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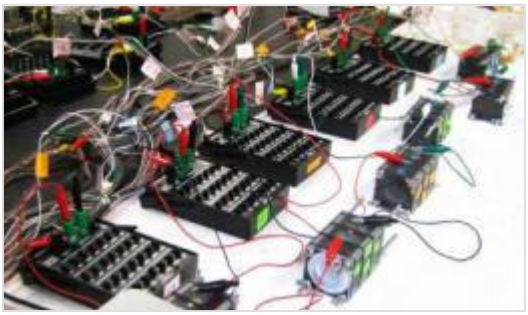
Microbial Fuel Cell Cleans Wastewater, I Generates Power

Not bad for a microbe

By Clay Dillow Posted 08.06.2009 at 5:27 pm



Microbial fuel cell desalinates water while generating electricity This microbial fuel cell not only cleans wastewate *State*

Desalinization technology has long been trapped between two competing nightmare scenarios. Without desa crippling water shortages. But if we desalinate on a large scale, we keep burning fossil fuels, the earth warm

Desalinization could theoretically solve the impending water crisis if it weren't such an energy-intensive proc generated by burning fossil fuels. Call it a catch-22. But researchers at Penn State think they've solved the p electricity, simultaneously removing 90 percent of salt from seawater.

Current desal methods -- which either employ reverse osmosis to push high-pressure seawater through salt- electricity -- require a great deal of power. The Penn State team has sidestepped the problem by custom-toc optimized (it currently uses 200 milliliters of wastewater to desalinate 3 milliliters of saltwater), the fact that it'

Microbial fuels cells convert chemical energy to electrical energy by tapping the electron exchange between in this case, wastewater -- is oxidized by naturally occurring bacteria (though researchers are genetically too electrons, from which the fuel cell extracts electrical power. The researchers placed a third chamber in betwe two with ion-specific membranes that allow either positive or negative ions to pass, but not both.

The salt water goes into this central chamber, and this is where the magic happens. When salt dissolves in v positive and negative ions. As the microbial fuel cell polarizes (electrons gather on the cathode side, protons try to flow through the center chamber, but cannot pass through the anion membrane. The membrane will, h pass out of the saltwater into the anode chamber. The opposite happens at the other end, as positive ions p chamber to the negatively charged cathode chamber. Left in the middle: nearly salt-free water.

As the icing on the cake, the release of ions into the anode and cathode from the salt water actually improve efficiency over standard microbial cells. The byproducts of the process are cleaned wastewater and salt, whi back into the ocean. While far from emerging on a commercial scale, an optimized process could treat waste water, all while generating electricity -- scoring a trifecta of sustainable tech in one neat little package.

[via **PhysOrg**]

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