

The Chemistry of Transition Metals

Chemistry 332

Section: D100

Term: 2010 Fall

Instructor: Dr. J. Canal

Discussion Topics: General Course Description:

The synthesis and characterization of classical and organometallic complexes of the transition metals, and their physical and chemical properties.

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

Topics:

1. Introduction. Classification of the transition metal (TM) elements, lanthanides and actinides and comparison with main group elements. Review of basic concepts and nomenclature
2. Brief overview of the coordination chemistry of the transition metals
3. Introduction to common techniques used to characterize transition metal compounds: Infrared, Raman, NMR, ESR, X-ray, etc.
4. Symmetry and Group Theory
5. Crystal/ligand field theory, magnetic properties and spin transition materials
6. UV-vis spectroscopy of classical transition-metal complexes.
7. Reaction mechanisms exhibited by TM complexes: substitution and electron transfer.
8. Introduction to TM organometallic chemistry: 18 electron rule, ligand survey, common reactions, catalysis.
9. Lanthanide and Actinide chemistry

Grading: 25% First In-Term Examination
25% Second In-Term Examination
50% Final Examination

Required Texts: Housecroft, C. E., and Sharpe, A. G. Inorganic Chemistry 3rd ed, 2008, Prentice Hall
&
Alan K. Brisdon, "Inorganic Spectroscopic Methods". Oxford University Press. 1998.

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Recommended Texts: None

Materials/Supplies: None

Prerequisite/Corequisite: Prerequisite: CHEM 230, 236 and 260, or permission of the department.

Notes: None

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