

## Fabrication and Characterization of MgB<sub>2</sub> Superconductor by Addition of Polyacrylic Acid

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We fabricated the carbon doped MgB<sub>2</sub> bulks by addition of polyacrylic acid (PAA) as a C source and evaluated variation of the lattice parameter, grain size, electrical connectivity, microstructure, and critical properties of MgB<sub>2</sub> bulks. The boron powder and PAA were mixed in NN-dimethylformamide and then the solvent was burnt out at 200°C. The carbon treated boron powder was mixed with magnesium powder and the mixture was compacted by uniaxially pressing at 500 MPa, followed by sintering at 900°C for 1 h in high purity Ar atmosphere. The phase formation, lattice change, and microstructure were characterized and correlated with the  $T_c$  and  $J_c$  variations.

Microstructure was observed by scanning electron microscopy (SEM) and phase confirmation was performed by high resolution x-ray diffraction (HR-XRD). The critical temperature ( $T_c$ ) and critical current density ( $J_c$ ) were measured by the standard four-probe method in cryostat and magnetic property measurement system (MPMS), respectively. We observed that the lattice parameters and  $J_c$  were significantly dependent on the amount of PAA addition.

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