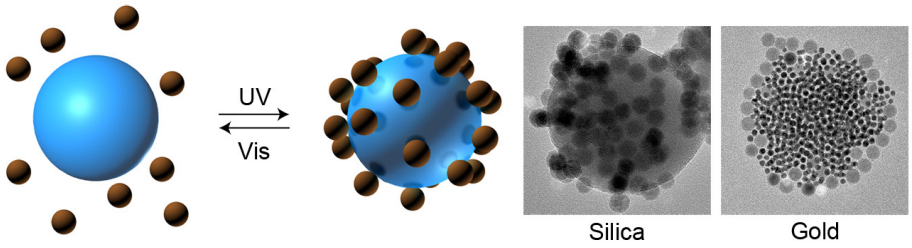
Dr. Rafal Klajn
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Title:

Dynamic materials and systems based on photoresponsive molecules and superparamagnetic nanoparticles



Abstract:

DYNAMIC MATERIALS are emerging as a novel, powerful class of materials possessing a unique capability to adjust their structure and properties in a reversible fashion in response to external stimuli. In our research we explore different ways to construct new dynamic materials based on photoswitchable molecules and superparamagnetic nanoparticles. We have demonstrated that materials as different as porous aromatic networks and inorganic nanocrystals can be rendered responsive to light by immobilization of a monolayer of photoswitchable molecules onto their surfaces. On the other hand, the superparamagnetic nature of magnetite nanoparticles can be employed to construct dynamic nanoparticle assemblies, which form and are able to exist only as long as external magnetic field is applied. We have subsequently combined these two modes of switchability in a single material by constructing dual-responsive nanoparticles, capable of responding to light and magnetic field at the same time. This design has enabled a unique goal of manipulating non-magnetic objects with the help of magnets.

Brief biography:

Dr. Rafal Klajn was born in Poland, where he completed his undergraduate studies and MSc in Chemistry at the University of Warsaw. He received his PhD in Chemical and Biological Engineering at Northwestern University, US, under the supervision of Profs. Bartosz Grzybowski and Sir Fraser Stoddart. Since 2009, he has been an Assistant Professor at the Department of Organic Chemistry at the Weizmann Institute of Science. Among his awards are the Goldman Sachs Global Leader Award, the International Precious Metals Institute Award, and the IUPAC Prize for Young Chemists.