EFFECTS OF BIODEGRADATION ON THE PHYSICAL CHARACTERISTICS OF SELECTED NONWOVENS

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Abstract

Because environmentalism is one of the most urgent social reform issues for today's textile industry, nonwovens, which are classified as disposables, must be environmentally degradable. This study addresses the utilization of soil burial to determine the effects of biodegradation on the physical characteristics of selected nonwovens.

The physical and morphological characteristics of six nonwovens were assessed following burial in Calloway Silt Loam and Red Clay soils. Polarized light microscopy, tensile testing and colorimeter readings were used for evaluation purposes.

Soil burial did degrade the selected nonwovens. Microscopic examination revealed cracks and fibrillations within the fiber structures. Those nonwoven fabrics containing cotton degraded faster than those composed of polyester or polypropylene. The alkaline soil type produced a faster rate of fabric degradation. Significant differences occurred between breaking strength, breaking elongation and color change between exposure periods for the nonwovens containing cotton.

This information may be utilized by textile manufacturers, agricultural producers and environmentalists who are interested in reducing global environmental pollution.