Description:

The presented volume “Transport Problems with a Focus on Fluid and Heat Flow” covers in a wider sense diffusion related phenomena. The basic phenomena of heat and mass transfer play an important role in basic and applied research and this volume presents a balanced collection of recent developments in this area.

Keywords:
Heat and Mass Transfer, Flow Rate, Fluid Dynamics, Moisture Diffusion, Porous Media, Modeling, Technological Parameters

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Table of Contents

Preface

The topical volume “Transport Problems with a Focus on Fluid and Heat Flow” of Defect and Diffusion Forum covers in a wider sense diffusion related phenomena. The basic phenomena of heat and mass transfer play an important role in basic and applied research and this volume presents a balanced collection of recent developments in this area. In the context of materials engineering, heat transfer and mass diffusion processes are directly connected to the formation and alteration of the microstructure which ultimately defines the physical properties of modern alloys. Furthermore, many properties of composite materials are related or based on diffusion processes, for example related to the moisture content and the influence on properties.
In addition to fundamental properties, technological processes, such as friction stir welding, are described based on the principles of heat transfer. Noteless that the optimization of heating and cooling cycles are a permanent research focus due to their high energy demand. Novel topics from multidisciplinary research between engineering and biomedical applications are as well highlighted.
Another classical area is related to energy conversion and the emerging field of alternative energies. In this context, the strategic planning on the support of these energies as well as the optimization of processes and technologies is of utmost importance. The topics mainly related to fluid flow span from quite fundamental investigations, such as flow characteristics around objects or highly nonlinear processes in detonation fluid dynamics, to engineering applications related to automotive engines and biorefineries.

Finally we would like to thank all authors for their valuable contributions and all the reviewers, which made this volume possible.

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