

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Sorting Category: 25.2 (E)

Magnetic Properties of Ordered Nanoporous Nickel Films¹ JIABIN LIU, HAN-CHANG YANG, X.M. CHENG, Bryn Mawr College — Nanoporous materials have been of great interest for applications such as biosensors and energy storage. Magnetic properties and the magnetization reversal mechanism of nanoporous magnetic materials remain to be fully understood. In this work, we report the fabrication and magnetic properties of ordered nanoporous nickel (Ni) films. The fabrication involved the following steps: self-assembly of monodispersed polystyrene spheres, electrochemical deposition of desired materials, and sphere removal by a dissolution process. Scanning electron microscopy (SEM) images confirmed the highly ordered three-dimensional hexagonal closed pack structures of the Ni films. We characterized magnetic properties of the three-dimensional nanoporous Ni films using vibrating sample magnetometer (VSM). Magnetic hysteresis loops and first-order reversal curves (FORCs) were measured on the nanoporous Ni films of 200 nm pore size with different thicknesses. Analysis on hysteresis loops and FORC distributions shed light on the reversal mechanism of magnetization and magnetostatic interactions of ordered three-dimensional porous structures.

¹The work at Bryn Mawr College is supported by the National Science Foundation under Grant No. 1053854.

Prefer Oral Session
 Prefer Poster Session

Jiabin Liu
jliu04@brynmawr.edu
Bryn Mawr College

Date submitted: 15 Dec 2011

Electronic form version 1.4