



Wicking in Porous Materials: Traditional and Modern Modeling Approaches

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A comprehensive presentation of wicking models developed in academia and industry, **Wicking in Porous Materials: Traditional and Modern Modeling Approaches** contains some of the most important approaches and methods available, from the traditional Washburn-type models to the latest Lattice-Boltzmann approaches developed during the last few years. It provides a sound conceptual framework for learning the science behind different mathematical models while at the same time being aware of the practical issues of model validation as well as measurement of important properties and parameters associated with various models.

Top experts in the field reveal the secrets of their wicking models. The chapters cover the following topics:

- Wetting and wettability
- Darcy's law for single- and multi-phase flows
- Traditional capillary models, such as the Washburn-equation based approaches
- Unsaturated-flow based methodologies (Richard's Equation)
- Sharp-front (plug-flow) type approaches using Darcy's law
- Pore network models for wicking after including various micro-scale fluid-flow phenomena
- Studying the effect of evaporation on wicking using pore network models
- Fractal-based methods
- Modeling methods based on mixture theory
- Lattice-Boltzmann method for modeling wicking in small scales
- Modeling wicking in swelling and non-rigid porous media

This extensive look at the modeling of porous media compares various methods and treats traditional topics as well as modern technologies. It emphasizes experimental validation of modeling approaches as well as experimental determination of model parameters. Matching models to particular media, the book provides guidance on what models to use and how to use them.



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