Review of: "Normally, the length of nanowires is more than 1000 times greater than their diameter. This huge difference in ratio (length to diameter) compared to nanowires is often referred to as ١D materials"

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> ***Note:*** ***Nanowires are just like regular electrical wires except for the fact that they are much smaller. Like normal wires, nanowires can be made from a variety of conductive and semi-conductive materials such as copper, silver, gold, iron, silicon, zinc oxide and germanium. Nanowires can also be made from carbon nanotubes.***

Nanowires are less than 100 nm in diameter and can be as small as 3 nm. Typically, nanowires are more than 1000 times larger than their diameter. This huge difference in length-to-diameter ratio compared to nanowires is often referred to as 1D materials. This leads to unique properties not seen in bulk materials, The minute size of nanowires means that the quantum mechanical effects of are of great importance. "Quantum Wires" They use quantum mechanics to produce wires with a wide range of unique electrical properties. These features include quantum tunneling, which allows wires made of carbon nanotubes to conduct very high with electrons passing through the wire in a ballistic manner. > In the immersion method, nanowires have enough time to transfer from the particles of nanowires to the holes ; The step of forming uniform nanoparticles is done slowly and finally uniform nanowires are formed. Structural investigation with FESEM In the immersion method, nanowires are uniformly formed in all pores and in a wide area in the particles of nanowires.The simple answer to this The question of any particle is less than 100 nm. But like the scale from 1 - 100 nm determines the size range of a nanoparticle. In order to avoid the contact of particles, a cluster of atoms may be removed below 1 nm, but the movement of electrons in nanoparticles is <1 nm. Because the particles are three-dimensional.

> ***One-dimensional structures such as nanotubes, nanowires, and quantum wires are noteworthy structures in the fields of nanospintronics, nanophotonics, nanoelectronics, etc.***

The reason for this attention is their large length to diameter ratio and the difference in their electrical, optical, chemical, and magnetic properties, which lead to their use as building blocks in electronic devices. 1> Nanoscale optoelectronics. Different methods for obtaining one-dimensional nanoarrays have been mentioned, among them

are methods based on lithography (electron beam lithography, optical lithography, electric lithography, ion beam lithography, by microscope He mentioned the method of deposition from the vapor phase (physical vapor deposition and chemical vapor deposition) and methods based on the use of templates. The nucleus rotates around it, it also has a rotational motion around itself. This type of rotation in the structure of nanowires is called electron nanospin.The advantages of using nanoporous aluminum oxide as a template for the production of nanowires compared to other methods, including the high order of pores, the alignment of pores, and the controllability of the ratio The length is equal to the diameter and high density of the porosity. The amount of order and dimensions of the nanowires produced using this set of templates is determined and controlled by the initial conditions of the anodizing process. due to chemical stability, high saturation magnetization, high axial anisotropy, high temperature, chemical stability and high corrosion resistance excellent, and high special resistance of nano-electricity, they have good electromagnetic and nano-magneto-optic properties.

> *Nanostructure is defined as any structure with one or more dimensions and is measured in the range of nanometer scale.*

Nanostructures are materials or structures that have at least one dimension between 1 and 100 nanometers have. The importance of the nanoscale is in changing the properties and characteristics of materials in these dimensions. Properties such as electrical conductivity, electromagnetic properties, etc. Starting to change the properties of the material by shrinking it depends above all on the type of material and the desired property. For example, by shrinking the dimensions of a material, generally, some of the electromagnetic properties of nano-molecular materials, such as the conductivity of nano particles in materials, are improved. This increase in strength does not happen only in the range of a few nanometers, and the strength of materials of several tens or even hundreds of nanometers may be much more than the mass material of a large scale. On the other hand, the change of some properties such as conductivity in electromagnetic properties in nanowires can occur in dimensions of only a few nanometers.Self-assembly (nanoparticles) into nanostructures is a spontaneous process by which nanomolecules/nanophases are transformed into organized functions. Two important types of nanostructures conductive nanoparticles (microstructured particles, mostly semiconducting materials) and a> (tiny tubes, usually made of pure carbon). Self-assembled nanoparticles made of semiconductors change nanostructures depending on their scale size. CNT carbon nanotubes can be large amounts transfer electric current, much more than graphene nanowires and nanoribbons generally self-aggregate in nanostructures, increasing nanoelectromagnetic interaction (nanoparticles) in conductive nanomaterials and semiconductors.Nanotubes are CNTs

> ***Conclusion :***
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> *Nanowires are just like regular electrical wires except for the fact that they are much smaller. Like normal wires, nanowires can be made from a variety of conductive and semi-conductive materials such as*

> ***copper, silver, gold, iron, silicon, zinc oxide and germanium. Nanowires can also be made from carbon nanotubes.***

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