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Book reviews

Low-calorie Foods and Food Ingredients. Edited by Blackie Academic & Professional, Glasgow 1993. xv + 183 pp. Price Hardback £65.00. ISBN 0-7514-0004-1.

Overweight and obesity bother many people who have the Western diet and comfortable lifestyle, because they lead to all sorts of serious diseases such as heart conditions and non-insulin dependent diabetes. Therefore there is a huge demand for low-calorie foods and food ingredients sufficient to control body weight. Several sorts of low-calorie foods and food ingredients are already in use or under development. However, since food additives must have quality texture, flavour and taste and be free from any toxicity such as genetic toxicity and carcinogenicity, it is enough of a challenge to develop new low-calorie foods and food ingredients.

Low-calorie Foods and Food Ingredients, consisting of eight chapters, aims to review the existing and incoming low-calorie food technology with respect to physiology and psychology, safety, toxicity, nutrition, process technology, physicochemical and functional properties, product formulations, and market and market potential. The role of low-calorie foods in the biological and behavioural responses in energy balance is discussed in Chapter 1. Regulatory aspects of low-calorie foods are discussed in Chapter 2. The other chapters from Chapter 3 to Chapter 8 focus on low-calorie bulk sweeteners, low-calorie bulking ingredients, fat replacer ingredients and the markets for reduced food, fat and calorie-modified bakery products, high-intensity sweeteners and low-calorie soft drinks, respectively.

This book is quite helpful for technologists and production managers in food industry who wish to obtain an overview of low-calorie foods and food ingredients, though each of them is mentioned briefly.

John F. Kennedy
Jiro Shimizu

Polymers of Biological and Biomedical Significance. Edited by S.W. Shalaby, Y. Ikada, R. Langer & J. Williams, American Chemical Society, Washington, DC, 1994. xii + 337 pp. Price $89–95. ISBN 0-8412-2732-2.

Human use of polymeric materials has a long history. In fact, many of the original materials used by mankind were polymers derived from nature, such as wood, flax, cotton, wool and animal skins, which were used for shelter and clothing. But only having had the recent advances in materials science and surgery have made it possible to rebuild many parts of the human body. Artificial organs and prostheses made of polymers constitute some of the most valuable remedies in present medical armamentaria. Polymers penetrate virtually every aspect of medicine. Hydrogels have been used for soft contact lenses, poly(glycolic acid) for absorbable sutures, and semipermeable membranes made of cellulose acetate, regenerated cellulose, poly(methyl methacrylate), polyacrylonitrile, ethylene-vinyl alcohol copolymer, and polysulfone for artificial kidneys. Polymeric substances are also used in pharmaceutical products. They are in contact with drugs not only as ingredients in final dosage forms but also as processing aids or packaging materials. There is no doubt that polymers will play more and more important roles in the development of biological and biomedical sciences and technologies.

Polymers of Biological and Biomedical Significance provides comprehensive coverage of recent advances in polymers as materials of significance in the biological and biomedical research. These reviews constitute the first part of the book. The second part of the book deals with a wide variety of topics with inter-related coverage of current activities on synthesis, surface activation, and characterisation of biomaterials. Examinations of biological effects related to specific physical chemical factors are included in the third part of the book. The importance of understanding the interaction of polymers with the biological environment is specially stressed in this part. The last part of the book concentrates on synthetic bioactive chain molecules and polymers for controlled transport of bioactive agents.

The book is a rare specimen of good sources of information for industrial and academic polymer, medical and pharmaceutical chemists, materials scientists, and chemical engineers working in the fields of biological polymers, biomaterials, and controlled drug release.

Yu Fang
John F. Kennedy

Chemical Fixation of Carbon Dioxide Methods for Recycling CO_2 into Useful Products. M.M. Halmann, CRC Press Inc., Boca Raton, Florida, 1993. 172 pp. Price £56.00. ISBN 0-8493-4428-X.

The increase in levels of atmospheric carbon dioxide after the industrial revolution, albeit to only 340 ppm

(1980), is annoying humankind, because it is widely believed to have a crucial influence upon global weather, the so-called '*greenhouse effect*'. Thus, we have to make a great effort to eliminate atmospheric carbon dioxide for the next generation. Therefore, it is quite interesting to recycle carbon dioxide as useful organic matter as well as to develop alternative energy resources and decrease the consumption of fossil fuel. Improving efficiency and economy of the reduction of carbon dioxide might be the key to recycling carbon dioxide, though many methods are under research.

'*Chemical Fixation of Carbon Dioxide*' consisting of 11 chapters aims to review the results already obtained by the various methods of fixing carbon dioxide. The relations between carbon dioxide and global warming are summarized in Chapter 1. Basic ideas on carbon dioxide chemistry are mentioned in Chapters 2 and 3. Each of the methods of reducing carbon dioxide is focused on in Chapters 4–10, respectively: high free-energy-content coupling, thermal heterogeneous, photochemical, electrochemical, photoelectrochemical, heterogeneous photo-assisted and biological reductions. Finally, alternative approaches such as ocean disposal are discussed. Whereas the plant kingdom is continuously building up materials from carbon dioxide, and, therefore, enzymes exist for such processes, the book largely only takes bioconversion so far as production of low molecular weight compounds as methanol. There is, however, scope for a wealth of production of bio-organics including polymers, for example via fermentation from fixation of carbon dioxide.

This book can be recommended to university students interested in chemical fixation of carbon dioxide, because it gives a good overview of each of the methods of reducing carbon dioxide under investigation.

John F. Kennedy
Jiro Shimizu