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Book Review

Homogeneous photocatalysis
by M. Chanon (editor), John Wiley, New York, 1997, ISBN 0-471-96753-X

This is a well-written and comprehensive text, with contributions from many leading workers in the field. It particularly serves to emphasise the interdisciplinary nature of the subject across the physical and biological sciences, and indeed, the very definition of the term photocatalysis is discussed in the first chapter, which although somewhat convoluted, does serve to emphasise the diversity of the subject. This is followed by a detailed theoretical treatment of the fundamental interactions between light and matter, which underpins the remainder of the text.

A wide ranging chapter considering photo induced electron transfer in organic synthesis, highlights numerous applications and the need for new sensitisers. The application of modern spectroscopic techniques for the identification of radical intermediates is also discussed. This is followed by a consideration of the mechanistic aspects of organic reactions catalysed by soluble transition metal complexes and organometallics, again with numerous examples. The underlying theory of charge transfer and the relevant redox chemistry is dealt with in a clear and concise manner. In general, however, the subject matter here is well-documented, and a more detailed update on recent or potential applications would have been desirable, rather than a simple referral to other reviews.

Chapter Six is a well-written overview of the silver halide photographic process, initially placed in a historical context but with an eye to the future. Although the discussion of the primary photographic process, and processing chemistry is covered in many texts, recent time resolved spectroscopic studies of silver clusters are presented, which is of relevance to any mechanistic interpretation of formation of the elusive latent image.

The advantages and disadvantages offered by immobilisation of photosensitisers on supports such as silicas, aluminas and zeolites are discussed in detail. The importance of the type of support, as a means of stabilising the photocatalyst and tailoring photosensitiser behaviour during reaction is emphasised. Numerous examples are included. This is followed by consideration of the 'high profile' topic of the photolysis of water, which, in order to emphasise the scope of the subject, impinges slightly on (micro)heterogeneous systems. Consideration of well-established molecular systems, e.g., $[Ru(bpy)_3]^{2+}$ and methyl viologen electron relays leads to the application of supramolecular systems for water splitting. The last two chapters consider the applications of organised molecular systems including microemulsions and vesicles which meshes effectively with a consideration of photosynthetic pathways which serves to emphasise the significant progress made with artificial systems.

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