ENERGY APPLICATIONS OF NANOFIBERS

FOR LI-BATTERIES

The incentive of energy and nanofiber related research has increased in recent years due to the advancing progress of electrospinning and the possibility of fabricating environmentally friendly energy products. Due to their high surface area, strong crystalline structure, and high kinetic property, nanofibers are commonly used in energy applications. As in many other application areas, nanofibers have the potential to enhance the properties of several energy products, such as super-capacitors, li-batteries, nanogenerators, fuel cells, solar cells etc.

Advantages of Nanofibers in Energy applications

Surface Area-to-Volume Ratio

Flexibility

Low cost

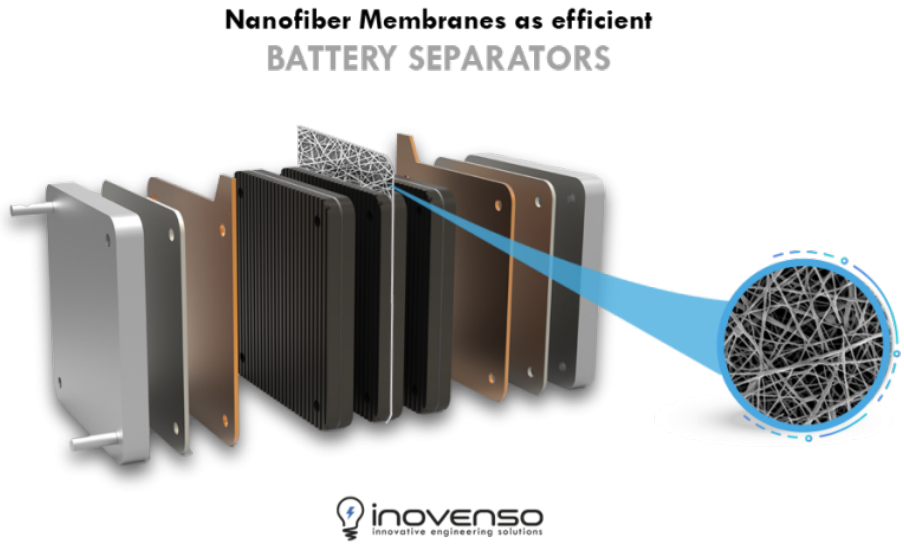
High degree of porosity

Small diameters

NANOFIBERS AND BATTERY PRODUCTS

Another major energy-related application is engineering nanofibers for batteries. Nanofibers are suitable candidates for the materials used to design batteries. The network of nanofibers that are formed via electrospinning are conducive to ion transport, so a flow of charge is feasible with nanofiber media.

Nanofibers having a high degree of porosity, small diameters and large surface area allows an increase in charge and discharge rate, resulting in better storage capacity and stability of the battery.



https://www.inovenso.com/nanofibers-energy-applications

Li-Batteries

Research has been conducted in the past for use of nanofiber scaffolds as both anode/cathode materials and battery separator media for Li-based batteries. The electrode materials of a battery can be composed of post-treated electrospun nanofibers that are often carbonized. With the versatility of electrospinning, polymers can be blended with additional materials such as tin oxide particles to improve ionic conductivity of the material.

Nanofibers can be adjusted to have small and uniform pore size and high porosity to prevent direct contact of opposite electrodes but still create a channel for Li+ ions with electrospinning technology.

What Inovenso Offers?

The polymeric nanofibrous materials that are commonly investigated for the above-mentioned applications are normally PVDF, PAN, and PMMA, and PEG. All of which our R&D team are familiar with and have worked with these polymers extensively. As such our team is capable of executing R&D services in the form of proof of concept and even product development. For ready-made products we can scale it up and offer contract manufacturing. . Our facility consists of industrial level electrospinning machines that are catered towards customer demands of units per month.