Method and Apparatus for Carbon Nanotube Production

INVENTORS • Amit Lal

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method of using ultrasonic vibration of a cathode to increase the length and yield of carbon nanotubes.

OVERVIEW

Nanotubes are C60 fullerene structures that have a cage-like structure. They are highly desirable for nanoprobeing and for creating better carbon fiber composites.

Carbon nanotubes are produced in carbon arcs between a cathode and anode. The nanotubes are formed on the cathode at the locations of the arcs. One problem with current technology is that the arcs are unstable; this disrupts the formation of nanotubes so that the largest produced are only 100 nm in length. Also, unwanted, non-nanotube carbonaceous materials are formed.

THE INVENTION

A UW-Madison researcher has developed a method for driving the cathode ultrasonically, resulting in a high tip acceleration that dislodges large carbon chunks, leaving the lighter nanotubes to form. The method also describes the use of a cooling method on the cathode to diminish the formation of unwanted carbon material. Nanotubes created using this technique are greatly increased in length (greater than one mm) and quantity.

APPLICATIONS

• Production of carbon nanotubes

KEY BENEFITS

• Significantly increases the length of the nanotubes produced, making them candidates for probing deep crevices like those found on integrated circuits, nanostructures and biological molecules.
• Increases the yield of nanotubes, making it feasible to create lighter and stronger...
carbon-fiber composite materials that can be used in the defense, aerospace and automobile markets.
• Eliminates the need to halt the production process to remove carbon materials from the electrodes
• Significantly increases the economy and efficiency of carbon nanotube production

ADDITIONAL INFORMATION

Tech Fields
Micro & Nanotech - MEMS & NEMS
Materials & Chemicals - Nanocomposites

CONTACT INFORMATION

For current licensing status, please contact Mark Staudt at mstaudt@warf.org or 608-960-9845.