

the form of food that you eat. They supply your body with nutrients and protect you from diseases.

Carbohydrates comprise the most abundant group of natural compounds. They are essential components of all living organisms, which also perform a variety of functions. In many cases, they are utilized as food by man, other animals or micro-organisms. They are a source of energy and important devices for the storage of solar energy. Others — starch and glycogen — serve as the major source of metabolic energy for the human body while cellulose is the most important component of the supporting tissue of plants. The vital constituents of shells of insects, crabs and lobsters are chitin.

*Chemistry and the Living Organism* is the sixth edition which updates the content and format of the previous ones. It is divided into three sections: the living organism, the elements necessary for life and the compounds for life. Studies on carbohydrates are in the fifteenth chapter. Beginning with an interesting story, it discusses diabetes — one of the most common diseases associated with carbohydrates. In addition, it deals with the definition, structure, properties and functions of monosaccharides, disaccharides and polysaccharides. Important examples of monosaccharides are glucose, fructose, galactose and ribose. Sucrose, maltose and lactose are also significant examples of disaccharides. Polysaccharides can be both linear polymers of glucose — amylose and cellulose — and branched polymers of glucose — glycogen and amylopectin.

This book offers the fundamental chemistry for students. It is easily understandable and enjoyable to read since the fundamental concepts of chemistry are clearly presented through examples relevant to the student's own lives. Furthermore, it contains a lot of learning aids such as learning objectives, perspectives, chapter summaries, problem sets, appendices, an extensive glossary and index.

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**Biomass, for Energy, Environment, Agriculture and Industry: 8th EC Conference, Vols 1–3.** Edited by Ph. Chartier, A.A.C. Beenackers & G. Grassi. Pergamon, Oxford, UK, 1995. LII + 2426 pp. Price £275.00. ISBN 0-08-042135-0.

Interest in the use of biomass for non-food applications has grown rapidly over recent years, mainly due to increased environmental awareness with respect to the need for prime renewable energy resources. The development of such resources will contribute greatly to the prevention of dramatic climatic change and to the security of energy supplies for the benefit of future generations.

These three volumes chart the proceedings of the 8th European Community Conference, held in Vienna in 1994. The conference was larger than any of its predecessors, with over 300 refereed contributions from over 20 countries around the world, providing the opportunity for an international exchange of information on recent progress in the development and implementation of renewable biomass based non-food technologies. This publication therefore contains one of the most complete overviews of the present state-of-the-art in this ever expanding field of research.

A wide variety of subject areas are covered, including biomass resource bases, bio- and thermo-chemical conversion technologies, environmental and economic aspects, and worldwide implementation (particularly in developing countries). The cost of any bioenergy system depends to a large extent on the ability to secure the resource within a manageable catchment area at a cost which allows the whole production, conversion and distribution scheme to be financially viable. For an energy crop to be truly renewable the biomass harvested for use as a fuel must represent substantially more energy than that consumed in its production (planting, harvesting, maintenance).

Volume 1 covers resource bases and the generation of electricity and heat from such resources. The use of a wide variety of specialist natural biopolymer based crops is highlighted, e.g. many types of wood, sorghum, *miscanthus sinensis* (a perennial grass), eucalyptus, hemp and olive husks. The state of biomass programmes all over Europe is also discussed. The second volume is chiefly concerned with the production of transportation fuels from biomass sources, such as biodiesel, rapeseed methyl ester fuels, and fuels from sugarbeet, and the use of biotechnology to produce a variety of chemicals and products, such as bioaerosols, xylitol from hemi-cellulosics, lactic acid production, and the enzymatic saccharification of cellulosics. The final volume deals with the production of chemicals and products by thermochemistry and includes the gasification of many natural products such as almond shells and horse chestnut seeds. The economics and the effect on the environment of such developments are also discussed in some detail in this volume.

The publication also contains authoritative reviews on many of the mentioned subjects by leading experts in each field, and provides a detailed background to the agricultural policy history of the EC (Common Agricultural Policy). Overall, this three volume set is indispensable for those working in any area of biomass technology, whether in research, design or policy development, and is thoroughly recommended.

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