

## Organic Photo-functional Materials

2 units (selection)

Hitoshi Tanaka · PROFESSOR / OPTICAL MATERIALS AND DEVICES, OPTICAL SYSTEMS ENGINEERING, SYSTEMS INNOVATION ENGINEERING, Yoshihiko Tezuka · ASSOCIATE PROFESSOR / OPTICAL MATERIALS AND DEVICES, OPTICAL SYSTEMS ENGINEERING, SYSTEMS INNOVATION ENGINEERING

**Target** The objective of this course is to develop basic and practical knowledge of chemistry that is required to design, synthesize, and construct organic materials with desired functionality.

**Outline** Physical and chemical properties of molecules and molecular assemblies. Molecular design for functional materials based on the molecular structure. Synthetic method for constructing desired molecular structures. Molecular design, and characteristics of organic photo-functional materials (Tanaka). Physical and chemical properties of conjugated  $\pi$ -electron system and its application for opto-electronic devices (Tezuka).

**Style** Portfolio

**Relational Lecture** “Optical and Functional Inorganic Materials”(0.5)

**Notice** You have to prepare for next lesson and review that day’s lesson for 2 hrs respectively against 2 hr lesson to understand the lesson and acquire the credits.

**Goal**

1. to enable a student to understand functionality of organic materials in terms of their molecular structures.
2. to enable a student to construct practical routes for synthesizing desired molecules.

**Schedule**

1. Introduction to organic materials
2. Atomic groups expressing photo-functionality (1)
3. Atomic groups expressing photo-functionality (2)
4. Generation of photo-functionality by molecular assembly
5. Chemical modification (1): incorporation of functional atomic groups
6. Chemical modification (2): incorporation of functional atomic groups
7. Chemical modification (3): polymerization and polymer reaction
8. Spectroscopic analysis of molecular structure
9. Introduction to  $\pi$ -electron conjugated molecules
10. Synthesis of  $\pi$ -electron conjugated molecules
11. Properties of  $\pi$ -electron conjugated molecules (1)
12. Properties of  $\pi$ -electron conjugated molecules (2)
13. Applications to organic conducting materials
14. Applications to organic electroluminescence devices
15. Applications to organic solar cells

**Evaluation Criteria** Term papers and oral examination.

**Textbook** Text books will be decided after interview.

**Reference** – to be introduced in the class.

**Contents** <http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216899>

**Contact**

⇒ Tanaka (Opt.211, +81-88-656-9420, [tanaka@opt.tokushima-u.ac.jp](mailto:tanaka@opt.tokushima-u.ac.jp)) MAIL

⇒ Tezuka (Opt.307, +81-88-656-9423, [ytezuka@opt.tokushima-u.ac.jp](mailto:ytezuka@opt.tokushima-u.ac.jp)) MAIL