

Fall 2002

Stephen M. Holmes

Chem 510
Advanced Inorganic Chemistry

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Office hours by appointment

When: 10 – 10:50 AM MWF
Where: 201 Chemistry-Physics Bldg.

Required Texts:

G. L. Miessler; D. A. Tarr *Inorganic Chemistry, 2nd Ed.*

A. Vincent *Molecular Symmetry and Group Theory*

F. A. Cotton; G. Wilkinson; P. L. Gaus *Basic Inorganic Chemistry, 3rd Ed.*

Supplementary Texts (optional and useful additions to your library):

F. A. Cotton *Chemical Applications of Group Theory*

Y. Jean; F. Volatron; J. Burdett *An Introduction to Molecular Orbitals*

D. F. Shriver; P. W. Atkins; C. H. Langford *Inorganic Chemistry*

K. F. Purcell; J. C. Kotz *An Introduction to Inorganic Chemistry*

N. N. Greenwood; A. Earnshaw *Chemistry of the Elements*

C. Elschenbroich; A. Salzer *Organometallics A Concise Introduction*

F. A. Cotton; G. Wilkinson *Advanced Inorganic Chemistry, 5th Ed.*

Grading Distribution

75% Exams (3 x 25%)

25% Final Exam

Attendance

Mandatory

Chem 510

Date	Tentative Topics/Order
Aug. 28	Atomic Structure
Aug. 30	Atomic Structure
Sept. 2	Labor Day (no classes)
Sept. 4	Periodic Trends
Sept. 6	Periodic Trends
Sept. 9	Lewis and VSEPR structures
Sept. 11	Group Theory: Symmetry operations
Sept. 13	Group Theory: Symmetry operations
Sept. 16	Point Groups
Sept. 18	Point Groups
-----Exam 1: 8 PM, TH Sept. 19	
Sept. 20	Point Groups
Sept. 23	Reducible Representations
Sept. 25	Reducible Representations
Sept. 27	Group Theory; IR and Raman
Sept. 30	Group Theory; IR and Raman
Oct. 2	Hybridization and Molecular Orbital theory
Oct. 4	Fall Break (no classes)
Oct. 7	SALCS
Oct. 9	SALCS
Oct. 11	Molecular Orbital Diagrams
Oct. 14	Molecular Orbital Diagrams
Oct. 16	Molecular Orbital Diagrams
-----Exam 2: 8 PM, TH Oct. 17	
Oct. 18	Crystal-Field Splitting Diagrams
Oct. 21	MO Diagrams of Complexes
Oct. 23	MO Diagrams of Complexes
Oct. 25	Walsh diagrams
Oct. 23	Isolobal Analogy
Oct. 25	Electron Poor Compounds
Oct. 28	Spectrochemical and Nephelauxetic Series
Oct. 30	Spectrochemical and Nephelauxetic Series
Nov. 1	Metal-Ligand bonding/Ligand Types
Nov. 4	Metal-Ligand bonding, consequences

Nov. 6	Electron Counting (EAN Rule)
Nov. 8	Crystal-Field Splitting Diagrams
Nov. 11	Ligand-Field Stabilization Energies
Nov. 13	Typical Complex Geometries

-----Exam 3: 8 PM, TH Nov. 14

Nov. 15	Inorganic Nomenclature
Nov. 18	General Reaction Types; Thermodynamics
Nov. 20	Redox Reactions, Self-Exchange Reactions
Nov. 22	Ligand Substitution Reactions
Nov. 25	Ligand Substitution Reactions
Nov. 27	Reductive Elimination/Oxidative Addition
Nov. 29	Thanksgiving Break (no classes)
Dec. 2	Kinetics
Dec. 4	Catalysis
Dec. 6	Catalysis
Dec. 9	Solid State
Dec. 11	Solid State
Dec. 13	Review, last day of class

-----Final Exam: 10:30 AM, Fri. Dec. 20