

Syllabus CHEM 313 Spring Semester 2010

Environmental Chemistry Laboratory (Tuesday 8:30am-12:20pm, FH313)

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Grading: The final grade consists of the average grade obtained from all lab reports. The lab reports have to be turned in **not later than one week** after the lab has been completed. No lab reports will be accepted after that date. The format of the lab reporting is described under a separate paragraph.

A:	93% and higher;	A-:	87- 92%		
B+:	83-86%	B:	78-82%	B-:	74-77%
C+:	69-73%	C:	65-68%	C-:	61-64%
D+:	56-60%	D:	50-55%		
F:	0 to 49%				

Office Hours: Monday and Wednesday 9:30am - 10:30am or by appointment (MS)
Tuesday 1:00-2:00pm & Wednesday 11:00am - 12:00pm or by appointment (KB)

Objectives:

The lab consists currently of 7 experiments, covering some of the most interesting and important environmental applications. During the lab periods you will learn how to prepare the samples for subsequent analysis, how to prepare standards for quantification of selected species in the sample and the working of some instrumentation. You will form groups (3-4 group members) in order to work more efficient and provide everybody with the opportunity of a hands-on experience with the instrumentation. Lab reports however have to be submitted by each individual. The lab reports should reflect your own work and copying major passages from other sources will result in substantial reduction in grade. Please read the CAS policy regarding plagiarism carefully.

http://www.luc.edu/cas/pdfs/CAS_Academic_Integrity_Statement_December_07.pdf

Please note that the dates and the order of the experiments are tentative. Experiments might need to be rescheduled due to use of equipment by other lab in the department.

- 1) Determination of pH, buffer capacity and conductivity of natural waters (January 26, 2010)
- 2) Determination of chloride ions in natural waters (February 2, 2010)
- 3) Determination of iron in natural waters (February 9 and February 16, 2010)
- 4) Determination of PAH's in environmental samples (February 23 and March 2, 2010)

- 5) Determination of ions in drinking water by EDTA
(March 16 and March 23, 2010)
- 6) Phytoremediation of copper with mustard plants
(March 30, April 6, and April 13, 2010)
- 7) Photolysis of Fe(III) EDTA
(April 20 and 27, 2010)

Laboratory Report Format

Each lab report should consist of:

- a) Title page
Should contain: title of report, name of student, name(s) of the other group members, name of the course, date of experiment, date of report.
- b) Introduction
Should include: brief description of the background of the experiment. For example, what are the reasons for the experiment performed, what species or property is measured and why, how does the instrument used work and what does it measure etc.
- c) Experimental
Should include:
 - *Reagents and glassware used,
 - *Apparatus used (manufacturer, model etc.)
 - *Instrumental settings
 - *Description of sample preparation procedure, standardization procedureAll of this should be formulated in such way that somebody else will be able to perform the lab after reading this report.
- d) Results
Should include:
 - *Raw Data (organized in tables and clearly readable and understandable)
 - *Sample calculations (one example calculation for each calculation procedure should be shown, including proper units and significant figures and explained)
 - *Data calculated (also organized in tables and properly labeled)
 - *Graphs and Figures (all graphs should be stand-alone and must be numbered, labeled properly and titled, provide a brief description for each graph/figure, linear regression should be used to obtain straight lines and the parameter must be included, this part should also include all spectra and/or chromatograms labeled and numbered properly)
- e) Discussion
The discussion should refer to the range of data, whether the data are useful and make sense, what are the implications of the data, what kind of errors could be present and what is the meaning of the data with respect to the sample analyzed.

f) Conclusions

This should conclude the experiment with respect to importance of method, selectivity of instrumentation (maybe another method would be more appropriate?)

g) References

All references used should be cited in accordance to the ACS published journal "Analytical Chemistry".

The report style should be like in a peer reviewed paper with all pertinent information present. Despite data sharing as working in a group on the experiments, each student has to turn in his/her own report with own calculations, discussion, conclusion etc.

Grading Scale for Lab Reports:

Each lab report is worthy 100 points distributed in the following:

Title page	05 points
Introduction	10 points
Experimental	20 points
Results	40 points
Discussion	15 points
Conclusions	05 points
Overall appearance	05 points

Points will be taken off when parts are missing from the listed items a) to g).