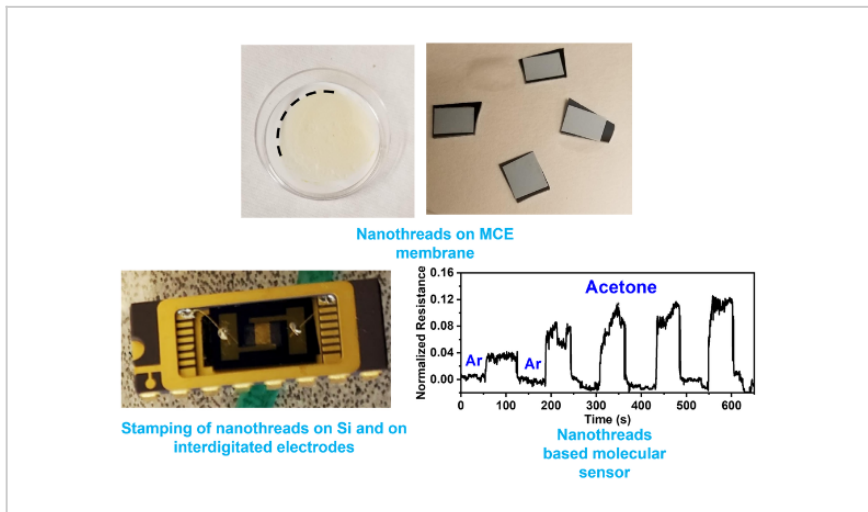


Exfoliation and Dispersion of Carbon Nanothreads

ID# 2021-5329



Carbon nanothread film deposition and device fabrication

Technology Summary

The invention is a simple process of chemically activating the carbon nanothread crystals within a specific temperature range that produces a chemically activated carbon nanothread compound. The chemical activation of carbon nanothreads is fast and solvent free and does not require significant energy input. The chemically activated carbon nanothread compound is then dispersed in specific organic solvents to yield stable dispersions of exfoliated carbon nanothreads in organic solvents under inert environments. Additional processing results in air-stable dispersions of exfoliated carbon nanothreads in organic solvents or in water. The process can be used on all types of carbon nanothreads. The air-stable dispersions of carbon nanothreads may be purified by a number of means and sorted by structure and/or length, processed into polymer nanocomposites, and large area thin films.

Application & Market Utility

The disentangled, exfoliated carbon nanothreads enable large-scale manipulation for applications in nanoelectronics, optoelectronic systems, chemical sensors, polymer nanocomposites, and energy storage. Exfoliation and dispersion permit further functionalization for uses such as drug carriers and biomedical imaging probes. Dispersed, exfoliated carbon nanothreads provide nanoscale building blocks for thin films on a variety of substrates, aerogels, fibers and novel composites. The researchers have fabricated and tested devices such as chemical and photo sensors.

Next Steps

Additional research to explore applications such as photocatalysts, electron emitters, chemical sensors and potential superconductors.

TECHNOLOGY READINESS LEVEL

4

Seeking

Investment | Licensing | Research

Keywords

- Carbon Nanothreads
- Composites
- Smart Materials
- Sensor
- Thin Films

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