

As quoted by Schwerdtfeger and Lein, “*Aurum scientiaque potestas sunt*” or “Gold and knowledge are power.” Don’t miss this powerful and enjoyable book!

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Oxidation of Organic Compounds by Dioxiranes

The book is concerned with dioxirane oxidations and covers the literature essentially from the beginning in 1974 up to mid-2008. Dioxiranes are currently an area of much research. The literature on dioxiranes is well over 1000 publications, and the book reaffirms their usefulness in synthetic organic chemistry. Dioxiranes are reactive, yet mild and selective oxidants. Organic compounds can be oxidized by two routes, either stoichiometrically by isolated dioxiranes or catalytically by dioxiranes prepared in situ from ketone precursors. The in situ preparation, however, requires that substrates and products are hydrolytically stable.

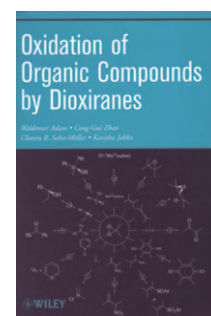
The first chapter of the book describes dioxirane epoxidations of electron-rich, electron-poor, and unfunctionalized alkenes. A table showing functional group tolerance to epoxide-forming reactions was also included which is quite useful. The second chapter describes dioxirane oxidations of allenes, alkynes, arenes, heteroatom substrates, alkanes, silanes, and organometallic compounds. Here, dioxiranes readily oxidize compounds with π -bonds, heteroatom compounds with lone-pair electrons, and certain transition-metal compounds. In some cases, dioxiranes can insert an oxygen atom into C–H and Si–H σ -bonds.

Various facets of the dioxirane theme are weighted well. Comparisons of dioxirane oxidations were made with other oxidation methods. The book has uses for different types of readers. There are sections of experimental conditions and procedures, encouraging researchers (even first timers) to try these reactions. For many readers, half the fun will be scanning the tabular surveys of dioxirane reactions at the end of the chapters. Meticulous care was taken to produce these tabular surveys.

Synthetically, dioxiranes are now established and renowned for their oxidations of organic compounds. Historically, they show strained structures with unstable O–O bonds just as was first envisioned for them in the Baeyer–Villiger reaction 110 years ago. I anticipate the book will be highly valued by organic chemists for years to come.

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DOI: 10.1002/anie.200906237



Oxidation of Organic Compounds by Dioxiranes
By Waldemar Adam, Cong-Gui Zhao, Chantou R. Saha-Möller and Kavitha Jakka.
John Wiley & Sons, Hoboken
2009. 670 pp., softcover
€ 84.90.—|ISBN 978-0470454077