

Synthesis of Cross-Linked Carboxypolystyrene Particles with Diameter Spanning Four Orders of Magnitude

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Polystyrene (PS) resins and nanoparticles have appeared in a variety of applications from solid-phase synthesis to diagnostic assays. The carboxylic acid is one of the most versatile functional groups to be incorporated in these particles due to its charged character and potential for further derivatization. Our group has used a one-step synthesis of *tert*-butyl 4-vinylbenzoate, a monomer which can be co-polymerized with styrene and divinylbenzene. Suspension, dispersion, and emulsion polymerizations yielded particles of various sizes ranging from 50 nm to 500 μm . Subsequent deprotection of the *tert*-butyl ester gave carboxyPS particles. These particles have been further functionalized and characterized by a variety of methods. Our approach not only simplifies the synthesis of carboxyPS resins but also allows for the production of cross-linked nanoparticles with benzoic acid functionality.

