

Course title: Basics of Applied Photochemistry II – selectable course

Number of contact hours: 15 hours (15h of lectures)

ETCS credits: 1

Course description: Within the second part of Applied Photochemistry course, the student will learn about applications of photochemistry in modern electronics and other contemporary technologies, where combination of knowledge from chemistry, physics, electronics and other apparently non-related disciplines has to be combined to create innovative products. Hence, the lectures will cover in details applications of photolithography for production of computer components, chemical basics of modern light sources (e.g., LEDs, lasers, etc), application of fast photopolymerization processes for production of protective polymer coatings, fiber optics, 3D printing, etc. If the time allows, other contemporary applications of photochemistry, such as application of fluorescent molecular probes for monitoring chemical processes in real time, photochromic materials or some current trends in conversion of solar into electrical energy will also be presented.

Education effects (P6S_WG, P6S_UW, P7S_WG):

- **knowledge;** student knows photolithography processes used in modern electronic industry for production of microprocessors, computer memories and other integrated circuits; knows structure and characteristics of modern light sources and processes affecting their lifetime, and knows how to replace traditional solvent-based coating technologies with solvent-free photopolymerization processes.

- **skills:** student can select appropriate light sources with characteristics optimal for particular applications, can apply photopolymerization processes for protective coatings on various objects, and can propose innovative solutions to technical problems, which require spatial resolution (e.g., high resolution 3D printing).

Literature: [1] G.M. Wallraff, W.D. Hinsberg. Chem.Rev. 99, 1801-1821 (1999). [2] R.C.Evans, P.Douglas, H.D.Burrows. "Applied Photochemistry", Springer 2007.

Assessment method: Final test

Prerequisites: Basic knowledge of chemistry at the level of first degree (engineering) studies

Primary target group: All specialties of chemistry, chemical engineering or technology

Lecturer: dr hab. inż. Roman Popielarz, prof. PK

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