

AC Susceptibility of High- T_c Superconductor $\text{SmBa}_2\text{Cu}_3\text{O}_y$

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The polycrystalline $\text{SmBa}_2\text{Cu}_3\text{O}_y$ were synthesized by the solid state reaction method. The dependence of AC susceptibility on temperature and applied ac field was studied. The critical temperature T_c is about 92 K. As the ac field is increased, the slope and the value of real part of susceptibility become smaller and the peak position of imaginary part T_p was shifted to a lower temperature with peak broadening. Using Bean's model, we determined intergranular critical current density J_c and obtained 44 A/cm^2 at 75 K. From the relation of the $J_c(T)=(1-T/T_c)^\beta$, we obtained $\beta=0.8$ and found that the Josephson junction type of the $\text{SmBa}_2\text{Cu}_3\text{O}_y$ is SIS junction type. The peak of the imaginary part shifts to higher temperature with increasing frequency, f . From Arrhenius plot, we obtained the activation energy of about 0.96 eV.

keywords : Polycrystalline $\text{SmBa}_2\text{Cu}_3\text{O}_y$, AC susceptibility