Nanowire-Polymer Composite Electrodes

Tech ID: 21574 / UC Case 2011-133-0

SUMMARY

Researchers at UCLA have developed a simple procedure to fabricate highly flexible silver nanowire (AgNW) electrodes on transparent polymer substrates demonstrating optimum electric properties, shape memory, and providing an alternative to the costly and brittle indium-doped tin oxide (ITO) electrodes

BACKGROUND

As the demand for cheap, flexible, and lightweight transparent optoelectronic devices rapidly increases, various transparent electrodes have been investigated to replace ITO in order to enhance the flexibility and reduce the cost of the devices.

INNOVATION

Researchers at UCLA have demonstrated a simple method to fabricate flexible and transparent electrodes through creating a network of AgNW coating on polymer substrates. The electrodes exhibit higher electric conductivity than their ITO and single walled carbon nanotube (SWNT) counterparts. Additionally, because the AgNW coating have very smooth surface topography the proposed AgNW/polymer electrodes show negligible change under tensile and compressive strain and fully recover when returned to their un-deformed shape.

APPLICATIONS

- Optoelectronic devices
- Flexible and transparent organic LED, solar panels, touchscreen electronics, wearable displays, non-invasive biomedical devices

ADVANTAGES

- Low cost and simple fabrication
- Compatible with large-scale manufacturing methods
- High electrical conductivity, high optical transparency

STATE OF DEVELOPMENT

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,824,789	11/21/2017	2011-133
China	Issued Patent	ZL 2011 8 0044909.1	07/20/2016	2011-133

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Electrocaloric Cooling With Electrostatic Actuation
- An Actuator Device Driven By Electrostatic Forces
- Bulk Polymer Composites
- A Phase-Changing Polymer Film for Broadband Smart Windows Applications

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INVENTORS

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OTHER INFORMATION

KEYWORDS

Transparent flexible electrode, shape memorable polymer LED, Silver nanowire, organic electronics

CATEGORIZED AS

- **Materials & Chemicals**
  - Nanomaterials
  - Polymers

RELATED CASES

2011-133-0

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