Fabrication and Characterization the of Ex-Situ Processed MgB$_2$ Wires for Improved Critical Properties


$^a$ School of Advanced Materials Science and Engineering, Sungkyunkwan University, Suwon, Gyeonggi, Korea
$^b$ Neutron Science Division, Korea Atomic Energy Research Institute, Daejeon, Korea

The ex-situ processed MgB$_2$ wires were fabricated with C-doped MgB$_2$ powder as a precursor for enhancement of the core density and critical current density of the wires. The C-doped powder was prepared with Mg, B, and C powders by the in-situ technique, which was subsequently used for the C-doped MgB$_2$ wires by the ex-situ technique using the powder-in-tube method as a function of carbon content (MgB$_2$$_x$C$_x$: x=0, 0.01, and 0.03). In addition, we added additional Mg in the ex-situ process as a sintering agent. The phase formation, lattice change, and microstructure were characterized and their correlations with the $T_c$ and $J_c$ variations will be presented.

Keywords: carbon, critical properties, doping, ex-situ process, MgB$_2$

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