

Fabrication of the $\text{SmBa}_2\text{Cu}_3\text{O}_{7-\delta}$ Superconducting Thin Films on the $\text{LaAlO}_3(100)$ Single Crystalline Substrate by the TFA-MOD Method

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The trifluoroacetate-metal organic deposition(TFA-MOD) method has been developed as a low-cost non-vacuum process for coated conductor. Under the oxygen partial pressure(PO_2) of 10ppm and the firing temperatures ranging from 810 to 850°C, we have fabricated a high quality $\text{SmBa}_2\text{Cu}_3\text{O}_{7-\delta}$ (SmBCO) thin films on LaAlO_3 (LAO) (100) single crystalline substrates by a modified TFA-MOD method. The highest value of the critical temperature(T_c) was 90.2K, and the highest critical current density(J_c) was 0.8MA/cm² at 77K in the self-field, implying that MOD-processed SmBCO films can be a promising alternative to $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ (YBCO) films for coated conductors. We discuss the relationship between processing conditions, microstructures, and superconducting properties.

keywords : SmBCO, TFA-MOD, coated conductor

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