

Preparation of Ultra Large Hollow Sphere Mesoporous Silica Using Facile Emulsion System

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Hollow mesoporous silicas with uniform pore size have been used in various fields, which are prepared by using complex and various methods to provide appropriate functions. Here, we report the facile preparation method of hollow sphere mesoporous silicas through the simple emulsion system that can control the geometries using parameters related to emulsion formation. This emulsion system was composed of continuous phase (aqueous acid solution), dispersed phase (silica source and organic solvent) and Pluronic P123 (triblock copolymer) which plays the role of both emulsifier and template, simultaneously. The particles synthesized under the condition of stable emulsion formation exhibited both hollow structure generated by the organic solvent, and mesoporous shells. In addition, as adjusting the composition of the dispersed phase and the input amount of P123, we successfully controlled the total particle size (150~300 μm) and hollow size (30~90 μm) of the synthesized particles. Consequently, the synthesized ultra large hollow sphere mesoporous silicas are expected to provide additional advantages in various applications such as catalysis and separation.