

UA07

Magnetic property change of FeMn-NiFe films by He ion irradiation using DuoPIGatron source

Y.O Noh^{1,2}, C.O Kim^{1,2}, and C.G Kim^{1,2*}

¹Department of Materials Engineering, Chungnam National University, 220, Gung-dong, Yuseong-gu, Taejeon, 305-764 Republic of Korea

²ReCAMM, Chungnam National University, Daejeon, 305-764 Republic of Korea

*Corresponding author: siren746@gmail.com, Phone: +82 42 821 6236, Fax: +82 42 822 6272

Exchange bias in the interfaces of Ferronagnet/Antiferromagnetic alloy films by He ion irradiation using DuoPIGatron Ion source is investigated. VSM carry out on sputtered exchange biased films before and after He ion irradiation. The crystal structure was examined by XRD. Exchange bias and magnetic characteristics of NiFe/FeMn exchange coupled bilayers are extremely sensitive to the NiFe(111) texture. He ion irradiation oriented NiFe tends to provide a exchange interaction at the interface between NiFe and FeMn films and It changes an exchange bias field. After He ion irradiation the FeMn-based system shows with increasing ion dose an enhancement followed by a decrease and finally a full suppression of the exchange bias field. For a dose of 4×10^{14} ions/cm², the loop is shifted towards higher positive fields indicating an enhancement of the exchange bias effect.

REFERENCES

- [1] J. Nogués, I. Schuller, J. Magn. Mater. 192 (1999) 203.
- [2] H. Bernas, T. Devolder, C. Chappert, J. Ferré, V. Kottler, Y. Chen, C. Vieau, J. P. Jamet, V. Mathet, and E. Cambri, Nucl. Instrum. Methods Phys. Res. B 148, 872(1999).
- [3] T. Mewes, R. Lopusnik, J. Fassbender, B. Hillebrands, M. Jung, D. Engel, A. Ehresmann, and H. Schmorranzer, Appl. Phys. Lett. 76, 1057(2000).

UA08

Effect of buffer layer on properties of He ion irradiated NiFe/FeMn bilayer thin films

Y.O Noh^{1,2}, C.O Kim^{1,2}, and C.G Kim^{1,2*}

¹Department of Materials Engineering, Chungnam National University, 220, Gung-dong, Yuseong-gu, Taejeon, 305-764 Republic of Korea

²ReCAMM, Chungnam National University, Daejeon, 305-764 Republic of Korea

*Corresponding author: siren746@gmail.com, Phone: +82 42 821 6236, Fax: +82 42 822 6272

The films of NiFe/FeMn with Ta and Cu buffer layer were prepared by magnetron sputtering. He ion was irradiated on the surface of each films by DuoPIGatron source for ion energy is 13 keV and ion dose are 4×10^{14} ions/cm². VSM carry out on sputtered exchange biased films before and after He ion irradiation. The crystal structure was examined by XRD. Surface roughness of those samples were examined by AFM. The decrease of the exchange bias field for NiFe/FeMn films with Cu buffer layer is mainly caused by diffusion of Cu atoms through NiFe layer, which stayed at the interface of NiFe/FeMn films or even intrude into FeMn layer.

REFERENCES

- [1] K. Nishioke, C.H. Hou, H. Fujiwara, R.D. Metzger, J. Appl. Phys. 80 (1996) 4528.
- [2] Z. H. Qian, J.M. Siccirtsen, J.H. Judy, J. Appl. Phys. 83 (1996) 6825.