

Effects of Propane-1, 2, 3-Triol Doping on the Superconducting Properties of MgB₂

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Significant improvement in the critical current density (J_c) of a MgB₂ superconductor by a carbon doping has been reported. In this study, glycerin and toluene were used as a carbon source for a doping. Boron powder was first mixed thoroughly in glycerin and toluene by a ultrasonic followed by a drying in a vacuum oven. The aim was to achieve a homogenous mixing between the dopant and the boron powder. After a drying, bulk samples were prepared by mixing the obtained mixture with an appropriate amount of magnesium powder, followed by heat treatments at temperatures between 650°C and 1000°C for 30 min in a flowing Ar atmosphere. Preliminary results show an enhancement in the J_c at high fields when the boron powder was pre-treated with a glycerin addition. The critical temperatures and the critical current densities of the glycerine added MgB₂ at various annealing temperatures will be presented and discussed.

Keywords: carbon source, critical current density

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