

Directional self-assembly of patchy particles

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In this communication, we report on a new route to synthesize patchy particles with a controlled number of patches or dimples as well as on their potential use as building blocks for the elaboration of new supracolloids with unusual morphology and optical properties.

The so-patchy particles were derived from colloidal molecules [1] made of a central silica core surrounded by a precise number n of polystyrene satellite nodules [2,3]. We succeeded in promoting the growth of the silica core of these colloidal molecules. While growing, the silica surface conforms to the shape of the PS nodules. After the dissolution of the polystyrene nodules and functionalization of the dimples, homogeneous batches of silica particles with n well-located patches at their surface can be produced in large quantities [4,5]. The patchy character of the silica particles was evidenced by TEM characterization (see Figure 1a) as well as regioselective functionalization.

We will also present some results about the self-assembly of the patchy particles in the form of new supraparticles (see Figure 1b).

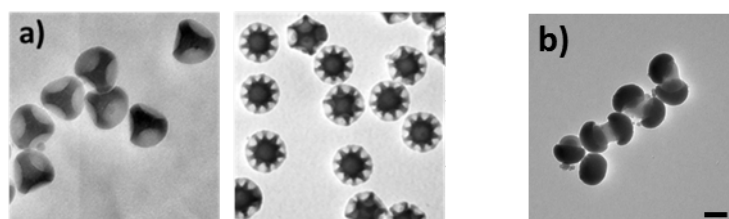


Figure 1 TEM image of silica particles with four (left) and twelve (right) non-functionalized [4] and b) functionalized dimples [5].

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