Investigating The Degree of Organization and Dimensions of Nanowires Produced Using Templates

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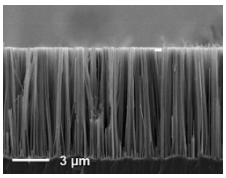
- **Abstract:**

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

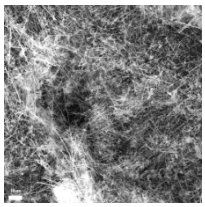
- **Keywords:** Nanochips , Nanophotonics , Nanoelectronic , Nanospintronics , Nanowires

Introduction •

The reason for this attention is their large aspect ratio and the difference in their electrical, optical, chemical and magnetic properties, which has led to their use as building blocks in nanoscale electronic and optoelectronic devices. Different methods have been mentioned to achieve one-dimensional nanoarrays, including lithography-based methods (electron beam lithography, optical lithography, electrical, ion beam, lithography, scanning microscope lithography), vapor deposition methods (physical vapor deposition and chemical vapor deposition), and template-based methods. In addition to orbiting the nucleus under the influence of the gravitational force, the electron in the atom 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 producing nanowires compared to other methods include high porosity order, porosity alignment, controllable length-to-diameter ratio, and high porosity density. The degree of order and dimensions of the nanowires produced using this set of templates are determined and controlled by the initial conditions of the anodizing process. Due to their chemical stability, high saturation magnetization, high axial anisotropy, high Curie temperature, excellent chemical stability, and corrosion resistance, and high nanoelectrical resistivity, they have good electromagnetic and nanomagneto-optical properties.



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

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