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Self-Assembly of Multi-Dimpled Spherical Particles[1] N. KHALID AHMED, GREG VAN ANDERS, University of Michigan, Ann Arbor, ELIZABETH R. CHEN, School of Engineering and Applied Sciences, Harvard University, MICHAEL ENGEL, SHARON C. GLOTZER, University of Michigan, Ann Arbor
— Self-assembly of hard convex polyhedra has been extensively studied, demonstrating the formation of complex crystal structures. Recently synthesized multi-dimpled concave particles made of spheres have the potential for comparable complexity. Phase behavior and confinement have been studied for single-dimpled spherical cap and bowl shaped particles. Motivated by the synthesis of multi-dimpled spherical concave particles, we investigate the assembly of spherical particles with up to six dimples. We demonstrate that the assembly is controlled by competition between the spherical and the dimpled surface segments of the particle. Shrinking and swelling the inner spherical core of such particles can result in reconfigurable structures.

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