

### The synthesis of Spherical Mesoporous Silica Nanoparticles with Controlled Particle Size

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A rapid and facile synthesis route to the spherical mesoporous silica is developed based on the modified Stöber method that is applying tetraethoxysilane, ethanol, water, ammonia and n-hexadecyltrimethylammoniumbromide as template. Further investigation has been carried out to understand factors influencing the properties of the materials synthesized with the modified Stöber method. The phase domain of synthesized silica can be extended by controlling the stirring rate, temperature and molar ratios of silica source and surfactant.

The formation of spherical mesoporous silica is obtained using triblock copolymers, Pluronic F127 and Brij 30, as a particle size designer.

The synthesized mesoporous silica has high specific surface area, large pore volume. The average size of spherical silica can be controlled within the range of 250 to 500 nm depending on the amount of copolymer and solvent.