Review of: "Nanotubes other than CMOS nanotransistors in making gauges and actuators; Supercapacitors are also used in many other industries"

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The structure behaves as a metal conductor, while the chiral structure behaves as a semiconductor, and its reaction is a small part of the energy gap with carbon nanotubes, which have unique electrical and mechanical properties. For example, the structure of a nanotube is a thousand times more than that of copper, and the metal nanotube is capable of carrying an electric current with a density of cm/A. These characteristics have led to the use of this material in the manufacture of electronic devices such as CMOS (semiconductor) transistors. Carbon nanotubes have been proposed as a replacement for silicon in the MOSFET transistor channel. Nanotubes can solve some problems of reducing the length of the channel in the transistor, such as electron tunneling from the inside of the channel or from the gate to the inside of the channel.

> *Nanotubes are used in making gauges and actuators other than CMOS nanotransistors; supercapacitors are also used in many other industries. The main problem in the application of nanotubes is that they must be used lying on the surface in order to be able to bond them and establish a metallic connection to achieve CMOS transistor behavior. This is because the nanotubes grow vertically. In addition, there should be the possibility of precise control over the characteristics of each nanotube as well as its growth location and length. They will increase the speed of integrated electronics as much as possible. In nanoelectronic circuits, especially RF and microwave blocks, very high-speed switches are needed. Usually, the transistors with records of very high speeds are 2 and inhomogeneous bipolar MOSFET transistors and high electron mobility, up to about 600GHz and 750GHz.*

Conclusion:

CMOS nano-transistors are combined with compound semiconductors, especially nano-tubes, the structure of nano-electronic compounds, and perhaps optical and opto-electronic devices can benefit the most from these semiconductor compounds. The main reason is the possibility of engineering the energy gap in these compounds, unlike silicon.

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