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Ext. 7395
Caputo 213
Office Hours: M, W & F : 11:00 – 11:50 am; R : 11:00 – 12:50 pm.

CHEM 452
Advanced Inorganic Chemistry

FALL 2022

Text: Inorganic Chemistry, Miessler, Fischer & Tarr (5th edition Pearson, 2014)

Chapter Topic

- 1 Introduction
- 2 Atomic Structure: Schrodinger Equation, Periodic Properties of Atoms.
- 3 Simple Bonding Theory: Lewis Structures, VSEPR (*Review CHEM 111*)
- 4 Symmetry and Group Theory: Symmetry Elements and Operations, Point Groups, Properties of Groups, Applications of Symmetry.

EXAM 1 Chapters 1-4

- 5 Molecular Orbitals: Formation of M.O. from Atomic Orbitals, Homonuclear and Heteronuclear Diatomics, M.O for Larger Molecules, Photo Electron Spectroscopy
- 6 Acid-Base and Donor-Acceptor Chemistry (*Review CHEM 251*)
- 7 The Crystalline Solid State and Ionic Lattices (*Review CHEM 251*)
- 8 The Chemistry of the Main Group Elements (*Review CHEM 112 & 251*)

EXAM 2 Chapters 5-8

- 9 Coordination Chemistry: Structures and Isomers
- 10 Coordination Chemistry: Bonding, Crystal Field Theory, Ligand Field Theory, The Jahn-Teller Effect.
- 11 Coordination Chemistry: Electronic Spectra, Selection Rules, Correlation Diagrams, Tanabe-Sugano Diagrams, Jahn-Teller Distortions, Charge-Transfer Spectra.

EXAM 3 Chap. 9-11

- 12 Coordination Chemistry: Reactions and Mechanisms, Substitution in Octahedral and Square planar Complexes, Trans-Effect.
- 13 Organometallic Chemistry: Ligands, Nomenclature, EAN Rule, Synergistic Bonding, Spectral Analysis and Characterization.
- 14 Organometallic-Reactions and Catalysis: Types of Reactions, Homogeneous Catalysts, Heterogeneous Catalysts.

EXAM 4 Chapters 12-14

COMPREHENSIVE FINAL EXAM (ACS) Thursday Dec 8, 8– 10 am

Problem Sets:

2: 15-17, 22-24, 27-30, 38, 39, 43-45

3: 2, 3, 5, 6, 8-12, 16, 17, 20, 39, 42, 45

4: 1-5, 13, 20, 21, 23

5: 2-5, 7-9, 31-35

6: 3, 4, 25, 30, 32, 34, 39

7: 5, 7, 18, 19, 21

8: 2, 9, 13, 16, 22, 34, 35, 42, 45, 48

9: 2-12

10: 1-3, 5, 6, 18, 19, 21, 22, 23

11: 1-3, 6-9, 11, 17, 20, 22, 27

12: 1-4, 15, 16

13: 1-7, 12-15, 35, 37, 39, 41-43, 48, 50

14: 1-3, 13, 14, 22, 23

Grading:

Four Unit Exams (100 pts. each)	400
Final Exam	200
Quiz (average)	<u>200</u>
TOTAL POINTS	800

Guaranteed Letter Grades:

A	90-100%	C	70 - 74%
A-	87 - 90%	C-	67 - 70%
B+	84 - 87%	D+	64 - 67%
B	80 - 84%	D	60 - 64%
B-	77 - 80%	D-	57 - 60%
C+	74 - 77%	F	BELOW 57%

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