Spray Pyrolysis using TFA Precursor for the Preparation of YBCO Thin Film

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TFA-MOD precursor has been used for spray pyrolysis in order to prepare a YBCO film thicker than 2 micron by a single coating. 0.1 mole coating solution was prepared by diluting TFA-MOD precursor using water. Coating solution was sprayed on a heated $LaAlO_3$ (100) single crystal substrate by using a concentric nebulizer. Ar was used as a nebulizing gas with a flow rate of 3500 sccm. The cation ratio of precursor solution was Y:Ba:Cu = 1:2:1. Film deposition has been carried out at a reduced pressure of 10 Torr. Substrate temperature was ranged from 500 to 900℃ and precursor solution was fed with a flow rate of 0.5~2ml/min. SEM observations showed that the thickness of coated film was 0.5~10 m. It is also seen that YBCO film was porous and the thickness uniformity was poor. XRD data showed that the spray coated film was consisted of CuO, Y_2O_3 and BaF_2. After conversion heat treatment at 800℃ for 12 hr under a humid Ar gas atmosphere containing 1000 ppm oxygen, a highly textured YBCO film has been formed with (00l) plans parallel to substrate plane.

Keywords : spray pyrolysis, YBCO, thick film, thickness uniformity

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