

Design and synthesis of magnetic nanoparticles for drug controlled release and magnetic hyperthermia mediation

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Controlled drug release is very important for theranostics. Important capabilities of magnetic nanoparticles are the external controllability of magnetic heat generation and magnetic attractive forces for the particle transportation and movement. Herein, we designed and synthesized the magnetic nanoparticles with porous/hollow structure for drug delivery and magnetic hyperthermia mediation. The magnetite porous/hollow nanoparticles were synthesized through one-pot solvothermal process, in an isothermal environment, using a sole iron precursor ($\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$) and without any template. A large quantity of uniform spheres with an average diameter of 300 nm and shell thickness of 40 nm was formed. Those nanoparticles exhibited a synergistic manner on a targeted and controlled release of chemotherapeutics along with a site-specific raise of temperature.