Temperature responsive hydrogel nanofibers and nanoparticles
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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 be-
havior 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 an-
nealing 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 with-
out 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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