

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**Effects of Carbon Doping and Neutron Irradiation on MgB<sub>2</sub>**

R.H.T. WILKE, S.L. BUD'KO, P.C. CANFIELD, D.K. FINNEMORE, Ames Laboratory, Iowa State University and Department of Physics and Astronomy, Iowa State University, RAYMOND J. SUPLINSKAS, Specialty Materials, Inc., S.T. HANNAHS, National High Magnetic Field Laboratory, Florida State University, J. FARMER, Missouri University Research Reactor, University of Missouri — We have irradiated Mg(B<sub>0.962</sub>C<sub>0.038</sub>)<sub>2</sub> with thermal neutrons and performed post exposure annealing studies to probe the interplay between two different sources of defects. Carbon is believed to act as a point defect, enhancing H<sub>c2</sub> due to an increase in scattering in the  $\pi$  band, without significantly enhancing flux pinning. Neutron damage studies on pure MgB<sub>2</sub> wire segments show a suppression of H<sub>c2</sub> that approximately scales with T<sub>c</sub>, and an increase in the critical current density at low fields. Irradiation of carbon doped fibers results in a similar scaling of the enhanced H<sub>c2</sub> with T<sub>c</sub>, and the cumulative effects enhance J<sub>c</sub> at intermediate fields.

R.H.T. Wilke

Date submitted: 30 Nov 2004

Electronic form version 1.4