Anisotropic properties of high - te superconducting YBCO films grown on SrTiO3 (110) substrates

陳億蔚、王立民、李得勝

E-mail: 321998@mail.dyu.edu.tw

ABSTRACT

We studied the anisotropic properties of High-Tc superconducting YBa2Cu3O7-δ (YBCO) films grown on SrTiO3 (110) substrates. The YBCO films were characterized by X-Ray diffraction, the atomic force microscope (AFM), and resistivity measurement. We researched the upper critical field (Hc2) and the pinning potential energy (U) in the different direction. The critical temperature (Tc) was decreasing with the field was increasing. As the anisotropic angle increased, the plot of Hc2 vs Tc curves of films showed downward straight lines. The pinning potential energy was decresing the field was increasing.

Keywords : High-Tc superconductor、critical temperature、upper critical field、pinning potential energy

Table of Contents

REFERENCES

[1] J. G. Bednorz, K. A. M?刺ler, Z. Phys. B64(1986)189.

[2] M. K. Wu, J. R. Ashburn, C. J. Trong, P. H. Hor, R. L. Gao, Z. J. Huang, Y. Q. Wang, and C. W. Chu, Phys. Rev. B35(1987)5337.

[3] H. Maeda, Y. Tanaka, M. Fukutomi, and T. Asano, Japan, J. Appl. Phys.27(1988)L209.

[4] A. Schalling, M. Cantori, J. D. Guo, and H. R. Ott, Nature, 363(1993)56.

[5] A. Inam, C. T. Rogers, R. Ramesh, K. Remschnig, L. Farrow, D. Hart, T.Venkatesan, amd B. Wilkens, Appl.Phys.Lett.57, 2484(1990).

[6] J. P. Zeng, S. Y. Dong, D. Bhattacharya, and H. S. Kwork, J .Appl. Phys.70,7167(1991).

[7] S. Poelders, R. Auer, G. Linker, R. Smithey, R. Schneider, Physica C 247,309(1995).

[8] J-P. Krumme, V. Doormann, F. Welz, R. Eckart, and O. D?宂sel, J. Mater. Res., Vol. 9 , No. 12 (1994).

[9] L. M. Wang, Chih-Chian Guo, and Shih-Min Lai, Chinese Journal of Physics,VOL. 43, NO. 3-II(2005).

[10] A. Lisauskas, S. I. Khartsev, and A. Grishin, Appl. Phys. Lett. 77, 3302(2000).

[11] P. W. Anderson, Phys. Rev. Lett. 9, 309(1962).

[12] P. W. Anderson, and Y. B. Kim, rev. of Mod. Phys.(1964)39.
[13] O. Brunner, L. Antognazza, J-M. Triscone, L. Mieville, and O. Fisher, Phys.RRev. Lett. 67(1991)1354.
[14] X.W.Cao, X.J.Xu, Z.H.Wang, J. Fang, R.L.Wang, H.C.Li, Physica C 282-287(1997) 1993-1994.
[15] P.K. Petrov, Z.G. Ivanov, and S.S. Gevorgyan, Materials Science andEngineering A288 (2000) 231 – 234.
[16] Sansheng WANG, Lin WANG and Bingfu GU, J. Mater. Sci. Technol., Vol.24No.6, 2008.
[17] Toshiyuki Usagawa, Yoshihiro lshimaru, Jianguo Wen, Satoshi Koyama, andYouichi Enomoto, Physiea C 282-287 (1997) 597-598.
[18] 大葉大學, 郭致謙, 95年碩士論文 [19] 大葉大學, 白順昌, 98年碩士論文 [20] 台灣大學, 陳政宏, 84年碩士論文