Advanced Molecular Transformations

2 units (selection)

Yasuhiko Kawamura · Professor / Synthetic and Polymer Chemistry, Chemical Science and Technology, Earth and Life Environmental Engineering

Target⟩ Let students understand the latest synthetic methodology of highly functionallized organic molecules. The method enhances both the energy and atomic efficiency.

Outline⟩ This lecture shows modern synthetic methodologies, i.e. reagents, synthetic design, and synthetic processes, etc., which are situated as a basic concept of the synthesis of biologically active molecules and of high functionallized organic molecules.

Style⟩ Lecture in combination with Portfolio

Keyword⟩ ***biologically active molecule, organometallic compound, microwave, green sustainable chemistry, excited state chemistry***

Fundamental Lecture⟩ "**Advanced Organic Chemistry**"(1.0)

Relational Lecture⟩ "**Advanced Molecular Design**"(0.5)

Requirement⟩ Students should have sound knowledge of organic chemistry of the master-course level.

Goal⟩

1. Understanding the synthetic method of biologically active molecules by microwave activation.
2. Understanding environmentally friendly and highly stereoselective organic syntheses by using organometallic reagents.
3. Understanding the organic reaction mechanism and basic computer chemistry.

Schedule⟩

1. Introduction to the microwave chemistry
2. Microwave excitation and its application
3. Application of the microwave excitation to the molecular conversion (1)
4. Application of the microwave excitation to the molecular conversion (2):
5. Introduction of the green, homogenious organometallic catalyst to the highly selective organic synthesis
6. Application of the green, homogenious organometallic catalyst to the highly selective organic synthesis
7. Introduction of the green, solid acidic catalyst to organic synthesis
8. Application of the green, solid acidic catalyst to organic synthesis
9. Application of the green, solid catalyst to the hoghly selective oxidation reaction
10. Molecular modelling: molecular orbital theory 1
11. Molecular modelling: molecular orbital theory 2
12. Excited state chemistry 1: Interaction of organic molecules with light
13. Excited state chemistry 2: Reaction mechanisms of the photoexcited organic molecules
14. Excited state chemistry 3: Reaction mechanisms of the photoexcited organic molecules
15. Excited state chemistry 4: Application of the photoexcited molecules

Evaluation Criteria⟩ Credit is given to the students who earn the total 60% up scores. The score is assigned by evaluating the reports submitted.

Contents⟩ http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216862

Student⟩ Able to be taken by only specified class(es)

Contact⟩

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