

Method of synthesizing carbon nanotubes with enhanced electron field emission properties

Value Proposition

Carbon nanotubes are cylindrical large molecules that possess exceptional thermal, mechanical, and electrical properties. Comparing with conventional electron emission materials, carbon nanotubes have been shown to be excellent electron field emitters, making them highly attractive for a range of device applications such as flat panel display and X-ray devices. However, for device applications, it is essential that the nanotubes have a heightened emission stability and long operating lifetime. Thus, it is desirable to design and fabricate carbon nanotubes with enhanced electron emission characteristics.

Technology

Researchers at Duke have developed a method for fabricating a material comprised of carbon nanotubes with enhanced emission features. The synthesis includes a scalable one-step method for catalysts preparation and a process for the growth of nanotubes using chemical vapor deposition method. The unique combination of the catalysts and growth conditions yields high quality small diameter and few-walled carbon nanotubes (FWNTs) with superior emission current-voltage characteristics.

Advantages

- The method produces high quality small diameter (less than 10nm) FWNTs
- Easy preparation of catalysts
- Compatible with industrial scale production
- The material has better long-term stability and higher emission current density

Publications

- [Fabrication of Small Diameter Few-Walled Carbon Nanotubes with Enhanced Field Emission Property \(J. Nanosci. Nanotechnol. 2006\)](#)

Duke

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Links

- [From the lab of Dr. Jie Liu](#)

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