

**Polymeric fiber  
technology  
Lecture (2)  
Synthetic Fibers**

**Dr. Manar Abd Ul- Jabbar Najim**

# :Man-made fibers

孃 Regenerated Fibers.

孃 Synthetic Organic Fibers.

孃 Synthetic Inorganic Fibers.

# :Regenerated fibers

孀 Regenerated fiber is created by dissolving the cellulose area of plant fiber in chemicals and making it into fiber again (by viscose method). Since it consists of cellulose like cotton and hemp, it is also called "regenerated cellulose fiber." Regenerated fibers produced from naturally occurring polymers, these polymers do not occur naturally as fibers; therefore, processing is needed.

嫻 wet spinning is the most common method for processing:

嫻 - purified cellulose is chemically converted to a viscose solution.

嫻 - forced through spinnerets into a bath.

嫻 - returned to solid 100% cellulose filaments.

# Synthetic organic fibers

## 1- Polyester fibers.

媿 Polyester is a category of polymer which contains ester functional group in their main chain.

媿 Polyester fibers have high melting temperatures.

媿 Thermoplastic.

媿 Have good strength.

媿 Hydrophobic.

媿 Polyester fibers have excellent resiliency, and it's the best wash and wear fabric.

## 2- Polyamide fibers (Nylon):

It's one of the most common polymers used as fibers.

Thermoplastic.

Nylons are also called polyamides, because of the characteristic amide groups in the backbone chain.

These amide groups are very polar and are linked with each other with hydrogen bonds.

Nylon is a regular and symmetrical fiber with crystalline regions and make fibers.

The fiber has a smooth rod like shape with a smooth surface.

### 3- Rubber Fibers:

The manufacturing process consists of extruding the natural rubber latex into a coagulating bath to form filament. The material is cross linked to obtain fibers which exhibit high stretch.

It can be synthesized.

Natural rubber is essentially a polymer of isoprene units, a hydrocarbon monomer. Synthetic rubber can be made as a polymer of isoprene or various other monomers.

The material properties of natural rubber make it an elastomer

# :Synthetic inorganic fibers

## 1- Glass Fibers:

媿 Glass fibers are also known as Fiberglass that is a material made from extremely fine fibers of glass.

媿 Glass fiber is formed when thin strands silica-based or other formulation glass is extruded into many fibers with small diameters textile processing



## 2- Metallic Fibers:

Metallic fibers are manufactured fibers composed of metal, plastic-coated metal, metal-coated Gold and silver have been used since ancient yarns for fabric decoration.

More recently, aluminum yarns, aluminized plastic nylon yarns have replaced gold.

They are made through laminating process.

Coated metallic filaments help to minimize tarnishing.

When suitable adhesives and films are used, they are not affected by salt water, chlorinated water in swimming pools or