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Upper Critical Field in C-Doped MgB2 Thin Films and Coated Fibers V. FERRANDO, J. CHEN, P. ORGIANI, A.V. POGREBNYAKOV, X.X. XI, QI LI, Department of Physics, Penn State, University Park, PA, J. REDWING, Department of Materials Science and Engineering, Penn State University — We have studied H_{c2} and its anisotropy γ of C-doped MgB_2 thin films grown on (0001) SiC single crystal substrates and SiC/W fibers by hybrid physical-chemical vapor deposition (HPCVD). Residual resistivity increases systematically with doping, but Tc is not affected seriously. The H_{c2} in both direction was found to increase with increasing residual resistivity. In the field range between 1 - 9 T, the slope of $Hc_2^{\perp ab}$ (T) increases from about 0.1Tesla/K to1.1Tesla/K and the slope of $Hc_2^{//ab}$ (T) increases from about 0.6 T/K to 2.2 T/K. The temperature dependence of the anisotropy changes dramatically with the doping level. In the fiber samples, large upper critical field similar to $Hc_2^{//ab}$ (T) in thin films was obtained. The results measured in pulsed higher magnetic fields (60T) will also be presented. The effects will be compared with the recent theoretical predictions on two band superconductors.

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