NINTH YOUNG RESEARCHERS CONFERENCE
MATERIALS SCIENCES AND ENGINEERING

December 20-22, 2010, Belgrade, Serbia
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Program and the Book of Abstracts

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Aim of the Conference

Main aim of the conference is to enable young researchers (post-graduate, master or doctoral student, or a PhD holder younger than 35) working in the field of materials science and engineering, to meet their colleagues and exchange experiences about their research.

Topics

Nanostructured materials
New synthesis and processing methods
Materials for high-technology applications
Biomaterials

Scientific and Organizing Committee

Results of the Conference

Beside printed «Program and the Book of Abstracts», which is disseminated to all conference participants, selected and awarded peer-reviewed papers will be published in the journals Tehnika – Novi Materijali and Chemical Industry. The best presented papers, suggested by Session Chairpersons and selected by Awards Committee, will be proclaimed at the Closing Ceremony.

V/3

Synthesis of nanostructured polyaniline in the presence of vanillic acid

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Self-assembled polyaniline nanorods were synthesized by the oxidation of aniline with ammonium peroxydisulfate in an aqueous solution of vanillic acid, using the template-free falling-pH method. The effects of the initial mole ratio of vanillic acid to aniline (starting pH) and the reaction time on the yield of polymerization, morphology, molecular structure and conductivity of synthesized polymer were studied. The morphological change of polymerization products due to the change of reaction conditions, from the nanorods (possibly the nanotubes), with a diameter of 70 – 380 nm and a length of 0.3–1.0 μm, to the nanorods co-existing with the submicrospheres, was revealed by scanning electron microscopy. Molecular structure of synthesized polyaniline was investigated by FTIR and Raman spectroscopies.

V/4

Microstructure and crystallinity of oriented polyolefins

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The influence of orientation on polyolefins was studied in accordance with Peterlin's molecular model of drawing. Isotactic polypropylene and low density, linear low density and high density polyethylenes were oriented via solid-state stretching at an elevated temperature. Orientation-induced changes in the morphology were analyzed by optical and scanning electron microscopy. Differential scanning calorimetry and wide-angle X-ray diffraction were used to determine changes in the crystallinity where a two-stage evolution was revealed. The first stage is characterized by a significant increase in crystallinity while the following saturation occurs with a further draw ratio increase at the second one. The value of the critical draw ratio, which separates these two stages and corresponds to the transformation from the initial to the fully developed fibrillar structure, was influenced by the structural peculiarities of each polyolefin.