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SIZE AND MORPHOLOGY CONTROLLING OF ETHYLCELLULOSE NANOPARTICLES BY USING DIFFERENT SURFACE ACTIVE POLYSACCHARIDES IN THE EMULSION EVAPORATION PREPARATION METHOD

Manja Kurečič[1,2], Božič Mojca[1], Matej Bračič[1], Rupert Kargl[1,2], Thomas Elschner[1], Doris Tkaučič[1], Silvo Hribernik[1] and **Karin Stana-Kleinschek[1,2]**

[1]University of Maribor, Slovenia
[2]Graz University of Technology, Austria

Cellulose ethers, e.g., ethylcellulose (EC) was discovered in 1912 by the work of Lilienfeld (US patent 1188376 A). EC and ethylhydroxyethylcellulose are the only industrially significant organosoluble cellulose ether derivates being commercially produced for around 90 years now. Despite of their wide usage in plastics as a pigment grinding base, as flexible coatings for paper, cloth, and leather, as an electrical insulant, etc. there is still huge research going on in regards to the EC exploitation for new commercial applications. In the recent years, special attention is being paid to design new methods for producing a polysaccharide nanostructured assembly that can possess properties that are significantly different from the bulk material, especially, cellulosic based nanoparticles that exhibit a great potential as holders for imaging and drug agents because of their intrinsic physicochemical properties being biocompatible and biodegradable. In this study, we applied an emulsification–evaporation method to manufacture the EC nanoparticles. Ethyl acetate was used as a water immiscible, volatile organic solvent and as a stabilizing surfactant in water polyvinyl alcohol and different surface active polysaccharides (i.e. carboxymethyl cellulose, hydroxyethyl cellulose, high molecular weight methylcellulose and low molecular weight methylcellulose) were examined. To control particle properties, the nanoemulsion template was regulated by adapting the concentration of the surface active polysaccharides. Newly produced EC nanoparticles were characterized for particle size by particle size analyzer, stability by Zetasizer and surface morphology by FE-SEM.

Biography

Manja Kurečič is a Scientific Associate at the Faculty of Mechanical Engineering, University of Maribor and Technical University Graz, Austria, where she is working on several national and international basic and applied projects. She has a background on nanocomposite hydrogels for water purification, which she upgraded with new technologies for preparation of different nanostructured materials that can find applications in technical as well as in the biomedical area. Lately, she is focusing on development of innovative nanofibrous materials by using electrospinning method.

manja.kurecic@um.si