

Abstract Submitted
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Cluster-deposited high-anisotropy magnetic nanoparticles¹ BAL-AMURUGAN BALASUBRAMANIAN, RALPH SKOMSKI, XINGZHONG LI, DAVID SELLMYER, Nebraska Center for Materials and Nanoscience and Department of Physics and Astronomy, University of Nebraska, Lincoln, NE-68588 — Magnetic nanoparticles of size less than 10 nm with high magnetocrystalline anisotropy are highly desirable to understand the nanoscale effects on their magnetic properties and create building blocks for modern applications such as ultra-high-density recording media and high-performance permanent magnets. In the present study, monodisperse Co-based nanoparticles with an average particle size of 3 -10 nm, such as YCo_5 and $\text{Co}_{1-x}\text{Pt}_x$ ($x < 0.2$), were produced using an inert-gas-condensation cluster-deposition system and characterized using XRD, TEM, EDX and SQUID magnetometer. These nanoparticles were directly ordered into high-anisotropy crystal structures during the cluster-aggregation process and exhibit high anisotropic constant of order 10^7 ergs/cm³. Size-effects on the structural and magnetic properties of YCo_5 and $\text{Co}_x\text{Pt}_{1-x}$ nanoparticles will be discussed.

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