaced experiments known as LabWorks. You will use a computer interface from Vernier called LabPro to do these experiments which is powered by Logger Pro 3 software. Using the experience which you have gained performing these experiments, on the third day you will design an experiment aimed at solving or elucidating the phenomenon posed in an assigned problem. The fourth day is devoted to an oral presentation of the results and concepts of your assigned problem.

Before coming to the first lab meeting of the course be sure to have purchased goggles, a bound laboratory notebook (does not need to have carbon copies), and some high density 3.5" floppy diskettes. Make sure that you insert only new diskettes into our computers! Never insert a diskette that has been in any computer outside of our lab. Our computers are virus free. If you wish to process your data outside of lab clearly label another diskette as foreign. Never insert a foreign floppy into our computers. Download LabWorks\_Module1, LabWorks\_Module6, and LabPro Tutorial from the class website: <http://www.chem.uic.edu/audrey/chem343>. Module 1 is required reading for the two experiments which you will perform on the first day of lab and Module 6 is your assigned reading for the second day of lab. Before you begin these experiments be sure to read the appropriate LabWorks module. If you are unclear about the physical concepts involved in the experiments refer back to your freshman general chemistry text and your physical chemistry text.

#### Day 1 - LabWorks Module 1 and LabPro Tutorial #1

Get assigned group number and laboratory partner

LabPro Tutorial #1

Experiment 1-3 - Heat Associated with Chemical Change, p. 14

Experiment 1-8 - Chemistry of Antifreeze: Density and Freezing Point, p. 28

Obtain assigned problem - Experiment 1-9, 1-10, 1-11, 6-5, or 6-6

#### Day 2 - LabWorks Module 6 and LabPro Tutorial #1, #3

Turn in copy of Data Summary Sheet for Experiment 1-3

Turn in graphs of cooling curves and density linear regression plots for Experiment 1-8

Hand in experimental plan for assigned problem

LabPro Tutorial #1

Experiment 6-1 - Charles' Law, p. 11

LabPro Tutorial #3 (Boyle's Law Experiment)

Get returned experimental plan with comments from TA

#### Day 3 - Assigned Experiment

Turn in copy of Data Summary Sheet for Experiment 6-1

Turn in  $P$  vs  $V$ ,  $1/P$  vs  $V$  graphs and linear regression plots for Boyle's Law Experiment

Perform experiment you designed for assigned problem

#### Day 4 - Oral Presentation

Give oral presentation of the results and concepts of your assigned problem

You will be using the modules in 2013A SEL which is a very small room. Hence we need to require that **BACKPACKS, ATTACHE CASES, AND COATS CANNOT BE BROUGHT INTO 2013A SEL**. 2011 SEL is a secure locked room that you may use.