Enhanced critical current densities in MgB2 by mixing relatively impure boron powders.

ABSTRACT

Polycrystalline MgB2 samples were prepared from 99.98% purity Mg powder and different mixtures of relatively impure boron (99% pure crystalline boron and 95–97% amorphous boron) precursor powders. At both 6 and 20 K, for the mixed boron samples a doubling in Jc was observed over the highest values for single precursor samples. It is shown that the enhanced Jc results from the mixing effect of using different reaction rates of the different boron precursor powders. The work represents a cost-effective means of significantly improving current carrying Performance in MgB2 conductors.

Keyword: Polycrystalline MgB; Precursor powder; Polycrystalline; Boron powder