

Research Activity: **Lithium metal solid-state and semi-solid batteries development**

The researcher will focus on the development and optimization of solid-state and semi-solid batteries with Li metal anodes for automotive applications. The main objective will be to improve the compatibility of gel and sulfide-based solid electrolytes with Li metal to enhance stability, safety and cycling performance. The work will involve assembling test cells, implementing systematic electrochemical protocols to assess performance using techniques such as impedance spectroscopy, galvanostatic cycling, and rate capability testing. Optimization will center on tuning interfaces between Li metal and electrolytes to minimize resistance, dendrite formation and degradation. In parallel, structural properties of electrodes and interfaces will be examined using microscopy, and surface analysis methods to establish correlations between structure and electrochemical behavior. Algorithms and optimization matrices will be applied to guide formulation choices and research progress.