Supercapacitors for Rechargeable Batteries with Longer Lifetimes (2012-657)

Tech ID: 22536 / UC Case 2012-657-0

BRIEF DESCRIPTION

A type of EDLC that is boosted by an electrolyte with both a catholyte and anolyte.

BACKGROUND

Electrochemical capacitors are fast recharging energy storage systems that provide power to heavy-duty electronics and electric vehicles. Electrochemical double-layer capacitors (EDLCs), also known as supercapacitors, store electric charges via electrostatic absorption of electrolyte ions into an electrolyte surface. These devices are superior to batteries because electrons are not transferred between the electrode and the electrolyte. The main problem with conventional capacitors is their low-to-moderate energy density. This low energy density is ascribed to the native surface-limited charging process at the electrode, which makes storing charge inefficient.

DESCRIPTION

Researchers at the University of California, Santa Barbara have developed a type of EDLC that is boosted by an electrolyte with both a catholyte and anolyte. This type of EDLC can be used to create rechargeable batteries with extremely long lifetimes of up to 16 times as long as state-of-the-art lithium ion batteries. They are also cheaper, easier to manufacture, and specialize in quick power delivery, complementing existing batteries in electric vehicles (EVs) and working as the electric power source in hybrid vehicles.

ADVANTAGES

- Increases the energy density of electrochemical capacitors, thus reducing manufacturing costs
- Reduces self-discharge processes within the redox capacitor
- Charge is stored in Faradaic reactions with soluble redox-active molecules
- Provides energy during power failures and initiates backup power systems

APPLICATIONS

- Heavy-duty electronics

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OTHER INFORMATION

KEYWORDS

Battery, Capacitor, Rechargeable, Electric, indautomotive, cenIEE, indenergy, indadvmat

CATEGORIZED AS

- **Energy**
  - Storage/Battery
- **Engineering**
  - Other

RELATED CASES

2012-657-0

- Electric vehicles
- Other energy storage applications

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,196,425	11/24/2015	2012-657

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Hybrid Supercapacitor and Battery System
- Hemostatic Compositions And Methods Of Use
- Oxides for Wound Healing and Body Repair
- Mesocellular Oxide Foams as Hemostatic Compositions and Methods of Use

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