Making Sustainable Fabrics From Seaweed

Mattingly, Barbara (School: West Lauderdale High School)

Can you imagine clothing made from seaweed? The textile/fashion industry discards in excess of 90 tons of textile waste annually. The industry is trying to become more sustainable by developing eco-friendly fabrics that will biodegrade in landfills. Bio-fabrics composed of living organisms such as seaweed or bacteria have been proposed as possible replacements for synthetic fibers. This project involves making bio-fabrics from sodium alginate (seaweed) and differing amounts of glycerin and investigating mechanical properties and durability. Bio-fabrics were made by using an immersion blender to combine sodium alginate solutions with different amounts of glycerin. The alginate mixture was sealed to a piece of canvas using a calcium water based membrane. The bio-fabrics were air dried and removed from the canvas molds. Sample pieces of different bio-fabrics underwent tensile strength, torsion, and sewing tests to evaluate their viability in replacing synthetic fibers. The torsion tests revealed the bio-fabric with the greatest amount of glycerin to be the most flexible and the absence of glycerin to be hard and far less flexible. Tensile strength was the greatest (3.61Pa) in the bio-fabric absent of glycerin, in comparison to glycerin/seaweed samples which averaged from 0.053-0.078 Pa . Results indicated that adding glycerin to an alginate bio-fabric increased flexibility, but decreased the amount of weight it was able to withstand contributing to the stretchiness and durability of the bio-fabric. In conclusion I think that adding glycerin to the alginate bio-fabric increases the flexibility but decreases the weight it is able to withstand, contributing to the stretchy-ness and durability of the bio-fabric.

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