

Versatile functionalization of textile surfaces by light-induced grafting of thin layers.

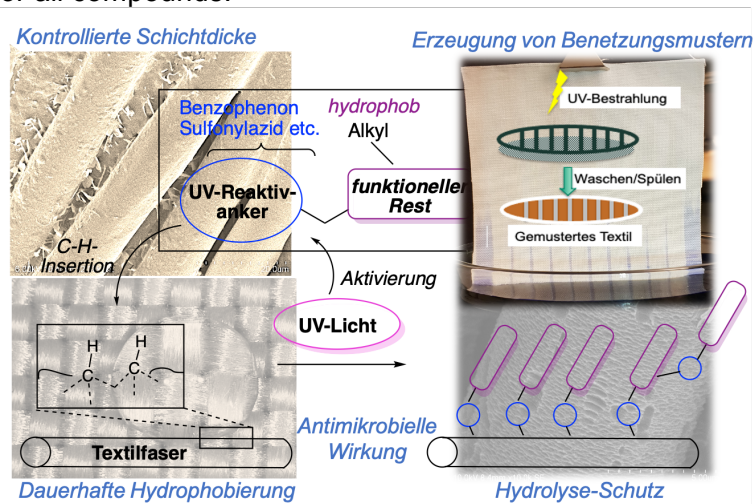
The aim of the completed project was to develop finishes that can be applied by established methods and form very thin layers that are covalently anchored to the surface after UV activation.

For this purpose, bifunctional reagents consisting of UV reactive anchor (4-hydroxy-benzophenone, designated BP) and functional residue (alkyl chain consisting of 6 to 16 carbon atoms) were synthesized and characterized with respect to their application potential as hydrophobic finishes on various textile substrates (PET, cotton and viscose).

The finishes were applied from both organic solvents and water-based formulations in the form of a dispersion. The coating thickness was controlled by the employed solvents, concentration of the formulation as well as the length of the alkyl chain of the BP derivative. The formation of the coating was due to the covalent grafting of the compounds to the fiber surface, as well as intermolecular crosslinking. In the case of water-based dispersion, thick coatings were formed up to 20% add-on. Depending on the textile substrate, the resistance of the coatings shows clear differences.

A durable hydrophobic effect (up to 140 ° contact angle) was achieved on PET textiles already with the coatings below 0.2%. Moreover, the finishes are stable to at least 5 washings and even extraction with organic solvent and have shown positive effects on hydrolysis resistance of PET phase in alkaline environment.

The coatings on the hydrophilic fibers such as cotton and viscose have shown significant hydrophobic effect (by drop sinking time) but were not resistant to washing. In addition to the hydrophobic effect, antimicrobial properties were also demonstrated using the Fischeri test for all compounds.



Project Information:

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