Proceedings of the Technical Session of Institute of Physics, Sri Lanka 5 (1989) c3

Fabrication Techniques of Crystal Orientation to Obtain a High Critical Current Desity in Ceramic Superconductors

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The practical use of a superconductor is mainly determined by the ability of the material to conduct a high critical current at the superconducting stage. Although the new Y-Ba-Cu-O ceramic superconductor has a high transition temperature (Y_c), the critical current density (J_c) in the bulk sintered samples is considerably low for practical applications. In this communication we report some fabrication techniques of crystal current. These techniques include hot-pressing, hot-extrusion, thin film deposition, tape casting and gradient sintering. The microstructural development during fabrication is also discussed.