

Book Review

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Reactive intermediate chemistry

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Reactive intermediates were once regarded as mechanistic curiosities in organic chemistry. These days, thanks to advances in spectroscopy and computational methods, we know a lot more about the nature and reactivity of these intermediates. Moreover, the use of species such as radicals, carbenes, nitrenes and arynes in organic synthesis has increased dramatically over the past 10–15 years. It is now commonplace for organic chemists to plan synthetic strategies around the reactions of such species. Therefore the appearance of this book is certainly timely.

Reactive Intermediate Chemistry is co-edited by three of the world's leading practitioners in the area, and they have

persuaded a truly impressive collection of authors to contribute chapters. The book is organized firstly by type of reactive intermediate. Thus, there are 15 chapters covering carbocations, carbanions, radicals, non-Kekulé molecules, radical ions, carbenes, atomic carbon, nitrenes, nitrenium ions, silylenes (and their germanium, tin and lead analogues), strained hydrocarbons and arynes. An additional chapter covers the uses of carbenes and nitrenes in organic synthesis. The second part of the book comprises six further chapters that address the experimental techniques involved in the study of highly reactive and transient species: matrix isolation, laser flash photolysis, and studies on the nano-, pico- and femto-second time scales. The fact that many of these intermediates can now be directly observed reflects progress in recent years.

Many of the book's 22 chapters are written by *the* leading expert in the field, and, as one would expect, are written with the authority that such experts bring. For the most part, chapters follow a similar

pattern, often starting with a brief historical overview, followed by a detailed discussion of the structure and reactivity of the reactive intermediate in question. Where relevant, the discussions on structure summarize all the modern spectroscopic evidence. With the exception of the chapter on the synthetic uses of carbenes and nitrenes, the discussion of the reactivity and reactions of the intermediates is discussed from a mechanistic and kinetic standpoint rather than that of a synthetic organic chemist. Each chapter finishes with a 'conclusion and outlook' section that summarizes the current situation and points up further research directions. In addition to the relevant list of references, a compilation of key reviews appears in each chapter as suggested further reading.

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