Mesoscopic Nano Structures in Espatterning Multilayer Systems

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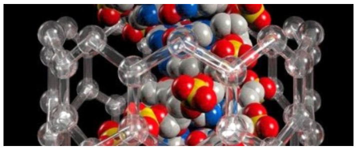
- **Abstract:**

- Modeling of Si / Cu nanoparticles based on a relationship between molecular mechanics and solids mechanics, an energy-equivalent model is used for the mechanical properties and nanomolecular structure of the material sputtering layer.

- **Keywords:** between molecular mechanics , energy-equivalent model , energy-equivalent

Introduction •

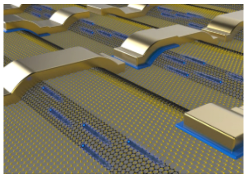
In nanoelectronics technology, special parameters and systems must be used to perform such processes. For example, in the metalworking process, the use of copper metal instead of conventional aluminum metal for internal connections between different parts is practically inevitable. However, the rapid penetration of Cu atoms under Si in heat treatment leads to the formation of a copper silica layer and ultimately to the destruction of the electronic component. To solve this problem, a middle layer of retardant materials such as Ta, w or Mo is usually used as an penetration barrier to improve the thermal stability of the Si / Cu layer . In the characterization of nanoparticles and Si / Ta / Cu multilayer systems, there is the effect of negative bias voltage on improving the electrical and structural properties of the Sputtering Ta penetration barrier in the Si / Ta system. Surface processes of the Si layer, including combustion, are performed by plasma and ion beam technology. This kind of Integrated circuits with their unique properties at the nanometer scale have a variety of applications of mesoscopic systems.



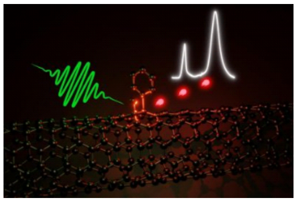
The macroscopic properties of nanoparticles, such as melting point, boiling point, and electrical conductivity, are determined by a sample large enough to be measured under normal laboratory conditions. When the melting point of a nanomolecule is measured, the behavior of a large number of nanoparticle molecules is actually examined, and this is not true for all materials; When the size of the material is reduced to nanometer dimensions, completely different behaviors and properties may be observed from the same material in large dimensions.The properties of nanomaterials and nanoparticles can depend on its size. This fact may be contradicted by the fact that the properties of materials (solids, liquids and gases) are related only to the atoms and molecules that make up the substance and the type of bond they have, or to the arrangement of the atoms. But everything has changed at the nanoscale, as a result of which the properties of the material may undergo fundamental changes.

(Nano structure) •

The main basis of nanotechnology is the use of materials. Every material in space has three dimensions of length, width and height. If in materials at least one of these three dimensions is in the nanometer range, it is called a substance, a nanostructure.



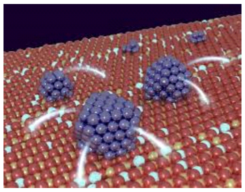
There is no accepted definition for the nanometer range, but a more acceptable definition is the range of one to one hundred nanometers. Even though the dimensions of a few hundred nanometers in a material, it is still called a nanostructure. In fact, the definition of the range of 1 to 100 nanometers is to have a definition and standard.



This classification of nanomaterials (nanostructures) is not an apparent and worthless classification. These three types of nanostructures have fundamental differences, both in terms of synthesis and production, as well as in terms of properties and applications. In general, the electrical, optical, magnetic, surface, etc. properties of these three structures are fundamentally different from each other, and of course their applications are also different. One-dimensional nanostructures can be used for electronic connections, while zero-dimensional and two-dimensional nanomaterials do not.

Cobalt Nano Nanoparticles Cobalt Nano Structure Investigation •

Cobalt Nano Wire Cobalt Nano Wire has a structure that has an amazing length to width ratio . Nanowires are very thin - it is possible to create nanowires with a diameter of only one nanometer, nanowires are used to create the smallest transistors (nanotransistors). Cobalt nanowires exhibit electromagnetic absorber behavior at moderate temperatures, and when a magnetic field perpendicular to the nanowires is applied, these nanoelectronic devices have a larger coercive field than when the electromagnetic field is parallel to the nanoparticles. Cobalt wires are formed. Cobalt nanowire technology is approximately 1 to 100 nanometers in size, where only one of its kind phenomena offers descriptive applications. Nanotechnology encompasses science, engineering, and non-scale technology, imaging, measuring, designing, and manipulating materials at this length scale. Due to nanotechnology, computers have become faster than before and the value of computing has decreased. In the immersion method, nanowires have enough time to transfer from nanoparticle particles to cavities ; The formation step of uniform nanoparticles is done slowly and finally uniform nanowires are formed. Structural study with FESEM in the immersion method of single-stranded nanowires in all porosities and in a large area of nanowire particles are formed. The simple answer to this question is that each particle is less than 100 nanometers. But like The scale from 1 to 100 nm determines the size range of a nanoparticle. In order to prevent cluster particles from contacting atoms, less than 1 nm may be removed, but the electron movement in nanoparticles is <1 nm. Because the particles are three-dimensional.



Cobalt Nano Wire Cobalt Nano Wire can have insulating, semiconductor or metal properties . Insulators do not withstand electrical charges, while metals have very good electrical charges. The semiconductors are located between the two and are charged under suitable conditions. By placing the semiconductor wires in the proper configuration, transistors can be made that act either as switches or amplifiers . Some interesting and anti-flexible features of nanowires are due to their small scale.

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