

The Chemistry and Application of Dyes

TOPICS IN APPLIED CHEMISTRY

Series Editors: Alan R. Katritzky, FRS

*Kenan Professor of Chemistry
University of Florida, Gainesville, Florida*

Gebran J. Sabongi

*Laboratory Manager, Encapsulation Technology Center
3M, St. Paul, Minnesota*

CHEMICAL TRIGGERING

Reactions of Potential Utility in Industrial Processes

Gebran J. Sabongi

THE CHEMISTRY AND APPLICATION OF DYES

Edited by David R. Waring and Geoffrey Hallas

STRUCTURAL ADHESIVES

Edited by S. R. Hartshorn

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The Chemistry and Application of Dyes

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David R. Waring

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The majority of the synthetic examples described are taken from the published literature and it should be noted that claims, including those regarding yields and reaction conditions, are those of the published authors.

Before undertaking any of the described syntheses, the experimenter should consult the literature regarding the safe handling of the chemicals used. Where possible all syntheses should be carried out in a hood (fume cupboard) and personal protection should include gloves, safety glasses, and laboratory coat.

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Contributors

- S. M. Burkinshaw**, Department of Colour Chemistry and Dyeing, The University of Leeds, Leeds, West Yorkshire LS2 9JT, England
- P. F. Gordon**, Fine Chemicals Research Centre, ICI Organics Division, Hexagon House, Blackley, Manchester M9 3DA, England
- P. Gregory**, Fine Chemicals Research Centre, ICI Colours and Fine Chemicals, Hexagon House, Blackley, Manchester M9 3DA, England
- J. Griffiths**, Department of Colour Chemistry and Dyeing, The University of Leeds, Leeds, West Yorkshire LS2 9JT, England
- L. Shuttleworth**, Research Laboratories, Photographic Products Group, Eastman Kodak Company, Rochester, NY 14650, U.S.A.
- D. R. Waring**, Kodak Limited, Acornfield Road, Kirkby, Liverpool L33 7UF, England
- F. Walker**, 43 Child Lane, Roberttown, Liversedge, West Yorkshire WF15 7QN, England. Retired, formerly of L. B. Holliday & Co. Ltd., Leeds Road, Huddersfield HD2 1UH, England
- M. A. Weaver**, Retired from Research Laboratories, Eastman Chemicals Division, Eastman Kodak Company, Kingsport, TN 37662, U.S.A.

Preface

It is particularly appropriate that a volume concerned with dye chemistry should be included in the series *Topics in Applied Chemistry*. The development of the dye industry has been inexorably linked not only with the development of the chemical industry but also with organic chemistry itself since the middle of the last century. The position of dye chemistry at the forefront of chemical advance has declined somewhat since 1945 and more markedly so during the last 15 years, with pharmaceutical and medicinal chemistry assuming an increasingly prominent position. Nevertheless, dye production still accounts for a significant portion of the business of most major chemical companies.

The field of dye chemistry has stimulated the publication of many books over the years but surprisingly few have concentrated on or even included the practical aspects of dye synthesis and application. Thus, the present volume is designed to fulfill that need and provide the reader with an account of advances in dye chemistry, concentrating on more recent work and giving, in a single volume, synthetic detail and methods of application of the most important classes, information which will be invaluable to both student and research chemist alike.

The volume is divided into eight chapters. The introductory chapter briefly chronicles the evolution of dye technology and the theory of color. Although the book is essentially practical, it is intended to direct the reader to literature concerned with the theory of color, a topic which has attracted considerable attention during recent years, in parallel with the increased availability of computing power. The following chapter discusses the classification or division of dyes by structure. Various structural classes of dye, notably azo and anthraquinone types, have been adapted, by careful selection of substituents, for application to a variety of fibers. Such fibers, by virtue of their own innate chemistry, place many demands on the dyes with which they can effectively be colored. The chapter discusses some of the chemistry associated with particular structural types.

Chapters 3–6 describe the dyes used for application to the four most important fiber types, namely cellulosic (essentially cotton), polyester, polyamide (nylon and wool), and polyacrylonitrile. Each chapter includes an account of the dyes used for the particular fiber and synthetic details for a selection of the structures under discussion.

Chapter 7 describes the methods used in the application of dyes to the major fiber types and their more important blends and concludes with appropriate practical details.

In some respects the final chapter points to the future of dye innovation in its discussion of nontextile applications of dyes. This important growth area for the dye industry has stimulated vigorous research activity in recent years, not least because it is in this arena that there is a greater potential for proprietary products and improved profit margins.

D. R. Waring
G. Hallas

Liverpool and Leeds

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