Isotron®
Advanced Polymer Composites

U.S. DEPARTMENT OF ENERGY
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ISOTRON IS AWARDED CONTRACT TO DEMONSTRATE ADVANCED MEMBRANE FOR LARGE-SCALE HYDROGEN PRODUCTION

November, 2006 (Seattle, WA) – Isotron announces an effort to demonstrate the use of a new class of proton exchange membranes for use in large-scale, hydrogen production. The effort will involve the definition of the cost-effective performance targets for commercial-scale deployment of the Hybrid Sulfur (HyS) Cycle (also known as the Westinghouse Sulfur Cycle) for production of hydrogen ancillary to nuclear power plant operation. In order to achieve cost effective hydrogen production in this scenario, this team is demonstrating a novel class of membrane electrodes, which have demonstrated improved power density and reduced methanol crossover versus Nafion® PEMDMFCs. It is anticipated that these inorganic membrane electrodes will also exhibit reduced acid crossover in the proposed application. Their construction affords potential operation at temperatures up to 400^{o}C in concentrated solutions of sulfuric acid without degradation in performance, and will therefore accept hotter feeds from the thermochemical SO_2 extraction process. A cost and thermochemical model of the HyS process will be developed in order to simulate performance targets and derive a specification for the components of an effective, commercial-scale HyS plant.

Isotron has been involved in the development of polymer composite materials for electrochemical separation processes, ranging from radionuclide and heavy metal extraction to electrically switched ion exchange membrane and electrode-membrane assemblies. Isotron has worked under contract for the Department of Energy, Department of Homeland Security and Office of Naval Research on the design of flow-through electrochemical cells. Isotron will leverage this work and that of its partner Neah™ Power Systems to develop a series of candidate membrane electrode assemblies that meet the cost-effective operation target.