

Reagents and Organic reactions - Web course

COURSE OUTLINE

The course covers the reagents for organic reactions with five modules. The modules 1 and 2 describe the oxidizing and reducing reagents, respectively, for functional group transformations. The modules 3 and 4 focus the reactions with organometallic and lanthanide compounds, respectively. The module 5 describes the application of miscellaneous reagents for organic reactions.

COURSE DETAIL

Module No.	Topic/s	Lectures
1	Oxidation Reactions Lectures	
	1.1 Osmium Oxidants	1
	1.2 Manganese Oxidants	1
	1.3 Chromium Oxidants	1
	1.4 Selenium and Aluminum Oxidants	1
	1.5 Peracids and Peroxides	2
	1.6 Ozone, Lead Tetraacetate and Sodium Periodate	1
	1.7 Molecular Oxygen	1
	1.8 Other Metal Oxidants (Ag, Ru, Pd, etc.)	1
	1.9 Other Nonmetal Oxidants (Dess-Martin, TEMPO, IBX, DDQ etc.)	3
1.10 Bio-oxidations	1	
2	Reduction Reactions	
	2.1 Lithium Aluminum Hydride, Sodium Borohydride and Their Derivatives	2
	2.2 Dissolving Metal Reductions (Na-Liq. NH ₃ , Li-Liq. NH ₃ , etc.)	1
	2.3 Molecular Hydrogen	1
	2.4 Miscellaneous Reducing Agents (Al-Alkoxides, Me ₃ SiH, etc.)	1
2.5 Photoreductions and Bio-reductions		
3	Reactions with Organometallic Compounds	
	3.1 Organomagnesium and -Lithium Reagents	2
	3.2 Organozinc Compounds	1



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Chemistry and Biochemistry

Pre-requisites:

Organic Chemistry Background

Coordinators:

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	3.3 Organocopper Compounds	2
	3.4 Organoboranes	2
	3.5 Organosilicon Compounds	1
	3.6 Organotin Compounds	2
	3.7 Organopalladium Compounds	2
	3.8. Organonickel Compounds	2
	Other Organometallic Compounds (Ti, Zr, Cr, Rh, Ru, Fe, etc.)	
4	Reactions with Lanthanides	
	4.1 Cerium Compounds	1
	4.2 Samarium and Ytterbium Compounds	2
5	Reactions with Miscellaneous Reagents	
	5.1 N-Bromosuccinimide (NBS)	1
	5.2 N,N-Dicyclohexylcarbodiimide (DCC)	1
	5.3 Diazomethane	1
	5.4 Phosphorus Reagents	1
	5.5 Sulfur, -Selenium and -Tellurium Compounds	1

References:

1. W. Carruthers and I. Coldham, Modern Methods of Organic Synthesis, 4th ed., Cambridge University Press, UK, 2004.
2. F. A. Carey and R. J. Sundberg, Advanced Organic Chemistry, Part A & B, 5th ed., Springer, New York, 2007.
3. J. March, Advanced Organic Chemistry, 4th ed., John Wiley & Sons, Inc., Canada, 1992.