

MWP – Young Researcher Abstract 2024

Project title: Scalable chemical modification of cellulose for novel applications	
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Abstract (approx. 200 words): Paper and other fiber-based materials are fantastic, and pivotal in the transition to a sustainable society. However, such materials do not always provide the properties needed to fully replace less sustainable counterparts. My research focus on scalable processes to chemically modify cellulosic fibers with the purpose of altering the properties of the fiber-based material. More specifically, the research is focused on cellulose etherification, and, in particular, quaternization to introduce cationic functionality. This approach provides a plethora of new properties to the fibers and materials made therefrom, including a strongly enhanced absorption and water-holding capacity, increased strength and strainability of the fiber-based material and a pathway for the production of cationic nanocellulose, a research field of its own with almost unlimited possibilities. While the modification studied needs to mature to find its full potential on industrial scale. I envision that quaternized cellulose can, for example, be used for applications ranging from the replacement of fossil-based packaging materials to the development of (super)absorbent materials. In the Young Researchers' Challenge I would like to tell you more about how we were able to increase the potential industrial interest for quaternized cellulose and what properties that have been demonstrated for these materials so far.	
Key words: Cellulose fibers, Chemical modification, Etherification, Quaternization, Nanocellulose, Renewable materials	