Postdoctoral Researcher in Controlled Porous Cellulose

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Aalto University

Aalto University is where science and art meet technology and business. We shape a sustainable future by making research breakthroughs in and across our disciplines, sparking the game changers of tomorrow and creating novel solutions to major global challenges. Our community is made up of 13 000 students, 400 professors, and more than 4 500 other faculty and staff working on our dynamic campus in Espoo, Greater Helsinki, Finland. Diversity is part of who we are, and we actively work to ensure our community's diversity and inclusiveness. This is why we warmly encourage qualified candidates from all backgrounds to join our community.

The School of Chemical Engineering is one of the six schools of Aalto University. It combines natural sciences and engineering in a unique way.

The position

The successful candidate will carry out cutting edge work on the development of controlled pore cellulose (CPC) materials within the biobased materials group of Thad Maloney. These are regenerated cellulosic particles with defined meso and microporosity and corresponding high surface area. CPC materials have a wide range of industrial and consumer product applications in e.g. food, pharma, personal care and engineered composites. The substation of microplastics and environmentally questionable materials with CPC will enhance the sustainability of the world and open up highly potential commercial possibilities.

The scientist will synthesize, characterize and study applications of CPC materials. The work will be carried out within a 2-year multi-party project including various academic and industrial partners. The interaction of water with cellulose, swelling, hornification (structural changes from drying) are important themes of the project.

The research labs at Aalto a sufficient for most of the analytical work, though international collaboration is encouraged. The work targets high scientific publications and the development of novel materials suitable for scale-up to mass production. This "duel mandate" is challenging and will require an exceptionally strong candidate.

Scientific environment

The Department of Bioproducts and Biosystems (BIO2), one of three departments in the School of Chemical Engineering at Aalto University, has an internationally leading reputation in basic and applied research for the development of advanced materials from natural resources. It is one of Europe's leading research and higher education institutions in the field of sustainable chemistry and engineering based on the utilization of renewable resources.

BIO2 aims to contribute to the development of novel solutions to move towards sustainable primary production and processing systems that can produce materials with fewer inputs, less

environmental impact, and reduced greenhouse gas emissions. Within bioscience, the department has research in bioprocess technology, molecular biotechnology, enzyme technology, metabolic engineering, synthetic biology, biomolecular, and biohybrid materials. Other strengths of the department include sustainable materials and products based on lignocellulose, ranging from nanomaterials to novel cellulose-based textiles.

Requirements

- Recently obtained PhD (within five years) in materials science, chemistry or similar.
- Experience with cellulosic materials.
- Strong experience with material analytical methods.
- Willing to commit for a 2 year period.
- A proven track record of scientific excellence and innovation.
- The ability to work independently in a laboratory environment.

Additionally, the following skills are appreciated

- Experience with porous materials.
- Experience with gas sorption and other porosity methods.
- Knowledge of water-cellulose interactions.
- Experience with dissolution and regeneration of cellulosic materials.

What we offer

The candidate will be granted fixed-term contract for 24 months. The expected starting salary of a postdoctoral researcher is approximately 3900-4100 EUR/month depending on experience.

Needed equipment is in place for experimental work. This includes: state of the art gas sorption equipment, thermoporosimetry analysis, a range of SEM and other microscopes, x-ray scattering, equipment for processing, dissolving, regenerating cellulosic materials. There is a very good local scientific community extending from Aalto University to VTT and other institutions on the Otaniemi campus. More than 10 companies will participate in the SUPER project under which the work will be carried out. Additionally, there are good possibilities to build internation networks through conference, short term visits etc.

Ready to apply?

You can send your application or enquiry directly to thaddeus.maloney@aalto.fi

The application should be 1 page and include: motivation, qualifications and planned contribution to the project.