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**Optimization of Fe3O4 Nanoparticle Synthesis** E VILA, Baker University, K STOJAK REPA, H SRIKANTH, MH PHAN, University of South Florida — Magnetic nanoparticles have been of great interest for the past several decades due to the increasing demands of technology as a direct result of device miniaturization. Additionally, they are interesting for biomedical applications, such as magnetic hyperthermia, because of their controllable size and shape, which can make them compatible with biological entities such as cells or viruses. In this study, iron oxide nanoparticles were synthesized through a thermal decomposition process. The original recipe was altered by changing the type and amounts of reagents used; the reaction time was also changed. Specifically, the amount of surfactants and solvent were altered, and the typical co-surfactant, 1,2-hexadecanediol was substituted by 1,2-tetradecanediol. Finally, a systematic reflux time study was conducted to determine the importance of reaction time to the synthetic process. Each sample was analyzed structurally via XRD to confirm the Fe3O4 phase and TEM to confirm their size. Several samples were also measured in a standard magnetometer to observe changes in their magnetic properties. Results from the systematic study will be presented here.

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