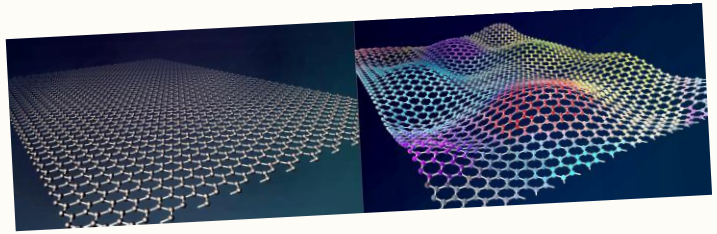
Modern materials

A modren materials is a materials that has been engineered to have improved properties . Concrete , aluminium and steel are all commonly used modren materials, but more recent additions include materials that have changed the way we manufacture and use products.

GRAPHENE



What is graphene?!

Graphene is an allotrope of carbon in the form of a single layer of atoms in a two-dimensional hexagonal lattice in which one atom forms each vertex. It is the basic structural element of other allotropes, including graphite, charcoal, carbon nanotubes and fullerenes.

How is graphene used in products??

Graphene can be incorporated in many other fields and products like sensors, electronics and more.
Applied graphene Materials announced that it has supplied its graphene material for use in the production of a range of fishing rods, made by UK's Century Composites.

What is graphene used for?!

Coatings, sensors, electronics and more
Graphene has a lot of other promising applications: anti-corrosion coatings and paints, efficient and precise sensors, faster and efficient electronics, flexible displays, efficient solar panels, faster DNA sequencing, drug delivery, and more.

Graphene is a two-dimensional carbon allotrope with the carbon atoms arranged in a two-dimensional honeycomb lattice. It is one of the strongest materials at present and the carbon arrangement provides it with attractive and unusual characteristics.

METAL FOAM

What is metal foam?

A metal foam is a cellular structure consisting of a solid metal with gas-filled pores comprising a large portion of the volume. The pores can be sealed or interconnected.

What is metal foam used for?

Metal foam are used for stiffening a structure without increasing its mass. For this application, metal foams are generally closed pore and made of aluminum.

How strong is metal foam?

The defining characteristic of metal foams is a very high porosity: typically 75-95% of the volume consists of void spaces. The strength of foamed metal possesses a power law relationship to its density; that is, a 20% dense material is more than twice as strong as a 10% dense material.

What does metal foam do?

Foam metal is being used as an experimental prosthetic in animals. Metal foams with high strengths can act as high-capacity impact-energy absorbers.

Benefits of metal foam

.Ultralight material (75-95% of the volume consists of void spaces)

.Very high porosity.

.High compression strengths combined with good energy absorption characteristics.

.Thermal conductivity is low.

.High strength.

TITANIUM

What is titanium??

Titanium is a chemical element with the symbol Ti and atomic number 22. It is a lustrous transition metal with a silver color, low density, and high strength.

There are several things that are special about titanium. Titanium metal is a very durable metal for engineering applications because this metal is corrosion-resistant and, also this metal is very strong and very light.

Why titanium is expensive?

Titanium has a very high melting point. The metal is hard enough for machining. That is the real reason why the production process of titanium is energy intensive as well as expensive.

What is titanium made up of?

It has, to be made from mineral ores called ilmenite a complex compound of iron, titanium, and oxygen with chemical formula $FeTiO_3$ and rutile mostly titanium dioxide, a compound of titanium and oxygen with chemical formula TiO_2 using a series of chemical reactions that can be difficult and costly.

Examples of titanium?

Titanium is a metallic element. Titanium in its metal form is very strong and yet quite light, so it is used where the strength to weight ratio is critical (e.g. aircraft parts, high end bike frames, tennis rackets).

NANOMATERIAL

What is nanomaterial??

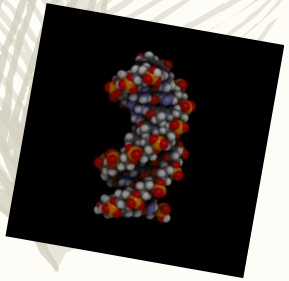
Nanomaterials are chemical substances or materials that are manufactured and used at a very small scale. Nanomaterial are developed to exhibit novel characteristics compared to the same material without nanoscale features, such as increased strength, chemical reactivity or conductivity.

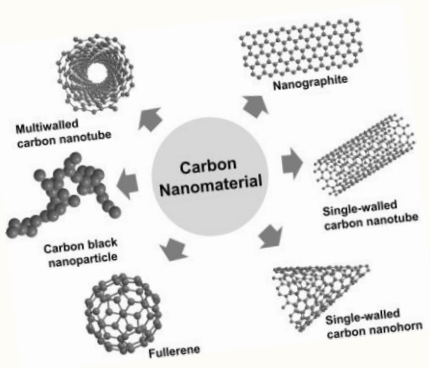
What is the differnce between naomateriaks and nanoparticels??

Nanomaterials are materials that have structural components smaller than 1 micrometer in at least one dimension. Nanoparticels are particles with at least one dimension smaller than 1 micron and potentially as small as atomic and molecular length scales (~0.2 nm).

What are nanomaterial used for?

Nano materials are used in a variety of, manufacturing processes, products and healthcare including paints, filters, insulation and lubricant additives. In healthcare Nanozymes are nanomaterial with enzyme-like characteristics.





How are the nanomaterial made?

Gas phase processes are among the most common industrial-scale technologies for producing nanomaterial in powder or film form. Nanoparticels are created from the gas phase by producing a vapor of the product material using chemical or physical means.

LIQUID CRYSTAL DISPLAY (LCD)

What is LCD?

A liquid crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals combined with polarizers. Liquid crysral do not emit light directly, instead using a backlight or reflector to produce images in color or monochrome.

What type of liquid crystal display work?

Highly anisotropic, rod-shaped, thermotropic calamitic nematic liquid crystal are generally used in liquid crystal displays (LCDs).

What are the type of LCD??

.Monochrome (single color) Static. Graphic. Character. Custom.

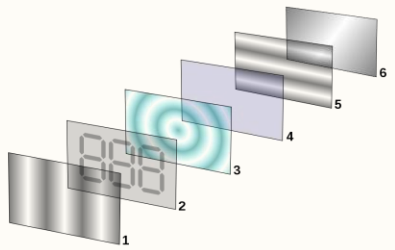
.Multi-Color. TFT. OLED. FSC (Field Sequential Color LCD)

EBT (Excellent Black Technology) aka VA (Vertical alignment)

CSTN.

How does liqud crysals display work??

Liquid crystal display technology works by blocking light. Specifically, an LDC is made of two pieces of polarized glass (also called substrate) that contain a liquid crystal material between them.



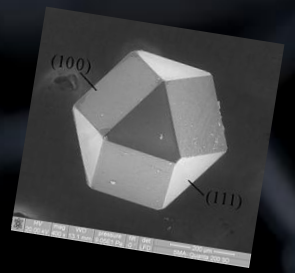
Why is LCD used?

LCD uses a liquid crystal to produce a visible image. Liquid crystal displays are super-thin technology display screen that are generally used in laptop computer screen, TVs, cell phones and portable video games.

Modern materials

NANOMATERIALS

Nanomaterials describe, in principle, materials of which a single unit small sized between 1 and 100 nm. Nanomaterials research takes a materials science-based approach to nanotechnology, leveraging advances in materials metrology and synthesis which have been developed in support of microfabrication research.



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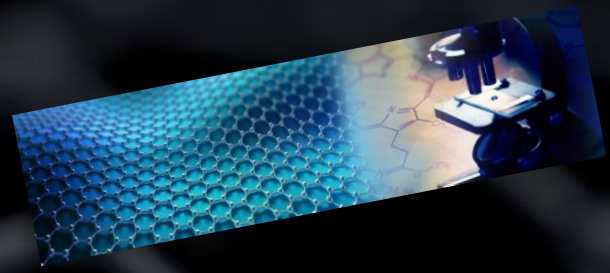

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