Journal of
Medicinal
Chemistry
Book Review

Heterocyclic Chemistry. Fifth Edition. By J. A. Joule and K. Mills. Chichester, West Sussex, U.K. 2010. xxviii + 689 pp. 19 × 25 cm. ISBN 978105133005. $59.95.

This fifth edition textbook has been substantially updated to remain a mainstay in this field of chemistry so important to modern drug discovery. It examines the fundamentals of heterocyclic structure reactivity and synthesis at an advanced undergraduate or graduate chemistry student level while retaining the encyclopedic breadth and up-to-date literature citations required of a reference text for the bench chemist.

The novel use of red highlighting within structures throughout the text was adopted for the fifth edition, whereby the reader's attention precisely transitions from the narrative to the specific structural moiety or mechanistic process being addressed. This new edition also includes a chapter dedicated to the increasingly important topic of organometallic chemistry with a complement of late-breaking citations. The authors responsibly address toxicity issues associated with specific reagents throughout the entire 33 chapters.

The clear illustration of reaction mechanisms allows rational prediction of how general a synthetic pathway is likely to be. The ratios of isomeric or side reaction products are frequently included to help demonstrate the potential limitations of particular reaction schemes.

Complete chapters are dedicated to the more commonly encountered heterocyclic rings and ring systems. Most chapters end with select syntheses of notable compounds of biological interest and with student exercises categorized as "straightforward" or "advanced".

Aromatic theory and other electronic effects are comprehensively addressed in the context of developing rational synthetic strategies. Solid-phase reaction techniques and saturated heterocyclic systems are introduced but not emphasized. The coverage of purines takes on a distinct medicinal chemistry perspective in the context of anticancer/antiviral scaffolds. A "Special Topics" chapter includes fluorination and isotopic labeling. The closing two chapters pertain to heterocyclic natural products, then general drug design theory. This excellent book is well written, heavily referenced, and thoroughly indexed. Accordingly, it serves as both an instructional heterocyclic chemistry textbook and a portal to the primary synthetic chemistry literature.

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DOI: 10.1021/jm101483n
Published on Web 12/07/2010