

Enzyme based detergents and the nanostructure of cellulose fibers

Danish company Novozymes is the world leader of industrial production of enzymes (www.novozymes.com).

THE PROBLEM TO SOLVE

Novozymes produce enzymes for laundry detergents and they want to understand how enzymes affect the cellulose fibers in cotton fabrics so fabric may become more resistant to picking up dirt or fabric may retain the experience of newness longer, for example. (<http://www.novozymes.tv/video/10496189/imaging-laundry-greasy-and-whiteness>)

Textile fiber networks are multi-scale and to reveal nanoscale features, Novozymes took the opportunity to use neutron measurements.

A STEP TOWARDS THE SOLUTION

Supported by colleagues from University of Copenhagen (LINX project), Novozymes took part in measurements using Small Angle Neutron scattering (SANS) and Spin-Echo SANS (SESANS) techniques respectively at the Budapest neutron Centre (Hungary) and the Technical University of Delft (Netherlands).

Three fabric samples were investigated either dry or wet (soaked in water or heavy water).

“SESANS extends the length scale probed by regular SANS from the nano- to the micro-meter region, enabling us to model the average dimensions of the cellulose fiber walls and distinguish our samples.”

Thomas H. Callisen, Senior Manager at Novozymes



Fig.1 Enzymes are a key component in modern laundry detergents.

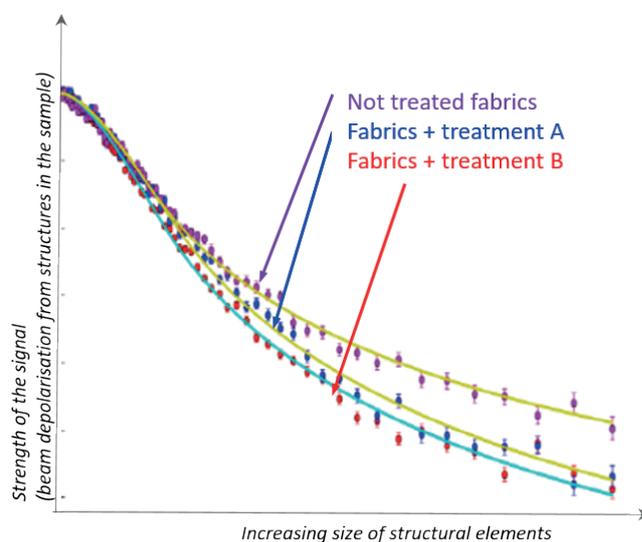


Fig.2 From SESANS measurements: the differences of the curves in shape and intensity reveal features of nano/microstructures of the fabric fiber network.

NEUTRONS FOR INDUSTRY

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Proof-of-concept experimental beam time is being offered to Industry!

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Fast-stream processing for industrial applications, optimising result lead times.

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Activity covered by non-disclosure agreements. Only company name and measurement type to be published.

FLEXIBLE SERVICES

In many cases industrial processes and conditions can be re-created in the test laboratory. Final data analysis and reporting are provided.

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