

3M Scientist Mark Debe Wins Department of Energy R&D Award Citing Advances in Hydrogen Fuel Cell Development for Vehicles

The U.S. Department of Energy (D.O.E.) has presented its 2006 Hydrogen Program R&D Award for Outstanding Achievement in Fuel Cell R&D to 3M senior staff scientist Mark Debe.

Dr. Debe is heading a 3M research team operating under a cooperative agreement between the D.O.E. and 3M to improve the performance, cost and durability of membrane exchange assemblies (MEAs), a critical component of hydrogen fuel cells. The team's goal is to develop MEAs that will help make fuel cells a practical option for powering cars and other vehicles by the next decade.

MEAs convert hydrogen fuel and air into electricity and water in the fuel cell system. At several recent fuel cell industry conferences, Dr. Debe's team has reported that coating membranes with 3M's nanostructured, thin-film electrocatalyst has produced more robust performance with less platinum by reducing the loss of surface area under repetitive high-voltage cycling. The new catalyst also completely eliminates the carbon corrosion that affects conventional electrocatalysts.

In addition, the team has reported on a new 3M membrane, developed in part under the cooperative agreement, that meets 5,000-hour-lifetime targets under laboratory tests.

"Several technical challenges still remain, but we and other researchers are making steady incremental progress toward the day when hydrogen fuel cells become a very viable alternative to fossil fuels in transportation," says Dr. Debe. "My team and I are very grateful to the D.O.E. for its recognition of our progress."

Dr. Debe, a 3M employee since 1978, helped launch the company's development of fuel cell components in the Science Research Laboratory in 1995. He holds a Ph.D. in physics from the University of Wisconsin, where he specialized in surface science.

3M is a leading developer and manufacturer of MEAs for hydrogen fuel cells, which already are finding widespread use as back-up power sources in various industries, especially in telecommunications facilities. Eventually, miniaturized hydrogen fuel cells are expected to become a primary power source for hand-held electronic products.

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