Green Car Congress
Energy, technologies, issues and policies for sustainable mobility

BASF and KIT to investigate opportunities of multilayered anodes for Li-ion batteries

20 October 2021

One potential solution for enhancing capacity and production efficiency of lithium-ion batteries is to subdivide electrodes into dedicated functional layers. For example, a thin primer layer below the actual active anode helps to improve adhesion performance. At the same time, the overall binder content is reduced, resulting in higher energy density. Application via simultaneous multilayer coating skips additional process steps that would increase costs and wastage.

Both academia and some first battery manufacturers are beginning to explore this approach. However, the potential range of coating formulations which can be combined is yet unknown.

To address this issue, BASF and Karlsruhe Institute of Technology (KIT) have joined forces to investigate the formulation boundary conditions in multilayer battery coatings within a research project supported by public co-funding. This research project is part of the "Batterie 2020 Transfer" research cluster initiated by the German Federal Ministry of Education and Research.

The goal of the joint project is to design a fully established formulation and coating model for multilayered battery coatings. While BASF specialists provide their formulation experience as well as know-how in application tests for defining the range of potentially combinable functional layers, KIT experts will implement those into and expand existing coating stability models.

> *By applying several functional layers at once, we can meet the demanding requirements of tomorrow's lithium-ion batteries.*
>
> —Prof. Wilhelm Schabel, who leads the participating group "Thin Film Technology" at KIT

> *With BASF as a complementary partner in this project, we are confident about extending the theories of multilayer coating by this major step.*
>
> —Dr. Philip Scharfer, co-head of the KIT research group

BASF is a leading player in the battery materials market focusing on high-performance cathode active materials (CAM) and anode binders for both standard tasks and tailored solutions, operating production facilities all around the globe. To enhance the performance of lithium ion-batteries in terms of increased range and reduced charging time, BASF collaborates with its academic network to further develop its smart materials and production processes with reduced CO_2 footprint.