

**THE INFLUENCE OF COOLING RATE ON THE CRITICAL CURRENT DENSITY OF BSCCO-2223 Ag-SHEATHED SUPERCONDUCTOR TAPES USING POWDERS PREPARED BY CO-PRECIPIATION METHOD**

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**ABSTRACT**

The influence of cooling rate after final reaction on the transport critical current density of Ag-sheathed  $\text{Bi}_2\text{Sr}_2\text{Ca}_2\text{Cu}_3\text{O}_x$  superconductor tapes prepared from fine powders is reported. The tapes were fabricated using the powder-in-tube (PIT) method. The critical temperature,  $T_c$  and transport critical current density,  $J_c$  were measured at liquid nitrogen temperature by standard four-probe method in conjunction with a CTI cryogenics Model 21 closed cycle refrigerator. A Philips XL-30 scanning electron microscope was used to record the microstructure of the sample. It was found that  $J_c$  for these tapes increased by 40% when slow cooled at  $1^\circ\text{C}/\text{min}$ . The 2223 phase generally align almost parallel to the current flow direction. SEM image also shows that larger grains size is visible in high critical current density tapes. We suggested that the decreased in  $J_c$  occur when cooled with slower rate than  $1^\circ\text{C}/\text{min}$  is because of the appearance of the 2212 phase by the decomposition of the 2223 phase.

<http://journal.massshp.net/wp-content/uploads/Journal/2004/Mahizah%20Ismail%2065-70.pdf>

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