

Less expensive fuel cell may be possible

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Scientists at Los Alamos National Laboratory have developed a new class of hydrogen fuel-cell catalysts that exhibit promising activity and stability. The catalysts are made of low-cost nonprecious metals entrapped in something called a heteroatomic-polymer structure, instead of platinum materials typically used in fuel cells.

In research published recently in the scientific journal *Nature*, Los Alamos scientists Rajesh Bashyam and Piotr Zelenay describe tests conducted on a cobalt-polypyrrole-carbon (Co-PPY-XC72) composite. The composite, consisting of cobalt, polymer and carbon, was developed in research aimed at developing low-cost non-platinum catalysts for the polymer electrolyte fuel-cell (PEFC) cathode.

While the electrical energy producing activity of the catalyst is lower than that of platinum-based catalysts used in polymer electrolyte fuel cells, the new material shows exceptional performance stability for over one hundred hours of continuous testing, a result never before obtained with non-precious metal catalysts in PEFCs.

"Besides being made of inexpensive and environmentally benign materials," said Zelenay, "the chief advantage of these composite catalysts for oxygen reduction is that they can operate in the acidic environment of the polymer electrolyte fuel cell."

Bashyam and Zelenay are investigating the nature of catalysts in a variety of composites. They are also part of a larger Laboratory effort aimed at developing new catalyst and electrode structures that could increase the

current output from fuel cells.

According to Ken Stroh, program manager for the Los Alamos fuel-cell effort, "The two biggest obstacles in making a commercially viable fuel cell have traditionally been high cost and inadequate durability. Our focus at Los Alamos is to attack those obstacles as a system in which you simultaneously strive for lower costs and higher durability."

Source: Los Alamos National Laboratory

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