

### **513e Synthesis and Characterization of Au-Fe Alloy Magnetic Nanoparticles**

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Gold-Iron alloy nanoparticles of defined size have been synthesized using a mesoporous alumina membrane as a template for the co-deposition of gold and iron. The metals were deposited in the membrane using either electrochemical or pulsed laser deposition. The particle size was determined by the properties of the membrane template and means of deposition. The composition of the particles was similar to that of the target for PLD, but was not simply related to the concentration of the reagents for electrodeposition. Particles 35-65 nm in diameter with Fe compositions varying between 25% and 40% were found to be strongly paramagnetic. These particles were readily functionalized a thiol linker but did not exhibit the strong surface enhanced Raman peak that is characteristic of gold nanoparticles. These novel magnetic nanoparticles are unique in that they are paramagnetic, excellent conductors, and readily functionalized with biomolecular receptors.