Vasilis G. Gregoriou, Mark S. Braiman (Eds.), Vibrational Spectroscopy of Biological and Polymeric Materials, CRC Press, Boca Raton, FL, USA, 2006 (xi+430 pp., £79-99, ISBN 1-57444-539-1)

Vibrational spectroscopy is used primarily for characterising polymers and biological systems. Vibrational spectroscopy continues to uncover structural information pertinent to a growing number of applications. *Vibrational Spectroscopy of Biology and Polymeric Materials* compiles the latest developments in advanced infrared red and Raman spectroscopic techniques that are applicable to both polymeric material and biological compounds. It consists of eight chapters which cover varies aspects of Vibrational spectroscopy.

Understanding the structure and property relationships encountered in liquid crystalline segmented copolymer systems is fundamental to establishing and exploiting the potential of the material for technological applications. Fourier transform infrared spectroscopy is a very powerful tool for studying liquid crystalline polyurethanes (Chapter 1). A key issue in structural engineering is determining the state of stress in structural materials during service. In both single and multiple fibre composite materials Raman spectroscopy is used to measure stress and strain (Chapter 2). The study of ultra thin biological and polymeric material using Vibrational spectroscopy is presented in Chapter 3. A two-dimensional correlation spectroscopy is a new spectral analysis method, which can be used in an array of applications to both polymeric material and biological compounds (Chapter 4). Raman and infrared spectroscopy have provided molecular characterisation of complex assemblies and the ability to reconstruct a sample image visualising the spatial distribution of chemical components (Chapter 5). Vibrational circular dichroism is a measurement of the differential absorption of the left and right circularly polarized light by molecular vibrational transition in the infrared region of the spectrum (Chapter 6). Understanding the functional mechanism of any biological macromolecule requires atomic resolution characterisation of both its three-dimensional structure and the nature of its conformational changes (Chapter 7). The final character focuses on the application of time resolved FT-IR spectroscopy to biological material.

The book is an ideal and practical reference in the analysis and integration of biological and polymeric materials. The book is designed for researchers, students, analytical chemists and engineers.

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G.H. Michler, F.J. Baltá-Calleja (Eds.), Mechanical Properties of Polymers Based on Nanostructure and Morphology, CRC Press, Taylor and Francis Group, Boca Raton, FL, USA, 2005 (xxii+760 pp., £97.00, ISBN 1-57444-771-8)

Polymers are ubiquitous organic materials, which exist in the world. Except of that they create alive organisms, they have implications relevant to industrial, medical and household applications. Therefore, a continuous goal of polymer research focuses on the improvement of their properties in general and the better fitting of specific properties to defined applications. Profound understanding of the multiple dependence between molecular structure, morphology, polymerization and processing methods, ultimate mechanical properties of polymers are necessary to discover higher quality materials. Moreover, new classes of materials have appeared: the so-called nanostructured polymers, nanopolymers or nanocomposites, which have structural size below 100 nm. Nowadays, we can investigate so small a system by means of sophisticated techniques. This in turn promises to open up ways to improve their properties such as stiffness, strength or toughness that might result in better quality materials.

"Mechanical Properties of Polymers Based on Nanostructure and Morphology" is a three-part volume, which focuses on selected results concerning the mechanical properties of polymers as derived from the improved knowledge of their structures at the μm- and nm-scale as well as from the interactions between the complex hierarchical structures and functional requirements. Polymer morphology is mostly concerned with crystalline polymers, partly because of their rich record but also because the two most economically important synthetic polymers, polyethylene and polypropylene. The main aspects of the morphology of semicrystalline polymers, as revealed by electron microscopy and X-ray scattering techniques are highlighted in the first part, which contains structural and morphological characterization.

The deformation and fracture behaviour of polymers depends on different reasons. The mechanical strength of an isotropic thermoplastic polymer derives primarily from de van der Waals attraction between chain segments. Moreover, strength and toughness depend on the molecular properties of the chosen material, on molecular packing (e.g. density, phase structure, micro-morphology), on the way stresses are transmitted between them (e.g. through cross-links, entanglements or cohesive forces) and on the nature and intensity of relaxation mechanisms. Thus, describing the main micro- and nanomicroscopic effects and mechanisms occurring in different classes of polymers is the aim of the second part of volume.

Nanocomposites, nanoparticles which have a nanometer scale of size, have been produced industrially for more than