ΙΤΕ/ΙΕΧΜΗ

ΣΕΜΙΝΑΡΙΟ

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ΟΜΙΛΗΤΗΣ: **Γεώργιος Μπόκιας,** Αναπληρωτής Καθηγητής
Τμήμα Χημείας, Πανεπιστήμιο Πατρών

ΘΕΜΑ: **Soluble polymers and crosslinked polymeric nanostructures with functional/responsive properties**

ΤΟΠΟΣ: Αίθουσα Σεμιναρίων ΙΤΕ/ΙΕΧΜΗ

ΗΜΕΡΟΜΗΝΙΑ: **Δευτέρα, 20 Ιουλίου 2015**

ΩΡΑ: **12:30**

ΠΕΡΙΛΗΨΗ

The introduction of functional or responsive properties in polymeric structures remains always a fascinating research area, providing materials with functional/specific properties for a wide range of applications. Some examples are the areas of antifouling materials, cosmetics, bioapplications, packaging, water purification, etc. In general, the action of such polymers can be expressed in solution (soluble polymers) or dispersions (crosslinked polymeric nanostructures), as well as in the solid state (bulk products, surfaces or polymer blends).

In this presentation, we will give three characteristic examples of the research activities in our laboratory, concerning the development of functional/responsive polymeric materials. A first functionality is biocidal activity, aiming at polymeric materials with antifouling properties. This functionality is based on quaternary ammonium-type units, electrostatically bound or covalently attached along the polymer chain. The influence of the copolymer architecture (random or block) as well as the introduction of other more or less hydrophobic units has been evaluated in terms of antifouling efficiency. For selected materials, industrial marine paints or fish nets have been used to study the antifouling properties under real conditions.

A second example is the design of polymeric materials responding optically (luminescence) to pH changes. These properties are based on the quinoline unit, suitably modified in order

to be readily copolymerized through free radical copolymerization. To this end, polymeric materials and crosslinked nanoparticles, exhibiting (in solution, dispersion or blends) a characteristic color change from blue to green upon acidification, have been developed.

A final example concerns the development of hydrophobically modified polymers, decorated with quinoline units as well as with thermosensitive chains. These polymers are able to transfer in water hydrophobic magnetic nanoparticles, in an attempt to design materials with potential MRI or hyperthermia applications.

Short CV

Georgios Bokias is Associate Professor at the Department of Chemistry, University of Patras, since 2011. He obtained his degree in Chemistry from the University of Athens (1989) and his Ph.D. from the University of Patras (1994). He spent about three years at the Ecole Superieure de Physicochimie Industrielle (ESPCI), Paris, France, within the frame of a Marie Curie Fellowship and other national or industrial grants. Since 2002 he joined the Department of Chemistry of the University of Patras as an Assistant Professor. His main research activities are covering the development of stimuli-responsive polymers and polymeric nanostructures, association of water-soluble polymers with other complementary species (e.g. complementary polymers, surfactants, metal ions, biopolymers) through electrostatic, hydrogen-bonding or hydrophobic interactions, hydrogels and hybrid organic/inorganic nanomaterials.