

Effects of Partial Melting Heat Treatment on the Critical Current of BSCCO Tube

Jung-Suk Choi ^{*,a}, Byung-Hyuk Jun ^a, He-Rim Kim ^b, Ok-Bae Hyun ^b, Chan-Joong Kim ^a

^a *Korea Atomic Energy Research Institute*

^b *Advanced Technology Center, Korea Electric Power Research Institute, Daejeon, Korea*

$\text{Bi}_2\text{Sr}_2\text{Ca}_1\text{Cu}_2\text{O}_x$ (BSCCO 2212) tubes were fabricated by fault current limiter (FCL) and centrifugal melting process (CMP). BSCCO 2212 powder was melted in a Pt crucible and solidified in a rotating steel mold. The BSCCO 2212 tube samples were heat-treated by partial melting process. The current-voltage curves at 77K of the samples were obtained by transport measurement, and the microstructure was investigated by scanning electron microscope. It is found that critical current (I_c) of the BSCCO 2212 sample was dependent on the heating schedule regarding the grain growth of the BSCCO 2212 plates. The high I_c was obtained by the combination of slow cooling and isothermal holding of the samples at 850~880 °C which is just below of the partial melting temperature of Bi-2212.

Keyword: BSCCO 2212 tube, Centrifugal Melting Process, Fault Current Limiter, Partial Melting Process, Critical Current Density