

Accepted Manuscript

Exchange coupled L10 FeCuPt/Fe heterostructures: Magnetic properties and reversal behavior at elevated temperatures

D. Mitin, M. Wachs, N.Y. Safonova, O. Klein, M. Albrecht

PII: S0040-6090(17)30494-7
DOI: doi: [10.1016/j.tsf.2017.06.059](https://doi.org/10.1016/j.tsf.2017.06.059)
Reference: TSF 36066
To appear in: *Thin Solid Films*
Received date: 8 November 2016
Revised date: 4 May 2017
Accepted date: 30 June 2017



Please cite this article as: D. Mitin, M. Wachs, N.Y. Safonova, O. Klein, M. Albrecht, Exchange coupled L10 FeCuPt/Fe heterostructures: Magnetic properties and reversal behavior at elevated temperatures, *Thin Solid Films* (2017), doi: [10.1016/j.tsf.2017.06.059](https://doi.org/10.1016/j.tsf.2017.06.059)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Exchange coupled L1₀ FeCuPt/Fe heterostructures: Magnetic properties and reversal behavior at elevated temperatures

D. Mitin^{1,a)}, M. Wachs², N. Y. Safonova¹, O. Klein¹, and M. Albrecht¹

¹*Institute of Physics, Universität Augsburg, Universitätsstr. 1 Nord, D-86159 Augsburg, Germany*

²*Institute of Physics, Technische Universität Chemnitz, Reichenhainerstr. 70, D-09107 Chemnitz, Germany*

Keywords: L1₀ FePt-X; Exchange-coupled composite; Heat-assisted magnetic recording; Magnetic recording; Curie temperature; Scanning magnetoresistive microscopy.

Exchange-coupled heterostructures were prepared by combining hard magnetic L1₀ FeCuPt alloy films with soft magnetic Fe thin films. For the FeCuPt thin film, the addition of Cu allows adjusting magnetic properties such as perpendicular magnetic anisotropy, coercivity, saturation magnetization, and Curie temperature. The coupling to thin Fe layers, providing high saturation magnetization and high Curie temperature, leads to lowering of the switching field of the hard magnetic FeCuPt layer and to a reduction of thermally induced recording errors. We have investigated the influence of the Fe layer thickness on the switching behavior of the hard layer, revealing a strong reduction for Fe layer thicknesses larger than the exchange length of Fe of about 2 nm. Furthermore, superior performance of bilayer structures in comparison to single FeCuPt layers has been demonstrated by recording experiments at temperatures below 150 °C, employing a scanning magnetoresistive microscope.

^{a)} Author to whom correspondence should be addressed.
Telephone: +49 821 598 3431
Fax: +49 821 598 3425
Electronic mail: dmitriy.mitin@physik.uni-augsburg.de

Download English Version:

<https://daneshyari.com/en/article/8032844>

Download Persian Version:

<https://daneshyari.com/article/8032844>

[Daneshyari.com](https://daneshyari.com)