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**(Nanotechnology & Nanotube and their applications to materials and Ceramic bodies)**

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**Axis of production Technology and Management**

**(Modern science applications in the design and production)**

## **Abstract**

**Nanotechnology** is considered one of the most important technologies in 21 century. Nanotechnology is an enormous scientific revolution, not less than the industrial revolution, which transferred humans to the era of machinery or technology revolution, which transferred humans to the era of space, communications, and the internet. It is also a comprehensive development in the various fields and all branches of science, what is offered by nanotechnology is the ability to make that all the human imagined, but with lower cost and higher quality. The Nanotechnology's capability will be the key scientific advances that will change the parameters of life in a way that we cannot imagine. So, all what we produced and discovered with this technology in the next few years will be the equivalent, but will exceed what has been discovered since the creation of the earth.

Nanotechnology is the fifth generation that emerged in the world of electronics, and was preceded by the first generation which include using electronic lamp and television, the second generation, which include using transistor, then the third generation of electronics, which include using circuit integration, and the fourth generation which include using microprocessors that caused a huge revolution in electronics by producing personal computers and silicon chips that have brought progress in many fields of science and industry.

So Nano means the techniques are made on scale nano-meters. It Is a more precise unit of measurement metric known until now (nm) and a length of it is one-billionth of a meter, equivalent to ten times the unit of measurement of atomic known Belonged++storm, and the size of nano is smaller about 80.000 times the diameter of the hair. Nanotechnology means also the technology of micro materials or nanotechnology or micro-miniature technology.

**So the aim of this study** is to study the nature of nanotechnology, its history and development, its components and applications with a focus on achieved progress in ceramic industry and materials and then analyze the implications for the use of nanotechnology in the field of ceramic applications .

**Key words:** Nanotechnology – carbon nanotube – particle size –sol gel

## **Introduction**

The Nanotechnology is the technology of the 21st century; a science is located between quantum mechanics and classical mechanics, Dr Mohamed El Nashaee the Egyptian scientist specialized in Nanotechnology take the importance of nanotechnology and science, who said it would control the future of humanity during the next forty years.

Research and study in nanotechnology has achieved a huge progress in ceramics Fields and Ceramic Industries , because it is one of the industries that rely entirely on raw materials and it particle size, the interest in this technology was the result of distinct and unique characteristics that we can get from such technology leads to exciting applications , it promoting the electrical and mechanical properties and magnetic and optical that provided by these materials , 98 % of the raw materials in the form of Nano materials dry or dispersed liquid substances which interfere too much in the casting Ceramic suspensions for both ceramic body recipes or glazes and prefabricated stains , and the use of nanotechnology in the work of Ceramic membranes that are used in the manufacture of ceramic filters and various other applications.

## **Research importance**

- ⇒ The technological development in the use of nanotechnology in the field of raw materials and Ceramic Industries has affected a direct impact on the properties of the structural and functional products and visual as this development helped to resolve many of the production problems in the light of recent technology.
- ⇒ Development that has occurred in modern technology and its applications is a strategic and integrated with an effective impact on the raw materials and production processes , as well as the properties of raw materials and products and this strategic development requires us to reconsider the correct many of the prevailing traditional concepts down to the objectives required.
- ⇒ This advanced technology did not take an apart of study, which provides for students or those who for the production of information to resolve problems.

## **Statement of the problem:**

- ⇒ The lack of use nanotechnology in the ceramic industry.
  - ⇒ Obstacles that stand Hail without the use of this technology in Ceramic Industries.
- Many developed countries applied and the evolution of this technology in industrial various fields.

## **Objectives**

- ⇒ Highlight the importance of nanotechnology and its applications in the ceramic industry& raw materials
- ⇒ Achieved requested soldering between nanotechnology and design in industrial, scientific and technologic institutions.

## **Methodology:**

This study is based on analytical descriptive

Researches in order to describe and analyze the importance of nanotechnology and its application in ceramic materials and bodies

## **Research Assumptions**

**The research supposed to:**

- ⇒ The Interest in the field of nanotechnology Ceramic Industries was the result of distinct and unique characteristics of this technology.
- ⇒ The Interest in this technology contributes to closer contact between design and technology in the ceramic industry.
- ⇒ Application and development of this technology contributes greatly to the development of ceramic designs ,sophisticated and innovative.

## **Methodology:**

This study is based on analytical descriptive Researches in order to describe and analyze the importance of nanotechnology and its application in ceramic materials and bodies

## **Research plan**

**Research is addressed through these main axes**

### **“Nanotechnology concept “**

A brief history of nanotechnology - nanotechnology Philosophy - types of Nano materials - economic state for Nano materials

### **“Nanotechnology applications in the field of ceramics:-“**

- ⇒ Ceramic structures
- ⇒ Scratch- resistant material
- ⇒ Ceramic membranes
- ⇒ Rearranging atoms and porcelain production of a new type of porcelain
- ⇒ Nanoparticles commercial products

### **“Nanotube definition “(nanotube)**

Nanotube applications in the ceramics field.

## **References**

### **First: the Arabic references:**

- ١- جريدة الأخبار / الأحد ٢٨/١/٢٠٠٧ / العدد ١٧٠.٨٩ / السنة ٥٥).
- ٢- جريدة الأهرام / ٢٩/١/٢٠٠٧ / ص ١٥.
- ٣- جريدة الوفد/العدد/١٢٥٢ (١٤/٣/٢٠٠٧).
- ٤- عبد الهادى مصباح/جريدة الأهرام/ص١٢/(٢٨/١/٢٠٠٧).

## Second : the foreign references :

- 5- Hamer, Frank and Sanet, "The Potter's Dictionary of Materials and Techniques", Pit Man Publishing, London, repinted1992.
- 6- (American Ceramic Society Bulletin,vol 81,No3/Greg Geiger /April /1999).
- 7- (American Ceramic Society Bulletin,vol 81,No3/Mindy N.Rittner /March 2002).
- 8- Net (3) <http://www.Clemson.edu/research/ottsite/techs/nopatent/00/35.htm>
- 9- Net(4) <http://Islamicceramics.ashmol.ox.ac.vk/technology2/ethnog.htm>
- 10- Net (6) <http://books.cambrige.org/0521432898.htm>
- 11- Net (7) [www.ceramic.org/news/fact sheets/military. asp](http://www.ceramic.org/news/fact%20sheets/military.asp).
- 11- Net (8) [www.grc.nasagav/www/RT2001/5000/30](http://www.grc.nasagav/www/RT2001/5000/30)
- 12-Net (11) (<http://ar.wikipedia.org/>)
- 13-Net (12) (<http://www.islamonline.net/arabic/science/2001/11/Article2.shtml>)
- 14-Net (13) (<http://www.americanelements.com/nanotech.htm>)
- 15-Net (14) (<http://www.zyvex.com/nanotech/feynman.html>)
- 16-Net (15)<http://www.islamonline.net/arabic/science/2001/11/Article8.shtml>
- 17-Net (16)<http://www.nsti.org/Nanotech2006/showabstract.html?absno=21000>
- 18-Net(17)<http://bionano.en.ecplaza.net/catalog.asp?DirectoryID=63750&CatalogID=81618>
- 19-Net (18)<http://bionano.en.ecplaza.net/product.asp>
- 20-Net (19)<http://www.filtersfast.com/Doulton-W9123053-Ceramic-Filter.asp>
- 21-Net (20)<http://www.islamonline.net/iol-arabic/dowalia/scince-23/scince6.asp>
- 22-Net (21) <http://www.spacedaily.com/news/nanotech-03zt.html>