

## Cotton Used as Base for Growth of Graphene

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**Categories:**

- Materials and Manufacturing
- Mechanical Engineering

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- Cellulose
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- Sensors
- Supercapacitors

Currently, conductive copper, nickel sheets, and carbon cloth are being used as a substrate to grow graphene nanopetals and metalized nanopetals for applications where a conductive sheet with a large surface area is necessary. These substrate materials are expensive and the carbon cloth is expensive to manufacture. Most applications that use these conductive materials are cost sensitive; therefore, there is an unmet need for a low-cost material with higher surface area for use in such applications.

Researchers at Purdue University have developed a technology for the growth of carbon nanopetals using cloth comprised of cellulose fibers, such as cotton, as a base material. During the microwave plasma chemical vapor deposition (MPCVD) process, the cellulose fibers convert to conductive carbonized fibers and carbon nanopetals are grown on their surface in an integral fashion. This process increases the effective surface area of the cloth while transforming it from an electrical insulator to an electrical conductor. Growing the carbon nanopetals on the fibers of the cloth increases the effective surface area of the electrically conductive, carbonized cloth base. This technology provides a low-cost base for the generation of conductive electrodes with increased surface area for sensors and supercapacitors.

**Advantages:**

- Low-cost base for the growth of carbon nanopetals
- The graphene nanopetals that grow can be used in low-cost applications
- Conductive electrode material generation with increased surface area

**Potential Applications:**

- Electronics Manufacturers

**People:**

- Fisher, Timothy Scott (Project leader)
- Xiong, Guoping

**Intellectual Property:**

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**Contact OTC:**

Purdue Office of Technology Commercialization

The Convergence Center

101 Foundry Drive, Suite 2500

West Lafayette, IN 47906

Phone: (765) 588-3475

Fax: (765) 463-3486

Email: [otcip@prf.org](mailto:otcip@prf.org)