

Preface

Multidisciplinary cooperation is one of the key contributors to successful innovation and project execution within the current and future process industry. The main challenge within multidisciplinary teams is communication, which will be much more effective when possessing basic understanding of each other's discipline. It is exactly this reason, enhancing the understanding of process technology by those without a background in (bio)chemical process engineering, that has motivated us to create the second edition of this book. The first edition served as the basis for the industrial course "Introduction into the World of Process Technology," which has been given for many years within multiple multinational companies. Participants included chemists (organic/catalytic/bio/physical/analytical), material technologists, economists, accountants, lawyers and many others working in a position where cooperation and communication with (bio)chemical process engineers was an essential part of their job. Since 2020 the course has been revived and is now provided as "Process Technology for Non-process Technologists" by the TU Delft Process & Product Technology Institute (www.tudelft.nl/Pro2Tech). Besides small revisions/corrections throughout all chapters and an update of references for further reading, this second edition now includes electrochemical conversion, a more complete overview of computational fluid dynamics approaches and more background on economic evaluation of projects.

The main objective of this book is to provide a general overview of chemical and biochemical process and product technology. It focuses on the structure and development of production processes, main technological operations and the most important aspects of product and process development, including economics. For the technological operations, the emphasis is on their operating principles, reasons for application and available industrial equipment. Design calculations and mathematics have been kept to a minimum required to understand why process technologists and engineers need certain information. All topics are extensively illustrated by representative examples.

The book is organized into seven distinct parts. An introduction to the structure of the chemical industry and (bio)chemical processes is treated in Chapters 1 and 2. Chapters 3–5 deal with (bio)chemical reaction engineering and reactor technology. The most frequently applied molecular separation techniques such as distillation, extraction, absorption, stripping, adsorption and ion exchange are discussed in Chapters 6–9. The part on mechanical separation technology presents an overview of the most important techniques for separating heterogeneous mixtures in Chapters 10–12. Technologies relevant for particles and final product manufacturing are treated in Chapters 13–15. Chapters 16–18 deal with the development, scale-up, design, engineering and safety of processes. The book concludes with three appendices in which major industrial processes for the production of base chemicals, polymers and fine chemicals are described. It should be noted by the reader that the appendices only represent a small selection of the numerous industrial processes in

operation and that the described processes have been selected with a bias on the companies where the course was lectured. For further reading, an extensive list of reference books is provided.

André B. de Haan
Johan T. Padding