

Fall 2001

Stephen M. Holmes

Chem 510
Advanced Inorganic Chemistry

Dr. Stephen M. Holmes
15 Chemistry-Physics
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Office hours by appointment

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

Required Text:

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

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

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

A. Vincent *Molecular Symmetry and 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

90% Exams (3 x 30%)

10% Homework (7 problem sets expected)

Attendance

Mandatory

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Date	Tentative Topics/Order
Aug. 22	Atomic Structure
Aug. 24	Atomic Structure
Aug. 27	Periodic Trends
Aug. 29	Periodic Trends
Aug. 31	Lewis and VSEPR structures
Sept. 3	Labor Day (no classes)
Sept. 5	Lewis/VSEPR structures
Sept. 7	Lewis/VSEPR structures
Sept. 10	Symmetry operations
Sept. 12	Symmetry operations
Sept. 12	Point Groups
Sept. 14	Point Groups
Sept. 17	Reducible Representations
Sept. 19	Group theory; IR and Raman
-----Test 1: 8 PM, Sept. 20	
Sept. 21	VSEPR and Molecular Orbital theory
Sept. 24	SALCS
Sept. 26	SALCS
Sept. 28	Molecular Orbital Diagrams
Oct. 1	Molecular Orbital Diagrams
Oct. 3	Molecular Orbital Diagrams
Oct. 5	Fall Break (no classes)
Oct. 8	MO Diagrams of Complexes
Oct. 10	Walsh diagrams
Oct. 12	Isolobal Analogy
Oct. 15	Electron Poor Compounds
Oct. 19	Spectrochemical and Nephelauxetic Series
Oct. 22	Spectrochemical and Nephelauxetic Series
Oct. 24	Metal-Ligand bonding/Ligand Types
Oct. 26	Metal-Ligand bonding, consequences
-----Test 2: 8 PM, Oct. 27	
Oct. 31	Electron Counting (EAN Rule)
Nov. 1	Crystal-Field Splitting Diagrams
Nov. 5	Ligand-Field Stabilization Energies
Nov. 7	Typical Complex Geometries
Nov. 9	Inorganic Nomenclature

Nov. 12	Inorganic Nomenclature
Nov. 14	Reaction types
Nov. 16	Redox Reactions
Nov. 19	Ligand Substitution Reactions
Nov. 21	Reductive Elimination/Oxidative Addition
Nov. 23	Thanksgiving Break (no classes)
Nov. 26	Kinetics
Nov. 28	Catalysis/Industrial Processes
Dec. 3	Catalysis/Industrial Processes
Dec. 5	Solid State
Dec. 7	Solid State

-----Test 3: Final Exam time slot.