

The synthetic method of shape and size controllable iron oxide nanoparticles

김종훈, 김종득*

KAIST

(kjd@kaist.ac.kr*)

The synthesis of iron oxide nanoparticle has been focused on recent research interest for the reason of their diverse potential applications. The synthesis of monodisperse nanoparticle is the most important, since the properties of these nanoparticles strongly depend on their dimensions. We have designed and prepared monodisperse, size & shape controllable, and highly crystalline nanoparticle with a simple method. Metal-oleate complex consisting of metal precursors, sodium oleate, and oleic acid is dissolved in water-ethanol-toluene solution. Also, we inject hydrazine to reduce the metal-oleic acid complex.

We report the large scale synthetic method in low temperature, and a easy way. We were able to synthesize about 20g of magnetite nanocrystals. Moreover, we control the particle size by varying the experimental conditions without size sorting process. The nanoparticles obtained were characterized by TEM, X-ray diffraction, Vibrating Sample Magnetometer, and Raman spectroscopy. Magnetite nanoparticle could be applied for MRI contrast agent, targeted drug delivery, magnetic hyperthermia for tumor treatment, biochip, and so on.