

Deposition of YBCO thin Films on MgO Substrates by RF-sputtering Using $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$ Targets Prepared at Various Sintering Temperatures

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The effects of the target quality on the formation of $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$ (123) in the films deposited by a RF sputtering method. The target were prepared at sintering temperatures of 800 °C and 900 °C. The composition of the two targets estimated by SEM EDAX was closed to the stoichiometric 123 composition, but the grains size of the target prepared at 900 °C was slightly higher than that prepared at 800 °C. Using the two targets, the $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$ films were deposited at 900 °C on MgO single crystal substrates at RF power of 120W and O₂/Ar flowing ratio of 1/3 and then the films were annealed at 550 °C for 5 h for oxygen embedding. When using the 900 °C target, 123 film was not obtained, but epitaxially grown 123 films was obtained when using the 800 °C target. We will discuss the formation of 123 film in terms of the target quality.

Keywords : RF sputter, $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$ formation, target quality, epitaxial growth

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