New Physico-chemical Techniques for the Characterization of Complex Food Systems. Edited by E. Dickinson. Blackie, Glasgow, UK, 1995. xii + 356 pp. Price £75. ISBN 0-7514-0252-4.

The two major classes of food materials are proteins and polysaccharides, and either can occur as essentially pure macromolecules or as part of highly specific structures, the properties of which are not macromolecular but supramolecular in form. Major advances have occured in the understanding of food biopolymer behaviour mainly by the application of many chemical and physical techniques. The importance of these techniques is clearly on many levels. There is academic interest in understanding the structure/function relationships in food components, but there is also great practical importance. The food industry has as major tasks the maintenance of consistent quality and the control of the behaviour and performance of food materials.

New Physico-Chemical Techniques for the Characterization of Complex Food Systems is based on a collection of lectures delivered at a symposium under the same name held at the University of Leeds, UK. It describes a range of new techniques in the fields of microscopy, spectroscopy, scattering and rheology, which can be used to probe food structure at the molecular, colloidal and microscopic levels.

Among the many topics covered are the advances in electron microscopy, imaging food systems by confocal laser scanning microscopy, scanning probe microscopy of food related systems, electron spin resonance spectroscopy for detection of irradiated food, fracture mechanics of solid foods ultracentrifugation, and rheology studies of food biopolymers. Also covered are recent developments in infrared spectroscopy and microscopy, ultrasound studies of crystallization, dynamic surface tension, light scattering studies, high resolution nuclear magnetic resonance spectroscopy of food components, and magnetic resonance imaging in food science.

Each chapter introduces the essential background principles of the technique, discusses its main advantages and disadvantages, and illustrates its application with a number of food related examples.

This book is an important reference tool for students, food technologists in industry and experienced researchers.

Marion Paterson
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Production of Hydroxypropyl Starch in a Continuous Static Mixer Reactor. By Gerard Lambers. PhD Thesis, University of Groningen, The Netherlands, 1995. 185 pp. Price Dfl 60.00. ISBN 90-9008699-4.

The physical properties of native unmodified starches have made starch an important substance in food and industrial applications for centuries, but very often native starch is not the best product for a particular application. Modification of starch properties by chemical derivation is therefore an important factor in the large scale use of starch.

A most significant group of modified starches is the hydroxyalkyl starch esters, such as hydroxyethyl and hydroxypropyl starch. Manufacturing techniques for the production of hydroxyalkyl starch esters have been around since the 1930s. From the 1950s these processes were applied to the manufacture of hydroxyalkyl starch esters by reacting alkaline starch with alkylene oxide (ethylene or propylene oxide).

This thesis focuses on the production of hydroxypropyl starch in a continuous static mixer reactor. It consists of ten chapters and is roughly divided into two halves. It begins with an overview of different modified starch types and production methods and gives an outline to the thesis. The design of a suitable continuous static mixer reactor for this process requires the selection of a commercially available static mixer together with knowledge of the kinetics of the reactions that are involved in the production of hydroxypropyl starch and the viscosity of concentrated starch pastes. All such considerations are explored in Chapters 2–5.

The second half of the thesis is concerned with the actual running of the static mixer reactor and commercial scale production of hydroxypropyl starch. This requires not only knowledge of the rheological behaviour of starch pastes within the static mixer reactor but also resistance time distributions as well as heat transfer within the static mixer reactor, together with actual plant scale production and operation, all of which are covered in Chapters 6–10.

This is an extremely informative thesis which is also well referenced. It should prove useful to anyone working within the starch industry or those in academia with an interest in starch chemistry.

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Sugar Confectionery Manufacture: Second Edition. Edited by E.B. Jackson. Blackie, Glasgow, UK, 1995. xxiii + 400 pp. Price £79. ISBN 0-75140-198-7.

Sugars are undoubtedly the most important components of virtually all confectionery products. The successful manufacture of sugar confectionery products is dependent on a limited but key group of physical and chemical changes which influence recipe composition and methods of production. This fully revised and updated volume provides a highly practical and comprehensive review of the sugar confectionery manu-