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Sodium-Ion and sodium Metal BAtteries for efficient and sustainable next-generation energy storage

GRANT AGREEMENT No. 963542

SIMBA – Deliverable Report

D 5.1 – Report on industrial size cell (1 Ah) test results

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Written By	Faduma Maddar (WMG), Ivana Hasa (WMG), Tengfei Song (UBham), Emma Kendrick (UBham), Waleri Milde (FHG), Stephan Lux (FHG)	2023-08-07
Checked by	Magda Graczyk-Zajac (TUDa)	2023-08-22
Reviewed by (if applicable)	Piter Miedema (UNR) Ying Zhan (TUDa)	2023-08-15
Approved by	Ralf Riedel (TUDa)	2023-08-31
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Publishable summary

The main goal of the SIMBA project is the development of a highly cost-effective, safe, all-solid-state-battery with sodium as mobile ionic charge carrier for stationary energy storage applications. Although in many ways SIBs are similar to LIBs, there are still a number of persistent scientific and technical challenges to be addressed in understanding electrochemical processes and degradation mechanisms, electrode, solid-state electrolyte and cell manufacturing.

Deliverable 5.1 is associated with task T5.1 (Safety and performance testing) of work package 5 as well the detail design of the battery management system (BMS). This document outlines the activities related ST5.1.1 and ST5.1.2. carried out by UBham at coin cell level and WMG at pouch cell level on storage conditions, formation protocol development, temperature, and discharge rate effect on the performance of SIMBA cells. Some of these tests were also coupled with post-mortem analysis to evaluate the effect of different cycling conditions on the electrode materials. All cells were produced by processing materials developed in WP2 together with some preliminary work on layered oxides, all coupled with a liquid electrolyte. These cells represent a good case study from which knowledge can be built and transferred to solid state cells. Furthermore, FHG-ISE have outlined their BMS design in which the battery cells integrated sensors information will be read. Results from UBham and WMG will be used to develop BMS algorithms that will be further implemented in tasks T5.2.