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**Synthesis and characterization of Fe/Au nanoparticles.** SHAHID AHMAD, SALEEM RAO, DONNY MAGANA, GEOFFREY STROUSE, SHAHID SHAHEEN, Florida State University — Magnetic nanoparticles are the materials of interest for their fundamental properties, such as single domain state, quantization of spin waves, and coercivity enhancement, and for their potential applications in magnetic recording, sensing, and biological diagnosis and treatment. The core/shell structured nanoparticles, with magnetic materials as core and gold as shell, are of special interest, because the gold shell protects the oxidization of magnetic core and is biocompatible and easy to functionalize. Here we report the synthesis and characterization of Fe/Au nanoparticles with different atomic concentrations of Fe and Au. The nanoparticles were annealed under the flow of nitrogen gas and their magnetic behavior was characterized as a function of time and annealing temperature. A large change in blocking temperature (18K to 210K) was observed on gradual annealing up to 400<sup>0</sup>C. The XPS data shows the presence of Au at the surface and no indication of iron or iron oxide. Also TEM images do not show any agglomeration of particles and the particle size remains unchanged on annealing.

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