

Abstract Submitted
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High density FePt-based nanocomposite bulk magnets prepared by warm compaction¹ CHUAN-BING RONG, VIKAS NANDWANA, NARAYAN POUDYAL, J. PING LIU, Department of Physics, The University of Texas at Arlington, Arlington, Texas 76019, MIKHAIL E. KOZLOV, RAY H. BAUGHMAN, NanoTech Institute, University of Texas at Dallas, Richardson, TX 75083, YONG DING, ZHONGLIN WANG, School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, Georgia 30332 — Bulk FePt/Fe₃Pt nanocomposite magnets have been prepared by high-pressure warm compaction of chemically synthesized nanoparticles. Density of the bulk samples up to 95% theoretical value has been obtained while the nanostructured morphology is retained. The grain size and size distribution of the bulk samples are quite small compared to those for materials fabricated by traditional techniques. It is found that the density is a function of the compaction pressure and temperature and is also strongly affected by the phase transition of the FePt compound from face-centered cubic structure to face-centered tetragonal structure. The compaction leads to strong interparticle exchange coupling in the compacts. Post-annealing of the compacts results in improved interface condition and a further enhancement of magnetic performance. Energy products up to 16.3 MGOe of the isotropic bulk nanocomposite magnets have been achieved.

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