

Thickness dependence of the phase transformation in FePt alloy thin films

Minh P.T.L., Thuy N.P., Chan N.T.N.

Intl. Train. Inst. for Mat. Science, Dai hoc bach khoa, 1 Dai Co Viet, Hanoi, Viet Nam; Faculty of Technology, Vietnam National University, Hanoi, Viet Nam; Institute of Engineering Physics, Hanoi University of Technology, Hanoi, Viet Nam

Abstract: FePt alloy thin films of different thickness have been prepared and studied. Both X-ray analysis and magnetization measurements have been used to detect the FCC (A1)-FCT ($L1_0$) phase transformation due to annealing in these films. It was found that the ordering process in the thick samples takes place at much lower temperature in comparison to the thinner ones. The observed phenomenon can be understood taking into account the kinetics of the FCC-FCT phase transformation and grain growth. The obtained experimental results suggest the existence of an optimal annealing temperature for each defined sample thickness. ?? 2003 Elsevier B.V. All rights reserved.

Author Keywords: Fe-Pt thin film; Grain growth; Magnetization process; Ordering kinetics

Index Keywords: Annealing; Grain growth; Iron alloys; Magnetization; Metallographic microstructure; Phase transitions; Thickness measurement; X ray analysis; Equiatomic films; High-density magnetic recording; Ordering kinetics; Post-annealing; Thin films

Year: 2004

Source title: Journal of Magnetism and Magnetic Materials

Volume: 277

Issue: 2-Jan

Page : 187-191

Cited by: 11

Link: [Scopus Link](#)

Correspondence Address: Thuy, N.P.; Intl. Train. Inst. for Mat. Science, Dai hoc bach khoa, 1 Dai Co Viet, Hanoi, Viet Nam; email: thuy@itims.edu.vn

ISSN: 3048853

CODEN: JMMMD

DOI: 10.1016/j.jmmm.2003.10.032

Language of Original Document: English

Abbreviated Source Title: Journal of Magnetism and Magnetic Materials

Document Type: Article

Source: Scopus

Authors with affiliations:

1. Minh, P.T.L., Intl. Train. Inst. for Mat. Science, Dai hoc bach khoa, 1 Dai Co Viet, Hanoi, Viet Nam
2. Thuy, N.P., Intl. Train. Inst. for Mat. Science, Dai hoc bach khoa, 1 Dai Co Viet, Hanoi, Viet Nam, Faculty of Technology, Vietnam National University, Hanoi, Viet Nam

3. Chan, N.T.N., Institute of Engineering Physics, Hanoi University of Technology, Hanoi, Viet Nam

References:

1. Takahashi, Y.K., Ohnuma, M., Hono, K., (2001) Jpn. J. Appl. Phys., 40, pp. L1367
2. Minh, P.T.L., Thuy, N.P., Van, N.D., Chan, N.T.N., (2002) J. Magn. Magn. Mater., 239, p. 335
3. Minh, P.T.L., Van, N.D., Thuy, N.P., Nguyen, L.T., Lodder, J.C., Thang, P.D., Chan, N.T.N., (2003) Physica B, 327, p. 360
4. Chen, S.C., Kuo, P.C., Sun, A.C., Lie, C.T., Hsu, W.C., (2002) Mater. Sci. Eng., B88, p. 91
5. Platt, C.L., Wierman, K.W., Svedberg, E.B., Van de Veerdonk, R., Howard, J.K., Roy, A.G., Laughlin, D.E., (2002) J. Appl. Phys., 92, p. 6104
6. Saito, T., Kitakami, O., Shimada, Y., (2002) J. Magn. Magn. Mater., 239, p. 310
7. Maeda, T., Kai, T., Kikitsu, A., Nagase, T., Akiyama, J., (2002) Appl. Phys. Lett., 80, p. 2147
8. Takahashi, Y.K., Ohnuma, M., Hono, K., (2002) J. Magn. Magn. Mater., 246, p. 259
9. Lee, S.R., Yang, S., Kim, Y.K., Na, J.G., (2002) J. Appl. Phys., 91, p. 6857
10. Endo, Y., Kikouchi, N., Kitakami, O., Shimada, Y., (2001) J. Appl. Phys., 89, p. 7065
11. Ristau, R.A., Barmak, K., Lewis, L.H., Coffey, K.R., (1999) J. Appl. Phys., 86, p. 4527
12. Barmak, K., Kim, J., Shell, S., Svedberg, E.B., Howard, J.K., (2002) Appl. Phys. Lett., 80, p. 4268
13. Ristau, R.A., Barmak, K., Coffey, K.R., Howard, J.K., (1999) J. Mater. Res., 14, p. 3263