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Structure and magnetism of nanostructured Zr_2Co_{11}[1] BHASKAR DAS, BALAMURUGAN BALASUBRAMANIAN, WENYONG ZHANG, RALPH SKOMSKI, DAVID SELLMYER, Nebraska Center for Materials & Nanoscience and Department of Physics and Astronomy, University of Nebraska - Lincoln — Recently nanostructured Zr_2Co_{11}-based alloys crystallizing in the rhombohederal structure have emerged as novel magnetic material with an appreciable magnetocrystalline anisotropy constant ($K_1 \approx 20$ Mergs/cm^3), a high saturation magnetic polarization ($J_s \geq 10$ kG), and a high Curie temperature ($T_c \approx 783$ K) [1, 2]. The nanostructured Zr_2Co_{11} films were fabricated using cluster-deposited nanoparticles of smaller than 10 nm as building blocks. The nanoscale effect on structure and room-temperature magnetic properties was investigated by comparing those of melt-spun bulk alloys. In addition, the magnetic properties at elevated temperatures also will be discussed and this will provide a further insight to understand the magnetism of Zr_2Co_{11} nanostructures and explore the possibility of using them for high-temperature applications.

[1] B. Balamurugan, B. Das, R. Skomski, W. Y. Zhang and D. J. Sellmyer, *Adv. Mater.* 25, 6089 (2013)
[2] B. Balamurugan, B. Das, R. Skomski, W. Y. Zhang and D. J. Sellmyer, *J. Phys.: Condens. Matter.* (in press).

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