Nanowire Propagation Wafer (Silicone Wafer) and Mounting or Growing Nanowire Particles

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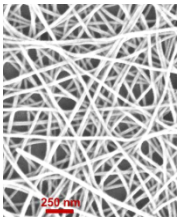
- **Abstract:**

- Cobalt nanowires with a diameter of about 93 nm are made using the electrospinning technique on an aluminum mold. Nanowires are made using the galvanostatic deposition method.

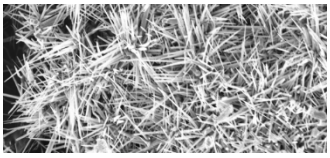
- **Keywords:** Nanostructures ,Nanoelectronic , Nanowires , Nano Particle

Introduction •

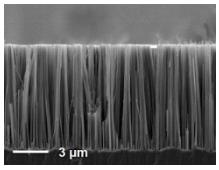
The aluminum mold is fabricated by multi-step anodization of pure aluminum foil. Arrays of vertically aligned cobalt nanowires are fabricated on flat surfaces and field emission (FE) is used as an electron cathode . These arrays are obtained by electrodeposition of nanoparticle molds on Au/Ti/Si substrates at very low temperatures (<100°C).



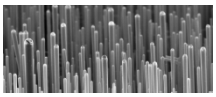
After template removal, the arrays consist of structurally upright nanowires with high aspect ratios, uniform dimensions, and predetermined density. Electron field emission measurements characterize the metallic properties and propagation of the cobalt nanowires. In the propagation of cobalt oxide nanotubes, cobalt nanowires are synthesized by computing the cobalt nanowires embedded in the alumina template in air.



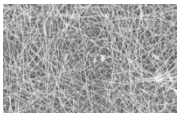
Cobalt Nano Wires can have the properties of an insulator, a semiconductor, or a metal. Insulators do not carry an electric charge, while metals are very good at carrying electric charges. Semiconductors fall between the two and become charged under the right conditions. By placing semiconductor wires in the right configuration, transistors can be made that act as either switches or amplifiers . Some of the interesting and counterintuitive properties of nanowires are due to their small scale.



Silicon nanowires are one of the best examples of semiconductor nanostructures that can be made as single crystals with a small diameter of 9 to 0 nm. Electromagnetic nature of nanoparticles In magnetic materials, the molecules and atoms that make up them have electromagnetic properties. In simpler terms, elements such as iron, cobalt, nickel and their alloys that are attracted by a magnet are called magnetic materials. The classification of electromagnetic materials is based on magnetic susceptibility (the ability of a material to become magnetized). Accordingly, materials are classified into three groups: ferromagnetic, paramagnetic and diamagnetic. The resultant dipole moment in diamagnetic electromagnetic materials is zero and in the presence of a magnetic field, a dipole moment is induced in them; But the direction of these induced dipoles is opposite to the direction of the external magnetic field, which causes the (diamagnetic) material to be repelled from the magnetic field.



When an external magnetic field is removed, the magnetic properties of these materials do not remain. The magnetic susceptibility of these materials is negative and very low (about 6-10 -3). All gases (except oxygen), water, silver, gold, copper, diamond, graphite, bismuth and many organic compounds are diamagnetic. The magnetic dipoles in paramagnetic materials do not have a specific and regular orientation; as a result, these materials do not have magnetic properties. If they are placed in a magnetic field, they become regular in the direction of the magnetic field lines. When the magnetic field is removed, the magnetic dipoles quickly return to the previous state they had in the absence of the field. In this way, paramagnetic materials acquire magnetic properties in strong nanoelectromagnetic fields.



Cobalt nanowires with a diameter of about 93 nanometers are made using the electrospinning technique on an aluminum nanowire mold using the galvanostatic spinning method .

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