

Physical Organic Chemistry/Mechanisms of Organic Reactions

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Lectures: Monday, Wednesday 17:30-19:00, SC 205

Office hours: Anytime or by appointment.

Topics to be covered.

1. Experimental methods for studying reaction mechanism
2. Study of reaction intermediates
  - (a) Carbocations
  - (b) Carbanions
  - (c) Neutral intermediates (free radicals, carbenes, nitrenes)
3. Acid-base reactions
4. Strain effects in chemical reactions

Proposed marks scheme (CHEM 4023)

Two Assignments (problem sets).....	30%
Two Class tests .....	30%
Final exam.....	40%

Proposed marks scheme for CHEM 5030

Two term tests.....	25%
Two assignments.....	25%
Essay and oral presentation.....	25%
Final exam.....	25%

Important dates:

Thanksgiving October 12 (Monday).

Test #1.....	October 19
Test #2.....	November 25
Last date to drop course without receiving a grade.....	November 9
CHEM 5030 essays to be submitted.....	November 25
Presentations by CHEM 5030 students.....	December 2
Final exam.....	During exam schedule in December TBA

## Texts

There are MANY books on physical organic chemistry/mechanisms. Listed below are some of the classics and more recent ones in this area, given in two categories, general and specialized.

### General

1. E. V. Anslyn and Dennis Dougherty "Modern Physical Organic Chemistry" University Science Books (2006) QD476.A57 2004.
2. F.A. Carroll "Perspectives on Structure and Mechanism in Organic Chemistry" (2<sup>nd</sup> Edition), J. Wiley (2010) QD476.C375 1998.
3. M.B. Smith and J. March "Advanced Organic Chemistry" 6<sup>th</sup> ed. Wiley Interscience (2007). (More of a descriptive compilation of mechanisms).
4. N. Isaacs "Physical Organic Chemistry" 2<sup>nd</sup> ed. Pearson/Prentice Hall (1995).
5. F.A. Carey and R.J. Sundberg "Advanced Organic Chemistry" Part A 5<sup>th</sup> ed. Springer (2007) (available as electronic version with pdf uploads)
6. T.H. Lowry and K.S. Richardson: "Mechanism and Theory in Organic Mechanisms" Harper and Row, 3<sup>rd</sup> ed. (1987) QD476.L68 1987.
7. B.K. Carpenter: "Determination of Organic Reaction Mechanisms" Wiley, 1984. QD476.C37 1984
8. C.D. Ritchie: "Physical Organic Chemistry: The Fundamental Concepts" Marcel Dekker (1990). The most mathematical of these texts.
9. E.M. Kosower "An Introduction to Physical Organic Chemistry" Wiley, 1968. This one is quite physical.

### b) Specialized

1. R.P. Bell "The Proton in Chemistry" Cornell University Press, 1973. A classic!
2. G.A. Olah and P.v.R. Schleyer "Carbonium Ions" Wiley. This is a series of 5 volumes spanning the years 1969-1976.
3. M. Jones, Jr. and R.A. Moss "Carbenes" Wiley 1973 and 1975 (two volumes).
4. A. Greenberg and J. Liebman "Strained Organic Molecules" in "Organic Chemistry" Volume 38, Academic Press (1978) QD 476.G66.