Stepwise Fabrication of Conductive Carbon Nanotube Bridges via Dielectrophoresis

Tech ID: 32485 / UC Case 2020-645-0

BRIEF DESCRIPTION

SUGGESTED USES

·CNTs used for enhanced performance of electronic devices i.e. chemical and biological sensors, field effect transistors, computing devices and conductive interconnects

·Particular applications in micro- and nanoelectronics, sensors, and energy storage and conversion

FEATURES/BENEFITS

·The long CNT bridges allow for connecting electrodes separated by distances longer than 50 micros while avoiding slow and expensive operations.

TECHNOLOGY DESCRIPTION

CNTs have long been of great interest to nanoelectronic and sensor research due to their remarkable electrical, mechanical and physical properties. Therefore, integrating them into micro- and nano-devices/systems would offer higher sensitivity and miniaturization opportunities in photovoltaics, sensors, semiconductor devices, displays, conductors, etc. The electrical architecture of these nanoelectronic devices are becoming more complex and vaster in structure.

Previously, a number of techniques have been developed for the deposition of CNT bundles onto electrodes. However, many of these techniques are considered laborious, slow and expensive and do not always yield electrically conductive bridges to connect adjacent circuits.

For the first time, researchers at UCI have developed a novel stepwise technique employing dielectrophoresis to create conductive bridges spanning 50 microns. This represents the longest ever reported CNT bridge deposition.

STATE OF DEVELOPMENT

This research is currently at working towards a prototype. The researchers aim to combine CNT bridges with CVD (chemical vapor deposition) process in order to increase the conductivity.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,912,900	02/27/2024	2020-645

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INVENTORS

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OTHER INFORMATION

CATEGORIZED AS

» **Materials & Chemicals**
  » Nanomaterials
» **Nanotechnology**
  » Electronics
  » Materials

RELATED CASES

2020-645-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Dissolvable Calcium Alginate Microfibers via Immersed Microfluidic Spinning
- Guided Template Based Electrokinetic Microassembly (TEA)

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