

Effect of the Interaction Heterogeneity on Colloidal Assemblies Confined at a Curved Interface

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We report the unique assembly behaviors of colloidal particles at a centrosymmetrically curved oil-water interface, depending on the heterogeneous interactions between the particles. To generate the curved interface, we gently place a drop of hydrocarbon oil on a neat water surface, forming an oil lens. Individual polystyrene particles initially introduced at an air-water interface spontaneously collect to the bottom region of the concave oil-water interface. Based on the energy minimization of the electrostatic repulsion and the geometrical confinement force that acts as the attraction, we found that the pair interactions are heterogeneous. This interaction heterogeneity directly affects the uniqueness and diversity in the assembly structures at the curved interface.