THE MANUFACTURE OF INTERMEDIATE PRODUCTS FOR DYES

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The manufacture of intermediate products for dyes by John Cannell Cain

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THE MANUFACTURE OF INTERMEDIATE PRODUCTS FOR DYES

BY

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PREFACE

NOTHING is more important in the present revival of the aniline dye industry in England and America than a knowledge of the literature dealing with the manufacture of intermediate products. The scope of most of the books on the subject to which one naturally turns is necessarily limited, and the authors must perforce content themselves with describing the chemistry of the processes concerned. It is, however, of prime importance to the would-be manufacturer to have, in a convenient form, detailed information as to the preparation of the materials he proposes to make, so that he may be sure that he will not spend time and money in rediscovering, perhaps, some process that may have been already elaborately described in an obscure book or periodical.

The chemist, confronted with the task of compiling such information, immediately encounters difficulties. It is rarely that he has ready access to a good technical library, and even if that difficulty is overcome, and much time and labour are spent in the search, he will be chary of asserting that he has exhausted the whole of the literature on the subject of his investigation.

It appeared to the author that a concise account of the literature dealing with the manufacture of intermediate products for dyes might therefore be of considerable use, and in this book he has endeavoured to present such an account in detail so as to render it unnecessary to refer to the original descriptions.

It may perhaps be stated that he doubts whether any single library in England contains the whole of the literature consulted.

As a guide to the selection of these materials the author has made considerable use of the "Dyestuff Census of the United States" (published in the *Journal of the Society of Chemical Industry*, 1916, 35, 1202), as well as of other information as to the dyes in general use, and believes that he has included all the more important intermediate products.

The aim has been to record the most recent or the most trustworthy method of manufacture of each substance in the same detail as in the original publication, to mention other processes or modifications, and to record essential scientific data, such as melting points, boiling points, densities, solubilities, etc. The pure chemistry of the subject has been left alone as it is readily available.

It has not been possible to attain this aim in all cases, for although the manufacture of certain products has been previously described in the most minute detail (see, for example, the description of the manufacture of diethyl-*m*-aminophenol, p. 121), the only references to others are accounts of laboratory experiments.

Both, however, have their uses: improvement of elaborately described processes can often be made (in the above instance conspicuously so); in any event it will be rare that such a process will be blindly imitated, and the description of a laboratory experiment can often be rapidly developed to a large scale manufacture.

In a few cases the author has supplemented published descriptions by his own experience, and in certain important instances (for example, phenylglycine and anthrarufin) practically all the published processes are given in full.

Throughout the book the original weights and volumes, method of indicating density, etc., are reproduced. The latter can easily be converted, if required, by means of the tables in the Appendix.

Details of certain frequently occurring operations, such as sulphonation, etc., are not, of course, repeated. Thus chlorination is treated very fully under Chlorobenzene and Benzyl chloride, nitration under Nitrobenzene, reduction under Aniline, sulphonation under Phenol, and so on.

It seemed superfluous to reproduce figures of ordinary plant such as sulphonation pans, filter presses, etc., which are illustrated in the advertisement columns of periodicals such as the *Journal of the Society of Chemical Industry* and the *Journal of Industrial and Engineering Chemistry*, and the author has therefore contented himself with giving diagrams of special plant, which are, perhaps, not quite so readily available. In this connexion his grateful thanks and acknowledgments are due to Dr. R. Seligman, of the Aluminium Plant and Vessel Co., for the loan of the block of Fig. 15, to M. P. Blondel for permission to reproduce Figs. 4, 6, 7, 8, 11, and 23 from *La Revue des Produits*

chimiques, and to Messrs. Davis Bros. for similar kindness with regard to Figs. 5, 13 and 14, which were first published in *The Chemical Trade Journal*.

In conclusion, the hope may be expressed that the book may be found useful, not only to manufacturers and technical chemists, but also to students of chemistry in technical schools and universities.

LONDON, *February*, 1918.

PREFACE TO SECOND EDITION

IN the short period since this book was first published, considerable additions have been made to the scientific and technical literature of the subject, particularly in America. These have been duly incorporated in the present revision of the book; several of the descriptions have also been expanded, and some useful suggestions made by the reviewers have been adopted.

LONDON, *March*, 1919.