

Transport Phenomena In Materials Processing Poirier

Non Linear Phenomena in Materials Science II An Introduction to Transport Phenomena in Materials Engineering Electrooptics Basic Transport Phenomena in Materials Engineering Transport Phenomena in Materials Processing Transport Phenomena in Materials Processing Transport Phenomena and Materials Processing Synthesis, Characterization and Properties of Nanostructures Phenomena of Materialisation Multiscale Phenomena in Plasticity The Purdue Engineering Review Concrete and Constructional Engineering Guide to Modeling of Phase Change Phenomena in Chemical and Materials Engineering The Engineering Review A Manual of Physiology The industrial self-instructor and technical journal Transport phenomena in materials processing. Papers ; 1990 Directory of Published Proceedings Technology Review High Tc Update G. Martin David R. Gaskell Jose Manuel Cabrera Manabu Iguchi David R. Poirier E. J. Poirier Kou Prafulla K. Jha Albert Schrenck-Notzing Joel Lepinoux Petr A. Nikrityuk Gerald Francis Yeo Ward, Lock and co, ltd

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one of the main characteristics of materials science is that it deals with properties which often deviate from linear relationships when compared with such parameters as temperature pressure and concentration the reasons for this behavior of materials are twofold the speed of linear reaction can vary greatly and abrupt changes may occur in the static or dynamic states of self organisation

this book elucidates the important role of conduction convection and radiation heat transfer mass transport in solids and fluids and internal and external fluid flow in the behavior of materials processes these phenomena are critical in materials engineering because of the connection of transport to the evolution and distribution of microstructural properties during processing from making choices in the derivation of fundamental conservation equations to using scaling

order of magnitude analysis showing relationships among different phenomena to giving examples of how to represent real systems by simple models the book takes the reader through the fundamentals of transport phenomena applied to materials processing fully updated this third edition of a classic textbook offers a significant shift from the previous editions in the approach to this subject representing an evolution incorporating the original ideas and extending them to a more comprehensive approach to the topic features introduces order of magnitude scaling analysis and uses it to quickly obtain approximate solutions for complicated problems throughout the book focuses on building models to solve practical problems adds new sections on non newtonian flows turbulence and measurement of heat transfer coefficients offers expanded sections on thermal resistance networks transient heat transfer two phase diffusion mass transfer and flow in porous media features more homework problems mostly on the analysis of practical problems and new examples from a much broader range of materials classes and processes including metals ceramics polymers and electronic materials includes homework problems for the review of the mathematics required for a course based on this book and connects the theory represented by mathematics with real world problems this book is aimed at advanced engineering undergraduates and students early in their graduate studies as well as practicing engineers interested in understanding the behavior of heat and mass transfer and fluid flow during materials processing while it is designed primarily for materials engineering education it is a good reference for practicing materials engineers looking for insight into phenomena controlling their processes a solutions manual lecture slides and figure slides are available for qualifying adopting professors companion website transportphenomena.org

this comprehensive text provides an understanding of the physical phenomenon behind electrooptics it describes in detail modern electrooptic materials and operative physical mechanisms and devotes a full chapter to the new materials engineering that is contributing to the development of low dimensional systems the book also reviews device applications in both bulk and waveguide technologies provides extensive coverage in a self contained format and consequently useful to beginners as well as specialists includes the most current information features many tables and illustrations to facilitate understanding

this book presents the basic theory and experimental techniques of transport phenomena in materials processing operations such fundamental knowledge is highly useful for researchers and engineers in the field to improve the efficiency of conventional processes or develop novel technology divided into four parts the book comprises 11 chapters describing the principles of momentum transfer heat transfer and mass transfer in single phase and multiphase systems each chapter includes examples with solutions and exercises to facilitate students learning diagnostic problems are also provided at the end of each part to assess students comprehension of the material the book is aimed primarily at students in materials science and engineering however it can also serve as a useful reference text in chemical engineering as well as an introductory transport phenomena text in mechanical engineering in addition researchers and engineers engaged in materials processing operations will find the material useful for the design of experiments and mathematical models in transport phenomena this volume contains unique features not usually found in traditional transport phenomena texts it integrates experimental techniques and theory both of which are required to adequately solve the inherently complex problems in materials processing operations it takes a holistic approach by considering both single and

multiphase systems augmented with specific practical examples there is a discussion of flow and heat transfer in microscale systems which is relevant to the design of modern processes such as fuel cells and compact heat exchangers also described are auxiliary relationships including turbulence modeling interfacial phenomena rheology and particulate systems which are critical to many materials processing operations

this text provides a teachable and readable approach to transport phenomena momentum heat and mass transport by providing numerous examples and applications which are particularly important to metallurgical ceramic and materials engineers because the authors feel that it is important for students and practicing engineers to visualize the physical situations they have attempted to lead the reader through the development and solution of the relevant differential equations by applying the familiar principles of conservation to numerous situations and by including many worked examples in each chapter the book is organized in a manner characteristic of other texts in transport phenomena section i deals with the properties and mechanics of fluid motion section ii with thermal properties and heat transfer and section iii with diffusion and mass transfer the authors depart from tradition by building on a presumed understanding of the relationships between the structure and properties of matter particularly in the chapters devoted to the transport properties viscosity thermal conductivity and the diffusion coefficients in addition generous portions of the text numerous examples and many problems at the ends of the chapters apply transport phenomena to materials processing

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