

# CHEMISTRY 636 – Mechanistic Inorganic Chemistry

Spring 2011 \* MWF 10:20 - 11:10 a.m. \* Room 2122

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## REFERENCE TEXTS:

(Most of these will be available On Reserve at Evans Library Annex)

- 1) "Inorganic Reaction Mechanisms," Martin L. Tobe and John Burgess, Addison Wesley Longman Inc., 1999 ISBN 0582236770.
- 2) "Reaction Mechanisms of Inorganic and Organometallic Systems," 3<sup>rd</sup> Ed., Robert B. Jordan, Oxford University Press, 2007 ISBN 9780195301007.
- 3) "Mechanisms of Inorganic Reactions," Dimitris Katakis and Gilbert Gordon, Wiley-Interscience Publication, 1987 ISBN 0471842583.
- 4) "Kinetics and Mechanisms of Reaction of Transition Metal Complexes," Ralph G. Wilkins, 2<sup>nd</sup> Thoroughly Revised Edition, VCH Publishers, 1992, ISBN 9783527282531  
(Online book access at <http://onlinelibrary.wiley.com/book/10.1002/3527600825>)
- 5) "Homogeneous Catalysis – Understanding the Art," 2004 Ed., Piet W.N.M. van Leeuwen, Kluwer Academic Publishers, 2004, ISBN 1402019998.
- 6) "Ligand Substitution Processes," C.H. Langford and H.B. Gray, W.A. Benjamin, Inc., 1966  
(Online book access at [http://caltechbook.library.caltech.edu/100/1/Langford\\_Lsp.pdf](http://caltechbook.library.caltech.edu/100/1/Langford_Lsp.pdf))
- 7) "Catalysis Without Precious Metals," Ed. R. Morris Bullock, Wiley-VCH, 2010 ISBN 9783527323548.
- 8) "Principles and Applications of Organotransition Metal Chemistry," Collman, Hegedus, Norton, Finke, University Science Press, 1987 ISBN 9780935702514.

**We will use reviews and papers from the current literature extensively.**

## COURSE DESCRIPTION:

## GRADING:

25 %	Midterm Exam: March 4 <sup>th</sup> , 2011
50 %	Problem Sets & Other Assignments
25 %	Final Exam: May 10 <sup>th</sup> , 8:00 – 10:00 am

**SUBJECTS COVERED:**

- Reaction Energetics
- Chemical Kinetics and Rate Laws
- The Determination of the Rate Law
- The Deduction of Mechanism
- Ligand Substitution Reactions
  - Square-planar complexes
  - Werner  $O_h$  complexes
  - Organometallic complexes, including multinuclear metal complexes
- Reactions of Extreme Rates, including stereochemical nonrigidity
- Electron-Transfer Reactions and Marcus Theory
- Reaction Mechanisms of selected processes, including isotope rate effects, Organometallic, Bioinorganic, and Catalytic processes.

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