

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

The effect of Sm substitution on properties of $Bi_{1.6}Pb_{0.4}Sr_2Ca_{2-x}Sm_xCu_3O_y$ superconductors. HUSEYIN AYDIN, Abant Izzet Baysal University, MUSTAFA YILMAZLAR, Sakarya University, OZGUR OZTURK, DINCER YEGEN, CABIR TERZIOGLU, Abant Izzet Baysal University — The effect of the partial substitution of Ca by Sm in the $Bi-2223$ superconducting samples have been investigated in terms of XRD, magnetoresistivity, critical temperature, transport critical current density, and ac susceptibility. The samples were prepared by the conventional solid-state reaction method. XRD patterns are used to calculate lattice parameters and obtain about Bi-2223 phase ratio. The volume fraction was determined from the intensities of Bi-2223 and Bi-2212 peaks. The room temperature XRD patterns of the samples showed the presence of Bi-2223 phase decreases with increasing the Sm content. We estimated the transition temperature, the activation energy values of the samples from the resistivity vs. temperature measurements in dc magnetic fields up to 0.6 T. We observed that transition temperature, T_c , and transport critical current density, $J_{c\,trans}$, depend on the Sm substitution. They both decrease with increasing the Sm substitution. Activation energy, U_0 , is calculated from resistivity versus temperature at various magnetic fields in both high temperature region and low temperature region. It is observed that U_0 depend on both the Sm content of samples and the applied magnetic field.

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Date submitted: 20 Nov 2006

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