Preparing Nano Material As Introduction To Network

ISRAA FALIH MUSLM

Department of Performance Evaluation, University of Babylon/Iraq

Israafalih4@gmail.com

Abstract

Carbon nanotube technology has been used in many fields, and among the new applications of nanotechnology, the carbon nanotube is composed of ink, which is an ink that has been developed by Dr. Lee Jin Wong of the Korea Electrical Technology Research Institute. This technology is very sophisticated and can be applied. This technology is applied to a variety of fields, including touch screens and foldable displays, although Dr. Lee may have chosen the field of touch screens, due to the lack of technology for permanent coating of plastic surfaces and the development of a carbon tube of ink marked the beginning of a new journey of incredible excellence in the field of nanotechnology. That would be a huge technological revolution.

Keywords: nanotube, network, nanometer, carbon molecule, microtube

1. Introduction

Technological progress in the current era is measured by the ability to manufacture electronic devices that are smaller and more efficient than in terms of speed and quality in performing various operations. Lamp In the last century, the first generation in the world of electronics began, the generation of lamp technology electronic, black and white televisions were produced using this technology, then the second generation came into the world The Transistor, which made electronic devices smaller and better, is the generation of the transistor (1) Semiconductor generation was efficient. And after the great development that occurred in the field of semiconductors It is a small piece, C D, that does the same, the third IC in the world of electronics, which is the generation of integrated circuits Functions of the transistor; These departments helped reduce the size of many devices, and even raised their efficiency. And she enumerated her functions (2).

Then came the fourth generation, the generation of microprocessors Microcomputers, who have been credited after the field of electronics, have produced small personal computers God Almighty in the information revolution that we are witnessing now, and in the progress that has occurred in many areas Scientific, industrial, educational and in various aspects of life. Over the past few years, a new term has emerged that has thrown its weight around the world and has become a fixture. Interestingly enough, this term is nanotechnology. This technology represents the fifth generation in a world This is what we will discuss in the following lines. (nanotubes) electronics, the generation of nanotube (3)
2- How can prepare nanotube

Nanotube carbon nanotube, a highly advanced technology, which are blank cylinders in the form of tubes of size The nanometer and it consists of a huge group of hexagonal structures that in turn are made of carbon atoms. And carbon Japan's electronics industries NEC nanotubes have a physical phenomenon that was first observed in 1991 at a company While studying the evacuated ash (Sumio Lijima) by the scientist Sumio Lijima (High-resolution electrophoresis between two carbon electrodes using a highly efficient electron microscope Legima noted that there is some luster within the transmission electron microscope) This ashes, and he thought that carbon had turned into diamonds, so he decided to examine it in a good way (4). Sumio Legima used an electron microscope to examine the ashes and found that the carbon particles were in an impermeable position. Natural, as it is assumed that the arrangement of the carbon molecules is as follows:

But Legima was surprised by another thing, which is that the carbon molecules have turned to connect with each other, forming something like

The experiment was repeated several times, and each time there was a new one after each examination, and the entirety of Sumio's findings Legima is that: -1 carbon molecules in a tube-like arrangement. 2- The resulting carbon tubes are not equal in size. And different in (Multi-Wall) -3 produces multi-layer tubes in the sense that it is a group of overlapping tubes Color and subtlet (5)
Methods for preparing carbon nanotubes:

Micro-carbon tubes in which the atoms are triple interlinked in curved sheets forming vacuum cylinders are obtained. Using the carbon arc method with changing its energy so that the current becomes continuous instead of alternating, and thus can be obtained on tubular structures in an electrode sediment. These tubes are made entirely of carbon, and are finished. They are called nanotubes because of their diameter, which is several nanometers. There are several methods for producing carbon particles made from nanotubes, namely (6): - Performing an electrolysis using graphite electrodes in molten salts. Catalytic hydrocarbon thermal analysis. Graphite evaporation using a laser. And in different ways of making nanotubes, they have different electronic properties, some of which are expected to be metallic. Others are semiconductors. And it turns out that these nanotubes are incredibly strong. Hundreds of times stronger than steel, due in part to its hexagonal geometry, which it can distribute. The forces and deformations are due to the strength of the carbon-carbon bond, and thus have unusual electronic properties (7).

Shapes of nanotubes:

Carbon nanotubes are graphite plates that have been bent into a hollow cylindrical shape, dimensioned laterally from 0.2 to several nanometers. Of course, the nanotube will acquire its physical properties from the properties of two-dimensional graphite (Fig.6)

There are three geometric shapes for carbon nanotubes (see figures) that depend on the uproll method (8):

1- zig-zag has dimensions of graphite plate to obtain the cylindrical shape which is n.
2- chiral has dimensions (n,m)
3- armchair has dimensions \((n,n)\)

Figure (3) a type of carbon nanotube chiral Resulted from draining a graphite plate.

Figure (8) left (zig-zag), medium armchair, Right chiral

**Conclusion**

Carbon nanotubes technology is still in its infancy, and it is so far under study to find out more of its properties. Its physical properties and its exciting capabilities, but the method currently used to obtain the nanotubes is very expensive. Where the very high price of nanotubes (\$ 15,000 per ounce) is the first hurdle in using this fabric. And commercial nanotube ash costs 10 times the price of gold. Research is in this technology, it needs high costs, which requires great support from governments and major scientific bodies, to continue research and development in this area. Nanotube technology is expected to spark a series of industrial revolutions in the process. The next two decades, which will affect our lives greatly and open before us a new world that we did not know anything about before.
References

[1] Pantano A. Electrical conduction in carbon nanotubes under mechanical deformations. InTrends in Computational Nanomechanics 2010 (pp. 335-365). Springer, Dordrecht.

[2] Pantano. “Carbon nanotube - Polymer Composites and their applications”. Chapter of the book “Carbon Nanotubes: Synthesis, Properties and Applications”, Applied Science Innovations Pvt. Ltd., in press 2008.

[3] Mudhafar A. Salim and Salwan Ali Abed 2021 IOP Conf. Ser.: Earth Environ. Sci. 735 012021

[4] Charlier JC, Blase X. Electronic and transport properties of nanotubes. Reviews of modern physics. 2007 May 16;79(2):677.

[5] Ahmed Sabah Al-Jasimee et al 2020 J. Phys.; Conf. Ser. 1664 012141.

[6] Hall AR, An L, Liu J, Vicci L, Falvo MR, Superfine R, Washburn S. Experimental measurement of single-wall carbon nanotube torsional properties. Physical review letters. 2006 Jun 28;96(25):256102

[7] Hall AR, An L, Liu J, Vicci L, Falvo MR, Superfine R, Washburn S. Erratum: Experimental Measurement of Single-Wall Carbon Nanotube Torsional Properties [Phys. Rev. Lett. 96, 256102 (2006)]. Physical Review Letters. 2010 Aug 3;105(6):069904.

[8] Cui T. Structural and physical properties of torsional carbon nanotube devices by electron diffraction and microscopy.

[9] Qin LC. Determination of the chiral indices (n, m) of carbon nanotubes by electron diffraction. Physical Chemistry Chemical Physics. 2007;9(1):31-48.

[10] Ewaid, S.H.; Abed, S.A.; Al-Ansari, N. Crop Water Requirements and Irrigation Schedules for Some Major Crops in Southern Iraq. Water 2019, 11, 756.

[11] Ewaid, S.H.; Abed, S.A.; Al-Ansari, N. Water Footprint of Wheat in Iraq. Water 2019, 11, 535.

[12] Ewaid, S.H.; Abed, S.A.; Al-Ansari, N. Assessment of Main Cereal Crop Trade Impacts on Water and Land Security in Iraq. Agronomy 2020, 10, 98.

[13] Ewaid, S.H.; Abed, S.A.; Al-Ansari, N.; Salih, R.M. Development and Evaluation of a Water Quality Index for the Iraqi Rivers. Hydrology 2020, 7, 67.

[14] Salam Hussein Ewaid et al 2020 J. Phys.; Conf. Ser. 1664 012143.

[15] Akyildiz IF, Jornet JM, Pierobon M. Nanonetworks: A new frontier in communications. Communications of the ACM. 2011 Nov 1;54(11):84-9.

[16] Salah, A. (2020). The New Combination of Semi-Analytical Iterative Method and Elzaki Transform for Solving Some Korteweg-de Vries Equations. Al-Qadisiyah Journal Of Pure Science, 25(1), Math. 23 -26.

[17] Salam Hussein Ewaid et al 2020 J. Phys.; Conf. Ser. 1664 012143.

[18] Salam Hussein Ewaid et al 2021 IOP Conf. Ser. : Earth Environ. Sci. 790 012075

[19] Ali , W., & R.Annon, M. (2020). Biological Effective of organic solvent extracts of Mirabilis jalapa Leaves in the Non-cumulative for mortality of Immature stages Culex quinquefasciatus Say ( Diptera : Culicidae ). Al-Qadisiyah Journal Of Pure Science, 25(1), Bio 1-6.

[20] Salam Hussein Ewaid et al 2021 IOP Conf. Ser. : Earth Environ. Sci. 722 012008

[21] Sami Abd ali , mohammed, Shaker Hussein, A., & mohammed hadi, H. (2020). Study The Current Density-Voltage (J-V) Characteristics of α-Fe2O3 Thin Film Prepared by Spray Pyrolysis Technique. Al-Qadisiyah Journal Of Pure Science, 25 (1), Phys 1-7.