**Organometallic Chemistry**

Chemistry 432

Section: D100

Term: 2003 Spring

Instructor: Dr. R. K. Pomeroy

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Discussion Topics: General Course Description:

The course provides an introduction to organometallic chemistry.
Emphasis is placed on the use of organometallics in organic synthesis.

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

Main Group Organometallics.

(a) Brief review of the LCAO treatment of bonding and the importance of HOMO/LUMO interactions. Three-center two-electron bonds. (b) Lithium reagents. (c) Magnesium reagents. (d) Boron and aluminum reagents. (e) Group 12(Zn, Cd, Hg) reagents. (f)Phosphorus ligands.

Transition Metal Organometallics.

(a) Bonding of transition metals to organic units (e.g., CH2, C2H4, C6H6). The isolobal concept. Stability of transition metal complexes (e.g., lanthanide contraction, relativity effects).

(b) The 18-electron rule. The 16-18e concept in the reactions of organo-transition metal complexes. The common methanisms exhibited by organometallic complexes.

(c) Hydrogenation, including asymmetric catalysis and polymer supported catalysts.

(d) CO insertion reactions.

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(e) Olefin metathesis and polymerization.

(f) Nucleophilic attack on metal -olefins and -arene complexes.

(g) Transition metal units as protecting groups and chiral auxilaries in organic synthesis.

Grading: 15% First In-Term Examination (Feb. 19)

25% Second In-Term Examination (˜11th week)

60% Final Examination (April 15)

Required Texts: Notes are provided. No textbook is required for the course.

Recommended Texts: None

Materials/Supplies: None

Prerequisite/Corequisite: Pre-requisite: CHEM 332-3.

Notes: None