Researchers report fuel cell breakthroughs

'Simplicity' of cheaper materials and solar power 'is amazing,' says official

Associated Press, updated 2:51 p.m. CT, Thurs., July. 31, 2008

WASHINGTON - Less costly methods for producing oxygen from water have been developed by researchers in the U.S. and Australia, possibly setting the stage for more use of fuel cells to produce energy. Fuel cells have been touted as an important future source of energy. They combine hydrogen and oxygen to produce power without any damaging pollution. Expensive platinum has been used as a catalyst in the process of producing oxygen previously, but the new research substitutes more common chemicals.

The two independent developments are reported in Friday's edition of the journal Science. In one study, chemist Daniel Nocera of the Massachusetts Institute of Technology added cobalt and phosphates to neutral water and then inserted a conductive-glass electrode. When the researchers applied an electrical current, a dark film formed on the electrode from which tiny pockets of oxygen began to appear, eventually building into a stream of bubbles. That raises the possibility of using solar energy to generate the electricity in daytime and using excess power to get oxygen from water, which could then be stored for use in producing energy when the sun wasn't shining.

"The discovery has enormous implications for the large scale deployment of solar since it puts us on the doorstep of a cheap and easily manufactured storage mechanism," Nocera said in a statement. "The simplicity of this process is amazing," added Luis Echegoyen, director of the National Science Foundation's chemistry division. "Using common and affordable elements, and a glass of water, these chemists may have given us a future way to efficiently obtain oxygen by splitting water." Nocera's process could still be a decade away from commercial use since the exact mechanism driving the reactions is not yet known.

In the second report, researchers led by Bjorn Winther-Jensen at the Australian Centre for Electromaterials Science, developed an electrode that consists of a conducting polymer on a Goretex membrane.

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