Influence of Silica Coating on Magnetic Properties and Zeta Potential of Fe_3O_4@mSiO_2 Core-Shell for Drug Delivery Systems

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Abstract. To evaluate the possibility of use the mesoporous silica magnetic nanoparticles as potential drug carrier or magnetic resonance imaging agent, the magnetization properties, Zeta potential and size of Fe_3O_4@mSiO_2 NPs were characterized. Magnetic Fe_3O_4 cores with two different concentrations of Fe ions were prepared by co-precipitation method and were subsequently coated with mesoporous SiO_2 shell. Coating results in slightly decrease of Zeta potential which suggests, that prepared NPs can remain longer in blood stream and thus the possibility of drug releasing increases. Coating also affected the magnetic properties, coated core (1) shows strong ferromagnetic contribution, while coated core (2) have larger superparamagnetic contribution, and thus this system is suitable for future purposes as drug carrier for functional drug delivery systems.