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Synthesis of highly tunable Janus particles in chemical and physical anisotropy and their assembly JONGMIN KIM, CHANG-HYUNG CHOI, SUNG-MIN KANG, CHANG-SOO LEE[1], Chungnam National University — Self-assembly has been explored as a novel strategy for making new functional materials with unique physical, chemical, and mechanical properties in various fields. To date, many assembly building blocks and techniques has been introduced from molecular to meso-scale, which rely on chemical and physical driving forces. Janus particles are considered as a favorable building block to make various structures. However, to achieve complex 3D structure in self-assembly, it still requires further complexity in particle shapes. Several techniques have been reported in literatures providing variety in shapes but, it is still difficult to make 3D shapes such convex or concave particles. Herein, we present a simple micromolding method for synthesis of complex Janus particles and its self-assembly via 2D orbital shaking. The synthetic method allows for both chemical and physical anisotropy such as the length of hydrophobic block and 3D shapes with high controllability. We also demonstrate self-assembly induced by shape complexity, aspect ratio and solvent polarity which results in various assembled structures including simple dimer, linear polymer like structure, and ring like structure.

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