second, the photophysical behaviour of the singlet excited state is shown to be strongly influenced by the configuration and the conformational distribution within each configuration. The third of these papers shows that both steady state and transient fluorescence spectroscopy indicate the existence of intramolecular excimer formation in naphthalene diisocyanate-based polyurethanes.

Three of the ten papers dealing with 'Energy Migration' make use of transient fluorescence spectroscopy. Philips discusses 'Complex Decay of Fluorescence in Synthetic Polymers' in his article on nanosecond time scales while Kauffman *et al.* use both nanosecond and picosecond time scales whilst examining 'Electronic Energy Relaxation in Aromatic Vinyl Homopolymers', while Peterson *et al.* use time-resolved fluorescence depolarization spectroscopy to examine 'Ensemble Average Conformation of Isolated Polymer Coils in Solid Blends'. Use is made of delayed fluorescence in the papers by Burkhart and Caldwell on the 'Influence of Chromophore Organization on Triplet Energy Migration in Amorphous Polymer Solids' and by Klöpffer on 'Aromatic Polymers in Dilute Solid Solutions' where he also makes use of phosphorescence spectra and quenching. The use of quenchers and traps is also exploited in three of the papers in this section on 'Triplet Antenna Effect in Poly(acetonaphthyl methacrylate)' by Holden and Safarzadeh-Amiri, 'Excited-State Singlet Energy Transport in Polystyrene' by Coulter *et al.* as well as in the paper entitled 'Exciton Migration in Copolymers of Acenaphthylene' by Cabaness *et al.* Interchromophoric interactions in the excited states of a new class of polypeptides have been studied by static and dynamic fluorescence spectroscopy including circular polarized fluorescence spectroscopy by Sisido, while MacCallum questioned the 'Significance of Energy Migration in the Photophysics of Polystyrene'.

There are six chapters dealing with the 'Photophysics of Polyelectrolytes'. The experimental techniques reported are somewhat similar to those mentioned earlier except for the paper entitled 'Polymer Models for Photosynthesis' by Guillet *et al.* where electron spin resonance measurements are reported, and in the articles entitled 'Complex Formation Between Poly(acrylic acid) and Poly(ethylene glycol) in Aqueous Solution' by Oyama *et al.*, where pyrene excimer fluorescence is monitored. Excimer to monomer ratios are also made use of in the paper by Chu and Thomas entitled 'Interaction of Cationic Species with Polyelectrolytes'. The other two papers in this section by Ghiggino *et al.* on 'Kinetic Spectroscopy of Relaxation and Mobility in Synthetic Polymers' and by Bai *et al.* on 'Alternating Copolymers of 2-Vinylnaphthalene and Methacrylic Acid in Aqueous Solution' report measurements using time-resolved luminescence and the effect of quenchers on fluorescence lifetimes, intensities and spectra respectively.

Finally, there are two small sections, one dealing with 'Luminescent Polymerization Probes' with two articles, the first by Wang *et al.* on the 'Fluorescence Monitoring of Viscosity and Chemical Changes During Polymerization' and by Sung on 'Application of Reactive Dye Labeling Technique for Cure Characterization of Epoxy Networks'. The final section deals with the 'Photophysics of Silicon-Based Polymers' and includes two papers by Harrah and Zeigler on 'Emission Spectra of Polysilylenes' concluding that the triplet is the immediate precursor to photochemistry and by Johnson and McGrane on 'Spectroscopic and Photophysical Properties of Poly(organosilylenes)'.

The volume is well produced and many or the articles are first class. A wide range of topics and techniques are reported. Experts in the field will find it useful and others will gain an impression of the breadth of this rapidly growing area. The volume concludes with a useful subject index.

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Molecular Engineering of Ultrathin Polymeric Films

P. Stroeve and E. Franses (Eds.)
Elsevier Applied Science, New York, 1978, vi+412 pages, £75
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This book records the proceedings of a Workshop on the Molecular Engineering of Ultrathin Polymeric Films held in Davis, California in February 1987. The tital of the book is very misleading. Of the 23 articles in the book only seven have any significant polymeric content and two of these discuss polymer films which many would not classify as ultrathin. In addition, the few articles which set out to discuss the subject of molecular engineering are rather speculative. A more accurate title might be 'The Physics and Chemistry of Organic Thin Films'. The prospective purchaser may also be put off by the fact that most of the articles have already been published in the journal *Thin Solid Films* as sections 1 and 2 of Volume 152. There certainly are workshops and conferences where the proceedings can be usefully duplicated in a journal and a separate book; in this case the papers cover such a variety of topics that republication is probably only useful to the delegates of the conference.

The book includes two papers primarily devoted to polymer chemistry. The chemistry of polymeric photoresists and the synthesis of liquid crystal polymers are comprehensively reviewed in one, while the other describes the epitaxial polymerization of *p*-terphenyl on alkali halide crystals. Two papers concentrate on the versatile polydiacetylenes. Tubule microstructures of phospholipid diacetylenes have been polymerized and then metallized; the hollow multilayered cylinders had typical dimensions of 0.5 μm in diameter by 25 μm long. In another paper the non-linear optical properties of polydiacetylene Langmuir–Blodgett films are described. The use of a non-linear effect, second harmonic generation, as a probe of poled polymer films is also reported. Two more papers review the preparation, characterization and application of Langmuir–Blodgett films and liposomes made from preformed polymeric amphiphiles. The book concludes with a prediction for the future of ordered polymeric thin films, including their application in OPTIMUL, the optical multiport computer.

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Classical Light Scattering from Polymer Solutions

P. Kratochvil
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The application of light scattering to the characterization of polymers in dilute solution, effectively falls into two broad classes, based upon the physical principles of measurement. The first concerns measurement of the intensity continuously scattered by the medium. This is called 'intensity scattering' or 'classical light scattering'. The second involves measurement of the continuous flickering or fluctuation in the intensity which accompanies local molecular motions. Measurements are made on a faster time scale and the method is generally referred to as 'photon correlation spectroscopy' or 'fluctuation light scattering'.

In the mid-1960s, intensity light scattering was at its scientific zenith. The methodology was being advanced and papers were appearing in the scientific literature at a great rate. By far the greatest number were in the application of the method to study the molecular weight, size, conformation and interactions of macromolecules and polymers. During the following decade, classical intensity scattering became consolidated and the academically