Microstructural Control and Magnetic Properties of FePt Thin Films

by Li Huihui

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Abstract

Ultrahigh magnetic anisotropy, moderate Curie temperature and extraordinary chemical stability of L10 FePt alloy have inspired intense research on the FePt-based next generation high density magnetic recording media. The aim of this study was to optimize the microstructure and magnetic properties of FePt thin film simultaneously by introducing some new materials and novel layer structures. Firstly, we proposed TiN intermediate layer. The TiN intermediate layer exhibited great advantages over the MgO intermediate layer in reducing in-plane hysteresis, improving epitaxial growth and optimizing the perpendicular magnetic anisotropy. Thereafter, improved solid solution TiON intermediate layer, which showed smaller surface energy and lattice constant than TiN, was developed to promote the island growth of FePt. The 90° contact angle between FePt and TiON was observed. Finally, granular FePt thin films with small grain sizes around 6 nm and good perpendicular magnetic anisotropy were obtained by SiNx-C doping and SiOx-C doping.

Speaker  Li Huihui

Biography

Mr. Li Huihui received his Bachelor of Theoretical Physics from the Physical Science and Technology Dept. at Lanzhou University in 2008. He is currently pursuing his PhD degree under the supervision of A/Prof. Chen Jing-Sheng and the co-supervisor Prof. Chow Gan Moog in the Materials Science and Engineering Dept. His research work focuses on the microstructures and nanomagnetism of L10 (001) FePt thin film.

ALL ARE WELCOME!

Assoc Prof Daniel J. Blackwood Host