

Unprecedented efficiency in producing hydrogen from water

December 4 2006

Scientists are reporting a major advance in technology for water photooxidation ◆ using sunlight to produce clean-burning hydrogen fuel from ordinary water. Michael Gratzel and colleagues in Switzerland note that nature found this Holy Grail of modern energy independence 3 billion years ago, with the evolution of blue-green algae that use photosynthesis to split water into its components, hydrogen and oxygen.

Gratzel is namesake for the Gratzel Cell, a more-efficient solar cell that his group developed years ago. Solar cells produce electricity directly from sunlight. Their new research, scheduled for publication in the Dec. 13 issue of the weekly *Journal of the American Chemical Society*, reports development of a device that sets a new benchmark for efficiency in splitting water into hydrogen and oxygen using visible light, which is ordinary sunlight.

Previously, the best water photooxidation technology had an external quantum efficiency of about 37 percent. The new technology's efficiency is 42 percent, which the researchers term "unprecedented." The efficiency is due to an improved positive electrode and other innovations in the water-splitting device, researchers said.

Source: American Chemical Society

Citation: Unprecedented efficiency in producing hydrogen from water (2006, December 4)

retrieved 26 April 2024 from

<https://phys.org/news/2006-12-unprecedented-efficiency-hydrogen.html>

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