

Book of abstracts



IX International School and Conference on Photonics

PHOTONICA2023

with joint events:

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Biological and bioinspired structures for multispectral surveillance

&

Quantum sensing integration within microfluidic Lab-on-a Chips for biomedical applications

&

Advanced Biophysical Methods for Soil Targeted Fungi-Based Biocontrol Agents

August 28 - September 01, 2023, Belgrade, Serbia

Editors

Jelena Potočnik, Maja Popović, Dušan Božanić

Vinča Institute of Nuclear Sciences – National Institute of the Republic of Serbia, University of Belgrade

Belgrade, 2023

ABSTRACTS OF TUTORIAL, KEYNOTE, INVITED LECTURES,
PROGRESS REPORTS AND CONTRIBUTED PAPERS

of

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Synchrotron radiation photoemission spectroscopy study of the valence band electronic structure of Ag-Ag₂S Janus nanoparticles for the development of nanomotors propelled by NIR light

D. Danilović^{1,2}, D.K. Božanić^{1,2}, J. Pajović³, G.A. Garcia⁴, L. Nahon⁴, T. Marić⁵ and V. Djoković^{1,2}

¹Vinca Institute of Nuclear Sciences, University of Belgrade, P.O. Box 522, 11001 Belgrade, Serbia

²Center of Excellence for Photoconversion, Vinča Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade, Serbia,

³Faculty of Physics, University of Belgrade, Studentski trg 12, 11001 Belgrade, Serbia

⁴Synchrotron SOLEIL, l'Orme des Merisiers, St. Aubin, BP48, 91192 Gif sur Yvette Cedex, France

⁵Department of Health Technology, Technical University of Denmark, Kgs Lyngby, 2800 Denmark

e-mail: danjelad@vin.bg.ac.rs

Silver-silver sulfide (Ag-Ag₂S) hybrid nanosystem which consists of plasmonic metal Ag and narrow band gap semiconductor Ag₂S is typically studied as a photocatalyst under visible and NIR light [1,2]. Janus morphology of this system is especially interesting due to the possibility of initiating two different chemical reactions that are spatially separated on two halves of the system. Here, we present the fabrication of Ag-Ag₂S Janus nanoparticles and the examination of their valence electronic structure. For the investigation of the electronic structure of isolated nanoparticles, we performed synchrotron radiation vacuum ultraviolet photoelectron spectroscopy using the velocity map imaging (VMI) technique. By using two different photon energies, $h\nu = 9.5$ eV and $h\nu = 11$ eV, we obtained angle-resolved photoelectron images. Photoemission spectra and the dependence of the asymmetry parameter α on the binding energy are derived from VMI images using modified p-Basex inversion method [3]. In addition, we coupled Ag-Ag₂S nanoparticles to the TiO₂ and studied the actuation of obtained hybrid nanosystem in a liquid medium under visible and NIR light.

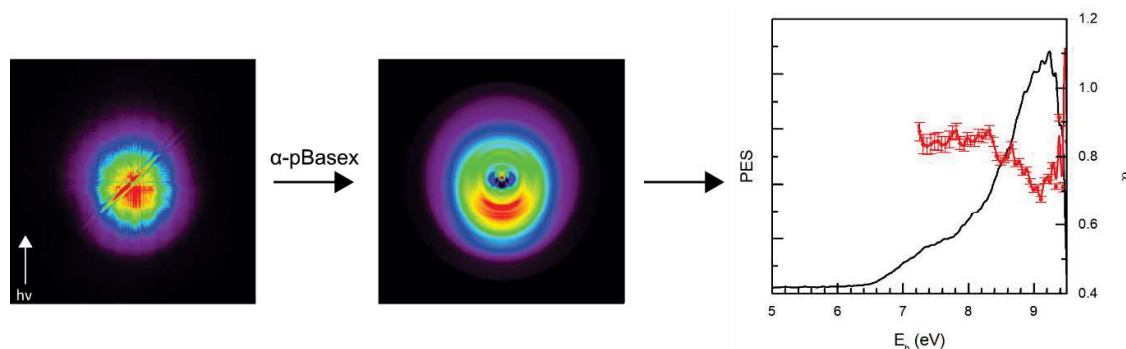


Figure 1. Raw and p-Basex reconstructed photoelectron image of Ag-Ag₂S nanoparticles, and photoemission spectrum and α parameter dependence on the binding energy ($h\nu = 9.5$ eV).

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