

**Improvement of the Superconducting Properties of High-temperature Superconductors  
with a Technique to Impregnate Bi-Pb-Sn-Cd Alloys and Resins**

Masaru TOMITA

Bulk RE-Ba-Cu-O materials have significant potential for various industrial applications. The maximum trapped-field values of bulk high-temperature superconductors are restricted by poor mechanical properties and low thermal conductivity rather than their superconducting properties. An improvement in mechanical properties and cryostability were essential to realize such applications. We developed a novel technique to dramatically improve the mechanical properties of bulk RE-Ba-Cu-O superconductors, for which epoxy resin was impregnated. We also developed a technique to impregnate Bi-Pb-Sn-Cd alloys into bulk superconductors with the aim of improvement of cryostability through increasing the thermal conductivity of bulk superconductors. As a result, 17.24T could be trapped, without fracturing, in a bulk Y-Ba-Cu-O sample at 29K. This is the highest trapped-field ever recorded in high-temperature superconductors.