

Influence of Hydrolytic Degradation on Properties of Moisture Membranes Used in Fire-Protective Clothing

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Abstract : This study intends to show the influence of the hydrolytic degradation on the properties of the e-PTFE/NOMEX® membranes used in fire-protective clothing. The modification of water vapour permeability, morphology and chemical structure was examined by MOCON Permatran, electron microscopy scanning (SEM), and ATR-FTIR, respectively. A decrease in permeability to water vapour of the aged samples was observed following closure of transpiration pores. Analysis of fiber morphology indicates the appearance of defects at the fibers surface with the presence of micro cavities as well as the of fibrils. ATR-FTIR analysis reveals the presence of a new absorption band attributed to carboxylic acid terminal groups generated during the amide bond hydrolysis.

Keywords : hydrolytic ageing, moisture membrane, water vapor permeability, morphology

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