

分离工程

## 19通道多孔陶瓷膜渗透过程的CFD模拟

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**摘要** 根据Darcy定律,建立了多孔陶瓷膜中渗透流动的CFD计算模型,定量描述了纯水在多孔陶瓷膜中的渗流情况。根据CFD模型,采用有限体积法,模拟计算出四种平均孔径陶瓷膜的纯水通量,并与实验值进行了对比,结果吻合较好。采用该模型,定量计算出19通道陶瓷膜中每个通道对整体陶瓷膜渗透通量的贡献,并分析了其中的变化规律,为多孔陶瓷膜的构型优化奠定了基础。

**关键词**

[多孔陶瓷膜](#) [纯水通量](#) [CFD模拟](#) [构型](#)

分类号

## CFD modeling of permeate process in 19-channel porous ceramic membranes

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### Abstract

Based on Darcy's law, a CFD model of permeate process in 19-channel ceramic membrane was established. The pure water flux (PWF) of ceramic membranes was predicted by the CFD model with the finite volume method. By using this method, the simulated PWF of 19-channel ceramic membrane was in good agreement with experimental results. The contributions of each channel to the total PWF of 19-channel ceramic membranes depended on the mean pore size of membrane as well as on the distance of the channel from the membrane outer surface. CFD modeling is an essential tool in designing the configuration of ceramic membrane.

### Key words

[porous ceramic membrane](#) [pure water flux \(PWF\)](#) [CFD modeling](#) [configuration](#)

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