SEARCH FOR NEW SUPERCONDUCTING PHASES IN THE Y-Ba-Cu-O AND Bi-Ca-Sr-Cu-O MIXTURES

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The discovery of high temperature superconductivity by Bednorz and Muller in 1986 has resulted in finding a number of superconductors based on Y, Bi and Tl compounds with Tc above 77K. It is also interesting to search for new superconductors in mixed phase systems consisting of these high Tc compounds. We have found a new superconducting system in the mixture prepared from the $YBa_2Cu_3O_{70x}$ and $Bi_2CaSr_2Cu_2O_{9-x}$ superconductors at 1 : 1 cation molar ratio. The new superconductor shows an onset of resistivity transition at 100 K and zero resistivity below 55 K. Powder diffraction pattern of the new system differs completely from those of the original Y and Bi superconductors. The compound prepared using the oxides/carbonates with identical cation molar ratios, on the other hand, does not exhibit superconductivity.