

Abstract Submitted
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Importance of specific magnetic moment and size monodispersity of magnetic nanoparticles for biomedical applications¹ YOU QIANG, Physics, University of Idaho, JOE NUTTING, JIJI ANTONY, SWETA PENDYALA, AMIT SHARMA, DANIEL MEYER — Magnetic nanoparticles with suitable biocompatible coatings are becoming increasingly important recently in biomedical applications. In most cases people just use nanoparticles but don't pay much attention to their magnetic properties and size effects, which could improve greatly the applications. There are very few publications dealing with underlying physics and discussing how the magnetic properties and size distribution of nanoparticles influence the applications. Most magnetic particles or beads used currently are based on ferromagnetic iron oxides with low magnetic moment and large size distribution. In this paper we will discuss the important role of high magnetic moment and monodispersity of magnetic nanoparticles from physics point review. Physics of hyperthermia treatments of nanoparticles, and biomolecule detection using Brownian rotation dynamics will be discussed in detail. As an example we will show how we produce monodisperse core-shell iron nanoparticles with ultrahigh magnetic moment and the significant results in biomedical applications.

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