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### Making society independent of fossil fuels - Danish researchers reveal new technology - 07.09.05 [Print](#)

Scientists at the Technical University of Denmark have invented a technology which may be an important step towards the hydrogen economy: a hydrogen tablet that effectively stores hydrogen in an inexpensive and safe material.

With the new hydrogen tablet, it becomes much simpler to use the environmentally-friendly energy of hydrogen. Hydrogen is a non-polluting fuel, but since it is a light gas it occupies too much volume, and it is flammable. Consequently, effective and safe storage of hydrogen has challenged researchers world-wide for almost three decades. At the Technical University of Denmark, DTU, an interdisciplinary team has developed a hydrogen tablet which enables storage and transport of hydrogen in solid form.

"Should you drive a car 600 km using gaseous hydrogen at normal pressure, it would require a fuel tank with a size of nine cars. With our technology, the same amount of hydrogen can be stored in a normal gasoline tank", says Professor Claus Hviid Christensen, Department of Chemistry at DTU.



*Dr. Tue Johannessen*

The hydrogen tablet is safe and inexpensive. In this respect it is different from most other hydrogen storage technologies. You can literally carry the material in your pocket without any kind of safety precaution. The reason is that the tablet consists solely of ammonia absorbed efficiently in sea-salt. Ammonia is produced by a combination of hydrogen with nitrogen from the surrounding air, and the DTU-tablet therefore contains large amounts of hydrogen. Within the tablet, hydrogen is stored as long as desired, and when hydrogen is needed, ammonia is released through a catalyst that decomposes it back to free hydrogen. When the tablet is empty, you merely give it a "shot" of ammonia and it is ready for use again.

"The technology is a step towards making the society independent of fossil fuels" says Professor Jens Nørskov, director of the Nanotechnology Center at DTU. He, Claus Hviid Christensen, Tue Johannessen, Ulrich Quaade and Rasmus Zink Sørensen are the five researchers behind the invention. The advantages of using hydrogen are numerous. It is CO2-free, and it can be produced by renewable energy sources, e.g. wind power.

"We have a new solution to one of the major obstacles to the use of hydrogen as a fuel. And we need new energy technologies – oil and gas will not last, and without energy, there is no modern society", says Jens Nørskov.

Together with DTU and SeeD Capital Denmark, the researchers have founded the company Amminex A/S, which will focus on the further development and commercialization of the technology.

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