

Physical Chemistry
Fall 2009

Text: T. W. Shattuck, *Physical Chemistry*, Colby College, 2009.

Alternate texts: I. M. Klotz, R. M. Rosenberg, *Chemical Thermodynamics: Basic Theory and Methods*, Benjamin/Cummings, Menlo Park, CA, 1986.

J. S. Winn, *Physical Chemistry*, Harper Collins, New York, NY, 1995.

K. A. Dill, S. Bromberg, *Molecular Driving Forces: Statistical Thermodynamics in Chemistry and Biology*, Garland Science, New York, NY, 2003. Chaps. 1-7.

D. A. McQuarrie, J. D. Simon, *Physical Chemistry: A Molecular Approach*, University Science Books, 1997.

P. W. Atkins, J. de Paula, *Physical Chemistry*, 7th Ed., Freeman, New York, NY, 2002.

Week	Chapter	Topic	Test	Lab
1-9/9	1	Chemical Reactivity		
2-9/14	2,3	Concentrations, Kinetics		Linear Fitting
3-9/21	4,5	Mechanisms, Photo, Surface Chemistry		Methyl-Red
4-9/28	6,7	Applications of Kinetics, Heat and Work		Kinetics of Aqueation
5-10/5	8,9	First Law, Thermochemistry	10/9 Friday PM	* Kinetics
6-10/14	10-12	Entropy, Entropy Applications	Semester Break	Break
7-10/19	14,15	Constraints, Spontaneity, Gibbs Free Energy		Mechanics ⁺ *
8-10/26	15,16	Foundations of Thermodynamics		* Thermochem
9-11/2	17, 18	Phase Transitions, Solutions-ideal		* Thermochem
10-11/9	19	Solutions-real	11/13 Friday PM	CAMD ⁺
11-11/16	20	Chemical Equilibrium		* Equilibrium
12-11/23	21	Electrochemistry	Thanksgiving ^o	Dynamics ⁺ \$
13-11/30	22	Electrochemistry		K _{sp} -AgBrO ₃ [#]
14-12/7	23	Non-equilibrium Thermodynamics		Clean Up [^]

* Choose experiment from lab list

+ Molecular modeling computer calculations

^o Note that the lab, while shorter than the full lab session, will definitely meet on Monday afternoon and Tuesday morning or afternoon of this week. Please schedule your travel plans to allow you to complete the full exercise.

[#] You must prepare your samples before 8:00 on the morning of your lab day.

\$ A Tuesday morning session will be available.

[^] Clean up and lecture and lab evaluation, mandatory

Point Distribution

Hour Tests	200
Final	200
Homework	100
Laboratory	<u>300</u>
	800

The schedule and point distribution given above is a close approximation, but we will deviate from this schedule as the semester progresses. Two of your lab reports will be written, two will be presented orally in my office, and for three you will just turn in the calculations and questions. If you have tests or papers coming up at the same time a lab is due, make sure to do your report early. Written lab reports are due on the Wednesday or Thursday of the next week after you complete your lab. Oral lab reports begin on the Monday of the week following the lab. Weekly homework is due on Friday, PM. No work will be accepted after the final.

Graded Assignment Policy

Collaboration with your classmates is encouraged, because you can learn a lot from listening to each other and from explaining ideas to each other. However, whenever a grade is given for the work, it must represent the accomplishments of the individual, unless explicitly specified as a group project by the instructor. For some of the lab reports you will turn in your assignment with your partner. But otherwise, lab reports, homework to hand in, and tests are to be your own work. Students might make the mistake of assuming that while cheating on tests is dishonorable, collaboration on lab reports or homework to hand in is OK. Please note that lab reports and homework are just as important with regards to academic dishonesty as tests, perhaps even more important. Science advances through the honest and careful reporting of laboratory work. Dishonesty in the lab impedes scientific progress and cannot be allowed. In working with a partner in the lab, your collaboration **ends with the taking of data**, unless otherwise specifically stated. Let's make it clear what is appropriate for individual lab reports and homework to hand in for this course.

On individual work for a grade, any assistance that you give or receive from another student must be limited to correcting errors in the data as recorded in the laboratory. It is wrong to show your work to another student as a means of helping. Recording another person's answer is also plagiarism whether it is given verbally or in writing. Sharing spreadsheets or parts of spreadsheets is also not allowable. You must also maintain access privileges on your server folders to ensure that other students do not have access to your work. You may, however, honestly consult the instructor as a way of checking if you are on the right track.

On the other hand, working in a group on suggested problems that are not to be turned in for a grade is an excellent idea. In other words, the suggested homework provides ample opportunity to share ideas and provide help to others. Regular meetings of such help groups are a useful way to keep up with course work.

As in all your academic work, any ideas or information that you obtain from the literature should be properly cited. Citing literature sources is necessary even if you do not give a direct quote. Formal lab reports should use ACS format for references. References to text tables, the CRC, or Lange's Handbook can be simply given in-line, including the edition. For example:

The literature value for the enthalpy of formation is -134.23 kJ/mol (CRC 48th Ed.)

These guidelines are consistent with the College's policy on academic honesty as discussed in the College Student Handbook and the Catalog. If you have any problems on any assignment, you are strongly encouraged to come in to my office for help.

Resources

The **Answer Book** for the textbook problems is on-line in the homework section of the course Web page. Previous year's tests are on the course Web page. Check the course Tracker often for up-to-date information and problem assignments.