

Abstract Submitted
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Packing of DNA-assembled Nanocubes and Nanooctahedra¹ FANG LU, YUGANG ZHANG, KEVIN YAGER, Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, NY, 11973, DANIEL VAN DER LELIE, Center for Agricultural and Environmental Biotechnology, Research Triangle Institute International, Research Triangle Park, NC, 12194, OLEG GANG, Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, NY, 11973 — Nanoparticle shape has a profound effect on assembly behavior. However, the contribution of surface-attached molecules can significantly modulate the packing of nanoscale objects, inducing phases markedly different from the known packing rules of macroscopic objects. Our studies uncover the phase behavior of nanocubes and nanooctahedron assembled by DNA-mediated interactions into three-dimensional structures, which were probed in-situ by small angle x-ray scattering. We observed that the packing of these nanoscale anisotropic objects depends strongly on the details of the DNA linkages. Using electron microscopy and optical spectroscopy, we elucidate the factors that drive assembly and dictate the spatial organization of the nano-objects. The relationship between particle shape and the mechanism of phase formation for nanocubes has been also investigated.

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