NATURAL AND MAN-MADE FIBERS

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Abstract.

Fibers, which are an integral part of the textile industry, have been used for a long time in human history. Fibers are divided into two main types: natural and chemical fibers. Natural fibers are obtained from plants, animals or minerals, while chemical fibers are produced through artificial or synthetic methods. Both types of fibers are widely used in industry and have their own specific physical and chemical properties. Natural and chemical fibers play an important role in the production of fabrics and other materials. Fiber materials are widely used in various areas of human life, including clothing, industry, medicine and ecology. Natural fibers are often obtained from plants or animals, while chemical fibers are produced through synthetic processes.

Keywords:

Natural fibers, chemical fibers, cotton, wool, viscose, polyester, textile industry, synthetic fibers, ecology, silk, nylon, Natural fibers, Viscose, Synthetic fibers.

Аннотация. Волокна, являющиеся неотъемлемой частью текстильной промышленности, используются уже давно в истории человечества. Волокна делятся на два основных типа: натуральные и химические. Натуральные волокна получают из растений, животных или минералов, в то время как химические волокна производятся искусственным или синтетическим путем. Оба типа волокон широко используются в промышленности и имеют свои собственные специфические физические и химические свойства. Натуральные и химические волокна играют важную роль в производстве тканей и других материалов. Волокнистые материалы широко используются в различных областях жизни человека, включая одежду, промышленность, медицину и экологию. Натуральные волокна часто получают из растений или животных, в то время как химические волокна производятся синтетическими процессами.

Ключевые слова: Натуральные волокна, химические волокна, хлопок, шерсть, вискоза, полиэстер, текстильная промышленность, синтетические волокна, экология, шелк, нейлон, Натуральные волокна, Вискоза, Синтетические волокна.

Natural fibers

Natural fibers are obtained from biological sources. They are divided into the following types:

-Plant fibers (cellulose-based):

- Cotton - the most common type of natural fiber.
- Linen - strong and has cooling properties.
- Hemp, coconut, jute - used in industrial sectors.
- Animal fibers (protein-based):

- Wool – obtained from sheep's wool, retains heat.
- Silk – produced by silkworms.
- Alpaca, cashmere – valuable fibers.

Chemical (artificial) fibers

Chemical fibers are obtained using chemical reactions in laboratory or industrial equipment:

- Artificial fibers (derived from natural sources, but processed):
- Viscose – obtained from wood cellulose.
- Acetate – obtained from a mixture of cellulose and acetic acid.
- Synthetic fibers (created entirely chemically):
- Polyester – the most widely used artificial fiber.
- Nylon – known for its strength and stretchability.
- Acrylic, lycra – characterized by elasticity and lightness.

Comparison

Features	Natural fibers	Chemical fibers
Source	Biological (plant, animal)	Chemical (oil, gas)
Environmental safety	Environmentally friendly	Often not recycled
Strength	Average	High
Price	Expensive (some)	Cheap
Thermal stability	Less	High

Production process

- Weaving
- Skepticism
- Chemical modification
- Reactive knitting

Application:

- Clothing
- Industrial materials
- Medicine (e.g. medicines)
- Eco-friendly materials

Features:

- Durability
- Elasticity
- Air permeability
- Water resistance
- Biodegradability

Main results:

Although natural fibers are more environmentally friendly, they sometimes have disadvantages in terms of strength or durability. Chemical fibers, although convenient for industry, cheap and easy to produce, can have a negative impact on the environment. Today, due to the increased focus on sustainable textile production, the demand for recyclable, environmentally friendly fibers is increasing. By combining both types of fibers, there is an opportunity to create new, efficient and balanced fabrics.

Conclusion

Natural and chemical fibers play an important role in the development of the textile industry. Each has its advantages and disadvantages, and the choice depends on their application, environmental requirements and price. Today, as the issue of environmental sustainability becomes more urgent, the demand for natural fibers is increasing. Natural and chemical fibers play a key role in the textile industry. Natural fibers are important from the point of view of human health and environmental safety. They are biodegradable, do not harm the skin, and often have a high level of air permeability. Chemical fibers, on the other hand, have great advantages in modern production with their properties such as high durability, low cost, color retention and elasticity.

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