Battery research and development helsinki

Battery research and development helsinki

The Next Generation Battery Materials and Concepts project will develop materials and their processing technologies for solid-state lithium batteries (SSLB). Its focus is on materials for new lithium-metal anodes, both ceramic and polymeric electrolytes, as well as nickel-manganese-cobalt oxide (NMC) cathodes, and especially the phenomena at the interphases between the components. In addition to state-of-the-art slurry coating and printing processes, pulsed laser (PLD) and atomic layer (ALD) thin film deposition processes will be studied.

Finnish companies are global frontrunners in these processes. Moreover, cellulose-based webs will be used to reinforce battery components. The project will combine the thin film processing know-how by Pulsedeon Ltd and Beneq Ltd, with paper processing experience by Tervakoski Oy (Delfort), and battery materials and manufacturing skills by the research organizations.

Aalto University, Tampere University and VTT Technical Research Centre of Finland Ltd will support the companies in the synthesis and characterization ofbattery materials and components. The objective is to demonstrate the functionality of the materials and concepts developed in nickel-manganese-cobalt-based solid-state lithium battery pouch cells. International cooperation with German, French, Italian and US companies and research organizations is foreseen.

The research organizations have received a total funding of about 1.2 MEUR from Business Finland for three years (2021-2024). The project is a part of Business Finland"s Smart Mobility and Batteries from Finland program.

At Aalto University, we create the conditions needed for innovation, economic growth, employment and wellbeing. Our research focuses on seven key areas combining four core competences in the fields of ICT, materials, arts, design and business together with three grand challenges related to energy, living environment, and health.

The Department of Chemistry and Materials Science focuses on micro-, nano- and atomic scale engineering of compounds and materials. Our work in these areas encompasses synthesis, characterization and computational research. The research in the department focuses on advanced and functional materials, chemical synthesis, energy storage and conversion, as well as, molecular and materials modelling. Our teaching provides students a solid background for these topics.

Electrochemical Energy Conversion Research Group, led by prof. Tanja Kallio, investigates and develops materials and devices for electrochemical energy conversion and storage. The group"s main research areas are:

Battery research and development helsinki

In the NextGenBat project, Tampere University (TAU) will implement its know-how on ceramic materials processing and pulsed laser deposition (PLD) coating technology to sensitive battery materials.

The TAU Ceramic materials research group investigates materials related to the PLD process, e.g., raw material development, target processing and post treatments of coatings. The target materials and structures of PLD are in a focal role for developing reliable and effective components for lithium-ion batteries.

Multidisciplinary, foundation-based Tampere University is Finland"s second-largest university. TAU conducts scientific research in technology, health and society and provides the highest education within these fields. Tampere University Foundation that operates as Tampere University is also the majority shareholder of Tampere University of Applied Sciences. This new higher education community in Tampere consists of 30,000 students, 330 professors, and 4,400 employees.

Materials Science and Environmental Engineering (MSEE) is one of the units under Faculty of Engineering and Natural Sciences. MSEE has three research fields: Engineering Materials Science (EMS), Chemistry and Advanced Materials, and Bio and Circular Economy. The Engineering Materials Science research activities cover all material groups, i.e., metals, ceramics, polymers, and composites and technologies like surface engineering, paper and packaging, and tribology.

The Ceramic Materials research group, headed by prof. Erkki Lev?nen, focuses on research of green processing and properties of functional and engineering ceramics. The group has expertise on and access to equipment for whole manufacturing steps for ceramic materials, from powder synthesis and processing to shape forming and sintering. Current interlinked research highlights are; green scCO2 assisted laser processing of ceramics, inorganic circular economy, ceramics via PLD; plastic deformation of thin film alumina and 3D manufacturing of functional ceramic materials and structures.