Technical Project Series

Novel Metal Silicates for Enhanced Lead Battery Performance

Expected Impact

Enhancing charge recovery and pulse power performance is vital for improving **lead battery performance** in auxiliary applications.

This project will deliver guidelines for optimizing **positive electrode performance** to meet these two key performance indicators (KPIs). Examination of the impact at both electrical and microstructural levels will be conducted, offering insights into how cohesion and stratification impact charge recovery (CR) and PPC.

Initial Results

1. Defined lab-based and auxiliary battery test packages with current work focused on screening oxides using 2V lab-sized cells.

2. Conducted charge recovery test, following IEC 60095-8, on oxide and silicate variants at multiple temperatures, benchmarked two controls (one without additives and one with silicate).

3. Completed CCA testing (following EN standards) on lab-based cells, providing initial comparisons of pulse power performance.

CONSORTIUM FOR BATTERY INNOVATION

Objective

This project aims to improve pulse power capability (PPC) and charge recovery by incorporating silicate and metal oxide additives into the **positive electrode**.

Preliminary studies on silicates have shown that, in small amounts, they enhance cold cranking amperage (CCA) and charge acceptance in the positive electrode.

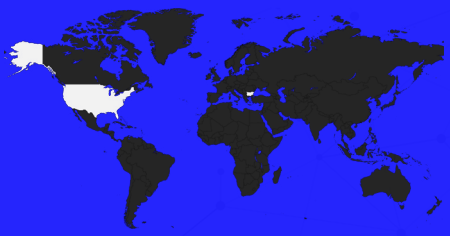
Project Info

Duration: 2 years

Partners: Hammond Group, East Penn Manufacturing, Bulgarian Academy of Sciences

Focus: Automotive Applications

Location: Bulgaria, USA



Research Imagery

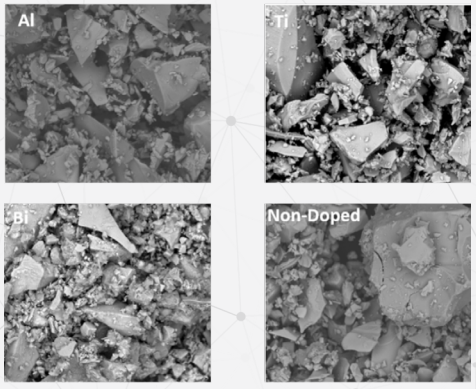


Figure 1: Microstructural characterization of the electrodes doped with different oxides and lead monosilicate (LMS). The structural behavior does not change, varying levels of faceted lead sulfates are present across the analyzed samples.