

동시증발법을 이용한 SmBCO/IBAD-MgO 박막 장선재 제조

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Fabrication of long SmBCO coated conductor on IBAD-MgO template using co-evaporation method

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Abstract : We fabricated SmBCO coated conductors(CCs) on IBAD-MgO templates using co-evaporation method. IBAD-MgO templates consist of PLD-LMO/epi-MgO/IBAD-MgO/Ni-alloy and showed good in-plane texture of below FWHM 7 degree. Evaporation rates of Sm, Ba, and Cu were precisely controlled to get the optimum composition ratio after deposition process. To optimize the oxygen partial pressure of reaction region, wide range of the partial pressure was investigated from 1 mTorr to 15 mTorr. By reducing the oxygen partial pressure to 5mTorr, (103)grains in SmBCO layer have been increased. On the other hand, there were only (001)grains in SmBCO layer deposited at 15 mTorr O₂. Deposition temperature was also investigated from 600 °C to 800 °C to make high I_c SmBCO CCs. SmBCO on IBAD MgO template showed that the I_c increased gradually at higher growth temperature to 800°C, which the highest J_c and I_c is 2.6 MA/cm² and 500 A/cm-w., respectively.

Key Words : SmBCO, coated conductor, IBAD-MgO, critical current