General Chemistry Laboratory

Chem-110 - Fall semester of 2009

General information

Location

The Laboratory is located in the basement of the Otto Maass Building, room #1.

Instructor

Jean-Marc Gauthier Coordinator room #3 jean-marc.gauthier@mcgill.ca
Lab phone number 514-398-6223

Schedule

Week	Date	Lab Experiments		Lecture
		Group A	**Group B**	**Butler** Quantum + Periodic Table
1	Sept. 1 – 4	*no lab*	*no lab*	• atomic spectra & Bohr model
2	7 – 11	Syllabus & Safety	Syllabus & Safety	• Electronic configuration
3	14 – 18	**1 – Sig. fig. & Tech.**	*no lab*	• atomic & ionic radii
4	21 – 25	*no lab*	**1 – Sig. fig. & Tech.**	• E_I, E_A, E_N
5	28 – 2	**2 – Chemical Sep.**	*no lab*	*MIDTERM #1 Sept. 30*
6	Oct. 5 – 9	*no lab*	**2 – Chemical Sep.**	**Fenster** Nuclear + Bonding • isotopes
7	12 – 16	*no lab*	*no lab*	• Lewis structures, covalent & ionic bonds
8	19 – 23	**3 - Copper cycle**	*no lab*	• resonance, polarity
9	26 – 30	*no lab*	**3 - Copper cycle**	• VSEPR, valence bond, hybridization • metallic bonds
10	Nov. 2 – 6	**4 – Molecular geom.**		**Kakkar** Coordination + Intermolecular forces *MIDTERM #2 Nov. 2*
11	9 – 13	**5 – Aspirin Synth.**	*no lab*	• Werner, ligands, crystal field
12	16 – 20	*no lab*	**5 – Aspirin Synth.**	• London, H-bonding, solid structure
13	23 – 27	**6 - Coordination complex**		• descriptive chemistry
14	30 – 3	*no lab*	*no lab*	

Objectives

Laboratory experiments in this course, are complement to the principles and concepts covered during lectures. Time spent in the lab will give you the opportunity to acquire technique, knowledge and skills to achieve reliable scientific measurements. Experimental verification of a theory is possible only if the data and observations collected are reliable. Therefore, data quality will count as an important part of your evaluation.

The lab manual, containing the procedures for all experiments is available from the course WebCT only.

Safety

Safety is of paramount importance. The first lab period is devoted to a *Safety Exercise*. If this is your first chemistry course at McGill, it is mandatory that you complete the safety exercise prior to be allowed in the lab for experiments. You will learn the safety rules, and acquaint yourself with the locations of the exits, fire extinguishers, eye wash stations, and other safety equipment. Time will be taken to establish a procedure for evacuating the laboratory in case of emergency.

Lab coats and safety glasses must be worn at all times when you are in the laboratory. Both are sold from the Holmes Room (in front of the laboratory) at the beginning of the semester. Students without lab coats and safety glasses will not be allowed to carry out experiments. ***Contact lenses are forbidden in the laboratory.*** Bags and coats must be stored in the proper spaces underneath your workbench to keep the main alley and the aisles free for easy circulation.

Note that, no matter how severe: ***All accidents must be reported***.

Method

You are going to perform the laboratory experiments *singly*. Each laboratory experiment should be completed within 2 hours. Be well prepared before coming to the laboratory. To prepare for a Lab, you should:

- go through the text from the lab manual and write down a summary of the Lab procedure. ***That summary will become your only reference in the laboratory to complete the experiment***,
- answer the questions included at the end of the text of each experiment.

Note that the texts for each experiment will become available on WebCT about one week in advance.

During the lab period

A demonstrator will be present to assist you during each experiment. Your demonstrator is the first person you should turn to for questions or problems. If he (or she) is not available, seek the advice of another demonstrator or ask the Lab Coordinator. The demonstrator will also be grading your lab reports.

At the beginning of each Lab, your demonstrator will give a short tutorial to provide complement information and sometimes perform technical demonstrations. When performing an experiment, all data and observations must be recorded directly onto the appropriate data sheets. Data sheets are included in the lab manual, they are labelled with the heading *Data sheet, hand in before leaving the lab*. Each *student* must come to the Lab with ***two copies of the data sheets***, both will be filled during the lab period; one copy turned in to the demonstrator before leaving the lab, the other used to complete the lab report. All writing *in the lab* must be in permanent ink, no pencils. Mistakes are to be corrected by drawing a single line through the error. Liquid paper and other techniques, which make it impossible to read the original entry, are forbidden. At times you may find that you need to refer to the original entry.

Experimental work should be completed 20 minutes before the end of the lab period, and then cleanup performed.

Personal belongings should never be placed in the drawers. Books and purses may be stored in the proper space with your bags and coats. *Never leave money or valuables around.*

Laboratory reports

A lab report is composed of the pages labelled with the heading *Lab report*. These pages are also included in the lab manual. Lab reports must be dropped in your demonstrator's box (in front of the laboratory) usually within 24 hours after you completed an experiment.

Partners

You will work most experiments singly. Only Exp. #6 will be done in pairs. Although, ***you will be solely responsible for the quality of the data and lab report***. Your demonstrator will assign you a partner for that experiment (at the end of the preceding lab period). It is recommended that you meet with your partner prior to the lab, to discuss the experiment. When impossible to pair everyone, one person will work alone, with the necessary assistance from the demonstrator.

Behavior

Your general behavior in the laboratory will be evaluated. Most important, we expect you to obey all safety rules. But also that you follow instructions and be careful with instruments. Note the following basic rules concerning chemicals:

- Chemicals needed for an experiment are placed at the ends of the benches. Do not monopolize reagents, take what you need (do not waste) and leave the containers at the end of the bench.
- Spills of chemicals must be cleaned up at once (if they are acid or alkali they will need to be flooded with plenty of water), in doubt, ask a demonstrator.
- Dispose of chemicals as mentioned in the lab manual, use the waste containers when indicated.

Grading

Evaluation

You are going to perform 6 experiments, each graded on a scale of 100, all having the same importance. Marks will be approximately distributed the following way:

50 % data quality (precision and accuracy),

50 % lab report (calculations, explanations).

100 % Total

The final laboratory grade will be reported on a scale of 20, using the grades of all 6 experiments. The laboratory grade counts as 20% of the total mark for the General Chemistry course (CHEM 110), while the other 80% is indeed coming from the lecture part (two midterms + one final exam). Be aware that ***a minimum laboratory grade of 50% is required to obtain a course grade,*** otherwise the lab and full course are considered ***failed***.

Lateness

A penalty of 10 marks will be applied to any report that is late by 24 hours or less. When a report is more than 24 hours late, only the data sheets will be graded, the lab report is given the mark *zero*.

A student who is more than 30 minutes late coming in the lab, will not be allowed in and will be considered absent (see hereafter for consequences).

Absence

When absent to a laboratory experiment, you automatically get the mark ***zero*** for that experiment. You will be allowed to do the experiment during another lab period only if you can provide a *legitimate university excuse*. Medical excuses will only be accepted with a doctor note. The note must include the doctor name, phone number, the date and the reason for the absence.

If you know in advance you will have to miss a laboratory experiment (for a legitimate reason), you must contact JM Gauthier as soon as possible to make an arrangement for a make-up.