

Preparation of $Y_1Ba_2Cu_3O_y$ Films by Using Nano-sized Oxide Precursors

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$Y_1Ba_2Cu_3O_y$ films have been prepared on $LaAlO_3$ (001) single crystal using nano-size oxide powders as starting precursors. Commercial Y_2O_3 and CuO powders with a size of ~ 30 nm were mixed with $BaCuO_2$ powder with a size of ~ 5 microns and ground using planetary ball mill for 4 hr with α -terpineol and 2-(2-butoxyethoxy)ethyl acetate as solvent. Obtained paste was coated on $LaAlO_3$ (001) single crystal using dip coating method and dried in air. Coated films were heated to 900-1000, held for 2 hrs and then cooled down to 800°C for 5 hrs followed by furnace cooling. SEM and XRD observations revealed that 2 micron-thick YBCO film was formed for the film heat treated at 900°C with a porous microstructure. The development of microstructure and phase formation will be discussed with processing parameters.

Keywords: nano-size oxide powder, coated conductor