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Enhancement of (Bi,Pb)-2223 HTS Formation by Boron-Doping

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Abstract

Influence of boron-doping on the superconducting properties of (Bi,Pb)-2223 HTS ceramics prepared in an alumina crucibles has been investigated. X-ray diffraction, resistivity, and AC susceptibility measurements were performed on the undoped and boron-doped compounds. Obtained results have shown that B_2O_3 addition in the $Bi_{1.7}Pb_{0.3}Ca_2Sr_2Cu_3O_y$ precursor enhances the formation of high-T_c phase. The boron-doped samples with starting composition $Bi_{1.7}Pb_{0.3}Ca_2Sr_2Cu_3B_xO_y$ (x=0.05 and 0.5) reveal significant improvement in the zero resistivity temperature compared to the undoped sample (from 72 K up to 100 K). Boron-doping level x=1.5 results in a substantial degradation of the (Bi,Pb)-2223 phase.

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References

1. Michel, C., Hervieu, M., Borel, M.M., Grandin, A., Deslandes, F., Provost, J., Raveau, B.: Z. Phys. B **68**, 421 (1987)

2. Maeda, H., Tanaka, Y., Fukutomi, M., Asano, T.: Jpn. J. Appl. Phys. **27**, L209 (1988)

3. Liang, B., Bernhard, C., Wolf, Th., Lin, C.T.: Supercond. Sci. Technol. **17**, 731 (2004)

4. Eltsev, Y., Lee, S., Nakao, K., Tajima, S.: Supercond. Sci. Technol. **23** (2010). doi:10.1088/0953-2048/23/5/055007

5. Takano, M., Takada, J., Oda, K., Kitaguchi, H., Miura, Y., Ikeda, Y., Tomii, Y., Mazaki, H.: Jpn. J. Appl. Phys. **27**, L1041 (1988)

6. Watanabe, K., Kojima, M.: Supercond. Sci. Technol. **11**, 392 (1998)

7. Smrckova, O., Sykorova, D., Petrydes, D., Vasek, P.: Int. J. Mod. Phys. B **13**, 3729 (1999)

8. Eremina, E.A., Kravchenko, A.V., Kazin, P.E., Tretyakov, Y.D., Jansen, M.: Supercond. Sci. Technol. **11**, 223 (1998)

9. Khavronin, V.P., Luzianin, I.D., Ginzburg, S.L.: Phys. Lett. A **129**, 399 (1988)

10. Schlenoff, J.B., Rink, W.J., Seger, L.: Physica C **180**, 387 (1991)

11. Gimenez, J.M.A., Grandini, C.R., dos Santos, D.I.: Supercond. Sci. Technol. **19**, 813 (2006)

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