Effect of Sm Doping on Superconducting Properties of Y-123 Films Prepared by the MOD-TFA Process

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$(Y_{1-x}, Sm_x)Ba_2Cu_3O_{7-x}$(x=0 ~ 1) films have been prepared on $LaAlO_3$ (100) single-crystal substrates by the metalorganic deposition of trifluoroacetate precursors (MOD-TFA). The films showed superconductivity with the Tc above the boiling point of liquid nitrogen ranging 87 ~ 92.5 K regardless of Sm content. YBCO and SmBCO TFA precursor solutions using Y-, Sm-, Ba-, Cu-acetates were prepared separately and mixed to the desired doping content. The films were calcined to the temperature of 400°C in pure O_2 atmosphere followed by the high temperature annealing in the range of 750 – 800°C in an atmosphere of 100 ppm O_2 containing Ar with moisture. The dependence of Sm content on the microstructure and evolution of superconducting 123 phase, and magnetic field dependence of superconducting properties will be discussed.

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