

Superconducting Properties of Bi-2223 Tapes with Various Pre-annealing Conditions

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A lot of efforts have been focused on the optimization of PIT parameters for Bi-2223/Ag wire. In this paper, pre-annealing of Bi-2223/Ag wire to transform Bi-2212 orthorhombic from Bi-2212 tetragonal precursor was investigated. Bi-2223 superconducting wires with 55 filaments were fabricated by stacking, drawing process. Before rolling process, round wires were pre-annealed at 760 – 820 °C and low oxygen partial pressure. We confirmed that pre-annealing step was to transform Bi-2212 orthorhombic structure from Bi-2212 tetragonal structure and to reduce the formation of second phases at superconducting wire. However Bi-2223 Phases were formed at higher pre-annealing temperature. And we controlled the sintering atmosphere – low oxygen partial pressure and air. The critical currents (J_c) of Bi-2223/Ag tapes were sintered at low oxygen partial pressure were higher than that of the wires sintered at air. In order to investigate the effect of rolling reduction ratio, Bi-2223/Ag HTS tapes were rolled with different reduction ratio. There were no clear difference of J_c and filaments shape with various rolling reduction ratio. The better filaments shapes of cross section area were appeared the lower reduction ratio tapes rolled with.

keywords : Bi-2223, pre-annealing, low oxygen partial pressure