

Preparation and characterization of polystyrene/silica composite nano-spheres

김옥희, 황민진, 류동완, 이준석¹, 문 희*
전남대학교; ¹(주) 동양화학
(hmoon@jnu.ac.kr*)

Organic/inorganic composite materials have been extensively studied for a long time to combine the advantages of individual materials. Especially the preparation of mono-dispersed latex spheres has received considerable academic and industrial attention due to their wide applications. Average particle sizes and narrow size distributions are important factors for most applications. In this work, polystyrene latex spheres (PLS) containing silanol groups are firstly synthesized by emulsion polymerization using methyltrimethoxysilane (MPS) as a functional monomer. Then, a silica layer is formed on the copolymer particle surface by the reaction with tetraethylorthosilicate (TEOS) in aqueous solution. The morphology of the composite latex spheres are studied using a scanning electron microscope (SEM) and the particle size distributions are obtained by a particle size analyzer. The particle size of the composite latex spheres is controlled by changing reaction temperature, solution pH, the concentrations of an initiator, potassium persulfate (KPS), and a stabilizer, sodium dodecyl sulfate (SDS) and the agitation speed.