

The Formation of Y123 and CuO Phases in Cu-sheath YBCO Thick Films

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We studied on the forming behavior of Y123 and CuO phases in the heat-treatment process of Cu-sheathed YBCO thick films. The thick films were prepared by screen-printing method with BaCO₃ and Y211 powders on Cu tapes. Heat treatment was performed at 930 °C in the tube furnace of air atmosphere for 60 sec, 90sec, 120 sec, 180 sec and 300 sec, respectively. We observed microstructure and phases of thick films by using optical microscope, X-ray diffraction (XRD) and SEM image analysis. During the heat treatment procedure, partial melting occurred rapidly in the printed layers by liquid reaction between CuO and precursor powders on Cu tapes, and then YBCO superconducting phases nucleated and grew in the thick films.

keywords : partial melting, Cu-sheath, YBCO thick films, screen printing