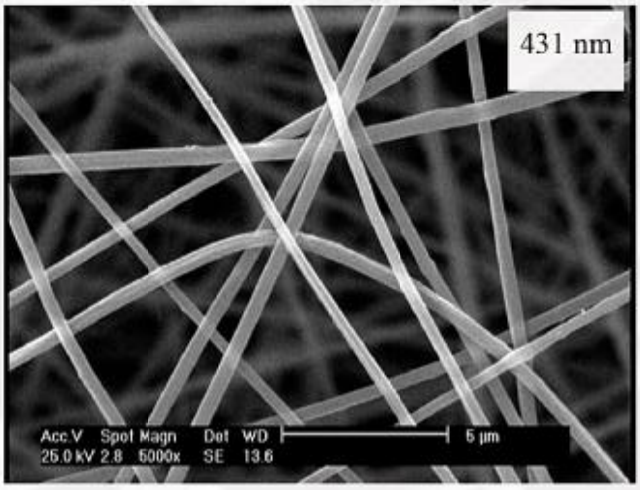
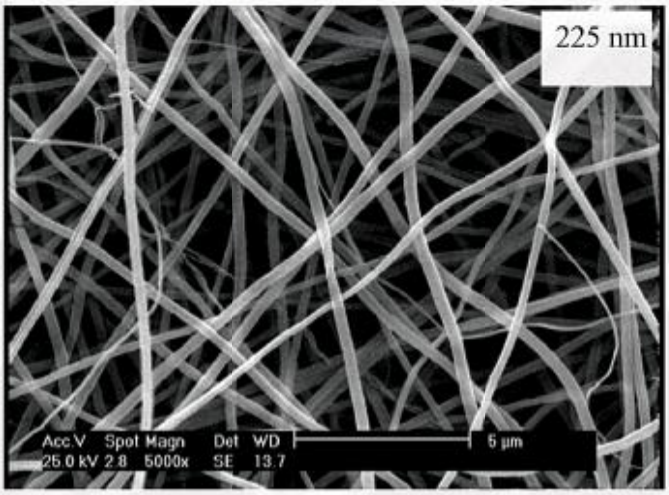
Inorganic Nanofiber - Al2O3

Product description

Alumina (Al2O3) is one of the most excellent oxide precursors and has been studies extensively over a long period of time because of their potential for broad applications in adsorbents, catalysts and catalyst support, and reinforcements for composite materials. These materials have potential applications in the area of catalysis, microelectronics and optics both in pure or doped form as well as in combination with others. Nanofibers having α-alumina structure are excellent candidates to be used as reinforcement for metal, ceramic or polymer matrix composites, as well as to prepare the .nonwoven products having good chemical stability and desired microstructure



Before Calcination. SEM image. magnification: 5000 x



After calcination. SEM image, magnification: 5000 x

Application

α- alumina (corundum) – trigonal

Catalysts or absorbents for scavenging precious or heavy metals|Abrasive | Advanced ceramic material | Electrical components – electrical insulator| Thermal conductor | nanocomposites

γ- alumina – cubic

Optical displays | Catalyst and catalyst carrier | Electrical components | electrical insulator | Thermal conductor | Nanocomposites | Separator | Separator material for batteries

Material characteristics

Fiber structure	Polycrystalline nanofiber
Typical fiber diameter	225 nm
Fiber length	2<L µm
Crystal phase	alpha-gamma
Typical size of crystallites	N/A
Physical form	White fluffy powder

Producer can modify the fiber length to different values in accordance to customers requests and application.
Please feel free to contact us for more info. (nanofiber@fnm.ir)

www.fnm.ir; e-mail: info@fnm.ir

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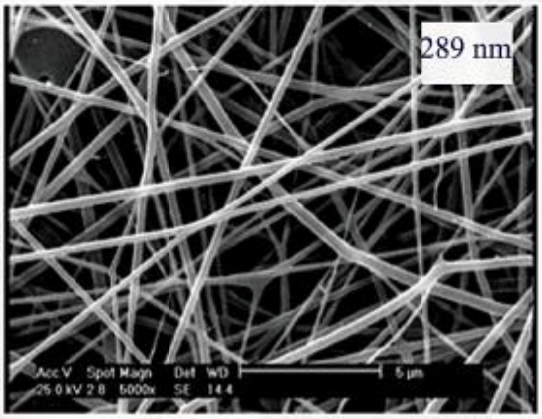
.Fanavaran Nano Meghyas, LTD

فناوران نانومقیاس

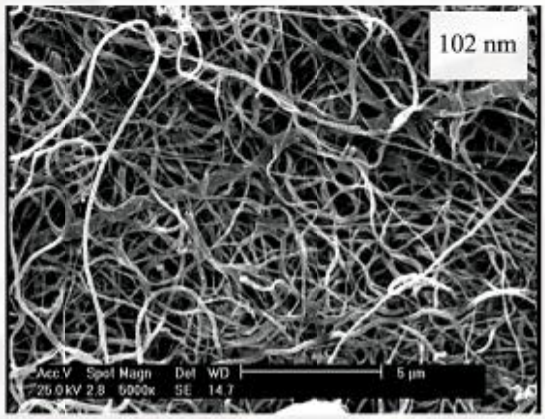
Inorganic Nanofiber - Fe2O3

Product description

Iron(III) oxide or ferric oxide is the inorganic compound with the formula Fe2O3. It is one of the three main oxides of iron, the other two being iron(II) oxide (FeO), which is rare, and iron(II,III) oxide (Fe3O4), which also occurs naturally as the mineral magnetite. Hematite (γ-Fe2O3), the most stable iron oxide under ambient conditions, has been widely used as pigment, catalysts, gas-sensing material and photoanode for possible photoelectrochemical cell. There has been much interest in the investigation of synthetic methods and properties for nanosized α-Fe2O3 materials. The α-Fe2O3 nanofibers .were prepared using ferrous acetate (FeAc) mixed with polyvinyl alcohol (PVA) as precursors



Before Calcination. SEM image. magnification: 5000 x



After calcination. SEM image, magnification: 5000 x

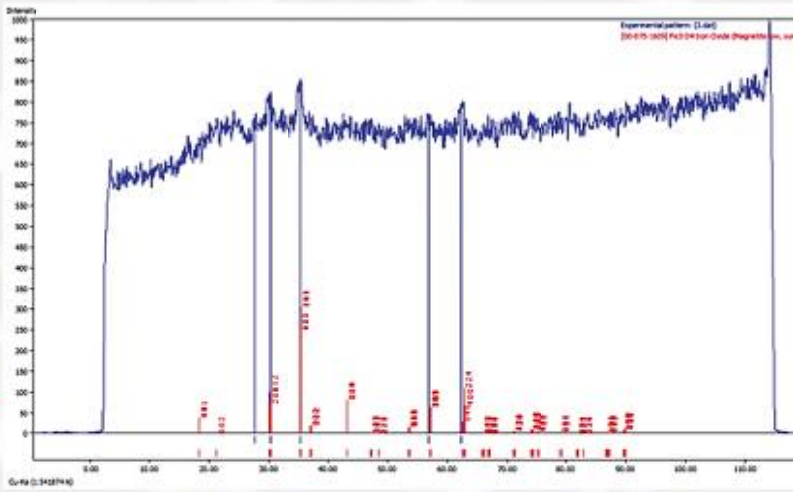
Physical form

Application

Rechargeable lithium-ion batteries | Filter | microfluidic device | Biochip with fast-response time | Self-cleaning surface devices

Material characteristics

Fiber structure	Polycrystalline nanofiber
Typical fiber diameter	102 nm
Fiber length	5<L μm
Crystal phase	γ
Typical size of crystallites	12 nm
Physical form	Brown powder



XRD patterns of the calcinated nanofibers

Producer can modify the fiber length to different values in accordance to customers requests and application.
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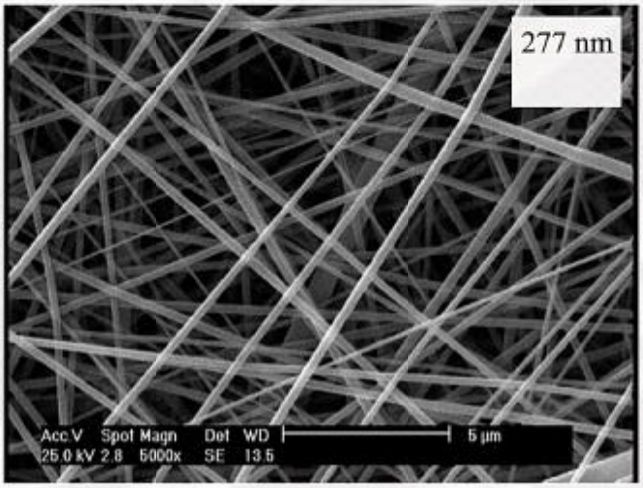
Inorganic Nanofiber - SiO2

Product description

Silicon dioxide, is a chemical compound, manufactured in several forms including precipitated, fused quartz, crystal, fumed silica (pyrogenic silica)and .. Silicon dioxide is a kind of inorganic material extensively applied in many fields due to its relative ease of preparation, hydrophilic nature, physical and chemical stability and good biocompatibility, the mild reactivity and well chemical properties. Electrospun SiO2 nanofibers are possess high specific .surface area, high length-to-diameter ratio, uniform pore-size distribution, controllable morphology



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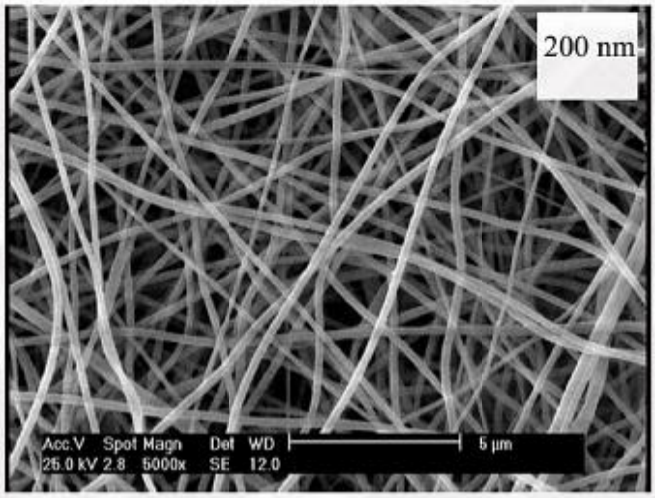

After calcination. SEM image, magnification: 5000 x

Application

SiO2 nanofibers can be used for improving the oxidation resistive property of carbon nanofiber | adsorbent dye | superhydrophobic surfaces | in biological applications such as culturing cells and as wound cover | Battery Separator

Material characteristics

Fiber structure	Polycrystalline nanofiber
Typical fiber diameter	200 nm
Fiber length	Continues
Crystal phase	Amorphous SiO_2
Typical size of crystallites	-
Physical form	White fluffy powder

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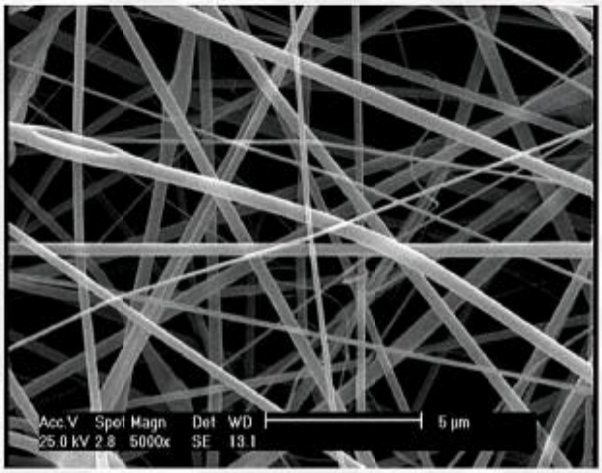
Inorganic Nanofiber - TiO2

Product description

TiO2 is the most widely studied owing to its advantages such as a suitable band gap for redox reactions, long-term stability, low cost, and so on. As a photocatalyst, nano-TiO2 has been attracting considerable attention since recent years, especially in environmental remediation and protection, photocatalysis, dye-sensitized solar cells, gas sensors, batteries the treatment of organic pollutants in water and air. Nanosized TiO2 particles possess high specific surface area, the poor recuperability and repeatability of nano-TiO2 particles will limit its further application. While titania nanofiber poses higher specific .surface area and collision factor air draft



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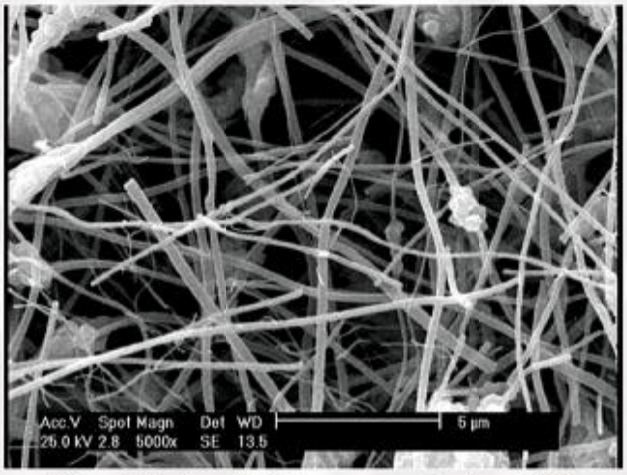

After calcination. SEM image, magnification: 5000 x

Application

Anatase

Energy convertor in solar cells | Air/fuel ratio controller | in automotive | Sensors – humidity and gas sensors Electrode material in lithium batteries | Solid oxide fuel cells | Inorganic membranes | DSSC- dye sensitized solar cells | Photocatalytic degradation of volatile compounds (VOC), bacteria and NOx | Waste water purification

Anatase-rutil

UV absorbent | White pigment | Inorganic membranestor | Nanocomposites | Separator | Separator material for batteries

Material characteristics

Fiber structure	Polycrystalline nanofiber
Typical fiber diameter	174 nm
Fiber length	2<L µm
Crystal phase	anatase-rutile
Typical size of crystallites	7-10 nm
Physical form	White fluffy powder

Producer can modify the fiber length to different values in accordance to customers requests and application.
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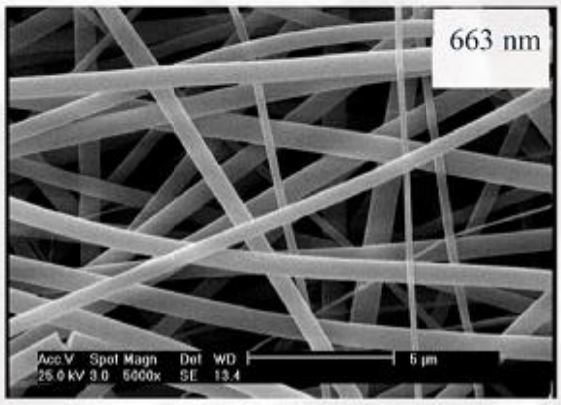
فناوران نانومقیاس

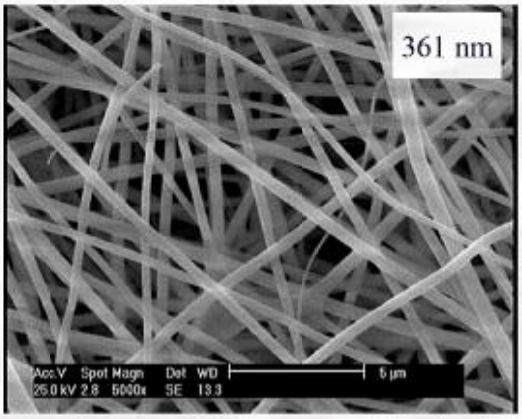
Inorganic Nanofiber - ZrO2

Product description

Zirconium oxide (ZrO2) that known as zirconia is a material with three phases, namely, monoclinic, tetragonal and cubic and it is chemically unreactive. Also possess properties such as high resistance to crack propagation, High thermal expansion, low thermal conductivity, high fracture toughness, Ionic electrical conduction, electrically conductive above 600°C. Zirconia (ZrO2) nanofibers creates a high surface area and porosity, good morphology, good resistant to heat, anti-corrosion and etc, hence it can be used as catalysts, electrodes ,membrane materials and etc, for example with use ZrO2 nanofiber photoelectrode for dye-sensitized solar cells the amount of dye loading, short-circuit photocurrent density



Before Calcination .SEM image. magnification: 5000 x



After calcination. SEM image, magnification: 5000 x

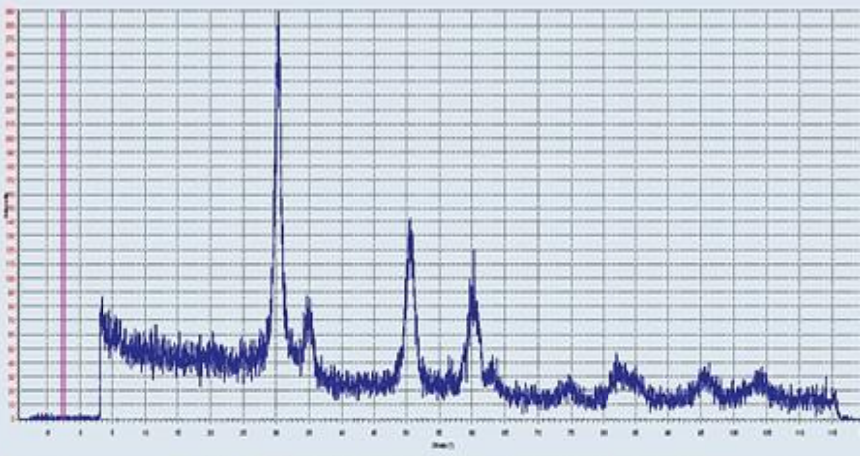
Physical form

Application

Thermal barrier coating | Insulation and infrared heating systems | Crowns and bridges in the dental industry | Marine pump seals | Fuel cell membranes | Oxygen sensors | Refractory material | High temperature .induction furnace subsectors | Hot metal extrusion dies | Auxiliaries in welding

Material characteristics

Fiber structure	Polycrystalline nanofiber
Typical fiber diameter	381 nm
Fiber length	2<L µm
Crystal phase	monoclinic and tetragonal
Typical size of crystallites	9-13 nm
Physical form	Yellow powder



XRD patterns of the calcinated nanofibers

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