Organometallic Chemistry (CHEM 334/534)

Fall 2011

Prof. W. P. Malachowski
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course web page: http://www.brynmawr.edu/chemistry/malachowski/Organometallics/Organometalintro.html

Educational Goals:
-develop a knowledge base of organometallic chemistry, including an understanding of bonding, reaction mechanisms, and catalytic processes
-develop an understanding of structure-reactivity principles in a variety of organometallic complexes
-develop fundamental critical thinking skills, including pattern recognition and analogous reasoning

Class Meetings:
Tues., Thurs. 8:15-9:45 AM
All class meetings will be held in Park 264. Class cancellations, i.e. for inclement weather, will be posted on the course website
and/or communicated via e-mail.

Office Hours: Mon.12:00-1:00 PM, Wed. 10:00-11:30 AM and by appointment.

Textbook: The Organometallic Chemistry of the Transition Metals, 5th Edition, by Robert H. Crabtree

Additional References:
Advanced Organic Chemistry, Part B: Reactions and Synthesis, 5th edition (2007) by Francis A. Carey and Richard J. Sundberg
Comprehensive Organometallic Chemistry II, (1995) eds. G. Wilkinson, F. G. A. Stone, E. W. Abel
Encyclopedia of Reagents for Organic Synthesis, (1995) Leo Paquette
Handbook of Reagents for Organic Synthesis (1999)
Organometallic Chemistry, (1997) Gary O. Spessard, Gary L. Miessler

Online Resources:
Wikipedia: http://en.wikipedia.org/wiki/Organometallic_chemistry
Organometallic HyperTextBook: http://www.ilpi.com/organomet/
University of Victoria: http://web.uvic.ca/~mcindoe/423/423cm.html

Class Schedule:

Week	Tuesday	Thursday	Lecture Topic (Text Reading)
1	8/30	9/1	Transition metal complex basics (Ch. 1 and 2)
2	9/ 6	9/8 *PS#1*	Metal alkyls (Ch. 3)
3	9/13	9/15	L-type ligands (Ch. 4)
4	9/20 *PS#2*	9/22	Pi-bound complexes (Ch. 5)
5	9/27	9/29 *PS#3*	Oxidative addition and reductive elimination (Ch. 6)
6	10/4	10/6 **Exam 1**	Insertions and eliminations (Ch. 7)
Fall Break	10/8-10/16		
7	10/18	10/20	Nucleophilic and electrophilic reactions (Ch. 8)

8	10/25	10/27 *PS#4*	Open
9	11/1	11/3	Analysis of organometallic reactions (Ch. 10)
10	11/8 *PS#5*	11/10	M-L multiple bonds (Ch. 11)
11	11/15	11/17 *PS#6*	Applications in organic synthesis (Ch. 12 and 14)
12	11/22 **Exam 2**	Thanksgiving Break	Open
13	11/29	12/1	Student Oral Presentations
14	12/6	12/8	Student Oral Presentations

Problem Sets: There will be six take-home problem sets which will be collected at the beginning of class on the date shown on the schedule above. You may work in study groups to complete the problem sets, but you should submit your own version of the problem set solution.

Exams: There will be two mid-semester exams given during the class meeting time on October 6 and November 22.

Oral Presentation: Students will work in groups of two or three to present a recent article from the organometallic chemistry literature to the class. The literature article will be chosen by the students from a selection of articles on organometallic chemistry topics assembled by the instructor. Student groups will have 30-45 minutes to deliver a presentation which explains the context and significance of the literature article while exploring the experimental details of the research.

Final Exam: There will be a three-hour scheduled final exam without lecture notes, textbook or any other associated course materials.

Course Grading:

Problem Sets	20 pts. (x6)	=120 pts.
Mid-term Exams	100 pts. (x 2)	=200 pts.
Oral Presentation		=100 pts.
Self-scheduled Final Exam		=150 pts
		_____
		570 pts.

Approximate Grading Scheme:

93-100%	4.0 (A)	70-73%	2.0 (C)
89-92%	3.7 (A-)	66-69%	1.7 (C-)
85-88%	3.3 (B+)	62-67%	1.3 (D+)
81-84%	3.0 (B)	58-61%	1.0 (D)
77-80%	2.7 (B-)	<57%	0.0 (F)
73-76%	2.3 (C+)		

I reserve the right to make modifications to this scheme when I consider it necessary.

Students with Disabilities: Students who think they may need accommodations in this course because of the impact of a learning, physical, or psychological disability are encouraged to meet with me privately early in the semester to discuss their concerns. In addition, students must contact Stephanie Bell, Coordinator of Access Services (610-526-7351 or sbell@brynmawr.edu), as soon as possible, to verify their eligibility for reasonable academic accommodations. Early contact will help to avoid unnecessary inconvenience and delays.