

Synthesis of various magnetic nanoparticles prepared by capping agent controlled method

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The synthesis of magnetic nanocrystal has been focused because of their diverse potential applications as new materials. The synthesis of monodisperse nanoparticle is the most important, because the properties of these nanoparticles are strongly dependent on their dimensions. Various synthetic methods are developed for magnetic nanoparticles, but they have several problems such as size deviations, severe reaction conditions, low crystallinity. We have designed and prepared monodisperse, size-controllable, shape-controllable and highly crystalline nanocrystal with mild reaction conditions by simply changing the amount of capping agent. In this work, various magnetic nanoparticles (MFe_2O_4 , $M=Fe, Mn, Co$) are able to synthesized with simple 1-step synthetic method. Although most synthetic method produced few grams of nanoparticles, we report the large scale synthetic method which is able to synthesize up to 20g nanocrystals. Moreover, we control the particle size by varying the experimental conditions without size sorting process.