

# Low Temperature Operable Electrical Energy Supply Device

 Energy & Environment

 Manufacturing

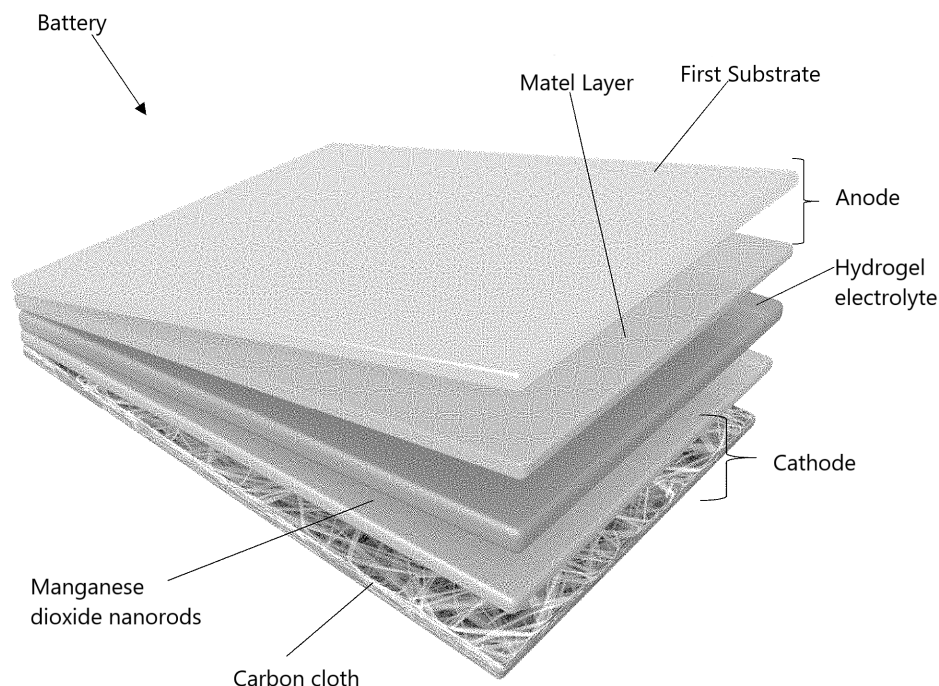
Consumer Electronics

Electricity and Power Electronics

Energy Conservation/Generation/Management/Storage (Battery)

Nanotechnology and New Materials

Sensors



An exploded view of the battery with freeze resistant electrolyte

## IP Status

Patent granted



Technology Readiness Level (TRL) ?

3

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## Opportunity

Electrical energy supply devices have been commonplace in a number of industries and products with increasing use of electronics within technologies and products. They provide a power source to various electronics. A stable power source is a requirement for use in devices and technologies that incorporate electronics. Some example electrical energy supply devices that are commonly used are batteries (i.e. cells) or capacitors or supercapacitors.

Flexible and wearable devices are growing in use and are starting become more mainstream. They are being incorporated into wearable products that are also starting to become more popular and are starting to gain wider usage. A wearable energy source (i.e. a wearable energy device) that is a requirement for any wearable device has attracted tremendous attention due to the rapid development of wearable electronics. Performance of flexible and wearable energy sources can deteriorate in low temperatures.

## Technology

The present technology relates to a low temperature operable electrical energy supply device. In particular, it is related to a freeze resistant electrical energy supply device that is operable at low temperatures. A system and a method for an electrical energy supply device, such as for example a battery, including an anode; a cathode; an electrolyte disposed between the anode and the cathode that is freeze resistant and able to perform and operate at a temperature below 0° C. without deterioration in electrical properties or electrical performance.

## Advantages

- Operable at low temperatures, at least as a useful alternative.
- Freezing resistant against the binding energies among water molecules and the interactions between the electrolyte components.

## Applications

- Battery for flexible electronic or wearable devices operates at temperatures below 0° C., and more specifically up to -25° C.

