

Enhancement of Critical Current Density of Ba, Ce-doped $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ Thin Films Deposited by TFA-MOD Method

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The effect of Ba and Ce addition on the properties of $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ (YBCO) thin film prepared on single crystal LAO substrate by a TFA-MOD method has been investigated. Precursor solution with cation ratios of Y:Ba:Cu=1:2:3 and Ba:Ce= 1:1 have been prepared in order to dope the BaCeO_3 in a stoichiometric solution. Coating solutions with the cation ratios of Y:Ba:Cu:Ce=1:2+x:3:x were prepared by mixing the separately prepared solutions. Coated films obtained by a dip coating were calcined at low temperature under a moisture-containing oxygen atmosphere. Superconducting YBCO films have been obtained by performing conversion heat treatment at temperature of $780^\circ\text{C}\sim 810^\circ\text{C}$ under a moisture-containing Ar (1,000 ppm oxygen) atmosphere. The critical current density showed highest value for the film prepared using a coating solution with 40% doping of BaCeO_3 . SEM and XRD observations showed that BaCeO_3 particles were formed for the film doped with large amount of Ba and Ce.

Keywords: flux pinning, BaCeO_3 , YBCO, metal organic deposition

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