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# Size Control of Cross-Linked Carboxy- Functionalized Polystyrene Particles: Four Orders of Magnitude of Dimensional Versatility

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ABSTRACT Synthesis of functionalized organic particles is an expanding area of exploration due to versatile potential applications including imaging agents, drug delivery vehicles, and supported synthesis. A robust, customizable method that allows modification of size, degree of cross-linking, identity of the crosslinker, and desired functionality, while retaining particle integrity would be highly advantageous. Here, we report the straightforward, versatile syntheses of cross-linked carboxy polystyrene (PS) particles ranging from 50 nm to 500  $\mu$ m in diameter that retain their morphology in organic solvents. Removal of a protecting group exposed free benzoic acid groups that were readily functionalized to afford peroxide, ester, or amide moieties. The identity and density of the crosslinker was also systematically modified to alter the swelling

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