



## 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](#)
- ▶ [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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