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## **Doping of natural diamond powder with boron to increase its hydrogen storage capacity**

Christian Alvarez and Tushar K. Gosh

Have you asked yourself what will happen when we run out of fossil fuels, where will our electric power come from, how would we be able to transport ourselves over long distances? Think about what will happen to our economy and our way of life. The answer may be hydrogen. In a recent visit to a hydrogen fueling station in Washington D.C. [<http://www.whitehouse.gov/news/releases/2005/05/20050525-1.html>], President Bush said that "hydrogen is the wave of the future" and he further stated that "We're spending about \$1.2 billion on hydrogen research". The purpose of this research was to dope natural diamond powder with Boron to improve the hydrogen storage capabilities of diamond. Previous studies by the researchers from Nuclear Science & Engineering Institute, University of Missouri-Columbia have shown that diamond powder can store about 2% by weight hydrogen. It is hypothesized that the hydrogen storage capacity can be further enhanced by creating more micro-pores in diamond. In this study, we doped diamond with boron first at high temperature and then irradiated at MURR in a neutron flux to create more micro-pores. It is expected that this treatment will increase the storage capability of hydrogen, hopefully enough to meet the requirements of the US Department of Energy (DOE)'s goal of 6% weight percent hydrogen.