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Introduction To Transport Phenomena



Synopsis

* Transport phenomena: Fundamental concepts and problem solving * Transport phenomena: basic principles and laws * Molecular and convective transport * Similarity analysis, transfer coefficients, and other key concepts * Use differential equation solvers to solve complex transport problems This book is a true introduction to transport phenomena that presents all basic principles with a minimum of mathematical complexity. Readers will only need to know the basics of differential equations, and how to use a differential equation solver such as Matlab or ACSL. Professor William J. Thomson emphasizes the formulation of differential equations to describe physical problems, helping readers understand what they are doing-and why. The solutions are either simple (separable, linear second order) or derivable with a differential equation solver. Thomson begins with a detailed introduction to molecular transport, including the basic underlying laws, one-dimensional molecular energy transport, molecular mass and momentum transport principles, and transport coefficients. Each major similarity analysis technique is covered, including dimensionless groups in molecular transport, dimensionless dif

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principles with a minimum of mathematical complexity. Readers will only need to know the basics of differential equations, and how to use a differential equation solver such as Matlab or ACSL. Professor William J. Thomson emphasizes the formulation of differential equations to describe physical problems, helping readers understand what they are doing-and why. The solutions are either simple (separable, linear second order) or derivable with a differential equation solver. Thomson begins with a detailed introduction to molecular transport, including the basic underlying laws, one-dimensional molecular energy transport, molecular mass and momentum transport principles, and transport coefficients. Each major similarity analysis technique is covered, including dimensionless groups in molecular transport, dimensionless differential transforms, and similarity transforms. In Part II, Thomson reviews convective transport, presenting a straightforward description of turbulence, and introducing the fundamental concept of transfer coefficients. Building on previous coverage, he then addresses the macroscopic calculation issues associated with momentum, heat, and mass transfer-enabling readers to solve even complex gas absorption and cooling tower problems.

WILLIAM J. THOMSON is Professor of Chemical Engineering at Washington State University, Pullman, WA. He has published widely in chemical engineering research and trade journals, and is a member of the American Institute of Chemical Engineers (AIChE), American Chemical Society (ACS), and American Society of Engineering Education (ASEE).

the most horrific book ever made!!! Professors should seriously stop using it, like now...

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As a student chemical engineer I found the book somewhat helpful, but not really. My teacher taught the same material but in a different way and his way seemed much simpler than the books. I returned the book at the end of the semester because none of my classes 'needed' the book. Surprise! I now need the book and apparently takes 1 to 3 months to ship this book...aka I'll get the book at the end of the semester.

I'm a professional chemical engineer who studied under Dr. Thomson 25+ years ago. Transport Phenomena by Bird Stewart & Lightfoot was the standard then. Chemical engineering students had a heck of a time relating to the material. As a subject, transport phenomena is a lot of math applied

to practical problems. Fledgling chemical engineers have tended to need a primer that is more grounded in practical matters. Introduction to Transport Phenomena provides a matter of fact, grounded (as grounded, I suppose, as theoretical chemical engineering can be) approach that the student and the old fud looking for a refresher alike can use. A word of caution for the person looking for the one book to answer all Transport Phenomena woes: This subject is taught throughout academia, regardless of the specific text, by providing several examples that are intended to show the reader the correct approach and 'tricks' for a particular set of problems. Although Introduction to Transport Phenomena by Dr. Thomson is a great primer, and Transport Phenomena by Bird Stewart & Lightfoot is the "Bible," I suggest that one maintains a 'living library' of reference material that helps understanding in this subject area. I'm currently saving for Transport Phenomena: Equations and Numerical Solutions by Esteban Saadjiian, to round out my reference materials on the subject. In conclusion, Introduction to Transport Phenomena by William Thomson is a very well written, easy to follow primer that provides the reader with excellent guidance and understandable reasoning for the approach to solving most transport phenomena problems. This book will readily show the correct approach in solving the vast majority of transport phenomena problems the chemical engineer tends to need solved in industry. Side note: All books have typos and a few missed errors. Dr. Thomson is a professor at Washington State University. I found the errata for Introduction to Transport Phenomena there.

This will probably be the least helpful transport phenomena textbook you will ever own, it is filled with mistakes and the end of chapter problems can not be completed without information found outside of this textbook.

I have had Dr. Thomson as an instructor and have used his book for three separate classes. I find the book difficult to follow at times. The end of chapter problems are confusing and seldom can be completed by following the material covered in the text. The book, which is not on its first edition, is filled with "minor errors" (for example, constants and/or exponents in presented equations are incorrect). On the plus side, the unit conversions in the appendices are very useful.

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