

### Droplet-based microfluidic synthesis of monodisperse magnetic PEGDA microparticles

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Polymerized poly(ethylene glycol) diacrylate(PEGDA) was used as container of  $\text{Fe}_3\text{O}_4$  nanoparticles and fluorescent silica particles. A droplet-based microfluidic method for the preparation of monodisperse PEGDA microdroplets was developed. Prepared PEGDA microdroplets have uniform size and fine round shape, with a size around 60  $\mu\text{m}$  using 50  $\mu\text{m}$  orifice flow-focusing device. The size of microdroplets can be controlled through the changing orifice width and continuous phase flow rate. Successful fabrication of PEGDA microdroplets entrapping  $\text{Fe}_3\text{O}_4$  nanoparticles and fluorescent silica particles were confirmed by attraction to external magnetic field and exhibition of the fluorescence, respectively. Due to the biocompatibility of PEGDA and the magnetism of  $\text{Fe}_3\text{O}_4$ , this microparticle could be applied to pharmaceutical field such as a smart drug delivery.