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Zero-dimensional organic nanoparticles via copolymer directed self-assembly DEQUAN XIAO¹, KUNHUA LIN, Department of Chemistry, Sichuan University, Chengdu, 610064 China, QIANG FU, Department of Polymer Science and Engineering, Sichuan University, State Key Laboratory of Polymer Materials Engineering, Chengdu, 610065 China, QINJIAN YIN, Department of Chemistry, Sichuan University, Chengdu, 610064 China — Inspired by inorganic nanomaterials, low-dimensional organic nanostructures have emerged as a new field of nanomaterials with the presence of size-dependent physical properties. Here, we report a zero-dimensional organic nanoparticles formed by copolymer-directed self-assembly. The nanoparticles are thermally stable up to $\sim 200^{\circ}\text{C}$. The nanoparticle morphologies are probed by TEM and SEM images. The quantum confinement effect is suggested by the appearance of strongly broadened Raman shift spectra. By proof-of-principle quantum chemical calculations, we suggested that both vibration-vibration and electron-vibration coupling at nanoscale can cause the Raman broadening. The present organic nanoparticles provides a new class of nanostructures to exploring size-dependent physical properties.

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