

Development of a Process for Recovering Nickel and Cobalt Sulfates from Used Lithium-ion Batteries

DOWA ECO-SYSTEM CO., LTD. (14-1, Sotokanda 4-Chome, Chiyoda-ku, Tokyo; Capital: 1.0 billion yen; President: YANAI Yasuharu, hereinafter "DOWA ECO-SYSTEM"), a subsidiary of DOWA HOLDINGS CO., LTD. (same location; Capital: 36.4 billion yen; President: FUKUDA Kensaku), has developed a process for recovering nickel and cobalt sulfates from used lithium-ion batteries (hereinafter "LIBs") and has commenced demonstration testing toward direct sales to cathode producers.

As the volume of used LIBs is expected to increase, DOWA ECO-SYSTEM aims to establish an integrated recycling process—from the safe inactivation of used LIBs to the refining of raw materials—and to enhance recovery technologies, thereby ensuring a stable supply of critical raw materials.

Background

LIBs, which are expected to play a significant role in the efficient use of energy toward realizing a carbon-neutral society, are increasingly being adopted in various applications, including electronic devices, hybrid and electric vehicles (HV/EV), and residential use.

Meanwhile, critical raw materials such as lithium, cobalt, and nickel—essential materials for LIB cathodes—are geographically concentrated and produced in relatively limited quantities compared with common metals. As demand continues to grow, competition for securing these resources is expected to intensify globally. Therefore, in addition to natural resource development, the realization of recycling critical raw materials from used LIBs is increasingly required.

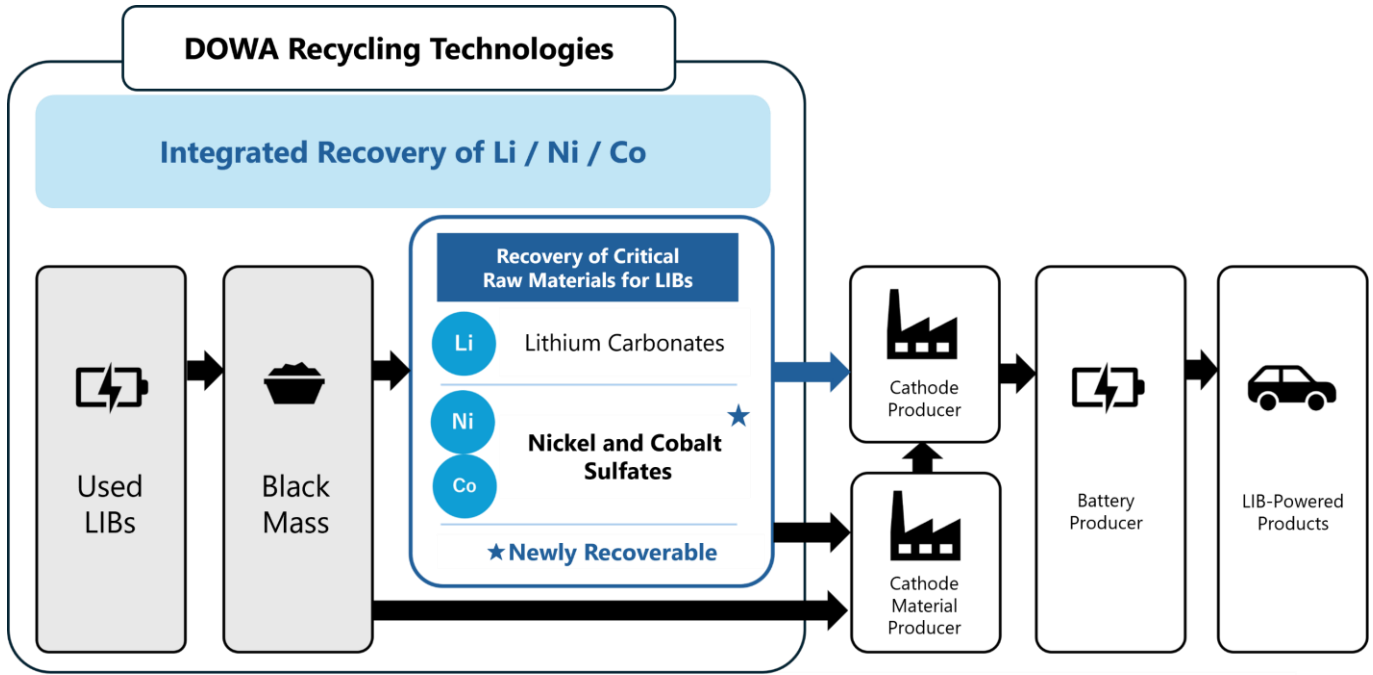
Overview of the New Recovery Process

DOWA ECO-SYSTEM has one of the largest capacities in Japan for recovering black mass, an intermediate product for cathodes, from used LIBs that are safely processed at its own waste treatment facilities. Lithium contained in black mass has been recovered as lithium carbonates, and its applicability for cathode materials has been verified through demonstration testing.

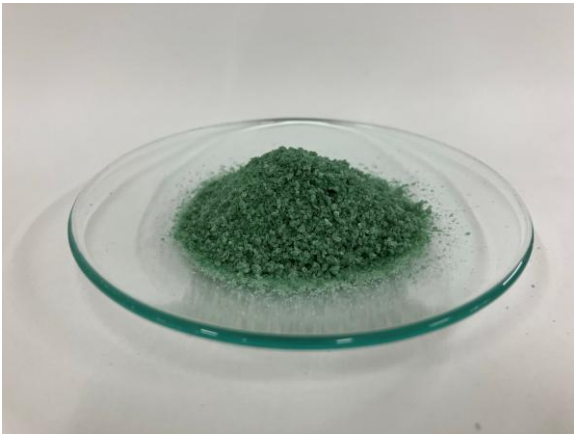
With the newly developed process for recovering nickel and cobalt sulfates from black mass, DOWA ECO-SYSTEM has established integrated recycling processes covering the recovery of the major critical raw materials contained in LIBs (lithium, nickel, and cobalt). As a result, it is now possible to recover all rare metals contained in used LIBs, for which recovery targets have been set by 2030 under the EU Battery Regulation.

Nickel and cobalt sulfates recovered through this process are currently being supplied to cathode material producers as samples, and performance evaluations are underway.

This process has been established through the integration of black mass recovery technology possessed by DOWA ECO-SYSTEM and refining technology possessed by another subsidiary, DOWA ELECTRONICS MATERIALS CO., LTD. (same location; Capital: 1.0 billion yen; President: SUZUKI Takehiko). The entire recycling process is currently under patent application.



Critical Raw Materials Recovering Process from Used LIBs



Nickel and Cobalt Sulfates



Overall View of the Demonstration Plant

Future Outlook

Going forward, DOWA ECO-SYSTEM will verify the operational stability and product quality of the demonstration plant, while continuing evaluations through the provision of samples to cathode material producers. Based on these efforts, DOWA ECO-SYSTEM aims to scale up the process for future mass production.

In addition, DOWA ECO-SYSTEM will consider expanding this initiative not only within Japan but also to its overseas group sites.



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

1. Head Office: 14-1, Sotokanda 4-Chome, Chiyoda-ku, Tokyo
2. Established: October 2006
3. Capital: 1.0 billion yen
4. Representative: YANAI Yasuharu, President and Representative Director
5. Employees: Approx. 3,700 (DOWA ECO-SYSTEM consolidated, as of the end of March 2026)
6. Shareholder: DOWA HOLDINGS CO., LTD. (100%)
7. Business: Environmental Management and Recycling
(Resource Recycling, Waste Treatment, Soil Remediation, Logistics, Consulting)

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