

PREFACE

Chemists and chemical engineers both in training and at work will find this text quite useful. It provides comprehensive information about how chemistry applies to environmental practice, so that it will be easy for chemists and chemical engineers to become environmental engineers. Professional environmental and civil engineers can also use this volume as a constant companion for easy reference.

In addition to environmental sustainability, policy-making and the political infrastructure make up another crucial element in creating a better environment. As well as providing instruction for professional environmental engineers, this book also provides ample information for non-science, non-engineering professionals, such as political officials, legal professionals, and journalists. They will be able to use information contained in these pages to develop better, more informed decision-making.

In order to tackle environmentally related chemical problems, scientists must have a grasp of both chemistry and environmental engineering. This volume includes introductions to fundamental engineering concepts such as fluid mechanics, hydraulics, mass transfer, and diffusion phenomena are blended into the scientific segments. We have purposely omitted the design and implementation of processes, since these can be found in other excellent sources.

In every chapter, mathematical expressions are used to rationalize certain thoughts and ideas. The level of mathematics needed for this volume extends to calculus and differential equations, which are included in the Bachelor of Science requirements of most colleges and universities. This volume can also serve as a refresher before a modeling course is taught.

Both Metric and English units are used throughout the text. Often, the choice depends upon the preference of the user. For conversion of a given system, both the popular and expert usages are listed; those that are defined by the International Union of Pure and Applied Chemistry (IUPAC) are recommended.

To economize time and space, the secondary lists of authors' references in many tables are eliminated. However, the names of the authors are maintained for the user's convenience, in order to locate the references through the available computer database. Some portions of this book have been used in Environmental Chemistry published by Prentice Hall in two volumes. Permission has been given to use that material for the present version with the appropriate corrections and additions. These volumes have been used to teach the basics of chemical processes and environmental chemistry to students in universities for close to twenty years.

The author would like to take this opportunity to thank all of the colleagues and previous students, too many to mention, who have taken the course and who have contributed to shaping this book. He would also like to acknowledge the scientists who have summarized work done in the past, without which the present volume would not be possible. Lastly, the author would like to name Ngo Yeung Chan, Zixuan Chen, Vivek Gupta, Kinjal Modi, Abhay Nadkarni, Arpitha Shetty, Karan Singh and Rachel Tucker for their assistance.

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