UNIVERSITY OF WYOMING
Wyoming Technology Transfer and Research Products Center

Electrical Energy Generation in Fluidic Channels and Membranes using Spontaneous Capillary Flow

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Patent Status: Patent Pending

Description of Technology

Fluidic batteries are attractive, inexpensive, miniature and portable sources of electrical power for a variety of applications. They take advantage of a phenomenon called "streaming potential" to convert fluid motion into electrical power. Streaming potential works by having dissolved positive and negative ions flow through a nano-sized channel which has a charge. The charge differential created by the flow generates electricity. Conventional fluidic batteries utilize an external pump or pressurized vessel to drive liquid flow through the channels. Utilizing external pumps makes the fluidic battery less efficient, increases complexity, and limits the device's lifetime.

Researchers at the University of Wyoming have been experimenting with fluidic batteries and have created a fluidic battery that does not require an external pump. The battery still works on the same streaming potential to generate electricity, but it utilizes capillary force to drive fluid through the channels. It does this by evaporating fluid on one side of the channel to increase the pressure which pushes the fluid through the channel, creating the fluid flow. This approach eliminates the need for an external pump or pressure vessel which increases the net energy generation, and decreases the complexity and size of the fluidic battery.

Applications

The fluidic battery has many applications as an inexpensive and miniature way of creating electricity. The researchers at the University of Wyoming have expanded the potential of these batteries by making them even smaller and inexpensive with a better net energy yield.

Features & Benefits

- Eliminates the need for external pump or pressure vessel on fluidic batteries
- Decreases size
- Decreases complexity
- Increased net energy generation compared to conventional fluidic batteries

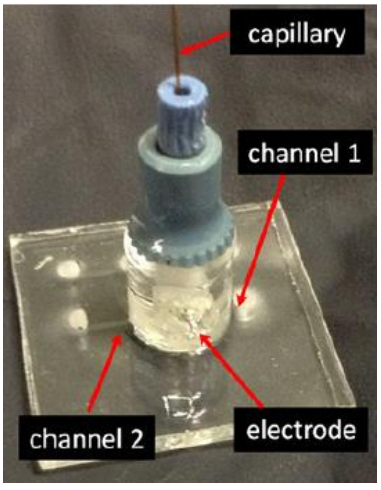

Figure: Fluidic Battery

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