REGENERATED CELLULOSE FIBRES

Edited by
Calvin Woodings

The Textile Institute

CRC

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Preface

Until the early years of the 20th century, textiles were based solely on natural products such as cotton, wool, silk and linen. However a chain of developments commencing in the 1890s led to a global textile industry based largely on fibres manufactured by industrial processes.

These processes can be subdivided into those which use the cell walls of plants *directly* as their starting point, and thermoplastic fibres which start from non-renewable fossil reserves and hence use the plant matter *indirectly*. Synthetic fibres, now economically manufactured from oil reserves valued at little more than the cost of extraction, have come to dominate the manufactured fibre market, and as the 20th century drew to a close, their use overtook that of natural and regenerated fibres combined.

Will this trend continue until natural and regenerated fibres are no more than costly specialities confined to high fashion, 'environmentally friendly' and luxury end-uses? Has cotton usage peaked, like wool and silk in earlier decades, leaving the fibre future to ever-improving synthetics? Will synthetic fibres sustain their cost effectiveness as oil becomes scarcer? If not, will processes such as those described in this book form the basis of a new textile industry based on readily renewable resources, or will fibre-making polymers such as polyesters be producable economically from annual crops? Will thermoplastic hydrophilic polymers ever be synthesised by purpose-designed genetically engineered plants?

These are the big questions facing fibre manufacturers at the turn of the millennium, and this Fibre Series from Woodhead Publishing aims to provide the facts to allow such questions to be debated fully. This book on the regenerated cellulose fibres deals with the original manufactured fibre processes which 'simply' take natural cellulose into solution in order to regenerate it in fibrous form. Cellulosics, including cotton, may be losing market dominance to the cheaper synthetics, but nevertheless remain uniquely capable of providing levels of wearer comfort, absorbency, softness, biodegradability, and environmental compatibility that the synthetics have yet to emulate.

Cellulose will, of course, remain the most abundant biopolymer and will continue to be the driving force of the carbon cycle on which all life depends. Its credentials as a safe, environmentally benign and renewable raw material for many industrial processes will be hard to surpass. Photosynthesis will undoubtedly remain the most efficient polymerisation process on Earth, and it is conceivable that a full understanding of its biochemistry may allow us to engineer organisms to produce modified celluloses and cellulose derivatives directly.

Helping Nature to add to cellulose those properties which the 20th century textile industry has come to regard highly, seems to be at least as worthwhile as trying to make natural processes synthesise the plastic polymers that happen to be the market leaders at the time the fossil reserves, on which they are based, are becoming scarce.

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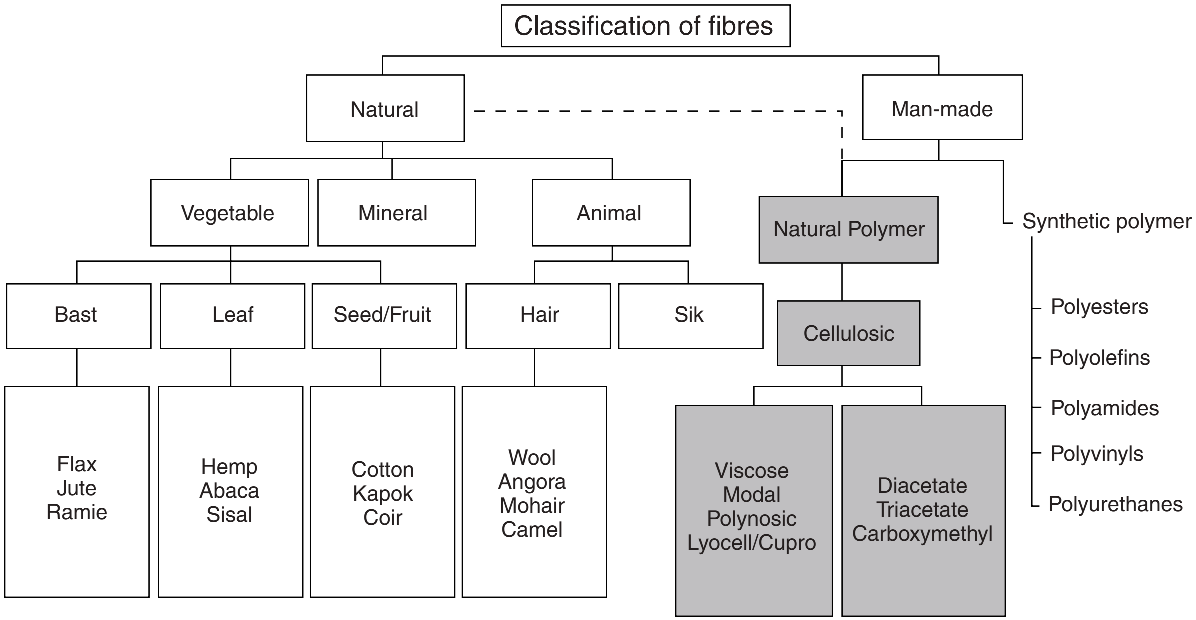
Classification of fibres
Natural
Man-made
Vegetable
Mineral
Animal
Natural Polymer
Synthetic polymer
Bast
Leaf
Seed/Fruit
Hair
Sik
Cellulosic
Polyesters
Polyolefins
Polyamides
Polyvinyls
Polyurethanes
Flax
Jute
Ramie
Hemp
Abaca
Sisal
Cotton
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Angora
Mohair
Camel
Viscose
Modal
Polynosic
Lyocell/Cupro
Diacetate
Triacetate
Carboxymethyl

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