

Textiles Made of Poplar Fibers

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Abstract:

Unfortunately, the textile industry is one of the most polluting industries in the world. Since fibers are the building blocks of textiles, it is important to use environmentally friendly and sustainable fibers to mitigate the pollution of the textile industry. In recent years, sustainable production methods of man-made fibers have received great interest, and a lot of investment has been made to increase the production of such fibers. For sure, these are very important effort to create an environmentally friendly textile. However, using nontraditional natural fibers might be an alternative solution to mitigate the pollution generated by the textile industry.

Poplar fibers are one of the nontraditional seed fibers that grow naturally, without requiring additional irrigation. However, these fibers are not harvested at industrial levels yet. Main reason of this is their short length, which makes them a difficult candidate for spinning. However, these fibers have exceptional properties such as huge lumen, extra low density, very hydrophobic surface and perfect insulation behavior.

In our recently founded projects, it has been shown that poplar fibers can be turn into nonwoven samples through wet laid process. In addition, they can be blended with other fibers to develop needle-punched nonwovens or carded and hot-pressed webs. These webs provide exceptional thermal and sound insulation, oil and dye

absorption. Coating these webs with silver nanowires results conductive webs which can be used for electronic textile applications.

Developing traditional and advanced textiles using this nontraditional fibers is the aim of this study.

Keywords: sustainability, natural fibers, poplar fibers, electronic textiles.

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