

STUDY OF ZN DOPING IN UNDER DOPED AND OVER DOPED REGIMES CUPRATE PEROVSKITES

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ABSTRACT

The experimental results are presented Zn substitution in copper oxide superconductors has a strong influence on the critical temperature T_c and offers an opportunity to characterize the high-T, superconducting state. Most experimental and theoretical studies have been conducted to determine or explain the T_c depression as a function of Zn content. In this paper we show the results of resistivity measurements on the single crystals of Zn-substituted $YB_{a_2}Cu_3O_{7-y}$ (Y123) and $La_{2-x}Sr_xCuO_4$ (La214) with different levels of hole doping. How the Zn-induced residual resistivity varies with hole density and establish the depairing relation between T_c and the two-dimensional resistance which would serve as a constraint for various theoretical models. It is highlighted that Zn probe a remarkable difference in the electronic state between under doped and over doped superconducting regime.

KEYWORDS: Transport Properties, Effect of Crustal Defect, Doping and Substitution