UNIVERSITY OF PANNONIA

COURSE DATASHEET

Semester:	2014/15/2
Course:	Environmental Photochemistry
Code:	VEMKAKSA12F
Responsible department:	Department of General and Inorganic Chemistry
Department code:	MKAK
Responsible instructor:	dr. Ottó Horváth

Course objectives:

To lay down the basic principles and laws of the photochemical reactions, to provide necessary background for study of the mechanisms of photochemical processes occurring in the natural environment, and to give knowledge on the methods, tools, equipments and applications of photochemistry, which can be used in experimental as well as theoretical studies.

Course content:

1. Basic principles and laws of photochemistry; Grotthous-Draper law, Stark-Einstein Law, Beer-Lambert law. 2. Light absorption, properties of the excited molecule, photophysical processes of the excited molecules. 3. Reactivity of the excited molecules, classification of the photochemical processes, photoinduced redox, substitution, addition, elimination and isomerization reactions. 4. Methods, tools and equipments of the photochemistry used for preparative procedures, kinetic and spectroscopic studies. 5. Photochemical reactions in atmosphere I.; evolution of the atmosphere. 6. Photochemical reactions in atmosphere II.; photoinduced reactions occurring in the troposphere and the stratosphere. 7. Photochemical reactions occurring in natural and surface water. 8. Photochemical reactions in cloud mist and aerosol particles. 9. Photochemical reaction occurring on solid surfaces in the nature. 10. The role of photochemistry in the bio-geochemical cycle of some elements. 11. Photochemical processes in living systems; photosynthesis, photochemical background of vision. 12. Solar energy conversion; photochemical and photoelectrocemical methods. 13. Photomineralization of some pollutant. 14. Photochemistry in therapy, lasers in therapy, phototherapy, photoinduced dynamic chemotherapy. 15. Summary.

Requirements, evaluation and grading:

The condition of the pass mark is a satisfactory level of the examination paper.

Required and recommended readings:

Papp, S., Kümmel, R.: Környezeti kémia, Tankönyvkiadó, Bp. 1992. R.P. Wayne: Principles and Applications of Photochemistry, University Press, Oxford, 1988. G.R. Helz, R.G. Zepp, D.G. Crosgy (eds.): Aquatic and Surface Photochemistry, Lewis, Boca Raton, 1994 A. Gianguzza, E. Pelizetti, S. Sammarto (eds.): Marine Chemistry, Kluwer, Dordrecht, 1997 R.P. Wayne: Principles and Applications of Photochemistry, University Press, Oxford, 1988. R. P. Wayne: Chemistry of Atmospheres, Oxford University Press, Oxford, 1994 J. D.

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Required and recommended readings:

Coyle, R. R. Hill and D. R. Roberts (eds.): Light, chemical change and life: a source book in photochemistry, The Open University Press,Walton Hall, 1982. H. Okabe: Photochemistry of small molesules, John Wiley, New York, 1978