WBP3-2

Effect of the metallic oxide mix-doping on the microstructure and superconducting properties of Bi-2223 Ag/tapes

*Xiaoye Lu[1], Danqing Yi[2], Akihiko Nagata[1]

Akita University, Japan[1]
Central South University, China[2]

The Bi-2223 Ag/tapes with the composition $Bi_{1.8}Pb_{0.4}Sr_{1.9}Ca_{2.1}Cu_{3.5}O_y$ + Xn (X1: un-doped; X2: 1wt% MgO + 1wt%Ag_2O mix-doped; X3: 1wt% MgO + 1wt%Ag_2O + 0.05wt%SnO_2 mix-doped; X4: 1wt% MgO + 1wt%Ag_2O + 0.05wt%B_2O_3 mix-doped; X5: 1wt% MgO + 1wt%Ag_2O + 0.05wt%Li_2O; X6: 1wt% MgO + 1wt%Ag_2O + 0.05wt%La_2O_3 mix-doped) were prepared by sintering at 837℃ for 120 h after partial-melting at 850℃ for 1 h. The B_2O_3 mix-doping (X4) and B_2O_3 mix-doping (X5) decrease the conversion of Bi-2212 phase to Bi-2223 phase. However, the SnO_2 mix-doping (X3) and La_2O_3 mix-doping (X6) increase the conversion of Bi-2212 phase to Bi-2223 phase in comparison with the un-doping (X1). The tape with 1wt% MgO + 1wt%Ag_2O + 0.05wt%La_2O_3 mix-doping shows the highest proportion of Bi-2223 phase and the highest critical current density.

Keywords: Bi-2223, mix-doping, microstructure, superconducting