AzTE Arizona Technology Enterprises

www.azte.com

Bicarbonate and Carbonate as Hydroxide Carriers in a Biological Fuel Cell

AzTE Case # M08-068

Inventors

Bruce Rittmann
Director Center for Environmental Biotechnology
The Biodesign Institute
Arizona State University

César Torres
Post-Doctoral Associate
The Biodesign Institute
Arizona State University

Hyung-Sool Lee
Post-Doctoral Associate
The Biodesign Institute
Arizona State University

Invention Description

Biological fuel cells (BFCs) are being widely researched these days as a means to produce combustion-less electrical energy from organic compounds present in waste water. BFCs are capable of oxidizing many complex and simple organic compounds.

BFCs open up the possibility of producing electrical energy directly from biomass feed stocks that are renewable and carbon-neutral fuels. Currently, however, this technology is limited by the development of a pH gradient across the anode/cathode compartments of the cell that results in approximately a 20% loss in available energy output.

Researchers at the Biodesign Institute of Arizona State University have discovered new methods and devices for reducing the pH gradient between the cathode and anode compartments in fuel cells by supplying carbon dioxide to the cathode compartment. The gas flow to the cathode is controlled and maintained at a sufficient concentration to reduce the pH gradient and raise the energy output efficiency.

The technology can improve the performance of BFCS and make them a more viable source of renewable energy.

Potential Applications

- Alternative energy source
- Renewable energy source

Benefits and Advantages

- Improves biological fuel cell performance by increasing power output
- Carbon dioxide produced in the anode chamber can be recycled to the cathode chamber

Intellectual Property Status:

Patent Pending

Contact

Jack Geltosky, PhD

Senior Vice President

Business Development, Life Sciences

Arizona Technology Enterprises, LLC (AzTE)

P: 480.884.1989

F: 480.884.1984

JGELTOSKY@AZTE.COM

HEALTHSCIENCES@AZTE.COM