

Abstract Submitted
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Pressure and temperature response of Poly(N-isopropyl acrylamide) in aqueous solution probed with Raman microscopy COLEMAN CARIKER, ALFONS SCHULTE, University of Central Florida — Poly(N-isopropylacrylamide) (PNIPAM) is a thermo-responsive hydrogel that exists in a hydrated state beneath its lower critical solution temperature (LCST) near 305 K. Above this temperature water is expelled by the polymer as it undergoes a coil to globule collapse. High pressure is an important variable as it influences the strength of hydrogen bonding and can destabilize hydrophobic contacts. We present results from optical imaging on a micron scale and Raman spectroscopic measurements as a function of temperature (295 - 315 K) and hydrostatic pressure (0.1 - 400 MPa). Samples consisted of 25% PNIPAM in aqueous solution in micro-capillaries with 100 micron cross section. Our experiments reveal differences in the spatial evolution of the phase change across the temperature and pressure transitions. These are corroborated by bond specific and hydration changes observed in the Raman spectra.

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