

International Conference on

**DIAMOND AND CARBON MATERIALS & GRAPHENE AND SEMICONDUCTORS**

July 17-18, 2017 Chicago, USA

**Enhanced characteristics of solar absorber coating based on platelets graphene**Ervin Šest<sup>1, 3</sup>, Goran Dražič<sup>1, 3</sup>, Boštjan Genorio<sup>2</sup> and Ivan Jerman<sup>1</sup><sup>1</sup>National Institute of Chemistry, Slovenia<sup>2</sup>Faculty of Chemistry and Chemical Technology, Slovenia<sup>3</sup>Jozef Stefan International Postgraduate School, Slovenia

When developing new, commercially available products, nanostructured materials are receiving an increasing amount of interest. Transition from fossil fuel to sustainable sources of energy is essential. Solar energy is a promising alternative energy source that can address this challenge. Platelets graphene as flake like material is one of the nanomaterials suitable for improvement of spectrally selective coatings. Synthesized platelets graphene was used as a corrosion protection agent while also serving as a solar absorbing pigment. The main obstacle in the synthesis of platelets graphene is agglomeration of the particles, thus they have to be functionalized. With the functionalization of the particles the application of the prepared dispersions is simple and infusion of platelets graphene less evident. High absorptivity is expected due to the platelets graphene structure. The latter is also a candidate for an improvement of the corrosion inhibition effect. Raman spectroscopy, atomic force microscopy and transmission electron microscopy were used to characterize prepared platelets graphene (especially for the definition of the layers) and coatings. In addition to the proposed techniques, the Fourier Transformation Infrared Spectroscopy and UV-Vis spectroscopy were introduced to characterize optical properties of the coating. The presented results demonstrate improvements of spectrally selective coatings for low temperature application.

**Biography**

Ervin Šest has his expertise in evaluation and passion in improving the sustainable energy resources. He is developing and preparing innovative paint coatings for solar application. He is also evaluating the prepared materials and applied coatings. He obtained a degree in the field of dye sensitized cells and developed effective method of sintering TiO<sub>2</sub> as the working electrode. Now, he is a Young Researcher at the National Institute of Chemistry Slovenia and studying Nanosciences and Nanotechnologies at the Josef Stefan International Postgraduate School. His research interests include sol-gel thin films; modification of pigments for spectrally selective paint coatings; surface treatments and nanocoatings; dye sensitized solar cells; electron microscopy, sample preparation.

ervin.sest@ki.si

**Notes:**