Formation and Characterization of Biobased Nanofibers from poly(Tulipalin A) prepared by Photomediated ATRP

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The development of polymers from renewable resources is becoming a prominent area of interest for industry and academia. One of the most attracting renewable monomers is Tulipalin A - namely α-methylene-γ butyrolactone (MBL) which is a fully renewable vinyl monomer found in tulips. MBL consists of a five-member ring with an oxygen and carbonyl group, possesses structural features similar to those of methyl methacrylate (MMA). MBL was already reported for preparation of thermoplastic elastomers[1], hydrogels[2], polyester with pendant double bonds[3]. Its functional groups have been also used for surface functionalization which open a new window for imparting new properties for different surfaces. Here, we show the transformation of PMBL to nanofibers by electrospinning technique. PMBL with different molar masses was first synthesized by photomediated atom transfer radical polymerization according to our reported study[4], then the obtained polymers were tested for electrospinning. PMBL with 55000 g/mole and Đ of 1.2 was found to form nanofibers in 40% DMF. PMBL of low molar mass was also found to form nanofibers when it was mixed with poly(caprolactone). The obtained fibers were characterized by FTIR and SEM. The mechanical properties and other analyses will be tested as well.

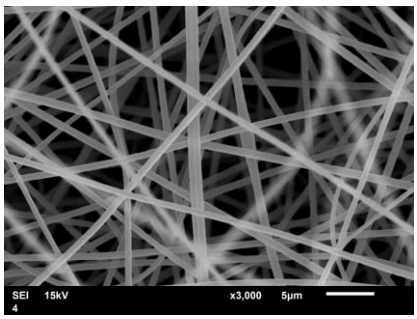

Figure 1. PMBL nanofibers.

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