Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Towards the development of a high quality doped boron precursor and the effect on the superconducting properties of MgB_2 JAMES MARZIK, Specialty Materials, Inc., ALBERT KUMNICK, Specialty Materials, Inc. — Gas phase plasma synthesis techniques were used to produce nano-sized doped boron powder from vapor phase precursors. The powders were reacted with magnesium to make MgB_2. The measurement of the resultant superconducting properties suggests that boron made by this synthetic method may result in MgB_2 superconductors with enhanced critical currents and upper critical fields. The values of J_c and H_{c2} obtained using plasma synthesized boron precursors are compared with those values for MgB_2 obtained using crystalline and amorphous boron powder made by other techniques, as well as boron fiber made by chemical vapor deposition. The roles of processing temperature and time, particle and grain size, purity, dopant concentration, and chemical homogeneity are evaluated in terms of their relative effects on the critical current and upper critical field of MgB_2.

James Marzik
Specialty Materials, Inc.

Date submitted: 30 Nov 2005 Electronic form version 1.4