

## **Controlling interactions for high performance lignocellulosic barrier materials**

Supervisor: Prof. Monika Österberg and Dr. Bruno Mattos

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We are now looking for a **Doctoral Researcher in the field of barrier materials**.

*Have you ever thought of making a big impact on everyone's life? Are you curious about how sustainable precursors can be combined to yield barrier properties in packaging materials?*

We are now looking for a doctoral candidate to join the Circular Biobased Materials group at Aalto University. In this position, you will have a chance to make an impact by upcycling agricultural and forestry side streams into advanced packaging materials. You will use fundamental aspects of interfacial science and surface sensitive methods to intelligently create new biobased packaging materials.

### **Scientific environment**

[The Circular Biobased Materials group](#) is dedicated to advancing sustainable solutions for materials development, production, and utilization. Our primary focus lies in harnessing the potential of non-utilized biobased resources to create materials that adhere to the principles of circular and bioeconomy. We seek strategies to better convert biobased precursors into materials, while considering the best scenario for their end-of-life. Aalto University has excellent research facilities, being part of major national research infrastructures such as the Bioeconomy ([www.bioeconomyinfra.fi](http://www.bioeconomyinfra.fi)) and Raw Materials ([www.rami-firi.fi](http://www.rami-firi.fi)) Research Infrastructure, as well as a top-notch Nanomicroscopy Center (<http://nmc.aalto.fi/en/>).

The work will be done in close collaboration with Prof. Monika Österberg, and you will have access to a broad network across Europe and the Americas. Collaboration with industry and/or Research and Technology organization are also to be expected.

*In the first weeks, you will be assigned your own onboarding buddy who will help you get started with your work and studies at Aalto.*

### **Your role and goals**

You will develop biobased materials displaying barrier properties suitable for packaging applications. You will become an expert in biomass modification and compositing, especially in multilayer configurations. For that, you will learn fundamental aspects on interfacial and colloidal science, as well as surface chemistry. You will become an expert in barrier properties, which is extremely relevant for the materials of the future bioeconomy. Nevertheless, you will use several analytical techniques, including oxygen and vapor transmission, mechanical characterization, XPS, QCM-D, rheology, and many more.

CIMANET organizes several networking events and joint courses that you are expected to participate in. In total 40 ECTS of theoretical studies are included. You will be expected to write scientific papers and present your work at international conferences.

### **Your experience and ambitions**

- Experience working in laboratory environment, interest to perform your own experiments and analyze your results.
- Excellent student track records.

- Experience (or interest) with collaborative and multidisciplinary work.
- Passionate about applied science.
- General curiosity to understand fundamental aspects related to applications.

**An applicant must have completed by 31 July 2024 or preferably earlier (to start employment on 1 August 2024) or by 31 December 2024 or preferably earlier (to start employment on 1 January 2025)**

- a master's degree awarded by a university, or
- a study programme that in the awarding country gives eligibility for doctoral level studies

in chemical engineering, chemistry, materials science, or a closely related field. Preferably with MSc in physical chemistry and/or nanomaterials, with knowledge about lignocellulosics. A good command of English is required, Finnish language is not.