

SUPERCONDUCTIVITY STUDIES ON Tl-RE-Sr-Ca-Cu-O SYSTEM

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It is now well established that several perovskite based copper containing mixed oxides exhibit superconductivity with T_c above liquid nitrogen temperatures (77K). Four types of high temperature superconductors (HTSC) are known: i. $\text{YBa}_2\text{Cu}_3\text{O}_7$ ('123'), $T_c = 90\text{K}$, ii. $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_8$, $T_c = 80\text{K}$, iii. $\text{Tl}_2\text{Ba}_2\text{CaCu}_2\text{O}_8$, $T_c = 105\text{K}$ and $\text{Tl}_2\text{Ba}_2\text{Ca}_2\text{Cu}_3\text{O}_{10}$, $T_c = 125\text{K}$ and iv. $\text{Pb}_2\text{Sr}_2(\text{Ca}, \text{Y})\text{Cu}_3\text{O}_8$, $T_c \leq 77\text{K}$. Recently, superconductivity in the RE-Tl-Sr-Ca-Cu-O (RE=rare earth or Y) system with $T_c \sim 80-90\text{K}$ has been reported. However, the crystal structure and other details are not known. Presently we have synthesized several phases in the system RE-Tl-Sr-Ca-Cu-O with the nominal composition 12223 where Re=rare earth, Y and Th. We find that the T_c^{zero} ranges from 60-75K. Detailed results will be presented.