

# Nature inspires research to convert solar into liquid fuel

October 23 2012

---

It has long been a dream of scientists to use solar energy to produce chemicals which could be stored and later used to create electricity or fuels.

A recent scientific breakthrough is providing hope that this may soon be possible.

The development would offer many benefits, including the ability to store chemicals until needed - current solar [power technology](#) has difficulties in this area.

In the laboratory, a new technology mimics photosynthesis, the process used by plants, by combining sunlight and water in such a way that promises storable fuels.

The "solar to chemical energy conversion" process is outlined in an article just published in a prominent journal, [Nature Photonics](#), authored by RMIT University researcher Associate Professor Yasuhiro Tachibana, from the School of Aerospace, Mechanical and [Manufacturing Engineering](#).

Inspired by [photosynthesis](#), in which oxygen and carbohydrates are produced from water and carbon dioxide, the newly developed technology emulates this process using man-made materials.

According to Associate Professor Tachibana, it remains a challenge to

construct a device capable of producing molecular fuels like hydrogen at a scale and cost able to compete with fossil fuels.

The key to improving efficiency will be in the development of new "nano-materials" (microscopically small components), along with efficient control of charge transfer reaction processes, and improvement to the structure of devices.

Recent developments in the field of nanotechnology have been leading to promising improvements in cost and effectiveness of the conversion process, Associate Professor Tachibana said.

"Our future scientific goal is to establish a solar [water splitting](#) system operated only by abundant sunlight and [sea water](#)," Associate Professor Tachibana remarked.

"Fortunately these resources are freely available on this blue planet."

Professor Xinghuo Yu, Director of RMIT's Platform Technologies Research Institute, said the latest research was significant, but challenges remained in how to translate laboratory-scale academic research into a practical, economically viable technology.

In addition to using solar energy, other commercially available renewable energy sources like wind and tidal power could also conceivably be applied, Professor Yu said.

Provided by RMIT University

Citation: Nature inspires research to convert solar into liquid fuel (2012, October 23) retrieved 26 April 2024 from <https://phys.org/news/2012-10-nature-solar-liquid-fuel.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.