

Synthesis of organic/inorganic hybrid microspheres  
by emulsion polymerization in the presence of titania  
nanoparticles in water

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Organic/inorganic hybrid microspheres containing  
functional TiO<sub>2</sub> nanoparticles were synthesized by  
emulsion polymerization. The TiO<sub>2</sub> nanoparticle was  
synthesized by the sol-gel method and peptization  
process. Positively charged polystyrene(PS)  $\mu$ -  
particle was synthesized by emulsion polymerization,  
and negatively charged TiO<sub>2</sub> nanoparticle was  
subsequently added after polymerization.

Organic/inorganic composite particles were prepared  
by electrostatic force between PS particle and TiO<sub>2</sub>  
nanoparticle. The hollow TiO<sub>2</sub> shell could be  
obtained by calcinations process. The synthesized  
TiO<sub>2</sub>/PS composite particles were analyzed by  
scanning electron microscope (SEM) and  
transmission electron microscopy (TEM). The  
composite micro particles synthesized in this study  
are expected to be applicable to various fields such as  
colloidal photonic crystal template or dye-sensitized  
solar cell photoelectrode, and so on.