Fizički odsjek, PMF, Sveučilište u Zagrebu
Bijenička cesta 32

Seminar Fizičkog odsjeka

Time (c.t.)	Location
Monday, 13th June 2022, **14**h	F201
Link	id
https://zoom.us/j/8205066086	820 506 6086

Integrating "in-situ" Optical Spectroscopic Techniques for the Understanding of Functionalization in Carbon Nanomaterials

Julio C. Chacón-Torres

School of Physical Sciences and Nanotechnology, Yachay Tech University Hda. San José SN y Proyecto Yachay, 100119 Urcuquí, Ecuador

Over the past years Chemistry and Physics have merged together developing a novel method for studying chemical, electrochemical and physicochemical surface interactions between carbon nanostructures and diverse functional groups and molecules. In our most recent works we have disclosed a near universal trend where charge transfer governs the electrochemical activation of carbon nanomaterials when exposed to potassium undergoing an electron doping (e-doping) process. An entire picture of how electron doping alters the carbon nanostructure vibrational response as a function of doping concentration and the structure of the nanomaterial is evident, as well as the immediate changes revealed after they get exposed to water, gases or pre-selected functionalities. We found three main important results: i) Electron doping/intercalation works for majority of the carbon nanostructures (SWCNTs, MWCTs, carbon nano-onions, graphite, graphene, and carbon nanoribbons). ii) There exist a trend along the doping process in carbon nanotubes dependent on the nanotube diameter and chirality. iii) Functional groups can be attached to the surface of the nanostructure without damaging the crystallinity of the nanostructure. By combining theoretical and experimental studies, we can cross confirm the effects of doping and functionalization that takes place by induced charge transfer and alkali-metal intercalation. These studies are extended to none carbon nanostructures revealing imprecedent novel results that could drive a new area of study along the controlled synthesis of functional nanomaterials for optoelectronics, batteries and sensing devices.

Voditelji seminara FO
Sanjin Benić i Damjan Pelc