

Preface

In the last years, several heat and mass transfer textbooks have been published. The study of heat and mass transfer is a subject of continuous discussion, since the knowledge gained about the processes involving the heating/cooling of fluids or solids, the change in the concentration of a substance, the rate at which these phenomena occur and the determining factors in its development, will allow to predict the behaviour of many materials, the equipment design and to predict the performance of equipment in operation.

Thermal energy is the fraction of internal energy of a body that can be transferred due to a difference in temperatures itself and the process is called heat transfer. Mass transfer can be understood as the spatial motion of matter. However, “mass transfer” generally refers to the movement of a particular component in a system of several components, either by molecular diffusion or by convection. In most cases, it simultaneously occurs in heat and mass transfer, so that these topics are often addressed simultaneously.

A porous medium refers to a solid having empty spaces that are filled with a fluid. Generally, many of these pores are interconnected so that transport of mass and heat is possible through the pore. This process is, in the vast majority of cases, a faster transport process than through the solid matrix. A wide variety of materials can be studied as porous media, such as rocks, soils, plant and animal tissues, paper and other packaging materials, etc.

The book *Numerical Analysis of Heat and Mass Transfer in Porous Media* was designed with the purpose of providing the scientific community with the latest developments in the field of heat and/or mass transfer in porous media, with special emphasis on a numerical/computational approach of the physical situations.

The main benefit of the book is that it discusses the majority of the topics related to numerical transport phenomenon in engineering (including state of the art and applications) and presents some of the most important theoretical and computational developments in porous media and transport phenomenon domain, providing a self-contained major reference that is appealing to scientists, researchers and engineers. At the same time, these topics will encounter a variety of scientific and engineering disciplines, such as chemical, civil, agricultural,

mechanical engineering, etc. The book is divided into several chapters that intend to be a resume of the current state of knowledge for the benefit of professional colleagues.

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