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PREPARATION OF DUALLY, pH- AND TEMPERATURE- RESPONSIVE POLY(NIPA) NANOCOMPOSITE HYDROGELS FILLED WITH COLLOID SILICA

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In this contribution, we present the preparation of highly porous nanocomposite hydrogels based on poly(N-isopropylacrylamide) and modified by the incorporation of ionogenic comonomers, sodium acrylate (SA) and sodium methacrylate (SMA). As nano-filler, colloid silica nanoparticles were employed, which were generated in-situ during the organic monomers polymerization. The highly porous gel structure, which together with the reinforcement by colloid silica enables a very fast stimuli-responsivity, was achieved by conducting the later stage of the polymerization at a “freezing” temperature, with a part of solvent crystallizing (cryogels).

The effects of comonomer type (SA or SMA) and content on the gels mechanical properties, pH- and T-dependent swelling, and on the kinetics of stimuli-responsivity are studied and presented in more detail in this contribution.

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