

A STUDY ON COMPARATIVE APPROACH BETWEEN NATURAL FIBRE AND SYNTHETIC FIBRE

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ABSTRACT

This work presents a brief overview of natural fibre and synthetic fibre, the merits and demerits of natural and synthetic fibre and the differences between the synthetic fibre. Further the paper describes the causes of using synthetic fibres and through this paper the researches going to create awareness about the advantages of using natural fibres and how it safeguard our health physically. This papers makes a comparative approach about both the natural and the synthetic fibres.

INTRODUCTION

Basic necessities of human are Food, Shelter and Cloth since from the ancient period. In olden days the people used to buy the cloth material which is available in their near shops or town where the Textiles store is available. During that time we could not find more varieties of material and designs in the Textiles shops. So we did not have option with huge varieties for selection process of cloth or any dresses. But at present the entire situation has been changed. Due to the development in science and technology, changes in fashion and increase in the awareness level of public lead to prefer more design and models in their dresses. Technology up-gradation in the textiles industry helped to manufacture en number of design and varieties using synthetic materials and colours. These synthetic products were much attracted by all classes of the society. Gradually the natural fibre cloths were purchased in lower quantity. The young generation are only interested in synthetic materials. Even the elders also prefer the synthetic materials. Only in few areas till now the natural fibre materials are purchased. This leads to more expenses on the synthetic materials by everyone. Buying of cloths is depending on individual's interest, nobody can interfere. It is acceptable one. But being a citizen of a country like India we are familiar of traditional culture and costumes. It is the responsibility of all Indians to safeguard our traditional values. The interest in Traditional dresses is nowadays going deteriorating. This should be stopped. We should create awareness about the natural fibres to all younger generation. Then only the Indian culture can be safeguarded. Further when we wear materials, dresses or cloth made up of synthetic materials, they create some trouble to our health physically. Many of the people face skin allergy problems while they use some types of synthetic materials. Hence a study on the above title is need of our and very pertinent to safeguard our traditional rich dresses which are made by using natural fibre materials. Through this paper the researchers will bring the utility of using the natural fibres and how the synthetic material causes our health and the reason for choosing the synthetic material by the youth and younger generation.

NATURAL FIBRES:

Fibres produced by plants or animals are called natural fibres. The best examples of plant fibres are: linen and cotton. Examples of animal fibres are: wool and silk. They have natural colour. In case colouring is required then dyeing is very easy. Usually natural fabrics are comfortable to wear. It is environmentally friendly. On burning, it turns into ash. Limited use of these fibres when compared to synthetic fibres.

SYNTHETIC FIBRES:

Man-made fibres created in laboratories are called synthetic fibres. Examples of synthetic fibres are acrylic, nylon and polyester. Colours can be added as per required. Colouring is difficult. These fabrics are not comfortable to wear when compared to natural fibres. It is not environmentally

friendly because some fibres like polypropylene are harmful. On burning, it melts and gives out a chemical smell. These fibres are more durable than natural fibres.

To make you understand how **natural and synthetic fibres** are different from each other, here are some of the major **differences between natural and synthetic fibres**:

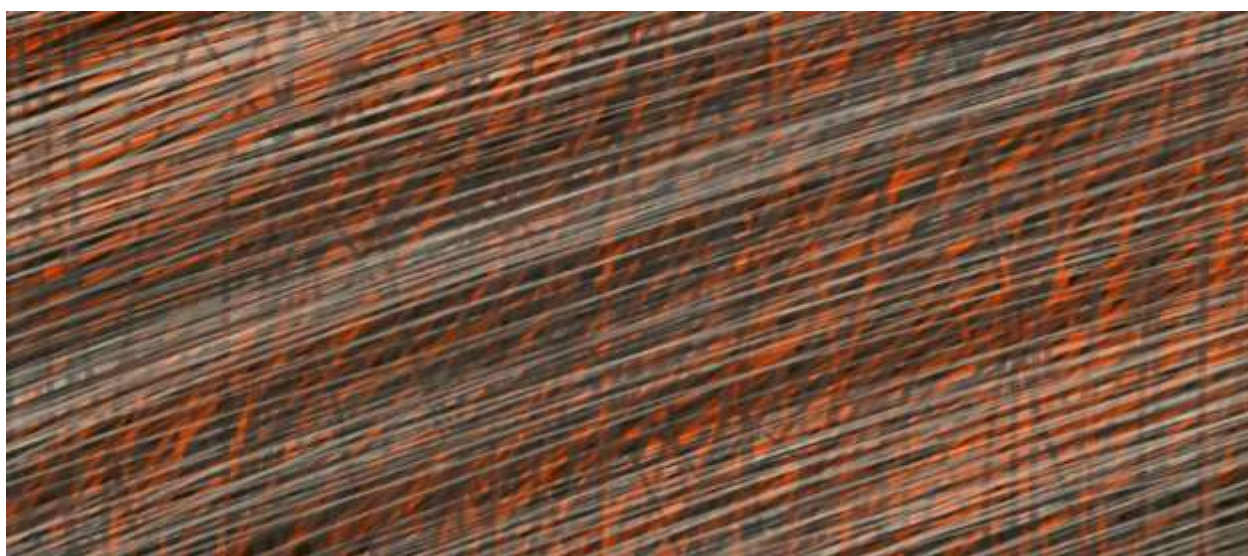
DIFFERENCE BETWEEN NATURAL AND SYNTHETIC FIBRES

Serial No	NATURAL FIBRES	SYNTHETIC FIBRES
1	Comes from nature	Manmade fibres
2	Natural colour	Colour as per requirement is added in colour bath
3	During spinning process spinneret is not necessary	During spinning process spinneret is necessary for the production of filament
4	Chances of containing dust or impurities	No chance of any dust or impurities
5	Less durable than synthetic	More durable than natural

NATURAL FIBRE SAMPLE-1



NATURAL FIBRE SAMPLE-2



SYNTHETIC FIBRE SAMPLE-1



SYNTHETIC FIBRE SAMPLE-2



The advantages and disadvantages of synthetic fabrics

- Most synthetic fibres have good elasticity.
- Most fabrics made of synthetic fibres do not wrinkle easily.
- Fabrics made of synthetic fibres are generally more durable, less expensive, and more readily available than those made of natural fibres.
- Most synthetic fibres can handle heavy loads without breaking

Disadvantages...

- Synthetic fibres do not absorb water or sweat.
- Synthetic fibres melt and burn easily.
- Synthetic fibres on catching fire shrink forming beads which stick to the skin. ...
- Synthetic fibres are non-biodegradable.

Using synthetic fibres such as nylon, is that they are stronger than many natural fibres such as silk or wool. Most synthetic fibres absorb very little moisture and do not allow air circulation making them

hot and uncomfortable to wear. These fibres are strong and elastic which gives it the properties to bounce

ADVANTAGES OF NATURAL FIBRE

1. **Comfortable:** Clothes made by natural fibres are more comfortable than those made of synthetic fibres.
2. **Environment:** Producing materials from natural fibres are less harmful to our environment.
3. **Non allergic to skin**

DISADVANTAGES OF NATURAL FIBRE

1. **Expensive:** Materials produced by natural fibres are generally expensive as synthetic fibres can be made easily by manufacturing.
2. **Shrink:** Natural fibres might shrink due to aggressive washing.
3. Unlike manmade fibres, natural fibres are not available in high tenacity (HT) and medium tenacity (MT).
4. Natural fibres do not possess a high degree of resiliency as compared to manmade fibres, hence the fabrics made out of them do get wrinkles from 'baggy knees', possess less crease recovery.
5. Production of natural fibres cannot be completely controllable. Therefore, from year to year quantities of specific qualities vary and this tends to cause price fluctuations according to variations in demand which cannot be foreseen until the fibres have been produced.
6. Variation in length, fineness, etc. of the natural fibre causes less regular and uniform yarn than that obtained from manmade fibres.

RECOMMENDATIONS AND CONCLUSION

Natural fibers such as lignocellulosics and protein are fully sustainable, renewable, and biodegradable. They have several advantages in comparison with man-made fibers and are widely used in the apparel sector and interior design. Unfortunately, they are flammable and not resistant to biodegradation. For this reason, their use is very often limited. For improving flame retardancy, delaying the time to ignition, decreasing HRR and surface spread of the flame, as well as significantly reducing fire propagation and release of smoke and gases are of major importance. There are three main ways to protect natural fibers against flammability. The methods described in this chapter include nondurable finishes that are very often based on simple compounds like ammonium phosphate, ammonium polyphosphate, melamine phosphate, and melamine borate. Durable flame retardants, which make natural textiles flame resistant up to 50 washes, are mainly Pyrowatex CP and THPC Proban. The mentioned flame retardants are called reactive systems of protection. A new development in the flame retardancy of lignocellulosic fibers is based on the chemical reaction between hydroxyl groups of cellulose and reactive polyphosphate, polyborate, or polyperoxymolybdate. Another promising method is the application of intumescent coatings that were mainly developed for backcoating of upholstery furniture, curtains, and draperies.

In the case of protein fibers and leather, which ignite and burn with more difficulty than do cellulosic fibers, the most popular durable system is Zirpro that is based on the exhaustion of negatively charged complexes of titanium or zirconium onto positively charged protein fibers under acid conditions.

A very important matter is also the protection of natural cellulosic and protein fibers against biodeterioration, because they are susceptible to it. The decomposition of natural fibers can occur mainly in high humidity conditions at a relevant temperature in the presence of bacteria and fungi. The protection of these fibrous materials can be obtained by using nanocopper, nanosilver, quaternary ammonium salts (QACs), 2-hydroxypropyl-3-piperazinyl quinoline carboxylic acid methacrylate (HPQM), PHMG, some dyes, widely used compounds such as triclosan, chitosan, and lately developed antimicrobial peptides. Among the future trends are chemical functionalization of cellulosic fibers and genetic modification. Unfortunately, enhancing the flame retardancy of natural fibers and making them resistant to

biodeterioration create up to now significant problems related to toxicity and increased bioavailability of chemicals, which can be hazardous to human health and the environment. The awareness of these problems resulted in the creation of a controversial opinion that flame retardants and biocides used in consumer goods are toxic and ineffective, and some voices even demanded a ban on certain flame retardants and some biocides. These voices bring signals to researchers that they should pay more attention to the search for new safer flame retardants and biocides.

REFERENCES

1. Baley C., Analysis of the flax fibers tensile behavior and analysis of tensile stiffness increase, *Compos. Part A*, 33(7), 939-348 (2002).
2. Bettini S.H.P., Uliana A.T. and Holzschuh D.J., Effect of Process Parameters and Composition on Mechanical, Thermal and Morphological Properties of Polypropylene/Sawdust Composites, *J. Appl. Polym. Sci.*, 108, 2233-2241(2008).
3. Bledzki A.K., Mamun A.A. and Faruk O., Abaca fibre reinforced PP composites and comparison with jute and flax fibre PP composites, *Express. Polym. Lett.*, 1(11), 755-762 (2007)
4. Coutinho F.M.B. and Costa T.H.S., Performance of polypropylene-wood fiber composites, *Polym. Test.*, 18(8), 581-587 (1999).
5. Isaac M. and Ishai D.O., *Engineering Mechanics of Composite Materials*, (Oxford, New York), 3-13 (2006).
6. Karmaker A.C., Hoffmann A. and Hinrichsen G.J., Influence of water uptake on the mechanical properties of jute fiber-reinforced polypropylene, *J. Appl. Polym. Sci.*, 54, 1803-1807 (1994).
7. Mohanty A.K., Misra M. and Drzal L.T., *Natural Fibers, Biopolymers and Biocomposites*, Boca Raton (FL: CRC Press) (2005).
8. Poostforush M., Al-Mamun M. and Fasihi M., Investigation of Physical and Mechanical Properties of High Density Polyethylene/Wood Flour Composite Foams, *Res. J. Engineering Sci.*, 2(1), 15-20 (2013).
9. Rana A.K., Mandal A., Mitra B.C., Jacobson R., Rowell R. and Banerjee A.N., Short Jute Fiber-Reinforced Polypropylene Composites: Effect of Compatibilizer, *J. Appl. Polym. Sci.*, 69, 329-338 (1998).
10. Saheb D.N. and Jog J.P., Natural Fiber Polymer Composites: A Review, *Adv. Polym. Technol.*, 18(4) 351- 363 (1999).