Searching out the keys to hydrogen storage

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A multi-organizational Department of Energy program is developing a class of materials intended to store hydrogen safely and economically aboard a vehicle.
The DOE Center of Excellence for the development of reversible metal hydrides materials consists of nine universities, five other national laboratories, and three industrial companies, with Sandia serving as laboratory lead and coordinator of R&D. It is undertaking $30 million of research and development in a five-year period.

Created as part of a "Grand Challenge" introduced by the DOE in 2003, the center was established at Sandia California (Livermore, Calif.) in October, 2004. Basic science in hydrogen storage has been part of Sandia's R&D portfolio for more than 45 years.

The center brings together scientists and institutions with strong and focused capabilities in several research areas. Partnered are four national laboratories (Sandia, Brookhaven National Laboratory, Jet Propulsion Laboratory, and NIST); Nine universities (University of Hawaii, University of Pittsburgh, Carnegie Mellon University, University of Nevada-Reno, University of Illinois-Urbana-Champaign, University of Utah, California Institute of Technology, Stanford University and The University of Missouri St. Louis); and one industrial company (HRL Laboratories).

The study of a promising new class of hydrides, complex metal hydrides, is a key stepping stone in clearing the hydrogen storage riddle. Storage is widely considered one of the most important keys to success in the commercial use of hydrogen as a clean fuel -- especially in powering vehicles, where weight, volume, and cost are of particular importance.

Hydrides can absorb hydrogen in a small volume and release it later. Sandia researchers have developed a promising new class of hydrides called complex metal hydrides, which operate at pressures and temperatures that are close to ambient conditions, making them highly promising for developing future onboard hydrogen storage systems.

The group is focusing on achieving or exceeding the DOE's hydrogen storage targets through novel materials development, supported by its strengths in fundamental and applied materials science.

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