A Method for Preparing Electrically Conductive Carbon Nanotubes for Electronic Applications

Georgia Tech inventors had developed a method of anchoring and growing carbon nanotube (CNT) structures on various substrates coated with thin layers of metal such as gold, silver, and copper. This method involves CNTs being surface functionalized and modified to allow molecules to bond to the surface, during chemical vapor deposition. Once functionalized, reactive functional groups are attached to the CNT without altering the aligned CNT structure. These CNTs with reactive functional groups are bonded to metal-coated substrates through mild heating, creating strong adhesion between the CNT and metal substrates. The resulting anchored CNT structures are strong electrical conductors.

Summary Bullets

- **Conductive –** Anchored CNT structures achieve high electrical conductivity
- **Strong –** CNTs and metal substrates have high adhesion strength
- **Heat resistant –** Anchored CNT structures have high thermal resistance

Solution Advantages

- **Conductive –** Anchored CNT structures achieve high electrical conductivity
- **Strong –** CNTs and metal substrates have high adhesion strength
- **Heat resistant –** Anchored CNT structures have high thermal resistance

Potential Commercial Applications

- Electrical interconnects
- Thermal interfacial material
- Solar cells

Background and More Information

Revolutionary increases in speed and reliability of microprocessors has been achieved successfully in the past 60 years. The faster and higher performance of microprocessors is based on increased transistor density. Copper interconnects and transistors are often used. However, small copper interconnects have poor electrical performance. With the rising demand for electrical and thermal performance of microprocessors, there is also an

increasing demand for better electrically conductive materials.

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Publications

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