Sächsisches Textilforschungsinstitut e.V.

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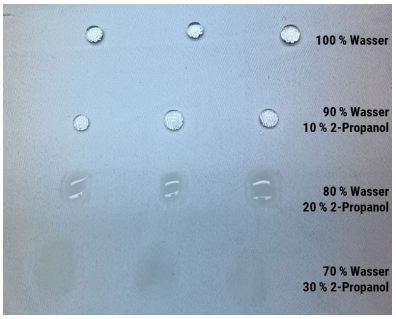
Development of biodegradable textile coatings

Objective

The increasing demand for sustainable materials and the critical view of traditional plastics are leading to a growing interest in bio-based and biodegradable plastics. Modern textiles made from renewable raw materials combine their biological origin and biodegradability with technical achievements that often require further functionalization of the textile surface. The project therefore focused on the extent to which the textile finishes used for this purpose influence the biodegradability of the textiles or are themselves biodegradable.

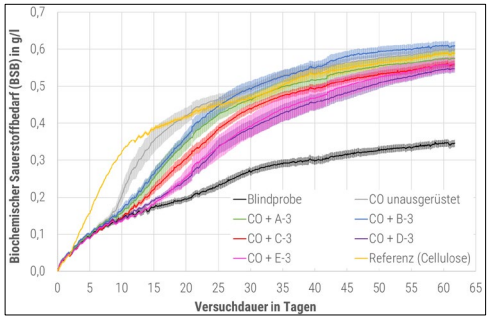
Approach and results

Textile finishes declared as biodegradable and available on the market were characterized and their performance was compared with regard to selected characteristics (hydrophilicity, hydrophobicity and abrasion protection). In addition, suitable alternatives based on chitosan were researched and investigations into their processing, performance and biodegradability were carried out. The results show that the developed chitosan-based textile finishes are highly biodegradable both in the non-crosslinked and crosslinked state, but have noticeable deficits in terms of selected functionalities and resistance compared to conventional finishes. However, they represent a very good starting point (basic formulation) for the further development and improved functionalization of textile finishes.



Testing of water-repellent properties using the 3M water drop test

Testing of biodegradability using the OxiTop®-IDS BOD measuring system



Trend of the biochemical oxygen demand during the biodegradation of chitosan-finished cotton fabrics

Acknowledgement

We would like to thank the Federal Ministry for Economic Affairs and Energy for funding the research project Development of biodegradable textile coatings (Reg.-Nr. 49VF240012) within the funding programme "FuE-Förderung gemeinnütziger externer Industrieforschungseinrichtungen – Innovationskompetenz (INNO-KOM) – Vorlaufforschung (VF)".

INNO-KOM

Gefördert durch:

Bundesministerium für Wirtschaft und Energie

aufgrund eines Beschlusses des Deutschen Bundestages

The final report on this project is available on request.

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