

Inorganic Chemistry

Chemistry 230

Section: D100

Term: 2010 Fall

Instructor: Dr. T. Storr

Discussion Topics: The detailed chemistry of elements and their inorganic compounds in terms of fundamental concepts of periodicity, valence, bonding, structure and stereochemistry, coordination complexes and organometallic chemistry.

3 lecture hours/week; 1 tutorial hour/week; 0 lab hours.

Periodicity: Periodic trends (e.g. ionization potentials, electronegativities, atomic radii) comparison of a first row member of chemical group with the other members of the group.

Covalent Bonding: Atomic orbitals, LCAO description of the bonding in homonuclear and heteronuclear diatomic molecules, simple inorganic molecules with extended Pi systems, photoelectron spectroscopy, metallic bonding, semiconductors.

Ionic Solids: Close packing of spheres, radii of ions, structures of common ionic lattices, radius ratio, theoretical lattice energy, Born-Haber cycle, physical properties and lattice energy, solubility of ionic solids, and hydration of ions. Hard/soft, acid/base concept.

Classical Coordination Chemistry: The common coordination numbers and isomerism in coordination complexes, ligand field theory of octahedral, tetrahedral and square planar complexes, visible spectra and paramagnetism. The chelate effect, trans effect, simple kinetics of complexes of first-row transition metal including redox reactions.

Organometallic Complexes: Bonding of CO and C₂H₄ to low-valent transition metal, the 18-Electron Rule.

Some Special Topics: TBA

Grading: Interim Exams: (40%); Final Exam: (60%)

Required Texts: Housecroft & Sharpe, "Inorganic Chemistry", 3rd Ed. 2008. Prentice Hall.

Recommended Texts: None

Materials/Supplies: None

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Prerequisite/Corequisite: Chem 122 (or Chem 103).

Notes: Notes will be posted on the web.

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