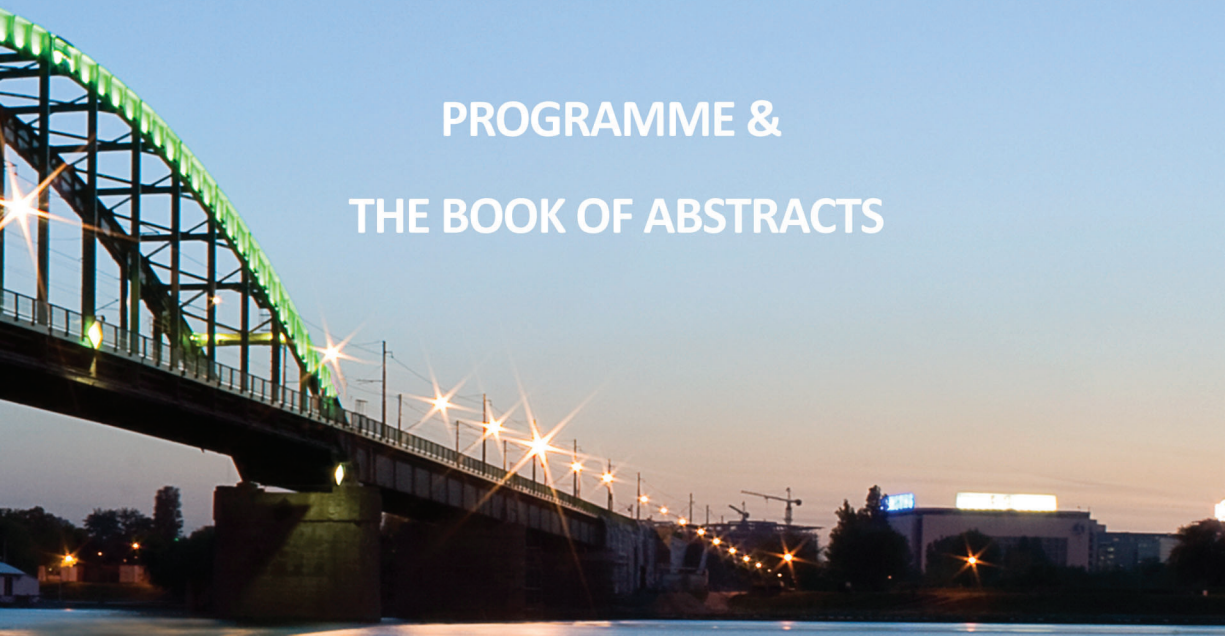
FOURTEENTH YOUNG RESEARCHERS' CONFERENCE
MATERIALS SCIENCE AND ENGINEERING

December 9-11, 2015, Belgrade, Serbia

Serbian Academy of Sciences and Arts, Knez Mihailova 36



PROGRAMME &
THE BOOK OF ABSTRACTS

MATERIALS RESEARCH SOCIETY OF SERBIA

INSTITUTE OF TECHNICAL SCIENCES OF SASA

December 2015, Belgrade, Serbia

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2-1

Electrochemical synthesis of silver/polyvinyl alcohol hydrogel nanocomposites

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Nanocomposite materials based on polymeric hydrogels with incorporated silver nanoparticles (AgNPs) have potential for use in biomedical purposes, due to good antimicrobial properties of silver. In this paper, silver/polyvinyl alcohol (Ag/PVA) and Ag/PVA with graphene (Ag/PVA/Gr) nanocomposites were obtained by in situ electrochemical reduction of silver in the hydrogel matrices, cross-linked by the freezing-thawing method. Samples were characterized using cyclic voltammetry (CV), atomic absorption spectroscopy (AAS) and cytotoxicity tests (CT). Cyclic voltammograms of 0.25 mM and 1.0 mM Ag/PVA and Ag/PVA/Gr have proved the existence of AgNPs in the polymer matrix. Silver release profiles, measured using AAS, point to retention of 35 % Ag in Ag/PVA, i.e. 20 % Ag in Ag/PVA/Gr nanocomposites at the end of 28-day experiment. Biocompatibility of 0.25 mM Ag/PVA and Ag/PVA/Gr was proved using CT.

2-2

Development and characterization of composite pectin/sodium alginate films crosslinked with zinc ions

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In this paper, physico-chemical and antimicrobial properties of films based on pectin/sodium alginate blends crosslinked by zinc ions were investigated. The polyglycerol was used as plasticizer. The blending of pectin with alginate improved properties such as tensile strength, elasticity and water vapour barrier properties, when compared to the neat pectin film. The introduction of the cross-linking points caused an appreciable change in the physical properties due to increased free volume during the cross-linking process with zinc ions. In addition, zinc-crosslinked films evidenced antimicrobial activity against pathogens: Staphylococcus aureus, Candida Albicans and Escherichia coli. Overall, the characteristics of the pectin/sodium alginate films crosslinked with zinc showed their potential interest as materials for wound dressing.