

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Ferromagnetism in Ti-Doped ZnO Nanoclusters¹ JIJI ANTONY, SWETA PENDYALA, AMIT SHARMA, DANIEL MEYER, YOU QIANG, University of Idaho — Ferromagnetic behavior at room temperature is observed when a small percentage of non-magnetic titanium is combined with ZnO to form nanoclusters in the presence of oxygen atmospheres. The 5% Ti-doped ZnO nanocluster film is prepared at room temperature using a technique that is a combination of high pressure sputtering and aggregation. A SQUID magnetometer measures the magnetic properties of this cluster film at various temperatures. The coercivity of the samples decreases exponentially with the increase of temperature. The maximum value of coercivity is 204.76 Oe obtained at 5K. The remanent magnetization increases at low temperatures up to 30K and decreases afterwards. A distorted hysteresis curve is observed at 45K, 50K, 55K and 300K, whereas at 5K, 30K and 90K the hysteresis curve showed normal ferromagnetic behavior. The field cooling (FC) and zero-field cooling (ZFC) measurements reveal a phase transition mechanism related to the spin ordering/disordering, which depends on the temperature.

¹Financial support by NSF-EPSCoR, DOE-EPSCoR, ONR, Battelle-PNNL.

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Date submitted: 04 Dec 2004

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