

Bitter Patterns on Bi-2212 Single Crystal with H//ab-plane

Akira Kamimura, Kazuto Hirata, Takashi Mochiku

National Research Institute for Metals, 1-2-1 Sengen, Tsukuba, 305-0047, Japan

Abstract

On the surface of ab-plane of Bi-2212 single crystals, a hexagonal lattice of vortices has been observed with a magnetic field perpendicular to the ab-plane. With a magnetic field parallel to the ab-plane, it has been believed that the arrangement of vortices is distorted only from the hexagonal structure, depressed along the c-axis, for the sake of large anisotropy. Recently, it has been demonstrated by the computer-simulation that the vortices are aligned in a chain-like structure along the c-axis [Tachiki, Chinese J. Phys. **36**,171(1998), Hu and Tachiki, Phys. Rev. Lett.,**80**,4044(1998)]. In Y-123 single crystals, such a chain-like structure has been observed by Dolan *et al.* However, they considered it as an effect of the twin boundaries. To confirm the arrangement of the vortices, we have performed the Bitter decoration on the surfaces of Bi-2212 single crystals with the perpendicular-plane and the parallel-plane to the c-axis, simultaneously, at the temperatures of 4.5K and 39K. On the perpendicular-plane, we observed a clear Abrikosov lattice using an optical microscope. On the parallel-plane, however, the distribution of the vortices shows quite different features from the Abrikosov lattice. It appears in a network structure, which is considered as a combination of vortices' chains.