

## Investigating the attraction between hard spheres undergoing liquid-to-solid transitions

The liquid-to-solid transitions (gelation and glassification) in a colloidal system, where the adsorption of small soft microgels to the surface of large hard spheres introduces a bridging attraction between large particles, is systematically investigated. By using small angle neutron scattering technique to probe the effective short-range attraction between hard spheres undergoing liquid-to-solid transitions, we conclusively demonstrate that the formation of physical gels at the intermediate volume fraction of our bridging attraction system follows more closely with the percolation line that is in stark contrast to what are observed in depletion attraction systems, where the gelation transition is related with the frustrated spinodal separation, not purely kinetic phenomenon. Our researches introduce a different way to control the effective attraction in spherical colloidal systems, and imply that people need to be prudent when generalizing the physical picture of liquid-to-solid transitions obtained from systems with different origins of effective attraction as the tiny solvent molecules play important roles.

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