Lakehead
UNIVERSITY

DEPARTMENT OF CHEMISTRY

Chemistry 3371: Inorganic Chemistry II (Transition Metal Organometallic Chemistry)
Course Outline, Fall 2006

Contact Information

Instructor: C. D. MacKinnon
Phone: 343-8327 E-mail: craig.mackinnon@lakeheadu.ca
Office: CB-4038 Office hours: 9:30-10:30 T, Th, F
Website: www.chemistry.lakeheadu.ca or by appointment

Lab Instructor: Ainsley Bharath (CB-2038A, 343-8765, ainsley.bharath@lakeheadu.ca)

Lectures: M, W 10:00 - 11:30. **Location**: RB-1024
Laboratory: F 2:30 - 5:30. **Location**: CB-2050

Prerequisite: Chemistry 3351

Course Overview: The course will introduce students to the transition metals, with an emphasis on the structure and bonding of organometallic compounds. Some reactions will also be introduced, and the laboratory component will emphasize organometallic synthetic methods.

Texts - BOTH are "required" for the course (same text as CHEM 3351).

1. Inorganic Chemistry, 3rd Edition. G.L. Miessler & D.A. Tarr, Pearson (Prentice Hall) Education Inc.
2. Chemistry 3371 Laboratory Manual, Department of Chemistry, Lakehead University, Fall 2006 version.

Marking Scheme

15%	term test
35%	final exam (scheduled by registrar)
30%	laboratory (5% each lab, 5% qualitative performance mark) Labs are due the Friday (1 week) after completion
10%	assignment(s)
10%	presentation (details to follow in class - these will take place at the end of the semester)

Course Outline (Chapters are from Miessler and Tarr, but there will be substantial material taken from other sources)

Review Topics: Symmetry, molecular orbital theory (especially of diatomic molecules), crystal field theory, coordination chemistry. (*Ch. 4, 5, 9*)

1. *Ligand Field Theory* Bonding in coordination compounds, ligand-metal bonding, metal-metal bonding. *Chapter 10*.
2. *Spectroscopy* Electronic (UV-vis), IR, and NMR spectroscopy of transition metal compopunds. *Chapter 11 and Section 4.4.2*.
3. *Organometallic Compounds* 18-electron rule, organometallic ligands. *Chapter 13*.
4. *Organometallic Reactions* Oxidative addition, reductive elimination, metathesis, electron-transfer reactions, etc. *Chapters 12, 14*.

BOOKS

The following are textbooks that cover the same material as Miessler and Tarr, but in a wide variety of ways. You may find them useful as supplementary texts if you wish. These four are on reserve in the library.

Gary Wulfsberg, Inorganic Chemistry, QD 151.5 W84 2000. A text used in 3371 several years ago - used copies might be available

D.F. Shriver, P.W. Atkins, C.H. Langford, Inorganic Chemistry, 2nd Edition, QD151.5 S57 1994.

F.A. Cotton, G.W. Wilkinson, C.A. Murillo, M. Bochmann, Advanced Inorganic Chemistry, 6th Edition, QD 151.2 C8 1999. Very good for metal-based chemistry; the all-time classic inorganic text.

J.E. Huheey, E.A. Keiter, R.L. Keiter, Inorganic Chemistry: Principles of Structure and Reactivity, 4th Edition, QD 151.2 H89 1993.

In addition, there are a number of older books available in the stacks that you can check out normally. They include a 1st edition of Shriver, Atkins, and Langford, earlier editions of Cotton & Wilkinson, and Purcell and Kotz.