Preparation of Re-123 Film by the MOD-TFA Process

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Abstract. Superconducting $ReBa_2Cu_3O_{7-x}$(Re=Sm, Nd, Eu, Y) films have been successfully fabricated on $LaAlO_3$ (100) single-crystal substrates by the metal organic deposition of trifluoroacetate precursors (MOD-TFA). The TFA precursor solutions were prepared using Re-, Ba-, Cu-acetates and ReBCO powders as starting materials. All the ReBCO films fired at temperature range of 750-800°C exhibit good crystallinity of c-axis without any second phases. Tc values of 87-91K were obtained when Re =Y, Sm, Eu, whereas NdBCO showed no Tc down to 77K. When final anneal was carried out at 750°C in a flowing high purity Ar gas(100 ppm oxygen) with various moisture content. The dependence of rare earth elements and microstructure and evolution of superconducting 123 phase, and magnetic field dependence of superconducting properties will be discussed.

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