

INFLUENCE OF HUMIDITY ON THE BIODEGRADABILITY PROCESS OF TEXTILES

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Abstract:

Solid waste management in the textile industry is an issue of growing interest, as the new European Waste Directive ((EU) 2018/851) from 2025 onwards will require solid waste to be managed in a way that promotes reduction, reuse and recycling, prohibiting the landfilling of unused textiles and enhancing the circular economy [1].

However, the impact of the textile product itself requires more extensive studies, such as measuring the biodegradability of the samples, since the textile recycling process cannot be prolonged indefinitely due to the loss of textile properties.

The biodegradability of natural and synthetic polymers depends on various physical and chemical configuration including internal structure, hydrophilic characteristics, thickness and also environmental factors where these are disposed such as land fill, compost, soil and aqueous media conditions. The biodegradability of materials and products cannot be predicted based on the raw materials whether it is bio-derived or synthetic origin. To claim biodegradable materials and products, it requires CO₂ measurement to validate the complete biodegradation that leaves no toxic residues in a defined period as per the relevant standard test methods. For this reason, every new product is necessary to be verified in their biodegradability in natural environmental conditions [2].

There are different regulations in force on the determination of the aerobic biodegradability of plastic materials. Nevertheless, there are no specific standards or methodologies for textile materials, which differ structurally from plastics.

Therefore, the evolution toward sustainability will lead the textile market to manufacture more sustainable products, advocating for the biodegradability and recyclability of products. So, it is crucial to establish a method to measure the biodegradability of textiles.

For that reason, this project analysed the influence of humidity on the proposed biodegradability process of textile [3] based on adaptations of plastic biodegradability regulations [2]. In order to determine a method that provides significant differences between different textile materials and is valid and reproducible.



Figure 1 Ecosystems of the biodegradability process prepared.

Keywords: Sustainability, burial, textile, method, moisture

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