

Seminar Series

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School of Materials Science and Engineering

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2:00 PM – Room 364 Surrine Hall

Intelligent Nanostructured Materials from Stimuli-Responsive Polymers

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Abstract

Response to stimuli is one of the major life processes, by which living systems interact with the external environment. Advances in nanotechnology have focused on designing "responsive to stimuli" or "smart" materials that mimic many processes found in living systems. The contact of synthetic materials with complex biological environments implies requirements for the materials to demonstrate multiresponsive behavior.

The talk addresses our recent results on the synthesis, study, interesting applications and prospects of nanostructured polymer and colloidal systems for the fabrication of smart responsive surfaces, membranes, sensors with various transduction mechanisms, micro/nanoactuators, and capsules. We also use surface modification of nanoparticles with a stimuli-responsive shell for a new intriguing opportunity to turn on and off and tune interactions between nanoparticles, allowing control of the directed self-assembly with external stimuli/signals. Our works show that stimuli responsive polymeric and hybrid systems demonstrate strong advantages for the fabrication of robust multifunctional and multiresponsive materials and nanodevices. The advanced nanostructured materials which recognize specific signals and respond in an intelligent way are important for renewable energy production, biomedical and technical applications, cloth and construction.



Education

Institute of Physical Chemistry, National Academy of Sciences (NAS), Ukraine	Macromolecular Chemistry, D.Sc.	06/1993
Lviv Polytechnic National University, Ukraine	Organic Chemistry, Ph.D.	11/1983
Lviv Polytechnic National University, Ukraine	Chemical Engineering, M.S/BS	06/1979

Professional Experience

Egon Matijevic Chaired Professor, Department of Chemistry and Biomolecular Science, Clarkson University, Potsdam, NY	2003-present
Senior Staff Scientist and Group Leader, Leibniz Institute of Polymer Research, Dresden, Germany	2000–2003
Head, Department of Chemistry of Oxidation Processes and Professor, Institute of Physical Chemistry, NAS, Lviv, Ukraine	1993–1997
Senior Research Fellow and Group Leader, Institute of Physical Chemistry, NAS, Lviv, Ukraine	1983–1993

Publications

140 peer reviewed articles, 15 patents, book chapters 17, H-index 29