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Gelation and glass transition of particles with short-range attraction induced by adsorbing microgel[1] GUANGCUI YUAN, JUNHUA LUO, CHARLES C. HAN, Institute of Chemistry, Chinese Academy of Sciences — Mixed suspensions of large hard polystyrene microsphere and small poly(N-isopropylacrylamide) microgel is used as model systems to investigate the static and viscoelastic properties of suspensions which go through liquid to gel and to glass transitions. The microgels cause short-range attraction between microspheres through bridging and depletion mechanism whose strength can be tuned by the microgel concentration. Baxter's sticky hard-sphere model is used to extract the effective inter-microsphere interaction introduced by bridging or depletion of microgels despite the fact that the physical mechanisms of bridging attraction and depletion attraction are different at a molecular level. A new state diagram of gelation and even of glass transition was constructed by taking the bridges as a short-ranged attractive interaction With the help of the well-defined bridging bonds, some controversies regarding to the interference between two origins for ergodic to non-ergodic transition in condensed system, i.e. cage effect and bond effect, were clarified.

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Guangcui Yuan
Institute of Chemistry, Chinese Academy of Sciences

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