

Preparation and characterization of magnetic particles using PEO-PPO-PEO triblock copolymers

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Water soluble block copolymer systems, such as Pluronic block copolymers, have been studied in multiple applications as drug delivery systems. Due to self-assembled property, Pluronic block copolymers can stabilize hydrophobic substances in aqueous phase. In analogy to hydrophobic substances, stabilized magnetic nanoparticles were prepared by micellization of Pluronic block copolymers. Mono-disperse magnetic nanoparticles were synthesis by thermal decomposition methods. Characteristics of magnetic nanoparticles were determined by X-ray diffraction and Vibration Sample Magnetometer. Aqueous phase magnetic nanoparticles were prepared by emulsion-solvent evaporation methods. Morphology and Size distribution was measured by Transmission Electron Microscopy, X-ray diffraction and Dynamic Light Scattering. The magnetic weight ratio of aqueous phase magnetic nanoparticles was measured by thermogravimetry analysis. In these results, aqueous phase magnetic nanoparticles have sufficient magnetic susceptibility for a potential magnetic drug carrier for targeted delivery.