

# Electrochemical Power Source Using Halogenated Organic Compounds

**R**esearchers at the University of South Florida have developed an electrochemical battery using halogenated organic compounds.

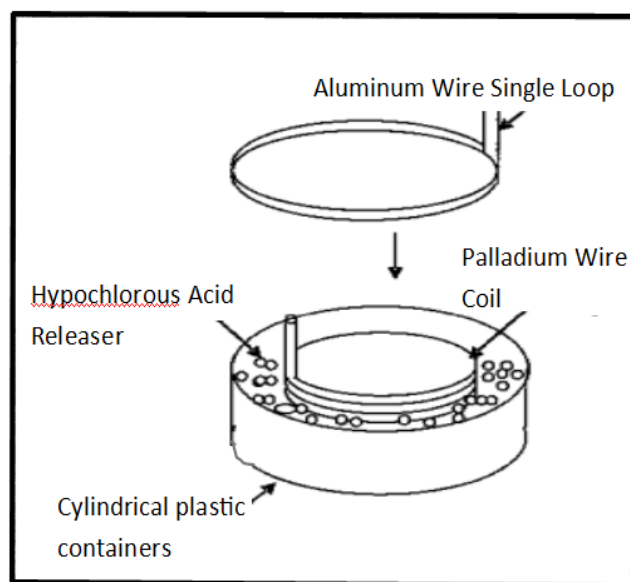
A battery is a device in which an electrochemical reaction, capable of producing energy, occurs spontaneously. Electronic devices, common in households, as well as observing and sensing systems with applications in various arenas motivate the development of powering systems with increased performance. It is known that aluminum, as well as magnesium and zinc, have been coupled with a very high number of available oxidizers, including oxygen from the air to form electrochemical cells. In spite of recent advances in these arenas, batteries utilizing these metals have not been successful in widespread commercial products primarily due to anode inefficiencies as well as unexpected polarization of the anodes. Therefore, there is a need for an improved electrochemical battery that is safe, efficient and economical.

Researchers at USF have developed an electrochemical battery by using halogenated organic compounds that are inexpensive and readily available. These chemicals are activated upon contact with water or aqueous solutions of conductive salts. The reaction results in the release of hydrogen ions that are capable of reacting with catalytic cathodes that are coupled with metallic anode materials to fabricate galvanic cells. These cells have high energy density and have a long shelf life. These materials are novel, as they are extremely low-cost, solid in nature and possess a high theoretical capacity as oxidizing materials. These cells can be used for portable devices and also as reserve cells for various applications, providing an alternative to fuel cells.

### ADVANTAGES:

- Low cost
- High energy density
- On-demand activation
- Various cell geometries possible

### *Inexpensive Electrochemical Batteries with High Energy Density*



### *Cylindrical Assembly of a Button Sized Cell*

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