Pharmaceutical Chemistry

Volume-2

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VOLUME 2

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Instrumental Techniques

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Preface

The increasing complexities of pharmaceutical preparations and the marked emphases on quality control by the ethical manufacturer have placed a greater load on the ingenuity of the control chemist. Such an individual must be so well trained that he is capable of appreciating the merits of the known techniques before selecting the one most suited to the task at hand. If established procedures are not suitable, the control chemist must be capable of developing new methods. Therefore, this new and comprehensive two-volume textbook on pharmaceutical chemistry has been written for use in the practical training of pharmacy students to enable them to take their rightful place in the pharmaceutical industry and in government laboratories concerned with the quality of medicinal preparations.

Texts dealing with analytical chemistry that have been written for and by analytical chemists do not, in general, adequately treat the subject of analytical pharmaceutical chemistry. When one applies quantitative techniques to the analyses of pharmaceutical dosage forms which, even in their simplest state, are complex entities, one must employ special considerations. Books on analytical chemistry lack the proper emphasis and suitable applications. Existing textbooks in pharmaceutical chemistry, while considering the pharmaceutical aspects, often fail to treat the subject in the depth which it deserves. This text is meant to fulfill these needs.

The editor, based upon his experience with the Food and Drug Directorate of the Government of Canada as well as his teaching of pharmaceutical chemistry at the University of Alberta, and the contributors, who, for the most part, are all experienced teachers of pharmaceutical chemistry or a related discipline of pharmacy, have consciously attempted to arrive at a satisfactory blend of procedures in order to provide a broad basis on which the senior undergraduate and graduate student can build. The focal point of each chapter is the presentation of the theory. Practical experiments have been carefully selected to demonstrate an application of the theoretical considerations. Questions and problems, together with a list of references for supplementary reading, have been included at the end of most chapters.

Since the aim of this book is to provide a depth of understanding not evident in other books, it was decided to separate what is generally thought of as classical analytical techniques from those of instrumentation. The first volume, therefore, deals with theoretical and practical considerations of gravimetric analysis, acid-base titrimetry and pH, precipitation and complex formation, acidimetry and alkalimetry, nonaqueous titrimetry, complexometric analysis, alkaloidal assay, miscellaneous methods, ion exchange, chromatography, and the analysis of fixed and volatile oils. The second volume presents the theory and application of the following instrumental techniques: visible and ultraviolet spectrophotometry, fluorescence spectrophotometry, turbidimetry and nephelometry, infrared spectrophotometry and Raman spectroscopy, flame photometry and atomic absorption analysis, x-ray diffraction and optical crystallography, mass spectrometry, refractometry and interferometry, polarimetry and optical rotatory dispersion, gas chromatography, radioactivity, nuclear magnetic resonance, potentiometric titrations and instrumental determination of pH, coulometric methods and chronopotentiometry, polarography, amperometry, and conductance and high frequency.

The editor is indebted to the various authors for their contributions. Their efforts are responsible for the quality of this text.

L. G. C.

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