Defence of a Doctoral Thesis in Chemistry

Eco-Friendly and Catalytic Surface Engineering of Cellulose and Nanocellulose

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Abstract
The non-stop use of petroleum-based materials such as plastics can generate significant environmental problems, including pollution of the oceans and increased CO2 levels, and cause diseases like cancer due to the starting monomers. Consequently, increased use of sustainable and non-toxic polymers and monomers is required to address these issues. Cellulose, generously supplied by Mother Nature, is the most abundant biopolymer on Earth. Nanocellulose is a sustainable polymer extracted from the cellulose in wood or produced by bacteria and algae. This biodegradable nanomaterial has recently been receiving intense research attention, since it has great potential for use in a broad range of industrial and biomedical applications. However, it has limitations such as moisture sensitivity and incompatibility with hydrophobic materials due to its hydrophilic nature. Chemical modification is necessary for it to fulfill the requirements for applications that require high moisture resistance and water repellency. Unfortunately, several of the existing methods involve harsh and toxic conditions or reagents. In this thesis, together with my co-workers, I have employed the toolbox of organocatalysis for accomplishing eco-friendly and innovative surface modification of cellulose and nanocellulose. The organocatalysts we used most in our research are the naturally abundant and industrially relevant organic acids tartaric acid and citric acid. Read the whole abstract on **www.miun.se**

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