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| Nota di contenuto | Food Materials Science and Engineering; Contents; Preface; List of Contributors; 1 Food Materials Science and Engineering: An Overview; 1.1 Introduction; 1.2 Molecular basis of food materials; 1.3 Observation of materials at various size ranges and size-property relationship; 1.4 Amorphous and crystalline structures of materials; 1.5 Gel structures of food materials; 1.6 Interfacial properties of the food materials; 1.6.1 Emulsions and surface active compounds; 1.6.2 Colloids; 1.6.3 Foams; 1.6.4 Stickiness and fouling<br>1.7 Application of materials science in food design and development of engineered food materials1.8 Conclusion; References; 2 Micro to Macro Level Structures of Food Materials; 2.1 Microstructure definitions; 2.2 Measurement of microstructures/nanostructures; 2.3 The relationship between structure and quality; 2.4 Microstructure and emulsions; 2.5 Structure and sensory perception; 2.6 Process to control the structure of food materials; 2.6.1 Different processing aids to create microstructure; 2.6.2 Engineering microstructures in foods; 2.7 Concluding remarks; References |

3 Characterisation Techniques in Food Materials Science3.1 Introduction; 3.2 Nuclear Magnetic Resonance (NMR); 3.2.1 General principles; 3.2.2 Chemical and physical information; 3.2.3 High resolution NMR spectra from solids; 3.2.4 Mobility-resolved NMR spectroscopy; 3.2.5 Probing water 'pool' sizes using 1HT2 properties; 3.2.6 Integration of techniques to study protein denaturation and glassing; 3.3 Fourier Transform Infra-Red (FT-IR); 3.4 X-ray powder diffraction; 3.5 Small angle neutron & X-ray scattering (SANS and SAXS); 3.6 Confocal microscopy
3.6.1 Applications of confocal microscopy in food science3.7 Scanning electron microscopy; 3.7.1 Immobilisation in solid substrates; 3.7.2 Cryo-SEM; 3.7.3 Environmental SEM (ESEM); 3.8 Atomic Force Microscopy (AFM); 3.8.1 Applications of atomic force microscopy in food science; 3.9 Summary; References; 4 Interfacial Phenomena in Structured Foods; 4.1 Introduction; 4.2 Visualisation of surface structures; 4.2.1 Brewster angle microscopy; 4.2.2 Interfacial fluorescence microscopy; 4.2.3 Atomic force microscopy; 4.3 Fundamentals of interfacial assembly
4.3.1 The adsorption process - diffusion vs. convection4.3.2 The adsorbed layer - surface viscosity, surface rheology, surface structure; 4.4 The dynamic interface; 4.4.1 Biochemical effects on interfacial structure and properties; 4.4.2 Competitive adsorption; 4.4.3 Hydrophobin - a unique protein interface; 4.5 Conclusions and future directions; References; 5 Phase and State Transitions and Related Phenomena in Foods; 5.1 Introduction; 5.2 Phase and state transitions; 5.2.1 First-order transitions; 5.2.2 The glass transition; 5.3 Food properties and formulation
5.3.1 Crystallisation and melting

Sommario/riassunto

"Food Materials Science and Engineering covers a comprehensive range of topics in relation to food materials, their properties and characterisation techniques, thus offering a new approach to understanding food production and quality control"--