

<<膜科学与工程基础>>

图书基本信息

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### 内容概要

膜技术在许多领域发挥着主导作用，如海水淡化、废水处理与回用、人造器官等。

膜科学与工程基础（英文导读版）主要论述了膜科学与工程的传递现象基础，包括基于高分子、无机及混合基质膜材料表征分子分离过程中的渗透性和选择性，以及基于这些材料制备各种可能的形态（板式、管式、微胶囊式等）的膜的基本原理。

此外，还论述了用于表征的常见的一些基本方法。

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### 书籍目录

第1卷的目录总目录引言第1卷 膜科学与工程基础生物膜和人造膜的作用与功能1.01 生物膜和仿生人造膜1.02 用于吸着、分离和反应的功能膜:综述膜内传递现象基础1.03 膜结构与传递性质的模型和模拟1.04 聚合物膜内传递现象基础聚合物和无机膜制备基础1.05 聚合物膜制备基础1.06 用于压力驱动过程的先进聚合物膜和有机-无机膜1.07 作为气体分离膜材料的降冰片烯1.08 无定形全氟聚合物膜1.09 等离子体膜1.10 超临界流体法膜的制备1.11 无机膜制备基础1.12 陶瓷中空纤维膜及其应用1.13 用于气体分离的炭膜的制备1.14 碳纳米管膜:膜科学最新前沿膜表征1.15 过滤膜表征1.16 原子力显微镜在膜表征中的应用第1卷的索引

## 章节摘录

版权页：插图：structure of porous membranes. This can be done in a well-defined and ordered manner, like the introduction of spherical chambers at the junctions of regular networks of capillaries, or in a random, order-less fashion. In both cases, one may assume entirely random sampling of sphere and cylinder sizes to decorate the network or prescribe some spatial correlation of sizes among chambers, among capillaries, or among chambers and capillaries. Obviously, the prediction of transport coefficients in such pore structures has to resort to trajectory computations or numerical techniques due to the inevitable appearance of considerable overlapping among pore segments. Despite the increased complexity in the construction of such pore space representations and in the prediction of their transport properties, they have found extensive use in a wide variety of porous materials, including porous rocks, catalysts, membranes, etc. The main supporting argument of their use is that they appear to represent the pore space of a variety of porous materials better than capillary networks do. In fact, optical or electron microscopy analysis of consolidated materials indicate the existence of large pore spaces that are interconnected through narrow pore necks. In addition, it is often convenient to represent the non-solid space of granular materials by a collection of large cavities and narrow interconnectors. Alternatively, these domains can also be represented by networks of pore necks with converging-diverging geometry (for instance, sinusoidally shaped ends). The former is more suitable for unconsolidated materials, whereas the latter is usually employed for the description of the interstitial space in low porosity, consolidated materials. Thanks to the limited pore overlap in low porosity materials, the technique of the equivalent resistor network approximation can be used for the determination of the overall flow permeability or gas diffusivity.

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### 编辑推荐

《膜科学与工程大全:膜科学与工程基础(导读版)》展示和讨论了近年来膜科学与工程方面取得的一些最具重大作用的成果。

着重于膜技术在能源、环境、生物医学、生物技术、化学制造等领域的应用。

作者是膜领域的权威专家,其他编者均为相关领域的资深科学家。

适合材料、化学化工、环境等领域的师生、科研人员阅读参考。

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