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BOOK REVIEWS

RADICALS IN ORGANIC SYNTHESIS: FORMATION OF CARBON–CARBON BONDS
by *Bernd Giese* (Pergamon Press, 1986)

This is a very timely study of a rapidly developing field. To one who has worked with radicals over more years than he cares to recall, it is good news that they are at last coming into their own. There have been barriers to overcome, since the "ionic" concepts have been deeply inbuilt. I am reminded of the fact that my Ph.D. thesis was initially rejected solely because I had postulated radical mechanisms which were not acceptable at that time!

The book is a "working book", concerned very much with optimum conditions, yields, etc., so it is primarily for experimentalists. The author is a pioneer of these "new" reagents, as are, for example, Barton, Baldwin, Corey, Curran, Kochi, Richardt, Russell, Stork and Walling, whose recent work is nicely reviewed herein.

After outlining the basic principles involved in organic radical chemistry, the subject is treated systematically, covering inter- and intra-formation of aliphatic C–C bonds and C–C bond formation in aromatic systems. In fact the discussion includes much radical chemistry which goes well beyond the formation of C–C bonds, although this remains the primary theme. Stress is laid on the differing reactions of electrophilic and nucleophilic radicals and especially on stereoselectivity. The importance of chain reactions is stressed, and the $S_{RN}1$ process is highlighted.

However, the book is very hard to read unless you have both hands free! Some books open easily and others only with difficulty. This one is the worst I have ever come across. It has a mind of its own, and is determined to remain closed. Pergamon Press really *must* do something about this problem, which shouldn't be with us in 1987!

M.C.R. Symons

METABOLISM AND ACTION OF ANTI-CANCER DRUGS
G. POWIS and R.A. PROUGH (Eds.)
Taylor & Francis: London
1987. ISBN 0-85066-3695

This is a quality book describing recent developments in our knowledge of the metabolism and action of cytotoxic chemicals routinely used in the treatment of neoplastic diseases. Fourteen American specialists have contributed ten chapters to the book covering 2-chloroethyl-nitrosoureas, procarbazine, oxazaphosphorines, purine and pyrimidine antimetabolites, folic acid antagonists, platinum, bleomycin,

anthracyclines and anti-steroids. The last section describes some new drugs under development. The first three groups of agents described are alkylating agents and some of these have 20 or more years of biochemical study and clinical use behind them. Cyclophosphamide is one such example of a drug synthesised 30 years ago but widely recognised as a therapeutic agent for cancer treatment and immunosuppression. Unfortunately, most anticancer agents such as those described here also have mutagenic and carcinogenic properties under appropriate conditions.

Folic acid antagonists as antimetabolites are one of the oldest anti-tumour agents used with a history dating back to the 1940s. Methotrexate is perhaps the best known of this class of compound which interfere with cell growth. Methotrexate has even been used as an anti-inflammatory drug for arthritis. Purine and pyrimidine antimetabolites are 'pro-drugs' that become activated only after intracellular conversion. The synthesis of platinum drugs apparently dates back to the 1840s although their present role in cancer treatment is quite recent. Cisplatin is probably active because of its ability to inhibit DNA replication through binding. The metal chelating antibiotic bleomycin is still an intriguing molecule for scientists to study. Bleomycin has an enzyme-like activity and is able to turn-over some 5000 moles of ferrous ions per minute (ferrous oxidase activity) although the involvement of metal ions and oxygen in DNA damage is only briefly reviewed.

The chapter on anthracycline metabolism and free radical formation is a comprehensive in-depth review of the field with some pleasingly accurate chronology. Anthracyclines such as doxorubicin (adriamycin) are obtained from Streptomyces and widely used in cancer treatment although effective dose is limited by complications of serious cardiotoxicity. The suggestion, however, that drug semiquinone free radicals can react with hydrogen peroxide to form hydroxyl radicals without the need for an iron catalyst has now been discounted by those who originally proposed it.

The last two chapters describe in depth the use of anti-steroids to treat hormone-dependent cancers and the metabolism of some new anticancer drugs under development.

The book is a well-edited up-to-date account of important chemotherapeutic agents used in modern cancer therapy. It makes a valuable contribution to the field.

John M.C. Gutteridge