

Mechanical Properties of YBCO Superconductor with Bi/CNT Composite Impregnation

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Bi/CNT composite was chosen to improve the mechanical properties of $\text{YBa}_2\text{Cu}_3\text{O}_7$ (YBCO) superconductor. In order to elucidate the effects of Bi/CNT composite in YBCO superconductors, melt texture superconductor were impregnated by mixed compound of Bi and CNT into the artificial holes parallel to the c-axis, which were drilled on the YBCO superconductor. Various amount of Bi/CNT was impregnated to YBCO superconductor with different holes diameters. Typically artificial holes diameters were 0.5, 0.7, and 1.0 mm respectively. We could know that Bi/CNT composite was reinforced into the crack, the void and the hole of YBCO bulk out of observing with the SEM. Result of three-point bending test measurement, the bending strength with Bi/CNT composite impregnation was improved up to 67 ~ 70MPa as compared with 50.79 MPa of Bi-compound free bulk. Bi/CNT composite impregnation has been found to be one of effective ways in improving the mechanical properties of bulk superconductor.

Keywords: YBCO superconductor, artificial hole, Bi/CNT composite, mechanical property