

**Fluorine-18 Labeling of Radiopharmaceuticals.** Michael Kilbourn, Washington, DC, National Academy Press, 1991, 148 pp.

The Committee on Nuclear and Radiochemistry, a subcommittee of The National Research Council, through the National Academy Press is sponsoring a series of monographs on PET radiochemistry and radiopharmacology. The first of these was on  $^{11}\text{C}$  by Dr. Joanna Fowler of Brookhaven National Laboratory, and the second on  $^{18}\text{F}$  by Dr. Michael Kilbourn from the University of Michigan is now available. The chemistry of  $^{18}\text{F}$  has the reputation of being both difficult and uncertain, but in recent years most, if not all, of the difficulties have been understood and measures to bring the reactions under control are possible. Thus, it was appropriate at this time to produce a comprehensive review of the chemistry of  $^{18}\text{F}$ .

The review is encyclopedic and authoritative with 148 pages and 408 references. It covers the preparation of  $^{18}\text{F}$  as well as the advantages and disadvantages of the

nuclear reactions that are commonly used to produce it. The various chemical reactions that have been used to incorporate  $^{18}\text{F}$  into organic molecules are discussed under the generalized headings of aliphatic electrophilic and nucleophilic reactions and aromatic reactions. In addition, there is a chapter on the meaning of the terms "specific activity" and "yield" as applied specifically to the chemistry of  $^{18}\text{F}$ . This discussion is valuable since it helps to clarify terms which, with short-lived radio-nuclides, are essentially moving targets. This chapter also contains a brief but informative and helpful review of the IUPAC conventions for the nomenclature of labeled compounds.

There are also two valuable appendices, one listing all the compounds that have been made with  $^{18}\text{F}$  and the literature references to their preparation. The second appendix gives a brief history of those  $^{18}\text{F}$ -labeled compounds that have received widespread use as radiopharmaceuticals.

This monograph provides a valuable resource to any chemist working with  $^{18}\text{F}$

and will also be useful to anyone interested in radiopharmaceuticals who asks the question "How could I make that?".

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#### BOOKS RECEIVED

*Annals of the ICRP: 1990. Recommendations of the International Commission on Radiological Protection, H. Smith, Ed, Pergamon Press, Headington Hill Hall, Oxford, United Kingdom, \$142.50, 201 pages.*

*Musculoskeletal Imaging: MRI, CT, Nuclear Medicine, and Ultrasound in Clinical Practice, John A. Markisz, Little, Brown and Company, Boston, MA, \$125.00, 397 pages.*