

Preparation of Monodisperse PMO Particles with Bifunctionality and Large Pore

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Bifunctional periodic mesoporous organosilicas (PMOs) with phenylene- and ethane bridging groups were synthesized using 1,2-bis(triethoxysilyl)ethane (BTEE) and 1,4-bis(triethoxysilyl)benzene (BTEB) organosilica precursors and a P123 PEO-PPO-PEO triblock copolymer template under a low acidic condition. The PMO samples with different concentrations of organic bridging groups were obtained in the form of particles having average diameters of 2–3 μm and 2D hexagonal (p6m) mesostructure with pore diameters of 7.4 nm. Especially, monodisperse particle and its unique morphology can be obtained by using a specific ratio of organosilica precursors, which was resolved by SEM images. Adsorption and mesostructural properties of the aforementioned PMOs have been studied by nitrogen adsorption and small angle X-ray scattering, whereas their framework chemistry was quantitatively analyzed by solid state ^{13}C and ^{29}Si MAS NMR.