



processes



Special Issue Reprint

Transport of Fluids in Nanoporous Materials

www.mdpi.com/books/reprint/1108

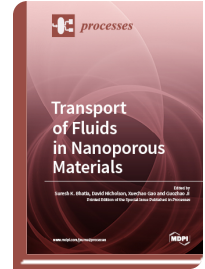
Edited by

Suresh K. Bhatia

David Nicholson

Xuechao Gao

Guozhao Ji



ISBN 978-3-03897-529-8 (Softback)

ISBN 978-3-03897-530-4 (PDF)

Fluid transport in narrow pores is central to the design and optimization of nanoporous materials in industrial applications, such as catalysis, nanofluids, electrochemical batteries, and membrane separation. However, due to the strong potential field in nanopores, conventional models and methods have become inadequate for predicting the transport behavior of molecules confined in the pore space. In addition, the inherent complexity of the pore structure in nanomaterials requires consideration of local or nanoscale transport at the single pore level, and averaging over the macroscale, which further impedes the application and validation of the formulated mechanical models. To solve the problem of fluid transport in narrow nanopores beyond Knudsen limits, experimental characterizations should be combined to molecular simulations in order to probe the fluid movement under realistic conditions. This book provides comprehensive perspectives on the current research in the investigation of fluid transport processes in nanomaterials. The articles from leading scholars in this field are conveniently arranged according to three categories based on the approaches used in the papers: modeling and simulation, nanomaterial manipulation and characterization, and practical application. The 14 contributions not only demonstrate the importance of fluid behavior in different applications but also address the main theories and simulations to model the fluid transport behavior in nanoporous materials. This collection shows that “fluid transport in nanomaterials” remains a versatile and vibrant topic in terms of both theories and applications.



Order Your Print Copy

You can order print copies at

www.mdpi.com/books/reprint/1108

MDPI Books offers quality open access book publishing to promote the exchange of ideas and knowledge in a globalized world. MDPI Books encompasses all the benefits of open access – high availability and visibility, as well as wide and rapid dissemination. With MDPI Books, you can complement the digital version of your work with a high quality printed counterpart.



Open Access

Your scholarly work is accessible worldwide without any restrictions. All authors retain the copyright for their work distributed under the terms of the Creative Commons Attribution License.



Author Focus

Authors and editors profit from MDPI's over two decades of experience in open access publishing, our customized personal support throughout the entire publication process, and competitive processing charges as well as unique contributor discounts on book purchases.



High Quality & Rapid Publication

MDPI ensures a thorough review for all published items and provides a fast publication procedure. State-of-the-art research and time-sensitive topics are released with a minimum amount of delay.



High Visibility

Due to our global network and well-known channel partners, we ensure maximum visibility and broad dissemination. Title information of books is sent to international indexing databases and archives, such as the Directory of Open Access Books (DOAB), and the Verzeichnis Lieferbarer Bücher (VLB).



Print on Demand and Multiple Formats

MDPI Books are available for purchase and to read online at any time. Our print-on-demand service offers a sustainable, cost-effective and fast way to publish MDPI Books printed versions.