

### Synthesis and evaluation of polystyrene-silica composite nanospheres under various conditions

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Monodispersed polystyrene-silica composite nanospheres were synthesized by a two-step process in order to improve the thermal stability as artificial dusts. The poly(styrene-co-MPS) copolymer spheres containing silanol groups were firstly prepared as seed spheres by emulsion polymerization using 3-(trimethoxysilyl)propyl methacrylate (MPS) as a co-monomer, potassium persulfate (KPS) as an initiator, and sodium dodecyl sulfate (SDS) as a stabilizer. Later silica layers were grown on the seed copolymer spheres by a sol-gel reaction with tetraethylorthosilicate (TEOS) in aqueous solution at room temperature. It was experimentally proven that silica layers greatly enhance the thermal stability of nanospheres.