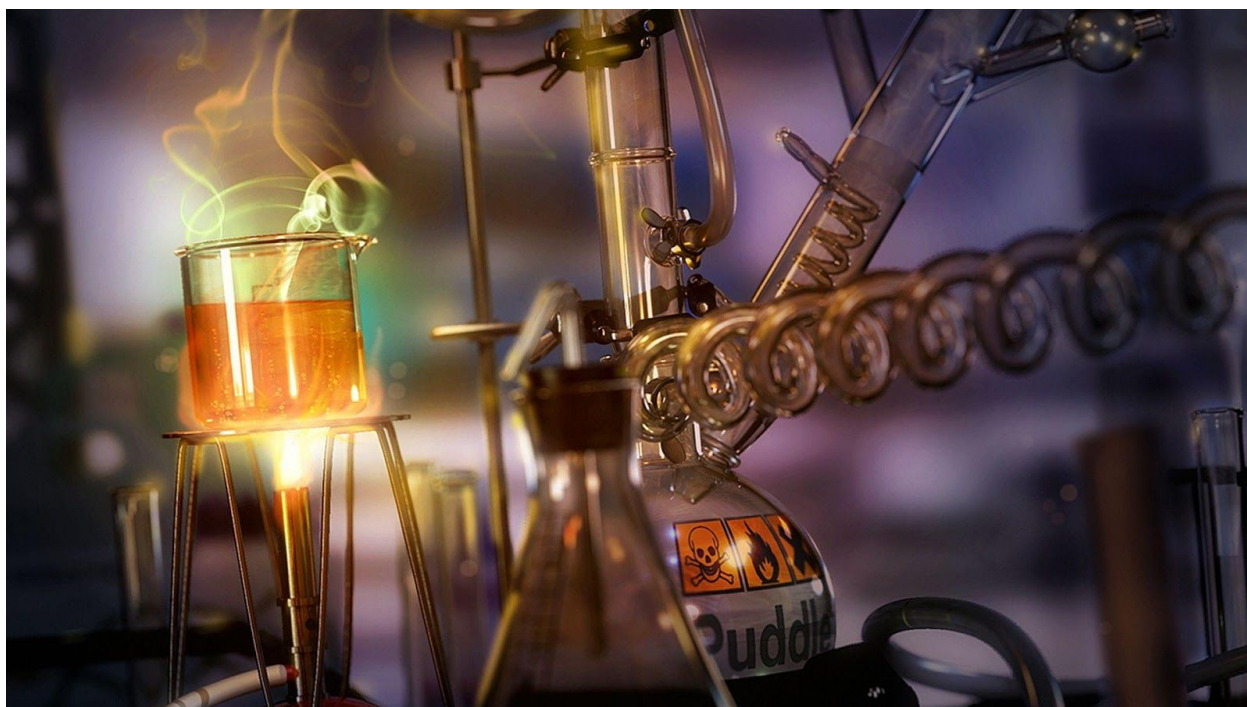


Principles of Organic Chemistry: A Compendium of Video Lectures

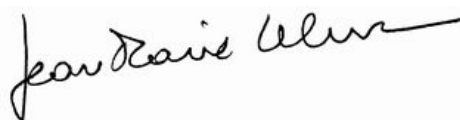
Syeda Sadia Khatoon and Atta-ur-Rahman*



Foreword

The “Video Book” entitled “Principles of Organic Chemistry: A Compendium of Video Lectures” prepared by Atta-ur-Rahman and Syeda Sadia Khatoon is a very worthwhile addition to the already existing video and other documentation/lectures available. However these are often of variable quality and not organized systematically to cover most of the requirements of undergraduate courses in one place. The present work represents a welcome effort to provide quality lectures in Organic Chemistry delivered by faculty members of renowned institutions such as MIT, Yale, University of California and other leading universities. What is particularly useful about this effort is that the materials have been carefully screened by the authors to ensure quality, and then organized to cover a broad range of topics including basic concepts, synthesis, spectroscopy and macromolecules. The novel arrangement of the materials in the format of a standard book, with chapters and sections containing the video links within them, should make it particularly attractive to users.

This Compendium of some 300 lectures should be a useful source of learning for organic chemistry students. It also represents a very valuable effort in line with the evolution of teaching and knowledge transfer methodologies.



Jean-Marie Lehn

(Nobel Laureate)

PREFACE

The single biggest problem to providing quality education, particularly in the developing world, is the non-availability of high quality faculty. This can now be partly addressed through access to the excellent lecture materials that are available on the net. Unfortunately they are scattered and there is need to screen and organise them in a proper form that will be useful to students. This may partly help to level the playing field between the West and the developing world as far as quality of education is concerned.

The "Video Book" that we have just prepared has contents arranged in the form of a normal text book except that it has no text! It contains just links to some 300 lectures by good scientists! These are systematically arranged according to headings and sub-headings in a standard organic chemistry text book format. To my knowledge it is the first "Video Book" (VB) of its kind and I hope that it will start a new trend.

"Video Books" of this type will allow students to have free access to excellent lectures delivered by world authorities in their respective fields from leading universities. This could lead to a major transformation in the manner that "teaching" is carried out in a typical class room, with both students and teachers having studied the materials in advance. This should result in a paradigm shift with the class rooms becoming more as places for discussion between teachers and students for clarification of concepts rather than just for lecture delivery.

The Commonwealth of Learning (Vancouver, Canada) has kindly agreed to publicise the "book" internationally for which we are grateful. We shall be obliged if you could pass this "Video Book" on to the departments of chemistry and biochemistry so that it reaches the widest possible viewership. It is free. We hope that this novel approach to education contributes substantially in raising standards.

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Professor Emeritus

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1.

Chapter 1: Basic principles

1.1. The Importance of Chemical Principles

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-1/>

1.2. Discovery of Electron and Nucleus

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-2/>

1.3. Wave-Particle Duality of Light

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-3/>

1.4. Hydrogen Atom Energy Levels

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-5/>

1.5. Hydrogen Atom Wave functions

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-6/>

1.6. p-Orbitals

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-7/>

1.7. Multi Electron Atoms and Electron Configurations

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-8/>

1.8. Periodic Trends

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-9/>

1.9. Thermochemistry

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-16/>

1.10. Entropy and Disorder

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-17/>

1.11. Free Energy and Control of Spontaneity

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-18/>

2.**Chapter 2: Bonding and Molecular Structure****2.1. Dot Structure : Single Bond**

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/dot-structures-jay/v/dot-structures-i-single-bonds-1>

2.2. Dot Structure : Double Bond

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/dot-structures-jay/v/dot-structures-ii-multiple-bonds-1>

2.3. sp^3 Hybridized Orbitals and Sigma Bonds

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/hybrid-orbitals-jay/v/sp3-hybridized-orbitals-and-sigma-bonds>

2.4. Pi Bonds and sp^2 Hybridized Orbitals

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/hybrid-orbitals-jay/v/pi-bonds-and-sp2-hybridized-orbitals>

2.5. sp^3 Hybridization

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/hybrid-orbitals-jay/v/sp3-hybrid-orbital-jay-final>

2.6. Steric Number and sp^3 Hybridization

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/hybrid-orbitals-jay/v/steric-number-sp3-hybridization>

2.7. sp^2 Hybridization

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/hybrid-orbitals-jay/v/sp2-hybridization-jay-final>

2.8. sp Hybridization

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/hybrid-orbitals-jay/v/sp-hybridization-jay-final>

2.9. Organic Hybridization Practice

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/hybrid-orbitals-jay/v/organic-hybridization-practice>

2.10. Bond-line Structures: Condensed Structures

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/bond-line-structures/v/condensed-structures>

2.11. Bond-line Structures

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/bond-line-structures/v/bond-line-structures-new>

2.12. Three-Dimensional Bond-line Structures

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/bond-line-structures/v/three-dimensional-bond-line-structures-new>

2.13. Structural (Constitutional) Isomers

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/bond-line-structures/v/structural-constitutional-isomers-new>

2.14. Electronegativity and Bonding

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/electronegativity-polarity/v/electronegativity-and-chemical-bonds>

2.15. Dipole Moment

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/electronegativity-polarity/v/dipole-moment>

2.16. Intermolecular Forces

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/electronegativity-polarity/v/intermolecular-forces-and-molecular-bonds>

2.17. Boiling Points of Organic Compounds

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/electronegativity-polarity/v/boiling-points-of-organic-compounds>

2.18. Solubility of Organic Compounds

<https://www.khanacademy.org/science/organic-chemistry/gen-chem-review/electronegativity-polarity/v/solubility-of-organic-compounds-redo>

2.19. Ionic & Covalent Bonding

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lec_02.html

2.20. Resonance Structures

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lec_03.html

2.21. Molecular Orbital Theory & Hybridization

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lec_04.html

2.22. Valence Bond Theory and Hybridization

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-15/>

2.23. Bonding in Small Molecules & Reactive Intermediates

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lec_05.html

2.24. Bonding in Molecules

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lec_06.html

2.25. Covalent Bonds

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-10/>

2.26. Lewis Structures

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-11/>

2.27. Ionic Bonds

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-12/>

2.28. Polar Covalent Bonds and VSEPR Theory

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-13/>

2.29. Electronegativity & Polarity of Molecules

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry Lec_07.html

2.30. Intermolecular Forces

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry Lec_11.html

2.31. Molecular Orbital Theory

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-14/>

2.32. Molecular Orbital Theory (Pt. I)

http://ocw.uci.edu/lectures/chem_201 Lec_02_organic_reaction_mechanisms_i_molecular_orbital_theory_pt_i.html

2.33. Molecular Orbital Theory (Pt. II) & Energy, Part 1

http://ocw.uci.edu/lectures/chem_201 Lec_02_pt_2_organic_reaction_mechanisms_i_molecular_orbital_theory_pt_ii_energy_part_1.html

2.34. Molecular Orbital Theory (Pt. III) & Energy Pt. 2

http://ocw.uci.edu/lectures/chem_201 Lec_03_organic_reaction_mechanisms_i_molecular_orbital_theory_pt_iii_energy_pt_2.html

2.35. Review of Orbitals

http://ocw.uci.edu/lectures/chemistry_202_lecture_02_organic_reaction_mechanisms_ii_review_of_orbitals.html

2.36. The Shape of Frontier Molecular Orbitals

http://ocw.uci.edu/lectures/chemistry_202_lecture_03_organic_reaction_mechanisms_ii_the_shape_of_frontier_molecular_orbitals.html

3.

Chapter 3: Nomenclature

3.1. Systematic Nomenclature

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lec_13.html

3.2. Systematic Nomenclature

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lec_14.html

4.

Chapter 4: Acids and Bases

4.1. Introduction to Acids and Bases

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lec_08.html

4.2. Structural Effects of pKa

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lec_09.html

4.3. Acidity & Basicity of Amines

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_21_acidity_basicity_of_amines.html

4.4. Acid-Base Titrations

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-23/>

5.

Chapter 5: Functional Group Chemistry

5.1. Introduction to Organic Molecules and Functional Groups

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lec_10.html

5.2. Unimolecular Elimination

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_04.html

5.3. E1 Mechanism & Double Elimination

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_05.html

6.

Chapter 6: Stereochemistry

6.1. Introduction to Chirality

- a) <https://www.khanacademy.org/science/organic-chemistry/stereochemistry-topic/chirality-r-s-system/v/introduction-to-chirality>
- b) <https://www.khanacademy.org/science/organic-chemistry/stereochemistry-topic/chirality-r-s-system/v/chiral-examples-1>
- c) <https://www.khanacademy.org/science/organic-chemistry/stereochemistry-topic/chirality-r-s-system/v/chiral-examples-2>

6.2. Chiral vs Achiral

<https://www.khanacademy.org/science/organic-chemistry/stereochemistry-topic/chirality-r-s-system/v/chiral-achiral-jay>

6.3. Stereoisomers, Enantiomers, and Chirality Centers

<https://www.khanacademy.org/science/organic-chemistry/stereochemistry-topic/chirality-r-s-system/v/stereoisomer-enantiomer-jay>

6.4. Identifying Chirality Centers

<https://www.khanacademy.org/science/organic-chemistry/stereochemistry-topic/chirality-r-s-system/v/chirality-center-jay>

6.5. Conformations of Acyclic Alkanes

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry Lec_12.html

6.6. Stereochemistry

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry Lec_16.html

6.7. Properties of Enantiomers and Stereoisomers

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry Lec_17.html

6.8. Enantiomeric Resolution

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry Lec_18.html

6.9. Stereochemistry of Elimination Reactions

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry Lec_03.html

6.10. Stereochemistry of Radical Reactions & Free Radical Oxidation

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry Lec_19.html

6.11. Fischer Projections

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry Lec_24_fischer_projections.html

7.

Chapter 7: Organic Reactions Mechanisms

7.1. Introduction

http://ocw.uci.edu/lectures/chemistry_202_lecture_01_organic_reaction_mechanisms_ii_introduction.html

7.2. Arrow Pushing (Pt. 1)

http://ocw.uci.edu/lectures/chem_201_lec_01_organic_reaction_mechanisms_i_arrow_pushing_pt_1.html

7.3. Arrow Pushing (Pt. 2)

http://ocw.uci.edu/lectures/chem_201_lec_01_pt_2_organic_reaction_mechanisms_i_arrow_pushing_pt_2.html

7.4. Selectivity

http://ocw.uci.edu/lectures/chem_201_lec_04_organic_reaction_mechanisms_i_selectivity.html

7.5. Carbocations

http://ocw.uci.edu/lectures/chem_201_lec_05_organic_reaction_mechanisms_i_carbocations.html

7.6. Carbocation Stabilization by Vicinal Sigma Bonds

http://ocw.uci.edu/lectures/chem_201_lec_06_organic_reaction_mechanisms_i_carbocation_stabilization_by_vicinal_sigma_bonds.html

7.7. Neighboring Groups

http://ocw.uci.edu/lectures/chem_201_lec_07_organic_reaction_mechanisms_i_neighboring_groups.html

7.8. Neighboring Groups & Solvation

http://ocw.uci.edu/lectures/chem_201_lec_07_pt_2_and_lec_08_organic_reaction_mechanisms_i_neighboring_groups_solvation.html

7.9. Addition to Sigma Star (σ^*)

http://ocw.uci.edu/lectures/chem_201_lec_09_organic_reaction_mechanisms_i_addition_to_sigma_star_%CF%83*.html

7.10. Addition to Sigma Star (σ^*)

http://ocw.uci.edu/lectures/chem_201_lec_09_pt_2_organic_reaction_mechanisms_i_addition_to_sigma_star_%CF%83*.html

7.11. Addition to Sigma Star (σ^*) & Migratory Displacements

http://ocw.uci.edu/lectures/chem_201_lec_09_pt_3_and_lec_10_organic_reaction_mechanisms_i_addition_to_sigma_star_%CF%83*_migratory_displacements.html

7.12. Eliminations

http://ocw.uci.edu/lectures/chem_201_lec_11_organic_reaction_mechanisms_i_eliminations.html

7.13. Eliminations & Addition to Pi Star (π^*)

http://ocw.uci.edu/lectures/chem_201_lec_11_pt_2_and_lec_12_organic_reaction_mechanisms_i_eliminations_addition_to_pi_star_%CF%80*.html

7.14. Addition to Pi Star (π^*), Part. 2

http://ocw.uci.edu/lectures/chem_201_lec_12_organic_reaction_mechanisms_i_addition_to_pi_star_%CF%80*_part_2.html

7.15. Addition to Pi Star (π^*), Part 3

http://ocw.uci.edu/lectures/chem_201_lec_13_organic_reaction_mechanisms_i_addition_to_pi_star_%CF%80*_part_3.html

7.16. Anions

http://ocw.uci.edu/lectures/chem_201_lec_14_organic_reaction_mechanisms_i_anions.html

7.17. Nucleophilic Sigma Bonds

http://ocw.uci.edu/lectures/chemistry_202_lecture_04_organic_reaction_mechanisms_ii_nucleophilic_sigma_bonds.html

7.18. Nucleophilic Sigma Bonds, Part 2

http://ocw.uci.edu/lectures/chemistry_202_lecture_05_organic_reaction_mechanisms_ii_nucleophilic_sigma_bonds_part_2.html

8.

Chapter 8: Chemical Equilibrium

8.1. Chemical Equilibrium

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-19/>

8.2. Le Chatelier's Principle

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-20/>

8.3. Acid-Base Equilibrium

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-21/>

8.4. Chemical and Biological Buffers

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-22/>

9.

Chapter 9: Kinetics

9.1. Kinetics and Rate Equations

http://ocw.uci.edu/lectures/chemistry_202_lecture_16_organic_reaction_mechanisms_ii_kinetics_and_rate_equations.html

9.2. Kinetics and Rate Equations, Part 2

http://ocw.uci.edu/lectures/chemistry_202_lecture_17_organic_reaction_mechanisms_ii_kinetics_and_rate_equations_part_2.html

9.3. Thermodynamic vs Kinetic Control

http://ocw.uci.edu/lectures/chemistry_202_lecture_18_organic_reaction_mechanisms_ii_thermodynamic_vs_kinetic_control.html

9.4. Selectivity & Transition State Theory

http://ocw.uci.edu/lectures/chemistry_202_lecture_19_organic_reaction_mechanisms_ii_selectivity_transition_state_theory.html

9.5. Transition State Theory, Temp, & Half-Lives

http://ocw.uci.edu/lectures/chemistry_202_lecture_20_organic_reaction_mechanisms_ii_transition_state_theory_temp_halfives.html

9.6. Kinetic Isotope Effects

http://ocw.uci.edu/lectures/chemistry_202_lecture_21_organic_reaction_mechanisms_ii_kinetic_isotope_effects.html

9.7. Rate Laws

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-31/>

9.8. Reaction Mechanism

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-33/>

9.9. Temperature and Kinetics

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-34/>

10.**Chapter 10: Ionic Reactions: Nucleophilic Substitution and Elimination Reactions**

10.1. Alkyl Halides and Nucleophilic Substitution

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lec_21.html

10.2. Nucleophilic and Bimolecular Substitution

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lec_22.html

10.3. Substitution, Nucleophilic, Unimolecular -- SN1 Reactions

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lec_23.html

10.4. Factors that Affect the Rate of the SN1 Reactions

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lec_24.html

11.**Chapter 11: Radical Reactions**

11.1. http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_18.html

11.2. Radical Structure & Reactivity

http://ocw.uci.edu/lectures/chemistry_202_lecture_22_organic_reaction_mechanisms_ii_radical_structure_reactivity.html

11.3. Radical Reactions

http://ocw.uci.edu/lectures/chemistry_202_lecture_23_organic_reaction_mechanisms_ii_radical_reactions.html

12.**Chapter 12: Alkenes and Alkynes: Addition Reactions****12.1. Electrophilic Addition Reactions**

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_10.html

12.2. Reactions, Synthesis, & Alkynes

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_13.html

12.3. Electrophilic Addition Reactions of Alkynes

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_14.html

13.

Chapter 13: Alcohols and Ethers: Synthesis and Reactions

13.1. Alcohols, Ethers, and Epoxides

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_06.html

13.2. Conversion of Alcohols to Alkyl Halides

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_07.html

13.3. Methods for Converting Alcohols to Alkyl Halides

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_08.html

13.4. Reactions of Epoxides

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_09.html

14.

Chapter 14: Reaction of Aromatic Compounds

14.1. Naming Benzene Derivative Introduction

- a) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/naming-aromatic/v/naming-benzene-derivatives-introduction>
- b) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/naming-aromatic/v/naming-benzene-derivatives>

14.2. Reactions of Benzene : Resonance

<https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/reactions-benzene/v/resonance>

14.3. Reactions of Benzene : Electrophilic Aromatic Substitution

<https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/reactions-benzene/v/electrophilic-aromatic-substitution>

14.4. Reactions of Benzene: Bromination of Benzene

<https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/reactions-benzene/v/bromination-of-benzene>

14.5. Reactions of Benzene: Friedel Crafts Acylation

<https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/reactions-benzene/v/friedel-crafts-acylation>

14.6. Aromatic Stability

- a) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/aromatic-stability/v/aromatic-stability-i>
- b) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/aromatic-stability/v/aromatic-stability-ii>
- c) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/aromatic-stability/v/aromatic-stability-iii>
- d) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/aromatic-stability/v/aromatic-stability-iv>
- e) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/aromatic-stability/v/aromatic-stability-v>

14.7. Aromatic Heterocycles

- a) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/aromatic-stability/v/aromatic-heterocycles-i>
 - b) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/aromatic-stability/v/aromatic-heterocycles-ii>
-

c)

14.8. Electrophilic Aromatic Substitution Mechanism

- a) http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_23.html
- b) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/electrophilic-aromatic-substitution/v/electrophilic-aromatic-substitution-mechanism>

14.9. Halogenation

<https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/electrophilic-aromatic-substitution/v/halogenation-of-benzene-1>

14.10. Nitration

<https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/electrophilic-aromatic-substitution/v/nitration>

14.11. Sulfonation

<https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/electrophilic-aromatic-substitution/v/sulfonation-benzene>

14.12. Friedel Crafts Alkylation

<https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/electrophilic-aromatic-substitution/v/friedel-crafts-alkylation>

14.13. Friedel Crafts Acylation

<https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/electrophilic-aromatic-substitution/v/friedel-crafts-acylation-1>

14.14. Benzene and Aromatic Compounds

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_22.html

14.15. Aromatic Substitution with Carbocations as Electrophiles

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_24.html

14.16. Substituent Effect and Friedel-Crafts Reactions

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry Lec_25.html

14.17. Synthetic Applications of Electrophile Aromatic Substitution

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry Lec_26.html

14.18. Nucleophilic Aromatic Substitution

- a) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/nucleophilic-aromatic-substitution/v/nucleophilic-aromatic-substitution-i>
- b) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/nucleophilic-aromatic-substitution/v/nucleophilic-aromatic-substitution-ii>

14.19. Directing Effects : Ortho Para Director

- a) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/directing-effects-2013-07-03T14:44:54.851Z/v/ortho-para-directors-i>
- b) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/directing-effects-2013-07-03T14:44:54.851Z/v/ortho-para-directors-ii>
- c) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/directing-effects-2013-07-03T14:44:54.851Z/v/ortho-para-directors-iii>

14.20. Directing Effects : Meta Director

- a) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/directing-effects-2013-07-03T14:44:54.851Z/v/meta-directors-i>
- b) <https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/directing-effects-2013-07-03T14:44:54.851Z/v/meta-directors-ii>

14.21. Multiple substituents

<https://www.khanacademy.org/science/organic-chemistry/aromatic-compounds/directing-effects-2013-07-03T14:44:54.851Z/v/multiple-substituents>

15.

Chapter 15: Aldehydes and Ketones: Nucleophilic Addition to the Carbonyl Group

15.1. Aldehyde Introduction

<https://www.khanacademy.org/science/organic-chemistry/aldehydes-ketones/nomenclature-aldehyde-ketone/v/aldehyde-introduction>

15.2. Ketone Naming

<https://www.khanacademy.org/science/organic-chemistry/aldehydes-ketones/nomenclature-aldehyde-ketone/v/ketone-naming>

15.3. Nomenclature of Aldehydes and Ketones

<https://www.khanacademy.org/science/organic-chemistry/aldehydes-ketones/nomenclature-aldehyde-ketone/v/nomenclature-of-aldehydes-and-ketones>

15.4. Physical Properties of Aldehydes and Ketones

<https://www.khanacademy.org/science/organic-chemistry/aldehydes-ketones/nomenclature-aldehyde-ketone/v/physical-properties-of-aldehydes-and-ketones>

15.5. Reactivity of Aldehydes and Ketones

<https://www.khanacademy.org/science/organic-chemistry/aldehydes-ketones/nomenclature-aldehyde-ketone/v/reactivity-of-aldehydes-and-ketones>

15.6. Reactions of Aldehydes and Ketones : formation of Hydrates

<https://www.khanacademy.org/science/organic-chemistry/aldehydes-ketones/reactions-aldehydes-ketones-jay/v/formation-of-hydrates>

15.7. Reactions of Aldehydes and Ketones: Formation of Hemiacetals

<https://www.khanacademy.org/science/organic-chemistry/aldehydes-ketones/reactions-aldehydes-ketones-jay/v/formation-of-hemiacetals>

15.8. Reactions of Aldehydes and Ketones: Acid and Base Catalyzed Formation of Hydrates and Hemiacetals

<https://www.khanacademy.org/science/organic-chemistry/aldehydes-ketones/reactions-aldehydes-ketones-jay/v/acid-and-base-catalyzed-formation-of-hydrates-and-hemiacetals>

15.9. Reaction of Aldehydes and Ketones: Formation of Acetals

<https://www.khanacademy.org/science/organic-chemistry/aldehydes-ketones/reactions-aldehydes-ketones-jay/v/formation-of-acetals>

15.10. Reactions of Aldehydes and Ketones: Acetals as Protecting groups and Thioacetals

<https://www.khanacademy.org/science/organic-chemistry/aldehydes-ketones/reactions-aldehydes-ketones-jay/v/acetals-as-protecting-groups-and-thioacetals>

15.11. Reactions of Aldehydes and Ketones: Formation of Imines and Enamines

<https://www.khanacademy.org/science/organic-chemistry/aldehydes-ketones/reactions-aldehydes-ketones-jay/v/formation-of-imines-and-enamines>

15.12. Reactions of Aldehydes and Ketones: Formation of Oximes and Hydrazones

<https://www.khanacademy.org/science/organic-chemistry/aldehydes-ketones/reactions-aldehydes-ketones-jay/v/formation-of-oximes-and-hydrazones>

15.13. Reactions of Aldehydes and Ketones: Addition of Carbon Nucleophiles to Aldehydes and Ketones

<https://www.khanacademy.org/science/organic-chemistry/aldehydes-ketones/reactions-aldehydes-ketones-jay/v/addition-of-carbon-nucleophiles-to-aldehydes-and-ketones>

15.14. Aldehydes & Ketones: Nucleophilic Substitution

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry Lec_07_aldehydes_ketones_nucleophilic_substitution.html

15.15. Addition of Water, Alcohol & Cyanide

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_08_addition_of_water_alcohol_cyanide.html

15.16. Wittig Reaction

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_09_wittig_reaction.html

15.17. Electrophilic Addition Reactions of Type 2 Carbonyl Compounds

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_10_electrophilic_addition_reactions_of_type_2_carbonyl_compounds.html

15.18. The Organic Chemistry of Phosphorus

- a) http://ocw.uci.edu/lectures/chemistry_202_lecture_06_organic_reaction_mechanisms_ii_the_organic_chemistry_of_phosphorus.html
- b) http://ocw.uci.edu/lectures/chem_201_lec_20_organic_reaction_mechanisms_i_phosphorus_chemistry.html
- c) http://ocw.uci.edu/lectures/chemistry_202_lecture_07_organic_reaction_mechanisms_ii_phosphorus_chemistry.html

15.19. Sulfur Chemistry

http://ocw.uci.edu/lectures/chem_201_lec_19_organic_reaction_mechanisms_i_sulfur_chemistry.html

15.20. The Organic Chemistry of Sulfur

http://ocw.uci.edu/lectures/chemistry_202_lecture_08_organic_reaction_mechanisms_ii_the_organic_chemistry_of_sulfur.html

16.

Chapter 16: Carboxylic Acids and Their Derivatives

16.1. Carboxylic Acids: Introduction

<https://www.khanacademy.org/science/organic-chemistry/carboxylic-acids-derivatives/naming-carboxylic-acids-sal/v/carboxylic-acid-introduction>

16.2. Carboxylic Acids: Naming

<https://www.khanacademy.org/science/organic-chemistry/carboxylic-acids-derivatives/naming-carboxylic-acids-sal/v/carboxylic-acid-naming>

16.3. Formation of Carboxylic Acid Derivatives: Fischer Esterification

<https://www.khanacademy.org/science/organic-chemistry/carboxylic-acids-derivatives/formation-carboxylic-acid-derivatives-sal/v/fisher-esterification>

16.4. Formation of Carboxylic Acid Derivatives: Acid Chloride Formation

<https://www.khanacademy.org/science/organic-chemistry/carboxylic-acids-derivatives/formation-carboxylic-acid-derivatives-sal/v/acid-chloride-formation>

16.5. Formation of Carboxylic Acid Derivatives Amides, Anhydrides, Esters, and Acyl Chlorides

<https://www.khanacademy.org/science/organic-chemistry/carboxylic-acids-derivatives/formation-carboxylic-acid-derivatives-sal/v/amides-anhydrides-esters-and-acyl-chlorides>

16.6. Relative Stability of Amides, Esters, Anhydrides, and Acyl Chlorides

<https://www.khanacademy.org/science/organic-chemistry/carboxylic-acids-derivatives/formation-carboxylic-acid-derivatives-sal/v/relative-stability-of-amides-esters-anhydrides-and-acyl-chlorides>

16.7. Amide Formation from Acyl Chloride

<https://www.khanacademy.org/science/organic-chemistry/carboxylic-acids-derivatives/formation-carboxylic-acid-derivatives-sal/v/amide-formation-from-acyl-chloride>

16.8. Carboxylic Acids

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_01_carboxylic_acids.html

16.9. Preparation of Carboxylic Acids

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_02_preparation_of_carboxylic_acids.html

16.10. Reaction of Esters

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_11_reaction_of_esters.html

16.11. Reactions of Carboxylic Acids

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_12_reactions_of_carboxylic_acids.html

17.

Chapter 17: Alpha Carbon Chemistry

17.1. Formation of Enolate Anions Keto-Enol Tautomerization

- a) <https://www.khanacademy.org/science/organic-chemistry/ochem-alpha-carbon-chemistry/formation-of-enolate-anions/v/keto-enol-tautomerization>
- b) <https://www.khanacademy.org/science/organic-chemistry/ochem-alpha-carbon-chemistry/formation-of-enolate-anions/v/keto-enol-tautomerization-2>

17.2. Enolate Formation from Aldehydes

<https://www.khanacademy.org/science/organic-chemistry/ochem-alpha-carbon-chemistry/formation-of-enolate-anions/v/enolate-formation-from-aldehydes>

17.3. Enolate Formation from Ketones

<https://www.khanacademy.org/science/organic-chemistry/ochem-alpha-carbon-chemistry/formation-of-enolate-anions/v/enolate-formation-from-ketones>

17.4. Kinetic and Thermodynamic Enolates

<https://www.khanacademy.org/science/organic-chemistry/ochem-alpha-carbon-chemistry/formation-of-enolate-anions/v/kinetic-and-thermodynamic-enolates>

17.5. Aldol Condensation: Aldol Reactions

<https://www.khanacademy.org/science/organic-chemistry/ochem-alpha-carbon-chemistry/aldol-condensation-jay/v/aldol-reaction>

17.6. Aldol Condensation

<https://www.khanacademy.org/science/organic-chemistry/ochem-alpha-carbon-chemistry/aldol-condensation-jay/v/aldol-condensation>

17.7. Mixed (crossed) Aldol Condensation

<https://www.khanacademy.org/science/organic-chemistry/ochem-alpha-carbon-chemistry/aldol-condensation-jay/v/mixed-crossed-aldol-condensation>

17.8. Mixed (crossed) Aldol Condensation using a Lithium Enolate

<https://www.khanacademy.org/science/organic-chemistry/ochem-alpha-carbon-chemistry/aldol-condensation-jay/v/mixed-crossed-aldol-condensation-using-a-lithium-enolate>

17.9. Retro-Aldol and Retrosynthesis

<https://www.khanacademy.org/science/organic-chemistry/ochem-alpha-carbon-chemistry/aldol-condensation-jay/v/retro-aldol-and-retrosynthesis>

17.10. Intramolecular Aldol Condensation

<https://www.khanacademy.org/science/organic-chemistry/ochem-alpha-carbon-chemistry/aldol-condensation-jay/v/intramolecular-aldol-condensation>

18.**Chapter 18: Reactions at the alpha Carbon of Carbonyl Compounds: Enols and Enolates****18.1. Substitution Reactions of Carbonyl Compounds at the α -Carbon**

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry Lec_13_substitution_reactions_of_carbonyl_compounds_at_the_%CE%B1carbon.html

18.2. Reactions at the Alpha-Carbon

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_14_reactions_at_the_alpha_carbon.html

19.**Chapter 19: Condensation and Conjugated Addition Reactions of Carbonyl Compounds****19.1. Alternatives to Direct Alkylation of Enolate Ions**

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_15_alternatives_to_direct_alkylation_of_enolate_ions.html

19.2. Enols, Enamines, and Enolates

http://ocw.uci.edu/lectures/chem_201_lec_17_organic_reaction_mechanisms_i_enols_enamines_and_enolates.html

19.3. Alkylation of Acetic Acids

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_16_alkylation_of_acetic_acids.html

19.4. Carbonyl Condensation Reactions

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_17_carbonyl_condensation_reactions.html

19.5. The Claisen Condensation

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_18_the_claisen_condensation.html

19.6. Synthesis with Claisen Condensation

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_19_synthesis_with_claisen_condensation.html

20.

Chapter 20: Amines

20.1. Amine Naming: Introduction

- a) <https://www.khanacademy.org/science/organic-chemistry/amines-topic/naming-amines/v/amine-naming-introduction>
- b) <https://www.khanacademy.org/science/organic-chemistry/amines-topic/naming-amines/v/amine-naming-2>

20.2. Preparation of Amines

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_22_preparation_of_amines.html

20.3. Nucleophile Aromatic Substitution to Aniline Rings

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_23_nucleophile_aromatic_substitution_to_aniline_rings.html

20.4. Properties of Anomers - Mutarotation

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_25_properties_of_anomers_mutarotation.html

21.

Chapter 21: Electrophilic Addition to C=C

21.1. Addition of E⁺ to C=C

http://ocw.uci.edu/lectures/chem_201_lec_15_organic_reaction_mechanisms_i_addition_of_e_to_c=c.html

21.2. Addition of E⁺ to C=C (Pt. II) & C-C Bonds

http://ocw.uci.edu/lectures/chem_201_lec_15_pt_2_and_lec_16_organic_reaction_mechanisms_i_addition_of_e_to_c=c_pt_ii_cc_bonds.html

22.

Chapter 22: Tautomerization, Oxidations and Reductions

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_15.html

23.

Chapter 23: Oxidations

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_16.html

24.

Chapter 24: Reductions**24.1. Addition of Water, Bromine & Chlorine to Alkenes**

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_11.html

24.2. Addition of Borane

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_12.html

24.3. Hydride Reagents and Addition to Carbonyls Reduction

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_03_hydride_reagents_and_addition_to_carbonyls.html

24.4. Hydride Reagents and Addition to Carbonyls

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_04_hydride_reagents_and_addition_to_carbonyls_part_2.html

25.

Chapter 25: Electrocyclic Reactions

25.1. Conjugation, Resonance, and Dienes

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry Lec_20.html

25.2. Diels-Alder Reactions

- a) <https://www.khanacademy.org/science/organic-chemistry/conjugation-diels-alder-mo-t-heory/diels-alder-reaction/v/diels-alder-reaction-new>
- b) <https://www.khanacademy.org/science/organic-chemistry/conjugation-diels-alder-mo-t-heory/diels-alder-reaction/v/diels-alder-stereochemistry-of-dienophile>
- c) <https://www.khanacademy.org/science/organic-chemistry/conjugation-diels-alder-mo-t-heory/diels-alder-reaction/v/diels-alder-stereochemistry-of-diene-new>
- d) <https://www.khanacademy.org/science/organic-chemistry/conjugation-diels-alder-mo-t-heory/diels-alder-reaction/v/diels-alder-endo-rule-new>
- e) <https://www.khanacademy.org/science/organic-chemistry/conjugation-diels-alder-mo-t-heory/diels-alder-reaction/v/diels-alder-intramolecular-new>
- f) http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry Lec_21.html

25.3. Pericyclic Reactions

- a) http://ocw.uci.edu/lectures/chemistry_202_lecture_09_organic_reaction_mechanisms_ii_pericyclic_reaction.html
- b) http://ocw.uci.edu/lectures/chemistry_202_lecture_10_organic_reaction_mechanisms_ii_pericyclic_reactions_part_2.html

25.4. Cycloadditions

http://ocw.uci.edu/lectures/chemistry_202_lecture_11_organic_reaction_mechanisms_ii_cycloaddition.html

25.5. Ene Reactions

http://ocw.uci.edu/lectures/chemistry_202_lecture_12_organic_reaction_mechanisms_ii_ene_reactions.html

25.6. Electrocyclic Reactions

http://ocw.uci.edu/lectures/chemistry_202_lecture_13_organic_reaction_mechanisms_ii_electrocyclic_reactions.html

25.7. Sigmatropic Rearrangements

a) http://ocw.uci.edu/lectures/chemistry_202_lecture_14_organic_reaction_mechanisms_ii_sigmatropic_rearrangements.html

b) http://ocw.uci.edu/lectures/chemistry_202_lecture_15_organic_reaction_mechanisms_ii_sigmatropic_rearrangements_part_2.html

26.

Chapter 26: Chemical Structure and Reactivity

26.1. S_N1 , S_N2 , Allylic Organometallic and Conjugated Double Bond Reactions

a) <https://www.khanacademy.org/science/organic-chemistry/substitution-elimination-reactions/sn1-sn2-tutorial/v/sn1-reaction-mechanism>

b) <https://www.khanacademy.org/science/organic-chemistry/substitution-elimination-reactions/sn1-sn2-tutorial/v/sn1-reaction-stereochemistry>

c) <https://www.khanacademy.org/science/organic-chemistry/substitution-elimination-reactions/sn1-sn2-tutorial/v/sn2-mechanism-and-stereochemistry>

d) <https://www.khanacademy.org/science/organic-chemistry/substitution-elimination-reactions/sn1-sn2-tutorial/v/sn1-vs-sn2-solvent-effects>

e) https://www.youtube.com/watch?v=4g7TTXDSdME&index=2&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb

26.2. Pericyclic Reactions and Diels Alder Reactions

https://www.youtube.com/watch?v=qVBh9TL2ONo&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb&index=4

26.3. Electrocyclic Reactions, Benzene and Aromaticity

https://www.youtube.com/watch?v=qVBh9TL2ONo&index=4&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb

26.4. Electrophonic attack on Derivatives of Benzene

https://www.youtube.com/watch?v=GCqOG4FjKD4&index=5&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb

26.5. Electrophilic Aromatic Substitution, Halogenation, Nitration and Sulfonation

https://www.youtube.com/watch?v=zXgTlirzjz8&index=6&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb

26.6. Strategies in Electrophilic Aromatic Substitution

https://www.youtube.com/watch?v=y_7Cfq8MWAY&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb&index=7

26.7. Synthesis, Oxidation, Ozonolysis of Alkenes, Hydration of Alkynes, Friedel-Crafts Acylation and Alcohols

https://www.youtube.com/watch?v=lekbh6HCFwU&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb&index=8

26.8. Acetal Formation, Acetal Pro-Drugs, Amine Addition and Intermolecular Reactions

https://www.youtube.com/watch?v=TO339Z7JBxM&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb&index=9

26.9. Resonance Stabilized yields are Trans-Selective, Baeyer Villiger Oxidation

https://www.youtube.com/watch?v=tnUdDDPOLmA&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb&index=10

26.10. Enamines, Aldol formation, α , β Unsaturated Aldehyde and Ketones, Wittig Reactions

https://www.youtube.com/watch?v=hnPQ3hD-New&index=11&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb

26.11. Hydrogen Cyanide Conjugate Addition , Robinson Annulation and Carboxylic Acids

https://www.youtube.com/watch?v=2f_yfWTK7o&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb&index=12

26.12. Oxidation of Primary Alcohols and Aldehydes, Carbonation, Nitrile Hydrolysis, Nucleophilic Substitution by Addition, Synthesis of Carboxylic Derivatives

https://www.youtube.com/watch?v=nPR2p_l816U&index=13&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb

26.13. Reactions of Carboxylic acids, Carboxylic Acid Derivatives. Acyl Halides Reactions

https://www.youtube.com/watch?v=hXk-RJRduVU&index=14&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb

26.14. Esters, Reaction of Esters and Amides

https://www.youtube.com/watch?v=Zz3ftdq7vmQ&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb&index=15

26.15. Amides, Alkanenitriles, Amines and their Derivatives

https://www.youtube.com/watch?v=UKILPthcJkY&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb&index=16

26.16. Amines and their Derivatives, Synthesis

https://www.youtube.com/watch?v=82K9_64NL88&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb&index=17

26.17. Reactions of Amines, Benzylic Resonance, Benzylic Oxidation Reduction

https://www.youtube.com/watch?v=juLq538gjac&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb&index=18

26.18. Kolbe Schmitt Reaction, etc

https://www.youtube.com/watch?v=XmCrTMdiJds&index=19&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb

26.19. Claisen Rearrangement, Cope Rearrangement, Arenamines, the Calsien Condensation

https://www.youtube.com/watch?v=dNrXZQXvcx0&index=20&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb

26.20. Formation and Decarboxylation of 3Ketoacids, α Hydroxycarbonlys, Aldehyde Ketone Synthesis and Carbohydrates

https://www.youtube.com/watch?v=pzbGtNaWy5U&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb&index=21

26.21. Carbohydrates - Cyclic Hemiacetal Formation by Glucose, Reactions of Sugars

https://www.youtube.com/watch?v=IOoVnP7S3B8&index=22&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb

26.22. Reaction of Sugars - Kiliniani Fischer Extension, Higher Saccharides, Heterocycles, Hetrocyclopentadienes.

https://www.youtube.com/watch?v=rVtkgmUuR1A&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb&index=23

26.23. Pyridine, Reaction of Pyridine, Synthesis of Amino Acids

https://www.youtube.com/watch?v=AkBQjP-R_yc&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb&index=24

26.24. Polypeptides, Synthesis of Polypeptides, Structure of Nucleic acids, Protein Synthesis

https://www.youtube.com/watch?v=i54Z9HzuF-8&index=25&list=PL-XXv-cvA_iAqa_0qj7SI0y3KJHcgRgrb

27.

Chapter 27: Click chemistry

27.1. Nobel conference: K. Barry Sharpless “Click Chemistry: Illusions in Chemistry”

<https://vimeo.com/45116622>

27.2. Barry Sharpless: Click Chemistry: Recent Advances Used in Biomedicine

<https://www.youtube.com/watch?v=aOpJMmmG80k>

28.**Chapter 28: Organometallics****28.1. Alkali Organometallics**

- a) http://ocw.uci.edu/lectures/chem_201_lec_14_pt_2_organic_reaction_mechanisms_i_anions_pt_2_alkali_organometallics.html
- b) http://ocw.uci.edu/lectures/chem_201_lec_14_pt_3_organic_reaction_mechanisms_i_alkali_organometallics_part_2.html

28.2. Alkali Organometallics (Pt. 3) & Addition of E⁺ to C=C

http://ocw.uci.edu/lectures/chem_201_lec_14_pt_4_and_lec_15_organic_reaction_mechanisms_i_alkali_organometallics_pt_3_addition_of_e_to_c=c.html

29.**Chapter 29: Addition of Organometallic Reagents to Carbonyls**

- a) http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_05_addition_of_organometallic_reagents_to_carbonyls.html
 - b) http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_06_alpha_unsaturated_carbonyl_compounds.html
-

30.

Chapter 30: Transition Metals and Redox Reactions

30.1. Balancing Redox Equations

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-24/>

30.2. Electrochemical Cells

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-25/>

30.3. Chemical and Biological Redox Reactions

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-26/>

30.4. Transition Metals

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-27/>

30.5. Crystal Field Theory

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-28/>

31. Chapter 31: Named Reactions of Organic Chemistry

31.1. Arndt-Eistert Reaction

<https://www.youtube.com/watch?v=xYDIXqekgMk&list=PL85C9357345F6AA35>

31.2. Baeyer-Villiger Oxidation Reaction and Mechanism

<https://www.youtube.com/watch?v=Lp7BJHL2Bpk&list=PL85C9357345F6AA35&index=2>

31.3. Baylis-Hillman Reaction

<https://www.youtube.com/watch?v=G3bbjxxFF-8&list=PL85C9357345F6AA35&index=4>

31.4. Beckmann rearrangement

<https://www.youtube.com/watch?v=gCd4G72q6Lo&list=PL85C9357345F6AA35&index=5>

31.5. Curtius reaction

<https://www.youtube.com/watch?v=eMucWgEiRRI&index=11&list=PL85C9357345F6AA35>

31.6. Darzen's condensation

https://www.youtube.com/watch?v=a_GldtZGbDg&list=PL85C9357345F6AA35&index=12

31.7. Favorskii Rearrangement

<https://www.youtube.com/watch?v=P8hfRdmPfyw&list=PL85C9357345F6AA35&index=15>

31.8. The Fischer Indole synthesis

<https://www.youtube.com/watch?v=N1QVC9v22-0&list=PL85C9357345F6AA35&index=16>

31.9. Friedel-Crafts Acylation Reaction

<https://www.youtube.com/watch?v=mxN45lBCGWs&index=18&list=PL85C9357345F6AA35>

31.10. Friedel Crafts Alkylation

https://www.youtube.com/watch?v=2Sk_LafcNDk&index=21&list=PL85C9357345F6AA35

31.11. Gabriel Synthesis

<https://www.youtube.com/watch?v=O1ghSY-0a4A&list=PL85C9357345F6AA35&index=22>

31.12. Grignard Reaction

https://www.youtube.com/watch?v=aB251H3_774&list=PL85C9357345F6AA35&index=24

31.13. Heck Reaction

<https://www.youtube.com/watch?v=Nz15ccKevdg&list=PL85C9357345F6AA35&index=25>

31.14. Henry Reaction

https://www.youtube.com/watch?v=Jy9qnm7e_8g&index=26&list=PL85C9357345F6AA35

31.15. Hofmann Elimination

<https://www.youtube.com/watch?v=IDLzk3uw5L4&index=27&list=PL85C9357345F6AA35>

31.16. Mannich Reaction

<https://www.youtube.com/watch?v=S8QX8GogZVY&index=28&list=PL85C9357345F6AA35>

31.17. Michael Reaction

<https://www.youtube.com/watch?v=N3pcFxWFYNg&list=PL85C9357345F6AA35&index=29>

31.18. Mitsunobu Reaction

<https://www.youtube.com/watch?v=UBhNrrlo-AM&list=PL85C9357345F6AA35&index=30>

31.19. Oppenauer Oxidation

https://www.youtube.com/watch?v=wj24oo_SbUA&index=31&list=PL85C9357345F6AA35

31.20. Riemer-Tiemann Reaction

<https://www.youtube.com/watch?v=giwibzFc2b4&index=32&list=PL85C9357345F6AA35>

31.21. Robinson ring Annulations

https://www.youtube.com/watch?v=wOJlu0_Gw6o&index=33&list=PL85C9357345F6AA35

31.22. Stork Enamine Reaction

<https://www.youtube.com/watch?v=16blyMZm-8&list=PL85C9357345F6AA35&index=34>

31.23. Suzuki Reaction

<https://www.youtube.com/watch?v=7CpwtOGjDPs&index=35&list=PL85C9357345F6AA35>

31.24. Swern Oxidation

<https://www.youtube.com/watch?v=k3093efdwP4&index=36&list=PL85C9357345F6AA35>

31.25. Ugi Reactions

<https://www.youtube.com/watch?v=t7DWcsg73XE&index=37&list=PL85C9357345F6AA35>

31.26. Vilsmeier-Haack Reaction

<https://www.youtube.com/watch?v=2T2soAxu79c&index=38&list=PL85C9357345F6AA35>

31.27. Williamson Ether Synthesis

<https://www.youtube.com/watch?v=-SRWjxHRL7o&list=PL85C9357345F6AA35&index=39>

<https://www.youtube.com/watch?v=X9ypryY7hrQ&index=40&list=PL85C9357345F6AA35>

31.28. Wolff-Kishner Reduction

<https://www.youtube.com/watch?v=2M1cRy8HOno&index=44&list=PL85C9357345F6AA35>

31.29. Wolff Rearrangement

<https://www.youtube.com/watch?v=8fWW-TSt2RU&list=PL85C9357345F6AA35&index=45>

32.

Chapter 32: Spectroscopy: Introduction

32.1. Spectroscopy in the Frequency and Time Domains

<http://video.mit.edu/watch/chemistry-535-spectroscopy-in-the-frequency-and-time-domains-2473/>

32.2. Linear and Nonlinear Spectroscopy

<http://video.mit.edu/watch/chemistry-535-linear-and-nonlinear-spectroscopy-2471/>

32.3. Magnetism and Spectrochemical Theory

<http://ocw.mit.edu/courses/chemistry/5-111-principles-of-chemical-science-fall-2008/video-lectures/lecture-30/>

33.

Chapter 33: UV/Vis Spectroscopy

33.1. Introduction UV/Vis Spectroscopy

<https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/uv-vis-spectroscopy/v/uv-vis-spectroscopy>

33.2. UV/Vis Spectroscopy: Absorption in the Visible Region

<https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/uv-vis-spectroscopy/v/absorption-in-the-visible-region>

33.3. UV/Vis Spectroscopy: Conjugation and Color

<https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/uv-vis-spectroscopy/v/conjugation-and-color-1>

34.

Chapter 34: Infrared Spectroscopy

34.1. Infrared Spectroscopy: Introduction, Theory, Instrumentation, and Sample Preparation

- a) http://ocw.uci.edu/lectures/chem_203_lecture_01_organic_spectroscopy_infrared_spectroscopy_introduction_theory_instrumentation_and_sample_preparation.html
- b) <https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/infrared-spectroscopy-theory/v/introduction-to-infrared-spectroscopy>

34.2. IR: Bond As Springs

<https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/infrared-spectroscopy-theory/v/bonds-as-springs>

34.3. IR: Signal Characteristics – Wave number

<https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/infrared-spectroscopy-theory/v/signal-characteristics-wave-number>

34.4. IR Spectra for Hydrocarbons

<https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/infrared-spectroscopy-theory/v/ir-spectra-for-hydrocarbons>

34.5. IR: Signal Characteristics - Intensity

<https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/infrared-spectroscopy-theory/v/signal-characteristics-intensity>

34.6. IR: Signal Characteristics – Shape

<https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/infrared-spectroscopy-theory/v/signal-characteristics-shape>

34.7. IR: Symmetric and Asymmetric Stretching

<https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/infrared-spectroscopy-theory/v/symmetric-and-asymmetric-stretching>

34.8. IR Signals for Carbonyl Compounds

<https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/infrared-spectroscopy-theory/v/ir-signals-for-carbonyl-compounds>

34.9. IR spectra Practice

<https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/infrared-spectroscopy-theory/v/ir-spectra-practice>

34.10. C,H,O-Containing Functional Groups

http://ocw.uci.edu/lectures/chem_203_lecture_02_organic_spectroscopy_infrared_spectroscopy_chocontaining_functional_groups.html

34.11. Effect of Ring Size Conjugation Electron-Withdrawing Groups

http://ocw.uci.edu/lectures/chem_203_lecture_03_organic_spectroscopy_effect_of_ring_size_conjugation_electronwithdrawing_groups.html

35.

Chapter 35: NMR Spectroscopy

35.1. Introduction NMR

<http://www.chem.ox.ac.uk/vrchemistry/webcast/odell.htm>

35.2. Organic Spectroscopy: Introduction to NMR Spectroscopy: Concepts and Theory,

- a) http://ocw.uci.edu/lectures/chem_203_lecture_07_organic_spectroscopy_introduction_to_nmr_spectroscopy_concepts_and_theory_part_1.html
 - b) http://ocw.uci.edu/lectures/chem_203_lecture_08_organic_spectroscopy_introduction_to_nmr_spectroscopy_concepts_and_theory_part_2.html
-

35.3. Organic Spectroscopy: Chemical Shift. ^1H NMR Chemical Shifts

http://ocw.uci.edu/lectures/chem_203_lecture_09_organic_spectroscopy_chemical_shift_1h_nmr_chemical_shifts.html

35.4. Nuclear Magnetic Resonance Spectroscopy

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lect_25.html

35.5. Proton Nuclear Magnetic Resonance (HNMR)

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lect_26.html

35.6. Spin-Spin Coupling

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lect_27.html

35.7. Carbon-13 Nuclear Magnetic Resonance (CNMR)

http://ocw.uci.edu/lectures/chem_51a_organic_chemistry_lect_28.html

35.8. ^{13}C NMR Chemical Shifts. Chemical Equivalence and Spin-Spin Coupling

http://ocw.uci.edu/lectures/chem_203_lecture_10_organic_spectroscopy_13c_nmr_chemical_shifts_chemical_equivalence_and_spinspin_coupling.html

35.9. Magnetic Equivalence, Spin Systems, and Pople Notation

http://ocw.uci.edu/lectures/chem_203_lecture_11_organic_spectroscopy_magnetic_equivalence_spin_systems_and_pople_notation.html

35.10. Coupling Analysis in First-Order and Near-First-Order Systems

a) http://ocw.uci.edu/lectures/chem_203_lecture_12_organic_spectroscopy_coupling_analysis_in_firstorder_and_nearfirstorder_systems.html

b) http://ocw.uci.edu/lectures/chem_203_lecture_13_organic_spectroscopy_coupling_analysis_in_firstorder_and_nearfirstorder_systems_part_2.html

35.11. Spin-Spin Coupling in Stereochemistry and Structure Determination.

http://ocw.uci.edu/lectures/chem_203_lecture_14_organic_spectroscopy_spinspin_coupling_in_stereochemistry_and_structure_determination.html

35.12. Organic Spectroscopy: Coupling Involving Other Nuclei

http://ocw.uci.edu/lectures/chem_203_lecture_15_organic_spectroscopy_coupling_involving_other_nuclei.html

35.13. The Importance of ^{13}C Chemical Shifts in Structure and Stereochemistry Determination

http://ocw.uci.edu/lectures/chem_203_lecture_16_organic_spectroscopy_the_importance_of_13c_chemical_shifts_in_structure_and_stereochemistry_determination.html

35.14. Introduction to 2D NMR Spectroscopy

http://ocw.uci.edu/lectures/chem_203_lecture_17_organic_spectroscopy_introduction_to_2d_nmr_spectroscopy.html

35.15. Dynamic Effects in NMR Spectroscopy

http://ocw.uci.edu/lectures/chem_203_lecture_18_organic_spectroscopy_dynamic_effects_in_nmr_spectroscopy.html

35.16. The Nuclear Overhauser Effect in Stereochemistry and Structure Determination

http://ocw.uci.edu/lectures/chem_203_lecture_19_organic_spectroscopy_the_nuclear_overhauser_effect_in_stereochemistry_and_structure_determination.html

35.17. Understanding Complex Pulse Sequences

http://ocw.uci.edu/lectures/chem_203_lecture_20_organic_spectroscopy_understanding_complex_pulse_sequences.html

35.18. Using HMBC to Help Solve Structures: Putting the Pieces Together

http://ocw.uci.edu/lectures/chem_203_lecture_21_organic_spectroscopy_using_hmbc_to_help_solve_structures_putting_the_pieces_together.html

35.19. Aspects of COSY, HMQC, HMBC, and Related Experiments

http://ocw.uci.edu/lectures/chem_203_lecture_22_organic_spectroscopy_aspects_of_cosy_hmqc_hmbc_and_related_experiments.html

35.20. Using TOCSY to Elucidate Spin Systems. ROESY

http://ocw.uci.edu/lectures/chem_203_lecture_23_organic_spectroscopy_using_tocsy_to_elucidate_spin_systems_roesy.html

35.21. Using Organic Spectroscopy to Solve Complex Structure

http://ocw.uci.edu/lectures/chem_203_lecture_24_organic_spectroscopy_using_organic_spectroscopy_to_solve_complex_structures.html

35.22. Organic Spectroscopy: Inadequate. Some Thoughts on Homework Set 9

http://ocw.uci.edu/lectures/chem_203_lecture_25_organic_spectroscopy_inadequate_some_thoughts_on_homework_set_9.html

35.23. Organic Spectroscopy: Using Organic Spectroscopy to Solve Complex Structures, Part 2

http://ocw.uci.edu/lectures/chem_203_lecture_26_organic_spectroscopy_using_organic_spectroscopy_to_solve_complex_structures_part_2.html

35.24. Using HMQC-TOCSY or HSQC-TOCSY to Deal with Overlap

http://ocw.uci.edu/lectures/chem_203_lecture_27_organic_spectroscopy_using_hmqctocsy_or_hsqctocsy_to_deal_with_overlap.html

35.25. Some Other Useful NMR Techniques

http://ocw.uci.edu/lectures/chem_203_lecture_28_organic_spectroscopy_some_other_useful_nmr_techniques.html

36.**Chapter 36: Mass Spectroscopy****36.1. Introduction**

<http://www.chem.ox.ac.uk/vrchemistry/webcast/oldham.htm>

36.2. Mass Spectrometry: Theory, Instrumentation, and Techniques

http://ocw.uci.edu/lectures/chem_203_lecture_04_organic_spectroscopy_mass_spectrometry_theory_instrumentation_and_techniques.html

36.3. Isotopic Masses, Isotopic Abundances, and High-Resolution Mass Spectrometry

http://ocw.uci.edu/lectures/chem_203_lecture_05_organic_spectroscopy_isotopic_masses_isotopic_abundances_and_highresolution_mass_spectrometry.html

36.4. Fragmentation in EIMS: Alkanes, Alkenes, Heteroatom Compounds, Carbonyl Compounds

http://ocw.uci.edu/lectures/chem_203_lecture_06_organic_spectroscopy_fragmentation_in_eims_alkanes_alkenes_heteroatom_compounds_carbonyl_compounds.html

37.

Chapter 37: Chemistry of Natural Products

37.1. Oxidation Reactions of Sugars

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_26_oxidation_reactions_of_sugars.html

37.2. Polysaccharides

http://ocw.uci.edu/lectures/chem_51c_organic_chemistry_lec_27_polysaccharides.html

38.

Chapter 38: Green Chemistry

38.1. Green Chemistry

http://ocw.uci.edu/lectures/chemistry_51b_organic_chemistry_lec_17.html

39.

Chapter 39: Chemical Biology

39.1. What is Chemical Biology

http://ocw.uci.edu/lectures/chem_128_lec_01_intro_to_chemical_biology_introductionwhat_is_chemical_biology.html

39.2. Common Tools in Chemical Biology

http://ocw.uci.edu/lectures/chem_128_lec_02_intro_to_chemical_biology_common_tools_in_chemical_biology.html

39.3. Reactivity and Arrow Pushing

http://ocw.uci.edu/lectures/chem_128_lec_03_intro_to_chemical_biology_reactivity_and_arrow_pushing.html

39.4. Combinatorial Chemistry and Biology

http://ocw.uci.edu/lectures/chem_128_lec_04_intro_to_chemical_biology_combinatorial_chemistry_and_biology.html

39.5. Non Covalent Interaction, DNA

http://ocw.uci.edu/lectures/chem_128_lec_05_intro_to_chemical_biology_noncovalent_interactions_dna.html

39.6. DNA Reactivity with Small Molecules

http://ocw.uci.edu/lectures/chem_128_lec_06_intro_to_chemical_biology_dna_reactivity_with_small_molecules.html

39.7. DNA, RNA and Cancer

http://ocw.uci.edu/lectures/chem_128_lec_07_intro_to_chemical_biology_dna_rna_and_cancer.html

39.8. Introduction to Chemical Biology: RNA

http://ocw.uci.edu/lectures/chem_128_lec_08_intro_to_chemical_biology_rna.html

http://ocw.uci.edu/lectures/chem_128_lec_09_intro_to_chemical_biology_rna_part_2.html

39.9. Protein and Amino Acids Conformations

http://ocw.uci.edu/lectures/chem_128_lec_10_intro_to_chemical_biology_proteins_and_amino_acid_conformations.html

http://ocw.uci.edu/lectures/chem_128_lec_11_intro_to_chemical_biology_proteins_and_amin_o_acid_conformations_part_2.html

39.10. Protein Functions

http://ocw.uci.edu/lectures/chem_128_lec_12_intro_to_chemical_biology_protein_functions.html

39.11. Protein Functions and Enzymes

http://ocw.uci.edu/lectures/chem_128_lec_13_intro_to_chemical_biology_protein_functions_and_enzymes.html

39.12. Glycobiology

http://ocw.uci.edu/lectures/chem_128_lec_14_intro_to_chemical_biology_glycobiology.html

39.13. Glycobiology and Polyketides

http://ocw.uci.edu/lectures/chem_128_lec_15_intro_to_chemical_biology_glycobiology_polyketides.html

http://ocw.uci.edu/lectures/chem_128_lec_16_intro_to_chemical_biology_glycobiology_polyketides_part_2.html

39.14. Terpenes and cell Signaling

http://ocw.uci.edu/lectures/chem_128_lec_17_intro_to_chemical_biology_terpenes_and_cell_signaling_part_1.html

http://ocw.uci.edu/lectures/chem_128_lec_18_intro_to_chemical_biology_terpenes_and_cell_signaling_part_2.html

40.

Chapter 40: Polymers

40.1. Polymers: Sorting and Identification of Post

https://www.youtube.com/watch?v=qn_FXw24JAQ&list=PL-XXv-cvA_iCoOrAmAIHGW05ZqamH7tiA&index=2

40.2. Polymers: Toy design contest

https://www.youtube.com/watch?v=8YDdOceCaBw&index=4&list=PL-XXv-cvA_iCoOrAmAIHGW05ZqamH7tiA

40.3. Polymers: Toy design and Power Point Projects

https://www.youtube.com/watch?v=Op_ma1DW85c&index=5&list=PL-XXv-cvA_iCoOrAmAIHGW05ZqamH7tiA

40.4. Polymers: Poster Presentation Projects

https://www.youtube.com/watch?v=3026DmrPqyg&index=6&list=PL-XXv-cvA_iCoOrAmAIHGW05ZqamH7tiA

40.5. Polymers: Depolymerization Reactions and acids

https://www.youtube.com/watch?v=0k7oZoRDxRk&list=PL-XXv-cvA_iCoOrAmAIHGW05ZqamH7tiA&index=8

40.6. Polymers: Depolymerization Reactions and Base

https://www.youtube.com/watch?v=M3jpKG28kZo&index=9&list=PL-XXv-cvA_iCoOrAmAIHGW05ZqamH7tiA

40.7. Polymers: Depolymerization Reactions and Base

https://www.youtube.com/watch?v=M3jpKG28kZo&index=9&list=PL-XXv-cvA_iCoOrAmAIHGW05ZqamH7tiA

41.

Chapter 41: Chromatography

41.1. Column Chromatography

- a. <http://ocw.mit.edu/resources/res-5-0001-digital-lab-techniques-manual-spring-2007/videos/column-chromatography/> (MIT)
- b. <https://www.youtube.com/watch?v=clx8IfAgtXo> Part 1
- c. <https://www.youtube.com/watch?v=mwEiq2pGKU8> Part 2

41.2. Thin-Layer Chromatography (TLC)

- a. <http://ocw.mit.edu/resources/res-5-0001-digital-lab-techniques-manual-spring-2007/videos/tlc-the-basics/>
- b. <http://ocw.mit.edu/resources/res-5-0001-digital-lab-techniques-manual-spring-2007/videos/tlc-advanced/>
- c. <https://www.youtube.com/watch?v=qdmKGskCyh8>

41.3. Ion-Exchange Chromatography

- a. https://www.youtube.com/watch?v=jOf_zHw2Hd4
- b. <https://www.youtube.com/watch?v=kxD5X0fyZWk>

41.4. HPLC

- a. https://www.youtube.com/watch?v=kz_egMtdnL4&list=PLh7qJALewvA6-_bSqb6DesISTyr4g7I2P
- b. https://www.youtube.com/watch?v=Y7-CuEGfnyl&list=PLh7qJALewvA6-_bSqb6DesISTyr4g7I2P&index=2

41.5. Gas chromatography

<https://www.youtube.com/watch?v=5eUDvvggBCMA&index=42&list=PLf9x1YPYxyakBtpulzcOCYZc-Uqb1Atf>

42.

Chapter 42: Laboratory Techniques

42.1.

<http://www.dnatube.com/video/14953/Lec-1-MIT-5301-Chemistry-Laboratory-Techniques-IAP-2004>

42.2.

<http://www.dnatube.com/video/14954/Lec-2-MIT-5301-Chemistry-Laboratory-Techniques-IAP-2004>

42.3.

<https://www.youtube.com/watch?v=EUn2skAAjHk>

42.4.

<http://www.dnatube.com/video/14956/Lec-4-MIT-5301-Chemistry-Laboratory-Techniques-IAP-2004>

42.5.

<http://www.dnatube.com/video/14957/Lec-5-MIT-5301-Chemistry-Laboratory-Techniques-IAP-2004>

42.6.

<https://www.youtube.com/watch?v=7c0XL-ZQn5I>

42.7.

https://www.youtube.com/watch?v=Q47hTa1KvN0&ebc=ANyPxKrw9L87CFkbamFFTR53DHbPGT_SpdcbXEOT42BueAuAZu2Qg7ZjyWQVJLIUeGD2z49dkzgZvIidNoHqLZCfrdlvGSJXyg&spfreload=10

42.8.

<https://www.youtube.com/watch?v=6fzBJ8nuuzk>

43.

Chapter 43: Organic Chemistry Problems

43.1. Organic Synthesis Strategies

- a) <https://www.youtube.com/watch?v=3kLBA24CC1k>
 - b) <https://www.youtube.com/watch?v=xMyToMB1uY8>
 - c) <https://www.youtube.com/watch?v=4XR1-TmViNo>
 - d) <https://www.youtube.com/watch?v=KQJ-VjAZyVY>
 - e) <https://www.youtube.com/watch?v=jM8HxK1fln8>
 - f) <https://www.youtube.com/watch?v=QkWLv9wYmpE>
 - g) <https://www.youtube.com/watch?v=m35A8uzwETk>
 - h) <https://www.youtube.com/watch?v=00s8Q8t47bY>
 - i) <https://www.youtube.com/watch?v=SKxBqEEFV18>
 - j) <https://www.youtube.com/watch?v=OOeUvopss2w>
 - k) <https://www.youtube.com/watch?v=O-LfUahJrYw>
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- l) <https://www.youtube.com/watch?v=wLtMBh4o7LI>
 - m) <https://www.youtube.com/watch?v=iiTMikzM3nU>
 - n) <https://www.youtube.com/watch?v=rtNWON6RRxY>
 - o) <https://www.youtube.com/watch?v=B8biOoxqwaQ>
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