Clean Technology


# Nanoporous Insulating Oxide Electrolyte Membrane Ultracapacitor and Button Cell

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**WARF: P06293US**

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**The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing methods of using nano-scale nanoporous insulating oxides to construct ultracapacitors that provide energy storage equal to or better than conventional ultracapacitors.**

## Overview

Metal oxides presently are used in the manufacture of electrochemical capacitors, which are found in almost every electrical device. However, these materials are expensive and tend to undergo redox reactions, which can affect cycling performance. When reduced to nano-scale particles, nanoporous insulating oxides have electrochemical properties due to their increased surface area that surpass traditional electrochemical capacitors, in terms of electrochemical energy storage.

## The Invention

UW-Madison researchers have developed methods of using nano-scale nanoporous insulating oxides to construct capacitors and ultracapacitors. Combining an insulating oxide composite layer ($Al_2O_3$, $TiO_2$, $MgAl_2O_4$, etc.) member with a conductive member results in an electrode that is useful in the construction of ultracapacitors. The composite layer is made from a stable sol-gel suspension containing particles of the insulating oxide.

These ultracapacitors provide energy storage equal to or better than conventional ultracapacitors, making them potentially useful in innumerable industries, especially the automotive industry. The ultracapacitor is preferably configured in a stacked, coiled or button cell.

## Applications

- Energy storage
- Hybrid vehicles

## Key Benefits

- Less expensive than metal oxide-based capacitors

**Tech Fields**

- Clean Technology : Energy storage, delivery & resource efficiencies

For current licensing status, please contact Michael Carey at mcarey@warf.org or 608-960-9867