

A Study on the Structural and Microwave Properties of $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ thin Films Grown on CeO_2 -buffered Nickel Tapes and Effect of Deposition Conditions on Structural Characteristics of CeO_2 Buffer Layers

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$\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ (YBCO) films grown on CeO_2 - buffered - Nickel tapes are prepared and their structural, electrical and microwave properties are measured. Nickel tape was made by RABiTS method. CeO_2 buffer layer is epitaxially deposited on nickel tape at 700°C , $\text{Ar} = 11$ mtorr. X-ray diffraction data revealed that the YBCO films are epitaxially grown along the c-axis. $T_C > 85\text{K}$, $\Delta T = 5\text{K}$ and $R(300\text{ K})/R(100\text{ K}) = 1.94$ are measured from the YBCO films. The YBCO films deposited on nickel tape have the surface resistance of $0.8\text{ m}\Omega$ at 77K , 8.5 GHz .

CeO_2 films are grown on r-cut sapphire with different sputtering gas conditions and their structural properties are measured. When $\text{Ar}/\text{O}_2 = 36/2$, CeO_2 film is epitaxially grown on r-cut sapphire substrate. X-ray diffraction data shows that the CeO_2 films are epitaxially grown and the typical FWHM of (200) Θ - 2Θ peak about $0.1^\circ \sim 0.2^\circ$, $\Delta\omega$ of (200) CeO_2 was 0.52° .

keywords : YBCO, Nickel tape, CeO_2 , deposition condition