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BOOK REVIEW

S. P. Rudobashta and E. M. Kartashov, "Diffuziya v khimiko-tekhnologicheskikh protsessakh" (Diffusion in Chemical Processes), Moscow: KolosS, 2010

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The first edition of this book was published by the Khimiya publishing company in 1993. This article is a review of the second, revised and supplemented, edition. This edition includes two new chapters, which deal with the application of diffusion theory to description and design of mass transfer processes in systems containing a solid phase. In the 17 years that have passed since the first edition of the book, classical diffusion theory retained its fundamental importance in mass transfer description and was enriched with new data essential for solving applied problems. Some of these data are included in the second edition.

In essence, the book under review unites and develops the concepts presented in the book *Massoperenos v sistemakh s tverdoi fazoi* (Mass Transfer in Systems Containing a Solid Phase) by S.P. Rudobashta (Moscow: Khimiya, 1980) and in the book *Analiticheskie metody v teorii teploprovodnosti yverdykh tel* (Analytical Methods in the Theory of Heat Conduction in Solids) by E.M. Kartashov (Moscow: Vysshaya Shkola, 2001). The authors are renowned specialists in heat and mass transfer. They have published a large number of articles on the issues considered in their book. Their experience and good knowledge of the subject enabled them to present the material in a proper way. The authors discuss the subject in the light of their own understanding, and this makes their book particularly valuable. The book considers the physical phenomena underlying different diffusion problems and analytical methods for their solution, as well as the known solutions to some problems. This allows the reader both to analyze diffusion phenomena by themselves, formulating a problem and finding an analytical solution, and to use, if possible, ready mathematical descriptions suggested in the book.

The theoretical part of the book is finely complemented by consideration of practically important issues, such as formulation and solution particular diffusion problems arising in engineering calculations. The authors do not limit themselves to mathematical descriptions, but present, in the Appendix, selected diffusion coefficient and phase equilibrium data for polymers and other materials. This Appendix allows kinetic calculations to be carried out without searching the literature for the necessary thermophysical data, which is often very difficult to do because these data are scattered among various sources. The most remarkable feature of the Appendix is that it provides integral transform tables, which help the reader find analytical solutions to diffusion problems by integral methods.

Since the book is written in the form of a textbook, it is quite natural that it includes test questions and exercises and examples of kinetic calculations. The applied part of the book, which presents mathematical models of particular diffusion processes, deals mainly with drying, adsorption, extraction from the solid phase, and vapor diffusion permeability and systematizes the authors' data that were earlier published in various scientific journals.

The book is notable for its high scientific level, mathematical rigor, and deep physical analysis of diffusion processes. It supplements the earlier books devoted to mass transfer in chemical engineering and will certainly be in high demand among many of those who are engaged in various fields of science and engineering, particularly in the chemical and related (textile, light, food, etc.) industries. It will also be helpful for students specializing in these areas.

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