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Book review

Menachem Lewin (Ed.), Handbook of fiber chemistry, third ed., CRC Press, Boca Raton, FL, USA, 2007 (vi + 1044 pp., £130-00, ISBN: 0-8247-2565-4)

One of the definitions of fibres says that they are "a thin and long material with a certain level of tensile strength". This feature allows them to be a material, which has a huge potential in miscellaneous applications. They take significant place in such branches as the car industry, civil engineering and construction, the aerospace industry, medicine, garments, plastic optical fibres for information technology or biodegradable material for ecological conservation. They are popular as the scaffolds for artificial organs and tissue engineering or composites for wound dressings. Certainly, this list of usefulness of fibres is much longer and their importance in current industry is undeniable. However, this still expanding area of fibre science has prospects for further development and a lot of possibilities for new exploitation. Especially the investigations moving forward to create new fibres, nanofibres or electronically active fibres are producing especially novel materials.

"Handbook of Fiber Chemistry" provides a comprehensive account of structure, definitions, morphology, properties and utilisation of different types of fibres. The largest volume worldwide production of synthetic fibres is due to polyesters, particularly due to poly(ethylene terephthalate), which is the condensation product of terephthalic acid and ethylene glycol (Chapter 1). This book comprises extensive information about different types of fibres. Separate attention is given to the polyamide, polypropylene and vinyl fibres (Chapters 2–4). Polyvinyl alcohol fibre (vinylon), is very well suited to textile production, was used in the early 1950s as a material for school uniforms because of its good durability to chemicals and sunlight.

In the textile industry wool and related mammalian fibres such as mohair, cashmere, alpaca or angora rabbit are also used (Chapter 5). Another very important type of fibres is silk from silkworms, which has been used in textiles for nearly 5000 years. Moreover, reprocessed silks may be used as a material not only for fibre production but also for films, hydrogels or spongy 3D porous materials (Chapter 6). Such examples as jute and kenaf may be applied e.g. in packaging, paper industries or as fibre thermoplastic blends (Chapter 7). Fibres also come from the plant world. Some of them have a protective function e.g. cotton and coir protect the seed or fruit from mechanical, pest or microbial damage (Chapters 8 and 9). Cellulosic fibres are strong and tough. Their fibres (e.g. rayon) may be used e.g. in textiles and fashion oriented markets (Chapter10). Some non-textile applications of acrylic fibres are used in innovative technology such as manufacture of high-strength graphite fibre.

This informative volume touches only a small part of the subjects discussed. The whole volume covers extended information in the fibres area, with the emphasis on their chemical structure and distinguished applications. Therefore it is a helpful source of knowledge for scientists, technologists and engineers in different disciplines e.g. biology, medicine, engineering, agriculture or polymer science.

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