November 7, 2022
DOWA HOLDINGS CO., LTD.
AKITA UNIVERSITY

DOWA and Akita University Succeed in Recycling Cathode Materials from Spent Lithium-ion Batteries

DOWA ECO-SYSTEM CO., LTD. (14-1 Sotokanda 4-Chome, Chiyoda-ku, Tokyo; Capital: 1 billion yen; President: YANAI Yasuharu), a subsidiary of DOWA HOLDINGS CO., LTD. (same location; Capital: 36.4 billion yen; President: SEKIGUCHI Akira), and a research group at Akita University (President: YAMAMOTO Fumio), led by specially appointed Assistant Professor ABE Yusuke at the Joint Research Center for Electric Architecture and Professor KUMAGAI Seiji of Graduate School of Engineering Science, succeeded in recycling cathode materials from spent automotive lithium-ion batteries which had been inactivated with heat treatment, through a joint research supported by the Dowa Techno Fund*.

Lithium-ion batteries (hereinafter LIBs), which are expected to play a major role in efficient energy utilization to realize a decarbonized society, have become increasingly widespread in various fields. To create a sustainable supply chain, it is necessary to build a recycling system where spent LIBs can be re-manufactured into new LIBs, with a particular need for the recycling of rare metals such as cobalt and nickel used in cathode materials.

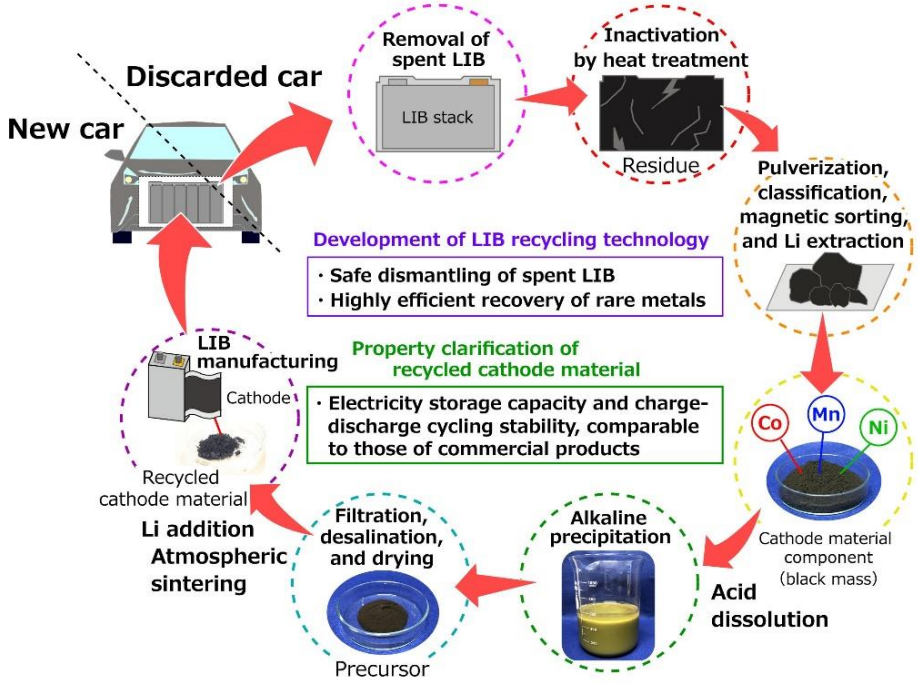
DOWA ECO-SYSTEM and Akita University are advancing the empirical research to recycle the cathode materials with the goal of expanding spent LIBs recycling in the future. For this research, we recreated cathode material using cathode material components (Black mass) with some impurities collected from spent LIBs which had been inactivated by heat treatment. As a result, we were able to attain similar electrochemical performance to automotive LIBs on the market in electricity storage capacity and charge-discharge cycling stability.

Moving forward, we are targeting on developing a process to control impurity content more efficiently while learning more about the relationship between the nature of cathode impurities and battery performance in detail.

The achievement of this joint research has been reported in the “Journal of Electroanalytical Chemistry” published by the International Society of Electrochemistry on October 1st, and are expected to be presented at the 63rd Battery Symposium in Japan on November 9.

The DOWA Group and Akita University will continue the joint research towards creating a sustainable supply chain for LIBs.

*Dowa Techno Fund: DOWA HOLDINGS CO., LTD. offers financial and technological support for joint research and development in research with potential and advanced technology research at universities and public institutions, revitalizing and increasing the level of research.



References

[Published Papers]

Journal : Journal of Electroanalytical Chemistry (published October 1, 2022)

Title : Electrochemical performance of $LiNi_{1/3}Co_{1/3}Mn_{1/3}O_2$ cathode recovered from pyrolysis residue of waste Li-ion batteries

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DOI : https://doi.org/10.1016/j.jelechem.2022.116761

[Overview of DOWA ECO-SYSTEM CO., LTD.]

1. Head office : 14-1 Sotokanda 4-chome, Chiyoda-ku, Tokyo
2. Representative : YANAI Yasuharu
3. Founded : October 2006
4. Capital : 1 billion yen
5. Number of employees : about 2,600 (DOWA ECO-SYSTEM consolidated, as of end of March 2022)
6. Shareholders : DOWA HOLDINGS CO., LTD. 100%
7. Business : Environment and Recycling business (Resource recycling, Waste treatment, Soil remediation, Logistics, Consulting)

[Overview of Akita University]

1. Head office : 1-1 Tegatagakuen-machi, Akita-shi, Akita
2. President : YAMAMOTO Fumio
3. Founded : May 1949
4. Details : Akita University website (https://www.akita-u.ac.jp/)

[Past press releases related to this release]

"DOWA ECO-SYSTEM Increases Processing of Lithium-Ion Batteries and Enables Both Safe Treating and Efficient Metal Recycling" December 17, 2018
https://ir.dowa.co.jp/en/ir/news/news-5617789479587210707.html

“DOWA ECO-SYSTEM Expands Used Lithium-Ion Battery Recycling Capacity” April 19, 2021
https://ir.dowa.co.jp/en/ir/news/news20210419.html

Contact for inquiries

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https://ir.dowa.co.jp/en/ir/contact1.html