

**EFFECT OF INTERMEDIATE ROLLING ON THE TRANSPORT PROPERTIES OF
(Bi_{1.6}Pb_{0.4})Sr₂Ca₂Cu₃O₁₀ SUPERCONDUCTOR
TAPES WITH NANO NiFe₂O₄ ADDITION**

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ABSTRACT

The effects of nano sized NiFe₂O₄ addition in (Bi_{1.6}Pb_{0.4})Sr₂Ca₂Cu₃O₁₀ (Bi2223) superconductor tapes were investigated. The (Bi_{1.6}Pb_{0.4})Sr₂Ca₂Cu₃O₁₀ powders were prepared by using coprecipitation technique and the tapes were prepared by using the powder-in-tube method (PIT). 0.01 wt% nano sized NiFe₂O₄ (13 nm) was added to the powders as this ratio of nano NiFe₂O₄ optimized the critical current density (J_c) of bulk samples based on our initial studies. The effects of intermediate rolling on the transport critical current density of the (Bi_{1.6}Pb_{0.4})Sr₂Ca₂Cu₃O₁₀-(NiFe₂O₄)_{0.01} tapes were investigated. The transport critical current density at 30 K was 17870 A/cm² for tapes sintered for 50 hours without intermediate rolling. Intermediate rolling up to two times increased the J_c at 30 K to 32700 A/cm². Intermediate rolling improved the J_c of the tapes by 83 % compared to tapes without intermediate rolling.

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