

Swelling behavior of thermosensitive  
N-isopropylacrylamide hydrogel in water-PEG  
solvent system

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We investigated the swelling behavior of thermosensitive N-isopropylacrylamide (NIPA) hydrogel in water-poly(ethylene glycol) (PEG) solvent system. Nanometer-sized NIPA gel particles were prepared by precipitation polymerization and their swelling behavior were determined using photon correlation spectroscopy (PCS). With increasing weight fraction of PEG in aqueous solution, NIPA hydrogels exhibit reentrant transition. Transition temperatures of NIPA gels in water-PEG system were also observed when the ratio of water to PEG was varied. The modified double lattice model (MDL) and the Flory-Erman theory were employed to calculate the Helmholtz energy of mixing and elastic contributions, respectively. The advantage of this work is to be suitable for qualitatively predicting the reentrant swelling behavior of given system.