Klub mladih hemičara Srbije
Serbian Young Chemists' Club

Srpsko hemijsko društvo
Serbian Chemical Society

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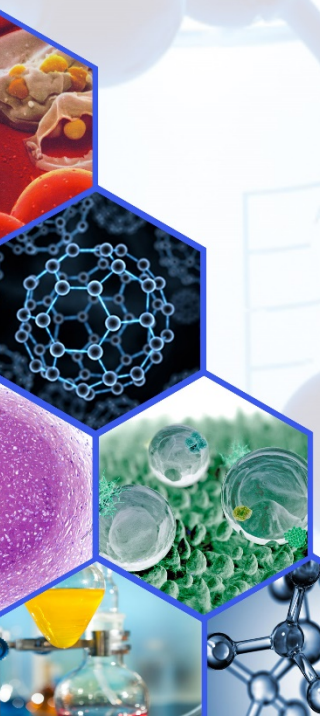
mladih hemičara Srbije
Kratki izvodi radova

Sixth Conference
of the Young Chemists of Serbia
Book of Abstracts



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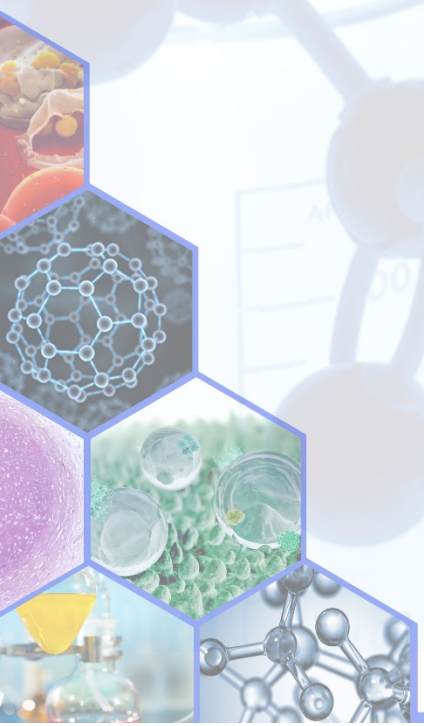


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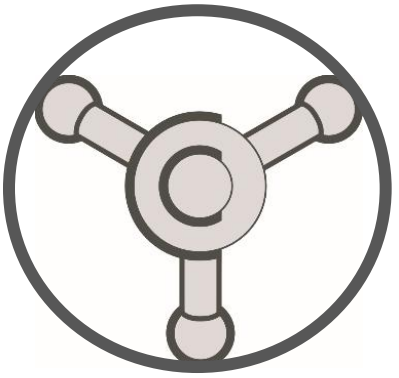

Serbian Young
Chemists' Club

Hemija makromolekula i nanotehnologije

Chemistry of macromolecules and nanotechnology

MN02 PE 2

Synthesis and characterization of novel semi-degradable, pH and temperature sensitive hydrogels based on 2-hydroxyethyl methacrylate and 2-hydroxyethyl acrylate

Vuk Filipović[1], Maja Marković[2], Simonida Tomić[2]
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Hydrogels represent three-dimensional hydrophilic polymer networks, capable of absorbing large quantities of water[1]. Due to their tissue-like characteristics, hydrogels have been widely used for a variety of biomedical and pharmaceutical applications. The synthesis and characterization of novel semi-degradable, pH and temperature sensitive hydrogels is presented in this work. These new functional hydrogels represent copolymers based on 2-hydroxyethyl methacrylate (HEMA) and 2-hydroxyethyl acrylate (HEA), crosslinked using poly(β-amino ester) (PBAE) degradable macromer. PBAE crosslinker was synthesized by Michael addition reaction of diethylene glycol diacrylate (DEGDA) and piperazine. PBAE chemical structure was confirmed by proton nuclear magnetic resonance (^{1}H NMR) and Fourier transform infrared (FTIR) spectroscopy. HEMA/HEA/PBAE hydrogels were synthesized by free radical copolymerization, by varying the monomer ratio. Structural characterization of hydrogels was carried out using Fourier transform infrared spectroscopy (FTIR). Swelling studies, performed in different pH buffers, ranging from 2.00 to 7.40, and different temperature values, ranging from 20 to 55°C, showed the pH and temperature sensitivity of the hydrogels. From the obtained results it can also be concluded that the swelling and degradation rates of new hydrogels can easily be adjusted by altering the comonomer ratio, making them a class of materials that is particularly suitable for potential drug delivery and tissue engineering applications.

References

1. R. Langer, D. A. Tirrell, *Nature*. **2004**, *428*, 487–492.

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