

MWP – Young Researcher Abstract 2024

Project title: Cellulose for high-performance derivatives	
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Abstract (approx. 200 words): <p>From the paper in your hands to the food on your plate, cellulose derivatives are everywhere! My PhD project aims to develop effective methods to enhance the reactivity of cellulose through swelling and controlled drying techniques. Building upon previous studies, our goal is to address the limitations of hornification that occur when drying cellulose. This project will explore different drying techniques and their impact on hornification, thereby optimizing methods to prepare cellulose with enhanced reactivity. Cellulose with enhanced reactivity will drastically reduce chemical consumption during derivatization, which would be more sustainable, and economically beneficial for several industries.</p> <p>Cellulose offers great potential as a feedstock for a wide range of products; however, its inherent hydrophilic but water-insoluble nature presents challenges in some technical applications. One approach to address these challenges is derivatization, which involves chemical modification of cellulose to enhance its properties. These modifications make cellulose derivatives excellent substitutes for petroleum-based plastics. However, the chemical reactivity of cellulose is hindered by its crystalline structure. Previous research has demonstrated that reprecipitating cellulose into a less crystalline and highly swollen state can enhance its reactivity, but hornification during drying poses a significant problem. This project addresses a need in the field of cellulose chemistry, boosting the development of sustainable materials and unlocking the full potential of cellulose.</p>	
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