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Synthesis and Characterization of Thermally Responsive Polysaccharide Nanoparticles KRISTA FREEMAN, SEAN SHERIDAN, IMAAN BEN-MERZOUGA, JOHN MCKENNA, KIRIL STRELETZKY, Cleveland State University — Environmentally-manipulable nanoparticles (microgels) have been synthesized from the amphiphilic polymer hydroxypropyl-cellulose and characterized using dynamic and static light scattering spectroscopies. Careful synthesis studies have revealed dependences of microgel size and structure on polymer molecular weight, polymer concentration, salt concentration, and crosslinker density. An understanding of these dependences has allowed the synthesis of stable, largely spherical, and relatively small (about 100nm) and monodisperse microgels. The synthesized microgels exhibit a volume phase transition between temperatures of 40 and 41C, under which particles undergo a reversible 15-50-fold change in volume. The microgel structure, dynamics, and longevity have been systematically studied by light scattering both below and above the transition temperature.

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