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И УМЈЕТНОСТИ
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REPUBLIC OF SRSKA

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САВРЕМЕНИ МАТЕРИЈАЛИ 2013

ПРОГРАМ РАДА
И
КЊИГА АПСТРАКАТА

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CONTEMPORARY MATERIALS 2013

PROGRAMME
AND
THE BOOK OF ABSTRACTS

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The scientific conference will take place in the Great hall of ASARS.

gy of films, making them highly porous. Addition of nanoparticles improves the mechanical properties of films, increasing the tensile strength by 40% and elongation by 65%, although the nanocomposites films have porous structures.

Keywords: elastomers, polymer thin films, nanocomposite materials.

STRUCTURE AND MORPHOLOGY OF MACROPOROUS POLYMER-BASED COMPOSITE MATERIAL

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Composite of macroporous monolithic copolymers of glycidyl methacrylate and ethylene glycol dimethacrylate [abbreviated PGME] and boehmite sol (in content of 5, 25 and 50 mass% with respect to monomer mixture) were synthesized by in situ radical copolymerization in a cast of cylindrical shape. Composite samples were caracterized by XRD, SEM and FTIR techniques. Observation revealed that the obtained composites completely crystallize in amorphous structure, without the presence of the crystalline boehmite phase. Also, there is slight change in the size and morphology composite particles compared to starting copolymers. Polymeric material with such structural and morphologycal characteristics could be applied as a suitable support in solid phase reactors.

Keywords: composite, boehmite sol, structure, morphology.

STRUCTURAL, THERMAL AND MORPHOLOGICAL CHARACTERIZATION OF FUNCTIONALIZED MACROPOROUS COPOLYMERS

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Macroporous copolymers of glycidyl methacrylate and ethylene glycol dimethacrylate were functionalized with hexamethylene diamine, 1,3-bis (3-aminopropyl) tetramethyldisiloxane and α,ω-diamino propyl poly(dimethylsiloxane). The samples were characterized by Fourier transform infrared spectroscopy (ATR-FTIR), mercury porosimetry, scanning electron microscopy (SEM) with energy

dispersive X-ray analysis (EDX), thermogravimetric analysis (TGA) and differential scanning calorimetry (DSC). Fuctionalization significantly alters porosity parameters, mechanism of thermal degradation and increases thermal stability. The sample functionalized with disiloxane exhibited better thermal stability comparing with the initial and other functionalized samples. Acknowledgements. This work was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Projects III43009, ON 172062 and III45001).

Keywords: functionalization, hexamethylene diamine, siloxanes, thermal degradation.

THE INFLUENCE OF SILICA NANOPARTICLES ON PRINTABILITY OF POLYLACTIDE FILMS

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Over the past decade polylactide (PLA) based materials, due to its biodegradability and biorenewability, has been the subject of numerous researches in order to solve the problem of solid wastes, and to reduce the consumption of fossil raw materials and emission of carbon dioxide into the atmosphere. Polylactide is a thermoplastic aliphatic polyester made from renewable resources like corn, sugar beets or rice. Physical and mechanical properties of PLA films can be improved by incorporation of only small amounts of nanoparticles into polymer matrix. The aim of this work was to determine the influence of addition of silica nanoparticles on the printing properties of PLA films, and to research the influence of printing on mechanical properties of samples. Pure PLA and PLA films with different nanosilica content were prepared on laboratory extruder. A lab printability tester was used to print on polylactide films. Ink transfer on film substrates was observed and surface energy of biodegradable films was measured. It was found that the low content of silica nanoparticles improved a printing properties of PLA films.

Keywords: polylactide, printing properties, mechanical properties.