

Fabrication of Hollow Polymeric Microspheres via Template Free Method

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Hollow polymeric microspheres have attracted a great deal of interest because of various application including diagnostics, drug delivery, bioactive materials and so on. Some method including layer-by-layer (LBL) deposition, hard-template and emulsion methods have been developed to prepare hollow polymeric spheres, which require time consuming, multistep process. Here we proposed a convenient way for fabrication of polymeric shell particles. Single emulsion droplets of polyethyleneglycoldiacrylate (PEGDA) were generated by using conventional PDMS chip. PEGDA droplets were rapidly encapsulated with oil flow containing surfactant and photo initiator. Photo initiator was diffused into emulsion droplets with time. After few minute, PEGDA droplets were exposed by UV light and polymeric shell structure which have non-cured core region could be fabricated because of diffused photo initiator. Shell thickness could easily be controlled by varying diffusion time or amount of photo initiator. Various functions could be incorporated into microcapsules by introducing fluorescence dye or inorganic colloidal particles such as silica or magnetic nanoparticles.