Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION IV
New Frontiers in Multifunctional Material Science and Processing

Serbian Ceramic Society
Institute for Testing of Materials
Institute of Chemistry Technology and Metallurgy
Institute for Technology of Nuclear and Other Raw Mineral Materials
School of Electrical Engineering and Computer Science of Applied Studies

PROGRAM AND THE BOOK OF ABSTRACTS

Serbian Academy of Sciences and Arts, Knez Mihailova 35
Serbia, Belgrade, 21-23. September 2015

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clay. The newly formed coating possesses acceptable porosity for porous building materials (porosity within the range of 24-36 %) and satisfied photocatalytic activity, as well as mineralogical compatibility with the substrates (mortars, renders, bricks). Additionally, a positive effect considering the self-cleaning and durability phenomenon was attained.

OR7

High efficiency Sb_2S_3-based hybrid solar cell at low light intensity: cell made of synthesized Cu and Se doped Sb_2S_3

Valentina Janošević, Miodrag Mitrić, Ivana Lj Validžić
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Cu-doped (as p-doped) and Se-doped (as n-doped) Sb_2S_3 were synthesized from undoped Sb_2S_3 using a newly developed technique, simple colloidal synthesis method. X-ray diffraction measurements detected no peaks related to any of the Cu and Se compounds in Cu and Se doped samples. Energy dispersive x-ray analysis, however, confirmed the presence of Cu and Se ions in the doped samples. Diffuse reflectance spectroscopy revealed the optical band gap energy changes due to doping effect, as reported for both the p-type and the n-type material. The valence-band X-ray photoelectron spectroscopy data showed a significant shift in the valence band to higher (Se-doped; +0.53 eV), and a shift to lower (Cu-doped; -0.41 eV) binding energy respectively, when compared to the undoped sample. We report here on an inexpensive solar cell designed and made entirely of a synthesized material (ITO/p-doped Sb_2S_3 + PANI/amorphous/undoped Sb_2S_3 + PANI/n-doped Sb_2S_3 + PANI/ PANI / electrolyte (0.5 M KI + 0.05 M I_2)/Al). The cell has a high efficiency of 8-9 % at a very low light intensity of only 5% sun, which makes it particularly suitable for indoor applications. As found, the cell performance at the intensity of 5 % sun is governed by high shunt resistance (R_{SH}) only, which satisfies standard testing conditions (STC). At higher light intensities (25 % sun), however, the cell exhibits lower but not insignificant efficiency (around 2 %) governed by both the series (R_S) and the shunt resistance (R_{SH}). Minimal permeability in the UV region (up to 375 nm) and its almost constant value in the visible and the NIR region at low light intensity of 5% sun could be the reason for higher cell efficiency.

OR8

Thermal treatment of oxides in different atmospheres

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The influence of atmosphere on changes in microstructure was observed on three oxides: TiO_2, $ZnTiO_3$, and $Mn_xZn_{1-x}Fe_2O_4$. These oxides were analyzed during thermal treatment in a dilatometer and by differential temperature analysis in air and nitrogen atmosphere. Scanning electron microscopy was also used to analyze the influence of