

## Pressemitteilung

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## Circular economy: joint project aims to increase recycling rate of lithium-ion batteries

**Chemist Prof. Jan J. Weigand and his team at TU Dresden are partnering in a joint project aimed at improving the ecological footprint of lithium-ion batteries (LIBs). The project led by the company Elyte Innovations GmbH is named "SWELL – Recovery of Electrolyte Salts and Solvents", and funded by the German Federal Ministry of Economics and Climate Protection. In contrast to most previous research approaches, the projects does not focus on recycling the metals in LIBs, but on recovering the non-metallic components, including lithium salts, solvents and electrolyte additives.**

Electromobility is a crucial building block for the energy transition. Most electric vehicles today use lithium-ion batteries as their main energy storage device, as these are extremely versatile due to their high energy and power density. Due to the increased demand in battery production in recent years, the raw material requirements for lithium, cobalt and other metals have also increased enormously. The costly extraction of these materials entails numerous ecological risks. Effective recycling of used batteries therefore represents an important sustainability factor for this technology.

While established recycling processes have focused predominantly on recovering the metals contained in LIBs, the "SWELL" project is addressing the recovery of the non-metallic components, i.e. the electrolytes, consisting of lithium salts, solvents and electrolyte additives, for the first time. "The electrolytes are largely lost in previous processes in the form of thermal recycling or duncycling. However, the electrolyte components have significant material value and contain critical, environmentally relevant resources, such as lithium, fluorine and phosphorus. Their recovery and efficient reprocessing with the aim of direct reuse in LIBs is therefore of great interest and can lead to a significant increase in the sustainability of battery cell production," explains team member Dr. Kai Schwedtmann from the Chair of Inorganic Molecular Chemistry at Technische Universität Dresden.

To increase the material recovery rates during the recycling of LIBs, the team led by Prof. Jan J. Weigand is working on efficient separation methods of liquid and solid electrolyte components. "By developing and evaluating such a method, we aim to improve access to battery materials in Europe and reduce the environmental footprint of LIBs. We can achieve these goals by providing secondary components from cost-efficient processes in the future, thereby reducing dependencies along the battery value chain on non-European suppliers," TUD project manager Jan J. Weigand confirms the project aim.

The project is supported by the lead partner Jülich and funded by the German Federal Ministry of Economics and Climate Protection. Led by the company Elyte Innovations GmbH, the consortium includes TU Dresden and Fuchs Schmierstoffe GmbH.

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