

# Hydrogen Absorption on Irradiated Carbon and Other Materials

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This presentation does not contain any proprietary or confidential information.

Project ID #STP54

# Overview

## Timeline

- Project start date:  
2005
- Project end date:  
2009

## Budget

- Funding for FY05:  
not yet funded

## Consultant

- Dr. R.J. Hanrahan,  
University of Florida

# Objectives

To investigate a novel approach for enhancing the physi-/chemi-absorption of hydrogen on selected powdered forms of carbon and boron nitride, with the goal of meeting DOE 2010 guidelines for hydrogen storage.

# Approach

The electronic environment at surface and interior sites is excited and activated by penetrating radiation thus preparing the sites for quasi-bonding of hydrogen.

# Technical Accomplishments/ Progress/Results

- The experimental set-up (gas handling manifold, pressurized sample cartridges and modification of irradiation facility) has been completed.
- System calibration is underway.
- The first sample irradiation is now in progress.

# Future Work

- Measure the amount of retrievable hydrogen gas (as a function of temperature) upon loading (at reasonable temperatures and pressures) on to irradiated powders.
- Extend approach to other carbon allotropes and boron/nitrogen containing solids.

# Hydrogen Safety

The most significant hydrogen hazard associated with this project is:

Slow hydrogen leak in gas manifold/sample cartridge and valves/regulators resulting in the accumulation of a pocket of combustible hydrogen.

# Hydrogen Safety

Our approach to deal with this hazard is:

- Use adequate room ventilation with exhaust to exterior.
- Place hydrogen sensors/alarms at appropriate sites in laboratory area.
- Maintain a regimen of safe laboratory practices.