

Effects of Heat-treatment Parameters of YBCO Film by TFA-MOD Process

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We fabricated YBCO coated conductors (CCs) by TFA-MOD process and evaluated microstructure, texture formation, and critical temperature (T_c) and current (I_c). YBCO precursor solution was synthesized using metal-trifluoroacetates and dip coated on LaAlO_3 (LAO) substrate. The phase formation and microstructure was characterized by X-ray diffraction and scanning electron microscopy (SEM) and the degree of texture was evaluated by pole-figure analysis.

The CC was heat-treated in various calcining temperatures (370°C-460°C) and firing temperatures (750°C-800°C). As fired at 775°C for 4h, the CC had highest T_c of 90.5 K and I_c of 40 A/cm-width ($J_c=2.0 \text{ MA/cm}^2$). Microstructural observation indicated that the second phase was effectively reduced and the full-width at half-maximum (FWHM) was approximately 7° under the optimum condition.

keywords : critical current, pole-figure, TFA-MOD process, trifluoroacetates, YBCO coated conductor

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