TRANSPORT CURRENT DENSITY PERFORMANCE OF DOPED TL1212 SUPERCONDUCTOR TAPES IN MAGNETIC FIELD

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ABSTRACT

Superconducting powder from high purity chemicals with nominal composition of Tlo.gBio.iSri.glno.iCaosiYo.iQ^Oy were used to fabricate Tl-1212/Ag superconducting tapes using the dip-coating (DC) method. The tapes were subjected to reannealing under different heating conditions where some of the tapes were subjected to intermediate mechanical rolling. Results showed that annealing temperature together with intermediate mechanical rolling (IR) could be optimized to increase T_c and 1212 phase formation and J_c of In-substituted Tl-1212/Ag tapes. The highest J_c was observed for the tape, which was reannealed at 910 °C for a total duration of 60 minutes and subjected to IR. The increased J_c could be due to the densification of superconducting core and the increase in 1212 phase after thermomechanical treatment. The performance of J_c of the tapes in external magnetic fields showed existence of weak links at low fields (< 0.2 T) followed by strong links which are dominant at higher fields.