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Fabrication of Magnetically Half-Coated Nanoparticles Using Molecular Beam Deposition BRANDON H. MCNAUGHTON, University of Michigan, Department of Chemistry, JEFFREY N. ANKER, University of Michigan, Department of Chemistry, VLADIMIR A. STOICA, University of Michigan, Department of Applied Physics, ROY CLARKE, University of Michigan, Department of Applied Physics, RAOUL KOPELMAN, University of Michigan, Department of Chemistry — The top-down approach of building nanodevices can be combined with the bottom-up to create half-coated nanoparticles with well controlled magnetic, optical, electronic, and chemical properties. A type of half-coated nanoparticle particle that utilizes both optical and magnetic control is Magnetically Modulated Optical Nanoprobes (MagMOONs) (JN Anker, and R Kopelman, Appl. Phys. Lett., 82, 1102-1104 (2003).). MagMOONs emit modulated fluorescence or reflection intensities when externally manipulated by a magnetic field. We have fabricated functional MagMOONs by coating a thin layer of polycrystalline cobalt onto micro and nanospheres using molecular beam deposition (MBD). Additionally, vectorial magneto-optical Kerr effect was used to study the magnetization reversal of the coated spheres supported by a substrate. Hysteresis loop variations associated with the sphere size changes are observed and compared with the case of planar deposited films.

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