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# Book reviews

**M. Jenkins (Ed.), Materials in Sport Equipment, Woodhead Publishing Ltd, Cambridge, UK, 2003 (xv + 407 pp., £135.00, ISBN 1-85573-599-7).**

In the last century sport has become one of the main forms of entertainment of modern societies, being either practiced or followed by increasing numbers of people. This can be easily seen by considering the size of the population and market involved in sports such as football and tennis. The sport market has increased from £115 million in 1995 to £180 million in 1998 in the UK alone. Improvements in athlete's performances have mirrored such increases, with the ongoing breaking of world records. Taking the triple jump as an example, the world record has increased from 15.5 m in 1910 to 18.75 m in 2000. Such performance improvements have been achieved as a result of both development of the human element, such as the psychological and physiological coaching of athletes, and also the technological evolution of materials used in sports equipment.

Carbohydrate polymers play important parts in the fibres of many sport equipment materials—and there is no substitute in absolute reality for cellulose fibres. However, other carbohydrate polymer derivatives are being developed which have absorptive properties or antimicrobial activities or lubricating actions. Sport equipment is therefore just one of several areas ripe for the development of new functional carbohydrate polymer preparations.

*Materials in Sport Equipment* presents an overview of new technologies involved in the production of materials used in sports equipment manufacture, and begins with an introductory chapter from the volume editor that briefly reviews the issues related to performances, materials and designs in sport. The first part of the volume then focuses on the general uses of materials such as foam protectors, sports surfaces, running shoes and balls. Sport surfaces have a broad range of uses (e.g. in football, rugby, tennis and hockey), and are subject to a large range of studies such as the measurement of resilience and torsion in order to improve the practicability and performances of athletes. The second part of the volume focuses on particular sports, including golf, tennis, cycling, skiing, cricket, and paralympic sports, and provides detailed descriptions of the current materials, concerns and trends related to these sports. New technologies and trends involve engineering skills for the development of 'intelligent' equipment, such as the development of tennis rackets that prevent tennis elbow, cricket bats that maximise post-impact ball velocity, and piezo-ceramics and electro-active polymers for use in skiing.

This volume is an excellent resource for all individuals interested in the development and application of advanced sports materials. The technologies and theories behind such equipment is clearly explained and illustrated. Selected chapters also contain a brief historical review of the particular sport in question, making this volume also of interest to the sport historian.

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**E.J. Vandamme, S. De Baets, A. Steinbüchel, Biopolymers, Volume 6, WILEY-VCH Verlag GmbH, Weinheim, 2002 (636 pp., £150.00, ISBN 3-527-30227-1).**

Biopolymers represent the most abundant organic compounds in the biosphere. They are important for life and exhibit fascinating properties, and are of increasing importance for various applications. Eight main classes of biopolymers are distinguished according to their chemical structure: (1) nucleic acids such as ribonucleic acids and deoxyribonucleic acids, (2) polyamides such as proteins and poly(amino acids), (3) polysaccharides such as cellulose, starch, and xanthan, (4) organic polyoxoesters such as poly(hydroxyalkanoic acids), poly(malic acid) and cutin, (5) polythioesters, (6) inorganic polyesters with polyphosphate, (7) polyisoprenoids or Gutta Percha and (8) polyphenols such as lignin or humic acids.

Furthermore, biopolymers occur in any organism and possess a wide range of different essential or beneficial functions for the organisms: conservation and expression of

genetic information, catalysis of reactions, storage of carbon, nitrogen, phosphorous and other nutrients and energy, protection against the attack of other cells and hazardous environmental or intrinsic factors, sensors of biotic and abiotic factors, communication with the environment and other organisms, mediators of adhesion to surfaces of other organisms or of non-living matter. In addition, many biopolymers are structural components of cells, tissues, and whole organisms.

To fulfil all these different functions, biopolymers must exhibit rather diverse properties. They must very specifically interact with a large variety of different substances, components and materials, and many of them must have a high strength. Some of these properties are utilised directly or indirectly for various applications. This and the possibility to produce them from renewable resources, as living matter mostly does, make biopolymers interesting candidates to industry.

This book series provide a throughout overview of the occurrence and metabolism of biopolymers. In addition, processes for biotechnological production, isolation from organisms and modification, material properties and technical applications in various areas such as, for example, in daily life products, medicine, pharmacy, the food industry agriculture, textiles, and chemical industry and the packaging industry are provided. The future perspectives of biopolymers are outlined.

Polysaccharides comprise a distinct class of biopolymers, produced universally among living organisms. They exhibit a large variety of unique and in most cases complex chemical structures, different physiological functions and wide range of potential applications.

Volume 6 opens with four chapters on extracellular polysaccharides produced by yeasts and fungi such as pullulan, elsinan, schizophyllan, scleroglucan and exopolysaccharides from yeasts. Three chapters deal with the cell wall polysaccharides of these lower eukaryotes follow; chitin and chitosan from fungi, glycans from fungal cell walls and the $\beta$-glucans from yeast are included. Subsequently, algal polysaccharides such as alginates and carrageenan and plant polysaccharides such as cellulose, seed gums, pectins, starch and inulin are covered in seven chapters. The volume concludes with two chapters covering the important animal polysaccharides chitin, chitosan as well as proteoglycans. Also, the properties, functions and industrial uses or potential applications in industry, agriculture/or medicine were discussed.

According to the Editor notes, 6th volume of this 10-volume book attempts to review what is currently known about these fascinating eukaryotic polysaccharides with respect to their discovery, occurrence, chemical and physical properties, analysis, biosynthesis, molecular genetics, physiological role, production, isolation and application. Every possible attempt has been made to collect the most recently published scientific data up to late 2001.

This book series will be helpful to many scientists, physicians, pharmaceutics, engineers and other experts in a wide variety of different disciplines, in academia and in industry. It may not only support research and development but may be also suitable for teaching.

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