Improvement of flux pinning properties of RCE-DR processed GdBa$_2$Cu$_3$O$_{7-\delta}$ coated conductors by post-annealing

Won-Jae Oh $^a$, Soon-Mi Choi $^a$, Jae-Hun Lee $^b$, Seung-Hyun Moon $^b$, Sang-Im Yoo $^{a,*}$

$^a$Department of Materials Science & Engineering and Research Institute of Advanced Materials (RIAM), Seoul National University, Seoul 151-744, Korea

$^b$Superconductor, Nano & Advanced Materials Corporation (SuNAM Co.) Ltd, Anseong, Gyunggi-do 456-812, Korea

We report the improved superconducting properties of GdBa$_2$Cu$_3$O$_{7-\delta}$ (GdBCO) coated conductors (CCs) by a post-annealing process. Following the stability phase diagram of GdBCO, GdBCO CCs fabricated by a reactive co-evaporation deposition & reaction (RCE-DR) process were post-annealed at various high temperatures of ~700°C in low oxygen pressures below 300 mTorr. In relation to $T_c$ and $J_c$ of as-deposited sample, those of GdBCO CCs could be improved with the optimal post-annealing condition. Post annealing process was proceeded from 5min to 2hour. It was found that the microstructure and superconducting properties of GdBCO CCs strongly depend on the post-annealing condition. In this presentation, details of the relationship among the post-annealing conditions, microstructure, and superconducting properties of GdBCO CCs are discussed.

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