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## **Carbon Nanotube And Graphene Device**

A carbon nanotube field-effect transistor (CNTFET) is a field-effect transistor that utilizes a single carbon nanotube or an array of carbon nanotubes as the channel material instead of bulk silicon in the traditional MOSFET structure. First demonstrated in 1998,

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there have been major developments in CNTFETs since.

## **Carbon nanotube field-effect transistor - Wikipedia**

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2)|Rachel Aaron

## **Carbon Nanotube And Graphene Device Physics|Deji Akinwande**

(a) False color  
scanning electron  
microscope image of a  
typical SWNT-graphene  
drag device, Graphene

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(green) is encapsulated in hBN (dark blue) and transferred on top of a metallic SWNT (dashed line in center of blue charged region). Electrical contacts (gold) are made to the graphene and SWNT. Inset: cross-section schematic of the device.

### **Coulomb Drag between a Carbon Nanotube and Monolayer Graphene**

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## Graphene Device

Yang et al. created a nanoporous graphene membrane reinforced by a network of single-walled carbon nanotubes (SWNTs) to provide mechanical stability (see the Perspective by Mi). The SWNT network also stopped the propagation of cracks in the graphene, effectively localizing the damage to a small area defined by a cell in the carbon nanotube



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mesh.

## **Large-area graphene -nanomesh/carbon- nanotube hybrid ...**

Carbon nanotube applications in nanotechnology also include the high aspect ratio resonators and sensors (Fig. 1.12). Carbon nanotube resonators make use of the elongated structure of SWCNTs and their high stiffness (Treacy et al., 1996; Wong et

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al., 1997). Carbon nanotube sensors, which monitor changes in the frequency of vibrations of SWCNTs (Overney et al., 1993) after the absorption of ...

## **Carbon Nanotubes - an overview | ScienceDirect Topics**

Graphene (/ ' g r æ f i : n /) is an allotrope of carbon consisting of a single layer of atoms arranged in a two-

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dimensional  
honeycomb lattice  
nanostructure. The  
name is derived from  
"graphite" and the  
suffix -ene, reflecting  
the fact that the  
graphite allotrope of  
carbon contains  
numerous double  
bonds.. Each atom in a  
graphene sheet is  
connected to its three  
nearest neighbors by a  
 $\sigma$ -bond ...

**Graphene -**

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## Wikipedia

The development of modern integrated circuits (ICs) has required scaling of field-effect transistors (FETs) to provide increased density, performance, and energy efficiency (). Ultrathin semiconducting channels with high carrier mobility minimize the short-channel effect in aggressively scaled

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FETs (such as sub-10 nm technology nodes) ( ). Single-walled carbon nanotubes (CNTs) can be 10 times ...

### **Aligned, high-density semiconducting carbon nanotube ...**

OCSiAl, the world's largest single wall carbon nanotube supplier, operates in 45 countries. Develops nanotube solutions for li-ion batteries,

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numerous polymers.

## **Carbon nanotube supplier - 97% of the global SWCNT market**

Recent discoveries of salient carbon nanoforms have paved tremendous interest among research and also toward their discrete applications in scientific fields. Various generation methods for carbon nanotubes (CNTs) involve

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chemical deposition of vapor, discharge using electric arc and laser ablation mechanism which were driven by functionalization, chemical addition, doping, and filing such ...

## **Carbon Nanotubes: Synthesis, Properties and Applications ...**

The reports about stretchable artificial synaptic transistors are

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very limited and further exploration is urgently required. In this work, intrinsically stretchable carbon nanotube synaptic transistors (IS-CNT-STs) with poly (urea-urethane) dielectric have been realized. The synaptic characteristics and the synaptic mechanism have been analysed.

**Intrinsically  
stretchable carbon**



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## **nanotube synaptic** **Physics**

A non-destructive soft-lock drawing method can achieve carbon nanotube arrays with ultraclean surfaces and a very high degree of alignment. Such arrays could be used as nano-sized electrical ...

## **Soft-lock drawing of super-aligned carbon nanotube bundles ...**

In a real device, the

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catalyst produces 15.4% more hydrogen per power consumed, and shows a higher Faradaic efficiency (92.28%) than the benchmark Pt/C (85.97%). ... including carbon nanotubes 41 ...

### **Ruthenium anchored on carbon nanotube electrocatalyst for ...**

This paper explores the stability and physical properties of double-

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walled carbon nanotubes and the bilayer graphene obtained from their unfolding. It can be found that the stability is almost unchanged within a certain range of diameter of the double-walled carbon nanotubes. As the diameter of the carbon nanotubes increases to around  $27.798 \text{ \AA}$ , the rising average atomic energy indicates a ...

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## **Atomic Correlation between Bilayer Graphene and Double ...**

In this study, an N, O-co-doped porous carbon/carbon nanotube composite was prepd. by functionalizing coal-based porous carbon with carbon nanotubes (CNTs) and ionic liq. via annealing. The N, O co-doped porous carbon/CNT composite (N, O-PC-CNTs) showed

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a surface area of 2164  $\text{m}^2 \text{g}^{-1}$ , and a high level of N/O dopants (8.0 and 3.0 at%, resp.).

## **Optimizing the Properties of Hybrids Based on Graphene ...**

Engineers from Iowa State University print the circuits of the device with graphene flakes because graphene is transparent, strong

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and conducts electricity. Graphene flakes are arranged in a specific order and non-conductive binders are used to combine them which improved the conductivity. ...

Read: Feeding Silkworms with Carbon Nanotube or ...

### **60 Uses of Graphene - The Ultimate Guide to Graphene's ...**

Thus, metal nanowires (NWs) and carbon-

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based materials such as carbon nanotubes and graphene have been investigated to replace ITO [22,66,67,68,69]. Zhang et al. fabricated four-inch flexible organic light-emitting diodes (OLEDs) showing a high brightness of  $\sim 10,000$   $\text{cd m}^{-2}$  by transferring ultraclean and damage-free graphene supported by

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## **Electronic and Thermal Properties of Graphene and Recent ...**

Graphene sheets are building blocks for other graphitic materials: Bonded on top of each other make graphite; rolled up make a carbon nanotube; cut and folded into a spherical shape make a fullerene. (Adopted from Nat. Mater.,



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6:183-191, 2007)

## **Graphene - All You Need to Know - Nanowerk**

2.1. Basics of graphene structure. Carbon is the sixth element in the periodic table, with a ground-state electronic configuration of  $1s^2 2s^2 2p_x^1 2p_y^1 2p_z^0$ , as shown in Figure 2(b). For convenience, the energy level of  $2p_z$  is kept with no electron, though it is

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Physics  
equivalent to the energy levels of  $2p_x$  and  $2p_y$ . As seen in Figure 2(a), the nucleus of a carbon atom is surrounded by six ...

## **Structure of graphene and its disorders: a review**

In the field of nanotechnology, materials like nanofibers (see for instance: "Light-emitting nanofibers

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shine the way for optoelectronic textiles") and carbon nanotubes have been used and especially graphene has shown exciting potential for optoelectronic devices.

## **Nanoelectronics - Definition and Applications - Nanowerk**

Increased energy consumption stimulates the development of various

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energy types. As a result, the storage of these different types of energy becomes a key issue. Supercapacitors, as one important energy storage device, have gained much attention and owned a wide range of applications by taking advantages of micro-size, lightweight, high power density and long cycle life. From this perspective ...

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