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研究论文

溶剂溶胀对聚丙烯熔喷非织造布过滤性能的影响

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摘要:

通过跟踪测试表面电位和过滤效率, 研究了聚丙烯熔喷非织造布驻极体空气过滤材料经不同溶剂浸泡后过滤性能的变化及其与驻极体电场的相关性. 结果表明: 聚丙烯熔喷非织造布的高过滤效率主要源于驻极体电场产生的静电效应, 而过滤阻力的大小则由其本身的结构所决定; 驻极体电场的稳定性依赖于溶剂的溶胀作用. 根据Flory--Huggins的溶剂溶胀理论探讨了溶剂浸泡对材料电荷存储能力和过滤效率的影响规律.

关键词: 有机高分子材料 溶剂溶胀作用 过滤性能 驻极体空气过滤材料 聚丙烯熔喷非织造布

Influence of solvent swelling effcct on filtration efficiency of melt-blown polypropylene electret nonwoven web used as air filter

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Abstract:

The correlation between filtration efficiency and electret charge is investigated by means of measuring surface potential and filtration efficiency after solvent soakage in this paper. It is confirmed that the high filtration efficiency of melt-blown polypropylene nonwoven web is mainly originated from electret electrostatic effect and the filter resistance is determined by the fiber structure of nonwoven web. The stablity of electret electrostatic field depends on solvent swelling effcct on melt-blown polypropylene nonwoven web. Impact of solvent soakage on charge storage stability and filtration efficiency is thoroughly discussed according to the Flory-Huggins solvent swelling theory.

Keywords: organic polymer materials solvent swelling effcct filtration efficiency electret air filter material melt-blown polypropylene nonwoven web

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