

Self-Assembly of Differently Surface Modified Colloidal Particles

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Colloidal clusters have been studied as a building block for unusual lattices of colloidal crystals, which cannot be achieved by self-assembly of spherical colloids. Clusters composed of less than 12 particles have shown to have the minimal second moment structures. In this work, we introduce the bidisperse colloidal particles of different surface properties onto O/W emulsion interface to create the colloidal clusters which have enhanced complexity compared with the minimal second moment structures. To modify the surface property of particles, we treated silica particles with silane coupling agents such as dichlorodimethylsilane (DCDMS) and octadecyltrimethoxysilane (OTMOS). Then, we applied dye molecules on the surface of silica spheres in order to distinguish silica spheres from those which have different surface properties. In oil-in-water emulsion, as the volatile oil droplets containing bidisperse colloids were evaporated, the colloids formed aggregates in the aqueous medium, which showed much richer configurations of particle coordinations in comparison with conventional colloidal clusters.