

A New Templated Mesoporous Silica with Bimodal Pore System Based on Porogen-Grafted Silica Precursors

조휘량, 차봉준, 김지만¹, 차국현*

서울대학교 화학생물공학부; ¹성균관대학교 화학과

(khchar@plaza.snu.ac.kr*)

Here in, we present a more direct method to prepare hierarchically ordered mesoporous silica with bimodal pore structure from the co-condensation of TEOS and porogen-grafted trimethoxysilane in the presence of a triblock copolymer Pluronic P123 (EO20PO70EO20, Mw = 5,800), used as a structure-directing agent. New porogen-grafted silicas, with carbon cages such as adamantylphenols chemically linked to silsesquioxane precursors, were designed and synthesized in our laboratory. Without the adamantane-grafted trimethoxysilane, hexagonally ordered (p6mm) primary pores with pore size around 6.4 nm are produced, whereas two distinct 7.5 nm and 3 nm mesopores are obtained with a mixture of TEOS and adamantine-grafted silica. It is shown that the relative concentration of TEOS over the adamantine-grafted silica precursors is crucial to realize well-defined bimodal mesoporous silica with a hexagonal long-range order and the secondary pores can also be located either near or far away from the primary pores depending on the chemical structure of such pore-generating moieties.