

Synthesis of Micron-Sized Spherical Silica based on the Seed

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While mono-dispersed spherical silica can be manufactured with the hydration and condensation reactions of TEOS, the maximum size of the silica particles is about $1.5\mu\text{m}$. To overcome this limit, a method where the seed was synthesized, dispersed, and then reacted with TEOS again, was introduced. Silica seed of $0.6\mu\text{m}$ size was synthesized using $\text{C}_{16}\text{-NH}_2$ as an additive and $1\mu\text{m}$ size seed was synthesized using the Stober method. The particle size of the silica produced with $1\mu\text{m}$ silica seed ranged between 1.3 to $1.7\mu\text{m}$, and the particles showed more elliptical-like shape as they became bigger. The particle size of the silica produced with $0.6\mu\text{m}$ silica seed ranged between 1.6 to $1.75\mu\text{m}$, according to the process conditions, in round shape, by a maximum size of $2\mu\text{m}$.