

Synthesis of Monodisperse Photocurable Poly(Methyl Methacrylate-co-Glycidyl Methacrylate) Nanoparticles

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Monodisperse colloidal particles are widely used for various applications in material science, chemistry and biology. In particular, colloidal particles which have unique functionality have been attracted by many researchers. Herein, we report poly(methyl methacrylate) (PMMA) based functional nanoparticles by conducting emulsion polymerization. To achieve this, methyl methacrylate (MMA) as a monomer, ammonium persulfate (APS) as an initiator and glycidyl methacrylate (GMA) as a comonomer were used. GMA was chosen in order to give PMMA nanoparticle photo-crosslinkable functionality. Sizes of poly(MMA-co-GMA) nanoparticles were readily controlled from 190nm to 290nm by manipulating concentration of monomer. Poly(MMA-co-GMA) nanoparticles showed red/green/blue reflection colors according to the size of particles. Finally, photocurable poly(MMA-co-GMA) nanoparticles were crosslinked by illumination of UV light which shows good stability upon chemical and physical stimulus. We expect photocurable nanoparticles can be used for nanoparticle patterning, emulsion-templated hollow shell structure due to its selective crosslinking characteristics.