

Preparation of Janus Colloidal Particles for DNA-Directed Assembly

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We present the fabrication process to prepare complex building blocks of Janus biphasic nanocolloids. Micro- and nano-scale anisotropically coated “Janus” particles were successfully prepared using a combination of spin coating and centrifugation processes in conjunction with a metal deposition technique. A monolayer of polystyrene (PS) microspheres was first formed on a glass substrate via a spin coater. The uniformity and continuity of the PS monolayer was characterized and found to be dependent on particle size, the spinning speed, concentration, solvent and, surfactant used. The PS monolayer was coated with gold using a metal evaporator. The amount of gold used dictated the thickness of the gold layer and area of coverage. The coated PS microspheres were separated from the substrate by mild sonication. The Janus particles were separated from the excess gold by centrifugation. These Janus colloidal particles will be further selectively modified with DNA. Self- or directed assembly of the asymmetric micro and nanospheres into 3D colloidal crystal assemblies using the complementarities of DNA-based hybridization is under investigation and expected to be achieved.