Additions and Corrections

Structure and Mechanism in the Photo-Retro-Aldol Type Reactions of Nitrobenzyl Derivatives. Photochemical Heterolytic Cleavage of C–C Bonds [*J. Am. Chem. Soc.* **1988**, *110*, 4336–4345]. PETER WAN* and S. MURALIDHARAN

Reported quantum yields for photo-retro-aldol reaction of the alcohols and acetals (Figures 2 and 3) are in error and should be multiplied by a factor of 3 to give the correct quantum yields. The error arose from the failure to take into account the volume of the cuvette (3.0 mL) in calculating the quantum yields by UV spectrophotometry. This correction does not alter the mechanistic deductions of the paper.

Book Reviews*

Photophysics of Polymers. ACS Symposium Series 358. Edited by Charles E. Hoyle and John M. Torkelson. American Chemical Society: Washington, DC. 1987. XI + 531 pp. $99.95. ISBN 0-8412-1439-5.

This compilation of a symposium sponsored by the Division of Polymer Chemistry is, according to the editors, "designed to provide scientists who are engaged in basic and applied polymer research with a clear status of polymer photophysics". This volume contains 36 contributions and is organized into seven sections: 1, Overviews; 2, Polymer Dynamics and Complexation; 3, Eximer Photophysics; 4, Energy Migration; 5, Photophysics of Polyelectrolytes; 6, Luminescent Polymerization Probes; 7, Photophysics of Silicon-Based Polymers. As to be expected in any symposium proceedings, there is a wide diversity in the quality of the contributions, both in scientific content and in presentation.

The inclusion by the editors of an Overviews section is commended, even though the implicit promise of providing a basic introduction to the photophysics of polymers is not realized. Of the four contributions, the presentations by Winnik (fluorescence quenching techniques) and by Frank and Zin (morphology in polymer blends) are the most useful didactically. In contrast, the introductory summation by Hoyle was disappointing in its brevity; however, the reader will find the bibliography useful in suggesting sources for study in this field.

The bulk of the contributions are contained in the sections on Polymer Dynamics and Energy Migration (10 each). Polymer dynamics encompass a variety of processes, ranging from local motion of the polymer chain and pendant groups to conformational changes and diffusion of solvents and small molecule reactants in polymers. Local dynamics of polymers are typically investigated using time-resolved fluorescence anisotropy measurements and the exposition of Monnerie et al. (local dynamics in polybutadienes) is a good example of this genre. Similarly, Waldow et al. utilize the picosecond holographic grating technique to monitor the anisotropy of polymer motion along the backbone of polyisoprene; this contribution conveys the excitement and potentiality of newer techniques derived from optical physics. In addition to probing molecular motion, fluorescence depolarization studies can also provide information on the dynamics of excitation transfer or migration between polymeric chromophores. The contribution of Phillips presents a lucid introduction to this important topic in polymer photophysics and emphasizes that the complex, multiexponential fluorescence decays observed in many polymeric systems may originate not only from heterogeneity in molecular motion, but also from complex formation or energy transfer. In a more practical contribution which amalgamates theory and experiment, Peterson et al. demonstrate that in well-characterized systems quantitative information concerning coil size of guest polymers in defined polymer blends can be extracted from excitation transfer experiments.

The predominant emphasis in this volume is on luminescence techniques, both fluorescence and phosphorescence. In this regard, the final section of this volume provides an interesting variation on this theme: the thermochromism of polyorganosilylenes.

As a composite portrait of the mainstream of polymer photophysics, this volume, though pedestrian, is useful for those researchers with interests in polymer structure, dynamics, and characterization. However, for insight into future directions of research and focus on topics at the leading edge of photophysical studies in polymer science, this book is not recommended. This reviewer was puzzled by the lack of coverage of photoactive polymers and photoresists, indeed emergent areas such as photophysical studies of biopolymers and nonlinear optical properties of polymers were excluded completely. As to whether the editors achieved their goal as stated above, the verdict is not conclusive.

Joseph T. Warden, *Rensselaer Polytechnic Institute*

Advances in Magnetic Resonance. Volume 12. Edited by John S. Waugh (Massachusetts Institute of Technology). Academic: San Diego and New York. 1988. vii + 438 pp. $88.00. ISBN 0-12-025512-x.

This volume of the *Advances in Magnetic Resonance* series consists of six chapters, all written by respected experts in the respective areas in magnetic resonance. The contents of the chapters range from the practical applications of ^{1}H NMR thermal analysis in complex materials to the very basic descriptions of spin relaxation in mixtures of hydrogen isotopes and in pairs of spin-1/2 nuclei.

The first chapter, written by Jörg Kärger, Harry Pfeifer, and Wilfried Heink, describes the theory of NMR self-diffusion measurements. A detailed account of the various modifications of the basic field gradient spin–echo technique is given. Examples of applications of these measurements to systems such as polymer melts and solutions, liquid crystals, and molecules on surfaces and in porous solids are illustrated.

In Chapter 2 (James R. Gaines and P. C. Sauers), the theory of spin–lattice relaxation in solid H_2 is reviewed. The measurements of relaxation rates of the hydrogen isotopes and their mixtures and the use of these results to test the relaxation models are described.

Chapter 3, by C. von Borczyskowski, describes optical detection of nuclear spin alignment and NQR in organic molecular crystals. The basic principles of optical nuclear polarization (ONP) in general and its exploitations in NMR techniques are reviewed. The emphasis, however, is on the principles of optical detection of nuclear spin alignment and NQR (ODNQR). An extensive review of applications of the ODNQR is presented. This chapter also contains the discussions on the comparisons between the increased sensitivity of ODNQR and that of the conventional NQR, and between ODNQR in the ground state and the optical detection of ENDOR (ODENDOR) in excited states of the molecules.

Chapter 4, by Alexander Keller, examines the relaxation of dipolarly coupled pairs of spin-1/2 nuclei in terms of the spin-1 behavior. Both the theoretical and experimental aspects are discussed. In particular, the experimental procedures for preparing the spin system in any coherence states or quasi-invariants of the motion, and the monitoring of their time evolution are demonstrated. Some special techniques, such as selective excitation of single-quantum transitions with hard pulses, single-shot detection of double-quantum coherence evolution, and double-quantum line narrowing by multiple-pulse techniques are also discussed.

Chapter 5, written by Warren S. Warren and Michael S. Silver,

*Unsigned book reviews are by the Book Review Editor.