

Chem 312 Course outline Fall, 2009

Location: Chernoff Hall, Room 117

Lecture hours: Monday 10:30 – 11:20
 Wednesday 9:30 – 10:20
 Friday 8:30 – 9:20

Instructor: Suning Wang

Office: Chernoff Hall 406, research lab: Chernoff Hall 430

Wangs@chem.queensu.ca or suning.wang@chem.queensu.ca

Phone 613 533 6941 (36941)

Office hours: There is no fixed time for office hours. Anyone who has any questions or concerns about the class materials is welcome to talk to Professor Wang anytime in her office or contact her via email.

Weekly tutorial: Monday, 5:30- 6:30 pm, Che117.

Tutorial TA: Zac Hudson (Zachary.hudson@chem.queensu.ca, Che 430, lab phone 74394)

Textbooks:

Inorganic Chemistry, Catherine E. Housecroft and Alan G. Sharpe (2nd or 3rd edition)

Reference books (on reserve in Douglas library):

1. *Inorganic Chemistry*, by Shriver and Atkins
2. *Inorganic Chemistry*, by Miessler and Tarr
3. *Inorganic Chemistry, Principles of Structure and Reactivity*, by J. E. Huheey
4. *Basic Inorganic Chemistry*, by F. A. Cotton, G. Wilkinson, and P. L. Gaus
5. *Concepts and Models of Inorganic Chemistry*, by Douglas, McDaniel, and Alexander
6. *Principles of Bioinorganic Chemistry*, by S. J. Lippard and J. M. Berg
7. *Advanced Inorganic Chemistry*, by F. A. Cotton and G. Wilkinson

Making Scheme:

Assignments (3)	15%
Midterm Test (1)	35%
Final Exam	50%

Mid-term Test: 2 hours, October 26 (Monday, 5:30-7:30 pm), Walter Light Hall, room 205

Policy on late submission of assignments:

- 1 day late: 25% mark reduction
- 2 days late: 50% mark reduction
- 3 days late: 0 credit.

Course Outline

This course focuses on structures, bondings, and coordination chemistry of transition metals including a brief discussion on some topics in bioinorganic chemistry, inorganic material chemistry and organometallic chemistry.

Topics:

Coordination Complexes

- Molecular symmetry and symmetry groups (a quick review)
- Ligands, complexes
- Coordination numbers and geometries
- Stereochemistry, isomerism
- Nomenclature

Electronic structures and bondings in transition metal complexes

- Valence bond theory
- Ligand and crystal field theory
- Molecular orbital theory
- Metal-metal bondings

Electronic Spectra and colors of transition metal complexes

- Tanabe Sugano diagrams, spectral assignments
- Selection rules
- Charge transfer transitions
- Luminescence

Magnetic Properties of transition metal complexes

Redox Properties of transition metal complexes

Reaction mechanisms

Introduction to Bioinorganic Chemistry

Introduction to Organometallic Chemistry and Catalysis

Synthetic methods in Coordination Chemistry