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## Hydrogel Nanoparticle Dispersions with Inverse Thermoreversible Gelation

Hydrogels have been studied extensively because of their abilities to simulate biological tissues and to gel or collapse reversibly in response to external stimuli. Nanostructured hydrogels have been synthesized by entrapping a colloidal array inside a gel, by covalently bonding self-assembled nanoparticles into a network, or by dissolving colloidal arrays inside a gel. All such hydrogels have permanent structures arising from covalent bonding. However, in many cases, a material is needed that can change reversibly from a liquid to a solid under an external stimulus such as temperature. Here we show a novel aqueous solution of hydrogel nanoparticles that can form a physically bonded nanoparticle network above a gelation temperature. The gel is a fluid at room temperature but becomes a solid above about 33°C.

For Additional Information, Please Contact:

The University of North Texas  
Office of the Vice President for Research  
and Economic Development  
3940 North Elm, A160  
Denton, TX 76207  
Fax: 940-565-2944  
Email: [richard.croley@unt.edu](mailto:richard.croley@unt.edu)