

BMBF Project About the Conductivity of Solid Electrolytes Starts

15 September 2022 – As part of the joint BMBF project STAMPF, Helmholtz Institute Münster (HI MS; IEK-12) of Forschungszentrum Jülich and rhd instruments GmbH & Co. KG (RHD) are working on the development of a best-practice guide for the determination of the conductivity of solid electrolytes. The Federal Ministry of Education and Research (BMBF) is funding the project, whose (German) abbreviation "STAMPF" stands for "Standardised measurement and processing protocols and automated evaluation of impedance data for solid electrolytes", with half a million euros. The main goal of STAMPF is to advance the development and benchmarking of solid electrolytes for solid-state batteries.



Photo showing the test setup „CompreDrive“ for solid state battery and solid electrolyte research (rhd instruments GmbH & Co. KG).
© Michael Schöll



Solid Electrolytes as the Most Important Component of Solid-State Batteries

"Solid-state battery technology allows us to replace liquid electrolytes with polymer or inorganic solid electrolytes," explains Dr Nella Vargas-Barbosa from HI MS, who is leading the project.

Apart from polymer-based solid-state batteries, the leap to large-scale industrial production has not yet been made. This is partly due to the lack of availability of solid electrolytes in the high-scale range. The development of new solid electrolytes and the optimisation of known materials also face a challenge in electrochemical characterisation. This lies in a lack or incomplete standardisation of (i) manufacturing processes and sample preparation steps, (ii) test cells and test setups, (iii) measurement procedures, and finally (iv) data evaluation procedures.

Best Practice Guide for Conductivity Determination

"Together with our partners at Helmholtz Institute Münster, we are striving to develop reference materials for determining the conductivity of solid electrolytes, and to optimise their measurement and processing protocols in the three-year STAMPF project. Based on this, our team will design test cells and test set-ups for existing designs and standardise measurement and evaluation routines including all parameters," says Dr Marcel Drüschler from RHD, summarising main tasks. The goal is to develop an innovative package for performing valid, reproducible, and robust measurements of the temperature-dependent

conductivity of solid electrolytes, which includes (i) at least one reference standard, (ii) customised test cells, as well as (iii) a best-practice guide for performing and evaluating the experiments. Another ambitious goal is the (iv) automated data analysis of several thousand impedance spectra for end-to-end industrial quality control of solid electrolytes, and thus solid batteries in the long term.

Contacts:

HI MS: Dr. Nella Vargas-Barbosa, n.vargas-barbosa@fz-juelich.de

RHD: Dr. Marcel Drüschler, drueschler@rhd-instruments.de

SPONSORED BY THE



Federal Ministry
of Education
and Research