

# Solid state sUlfide Based LI-MEtal batteries for EV applications

## D4.4 Report on layer processing towards upscaling

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## Publishable summary

The deliverable D4.4 “Report on layer processing towards upscaling” concludes the process evaluation for the fabrication of cathode and separator compounds for all solid-state batteries in WP4 of SUBLIME. Besides the processing steps for wet coating, infiltration, and dry processing which have been reported in Deliverable D4.3 “Report on formulation and process at lab scale”, the extrusion process has been identified as a possible method. It combines intensive mixing and therefore a homogenous distribution of materials with a high throughput, suitable for the fabrication of larger numbers of compounds. For the initial establishment of relevant parameters, the speed, temperature and mass flow rate in the extrusion process have been varied during the fabrication of cathode and separator layers. For analysis, the adhesive strength, electrochemical impedance, ionic conductivity as well as discharge capacity have been considered as most relevant parameters. In a first step, this has been performed with commercial solid-state electrolyte Li3PS4 and NCM 811 cathode active material. After the successful implementation of a parameter set, the transfer to the SUBLIME GenIV electrolyte Li6PS5Cl and SUBLIME NCM 811 material was executed. Based on the electrochemical and physicochemical results, the necessity of calendaring as additional processing step for the fabrication solid-state cathode and separator components has been identified and will be addressed in future works.