

NANOTECHNOLOGY ITS FUNDAMENTALS AND RAPID PROTOTYPE MAKING

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ABSTRACT : A basic definition of Nanotechnology is the study manipulation and manufacture of extremely minute machines or devices. These devices are so small to the point of manipulating the atoms themselves to form materials. By this Nanotechnology we can make computers billions of times more than today's and new medical capabilities that will heal and cure in cases that are now viewed as utterly hopelessly. The properties of manufactured products depend on how those atoms are arranged .If we know about exactly how many dopant atoms are in a single transistor and exactly where each individual dopant atom is located and placed roughly the right number in roughly the right place, we can make a working transistor. Another improvement in Nanotechnology is self replication. Self replication make a effective route to truly low cost manufacturing .Our intuitions about self replicating systems learned from biological systems that surround us are likely to seriously mislead us about the properties and characteristics of artificial self replicating systems designed for manufacturing purposes. Artificial systems able to make a wide range of non biological products like diamond under programmatic control are likely to be more brittle and less adaptable in their response to changes in their environment than biological systems. At the same time they should be simpler and easier to design. Thus the progress of technology around the world has already given us more precise less expensive manufacturing technologies that can make an unprecedented diversity of new products. Everything requires the computer is a major reason why people should research and develop Nanotechnology.

KEY WORDS : Nanotechnology, fundamentals of nanotechnology, basic principle of prototype making.

1. INTRODUCTION

Nanotechnology is the art and science of manipulating matter at the nanoscale. We All Should care Because it can and most likely will bring revolution in the current industrialization and manufacturing processes. The American government is investing a wholesome of around 1 trillion USD/year....in different sectors, Some of which are mentioned in this chart a big proportion of the R&D is being invested on materials and electronics field. Like as prototyping or model making is one of the important steps to finalize. It helps in conceptualization of a design. Before the start of full production prototype is usually fabricated and tested. Prototype making is the sub part of Nanotechnology.

2. HOW SMALL NANO-SCALE IS

. Its a bit difficult to realize how small the Nano-scale is. To make things easier to get, we can say that one nanometre (nm) is one billionth of a metre. Rapid prototype (RP) is additive process, unlike all other familiar workshop machine methods that cut away

the materials until desired shape is achieved the removal of material is done in Nano-scale also.

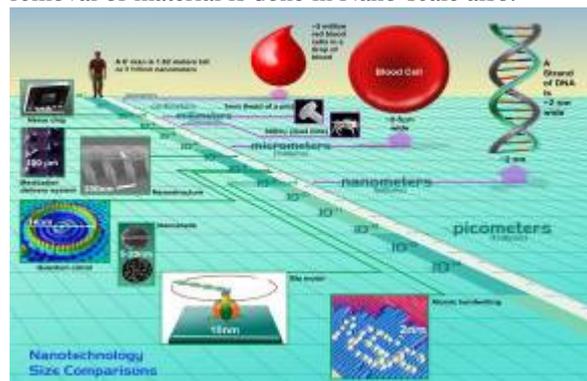


Fig. 1 Nano-scale.

3. APPLICATIONS OF NANOTECHNOLOGY ELECTRONICS

In the field of electronics Nano transistors are becoming more and more popular because of it's compactness. If u are thinking that this is a single transistor then you need to reshape your thinking, because this is a transistor box containing thousands of transistors in it. Some other examples of Nano-electronics are Nano-diodes, OLEDs etc.

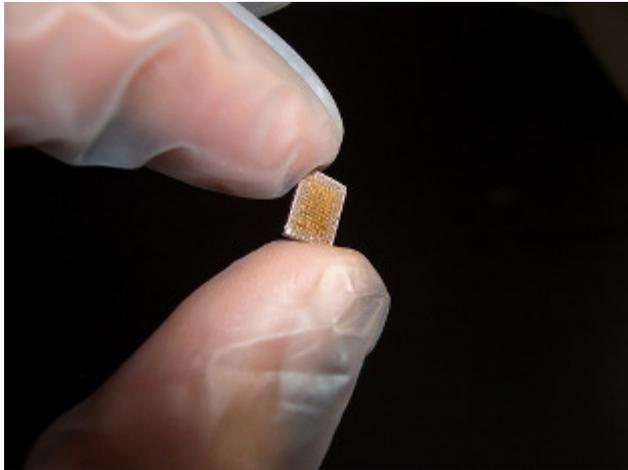


Fig. 2. Nano-transistor

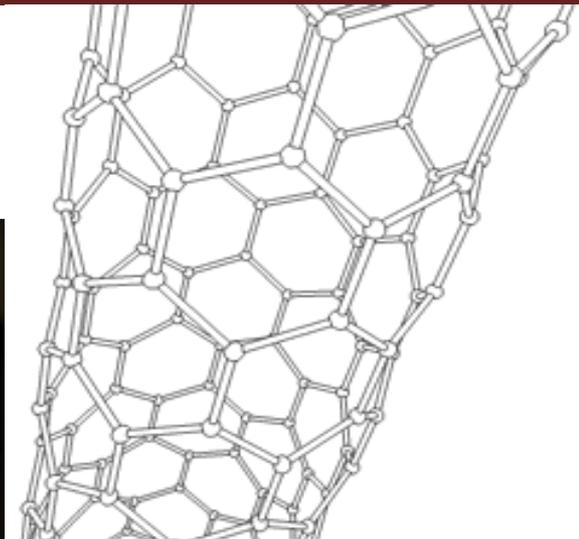


Fig. 4. Nano-tubes



Fig. 5. Nano particles

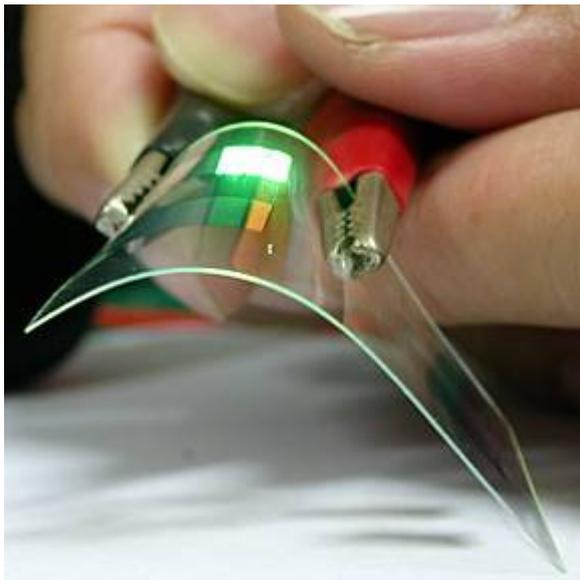


Fig. 3. OLEDs

ENERGY

This is a Nano-engineered battery, light in weight and flexible just like a paper. It can be rolled, twisted, folded or cut into a number of shapes with absolutely no loss of mechanical efficiency. Other energy supplement examples with some change in their properties are fuel cells and solar cells.

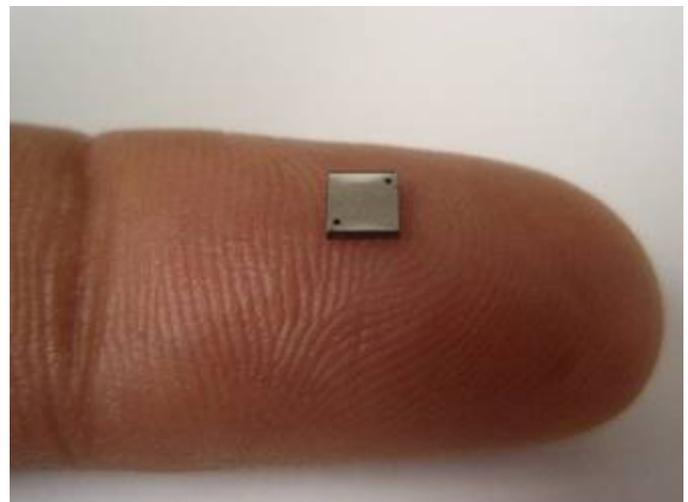


Fig. 6. Fuel cell

MATERIALS

This rotating picture is actually a model of carbon nanotube, the strongest and stiffest materials discovered till to date. These tubes are the building block of almost all the NT objects. Aerogel. The world's lightest crystalline solid and Nano- particles.

