



Final Exam
TUESDAY,
DECEMBER 16, 2014 3-6P

1 Le Conte

Lecture Notes/Slides/Homework
Exams I, II



Atomic Structures

s, p, d orbitals, quantum numbers
Nodal planes
Radial Distribution Functions
Contour diagram
Hydrogen energy level
Electron configuration, Aufbau Principle
Ground State, Term symbol
Periodic Trends: IE, EA, Radius, EN



Group Theory

Symmetry
Point Group
Character Table
Representation
Vibrational Spectroscopy
Raman, IR



Bond Theory

Valence Bond theory
Lewis structure
Orbital hybridization
VSEPR

Molecular orbital theory,
Bond order
sp mixing
Ligand group orbitals
Projection Operator Method
Photoelectron spectroscopy
Walsh Diagram
LUMO-HOMO



Solid State Structures

Common crystal structures
Madelung Constant
Crystal symmetry
Bravais Lattice
Unit Cell
Coordination No, Composition
Close packed lattice
Radius Ratio Rules



Band Theory

Energy band formation
Fermi level
Fermi-Dirac distribution
Band gap
Doping, p, n



Acid-Base Chemistry

Bronsted Definition
Lewis definition

Oxyacid trend, PKa
Conjugated acid-base

Hard, soft acid /base
Reaction direction
Some MO explanation



Main Group Chemistry

Boron bonding feature

Boron clusters