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Magnetic hysteresis studies of Tl-2223 substituted by Fe and Zn
ALY ABOU-ALY, RAMADAN AWAD, IBRAHIM IBRAHIM, Faculty of Science,
Alexandria, Egypt, AHMED FARAJ, Physics Department, Faculty of Science, BAU
University, Beirut. Lebanon — Effect of Fe and Zn substitutions on the magnetic
hysteresis of Tl-2223 are investigated in high magnetic fields up to 9 Tesla and at
different temperatures ($T= 6, 20, 40$ and 80 K). The results of magnetic hysteresis
loops show that the area of these loops decreases as Fe-content increases, whereas
it increases for Zn-substitutions till $x = 0.2$ and then decreases for $x > 0.2$. The
magnetization difference ΔM is found to decay exponentially with temperature at
low magnetic fields, according to $\Delta M \propto \exp(-T/T_0)$. The characteristic temperature
 T_0 is found to be varied from 6 K to 40 K and it is related to the applied magnetic
field B according to $T_0 \propto B^{-1/n}$. The critical current density is calculated for the
prepared samples from magnetic hysteresis measurements and compared with that
determined from ac magnetic susceptibility. The results are discussed according to
the flux motion and flux pinning.

Aly Abou-Aly
Faculty of Science, Alexandria, Egypt

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