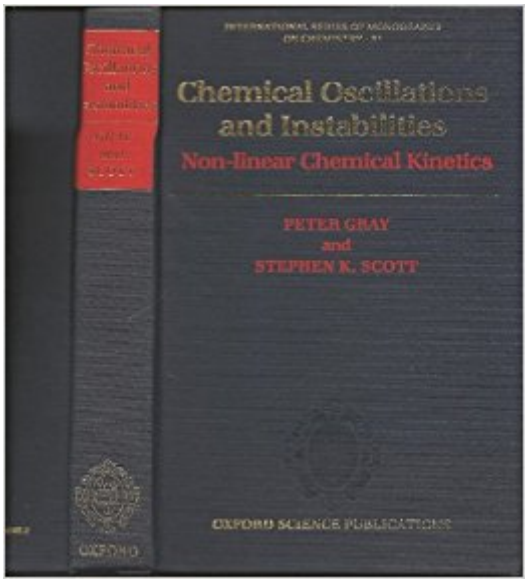
Chemical Oscillations And Instabilities: Non-linear Chemical Kinetics (International Series Of Monographs On Chemistry)



Synopsis

Today, scientists in many fields are expressing considerable interest in non-linearity and the ideas of oscillations and chaos. Chemical reactions provide perfect examples of these phenomena. This book is an excellent introduction to the area of nonlinear phenomena in chemical kinetics that involve chemical feedback such as chain branching, autocatalysis, and self-heating. The emphasis is on physical and pictorial representation, and on identifying those gross features which are essential. The experimental conditions under which such behavior will occur can be predicted using simple mathematical recipes, and these are also included. Readers will find full discussions of long-lived oscillations for autocatalytic or exothermic reactions in closed vessels and stationary states, bistability, and oscillations in continuous flow reactors and diffusion cells. Other topics considered include chemical wave propagation, pattern selection and formation, heterogeneous reactions, complex oscillations, quasiperiodicity, and chemical chaos, both forced and spontaneous. The second part of the book describes actual experimental systems, such as the Belousov-Zhabotinskii reaction, and include discussion of the behavior of important gas-phase reactions. This volume is an ideal sourcebook of applied problems for graduate courses in dynamical systems, advanced chemical kinetics, and chemical reactor engineering, as well as for research workers in physical chemistry, and mathematicians, biologists, physicists, and physiologists.

Book Information

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Customer Reviews

"This is a timely and authoritative introduction to the specifically chemical aspects of dynamical instabilities. It complements several recent books that focus on mathematical and physical principles." --Journal of the American Chemical Society --This text refers to the Paperback edition.

Peter Gray is also Visiting Professor, University of Leeds --This text refers to the Paperback edition.

A very good introduction to the subject. Absolutely wonderful. I read this book in my chemistry graduate and I love it.

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