

## Easy synthesis and characterization of $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> nanoparticles for biomedical applications

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Easy syntheses of  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> nanoparticles have been fabricated by the sol-gel method. The powders present average particle size of 7, 10, and 13 nm with narrow size distribution for samples as-obtained and annealed at 150, 175, and 200 °C, respectively. At a room temperature, 10 nm particles were partially superparamagnetic. The Mössbauer spectrum for the 7 nm samples at room temperature displays superparamagnetic behavior as demonstrated by the single quadrupole doublet with zero hyperfine fields. Superparamagnetic particles display no sextet in Mössbauer spectra at temperatures above blocking temperature ( $T_B=165$  K for the 7 nm sample). © 2005 American Institute of Physics. [DOI: 10.1063/1.1851919]