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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

<< D6.2 – Deliver process for 80% of materials to be
reclaimed from the solid-state cell >>

Deliverable No.	SIMBA D6.2	
Related WP	6	
Deliverable Title	Deliver process for 80% of materials to be reclaimed from the solid-state cell	
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Publishable summary

The efforts that devoted into deliverable D6.2 were focusing on materials recycling/recover from solid-state cells that developed in SIMBA. This single-layer solid-state cells consisted of an innovative sodium polysiloxane (Na-PSiO) membrane as solid electrolyte which was developed in WP2. The recycling processes started by implanting the existing mechanical-sorting process which was initially designed for SIMBA baseline cells (liquid electrolytes). The objective was to recover various fractions, including high-purity aluminum and the solid electrolyte membrane, and to assess the suitability of these fractions for chemical processing as described in Deliverable D6.1.

During M36-M42, modifications were made to the mechanical-sorting process to handle solid-state cells. The process successfully recovered high-purity aluminum from the casing and current collectors. An additional two-step dissolution process was developed to recover the solid electrolyte membrane, which involved dissolving the membrane in hot deionized water and hot DMSO. This method effectively separated the membrane from the aluminum casing and active materials, resulting in clean aluminum fractions.

The results demonstrate that the adapted mechanical-sorting process and the new dissolution step efficiently recover over 80% of materials from single-layer solid-state cells. These recovered materials, including the solid electrolyte membrane and active materials, are suitable for further chemical processing as outlined in Deliverable D6.1. This achievement supports sustainable recycling practices and advances the circular economy in battery disposal.

Appendix B- Acknowledgement

The author(s) would like to thank the partners in the project for their valuable comments on previous drafts and for performing the review.

Project partners:

#	Partner	Partner Full Name
1	TUDa	TECHNISCHE UNIVERSITÄT DARMSTADT
2	UU	UPPSALA UNIVERSITET
3	UBham	THE UNIVERSITY OF BIRMINGHAM
4	WMG	THE UNIVERSITY OF WARWICK
5	KIT	KARLSRUHER INSTITUT FÜR TECHNOLOGIE
6	CEA	COMMISSARIAT À L'ÉNERGIE ATOMIQUE ET AUX ÉNERGIES ALTERNATIVES
7	IFE	INSTITUTT FOR ENERGITEKNIKK
8	SAS	USTAV ANORGANICKEJ CHEMIE SLOVENSKA AKADEMIA VIED (Institute of Inorganic Chemistry, Slovak Academy of Sciences)
9	FHG	FRAUNHOFER GESELLSCHAFT ZUR FÖRDERUNG DER ANGEWANDTEN FORSCHUNG E.V.
10	JM	JOHNSON MATTHEY PLC
11	Elkem	ELKEM AS
12	YUN	YUNASKO-UKRAINE LLC
13	SAFT	SAFT
14	Altris	ALTRIS AB
15	Recupyl	TES RECUPYL SAS
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