

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**High temperature magnetic phase transitions and exchange bias effect of FeSiCr alloy** XIN WANG, University of Electronic Science and Technology of China, STATE KEY LABORATORY OF ELECTRONIC THIN FILMS AND INTEGRATED DEVICES COLLABORATION — We present magnetic properties of FeSiCr alloy which was synthesized by melting and crushing method followed by milling and heat treatment. The samples under different heat treatment temperature were characterized by using X-ray diffractometer, scanning electron microscopy, vibrating sample magnetometer and Mössbauer spectroscopy. The micro-structure undergo crystallization and grain growth process starting from as-crushed state, and gradually transform to B2 atomic disordered crystal phase. B2 phase is formed into DO3 atomic ordered phase with the increasing temperature. Mössbauer spectroscopy are well fitted into one or two subspectras correspond to DO3 structure and two subspectras to Fe(7) and Fe(4) structures. Only one DO3 subspectra with hyperfine magnetic field increasing from 26.8T to 30.4T with temperature is observed under 450°. The shift of hysteresis loop exhibits exchange bias effect based on zero-field cooling and FC measurement. The bias effect and DO3 ordered phase are simultaneously formed and changed, suggesting the exchange interaction between Fe-Cr crystal planes and Fe-Fe crystal planes contribute to unidirectional anisotropy in powder.

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Date submitted: 11 Nov 2014

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