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Abstract

Chemical and biochemical processes can be found in our daily lives, in large industries, as well as in cutting-edge fields worldwide, such as the kinetics of drug action, the functioning of our stomach, increasing the octane number of gasoline, the production of plastics, synthesis of various chemicals, the action of enzymes and microbes etc. This multitude of applications of chemical and biochemical processes make this subject particularly interesting to study and understand. This book aspires to be a readily accessible and highly comprehensible introductory textbook to the Engineering of chemical reactions and chemical and biochemical processes as well as the chemical reactor design. It is targeted mainly to undergraduate students, although some chapters may also be used in postgraduate courses. It has been written aiming to provide all the necessary information so that it can be used as it is in the teaching

of a semester course. The aim of this book, in addition to the knowledge and understanding of each subject discussed, is also the consolidation of knowledge through its application. For this reason, special emphasis has been placed on the integration of several solved examples and exercises in each chapter to enable the student to practice and apply his knowledge. Briefly, it includes the following sections: initially, the study of the kinetics of various homogeneous and heterogeneous reactions, and then, the design of all types of homogeneous ideal chemical reactors, as well as their non-isothermal operation. It continues with the study of reactor cascades and the optimization of their operation. A presentation of heterogeneous catalytic and non-catalytic processes and reactors follows. Enzymatic and microbial reactions come next, and the content closes with the presentation of non-ideal reactors.

