

Abstract Submitted  
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**Temperature responsive hydrogel nanofibers and nanoparticles**

JANNE RUOKOLAINEN, Aalto University/Department of Applied Physics — Poly(N-isopropylacrylamide) (PNIPAM) is one of the most extensively investigated synthetic temperature-responsive polymers. In this work temperature-responsive PNIPAM based triblock copolymer hydrogels, their self-assembly and phase behavior in bulk, are described. Additionally, recent results from responsive hydrogel nanofibers and hydrogel nanoparticles are shown. It is known that block copolymers form well-organized nano structures in bulk or thin films when annealed thermally or in solvent vapours. However, in the case of nanofibers or nanoparticles, the annealing leads in most cases to aggregation and particle sintering. This work utilizes aerosol-based gas phase method where the preparation and annealing of hydrogel nanoparticles with well-organized, hierarchical inner structures are performed without any particle coagulation or sintering. In the method, the block copolymers assemble within aerosol nanoparticles to form, for instance, lamellar onion-like or gyroid inner structures.

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