

Abstract Submitted
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Synthesis and properties of bimagnetic core-shell nanoparticles¹

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University of Texas at Arlington — Bimagnetic core-shell nanoparticles are synthesized from high-temperature solution phase coating of FePt core with tunable Fe₃O₄, CoFe₂O₄ or FeCo shell. Magnetic properties of the as-synthesized core-shell particles are dependent on shell material and its thickness due to the exchange coupling between core and shell. Upon reductive annealing, an assembly of the core/shell nanoparticles is transformed into a hard magnetic nanocomposite with enhanced energy product which is 30% higher than single FePt phase. With proper choice of materials and dimension tuning of both core and shell, these core-shell nanoparticles may be used as building blocks for creation of novel functional nanomaterials for various magnetic applications.

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