

# Solid state sulfide Based LI-Metal batteries for EV applications

## Deliverable 3.4 Report on the protective strategies on Lithium metal

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## Publishable summary

This report aims to provide information for tasks related to Work Package 3 (WP3) of the SUBLIME project. Main objectives of WP3 are material optimization and scale up of high performing and safe all solid-state batteries for EV applications. WP3 is further sub tasked to: (i) WP3.1 – where the main focus is the sulphide solid electrolyte design and upscale; (ii) WP3.2 – Li metal protection design and upscale; (iii) WP3.3 – cathode design and upscale (the main focus of this report).

This report addresses the lithium metal protection, focusing on the development of solutions to prevent the formation of lithium dendrites creating short circuits and safety issues.

Three promising routes were explored and cutting edge coatings were applied on the lithium metal foil as protective layers to mitigate dendrite formation/short circuits, focusing on polymeric coating and inorganic coatings done with two deposition technics.

Even if no definitive solution solving dendritic growth was found in the investigations, several solutions have shown positive results which have now to be confirmed using cleaned lithium surfaces: indeed initial state of the lithium metal appeared during the investigation as a key driver for performances, the presence of native surface layers adding additional impedance.