

Researchers create catalysts for use in hydrogen storage materials

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A team of scientists from Virginia Commonwealth University, the University of Uppsala in Sweden, and the Savannah River National Laboratory have identified that carbon nanostructures can be used as catalysts to store and release hydrogen, a finding that may point researchers toward developing the right material for hydrogen storage for use in cars.

Scientific findings indicate that hydrogen has all the makings of an ideal alternative fuel because it is clean, renewable and abundant, but there are challenges to safely and efficiently store it.

"Currently there are no [hydrogen storage](#) materials that meet industry requirements. Our work paves the way to design and synthesize new and improved catalysts for the dehydrogenation of complex hydrides, taking us one step closer to finding the right material for hydrogen storage," said Puru Jena, Ph.D., distinguished professor in the VCU Department of Physics.

According to Jena, complex hydrides are a class of materials that have shown promise for the storage of hydrogen. Because complex hydrides are not reversible and removing hydrogen from them is difficult at temperatures less than 100°C, catalysts are needed to improve the reaction rates. However, previous studies indicate that the addition of catalysts creates defects in the hydrides.

The experimental group led by Ragaiy Zidan, Ph.D., a researcher at the

Savannah National Laboratory, developed a solvent technique which allowed the introduction of carbon fullerenes and [nanotubes](#) without introducing any defects and also functioned as catalysts. Jena and the team at the University of Uppsala led by Rajeev Ahuja, Ph.D., performed [theoretical calculations](#) to illustrate the mechanism of how these catalysts work.

More information: The study appears online and in the journal [Nano Letters](#). Article abstract -- pubs.acs.org/doi/abs/10.1021/nl803498e

Source: Virginia Commonwealth University

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