

Anode-free all-solid-state batteries: From thin film to bulk

- AfreeSSB -

Martin Finsterbusch¹; Jędrzej Morzy²; Moritz Futscher²; Yaroslav Romanyuk²; Juan Carlos González-Rosillo³; Alex Morata³; Beat Ruhstaller⁴; Raúl Aragonés⁵; Bernd Schineller⁶; Michael Heuken⁶

1) Institute of Energy Materials and Devices (IMD-2); Forschungszentrum Jülich GmbH; Wilhelm-Johnen-Straße; 52425 Jülich

2) Laboratory for Thin Films and Photovoltaics, Empa – Swiss Federal Laboratories for Materials Science and Technology, Überlandstrasse 129, 8600 Dübendorf, Switzerland

3) Catalonia Institute for Energy Research (IREC) Jardins de les Dones de Negre 1, Sant Adrià del Besòs, 08930 Barcelona, Spain

4) Fluxim AG, Katharina-Sulzer-Platz 2, 8400 Winterthur, Switzerland

5) AEInnova - Alternative Energy Innovations SL, Pare Llaurador 169, 08224 - Terrassa, Barcelona, Spain

6) AIXTRON SE, Dornkaulstraße 2, 52134 Herzogenrath

The AfreeSSB project aimed to develop Generation 4 all-solid-state batteries (SSBs) with high power and energy densities, combined with fast charging/discharging, deep discharging cycles, long cycle life, and safe operation in a wide temperature range. Potential applications for these batteries include high-end and mobile applications such as drones, robots, aerospace, or urban mobility.

Specific innovation objectives included: i) The development of anode-free thin-film SSBs with high power densities, ii) the transfer of the anode-free concept to bulk cathodes for high energy densities, iii) the development of in-operando characterization methods, and iv) the validation of the project results on industrial level and demonstrate a prototype in an operational environment.

We will present the project results that have led to multiple publications and conference presentations. Especially, the advances on thin film batteries and the lessons learned for integrating extremely thin solid-state separators into full cells. Advances on new CNT based current collectors manufactured via roll-to-roll processing for anode-free all-solid-state batteries and new software and measurement hardware product for battery testing. The results will help to push SSBs for industrial IoT that require safe operation in a wide temperature range.

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