

Development of Alternative and Durable High Performance Cathode Supports for PEM Fuel Cells (Topic 3)

Pacific Northwest National Laboratory

- Funding

DOE Cost Share	Recipient Cost Share	TOTAL
\$4,645,758	\$252,708	\$4,898,466
95%	5%	100%

- **Project Description:** The goal of this collaborative effort is to develop and evaluate new classes of durable, high-performance cathode supports for polymer electrolyte membrane (PEM) fuel cells. The approach is to use graphitized carbons as the scaffolds and protect the carbon surface with tungsten carbide. This concept will also be extended to modify the surface of carbon scaffolds with more durable oxycarbides and conductive metal oxides. Some preliminary work shows these approaches to be promising. The expected advantages of these strategies are: 1) a protective barrier between carbon and platinum to mitigate the carbon corrosion, 2) an enhanced stability of platinum particles because of the bonding between platinum and the tungsten carbide, oxycarbide or metal oxide substrate, and 3) a better dispersion of platinum to reduce the loading of platinum in the electrocatalysts. The three major tasks to be performed are: 1) fundamental understanding of model systems, 2) synthesis of high surface area cathode supports, and 3) characterization and electrochemical evaluation of cathode supports.
- **Timeframe:** 4 years, starting in FY07

Sub-Contractors

Institutions
Oak Ridge National Laboratory
University of Delaware
Ballard Power Systems