Preparation of YBCO Thin Film by Spray Pyrolysis Method Using the Various Precursor Solutions

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YBCO films have been deposited on LAO substrate and metal substrate by spray pyrolysis method using various precursor solutions. The ethanol was added to aqueous nitrate precursor solution. Non-aqueous precursor solution was prepared by dissolving Y-nitrate, Ba-acac and Cu-nitrate in DMF solvent. Aerosol droplets generated by a concentric spray nozzle were directly sprayed on substrate. The addition of ethanol did not lead to the improvement of the quality of the YBCO film deposited on LAO substrate and led to the formation of amorphous phases in the film deposited on metal substrate. In case of mixed precursor solution of nitrates and acetylacetonate, high quality c-axis oriented YBCO thin films were obtained on LAO substrate whereas the film deposited on metal substrate showed nearly zero I_c even though c-axis oriented YBCO film was developed. XRD and SEM observations showed the traces of reactions between metal substrate and YBCO film.

Keywords : spray pyrolysis, nitrate precursor, YBCO, J_c