

Fall 2003

Stephen M. Holmes

**Chem 510**  
**Advanced Inorganic Chemistry**

Dr. Stephen M. Holmes  
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Office hours by appointment

When: 10 – 10:50 AM MWF  
Where: 208 Chemistry-Physics Bldg.

**Required Texts:**

G. L. Miessler; D. A. Tarr *Inorganic Chemistry, 2<sup>nd</sup> 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, 5<sup>th</sup> Ed.*

**Grading Distribution**

60% Exams (3 x 20%)

30% Final Exam (comprehensive)

10% Homework

**Attendance**

Mandatory

Three absences are allowed without penalty. (see UK rules defining excused absence policies)

Fourth absence decreases your overall course grade by one-half letter.

Greater than six absences decreases your final course grade by one full letter.

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## Chem 510

Date		Tentative Topics/Order/Assigned Reading
Wednesday	Aug. 27	Atomic Structure
Friday	Aug. 29	Atomic Structure
<b>Monday</b>	<b>Sept. 1</b>	<b>Labor Day (no classes)</b>
Wednesday	Sept. 3	Periodic Trends
Friday	Sept. 5	Periodic Trends
Monday	Sept. 8	Lewis and VSEPR structures
Wednesday	Sept. 10	Group Theory: Symmetry operations
Friday	Sept. 12	Group Theory: Symmetry operations
Monday	Sept. 15	Point Groups
Wednesday	Sept. 17	Point Groups
Friday	Sept. 19	Point Groups
----- <b>Exam 1: 8 PM, Wed. Sept. 24</b> -----		
Monday	Sept. 22	Reducible Representations
Wednesday	Sept. 24	Reducible Representations
Friday	Sept. 26	Group Theory; IR and Raman
Monday	Sept. 29	Group Theory; IR and Raman
Wednesday	Oct. 1	Hybridization and Molecular Orbital theory
<b>Friday</b>	<b>Oct. 3</b>	<b>Fall Break (no classes)</b>
Monday	Oct. 6	SALCS: Homonuclear diatomic molecules
Wednesday	Oct. 8	SALCS: Heteronuclear diatomic molecules
Friday	Oct. 10	Molecular Orbital Diagrams
Monday	Oct. 13	Molecular Orbital Diagrams
Wednesday	Oct. 15	Molecular Orbital Diagrams
----- <b>Exam 2: 8 PM, Wed. Oct. 22</b> -----		
Friday	Oct. 17	Crystal-Field Splitting Diagrams
Monday	Oct. 20	MO Diagrams of Complexes
Wednesday	Oct. 22	MO Diagrams of Complexes
Friday	Oct. 24	Walsh/Correlation diagrams
Monday	Oct. 27	Correlation Diagrams
Wednesday	Oct. 29	MO Review
Friday	Oct. 31	Spectrochemical and Nephelauxetic Series
Monday	Nov. 3	Spectrochemical and Nephelauxetic Series
Wednesday	Nov. 5	Metal-Ligand bonding/Ligand Types
Friday	Nov. 7	Metal-Ligand bonding, consequences
Monday	Nov. 10	Electron Counting (EAN Rule)
Wednesday	Nov. 12	Electron Counting

Friday	Nov. 14	Crystal-Field Splitting Diagrams
Monday	Nov. 17	Ligand-Field Stabilization Energies

-----**Exam 3: 8 PM, Wed. Nov. 19**

Wednesday	Nov. 19	Typical Complex Geometries
Friday	Nov. 21	Inorganic Nomenclature
Monday	Nov. 24	General Reaction Types; Thermodynamics
Wednesday	Nov. 26	Redox Reactions, Self-Exchange Reactions
<b>Friday</b>	<b>Nov. 28</b>	<b>Thanksgiving Break (no classes)</b>
Monday	Dec. 1	Ligand Substitution Reactions
Wednesday	Dec. 3	Ligand Substitution Reactions
Friday	Dec. 5	Reductive Elimination/Oxidative Addition
Monday	Dec. 8	Kinetics
Wednesday	Dec. 10	Catalysis
Friday	Dec. 12	Catalysis

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