

Material Technology

Title

Method for Manufacturing Conductive Fiber Networks and Electrodes

Abstract

This patent researches the use of plasma surface treatment to modify and etch the surface of the electrospinning polymer. The metal precursors are first pre-loaded with the polymer to convert into nano-metal particles. Following with electrospinning polymer surface etching removal process, the nano-metal particles gradually accumulate on the electrospinning surface to become a continuous metal conductive layer. The core-sheath structure presented by the polymer filament's main body and the metal outer layer includes the characteristics such as the continuous metal scaffold required for high electrical conductivity, as well as the mechanical strength and structural flexibility/ extensibility of the polymer filament. The gap between the silk provides high light transmittance with high breathability. This product can be used in optoelectronic components or wearable devices such as highly transparent conductive substrates, flexible electrodes and breathable conductive films.

Benefits

1. Metal grid
 - i. The process is cumbersome, the equipment and process procedures are relatively complicated, and the cost is high
 - ii. The choice of substrate is limited
2. Silver nanowires
 - i. The stability and dispersibility of nano silver wire suspension are poor; after transfer printing, the uniform yield of silver wire coating is not good
 - ii. Poor adhesion between the silver nanowire and substrate
2. The purpose of this invention is to provide a series of competitive technologies to make mesh conductive film electrodes. 2. The mesh-shaped conductive film electrode produced by this technology has the following advantages: High penetration, low sheet resistance, flexibility, air permeability, good uniformity, stable yield, and Graphical, high mechanical strength. 3. The process of this technology is simple, low-cost of raw materials and equipment, and there is no need for complicated procedures such as lithography etching, chemical agent cleaning or high-temperature treatment, etc. It is suitable for most substrates and even does not require substrates for support.

Industry Categories

1. Transparent conductive film manufacturing industry
2. Display industry
3. Solar cell industry
4. Smart glass industry
5. Touch sensor
6. Medical care (wearable devices)

Keywords

Transparent electrode · Electrospinning technology · Plasma treatment

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