

Putting the fuel in fuel cells

September 12 2006

Ammonia borane holds promise as a chemical compound to store and release hydrogen in fuel cell-powered vehicles – and it appears stable enough to offset some safety concerns. These findings were presented by Pacific Northwest National Laboratory researcher Scot Rassat at the national meeting of the American Chemical Society.

High efficiency fuel cells are envisioned as a way to reduce dependence on foreign oil and reduce harmful gas emissions – but they require hydrogen as a power source.

For its relatively light weight, ammonia borane contains a large fraction of hydrogen that can be released as a gas – and it is a stable solid at room temperature. This material can release hydrogen for fuel cell operation by heating it to temperatures near the boiling point of water.

But how does the material hold up to warm temperatures – for example, in a car parked in the hot desert sun? PNNL and Rohm and HAAS Company researchers measured heat flow and temperature over several days to evaluate potential safety issues associated with premature release of hydrogen gas when fuel is stored on-board at relatively high temperatures.

The experiments and calculations both indicate that the stability of ammonia borane relates to its purity and that it can remain stable for many days or longer in high temperatures.

Their research also will help determine if auxiliary cooling is required to

minimize the inadvertent release of hydrogen in the tank and keep the vehicle safe.

Source: Pacific Northwest National Laboratory

Citation: Putting the fuel in fuel cells (2006, September 12) retrieved 16 April 2024 from <https://phys.org/news/2006-09-fuel-cells.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.