

Sixteenth Annual Conference

YUCOMAT 2014

Hunguest Hotel Sun Resort Herceg Novi, Montenegro, September 1–5, 2014

PROGRAMME & THE BOOK OF ABSTRACTS

Organised by

MATERIALS RESEARCH SOCIETY OF SERBIA

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FEDERATION OF EUROPEAN MATERIALS SOCIETIES (FEMS)

MATERIALS RESEARCH SOCIETY (MRS)



SIXTEENTH ANNUAL CONFERENCE

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<http://www.mrs-serbia.org.rs>

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Acknowledgments: This conference is held in honour of Prof. Dragan Uskoković's 70th birthday.



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HISTORY:

Materials science and engineering incorporate acquiring of knowledge on synthesis and processing of materials, their composition and structure, properties and behaviour, functions and potentialities as well as application of that knowledge to various final products. Economic prosperity, life quality, and healthy environment are tightly connected with the improvements in the existing and the development of new materials and processing technologies. These improvements and development can contribute greatly to the national priorities: energy saving, environment and health protection, information and communication, infrastructure, transportation, etc.

The First Conference on materials science and engineering, including physics, physical chemistry, condensed matter chemistry, and technology in general, was held in September 1995, in Herceg Novi. An initiative to establish Yugoslav Materials Research Society was born at the conference and, similar to other MR societies in the world, the programme was made and objectives determined. The Yugoslav Materials Research Society (Yu-MRS), a non-government and non-profit scientific association, was founded in 1997 to promote multidisciplinary goal-oriented research in materials science and engineering. Main task and objective of the Society is to encourage creativity in materials research and engineering to reach a harmonic coordination between achievements in this field in our country and

P.S.C.3

CELL PERFORMANCES OF LENGTH-TUNABLE SILICON NANOWIRE/POLYMER HYBRID SOLAR CELLS

Keisuke Sato^{1,2}, Mrinal Dutta², Naoki Fukata²

¹*Department of Electrical and Electronic Engineering, Tokyo Denki University, 5 Senju-Asahi-cho, Adachi-ku, Tokyo, Japan,* ²*World Premier International Research Center for Materials Nanoarchitectonics, National Institute for Materials Science, 1-1 Namiki, Tsukuba, Ibaraki, Japan*

Hybrid solar cells that combine inorganic nanostructured materials with organic materials have gained much attention, because they enable not only enhancement of power conversion efficiency (PCE) but also reduction in material cost. We fabricated the hybrid solar cells consisting of length-tunable and vertically-aligned n-type silicon nanowires (SiNWs) and organic poly(3,4-ethylene-dioxythiophene):poly(styrene-sulfonate) (PEDOT:PSS). We report herein on the effects of nanowire length and annealing temperature on the cell performances of SiNW/PEDOT:PSS hybrid solar cells. The obtained hybrid solar cells achieved the best cell performance with the PCE of 9.3% by optimizing the nanowire length and annealing temperature. Our approach is a significant contribution to design for higher-performance and lower-cost inorganic/organic hybrid solar cells.

P.S.C.4

DEGRADATION OF THIN 4,4'-BIS(2,2'DIPHENYL VINYL)-1,1'-BIPHENYL FILMS BY UV LIGHT

Aleksandar Ž. Tomović¹, V.P. Jovanović¹, I. Djurišić¹, V.Z. Cerovski¹, B. Nastasijević²,
S. Veličković², K. Radulović³, R. Žikić¹, V.I. Srdanov⁴

¹*Institute of Physics, University of Belgrade, Belgrade, Serbia,* ²*Vinča Institute of Nuclear Sciences, University of Belgrade, Belgrade, Serbia,* ³*Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Belgrade, Serbia,* ⁴*V&G Research, Santa Barbara, CA, USA*

We studied degradation of 4,4'-bis(2,2'diphenyl vinyl)-1,1'-biphenyl (DPVBi), well known OLED material. Thermally evaporated thin films of DPVBi were irradiated with UV light in ambient, vacuum and under different oxygen pressures. The cause of degradation is reaction between UV excited DPVBi molecules and oxygen, via formation of singlet oxygen or electron transfer from excited DPVBi to molecular oxygen. Reaction rates depend on oxygen concentration and UV light intensity. These reactions lead to formation of oxidized species as evidenced by ASAP and MALDI-TOF mass spectroscopy. Photoluminescence quenching has two parts. One part is reversible and may imply formation of charge transfer complexes and the other is irreversible, caused by formation of oxidized species. IR and absorption spectra are studied by Density Functional Theory and results compared with the experiment.