

Systematic morphology control of periodic mesoporous silica in nanometer scale

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Preparation of periodic mesoporous silicas via supra-molecular assembly and sol-gel reaction has been highly active research field due to the high surface area and regular mesopores exhibiting consequent potential applications. Mesostructural, compositional and morphological control has been the main interest in the synthesis of mesoporous silica materials. Especially the morphological control has been understood as one of the most important mater for material design related to the targeted applications. For example, in catalytic reactions, small and fine particles of mesoporous support would have accessible pores and facilitate the diffusion and mass transfer of reactants, resulting the enhancement of catalytic activity.

In the current report, the particle size of large pore mesoporous silica, MSU-H is finely controlled from several hundreds of nanometers upto around 50nm in diameter by controlling sol-gel reaction rate. The samples are characterized by FESEM, HRTEM, XRD, N₂ sorption, NMR and so on.