

Study of growth in Bi₂Sr₂CaCu₂O_y single crystals

ABSTRACT

We put attention on Intrinsic Josephson Junction (IJJ) to study the fundamental physics for device applications. Convenient self-flux method was used to grow BSCCO single crystals. We investigated the lid effect to examine the single crystal growth of high TC (Critical Temperature). We found that for the crystal growth with no lid, two stage transitions of TC # 61 K and 77 K were observed. While for the crystal growth with lid, the BSCCO has TC # 80K, $T_C = 10K$ and approximately average size $5 \times 2 \text{ mm}^2$. When we increased weight of lid, the single crystal have increased to TC = 80K, $T_C = 4K$ and the typical size was $7 \times 3 \text{ mm}^2$. TC and the crystal growth show a tendency to increase by the effect of the lid. From observed quasi-particle characteristics, c-axis direction changed from semiconductor to intrinsic Josephson characteristic with decreasing temperature.