传递现象

基于亲水／憎水复合膜的全热交换器换热换湿性能[

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摘要　　膜全热交换器由于可以同时回收空调排风中的潜热和显热而受到重视。研究了基于PVAL/PVDF复合透湿膜的全热交换器的透热透湿性能，实验测定了新风与排风之间的显热交换能力和水蒸气交换能力，并建立了基于亲水/憎水复合膜的逆流膜全热交换器传热传质计算模型，实验与理论结果吻合较好。结果表明，该复合膜全热交换器的总传热系数为20～35 W·m-2·℃-1，总传质系数为（1.5～3.5）×10-3 m·s-1。

关键词　　空调　全热交换器　复合膜　换热换湿

分类号

Performance of heat and mass transfer based on hydrophilic/hydrophobic composite membrane

Abstract

The membrane-based total heat exchanger is a novel heat recovery unit due to its simultaneous recovery of sensible heat and moisture.This study investigated the heat and moisture exchange capabilities through a PVAL/PVDF composite membrane, between the fresh air and exhaust air in a total heat exchanger.A heat and mass transfer model was set up for the counter flow exchanger.The calculated and experimental results were in agreement.The total heat transfer coefficient was in the order of 20—35 W·m-2·℃-1 and the total mass transfer coefficient was in the order of （1.5—3.5）×10-3 m·s-1 respectively.

Key words　air conditioning　total heat exchanger　composite membrane　heat moisture transfer

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