FROM... ScienceDaily®
Your source for the latest research news

Science News

from research organizations

A 'fairly simple' breakthrough makes accessing stored hydrogen more efficient.

Date: February 10, 2022
Source: DOE/Ames Laboratory
Link: https://www.sciencedaily.com/releases/2022/02/220210114038.htm

Summary:

A new catalyst extracts hydrogen from hydrogen storage materials easily and efficiently. The process occurs at mild temperatures and under normal atmospheric conditions, without using metals or additives.

FULL STORY

A new catalyst from the U.S. Department of Energy's Ames Laboratory and collaborators extracts hydrogen from hydrogen storage materials easily and efficiently. The process occurs at mild temperatures and under normal atmospheric conditions, without using metals or additives. The breakthrough offers a promising new solution that addresses a long-standing challenge to adopting hydrogen fuel for transportation and other applications.

Hydrogen fuel is one potential solution in the nationwide effort to decrease reliance on fossil fuels. According to the DOE, improving hydrogen storage is key to advancing hydrogen fuel cell technologies. At Ames Laboratory, scientists Long Qi and Wenyu Huang research the extraction of hydrogen from a class of materials called liquid organic hydrogen carriers, or LOHCs.

One of the ways to store hydrogen is chemically. Chemical storage relies on materials that react with hydrogen molecules and store them as hydrogen atoms, such as in LOHCs. This type of storage allows large amounts of hydrogen to be stored in small volumes at ambient temperatures. However, for the hydrogen to be useful, catalysts are needed to activate LOHCs and release the hydrogen. This process is called dehydrogenation.

Qi explained that currently there are other dehydrogenation methods, but they raise some challenges. Some methods rely on metal-based catalysts, which involve critical platinum group metals. Supplies of these metals are limited and expensive. Other methods require additives to release the hydrogen. The additives are not reusable and result in a higher overall cost because they need to be added in each cycle.

Read the Rest of the Story at LINK: https://www.sciencedaily.com/releases/2022/02/220210114038.htm