Researchers at the University of South Florida have developed a method of producing an integrated circuit which consists of a carbon nanotube as a major component.

Current methods utilize previously prepared carbon Nanotubes (CNT) and manually micro-manipulate them into useful structures. Such manual methods are extremely slow and only suitable for the preparation of exploratory test structures, thereby limiting advances in the field of nanotechnology.

The method developed by our inventors overcome these drawbacks, by allowing for the CNT to be positioned at specific locations on circuit structures to fulfill specific electronic functions such as forming electric interconnects, diodes and transistors.

The integrated circuit includes a source, a drain, and a gate. The source and the drain are positioned on the gate and a catalytic material is deposited on one of them to initiate growth of the nanotube through Chemical Vapor Deposition. The carbon nanotube is then bent toward the integrated circuit such that the carbon nanotube extends between the source and the drain rendering the integrated circuit operable.

The electronic properties of the device consisting of CNTs depend on the diameter, number of walls, and defect density of the CNT. The invention allows for mass production of circuits having CNT connections due to the repeatability of making the circuits functional which would greatly benefit the field of semiconductor device manufacturing.

**ADVANTAGES:**
- Allows mass production
- Faster processing time
- Wide range of applications possible
- Properties of the device tunable by varying properties of the CNT

Tech ID # 01B078 Patent #: 6,835,613