

EFFECT OF NANOSIZE MgO PARTICLES ADDITION ON FORMATION AND SUPERCONDUCTIVITY OF $Tl_{0.9}Bi_{0.1}Sr_{1.95}Ta_{0.05}Ca_{0.9}Y_{0.1}Cu_2O_{7-\delta}$ CERAMICS

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ABSTRACT

In this paper, nanosize MgO particles were added to $Tl_{0.9}Bi_{0.1}Sr_{1.95}Ta_{0.05}Ca_{0.9}Y_{0.1}Cu_2O_{7-\delta}$ superconductor in various weight fraction between 0 wt.% to 0.8 wt.% before sintering using the conventional solid state synthesis method. The phase formation and the microstructure of the samples were studied by XRD and SEM, respectively. The highest critical temperature $T_{c,zero}$ of 80 K was observed at 0.2 wt.% MgO and T_c was gradually suppressed for higher MgO additions. The effect of the MgO addition on J_c revealed maximum J_c at 0.2 wt.% MgO addition. SEM investigations revealed no difference in microstructure for the pure sample and the MgO added samples. The results showed that a small amount of MgO addition (0.2 wt.%) in Tl-1212 enhanced J_c and this is suggested as due to increased flux pinning in the sample due to the MgO addition.

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REFERENCES

- [1] W.Weil, J.Schwartz, K.C Goretta, U.Balachandran, A.Bhargava (1998); Physica C 298 279-288.
- [2] M. Annabi, A. M'chirgui, F.Ben Azzouz, M. Zonuaoui, M .Ben Salem (2004); Physica C 405 25.
- [3] E.Guilmeau, B.Andrzejewski and J.G Noudem (2003); Physica C 387 382S.
- [4] Y.C Guo,Y.Tanaka, T.Kuroda, S.X Dou, Z.Q.Yang (1999); Physica C 311 65.
- [5] Z.Y.Jia, H.Tang,Z.Q Yang, Y.T Xing,Y.Z Wang,G.W.Qiao (2000); Physica C 337 130..
- [6] P.E. Kazin, M.Jansen, A.Larrea, G.F de la Fuente, Yu.D. Tretyakov (1995); Physica C 253 391.
- [7] S.K Chen, K.T Lau, R. Abd-Shukor (2002); Material Science and Engineering B90 234-240.