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Τίτλος

«Development of functional “Janus” particles from hybrid colloidosomes »

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Abstract

“Janus particles” are named after the two-faced Etruscan god, Janus, based on the chemical and physical anisotropy that these particles exhibit. The high demand for such particles is in contrast to their usually small production scale. In response to that, the formation of hybrid colloidosomes, that is solid Pickering emulsions, and their use in the formation of Janus particles is studied. In this way, part of the surface of silica particles was masked into a solid polymer microsphere allowing the exposed surface of the particles to be chemically modified in order to serve as a multifunctional initiator for atom transfer radical polymerization (ATRP). These Janus initiator particles were used for the preparation of Janus polymer-silica hybrid particles. The controlled nature of the ATRP process was first studied in the absence of the particles, in order to optimize the reaction conditions.

Fully polymer-coated particles and Janus polymer particles are compared in order to prove the successful synthesis of the anisotropic particles. The use of three monomers allowed the synthesis of amphiphilic poly(methyl methacrylate)-silica Janus particles, poly(*tert*-butyl acrylate)-silica Janus particles that can be hydrolyzed to form polyampholyte poly(acrylic acid)-silica Janus particles and ionizable poly(2-(dimethylamino)ethyl methacrylate)-silica Janus particles that are pH- and temperature-responsive.

Ο Πρόεδρος του Τμήματος

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