



## Theo G M van de Ven

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### A novel aqueous process for the production of functional textile from Cellulose fibers

The biggest issue facing our planet is climate change, caused mainly by emissions generated by combustion of fossil fuels by industry, automobiles and heating of buildings. To mitigate climate change, we should make extensive efforts to find economically sustainable solutions for the use of wood, while at the same time planting more trees than that we cut. At present the large scale uses of wood are: building materials, paper and textile. This study deals with a new way of making functional cellulose fibers, which can be made into filaments, smart textiles, high value cellulose biomaterials, such as superhydrophobic fibers and fibers of high tenacity, as well as high value dyed fibers. In the novel process, kraft fibers are chemically modified in water and made into a dope by dissolving it in an alkaline solution. The dissolved cellulose is regenerated in the acid bath of a spinneret, producing cellulose filaments, which can be further functionalized if desired. Trials on

a demonstration spinneret show that such fibers can be spun at industrially speeds and drawing rates. Properties of the novel fibers, such as tenacity, elongation and water take-up are compared to those of rayon and cotton.

#### Speaker Biography

Theo van de Ven obtained the equivalent of a B.Sc and M.Sc. (in physical and colloid chemistry with a minor in theoretical physics) from the University of Utrecht, Holland, and obtained his PhD from McGill University. After a 2 year postdoc at the University of Sydney, Australia, he returned to McGill, where he is now a Full Professor in the Department of Chemistry, where he holds the Sir William C Macdonald Chair in Chemistry. He is an expert in colloid and surface chemistry, both in fundamental aspects and applied to papermaking and cellulosic materials. He has published over 400 papers in the scientific literature, among which a book ("Colloidal Hydrodynamics", Acad. Press 1989) and several book chapters. He was awarded with ACS Award in Colloid and Surface Science and was elected as Fellow of the Royal Society of Canada.

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