

Fall 2004

Stephen M. Holmes

Chem 510
Advanced Inorganic Chemistry

Dr. Stephen M. Holmes
15 Chemistry-Physics
smholm2@uky.edu
(859) 257-7073
Office hours by appointment

When: 10 – 10:50 AM MWF
Where: 111 Chemistry-Physics Bldg.

Required Texts:

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

A. Vincent *Molecular Symmetry and Group Theory*

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.*

R. S. Drago *Physical Methods for Chemists, 2nd Ed.*

Grading Distribution

	Graduate		Undergraduate
60%	Exams (3 x 20%)	60%	Exams (3 x 20%)
30%	Final Exam (comprehensive)	30%	Final Exam (comprehensive)
10%	Homework (5-6 expected)	10%	Homework (5-6 expected)

To satisfy recent SACS requirements undergraduate students will answer fewer questions per homework assignments.

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Date		Tentative Topics/Order/Assigned Reading
Wednesday	Aug. 25	Atomic Structure
Friday	Aug. 27	no class
Monday	Aug. 30	Atomic Structure
Wednesday	Sept. 1	Periodic Trends
Friday	Sept. 3	Periodic Trends and Lewis Structures
Monday	Sept. 6	Labor Day (no classes)
Wednesday	Sept. 8	Lewis and VSEPR Structures
Friday	Sept. 10	VSEPR Structures
Monday	Sept. 13	Group Theory: Symmetry operations
Wednesday	Sept. 15	Group Theory: Symmetry operations
Friday	Sept. 17	Point Groups
Monday	Sept. 20	Point Groups
Wednesday	Sept. 22	Point Groups
----- Exam 1: 7 PM, Wed. Sept. 22 -----		
Friday	Sept. 24	Reducible Representations
Monday	Sept. 27	Reducible Representations
Wednesday	Sept. 29	Group Theory; IR and Raman
Friday	Oct. 1	Fall Break (no classes)
Monday	Oct. 4	Group Theory; IR and Raman
Wednesday	Oct. 6	Hybridization and Molecular Orbital theory
Friday	Oct. 8	SALCS: Homonuclear diatomic molecules
Monday	Oct. 11	SALCS: Heteronuclear diatomic molecules
Wednesday	Oct. 13	Molecular Orbital Diagrams
Friday	Oct. 15	Molecular Orbital Diagrams
Monday	Oct. 18	Molecular Orbital Diagrams
Wednesday	Oct. 20	Molecular Orbital Diagrams
----- Exam 2: 7 PM, Wed. Oct. 20 -----		
Friday	Oct. 22	Crystal-Field Splitting Diagrams
Monday	Oct. 25	MO Diagrams of Complexes
Wednesday	Oct. 27	MO Diagrams of Complexes
Friday	Oct. 29	Walsh/Correlation diagrams
Monday	Nov. 1	Correlation Diagrams
Wednesday	Nov. 3	MO Review
Friday	Nov. 5	Spectrochemical and Nephelauxetic Series
Monday	Nov. 8	Spectrochemical and Nephelauxetic Series
Wednesday	Nov. 10	Metal-Ligand bonding/Ligand Types

Friday	Nov. 12	Metal-Ligand bonding, consequences
Monday	Nov. 15	Electron Counting (EAN Rule)
Wednesday	Nov. 17	Electron Counting
Friday	Nov. 19	Crystal-Field Splitting Diagrams
Monday	Nov. 22	Ligand-Field Stabilization Energies

-----**Exam 3: 7 PM, Mon. Nov. 22**

Wednesday	Nov. 24	Typical Complex Geometries
Friday	Nov. 26	Thanksgiving Break (no classes)
Monday	Nov. 29	Inorganic Nomenclature
Wednesday	Dec. 1	General Reaction Types; Thermodynamics
Friday	Dec. 3	Redox Reactions, Self-Exchange Reactions
Monday	Dec. 6	Ligand Substitution Reactions
Wednesday	Dec. 8	Ligand Substitution Reactions
Friday	Dec. 10	Reductive Elimination/Oxidative Addition

-----**Final Exam: 8:00 AM, Wed. Dec. 15**