Abstract Submitted
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Assembly of Magnetic Nanoclusters[1] BALAMURUGAN BALASUBRAMANIAN, RALPH SKOMSKI, BHASKAR DAS, Nebraska Center for Materials and Nanoscience and Department of Physics and Astronomy, University of Nebraska, Lincoln, NE - 68588, GEORGE HADJIPANAYIS, Department of Physics and Astronomy, University of Delaware, Newark, DE -19716, DAVID SELLMYER, Nebraska Center for Materials and Nanoscience and Department of Physics and Astronomy, University of Nebraska, Lincoln, NE - 68588 — Nanostructured Co or Fe-rich magnetic materials are of interest for a wide range of applications because of their novel structures and spin phenomena [1, 2]. In this presentation, the synthesis and stability of nanoparticles of (Co-Fe):X alloys (X = Hf, Sm, Si) having unusual crystal structures will be discussed. The nanoparticles are produced using a single step-process in a cluster-deposition system and are smaller than 10 nm with an rms standard deviation of $\sigma/d \leq 0.15$. In particular, Co-rich nanoparticles such as $HfCo_7$ and $SmCo_5$ exhibit high magnetocrystalline anisotropies (K_1 >10 Mergs/cm^3) and saturation magnetic polarizations (J_s >10 kG). The nanoscale effects on the magnetism including spin structure, magnetic polarization, and other intrinsic properties, and the potential of the nanostructures for various applications will be presented.

[1] B. Balamurugan, B. Das, V.R. Shah, R. Skomski, X.Z. Li, and D.J. Sellmyer, *Appl. Phys. Lett.* 101, 122407 (2012).
[2] Advanced Magnetic Nanostructures, Eds. D.J. Sellmyer and R. Skomski. Springer: New York, 2001.

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