

## Book Reviews

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**Bioorganic and Medicinal Chemistry of Fluorine.** By Jean-Pierre Bégué and Danièle Bonnet-Delpon. John Wiley & Sons, Inc., Hoboken, NJ. 2008. xvii + 365 pp. 24 × 16 cm. ISBN 978-0-470-27830-7. \$99.95.

This is an excellent book dealing with the properties of fluorine, as well as attendant physical and biological properties alterations when small organic molecules bear this atom. The book contains eight chapters with self-explanatory titles and index. The chapters are (1) General Remarks on Structural, Physical, and Chemical Properties of Fluorinated Compounds; (2) Overview on the Preparation of Fluorinated Compounds; (3) Effects of Fluorine Substitution on Biological Properties; (4) Fluorinated Analogues of Natural Products; (5) Fluorinated Derivatives of  $\alpha$ -Amino Acids and Proteins; (6) Saccharidic Fluorinated Derivatives; (7) Inhibition of Enzymes by Fluorinated Compounds; and (8) Fluorinated Drugs. The book was first written in French and published in 2005. The authors used the opportunity of translation into English to update references to 2007 and to add new sections.

The importance of this field can be illustrated by the number of drugs and agrochemicals containing fluorine atom(s). The percentage of pharmaceutical products containing fluorine has gradually increased from 2% in 1970 to 18% in 2000 with many in the top selling dozen. In the agrochemicals sector, the percentage is even higher. Arguably, the most important chapters in the book are Chapters 1 and 8. Chapter 1 addresses the atomic parameters of fluorine compared with several other atoms, from size to ionization energy to electronegativity. How these then affect physical properties of molecules bearing fluorine were illustrated with boiling point, surface tension and activity,

solubility, lipophilicity, acidity, hydrogen bonding, and reactivity. Examples showing how inductive and resonance effects of fluorine interplay and resulting consequences in molecular properties are given. Chapter 8 provides many examples of fluorinated pharmaceutical products, from diagnostics to drugs acting via enzyme inhibition to those acting on various receptors. These products include antitumor, antiviral, antifungal, anti-infectious, CNS, NSAIDs, cardiovascular, endocrine, metabolic, inflammatory, and immunity disorders agents as well as others used as general anesthetics, contrast agents for ultrasound imaging, blood substitute, and oxygen carriers. The chemical classes bearing fluorine include, inter alia, nucleosides, quinolones, steroids, and azoles.

Synthetic routes leading to many of the drugs are also provided. An extensive appendix showing fluorinated drugs in the various therapeutic areas and their trade names is given. This is an excellent book for those contemplating incorporation of fluorine into their drug design research investigations and how it can be accomplished. It is also an excellent reference book for experts in the area. I enthusiastically recommend adding this to both individual and library collections.

**Adeboye Adejare**

*Department of Pharmaceutical Sciences  
Philadelphia College of Pharmacy  
University of the Sciences in Philadelphia  
Philadelphia, PA 19104*

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