SPEAKER



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BIOGRAPHY

Employment 05/2019-present Full Professor for Pulp Fiber Technology Institute of Bioproducts and Paper Technology Graz University of Technology 01/2010-07/2019 Assistant Professor and Associate Professor 2016 Associate Professor 2010 Assistant Professor Graz University of Technology 08/2009-02/2010 Industrial Research SCA R&D Centre AB Sundsvall, Sweden 07/2000–07/2009 Ph.D. and PostDoc Researcher Institute of Paper-, Pulp and Fiber Technology Graz University of Technology 06/1990-09/1998 Software Development (C++, MATLAB, VBA, Oracle SQL) 1998 King Mongkut University, Bangkok, Thailand 1996 Federal Transtel Inc., Atlanta (GA), USA 1990-1996 AVL List, Steyr Fahrzeugtechnik, Elin EBT.

Education

01/2016 Habilitation for Pulp- and Paper Science Graz University of Technology 06/2006 Ph.D. in Pulp- and Paper Science (magna cum laude) Graz University of Technology 01/2000 Masters Degree in Mechanical Engineering (magna cum laude) Graz University of Technology 1990-1993 Psychology, not completed University of Graz 1985-1987 Pre- Masters Class in Violin, Prof. Kroemer Graz University of Music and Performing Arts 1981-1989 Secondary School Graz, Austria

1981-1989 Secondary School Graz, Austria Branch of studies: Languages (English, Latin, French)

LECTURE

Fiber-Fiber adhesion – Evaluating nanoscale contact area with FRET microscopy

G. Urstöger, M. Gaspar-Simoes, R. Schennach, and U. Hirn

Several different mechanisms have been found to be responsible for the bonding of pulp fibers. Those are e.g. hydrogen bonding, van der Waals forces and electrostatic interaction (bonding between oppositely charged ions). Among these mechanisms hydrogen bonding and van der Waals attraction only work if molecular contact -- i.e. a distance between surfaces below a few angstrom -- is achieved. Thus, the area of molecular contact between pulp fibers is the most important factor determining the inter-fiber bond strength. In fact it is a multiplier to all the molecular mechanisms, an increase in contact area leads to a directly proportional increase in bond strength.

FRET (Förster Resonance Energy Transfer) fluorescence is a technique where fluorescence energy between dyes can only be transmitted when the dyes molecules are in close distance in the nanometer range. We are using this technique to quantify the degree of nanoscale contact between polymeric surfaces. For p-Hema thin films we have been able to demonstrate a direct relation between the adhesion force and the adhesion contact area evaluated as FRET intensity. Challenges and results in adapting this method for evaluating molecular contact between cellulosic surfaces are presented and discussed.

ZELLCCHEMING