



Jan-Lukas Schäfer<sup>1</sup>, Tobias Meckel<sup>2</sup> and Markus Biesalski<sup>3</sup>

### Crosslinked polymer networks inside cellulose fiber networks – towards better understanding of tensile properties & wet strengthening of paper

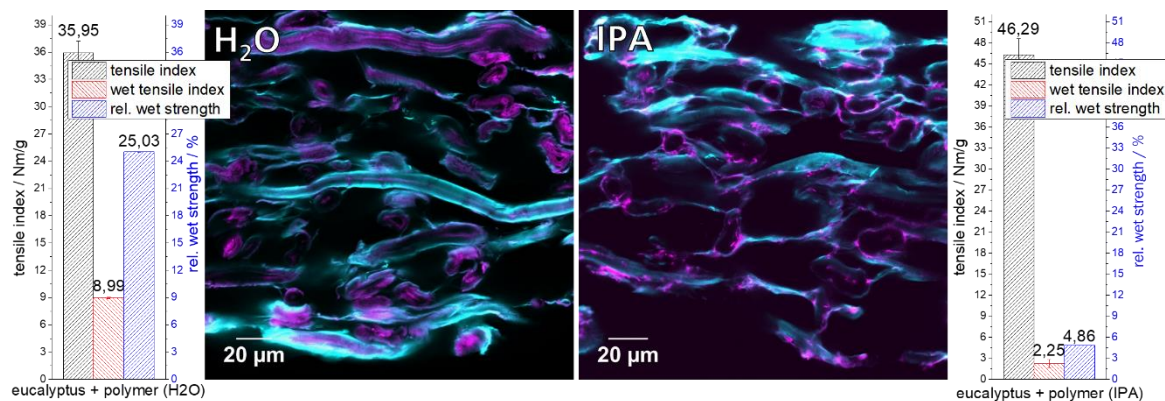
1 Jan-Lukas Schäfer M. Sc., Macromolecular and Paper Chemistry Prof. Biesalski, Technical University Darmstadt, Alarich-Weiss-Str. 8, 64287 Darmstadt, Germany, j.schaefer@cellulose.tu-darmstadt.de

2 PD Dr. Tobias Meckel, Macromolecular and Paper Chemistry Prof. Biesalski, Technical University Darmstadt, Alarich-Weiss-Str. 8, 64287 Darmstadt, Germany, meckel@bio.tu-darmstadt.de

3 Prof. Dr. Markus Biesalski, Macromolecular and Paper Chemistry Prof. Biesalski, Technical University Darmstadt, Alarich-Weiss-Str. 8, 64287 Darmstadt, Germany, biesalski@tu-darmstadt.de

#### Abstract

To retain at least some of the strength of cellulose paper in the swollen state, wet strength agents are used. Most commonly these agents are reactive polymers thermo-crosslinked after paper formation or polymer precursors which are thermally crosslinked in situ during paper formation. Another way to crosslink polymers with fibers, is by incorporating photoreactive groups like benzophenone via a co-monomer, which can also be used to improve the wet tensile strength of paper.<sup>[1]</sup> Additionally, by using a second co-monomer with a fluorescing group it was possible to assess the spatial binding of the copolymer inside the fiber network with confocal laser scanning microscopy. Combining these with tensile results, it was apparent that more experiments are needed to gain a better understanding of the wet strengthening mechanism. For this, a videography-system was developed to assess the failure-mechanisms while tensile straining.





ZELLCHEMING-CONFERENCE

CELLULOSE-BASED MATERIALS –  
FROM SCIENCE TO TECHNOLOGY

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## References

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### **KEYWORDS:**

Cellulose  
Paper  
Wet strength  
Spatial  
Tensile  
Failure  
Mechanism  
Videography

## Biography

Jan-Lukas Schäfer, born 30.07.1994 in Dieburg, Germany, began studying chemistry at the Technical University Darmstadt in 2013. After finishing his master's degree in 2018, he started to work on his thesis in the working group of Prof. Dr. Markus Biesalski on the topic of novel wet strength agents for cellulose paper and their wet strengthening mechanism.