Syntheis and adsorption property of mesoporous silica particles

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Mesoporous silica particles were prepared using tetraethoxysilane (TEOS) and cetyltrimethylammonium bromide (CTAB). Nonporous silica particles were also synthesized using the Stöber method for a comparison. The mesoporous structure of the calcined silica particles was characterized by nitrogen sorption method, and the morphology and size of the particles were studied by scanning electron microscopy (SEM) and transmission electron microscopy (TEM). To compare the adsorption property of mesoporous and nonporous silica particles, we performed the organic dye adsorption experiments. Our results showed that mesoporous particles have much higher adsorption capacity than Stöber particles. This suggests that the mesoporous silica particles can be used as adsorbents in separation of various organic species.